



SAR TEST REPORT

Test Report No. : 10004954H-O-R3

Applicant : Sony Corporation
Type of Equipment : Personal Computer
Model No. : SVD132A1WL
FCC ID : AK8SVD132A1WL
Test regulation : FCC47CFR 2.1093
FCC OET Bulletin 65, Supplement C (Edition 01-01)
Test Result : Complied

Reported SAR(1g) Value

FCC Part 22H(GSM850, WCDMA V)	Body	: 1.385W/kg
FCC Part 24E(PCS1900, WCDMA II)	Body	: 1.313W/kg
FCC Part 27C(LTE IV, LTEXVII)	Body	: 1.331W/kg
FCC Part15.247(WLAN 11b/g/n(2.4GHz band), 11a/n(5.8GHz band)	Body	: 1.010W/kg
FCC Part15.407(WLAN 11a/n(5.2GHz band, 5.3GHz band, 5.6GHz band)	Body	: 0.775W/kg

The highest reported SAR(1g) Value for the device is 1.385 W/kg.

Simultaneous transmission test was excluded. SAR to peak location separation ratio ≤ 0.04 .

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
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5. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.
6. This report is a revised version of 10004954H-O-R2. 10004954H-O-R2 is replaced with this report.

Date of test: March 14 to April 20, 2013

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NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation. *As for the range of Accreditation in NVLAP, you may refer to the WEB address, <http://www.ul.com/japan/jpn/pages/services/emc/about/mark1/index.jsp#nvlap>

REVISION HISTORY

Original Test Report No.: 10004954H-O

Revision	Test report No.	Date	Page revised	Contents
- (Original)	10004954H-O	May 7, 2013	-	-
1	10004954H-O-R1	May 9, 2013	P.37, 353	Correction of useful frequency. 2412-2462MHz → 2422-2452MHz
1	10004954H-O-R1	May 9, 2013	P.37, 353	Correction of SAR value 0.00663W/Kg → 0.00633W/kg 0.042W/Kg → 0.0042W/Kg
1	10004954H-O-R1	May 9, 2013	P.96	Correction of SAR value of WLAN 2.4G Top side 0.042W/Kg → 0.0042W/Kg
1	10004954H-O-R1	May 9, 2013	P.248, 353	Deletion of 2nd Repeat data.
1	10004954H-O-R1	May 9, 2013	P.4, 353	Correction of EUT size. H: 210/ W:330/ D: 24.5mm
2	10004954H-O-R2	May 13, 2013	P.95	Correction of Calculation of Estimated SAR Bottom(Laptop) and Bottom side.
2	10004954H-O-R2	May 13, 2013	P. 96	Correction of Stand alone SAR(1g) [W/kg] of Bottom(Laptop) and Bottom side. (Bluetooth)
3	10004954H-O-R3	May 20, 2013	P. 4, 7	Added the information about NFC module in section 2.2
3	10004954H-O-R3	May 20, 2013	P. 29	Power result of LTE band IV 1.4MHz band width 16QAM 1710.7MHz(Low ch/ 19957ch) had a clerical error. Incorrect: 23.01 dBm This data was changed. Correct: 22.98 dBm Power result of LTE band IV 5MHz band width 16QAM 1712.5MHz(Low ch/ 19975ch) had a clerical error. Incorrect: 23.02 dBm This data was changed. Correct: 22.99 dBm
3	10004954H-O-R3	May 20, 2013	P.20 to P.23	Correction to "Average burst power" from "Average frame power". In Power result sheet of GSM850 and PCS1900
3	10004954H-O-R3	May 20, 2013	P.353 to P.369	Addition of APPENDIX 5: Details about KDB 616217 D04 application of Proximity Sensor. Correction of Angle the sensor sets back to normal. Addition of distance from antenna to phantom in Triggered full power(P.363). Addition of Hotspot position (P.356 to P.358).
3	10004954H-O-R3	May 20, 2013	P.96	Addition of following note: *4 Since result of $\sum SAR_{1g}$ of Body exceeded 1.6 W/kg, the method of SAR to Peak Location Separation Ratio was applied. Refer to clause 10.2. (In Section 10.2 Result of $\sum SAR_{1g}$ of Body sheet)
3	10004954H-O-R3	May 20, 2013	P.342	Addition of NFC antenna position in the figure of antenna location. Addition of following note in Appendix 4 clause 2 Position of antenna: *The module and antenna of NFC is installed in this EUT. The SAR test of this test report was measured using the sample with NFC module and antenna.

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SECTION 1: Customer information

Company Name : Sony Corporation.
Address : 1-7-1 Konan, Minato-ku, Tokyo, 399-8282 Japan
Telephone Number : +81-3-6748-2569
Facsimile Number : +81-3-6748-2574
Contact Person : Hirofumi Kojima

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment : Personal Computer
Model No. : SVD132A1WL
Serial No. : XTS2-1 7, XTS2-1 8
Rating : INPUT: 100-240V, 1.2A, 50/60Hz
OUTPUT: DC 10.5V, 3.8A, 39.9W
DC 5V, 1A, 5W
Li-ion Battery (Model No.: VGP-BPS36)
DC7.5V/ 6320mAh 48Wh

Option Battery : N/A
Body-worn accessory : N/A
Device category : Portable
Antenna to antenna separation distance : The shortest distance of WWAN antenna to WLAN Ant.0 is 20 cm or more.
The shortest distance of WWAN antenna to WLAN Ant.1 is less than 20 cm.
The shortest distance of WLAN Ant.1 antenna to Bluetooth antenna(WLAN Ant.0 shared) is 20 cm or more.

Simultaneous transmission : WWAN can transmit simultaneously with WLAN.
WLAN 5GHz(WLAN Ant.1) can transmit simultaneously with Bluetooth(WLAN Ant.0 shared).
WLAN 5GHz(WLAN Ant.0) can transmit simultaneously with Bluetooth(WLAN Ant.0 shared).
WLAN 2.4GHz(WLAN Ant.1) can't transmit simultaneously with Bluetooth(WLAN Ant.0 shared).

Size of EUT : H:210 mm * W:330 mm * D:24.5 mm
Receipt Date of Sample : February 27, 2013
Country of Mass-production : Japan
Condition of EUT : Engineering prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT : No Modification by the test lab

2.2 Product description

General Specification

Feature of EUT	This model is co-located with Wireless LAN and Bluetooth module(IEEE802.11 a/b/g/n, Bluetooth) and Wireless-WAN module(GSM850/PCS/UMTS/LTE) and NFC module. Each antenna is included in the Personal computer. This model can co-operate Wireless LAN(5GHz band) + Bluetooth + Wireless WAN + NFC.
Operation Clock	CPU: 1.0GHz

Radio Specification

Bluetooth (BDR/EDR)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	FHSS
Bandwidth & Channel spacing	1MHz & 1MHz
Antenna Type	PIFA
Antenna Gain	-0.56 dBi (peak) (Including Cable Loss)

Bluetooth (Low Energy)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	GFSK
Bandwidth & Channel spacing	1MHz & 2MHz
Antenna Type	PIFA
Antenna Gain	-0.56 dBi (peak) (Including Cable Loss)

WLAN (IEEE802.11a/b/g/n-20)

Equipment Type	Transceiver	
Frequency of Operation	2412-2462MHz	5180-5320MHz 5500-5700MHz * 5745-5825MHz
Type of Modulation	DSSS, OFDM	OFDM
Bandwidth & Channel spacing	20MHz & 5MHz	20MHz & 20MHz
Antenna Type	PIFA	
Antenna Gain	Ant 0: -0.56dBi (peak) Ant 1: -4.07dBi (peak) (Including Cable Loss)	Ant 0: 5150-5350MHz -0.46dBi (peak) 5470-5725MHz -1.25dBi (peak) 5825-5850MHz -2.63dBi (peak) Ant 1: 5150-5350MHz +1.32dBi (peak) 5470-5725MHz +1.20dBi (peak) 5825-5850MHz -2.73dBi (peak) (Including Cable Loss)

*5600MHz-5640MHz is not used in Canada.

WLAN (IEEE802.11n-40)

Equipment Type	Transceiver	
Frequency of Operation	2422-2452MHz	5190-5310MHz 5510-5670MHz * 5755-5795MHz
Type of Modulation	OFDM	OFDM
Bandwidth & Channel spacing	40MHz & 5MHz	40MHz & 40MHz
Antenna Type	PIFA	
Antenna Gain	Ant 0: -0.56dBi (peak) Ant 1: -4.07dBi (peak) (Including Cable Loss)	Ant 0: 5150-5350MHz -0.46dBi (peak) 5470-5725MHz -1.25dBi (peak) 5825-5850MHz -2.63dBi (peak) Ant 1: 5150-5350MHz +1.32dBi (peak) 5470-5725MHz +1.20dBi (peak) 5825-5850MHz -2.73dBi (peak) (Including Cable Loss)

*5590MHz-5630MHz is not used in Canada.

GSM

Equipment Type	Transceiver
Frequency of Operation	[Up Link] GSM850: 824 – 849MHz PCS: 1850 – 1910MHz [Down Link] GSM850: 869 – 894MHz PCS: 1930 – 1990MHz
Type of Modulation	GMSK , 8PSK
Emission Designator	GSM850: 249KGXW, 248KG7W PCS: 247KGXW, 247KG7W
Antenna Type	PIFA
Antenna Gain	GSM850: 824-849MHz: +0.64dBi (peak) PCS: 1850-1910MHz: +1.21dBi (peak) (Including Cable Loss)

W-CDMA

Equipment Type	Transceiver
Frequency of Operation	[Up Link] Band V: 824 – 849MHz Band II: 1850 – 1910MHz [Down Link] Band V: 869 – 894MHz Band II: 1930 – 1990MHz
Type of Modulation	QPSK
Emission Designator	Band V: 4M17F9W Band II: 4M16F9W
Antenna Type	PIFA
Antenna Gain	Band V: 824-849MHz: +0.64dBi (peak) Band II: 1850-1910MHz: +1.21dBi (peak) (Including Cable Loss)

LTE

Equipment Type	Transceiver
Frequency of Operation	[Up Link] Band IV: 1710 – 1755MHz Band X VII: 704 – 716MHz [Down Link] Band IV: 2110 – 2155MHz Band X VII: 734 – 746MHz
Type of Modulation	QPSK, 16QAM
Emission Designator	Band IV: 1M11G7D, 1M09W7D, 2M71G7D, 2M70W7D, 4M50G7D, 4M50W7D, 8M97G7D, 8M98W7D, 13M43G7D, 13M45W7D, 17M95G7D, 17M95W7D Band X VII: 4M51G7D, 4M52W7D, 8M96G7D, 8M97W7D
Antenna Type	PIFA
Antenna Gain	Band IV: 1710-1755MHz: +1.21dBi (peak) Band X VII: 704-716MHz: -1.35dBi (peak) (Including Cable Loss)

NFC (FCC ID: NKR-DFCN67H)

Equipment Type	Transceiver
Frequency of Operation	13.56MHz
Type of Modulation	ASK

*This test report applies for WLAN (IEEE802.11a/11b/11g/11n-20/11n-40[2412-2462MHz, 5745-5825MHz]) and Bluetooth (Low Energy).

*NFC module was operated by polling mode during the testing.

SECTION 3 : Test standard information

3.1 Test Specification

Title : **Supplement C (Edition 01-01) to OET Bulletin 65 (Edition 97-01):**

Supplement C (Edition 01-01) - Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions
OET Bulletin 65 (Edition 97-01) - Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields

: **IEEE Std 1528-2003:**

IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques Supplement C

In additions;

- KDB450824D01(v01r01)** SAR Prob Cal and Ver Meas
- KDB450824D02(v01r01)** Dipole SAR Validation Verification
- KDB447498D01(v05)** Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies
- KDB447498D02(v02)** SAR Measurement Procedures for USB Dongle Transmitters
- KDB648474D04(v01)** SAR Evaluation Considerations for Wireless Handsets
- KDB941225D01(v02)** SAR Measurement Procedures for 3G Devices
- KDB941225D02(v02v01)** 3GPP R6 HSPA and R7 HSPA+ SAR Guidance
- KDB941225D03(v01)** Recommended SAR Test Reduction Procedures for GSM/GPRS/EDGE
- KDB941225D04(v01)** Evaluating SAR for GSM/(E)GPRS Dual Transfer Mode
- KDB941225D05(v02)** SAR for LTE Devices
- KDB941225D06(v01)** SAR test procedures for devices incorporating SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities (Hot Spot SAR)
- KDB941225D07(v01)** SAR Evaluation Procedures for UMPC Mini-Tablet Devices
- KDB 616217D04(v01)** SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers
- KDB865664D01(v01)** SAR Measurement Requirements for 100MHz to 6 GHz
- KDB248227D01(v01r02)** SAR Measurement Procedures for 802.11a//b/g Transmitters

Reference

- [1]ANSI, ANSI/IEEE C95.1-1992: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz, The Institute of Electrical and Electronics Engineers, Inc., New York, NY 10017, 1992.
- [2]SPEAG uncertainty document (AN 15-7/AN19-17) for DASY 5 System from SPEAG (Shimid & Partner Engineering AG).

3.2 Procedure

Transmitter	WWAN	WLAN	Bluetooth
Test Procedure	FCC OET BULLETIN 65, SUPPLEMENT C	FCC OET BULLETIN 65, SUPPLEMENT C	Exemption*
	SAR	SAR	
Category	FCC47CFR 2.1093	FCC47CFR 2.1093	FCC47CFR 2.1093

Note: UL Japan, Inc. 's SAR Work Procedures 13-EM-W0429 and 13-EM-W0430

* Since SAR exclusion threshold conditions are corresponded by KDB 447498 D01, an SAR test is not required.
Refer to Section 6.

3.3 Exposure limit

(A) Limits for Occupational/Controlled Exposure (W/kg)

Spatial Average (averaged over the whole body)	Spatial Peak (averaged over any 1g of tissue)	Spatial Peak (hands/wrists/feet/ankles averaged over 10g)
0.4	8.0	20.0

(B) Limits for General population/Uncontrolled Exposure (W/kg)

Spatial Average (averaged over the whole body)	Spatial Peak (averaged over any 1g of tissue)	Spatial Peak (hands/wrists/feet/ankles averaged over 10g)
0.08	1.6	4.0

Occupational/Controlled Environments: are defined as locations where there is exposure that may be incurred by people who are aware of the potential for exposure, (i.e. as a result of employment or occupation).

General Population/Uncontrolled Environments: are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

**NOTE:GENERAL POPULATION/UNCONTROLLED EXPOSURE
SPATIAL PEAK(averaged over any 1g of tissue) LIMIT
1.6 W/kg**

3.4 Test Location

*Shielded room for SAR testings
UL Japan, Inc. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999 Facsimile : +81 596 24 8124

SECTION 4 : Test result

4.1 Stand-alone SAR result

Stand-alone SAR Procedure

No.	Capable Tx configurations		Head SAR	Body-worn SAR	Body SAR	Product specific (Hotspot)	Note
1	WWAN	GSM850 MHz	-	-	Yes	-	-
2		PCS1900 MHz	-	-	Yes	-	-
3		WCDMA band V	-	-	Yes	-	-
4		LTE band IV, band XVII	-	-	Yes	-	-
5	WLAN	WLAN 2.4GHz band	-	-	Yes	-	-
6		WLAN 5GHz band	-	-	Yes	-	-
7	Bluetooth	Bluetooth BDR/EDR/LE	Exemption*1				

Reported SAR

Measured SAR is scaled to the maximum tune-up tolerance limit by the following formulas.

Reported SAR = Maximum tune-up tolerance limit [mW] / Measured maximum power [mW] · Measured SAR [W/kg]

1g Body SAR

Mode	Measured maximum power [mW]*2	Maximum tune-up tolerance limit [mW]	Measured SAR [W/kg]	Reported SAR [W/kg]
GSM850	380.19	411.15	0.949	1.026
PCS1900	109.4	166.34	0.774	1.177
WCDMA band V	205.59	281.84	1.010	1.385
WCDMA band II	208.93	281.84	0.973	1.313
LTE band IV	125.03	158.49	1.050	1.331
LTE band XVII	208.45	251.19	0.468	0.564
WLAN 2.4GHz band	68.23	-*3	0.187	0.187
WLAN 5.2GHz band	43.35	-*3	0.258	0.258
WLAN 5.3GHz band	92.26	-*3	0.463	0.463
WLAN 5.6GHz band	128.23	-*3	0.775	0.775
WLAN 5.8GHz band	138.36	-*3	1.010	1.010
Bluetooth	-*1			

Note

*1 Since SAR exclusion threshold conditions are corresponded by KDB 447498 D01, and SAR test is not required.

Refer to Section 6

*2 The sample used by the SAR test is within the tune-up tolerance but not more than 2 dB lower than the maximum tune-up tolerance limit. That is, measured maximum power is included the tune-up tolerance range.

*3 Measured maximum output power is the maximum tune-up tolerance limit. Therefore, compensation calculation was not done.

4.2 Simultaneous transmission SAR result

<Simultaneous Procedure>

This EUT has the unlicensed transmitter such as WLAN (802.11a/b/g/n) & Bluetooth devices besides licensed transmitter WWAN (GSM/WCDMA/LTE), and the following simultaneous transmission is possible.

No.	Capable Tx configurations	Head SAR	Body SAR	Note
8	WWAN+WLAN ant.1	-	Yes	
9	WWAN+Bluetooth	-	Yes (Exemption*)	
10	WLAN ant.0+Bluetooth	-	Yes	
11	WLAN ant.1+Bluetooth	-	Yes (Exemption*)	

*It is separated 20 cm or more between antennas.

Simultaneous transmission SAR

<WWAN + WLAN ant.1 >

Simultaneous transmitter evaluation based on the KDB447498D01 Refer to the clause 4.3.2..

Step1	Standalone SAR test exclusion considerations. Refer to Section 6.
Step2	Measured Stand-alone SAR for WWAN.
Step3	Measured Stand-alone SAR for WLAN ant.0.
Step4	Simultaneous transmission is possible (WWAN+ WLAN ant.1) Simultaneous transmission SAR test exclusion considerations
Step5	$1.6\text{W/kg} < \sum 1\text{g SAR (WWAN + WLAN)}$ Body: 1.64 W/kg Refer to Section 10.
Step6	$\text{SAR to peak location separation ratio} \leq 0.04$ $(\sum 1\text{g SAR(WWAN + WLAN)})^{1.5} [\text{W/kg}] / \text{peak location separation} [\text{mm}]$ $= 1.64 [\text{W/kg}] / 144.6 [\text{mm}] = 0.01$ Refer to Section 10.
Step7	SAR test for simultaneous transmission is not measured.

<WLAN + Bluetooth >

Simultaneous transmitter evaluation based on the KDB447498D01 Refer to the clause 4.3.2..

Step1	Standalone SAR test exclusion considerations. Refer to Section 6.
Step2	Measured Stand-alone SAR for WLAN ant.0.
Step3	No measured Stand-alone SAR for Bluetooth.
Step4	Simultaneous transmission is possible (WLAN ant.0+ Bluetooth) Simultaneous transmission SAR test exclusion considerations.
Step5	Estimated SAR for Bluetooth is calculated.
Step6	$1.6\text{W/kg} > \sum 1\text{g SAR (WWAN + Bluetooth)}$ Body: 0.814 W/kg Refer to Section 10
Step6	No simultaneous transmission.

SECTION 5 : Description of the operating mode

This EUT has proximity Sensor function.

We confirmed Proximity Sensor function for this product as per section 6, [Proximity Sensor Considerations] of KDB616217 D04 SAR for laptop and tablets v01.

It can be confirmed that the power reduction is implemented using a single fixed level of reduction through static table look-up for all configurations in a single wireless operating mode of a frequency band and it is triggered by a single event or operation so that attenuation sensor is found to function to the top side direction. Please refer to Appendix 5.

5.1 Output power operating modes

WWAN(GSM/WCDMA)

Band	Duty cycle or Multi class(GSM)	Test Frequency	Mode
GSM850	Multi class 8	824.2MHz (128ch) 836.6MHz(190ch) 848.8MHz(251ch)	GSM GPRS (CS-1)
PCS1900	Multi class 8	1850.2MHz(512ch) 1880.0MHz(661ch) 1909.8MHz(810ch)	
WCDMA V	100%	826.4MHz (4132ch) 836.6MHz(4183ch) 846.6MHz(4233ch)	AMR 12.2k RMC HSDPA HSUPA
WCDMA II	100%	1852.4MHz(9262ch) 1880.0MHz(9400ch) 1907.6MHz(9538ch)	
Setting			
The communication link was set up with the Wireless Communications Test Set(Agilent M/N: E5515C). The EUT was command to operate at maximum transmit power. GSM850 :PCL 5 PCS1900 :PCL 0 W-CDMA :All up bits			

WWAN(LTE)

LTE Band	Duty cycle	Test Frequency		Mode
		Bandwidth	Frequency (channel)	
Band 4 (1710.7MHz-1754.3MHz)	100%	1.4MHz	1710.7MHz(19957ch) 1732.5MHz(20175ch) 1754.3MHz (20393ch)	QPSK 16QAM
		3MHz	1711.5MHz(19965ch) 1732.5MHz(20175ch) 1753.5MHz(20385ch)	
		5MHz	1712.5MHz(19975ch) 1732.5MHz(20175ch) 1752.5MHz(20375ch)	
		10MHz	1715.0MHz(20000ch) 1732.5MHz(20175ch) 1750.0MHz(20350ch)	
		15MHz	1717.5MHz(20025ch) 1732.5MHz(20175ch) 1747.5MHz(20325ch)	
		20MHz	1720.0MHz(20050ch) 1732.5MHz(20175ch) 1745.0MHz(20300ch)	
Bnad 17 (706.5MHz-713.5MHz)	100%	5MHz	706.5MHz(23755ch) 710.0MHz(23790ch) 713.5MHz(23825ch)	QPSK 16QAM
		10MHz	709.0MHz(23780ch) 710.0MHz(23790ch) 711MHz(23800ch)	
Setting				
<p>The communication link was set up with the Wireless Communications Test Set (Rohde & Schwarz M/N: CMW500). The EUT was command to operate at maximum transmit power. LTE : All up bits</p>				

WLAN

Mode	Duty cycle	Frequency Band	Test Frequency	Modulation
IEEE802.11b	100%	2412-2462MHz	2412MHz (1ch) 2437MHz(6ch) 2462MHz(11ch)	DSSS (DBPSK.DQPSK.CCK)
IEEE802.11g	100%	2412-2462MHz	2412MHz (1ch) 2437MHz(6ch) 2462MHz(11ch)	OFDM (BPSK.QPSK.16QAM,64QAM)
IEEE802.11n20 (2.4G)	100%	2412-2462MHz	2412MHz (1ch) 2437MHz(6ch) 2462MHz(11ch)	
IEEE802.11n40 (2.4G)	100%	2412-2462MHz	2422MHz (3ch) 2437MHz(6ch) 2462MHz(11ch)	
IEEE802.11a	100%	5180-5240MHz	All channel	
	100%	5260-5320MHz	All channel	
	100%	5500-5700MHz	All channel	
	100%	5745-5825MHz	All channel	
IEEE802.11n20 (5G)	100%	5180-5240MHz	All channel	
	100%	5260-5320MHz	All channel	
	100%	5500-5700MHz	All channel	
	100%	5745-5825MHz	All channel	
IEEE802.11n40 (5G)	100%	5190-5230MHz	All channel	
	100%	5270-5310MHz	All channel	
	100%	5510-5670MHz	All channel	
	100%	5755-5795MHz	All channel	

Setting

WLAN

*Power of the EUT was set by the software as follows;
Software: 43241_B4_mfg_tool_package, Version 1.3
Power settings: See below tables

*This setting of software is the worst case.

Any conditions under the normal use do not exceed the condition of setting.
In addition, end users cannot change the settings of the output power of the product.

*This setting of software is the worst case.

Any conditions under the normal use do not exceed the condition of setting.
In addition, end users cannot change the settings of the output power of the product.

WLAN power settings

11b, 1Mbps

Ch	Freq.	Power set
		Ant 0
1	2412	54
6	2437	60
11	2462	50

11g, 6Mbps

Ch	Freq.	Power set
		Ant 0
1	2412	36
6	2437	81
11	2462	21

11n20(MISO), MCS0

Ch	Freq.	Power set
		Ant 0
1	2412	35
6	2437	87
11	2462	20

11n40(MISO), MCS0

Ch	Freq.	Power set
		Ant 0
3	2422	20
6	2437	32
9	2452	20

11n20(MIMO), MCS8

Ch	Freq.	Power set
		Ant 0 & 1
1	2412	18
6	2437	49
11	2462	20

11n40(MIMO), MCS8

Ch	Freq.	Power set
		Ant 0 & 1
3	2422	12
6	2437	27
9	2452	10

11a 6Mbps

	Ch	Freq.	Power set	
			Ant 0	
W52/53	36	5180	24	
	40	5200	24	
	44	5220	28	
	48	5240	29	
	52	5260	100	
	56	5280	100	
	60	5300	109	
	64	5320	63	
W56	100	5500	39	
	104	5520	103	
	108	5540	103	
	112	5560	103	
	116	5580	103	
	120	5600	103	
	124	5620	115	
	128	5640	110	
	132	5660	103	
	136	5680	100	
W58	140	5700	52	
	149	5745	97	
	153	5765	102	
	157	5785	99	
	161	5805	109	
	165	5825	99	

11n20(MISO), MCS0

	Ch	Freq.	Power set
			Ant 0
W52/53	36	5180	27
	40	5200	27
	44	5220	29
	48	5240	27
	52	5260	95
	56	5280	95
	60	5300	102
	64	5320	63
W56	100	5500	41
	104	5520	100
	108	5540	102
	112	5560	104
	116	5580	104
	120	5600	110
	124	5620	110
	128	5640	110
	132	5660	95
	136	5680	100
140	5700	52	
W58	149	5745	92
	153	5765	93
	157	5785	93
	161	5805	107
	165	5825	98

11n40(MISO), MCS0

	Ch	Freq.	Power set
			Ant 0
W52/53	38	5190	26
	46	5230	54
	54	5270	82
	62	5310	30
W56	102	5510	20
	110	5550	44
	118	5590	54
	126	5630	54
	134	5670	46
W58	151	5755	100
	159	5795	98

11n20(MIMO), MCS8

	Ch	Freq.	Power set
			Ant 0 & 1
W52/53	36	5180	14
	40	5200	14
	44	5220	15
	48	5240	15
	52	5260	57
	56	5280	54
	60	5300	48
	64	5320	30
W56	100	5500	28
	104	5520	82
	108	5540	81
	112	5560	85
	116	5580	86
	120	5600	86
	124	5620	86
	128	5640	86
	132	5660	53
	136	5680	79
140	5700	21	
W58	149	5745	82
	153	5765	88
	157	5785	91
	161	5805	91
	165	5825	86

11n40(MIMO), MCS8

	Ch	Freq.	Power set
			Ant 0 & 1
W52/53	38	5190	18
	46	5230	21
	54	5270	48
	62	5310	20
W56	102	5510	16
	110	5550	38
	118	5590	40
	126	5630	43
	134	5670	25
W58	151	5755	73
	159	5795	73

5.2 Confirmation before SAR testing (Output power measurement results)

Output power measurement for GSM

[GSM]

*Connection Type : AUTO
*Power control level : 5(GSM850), 0(PCS1900)

[GPRS]

*Connection Type : Type B
*Power control level : 5(GSM850), 0(PCS1900)
*Coding Scheme : CS-1

[EGPRS]

*Connection Type > Type B
*Power control level > 5(GSM850),0(PCS1900)
*Coding Scheme > MCS-1 & MCS-5

1) GSM850 (Normal mode)

GSM850 SAR Power (Normal)												
Mode	Crest Factor (typical)	Ch	Frequency [MHz]	Time-based average power				Average burst power				
				Reading [dBm] Time-AVG	Atten. [dB]	Cable Loss [dB]	Result [dBm] Time-AVG	Reading [dBm] slotted AVG	Cable Loss [dB]	Result [dBm] Slotted AVG		
GPRS (CS1)	1slot	8.3	128	824.2	5.55	16.14	0.96	22.65	25.03	7.66	32.69	
			190	836.6	5.72	16.14	0.97	22.83	25.00	7.67	32.67	
			251	848.8	5.91	16.14	0.98	23.03	24.99	7.68	32.67	
	2slots	4.2	128	824.2	7.93	16.14	0.96	25.03	24.45	7.66	32.11	
			190	836.6	8.50	16.14	0.97	25.61	24.76	7.67	32.43	
			251	848.8	8.68	16.14	0.98	25.80	24.78	7.68	32.46	
EGPRS (MCS1)	1slot	8.3	128	824.2	5.51	16.14	0.96	22.61	25.01	7.66	32.67	
			190	836.6	5.65	16.14	0.97	22.76	24.96	7.67	32.63	
			251	848.8	5.94	16.14	0.98	23.06	24.99	7.68	32.67	
	2slots	4.2	128	824.2	7.88	16.14	0.96	24.98	24.45	7.66	32.11	
			190	836.6	8.38	16.14	0.97	25.49	24.75	7.67	32.42	
			251	848.8	8.70	16.14	0.98	25.82	24.77	7.68	32.45	
	3slots	2.8	128	824.2	7.61	16.14	0.96	24.71	22.75	7.66	30.41	
			190	836.6	7.81	16.14	0.97	24.92	22.60	7.67	30.27	
			251	848.8	7.94	16.14	0.98	25.06	22.58	7.68	30.26	
	4slots	2.1	128	824.2	6.81	16.14	0.96	23.91	20.67	7.66	28.33	
			190	836.6	6.82	16.14	0.97	23.93	20.47	7.67	28.14	
			251	848.8	7.28	16.14	0.98	24.40	20.78	7.68	28.46	
	EGPRS (MCS5)	1slot	8.3	128	824.2	-0.09	16.14	0.96	17.01	19.06	7.66	26.72
				190	836.6	-0.05	16.14	0.97	17.06	18.85	7.67	26.52
				251	848.8	0.16	16.14	0.98	17.28	18.98	7.68	26.66
2slots		4.2	128	824.2	2.66	16.14	0.96	19.76	18.98	7.66	26.64	
			190	836.6	2.71	16.14	0.97	19.82	18.82	7.67	26.49	
			251	848.8	2.99	16.14	0.98	20.11	18.90	7.68	26.58	
3slots		2.8	128	824.2	4.07	16.14	0.96	21.17	18.61	7.66	26.27	
			190	836.6	4.03	16.14	0.97	21.14	18.46	7.67	26.13	
			251	848.8	4.34	16.14	0.98	21.46	18.50	7.68	26.18	
4slots		2.1	128	824.2	5.10	16.14	0.96	22.20	18.53	7.66	26.19	
			190	836.6	5.17	16.14	0.97	22.28	18.33	7.67	26.00	
			251	848.8	5.41	16.14	0.98	22.53	18.44	7.68	26.12	

Time based AVG Results = P/M Reading + Atten.Loss + Cable Loss

Slotted AVG Results = Agilent Reading + Cable Loss

Maximum time based AVG power mode

SAR test mode

2) GSM850 (Power reduction mode)

GSM850 SAR Power (Power reduction)												
Mode	Crest Factor (typical)	Ch	Frequency [MHz]	Time-based average power				Average burst power				
				Reading [dBm] Time-AVG	Atten. [dB]	Cable Loss [dB]	Result [dBm] Time-AVG	Reading [dBm] slotted AVG	Cable Loss [dB]	Result [dBm] Slotted AVG		
GPRS (CS1)	1slot	8.3	128	824.2	3.03	16.14	0.96	20.13	22.75	7.12	29.87	
			190	836.6	3.03	16.14	0.97	20.14	22.69	7.13	29.82	
			251	848.8	3.16	16.14	0.98	20.28	22.75	7.14	29.89	
	2slots	4.2	128	824.2	3.00	16.14	0.96	20.10	19.78	7.12	26.90	
			190	836.6	3.04	16.14	0.97	20.15	19.87	7.13	27.00	
			251	848.8	3.11	16.14	0.98	20.23	19.93	7.14	27.07	
EGPRS (MCS1)	1slot	8.3	128	824.2	2.97	16.14	0.96	20.07	22.67	7.12	29.79	
			190	836.6	3.05	16.14	0.97	20.16	22.64	7.13	29.77	
			251	848.8	3.10	16.14	0.98	20.22	22.67	7.14	29.81	
	2slots	4.2	128	824.2	2.99	16.14	0.96	20.09	19.79	7.12	26.91	
			190	836.6	3.05	16.14	0.97	20.16	19.87	7.13	27.00	
			251	848.8	3.04	16.14	0.98	20.16	19.87	7.14	27.01	
	3slots	2.8	128	824.2	2.62	16.14	0.96	19.72	17.76	7.12	24.88	
			190	836.6	2.45	16.14	0.97	19.56	17.69	7.13	24.82	
			251	848.8	2.65	16.14	0.98	19.77	17.84	7.14	24.98	
	4slots	2.1	128	824.2	2.67	16.14	0.96	19.77	16.70	7.12	23.82	
			190	836.6	2.56	16.14	0.97	19.67	16.53	7.13	23.66	
			251	848.8	2.80	16.14	0.98	19.92	16.69	7.14	23.83	
EGPRS (MCS5)	1slot	8.3	128	824.2	-0.29	16.14	0.96	16.81	19.26	7.12	26.38	
			190	836.6	-0.35	16.14	0.97	16.76	19.14	7.13	26.27	
			251	848.8	-0.30	16.14	0.98	16.82	19.23	7.14	26.37	
	2slots	4.2	128	824.2	2.64	16.14	0.96	19.74	19.21	7.12	26.33	
			190	836.6	2.49	16.14	0.97	19.60	19.05	7.13	26.18	
			251	848.8	2.53	16.14	0.98	19.65	19.10	7.14	26.24	
	3slots	2.8	128	824.2	2.82	16.14	0.96	19.92	17.68	7.12	24.80	
			190	836.6	2.68	16.14	0.97	19.79	17.47	7.13	24.60	
			251	848.8	2.74	16.14	0.98	19.86	17.55	7.14	24.69	
	4slots	2.1	128	824.2	2.94	16.14	0.96	20.04	16.60	7.12	23.72	
			190	836.6	2.84	16.14	0.97	19.95	16.41	7.13	23.54	
			251	848.8	2.89	16.14	0.98	20.01	16.47	7.14	23.61	

Time based AVG Results = P/M Reading + Atten.Loss + Cable Loss

Slotted AVG Results = Agilent Reading + Cable Loss

Maximum time based AVG power mode

SAR test mode

3) PCS1900 (Normal mode)

PCS1900 SAR Power (Normal)												
Mode	Crest Factor (typical)	Ch	Frequency [MHz]	Time-based average power				Average burst power				
				Reading [dBm] Time-AVG	Atten. [dB]	Cable Loss [dB]	Result [dBm] Time-AVG	Reading [dBm] slotted AVG	Cable Loss [dB]	Result [dBm] Slotted AVG		
GPRS (CS1)	1slot	8.3	512	1850.2	2.56	9.96	7.73	20.25	22.04	7.71	29.75	
			661	1880.0	2.55	9.96	7.78	20.29	22.06	7.76	29.82	
			810	1909.8	2.28	9.97	7.76	20.01	21.79	7.74	29.53	
	2slots	4.2	512	1850.2	5.33	9.96	7.73	23.02	21.96	7.71	29.67	
			661	1880.0	5.31	9.96	7.78	23.05	21.95	7.76	29.71	
			810	1909.8	5.05	9.97	7.76	22.78	21.72	7.74	29.46	
EGPRS (MCS1)	1slot	8.3	512	1850.2	2.60	9.96	7.73	20.29	22.07	7.71	29.78	
			661	1880.0	2.50	9.96	7.78	20.24	22.04	7.76	29.80	
			810	1909.8	2.28	9.97	7.76	20.01	21.77	7.74	29.51	
	2slots	4.2	512	1850.2	5.33	9.96	7.73	23.02	21.94	7.71	29.65	
			661	1880.0	5.28	9.96	7.78	23.02	21.97	7.76	29.73	
			810	1909.8	5.06	9.97	7.76	22.79	21.70	7.74	29.44	
	3slots	2.8	512	1850.2	4.89	9.96	7.73	22.58	19.86	7.71	27.57	
			661	1880.0	5.00	9.96	7.78	22.74	20.01	7.76	27.77	
			810	1909.8	4.86	9.97	7.76	22.59	19.86	7.74	27.60	
	4slots	2.1	512	1850.2	4.14	9.96	7.73	21.83	17.94	7.71	25.65	
			661	1880.0	4.17	9.96	7.78	21.91	18.11	7.76	25.87	
			810	1909.8	4.17	9.97	7.76	21.90	18.06	7.74	25.80	
	EGPRS (MCS5)	1slot	8.3	512	1850.2	-1.54	9.96	7.73	16.15	17.66	7.71	25.37
				661	1880.0	-1.63	9.96	7.78	16.11	17.71	7.76	25.47
				810	1909.8	-1.70	9.97	7.76	16.03	17.65	7.74	25.39
2slots		4.2	512	1850.2	1.33	9.96	7.73	19.02	17.66	7.71	25.37	
			661	1880.0	1.20	9.96	7.78	18.94	17.58	7.76	25.34	
			810	1909.8	1.21	9.97	7.76	18.94	17.55	7.74	25.29	
3slots		2.8	512	1850.2	2.70	9.96	7.73	20.39	17.42	7.71	25.13	
			661	1880.0	2.66	9.96	7.78	20.40	17.42	7.76	25.18	
			810	1909.8	2.64	9.97	7.76	20.37	17.31	7.74	25.05	
4slots		2.1	512	1850.2	3.84	9.96	7.73	21.53	17.31	7.71	25.02	
			661	1880.0	3.80	9.96	7.78	21.54	17.41	7.76	25.17	
			810	1909.8	3.82	9.97	7.76	21.55	17.26	7.74	25.00	

Time based AVG Results = P/M Reading + Atten.Loss + Cable Loss

Slotted AVG Results = Agilent Reading + Cable Loss

Maximum time based AVG power mode

SAR test mode

4) PCS1900 (Power reduction mode)

PCS1900 SAR Power (Power reduction)												
Mode	Crest Factor (typical)	Ch	Frequency [MHz]	Time-based average power				Average burst power				
				P/M Reading [dBm] Time-AVG	Atten. [dB]	Cable Loss [dB]	Result [dBm] Time-AVG	Agilent Reading [dBm] slotted AVG	Cable Loss [dB]	Result [dBm] Slotted AVG		
GPRS (CS1)	1slot	8.3	512	1850.2	2.38	9.96	7.73	20.07	21.86	7.71	29.57	
			661	1880.0	2.41	9.96	7.78	20.15	21.89	7.76	29.65	
			810	1909.8	2.16	9.97	7.76	19.89	21.76	7.74	29.50	
	2slots	4.2	512	1850.2	2.55	9.96	7.73	20.24	19.32	7.71	27.03	
			661	1880.0	2.59	9.96	7.78	20.33	19.34	7.76	27.10	
			810	1909.8	2.66	9.97	7.76	20.39	19.44	7.74	27.18	
EGPRS (MCS1)	1slot	8.3	512	1850.2	2.36	9.96	7.73	20.05	21.85	7.71	29.56	
			661	1880.0	2.36	9.96	7.78	20.10	21.87	7.76	29.63	
			810	1909.8	2.22	9.97	7.76	19.95	21.75	7.74	29.49	
	2slots	4.2	512	1850.2	2.52	9.96	7.73	20.21	19.29	7.71	27.00	
			661	1880.0	2.53	9.96	7.78	20.27	19.28	7.76	27.04	
			810	1909.8	2.62	9.97	7.76	20.35	19.38	7.74	27.12	
	3slots	2.8	512	1850.2	2.16	9.96	7.73	19.85	17.41	7.71	25.12	
			661	1880.0	2.23	9.96	7.78	19.97	17.42	7.76	25.18	
			810	1909.8	2.37	9.97	7.76	20.10	17.60	7.74	25.34	
	4slots	2.1	512	1850.2	2.44	9.96	7.73	20.13	16.51	7.71	24.22	
			661	1880.0	2.31	9.96	7.78	20.05	16.39	7.76	24.15	
			810	1909.8	2.51	9.97	7.76	20.24	16.52	7.74	24.26	
	EGPRS (MCS5)	1slot	8.3	512	1850.2	-1.72	9.96	7.73	15.97	17.91	7.71	25.62
				661	1880.0	-1.77	9.96	7.78	15.97	17.84	7.76	25.60
				810	1909.8	-1.76	9.97	7.76	15.97	17.83	7.74	25.57
2slots		4.2	512	1850.2	1.11	9.96	7.73	18.80	17.61	7.71	25.32	
			661	1880.0	1.06	9.96	7.78	18.80	17.61	7.76	25.37	
			810	1909.8	1.00	9.97	7.76	18.73	17.59	7.74	25.33	
3slots		2.8	512	1850.2	2.19	9.96	7.73	19.88	16.96	7.71	24.67	
			661	1880.0	2.25	9.96	7.78	19.99	17.43	7.76	25.19	
			810	1909.8	2.29	9.97	7.76	20.02	17.49	7.74	25.23	
4slots		2.1	512	1850.2	2.39	9.96	7.73	20.08	16.38	7.71	24.09	
			661	1880.0	2.35	9.96	7.78	20.09	16.36	7.76	24.12	
			810	1909.8	2.49	9.97	7.76	20.22	16.50	7.74	24.24	

Time based AVG Results = P/M Reading + Atten.Loss + Cable Loss

Slotted AVG Results = Agilent Reading + Cable Loss

Maximum time based AVG power mode

SAR test mode

Output power measurement for W-CDMA

Maximum output power for W-CDMA and HSPA was verified on the high, middle and low channels according to the procedures described in section 5.2 of 3GPP TS 34.121 and "KDB 941225 document".

The WCDMA and HSPA modes of EUT were verified each channel and "sub-tests" according to Release-6 procedures in section 5.2 of 3GPP TS 34.121.

[Rel.99]

The communication test set was using a 12.2k RMC (reference measurement channel) with TPC (transmit power control) set to all "1's" configured in Test Loop Mode 1.

[HSDPA]

The communication test set was using an FRC (Fixed reference channel) with H-set 1 and 12.2kbps RMC with TPC (transmit power control) set to all "1's". Output power was measured according requirements for HS-DPCCH Sub-test 1-4.

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note 1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15	15/15	64	12/15	24/15	1.0	0.0
	(Note 4)	(Note 4)		(Note 4)			
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and $\Delta_{NACK} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$, and $\Delta_{CQI} = 24/15$ with $\beta_{hs} = 24/15 * \beta_c$.

Note 3: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPDCCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$.

Test Equipment Setting Summary Table

The following table is the key parameters that was configured in test equipment.

Subtest	Mode	Loopback Mode	Rel99 RMC	HSDPA FRC	HSUPA Test	Common Setting		β_c/β_d	MPR	Power Class 3 limit
						β_c	β_d			
	Rel99	Test Mode 1	12.2kbps RMC	-	-			8/15		24(+1.7/-3.7dB)
1	Rel6 HSDPA	Test Mode 1	12.2kbps RMC	H-Set 1 (HPSK)	-	2/15	15/15	2/15	0	24(+1.7/-3.7dB)
2	Rel6 HSDPA	Test Mode 1	12.2kbps RMC	H-Set 1 (HPSK)	-	12/15	15/15	12/15	0	24(+1.7/-3.7dB)
3	Rel6 HSDPA	Test Mode 1	12.2kbps RMC	H-Set 1 (HPSK)	-	15/15	8/15	15/8	0.5	23.5(+2.2/-3.7dB)
4	Rel6 HSDPA	Test Mode 1	12.2kbps RMC	H-Set 1 (HPSK)	-	15/15	4/15	15/4	0.5	23.5(+2.2/-3.7dB)

Subtest	HSDPA Specific Settings						
	Δ_{ACK}	Δ_{NACK}	Δ_{CQI}	Ack-Nack repetition factor	CQI Feedback	CQI Repetition Factor	Ahs= β_{hs}/β_c
Rel 6 HSDPA							
1	8	8	8	3	4ms	2	30/15
2	8	8	8	3	4ms	2	30/15
3	8	8	8	3	4ms	2	30/15
4	8	8	8	3	4ms	2	30/15

5) WCDMA V (Normal mode/ Power reduction mode)

WCDMA V band								
Normal						Power reduction		
Mode	Ch	Frequency [MHz]	Reading AVG [dBm]	Cable loss [dB]	Result [dBm]	Reading AVG [dBm]	Cable loss [dB]	Result [dBm]
RMC 12.2kbps	4132	826.4	22.17	0.96	23.13	20.59	0.96	21.55
	4183	836.6	22.38	0.97	23.35	20.86	0.97	21.83
	4233	846.6	22.23	0.98	23.21	20.55	0.98	21.53
HSDPA Subtest1	4132	826.4	21.12	0.96	22.08	19.49	0.96	20.45
	4183	836.6	21.37	0.97	22.34	19.78	0.97	20.75
	4233	846.6	21.11	0.98	22.09	19.47	0.98	20.45
HSDPA Subtest2	4132	826.4	21.11	0.96	22.07	19.52	0.96	20.48
	4183	836.6	21.41	0.97	22.38	19.78	0.97	20.75
	4233	846.6	21.13	0.98	22.11	19.46	0.98	20.44
HSDPA Subtest3	4132	826.4	20.64	0.96	21.60	19.00	0.96	19.96
	4183	836.6	20.92	0.97	21.89	19.28	0.97	20.25
	4233	846.6	20.63	0.98	21.61	18.96	0.98	19.94
HSDPA Subtest4	4132	826.4	20.67	0.96	21.63	18.99	0.96	19.95
	4183	836.6	20.91	0.97	21.88	19.27	0.97	20.24
	4233	846.6	20.64	0.98	21.62	19.05	0.98	20.03
HSUPA Subtest1	4132	826.4	21.32	0.96	22.28	19.31	0.96	20.27
	4183	836.6	21.39	0.97	22.36	19.63	0.97	20.60
	4233	846.6	20.93	0.98	21.91	19.34	0.98	20.32
HSUPA Subtest2	4132	826.4	20.25	0.96	21.21	17.82	0.96	18.78
	4183	836.6	20.52	0.97	21.49	18.23	0.97	19.20
	4233	846.6	19.77	0.98	20.75	18.08	0.98	19.06
HSUPA Subtest3	4132	826.4	19.82	0.96	20.78	18.14	0.96	19.10
	4183	836.6	20.06	0.97	21.03	18.38	0.97	19.35
	4233	846.6	19.70	0.98	20.68	18.07	0.98	19.05
HSUPA Subtest4	4132	826.4	20.68	0.96	21.64	18.94	0.96	19.90
	4183	836.6	20.95	0.97	21.92	19.25	0.97	20.22
	4233	846.6	20.69	0.98	21.67	18.98	0.98	19.96
HSUPA Subtest5	4132	826.4	20.91	0.96	21.87	19.25	0.96	20.21
	4183	836.6	21.17	0.97	22.14	19.46	0.97	20.43
	4233	846.6	20.79	0.98	21.77	19.17	0.98	20.15

Results = Reading + Loss

 : Maximum power mode

 : SAR test mode

Note: HSUPA

The enhanced power reduction may result in around 1dB of variance from the MPR target values depending on HSPA channel configuration (e.g. 34.121 subtest) and characteristics of hardware RF design.

6) WCDMA II (Normal mode/ Power reduction mode)

WCDMA II band								
Mode	Ch	Normal				Power reduction		
		Frequency [MHz]	Reading AVG [dBm]	Cable [dB]	Result [dBm]	Reading AVG [dBm]	Cable [dB]	Result [dBm]
RMC 12.2kbps	9262	1852.4	21.66	1.54	23.20	20.17	1.54	21.71
	9400	1880.0	21.82	1.59	23.41	20.40	1.59	21.99
	9538	1907.6	21.49	1.57	23.06	20.02	1.57	21.59
HSDPA Subtest1	9262	1852.4	20.49	1.54	22.03	19.23	1.54	20.77
	9400	1880.0	20.62	1.59	22.21	19.34	1.59	20.93
	9538	1907.6	20.36	1.57	21.93	19.16	1.57	20.73
HSDPA Subtest2	9262	1852.4	20.54	1.54	22.08	19.22	1.54	20.76
	9400	1880.0	20.61	1.59	22.20	19.33	1.59	20.92
	9538	1907.6	20.40	1.57	21.97	19.15	1.57	20.72
HSDPA Subtest3	9262	1852.4	20.10	1.54	21.64	18.76	1.54	20.30
	9400	1880.0	20.12	1.59	21.71	18.92	1.59	20.51
	9538	1907.6	19.88	1.57	21.45	18.77	1.57	20.34
HSDPA Subtest4	9262	1852.4	20.08	1.54	21.62	18.71	1.54	20.25
	9400	1880.0	20.16	1.59	21.75	18.91	1.59	20.50
	9538	1907.6	19.88	1.57	21.45	18.77	1.57	20.34
HSUPA Subtest1	9262	1852.4	20.08	1.54	21.62	19.15	1.54	20.69
	9400	1880.0	20.33	1.59	21.92	19.06	1.59	20.65
	9538	1907.6	20.14	1.57	21.71	18.75	1.57	20.32
HSUPA Subtest2	9262	1852.4	19.47	1.54	21.01	18.10	1.54	19.64
	9400	1880.0	19.61	1.59	21.20	18.16	1.59	19.75
	9538	1907.6	19.27	1.57	20.84	17.96	1.57	19.53
HSUPA Subtest3	9262	1852.4	19.35	1.54	20.89	18.36	1.54	19.90
	9400	1880.0	19.83	1.59	21.42	18.47	1.59	20.06
	9538	1907.6	19.24	1.57	20.81	18.08	1.57	19.65
HSUPA Subtest4	9262	1852.4	19.87	1.54	21.41	18.39	1.54	19.93
	9400	1880.0	19.95	1.59	21.54	18.53	1.59	20.12
	9538	1907.6	19.66	1.57	21.23	18.18	1.57	19.75
HSUPA Subtest5	9262	1852.4	20.20	1.54	21.74	18.89	1.54	20.43
	9400	1880.0	20.31	1.59	21.90	18.87	1.59	20.46
	9538	1907.6	20.07	1.57	21.64	18.57	1.57	20.14

Results = Reading + Loss

Maximum power mode

SAR test mode

Note: HSUPA

The enhanced power reduction may result in around 1dB of variance from the MPR target values depending on HSPA channel configuration (e.g. 34.121 subtest) and characteristics of hardware RF design.

MPR Explanation

The product implements an Enhanced MPR (E-MPR) software algorithm that also considers power compression (Scaling), a requirement per 3GPP 25.214 section 5.1.2.6, to generate a more accurate Cubic Metric (CM) value that is used to determine the magnitude of power reduction for HSPA signals. The Enhanced MPR solution can introduce a deviation of the actual observed power reduction from the MPR target values configured for a device.

In the power scaling process defined by 3GPP TS 25.214, the channel beta values are modified as the transmitted signal approaches maximum power to ensure that the transmit power does not exceed the maximum rated transmit power and is also compliant with emissions requirements. The power scaling process considers the software-defined MPR target values based on the CM for the signal to be transmitted to determine the required power reduction for a given signal. The actual CM value of the signal transmitted after power scaling, however, is often different from the estimated CM value used in the power reduction algorithm.

An accurate CM value is desirable as the goal of power reduction is to maintain compliance with emissions limits. By using a more accurate CM value, the E-MPR process minimizes the magnitudes of power reduction required to maintain emissions compliance whereas the legacy MPR software may incorporate a magnitude of power reduction that is higher than is required for emissions compliance.

The enhanced power reduction may result in around 1dB of variance from the MPR target values depending on HSPA channel configuration (e.g. 34.121 subtest) and characteristics of hardware RF design.

Output power measurement for LTE

Maximum output power for LTE was verified on the high, middle and low channels according to the procedures described in "KDB 941225 D05 document".

Test configuration for Resource Block

50% RB allocation is decided according to the KDB 941225D05.

Test configuration /Channel bandwidth BW [MHz]	5	10	15	20	
100% RB allocation	RB allocation	25	50	75	100
	RB offset (RB start)	0	0	0	0
50% RB allocation Center	RB allocation	12	25	36	50
	RB offset (RB start)	6	12	18	25
1 RB lower	RB allocation	1	1	1	1
	RB offset (RB start)	0	0	0	0
1RB upper	RB allocation	1	1	1	1
	RB offset (RB start)	24	49	74	99

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification. UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

Modulation	Channel bandwidth / Transmission bandwidth (RB)				MPR
	5MHz	10MHz	15MHz	20MHz	
QPSK	> 8	> 12	> 16	> 18	≤ 1
16QAM	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16QAM	> 8	> 12	> 16	> 18	≤ 2

7) LTE band IV (Normal mode)

Test Frequency ID	Bandwidth [MHz]	N _{UL}	Frequency of Uplink [MHz]	N _{DL}	Frequency of Downlink [MHz]
Low Range	1.4	19957	1710.7	1957	2110.7
	3	19965	1711.5	1965	2111.5
	5	19975	1712.5	1975	2112.5
	10	20000	1715	2000	2115
	15	20025	1717.5	2025	2117.5
	20	20050	1720	2050	2120
Mid Range	1.4/3/5/10/15/20	20175	1732.5	2175	2132.5
High Range	1.4	20393	1754.3	2393	2154.3
	3	20385	1753.5	2385	2153.5
	5	20375	1752.5	2375	2152.5
	10	20350	1750	2350	2150
	15	20325	1747.5	2325	2147.5
	20	20300	1745	2300	2145

BW	Mode	UL RB Allocation (Count)		UL RB Start	MPR [dB]	Result (dBm)		
						Low ch	Mid ch	High ch
1.4	QPSK	1/lower	1	0	0	23.71	23.40	23.74
		1/center	1	2	0	23.71	23.54	23.57
		1/upper	1	5	0	23.58	23.68	23.67
		50%/lower	3	0	0	23.66	23.50	23.66
		50%/center	3	1	0	23.57	23.39	23.53
		50%/upper	3	3	0	23.70	23.61	23.66
	100%/center	6	0	1	22.70	22.46	22.58	
	16QAM	1/lower	1	0	1	22.98	21.94	22.23
		1/center	1	2	1	22.93	21.97	22.32
		1/upper	1	5	1	22.93	22.08	22.35
		50%/lower	3	0	1	22.92	22.48	22.78
		50%/center	3	1	1	22.55	22.45	22.76
50%/upper		3	3	1	22.85	22.59	22.87	
100%/center	6	0	2	21.81	21.67	21.79		
3	QPSK	1/lower	1	0	0	23.68	23.60	23.49
		1/center	1	7	0	23.61	23.57	23.51
		1/upper	1	14	0	23.71	23.61	23.53
		50%/lower	8	0	1	22.79	22.45	22.58
		50%/center	8	4	1	22.77	22.44	22.50
		50%/upper	8	7	1	22.70	22.60	22.60
	100%/center	15	0	1	22.77	22.40	22.52	
	16QAM	1/lower	1	0	1	22.11	22.87	21.98
		1/center	1	7	1	22.33	22.92	22.17
		1/upper	1	14	1	22.06	22.94	22.04
		50%/lower	8	0	2	21.78	21.45	21.59
		50%/center	8	4	2	21.72	21.41	21.64
50%/upper		8	7	2	21.74	21.63	21.60	
100%/center	15	0	2	21.73	21.46	21.66		
5	QPSK	1/lower	1	0	0	23.71	23.47	23.47
		1/center	1	12	0	23.71	23.67	23.54
		1/upper	1	24	0	23.71	23.59	23.55
		50%/lower	12	0	1	22.73	22.78	22.58
		50%/center	12	6	1	22.67	22.69	22.57
		50%/upper	12	13	1	22.76	22.84	22.61
	100%/center	25	0	1	22.67	22.45	22.54	
	16QAM	1/lower	1	0	1	22.70	22.54	22.46
		1/center	1	12	1	22.99	22.85	22.60
		1/upper	1	24	1	22.79	22.61	22.66
		50%/lower	12	0	2	21.68	21.71	21.63
		50%/center	12	6	2	21.74	21.50	21.76
50%/upper		12	13	2	21.79	21.79	21.65	
100%/center	25	0	2	21.63	21.48	21.62		

BW	Mode	UL RB Allocation (Count)		UL RB Start	MPR [dB]	Result (dBm)	Result (dBm)	Result (dBm)
						Low ch	Mid ch	High ch
10	QPSK	1/lower	1	0	0	23.71	23.59	23.41
		1/center	1	24	0	23.71	23.52	23.39
		1/upper	1	49	0	23.70	23.52	23.63
		50%/lower	25	0	1	22.69	22.41	22.32
		50%/center	25	12	1	22.57	22.45	22.44
		50%/upper	25	25	1	22.66	22.44	22.46
		100%/center	50	0	1	22.45	22.36	22.47
	16QAM	1/lower	1	0	1	22.85	21.96	22.10
		1/center	1	24	1	22.97	21.76	22.08
		1/upper	1	49	1	22.79	21.81	22.29
		50%/lower	25	0	2	21.77	21.53	21.49
		50%/center	25	12	2	21.73	21.52	21.50
		50%/upper	25	25	2	21.77	21.54	21.57
		100%/center	50	0	2	21.58	21.36	21.59
15	QPSK	1/lower	1	0	0	23.61	23.50	23.51
		1/center	1	37	0	23.60	23.58	23.54
		1/upper	1	74	0	23.60	23.60	23.58
		50%/lower	36	0	1	22.62	22.43	22.40
		50%/center	36	19	1	22.49	22.37	22.39
		50%/upper	36	39	1	22.50	22.44	22.39
		100%/center	75	0	1	22.37	22.33	22.45
	16QAM	1/lower	1	0	1	22.45	22.78	22.23
		1/center	1	37	1	22.52	22.84	22.22
		1/upper	1	74	1	22.47	22.87	22.34
		50%/lower	36	0	2	21.52	21.41	21.30
		50%/center	36	19	2	21.44	21.37	21.42
		50%/upper	36	39	2	21.50	21.50	21.37
		100%/center	75	0	2	21.35	21.38	21.26
20	QPSK	1/lower	1	0	0	23.71	23.58	23.55
		1/center	1	49	0	23.66	23.48	23.55
		1/upper	1	99	0	23.71	23.70	23.60
		50%/lower	50	0	1	22.40	22.38	22.40
		50%/center	50	25	1	22.44	22.38	22.38
		50%/upper	50	50	1	22.70	22.46	22.46
		100%/center	100	0	1	22.35	22.36	22.42
	16QAM	1/lower	1	0	1	22.64	22.00	22.68
		1/center	1	49	1	22.81	21.99	22.95
		1/upper	1	99	1	22.37	22.16	22.92
		50%/lower	50	0	2	21.33	21.51	21.34
		50%/center	50	25	2	21.59	21.44	21.50
		50%/upper	50	50	2	21.72	21.58	21.46
		100%/center	100	0	2	21.49	21.46	21.55

Maximum power mode
SAR test mode

8) LTE band IV (Reduction power mode)

Test Frequency ID	Bandwidth [MHz]	N _{UL}	Frequency of Uplink [MHz]	N _{DL}	Frequency of Downlink [MHz]
Low Range	1.4	19957	1710.7	1957	2110.7
	3	19965	1711.5	1965	2111.5
	5	19975	1712.5	1975	2112.5
	10	20000	1715	2000	2115
	15	20025	1717.5	2025	2117.5
	20	20050	1720	2050	2120
Mid Range	1.4/3/5/10/15/20	20175	1732.5	2175	2132.5
High Range	1.4	20393	1754.3	2393	2154.3
	3	20385	1753.5	2385	2153.5
	5	20375	1752.5	2375	2152.5
	10	20350	1750	2350	2150
	15	20325	1747.5	2325	2147.5
	20	20300	1745	2300	2145

BW	Mode	UL RB Allocation (Count)		UL RB Start	MPR [dB]	Result (dBm)		
		Low ch	Mid ch			High ch		
1.4	QPSK	1/lower	1	0	0	21.48	21.12	21.05
		1/center	1	2	0	21.35	21.10	21.08
		1/upper	1	5	0	21.44	20.90	21.18
		50%/lower	3	0	0	21.21	21.14	21.08
		50%/center	3	1	0	21.36	21.14	21.18
		50%/upper	3	3	0	21.26	20.98	21.17
		100%/center	6	0	0	21.46	21.04	21.15
	16QAM	1/lower	1	0	0	20.91	21.35	20.51
		1/center	1	2	0	20.91	21.41	20.55
		1/upper	1	5	0	21.01	21.17	20.57
		50%/lower	3	0	0	21.29	21.11	21.12
		50%/center	3	1	0	21.34	21.10	21.22
		50%/upper	3	3	0	21.30	20.95	21.17
		100%/center	6	0	0	21.16	20.94	21.12
3	QPSK	1/lower	1	0	0	21.41	21.06	21.17
		1/center	1	7	0	21.30	20.97	21.01
		1/upper	1	14	0	21.45	21.17	21.23
		50%/lower	8	0	0	21.41	21.10	21.07
		50%/center	8	4	0	21.21	21.04	21.13
		50%/upper	8	7	0	21.34	20.91	21.12
		100%/center	15	0	0	21.31	21.05	21.09
	16QAM	1/lower	1	0	0	21.66	20.34	21.35
		1/center	1	7	0	21.48	20.51	20.65
		1/upper	1	14	0	21.50	20.40	21.44
		50%/lower	8	0	0	21.35	21.01	21.05
		50%/center	8	4	0	21.23	20.93	21.09
		50%/upper	8	7	0	21.22	20.83	21.12
		100%/center	15	0	0	21.20	21.04	21.06
5	QPSK	1/lower	1	0	0	21.30	21.07	20.97
		1/center	1	12	0	21.23	21.03	21.02
		1/upper	1	24	0	21.32	21.23	21.11
		50%/lower	12	0	0	21.21	21.01	21.08
		50%/center	12	6	0	21.30	21.06	21.11
		50%/upper	12	13	0	21.16	21.10	21.15
		100%/center	25	0	0	21.20	20.98	20.99
	16QAM	1/lower	1	0	0	21.39	20.98	21.04
		1/center	1	12	0	21.31	20.98	21.23
		1/upper	1	24	0	21.20	21.11	21.25
		50%/lower	12	0	0	21.27	21.00	21.09
		50%/center	12	6	0	21.26	21.06	21.06
		50%/upper	12	13	0	21.25	21.11	21.15
		100%/center	25	0	0	21.22	20.95	20.89

BW	Mode	UL RB Allocation (Count)		UL RB Start	MPR [dB]	Result (dBm)		
						Low ch	Mid ch	High ch
10	QPSK	1/lower	1	0	0	21.39	21.06	20.97
		1/center	1	24	0	21.18	21.06	20.90
		1/upper	1	49	0	21.19	21.03	21.19
		50%/lower	25	0	0	21.08	20.92	20.91
		50%/center	25	12	0	21.16	20.95	21.00
		50%/upper	25	25	0	21.04	21.04	21.01
	100%/center	50	0	0	21.06	20.90	20.90	
	16QAM	1/lower	1	0	0	21.43	20.33	20.48
		1/center	1	24	0	21.45	20.34	20.61
		1/upper	1	49	0	21.19	20.26	20.67
		50%/lower	25	0	0	21.09	20.93	20.99
		50%/center	25	12	0	21.20	20.98	21.01
		50%/upper	25	25	0	21.10	21.12	21.04
	100%/center	50	0	0	21.00	20.90	20.80	
15	QPSK	1/lower	1	0	0	21.28	21.01	21.03
		1/center	1	37	0	21.14	20.93	21.19
		1/upper	1	74	0	21.11	21.09	21.18
		50%/lower	36	0	0	21.06	20.79	20.80
		50%/center	36	19	0	20.91	20.80	20.88
		50%/upper	36	39	0	20.97	20.79	20.81
	100%/center	75	0	0	20.96	20.66	20.84	
	16QAM	1/lower	1	0	0	20.88	21.20	20.72
		1/center	1	37	0	20.80	21.19	20.80
		1/upper	1	74	0	20.74	21.30	20.88
		50%/lower	36	0	0	20.94	20.79	20.74
		50%/center	36	19	0	20.85	20.79	20.79
		50%/upper	36	39	0	20.93	20.81	20.76
	100%/center	75	0	0	20.83	20.60	20.80	
20	QPSK	1/lower	1	0	0	21.27	20.97	21.01
		1/center	1	49	0	21.06	20.90	21.05
		1/upper	1	99	0	21.14	21.05	21.11
		50%/lower	50	0	0	20.98	20.82	20.77
		50%/center	50	25	0	20.99	20.83	20.87
		50%/upper	50	50	0	20.90	20.88	20.93
	100%/center	100	0	0	20.94	20.82	20.90	
	16QAM	1/lower	1	0	0	20.62	21.28	20.53
		1/center	1	49	0	20.31	21.22	20.51
		1/upper	1	99	0	20.38	21.29	20.58
		50%/lower	50	0	0	21.02	20.72	20.83
		50%/center	50	25	0	20.95	20.77	20.93
		50%/upper	50	50	0	20.89	20.77	20.94
	100%/center	100	0	0	20.89	20.69	20.84	

Maximum power mode
SAR test mode

9) LTE band XVII (Normal mode)

Test Frequency ID	Bandwidth [MHz]	N _{UL}	Frequency of Uplink [MHz]	N _{DL}	Frequency of Downlink [MHz]
Low Range	5	23755	706.5	5755	736.5
	10	23780	709	5780	739
Mid Range	5 /10	23790	710	5790	740
High Range	5	23825	713.5	5825	743.5
	10	23800	711	5800	741

BW	Mode	UL RB Allocation (Count)		UL RB Start	MPR [dB]	Result (dBm)	Result (dBm)	Result (dBm)
						Low ch	Mid ch	High ch
5	QPSK	1/lower	1	0	0	23.31	23.19	23.24
		1/center	1	12	0	23.26	23.17	23.24
		1/upper	1	24	0	23.21	23.19	22.63
		50%/lower	12	0	1	22.20	22.08	22.06
		50%/center	12	6	1	22.18	22.09	22.03
		50%/upper	12	13	1	22.19	22.05	22.00
	16QAM	100%/center	25	0	1	22.09	21.99	21.87
		1/lower	1	0	1	22.24	22.19	22.10
		1/center	1	12	1	22.24	22.27	22.10
		1/upper	1	24	1	22.21	22.29	21.61
		50%/lower	12	0	2	21.27	21.12	21.08
		50%/center	12	6	2	21.35	21.06	21.13
		50%/upper	12	13	2	21.25	21.09	21.11
		100%/center	25	0	2	21.19	20.88	21.02
10	QPSK	1/lower	1	0	0	23.08	23.15	23.17
		1/center	1	24	0	22.93	22.96	23.09
		1/upper	1	49	0	22.71	23.19	23.14
		50%/lower	25	0	1	21.96	22.08	21.94
		50%/center	25	12	1	21.92	22.24	21.98
		50%/upper	25	25	1	21.89	22.09	21.92
	16QAM	100%/center	50	0	1	21.96	22.13	21.97
		1/lower	1	0	1	21.62	22.47	22.21
		1/center	1	24	1	21.50	22.38	22.23
		1/upper	1	49	1	21.15	22.52	22.27
		50%/lower	25	0	2	21.05	21.28	21.06
		50%/center	25	12	2	21.01	21.29	20.98
		50%/upper	25	25	2	21.02	21.28	21.05
		100%/center	50	0	2	21.06	21.11	21.02

Maximum power mode

SAR test mode

10) LTE band XVII (Reduction power mode)

Test Frequency ID	Bandwidth [MHz]	N _{UL}	Frequency of Uplink [MHz]	N _{DL}	Frequency of Downlink [MHz]
Low Range	5	23755	706.5	5755	736.5
	10	23780	709	5780	739
Mid Range	5 /10	23790	710	5790	740
High Range	5	23825	713.5	5825	743.5
	10	23800	711	5800	741

BW	Mode	UL RB Allocation (Count)		UL RB Start	MPR [dB]	Result (dBm)	Result (dBm)	Result (dBm)
						Low ch	Mid ch	High ch
5	QPSK	1/lower	1	0	0	21.24	20.98	20.86
		1/center	1	12	0	21.16	20.88	21.02
		1/upper	1	24	0	21.10	20.92	20.69
		50%/lower	12	0	1	21.06	20.94	20.96
		50%/center	12	6	1	21.09	21.07	20.99
		50%/upper	12	13	1	21.08	20.89	20.83
	100%/center	25	0	1	21.03	20.84	20.87	
	16QAM	1/lower	1	0	1	21.18	21.11	20.24
		1/center	1	12	1	21.12	20.98	20.15
		1/upper	1	24	1	21.02	21.16	20.09
		50%/lower	12	0	2	21.00	20.99	20.95
		50%/center	12	6	2	21.11	20.98	20.97
		50%/upper	12	13	2	21.07	20.87	20.84
	100%/center	25	0	2	21.09	20.77	20.89	
10	QPSK	1/lower	1	0	0	20.53	20.97	21.16
		1/center	1	24	0	21.05	20.82	20.91
		1/upper	1	49	0	20.90	21.02	20.75
		50%/lower	25	0	1	20.87	20.85	20.89
		50%/center	25	12	1	20.90	20.89	20.94
		50%/upper	25	25	1	20.99	20.90	20.94
	100%/center	50	0	1	20.88	20.85	20.77	
	16QAM	1/lower	1	0	1	19.88	21.25	20.32
		1/center	1	24	1	20.48	21.13	20.12
		1/upper	1	49	1	20.26	21.28	19.91
		50%/lower	25	0	2	20.84	20.86	20.94
		50%/center	25	12	2	20.97	20.91	20.92
		50%/upper	25	25	2	20.89	20.92	20.94
	100%/center	50	0	2	20.85	20.81	20.77	
		: Maximum power mode						
		: SAR test mode						

11) WLAN (11b/g/n(2.4G))

[IEEE802.11b] Rate Check

Rate [Mbps]	Freq. [MHz]	P/M Reading [dBm]		Cable Loss [dB]	Atten. [dB]	Result			
		[dBm]				[mW]			
		PK	AVG			PK	AVG		
1.0	2437	8.55	5.50	1.78	10.07	20.40	17.35	109.65	54.33
2.0	2437	8.85	5.45	1.78	10.07	20.70	17.30	117.49	53.70
5.5	2437	8.77	5.32	1.78	10.07	20.62	17.17	115.35	52.12
11.0	2437	8.84	5.27	1.78	10.07	20.69	17.12	117.22	51.52

:Worst data rate

IEEE802.11b 1Mbps

Ch	Frequency [MHz]	P/M Reading [dBm]		Cable Loss [dB]	Atten. [dB]	Result			
		[dBm]				[mW]			
		PK	AVG			PK	AVG		
1	2412	7.78	4.06	1.76	10.07	19.61	15.89	91.41	38.82
6	2437	8.67	5.50	1.78	10.07	20.52	17.35	112.72	54.33
11	2462	7.84	5.05	1.75	10.07	19.66	16.87	92.47	48.64

:SAR test channel

[IEEE802.11g] Rate Check

Rate [Mbps]	Frequency [MHz]	P/M Reading [dBm]		Cable Loss [dB]	Atten. [dB]	Result			
		[dBm]				[mW]			
		PK	AVG			PK	AVG		
6.0	2437	11.76	6.29	1.78	10.07	23.61	18.14	229.61	65.16
9.0	2437	12.03	6.17	1.78	10.07	23.88	18.02	244.34	63.39
12.0	2437	11.98	6.02	1.78	10.07	23.83	17.87	241.55	61.24
18.0	2437	12.00	5.81	1.78	10.07	23.85	17.66	242.66	58.34
24.0	2437	12.06	5.58	1.78	10.07	23.91	17.43	246.04	55.34
36.0	2437	12.05	5.19	1.78	10.07	23.90	17.04	245.47	50.58
48.0	2437	12.08	4.84	1.78	10.07	23.93	16.69	247.17	46.67
54.0	2437	12.02	4.61	1.78	10.07	23.87	16.46	243.78	44.26

:Worst data rate

IEEE802.11g 6Mbps

Ch	Frequency [MHz]	P/M Reading [dBm]		Cable Loss [dB]	Atten. [dB]	Result			
		[dBm]				[mW]			
		PK	AVG			PK	AVG		
1	2412	9.87	2.14	1.76	10.07	21.70	13.97	147.91	24.95
6	2437	11.86	6.29	1.78	10.07	23.71	18.14	234.96	65.16
11	2462	10.31	1.12	1.75	10.07	22.13	12.94	163.31	19.68

:SAR test channel

Sample Calculation:

$$\text{Result} = \text{Reading} + \text{Cable Loss} + \text{Attenuator}$$

[IEEE802.11n-20 MISO] Rate Check

Rate	Frequency [MHz]	P/M Reading [dBm]		Cable Loss [dB]	Atten. [dB]	Result			
		PK	AVG			[dBm]		[mW]	
						PK	AVG	PK	AVG
MCS0	2437	11.73	6.49	1.78	10.07	23.58	18.34	228.03	68.23
MCS1	2437	11.83	6.12	1.78	10.07	23.68	17.97	233.35	62.66
MCS2	2437	11.88	5.88	1.78	10.07	23.73	17.73	236.05	59.29
MCS3	2437	11.88	5.65	1.78	10.07	23.73	17.50	236.05	56.23
MCS4	2437	11.99	5.22	1.78	10.07	23.84	17.07	242.10	50.93
MCS5	2437	11.98	4.94	1.78	10.07	23.83	16.79	241.55	47.75
MCS6	2437	11.97	4.72	1.78	10.07	23.82	16.57	240.99	45.39
MCS7	2437	12.01	4.54	1.78	10.07	23.86	16.39	243.22	43.55

:Worst data rate

IEEE802.11n-20 MISO, MCS0

Ch	Frequency [MHz]	P/M Reading [dBm]		Cable Loss [dB]	Atten. [dB]	Result			
		PK	AVG			[dBm]		[mW]	
						PK	AVG	PK	AVG
1	2412	9.84	2.12	1.76	10.07	21.67	13.95	146.89	24.83
6	2437	12.00	6.49	1.78	10.07	23.85	18.34	242.66	68.23
11	2462	10.18	0.96	1.75	10.07	22.00	12.78	158.49	18.97

:SAR test channel

Sample Calculation:

Result = Reading + Cable Loss + Attenuator

[IEEE802.11n-40 MISO] Rate Check

Rate	Frequency [MHz]	P/M Reading [dBm]		Cable Loss [dB]	Atten. [dB]	Result			
		PK	AVG			[dBm]		[mW]	
						PK	AVG	PK	AVG
MCS0	2437	10.51	2.42	1.78	10.07	22.36	14.27	172.19	26.73
MCS1	2437	10.54	1.90	1.78	10.07	22.39	13.75	173.38	23.71
MCS2	2437	10.60	1.47	1.78	10.07	22.45	13.32	175.79	21.48
MCS3	2437	10.72	1.14	1.78	10.07	22.57	12.99	180.72	19.91
MCS4	2437	10.74	0.53	1.78	10.07	22.59	12.38	181.55	17.30
MCS5	2437	10.85	0.27	1.78	10.07	22.70	12.12	186.21	16.29
MCS6	2437	10.81	0.00	1.78	10.07	22.66	11.85	184.50	15.31
MCS7	2437	10.86	-0.14	1.78	10.07	22.71	11.71	186.64	14.83

:Worst data rate

IEEE802.11n-40 MISO, MCS0

Ch	Frequency [MHz]	P/M Reading [dBm]		Cable Loss [dB]	Atten. [dB]	Result			
		PK	AVG			[dBm]		[mW]	
						PK	AVG	PK	AVG
3	2422	9.06	-0.07	1.77	10.07	20.90	11.77	123.03	15.03
6	2437	10.59	2.42	1.78	10.07	22.44	14.27	175.39	26.73
9	2452	9.91	0.67	1.77	10.07	21.75	12.51	149.62	17.82

:SAR test channel

Sample Calculation:

Result = Reading + Cable Loss + Attenuator

AVG, [IEEE802.11n-20 MIMO, 2437MHz] Rate Check

MCS Number	Ant	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result Total		Remark
					[dBm]	[dBm]	
8	Ant0	4.00	1.78	10.07	15.85	18.58	*
	Ant1	3.47	1.78	10.03	15.28		
9	Ant0	3.40	1.78	10.07	15.25	18.06	
	Ant1	3.02	1.78	10.03	14.83		
10	Ant0	2.98	1.78	10.07	14.83	17.69	
	Ant1	2.72	1.78	10.03	14.53		
11	Ant0	2.75	1.78	10.07	14.60	17.33	
	Ant1	2.21	1.78	10.03	14.02		
12	Ant0	2.33	1.78	10.07	14.18	16.92	
	Ant1	1.81	1.78	10.03	13.62		
13	Ant0	1.89	1.78	10.07	13.74	16.48	
	Ant1	1.38	1.78	10.03	13.19		
14	Ant0	1.61	1.78	10.07	13.46	16.17	
	Ant1	1.02	1.78	10.03	12.83		
15	Ant0	1.49	1.78	10.07	13.34	16.04	
	Ant1	0.88	1.78	10.03	12.69		

*:Worst data rate

All comparison were carried out on same frequency and measurement factors.

AVG, IEEE802.11n-20 MIMO, MCS8

Freq. [MHz]	Antenna 0	Antenna 1	Result	
	Result [mW]	Result [mW]	[dBm]	[mW]
2412	11.97	10.67	13.55	22.63
2437	38.46	33.73	18.58	72.19
2462	17.82	15.74	15.26	33.56

*:SAR test channel

Sample Calculation:

Result = Antenna 0 + 1

Antenna 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
2412	-1.05	1.76	10.07	10.78	11.97
2437	4.00	1.78	10.07	15.85	38.46
2462	0.69	1.75	10.07	12.51	17.82

Antenna 1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
2412	-1.51	1.76	10.03	10.28	10.67
2437	3.47	1.78	10.03	15.28	33.73
2462	0.19	1.75	10.03	11.97	15.74

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator

AVG, [IEEE802.11n-40 MIMO, 2437MHz] Rate Check

MCS Number	Ant	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Remark
					[dBm]	Total [dBm]	
8	Ant0	1.35	1.78	10.07	13.20	15.82	*
	Ant1	0.58	1.78	10.03	12.39		
9	Ant0	0.74	1.78	10.07	12.59	15.04	
	Ant1	-0.43	1.78	10.03	11.38		
10	Ant0	0.17	1.78	10.07	12.02	14.49	
	Ant1	-0.95	1.78	10.03	10.86		
11	Ant0	-0.54	1.78	10.07	11.31	13.95	
	Ant1	-1.28	1.78	10.03	10.53		
12	Ant0	-1.07	1.78	10.07	10.78	13.52	
	Ant1	-1.58	1.78	10.03	10.23		
13	Ant0	-1.57	1.78	10.07	10.28	13.02	
	Ant1	-2.08	1.78	10.03	9.73		
14	Ant0	-1.85	1.78	10.07	10.00	12.75	
	Ant1	-2.35	1.78	10.03	9.46		
15	Ant0	-2.01	1.78	10.07	9.84	12.54	
	Ant1	-2.61	1.78	10.03	9.20		

2437 : Worst data rate

All comparison were carried out on same frequency and measurement factors.

AVG, IEEE802.11n-40 MIMO, MCS8

Freq. [MHz]	Antenna 0	Antenna 1	Result	
	Result [mW]	Result [mW]	[dBm]	[mW]
2422	7.73	7.18	11.73	14.90
2437	20.89	17.34	15.82	38.23
2452	7.41	6.41	11.41	13.83

2437 : SAR test channel

Sample Calculation:

Result = Antenna 0 + 1

Antenna 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
2422	-2.95	1.76	10.07	8.88	7.73
2437	1.35	1.78	10.07	13.20	20.89
2452	-3.12	1.75	10.07	8.70	7.41

Antenna 1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
2422	-3.23	1.76	10.03	8.56	7.18
2437	0.58	1.78	10.03	12.39	17.34
2452	-3.71	1.75	10.03	8.07	6.41

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator

12) WLAN (11a/n(5180-5240MHz):

[IEEE802.11a 5180-5240MHz band] Rate Check

Rate [Mbps]	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
6.0	5240	1.65	2.76	10.13	14.54	28.44
9.0	5240	1.55	2.76	10.13	14.44	27.80
12.0	5240	1.41	2.76	10.13	14.30	26.92
18.0	5240	1.34	2.76	10.13	14.23	26.49
24.0	5240	0.86	2.76	10.13	13.75	23.71
36.0	5240	0.63	2.76	10.13	13.52	22.49
48.0	5240	0.19	2.76	10.13	13.08	20.32
54.0	5240	0.06	2.76	10.13	12.95	19.72

6.0 : Worst data rate

IEEE802.11a 5180-5240MHz band 6Mbps

Ch	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
36	5180	0.84	2.89	10.13	13.86	24.32
40	5200	0.99	2.81	10.13	13.93	24.72
44	5220	1.60	2.76	10.13	14.49	28.12
48	5240	1.65	2.76	10.13	14.54	28.44

Sample Calculation: Result = Reading + Cable Loss + Attenuator

48 : SAR test channel

[IEEE802.11n-20 5180-5240MHz band] Rate Check

Rate [Mbps]	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
MCS0	5240	1.35	2.76	10.13	14.24	26.55
MCS1	5240	1.21	2.76	10.13	14.10	25.70
MCS2	5240	0.76	2.76	10.13	13.65	23.17
MCS3	5240	0.56	2.76	10.13	13.45	22.13
MCS4	5240	0.05	2.76	10.13	12.94	19.68
MCS5	5240	-0.27	2.76	10.13	12.62	18.28
MCS6	5240	-0.49	2.76	10.13	12.40	17.38
MCS7	5240	-0.69	2.76	10.13	12.20	16.60

Worst data rate

IEEE802.11n-20 5180-5240MHz band MCS0

Ch	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
36	5180	1.06	2.89	10.13	14.08	25.59
40	5200	1.17	2.81	10.13	14.11	25.76
44	5220	1.40	2.76	10.13	14.29	26.85
48	5240	1.35	2.76	10.13	14.24	26.55

SAR test channel

[IEEE802.11n-40 5190-5230MHz band] Rate Check

Rate [Mbps]	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
MCS0	5230	3.49	2.75	10.13	16.37	43.35
MCS1	5230	2.93	2.75	10.13	15.81	38.11
MCS2	5230	2.53	2.75	10.13	15.41	34.75
MCS3	5230	2.16	2.75	10.13	15.04	31.92
MCS4	5230	1.55	2.75	10.13	14.43	27.73
MCS5	5230	1.20	2.75	10.13	14.08	25.59
MCS6	5230	0.98	2.75	10.13	13.86	24.32
MCS7	5230	0.86	2.75	10.13	13.74	23.66

Worst data rate

IEEE802.11n-40 5190-5230MHz band MCS0

Ch	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
38	5190	0.49	2.84	10.13	13.46	22.18
46	5230	3.49	2.75	10.13	16.37	43.35

SAR test channel

AVG, [IEEE802.11n-20 MIMO, 5180-5240MHz band] Rate Check

Freq. [MHz]	MCS Number	Ant	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Remark
						[dBm]	Total [dBm]	
5240	8	Ant0	-1.37	2.76	10.13	11.52	13.94	*
		Ant1	-2.61	2.76	10.09	10.24		
5240	9	Ant0	-1.81	2.76	10.13	11.08	13.42	
		Ant1	-3.23	2.76	10.09	9.62		
5240	10	Ant0	-2.30	2.76	10.13	10.59	12.96	
		Ant1	-3.66	2.76	10.09	9.19		
5240	11	Ant0	-2.61	2.76	10.13	10.28	12.71	
		Ant1	-3.81	2.76	10.09	9.04		
5240	12	Ant0	-3.14	2.76	10.13	9.75	12.13	
		Ant1	-4.46	2.76	10.09	8.39		
5240	13	Ant0	-3.69	2.76	10.13	9.20	11.67	
		Ant1	-4.81	2.76	10.09	8.04		
5240	14	Ant0	-3.75	2.76	10.13	9.14	11.60	
		Ant1	-4.90	2.76	10.09	7.95		
5240	15	Ant0	-3.89	2.76	10.13	9.00	11.49	
		Ant1	-4.97	2.76	10.09	7.88		

5240 : Worst data rate

All comparison were carried out on same frequency and measurement factors.

AVG, IEEE802.11n-20 MIMO, MCS8

Freq. [MHz]	Antenna 0 Result [mW]	Antenna 1 Result [mW]	Result	
			[dBm]	[mW]
5180	13.27	10.69	13.80	23.96
5200	13.24	10.59	13.77	23.84
5220	13.74	10.57	13.86	24.31
5240	14.19	10.57	13.94	24.76

5240 : SAR test channel

Sample Calculation:

Result = Antenna 0 + 1

Antenna 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
5180	-1.79	2.89	10.13	11.23	13.27
5200	-1.72	2.81	10.13	11.22	13.24
5220	-1.51	2.76	10.13	11.38	13.74
5240	-1.37	2.76	10.13	11.52	14.19

Antenna 1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
5180	-2.69	2.89	10.09	10.29	10.69
5200	-2.65	2.81	10.09	10.25	10.59
5220	-2.61	2.76	10.09	10.24	10.57
5240	-2.61	2.76	10.09	10.24	10.57

AVG, [IEEE802.11n-40 MIMO, 5190-5230MHz band] Rate Check

Freq. [MHz]	MCS Number	Ant	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Remark
						[dBm]	Total [dBm]	
5230	8	Ant0	-1.50	2.84	10.13	11.47	14.02	*
		Ant1	-2.44	2.84	10.09	10.49		
5230	9	Ant0	-2.35	2.84	10.13	10.62	13.19	
		Ant1	-3.23	2.84	10.09	9.70		
5230	10	Ant0	-2.90	2.84	10.13	10.07	12.60	
		Ant1	-3.88	2.84	10.09	9.05		
5230	11	Ant0	-3.48	2.84	10.13	9.49	12.10	
		Ant1	-4.28	2.84	10.09	8.65		
5230	12	Ant0	-4.15	2.84	10.13	8.82	11.43	
		Ant1	-4.95	2.84	10.09	7.98		
5230	13	Ant0	-4.60	2.84	10.13	8.37	11.05	
		Ant1	-5.25	2.84	10.09	7.68		
5230	14	Ant0	-4.51	2.84	10.13	8.46	11.03	
		Ant1	-5.41	2.84	10.09	7.52		
5230	15	Ant0	-4.74	2.84	10.13	8.23	10.90	
		Ant1	-5.41	2.84	10.09	7.52		

:Worst data rate

All comparison were carried out on same frequency and measurement factors.

AVG, IEEE802.11n-40 MIMO, MCS8

Freq. [MHz]	Antenna 0	Antenna 1	Result	
	Result [mW]	Result [mW]	[dBm]	[mW]
5190	14.03	11.19	14.02	25.22
5230	16.67	12.97	14.72	29.64

:SAR test channel

Sample Calculation:

Result = Antenna 0 + 1

Antenna 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
5190	-1.50	2.84	10.13	11.47	14.03
5230	-0.66	2.75	10.13	12.22	16.67

Antenna 1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
5190	-2.44	2.84	10.09	10.49	11.19
5230	-1.71	2.75	10.09	11.13	12.97

Sample Calculation:

13) WLAN (11a/n(5260-5320MHz):

[IEEE802.11a 5260-5320MHz band] Rate Check

Rate [Mbps]	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
6.0	5280	6.41	3.06	10.13	19.60	91.20
9.0	5280	6.38	3.06	10.13	19.57	90.57
12.0	5280	6.25	3.06	10.13	19.44	87.90
18.0	5280	6.02	3.06	10.13	19.21	83.37
24.0	5280	5.84	3.06	10.13	19.03	79.98
36.0	5280	5.44	3.06	10.13	18.63	72.95
48.0	5280	5.06	3.06	10.13	18.25	66.83
54.0	5280	4.87	3.06	10.13	18.06	63.97

: Worst data rate

IEEE802.11a 5260-5320MHz band 6Mbps

Ch	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
52	5260	6.41	2.87	10.13	19.41	87.30
56	5280	6.41	3.06	10.13	19.60	91.20
60	5300	6.35	3.17	10.13	19.65	92.26
64	5320	4.60	3.05	10.13	17.78	59.98

Sample Calculation: Result = Reading + Cable Loss + Attenuator

: SAR test channel

[IEEE802.11n-20 5260-5320MHz band] Rate Check

Rate [Mbps]	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
MCS0	5280	6.02	3.06	10.13	19.21	83.37
MCS1	5280	5.81	3.06	10.13	19.00	79.43
MCS2	5280	5.48	3.06	10.13	18.67	73.62
MCS3	5280	5.29	3.06	10.13	18.48	70.47
MCS4	5280	4.86	3.06	10.13	18.05	63.83
MCS5	5280	4.50	3.06	10.13	17.69	58.75
MCS6	5280	4.38	3.06	10.13	17.57	57.15
MCS7	5280	4.22	3.06	10.13	17.41	55.08

Worst data rate

IEEE802.11n-20 5260-5320MHz band MCS0

Ch	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
52	5260	6.08	2.87	10.13	19.08	80.91
56	5280	6.02	3.06	10.13	19.21	83.37
60	5300	6.27	3.17	10.13	19.57	90.57
64	5320	4.53	3.05	10.13	17.71	59.02

Result = Reading + Cable Loss + Attenuator

Channel of SAR testing

[IEEE802.11n-40 5270-5310MHz band] Rate Check

Rate [Mbps]	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
MCS0	5270	5.68	2.97	10.13	18.78	75.51
MCS1	5270	5.07	2.97	10.13	18.17	65.61
MCS2	5270	4.70	2.97	10.13	17.80	60.26
MCS3	5270	4.29	2.97	10.13	17.39	54.83
MCS4	5270	3.75	2.97	10.13	16.85	48.42
MCS5	5270	3.31	2.97	10.13	16.41	43.75
MCS6	5270	3.06	2.97	10.13	16.16	41.30
MCS7	5270	3.02	2.97	10.13	16.12	40.93

Worst data rate

IEEE802.11n-40 5270-5310MHz band MCS0

Ch	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
54	5270	5.68	2.97	10.13	18.78	75.51
62	5310	1.37	3.14	10.13	14.64	29.11

Sample Calculation: Result = Reading + Cable Loss + Attenuator

Channel of SAR testing

AVG, [IEEE802.11n-20 MIMO, 5260-5320MHz band] Rate Check

Freq. [MHz]	MCS Number	Ant	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Remark
						[dBm]	Total [dBm]	
5280	8	Ant0	3.78	2.87	10.13	16.78	19.25	*
		Ant1	2.66	2.87	10.09	15.62		
5280	9	Ant0	3.30	2.87	10.13	16.30	18.74	
		Ant1	2.12	2.87	10.09	15.08		
5280	10	Ant0	2.91	2.87	10.13	15.91	18.34	
		Ant1	1.69	2.87	10.09	14.65		
5280	11	Ant0	2.52	2.87	10.13	15.52	17.97	
		Ant1	1.35	2.87	10.09	14.31		
5280	12	Ant0	1.98	2.87	10.13	14.98	17.51	
		Ant1	0.99	2.87	10.09	13.95		
5280	13	Ant0	1.53	2.87	10.13	14.53	17.06	
		Ant1	0.54	2.87	10.09	13.50		
5280	14	Ant0	1.35	2.87	10.13	14.35	16.92	
		Ant1	0.47	2.87	10.09	13.43		
5280	15	Ant0	1.21	2.87	10.13	14.21	16.67	
		Ant1	0.07	2.87	10.09	13.03		

*:Worst data rate

All comparison were carried out on same frequency and measurement factors.

AVG, IEEE802.11n-20 MIMO, MCS8

Freq. [MHz]	Antenna 0 Result [mW]	Antenna 1 Result [mW]	Result	
			[dBm]	[mW]
5260	48.31	38.28	19.37	86.59
5280	47.64	36.48	19.25	84.12
5300	43.95	32.81	18.85	76.76
5320	29.99	21.43	17.11	51.42

*:SAR test channel

Sample Calculation:

Result = Antenna 0 + 1

Antenna 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
5260	3.95	2.76	10.13	16.84	48.31
5280	3.78	2.87	10.13	16.78	47.64
5300	3.24	3.06	10.13	16.43	43.95
5320	1.47	3.17	10.13	14.77	29.99

Antenna 1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
5260	2.98	2.76	10.09	15.83	38.28
5280	2.66	2.87	10.09	15.62	36.48
5300	2.01	3.06	10.09	15.16	32.81
5320	0.05	3.17	10.09	13.31	21.43

AVG, [IEEE802.11n-40 MIMO, 5270-5310MHz band] Rate Check

Freq. [MHz]	MCS Number	Ant	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Remark
						[dBm]	Total [dBm]	
5270	8	Ant0	2.76	2.75	10.13	15.64	18.07	*
		Ant1	1.56	2.75	10.09	14.40		
5270	9	Ant0	2.60	2.75	10.13	15.48	17.53	
		Ant1	0.44	2.75	10.09	13.28		
5270	10	Ant0	1.35	2.75	10.13	14.23	16.74	
		Ant1	0.33	2.75	10.09	13.17		
5270	11	Ant0	0.98	2.75	10.13	13.86	16.29	
		Ant1	-0.23	2.75	10.09	12.61		
5270	12	Ant0	0.21	2.75	10.13	13.09	15.59	
		Ant1	-0.84	2.75	10.09	12.00		
5270	13	Ant0	-0.15	2.75	10.13	12.73	15.19	
		Ant1	-1.29	2.75	10.09	11.55		
5270	14	Ant0	-0.27	2.75	10.13	12.61	15.06	
		Ant1	-1.43	2.75	10.09	11.41		
5270	15	Ant0	-0.42	2.75	10.13	12.46	14.94	
		Ant1	-1.52	2.75	10.09	11.32		

5270 : Worst data rate

All comparison were carried out on same frequency and measurement factors.

AVG, IEEE802.11n-40 MIMO, MCS8

Freq. [MHz]	Antenna 0 Result [mW]	Antenna 1 Result [mW]	Result	
			[dBm]	[mW]
5270	36.64	27.54	18.07	64.19
5310	16.79	11.51	14.52	28.30

5270 : SAR test channel

Sample Calculation:

Result = Antenna 0 + 1

Antenna 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
5270	2.76	2.75	10.13	15.64	36.64
5310	-0.85	2.97	10.13	12.25	16.79

Antenna 1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
5270	1.56	2.75	10.09	14.40	27.54
5310	-2.45	2.97	10.09	10.61	11.51

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator

14) WLAN (11a/n(5500-5700MHz):

[IEEE802.11a 5500-5700MHz band] Rate Check

Rate [Mbps]	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
6.0	5580	6.80	2.93	10.14	19.87	97.05
9.0	5580	6.66	2.93	10.14	19.73	93.97
12.0	5580	6.54	2.93	10.14	19.61	91.41
18.0	5580	6.31	2.93	10.14	19.38	86.70
24.0	5580	6.11	2.93	10.14	19.18	82.79
36.0	5580	5.75	2.93	10.14	18.82	76.21
48.0	5580	5.40	2.93	10.14	18.47	70.31
54.0	5580	5.26	2.93	10.14	18.33	68.08

: Worst data rate

[IEEE802.11a 5500-5700MHz band] band 6Mbps

Ch	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
100	5500	3.19	2.99	10.14	16.32	42.85
104	5520	6.67	3.05	10.14	19.86	96.83
108	5540	6.71	3.03	10.14	19.88	97.27
112	5560	6.74	2.99	10.14	19.87	97.05
116	5580	6.80	2.93	10.14	19.87	97.05
120	5600	6.70	2.93	10.14	19.77	94.84
124	5620	6.87	2.79	10.14	19.80	95.50
128	5640	6.79	2.93	10.14	19.86	96.83
132	5660	6.55	3.18	10.14	19.87	97.05
136	5680	6.37	3.35	10.14	19.86	96.83
140	5700	3.98	3.27	10.14	17.39	54.83

Sample Calculation: Result = Reading + Cable Loss + Attenuator

: SAR test channel

[IEEE802.11n-20 5500-5700MHz band] Rate Check

Rate [Mbps]	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
MCS0	5580	6.64	2.93	10.14	19.71	93.54
MCS1	5580	6.36	2.93	10.14	19.43	87.70
MCS2	5580	6.06	2.93	10.14	19.13	81.85
MCS3	5580	5.86	2.93	10.14	18.93	78.16
MCS4	5580	5.45	2.93	10.14	18.52	71.12
MCS5	5580	5.15	2.93	10.14	18.22	66.37
MCS6	5580	5.01	2.93	10.14	18.08	64.27
MCS7	5580	4.84	2.93	10.14	17.91	61.80

Worst data rate

[IEEE802.11n-20 5500-5700MHz band] band MCS0

Ch	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
100	5500	3.25	2.99	10.14	16.38	43.45
104	5520	6.57	3.05	10.14	19.76	94.62
108	5540	6.53	3.03	10.14	19.70	93.33
112	5560	6.69	2.99	10.14	19.82	95.94
116	5580	6.64	2.93	10.14	19.71	93.54
120	5600	6.76	2.83	10.14	19.73	93.97
124	5620	6.90	2.79	10.14	19.83	96.16
128	5640	6.70	2.93	10.14	19.77	94.84
132	5660	6.05	3.18	10.14	19.37	86.50
136	5680	6.35	3.35	10.14	19.84	96.38
140	5700	3.86	3.27	10.14	17.27	53.33

Sample Calculation: Result = Reading + Cable Loss + Attenuator

SAR test channel * : This channel was tested instead of an adjacent "default test channel".

[IEEE802.11n-40 5510-5670MHz band] Rate Check

Rate [Mbps]	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
MCS0	5590	3.85	2.88	10.14	16.87	48.64
MCS1	5590	3.41	2.88	10.14	16.43	43.95
MCS2	5590	3.00	2.88	10.14	16.02	39.99
MCS3	5590	2.53	2.88	10.14	15.55	35.89
MCS4	5590	2.07	2.88	10.14	15.09	32.28
MCS5	5590	1.62	2.88	10.14	14.64	29.11
MCS6	5590	1.33	2.88	10.14	14.35	27.23
MCS7	5590	1.16	2.88	10.14	14.18	26.18

MCS0 : Worst data rate

[IEEE802.11n-40 5500-5700MHz band] band MCS0

Ch	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
102	5510	-0.04	3.04	10.14	13.14	20.61
110	5550	3.26	3.02	10.14	16.42	43.85
118	5590	3.85	2.88	10.14	16.87	48.64
126	5630	3.73	2.83	10.14	16.70	46.77
134	5670	3.25	3.29	10.14	16.68	46.56

Sample Calculation: Result = Reading + Cable Loss + Attenuator

AVG, [IEEE802.11n-20 MIMO, 5500-5700MHz band] Rate Check

Freq. [MHz]	MCS Number	Ant	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Remark
						[dBm]	Total [dBm]	
5580	8	Ant0	5.47	2.93	10.14	18.54	21.11	*
		Ant1	4.59	2.93	10.10	17.62		
5580	9	Ant0	4.91	2.93	10.14	17.98	20.55	
		Ant1	4.03	2.93	10.10	17.06		
5580	10	Ant0	4.47	2.93	10.14	17.54	20.15	
		Ant1	3.66	2.93	10.10	16.69		
5580	11	Ant0	4.17	2.93	10.14	17.24	19.81	
		Ant1	3.28	2.93	10.10	16.31		
5580	12	Ant0	3.62	2.93	10.14	16.69	19.27	
		Ant1	2.75	2.93	10.10	15.78		
5580	13	Ant0	3.19	2.93	10.14	16.26	18.82	
		Ant1	2.28	2.93	10.10	15.31		
5580	14	Ant0	3.04	2.93	10.14	16.11	18.67	
		Ant1	2.13	2.93	10.10	15.16		
5580	15	Ant0	2.84	2.93	10.14	15.91	18.49	
		Ant1	1.98	2.93	10.10	15.01		

*: Worst data rate

All comparison were carried out on same frequency and measurement factors.

AVG, IEEE802.11n-20 MIMO, MCS8

Freq. [MHz]	Antenna 0 Result [mW]	Antenna 1 Result [mW]	Result	
			[dBm]	[mW]
5500	29.31	21.83	17.09	51.14
5520	71.12	58.61	21.13	129.74
5540	69.98	57.68	21.06	127.66
5560	71.78	58.34	21.14	130.12
5580	71.45	57.81	21.11	129.26
5600	68.39	56.89	20.98	125.28
5620	66.53	56.10	20.89	122.63
5640	68.39	58.48	21.03	126.87
5660	49.32	41.98	19.60	91.29
5680	68.87	59.43	21.08	128.29
5700	22.91	19.05	16.23	41.96

:SAR test channel

Sample Calculation:

Result = Antenna 0 + 1

Antenna 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
5500	1.54	2.99	10.14	14.67	29.31
5520	5.33	3.05	10.14	18.52	71.12
5540	5.28	3.03	10.14	18.45	69.98
5560	5.43	2.99	10.14	18.56	71.78
5580	5.47	2.93	10.14	18.54	71.45
5600	5.38	2.83	10.14	18.35	68.39
5620	5.30	2.79	10.14	18.23	66.53
5640	5.28	2.93	10.14	18.35	68.39
5660	3.61	3.18	10.14	16.93	49.32
5680	4.89	3.35	10.14	18.38	68.87
5700	0.19	3.27	10.14	13.60	22.91

Antenna 1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
5500	0.30	2.99	10.10	13.39	21.83
5520	4.53	3.05	10.10	17.68	58.61
5540	4.48	3.03	10.10	17.61	57.68
5560	4.57	2.99	10.10	17.66	58.34
5580	4.59	2.93	10.10	17.62	57.81
5600	4.62	2.83	10.10	17.55	56.89
5620	4.60	2.79	10.10	17.49	56.10
5640	4.64	2.93	10.10	17.67	58.48
5660	2.95	3.18	10.10	16.23	41.98
5680	4.29	3.35	10.10	17.74	59.43
5700	-0.57	3.27	10.10	12.80	19.05

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator

AVG, [IEEE802.11n-40 MIMO, 5510-5670MHz band] Rate Check

Freq. [MHz]	MCS Number	Ant	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Remark
						[dBm]	[dBm]	
5590	8	Ant0	2.31	2.88	10.14	15.33	17.81	*
		Ant1	1.21	2.88	10.10	14.19		
5590	9	Ant0	1.61	2.88	10.14	14.63	17.15	
		Ant1	0.61	2.88	10.10	13.59		
5590	10	Ant0	1.04	2.88	10.14	14.06	16.57	
		Ant1	0.01	2.88	10.10	12.99		
5590	11	Ant0	0.70	2.88	10.14	13.72	16.18	
		Ant1	-0.43	2.88	10.10	12.55		
5590	12	Ant0	-0.07	2.88	10.14	12.95	15.47	
		Ant1	-1.08	2.88	10.10	11.90		
5590	13	Ant0	-0.43	2.88	10.14	12.59	15.10	
		Ant1	-1.46	2.88	10.10	11.52		
5590	14	Ant0	-0.53	2.88	10.14	12.49	14.95	
		Ant1	-1.66	2.88	10.10	11.32		
5590	15	Ant0	-0.81	2.88	10.14	12.21	14.73	
		Ant1	-1.82	2.88	10.10	11.16		

5590 : Worst data rate

All comparison were carried out on same frequency and measurement factors.

AVG, IEEE802.11n-40 MIMO, MCS8

Freq. [MHz]	Antenna 0	Antenna 1	Result	
	Result [mW]	Result [mW]	[dBm]	[mW]
5510	14.72	10.54	14.03	25.27
5550	33.57	25.47	17.71	59.04
5590	34.12	26.24	17.81	60.36
5630	34.28	27.29	17.89	61.57
5670	23.33	18.54	16.22	41.87

5630 : SAR test channel

Sample Calculation:

Result = Antenna 0 + 1

Antenna 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
5510	-1.50	3.04	10.14	11.68	14.72
5550	2.10	3.02	10.14	15.26	33.57
5590	2.31	2.88	10.14	15.33	34.12
5630	2.38	2.83	10.14	15.35	34.28
5670	0.25	3.29	10.14	13.68	23.33

Antenna 1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
5510	-2.91	3.04	10.10	10.23	10.54
5550	0.94	3.02	10.10	14.06	25.47
5590	1.21	2.88	10.10	14.19	26.24
5630	1.43	2.83	10.10	14.36	27.29
5670	-0.71	3.29	10.10	12.68	18.54

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator

15) WLAN (11a/n(5745-5825MHz):

[IEEE802.11a 5745-5825MHz band] Rate Check

Rate [Mbps]	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
6.0	5785.0	6.13	3.34	10.14	19.61	91.41
9.0	5785.0	6.03	3.34	10.14	19.51	89.33
12.0	5785.0	5.84	3.34	10.14	19.32	85.51
18.0	5785.0	5.61	3.34	10.14	19.09	81.10
24.0	5785.0	5.46	3.34	10.14	18.94	78.34
36.0	5785.0	5.01	3.34	10.14	18.49	70.63
48.0	5785.0	4.70	3.34	10.14	18.18	65.77
54.0	5785.0	4.56	3.34	10.14	18.04	63.68

: Worst data rate

IEEE802.11a 5745-5825MHz band 6Mbps

Ch	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
149	5745.0	6.03	3.10	10.14	19.27	84.53
153	5765.0	6.24	3.27	10.14	19.65	92.26
157	5785.0	6.13	3.34	10.14	19.61	91.41
161	5805.0	6.31	3.22	10.14	19.67	92.68
165	5825.0	6.13	3.04	10.14	19.31	85.31

Sample Calculation: Result = Reading + Cable Loss + Attenuator

: SAR test channel

[IEEE802.11n-20 5745-5825MHz band] Rate Check

Rate [Mbps]	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
MCS0	5785.0	6.07	3.34	10.14	19.55	90.16
MCS1	5785.0	5.78	3.34	10.14	19.26	84.33
MCS2	5785.0	5.43	3.34	10.14	18.91	77.80
MCS3	5785.0	5.26	3.34	10.14	18.74	74.82
MCS4	5785.0	4.89	3.34	10.14	18.37	68.71
MCS5	5785.0	4.56	3.34	10.14	18.04	63.68
MCS6	5785.0	4.47	3.34	10.14	17.95	62.37
MCS7	5785.0	4.24	3.34	10.14	17.72	59.16

MCS0 : Worst data rate

IEEE802.11n-20 5745-5825MHz band MCS0

Ch	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
149	5745.0	6.01	3.10	10.14	19.25	84.14
153	5765.0	6.21	3.27	10.14	19.62	91.62
157	5785.0	6.07	3.34	10.14	19.55	90.16
161	5805.0	6.33	3.22	10.14	19.69	93.11
165	5825.0	6.03	3.04	10.14	19.21	83.37

Sample Calculation: Result = Reading + Cable Loss + Attenuator

[IEEE802.11n-40 5755-5795MHz band] Rate Check

Rate [Mbps]	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
MCS0	5755.0	6.18	3.19	10.14	19.51	89.33
MCS1	5755.0	5.66	3.19	10.14	18.99	79.25
MCS2	5755.0	5.19	3.19	10.14	18.52	71.12
MCS3	5755.0	4.95	3.19	10.14	18.28	67.30
MCS4	5755.0	4.24	3.19	10.14	17.57	57.15
MCS5	5755.0	3.93	3.19	10.14	17.26	53.21
MCS6	5755.0	3.72	3.19	10.14	17.05	50.70
MCS7	5755.0	3.62	3.19	10.14	16.95	49.55

: Worst data rate

IEEE802.11n-40 5755-5795MHz band MCS0

Ch	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
151	5755.0	6.18	3.19	10.14	19.51	89.33
159	5795.0	6.11	3.30	10.14	19.55	90.16

Sample Calculation: Result = Reading + Cable Loss + Attenuator

AVG, [IEEE802.11n-20 MIMO, 5745-5825MHz band] Rate Check

Freq. [MHz]	MCS Number	Ant	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Remark
						[dBm]	Total [dBm]	
5785	8	Ant0	5.24	3.34	10.14	18.72	21.42	*
		Ant1	4.62	3.34	10.11	18.07		
5785	9	Ant0	4.91	3.34	10.14	18.39	21.04	
		Ant1	4.19	3.34	10.11	17.64		
5785	10	Ant0	4.46	3.34	10.14	17.94	20.57	
		Ant1	3.70	3.34	10.11	17.15		
5785	11	Ant0	4.13	3.34	10.14	17.61	20.29	
		Ant1	3.48	3.34	10.11	16.93		
5785	12	Ant0	3.63	3.34	10.14	17.11	19.75	
		Ant1	2.88	3.34	10.11	16.33		
5785	13	Ant0	3.10	3.34	10.14	16.58	19.30	
		Ant1	2.53	3.34	10.11	15.98		
5785	14	Ant0	2.97	3.34	10.14	16.45	19.13	
		Ant1	2.31	3.34	10.11	15.76		
5785	15	Ant0	2.79	3.34	10.14	16.27	18.93	
		Ant1	2.09	3.34	10.11	15.54		

*:Worst data rate

All comparison were carried out on same frequency and measurement factors.

AVG, IEEE802.11n-20 MIMO, MCS8

Freq. [MHz]	Antenna 0 Result [mW]	Antenna 1 Result [mW]	Result	
			[dBm]	[mW]
5745	68.39	59.84	21.08	128.23
5765	74.30	64.27	21.42	138.57
5785	74.47	64.12	21.42	138.59
5805	72.78	63.24	21.34	136.02
5825	66.99	58.21	20.98	125.20

*:SAR test channel

Sample Calculation:

Result = Antenna 0 + 1

Antenna 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
5745	5.11	3.10	10.14	18.35	68.39
5765	5.30	3.27	10.14	18.71	74.30
5785	5.24	3.34	10.14	18.72	74.47
5805	5.26	3.22	10.14	18.62	72.78
5825	5.08	3.04	10.14	18.26	66.99

Antenna 1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
5745	4.56	3.10	10.11	17.77	59.84
5765	4.70	3.27	10.11	18.08	64.27
5785	4.62	3.34	10.11	18.07	64.12
5805	4.68	3.22	10.11	18.01	63.24
5825	4.50	3.04	10.11	17.65	58.21

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator

AVG, [IEEE802.11n-40 MIMO, 5755-5795MHz band] Rate Check

Freq. [MHz]	MCS Number	Ant	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Remark
						[dBm]	[dBm]	
5755	8	Ant0	4.39	3.19	10.14	17.72	20.46	*
		Ant1	3.86	3.19	10.11	17.16		
5755	9	Ant0	3.56	3.19	10.14	16.89	19.66	
		Ant1	3.09	3.19	10.11	16.39		
5755	10	Ant0	3.03	3.19	10.14	16.36	19.13	
		Ant1	2.57	3.19	10.11	15.87		
5755	11	Ant0	2.59	3.19	10.14	15.92	18.70	
		Ant1	2.15	3.19	10.11	15.45		
5755	12	Ant0	1.91	3.19	10.14	15.24	17.99	
		Ant1	1.40	3.19	10.11	14.70		
5755	13	Ant0	1.52	3.19	10.14	14.85	17.63	
		Ant1	1.08	3.19	10.11	14.38		
5755	14	Ant0	1.41	3.19	10.14	14.74	17.51	
		Ant1	0.95	3.19	10.11	14.25		
5755	15	Ant0	1.28	3.19	10.14	14.61	17.38	
		Ant1	0.82	3.19	10.11	14.12		

*: Worst data rate

All comparison were carried out on same frequency and measurement factors.

AVG, IEEE802.11n-40 MIMO, MCS8

Freq. [MHz]	Antenna 0 Result [mW]	Antenna 1 Result [mW]	Result	
			[dBm]	[mW]
5755	59.16	52.00	20.46	111.16
5795	61.66	53.09	20.60	114.75

*: SAR test channel

Sample Calculation:

Result = Antenna 0 + 1

Antenna 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
5755	4.39	3.19	10.14	17.72	59.16
5795	4.46	3.30	10.14	17.90	61.66

Antenna 1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
5755	3.86	3.19	10.11	17.16	52.00
5795	3.84	3.30	10.11	17.25	53.09

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator

5.3 Detail for Power tolerance

Mode	Measured average power deviation		Tune-up tolerance*	
	Reduction power [dB]	Normal [dB]	Reduction power [dB]	Normal [dB]
GSM850 GPRS 2slots(CS1)	20.10 to 20.23	25.03 to 25.80	20.00 to 22.00	24.14 to 26.14
PCS1900 GPRS 2slots(CS1)	20.24 to 20.39	22.78 to 23.05	20.23 to 22.23	21.35 to 23.35
WCDMA band V 12.2k RMC	21.53 to 21.83	23.13 to 23.35	20.5 to 22.5	22.5 to 24.5
WCDMA band II 12.2k RMC	21.59 to 21.99	23.06 to 23.41	20.5 to 22.5	22.5 to 24.5
LTE band IV (1RB)	20.90 to 21.27	23.48 to 23.71	20.0 to 22.0	22.0 to 24.0
LTE band IV (50%RB)	20.77 to 20.99	22.38 to 22.70	19.0 to 21.0	21.0 to 23.0
LTE band XVII (1RB)	20.53 to 21.16	22.71 to 23.19	20.0 to 22.0	22.0 to 24.0
LTE band XVII (50%RB)	20.85 to 20.99	21.89 to 22.24	19.0 to 21.0	21.0 to 23.0
WLAN 11a/b/g/n	Power reduction is not implemented for WLAN			
Bluetooth	Power reduction is not implemented for Bluetooth			

From the above sheet, all measured power is in tune-up tolerance.

* The value which added the difference of tune-up tolerance upper limit of average burst power and measured average burst power to measured time average power is made into the tune-up tolerance upper limit of time average power.

5.4 SAR testing operating modes

The operating mode for SAR testing was decided by the output power

1) SAR measurement for GSM and W-CDMA

Band	Crest factor	Mode	Test Frequency	Note
GSM850	8.3	GSM GPRS (CS-1) 1 slots	836.6MHz(190ch)	
PCS1900	8.3	GSM GPRS (CS-1) 1 slots	1880.0MHz(661ch)	
WCDMA band V	1	12.2k RMC	836.6MHz(4183ch)	
WCDMA band II	1	12.2k RMC	1852.4MHz(9262ch) 1880.0MHz(9400ch) 1907.6MHz(9538ch)	
Setting				
The communication link was set up with the Wireless Communications Test Set(Agilent M/N: E5515C). The EUT was command to operate at maximum transmit power. GSM850 :PCL 5 PCS1900 :PCL 0 W-CDMA :All up bits				

2) SAR measurement for LTE

Band	Crest factor	Mode	Test Frequency	Note
LTE band IV	1	QPSK (20MHz band width)	1720.0MHz(20050ch) 1732.5MHz(20175ch) 1745.0MHz(20300ch)	
LTE band XVII	1	QPSK (10MHz band width)	710.0MHz(23790ch) 711.0MHz(23800ch)	
Setting				
The communication link was set up with the Wireless Communications Test Set(Rohde & Schwarz M/N: CMW500). The EUT was command to operate at maximum transmit power. LTE :All up bits				

3) SAR measurement for WLAN

Decision of SAR test channel

The operating mode for SAR testing was decided by the output power

The average output power for 802.11a was measured on all channels in each frequency band.

Mode	GHz	Channel	"Default Test Channel"		UNII		
			FCC 15.247				
			802.11b	802.11g			
802.11 b/g/n20	2.412	1	√	Δ			
	2.437	6	√	Δ			
	2.462	11	√	Δ			
802.11a/n20	5.18	36			√		
	5.20	40				*	
	5.22	44				*	
	5.24	48			√		
	5.26	52			√		
	5.28	56				*	
	5.30	60				*	
	5.32	64			√		
	5.50	100				*	
	5.52	104			√		
	5.54	108				*	
	5.56	112				*	
	5.58	116			√		
	5.60	120				*	
	5.62	124			√		
	5.64	128				*	
	5.66	132				*	
	5.68	136			√		
	5.70	140				*	
	UNII or FCC 15.247	5.745	149	√		√	
		5.765	153		*		*
5.785		157	√			*	
5.805		161		*	√		
FCC 15.247	5.825	165	√				
802.11n40	5.19	38			√		
	5.23	46			√		
	5.27	54			√		
	5.31	62			√		
	5.51	102			√		
	5.55	110			√		
	5.59	118				*	
	5.63	126			√		
	5.67	134			√		
	UNII or FCC 15.247	5.755	151	√		√	
5.795		159	√		√		

√ = "default test channels"

* = Possible 802.11a channels with maximum average output > the "default test channels"

Δ = Possible 802.11g channels with maximum average output ¼ dB ≥ the "default test channels"

Mode	Test Frequency	Modulation	Crest factor	Note
IEEE802.11b	2437MHz(6ch)	DBPSK(1Mbps)	1	
IEEE802.11g	2437MHz(6ch)	BPSK(6Mbps)	1	
IEEE802.11n20 (2.4G)	2437MHz(6ch)	BPSK(MCS0) BPSK(MCS8)	1	
IEEE802.11n40 (2.4G)	2437MHz(6ch)	BPSK(MCS0) BPSK(MCS8)	1	
IEEE802.11a	5220MHz(44ch) 5240MHz(48ch) 5300MHz(60ch) 5540MHz(108ch) 5805MHz(161ch)	BPSK(6Mbps)	1	
IEEE802.11n20 (5G)	5240MHz(48ch) 5260MHz(52ch) 5520MHz(104ch) 5560MHz(112ch) 5620MHz(124ch) 5640MHz(128ch) 5680MHz(136ch) 5765MHz(153ch) 5785MHz(157ch) 5805MHz(161ch)	BPSK(MCS0) BPSK(MCS8)	1	
IEEE802.11n40 (5G)	5230MHz(46ch) 5270MHz(54ch) 5590MHz(118ch) 5630MHz(126ch) 5755MHz(151ch) 5795MHz(159ch)	BPSK(MCS0) BPSK(MCS8)	1	

Setting

WLAN

*Power of the EUT was set by the software as follows;

Software: 43241_B4_mfg_tool_package, Version 1.3

Power settings: Refer to clause 5.1 WLAN setting

*This setting of software is the worst case.

Any conditions under the normal use do not exceed the condition of setting.

In addition, end users cannot change the settings of the output power of the product.

*This setting of software is the worst case.

Any conditions under the normal use do not exceed the condition of setting.

In addition, end users cannot change the settings of the output power of the product.

5.5 Confirmation after SAR testing

It was checked that the power drift [W] is within +/-5%. The verification of power drift during the SAR test is that DASY5 system calculates the power drift by measuring the e-field at the same location at beginning and the end of the scan measurement for each test position.

DASY5 system calculation Power drift value[dB] = $20\log(E_a)/(E_b)$
Before SAR testing : E_b [V/m]
After SAR testing : E_a [V/m]

Limit of power drift[W] = +/-5%
 $X[\text{dB}] = 10\log[P] = 10\log(1.05/1) = 10\log(1.05) - 10\log(1) = 0.212\text{dB}$

from E-field relations with power.

$$p = E^2/\eta = E^2/$$

Therefore, The correlation of power and the E-field

$$X_{\text{dB}} = 10\log(P) = 10\log(E)^2 = 20\log(E)$$

Therefore,

The calculated power drift of DASY5 System must be the less than +/-0.212dB.

SECTION 6 SAR test exclusion considerations

6.1 Standalone SAR test exclusion considerations

1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$$

for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

$f(\text{GHz})$ is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation¹⁷

The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

WWAN GSM850

Standalone SAR tested	Position	Upper frequency of band *1	Maximum tune-up tolerance limit *5	Min distance *2	Calculation of exclusion *3
<input checked="" type="checkbox"/>	Top	848.8 [MHz] (251ch)	26.14 [dBm] 411.15 [mW]	5 [mm]	75.8
<input checked="" type="checkbox"/>	Left side	848.8 [MHz] (251ch)	26.14 [dBm] 411.15 [mW]	5 [mm]	75.8
<input checked="" type="checkbox"/>	Rear	848.8 [MHz] (251ch)	26.14 [dBm] 411.15 [mW]	20.0 [mm]	18.9

WWAN PCS1900

Standalone SAR tested	Position	Upper frequency of band *1	Maximum tune-up tolerance limit *5	Min distance *2	Calculation of exclusion *3
<input checked="" type="checkbox"/>	Top	1909.8 [MHz] (810ch)	23.32 [dBm] 214.78 [mW]	5 [mm]	59.4
<input checked="" type="checkbox"/>	Left side	1909.8 [MHz] (810ch)	23.32 [dBm] 214.78 [mW]	5 [mm]	59.4
<input checked="" type="checkbox"/>	Rear	1909.8 [MHz] (810ch)	23.32 [dBm] 214.78 [mW]	20.0 [mm]	14.8

WWAN WCDMA V

Standalone SAR tested	Position	Upper frequency of band *1	Maximum tune-up tolerance limit *5	Min distance *2	Calculation of exclusion *3
<input checked="" type="checkbox"/>	Top	846.6 [MHz] (4233ch)	24.5 [dBm] 281.84 [mW]	5 [mm]	51.9
<input checked="" type="checkbox"/>	Left side	846.6 [MHz] (4233ch)	24.5 [dBm] 281.84 [mW]	5 [mm]	51.9
<input checked="" type="checkbox"/>	Rear	846.6 [MHz] (4233ch)	24.5 [dBm] 281.84 [mW]	20.0 [mm]	13.0

WWAN WCDMA II

Standalone SAR tested	Position	Upper frequency of band *1	Maximum tune-up tolerance limit *5	Min distance *2	Calculation of exclusion *3
<input checked="" type="checkbox"/>	Top	1907.6 [MHz] (9538ch)	24.5 [dBm] 281.84 [mW]	5 [mm]	77.9
<input checked="" type="checkbox"/>	Left side	1907.6 [MHz] (9538ch)	24.5 [dBm] 281.84 [mW]	5 [mm]	77.9
<input checked="" type="checkbox"/>	Rear	1907.6 [MHz] (9538ch)	24.5 [dBm] 281.84 [mW]	20.0 [mm]	19.5

WWAN LTE IV

Standalone SAR tested	Position	Upper frequency of band *1	Maximum tune-up tolerance limit *5	Min distance *2	Calculation of exclusion *3
<input checked="" type="checkbox"/>	Top	1754.3 [MHz] (20393ch)	24 [dBm] 251.19 [mW]	5 [mm]	66.5
<input checked="" type="checkbox"/>	Left side	1754.3 [MHz] (20393ch)	24 [dBm] 251.19 [mW]	5 [mm]	66.5
<input checked="" type="checkbox"/>	Rear	1754.3 [MHz] (20393ch)	24 [dBm] 251.19 [mW]	20.0 [mm]	16.6

WWAN LTE XVII

Standalone SAR tested	Position	Upper frequency of band *1	Maximum tune-up tolerance limit *5	Min distance *2	Calculation of exclusion *3
<input checked="" type="checkbox"/>	Top	711 [MHz] (23800ch)	24 [dBm] 251.19 [mW]	5 [mm]	42.4
<input checked="" type="checkbox"/>	Left side	711 [MHz] (23800ch)	24 [dBm] 251.19 [mW]	5 [mm]	42.4
<input checked="" type="checkbox"/>	Rear	711 [MHz] (23800ch)	24 [dBm] 251.19 [mW]	20.0 [mm]	10.6

Ant.0 WLAN 2.4GHz

Band	Standalone SAR tested	Position	Mode	Upper frequency of band *1	Maximum tune-up tolerance limit *6	Min distance *2	Calculation of exclusion *3
WLAN(2.4 GHz band)	<input checked="" type="checkbox"/>	Right side	11n 20M BPSK(MCS0)	2462 [MHz] (11ch)	18.62 [dBm] 72.78 [mW]	6 [mm]	19.0
WLAN(2.4 GHz band)	<input checked="" type="checkbox"/>	Rear	11n 20M BPSK(MCS0)	2462 [MHz] (11ch)	18.62 [dBm] 72.78 [mW]	13.0 [mm]	8.8

Ant.0 WLAN 5GHz

Band	Standalone SAR tested	Position	Mode	Upper frequency of band *1	Maximum tune-up tolerance limit *6	Min distance *2	Calculation of exclusion *3
WLAN(5G Hz band)	<input checked="" type="checkbox"/>	Right side	11a BPSK(6Mbps)	5825 [MHz] (165ch)	20.16 [dBm] 103.75 [mW]	6 [mm]	41.7
WLAN(5G Hz band)	<input checked="" type="checkbox"/>	Rear	11a BPSK(6Mbps)	5825 [MHz] (165ch)	20.16 [dBm] 103.75 [mW]	13.0 [mm]	19.3

Ant.1 WLAN 2.4GHz

Band	Standalone SAR tested	Position	Mode	Upper frequency of band *1	Maximum tune-up tolerance limit *6	Min distance *2	Calculation of exclusion *3
WLAN(2.4 GHz band)	<input checked="" type="checkbox"/>	Right side	11n 20M BPSK(MCS8)	2462 [MHz] (11ch)	19.13 [dBm] 81.85 [mW]	5 [mm]	25.7
WLAN(2.4 GHz band)	<input checked="" type="checkbox"/>	Rear	11n 20M BPSK(MCS8)	2462 [MHz] (11ch)	19.13 [dBm] 81.85 [mW]	11.0 [mm]	11.7
WLAN(2.4 GHz band)	<input checked="" type="checkbox"/>	Bottom side	11n 20M BPSK(MCS8)	2462 [MHz] (11ch)	19.13 [dBm] 81.85 [mW]	20.0 [mm]	6.4
WLAN(2.4 GHz band)	<input checked="" type="checkbox"/>	Bottom(Laptop)	11n 20M BPSK(MCS8)	2462 [MHz] (11ch)	19.13 [dBm] 81.85 [mW]	30 [mm]	4.3

Ant.1 WLAN 5GHz

Band	Standalone SAR tested	Position	Mode	Upper frequency of band *1	Maximum tune-up tolerance limit *6	Min distance *2	Calculation of exclusion *3
WLAN(5G Hz band)	<input checked="" type="checkbox"/>	Right side	11n 20M BPSK(MCS8)	5825 [MHz] (165ch)	21.96 [dBm] 157.04 [mW]	5 [mm]	75.8
WLAN(5G Hz band)	<input checked="" type="checkbox"/>	Rear	11n 20M BPSK(MCS8)	5825 [MHz] (165ch)	21.96 [dBm] 157.04 [mW]	11.0 [mm]	34.5
WLAN(5G Hz band)	<input checked="" type="checkbox"/>	Bottom side	11n 20M BPSK(MCS8)	5825 [MHz] (165ch)	21.96 [dBm] 157.04 [mW]	20.0 [mm]	19.0
WLAN(5G Hz band)	<input checked="" type="checkbox"/>	Bottom(Laptop)	11n 20M BPSK(MCS8)	5825 [MHz] (165ch)	21.96 [dBm] 157.04 [mW]	30 [mm]	12.6

Bluetooth

Standalone SAR tested	Positiom	Upper frequency of band *1	Maximum tune-up tolerance limit *7	Min distance *2	Calculation of exclusion *3
<input type="checkbox"/>	Right side	2480 [MHz] (79ch)	10.01 [dBm] 10.02 [mW]	6 [mm]	2.6
<input type="checkbox"/>	Rear	2480 [MHz] (79ch)	10.01 [dBm] 10.02 [mW]	13.0 [mm]	1.2

2) At 100 MHz to 6 GHz and for *test separation distances* > 50 mm, the SAR test exclusion threshold is determined according to the following.

- a) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·(f(MHz)/150)] mW, at 100 MHz to 1500 MHz
b) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·10] mW at > 1500 MHz and ≤ 6 GHz

WWAN GSM850

Standalone SAR tested	Positiom	Upper frequency of band *1	Maximum tune-up tolerance limit *5	Min distance *2	Calculation of threshold*4
<input type="checkbox"/>	Bottom side	848.8 [MHz] (251ch)	26.14 [dBm] 411.15 [mW]	200 [mm]	1011.6 [mW]
<input type="checkbox"/>	Right side	848.8 [MHz] (251ch)	26.14 [dBm] 411.15 [mW]	238 [mm]	1226.6 [mW]
<input type="checkbox"/>	Bottom(Laptop)	848.8 [MHz] (251ch)	26.14 [dBm] 411.15 [mW]	155 [mm]	757.0 [mW]

WWAN PCS1900

Standalone SAR tested	Positiom	Upper frequency of band *1	Maximum tune-up tolerance limit *5	Min distance *2	Calculation of threshold*4
<input type="checkbox"/>	Bottom side	1909.8 [MHz] (810ch)	23.32 [dBm] 214.78 [mW]	200 [mm]	1608.5 [mW]
<input type="checkbox"/>	Right side	1909.8 [MHz] (810ch)	23.32 [dBm] 214.78 [mW]	238 [mm]	1988.5 [mW]
<input type="checkbox"/>	Bottom(Laptop)	1909.8 [MHz] (810ch)	23.32 [dBm] 214.78 [mW]	155 [mm]	1158.5 [mW]

WWAN WCDMA V

Standalone SAR tested	Positiom	Upper frequency of band *1	Maximum tune-up tolerance limit *5	Min distance *2	Calculation of threshold*4
<input type="checkbox"/>	Bottom side	846.6 [MHz] (4233ch)	24.5 [dBm] 281.84 [mW]	200 [mm]	1009.6 [mW]
<input type="checkbox"/>	Right side	846.6 [MHz] (4233ch)	24.5 [dBm] 281.84 [mW]	238 [mm]	1224.1 [mW]
<input type="checkbox"/>	Bottom(Laptop)	846.6 [MHz] (4233ch)	24.5 [dBm] 281.84 [mW]	155 [mm]	755.6 [mW]

WWAN WCDMA II

Standalone SAR tested	Positiom	Upper frequency of band *1	Maximum tune-up tolerance limit *5	Min distance *2	Calculation of threshold*4
<input type="checkbox"/>	Bottom side	1907.6 [MHz] (9538ch)	24.5 [dBm] 281.84 [mW]	200 [mm]	1608.6 [mW]
<input type="checkbox"/>	Right side	1907.6 [MHz] (9538ch)	24.5 [dBm] 281.84 [mW]	238 [mm]	1988.6 [mW]
<input type="checkbox"/>	Bottom(Laptop)	1907.6 [MHz] (9538ch)	24.5 [dBm] 281.84 [mW]	155 [mm]	1158.6 [mW]

WWAN LTE IV

Standalone SAR tested	Positiom	Upper frequency of band *1	Maximum tune-up tolerance limit *5	Min distance *2	Calculation of threshold*4
<input type="checkbox"/>	Bottom side	1754.3 [MHz] (20393ch)	24 [dBm] 251.19 [mW]	200 [mm]	1613.3 [mW]
<input type="checkbox"/>	Right side	1754.3 [MHz] (20393ch)	24 [dBm] 251.19 [mW]	238 [mm]	1993.3 [mW]
<input type="checkbox"/>	Bottom(Laptop)	1754.3 [MHz] (20393ch)	24 [dBm] 251.19 [mW]	155 [mm]	1163.3 [mW]

WWAN LTE XVII

Standalone SAR tested	Positiom	Upper frequency of band *1	Maximum tune-up tolerance limit *5	Min distance *2	Calculation of threshold*4
<input type="checkbox"/>	Bottom side	711 [MHz] (23800ch)	24 [dBm] 251.19 [mW]	200 [mm]	888.9 [mW]
<input type="checkbox"/>	Right side	711 [MHz] (23800ch)	24 [dBm] 251.19 [mW]	238 [mm]	1069.0 [mW]
<input type="checkbox"/>	Bottom(Laptop)	711 [MHz] (23800ch)	24 [dBm] 251.19 [mW]	155 [mm]	675.6 [mW]

Ant.0 WLAN 2.4GHz

Band	Standalone SAR tested	Positiom	Mode	Upper frequency of band *1	Maximum tune-up tolerance limit *6	Min distance *2	Calculation of threshold*4
WLAN(2.4 GHz band)	<input type="checkbox"/>	Top side	11n 20M BPSK(MCS0)	2462 [MHz] (11ch)	18.62 [dBm] 72.78 [mW]	115 [mm]	745.6 [mW]
WLAN(2.4 GHz band)	<input type="checkbox"/>	Bottom side	11b DBPSK(1Mbps)	2462 [MHz] (11ch)	17.5 [dBm] 56.23 [mW]	62 [mm]	215.6 [mW]
WLAN(2.4 GHz band)	<input type="checkbox"/>	Bottom(Laptop)	11b DBPSK(1Mbps)	2462 [MHz] (11ch)	17.91 [dBm] 61.80 [mW]	65 [mm]	245.6 [mW]

Ant.0 WLAN 5GHz

Band	Standalone SAR tested	Positiom	Mode	Upper frequency of band *1	Maximum tune-up tolerance limit *6	Min distance *2	Calculation of threshold*4
WLAN(5G Hz band)	<input type="checkbox"/>	Top side	11a BPSK(6Mbps)	5825 [MHz] (165ch)	20.16 [dBm] 103.75 [mW]	115 [mm]	712.2 [mW]
WLAN(5G Hz band)	<input type="checkbox"/>	Bottom side	11a BPSK(6Mbps)	5825 [MHz] (165ch)	20.16 [dBm] 103.75 [mW]	62 [mm]	182.2 [mW]
WLAN(5G Hz band)	<input type="checkbox"/>	Bottom(Laptop)	11a BPSK(6Mbps)	5825 [MHz] (165ch)	20.16 [dBm] 103.75 [mW]	65 [mm]	212.2 [mW]

Ant.1 WLAN 2.4GHz

Band	Standalone SAR tested	Positiom	Mode	Upper frequency of band *1	Maximum tune-up tolerance limit *6	Min distance *2	Calculation of threshold*4
WLAN(2.4 GHz band)	<input type="checkbox"/>	Top side	11n 20M BPSK(MCS8)	2462 [MHz] (11ch)	19.13 [dBm] 81.85 [mW]	160 [mm]	1195.6 [mW]

Ant.1 WLAN 5GHz

Band	Standalone SAR tested	Positiom	Mode	Upper frequency of band *1	Maximum tune-up tolerance limit *6	Min distance *2	Calculation of threshold*4
WLAN(5G Hz band)	<input type="checkbox"/>	Top side	11n 20M BPSK(MCS8)	5825 [MHz] (165ch)	21.96 [dBm] 157.04 [mW]	160 [mm]	1162.2 [mW]

Bluetooth

Standalone SAR tested	Positiom	Upper frequency of band *1	Maximum tune-up tolerance limit *7	Min distance *2	Calculation of threshold*4
<input type="checkbox"/>	Top side	2480 [MHz] (79ch)	10.01 [dBm] 10.02 [mW]	115 [mm]	745.3 [mW]
<input type="checkbox"/>	Bottom side	2480 [MHz] (79ch)	10.01 [dBm] 10.02 [mW]	62 [mm]	215.3 [mW]
<input type="checkbox"/>	Bottom(Laptop)	2480 [MHz] (79ch)	10.01 [dBm] 10.02 [mW]	65 [mm]	245.3 [mW]

*1 The upper frequency of the frequency band was used in order to calculate standalone SAR test exclusion considerations.

*2 When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion. Refer to Appendix 4.

*3 $[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$

If it is Calculation of exclusion ≤ 3.0 standalone SAR test is excluded.

*4 $[(3 \cdot 50) / (\sqrt{f(\text{GHz})})] + (\text{test separation distance} - 50 \text{ mm}) \cdot 10 \text{ mW}$ at > 1500 MHz and $\leq 6 \text{ GHz}$

If it is maximum tune-up tolerance limit < Threshold, standalone SAR test is excluded.

*5 Please refer to an attached sheet(tune-up procedure).

*6 The measured output power is the maximum tune-up tolerance limit on specification.

*7 Maximum tune-up tolerance limit is maximum power of test report of Bluetooth module (FCC ID: QDS-BRCM1073 Test report No.: FR330410AC).

SECTION 7 : Description of the Body setup

7.1 Description of the Body setup

i) Procedure for SAR testing

-The tested procedure was performed according to the KDB 447498 D01 (Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies) and the KDB 616217 D04.

ii) Test mode

GSM850/PCS1900	Data transmission mode (GPRS)
WCDMA V/II	Data transmission mode (12.2kRMC)
LTE IV/ XVII	Data transmission mode (QPSK)
WLAN	Data transmission mode (11a/b/g/n)

iii) Test position

No.	Position*1	Test distance	WWAN			WLAN(ant.0)		WLAN(ant.1)	
			Reduction on <input checked="" type="checkbox"/> /off <input type="checkbox"/>	Tested	Antenna	Tested	Antenna	Tested	Antenna
1	Front	0mm	<input type="checkbox"/>	<input type="checkbox"/>	Fixed	<input type="checkbox"/>	Fixed	<input type="checkbox"/>	Fixed
2	Top side	2mm*5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Fixed	<input type="checkbox"/>	Fixed	<input type="checkbox"/>	Fixed
3	Top side	4mm*4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Fixed	<input type="checkbox"/>	Fixed	<input type="checkbox"/>	Fixed
4	Top side	0mm	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Fixed	<input type="checkbox"/>	Fixed	<input checked="" type="checkbox"/> *3	Fixed
5	Right side	0mm	<input type="checkbox"/>	<input type="checkbox"/>	Fixed	<input checked="" type="checkbox"/>	Fixed	<input type="checkbox"/>	Fixed
6	Left side	0mm	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Fixed	<input type="checkbox"/>	Fixed	<input checked="" type="checkbox"/>	Fixed
7	Rear	0mm	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Fixed	<input checked="" type="checkbox"/>	Fixed	<input checked="" type="checkbox"/>	Fixed
8	Bottom(Laptop)	0mm	<input type="checkbox"/>	<input checked="" type="checkbox"/> *3	Fixed	<input checked="" type="checkbox"/>	Fixed	<input checked="" type="checkbox"/>	Fixed
9	Bottom side	0mm	<input type="checkbox"/>	<input type="checkbox"/>	Fixed	<input checked="" type="checkbox"/>	Fixed	<input checked="" type="checkbox"/>	Fixed
10	Top tilt 30deg*2	0mm	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Fixed	<input type="checkbox"/>	Fixed	<input type="checkbox"/>	Fixed

*1 Refer to Section 6 and Appendix 4.

*2 The angle was contacted to the phantom and it measured in 30 degrees of inclinations of Top side which a sensor runs by WWAN mode of maximum SAR value(WCDMA V).

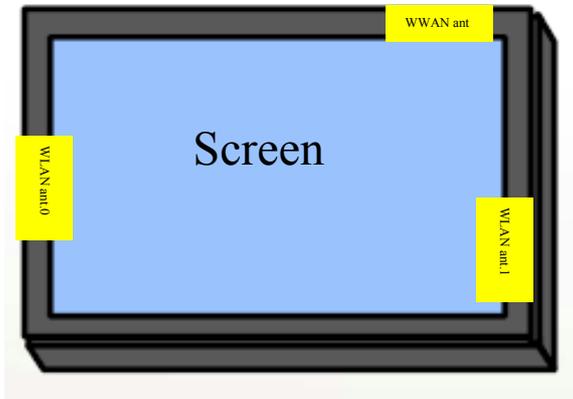
*3 Although stand-alone SAR measurement was excepted, it was measured in this test report.

*4 This EUT has sensors for power reduction. These sensors detect the human skin within 5mm from top side of EUT. Refer to KDB616217 D04 clause 6.2 11). To ensure all production units are compliant, it is generally necessary to reduce the triggering distance determined from the triggering tests by 1 mm, or more if it is necessary, and use the smallest distance for movements to and from the phantom, minus 1 mm, as the sensor triggering distance for determining the SAR measurement distance.

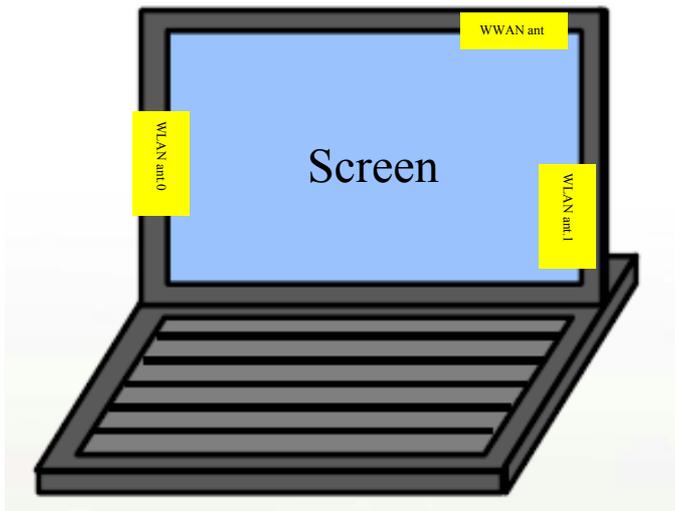
*5 It measured in a distance smaller than "sensing distance-1mm" currently recommended by the standard.

<Antenna position>

The antennas use for WWAN and WLAN are both separate in a single fixed position. The antennas are integral part of the device. Refer to Appendix 4.



Tablet style



Laptop style

SECTION 8 : Test surrounding

8.1 Measurement uncertainty

The uncertainty budget has been determined for the DASY5 measurement system according to the SPEAG documents[2] and is given in the following Table.

<0.3 – 3GHz range>

Error Description	Uncertain value ±	Probability distribution	divisor	(ci) lg	Standard (lg)	vi or veff
Measurement System						
Probe calibration	± 6.00	Normal	1	1	± 6.00	∞
Axial isotropy of the probe	± 4.7	Rectangular	√3	0.7	± 1.9	∞
Spherical isotropy of the probe	± 9.6	Rectangular	√3	0.7	± 3.9	∞
Boundary effects	± 1.0	Rectangular	√3	1	± 0.6	∞
Probe linearity	± 4.7	Rectangular	√3	1	± 2.7	∞
Detection limit	± 1.0	Rectangular	√3	1	± 0.6	∞
Modulation response	± 2.4	Rectangular	√3	1	± 1.4	∞
Readout electronics	± 0.3	Normal	1	1	± 0.3	∞
Response time	± 0.8	Rectangular	√3	1	± 0.5	∞
Integration time	± 2.6	Rectangular	√3	1	± 1.5	∞
RF ambient Noise	± 3.0	Rectangular	√3	1	± 1.7	∞
RF ambient Reflections	± 3.0	Rectangular	√3	1	± 1.7	∞
Probe Positioner	± 0.4	Rectangular	√3	1	± 0.2	∞
Probe positioning	± 2.9	Rectangular	√3	1	± 1.7	∞
Max.SAR Eval.	± 1.0	Rectangular	√3	1	± 0.6	∞
Test Sample Related						
Device positioning	± 2.9	Normal	1	1	± 2.9	70
Device holder uncertainty	± 3.6	Normal	1	1	± 3.6	6
Power drift	± 5.0	Rectangular	√3	1	± 2.9	∞
Power Scaling	+ 0.0	Rectangular	√3	1	± 0.0	∞
Phantom and Setup						
Phantom uncertainty	± 4.0	Rectangular	√3	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	Rectangular	√3	0.64	± 1.8	∞
Liquid conductivity (meas.)	+ 3.2	Rectangular	1	0.64	+ 2.0	∞
Liquid permittivity (target)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
Liquid permittivity (meas.)	- 4.2	Rectangular	1	0.6	- 2.5	∞
Liquid conductivity - temp.unc (below 2deg.C.)	± 1.7	Rectangular	√3	0.78	± 0.8	∞
Liquid permittivity - temp.unc (below 2deg.C.)	± 0.3	Rectangular	√3	0.23	± 0.0	∞
Combined Standard Uncertainty					± 11.277	
Expanded Uncertainty (k=2)					± 22.6	

<3 – 6GHz range>

Error Description	Uncertai value ±	Probability distribution	divisor	(ci) lg	Standard (1g)	vi or veff
Measurement System						
Probe calibration	± 6.55	Normal	1	1	± 6.55	∞
Axial isotropy of the probe	± 4.7	Rectangular	√3	0.7	± 1.9	∞
Spherical isotropy of the probe	± 9.6	Rectangular	√3	0.7	± 3.9	∞
Boundary effects	± 2.0	Rectangular	√3	1	± 1.2	∞
Probe linearity	± 4.7	Rectangular	√3	1	± 2.7	∞
Detection limit	± 1.0	Rectangular	√3	1	± 0.6	∞
Modulation response	± 2.4	Rectangular	√3	1	± 1.4	∞
Readout electronics	± 0.3	Normal	1	1	± 0.3	∞
Response time	± 0.8	Rectangular	√3	1	± 0.5	∞
Integration time	± 2.6	Rectangular	√3	1	± 1.5	∞
RF ambient Noise	± 3.0	Rectangular	√3	1	± 1.7	∞
RF ambient Reflections	± 3.0	Rectangular	√3	1	± 1.7	∞
Probe Positioner	± 0.8	Rectangular	√3	1	± 0.5	∞
Probe positioning	± 6.7	Rectangular	√3	1	± 3.9	∞
Max.SAR Eval.	± 4.0	Rectangular	√3	1	± 2.3	∞
Test Sample Related						
Device positioning	± 2.9	Normal	1	1	± 2.9	66
Device holder uncertainty	± 3.6	Normal	1	1	± 3.6	5
Power drift	± 5.0	Rectangular	√3	1	± 2.9	∞
Power Scaling	+ 0.0	Rectangular	√3	1	± 0.0	∞
Phantom and Setup						
Phantom uncertainty	± 4.0	Rectangular	√3	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	Rectangular	√3	0.64	± 1.8	∞
Liquid conductivity (meas.)	+ 3.3	Rectangular	1	0.64	+ 2.1	∞
Liquid permittivity (target)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
Liquid permittivity (meas.)	- 4.2	Rectangular	1	0.6	- 2.5	∞
Liquid conductivity - temp.unc (below 2deg.C.)	± 1.7	Rectangular	√3	0.78	± 0.8	∞
Liquid permittivity - temp.unc (below 2deg.C.)	± 0.3	Rectangular	√3	0.23	± 0.0	∞
Combined Standard Uncertainty						± 12.357
Expanded Uncertainty (k=2)						± 24.7

SECTION 9 : Measurement results

9.1 GSM 850MHz Body SAR

(1)Method of measurement

<Body>

- Step1. The searching for the worst position
The test was performed in the middle channel.

- Step2. The changing to the channels (Low,High)
The test was performed at the worst condition of Step1 to Step2.

- Step3. The repeated measurement.
The test was performed at the worst condition of Step1 to Step3.

Note:

- 1) The GPRS 2up mode was maximum time-based average power. The other slots SAR is not required for other mode because the maximum average output power for other mode is less than 1/4dB higher than that measured GPRS 2up mode.
- 2) The other channel was not required since middle channel SAR value is less than 0.8W/kg.
- 3) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg. When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once. Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).

(2)Simulated Tissue Liquid Parameter confirmation

The dielectric parameters were checked prior to assessment using the HP85070D dielectric probe kit. The dielectric parameters measurement is reported in each correspondent section.

DIELECTRIC PARAMETERS MEASUREMENT RESULTS										
Date	Ambient Temp. [deg.c]	Relative Humidity [%]	Liquid type	Liquid Temp. [deg.c]	Measured Frequency [MHz]	Parameters	Target Value*1	Measured	Deviation [%]	Limit [%]
14-Mar	24.0	45	MSL 900	23.5	835	εr	55.2	55.5	0.5	+/-5
						σ [mho/m]	0.97	0.96	-1.0	+/-5
19-Mar	23.5	45	MSL 900	22.5	835	εr	55.2	53.7	-2.8	+/-5
						σ [mho/m]	0.97	0.95	-2.4	+/-5

εr: Relative Permittivity / σ : Conductivity

*1 The Target value is a parameter defined in FCC OET65.

(3)Result of Body SAR

BODY SAR MEASUREMENT RESULTS												
Frequency		Modulation	Max power(Meas)		Maximum tune-up tolerance limit		Phantom Section	EUT Set-up Conditions			Measured SAR(1g) [W/kg]	Reported SAR(1g) *1 [W/kg]
Channel	[MHz]		[dBm]	[mW]	[dBm]	[mW]		Antenna	Position	Separation [mm]	Maximum of multi-peak	Maximum of multi-peak
Step.1 Position searching												
190	836.6	GPRS 2slots	25.51	355.63	25.88	387.26	Flat	Fixed	Top side(Tablet)	2*3	0.916	0.997
190	836.6	GPRS 2slot	20.15	103.51	21.95	156.68	Flat	Fixed	Top side(Tablet)	0*2	0.497	0.752
190	836.6	GPRS 2slots	25.51	355.63	25.88	387.26	Flat	Fixed	Left side(Tablet)	0	0.227	0.247
190	836.6	GPRS 2slots	25.51	355.63	25.88	387.26	Flat	Fixed	Rear(Tablet)	0	0.454	0.494
190	836.6	GPRS 2slots	25.51	355.63	25.88	387.26	Flat	Fixed	Bottom (Laptop)	0	0.014	0.015
Step.2 Channel change (SAR level in Step.1 > 0.8 w/kg)												
128	824.2	GPRS 2slots	25.03	318.42	25.72	373.25	Flat	Fixed	Top side(Tablet)	2*3	0.838	0.982
251	848.8	GPRS 2slots	25.80	380.19	26.14	411.15	Flat	Fixed	Top side(Tablet)	2*3	0.949	1.026
Step.3 Repeat of worst mode (SAR level in Step.1 to Step.2 > 0.8 w/kg)												
251	848.8	GPRS 2slots	25.80	380.19	26.14	411.15	Flat	Fixed	Top side(Tablet)	2*3	0.937	1.013

*1 Reported SAR= Maximum tune-up tolerance limit [mW] / Measured maximum power [mW] · Measured SAR [W/kg]

*2 Reduction power sample used.

*3 It measured in a distance smaller than “sensing distance-1mm” currently recommended by the standard.

9.2 PCS1900MHz Body SAR

(1)Method of measurement

<Body>

- Step1. The searching for the worst position
The test was performed in the middle channel.

- Step2. The changing to the channels (Low,High)
The test was performed at the worst condition of Step1 to Step2.

- Step3. The repeated measurement.
The test was performed at the worst condition of Step1 to Step3.

Note:

- 1) The GPRS 2up mode was maximum time-based average power. The other slots SAR is not required for other mode because the maximum average output power for other mode is less than 1/4dB higher than that measured GPRS 2up mode.
- 2) The other channel was not required since middle channel SAR value is less than 0.8W/kg.
- 3) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg.
When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).

(2)Simulated Tissue Liquid Parameter confirmation

The dielectric parameters were checked prior to assessment using the HP85070D dielectric probe kit.

The dielectric parameters measurement is reported in each correspondent section.

DIELECTRIC PARAMETERS MEASUREMENT RESULTS										
Date	Ambient Temp. [deg.c]	Relative Humidity [%]	Liquid type	Liquid Temp. [deg.c]	Measured Frequency [MHz]	Parameters	Target Value*1	Measured	Deviation [%]	Limit [%]
14-Mar	24.0	51	MSL 1800	23.5	1880	ϵ_r	53.3	51.9	-2.6	+/-5
						σ [mho/m]	1.52	1.55	1.7	+/-5
3-Apr	24.0	40	MSL 1800	23.5	1880	ϵ_r	53.3	54.6	2.4	+/-5
						σ [mho/m]	1.52	1.57	3.2	+/-5

ϵ_r : Relative Permittivity / σ : Conductivity

*1 The Target value is a parameter defined in FCC OET65.

(3)Result of Body SAR

BODY SAR MEASUREMENT RESULTS												
Frequency		Modulation	Max power(Meas)		Maximum tune-up tolerance limit		Phantom Section	EUT Set-up Conditions			Measured SAR(1g)	Reported SAR(1g) *1
Channel	[MHz]		[dBm]	[mW]	[dBm]	[mW]		Antenna	Position	Separation [mm]	Maximum of multi-peak	Maximum of multi-peak
Step.1 Position searching												
661	1880	GPRS 2slots	23.05	201.84	23.34	215.77	Flat	Fixed	Top side(Tablet)	4	0.904	0.966
661	1880	GPRS 2slots	20.33	107.89	22.23	167.11	Flat	Fixed	Top side(Tablet)	0*2	0.692	1.072
661	1880	GPRS 2slots	23.05	201.84	23.34	215.77	Flat	Fixed	Left side(Tablet)	0	0.392	0.419
661	1880	GPRS 2slots	23.05	201.84	23.34	215.77	Flat	Fixed	Rear(Tablet)	0	0.121	0.129
661	1880	GPRS 2slots	23.05	201.84	23.34	215.77	Flat	Fixed	Bottom (Laptop)	0	0.026	0.028
Step.2 Channel change (SAR level in Step.1 > 0.8 w/kg)												
512	1850.2	GPRS 2slots	23.02	200.45	23.35	216.27	Flat	Fixed	Top side(Tablet)	4	0.973	1.050
810	1909.8	GPRS 2slots	22.78	189.67	23.32	214.78	Flat	Fixed	Top side(Tablet)	4	0.667	0.755
512	1850.2	GPRS 2slots	20.24	105.68	22.16	164.44	Flat	Fixed	Top side(Tablet)	0	0.735	1.144
810	1909.8	GPRS 2slots	20.39	109.40	22.21	166.34	Flat	Fixed	Top side(Tablet)	0	0.770	1.171
Step.3 Repeat of worst mode (SAR level in Step.1 to Step.2 > 0.8 w/kg)												
810	1909.8	GPRS 2slots	20.39	109.40	22.21	166.34	Flat	Fixed	Top side(Tablet)	0	0.774	1.177

*1 Reported SAR= Maximum tune-up tolerance limit [mW] / Measured maximum power [mW] · Measured SAR [W/kg]

*2 Reduction power sample used.

9.3 WCDMA Band V Body SAR

(1)Method of measurement

<Body>

- Step1. The searching for the worst position
The test was performed in the middle channel.

- Step2. The changing to the channels (Low,High)
The test was performed at the worst condition of Step1 to Step2.

- Step3. The repeated measurement.
The test was performed at the worst condition of Step1 to Step3.

- Step4. Measurement of Top side tilt position
The angle was contacted to the phantom and it measured in 30 degrees of inclinations of Top side which a sensor runs by WWAN mode of maximum SAR value.

Note:

- 1) The BODY SAR is not required for HSDPA mode because the maximum average output power for HSDPA mode is less than 1/4dB higher than that measured 12.2k RMC mode.
- 2) The other channel was not required since middle channel SAR value is less than 0.8W/kg.
- 3) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg.
When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).

(2)Simulated Tissue Liquid Parameter confirmation

The dielectric parameters were checked prior to assessment using the HP85070D dielectric probe kit.
The dielectric parameters measurement is reported in each correspondent section.

DIELECTRIC PARAMETERS MEASUREMENT RESULTS										
Date	Ambient Temp. [deg.c]	Relative Humidity [%]	Liquid type	Liquid Temp. [deg.c]	Measured Frequency [MHz]	Parameters	Target Value*1	Measured	Deviation [%]	Limit [%]
14-Mar	24.0	45	MSL 900	23.5	835	εr	55.2	55.5	0.6	+/-5
						σ [mho/m]	0.97	0.96	-1.3	+/-5
4-Apr	24.0	45	MSL 900	23.5	835	εr	55.2	55.0	-0.4	+/-5
						σ [mho/m]	0.97	0.98	1.3	+/-5

εr: Relative Permittivity / σ : Conductivity

*1 The Target value is a parameter defined in FCC OET65.

(3)Result of Body SAR

BODY SAR MEASUREMENT RESULTS												
Frequency		Modulation	Max power(Meas)		Maximum tune-up tolerance limit		Phantom Section	EUT Set-up Conditions			Measured SAR(1g) [W/kg]	Reported SAR(1g) *1 [W/kg]
Channel	[MHz]		[dBm]	[mW]	[dBm]	[mW]		Antenna	Position	Separation [mm]	Maximum of multi-peak	Maximum of multi-peak
Step.1 Position searching												
4183	836.6	RMC 12.2k	23.35	216.27	24.50	281.84	Flat	Fixed	Top side(Tablet)	4	0.940	1.225
4183	836.6	RMC 12.2k	21.83	152.41	22.50	177.83	Flat	Fixed	Top side(Tablet)	0*2	0.645	0.753
4183	836.6	RMC 12.2k	23.35	216.27	24.50	281.84	Flat	Fixed	Left	0	0.253	0.330
4183	836.6	RMC 12.2k	23.35	216.27	24.50	281.84	Flat	Fixed	Rear(Tablet)	0	0.285	0.371
4183	836.6	RMC 12.2k	23.35	216.27	24.50	281.84	Flat	Fixed	Bottom (Laptop)	0	0.00591	0.008
Step.2 Channel change (SAR level in Step.1 > 0.8 w/kg)												
4132	826.4	RMC 12.2k	23.13	205.59	24.50	281.84	Flat	Fixed	Top side(Tablet)	4	0.998	1.368
4233	846.6	RMC 12.2k	23.21	209.41	24.50	281.84	Flat	Fixed	Top side(Tablet)	4	0.964	1.297
Step.3 Repeat of worst mode (SAR level in Step.1 to Step.2 > 0.8 w/kg)												
4132	826.4	12.2k RMC	23.13	205.59	24.50	281.84	Flat	Fixed	Top side(Tablet)	4	1.010	1.385
Step.4: Measurement of Top side tilt position *3												
4132	826.4	12.2k RMC	23.13	205.59	24.50	281.84	Flat	Fixed	Top side tilt 30 deg	0	0.099	0.136

*1 Reported SAR= Maximum tune-up tolerance limit [mW] / Measured maximum power [mW] · Measured SAR [W/kg]

*2 Reduction power sample used.

*3 The angle was contacted to the phantom and it measured in 30 degrees of inclinations of Top side which a sensor runs by WWAN mode of maximum SAR value.

9.4 WCDMA Band II Body SAR

(1)Method of measurement

<Body>

- Step1. The searching for the worst position
The test was performed in the middle channel.

- Step2. The changing to the channels (Low,High)
The test was performed at the worst condition of Step1 to Step2.

- Step3. The repeated measurement.
The test was performed at the worst condition of Step1 to Step3.

Note:

- 1) The BODY SAR is not required for HSDPA mode because the maximum average output power for HSDPA mode is less than 1/4dB higher than that measured 12.2k RMC mode.
- 2) The other channel was not required since middle channel SAR value is less than 0.8W/kg.
- 3) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg.

(2)Simulated Tissue Liquid Parameter confirmation

The dielectric parameters were checked prior to assessment using the HP85070D dielectric probe kit.
The dielectric parameters measurement is reported in each correspondent section.

DIELECTRIC PARAMETERS MEASUREMENT RESULTS										
Date	Ambient Temp. [deg.c]	Relative Humidity [%]	Liquid type	Liquid Temp. [deg.c]	Measured Frequency [MHz]	Parameters	Target Value*1	Measured	Deviation [%]	Limit [%]
14-Mar	24.0	45	MSL 1800	23.5	1880	ϵ_r	53.3	51.9	-2.6	+/-5
						σ [mho/m]	1.52	1.55	1.7	+/-5
3-Apr	24.0	44	MSL 1800	23.5	1880	ϵ_r	53.3	51.2	-4.0	+/-5
						σ [mho/m]	1.52	1.52	-0.1	+/-5

ϵ_r : Relative Permittivity / σ : Conductivity

*1 The Target value is a parameter defined in FCC OET65.

(3)Result of Body SAR

BODY SAR MEASUREMENT RESULTS												
Frequency		Modulation	Max power(Meas)		Maximum tune-up tolerance limit		Phantom Section	EUT Set-up Conditions			Measured SAR(1g)	Reported SAR(1g) *1
Channel	[MHz]		[dBm]	[mW]	[dBm]	[mW]		Antenna	Position	Separation [mm]	Maximum of multi-peak	Maximum of multi-peak
Step.1 Position searching												
9400	1880	12.2k RMC	23.41	219.28	24.50	281.84	Flat	Fixed	Top side(Tablet)	4	0.928	1.193
9400	1880	12.2k RMC	21.99	158.12	22.50	177.83	Flat	Fixed	Top side(Tablet)	0*2	1.070	1.203
9400	1880	12.2k RMC	23.41	219.28	24.50	281.84	Flat	Fixed	Left side(Tablet)	0	0.490	0.630
9400	1880	12.2k RMC	23.41	219.28	24.50	281.84	Flat	Fixed	Rear(Tablet)	0	0.144	0.185
9400	1880	12.2k RMC	23.41	219.28	24.50	281.84	Flat	Fixed	Bottom (Laptop)	0	0.023	0.030
Step.2 Channel change (SAR level in Step.1 > 0.8 w/kg)												
9262	1852.4	12.2k RMC	23.2	208.93	24.50	281.84	Flat	Fixed	Top side(Tablet)	4	0.965	1.302
9538	1907.6	12.2k RMC	23.06	202.30	24.50	281.84	Flat	Fixed	Top side(Tablet)	4	0.679	0.946
9262	1852.4	12.2k RMC	21.71	148.25	22.50	177.83	Flat	Fixed	Top side(Tablet)	0	0.941	1.129
9538	1907.6	12.2k RMC	21.59	144.21	22.50	177.83	Flat	Fixed	Top side(Tablet)	0	0.967	1.192
Step.3 Repeat of worst mode (SAR level in Step.1 to Step.2 > 0.8 w/kg)												
9262	1852.4	12.2k RMC	23.2	208.93	24.50	281.84	Flat	Fixed	Top side(Tablet)	4	0.973	1.313

*1 Reported SAR= Maximum tune-up tolerance limit [mW] / Measured maximum power [mW] · Measured SAR [W/kg]

*2 Reduction power sample used.

9.5 LTE Band IV Body SAR

(1)Method of measurement

Test configuration					
Step.	Channel	RB allocation	Bandwidth (largest BW)	Modulation	Tested position
Step.1-a	Highest power channel	1RB (The highest maximum output power for RB offsets at the upper edge, middle and lower edge)	20M	QPSK	all positions required
Step.1-b	<i>If 1g SAR value > 0.8W/kg</i>				
	Other channel	1RB (The highest maximum output power for RB offsets at the upper edge, middle and lower edge)	20M	QPSK	position >0.8 W/kg
Step.1-c	<i>If 1g SAR value (Step1) > 1.45W/kg. Other 1RB allocation tested.</i>				
	Low, Mid, High channel	1RB Upper, Middle and Lower edge	20M	QPSK	position >1.45 W/kg
Step.2-a	Highest power channel	50%RB (The highest maximum output power for RB offsets at the upper edge, middle and lower edge)	20M	QPSK	Worst position of step.1-a
Step.2-b	<i>If 1g SAR value > 0.8W/kg</i>				
	Other channel	50%RB (The highest maximum output power for RB offsets at the upper edge, middle and lower edge)	20M	QPSK	position >0.8 W/kg
Step.2-c	<i>If 1g SAR value (Step1) > 1.45W/kg. Other 50%RB allocation tested.</i>				
	Low, Mid, High channel	50%RB Upper, Middle and Lower edge	20M	QPSK	position >1.45 W/kg
Step.3 Repeat of worst mode (SAR level in Step.1 to Step.2 > 0.8 w/kg)					

Note:

Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg.

When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.

Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).

(2) Simulated Tissue Liquid Parameter confirmation

The dielectric parameters were checked prior to assessment using the HP85070D dielectric probe kit. The dielectric parameters measurement is reported in each correspondent section.

DIELECTRIC PARAMETERS MEASUREMENT RESULTS										
Date	Ambient Temp. [deg.c]	Relative Humidity [%]	Liquid type	Liquid Temp. [deg.c]	Measured Frequency [MHz]	Parameters	Target Value*1	Measured	Deviation [%]	Limit [%]
28-Mar	24.0	42	MSL1800	23.5	1750	ϵ_r	53.4	51.2	-4.2	+/-5
						σ [mho/m]	1.49	1.49	-0.2	+/-5
1-Apr	24.0	39	MSL1800	23.5	1750	ϵ_r	53.4	53.0	-0.7	+/-5
						σ [mho/m]	1.49	1.47	-1.1	+/-5
2-Apr	24.0	44	MSL1800	23.5	1750	ϵ_r	53.4	51.8	-3.1	+/-5
						σ [mho/m]	1.49	1.46	-1.9	+/-5

ϵ_r : Relative Permittivity / σ : Conductivity

*1 The Target value is a parameter defined in FCC OET65.

(2) Result of Body

BODY SAR MEASUREMENT RESULTS												
Frequency		Modulation	Max power(Meas)		Maximum tune-up tolerance limit		Phantom Section	EUT Set-up Conditions			Measured SAR(1g) [W/kg]	Reported SAR(1g) *1 [W/kg]
Channel	[MHz]		[dBm]	[mW]	[dBm]	[mW]		Antenna	Position	Separation [mm]	Maximum of multi-peak	Maximum of multi-peak
Step.1-a Position searching												
QPSK 1RB 20MHz BW												
20050	1720.0	QPSK 1RB upper	23.71	234.96	24.00	251.19	Flat	Fixed	Top side(Tablet)	4	1.200	1.283
20050	1720.0	QPSK 1RB lower	21.27	133.97	22.00	158.49	Flat	Fixed	Top side(Tablet)	0*2	1.100	1.301
20050	1720.0	QPSK 1RB upper	23.71	234.96	24.00	251.19	Flat	Fixed	Left side(Tablet)	0	0.435	0.465
20050	1720.0	QPSK 1RB upper	23.71	234.96	24.00	251.19	Flat	Fixed	Rear(Tablet)	0	0.158	0.169
20050	1720.0	QPSK 1RB upper	23.71	234.96	24.00	251.19	Flat	Fixed	Bottom (Laptop)	0	0.00514	0.00549
Step.1-b Channel change (SAR level in Step.1 > 0.8 w/kg)												
20175	1732.5	QPSK 1RB upper	23.7	234.42	24.00	251.19	Flat	Fixed	Top side(Tablet)	4	1.140	1.222
20300	1745.0	QPSK 1RB upper	23.6	229.09	24.00	251.19	Flat	Fixed	Top side(Tablet)	4	0.988	1.083
20175	1732.5	QPSK 1RB lower	20.97	125.03	22.00	158.49	Flat	Fixed	Top side(Tablet)	0*2	1.050	1.331
20300	1745.0	QPSK 1RB lower	21.01	126.18	22.00	158.49	Flat	Fixed	Top side(Tablet)	0*2	1.020	1.281
Step.2-a Mode change												
QPSK 50%RB 20MHz BW												
20050	1720.0	QPSK 50%RB upper	22.7	186.21	23.00	199.53	Flat	Fixed	Top side(Tablet)	0*2	0.839	0.899
Step.2-b Channel change (SAR level in Step.1 > 0.8 w/kg)												
20175	1732.5	QPSK 50%RB upper	22.46	176.20	23.00	199.53	Flat	Fixed	Top side(Tablet)	0*2	0.906	1.026
20300	1745.0	QPSK 50%RB upper	22.46	176.20	23.00	199.53	Flat	Fixed	Top side(Tablet)	0*2	0.802	0.908
Step.3 Repeat of worst mode (SAR level in Step.1 to Step.2 > 0.8 w/kg)												
20175	1732.5	QPSK 1RB lower	20.97	125.03	22.00	158.49	Flat	Fixed	Top side(Tablet)	0*2	1.000	1.268

*1 Reported SAR= Maximum tune-up tolerance limit [mW] / Measured maximum power [mW] · Measured SAR [W/kg]

*2 Reduction power sample used.

9.6 LTE Band XVII Body SAR

(1)Method of measurement

Test configuration					
Step.	Channel	RB allocation	Bandwidth (largest BW)	Modulation	Tested position
Step.1-a	Highest power channel	1RB (The highest maximum output power for RB offsets at the upper edge, middle and lower edge)	10M	QPSK	all positions required
Step.1-b	<i>If 1g SAR value > 0.8W/kg</i>				
	Other channel	1RB (The highest maximum output power for RB offsets at the upper edge, middle and lower edge)	10M	QPSK	position > 0.8 W/kg
Step.1-c	If 1g SAR value (Step1) > 1.45W/kg. Other 1RB allocation tested.				
	Low, Mid, High channel	1RB Upper, Middle and Lower edge	10M	QPSK	position > 1.45 W/kg
Step.2-a	Highest power channel	50%RB (The highest maximum output power for RB offsets at the upper edge, middle and lower edge)	10M	QPSK	Worst position of step.1-a
Step.2-b	<i>If 1g SAR value > 0.8W/kg</i>				
	Other channel	50%RB (The highest maximum output power for RB offsets at the upper edge, middle and lower edge)	10M	QPSK	position > 0.8 W/kg
Step.2-c	If 1g SAR value (Step1) > 1.45W/kg. Other 50%RB allocation tested.				
	Low, Mid, High channel	50%RB Upper, Middle and Lower edge	10M	QPSK	position > 1.45 W/kg
Step.3 Repeat of worst mode (SAR level in Step.1 to Step.2 > 0.8 w/kg)					

(2) Simulated Tissue Liquid Parameter confirmation

The dielectric parameters were checked prior to assessment using the HP85070D dielectric probe kit. The dielectric parameters measurement is reported in each correspondent section.

DIELECTRIC PARAMETERS MEASUREMENT RESULTS										
Date	Ambient Temp. [deg.c]	Relative Humidity [%]	Liquid type	Liquid Temp. [deg.c]	Measured Frequency [MHz]	Parameters	Target Value*1	Measured	Deviation [%]	Limit [%]
29-Mar	24.0	40	MSL750	23.5	750	ϵ_r	55.5	55.6	0.2	+/-5
						σ [mho/m]	0.96	0.96	0.1	+/-5
1-Apr	24.0	39	MSL750	23.5	750	ϵ_r	55.5	54.9	-1.2	+/-5
						σ [mho/m]	0.96	0.94	-2.4	+/-5

ϵ_r : Relative Permittivity / σ : Conductivity

*1 The Target value is a parameter defined in FCC OET65.

(2) Result of Body

BODY SAR MEASUREMENT RESULTS												
Frequency		Modulation	Max power(Meas)		Maximum tune-up tolerance limit		Phantom Section	EUT Set-up Conditions			Measured SAR(1g) [W/kg]	Reported SAR(1g) *1 [W/kg]
Channel	[MHz]		[dBm]	[mW]	[dBm]	[mW]		Antenna	Position	Separation [mm]	Maximum of multi-peak	Maximum of multi-peak
Step.1-a Position searching												
QPSK 1RB 10MHz BW												
23790	710.0	QPSK 1RB upper	23.19	208.45	24.00	251.19	Flat	Fixed	Top side(Tablet)	4	0.468	0.564
23800	711.0	QPSK 1RB lower	21.16	130.62	22.00	158.49	Flat	Fixed	Top side(Tablet)	0*2	0.377	0.457
23790	710.0	QPSK 1RB upper	23.19	208.45	24.00	251.19	Flat	Fixed	Left side(Tablet)	0	0.082	0.099
23790	710.0	QPSK 1RB upper	23.19	208.45	24.00	251.19	Flat	Fixed	Rear(Tablet)	0	0.072	0.087
23790	710.0	QPSK 1RB upper	23.19	208.45	24.00	251.19	Flat	Fixed	Bottom (Lapton)	0	0.016	0.019
Step.2-a Mode change												
QPSK 50%RB 20MHz BW												
23790	710.0	QPSK 50%RB center	22.24	167.49	23.00	199.53	Flat	Fixed	Top side(Tablet)	4	0.260	0.310

*1 Reported SAR= Maximum tune-up tolerance limit [mW] / Measured maximum power [mW] · Measured SAR [W/kg]

*2 Reduction power sample used.

9.7 WLAN Body SAR (2.4G)

(1)Method of measurement

- Step.1 The searching for the worst position
The test was performed in mode of the maximum average output power
- Step.2 The searching for the worst transmitter mode.
The other mode was performed at the worst position of Step.1.
- Step.3 11n MIMO mode
The test was performed in mode of the maximum average output power

Note:

- 1)The other channel was not required since maximum average output power channel SAR value is less than 0.8W/kg.
- 2) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg.
When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).

(2)Simulated Tissue Liquid Parameter confirmation

The dielectric parameters were checked prior to assessment using the HP85070D dielectric probe kit.
The dielectric parameters measurement is reported in each correspondent section.

DIELECTRIC PARAMETERS MEASUREMENT RESULTS										
Date	Ambient Temp. [deg.c]	Relative Humidity [%]	Liquid type	Liquid Temp. [deg.c]	Measured Frequency [MHz]	Parameters	Target Value*1	Measured	Deviation [%]	Limit [%]
15-Apr	24	40	MSL 2450	23.5	2450	ϵ_r	52.7	51.2	-2.8	+/-5
						σ [mho/m]	1.95	2.00	2.6	+/-5
16-Apr	24	35	MSL 2450	23.5	2450	ϵ_r	52.7	51.2	-2.8	+/-5
						σ [mho/m]	1.95	2.01	3.1	+/-5

ϵ_r : Relative Permittivity / σ : Conductivity

*1 The Target value is a parameter defined in FCC OET65.

(3)Result of Body SAR

BODY SAR MEASUREMENT RESULTS												
Frequency		Modulation	Max power(Meas)		Maximum tune-up tolerance limit		Phantom Section	EUT Set-up Conditions			Measured SAR(1g)	Reported SAR(1g) *1
Channel	[MHz]		[dBm]	[mW]	[dBm]	[mW]		Antenna	Position	Separation [mm]	[W/kg] Maximum of multi-peak	[W/kg] Maximum of multi-peak
Step.1 Position searching												
6	2437	11g 6Mbps	18.14	65.16	-	-	Flat	Ant.0	Right side(Tablet)	0	0.172	-
6	2437	11g 6Mbps	18.14	65.16	-	-	Flat	Ant.0	Rear(Tablet)	0	0.00633	-
6	2437	11g 6Mbps	18.14	65.16	-	-	Flat	Ant.0	Bottom (Laptop)	0	0.012	-
6	2437	11g 6Mbps	18.14	65.16	-	-	Flat	Ant.0	Bottom side(Tablet)	0	0.060	-
Step.2 Mode change												
6	2437	11b 1Mbps	17.35	54.33	-	-	Flat	Ant.0	Right side(Tablet)	0	0.155	-
6	2437	11n20 MCS0	18.34	68.23	-	-	Flat	Ant.0	Right side(Tablet)	0	0.187	-
6	2437	11n40 MCS0	14.27	26.73	-	-	Flat	Ant.0	Right side(Tablet)	0	0.066	-

*1 Reported SAR= Maximum tune-up tolerance limit [mW] / Measured maximum power [mW] · Measured SAR [W/kg]

BODY SAR MEASUREMENT RESULTS												
Frequency		Modulation	Max power(Meas)		Maximum tune-up tolerance limit		Phantom Section	EUT Set-up Conditions			Measured SAR(1g)	Reported SAR(1g) *1
Channel	[MHz]		[dBm]	[mW]	[dBm]	[mW]		Antenna	Position	Separation [mm]	[W/kg] Maximum of multi-peak	[W/kg] Maximum of multi-peak
Step.1 Position searching												
6	2437	11n 20 MCS8	18.58	72.11	-	-	Flat	Ant.1	Top side(Tablet)	0	0.0042	-
6	2437	11n 20 MCS8	18.58	72.11	-	-	Flat	Ant.1	Left side(Tablet)	0	0.069	-
6	2437	11n 20 MCS8	18.58	72.11	-	-	Flat	Ant.1	Rear(Tablet)	0	0.00439	-
6	2437	11n 20 MCS8	18.58	72.11	-	-	Flat	Ant.1	Bottom (Laptop)	0	0.000206	-
6	2437	11n 20 MCS8	18.58	72.11	-	-	Flat	Ant.1	Bottom side(Tablet)	0	0.041	-
Step.2 Mode change												
6	2437	11n 40 MCS8	15.82	38.19	-	-	Flat	Ant.1	Left side(Tablet)	0	0.055	-

*1 Reported SAR= Maximum tune-up tolerance limit [mW] / Measured maximum power [mW] · Measured SAR [W/kg]

BODY SAR MEASUREMENT RESULTS												
Frequency		Modulation	Max power(Meas)		Maximum tune-up tolerance limit		Phantom Section	EUT Set-up Conditions			Measured SAR(1g)	Reported SAR(1g) *1
Channel	[MHz]		[dBm]	[mW]	[dBm]	[mW]		Antenna	Position	Separation [mm]	[W/kg] Maximum of multi-peak	[W/kg] Maximum of multi-peak
Step.3 11n MIMO mode												
6	2437	11n 20 MCS8	18.58	72.11	-	-	Flat	Ant.0+1	Bottom side(Tablet)	0	0.041	-
6	2437	11n 40 MCS8	15.82	38.19	-	-	Flat	Ant.0+1	Bottom side(Tablet)	0	0.021	-

*1 Reported SAR= Maximum tune-up tolerance limit [mW] / Measured maximum power [mW] · Measured SAR [W/kg]

9.8 WLAN Body SAR (5G)

(1)Method of measurement

- Step.1 The searching for the worst position
The test was performed in mode of the maximum average output power
- Step.2 The searching for the worst transmitter mode.
The other mode was performed at the worst position of Step.1.
- Step.3 The changing to the channels
The test was performed at the worst condition of Step1 to Step2.
- Step.4 11n MIMO mode
The other mode was performed at the worst position of Step.1
(excepted Right side position and Left side position)
- Step5. The repeated measurement.
The test was performed at the worst condition of Step1 to Step4.

Note:

- 1)For 5500-5700MHz band, the other channel was not required since maximum average output power channel SAR value is less than 0.4W/kg.
- 2) For 5180-5240MHz band, 5260-5320MHz and 5745-5825MHz band, the other channel was not required since maximum average output power channel SAR value is less than 0.8W/kg.
- 3) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg.
When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).

(2)Simulated Tissue Liquid Parameter confirmation

The dielectric parameters were checked prior to assessment using the HP85070D dielectric probe kit.
The dielectric parameters measurement is reported in each correspondent section.

DIELECTRIC PARAMETERS MEASUREMENT RESULTS										
Date	Ambient Temp. [deg.c]	Relative Humidity [%]	Liquid type	Liquid Temp. [deg.c]	Measured Frequency [MHz]	Parameters	Target Value*1	Measured	Deviation [%]	Limit [%]
17-Apr	24.5	45	MSL 3-6GHz	24.0	5200	ϵ_r	49.0	47.6	-2.9	+/-5
						σ [mho/m]	5.30	5.34	0.8	+/-5
18-Apr	24.5	47	MSL 3-6GHz	24.0	5200	ϵ_r	49.0	47.8	-2.5	+/-5
						σ [mho/m]	5.30	5.18	-2.3	+/-5
18-Apr	24.5	47	MSL 3-6GHz	24.0	5300	ϵ_r	48.9	47.8	-2.2	+/-5
						σ [mho/m]	5.42	5.33	-1.7	+/-5
19-Apr	24.5	40	MSL 3-6GHz	24.0	5500	ϵ_r	48.6	47.2	-2.8	+/-5
						σ [mho/m]	5.65	5.73	1.5	+/-5
19-Apr	24.5	40	MSL 3-6GHz	24.0	5600	ϵ_r	48.5	47.0	-3.0	+/-5
						σ [mho/m]	5.77	5.87	1.8	+/-5
20-Apr	24.5	35	MSL 3-6GHz	24.0	5800	ϵ_r	48.2	46.2	-4.2	+/-5
						σ [mho/m]	6.00	6.20	3.3	+/-5
20-Apr	24.5	35	MSL 3-6GHz	24.0	5600	ϵ_r	48.5	47.0	-3.0	+/-5
						σ [mho/m]	5.77	5.87	1.8	+/-5
20-Apr	24.5	35	MSL 3-6GHz	24.0	5700	ϵ_r	48.3	46.9	-3.0	+/-5
						σ [mho/m]	5.88	6.01	2.3	+/-5

ϵ_r : Relative Permittivity / σ : Conductivity

*1 The Target value is a parameter defined in FCC OET65.

(3)Result of Body SAR

5.2GHz band

BODY SAR MEASUREMENT RESULTS												
Frequency		Modulation	Max power(Meas)		Maximum tune-up tolerance limit		Phantom Section	EUT Set-up Conditions			Measured SAR(1g) [W/kg]	Reported SAR(1g) *1 [W/kg]
Channel	[MHz]		[dBm]	[mW]	[dBm]	[mW]		Antenna	Position	Separation [mm]	Maximum of multi-peak	Maximum of multi-peak
Step.1 Position searching												
48	5240	11a 6Mbps	14.54	28.44	-	-	Flat	Ant.0	Right side(Tablet)	0	0.185	-
48	5240	11a 6Mbps	14.54	28.44	-	-	Flat	Ant.0	Rear(Tablet)	0	0.00803	-
48	5240	11a 6Mbps	14.54	28.44	-	-	Flat	Ant.0	Bottom (Laptop)	0	0.010	-
48	5240	11a 6Mbps	14.54	28.44	-	-	Flat	Ant.0	Bottom side(Tablet)	0	0.154	-
Step.2 Mode change												
44	5220	11n20 MCS0	14.29	26.85	-	-	Flat	Ant.0	Right side(Tablet)	0	0.166	-
46	5230	11n40 MCS0	16.37	43.35	-	-	Flat	Ant.0	Right side(Tablet)	0	0.258	-

*1 Reported SAR= Maximum tune-up tolerance limit [mW] / Measured maximum power [mW] · Measured SAR [W/kg]

BODY SAR MEASUREMENT RESULTS												
Frequency		Modulation	Max power(Meas)		Maximum tune-up tolerance limit		Phantom Section	EUT Set-up Conditions			Measured SAR(1g) [W/kg]	Reported SAR(1g) *1 [W/kg]
Channel	[MHz]		[dBm]	[mW]	[dBm]	[mW]		Antenna	Position	Separation [mm]	Maximum of multi-peak	Maximum of multi-peak
Step.1 Position searching												
48	5240	11n40 MCS8	13.94	24.77	-	-	Flat	Ant.1	Top side(Tablet)	0	0.00368	-
48	5240	11n20 MCS8	13.94	24.77	-	-	Flat	Ant.1	Left side(Tablet)	0	0.061	-
48	5240	11n20 MCS8	13.94	24.77	-	-	Flat	Ant.1	Rear(Tablet)	0	0.00520	-
48	5240	11n20 MCS8	13.94	24.77	-	-	Flat	Ant.1	Bottom (Laptop)	0	0.00426	-
48	5240	11n20 MCS8	13.94	24.77	-	-	Flat	Ant.1	Bottom side(Tablet)	0	0.020	-
Step.2 Mode change												
46	5230	11n40 MCS8	14.72	29.65	-	-	Flat	Ant.1	Left side(Tablet)	0	0.065	-

*1 Reported SAR= Maximum tune-up tolerance limit [mW] / Measured maximum power [mW] · Measured SAR [W/kg]

BODY SAR MEASUREMENT RESULTS												
Frequency		Modulation	Max power(Meas)		Maximum tune-up tolerance limit		Phantom Section	EUT Set-up Conditions			Measured SAR(1g) [W/kg]	Reported SAR(1g) *1 [W/kg]
Channel	[MHz]		[dBm]	[mW]	[dBm]	[mW]		Antenna	Position	Separation [mm]	Maximum of multi-peak	Maximum of multi-peak
Step.4 11n MIMO mode												
48	5240	11n20 MCS8	13.94	24.77	-	-	Flat	Ant0+1	Bottom side(Tablet)	0	0.020	-
46	5230	11n40 MCS8	14.72	29.65	-	-	Flat	Ant0+1	Bottom side(Tablet)	0	0.039	-

*1 Reported SAR= Maximum tune-up tolerance limit [mW] / Measured maximum power [mW] · Measured SAR [W/kg]

5.3GHz band

BODY SAR MEASUREMENT RESULTS												
Frequency		Modulation	Max power(Meas)		Maximum tune-up tolerance limit		Phantom Section	EUT Set-up Conditions			Measured SAR(1g) [W/kg]	Reported SAR(1g) *1 [W/kg]
Channel	[MHz]		[dBm]	[mW]	[dBm]	[mW]		Antenna	Position	Separation [mm]	Maximum of multi-peak	Maximum of multi-peak
Step.1 Position searching												
60	5300	11a 6Mbps	19.65	92.26	-	-	Flat	Ant.0	Right side(Tablet)	0	0.463	-
60	5300	11a 6Mbps	19.65	92.26	-	-	Flat	Ant.0	Rear(Tablet)	0	0.015	-
60	5300	11a 6Mbps	19.65	92.26	-	-	Flat	Ant.0	Bottom (Laptop)	0	0.013	-
60	5300	11a 6Mbps	19.65	92.26	-	-	Flat	Ant.0	Bottom side(Tablet)	0	0.312	-
Step.2 Mode change												
60	5300	11n20 MCS0	19.57	90.57	-	-	Flat	Ant.0	Right side(Tablet)	0	0.403	-
54	5270	11n40 MCS0	18.78	75.51	-	-	Flat	Ant.0	Right side(Tablet)	0	0.333	-

*1 Reported SAR= Maximum tune-up tolerance limit [mW] / Measured maximum power [mW] · Measured SAR [W/kg]

BODY SAR MEASUREMENT RESULTS												
Frequency		Modulation	Max power(Meas)		Maximum tune-up tolerance limit		Phantom Section	EUT Set-up Conditions			Measured SAR(1g) [W/kg]	Reported SAR(1g) *1 [W/kg]
Channel	[MHz]		[dBm]	[mW]	[dBm]	[mW]		Antenna	Position	Separation [mm]	Maximum of multi-peak	Maximum of multi-peak
Step.1 Position searching												
52	5260	11n20 MCS8	19.37	86.50	-	-	Flat	Ant.1	Top side(Tablet)	0	0.00398	-
52	5260	11n20 MCS8	19.37	86.50	-	-	Flat	Ant.1	Left side(Tablet)	0	0.212	-
52	5260	11n20 MCS8	19.37	86.50	-	-	Flat	Ant.1	Rear(Tablet)	0	0.00547	-
52	5260	11n20 MCS8	19.37	86.50	-	-	Flat	Ant.1	Bottom (Laptop)	0	0.00535	-
52	5260	11n20 MCS8	19.37	86.50	-	-	Flat	Ant.1	Bottom side(Tablet)	0	0.091	-
Step.2 Mode change												
54	5270	11n40 MCS8	18.07	64.12	-	-	Flat	Ant.1	Left side(Tablet)	0	0.247	-

*1 Reported SAR= Maximum tune-up tolerance limit [mW] / Measured maximum power [mW] · Measured SAR [W/kg]

BODY SAR MEASUREMENT RESULTS												
Frequency		Modulation	Max power(Meas)		Maximum tune-up tolerance limit		Phantom Section	EUT Set-up Conditions			Measured SAR(1g) [W/kg]	Reported SAR(1g) *1 [W/kg]
Channel	[MHz]		[dBm]	[mW]	[dBm]	[mW]		Antenna	Position	Separation [mm]	Maximum of multi-peak	Maximum of multi-peak
Step.4 11n MIMO mode												
52	5260	11n20 MCS8	19.37	86.50	-	-	Flat	Ant0+1	Bottom side(Tablet)	0	0.091	-
54	5270	11n40 MCS8	18.07	64.12	-	-	Flat	Ant0+1	Bottom side(Tablet)	0	0.074	-

*1 Reported SAR= Maximum tune-up tolerance limit [mW] / Measured maximum power [mW] · Measured SAR [W/kg]

5.6GHz band

BODY SAR MEASUREMENT RESULTS												
Frequency		Modulation	Max power(Meas)		Maximum tune-up tolerance limit		Phantom Section	EUT Set-up Conditions			Measured SAR(1g) [W/kg]	Reported SAR(1g) *1 [W/kg]
Channel	[MHz]		[dBm]	[mW]	[dBm]	[mW]		Antenna	Position	Separation [mm]	Maximum of multi-peak	Maximum of multi-peak
Step.1 Position searching												
108	5540	11a 6Mbps	19.88	97.27	-	-	Flat	Ant.0	Right side(Tablet)	0	0.257	-
108	5540	11a 6Mbps	19.88	97.27	-	-	Flat	Ant.0	Rear(Tablet)	0	0.010	-
108	5540	11a 6Mbps	19.88	97.27	-	-	Flat	Ant.0	Bottom (Laptop)	0	0.029	-
108	5540	11a 6Mbps	19.88	97.27	-	-	Flat	Ant.0	Bottom side(Tablet)	0	0.124	-
Step.2 Mode change												
136	5680	11n20 MCS0	19.84	96.38	-	-	Flat	Ant.0	Right side(Tablet)	0	0.654	-
118	5590	11n40 MCS0	16.87	48.64	-	-	Flat	Ant.0	Right side(Tablet)	0	0.176	-
Step.3 Channel change												
104	5520	11n20 MCS0	20.36	108.64	-	-	Flat	Ant.0	Right side(Tablet)	0	0.212	-
112	5560	11n20 MCS0	19.82	95.94	-	-	Flat	Ant.0	Right side(Tablet)	0	0.215	-
124	5620	11n20 MCS0	19.83	96.16	-	-	Flat	Ant.0	Right side(Tablet)	0	0.399	-

*1 Reported SAR= Maximum tune-up tolerance limit [mW] / Measured maximum power [mW] · Measured SAR [W/kg]

BODY SAR MEASUREMENT RESULTS												
Frequency		Modulation	Max power(Meas)		Maximum tune-up tolerance limit		Phantom Section	EUT Set-up Conditions			Measured SAR(1g) [W/kg]	Reported SAR(1g) *1 [W/kg]
Channel	[MHz]		[dBm]	[mW]	[dBm]	[mW]		Antenna	Position	Separation [mm]	Maximum of multi-peak	Maximum of multi-peak
Step.1 Position searching												
112	5560	11n20 MCS8	21.14	130.02	-	-	Flat	Ant.1	Top side(Tablet)	0	0.013	-
112	5560	11n20 MCS8	21.14	130.02	-	-	Flat	Ant.1	Left side(Tablet)	0	0.500	-
112	5560	11n20 MCS8	21.14	130.02	-	-	Flat	Ant.1	Rear(Tablet)	0	0.013	-
112	5560	11n20 MCS8	21.14	130.02	-	-	Flat	Ant.1	Bottom (Laptop)	0	0.00661	-
112	5560	11n20 MCS8	21.14	130.02	-	-	Flat	Ant.1	Bottom side(Tablet)	0	0.061	-
Step.2 Mode change												
126	5630	11n40 MCS8	17.89	61.52	-	-	Flat	Ant.1	Left side(Tablet)	0	0.280	-
Step.3 Channel change												
104	5520	11n20 MCS8	21.13	129.72	-	-	Flat	Ant.1	Left side(Tablet)	0	0.598	-
128	5640	11n20 MCS8	21.03	126.77	-	-	Flat	Ant.1	Left side(Tablet)	0	0.533	-
136	5680	11n20 MCS8	21.08	128.23	-	-	Flat	Ant.1	Left side(Tablet)	0	0.664	-
Step.5 Repeat of worst mode (SAR level in Step.1 to Step.2 > 0.8 w/kg)												
136	5680	11n20 MCS8	21.08	128.23	-	-	Flat	Ant.1	Left side(Tablet)	0	0.775	-

*1 Reported SAR= Maximum tune-up tolerance limit [mW] / Measured maximum power [mW] · Measured SAR [W/kg]

BODY SAR MEASUREMENT RESULTS												
Frequency		Modulation	Max power(Meas)		Maximum tune-up tolerance limit		Phantom Section	EUT Set-up Conditions			Measured SAR(1g) [W/kg]	Reported SAR(1g) *1 [W/kg]
Channel	[MHz]		[dBm]	[mW]	[dBm]	[mW]		Antenna	Position	Separation [mm]	Maximum of multi-peak	Maximum of multi-peak
Step.4 11n MIMO mode												
112	5560	11n20 MCS8	21.14	130.02	-	-	Flat	Ant0+1	Bottom side(Tablet)	0	0.061	-
126	5630	11n40 MCS8	17.89	61.52	-	-	Flat	Ant0+1	Bottom side(Tablet)	0	0.022	-

*1 Reported SAR= Maximum tune-up tolerance limit [mW] / Measured maximum power [mW] · Measured SAR [W/kg]

5.8GHz band

BODY SAR MEASUREMENT RESULTS												
Frequency		Modulation	Max power(Meas)		Maximum tune-up tolerance limit		Phantom Section	EUT Set-up Conditions			Measured SAR(1g) [W/kg]	Reported SAR(1g) *1 [W/kg]
Channel	[MHz]		[dBm]	[mW]	[dBm]	[mW]		Antenna	Position	Separation [mm]	Maximum of multi-peak	Maximum of multi-peak
Step.1 Position searching												
161	5805	11a 6Mbps	19.67	92.68	-	-	Flat	Ant.0	Right side(Tablet)	0	0.355	-
161	5805	11a 6Mbps	19.67	92.68	-	-	Flat	Ant.0	Rear(Tablet)	0	0.00337	-
161	5805	11a 6Mbps	19.67	92.68	-	-	Flat	Ant.0	Bottom (Laptop)	0	0.044	-
161	5805	11a 6Mbps	19.67	92.68	-	-	Flat	Ant.0	Bottom side(Tablet)	0	0.254	-
Step.2 Mode change												
161	5805	11n20 MCS0	19.69	93.11	-	-	Flat	Ant.0	Right side(Tablet)	0	0.344	-
159	5795	11n40 MCS0	19.55	90.16	-	-	Flat	Ant.0	Right side(Tablet)	0	0.363	-

*1 Reported SAR= Maximum tune-up tolerance limit [mW] / Measured maximum power [mW] · Measured SAR [W/kg]

BODY SAR MEASUREMENT RESULTS												
Frequency		Modulation	Max power(Meas)		Maximum tune-up tolerance limit		Phantom Section	EUT Set-up Conditions			Measured SAR(1g) [W/kg]	Reported SAR(1g) *1 [W/kg]
Channel	[MHz]		[dBm]	[mW]	[dBm]	[mW]		Antenna	Position	Separation [mm]	Maximum of multi-peak	Maximum of multi-peak
Step.1 Position searching												
157	5785	11n20 MCS8	21.42	138.68	-	-	Flat	Ant.1	Topside (Tablet)	0	0.015	-
157	5785	11n20 MCS8	21.42	138.68	-	-	Flat	Ant.1	Left side(Tablet)	0	0.833	-
157	5785	11n20 MCS8	21.42	138.68	-	-	Flat	Ant.1	Rear(Tablet)	0	0.00954	-
157	5785	11n20 MCS8	21.42	138.68	-	-	Flat	Ant.1	Bottom (Laptop)	0	0.00635	-
157	5785	11n20 MCS8	21.42	138.68	-	-	Flat	Ant.1	Bottom side(Tablet)	0	0.094	-
Step.2 Mode change												
159	5795	11n40 MCS8	20.6	114.82	-	-	Flat	Ant.1	Left side(Tablet)	0	0.839	-
Step.3 Channel change												
153	5765	11n20 MCS8	21.41	138.36	-	-	Flat	Ant.1	Left side(Tablet)	0	1.010	-
161	5805	11n20 MCS8	21.33	135.83	-	-	Flat	Ant.1	Left side(Tablet)	0	0.985	-
151	5755	11n40 MCS8	20.46	111.17	-	-	Flat	Ant.1	Left side(Tablet)	0	0.837	-
Step.5 Repeat of worst mode (SAR level in Step.1 to Step.3 > 0.8 w/kg)												
153	5765	11n20 MCS8	21.41	138.36	-	-	Flat	Ant.1	Left side(Tablet)	0	0.989	-

*1 Reported SAR= Maximum tune-up tolerance limit [mW] / Measured maximum power [mW] · Measured SAR [W/kg]

BODY SAR MEASUREMENT RESULTS												
Frequency		Modulation	Max power(Meas)		Maximum tune-up tolerance limit		Phantom Section	EUT Set-up Conditions			Measured SAR(1g) [W/kg]	Reported SAR(1g) *1 [W/kg]
Channel	[MHz]		[dBm]	[mW]	[dBm]	[mW]		Antenna	Position	Separation [mm]	Maximum of multi-peak	Maximum of multi-peak
Step.4 11n MIMO mode												
157	5785	11n20 MCS8	21.42	138.68	-	-	Flat	Ant0+1	Bottom side(Tablet)	0	0.094	-
159	5795	11n40 MCS8	20.6	114.82	-	-	Flat	Ant0+1	Bottom side(Tablet)	0	0.068	-

*1 Reported SAR= Maximum tune-up tolerance limit [mW] / Measured maximum power [mW] · Measured SAR [W/kg]

SECTION 10 : Simultaneous transmission SAR test exclusion considerations

10.1 Estimated SAR is calculated about Bluetooth

When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:

- $(\text{max. power of channel, including tune-up tolerance, } mW) / (\text{min. test separation distance, } mm) \cdot [\sqrt{f(\text{GHz})} / x] \text{ W/kg}$ for test separation distances $\leq 50 \text{ mm}$;
where $x = 7.5$ for 1-g SAR, and $x = 18.75$ for 10-g SAR.
- 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the test separation distances is $> 50 \text{ mm}$.

Position	Upper frequency of band *1	Maximum tune-up tolerance limit	Min distance *2	Calculation of Estimated SAR*3
Right side	2480 [MHz] (79 ch)	10.01 [dBm] 10.02 [mW]	6 [mm]	0.351 [W/kg]
Rear	2480 [MHz] (79 ch)	10.01 [dBm] 10.02 [mW]	13 [mm]	0.162 [W/kg]
Bottom(Laptop)	2480 [MHz] (79 ch)	10.01 [dBm] 10.02 [mW]	65 [mm]	0.032 [W/kg]
Bottom side	2480 [MHz] (79 ch)	10.01 [dBm] 10.02 [mW]	62 [mm]	0.034 [W/kg]

*1 The upper frequency of the frequency band of Bluetooth was used in order to calculate the maximum estimated SAR.

*2 Refer to Appendix 4. When the minimum test separation distance is $< 5 \text{ mm}$, a distance of 5 mm is applied.

*3 $(\text{max. power of channel, including tune-up tolerance, } mW) / (\text{min. test separation distance, } mm) \cdot [\sqrt{f(\text{GHz})} / x] \text{ W/kg}$

10.2 Result of SUM Σ SAR1g of Body

If less than 1.6W/kg of sum total values become about the SAR value of two antennas, the SAR test of simultaneous transmission will be excepted.

In the case of two, the SAR test of simultaneous transmission is not considered below.

- Antenna of one of the two is separated from the human body 20 cm or more.
- Between two antennas is separated 20 cm or more.

WWAN + WLAN ant.1

SUM Σ SAR1g (WWAN+WLAN)					
Position	Stand alone SAR(1g) [W/kg]			SUM SAR(1g)[W/kg]	SUM SAR(1g)[W/kg]
	GSM850 *1	WLAN 2.4G *1	WLAN 5G *1	WWAN + WLAN(2.4G)	WWAN + WLAN(5G)
Top side	1.026	0.0042	0.015	1.030	1.041
Left side	0.247	0.069	1.010	0.316	1.257
Rear	0.494	0.00439	0.01300	0.498	0.507
Bottom(Laptop)	0.015	0.000206	0.00661	0.015	0.022

SUM Σ SAR1g (WWAN+WLAN)					
Position	Stand alone SAR(1g) [W/kg]			SUM SAR(1g)[W/kg]	SUM SAR(1g)[W/kg]
	PCS1900 *1	WLAN 2.4G *1	WLAN 5G *1	WWAN + WLAN(2.4G)	WWAN + WLAN(5G)
Top side	1.177	0.0042	0.015	1.181	1.192
Left side	0.419	0.069	1.010	0.488	1.429
Rear	0.129	0.00439	0.01300	0.133	0.142
Bottom(Laptop)	0.028	0.000206	0.00661	0.028	0.035

SUM Σ SAR1g (WWAN+WLAN)					
Position	Stand alone SAR(1g) [W/kg]			SUM SAR(1g)[W/kg]	SUM SAR(1g)[W/kg]
	WCDMA V *1	WLAN 2.4G *1	WLAN 5G *1	WWAN + WLAN(2.4G)	WWAN + WLAN(5G)
Top side	1.385	0.0042	0.015	1.389	1.400
Left side	0.330	0.069	1.010	0.399	1.340
Rear	0.371	0.00439	0.01300	0.375	0.384
Bottom(Laptop)	0.008	0.000206	0.00661	0.008	0.015

SUM Σ SAR1g (WWAN+WLAN)					
Position	Stand alone SAR(1g) [W/kg]			SUM SAR(1g)[W/kg]	SUM SAR(1g)[W/kg]
	WCDMA II *1	WLAN 2.4G *1	WLAN 5G *1	WWAN + WLAN(2.4G)	WWAN + WLAN(5G)
Top side	1.313	0.0042	0.015	1.317	1.328
Left side	0.630	0.069	1.010	0.699	1.640
Rear	0.185	0.00439	0.01300	0.189	0.198
Bottom(Laptop)	0.030	0.000206	0.00661	0.030	0.037

SUM Σ SAR1g (WWAN+WLAN)					
Position	Stand alone SAR(1g) [W/kg]			SUM SAR(1g)[W/kg]	SUM SAR(1g)[W/kg]
	LTE IV *1	WLAN 2.4G *1	WLAN 5G *1	WWAN + WLAN(2.4G)	WWAN + WLAN(5G)
Top side	1.331	0.0042	0.015	1.335	1.346
Left side	0.465	0.069	1.010	0.534	1.475
Rear	0.169	0.00439	0.01300	0.173	0.182
Bottom(Laptop)	0.00549	0.000206	0.00661	0.006	0.012

SUM Σ SAR1g (WWAN+WLAN)					
Position	Stand alone SAR(1g) [W/kg]			SUM SAR(1g)[W/kg]	SUM SAR(1g)[W/kg]
	LTE XVII *1	WLAN 2.4G *1	WLAN 5G *1	WWAN + WLAN(2.4G)	WWAN + WLAN(5G)
Top side	0.564	0.0042	0.015	0.568	0.579
Left side	0.099	0.069	1.010	0.168	1.109
Rear	0.087	0.00439	0.01300	0.091	0.100
Bottom(Laptop)	0.019	0.000206	0.00661	0.019	0.026

Bluetooth + WLAN ant.0*3

SUM Σ SAR1g (Bluetooth + WLAN 5GHz band)			
Position	Stand alone SAR(1g) [W/kg]		SUM SAR(1g)[W/kg]
	Bluetooth*2	WLAN 5G *1	Bluetooth + WLAN(5G)
Right side	0.351	0.463	0.814
Rear	0.162	0.015	0.177
Bottom(Laptop)	0.032	0.044	0.076
Bottom side(Tablet)	0.034	0.312	0.346

*1 Use the measured SAR to determine simultaneous transmission SAR test exclusion.

*2 Use the estimated SAR to determine simultaneous transmission SAR test exclusion.

*3 WLAN 5GHz(WLAN Ant.0) can transmit simultaneously with Bluetooth(WLAN Ant.0 shared).

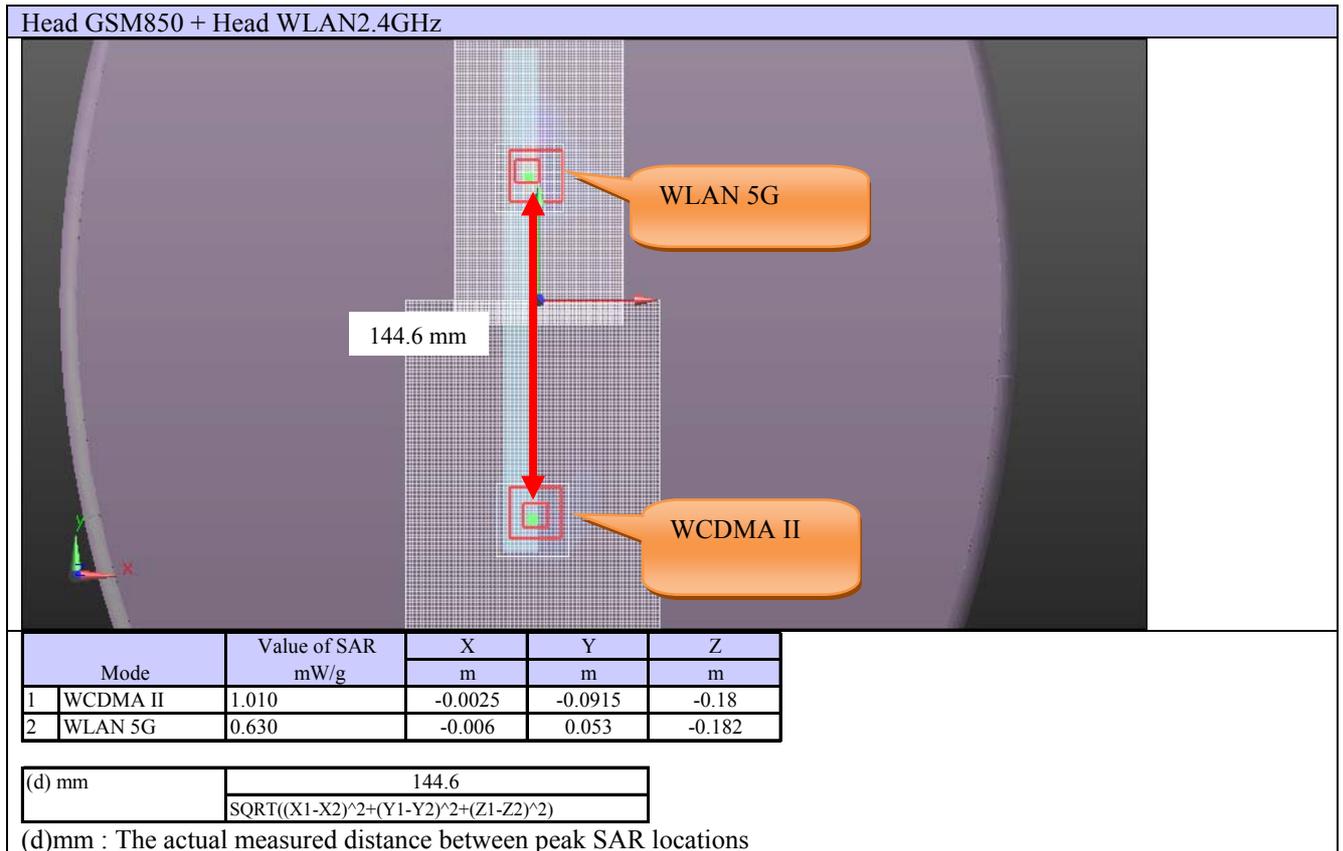
*4 Since result of SUM Σ SAR1g of Body exceeded 1.6 W/kg, the method of SAR to Peak Location Separation Ratio was applied. Refer to clause 10.3.

10.3 SAR to Peak Location Separation Ratio

SAR to Peak Location Separation Ratio

$$= (\sum 1g \text{ SAR})^{1.5} [\text{W/kg}] / \text{peak location separation [mm]} \leq 0.04 \text{ (rounded to two decimal digits)}$$

$\sum \text{SAR} 1g > 1.6 \text{W/kg}$ Condition	$\sum 1\text{-g SAR (W/kg)}$	3D distance (mm)	SAR to peak location separation ratio ≤ 0.04
WCDMA II + WLAN 5GHz	1.640	144.60	0.01



SECTION 11 Test instruments

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MPM-10	Dual Power Meter	Hewlett Packard	E4419A (=EPM-442A)	GB37170359	SAR	2012/07/25 * 12
MPSE-13	Power Sensor	Hewlett Packard	ECP-E18A (=E4412A)	US37181068	SAR	2012/07/25 * 12
MPSE-14	Power Sensor	Hewlett Packard	ECP-E18A (=E4412A)	US37181064	SAR	2012/07/25 * 12
MAT-21	Attenuator(20dB)(above1 GHz)	HIROSE ELECTRIC CO.,LTD.	AT-120	901247	SAR	2013/01/23 * 12
MSG-10	Signal Generator	Agilent	N5181A	MY47421098	SAR	2012/10/08 * 12
MRFA-12	RF Power Amplifier	MILMEGA	AS0825-65	I015249	SAR(0.8-2.5GHz)	2012/08/28 * 12
MHDC-11	Dual Directional Coupler	Hewlett Packard	778D	16605	SAR(0.1-2GHz)	Pre Check
MRFA-08	Pre Amplifier	TSJ	TCBP0206	-	SAR(2-6GHz)	2013/03/21 * 12
MHDC-12	Dual Directional Coupler	Hewlett Packard	772D	2839A0016	SAR(2-18GHz)	Pre Check
MNA-01	Network Analyzer	Agilent/HP	E8358A	US41080381	SAR	2012/09/14 * 12
MDPK-01	Dielectric probe kit	Agilent	85070D	702	SAR	2012/08/14 * 12
MNCK-01	Type N Calibration Kit	Agilent	85032F	MY41495257	SAR	2012/09/18 * 12
MPB-07	Dosimetric E-Field Probe	Schmid&Partner Engineering AG	EX3DV4	3825	SAR	2012/12/10 * 12
MDAE-01	Data Acquisition Electronics	Schmid&Partner Engineering AG	DAE4	509	SAR	2012/07/13 * 12
COTS-MSAR-03	Dasy5	Schmid&Partner Engineering AG	DASY5	-	SAR	-
COTS-MSAR-02	S-Parameter Network Analyzer	Agilent	-	-	SAR	-
MDA-20	Dipole Antenna	Schmid&Partner Engineering AG	D750V3	1058	SAR	2012/05/10 * 36
MDA-05	Dipole Antenna	Schmid&Partner Engineering AG	D900V2	155	SAR	2010/12/06 * 36
MDA-06	Dipole Antenna	Schmid&Partner Engineering AG	D1800V2	2d040	SAR	2010/12/09 * 36
MDA-07	Dipole Antenna	Schmid&Partner Engineering AG	D2450V2	713	SAR	2010/09/06 * 36
MDA-08	Dipole Antenna	Schmid&Partner Engineering AG	D5GHzV2	1020	SAR	2013/01/11 * 12
MPSAM-02	SAM Phantom	Schmid&Partner Engineering AG	SAM Twin Phantom V4.0	1333	SAR	2012/05/07 * 12
MPF-02	2mmOval Flat Phantom ERI 4.0	Schmid&Partner Engineering AG	QD VA 001B (ERI4.0)	1045	SAR	2012/05/08 * 12
MDH-01	Device holder	Schmid&Partner Engineering AG	Mounting device for transmitter	-	SAR	Pre Check
MOS-26	Thermo-Hygrometer	CUSTOM	CTH-201	A08Q29	SAR	2012/05/14 * 12
MOS-10	Digital thermometer	HANNA	Checktemp-2	MOS-10	SAR	2012/08/06 * 12
MBM-13	Barometer	Sunoh	SBR121	837	SAR	2011/03/14 * 36
MSL750					Daily check	Target value \pm 5%
MSL900					Daily check	Target value \pm 5%
MSL1800					Daily check	Target value \pm 5%
MSL2450					Daily check	Target value \pm 5%
MSL 5GHz(BR)					Daily check	Target value \pm 5%
SAR room					Daily check	Ambient Noise<0.012W/kg

The expiration date of the calibration is the end of the expired month.

All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

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APPENDIX 1 : SAR Measurement data

1. Evaluation procedure

The evaluation was performed with the following procedure:

Step 1: Measurement of the E-field at a fixed location above the ear point or central position of flat phantom was used as a reference value for assessing the power drop.

Step 2: The SAR distribution at the exposed side of head or body position was measured at a distance of each device from the inner surface of the shell. The area covered the entire dimension of the antenna of EUT and the horizontal grid spacing was 15 mm x 15 mm for below 3GHz. (or 10mm x 10mm for above 3GHz.). Based on these data, the area of the maximum absorption was determined by spline interpolation.

Step 3: Around this point found in the Step 2 (area scan), a volume of 30mm x 30mm x 30mm or more was assessed by measuring 7 x 7 x 7 points at least for below 3GHz and a volume of 28 mm x 28mm x 22.5mm or more was assessed by measuring 8 x 8 x 6(ratio step method (*1)) points at least for 5GHz band.

And for any secondary peaks found in the Step2 which are within 2dB of maximum peak and not with this Step3 (Zoom scan) is repeated. On the basis of this data set, the spatial peak SAR value was evaluated under the following procedure:

(1). The data at the surface were extrapolated, since the center of the dipoles is 1mm(EX3DV4) away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.3 mm. The extrapolation was based on a least square algorithm [4]. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.

(2). The maximum interpolated value was searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g or 10 g) were computed by the 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) [4], [5]. The volume was integrated with the trapezoidal-algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.

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

Step 4: Re-measurement of the E-field at the same location as in Step 1.

***1. Ratio step method parameters used;**

The first measurement point: 2mm from the phantom surface, the initial grid separation: 2mm, subsequent graded grid ratio: 1.5

These parameters comply with the requirement of the KDB 865664.

In the section of SAR Scan Procedures-Zoom Scan, in KDB 865664 (October 2006 revised, publication date: April 16, 2007): SAR Measurement Requirements

for 3-6GHz, the graded grids requirement is as follows;

“When graded grids are used (z), the first measurement point should be within 3mm of the phantom surface for measurements below 4.5GHz and within 2mm at or above 4.5GHz. The initial grid separation, closest to the phantom, should be 2.0mm. A subsequent graded ration of 1.5 is recommended and less than 2.0 is required.”

2. Measurement data

i) GSM 850MHz

AK8SVD132A1WL GSM850 GPRS 2slots 836.6MHz Top side 2mm

Communication System: GSM850; Communication System Band: Exported from older format (data unavailable - please correct).; Frequency: 836.6 MHz; Duty Cycle: 1:4.19952

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.948$ mho/m; $\epsilon_r = 53.665$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(9.55, 9.55, 9.55); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

Area Scan 2 (61x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.34 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 25.954 V/m; Power Drift = -0.16 dB

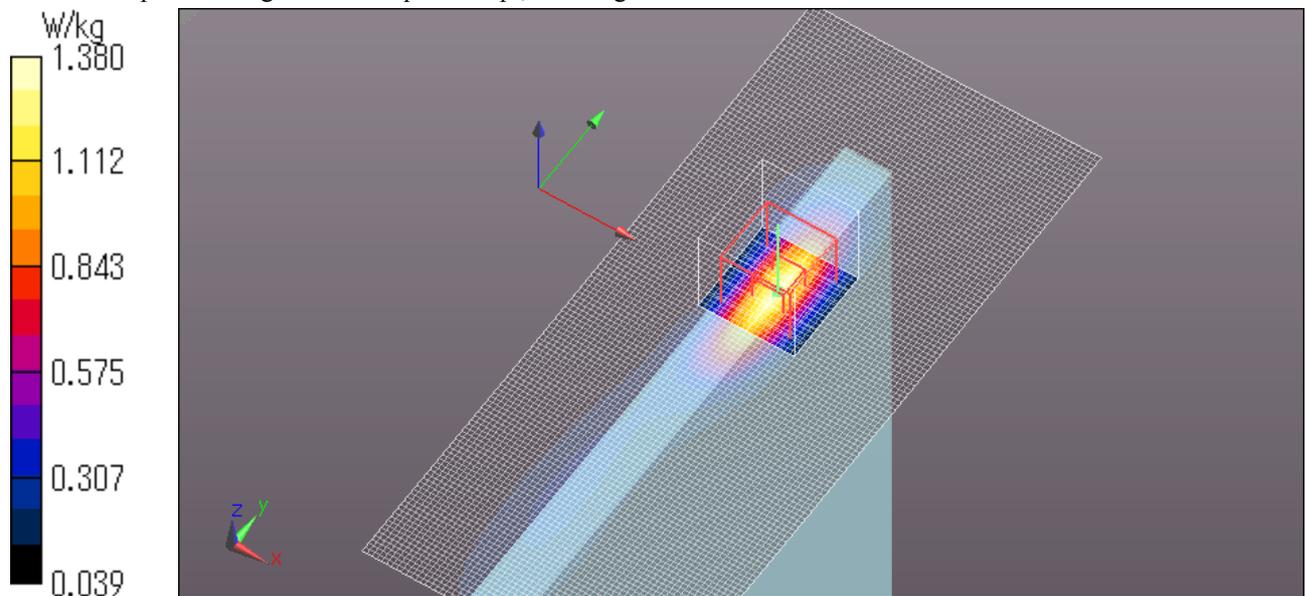
Peak SAR (extrapolated) = 1.86 W/kg

SAR(1 g) = 0.916 W/kg; SAR(10 g) = 0.462 W/kg

Maximum value of SAR (measured) = 1.38 W/kg

Date: 2013/03/19

Ambient Temp. : 23.5 degree.C. Liquid Temp.; 22.5 degree.C.



AK8SVD132A1WL GSM850 GPRS 2slots 836.6MHz Top side 0mm

Communication System: GSM850; Communication System Band: Exported from older format (data unavailable - please correct).; Frequency: 836.6 MHz; Duty Cycle: 1:8.30042

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.957$ mho/m; $\epsilon_r = 55.522$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(9.55, 9.55, 9.55); Calibrated: 2012/12/10; {Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

Area Scan (41x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.759 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.470 V/m; Power Drift = 0.15 dB

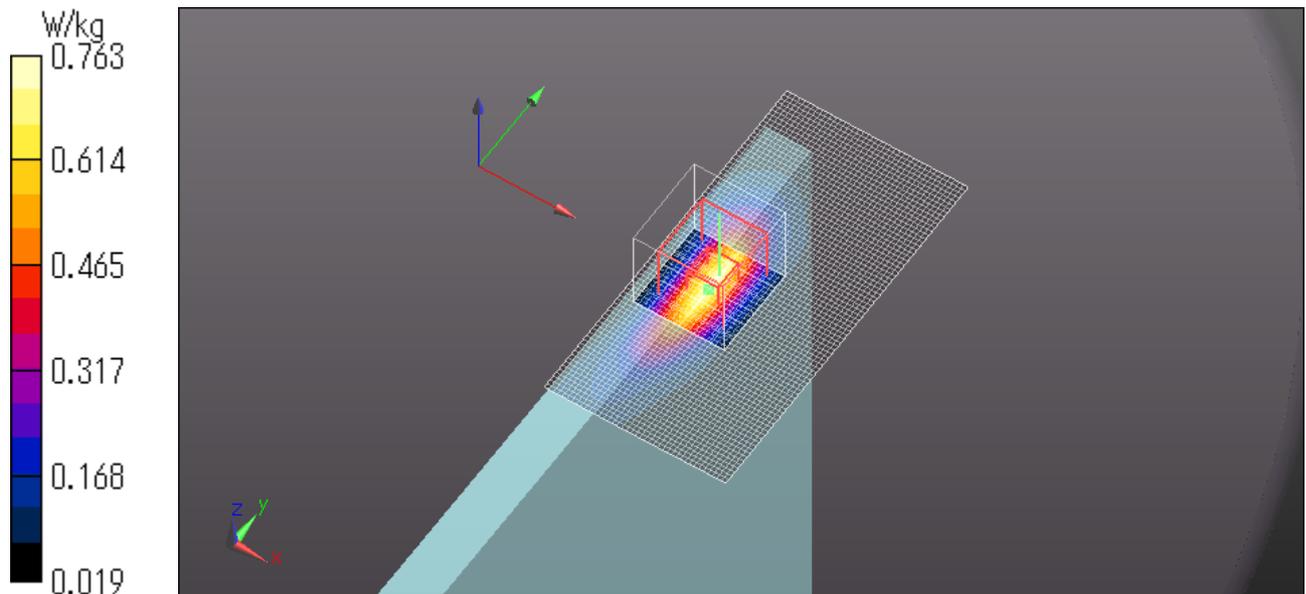
Peak SAR (extrapolated) = 1.05 W/kg

SAR(1 g) = 0.497 W/kg; SAR(10 g) = 0.244 W/kg

Maximum value of SAR (measured) = 0.763 W/kg

Date: 2013/03/14

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL GSM850 GPRS 2slots 836.6MHz Left side 0mm

Communication System: GSM850; Communication System Band: Exported from older format (data unavailable - please correct).; Frequency: 836.6 MHz; Duty Cycle: 1:4.19952

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.948$ mho/m; $\epsilon_r = 53.665$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(9.55, 9.55, 9.55); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (3);

Area Scan 3 (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (interpolated) = 0.295 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 18.337 V/m; Power Drift = -0.00 dB

Peak SAR (extrapolated) = 0.607 W/kg

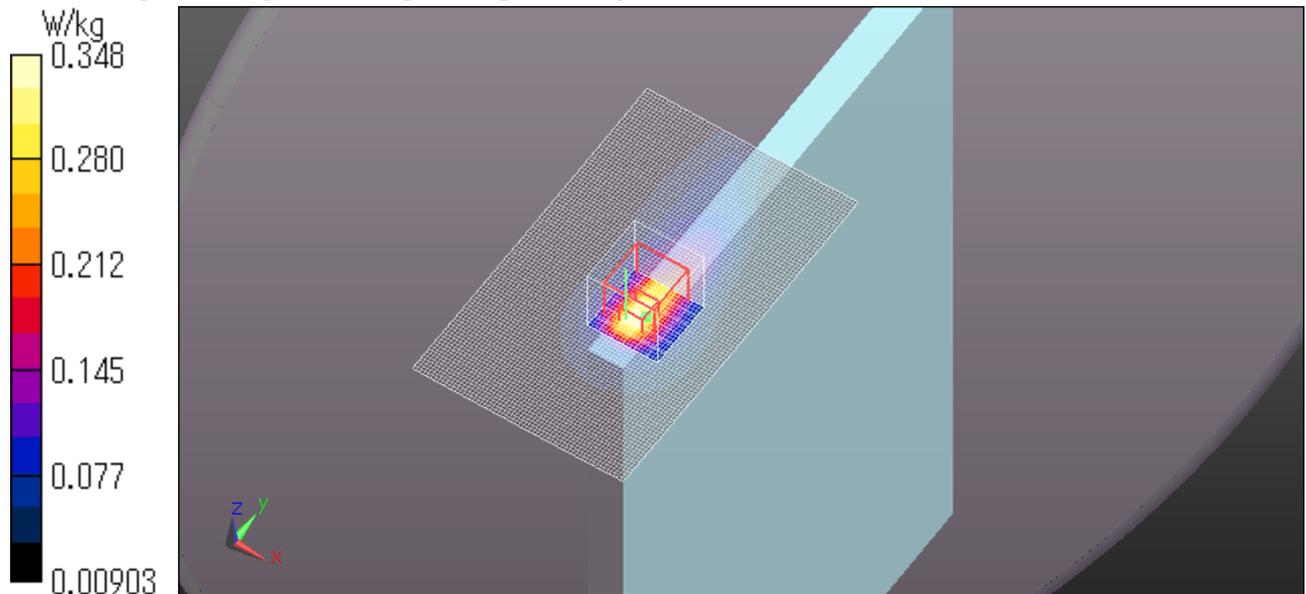
SAR(1 g) = 0.227 W/kg; SAR(10 g) = 0.114 W/kg

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.348 W/kg

Date: 2013/03/19

Ambient Temp. : 23.5 degree.C. Liquid Temp.; 22.5 degree.C.



AK8SVD132A1WL GSM850 GPRS 2slots 836.6MHz Rear 0mm

Communication System: GSM850; Communication System Band: Exported from older format (data unavailable - please correct.); Frequency: 836.6 MHz; Duty Cycle: 1:4.19952

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.948$ mho/m; $\epsilon_r = 53.665$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(9.55, 9.55, 9.55); Calibrated: 2012/12/10; {Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (3);

Area Scan (81x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.625 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 0.662 V/m; Power Drift = 0.10 dB

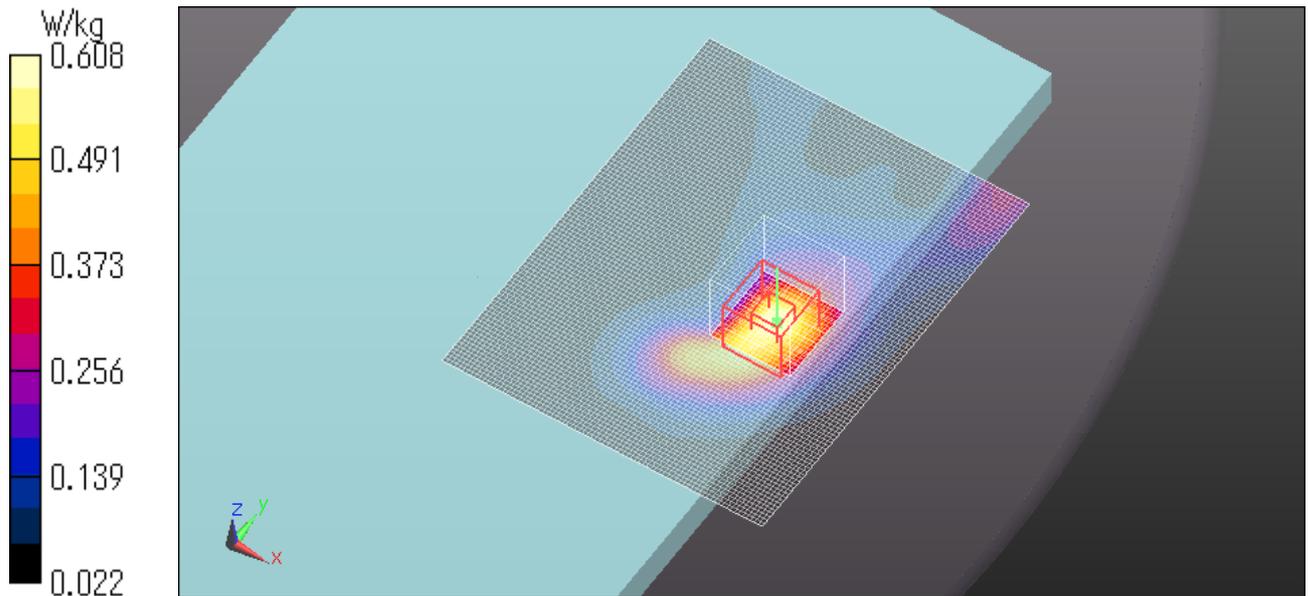
Peak SAR (extrapolated) = 0.779 W/kg

SAR(1 g) = 0.454 W/kg; SAR(10 g) = 0.286 W/kg

Maximum value of SAR (measured) = 0.608 W/kg

Date: 2013/03/19

Ambient Temp. : 23.5 degree.C. Liquid Temp.; 22.5 degree.C.



AK8SVD132A1WL GSM850 GPRS 2slots 836.6MHz Bottom(Laptop) 0mm

Communication System: GSM850; Communication System Band: Exported from older format (data unavailable - please correct).; Frequency: 836.6 MHz; Duty Cycle: 1:4.19952

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.948$ mho/m; $\epsilon_r = 53.665$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(9.55, 9.55, 9.55); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (3);

Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.0195 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 0.849 V/m; Power Drift = 0.14 dB

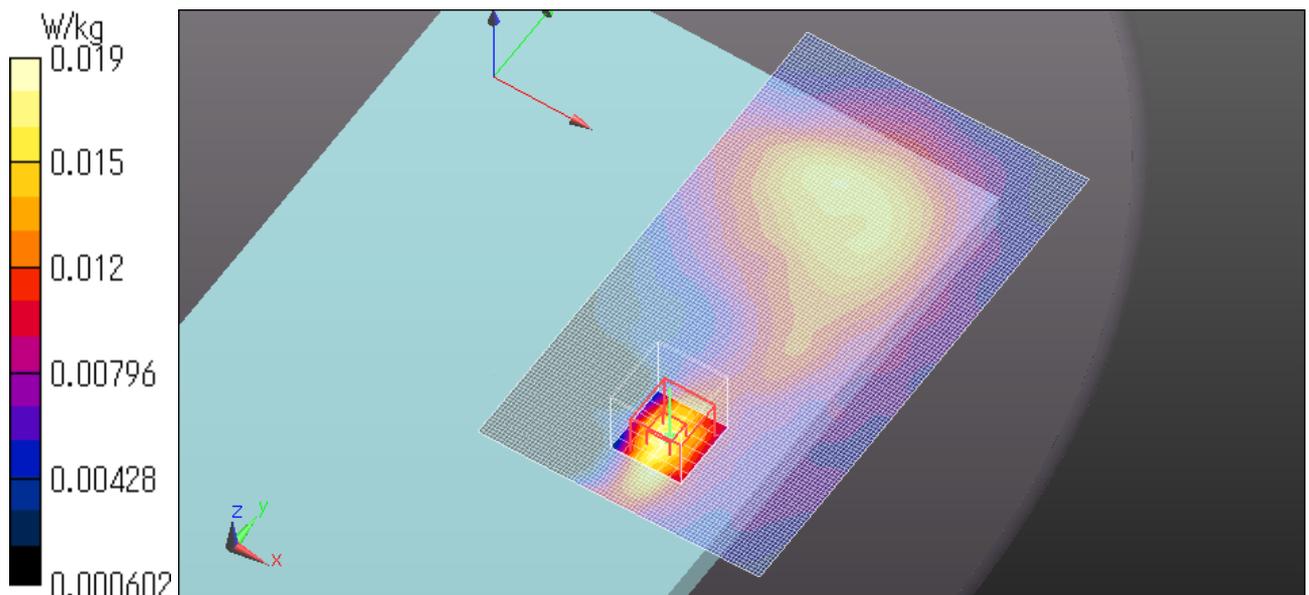
Peak SAR (extrapolated) = 0.0220 W/kg

SAR(1 g) = 0.014 W/kg; SAR(10 g) = 0.00916 W/kg

Maximum value of SAR (measured) = 0.0190 W/kg

Date: 2013/03/19

Ambient Temp. : 23.5 degree.C. Liquid Temp.; 22.5 degree.C.



AK8SVD132A1WL GSM850 GPRS 2slots 824.2MHz Top side 2mm

Communication System: GSM850; Communication System Band: Exported from older format (data unavailable - please correct).; Frequency: 824.2 MHz; Duty Cycle: 1:4.19952

Medium parameters used: $f = 825$ MHz; $\sigma = 0.937$ mho/m; $\epsilon_r = 53.788$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(9.55, 9.55, 9.55); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

Area Scan 2 (61x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.18 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 36.000 V/m; Power Drift = 0.03 dB

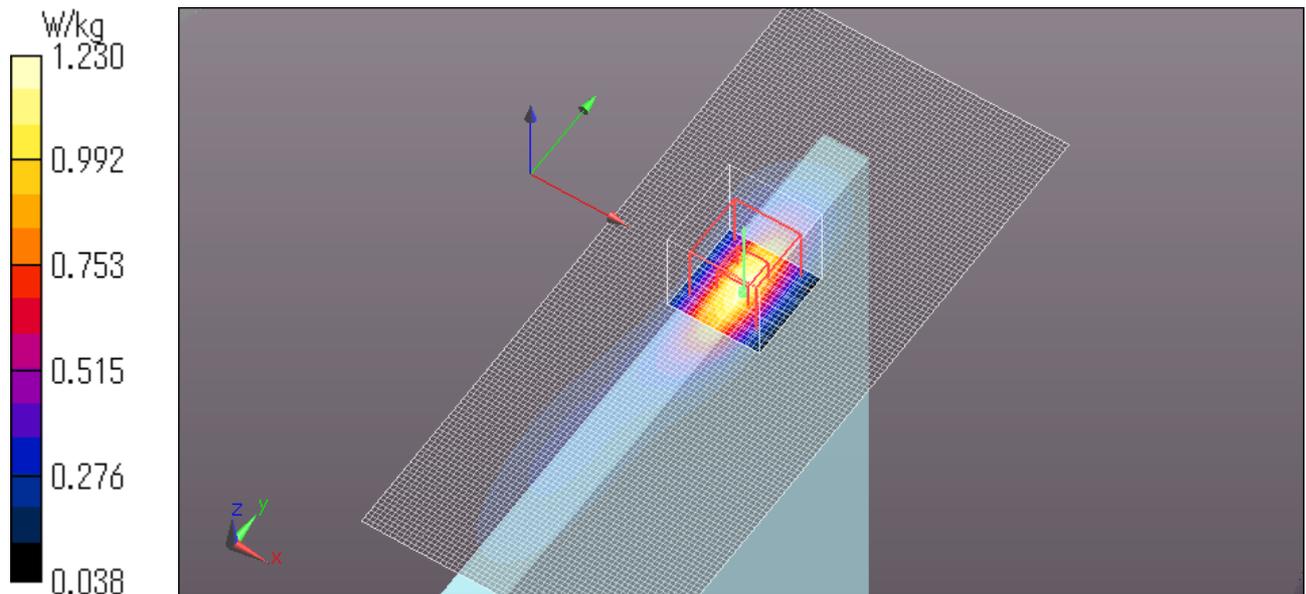
Peak SAR (extrapolated) = 1.75 W/kg

SAR(1 g) = 0.838 W/kg; SAR(10 g) = 0.424 W/kg

Maximum value of SAR (measured) = 1.23 W/kg

Date: 2013/03/19

Ambient Temp. : 23.5 degree.C. Liquid Temp.; 22.5 degree.C.



AK8SVD132A1WL GSM850 GPRS 2slots 848.8MHz Top side 2mm

Communication System: GSM850; Communication System Band: Exported from older format (data unavailable - please correct).; Frequency: 848.8 MHz; Duty Cycle: 1:4.19952

Medium parameters used (interpolated): $f = 848.8$ MHz; $\sigma = 0.961$ mho/m; $\epsilon_r = 53.534$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(9.55, 9.55, 9.55); Calibrated: 2012/12/10; {Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (3);

Area Scan 2 (61x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.34 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 38.259 V/m; Power Drift = 0.05 dB

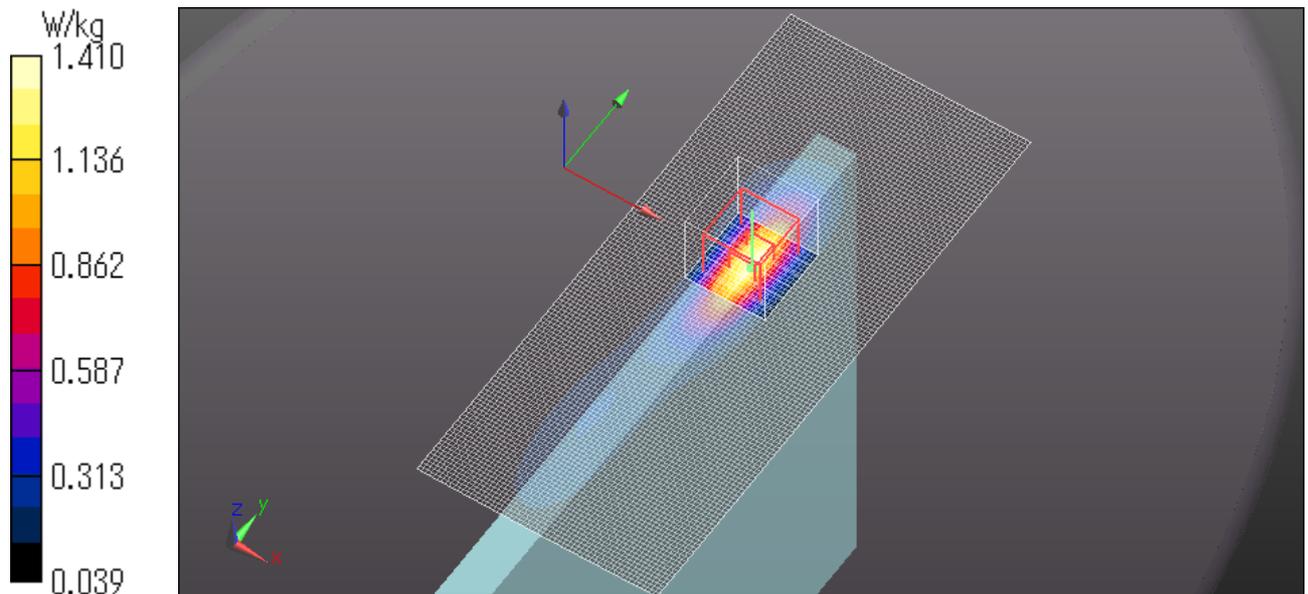
Peak SAR (extrapolated) = 1.95 W/kg

SAR(1 g) = 0.949 W/kg; SAR(10 g) = 0.474 W/kg

Maximum value of SAR (measured) = 1.41 W/kg

Date: 2013/03/19

Ambient Temp. : 23.5 degree.C. Liquid Temp.; 22.5 degree.C.



Z Scan at Maximum Body SAR position in GSM850 band

AK8SVD132A1WL GSM850 GPRS 2slots 848.8MHz Top side 2mm

Communication System: GSM850; Communication System Band: Exported from older format (data unavailable - please correct).; Frequency: 848.8 MHz;Duty Cycle: 1:4.19952

Medium parameters used (interpolated): $f = 848.8$ MHz; $\sigma = 0.961$ mho/m; $\epsilon_r = 53.534$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(9.55, 9.55, 9.55); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

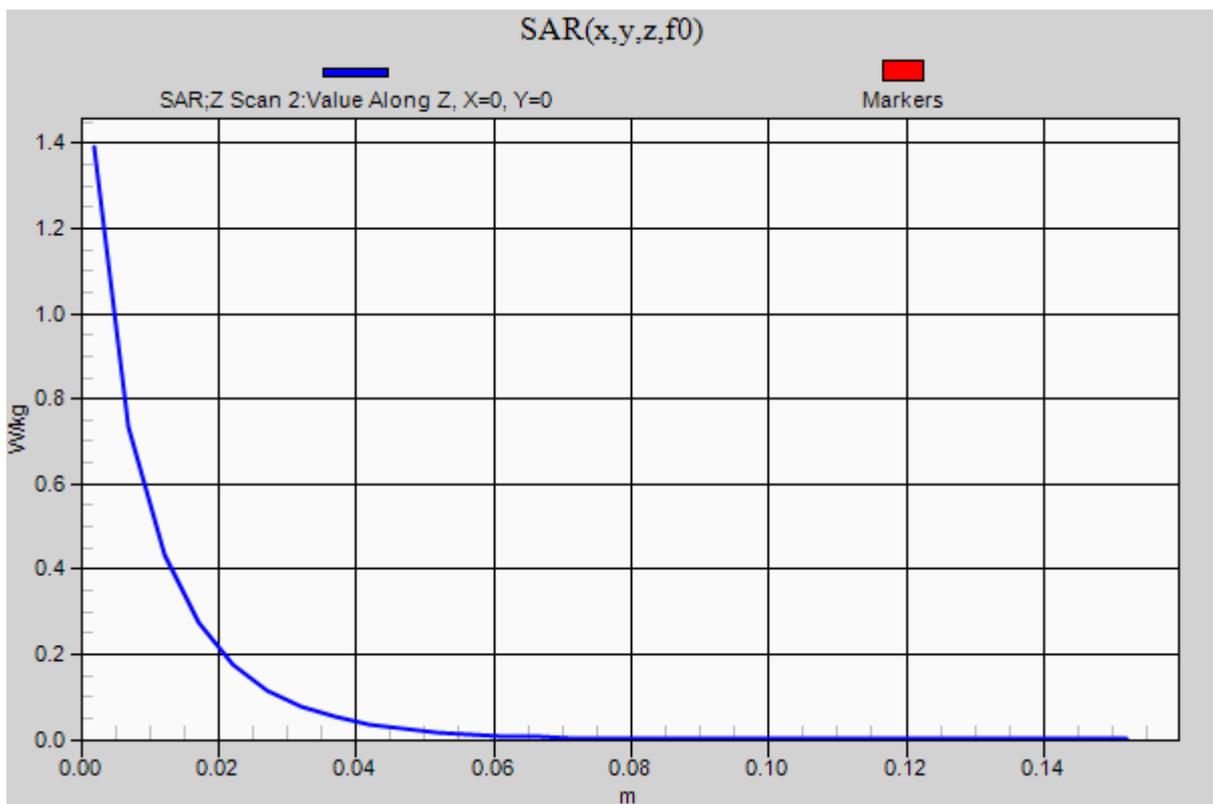
Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (3);

Z Scan 2 (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Date: 2013/03/19

Ambient Temp. : 23.5 degree.C. Liquid Temp.; 22.5 degree.C.



AK8SVD132A1WL GSM850 GPRS 2slots 848.8MHz Top side 2mm

Communication System: GSM850; Communication System Band: Exported from older format (data unavailable - please correct).; Frequency: 848.8 MHz;Duty Cycle: 1:4.19952

Medium parameters used (interpolated): $f = 848.8$ MHz; $\sigma = 0.961$ mho/m; $\epsilon_r = 53.534$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(9.55, 9.55, 9.55); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (3);

Area Scan 2 (61x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.33 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 38.304 V/m; Power Drift = -0.01 dB

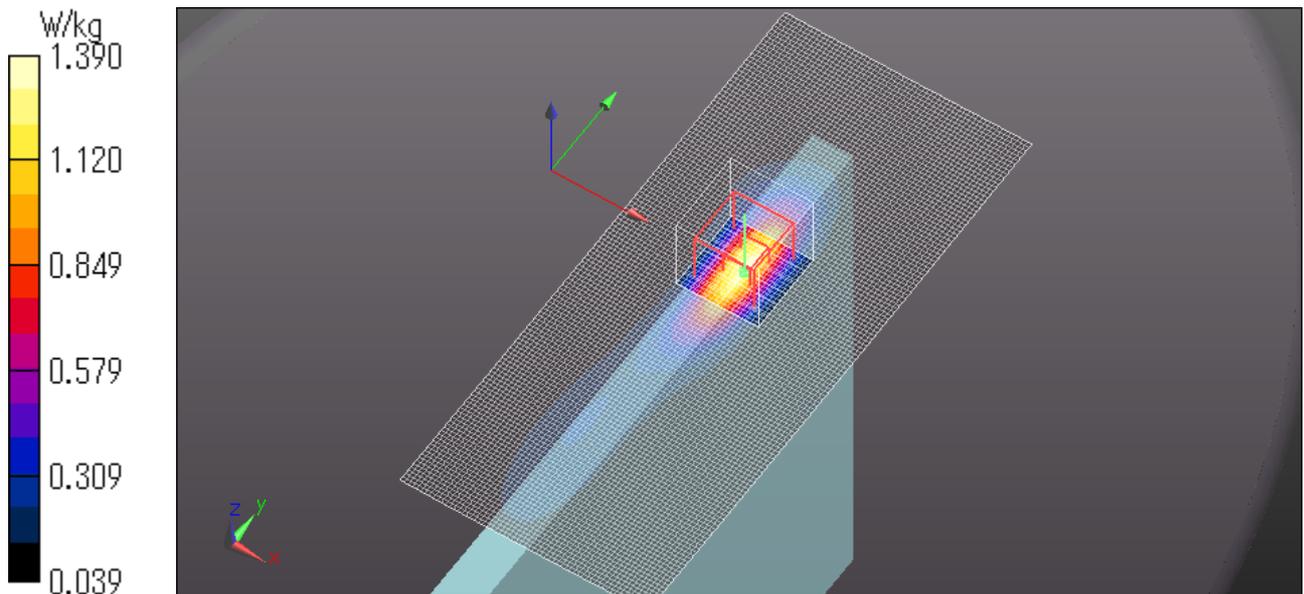
Peak SAR (extrapolated) = 1.93 W/kg

SAR(1 g) = 0.937 W/kg; SAR(10 g) = 0.469 W/kg

Maximum value of SAR (measured) = 1.39 W/kg

Date: 2013/03/19

Ambient Temp. : 23.5 degree.C. Liquid Temp.; 22.5 degree.C.



ii) **PCS 1900MHz**

AK8SVD132A1WL PCS1900 GPRS 2slots 1880MHz Top side 4mm

Communication System: PCS1900; Communication System Band: PCS1900; Frequency: 1880 MHz; Duty Cycle: 1:4.19952

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.569$ mho/m; $\epsilon_r = 54.581$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.59, 7.59, 7.59); Calibrated: 2012/12/10; {Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.32 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.010 V/m; Power Drift = -0.17 dB

Peak SAR (extrapolated) = 1.99 W/kg

SAR(1 g) = 0.904 W/kg; SAR(10 g) = 0.404 W/kg

Maximum value of SAR (measured) = 1.42 W/kg

Zoom Scan 2 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.010 V/m; Power Drift = -0.12 dB

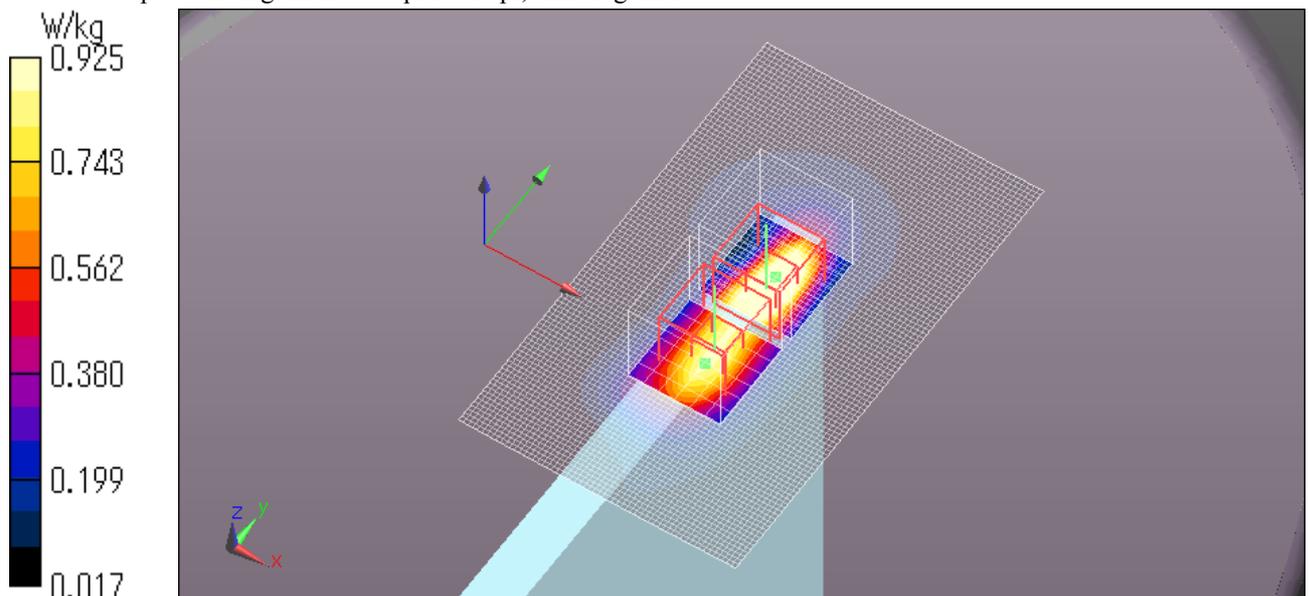
Peak SAR (extrapolated) = 1.21 W/kg

SAR(1 g) = 0.652 W/kg; SAR(10 g) = 0.358 W/kg

Maximum value of SAR (measured) = 0.925 W/kg

Date: 2013/04/03

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL PCS1900 GPRS 2slots 1880MHz Top side 0mm

Communication System: GSM 1800; Communication System Band: PCS1900; Frequency: 1880 MHz; Duty Cycle: 1:4.19952

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.617$ mho/m; $\epsilon_r = 51.898$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.59, 7.59, 7.59); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

above 1 GHz/Top/Area Scan 2 (81x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.957 W/kg

above 1 GHz/Top/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.344 V/m; Power Drift = -0.16 dB

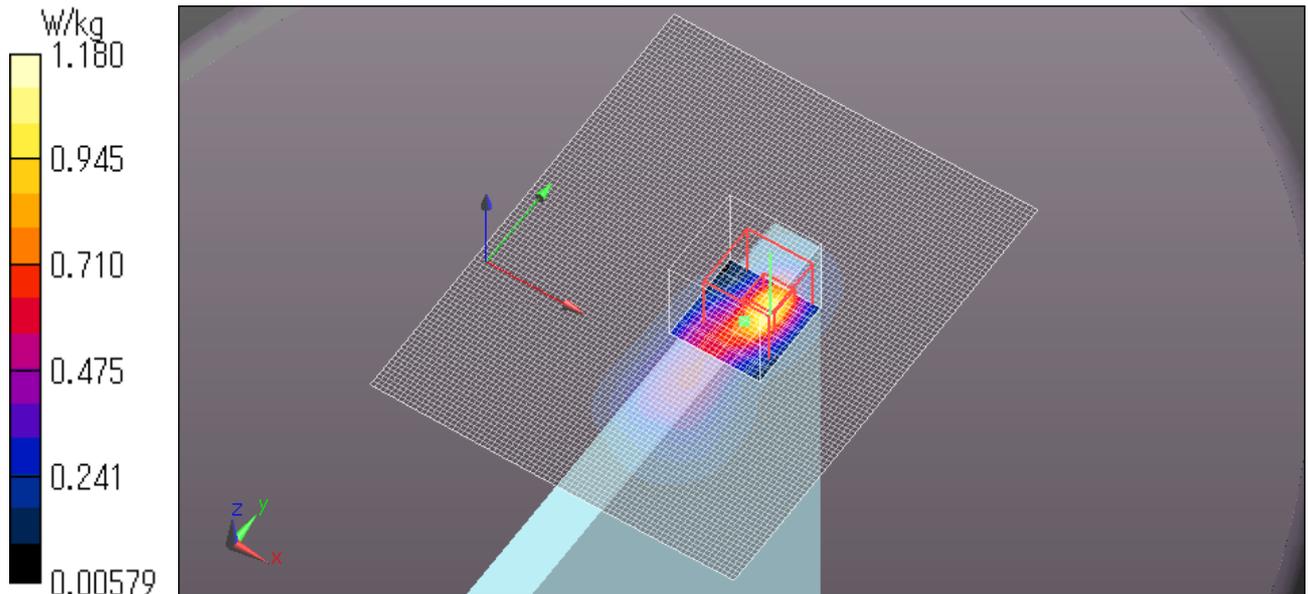
Peak SAR (extrapolated) = 1.74 W/kg

SAR(1 g) = 0.692 W/kg; SAR(10 g) = 0.283 W/kg

Maximum value of SAR (measured) = 1.18 W/kg

Date: 2013/03/14

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL PCS1900 GPRS 2slots 1880MHz Left side 0mm

Communication System: PCS1900; Communication System Band: PCS1900; Frequency: 1880 MHz; Duty Cycle: 1:4.19952

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.583$ mho/m; $\epsilon_r = 50.749$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.59, 7.59, 7.59); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (3);

Area Scan 2 (81x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.373 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14.649 V/m; Power Drift = 0.18 dB

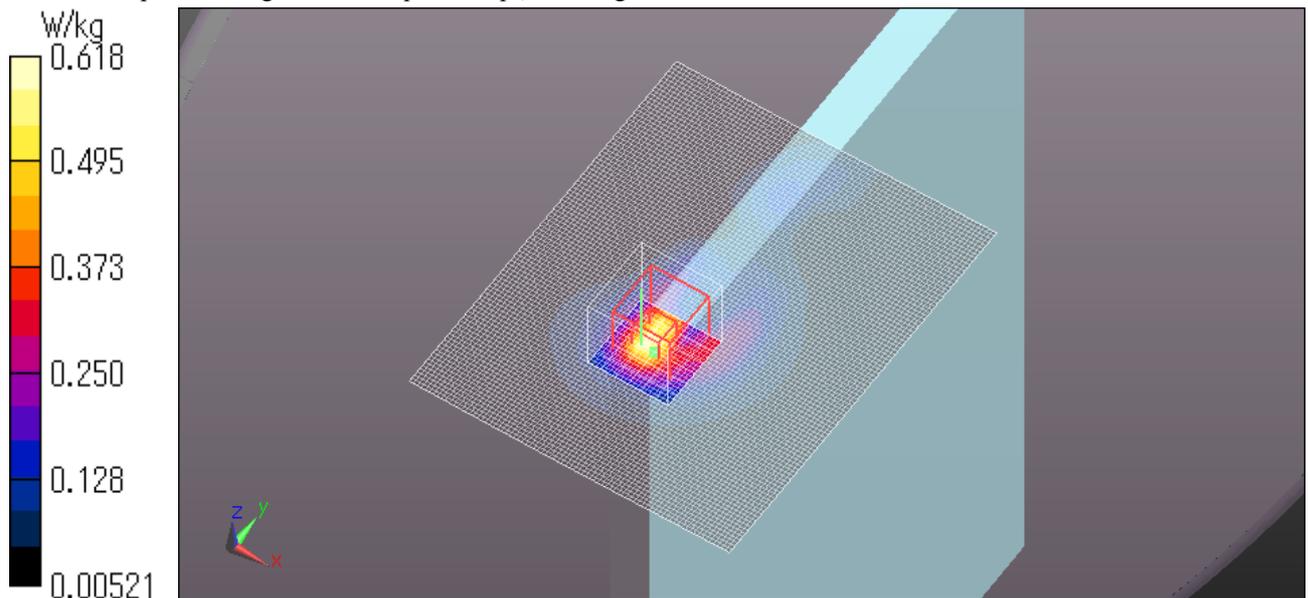
Peak SAR (extrapolated) = 0.935 W/kg

SAR(1 g) = 0.392 W/kg; SAR(10 g) = 0.187 W/kg

Maximum value of SAR (measured) = 0.618 W/kg

Date: 2013/03/14

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL PCS1900 GPRS 2slots 1880MHz Rear 0mm

Communication System: PCS1900; Communication System Band: PCS1900; Frequency: 1880 MHz; Duty Cycle: 1:4.19952

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.583$ mho/m; $\epsilon_r = 50.749$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.59, 7.59, 7.59); Calibrated: 2012/12/10; {Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (3);

Area Scan (81x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.163 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 0.636 V/m; Power Drift = 0.02 dB

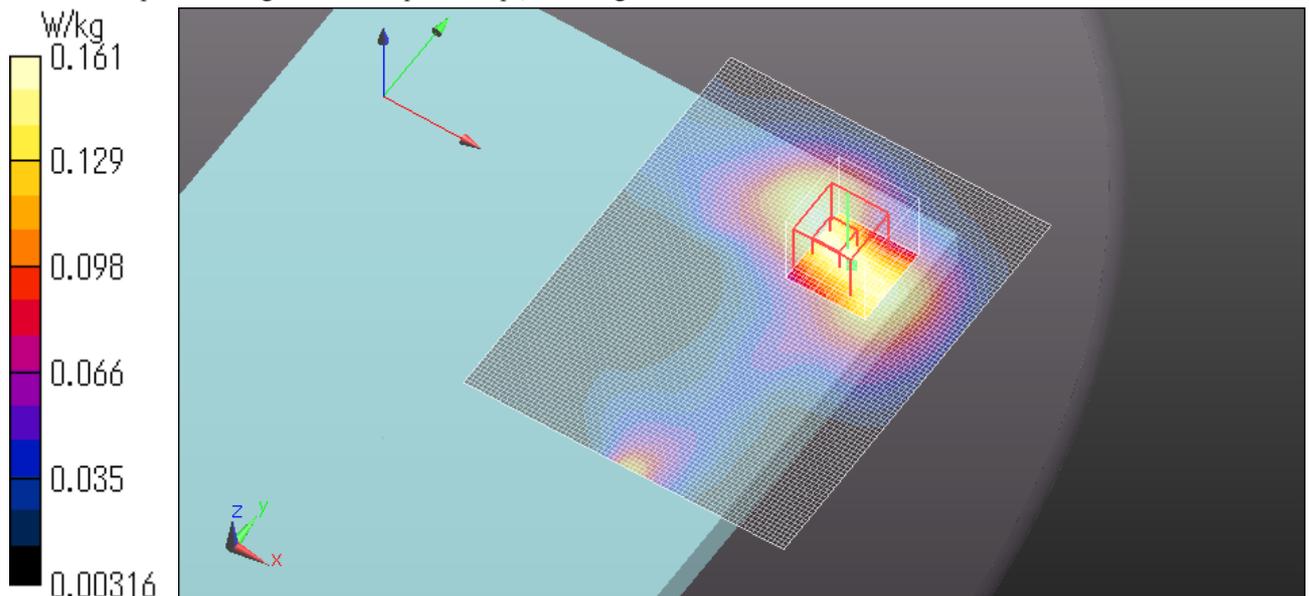
Peak SAR (extrapolated) = 0.202 W/kg

SAR(1 g) = 0.121 W/kg; SAR(10 g) = 0.070 W/kg

Maximum value of SAR (measured) = 0.161 W/kg

Date: 2013/03/14

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL PCS1900 GPRS 2slots 1880MHz Bottom(Laptop) 0mm

Communication System: PCS1900; Communication System Band: PCS1900; Frequency: 1880 MHz; Duty Cycle: 1:4.19952

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.583$ mho/m; $\epsilon_r = 50.749$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.59, 7.59, 7.59); Calibrated: 2012/12/10; {Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.0322 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 0.861 V/m; Power Drift = 0.18 dB

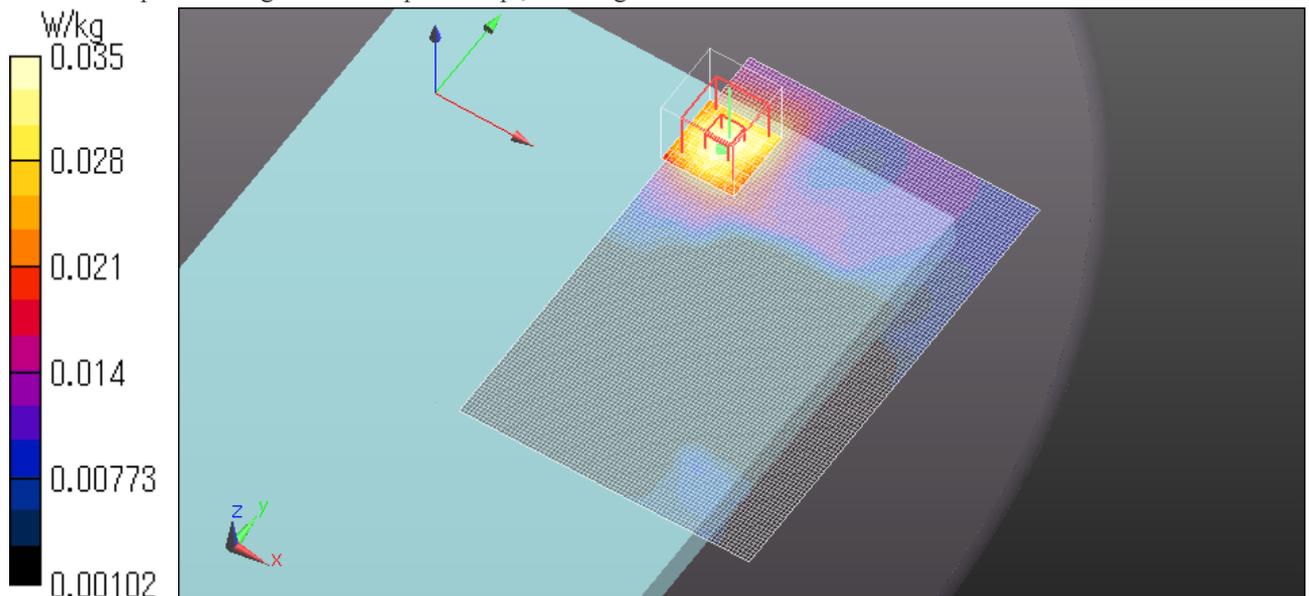
Peak SAR (extrapolated) = 0.0430 W/kg

SAR(1 g) = 0.026 W/kg; SAR(10 g) = 0.016 W/kg

Maximum value of SAR (measured) = 0.0346 W/kg

Date: 2013/03/14

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL PCS1900 GPRS 2slots 1850.2MHz Top side 4mm

Communication System: PCS1900; Communication System Band: PCS1900; Frequency: 1850.2 MHz; Duty Cycle: 1:4.19952

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 54.715$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.59, 7.59, 7.59); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (3);

Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.50 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.509 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 2.12 W/kg

SAR(1 g) = 0.973 W/kg; SAR(10 g) = 0.447 W/kg

Maximum value of SAR (measured) = 1.51 W/kg

Zoom Scan 2 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.509 V/m; Power Drift = -0.13 dB

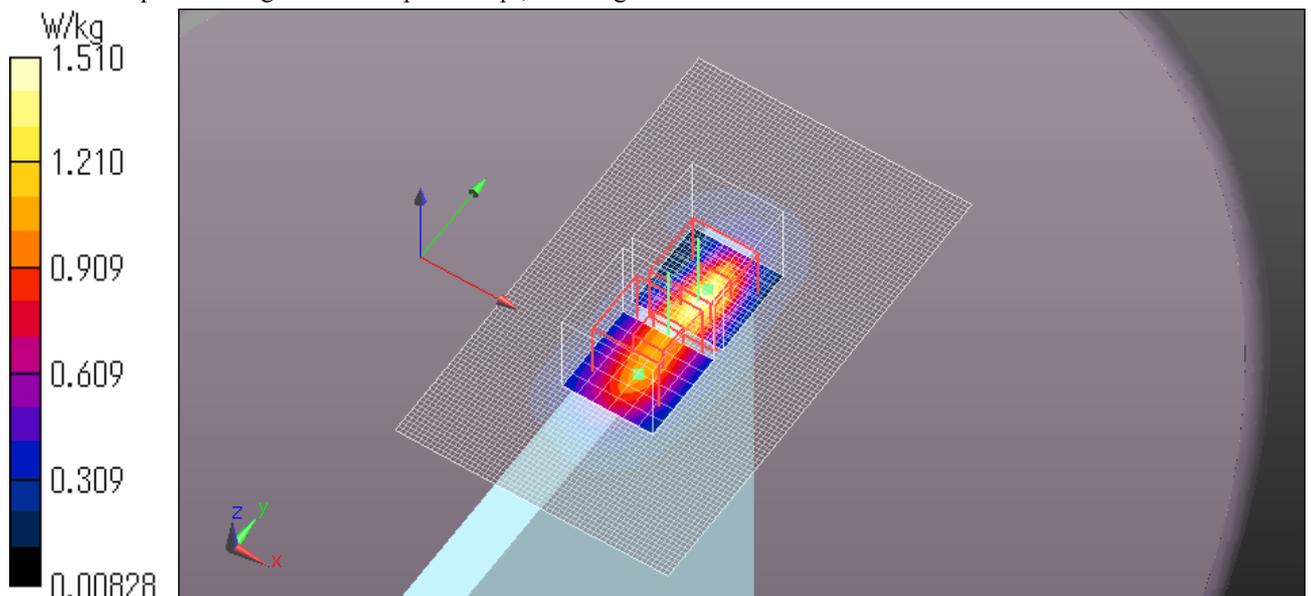
Peak SAR (extrapolated) = 1.45 W/kg

SAR(1 g) = 0.799 W/kg; SAR(10 g) = 0.437 W/kg

Maximum value of SAR (measured) = 1.12 W/kg

Date: 2013/04/03

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL PCS1900 GPRS 2slots 1909.8MHz Top side 4mm

Communication System: PCS1900; Communication System Band: PCS1900; Frequency: 1909.8 MHz; Duty Cycle: 1:4.19952

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.556$ mho/m; $\epsilon_r = 52.843$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.59, 7.59, 7.59); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.01 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.088 V/m; Power Drift = 0.03 dB

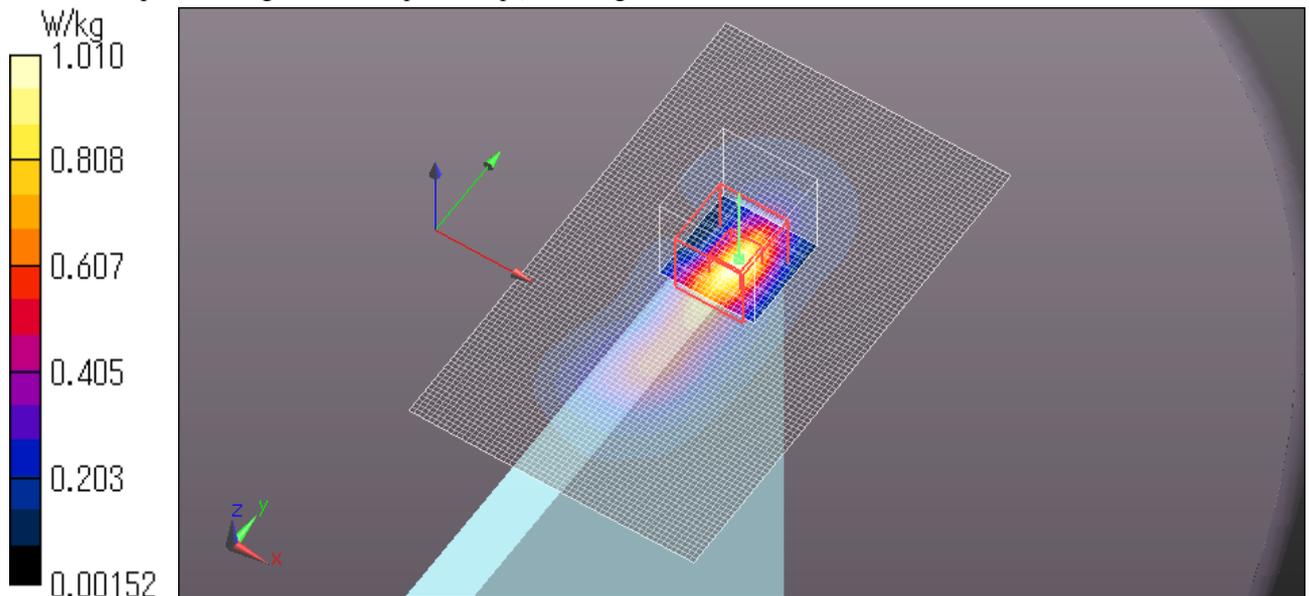
Peak SAR (extrapolated) = 1.46 W/kg

SAR(1 g) = 0.667 W/kg; SAR(10 g) = 0.295 W/kg

Maximum value of SAR (measured) = 1.05 W/kg

Date: 2013/04/03

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL PCS1900 GPRS 2slots 1850.2MHz Top side 0mm

Communication System: PCS1900; Communication System Band: PCS1900; Frequency: 1850.2 MHz; Duty Cycle: 1:4.19952

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.592$ mho/m; $\epsilon_r = 51.975$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.59, 7.59, 7.59); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

Area Scan 2 (81x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.01 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.373 V/m; Power Drift = -0.18 dB

Peak SAR (extrapolated) = 1.82 W/kg

SAR(1 g) = 0.735 W/kg; SAR(10 g) = 0.312 W/kg

Maximum value of SAR (measured) = 1.19 W/kg

Zoom Scan 2 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.373 V/m; Power Drift = -0.18 dB

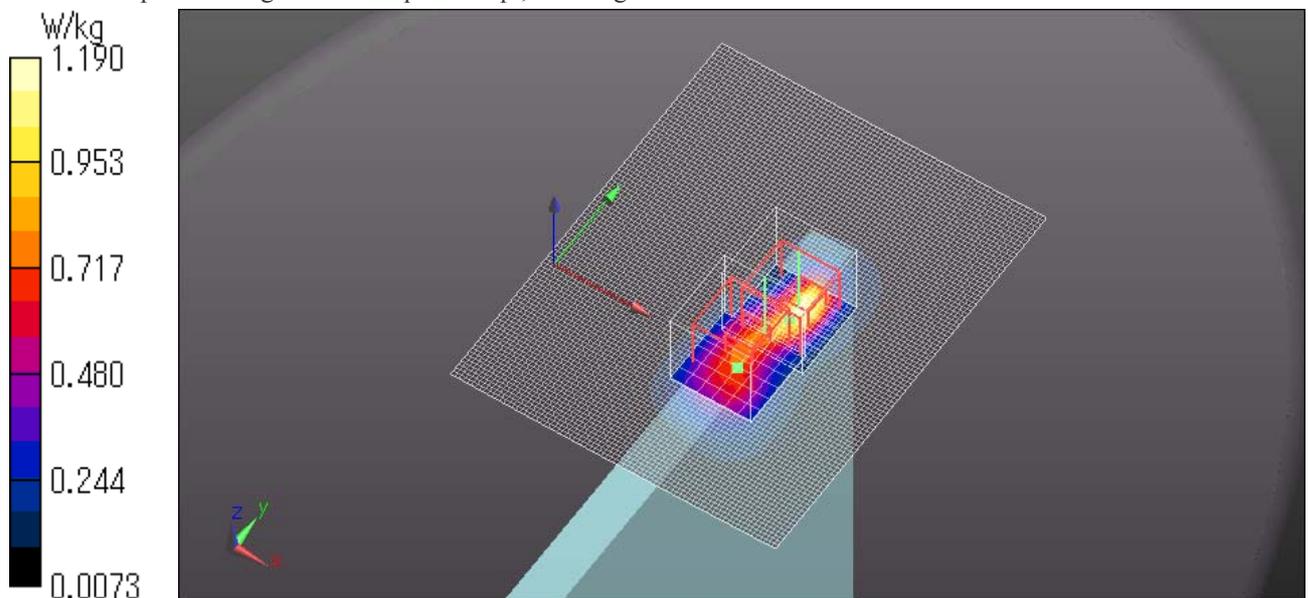
Peak SAR (extrapolated) = 1.06 W/kg

SAR(1 g) = 0.554 W/kg; SAR(10 g) = 0.299 W/kg

Maximum value of SAR (measured) = 0.796 W/kg

Date: 2013/03/14

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL PCS1900 GPRS 2slots 1909.8MHz Top side 0mm

Communication System: PCS1900; Communication System Band: PCS1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.30042

Medium parameters used (extrapolated): $f = 1909.8$ MHz; $\sigma = 1.645$ mho/m; $\epsilon_r = 51.719$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.59, 7.59, 7.59); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

Area Scan 2 (81x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.06 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 26.527 V/m; Power Drift = -0.19 dB

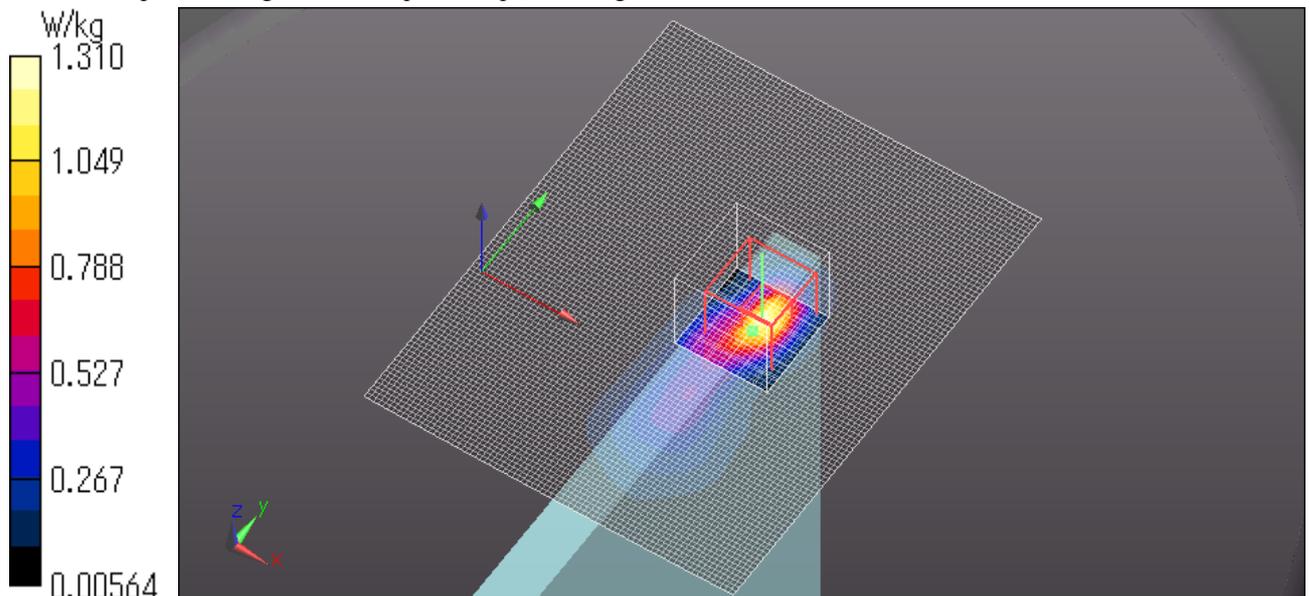
Peak SAR (extrapolated) = 2.06 W/kg

SAR(1 g) = 0.770 W/kg; SAR(10 g) = 0.300 W/kg

Maximum value of SAR (measured) = 1.31 W/kg

Date: 2013/03/14

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL PCS1900 GPRS 2slots 1909.8MHz Top side 0mm Repeat

Communication System: PCS1900; Communication System Band: PCS1900; Frequency: 1909.8 MHz; Duty Cycle: 1:4.19952

Medium parameters used (extrapolated): $f = 1909.8$ MHz; $\sigma = 1.645$ mho/m; $\epsilon_r = 51.719$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.59, 7.59, 7.59); Calibrated: 2012/12/10; $\{$ Probe: Calibration Date $\}$

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

above 1 GHz/Top Lch/Area Scan 2 (81x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

[Info: Extrapolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.07 W/kg

above 1 GHz/Top Lch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.386 V/m; Power Drift = -0.18 dB

Peak SAR (extrapolated) = 1.92 W/kg

SAR(1 g) = 0.774 W/kg; SAR(10 g) = 0.329 W/kg

[Info: Extrapolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.26 W/kg

above 1 GHz/Top Lch/Zoom Scan 2 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.386 V/m; Power Drift = -0.18 dB

Peak SAR (extrapolated) = 1.12 W/kg

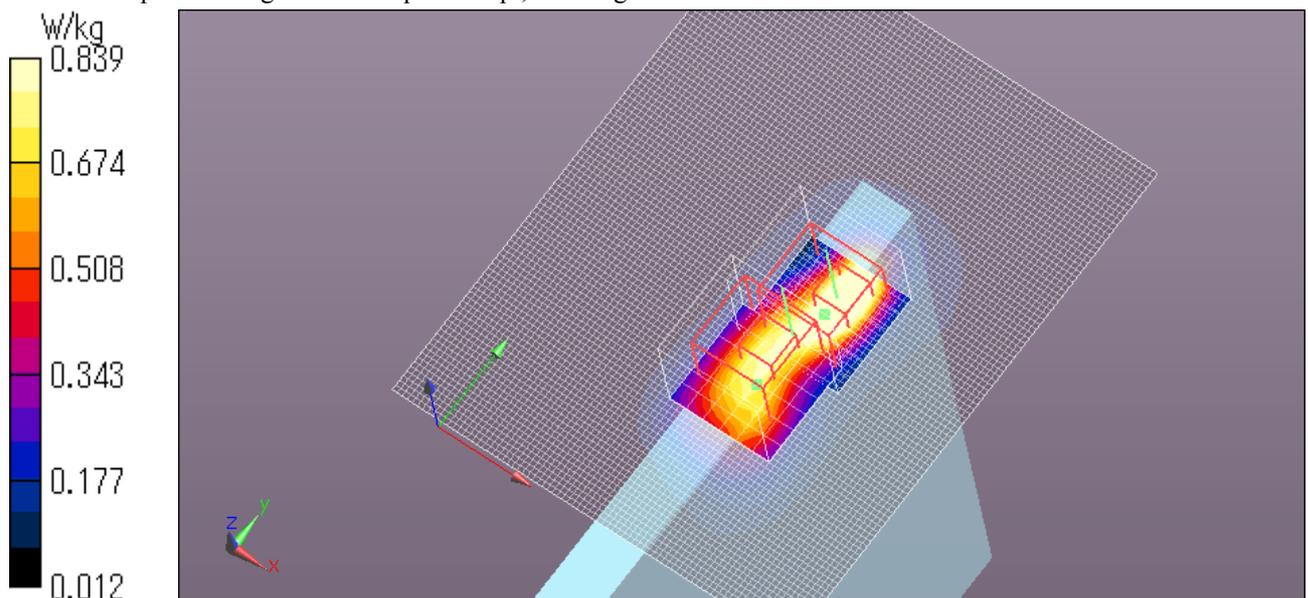
SAR(1 g) = 0.583 W/kg; SAR(10 g) = 0.315 W/kg

[Info: Extrapolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.839 W/kg

Date: 2013/03/14

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



Z Scan at Maximun Body SAR position in PCS1900MHz band

AK8SVD132A1WL PCS1900 GPRS 2slots 1909.8MHz Top side Repeat

Communication System: PCS1900; Communication System Band: PCS1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.30042

Medium parameters used (extrapolated): $f = 1909.8$ MHz; $\sigma = 1.645$ mho/m; $\epsilon_r = 51.719$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.59, 7.59, 7.59); Calibrated: 2012/12/10; {Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (3);

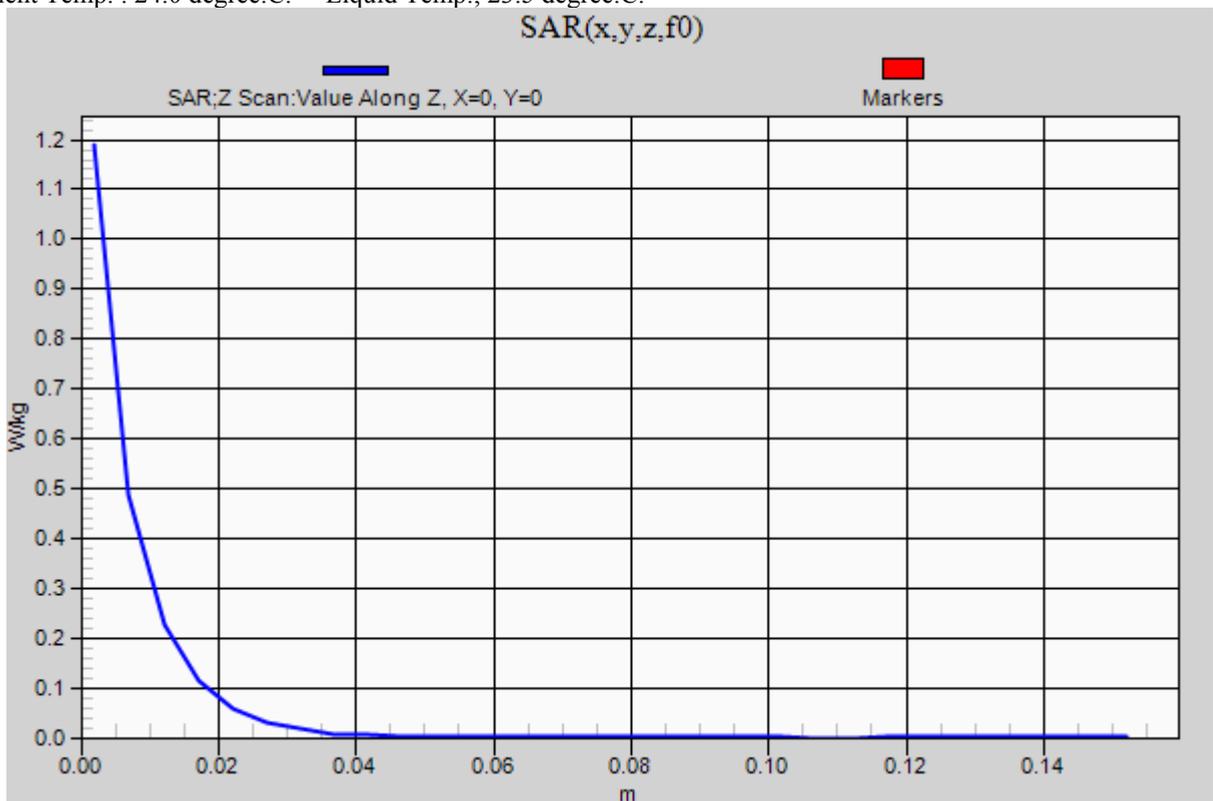
above 1 GHz/Top Hch/Z Scan (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Info: Extrapolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.19 W/kg

Date: 2013/03/14

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



iii) WCDMA Band V

AK8SVD132A1WL WCDMA Band V 12.2k RMC 836.6MHz Top side 4mm

Communication System: WCDMA V 835M; Communication System Band: WCDMA V band; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.985$ mho/m; $\epsilon_r = 54.967$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(9.55, 9.55, 9.55); Calibrated: 2012/12/10; {Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

Area Scan (61x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.39 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 34.236 V/m; Power Drift = 0.08 dB

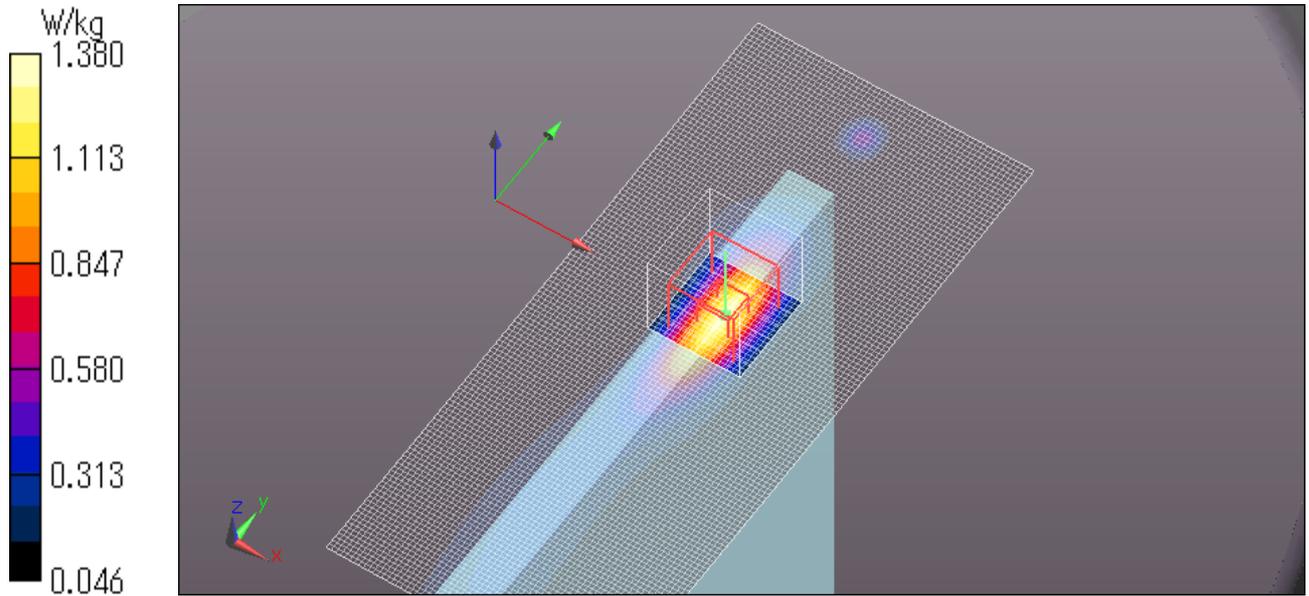
Peak SAR (extrapolated) = 1.82 W/kg

SAR(1 g) = 0.940 W/kg; SAR(10 g) = 0.491 W/kg

Maximum value of SAR (measured) = 1.38 W/kg

Date: 2013/04/04

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL WCDMA Band V 12.2k RMC 836.6MHz Top side 0mm

Communication System: WCDMA V 835M; Communication System Band: WCDMA V band; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.957$ mho/m; $\epsilon_r = 55.522$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(9.55, 9.55, 9.55); Calibrated: 2012/12/10; {Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (3);

Area Scan (31x71x1): Interpolated grid: dx=3.000 mm, dy=3.000 mm

Maximum value of SAR (interpolated) = 0.278 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.140 V/m; Power Drift = -0.18 dB

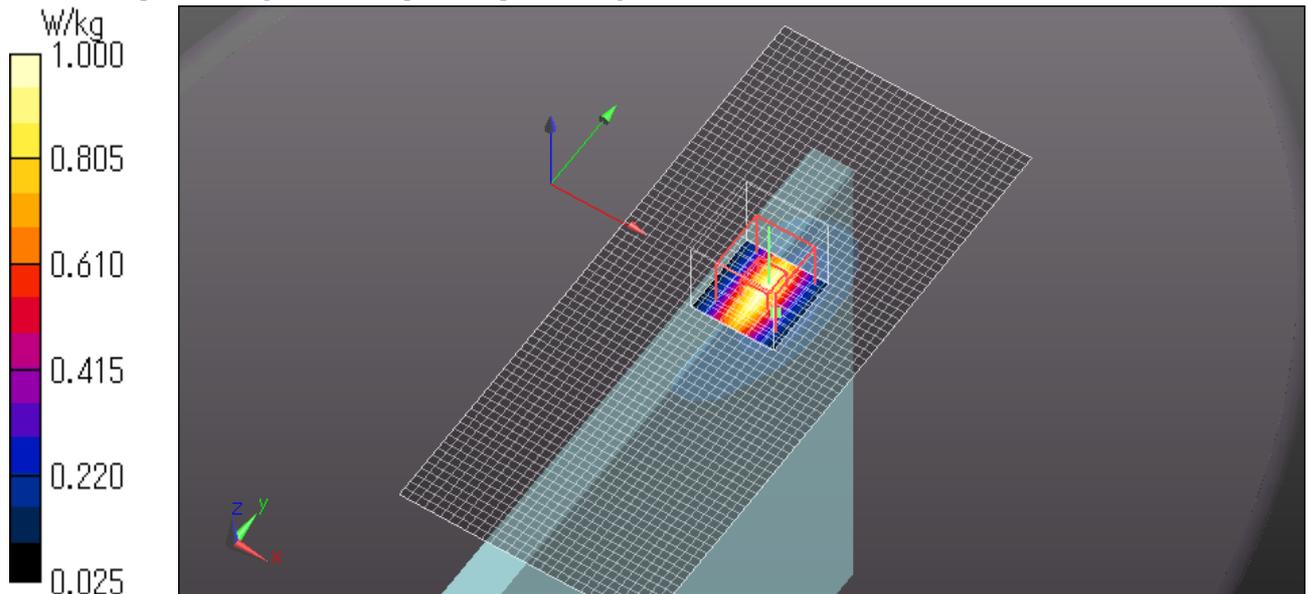
Peak SAR (extrapolated) = 1.38 W/kg

SAR(1 g) = 0.645 W/kg; SAR(10 g) = 0.317 W/kg

Maximum value of SAR (measured) = 1.00 W/kg

Date: 2013/03/14

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL WCDMA Band V 12.2k RMC 836.6MHz Left side 0mm

Communication System: WCDMA V 835M; Communication System Band: WCDMA V band; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.948$ mho/m; $\epsilon_r = 53.665$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(9.55, 9.55, 9.55); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (3);

Area Scan 3 (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.445 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.711 V/m; Power Drift = 0.10 dB

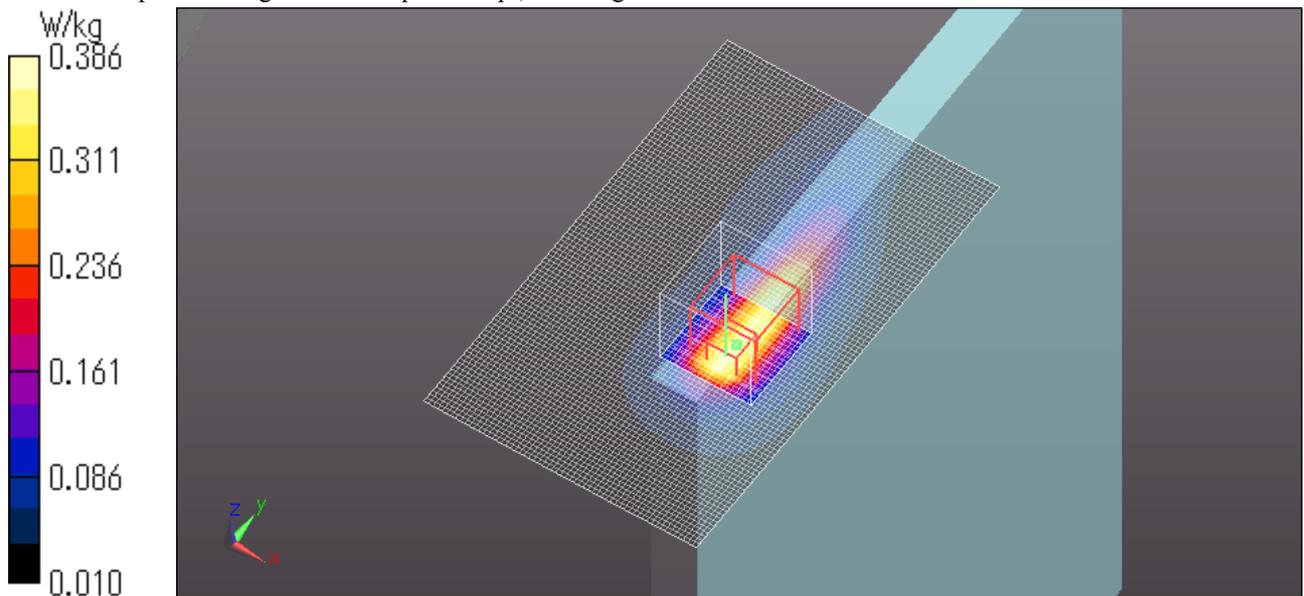
Peak SAR (extrapolated) = 0.633 W/kg

SAR(1 g) = 0.253 W/kg; SAR(10 g) = 0.132 W/kg

Maximum value of SAR (measured) = 0.386 W/kg

Date: 2013/03/14

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL WCDMA Band V 12.2k RMC 836.6MHz Rear 0mm

Communication System: WCDMA V 835M; Communication System Band: WCDMA V band; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.948$ mho/m; $\epsilon_r = 53.665$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(9.55, 9.55, 9.55); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (3);

Area Scan (81x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.380 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 0.358 V/m; Power Drift = 0.17 dB

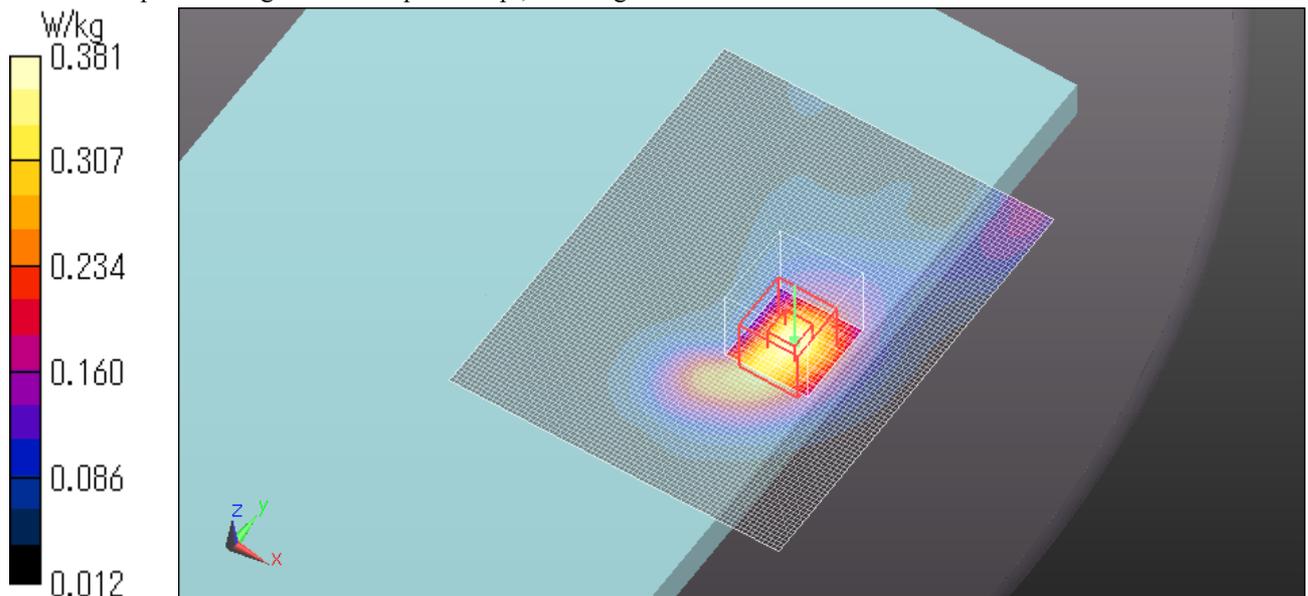
Peak SAR (extrapolated) = 0.489 W/kg

SAR(1 g) = 0.285 W/kg; SAR(10 g) = 0.177 W/kg

Maximum value of SAR (measured) = 0.381 W/kg

Date: 2013/03/14

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL WCDMA Band V 12.2k RMC 836.6MHz Bottom(Laptop) 0mm

Communication System: WCDMA V 835M; Communication System Band: WCDMA V band; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.948$ mho/m; $\epsilon_r = 53.665$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(9.55, 9.55, 9.55); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.00848 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 0.524 V/m; Power Drift = 0.05 dB

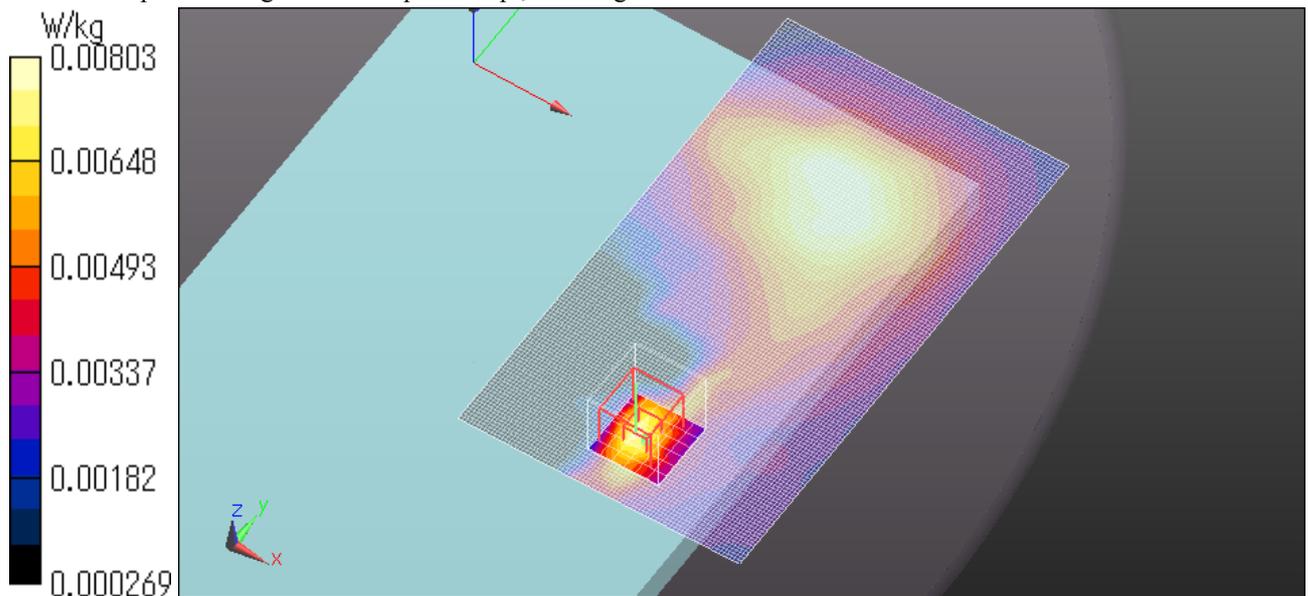
Peak SAR (extrapolated) = 0.0180 W/kg

SAR(1 g) = 0.00591 W/kg; SAR(10 g) = 0.00309 W/kg

Maximum value of SAR (measured) = 0.00803 W/kg

Date: 2013/03/14

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL WCDMA Band V 12.2k RMC 826.4MHz Top side 4mm

Communication System: WCDMA V 835M; Communication System Band: WCDMA V band; Frequency: 826.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 826.4$ MHz; $\sigma = 0.974$ mho/m; $\epsilon_r = 55.074$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(9.55, 9.55, 9.55); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

Area Scan (61x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.50 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 35.932 V/m; Power Drift = -0.11 dB

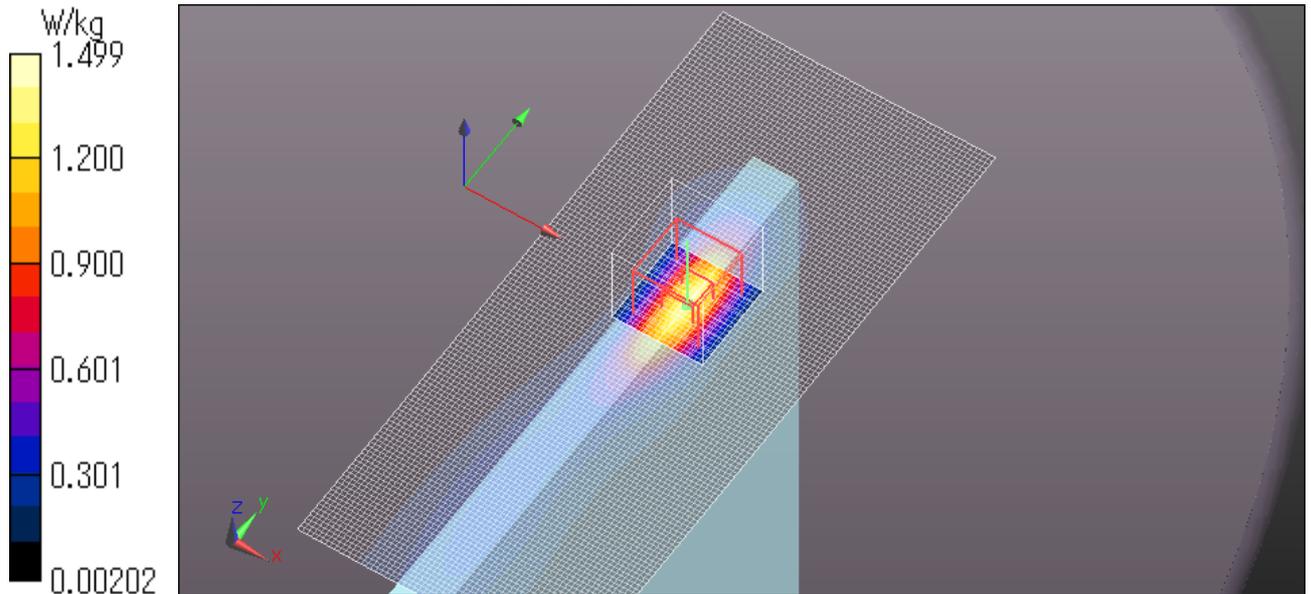
Peak SAR (extrapolated) = 1.93 W/kg

SAR(1 g) = 0.998 W/kg; SAR(10 g) = 0.522 W/kg

Maximum value of SAR (measured) = 1.47 W/kg

Date: 2013/04/04

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL WCDMA Band V 12.2k RMC 846.6MHz Top side 4mm

Communication System: WCDMA V 835M; Communication System Band: WCDMA V band; Frequency: 846.6 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 846.6$ MHz; $\sigma = 0.995$ mho/m; $\epsilon_r = 54.86$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(9.55, 9.55, 9.55); Calibrated: 2012/12/10; $\{$ Probe: Calibration Date $\}$

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

Area Scan (61x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.46 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 33.529 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 1.86 W/kg

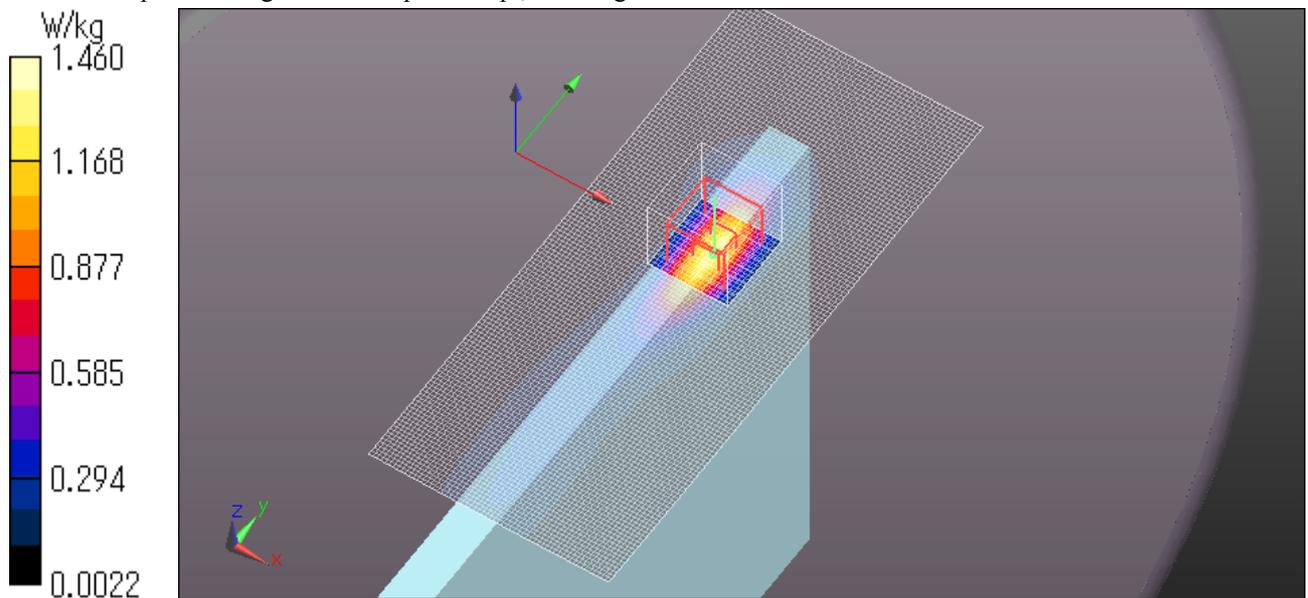
SAR(1 g) = 0.964 W/kg; SAR(10 g) = 0.502 W/kg

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.42 W/kg

Date: 2013/04/04

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL WCDMA Band V 12.2k RMC 826.4MHz Top side 4mm Repeat

Communication System: WCDMA V 835M; Communication System Band: WCDMA V band; Frequency: 826.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 826.4$ MHz; $\sigma = 0.974$ mho/m; $\epsilon_r = 55.074$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(9.55, 9.55, 9.55); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

Area Scan (61x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.58 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 18.073 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 1.95 W/kg

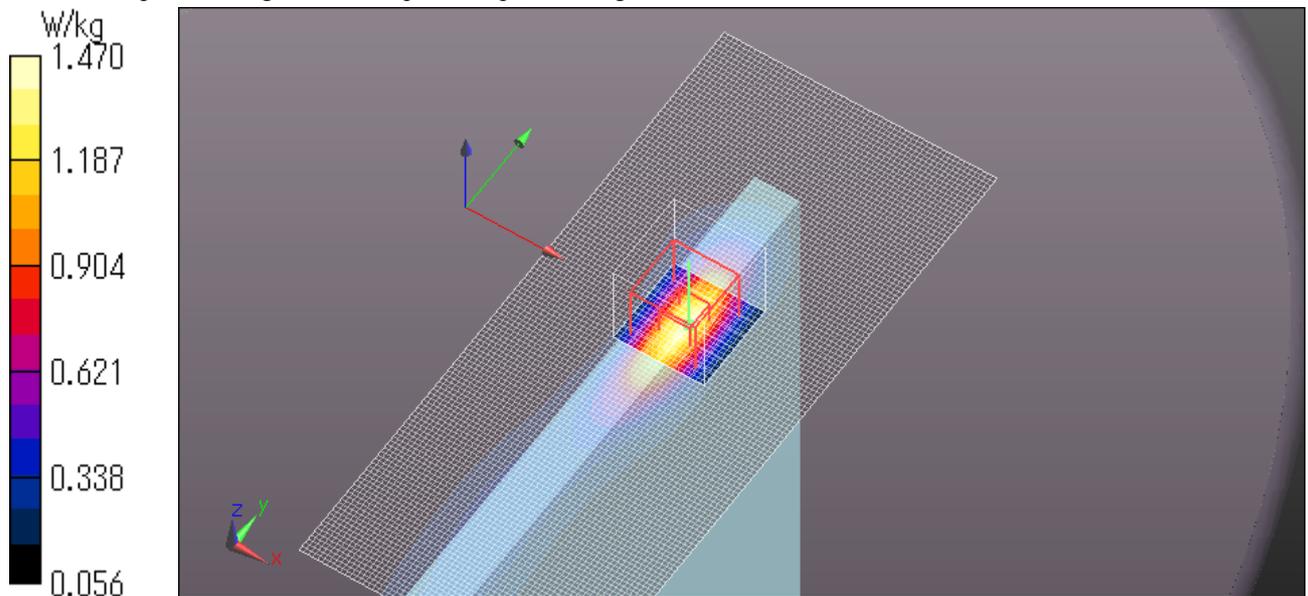
SAR(1 g) = 1.01 W/kg; SAR(10 g) = 0.528 W/kg

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.47 W/kg

Date: 2013/04/04

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



Z Scan at Maximun Body SAR position in WCDMA band V

AK8SVD132A1WL WCDMA Band V 12.2k RMC 826.4MHz Top side 4mm Repeat

Communication System: WCDMA V 835M; Communication System Band: WCDMA V band; Frequency: 826.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 826.4$ MHz; $\sigma = 0.974$ mho/m; $\epsilon_r = 55.074$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(9.55, 9.55, 9.55); Calibrated: 2012/12/10; {Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

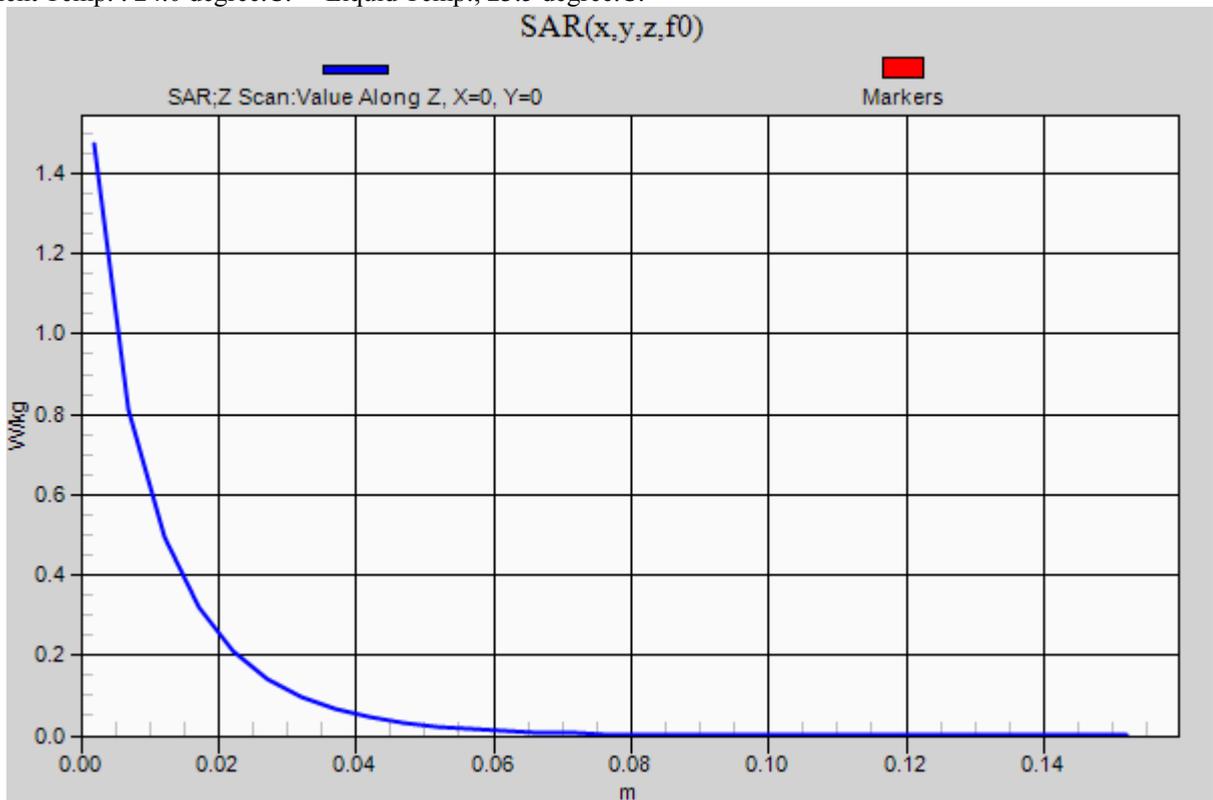
Measurement SW: DASY52, Version 52.8 (3);

Z Scan (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of SAR (measured) = 1.47 W/kg

Date: 2013/04/04

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL WCDMA Band V 12.2k RMC 846.6MHz Top side tilt 30 degree

Communication System: WCDMA V 835M; Communication System Band: WCDMA V band; Frequency: 826.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 826.4$ MHz; $\sigma = 0.974$ mho/m; $\epsilon_r = 55.074$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(9.55, 9.55, 9.55); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (3);

Area Scan 2 2 2 (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.125 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 0.606 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 0.144 W/kg

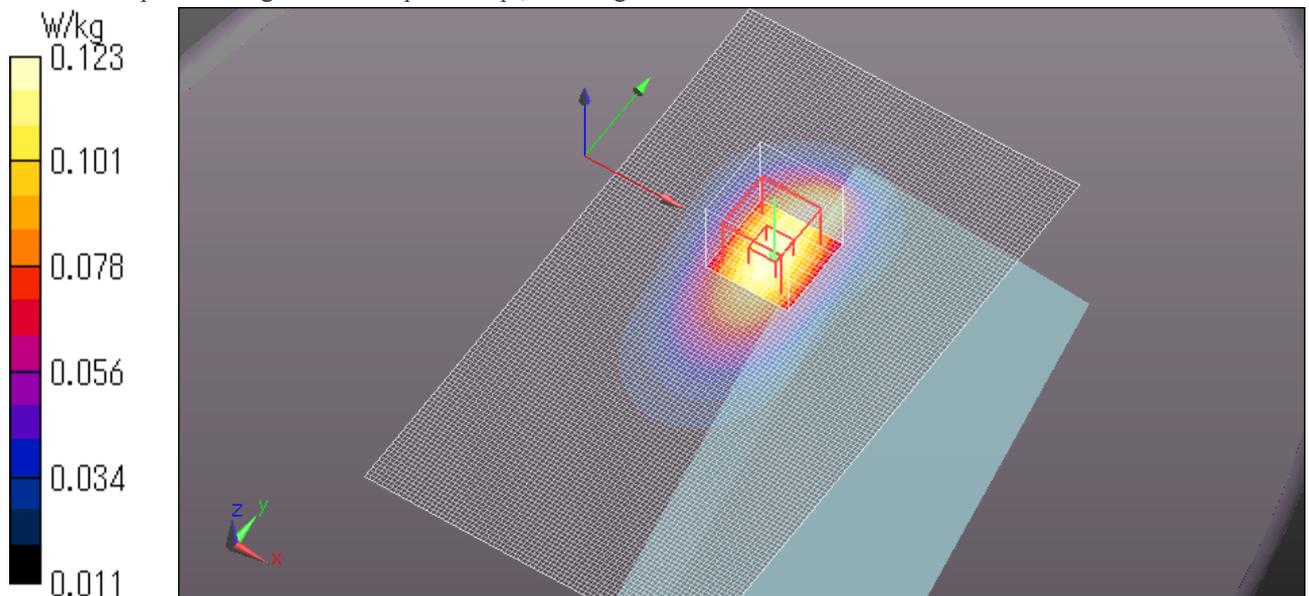
SAR(1 g) = 0.099 W/kg; SAR(10 g) = 0.067 W/kg

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.123 W/kg

Date: 2013/04/04

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



iv) WCDMA II

AK8SVD132A1WL WCDMA Band II 12.2k RMC 1880MHz Top side 4mm

Communication System: WCDMA Bnad II; Communication System Band: WCDMA II; Frequency: 1880 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.519$ mho/m; $\epsilon_r = 51.167$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.59, 7.59, 7.59); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.37 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.127 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 2.02 W/kg

SAR(1 g) = 0.928 W/kg; SAR(10 g) = 0.422 W/kg

Maximum value of SAR (measured) = 1.47 W/kg

Zoom Scan 2 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.127 V/m; Power Drift = -0.15 dB

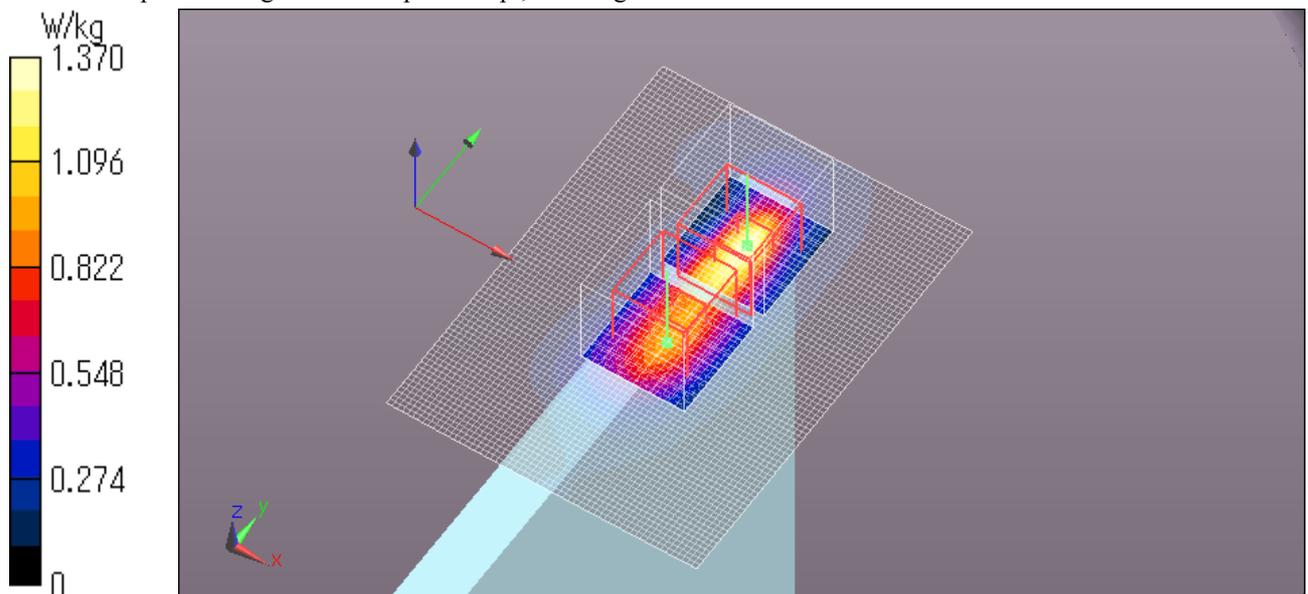
Peak SAR (extrapolated) = 1.32 W/kg

SAR(1 g) = 0.706 W/kg; SAR(10 g) = 0.383 W/kg

Maximum value of SAR (measured) = 1.01 W/kg

Date: 2013/04/03

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL WCDMA Band II 12.2k RMC 1880MHz Top side 0mm

Communication System: WCDMA Bnad II; Communication System Band: WCDMA II; Frequency: 1880 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.617$ mho/m; $\epsilon_r = 51.898$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.59, 7.59, 7.59); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

Area Scan 2 (81x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.59 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.587 V/m; Power Drift = -0.18 dB

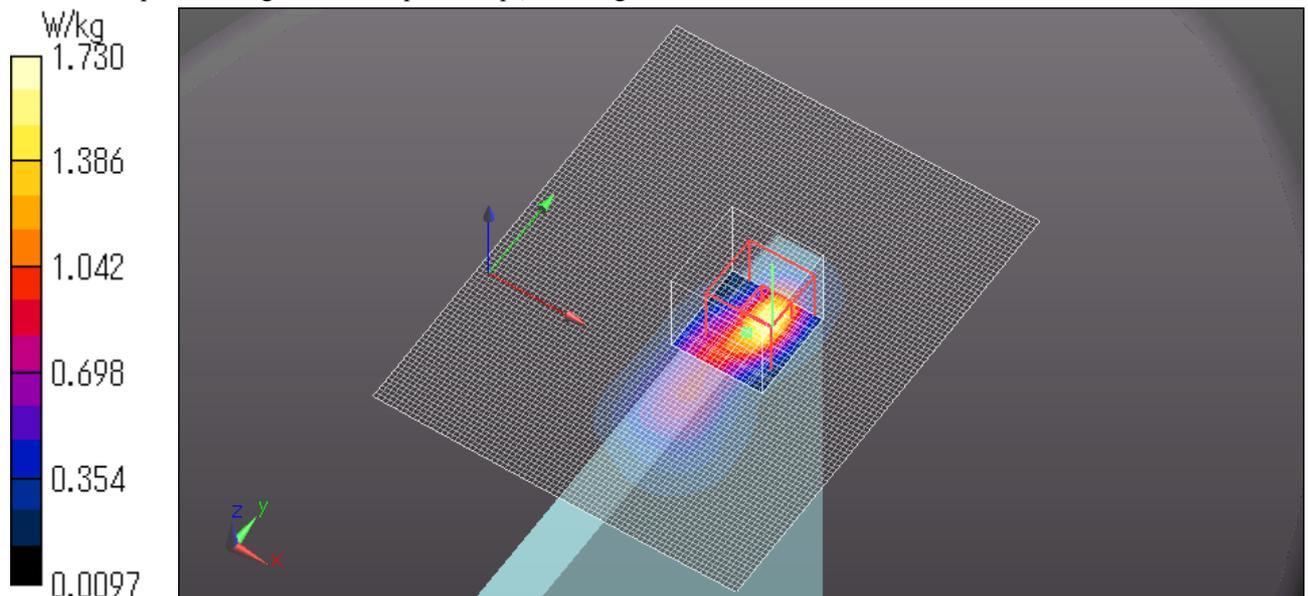
Peak SAR (extrapolated) = 2.68 W/kg

SAR(1 g) = 1.07 W/kg; SAR(10 g) = 0.441 W/kg

Maximum value of SAR (measured) = 1.73 W/kg

Date: 2013/03/14

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL WCDMA Band II 12.2k RMC 1880MHz Left side 0mm

Communication System: WCDMA Bnad II; Communication System Band: WCDMA II; Frequency: 1880 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.583$ mho/m; $\epsilon_r = 50.749$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.59, 7.59, 7.59); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (3);

Area Scan 2 (71x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.494 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.100 V/m; Power Drift = -0.07 dB

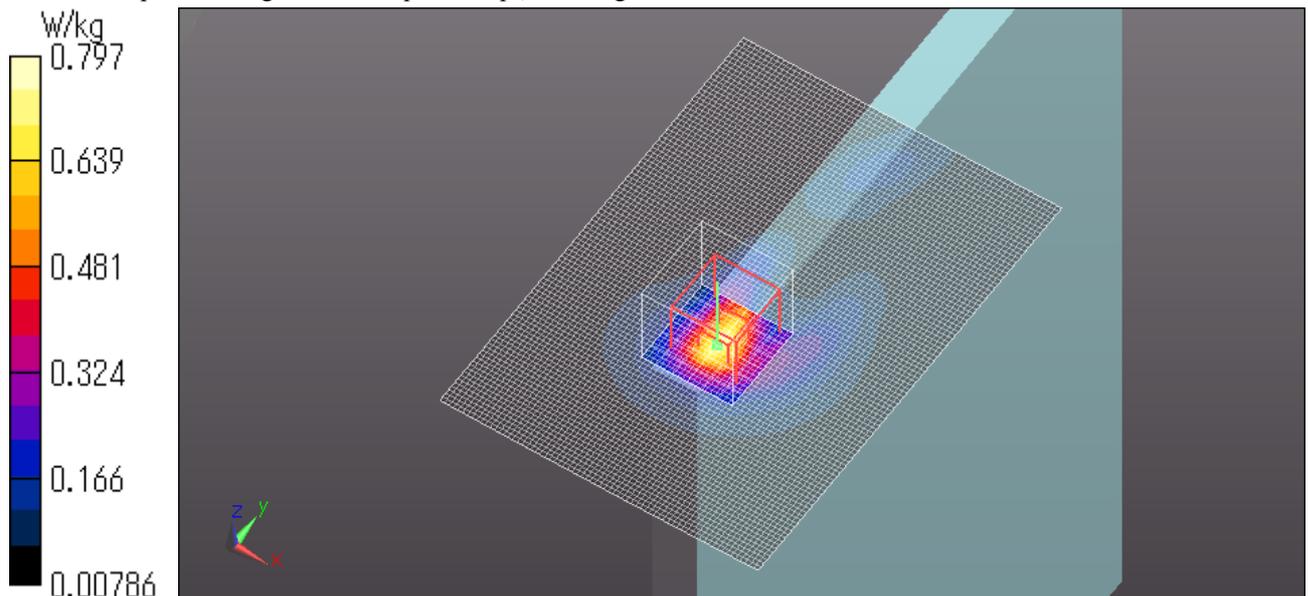
Peak SAR (extrapolated) = 1.13 W/kg

SAR(1 g) = 0.490 W/kg; SAR(10 g) = 0.228 W/kg

Maximum value of SAR (measured) = 0.797 W/kg

Date: 2013/03/14

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL WCDMA Band II 12.2k RMC 1880MHz Rear 0mm

Communication System: WCDMA Bnad II; Communication System Band: WCDMA II; Frequency: 1880 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.583$ mho/m; $\epsilon_r = 50.749$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.59, 7.59, 7.59); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (3);

Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.190 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.242 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.224 W/kg

SAR(1 g) = 0.144 W/kg; SAR(10 g) = 0.089 W/kg

Maximum value of SAR (measured) = 0.186 W/kg

Area Scan 2 2 (81x31x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.198 W/kg

Zoom Scan 2 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

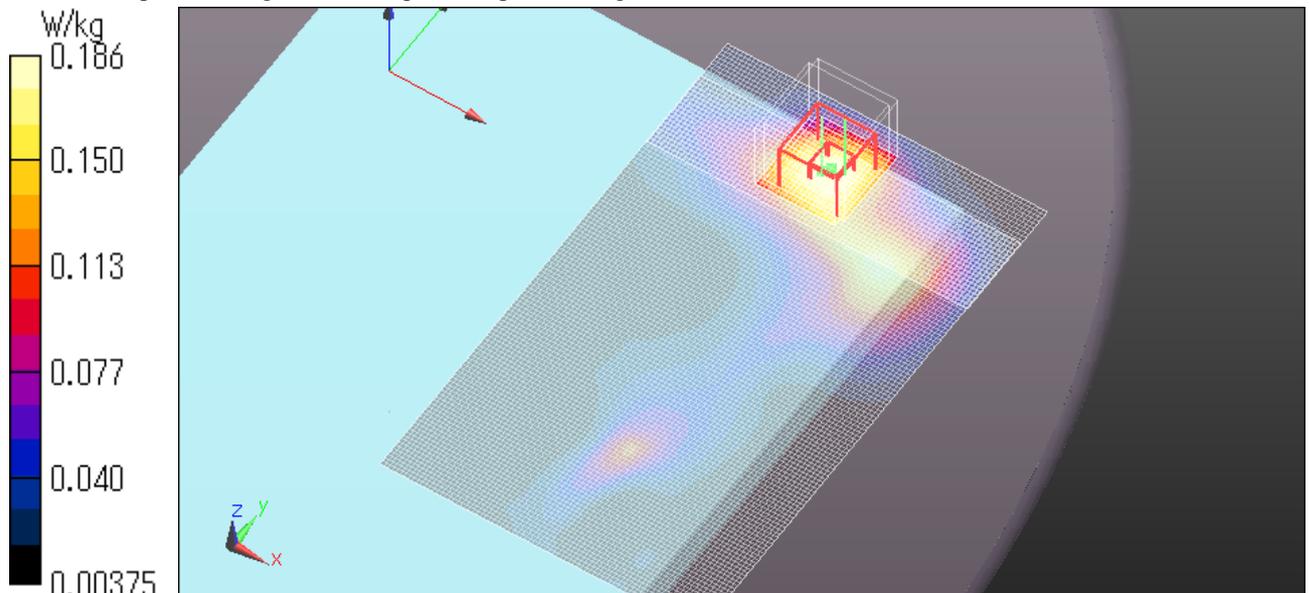
Reference Value = 5.242 V/m; Power Drift = 0.02

Peak SAR (extrapolated) = 0.225 W/kg

SAR(1 g) = 0.144 W/kg; SAR(10 g) = 0.090 W/kg

Date: 2013/03/14

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL WCDMA Band II 12.2k RMC 1880MHz Bottom(Laptop) 0mm

Communication System: WCDMA Bnad II; Communication System Band: WCDMA II; Frequency: 1880 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.583$ mho/m; $\epsilon_r = 50.749$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.59, 7.59, 7.59); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (3);

Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.0284 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 0.647 V/m; Power Drift = 0.05 dB

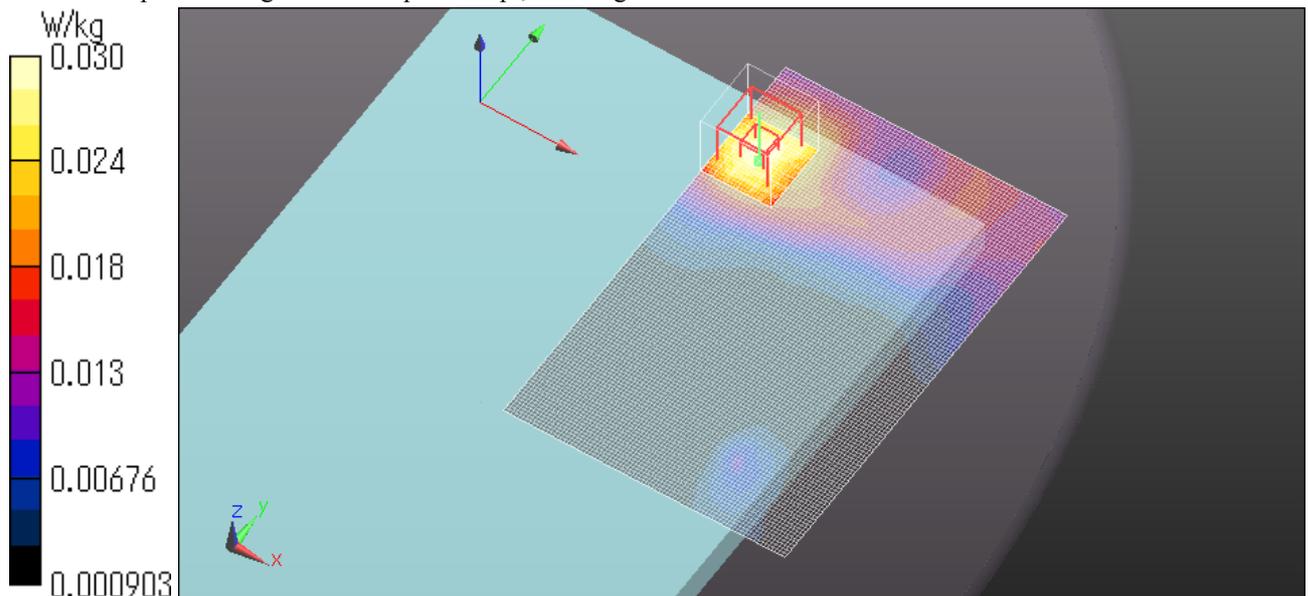
Peak SAR (extrapolated) = 0.0370 W/kg

SAR(1 g) = 0.023 W/kg; SAR(10 g) = 0.014 W/kg

Maximum value of SAR (measured) = 0.0302 W/kg

Date: 2013/03/14

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL WCDMA Band II 12.2k RMC 1852.4MHz Top side 4mm

Communication System: WCDMA Bnad II; Communication System Band: WCDMA II; Frequency: 1852.4 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1852.4$ MHz; $\sigma = 1.489$ mho/m; $\epsilon_r = 51.247$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.59, 7.59, 7.59); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (3);

Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.35 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14.373 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 2.05 W/kg

SAR(1 g) = 0.965 W/kg; SAR(10 g) = 0.450 W/kg

Maximum value of SAR (measured) = 1.50 W/kg

Zoom Scan 2 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14.373 V/m; Power Drift = -0.16 dB

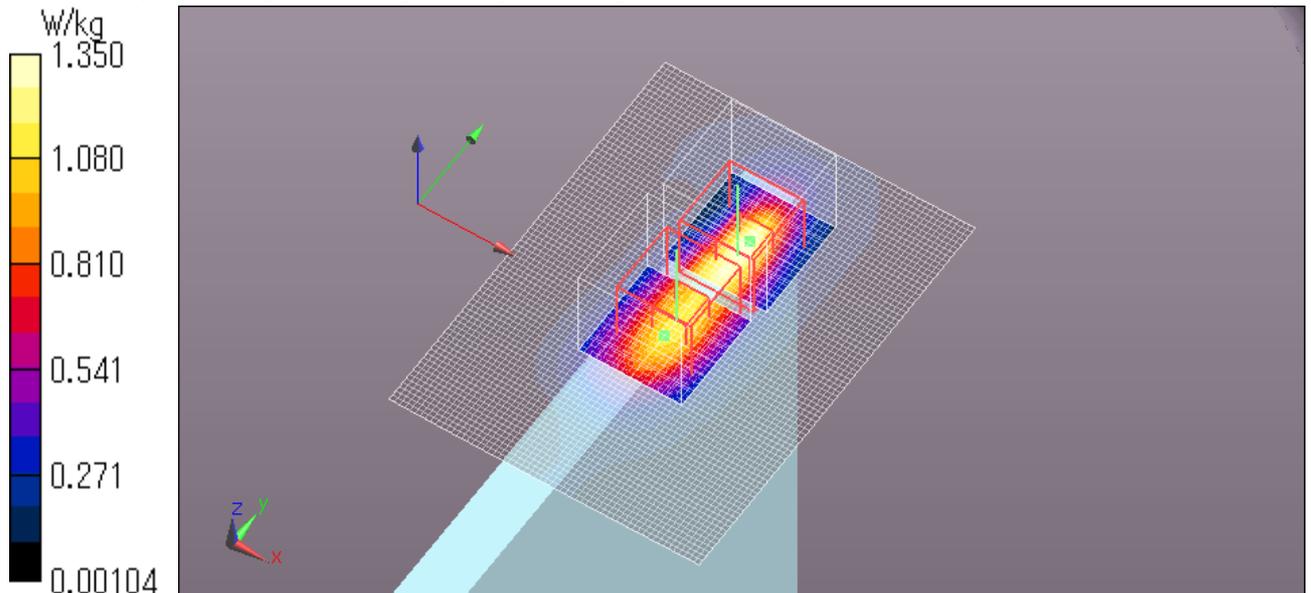
Peak SAR (extrapolated) = 1.54 W/kg

SAR(1 g) = 0.833 W/kg; SAR(10 g) = 0.454 W/kg

Maximum value of SAR (measured) = 1.18 W/kg

Date: 2013/04/03

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL WCDMA Band II 12.2k RMC 1907.6MHz Top side 4mm

Communication System: WCDMA Bnad II; Communication System Band: WCDMA II; Frequency: 1907.6 MHz;Duty Cycle: 1:1

Medium parameters used (extrapolated): $f = 1907.6$ MHz; $\sigma = 1.549$ mho/m; $\epsilon_r = 51.098$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.59, 7.59, 7.59); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (3);

Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.00 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.787 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 1.45 W/kg

SAR(1 g) = 0.679 W/kg; SAR(10 g) = 0.311 W/kg

Maximum value of SAR (measured) = 1.07 W/kg

Zoom Scan 2 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.787 V/m; Power Drift = 0.09 dB

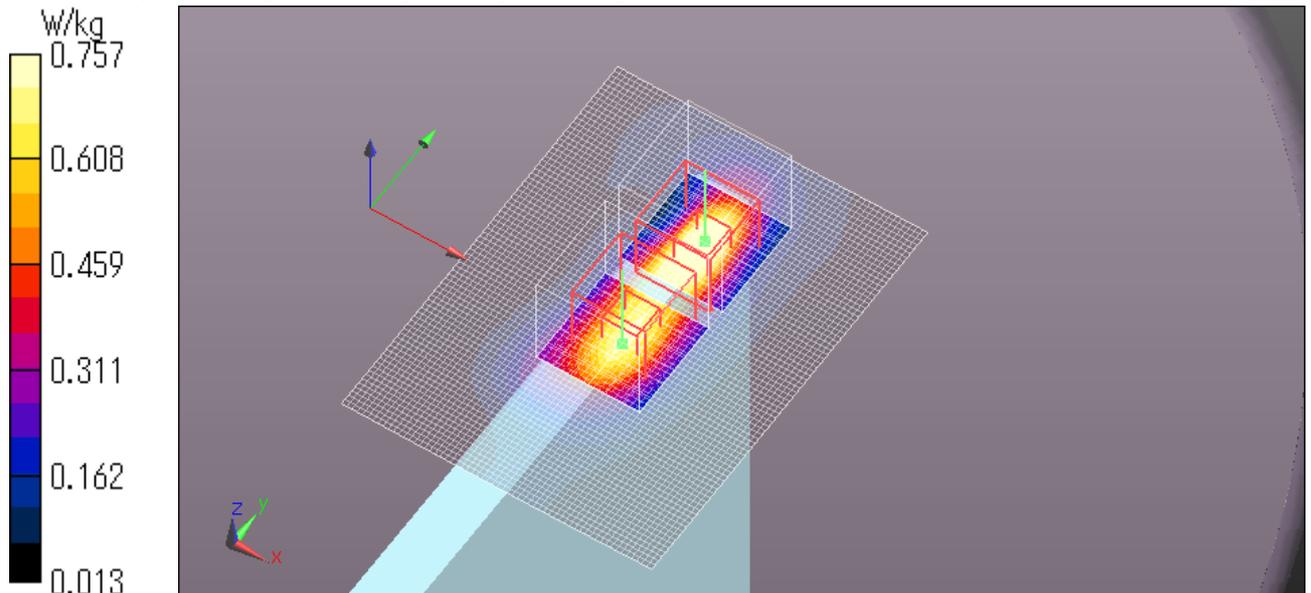
Peak SAR (extrapolated) = 0.987 W/kg

SAR(1 g) = 0.527 W/kg; SAR(10 g) = 0.287 W/kg

Maximum value of SAR (measured) = 0.757 W/kg

Date: 2013/04/03

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL WCDMA Band II 12.2k RMC 1852.4MHz Top side 0mm

Communication System: WCDMA Bnad II; Communication System Band: WCDMA II; Frequency: 1852.4 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1852.4$ MHz; $\sigma = 1.594$ mho/m; $\epsilon_r = 51.973$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.59, 7.59, 7.59); Calibrated: 2012/12/10; $\{$ Probe: Calibration Date $\}$ Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection) Electronics: DAE4 Sn509; Calibrated: 2012/07/13 Phantom: ELI 4.0; Type: QDOVA001BA; Measurement SW: DASYS2, Version 52.8 (3);

Area Scan 2 (81x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.37 W/kg

aoev 1 GHz/Top Lch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.460 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 2.30 W/kg

SAR(1 g) = 0.941 W/kg; SAR(10 g) = 0.399 W/kg

Maximum value of SAR (measured) = 1.51 W/kg

Zoom Scan 2 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.460 V/m; Power Drift = -0.03 dB

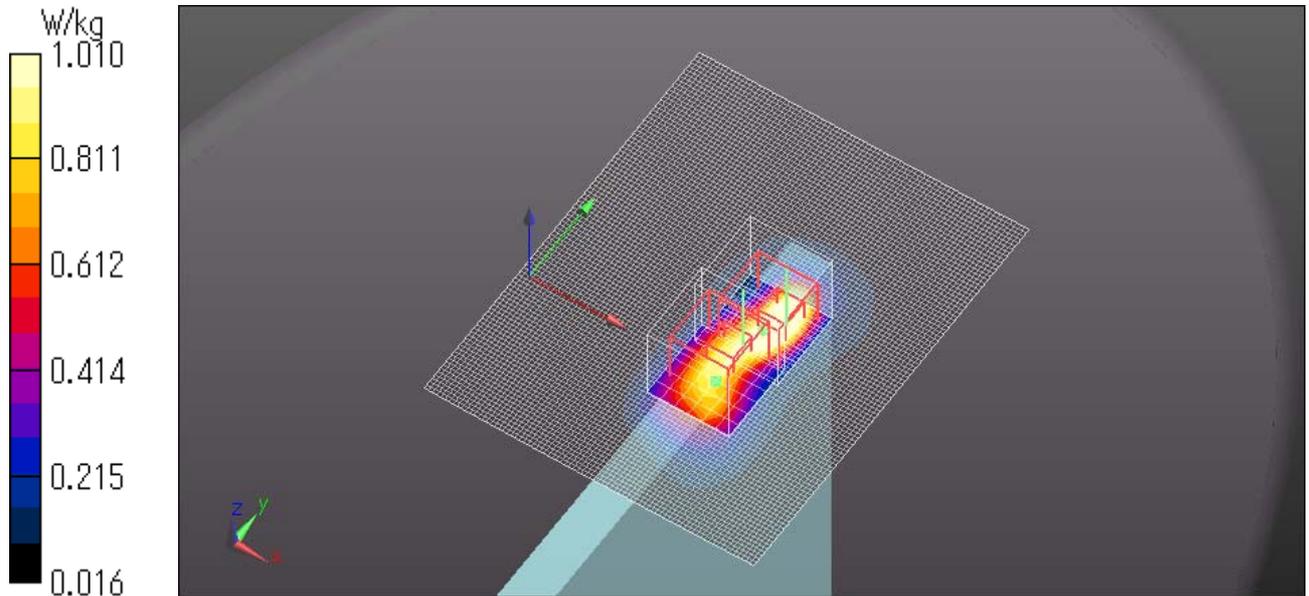
Peak SAR (extrapolated) = 1.35 W/kg

SAR(1 g) = 0.690 W/kg; SAR(10 g) = 0.370 W/kg

Maximum value of SAR (measured) = 1.01 W/kg

Date: 2013/03/14

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL WCDMA Band II 12.2k RMC 1907.6MHz Top side 0mm

Communication System: WCDMA Bnad II; Communication System Band: WCDMA II; Frequency: 1907.6 MHz;Duty Cycle: 1:1

Medium parameters used (extrapolated): $f = 1907.6$ MHz; $\sigma = 1.643$ mho/m; $\epsilon_r = 51.728$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.59, 7.59, 7.59); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

Area Scan 2 (81x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.34 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 27.424 V/m; Power Drift = -0.11 dB

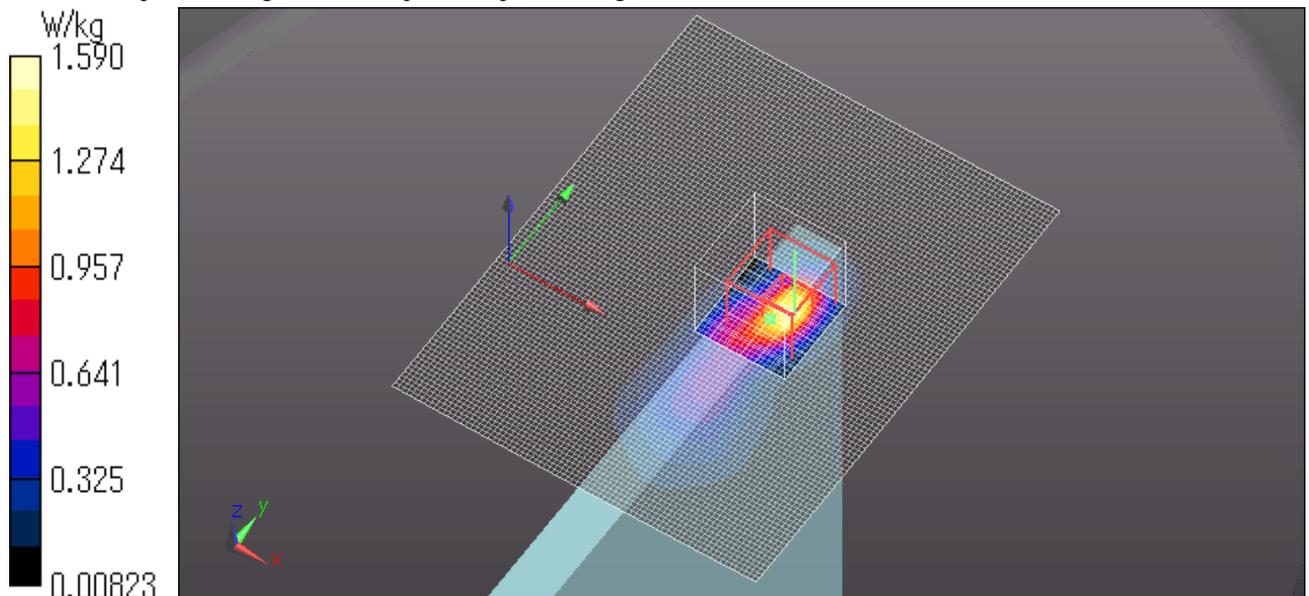
Peak SAR (extrapolated) = 2.47 W/kg

SAR(1 g) = 0.967 W/kg; SAR(10 g) = 0.387 W/kg

Maximum value of SAR (measured) = 1.59 W/kg

Date: 2013/03/14

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL WCDMA Band II 12.2k RMC 1852.4MHz Top side 4mm Repeat

Communication System: WCDMA Bnad II; Communication System Band: WCDMA II; Frequency: 1852.4 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1852.4$ MHz; $\sigma = 1.523$ mho/m; $\epsilon_r = 54.699$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.59, 7.59, 7.59); Calibrated: 2012/12/10; $\{$ Probe: Calibration Date $\}$

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (3);

above 1 GHz/Flat 2 2/Area Scan 2 (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.40 W/kg

above 1 GHz/Flat 2 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.401 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 2.15 W/kg

SAR(1 g) = 0.973 W/kg; SAR(10 g) = 0.429 W/kg

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.58 W/kg

above 1 GHz/Flat 2 2/Zoom Scan 2 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.401 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 1.27 W/kg

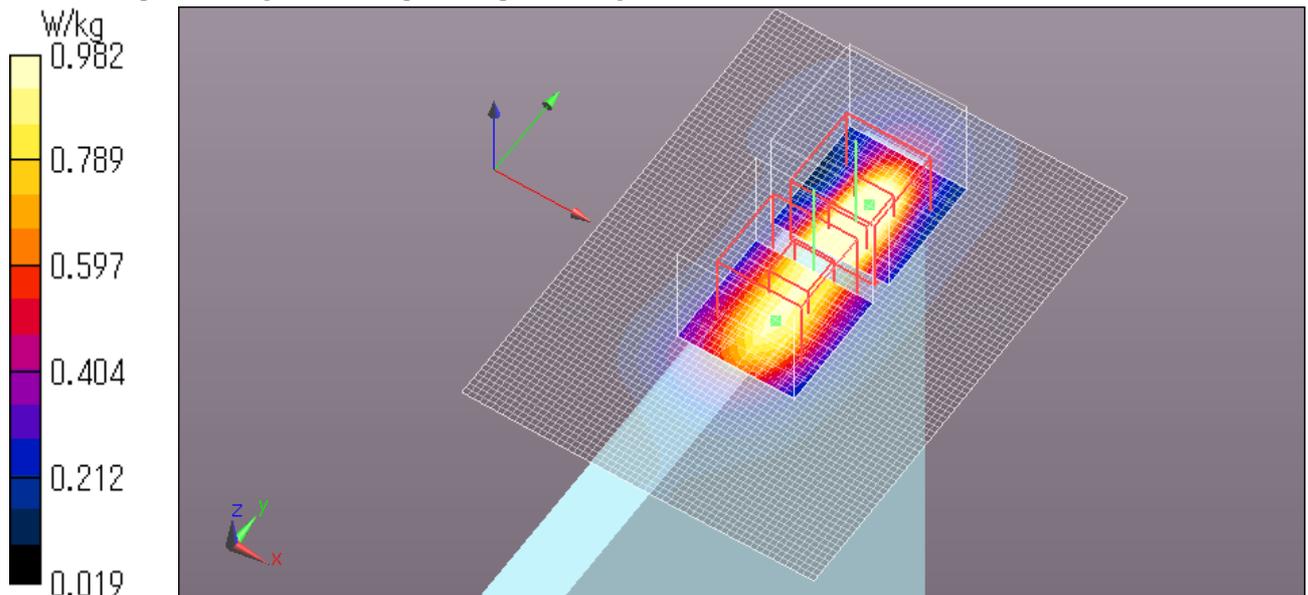
SAR(1 g) = 0.698 W/kg; SAR(10 g) = 0.387 W/kg

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.982 W/kg

Date: 2013/04/03

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



Z Scan at Maximum Body SAR position in WCDMA band II

AK8SVD132A1WL WCDMA Band II 12.2k RMC 1852.4MHz Top side 4mm

Communication System: WCDMA Bnad II; Communication System Band: WCDMA II; Frequency: 1852.4 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1852.4$ MHz; $\sigma = 1.489$ mho/m; $\epsilon_r = 51.247$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.59, 7.59, 7.59); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

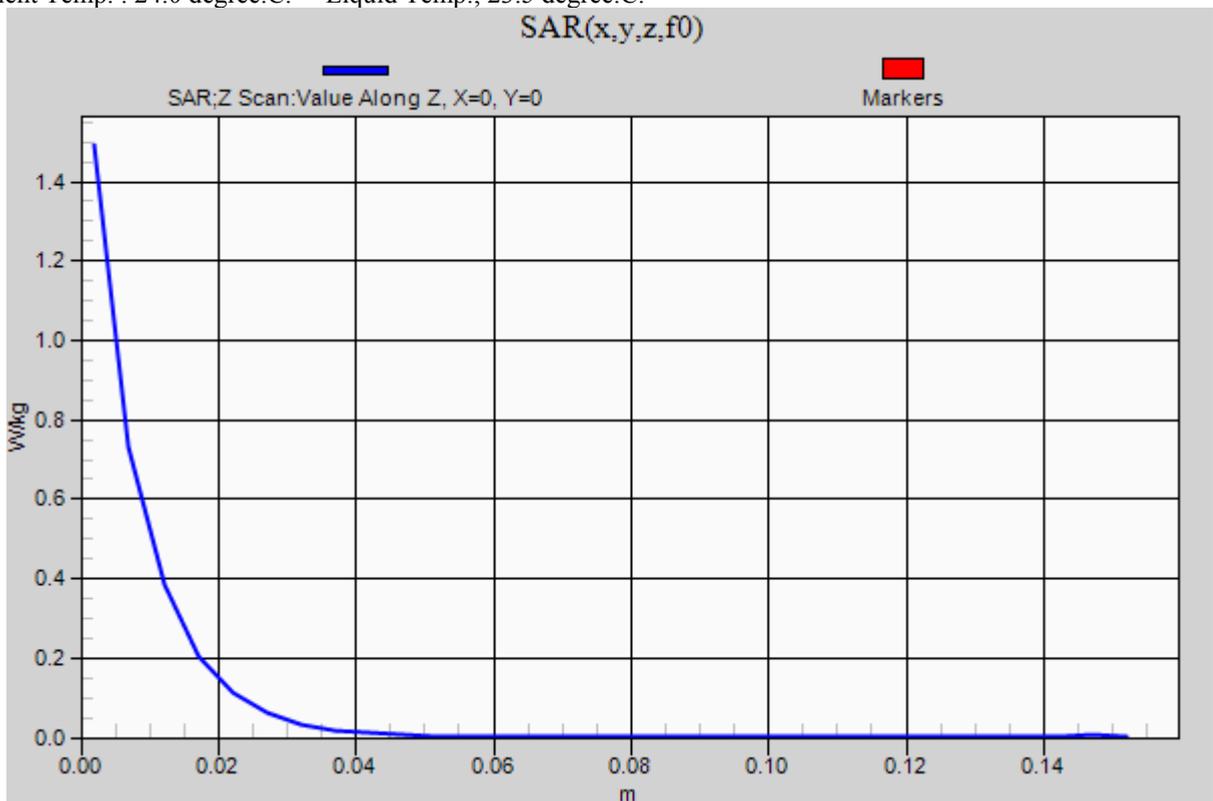
above 1 GHz/Flat 2 2/Z Scan (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Info: [Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.49 W/kg

Date: 2013/04/02

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



v) **LTE Band IV**

AK8SVD132A1WL LTE band IV 20MHz band width QPSK 1RB Upper 1720MHz Top side 4mm

Communication System: LTE Band 4; Communication System Band: LTE band 4; Frequency: 1720 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1720$ MHz; $\sigma = 1.461$ mho/m; $\epsilon_r = 50.99$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.99, 7.99, 7.99); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (3);

above 1 GHz/Top 2/Area Scan 3 (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.75 W/kg

above 1 GHz/Top 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 31.011 V/m; Power Drift = -0.20 dB

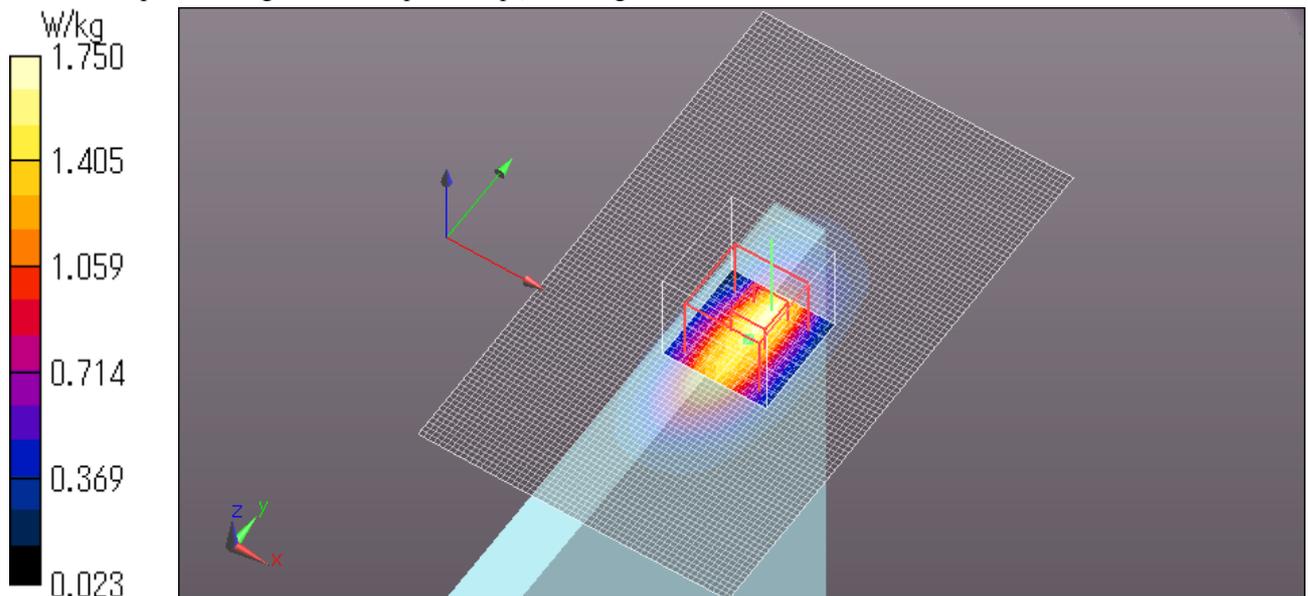
Peak SAR (extrapolated) = 2.31 W/kg

SAR(1 g) = 1.2 W/kg; SAR(10 g) = 0.625 W/kg

Maximum value of SAR (measured) = 1.75 W/kg

Date: 2013/03/28

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL LTE band IV 20MHz band width QPSK 1RB Lower 1720MHz Top side 0mm

Communication System: LTE Band 4; Communication System Band: LTE band 4; Frequency: 1720 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 1720$ MHz; $\sigma = 1.405$ mho/m; $\epsilon_r = 53.15$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.99, 7.99, 7.99); Calibrated: 2012/12/10; {Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

above 1 GHz/Top/Area Scan 3 (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.71 W/kg

above 1 GHz/Top/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 33.768 V/m; Power Drift = 0.07 dB

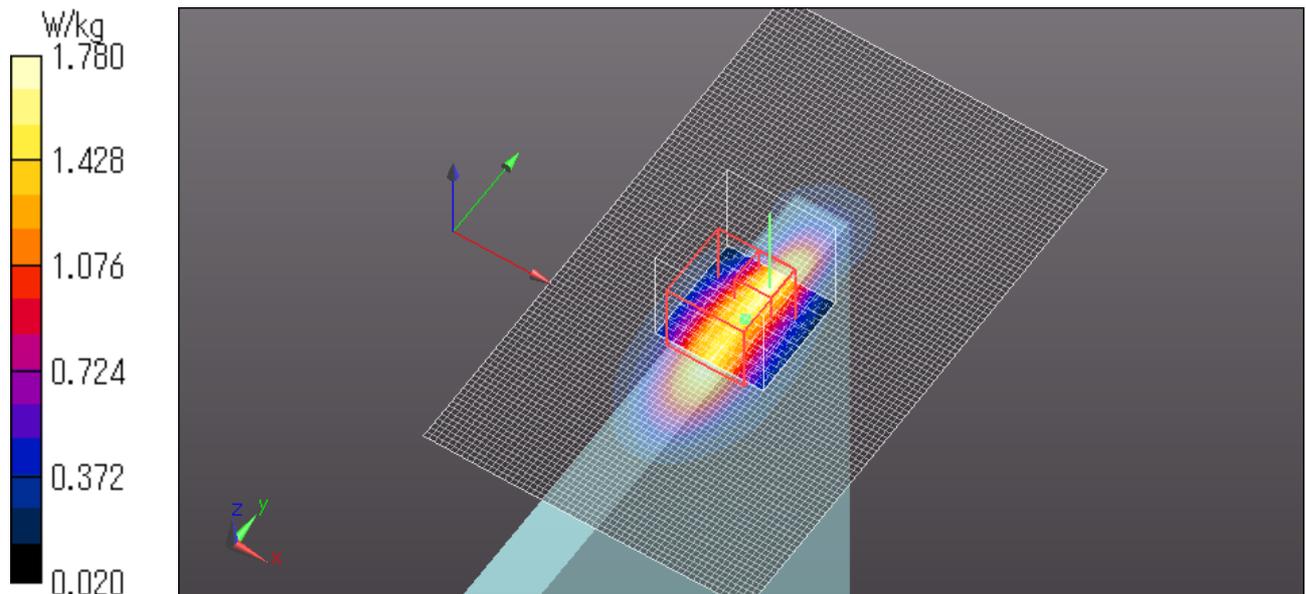
Peak SAR (extrapolated) = 2.49 W/kg

SAR(1 g) = 1.1 W/kg; SAR(10 g) = 0.579 W/kg

Maximum value of SAR (measured) = 1.78 W/kg

Date: 2013/04/02

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL LTE band IV 20MHz band width QPSK 1RB upper 1720MHz Left side 0mm

Communication System: LTE Band 4; Communication System Band: LTE band 4; Frequency: 1720 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 1720$ MHz; $\sigma = 1.433$ mho/m; $\epsilon_r = 51.806$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.99, 7.99, 7.99); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (3);

above 1 GHz/Left/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.508 W/kg

above 1 GHz/Left/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.907 V/m; Power Drift = -0.05 dB

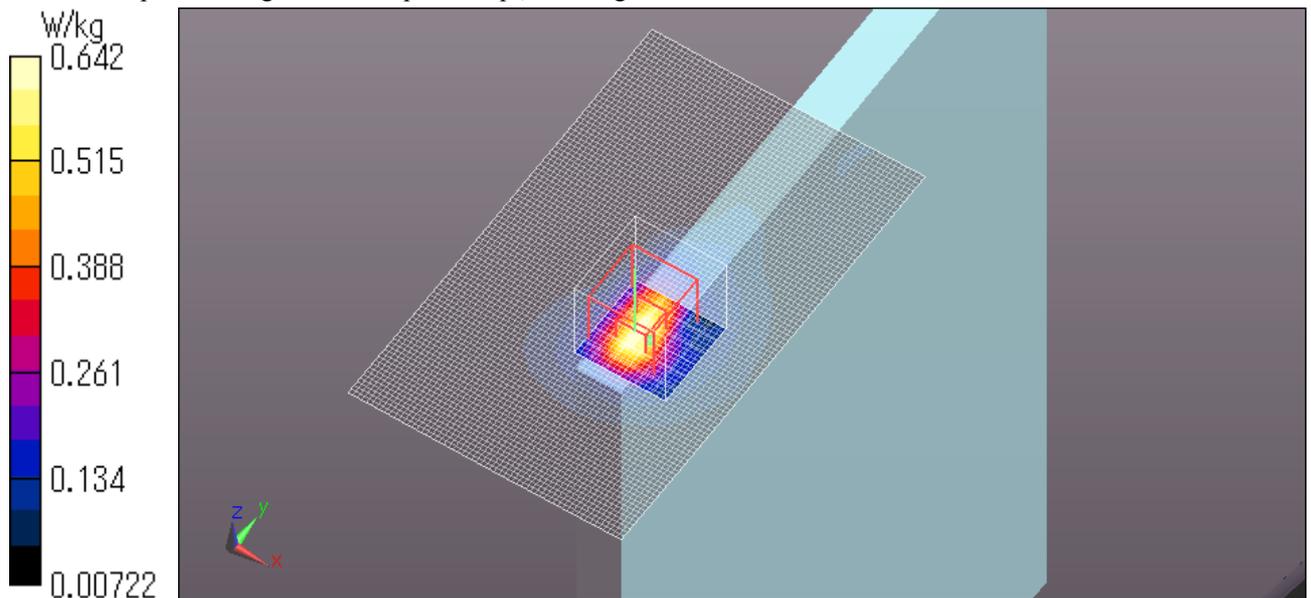
Peak SAR (extrapolated) = 0.939 W/kg

SAR(1 g) = 0.435 W/kg; SAR(10 g) = 0.203 W/kg

Maximum value of SAR (measured) = 0.642 W/kg

Date: 2013/04/02

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL LTE band IV 20MHz band width QPSK 1RB upper 1720MHz Rear 0mm

Communication System: LTE Band 4; Communication System Band: LTE band 4; Frequency: 1720 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 1720$ MHz; $\sigma = 1.433$ mho/m; $\epsilon_r = 51.806$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.99, 7.99, 7.99); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (3);

above 1 GHz/Raer/Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.217 W/kg

above 1 GHz/Raer/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 0.339 V/m; Power Drift = 0.04 dB

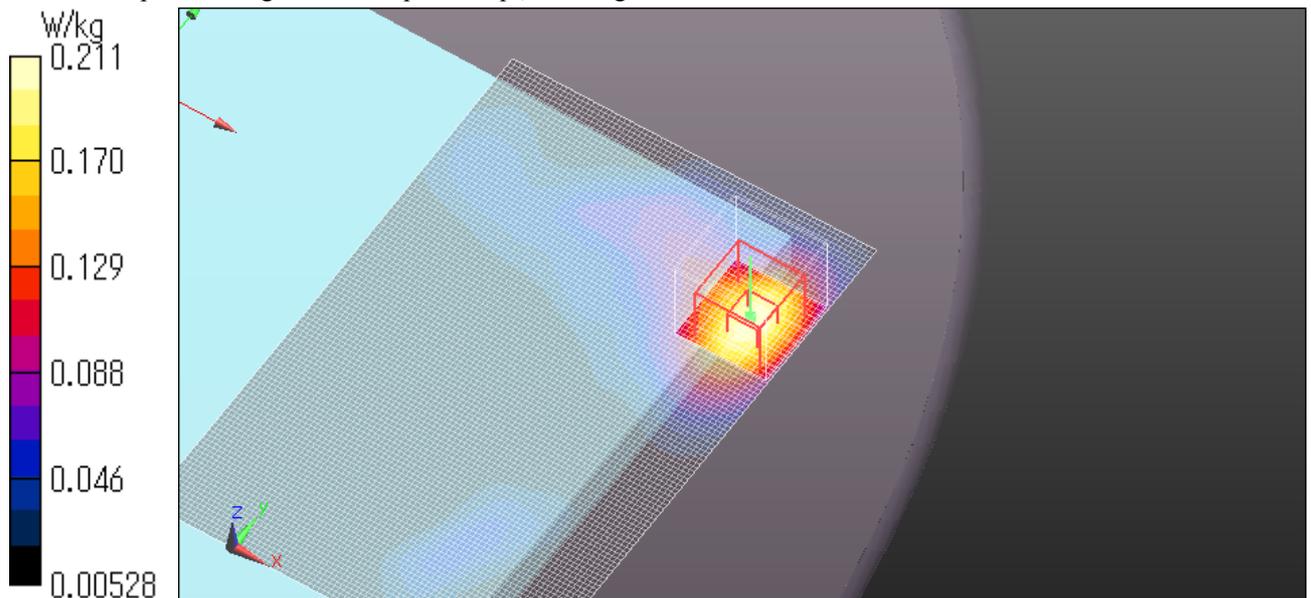
Peak SAR (extrapolated) = 0.261 W/kg

SAR(1 g) = 0.158 W/kg; SAR(10 g) = 0.094 W/kg

Maximum value of SAR (measured) = 0.211 W/kg

Date: 2013/04/02

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL LTE band IV 20MHz band width QPSK 1RB upper 1720MHz Bottom(Laptop) 0mm

Communication System: LTE Band 4; Communication System Band: LTE band 4; Frequency: 1720 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 1720$ MHz; $\sigma = 1.433$ mho/m; $\epsilon_r = 51.806$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.99, 7.99, 7.99); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

below 1 GHz/Bottom/Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.00927 W/kg

below 1 GHz/Bottom/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 0 V/m; Power Drift = 0.10 dB

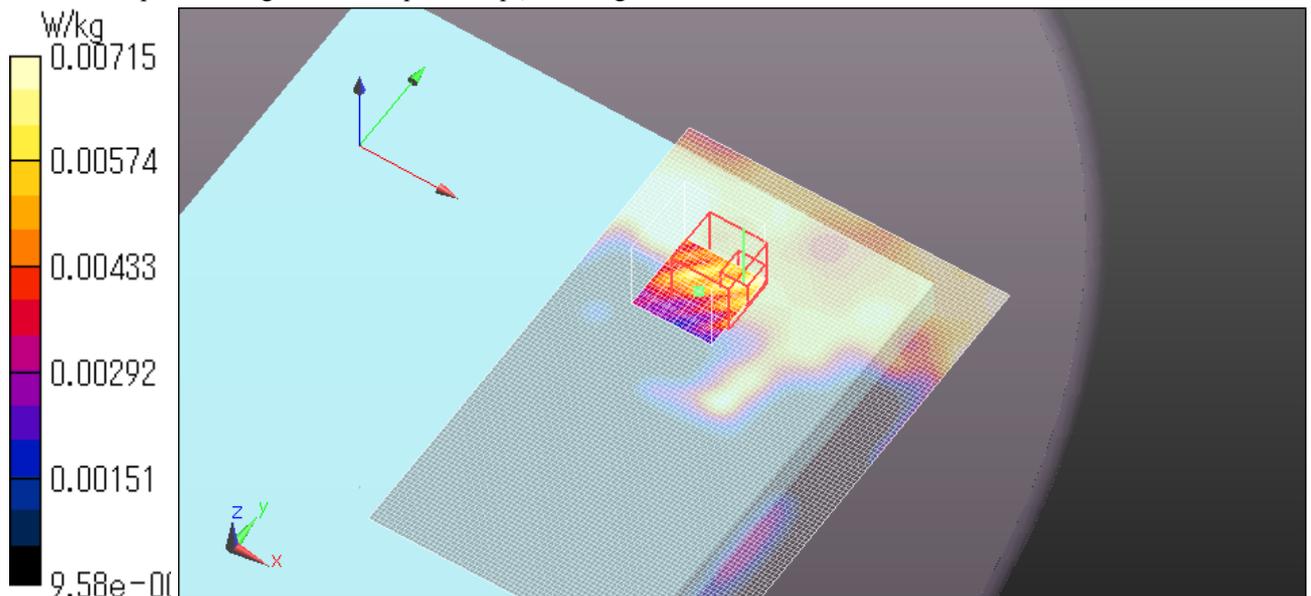
Peak SAR (extrapolated) = 0.00774 W/kg

SAR(1 g) = 0.00514 W/kg; SAR(10 g) = 0.00227 W/kg

Maximum value of SAR (measured) = 0.00715 W/kg

Date: 2013/04/02

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL LTE band IV 20MHz band width QPSK 1RB Upper 1732.5MHz Top side 4mm

Communication System: LTE Band 4; Communication System Band: LTE band 4; Frequency: 1732.5 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1732.5$ MHz; $\sigma = 1.476$ mho/m; $\epsilon_r = 51.068$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.99, 7.99, 7.99); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

Area Scan 3 (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.69 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 29.946 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 2.17 W/kg

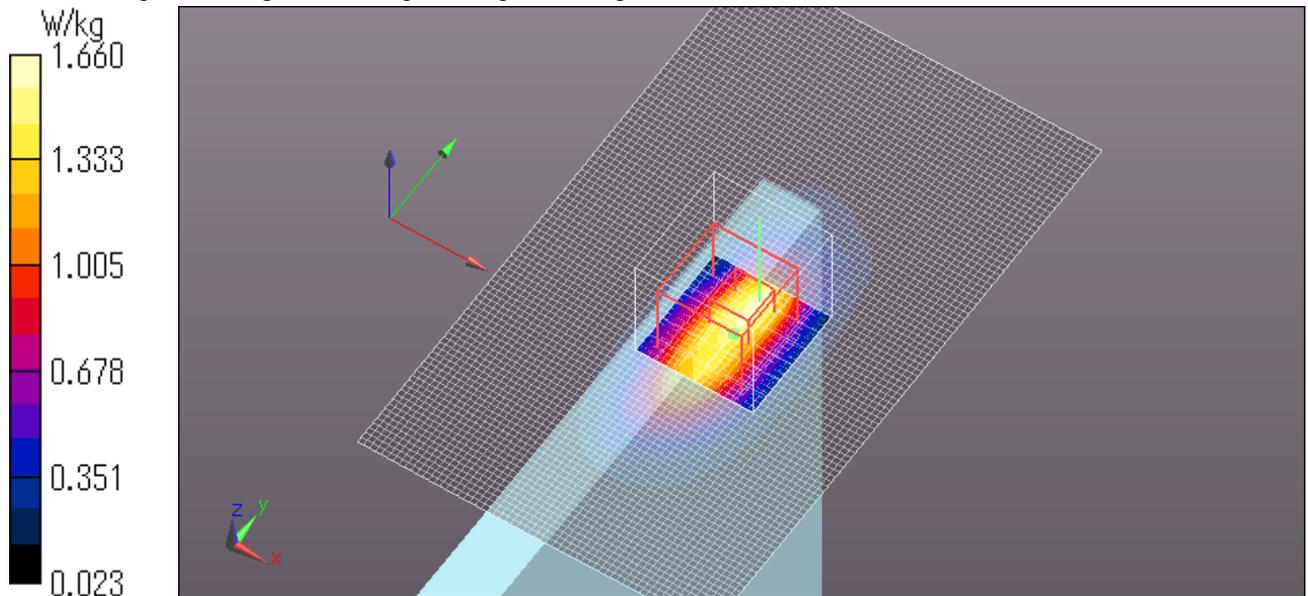
SAR(1 g) = 1.14 W/kg; SAR(10 g) = 0.603 W/kg

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.66 W/kg

Date: 2013/03/28

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL LTE band IV 20MHz band width QPSK 1RB Upper 1745MHz Top side 4mm

Communication System: LTE Band 4; Communication System Band: LTE band 4; Frequency: 1745 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1745$ MHz; $\sigma = 1.485$ mho/m; $\epsilon_r = 51.168$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.99, 7.99, 7.99); Calibrated: 2012/12/10; $\{Probe: Calibration Date\}$

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

Area Scan 3 (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.43 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 28.606 V/m; Power Drift = -0.20 dB

Peak SAR (extrapolated) = 1.87 W/kg

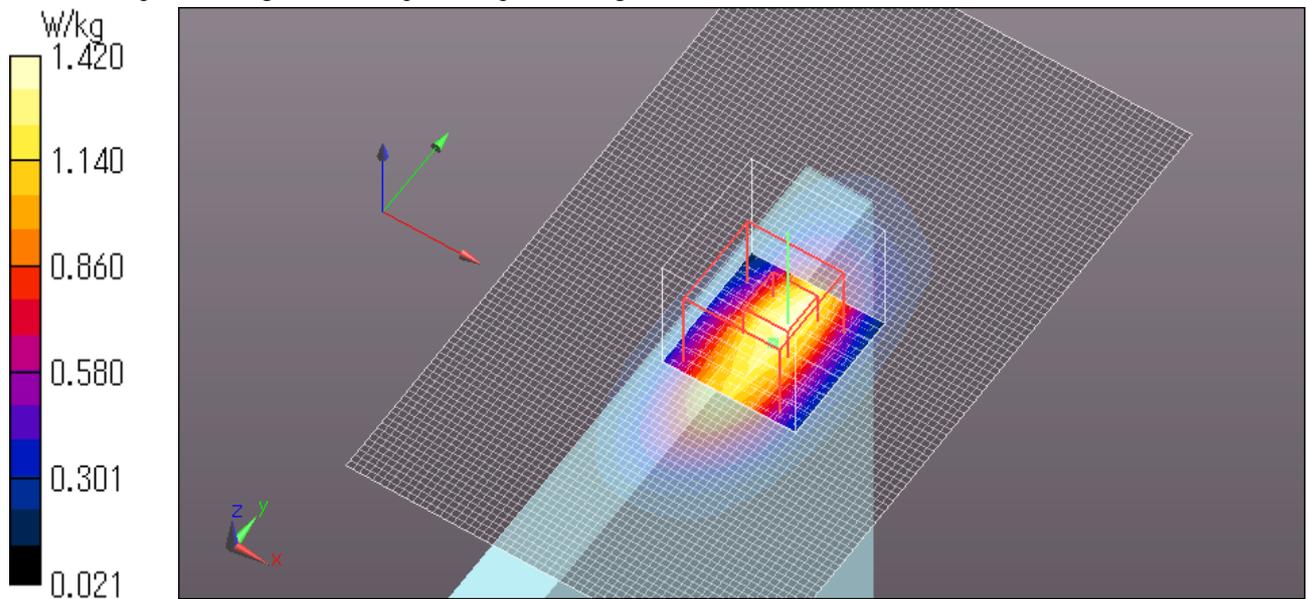
SAR(1 g) = 0.988 W/kg; SAR(10 g) = 0.529 W/kg

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.42 W/kg

Date: 2013/03/28

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL LTE band IV 20MHz band width QPSK 1RB Lower 1732.5MHz Top side 0mm

Communication System: LTE Band 4; Communication System Band: LTE band 4; Frequency: 1732.5 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1732.5$ MHz; $\sigma = 1.418$ mho/m; $\epsilon_r = 53.105$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.99, 7.99, 7.99); Calibrated: 2012/12/10; {Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

above 1 GHz/Top 2/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.64 W/kg

above 1 GHz/Top 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 32.626 V/m; Power Drift = 0.05 dB

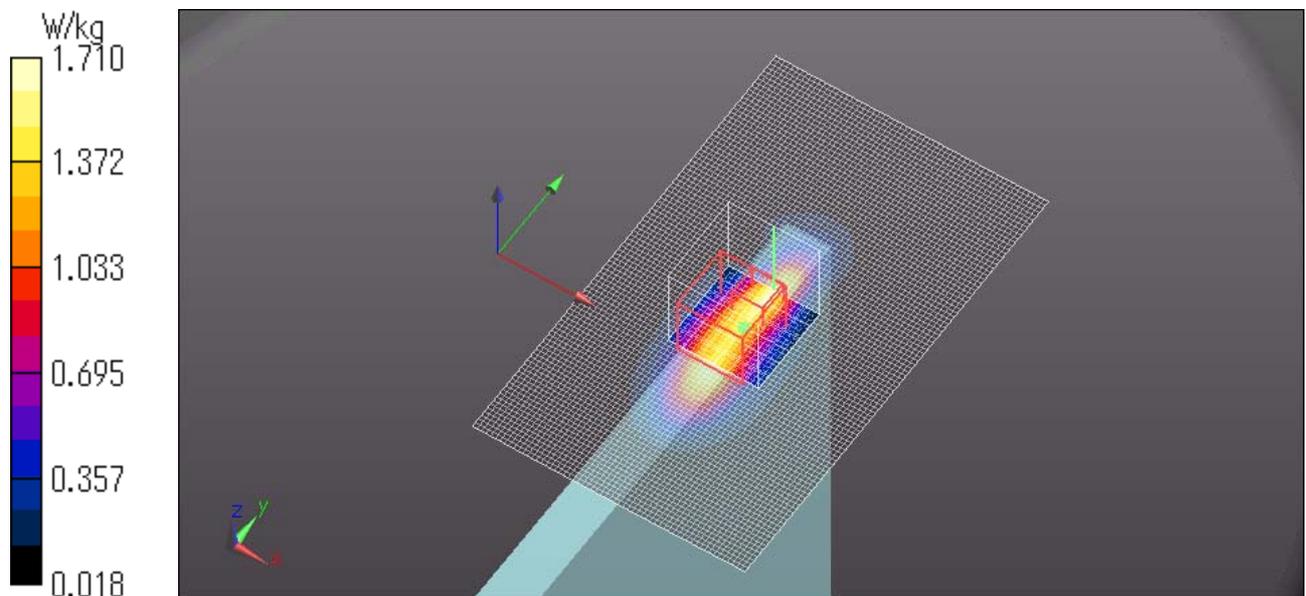
Peak SAR (extrapolated) = 2.40 W/kg

SAR(1 g) = 1.05 W/kg; SAR(10 g) = 0.552 W/kg

Maximum value of SAR (measured) = 1.71 W/kg

Date: 2013/04/02

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



Z Scan at Maximum BODY SAR position in LTE Band VI

AK8SVD132A1WL LTE band IV 20MHz band width QPSK 1RB Lower 1732.5MHz Top side 0mm

Communication System: LTE Band 4; Communication System Band: LTE band 4; Frequency: 1732.5 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1732.5$ MHz; $\sigma = 1.418$ mho/m; $\epsilon_r = 53.105$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.99, 7.99, 7.99); Calibrated: 2012/12/10; {Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

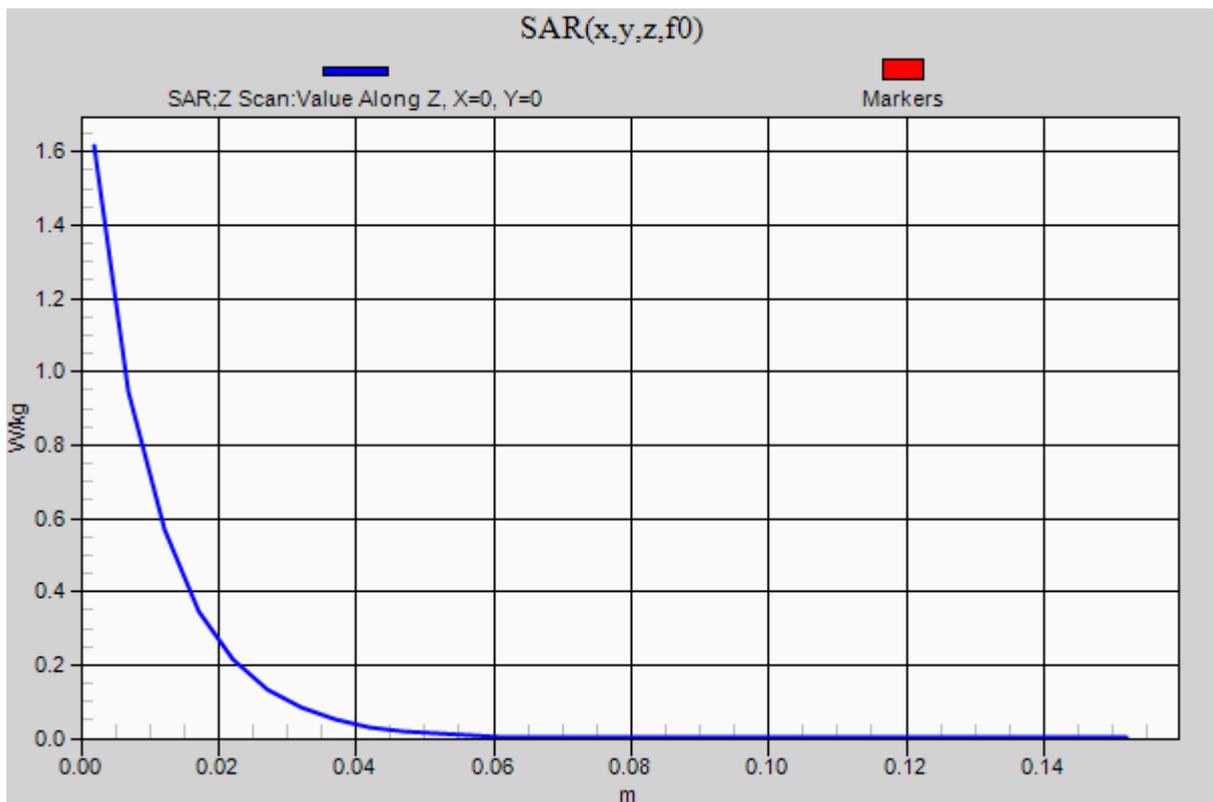
Z Scan (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.62 W/kg

Date: 2013/04/02

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL LTE band IV 20MHz band width QPSK 1RB Lower 1745MHz Top side 0mm

Communication System: LTE Band 4; Communication System Band: LTE band 4; Frequency: 1745 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1745$ MHz; $\sigma = 1.43$ mho/m; $\epsilon_r = 53.06$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.99, 7.99, 7.99); Calibrated: 2012/12/10; {Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

above 1 GHz/Top 3/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.59 W/kg

above 1 GHz/Top 3/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 31.780 V/m; Power Drift = -0.11 dB

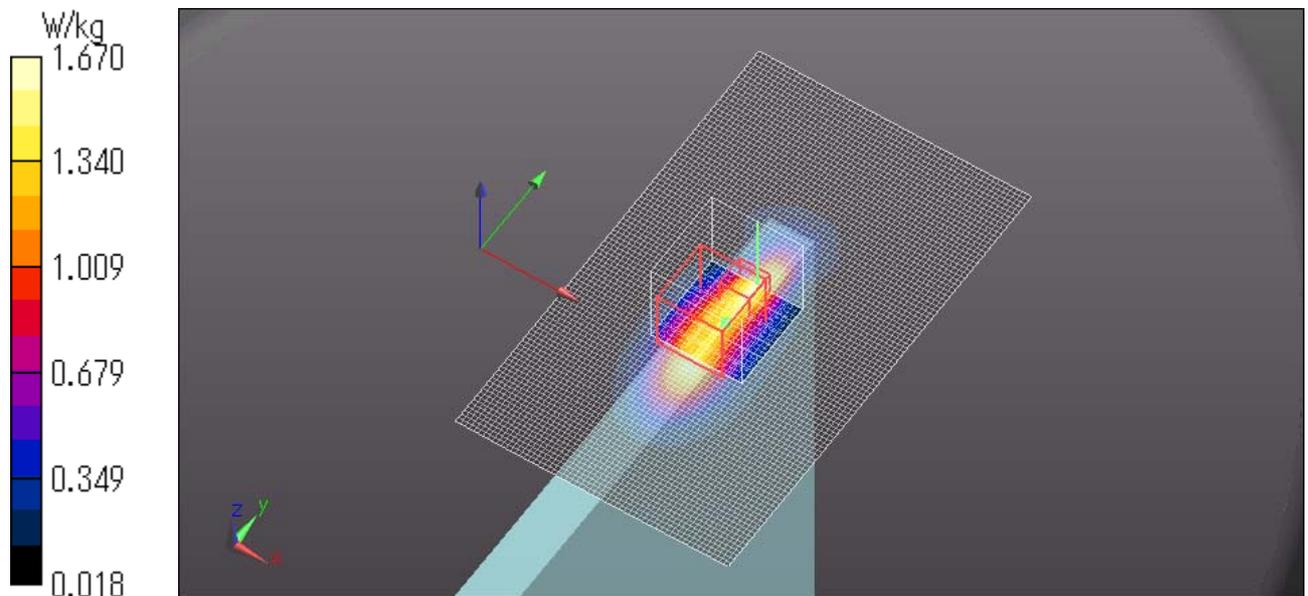
Peak SAR (extrapolated) = 2.34 W/kg

SAR(1 g) = 1.02 W/kg; SAR(10 g) = 0.534 W/kg

Maximum value of SAR (measured) = 1.67 W/kg

Date: 2013/04/02

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL LTE band IV 20MHz band width QPSK 50%RB upper 1720.0MHz Top side 0mm

Communication System: LTE Band 4; Communication System Band: LTE band 4; Frequency: 1720 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 1720$ MHz; $\sigma = 1.461$ mho/m; $\epsilon_r = 50.99$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.99, 7.99, 7.99); Calibrated: 2012/12/10; {Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

Area Scan 3 (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.35 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 25.651 V/m; Power Drift = -0.18 dB

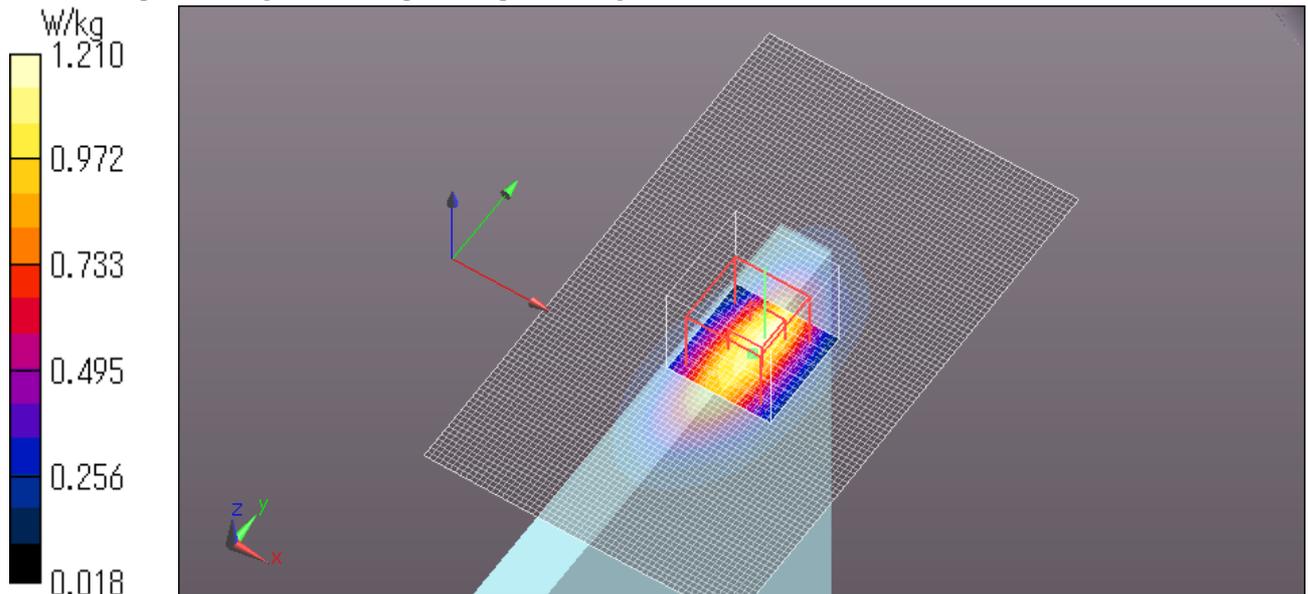
Peak SAR (extrapolated) = 1.58 W/kg

SAR(1 g) = 0.839 W/kg; SAR(10 g) = 0.444 W/kg

Maximum value of SAR (measured) = 1.21 W/kg

Date: 2013/03/28

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL LTE band IV 20MHz band width QPSK 50%RB upper 1732.5MHz Top side 0mm

Communication System: LTE Band 4; Communication System Band: LTE band 4; Frequency: 1732.5 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1732.5$ MHz; $\sigma = 1.476$ mho/m; $\epsilon_r = 51.068$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.99, 7.99, 7.99); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

Area Scan 3 (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.34 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 26.687 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 1.76 W/kg

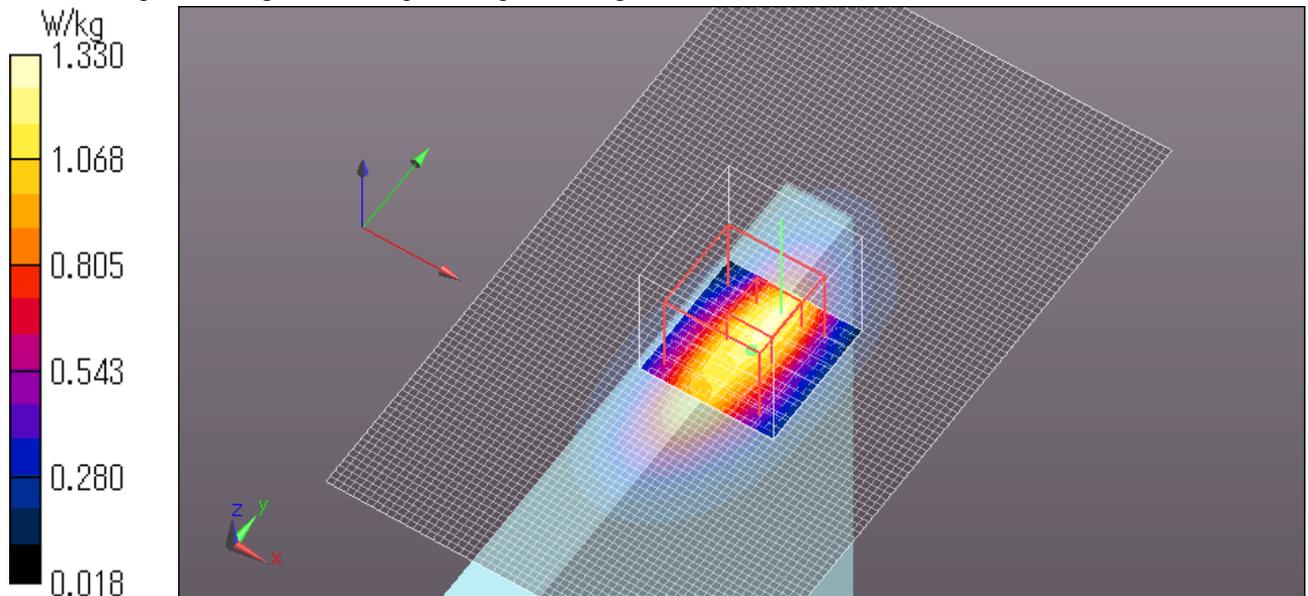
SAR(1 g) = 0.906 W/kg; SAR(10 g) = 0.476 W/kg

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.33 W/kg

Date: 2013/03/28

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL LTE band IV 20MHz band width QPSK 50%RB upper 1745.0MHz Top side 0mm

Communication System: LTE Band 4; Communication System Band: LTE band 4; Frequency: 1745 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1745$ MHz; $\sigma = 1.485$ mho/m; $\epsilon_r = 51.168$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.99, 7.99, 7.99); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (3);

above 1 GHz/Top 2 2 2 2 2 2 2/Area Scan 3 (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.22 W/kg

above 1 GHz/Top 2 2 2 2 2 2 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 24.086 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 1.52 W/kg

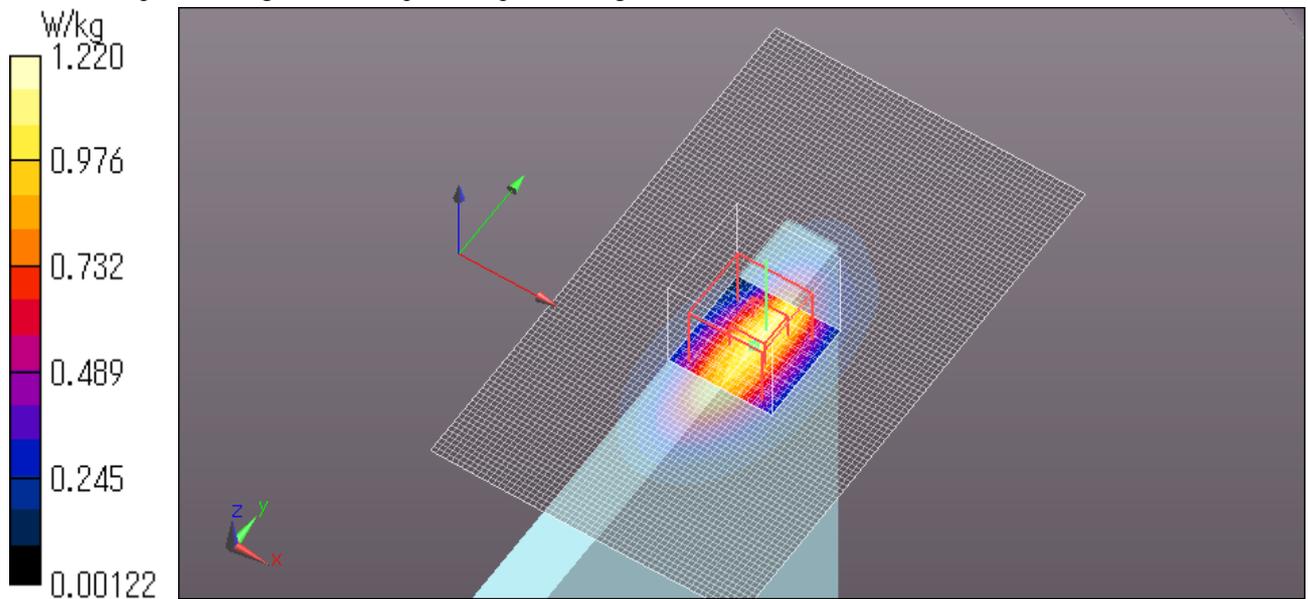
SAR(1 g) = 0.802 W/kg; SAR(10 g) = 0.431 W/kg

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.16 W/kg

Date: 2013/03/28

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL LTE band IV 20MHz band width QPSK 1RB Lower 1732.5MHz Top side 0mm Repeat
Communication System: LTE Band 4; Communication System Band: LTE band 4; Frequency: 1732.5 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1732.5$ MHz; $\sigma = 1.418$ mho/m; $\epsilon_r = 53.105$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.99, 7.99, 7.99); Calibrated: 2012/12/10; \${Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.57 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 31.715 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 2.31 W/kg

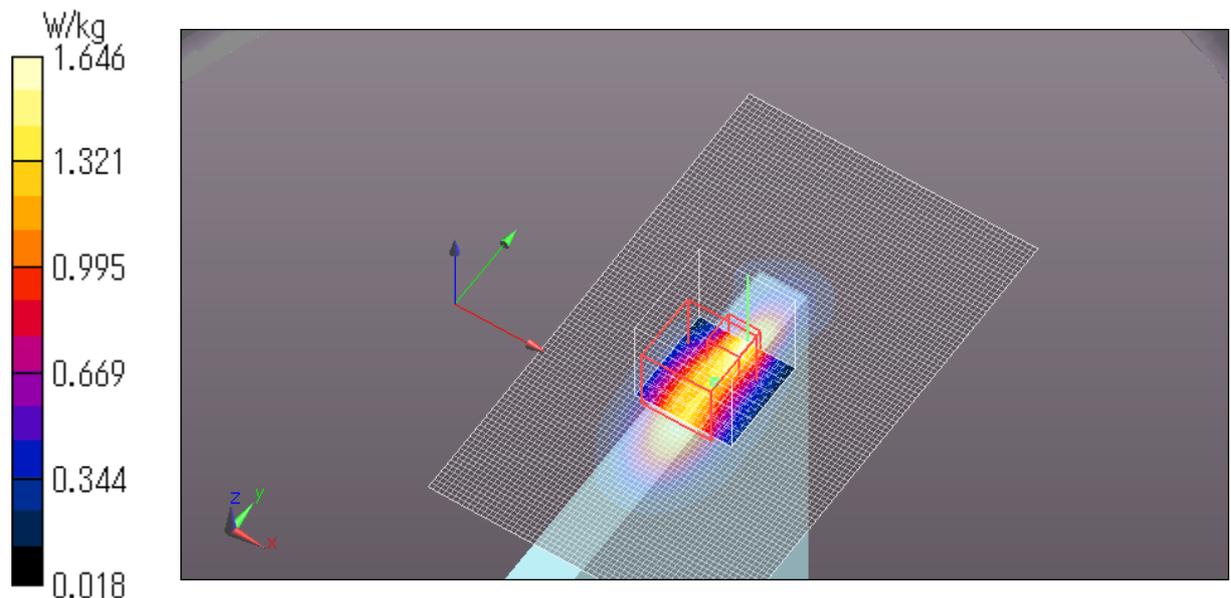
SAR(1 g) = 1 W/kg; SAR(10 g) = 0.527 W/kg

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.65 W/kg

Date: 2013/04/02

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



vi) **LTE Band XVII**

AK8SVD132A1WL LTE band XVII 10MHz band width QPSK 1RB upper 710MHz Top side 4mm

Communication System: LTE Band 17; Communication System Band: LTE Band 17; Frequency: 710 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 710 \text{ MHz}$; $\sigma = 0.918 \text{ mho/m}$; $\epsilon_r = 56.176$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(9.69, 9.69, 9.69); Calibrated: 2012/12/10; {Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

Area Scan 3 (61x101x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 0.702 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 12.349 V/m ; Power Drift = -0.13 dB

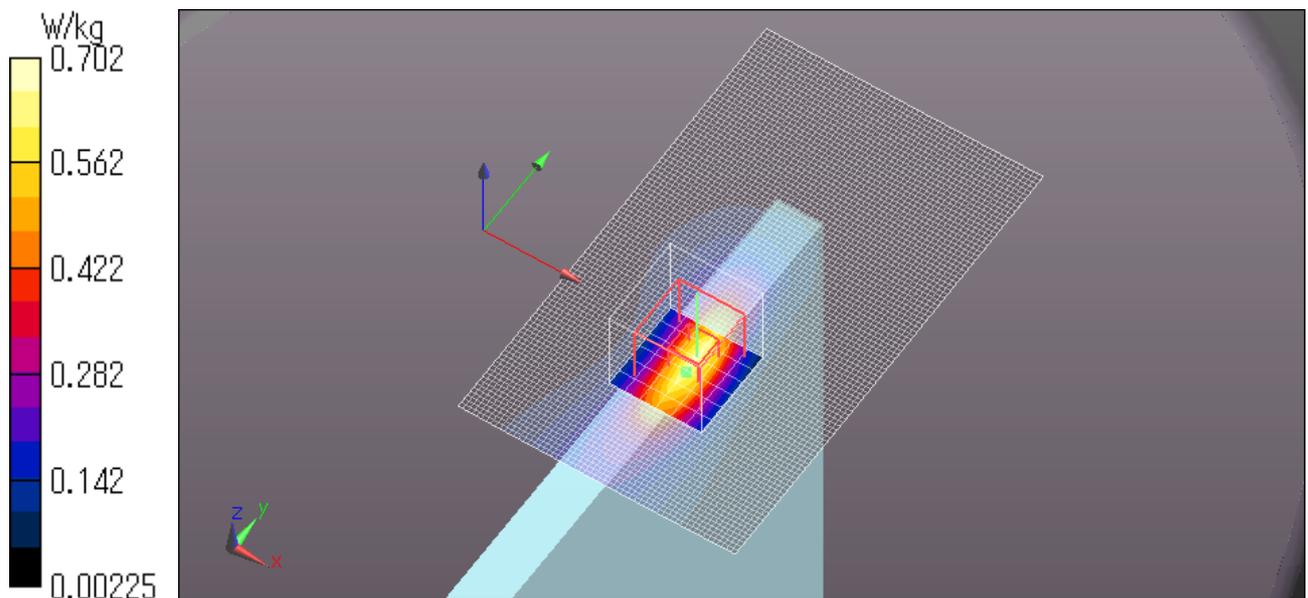
Peak SAR (extrapolated) = 0.885 W/kg

SAR(1 g) = 0.468 W/kg ; SAR(10 g) = 0.252 W/kg

Maximum value of SAR (measured) = 0.682 W/kg

Date: 2013/03/29

Ambient Temp. : 24.0 degree.C . Liquid Temp.; 23.5 degree.C .



Z Scan at Maximum BODY SAR position in LTE Band XVII

AK8SVD132A1WL LTE band XVII 10MHz band width QPSK 1RB upper 710MHz Top side 4mm

Communication System: LTE Band 17; Communication System Band: LTE Band 17; Frequency: 710 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 710 \text{ MHz}$; $\sigma = 0.918 \text{ mho/m}$; $\epsilon_r = 56.176$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(9.69, 9.69, 9.69); Calibrated: 2012/12/10; {Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

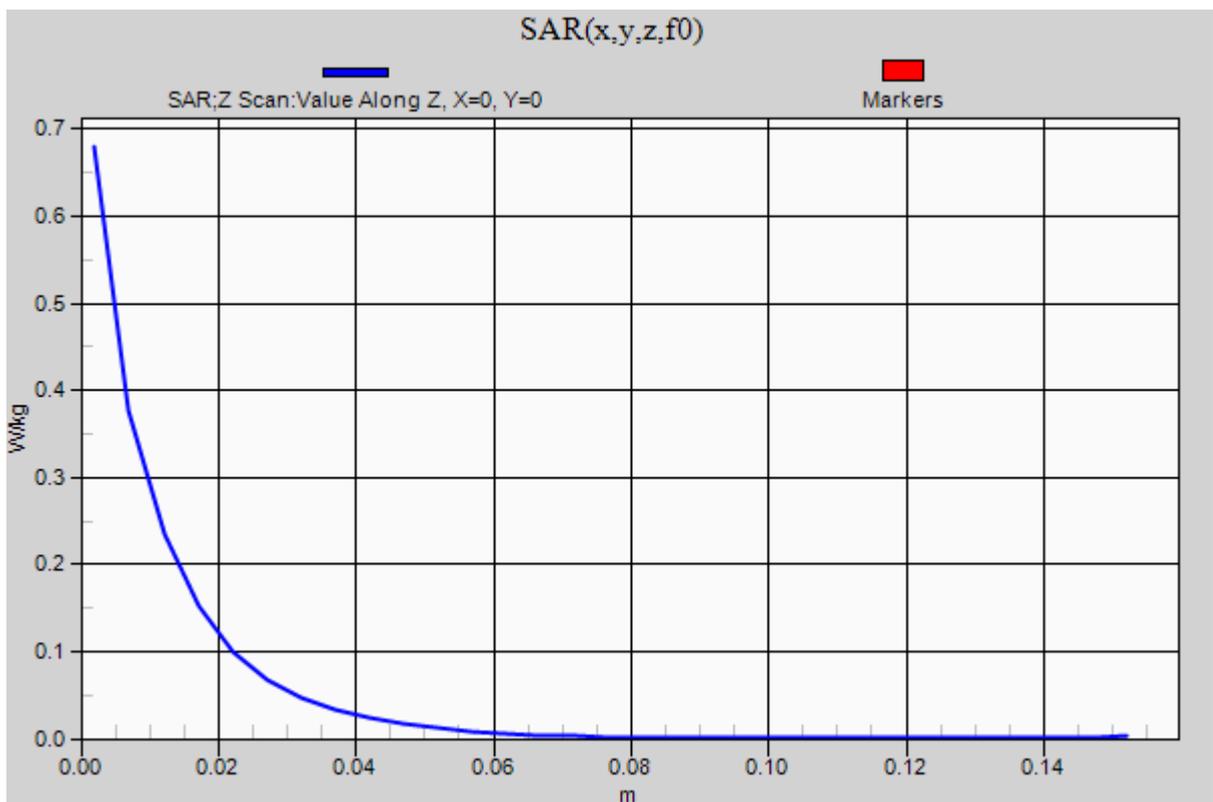
Measurement SW: DASY52, Version 52.8 (3);

Z Scan (1x1x31): Measurement grid: $dx=20\text{mm}$, $dy=20\text{mm}$, $dz=5\text{mm}$

Maximum value of SAR (measured) = 0.680 W/kg

Date: 2013/03/29

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL LTE band XVII 10MHz band QPSK 1RB Lower High 711MHz Top side 0mm

Communication System: LTE Band 17; Communication System Band: LTE Band 17; Frequency: 711 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 711$ MHz; $\sigma = 0.896$ mho/m; $\epsilon_r = 55.139$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(9.69, 9.69, 9.69); Calibrated: 2012/12/10; {Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

above 1 GHz/Top/Area Scan 3 (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.550 W/kg

above 1 GHz/Top/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 0.636 V/m; Power Drift = 0.14 dB

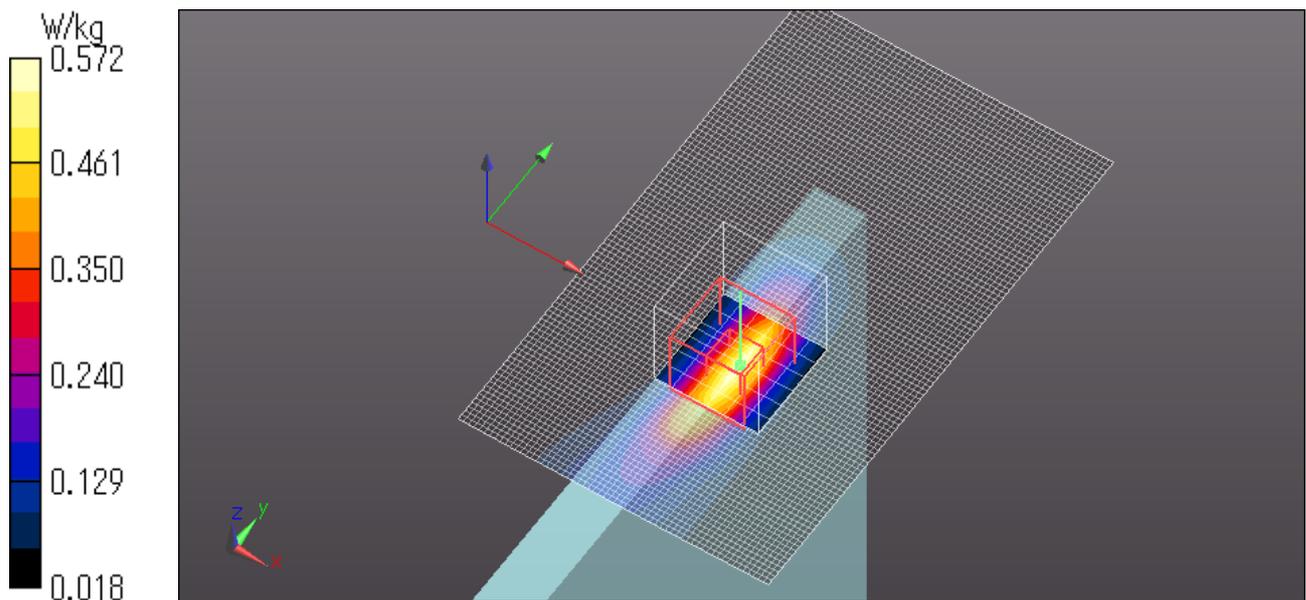
Peak SAR (extrapolated) = 0.770 W/kg

SAR(1 g) = 0.377 W/kg; SAR(10 g) = 0.191 W/kg

Maximum value of SAR (measured) = 0.572 W/kg

Date: 2013/04/01

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



AK8SVD132A1WL LTE band XVII 10MHz band width QPSK 1RB upper Middle710MHz Left side 0mm

Communication System: LTE Band 17; Communication System Band: LTE Band 17; Frequency: 710 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 710 \text{ MHz}$; $\sigma = 0.918 \text{ mho/m}$; $\epsilon_r = 56.176$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(9.69, 9.69, 9.69); Calibrated: 2012/12/10; {Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

Area Scan (61x101x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 0.125 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 5.148 V/m ; Power Drift = 0.17 dB

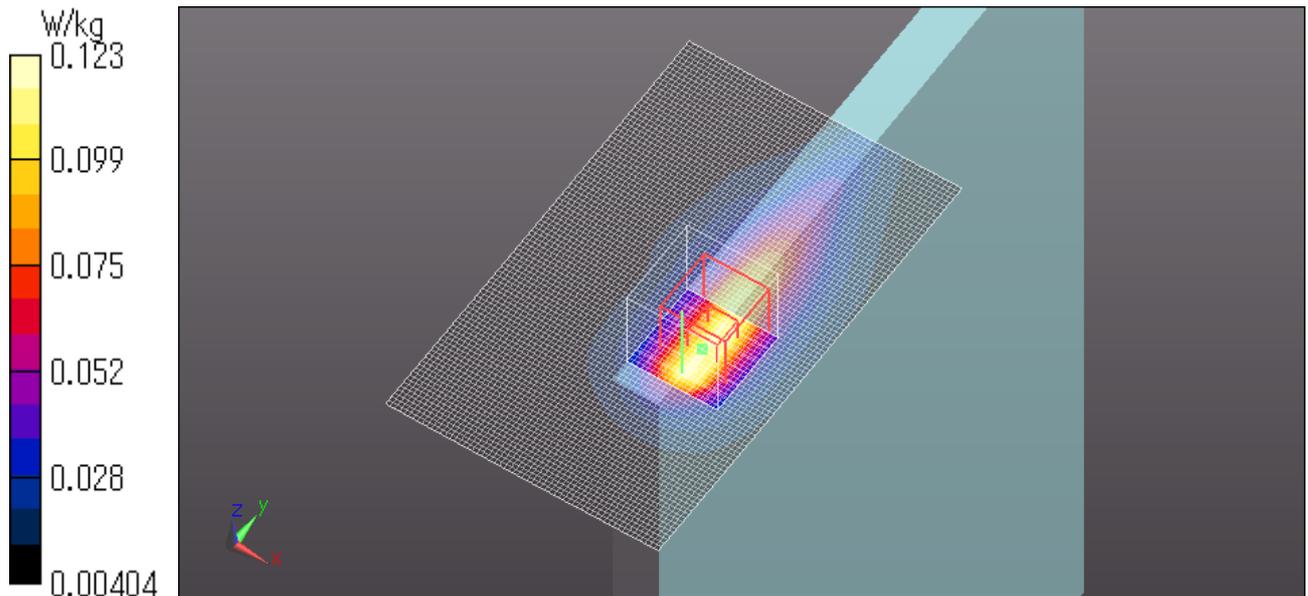
Peak SAR (extrapolated) = 0.193 W/kg

SAR(1 g) = 0.082 W/kg ; SAR(10 g) = 0.046 W/kg

Maximum value of SAR (measured) = 0.123 W/kg

Date: 2013/03/29

Ambient Temp. : 24.0 degree.C . Liquid Temp.; 23.5 degree.C .



AK8SVD132A1WL LTE band XVII 10MHz band width QPSK 1RB upper 710MHz Rear 0mm

Communication System: LTE Band 17; Communication System Band: LTE Band 17; Frequency: 710 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 710 \text{ MHz}$; $\sigma = 0.918 \text{ mho/m}$; $\epsilon_r = 56.176$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(9.69, 9.69, 9.69); Calibrated: 2012/12/10; {Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (3);

Area Scan (81x121x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 0.108 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 4.886 V/m ; Power Drift = 0.07 dB

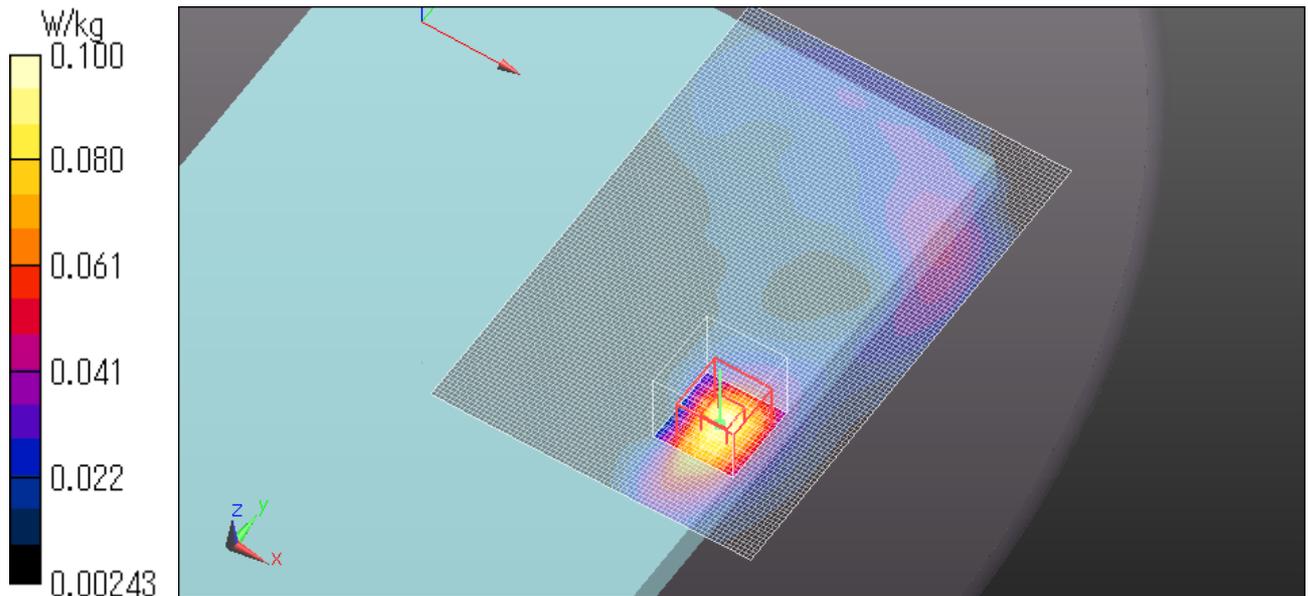
Peak SAR (extrapolated) = 0.129 W/kg

SAR(1 g) = 0.072 W/kg ; SAR(10 g) = 0.041 W/kg

Maximum value of SAR (measured) = 0.100 W/kg

Date: 2013/03/29

Ambient Temp. : 24.0 degree.C . Liquid Temp.; 23.5 degree.C .



AK8SVD132A1WL LTE band XVII 10MHz band width QPSK 1RB upper 710MHz Bottom(Laptop) 0mm

Communication System: LTE Band 17; Communication System Band: LTE Band 17; Frequency: 710 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 710 \text{ MHz}$; $\sigma = 0.918 \text{ mho/m}$; $\epsilon_r = 56.176$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(9.69, 9.69, 9.69); Calibrated: 2012/12/10; {Probe: Calibration Date}

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (3);

Area Scan (81x121x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$
Maximum value of SAR (interpolated) = 0.0212 W/kg

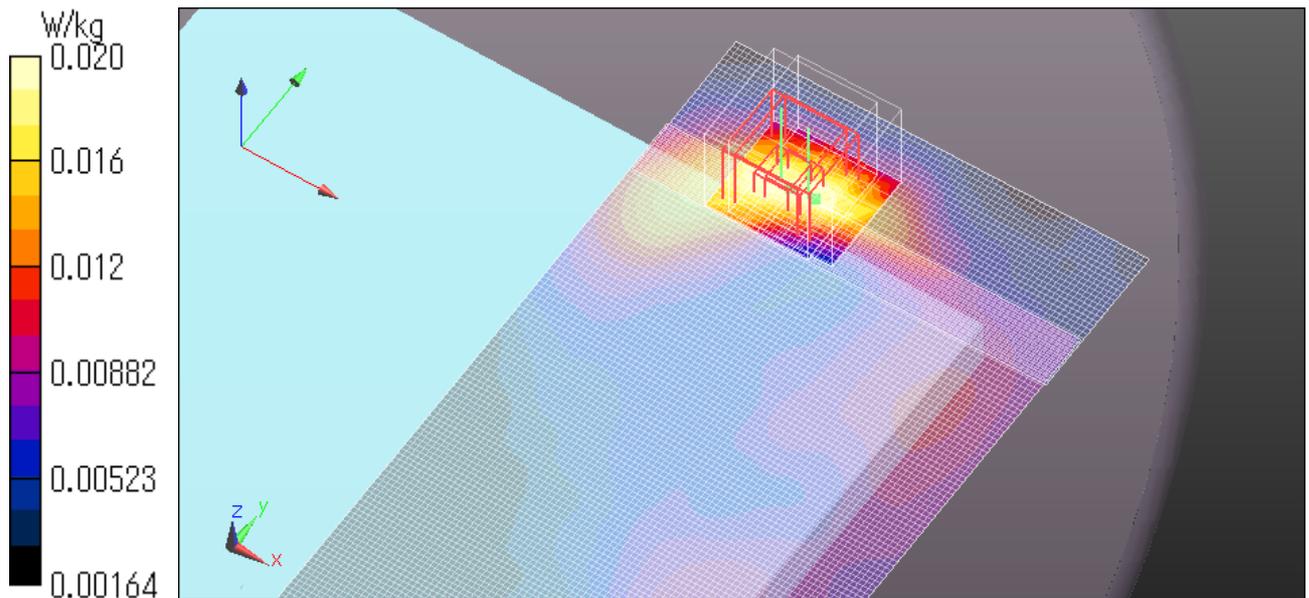
Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$
Reference Value = 0.590 V/m ; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.0230 W/kg
SAR(1 g) = 0.016 W/kg ; SAR(10 g) = 0.011 W/kg
Maximum value of SAR (measured) = 0.0203 W/kg

Area Scan 2 (81x31x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$
Maximum value of SAR (interpolated) = 0.0192 W/kg

Zoom Scan 2 (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$
Reference Value = 0.590 V/m ; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.0220 W/kg
SAR(1 g) = 0.016 W/kg ; SAR(10 g) = 0.011 W/kg
Maximum value of SAR (measured) = 0.0196 W/kg

Date: 2013/03/29

Ambient Temp. : 24.0 degree.C . Liquid Temp.; 23.5 degree.C .



AK8SVD132A1WL(LTE) LTE band XVII 10MHz band width QPSK 50%RB center Middle710MHz Top side 4mm

Communication System: LTE Band 17; Communication System Band: LTE Band 17; Frequency: 710 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 710$ MHz; $\sigma = 0.918$ mho/m; $\epsilon_r = 56.176$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(9.69, 9.69, 9.69); Calibrated: 2012/12/10; $\{Probe: Calibration Date\}$

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2012/07/13

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASYS2, Version 52.8 (3);

Area Scan 3 (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.376 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.226 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 0.492 W/kg

SAR(1 g) = 0.260 W/kg; SAR(10 g) = 0.140 W/kg

Maximum value of SAR (measured) = 0.378 W/kg

Date: 2013/03/29

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.

