PCTEST ENGINEERING LABORATORY, INC.
18855 Adams Ct, Morgan Hill, CA 95037 USA
Tel. +1.410.290.6652 / Fax +1.410.290.6654
http://www.pctest.com

SAR EVALUATION REPORT

Applicant Name:
Apple, Inc.
One Apple Park Way
Cupertino, CA 95014 USA

Date of Testing:
01/14/19 – 02/01/19
Test Site/Location:
PCTEST Lab, Morgan Hill, CA, USA
Document Serial No.:
1C1811080027-01-R1.BCG

FCC ID:	**BCGA2124**
APPLICANT:	**APPLE, INC.**

DUT Type:	Tablet Device
Application Type:	Certification
FCC Rule Part(s):	CFR §2.1093
Model:	A2124
Additional Model(s):	A2125

Equipment Class	Band & Mode	Tx Frequency	SAR
			1g Body (W/kg)
PCB	GPRS/EDGE 850	824.20 - 848.80 MHz	1.02
PCB	GPRS/EDGE 1900	1850.20 - 1909.80 MHz	1.12
PCB	UMTS 850	826.40 - 846.60 MHz	1.17
PCB	UMTS 1750	1712.4 - 1752.6 MHz	1.18
PCB	UMTS 1900	1852.4 - 1907.6 MHz	1.04
PCB	LTE Band 12	699.7 - 715.3 MHz	1.16
PCB	LTE Band 17	706.5 - 713.5 MHz	N/A
PCB	LTE Band 13	779.5 - 784.5 MHz	1.01
PCB	LTE Band 14	790.5 - 795.5 MHz	0.91
PCB	LTE Band 26 (Cell)	814.7 - 848.3 MHz	1.09
PCB	LTE Band 5 (Cell)	824.7 - 848.3 MHz	1.19
PCB	LTE Band 66 (AWS)	1710.7 - 1779.3 MHz	1.19
PCB	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	N/A
PCB	LTE Band 25 (PCS)	1850.7 - 1914.3 MHz	1.08
PCB	LTE Band 2 (PCS)	1850.7 - 1909.3 MHz	N/A
PCB	LTE Band 30	2307.5 - 2312.5 MHz	1.19
PCB	LTE Band 7	2502.5 - 2567.5 MHz	1.18
PCB	LTE Band 41	2498.5 - 2687.5 MHz	1.19
DTS	2.4 GHz WLAN	2412 - 2472 MHz	1.19
NII	U-NII-1	5180 - 5240 MHz	0.90
NII	U-NII-2A	5260 - 5320 MHz	0.88
NII	U-NII-2C	5500 - 5720 MHz	1.10
NII	U-NII-3	5745 - 5825 MHz	1.09
DSS/DTS	Bluetooth	2402 - 2480 MHz	1.16
Simultaneous SAR per KDB 690783 D01v01r03:			1.59

Note: This revised Test Report (S/N: 1C1811080027-01-R1.BCG) supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

This wireless portable device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in ANSI/IEEE C95.1-1992 and has been tested in accordance with the measurement procedures specified in Section 1.7 of this report; for North American frequency bands only.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them. Test results reported herein relate only to the item(s) tested.

Randy Ortanez
President

The SAR Tick is an initiative of the Mobile & Wireless Forum (MWF). While a product may be considered eligible, use of the SAR Tick logo requires an agreement with the MWF. Further details can be obtained by emailing: sartick@mwfai.info.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

TABLE OF CONTENTS

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
UMTS 850	Data	826.40 - 846.60 MHz
UMTS 1750	Data	1712.4 - 1752.6 MHz
UMTS 1900	Data	1852.4 - 1907.6 MHz
GPRS/EDGE 850	Data	824.20 - 848.80 MHz
GPRS/EDGE 1900	Data	1850.20 - 1909.80 MHz
LTE Band 12	Data	699.7 - 715.3 MHz
LTE Band 17	Data	706.5 - 713.5 MHz
LTE Band 13	Data	779.5 - 784.5 MHz
LTE Band 14	Data	790.5 - 795.5 MHz
LTE Band 26 (Cell)	Data	814.7 - 848.3 MHz
LTE Band 5 (Cell)	Data	824.7 - 848.3 MHz
LTE Band 66 (AWS)	Data	1710.7 - 1779.3 MHz
LTE Band 4 (AWS)	Data	1710.7 - 1754.3 MHz
LTE Band 25 (PCS)	Data	1850.7 - 1914.3 MHz
LTE Band 2 (PCS)	Data	1850.7 - 1909.3 MHz
LTE Band 30	Data	2307.5 - 2312.5 MHz
LTE Band 7	Data	2502.5 - 2567.5 MHz
LTE Band 41	Data	2498.5 - 2687.5 MHz
2.4 GHz WLAN	Voice/Data	2412 - 2472 MHz
U-NII-1	Voice/Data	5180 - 5240 MHz
U-NII-2A	Voice/Data	5260 - 5320 MHz
U-NII-2C	Voice/Data	5500 - 5720 MHz
U-NII-3	Voice/Data	5745 - 5825 MHz
Bluetooth	Data	2402 - 2480 MHz

1.2 Power Reduction for SAR

This device uses the manufacturer's proprietary motion detect mode to determine proximity to the user's body and set the licensed power level accordingly for SAR compliance. When being used in the hand or the body, the output power for licensed transmitters will always be reduced. Per FCC KDB Guidance, SAR testing was performed only using reduced output powers following the test positions in KDB Publication 616217.

This device additionally utilizes a power reduction mechanism for Bluetooth and 2.4 GHz WLAN operations. When WLAN/Bluetooth is operating simultaneously with certain combinations of 2G/3G4G and 5 GHz WLAN antennas, the output power is permanently reduced. SAR evaluations were additionally performed at the maximum allowed output power for these scenarios to evaluate simultaneous transmission compliance.

Detailed descriptions of the power reduction mechanisms are included in the operational description. The power reduction mechanisms were confirmed during the SAR Evaluation. Appendix G contains a summary of the verification results.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

1.3 Nominal and Maximum Output Power Specifications

This device operates using the following maximum and nominal output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB Publication 447498 D01v06.

1.3.1 2G/3G/4G Output Power for Portable Use Conditions

A. Antenna WF3

Mode / Band		Burst Average GMSK (dBm)		Burst Average 8-PSK (dBm)	
		1 TX Slots	*2 TX Slots*	*1 TX Slots*	*2 TX Slots*
GPRS/EDGE 850	Maximum	**28.00**	**25.00**	**24.75**	**23.75**
	Nominal	**27.25**	**24.25**	**24.00**	**23.00**
GPRS/EDGE 1900	Maximum	**23.00**	**20.00**	**23.00**	**20.00**
	Nominal	**22.25**	**19.25**	**22.25**	**19.25**

Mode / Band		Modulated Average (dBm)			
		3GPP WCDMA	*3GPP HSDPA*	*3GPP HSUPA*	*3GPP DC-HSDPA*
UMTS Band 5 (850 MHz)	Maximum	**19.00**	**19.00**	**19.00**	**19.00**
	Nominal	**18.50**	**18.50**	**18.50**	**18.50**
UMTS Band 4 (1750 MHz)	Maximum	**14.50**	**14.50**	**14.50**	**14.50**
	Nominal	**14.00**	**14.00**	**14.00**	**14.00**
UMTS Band 2 (1900 MHz)	Maximum	**14.00**	**14.00**	**14.00**	**14.00**
	Nominal	**13.50**	**13.50**	**13.50**	**13.50**

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Mode / Band		Modulated Average (dBm)
LTE Band 17	Maximum	**19.80**
	Nominal	**19.30**
LTE Band 12	Maximum	**19.80**
	Nominal	**19.30**
LTE Band 13	Maximum	**19.10**
	Nominal	**18.60**
LTE Band 13 DLCA	Maximum	**17.50**
	Nominal	**17.00**
LTE Band 14	Maximum	**19.10**
	Nominal	**18.60**
LTE Band 26 (Cell)	Maximum	**19.00**
	Nominal	**18.50**
LTE Band 5 (Cell)	Maximum	**19.00**
	Nominal	**18.50**
LTE Band 66 (AWS)	Maximum	**14.50**
	Nominal	**14.00**
LTE Band 4 (AWS)	Maximum	**14.50**
	Nominal	**14.00**
LTE Band 25 (PCS)	Maximum	**14.00**
	Nominal	**13.50**
LTE Band 2 (PCS)	Maximum	**14.00**
	Nominal	**13.50**
LTE Band 30	Maximum	**12.50**
	Nominal	**12.00**
LTE Band 7	Maximum	**12.00**
	Nominal	**11.50**
LTE Band 7 ULCA	Maximum	**12.00**
	Nominal	**11.00**
LTE Band 41 PC3	Maximum	**13.50**
	Nominal	**13.00**
LTE Band 41 PC2	Maximum	**13.50**
	Nominal	**13.00**
LTE Band 41 ULCA	Maximum	**13.50**
	Nominal	**12.50**

B. Antenna WF5

Mode / Band		Burst Average GMSK (dBm)		Burst Average 8-PSK (dBm)	
		1 TX Slots	*2 TX Slots*	*1 TX Slots*	*2 TX Slots*
GPRS/EDGE 850	Maximum	**28.25**	**25.50**	**22.75**	**21.75**
	Nominal	**27.50**	**24.75**	**22.00**	**21.00**
GPRS/EDGE 1900	Maximum	**24.50**	**21.50**	**22.75**	**21.50**
	Nominal	**23.75**	**20.75**	**22.00**	**20.75**

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Mode / Band		Modulated Average (dBm)			
		3GPP WCDMA	*3GPP HSDPA*	*3GPP HSUPA*	*3GPP DC-HSDPA*
UMTS Band 5 (850 MHz)	Maximum	**18.70**	**18.70**	**18.70**	**18.70**
	Nominal	**18.20**	**18.20**	**18.20**	**18.20**
UMTS Band 4 (1750 MHz)	Maximum	**14.50**	**14.50**	**14.50**	**14.50**
	Nominal	**14.00**	**14.00**	**14.00**	**14.00**
UMTS Band 2 (1900 MHz)	Maximum	**14.30**	**14.30**	**14.30**	**14.30**
	Nominal	**13.80**	**13.80**	**13.80**	**13.80**

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Mode / Band		Modulated Average (dBm)
LTE Band 17	Maximum	**20.00**
	Nominal	**19.50**
LTE Band 12	Maximum	**20.00**
	Nominal	**19.50**
LTE Band 13	Maximum	**19.10**
	Nominal	**18.60**
LTE Band 14	Maximum	**19.10**
	Nominal	**18.60**
LTE Band 26 (Cell)	Maximum	**18.70**
	Nominal	**18.20**
LTE Band 5 (Cell)	Maximum	**18.70**
	Nominal	**18.20**
LTE Band 66 (AWS)	Maximum	**14.50**
	Nominal	**14.00**
LTE Band 4 (AWS)	Maximum	**14.50**
	Nominal	**14.00**
LTE Band 25 (PCS)	Maximum	**14.30**
	Nominal	**13.80**
LTE Band 2 (PCS)	Maximum	**14.30**
	Nominal	**13.80**
LTE Band 30	Maximum	**14.50**
	Nominal	**14.00**
LTE Band 7	Maximum	**14.40**
	Nominal	**13.90**
LTE Band 7 ULCA	Maximum	**14.40**
	Nominal	**13.40**
LTE Band 41 PC3	Maximum	**16.00**
	Nominal	**15.50**
LTE Band 41 PC2	Maximum	**16.00**
	Nominal	**15.50**
LTE Band 41 ULCA	Maximum	**16.00**
	Nominal	**15.00**

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

1.3.2 Unlicensed Maximum Output Power

A. Antenna WF1

Mode / Band		Modulated Average (dBm)
Bluetooth BDR/LE	Maximum	**16.00**
Bluetooth EDR	Maximum	**11.50**
Bluetooth HDR	Maximum	**9.50**

Mode / Band		Modulated Average (dBm)			
		Ch. 1-10	Ch. 11	Ch. 12	Ch. 13
IEEE 802.11b (2.4 GHz)	Maximum	**15.25**			**14.00**
	Nominal	**13.75**			**12.50**
IEEE 802.11g (2.4 GHz)	Maximum	**15.25**	**14.00**	**12.00**	**4.00**
	Nominal	**13.75**	**12.50**	**10.50**	**2.50**
IEEE 802.11n (2.4 GHz)	Maximum	**15.25**	**14.00**	**12.00**	**4.00**
	Nominal	**13.75**	**12.50**	**10.50**	**2.50**

Mode / Band		Modulated Average - MIMO (dBm)				
		Ch. 1	Ch. 2-10	Ch. 11	Ch. 12	Ch. 13
IEEE 802.11g/n (2.4 GHz)	Maximum	**14.50**	**15.25**	**12.50**	**10.00**	**3.00**
	Nominal	**13.00**	**13.75**	**11.00**	**8.50**	**1.50**

Note: In MIMO operations, Antenna WF1 transmits at maximum allowed powers as indicated above.

Mode / Band		Modulated Average (dBm)															
		20 MHz Bandwidth						40 MHz Bandwidth					80 MHz Bandwidth				
		Ch. 36	Ch. 40-64	Ch. 104-136,144	Ch. 140	Ch. 149-165	Ch. 100	Ch. 38, 102	Ch. 46-54	Ch. 62	Ch. 110-142	Ch. 151-159	Ch. 42	Ch. 58	Ch. 106	Ch. 122-138	Ch. 155
IEEE 802.11a (5 GHz)	Maximum	**16.25**	**16.50**	**16.00**	**15.00**	**17.25**	**15.50**										
	Nominal	**14.75**	**15.00**	**14.50**	**13.50**	**15.75**	**14.00**										
IEEE 802.11n (5 GHz)	Maximum	**16.25**	**16.50**	**16.00**	**15.00**	**17.25**	**15.50**	**14.00**	**16.50**	**14.50**	**16.00**	**17.25**					
	Nominal	**14.75**	**15.00**	**14.50**	**13.50**	**15.75**	**14.00**	**12.50**	**15.00**	**13.00**	**14.50**	**15.75**					
IEEE 802.11ac (5 GHz)	Maximum	**16.25**	**16.50**	**16.00**	**15.00**	**17.25**	**15.50**	**14.00**	**16.50**	**14.50**	**16.00**	**17.25**	**13.00**	**13.50**	**14.00**	**16.00**	**17.25**
	Nominal	**14.75**	**15.00**	**14.50**	**13.50**	**15.75**	**14.00**	**12.50**	**15.00**	**13.00**	**14.50**	**15.75**	**11.50**	**12.00**	**12.50**	**14.50**	**15.75**

Mode / Band		Modulated Average - MIMO (CDD) (dBm)														
		20 MHz Bandwidth					40 MHz Bandwidth					80 MHz Bandwidth				
		Ch. 36,100-136,144	Ch. 40-48	Ch. 52-64	Ch. 140	Ch. 149-165	Ch. 38, 62-102	Ch. 46-54	Ch. 110-126, 142	Ch. 134	Ch. 151-159	Ch. 42	Ch. 58	Ch. 106	Ch. 122-138	Ch. 155
IEEE 802.11a (5 GHz)	Maximum	**15.00**	**16.00**	**15.50**	**14.00**	**17.25**										
	Nominal	**13.50**	**14.50**	**14.00**	**12.50**	**15.75**										
IEEE 802.11n (5 GHz)	Maximum	**15.00**	**16.00**	**15.50**	**14.00**	**17.25**	**13.00**	**16.50**	**16.00**	**15.00**	**17.25**					
	Nominal	**13.50**	**14.50**	**14.00**	**12.50**	**15.75**	**11.50**	**15.00**	**14.50**	**13.50**	**15.75**					
IEEE 802.11ac (5 GHz)	Maximum	**15.00**	**16.00**	**15.50**	**14.00**	**17.25**	**13.00**	**16.50**	**16.00**	**15.00**	**17.25**	**12.50**	**12.00**	**12.50**	**16.00**	**17.25**
	Nominal	**13.50**	**14.50**	**14.00**	**12.50**	**15.75**	**11.50**	**15.00**	**14.50**	**13.50**	**15.75**	**11.00**	**10.50**	**11.00**	**14.50**	**15.75**

Note: In MIMO operations, Antenna WF1 transmits at maximum allowed powers as indicated above.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Mode / Band		Modulated Average - MIMO (SDM) (dBm)															
		20 MHz Bandwidth						40 MHz Bandwidth					80 MHz Bandwidth				
		Ch. 36, 100	Ch. 40-60	Ch. 104-136, 144	Ch. 140	Ch. 149-165	Ch. 64	Ch. 38, 62-102	Ch. 46-54	Ch. 110-126, 142	Ch. 134	Ch. 151-159	Ch. 42	Ch. 58	Ch. 106	Ch. 122-138	Ch. 155
IEEE 802.11n (5 GHz)	Maximum	15.00	16.50	16.00	14.00	17.25	15.50	13.00	16.50	16.00	15.00	17.25					
	Nominal	13.50	15.00	14.50	12.50	15.75	14.00	11.50	15.00	14.50	13.50	15.75					
IEEE 802.11ac (5 GHz)	Maximum	15.00	16.50	16.00	14.00	17.25	15.50	13.00	16.50	16.00	15.00	17.25	12.50	12.00	12.50	16.00	17.25
	Nominal	13.50	15.00	14.50	12.50	15.75	14.00	11.50	15.00	14.50	13.50	15.75	11.00	10.50	11.00	14.50	15.75

Note: In MIMO operations, Antenna WF1 transmits at maximum allowed powers as indicated above.

B. Antenna WF2

Mode / Band		Modulated Average (dBm)
Bluetooth BDR/LE	Maximum	**17.00**
Bluetooth EDR	Maximum	**11.50**
Bluetooth HDR	Maximum	**9.50**

Mode / Band		Modulated Average (dBm)			
		Ch 1-10	Ch. 11	Ch. 12	Ch. 13
IEEE 802.11b (2.4 GHz)	Maximum	**16.25**			**14.50**
	Nominal	**14.75**			**13.00**
IEEE 802.11g (2.4 GHz)	Maximum	**16.25**	**14.50**	**13.00**	**4.00**
	Nominal	**14.75**	**13.00**	**11.50**	**2.50**
IEEE 802.11n (2.4 GHz)	Maximum	**16.25**	**14.50**	**13.00**	**4.00**
	Nominal	**14.75**	**13.00**	**11.50**	**2.50**

Mode / Band		Modulated Average - MIMO (dBm)				
		Ch. 1	Ch. 2-10	Ch. 11	Ch. 12	Ch. 13
IEEE 802.11g/n (2.4 GHz)	Maximum	**15.00**	**16.25**	**14.50**	**11.00**	**4.00**
	Nominal	**13.50**	**14.75**	**13.00**	**9.50**	**2.50**

Note: In MIMO operations, Antenna WF2 transmits at maximum allowed powers as indicated above.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Mode / Band		Modulated Average (dBm)																	
		20 MHz Bandwidth						40 MHz Bandwidth						80 MHz Bandwidth					
		Ch. 36	Ch. 40-48, 104-136, 144	Ch. 52-60	Ch. 64, 149-165	Ch. 100	Ch. 140	Ch. 38, 102	Ch. 46, 110-126, 142	Ch. 54	Ch. 62	Ch. 134	Ch. 151-159	Ch. 42	Ch. 58	Ch. 106	Ch. 122-138	Ch. 155	
IEEE 802.11a (5 GHz)	Maximum	16.25	17.00	16.75	16.50	15.50	15.00												
	Nominal	14.75	15.50	15.25	15.00	14.00	13.50												
IEEE 802.11n (5 GHz)	Maximum	16.25	17.00	16.75	16.50	15.50	15.00	14.00	17.00	16.75	14.50	16.00	16.50						
	Nominal	14.75	15.50	15.25	15.00	14.00	13.50	12.50	15.50	15.25	13.00	14.50	15.00						
IEEE 802.11ac (5 GHz)	Maximum	16.25	17.00	16.75	16.50	15.50	15.00	14.00	17.00	16.75	14.50	16.00	16.50	13.00	13.50	14.00	17.00	16.50	
	Nominal	14.75	15.50	15.25	15.00	14.00	13.50	12.50	15.50	15.25	13.00	14.50	15.00	11.50	12.00	12.50	15.50	15.00	

Mode / Band		Modulated Average - MIMO (CDD) (dBm)																
		20 MHz Bandwidth					40 MHz Bandwidth					80 MHz Bandwidth						
		Ch. 36,100-136,144	Ch. 40-48	Ch. 52-64	Ch. 140	Ch. 149-165	Ch. 38, 62-102	Ch. 46, 110-126, 142	Ch. 54	Ch. 134	Ch. 151-159	Ch. 42	Ch. 58	Ch. 106	Ch. 122-138	Ch. 155		
IEEE 802.11a (5 GHz)	Maximum	15.00	16.00	15.50	14.00	16.50												
	Nominal	13.50	14.50	14.00	12.50	15.00												
IEEE 802.11n (5 GHz)	Maximum	15.00	16.00	15.50	14.00	16.50	13.00	17.00	16.75	15.00	16.50							
	Nominal	13.50	14.50	14.00	12.50	15.00	11.50	15.50	15.25	13.50	15.00							
IEEE 802.11ac (5 GHz)	Maximum	15.00	16.00	15.50	14.00	16.50	13.00	17.00	16.75	15.00	16.50	12.50	12.00	12.50	17.00	16.50		
	Nominal	13.50	14.50	14.00	12.50	15.00	11.50	15.50	15.25	13.50	15.00	11.00	10.50	11.00	15.50	15.00		

Note: In MIMO operations, Antenna WF2 transmits at maximum allowed powers as indicated above.

Mode / Band		Modulated Average - MIMO (SDM) (dBm)																
		20 MHz Bandwidth						40 MHz Bandwidth						80 MHz Bandwidth				
		Ch. 36, 100	Ch. 40-48, 104-136, 144	Ch. 52-60	Ch. 140	Ch. 149-165	Ch. 64	Ch. 38, 62-102	Ch. 46, 110-126, 142	Ch. 54	Ch. 134	Ch. 151-159	Ch. 42	Ch. 58	Ch. 106	Ch. 122-138	Ch. 155	
IEEE 802.11n (5 GHz)	Maximum	15.00	17.00	16.75	14.00	16.50	15.50	13.00	17.00	16.75	15.00	16.50						
	Nominal	13.50	15.50	15.25	12.50	15.00	14.00	11.50	15.50	15.25	13.50	15.00						
IEEE 802.11ac (5 GHz)	Maximum	15.00	17.00	16.75	14.00	16.50	15.50	13.00	17.00	16.75	15.00	16.50	12.50	12.00	12.50	17.00	16.50	
	Nominal	13.50	15.50	15.25	12.50	15.00	14.00	11.50	15.50	15.25	13.50	15.00	11.00	10.50	11.00	15.50	15.00	

Note: In MIMO operations, Antenna WF2 transmits at maximum allowed powers as indicated above.

C. Antenna WF5

Mode / Band		Modulated Average (dBm)
Bluetooth BDR/LE	Maximum	**15.50**
Bluetooth EDR	Maximum	**9.00**
Bluetooth HDR	Maximum	**7.00**

Mode / Band		Modulated Average (dBm)			
		Ch. 1-10	Ch. 11	Ch. 12	Ch. 13
IEEE 802.11b (2.4 GHz)	Maximum	**14.50**			**13.00**
	Nominal	**13.00**			**11.50**
IEEE 802.11g (2.4 GHz)	Maximum	**14.50**	**13.00**	**11.50**	**4.00**
	Nominal	**13.00**	**11.50**	**10.00**	**2.50**
IEEE 802.11n (2.4 GHz)	Maximum	**14.50**	**13.00**	**11.50**	**4.00**
	Nominal	**13.00**	**11.50**	**10.00**	**2.50**

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Mode / Band		Modulated Average - MIMO (dBm)			
		Ch. 1-10	Ch. 11	Ch. 12	Ch. 13
IEEE 802.11g/n (2.4 GHz)	Maximum	**14.50**	**12.50**	**10.00**	**3.00**
	Nominal	**13.00**	**11.00**	**8.50**	**1.50**

Note: In MIMO operations, Antenna WF5 transmits at maximum allowed powers as indicated above.

1.3.3 Unlicensed Reduced Output Power

A. Antenna WF1 - Output Power for Simultaneous Operations with 5 GHz WIFI

Mode / Band		Modulated Average (dBm)
Bluetooth BDR/LE	Maximum	**9.00**
Bluetooth EDR	Maximum	**9.00**
Bluetooth HDR	Maximum	**9.00**

Note: The above power levels are implemented when 2.4 BT Operations are active with 5 GHz WIFI.

B. Antenna WF2 - Output Power for Simultaneous Operations with 5 GHz WIFI

Mode / Band		Modulated Average (dBm)
Bluetooth BDR/LE	Maximum	**10.00**
Bluetooth EDR	Maximum	**10.00**
Bluetooth HDR	Maximum	**9.50**

Note: The above power levels are implemented when 2.4 BT Operations are active with 5 GHz WIFI.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

B. Antenna WF5 - Output Power for Simultaneous Operations with 2G/3G/4G Antennas WF3 and WF5

Mode / Band		Modulated Average (dBm)
Bluetooth BDR/LE Reduced Level 1	Maximum	**11.50**
Bluetooth EDR Reduced Level 1	Maximum	**9.00**
Bluetooth HDR Reduced Level 1	Maximum	**7.00**

Note: The above power levels are implemented when 2G/3G/4G Operations are active with Antenna WF3.

Mode / Band		Modulated Average (dBm)
Bluetooth BDR/LE Reduced Level 2	Maximum	**8.50**
Bluetooth EDR Reduced Level 2	Maximum	**8.50**
Bluetooth HDR Reduced Level 2	Maximum	**7.00**

Note: The above power levels are implemented when 2G/3G/4G Operations are active with Antenna WF5.

Mode / Band		Modulated Average (dBm)	
		Ch. 1-12	Ch. 13
IEEE 802.11b (2.4 GHz)	Maximum	**10.50**	
	Nominal	**9.00**	
IEEE 802.11g (2.4 GHz)	Maximum	**10.50**	**4.00**
	Nominal	**9.00**	**2.50**
IEEE 802.11n (2.4 GHz)	Maximum	**10.50**	**4.00**
	Nominal	**9.00**	**2.50**

Mode / Band		Modulated Average - MIMO (dBm)		
		Ch. 1-11	Ch. 12	Ch. 13
IEEE 802.11g/n (2.4 GHz)	Maximum	**10.50**	**10.00**	**3.00**
	Nominal	**9.00**	**8.50**	**1.50**

Note: The above power levels are implemented when 2G/3G/4G Operations are active with Antenna WF3. In MIMO operations, Antenna WF5 transmits at maximum allowed powers as indicated above.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Mode / Band		Modulated Average (dBm)	
		Ch. 1-12	Ch. 13
IEEE 802.11b (2.4 GHz)	Maximum	**7.50**	
	Nominal	**6.00**	
IEEE 802.11g (2.4 GHz)	Maximum	**7.50**	**4.00**
	Nominal	**6.00**	**2.50**
IEEE 802.11n (2.4 GHz)	Maximum	**7.50**	**4.00**
	Nominal	**6.00**	**2.50**

Mode / Band		Modulated Average - MIMO (dBm)	
		Ch. 1-12	Ch. 13
IEEE 802.11g/n (2.4 GHz)	Maximum	**7.50**	**3.00**
	Nominal	**6.00**	**1.50**

Note: The above power levels are implemented when 2G/3G/4G Operations are active with Antenna WF5. In MIMO operations, Antenna WF5 transmits at maximum allowed powers as indicated above.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

1.4 DUT Antenna Locations

The overall diagonal dimension of the device is > 200 mm. A diagram showing the location of the device antennas can be found in Appendix F. Exact antenna dimensions and separation distances are shown in the Technical Descriptions in the FCC filings.

Table 1-1
Device Edges/Sides for SAR Testing

Device Sides/Edges for SAR Testing						
Mode	Back	Front	Top	Bottom	Right	Left
GPRS 850 Ant WF3	Yes	No	Yes	No	Yes	No
GPRS 1900 Ant WF3	Yes	No	Yes	No	Yes	No
UMTS 850 Ant WF3	Yes	No	Yes	No	Yes	No
UMTS 1750 Ant WF3	Yes	No	Yes	No	Yes	No
UMTS 1900 Ant WF3	Yes	No	Yes	No	Yes	No
LTE Band 12 Ant WF3	Yes	No	Yes	No	Yes	No
LTE Band 13 Ant WF3	Yes	No	Yes	No	Yes	No
LTE Band 14 Ant WF3	Yes	No	Yes	No	Yes	No
LTE Band 5 (Cell) Ant WF3	Yes	No	Yes	No	Yes	No
LTE Band 26 (Cell) Ant WF3	Yes	No	Yes	No	Yes	No
LTE Band 66 (AWS) Ant WF3	Yes	No	Yes	No	Yes	No
LTE Band 25 (PCS) Ant WF3	Yes	No	Yes	No	Yes	No
LTE Band 30 Ant WF3	Yes	No	Yes	No	Yes	No
LTE Band 7 Ant WF3	Yes	No	Yes	No	Yes	No
LTE Band 41 Ant WF3	Yes	No	Yes	No	Yes	No
GPRS 850 Ant WF5	Yes	No	Yes	No	No	Yes
GPRS 1900 Ant WF5	Yes	No	Yes	No	No	Yes
UMTS 850 Ant WF5	Yes	No	Yes	No	No	Yes
UMTS 1750 Ant WF5	Yes	No	Yes	No	No	Yes
UMTS 1900 Ant WF5	Yes	No	Yes	No	No	Yes
LTE Band 12 Ant WF5	Yes	No	Yes	No	No	Yes
LTE Band 13 Ant WF5	Yes	No	Yes	No	No	Yes
LTE Band 14 Ant WF5	Yes	No	Yes	No	No	Yes
LTE Band 5 (Cell) Ant WF5	Yes	No	Yes	No	No	Yes
LTE Band 26 (Cell) Ant WF5	Yes	No	Yes	No	No	Yes
LTE Band 66 (AWS) Ant WF5	Yes	No	Yes	No	No	Yes
LTE Band 25 (PCS) Ant WF5	Yes	No	Yes	No	No	Yes
LTE Band 30 Ant WF5	Yes	No	Yes	No	No	Yes
LTE Band 7 Ant WF5	Yes	No	Yes	No	No	Yes
LTE Band 41 Ant WF5	Yes	No	Yes	No	No	Yes
2.4 GHz WLAN Ant WF1	Yes	No	No	Yes	No	Yes
2.4 GHz WLAN Ant WF2	Yes	No	No	Yes	Yes	No
2.4 GHz WLAN Ant WF5	Yes	No	Yes	No	No	Yes
5 GHz WLAN Ant WF1	Yes	No	No	Yes	No	Yes
5 GHz WLAN Ant WF2	Yes	No	No	Yes	Yes	No
Bluetooth Ant WF1	Yes	No	No	Yes	No	Yes
Bluetooth Ant WF2	Yes	No	No	Yes	Yes	No
Bluetooth Ant WF5	Yes	No	Yes	No	No	Yes

Note: Per FCC KDB Publication 616217 D04v01r01, particular edges were not required to be evaluated for SAR based on the SAR exclusion threshold in KDB 447498 D01V06. Additional edges may have been evaluated for simultaneous transmission analysis.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

1.5 Simultaneous Transmission Capabilities

According to FCC KDB Publication 447498 D01v06, transmitters are considered to be transmitting simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds.

This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis according to FCC KDB Publication 447498 D01v06 4.3.2 procedures.

Table 1-2
Simultaneous Transmission Scenarios

No.	Capable Transmit Configuration	Body
1	Cellular Band + 2.4 GHz WI-FI	Yes
2	Cellular Band + 5 GHz WI-FI	Yes
3	Cellular Band + 2.4 GHz Bluetooth	Yes
4	Cellular Band+ 2.4 GHz WI-FI MIMO	Yes
5	Cellular Band + 5 GHz WI-FI MIMO	Yes
6	Cellular Band + 2.4 GHz Bluetooth + 5 GHz WI-FI	Yes
7	Cellular Band + 2.4 GHz Bluetooth + 5 GHz WI-FI MIMO	Yes
8	2.4 GHz Bluetooth + 5 GHz WI-FI	Yes
9	2.4 GHz Bluetooth + 5 GHz WI-FI MIMO	Yes

1. There are no limitations in the above listed simultaneous transmission scenarios between cellular antennas and BT/WI-FI antennas.
2. 2.4 GHz WLAN and 2.4 GHz Bluetooth share the same antenna path and cannot transmit simultaneously on any antenna (WF1, WF2, WF5).
3. All licensed modes share the same antenna path and cannot transmit simultaneously.
4. This device supports 2x2 MIMO Tx for WLAN. 802.11a/g/n/ac supports CDD/STBC and 802.11n/ac additionally supports SDM. Each WLAN antenna can transmit independently or together when operating with MIMO.
5. This device support VoWIFI.
6. 2.4 GHz WLAN WF2 and 2.4 GHz WLAN WF5 cannot transmit simultaneously.

1.6 Miscellaneous SAR Test Considerations

(A) WIFI/BT

Based on the maximum allowed power for the respective antennas, U-NII-1 was evaluated for Antenna WF2 SAR, and U-NII-2A was evaluated for Antenna WF1 SAR. Additional testing for U-NII-2A Antenna WF2 SAR or U-NII-1 Antenna WF1 SAR was not required since all reported SAR was less than 1.2 W/kg per FCC KDB Publication 248227 D01v02r02.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

The WLAN/Bluetooth chipset in this device is produced by two different suppliers. The electrically identical modules are manufactured with the identical mechanical structure to meet the same specifications and functions. Two device variants are referenced as Variant 1 and Variant 2 in this report.

WLAN/Bluetooth SAR worst case configuration was spotchecked on Variant 1 and Variant 2. The Variant with the highest reported SAR value was evaluated for the remaining WLAN/Bluetooth configurations.

This device supports channel 1-13 for 2.4 GHz WLAN. However, because channel 12/13 targets are not higher than that of channels 1-11, channels 1, 6 and 11 were considered for SAR testing per FCC KDB 248227 D01V02r02.

This device supports IEEE 802.11ac with the following features:

a) Up to 80 MHz Bandwidth only
b) No aggregate channel configurations
c) 2 Tx antenna output
d) 256 QAM is supported
e) TDWR and Band gap channels are supported

(B) Licensed Transmitter(s)

This device is only capable of QPSK HSUPA in the uplink. Therefore, no additional SAR tests are required beyond that described for devices with HSUPA in KDB 941225 D01v03r01.

LTE SAR for the higher modulations and lower bandwidths were not tested since the maximum average output power of all required channels and configurations was not more than 0.5 dB higher than the highest bandwidth; and the reported LTE SAR for the highest bandwidth was less than 1.45 W/kg for all configurations according to FCC KDB 941225 D05v02r04.

This device supports LTE Carrier Aggregation (CA) in the downlink. All uplink communications are identical to Release 8 specifications. Per FCC KDB Publication 941225 D05A v01r02, SAR for LTE CA operations was not needed since the maximum average output power in LTE CA mode was not >0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive. DLCA power measurements can be found in Appendix H.

This device supports LTE Carrier Aggregation (CA) in the uplink for LTE Band 7 and LTE Band 41 with two component carriers in the uplink. SAR Measurements and conducted powers were evaluated per 2017 Fall TCB Workshop Notes.

This device supports 64QAM on the uplink and 256QAM on the downlink for LTE Operations. Conducted powers for 64QAM uplink configurations were measured per Section 5.1 of FCC KDB Publication 941225 D05v02r05. SAR was not required for 64QAM since the highest maximum output power for 64 QAM is ≤ ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg, per Section 5.2.4 of FCC KDB Publication 941225 D05v02r05.

This device supports both Power Class 2 (PC2) and Power Class 3 (PC3) for LTE Band 41. Per May 2017 TCB Workshop Notes, SAR tests were performed with Power Class 3 (given the specific UL/DL limitations for Power Class 2). Additionally, SAR testing for the power class condition was evaluated for the highest configuration in Power Class 3 for each test configuration to confirm the results were scalable linearly (See Section 14.2).

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

This device supports LTE capabilities with overlapping transmission frequency ranges. When the supported frequency range of an LTE Band falls completely within an LTE band with a larger transmission frequency range, both LTE bands have the same target power (or the band with the larger transmission frequency range has a higher target power), and both LTE bands share the same transmission path and signal characteristics, SAR was only assessed for the band with the larger transmission frequency range.

1.7 Guidance Applied

- FCC KDB Publication 941225 D01v03r01, D05v02r04, D05Av01r02 (2G/3G/4G)
- FCC KDB Publication 248227 D01v02r02 (SAR Considerations for 802.11 Devices)
- FCC KDB Publication 447498 D01v06 (General SAR Guidance)
- FCC KDB Publication 865664 D01v01r04, D02v01r02 (SAR Measurements up to 6 GHz)
- FCC KDB Publication 616217 D04v01r02 (Tablet)
- October 2013 TCB Workshop Notes (GPRS Testing Considerations)
- May 2017 TCB Workshop Notes (LTE Band 41 Power Class 2/3)
- April 2018 TCB Workshop Notes (LTE Carrier Aggregation)

1.8 Device Serial Numbers

Several samples with identical hardware were used to support SAR testing. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units. The serial numbers used for each test are indicated alongside the results in Section 10.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

2 LTE INFORMATION

LTE Information					
FCC ID	BCGA2124				
Form Factor	Tablet Device				
Frequency Range of each LTE transmission band	LTE Band 12 (699.7 - 715.3 MHz)				
	LTE Band 17 (706.5 - 713.5 MHz)				
	LTE Band 13 (779.5 - 784.5 MHz)				
	LTE Band 14 (790.5 - 795.5 MHz)				
	LTE Band 26 (Cell) (814.7 - 848.3 MHz)				
	LTE Band 5 (Cell) (824.7 - 848.3 MHz)				
	LTE Band 66 (AWS) (1710.7 - 1779.3 MHz)				
	LTE Band 4 (AWS) (1710.7 - 1754.3 MHz)				
	LTE Band 25 (PCS) (1850.7 - 1914.3 MHz)				
	LTE Band 2 (PCS) (1850.7 - 1909.3 MHz)				
	LTE Band 30 (2307.5 - 2312.5 MHz)				
	LTE Band 7 (2502.5 - 2567.5 MHz)				
	LTE Band 41 (2498.5 - 2687.5 MHz)				
	LTE Band 12: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz				
	LTE Band 17: 5 MHz, 10 MHz				
	LTE Band 13: 5 MHz, 10 MHz				
	LTE Band 14: 5 MHz, 10 MHz				
	LTE Band 26 (Cell): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz				
	LTE Band 5 (Cell): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz				
	LTE Band 66 (AWS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 4 (AWS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 25 (PCS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 2 (PCS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 30: 5 MHz, 10 MHz				
	LTE Band 7: 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 41: 5 MHz, 10 MHz, 15 MHz, 20 MHz				
Channel Numbers and Frequencies (MHz)	Low	Low-Mid	Mid	Mid-High	High
LTE Band 12: 1.4 MHz	699.7 (23017)		707.5 (23095)	715.3 (23173)	
LTE Band 12: 3 MHz	700.5 (23025)		707.5 (23095)	714.5 (23165)	
LTE Band 12: 5 MHz	701.5 (23035)		707.5 (23095)	713.5 (23155)	
LTE Band 12: 10 MHz	704 (23060)		707.5 (23095)	711 (23130)	
LTE Band 17: 5 MHz	706.5 (23755)		710 (23790)	713.5 (23825)	
LTE Band 17: 10 MHz	709 (23780)		710 (23790)	711 (23800)	
LTE Band 13: 5 MHz	779.5 (23205)		782 (23230)	784.5 (23255)	
LTE Band 13: 10 MHz	N/A		782 (23230)	N/A	
LTE Band 14: 5 MHz	790.5 (23305)		793 (23330)	795.5 (23355)	
LTE Band 14: 10 MHz	N/A		793 (23330)	N/A	
LTE Band 26 (Cell): 1.4 MHz	814.7 (26697)		831.5 (26865)	848.3 (27033)	
LTE Band 26 (Cell): 3 MHz	815.5 (26705)		831.5 (26865)	847.5 (27025)	
LTE Band 26 (Cell): 5 MHz	816.5 (26715)		831.5 (26865)	846.5 (27015)	
LTE Band 26 (Cell): 10 MHz	819 (26740)		831.5 (26865)	844 (26990)	
LTE Band 5 (Cell): 1.4 MHz	824.7 (20407)		836.5 (20525)	848.3 (20643)	
LTE Band 5 (Cell): 3 MHz	825.5 (20415)		836.5 (20525)	847.5 (20635)	
LTE Band 5 (Cell): 5 MHz	826.5 (20425)		836.5 (20525)	846.5 (20625)	
LTE Band 5 (Cell): 10 MHz	829 (20450)		836.5 (20525)	844 (20600)	
LTE Band 66 (AWS): 1.4 MHz	1710.7 (131979)		1745 (132322)	1779.3 (132665)	
LTE Band 66 (AWS): 3 MHz	1711.5 (131987)		1745 (132322)	1778.5 (132657)	
LTE Band 66 (AWS): 5 MHz	1712.5 (131997)		1745 (132322)	1777.5 (132647)	
LTE Band 66 (AWS): 10 MHz	1715 (132022)		1745 (132322)	1775 (132622)	
LTE Band 66 (AWS): 15 MHz	1717.5 (132047)		1745 (132322)	1772.5 (132597)	
LTE Band 66 (AWS): 20 MHz	1720 (132072)		1745 (132322)	1770 (132572)	
LTE Band 4 (AWS): 1.4 MHz	1710.7 (19957)		1732.5 (20175)	1754.3 (20393)	
LTE Band 4 (AWS): 3 MHz	1711.5 (19965)		1732.5 (20175)	1753.5 (20385)	
LTE Band 4 (AWS): 5 MHz	1712.5 (19975)		1732.5 (20175)	1752.5 (20375)	
LTE Band 4 (AWS): 10 MHz	1715 (20000)		1732.5 (20175)	1750 (20350)	
LTE Band 4 (AWS): 15 MHz	1717.5 (20025)		1732.5 (20175)	1747.5 (20325)	
LTE Band 4 (AWS): 20 MHz	1720 (20050)		1732.5 (20175)	1745 (20300)	
LTE Band 25 (PCS): 1.4 MHz	1850.7 (26047)		1882.5 (26365)	1914.3 (26683)	
LTE Band 25 (PCS): 3 MHz	1851.5 (26055)		1882.5 (26365)	1913.5 (26675)	
LTE Band 25 (PCS): 5 MHz	1852.5 (26065)		1882.5 (26365)	1912.5 (26665)	
LTE Band 25 (PCS): 10 MHz	1855 (26090)		1882.5 (26365)	1910 (26640)	
LTE Band 25 (PCS): 15 MHz	1857.5 (26115)		1882.5 (26365)	1907.5 (26615)	
LTE Band 25 (PCS): 20 MHz	1860 (26140)		1882.5 (26365)	1905 (26590)	
LTE Band 2 (PCS): 1.4 MHz	1850.7 (18607)		1880 (18900)	1909.3 (19193)	
LTE Band 2 (PCS): 3 MHz	1851.5 (18615)		1880 (18900)	1908.5 (19185)	
LTE Band 2 (PCS): 5 MHz	1852.5 (18625)		1880 (18900)	1907.5 (19175)	
LTE Band 2 (PCS): 10 MHz	1855 (18650)		1880 (18900)	1905 (19150)	
LTE Band 2 (PCS): 15 MHz	1857.5 (18675)		1880 (18900)	1902.5 (19125)	
LTE Band 2 (PCS): 20 MHz	1860 (18700)		1880 (18900)	1900 (19100)	
LTE Band 30: 5 MHz	2307.5 (27685)		2310 (27710)	2312.5 (27735)	
LTE Band 30: 10 MHz	N/A		2310 (27710)	N/A	
LTE Band 7: 5 MHz	2502.5 (20775)		2535 (21100)	2567.5 (21425)	
LTE Band 7: 10 MHz	2505 (20800)		2535 (21100)	2565 (21400)	
LTE Band 7: 15 MHz	2507.5 (20825)		2535 (21100)	2562.5 (21375)	
LTE Band 7: 20 MHz	2510 (20850)		2535 (21100)	2560 (21350)	
LTE Band 41: 5 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
LTE Band 41: 10 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
LTE Band 41: 15 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
LTE Band 41: 20 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
UE Category	DL UE Cat16 (QPSK, 16QAM, 64QAM, 256QAM), UL UE Cat13 (QPSK, 16QAM, 64QAM)				
Modulations Supported in UL	QPSK, 16QAM, 64QAM				
LTE MPR Permanently implemented per 3GPP TS 36.101 section 6.2.3~6.2.5? (manufacturer attestation to be provided)	YES				
A-MPR (Additional MPR) disabled for SAR Testing?	YES				
LTE Carrier Aggregation Possible Combinations	The technical description includes all the possible carrier aggregation combinations				
LTE Additional Information	"This device does not support full CA features on 3GPP Release 13. It supports carrier aggregation as shown in Section 8 and Appendix H. All other uplink communications are identical to the Release 8 Specifications. Uplink communications are done on the PCC unless otherwise specified. The following LTE Release 13 Features are not supported: Relay, HetNet, Enhanced MIMO, eICIC, eMBMS, Cross-Carrier Scheduling, Enhanced SC-FDMA."				

© 2019 PCTEST Engineering Laboratory, Inc.

REV 20.06 M
12/06/2017

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

3 INTRODUCTION

The FCC and Innovation, Science, and Economic Development Canada have adopted the guidelines for evaluating the environmental effects of radio frequency (RF) radiation in ET Docket 93-62 on Aug. 6, 1996 and Health Canada Safety Code 6 to protect the public and workers from the potential hazards of RF emissions due to FCC-regulated portable devices. [1]

The safety limits used for the environmental evaluation measurements are based on the criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in IEEE/ANSI C95.1-1992 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz [3] and Health Canada RF Exposure Guidelines Safety Code 6 [22]. The measurement procedure described in IEEE/ANSI C95.3-2002 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave [4] is used for guidance in measuring the Specific Absorption Rate (SAR) due to the RF radiation exposure from the Equipment Under Test (EUT). These criteria for SAR evaluation are similar to those recommended by the International Committee for Non-Ionizing Radiation Protection (ICNIRP) in Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields," Report No. Vol 74. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards.

3.1 SAR Definition

Specific Absorption Rate is defined as the time derivative (rate) of the incremental energy (dU) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dV) of a given density (□). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body (see Equation 3-1).

Equation 3-1
SAR Mathematical Equation

$$SAR = \frac{d}{dt}\left(\frac{dU}{dm}\right) = \frac{d}{dt}\left(\frac{dU}{\rho dv}\right)$$

SAR is expressed in units of Watts per Kilogram (W/kg).

$$SAR = \frac{\sigma \cdot E^2}{\rho}$$

where:

σ = conductivity of the tissue-simulating material (S/m)
ρ = mass density of the tissue-simulating material (kg/m^3)
E = Total RMS electric field strength (V/m)

NOTE: The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relation to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane.[6]

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

4 DOSIMETRIC ASSESSMENT

4.1 Measurement Procedure

The evaluation was performed using the following procedure compliant to FCC KDB Publication 865664 D01v01r04 and IEEE 1528-2013:

1. The SAR distribution at the exposed side of the head or body was measured at a distance no greater than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the device-head and body interface and the horizontal grid resolution was determined per FCC KDB Publication 865664 D01v01r04 (See Table 4-1) and IEEE 1528-2013.
2. The point SAR measurement was taken at the maximum SAR region determined from Step 1 to enable the monitoring of SAR fluctuations/drifts during the 1g/10g cube evaluation. SAR at this fixed point was measured and used as a reference value.

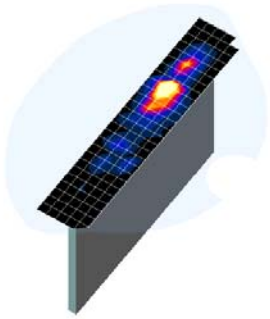


Figure 4-1
Sample SAR Area Scan

3. Based on the area scan data, the peak of the region with maximum SAR was determined by spline interpolation. Around this point, a volume was assessed according to the measurement resolution and volume size requirements of FCC KDB Publication 865664 D01v01r04 (See Table 4-1) and IEEE 1528-2013. On the basis of this data set, the spatial peak SAR value was evaluated with the following procedure (see references or the DASY manual online for more details):

   a. SAR values at the inner surface of the phantom are extrapolated from the measured values along the line away from the surface with spacing no greater than that in Table 4-1. The extrapolation was based on a least-squares algorithm. A polynomial of the fourth order was calculated through the points in the z-axis (normal to the phantom shell).

   b. After the maximum interpolated values were calculated between the points in the cube, the SAR was averaged over the spatial volume (1g or 10g) using a 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the "Not a knot" condition (in x, y, and z directions). The volume was then integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were obtained through interpolation, in order to calculate the averaged SAR.

   c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

4. The SAR reference value, at the same location as step 2, was re-measured after the zoom scan was complete to calculate the SAR drift. If the drift deviated by more than 5%, the SAR test and drift measurements were repeated.

Table 4-1
Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v01r04*

Frequency	Maximum Area Scan Resolution (mm) (Δx_{area}, Δy_{area})	Maximum Zoom Scan Resolution (mm) (Δx_{zoom}, Δy_{zoom})	Maximum Zoom Scan Spatial Resolution (mm)			Minimum Zoom Scan Volume (mm) (x,y,z)
			Uniform Grid	Graded Grid		
			$\Delta z_{zoom}(n)$	$\Delta z_{zoom}(1)$*	$\Delta z_{zoom}(n>1)$*	
≤ 2 GHz	≤ 15	≤ 8	≤ 5	≤ 4	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 30
2-3 GHz	≤ 12	≤ 5	≤ 5	≤ 4	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 30
3-4 GHz	≤ 12	≤ 5	≤ 4	≤ 3	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 28
4-5 GHz	≤ 10	≤ 4	≤ 3	≤ 2.5	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 25
5-6 GHz	≤ 10	≤ 4	≤ 2	≤ 2	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 22

*Also compliant to IEEE 1528-2013 Table 6

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

5 TEST CONFIGURATION POSITIONS

5.1 Device Holder

The device holder is made out of low-loss POM material having the following dielectric parameters: relative permittivity ε = 3 and loss tangent δ = 0.02.

5.2 SAR Testing for Tablet per KDB Publication 616217 D04v01r02

Per FCC KDB Publication 616217 D04v01r02, the back surface and edges of the tablet should be tested for SAR compliance with the tablet touching the phantom. The SAR Exclusion Threshold in KDB 447498 D01v06 can be applied to determine SAR test exclusion for adjacent edge configurations. The closest distance from the antenna to an adjacent tablet edge is used to determine if SAR testing is required for the adjacent edges, with the adjacent edge positioned against the phantom and the edge containing the antenna positioned perpendicular to the phantom.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

6 RF EXPOSURE LIMITS

6.1 Uncontrolled Environment

UNCONTROLLED ENVIRONMENTS are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

6.2 Controlled Environment

CONTROLLED ENVIRONMENTS are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Table 6-1
SAR Human Exposure Specified in ANSI/IEEE C95.1-1992 and Health Canada Safety Code 6

HUMAN EXPOSURE LIMITS		
	UNCONTROLLED ENVIRONMENT *General Population* (W/kg) or (mW/g)	CONTROLLED ENVIRONMENT *Occupational* (W/kg) or (mW/g)
Peak Spatial Average SAR Head	1.6	8.0
Whole Body SAR	0.08	0.4
Peak Spatial Average SAR Hands, Feet, Ankle, Wrists, etc.	4.0	20

1. The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.
2. The Spatial Average value of the SAR averaged over the whole body.
3. The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

7 FCC MEASUREMENT PROCEDURES

Power measurements for licensed transmitters are performed using a base station simulator under digital average power.

7.1 Measured and Reported SAR

Per FCC KDB Publication 447498 D01v06, when SAR is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance. For simultaneous transmission, the measured aggregate SAR must be scaled according to the sum of the differences between the maximum tune-up tolerance and actual power used to test each transmitter. When SAR is measured at or scaled to the maximum tune-up tolerance limit, the results are referred to as *reported* SAR. The highest *reported* SAR results are identified on the grant of equipment authorization according to procedures in KDB 690783 D01v01r03.

7.2 3G SAR Test Reduction Procedure

In FCC KDB Publication 941225 D01v03r01, certain transmission modes within a frequency band and wireless mode evaluated for SAR are defined as primary modes. The equivalent modes considered for SAR test reduction are denoted as secondary modes. When the maximum output power including tune-up tolerance specified for production units in a secondary mode is ≤ 0.25 dB higher than the primary mode or when the highest reported SAR of the primary mode, scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode, is ≤ 1.2 W/kg, SAR measurements are not required for the secondary mode. These criteria are referred to as the 3G SAR test reduction procedure. When the 3G SAR test reduction procedure is not satisfied, SAR measurements are additionally required for the secondary mode.

7.3 Procedures Used to Establish RF Signal for SAR

The following procedures are according to FCC KDB Publication 941225 D01v03r01 “3G SAR Measurement Procedures.”

The device is placed into a simulated call using a base station simulator in a RF shielded chamber. Establishing connections in this manner ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. Devices under test are evaluated prior to testing, with a fully charged battery and were configured to operate at maximum output power. In order to verify that the device is tested throughout the SAR test at maximum output power, the SAR measurement system measures a “point SAR” at an arbitrary reference point at the start and end of the 1 gram SAR evaluation, to assess for any power drifts during the evaluation. If the power drift deviates by more than 5%, the SAR test and drift measurements are repeated.

7.4 SAR Measurement Conditions for UMTS

7.4.1 Output Power Verification

Maximum output power is verified on the High, Middle and Low channels according to the general descriptions in section 5.2 of 3GPP TS 34.121, using the appropriate RMC with TPC (transmit power control) set to all “1s” or applying the required inner loop power control procedures to maintain maximum output power while HSUPA is active. Results for all applicable physical channel configurations (DPCCH, DPDCHn and spreading codes, HS-DPCCH etc) are tabulated in this test report. All configurations that are not supported by the DUT or cannot be measured due to technical or equipment limitations are identified.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

7.4.2 Body SAR Measurements

SAR for body exposure configurations is measured using the 12.2 kbps RMC with the TPC bits all “1s”. The 3G SAR test reduction procedure is applied to other spreading codes and multiple $DPDCH_n$ configurations supported by the handset with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured using an applicable RMC configuration with the corresponding spreading code or $DPDCH_n$, for the highest reported SAR configuration in 12.2 kbps RMC.

7.4.3 SAR Measurements with Rel 5 HSDPA

The 3G SAR test reduction procedure is applied to HSDPA body configurations with 12.2 kbps RMC as the primary mode. Otherwise, Body SAR for HSDPA is measured using an FRC with H-Set 1 in Sub-test 1 and a 12.2 kbps RMC configured in Test Loop Mode 1, for the highest reported SAR configuration in 12.2 kbps RMC without HSDPA. Handsets with both HSDPA and HSUPA are tested according to Release 6 HSPA test procedures.

7.4.4 SAR Measurements with Rel 6 HSUPA

The 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) body configurations with 12.2 kbps RMC as the primary mode. Otherwise, Body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set 1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 and power control algorithm 2, according to the highest reported body SAR configuration in 12.2 kbps RMC without HSPA.

When VOIP applies to head exposure, the 3G SAR test reduction procedure is applied with 12.2 kbps RMC as the primary mode; otherwise, the same HSPA configuration used for body SAR measurements are applied to head exposure testing.

7.4.5 SAR Measurement Conditions for DC-HSDPA

SAR is required for Rel. 8 DC-HSDPA when SAR is required for Rel. 5 HSDPA; otherwise, the 3G SAR test reduction procedure is applied to DC-HSDPA with 12.2 kbps RMC as the primary mode. Power is measured for DC-HSDPA according to the H-Set 12, FRC configuration in Table C.8.1.12 of 3GPP TS 34.121-1 to determine SAR test reduction. A primary and a secondary serving HS-DSCH Cell are required to perform the power measurement and for the results to be acceptable.

7.5 SAR Measurement Conditions for LTE

LTE modes are tested according to FCC KDB 941225 D05v02r04 publication. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. The R&S CMW500 or Anritsu MT8820C simulators are used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

7.5.1 Spectrum Plots for RB Configurations

A properly configured base station simulator was used for SAR tests and power measurements. Therefore, spectrum plots for RB configurations were not required to be included in this report.

7.5.2 MPR

MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

7.5.3 A-MPR

A-MPR (Additional MPR) has been disabled for all SAR tests by setting NS=01 on the base station simulator.

7.5.4 Required RB Size and RB Offsets for SAR Testing

According to FCC KDB 941225 D05v02r04:

a. Per Section 5.2.1, SAR is required for QPSK 1 RB Allocation for the largest bandwidth
   i. The required channel and offset combination with the highest maximum output power is required for SAR.
   ii. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required. Otherwise, SAR is required for the remaining required test channels using the RB offset configuration with highest output power for that channel.
   iii. When the reported SAR for a required test channel is > 1.45 W/kg, SAR is required for all RB offset configurations for that channel.
b. Per Section 5.2.2, SAR is required for 50% RB allocation using the largest bandwidth following the same procedures outlined in Section 5.2.1.
c. Per Section 5.2.3, QPSK SAR is not required for the 100% allocation when the highest maximum output power for the 100% allocation is less than the highest maximum output power of the 1 RB and 50% RB allocations and the reported SAR for the 1 RB and 50% RB allocations is < 0.8 W/kg.
d. Per Section 5.2.4 and 5.3, SAR tests for higher order modulations and lower bandwidths configurations are not required when the conducted power of the required test configurations determined by Sections 5.2.1 through 5.2.3 is less than or equal to ½ dB higher than the equivalent configuration using QPSK modulation and when the QPSK SAR for those configurations is <1.45 W/kg.

According to FCC KDB 447498 D01v06, when the reported (scaled) SAR for LTE Band 41 is ≤ 0.6 W/kg, testing of the remaining RB offset configurations and required test channels is not required. Otherwise, SAR is required for the remaining required test channels using the RB offset configuration with highest output power for that channel.

7.5.5 TDD

LTE TDD testing is performed using the SAR test guidance provided in FCC KDB 941225 D05v02r04. TDD is tested at the highest duty factor using UL-DL configuration 0 with special subframe configuration 6 and applying the FDD LTE procedures in KDB 941225 D05v02r04. SAR testing is performed using the extended cyclic prefix listed in 3GPP TS 36.211 Section 4.

7.5.6 Downlink Only Carrier Aggregation

Conducted power measurements with LTE Carrier Aggregation (CA) (downlink only) active are made in accordance to KDB Publication 941225 D05Av01r02. The RRC connection is only handled by one cell, the primary component carrier (PCC) for downlink and uplink communications. After making a data connection to the PCC, the UE device adds secondary component carrier(s) (SCC) on the downlink only. All uplink communications and acknowledgements remain identical to specifications when downlink carrier aggregation is inactive on the PCC. For every supported combination of downlink only carrier aggregation, additional conducted output powers are measured with the downlink carrier aggregation active for the configuration with highest measured maximum conducted power with downlink carrier aggregation inactive measured among the channel bandwidth, modulation, and RB combinations in each frequency band. Per FCC KDB Publication 941225 D05Av01r02, no SAR measurements are required for carrier aggregation configurations when the average output power with downlink only carrier aggregation

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

active is not more than 0.25 dB higher than the average output power with downlink only carrier aggregation inactive.

7.6 SAR Testing with 802.11 Transmitters

The normal network operating configurations of 802.11 transmitters are not suitable for SAR measurements. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure the results are consistent and reliable. See KDB Publication 248227 D01v02r02 for more details.

7.6.1 General Device Setup

Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters.

A periodic duty factor is required for current generation SAR systems to measure SAR. When 802.11 frame gaps are accounted for in the transmission, a maximum transmission duty factor of 92 - 96% is typically achievable in most test mode configurations. A minimum transmission duty factor of 85% is required to avoid certain hardware and device implementation issues related to wide range SAR scaling. The reported SAR is scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

7.6.2 U-NII-1 and U-NII-2A

For devices that operate in both U-NII-1 and U-NII-2A bands, when the same maximum output power is specified for both bands, SAR measurement using OFDM SAR test procedures is not required for U-NII-1 unless the highest reported SAR for U-NII-2A is > 1.2 W/kg. When different maximum output powers are specified for the bands, SAR measurement for the U-NII band with the lower maximum output power is not required unless the highest reported SAR for the U-NII band with the higher maximum output power, adjusted by the ratio of lower to higher specified maximum output power for the two bands, is > 1.2 W/kg.

7.6.3 U-NII-2C and U-NII-3

The frequency range covered by U-NII-2C and U-NII-3 is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. When Terminal Doppler Weather Radar (TDWR) restriction applies, the channels at 5.60 – 5.65 GHz in U-NII-2C band must be disabled with acceptable mechanisms and documented in the equipment certification. Unless band gap channels are permanently disabled, SAR must be considered for these channels. Each band is tested independently according to the normally required OFDM SAR measurement and probe calibration frequency points requirements.

7.6.4 2.4 GHz SAR Test Requirements

SAR is measured for 2.4 GHz 802.11b DSSS using either the fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:

1) When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

2) When the reported SAR is > 0.8 W/kg, SAR is required for that position using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

2.4 GHz 802.11 g/n OFDM are additionally evaluated for SAR if the highest reported SAR for 802.11b, adjusted by the ratio of the OFDM to DSSS specified maximum output power, is > 1.2 W/kg. When SAR is required for OFDM modes in 2.4 GHz band, the Initial Test Configuration Procedures should be followed.

7.6.5 OFDM Transmission Mode and SAR Test Channel Selection

When the same maximum output power was specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration with the largest channel bandwidth, lowest order modulation and lowest data rate. When the maximum output power of a channel is the same for equivalent OFDM configurations; for example, 802.11a, 802.11n and 802.11ac or 802.11g and 802.11n with the same channel bandwidth, modulation and data rate etc., the lower order 802.11 mode i.e., 802.11a, then 802.11n and 802.11ac or 802.11g then 802.11n, is used for SAR measurement. When the maximum output power are the same for multiple test channels, either according to the default or additional power measurement requirements, SAR is measured using the channel closest to the middle of the frequency band or aggregated band. When there are multiple channels with the same maximum output power, SAR is measured using the higher number channel.

7.6.6 Initial Test Configuration Procedure

For OFDM, an initial test configuration is determined for each frequency band and aggregated band, according to the transmission mode with the highest maximum output power specified for SAR measurements. When the same maximum output power is specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration(s) with the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order IEEE 802.11 mode. The channel of the transmission mode with the highest average RF output conducted power will be the initial test configuration.

When the reported SAR is ≤ 0.8 W/kg, no additional measurements on other test channels are required. Otherwise, SAR is evaluated using the subsequent highest average RF output channel until the reported SAR result is ≤ 1.2 W/kg or all channels are measured. When there are multiple untested channels having the same subsequent highest average RF output power, the channel with higher frequency from the lowest 802.11 mode is considered for SAR measurements (See Section 7.6.5).

7.6.7 Subsequent Test Configuration Procedures

For OFDM configurations in each frequency band and aggregated band, SAR is evaluated for initial test configuration using the fixed test position or the initial test position procedure. When the highest reported SAR (for the initial test configuration), adjusted by the ratio of the specified maximum output power of the subsequent test configuration to initial test configuration, is ≤ 1.2 W/kg, no additional SAR tests for the subsequent test configurations are required.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

7.6.8 MIMO SAR Considerations

Per KDB Publication 248227 D01v02r02, the simultaneous SAR provisions in KDB Publication 447498 D01v06 should be applied to determine simultaneous transmission SAR test exclusion for WIFI MIMO. If the sum of 1g single transmission chain SAR measurements is <1.6 W/kg, no additional SAR measurements for MIMO are required. Alternatively, SAR for MIMO can be measured with all antennas transmitting simultaneously at the specified maximum output power of MIMO operation. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

8 RF CONDUCTED POWERS

8.1 GSM Conducted Powers

Table 8-1
Conducted Power Ant WF3

Maximum Burst-Averaged Output Power					
		GPRS/EDGE Data (GMSK)		*EDGE Data (8-PSK)*	
Band	**Channel**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**
GSM 850	128	27.93	24.97	24.69	23.71
	190	27.91	24.96	24.67	23.72
	251	27.85	24.95	24.60	23.63
GSM 1900	512	22.81	19.81	22.91	19.95
	661	22.71	19.73	22.83	19.83
	810	22.95	19.96	23.00	20.00

Calculated Maximum Frame-Averaged Output Power					
		GPRS/EDGE Data (GMSK)		*EDGE Data (8-PSK)*	
Band	**Channel**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**
GSM 850	128	18.90	18.95	15.66	17.69
	190	18.88	18.94	15.64	17.70
	251	18.82	18.93	15.57	17.61
GSM 1900	512	13.78	13.79	13.88	13.93
	661	13.68	13.71	13.80	13.81
	810	13.92	13.94	13.97	13.98

GSM 850	**Frame Avg.Targets:**	18.97	18.98	15.72	17.73
GSM 1900		13.97	13.98	13.97	13.98

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-2
Conducted Power Ant WF5

Maximum Burst-Averaged Output Power					
		GPRS/EDGE Data (GMSK)		*EDGE Data (8-PSK)*	
Band	**Channel**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**
GSM 850	128	27.47	25.41	22.69	21.68
	190	27.33	25.25	22.73	21.70
	251	27.30	25.25	22.62	21.58
GSM 1900	512	24.23	21.31	22.46	21.22
	661	24.07	21.15	22.30	21.05
	810	24.48	21.49	22.74	21.47

Calculated Maximum Frame-Averaged Output Power					
		GPRS/EDGE Data (GMSK)		*EDGE Data (8-PSK)*	
Band	**Channel**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**
GSM 850	128	18.44	19.39	13.66	15.66
	190	18.30	19.23	13.70	15.68
	251	18.27	19.23	13.59	15.56
GSM 1900	512	15.20	15.29	13.43	15.20
	661	15.04	15.13	13.27	15.03
	810	15.45	15.47	13.71	15.45

GSM 850	**Frame Avg.Targets:**	19.22	19.48	13.72	15.73
GSM 1900		15.47	15.48	13.72	15.48

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Note:

1. Both burst-averaged and calculated frame-averaged powers are included. Frame-averaged power was calculated from the measured burst-averaged power by converting the slot powers into linear units and calculating the energy over 8 timeslots.
2. GPRS/EDGE (GMSK) output powers were measured with coding scheme setting of 1 (CS1) on the base station simulator. CS1 was configured to measure GPRS output power measurements and SAR to ensure GMSK modulation in the signal. Our Investigation has shown that CS1 - CS4 settings do not have any impact on the output levels or modulation in the GPRS modes.
3. EDGE (8-PSK) output powers were measured with MCS7 on the base station simulator. MCS7 coding scheme was used to measure the output powers for EDGE since investigation has shown that choosing MCS7 coding scheme will ensure 8-PSK modulation. It has been shown that MCS levels that produce 8PSK modulation do not have an impact on output power.

GSM Class: C
GPRS Multislot class: 10 (Max 2 Tx uplink slots)
EDGE Multislot class: 10 (Max 2 Tx uplink slots)
DTM Multislot Class: N/A

Figure 8-1
Power Measurement Setup

8.2 UMTS Conducted Powers

Table 8-3
Conducted Power Ant WF3

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			AWS Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	1312	1412	1513	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	18.95	18.87	18.85	14.46	14.42	14.40	13.76	13.72	13.99	-
6	HSDPA	Subtest 1	18.65	18.58	18.67	14.49	14.47	14.36	13.96	13.93	13.99	0
6		Subtest 2	18.70	18.62	18.68	14.37	14.43	14.46	13.92	13.89	13.96	0
6		Subtest 3	18.72	18.64	18.75	14.40	14.43	14.47	13.96	13.94	13.96	0.5
6		Subtest 4	18.70	18.60	18.72	14.41	14.44	14.48	13.95	13.96	13.97	0.5
6	HSUPA	Subtest 1	18.45	18.35	18.42	14.47	14.40	14.44	13.58	13.50	13.62	0
6		Subtest 2	18.75	18.67	18.69	14.30	14.42	14.40	13.90	13.87	13.91	2
6		Subtest 3	18.53	18.47	18.48	14.36	14.44	14.46	13.60	13.55	13.65	1
6		Subtest 4	18.70	18.63	18.62	14.28	14.43	14.42	13.76	13.71	13.75	2
6		Subtest 5	18.68	18.62	18.69	14.37	14.45	14.44	13.97	13.96	13.94	0
8	DC-HSDPA	Subtest 1	18.70	18.57	18.73	14.43	14.50	14.50	13.95	13.91	13.99	0
8		Subtest 2	18.71	18.63	18.68	14.34	14.43	14.47	13.94	13.90	13.96	0
8		Subtest 3	18.70	18.63	18.70	14.38	14.45	14.48	13.97	13.92	13.94	0.5
8		Subtest 4	18.71	18.61	18.69	14.40	14.46	14.46	13.99	13.91	13.98	0.5

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-4
Conducted Power Ant WF5

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			AWS Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	1312	1412	1513	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	18.69	18.57	18.63	14.35	14.42	14.34	14.26	14.12	14.15	-
6	HSDPA	Subtest 1	18.41	18.50	18.48	14.44	14.50	14.37	13.92	13.91	14.07	0
6		Subtest 2	18.50	18.55	18.49	14.36	14.46	14.30	13.87	13.85	13.97	0
6		Subtest 3	18.54	18.58	18.52	14.33	14.47	14.31	13.90	13.83	13.96	0.5
6		Subtest 4	18.46	18.52	18.48	14.32	14.43	14.35	13.94	13.87	14.00	0.5
6	HSUPA	Subtest 1	18.51	18.62	18.55	14.04	14.15	14.00	13.88	13.81	13.96	0
6		Subtest 2	18.67	18.66	18.58	14.29	14.43	14.30	13.87	13.84	13.95	2
6		Subtest 3	18.60	18.68	18.55	14.08	14.18	14.05	13.89	13.83	13.96	1
6		Subtest 4	18.62	18.70	18.60	14.21	14.30	14.17	13.83	13.84	13.93	2
6		Subtest 5	18.55	18.62	18.55	14.36	14.48	14.32	13.93	13.89	13.97	0
8	DC-HSDPA	Subtest 1	18.56	18.62	18.61	14.41	14.48	14.34	13.94	13.95	14.07	0
8		Subtest 2	18.63	18.68	18.63	14.34	14.46	14.29	13.91	13.85	14.00	0
8		Subtest 3	18.67	18.70	18.67	14.40	14.47	14.34	13.92	13.88	14.05	0.5
8		Subtest 4	18.66	18.70	18.61	14.30	14.46	14.29	13.94	13.90	14.02	0.5

DC-HSDPA considerations

- 3GPP Specification 34.121-1 Release 8 Ver 8.10.0 was used for DC-HSDPA guidance
- H-Set 12 (QPSK) was confirmed to be used during DC-HSDPA measurements
- The DUT supports UE category 24 for HSDPA

Figure 8-2
Power Measurement Setup

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

8.3 LTE Conducted Powers

8.3.1 LTE Band 12

Table 8-5
LTE Band 12 Conducted Powers Ant WF3 - 10 MHz Bandwidth

LTE Band 12 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23095 (707.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	**19.11**	0	0
	1	25	18.80		0
	1	49	18.85		0
	25	0	**19.15**	0-1	0
	25	12	18.84		0
	25	25	18.89		0
	50	0	19.10		0
16QAM	1	0	19.38	0-1	0
	1	25	19.25		0
	1	49	19.20		0
	25	0	19.10	0-2	0
	25	12	19.03		0
	25	25	19.05		0
	50	0	19.02		0
64QAM	1	0	19.12	0-2	0
	1	25	19.22		0
	1	49	19.01		0
	25	0	18.84	0-3	0
	25	12	18.82		0
	25	25	18.85		0
	50	0	18.81		0

Note: LTE Band 12 at 10 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

Table 8-6
LTE Band 12 Conducted Powers Ant WF3 - 5 MHz Bandwidth

LTE Band 12 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 23035 (701.5 MHz)	Mid Channel 23095 (707.5 MHz)	High Channel 23155 (713.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.90	19.06	18.89	0	0
	1	12	18.96	18.95	18.86		0
	1	24	19.00	18.99	19.02		0
	12	0	18.88	18.90	18.86	0-1	0
	12	6	18.93	18.89	18.82		0
	12	13	18.91	18.88	18.84		0
	25	0	18.97	18.90	18.83		0
16QAM	1	0	19.28	19.32	19.20	0-1	0
	1	12	19.30	19.20	19.13		0
	1	24	19.32	19.26	19.25		0
	12	0	18.96	18.96	18.95	0-2	0
	12	6	18.99	18.97	18.89		0
	12	13	18.97	18.98	18.92		0
	25	0	18.99	18.95	18.91		0
64QAM	1	0	19.04	19.12	19.01	0-2	0
	1	12	19.06	19.04	19.07		0
	1	24	19.22	19.03	19.09		0
	12	0	18.80	18.83	18.86	0-3	0
	12	6	18.82	18.93	18.83		0
	12	13	18.85	18.84	18.83		0
	25	0	18.82	18.83	18.81		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-7
LTE Band 12 Conducted Powers Ant WF3 - 3 MHz Bandwidth

LTE Band 12 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 23025 (700.5 MHz)	Mid Channel 23095 (707.5 MHz)	High Channel 23165 (714.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.87	18.98	18.81	0	0
	1	7	18.87	18.98	18.97		0
	1	14	18.96	18.84	18.94		0
	8	0	18.88	18.94	18.89	0-1	0
	8	4	18.88	18.94	18.92		0
	8	7	18.91	18.89	18.96		0
	15	0	18.86	18.93	18.91		0
16QAM	1	0	19.16	19.23	19.32	0-1	0
	1	7	19.09	19.27	19.51		0
	1	14	19.20	19.23	19.29		0
	8	0	18.90	18.97	18.98	0-2	0
	8	4	18.94	18.94	18.94		0
	8	7	18.97	18.97	19.05		0
	15	0	18.86	18.90	18.95		0
64QAM	1	0	18.83	19.04	18.97	0-2	0
	1	7	18.95	19.01	18.94		0
	1	14	18.93	18.93	18.91		0
	8	0	18.84	18.81	18.82	0-3	0
	8	4	18.80	18.82	18.80		0
	8	7	18.84	18.80	18.84		0
	15	0	18.83	18.86	18.81		0

Table 8-8
LTE Band 12 Conducted Powers Ant WF3 -1.4 MHz Bandwidth

LTE Band 12 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 23017 (699.7 MHz)	Mid Channel 23095 (707.5 MHz)	High Channel 23173 (715.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.83	18.89	18.98	0	0
	1	2	18.82	18.88	18.98		0
	1	5	18.86	18.94	19.00		0
	3	0	18.83	18.89	18.96		0
	3	2	18.82	18.88	18.95		0
	3	3	18.81	18.89	18.95		0
	6	0	18.82	18.89	18.94	0-1	0
16QAM	1	0	19.12	19.27	19.48	0-1	0
	1	2	19.14	19.30	19.28		0
	1	5	19.27	19.30	19.39		0
	3	0	19.02	19.00	19.06		0
	3	2	18.91	19.02	19.03		0
	3	3	18.95	19.00	19.08		0
	6	0	18.88	18.96	19.00	0-2	0
64QAM	1	0	18.96	19.04	19.03	0-2	0
	1	2	18.98	19.01	18.96		0
	1	5	18.91	19.02	19.09		0
	3	0	18.87	18.85	18.95		0
	3	2	18.84	18.87	18.91		0
	3	3	18.91	18.91	18.98		0
	6	0	18.82	18.82	18.92	0-3	0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-9
LTE Band 12 Conducted Powers Ant WF5 - 10 MHz Bandwidth

LTE Band 12 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23095 (707.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	**19.83**	0	0
	1	25	19.75		0
	1	49	19.70		0
	25	0	**19.94**	0-1	0
	25	12	19.80		0
	25	25	19.85		0
	50	0	19.80		0
16QAM	1	0	19.77	0-1	0
	1	25	19.75		0
	1	49	19.76		0
	25	0	19.44	0-2	0
	25	12	19.39		0
	25	25	19.36		0
	50	0	19.32		0
64QAM	1	0	19.76	0-2	0
	1	25	19.75		0
	1	49	19.74		0
	25	0	19.40	0-3	0
	25	12	19.35		0
	25	25	19.33		0
	50	0	19.34		0

Note: LTE Band 12 at 10 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

Table 8-10
LTE Band 12 Conducted Powers Ant WF5 - 5 MHz Bandwidth

LTE Band 12 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 23035 (701.5 MHz)	Mid Channel 23095 (707.5 MHz)	High Channel 23155 (713.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	19.42	19.46	19.25	0	0
	1	12	19.47	19.39	19.26		0
	1	24	19.49	19.36	19.29		0
	12	0	19.33	19.28	19.28	0-1	0
	12	6	19.37	19.28	19.29		0
	12	13	19.36	19.21	19.33		0
	25	0	19.40	19.27	19.28		0
16QAM	1	0	19.81	19.85	19.63	0-1	0
	1	12	19.83	19.73	19.65		0
	1	24	19.87	19.73	19.75		0
	12	0	19.40	19.36	19.39	0-2	0
	12	6	19.43	19.36	19.35		0
	12	13	19.43	19.29	19.36		0
	25	0	19.44	19.37	19.33		0
64QAM	1	0	19.73	19.76	19.76	0-2	0
	1	12	19.40	19.39	19.51		0
	1	24	19.84	19.31	19.57		0
	12	0	19.31	19.23	19.25	0-3	0
	12	6	19.40	19.33	19.21		0
	12	13	19.30	19.21	19.23		0
	25	0	19.29	19.25	19.19		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-11
LTE Band 12 Conducted Powers Ant WF5 - 3 MHz Bandwidth

LTE Band 12 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 23025 (700.5 MHz)	Mid Channel 23095 (707.5 MHz)	High Channel 23165 (714.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	19.29	19.32	19.16	0	0
	1	7	19.35	19.37	19.20		0
	1	14	19.34	19.27	19.15		0
	8	0	19.30	19.25	19.20	0-1	0
	8	4	19.30	19.25	19.28		0
	8	7	19.37	19.20	19.32		0
	15	0	19.29	19.24	19.30		0
16QAM	1	0	19.64	19.53	19.50	0-1	0
	1	7	19.61	19.59	19.60		0
	1	14	19.64	19.47	19.57		0
	8	0	19.43	19.32	19.36	0-2	0
	8	4	19.40	19.33	19.37		0
	8	7	19.46	19.29	19.41		0
	15	0	19.31	19.29	19.33		0
64QAM	1	0	19.56	19.42	19.52	0-2	0
	1	7	19.65	19.49	19.65		0
	1	14	19.61	19.37	19.59		0
	8	0	19.29	19.31	19.39	0-3	0
	8	4	19.38	19.32	19.29		0
	8	7	19.53	19.25	19.34		0
	15	0	19.29	19.32	19.30		0

Table 8-12
LTE Band 12 Conducted Powers Ant WF5 -1.4 MHz Bandwidth

LTE Band 12 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 23017 (699.7 MHz)	Mid Channel 23095 (707.5 MHz)	High Channel 23173 (715.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	19.33	19.48	19.33	0	0
	1	2	19.44	19.44	19.34		0
	1	5	19.45	19.46	19.38		0
	3	0	19.35	19.25	19.37		0
	3	2	19.35	19.25	19.35		0
	3	3	19.35	19.24	19.35		0
	6	0	19.32	19.23	19.31	0-1	0
16QAM	1	0	19.67	19.46	19.69	0-1	0
	1	2	19.65	19.48	19.70		0
	1	5	19.70	19.50	19.73		0
	3	0	19.50	19.48	19.55		0
	3	2	19.53	19.48	19.58		0
	3	3	19.54	19.48	19.53		0
	6	0	19.45	19.43	19.44	0-2	0
64QAM	1	0	19.63	19.60	19.58	0-2	0
	1	2	19.48	19.50	19.63		0
	1	5	19.65	19.77	19.50		0
	3	0	19.53	19.48	19.49		0
	3	2	19.39	19.37	19.50		0
	3	3	19.37	19.47	19.54		0
	6	0	19.29	19.31	19.20	0-3	0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

8.3.2 LTE Band 13

Table 8-13
LTE Band 13 Conducted Powers Ant WF3 - 10 MHz Bandwidth

LTE Band 13 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23230 (782.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	**19.10**	0	0
	1	25	18.70		0
	1	49	18.55		0
	25	0	**18.68**	0-1	0
	25	12	18.58		0
	25	25	18.47		0
	50	0	18.54		0
16QAM	1	0	19.07	0-1	0
	1	25	18.96		0
	1	49	18.46		0
	25	0	18.31	0-2	0
	25	12	18.23		0
	25	25	18.33		0
	50	0	18.55		0
64QAM	1	0	19.08	0-2	0
	1	25	18.60		0
	1	49	18.59		0
	25	0	18.45	0-3	0
	25	12	18.36		0
	25	25	18.30		0
	50	0	18.36		0

Table 8-14
LTE Band 13 Conducted Powers Ant WF3 - 5 MHz Bandwidth

LTE Band 13 5 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23230 (782.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	18.69	0	0
	1	12	18.64		0
	1	24	18.80		0
	12	0	18.65	0-1	0
	12	6	18.73		0
	12	13	18.72		0
	25	0	18.65		0
16QAM	1	0	18.74	0-1	0
	1	12	18.65		0
	1	24	18.76		0
	12	0	18.45	0-2	0
	12	6	18.51		0
	12	13	18.50		0
	25	0	18.44		0
64QAM	1	0	18.51	0-2	0
	1	12	18.46		0
	1	24	18.54		0
	12	0	18.32	0-3	0
	12	6	18.38		0
	12	13	18.35		0
	25	0	18.29		0

Note: LTE Band 13 at 5 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-15
LTE Band 13 Conducted Powers Ant WF5 - 10 MHz Bandwidth

LTE Band 13 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23230 (782.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	**19.10**	0	0
	1	25	18.75		0
	1	49	18.69		0
	25	0	**18.80**	0-1	0
	25	12	18.71		0
	25	25	18.59		0
	50	0	18.77		0
16QAM	1	0	19.08	0-1	0
	1	25	18.89		0
	1	49	18.69		0
	25	0	18.42	0-2	0
	25	12	18.30		0
	25	25	18.26		0
	50	0	18.22		0
64QAM	1	0	19.07	0-2	0
	1	25	18.79		0
	1	49	18.30		0
	25	0	18.35	0-3	0
	25	12	18.24		0
	25	25	18.23		0
	50	0	18.29		0

Table 8-16
LTE Band 13 Conducted Powers Ant WF5 - 5 MHz Bandwidth

LTE Band 13 5 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23230 (782.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	18.47	0	0
	1	12	18.38		0
	1	24	18.38		0
	12	0	18.28	0-1	0
	12	6	18.15		0
	12	13	18.17		0
	25	0	18.24		0
16QAM	1	0	18.54	0-1	0
	1	12	18.44		0
	1	24	18.36		0
	12	0	18.31	0-2	0
	12	6	18.29		0
	12	13	18.35		0
	25	0	18.23		0
64QAM	1	0	18.57	0-2	0
	1	12	18.40		0
	1	24	18.31		0
	12	0	18.31	0-3	0
	12	6	18.37		0
	12	13	18.29		0
	25	0	18.23		0

Note: LTE Band 13 at 5 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

© 2019 PCTEST Engineering Laboratory, Inc.

REV 20.06 M
12/06/2017

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

8.3.3 LTE Band 14

Table 8-17
LTE Band 14 Conducted Powers Ant WF3 - 10 MHz Bandwidth

LTE Band 14 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23330 (793.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	**19.09**	0	0
	1	25	18.92		0
	1	49	18.83		0
	25	0	**18.97**	0-1	0
	25	12	18.89		0
	25	25	18.87		0
	50	0	18.94		0
16QAM	1	0	19.08	0-1	0
	1	25	18.92		0
	1	49	18.86		0
	25	0	18.56	0-2	0
	25	12	18.53		0
	25	25	18.49		0
	50	0	18.49		0
64QAM	1	0	19.00	0-2	0
	1	25	18.90		0
	1	49	18.81		0
	25	0	18.56	0-3	0
	25	12	18.48		0
	25	25	18.43		0
	50	0	18.45		0

Table 8-18
LTE Band 14 Conducted Powers Ant WF3 - 5 MHz Bandwidth

LTE Band 14 5 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23330 (793.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	18.88	0	0
	1	12	18.80		0
	1	24	18.76		0
	12	0	18.81	0-1	0
	12	6	18.79		0
	12	13	18.81		0
	25	0	18.82		0
16QAM	1	0	18.73	0-1	0
	1	12	18.71		0
	1	24	18.63		0
	12	0	18.42	0-2	0
	12	6	18.42		0
	12	13	18.44		0
	25	0	18.43		0
64QAM	1	0	18.62	0-2	0
	1	12	18.57		0
	1	24	18.54		0
	12	0	18.42	0-3	0
	12	6	18.42		0
	12	13	18.43		0
	25	0	18.43		0

Note: LTE Band 14 at 5 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-19
LTE Band 14 Conducted Powers Ant WF5 - 10 MHz Bandwidth

LTE Band 14 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23330 (793.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	**19.09**	0	0
	1	25	18.85		0
	1	49	18.70		0
	25	0	**18.90**	0-1	0
	25	12	18.89		0
	25	25	18.78		0
	50	0	18.81		0
16QAM	1	0	19.05	0-1	0
	1	25	18.92		0
	1	49	18.70		0
	25	0	18.55	0-2	0
	25	12	18.44		0
	25	25	18.30		0
	50	0	18.35		0
64QAM	1	0	19.06	0-2	0
	1	25	18.70		0
	1	49	18.84		0
	25	0	18.55	0-3	0
	25	12	18.42		0
	25	25	18.45		0
	50	0	18.50		0

Table 8-20
LTE Band 14 Conducted Powers Ant WF5 - 5 MHz Bandwidth

LTE Band 14 5 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 23330 (793.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	18.74	0	0
	1	12	18.62		0
	1	24	18.69		0
	12	0	18.65	0-1	0
	12	6	18.64		0
	12	13	18.61		0
	25	0	18.60		0
16QAM	1	0	18.57	0-1	0
	1	12	18.48		0
	1	24	18.57		0
	12	0	18.19	0-2	0
	12	6	18.16		0
	12	13	18.18		0
	25	0	18.12		0
64QAM	1	0	18.70	0-2	0
	1	12	18.63		0
	1	24	18.31		0
	12	0	18.61	0-3	0
	12	6	18.55		0
	12	13	18.43		0
	25	0	18.54		0

Note: LTE Band 14 at 5 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

© 2019 PCTEST Engineering Laboratory, Inc.

REV 20.06 M
12/06/2017

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

8.3.4 LTE Band 5 (Cell)

Table 8-21
LTE Band 5 (Cell) Conducted Powers Ant WF3 - 10 MHz Bandwidth

LTE Band 5 (Cell) 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 20525 (836.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	18.64	0	0
	1	25	18.67		0
	1	49	**18.91**		0
	25	0	18.73	0-1	0
	25	12	18.70		0
	25	25	**18.93**		0
	50	0	18.88		0
16QAM	1	0	18.73	0-1	0
	1	25	18.75		0
	1	49	18.92		0
	25	0	18.61	0-2	0
	25	12	18.50		0
	25	25	18.52		0
	50	0	18.56		0
64QAM	1	0	18.84	0-2	0
	1	25	18.95		0
	1	49	18.94		0
	25	0	18.62	0-3	0
	25	12	18.60		0
	25	25	18.68		0
	50	0	18.54		0

Note: LTE Band 5 (Cell) at 10 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

Table 8-22
LTE Band 5 (Cell) Conducted Powers Ant WF3 - 5 MHz Bandwidth

LTE Band 5 (Cell) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20425 (826.5 MHz)	Mid Channel 20525 (836.5 MHz)	High Channel 20625 (846.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.82	18.62	18.83	0	0
	1	12	18.66	18.71	18.92		0
	1	24	18.58	18.78	18.89		0
	12	0	18.70	18.68	18.86	0-1	0
	12	6	18.66	18.65	18.86		0
	12	13	18.64	18.71	18.75		0
	25	0	18.63	18.64	18.84		0
16QAM	1	0	18.94	18.96	19.00	0-1	0
	1	12	18.94	18.71	18.99		0
	1	24	18.85	18.89	18.98		0
	12	0	18.56	18.45	18.69	0-2	0
	12	6	18.54	18.54	18.55		0
	12	13	18.52	18.53	18.54		0
	25	0	18.59	18.49	18.66		0
64QAM	1	0	18.90	18.83	18.92	0-2	0
	1	12	18.84	18.82	18.85		0
	1	24	18.85	18.85	18.93		0
	12	0	18.76	18.60	18.85	0-3	0
	12	6	18.67	18.52	18.76		0
	12	13	18.66	18.69	18.70		0
	25	0	18.64	18.55	18.72		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-23
LTE Band 5 (Cell) Conducted Powers Ant WF3 - 3 MHz Bandwidth

LTE Band 5 (Cell) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20415 (825.5 MHz)	Mid Channel 20525 (836.5 MHz)	High Channel 20635 (847.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.72	18.62	18.87	0	0
	1	7	18.64	18.69	18.83		0
	1	14	18.63	18.72	18.81		0
	8	0	18.79	18.68	18.87	0-1	0
	8	4	18.67	18.66	18.85		0
	8	7	18.73	18.76	18.84		0
	15	0	18.66	18.65	18.84		0
16QAM	1	0	18.88	18.77	18.88	0-1	0
	1	7	18.99	18.93	18.85		0
	1	14	18.84	18.80	18.71		0
	8	0	18.65	18.56	18.61	0-2	0
	8	4	18.64	18.54	18.53		0
	8	7	18.60	18.70	18.58		0
	15	0	18.50	18.56	18.53		0
64QAM	1	0	18.97	18.94	18.84	0-2	0
	1	7	18.97	18.81	18.73		0
	1	14	18.82	19.00	18.95		0
	8	0	18.82	18.67	18.86	0-3	0
	8	4	18.68	18.68	18.85		0
	8	7	18.70	18.65	18.82		0
	15	0	18.63	18.64	18.72		0

Table 8-24
LTE Band 5 (Cell) Conducted Powers Ant WF3 - 1.4 MHz Bandwidth

LTE Band 5 (Cell) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20407 (824.7 MHz)	Mid Channel 20525 (836.5 MHz)	High Channel 20643 (848.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.79	18.75	18.89	0	0
	1	2	18.75	18.64	18.87		0
	1	5	18.73	18.70	18.94		0
	3	0	18.80	18.69	18.83		0
	3	2	18.72	18.67	18.82		0
	3	3	18.76	18.60	18.84		0
	6	0	18.74	18.67	18.81	0-1	0
16QAM	1	0	18.86	18.84	19.00	0-1	0
	1	2	18.97	18.81	18.96		0
	1	5	18.86	18.94	18.98		0
	3	0	18.73	18.73	18.76		0
	3	2	18.59	18.76	18.60		0
	3	3	18.74	18.61	18.67		0
	6	0	18.63	18.50	18.71	0-2	0
64QAM	1	0	18.83	18.93	18.89	0-2	0
	1	2	18.87	19.00	18.90		0
	1	5	18.83	18.87	18.99		0
	3	0	18.75	18.71	18.89		0
	3	2	18.70	18.79	18.83		0
	3	3	18.80	18.65	18.83		0
	6	0	18.70	18.63	18.82	0-3	0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-25
LTE Band 5 (Cell) Conducted Powers Ant WF5 - 10 MHz Bandwidth

LTE Band 5 (Cell) 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 20525 (836.5 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	18.56	0	0
	1	25	18.61		0
	1	49	**18.68**		0
	25	0	18.52	0-1	0
	25	12	18.49		0
	25	25	**18.59**		0
	50	0	18.51		0
16QAM	1	0	18.50	0-1	0
	1	25	18.42		0
	1	49	18.69		0
	25	0	18.09	0-2	0
	25	12	18.05		0
	25	25	18.11		0
	50	0	17.98		0
64QAM	1	0	18.52	0-2	0
	1	25	18.45		0
	1	49	18.68		0
	25	0	18.08	0-3	0
	25	12	18.04		0
	25	25	18.14		0
	50	0	18.08		0

Note: LTE Band 5 (Cell) at 10 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

\

Table 8-26
LTE Band 5 (Cell) Conducted Powers Ant WF5 - 5 MHz Bandwidth

LTE Band 5 (Cell) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20425 (826.5 MHz)	Mid Channel 20525 (836.5 MHz)	High Channel 20625 (846.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.51	18.50	18.63	0	0
	1	12	18.50	18.51	18.62		0
	1	24	18.56	18.60	18.61		0
	12	0	18.55	18.49	18.55	0-1	0
	12	6	18.53	18.43	18.49		0
	12	13	18.52	18.45	18.45		0
	25	0	18.48	18.40	18.52		0
16QAM	1	0	18.42	18.39	18.50	0-1	0
	1	12	18.38	18.40	18.53		0
	1	24	18.36	18.46	18.55		0
	12	0	18.16	18.34	18.37	0-2	0
	12	6	18.13	18.20	18.32		0
	12	13	18.15	18.23	18.30		0
	25	0	18.19	18.22	18.30		0
64QAM	1	0	18.58	18.25	18.57	0-2	0
	1	12	18.43	18.24	18.51		0
	1	24	18.46	18.40	18.44		0
	12	0	18.21	18.06	18.28	0-3	0
	12	6	18.04	18.09	18.25		0
	12	13	18.11	18.07	18.16		0
	25	0	18.07	18.02	18.22		0

Table 8-27
LTE Band 5 (Cell) Conducted Powers Ant WF5 - 3 MHz Bandwidth

LTE Band 5 (Cell) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20415 (825.5 MHz)	Mid Channel 20525 (836.5 MHz)	High Channel 20635 (847.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.42	18.54	18.62	0	0
	1	7	18.38	18.53	18.58		0
	1	14	18.40	18.57	18.60		0
	8	0	18.47	18.50	18.54	0-1	0
	8	4	18.41	18.46	18.44		0
	8	7	18.43	18.51	18.45		0
	15	0	18.39	18.40	18.43		0
16QAM	1	0	18.32	18.35	18.47	0-1	0
	1	7	18.29	18.38	18.46		0
	1	14	18.25	18.37	18.41		0
	8	0	18.20	18.24	18.33	0-2	0
	8	4	18.15	18.21	18.32		0
	8	7	18.13	18.25	18.28		0
	15	0	18.15	18.19	18.25		0
64QAM	1	0	18.52	18.29	18.54	0-2	0
	1	7	18.26	18.63	18.42		0
	1	14	18.30	18.35	18.28		0
	8	0	18.21	18.09	18.16	0-3	0
	8	4	18.13	18.13	18.31		0
	8	7	18.16	18.11	18.13		0
	15	0	18.17	18.06	18.22		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-28
LTE Band 5 (Cell) Conducted Powers WF5 - 1.4 MHz Bandwidth

LTE Band 5 (Cell) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20407 (824.7 MHz)	Mid Channel 20525 (836.5 MHz)	High Channel 20643 (848.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.49	18.60	18.63	0	0
	1	2	18.46	18.63	18.65		0
	1	5	18.45	18.64	18.66		0
	3	0	18.51	18.53	18.60		0
	3	2	18.50	18.54	18.61		0
	3	3	18.52	18.52	18.59		0
	6	0	18.52	18.53	18.59	0-1	0
16QAM	1	0	18.23	18.22	18.39	0-1	0
	1	2	18.22	18.23	18.38		0
	1	5	18.19	18.26	18.38		0
	3	0	18.14	18.23	18.36		0
	3	2	18.13	18.25	18.35		0
	3	3	18.13	18.23	18.37		0
	6	0	18.10	18.15	18.25	0-2	0
64QAM	1	0	18.65	18.30	18.55	0-2	0
	1	2	18.57	18.38	18.29		0
	1	5	18.48	18.18	18.37		0
	3	0	18.23	18.19	18.27		0
	3	2	18.30	18.24	18.40		0
	3	3	18.37	18.02	18.30		0
	6	0	18.24	18.11	18.15	0-3	0

8.3.5 LTE Band 26 (Cell)

Table 8-29
LTE Band 26 (Cell) Conducted Powers Ant WF3 - 10 MHz Bandwidth

LTE Band 26 (Cell) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26740 (819.0 MHz)	Mid Channel 26865 (831.5 MHz)	High Channel 26990 (844.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	**18.93**	18.68	18.70	0	0
	1	25	18.85	18.44	18.73		0
	1	49	18.84	18.58	18.75		0
	25	0	18.69	18.59	18.72	0-1	0
	25	12	18.70	18.44	18.72		0
	25	25	**18.79**	18.51	18.73		0
	50	0	18.78	18.47	18.74		0
16QAM	1	0	18.94	18.89	18.72	0-1	0
	1	25	18.86	18.60	18.74		0
	1	49	18.83	18.71	18.77		0
	25	0	18.36	18.30	18.44	0-2	0
	25	12	18.37	18.18	18.43		0
	25	25	18.48	18.22	18.47		0
	50	0	18.46	18.20	18.43		0
64QAM	1	0	18.99	18.60	18.81	0-2	0
	1	25	18.75	18.58	18.80		0
	1	49	18.52	18.66	18.83		0
	25	0	18.45	18.18	18.47	0-3	0
	25	12	18.50	18.16	18.38		0
	25	25	18.33	18.18	18.43		0
	50	0	18.35	18.19	18.45		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-30
LTE Band 26 (Cell) Conducted Powers Ant WF3 - 5 MHz Bandwidth

LTE Band 26 (Cell) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26715 (816.5 MHz)	Mid Channel 26865 (831.5 MHz)	High Channel 27015 (846.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.72	18.32	18.55	0	0
	1	12	18.58	18.25	18.63		0
	1	24	18.57	18.28	18.59		0
	12	0	18.60	18.27	18.55	0-1	0
	12	6	18.53	18.26	18.51		0
	12	13	18.50	18.31	18.47		0
	25	0	18.53	18.28	18.53		0
16QAM	1	0	18.96	18.70	18.86	0-1	0
	1	12	18.93	18.59	18.98		0
	1	24	18.98	18.58	18.92		0
	12	0	18.53	18.32	18.59	0-2	0
	12	6	18.61	18.29	18.58		0
	12	13	18.54	18.38	18.57		0
	25	0	18.60	18.37	18.53		0
64QAM	1	0	18.99	18.51	18.60	0-2	0
	1	12	18.92	18.44	18.82		0
	1	24	18.54	18.53	18.42		0
	12	0	18.45	18.17	18.43	0-3	0
	12	6	18.37	18.13	18.41		0
	12	13	18.45	18.19	18.37		0
	25	0	18.34	18.13	18.36		0

Table 8-31
LTE Band 26 (Cell) Conducted Powers Ant WF3 - 3 MHz Bandwidth

LTE Band 26 (Cell) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26705 (815.5 MHz)	Mid Channel 26865 (831.5 MHz)	High Channel 27025 (847.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.61	18.27	18.50	0	0
	1	7	18.58	18.38	18.64		0
	1	14	18.40	18.33	18.46		0
	8	0	18.64	18.27	18.53	0-1	0
	8	4	18.57	18.31	18.53		0
	8	7	18.52	18.26	18.50		0
	15	0	18.61	18.26	18.51		0
16QAM	1	0	18.85	18.86	18.78	0-1	0
	1	7	18.95	18.81	18.93		0
	1	14	18.86	18.72	18.82		0
	8	0	18.70	18.35	18.73	0-2	0
	8	4	18.65	18.35	18.66		0
	8	7	18.69	18.38	18.60		0
	15	0	18.58	18.38	18.56		0
64QAM	1	0	18.68	18.44	18.71	0-2	0
	1	7	18.70	18.40	18.51		0
	1	14	18.69	18.41	18.44		0
	8	0	18.52	18.23	18.46	0-3	0
	8	4	18.45	18.21	18.46		0
	8	7	18.44	18.14	18.45		0
	15	0	18.41	18.17	18.33		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-32
LTE Band 26 (Cell) Conducted Powers Ant WF3 -1.4 MHz Bandwidth

LTE Band 26 (Cell) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26697 (814.7 MHz)	Mid Channel 26865 (831.5 MHz)	High Channel 27033 (848.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.69	18.35	18.60	0	0
	1	2	18.65	18.32	18.58		0
	1	5	18.57	18.33	18.61		0
	3	0	18.65	18.30	18.53		0
	3	2	18.58	18.28	18.48		0
	3	3	18.62	18.28	18.51		0
	6	0	18.64	18.26	18.49	0-1	0
16QAM	1	0	18.97	18.76	18.90	0-1	0
	1	2	18.90	18.66	18.78		0
	1	5	18.81	18.69	18.99		0
	3	0	18.84	18.26	18.74		0
	3	2	18.90	18.54	18.41		0
	3	3	18.82	18.66	18.65		0
	6	0	18.82	18.44	18.54	0-2	0
64QAM	1	0	18.98	18.61	18.53	0-2	0
	1	2	18.89	18.42	18.79		0
	1	5	18.83	18.69	18.74		0
	3	0	18.56	18.30	18.53		0
	3	2	18.67	18.31	18.51		0
	3	3	18.51	18.46	18.59		0
	6	0	18.55	18.27	18.34	0-3	0

Table 8-33
LTE Band 26 (Cell) Conducted Powers Ant WF5 - 10 MHz Bandwidth

LTE Band 26 (Cell) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26740 (819.0 MHz)	Mid Channel 26865 (831.5 MHz)	High Channel 26990 (844.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.65	18.61	18.56	0	0
	1	25	18.62	18.53	18.60		0
	1	49	18.50	18.44	**18.67**		0
	25	0	18.45	18.43	18.50	0-1	0
	25	12	18.44	18.38	18.56		0
	25	25	18.52	18.36	**18.59**		0
	50	0	18.50	18.31	18.55		0
16QAM	1	0	18.69	18.60	18.60	0-1	0
	1	25	18.60	18.62	18.62		0
	1	49	18.67	18.56	18.64		0
	25	0	18.06	18.00	18.10	0-2	0
	25	12	18.04	17.98	18.15		0
	25	25	18.05	17.93	18.13		0
	50	0	18.10	17.93	18.11		0
64QAM	1	0	18.69	18.30	18.33	0-2	0
	1	25	18.63	18.35	18.27		0
	1	49	18.50	18.26	18.25		0
	25	0	17.89	17.92	18.06	0-3	0
	25	12	17.92	17.88	18.05		0
	25	25	18.00	17.81	18.06		0
	50	0	18.08	17.88	18.11		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-34
LTE Band 26 (Cell) Conducted Powers Ant WF5 - 5 MHz Bandwidth

LTE Band 26 (Cell) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26715 (816.5 MHz)	Mid Channel 26865 (831.5 MHz)	High Channel 27015 (846.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.60	18.51	18.65	0	0
	1	12	18.52	18.50	18.66		0
	1	24	18.61	18.52	18.67		0
	12	0	18.62	18.45	18.60	0-1	0
	12	6	18.59	18.42	18.58		0
	12	13	18.60	18.40	18.56		0
	25	0	18.50	18.43	18.57		0
16QAM	1	0	18.39	18.30	18.52	0-1	0
	1	12	18.31	18.26	18.49		0
	1	24	18.35	18.32	18.42		0
	12	0	18.20	18.15	18.23	0-2	0
	12	6	18.13	18.11	18.16		0
	12	13	18.08	18.09	18.15		0
	25	0	18.09	18.12	18.21		0
64QAM	1	0	18.35	18.18	18.49	0-2	0
	1	12	18.29	18.17	18.37		0
	1	24	18.26	18.18	18.48		0
	12	0	18.27	18.03	18.32	0-3	0
	12	6	18.14	18.01	18.34		0
	12	13	18.04	18.02	18.25		0
	25	0	18.18	18.07	18.32		0

Table 8-35
LTE Band 26 (Cell) Conducted Powers Ant WF5 - 3 MHz Bandwidth

LTE Band 26 (Cell) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26705 (815.5 MHz)	Mid Channel 26865 (831.5 MHz)	High Channel 27025 (847.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.65	18.30	18.54	0	0
	1	7	18.61	18.32	18.53		0
	1	14	18.59	18.28	18.47		0
	8	0	18.58	18.35	18.54	0-1	0
	8	4	18.62	18.38	18.53		0
	8	7	18.57	18.45	18.51		0
	15	0	18.57	18.36	18.54		0
16QAM	1	0	18.54	18.29	18.56	0-1	0
	1	7	18.49	18.32	18.54		0
	1	14	18.41	18.30	18.49		0
	8	0	18.45	18.22	18.41	0-2	0
	8	4	18.37	18.18	18.37		0
	8	7	18.37	18.20	18.34		0
	15	0	18.37	18.24	18.32		0
64QAM	1	0	18.66	18.27	18.40	0-2	0
	1	7	18.36	18.10	18.43		0
	1	14	18.17	18.01	18.41		0
	8	0	18.18	17.96	18.21	0-3	0
	8	4	18.16	17.98	18.08		0
	8	7	18.06	17.94	18.06		0
	15	0	18.09	17.86	18.12		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-36
LTE Band 26 (Cell) Conducted Powers Ant WF5 -1.4 MHz Bandwidth

LTE Band 26 (Cell) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26697 (814.7 MHz)	Mid Channel 26865 (831.5 MHz)	High Channel 27033 (848.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	18.68	18.65	18.55	0	0
	1	2	18.65	18.63	18.52		0
	1	5	18.67	18.64	18.51		0
	3	0	18.61	18.50	18.60		0
	3	2	18.55	18.47	18.57		0
	3	3	18.54	18.47	18.56		0
	6	0	18.65	18.49	18.60	0-1	0
16QAM	1	0	18.55	18.25	18.55	0-1	0
	1	2	18.53	18.23	18.47		0
	1	5	18.50	18.22	18.44		0
	3	0	18.31	18.10	18.29		0
	3	2	18.33	18.07	18.28		0
	3	3	18.34	18.17	18.29		0
	6	0	18.32	18.10	18.28	0-2	0
64QAM	1	0	18.56	18.37	18.37	0-2	0
	1	2	18.37	18.21	18.39		0
	1	5	18.42	18.28	18.47		0
	3	0	18.27	18.05	18.26		0
	3	2	18.23	18.01	18.22		0
	3	3	18.36	18.04	18.25		0
	6	0	18.15	17.99	18.07	0-3	0

8.3.6 LTE Band 66 (AWS)

Table 8-37
LTE Band 66 (AWS) Conducted Powers Ant WF3 - 20 MHz Bandwidth

LTE Band 66 (AWS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 132072 (1720.0 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132572 (1770.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	**14.48**	14.32	14.26	0	0
	1	50	14.45	14.26	14.16		0
	1	99	14.40	14.29	14.23		0
	50	0	14.33	14.28	14.17	0-1	0
	50	25	**14.42**	14.24	14.10		0
	50	50	14.39	14.27	14.13		0
	100	0	14.40	14.31	14.15		0
16QAM	1	0	14.40	14.30	14.30	0-1	0
	1	50	14.38	14.29	14.42		0
	1	99	14.29	14.33	14.46		0
	50	0	13.99	13.85	13.95	0-2	0
	50	25	14.09	13.86	13.96		0
	50	50	13.98	13.91	14.02		0
	100	0	14.13	13.89	14.06		0
64QAM	1	0	14.40	14.31	14.32	0-2	0
	1	50	14.36	14.05	14.35		0
	1	99	14.29	14.11	14.41		0
	50	0	14.05	13.82	14.02	0-3	0
	50	25	14.09	13.91	14.01		0
	50	50	14.06	13.95	14.06		0
	100	0	14.15	13.95	14.07		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-38
LTE Band 66 (AWS) Conducted Powers Ant WF3 - 15 MHz Bandwidth

LTE Band 66 (AWS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 132047 (1717.5 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132597 (1772.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	14.01	13.95	13.91	0	0
	1	36	13.96	13.88	13.89		0
	1	74	14.00	13.83	13.94		0
	36	0	13.97	13.86	13.86	0-1	0
	36	18	13.97	13.85	13.89		0
	36	37	14.03	13.79	13.87		0
	75	0	14.01	13.88	13.95		0
16QAM	1	0	14.28	14.07	14.03	0-1	0
	1	36	14.18	14.03	14.08		0
	1	74	14.28	14.08	14.17		0
	36	0	13.89	13.68	13.79	0-2	0
	36	18	13.89	13.71	13.83		0
	36	37	13.98	13.79	13.79		0
	75	0	13.92	13.79	13.86		0
64QAM	1	0	14.24	14.12	13.94	0-2	0
	1	36	14.19	13.97	14.04		0
	1	74	14.20	14.05	14.15		0
	36	0	13.97	13.73	13.82	0-3	0
	36	18	13.98	13.77	13.86		0
	36	37	14.03	13.81	13.84		0
	75	0	14.00	13.84	13.87		0

Table 8-39
LTE Band 66 (AWS) Conducted Powers Ant WF3 - 10 MHz Bandwidth

LTE Band 66 (AWS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 132022 (1715.0 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132622 (1775.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	14.07	13.87	13.83	0	0
	1	25	14.02	13.87	13.87		0
	1	49	14.09	13.93	13.98		0
	25	0	14.04	13.86	13.87	0-1	0
	25	12	13.98	13.83	13.85		0
	25	25	13.99	13.84	13.89		0
	50	0	14.02	13.88	13.89		0
16QAM	1	0	14.25	14.06	14.05	0-1	0
	1	25	14.17	14.16	14.15		0
	1	49	14.29	14.10	14.27		0
	25	0	13.93	13.74	13.78	0-2	0
	25	12	13.85	13.68	13.76		0
	25	25	13.85	13.69	13.79		0
	50	0	13.89	13.77	13.77		0
64QAM	1	0	14.25	14.00	13.95	0-2	0
	1	25	14.19	14.01	13.98		0
	1	49	14.29	13.98	14.08		0
	25	0	13.99	13.77	13.79	0-3	0
	25	12	13.95	13.77	13.78		0
	25	25	13.96	13.78	13.82		0
	50	0	13.97	13.82	13.80		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-40
LTE Band 66 (AWS) Conducted Powers Ant WF3 - 5 MHz Bandwidth

LTE Band 66 (AWS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 131997 (1712.5 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132647 (1777.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	14.13	13.89	13.95	0	0
	1	12	14.07	13.87	13.94		0
	1	24	14.10	13.87	13.99		0
	12	0	14.11	13.85	13.93	0-1	0
	12	6	14.08	13.83	13.90		0
	12	13	14.07	13.85	13.92		0
	25	0	14.10	13.85	13.92		0
16QAM	1	0	14.38	14.34	14.18	0-1	0
	1	12	14.18	14.23	14.26		0
	1	24	14.26	14.25	14.25		0
	12	0	14.00	14.00	13.90	0-2	0
	12	6	14.00	13.98	13.87		0
	12	13	13.99	13.99	13.91		0
	25	0	13.98	14.00	13.88		0
64QAM	1	0	14.32	14.05	14.13	0-2	0
	1	12	14.47	14.06	14.16		0
	1	24	14.25	14.10	14.25		0
	12	0	14.06	13.82	13.89	0-3	0
	12	6	14.11	13.76	13.90		0
	12	13	14.08	13.89	13.92		0
	25	0	14.07	13.83	13.89		0

Table 8-41
LTE Band 66 (AWS) Conducted Powers Ant WF3 - 3 MHz Bandwidth

LTE Band 66 (AWS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 131987 (1711.5 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132657 (1778.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	14.06	13.90	14.01	0	0
	1	7	14.10	13.81	13.95		0
	1	14	14.07	13.84	13.98		0
	8	0	14.11	13.86	13.97	0-1	0
	8	4	14.10	13.86	13.95		0
	8	7	14.10	13.87	13.97		0
	15	0	14.10	13.87	13.95		0
16QAM	1	0	14.30	13.95	14.13	0-1	0
	1	7	14.35	14.05	14.27		0
	1	14	14.30	13.96	14.21		0
	8	0	14.05	13.80	13.93	0-2	0
	8	4	14.05	13.82	13.97		0
	8	7	14.05	13.84	13.96		0
	15	0	14.00	13.77	13.91		0
64QAM	1	0	14.28	13.95	14.10	0-2	0
	1	7	14.35	14.05	14.15		0
	1	14	14.24	14.08	13.98		0
	8	0	14.16	13.86	13.97	0-3	0
	8	4	14.14	13.90	13.95		0
	8	7	14.13	13.94	13.98		0
	15	0	14.21	13.88	13.93		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-42
LTE Band 66 (AWS) Conducted Powers Ant WF3 -1.4 MHz Bandwidth

LTE Band 66 (AWS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 131979 (1710.7 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132665 (1779.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	14.12	13.87	14.02	0	0
	1	2	14.08	13.83	14.02		0
	1	5	14.10	13.90	14.05		0
	3	0	14.10	13.85	14.02		0
	3	2	14.09	13.88	14.02		0
	3	3	14.10	13.89	14.02		0
	6	0	14.10	13.89	14.03	0-1	0
16QAM	1	0	14.23	14.26	14.20	0-1	0
	1	2	14.27	14.21	14.25		0
	1	5	14.15	14.21	14.30		0
	3	0	14.03	14.14	14.03		0
	3	2	14.00	14.05	14.01		0
	3	3	14.02	14.05	14.00		0
	6	0	13.98	14.03	13.98	0-2	0
64QAM	1	0	14.20	14.03	14.22	0-2	0
	1	2	14.19	14.01	14.15		0
	1	5	14.16	14.13	14.20		0
	3	0	14.09	13.92	14.08		0
	3	2	14.07	13.99	14.10		0
	3	3	14.03	13.99	14.09		0
	6	0	14.00	13.92	14.02	0-3	0

Table 8-43
LTE Band 66 (AWS) Conducted Powers Ant WF5 - 20 MHz Bandwidth

LTE Band 66 (AWS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 132072 (1720.0 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132572 (1770.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	14.44	14.41	14.31	0	0
	1	50	**14.48**	14.32	14.26		0
	1	99	14.46	14.28	14.33		0
	50	0	14.34	14.24	14.21	0-1	0
	50	25	**14.38**	14.22	14.25		0
	50	50	14.29	14.18	14.26		0
	100	0	14.37	14.27	14.32		0
16QAM	1	0	14.43	14.45	14.48	0-1	0
	1	50	14.36	14.37	14.43		0
	1	99	14.35	14.41	14.33		0
	50	0	13.98	13.94	14.02	0-2	0
	50	25	13.91	14.00	13.99		0
	50	50	13.91	13.99	13.97		0
	100	0	13.94	14.08	14.07		0
64QAM	1	0	14.33	14.43	14.49	0-2	0
	1	50	14.23	14.29	14.36		0
	1	99	14.34	14.45	14.43		0
	50	0	14.02	14.02	14.09	0-3	0
	50	25	13.99	14.03	14.05		0
	50	50	14.01	13.99	14.01		0
	100	0	14.02	14.10	14.14		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-44
LTE Band 66 (AWS) Conducted Powers Ant WF5 - 15 MHz Bandwidth

LTE Band 66 (AWS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 132047 (1717.5 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132597 (1772.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	13.85	13.85	13.86	0	0
	1	36	13.83	13.90	13.83		0
	1	74	13.87	13.89	13.85		0
	36	0	13.86	13.79	13.85	0-1	0
	36	18	13.80	13.87	13.81		0
	36	37	13.80	13.79	13.76		0
	75	0	13.83	13.90	13.83		0
16QAM	1	0	14.39	14.37	14.50	0-1	0
	1	36	14.21	14.45	14.30		0
	1	74	14.26	14.42	14.25		0
	36	0	13.98	13.95	13.97	0-2	0
	36	18	13.94	14.00	13.93		0
	36	37	14.01	13.96	13.88		0
	75	0	13.94	14.00	13.94		0
64QAM	1	0	14.27	14.41	14.30	0-2	0
	1	36	14.30	14.35	14.23		0
	1	74	14.43	14.49	14.28		0
	36	0	14.06	13.99	14.12	0-3	0
	36	18	14.00	14.08	14.01		0
	36	37	14.01	14.05	13.97		0
	75	0	14.04	14.06	14.02		0

Table 8-45
LTE Band 66 (AWS) Conducted Powers Ant WF5 - 10 MHz Bandwidth

LTE Band 66 (AWS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 132022 (1715.0 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132622 (1775.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	13.87	13.89	13.95	0	0
	1	25	13.81	13.86	13.81		0
	1	49	13.86	13.85	13.87		0
	25	0	13.83	13.85	13.83	0-1	0
	25	12	13.79	13.84	13.87		0
	25	25	13.78	13.87	13.84		0
	50	0	13.81	13.88	13.81		0
16QAM	1	0	14.25	14.33	14.34	0-1	0
	1	25	14.36	14.36	14.33		0
	1	49	14.31	14.25	14.50		0
	25	0	13.95	13.99	14.03	0-2	0
	25	12	13.94	13.96	13.95		0
	25	25	13.94	13.98	13.95		0
	50	0	13.93	13.97	13.96		0
64QAM	1	0	14.26	14.33	14.38	0-2	0
	1	25	14.32	14.48	14.46		0
	1	49	14.26	14.36	14.26		0
	25	0	14.00	14.05	13.98	0-3	0
	25	12	14.01	14.02	14.00		0
	25	25	14.04	14.04	13.98		0
	50	0	14.00	14.04	14.00		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-46
LTE Band 66 (AWS) Conducted Powers Ant WF5 - 5 MHz Bandwidth

LTE Band 66 (AWS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 131997 (1712.5 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132647 (1777.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	13.86	13.94	13.81	0	0
	1	12	13.85	13.90	13.83		0
	1	24	13.80	13.98	13.77		0
	12	0	13.82	13.88	13.79	0-1	0
	12	6	13.83	13.88	13.74		0
	12	13	13.82	13.84	13.75		0
	25	0	13.83	13.87	13.80		0
16QAM	1	0	14.41	14.34	14.35	0-1	0
	1	12	14.24	14.40	14.34		0
	1	24	14.39	14.35	14.33		0
	12	0	13.96	14.00	14.00	0-2	0
	12	6	13.95	14.01	13.95		0
	12	13	13.95	14.07	13.96		0
	25	0	13.96	14.00	14.01		0
64QAM	1	0	14.37	14.45	14.34	0-2	0
	1	12	14.31	14.29	14.38		0
	1	24	14.31	14.23	14.36		0
	12	0	14.06	14.08	14.05	0-3	0
	12	6	14.05	14.04	14.02		0
	12	13	14.13	14.20	13.98		0
	25	0	14.05	14.08	14.02		0

Table 8-47
LTE Band 66 (AWS) Conducted Powers Ant WF5 - 3 MHz Bandwidth

LTE Band 66 (AWS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 131987 (1711.5 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132657 (1778.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	13.83	13.85	13.83	0	0
	1	7	13.88	13.90	13.81		0
	1	14	13.82	13.84	13.76		0
	8	0	13.85	13.91	13.84	0-1	0
	8	4	13.82	13.90	13.79		0
	8	7	13.84	13.90	13.80		0
	15	0	13.83	13.91	13.79		0
16QAM	1	0	14.33	14.28	14.41	0-1	0
	1	7	14.34	14.40	14.31		0
	1	14	14.30	14.37	14.23		0
	8	0	14.03	14.08	14.04	0-2	0
	8	4	14.03	14.07	14.04		0
	8	7	14.06	14.09	14.02		0
	15	0	14.10	14.02	13.97		0
64QAM	1	0	14.29	14.26	14.18	0-2	0
	1	7	14.50	14.32	14.39		0
	1	14	14.30	14.31	14.30		0
	8	0	14.09	14.11	14.10	0-3	0
	8	4	14.12	14.10	14.07		0
	8	7	14.10	14.20	14.09		0
	15	0	14.03	14.07	14.05		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-48
LTE Band 66 (AWS) Conducted Powers Ant WF5 -1.4 MHz Bandwidth

LTE Band 66 (AWS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 131979 (1710.7 MHz)	Mid Channel 132322 (1745.0 MHz)	High Channel 132665 (1779.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	13.86	13.86	13.81	0	0
	1	2	13.83	13.85	13.79		0
	1	5	13.85	13.85	13.85		0
	3	0	13.85	13.87	13.80		0
	3	2	13.84	13.85	13.81		0
	3	3	13.84	13.86	13.81		0
	6	0	13.85	13.85	13.79	0-1	0
16QAM	1	0	14.32	14.16	14.43	0-1	0
	1	2	14.23	14.37	14.26		0
	1	5	14.26	14.44	14.31		0
	3	0	14.05	14.24	14.07		0
	3	2	14.20	14.07	14.11		0
	3	3	14.06	14.19	14.13		0
	6	0	14.01	14.10	14.10	0-2	0
64QAM	1	0	14.38	14.34	14.34	0-2	0
	1	2	14.28	14.36	14.44		0
	1	5	14.24	14.35	14.25		0
	3	0	14.20	14.16	14.12		0
	3	2	14.26	14.37	14.15		0
	3	3	14.20	14.19	14.16		0
	6	0	14.09	14.11	14.14	0-3	0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

8.3.7 LTE Band 25 (PCS)

Table 8-49
LTE Band 25 (PCS) Conducted Powers Ant WF3 - 20 MHz Bandwidth

LTE Band 25 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26140 (1860.0 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26590 (1905.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	13.86	13.84	13.90	0	0
	1	50	13.91	13.86	13.88		0
	1	99	13.80	13.91	**13.99**		0
	50	0	13.88	13.69	13.76	0-1	0
	50	25	13.87	13.70	13.83		0
	50	50	13.80	13.80	**13.94**		0
	100	0	13.89	13.86	13.90		0
16QAM	1	0	13.80	13.81	13.83	0-1	0
	1	50	13.85	13.89	13.86		0
	1	99	13.88	13.89	13.99		0
	50	0	13.49	13.55	13.56	0-2	0
	50	25	13.53	13.53	13.65		0
	50	50	13.49	13.52	13.69		0
	100	0	13.59	13.65	13.79		0
64QAM	1	0	13.70	13.65	13.72	0-2	0
	1	50	13.66	13.62	13.65		0
	1	99	13.62	13.66	13.93		0
	50	0	13.53	13.45	13.58	0-3	0
	50	25	13.41	13.51	13.59		0
	50	50	13.36	13.56	13.69		0
	100	0	13.49	13.56	13.65		0

Table 8-50
LTE Band 25 (PCS) Conducted Powers Ant WF3 - 15 MHz Bandwidth

LTE Band 25 (PCS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26115 (1857.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26615 (1907.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	13.64	13.52	13.61	0	0
	1	36	13.71	13.73	13.75		0
	1	74	13.46	13.66	13.88		0
	36	0	13.66	13.60	13.72	0-1	0
	36	18	13.71	13.74	13.77		0
	36	37	13.73	13.69	13.82		0
	75	0	13.72	13.71	13.83		0
16QAM	1	0	13.73	13.61	13.66	0-1	0
	1	36	13.77	13.75	13.82		0
	1	74	13.51	13.67	13.94		0
	36	0	13.43	13.37	13.48	0-2	0
	36	18	13.49	13.49	13.54		0
	36	37	13.50	13.47	13.55		0
	75	0	13.47	13.50	13.56		0
64QAM	1	0	13.38	13.37	13.66	0-2	0
	1	36	13.62	13.57	13.53		0
	1	74	13.35	13.52	13.76		0
	36	0	13.38	13.28	13.42	0-3	0
	36	18	13.39	13.42	13.46		0
	36	37	13.31	13.36	13.50		0
	75	0	13.38	13.39	13.49		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-51
LTE Band 25 (PCS) Conducted Powers Ant WF3 - 10 MHz Bandwidth

LTE Band 25 (PCS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26090 (1855.0 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26640 (1910.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	13.62	13.55	13.77	0	0
	1	25	13.64	13.63	13.82		0
	1	49	13.72	13.76	13.89		0
	25	0	13.60	13.67	13.77	0-1	0
	25	12	13.66	13.72	13.81		0
	25	25	13.69	13.75	13.84		0
	50	0	13.68	13.68	13.81		0
16QAM	1	0	13.75	13.60	13.75	0-1	0
	1	25	13.41	13.49	13.89		0
	1	49	13.84	13.76	13.45		0
	25	0	13.40	13.42	13.45	0-2	0
	25	12	13.36	13.46	13.46		0
	25	25	13.50	13.47	13.52		0
	50	0	13.45	13.43	13.53		0
64QAM	1	0	13.65	13.60	13.37	0-2	0
	1	25	13.56	13.68	13.66		0
	1	49	13.54	13.56	13.77		0
	25	0	13.25	13.37	13.35	0-3	0
	25	12	13.42	13.43	13.38		0
	25	25	13.47	13.49	13.35		0
	50	0	13.42	13.34	13.41		0

Table 8-52
LTE Band 25 (PCS) Conducted Powers Ant WF3 - 5 MHz Bandwidth

LTE Band 25 (PCS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26065 (1852.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26665 (1912.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	13.63	13.69	13.80	0	0
	1	12	13.58	13.70	13.74		0
	1	24	13.68	13.74	13.86		0
	12	0	13.64	13.65	13.71	0-1	0
	12	6	13.61	13.67	13.72		0
	12	13	13.64	13.65	13.73		0
	25	0	13.62	13.63	13.76		0
16QAM	1	0	13.62	13.80	13.45	0-1	0
	1	12	13.88	13.68	13.84		0
	1	24	13.57	13.67	13.80		0
	12	0	13.57	13.49	13.48	0-2	0
	12	6	13.55	13.53	13.61		0
	12	13	13.56	13.46	13.66		0
	25	0	13.52	13.41	13.48		0
64QAM	1	0	13.71	13.57	13.89	0-2	0
	1	12	13.58	13.67	13.94		0
	1	24	13.69	13.62	13.96		0
	12	0	13.42	13.40	13.41	0-3	0
	12	6	13.44	13.43	13.52		0
	12	13	13.49	13.38	13.58		0
	25	0	13.36	13.38	13.45		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-53
LTE Band 25 (PCS) Conducted Powers Ant WF3 - 3 MHz Bandwidth

LTE Band 25 (PCS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26055 (1851.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26675 (1913.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	13.59	13.58	13.74	0	0
	1	7	13.73	13.58	13.86		0
	1	14	13.61	13.55	13.91		0
	8	0	13.64	13.64	13.75	0-1	0
	8	4	13.62	13.57	13.76		0
	8	7	13.63	13.60	13.78		0
	15	0	13.64	13.58	13.78		0
16QAM	1	0	13.55	13.73	13.81	0-1	0
	1	7	13.58	13.77	13.76		0
	1	14	13.45	13.99	13.67		0
	8	0	13.50	13.55	13.55	0-2	0
	8	4	13.47	13.55	13.70		0
	8	7	13.45	13.53	13.57		0
	15	0	13.49	13.44	13.54		0
64QAM	1	0	13.69	13.44	13.49	0-2	0
	1	7	13.38	13.40	13.80		0
	1	14	13.43	13.64	13.52		0
	8	0	13.46	13.47	13.46	0-3	0
	8	4	13.36	13.39	13.51		0
	8	7	13.37	13.35	13.43		0
	15	0	13.34	13.33	13.49		0

Table 8-54
LTE Band 25 (PCS) Conducted Powers Ant WF3 -1.4 MHz Bandwidth

LTE Band 25 (PCS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26047 (1850.7 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26683 (1914.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	13.70	13.76	13.75	0	0
	1	2	13.65	13.60	13.73		0
	1	5	13.71	13.62	13.85		0
	3	0	13.68	13.68	13.79		0
	3	2	13.65	13.62	13.79		0
	3	3	13.66	13.65	13.80		0
	6	0	13.65	13.62	13.79	0-1	0
16QAM	1	0	13.84	13.73	13.86	0-1	0
	1	2	13.98	13.95	13.76		0
	1	5	13.77	13.51	13.93		0
	3	0	13.48	13.45	13.61		0
	3	2	13.52	13.57	13.73		0
	3	3	13.57	13.52	13.71		0
	6	0	13.50	13.45	13.71	0-2	0
64QAM	1	0	13.71	13.42	13.78	0-2	0
	1	2	13.70	13.26	13.49		0
	1	5	13.87	13.49	13.65		0
	3	0	13.34	13.55	13.43		0
	3	2	13.47	13.56	13.54		0
	3	3	13.51	13.41	13.41		0
	6	0	13.56	13.48	13.45	0-3	0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-55
LTE Band 25 (PCS) Conducted Powers Ant WF5 - 20 MHz Bandwidth

LTE Band 25 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26140 (1860.0 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26590 (1905.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	14.25	14.18	14.20	0	0
	1	50	14.26	14.16	14.16		0
	1	99	14.25	14.21	**14.27**		0
	50	0	**14.24**	14.15	14.13	0-1	0
	50	25	14.15	14.17	14.13		0
	50	50	14.10	14.18	14.14		0
	100	0	14.13	14.21	14.22		0
16QAM	1	0	14.23	14.20	14.28	0-1	0
	1	50	14.18	14.16	14.16		0
	1	99	14.30	14.14	14.21		0
	50	0	13.80	13.70	13.60	0-2	0
	50	25	13.69	13.67	13.64		0
	50	50	13.60	13.67	13.62		0
	100	0	13.66	13.74	13.76		0
64QAM	1	0	14.26	14.15	14.10	0-2	0
	1	50	14.24	14.20	14.08		0
	1	99	14.16	14.11	14.24		0
	50	0	13.68	13.53	13.56	0-3	0
	50	25	13.58	13.56	13.58		0
	50	50	13.46	13.60	13.53		0
	100	0	13.54	13.61	13.67		0

Table 8-56
LTE Band 25 (PCS) Conducted Powers Ant WF5 - 15 MHz Bandwidth

LTE Band 25 (PCS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26115 (1857.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26615 (1907.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	14.20	13.85	13.78	0	0
	1	36	14.10	13.94	13.85		0
	1	74	13.85	13.95	13.91		0
	36	0	13.99	13.90	13.90	0-1	0
	36	18	14.00	14.00	13.82		0
	36	37	13.95	13.99	13.87		0
	75	0	13.95	13.92	13.97		0
16QAM	1	0	13.89	13.75	13.63	0-1	0
	1	36	13.78	13.90	13.75		0
	1	74	13.60	13.80	13.80		0
	36	0	13.66	13.52	13.55	0-2	0
	36	18	13.70	13.67	13.52		0
	36	37	13.60	13.65	13.50		0
	75	0	13.61	13.63	13.65		0
64QAM	1	0	14.29	14.05	14.25	0-2	0
	1	36	14.22	14.20	14.03		0
	1	74	14.06	14.17	14.20		0
	36	0	13.82	13.75	13.82	0-3	0
	36	18	13.85	13.93	13.86		0
	36	37	13.85	13.91	13.80		0
	75	0	13.87	13.91	13.87		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-57
LTE Band 25 (PCS) Conducted Powers Ant WF5 - 10 MHz Bandwidth

LTE Band 25 (PCS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26090 (1855.0 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26640 (1910.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	14.15	14.01	13.98	0	0
	1	25	14.12	14.14	13.98		0
	1	49	14.15	14.17	14.11		0
	25	0	14.09	14.03	14.00	0-1	0
	25	12	14.07	14.08	13.98		0
	25	25	14.08	14.13	14.01		0
	50	0	14.09	14.08	14.02		0
16QAM	1	0	14.25	14.00	14.19	0-1	0
	1	25	14.13	14.20	13.93		0
	1	49	14.05	14.10	14.30		0
	25	0	13.84	13.81	13.76	0-2	0
	25	12	13.82	13.75	13.72		0
	25	25	13.89	13.76	13.66		0
	50	0	13.80	13.80	13.68		0
64QAM	1	0	14.17	13.93	14.17	0-2	0
	1	25	14.26	14.13	14.02		0
	1	49	14.29	14.30	14.27		0
	25	0	13.87	13.88	13.80	0-3	0
	25	12	13.82	13.84	13.75		0
	25	25	13.86	13.86	13.78		0
	50	0	13.88	13.86	13.78		0

Table 8-58
LTE Band 25 (PCS) Conducted Powers Ant WF5 - 5 MHz Bandwidth

LTE Band 25 (PCS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26065 (1852.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26665 (1912.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	14.19	14.00	14.05	0	0
	1	12	14.04	14.12	14.01		0
	1	24	14.09	14.10	14.12		0
	12	0	14.06	14.04	13.98	0-1	0
	12	6	14.06	14.10	14.01		0
	12	13	14.05	14.08	14.01		0
	25	0	14.05	14.09	14.00		0
16QAM	1	0	13.90	14.17	14.16	0-1	0
	1	12	14.21	14.26	14.21		0
	1	24	14.16	14.23	14.19		0
	12	0	13.84	13.78	13.68	0-2	0
	12	6	13.81	13.82	13.80		0
	12	13	13.88	13.89	13.72		0
	25	0	13.83	13.78	13.70		0
64QAM	1	0	14.22	13.86	14.00	0-2	0
	1	12	14.16	13.96	14.14		0
	1	24	14.00	14.22	14.07		0
	12	0	13.91	13.87	13.80	0-3	0
	12	6	13.84	13.94	13.81		0
	12	13	13.92	13.96	13.75		0
	25	0	13.87	13.79	13.81		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-59
LTE Band 25 (PCS) Conducted Powers Ant WF5 - 3 MHz Bandwidth

LTE Band 25 (PCS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26055 (1851.5 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26675 (1913.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	14.09	13.93	13.94	0	0
	1	7	14.17	14.00	14.09		0
	1	14	14.03	14.07	14.04		0
	8	0	14.07	14.03	13.97	0-1	0
	8	4	14.11	14.04	13.96		0
	8	7	14.04	14.04	13.99		0
	15	0	14.10	14.02	13.97		0
16QAM	1	0	14.00	14.29	14.23	0-1	0
	1	7	14.03	13.99	14.21		0
	1	14	14.24	14.13	14.16		0
	8	0	13.94	13.92	13.82	0-2	0
	8	4	13.80	13.80	13.77		0
	8	7	13.87	13.83	13.81		0
	15	0	13.84	13.69	13.70		0
64QAM	1	0	14.06	14.21	14.07	0-2	0
	1	7	14.13	14.12	14.00		0
	1	14	14.22	14.04	13.99		0
	8	0	13.95	13.96	13.74	0-3	0
	8	4	13.94	13.94	13.90		0
	8	7	13.88	13.85	13.89		0
	15	0	13.86	13.90	13.78		0

Table 8-60
LTE Band 25 (PCS) Conducted Powers Ant WF5 -1.4 MHz Bandwidth

LTE Band 25 (PCS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 26047 (1850.7 MHz)	Mid Channel 26365 (1882.5 MHz)	High Channel 26683 (1914.3 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	14.14	14.08	14.05	0	0
	1	2	14.12	14.05	13.99		0
	1	5	14.11	14.08	14.04		0
	3	0	14.07	14.10	14.03		0
	3	2	14.06	14.00	13.98		0
	3	3	14.07	14.04	14.01		0
	6	0	14.04	14.02	13.98	0-1	0
16QAM	1	0	14.30	14.29	14.14	0-1	0
	1	2	14.11	14.05	14.10		0
	1	5	14.28	14.13	14.13		0
	3	0	13.94	14.07	13.96		0
	3	2	13.87	13.89	13.96		0
	3	3	13.98	13.94	13.86		0
	6	0	13.89	13.78	13.78	0-2	0
64QAM	1	0	14.23	14.03	14.05	0-2	0
	1	2	14.07	14.02	13.92		0
	1	5	14.15	14.12	14.00		0
	3	0	13.95	13.97	13.88		0
	3	2	13.90	13.95	13.89		0
	3	3	13.96	14.00	13.92		0
	6	0	13.93	13.81	13.84	0-3	0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

8.3.8 LTE Band 30

Table 8-61
LTE Band 30 Conducted Powers Ant WF3 - 10 MHz Bandwidth

LTE Band 30 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 27710 (2310.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	**12.48**	0	0
	1	25	12.35		0
	1	49	12.33		0
	25	0	**12.39**	0-1	0
	25	12	12.28		0
	25	25	12.20		0
	50	0	12.30		0
16QAM	1	0	12.50	0-1	0
	1	25	12.46		0
	1	49	12.42		0
	25	0	12.10	0-2	0
	25	12	11.98		0
	25	25	11.80		0
	50	0	11.91		0
64QAM	1	0	12.50	0-2	0
	1	25	12.45		0
	1	49	12.39		0
	25	0	12.10	0-3	0
	25	12	12.05		0
	25	25	11.94		0
	50	0	12.05		0

Table 8-62
LTE Band 30 Conducted Powers Ant WF3 - 5 MHz Bandwidth

LTE Band 30 5 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 27710 (2310.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	12.29	0	0
	1	12	12.31		0
	1	24	12.32		0
	12	0	12.42	0-1	0
	12	6	12.43		0
	12	13	12.41		0
	25	0	12.39		0
16QAM	1	0	12.35	0-1	0
	1	12	12.34		0
	1	24	12.32		0
	12	0	12.33	0-2	0
	12	6	12.34		0
	12	13	12.31		0
	25	0	12.29		0
64QAM	1	0	12.39	0-2	0
	1	12	12.37		0
	1	24	12.36		0
	12	0	12.37	0-3	0
	12	6	12.36		0
	12	13	12.35		0
	25	0	12.34		0

Note: LTE Band 30 at 5 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-63
LTE Band 30 Conducted Powers Ant WF5 - 10 MHz Bandwidth

LTE Band 30 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 27710 (2310.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	**14.50**	0	0
	1	25	14.44		0
	1	49	14.49		0
	25	0	**14.48**	0-1	0
	25	12	14.37		0
	25	25	14.40		0
	50	0	14.47		0
16QAM	1	0	14.43	0-1	0
	1	25	14.39		0
	1	49	14.42		0
	25	0	14.39	0-2	0
	25	12	14.40		0
	25	25	14.37		0
	50	0	14.39		0
64QAM	1	0	14.49	0-2	0
	1	25	14.46		0
	1	49	14.48		0
	25	0	14.36	0-3	0
	25	12	14.38		0
	25	25	14.30		0
	50	0	14.43		0

Table 8-64
LTE Band 30 Conducted Powers Ant WF5 - 5 MHz Bandwidth

LTE Band 30 5 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel 27710 (2310.0 MHz) Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
QPSK	1	0	14.45	0	0
	1	12	14.46		0
	1	24	14.37		0
	12	0	14.38	0-1	0
	12	6	14.36		0
	12	13	14.31		0
	25	0	14.39		0
16QAM	1	0	14.38	0-1	0
	1	12	14.40		0
	1	24	14.41		0
	12	0	14.38	0-2	0
	12	6	14.47		0
	12	13	14.38		0
	25	0	14.42		0
64QAM	1	0	14.49	0-2	0
	1	12	14.48		0
	1	24	14.43		0
	12	0	14.38	0-3	0
	12	6	14.42		0
	12	13	14.40		0
	25	0	14.43		0

Note: LTE Band 30 at 5 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

© 2019 PCTEST Engineering Laboratory, Inc.

REV 20.06 M
12/06/2017

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

8.3.9 LTE Band 7

Table 8-65
LTE Band 7 Conducted Powers Ant WF3 - 20 MHz Bandwidth

LTE Band 7 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20850 (2510.0 MHz)	Mid Channel 21100 (2535.0 MHz)	High Channel 21350 (2560.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	11.80	**11.92**	11.77	0	0
	1	50	11.77	11.80	11.73		0
	1	99	11.89	11.83	11.75		0
	50	0	11.73	**11.94**	11.79	0-1	0
	50	25	11.72	11.83	11.73		0
	50	50	11.75	11.87	11.72		0
	100	0	11.81	11.87	11.80		0
16QAM	1	0	11.71	11.95	11.90	0-1	0
	1	50	11.68	11.82	11.70		0
	1	99	11.67	11.83	11.80		0
	50	0	11.36	11.52	11.35	0-2	0
	50	25	11.33	11.45	11.29		0
	50	50	11.26	11.50	11.33		0
	100	0	11.37	11.43	11.36		0
64QAM	1	0	11.75	11.97	11.88	0-2	0
	1	50	11.66	11.88	11.84		0
	1	99	11.65	11.98	11.90		0
	50	0	11.55	11.66	11.50	0-3	0
	50	25	11.59	11.61	11.49		0
	50	50	11.51	11.52	11.46		0
	100	0	11.50	11.53	11.53		0

Table 8-66
LTE Band 7 Conducted Powers Ant WF3 - 15 MHz Bandwidth

LTE Band 7 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20825 (2507.5 MHz)	Mid Channel 21100 (2535.0 MHz)	High Channel 21375 (2562.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	11.97	11.97	11.97	0	0
	1	36	11.95	11.94	12.00		0
	1	74	11.94	11.95	11.98		0
	36	0	11.96	11.97	11.97	0-1	0
	36	18	11.97	11.95	11.99		0
	36	37	11.97	11.94	11.94		0
	75	0	11.98	11.93	11.92		0
16QAM	1	0	11.89	11.91	11.91	0-1	0
	1	36	11.91	11.92	11.88		0
	1	74	11.90	11.90	11.90		0
	36	0	11.86	11.93	11.89	0-2	0
	36	18	11.90	11.92	11.91		0
	36	37	11.88	11.91	11.93		0
	75	0	11.90	11.92	11.88		0
64QAM	1	0	12.00	11.78	11.82	0-2	0
	1	36	11.98	11.81	11.81		0
	1	74	11.99	11.83	11.78		0
	36	0	11.97	11.79	11.79	0-3	0
	36	18	11.84	11.80	11.75		0
	36	37	11.82	11.79	11.80		0
	75	0	11.84	11.82	11.81		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-67
LTE Band 7 Conducted Powers Ant WF3 - 10 MHz Bandwidth

LTE Band 7 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20800 (2505.0 MHz)	Mid Channel 21100 (2535.0 MHz)	High Channel 21400 (2565.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	11.81	11.81	11.81	0	0
	1	25	11.79	11.77	11.77		0
	1	49	11.79	11.79	11.79		0
	25	0	11.78	11.78	11.81	0-1	0
	25	12	11.77	11.84	11.80		0
	25	25	11.81	11.79	11.79		0
	50	0	11.78	11.77	11.76		0
16QAM	1	0	11.72	11.75	11.73	0-1	0
	1	25	11.76	11.72	11.72		0
	1	49	11.73	11.71	11.70		0
	25	0	11.74	11.73	11.75	0-2	0
	25	12	11.69	11.74	11.73		0
	25	25	11.72	11.72	11.71		0
	50	0	11.73	11.73	11.74		0
64QAM	1	0	11.86	11.85	11.87	0-2	0
	1	25	11.87	11.84	11.85		0
	1	49	11.86	11.87	11.84		0
	25	0	11.84	11.85	11.85	0-3	0
	25	12	11.83	11.87	11.82		0
	25	25	11.85	11.85	11.85		0
	50	0	11.86	11.83	11.83		0

Table 8-68
LTE Band 7 Conducted Powers Ant WF3 - 5 MHz Bandwidth

LTE Band 7 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20775 (2502.5 MHz)	Mid Channel 21100 (2535.0 MHz)	High Channel 21425 (2567.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	11.78	11.74	11.75	0	0
	1	12	11.74	11.77	11.81		0
	1	24	11.77	11.75	11.80		0
	12	0	11.76	11.76	11.77	0-1	0
	12	6	11.72	11.77	11.79		0
	12	13	11.75	11.68	11.76		0
	25	0	11.74	11.73	11.84		0
16QAM	1	0	11.70	11.68	11.66	0-1	0
	1	12	11.73	11.70	11.65		0
	1	24	11.69	11.68	11.68		0
	12	0	11.73	11.65	11.69	0-2	0
	12	6	11.68	11.69	11.65		0
	12	13	11.68	11.70	11.70		0
	25	0	11.74	11.71	11.72		0
64QAM	1	0	11.41	11.48	11.41	0-2	0
	1	12	11.44	11.43	11.39		0
	1	24	11.39	11.47	11.37		0
	12	0	11.44	11.42	11.50	0-3	0
	12	6	11.42	11.46	11.42		0
	12	13	11.38	11.44	11.51		0
	25	0	11.36	11.46	11.39		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-69
LTE Band 7 Conducted Powers Ant WF5 - 20 MHz Bandwidth

LTE Band 7 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20850 (2510.0 MHz)	Mid Channel 21100 (2535.0 MHz)	High Channel 21350 (2560.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	14.27	**14.36**	14.17	0	0
	1	50	14.28	14.29	14.13		0
	1	99	14.31	14.25	14.15		0
	50	0	14.26	**14.29**	14.12	0-1	0
	50	25	14.25	14.19	14.08		0
	50	50	14.27	14.13	14.10		0
	100	0	14.28	14.20	14.14		0
16QAM	1	0	14.35	14.34	14.23	0-1	0
	1	50	14.29	14.23	14.16		0
	1	99	14.34	14.25	14.12		0
	50	0	14.07	14.06	13.91	0-2	0
	50	25	14.06	13.97	13.90		0
	50	50	14.02	13.88	13.94		0
	100	0	14.18	13.95	13.93		0
64QAM	1	0	14.31	14.29	14.23	0-2	0
	1	50	14.22	14.24	14.12		0
	1	99	14.26	14.23	14.12		0
	50	0	14.09	14.04	13.96	0-3	0
	50	25	14.10	13.99	13.90		0
	50	50	14.07	13.93	13.89		0
	100	0	14.14	13.97	13.98		0

Table 8-70
LTE Band 7 Conducted Powers Ant WF5 - 15 MHz Bandwidth

LTE Band 7 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20825 (2507.5 MHz)	Mid Channel 21100 (2535.0 MHz)	High Channel 21375 (2562.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	14.00	14.17	13.91	0	0
	1	36	14.08	14.10	13.89		0
	1	74	14.02	13.79	13.94		0
	36	0	14.10	13.99	13.96	0-1	0
	36	18	14.06	13.97	13.90		0
	36	37	14.07	13.82	13.90		0
	75	0	14.09	13.92	13.93		0
16QAM	1	0	14.16	14.16	13.93	0-1	0
	1	36	14.22	14.09	13.81		0
	1	74	14.01	13.82	13.98		0
	36	0	13.90	13.78	13.73	0-2	0
	36	18	13.83	13.75	13.70		0
	36	37	13.81	13.58	13.70		0
	75	0	13.82	13.61	13.70		0
64QAM	1	0	13.95	14.16	13.85	0-2	0
	1	36	13.93	13.87	13.42		0
	1	74	13.90	13.74	13.83		0
	36	0	13.85	13.78	13.76	0-3	0
	36	18	13.76	13.76	13.70		0
	36	37	13.86	13.63	13.73		0
	75	0	13.84	13.66	13.71		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-71
LTE Band 7 Conducted Powers Ant WF5 - 10 MHz Bandwidth

LTE Band 7 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20800 (2505.0 MHz)	Mid Channel 21100 (2535.0 MHz)	High Channel 21400 (2565.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	13.96	14.03	13.91	0	0
	1	25	14.04	13.91	13.91		0
	1	49	14.10	13.93	14.03		0
	25	0	14.04	13.98	13.94	0-1	0
	25	12	14.04	14.02	13.90		0
	25	25	14.03	13.94	13.95		0
	50	0	14.03	13.84	13.93		0
16QAM	1	0	14.03	14.06	14.04	0-1	0
	1	25	14.21	14.15	14.04		0
	1	49	14.21	13.84	14.04		0
	25	0	13.83	13.73	13.79	0-2	0
	25	12	13.81	13.75	13.79		0
	25	25	13.80	13.75	13.79		0
	50	0	13.80	13.71	13.73		0
64QAM	1	0	13.93	14.05	14.10	0-2	0
	1	25	13.98	14.08	14.09		0
	1	49	14.10	14.15	14.10		0
	25	0	13.87	13.82	13.93	0-3	0
	25	12	13.81	13.77	13.92		0
	25	25	13.79	13.76	13.91		0
	50	0	13.79	13.66	13.92		0

Table 8-72
LTE Band 7 Conducted Powers Ant WF5 - 5 MHz Bandwidth

LTE Band 7 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel 20775 (2502.5 MHz)	Mid Channel 21100 (2535.0 MHz)	High Channel 21425 (2567.5 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]				
QPSK	1	0	14.37	14.02	14.12	0	0
	1	12	14.19	13.98	14.06		0
	1	24	14.15	14.01	14.06		0
	12	0	14.27	14.03	14.09	0-1	0
	12	6	14.20	14.00	14.07		0
	12	13	14.16	13.97	14.06		0
	25	0	14.18	14.01	14.09		0
16QAM	1	0	14.35	14.10	14.35	0-1	0
	1	12	14.20	14.06	14.18		0
	1	24	14.33	14.21	14.15		0
	12	0	14.00	13.89	13.92	0-2	0
	12	6	14.02	13.80	13.91		0
	12	13	13.95	13.85	13.89		0
	25	0	14.01	13.82	13.88		0
64QAM	1	0	14.30	14.04	14.19	0-2	0
	1	12	14.25	14.07	14.14		0
	1	24	14.23	14.03	14.12		0
	12	0	14.06	13.85	13.88	0-3	0
	12	6	14.00	13.83	13.96		0
	12	13	13.96	13.80	13.91		0
	25	0	13.95	13.78	13.91		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

8.3.10 LTE Band 41 PC3

Table 8-73
LTE Band 41 PC3 Conducted Powers Ant WF3 - 20 MHz Bandwidth

LTE Band 41 20 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	13.33	13.45	**13.49**	13.21	13.38	0	0
	1	50	13.29	13.38	13.37	13.15	13.32		0
	1	99	13.25	13.34	13.35	13.14	13.28		0
	50	0	13.24	13.38	**13.39**	13.21	13.30	0-1	0
	50	25	13.31	13.34	13.34	13.11	13.26		0
	50	50	13.23	13.33	13.32	13.09	13.21		0
	100	0	13.30	13.37	13.38	13.11	13.30		0
16QAM	1	0	13.36	13.43	13.47	13.15	13.34	0-1	0
	1	50	13.32	13.33	13.30	13.10	13.36		0
	1	99	13.25	13.33	13.37	13.09	13.16		0
	50	0	13.19	13.37	13.38	13.13	13.25	0-2	0
	50	25	13.25	13.31	13.31	13.09	13.16		0
	50	50	13.18	13.29	13.30	13.08	13.17		0
	100	0	13.32	13.38	13.35	13.09	13.26		0
64QAM	1	0	13.01	13.35	13.33	13.18	13.40	0-2	0
	1	50	13.04	13.34	13.09	13.00	13.30		0
	1	99	13.02	13.16	13.20	12.90	13.24		0
	50	0	12.86	13.08	13.10	12.84	13.10	0-3	0
	50	25	12.99	13.08	13.07	12.83	13.05		0
	50	50	12.94	13.04	13.03	12.81	12.99		0
	100	0	13.07	13.09	13.10	12.84	13.03		0

Table 8-74
LTE Band 41 PC3 Conducted Powers Ant WF3 - 15 MHz Bandwidth

LTE Band 41 15 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	13.40	13.25	13.27	13.15	13.05	0	0
	1	36	13.32	13.32	13.18	13.05	13.06		0
	1	74	13.28	13.28	13.08	13.00	13.03		0
	36	0	13.25	13.25	13.20	13.09	13.03	0-1	0
	36	18	13.23	13.27	13.16	13.03	12.92		0
	36	37	13.19	13.27	13.06	12.96	13.01		0
	75	0	13.31	13.29	13.20	13.07	13.01		0
16QAM	1	0	13.42	13.41	13.48	13.17	13.19	0-1	0
	1	36	13.37	13.18	13.43	13.09	13.39		0
	1	74	13.26	13.37	13.25	13.18	13.13		0
	36	0	13.20	13.24	13.20	13.08	13.00	0-2	0
	36	18	13.23	13.21	13.17	13.03	12.98		0
	36	37	13.16	13.23	13.20	12.95	12.95		0
	75	0	13.23	13.30	13.27	13.02	12.98		0
64QAM	1	0	13.36	13.17	13.19	13.30	13.18	0-2	0
	1	36	13.19	13.22	13.22	13.04	13.04		0
	1	74	13.16	13.24	13.33	12.88	12.95		0
	36	0	13.09	13.07	13.01	12.91	12.88	0-3	0
	36	18	13.05	13.08	13.05	12.83	12.81		0
	36	37	12.84	13.05	13.01	12.80	12.71		0
	75	0	13.02	13.04	13.01	12.84	12.82		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-75
LTE Band 41 PC3 Conducted Powers Ant WF3 - 10 MHz Bandwidth

LTE Band 41 10 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel 39750 (2506.0 MHz)	Low-Mid Channel 40185 (2549.5 MHz)	Mid Channel 40620 (2593.0 MHz)	Mid-High Channel 41055 (2636.5 MHz)	High Channel 41490 (2680.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]						
QPSK	1	0	13.34	13.33	13.32	13.16	13.13	0	0
	1	25	13.27	13.31	13.20	13.02	13.01		0
	1	49	13.24	13.32	13.19	13.04	13.02		0
	25	0	13.22	13.25	13.25	13.05	12.95	0-1	0
	25	12	13.25	13.30	13.22	13.00	12.98		0
	25	25	13.17	13.26	13.16	12.99	12.96		0
	50	0	13.20	13.28	13.22	12.99	12.96		0
16QAM	1	0	13.37	13.44	13.50	13.21	13.20	0-1	0
	1	25	13.32	13.48	13.20	13.13	13.33		0
	1	49	13.27	13.50	13.29	13.25	13.10		0
	25	0	13.27	13.20	13.28	13.06	13.00	0-2	0
	25	12	13.16	13.24	13.24	12.98	12.98		0
	25	25	13.22	13.22	13.25	13.00	12.92		0
	50	0	13.21	13.25	13.20	13.00	12.94		0
64QAM	1	0	13.12	13.34	13.26	13.05	13.04	0-2	0
	1	25	13.27	13.17	13.12	12.98	12.80		0
	1	49	13.31	13.23	13.17	12.95	12.94		0
	25	0	13.04	13.04	13.00	12.83	12.78	0-3	0
	25	12	12.95	13.06	12.90	12.76	12.72		0
	25	25	12.99	13.00	12.91	12.80	12.74		0
	50	0	13.07	13.05	13.00	12.80	12.71		0

Table 8-76
LTE Band 41 PC3 Conducted Powers Ant WF3 - 5 MHz Bandwidth

LTE Band 41 5 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel 39750 (2506.0 MHz)	Low-Mid Channel 40185 (2549.5 MHz)	Mid Channel 40620 (2593.0 MHz)	Mid-High Channel 41055 (2636.5 MHz)	High Channel 41490 (2680.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]						
QPSK	1	0	13.28	13.32	13.30	13.06	13.04	0	0
	1	12	13.32	13.30	13.15	12.98	13.03		0
	1	24	13.24	13.30	13.20	13.04	13.08		0
	12	0	13.21	13.23	13.21	13.03	12.98	0-1	0
	12	6	13.22	13.21	13.18	12.94	12.99		0
	12	13	13.22	13.24	13.11	12.95	12.94		0
	25	0	13.23	13.24	13.20	12.97	12.96		0
16QAM	1	0	13.35	13.45	13.35	13.26	13.40	0-1	0
	1	12	13.29	13.38	13.33	13.35	13.31		0
	1	24	13.32	13.30	13.07	13.15	13.28		0
	12	0	13.29	13.23	13.18	13.03	13.00	0-2	0
	12	6	13.24	13.24	13.21	12.96	12.94		0
	12	13	13.25	13.29	13.14	13.02	13.07		0
	25	0	13.23	13.33	13.20	13.02	13.04		0
64QAM	1	0	13.07	13.22	13.30	12.88	13.08	0-2	0
	1	12	13.15	13.10	12.90	13.05	12.90		0
	1	24	13.19	13.20	12.94	13.15	13.05		0
	12	0	13.05	13.02	13.03	12.73	12.73	0-3	0
	12	6	12.97	13.00	13.01	12.71	12.80		0
	12	13	13.07	13.11	13.00	12.74	12.74		0
	25	0	13.02	13.03	13.03	12.70	12.70		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-77
LTE Band 41 PC3 Conducted Powers Ant WF5 - 20 MHz Bandwidth

LTE Band 41 20 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	15.63	15.68	15.75	15.82	**15.96**	0	0
	1	50	15.59	15.69	15.72	15.70	15.89		0
	1	99	15.53	15.63	15.76	15.69	15.87		0
	50	0	15.56	15.65	15.65	15.73	**15.90**	0-1	0
	50	25	15.52	15.60	15.66	15.69	15.89		0
	50	50	15.51	15.62	15.62	15.67	15.82		0
	100	0	15.56	15.65	15.69	15.68	15.88		0
16QAM	1	0	16.00	15.88	15.93	15.98	15.79	0-1	0
	1	50	15.83	15.81	15.72	15.92	15.81		0
	1	99	15.72	15.78	15.85	15.81	15.61		0
	50	0	15.68	15.60	15.63	15.57	15.48	0-2	0
	50	25	15.58	15.58	15.54	15.55	15.37		0
	50	50	15.51	15.56	15.52	15.56	15.34		0
	100	0	15.59	15.63	15.59	15.60	15.44		0
64QAM	1	0	16.00	15.90	15.90	15.70	15.63	0-2	0
	1	50	15.70	15.80	15.64	15.69	15.59		0
	1	99	15.84	15.75	15.94	15.71	15.59		0
	50	0	15.72	15.62	15.58	15.55	15.42	0-3	0
	50	25	15.59	15.60	15.53	15.52	15.32		0
	50	50	15.55	15.62	15.47	15.53	15.29		0
	100	0	15.61	15.63	15.58	15.60	15.37		0

Table 8-78
LTE Band 41 PC3 Conducted Powers Ant WF5 - 15 MHz Bandwidth

LTE Band 41 15 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	15.87	15.65	15.68	15.61	15.53	0	0
	1	36	15.74	15.63	15.62	15.59	15.46		0
	1	74	15.54	15.62	15.55	15.56	15.38		0
	36	0	15.68	15.60	15.59	15.52	15.44	0-1	0
	36	18	15.66	15.57	15.55	15.52	15.41		0
	36	37	15.54	15.55	15.50	15.51	15.37		0
	75	0	15.58	15.59	15.57	15.54	15.43		0
16QAM	1	0	15.99	15.88	15.86	15.85	15.60	0-1	0
	1	36	15.96	15.78	15.73	15.69	15.45		0
	1	74	15.71	15.80	15.70	15.72	15.38		0
	36	0	15.67	15.58	15.57	15.52	15.34	0-2	0
	36	18	15.64	15.55	15.52	15.53	15.23		0
	36	37	15.53	15.53	15.49	15.50	15.18		0
	75	0	15.61	15.58	15.55	15.52	15.28		0
64QAM	1	0	15.99	15.79	15.77	15.72	15.52	0-2	0
	1	36	15.88	15.67	15.69	15.72	15.47		0
	1	74	15.63	15.72	15.68	15.64	15.32		0
	36	0	15.67	15.58	15.57	15.55	15.32	0-3	0
	36	18	15.66	15.56	15.57	15.50	15.30		0
	36	37	15.57	15.55	15.51	15.52	15.23		0
	75	0	15.58	15.58	15.57	15.54	15.32		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-79
LTE Band 41 PC3 Conducted Powers Ant WF5 - 10 MHz Bandwidth

LTE Band 41 10 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	15.75	15.63	15.65	15.62	15.39	0	0
	1	25	15.62	15.61	15.57	15.55	15.30		0
	1	49	15.56	15.60	15.54	15.55	15.27		0
	25	0	15.63	15.55	15.54	15.51	15.30	0-1	0
	25	12	15.62	15.52	15.51	15.49	15.26		0
	25	25	15.52	15.52	15.49	15.53	15.22		0
	50	0	15.54	15.54	15.52	15.51	15.27		0
16QAM	1	0	15.94	15.77	15.76	15.72	15.55	0-1	0
	1	25	15.70	15.76	15.66	15.57	15.48		0
	1	49	15.89	15.77	15.71	15.68	15.46		0
	25	0	15.62	15.55	15.51	15.52	15.46	0-2	0
	25	12	15.61	15.48	15.50	15.79	15.35		0
	25	25	15.50	15.50	15.49	15.70	15.26		0
	50	0	15.52	15.53	15.50	15.55	15.21		0
64QAM	1	0	15.82	15.78	15.60	15.64	15.54	0-2	0
	1	25	15.69	15.65	15.59	15.54	15.36		0
	1	49	15.65	15.68	15.58	15.67	15.43		0
	25	0	15.64	15.54	15.56	15.47	15.28	0-3	0
	25	12	15.60	15.50	15.45	15.46	15.25		0
	25	25	15.50	15.50	15.46	15.50	15.20		0
	50	0	15.55	15.56	15.49	15.50	15.30		0

Table 8-80
LTE Band 41 PC3 Conducted Powers Ant WF5 - 5 MHz Bandwidth

LTE Band 41 5 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	15.73	15.72	15.77	15.81	15.56	0	0
	1	12	15.72	15.70	15.72	15.79	15.53		0
	1	24	15.74	15.72	15.72	15.80	15.53		0
	12	0	15.67	15.65	15.68	15.74	15.51	0-1	0
	12	6	15.68	15.64	15.66	15.72	15.47		0
	12	13	15.67	15.65	15.64	15.74	15.48		0
	25	0	15.67	15.65	15.68	15.75	15.51		0
16QAM	1	0	15.99	15.90	15.93	16.00	15.80	0-1	0
	1	12	15.99	15.90	15.84	15.92	15.64		0
	1	24	15.95	16.00	15.97	15.94	15.62		0
	12	0	15.77	15.66	15.68	15.73	15.46	0-2	0
	12	6	15.78	15.70	15.65	15.71	15.43		0
	12	13	15.67	15.64	15.65	15.74	15.48		0
	25	0	15.67	15.68	15.67	15.73	15.54		0
64QAM	1	0	15.98	15.92	15.90	15.91	15.59	0-2	0
	1	12	15.78	15.81	15.83	15.81	15.65		0
	1	24	15.78	15.81	15.79	15.95	15.57		0
	12	0	15.80	15.71	15.68	15.73	15.51	0-3	0
	12	6	15.82	15.68	15.63	15.70	15.48		0
	12	13	15.78	15.67	15.68	15.72	15.44		0
	25	0	15.65	15.66	15.65	15.69	15.44		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

8.3.11 LTE Band 41 PC2

Table 8-81
LTE Band 41 PC2 Conducted Powers Ant WF3 - 20 MHz Bandwidth

LTE Band 41 20 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	**13.48**	13.22	13.31	13.16	13.45	0	0
	1	50	13.41	13.28	13.18	13.00	13.38		0
	1	99	13.30	13.32	13.25	12.88	13.4		0
	50	0	**13.35**	13.20	13.00	12.91	13.29	0-1	0
	50	25	13.26	13.11	12.95	12.79	13.28		0
	50	50	13.20	13.15	12.92	12.75	13.24		0
	100	0	13.25	13.18	12.97	12.89	13.31		0
16QAM	1	0	13.49	13.40	13.38	13.31	13.18	0-1	0
	1	50	13.38	13.26	13.34	13.04	13.06		0
	1	99	13.11	13.45	13.18	13.07	13.15		0
	50	0	12.76	12.82	12.88	12.62	12.52	0-2	0
	50	25	12.73	12.77	12.75	12.50	12.51		0
	50	50	12.66	12.79	12.71	12.51	12.50		0
	100	0	12.82	12.85	12.78	12.54	12.51		0
64QAM	1	0	13.00	13.48	13.32	13.25	13.12	0-2	0
	1	50	13.42	13.25	13.44	13.34	13.20		0
	1	99	13.30	13.48	13.36	13.24	13.16		0
	50	0	12.82	12.85	12.84	12.88	12.70	0-3	0
	50	25	12.79	12.80	12.79	12.90	12.69		0
	50	50	12.78	12.83	12.78	12.83	12.67		0
	100	0	12.87	12.84	12.84	12.85	12.71		0

Table 8-82
LTE Band 41 PC2 Conducted Powers Ant WF3 - 15 MHz Bandwidth

LTE Band 41 15 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	13.45	13.37	13.41	13.19	13.11	0	0
	1	36	13.35	13.38	13.32	13.08	13.10		0
	1	74	13.39	13.32	13.20	13.06	13.06		0
	36	0	13.26	13.21	13.26	13.10	12.96	0-1	0
	36	18	13.24	13.25	13.23	12.97	12.95		0
	36	37	13.15	13.25	13.19	12.94	12.95		0
	75	0	13.22	13.27	13.28	13.01	12.99		0
16QAM	1	0	13.31	13.41	13.41	13.32	13.40	0-1	0
	1	36	13.41	13.50	13.20	13.36	13.30		0
	1	74	13.32	13.34	13.48	13.33	13.46		0
	36	0	12.84	13.00	12.98	13.05	12.90	0-2	0
	36	18	12.82	12.92	12.92	13.04	12.85		0
	36	37	12.86	12.91	12.90	13.00	12.83		0
	75	0	12.98	12.93	12.96	13.05	12.87		0
64QAM	1	0	13.24	13.33	13.50	13.42	13.24	0-2	0
	1	36	13.26	13.49	13.37	13.32	13.36		0
	1	74	13.40	13.32	13.17	13.22	13.49		0
	36	0	12.85	12.90	12.95	12.94	12.92	0-3	0
	36	18	12.83	12.91	12.98	13.00	12.94		0
	36	37	12.94	12.93	12.96	12.98	12.87		0
	75	0	12.94	12.88	12.95	12.99	12.91		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-83
LTE Band 41 PC2 Conducted Powers Ant WF3 - 10 MHz Bandwidth

LTE Band 41 10 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel 39750 (2506.0 MHz)	Low-Mid Channel 40185 (2549.5 MHz)	Mid Channel 40620 (2593.0 MHz)	Mid-High Channel 41055 (2636.5 MHz)	High Channel 41490 (2680.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]						
QPSK	1	0	13.36	13.45	13.45	13.47	13.43	0	0
	1	25	13.39	13.36	13.35	13.46	13.41		0
	1	49	13.50	13.38	13.36	13.40	13.45		0
	25	0	13.30	13.30	13.32	13.36	13.30	0-1	0
	25	12	13.22	13.27	13.25	13.36	13.28		0
	25	25	13.33	13.26	13.28	13.33	13.32		0
	50	0	13.34	13.25	13.32	13.37	13.29		0
16QAM	1	0	13.22	13.33	13.40	13.41	13.48	0-1	0
	1	25	13.48	13.30	13.31	13.31	13.22		0
	1	49	13.49	13.27	13.17	13.26	13.40		0
	25	0	12.80	12.87	12.80	12.90	12.83	0-2	0
	25	12	12.73	12.82	12.83	12.87	12.83		0
	25	25	12.93	12.87	12.81	12.85	12.81		0
	50	0	12.85	12.90	12.92	12.95	12.84		0
64QAM	1	0	13.22	13.39	13.36	13.35	13.41	0-2	0
	1	25	13.44	13.23	13.38	13.46	13.35		0
	1	49	13.40	13.39	13.19	13.43	13.45		0
	25	0	12.85	12.87	12.91	12.99	12.85	0-3	0
	25	12	12.81	12.81	12.93	12.90	12.84		0
	25	25	12.91	12.83	12.89	12.92	12.88		0
	50	0	12.94	12.86	12.90	12.87	12.89		0

Table 8-84
LTE Band 41 PC2 Conducted Powers Ant WF3 - 5 MHz Bandwidth

LTE Band 41 5 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel 39750 (2506.0 MHz)	Low-Mid Channel 40185 (2549.5 MHz)	Mid Channel 40620 (2593.0 MHz)	Mid-High Channel 41055 (2636.5 MHz)	High Channel 41490 (2680.0 MHz)	MPR Allowed per 3GPP [dB]	MPR [dB]
			Conducted Power [dBm]						
QPSK	1	0	13.43	13.47	13.50	13.49	13.43	0	0
	1	12	13.42	13.46	13.41	13.43	13.39		0
	1	24	13.45	13.49	13.42	13.35	13.46		0
	12	0	13.22	13.29	13.31	13.38	13.26	0-1	0
	12	6	13.20	13.23	13.30	13.32	13.29		0
	12	13	13.31	13.34	13.34	13.36	13.24		0
	25	0	13.31	13.34	13.32	13.35	13.29		0
16QAM	1	0	13.49	13.35	13.39	13.25	13.26	0-1	0
	1	12	13.25	13.41	13.27	13.12	13.40		0
	1	24	13.25	13.46	13.23	13.19	13.34		0
	12	0	12.81	12.87	12.94	12.85	12.88	0-2	0
	12	6	12.75	12.91	12.84	12.94	12.81		0
	12	13	12.88	13.03	12.86	12.95	12.93		0
	25	0	12.84	12.92	12.90	12.88	12.85		0
64QAM	1	0	13.32	13.45	13.31	13.14	13.28	0-2	0
	1	12	13.12	13.27	13.21	13.49	13.43		0
	1	24	13.38	13.25	13.16	13.12	13.30		0
	12	0	12.68	12.84	12.83	12.90	12.88	0-3	0
	12	6	12.74	12.81	12.91	12.91	12.84		0
	12	13	12.83	12.81	12.83	12.81	12.89		0
	25	0	12.86	12.91	12.86	12.85	12.79		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-85
LTE Band 41 PC2 Conducted Powers Ant WF5 - 20 MHz Bandwidth

LTE Band 41 20 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	15.68	15.71	15.80	15.85	**15.91**	0	0
	1	50	15.62	15.71	15.77	15.81	15.86		0
	1	99	15.60	15.68	15.76	15.79	15.84		0
	50	0	15.55	15.59	15.60	15.69	**15.84**	0-1	0
	50	25	15.52	15.58	15.61	15.67	15.83		0
	50	50	15.48	15.56	15.57	15.65	15.80		0
	100	0	15.55	15.60	15.68	15.69	15.82		0
16QAM	1	0	15.96	15.82	15.79	15.78	15.84	0-1	0
	1	50	15.70	15.76	15.59	15.71	15.51		0
	1	99	15.68	15.81	15.62	15.89	15.37		0
	50	0	15.32	15.22	15.20	15.20	15.03	0-2	0
	50	25	15.20	15.18	15.13	15.17	15.00		0
	50	50	15.12	15.19	15.11	15.17	15.00		0
	100	0	15.24	15.23	15.15	15.20	15.02		0
64QAM	1	0	15.94	15.98	16.00	15.93	15.87	0-2	0
	1	50	15.99	15.90	15.88	15.92	15.76		0
	1	99	15.78	15.91	15.96	15.82	15.70		0
	50	0	15.66	15.54	15.56	15.58	15.44	0-3	0
	50	25	15.52	15.53	15.50	15.57	15.33		0
	50	50	15.43	15.54	15.50	15.55	15.32		0
	100	0	15.54	15.56	15.55	15.59	15.41		0

Table 8-86
LTE Band 41 PC2 Conducted Powers Ant WF5 - 15 MHz Bandwidth

LTE Band 41 15 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	16.00	15.76	15.83	15.83	15.61	0	0
	1	36	15.85	15.75	15.73	15.81	15.53		0
	1	74	15.62	15.73	15.68	15.78	15.44		0
	36	0	15.72	15.61	15.64	15.69	15.46	0-1	0
	36	18	15.72	15.62	15.63	15.69	15.42		0
	36	37	15.55	15.62	15.58	15.67	15.37		0
	75	0	15.64	15.64	15.67	15.70	15.43		0
16QAM	1	0	15.98	15.44	15.65	15.71	15.43	0-1	0
	1	36	15.75	15.54	15.66	15.65	15.54		0
	1	74	15.54	15.64	15.53	15.57	15.47		0
	36	0	15.28	15.13	15.16	15.16	15.00	0-2	0
	36	18	15.20	15.13	15.13	15.17	15.00		0
	36	37	15.06	15.13	15.11	15.17	15.03		0
	75	0	15.14	15.15	15.13	15.17	15.00		0
64QAM	1	0	16.00	15.94	15.98	15.93	15.85	0-2	0
	1	36	15.99	15.96	15.88	16.00	15.79		0
	1	74	15.80	15.90	15.88	15.94	15.66		0
	36	0	15.66	15.59	15.54	15.61	15.41	0-3	0
	36	18	15.58	15.54	15.50	15.56	15.41		0
	36	37	15.48	15.56	15.47	15.55	15.30		0
	75	0	15.51	15.53	15.55	15.56	15.37		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-87
LTE Band 41 PC2 Conducted Powers Ant WF5 - 10 MHz Bandwidth

LTE Band 41 10 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	15.91	15.76	15.62	15.85	15.63	0	0
	1	25	15.76	15.72	15.54	15.77	15.53		0
	1	49	15.71	15.73	15.52	15.80	15.50		0
	25	0	15.73	15.61	15.45	15.70	15.44	0-1	0
	25	12	15.71	15.63	15.43	15.68	15.40		0
	25	25	15.60	15.60	15.39	15.67	15.37		0
	50	0	15.65	15.62	15.44	15.70	15.43		0
16QAM	1	0	15.79	15.57	15.60	15.64	15.52	0-1	0
	1	25	15.66	15.58	15.63	15.48	15.35		0
	1	49	15.55	15.57	15.59	15.52	15.34		0
	25	0	15.20	15.10	15.14	15.15	15.00	0-2	0
	25	12	15.16	15.11	15.10	15.17	15.00		0
	25	25	15.07	15.10	15.07	15.14	15.00		0
	50	0	15.15	15.11	15.08	15.13	15.00		0
64QAM	1	0	15.63	15.64	15.60	15.62	15.33	0-2	0
	1	25	15.49	15.55	15.63	15.37	15.22		0
	1	49	15.40	15.64	15.57	15.57	15.30		0
	25	0	15.04	15.02	15.06	15.02	15.02	0-3	0
	25	12	15.06	15.01	15.01	15.01	15.01		0
	25	25	15.03	15.00	15.00	15.01	15.00		0
	50	0	15.03	15.00	15.00	15.07	15.00		0

Table 8-88
LTE Band 41 PC2 Conducted Powers Ant WF5 - 5 MHz Bandwidth

LTE Band 41 5 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	15.60	15.61	15.65	15.66	15.50	0	0
	1	12	15.55	15.61	15.62	15.63	15.38		0
	1	24	15.59	15.62	15.58	15.66	15.40		0
	12	0	15.56	15.46	15.50	15.54	15.31	0-1	0
	12	6	15.54	15.48	15.50	15.53	15.30		0
	12	13	15.47	15.46	15.43	15.50	15.26		0
	25	0	15.45	15.47	15.45	15.54	15.31		0
16QAM	1	0	15.50	15.92	15.82	15.81	15.69	0-1	0
	1	12	15.77	15.70	15.74	15.63	15.56		0
	1	24	15.67	15.84	15.73	15.70	15.49		0
	12	0	15.03	15.22	15.20	15.23	15.00	0-2	0
	12	6	15.00	15.21	15.19	15.25	15.02		0
	12	13	15.01	15.16	15.18	15.24	15.00		0
	25	0	15.00	15.19	15.16	15.18	15.01		0
64QAM	1	0	15.90	15.83	15.90	15.92	15.82	0-2	0
	1	12	15.82	15.95	15.86	15.98	15.78		0
	1	24	15.89	15.88	15.94	15.91	15.74		0
	12	0	15.53	15.62	15.61	15.65	15.36	0-3	0
	12	6	15.55	15.55	15.64	15.56	15.36		0
	12	13	15.52	15.48	15.58	15.50	15.35		0
	25	0	15.53	15.56	15.54	15.51	15.32		0

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

8.3.12 LTE Uplink Carrier Aggregation Conducted Powers

Table 8-89
LTE Uplink Carrier Aggregation Conducted Powers – Antenna WF3

	PCC									SCC									Power	
Combination	PCC Band	PCC Bandwidth [MHz]	PCC UL Channel	PCC UL Frequency [MHz]	PCC DL Channel	PCC DL Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC UL Channel	SCC UL Frequency [MHz]	SCC DL Channel	SCC DL Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	LTE Tx.Power with UL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_7C (1)	LTE B7	20	21350	2560.0	3350	2680.0	QPSK	50	0	LTE B7	20	21152	2540.2	3152	2660.2	QPSK	50	50	11.74	11.79

	PCC							SCC							Power	
Combination	PCC Band	PCC Bandwidth [MHz]	PCC (UL/DL) Channel	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	LTE Tx.Power with UL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_41C (1)	LTE B41	20	41055	2636.5	QPSK	50	0	LTE B41	20	40857	2616.7	QPSK	50	50	12.86	13.21

Table 8-90
LTE Uplink Carrier Aggregation Conducted Powers – Antenna WF5

Combination	PCC Band	PCC Bandwidth [MHz]	PCC UL Channel	PCC UL Frequency [MHz]	PCC DL Channel	PCC DL Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC UL Channel	SCC UL Frequency [MHz]	SCC DL Channel	SCC DL Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	LTE Tx.Power with UL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_7C (1)	LTE B7	20	21350	2560.0	3350	2680.0	QPSK	50	0	LTE B7	20	21152	2540.2	3152	2660.2	QPSK	50	50	14.20	14.12

	PCC							SCC							Power	
Combination	PCC Band	PCC Bandwidth [MHz]	PCC (UL/DL) Channel	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	LTE Tx.Power with UL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_41C (1)	LTE B41	20	40620	2593.0	QPSK	1	99	LTE B41	20	40818	2612.8	QPSK	1	0	15.90	15.76

Notes:

1. This device supports uplink carrier aggregation for LTE CA_7C(1) and LTE CA_41C(1) with a maximum of two 20 MHz component carriers. For intraband contiguous carrier aggregation scenarios, 3GPP 36.101 Table 6.2.2A-1 specifies that the aggregate maximum allowed output power is equivalent to the single carrier scenario. 3GPP 36.101 6.2.3A allows for several dB of MPR to be applied when non-contiguous RB allocation is implemented. The conducted powers and MPR settings in this device are permanently implemented per the above 3GPP requirements.
2. Per FCC Guidance, the output power with uplink CA active was measured for the configuration with the highest reported SAR with single carrier for each exposure condition. The power was measured with wideband signal integration over both component carriers.
3. Uplink carrier aggregation is only possible when the device is operating with Power Class 3 for LTE Band 41.

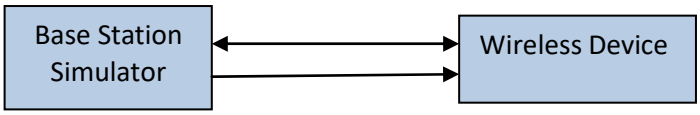


Figure 8-3
Power Measurement Setup

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

8.4 WLAN Maximum Conducted Powers

8.4.1 Variant 1

Table 8-91
2.4 GHz WLAN Average RF Power – Ant WF1

2.4GHz Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11b	802.11g	802.11n
2412	1	**15.25**	15.19	15.18
2437	6	15.24	15.25	15.25
2457	10	N/A	15.17	15.17
2462	11	15.19	13.99	13.85

Table 8-92
2.4 GHz WLAN Average RF Power – Ant WF2

2.4GHz Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11b	802.11g	802.11n
2412	1	**16.22**	16.25	16.25
2437	6	16.19	16.23	16.25
2457	10	N/A	16.15	16.25
2462	11	16.16	14.50	14.50

Table 8-93
2.4 GHz WLAN Average RF Power – Ant WF5

2.4GHz Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11b	802.11g	802.11n
2412	1	14.31	14.50	14.50
2437	6	**14.50**	14.50	14.39
2457	10	N/A	14.50	14.45
2462	11	14.49	13.00	13.00

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-94
5 GHz WLAN Average RF Power – Ant WF1

5GHz (40MHz) Conducted Power [dBm]		
Freq [MHz]	Channel	IEEE Transmission Mode
		802.11n
5190	38	13.77
5230	46	16.50
5270	54	**16.50**
5310	62	14.47

5GHz (80MHz) Conducted Power [dBm]		
Freq [MHz]	Channel	IEEE Transmission Mode
		802.11ac
5530	106	13.91
5610	122	**15.50**
5690	138	15.38
5775	155	**17.00**

Table 8-95
5 GHz WLAN Average RF Power – Ant WF2

5GHz (40MHz) Conducted Power [dBm]		
Freq [MHz]	Channel	IEEE Transmission Mode
		802.11n
5190	38	13.83
5230	46	**16.98**
5270	54	16.64
5310	62	14.41

5GHz (80MHz) Conducted Power [dBm]		
Freq [MHz]	Channel	IEEE Transmission Mode
		802.11ac
5530	106	13.93
5610	122	**16.99**
5690	138	16.91
5775	155	**16.42**

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

8.4.2 Variant 2

Table 8-96
2.4 GHz WLAN Average RF Power – Ant WF1

2.4GHz Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11b	802.11g	802.11n
2412	1	**15.24**	15.23	15.25
2437	6	15.19	15.19	15.20
2457	10	N/A	15.23	15.14
2462	11	15.20	14.00	13.83

Table 8-97
2.4 GHz WLAN Average RF Power – Ant WF2

2.4GHz Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11b	802.11g	802.11n
2412	1	**16.25**	16.24	16.25
2437	6	16.13	16.13	16.10
2457	10	N/A	16.22	16.10
2462	11	16.15	14.46	14.44

Table 8-98
2.4 GHz WLAN Average RF Power – Ant WF5

2.4GHz Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11b	802.11g	802.11n
2412	1	14.46	14.46	14.50
2437	6	**14.50**	14.49	14.25
2457	10	N/A	14.43	14.43
2462	11	14.42	12.84	12.97

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-99
5 GHz WLAN Average RF Power – Ant WF1

5GHz (40MHz) Conducted Power [dBm]		
Freq [MHz]	Channel	IEEE Transmission Mode
		802.11n
5190	38	13.95
5230	46	16.37
5270	54	**16.42**
5310	62	14.40

5GHz (80MHz) Conducted Power [dBm]		
Freq [MHz]	Channel	IEEE Transmission Mode
		802.11ac
5530	106	14.00
5610	122	**15.50**
5690	138	15.43
5775	155	**17.00**

Table 8-100
5 GHz WLAN Average RF Power – Ant WF2

5GHz (40MHz) Conducted Power [dBm]		
Freq [MHz]	Channel	IEEE Transmission Mode
		802.11n
5190	38	14.00
5230	46	**17.00**
5270	54	16.65
5310	62	14.21

5GHz (80MHz) Conducted Power [dBm]		
Freq [MHz]	Channel	IEEE Transmission Mode
		802.11ac
5530	106	14.00
5610	122	**17.00**
5690	138	16.84
5775	155	**16.50**

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

8.5 WLAN Reduced Conducted Powers

8.5.1 Variant 1

Table 8-101
2.4 GHz WLAN Average RF Reduced at 10.5 dBm – Ant WF5

2.4GHz Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11b	802.11g	802.11n
2412	1	10.40	10.40	10.42
2437	6	**10.49**	10.49	10.45
2462	11	10.20	10.20	10.44

Table 8-102
2.4 GHz WLAN Average RF Reduced at 7.5 dBm – Ant WF5

2.4GHz Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11b	802.11g	802.11n
2412	1	**7.50**	7.50	7.40
2437	6	7.35	7.35	7.32
2462	11	7.20	7.20	7.45

8.5.2 Variant 2

Table 8-103
2.4 GHz WLAN Average RF Reduced at 10.5 dBm – Ant WF5

2.4GHz Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11b	802.11g	802.11n
2412	1	**10.43**	10.43	10.47
2457	10	10.26	10.26	10.32
2462	11	10.40	10.40	10.45

Table 8-104
2.4 GHz WLAN Average RF Reduced at 7.5 dBm – Ant WF5

2.4GHz Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11b	802.11g	802.11n
2412	1	7.33	7.33	7.45
2437	6	**7.50**	7.50	7.30
2462	11	7.32	7.32	7.37

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

8.5.3 WLAN Power Reduction Verification Summary

Table 8-105
WLAN Power Reduction Verification

Antenna	Mode/Band	Condition (s)	Maximum Target Power [dBm] (Tolerance [dB])	Reduced Target Power [dBm] (Tolerance [dB])	Maximum Measured Power [dBm]	Reduced Measured Power [dBm]	Verdict
WF5	2.4 GHz WLAN (802.11b)	Main Band ANT WF3 ON	13.0 (±1.5)	9.0 (±1.5)	12.2	7.64	PASS
		Main Band ANT WF5 ON	13.0 (±1.5)	6.0 (±1.5)	12	5.1	PASS
WF5	2.4 GHz WLAN (802.11g/n) - MIMO	Main Band ANT WF3 ON	13.0 (±1.5)	9.0 (±1.5)	12.4	7.62	PASS
		Main Band ANT WF5 ON	13.0 (±1.5)	6.0 (±1.5)	12.1	4.8	PASS

Conducted powers were measured for each Mode/Band and applied condition. All conducted power measurements were verified to be within tolerance. Additional information about the power reduction mechanism can be found in the operational description.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

8.5.4 Notes for WLAN

Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02:

- Power measurements were performed for the transmission mode configuration with the highest maximum output power specified for production units.
- For transmission modes with the same maximum output power specification, powers were measured for the largest channel bandwidth, lowest order modulation and lowest data rate.
- For transmission modes with identical maximum specified output power, channel bandwidth, modulation and data rates, power measurements were required for all identical configurations.
- For each transmission mode configuration, powers were measured for the highest and lowest channels; and at the mid-band channel(s) when there were at least 3 channels supported. For configurations with multiple mid-band channels, due to an even number of channels, both channels were measured.
- The WLAN chipset in this device is produced by two different suppliers. The electrically identical modules are manufactured with the identical mechanical structure to meet the same specifications and functions. Two device variants are referenced as Variant 1 and Variant 2 in this report.
- WLAN SAR worst case configuration was spotchecked on Variant 1 and Variant 2. The Variant with the highest reported SAR value was evaluated for the remaining WLAN configurations.
- Full power measurements were performed for Variant 1 and Variant 2 per FCC KDB Procedures 248227.
- The bolded data rate and channel above were used for determining testing configuration for SAR.

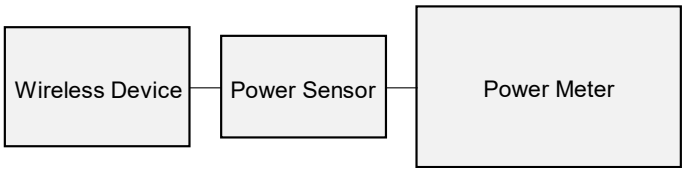


Figure 8-4
Power Measurement Setup

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

8.6 Bluetooth Conducted Powers

Table 8-106
Maximum Bluetooth Average RF Power – Ant WF1 - Variant 1

Frequency [MHz]	Modulation	Data Rate [Mbps]	Channel No.	Avg Conducted Power	
				[dBm]	[mW]
2402	GFSK	1.0	0	15.09	32.285
2441	GFSK	1.0	39	**15.45**	35.075
2480	GFSK	1.0	78	15.40	34.674

Table 8-107
Maximum Bluetooth Average RF Power – Ant WF2 - Variant 1

Frequency [MHz]	Modulation	Data Rate [Mbps]	Channel No.	Avg Conducted Power	
				[dBm]	[mW]
2402	GFSK	1.0	0	16.69	46.666
2441	GFSK	1.0	39	**16.94**	49.431
2480	GFSK	1.0	78	16.90	48.978

Table 8-108
Maximum Bluetooth Average RF Power – Ant WF5 - Variant 1

Frequency [MHz]	Modulation	Data Rate [Mbps]	Channel No.	Avg Conducted Power	
				[dBm]	[mW]
2402	GFSK	1.0	0	15.24	33.420
2441	GFSK	1.0	39	15.10	32.359
2480	GFSK	1.0	78	**15.50**	35.481

Table 8-109
Maximum Bluetooth Average RF Power – Ant WF1 - Variant 2

Frequency [MHz]	Modulation	Data Rate [Mbps]	Channel No.	Avg Conducted Power	
				[dBm]	[mW]
2402	GFSK	1.0	0	15.11	32.434
2441	GFSK	1.0	39	**15.25**	33.497
2480	GFSK	1.0	78	15.17	32.885

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-110
Maximum Bluetooth Average RF Power – Ant WF2 - Variant 2

Frequency [MHz]	Modulation	Data Rate [Mbps]	Channel No.	Avg Conducted Power	
				[dBm]	[mW]
2402	GFSK	1.0	0	**17.00**	50.119
2441	GFSK	1.0	39	16.97	49.774
2480	GFSK	1.0	78	16.84	48.306

Table 8-111
Maximum Bluetooth Average RF Power – Ant WF5 - Variant 2

Frequency [MHz]	Modulation	Data Rate [Mbps]	Channel No.	Avg Conducted Power	
				[dBm]	[mW]
2402	GFSK	1.0	0	15.42	34.834
2441	GFSK	1.0	39	**15.45**	35.075
2480	GFSK	1.0	78	15.24	33.420

.

Table 8-112
Reduced Bluetooth Average RF Power – Ant WF1 - Variant 2

Frequency [MHz]	Modulation	Data Rate [Mbps]	Channel No.	Avg Conducted Power	
				[dBm]	[mW]
2402	GFSK	1.0	0	8.06	6.397
2441	GFSK	1.0	39	**8.49**	7.063
2480	GFSK	1.0	78	8.27	6.714

Table 8-113
Reduced Bluetooth Average RF Power – Ant WF2 - Variant 1

Frequency [MHz]	Modulation	Data Rate [Mbps]	Channel No.	Avg Conducted Power	
				[dBm]	[mW]
2402	GFSK	1.0	0	9.44	8.790
2441	GFSK	1.0	39	9.59	9.099
2480	GFSK	1.0	78	**9.89**	9.750

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 8-114
Reduced Power Level 1 Bluetooth Average RF Power – Ant WF5 - Variant 2

Frequency [MHz]	Modulation	Data Rate [Mbps]	Channel No.	Avg Conducted Power	
				[dBm]	[mW]
2402	GFSK	1.0	0	11.17	13.092
2441	GFSK	1.0	39	**11.25**	13.335
2480	GFSK	1.0	78	11.12	12.942

Table 8-115
Reduced Power Level 2 Bluetooth Average RF Power – Ant WF5 - Variant 2

Frequency [MHz]	Modulation	Data Rate [Mbps]	Channel No.	Avg Conducted Power	
				[dBm]	[mW]
2402	GFSK	1.0	0	8.13	6.501
2441	GFSK	1.0	39	8.37	6.871
2480	GFSK	1.0	78	**8.45**	6.998

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

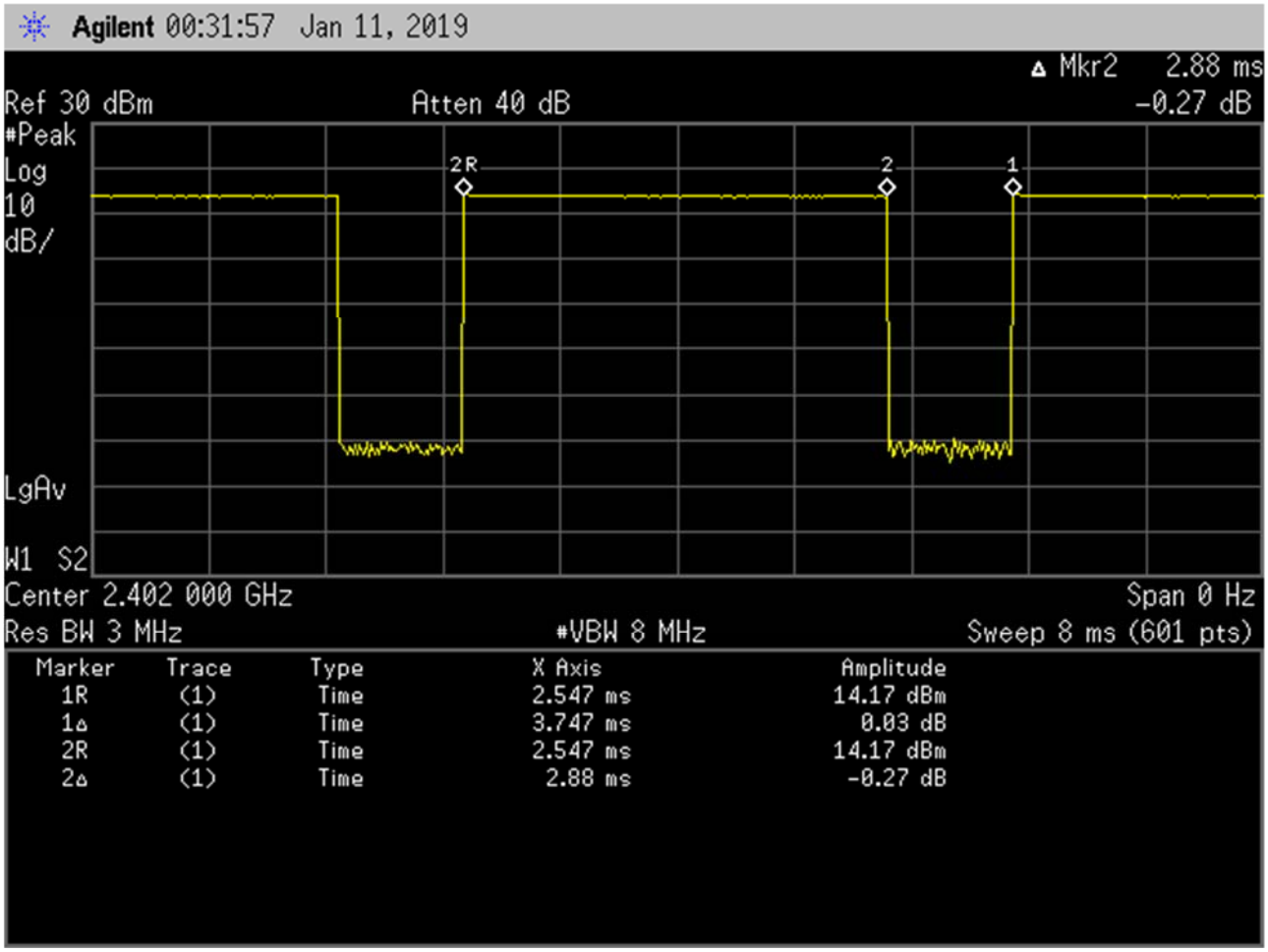


Figure 8-5
Bluetooth Transmission Plot & Duty Cycle Calculation – Ant WF1 Variant 1

$$\textbf{Duty Cycle} = \frac{\textbf{Pulse Width}}{\textbf{Period}} * 100\% = \frac{2.88ms}{3.747ms} * 100\% = 76.9\%$$

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

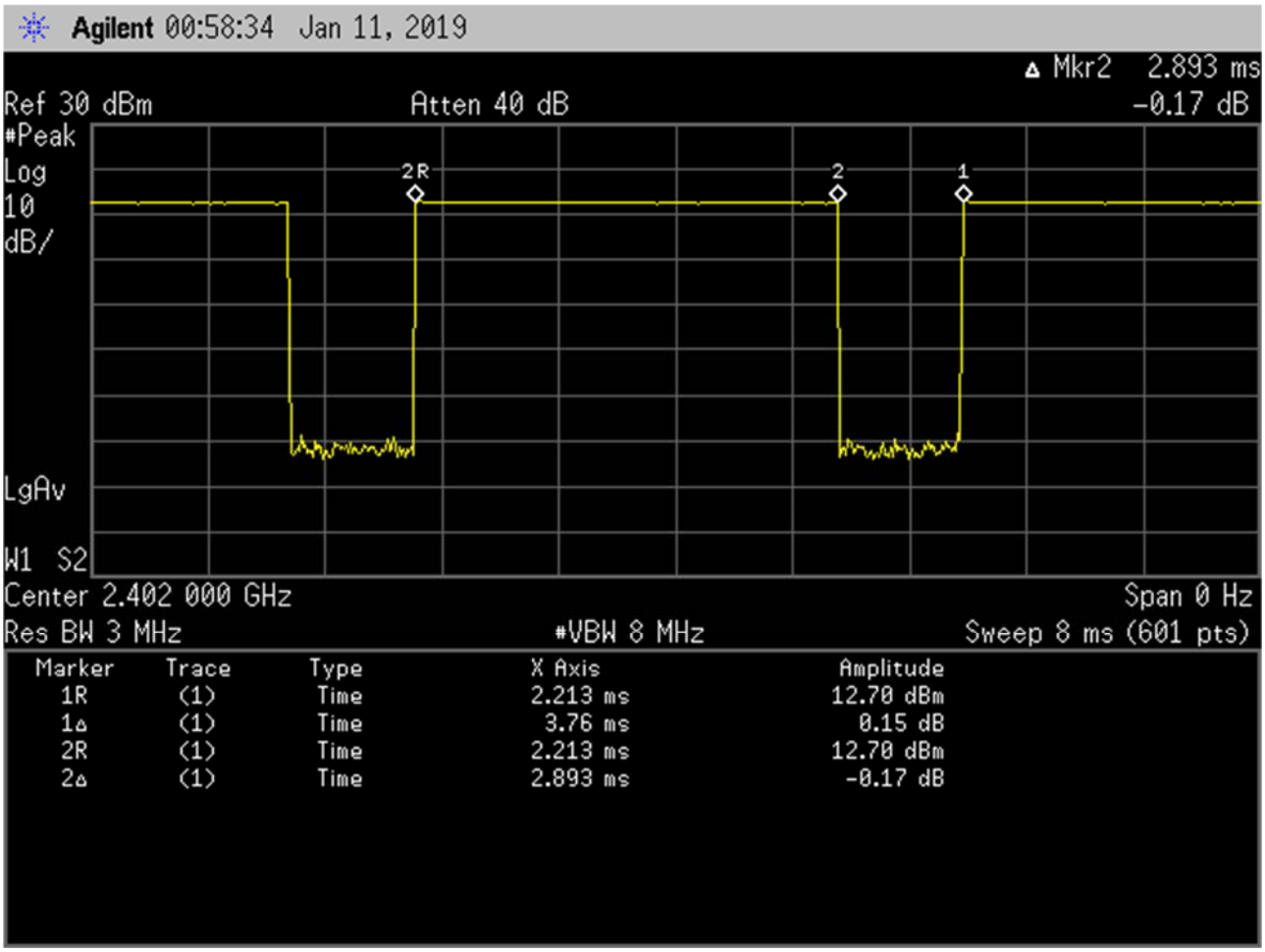


Figure 8-6
Bluetooth Transmission Plot & Duty Cycle Calculation – Ant WF2 Variant 1

$$\textbf{Duty Cycle} = \frac{\textbf{Pulse Width}}{\textbf{Period}} * 100\% = \frac{2.893ms}{3.76ms} * 100\% = 76.9\%$$

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

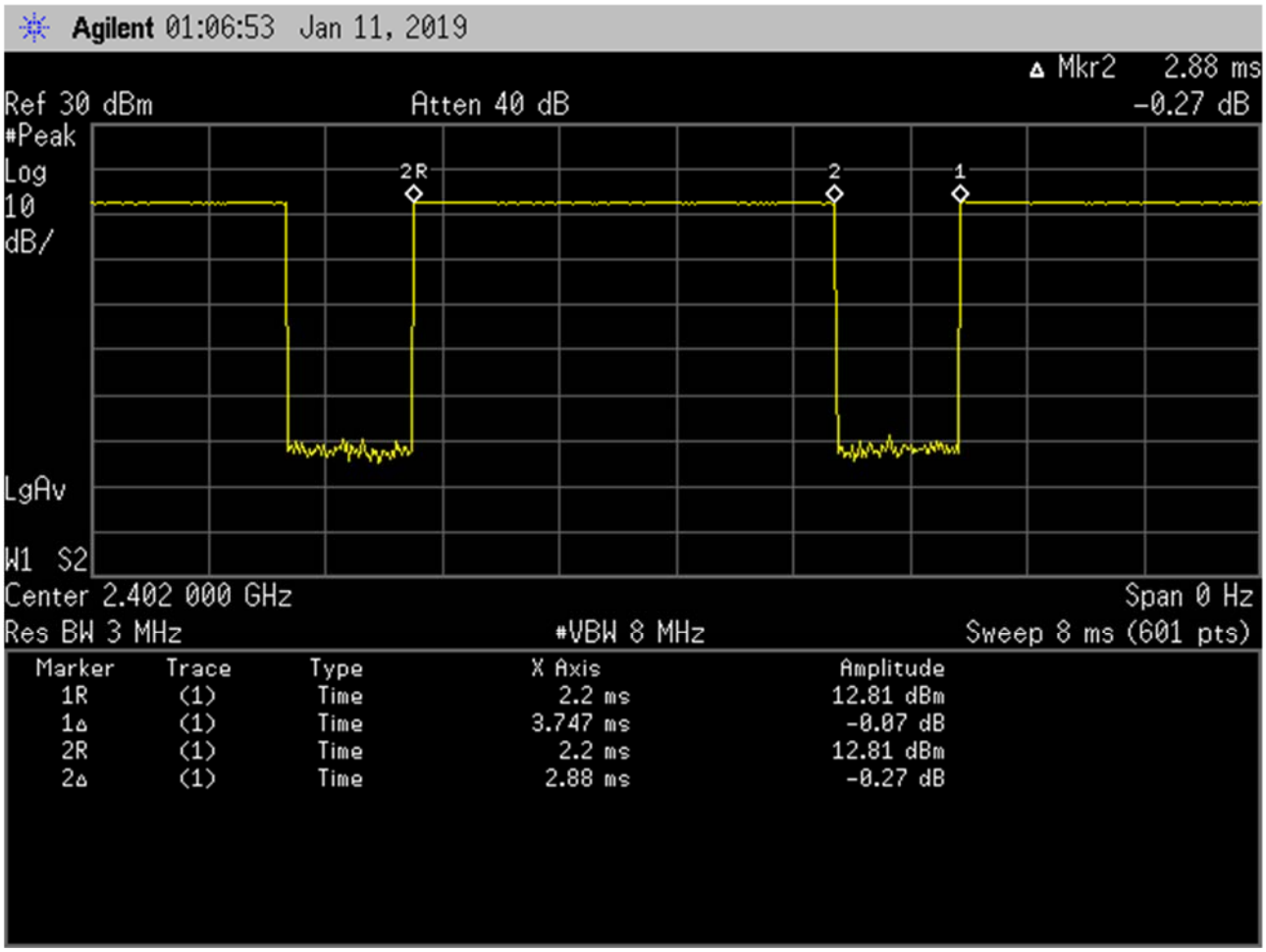


Figure 8-7
Bluetooth Transmission Plot & Duty Cycle Calculation – Ant WF5 Variant 1

$$\textbf{Duty Cycle} = \frac{\textbf{Pulse Width}}{\textbf{Period}} * 100\% = \frac{2.88ms}{3.747ms} * 100\% = 76.9\%$$

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

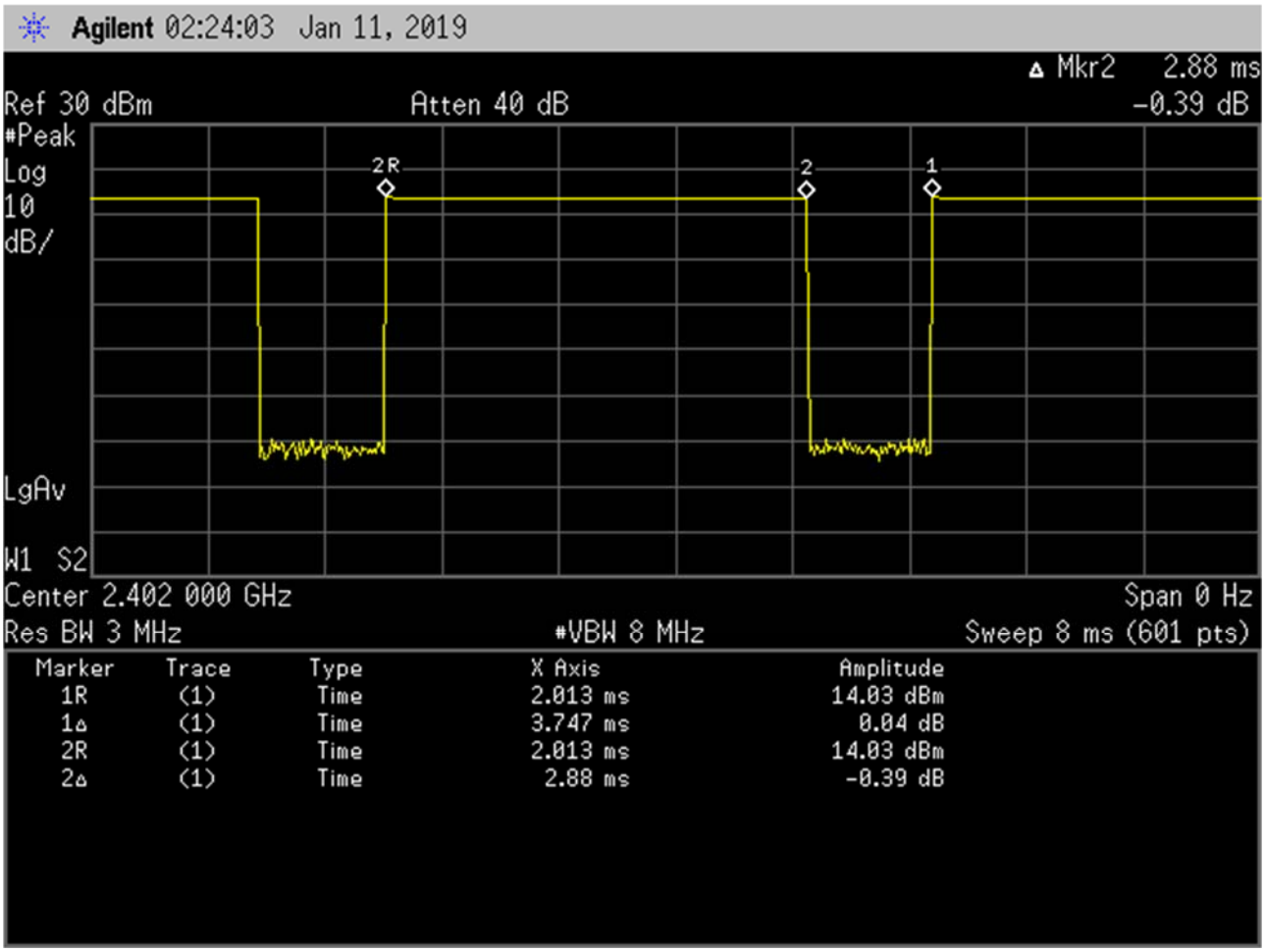


Figure 8-8
Bluetooth Transmission Plot & Duty Cycle Calculation – Ant WF1 Variant 2

$$\boldsymbol{Duty\ Cycle} = \frac{\boldsymbol{Pulse\ Width}}{\boldsymbol{Period}} * \mathbf{100\%} = \frac{\mathbf{2.88}\boldsymbol{ms}}{\mathbf{3.747}\boldsymbol{ms}} * \mathbf{100\%} = \mathbf{76.9\%}$$

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

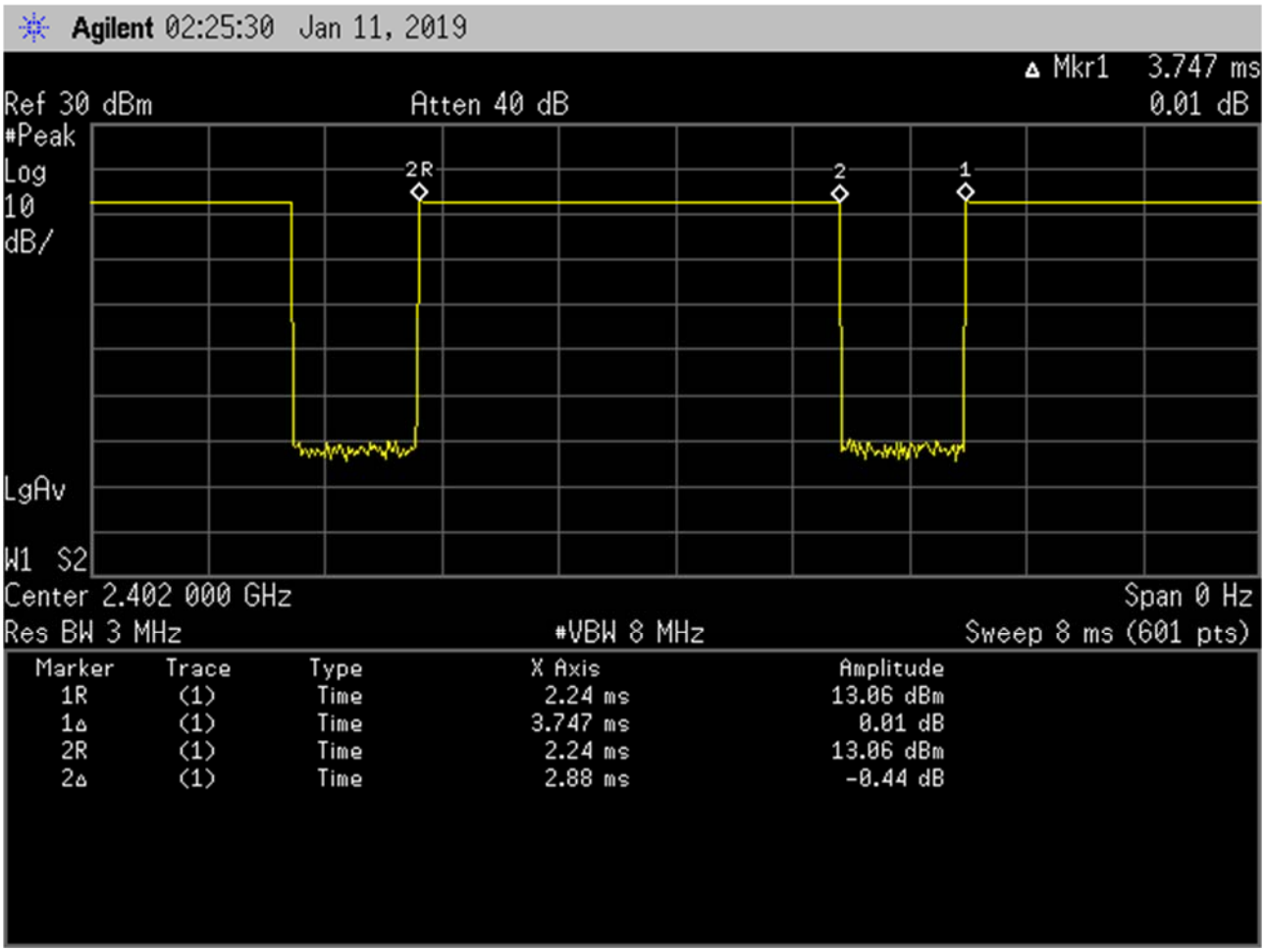


Figure 8-9
Bluetooth Transmission Plot & Duty Cycle Calculation – Ant WF2 Variant 2

$$\textbf{Duty Cycle} = \frac{\textbf{Pulse Width}}{\textbf{Period}} * 100\% = \frac{2.88ms}{3.747ms} * 100\% = 76.9\%$$

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

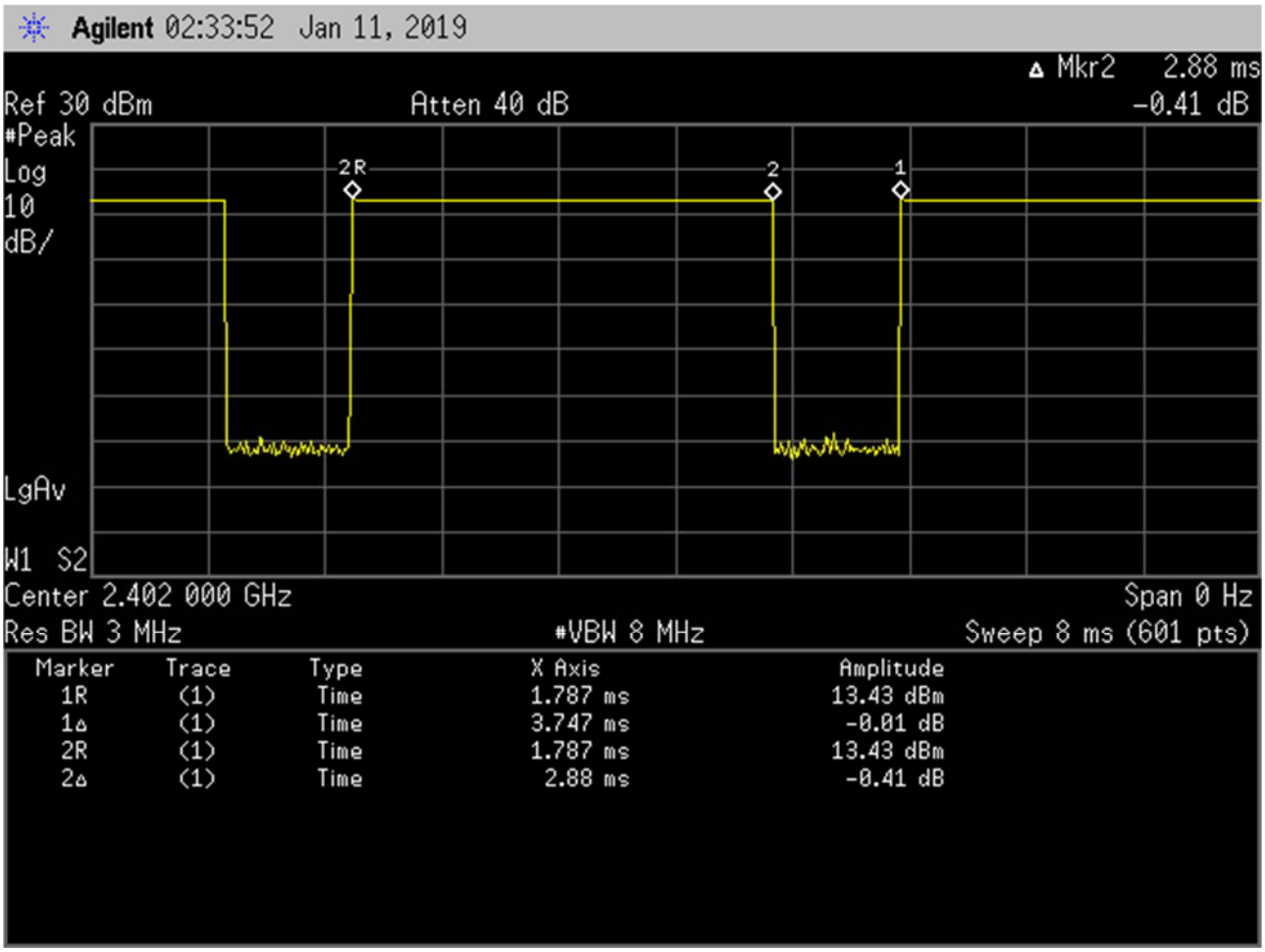


Figure 8-10
Bluetooth Transmission Plot & Duty Cycle Calculation – Ant WF5 Variant 2

$$Duty\ Cycle = \frac{Pulse\ Width}{Period} * 100\% = \frac{2.88ms}{3.747ms} * 100\% = 76.9\%$$

© 2019 PCTEST Engineering Laboratory, Inc.
REV 20.06 M
12/06/2017

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

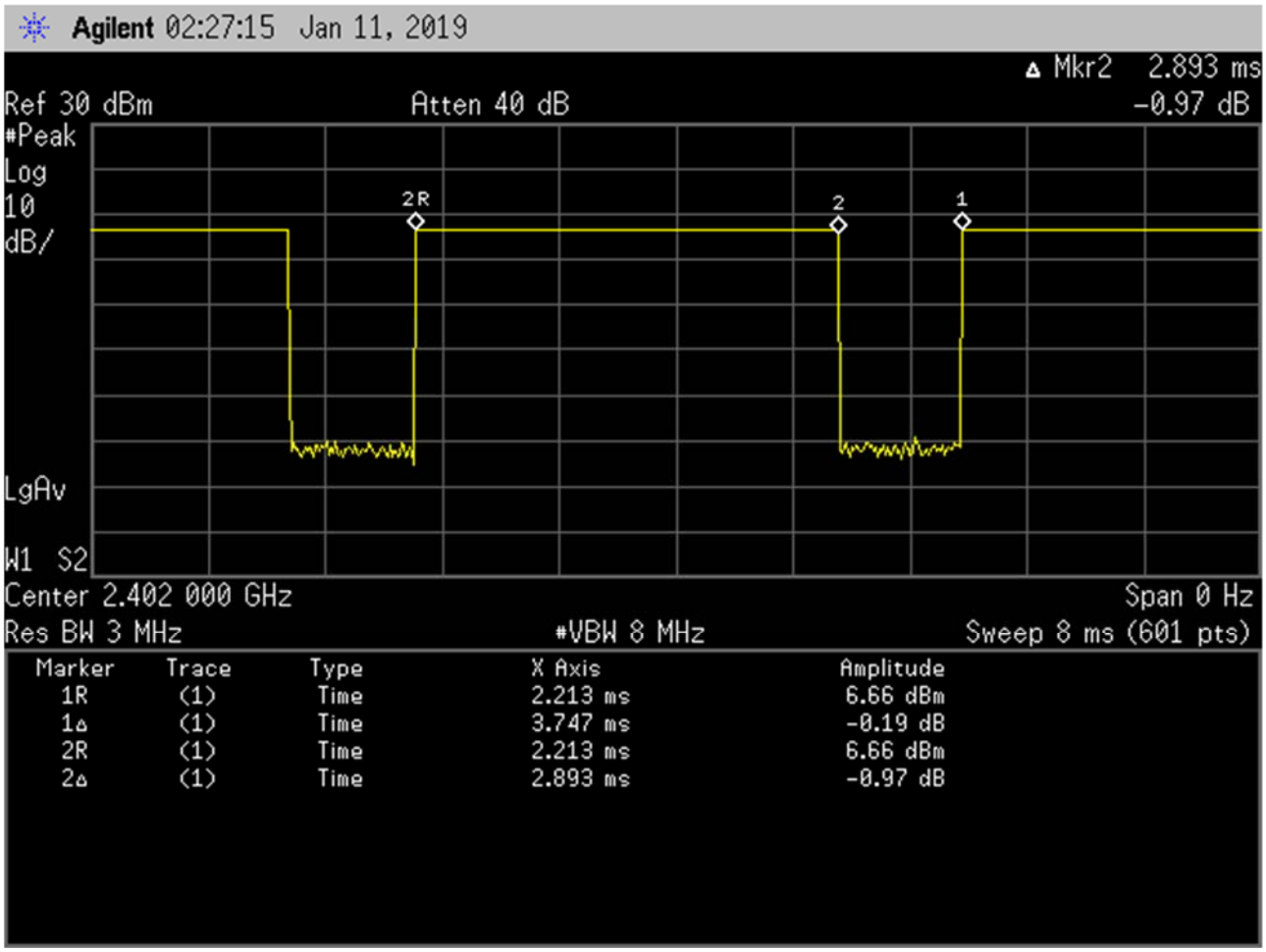


Figure 8-11
Reduced Bluetooth Transmission Plot & Duty Cycle Calculation – Ant WF1 Variant 2

$$\boldsymbol{Duty\ Cycle} = \frac{\boldsymbol{Pulse\ Width}}{\boldsymbol{Period}} * \mathbf{100\%} = \frac{\mathbf{2.893}\boldsymbol{ms}}{\mathbf{3.747}\boldsymbol{ms}} * \mathbf{100\%} = \mathbf{77.2\%}$$

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

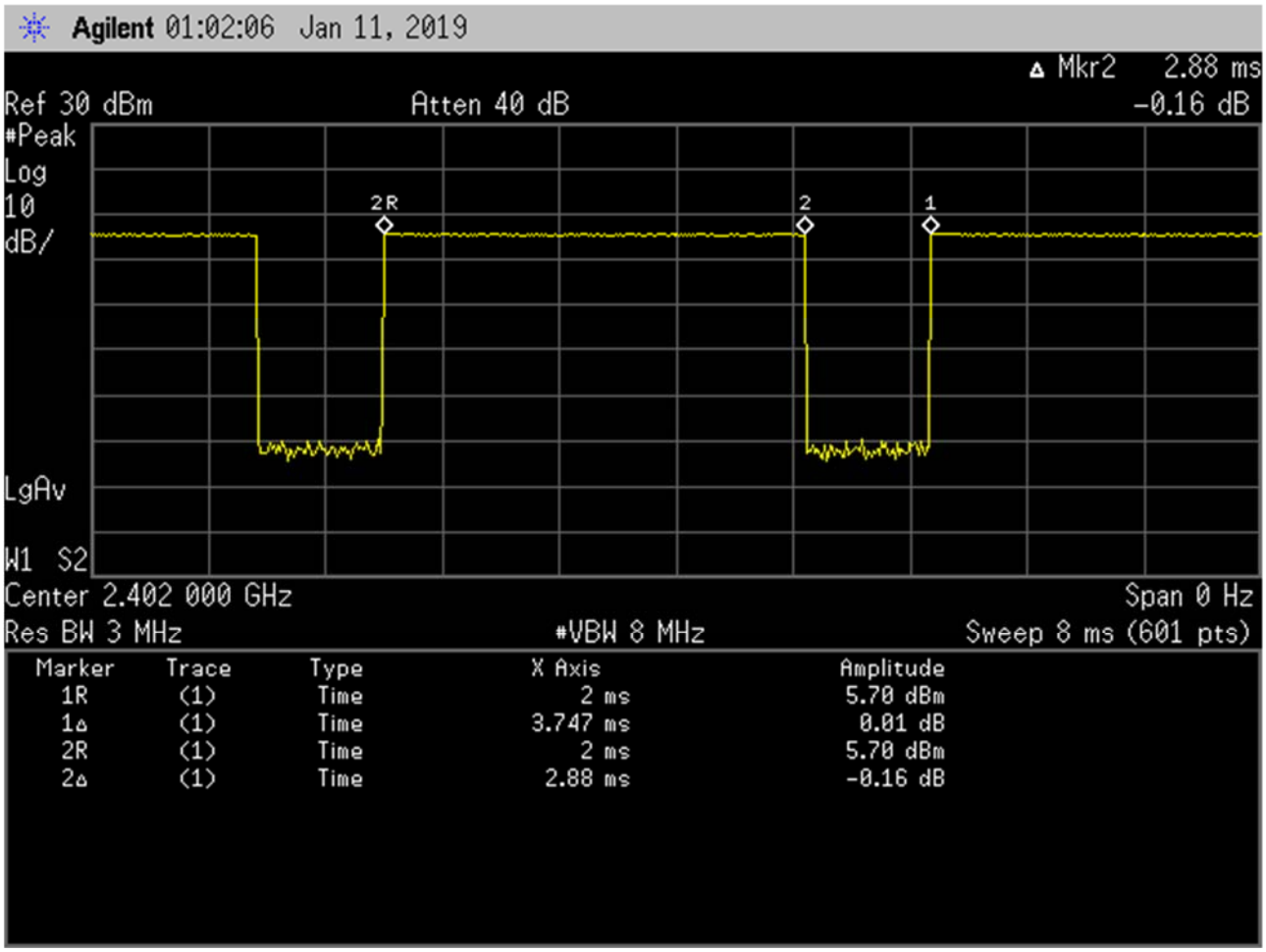


Figure 8-12
Reduced Bluetooth Transmission Plot & Duty Cycle Calculation – Ant WF2 Variant 1

$$\boldsymbol{Duty\ Cycle} = \frac{\boldsymbol{Pulse\ Width}}{\boldsymbol{Period}} * \mathbf{100\%} = \frac{\mathbf{2.88}\boldsymbol{ms}}{\mathbf{3.747}\boldsymbol{ms}} * \mathbf{100\%} = \mathbf{76.9\%}$$

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

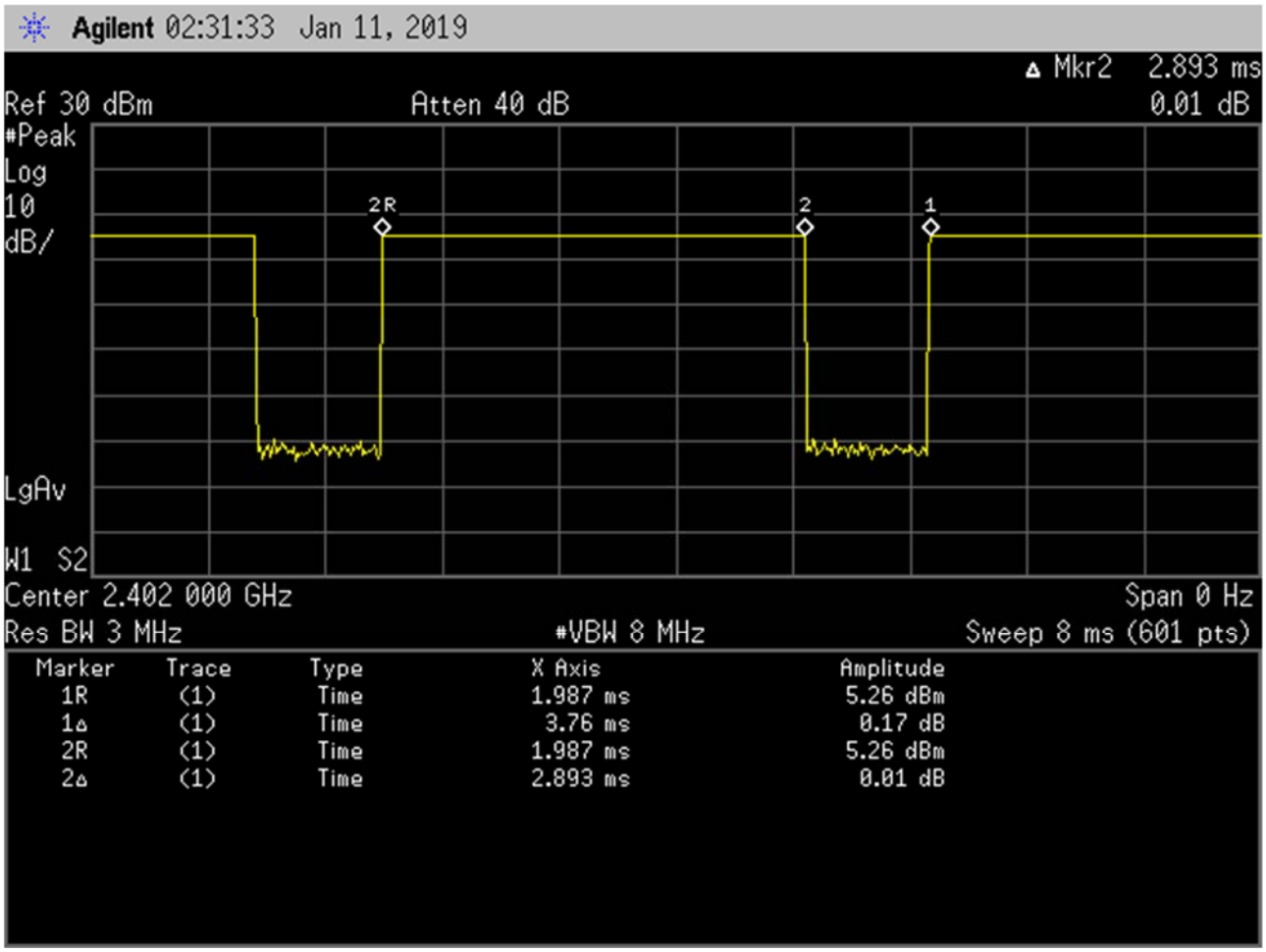


Figure 8-13
Reduced Power Level 1 Bluetooth Transmission Plot & Duty Cycle Calculation – Ant WF5 Variant 2

$$\textbf{Duty Cycle} = \frac{\textbf{Pulse Width}}{\textbf{Period}} * 100\% = \frac{2.893ms}{3.76ms} * 100\% = 76.9\%$$

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

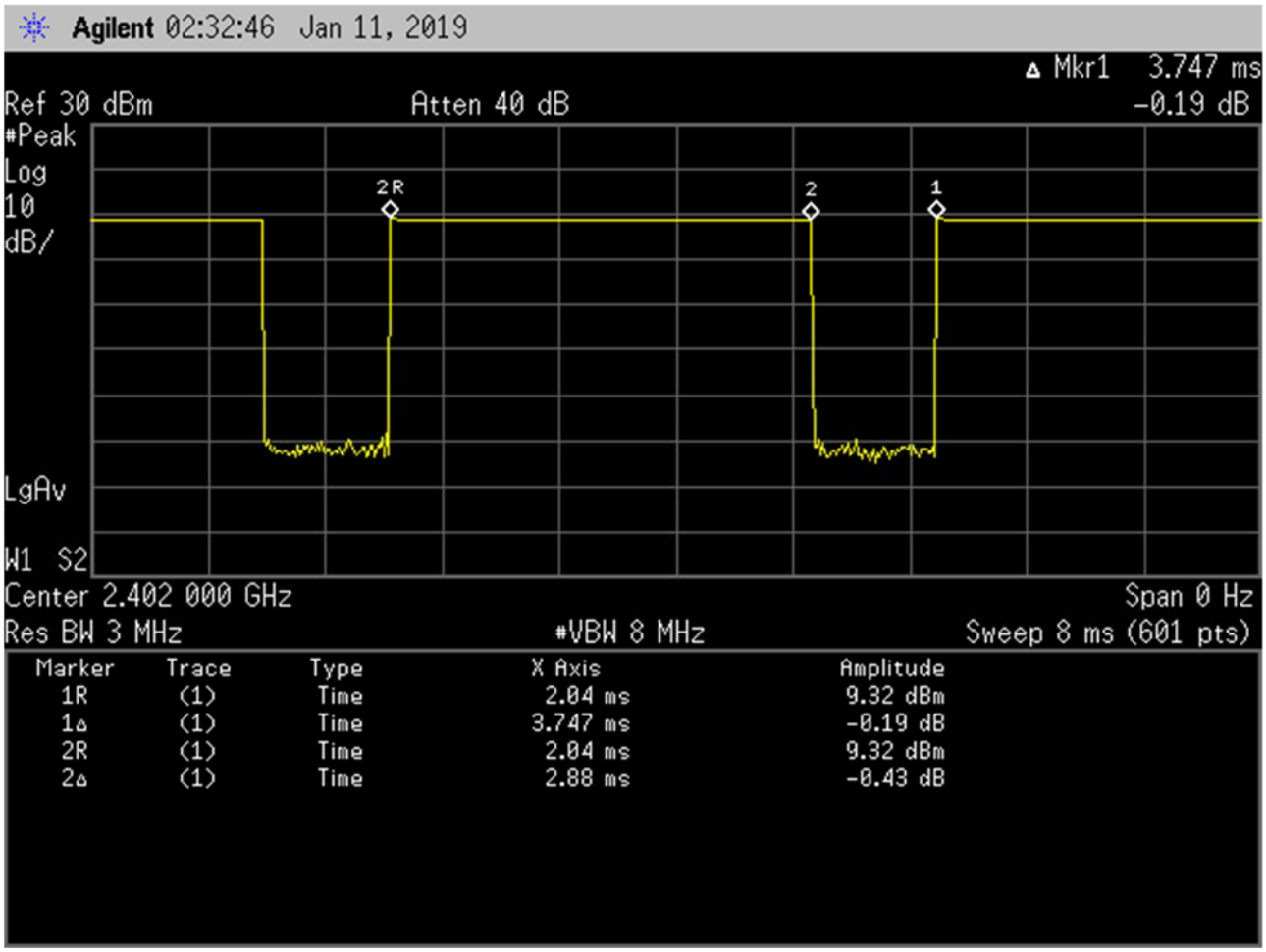


Figure 8-14
Reduced Power Level 2 Bluetooth Transmission Plot & Duty Cycle Calculation – Ant WF5 Variant 2

$$\textbf{Duty Cycle} = \frac{\textbf{Pulse Width}}{\textbf{Period}} * 100\% = \frac{2.88ms}{3.747ms} * 100\% = 76.9\%$$

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

8.6.1 Bluetooth Power Reduction Verification Summary

Table 8-116
Bluetooth Power Reduction Verification

Antenna	Mode/Band	Condition (s)	Maximum Target Power [dBm] (Tolerance [dB])	Reduced Target Power [dBm] (Tolerance [dB])	Maximum Measured Power [dBm]	Reduced Measured Power [dBm]	Verdict
WF1	2.4 GHz Bluetooth	5 GHz WLAN ON ANT WF1	14.5 (+1.5/-2.0)	7.5 (+1.5/-2.0)	14.91	8.12	PASS
	2.4 GHz Bluetooth	5 GHz WLAN ON ANT WF2	14.5 (+1.5/-2.0)	7.5 (+1.5/-2.0)	14.93	8.15	PASS
	2.4 GHz Bluetooth	5 GHz WLAN ON ANT WF1 & WF2	14.5 (+1.5/-2.0)	7.5 (+1.5/-2.0)	14.95	8.1	PASS
WF2	2.4 GHz Bluetooth	5 GHz WLAN ON ANT WF1	15.5 (+1.5/-2.0)	8.5 (+1.5/-2.0)	16.33	9.71	PASS
	2.4 GHz Bluetooth	5 GHz WLAN ON ANT WF2	15.5 (+1.5/-2.0)	8.5 (+1.5/-2.0)	16.32	9.66	PASS
	2.4 GHz Bluetooth	5 GHz WLAN ON ANT WF1 & WF2	15.5 (+1.5/-2.0)	8.5 (+1.5/-2.0)	16.34	9.7	PASS
WF5	2.4 GHz Bluetooth	Main Band ANT WF3 ON	14.0 (+1.5/-2.0)	10.0 (+1.5/-2.0)	12.72	10.6	PASS
	2.4 GHz Bluetooth	Main Band ANT WF5 ON	14.0 (+1.5/-2.0)	7.0 (+1.5/-2.0)	12.86	6.34	PASS

Conducted powers were measured for each Mode/Band and applied condition. All conducted power measurements were verified to be within tolerance. Additional information about the power reduction mechanism can be found in the operational description.

8.6.2 Notes for Bluetooth

- The Bluetooth chipset in this device is produced by two different suppliers. The electrically identical modules are manufactured with the identical mechanical structure to meet the same specifications and functions. Two device variants are referenced as Variant 1 and Variant 2 in this report.
- Bluetooth SAR worst case configuration was spotchecked on Variant 1 and Variant 2. The Variant with the highest reported SAR value was evaluated for the remaining Bluetooth configurations.
- Full power measurements were performed for Variant 1 and Variant 2 per FCC KDB Procedures 248227.

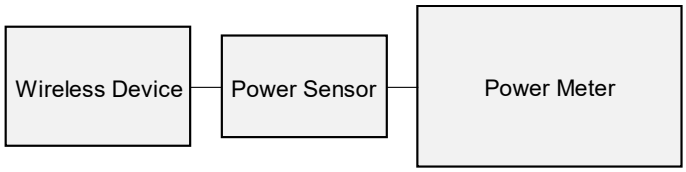


Figure 8-15
Power Measurement Setup

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

9 SYSTEM VERIFICATION

9.1 Tissue Verification

Table 9-1
Measured Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
1/21/2019	750B	19.4	680	0.952	53.172	0.958	55.804	-0.63%	-4.72%
			695	0.957	53.125	0.959	55.745	-0.21%	-4.70%
			700	0.959	53.111	0.959	55.726	0.00%	-4.69%
			710	0.962	53.090	0.960	55.687	0.21%	-4.66%
			720	0.965	53.057	0.961	55.648	0.42%	-4.66%
			725	0.967	53.046	0.961	55.629	0.62%	-4.64%
			740	0.972	53.004	0.963	55.570	0.93%	-4.62%
			755	0.978	52.972	0.964	55.512	1.45%	-4.58%
			770	0.985	52.950	0.965	55.453	2.07%	-4.51%
			785	0.991	52.923	0.966	55.395	2.59%	-4.46%
			800	0.996	52.896	0.967	55.336	3.00%	-4.41%
1/23/2019	750B	20.6	725	0.976	53.220	0.961	55.629	1.56%	-4.33%
			740	0.982	53.177	0.963	55.570	1.97%	-4.31%
			755	0.987	53.145	0.964	55.512	2.39%	-4.26%
			770	0.993	53.132	0.965	55.453	2.90%	-4.19%
			785	0.999	53.112	0.966	55.395	3.42%	-4.12%
			800	1.005	53.079	0.967	55.336	3.93%	-4.08%
1/22/2019	835B	20.5	820	0.999	52.664	0.969	55.258	3.10%	-4.69%
			835	1.004	52.590	0.970	55.200	3.51%	-4.73%
			850	1.010	52.552	0.988	55.154	2.23%	-4.72%
1/29/2019	835B	21.4	820	1.008	52.798	0.969	55.258	4.02%	-4.45%
			835	1.014	52.753	0.970	55.200	4.54%	-4.43%
			850	1.020	52.718	0.988	55.154	3.24%	-4.42%
1/30/2019	835B	20.6	820	1.009	52.862	0.969	55.258	4.13%	-4.35%
			835	1.014	52.809	0.970	55.200	4.54%	-4.33%
			850	1.020	52.775	0.988	55.154	3.24%	-4.31%
2/1/2019	835B	20.0	800	0.955	53.491	0.967	55.336	-1.24%	-3.33%
			820	0.963	53.431	0.969	55.258	-0.62%	-3.31%
			835	0.969	53.376	0.970	55.200	-0.10%	-3.30%
			850	0.976	53.326	0.988	55.154	-1.21%	-3.31%
1/23/2019	1750B	20.8	1710	1.453	51.221	1.463	53.537	-0.68%	-4.33%
			1750	1.489	51.130	1.488	53.432	0.07%	-4.31%
			1790	1.526	51.011	1.514	53.326	0.79%	-4.34%
1/24/2019	1900B	23.1	1850	1.550	50.980	1.520	53.300	1.97%	-4.35%
			1880	1.570	50.925	1.520	53.300	3.29%	-4.46%
			1910	1.592	50.911	1.520	53.300	4.74%	-4.48%
1/25/2019	1900B	24.3	1850	1.531	50.836	1.520	53.300	0.72%	-4.62%
			1880	1.559	50.748	1.520	53.300	2.57%	-4.79%
			1910	1.586	50.670	1.520	53.300	4.34%	-4.93%
1/27/2019	1900B	24.5	1850	1.540	50.927	1.520	53.300	1.32%	-4.45%
			1880	1.568	50.846	1.520	53.300	3.16%	-4.60%
			1910	1.595	50.762	1.520	53.300	4.93%	-4.76%
1/20/2019	2300B	23.0	2300	1.750	53.882	1.809	52.900	-3.26%	1.86%
			2310	1.764	53.846	1.816	52.887	-2.86%	1.81%
			2320	1.778	53.817	1.826	52.873	-2.63%	1.79%
1/14/2019	2400B	21.9	2400	1.982	50.824	1.902	52.767	4.21%	-3.68%
			2450	2.028	50.752	1.950	52.700	4.00%	-3.70%
			2500	2.070	50.696	2.021	52.636	2.42%	-3.69%
1/16/2019	2400B	21.8	2400	1.992	50.352	1.902	52.767	4.73%	-4.58%
			2450	2.038	50.274	1.950	52.700	4.51%	-4.60%
			2500	2.085	50.210	2.021	52.636	3.17%	-4.61%
1/16/2019	2400B	22.3	2400	1.994	50.345	1.902	52.767	4.84%	-4.59%
			2450	2.040	50.284	1.950	52.700	4.62%	-4.58%
			2500	2.081	50.222	2.021	52.636	2.97%	-4.59%
			2550	2.128	50.123	2.092	52.573	1.72%	-4.66%
			2600	2.175	50.094	2.163	52.509	0.55%	-4.60%
			2650	2.221	49.969	2.234	52.445	-0.58%	-4.72%
			2700	2.271	49.911	2.305	52.382	-1.48%	-4.72%
1/23/2019	2400B	21.9	2400	1.982	50.400	1.902	52.767	4.21%	-4.49%
			2450	2.026	50.317	1.950	52.700	3.90%	-4.52%
			2500	2.071	50.260	2.021	52.636	2.47%	-4.51%
			2550	2.120	50.147	2.092	52.573	1.34%	-4.61%
			2600	2.167	50.087	2.163	52.509	0.18%	-4.61%
			2650	2.217	49.986	2.234	52.445	-0.76%	-4.69%
			2700	2.266	49.901	2.305	52.382	-1.69%	-4.74%
01/16/2019	5200B-5800B	22.0	5180	5.444	47.256	5.276	49.041	3.18%	-3.64%
			5200	5.470	47.196	5.299	49.014	3.23%	-3.71%
			5220	5.480	47.167	5.323	48.987	2.95%	-3.72%
			5240	5.521	47.109	5.346	48.960	3.27%	-3.78%
			5260	5.547	47.095	5.369	48.933	3.32%	-3.76%
			5280	5.579	47.046	5.393	48.906	3.45%	-3.80%
			5300	5.600	47.008	5.416	48.879	3.40%	-3.83%
			5320	5.622	46.983	5.439	48.851	3.36%	-3.82%
			5500	5.857	46.666	5.650	48.607	3.66%	-3.99%
			5520	5.889	46.609	5.673	48.580	3.81%	-4.06%
			5540	5.919	46.585	5.696	48.553	3.92%	-4.05%
			5560	5.946	46.540	5.720	48.526	3.95%	-4.09%
			5580	5.969	46.481	5.743	48.499	3.94%	-4.16%
			5600	5.987	46.438	5.766	48.471	3.83%	-4.19%
			5620	6.033	46.415	5.790	48.444	4.20%	-4.19%
			5640	6.062	46.402	5.813	48.417	4.28%	-4.16%
			5660	6.078	46.365	5.837	48.390	4.13%	-4.18%
			5680	6.086	46.300	5.860	48.363	3.86%	-4.27%
			5700	6.135	46.256	5.883	48.336	4.28%	-4.30%
			5745	6.197	46.204	5.936	48.275	4.40%	-4.29%
			5765	6.213	46.179	5.959	48.248	4.26%	-4.29%
			5785	6.253	46.145	5.982	48.220	4.53%	-4.30%
			5800	6.275	46.087	6.000	48.200	4.58%	-4.38%
			5805	6.282	46.075	6.006	48.193	4.60%	-4.39%
			5825	6.298	46.071	6.029	48.166	4.46%	-4.35%

The above measured tissue parameters were used in the DASY software. The DASY software was used to perform interpolation to determine the dielectric parameters at the SAR test device frequencies (per KDB Publication 865664 D01v01r04 and IEEE 1528-2013 6.6.1.2). The tissue parameters listed in the SAR test plots may slightly differ from the table above due to significant digit rounding in the software.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

9.2 Test System Verification

Prior to SAR assessment, the system is verified to ±10% of the SAR measurement on the reference dipole at the time of calibration by the calibration facility. Full system validation status and result summary can be found in Appendix E.

Table 9-2
System Verification Results

System Verification TARGET & MEASURED												
SAR System #	Tissue Frequency (MHz)	Tissue Type	Date	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Source SN	Probe SN	Measured SAR_{1g} (W/kg)	1 W Target SAR_{1g} (W/kg)	1 W Normalized SAR_{1g} (W/kg)	$Deviation_{1g}$ (%)
AM1	750	BODY	01/21/2019	22.3	19.4	0.200	1034	3275	1.820	8.570	9.100	6.18%
AM1	750	BODY	01/23/2019	23.5	20.6	0.200	1097	3275	1.710	8.560	8.550	-0.12%
AM6	850	BODY	01/22/2019	23.5	20.5	0.200	1010	3131	2.080	10.200	10.400	1.96%
AM6	835	BODY	01/29/2019	21.4	22.2	0.200	4d040	3131	2.030	9.560	10.150	6.17%
AM1	835	BODY	01/30/2019	23.1	20.6	0.200	4d040	3275	1.970	9.560	9.850	3.03%
AM6	835	BODY	02/01/2019	20.2	20.0	0.200	4d180	3131	2.000	9.590	10.000	4.28%
AM4	1750	BODY	01/23/2019	22.3	20.9	0.100	1104	3119	3.930	36.600	39.300	7.38%
AM6	1900	BODY	01/24/2019	23.5	22.4	0.100	5d026	3131	3.940	39.900	39.400	-1.25%
AM4	1900	BODY	01/25/2019	23.3	22.3	0.100	5d026	3119	4.260	39.900	42.600	6.77%
AM4	1900	BODY	01/27/2019	21.1	22.5	0.100	5d026	3119	4.260	39.900	42.600	6.77%
AM7	2300	BODY	01/20/2019	22.2	23.0	0.100	1038	3329	4.940	46.700	49.400	5.78%
AM1	2450	BODY	01/14/2019	21.6	20.5	0.100	921	3275	5.080	50.800	50.800	0.00%
AM1	2450	BODY	01/16/2019	22.7	21.8	0.100	921	3275	5.040	50.800	50.400	-0.79%
AM2	2600	BODY	01/16/2019	22.9	21.3	0.100	1069	7416	5.930	55.300	59.300	7.23%
AM2	2600	BODY	01/23/2019	23.3	20.6	0.100	1069	7416	5.750	55.300	57.500	3.98%
AM3	5250	BODY	01/16/2019	21.2	22.0	0.050	1163	7420	3.650	77.700	73.000	-6.05%
AM3	5600	BODY	01/16/2019	21.2	22.0	0.050	1163	7420	4.080	80.100	81.600	1.87%
AM3	5750	BODY	01/16/2019	21.2	22.0	0.050	1163	7420	3.690	77.800	73.800	-5.14%

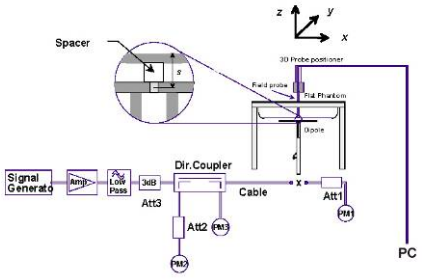


Figure 9-1
System Verification Setup Diagram

Figure 9-2
System Verification Setup Photo

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

10 SAR DATA SUMMARY

10.1 Standalone Body SAR Data

Table 10-1
GPRS 850 MHz Ant WF3 Body SAR Data

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	# of GPRS Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	(W/kg)	(W/kg)	
824.20	128	GSM 850	GPRS	25.0	24.97	0.15	0 mm	WF3	DLXXT022LQK9	2	1:4.15	back	1.010	1.007	1.017	0.474	0.477	A1
836.60	190	GSM 850	GPRS	25.0	24.96	0.14	0 mm	WF3	DLXXT022LQK9	2	1:4.15	back	0.931	1.009	0.939	0.437	0.441	
848.80	251	GSM 850	GPRS	25.0	24.95	0.13	0 mm	WF3	DLXXT022LQK9	2	1:4.15	back	0.870	1.012	0.880	0.409	0.414	
836.60	190	GSM 850	GPRS	25.0	24.96	0.08	0 mm	WF3	DLXXT022LQK9	2	1:4.15	top	0.658	1.009	0.664	0.330	0.333	
836.60	190	GSM 850	GPRS	25.0	24.96	0.07	0 mm	WF3	DLXXT022LQK9	2	1:4.15	bottom	0.022	1.009	0.022	0.011	0.011	
836.60	190	GSM 850	GPRS	25.0	24.96	0.09	0 mm	WF3	DLXXT022LQK9	2	1:4.15	right	0.168	1.009	0.170	0.082	0.083	
836.60	190	GSM 850	GPRS	25.0	24.96	-0.10	0 mm	WF3	DLXXT022LQK9	2	1:4.15	left	0.031	1.009	0.031	0.016	0.016	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram											

Table 10-2
GPRS 850 MHz Ant WF5 Body SAR Data

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	# of GPRS Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	(W/kg)	(W/kg)	
824.20	128	GSM 850	GPRS	25.5	25.41	0.05	0 mm	WF5	DLXXT023LQK9	2	1:4.15	back	0.777	1.021	0.793	0.351	0.358	
836.60	190	GSM 850	GPRS	25.5	25.25	0.07	0 mm	WF5	DLXXT023LQK9	2	1:4.15	back	0.751	1.059	0.795	0.338	0.358	
848.80	251	GSM 850	GPRS	25.5	25.25	0.10	0 mm	WF5	DLXXT023LQK9	2	1:4.15	back	0.724	1.059	0.767	0.327	0.346	
836.60	190	GSM 850	GPRS	25.5	25.25	-0.09	0 mm	WF5	DLXXT023LQK9	2	1:4.15	top	0.738	1.059	0.782	0.378	0.400	
836.60	190	GSM 850	GPRS	25.5	25.25	0.05	0 mm	WF5	DLXXT023LQK9	2	1:4.15	bottom	0.025	1.059	0.026	0.013	0.014	
836.60	190	GSM 850	GPRS	25.5	25.25	0.00	0 mm	WF5	DLXXT023LQK9	2	1:4.15	right	0.010	1.059	0.011	0.004	0.004	
836.60	190	GSM 850	GPRS	25.5	25.25	-0.02	0 mm	WF5	DLXXT023LQK9	2	1:4.15	left	0.136	1.059	0.144	0.076	0.080	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram											

Table 10-3
GPRS 1900 MHz Ant WF3 Body SAR Data

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	# of GPRS Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	(W/kg)	(W/kg)	
1850.20	512	GSM 1900	GPRS	20.0	19.81	0.00	0 mm	WF3	DLXXT01YLQK8	2	1:4.15	back	0.916	1.045	0.957	0.404	0.422	
1880.00	661	GSM 1900	GPRS	20.0	19.73	0.00	0 mm	WF3	DLXXT01YLQK8	2	1:4.15	back	0.911	1.064	0.969	0.400	0.426	
1909.80	810	GSM 1900	GPRS	20.0	19.96	0.00	0 mm	WF3	DLXXT01YLQK8	2	1:4.15	back	0.915	1.009	0.923	0.397	0.401	
1880.00	661	GSM 1900	GPRS	20.0	19.73	0.00	0 mm	WF3	DLXXT01YLQK8	2	1:4.15	top	0.664	1.064	0.706	0.286	0.304	
1880.00	661	GSM 1900	GPRS	20.0	19.73	0.19	0 mm	WF3	DLXXT01YLQK8	2	1:4.15	bottom	0.001	1.064	0.001	0.000	0.000	
1880.00	661	GSM 1900	GPRS	20.0	19.73	0.03	0 mm	WF3	DLXXT01YLQK8	2	1:4.15	right	0.031	1.064	0.033	0.015	0.016	
1880.00	661	GSM 1900	GPRS	20.0	19.73	0.03	0 mm	WF3	DLXXT01YLQK8	2	1:4.15	left	0.007	1.064	0.007	0.004	0.004	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram											

© 2019 PCTEST Engineering Laboratory, Inc.

REV 20.06 M
12/06/2017

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 10-4
GPRS 1900 MHz Ant WF5 Body SAR Data

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	# of GPRS Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	(W/kg)	(W/kg)	
1850.20	512	GSM 1900	GPRS	21.5	21.31	0.01	0 mm	WF5	DLXXT01YLQK8	2	1:4.15	back	1.010	1.045	1.055	0.466	0.487	
1880.00	661	GSM 1900	GPRS	21.5	21.15	0.00	0 mm	WF5	DLXXT01YLQK8	2	1:4.15	back	1.010	1.084	1.095	0.463	0.502	
1909.80	810	GSM 1900	GPRS	21.5	21.49	0.04	0 mm	WF5	DLXXT01YLQK8	2	1:4.15	back	1.120	1.002	1.122	0.504	0.505	A2
1880.00	661	GSM 1900	GPRS	21.5	21.15	-0.05	0 mm	WF5	DLXXT01YLQK8	2	1:4.15	top	0.717	1.084	0.777	0.311	0.337	
1880.00	661	GSM 1900	GPRS	21.5	21.15	0.20	0 mm	WF5	DLXXT01YLQK8	2	1:4.15	bottom	0.002	1.084	0.002	0.001	0.001	
1880.00	661	GSM 1900	GPRS	21.5	21.15	0.04	0 mm	WF5	DLXXT01YLQK8	2	1:4.15	right	0.029	1.084	0.031	0.014	0.015	
1880.00	661	GSM 1900	GPRS	21.5	21.15	-0.01	0 mm	WF5	DLXXT01YLQK8	2	1:4.15	left	0.109	1.084	0.118	0.054	0.059	
1909.80	810	GSM 1900	GPRS	21.5	21.49	-0.03	0 mm	WF5	DLXXT01YLQK8	2	1:4.15	back	1.120	1.002	1.122	0.502	0.503	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram											

Note: Blue entries indicate variability measurements.

Table 10-5
UMTS 850 MHz Ant WF3 Body SAR Data

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	(W/kg)	(W/kg)	
826.40	4132	UMTS 850	RMC	19.0	18.95	-0.06	0 mm	WF3	DLXXT023LQK9	1:1	back	1.160	1.012	1.174	0.544	0.551	A3
836.60	4183	UMTS 850	RMC	19.0	18.87	0.09	0 mm	WF3	DLXXT023LQK9	1:1	back	1.080	1.030	1.112	0.504	0.519	
846.60	4233	UMTS 850	RMC	19.0	18.85	0.11	0 mm	WF3	DLXXT023LQK9	1:1	back	1.020	1.035	1.056	0.475	0.492	
826.40	4132	UMTS 850	RMC	19.0	18.95	-0.02	0 mm	WF3	DLXXT023LQK9	1:1	top	0.889	1.012	0.900	0.455	0.460	
836.60	4183	UMTS 850	RMC	19.0	18.87	-0.01	0 mm	WF3	DLXXT023LQK9	1:1	top	0.860	1.030	0.886	0.438	0.451	
846.60	4233	UMTS 850	RMC	19.0	18.85	0.00	0 mm	WF3	DLXXT023LQK9	1:1	top	0.839	1.035	0.868	0.424	0.439	
836.60	4183	UMTS 850	RMC	19.0	18.87	0.03	0 mm	WF3	DLXXT023LQK9	1:1	bottom	0.028	1.030	0.029	0.014	0.014	
836.60	4183	UMTS 850	RMC	19.0	18.87	0.00	0 mm	WF3	DLXXT023LQK9	1:1	right	0.159	1.030	0.164	0.085	0.088	
836.60	4183	UMTS 850	RMC	19.0	18.87	0.14	0 mm	WF3	DLXXT023LQK9	1:1	left	0.005	1.030	0.005	0.003	0.003	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram											

Table 10-6
UMTS 850 MHz Ant WF5 Body SAR Data

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	(W/kg)	(W/kg)	
826.40	4132	UMTS 850	RMC	18.7	18.69	0.00	0 mm	WF5	DLXXT021LQK9	1:1	back	0.762	1.002	0.764	0.335	0.336	
836.60	4183	UMTS 850	RMC	18.7	18.57	-0.08	0 mm	WF5	DLXXT021LQK9	1:1	back	0.732	1.030	0.754	0.321	0.331	
846.60	4233	UMTS 850	RMC	18.7	18.63	-0.10	0 mm	WF5	DLXXT021LQK9	1:1	back	0.688	1.016	0.699	0.304	0.309	
836.60	4183	UMTS 850	RMC	18.7	18.57	0.02	0 mm	WF5	DLXXT021LQK9	1:1	top	0.657	1.030	0.677	0.344	0.354	
836.60	4183	UMTS 850	RMC	18.7	18.57	0.06	0 mm	WF5	DLXXT021LQK9	1:1	bottom	0.025	1.030	0.026	0.012	0.012	
836.60	4183	UMTS 850	RMC	18.7	18.57	0.06	0 mm	WF5	DLXXT021LQK9	1:1	right	0.004	1.030	0.004	0.002	0.002	
836.60	4183	UMTS 850	RMC	18.7	18.57	0.20	0 mm	WF5	DLXXT021LQK9	1:1	left	0.142	1.030	0.146	0.073	0.075	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram											

© 2019 PCTEST Engineering Laboratory, Inc.

REV 20.06 M
12/06/2017

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 10-7
UMTS 1750 MHz Ant WF3 Body SAR Data

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	(W/kg)	(W/kg)	
1712.40	1312	UMTS 1750	RMC	14.5	14.46	0.03	0 mm	WF3	DLXXT01ULQK8	1:1	back	1.170	1.009	1.181	0.528	0.533	A4
1732.40	1412	UMTS 1750	RMC	14.5	14.42	0.04	0 mm	WF3	DLXXT01ULQK8	1:1	back	1.150	1.019	1.172	0.525	0.535	
1752.60	1513	UMTS 1750	RMC	14.5	14.40	0.03	0 mm	WF3	DLXXT01ULQK8	1:1	back	1.140	1.023	1.166	0.518	0.530	
1732.40	1412	UMTS 1750	RMC	14.5	14.42	0.00	0 mm	WF3	DLXXT01ULQK8	1:1	top	0.715	1.019	0.729	0.317	0.323	
1732.40	1412	UMTS 1750	RMC	14.5	14.42	0.13	0 mm	WF3	DLXXT01ULQK8	1:1	bottom	0.004	1.019	0.004	0.002	0.002	
1732.40	1412	UMTS 1750	RMC	14.5	14.42	0.02	0 mm	WF3	DLXXT01ULQK8	1:1	right	0.078	1.019	0.079	0.039	0.040	
1732.40	1412	UMTS 1750	RMC	14.5	14.42	0.00	0 mm	WF3	DLXXT01ULQK8	1:1	left	0.040	1.019	0.041	0.021	0.021	
1712.40	1312	UMTS 1750	RMC	14.5	14.46	-0.03	0 mm	WF3	DLXXT01ULQK8	1:1	back	1.080	1.009	1.090	0.500	0.505	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram										

Note: Blue entries indicate variability measurements

Table 10-8
UMTS 1750 MHz Ant WF5 Body SAR Data

MEASUREMENT RESULTS																	
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	(W/kg)	(W/kg)	
1712.40	1312	UMTS 1750	RMC	14.5	14.35	-0.01	0 mm	WF5	DLXXT01ULQK8	1:1	back	1.020	1.035	1.056	0.491	0.508	
1732.40	1412	UMTS 1750	RMC	14.5	14.42	0.01	0 mm	WF5	DLXXT01ULQK8	1:1	back	1.010	1.019	1.029	0.484	0.493	
1752.60	1513	UMTS 1750	RMC	14.5	14.34	0.00	0 mm	WF5	DLXXT01ULQK8	1:1	back	1.010	1.038	1.048	0.482	0.500	
1732.40	1412	UMTS 1750	RMC	14.5	14.42	-0.07	0 mm	WF5	DLXXT01ULQK8	1:1	top	0.575	1.019	0.586	0.264	0.269	
1732.40	1412	UMTS 1750	RMC	14.5	14.42	0.09	0 mm	WF5	DLXXT01ULQK8	1:1	bottom	0.001	1.019	0.001	0.000	0.000	
1732.40	1412	UMTS 1750	RMC	14.5	14.42	-0.01	0 mm	WF5	DLXXT01ULQK8	1:1	right	0.015	1.019	0.015	0.008	0.008	
1732.40	1412	UMTS 1750	RMC	14.5	14.42	0.04	0 mm	WF5	DLXXT01ULQK8	1:1	left	0.039	1.019	0.040	0.020	0.020	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram										

Table 10-9
UMTS 1900 MHz Ant WF3 Body SAR Data

MEASUREMENT RESULTS																	
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	(W/kg)	(W/kg)	
1852.40	9262	UMTS 1900	RMC	14.0	13.76	0.01	0 mm	WF3	DLXXT01YLQK8	1:1	back	0.961	1.057	1.016	0.432	0.457	
1880.00	9400	UMTS 1900	RMC	14.0	13.72	-0.01	0 mm	WF3	DLXXT01YLQK8	1:1	back	0.971	1.067	1.036	0.435	0.464	
1907.60	9538	UMTS 1900	RMC	14.0	13.99	0.00	0 mm	WF3	DLXXT01YLQK8	1:1	back	0.991	1.002	0.993	0.441	0.442	A5
1880.00	9400	UMTS 1900	RMC	14.0	13.72	0.01	0 mm	WF3	DLXXT01YLQK8	1:1	top	0.712	1.067	0.760	0.315	0.336	
1880.00	9400	UMTS 1900	RMC	14.0	13.72	0.04	0 mm	WF3	DLXXT01YLQK8	1:1	bottom	0.003	1.067	0.003	0.001	0.001	
1880.00	9400	UMTS 1900	RMC	14.0	13.72	0.01	0 mm	WF3	DLXXT01YLQK8	1:1	right	0.098	1.067	0.105	0.046	0.049	
1880.00	9400	UMTS 1900	RMC	14.0	13.72	0.10	0 mm	WF3	DLXXT01YLQK8	1:1	left	0.030	1.067	0.032	0.015	0.016	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram										

© 2019 PCTEST Engineering Laboratory, Inc.

REV 20.06 M
12/06/2017

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 10-10
UMTS 1900 MHz Ant WF5 Body SAR Data

MEASUREMENT RESULTS																	
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	(W/kg)	(W/kg)	
1852.40	9262	UMTS 1900	RMC	14.3	14.26	0.01	0 mm	WF5	DLXXT01YLQK8	1:1	back	0.975	1.009	0.984	0.457	0.461	
1880.00	9400	UMTS 1900	RMC	14.3	14.12	-0.01	0 mm	WF5	DLXXT01YLQK8	1:1	back	0.959	1.042	0.999	0.449	0.468	
1907.60	9538	UMTS 1900	RMC	14.3	14.15	-0.03	0 mm	WF5	DLXXT01YLQK8	1:1	back	0.971	1.035	1.005	0.451	0.467	
1880.00	9400	UMTS 1900	RMC	14.3	14.12	-0.01	0 mm	WF5	DLXXT01YLQK8	1:1	top	0.704	1.042	0.734	0.302	0.315	
1880.00	9400	UMTS 1900	RMC	14.3	14.12	0.05	0 mm	WF5	DLXXT01YLQK8	1:1	bottom	0.002	1.042	0.002	0.001	0.001	
1880.00	9400	UMTS 1900	RMC	14.3	14.12	0.05	0 mm	WF5	DLXXT01YLQK8	1:1	right	0.015	1.042	0.016	0.008	0.008	
1880.00	9400	UMTS 1900	RMC	14.3	14.12	0.05	0 mm	WF5	DLXXT01YLQK8	1:1	left	0.077	1.042	0.080	0.036	0.038	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Body 1.6 W/kg (mW/g) averaged over 1 gram								

Table 10-11
LTE Band 12 Ant WF3 Body SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	(W/kg)	(W/kg)	
707.50	23095	Mid	LTE Band 12	10	19.8	19.11	-0.04	0	WF3	DLXXT022LQK9	QPSK	1	0	0 mm	back	1:1	0.968	1.172	1.134	0.417	0.489	
707.50	23095	Mid	LTE Band 12	10	19.8	19.15	-0.04	0	WF3	DLXXT022LQK9	QPSK	25	0	0 mm	back	1:1	0.999	1.161	1.160	0.427	0.496	
707.50	23095	Mid	LTE Band 12	10	19.8	19.10	-0.01	0	WF3	DLXXT022LQK9	QPSK	50	0	0 mm	back	1:1	0.985	1.175	1.157	0.428	0.503	
707.50	23095	Mid	LTE Band 12	10	19.8	19.11	0.01	0	WF3	DLXXT022LQK9	QPSK	1	0	0 mm	top	1:1	0.518	1.172	0.607	0.236	0.277	
707.50	23095	Mid	LTE Band 12	10	19.8	19.15	0.00	0	WF3	DLXXT022LQK9	QPSK	25	0	0 mm	top	1:1	0.518	1.161	0.601	0.232	0.269	
707.50	23095	Mid	LTE Band 12	10	19.8	19.11	0.07	0	WF3	DLXXT022LQK9	QPSK	1	0	0 mm	bottom	1:1	0.033	1.172	0.039	0.016	0.019	
707.50	23095	Mid	LTE Band 12	10	19.8	19.15	-0.01	0	WF3	DLXXT022LQK9	QPSK	25	0	0 mm	bottom	1:1	0.033	1.161	0.038	0.016	0.019	
707.50	23095	Mid	LTE Band 12	10	19.8	19.11	-0.11	0	WF3	DLXXT022LQK9	QPSK	1	0	0 mm	right	1:1	0.101	1.172	0.118	0.052	0.061	
707.50	23095	Mid	LTE Band 12	10	19.8	19.15	-0.13	0	WF3	DLXXT022LQK9	QPSK	25	0	0 mm	right	1:1	0.104	1.161	0.121	0.053	0.062	
707.50	23095	Mid	LTE Band 12	10	19.8	19.11	0.01	0	WF3	DLXXT022LQK9	QPSK	1	0	0 mm	left	1:1	0.012	1.172	0.014	0.007	0.008	
707.50	23095	Mid	LTE Band 12	10	19.8	19.15	0.11	0	WF3	DLXXT022LQK9	QPSK	25	0	0 mm	left	1:1	0.011	1.161	0.013	0.007	0.008	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram												

Table 10-12
LTE Band 12 Ant WF5 Body SAR

MEASUREMENT RESULTS																					
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	(W/kg)	(W/kg)	
707.50	23095	Mid	LTE Band 12	10	20.0	19.83	0.01	0	WF5	DLXXT022LQK9	QPSK	1	0	0 mm	back	1:1	1.090	1.040	1.134	0.531	0.552	
707.50	23095	Mid	LTE Band 12	10	20.0	19.94	-0.02	0	WF5	DLXXT022LQK9	QPSK	25	0	0 mm	back	1:1	1.120	1.014	1.136	0.538	0.546	A6
707.50	23095	Mid	LTE Band 12	10	20.0	19.80	0.00	0	WF5	DLXXT022LQK9	QPSK	50	0	0 mm	back	1:1	1.100	1.047	1.152	0.528	0.553	
707.50	23095	Mid	LTE Band 12	10	20.0	19.83	-0.05	0	WF5	DLXXT022LQK9	QPSK	1	0	0 mm	top	1:1	0.721	1.040	0.750	0.383	0.398	
707.50	23095	Mid	LTE Band 12	10	20.0	19.94	-0.06	0	WF5	DLXXT022LQK9	QPSK	25	0	0 mm	top	1:1	0.740	1.014	0.750	0.389	0.394	
707.50	23095	Mid	LTE Band 12	10	20.0	19.83	0.03	0	WF5	DLXXT022LQK9	QPSK	1	0	0 mm	bottom	1:1	0.021	1.040	0.022	0.011	0.011	
707.50	23095	Mid	LTE Band 12	10	20.0	19.94	0.06	0	WF5	DLXXT022LQK9	QPSK	25	0	0 mm	bottom	1:1	0.025	1.014	0.025	0.014	0.014	
707.50	23095	Mid	LTE Band 12	10	20.0	19.83	0.06	0	WF5	DLXXT022LQK9	QPSK	1	0	0 mm	right	1:1	0.007	1.040	0.007	0.004	0.004	
707.50	23095	Mid	LTE Band 12	10	20.0	19.94	-0.04	0	WF5	DLXXT022LQK9	QPSK	25	0	0 mm	right	1:1	0.001	1.014	0.001	0.000	0.000	
707.50	23095	Mid	LTE Band 12	10	20.0	19.83	-0.04	0	WF5	DLXXT022LQK9	QPSK	1	0	0 mm	left	1:1	0.080	1.040	0.083	0.044	0.046	
707.50	23095	Mid	LTE Band 12	10	20.0	19.94	-0.02	0	WF5	DLXXT022LQK9	QPSK	25	0	0 mm	left	1:1	0.085	1.014	0.086	0.047	0.048	
707.50	23095	Mid	LTE Band 12	10	20.0	19.94	-0.16	0	WF5	DLXXT022LQK9	QPSK	25	0	0 mm	back	1:1	1.000	1.014	1.014	0.423	0.429	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram												

Note: Blue entries indicate variability measurements.

© 2019 PCTEST Engineering Laboratory, Inc.

REV 20.06 M
12/06/2017

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 10-13
LTE Band 13 Ant WF3 Body SAR

MEASUREMENT RESULTS																							
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	(W/kg)	(W/kg)	
782.00	23230	Mid	LTE Band 13	10	19.1	19.10	0.02	0	WF3	DLXXT023LQK9	QPSK	1	0	0 mm	back	1:1	0.994	1.000	0.994	0.442	0.442	A7
782.00	23230	Mid	LTE Band 13	10	19.1	18.68	-0.08	0	WF3	DLXXT023LQK9	QPSK	25	0	0 mm	back	1:1	0.914	1.102	1.007	0.404	0.445	
782.00	23230	Mid	LTE Band 13	10	19.1	18.54	-0.03	0	WF3	DLXXT023LQK9	QPSK	50	0	0 mm	back	1:1	0.891	1.138	1.014	0.391	0.445	
782.00	23230	Mid	LTE Band 13	10	19.1	19.10	-0.01	0	WF3	DLXXT023LQK9	QPSK	1	0	0 mm	top	1:1	0.727	1.000	0.727	0.364	0.364	
782.00	23230	Mid	LTE Band 13	10	19.1	18.68	-0.03	0	WF3	DLXXT023LQK9	QPSK	25	0	0 mm	top	1:1	0.652	1.102	0.719	0.324	0.357	
782.00	23230	Mid	LTE Band 13	10	19.1	19.10	-0.10	0	WF3	DLXXT023LQK9	QPSK	1	0	0 mm	bottom	1:1	0.039	1.000	0.039	0.023	0.023	
782.00	23230	Mid	LTE Band 13	10	19.1	18.68	-0.02	0	WF3	DLXXT023LQK9	QPSK	25	0	0 mm	bottom	1:1	0.038	1.102	0.042	0.023	0.025	
782.00	23230	Mid	LTE Band 13	10	19.1	19.10	-0.08	0	WF3	DLXXT023LQK9	QPSK	1	0	0 mm	right	1:1	0.171	1.000	0.171	0.083	0.083	
782.00	23230	Mid	LTE Band 13	10	19.1	18.68	0.10	0	WF3	DLXXT023LQK9	QPSK	25	0	0 mm	right	1:1	0.141	1.102	0.155	0.073	0.080	
782.00	23230	Mid	LTE Band 13	10	19.1	19.10	0.17	0	WF3	DLXXT023LQK9	QPSK	1	0	0 mm	left	1:1	0.054	1.000	0.054	0.030	0.030	
782.00	23230	Mid	LTE Band 13	10	19.1	18.68	0.21	0	WF3	DLXXT023LQK9	QPSK	25	0	0 mm	left	1:1	0.052	1.102	0.057	0.030	0.033	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram													

Table 10-14
LTE Band 13 Ant WF5 Body SAR

MEASUREMENT RESULTS																							
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	(W/kg)	(W/kg)	
782.00	23230	Mid	LTE Band 13	10	19.1	19.10	-0.06	0	WF5	DLXXT023LQK9	QPSK	1	0	0 mm	back	1:1	0.736	1.000	0.736	0.343	0.343	
782.00	23230	Mid	LTE Band 13	10	19.1	18.80	-0.07	0	WF5	DLXXT023LQK9	QPSK	25	0	0 mm	back	1:1	0.530	1.072	0.568	0.254	0.272	
782.00	23230	Mid	LTE Band 13	10	19.1	19.10	-0.03	0	WF5	DLXXT023LQK9	QPSK	1	0	0 mm	top	1:1	0.728	1.000	0.728	0.379	0.379	
782.00	23230	Mid	LTE Band 13	10	19.1	18.80	-0.06	0	WF5	DLXXT023LQK9	QPSK	25	0	0 mm	top	1:1	0.687	1.072	0.736	0.354	0.379	
782.00	23230	Mid	LTE Band 13	10	19.1	19.10	0.01	0	WF5	DLXXT023LQK9	QPSK	1	0	0 mm	bottom	1:1	0.019	1.000	0.019	0.010	0.010	
782.00	23230	Mid	LTE Band 13	10	19.1	18.80	0.10	0	WF5	DLXXT023LQK9	QPSK	25	0	0 mm	bottom	1:1	0.017	1.072	0.018	0.009	0.010	
782.00	23230	Mid	LTE Band 13	10	19.1	19.10	-0.02	0	WF5	DLXXT023LQK9	QPSK	1	0	0 mm	right	1:1	0.038	1.000	0.038	0.021	0.021	
782.00	23230	Mid	LTE Band 13	10	19.1	18.80	-0.09	0	WF5	DLXXT023LQK9	QPSK	25	0	0 mm	right	1:1	0.042	1.072	0.045	0.023	0.025	
782.00	23230	Mid	LTE Band 13	10	19.1	19.10	-0.02	0	WF5	DLXXT023LQK9	QPSK	1	0	0 mm	left	1:1	0.156	1.000	0.156	0.085	0.085	
782.00	23230	Mid	LTE Band 13	10	19.1	18.80	-0.02	0	WF5	DLXXT023LQK9	QPSK	25	0	0 mm	left	1:1	0.152	1.072	0.163	0.083	0.089	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram													

Table 10-15
LTE Band 14 Ant WF3 Body SAR

MEASUREMENT RESULTS																							
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	(W/kg)	(W/kg)	
793.00	23330	Mid	LTE Band 14	10	19.1	19.09	0.05	0	WF3	DLXXT023LQK9	QPSK	1	0	0 mm	back	1:1	0.883	1.002	0.885	0.394	0.395	
793.00	23330	Mid	LTE Band 14	10	19.1	18.97	0.04	0	WF3	DLXXT023LQK9	QPSK	25	0	0 mm	back	1:1	0.886	1.030	0.913	0.391	0.403	A8
793.00	23330	Mid	LTE Band 14	10	19.1	18.94	0.03	0	WF3	DLXXT023LQK9	QPSK	50	0	0 mm	back	1:1	0.844	1.038	0.876	0.373	0.387	
793.00	23330	Mid	LTE Band 14	10	19.1	19.09	-0.06	0	WF3	DLXXT023LQK9	QPSK	1	0	0 mm	top	1:1	0.561	1.002	0.562	0.286	0.287	
793.00	23330	Mid	LTE Band 14	10	19.1	18.97	-0.06	0	WF3	DLXXT023LQK9	QPSK	25	0	0 mm	top	1:1	0.557	1.030	0.574	0.284	0.293	
793.00	23330	Mid	LTE Band 14	10	19.1	19.09	0.18	0	WF3	DLXXT023LQK9	QPSK	1	0	0 mm	bottom	1:1	0.024	1.002	0.024	0.014	0.014	
793.00	23330	Mid	LTE Band 14	10	19.1	18.97	0.06	0	WF3	DLXXT023LQK9	QPSK	25	0	0 mm	bottom	1:1	0.021	1.030	0.022	0.013	0.013	
793.00	23330	Mid	LTE Band 14	10	19.1	19.09	-0.02	0	WF3	DLXXT023LQK9	QPSK	1	0	0 mm	right	1:1	0.128	1.002	0.128	0.068	0.068	
793.00	23330	Mid	LTE Band 14	10	19.1	18.97	0.01	0	WF3	DLXXT023LQK9	QPSK	25	0	0 mm	right	1:1	0.121	1.030	0.125	0.064	0.066	
793.00	23330	Mid	LTE Band 14	10	19.1	19.09	-0.11	0	WF3	DLXXT023LQK9	QPSK	1	0	0 mm	left	1:1	0.053	1.002	0.053	0.030	0.030	
793.00	23330	Mid	LTE Band 14	10	19.1	18.97	-0.01	0	WF3	DLXXT023LQK9	QPSK	25	0	0 mm	left	1:1	0.048	1.030	0.049	0.027	0.028	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram													

© 2019 PCTEST Engineering Laboratory, Inc.

REV 20.06 M
12/06/2017

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 10-16
LTE Band 14 Ant WF5 Body SAR

MEASUREMENT RESULTS																							
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	(W/kg)	(W/kg)	
793.00	23330	Mid	LTE Band 14	10	19.1	19.09	-0.20	0	WF5	DLXXT023LQK9	QPSK	1	0	0 mm	back	1:1	0.735	1.002	0.736	0.357	0.358	
793.00	23330	Mid	LTE Band 14	10	19.1	18.90	-0.17	0	WF5	DLXXT023LQK9	QPSK	25	0	0 mm	back	1:1	0.657	1.047	0.688	0.290	0.304	
793.00	23330	Mid	LTE Band 14	10	19.1	19.09	-0.01	0	WF5	DLXXT023LQK9	QPSK	1	0	0 mm	top	1:1	0.716	1.002	0.717	0.376	0.377	
793.00	23330	Mid	LTE Band 14	10	19.1	18.90	0.00	0	WF5	DLXXT023LQK9	QPSK	25	0	0 mm	top	1:1	0.635	1.047	0.665	0.321	0.336	
793.00	23330	Mid	LTE Band 14	10	19.1	19.09	0.15	0	WF5	DLXXT023LQK9	QPSK	1	0	0 mm	bottom	1:1	0.016	1.002	0.016	0.008	0.008	
793.00	23330	Mid	LTE Band 14	10	19.1	18.90	0.19	0	WF5	DLXXT023LQK9	QPSK	25	0	0 mm	bottom	1:1	0.018	1.047	0.019	0.009	0.009	
793.00	23330	Mid	LTE Band 14	10	19.1	19.09	0.02	0	WF5	DLXXT023LQK9	QPSK	1	0	0 mm	right	1:1	0.006	1.002	0.006	0.002	0.002	
793.00	23330	Mid	LTE Band 14	10	19.1	18.90	0.04	0	WF5	DLXXT023LQK9	QPSK	25	0	0 mm	right	1:1	0.009	1.047	0.009	0.004	0.004	
793.00	23330	Mid	LTE Band 14	10	19.1	19.09	0.01	0	WF5	DLXXT023LQK9	QPSK	1	0	0 mm	left	1:1	0.097	1.002	0.097	0.054	0.054	
793.00	23330	Mid	LTE Band 14	10	19.1	18.90	0.02	0	WF5	DLXXT023LQK9	QPSK	25	0	0 mm	left	1:1	0.102	1.047	0.107	0.057	0.060	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram													

Table 10-17
LTE Band 5 (Cell) Ant WF3 Body SAR

MEASUREMENT RESULTS																							
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	(W/kg)	(W/kg)	
836.50	20525	Mid	LTE Band 5 (Cell)	10	19.0	18.91	0.13	0	WF3	DLXXT023LQK9	QPSK	1	49	0 mm	back	1:1	1.160	1.021	1.184	0.496	0.506	
836.50	20525	Mid	LTE Band 5 (Cell)	10	19.0	18.93	-0.05	0	WF3	DLXXT023LQK9	QPSK	25	25	0 mm	back	1:1	1.170	1.016	**1.189**	0.494	**0.502**	A9
836.50	20525	Mid	LTE Band 5 (Cell)	10	19.0	18.88	-0.02	0	WF3	DLXXT023LQK9	QPSK	50	0	0 mm	back	1:1	1.150	1.028	1.182	0.490	0.504	
836.50	20525	Mid	LTE Band 5 (Cell)	10	19.0	18.91	-0.01	0	WF3	DLXXT023LQK9	QPSK	1	49	0 mm	top	1:1	0.874	1.021	0.892	0.442	0.451	
836.50	20525	Mid	LTE Band 5 (Cell)	10	19.0	18.93	-0.04	0	WF3	DLXXT023LQK9	QPSK	25	25	0 mm	top	1:1	0.864	1.016	0.878	0.436	0.443	
836.50	20525	Mid	LTE Band 5 (Cell)	10	19.0	18.88	-0.02	0	WF3	DLXXT023LQK9	QPSK	50	0	0 mm	top	1:1	0.868	1.028	0.892	0.440	0.452	
836.50	20525	Mid	LTE Band 5 (Cell)	10	19.0	18.91	-0.08	0	WF3	DLXXT023LQK9	QPSK	1	49	0 mm	bottom	1:1	0.029	1.021	0.030	0.015	0.015	
836.50	20525	Mid	LTE Band 5 (Cell)	10	19.0	18.93	-0.11	0	WF3	DLXXT023LQK9	QPSK	25	25	0 mm	bottom	1:1	0.030	1.016	0.030	0.016	0.016	
836.50	20525	Mid	LTE Band 5 (Cell)	10	19.0	18.91	-0.14	0	WF3	DLXXT023LQK9	QPSK	1	49	0 mm	right	1:1	0.181	1.021	0.185	0.093	0.095	
836.50	20525	Mid	LTE Band 5 (Cell)	10	19.0	18.93	-0.08	0	WF3	DLXXT023LQK9	QPSK	25	25	0 mm	right	1:1	0.170	1.016	0.173	0.087	0.088	
836.50	20525	Mid	LTE Band 5 (Cell)	10	19.0	18.91	-0.10	0	WF3	DLXXT023LQK9	QPSK	1	49	0 mm	left	1:1	0.003	1.021	0.003	0.002	0.002	
836.50	20525	Mid	LTE Band 5 (Cell)	10	19.0	18.93	0.03	0	WF3	DLXXT023LQK9	QPSK	25	25	0 mm	left	1:1	0.004	1.016	0.004	0.002	0.002	
836.50	20525	Mid	LTE Band 5 (Cell)	10	19.0	18.93	-0.07	0	WF3	DLXXT023LQK9	QPSK	25	25	0 mm	back	1:1	1.010	1.016	1.026	0.486	0.494	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram													

Note: Blue entries indicate variability measurements

© 2019 PCTEST Engineering Laboratory, Inc.

REV 20.06 M
12/06/2017

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 10-18
LTE Band 5 (Cell) Ant WF5 Body SAR

MEASUREMENT RESULTS																							
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	(W/kg)	(W/kg)	
836.50	20525	Mid	LTE Band 5 (Cell)	10	18.7	18.68	0.02	0	WF5	DLXXT021LQK9	QPSK	1	49	0 mm	back	1:1	0.795	1.005	0.799	0.355	0.357	
836.50	20525	Mid	LTE Band 5 (Cell)	10	18.7	18.59	-0.06	0	WF5	DLXXT021LQK9	QPSK	25	25	0 mm	back	1:1	0.800	1.026	0.821	0.359	0.368	
836.50	20525	Mid	LTE Band 5 (Cell)	10	18.7	18.51	-0.02	0	WF5	DLXXT021LQK9	QPSK	50	0	0 mm	back	1:1	0.785	1.045	0.820	0.353	0.369	
836.50	20525	Mid	LTE Band 5 (Cell)	10	18.7	18.68	0.02	0	WF5	DLXXT021LQK9	QPSK	1	49	0 mm	top	1:1	0.670	1.005	0.673	0.354	0.356	
836.50	20525	Mid	LTE Band 5 (Cell)	10	18.7	18.59	0.02	0	WF5	DLXXT021LQK9	QPSK	25	25	0 mm	top	1:1	0.674	1.026	0.692	0.354	0.363	
836.50	20525	Mid	LTE Band 5 (Cell)	10	18.7	18.68	0.03	0	WF5	DLXXT021LQK9	QPSK	1	49	0 mm	bottom	1:1	0.022	1.005	0.022	0.010	0.010	
836.50	20525	Mid	LTE Band 5 (Cell)	10	18.7	18.59	0.06	0	WF5	DLXXT021LQK9	QPSK	25	25	0 mm	bottom	1:1	0.022	1.026	0.023	0.010	0.010	
836.50	20525	Mid	LTE Band 5 (Cell)	10	18.7	18.68	-0.06	0	WF5	DLXXT021LQK9	QPSK	1	49	0 mm	right	1:1	0.015	1.005	0.015	0.008	0.008	
836.50	20525	Mid	LTE Band 5 (Cell)	10	18.7	18.59	0.04	0	WF5	DLXXT021LQK9	QPSK	25	25	0 mm	right	1:1	0.013	1.026	0.013	0.008	0.008	
836.50	20525	Mid	LTE Band 5 (Cell)	10	18.7	18.68	-0.10	0	WF5	DLXXT021LQK9	QPSK	1	49	0 mm	left	1:1	0.160	1.005	0.161	0.082	0.082	
836.50	20525	Mid	LTE Band 5 (Cell)	10	18.7	18.59	0.00	0	WF5	DLXXT021LQK9	QPSK	25	25	0 mm	left	1:1	0.149	1.026	0.153	0.076	0.078	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram													

Table 10-19
LTE Band 26 (Cell) Ant WF3 Body SAR

MEASUREMENT RESULTS																							
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	(W/kg)	(W/kg)	
819.00	26740	Low	LTE Band 26 (Cell)	10	19.0	18.93	0.13	0	WF3	DLXXT023LQK9	QPSK	1	0	0 mm	back	1:1	1.040	1.016	1.057	0.463	0.470	
831.50	26865	Mid	LTE Band 26 (Cell)	10	19.0	18.68	0.17	0	WF3	DLXXT023LQK9	QPSK	1	0	0 mm	back	1:1	0.932	1.076	1.003	0.403	0.434	
844.00	26990	High	LTE Band 26 (Cell)	10	19.0	18.75	0.14	0	WF3	DLXXT023LQK9	QPSK	1	49	0 mm	back	1:1	0.849	1.059	0.899	0.380	0.402	
819.00	26740	Low	LTE Band 26 (Cell)	10	19.0	18.79	0.16	0	WF3	DLXXT023LQK9	QPSK	25	25	0 mm	back	1:1	1.030	1.050	1.082	0.452	0.475	
831.50	26865	Mid	LTE Band 26 (Cell)	10	19.0	18.59	0.17	0	WF3	DLXXT023LQK9	QPSK	25	0	0 mm	back	1:1	0.916	1.099	1.007	0.393	0.432	
844.00	26990	High	LTE Band 26 (Cell)	10	19.0	18.73	0.16	0	WF3	DLXXT023LQK9	QPSK	25	25	0 mm	back	1:1	0.887	1.064	0.944	0.394	0.419	
819.00	26740	Low	LTE Band 26 (Cell)	10	19.0	18.78	0.16	0	WF3	DLXXT023LQK9	QPSK	50	0	0 mm	back	1:1	1.040	1.052	1.094	0.455	0.479	A10
819.00	26740	Low	LTE Band 26 (Cell)	10	19.0	18.93	-0.06	0	WF3	DLXXT023LQK9	QPSK	1	0	0 mm	top	1:1	0.688	1.016	0.699	0.356	0.362	
819.00	26740	Low	LTE Band 26 (Cell)	10	19.0	18.79	-0.07	0	WF3	DLXXT023LQK9	QPSK	25	25	0 mm	top	1:1	0.711	1.050	0.747	0.366	0.384	
819.00	26740	Low	LTE Band 26 (Cell)	10	19.0	18.93	-0.09	0	WF3	DLXXT023LQK9	QPSK	1	0	0 mm	bottom	1:1	0.023	1.016	0.023	0.011	0.011	
819.00	26740	Low	LTE Band 26 (Cell)	10	19.0	18.79	0.05	0	WF3	DLXXT023LQK9	QPSK	25	25	0 mm	bottom	1:1	0.021	1.050	0.022	0.010	0.011	
819.00	26740	Low	LTE Band 26 (Cell)	10	19.0	18.93	0.13	0	WF3	DLXXT023LQK9	QPSK	1	0	0 mm	right	1:1	0.092	1.016	0.093	0.049	0.050	
819.00	26740	Low	LTE Band 26 (Cell)	10	19.0	18.79	0.11	0	WF3	DLXXT023LQK9	QPSK	25	25	0 mm	right	1:1	0.105	1.050	0.110	0.056	0.059	
819.00	26740	Low	LTE Band 26 (Cell)	10	19.0	18.93	0.14	0	WF3	DLXXT023LQK9	QPSK	1	0	0 mm	left	1:1	0.015	1.016	0.015	0.008	0.008	
819.00	26740	Low	LTE Band 26 (Cell)	10	19.0	18.79	0.02	0	WF3	DLXXT023LQK9	QPSK	25	25	0 mm	left	1:1	0.012	1.050	0.013	0.007	0.007	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram													

© 2019 PCTEST Engineering Laboratory, Inc.

REV 20.06 M
12/06/2017

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 10-20
LTE Band 26 (Cell) Ant WF5 Body SAR

MEASUREMENT RESULTS																							
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	(W/kg)	(W/kg)	
819.00	26740	Low	LTE Band 26 (Cell)	10	18.7	18.65	-0.04	0	WF5	DLXXT021LQK9	QPSK	1	0	0 mm	back	1:1	0.822	1.012	0.832	0.364	0.368	
831.50	26865	Mid	LTE Band 26 (Cell)	10	18.7	18.61	-0.04	0	WF5	DLXXT021LQK9	QPSK	1	0	0 mm	back	1:1	0.785	1.021	0.801	0.348	0.355	
844.00	26990	High	LTE Band 26 (Cell)	10	18.7	18.67	-0.04	0	WF5	DLXXT021LQK9	QPSK	1	49	0 mm	back	1:1	0.704	1.007	0.709	0.313	0.315	
819.00	26740	Low	LTE Band 26 (Cell)	10	18.7	18.52	-0.04	0	WF5	DLXXT021LQK9	QPSK	25	25	0 mm	back	1:1	0.819	1.042	0.853	0.361	0.376	
831.50	26865	Mid	LTE Band 26 (Cell)	10	18.7	18.43	-0.05	0	WF5	DLXXT021LQK9	QPSK	25	0	0 mm	back	1:1	0.765	1.064	0.814	0.338	0.360	
844.00	26990	High	LTE Band 26 (Cell)	10	18.7	18.59	-0.05	0	WF5	DLXXT021LQK9	QPSK	25	25	0 mm	back	1:1	0.721	1.026	0.740	0.319	0.327	
844.00	26990	High	LTE Band 26 (Cell)	10	18.7	18.55	-0.04	0	WF5	DLXXT021LQK9	QPSK	50	0	0 mm	back	1:1	0.736	1.035	0.762	0.326	0.337	
844.00	26990	High	LTE Band 26 (Cell)	10	18.7	18.67	0.01	0	WF5	DLXXT021LQK9	QPSK	1	49	0 mm	top	1:1	0.595	1.007	0.599	0.310	0.312	
844.00	26990	High	LTE Band 26 (Cell)	10	18.7	18.59	0.02	0	WF5	DLXXT021LQK9	QPSK	25	25	0 mm	top	1:1	0.629	1.026	0.645	0.328	0.337	
844.00	26990	High	LTE Band 26 (Cell)	10	18.7	18.67	-0.04	0	WF5	DLXXT021LQK9	QPSK	1	49	0 mm	bottom	1:1	0.020	1.007	0.020	0.009	0.009	
844.00	26990	High	LTE Band 26 (Cell)	10	18.7	18.59	0.12	0	WF5	DLXXT021LQK9	QPSK	25	25	0 mm	bottom	1:1	0.019	1.026	0.019	0.009	0.009	
844.00	26990	High	LTE Band 26 (Cell)	10	18.7	18.67	0.16	0	WF5	DLXXT021LQK9	QPSK	1	49	0 mm	right	1:1	0.025	1.007	0.025	0.014	0.014	
844.00	26990	High	LTE Band 26 (Cell)	10	18.7	18.59	0.15	0	WF5	DLXXT021LQK9	QPSK	25	25	0 mm	right	1:1	0.027	1.026	0.028	0.015	0.015	
844.00	26990	High	LTE Band 26 (Cell)	10	18.7	18.67	-0.03	0	WF5	DLXXT021LQK9	QPSK	1	49	0 mm	left	1:1	0.089	1.007	0.090	0.045	0.045	
844.00	26990	High	LTE Band 26 (Cell)	10	18.7	18.59	0.12	0	WF5	DLXXT021LQK9	QPSK	25	25	0 mm	left	1:1	0.104	1.026	0.107	0.052	0.053	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population															Body 1.6 W/kg (mW/g) averaged over 1 gram								

© 2019 PCTEST Engineering Laboratory, Inc.

REV 20.06 M
12/06/2017

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 10-21
LTE Band 66 (AWS) Ant WF3 Body SAR

MEASUREMENT RESULTS																								
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	(W/kg)	(W/kg)	
1720.00	132072	Low	LTE Band 66 (AWS)	20	14.5	14.48	0.03	0	WF3	DLXXT01ULQK8	QPSK	1	0	0 mm	back	1:1	1.120	1.005	1.126	0.511	0.514	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	14.5	14.32	0.05	0	WF3	DLXXT01ULQK8	QPSK	1	0	0 mm	back	1:1	1.110	1.042	1.157	0.505	0.526	
1770.00	132572	High	LTE Band 66 (AWS)	20	14.5	14.26	0.03	0	WF3	DLXXT01ULQK8	QPSK	1	0	0 mm	back	1:1	1.110	1.057	1.173	0.502	0.531	
1720.00	132072	Low	LTE Band 66 (AWS)	20	14.5	14.42	0.04	0	WF3	DLXXT01ULQK8	QPSK	50	25	0 mm	back	1:1	1.110	1.019	1.131	0.503	0.513	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	14.5	14.28	-0.10	0	WF3	DLXXT01ULQK8	QPSK	50	0	0 mm	back	1:1	1.090	1.052	1.147	0.490	0.515	
1770.00	132572	High	LTE Band 66 (AWS)	20	14.5	14.17	0.05	0	WF3	DLXXT01ULQK8	QPSK	50	0	0 mm	back	1:1	1.100	1.079	**1.187**	0.494	**0.533**	
1720.00	132072	Low	LTE Band 66 (AWS)	20	14.5	14.40	0.08	0	WF3	DLXXT01ULQK8	QPSK	100	0	0 mm	back	1:1	1.130	1.023	1.156	0.514	0.526	A11
1720.00	132072	Low	LTE Band 66 (AWS)	20	14.5	14.48	-0.01	0	WF3	DLXXT01ULQK8	QPSK	1	0	0 mm	top	1:1	0.595	1.005	0.598	0.281	0.282	
1720.00	132072	Low	LTE Band 66 (AWS)	20	14.5	14.42	0.00	0	WF3	DLXXT01ULQK8	QPSK	50	25	0 mm	top	1:1	0.599	1.019	0.610	0.283	0.288	
1720.00	132072	Low	LTE Band 66 (AWS)	20	14.5	14.48	0.03	0	WF3	DLXXT01ULQK8	QPSK	1	0	0 mm	bottom	1:1	0.005	1.005	0.005	0.003	0.003	
1720.00	132072	Low	LTE Band 66 (AWS)	20	14.5	14.42	0.11	0	WF3	DLXXT01ULQK8	QPSK	50	25	0 mm	bottom	1:1	0.005	1.019	0.005	0.002	0.002	
1720.00	132072	Low	LTE Band 66 (AWS)	20	14.5	14.48	0.06	0	WF3	DLXXT01ULQK8	QPSK	1	0	0 mm	right	1:1	0.073	1.005	0.073	0.037	0.037	
1720.00	132072	Low	LTE Band 66 (AWS)	20	14.5	14.42	0.06	0	WF3	DLXXT01ULQK8	QPSK	50	25	0 mm	right	1:1	0.079	1.019	0.081	0.040	0.041	
1720.00	132072	Low	LTE Band 66 (AWS)	20	14.5	14.48	0.06	0	WF3	DLXXT01ULQK8	QPSK	1	0	0 mm	left	1:1	0.032	1.005	0.032	0.016	0.016	
1720.00	132072	Low	LTE Band 66 (AWS)	20	14.5	14.42	0.02	0	WF3	DLXXT01ULQK8	QPSK	50	25	0 mm	left	1:1	0.033	1.019	0.034	0.017	0.017	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram														

Table 10-22
LTE Band 66 (AWS) Ant WF5 Body SAR

MEASUREMENT RESULTS																								
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	(W/kg)	(W/kg)	
1720.00	132072	Low	LTE Band 66 (AWS)	20	14.5	14.48	0.01	0	WF5	DLXXT01ULQK8	QPSK	1	50	0 mm	back	1:1	0.953	1.005	0.958	0.454	0.456	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	14.5	14.41	-0.02	0	WF5	DLXXT01ULQK8	QPSK	1	0	0 mm	back	1:1	0.953	1.021	0.973	0.455	0.465	
1770.00	132572	High	LTE Band 66 (AWS)	20	14.5	14.33	0.02	0	WF5	DLXXT01ULQK8	QPSK	1	99	0 mm	back	1:1	0.961	1.040	0.999	0.452	0.470	
1720.00	132072	Low	LTE Band 66 (AWS)	20	14.5	14.38	0.00	0	WF5	DLXXT01ULQK8	QPSK	50	25	0 mm	back	1:1	0.956	1.028	0.983	0.453	0.466	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	14.5	14.24	0.04	0	WF5	DLXXT01ULQK8	QPSK	50	0	0 mm	back	1:1	0.948	1.062	1.007	0.449	0.477	
1770.00	132572	High	LTE Band 66 (AWS)	20	14.5	14.26	-0.01	0	WF5	DLXXT01ULQK8	QPSK	50	50	0 mm	back	1:1	0.931	1.057	0.984	0.438	0.463	
1720.00	132072	Low	LTE Band 66 (AWS)	20	14.5	14.37	0.00	0	WF5	DLXXT01ULQK8	QPSK	100	0	0 mm	back	1:1	0.966	1.030	0.995	0.460	0.474	
1720.00	132072	Low	LTE Band 66 (AWS)	20	14.5	14.48	-0.03	0	WF5	DLXXT01ULQK8	QPSK	1	50	0 mm	top	1:1	0.569	1.005	0.572	0.257	0.258	
1720.00	132072	Low	LTE Band 66 (AWS)	20	14.5	14.38	-0.02	0	WF5	DLXXT01ULQK8	QPSK	50	25	0 mm	top	1:1	0.561	1.028	0.577	0.254	0.261	
1720.00	132072	Low	LTE Band 66 (AWS)	20	14.5	14.48	0.07	0	WF5	DLXXT01ULQK8	QPSK	1	50	0 mm	bottom	1:1	0.001	1.005	0.001	0.000	0.000	
1720.00	132072	Low	LTE Band 66 (AWS)	20	14.5	14.38	0.03	0	WF5	DLXXT01ULQK8	QPSK	50	25	0 mm	bottom	1:1	0.001	1.028	0.001	0.000	0.000	
1720.00	132072	Low	LTE Band 66 (AWS)	20	14.5	14.48	0.14	0	WF5	DLXXT01ULQK8	QPSK	1	50	0 mm	right	1:1	0.015	1.005	0.015	0.008	0.008	
1720.00	132072	Low	LTE Band 66 (AWS)	20	14.5	14.38	0.02	0	WF5	DLXXT01ULQK8	QPSK	50	25	0 mm	right	1:1	0.015	1.028	0.015	0.008	0.008	
1720.00	132072	Low	LTE Band 66 (AWS)	20	14.5	14.48	0.07	0	WF5	DLXXT01ULQK8	QPSK	1	50	0 mm	left	1:1	0.033	1.005	0.033	0.016	0.016	
1720.00	132072	Low	LTE Band 66 (AWS)	20	14.5	14.38	0.05	0	WF5	DLXXT01ULQK8	QPSK	50	25	0 mm	left	1:1	0.033	1.028	0.034	0.016	0.016	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram														

© 2019 PCTEST Engineering Laboratory, Inc.

REV 20.06 M
12/06/2017

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 10-23
LTE Band 25 (PCS) Ant WF3 Body SAR

MEASUREMENT RESULTS																							
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	(W/kg)	(W/kg)	
1860.00	26140	Low	LTE Band 25 (PCS)	20	14.0	13.91	0.00	0	WF3	DLXXT02NLQK8	QPSK	1	50	0 mm	back	1:1	0.975	1.021	0.995	0.443	0.452	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	14.0	13.91	-0.04	0	WF3	DLXXT02NLQK8	QPSK	1	99	0 mm	back	1:1	1.010	1.021	1.031	0.453	0.463	
1905.00	26590	High	LTE Band 25 (PCS)	20	14.0	13.99	-0.03	0	WF3	DLXXT02NLQK8	QPSK	1	99	0 mm	back	1:1	1.020	1.002	1.022	0.455	0.456	
1860.00	26140	Low	LTE Band 25 (PCS)	20	14.0	13.88	-0.02	0	WF3	DLXXT02NLQK8	QPSK	50	0	0 mm	back	1:1	0.991	1.028	1.019	0.449	0.462	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	14.0	13.80	-0.01	0	WF3	DLXXT02NLQK8	QPSK	50	50	0 mm	back	1:1	0.999	1.047	1.046	0.450	0.471	
1905.00	26590	High	LTE Band 25 (PCS)	20	14.0	13.94	-0.02	0	WF3	DLXXT02NLQK8	QPSK	50	50	0 mm	back	1:1	1.020	1.014	1.034	0.455	0.461	
1905.00	26590	High	LTE Band 25 (PCS)	20	14.0	13.90	-0.02	0	WF3	DLXXT02NLQK8	QPSK	100	0	0 mm	back	1:1	1.060	1.023	1.084	0.475	0.486	A12
1860.00	26140	Low	LTE Band 25 (PCS)	20	14.0	13.91	-0.03	0	WF3	DLXXT02NLQK8	QPSK	1	50	0 mm	top	1:1	0.768	1.021	0.784	0.331	0.338	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	14.0	13.91	0.01	0	WF3	DLXXT02NLQK8	QPSK	1	99	0 mm	top	1:1	0.790	1.021	0.807	0.336	0.343	
1905.00	26590	High	LTE Band 25 (PCS)	20	14.0	13.99	-0.01	0	WF3	DLXXT02NLQK8	QPSK	1	99	0 mm	top	1:1	0.829	1.002	0.831	0.351	0.352	
1860.00	26140	Low	LTE Band 25 (PCS)	20	14.0	13.88	-0.01	0	WF3	DLXXT02NLQK8	QPSK	50	0	0 mm	top	1:1	0.770	1.028	0.792	0.330	0.339	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	14.0	13.80	0.00	0	WF3	DLXXT02NLQK8	QPSK	50	50	0 mm	top	1:1	0.787	1.047	0.824	0.335	0.351	
1905.00	26590	High	LTE Band 25 (PCS)	20	14.0	13.94	0.01	0	WF3	DLXXT02NLQK8	QPSK	50	50	0 mm	top	1:1	0.817	1.014	0.828	0.346	0.351	
1905.00	26590	High	LTE Band 25 (PCS)	20	14.0	13.90	0.01	0	WF3	DLXXT02NLQK8	QPSK	100	0	0 mm	top	1:1	0.835	1.023	0.854	0.354	0.362	
1905.00	26590	High	LTE Band 25 (PCS)	20	14.0	13.99	-0.03	0	WF3	DLXXT02NLQK8	QPSK	1	99	0 mm	bottom	1:1	0.001	1.002	0.001	0.000	0.000	
1905.00	26590	High	LTE Band 25 (PCS)	20	14.0	13.94	0.13	0	WF3	DLXXT02NLQK8	QPSK	50	50	0 mm	bottom	1:1	0.001	1.014	0.001	0.000	0.000	
1905.00	26590	High	LTE Band 25 (PCS)	20	14.0	13.99	-0.01	0	WF3	DLXXT02NLQK8	QPSK	1	99	0 mm	right	1:1	0.098	1.002	0.098	0.045	0.045	
1905.00	26590	High	LTE Band 25 (PCS)	20	14.0	13.94	0.01	0	WF3	DLXXT02NLQK8	QPSK	50	50	0 mm	right	1:1	0.105	1.014	0.106	0.048	0.049	
1905.00	26590	High	LTE Band 25 (PCS)	20	14.0	13.99	0.10	0	WF3	DLXXT02NLQK8	QPSK	1	99	0 mm	left	1:1	0.032	1.002	0.032	0.015	0.015	
1905.00	26590	High	LTE Band 25 (PCS)	20	14.0	13.94	0.02	0	WF3	DLXXT02NLQK8	QPSK	50	50	0 mm	left	1:1	0.036	1.014	0.037	0.017	0.017	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram													

© 2019 PCTEST Engineering Laboratory, Inc.

REV 20.06 M
12/06/2017

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 10-24
LTE Band 25 (PCS) Ant WF5 Body SAR

MEASUREMENT RESULTS																							
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	(W/kg)	(W/kg)	
1860.00	26140	Low	LTE Band 25 (PCS)	20	14.3	14.26	0.04	0	WF5	DLXXT03NLQK8	QPSK	1	50	0 mm	back	1:1	1.040	1.009	1.049	0.480	0.484	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	14.3	14.21	0.04	0	WF5	DLXXT03NLQK8	QPSK	1	99	0 mm	back	1:1	1.010	1.021	1.031	0.460	0.470	
1905.00	26590	High	LTE Band 25 (PCS)	20	14.3	14.27	0.02	0	WF5	DLXXT03NLQK8	QPSK	1	99	0 mm	back	1:1	1.020	1.007	1.027	0.462	0.465	
1860.00	26140	Low	LTE Band 25 (PCS)	20	14.3	14.24	0.03	0	WF5	DLXXT03NLQK8	QPSK	50	0	0 mm	back	1:1	1.030	1.014	1.044	0.475	0.482	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	14.3	14.18	0.04	0	WF5	DLXXT03NLQK8	QPSK	50	50	0 mm	back	1:1	1.040	1.028	1.069	0.475	0.488	
1905.00	26590	High	LTE Band 25 (PCS)	20	14.3	14.14	0.04	0	WF5	DLXXT03NLQK8	QPSK	50	50	0 mm	back	1:1	1.010	1.038	1.048	0.462	0.480	
1905.00	26590	High	LTE Band 25 (PCS)	20	14.3	14.22	0.04	0	WF5	DLXXT03NLQK8	QPSK	100	0	0 mm	back	1:1	1.030	1.019	1.050	0.469	0.478	
1905.00	26590	High	LTE Band 25 (PCS)	20	14.3	14.27	-0.01	0	WF5	DLXXT03NLQK8	QPSK	1	99	0 mm	top	1:1	0.769	1.007	0.774	0.320	0.322	
1860.00	26140	Low	LTE Band 25 (PCS)	20	14.3	14.24	-0.03	0	WF5	DLXXT03NLQK8	QPSK	50	0	0 mm	top	1:1	0.753	1.014	0.764	0.316	0.320	
1905.00	26590	High	LTE Band 25 (PCS)	20	14.3	14.27	0.05	0	WF5	DLXXT03NLQK8	QPSK	1	99	0 mm	bottom	1:1	0.002	1.007	0.002	0.001	0.001	
1860.00	26140	Low	LTE Band 25 (PCS)	20	14.3	14.24	0.01	0	WF5	DLXXT03NLQK8	QPSK	50	0	0 mm	bottom	1:1	0.003	1.014	0.003	0.001	0.001	
1905.00	26590	High	LTE Band 25 (PCS)	20	14.3	14.27	-0.12	0	WF5	DLXXT03NLQK8	QPSK	1	99	0 mm	right	1:1	0.043	1.007	0.043	0.021	0.021	
1860.00	26140	Low	LTE Band 25 (PCS)	20	14.3	14.24	0.08	0	WF5	DLXXT03NLQK8	QPSK	50	0	0 mm	right	1:1	0.019	1.014	0.019	0.010	0.010	
1905.00	26590	High	LTE Band 25 (PCS)	20	14.3	14.27	0.06	0	WF5	DLXXT03NLQK8	QPSK	1	99	0 mm	left	1:1	0.096	1.007	0.097	0.046	0.046	
1860.00	26140	Low	LTE Band 25 (PCS)	20	14.3	14.24	0.04	0	WF5	DLXXT03NLQK8	QPSK	50	0	0 mm	left	1:1	0.059	1.014	0.060	0.028	0.028	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram													

Table 10-25
LTE Band 30 Ant WF3 Body SAR

MEASUREMENT RESULTS																							
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	(W/kg)	(W/kg)	
2310.00	27710	Mid	LTE Band 30	10	12.5	12.48	-0.16	0	WF3	DLXXT03NLQK8	QPSK	1	0	0 mm	back	1:1	0.949	1.005	0.954	0.402	0.404	
2310.00	27710	Mid	LTE Band 30	10	12.5	12.39	-0.02	0	WF3	DLXXT03NLQK8	QPSK	25	0	0 mm	back	1:1	0.935	1.026	0.959	0.396	0.406	
2310.00	27710	Mid	LTE Band 30	10	12.5	12.30	-0.02	0	WF3	DLXXT03NLQK8	QPSK	50	0	0 mm	back	1:1	0.936	1.047	0.980	0.398	0.417	
2310.00	27710	Mid	LTE Band 30	10	12.5	12.48	-0.05	0	WF3	DLXXT03NLQK8	QPSK	1	0	0 mm	top	1:1	0.752	1.005	0.756	0.277	0.278	
2310.00	27710	Mid	LTE Band 30	10	12.5	12.39	-0.07	0	WF3	DLXXT03NLQK8	QPSK	25	0	0 mm	top	1:1	0.743	1.026	0.762	0.276	0.283	
2310.00	27710	Mid	LTE Band 30	10	12.5	12.48	0.03	0	WF3	DLXXT03NLQK8	QPSK	1	0	0 mm	bottom	1:1	0.001	1.005	0.001	0.000	0.000	
2310.00	27710	Mid	LTE Band 30	10	12.5	12.39	-0.12	0	WF3	DLXXT03NLQK8	QPSK	25	0	0 mm	bottom	1:1	0.001	1.026	0.001	0.000	0.000	
2310.00	27710	Mid	LTE Band 30	10	12.5	12.48	-0.09	0	WF3	DLXXT03NLQK8	QPSK	1	0	0 mm	right	1:1	0.099	1.005	0.099	0.041	0.041	
2310.00	27710	Mid	LTE Band 30	10	12.5	12.39	0.03	0	WF3	DLXXT03NLQK8	QPSK	25	0	0 mm	right	1:1	0.090	1.026	0.092	0.039	0.040	
2310.00	27710	Mid	LTE Band 30	10	12.5	12.48	0.02	0	WF3	DLXXT03NLQK8	QPSK	1	0	0 mm	left	1:1	0.029	1.005	0.029	0.013	0.013	
2310.00	27710	Mid	LTE Band 30	10	12.5	12.39	0.10	0	WF3	DLXXT03NLQK8	QPSK	25	0	0 mm	left	1:1	0.029	1.026	0.030	0.013	0.013	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram													

© 2019 PCTEST Engineering Laboratory, Inc.

REV 20.06 M
12/06/2017

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 10-26
LTE Band 30 Ant WF5 Body SAR

MEASUREMENT RESULTS																						
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.																(W/kg)		(W/kg)	(W/kg)	(W/kg)	
2310.00	27710	Mid	LTE Band 30	10	14.5	14.50	-0.01	0	WF5	DLXXT03NLQK8	QPSK	1	0	0 mm	back	1:1	1.180	1.000	1.180	0.488	0.488	
2310.00	27710	Mid	LTE Band 30	10	14.5	14.48	0.01	0	WF5	DLXXT03NLQK8	QPSK	25	0	0 mm	back	1:1	1.180	1.005	**1.186**	0.482	**0.484**	
2310.00	27710	Mid	LTE Band 30	10	14.5	14.47	-0.03	0	WF5	DLXXT03NLQK8	QPSK	50	0	0 mm	back	1:1	1.180	1.007	**1.188**	0.485	**0.488**	A13
2310.00	27710	Mid	LTE Band 30	10	14.5	14.50	-0.03	0	WF5	DLXXT03NLQK8	QPSK	1	0	0 mm	top	1:1	1.130	1.000	1.130	0.453	0.453	
2310.00	27710	Mid	LTE Band 30	10	14.5	14.48	-0.05	0	WF5	DLXXT03NLQK8	QPSK	25	0	0 mm	top	1:1	1.140	1.005	1.146	0.452	0.454	
2310.00	27710	Mid	LTE Band 30	10	14.5	14.47	0.01	0	WF5	DLXXT03NLQK8	QPSK	50	0	0 mm	top	1:1	1.160	1.007	1.168	0.456	0.459	
2310.00	27710	Mid	LTE Band 30	10	14.5	14.50	0.12	0	WF5	DLXXT03NLQK8	QPSK	1	0	0 mm	bottom	1:1	0.000	1.000	0.000	0.000	0.000	
2310.00	27710	Mid	LTE Band 30	10	14.5	14.48	-0.02	0	WF5	DLXXT03NLQK8	QPSK	25	0	0 mm	bottom	1:1	0.000	1.005	0.000	0.000	0.000	
2310.00	27710	Mid	LTE Band 30	10	14.5	14.50	0.18	0	WF5	DLXXT03NLQK8	QPSK	1	0	0 mm	right	1:1	0.056	1.000	0.056	0.025	0.025	
2310.00	27710	Mid	LTE Band 30	10	14.5	14.48	0.14	0	WF5	DLXXT03NLQK8	QPSK	25	0	0 mm	right	1:1	0.056	1.005	0.056	0.025	0.025	
2310.00	27710	Mid	LTE Band 30	10	14.5	14.50	0.05	0	WF5	DLXXT03NLQK8	QPSK	1	0	0 mm	left	1:1	0.110	1.000	0.110	0.050	0.050	
2310.00	27710	Mid	LTE Band 30	10	14.5	14.48	0.02	0	WF5	DLXXT03NLQK8	QPSK	25	0	0 mm	left	1:1	0.112	1.005	0.113	0.051	0.051	
2310.00	27710	Mid	LTE Band 30	10	14.5	14.47	-0.02	0	WF5	DLXXT03NLQK8	QPSK	50	0	0 mm	back	1:1	1.160	1.007	1.168	0.481	0.484	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram														

Note: Blue entries indicate variability measurements

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 10-27
LTE Band 7 Ant WF3 Body SAR

MEASUREMENT RESULTS																									
1 CC Uplink	Component Carrier	FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	SAR (10g) (W/kg)	Reported SAR (10g) (W/kg)	Plot #
		MHz	Ch.																						
1 CC Uplink	N/A	2510.00	20850	Low	LTE Band 7	20	12.0	11.89	-0.03	0	WF3	DLXXT01YLQK8	QPSK	1	99	0 mm	back	1:1	0.938	1.026	0.962	0.389	0.399	
1 CC Uplink	N/A	2535.00	21100	Mid	LTE Band 7	20	12.0	11.92	-0.01	0	WF3	DLXXT01YLQK8	QPSK	1	0	0 mm	back	1:1	0.927	1.019	0.945	0.384	0.391	
1 CC Uplink	N/A	2560.00	21350	High	LTE Band 7	20	12.0	11.77	-0.02	0	WF3	DLXXT01YLQK8	QPSK	1	0	0 mm	back	1:1	0.956	1.054	1.008	0.369	0.389	
1 CC Uplink	N/A	2510.00	20850	Low	LTE Band 7	20	12.0	11.75	-0.02	0	WF3	DLXXT01YLQK8	QPSK	50	50	0 mm	back	1:1	0.959	1.059	1.016	0.397	0.420	
1 CC Uplink	N/A	2535.00	21100	Mid	LTE Band 7	20	12.0	11.94	-0.01	0	WF3	DLXXT01YLQK8	QPSK	50	0	0 mm	back	1:1	0.931	1.014	0.944	0.385	0.390	
1 CC Uplink	N/A	2560.00	21350	High	LTE Band 7	20	12.0	11.79	-0.02	0	WF3	DLXXT01YLQK8	QPSK	50	0	0 mm	back	1:1	0.982	1.050	1.031	0.406	0.426	
1 CC Uplink	N/A	2535.00	21100	Mid	LTE Band 7	20	12.0	11.87	-0.01	0	WF3	DLXXT01YLQK8	QPSK	100	0	0 mm	back	1:1	0.941	1.030	0.969	0.389	0.401	
2 CC Uplink	PCC	2560.00	21350	High	LTE Band 7	20	12.0	11.74	-0.07	0	WF3	DLXXV01ELQK9	QPSK	50	0	0 mm	back	1:1	0.993	1.062	1.055	0.418	0.444	
	SCC	2540.20	21152	High	LTE Band 7	20								50	50									
1 CC Uplink	N/A	2510.00	20850	Low	LTE Band 7	20	12.0	11.89	0.03	0	WF3	DLXXT01YLQK8	QPSK	1	99	0 mm	top	1:1	0.861	1.026	0.883	0.304	0.312	
1 CC Uplink	N/A	2535.00	21100	Mid	LTE Band 7	20	12.0	11.92	0.04	0	WF3	DLXXT01YLQK8	QPSK	1	0	0 mm	top	1:1	0.818	1.019	0.834	0.289	0.294	
1 CC Uplink	N/A	2560.00	21350	High	LTE Band 7	20	12.0	11.77	0.08	0	WF3	DLXXT01YLQK8	QPSK	1	0	0 mm	top	1:1	0.799	1.054	0.842	0.283	0.298	
1 CC Uplink	N/A	2510.00	20850	Low	LTE Band 7	20	12.0	11.75	0.04	0	WF3	DLXXT01YLQK8	QPSK	50	50	0 mm	top	1:1	0.875	1.059	0.927	0.307	0.325	
1 CC Uplink	N/A	2535.00	21100	Mid	LTE Band 7	20	12.0	11.94	0.06	0	WF3	DLXXT01YLQK8	QPSK	50	0	0 mm	top	1:1	0.819	1.014	0.830	0.289	0.293	
1 CC Uplink	N/A	2560.00	21350	High	LTE Band 7	20	12.0	11.79	0.02	0	WF3	DLXXT01YLQK8	QPSK	50	0	0 mm	top	1:1	0.797	1.050	0.837	0.281	0.295	
1 CC Uplink	N/A	2535.00	21100	Mid	LTE Band 7	20	12.0	11.87	0.07	0	WF3	DLXXT01YLQK8	QPSK	100	0	0 mm	top	1:1	0.826	1.030	0.851	0.292	0.301	
1 CC Uplink	N/A	2535.00	21100	Mid	LTE Band 7	20	12.0	11.92	0.02	0	WF3	DLXXT01YLQK8	QPSK	1	0	0 mm	bottom	1:1	0.000	1.019	0.000	0.000	0.000	
1 CC Uplink	N/A	2535.00	21100	Mid	LTE Band 7	20	12.0	11.94	0.06	0	WF3	DLXXT01YLQK8	QPSK	50	0	0 mm	bottom	1:1	0.000	1.014	0.000	0.000	0.000	
1 CC Uplink	N/A	2535.00	21100	Mid	LTE Band 7	20	12.0	11.92	0.04	0	WF3	DLXXT01YLQK8	QPSK	1	0	0 mm	right	1:1	0.112	1.019	0.114	0.042	0.043	
1 CC Uplink	N/A	2535.00	21100	Mid	LTE Band 7	20	12.0	11.94	0.07	0	WF3	DLXXT01YLQK8	QPSK	50	0	0 mm	right	1:1	0.113	1.014	0.115	0.043	0.044	
1 CC Uplink	N/A	2535.00	21100	Mid	LTE Band 7	20	12.0	11.92	0.03	0	WF3	DLXXT01YLQK8	QPSK	1	0	0 mm	left	1:1	0.046	1.019	0.047	0.018	0.018	
1 CC Uplink	N/A	2535.00	21100	Mid	LTE Band 7	20	12.0	11.94	0.20	0	WF3	DLXXT01YLQK8	QPSK	50	0	0 mm	left	1:1	0.046	1.014	0.047	0.018	0.018	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram															

Table 10-28
LTE Band 7 Ant WF5 Body SAR

MEASUREMENT RESULTS																									
1 CC Uplink	Component Carrier	FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	SAR (10g) (W/kg)	Reported SAR (10g) (W/kg)	Plot #
		MHz	Ch.																						
1 CC Uplink	N/A	2510.00	20850	Low	LTE Band 7	20	14.4	14.31	-0.02	0	WF5	DLXXT01YLQK8	QPSK	1	99	0 mm	back	1:1	1.070	1.021	1.092	0.432	0.441	
1 CC Uplink	N/A	2535.00	21100	Mid	LTE Band 7	20	14.4	14.36	-0.02	0	WF5	DLXXT01YLQK8	QPSK	1	0	0 mm	back	1:1	1.070	1.009	1.080	0.434	0.438	
1 CC Uplink	N/A	2560.00	21350	High	LTE Band 7	20	14.4	14.17	0.17	0	WF5	DLXXT01YLQK8	QPSK	1	0	0 mm	back	1:1	1.060	1.054	1.117	0.430	0.453	
1 CC Uplink	N/A	2510.00	20850	Low	LTE Band 7	20	14.4	14.27	-0.02	0	WF5	DLXXT01YLQK8	QPSK	50	50	0 mm	back	1:1	1.050	1.030	1.082	0.425	0.438	
1 CC Uplink	N/A	2535.00	21100	Mid	LTE Band 7	20	14.4	14.29	-0.02	0	WF5	DLXXT01YLQK8	QPSK	50	0	0 mm	back	1:1	1.070	1.026	1.098	0.432	0.443	
1 CC Uplink	N/A	2560.00	21350	High	LTE Band 7	20	14.4	14.12	0.16	0	WF5	DLXXT01YLQK8	QPSK	50	0	0 mm	back	1:1	1.100	1.067	1.174	0.444	1.610	
1 CC Uplink	N/A	2510.00	20850	Low	LTE Band 7	20	14.4	14.28	-0.02	0	WF5	DLXXT01YLQK8	QPSK	100	0	0 mm	back	1:1	1.050	1.028	1.079	0.424	0.436	
2 CC Uplink	PCC	2560.00	21350	High	LTE Band 7	20	14.4	14.20	-0.06	0	WF5	DLXXV01ELQK9	QPSK	50	0	0 mm	back	1:1	1.140	1.047	1.180	0.479	0.496	A14
	SCC	2540.20	21152	High	LTE Band 7	20								50	50									
1 CC Uplink	N/A	2510.00	20850	Low	LTE Band 7	20	14.4	14.31	0.04	0	WF5	DLXXT01YLQK8	QPSK	1	99	0 mm	top	1:1	1.000	1.021	1.021	0.381	0.389	
1 CC Uplink	N/A	2535.00	21100	Mid	LTE Band 7	20	14.4	14.36	0.05	0	WF5	DLXXT01YLQK8	QPSK	1	0	0 mm	top	1:1	1.040	1.009	1.049	0.385	0.388	
1 CC Uplink	N/A	2560.00	21350	High	LTE Band 7	20	14.4	14.17	0.04	0	WF5	DLXXT01YLQK8	QPSK	1	0	0 mm	top	1:1	0.966	1.054	1.018	0.371	0.391	
1 CC Uplink	N/A	2510.00	20850	Low	LTE Band 7	20	14.4	14.27	0.05	0	WF5	DLXXT01YLQK8	QPSK	50	50	0 mm	top	1:1	0.995	1.030	1.025	0.378	0.389	
1 CC Uplink	N/A	2535.00	21100	Mid	LTE Band 7	20	14.4	14.29	0.02	0	WF5	DLXXT01YLQK8	QPSK	50	0	0 mm	top	1:1	0.954	1.026	0.979	0.364	0.373	
1 CC Uplink	N/A	2560.00	21350	High	LTE Band 7	20	14.4	14.12	0.05	0	WF5	DLXXT01YLQK8	QPSK	50	0	0 mm	top	1:1	0.970	1.067	1.035	0.372	0.397	
1 CC Uplink	N/A	2510.00	20850	Low	LTE Band 7	20	14.4	14.28	0.04	0	WF5	DLXXT01YLQK8	QPSK	100	0	0 mm	top	1:1	0.999	1.028	1.027	0.379	0.390	
1 CC Uplink	N/A	2535.00	21100	Mid	LTE Band 7	20	14.4	14.36	0.09	0	WF5	DLXXT01YLQK8	QPSK	1	0	0 mm	bottom	1:1	0.000	1.009	0.000	0.000	0.000	
1 CC Uplink	N/A	2535.00	21100	Mid	LTE Band 7	20	14.4	14.29	0.01	0	WF5	DLXXT01YLQK8	QPSK	50	0	0 mm	bottom	1:1	0.000	1.026	0.000	0.000	0.000	
1 CC Uplink	N/A	2535.00	21100	Mid	LTE Band 7	20	14.4	14.36	0.02	0	WF5	DLXXT01YLQK8	QPSK	1	0	0 mm	right	1:1	0.044	1.009	0.044	0.018	0.018	
1 CC Uplink	N/A	2535.00	21100	Mid	LTE Band 7	20	14.4	14.29	0.09	0	WF5	DLXXT01YLQK8	QPSK	50	0	0 mm	right	1:1	0.043	1.026	0.044	0.017	0.017	
1 CC Uplink	N/A	2535.00	21100	Mid	LTE Band 7	20	14.4	14.36	0.00	0	WF5	DLXXT01YLQK8	QPSK	1	0	0 mm	left	1:1	0.154	1.009	0.155	0.058	0.059	
1 CC Uplink	N/A	2535.00	21100	Mid	LTE Band 7	20	14.4	14.29	0.06	0	WF5	DLXXT01YLQK8	QPSK	50	0	0 mm	left	1:1	0.153	1.026	0.157	0.057	0.058	
2 CC Uplink	PCC	2560.00	21350	High	LTE Band 7	20	14.4	14.20	-0.09	0	WF5	DLXXV01ELQK9	QPSK	50	0	0 mm	back	1:1	1.08	1.047	1.118	0.457	0.473	
	SCC	2540.20	21152	High	LTE Band 7	20								50	50									
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram															

Note: Blue entries indicate variability measurements.

© 2019 PCTEST Engineering Laboratory, Inc.

REV 20.06 M
12/06/2017

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 10-29
LTE Band 41 Ant WF3 Body SAR

MEASUREMENT RESULTS																									
1 CC Uplink | 2 CC Uplink, Power Class	Component Carrier	FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
		MHz	Ch.																(W/kg)		(W/kg)	(W/kg)	(W/kg)	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	13.5	13.33	0.05	0	WF3	DLXXT02NLQK8	QPSK	1	0	0 mm	back	1:1.58	0.907	1.040	0.943	0.383	0.398	
1 CC Uplink - Power Class 3	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	13.5	13.45	-0.09	0	WF3	DLXXT02NLQK8	QPSK	1	0	0 mm	back	1:1.58	1.010	1.012	1.022	0.419	0.424	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	13.5	13.49	-0.09	0	WF3	DLXXT02NLQK8	QPSK	1	0	0 mm	back	1:1.58	1.060	1.002	1.062	0.433	0.434	
1 CC Uplink - Power Class 3	N/A	2636.50	41055	Mid-High	LTE Band 41	20	13.5	13.21	-0.06	0	WF3	DLXXT02NLQK8	QPSK	1	0	0 mm	back	1:1.58	1.100	1.069	1.176	0.453	0.484	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	13.5	13.38	0.00	0	WF3	DLXXT02NLQK8	QPSK	1	0	0 mm	back	1:1.58	1.070	1.028	1.100	0.441	0.453	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	13.5	13.31	0.01	0	WF3	DLXXT02NLQK8	QPSK	50	25	0 mm	back	1:1.58	0.908	1.045	0.949	0.383	0.400	
1 CC Uplink - Power Class 3	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	13.5	13.38	-0.05	0	WF3	DLXXT02NLQK8	QPSK	50	0	0 mm	back	1:1.58	1.000	1.028	1.028	0.414	0.426	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	13.5	13.39	-0.11	0	WF3	DLXXT02NLQK8	QPSK	50	0	0 mm	back	1:1.58	1.050	1.026	1.077	0.431	0.442	
1 CC Uplink - Power Class 3	N/A	2636.50	41055	Mid-High	LTE Band 41	20	13.5	13.21	-0.05	0	WF3	DLXXT02NLQK8	QPSK	50	0	0 mm	back	1:1.58	1.110	1.069	**1.187**	0.450	**0.481**	A15
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	13.5	13.30	-0.01	0	WF3	DLXXT02NLQK8	QPSK	50	0	0 mm	back	1:1.58	1.060	1.047	1.110	0.435	0.455	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	13.5	13.38	-0.07	0	WF3	DLXXT02NLQK8	QPSK	100	0	0 mm	back	1:1.58	1.080	1.028	1.110	0.442	0.454	
1 CC Uplink - Power Class 2	N/A	2636.50	41055	Mid-High	LTE Band 41	20	13.5	12.91	-0.03	0	WF3	DLXXT02NLQK8	QPSK	50	0	0 mm	back	1:2.31	0.673	1.146	0.771	0.279	0.320	
2 CC Uplink - Power Class 3	PCC	2636.50	41055	Mid-High	LTE Band 41	20	13.5	12.86	0.15	0	WF3	DLXXV01ELQK9	QPSK	50	0	0 mm	back	1:1.58	0.975	1.159	1.130	0.410	0.475	
	SCC	2616.70	40857	Mid-High	LTE Band 41	20								50	50									
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	13.5	13.33	0.09	0	WF3	DLXXT02NLQK8	QPSK	1	0	0 mm	top	1:1.58	0.676	1.040	0.703	0.243	0.253	
1 CC Uplink - Power Class 3	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	13.5	13.45	-0.03	0	WF3	DLXXT02NLQK8	QPSK	1	0	0 mm	top	1:1.58	0.656	1.012	0.664	0.231	0.234	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	13.5	13.49	-0.04	0	WF3	DLXXT02NLQK8	QPSK	1	0	0 mm	top	1:1.58	0.643	1.002	0.644	0.224	0.224	
1 CC Uplink - Power Class 3	N/A	2636.50	41055	Mid-High	LTE Band 41	20	13.5	13.21	-0.04	0	WF3	DLXXT02NLQK8	QPSK	1	0	0 mm	top	1:1.58	0.621	1.069	0.664	0.215	0.230	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	13.5	13.38	-0.04	0	WF3	DLXXT02NLQK8	QPSK	1	0	0 mm	top	1:1.58	0.609	1.028	0.626	0.209	0.215	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	13.5	13.31	0.03	0	WF3	DLXXT02NLQK8	QPSK	50	25	0 mm	top	1:1.58	0.667	1.045	0.697	0.239	0.250	
1 CC Uplink - Power Class 3	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	13.5	13.38	-0.05	0	WF3	DLXXT02NLQK8	QPSK	50	0	0 mm	top	1:1.58	0.640	1.028	0.658	0.226	0.232	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	13.5	13.39	-0.03	0	WF3	DLXXT02NLQK8	QPSK	50	0	0 mm	top	1:1.58	0.625	1.026	0.641	0.218	0.224	
1 CC Uplink - Power Class 3	N/A	2636.50	41055	Mid-High	LTE Band 41	20	13.5	13.21	-0.05	0	WF3	DLXXT02NLQK8	QPSK	50	0	0 mm	top	1:1.58	0.614	1.069	0.656	0.212	0.227	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	13.5	13.30	-0.07	0	WF3	DLXXT02NLQK8	QPSK	50	0	0 mm	top	1:1.58	0.600	1.047	0.628	0.205	0.215	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	13.5	13.38	-0.05	0	WF3	DLXXT02NLQK8	QPSK	100	0	0 mm	top	1:1.58	0.639	1.028	0.657	0.222	0.228	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	13.5	13.49	0.03	0	WF3	DLXXT02NLQK8	QPSK	1	0	0 mm	bottom	1:1.58	0.027	1.002	0.027	0.010	0.010	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	13.5	13.39	0.18	0	WF3	DLXXT02NLQK8	QPSK	50	0	0 mm	bottom	1:1.58	0.017	1.026	0.017	0.005	0.005	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	13.5	13.49	-0.03	0	WF3	DLXXT02NLQK8	QPSK	1	0	0 mm	right	1:1.58	0.109	1.002	0.109	0.041	0.041	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	13.5	13.39	0.02	0	WF3	DLXXT02NLQK8	QPSK	50	0	0 mm	right	1:1.58	0.105	1.026	0.108	0.040	0.041	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	13.5	13.49	-0.04	0	WF3	DLXXT02NLQK8	QPSK	1	0	0 mm	left	1:1.58	0.027	1.002	0.027	0.010	0.010	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	13.5	13.39	-0.09	0	WF3	DLXXT02NLQK8	QPSK	50	0	0 mm	left	1:1.58	0.025	1.026	0.026	0.009	0.009	

ANSI / IEEE C95.1 1992 - SAFETY LIMIT	Body
Spatial Peak	1.6 W/kg (mW/g)
Uncontrolled Exposure/General Population	averaged over 1 gram

© 2019 PCTEST Engineering Laboratory, Inc.

REV 20.06 M
12/06/2017

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 10-30
LTE Band 41 Ant WF5 Body SAR

MEASUREMENT RESULTS																									
1 CC Uplink | 2 CC Uplink, Power Class	Component Carrier	FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	SAR (10g) (W/kg)	Reported SAR (10g) (W/kg)	Plot #
		MHz	Ch.																					
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	16.0	15.63	-0.01	0	WF5	DLXXT03NLQK8	QPSK	1	0	0 mm	back	1:1.58	0.938	1.089	1.021	0.391	0.426	
1 CC Uplink - Power Class 3	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	16.0	15.69	-0.01	0	WF5	DLXXT03NLQK8	QPSK	1	50	0 mm	back	1:1.58	0.901	1.074	0.968	0.382	0.410	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	16.0	15.76	0.01	0	WF5	DLXXT03NLQK8	QPSK	1	99	0 mm	back	1:1.58	0.972	1.057	1.027	0.404	0.427	
1 CC Uplink - Power Class 3	N/A	2636.50	41055	Mid-High	LTE Band 41	20	16.0	15.82	0.00	0	WF5	DLXXT03NLQK8	QPSK	1	0	0 mm	back	1:1.58	0.953	1.042	0.993	0.387	0.403	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	16.0	15.96	-0.03	0	WF5	DLXXT03NLQK8	QPSK	1	0	0 mm	back	1:1.58	0.889	1.009	0.897	0.351	0.354	
1 CC Uplink - Power Class 3	N/A	2506.00	39750	Low	LTE Band 41	20	16.0	15.56	-0.03	0	WF5	DLXXT03NLQK8	QPSK	50	0	0 mm	back	1:1.58	0.914	1.107	1.012	0.378	0.418	
1 CC Uplink - Power Class 3	N/A	2549.50	40185	Low-Mid	LTE Band 41	20	16.0	15.65	-0.01	0	WF5	DLXXT03NLQK8	QPSK	50	0	0 mm	back	1:1.58	0.897	1.084	0.972	0.378	0.410	
1 CC Uplink - Power Class 3	N/A	2593.00	40620	Mid	LTE Band 41	20	16.0	15.66	-0.01	0	WF5	DLXXT03NLQK8	QPSK	50	25	0 mm	back	1:1.58	0.934	1.081	1.010	0.389	0.421	
1 CC Uplink - Power Class 3	N/A	2636.50	41055	Mid-High	LTE Band 41	20	16.0	15.73	0.00	0	WF5	DLXXT03NLQK8	QPSK	50	0	0 mm	back	1:1.58	0.931	1.064	0.991	0.376	0.400	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	16.0	15.90	-0.05	0	WF5	DLXXT03NLQK8	QPSK	50	0	0 mm	back	1:1.58	0.864	1.023	0.884	0.339	0.347	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	16.0	15.88	0.02	0	WF5	DLXXT03NLQK8	QPSK	100	0	0 mm	back	1:1.58	0.859	1.028	0.883	0.335	0.344	
1 CC Uplink - Power Class 2	N/A	2593.00	40620	Mid	LTE Band 41	20	16.0	15.76	-0.06	0	WF5	DLXXT03NLQK8	QPSK	1	99	0 mm	back	1:2.31	0.655	1.057	0.692	0.266	0.281	
2 CC Uplink - Power Class 3	PCC	2593.00	40620	Mid	LTE Band 41	20	16.0	15.90	0.10	0	WF5	DLXXV01ELQK9	QPSK	1	99	0 mm	back	1:1.58	1.040	1.023	1.064	0.424	0.434	
	SCC	2612.80	40818	Mid	LTE Band 41	20								1	0									
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	16.0	15.96	-0.05	0	WF5	DLXXT03NLQK8	QPSK	1	0	0 mm	top	1:1.58	0.467	1.009	0.471	0.179	0.181	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	16.0	15.90	-0.01	0	WF5	DLXXT03NLQK8	QPSK	50	0	0 mm	top	1:1.58	0.443	1.023	0.453	0.170	0.174	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	16.0	15.96	0.07	0	WF5	DLXXT03NLQK8	QPSK	1	0	0 mm	bottom	1:1.58	0.000	1.009	0.000	0.000	0.000	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	16.0	15.90	0.02	0	WF5	DLXXT03NLQK8	QPSK	50	0	0 mm	bottom	1:1.58	0.000	1.023	0.000	0.000	0.000	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	16.0	15.96	-0.03	0	WF5	DLXXT03NLQK8	QPSK	1	0	0 mm	right	1:1.58	0.015	1.009	0.015	0.005	0.005	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	16.0	15.90	0.16	0	WF5	DLXXT03NLQK8	QPSK	50	0	0 mm	right	1:1.58	0.016	1.023	0.016	0.004	0.004	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	16.0	15.96	0.04	0	WF5	DLXXT03NLQK8	QPSK	1	0	0 mm	left	1:1.58	0.185	1.009	0.187	0.067	0.068	
1 CC Uplink - Power Class 3	N/A	2680.00	41490	High	LTE Band 41	20	16.0	15.90	0.02	0	WF5	DLXXT03NLQK8	QPSK	50	0	0 mm	left	1:1.58	0.173	1.023	0.177	0.063	0.064	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population																	Body 1.6 W/kg (mW/g) averaged over 1 gram								

© 2019 PCTEST Engineering Laboratory, Inc.

REV 20.06 M
12/06/2017

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 10-31
2.4GHz WLAN Body SAR- Ant WF1

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Variant	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.														(W/kg)			(W/kg)	(W/kg)	(W/kg)	
2412	1	802.11b	DSSS	22	15.25	15.24	0.01	0 mm	WF1	2	DLXXT020LQK9	1	back	100.0	0.094	1.002	1.000	0.094	0.043	0.043	
2412	1	802.11b	DSSS	22	15.25	15.24	0.14	0 mm	WF1	2	DLXXT020LQK9	1	top	100.0	0.008	1.002	1.000	0.008	0.003	0.003	
2412	1	802.11b	DSSS	22	15.25	15.24	-0.06	0 mm	WF1	2	DLXXT020LQK9	1	bottom	100.0	0.935	1.002	1.000	0.937	0.318	0.319	
2437	6	802.11b	DSSS	22	15.25	15.19	0.01	0 mm	WF1	2	DLXXT020LQK9	1	bottom	100.0	1.130	1.014	1.000	1.146	0.386	0.391	
2437	6	802.11b	DSSS	22	15.25	15.24	0.11	0 mm	WF1	1	DLXXT013LQK8	1	bottom	100.0	1.050	1.002	1.000	1.052	0.353	0.354	
2462	11	802.11b	DSSS	22	15.25	15.20	-0.17	0 mm	WF1	2	DLXXT020LQK9	1	bottom	100.0	0.978	1.012	1.000	0.990	0.342	0.346	
2412	1	802.11b	DSSS	22	15.25	15.24	0.16	0 mm	WF1	2	DLXXT020LQK9	1	right	100.0	0.009	1.002	1.000	0.009	0.003	0.003	
2412	1	802.11b	DSSS	22	15.25	15.24	0.16	0 mm	WF1	2	DLXXT020LQK9	1	left	100.0	0.182	1.002	1.000	0.182	0.081	0.081	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population															Body 1.6 W/kg (mW/g) averaged over 1 gram						

Table 10-32
2.4GHz WLAN Body SAR- Ant WF2

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Variant	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.														(W/kg)			(W/kg)	(W/kg)	(W/kg)	
2412	1	802.11b	DSSS	22	16.25	16.25	0.10	0 mm	WF2	2	DLXXT020LQK9	1	back	100.0	0.059	1.000	1.000	0.059	0.026	0.026	
2412	1	802.11b	DSSS	22	16.25	16.25	0.11	0 mm	WF2	2	DLXXT020LQK9	1	top	100.0	0.005	1.000	1.000	0.005	0.002	0.002	
2412	1	802.11b	DSSS	22	16.25	16.25	-0.06	0 mm	WF2	2	DLXXT020LQK9	1	bottom	100.0	0.879	1.000	1.000	0.879	0.295	0.295	
2437	6	802.11b	DSSS	22	16.25	16.13	-0.08	0 mm	WF2	2	DLXXT020LQK9	1	bottom	100.0	1.040	1.028	1.000	1.069	0.349	0.359	
2462	11	802.11b	DSSS	22	16.25	16.15	-0.08	0 mm	WF2	2	DLXXT020LQK9	1	bottom	100.0	1.080	1.023	1.000	1.105	0.361	0.369	
2462	11	802.11b	DSSS	22	16.25	16.16	-0.09	0 mm	WF2	1	DLXXT02DLQK8	1	bottom	100.0	0.969	1.021	1.000	0.989	0.317	0.324	
2412	1	802.11b	DSSS	22	16.25	16.25	-0.02	0 mm	WF2	2	DLXXT020LQK9	1	right	100.0	0.120	1.000	1.000	0.120	0.052	0.052	
2412	1	802.11b	DSSS	22	16.25	16.25	0.05	0 mm	WF2	2	DLXXT020LQK9	1	left	100.0	0.006	1.000	1.000	0.006	0.002	0.002	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population															Body 1.6 W/kg (mW/g) averaged over 1 gram						

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 10-33
2.4GHz WLAN Body SAR- Ant WF5

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Variant	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.														(W/kg)			(W/kg)	(W/kg)	(W/kg)	
2412	1	802.11b	DSSS	22	14.5	14.46	0.01	0 mm	WF5	2	DLXXT020LQK9	1	back	100.0	0.939	1.009	1.000	0.947	0.408	0.412	
2437	6	802.11b	DSSS	22	14.5	14.50	0.08	0 mm	WF5	2	DLXXT020LQK9	1	back	100.0	1.190	1.000	1.000	**1.190**	0.470	**0.470**	A16
2437	6	802.11b	DSSS	22	14.5	14.50	-0.08	0 mm	WF5	1	DLXXT02DLQK8	1	back	100.0	1.070	1.000	1.000	1.070	0.457	0.457	
2462	11	802.11b	DSSS	22	14.5	14.42	-0.06	0 mm	WF5	2	DLXXT020LQK9	1	back	100.0	1.050	1.019	1.000	1.070	0.406	0.414	
2412	1	802.11b	DSSS	22	14.5	14.46	0.01	0 mm	WF5	2	DLXXT020LQK9	1	top	100.0	0.778	1.009	1.000	0.785	0.307	0.310	
2437	6	802.11b	DSSS	22	14.5	14.50	0.00	0 mm	WF5	2	DLXXT020LQK9	1	top	100.0	0.864	1.000	1.000	0.864	0.335	0.335	
2462	11	802.11b	DSSS	22	14.5	14.42	0.19	0 mm	WF5	2	DLXXT020LQK9	1	top	100.0	0.751	1.019	1.000	0.765	0.283	0.288	
2437	6	802.11b	DSSS	22	14.5	14.50	0.04	0 mm	WF5	2	DLXXT020LQK9	1	bottom	100.0	0.000	1.000	1.000	0.000	0.000	0.000	
2437	6	802.11b	DSSS	22	14.5	14.50	0.05	0 mm	WF5	2	DLXXT020LQK9	1	right	100.0	0.098	1.000	1.000	0.098	0.042	0.042	
2437	6	802.11b	DSSS	22	14.5	14.50	0.00	0 mm	WF5	2	DLXXT020LQK9	1	left	100.0	0.132	1.000	1.000	0.132	0.054	0.054	
2412	1	802.11b	DSSS	22	10.5	10.43	-0.03	0 mm	WF5	2	DLXXT03PLQK8	1	back	100.0	0.381	1.016	1.000	0.387	0.148	0.150	
2412	1	802.11b	DSSS	22	10.5	10.43	0.12	0 mm	WF5	2	DLXXT03PLQK8	1	top	100.0	0.326	1.016	1.000	0.331	0.123	0.125	
2412	1	802.11b	DSSS	22	10.5	10.43	0.03	0 mm	WF5	2	DLXXT03PLQK8	1	bottom	100.0	0.000	1.016	1.000	0.000	0.000	0.000	
2412	1	802.11b	DSSS	22	10.5	10.43	0.07	0 mm	WF5	2	DLXXT03PLQK8	1	right	100.0	0.029	1.016	1.000	0.029	0.012	0.012	
2412	1	802.11b	DSSS	22	10.5	10.43	0.20	0 mm	WF5	2	DLXXT03PLQK8	1	left	100.0	0.046	1.016	1.000	0.047	0.017	0.017	
2437	6	802.11b	DSSS	22	7.5	7.50	0.00	0 mm	WF5	2	DLXXT03PLQK8	1	back	100.0	0.226	1.000	1.000	0.226	0.098	0.098	
2437	6	802.11b	DSSS	22	7.5	7.50	0.12	0 mm	WF5	2	DLXXT03PLQK8	1	top	100.0	0.190	1.000	1.000	0.190	0.071	0.071	
2437	6	802.11b	DSSS	22	7.5	7.50	0.04	0 mm	WF5	2	DLXXT03PLQK8	1	bottom	100.0	0.000	1.000	1.000	0.000	0.000	0.000	
2437	6	802.11b	DSSS	22	7.5	7.50	0.02	0 mm	WF5	2	DLXXT03PLQK8	1	right	100.0	0.017	1.000	1.000	0.017	0.007	0.007	
2437	6	802.11b	DSSS	22	7.5	7.50	0.10	0 mm	WF5	2	DLXXT03PLQK8	1	left	100.0	0.030	1.000	1.000	0.030	0.011	0.011	
2437	6	802.11b	DSSS	22	14.5	14.50	-0.07	0 mm	WF5	2	DLXXT020LQK9	1	back	100.0	1.190	1.000	1.000	**1.190**	0.469	**0.469**	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population												Body 1.6 W/kg (mW/g) averaged over 1 gram									

Note: Blue entries indicate variability measurements.

© 2019 PCTEST Engineering Laboratory, Inc.

REV 20.06 M
12/06/2017

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 10-34
5GHz WLAN Body SAR UNII-1

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Variant	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	SAR (1g) (W/kg)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g) (W/kg)	SAR (10g) (W/kg)	Reported SAR (10g) (W/kg)	Plot #
MHz	Ch.																				
5230	46	802.11n	OFDM	40	17.0	17.00	0.02	0 mm	WF2	2	DLXXT03SLQK8	13.5	back	97.8	0.132	1.000	1.022	0.135	0.052	0.053	
5230	46	802.11n	OFDM	40	17.0	17.00	0.03	0 mm	WF2	2	DLXXT03SLQK8	13.5	top	97.8	0.043	1.000	1.022	0.044	0.012	0.012	
5230	46	802.11n	OFDM	40	17.0	17.00	-0.04	0 mm	WF2	2	DLXXT03SLQK8	13.5	bottom	97.8	0.882	1.000	1.022	0.901	0.295	0.301	
5230	46	802.11n	OFDM	40	17.0	16.98	0.01	0 mm	WF2	1	DLXXT02LLQK8	13.5	bottom	97.8	0.849	1.005	1.022	0.872	0.285	0.293	
5190	38	802.11n	OFDM	40	14.0	14.00	0.20	0 mm	WF2	2	DLXXT03SLQK8	13.5	bottom	97.8	0.447	1.000	1.022	0.457	0.148	0.151	
5230	46	802.11n	OFDM	40	17.0	17.00	-0.08	0 mm	WF2	2	DLXXT03SLQK8	13.5	right	97.8	0.131	1.000	1.022	0.134	0.050	0.051	
5230	46	802.11n	OFDM	40	17.0	17.00	0.00	0 mm	WF2	2	DLXXT03SLQK8	13.5	left	97.8	0.000	1.000	1.022	0.000	0.000	0.000	
5230	46	802.11n	OFDM	40	17.0	17.00	0.01	0 mm	WF2	2	DLXXT03SLQK8	13.5	bottom	97.8	0.773	1.000	1.022	0.790	0.268	0.274	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population															Body 1.6 W/kg (mW/g) averaged over 1 gram						

Note: Blue entries indicate variability measurements.

Table 10-35
5GHz WLAN Body SAR UNII-2A

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Variant	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	SAR (1g) (W/kg)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g) (W/kg)	SAR (10g) (W/kg)	Reported SAR (10g) (W/kg)	Plot #
MHz	Ch.																				
5270	54	802.11n	OFDM	40	16.5	16.42	-0.18	0 mm	WF1	2	DLXXT03SLQK8	13.5	back	97.7	0.064	1.019	1.024	0.067	0.025	0.026	
5270	54	802.11n	OFDM	40	16.5	16.42	0.00	0 mm	WF1	2	DLXXT03SLQK8	13.5	top	97.7	0.000	1.019	1.024	0.000	0.000	0.000	
5270	54	802.11n	OFDM	40	16.5	16.42	0.00	0 mm	WF1	2	DLXXT03SLQK8	13.5	bottom	97.7	0.839	1.019	1.024	0.875	0.254	0.265	
5270	54	802.11n	OFDM	40	16.5	16.50	0.11	0 mm	WF1	1	DLXXT02LLQK8	13.5	bottom	97.7	0.801	1.000	1.024	0.820	0.237	0.243	
5310	62	802.11n	OFDM	40	14.5	14.40	0.01	0 mm	WF1	2	DLXXT03SLQK8	13.5	bottom	97.7	0.553	1.023	1.024	0.579	0.167	0.175	
5270	54	802.11n	OFDM	40	16.5	16.42	0.09	0 mm	WF1	2	DLXXT03SLQK8	13.5	right	97.7	0.000	1.019	1.024	0.000	0.000	0.000	
5270	54	802.11n	OFDM	40	16.5	16.42	-0.09	0 mm	WF1	2	DLXXT03SLQK8	13.5	left	97.7	0.155	1.019	1.024	0.162	0.059	0.062	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population															Body 1.6 W/kg (mW/g) averaged over 1 gram						

© 2019 PCTEST Engineering Laboratory, Inc.

REV 20.06 M
12/06/2017

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 10-36
5GHz WLAN Body SAR- UNII-2C

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Variant	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	SAR (1g) (W/kg)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g) (W/kg)	SAR (10g) (W/kg)	Reported SAR (10g) (W/kg)	Plot #
MHz	Ch.																				
5610	122	802.11ac	OFDM	80	16.0	15.50	-0.05	0 mm	WF1	2	DLXXT03SLQK8	29.3	back	95.3	0.070	1.122	1.049	0.082	0.027	0.032	
5610	122	802.11ac	OFDM	80	16.0	15.50	0.03	0 mm	WF1	2	DLXXT03SLQK8	29.3	top	95.3	0.010	1.122	1.049	0.012	0.003	0.004	
5530	106	802.11ac	OFDM	80	14.0	14.00	0.03	0 mm	WF1	2	DLXXT03SLQK8	29.3	bottom	95.3	0.575	1.000	1.049	0.603	0.180	0.189	
5610	122	802.11ac	OFDM	80	16.0	15.50	-0.05	0 mm	WF1	2	DLXXT03SLQK8	29.3	bottom	95.3	0.909	1.122	1.049	1.070	0.291	0.343	
5610	122	802.11ac	OFDM	80	16.0	15.50	0.04	0 mm	WF1	1	DLXXT02LLQK8	29.3	bottom	95.3	0.857	1.122	1.049	1.009	0.272	0.320	
5690	138	802.11ac	OFDM	80	16.0	15.43	-0.10	0 mm	WF1	2	DLXXT03SLQK8	29.3	bottom	95.3	0.662	1.140	1.049	0.792	0.213	0.255	
5610	122	802.11ac	OFDM	80	16.0	15.50	0.12	0 mm	WF1	2	DLXXT03SLQK8	29.3	right	95.3	0.000	1.122	1.049	0.000	0.000	0.000	
5610	122	802.11ac	OFDM	80	16.0	15.50	0.06	0 mm	WF1	2	DLXXT03SLQK8	29.3	left	95.3	0.136	1.122	1.049	0.160	0.048	0.056	
5610	122	802.11ac	OFDM	80	17.0	17.00	0.20	0 mm	WF2	2	DLXXT03SLQK8	29.3	back	95.5	0.118	1.000	1.047	0.124	0.049	0.051	
5610	122	802.11ac	OFDM	80	17.0	17.00	0.18	0 mm	WF2	2	DLXXT03SLQK8	29.3	top	95.5	0.051	1.000	1.047	0.053	0.016	0.017	
5530	106	802.11ac	OFDM	80	14.0	14.00	0.03	0 mm	WF2	2	DLXXT03SLQK8	29.3	bottom	95.5	0.439	1.000	1.047	0.460	0.146	0.153	
5610	122	802.11ac	OFDM	80	17.0	17.00	-0.03	0 mm	WF2	2	DLXXT03SLQK8	29.3	bottom	95.5	0.988	1.000	1.047	1.034	0.331	0.347	
5690	138	802.11ac	OFDM	80	17.0	16.84	0.13	0 mm	WF2	2	DLXXT03SLQK8	29.3	bottom	95.5	1.010	1.038	1.047	**1.098**	0.342	0.372	
5690	138	802.11ac	OFDM	80	17.0	16.91	0.03	0 mm	WF2	1	DLXXT02LLQK8	29.3	bottom	95.5	1.020	1.021	1.047	1.090	0.343	0.367	
5610	122	802.11ac	OFDM	80	17.0	17.00	0.04	0 mm	WF2	2	DLXXT03SLQK8	29.3	right	95.5	0.136	1.000	1.047	0.142	0.055	0.058	
5610	122	802.11ac	OFDM	80	17.0	17.00	0.04	0 mm	WF2	2	DLXXT03SLQK8	29.3	left	95.5	0.000	1.000	1.047	0.000	0.000	0.000	
5610	122	802.11ac	OFDM	80	17.0	17.00	-0.09	0 mm	WF2	2	DLXXT03SLQK8	29.3	bottom	95.5	0.918	1.000	1.047	0.961	0.308	0.322	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population															Body 1.6 W/kg (mW/g) averaged over 1 gram						

Note: Blue entries indicate variability measurements.

© 2019 PCTEST Engineering Laboratory, Inc.

REV 20.06 M
12/06/2017

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 10-37
5GHz WLAN Body SAR- UNII-3

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Variant	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.														(W/kg)			(W/kg)	(W/kg)	(W/kg)	
5775	155	802.11ac	OFDM	80	17.25	17.00	0.02	0 mm	WF1	1	DLXXT02LLQK8	29.3	back	95.3	0.098	1.059	1.049	0.109	0.038	0.042	
5775	155	802.11ac	OFDM	80	17.25	17.00	0.03	0 mm	WF1	1	DLXXT02LLQK8	29.3	top	95.3	0.036	1.059	1.049	0.040	0.009	0.010	
5775	155	802.11ac	OFDM	80	17.25	17.00	-0.10	0 mm	WF1	1	DLXXT02LLQK8	29.3	bottom	95.3	0.959	1.059	1.049	1.065	0.309	0.343	
5775	155	802.11ac	OFDM	80	17.25	17.00	0.05	0 mm	WF1	2	DLXXT03SLQK8	29.3	bottom	95.3	0.881	1.059	1.049	0.979	0.285	0.317	
5775	155	802.11ac	OFDM	80	17.25	17.00	0.00	0 mm	WF1	1	DLXXT02LLQK8	29.3	right	95.3	0.000	1.059	1.049	0.000	0.000	0.000	
5775	155	802.11ac	OFDM	80	17.25	17.00	0.06	0 mm	WF1	1	DLXXT02LLQK8	29.3	left	95.3	0.198	1.059	1.049	0.220	0.071	0.079	
5775	155	802.11ac	OFDM	80	16.5	16.50	0.02	0 mm	WF2	2	DLXXT03SLQK8	29.3	back	95.5	0.090	1.000	1.047	0.094	0.036	0.038	
5775	155	802.11ac	OFDM	80	16.5	16.50	0.01	0 mm	WF2	2	DLXXT03SLQK8	29.3	top	95.5	0.045	1.000	1.047	0.047	0.014	0.015	
5775	155	802.11ac	OFDM	80	16.5	16.50	0.12	0 mm	WF2	2	DLXXT03SLQK8	29.3	bottom	95.5	1.040	1.000	1.047	1.089	0.357	0.374	A17
5775	155	802.11ac	OFDM	80	16.5	16.42	-0.10	0 mm	WF2	1	DLXXT02LLQK8	29.3	bottom	95.5	1.020	1.019	1.047	1.088	0.343	0.366	
5775	155	802.11ac	OFDM	80	16.5	16.50	-0.04	0 mm	WF2	2	DLXXT03SLQK8	29.3	right	95.5	0.123	1.000	1.047	0.129	0.049	0.051	
5775	155	802.11ac	OFDM	80	16.5	16.50	0.09	0 mm	WF2	2	DLXXT03SLQK8	29.3	left	95.5	0.000	1.000	1.047	0.000	0.000	0.000	
5775	155	802.11ac	OFDM	80	16.5	16.50	0.14	0 mm	WF2	2	DLXXT03SLQK8	29.3	bottom	95.5	1.000	1.000	1.047	1.047	0.347	0.363	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population															Body 1.6 W/kg (mW/g) averaged over 1 gram						

Note: Blue entries indicate variability measurements.

Table 10-38
Bluetooth Body SAR- Ant WF1

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Variant	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.													(W/kg)			(W/kg)	(W/kg)	(W/kg)	
2441	39	Bluetooth	FHSS	16.0	15.25	0.10	0 mm	WF1	2	DLXXT020LQK9	1	back	76.9	0.074	1.189	1.008	0.089	0.034	0.041	
2441	39	Bluetooth	FHSS	16.0	15.25	0.12	0 mm	WF1	2	DLXXT020LQK9	1	top	76.9	0.014	1.189	1.008	0.017	0.006	0.007	
2402	0	Bluetooth	FHSS	16.0	15.11	0.20	0 mm	WF1	2	DLXXT020LQK9	1	bottom	76.9	0.862	1.227	1.008	1.066	0.293	0.362	
2441	39	Bluetooth	FHSS	16.0	15.25	0.09	0 mm	WF1	2	DLXXT020LQK9	1	bottom	76.9	0.971	1.189	1.008	**1.164**	0.328	**0.393**	
2441	39	Bluetooth	FHSS	16.0	15.45	-0.10	0 mm	WF1	1	DLXXT013LQK8	1	bottom	76.9	0.882	1.135	1.008	1.009	0.297	0.340	
2480	78	Bluetooth	FHSS	16.0	15.17	0.07	0 mm	WF1	2	DLXXT020LQK9	1	bottom	76.9	0.755	1.211	1.008	0.922	0.262	0.320	
2441	39	Bluetooth	FHSS	16.0	15.25	0.05	0 mm	WF1	2	DLXXT020LQK9	1	right	76.9	0.008	1.189	1.008	0.010	0.003	0.004	
2441	39	Bluetooth	FHSS	16.0	15.25	-0.05	0 mm	WF1	2	DLXXT020LQK9	1	left	76.9	0.132	1.189	1.008	0.158	0.060	0.072	
2441	39	Bluetooth	FHSS	9.0	8.49	-0.01	0 mm	WF1	2	DLXXT020LQK9	1	back	77.2	0.011	1.125	1.004	0.012	0.004	0.005	
2441	39	Bluetooth	FHSS	9.0	8.49	0.05	0 mm	WF1	2	DLXXT020LQK9	1	top	77.2	0.001	1.125	1.004	0.001	0.000	0.000	
2441	39	Bluetooth	FHSS	9.0	8.49	-0.03	0 mm	WF1	2	DLXXT020LQK9	1	bottom	77.2	0.169	1.125	1.004	0.191	0.058	0.066	
2441	39	Bluetooth	FHSS	9.0	8.49	0.02	0 mm	WF1	2	DLXXT020LQK9	1	right	77.2	0.000	1.125	1.004	0.000	0.000	0.000	
2441	39	Bluetooth	FHSS	9.0	8.49	-0.02	0 mm	WF1	2	DLXXT020LQK9	1	left	77.2	0.024	1.125	1.004	0.027	0.010	0.011	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population															Body 1.6 W/kg (mW/g) averaged over 1 gram						

Note: The reported SAR was scaled to the 77.5% transmission duty factor to determine compliance since the duty factor of the device is permanently limited to 77.5% per the manufacturer.

© 2019 PCTEST Engineering Laboratory, Inc.

REV 20.06 M
12/06/2017

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 10-39
Bluetooth Body SAR - Ant WF2

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Variant	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.													(W/kg)			(W/kg)	(W/kg)	(W/kg)	
2441	39	Bluetooth	FHSS	17.0	16.94	0.00	0 mm	WF2	1	DLXXT02DLQK8	1	back	76.9	0.006	1.014	1.008	0.006	0.002	0.002	
2441	39	Bluetooth	FHSS	17.0	16.94	0.09	0 mm	WF2	1	DLXXT02DLQK8	1	top	76.9	0.000	1.014	1.008	0.000	0.000	0.000	
2402	0	Bluetooth	FHSS	17.0	16.69	-0.03	0 mm	WF2	1	DLXXT02DLQK8	1	bottom	76.9	0.651	1.074	1.008	0.705	0.211	0.228	
2441	39	Bluetooth	FHSS	17.0	16.94	-0.08	0 mm	WF2	1	DLXXT02DLQK8	1	bottom	76.9	0.903	1.014	1.008	0.923	0.297	0.304	
2480	78	Bluetooth	FHSS	17.0	16.90	-0.16	0 mm	WF2	1	DLXXT02DLQK8	1	bottom	76.9	0.937	1.023	1.008	0.966	0.309	0.319	
2480	78	Bluetooth	FHSS	17.0	16.84	-0.04	0 mm	WF2	2	DLXXT03SLQK8	1	bottom	76.9	0.875	1.038	1.008	0.916	0.286	0.299	
2441	39	Bluetooth	FHSS	17.0	16.94	0.09	0 mm	WF2	1	DLXXT02DLQK8	1	right	76.9	0.134	1.014	1.008	0.137	0.056	0.057	
2441	39	Bluetooth	FHSS	17.0	16.94	0.01	0 mm	WF2	1	DLXXT02DLQK8	1	left	76.9	0.000	1.014	1.008	0.000	0.000	0.000	
2480	78	Bluetooth	FHSS	10.0	9.89	0.00	0 mm	WF2	1	DLXXT02DLQK8	1	back	76.9	0.000	1.026	1.008	0.000	0.000	0.000	
2480	78	Bluetooth	FHSS	10.0	9.89	0.01	0 mm	WF2	1	DLXXT02DLQK8	1	top	76.9	0.000	1.026	1.008	0.000	0.000	0.000	
2480	78	Bluetooth	FHSS	10.0	9.89	0.09	0 mm	WF2	1	DLXXT02DLQK8	1	bottom	76.9	0.211	1.026	1.008	0.218	0.067	0.069	
2480	78	Bluetooth	FHSS	10.0	9.89	0.04	0 mm	WF2	1	DLXXT02DLQK8	1	right	76.9	0.023	1.026	1.008	0.024	0.008	0.008	
2480	78	Bluetooth	FHSS	10.0	9.89	0.00	0 mm	WF2	1	DLXXT02DLQK8	1	left	76.9	0.000	1.026	1.008	0.000	0.000	0.000	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram													

Note: The reported SAR was scaled to the 77.5% transmission duty factor to determine compliance since the duty factor of the device is permanently limited to 77.5% per the manufacturer.

Table 10-40
Bluetooth Body SAR - Ant WF5

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Variant	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.													(W/kg)			(W/kg)	(W/kg)	(W/kg)	
2402	0	Bluetooth	FHSS	15.5	15.42	0.11	0 mm	WF5	2	DLXXT020LQK9	1	back	76.9	0.904	1.019	1.008	0.929	0.386	0.396	
2441	39	Bluetooth	FHSS	15.5	15.45	0.02	0 mm	WF5	2	DLXXT020LQK9	1	back	76.9	1.010	1.012	1.008	1.030	0.408	0.416	A18
2441	39	Bluetooth	FHSS	15.5	15.10	0.01	0 mm	WF5	1	DLXXT02DLQK8	1	back	76.9	0.832	1.096	1.008	0.919	0.358	0.396	
2480	78	Bluetooth	FHSS	15.5	15.24	0.20	0 mm	WF5	2	DLXXT020LQK9	1	back	76.9	0.877	1.062	1.008	0.939	0.342	0.366	
2441	39	Bluetooth	FHSS	15.5	15.45	-0.13	0 mm	WF5	2	DLXXT020LQK9	1	top	76.9	0.694	1.012	1.008	0.708	0.274	0.280	
2441	39	Bluetooth	FHSS	15.5	15.45	0.03	0 mm	WF5	2	DLXXT020LQK9	1	bottom	76.9	0.012	1.012	1.008	0.012	0.003	0.003	
2441	39	Bluetooth	FHSS	15.5	15.45	0.15	0 mm	WF5	2	DLXXT020LQK9	1	right	76.9	0.082	1.012	1.008	0.084	0.035	0.036	
2441	39	Bluetooth	FHSS	15.5	15.45	0.07	0 mm	WF5	2	DLXXT020LQK9	1	left	76.9	0.114	1.012	1.008	0.116	0.046	0.047	
2441	39	Bluetooth	FHSS	11.5	11.25	0.08	0 mm	WF5	2	DLXXT03PLQK8	1	back	76.9	0.371	1.059	1.008	0.396	0.157	0.168	
2441	39	Bluetooth	FHSS	11.5	11.25	-0.03	0 mm	WF5	2	DLXXT03PLQK8	1	top	76.9	0.359	1.059	1.008	0.383	0.136	0.145	
2441	39	Bluetooth	FHSS	11.5	11.25	0.04	0 mm	WF5	2	DLXXT03PLQK8	1	bottom	76.9	0.002	1.059	1.008	0.002	0.000	0.000	
2441	39	Bluetooth	FHSS	11.5	11.25	-0.05	0 mm	WF5	2	DLXXT03PLQK8	1	right	76.9	0.033	1.059	1.008	0.035	0.013	0.014	
2441	39	Bluetooth	FHSS	11.5	11.25	0.16	0 mm	WF5	2	DLXXT03PLQK8	1	left	76.9	0.054	1.059	1.008	0.058	0.019	0.020	
2480	78	Bluetooth	FHSS	8.5	8.45	0.06	0 mm	WF5	2	DLXXT03PLQK8	1	back	76.9	0.184	1.012	1.008	0.188	0.068	0.069	
2480	78	Bluetooth	FHSS	8.5	8.45	0.02	0 mm	WF5	2	DLXXT03PLQK8	1	top	76.9	0.134	1.012	1.008	0.137	0.050	0.051	
2480	78	Bluetooth	FHSS	8.5	8.45	0.09	0 mm	WF5	2	DLXXT03PLQK8	1	bottom	76.9	0.001	1.012	1.008	0.001	0.000	0.000	
2480	78	Bluetooth	FHSS	8.5	8.45	0.03	0 mm	WF5	2	DLXXT03PLQK8	1	right	76.9	0.005	1.012	1.008	0.005	0.001	0.001	
2480	78	Bluetooth	FHSS	8.5	8.45	0.03	0 mm	WF5	2	DLXXT03PLQK8	1	left	76.9	0.009	1.012	1.008	0.009	0.002	0.002	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram													

Note: The reported SAR was scaled to the 77.5% transmission duty factor to determine compliance since the duty factor of the device is permanently limited to 77.5% per the manufacturer.

© 2019 PCTEST Engineering Laboratory, Inc.

REV 20.06 M
12/06/2017

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

10.2 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in FCC KDB Publication 616217 D04v01r02 and FCC KDB Publication 447498 D01v06.
2. Batteries are fully charged at the beginning of the SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v06.
6. Per FCC KDB 865664 D01v01r04, variability SAR tests were performed when the measured SAR results for a frequency band were greater than or equal to 0.8 W/kg. Repeated SAR measurements are highlighted in the tables above for clarity. Please see Section 12 for variability analysis.
7. FCC KDB Publication 616217 D04v01r02 Section 4.3, SAR tests are required for the back surface and edges of the tablet with the tablet touching the phantom. The SAR Exclusion Threshold in FCC KDB 447498 D01v06 was applied to determine SAR test exclusion for adjacent edge configurations.

GSM Test Notes:

1. Justification for reduced test configurations per KDB Publication 941225 D01v03r01 and October 2013 TCB Workshop Notes: The source-based frame-averaged output power was evaluated for all GPRS/EDGE slot configurations. The configuration with the highest target frame averaged output power was evaluated for SAR. When the maximum frame-averaged powers are equivalent across two or more slots (within 0.25 dB), the configuration with the most number of time slots was tested.
2. Per FCC KDB Publication 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg for 1g evaluations then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel was used.

UMTS Notes:

1. UMTS mode in was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01v03r01. HSPA SAR was not required per the 3G Test Reduction Procedure in KDB Publication 941225 D01v03r01.
2. Per FCC KDB Publication 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg for 1g evaluations then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel was used.

LTE Notes:

1. LTE Considerations: LTE test configurations are determined according to SAR Evaluation Considerations for LTE Devices in FCC KDB Publication 941225 D05v02r04. The general test procedures used for testing can be found in Section 7.5.4.
2. MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.
3. A-MPR was disabled for all SAR tests by setting NS=01 and MCC=001 on the base station simulator. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).
4. Per FCC KDB Publication 447498 D01v06, when the reported (scaled) for LTE Band 41 SAR measured at the highest output power channel in a given a test configuration was > 0.6 W/kg for 1g evaluations, testing at the other channels was required for such test configurations.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

5. TDD LTE was tested per the guidance provided in FCC KDB Publication 941225 D05v02r04. Testing was performed using UL-DL configuration 0 with 6 UL subframes and 2 S subframes using extended cyclic prefix only and special subframe configuration 6. SAR tests were performed at maximum output power and worst-case transmission duty factor in extended cyclic prefix. Per 3GPP 36.211 Section 4, the duty factor for special subframe configuration 6 using extended cyclic prefix is 0.633.
6. Per KDB Publication 941225 D05Av01r02, SAR for downlink only LTE CA operations was not needed since the maximum average output power in LTE CA mode was not >0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive.
7. This device supports Power Class 2 and Power Class 3 operations for LTE Band 41. The highest available duty cycle for Power Class 2 operations is 43.3 % using UL-DL configuration 1. Per FCC Guidance, all SAR tests were performed using Power Class 3. SAR with power class 2 at the available duty factor was additionally performed for the power class 3 configuration with the highest SAR configuration for each exposure conditions. Please see Section 13 for linearity results.
8. For LTE Band 41 and LTE Band 7, per Fall 2017 TCB Workshop Notes, SAR was first measured with only a single carrier active in the uplink (carrier aggregation not active). For each exposure condition, the uplink CA scenario with two component carriers was additionally tested for the configuration with the highest SAR when carrier aggregation was not active. The SCC was configured with the closest available contiguous channel. The two component carriers were configured so the resource blocks are physically allocated side by side to achieve the maximum output power. When the reported 1g SAR was >1.2 W/kg or the reported 10g SAR was > 3.0 W/kg, all required test channels were additionally evaluated.

WLAN Notes:

1. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 2.4 GHz WIFI single transmission chain operations, the highest measured maximum output power channel for DSSS was selected for SAR measurement. SAR for OFDM modes (2.4 GHz 802.11g/n) was not required due to the maximum allowed powers and the highest reported DSSS SAR. See Section 7.6.4 for more information.
2. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 5 GHz WIFI single transmission chain operations, the initial test configuration was selected according to the transmission mode with the highest maximum allowed powers. Other transmission modes were not investigated since the highest reported SAR for initial test configuration adjusted by the ratio of maximum output powers is less than 1.2 W/kg for 1g evaluations. See Section 7.6.5 for more information.
3. When the maximum reported 1g averaged SAR is ≤0.8 W/kg, SAR testing on additional channels was not required. Otherwise, SAR for the next highest output power channel was required until the reported SAR result was ≤ 1.20 W/kg for 1g evaluations or all test channels were measured.
4. The device was configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools. The reported SAR was scaled to the 100% transmission duty factor to determine compliance. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8 MHz, VBW = 50 MHz, and detector = peak per guidance of Section 6.0 b) of ANSI C63. 10-2013 and KDB 558074 D01 v04. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100."

Bluetooth Notes

1. Bluetooth SAR was evaluated with a test mode with hopping disabled with DH5 operation. The reported SAR was scaled to the 77.5% transmission duty factor to determine compliance since the duty factor of the device is limited to 77.5% per the manufacturer. See Section 8.6 for the time domain plot and calculation for the duty factor of the device.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

11 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

11.1 Introduction

The following procedures adopted from FCC KDB Publication 447498 D01v06 are applicable to devices with built-in unlicensed transmitters such as 802.11 and Bluetooth devices which may simultaneously transmit with the licensed transmitter.

11.2 Simultaneous Transmission Procedures

This device contains transmitters that may operate simultaneously. Therefore, simultaneous transmission analysis is required. Per FCC KDB Publication 447498 D01v06 4.3.2 and IEEE 1528-2013 Section 6.3.4.1.2, simultaneous transmission SAR test exclusion may be applied when the sum of the 1g SAR for all the simultaneous transmitting antennas in a specific a physical test configuration is ≤1.6 W/kg. The different test positions in an exposure condition may be considered collectively to determine SAR test exclusion according to the sum of 1g or 10g SAR.

** The SAR distributions for at least one of the antennas are spatially separated from the other antennas per FCC KDB Publication 248227 Section 6.1 procedures. Therefore, the simultaneous transmission were treated independently for this configuration. See Section 11.4 for more information about the Spatial Separation Analysis.

For each position, the highest SAR value across all modes for the applicable cellular band antenna was considered for summation to determine simultaneous SAR test exclusion.

11.3 Body SAR Simultaneous Transmission Analysis

Table 11-1
Simultaneous Transmission Scenario with 2.4 GHz WLAN

Simult Tx	Configuration	2.4 GHz WLAN Ant WF1 SAR (W/kg)	2.4 GHz WLAN Ant WF2 SAR (W/kg)	2.4 GHz WLAN Ant WF5 SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+3
Body SAR	Back	0.094	0.059	1.190	0.153	**1.284**
	Top	0.008	0.005	0.864	0.013	0.872
	Bottom	1.146	1.105	0.000	1.146**	1.146
	Right	0.009	0.120	0.098	0.129	0.107
	Left	0.182	0.006	0.132	0.188	0.314

Table 11-2
Cellular Band Ant WF3 Simultaneous Transmission Scenario with 2.4 GHz WLAN

Simult Tx	Configuration	Cellular Band Ant WF3	2.4 GHz WLAN Ant WF1 SAR (W/kg)	2.4 GHz WLAN Ant WF2 SAR (W/kg)	2.4 GHz WLAN Ant WF5 Reduced at 10.5 dBm SAR (W/kg)	Σ SAR (W/kg)				
		1	2	3	4	1+2	1+3	1+4	1+2+3	1+2+4
Body SAR	Back	1.189	0.094	0.059	0.387	1.283	1.248	**1.576**	1.342	1.576**
	Top	0.927	0.008	0.005	0.331	0.935	0.932	1.258	0.940	1.266
	Bottom	0.042	1.146	1.105	0.000	1.188	1.147	0.042	1.188**	1.188
	Right	0.185	0.009	0.120	0.029	0.194	0.305	0.214	0.314	0.223
	Left	0.057	0.182	0.006	0.047	0.239	0.063	0.104	0.245	0.286

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 11-3
Cellular Band Ant WF5 Simultaneous Transmission Scenario with 2.4 GHz WLAN

Simult Tx	Configuration	Cellular Band Ant WF5	2.4 GHz WLAN Ant WF1 SAR (W/kg)	2.4 GHz WLAN Ant WF2 SAR (W/kg)	2.4 GHz WLAN Ant WF5 Reduced at 7.5 dBm SAR (W/kg)	Σ SAR (W/kg)				
		1	2	3	4	1+2	1+3	1+4	1+2+3	1+2+4
Body SAR	Back	1.188	0.094	0.059	0.226	1.282	1.247	1.414	1.341	**1.508**
	Top	1.168	0.008	0.005	0.190	1.176	1.173	1.358	1.181	1.366
	Bottom	0.026	1.146	1.105	0.000	1.172	1.131	0.026	1.172**	1.172
	Right	0.056	0.009	0.120	0.017	0.065	0.176	0.073	0.185	0.082
	Left	0.187	0.182	0.006	0.030	0.369	0.193	0.217	0.375	0.399

Table 11-4
Cellular Band Ant WF3 Simultaneous Transmission Scenario with 5 GHz WLAN

Simult Tx	Configuration	Cellular Band Ant WF3	5 GHz WLAN Ant WF1 SAR (W/kg)	5GHz WLAN Ant WF2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Body SAR	Back	1.189	0.109	0.135	1.298	1.324	**1.433**
	Top	0.927	0.040	0.053	0.967	0.980	1.020
	Bottom	0.042	1.070	1.098	1.112	1.140	1.140**
	Right	0.185	0.000	0.142	0.185	0.327	0.327
	Left	0.057	0.220	0.000	0.277	0.057	0.277

Table 11-5
Cellular Band Ant WF5 Simultaneous Transmission Scenario with 5 GHz WLAN

Simult Tx	Configuration	Cellular Band Ant WF5	5 GHz WLAN Ant WF1 SAR (W/kg)	5GHz WLAN Ant WF2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Body SAR	Back	1.188	0.109	0.135	1.297	1.323	**1.432**
	Top	1.168	0.040	0.053	1.208	1.221	1.261
	Bottom	0.026	1.070	1.098	1.096	1.124	1.124**
	Right	0.056	0.000	0.142	0.056	0.198	0.198
	Left	0.187	0.220	0.000	0.407	0.187	0.407

Table 11-6
Cellular Band Ant WF3 Simultaneous Transmission Scenario with Bluetooth

Simult Tx	Configuration	Cellular Band Ant WF3	Bluetooth Ant WF1 SAR (W/kg)	Bluetooth Ant WF2 SAR (W/kg)	Bluetooth Ant WF5 at 11.5 dBm SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	1+2	1+3	1+4
Body SAR	Back	1.189	0.089	0.006	0.396	1.278	1.195	**1.585**
	Top	0.927	0.017	0.000	0.383	0.944	0.927	1.310
	Bottom	0.042	1.164	0.966	0.002	1.206	1.008	0.044
	Right	0.185	0.010	0.137	0.035	0.195	0.322	0.220
	Left	0.057	0.158	0.000	0.058	0.215	0.057	0.115

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 11-7
Cellular Band Ant WF5 Simultaneous Transmission Scenario with Bluetooth

Simult Tx	Configuration	Cellular Band Ant WF5	Bluetooth Ant WF1 SAR (W/kg)	Bluetooth Ant WF2 SAR (W/kg)	Bluetooth Ant WF5 at 8.5 dBm SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	1+2	1+3	1+4
Body SAR	Back	1.188	0.089	0.006	0.188	1.277	1.194	**1.376**
	Top	1.168	0.017	0.000	0.137	1.185	1.168	1.305
	Bottom	0.026	1.164	0.966	0.001	1.190	0.992	0.027
	Right	0.056	0.010	0.137	0.005	0.066	0.193	0.061
	Left	0.187	0.158	0.000	0.009	0.345	0.187	0.196

Table 11-8
Cellular Band Ant WF3 Simultaneous Transmission Scenario with Bluetooth and 5 GHz WLAN

Simult Tx	Configuration	Cellular Band Ant WF3	Bluetooth Ant WF1 Reduced at 9dBm SAR (W/kg)	5 GHz WLAN Ant WF1 SAR (W/kg)	5 GHz WLAN Ant WF2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	1+2+3	1+2+4	1+2+3+4
Body SAR	Back	1.189	0.012	0.109	0.135	1.310	1.336	**1.445**
	Top	0.927	0.001	0.040	0.053	0.968	0.981	1.021
	Bottom	0.042	0.191	1.070	1.098	1.303	1.331	1.303**
	Right	0.185	0.000	0.000	0.142	0.185	0.327	0.327
	Left	0.057	0.027	0.220	0.000	0.304	0.084	0.304

Table 11-9
Cellular Band Ant WF3 Simultaneous Transmission Scenario with Bluetooth and 5 GHz WLAN

Simult Tx	Configuration	Cellular Band Ant WF3	Bluetooth Ant WF2 Reduced at 10 dBm SAR (W/kg)	5 GHz WLAN Ant WF1 SAR (W/kg)	5 GHz WLAN Ant WF2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	1+2+3	1+2+4	1+2+3+4
Body SAR	Back	1.189	0.000	0.109	0.135	1.298	1.324	**1.433**
	Top	0.927	0.000	0.040	0.053	0.967	0.980	1.020
	Bottom	0.042	0.218	1.070	1.098	1.330	1.358	1.358**
	Right	0.185	0.024	0.000	0.142	0.209	0.351	0.351
	Left	0.057	0.000	0.220	0.000	0.277	0.057	0.277

Table 11-10
Cellular Band Ant WF3 Simultaneous Transmission Scenario with Bluetooth and 5 GHz WLAN

Simult Tx	Configuration	Cellular Band Ant WF3	Bluetooth Ant WF5 Reduced at 11.5 dBm SAR (W/kg)	5 GHz WLAN Ant WF1 SAR (W/kg)	5 GHz WLAN Ant WF2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	1+2+3	1+2+4	1+2+3+4
Body SAR	Back	1.189	0.396	0.109	0.135	1.585**	1.585**	1.585**
	Top	0.927	0.383	0.040	0.053	1.350	1.363	**1.403**
	Bottom	0.042	0.002	1.070	1.098	1.114	1.142	1.142**
	Right	0.185	0.035	0.000	0.142	0.220	0.362	0.362
	Left	0.057	0.058	0.220	0.000	0.335	0.115	0.335

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 11-11
Cellular Band Ant WF5 Simultaneous Transmission Scenario with Bluetooth and 5 GHz WLAN

Simult Tx	Configuration	Cellular Band Ant WF5	Bluetooth Ant WF1 Reduced at 9dBm SAR (W/kg)	5 GHz WLAN Ant WF1 SAR (W/kg)	5 GHz WLAN Ant WF2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	1+2+3	1+2+4	1+2+3+4
Body SAR	Back	1.188	0.012	0.109	0.135	1.309	1.335	**1.444**
	Top	1.168	0.001	0.040	0.053	1.209	1.222	1.262
	Bottom	0.026	0.191	1.070	1.098	1.287	1.315	1.287**
	Right	0.056	0.000	0.000	0.142	0.056	0.198	0.198
	Left	0.187	0.027	0.220	0.000	0.434	0.214	0.434

Table 11-12
Cellular Band Ant WF5 Simultaneous Transmission Scenario with Bluetooth and 5 GHz WLAN

Simult Tx	Configuration	Cellular Band Ant WF5	Bluetooth Ant WF2 Reduced at 10 dBm SAR (W/kg)	5 GHz WLAN Ant WF1 SAR (W/kg)	5 GHz WLAN Ant WF2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	1+2+3	1+2+4	1+2+3+4
Body SAR	Back	1.188	0.000	0.109	0.135	1.297	1.323	**1.432**
	Top	1.168	0.000	0.040	0.053	1.208	1.221	1.261
	Bottom	0.026	0.218	1.070	1.098	1.314	1.342	1.342**
	Right	0.056	0.024	0.000	0.142	0.080	0.222	0.222
	Left	0.187	0.000	0.220	0.000	0.407	0.187	0.407

Table 11-13
Cellular Band Ant WF5 Simultaneous Transmission Scenario with Bluetooth and 5 GHz WLAN

Simult Tx	Configuration	Cellular Band Ant WF5	Bluetooth Ant WF5 Reduced at 8.5 dBm SAR (W/kg)	5 GHz WLAN Ant WF1 SAR (W/kg)	5 GHz WLAN Ant WF2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	1+2+3	1+2+4	1+2+3+4
Body SAR	Back	1.188	0.188	0.109	0.135	1.485	**1.511**	1.376**
	Top	1.168	0.137	0.040	0.053	1.345	1.358	1.398
	Bottom	0.026	0.001	1.070	1.098	1.097	1.125	1.125**
	Right	0.056	0.005	0.000	0.142	0.061	0.203	0.203
	Left	0.187	0.009	0.220	0.000	0.416	0.196	0.416

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 11-14
Simultaneous Transmission Scenario with Bluetooth and 5 GHz WLAN

Simult Tx	Configuration	Bluetooth Ant WF1 Reduced at 9 dBm SAR (W/kg)	5 GHz WLAN Ant WF1 SAR (W/kg)	5 GHz WLAN Ant WF2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Body SAR	Back	0.012	0.109	0.135	0.121	0.147	0.256
	Top	0.001	0.040	0.053	0.041	0.054	0.094
	Bottom	0.191	1.070	1.098	1.261	**1.289**	1.261**
	Right	0.000	0.000	0.142	0.000	0.142	0.142
	Left	0.027	0.220	0.000	0.247	0.027	0.247

Simult Tx	Configuration	Bluetooth Ant WF2 Reduced at 10 dBm SAR (W/kg)	5 GHz WLAN Ant WF1 SAR (W/kg)	5 GHz WLAN Ant WF2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Body SAR	Back	0.000	0.109	0.135	0.109	0.135	0.244
	Top	0.000	0.040	0.053	0.040	0.053	0.093
	Bottom	0.218	1.070	1.098	1.288	**1.316**	1.316**
	Right	0.024	0.000	0.142	0.024	0.166	0.166
	Left	0.000	0.220	0.000	0.220	0.000	0.220

Simult Tx	Configuration	Bluetooth Ant WF5 SAR (W/kg)	5 GHz WLAN Ant WF1 SAR (W/kg)	5 GHz WLAN Ant WF2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Body SAR	Back	1.030	0.109	0.135	1.139	1.165	**1.274**
	Top	0.708	0.040	0.053	0.748	0.761	0.801
	Bottom	0.012	1.070	1.098	1.082	1.110	1.110**
	Right	0.084	0.000	0.142	0.084	0.226	0.226
	Left	0.116	0.220	0.000	0.336	0.116	0.336

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

11.4 Spatial Separation Analysis

Per FCC KDB Publication 248227, antennas may be considered spatially separated when the aggregate SAR from multiple antennas at any location in the combined SAR distribution is either ≤ 1.2 W/kg where at least 90% of the SAR is attributed to a single SAR distribution or ≤ 0.4 W/kg where no more than one SAR distribution is contributing > 0.1 W/kg.

Spatial separation was determined by inspection of the area scan SAR distributions to confirm that at all locations, SAR was < 1.2 W/kg, where at least 90% of the SAR is attributed to a single SAR distribution. See below for illustrations of the spatial separated antennas considered.

11.4.1 Back Side Spatial Separation Analysis

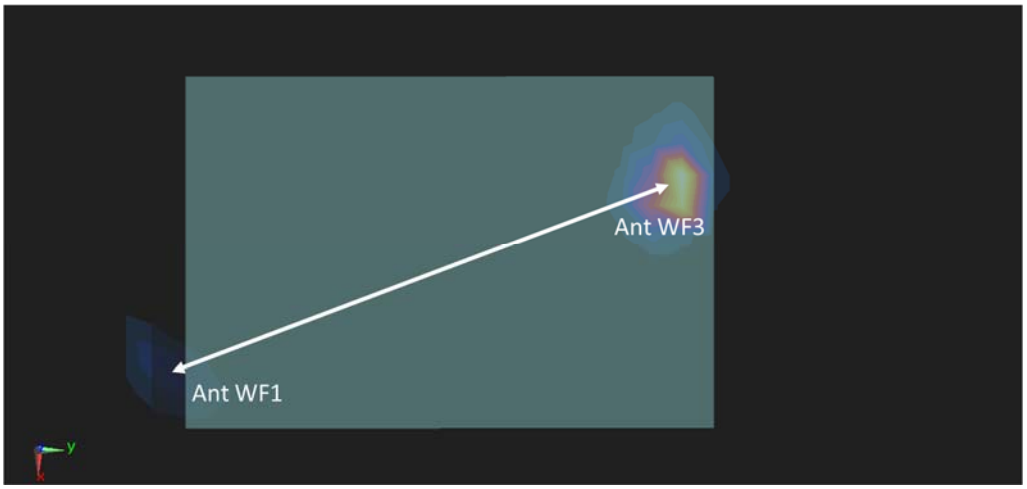


Figure 11-1
Back Side Spatial Separation for Ant WF1 and Ant WF3

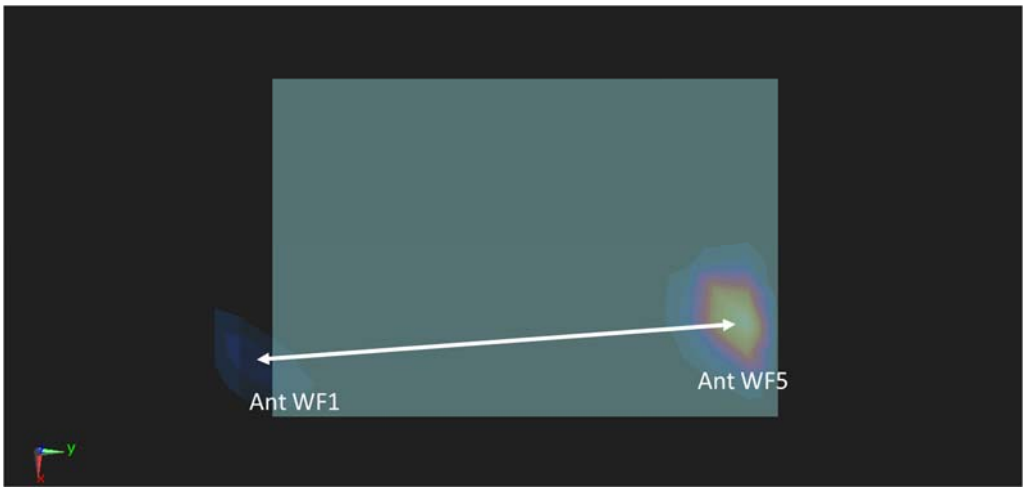


Figure 11-2
Back Side Spatial Separation for Ant WF1 and Ant WF5

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

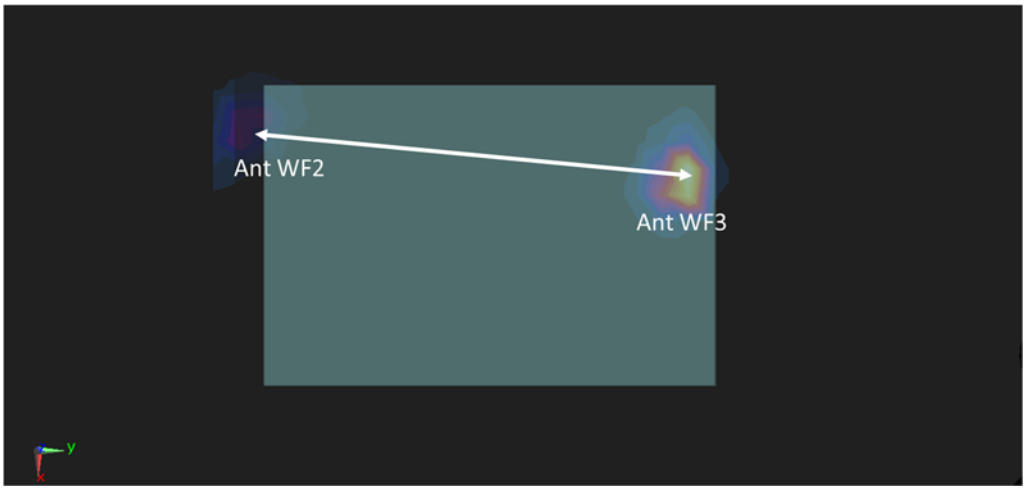


Figure 11-3
Back Side Spatial Separation for Ant WF2 and Ant WF3

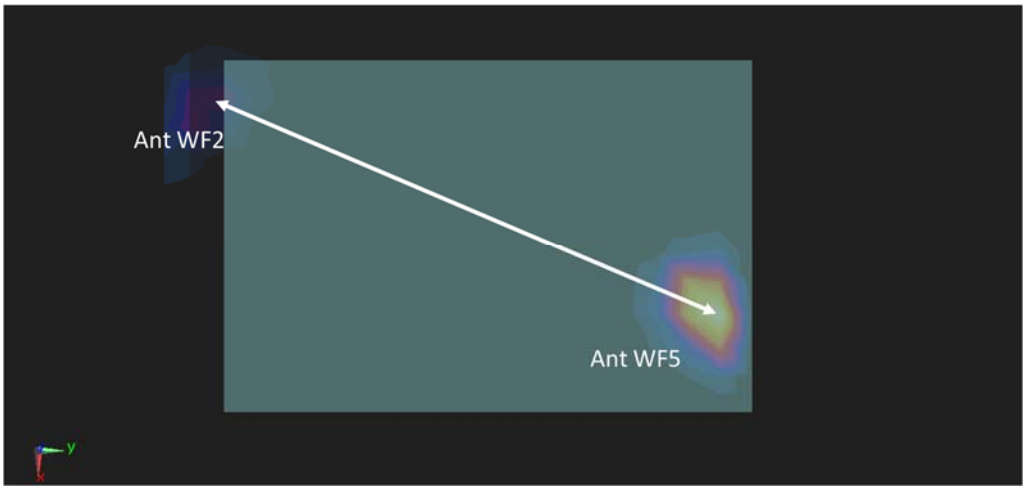


Figure 11-4
Back Side Spatial Separation for Ant WF2 and Ant WF5

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

11.4.2 Bottom Edge Spatial Separation Analysis

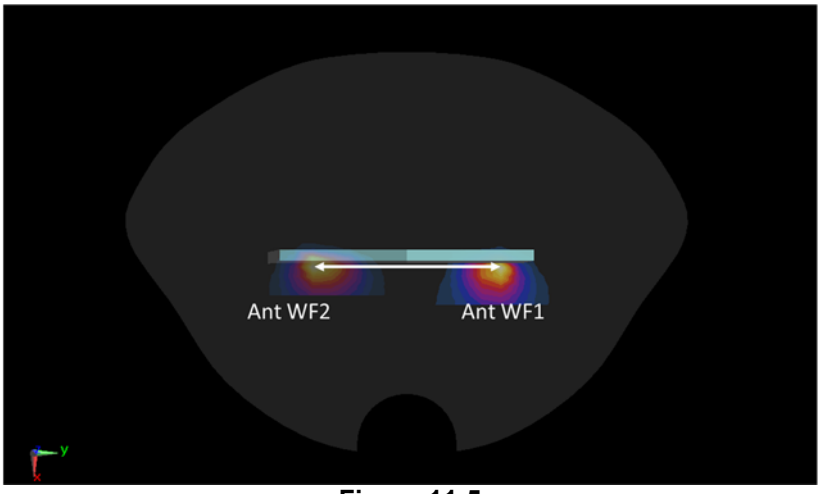


Figure 11-5
Bottom Edge Spatial Separation for Ant WF1 and Ant WF2

11.5 Simultaneous Transmission Conclusion

The above numerical summed SAR results and spatial separation analysis for all the worst-case simultaneous transmission conditions were below the SAR limit. Therefore, the above analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit and therefore no measured volumetric simultaneous SAR summation is required per FCC KDB Publication 447498 D01v06 and IEEE 1528-2013 Section 6.3.4.1.2.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

12 SAR MEASUREMENT VARIABILITY

12.1 Measurement Variability

Per FCC KDB Publication 865664 D01v01r04, SAR measurement variability was assessed for each frequency band, which was determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media were required for SAR measurements in a frequency band, the variability measurement procedures were applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. These additional measurements were repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device was returned to ambient conditions (normal room temperature) with the battery fully charged before it was re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

SAR Measurement Variability was assessed using the following procedures for each frequency band:

1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.
2) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1g SAR limit).
3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.
4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg

Table 12-1
Body SAR Measurement Variability Results

BODY VARIABILITY RESULTS																
Band	Component Carrier	FREQUENCY		Mode	Service	# of Time Slots	Data Rate (Mbps)	Side	Spacing	Measured SAR (1g)	1st Repeated SAR (1g)	Ratio	2nd Repeated SAR (1g)	Ratio	3rd Repeated SAR (1g)	Ratio
		MHz	Ch.							(W/kg)	(W/kg)		(W/kg)		(W/kg)	
750	N/A	707.50	23095	LTE Band 12, 10 MHz Bandwidth	QPSK, 25 RB, 0 RB Offset	N/A	N/A	back	0 mm	1.120	1.000	1.12	N/A	N/A	N/A	N/A
835	N/A	836.50	20525	LTE Band 5 (Cell), 10 MHz Bandwidth	QPSK, 25 RB, 25 RB Offset	N/A	N/A	back	0 mm	1.170	1.010	1.16	N/A	N/A	N/A	N/A
1750	N/A	1712.40	1312	UMTS 1750	RMC	N/A	N/A	back	0 mm	1.170	1.080	1.08	N/A	N/A	N/A	N/A
1900	N/A	1909.80	810	GSM 1900	GPRS	2	N/A	back	0 mm	1.120	1.120	1.00	N/A	N/A	N/A	N/A
2300	N/A	2310.00	27710	LTE Band 30, 10 MHz Bandwidth	QPSK, 50 RB, 0 RB Offset	N/A	N/A	back	0 mm	1.180	1.160	1.02	N/A	N/A	N/A	N/A
2600	PCC	2560.00	21350	LTE Band 7 ULCA, 20 MHz Bandwidth	QPSK, 50 RB, 0 RB Offset	N/A	N/A	back	0 mm	1.140	1.080	1.06	N/A	N/A	N/A	N/A
	SCC	2540.20	21152		QPSK, 50 RB, 50 RB Offset	N/A	N/A									
2450	N/A	2437.00	6	802.11b, 22 MHz Bandwidth	DSSS	N/A	1	back	0 mm	1.190	1.190	1.00	N/A	N/A	N/A	N/A
5250	N/A	5230.00	46	802.11n, 40 MHz Bandwidth	OFDM	N/A	13.5	bottom	0 mm	0.882	0.773	1.14	N/A	N/A	N/A	N/A
5600	N/A	5610.00	122	802.11ac, 80 MHz Bandwidth	OFDM	N/A	29.3	bottom	0 mm	0.988	0.918	1.08	N/A	N/A	N/A	N/A
5750	N/A	5775.00	155	802.11ac, 80 MHz Bandwidth	OFDM	N/A	29.3	bottom	0 mm	1.040	1.000	1.04	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram						

12.2 Measurement Uncertainty

The measured SAR was <1.5 W/kg for all frequency bands. Therefore, per KDB Publication 865664 D01v01r04, the extended measurement uncertainty analysis per IEEE 1528-2013 was not required.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

13 ADDITIONAL TESTING PER FCC GUIDANCE

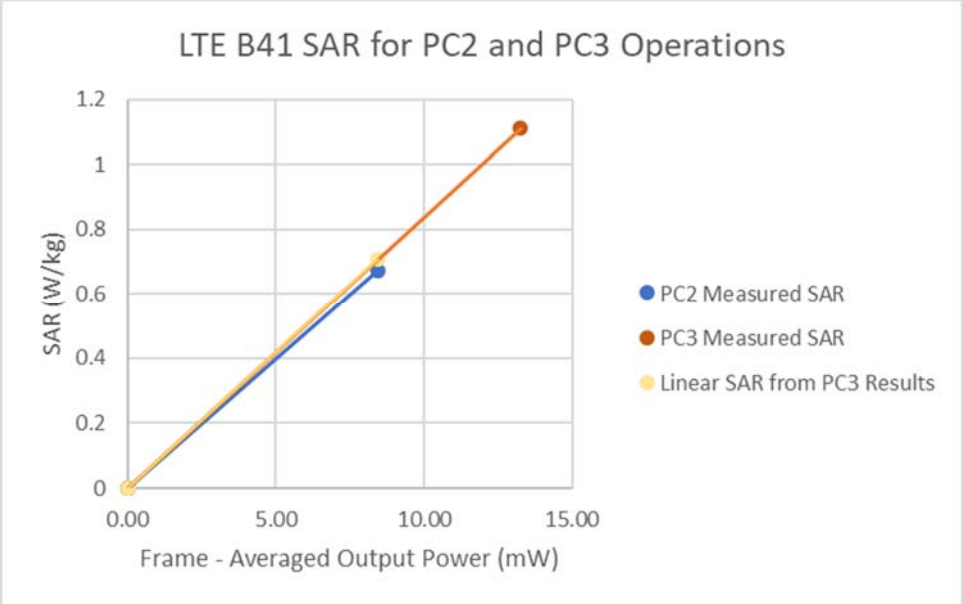
13.1 LTE Band 41 Power Class 2 and Power Class 3 Linearity

This device supports Power Class 2 and Power Class 3 operations for LTE Band 41. The highest available duty cycle for Power Class 2 operations is 43.3 % using UL-DL configuration 1. Per May 2017 TCB Workshop Notes based on the device behavior, all SAR tests were performed using Power Class 3. SAR with Power Class 2 at the highest power and available duty factor was additionally performed for the Power Class 3 configuration with the highest SAR for each exposure condition. The linearity between the Power Class 2 and Power Class 3 SAR results and the respective frame averaged powers was calculated to determine that the results were linear. Per May 2017 TCB Workshop, no additional SAR measurements were required since the linearity between power classes as < 10% and all reported SAR values were < 1.4 W/kg for 1g and < 3.5 W/kg for 10g.

LTE Band 41 SAR testing with power class 2 at the highest power and available duty factor was additionally performed for the power class 3 configuration with the highest SAR for each exposure condition.

Table 13-1
LTE Band 41 Body Linearity Data – Ant WF3

	LTE Band 41 PC3	LTE Band 41 PC2
Maximum Allowed Output Power (dBm)	13.5	13.5
Measured Output Power (dBm)	13.21	12.91
Measured SAR (W/kg)	1.11	0.673
Measured Power (mW)	20.94	19.54
Duty Cycle	63.3%	43.3%
Frame Averaged Output Power (mW)	13.26	8.46
% deviation from expected linearity		-5.03%

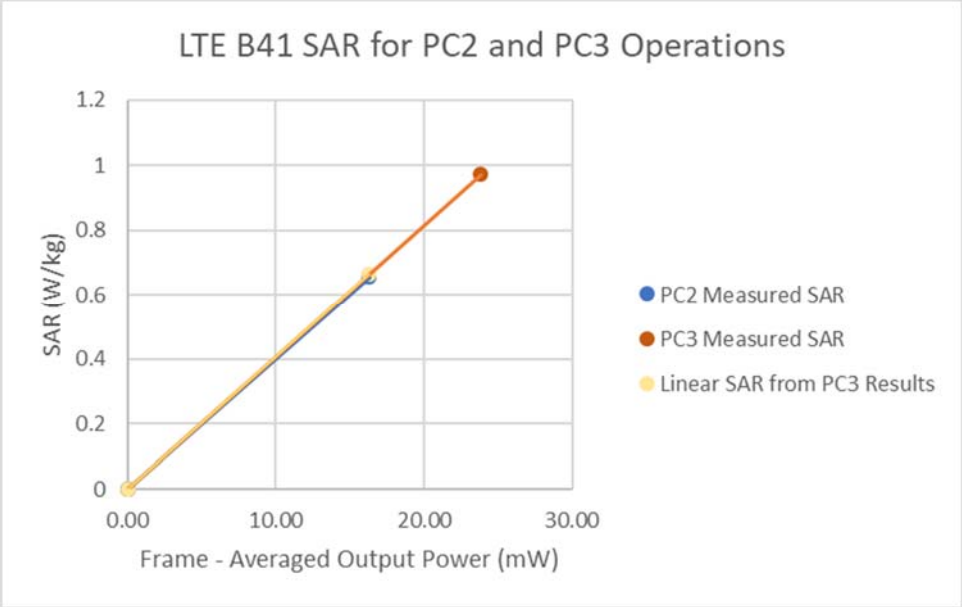


© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

Table 13-2
LTE Band 41 Body Linearity Data – Ant WF5

	LTE Band 41 PC3	LTE Band 41 PC2
Maximum Allowed Output Power (dBm)	16	16
Measured Output Power (dBm)	15.76	15.76
Measured SAR (W/kg)	0.972	0.655
Measured Power (mW)	37.67	37.67
Duty Cycle	63.3%	43.3%
Frame Averaged Output Power (mW)	23.85	16.31
% deviation from expected linearity		-1.49%



© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

14 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	85033E	3.5mm Standard Calibration Kit	8/13/2018	Annual	8/13/2019	MY53402352
Agilent	8753ES	S-Parameter Network Analyzer	10/2/2018	Annual	10/2/2019	US39170118
Agilent	8753ES	Network Analyzer	2/21/2018	Annual	2/21/2019	MY40001472
Agilent	E4438C	ESG Vector Signal Generator	6/22/2018	Annual	6/22/2019	MY53401181
Agilent	E4440A	PSA Series Spectrum Analyzer	11/14/2018	Annual	11/14/2019	MY46186272
Agilent	E5515C	Wireless Communications Test Set	2/28/2018	Biennial	2/28/2020	GB41450275
Agilent	N5182A	MXG Vector Signal Generator	6/15/2018	Annual	6/15/2019	MY47420837
Agilent	N9020A	MXA Signal Analyzer	1/24/2018	Annual	1/24/2019	US46470561
Amplifier Research	150A100C	Amplifier	CBT	N/A	CBT	350132
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	343972
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	343971
Anritsu	MA24106A	USB Power Sensor	7/17/2018	Annual	7/17/2019	1827527
Anritsu	MA24106A	USB Power Sensor	6/5/2018	Annual	6/5/2019	1248508
Anritsu	MA2411B	Pulse Power Sensor	10/30/2018	Annual	10/30/19	1207470
Anritsu	MA2411B	Pulse Power Sensor	11/20/2018	Annual	11/20/19	1339007
Anritsu	ML2495A	Power Meter	10/21/2018	Annual	10/21/19	941001
Anritsu	ML2496A	Power Meter	10/21/2018	Annual	10/21/19	1138001
Anritsu	MT8820C	Radio Communication Analyzer	6/27/2018	Annual	6/27/19	6201240328
Anritsu	MT8821C	Radio Communication Analyzer	3/20/2018	Annual	3/20/19	6201144419
Control Company	4040	Temperature / Humidity Monitor	2/28/2018	Biennial	2/28/2020	150761911
Control Company	4352	Ultra Long Stem Thermometer	6/6/2018	Biennial	6/6/2020	181334694
Control Company	4352	Ultra Long Stem Thermometer	5/21/2018	Biennial	5/21/2020	181292000
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
Mitutoyo	CD-6"CSX	Digital Caliper	4/18/2018	Biennial	4/18/2020	13264165
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Narda	BW-S3W2	Attenuator (3dB)	CBT	N/A	CBT	120
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE5011-1	Torque Wrench	7/19/2017	Biennial	7/19/2019	N/A
Rohde & Schwarz	CMW500	Radio Communication Tester	4/20/2018	Annual	4/20/2019	128635
Rohde& Schwarz	CMW500	Wideband Radio Communication Tester	7/6/2018	Annual	7/6/2019	151849
Rohde& Schwarz	CMW500	Wideband Radio Communication Tester	7/5/2018	Annual	7/5/2019	145663
SPEAG	D750V3	750 MHz SAR Dipole	5/18/2018	Annual	5/18/2019	1034
SPEAG	D750V3	750 MHz SAR Dipole	9/8/2017	Biennial	9/8/2019	1097
SPEAG	D850V2	850 MHz SAR Dipole	9/8/2017	Biennial	9/8/2019	1010
SPEAG	D835V2	835 MHz SAR Dipole	5/18/2018	Annual	5/18/2019	4d180
SPEAG	D835V2	835 MHz SAR Dipole	6/13/2017	Biennial	6/13/2019	4d040
SPEAG	D1750V2	1750 MHz SAR Dipole	9/7/2017	Biennial	9/7/2019	1104
SPEAG	D1900V2	1900 MHz SAR Dipole	5/14/2018	Annual	5/14/2019	5d026
SPEAG	D2300V2	2300 MHz SAR Dipole	3/7/2018	Annual	3/7/2019	1038
SPEAG	D2450V2	2450 MHz SAR Dipole	11/12/2018	Annual	11/12/2019	921
SPEAG	D2600V2	2600 MHz SAR Dipole	9/11/2017	Biennial	9/11/2019	1069
SPEAG	D5GHzV2	5 GHz SAR Dipole	9/13/2018	Annual	9/13/2019	1163
SPEAG	ES3DV3	SAR Probe	4/12/2018	Annual	4/12/2019	3275
SPEAG	ES3DV3	SAR Probe	3/13/2018	Annual	3/13/2019	3131
SPEAG	ES3DV3	SAR Probe	5/18/2018	Annual	5/18/2019	3119
SPEAG	ES3DV3	SAR Probe	2/13/2018	Annual	2/13/2019	3329
SPEAG	EX3DV4	SAR Probe	7/20/2018	Annual	7/20/2019	7416
SPEAG	EX3DV4	SAR Probe	9/18/2018	Annual	9/18/2019	7420
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/12/2018	Annual	4/12/2019	501
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/7/2018	Annual	3/7/2019	604
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/17/2018	Annual	5/17/2019	728
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/8/2018	Annual	2/8/2019	1403
SPEAG	DAE4	Dasy Data Acquisition Electronics	7/10/2018	Annual	7/10/2019	1402
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/12/2018	Annual	11/12/2019	1449
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/15/2018	Annual	5/15/2019	1070

Notes:

1. CBT (Calibrated Before Testing). Prior to testing, the measurement paths containing a cable, amplifier, attenuator, coupler or filter were connected to a calibrated source (i.e. a signal generator) to determine the losses of the measurement path. The power meter offset was then adjusted to compensate for the measurement system losses. This level offset is stored within the power meter before measurements are made. This calibration verification procedure applies to the system verification and output power measurements. The calibrated reading is then taken directly from the power meter after compensation of the losses for all final power measurements.
2. Each equipment item was used solely within its respective calibration period.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

15 MEASUREMENT UNCERTAINTIES

a	c	d	e= f(d,k)	f	g	h = c x f/e	i = c x g/e	k
Uncertainty Component	**Tol. (± %)**	**Prob. Dist.**	**Div.**	**c_i 1gm**	**c_i 10 gms**	**1gm u_i (± %)**	**10gms u_i (± %)**	**v_i**
Measurement System								
Probe Calibration	6.55	N	1	1.0	1.0	6.6	6.6	∞
Axial Isotropy	0.25	N	1	0.7	0.7	0.2	0.2	∞
Hemishperical Isotropy	1.3	N	1	0.7	0.7	0.9	0.9	∞
Boundary Effect	2.0	R	1.73	1.0	1.0	1.2	1.2	∞
Linearity	0.3	N	1	1.0	1.0	0.3	0.3	∞
System Detection Limits	0.25	R	1.73	1.0	1.0	0.1	0.1	∞
Readout Electronics	0.3	N	1	1.0	1.0	0.3	0.3	∞
Response Time	0.8	R	1.73	1.0	1.0	0.5	0.5	∞
Integration Time	2.6	R	1.73	1.0	1.0	1.5	1.5	∞
RF Ambient Conditions - Noise	3.0	R	1.73	1.0	1.0	1.7	1.7	∞
RF Ambient Conditions - Reflections	3.0	R	1.73	1.0	1.0	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	0.4	R	1.73	1.0	1.0	0.2	0.2	∞
Probe Positioning w/ respect to Phantom	6.7	R	1.73	1.0	1.0	3.9	3.9	∞
Extrapolation, Interpolation & Integration algorithms for Max. SAR Evaluation	4.0	R	1.73	1.0	1.0	2.3	2.3	∞
Test Sample Related								
Test Sample Positioning	2.7	N	1	1.0	1.0	2.7	2.7	35
Device Holder Uncertainty	1.67	N	1	1.0	1.0	1.7	1.7	5
Output Power Variation - SAR drift measurement	5.0	R	1.73	1.0	1.0	2.9	2.9	∞
SAR Scaling	0.0	R	1.73	1.0	1.0	0.0	0.0	∞
Phantom & Tissue Parameters								
Phantom Uncertainty (Shape & Thickness tolerances)	7.6	R	1.73	1.0	1.0	4.4	4.4	∞
Liquid Conductivity - measurement uncertainty	4.2	N	1	0.78	0.71	3.3	3.0	10
Liquid Permittivity - measurement uncertainty	4.1	N	1	0.23	0.26	1.0	1.1	10
Liquid Conductivity - Temperature Uncertainty	3.4	R	1.73	0.78	0.71	1.5	1.4	∞
Liquid Permittivity - Temperature Unceritainty	0.6	R	1.73	0.23	0.26	0.1	0.1	∞
Liquid Conductivity - deviation from target values	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Permittivity - deviation from target values	5.0	R	1.73	0.60	0.49	1.7	1.4	∞
Combined Standard Uncertainty (k=1)		RSS				11.5	11.3	60
Expanded Uncertainty (95% CONFIDENCE LEVEL)		k=2				23.0	22.6	

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

16 CONCLUSION

16.1 Measurement Conclusion

The SAR evaluation indicates that the EUT complies with the RF radiation exposure limits of the FCC and Innovation, Science, and Economic Development Canada, with respect to all parameters subject to this test. These measurements were taken to simulate the RF effects of RF exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The results and statements relate only to the item(s) tested.

Please note that the absorption and distribution of electromagnetic energy in the body are very complex phenomena that depend on the mass, shape, and size of the body, the orientation of the body with respect to the field vectors, and the electrical properties of both the body and the environment. Other variables that may play a substantial role in possible biological effects are those that characterize the environment (e.g. ambient temperature, air velocity, relative humidity, and body insulation) and those that characterize the individual (e.g. age, gender, activity level, debilitation, or disease). Because various factors may interact with one another to vary the specific biological outcome of an exposure to electromagnetic fields, any protection guide should consider maximal amplification of biological effects as a result of field-body interactions, environmental conditions, and physiological variables. [3]

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

17 REFERENCES

[1] Federal Communications Commission, ET Docket 93-62, Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation, Aug. 1996.

[2] ANSI/IEEE C95.1-2005, American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 3kHz to 300GHz, New York: IEEE, 2006.

[3] ANSI/IEEE C95.1-1992, American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 3kHz to 300GHz, New York: IEEE, Sept. 1992.

[4] ANSI/IEEE C95.3-2002, IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave, New York: IEEE, December 2002.

[5] IEEE Standards Coordinating Committee 39 –Standards Coordinating Committee 34 – IEEE Std. 1528-2013, IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques.

[6] NCRP, National Council on Radiation Protection and Measurements, Biological Effects and Exposure Criteria for RadioFrequency Electromagnetic Fields, NCRP Report No. 86, 1986. Reprinted Feb. 1995.

[7] T. Schmid, O. Egger, N. Kuster, Automated E-field scanning system for dosimetric assessments, IEEE Transaction on Microwave Theory and Techniques, vol. 44, Jan. 1996, pp. 105-113.

[8] K. Pokovic, T. Schmid, N. Kuster, Robust setup for precise calibration of E-field probes in tissue simulating liquids at mobile communications frequencies, ICECOM97, Oct. 1997, pp. 1 -124.

[9] K. Pokovic, T. Schmid, and N. Kuster, E-field Probe with improved isotropy in brain simulating liquids, Proceedings of the ELMAR, Zadar, Croatia, June 23-25, 1996, pp. 172-175.

[10] Schmid & Partner Engineering AG, Application Note: Data Storage and Evaluation, June 1998, p2.

[11] V. Hombach, K. Meier, M. Burkhardt, E. Kuhn, N. Kuster, The Dependence of EM Energy Absorption upon Human Modeling at 900 MHz, IEEE Transaction on Microwave Theory and Techniques, vol. 44 no. 10, Oct. 1996, pp. 1865-1873.

[12] N. Kuster and Q. Balzano, Energy absorption mechanism by biological bodies in the near field of dipole antennas above 300MHz, IEEE Transaction on Vehicular Technology, vol. 41, no. 1, Feb. 1992, pp. 17-23.

[13] G. Hartsgrove, A. Kraszewski, A. Surowiec, Simulated Biological Materials for Electromagnetic Radiation Absorption Studies, University of Ottawa, Bioelectromagnetics, Canada: 1987, pp. 29-36.

[14] Q. Balzano, O. Garay, T. Manning Jr., Electromagnetic Energy Exposure of Simulated Users of Portable Cellular Telephones, IEEE Transactions on Vehicular Technology, vol. 44, no.3, Aug. 1995.

[15] W. Gander, Computermathematick, Birkhaeuser, Basel, 1992.

[16] W.H. Press, S.A. Teukolsky, W.T. Vetterling, and B.P. Flannery, Numerical Recipes in C, The Art of Scientific Computing, Second edition, Cambridge University Press, 1992.

[17] N. Kuster, R. Kastle, T. Schmid, Dosimetric evaluation of mobile communications equipment with known precision, IEEE Transaction on Communications, vol. E80-B, no. 5, May 1997, pp. 645-652.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

[18] CENELEC CLC/SC111B, European Prestandard (prENV 50166-2), Human Exposure to Electromagnetic Fields High-frequency: 10kHz-300GHz, Jan. 1995.

[19] Prof. Dr. Niels Kuster, ETH, Eidgenössische Technische Hoschschule Zürich, Dosimetric Evaluation of the Cellular Phone.

[20] IEC 62209-1, Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Part 1: Devices used next to the ear (Frequency range of 300 MHz to 6 GHz), July 2016.

[21] Innovation, Science, Economic Development Canada RSS-102 Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands) Issue 5, March 2015.

[22] Health Canada Safety Code 6 Limits of Human Exposure to Radio Frequency Electromagnetic Fields in the Frequency Range from 3 kHz – 300 GHz, 2015

[23] FCC SAR Test Procedures for 2G-3G Devices, Mobile Hotspot and UMPC Devices KDB Publications 941225, D01-D07

[24] SAR Measurement Guidance for IEEE 802.11 Transmitters, KDB Publication 248227 D01

[25] FCC SAR Considerations for Handsets with Multiple Transmitters and Antennas, KDB Publications 648474 D03-D04

[26] FCC SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers, FCC KDB Publication 616217 D04

[27] FCC SAR Measurement and Reporting Requirements for 100MHz – 6 GHz, KDB Publications 865664 D01-D02

[28] FCC General RF Exposure Guidance and SAR Procedures for Dongles, KDB Publication 447498, D01-D02

[29] Anexo à Resolução No. 533, de 10 de Septembro de 2009.

[30] IEC 62209-2, Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Human models, instrumentation, and procedures - Part 2: Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz), Mar. 2010.

© 2019 PCTEST Engineering Laboratory, Inc.

© 2019 PCTEST Engineering Laboratory, Inc. All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

APPENDIX A: SAR TEST DATA

© 2019 PCTEST Engineering Laboratory, Inc.

PCTEST ENGINEERING LABORATORY, INC.

DUT: BCGA2124; Type: Tablet Device; Serial: DLXXT022LQK9

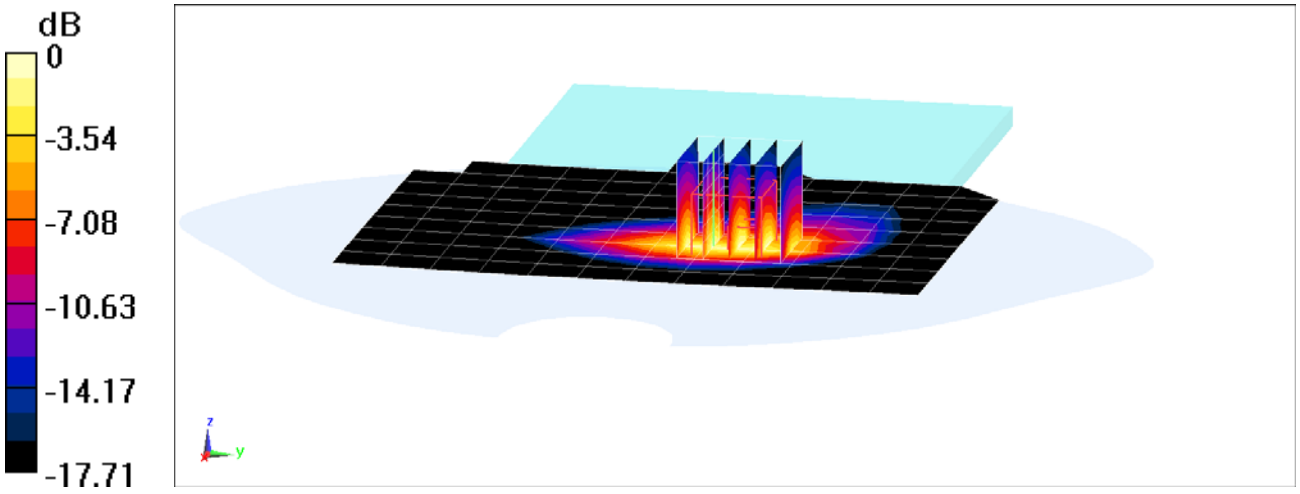
Communication System: UID 0, GSM GPRS; 2 Tx slots; Frequency: 824.2 MHz; Duty Cycle: 1:4.15
Medium: 835 Body; Medium parameters used (interpolated):
f = 824.2 MHz; σ = 1 S/m; ε_r = 52.643; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-22-2019; Ambient Temp: 23.5°C; Tissue Temp: 20.5°C

Probe: ES3DV3 - SN3131; ConvF(6.14, 6.14, 6.14) @ 824.2 MHz; Calibrated: 3/13/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn604; Calibrated: 3/7/2018
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

Mode: GPRS 850, Body SAR, Back side, Low.ch, 2 Tx Slots, Antenna WF3

Area Scan (11x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 32.49 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 2.71 W/kg
SAR(1 g) = 1.01 W/kg; SAR(10 g) = 0.474 W/kg



0 dB = 1.23 W/kg = 0.90 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: BCGA2124; Type: Tablet Device; Serial: DLXXT01YLQK8

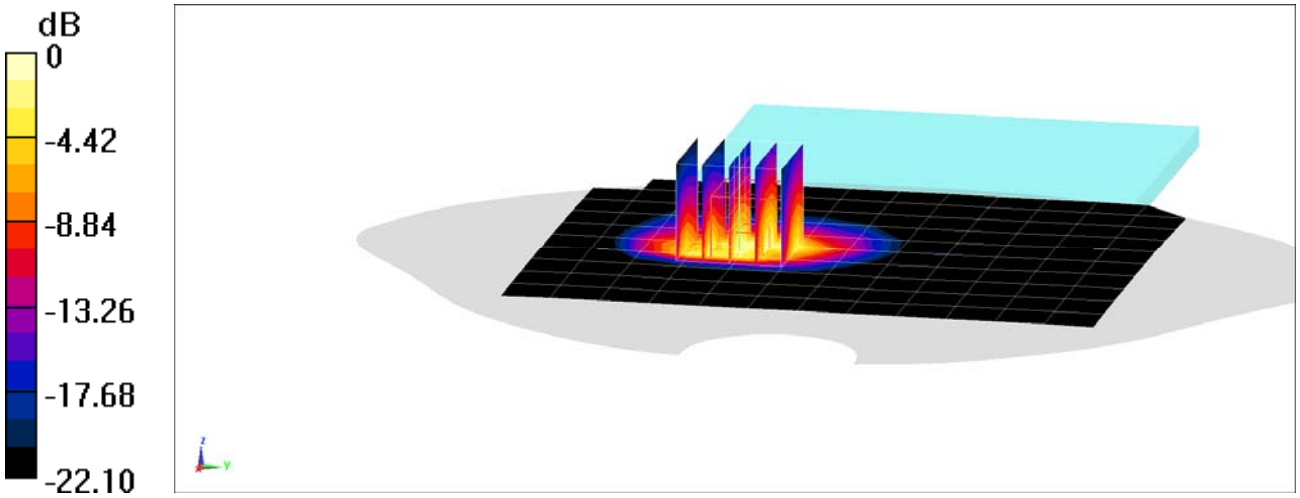
Communication System: UID 0, GSM GPRS; 2 Tx slots; Frequency: 1909.8 MHz; Duty Cycle: 1:4.15
Medium: 1900 Body; Medium parameters used:
f = 1910 MHz; σ = 1.595 S/m; ε_r = 50.762; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-27-2019; Ambient Temp: 21.1°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3119; ConvF(4.65, 4.65, 4.65) @ 1909.8 MHz; Calibrated: 5/18/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn728; Calibrated: 5/17/2018
Phantom: Twin-SAM V4.0; Type: QD 000 P40 CC; Serial: 1179
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

Mode: GPRS 1900, Body SAR, Back side, High.ch, 2 Tx Slots, Antenna WF5

Area Scan (11x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.30 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 2.32 W/kg
SAR(1 g) = 1.12 W/kg; SAR(10 g) = 0.504 W/kg



0 dB = 1.51 W/kg = 1.79 dBW/kg

DUT: BCGA2124; Type: Tablet Device; Serial: DLXXT023LQK9

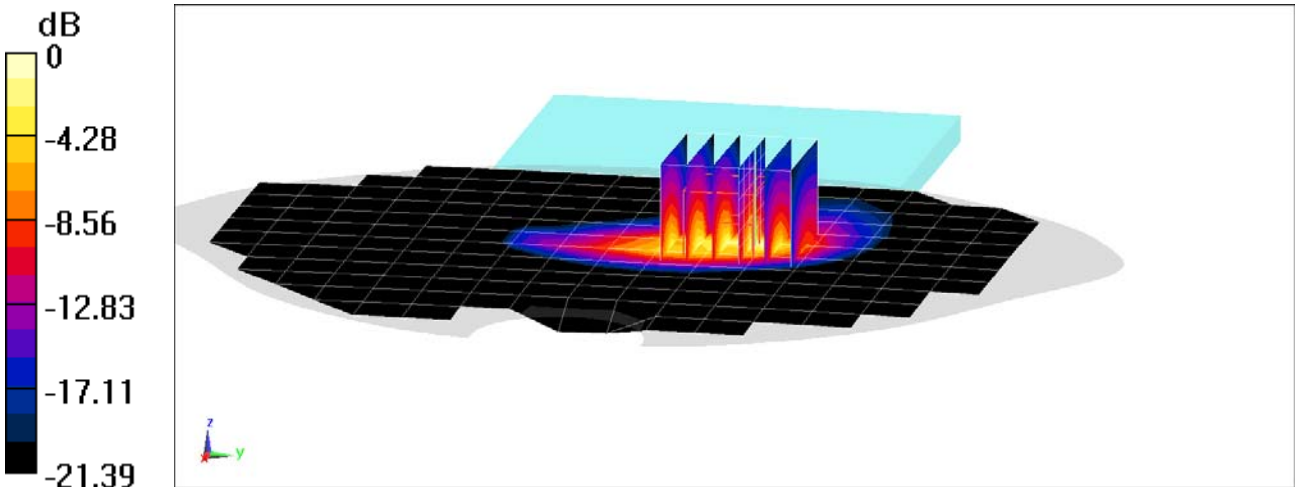
Communication System: UID 0, _UMTS; Frequency: 826.4 MHz; Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
f = 826.4 MHz; σ = 1.011 S/m; ε_r = 52.779; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-29-2019; Ambient Temp: 21.4°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3131; ConvF(6.14, 6.14, 6.14) @ 826.4 MHz; Calibrated: 3/13/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn604; Calibrated: 3/7/2018
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

Mode: UMTS 850, Body SAR, Back side, Low.ch, Antenna WF3

Area Scan (15x19x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 36.22 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 3.14 W/kg
SAR(1 g) = 1.16 W/kg; SAR(10 g) = 0.544 W/kg



0 dB = 2.37 W/kg = 3.75 dBW/kg

DUT: BCGA2124; Type: Tablet Device; Serial: DLXXT01ULQK8

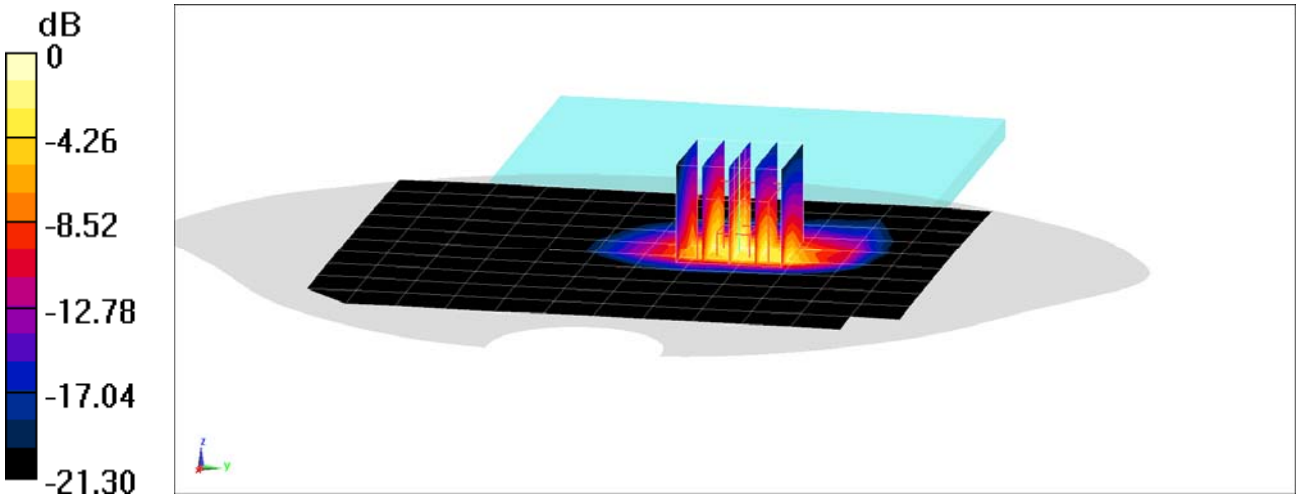
Communication System: UID 0, UMTS; Frequency: 1712.4 MHz; Duty Cycle: 1:1
Medium: 1750 Body; Medium parameters used (interpolated):
f = 1712.4 MHz; σ = 1.455 S/m; ε_r = 51.216; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-23-2019; Ambient Temp: 22.3°C; Tissue Temp: 20.9°C

Probe: ES3DV3 - SN3119; ConvF(4.87, 4.87, 4.87) @ 1712.4 MHz; Calibrated: 5/18/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn728; Calibrated: 5/17/2018
Phantom: Twin-SAM V4.0; Type: QD 000 P40 CC; Serial: 1179
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

Mode: UMTS 1750, Body SAR, Back side, Low.ch, Antenna WF3

Area Scan (11x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 31.33 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 2.33 W/kg
SAR(1 g) = 1.17 W/kg; SAR(10 g) = 0.528 W/kg



0 dB = 1.62 W/kg = 2.10 dBW/kg

DUT: BCGA2124; Type: Tablet Device; Serial: DLXXT01YLQK8

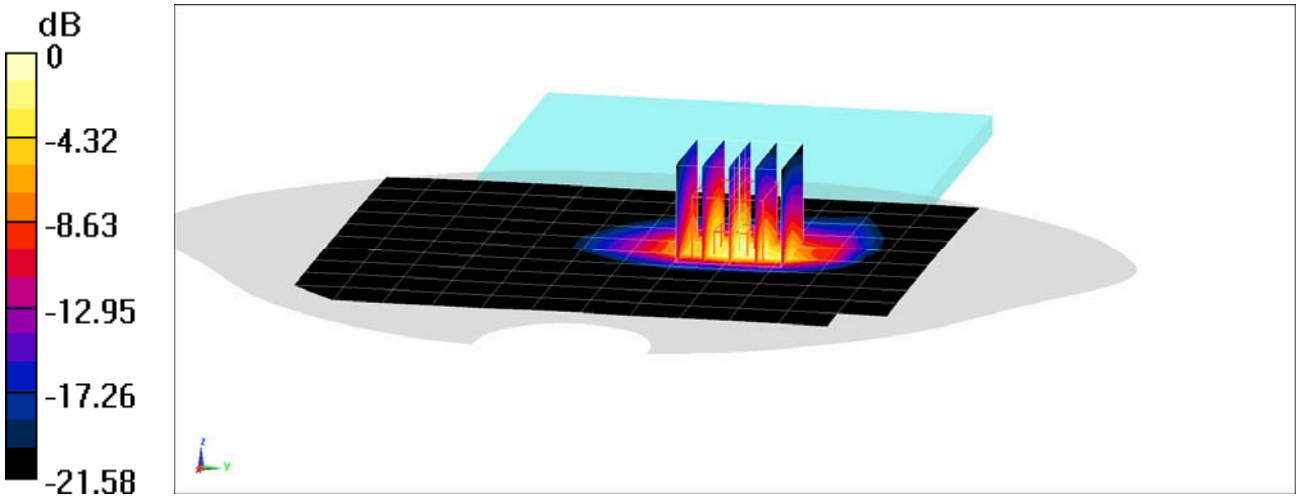
Communication System: UID 0, UMTS; Frequency: 1907.6 MHz; Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used (interpolated):
f = 1907.6 MHz; σ = 1.584 S/m; ε_r = 50.676; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-25-2019; Ambient Temp: 23.3°C; Tissue Temp: 22.3°C

Probe: ES3DV3 - SN3119; ConvF(4.65, 4.65, 4.65) @ 1907.6 MHz; Calibrated: 5/18/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn728; Calibrated: 5/17/2018
Phantom: Twin-SAM V4.0; Type: QD 000 P40 CC; Serial: 1179
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

Mode: UMTS 1900, Body SAR, Back side, High.ch, Antenna WF3

Area Scan (11x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.89 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 2.02 W/kg
SAR(1 g) = 0.991 W/kg; SAR(10 g) = 0.441 W/kg



0 dB = 1.37 W/kg = 1.37 dBW/kg

DUT: BCGA2124; Type: Tablet Device; Serial: DLXXT022LQK9

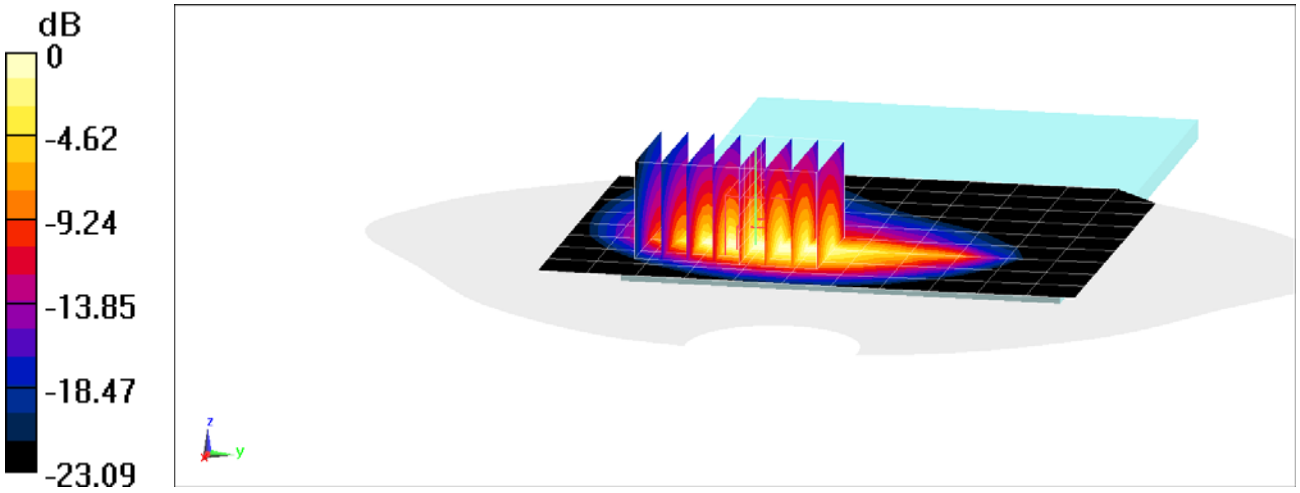
Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1
Medium: 750 Body; Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.961 S/m; ε_r = 53.095; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-21-2019; Ambient Temp: 22.3°C; Tissue Temp: 19.4°C

Probe: ES3DV3 - SN3275; ConvF(6.34, 6.34, 6.34) @ 707.5 MHz; Calibrated: 4/12/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn501; Calibrated: 4/12/2018
Phantom: Twin-SAM V4.0; Type: QD 000 P40 CD; Serial: 1736
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 12, Body SAR, Back side, Mid.ch,
10 MHz Bandwidth, QPSK, 25 RB, 0 RB Offset, Antenna WF5

Area Scan (10x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x8x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 35.03 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 3.12 W/kg
SAR(1 g) = 1.12 W/kg; SAR(10 g) = 0.538 W/kg



0 dB = 1.52 W/kg = 1.82 dBW/kg

DUT: BCGA2124; Type: Tablet Device; Serial: DLXXT023LQK9

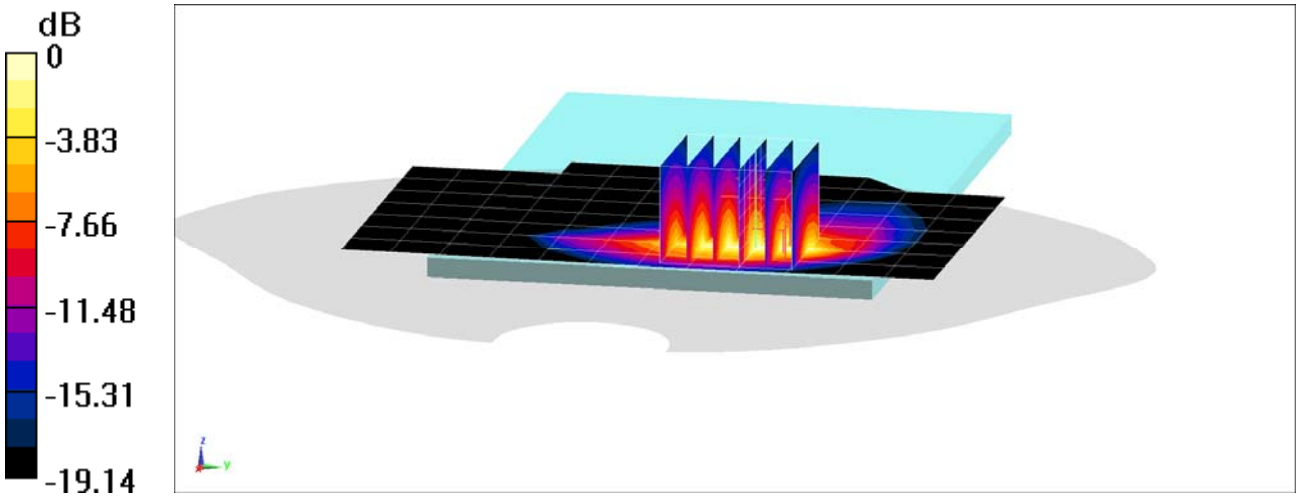
Communication System: UID 0, _LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1
Medium: 750 Body; Medium parameters used (interpolated):
f = 782 MHz; σ = 0.998 S/m; ε_r = 53.116; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-23-2019; Ambient Temp: 23.5°C; Tissue Temp: 20.6°C

Probe: ES3DV3 - SN3275; ConvF(6.34, 6.34, 6.34) @ 782 MHz; Calibrated: 4/12/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn501; Calibrated: 4/12/2018
Phantom: Twin-SAM V4.0; Type: QD 000 P40 CD; Serial: 1736
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 13, Body SAR, Back side,
Mid.ch, 10 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset, Antenna WF3

Area Scan (10x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 32.95 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 2.84 W/kg
SAR(1 g) = 0.994 W/kg; SAR(10 g) = 0.442 W/kg



0 dB = 1.31 W/kg = 1.17 dBW/kg

DUT: BCGA2124; Type: Tablet Device; Serial: DLXXT023LQK9

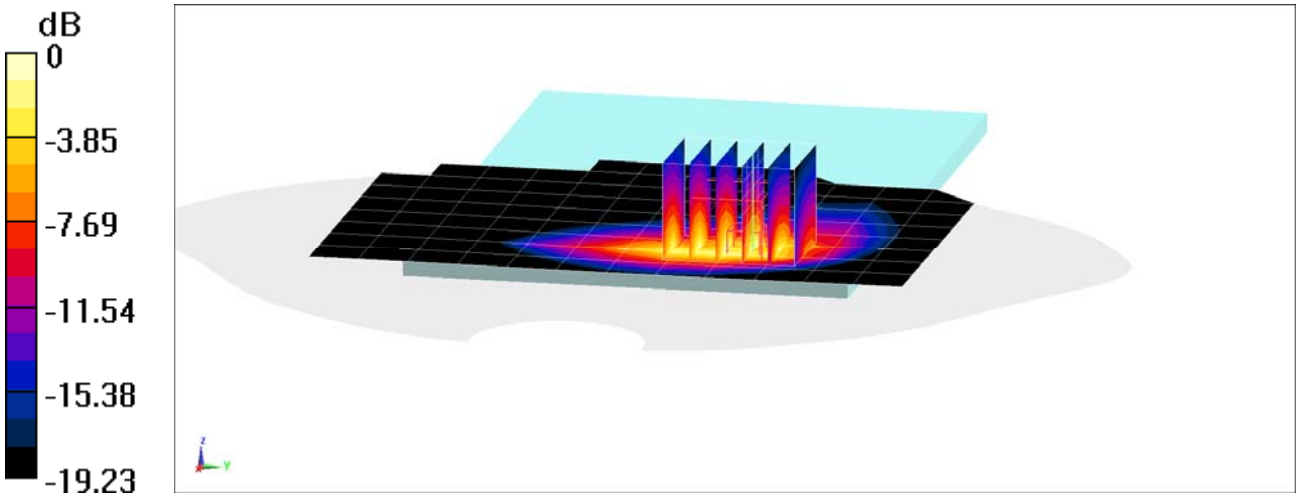
Communication System: UID 0, LTE Band 14; Frequency: 793 MHz; Duty Cycle: 1:1
Medium: 750 Body; Medium parameters used (interpolated):
f = 793 MHz; σ = 1.002 S/m; ε_r = 53.094; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-23-2019; Ambient Temp: 23.5°C; Tissue Temp: 20.6°C

Probe: ES3DV3 - SN3275; ConvF(6.34, 6.34, 6.34) @ 793 MHz; Calibrated: 4/12/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn501; Calibrated: 4/12/2018
Phantom: Twin-SAM V4.0; Type: QD 000 P40 CD; Serial: 1736
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 14, Body SAR, Back side, Mid.ch,
10 MHz Bandwidth, QPSK, 25 RB, 0 RB Offset, Antenna WF3

Area Scan (10x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 30.54 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 2.63 W/kg
SAR(1 g) = 0.886 W/kg; SAR(10 g) = 0.391 W/kg



0 dB = 1.16 W/kg = 0.64 dBW/kg

DUT: BCGA2124; Type: Tablet Device; Serial: DLXXT023LQK9

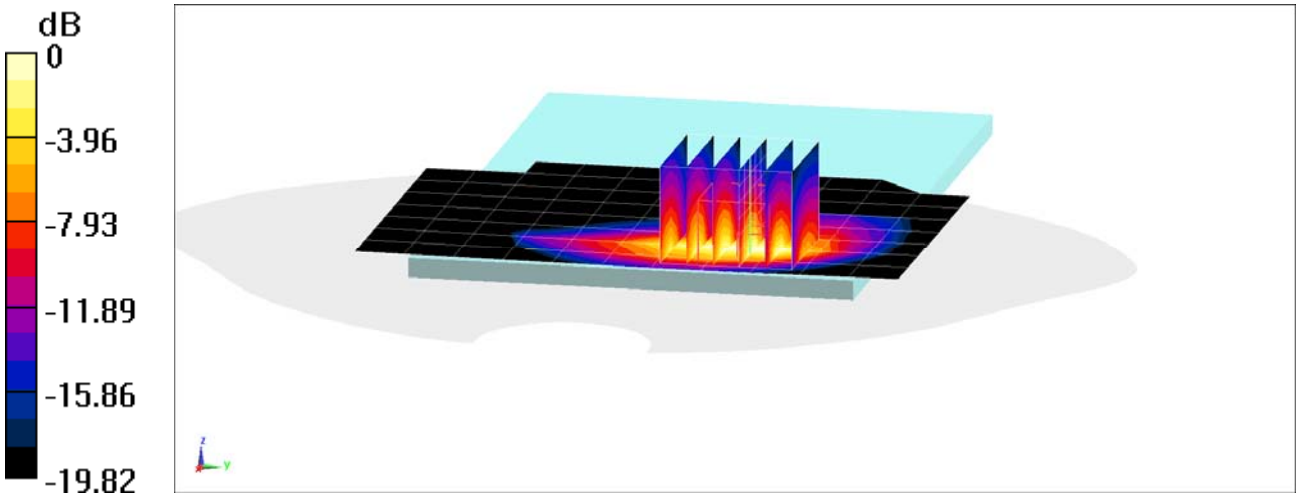
Communication System: UID 0, LTE Band 5; Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
$f = 836.5$ MHz; $\sigma = 1.015$ S/m; $\varepsilon_r = 52.806$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-30-2019; Ambient Temp: 23.1°C; Tissue Temp: 20.6°C

Probe: ES3DV3 - SN3275; ConvF(6.16, 6.16, 6.16) @ 836.5 MHz; Calibrated: 4/12/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn501; Calibrated: 4/12/2018
Phantom: Twin-SAM V4.0; Type: QD 000 P40 CD; Serial: 1736
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 5 (Cell.), Body SAR, Back side, Mid.ch,
10 MHz Bandwidth, QPSK, 25 RB, 25 RB Offset, Antenna WF3

Area Scan (10x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 38.60 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 3.81 W/kg
SAR(1 g) = 1.17 W/kg; SAR(10 g) = 0.494 W/kg



0 dB = 1.32 W/kg = 1.21 dBW/kg

DUT: BCGA2124; Type: Tablet Device; Serial: DLXXT023LQK9

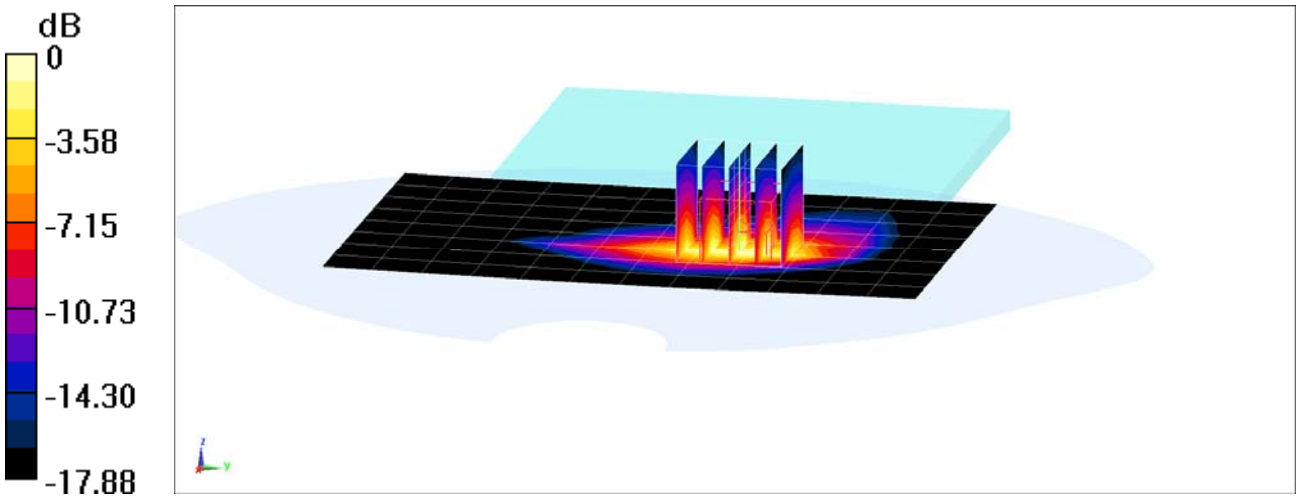
Communication System: UID 0, _LTE Band 26; Frequency: 819 MHz; Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
f = 819 MHz; σ = 0.963 S/m; ε_r = 53.434; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 02-01-2019; Ambient Temp: 20.2°C; Tissue Temp: 20.0°C

Probe: ES3DV3 - SN3131; ConvF(6.14, 6.14, 6.14) @ 819 MHz; Calibrated: 3/13/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn604; Calibrated: 3/7/2018
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 26 (Cell.), Body SAR, Back side, Low.ch,
10 MHz Bandwidth, QPSK, 50 RB, 0 RB Offset, Antenna WF3

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 33.11 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 3.09 W/kg
SAR(1 g) = 1.04 W/kg; SAR(10 g) = 0.455 W/kg



0 dB = 1.28 W/kg = 1.07 dBW/kg

DUT: BCGA2124; Type: Tablet Device; Serial: DLXXT01ULQK8

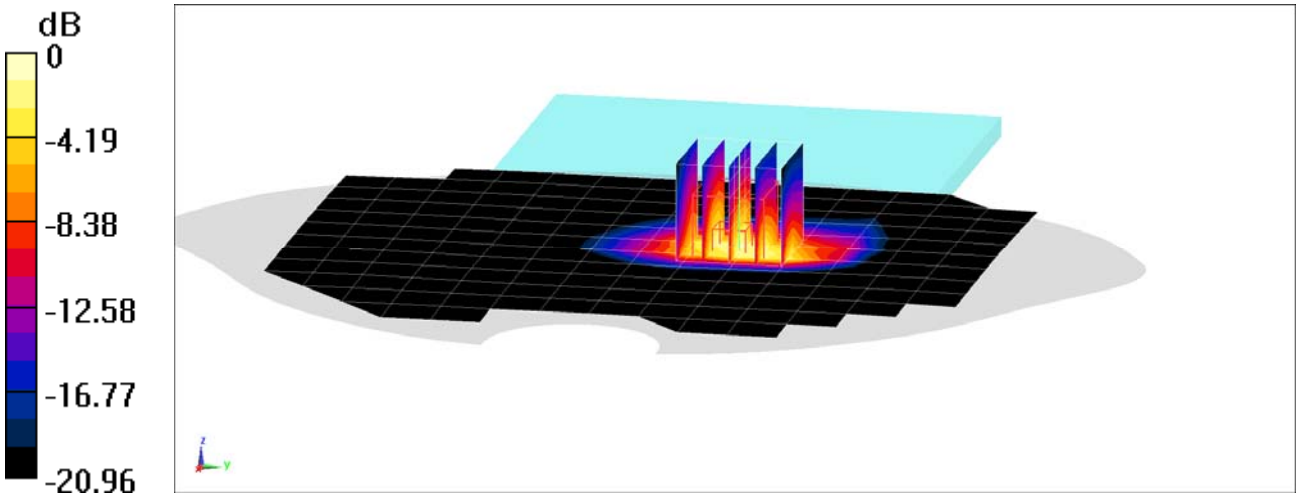
Communication System: UID 0, _LTE Band 66 (AWS); Frequency: 1720 MHz; Duty Cycle: 1:1
Medium: 1750 Body; Medium parameters used (interpolated):
f = 1720 MHz; σ = 1.462 S/m; ε_r = 51.198; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-23-2019; Ambient Temp: 22.3°C; Tissue Temp: 20.9°C

Probe: ES3DV3 - SN3119; ConvF(4.87, 4.87, 4.87) @ 1720 MHz; Calibrated: 5/18/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn728; Calibrated: 5/17/2018
Phantom: Twin-SAM V4.0; Type: QD 000 P40 CC; Serial: 1179
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 66 (AWS), Body SAR, Back side, Low.ch,
20 MHz Bandwidth, QPSK, 100 RB, 0 RB Offset, Antenna WF3

Area Scan (13x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.80 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 2.21 W/kg
SAR(1 g) = 1.13 W/kg; SAR(10 g) = 0.514 W/kg



0 dB = 1.45 W/kg = 1.61 dBW/kg

DUT: BCGA2124; Type: Tablet Device; Serial: DLXXT02NLQK8

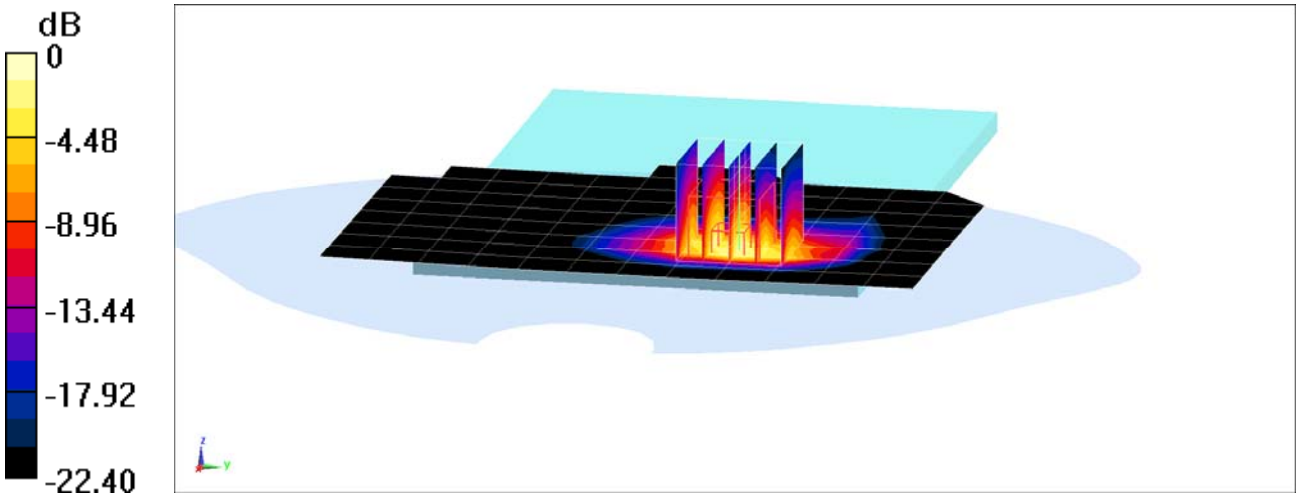
Communication System: UID 0, _LTE Band 25 (PCS); Frequency: 1905 MHz; Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used (interpolated):
f = 1905 MHz; σ = 1.588 S/m; ε_r = 50.913; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-24-2019; Ambient Temp: 23.5°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3131; ConvF(4.8, 4.8, 4.8) @ 1905 MHz; Calibrated: 3/13/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn604; Calibrated: 3/7/2018
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 25 (PCS), Body SAR, Back side, High.ch,
20 MHz Bandwidth, QPSK, 100 RB, 0 RB Offset, Antenna WF3

Area Scan (10x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.30 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 2.19 W/kg
SAR(1 g) = 1.06 W/kg; SAR(10 g) = 0.475 W/kg



0 dB = 1.43 W/kg = 1.55 dBW/kg

DUT: BCGA2124; Type: Tablet Device; Serial: DLXXT03NLQK8

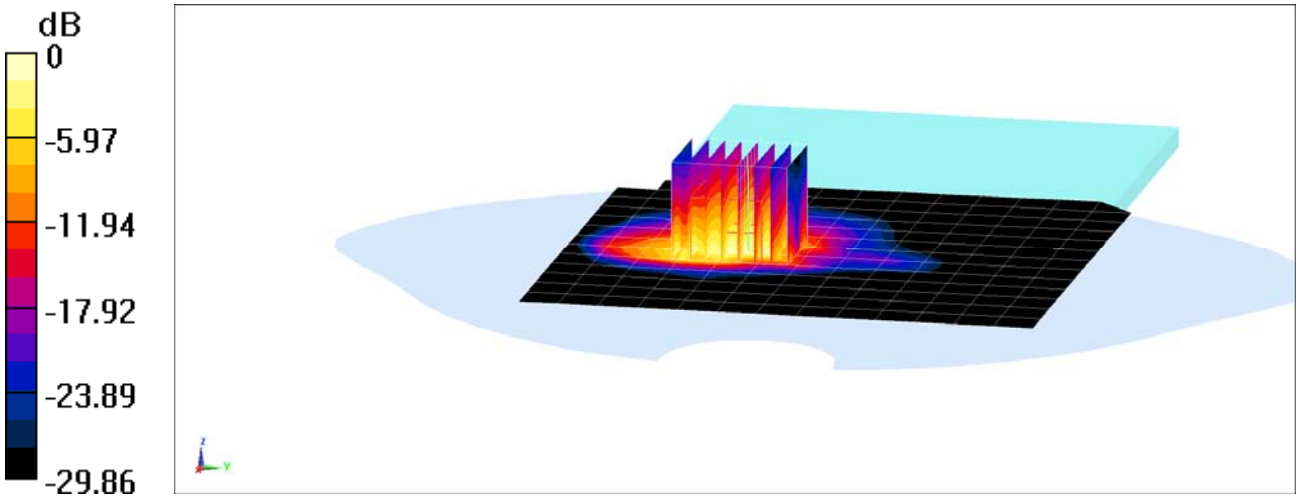
Communication System: UID 0, LTE Band 30; Frequency: 2310 MHz; Duty Cycle: 1:1
Medium: 2300 Body; Medium parameters used:
f = 2310 MHz; σ = 1.764 S/m; ε_r = 53.846; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-20-2019; Ambient Temp: 22.2°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3329; ConvF(4.6, 4.6, 4.6) @ 2310 MHz; Calibrated: 2/13/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1403; Calibrated: 2/8/2018
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 30, Body SAR, Back side, Mid.ch,
10 MHz Bandwidth, QPSK, 50 RB, 0 RB Offset, Antenna WF5

Area Scan (18x14x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 29.69 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 3.14 W/kg
SAR(1 g) = 1.18 W/kg; SAR(10 g) = 0.485 W/kg



0 dB = 1.77 W/kg = 2.48 dBW/kg

DUT: BCGA2124; Type: Tablet Device; Serial: DLXXT01ELQK9

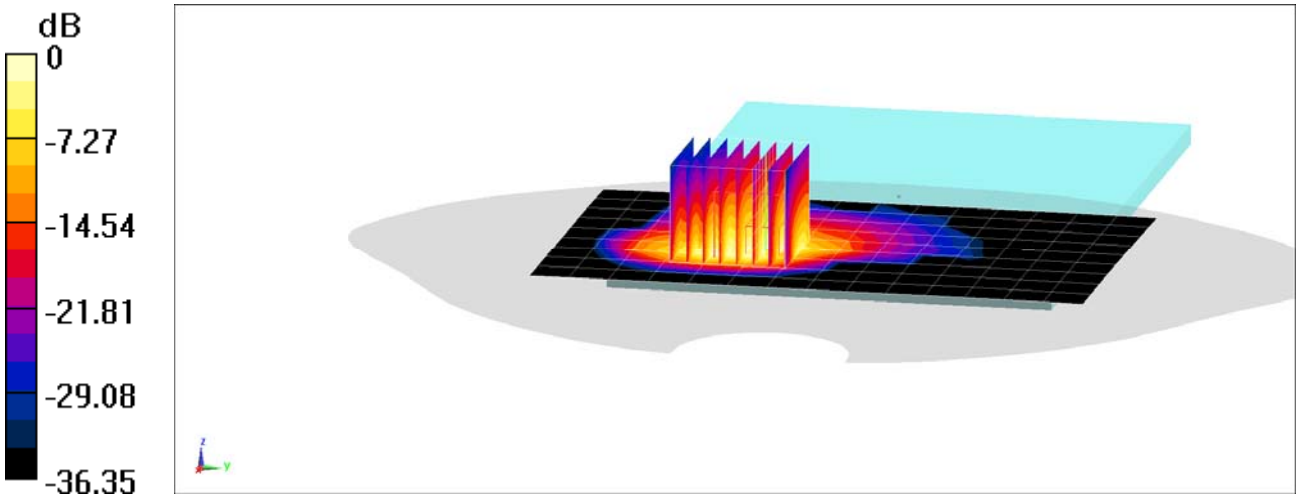
Communication System: UID 0, LTE Band 7; Frequency: 2560 MHz; Duty Cycle: 1:1
Medium: 2400 Body; Medium parameters used (interpolated):
f = 2560 MHz; σ = 2.129 S/m; ε_r = 50.135; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-23-2019; Ambient Temp: 23.3°C; Tissue Temp: 20.6 °C

Probe: EX3DV4 - SN7416;, ConvF(7.23, 7.23, 7.23) @ 2560 MHz; Calibrated: 7/20/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1402; Calibrated: 7/10/2018
Phantom: Twin-SAM V4.0; Type: QD 000 P40 CA; Serial: 1275
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 7 ULCA, Body SAR, Back side, High.ch, Antenna WF5
PCC: 20 MHz Bandwidth, QPSK, Ch.21350, 50 RB, 0 RB Offset
SCC: 20 MHz Bandwidth, QPSK, Ch.21152, 50 RB, 50 RB Offset

Area Scan (10x15x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 24.13 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 3.37 W/kg
SAR(1 g) = 1.14 W/kg; SAR(10 g) = 0.479 W/kg



0 dB = 2.43 W/kg = 3.86 dBW/kg

DUT: BCGA2124; Type: Tablet Device; Serial: DLXXT02NLQK8

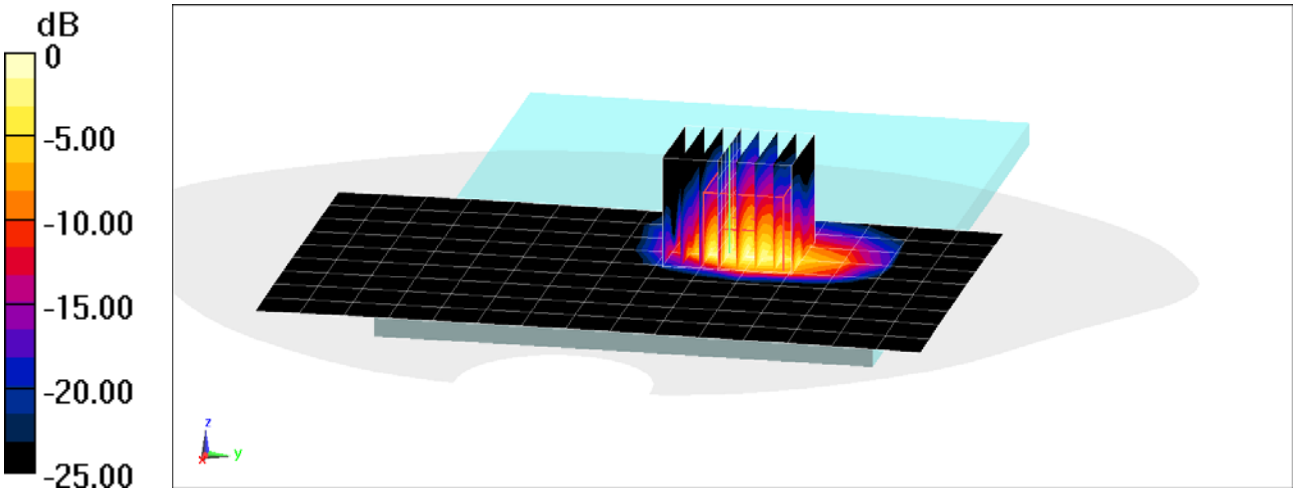
Communication System: UID 0, LTE Band 41; Frequency: 2636.5 MHz; Duty Cycle: 1:1.58
Medium: 2400 Body; Medium parameters used (interpolated):
f = 2636.5 MHz; σ = 2.209 S/m; ε_r = 50.003; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-16-2019; Ambient Temp: 22.9°C; Tissue Temp: 21.3 °C

Probe: EX3DV4 - SN7416; ConvF(7.23, 7.23, 7.23) @ 2636.5 MHz; Calibrated: 7/20/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1402; Calibrated: 7/10/2018
Phantom: Twin-SAM V4.0; Type: QD 000 P40 CA; Serial: 1275
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 41, Body SAR, Back side, Mid-High.ch,
20 MHz Bandwidth, QPSK, 50 RB, 0 RB Offset, Antenna WF3

Area Scan (10x16x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 24.07 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 3.31 W/kg
SAR(1 g) = 1.11 W/kg; SAR(10 g) = 0.450 W/kg



0 dB = 2.37 W/kg = 3.75 dBW/kg

DUT: BCGA2124; Type: Tablet Device; Serial: DLXXT020LQK9

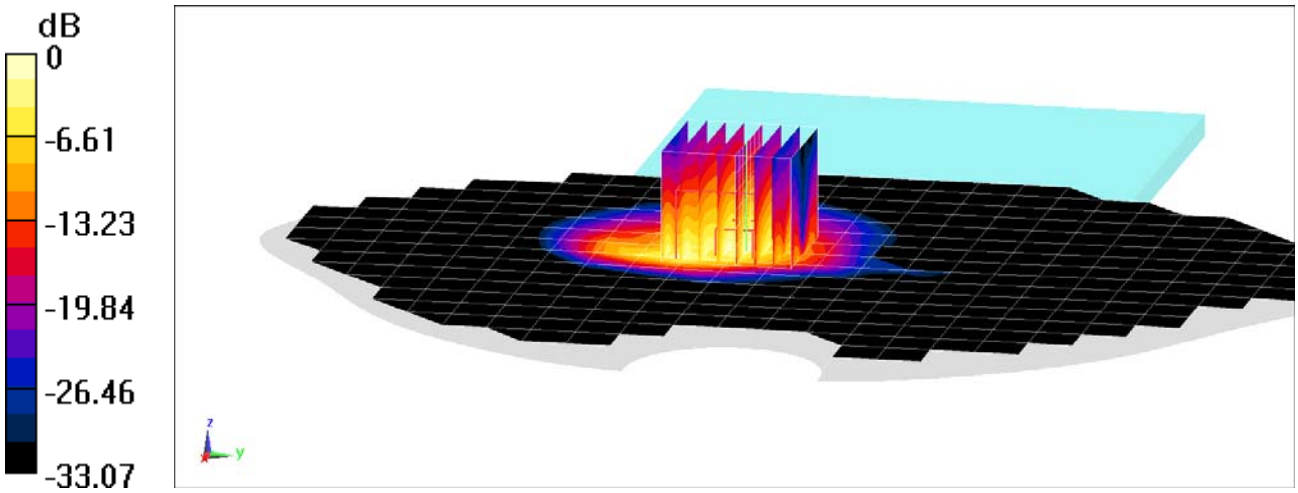
Communication System: UID 0, _IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: 2400 Body; Medium parameters used (interpolated):
f = 2437 MHz; σ = 2.016 S/m; ε_r = 50.771; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-14-2019; Ambient Temp: 21.6°C; Tissue Temp: 20.5°C

Probe: ES3DV3 - SN3275; ConvF(4.57, 4.57, 4.57) @ 2437 MHz; Calibrated: 4/12/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn501; Calibrated: 4/12/2018
Phantom: Twin-SAM V4.0; Type: QD 000 P40 CD; Serial: 1736
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

Mode: IEEE 802.11b, 22 MHz Bandwidth, Body SAR, Ch 6, 1 Mbps, Back Side, Antenna WF5, Variant 2

Area Scan (15x19x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 26.78 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 3.11 W/kg
SAR(1 g) = 1.19 W/kg; SAR(10 g) = 0.470 W/kg



0 dB = 1.74 W/kg = 2.41 dBW/kg

DUT: BCGA2124; Type: Tablet Device; Serial: DLXXT03SLQK8

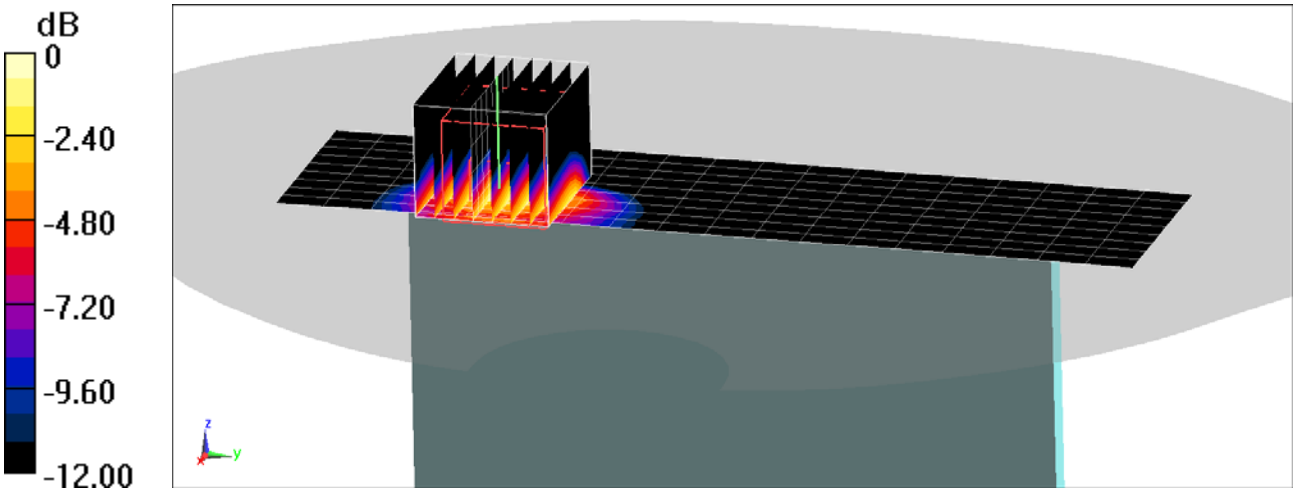
Communication System: UID 0, 802.11ac 5.2-5.8 GHz Band; Frequency: 5775 MHz; Duty Cycle: 1:1
Medium: 5GHz Body; Medium parameters used (interpolated):
f = 5775 MHz; σ = 6.233 S/m; ε_r = 46.162; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-16-2019; Ambient Temp: 21.2°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7420; ConvF(4.36, 4.36, 4.36) @ 5775 MHz; Calibrated: 9/18/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1449; Calibrated: 11/12/2018
Phantom: Twin-SAM V4.0; Type: QD 000 P40 CC; Serial: 1596
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

Mode: IEEE 802.11ac, U-NII-3, 80 MHz Bandwidth, Body SAR, Ch 155, 29.3 Mbps, Bottom Edge, Antenna WF2, Variant 2

Area Scan (10x19x1): Measurement grid: dx=5mm, dy=10mm
Zoom Scan (9x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 13.62 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 4.97 W/kg
SAR(1 g) = 1.04 W/kg; SAR(10 g) = 0.357 W/kg



0 dB = 2.56 W/kg = 4.08 dBW/kg

DUT: BCGA2124; Type: Tablet Device; Serial: DLXXT020LQK9

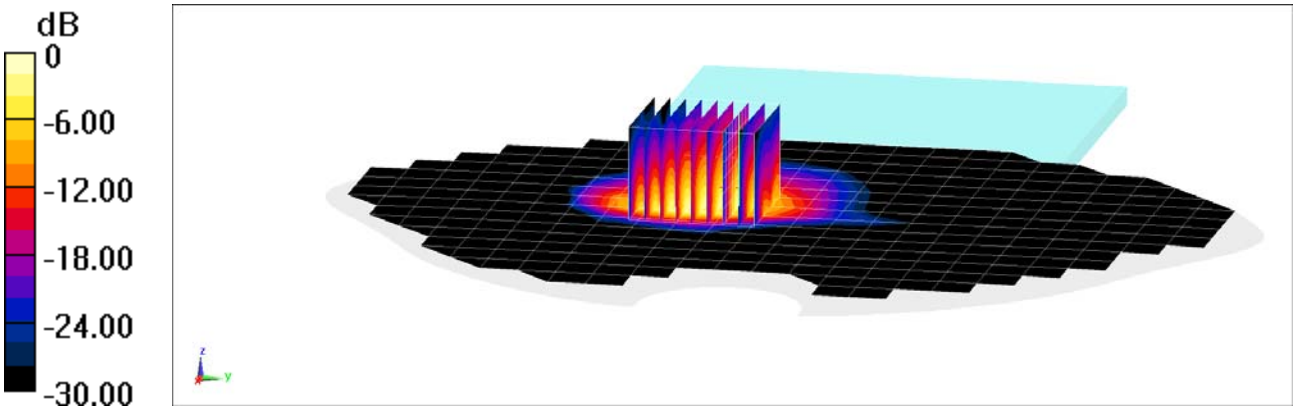
Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1.30
Medium: 2450 Body; Medium parameters used (interpolated):
f = 2441 MHz; σ = 2.03 S/m; ε_r = 50.288; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-16-2019; Ambient Temp: 22.7°C; Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3275; ConvF(4.57, 4.57, 4.57) @ 2441 MHz; Calibrated: 4/12/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn501; Calibrated: 4/12/2018
Phantom: Twin-SAM V4.0; Type: QD 000 P40 CD; Serial: 1736
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

Mode: Bluetooth, Body SAR, Ch 39, 1 Mbps, Back Side, Antenna WF5, Variant 2

Area Scan (15x19x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.62 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 2.60 W/kg
SAR(1 g) = 1.01 W/kg; SAR(10 g) = 0.408 W/kg



0 dB = 1.51 W/kg = 1.79 dBW/kg

APPENDIX B: SYSTEM VERIFICATION

© 2019 PCTEST Engineering Laboratory, Inc.

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1034

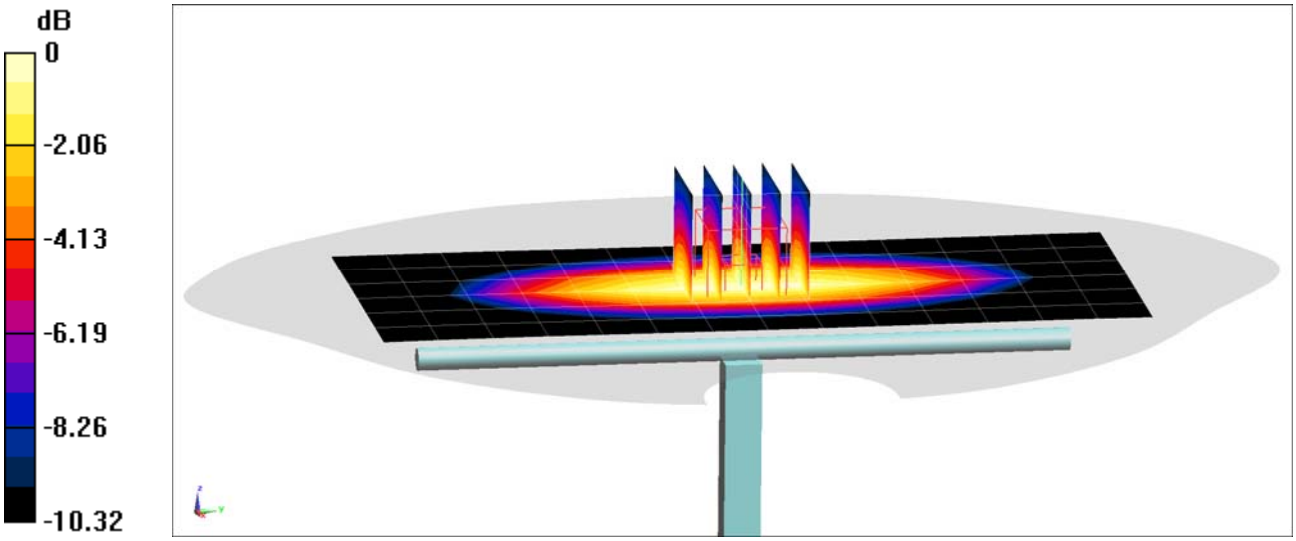
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 750 MHz; σ = 0.976 S/m; ε_r = 52.983; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-21-2019; Ambient Temp: 22.3°C; Tissue Temp: 19.4°C

Probe: ES3DV3 - SN3275; ConvF(6.34, 6.34, 6.34) @ 750 MHz; Calibrated: 4/12/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn501; Calibrated: 4/12/2018
Phantom: Twin-SAM V4.0; Type: QD 000 P40 CD; Serial: 1736
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

750 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.69 W/kg
SAR(1 g) = 1.82 W/kg; SAR(10 g) = 1.2 W/kg
Deviation(1 g) = 6.18%



0 dB = 2.12 W/kg = 3.26 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1097

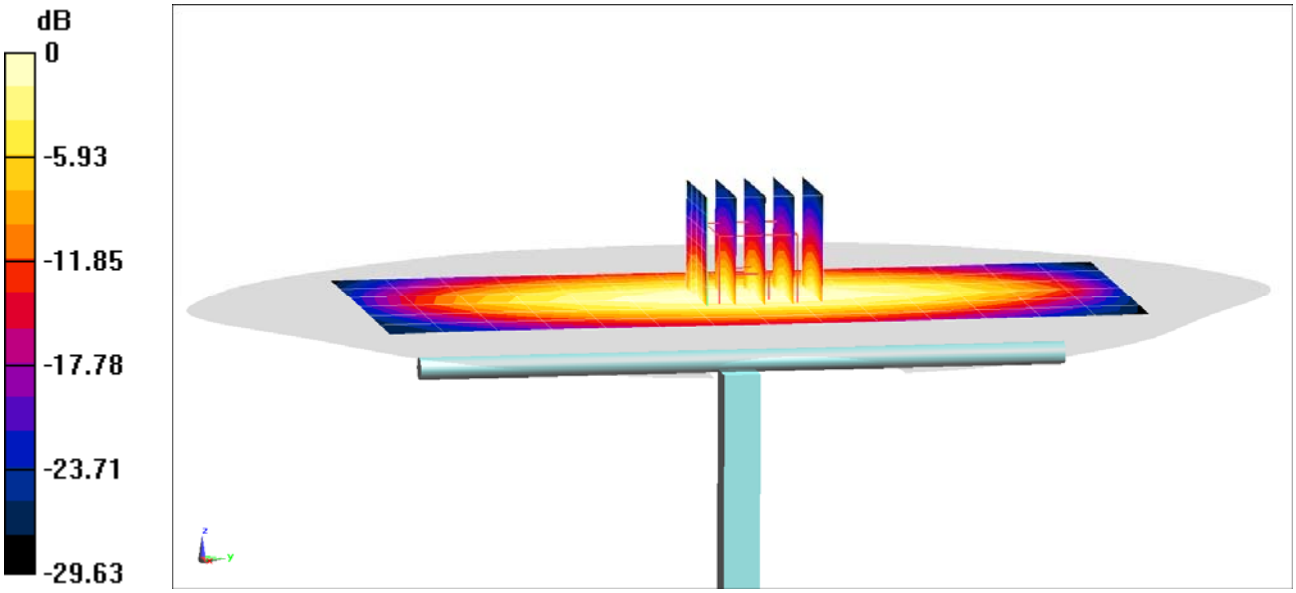
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 750 MHz; σ = 0.985 S/m; ε_r = 53.156; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-23-2019; Ambient Temp: 23.5°C; Tissue Temp: 20.6°C

Probe: ES3DV3 - SN3275; ConvF(6.34, 6.34, 6.34) @ 750 MHz; Calibrated: 4/12/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn501; Calibrated: 4/12/2018
Phantom: Twin-SAM V4.0; Type: QD 000 P40 CD; Serial: 1736
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

750 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.55 W/kg
SAR(1 g) = 1.71 W/kg; SAR(10 g) = 1.12 W/kg
Deviation(1 g) = -0.12%



0 dB = 2.16 W/kg = 3.35 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 850 MHz; Type: D850V2; Serial: 1010

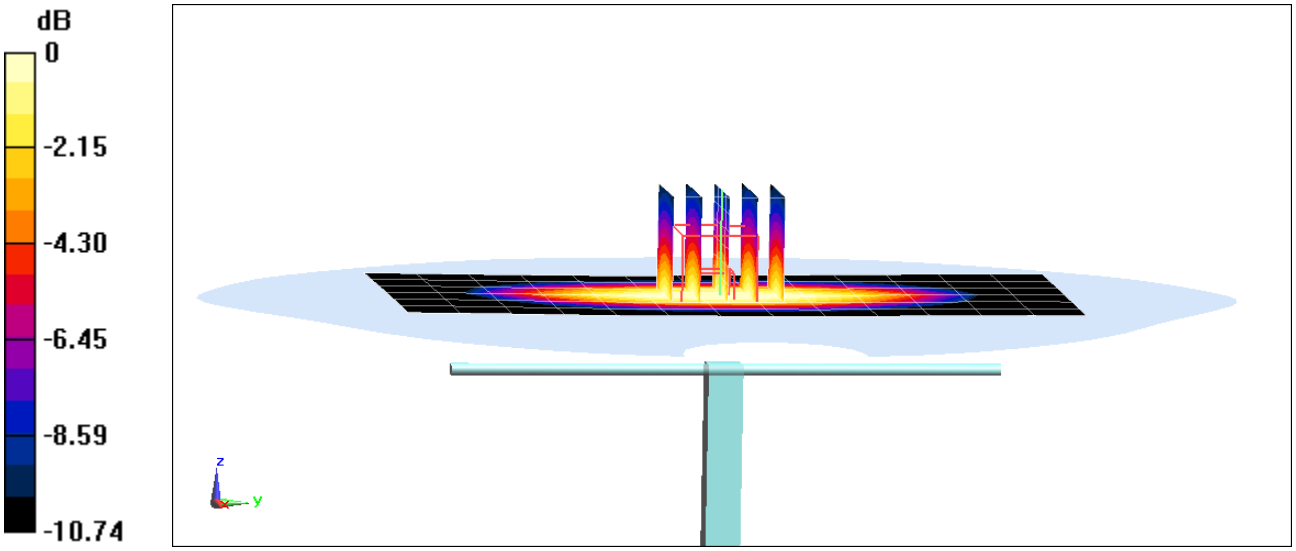
Communication System: UID 0, CW; Frequency: 850 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 850 MHz; σ = 1.01 S/m; ε_r = 52.552; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-22-2019; Ambient Temp: 23.5°C; Tissue Temp: 20.5°C

Probe: ES3DV3 - SN3131; ConvF(6.14, 6.14, 6.14) @ 850 MHz; Calibrated: 3/13/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn604; Calibrated: 3/7/2018
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

850 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan(5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 3.13 W/kg
SAR(1 g) = 2.08 W/kg; SAR(10 g) = 1.36 W/kg
Deviation(1 g) = 1.96%



0 dB = 2.42 W/kg = 3.84 dBW/kg

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d040

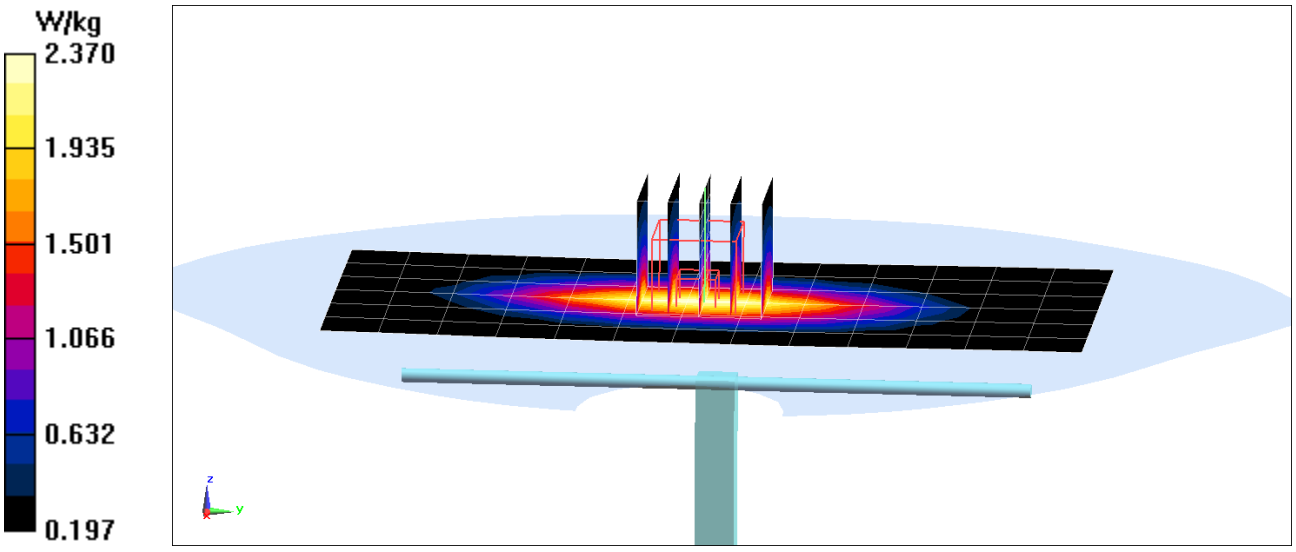
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 1.014 S/m; ε_r = 52.753; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-29-2019; Ambient Temp: 21.4°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3131; ConvF(6.14, 6.14, 6.14) @ 835 MHz; Calibrated: 3/13/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn604; Calibrated: 3/7/2018
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

835 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) =3.03
SAR(1 g) = 2.03 W/kg; SAR(10 g) = 1.32 W/kg
Deviation(1 g) = 6.17%



PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d040

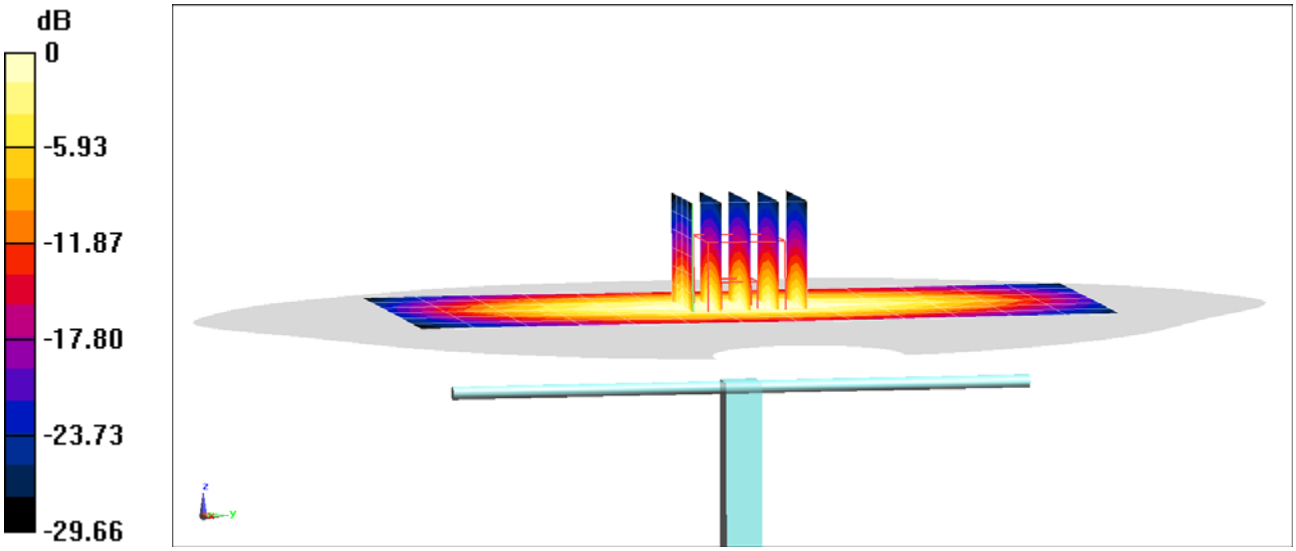
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 1.014 S/m; ε_r = 52.809; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-30-2019; Ambient Temp: 23.1°C; Tissue Temp: 20.6°C

Probe: ES3DV3 - SN3275; ConvF(6.16, 6.16, 6.16) @ 835 MHz; Calibrated: 4/12/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn501; Calibrated: 4/12/2018
Phantom: Twin-SAM V4.0; Type: QD 000 P40 CD; Serial: 1736
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

835 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.95 W/kg
SAR(1 g) = 1.97 W/kg; SAR(10 g) = 1.28 W/kg
Deviation(1 g) = 3.03%



0 dB = 2.50 W/kg = 3.98 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d180

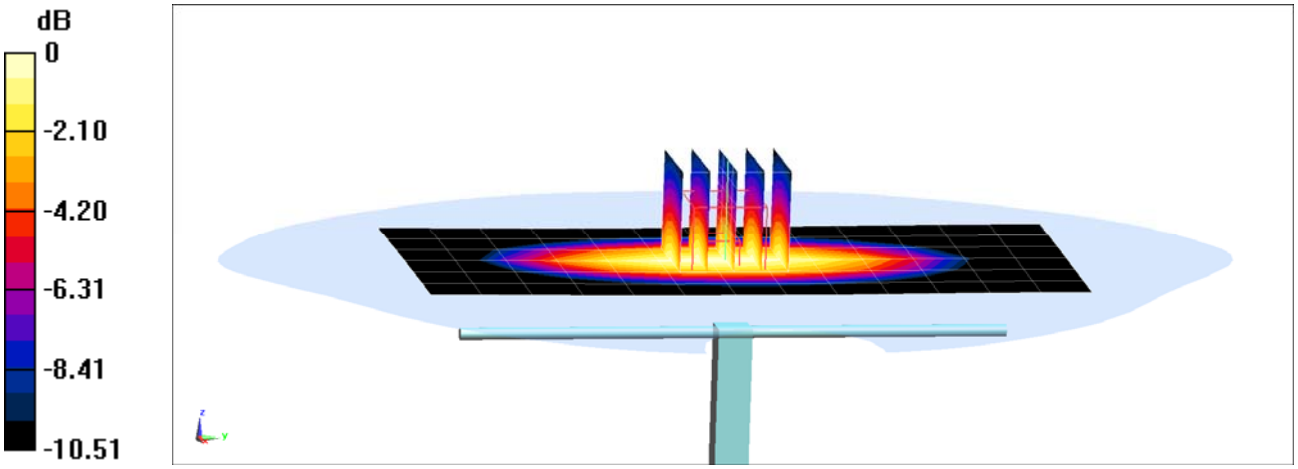
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 0.969 S/m; ε_r = 53.376; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-01-2019; Ambient Temp: 20.2°C; Tissue Temp: 20.0°C

Probe: ES3DV3 - SN3131; ConvF(6.14, 6.14, 6.14) @ 835 MHz; Calibrated: 3/13/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn604; Calibrated: 3/7/2018
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

835 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.96 W/kg
SAR(1 g) = 2 W/kg; SAR(10 g) = 1.32 W/kg
Deviation(1 g) = 4.28%



0 dB = 2.34 W/kg = 3.69 dBW/kg

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: 1104

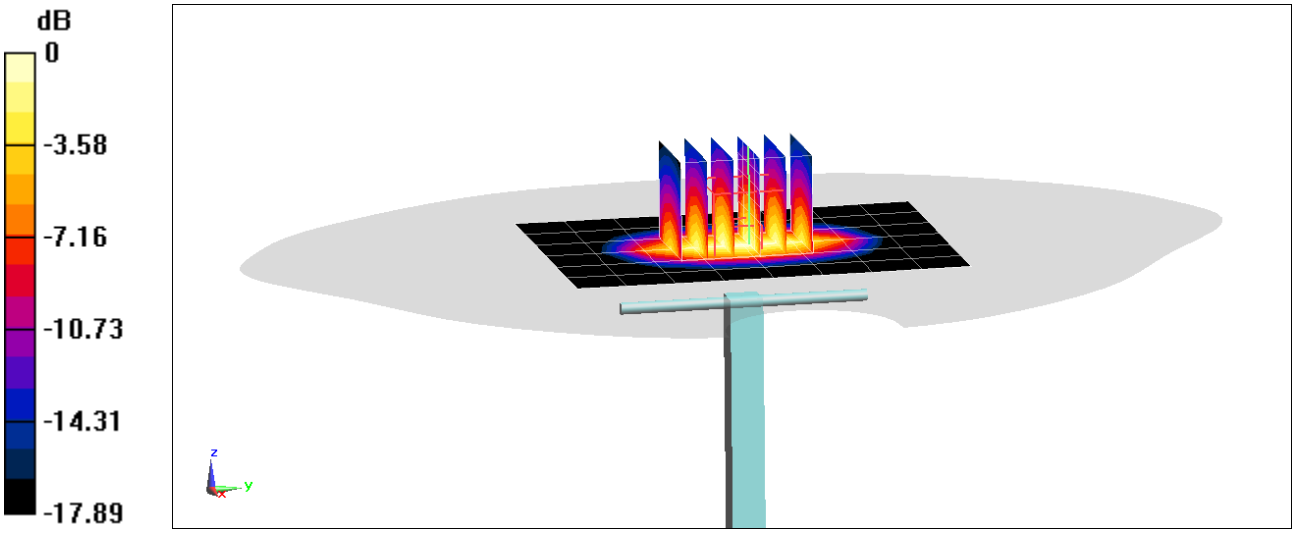
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.489 S/m; ε_r = 51.13; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-23-2019; Ambient Temp: 22.3°C; Tissue Temp: 20.9°C

Probe: ES3DV3 - SN3119; ConvF(4.87, 4.87, 4.87) @ 1750 MHz; Calibrated: 5/18/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn728; Calibrated: 5/17/2018
Phantom: Twin-SAM V4.0; Type: QD 000 P40 CC; Serial: 1179
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

1750 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 6.87 W/kg
SAR(1 g) = 3.93 W/kg; SAR(10 g) = 2.1 W/kg
Deviation(1 g) = 7.38%



0 dB = 4.94 W/kg = 6.94 dBW/kg

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d026

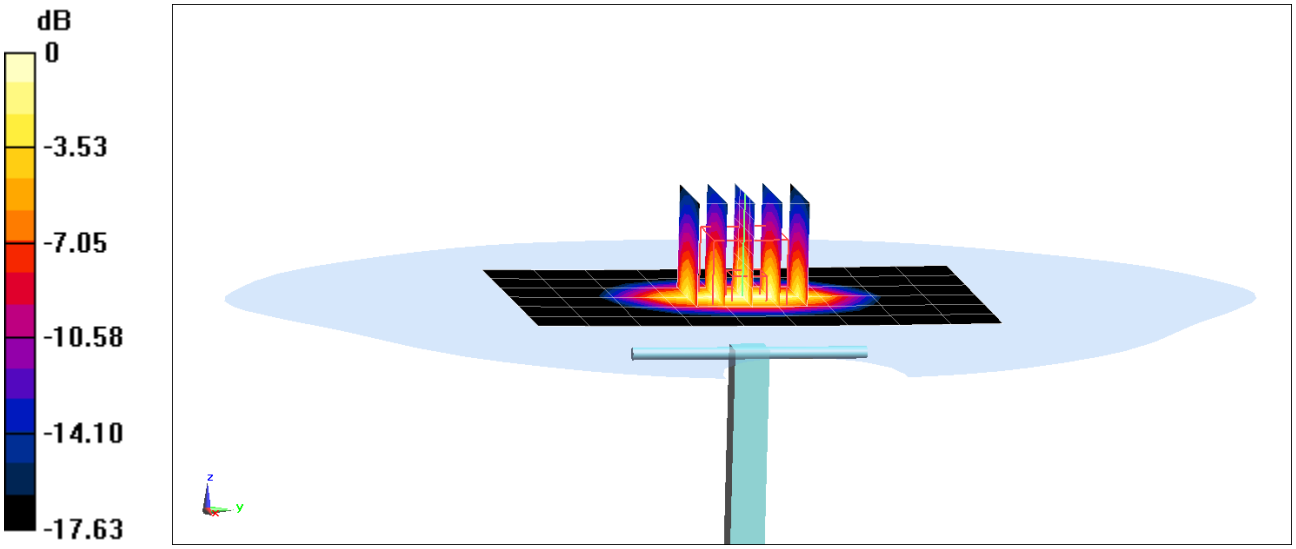
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.585 S/m; ε_r = 50.916; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-24-2019; Ambient Temp: 23.5°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3131; ConvF(4.8, 4.8, 4.8) @ 1900 MHz; Calibrated: 3/13/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn604; Calibrated: 3/7/2018
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

1900 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 6.99 W/kg
SAR(1 g) = 3.94 W/kg; SAR(10 g) = 2.06 W/kg
Deviation(1 g) = -1.25%



0 dB = 4.98 W/kg = 6.97 dBW/kg

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d026

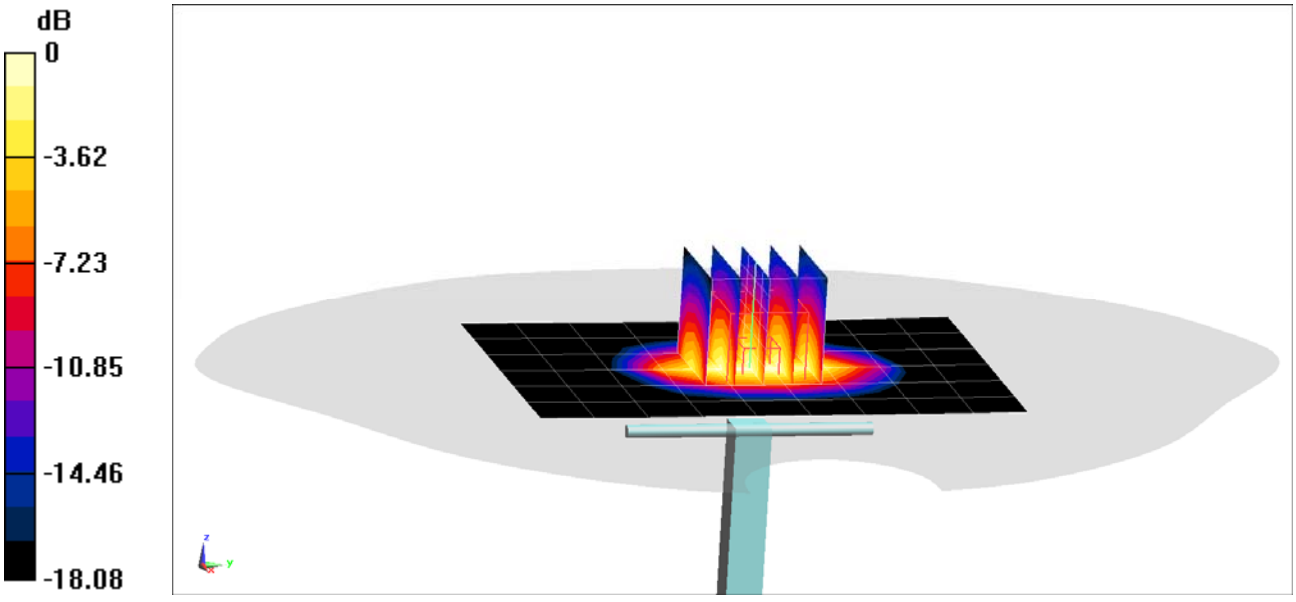
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.577 S/m; ε_r = 50.696; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-25-2019; Ambient Temp: 23.3°C; Tissue Temp: 22.3°C

Probe: ES3DV3 - SN3119; ConvF(4.65, 4.65, 4.65) @ 1900 MHz; Calibrated: 5/18/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn728; Calibrated: 5/17/2018
Phantom: Twin-SAM V4.0; Type: QD 000 P40 CC; Serial: 1179
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

1900 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 7.67 W/kg
SAR(1 g) = 4.26 W/kg; SAR(10 g) = 2.2 W/kg
Deviation(1 g) = 6.77%



0 dB = 5.38 W/kg = 7.31 dBW/kg

DUT: Dipole 2300 MHz; Type: D2300V2; Serial: 1038

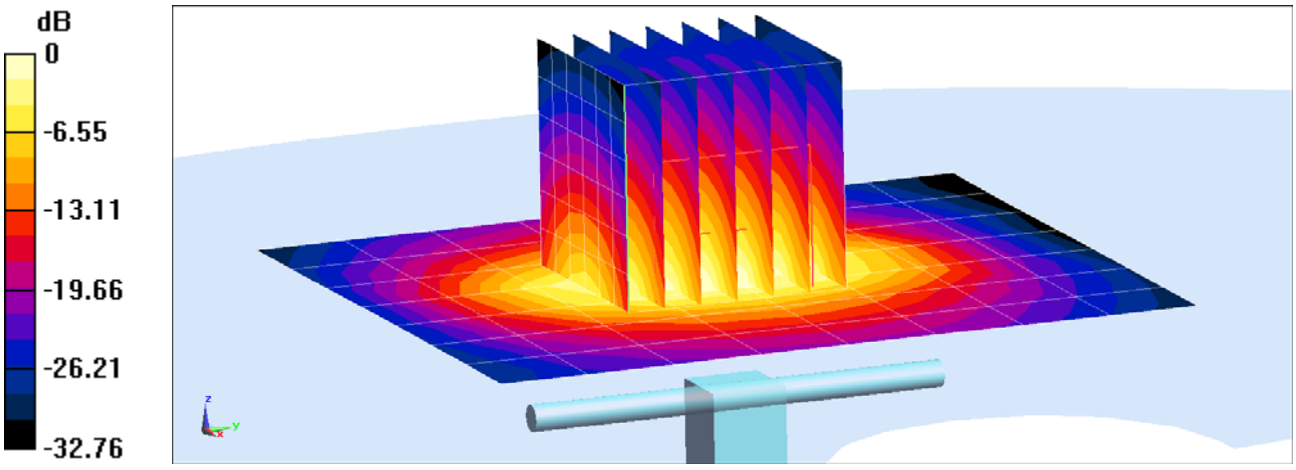
Communication System: UID 0, CW; Frequency: 2300 MHz; Duty Cycle: 1:1
Medium: 2300 Body Medium parameters used:
f = 2300 MHz; σ = 1.75 S/m; ε_r = 53.882; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-20-2019; Ambient Temp: 22.2°C; Tissue Temp: 23.0°C

Probe: ES3DV3 - SN3329; ConvF(4.6, 4.6, 4.6) @ 2300 MHz; Calibrated: 2/13/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1403; Calibrated: 2/8/2018
Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

2300 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 10.3 W/kg
SAR(1 g) = 4.94 W/kg; SAR(10 g) = 2.33 W/kg
Deviation(1 g) = 5.78%



0 dB = 2.38 W/kg = 3.77 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 921

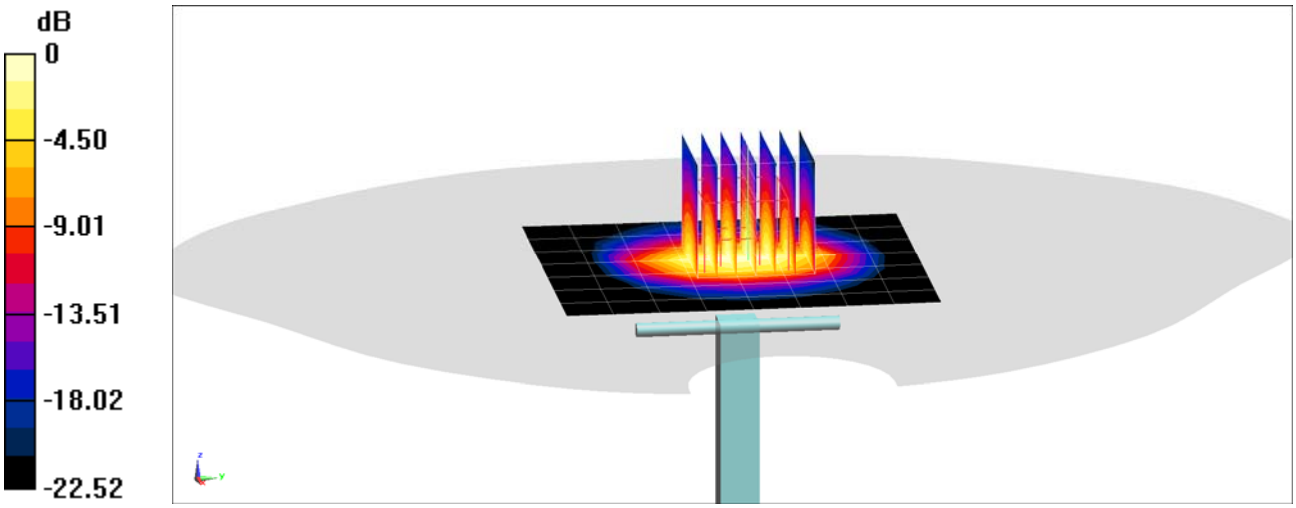
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 2.038 S/m; ε_r = 50.274; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-16-2019; Ambient Temp: 22.7°C; Tissue Temp: 21.8°C

Probe: ES3DV3 - SN3275; ConvF(4.57, 4.57, 4.57) @ 2450 MHz; Calibrated: 4/12/2018
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn501; Calibrated: 4/12/2018
Phantom: Twin-SAM V4.0; Type: QD 000 P40 CD; Serial: 1736
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

2450 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 10.1 W/kg
SAR(1 g) = 5.04 W/kg; SAR(10 g) = 2.33 W/kg
Deviation(1 g) = -0.79%



0 dB = 6.57 W/kg = 8.18 dBW/kg

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: 1069

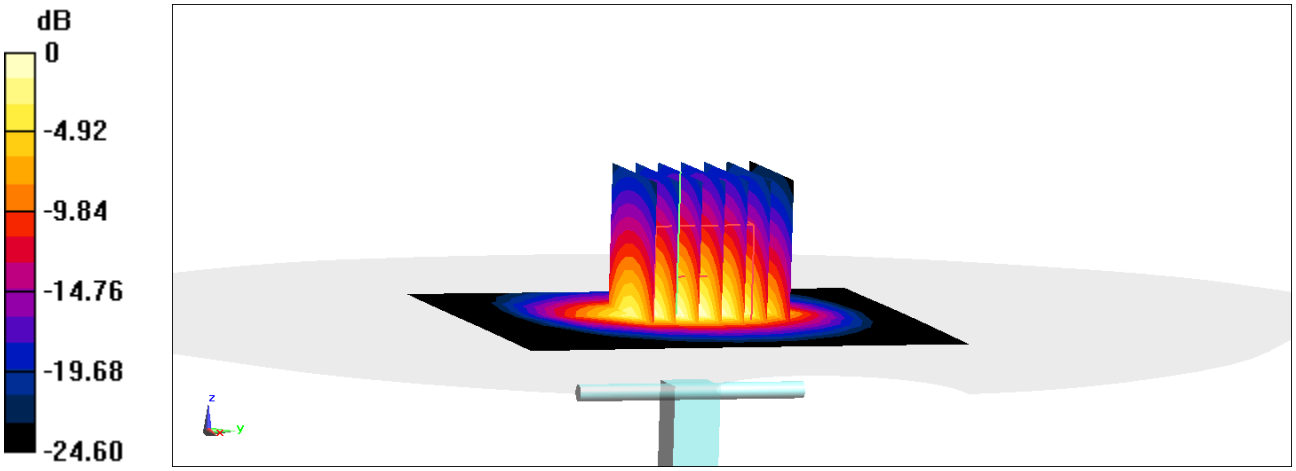
Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2600 MHz; σ = 2.175 S/m; ε_r = 50.094; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-16-2019; Ambient Temp: 22.9°C; Tissue Temp: 21.3°C

Probe: EX3DV4 - SN7416; ConvF(7.23, 7.23, 7.23) @ 2600 MHz; Calibrated: 7/20/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1402; Calibrated: 7/10/2018
Phantom: Twin-SAM V4.0; Type: QD 000 P40 CA; Serial: 1275
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

2600 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 13.3 W/kg
SAR(1 g) = 5.93 W/kg; SAR(10 g) = 2.62 W/kg
Deviation(1 g) = 7.23%



0 dB = 10.2 W/kg = 10.09 dBW/kg

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1163

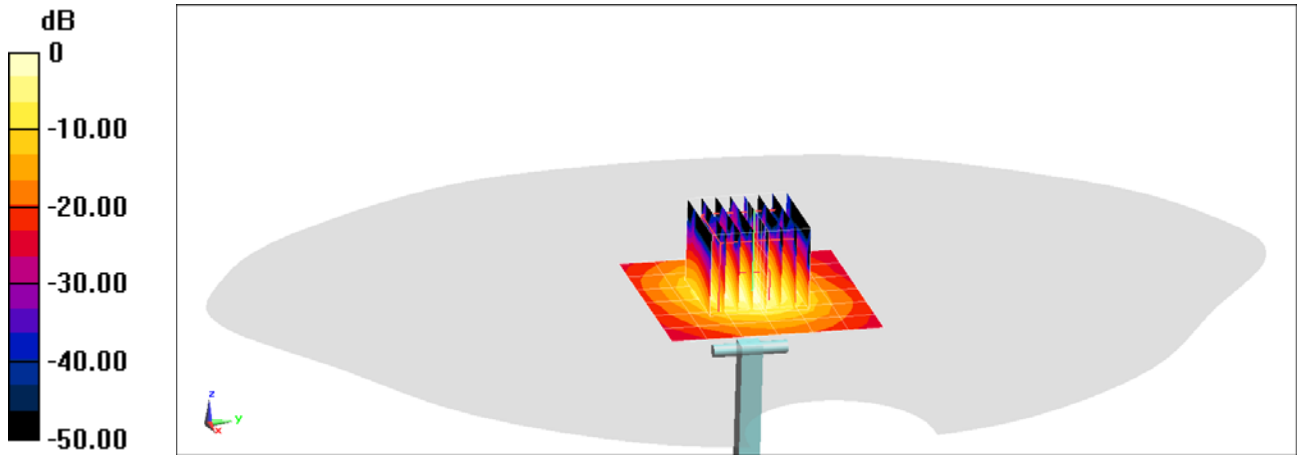
Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1
Medium: 5GHz Body Medium parameters used (interpolated):
$f = 5250$ MHz; $\sigma = 5.534$ S/m; $\varepsilon_r = 47.102$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-16-2019; Ambient Temp: 21.2°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7420; ConvF(4.79, 4.79, 4.79) @ 5250 MHz; Calibrated: 9/18/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1449; Calibrated: 11/12/2018
Phantom: Twin-SAM V4.0; Type: QD 000 P40 CC; Serial: 1596
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

5250 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Peak SAR (extrapolated) = 14.6 W/kg
SAR(1 g) = 3.65 W/kg; SAR(10 g) = 1.03 W/kg
Deviation(1 g) = -6.05%



0 dB = 8.39 W/kg = 9.24 dBW/kg

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1163

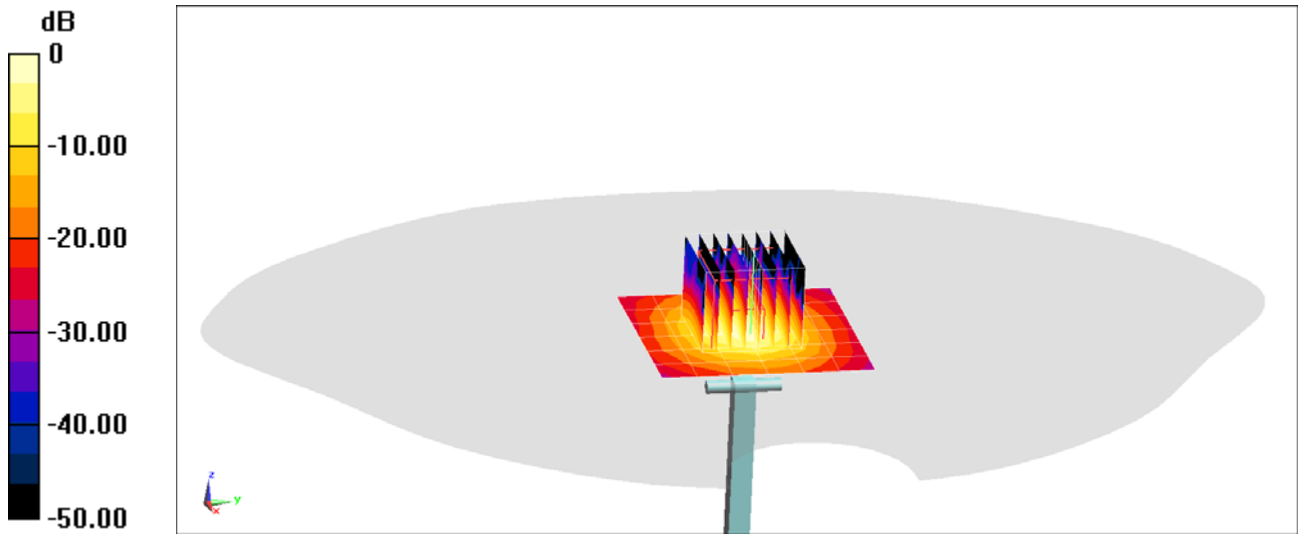
Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5GHz Body Medium parameters used:
f = 5600 MHz; σ = 5.987 S/m; ε_r = 46.438; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-16-2019; Ambient Temp: 21.2°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7420; ConvF(4.08, 4.08, 4.08) @ 5600 MHz; Calibrated: 9/18/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1449; Calibrated: 11/12/2018
Phantom: Twin-SAM V4.0; Type: QD 000 P40 CC; Serial: 1596
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

5600 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Peak SAR (extrapolated) = 18.2 W/kg
SAR(1 g) = 4.08 W/kg; SAR(10 g) = 1.14 W/kg
Deviation(1 g) = 1.87%



0 dB = 10.1 W/kg = 10.04 dBW/kg

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1163

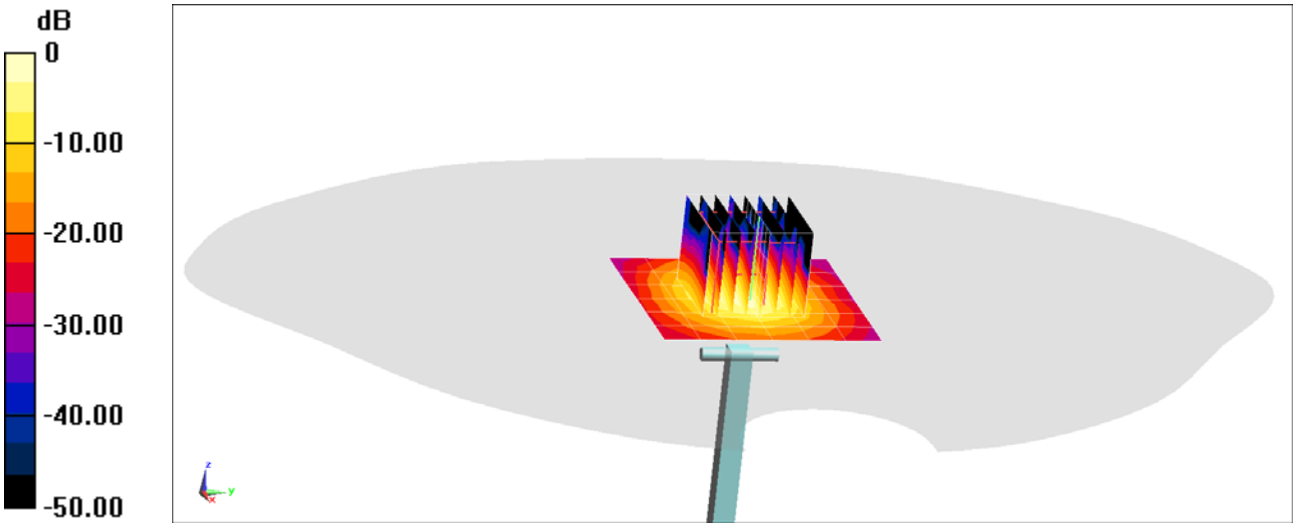
Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1
Medium: 5GHz Body Medium parameters used (interpolated):
$f = 5750$ MHz; $\sigma = 6.201$ S/m; $\varepsilon_r = 46.198$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-16-2019; Ambient Temp: 21.2°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7420; ConvF(4.36, 4.36, 4.36) @ 5750 MHz; Calibrated: 9/18/2018
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1449; Calibrated: 11/12/2018
Phantom: Twin-SAM V4.0; Type: QD 000 P40 CC; Serial: 1596
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

5750 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Peak SAR (extrapolated) = 16.9 W/kg
SAR(1 g) = 3.69 W/kg; SAR(10 g) = 1.04 W/kg
Deviation(1 g) = -5.14%



0 dB = 9.01 W/kg = 9.55 dBW/kg

APPENDIX C: PROBE CALIBRATION

© 2019 PCTEST Engineering Laboratory, Inc.

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client PC Test

Certificate No: D750V3-1034_May18

CALIBRATION CERTIFICATE

Object D750V3 - SN:1034

Calibration procedure(s) QA CAL-05.v10
Calibration procedure for dipole validation kits above 700 MHz

SC ✓
5/31/2018

Calibration date: May 18, 2018

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-18 (No. 217-02682)	Apr-19
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-18 (No. 217-02683)	Apr-19
Reference Probe EX3DV4	SN: 7349	30-Dec-17 (No. EX3-7349_Dec17)	Dec-18
DAE4	SN: 601	26-Oct-17 (No. DAE4-601_Oct17)	Oct-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18

	Name	Function	Signature
Calibrated by:	Manu Seitz	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: May 22, 2018

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.1
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.0 ± 6 %	0.89 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.09 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**8.32 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.36 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.42 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.7 ± 6 %	0.96 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.15 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**8.57 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.42 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**5.67 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	55.3 Ω + 0.0 jΩ
Return Loss	- 26.0 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.0 Ω - 3.2 jΩ
Return Loss	- 29.8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.034 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	July 06, 2011

DASY5 Validation Report for Head TSL

Date: 17.05.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1034

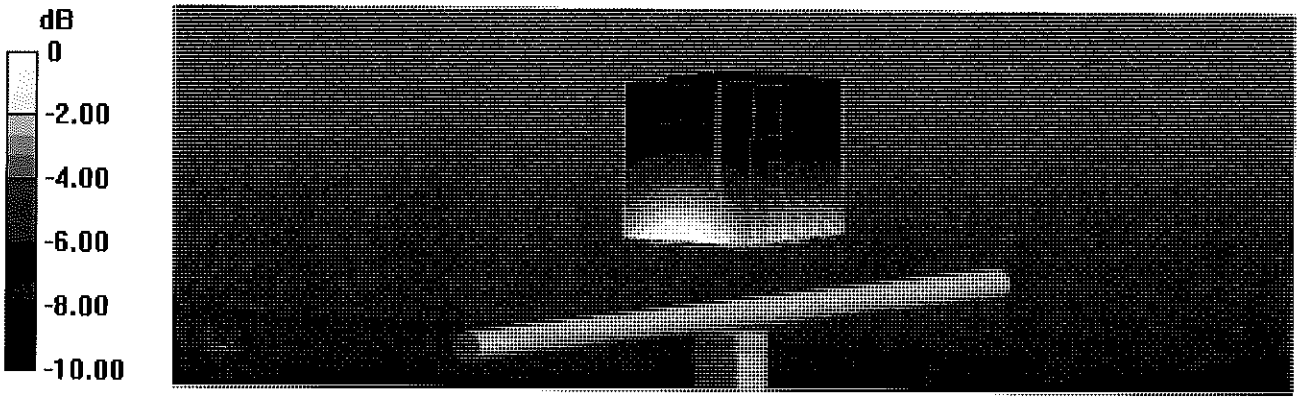
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.89 S/m; ε_r = 41; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.22, 10.22, 10.22) @ 750 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

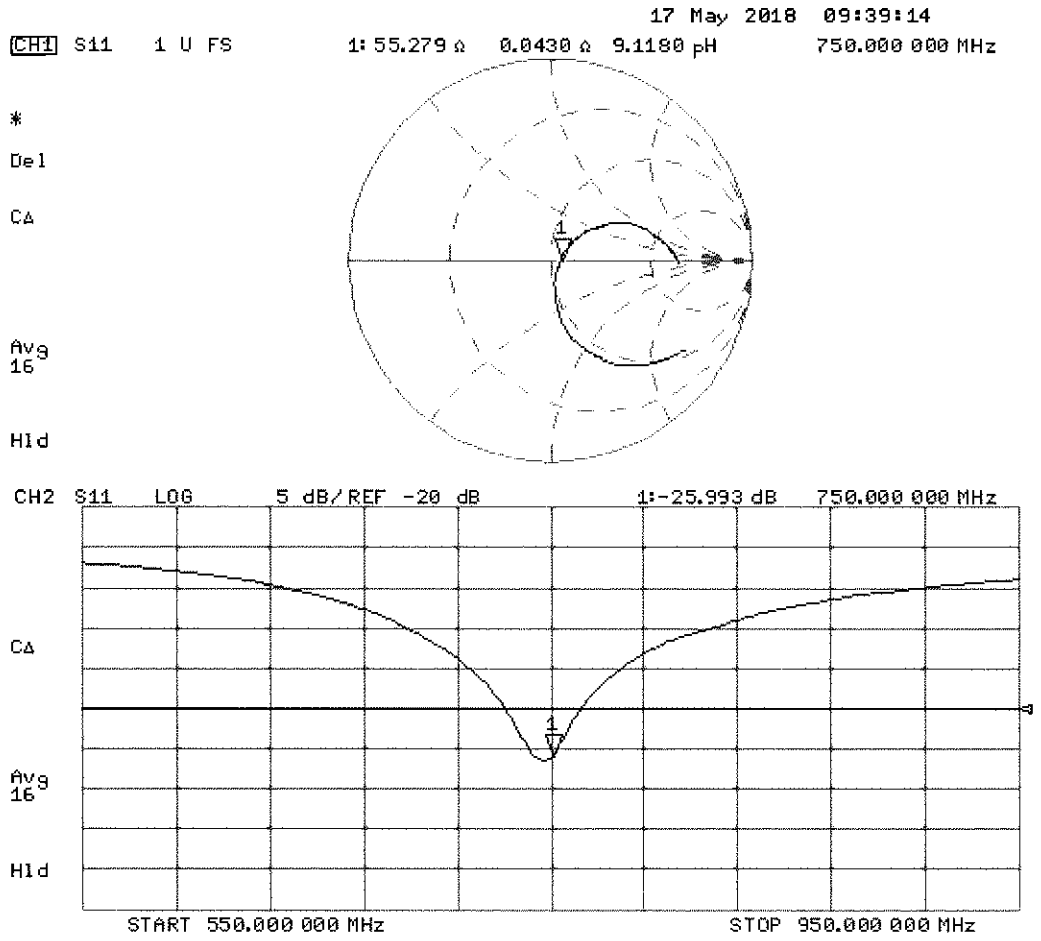
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 59.66 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 3.18 W/kg
SAR(1 g) = 2.09 W/kg; SAR(10 g) = 1.36 W/kg
Maximum value of SAR (measured) = 2.82 W/kg



0 dB = 2.82 W/kg = 4.50 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 18.05.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1034

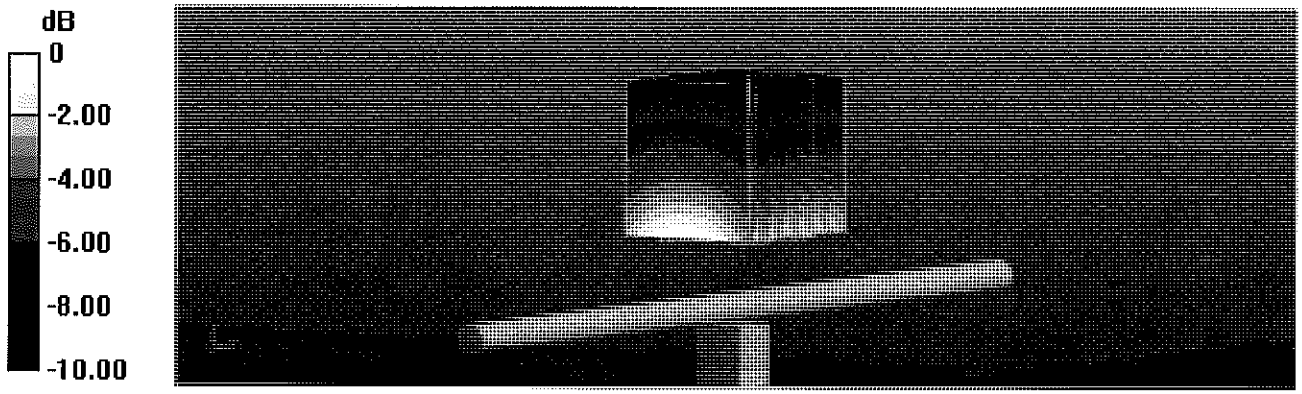
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.96 S/m; ε_r = 54.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.19, 10.19, 10.19) @ 750 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

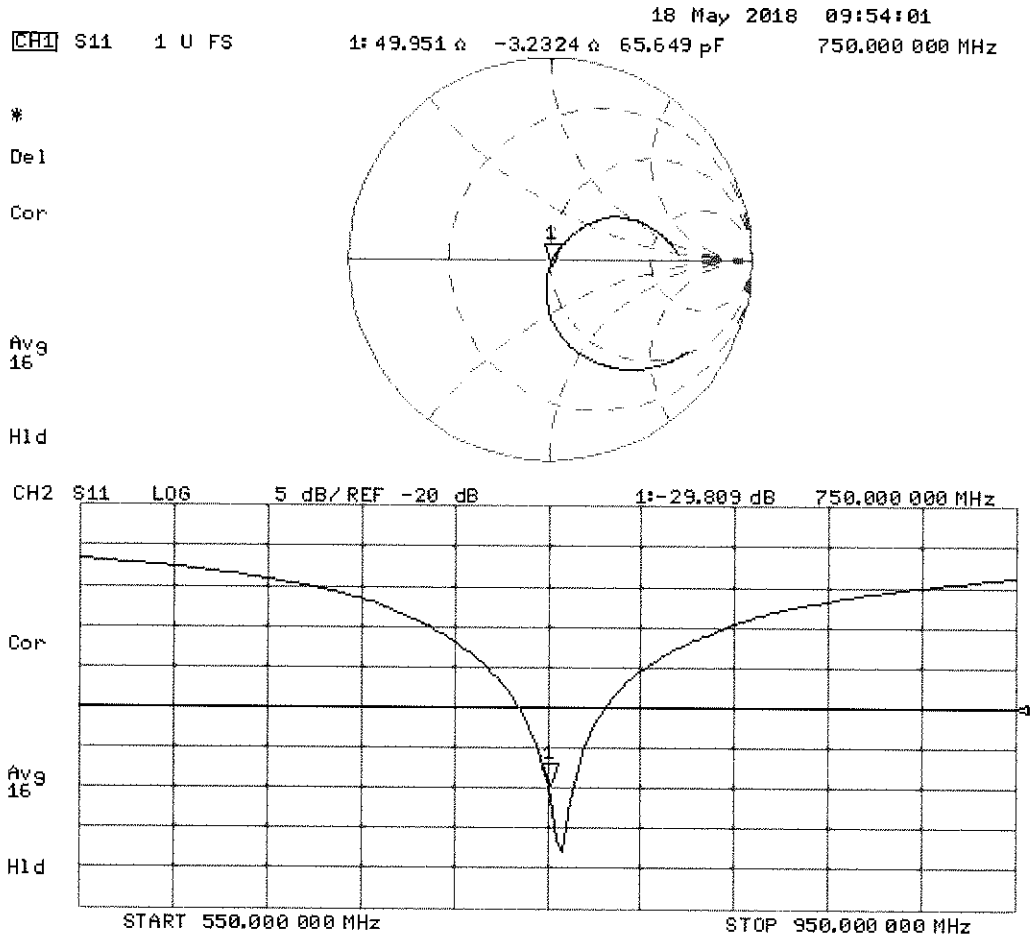
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.60 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 3.16 W/kg
SAR(1 g) = 2.15 W/kg; SAR(10 g) = 1.42 W/kg
Maximum value of SAR (measured) = 2.83 W/kg



0 dB = 2.83 W/kg = 4.52 dBW/kg

Impedance Measurement Plot for Body TSL



Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client **PC Test** Certificate No: **D750V3-1097_Sep17**

CALIBRATION CERTIFICATE

Object	D750V3 - SN:1097
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	September 08, 2017

SC ✓ 10/03/2017

SC ✓ 9/8/2018

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 7349	31-May-17 (No. EX3-7349_May17)	May-18
DAE4	SN: 601	28-Mar-17 (No. DAE4-601_Mar17)	Mar-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-16)	In house check: Oct-17

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: September 8, 2017

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.2 ± 6 %	0.90 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.08 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**8.22 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.36 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.39 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.5 ± 6 %	0.96 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.14 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**8.56 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.42 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**5.68 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.4 Ω - 0.6 jΩ
Return Loss	- 27.5 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.0 Ω - 3.6 jΩ
Return Loss	- 28.8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.034 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	July 05, 2013

DASY5 Validation Report for Head TSL

Date: 08.09.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1097

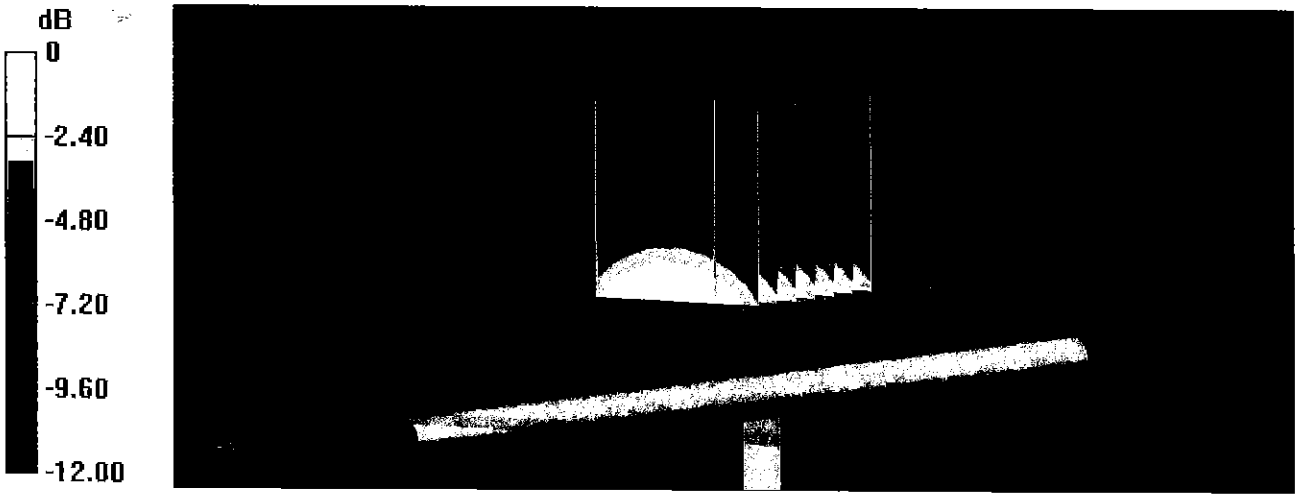
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.9 S/m; ε_r = 41.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.49, 10.49, 10.49); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

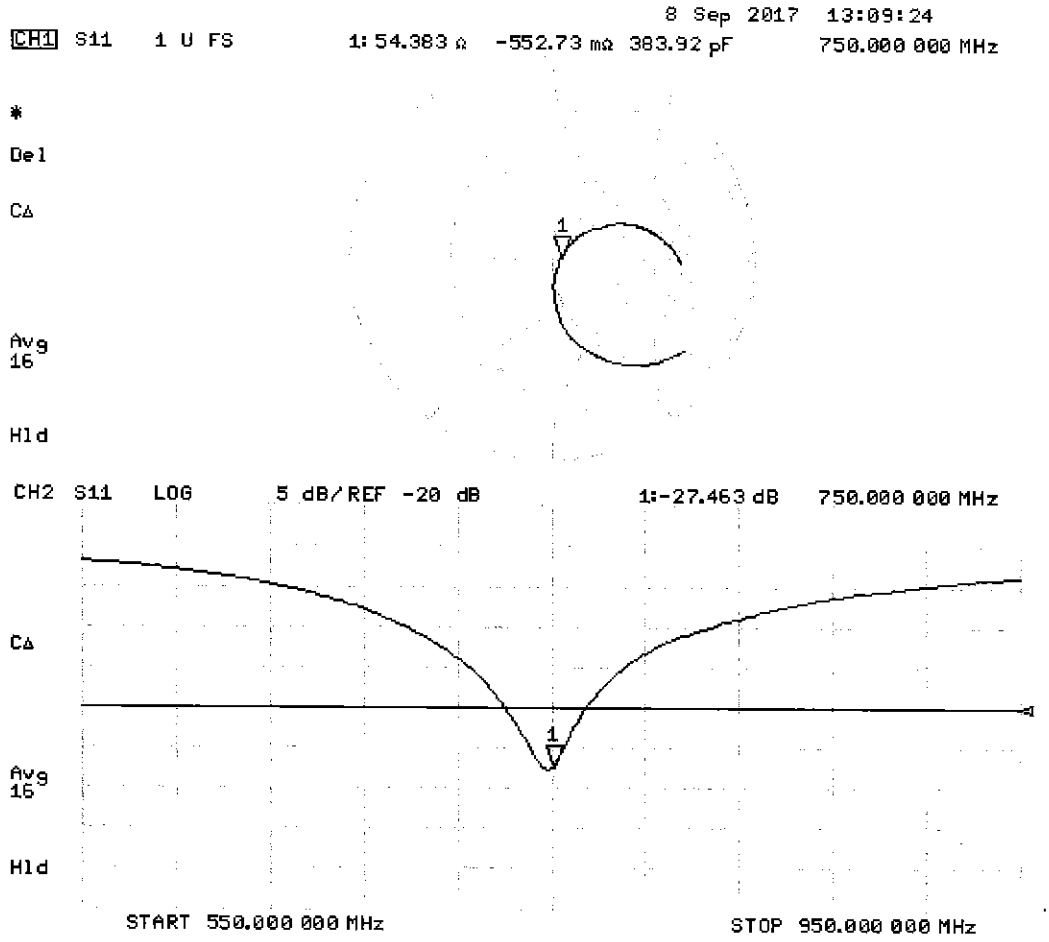
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 58.59 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 3.19 W/kg
SAR(1 g) = 2.08 W/kg; SAR(10 g) = 1.36 W/kg
Maximum value of SAR (measured) = 2.80 W/kg



0 dB = 2.80 W/kg = 4.47 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 08.09.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1097

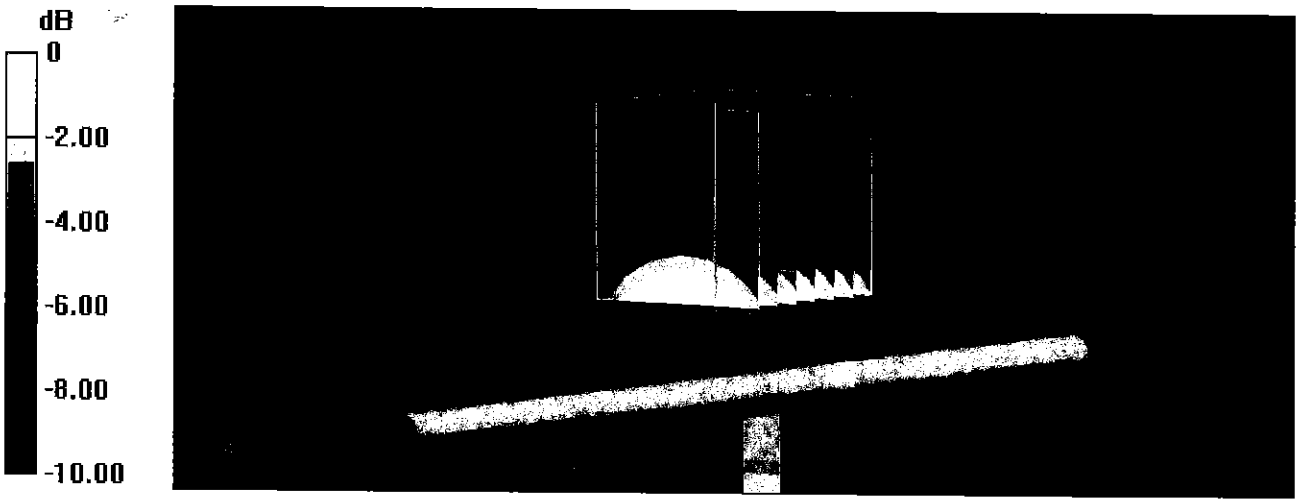
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.96 S/m; ε_r = 55.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.35, 10.35, 10.35); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

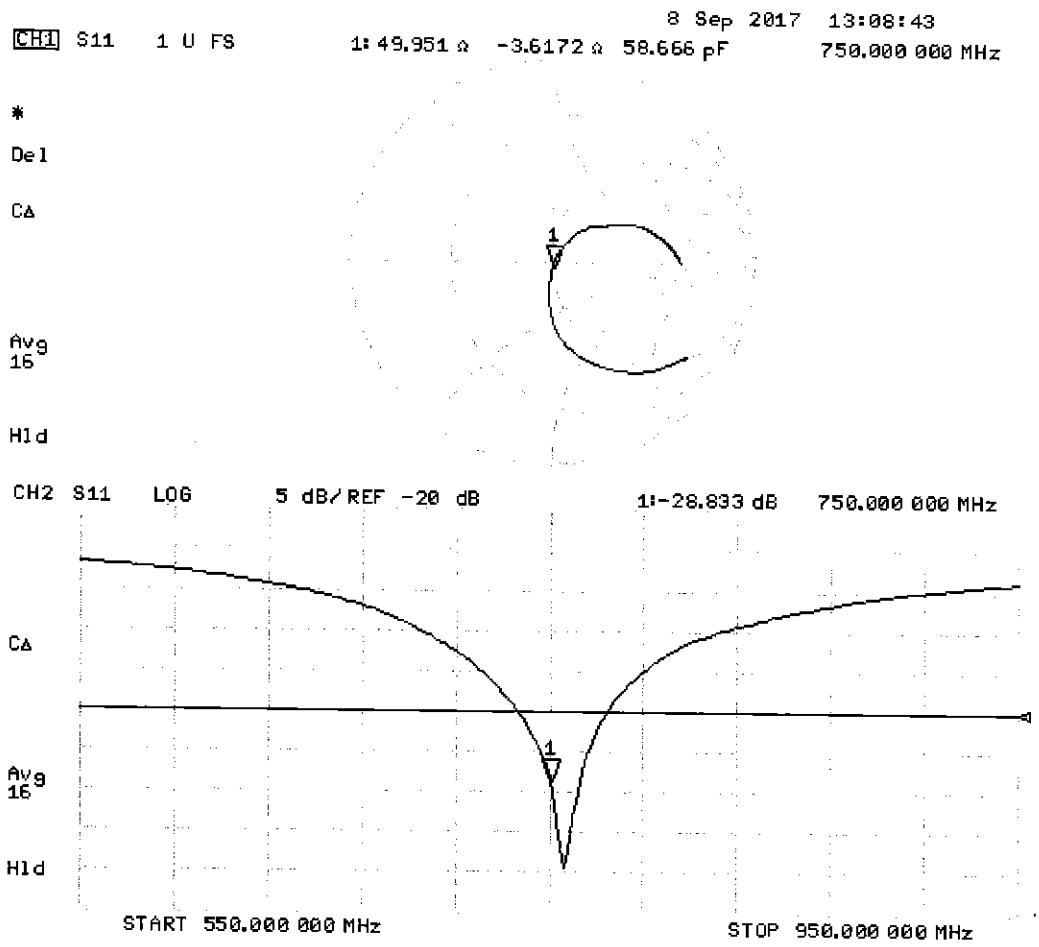
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.96 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 3.16 W/kg
SAR(1 g) = 2.14 W/kg; SAR(10 g) = 1.42 W/kg
Maximum value of SAR (measured) = 2.81 W/kg



0 dB = 2.81 W/kg = 4.49 dBW/kg

Impedance Measurement Plot for Body TSL



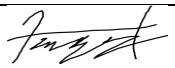
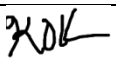
Certification of Calibration

Object	D750V3 – SN: 1097
Calibration procedure(s)	Procedure for Calibration Extension for SAR Dipoles.
Extended Calibration date:	September 08, 2018
Description:	SAR Validation Dipole at 750 MHz.

Calibration Equipment used:

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	8753ES	S-Parameter Network Analyzer	9/14/2017	Annual	9/14/2018	US39170118
Agilent	N5182A	MXG Vector Signal Generator	3/19/2018	Annual	3/19/2019	US46240505
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	343972
Anritsu	ML2496A	Power Meter	10/9/2017	Annual	10/9/2018	1138001
Anritsu	MA2411B	Pulse Power Sensor	11/15/2017	Annual	11/15/2018	1339007
Anritsu	MA2411B	Pulse Power Sensor	11/22/2017	Annual	11/22/2018	1339008
Control Company	4040	Temperature / Humidity Monitor	2/28/2018	Biennial	2/28/2020	150761911
Control Company	4352	Ultra Long Stem Thermometer	2/14/2017	Biennial	2/14/2019	170112507
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	6/4/2018	Annual	6/4/2019	MY53401181
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE5011-1	Torque Wrench	7/19/2017	Biennial	7/19/2019	N/A
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/15/2018	Annual	5/15/2019	1070
SPEAG	ES3DV3	SAR Probe	9/18/2017	Annual	9/18/2018	3287
SPEAG	DAE4	Data Acquisition Electronics	1/26/2018	Annual	1/26/2019	1533
SPEAG	EX3DV4	SAR Probe	7/20/2018	Annual	7/20/2019	7416
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/18/2018	Annual	1/18/2019	793

Measurement Uncertainty = ±23% (k=2)

	Name	Function	Signature
Calibrated By:	Sangmin Cha	Team Lead Engineer	
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	

DIPOLE CALIBRATION EXTENSION

Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

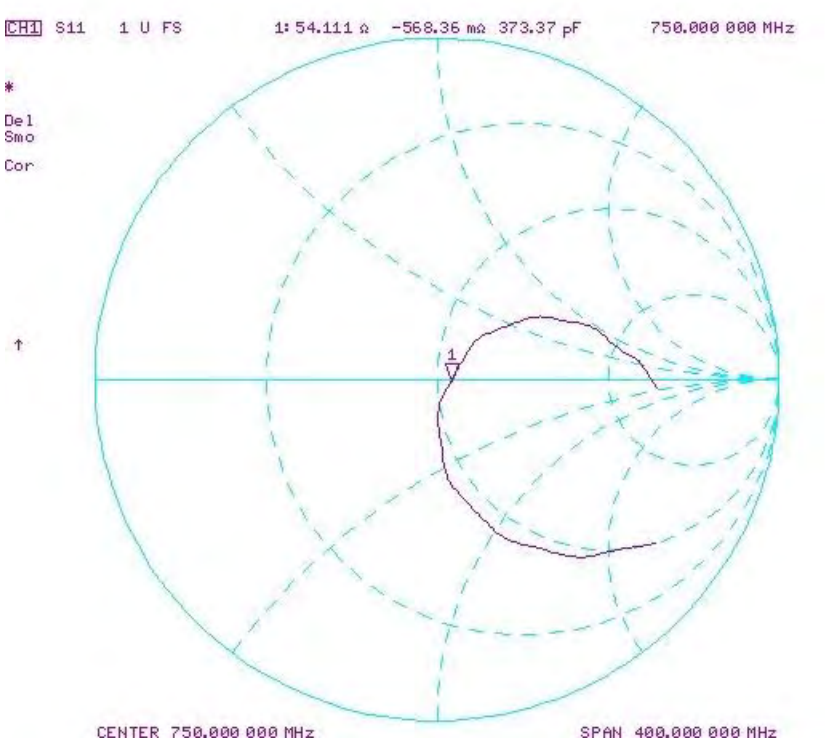
1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

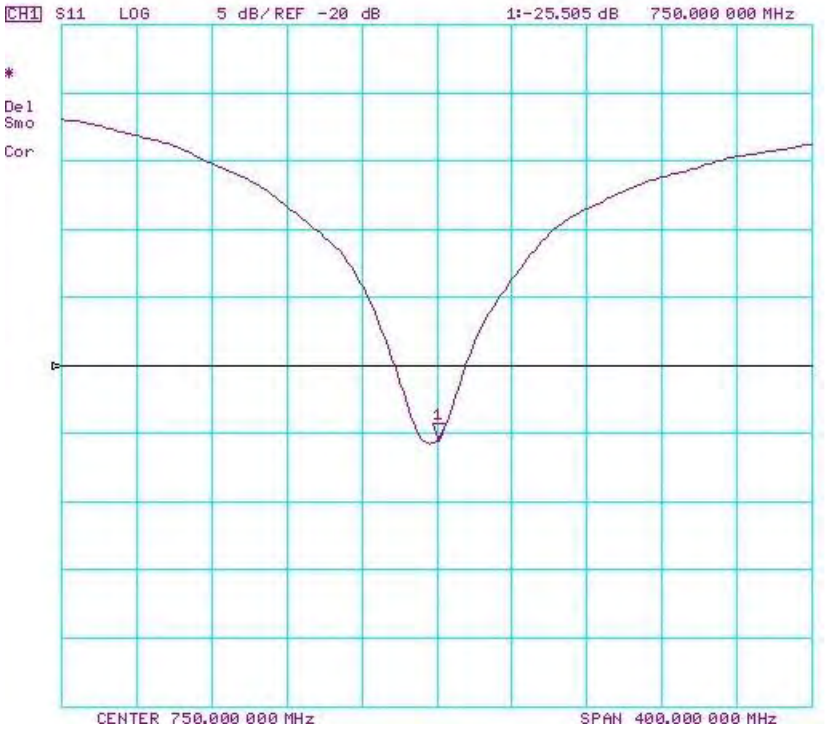
The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Head (1g) W/kg @ 23.0 dBm	Measured Head SAR (1g) W/kg @ 23.0 dBm	Deviation 1g (%)	Certificate SAR Target Head (10g) W/kg @ 23.0 dBm	Measured Head SAR (10g) W/kg @ 23.0 dBm	Deviation 10g (%)	Certificate Impedance Head (Ohm) Real	Measured Impedance Head (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Head (Ohm) Imaginary	Measured Impedance Head (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Head (dB)	Measured Return Loss Head (dB)	Deviation (%)	PASS/FAIL
9/8/2017	9/8/2018	1.034	1.644	1.7	3.41%	1.078	1.12	3.90%	54.4	54.1	0.3	-0.6	-0.6	0	-27.5	-25.5	7.30%	PASS

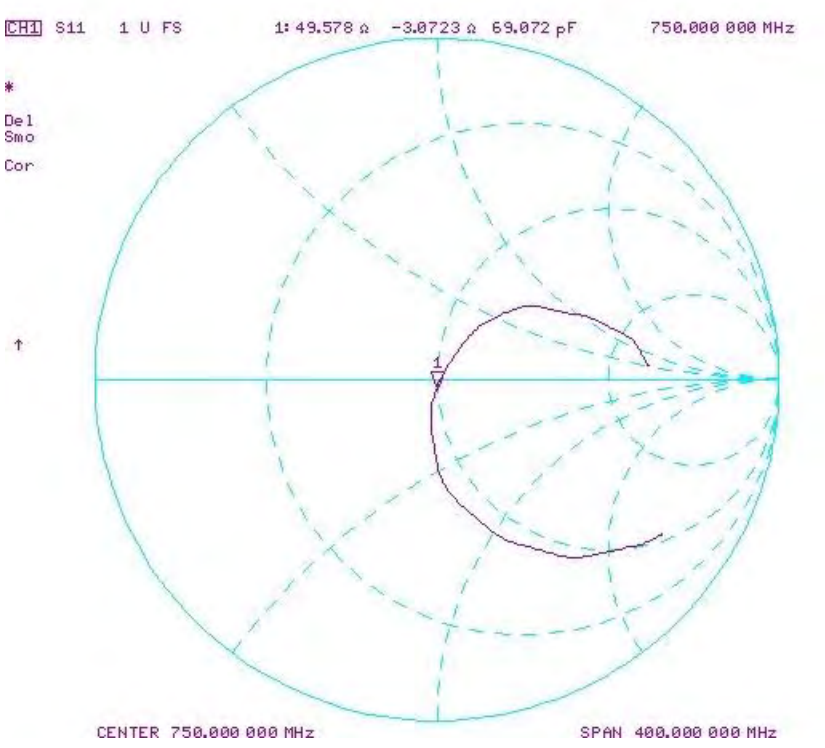
Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Body (1g) W/kg @ 23.0 dBm	Measured Body SAR (1g) W/kg @ 23.0 dBm	Deviation 1g (%)	Certificate SAR Target Body (10g) W/kg @ 23.0 dBm	Measured Body SAR (10g) W/kg @ 23.0 dBm	Deviation 10g (%)	Certificate Impedance Body (Ohm) Real	Measured Impedance Body (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Body (Ohm) Imaginary	Measured Impedance Body (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Body (dB)	Measured Return Loss Body (dB)	Deviation (%)	PASS/FAIL
9/8/2017	9/8/2018	1.034	1.712	1.78	3.97%	1.136	1.17	2.99%	50	49.6	0.4	-3.6	-3.1	0.5	-28.8	-30.3	-5.20%	PASS

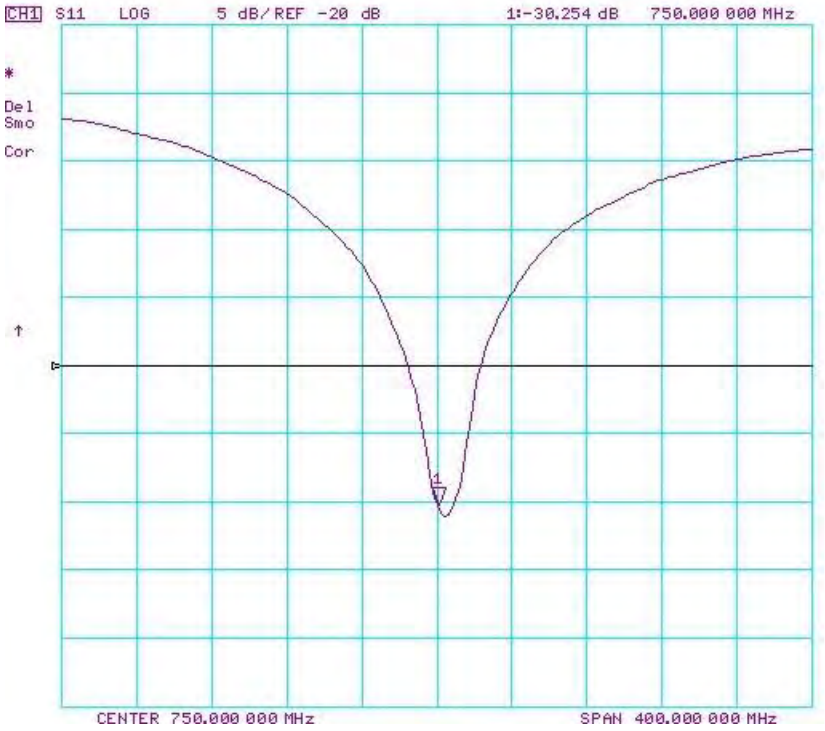
Impedance & Return-Loss Measurement Plot for Head TSL





Impedance & Return-Loss Measurement Plot for Body TSL





Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **PC Test** Certificate No: **D850V2-1010_Sep17**

CALIBRATION CERTIFICATE

Object	D850V2 - SN:1010
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	September 08, 2017

SC ✓ 10/03/2017

SC ✓ 9/8/2018

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 7349	31-May-17 (No. EX3-7349_May17)	May-18
DAE4	SN: 601	28-Mar-17 (No. DAE4-601_Mar17)	Mar-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-16)	In house check: Oct-17

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: September 8, 2017

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	850 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.5	0.92 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.9 ± 6 %	0.94 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.53 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.93 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.63 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**6.42 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.2	0.99 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.3 ± 6 %	0.99 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.55 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**10.2 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.67 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**6.68 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.2 Ω - 3.1 jΩ
Return Loss	- 30.2 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.6 Ω - 5.8 jΩ
Return Loss	- 23.2 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.432 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	September 04, 2012

DASY5 Validation Report for Head TSL

Date: 08.09.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 850 MHz; Type: D850V2; Serial: D850V2 - SN:1010

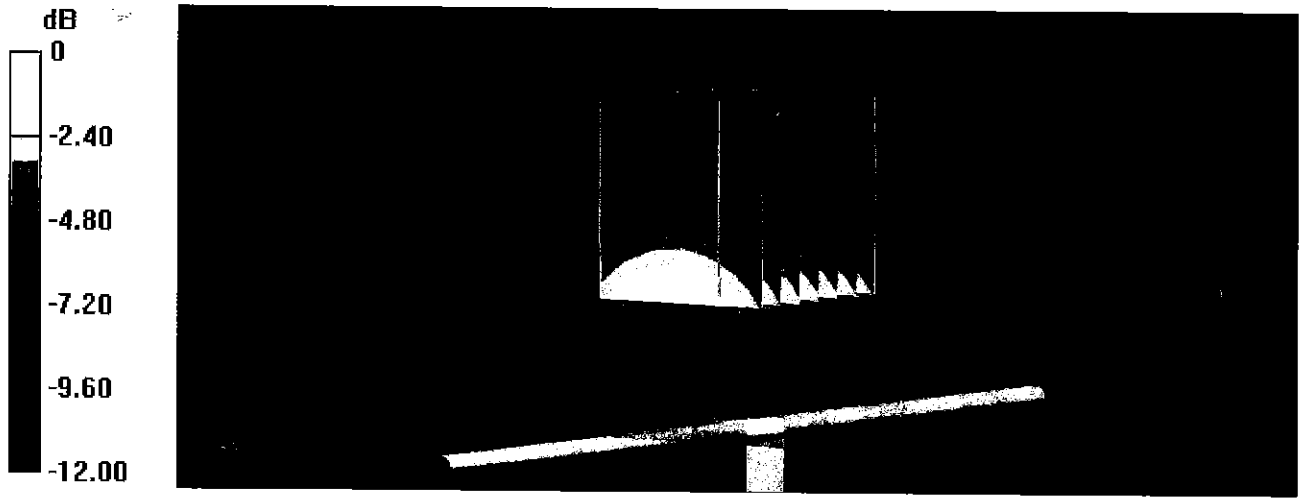
Communication System: UID 0 - CW; Frequency: 850 MHz
Medium parameters used: f = 850 MHz; σ = 0.94 S/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.93, 9.93, 9.93); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

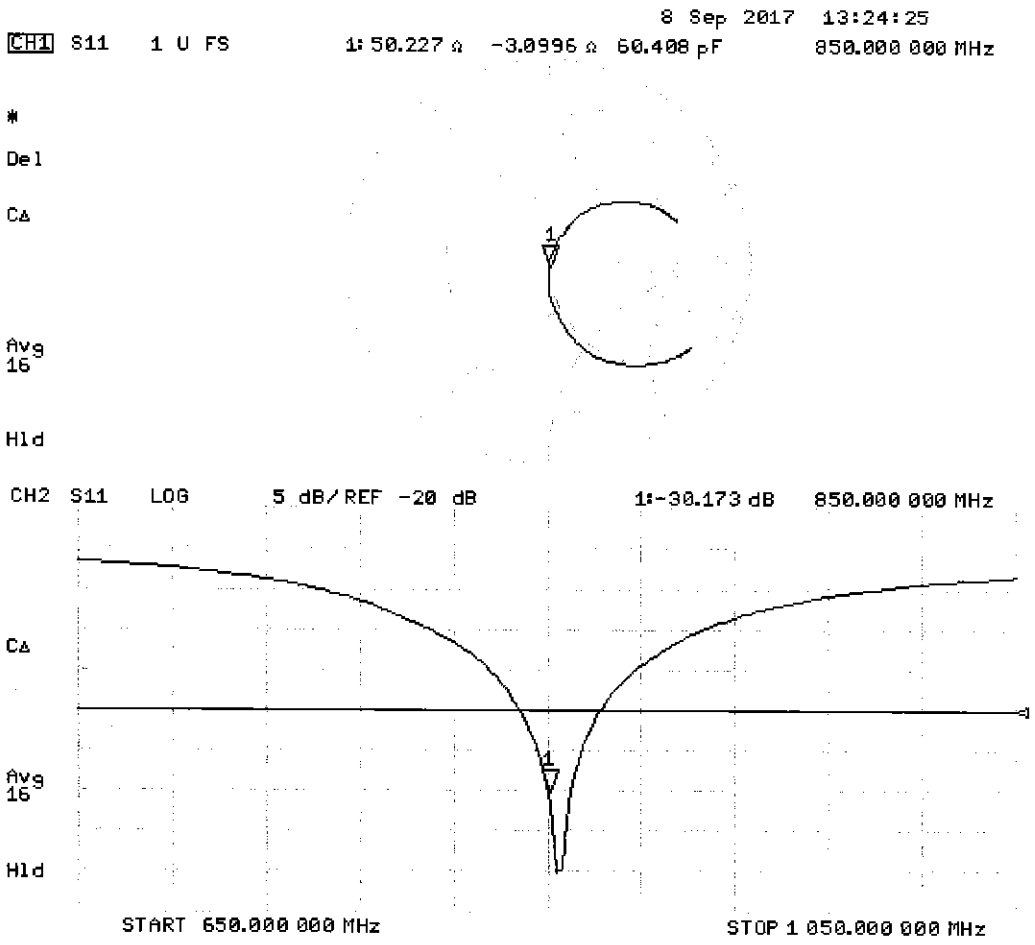
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 63.32 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 3.85 W/kg
SAR(1 g) = 2.53 W/kg; SAR(10 g) = 1.63 W/kg
Maximum value of SAR (measured) = 3.41 W/kg



0 dB = 3.41 W/kg = 5.33 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 08.09.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 850 MHz; Type: D850V2; Serial: D850V2 - SN:1010

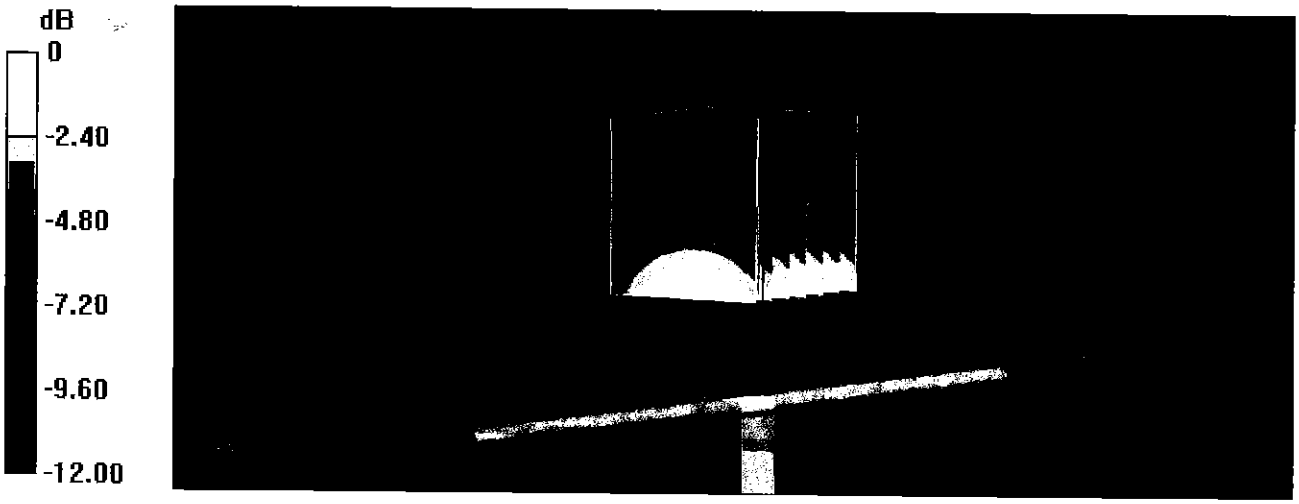
Communication System: UID 0 - CW; Frequency: 850 MHz
Medium parameters used: f = 850 MHz; σ = 0.99 S/m; ε_r = 55.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.11, 10.11, 10.11); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

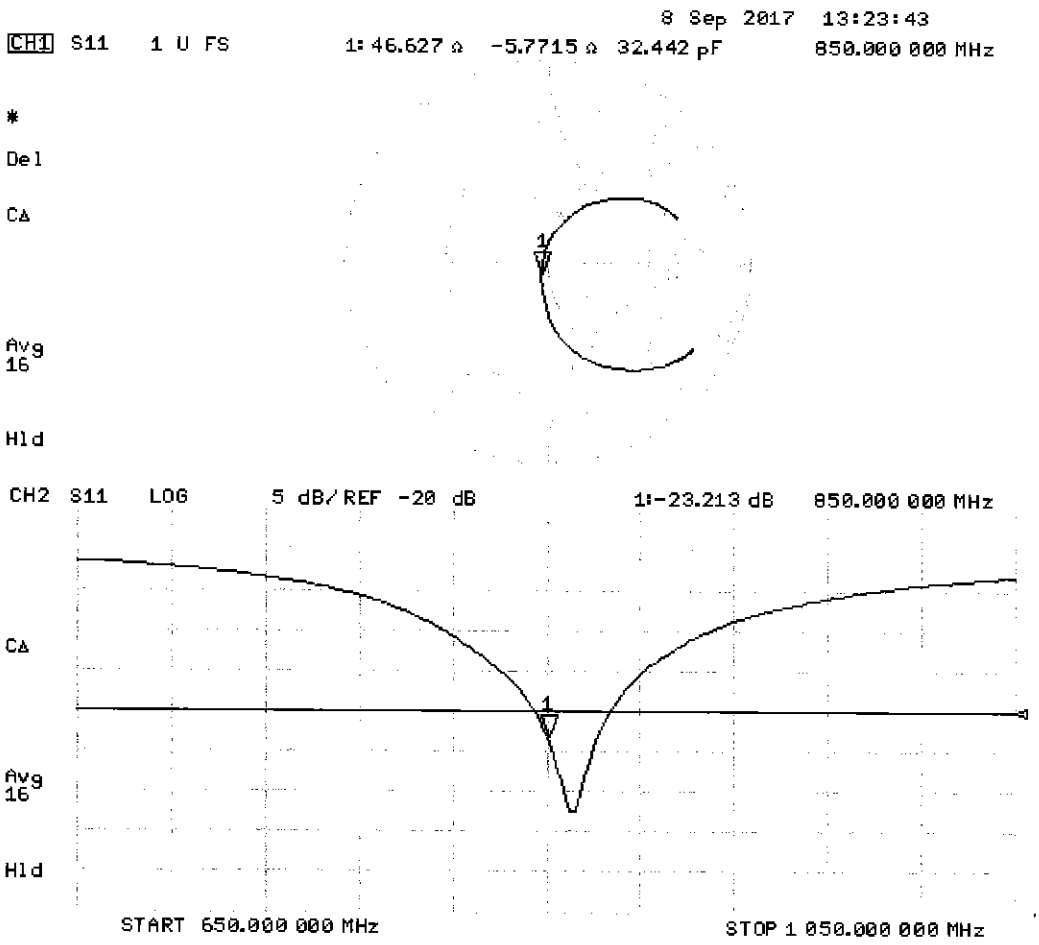
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 61.09 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 3.79 W/kg
SAR(1 g) = 2.55 W/kg; SAR(10 g) = 1.67 W/kg
Maximum value of SAR (measured) = 3.36 W/kg



0 dB = 3.36 W/kg = 5.26 dBW/kg

Impedance Measurement Plot for Body TSL



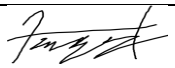
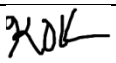
Certification of Calibration

Object	D850V2 – SN: 1010
Calibration procedure(s)	Procedure for Calibration Extension for SAR Dipoles.
Extended Calibration date:	September 08, 2018
Description:	SAR Validation Dipole at 850 MHz.

Calibration Equipment used:

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	8753ES	S-Parameter Network Analyzer	9/14/2017	Annual	9/14/2018	US39170118
Agilent	N5182A	MXG Vector Signal Generator	3/19/2018	Annual	3/19/2019	US46240505
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	343972
Anritsu	ML2496A	Power Meter	10/9/2017	Annual	10/9/2018	1138001
Anritsu	MA2411B	Pulse Power Sensor	11/15/2017	Annual	11/15/2018	1339007
Anritsu	MA2411B	Pulse Power Sensor	11/22/2017	Annual	11/22/2018	1339008
Control Company	4040	Temperature / Humidity Monitor	2/28/2018	Biennial	2/28/2020	150761911
Control Company	4352	Ultra Long Stem Thermometer	2/14/2017	Biennial	2/14/2019	170112507
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	6/4/2018	Annual	6/4/2019	MY53401181
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE5011-1	Torque Wrench	7/19/2017	Biennial	7/19/2019	N/A
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/15/2018	Annual	5/15/2019	1070
SPEAG	ES3DV3	SAR Probe	9/18/2017	Annual	9/18/2018	3287
SPEAG	DAE4	Data Acquisition Electronics	1/26/2018	Annual	1/26/2019	1533
SPEAG	EX3DV4	SAR Probe	1/26/2018	Annual	1/26/2019	7490
SPEAG	DAE4	Data Acquisition Electronics	1/26/2018	Annual	1/26/2019	1532

Measurement Uncertainty = ±23% (k=2)

	Name	Function	Signature
Calibrated By:	Sangmin Cha	Team Lead Engineer	
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	

DIPOLE CALIBRATION EXTENSION

Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

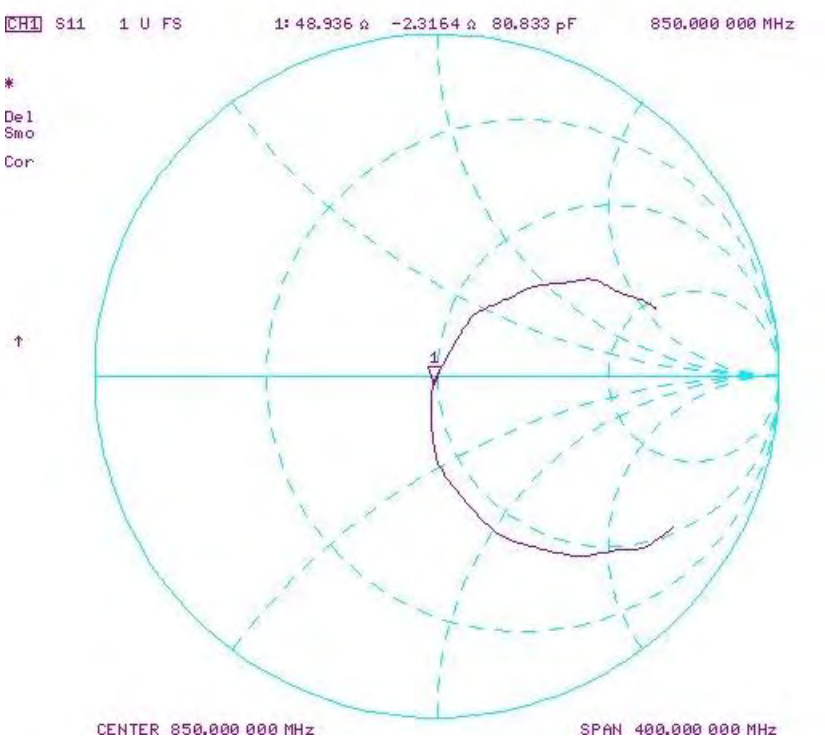
1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

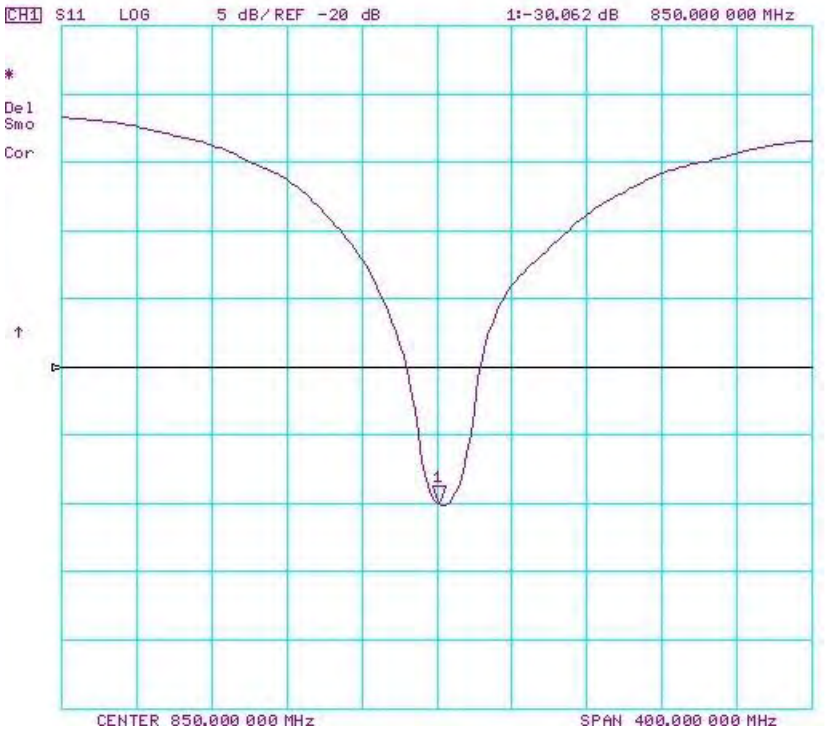
The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Head (1g) W/kg @ 23.0 dBm	Measured Head SAR (1g) W/kg @ 23.0 dBm	Deviation 1g (%)	Certificate SAR Target Head (10g) W/kg @ 23.0 dBm	Measured Head SAR (10g) W/kg @ 23.0 dBm	Deviation 10g (%)	Certificate Impedance Head (Ohm) Real	Measured Impedance Head (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Head (Ohm) Imaginary	Measured Impedance Head (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Head (dB)	Measured Return Loss Head (dB)	Deviation (%)	PASS/FAIL
9/8/2017	9/8/2018	1.432	1.986	2.01	1.21%	1.284	1.31	2.02%	50.2	48.9	1.3	-3.1	-2.3	0.8	-30.2	-30.1	0.30%	PASS

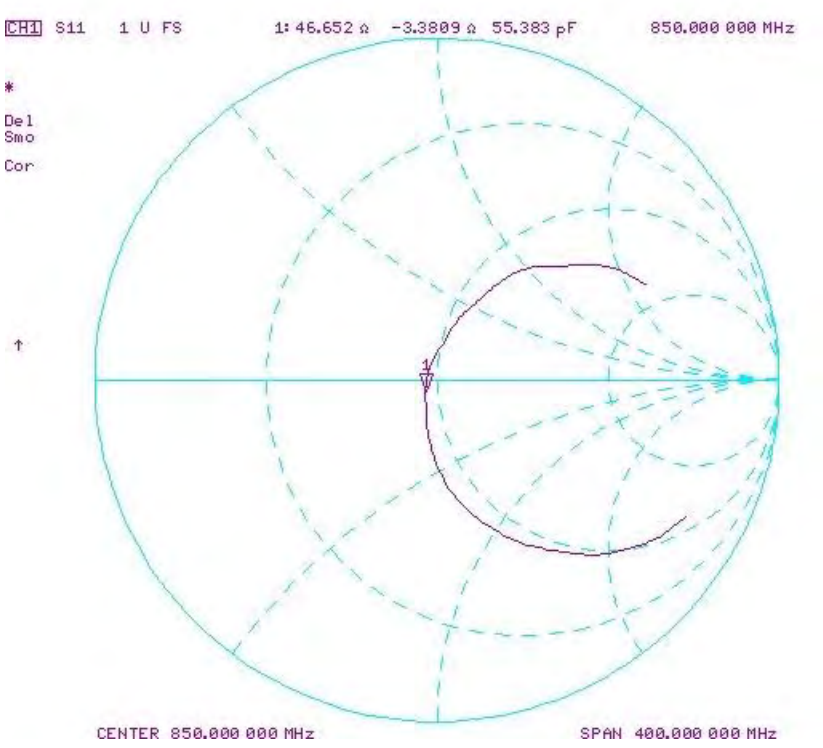
Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Body (1g) W/kg @ 23.0 dBm	Measured Body SAR (1g) W/kg @ 23.0 dBm	Deviation 1g (%)	Certificate SAR Target Body (10g) W/kg @ 23.0 dBm	Measured Body SAR (10g) W/kg @ 23.0 dBm	Deviation 10g (%)	Certificate Impedance Body (Ohm) Real	Measured Impedance Body (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Body (Ohm) Imaginary	Measured Impedance Body (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Body (dB)	Measured Return Loss Body (dB)	Deviation (%)	PASS/FAIL
9/8/2017	9/8/2017	1.432	2.04	2.01	-1.47%	1.336	1.32	-1.20%	46.6	46.7	0.1	-5.8	-3.4	2.4	-23.2	-25.8	-11.20%	PASS

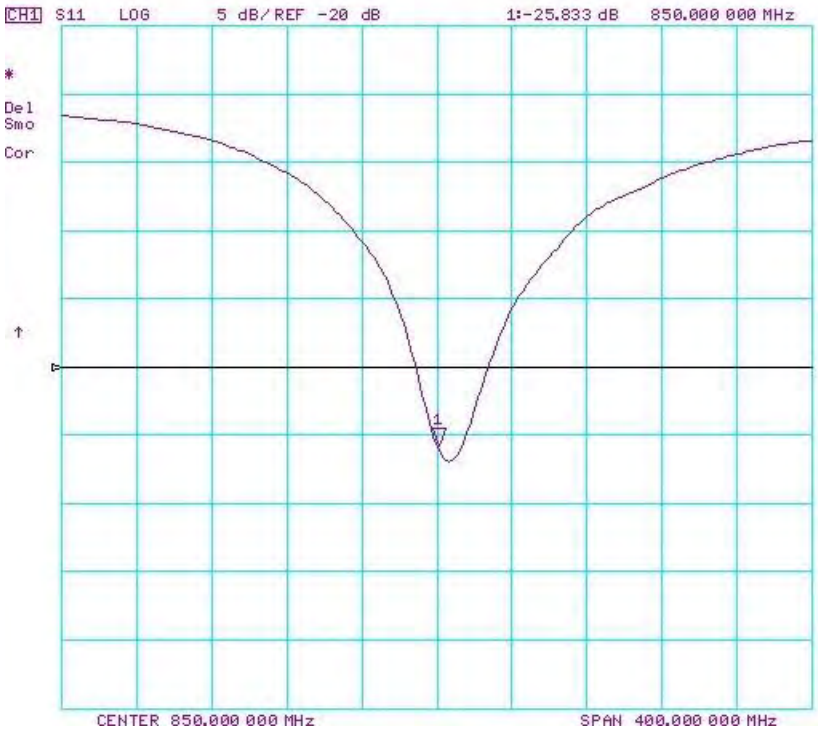
Impedance & Return-Loss Measurement Plot for Head TSL





Impedance & Return-Loss Measurement Plot for Body TSL





Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client PC Test

Certificate No: D835V2-4d180_May18

CALIBRATION CERTIFICATE

Object: D835V2 - SN:4d180

Calibration procedure(s): QA CAL-05.v10
Calibration procedure for dipole validation kits above 700 MHz

SCV 5/31/2018

Calibration date: May 18, 2018

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-18 (No. 217-02682)	Apr-19
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-18 (No. 217-02683)	Apr-19
Reference Probe EX3DV4	SN: 7349	30-Dec-17 (No. EX3-7349_Dec17)	Dec-18
DAE4	SN: 601	26-Oct-17 (No. DAE4-601_Oct17)	Oct-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18

	Name	Function	Signature
Calibrated by:	Manu Seitz	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: May 22, 2018

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.1
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.8 ± 6 %	0.92 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.45 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.60 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.58 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**6.22 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.6 ± 6 %	0.99 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.44 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**9.59 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.60 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**6.31 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.7 Ω - 5.1 jΩ
Return Loss	- 25.9 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.2 Ω - 8.2 jΩ
Return Loss	- 21.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.396 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	September 24, 2014

DASY5 Validation Report for Head TSL

Date: 17.05.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d180

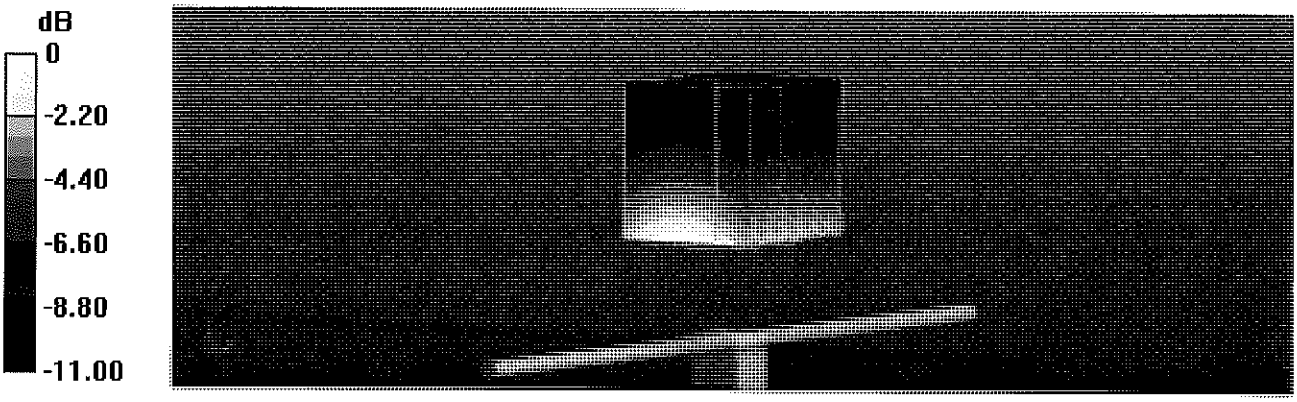
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.92 S/m; ε_r = 40.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.9, 9.9, 9.9) @ 835 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

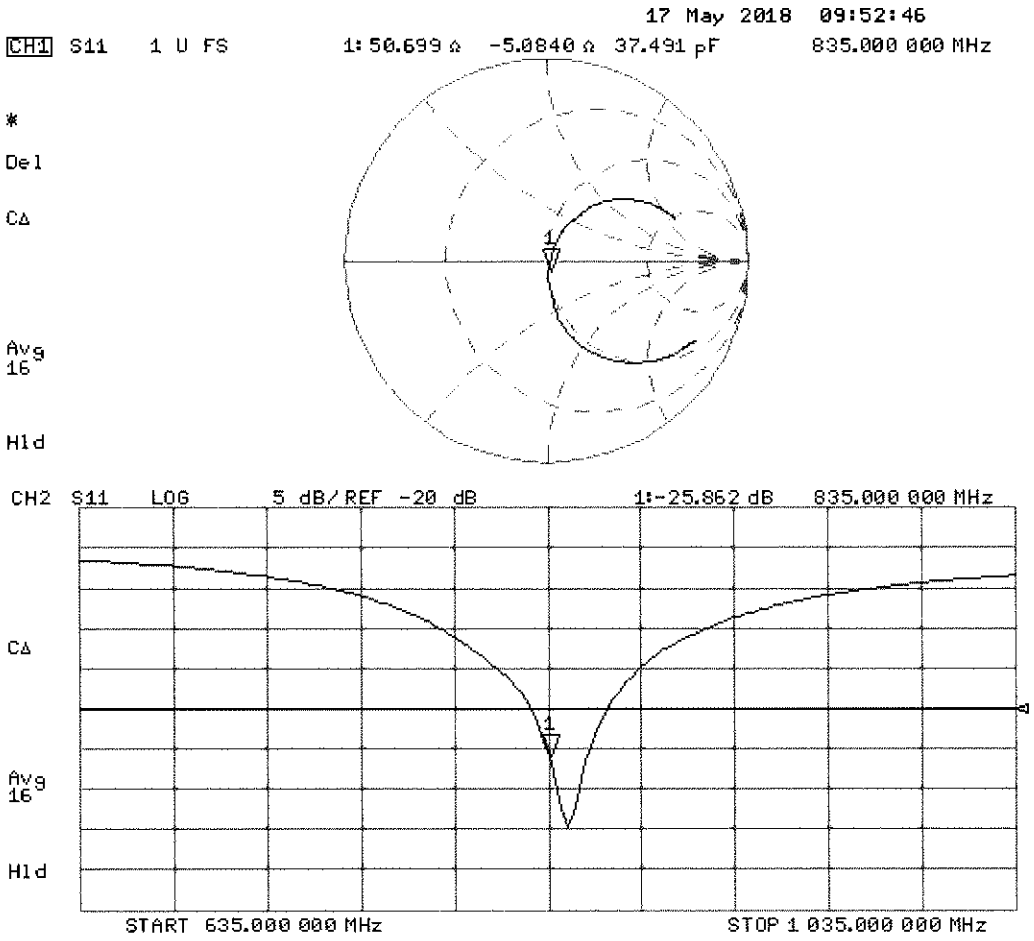
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 65.39 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 3.78 W/kg
SAR(1 g) = 2.45 W/kg; SAR(10 g) = 1.58 W/kg
Maximum value of SAR (measured) = 3.32 W/kg



0 dB = 3.32 W/kg = 5.21 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 18.05.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d180

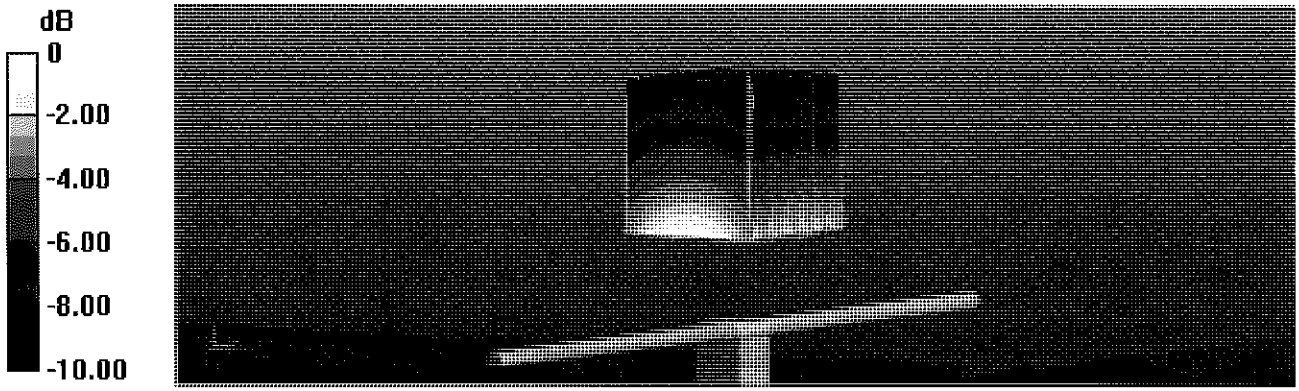
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.99 S/m; ε_r = 54.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.05, 10.05, 10.05) @ 835 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

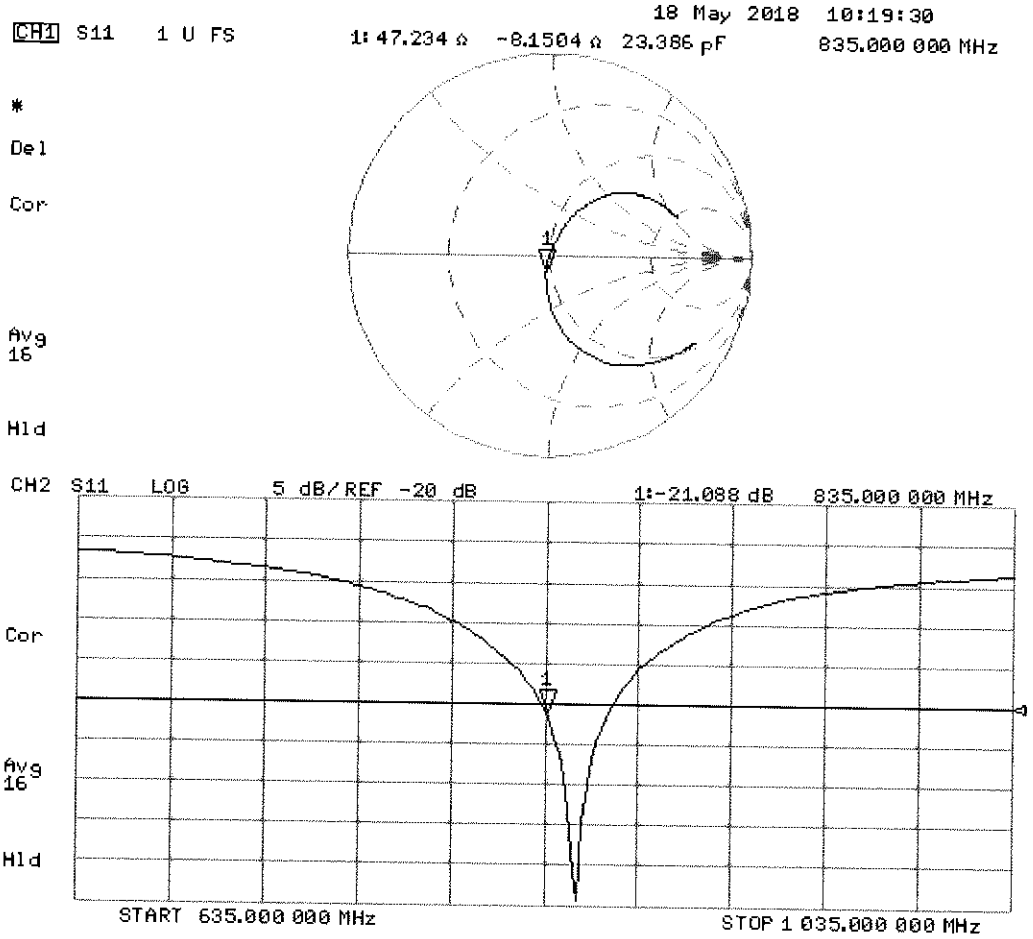
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 60.80 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 3.62 W/kg
SAR(1 g) = 2.44 W/kg; SAR(10 g) = 1.6 W/kg
Maximum value of SAR (measured) = 3.23 W/kg



0 dB = 3.23 W/kg = 5.09 dBW/kg

Impedance Measurement Plot for Body TSL



Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: D835V2-4d040_Jun17

CALIBRATION CERTIFICATE

Object D835V2 - SN:4d040

Calibration procedure(s) QA CAL-05.v9
Calibration procedure for dipole validation kits above 700 MHz

BNV 8/3/2017 SC ✓ 6/1/2018

Calibration date: June 13, 2017

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 7349	31-May-17 (No. EX3-7349_May17)	May-18
DAE4	SN: 601	28-Mar-17 (No. DAE4-601_Mar17)	Mar-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-16)	In house check: Oct-17

	Name	Function	Signature
Calibrated by:	Johannes Kurikka	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: June 15, 2017

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.0 ± 6 %	0.93 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.43 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.46 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.56 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**6.11 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.7 ± 6 %	1.00 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.45 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**9.56 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.60 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**6.28 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	49.8 Ω - 4.4 jΩ
Return Loss	- 27.0 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.4 Ω - 6.5 jΩ
Return Loss	- 22.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.391 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	September 20, 2005

DASY5 Validation Report for Head TSL

Date: 13.06.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d040

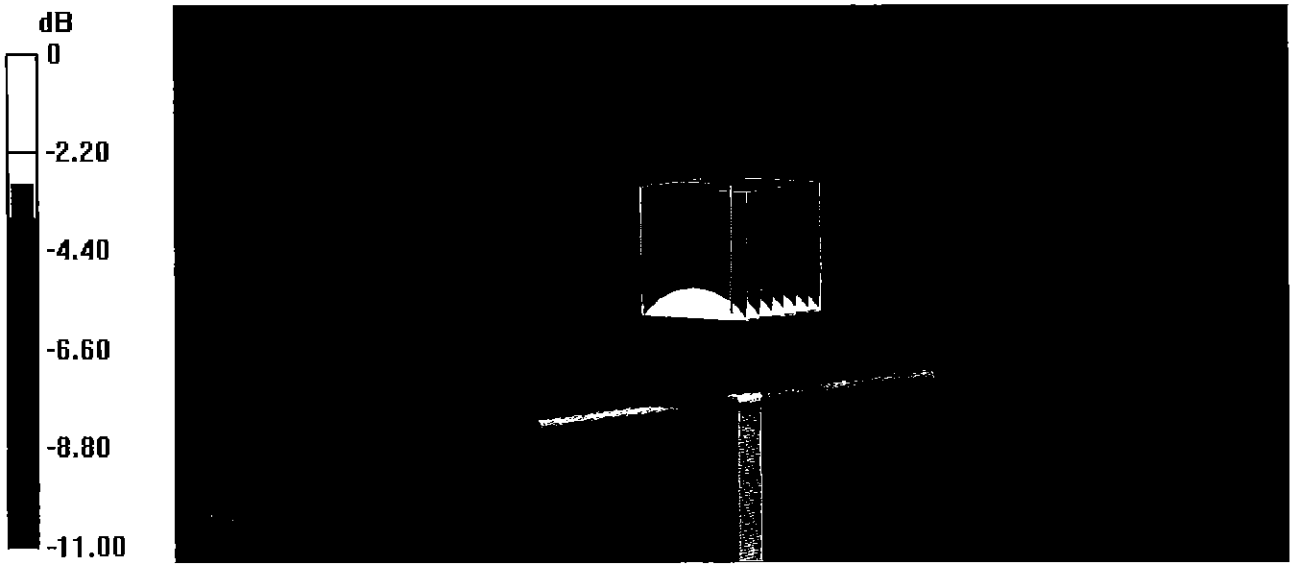
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; $\sigma = 0.93$ S/m; $\varepsilon_r = 41$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.07, 10.07, 10.07); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

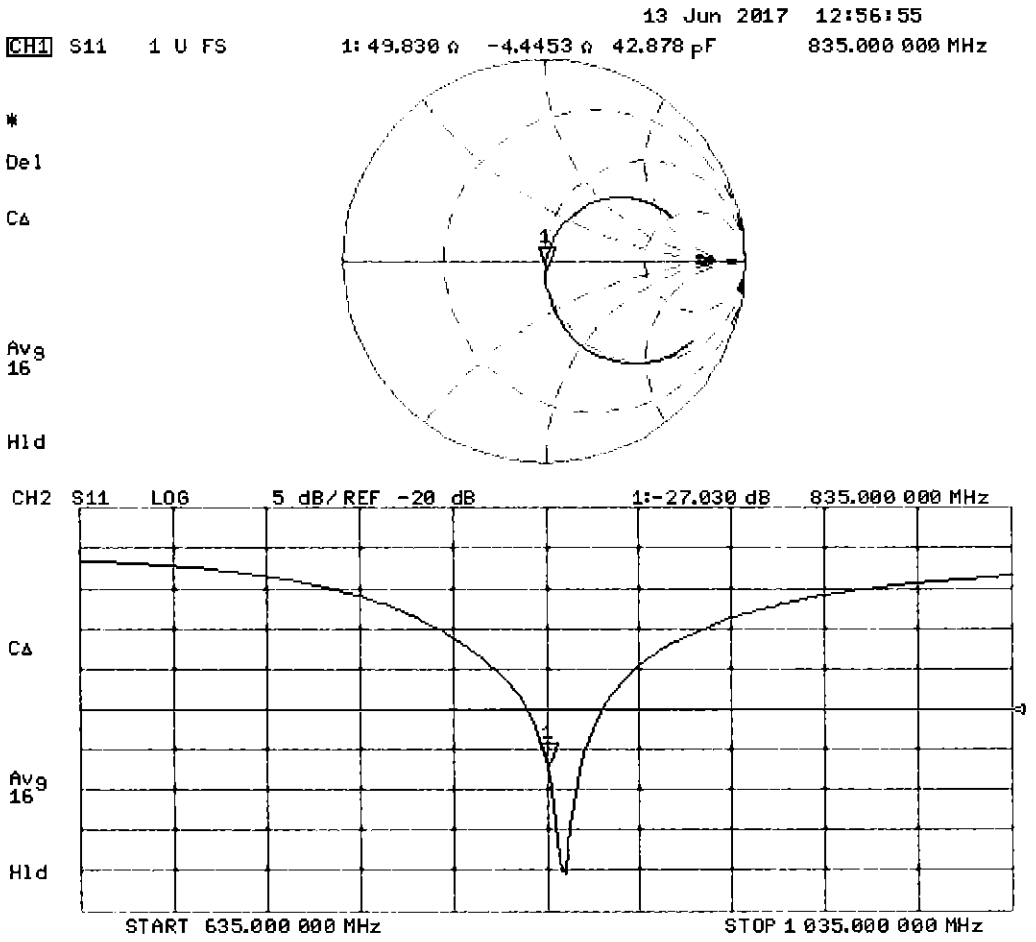
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 62.24 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 3.79 W/kg
SAR(1 g) = 2.43 W/kg; SAR(10 g) = 1.56 W/kg
Maximum value of SAR (measured) = 3.32 W/kg



0 dB = 3.32 W/kg = 5.21 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 12.06.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d040

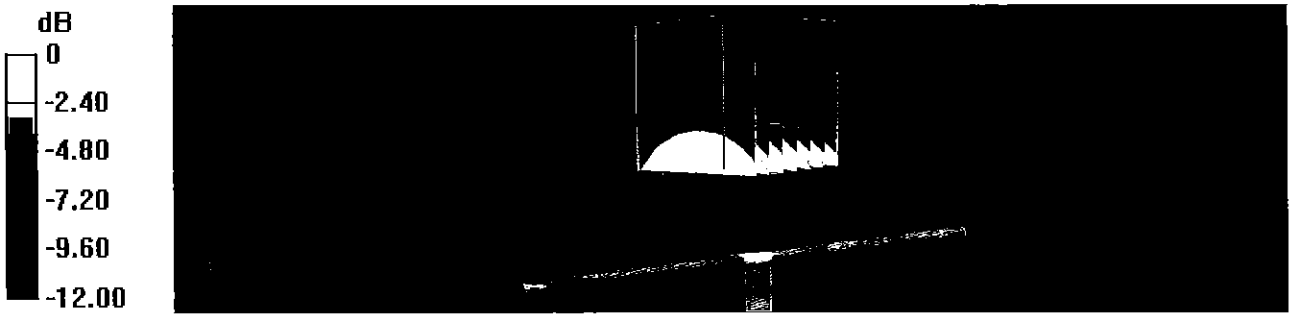
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 1 S/m; ε_r = 54.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.2, 10.2, 10.2); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

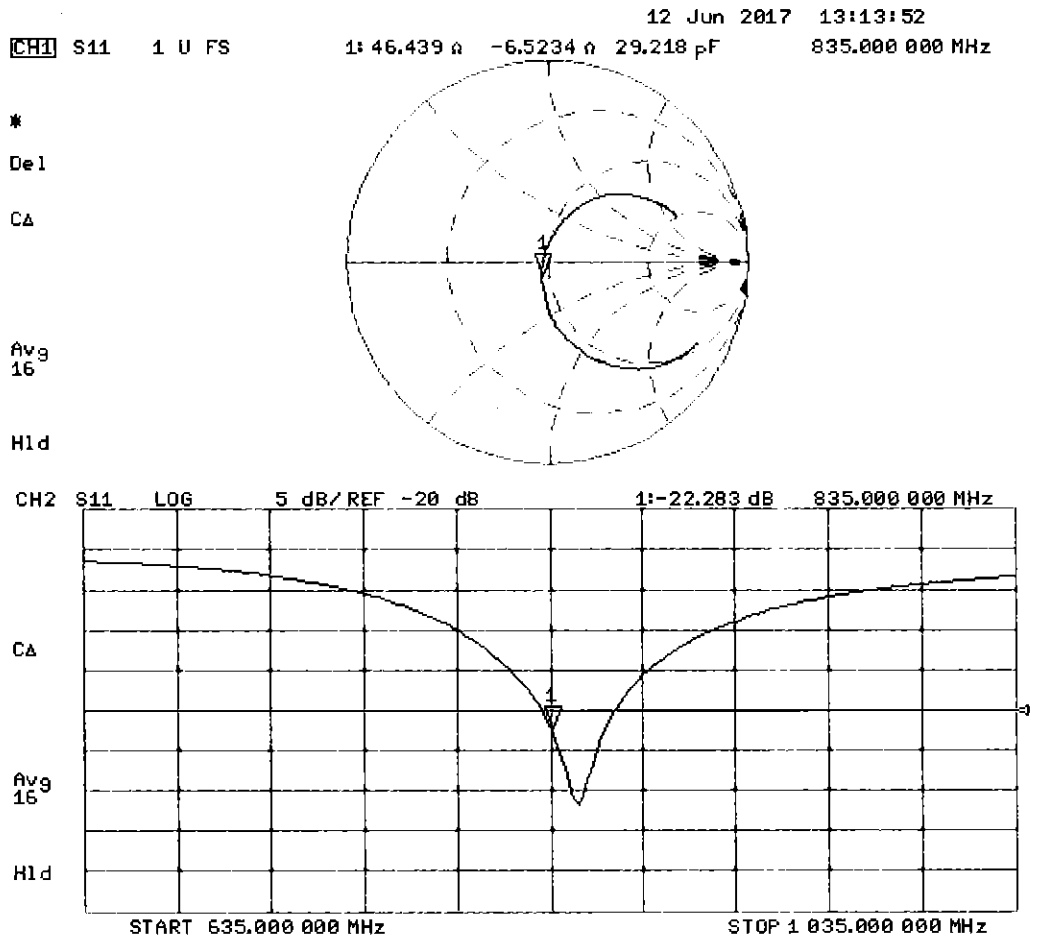
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 59.95 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 3.72 W/kg
SAR(1 g) = 2.45 W/kg; SAR(10 g) = 1.6 W/kg
Maximum value of SAR (measured) = 3.26 W/kg



0 dB = 3.26 W/kg = 5.13 dBW/kg

Impedance Measurement Plot for Body TSL



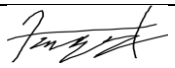
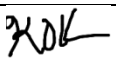
Certification of Calibration

Object	D835V2 – SN: 4d040
Calibration procedure(s)	Procedure for Calibration Extension for SAR Dipoles.
Extended Calibration date:	June 01, 2018
Description:	SAR Validation Dipole at 835 MHz.

Calibration Equipment used:

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	8753ES	S-Parameter Network Analyzer	9/14/2017	Annual	9/14/2018	US39170118
Agilent	N5182A	MXG Vector Signal Generator	3/19/2018	Annual	3/19/2019	US46240505
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	343972
Anritsu	ML2496A	Power Meter	10/9/2017	Annual	10/9/2018	1138001
Anritsu	MA2411B	Pulse Power Sensor	11/15/2017	Annual	11/15/2018	1339007
Anritsu	MA2411B	Pulse Power Sensor	11/22/2017	Annual	11/22/2018	1339008
Control Company	4040	Temperature / Humidity Monitor	2/28/2018	Biennial	2/28/2020	150761911
Control Company	4352	Ultra Long Stem Thermometer	2/14/2017	Biennial	2/14/2019	170112507
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	6/1/2017	Annual	6/1/2018	MY53401181
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE5011-1	Torque Wrench	7/19/2017	Biennial	7/19/2019	N/A
SPEAG	DAKS-3.5	Portable DAK	9/5/2017	Annual	9/5/2018	1045
SPEAG	ES3DV3	SAR Probe	3/13/2018	Annual	3/13/2019	3131
SPEAG	EX3DV4	SAR Probe	1/26/2018	Annual	1/26/2019	7490
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/7/2018	Annual	3/7/2019	604
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/26/2018	Annual	1/26/2019	1532

Measurement Uncertainty = ±23% (k=2)

	Name	Function	Signature
Calibrated By:	Sangmin Cha	Biomedical Engineer II	
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	

DIPOLE CALIBRATION EXTENSION

Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

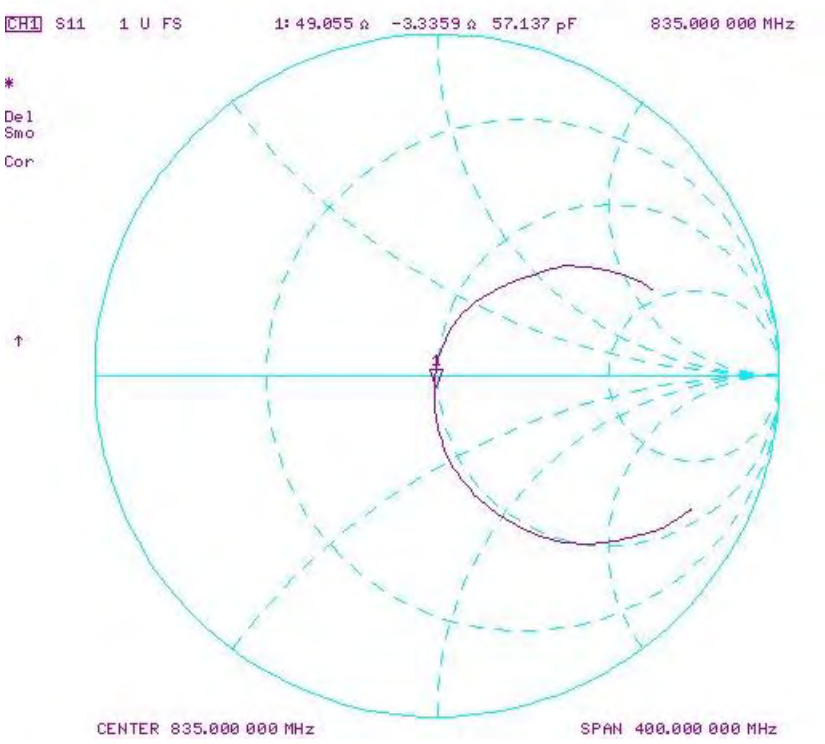
1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

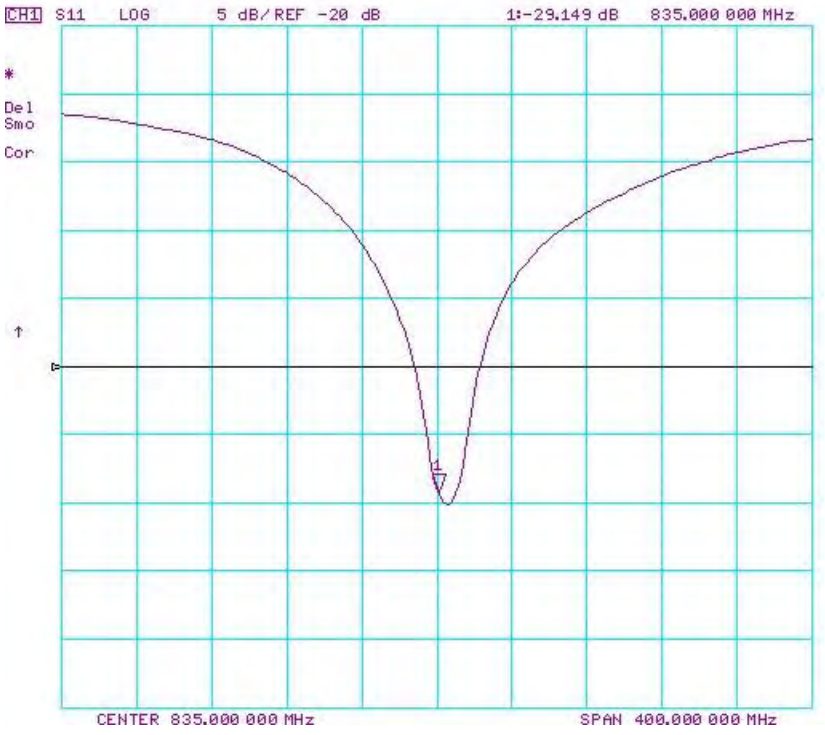
The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Head (1g) W/kg @ 23.0 dBm	Measured Head SAR (1g) W/kg @ 23.0 dBm	Deviation 1g (%)	Certificate SAR Target Head (10g) W/kg @ 23.0 dBm	Measured Head SAR (10g) W/kg @ 23.0 dBm	Deviation 10g (%)	Certificate Impedance Head (Ohm) Real	Measured Impedance Head (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Head (Ohm) Imaginary	Measured Impedance Head (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Head (dB)	Measured Return Loss Head (dB)	Deviation (%)	PASS/FAIL
6/13/2017	6/1/2018	1.391	1.892	1.99	5.18%	1.222	1.3	6.38%	49.8	49.1	0.7	-4.4	-3.3	1.1	-27	-29.1	-7.80%	PASS

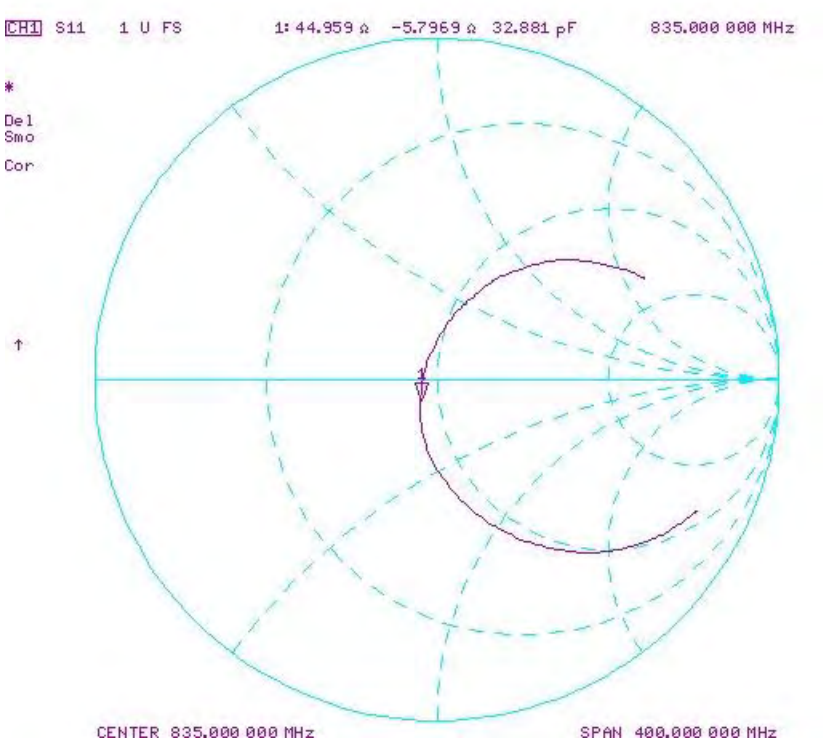
Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Body (1g) W/kg @ 23.0 dBm	Measured Body SAR (1g) W/kg @ 23.0 dBm	Deviation 1g (%)	Certificate SAR Target Body (10g) W/kg @ 23.0 dBm	Measured Body SAR (10g) W/kg @ 23.0 dBm	Deviation 10g (%)	Certificate Impedance Body (Ohm) Real	Measured Impedance Body (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Body (Ohm) Imaginary	Measured Impedance Body (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Body (dB)	Measured Return Loss Body (dB)	Deviation (%)	PASS/FAIL
6/13/2017	6/1/2018	1.391	1.912	1.9	-0.63%	1.256	1.26	0.32%	46.4	45	1.4	-6.5	-5.8	0.7	-22.3	-22.5	-0.90%	PASS

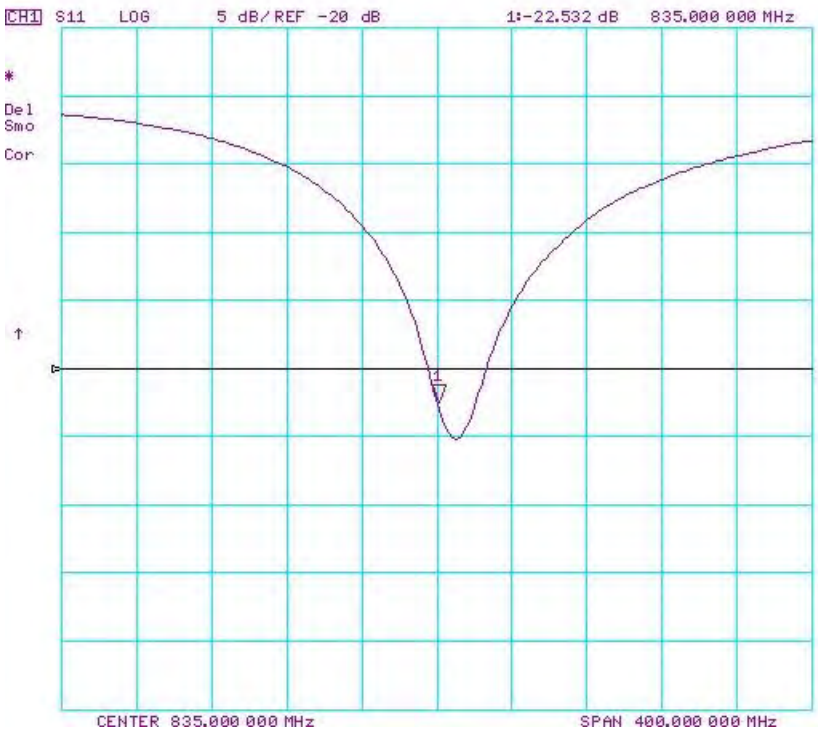
Impedance & Return-Loss Measurement Plot for Head TSL





Impedance & Return-Loss Measurement Plot for Body TSL





Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: D1750V2-1104_Sep17

CALIBRATION CERTIFICATE

Object	D1750V2 - SN:1104
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	September 07, 2017

SC ✓ 10/03/2017

SC ✓ 9/7/2018

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 7349	31-May-17 (No. EX3-7349_May17)	May-18
DAE4	SN: 601	28-Mar-17 (No. DAE4-601_Mar17)	Mar-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-16)	In house check: Oct-17

	Name	Function	Signature
Calibrated by:	Michael Weber	Laboratory Technician	M.Weber
Approved by:	Katja Pokovic	Technical Manager	

Issued: September 7, 2017

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.1	1.37 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.1 ± 6 %	1.36 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.11 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**36.4 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.81 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**19.2 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.4	1.49 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	53.8 ± 6 %	1.46 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.03 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**36.6 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	4.85 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**19.6 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.8 Ω - 0.2 jΩ
Return Loss	- 41.5 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.5 Ω - 0.7 jΩ
Return Loss	- 28.7 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.217 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	May 16, 2013

DASY5 Validation Report for Head TSL

Date: 07.09.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN:1104

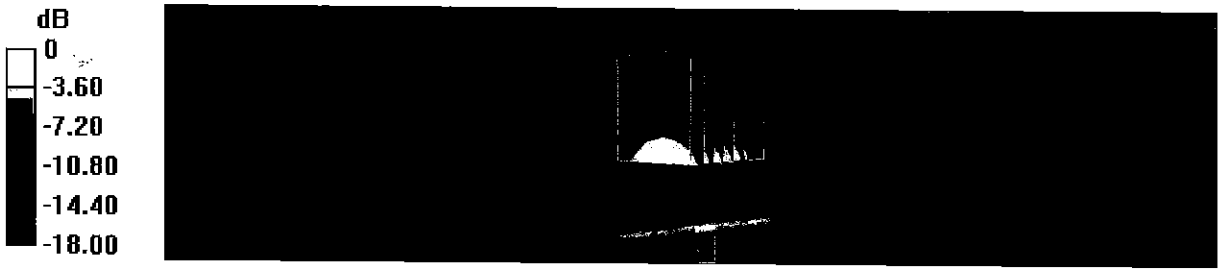
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.36 S/m; ε_r = 39.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.73, 8.73, 8.73); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

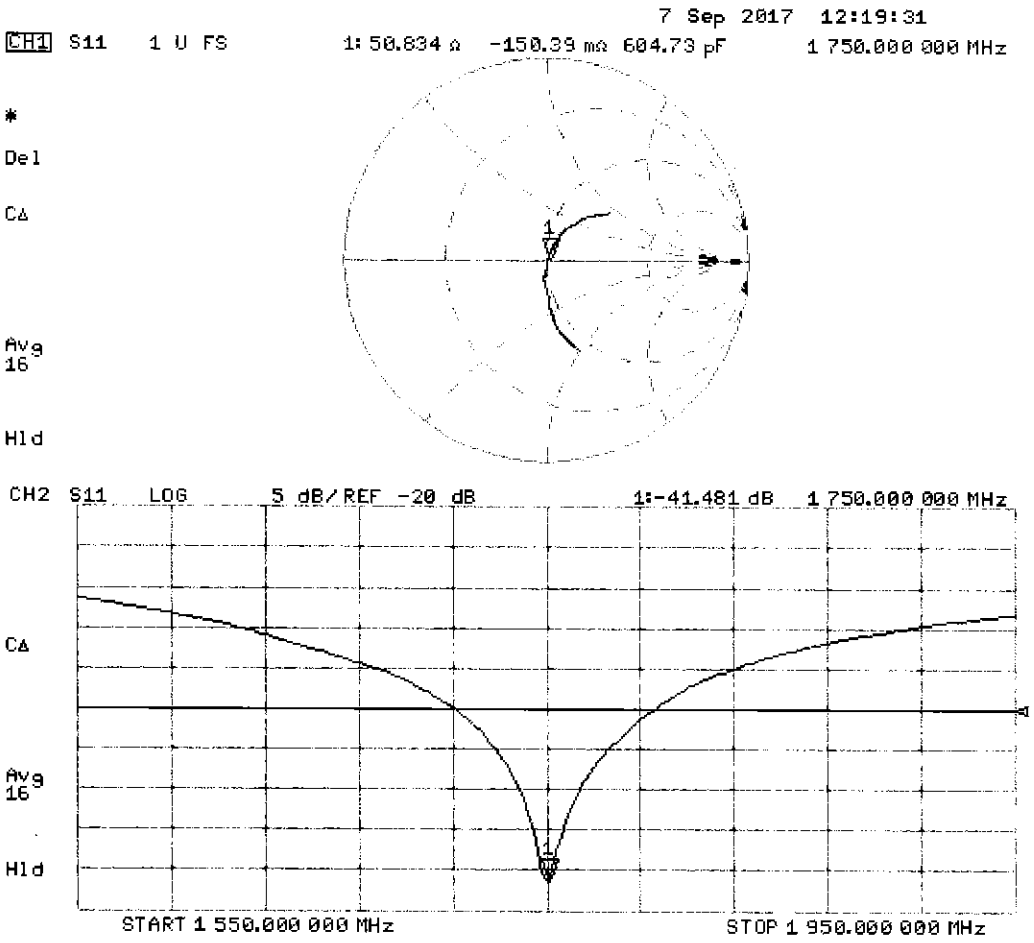
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 104.9 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 17.0 W/kg
SAR(1 g) = 9.11 W/kg; SAR(10 g) = 4.81 W/kg
Maximum value of SAR (measured) = 13.9 W/kg



0 dB = 13.9 W/kg = 11.43 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 07.09.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN:1104

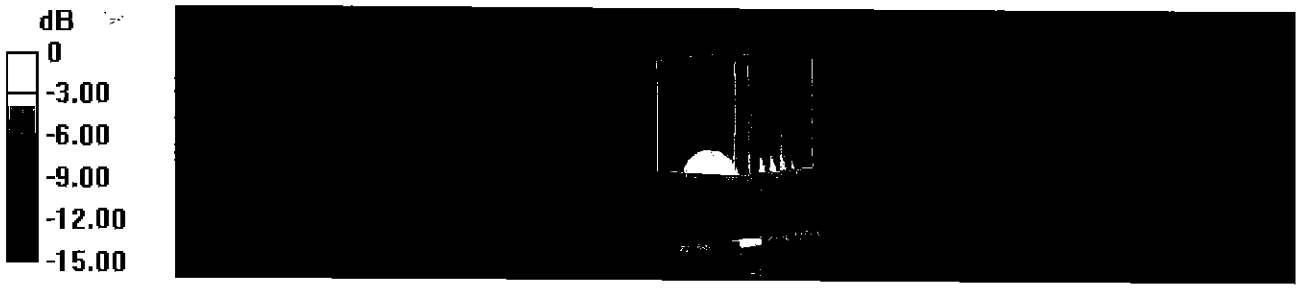
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.46 S/m; ε_r = 53.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.46, 8.46, 8.46); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

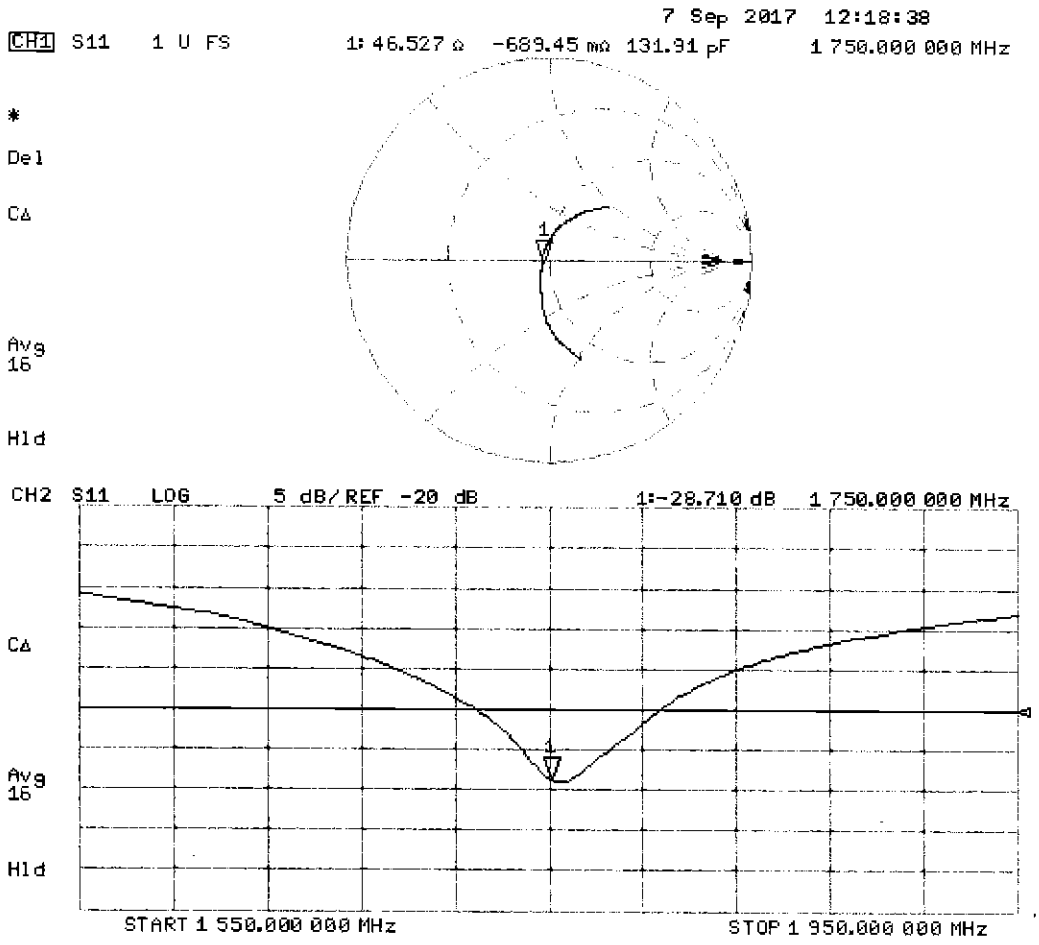
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 99.30 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 15.6 W/kg
SAR(1 g) = 9.03 W/kg; SAR(10 g) = 4.85 W/kg
Maximum value of SAR (measured) = 12.9 W/kg



0 dB = 12.9 W/kg = 11.11 dBW/kg

Impedance Measurement Plot for Body TSL



Certification of Calibration

Object	D1750V2 – SN: 1104
Calibration procedure(s)	Procedure for Calibration Extension for SAR Dipoles.
Extended Calibration date:	September 07, 2018
Description:	SAR Validation Dipole at 1750 MHz.

Calibration Equipment used:

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	8753ES	S-Parameter Network Analyzer	9/14/2017	Annual	9/14/2018	US39170118
Agilent	N5182A	MXG Vector Signal Generator	3/19/2018	Annual	3/19/2019	US46240505
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	343972
Anritsu	ML2496A	Power Meter	10/9/2017	Annual	10/9/2018	1138001
Anritsu	MA2411B	Pulse Power Sensor	11/15/2017	Annual	11/15/2018	1339007
Anritsu	MA2411B	Pulse Power Sensor	11/22/2017	Annual	11/22/2018	1339008
Control Company	4040	Temperature / Humidity Monitor	2/28/2018	Biennial	2/28/2020	150761911
Control Company	4352	Ultra Long Stem Thermometer	2/14/2017	Biennial	2/14/2019	170112507
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	6/4/2018	Annual	6/4/2019	MY53401181
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE5011-1	Torque Wrench	7/19/2017	Biennial	7/19/2019	N/A
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/15/2018	Annual	5/15/2019	1070
SPEAG	ES3DV3	SAR Probe	9/18/2017	Annual	9/18/2018	3287
SPEAG	DAE4	Data Acquisition Electronics	1/26/2018	Annual	1/26/2019	1533

Measurement Uncertainty = ±23% (k=2)

	Name	Function	Signature
Calibrated By:	Sangmin Cha	Team Lead Engineer	
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	

DIPOLE CALIBRATION EXTENSION

Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

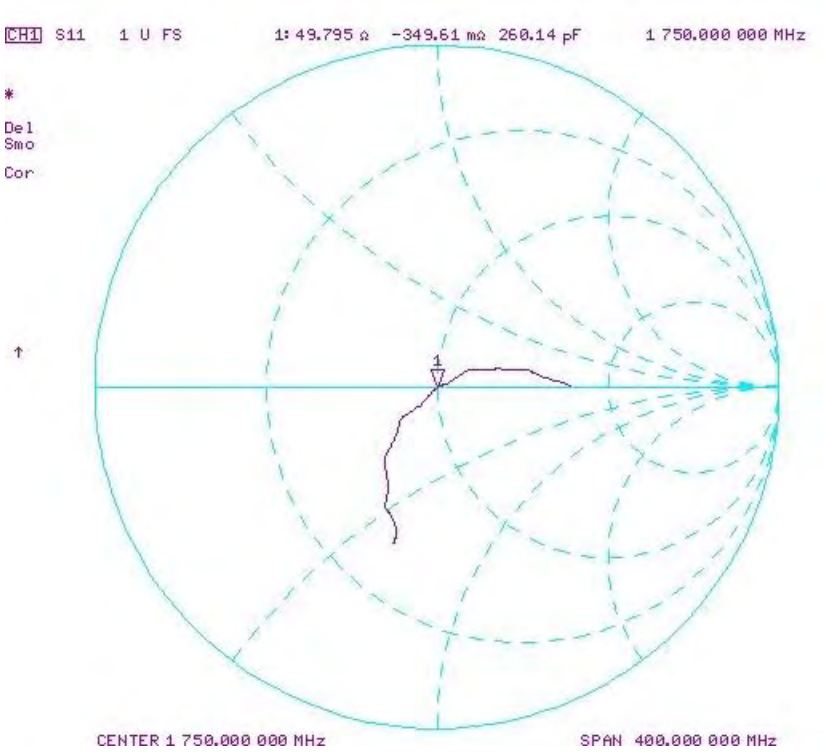
1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

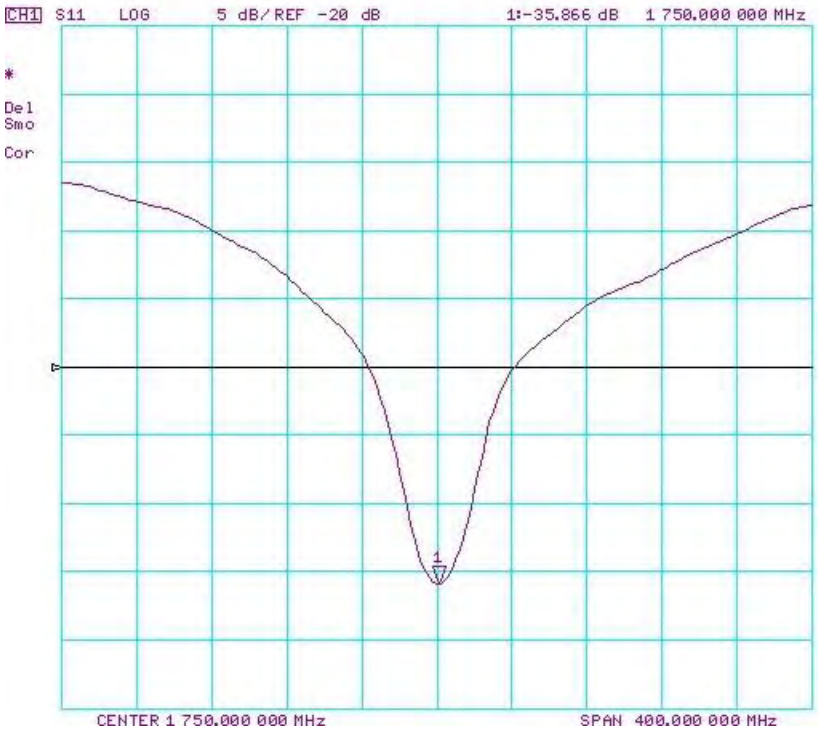
The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Head (1g) W/kg @ 20.0 dBm	Measured Head SAR (1g) W/kg @ 20.0 dBm	Deviation 1g (%)	Certificate SAR Target Head (10g) W/kg @ 20.0 dBm	Measured Head SAR (10g) W/kg @ 20.0 dBm	Deviation 10g (%)	Certificate Impedance Head (Ohm) Real	Measured Impedance Head (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Head (Ohm) Imaginary	Measured Impedance Head (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Head (dB)	Measured Return Loss Head (dB)	Deviation (%)	PASS/FAIL
9/7/2017	9/7/2018	1.217	3.64	3.62	-0.55%	1.92	1.94	1.04%	50.8	49.8	1	-0.2	-0.3	0.1	-41.5	-35.9	13.50%	PASS

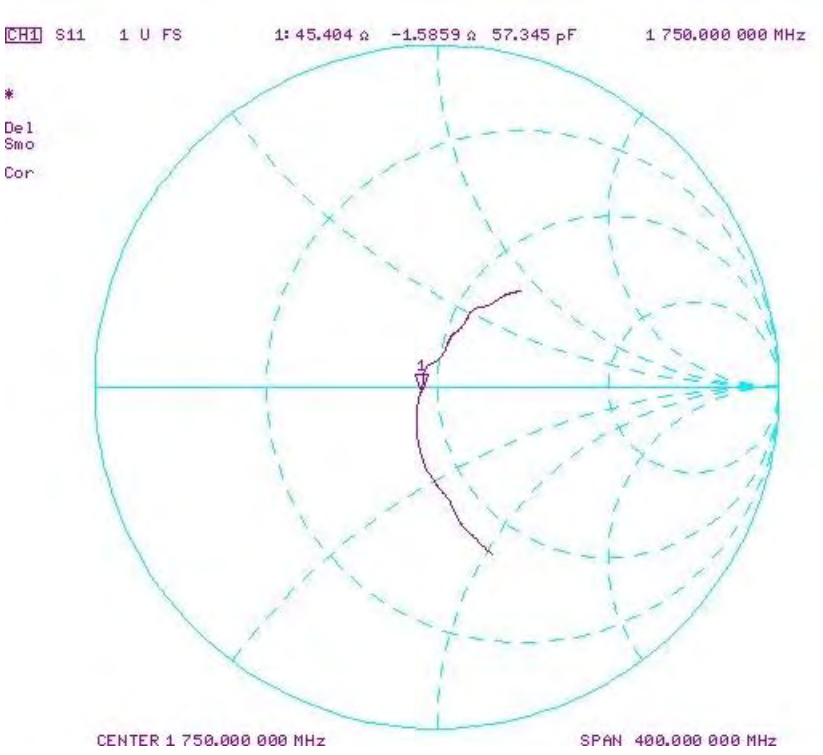
Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Body (1g) W/kg @ 20.0 dBm	Measured Body SAR (1g) W/kg @ 20.0 dBm	Deviation 1g (%)	Certificate SAR Target Body (10g) W/kg @ 20.0 dBm	Measured Body SAR (10g) W/kg @ 20.0 dBm	Deviation 10g (%)	Certificate Impedance Body (Ohm) Real	Measured Impedance Body (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Body (Ohm) Imaginary	Measured Impedance Body (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Body (dB)	Measured Return Loss Body (dB)	Deviation (%)	PASS/FAIL
9/7/2017	9/7/2018	1.217	3.66	3.84	4.92%	1.96	2.07	5.61%	46.527	45.4	1.1	-0.69	-1.6	0.9	-28.7	-25.8	10.10%	PASS

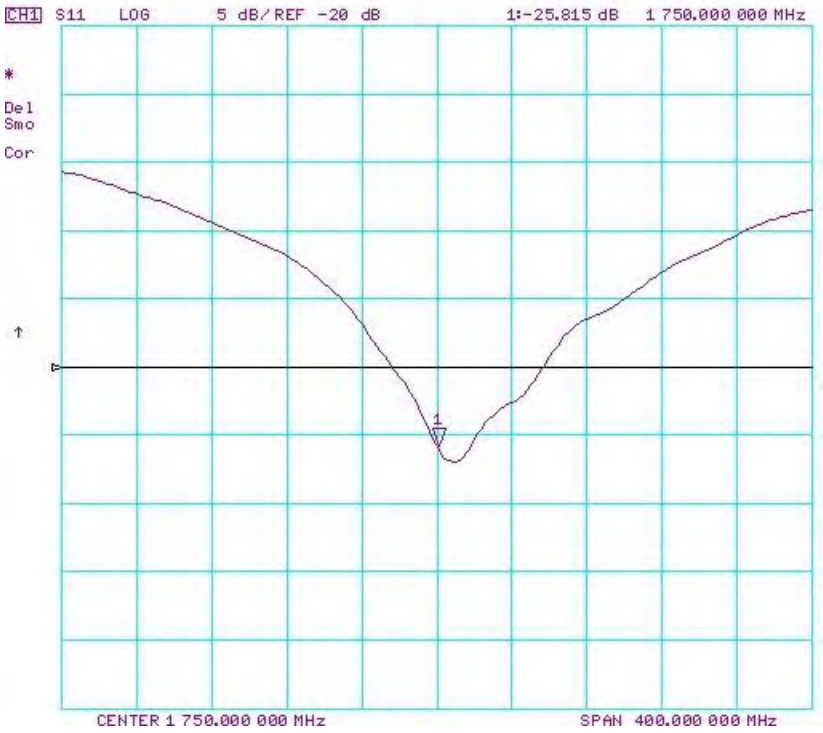
Impedance & Return-Loss Measurement Plot for Head TSL





Impedance & Return-Loss Measurement Plot for Body TSL





Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client PC Test

Certificate No: D1900V2-5d026_May18

CALIBRATION CERTIFICATE

Object D1900V2 - SN:5d026

Calibration procedure(s) QA CAL-05.v10
Calibration procedure for dipole validation kits above 700 MHz

SC ✓
5/31/2018

Calibration date: May 14, 2018

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-18 (No. 217-02682)	Apr-19
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-18 (No. 217-02683)	Apr-19
Reference Probe EX3DV4	SN: 7349	30-Dec-17 (No. EX3-7349_Dec17)	Dec-18
DAE4	SN: 601	26-Oct-17 (No. DAE4-601_Oct17)	Oct-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: May 14, 2018

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.1
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.2 ± 6 %	1.35 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.78 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**40.2 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.19 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**21.1 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.3 ± 6 %	1.46 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.65 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**39.9 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.19 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**21.2 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.0 Ω + 8.0 jΩ
Return Loss	- 21.6 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.1 Ω + 7.4 jΩ
Return Loss	- 21.8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.199 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	December 17, 2002

DASY5 Validation Report for Head TSL

Date: 14.05.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d026

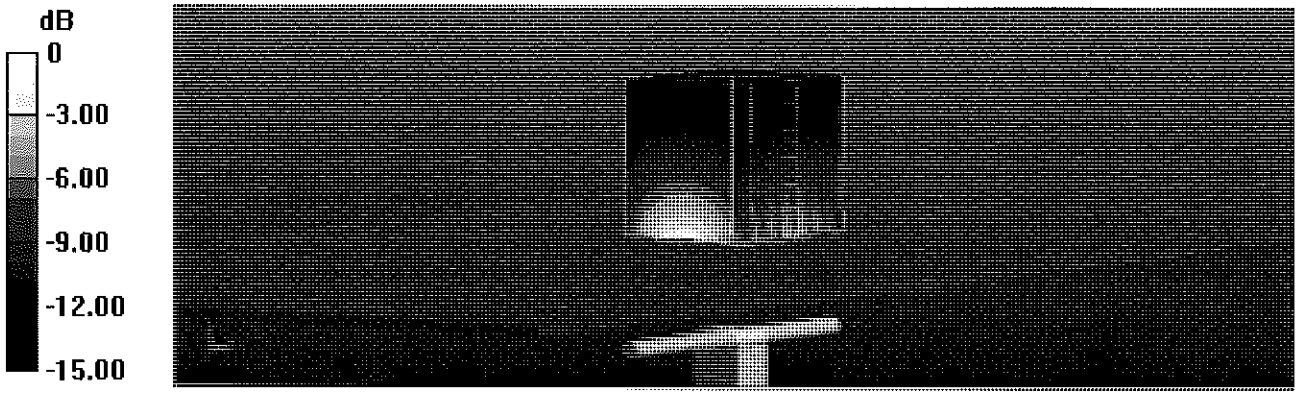
Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.35 S/m; ε_r = 41.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.18, 8.18, 8.18) @ 1900 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 109.9 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 17.8 W/kg
SAR(1 g) = 9.78 W/kg; SAR(10 g) = 5.19 W/kg
Maximum value of SAR (measured) = 15.0 W/kg



0 dB = 15.0 W/kg = 11.76 dBW/kg