RF SAFETY LAB
A NEXT GENERATION TEST LABORATORY™

RF Safety Laboratory, LLC
5520 Research Park Drive, Suite 140
Catonsville, Maryland 21228 USA
+1 202 240 9240
info@rfsafetylab.com

47CFR §2.1093 – FCC SAR REPORT

FCC ID:	**PY7-27433F**
Device Type:	Portable Device
Report Issue Date:	April 4, 2024

Sony Corporation
1-7-1 Konan Minato-ku
Tokyo, 108-0075, Japan

Certification

FCC Equipment Class	Head SAR [W/Kg]	Body-worn SAR [W/Kg]	Hotspot SAR [W/Kg]	1g Simultaneous Tx SAR [W/kg]	Phablet SAR [W/Kg]	10g Simultaneous Tx SAR [W/kg]
PCE	0.13	0.42	0.46	0.78	-	0.39
DTS	0.52	0.21	0.21	0.78	-	0.39
NII	0.28	0.13	0.13	0.78	0.35	0.39
DSS	< 0.10	< 0.10	0.14	0.78	-	0.39
DXX	-	-	-	-	< 0.10	0.39
FCC Limit	**1.6**	**1.6**	**1.6**	**1.6**	**4.0**	**4.0**

The measurement evaluations presented in this report are based on the maximum performance of the tested device(s), which has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/ general population exposure federal limits in 47CFR § 1.1310 and has been tested in accordance with the measurement procedures specified within this report.

This report and data apply only for US operations only.

This document has been revised and replaces all previously issued versions of this document with the same Test Report S/N.

ilac-MRA

ANAB
ANSI National Accreditation Board
ACCREDITED
ISO/IEC 17025
TESTING LABORATORY

Steve Liu
President

Table of Contents

1. DUT Specifics 3
2. DUT Conducted Powers 9
3. DUT SAR Test Results 19
4. DUT SAR Measurement Variability Requirement 25
5. General Introduction 26
6. Background on Radiofrequency (RF) Exposure Limits 27
7. RF Safety Laboratory SAR Measurement System 29
8. Technology Specific Test Setup Requirements 35
9. Equipment List 40
10. Conclusion 41

Appendix A: SAR Test Plots

Appendix B: Tissue Stimulating Liquids, System Checks and System Validation

Appendix C: System Check Plots

Appendix D: Calibration Certificates

Appendix E: Simultaneous Transmission Analysis

Appendix F : DUT Antenna Diagram and Test Setup Photos

Appendix G: Secondary Mode Conducted Powers

1. DUT Specifics

1.1. Device under Test

The manufacturer has confirmed that the device is within operational tolerances expected for production units and has the same physical, mechanical, and thermal characteristics expected for production units. The serial number of the device used for each test is indicated alongside the results.

Software version 0.721 was used during testing.

1.2. Maximum SAR per Mode

Table 1-1 Maximum SAR per Mode

FCC Equipment Class	Band/Mode	Frequency (MHz)	Head SAR [W/Kg]	Body-worn SAR [W/Kg]	Hotspot SAR [W/Kg]	1g Simultaneous Tx SAR [W/kg]	Phablet SAR [W/Kg]	10g Simultaneous Tx SAR [W/kg]
PCE	GSM 850	824 - 849 MHz	0.126	0.268	0.257	0.784	-	0.393
PCE	GSM 1900	1850 - 1910 MHz	0.025	0.210	0.276	0.784	-	0.393
PCE	UMTS Band 5	824 - 849 MHz	0.115	0.253	0.253	0.784	-	0.393
PCE	UMTS Band 4	1710 - 1755 MHz	0.124	0.415	0.462	0.784	-	0.393
PCE	UMTS Band 2	1850 - 1910 MHz	0.031	0.301	0.301	0.784	-	0.393
PCE	LTE Band 12	699 - 716 MHz	0.108	0.178	0.200	0.784	-	0.393
PCE	LTE Band 17	704 - 716 MHz	-	-	-	-	-	-
PCE	LTE Band 13	777 - 787 MHz	0.114	0.188	0.188	0.784	-	0.393
PCE	LTE Band 5	824 - 849 MHz	0.111	0.216	0.216	0.784	-	0.393
PCE	LTE Band 66	1710 - 1780 MHz	0.104	0.373	0.463	0.784	-	0.393
PCE	LTE Band 4	1710 - 1755 MHz	-	-	-	-	-	-
PCE	LTE Band 25	1850 - 1915 MHz	0.019	0.206	0.284	0.784	-	0.393
PCE	LTE Band 2	1850 - 1910 MHz	-	-	-	-	-	-
PCE	LTE Band 41	2496 - 2690 MHz	0.019	0.150	0.240	0.784	-	0.393
DTS	2.4 GHz WIFI	2412 - 2462 MHz	0.522	0.210	0.210	0.784	-	0.393
NII	5 GHz WIFI	5180 - 5825 MHz	0.283	0.127	0.127	0.784	0.350	0.393
DSS	2.4 GHz Bluetooth	2402 - 2480 MHz	0.043	0.072	0.137	0.784	-	0.393
DXX	NFC	13.56 MHz	-	-	-	0.784	0.011	0.393

1.3. LTE Supported Bandwidths and Modulations

Table 1-2 LTE Bands and Modulations

Band	Bandwidth (MHz)	UL Modulation
LTE Band 12	10, 5, 3, 1.4	QPSK, 16QAM, 64QAM, 256QAM
LTE Band 17	10, 5	QPSK, 16QAM, 64QAM, 256QAM
LTE Band 13	10, 5	QPSK, 16QAM, 64QAM, 256QAM
LTE Band 5	10, 5, 3, 1.4	QPSK, 16QAM, 64QAM, 256QAM
LTE Band 66	20, 15, 10, 5, 3, 1.4	QPSK, 16QAM, 64QAM, 256QAM
LTE Band 4	20, 15, 10, 5, 3, 1.4	QPSK, 16QAM, 64QAM, 256QAM
LTE Band 25	20, 15, 10, 5, 3, 1.4	QPSK, 16QAM, 64QAM,256QAM
LTE Band 2	20, 15, 10, 5, 3, 1.4	QPSK, 16QAM, 64QAM,256QAM
LTE Band 41	20, 15, 10, 5	QPSK, 16QAM, 64QAM,256QAM

1.4. Time-Averaging Algorithm for RF Exposure Compliance

This Device is enabled with the Qualcomm® Smart Transmit feature. **For this device, all US Operations are limited to peak exposure mode only.** In Peak Exposure Mode, the output power of the device is limited to the lower of the Pmax and the Plimit for each characterized technology and band. The device will never transmit higher than these levels at any point.

Note that WLAN/BT/NFC operations are not enabled with Smart Transmit for this device.

Note that the device uncertainty for sub-6GHz WWAN is 1.0 dB for this EUT.

Table 1-3 SAR Char

Exposure Scenario		Maximum Tune-Up Output Power*	Head	Body-worn / Hotspot	Phablet
DSI			3	3	3
Band/Mode	Antenna	Pmax (dBm)	Plimit (dBm)	Plimit (dBm)	Plimit (dBm)
GSM 850	Main1	23.3	23.3	23.3	23.3
GSM 1900	Main2	20.8	18.8	18.8	18.8
UMTS Band 5	Main1	24.0	22.0	22.0	22.0
UMTS Band 4	Main2	24.0	21.0	21.0	21.0
UMTS Band 2	Main2	24.0	19.0	19.0	19.0
LTE Band 12/17	Main1	24.0	21.0	21.0	21.0
LTE Band 13	Main1	24.3	21.0	21.0	21.0
LTE Band 5	Main1	24.3	21.0	21.0	21.0
LTE Band 66/4	Main2	24.0	20.0	20.0	20.0
LTE Band 25/2	Main2	24.0	18.0	18.0	18.0
LTE Band 41	Main2	22.0	16.0	16.0	16.0

*Note all Plimit EFS and maximum tune up output power Pmax levels entered in above Table correspond to average power levels after accounting for duty cycle in the case of TDD modulation schemes (e.g. LTE TDD).

The maximum time-averaged output power (dBm) for any Sub6 WWAN technology, band, and DSI = minimum of the "Plimit EFS" and "Maximum tune up output power Pmax", +1dB device uncertainty. SAR values in this report were scaled to this maximum time-averaged output power to determine compliance per KDB Publication 447498 D04v01.

1.5. Maximum Time-Averaged Power

This device follows the below target output power specifications and tolerances. SAR values were scaled to the maximum allowed power (including tolerance) to determine compliance per KDB Publication 447498 D04v01.

Table 1-4 GSM Target RF Output Power

GSM/GPRS/EDGE 850 - Main1 Antenna									
Power Level	Voice [dBm]	Data - Burst Average GMSK [dBm]				Data - Burst Average 8-PSK [dBm]			
	1 TX Slot	1 TX Slot	2 TX Slots	3 TX Slots	4 TX Slots	1 TX Slot	2 TX Slots	3 TX Slots	4 TX Slots
DSI 3 (Head/Body-worn/Hotspot/Phablet)	32.5	32.5	29.5	27.7	26.5	27.0	24.0	22.2	21.0

DTM 850 - Main1 Antenna								
Power Level	DTM 2 Tx Slots (GSM+ GPRS/EDGE GMSK) [dBm]		DTM 3 Tx Slots (GSM+ GPRS/EDGE GMSK) [dBm]		DTM 2 Tx Slots (GSM+ EDGE 8-PSK [dBm]		DTM 3 Tx Slots (GSM+ EDGE 8-PSK) [dBm]	
	CS 1 Tx Slot	PS 1 Tx Slot	CS 1Tx Slot	PS 2 Tx Slots	CS 1Tx Slot	PS 1 Tx Slot	CS 1Tx Slot	PS 2 Tx Slots
DSI 3 (Head/Body-worn/Hotspot/Phablet)	29.5	29.5	27.7	27.7	29.5	24.0	27.7	22.2

GSM/GPRS/EDGE 1900 - Main2 Antenna									
Power Level	Voice [dBm]	Data - Burst Average GMSK [dBm]				Data - Burst Average 8-PSK [dBm]			
	1 TX Slot	1 TX Slot	2 TX Slots	3 TX Slots	4 TX Slots	1 TX Slot	2 TX Slots	3 TX Slots	4 TX Slots
DSI 3 (Head/Body-worn/Hotspot/Phablet)	28.0	28.0	25.0	23.2	22.0	26.0	23.0	21.2	20.0

DTM 1900 - Main2 Antenna								
Power Level	DTM 2 Tx Slots (GSM+ GPRS/EDGE GMSK) [dBm]		DTM 3 Tx Slots (GSM+ GPRS/EDGE GMSK) [dBm]		DTM 2 Tx Slots (GSM+ EDGE 8-PSK [dBm]		DTM 3 Tx Slots (GSM+ EDGE 8-PSK) [dBm]	
	CS 1 Tx Slot	PS 1 Tx Slot	CS 1Tx Slot	PS 2 Tx Slots	CS 1Tx Slot	PS 1 Tx Slot	CS 1Tx Slot	PS 2 Tx Slots
DSI 3 (Head/Body-worn/Hotspot/Phablet)	25.0	25.0	23.2	23.2	25.0	23.0	23.2	21.2

Tolerance	Voice [dB]	Data - Burst Average GMSK [dB]				Data - Burst Average 8-PSK [dB]			
	1 TX Slot	1 TX Slot	2 TX Slots	3 TX Slots	4 TX Slots	1 TX Slot	2 TX Slots	3 TX Slots	4 TX Slots
Upper	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lower	-0.7	-0.7	-1.0	-1.0	-1.0	-1.5	-2.0	-2.0	-2.0

Tolerance	DTM 2 Tx Slots (GSM+ GPRS/EDGE GMSK) [dB]		DTM 3 Tx Slots (GSM+ GPRS/EDGE GMSK) [dB]		DTM 2 Tx Slots (GSM+ EDGE 8-PSK [dB]		DTM 3 Tx Slots (GSM+ EDGE 8-PSK) [dB]	
	CS 1 Tx Slot	PS 1 Tx Slot	CS 1Tx Slot	PS 2 Tx Slots	CS 1Tx Slot	PS 1 Tx Slot	CS 1Tx Slot	PS 2 Tx Slots
Upper	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lower	-1.0	-1.0	-1.0	-1.0	-1.0	-2.0	-1.0	-2.0

Table 1-5 UMTS Target RF Output Power

Power Level	**UTMS Band 5 Modulated Average Nominal Power - Main1 Antenna [dBm]**			
	3GPP WCDMA Rel 99	3GPP HSDPA Rel 5	3GPP HSUPA Rel 6	3GPP DC-HSDPA Rel 8
DSI 3 (Head/Body-worn/Hotspot/Phablet)	22.0	21.0	21.0	21.0

Power Level	**UTMS Band 4 Modulated Average Nominal Power - Main2 Antenna [dBm]**			
	3GPP WCDMA Rel 99	3GPP HSDPA Rel 5	3GPP HSUPA Rel 6	3GPP DC-HSDPA Rel 8
DSI 3 (Head/Body-worn/Hotspot/Phablet)	21.0	20.0	20.0	20.0

Power Level	**UTMS Band 2 Modulated Average Nominal Power - Main2 Antenna [dBm]**			
	3GPP WCDMA Rel 99	3GPP HSDPA Rel 5	3GPP HSUPA Rel 6	3GPP DC-HSDPA Rel 8
DSI 3 (Head/Body-worn/Hotspot/Phablet)	19.0	18.0	18.0	18.0

Tolerance [dB]	3GPP WCDMA Rel 99	3GPP HSDPA Rel 5	3GPP HSUPA Rel 6	3GPP DC-HSDPA Rel 8
Upper	1.0	1.0	1.0	1.0
Lower	-1.5	-2.0	-2.0	-2.0

Table 1-6 LTE Target RF Output Power

LTE		
Band/Mode	Antenna	Modulated Average Nominal Power [dBm]
		DSI 3 (Head/Body-worn/Hotspot/Phablet)
LTE Band 12	Main1	21.0
LTE Band 17	Main1	21.0
LTE Band 13	Main1	21.0
LTE Band 5	Main1	21.0
LTE Band 66	Main2	20.0
LTE Band 4	Main2	20.0
LTE Band 25	Main2	18.0
LTE Band 2	Main2	18.0
LTE Band 41	Main2	18.0
Upper Tolerance: +1.0 dB		
Lower Tolerance: -1.5 dB		

Table 1-7 2.4 GHz WLAN Maximum RF Output Power (including tolerance)

2.4 GHz WLAN									
Mode / Band	Power Level	Chain0 in MIMO				Chain1 in MIMO			
		802.11b (CDD + STBC)	802.11g (CDD + STBC)	802.11n (CDD + STBC, SDM)	802.11ax (SU) (CDD + STBC, SDM)	802.11b (CDD + STBC)	802.11g (CDD + STBC)	802.11n (CDD + STBC, SDM)	802.11ax (SU) (CDD + STBC, SDM)
		Maximum Allowed Power [dBm]							
2.45 GHz WLAN	Normal State	14.0	14.0	14 ch10: 11.5 ch1, 11: 9.0	14 ch10: 11.5 ch1, 11: 9.0	12.5	14.0	14 ch10: 11.5 ch1, 11: 9.0	14 ch10: 11.5 ch1, 11: 9.0
	Simultaneous Condition - RSDB	11.5	11.5	11.5 Ch1, 11: 9.0	11.5 Ch1, 11: 9.0	11.5	11.5	11.5 Ch1, 11: 9.0	11.5 Ch1, 11: 9.0

Note: IEEE 802.11ax RU operations are addressed in the associated EMC test report. Per April 2019 TCB Workshop Notes, SAR testing was not required for 802.11ax when applying the initial test configuration procedures of KDB 248227, with 802.11ax considered a higher order 802.11 mode. SISO operations are not supported.

Table 1-8 5 GHz WLAN Maximum RF Output Power (including tolerance)

5 GHz WLAN					
Mode	Band	Power Level	Chain0 / Chain1 in MIMO		
			802.11a (CDD + STBC)	802.11n (CDD + STBC, SDM)	802.11ac/ax (SU) (CDD + STBC, SDM)
			Maximum Allowed Power [dBm]		
5 GHz WLAN (20 MHz BW)	UNII-1/2A/2C/3	Normal State	11.5	11.5	11.5
	UNII-1/2A/2C/3	Simultaneous Condition - RSDB	9.5	9.5	9.5
5 GHz WLAN (40 MHz BW)	UNII-1/2A/2C/3	Normal State		11.5	11.5
	UNII-1/2A/2C/3	Simultaneous Condition - RSDB		9.5	9.5
5 GHz WLAN (80 MHz BW)	UNII-1	Normal State			11.5
	UNII-2A				11.0
	UNII-2C				11.5 Ch106: 10.5
	UNII-3				9.0
	UNII-1/2A/2C	Simultaneous Condition - RSDB			9.5
	UNII-3				9.0
5 GHz WLAN (160 MHz BW)	UNII-1/2A	Normal State			11.5
	UNII-2C				9.5
	UNII-1/2A/2C	Simultaneous Condition - RSDB			9.5

Note: IEEE 802.11ax RU operations are addressed in the associated EMC test report. Per April 2019 TCB Workshop Notes, SAR testing was not required for 802.11ax when applying the initial test configuration procedures of KDB 248227, with 802.11ax considered a higher order 802.11 mode. SISO operations are not supported.

Table 1-9 2.4 GHz Bluetooth Maximum RF Output Power (including tolerance)

2.4 GHz Bluetooth	
Chain0 / Chain1	
Mode	Maximum Allowed Power [dBm]
BR	14.0
EDR	14.0
BLE 1 Mbps	10.79
BLE 2 Mbps	10.79
BLE LR s2	10.79
BLE LR s8	10.79

1.6. Surfaces Required for Testing

Antennas	Back	Front	Top	Bottom	Right	Left
Main1	Yes	Yes	No	Yes	No	Yes
Main2	Yes	Yes	No	Yes	Yes	No
MIMO	Yes	Yes	Yes	Yes	No	Yes
WLAN/BT Chain0	Yes	Yes	Yes	No	No	Yes
WLAN/BT Chain1	Yes	Yes	No	Yes	No	Yes
NFC	Yes	Yes	Yes	No	No	Yes

Note: Particular DUT edges were not required to be evaluated if the edges were greater than 2.5 cm from the transmitting antenna according to FCC KDB Publication 941225 D06v02r01 Section III. The distances between the transmit antennas and the edges of the device are included in the filing.

1.7. Test Guidance Applied

- IEEE 1528-2013
- FCC KDB Publication 941225 D01v03r01, D05v02r05, D05Av01r02, D06v02r01 (2G/3G/4G and Hotspot)
- FCC KDB Publication 248227 D01v02r02 (SAR Considerations for 802.11 Devices)
- FCC KDB Publication 447498 D04v01 (General SAR Guidance)
- FCC KDB Publication 865664 D01v01r04, D02v01r02 (SAR Measurements up to 6 GHz)
- FCC KDB Publication 648474 D04v01r03 (Phablet Procedures)
- October 2013 TCB Workshop Notes (GPRS Testing Considerations)
- April 2019 TCB Workshop Notes (IEEE 802.11ax)

2. DUT Conducted Powers

2.1. GSM Conducted Powers

Table 2-1

GSM 850		Voice	GPRS/EDGE Data (GMSK)				EDGE Data (8-PSK)			
Antenna: Main1		GSM (1 Tx Slot)	GPRS (1 Tx Slot)	GPRS (2 Tx Slots)	GPRS (3 Tx Slots)	GPRS (4 Tx Slots)	EDGE (1 Tx Slot)	EDGE (2 Tx Slots)	EDGE (3 Tx Slots)	EDGE (4 Tx Slots)
Power Level	Channel Number	Burst-Averaged Conducted Powers [dBm]								
DSI 3 (Head/Body-worn/Hotspot/Phablet)	128	32.90	32.89	29.70	27.96	**26.93**	27.46	24.25	22.63	21.52
	190	33.01	32.99	29.57	28.03	**26.97**	27.50	24.35	22.66	21.56
	251	32.93	32.95	29.69	28.00	**26.70**	27.21	24.26	22.45	21.36

GSM 850		Voice	GPRS/EDGE Data (GMSK)				EDGE Data (8-PSK)			
Antenna: Main1		GSM (1 Tx Slot)	GPRS (1 Tx Slot)	GPRS (2 Tx Slots)	GPRS (3 Tx Slots)	GPRS (4 Tx Slots)	EDGE (1 Tx Slot)	EDGE (2 Tx Slots)	EDGE (3 Tx Slots)	EDGE (4 Tx Slots)
Power Level	Channel Number	Calculated Frame-Averaged Conducted Powers [dBm]								
DSI 3 (Head/Body-worn/Hotspot/Phablet)	128	23.70	23.69	23.51	23.53	**23.75**	18.26	18.06	18.20	18.34
	190	23.81	23.79	23.38	23.60	**23.79**	18.30	18.16	18.23	18.38
	251	23.73	23.75	23.50	23.57	**23.52**	18.01	18.07	18.02	18.18
DSI 3 (Head/Body-worn/Hotspot/Phablet)	Frame-Avg Target (dBm):	23.3	23.3	23.3	23.3	23.3	17.8	17.8	17.8	17.8

Table 2-2

DTM 850		DTM 2 Tx Slots (GSM+ GPRS/EDGE GMSK)		DTM 3 Tx Slots (GSM+ GPRS/EDGE GMSK)		DTM 2 Tx Slots (GSM+ EDGE 8-PSK)		DTM 3 Tx Slots (GSM+ EDGE 8-PSK)	
Antenna: Main1		CS 1 Tx Slot	PS 1 Tx Slot	CS 1Tx Slot	PS 2 Tx Slots	CS 1Tx Slot	PS 1 Tx Slot	CS 1Tx Slot	PS 2 Tx Slots
Power Level	Channel Number	Burst-Averaged Conducted Powers [dBm]							
DSI 3 (Head/Body-worn/Hotspot/Phablet)	128	29.39	29.34	**27.89**	**27.46**	29.42	23.98	27.78	22.05
	190	29.41	29.52	**27.70**	**27.25**	29.32	23.80	27.93	22.01
	251	29.38	29.40	**27.69**	**27.50**	29.43	24.01	27.78	21.82

DTM 850		DTM 2 Tx Slots (GSM+ GPRS/EDGE GMSK)		DTM 3 Tx Slots (GSM+ GPRS/EDGE GMSK)		DTM 2 Tx Slots (GSM+ EDGE 8-PSK)		DTM 3 Tx Slots (GSM+ EDGE 8-PSK)	
Antenna: Main1		CS 1 Tx Slot	PS 1 Tx Slot	CS 1Tx Slot	PS 2 Tx Slots	CS 1Tx Slot	PS 1 Tx Slot	CS 1Tx Slot	PS 2 Tx Slots
Power Level	Channel Number	Calculated Frame-Averaged Conducted Powers [dBm]							
DSI 3 (Head/Body-worn/Hotspot/Phablet)	128	23.20	23.15	**23.46**	**23.03**	23.23	17.79	23.35	17.62
	190	23.22	23.33	**23.27**	**22.82**	23.13	17.61	23.50	17.58
	251	23.19	23.21	**23.26**	**23.07**	23.24	17.82	23.35	17.39
DSI 3 (Head/Body-worn/Hotspot/Phablet)	Frame-Avg Target (dBm):	23.3	23.3	23.3	23.3	23.3	17.8	23.3	17.8

Table 2-3

GSM 1900		Voice	GPRS/EDGE Data (GMSK)				EDGE Data (8-PSK)			
Antenna: Main2		GSM (1 Tx Slot)	GPRS (1 Tx Slot)	GPRS (2 Tx Slots)	GPRS (3 Tx Slots)	GPRS (4 Tx Slots)	EDGE (1 Tx Slot)	EDGE (2 Tx Slots)	EDGE (3 Tx Slots)	EDGE (4 Tx Slots)
Power Level	Channel Number	Burst-Averaged Conducted Powers [dBm]								
DSI 3 (Head/Body-worn/Hotspot/Phablet)	512	28.17	28.25	24.95	23.30	**21.70**	26.33	23.30	21.35	20.02
	661	27.77	27.92	24.90	23.45	**21.65**	26.42	23.31	21.47	20.09
	810	28.61	28.73	24.59	23.80	**22.05**	26.76	23.65	21.80	20.42

GSM 1900		Voice	GPRS/EDGE Data (GMSK)				EDGE Data (8-PSK)			
Antenna: Main2		GSM (1 Tx Slot)	GPRS (1 Tx Slot)	GPRS (2 Tx Slots)	GPRS (3 Tx Slots)	GPRS (4 Tx Slots)	EDGE (1 Tx Slot)	EDGE (2 Tx Slots)	EDGE (3 Tx Slots)	EDGE (4 Tx Slots)
Power Level	Channel Number	Calculated Frame-Averaged Conducted Powers [dBm]								
DSI 3 (Head/Body-worn/Hotspot/Phablet)	512	18.97	19.05	18.76	18.87	**18.52**	17.13	17.11	16.92	16.84
	661	18.57	18.72	18.71	19.02	**18.47**	17.22	17.12	17.04	16.91
	810	19.41	19.53	18.40	19.37	**18.87**	17.56	17.46	17.37	17.24
DSI 3 (Head/Body-worn/Hotspot/Phablet)	Frame-Avg Target (dBm):	18.8	18.8	18.8	18.8	18.8	16.8	16.8	16.8	16.8

Table 2-4

DTM 1900		DTM 2 Tx Slots (GSM+ GPRS/EDGE GMSK)		DTM 3 Tx Slots (GSM+ GPRS/EDGE GMSK)		DTM 2 Tx Slots (GSM+ EDGE 8-PSK)		DTM 3 Tx Slots (GSM+ EDGE 8-PSK)	
Antenna: Main2		CS 1 Tx Slot	PS 1 Tx Slot	CS 1Tx Slot	PS 2 Tx Slots	CS 1Tx Slot	PS 1 Tx Slot	CS 1Tx Slot	PS 2 Tx Slots
Power Level	Channel Number	Burst-Averaged Conducted Powers [dBm]							
DSI 3 (Head/Body-worn/Hotspot/Phablet)	512	24.64	24.45	**23.03**	**22.89**	25.03	23.08	23.23	20.82
	661	24.37	24.22	**23.16**	**22.82**	24.99	23.07	23.37	21.23
	810	24.52	24.27	**23.53**	**23.29**	24.55	23.43	23.85	21.39

DTM 1900		DTM 2 Tx Slots (GSM+ GPRS/EDGE GMSK)		DTM 3 Tx Slots (GSM+ GPRS/EDGE GMSK)		DTM 2 Tx Slots (GSM+ EDGE 8-PSK)		DTM 3 Tx Slots (GSM+ EDGE 8-PSK)	
Antenna: Main2		CS 1 Tx Slot	PS 1 Tx Slot	CS 1Tx Slot	PS 2 Tx Slots	CS 1Tx Slot	PS 1 Tx Slot	CS 1Tx Slot	PS 2 Tx Slots
Power Level	Channel Number	Calculated Frame-Averaged Conducted Powers [dBm]							
DSI 3 (Head/Body-worn/Hotspot/Phablet)	512	18.45	18.26	**18.60**	**18.46**	18.84	16.89	18.80	16.39
	661	18.18	18.03	**18.73**	**18.39**	18.80	16.88	18.94	16.80
	810	18.33	18.08	**19.10**	**18.86**	18.36	17.24	19.42	16.96
DSI 3 (Head/Body-worn/Hotspot/Phablet)	Frame-Avg Target (dBm):	18.8	18.8	18.8	18.8	18.8	16.8	18.8	16.8

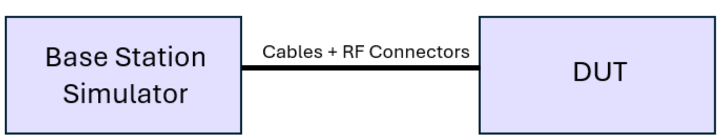


Figure 2-1 Power Measurement Setup

2.2. UMTS Conducted Powers

Table 2-5

UMTS Band 5		Frequency [MHz]	826.4	836.6	846.6
Antenna: Main1		Channel Number	4132	4183	4233
Power Level	Mode	Subtest	Conducted Power [dBm]		
DSI 3 (Head/Body-worn/Hotspot/Phablet)	WCDMA	RMC	22.44	22.40	22.30
		AMR	22.46	22.42	22.37

Table 2-6

UMTS Band 4		Frequency [MHz]	1712.4	1732.4	1752.6
Antenna: Main2		Channel Number	1312	1412	1513
Power Level	Mode	Subtest	Conducted Power [dBm]		
DSI 3 (Head/Body-worn/Hotspot/Phablet)	WCDMA	RMC	21.26	21.25	21.28
		AMR	21.27	21.24	21.27

Table 2-7

UMTS Band 2		Frequency [MHz]	1852.4	1880.0	1907.6
Antenna: Main2		Channel Number	9262	9400	9538
Power Level	Mode	Subtest	Conducted Power [dBm]		
DSI 3 (Head/Body-worn/Hotspot/Phablet)	WCDMA	RMC	19.39	19.40	19.47
		AMR	19.44	19.49	19.53

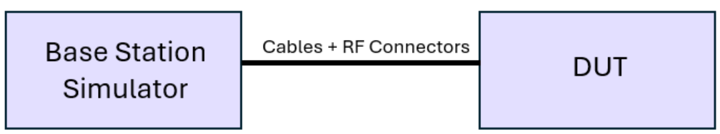


Figure 2-2 Power Measurement Setup

2.3. LTE Conducted Powers

Note: Per FCC KDB Publication 941225 D05v02r05, LTE SAR for the lower bandwidths and for higher order modulations was not required for testing 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. Conducted powers for the higher order modulations and for the lower bandwidths for all LTE Bands are included in the Secondary Mode Conducted Power Appendix.

Note: Some bands do 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 2-8

LTE Band 12		Frequency [MHz]		707.5	MPR [dB]
Antenna:	Main1				
Bandwidth [MHz]:	10	Channel Number		23095	
Power Level	Modulation	RB Size	RB Offset	Conducted Powers [dBm]	
DSI 3 (Head/Body-worn/Hotspot/Phablet)	QPSK	1	0	21.01	0
		1	25	**21.06**	0
		1	49	21.04	0
		25	0	21.03	0
		25	12	21.14	0
		25	25	**21.19**	0
		50	0	21.05	0

Table 2-9

LTE Band 13		Frequency [MHz]		782	MPR [dB]
Antenna:	Main1				
Bandwidth [MHz]:	10	Channel Number		23230	
Power Level	Modulation	RB Size	RB Offset	Conducted Powers [dBm]	
DSI 3 (Head/Body-worn/Hotspot/Phablet)	QPSK	1	0	20.91	0
		1	25	21.06	0
		1	49	**21.08**	0
		25	0	21.04	0
		25	12	21.03	0
		25	25	**21.16**	0
		50	0	20.99	0

Table 2-10

LTE Band 5		Frequency [MHz]		836.5	MPR [dB]
Antenna:	Main1				
Bandwidth [MHz]:	10	Channel Number		20525	
Power Level	Modulation	RB Size	RB Offset	Conducted Powers [dBm]	
DSI 3 (Head/Body-worn/Hotspot/Phablet)	QPSK	1	0	**21.11**	0
		1	25	20.88	0
		1	49	20.93	0
		25	0	20.98	0
		25	12	20.94	0
		25	25	**20.99**	0
		50	0	20.95	0

Table 2-11

LTE Band 66		Frequency [MHz]		1720	1745	1770	MPR [dB]
Antenna:	Main2						
Bandwidth [MHz]:	20	Channel Number		132072	132322	132572	
Power Level	Modulation	RB Size	RB Offset	Conducted Powers [dBm]			
DSI 3 (Head/Body-worn/Hotspot/Phablet)	QPSK	1	0	19.90	19.88	19.88	0
		1	50	20.02	**20.05**	19.96	0
		1	99	19.81	19.98	19.84	0
		50	0	19.88	20.05	20.04	0
		50	25	20.04	**20.07**	20.06	0
		50	50	20.00	20.05	19.97	0
		100	0	20.00	20.04	20.01	0

Table 2-12

LTE Band 25		Frequency [MHz]		1860	1882.5	1905	MPR [dB]
Antenna:	Main2						
Bandwidth [MHz]:	20	Channel Number		26140	26365	26590	
Power Level	Modulation	RB Size	RB Offset	Conducted Powers [dBm]			
DSI 3 (Head/Body-worn/Hotspot/Phablet)	QPSK	1	0	17.99	17.95	18.06	0
		1	50	18.09	18.02	**18.14**	0
		1	99	18.04	17.97	18.01	0
		50	0	18.08	18.07	18.17	0
		50	25	18.20	18.10	18.27	0
		50	50	18.11	18.17	**18.28**	0
		100	0	18.11	18.00	18.21	0

Table 2-13

LTE Band 41		Frequency [MHz]		2506	2549.5	2593	2636.5	2680	MPR [dB]
Antenna:	**Main2**								
Bandwidth [MHz]:	**20**	Channel Number		39750	40185	40620	41055	41490	
Power Level	Modulation	RB Size	RB Offset	Conducted Powers [dBm]					
DSI 3 (Head/Body-worn/Hotspot/Phablet)	QPSK	1	0	18.31	18.39	18.36	18.52	18.38	0
		1	50	18.42	18.41	18.47	**18.53**	18.36	0
		1	99	18.34	18.34	18.48	18.39	18.25	0
		50	0	18.31	18.36	18.38	18.50	18.35	0
		50	25	18.43	18.47	18.49	**18.63**	18.40	0
		50	50	18.38	18.41	18.48	18.56	18.39	0
		100	0	18.35	18.40	18.46	18.52	18.39	0

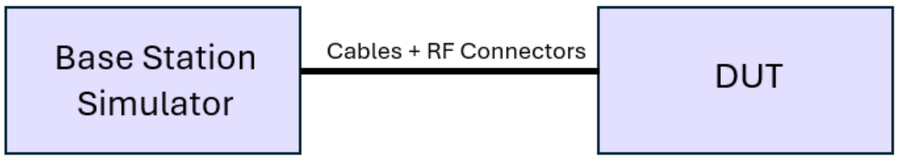


Figure 2-3 Power Measurement Setup

2.4. WIFI Conducted Powers

Table 2-14

2.4 GHz WIFI MIMO Conducted Power [dBm] - Normal State													
Mode		802.11b			802.11g			802.11n			802.11ax		
Channel	Frequency (MHz)	Chain0	Chain1	MIMO	Chain0	Chain1	MIMO	Chain0	Chain1	MIMO	Chain0	Chain1	MIMO
2	2417	13.76	12.44	16.16	13.36	13.66	16.52	13.40	13.72	16.57	13.50	13.72	16.62
6	2437	13.65	12.24	16.01	14.00	13.90	16.96	14.00	13.95	16.99	13.67	13.55	16.62
9	2452	13.37	12.50	15.97	13.91	13.76	16.85	13.95	13.91	16.94	13.59	13.36	16.49

Table 2-15

2.4 GHz WIFI MIMO Conducted Power [dBm] - Simultaneous 2 GHz and 5 GHz / 6 GHz State													
Mode		802.11b			802.11g			802.11n			802.11ax		
Channel	Frequency (MHz)	Chain0	Chain1	MIMO	Chain0	Chain1	MIMO	Chain0	Chain1	MIMO	Chain0	Chain1	MIMO
1	2412	10.82	11.48	14.17	10.86	11.22	14.05	8.40	8.68	11.55	8.46	8.71	11.60
6	2437	11.13	11.24	14.20	11.17	10.81	14.00	11.19	10.82	14.02	11.27	10.90	14.10
11	2462	11.08	11.09	14.10	11.10	10.70	13.91	8.89	8.68	11.80	9.00	8.83	11.93

Table 2-16

5 GHz WIFI SISO Conducted Power [dBm] - 80 MHz Bandwidth (Normal State)					
Mode		802.11ac		802.11ax	
Channel	Frequency (MHz)	Chain0	Chain1	Chain0	Chain1
106	5530	10.25	10.13	10.43	10.47
122	5610	11.33	11.41	11.44	11.17
138	5690	11.17	11.47	11.12	11.28

Table 2-17

5 GHz WIFI SISO Conducted Power [dBm] - 40 MHz Bandwidth (Normal State)							
Mode		802.11n		802.11ac		802.11ax	
Channel	Frequency (MHz)	Chain0	Chain1	Chain0	Chain1	Chain0	Chain1
38	5190	11.20	11.37	11.28	11.45	11.33	11.37
46	5230	11.41	11.37	11.30	11.41	11.38	11.36
54	5270	11.23	11.40	11.12	11.32	11.22	11.39
62	5310	11.35	11.41	11.32	11.37	11.39	11.43
151	5755	11.34	11.09	11.36	11.19	11.46	11.27
159	5795	11.26	11.24	11.40	11.29	11.37	11.30

Table 2-18

5 GHz WIFI SISO Conducted Power [dBm] - 80 MHz Bandwidth (Simultaneous State)					
Mode		802.11ac		802.11ax	
Channel	Frequency (MHz)	Chain0	Chain1	Chain0	Chain1
42	5210	9.50	9.23	9.34	9.32
58	5290	9.33	9.50	9.10	9.33
106	5530	9.34	9.46	9.45	9.19
122	5610	9.17	9.50	9.42	9.23
138	5690	9.24	9.48	9.43	9.31

Table 2-19

5 GHz WIFI SISO Conducted Power [dBm] - 40 MHz Bandwidth (Simultaneous State)							
Mode		802.11n		802.11ac		802.11ax	
Channel	Frequency (MHz)	Chain0	Chain1	Chain0	Chain1	Chain0	Chain1
151	5755	9.28	9.29	9.24	9.34	9.41	9.39
159	5795	9.40	9.25	9.34	9.29	9.48	9.22

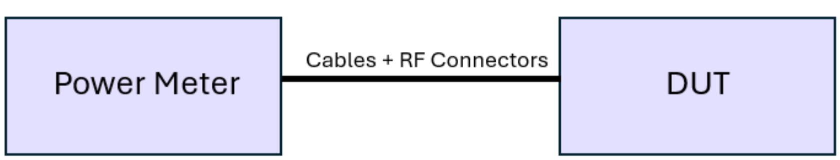


Figure 2-4 Power Measurement Setup

2.5. Bluetooth Conducted Powers

Table 2-20

Bluetooth Conducted Powers [dBm]				
Channel	Frequency (MHz)	Data rate	Chain	Conducted Power
0	2402	1 Mbps	0	13.38
39	2441	1 Mbps	0	13.31
78	2480	1 Mbps	0	13.55
0	2402	1 Mbps	1	13.43
39	2441	1 Mbps	1	13.74
78	2480	1 Mbps	1	13.68

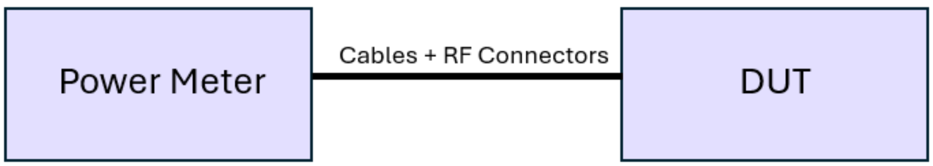
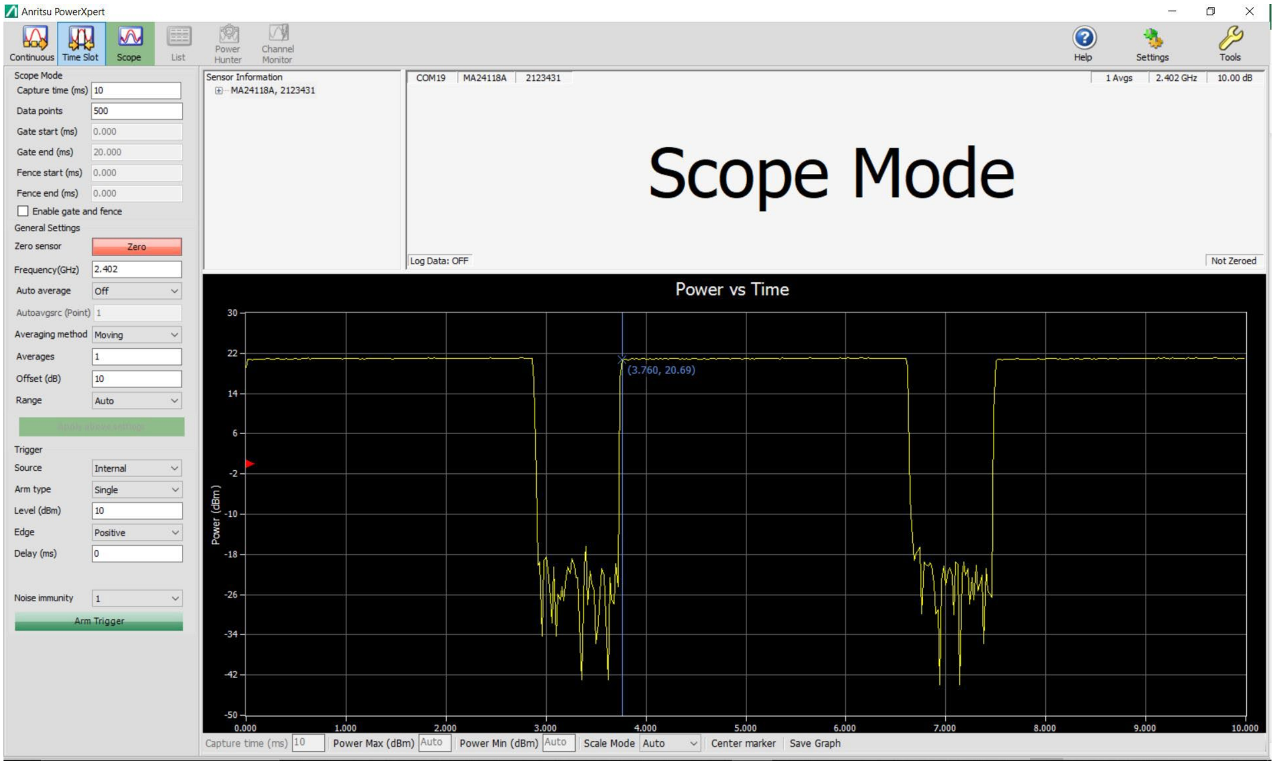
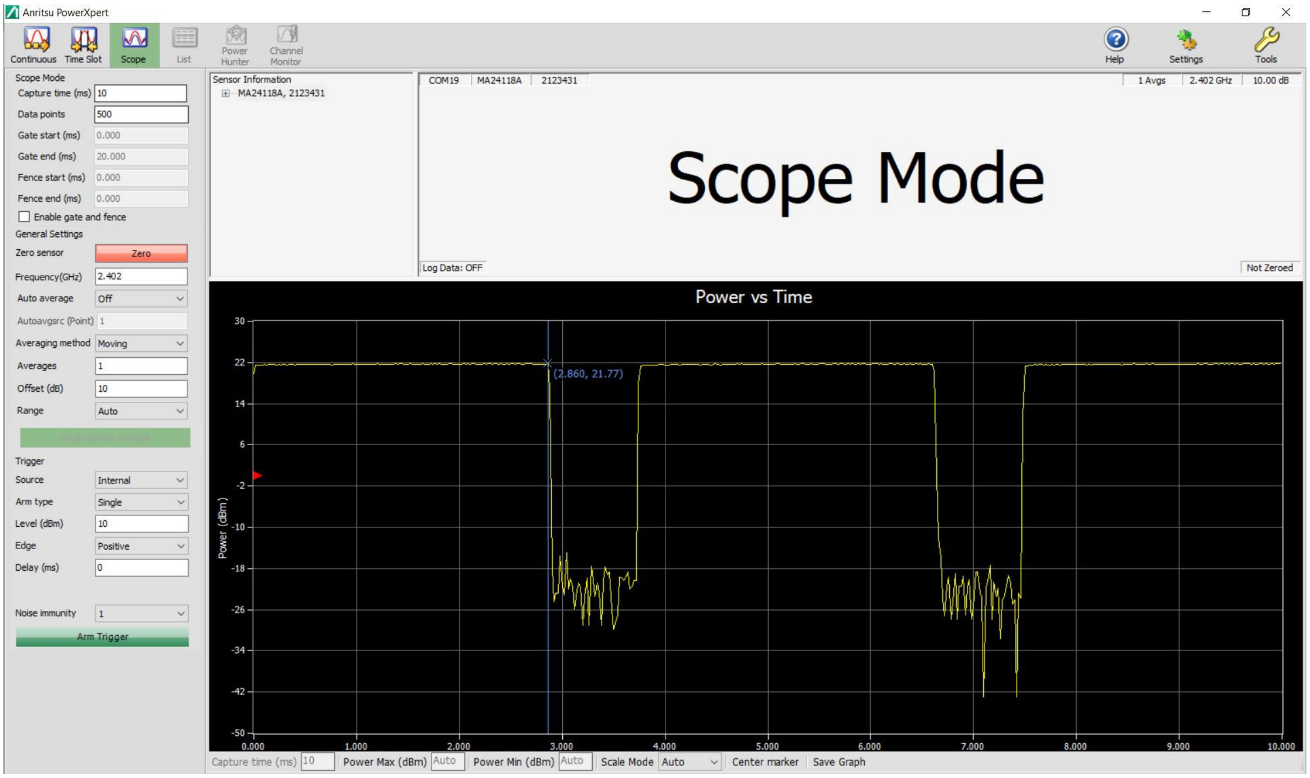


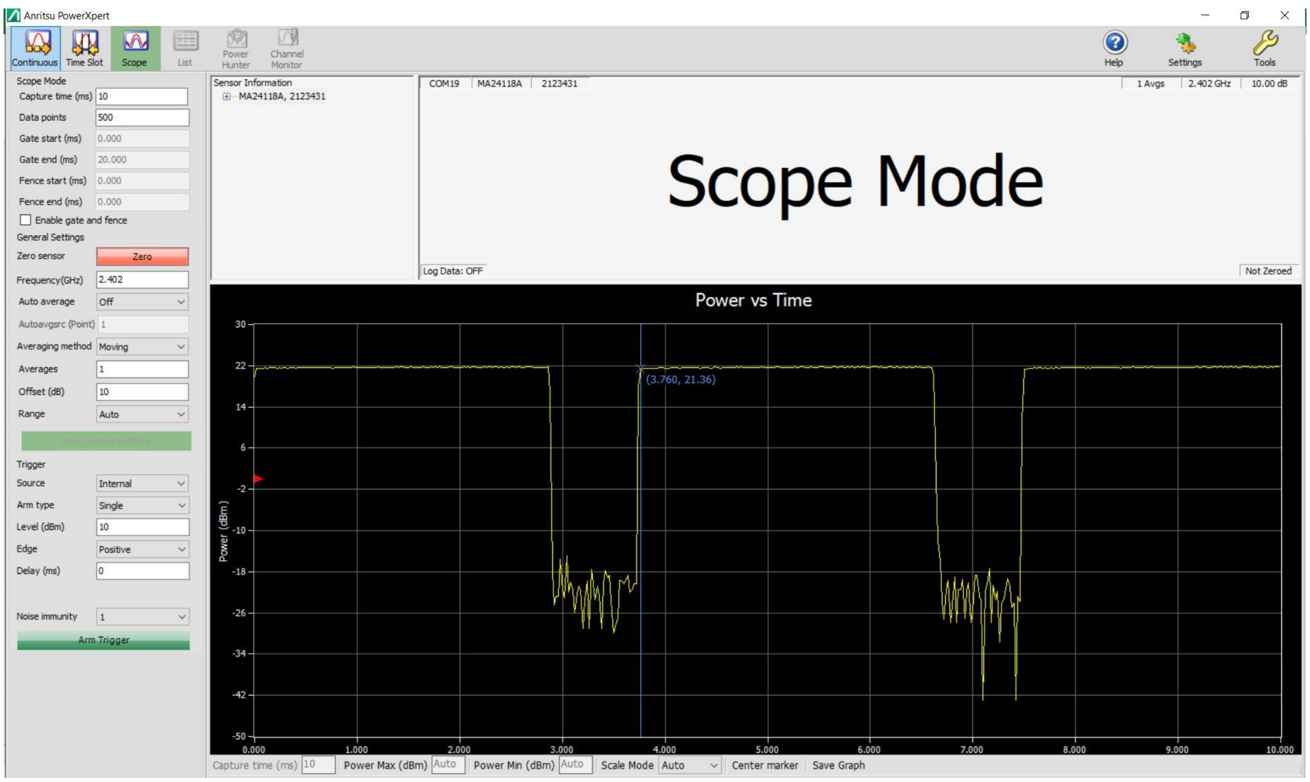
Figure 2-5 Power Measurement Setup



$$\text{Duty } Cycle = \frac{Pulse\ Width}{Period} * 100\% = \frac{2.86\ ms}{3.76\ ms} * 100\% = 76.1\%$$

Figure 2-6 2.4 GHz Bluetooth Chain0 Duty Cycle Plot and Calculation





$$\text{Duty Cycle} = \frac{\text{Pulse Width}}{\text{Period}} * 100\% = \frac{2.86\ ms}{3.76\ ms} * 100\% = 76.1\%$$

Figure 2-7 2.4 GHz Bluetooth Chain1 Duty Cycle Plot and Calculation

3. DUT SAR Test Results

3.1. GSM SAR Data

Table 3-1

Exposure Condition	Band/Mode	Antenna	DUT SN	Power Drift [dB]	Maximum Duty Cycle [%]	Measured Duty Cycle [%]	Frequency [MHz]	Channel	Modulation/Configuration	Maximum Allowed Power [dBm]	Measured Conducted Power [dBm]	Separation Distance [mm]	Position	Measured 1g SAR [W/Kg]	Reported 1g SAR [W/Kg]	Test Plot
Head	GSM 850	Main1	053LD	-0.03	36.1%	36.1%	824.2	128	DTM, 3 Tx Slots	28.7	27.46	0	Right Cheek	0.095	0.126	-
Head	GSM 850	Main1	053LD	-0.08	36.1%	36.1%	824.2	128	DTM, 3 Tx Slots	28.7	27.46	0	Right Tilt	0.043	0.057	-
Head	GSM 850	Main1	053LD	0.03	36.1%	36.1%	824.2	128	DTM, 3 Tx Slots	28.7	27.46	0	Left Cheek	0.091	0.121	-
Head	GSM 850	Main1	053LD	-0.07	36.1%	36.1%	824.2	128	DTM, 3 Tx Slots	28.7	27.46	0	Left Tilt	0.046	0.061	-
Head	GSM 850	Main1	053LD	0.03	12.0%	12.0%	836.6	190	GSM, 1 Tx Slot	33.5	33.01	0	Right Cheek	0.103	0.115	-
Head	GSM 850	Main1	053LD	0.00	12.0%	12.0%	836.6	190	GSM, 1 Tx Slot	33.5	33.01	0	Right Tilt	0.048	0.054	-
Head	GSM 850	Main1	053LD	-0.01	12.0%	12.0%	836.6	190	GSM, 1 Tx Slot	33.5	33.01	0	Left Cheek	0.108	0.121	1
Head	GSM 850	Main1	053LD	-0.02	12.0%	12.0%	836.6	190	GSM, 1 Tx Slot	33.5	33.01	0	Left Tilt	0.052	0.058	-
Body-worn	GSM 850	Main1	053LD	-0.02	12.0%	12.0%	836.6	190	GSM, 1 Tx Slot	33.5	33.01	10	Back	0.239	0.268	2
Body-worn/Hotspot	GSM 850	Main1	053LD	-0.15	36.1%	36.1%	824.2	128	DTM, 3 Tx Slots	28.7	27.46	10	Back	0.193	0.257	-
Hotspot	GSM 850	Main1	053LD	-0.03	36.1%	36.1%	824.2	128	DTM, 3 Tx Slots	28.7	27.46	10	Front	0.107	0.142	-
Hotspot	GSM 850	Main1	053LD	-0.03	36.1%	36.1%	824.2	128	DTM, 3 Tx Slots	28.7	27.46	10	Bottom	0.112	0.149	-
Hotspot	GSM 850	Main1	053LD	0.21	36.1%	36.1%	824.2	128	DTM, 3 Tx Slots	28.7	27.46	10	Left	0.122	0.162	-
Hotspot	GSM 850	Main1	053LD	0.02	48.1%	48.1%	836.6	190	GPRS, 4 Tx Slots	27.5	26.97	10	Back	0.194	0.219	3
Hotspot	GSM 850	Main1	053LD	0.00	48.1%	48.1%	836.6	190	GPRS, 4 Tx Slots	27.5	26.97	10	Front	0.128	0.145	-
Hotspot	GSM 850	Main1	053LD	-0.02	48.1%	48.1%	836.6	190	GPRS, 4 Tx Slots	27.5	26.97	10	Bottom	0.119	0.134	-
Hotspot	GSM 850	Main1	053LD	0.02	48.1%	48.1%	836.6	190	GPRS, 4 Tx Slots	27.5	26.97	10	Left	0.129	0.146	-

Table 3-2

Exposure Condition	Band/Mode	Antenna	DUT SN	Power Drift [dB]	Maximum Duty Cycle [%]	Measured Duty Cycle [%]	Frequency [MHz]	Channel	Modulation/Configuration	Maximum Allowed Power [dBm]	Measured Conducted Power [dBm]	Separation Distance [mm]	Position	Measured 1g SAR [W/Kg]	Reported 1g SAR [W/Kg]	Test Plot
Head	GSM 1900	Main2	053LD	0.04	36.1%	36.1%	1909.8	810	DTM, 3 Tx Slots	24.2	23.29	0	Right Cheek	0.020	0.025	4
Head	GSM 1900	Main2	053LD	0.21	36.1%	36.1%	1909.8	810	DTM, 3 Tx Slots	24.2	23.29	0	Right Tilt	0.009	0.011	-
Head	GSM 1900	Main2	053LD	0.21	36.1%	36.1%	1909.8	810	DTM, 3 Tx Slots	24.2	23.29	0	Left Cheek	0.013	0.016	-
Head	GSM 1900	Main2	053LD	0.21	36.1%	36.1%	1909.8	810	DTM, 3 Tx Slots	24.2	23.29	0	Left Tilt	0.009	0.011	-
Head	GSM 1900	Main2	053LD	-0.04	12.0%	12.0%	1909.8	810	GSM, 1 Tx Slot	29	28.61	0	Right Cheek	0.020	0.022	-
Head	GSM 1900	Main2	053LD	0.18	12.0%	12.0%	1909.8	810	GSM, 1 Tx Slot	29	28.61	0	Right Tilt	0.009	0.010	-
Head	GSM 1900	Main2	053LD	-0.02	12.0%	12.0%	1909.8	810	GSM, 1 Tx Slot	29	28.61	0	Left Cheek	0.016	0.018	-
Head	GSM 1900	Main2	053LD	0.21	12.0%	12.0%	1909.8	810	GSM, 1 Tx Slot	29	28.61	0	Left Tilt	0.014	0.015	-
Body-worn	GSM 1900	Main2	053LD	-0.07	12.0%	12.0%	1909.8	810	GSM, 1 Tx Slot	29	28.61	10	Back	0.192	0.210	5
Body-worn/Hotspot	GSM 1900	Main2	053LD	-0.06	36.1%	36.1%	1909.8	810	DTM, 3 Tx Slots	24.2	23.29	10	Back	0.169	0.208	-
Hotspot	GSM 1900	Main2	053LD	-0.07	36.1%	36.1%	1909.8	810	DTM, 3 Tx Slots	24.2	23.29	10	Front	0.153	0.189	-
Hotspot	GSM 1900	Main2	053LD	0.00	36.1%	36.1%	1909.8	810	DTM, 3 Tx Slots	24.2	23.29	10	Bottom	0.224	0.276	6
Hotspot	GSM 1900	Main2	053LD	-0.01	36.1%	36.1%	1909.8	810	DTM, 3 Tx Slots	24.2	23.29	10	Right	0.079	0.097	-
Hotspot	GSM 1900	Main2	053LD	-0.03	48.1%	48.1%	1909.8	810	GPRS, 4 Tx Slots	23	22.05	10	Back	0.191	0.238	-
Hotspot	GSM 1900	Main2	053LD	-0.07	48.1%	48.1%	1909.8	810	GPRS, 4 Tx Slots	23	22.05	10	Front	0.147	0.183	-
Hotspot	GSM 1900	Main2	053LD	0.04	48.1%	48.1%	1909.8	810	GPRS, 4 Tx Slots	23	22.05	10	Bottom	0.218	0.271	-
Hotspot	GSM 1900	Main2	053LD	0.04	48.1%	48.1%	1909.8	810	GPRS, 4 Tx Slots	23	22.05	10	Right	0.077	0.096	-

3.2. UMTS SAR Data

Table 3-3

Exposure Condition	Band/Mode	Antenna	DUT SN	Power Drift [dB]	Maximum Duty Cycle [%]	Measured Duty Cycle [%]	Frequency [MHz]	Channel	Modulation/Configuration	Maximum Allowed Power [dBm]	Measured Conducted Power [dBm]	Separation Distance [mm]	Position	Measured 1g SAR [W/Kg]	Reported 1g SAR [W/Kg]	Test Plot
Head	UMTS Band 5	Main1	053LD	-0.03	100.0%	100.0%	826.4	4132	RMC	23	22.44	0	Right Cheek	0.090	0.102	-
Head	UMTS Band 5	Main1	053LD	0.01	100.0%	100.0%	826.4	4132	RMC	23	22.44	0	Right Tilt	0.044	0.050	-
Head	UMTS Band 5	Main1	053LD	0.05	100.0%	100.0%	826.4	4132	RMC	23	22.44	0	Left Cheek	0.101	0.115	7
Head	UMTS Band 5	Main1	053LD	0.06	100.0%	100.0%	826.4	4132	RMC	23	22.44	0	Left Tilt	0.052	0.059	-
Body-worn/Hotspot	UMTS Band 5	Main1	053LD	-0.02	100.0%	100.0%	826.4	4132	RMC	23	22.44	10	Back	0.222	0.253	8
Hotspot	UMTS Band 5	Main1	053LD	-0.01	100.0%	100.0%	826.4	4132	RMC	23	22.44	10	Front	0.146	0.166	-
Hotspot	UMTS Band 5	Main1	053LD	0.03	100.0%	100.0%	826.4	4132	RMC	23	22.44	10	Bottom	0.143	0.163	-
Hotspot	UMTS Band 5	Main1	053LD	0.01	100.0%	100.0%	826.4	4132	RMC	23	22.44	10	Left	0.125	0.142	-

Table 3-4

Exposure Condition	Band/Mode	Antenna	DUT SN	Power Drift [dB]	Maximum Duty Cycle [%]	Measured Duty Cycle [%]	Frequency [MHz]	Channel	Modulation/Configuration	Maximum Allowed Power [dBm]	Measured Conducted Power [dBm]	Separation Distance [mm]	Position	Measured 1g SAR [W/Kg]	Reported 1g SAR [W/Kg]	Test Plot
Head	UMTS Band 4	Main2	0DMLD	-0.04	100.0%	100.0%	1752.6	1513	RMC	22	21.28	0	Right Cheek	0.105	0.124	9
Head	UMTS Band 4	Main2	0DMLD	-0.06	100.0%	100.0%	1752.6	1513	RMC	22	21.28	0	Right Tilt	0.055	0.065	-
Head	UMTS Band 4	Main2	0DMLD	-0.03	100.0%	100.0%	1752.6	1513	RMC	22	21.28	0	Left Cheek	0.047	0.055	-
Head	UMTS Band 4	Main2	0DMLD	0.02	100.0%	100.0%	1752.6	1513	RMC	22	21.28	0	Left Tilt	0.036	0.042	-
Body-worn/Hotspot	UMTS Band 4	Main2	0DMLD	0.01	100.0%	100.0%	1752.6	1513	RMC	22	21.28	10	Back	0.352	0.415	10
Hotspot	UMTS Band 4	Main2	0DMLD	-0.02	100.0%	100.0%	1752.6	1513	RMC	22	21.28	10	Front	0.260	0.307	-
Hotspot	UMTS Band 4	Main2	0DMLD	-0.01	100.0%	100.0%	1752.6	1513	RMC	22	21.28	10	Bottom	0.391	0.462	11
Hotspot	UMTS Band 4	Main2	0DMLD	0.00	100.0%	100.0%	1752.6	1513	RMC	22	21.28	10	Right	0.214	0.253	-

Table 3-5

Exposure Condition	Band/Mode	Antenna	DUT SN	Power Drift [dB]	Maximum Duty Cycle [%]	Measured Duty Cycle [%]	Frequency [MHz]	Channel	Modulation/Configuration	Maximum Allowed Power [dBm]	Measured Conducted Power [dBm]	Separation Distance [mm]	Position	Measured 1g SAR [W/Kg]	Reported 1g SAR [W/Kg]	Test Plot
Head	UMTS Band 2	Main2	0DMLD	0.21	100.0%	100.0%	1907.6	9538	RMC	20	19.47	0	Right Cheek	0.027	0.031	12
Head	UMTS Band 2	Main2	0DMLD	0.21	100.0%	100.0%	1907.6	9538	RMC	20	19.47	0	Right Tilt	0.013	0.015	-
Head	UMTS Band 2	Main2	0DMLD	-0.01	100.0%	100.0%	1907.6	9538	RMC	20	19.47	0	Left Cheek	0.019	0.021	-
Head	UMTS Band 2	Main2	0DMLD	0.08	100.0%	100.0%	1907.6	9538	RMC	20	19.47	0	Left Tilt	0.018	0.020	-
Body-worn/Hotspot	UMTS Band 2	Main2	0DMLD	-0.02	100.0%	100.0%	1907.6	9538	RMC	20	19.47	10	Back	0.266	0.301	13
Hotspot	UMTS Band 2	Main2	0DMLD	-0.01	100.0%	100.0%	1907.6	9538	RMC	20	19.47	10	Front	0.207	0.234	-
Hotspot	UMTS Band 2	Main2	0DMLD	0.00	100.0%	100.0%	1907.6	9538	RMC	20	19.47	10	Bottom	0.263	0.297	-
Hotspot	UMTS Band 2	Main2	0DMLD	-0.17	100.0%	100.0%	1907.6	9538	RMC	20	19.47	10	Right	0.118	0.133	-

3.3. LTE SAR Data

Table 3-6

Exposure Condition	Band/Mode	Antenna	DUT SN	Power Drift [dB]	Maximum Duty Cycle [%]	Measured Duty Cycle [%]	Frequency [MHz]	Channel	Modulation/Configuration	RB Size	RB Offset	Maximum Allowed Power [dBm]	Measured Conducted Power [dBm]	MPR [dB]	Separation Distance [mm]	Position	Measured 1g SAR [W/Kg]	Reported 1g SAR [W/Kg]	Test Plot
Head	LTE Band 12	Main1	0KQLD	0.00	100.0%	100.0%	707.5	23095	QPSK, 10 MHz	1	25	22	21.06	0	0	Right Cheek	0.072	0.089	-
Head	LTE Band 12	Main1	0KQLD	0.15	100.0%	100.0%	707.5	23095	QPSK, 10 MHz	25	25	22	21.19	0	0	Right Cheek	0.073	0.088	-
Head	LTE Band 12	Main1	0KQLD	0.03	100.0%	100.0%	707.5	23095	QPSK, 10 MHz	1	25	22	21.06	0	0	Right Tilt	0.028	0.035	-
Head	LTE Band 12	Main1	0KQLD	0.05	100.0%	100.0%	707.5	23095	QPSK, 10 MHz	25	25	22	21.19	0	0	Right Tilt	0.026	0.031	-
Head	LTE Band 12	Main1	0KQLD	0.02	100.0%	100.0%	707.5	23095	QPSK, 10 MHz	1	25	22	21.06	0	0	Left Cheek	0.087	0.108	14
Head	LTE Band 12	Main1	0KQLD	0.02	100.0%	100.0%	707.5	23095	QPSK, 10 MHz	25	25	22	21.19	0	0	Left Cheek	0.084	0.101	-
Head	LTE Band 12	Main1	0KQLD	0.10	100.0%	100.0%	707.5	23095	QPSK, 10 MHz	1	25	22	21.06	0	0	Left Tilt	0.036	0.045	-
Head	LTE Band 12	Main1	0KQLD	0.00	100.0%	100.0%	707.5	23095	QPSK, 10 MHz	25	25	22	21.19	0	0	Left Tilt	0.036	0.043	-
Body-worn/Hotspot	LTE Band 12	Main1	0KQLD	0.00	100.0%	100.0%	707.5	23095	QPSK, 10 MHz	1	25	22	21.06	0	10	Back	0.143	0.178	15
Body-worn/Hotspot	LTE Band 12	Main1	0KQLD	-0.02	100.0%	100.0%	707.5	23095	QPSK, 10 MHz	25	25	22	21.19	0	10	Back	0.138	0.166	-
Hotspot	LTE Band 12	Main1	0KQLD	0.01	100.0%	100.0%	707.5	23095	QPSK, 10 MHz	1	25	22	21.06	0	10	Front	0.108	0.134	-
Hotspot	LTE Band 12	Main1	0KQLD	0.01	100.0%	100.0%	707.5	23095	QPSK, 10 MHz	25	25	22	21.19	0	10	Front	0.107	0.129	-
Hotspot	LTE Band 12	Main1	0KQLD	0.05	100.0%	100.0%	707.5	23095	QPSK, 10 MHz	1	25	22	21.06	0	10	Bottom	0.084	0.104	-
Hotspot	LTE Band 12	Main1	0KQLD	-0.05	100.0%	100.0%	707.5	23095	QPSK, 10 MHz	25	25	22	21.19	0	10	Bottom	0.082	0.099	-
Hotspot	LTE Band 12	Main1	0KQLD	0.01	100.0%	100.0%	707.5	23095	QPSK, 10 MHz	1	25	22	21.06	0	10	Left	0.161	0.200	16
Hotspot	LTE Band 12	Main1	0KQLD	0.01	100.0%	100.0%	707.5	23095	QPSK, 10 MHz	25	25	22	21.19	0	10	Left	0.155	0.187	-

Table 3-7

Exposure Condition	Band/Mode	Antenna	DUT SN	Power Drift [dB]	Maximum Duty Cycle [%]	Measured Duty Cycle [%]	Frequency [MHz]	Channel	Modulation/Configuration	RB Size	RB Offset	Maximum Allowed Power [dBm]	Measured Conducted Power [dBm]	MPR [dB]	Separation Distance [mm]	Position	Measured 1g SAR [W/Kg]	Reported 1g SAR [W/Kg]	Test Plot
Head	LTE Band 13	Main1	0KQLD	0.01	100.0%	100.0%	782	23230	QPSK, 10 MHz	1	49	22	21.08	0	0	Right Cheek	0.074	0.091	-
Head	LTE Band 13	Main1	0KQLD	-0.06	100.0%	100.0%	782	23230	QPSK, 10 MHz	25	25	22	21.16	0	0	Right Cheek	0.072	0.087	-
Head	LTE Band 13	Main1	0KQLD	-0.03	100.0%	100.0%	782	23230	QPSK, 10 MHz	1	49	22	21.08	0	0	Right Tilt	0.038	0.047	-
Head	LTE Band 13	Main1	0KQLD	0.00	100.0%	100.0%	782	23230	QPSK, 10 MHz	25	25	22	21.16	0	0	Right Tilt	0.038	0.046	-
Head	LTE Band 13	Main1	0KQLD	0.15	100.0%	100.0%	782	23230	QPSK, 10 MHz	1	49	22	21.08	0	0	Left Cheek	0.092	0.114	17
Head	LTE Band 13	Main1	0KQLD	0.00	100.0%	100.0%	782	23230	QPSK, 10 MHz	25	25	22	21.16	0	0	Left Cheek	0.092	0.112	-
Head	LTE Band 13	Main1	0KQLD	0.07	100.0%	100.0%	782	23230	QPSK, 10 MHz	1	49	22	21.08	0	0	Left Tilt	0.049	0.061	-
Head	LTE Band 13	Main1	0KQLD	0.01	100.0%	100.0%	782	23230	QPSK, 10 MHz	25	25	22	21.16	0	0	Left Tilt	0.049	0.059	-
Body-worn/Hotspot	LTE Band 13	Main1	0KQLD	-0.03	100.0%	100.0%	782	23230	QPSK, 10 MHz	1	49	22	21.08	0	10	Back	0.152	0.188	18
Body-worn/Hotspot	LTE Band 13	Main1	0KQLD	-0.02	100.0%	100.0%	782	23230	QPSK, 10 MHz	25	25	22	21.16	0	10	Back	0.150	0.182	-
Hotspot	LTE Band 13	Main1	0KQLD	0.09	100.0%	100.0%	782	23230	QPSK, 10 MHz	1	49	22	21.08	0	10	Front	0.114	0.141	-
Hotspot	LTE Band 13	Main1	0KQLD	-0.01	100.0%	100.0%	782	23230	QPSK, 10 MHz	25	25	22	21.16	0	10	Front	0.115	0.140	-
Hotspot	LTE Band 13	Main1	0KQLD	0.08	100.0%	100.0%	782	23230	QPSK, 10 MHz	1	49	22	21.08	0	10	Bottom	0.105	0.130	-
Hotspot	LTE Band 13	Main1	0KQLD	0.04	100.0%	100.0%	782	23230	QPSK, 10 MHz	25	25	22	21.16	0	10	Bottom	0.105	0.127	-
Hotspot	LTE Band 13	Main1	0KQLD	0.04	100.0%	100.0%	782	23230	QPSK, 10 MHz	1	49	22	21.08	0	10	Left	0.142	0.176	-
Hotspot	LTE Band 13	Main1	0KQLD	-0.01	100.0%	100.0%	782	23230	QPSK, 10 MHz	25	25	22	21.16	0	10	Left	0.144	0.175	-

Table 3-8

Exposure Condition	Band/Mode	Antenna	DUT SN	Power Drift [dB]	Maximum Duty Cycle [%]	Measured Duty Cycle [%]	Frequency [MHz]	Channel	Modulation/Configuration	RB Size	RB Offset	Maximum Allowed Power [dBm]	Measured Conducted Power [dBm]	MPR [dB]	Separation Distance [mm]	Position	Measured 1g SAR [W/Kg]	Reported 1g SAR [W/Kg]	Test Plot
Head	LTE Band 5	Main1	0KQLD	0.00	100.0%	100.0%	836.5	20525	QPSK, 10 MHz	1	0	22	21.11	0	0	Right Cheek	0.080	0.098	-
Head	LTE Band 5	Main1	0KQLD	-0.02	100.0%	100.0%	836.5	20525	QPSK, 10 MHz	25	25	22	20.99	0	0	Right Cheek	0.088	0.111	19
Head	LTE Band 5	Main1	0KQLD	-0.02	100.0%	100.0%	836.5	20525	QPSK, 10 MHz	1	0	22	21.11	0	0	Right Tilt	0.037	0.045	-
Head	LTE Band 5	Main1	0KQLD	-0.01	100.0%	100.0%	836.5	20525	QPSK, 10 MHz	25	25	22	20.99	0	0	Right Tilt	0.039	0.049	-
Head	LTE Band 5	Main1	0KQLD	-0.03	100.0%	100.0%	836.5	20525	QPSK, 10 MHz	1	0	22	21.11	0	0	Left Cheek	0.088	0.108	-
Head	LTE Band 5	Main1	0KQLD	-0.06	100.0%	100.0%	836.5	20525	QPSK, 10 MHz	25	25	22	20.99	0	0	Left Cheek	0.088	0.111	-
Head	LTE Band 5	Main1	0KQLD	-0.05	100.0%	100.0%	836.5	20525	QPSK, 10 MHz	1	0	22	21.11	0	0	Left Tilt	0.043	0.053	-
Head	LTE Band 5	Main1	0KQLD	0.08	100.0%	100.0%	836.5	20525	QPSK, 10 MHz	25	25	22	20.99	0	0	Left Tilt	0.043	0.054	-
Body-worn/Hotspot	LTE Band 5	Main1	0KQLD	-0.01	100.0%	100.0%	836.5	20525	QPSK, 10 MHz	1	0	22	21.11	0	10	Back	0.172	0.211	20
Body-worn/Hotspot	LTE Band 5	Main1	0KQLD	-0.05	100.0%	100.0%	836.5	20525	QPSK, 10 MHz	25	25	22	20.99	0	10	Back	0.171	0.216	-
Hotspot	LTE Band 5	Main1	0KQLD	0.02	100.0%	100.0%	836.5	20525	QPSK, 10 MHz	1	0	22	21.11	0	10	Front	0.124	0.152	-
Hotspot	LTE Band 5	Main1	0KQLD	-0.02	100.0%	100.0%	836.5	20525	QPSK, 10 MHz	25	25	22	20.99	0	10	Front	0.127	0.160	-
Hotspot	LTE Band 5	Main1	0KQLD	-0.01	100.0%	100.0%	836.5	20525	QPSK, 10 MHz	1	0	22	21.11	0	10	Bottom	0.122	0.150	-
Hotspot	LTE Band 5	Main1	0KQLD	-0.01	100.0%	100.0%	836.5	20525	QPSK, 10 MHz	25	25	22	20.99	0	10	Bottom	0.121	0.153	-
Hotspot	LTE Band 5	Main1	0KQLD	-0.04	100.0%	100.0%	836.5	20525	QPSK, 10 MHz	1	0	22	21.11	0	10	Left	0.109	0.134	-
Hotspot	LTE Band 5	Main1	0KQLD	0.04	100.0%	100.0%	836.5	20525	QPSK, 10 MHz	25	25	22	20.99	0	10	Left	0.106	0.134	-

Table 3-9

Exposure Condition	Band/Mode	Antenna	DUT SN	Power Drift [dB]	Maximum Duty Cycle [%]	Measured Duty Cycle [%]	Frequency [MHz]	Channel	Modulation/Configuration	RB Size	RB Offset	Maximum Allowed Power [dBm]	Measured Conducted Power [dBm]	MPR [dB]	Separation Distance [mm]	Position	Measured 1g SAR [W/Kg]	Reported 1g SAR [W/Kg]	Test Plot
Head	LTE Band 66	Main2	0KQLD	0.04	100.0%	100.0%	1745	132322	QPSK, 20 MHz	1	50	21	20.05	0	0	Right Cheek	0.083	0.103	-
Head	LTE Band 66	Main2	0KQLD	0.02	100.0%	100.0%	1745	132322	QPSK, 20 MHz	50	25	21	20.07	0	0	Right Cheek	0.084	0.104	21
Head	LTE Band 66	Main2	0KQLD	0.07	100.0%	100.0%	1745	132322	QPSK, 20 MHz	1	50	21	20.05	0	0	Right Tilt	0.037	0.046	-
Head	LTE Band 66	Main2	0KQLD	-0.06	100.0%	100.0%	1745	132322	QPSK, 20 MHz	50	25	21	20.07	0	0	Right Tilt	0.040	0.050	-
Head	LTE Band 66	Main2	0KQLD	0.21	100.0%	100.0%	1745	132322	QPSK, 20 MHz	1	50	21	20.05	0	0	Left Cheek	0.040	0.050	-
Head	LTE Band 66	Main2	0KQLD	-0.08	100.0%	100.0%	1745	132322	QPSK, 20 MHz	50	25	21	20.07	0	0	Left Cheek	0.041	0.051	-
Head	LTE Band 66	Main2	0KQLD	0.01	100.0%	100.0%	1745	132322	QPSK, 20 MHz	1	50	21	20.05	0	0	Left Tilt	0.033	0.041	-
Head	LTE Band 66	Main2	0KQLD	0.13	100.0%	100.0%	1745	132322	QPSK, 20 MHz	50	25	21	20.07	0	0	Left Tilt	0.032	0.040	-
Body-worn/Hotspot	LTE Band 66	Main2	0KQLD	0.02	100.0%	100.0%	1745	132322	QPSK, 20 MHz	1	50	21	20.05	0	10	Back	0.296	0.368	-
Body-worn/Hotspot	LTE Band 66	Main2	0KQLD	0.03	100.0%	100.0%	1745	132322	QPSK, 20 MHz	50	25	21	20.07	0	10	Back	0.301	0.373	22
Hotspot	LTE Band 66	Main2	0KQLD	-0.01	100.0%	100.0%	1745	132322	QPSK, 20 MHz	1	50	21	20.05	0	10	Front	0.219	0.273	-
Hotspot	LTE Band 66	Main2	0KQLD	0.00	100.0%	100.0%	1745	132322	QPSK, 20 MHz	50	25	21	20.07	0	10	Front	0.223	0.276	-
Hotspot	LTE Band 66	Main2	0KQLD	0.00	100.0%	100.0%	1745	132322	QPSK, 20 MHz	1	50	21	20.05	0	10	Bottom	0.372	0.463	23
Hotspot	LTE Band 66	Main2	0KQLD	0.01	100.0%	100.0%	1745	132322	QPSK, 20 MHz	50	25	21	20.07	0	10	Bottom	0.372	0.461	-
Hotspot	LTE Band 66	Main2	0KQLD	0.06	100.0%	100.0%	1745	132322	QPSK, 20 MHz	1	50	21	20.05	0	10	Right	0.209	0.260	-
Hotspot	LTE Band 66	Main2	0KQLD	0.06	100.0%	100.0%	1745	132322	QPSK, 20 MHz	50	25	21	20.07	0	10	Right	0.212	0.263	-

Table 3-10

Exposure Condition	Band/Mode	Antenna	DUT SN	Power Drift [dB]	Maximum Duty Cycle [%]	Measured Duty Cycle [%]	Frequency [MHz]	Channel	Modulation/Configuration	RB Size	RB Offset	Maximum Allowed Power [dBm]	Measured Conducted Power [dBm]	MPR [dB]	Separation Distance [mm]	Position	Measured 1g SAR [W/Kg]	Reported 1g SAR [W/Kg]	Test Plot
Head	LTE Band 25	Main2	0KQLD	0.21	100.0%	100.0%	1905	26590	QPSK, 20 MHz	1	50	19	18.14	0	0	Right Cheek	0.015	0.018	-
Head	LTE Band 25	Main2	0KQLD	0.12	100.0%	100.0%	1905	26590	QPSK, 20 MHz	50	50	19	18.28	0	0	Right Cheek	0.016	0.019	24
Head	LTE Band 25	Main2	0KQLD	0.21	100.0%	100.0%	1905	26590	QPSK, 20 MHz	1	50	19	18.14	0	0	Right Tilt	0.005	0.006	-
Head	LTE Band 25	Main2	0KQLD	0.21	100.0%	100.0%	1905	26590	QPSK, 20 MHz	50	50	19	18.28	0	0	Right Tilt	0.006	0.007	-
Head	LTE Band 25	Main2	0KQLD	0.16	100.0%	100.0%	1905	26590	QPSK, 20 MHz	1	50	19	18.14	0	0	Left Cheek	0.013	0.016	-
Head	LTE Band 25	Main2	0KQLD	0.06	100.0%	100.0%	1905	26590	QPSK, 20 MHz	50	50	19	18.28	0	0	Left Cheek	0.015	0.018	-
Head	LTE Band 25	Main2	0KQLD	0.00	100.0%	100.0%	1905	26590	QPSK, 20 MHz	1	50	19	18.14	0	0	Left Tilt	0.012	0.015	-
Head	LTE Band 25	Main2	0KQLD	0.21	100.0%	100.0%	1905	26590	QPSK, 20 MHz	50	50	19	18.28	0	0	Left Tilt	0.012	0.014	-
Body-worn/Hotspot	LTE Band 25	Main2	0KQLD	-0.06	100.0%	100.0%	1905	26590	QPSK, 20 MHz	1	50	19	18.14	0	10	Back	0.169	0.206	-
Body-worn/Hotspot	LTE Band 25	Main2	0KQLD	0.01	100.0%	100.0%	1905	26590	QPSK, 20 MHz	50	50	19	18.28	0	10	Back	0.174	0.205	25
Hotspot	LTE Band 25	Main2	0KQLD	0.00	100.0%	100.0%	1905	26590	QPSK, 20 MHz	1	50	19	18.14	0	10	Front	0.132	0.161	-
Hotspot	LTE Band 25	Main2	0KQLD	0.03	100.0%	100.0%	1905	26590	QPSK, 20 MHz	50	50	19	18.28	0	10	Front	0.135	0.159	-
Hotspot	LTE Band 25	Main2	0KQLD	-0.02	100.0%	100.0%	1905	26590	QPSK, 20 MHz	1	50	19	18.14	0	10	Bottom	0.233	0.284	-
Hotspot	LTE Band 25	Main2	0KQLD	-0.03	100.0%	100.0%	1905	26590	QPSK, 20 MHz	50	50	19	18.28	0	10	Bottom	0.237	0.280	26
Hotspot	LTE Band 25	Main2	0KQLD	0.02	100.0%	100.0%	1905	26590	QPSK, 20 MHz	1	50	19	18.14	0	10	Right	0.079	0.096	-
Hotspot	LTE Band 25	Main2	0KQLD	0.03	100.0%	100.0%	1905	26590	QPSK, 20 MHz	50	50	19	18.28	0	10	Right	0.081	0.096	-

Table 3-11

Exposure Condition	Band/Mode	Antenna	DUT SN	Power Drift [dB]	Maximum Duty Cycle [%]	Measured Duty Cycle [%]	Frequency [MHz]	Channel	Modulation/Configuration	RB Size	RB Offset	Maximum Allowed Power [dBm]	Measured Conducted Power [dBm]	MPR [dB]	Separation Distance [mm]	Position	Measured 1g SAR [W/Kg]	Reported 1g SAR [W/Kg]	Test Plot
Head	LTE Band 41	Main2	02ELD	0.21	63.3%	63.3%	2636.5	41055	QPSK, 20 MHz	1	50	19	18.53	0	0	Right Cheek	0.017	0.019	-
Head	LTE Band 41	Main2	02ELD	0.18	63.3%	63.3%	2636.5	41055	QPSK, 20 MHz	50	25	19	18.63	0	0	Right Cheek	0.017	0.019	27
Head	LTE Band 41	Main2	02ELD	0.12	63.3%	63.3%	2636.5	41055	QPSK, 20 MHz	1	50	19	18.53	0	0	Right Tilt	0.009	0.010	-
Head	LTE Band 41	Main2	02ELD	0.04	63.3%	63.3%	2636.5	41055	QPSK, 20 MHz	50	25	19	18.63	0	0	Right Tilt	0.010	0.011	-
Head	LTE Band 41	Main2	02ELD	0.06	63.3%	63.3%	2636.5	41055	QPSK, 20 MHz	1	50	19	18.53	0	0	Left Cheek	0.015	0.017	-
Head	LTE Band 41	Main2	02ELD	0.13	63.3%	63.3%	2636.5	41055	QPSK, 20 MHz	50	25	19	18.63	0	0	Left Cheek	0.011	0.012	-
Head	LTE Band 41	Main2	02ELD	0.08	63.3%	63.3%	2636.5	41055	QPSK, 20 MHz	1	50	19	18.53	0	0	Left Tilt	0.015	0.017	-
Head	LTE Band 41	Main2	02ELD	0.19	63.3%	63.3%	2636.5	41055	QPSK, 20 MHz	50	25	19	18.63	0	0	Left Tilt	0.013	0.014	-
Body-worn/Hotspot	LTE Band 41	Main2	02ELD	0.21	63.3%	63.3%	2636.5	41055	QPSK, 20 MHz	1	50	19	18.53	0	10	Back	0.134	0.149	-
Body-worn/Hotspot	LTE Band 41	Main2	02ELD	-0.03	63.3%	63.3%	2636.5	41055	QPSK, 20 MHz	50	25	19	18.63	0	10	Back	0.138	0.150	28
Hotspot	LTE Band 41	Main2	02ELD	0.15	63.3%	63.3%	2636.5	41055	QPSK, 20 MHz	1	50	19	18.53	0	10	Front	0.096	0.107	-
Hotspot	LTE Band 41	Main2	02ELD	-0.01	63.3%	63.3%	2636.5	41055	QPSK, 20 MHz	50	25	19	18.63	0	10	Front	0.095	0.103	-
Hotspot	LTE Band 41	Main2	02ELD	0.09	63.3%	63.3%	2636.5	41055	QPSK, 20 MHz	1	50	19	18.53	0	10	Bottom	0.215	0.240	-
Hotspot	LTE Band 41	Main2	02ELD	-0.02	63.3%	63.3%	2636.5	41055	QPSK, 20 MHz	50	25	19	18.63	0	10	Bottom	0.219	0.238	29
Hotspot	LTE Band 41	Main2	02ELD	0.06	63.3%	63.3%	2636.5	41055	QPSK, 20 MHz	1	50	19	18.53	0	10	Right	0.045	0.050	-
Hotspot	LTE Band 41	Main2	02ELD	-0.04	63.3%	63.3%	2636.5	41055	QPSK, 20 MHz	50	25	19	18.63	0	10	Right	0.044	0.048	-

3.4. WLAN SAR Data

Table 3-12

Exposure Condition	Band/Mode	Antenna	Additional Information	DUT SN	Power Drift [dB]	Maximum Duty Cycle [%]	Measured Duty Cycle [%]	Frequency [MHz]	Channel	Modulation/Configuration	Data Rate (Mbps)	Maximum Allowed Power [dBm]	Measured Conducted Power [dBm]	Maximum Allowed Power 2nd Ant [dBm]	Measured Conducted Power 2nd Ant [dBm]	Separation Distance [mm]	Position	Measured 1g SAR [W/Kg]	Reported 1g SAR [W/Kg]	Test Plot
Head	2.4 GHz WIFI	MIMO	-	0D9LD	0.05	100.0%	98.9%	2437	6	IEEE 802.11n 20 MHz	13	14	14.00	14	13.95	0	Right Cheek	0.510	0.522	30
Head	2.4 GHz WIFI	MIMO	-	0D9LD	0.01	100.0%	98.9%	2437	6	IEEE 802.11n 20 MHz	13	14	14.00	14	13.95	0	Right Tilt	0.098	0.100	-
Head	2.4 GHz WIFI	MIMO	-	0D9LD	0.21	100.0%	98.9%	2437	6	IEEE 802.11n 20 MHz	13	14	14.00	14	13.95	0	Left Cheek	0.141	0.144	-
Head	2.4 GHz WIFI	MIMO	-	0D9LD	0.21	100.0%	98.9%	2437	6	IEEE 802.11n 20 MHz	13	14	14.00	14	13.95	0	Left Tilt	0.028	0.029	-
Head	2.4 GHz WIFI	MIMO	-	0D9LD	0.00	100.0%	99.3%	2437	6	IEEE 802.11b 22 MHz	1	11.5	11.13	11.5	11.24	0	Right Cheek	0.342	0.375	-
Head	2.4 GHz WIFI	MIMO	-	0D9LD	-0.08	100.0%	99.3%	2437	6	IEEE 802.11b 22 MHz	1	11.5	11.13	11.5	11.24	0	Right Tilt	0.062	0.068	-
Head	2.4 GHz WIFI	MIMO	-	0D9LD	-0.01	100.0%	99.3%	2437	6	IEEE 802.11b 22 MHz	1	11.5	11.13	11.5	11.24	0	Left Cheek	0.087	0.095	-
Head	2.4 GHz WIFI	MIMO	-	0D9LD	0.21	100.0%	99.3%	2437	6	IEEE 802.11b 22 MHz	1	11.5	11.13	11.5	11.24	0	Left Tilt	0.012	0.013	-
Body-worn/Hotspot	2.4 GHz WIFI	MIMO	Chain0	0D9LD	0.21	100.0%	98.9%	2437	6	IEEE 802.11n 20 MHz	13	14	14.00	14	13.95	10	Back	0.086	0.088	-
Body-worn/Hotspot	2.4 GHz WIFI	MIMO	Chain1	0D9LD	-0.09	100.0%	98.9%	2437	6	IEEE 802.11n 20 MHz	13	14	14.00	14	13.95	10	Back	0.205	0.210	31
Body-worn/Hotspot	2.4 GHz WIFI	MIMO	Chain0	0D9LD	-0.01	100.0%	99.3%	2437	6	IEEE 802.11b 22 MHz	1	11.5	11.13	11.5	11.24	10	Back	0.049	0.054	-
Body-worn/Hotspot	2.4 GHz WIFI	MIMO	Chain1	0D9LD	-0.01	100.0%	99.3%	2437	6	IEEE 802.11b 22 MHz	1	11.5	11.13	11.5	11.24	10	Back	0.096	0.105	-
Hotspot	2.4 GHz WIFI	MIMO	Chain0	0D9LD	0.21	100.0%	98.9%	2437	6	IEEE 802.11n 20 MHz	13	14	14.00	14	13.95	10	Front	0.070	0.072	-
Hotspot	2.4 GHz WIFI	MIMO	Chain1	0D9LD	-0.09	100.0%	98.9%	2437	6	IEEE 802.11n 20 MHz	13	14	14.00	14	13.95	10	Front	0.030	0.031	-
Hotspot	2.4 GHz WIFI	MIMO	-	0D9LD	0.17	100.0%	98.9%	2437	6	IEEE 802.11n 20 MHz	13	14	14.00	14	13.95	10	Top	0.010	0.010	-
Hotspot	2.4 GHz WIFI	MIMO	-	0D9LD	0.07	100.0%	98.9%	2437	6	IEEE 802.11n 20 MHz	13	14	14.00	14	13.95	10	Bottom	0.038	0.039	-
Hotspot	2.4 GHz WIFI	MIMO	-	0D9LD	-0.01	100.0%	98.9%	2437	6	IEEE 802.11n 20 MHz	13	14	14.00	14	13.95	10	Left	0.164	0.168	-
Hotspot	2.4 GHz WIFI	MIMO	Chain0	0D9LD	0.21	100.0%	99.3%	2437	6	IEEE 802.11b 22 MHz	1	11.5	11.13	11.5	11.24	10	Front	0.055	0.060	-
Hotspot	2.4 GHz WIFI	MIMO	Chain1	0D9LD	0.06	100.0%	99.3%	2437	6	IEEE 802.11b 22 MHz	1	11.5	11.13	11.5	11.24	10	Front	0.030	0.033	-
Hotspot	2.4 GHz WIFI	MIMO	-	0D9LD	0.21	100.0%	99.3%	2437	6	IEEE 802.11b 22 MHz	1	11.5	11.13	11.5	11.24	10	Top	0.006	0.007	-
Hotspot	2.4 GHz WIFI	MIMO	-	0D9LD	0.21	100.0%	99.3%	2437	6	IEEE 802.11b 22 MHz	1	11.5	11.13	11.5	11.24	10	Bottom	0.014	0.015	-
Hotspot	2.4 GHz WIFI	MIMO	-	0D9LD	-0.12	100.0%	99.3%	2437	6	IEEE 802.11b 22 MHz	1	11.5	11.13	11.5	11.24	10	Left	0.094	0.103	-

Table 3-13

Exposure Condition	Band/Mode	Antenna	DUT SN	Power Drift [dB]	Maximum Duty Cycle [%]	Measured Duty Cycle [%]	Frequency [MHz]	Channel	Modulation/Configuration	Data Rate (Mbps)	Maximum Allowed Power [dBm]	Measured Conducted Power [dBm]	Maximum Allowed Power 2nd Ant [dBm]	Measured Conducted Power 2nd Ant [dBm]	Separation Distance [mm]	Position	Measured 1g SAR [W/Kg]	Reported 1g SAR [W/Kg]	Measured 10g SAR [W/Kg]	Reported 10g SAR [W/Kg]	Test Plot
Head	5 GHz WIFI	Chain0	0LNLD	-0.07	100.0%	98.3%	5310	62	IEEE 802.11n 40 MHz	13.5	11.5	11.35	N/A	N/A	0	Right Cheek	0.269	0.283	-	-	32
Head	5 GHz WIFI	Chain0	0LNLD	0.21	100.0%	98.3%	5755	151	IEEE 802.11n 40 MHz	13.5	11.5	11.34	N/A	N/A	0	Right Cheek	0.084	0.089	-	-	-
Head	5 GHz WIFI	Chain0	0LNLD	0.00	100.0%	99.0%	5610	122	IEEE 802.11ac 80 MHz	29.3	11.5	11.33	N/A	N/A	0	Right Cheek	0.173	0.182	-	-	-
Head	5 GHz WIFI	Chain0	0LNLD	-0.06	100.0%	98.3%	5310	62	IEEE 802.11n 40 MHz	13.5	11.5	11.35	N/A	N/A	0	Right Tilt	0.128	0.135	-	-	-
Head	5 GHz WIFI	Chain0	0LNLD	0.21	100.0%	98.3%	5755	151	IEEE 802.11n 40 MHz	13.5	11.5	11.34	N/A	N/A	0	Right Tilt	0.022	0.023	-	-	-
Head	5 GHz WIFI	Chain0	0LNLD	0.16	100.0%	99.0%	5610	122	IEEE 802.11ac 80 MHz	29.3	11.5	11.33	N/A	N/A	0	Right Tilt	0.025	0.026	-	-	-
Head	5 GHz WIFI	Chain0	0LNLD	0.17	100.0%	98.3%	5310	62	IEEE 802.11n 40 MHz	13.5	11.5	11.35	N/A	N/A	0	Left Cheek	0.077	0.081	-	-	-
Head	5 GHz WIFI	Chain0	0LNLD	0.21	100.0%	98.3%	5755	151	IEEE 802.11n 40 MHz	13.5	11.5	11.34	N/A	N/A	0	Left Cheek	0.036	0.038	-	-	-
Head	5 GHz WIFI	Chain0	0LNLD	-0.09	100.0%	99.0%	5610	122	IEEE 802.11ac 80 MHz	29.3	11.5	11.33	N/A	N/A	0	Left Cheek	0.058	0.061	-	-	-
Head	5 GHz WIFI	Chain0	0LNLD	0.04	100.0%	98.3%	5310	62	IEEE 802.11n 40 MHz	13.5	11.5	11.35	N/A	N/A	0	Left Tilt	0.051	0.054	-	-	-
Head	5 GHz WIFI	Chain0	0LNLD	0.05	100.0%	98.3%	5755	151	IEEE 802.11n 40 MHz	13.5	11.5	11.34	N/A	N/A	0	Left Tilt	0.007	0.007	-	-	-
Head	5 GHz WIFI	Chain0	0LNLD	0.07	100.0%	99.0%	5610	122	IEEE 802.11ac 80 MHz	29.3	11.5	11.33	N/A	N/A	0	Left Tilt	0.010	0.011	-	-	-
Head	5 GHz WIFI	Chain0	0LNLD	0.21	100.0%	98.3%	5795	159	IEEE 802.11n 40 MHz	13.5	9.5	9.40	N/A	N/A	0	Right Cheek	0.147	0.153	-	-	-
Head	5 GHz WIFI	Chain0	0LNLD	0.14	100.0%	99.0%	5290	58	IEEE 802.11ac 80 MHz	29.3	9.5	9.33	N/A	N/A	0	Right Cheek	0.206	0.216	-	-	-
Head	5 GHz WIFI	Chain0	0LNLD	0.16	100.0%	99.0%	5530	106	IEEE 802.11ac 80 MHz	29.3	9.5	9.34	N/A	N/A	0	Right Cheek	0.068	0.071	-	-	-
Head	5 GHz WIFI	Chain0	0LNLD	0.21	100.0%	98.3%	5795	159	IEEE 802.11n 40 MHz	13.5	9.5	9.40	N/A	N/A	0	Right Tilt	0.020	0.021	-	-	-
Head	5 GHz WIFI	Chain0	0LNLD	0.17	100.0%	99.0%	5290	58	IEEE 802.11ac 80 MHz	29.3	9.5	9.33	N/A	N/A	0	Right Tilt	0.107	0.112	-	-	-
Head	5 GHz WIFI	Chain0	0LNLD	-0.11	100.0%	99.0%	5530	106	IEEE 802.11ac 80 MHz	29.3	9.5	9.34	N/A	N/A	0	Right Tilt	0.021	0.022	-	-	-
Head	5 GHz WIFI	Chain0	0LNLD	0.18	100.0%	98.3%	5795	159	IEEE 802.11n 40 MHz	13.5	9.5	9.40	N/A	N/A	0	Left Cheek	0.044	0.046	-	-	-
Head	5 GHz WIFI	Chain0	0LNLD	0.01	100.0%	99.0%	5290	58	IEEE 802.11ac 80 MHz	29.3	9.5	9.33	N/A	N/A	0	Left Cheek	0.069	0.072	-	-	-
Head	5 GHz WIFI	Chain0	0LNLD	0.21	100.0%	99.0%	5530	106	IEEE 802.11ac 80 MHz	29.3	9.5	9.34	N/A	N/A	0	Left Cheek	0.006	0.006	-	-	-
Head	5 GHz WIFI	Chain0	0LNLD	0.21	100.0%	98.3%	5795	159	IEEE 802.11n 40 MHz	13.5	9.5	9.40	N/A	N/A	0	Left Tilt	0.003	0.003	-	-	-
Head	5 GHz WIFI	Chain0	0LNLD	0.06	100.0%	99.0%	5290	58	IEEE 802.11ac 80 MHz	29.3	9.5	9.33	N/A	N/A	0	Left Tilt	0.048	0.050	-	-	-
Head	5 GHz WIFI	Chain0	0LNLD	0.17	100.0%	99.0%	5530	106	IEEE 802.11ac 80 MHz	29.3	9.5	9.34	N/A	N/A	0	Left Tilt	0.001	0.001	-	-	-
Body-worn	5 GHz WIFI	Chain0	088LD	0.21	100.0%	98.3%	5310	62	IEEE 802.11n 40 MHz	13.5	11.5	11.35	N/A	N/A	10	Back	0.045	0.047	-	-	-
Body-worn	5 GHz WIFI	Chain0	088LD	0.21	100.0%	99.0%	5610	122	IEEE 802.11ac 80 MHz	29.3	11.5	11.33	N/A	N/A	10	Back	0.043	0.045	-	-	-
Body-worn/Hotspot	5 GHz WIFI	Chain0	088LD	0.21	100.0%	98.3%	5755	151	IEEE 802.11n 40 MHz	13.5	11.5	11.34	N/A	N/A	10	Back	0.028	0.030	-	-	-
Hotspot	5 GHz WIFI	Chain0	088LD	-0.08	100.0%	98.3%	5230	46	IEEE 802.11n 40 MHz	13.5	11.5	11.41	N/A	N/A	10	Back	0.019	0.020	-	-	-
Hotspot	5 GHz WIFI	Chain0	088LD	0.08	100.0%	98.3%	5230	46	IEEE 802.11n 40 MHz	13.5	11.5	11.41	N/A	N/A	10	Front	0.026	0.027	-	-	-
Hotspot	5 GHz WIFI	Chain0	088LD	0.21	100.0%	98.3%	5755	151	IEEE 802.11n 40 MHz	13.5	11.5	11.34	N/A	N/A	10	Front	0.009	0.010	-	-	-
Hotspot	5 GHz WIFI	Chain0	088LD	0.21	100.0%	98.3%	5230	46	IEEE 802.11n 40 MHz	13.5	11.5	11.41	N/A	N/A	10	Top	0.004	0.004	-	-	-
Hotspot	5 GHz WIFI	Chain0	088LD	0.21	100.0%	98.3%	5755	151	IEEE 802.11n 40 MHz	13.5	11.5	11.34	N/A	N/A	10	Top	0.018	0.019	-	-	-
Hotspot	5 GHz WIFI	Chain0	088LD	0.21	100.0%	98.3%	5230	46	IEEE 802.11n 40 MHz	13.5	11.5	11.41	N/A	N/A	10	Left	0.028	0.029	-	-	-
Hotspot	5 GHz WIFI	Chain0	088LD	0.04	100.0%	98.3%	5755	151	IEEE 802.11n 40 MHz	13.5	11.5	11.34	N/A	N/A	10	Left	0.044	0.046	-	-	-
Phablet	5 GHz WIFI	Chain0	088LD	-0.14	100.0%	98.3%	5310	62	IEEE 802.11n 40 MHz	13.5	11.5	11.35	N/A	N/A	0	Back	0.274	0.289	0.087	0.092	-
Phablet	5 GHz WIFI	Chain0	088LD	-0.03	100.0%	99.0%	5610	122	IEEE 802.11ac 80 MHz	29.3	11.5	11.33	N/A	N/A	0	Back	0.491	0.516	0.113	0.119	-
Phablet	5 GHz WIFI	Chain0	088LD	-0.05	100.0%	98.3%	5310	62	IEEE 802.11n 40 MHz	13.5	11.5	11.35	N/A	N/A	0	Front	0.689	0.726	0.215	0.227	-
Phablet	5 GHz WIFI	Chain0	088LD	-0.05	100.0%	99.0%	5610	122	IEEE 802.11ac 80 MHz	29.3	11.5	11.33	N/A	N/A	0	Front	0.520	0.546	0.108	0.113	-
Phablet	5 GHz WIFI	Chain0	088LD	0.08	100.0%	98.3%	5310	62	IEEE 802.11n 40 MHz	13.5	11.5	11.35	N/A	N/A	0	Top	0.158	0.166	0.029	0.031	-
Phablet	5 GHz WIFI	Chain0	088LD	-0.17	100.0%	99.0%	5610	122	IEEE 802.11ac 80 MHz	29.3	11.5	11.33	N/A	N/A	0	Top	0.070	0.074	0.015	0.016	-
Phablet	5 GHz WIFI	Chain0	088LD	-0.02	100.0%	98.3%	5310	62	IEEE 802.11n 40 MHz	13.5	11.5	11.35	N/A	N/A	0	Left	1.400	1.475	0.295	0.311	-
Phablet	5 GHz WIFI	Chain0	088LD	0.21	100.0%	99.0%	5610	122	IEEE 802.11ac 80 MHz	29.3	11.5	11.33	N/A	N/A	0	Left	1.440	1.513	0.333	0.350	34
Head	5 GHz WIFI	Chain1	0LNLD	0.21	100.0%	99.0%	5310	62	IEEE 802.11n 40 MHz	13.5	11.5	11.41	N/A	N/A	0	Right Cheek	0.000	0.000	-	-	-
Head	5 GHz WIFI	Chain1	0LNLD	0.21	100.0%	99.0%	5795	159	IEEE 802.11n 40 MHz	13.5	11.5	11.24	N/A	N/A	0	Right Cheek	0.000	0.000	-	-	-
Head	5 GHz WIFI	Chain1	0LNLD	-0.04	100.0%	99.0%	5690	138	IEEE 802.11ac 80 MHz	29.3	11.5	11.47	N/A	N/A	0	Right Cheek	0.000	0.000	-	-	-
Head	5 GHz WIFI	Chain1	0LNLD	0.21	100.0%	99.0%	5310	62	IEEE 802.11n 40 MHz	13.5	11.5	11.41	N/A	N/A	0	Right Tilt	0.000	0.000	-	-	-
Head	5 GHz WIFI	Chain1	0LNLD	0.13	100.0%	99.0%	5795	159	IEEE 802.11n 40 MHz	13.5	11.5	11.24	N/A	N/A	0	Right Tilt	0.002	0.002	-	-	-
Head	5 GHz WIFI	Chain1	0LNLD	0.21	100.0%	99.0%	5690	138	IEEE 802.11ac 80 MHz	29.3	11.5	11.47	N/A	N/A	0	Right Tilt	0.000	0.000	-	-	-
Head	5 GHz WIFI	Chain1	0LNLD	0.21	100.0%	99.0%	5310	62	IEEE 802.11n 40 MHz	13.5	11.5	11.41	N/A	N/A	0	Left Cheek	0.000	0.000	-	-	-
Head	5 GHz WIFI	Chain1	0LNLD	0.16	100.0%	99.0%	5795	159	IEEE 802.11n 40 MHz	13.5	11.5	11.24	N/A	N/A	0	Left Cheek	0.000	0.000	-	-	-
Head	5 GHz WIFI	Chain1	0LNLD	0.21	100.0%	99.0%	5690	138	IEEE 802.11ac 80 MHz	29.3	11.5	11.47	N/A	N/A	0	Left Cheek	0.000	0.000	-	-	-
Head	5 GHz WIFI	Chain1	0LNLD	0.21	100.0%	99.0%	5310	62	IEEE 802.11n 40 MHz	13.5	11.5	11.41	N/A	N/A	0	Left Tilt	0.000	0.000	-	-	-
Head	5 GHz WIFI	Chain1	0LNLD	0.08	100.0%	99.0%	5795	159	IEEE 802.11n 40 MHz	13.5	11.5	11.24	N/A	N/A	0	Left Tilt	0.000	0.000	-	-	-
Head	5 GHz WIFI	Chain1	0LNLD	0.09	100.0%	99.0%	5690	138	IEEE 802.11ac 80 MHz	29.3	11.5	11.47	N/A	N/A	0	Left Tilt	0.000	0.000	-	-	-
Body-worn	5 GHz WIFI	Chain1	088LD	0.19	100.0%	99.0%	5310	62	IEEE 802.11n 40 MHz	13.5	11.5	11.41	N/A	N/A	10	Back	0.052	0.054	-	-	-
Body-worn	5 GHz WIFI	Chain1	088LD	0.21	100.0%	99.0%	5690	138	IEEE 802.11ac 80 MHz	29.3	11.5	11.47	N/A	N/A	10	Back	0.043	0.044	-	-	-
Body-worn/Hotspot	5 GHz WIFI	Chain1	088LD	-0.04	100.0%	99.0%	5795	159	IEEE 802.11n 40 MHz	13.5	11.5	11.24	N/A	N/A	10	Back	0.118	0.127	-	-	33
Hotspot	5 GHz WIFI	Chain1	088LD	0.07	100.0%	99.0%	5230	46	IEEE 802.11n 40 MHz	13.5	11.5	11.37	N/A	N/A	10	Back	0.032	0.033	-	-	-
Hotspot	5 GHz WIFI	Chain1	088LD	0.11	100.0%	99.0%	5230	46	IEEE 802.11n 40 MHz	13.5	11.5	11.37	N/A	N/A	10	Front	0.000	0.000	-	-	-
Hotspot	5 GHz WIFI	Chain1	088LD	0.20	100.0%	99.0%	5795	159	IEEE 802.11n 40 MHz	13.5	11.5	11.24	N/A	N/A	10	Front	0.000	0.000	-	-	-
Hotspot	5 GHz WIFI	Chain1	088LD	0.14	100.0%	99.0%	5230	46	IEEE 802.11n 40 MHz	13.5	11.5	11.37	N/A	N/A	10	Bottom	0.000	0.000	-	-	-
Hotspot	5 GHz WIFI	Chain1	088LD	0.19	100.0%	99.0%	5795	159	IEEE 802.11n 40 MHz	13.5	11.5	11.24	N/A	N/A	10	Bottom	0.000	0.000	-	-	-
Hotspot	5 GHz WIFI	Chain1	088LD	0.07	100.0%	99.0%	5230	46	IEEE 802.11n 40 MHz	13.5	11.5	11.37	N/A	N/A	10	Left	0.002	0.002	-	-	-
Hotspot	5 GHz WIFI	Chain1	088LD	0.15	100.0%	99.0%	5795	159	IEEE 802.11n 40 MHz	13.5	11.5	11.24	N/A	N/A	10	Left	0.021	0.023	-	-	-
Phablet	5 GHz WIFI	Chain1	088LD	-0.03	100.0%	99.0%	5310	62	IEEE 802.11n 40 MHz	13.5	11.5	11.41	N/A	N/A	0	Back	0.803	0.828	0.183	0.189	-
Phablet	5 GHz WIFI	Chain1	088LD	0.00	100.0%	99.0%	5690	138	IEEE 802.11ac 80 MHz	29.3	11.5	11.47	N/A	N/A	0	Back	1.040	1.058	0.259	0.263	-
Phablet	5 GHz WIFI	Chain1	088LD	0.21	100.0%	99.0%	5310	62	IEEE 802.11n 40 MHz	13.5	11.5	11.41	N/A	N/A	0	Front	0.005	0.005	0.000	0.000	-
Phablet	5 GHz WIFI	Chain1	088LD	0.14	100.0%	99.0%	5690	138	IEEE 802.11ac 80 MHz	29.3	11.5	11.47	N/A	N/A	0	Front	0.029	0.029	0.004	0.004	-
Phablet	5 GHz WIFI	Chain1	088LD	0.21	100.0%	99.0%	5310	62	IEEE 802.11n 40 MHz	13.5	11.5	11.41	N/A	N/A	0	Bottom	0.03	0.031	0.006	0.006	-
Phablet	5 GHz WIFI	Chain1	088LD	0.21	100.0%	99.0%	5690	138	IEEE 802.11ac 80 MHz	29.3	11.5	11.47	N/A	N/A	0	Bottom	0.009	0.009	0	0	-
Phablet	5 GHz WIFI	Chain1	088LD	0.15	100.0%	99.0%	5310	62	IEEE 802.11n 40 MHz	13.5	11.5	11.41	N/A	N/A	0	Left	0.054	0.056	0.012	0.012	-
Phablet	5 GHz WIFI	Chain1	088LD	0.21	100.0%	99.0%	5690	138	IEEE 802.11ac 80 MHz	29.3	11.5	11.47	N/A	N/A	0	Left	0.053	0.054	0.01	0.01	-

3.5. Bluetooth SAR Data

Table 3-14

Exposure Condition	Band/Mode	Antenna	DUT SN	Power Drift [dB]	Maximum Duty Cycle [%]	Measured Duty Cycle [%]	Frequency [MHz]	Channel	Modulation/Configuration	Data Rate (Mbps)	Maximum Allowed Power [dBm]	Measured Conducted Power [dBm]	Separation Distance [mm]	Position	Measured 1g SAR [W/Kg]	Reported 1g SAR [W/Kg]	Test Plot
Head	2.4 GHz Bluetooth	Chain0	088LD	0.07	83.3%	76.1%	2480	78	FHSS	1	14	13.55	0	Right Cheek	0.035	0.043	35
Head	2.4 GHz Bluetooth	Chain0	088LD	0.19	83.3%	76.1%	2480	78	FHSS	1	14	13.55	0	Right Tilt	0.007	0.009	-
Head	2.4 GHz Bluetooth	Chain0	088LD	0.06	83.3%	76.1%	2480	78	FHSS	1	14	13.55	0	Left Cheek	0.008	0.010	-
Head	2.4 GHz Bluetooth	Chain0	088LD	0.18	83.3%	76.1%	2480	78	FHSS	1	14	13.55	0	Left Tilt	0.004	0.005	-
Body-worn/Hotspot	2.4 GHz Bluetooth	Chain0	088LD	0.01	83.3%	76.1%	2480	78	FHSS	1	14	13.55	10	Back	0.059	0.072	36
Hotspot	2.4 GHz Bluetooth	Chain0	088LD	0.06	83.3%	76.1%	2480	78	FHSS	1	14	13.55	10	Front	0.045	0.055	-
Hotspot	2.4 GHz Bluetooth	Chain0	088LD	0.16	83.3%	76.1%	2480	78	FHSS	1	14	13.55	10	Top	0.011	0.013	-
Hotspot	2.4 GHz Bluetooth	Chain0	088LD	0.04	83.3%	76.1%	2480	78	FHSS	1	14	13.55	10	Left	0.113	0.137	37
Head	2.4 GHz Bluetooth	Chain1	088LD	0.15	83.3%	76.1%	2441	39	FHSS	1	14	13.74	0	Right Cheek	0.000	0.000	-
Head	2.4 GHz Bluetooth	Chain1	088LD	0.21	83.3%	76.1%	2441	39	FHSS	1	14	13.74	0	Right Tilt	0.000	0.000	-
Head	2.4 GHz Bluetooth	Chain1	088LD	0.07	83.3%	76.1%	2441	39	FHSS	1	14	13.74	0	Left Cheek	0.000	0.000	-
Head	2.4 GHz Bluetooth	Chain1	088LD	0.21	83.3%	76.1%	2441	39	FHSS	1	14	13.74	0	Left Tilt	0.003	0.003	-
Body-worn/Hotspot	2.4 GHz Bluetooth	Chain1	088LD	0.00	83.3%	76.1%	2441	39	FHSS	1	14	13.74	10	Back	0.002	0.002	-
Hotspot	2.4 GHz Bluetooth	Chain1	088LD	0.18	83.3%	76.1%	2441	39	FHSS	1	14	13.74	10	Front	0.000	0.000	-
Hotspot	2.4 GHz Bluetooth	Chain1	088LD	0.21	83.3%	76.1%	2441	39	FHSS	1	14	13.74	10	Bottom	0.002	0.002	-
Hotspot	2.4 GHz Bluetooth	Chain1	088LD	0.06	83.3%	76.1%	2441	39	FHSS	1	14	13.74	10	Left	0.006	0.007	-

3.6. NFC SAR Data

Table 3-15

Exposure Condition	Band/Mode	Antenna	DUT SN	Power Drift [dB]	Frequency [MHz]	Data Rate	Separation Distance [mm]	Position	Measured 10g SAR [W/Kg]	Reported 10g SAR [W/Kg]	Test Plot
Phablet	NFC	NFC	088LD	0.12	13.56	106k	0	Back	0.011	0.011	38
Phablet	NFC	NFC	088LD	0.21	13.56	106k	0	Front	0.000	0.000	-
Phablet	NFC	NFC	088LD	0.13	13.56	106k	0	Top	0.000	0.000	-
Phablet	NFC	NFC	088LD	0.17	13.56	106k	0	Left	0.000	0.000	-

3.7. General SAR Testing Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2013, and FCC KDB Publication 447498 D04v01.
2. Liquid tissue depth was at least 15.0 cm for all frequencies.
3. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D04v01.
4. Batteries are fully charged at the beginning of the SAR measurements.
5. DUT was tested using a fixed spacing for body-worn accessory testing. A separation distance of 10mm was considered because the manufacturer has determined that there will be body-worn accessories available for users to support this separation distance. Since the body-worn SAR was < 1.2 W/kg, no additional body-worn SAR evaluations using a headset cable were required.
6. Per FCC KDB Publication 648474 D04v01r03, this device is considered a “phablet.” Therefore, phablet SAR tests were required when the wireless router mode does not apply or when the wireless router 1g SAR was > 1.2 W/kg (when scaled to the maximum output power).
7. Unless otherwise noted, when 10g SAR measurement is considered, a factor of 2.5 is applied to the 1g thresholds for the equivalent test cases.
8. Simultaneous transmission analysis is provided in Appendix E.

3.8. GSM Notes:

1. Body-Worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.
2. 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 hotspot 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.
3. Per FCC KDB Publication 447498 D04v01, if the reported (scaled) SAR measured at the 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).
4. DTM SAR was evaluated when the device was operating in DTM mode using maximum CS and PS slots according to FCC KDB 941225 D01v03r01.

3.9. UMTS Notes:

1. UMTS mode was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01v03r01. AMR and HSPA SAR tests were not required per the 3G Test Reduction Procedure in KDB Publication 941225 D01v03r01.
2. Per FCC KDB Publication 447498 D04v01, if the reported (scaled) SAR measured at the 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).

3.10. LTE Notes:

1. 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 8.3.
2. 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.
3. 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.
4. 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).
5. Per FCC KDB Publication 447498 D04v01, when the reported 1g SAR measured at the highest output power channel in a given a test configuration was > 0.6 W/kg for LTE Band 41, testing at the other channels was required for such test configurations.
6. 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.
7. This device supports LTE Carrier Aggregation (CA) and 4x4 MIMO operations in the downlink. All uplink communications are identical to Release 8 specifications. Per KDB Publication 941225 D05Av01r02, SAR for downlink only LTE CA operations and 4x4 downlink MIMO 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.

3.11. WLAN Notes:

1. Since U-NII-1 and U-NII-2A bands have the same maximum output power and the highest reported SAR for U-NII-2A is less than 1.2 W/kg, SAR is not required for U-NII-1 band according to FCC KDB Publication 248227 D01v02r02.
2. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 2.4 GHz WIFI operations, the initial test configuration was selected according to the 802.11

transmission modes with the highest maximum allowed powers. SAR for other 802.11 modes was not required due to the maximum allowed powers and the highest reported SAR.

3. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 5 GHz WIFI 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.
4. Per KDB Publication 248227 D01v02r02, SAR for MIMO was evaluated by following the simultaneous SAR provisions from KDB Publication 447498 D04v01 making a measurement with both antennas transmitting simultaneously or by evaluating the summation of the 1g or 10g SAR values of each antenna. When Chain0 and Chain1 are indicated in the tables above in MIMO mode, a zoom scan was run centered over each of the antennas.
5. 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.
6. 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. Procedures used to measure the duty factor are identical to that in the associated Part 15 test reports.

3.12. Bluetooth Note:

1. Per October 2016 TCB Workshop Notes, the reported SAR was scaled to the 83.3% transmission duty factor for Bluetooth to determine compliance. See Section 2.5 for the time domain plot and calculation for the duty factor of the device.

3.13. NFC Note:

1. NFC was evaluated for phablet condition based on the expected use conditions of NFC operations (hand-held operations only).

4. DUT SAR Measurement Variability Requirement

Per FCC KDB Publication 865664 D01v01r04, SAR measurement variability was not required since the measured SAR results for a frequency band were less than 0.8 W/kg for 1g SAR and 2.0 W/kg for 10g SAR.

5. General Introduction

Title 47 of the Code of Federal Regulations (CFR) pertains to United States Federal regulation for Telecommunications. The **Federal Communications Commission (FCC)** is the agency responsible for implementing and enforcing these regulations. The rules define a **radiofrequency device** as any device which in its operation is capable of emitting radiofrequency energy by radiation, conduction, or other means.

47CFR §2.1093(b) states, "A **portable device** is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that the RF source's radiating structure(s) **is/are within 20 centimeters of the body of the user**."

Also, 47CFR §2.1093(d)(6) states, that General population/uncontrolled exposure limits defined in §1.1310 "apply to portable devices intended for use by consumers or persons who are exposed as a consequence of their employment and may not be fully aware of the potential for exposure or cannot exercise control over their exposure."

47CFR §2.1093(d)(2) states that evaluation of compliance within FCC's SAR limits can be demonstrated by laboratory measurements. This test report serves this purpose.

6. Background on Radiofrequency (RF) Exposure Limits

6.1. Controlled Environment

Controlled environments are defined as locations where the RF field intensities have been adequately characterized by means of measurement or calculation and exposure is incurred by persons who are: aware of the potential for RF field exposure, cognizant of the intensity of the RF fields in their environment, aware of the potential health risks associated with RF field exposure and able to control their risk using mitigation strategies. 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.

6.2. Uncontrolled Environment

Uncontrolled environments are defined as locations where either insufficient assessment of RF fields have been conducted or where persons who are allowed access to these areas have not received proper RF field awareness/safety training and have no means to assess or, if required, to mitigate their exposure to RF fields. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed, or in which persons who may not be made fully aware of the potential for exposure, or cannot exercise control over their exposure. Members of the general public would fall under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

6.3. RF Exposure Limits for 100kHz – 6 GHz

Per FCC 47 CFR §1.1310, the SAR limits are applied for frequencies 100kHz ~ 6 GHz as shown below.

Table 6-1 Human Exposure to RF Radiation Limits in 47 CFR §1.1310 - SAR Basic Restrictions

Environment	Condition	**SAR**	Averaging volume
Uncontrolled / General Population	Head, Neck Trunk	**1.6 W/kg**	1g cube
	Extremity	**4.0 W/kg**	10g cube
Controlled	Head/Trunk	**8 W/kg**	1g cube
	Extremity / Limbs	**20 W/kg**	10g cube

6.4. General FCC Policy on Human Exposure to RF

Quoted from the FCC OET website:

The FCC is required by the National Environmental Policy Act of 1969, among other things, to evaluate the effect of emissions from FCC-regulated transmitters on the quality of the human environment.   Several organizations, such as the American National Standards Institute (ANSI), the Institute of Electrical and Electronics Engineers, Inc. (IEEE) ,and the National Council on Radiation Protection and Measurements (NRCP) have issued recommendations for human exposure to RF electromagnetic fields.

On August 1, 1996, the Commission adopted the NCRP's recommended Maximum Permissible Exposure limits for field strength and power density for the transmitters operating at frequencies of 300 kHz to 100 GHz. In addition, the Commission adopted the specific absorption rate (SAR) limits for devices operating within close proximity to the body as specified within the ANSI/IEEE C95.1-1992 guidelines. (See Report and Order, FCC 96-326)

The Commission's requirements are detailed in Parts 1 and 2 of the FCC's Rules and Regulations [47 C.F.R. 1.1307(b), 1.1310, 2.1091, 2.1093]. The potential hazards associated with RF electromagnetic fields are discussed in the FCC's RF Safety FAQ.

7. RF Safety Laboratory SAR Measurement System

7.1. SAR Measurement Hardware and Software

Peak spatially averaged SAR (psSAR) measurements are performed using a DASY8 robot system with cDASY8 module SAR software. The DASY8 is made by SPEAG in Switzerland and consists of a 6-axis robot, robot controller, computer, dosimetric probe, probe alignment light beam unit, and various SAR phantoms.

7.2. E-Field Probe

Manufacturer	Schmid & Partner Engineering AG
Model	EX3DV4
Description	Smallest isotropic electric (E-) field probe for high precision specific absorption rate (SAR) measurements
Frequency Range	10 MHz - 10.0 GHz
Dynamic Range	10 µW/g – >100 mW/g
Overall Length (mm)	337
Body Diameter (mm)	12
Tip Length (mm)	337
Tip Diameter (mm)	2.5
Probe Tip to Sensor X Calibration Point (mm)	1
Probe Tip to Sensor Y Calibration Point (mm)	1
Applications	High precision dosimetric measurements in any exposure scenario (e.g. very strong gradient fields); the only probe that enables compliance testing for frequencies up to 6 GHz with precision of better than 30%
Compatibility	DASY8 robot + cDASY8 module SAR software

7.3. Peak Spatially Averaged SAR (psSAR) Measurements

SAR Evaluations are performed using the following procedure compliant to FCC KDB Publication 865664 D01v01r04, IEEE 1528:2013 and IEC/IEEE 62209-1528:

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, IEEE 1528:2013 and IEC/IEEE 62209-1528.

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.
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, IEEE 1528:2013 and IEC/IEEE 62209-1528. 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.
    d. The zoom scan is confirmed to meet both of the following parameters if the result is > 0.1 W/kg. If the result does not meet the below parameters, it is re-measured with a finer resolution scan until the below parameters are met.
        (1) The smallest horizontal distance from the local SAR peaks to all points 3 dB below the SAR peak shall be larger than the horizontal grid steps in both x- and y-directions.
        (2) The ratio of the SAR at the second measured point (M2) to the SAR at the closest measured point (Ml) at the x-y location of the measured maximum SAR value shall be at least 30%
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.

7.4. Head Reference Points

7.4.1. Ear Reference Point

Figure 7 shows the front, back and side views of the SAM Twin Phantom. The point “M” is the reference point for the center of the mouth, “LE” is the left ear reference point (ERP), and “RE” is the right ERP. The ERP is 15mm posterior to the entrance to the ear canal (EEC) along the B-M line (Back-Mouth), as shown in Figure 8. The plane passing through the two ear canals and M is defined as the Reference Plane. The line N-F (Neck-Front), also called the Reference Pivoting Line, is not perpendicular to the reference plane. Line B-M is perpendicular to the N-F line. Both N-F and B-M lines are marked on the external phantom shell to facilitate handset positioning.

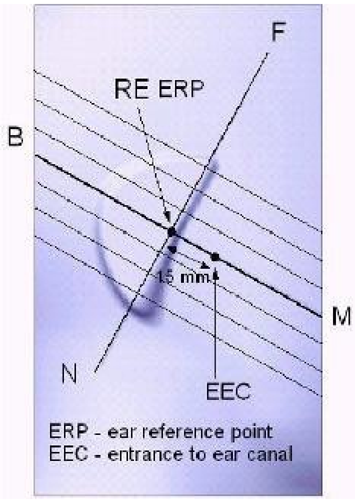


Figure 7 -Side View of ERP

Figure 8 - SAM Twin Phantom

7.4.2. Handset Reference Point

Two imaginary lines on the handset were established: the vertical centerline and the horizontal line. The test device was placed in a normal operating position with the acoustic output located along the “vertical centerline” on the front of the device aligned to the “ear reference point” (See Figure 9). The acoustic output was than located at the same level as the center of the ear reference point. The test device was positioned so that the “vertical centerline” was bisecting the front surface of the handset at its top and bottom edges, positioning the “ear reference point” on the outer surface of the both the left and right head phantoms on the ear reference point.

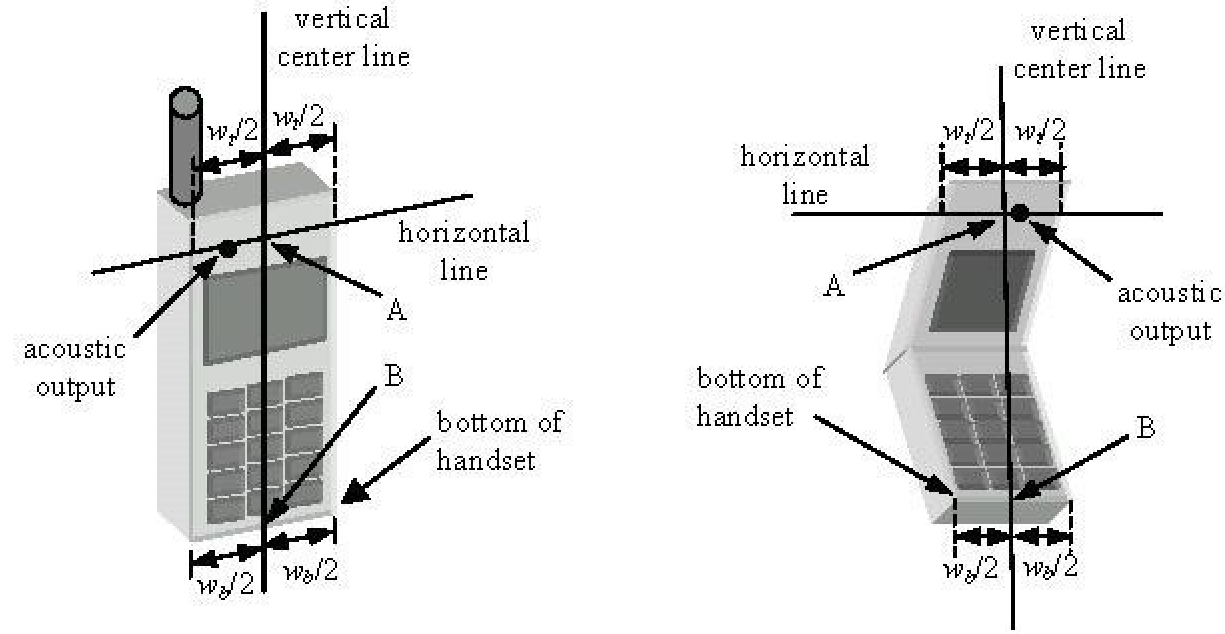


Figure 9 - Handset Reference Points

7.5. Test Positions

7.5.1. 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.

7.5.2. Positioning for Cheek

- The test device was positioned with the device close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom, such that the plane defined by the vertical center line and the horizontal line of the phone is approximately parallel to the sagittal plane of the phantom.
- The handset was translated towards the phantom along the line passing through RE & LE until the handset touches the pinna.
- While maintaining the handset in this plane, the handset was rotated around the LE-RE line until the vertical centerline was in the reference plane.
- The phone was then rotated around the vertical centerline until the phone (horizontal line) was symmetrical was respect to the line NF.
- While maintaining the vertical centerline in the reference plane, keeping point A on the line passing through RE and LE, and maintaining the device contact with the ear, the device was rotated about the NF line until any point on the handset made contact with a phantom point below the ear (cheek).

7.5.3. Positioning for Tilt

With the test device aligned in the "Cheek Position":

- While maintaining the orientation of the phone, the phone was retracted parallel to the reference plane far enough to enable a rotation of the phone by 15degrees.
- The phone was then rotated around the horizontal line by 15 degrees.
- While maintaining the orientation of the phone, the phone was moved parallel to the reference plane until any part of the handset touched the head. (In this position, point A was located on the line RE-LE). The tilted position is obtained when the contact is on the pinna. If the contact was at any location other than the pinna, the angle of the phone would then be reduced. In this situation, the tilted position was obtained when any part of the phone was in contact of the ear as well as a second part of the phone was in contact with the head.

7.5.4. Body-Worn Accessory Configurations

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 6-4). Per FCC KDB Publication 648474 D04v01r03, Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB Publication 447498 D04v01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

Body-worn accessories may not always be supplied or available as options for some devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used. Test position spacing was documented.

Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom in head fluid. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessories, including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

7.5.5. Extremity Exposure Configurations

Devices that are designed or intended for use on extremities or mainly operated in extremity only exposure conditions; i.e., hands, wrists, feet and ankles, may require extremity SAR evaluation. When the device also operates in close proximity to the user's body, SAR compliance for the body is also required. The 1g body and 10g extremity SAR Exclusion Thresholds found in KDB Publication 447498 D04v01 should be applied to determine SAR test requirements.
Per KDB Publication 447498 D04v01, Cell phones (handsets) are not normally designed to be used on extremities or operated in extremity only exposure conditions. The maximum output power levels of handsets generally do not require extremity SAR testing to show compliance. Therefore, extremity SAR was not evaluated for this device.

7.5.6. Wireless Router Configurations

Some battery-operated handsets have the capability to transmit and receive user data through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06v02r01 where SAR test considerations for handsets (L x W ≥ 9 cm x 5 cm) are based on a composite test separation distance of 10 mm from the front, back and edges of the device containing transmitting antennas within 2.5 cm of their edges, determined from general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each frequency transmission and mode separately and spatially summed with the WIFI transmitter according to FCC KDB Publication 447498 D04v01 procedures. The “Portable Hotspot” feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

7.5.7. Extremity Exposure Configurations

Devices that are designed or intended for use on extremities or mainly operated in extremity only exposure conditions; i.e., hands, wrists, feet and ankles, may require extremity SAR evaluation. When the device also operates in close proximity to the user’s body, SAR compliance for the body is also required. The 1g body and 10g extremity SAR Exclusion Thresholds found in KDB Publication 447498 D04v01 should be applied to determine SAR test requirements.

7.6. RF Safety Laboratory SAR System Measurement Uncertainty

SAR Uncertainty for DUTs
According to 62209-1528

Symbol	Input Quantity (Xi) (Source of Uncertainty)	62209-1528 Ref	Unc. (xi)	Prob. Dist. PDFi	Div(qi)	ci (1g)	ci (10g)	Std Unc (1g)	Std. Unc (10g)	vi
Measurement System Errors										
CF	Probe Calibration	8.4.1.1	18.6%	N (k=2)	2	1	1	9.30%	9.3%	∞
CFdrift	Probe Calibration Drift	8.4.1.2	1.7%	R	√3	1	1	1.0%	1.0%	∞
LIN	Probe Linearity and Detection Limit	8.4.1.3	4.7%	R	√3	1	1	2.7%	2.7%	∞
BBS	Broadband Signal	8.4.1.4	2.8%	R	√3	1	1	1.6%	1.6%	∞
ISO	Probe Isotropy	8.4.1.5	7.6%	R	√3	1	1	4.4%	4.4%	∞
DAE	Other probe and data acquisition errors	8.4.1.6	2.4%	N	1	1	1	2.4%	2.4%	∞
AMB	RF Ambient and Noise	8.4.1.7	1.8%	N	1	1	1	1.8%	1.8%	∞
Δxyz	Probe Positioning Errors	8.4.1.8	0.005 mm	N	1	0.5	0.5	0.3%	0.3%	
DAT	Data Processing Errors	8.4.1.9	3.5%	N	1	1	1	3.5%	3.5%	∞
Phantom and Device Errors										
LIQ(σ)	Measurement of Phantom Conductivity	8.4.2.1	2.5%	N	1	0.78	0.71	2.0%	1.8%	∞
LIQ(Tc)	Temperature Effects (Medium)	8.4.2.2	3.4%	R	√3	0.78	0.71	1.5%	1.4%	∞
EPS	Shell Permittivity	8.4.2.3	14.0%	R	√3	0.5	0.5	4.0%	4.0%	∞
DIS	Distance between the radiating element of the DUT and the phantom medium	8.4.2.4	2.0%	N	1	2	2	4.0%	4.0%	∞
Dxyz	Repeatability of Positioning the DUT or source against the phantom	8.4.2.5	1.0%	N	1	1	1	1.0%	1.0%	5
H	Device Holder Effects	8.4.2.6	3.6%	N	1	1	1	3.6%	3.6%	8
MOD	Effect of Operating mode on probe sensitivity	8.4.2.7	2.4%	R	√3	1	1	1.4%	1.4%	∞
RFdrift	Variation in SAR due to Drift in ouptput of DUT	8.4.2.9	2.5%	N	1	1	1	2.5%	2.5%	∞
VAL	Validation Antenna Uncertainty (Validation measurement only)	8.4.2.10	0.0%	N	1	1	1	0.0%	0.0%	∞
Pin	Uncertianty in Accepted Power (Validation Measurement only)	8.4.2.11	0.0%	N	1	1	1	0.0%	0.0%	∞
Correction to the SAR Results										
C(ε′,σ)	Phantom Deviation from Target (ε′,σ)	8.4.3.1	1.9%	N	1	1	0.84	1.9%	1.6%	∞
C(R)	SAR Scaling	8.4.3.2	0.0%	R	√3	1	1	0.0%	0.0%	∞
u(ΔS AR)	Combined Uncertainty							14.2%	14.1%	∞
U	Expanded Uncertainty and Effective Degrees of Freedom (k=2)							28.4%	28.3%	

8. Technology Specific Test Setup Requirements

8.1. Measured and Reported SAR

Per FCC KDB Publication 447498 D04v01, 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.

8.2. 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.

8.3. 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. 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.

8.4. SAR Measurement Conditions for UMTS

8.4.1. 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.

8.4.2. Head SAR Measurements

SAR for next to the ear head exposure is measured using a 12.2 kbps RMC with TPC bits configured to all “1’s”. The 3G SAR test reduction procedure is applied to AMR configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for 12.2 kbps AMR in 3.4 kbps SRB (signaling radio bearer) using the highest reported SAR configuration in 12.2 kbps RMC for head exposure.

8.4.3. 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 DPDCHn 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 DPDCHn, for the highest reported SAR configuration in 12.2 kbps RMC.

8.4.4. 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.

8.4.5. 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.

8.4.6. 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.

8.5. 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. 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).

8.5.1. 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.

8.5.2. MPR and A-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.

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

8.5.3. Required RB Size and RB Offsets for SAR Testing

According to FCC KDB 941225 D05v02r04:

1. Per Section 5.2.1, SAR is required for QPSK 1 RB Allocation for the largest bandwidth
    a. The required channel and offset combination with the highest maximum output power is required for SAR.
    b. 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.
    c. 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.
2. 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.
3. 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.
4. 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.

8.5.4. 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.

8.6. 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.

8.6.1. 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% duty factor to determine compliance at the maximum tune-up tolerance limit.

8.6.2. Initial Test Position Procedure

The test position with the highest extrapolated (peak) SAR is used as the initial test position. When reported SAR for the initial test position is ≤ 0.4 W/kg, no additional testing for the remaining test positions is required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

8.6.3. 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.

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. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

8.6.4. 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 or 802.11g and 802.11n with the same channel bandwidth, modulation and data rate etc., the lower order 802.11 mode i.e., then 802.11n or 802.11g then 802.11n, is used for SAR measurement.

8.6.5. 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 8.6.6). When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

8.6.6. 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. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

9. Equipment List

Manufacturer	Model	Description	Serial Number	Calibration Date	Calibration Due	CBT
Amplifier Research	15S4G8AM1	RF Broadband Amplifier (4 - 8 GHz)	0554497			✓
Amplifier Research	5S1G4	RF Broadband Amplifier (800 MHz - 4.2 GHz)	331258			✓
Anritsu	MA24118A	Microwave USB Power Sensor (10MHz - 18 GHz)	2123431	7/11/2023	7/10/2024	
Anritsu	MA24118A	Microwave USB Power Sensor (10MHz - 18 GHz)	2123500	11/15/2023	11/14/2024	
Anritsu	S820E	Vector Network Analyzer	2348026	11/30/2023	11/30/2024	
Control Company	4040	Ambient Thermometer	230581662	8/28/2023	8/28/2025	
Control Company	4040	Ambient Thermometer	230581657	8/28/2023	8/28/2025	
Control Company	4040	Ambient Thermometer	230581656	8/28/2023	8/28/2025	
Control Company	4352	Long Stem Liquid Thermometer	230662212	9/28/2023	9/28/2025	
Control Company	4352	Long Stem Liquid Thermometer	230662223	9/28/2023	9/28/2025	
Control Company	4352	Long Stem Liquid Thermometer	230662291	9/28/2023	9/28/2025	
Hewlett Packard	8648C	HP Signal Generator	3537A01741	8/16/2021	8/16/2024	
Micro-Coax	UFB205A-0-0240-30x30	SMA M-F RF test Cable (DC - 18 GHz)	-			✓
Mini-Circuits	BW-N20W20+	20dB RF Fixed Attenuator (DC - 18 GHz)	-			✓
Mini-Circuits	BW-N20W20+	20dB RF Fixed Attenuator (DC - 18 GHz)	-			✓
Mini-Circuits	BW-S3W2+	3dB RF Fixed Attenuator (DC - 18 GHz)	-			✓
Mini-Circuits	BW-S3W2+	3dB RF Fixed Attenuator (DC - 18 GHz)	-			✓
Mini-Circuits	CBL-6FT-SMNM+	Precision Test Cable SMA/N (DC - 18 GHz)	3318			✓
Mini-Circuits	CBL-6FT-SMNM+	Precision Test Cable SMA/N (DC - 18 GHz)	3335			✓
Mini-Circuits	CBL-6FT-SMNM+	Precision Test Cable SMA/N (DC - 18 GHz)	3329			✓
Mini-Circuits	NF-SF50+	RF Adapter N Male to SMA Female (DC - 18 GHz)	-			✓
Mini-Circuits	VLF-6000+	Coaxial Low Pass Filter (DC - 6 GHz)	-			✓
Mini-Circuits	VLF-3000+	Coaxial Low Pass Filter (DC - 3 GHz)	-			✓
Mini-Circuits	VLF-1000+	Coaxial Low Pass Filter (DC - 1 GHz)	-			✓
Mitutoyo	CD-4”AX	Digital Caliper	B23243217	9/28/2023	9/28/2025	
Narda	24785-20	20 dB SMA Fixed Attenuator (DC - 4.0 GHz)	-			✓
Narda	4226-20 (26733)	20 dB SMA Directional Coupler (0.5 - 18 GHz)	0201			✓
Rohde & Schwarz	SMCV100B	R&S SMCV100B Vector Signal Generator (VSG)	103882	12/21/2023	12/19/2025	
Rohde & Schwarz	CMW500	CMW500 Radio Communication Test Station	1201.0002K50-167186-cf	1/12/2024	1/12/2025	
SPEAG	D1750V2	1750 MHz System Validation Dipole	1205	10/11/2023	10/11/2024	
SPEAG	D1900V2	1900 MHz System Validation Dipole	5d252	10/6/2023	10/6/2024	
SPEAG	D2450V2	2450 MHz System Validation Dipole	1112	10/9/2023	10/9/2024	
SPEAG	D2600V2	2600 MHz System Validation Dipole	1215	10/12/2023	10/12/2024	
SPEAG	D5GHzV2	5GHz System Validation Dipole	1396	10/10/2023	10/10/2024	
SPEAG	CLA13	Confined Loop Antenna	1041	10/4/2023	10/4/2024	
SPEAG	D750V3	750 MHz System Validation Dipole	1235	10/11/2023	10/11/2024	
SPEAG	D835V2	835 MHz System Validation Dipole	4d311	10/9/2023	10/9/2024	
SPEAG	DAE4ip	Data Acquisition Electronics with Integ. Power	1844	11/2/2023	11/2/2024	
SPEAG	DAE4ip	Data Acquisition Electronics with Integ. Power	1839	10/9/2023	10/9/2024	
SPEAG	DAE4ip	Data Acquisition Electronics with Integ. Power	1843	11/2/2023	11/2/2024	
SPEAG	DAK-12	DAK-12 Dielectric Probe	1194	10/5/2023	10/5/2024	
SPEAG	DAK-3.5	DAK-3.5 Dielectric Probe	1349	10/5/2023	10/5/2024	
SPEAG	EX3DV4	SAR Measurement Probe	7853	11/14/2023	11/14/2024	
SPEAG	EX3DV4	SAR Measurement Probe	7836	10/11/2023	10/11/2024	
SPEAG	EX3DV4	SAR Measurement Probe	7859	12/19/2023	12/19/2024	
SPEAG	EX3DV4	SAR Measurement Probe	7857	12/19/2023	12/19/2024	
SPEAG	Powersource1	Signal Generator	4341	1/5/2024	1/5/2025	
Anritsu	MT8820C	Radio Communication Test Station	6201342024			
Anritsu	MT8820C	Radio Communication Test Station	6201179629			
Anritsu	MT8820C	Radio Communication Test Station	6201342019			
SPEAG	SE UMS 171 E	MAIA Modulation and Interference Analyzer	1814			
SPEAG	SE UMS 171 E	MAIA Modulation and Interference Analyzer	1817			
SPEAG	SE UMS 171 EA	MAIA Modulation and Interference Analyzer	1820			
SPEAG	SE UMS 171 EA	MAIA Modulation and Interference Analyzer	1815			
SPEAG	SE UMS 176 C	ANT Wideband Communication Antenna	1579			
SPEAG	SE UMS 176 C	ANT Wideband Communication Antenna	1601			
SPEAG	SE UMS 176 C	ANT Wideband Communication Antenna	1610			
SPEAG	SE UMS 176 C	ANT Wideband Communication Antenna	1590			

* Components calibrated before testing. Prior to testing, the measurement paths containing a cable, attenuator, coupler or filter were connected to a calibrated source (i.e. a signal generator, power sensor, or VNA) 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.

10. Conclusion

The SAR evaluation indicates that the DUT is capable of compliance with the RF radiation exposure limits of the FCC, 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.