FCC SAR Test Report

APPLICANT	: ZTE CORPORATION
EQUIPMENT	: WCDMA / LTE Dual-Mode Digital Mobile Phone
BRAND NAME	: ZTE
MODEL NAME	: Z820
FCC ID	: SRQ-Z820
STANDARD	: FCC 47 CFR Part 2 (2.1093) ANSI/IEEE C95.1-1992 IEEE 1528-2003

We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and had been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (KUNSHAN) INC., the test report shall not be reproduced except in full.

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Testing Laboratory
2627

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA532302	Rev. 01	Initial issue of report	May 07, 2015

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **ZTE CORPORATION, WCDMA / LTE Dual-Mode Digital Mobile Phone, Z820** are as follows.

Equipment Class	Frequency Band	Highest SAR Summary			
		Head (Separation 0mm) 1g SAR (W/kg)	Body-worn (Separation 10mm) 1g SAR (W/kg)	Wireless Router (Separation 10mm) 1g SAR (W/kg)	Highest Simultaneous Transmission 1g SAR (W/kg)
PCE	GSM850	0.37	0.53	**0.88**	1.58
	GSM1900	0.26	0.58	0.77	
	WCDMA Band V	0.11	0.19	0.29	
	WCDMA Band IV	0.50	**0.77**	0.77	
	WCDMA Band II	0.25	0.54	0.68	
	LTE Band 12	0.43	0.60	0.60	
	LTE Band 4	0.42	0.71	0.71	
	LTE Band 2	0.20	0.43	0.60	
DTS	WLAN 2.4GHz Band	**1.08**	0.21	0.21	1.58
Date of Testing:		Mar. 28, 2015 ~ Apr. 24, 2015			

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2003.

2. Administration Data

Testing Laboratory	
Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958

Applicant	
Company Name	ZTE CORPORATION
Address	ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

Manufacturer	
Company Name	ZTE CORPORATION
Address	ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

3. Guidance Standard

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards:

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2003
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r03
- FCC KDB 865664 D02 SAR Reporting v01r01
- FCC KDB 447498 D01 General RF Exposure Guidance v05r02
- FCC KDB 648474 D04 SAR Evaluation Considerations for Wireless Handsets v01r02
- FCC KDB 248227 D01 SAR meas for 802 11abg v01r02
- FCC KDB 941225 D01 3G SAR Procedures v03
- FCC KDB 941225 D05 SAR for LTE Devices v02r03
- FCC KDB 941225 D06 Hotspot Mode SAR v02

4. Equipment Under Test (EUT)

4.1 General Information

Product Feature & Specification	
Equipment Name	WCDMA / LTE Dual-Mode Digital Mobile Phone
Brand Name	ZTE
Model Name	Z820
FCC ID	SRQ-Z820
IMEI Code	867117020000935
Wireless Technology and Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz WCDMA Band IV: 1712.4 MHz ~ 1752.6 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz LTE Band 12: 699.7 MHz ~ 715.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 2: 1850.7 MHz ~ 1909.3 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Mode	•GSM/GPRS/EGPRS •RMC/AMR 12.2Kbps •HSDPA •HSUPA •DC-HSDPA •HSPA+ •LTE: QPSK, 16QAM •802.11b/g/n HT20/HT40 •Bluetooth v3.0+EDR, Bluetooth v4.0 LE
HW Version	WX4M71C1-2
SW Version	Z820V1.0.0B01
GSM / (E)GPRS Transfer mode	Class B – EUT cannot support Packet Switched and Circuit Switched Network simultaneously but can automatically switch between Packet and Circuit Switched Network.
EUT Stage	Production Unit
Remark: 1. This device 2.4GHz supports hotspot operation. 2. The EUT do not support DTM function. 3. This device supported VoIP in GPRS, EGPRS, WCDMA and LTE (e.g. 3rd party VoIP). 4. This device supports GRPS/EGPRS mode up to multi-slot class12.	

4.2 Maximum Tune-up Limit

Mode	Burst average power(dBm)	
	GSM 850	GSM 1900
GSM (GMSK, 1 Tx slot)	33.0	30.0
GPRS (GMSK, 1 Tx slot)	33.0	30.0
GPRS (GMSK, 2 Tx slots)	32.0	29.0
GPRS (GMSK, 3 Tx slots)	30.0	27.5
GPRS (GMSK, 4 Tx slots)	29.5	26.5
EDGE (8PSK, 1 Tx slot)	25.0	25.5
EDGE (8PSK, 2 Tx slots)	24.0	24.5
EDGE (8PSK, 3 Tx slots)	22.5	23.0
EDGE (8PSK, 4 Tx slots)	21.5	21.5

Mode	Average power (dBm)		
	WCDMA Band V	WCDMA Band II	WCDMA Band IV
AMR 12.2Kbps	23.5	23.0	23.0
RMC 12.2Kbps	23.5	23.0	23.0
HSDPA Subtest-1	22.0	22.0	22.0
HSDPA Subtest-2	22.0	22.0	22.0
HSDPA Subtest-3	21.5	21.5	21.5
HSDPA Subtest-4	21.5	21.5	21.5
DC-HSDPA Subtest-1	22.0	22.0	22.0
DC-HSDPA Subtest-2	22.0	22.0	22.0
DC-HSDPA Subtest-3	21.5	21.5	21.5
DC-HSDPA Subtest-4	21.5	21.5	21.5
HSUPA Subtest-1	20.5	20.5	20.0
HSUPA Subtest-2	20.0	20.0	20.0
HSUPA Subtest-3	20.0	20.0	20.0
HSUPA Subtest-4	21.0	21.0	21.0
HSUPA Subtest-5	20.0	19.5	19.5
HSPA+ (16QAM) Subtest-1	21.5	21.5	21.5

LTE Band 12				
Average Power (dBm)				
Modulation	BW (MHz)	RB size	MPR	Target Power
QPSK	10	≤ 12	0	23.0
QPSK	10	> 12	0	23.0
16QAM	10	≤ 12	0	23.0
16QAM	10	> 12	0	23.0
QPSK	5	≤ 8	0	23.0
QPSK	5	> 8	0	23.0
16QAM	5	≤ 8	0	23.0
16QAM	5	> 8	0	23.0
QPSK	3	≤ 4	0	23.0
QPSK	3	> 4	0	23.0
16QAM	3	≤ 4	0	23.0
16QAM	3	> 4	0	23.0
QPSK	1.4	≤ 5	0	23.0
QPSK	1.4	> 5	0	23.0
16QAM	1.4	≤ 5	0	23.0
16QAM	1.4	> 5	0	23.0

LTE Band 4				
Average Power (dBm)				
Modulation	BW (MHz)	RB size	MPR	Target Power
QPSK	20	≤ 18	0	22.5
QPSK	20	> 18	0	22.5
16QAM	20	≤ 18	0	22.5
16QAM	20	> 18	0	22.5
QPSK	15	≤ 16	0	22.5
QPSK	15	> 16	0	22.5
16QAM	15	≤ 16	0	22.5
16QAM	15	> 16	0	22.5
QPSK	10	≤ 12	0	22.5
QPSK	10	> 12	0	22.5
16QAM	10	≤ 12	0	22.5
16QAM	10	> 12	0	22.5
QPSK	5	≤ 8	0	22.5
QPSK	5	> 8	0	22.5
16QAM	5	≤ 8	0	22.5
16QAM	5	> 8	0	22.5
QPSK	3	≤ 4	0	22.5
QPSK	3	> 4	0	22.5
16QAM	3	≤ 4	0	22.5
16QAM	3	> 4	0	22.5
QPSK	1.4	≤ 5	0	22.5
QPSK	1.4	> 5	0	22.5
16QAM	1.4	≤ 5	0	22.5
16QAM	1.4	> 5	0	22.5

LTE Band 2				
Average Power (dBm)				
Modulation	BW (MHz)	RB size	MPR	Target Power
QPSK	20	≤ 18	0	23.0
QPSK	20	> 18	1	22.0
16QAM	20	≤ 18	1	22.0
16QAM	20	> 18	2	21.0
QPSK	15	≤ 16	0	23.0
QPSK	15	> 16	1	22.0
16QAM	15	≤ 16	1	22.0
16QAM	15	> 16	2	21.0
QPSK	10	≤ 12	0	23.0
QPSK	10	> 12	1	22.0
16QAM	10	≤ 12	1	22.0
16QAM	10	> 12	2	21.0
QPSK	5	≤ 8	0	23.0
QPSK	5	> 8	1	22.0
16QAM	5	≤ 8	1	22.0
16QAM	5	> 8	2	21.0
QPSK	3	≤ 4	0	23.0
QPSK	3	> 4	1	22.0
16QAM	3	≤ 4	1	22.0
16QAM	3	> 4	2	21.0
QPSK	1.4	≤ 5	0	23.0
QPSK	1.4	> 5	1	22.0
16QAM	1.4	≤ 5	1	22.0
16QAM	1.4	> 5	2	21.0

Mode		Maximum Average Power (dBm)
2.4GHz	802.11b	16.0
	802.11g	15.5
	802.11n-HT20	13.5
	802.11n-HT40	13.5
Bluetooth v3.0+EDR		5.0
Bluetooth v4.0 LE		-3.0

4.3 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r03	
FCC ID	SRQ-Z820
Equipment Name	WCDMA / LTE Dual-Mode Digital Mobile Phone
Operating Frequency Range of each LTE transmission band	LTE Band 12: 699.7 MHz ~ 715.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 2: 1850.7 MHz ~ 1909.3 MHz
Channel Bandwidth	1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz (LTE Band 2/4) 1.4MHz, 3MHz, 5MHz, 10MHz (LTE Band 12)
uplink modulations used	QPSK, and 16QAM
LTE Voice / Data requirements	Data only
LTE MPR permanently built-in by design	Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3
LTE A-MPR	In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)
Spectrum plots for RB configuration	A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.

Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

Transmission (H, M, L) channel numbers and frequencies in each LTE band

LTE Band 12

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	23017	699.7	23025	700.5	23035	701.5	23060	704
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5
H	23173	715.3	23165	714.5	23155	713.5	23130	711

LTE Band 4

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745

LTE Band 2

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900

5. RF Exposure Limits

5.1 Uncontrolled Environment

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

5.2 Controlled Environment

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

Limits for Occupational/Controlled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.4	8.0	20.0

Limits for General Population/Uncontrolled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.08	1.6	4.0

1. Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.

6. Specific Absorption Rate (SAR)

6.1 Introduction

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

6.2 SAR Definition

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). The equation description is as below:

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

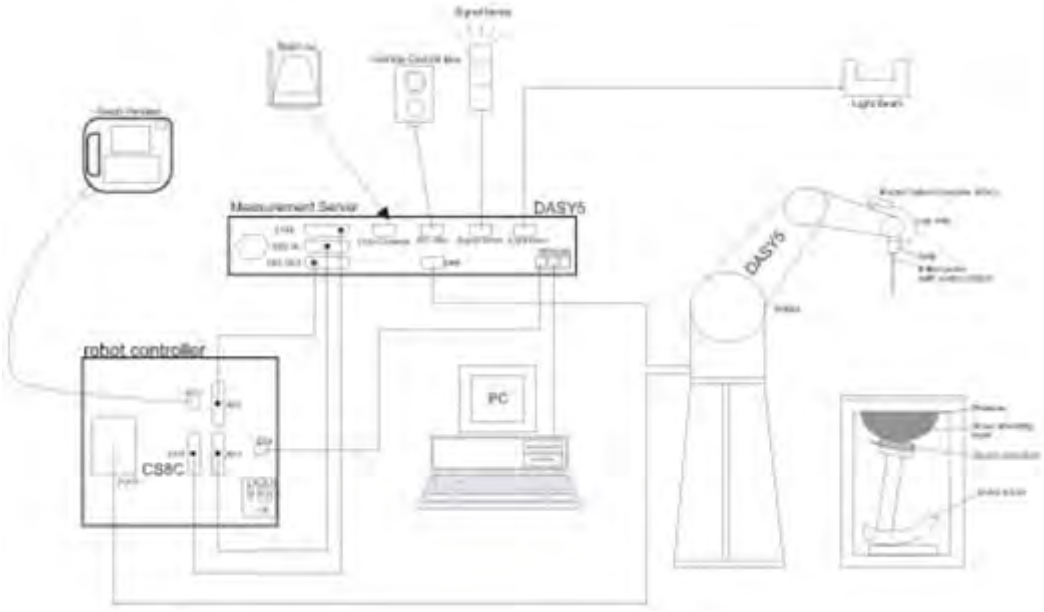
SAR is expressed in units of Watts per kilogram (W/kg)

$$\mathbf{SAR} = \frac{\boldsymbol{\sigma}|\mathbf{E}|^{\mathbf{2}}}{\boldsymbol{\rho}}$$

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength.

7. System Description and Setup

The DASY system used for performing compliance tests consists of the following items:



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP or Win7 and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

8. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

(a) For WWAN power measurement, use base station simulator to configure EUT WWAN transmission in conducted connection with RF cable, at maximum power in each supported wireless interface and frequency band.
(b) Read the WWAN RF power level from the base station simulator.
(c) For WLAN/BT power measurement, use engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power in each supported wireless interface and frequency band
(d) Connect EUT RF port through RF cable to the power meter, and measure WLAN/BT output power

<SAR measurement>

(a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power, in the highest power channel.
(b) Place the EUT in the positions as Appendix D demonstrates.
(c) Set scan area, grid size and other setting on the DASY software.
(d) Measure SAR results for the highest power channel on each testing position.
(e) Find out the largest SAR result on these testing positions of each band
(f) Measure SAR results for other channels in worst SAR testing position if the reported SAR of highest power channel is larger than 0.8 W/kg

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

(a) Power reference measurement
(b) Area scan
(c) Zoom scan
(d) Power drift measurement

8.1 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

(a) Extraction of the measured data (grid and values) from the Zoom Scan
(b) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
(c) Generation of a high-resolution mesh within the measured volume
(d) Interpolation of all measured values form the measurement grid to the high-resolution grid
(e) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
(f) Calculation of the averaged SAR within masses of 1g and 10g

8.2 Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

8.3 Area Scan

The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum found in the scanned area, within a range of the global maximum. The range (in dB0 is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan), if only one zoom scan follows the area scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of zoom scans has to be increased accordingly.

Area scan parameters extracted from FCC KDB 865664 D01v01r03 SAR measurement 100 MHz to 6 GHz.

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

8.4 Zoom Scan

Zoom scans are used assess the peak spatial SAR values within a cubic averaging volume containing 1 gram and 10 gram of simulated tissue. The zoom scan measures points (refer to table below) within a cube shoes base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the zoom scan evaluates the averaged SAR for 1 gram and 10 gram and displays these values next to the job's label.

Zoom scan parameters extracted from FCC KDB 865664 D01v01r03 SAR measurement 100 MHz to 6 GHz.

			≤ 3 GHz	> 3 GHz
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ 1.5·$\Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

* When zoom scan is required and the *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

8.5 Volume Scan Procedures

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the EUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing. When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

8.6 Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In DASY measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drifts more than 5%, the SAR will be retested.

9. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1065	Nov. 19, 2014	Nov. 18, 2015
SPEAG	835MHz System Validation Kit	D835V2	4d091	Nov. 21, 2014	Nov. 20, 2015
SPEAG	1750MHz System Validation Kit	D1750V2	1069	Nov. 21, 2014	Nov. 20, 2015
SPEAG	1900MHz System Validation Kit	D1900V2	5d118	Nov. 21, 2014	Nov. 20, 2015
SPEAG	2450MHz System Validation Kit	D2450V2	840	Nov. 19, 2014	Nov. 18, 2015
SPEAG	Data Acquisition Electronics	DAE4	1210	May 19, 2014	May 18, 2015
SPEAG	Dosimetric E-Field Probe	EX3DV4	3857	May 23, 2014	May 22, 2015
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1477	NCR	NCR
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1479	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio communication analyzer	MT8820C	6201091028	Jul. 10, 2014	Jul. 09, 2015
Agilent	Wireless Communication Test Set	E5515C	MY52102706	May 03, 2014	May 02, 2015
Agilent	Wireless Communication Test Set	E5515E	MY53211040	Jun. 12, 2014	Jun. 11, 2015
Agilent	Dielectric Probe Kit	85070E	MY44300475	NCR	NCR
Agilent	ENA Series Network Analyzer	E5071C	MY46111157	May 04, 2014	May 03, 2015
R&S	Signal Generator	SMBV100A	258305	Jan. 23, 2015	Jan. 22, 2016
Anritsu	Power Senor	MA2411B	0917070	Jan. 23, 2015	Jan. 22, 2016
Anritsu	Power Meter	ML2495A	1005002	Jan. 23, 2015	Jan. 22, 2016
ARRA	Power Divider	A3200-2	N/A	NA	NA
R&S	CBT BLUETOOTH TESTER	CBT	100783	Aug. 11, 2014	Aug. 10, 2015
R&S	Spectrum Analyzer	FSP40	100319	Oct. 28, 2014	Oct. 27, 2015
Agilent	Dual Directional Coupler	778D	50422	Note1	
Woken	Attenuator 1	WK0602-XX	N/A	Note1	
PE	Attenuator 2	PE7005-10	N/A	Note1	
PE	Attenuator 3	PE7005- 3	N/A	Note1	
AR	Power Amplifier	5S1G4M2	0328767	Note1	
Mini-Circuits	Power Amplifier	ZVE-3W	162601250	Note1	
Mini-Circuits	Power Amplifier	ZHL-42W+	13440021344	Note1	

General Note:

Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check source.

10. System Verification

10.1 Tissue Verification

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (εr)
For Head								
750	41.1	57.0	0.2	1.4	0.2	0	0.89	41.9
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
1800, 1900, 2000	55.2	0	0	0.3	0	44.5	1.40	40.0
2450	55.0	0	0	0	0	45.0	1.80	39.2
For Body								
750	51.7	47.2	0	0.9	0.1	0	0.96	55.5
835	50.8	48.2	0	0.9	0.1	0	0.97	55.2
1800, 1900, 2000	70.2	0	0	0.4	0	29.4	1.52	53.3
2450	68.6	0	0	0	0	31.4	1.95	52.7

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Tissue Type	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
750	Head	22.8	0.880	40.752	0.89	41.90	-1.12	-2.74	±5	Mar. 31, 2015
835	Head	22.9	0.893	41.380	0.90	41.50	-0.78	-0.29	±5	Mar. 31, 2015
1750	Head	22.6	1.375	41.375	1.37	40.10	0.36	3.18	±5	Apr. 04, 2015
1900	Head	22.8	1.424	39.075	1.40	40.00	1.71	-2.31	±5	Apr. 04, 2015
2450	Head	22.7	1.828	39.180	1.80	39.20	1.56	-0.05	±5	Apr. 24, 2015
750	Body	22.9	0.963	54.242	0.96	55.50	0.31	-2.27	±5	Mar. 29, 2015
835	Body	22.6	0.980	54.484	0.97	55.20	1.03	-1.30	±5	Mar. 29, 2015
1750	Body	22.9	1.515	55.246	1.49	53.40	1.68	3.46	±5	Mar. 28, 2015
1900	Body	22.7	1.552	53.391	1.52	53.30	2.11	0.17	±5	Mar. 28, 2015
2450	Body	22.7	1.943	50.964	1.95	52.70	-0.36	-3.29	±5	Apr. 24, 2015

10.2 System Performance Check Results

Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10 %. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the plots can be referred to Appendix A of this report.

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured SAR (W/kg)	Targeted SAR (W/kg)	Normalized SAR (W/kg)	Deviation (%)
Mar. 31, 2015	750	Head	250	1065	3857	1210	2.19	8.14	8.76	7.62
Mar. 31, 2015	835	Head	250	4d091	3857	1210	2.33	9.11	9.32	2.31
Apr. 04, 2015	1750	Head	250	1069	3857	1210	8.76	37.10	35.04	-5.55
Apr. 04, 2015	1900	Head	250	5d118	3857	1210	9.43	40.10	37.72	-5.94
Apr. 24, 2015	2450	Head	250	840	3857	1210	13.30	52.30	53.2	1.72
Mar. 29, 2015	750	Body	250	1065	3857	1210	2.11	8.64	8.44	-2.31
Mar. 29, 2015	835	Body	250	4d091	3857	1210	2.27	9.60	9.08	-5.42
Mar. 28, 2015	1750	Body	250	1069	3857	1210	8.88	38.10	35.52	-6.77
Mar. 28, 2015	1900	Body	250	5d118	3857	1210	10.40	40.00	41.6	4.00
Apr. 24, 2015	2450	Body	250	840	3857	1210	12.20	51.00	48.8	-4.31

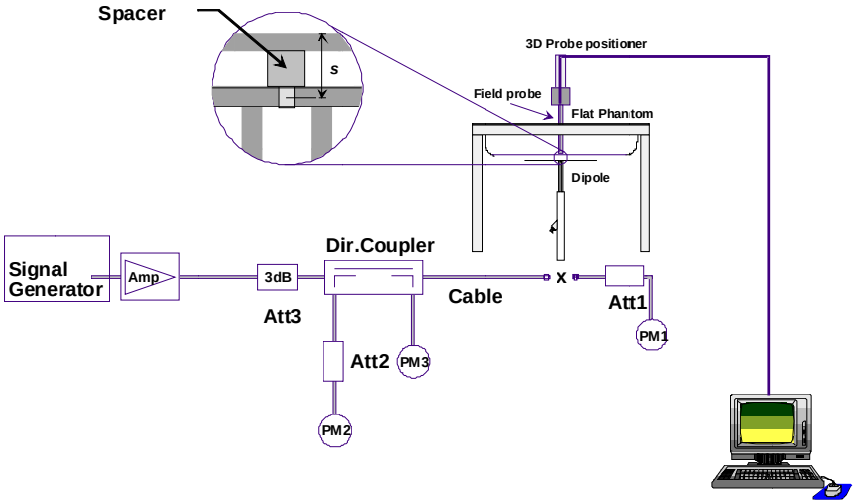


Fig 8.3.1 System Performance Check Setup

Fig 8.3.2 Setup Photo

11. RF Exposure Positions

11.1 Ear and handset reference point

Figure 9.1.1 shows the front, back, and side views of the SAM phantom. The center-of-mouth reference point is labeled “M,” the left ear reference point (ERP) is marked “LE,” and the right ERP is marked “RE.” Each ERP is 15 mm along the B-M (back-mouth) line behind the entrance-to-ear-canal (EEC) point, as shown in Figure 9.1.2 The Reference Plane is defined as passing through the two ear reference points and point M. The line N-F (neck-front), also called the reference pivoting line, is normal to the Reference Plane and perpendicular to both a line passing through RE and LE and the B-M line (see Figure 9.1.3). Both N-F and B-M lines should be marked on the exterior of the phantom shell to facilitate handset positioning. Posterior to the N-F line the ear shape is a flat surface with 6 mm thickness at each ERP, and forward of the N-F line the ear is truncated, as illustrated in Figure 9.1.2. The ear truncation is introduced to preclude the ear lobe from interfering with handset tilt, which could lead to unstable positioning at the cheek.

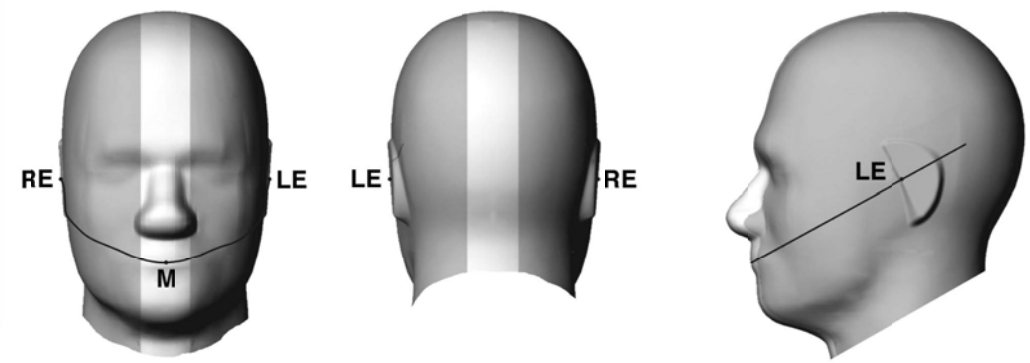


Fig 9.1.1 Front, back, and side views of SAM twin phantom

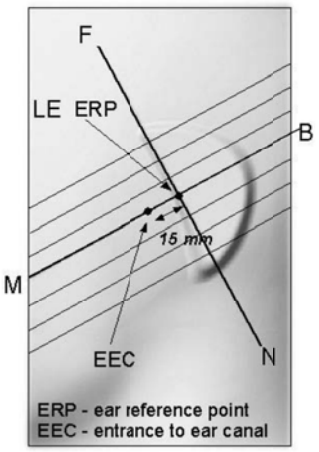


Fig 9.1.2 Close-up side view of phantom showing the ear region.

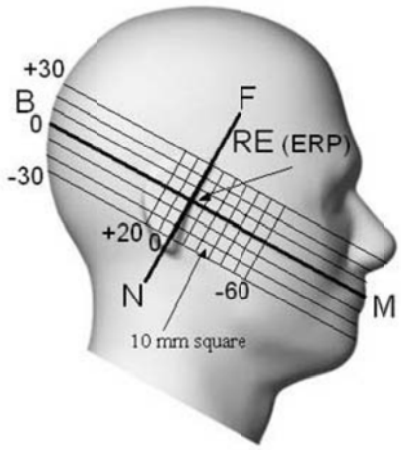


Fig 9.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

11.2 Definition of the cheek position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. Define two imaginary lines on the handset—the vertical centerline and the horizontal line. The vertical centerline passes through two points on the front side of the handset—the midpoint of the width wt of the handset at the level of the acoustic output (point A in Figure 9.2.1 and Figure 9.2.2), and the midpoint of the width wb of the bottom of the handset (point B). The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output (see Figure 9.2.1). The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset (see Figure 9.2.2), especially for clamshell handsets, handsets with flip covers, and other irregularly-shaped handsets.
3. Position the handset close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 9.2.3), such that the plane defined by the vertical centerline and the horizontal line of the handset is approximately parallel to the sagittal plane of the phantom.
4. Translate the handset towards the phantom along the line passing through RE and LE until handset point A touches the pinna at the ERP.
5. While maintaining the handset in this plane, rotate it around the LE-RE line until the vertical centerline is in the plane normal to the plane containing B-M and N-F lines, i.e., the Reference Plane.
6. Rotate the handset around the vertical centerline until the handset (horizontal line) is parallel to the N-F line.
7. While maintaining the vertical centerline in the Reference Plane, keeping point A on the line passing through RE and LE, and maintaining the handset contact with the pinna, rotate the handset about the N-F line until any point on the handset is in contact with a phantom point below the pinna on the cheek. See Figure 9.2.3. The actual rotation angles should be documented in the test report.

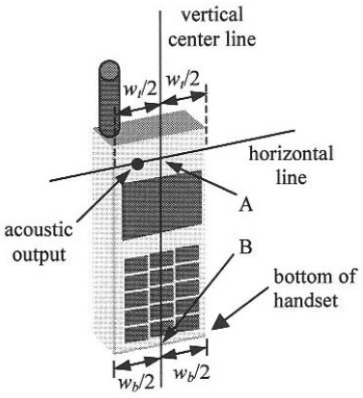


Fig 9.2.1 Handset vertical and horizontal reference lines—"fixed case

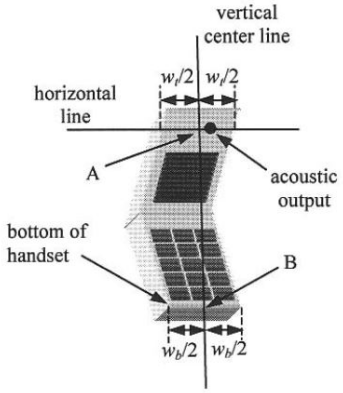


Fig 9.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

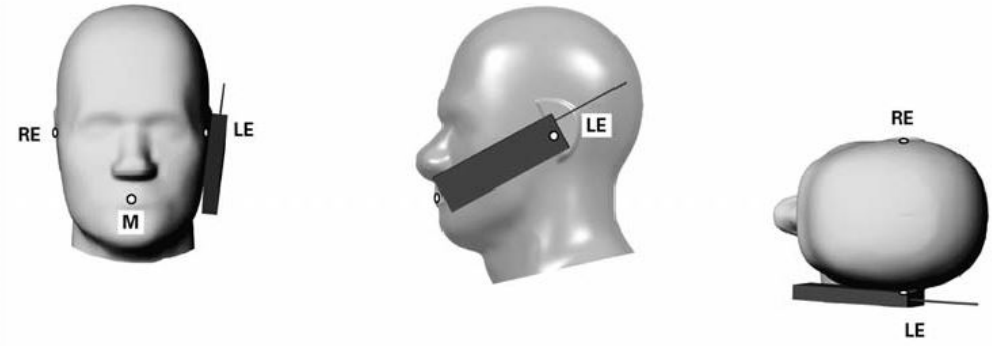


Fig 9.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

11.3 Definition of the tilt position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. While maintaining the orientation of the handset, move the handset away from the pinna along the line passing through RE and LE far enough to allow a rotation of the handset away from the cheek by 15°.
3. Rotate the handset around the horizontal line by 15°.
4. While maintaining the orientation of the handset, move the handset towards the phantom on the line passing through RE and LE until any part of the handset touches the ear. The tilt position is obtained when the contact point is on the pinna. See Figure 9.3.1. If contact occurs at any location other than the pinna, e.g., the antenna at the back of the phantom head, the angle of the handset should be reduced. In this case, the tilt position is obtained if any point on the handset is in contact with the pinna and a second point

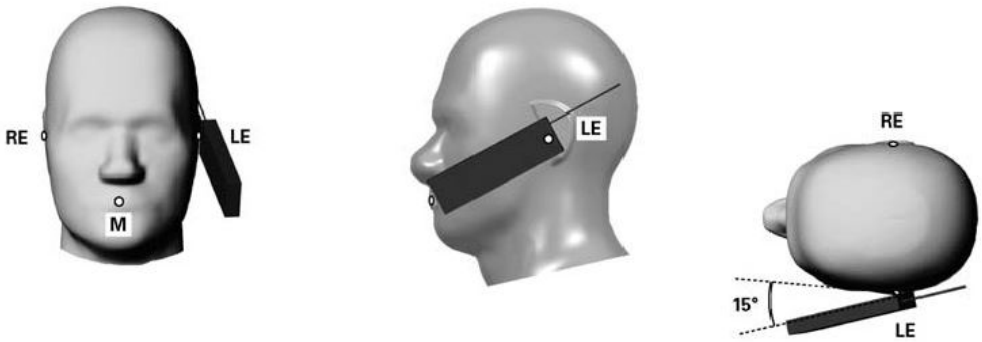


Fig 9.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

11.4 Body Worn Accessory

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 9.4). Per KDB 648474 D04v01r02, body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB 447498 D01v05r02 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for body-worn accessory, measured without a headset connected to the handset is < 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a handset attached to the handset.

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

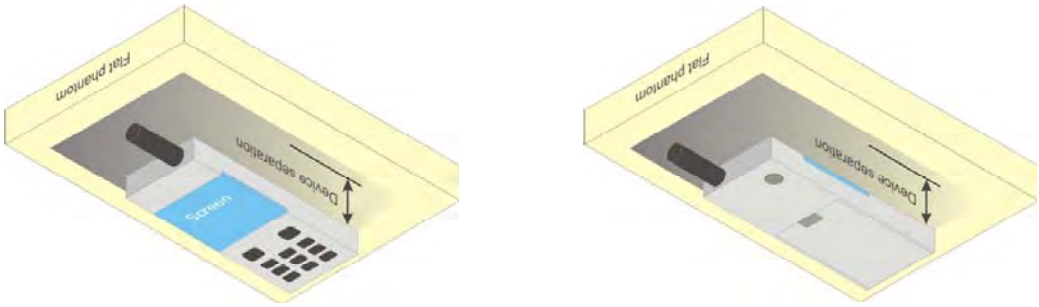


Fig 9.4 Body Worn Position

11.5 Wireless Router

Some battery-operated handsets have the capability to transmit and receive user through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC HDB Publication 941225 D06 v02 where SAR test considerations for handsets (L x W ≥ 9 cm x 5 cm) are based on a composite test separation distance of 10mm from the front, back and edges of the device containing transmitting antennas within 2.5cm of their edges, determined form general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each frequency transmission and mode separately and spatially summed with the WIFI transmitter according to FCC KDB Publication 447498 D01v05r02 publication procedures. The “Portable Hotspot” feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

12. Conducted RF Output Power (Unit: dBm)

<GSM Conducted Power>

1. Per KDB 447498 D01v05r02, the maximum output power channel is used for SAR testing and for further SAR test reduction.
2. Per KDB 941225 D01v03, considering the possibility of e.g. 3rd party VoIP operation for Head and body-worn SAR test reduction for GSM and GPRS and EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the EUT was set in GPRS (4Tx slots) for GSM850/GSM1900.
3. Per KDB 941225 D01v03, for Hotspot SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance, for modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested, therefore, the EUT was set in GPRS (4Tx slots) for GSM850/GSM1900.

Band GSM850	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
TX Channel	128	189	251		128	189	251	
Frequency (MHz)	824.2	836.4	848.8		824.2	836.4	848.8	
GSM (GMSK, 1 Tx slot)	32.43	**32.48**	32.46	33.0	23.43	23.48	23.46	24.0
GPRS (GMSK, 1 Tx slot) – CS1	32.40	32.47	32.46	33.0	23.40	23.47	23.46	24.0
GPRS (GMSK, 2 Tx slots) – CS1	31.60	31.65	31.65	32.0	25.60	25.65	25.65	26.0
GPRS (GMSK, 3 Tx slots) – CS1	29.78	29.80	29.75	30.0	25.52	25.54	25.49	25.74
GPRS (GMSK, 4 Tx slots) – CS1	28.74	28.78	28.69	29.5	25.74	**25.78**	25.69	26.5
EDGE (8PSK, 1 Tx slot) – MCS5	24.32	24.48	24.38	25.0	15.32	15.48	15.38	16.0
EDGE (8PSK, 2 Tx slots) – MCS5	23.69	23.74	23.60	24.0	17.69	17.74	17.60	18.0
EDGE (8PSK, 3 Tx slots) – MCS5	21.99	22.07	21.97	22.5	17.73	17.81	17.71	18.24
EDGE (8PSK, 4 Tx slots) – MCS5	21.07	21.10	20.87	21.5	18.07	18.10	17.87	18.5
Band GSM1900	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
TX Channel	512	661	810		512	661	810	
Frequency (MHz)	1850.2	1880	1909.8		1850.2	1880	1909.8	
GSM (GMSK, 1 Tx slot)	**29.71**	29.44	29.40	30.0	20.71	20.44	20.40	21.0
GPRS (GMSK, 1 Tx slot) – CS1	29.70	29.42	29.40	30.0	20.70	20.42	20.40	21.0
GPRS (GMSK, 2 Tx slots) – CS1	28.70	28.57	28.68	29.0	22.70	22.57	22.68	23.0
GPRS (GMSK, 3 Tx slots) – CS1	26.56	26.55	26.93	27.5	22.30	22.29	22.67	23.24
GPRS (GMSK, 4 Tx slots) – CS1	25.46	25.51	25.91	26.5	22.46	22.51	**22.91**	23.5
EDGE (8PSK, 1 Tx slot) – MCS5	25.26	25.21	25.14	25.5	16.26	16.21	16.14	16.5
EDGE (8PSK, 2 Tx slots) – MCS5	24.30	24.24	24.18	24.5	18.30	18.24	18.18	18.5
EDGE (8PSK, 3 Tx slots) – MCS5	22.52	22.43	22.35	23.0	18.26	18.17	18.09	18.74
EDGE (8PSK, 4 Tx slots) – MCS5	21.40	21.30	21.27	21.5	18.40	18.30	18.27	18.5

Remark: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots.
The calculated method are shown as below:
Frame-averaged power = Maximum burst averaged power (1 Tx Slot) - 9 dB
Frame-averaged power = Maximum burst averaged power (2 Tx Slots) - 6 dB
Frame-averaged power = Maximum burst averaged power (3 Tx Slots) - 4.26 dB
Frame-averaged power = Maximum burst averaged power (4 Tx Slots) - 3 dB

<WCDMA Conducted Power>

1. The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
2. The procedures in KDB 941225 D01 are applied for 3GPP Rel. 6 HSPA to configure the device in the required sub-test mode(s) to determine SAR test exclusion.
3. For HSPA+ devices supporting 16 QAM in the uplink, power measurements procedure is according to the configurations in Table C.11.1.4 of 3GPP TS 34.121-1.
4. For DC-HSDPA, the device was configured according to the H-Set 12, Fixed Reference Channel (FRC) configuration in Table C.8.1.12 of 3GPP TS 34.121-1, with the primary and the secondary serving HS-DSCH Cell enabled during the power measurement.

A summary of these settings are illustrated below:

HSDPA Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting:
   i. Set Gain Factors (β_c and β_d) and parameters were set according to each
   ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
   iii. Set RMC 12.2Kbps + HSDPA mode.
   iv. Set Cell Power = -86 dBm
   v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
   vi. Select HSDPA Uplink Parameters
   vii. Set Delta ACK, Delta NACK and Delta CQI = 8
   viii. Set Ack-Nack Repetition Factor to 3
   ix. Set CQI Feedback Cycle (k) to 4 ms
   x. Set CQI Repetition Factor to 2
   xi. Power Ctrl Mode = All Up bits
d. The transmitted maximum output power was recorded.

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} (Note1, 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 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
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 Δ_{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 Δ_{NACK} = 30/15 with $\beta_{hs} = 30/15 * \beta_c$, and Δ_{CQI} = 24/15 with $\beta_{hs} = 24/15 * \beta_c$.

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, 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 β_c = 11/15 and β_d = 15/15.

Setup Configuration

HSUPA Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting * :
   i. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
   ii. Set the Gain Factors (β_c and β_d) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121
   iii. Set Cell Power = -86 dBm
   iv. Set Channel Type = 12.2k + HSPA
   v. Set UE Target Power
   vi. Power Ctrl Mode= Alternating bits
   vii. Set and observe the E-TFCI
   viii. Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI
d. The transmitted maximum output power was recorded.

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (Note 5) (Note 6)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed}1: 47/15 β_{ed}2: 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c.
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.
Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 14/15 and β_d = 15/15.
Note 5: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.
Note 6: β_{ed} can not be set directly, it is set by Absolute Grant Value.

Setup Configuration

DC-HSDPA 3GPP release 8 Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration below
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting:
   i. Set RMC 12.2Kbps + HSDPA mode.
   ii. Set Cell Power = -25 dBm
   iii. Set HS-DSCH Configuration Type to FRC (H-set 12, QPSK)
   iv. Select HSDPA Uplink Parameters
   v. Set Gain Factors (β_c and β_d) and parameters were set according to each Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
      a). Subtest 1: β_c/β_d=2/15
      b). Subtest 2: β_c/β_d=12/15
      c). Subtest 3: β_c/β_d=15/8
      d). Subtest 4: β_c/β_d=15/4
   vi. Set Delta ACK, Delta NACK and Delta CQI = 8
   vii. Set Ack-Nack Repetition Factor to 3
   viii. Set CQI Feedback Cycle (k) to 4 ms
   ix. Set CQI Repetition Factor to 2
   x. Power Ctrl Mode = All Up bits
d. The transmitted maximum output power was recorded.

The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
A summary of these settings are illustrated below:

C.8.1.12 Fixed Reference Channel Definition H-Set 12

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Proces ses	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.		
Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

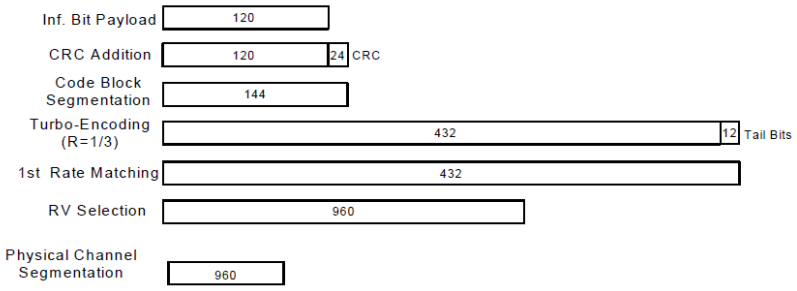


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

Setup Configuration

HSPA+ 3GPP release 7 (uplink category 7) 16QAM, Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting * :
   i. Call Configs = 5.2E:HSPA+:UL with 16QAM
   ii. Set the Gain Factors (β_c and β_d) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.4, quoted from the TS 34.121-1 s5.2E
   iii. Set Channel Parms
   iv. Set Cell Power = -86 dBm
   v. Set Channel Type = HSPA
   vi. Set UE Target Power =21 dBm
   vii. Power Ctrl Mode= All Up Bits
   viii. Set Manual Uplink DPCH Bc/Bd = Manual
   ix. Set Manual Uplink DPCH Bc and Bd=15,15(for 34.121-1 v8.10.0 table C11.1.4 sub-test 1)
   x. Set HSPA Conn DL Channel Levels
   xi. Set HS-SCCH Configs
   xii. Set RB Test Mode Setup
   xiii. Set Common HSUPA Parameters
   xiv. Set Serving Grant
   xv. Confirm that E-TFCI is equal to the target E-TFCI of 105 for sub-test 1, and other subtest's E-TFCI
d. The transmitted maximum output power was recorded.

Table C.11.1.4: β values for transmitter characteristics tests with HS-DPCCH and E-DCH with 16QAM

Sub-test	β_c (Note3)	β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (2xSF2) (Note 4)	β_{ed} (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	β_{ed}1: 30/15 β_{ed}2: 30/15	β_{ed}3: 24/15 β_{ed}4: 24/15	3.5	2.5	14	105	105

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with $\beta_{hs} = 30/15 * \beta_c$.
Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).
Note 3: DPDCH is not configured, therefore the β_c is set to 1 and β_d = 0 by default.
Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value.
Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signaled to use the extrapolation algorithm.

Setup Configuration

<WCDMA Conducted Power>

General Note:

1. Per KDB 941225 D01v03, SAR for Head / Hotspot / Body-worn exposure is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
2. Per KDB 941225 D01v03, RMC 12.2kbps setting is used to evaluate SAR. If the maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA / HSPA+ is ≤ ¼ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA / HSPA+ to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+.

Band			WCDMA Band V			WCDMA Band II			WCDMA Band IV		
TX Channel			4132	4182	4233	9262	9400	9538	1312	1413	1513
Rx Channel			4357	4407	4458	9662	9800	9938	1537	1638	1738
Frequency (MHz)			826.4	836.4	846.6	1852.4	1880	1907.6	1712.4	1732.6	1752.6
MPR (dB)	3GPP Rel 99	AMR 12.2Kbps	22.71	22.72	22.86	22.70	22.40	22.58	22.46	22.40	22.20
	3GPP Rel 99	RMC 12.2Kbps	22.71	22.73	**22.87**	**22.71**	22.41	22.60	**22.48**	22.42	22.21
0	3GPP Rel 6	HSDPA Subtest-1	21.75	21.74	21.82	21.63	21.35	21.53	21.50	21.43	21.18
0	3GPP Rel 6	HSDPA Subtest-2	21.72	21.73	21.81	21.62	21.35	21.52	21.48	21.40	21.17
0.5	3GPP Rel 6	HSDPA Subtest-3	21.24	21.26	21.35	21.17	20.84	21.05	21.01	20.93	20.69
0.5	3GPP Rel 6	HSDPA Subtest-4	21.23	21.24	21.34	21.15	20.82	21.03	21.00	20.92	20.67
0	3GPP Rel 8	DC-HSDPA Subtest-1	21.70	21.71	21.77	21.60	21.34	21.50	21.45	21.40	21.15
0	3GPP Rel 8	DC-HSDPA Subtest-2	21.68	21.67	21.75	21.59	21.31	21.50	21.44	21.38	21.14
0.5	3GPP Rel 8	DC-HSDPA Subtest-3	21.20	21.22	21.33	21.16	20.80	21.02	20.98	20.89	20.65
0.5	3GPP Rel 8	DC-HSDPA Subtest-4	21.18	21.21	21.32	21.14	20.80	21.00	20.97	20.88	20.63
0	3GPP Rel 6	HSUPA Subtest-1	20.19	20.16	20.27	20.05	19.74	19.94	19.90	19.84	19.58
2	3GPP Rel 6	HSUPA Subtest-2	19.66	19.67	19.84	19.68	19.56	19.78	19.09	19.53	19.29
1	3GPP Rel 6	HSUPA Subtest-3	19.61	19.64	19.82	19.61	19.48	19.69	19.56	19.54	19.27
2	3GPP Rel 6	HSUPA Subtest-4	20.68	20.70	20.80	20.69	20.55	20.73	20.57	20.54	20.30
0	3GPP Rel 6	HSUPA Subtest-5	19.14	19.17	19.56	19.08	19.04	19.18	19.03	19.00	18.81
2.5	3GPP Rel 7	HSPA+ (16QAM) Subtest-1	21.18	21.17	21.25	21.29	20.97	21.21	21.06	20.97	20.78

<LTE Conducted Power>

General Note:

1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r03, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r03, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r03, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r03, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r03, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r03, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r03, Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r03, smaller bandwidth SAR testing is not required.

<LTE Band 12>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune up Limit (dBm)	MPR (dB)
Channel				23060	23095	23130		
Frequency (MHz)				704	707.5	711		
10	QPSK	1	0	22.52	**22.63**	22.45	23.0	0
10	QPSK	1	24	22.21	22.53	22.31		
10	QPSK	1	49	22.30	22.31	22.30		
10	QPSK	25	0	22.18	22.23	22.25	23.0	0-1
10	QPSK	25	12	22.22	22.22	22.24		
10	QPSK	25	24	22.28	22.33	22.30		
10	QPSK	50	0	22.27	22.42	22.29		
10	16QAM	1	0	22.35	22.42	22.35	23.0	0-1
10	16QAM	1	24	22.17	22.28	22.31		
10	16QAM	1	49	22.30	22.23	22.30		
10	16QAM	25	0	22.18	22.34	22.18	23.0	0-2
10	16QAM	25	12	22.16	22.35	22.25		
10	16QAM	25	24	22.29	22.31	22.34		
10	16QAM	50	0	22.31	22.41	22.27		
Channel				23035	23095	23155	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				701.5	707.5	713.5		
5	QPSK	1	0	22.22	22.29	22.35	23.0	0
5	QPSK	1	12	22.12	22.23	22.43		
5	QPSK	1	24	22.20	22.28	22.41		
5	QPSK	12	0	22.18	22.25	22.50	23.0	0-1
5	QPSK	12	6	22.21	22.27	22.52		
5	QPSK	12	11	22.08	22.26	22.36		
5	QPSK	25	0	22.17	22.24	22.49		
5	16QAM	1	0	22.42	22.40	22.24	23.0	0-1
5	16QAM	1	12	22.24	22.34	22.56		
5	16QAM	1	24	22.29	22.37	22.36		
5	16QAM	12	0	22.23	22.26	22.47	23.0	0-2
5	16QAM	12	6	22.22	22.24	22.44		
5	16QAM	12	11	22.20	22.29	22.49		
5	16QAM	25	0	22.19	22.18	22.42		
Channel				23025	23095	23165	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				700.5	707.5	714.5		
3	QPSK	1	0	22.01	22.23	22.47	23.0	0
3	QPSK	1	7	22.17	22.18	22.43		
3	QPSK	1	14	22.01	22.16	22.57		
3	QPSK	8	0	22.19	22.20	22.55	23.0	0-1
3	QPSK	8	4	22.20	22.22	22.56		
3	QPSK	8	7	22.14	22.19	22.53		
3	QPSK	15	0	22.16	22.11	22.23		
3	16QAM	1	0	22.03	22.17	22.48	23.0	0-1
3	16QAM	1	7	22.20	22.27	22.46		
3	16QAM	1	14	22.19	22.43	22.43		
3	16QAM	8	0	22.27	22.26	22.52	23.0	0-2
3	16QAM	8	4	22.26	22.14	22.58		
3	16QAM	8	7	22.22	22.28	22.42		
3	16QAM	15	0	22.13	22.22	22.40		

Channel				23017	23095	23173	Tune up Limit (dBm)	Target MPR (dB)
Frequency (MHz)				699.7	707.5	715.3		
1.4	QPSK	1	0	22.15	22.16	22.60	23.0	0
1.4	QPSK	1	2	22.20	22.21	22.36		
1.4	QPSK	1	5	22.11	22.17	22.52		
1.4	QPSK	3	0	22.23	22.10	22.51		
1.4	QPSK	3	1	22.09	22.20	22.59		
1.4	QPSK	3	2	22.13	22.15	22.56		
1.4	QPSK	6	0	22.20	22.18	22.29	23.0	0-1
1.4	16QAM	1	0	22.40	22.48	22.59	23.0	0-1
1.4	16QAM	1	2	22.31	22.38	22.43		
1.4	16QAM	1	5	22.30	22.36	22.39		
1.4	16QAM	3	0	22.11	22.28	22.55		
1.4	16QAM	3	1	22.22	22.04	22.52		
1.4	16QAM	3	2	22.17	22.18	22.54		
1.4	16QAM	6	0	22.28	22.41	22.36	23.0	0-2

<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune up Limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	**22.27**	22.21	21.98	22.5	0
20	QPSK	1	49	21.91	21.98	21.79		
20	QPSK	1	99	21.84	21.68	21.86		
20	QPSK	50	0	21.97	21.95	21.89	22.5	0-1
20	QPSK	50	24	21.87	21.93	21.83		
20	QPSK	50	49	21.86	21.91	21.83		
20	QPSK	100	0	21.88	21.89	21.87		
20	16QAM	1	0	22.02	22.01	21.92	22.5	0-1
20	16QAM	1	49	21.99	21.92	21.76		
20	16QAM	1	99	21.87	21.83	21.85		
20	16QAM	50	0	22.01	21.98	21.88	22.5	0-2
20	16QAM	50	24	21.89	21.94	21.82		
20	16QAM	50	49	21.81	21.89	21.88		
20	16QAM	100	0	21.88	21.90	21.87		
Channel				20025	20175	20325	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	22.04	21.87	21.91	22.5	0
15	QPSK	1	37	21.81	21.78	21.85		
15	QPSK	1	74	21.76	21.79	21.80		
15	QPSK	36	0	22.01	21.86	21.90	22.5	0-1
15	QPSK	36	18	21.96	21.85	21.59		
15	QPSK	36	37	21.92	21.83	21.86		
15	QPSK	75	0	21.92	21.84	21.84		
15	16QAM	1	0	21.93	21.88	21.93	22.5	0-1
15	16QAM	1	37	21.99	22.03	21.90		
15	16QAM	1	74	21.92	22.08	21.88		
15	16QAM	36	0	21.98	21.85	21.90	22.5	0-2
15	16QAM	36	18	21.97	21.84	21.89		
15	16QAM	36	37	21.93	21.78	21.91		
15	16QAM	75	0	21.92	21.81	21.87		
Channel				20000	20175	20350	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	21.97	21.85	21.89	22.5	0
10	QPSK	1	24	21.88	21.69	21.94		
10	QPSK	1	49	21.71	21.72	21.74		
10	QPSK	25	0	22.00	21.80	21.90	22.5	0-1
10	QPSK	25	12	21.94	21.75	21.92		
10	QPSK	25	24	21.89	21.82	21.89		
10	QPSK	50	0	21.98	21.83	21.68		
10	16QAM	1	0	21.89	22.08	22.09	22.5	0-1
10	16QAM	1	24	22.01	22.09	22.04		
10	16QAM	1	49	21.77	22.11	22.12		
10	16QAM	25	0	22.00	21.85	21.87	22.5	0-2
10	16QAM	25	12	21.96	21.80	21.96		
10	16QAM	25	24	21.92	21.78	21.91		
10	16QAM	50	0	21.97	21.79	21.88		

Channel				19975	20175	20375	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	21.91	21.86	21.95	22.5	0
5	QPSK	1	12	21.87	21.75	21.85		
5	QPSK	1	24	21.82	21.74	21.87		
5	QPSK	12	0	21.98	21.85	21.56	22.5	0-1
5	QPSK	12	6	21.96	21.83	21.90		
5	QPSK	12	11	21.95	21.80	21.89		
5	QPSK	25	0	21.92	21.75	21.92		
5	16QAM	1	0	22.09	21.93	21.88	22.5	0-1
5	16QAM	1	12	22.11	21.67	21.78		
5	16QAM	1	24	22.08	21.62	21.72		
5	16QAM	12	0	22.00	21.90	21.70	22.5	0-2
5	16QAM	12	6	21.93	21.80	21.66		
5	16QAM	12	11	21.95	21.85	21.63		
5	16QAM	25	0	21.85	21.81	21.58		
Channel				19965	20175	20385	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	21.82	21.83	21.96	22.5	0
3	QPSK	1	7	21.85	21.73	21.87		
3	QPSK	1	14	21.69	21.60	21.75		
3	QPSK	8	0	21.97	21.82	21.93	22.5	0-1
3	QPSK	8	4	21.95	21.80	21.94		
3	QPSK	8	7	21.96	21.78	21.88		
3	QPSK	15	0	21.93	21.80	21.89		
3	16QAM	1	0	22.08	22.05	21.93	22.5	0-1
3	16QAM	1	7	22.09	21.70	21.72		
3	16QAM	1	14	21.81	21.85	21.68		
3	16QAM	8	0	22.04	21.96	21.95	22.5	0-2
3	16QAM	8	4	21.95	21.94	21.84		
3	16QAM	8	7	21.93	21.86	21.72		
3	16QAM	15	0	22.00	21.82	21.88		
Channel				19957	20175	20393	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	21.85	21.75	21.82	22.5	0
1.4	QPSK	1	2	21.94	21.78	21.94		
1.4	QPSK	1	5	21.82	21.71	21.85		
1.4	QPSK	3	0	21.99	21.65	21.91		
1.4	QPSK	3	1	21.93	21.62	21.89		
1.4	QPSK	3	2	21.86	21.73	21.85		
1.4	QPSK	6	0	21.92	21.77	21.89	22.5	0-1
1.4	16QAM	1	0	21.81	21.92	21.91	22.5	0-1
1.4	16QAM	1	2	22.03	21.84	21.88		
1.4	16QAM	1	5	22.08	21.91	21.77		
1.4	16QAM	3	0	21.99	21.90	21.92		
1.4	16QAM	3	1	21.95	21.83	21.91		
1.4	16QAM	3	2	22.05	21.76	21.73		
1.4	16QAM	6	0	21.85	21.82	21.81	22.5	0-2

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune up Limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	22.46	**22.64**	22.41	23.0	0
20	QPSK	1	49	22.23	22.45	22.32		
20	QPSK	1	99	22.25	22.55	22.30		
20	QPSK	50	0	21.46	21.63	21.46	22.0	0-1
20	QPSK	50	24	21.34	21.60	21.37		
20	QPSK	50	49	21.32	21.56	21.39		
20	QPSK	100	0	21.37	21.54	21.35		
20	16QAM	1	0	21.89	21.98	21.87	22.0	0-1
20	16QAM	1	49	21.34	21.68	21.27		
20	16QAM	1	99	21.42	21.52	21.57		
20	16QAM	50	0	20.49	20.59	20.49	21.0	0-2
20	16QAM	50	24	20.38	20.59	20.37		
20	16QAM	50	49	20.28	20.64	20.44		
20	16QAM	100	0	20.37	20.54	20.40		
Channel				18675	18900	19125	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	22.30	22.35	22.52	23.0	0
15	QPSK	1	37	22.22	22.25	22.46		
15	QPSK	1	74	22.28	22.31	22.62		
15	QPSK	36	0	21.56	21.44	21.66	22.0	0-1
15	QPSK	36	18	21.46	21.47	21.66		
15	QPSK	36	37	21.37	21.47	21.70		
15	QPSK	75	0	21.43	21.40	21.64		
15	16QAM	1	0	21.64	21.59	21.69	22.0	0-1
15	16QAM	1	37	21.48	21.80	21.44		
15	16QAM	1	74	21.78	21.56	21.47		
15	16QAM	36	0	20.52	20.53	20.68	21.0	0-2
15	16QAM	36	18	20.41	20.48	20.70		
15	16QAM	36	37	20.39	20.44	20.70		
15	16QAM	75	0	20.46	20.39	20.66		
Channel				18650	18900	19150	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	22.25	22.32	22.62	23.0	0
10	QPSK	1	24	22.23	22.35	22.61		
10	QPSK	1	49	22.21	22.40	22.49		
10	QPSK	25	0	21.48	21.45	21.68	22.0	0-1
10	QPSK	25	12	21.43	21.44	21.67		
10	QPSK	25	24	21.44	21.47	21.71		
10	QPSK	50	0	21.50	21.49	21.72		
10	16QAM	1	0	21.75	21.48	21.81	22.0	0-1
10	16QAM	1	24	21.50	21.71	21.81		
10	16QAM	1	49	21.63	21.44	21.97		
10	16QAM	25	0	20.51	20.42	20.64	21.0	0-2
10	16QAM	25	12	20.47	20.41	20.68		
10	16QAM	25	24	20.41	20.52	20.75		
10	16QAM	50	0	20.45	20.45	20.68		

Channel				18625	18900	19175	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	22.43	22.39	22.56	23.0	0
5	QPSK	1	12	22.32	22.27	22.50		
5	QPSK	1	24	22.27	22.37	22.54		
5	QPSK	12	0	21.54	21.49	21.75	22.0	0-1
5	QPSK	12	6	21.50	21.48	21.73		
5	QPSK	12	11	21.50	21.46	21.69		
5	QPSK	25	0	21.50	21.40	21.73		
5	16QAM	1	0	21.46	21.61	21.89	22.0	0-1
5	16QAM	1	12	21.73	21.54	21.86		
5	16QAM	1	24	21.52	21.53	21.85		
5	16QAM	12	0	20.48	20.47	20.77	21.0	0-2
5	16QAM	12	6	20.50	20.56	20.77		
5	16QAM	12	11	20.42	20.56	20.70		
5	16QAM	25	0	20.48	20.49	20.63		
Channel				18615	18900	19185	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	22.38	22.23	22.48	23.0	0
3	QPSK	1	7	22.40	22.39	22.47		
3	QPSK	1	14	22.37	22.28	22.49		
3	QPSK	8	0	21.54	21.42	21.70	22.0	0-1
3	QPSK	8	4	21.53	21.49	21.71		
3	QPSK	8	7	21.52	21.43	21.70		
3	QPSK	15	0	21.45	21.45	21.69		
3	16QAM	1	0	21.52	21.75	21.66	22.0	0-1
3	16QAM	1	7	21.56	21.42	22.00		
3	16QAM	1	14	21.23	21.50	21.72		
3	16QAM	8	0	20.52	20.49	20.72	21.0	0-2
3	16QAM	8	4	20.53	20.45	20.85		
3	16QAM	8	7	20.50	20.47	20.86		
3	16QAM	15	0	20.58	20.50	20.84		
Channel				18607	18900	19193	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	22.41	22.39	22.59	23.0	0
1.4	QPSK	1	2	22.40	22.36	22.58		
1.4	QPSK	1	5	22.39	22.34	22.58		
1.4	QPSK	3	0	22.37	22.38	22.46		
1.4	QPSK	3	1	22.38	22.36	22.48		
1.4	QPSK	3	2	22.28	22.37	22.50		
1.4	QPSK	6	0	21.51	21.42	21.69	22.0	0-1
1.4	16QAM	1	0	21.53	21.60	21.84	22.0	0-1
1.4	16QAM	1	2	21.83	21.36	21.87		
1.4	16QAM	1	5	21.41	21.51	21.76		
1.4	16QAM	3	0	21.53	21.50	21.69		
1.4	16QAM	3	1	21.47	21.40	21.68		
1.4	16QAM	3	2	21.37	21.29	21.67		
1.4	16QAM	6	0	20.53	20.61	20.77	21.0	0-2

<WLAN Conducted Power>

General Note:
For 2.4GHz WLAN SAR testing, highest average RF output power channel for the lowest data rate for 802.11b were selected for SAR evaluation. 802.11g/n HT20/HT40 were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of 802.11b mode.

<2.4GHz WLAN>

WLAN 2.4GHz 802.11b Average Power (dBm)						
Power vs. Channel			Power vs. Data Rate			
Channel	Frequency (MHz)	Data Rate 1Mbps	Channel	2Mbps	5.5Mbps	11Mbps
CH 01	2412	15.06	CH 11	15.35	15.45	15.42
CH 06	2437	14.36				
CH 11	2462	**15.46**				

WLAN 2.4GHz 802.11g Average Power (dBm)									
Power vs. Channel			Power vs. Data Rate						
Channel	Frequency (MHz)	Data Rate 6Mbps	Channel	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
CH 01	2412	14.21	CH 11	14.77	14.65	14.73	14.69	14.67	14.89	14.84
CH 06	2437	14.01								
CH 11	2462	**14.91**								

WLAN 2.4GHz 802.11n HT20 Average Power (dBm)									
Power vs. Channel			Power vs. MCS Index						
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412	12.32	CH 11	12.71	12.78	12.84	12.60	12.83	12.89	12.81
CH 06	2437	12.06								
CH 11	2462	**12.93**								

WLAN 2.4GHz 802.11n-HT40 Average Power (dBm)									
Power vs. Channel			Power vs. MCS Index						
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 3	2422	12.82	CH 09	12.97	12.99	13.01	12.88	12.91	12.92	12.90
CH 6	2437	12.44								
CH 9	2452	**13.04**								

13. Bluetooth Exclusions Applied

Mode Band	Average power(dBm)	
	Bluetooth v3.0+EDR	Bluetooth v4.0 LE
2.4GHz Bluetooth	5.0	-3.0

Note:

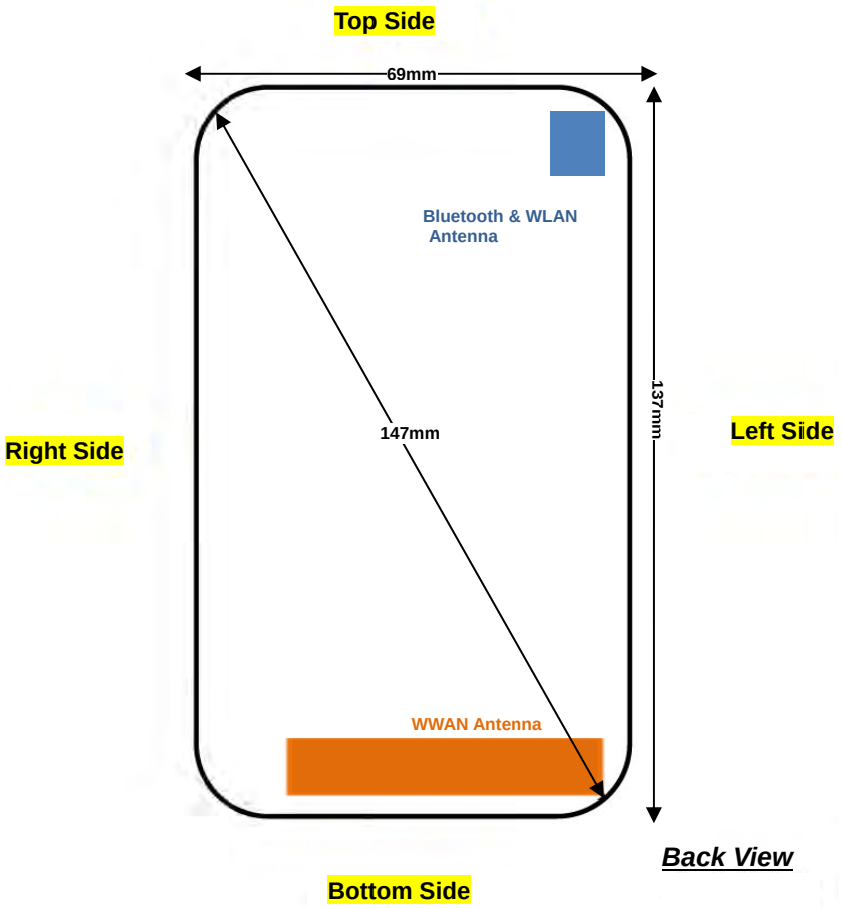
1. Per KDB 447498 D01v05r02, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances* ≤ 50 mm are determined by:
   [(*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)] ·[√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR
   - f(GHz) is the RF channel transmit frequency in GHz
   - Power and distance are rounded to the nearest mW and mm before calculation
   - The result is rounded to one decimal place for comparison

Bluetooth Max Power (dBm)	Separation Distance (mm)	Frequency (GHz)	exclusion thresholds
5.0	< 5	2.48	0.9

Note:

Per KDB 447498 D01v05r02, when the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion. The test exclusion threshold is 0.9 which is <= 3, SAR testing is not required.

14. Antenna Location



Distance of the Antenna to the EUT surface/edge						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Main	≤ 25mm	≤ 25mm	127mm	≤ 25mm	≤ 25mm	≤ 25mm
BT&WLAN	≤ 25mm	≤ 25mm	≤ 25mm	120mm	58mm	≤ 25mm

Positions for SAR tests; Hotspot mode						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Main	Yes	Yes	No	Yes	Yes	Yes
BT&WLAN	Yes	Yes	Yes	No	No	Yes

General Note:
Referring to KDB 941225 D06 v02, when the overall device length and width are ≥ 9cm*5cm, the test distance is 10 mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge

15. SAR Test Results

General Note:

1. Per KDB 447498 D01v05r02, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
2. Per KDB 447498 D01v05r02, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 648474 D04v01r02, when the reported SAR for a body-worn accessory measured without a headset connected to the handset is ≤ 1.2 W/kg, SAR testing with a headset connected to the handset is not required.
4. Per KDB 941225 D01v03, considering the possibility of e.g. 3rd party VoIP operation for Head and body-worn SAR test reduction for GSM and GPRS and EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the EUT was set in GPRS (4Tx slots) for GSM850/GSM1900.
5. Per KDB 941225 D01v03, for Hotspot SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance, for modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested, therefore, the EUT was set in GPRS (4Tx slots) for GSM850/GSM1900.
6. Per KDB 941225 D01v03, SAR for next to the ear head / Hotspot / Body-worn exposure is measured using a 12.2 kbps RMC with TPC bits configured to all “1’s”.
7. Per KDB 941225 D01v03, RMC 12.2kbps setting is used to evaluate SAR. If the maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA / HSPA+ is ≤ ¼ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA / HSPA+ to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA / HSPA+.
8. Per KDB 941225 D05v02r03, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
9. Per KDB 941225 D05v02r03, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
10. Per KDB 941225 D05v02r03, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
11. Per KDB 941225 D05v02r03, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r03, 16QAM SAR testing is not required.
12. Per KDB 941225 D05v02r03, Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r03, smaller bandwidth SAR testing is not required.
13. This device 2.4GHz WLAN supports Hotspot operation.
14. During SAR testing the WLAN transmission was verified using a spectrum analyzer.

15.1 Head SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM850	GPRS (4 Tx slots)	Right Cheek	189	836.4	28.78	29.50	1.180	0.06	0.248	0.293
	GSM850	GPRS (4 Tx slots)	Right Tilted	189	836.4	28.78	29.50	1.180	0.06	0.203	0.240
#01	**GSM850**	**GPRS (4 Tx slots)**	**Left Cheek**	**189**	**836.4**	**28.78**	**29.50**	**1.180**	**0.04**	**0.311**	**0.367**
	GSM850	GPRS (4 Tx slots)	Left Tilted	189	836.4	28.78	29.50	1.180	0.14	0.220	0.260
#02	**GSM1900**	**GPRS (4 Tx slots)**	**Right Cheek**	**810**	**1909.8**	**25.91**	**26.50**	**1.146**	**0.01**	**0.230**	**0.263**
	GSM1900	GPRS (4 Tx slots)	Right Tilted	810	1909.8	25.91	26.50	1.146	-0.18	0.041	0.047
	GSM1900	GPRS (4 Tx slots)	Left Cheek	810	1909.8	25.91	26.50	1.146	0.024	0.131	0.150
	GSM1900	GPRS (4 Tx slots)	Left Tilted	810	1909.8	25.91	26.50	1.146	0.12	0.048	0.055

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA Band V	RMC 12.2Kbps	Right Cheek	4233	846.6	22.87	23.50	1.156	0.05	0.081	0.094
	WCDMA Band V	RMC 12.2Kbps	Right Tilted	4233	846.6	22.87	23.50	1.156	0.12	0.065	0.075
#03	**WCDMA Band V**	**RMC 12.2Kbps**	**Left Cheek**	**4233**	**846.6**	**22.87**	**23.50**	**1.156**	**0.05**	**0.099**	**0.114**
	WCDMA Band V	RMC 12.2Kbps	Left Tilted	4233	846.6	22.87	23.50	1.156	0.036	0.068	0.079
#04	**WCDMA Band IV**	**RMC 12.2Kbps**	**Right Cheek**	**1312**	**1712.4**	**22.48**	**23.00**	**1.127**	**0.06**	**0.447**	**0.504**
	WCDMA Band IV	RMC 12.2Kbps	Right Tilted	1312	1712.4	22.48	23.00	1.127	0.01	0.154	0.174
	WCDMA Band IV	RMC 12.2Kbps	Left Cheek	1312	1712.4	22.48	23.00	1.127	0.05	0.412	0.464
	WCDMA Band IV	RMC 12.2Kbps	Left Tilted	1312	1712.4	22.48	23.00	1.127	0.04	0.116	0.131
#05	**WCDMA Band II**	**RMC 12.2Kbps**	**Right Cheek**	**9262**	**1852.4**	**22.71**	**23.00**	**1.069**	**-0.09**	**0.235**	**0.251**
	WCDMA Band II	RMC 12.2Kbps	Right Tilted	9262	1852.4	22.71	23.00	1.069	-0.07	0.160	0.171
	WCDMA Band II	RMC 12.2Kbps	Left Cheek	9262	1852.4	22.71	23.00	1.069	0.025	0.137	0.146
	WCDMA Band II	RMC 12.2Kbps	Left Tilted	9262	1852.4	22.71	23.00	1.069	0.15	0.055	0.059

<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offest	Test Position	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band12	10M	QPSK	1	0	Right Cheek	23095	707.5	22.63	23.00	1.089	0.1	0.342	0.372
	LTE Band12	10M	QPSK	25	24	Right Cheek	23095	707.5	22.33	23.00	1.167	0.066	0.334	0.390
	LTE Band12	10M	QPSK	1	0	Right Tilted	23095	707.5	22.63	23.00	1.089	0.12	0.218	0.237
	LTE Band12	10M	QPSK	25	24	Right Tilted	23095	707.5	22.33	23.00	1.167	0.14	0.214	0.250
	LTE Band12	10M	QPSK	1	0	Left Cheek	23095	707.5	22.63	23.00	1.089	0.034	0.375	0.408
#06	**LTE Band12**	**10M**	**QPSK**	**25**	**24**	**Left Cheek**	**23095**	**707.5**	**22.33**	**23.00**	**1.167**	**0.19**	**0.371**	**0.433**
	LTE Band12	10M	QPSK	1	0	Left Tilted	23095	707.5	22.63	23.00	1.089	0.09	0.226	0.246
	LTE Band12	10M	QPSK	25	24	Left Tilted	23095	707.5	22.33	23.00	1.167	0.05	0.222	0.259
	LTE Band4	20M	QPSK	1	0	Right Cheek	20050	1720	22.27	22.50	1.054	0.08	0.368	0.388
#07	**LTE Band4**	**20M**	**QPSK**	**50**	**0**	**Right Cheek**	**20050**	**1720**	**21.97**	**22.50**	**1.130**	**0.06**	**0.371**	**0.419**
	LTE Band4	20M	QPSK	1	0	Right Tilted	20050	1720	22.27	22.50	1.054	0.06	0.119	0.125
	LTE Band4	20M	QPSK	50	0	Right Tilted	20050	1720	21.97	22.50	1.130	0.11	0.120	0.136
	LTE Band4	20M	QPSK	1	0	Left Cheek	20050	1720	22.27	22.50	1.054	-0.05	0.365	0.385
	LTE Band4	20M	QPSK	50	0	Left Cheek	20050	1720	21.97	22.50	1.130	0.17	0.360	0.407
	LTE Band4	20M	QPSK	1	0	Left Tilted	20050	1720	22.27	22.50	1.054	0.19	0.088	0.093
	LTE Band4	20M	QPSK	50	0	Left Tilted	20050	1720	21.97	22.50	1.130	0.07	0.089	0.101
	LTE Band2	20M	QPSK	1	0	Right Cheek	18900	1880	22.64	23.00	1.086	0.026	0.179	0.194
#08	**LTE Band2**	**20M**	**QPSK**	**50**	**0**	**Right Cheek**	**18900**	**1880**	**21.63**	**22.00**	**1.089**	**0.028**	**0.186**	**0.203**
	LTE Band2	20M	QPSK	1	0	Right Tilted	18900	1880	22.64	23.00	1.086	0.066	0.035	0.038
	LTE Band2	20M	QPSK	50	0	Right Tilted	18900	1880	21.63	22.00	1.089	0.022	0.041	0.045
	LTE Band2	20M	QPSK	1	0	Left Cheek	18900	1880	22.64	23.00	1.086	0.023	0.106	0.115
	LTE Band2	20M	QPSK	50	0	Left Cheek	18900	1880	21.63	22.00	1.089	0.051	0.098	0.107
	LTE Band2	20M	QPSK	1	0	Left Tilted	18900	1880	22.64	23.00	1.086	0.07	0.032	0.035
	LTE Band2	20M	QPSK	50	0	Left Tilted	18900	1880	21.63	22.00	1.089	0.06	0.037	0.040

<DTS WLAN SAR>

Plot No.	Band	Mode	Test Position	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN 2.4GHz	802.11b 1Mbps	Right Cheek	11	2462	15.46	16.00	1.132	0.06	0.934	1.058
	WLAN 2.4GHz	802.11b 1Mbps	Right Tilted	11	2462	15.46	16.00	1.132	0.08	0.510	0.578
	WLAN 2.4GHz	802.11b 1Mbps	Left Cheek	11	2462	15.46	16.00	1.132	0.11	0.329	0.373
	WLAN 2.4GHz	802.11b 1Mbps	Left Tilted	11	2462	15.46	16.00	1.132	0.14	0.243	0.275
	WLAN 2.4GHz	802.11b 1Mbps	Right Cheek	1	2412	15.06	16.00	1.242	0.15	0.645	0.801
#09	**WLAN 2.4GHz**	**802.11b 1Mbps**	**Right Cheek**	**6**	**2437**	**14.36**	**16.00**	**1.459**	**0.021**	**0.738**	**1.077**

15.2 Hotspot SAR

Distance of the Antenna to the EUT surface/edge						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Main	≤ 25mm	≤ 25mm	127mm	≤ 25mm	≤ 25mm	≤ 25mm
BT&WLAN	≤ 25mm	≤ 25mm	≤ 25mm	120mm	58mm	≤ 25mm

Positions for SAR tests; Hotspot mode						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Main	Yes	Yes	No	Yes	Yes	Yes
BT&WLAN	Yes	Yes	Yes	No	No	Yes

General Note:
Referring to KDB 941225 D06 v02, when the overall device length and width are ≥ 9cm*5cm, the test distance is 10 mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM850	GPRS (4 Tx slots)	Front	1	189	836.4	28.78	29.50	1.180	0.04	0.334	0.394
	GSM850	GPRS (4 Tx slots)	Back	1	189	836.4	28.78	29.50	1.180	0.0049	0.445	0.525
	GSM850	GPRS (4 Tx slots)	Left Side	1	189	836.4	28.78	29.50	1.180	-0.0051	0.697	0.823
	GSM850	GPRS (4 Tx slots)	Right Side	1	189	836.4	28.78	29.50	1.180	0.02	0.343	0.405
	GSM850	GPRS (4 Tx slots)	Bottom Side	1	189	836.4	28.78	29.50	1.180	0.027	0.168	0.198
#10	**GSM850**	**GPRS (4 Tx slots)**	**Left Side**	**1**	**128**	**824.2**	**28.74**	**29.50**	**1.191**	**0.0052**	**0.741**	**0.883**
	GSM850	GPRS (4 Tx slots)	Left Side	1	251	848.8	28.69	29.50	1.205	0.03	0.544	0.656
	GSM1900	GPRS (4 Tx slots)	Front	1	810	1909.8	25.91	26.50	1.146	-0.023	0.510	0.584
	GSM1900	GPRS (4 Tx slots)	Back	1	810	1909.8	25.91	26.50	1.146	0.14	0.418	0.479
	GSM1900	GPRS (4 Tx slots)	Left Side	1	810	1909.8	25.91	26.50	1.146	0.09	0.093	0.107
	GSM1900	GPRS (4 Tx slots)	Right Side	1	810	1909.8	25.91	26.50	1.146	-0.04	0.089	0.102
#11	**GSM1900**	**GPRS (4 Tx slots)**	**Bottom Side**	**1**	**810**	**1909.8**	**25.91**	**26.50**	**1.146**	**0.1**	**0.675**	**0.773**

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA Band V	RMC 12.2Kbps	Front	1	4233	846.6	22.87	23.50	1.156	0.05	0.119	0.138
	WCDMA Band V	RMC 12.2Kbps	Back	1	4233	846.6	22.87	23.50	1.156	0.0042	0.166	0.192
#12	**WCDMA Band V**	**RMC 12.2Kbps**	**Left Side**	**1**	**4233**	**846.6**	**22.87**	**23.50**	**1.156**	**0.04**	**0.247**	**0.286**
	WCDMA Band V	RMC 12.2Kbps	Right Side	1	4233	846.6	22.87	23.50	1.156	0.02	0.111	0.128
	WCDMA Band V	RMC 12.2Kbps	Bottom Side	1	4233	846.6	22.87	23.50	1.156	0.17	0.057	0.066
	WCDMA Band IV	RMC 12.2Kbps	Front	1	1312	1712.4	22.48	23.00	1.127	-0.07	0.662	0.746
#13	**WCDMA Band IV**	**RMC 12.2Kbps**	**Back**	**1**	**1312**	**1712.4**	**22.48**	**23.00**	**1.127**	**0.12**	**0.681**	**0.768**
	WCDMA Band IV	RMC 12.2Kbps	Left Side	1	1312	1712.4	22.48	23.00	1.127	0.0025	0.268	0.302
	WCDMA Band IV	RMC 12.2Kbps	Right Side	1	1312	1712.4	22.48	23.00	1.127	0.06	0.280	0.316
	WCDMA Band IV	RMC 12.2Kbps	Bottom Side	1	1312	1712.4	22.48	23.00	1.127	-0.07	0.498	0.561
	WCDMA Band II	RMC 12.2Kbps	Front	1	9262	1852.4	22.71	23.00	1.069	-0.021	0.504	0.539
	WCDMA Band II	RMC 12.2Kbps	Back	1	9262	1852.4	22.71	23.00	1.069	0.07	0.394	0.421
	WCDMA Band II	RMC 12.2Kbps	Left Side	1	9262	1852.4	22.71	23.00	1.069	0.1	0.102	0.109
	WCDMA Band II	RMC 12.2Kbps	Right Side	1	9262	1852.4	22.71	23.00	1.069	-0.03	0.088	0.094
#14	**WCDMA Band II**	**RMC 12.2Kbps**	**Bottom Side**	**1**	**9262**	**1852.4**	**22.71**	**23.00**	**1.069**	**0.0048**	**0.637**	**0.681**

<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band12	10M	QPSK	1	0	Front	1	23095	707.5	22.63	23.00	1.089	-0.02	0.425	0.463
	LTE Band12	10M	QPSK	25	24	Front	1	23095	707.5	22.33	23.00	1.167	0.0086	0.425	0.496
	LTE Band12	10M	QPSK	1	0	Back	1	23095	707.5	22.63	23.00	1.089	0.03	0.507	0.552
#15	**LTE Band12**	**10M**	**QPSK**	**25**	**24**	**Back**	**1**	**23095**	**707.5**	**22.33**	**23.00**	**1.167**	**0.04**	**0.513**	**0.599**
	LTE Band12	10M	QPSK	1	0	Left Side	1	23095	707.5	22.63	23.00	1.089	0.03	0.357	0.389
	LTE Band12	10M	QPSK	25	24	Left Side	1	23095	707.5	22.33	23.00	1.167	0.04	0.354	0.413
	LTE Band12	10M	QPSK	1	0	Right Side	1	23095	707.5	22.63	23.00	1.089	0.03	0.307	0.334
	LTE Band12	10M	QPSK	25	24	Right Side	1	23095	707.5	22.33	23.00	1.167	0.02	0.306	0.357
	LTE Band12	10M	QPSK	1	0	Bottom Side	1	23095	707.5	22.63	23.00	1.089	0.028	0.109	0.119
	LTE Band12	10M	QPSK	25	24	Bottom Side	1	23095	707.5	22.33	23.00	1.167	0.032	0.105	0.123
	LTE Band4	20M	QPSK	1	0	Front	1	20050	1720	22.27	22.50	1.054	-0.17	0.549	0.579
	LTE Band4	20M	QPSK	50	0	Front	1	20050	1720	21.97	22.50	1.130	-0.11	0.562	0.635
#16	**LTE Band4**	**20M**	**QPSK**	**1**	**0**	**Back**	**1**	**20050**	**1720**	**22.27**	**22.50**	**1.054**	**0.08**	**0.672**	**0.709**
	LTE Band4	20M	QPSK	50	0	Back	1	20050	1720	21.97	22.50	1.130	0.09	0.567	0.641
	LTE Band4	20M	QPSK	1	0	Left Side	1	20050	1720	22.27	22.50	1.054	0.12	0.213	0.225
	LTE Band4	20M	QPSK	50	0	Left Side	1	20050	1720	21.97	22.50	1.130	0.12	0.220	0.249
	LTE Band4	20M	QPSK	1	0	Right Side	1	20050	1720	22.27	22.50	1.054	0.07	0.200	0.211
	LTE Band4	20M	QPSK	50	0	Right Side	1	20050	1720	21.97	22.50	1.130	0.05	0.202	0.228
	LTE Band4	20M	QPSK	1	0	Bottom Side	1	20050	1720	22.27	22.50	1.054	-0.16	0.407	0.429
	LTE Band4	20M	QPSK	50	0	Bottom Side	1	20050	1720	21.97	22.50	1.130	-0.01	0.420	0.475
	LTE Band2	20M	QPSK	1	0	Front	1	18900	1880	22.64	23.00	1.086	-0.024	0.399	0.433
	LTE Band2	20M	QPSK	50	0	Front	1	18900	1880	21.63	22.00	1.089	-0.029	0.391	0.426
	LTE Band2	20M	QPSK	1	0	Back	1	18900	1880	22.64	23.00	1.086	-0.13	0.320	0.348
	LTE Band2	20M	QPSK	50	0	Back	1	18900	1880	21.63	22.00	1.089	-0.04	0.324	0.353
	LTE Band2	20M	QPSK	1	0	Left Side	1	18900	1880	22.64	23.00	1.086	-0.07	0.072	0.078
	LTE Band2	20M	QPSK	50	0	Left Side	1	18900	1880	21.63	22.00	1.089	-0.04	0.075	0.082
	LTE Band2	20M	QPSK	1	0	Right Side	1	18900	1880	22.64	23.00	1.086	0.07	0.066	0.072
	LTE Band2	20M	QPSK	50	0	Right Side	1	18900	1880	21.63	22.00	1.089	0.03	0.065	0.071
#17	**LTE Band2**	**20M**	**QPSK**	**1**	**0**	**Bottom Side**	**1**	**18900**	**1880**	**22.64**	**23.00**	**1.086**	**-0.046**	**0.551**	**0.599**
	LTE Band2	20M	QPSK	50	0	Bottom Side	1	18900	1880	21.63	22.00	1.089	-0.01	0.535	0.583

<DTS WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
#18	**WLAN 2.4GHz**	**802.11b 1Mbps**	**Front**	**1**	**11**	**2462**	**15.46**	**16.00**	**1.132**	**0.06**	**0.186**	**0.211**
	WLAN 2.4GHz	802.11b 1Mbps	Back	1	11	2462	15.46	16.00	1.132	-0.1	0.153	0.173
	WLAN 2.4GHz	802.11b 1Mbps	Left Side	1	11	2462	15.46	16.00	1.132	-0.034	0.175	0.198
	WLAN 2.4GHz	802.11b 1Mbps	Top Side	1	11	2462	15.46	16.00	1.132	-0.0055	0.071	0.080

15.3 Body Worn Accessory SAR

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	GSM850	GPRS (4 Tx slots)	Front	1	189	836.4	28.78	29.50	1.180	0.04	0.334	0.394
#19	**GSM850**	**GPRS (4 Tx slots)**	**Back**	**1**	**189**	**836.4**	**28.78**	**29.50**	**1.180**	**0.0049**	**0.445**	**0.525**
#20	**GSM1900**	**GPRS (4 Tx slots)**	**Front**	**1**	**810**	**1909.8**	**25.91**	**26.50**	**1.146**	**-0.023**	**0.510**	**0.584**
	GSM1900	GPRS (4 Tx slots)	Back	1	810	1909.8	25.91	26.50	1.146	0.14	0.418	0.479

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA Band V	RMC 12.2Kbps	Front	1	4233	846.6	22.87	23.50	1.156	0.05	0.119	0.138
#21	**WCDMA Band V**	**RMC 12.2Kbps**	**Back**	**1**	**4233**	**846.6**	**22.87**	**23.50**	**1.156**	**0.0042**	**0.166**	**0.192**
	WCDMA Band IV	RMC 12.2Kbps	Front	1	1312	1712.4	22.48	23.00	1.127	-0.07	0.662	0.746
#13	**WCDMA Band IV**	**RMC 12.2Kbps**	**Back**	**1**	**1312**	**1712.4**	**22.48**	**23.00**	**1.127**	**0.12**	**0.681**	**0.768**
#22	**WCDMA Band II**	**RMC 12.2Kbps**	**Front**	**1**	**9262**	**1852.4**	**22.71**	**23.00**	**1.069**	**-0.021**	**0.504**	**0.539**
	WCDMA Band II	RMC 12.2Kbps	Back	1	9262	1852.4	22.71	23.00	1.069	0.07	0.394	0.421

<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band12	10M	QPSK	1	0	Front	1	23095	707.5	22.63	23.00	1.089	-0.02	0.425	0.463
	LTE Band12	10M	QPSK	25	24	Front	1	23095	707.5	22.33	23.00	1.167	0.0086	0.425	0.496
	LTE Band12	10M	QPSK	1	0	Back	1	23095	707.5	22.63	23.00	1.089	0.03	0.507	0.552
#15	**LTE Band12**	**10M**	**QPSK**	**25**	**24**	**Back**	**1**	**23095**	**707.5**	**22.33**	**23.00**	**1.167**	**0.04**	**0.513**	**0.599**
	LTE Band4	20M	QPSK	1	0	Front	1	20050	1720	22.27	22.50	1.054	-0.17	0.549	0.579
	LTE Band4	20M	QPSK	50	0	Front	1	20050	1720	21.97	22.50	1.130	-0.11	0.562	0.635
#16	**LTE Band4**	**20M**	**QPSK**	**1**	**0**	**Back**	**1**	**20050**	**1720**	**22.27**	**22.50**	**1.054**	**0.08**	**0.672**	**0.709**
	LTE Band4	20M	QPSK	50	0	Back	1	20050	1720	21.97	22.50	1.130	0.09	0.567	0.641
#23	**LTE Band2**	**20M**	**QPSK**	**1**	**0**	**Front**	**1**	**18900**	**1880**	**22.64**	**23.00**	**1.086**	**-0.024**	**0.399**	**0.433**
	LTE Band2	20M	QPSK	50	0	Front	1	18900	1880	21.63	22.00	1.089	-0.029	0.391	0.426
	LTE Band2	20M	QPSK	1	0	Back	1	18900	1880	22.64	23.00	1.086	-0.13	0.320	0.348
	LTE Band2	20M	QPSK	50	0	Back	1	18900	1880	21.63	22.00	1.089	-0.04	0.324	0.353

<DTS WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
#18	**WLAN 2.4GHz**	**802.11b 1Mbps**	**Front**	**1**	**11**	**2462**	**15.46**	**16.00**	**1.132**	**0.06**	**0.186**	**0.211**
	WLAN 2.4GHz	802.11b 1Mbps	Back	1	11	2462	15.46	16.00	1.132	-0.1	0.153	0.173

15.4 Repeated SAR Measurement

No.	Band	Mode	Test Position	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	WLAN 2.4GHz	802.11b 1Mbps	Right Cheek	11	2462	15.46	16.00	1.132	0.06	0.934	1	1.058
2nd	WLAN 2.4GHz	802.11b 1Mbps	Right Cheek	11	2462	15.46	16.00	1.132	0.08	0.929	1.006	1.052

General Note:

1. Per KDB 865664 D01v01r03, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg
2. Per KDB 865664 D01v01r03, if the ratio among the repeated measurement is ≤ 1.2 and the measured SAR <1.45W/kg, only one repeated measurement is required.
3. The ratio is the difference in percentage between original and repeated *measured SAR*.
4. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

16. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	Portable Handset			Note
		Head	Body-worn	Hotspot	
1.	GSM(Voice) + WLAN2.4GHz(data)	Yes	Yes		
2.	WCDMA(Voice) + WLAN2.4GHz(data)	Yes	Yes		
3.	GSM(Voice) + Bluetooth(data)	Yes	Yes		
4.	WCDMA((Voice) + Bluetooth(data)	Yes	Yes		
5.	GPRS/EDGE(Data) + WLAN2.4GHz(data)	Yes	Yes	Yes	2.4GHz Hotspot
6.	WCDMA(Data) + WLAN2.4GHz(data)	Yes	Yes	Yes	2.4GHz Hotspot
7.	LTE(Data) + WLAN2.4GHz(data)	Yes	Yes	Yes	2.4GHz Hotspot
8.	GPRS/EDGE(Data) + Bluetooth(data)	Yes	Yes	Yes	Bluetooth Tethering
9.	WCDMA(Data) + Bluetooth(data)	Yes	Yes	Yes	Bluetooth Tethering
10.	LTE(Data) + Bluetooth(data)	Yes	Yes	Yes	Bluetooth Tethering

General Note:

1. This device supported VoIP in GPRS, EGPRS, WCDMA and LTE (e.g. 3rd party VoIP).
2. This device 2.4GHz WLAN supports hotspot operation.
3. WLAN and Bluetooth share the same antenna, and cannot transmit simultaneously.
4. EUT will choose each GSM, WCDMA and LTE according to the network signal condition; therefore, they will not operate simultaneously at any moment.
5. The reported SAR summation is calculated based on the same configuration and test position.
6. Per KDB 447498 D01v05r02, simultaneous transmission SAR is compliant if,
   i) Scalar SAR summation < 1.6W/kg.
   ii) SPLSR = $(SAR_1 + SAR_2)^{1.5}$ / (*min. separation distance, mm*), and the peak separation distance is determined from the square root of $[(x_1-x_2)^2 + (y_1-y_2)^2 + (z_1-z_2)^2]$, where (x_1, y_1, z_1) and (x_2, y_2, z_2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
   iii) If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary.
   iv) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg.

Bluetooth Max Power	Exposure Position	Head	Hotspot	Body worn
	Test separation	0 mm	10 mm	10mm
5.0dBm	Estimated SAR (W/kg)	0.125W/kg	0.062W/kg	0.062W/kg

16.1 Head Exposure Conditions

<WWAN PCE + WLAN DTS>

WWAN Band		Exposure Position	WWAN PCE Max. WWAN SAR (W/kg)	WLAN DTS Max. WLAN SAR (W/kg)	Summed SAR (W/kg)	SPLSR	Case No
GSM	GSM850	Right Cheek	0.293	1.077	1.37		
		Right Tilted	0.240	0.578	0.82		
		Left Cheek	0.367	0.373	0.74		
		Left Tilted	0.260	0.275	0.54		
	GSM1900	Right Cheek	0.263	1.077	1.34		
		Right Tilted	0.047	0.578	0.63		
		Left Cheek	0.150	0.373	0.52		
		Left Tilted	0.055	0.275	0.33		
WCDMA	Band V	Right Cheek	0.094	1.077	1.17		
		Right Tilted	0.075	0.578	0.65		
		Left Cheek	0.114	0.373	0.49		
		Left Tilted	0.079	0.275	0.35		
	Band IV	Right Cheek	0.504	1.077	**1.58**		
		Right Tilted	0.174	0.578	0.75		
		Left Cheek	0.464	0.373	0.84		
		Left Tilted	0.131	0.275	0.41		
	Band II	Right Cheek	0.251	1.077	1.33		
		Right Tilted	0.171	0.578	0.75		
		Left Cheek	0.146	0.373	0.52		
		Left Tilted	0.059	0.275	0.33		
LTE	Band 12	Right Cheek	0.390	1.077	1.47		
		Right Tilted	0.250	0.578	0.83		
		Left Cheek	0.433	0.373	0.81		
		Left Tilted	0.259	0.275	0.53		
	Band 4	Right Cheek	0.419	1.077	1.50		
		Right Tilted	0.136	0.578	0.71		
		Left Cheek	0.407	0.373	0.78		
		Left Tilted	0.101	0.275	0.38		
	Band 2	Right Cheek	0.203	1.077	1.28		
		Right Tilted	0.045	0.578	0.62		
		Left Cheek	0.115	0.373	0.49		
		Left Tilted	0.040	0.275	0.32		

<WWAN PCE + Bluetooth DSS>

WWAN Band		Exposure Position	WWAN PCE	Bluetooth DSS	Summed SAR (W/kg)	SPLSR	Case No
			Max. WWAN SAR (W/kg)	Estimated Bluetooth SAR (W/kg)			
GSM	GSM850	Right Cheek	0.293	0.125	0.42		
		Right Tilted	0.240	0.125	0.37		
		Left Cheek	0.367	0.125	0.49		
		Left Tilted	0.260	0.125	0.39		
	GSM1900	Right Cheek	0.263	0.125	0.39		
		Right Tilted	0.047	0.125	0.17		
		Left Cheek	0.150	0.125	0.28		
		Left Tilted	0.055	0.125	0.18		
WCDMA	Band V	Right Cheek	0.094	0.125	0.22		
		Right Tilted	0.075	0.125	0.20		
		Left Cheek	0.114	0.125	0.24		
		Left Tilted	0.079	0.125	0.20		
	Band IV	Right Cheek	0.504	0.125	0.63		
		Right Tilted	0.174	0.125	0.30		
		Left Cheek	0.464	0.125	0.59		
		Left Tilted	0.131	0.125	0.26		
	Band II	Right Cheek	0.251	0.125	0.38		
		Right Tilted	0.171	0.125	0.30		
		Left Cheek	0.146	0.125	0.27		
		Left Tilted	0.059	0.125	0.18		
LTE	Band 12	Right Cheek	0.390	0.125	0.52		
		Right Tilted	0.250	0.125	0.38		
		Left Cheek	0.433	0.125	0.56		
		Left Tilted	0.259	0.125	0.38		
	Band 4	Right Cheek	0.419	0.125	0.54		
		Right Tilted	0.136	0.125	0.26		
		Left Cheek	0.407	0.125	0.53		
		Left Tilted	0.101	0.125	0.23		
	Band 2	Right Cheek	0.203	0.125	0.33		
		Right Tilted	0.045	0.125	0.17		
		Left Cheek	0.115	0.125	0.24		
		Left Tilted	0.040	0.125	0.17		

16.2 Hotspot Exposure Conditions

<WWAN PCE + WLAN DTS>

WWAN Band		Exposure Position	WWAN PCE Max. WWAN SAR (W/kg)	WLAN DTS Max. WLAN SAR (W/kg)	Summed SAR (W/kg)	SPLSR	Case No
GSM	GSM850	Front	0.394	0.211	0.61		
		Back	0.525	0.173	0.70		
		Left side	0.883	0.198	1.08		
		Right side	0.405		0.41		
		Top side		0.080	0.08		
		Bottom side	0.198		0.20		
	GSM1900	Front	0.584	0.211	0.80		
		Back	0.479	0.173	0.65		
		Left side	0.107	0.198	0.31		
		Right side	0.102		0.10		
		Top side		0.080	0.08		
		Bottom side	0.773		0.77		
WCDMA	Band V	Front	0.138	0.211	0.35		
		Back	0.192	0.173	0.37		
		Left side	0.286	0.198	0.48		
		Right side	0.128		0.13		
		Top side		0.080	0.08		
		Bottom side	0.066		0.07		
	Band IV	Front	0.746	0.211	0.96		
		Back	0.768	0.173	0.94		
		Left side	0.302	0.198	0.50		
		Right side	0.316		0.32		
		Top side		0.080	0.08		
		Bottom side	0.561		0.56		
	Band II	Front	0.539	0.211	0.75		
		Back	0.421	0.173	0.59		
		Left side	0.109	0.198	0.31		
		Right side	0.094		0.09		
		Top side		0.080	0.08		
		Bottom side	0.681		0.68		

WWAN Band		Exposure Position	WWAN PCE	WLAN DTS	Summed SAR (W/kg)	SPLSR	Case No
			Max. WWAN SAR (W/kg)	Max. WLAN SAR (W/kg)			
LTE	Band 12	Front	0.496	0.211	0.71		
		Back	0.599	0.173	0.77		
		Left side	0.413	0.198	0.61		
		Right side	0.357		0.36		
		Top side		0.080	0.08		
		Bottom side	0.123		0.12		
	Band 4	Front	0.635	0.211	0.85		
		Back	0.709	0.173	0.88		
		Left side	0.249	0.198	0.45		
		Right side	0.228		0.23		
		Top side		0.080	0.08		
		Bottom side	0.475		0.48		
	Band 2	Front	0.433	0.211	0.64		
		Back	0.353	0.173	0.53		
		Left side	0.082	0.198	0.28		
		Right side	0.072		0.07		
		Top side		0.080	0.08		
		Bottom side	0.599		0.60		

<WWAN PCE + Bluetooth DSS>

WWAN Band		Exposure Position	WWAN PCE	Bluetooth DSS	Summed SAR (W/kg)	SPLSR	Case No
			Max. WWAN SAR (W/kg)	Estimated Bluetooth SAR (W/kg)			
GSM	GSM850	Front	0.394	0.062	0.46		
		Back	0.525	0.062	0.59		
		Left side	0.883	0.062	0.95		
		Right side	0.405		0.41		
		Top side		0.062	0.06		
		Bottom side	0.198		0.20		
	GSM1900	Front	0.584	0.062	0.65		
		Back	0.479	0.062	0.54		
		Left side	0.107	0.062	0.17		
		Right side	0.102		0.10		
		Top side		0.062	0.06		
		Bottom side	0.773		0.77		
WCDMA	Band V	Front	0.138	0.062	0.20		
		Back	0.192	0.062	0.25		
		Left side	0.286	0.062	0.35		
		Right side	0.128		0.13		
		Top side		0.062	0.06		
		Bottom side	0.066		0.07		
	Band IV	Front	0.746	0.062	0.81		
		Back	0.768	0.062	0.83		
		Left side	0.302	0.062	0.36		
		Right side	0.316		0.32		
		Top side		0.062	0.06		
		Bottom side	0.561		0.56		
	Band II	Front	0.539	0.062	0.60		
		Back	0.421	0.062	0.48		
		Left side	0.109	0.062	0.17		
		Right side	0.094		0.09		
		Top side		0.062	0.06		
		Bottom side	0.681		0.68		

WWAN Band		Exposure Position	WWAN PCE	Bluetooth DSS	Summed SAR (W/kg)	SPLSR	Case No
			Max. WWAN SAR (W/kg)	Estimated Bluetooth SAR (W/kg)			
LTE	Band 12	Front	0.496	0.062	0.56		
		Back	0.599	0.062	0.66		
		Left side	0.413	0.062	0.48		
		Right side	0.357		0.36		
		Top side		0.062	0.06		
		Bottom side	0.123		0.12		
	Band 4	Front	0.635	0.062	0.70		
		Back	0.709	0.062	0.77		
		Left side	0.249	0.062	0.31		
		Right side	0.228		0.23		
		Top side		0.062	0.06		
		Bottom side	0.475		0.48		
	Band 2	Front	0.433	0.062	0.50		
		Back	0.353	0.062	0.42		
		Left side	0.082	0.062	0.14		
		Right side	0.072		0.07		
		Top side		0.062	0.06		
		Bottom side	0.599		0.60		

16.3 Body-Worn Accessory Exposure Conditions

<WWAN PCE + WLAN DTS>

WWAN Band		Exposure Position	WWAN PCE	WLAN DTS	Summed SAR (W/kg)	SPLSR	Case No
			Max. WWAN SAR (W/kg)	Max. WLAN SAR (W/kg)			
GSM	GSM850	Front	0.394	0.211	0.61		
		Back	0.525	0.173	0.70		
	GSM1900	Front	0.584	0.211	0.80		
		Back	0.479	0.173	0.65		
WCDMA	Band V	Front	0.138	0.211	0.35		
		Back	0.192	0.173	0.37		
	Band IV	Front	0.746	0.211	0.96		
		Back	0.768	0.173	0.94		
	Band II	Front	0.539	0.211	0.75		
		Back	0.421	0.173	0.59		
LTE	Band 12	Front	0.496	0.211	0.71		
		Back	0.599	0.173	0.77		
	Band 4	Front	0.635	0.211	0.85		
		Back	0.709	0.173	0.88		
	Band 2	Front	0.433	0.211	0.64		
		Back	0.353	0.173	0.53		

<WWAN PCE + Bluetooth DSS>

WWAN Band		Exposure Position	WWAN PCE	Bluetooth DSS	Summed SAR (W/kg)	SPLSR	Case No
			Max. WWAN SAR (W/kg)	Estimated Bluetooth SAR (W/kg)			
GSM	GSM850	Front	0.394	0.062	0.46		
		Back	0.525	0.062	0.59		
	GSM1900	Front	0.584	0.062	0.65		
		Back	0.479	0.062	0.54		
WCDMA	Band V	Front	0.138	0.062	0.20		
		Back	0.192	0.062	0.25		
	Band IV	Front	0.746	0.062	0.81		
		Back	0.768	0.062	0.83		
	Band II	Front	0.539	0.062	0.60		
		Back	0.421	0.062	0.48		
LTE	Band 12	Front	0.496	0.062	0.56		
		Back	0.599	0.062	0.66		
	Band 4	Front	0.635	0.062	0.70		
		Back	0.709	0.062	0.77		
	Band 2	Front	0.433	0.062	0.50		
		Back	0.353	0.062	0.42		

Test Engineer： Fulu Hu

17. Uncertainty Assessment

The component of uncertainly may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainly by the statistical analysis of a series of observations is termed a Type An evaluation of uncertainty. The evaluation of uncertainty by means other than the statistical analysis of a series of observation is termed a Type B evaluation of uncertainty. Each component of uncertainty, however evaluated, is represented by an estimated standard deviation, termed standard uncertainty, which is determined by the positive square root of the estimated variance.

A Type A evaluation of standard uncertainty may be based on any valid statistical method for treating data. This includes calculating the standard deviation of the mean of a series of independent observations; using the method of least squares to fit a curve to the data in order to estimate the parameter of the curve and their standard deviations; or carrying out an analysis of variance in order to identify and quantify random effects in certain kinds of measurement.

A type B evaluation of standard uncertainty is typically based on scientific judgment using all of the relevant information available. These may include previous measurement data, experience, and knowledge of the behavior and properties of relevant materials and instruments, manufacture's specification, data provided in calibration reports and uncertainties assigned to reference data taken from handbooks. Broadly speaking, the uncertainty is either obtained from an outdoor source or obtained from an assumed distribution, such as the normal distribution, rectangular or triangular distributions indicated in table below.

Uncertainty Distributions	Normal	Rectangular	Triangular	U-Shape
Multi-plying Factor[(a)]	1/k[(b)]	1/√3	1/√6	1/√2

(a) standard uncertainty is determined as the product of the multiplying factor and the estimated range of variations in the measured quantity

(b) κ is the coverage factor

Table 17.1. Standard Uncertainty for Assumed Distribution

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type B evaluation using the usual "root-sum-squares" (RSS) methods of combining standard deviations by taking the positive square root of the estimated variances.

Expanded uncertainty is a measure of uncertainty that defines an interval about the measurement result within which the measured value is confidently believed to lie. It is obtained by multiplying the combined standard uncertainty by a coverage factor. Typically, the coverage factor ranges from 2 to 3. Using a coverage factor allows the true value of a measured quantity to be specified with a defined probability within the specified uncertainty range. For purpose of this document, a coverage factor two is used, which corresponds to confidence interval of about 95 %. The DASY uncertainty Budget is shown in the following tables.

Error Description	Uncertainty Value (±%)	Probability Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (1g)	Standard Uncertainty (10g)
Measurement System							
Probe Calibration	6.0	Normal	1	1	1	± 6.0 %	± 6.0 %
Axial Isotropy	4.7	Rectangular	√3	0.7	0.7	± 1.9 %	± 1.9 %
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	0.7	± 3.9 %	± 3.9 %
Boundary Effects	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Linearity	4.7	Rectangular	√3	1	1	± 2.7 %	± 2.7 %
System Detection Limits	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Readout Electronics	0.3	Normal	1	1	1	± 0.3 %	± 0.3 %
Response Time	0.8	Rectangular	√3	1	1	± 0.5 %	± 0.5 %
Integration Time	2.6	Rectangular	√3	1	1	± 1.5 %	± 1.5 %
RF Ambient Noise	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
RF Ambient Reflections	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
Probe Positioner	0.4	Rectangular	√3	1	1	± 0.2 %	± 0.2 %
Probe Positioning	2.9	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
Max. SAR Eval.	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Test Sample Related							
Device Positioning	2.9	Normal	1	1	1	± 2.9 %	± 2.9 %
Device Holder	3.6	Normal	1	1	1	± 3.6 %	± 3.6 %
Power Drift	5.0	Rectangular	√3	1	1	± 2.9 %	± 2.9 %
Phantom and Setup							
Phantom Uncertainty	4.0	Rectangular	√3	1	1	± 2.3 %	± 2.3 %
Liquid Conductivity (Target)	5.0	Rectangular	√3	0.64	0.43	± 1.8 %	± 1.2 %
Liquid Conductivity (Meas.)	2.5	Normal	1	0.64	0.43	± 1.6 %	± 1.1 %
Liquid Permittivity (Target)	5.0	Rectangular	√3	0.6	0.49	± 1.7 %	± 1.4 %
Liquid Permittivity (Meas.)	2.5	Normal	1	0.6	0.49	± 1.5 %	± 1.2 %
Combined Standard Uncertainty						± 11.0 %	± 10.8 %
Coverage Factor for 95 %						K=2	
Expanded Uncertainty						**± 22.0 %**	**± 21.5 %**

Table 17.2. Uncertainty Budget for frequency range 300 MHz to 3 GHz

18. References

[1] FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”

[2] ANSI/IEEE Std. C95.1-1992, “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz”, September 1992

[3] IEEE Std. 1528-2003, “Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”, December 2003

[4] SPEAG DASY System Handbook

[5] FCC KDB 248227 D01 v01r02, “SAR Measurement Procedures for 802.11 a/b/g Transmitters”, May 2007

[6] FCC KDB 447498 D01 v05r02, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Feb 2014

[7] FCC KDB 648474 D04 v01r02, “SAR Evaluation Considerations for Wireless Handsets”, Dec 2013.

[8] FCC KDB 941225 D01 v03, “3G SAR MEAUREMENT PROCEDURES”, Oct 2014

[9] FCC KDB 941225 D05 v02r03, “SAR Evaluation Considerations for LTE Devices”, Dec 2013

[10] FCC KDB 941225 D06 v02, "SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities", Oct 2014.

[11] FCC KDB 865664 D01 v01r03, "SAR Measurement Requirements for 100 MHz to 6 GHz", Feb 2014.

[12] FCC KDB 865664 D02 v01r01, “RF Exposure Compliance Reporting and Documentation Considerations” May 2013.

Appendix A. Plots of System Performance Check

The plots are shown as follows.

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015.03.31

System Check_Head_750MHz_150331

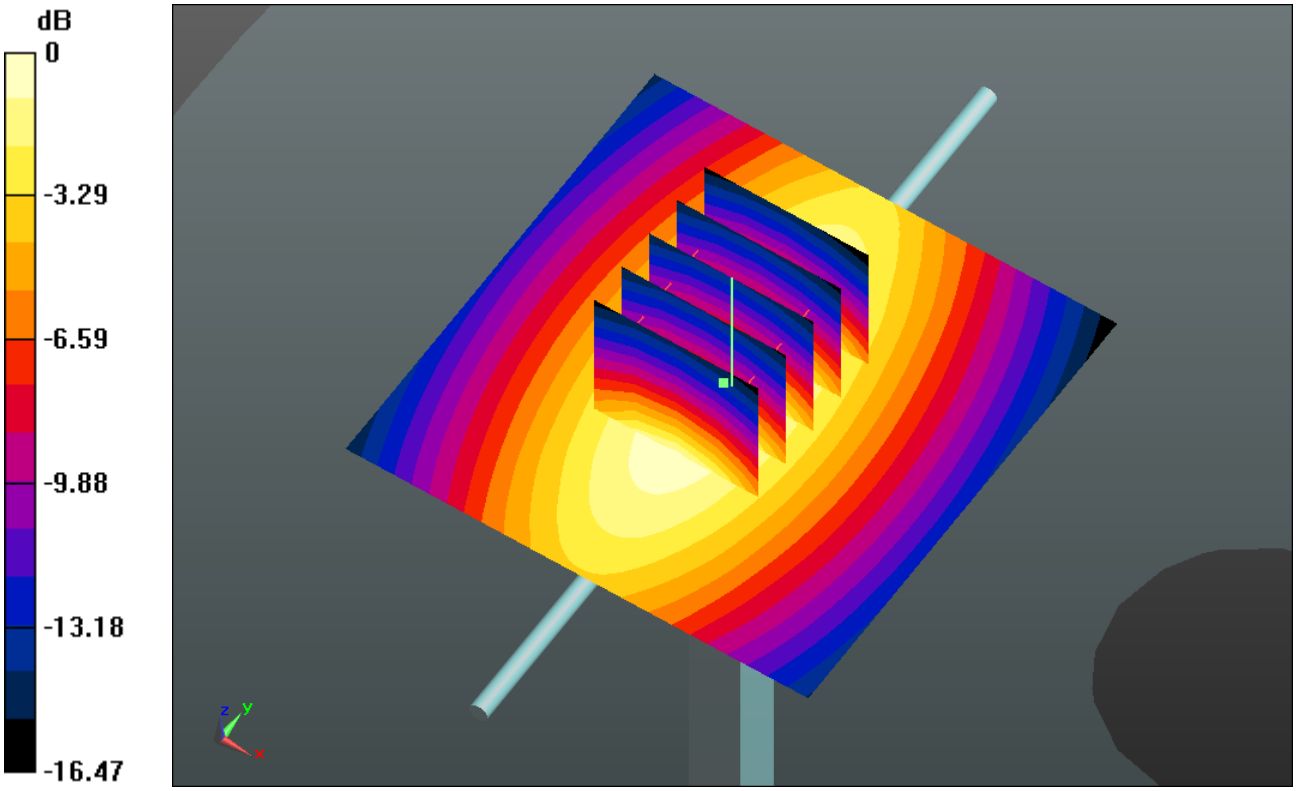
DUT: D750V3 - SN:1065

Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: HSL_750_150331 Medium parameters used: f = 750 MHz; σ = 0.88 mho/m; ε_r = 40.752; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.92, 9.92, 9.92); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 4.011 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 63.023 V/m; Power Drift = -0.0012 dB
Peak SAR (extrapolated) = 4.540 W/kg
SAR(1 g) = 2.19 mW/g; SAR(10 g) = 2.01 mW/g
Maximum value of SAR (measured) = 3.921 mW/g



0 dB = 3.920mW/g

System Check_Head_835MHz_150331

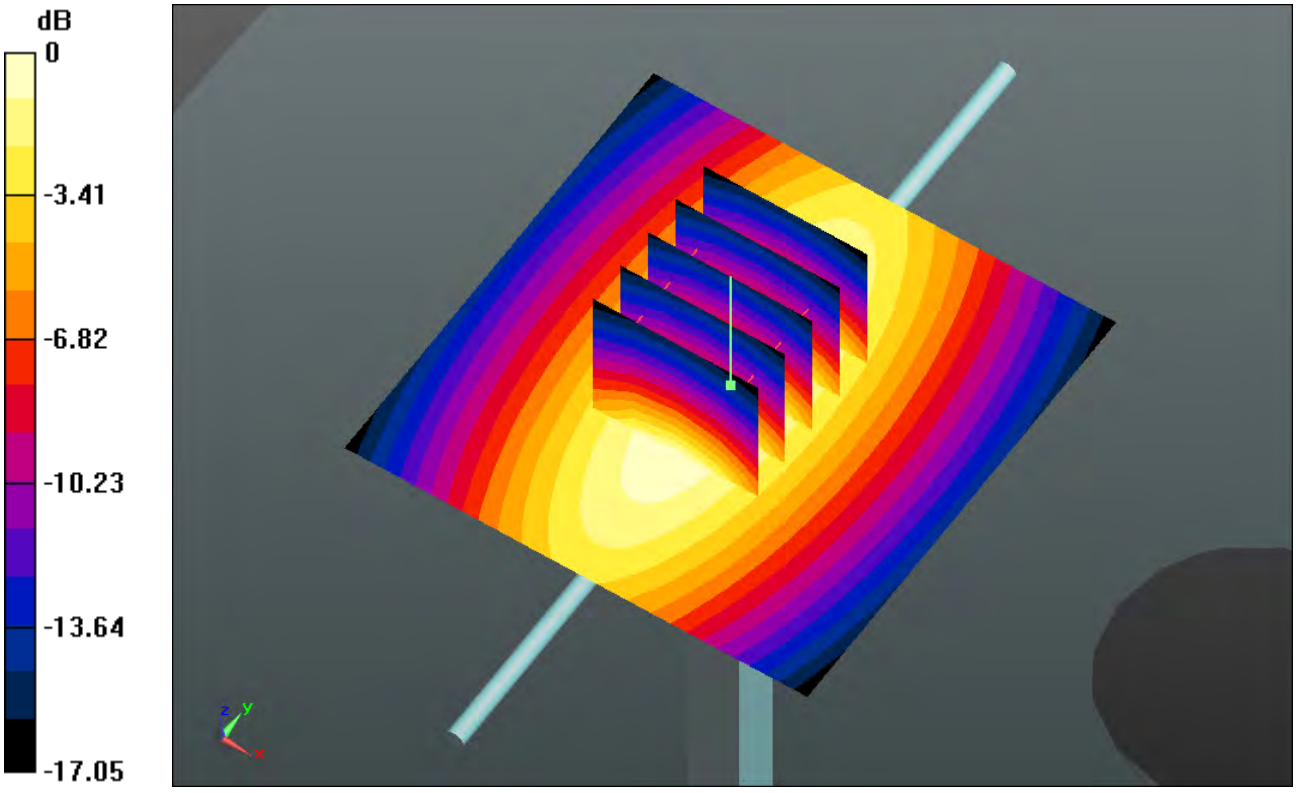
DUT: D835V2 - SN:4d091

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: HSL_835_150331 Medium parameters used: f = 835 MHz; σ = 0.893 mho/m; ε_r = 41.38; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃; Liquid Temperature：22.9 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.41, 9.41, 9.41); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.998 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 53.832 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 3.465 W/kg
SAR(1 g) = 2.33 mW/g; SAR(10 g) = 1.53 mW/g
Maximum value of SAR (measured) = 2.957 mW/g



0 dB = 3.000mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015.04.04

System Check_Head_1750MHz_150404

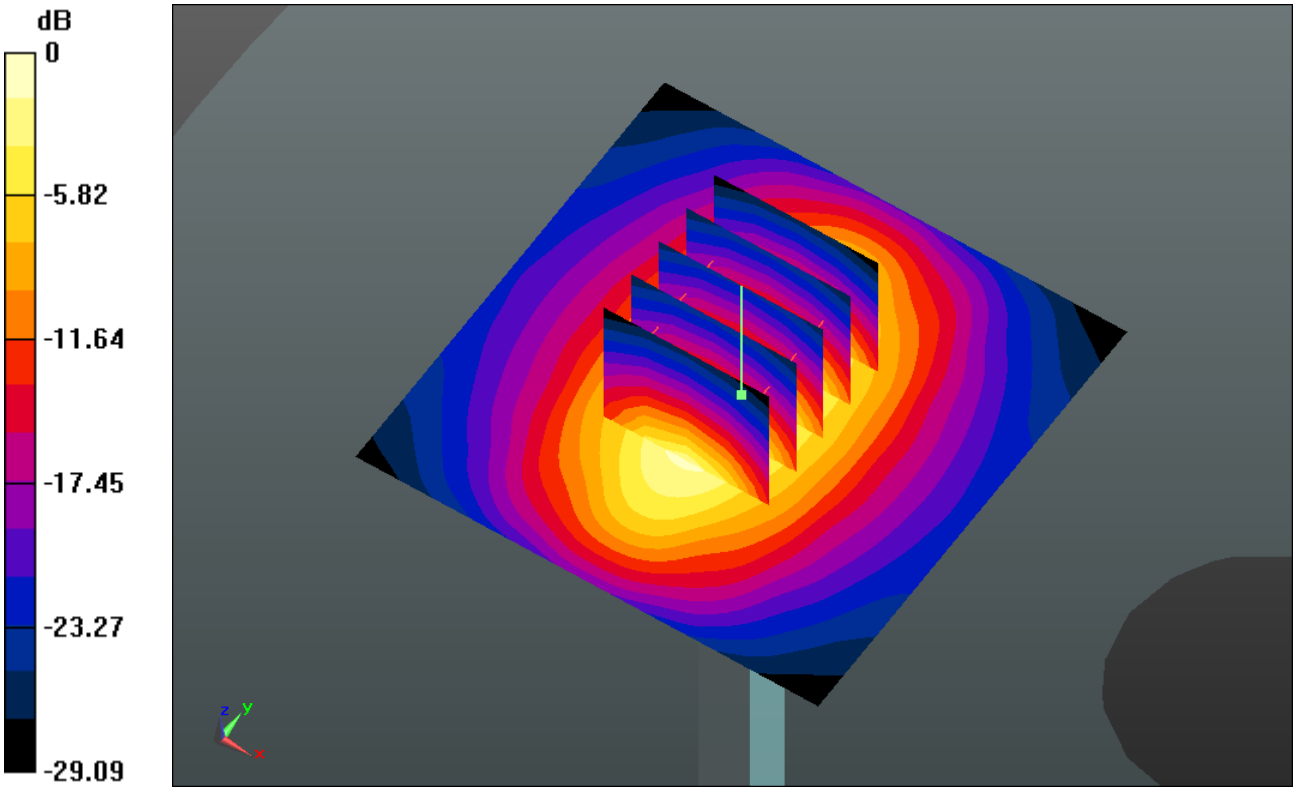
DUT: D1750V2 - SN:1069

Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: HSL_1750_150404 Medium parameters used: f = 1750 MHz; σ = 1.375 mho/m; ε_r = 41.375; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(8.55, 8.55, 8.55); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 12.550 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 84.239 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 16.364 W/kg
SAR(1 g) = 8.76 mW/g; SAR(10 g) = 4.53 mW/g
Maximum value of SAR (measured) = 12.732 mW/g



0 dB = 12.550mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015.04.04

System Check_Head_1900MHz_150404

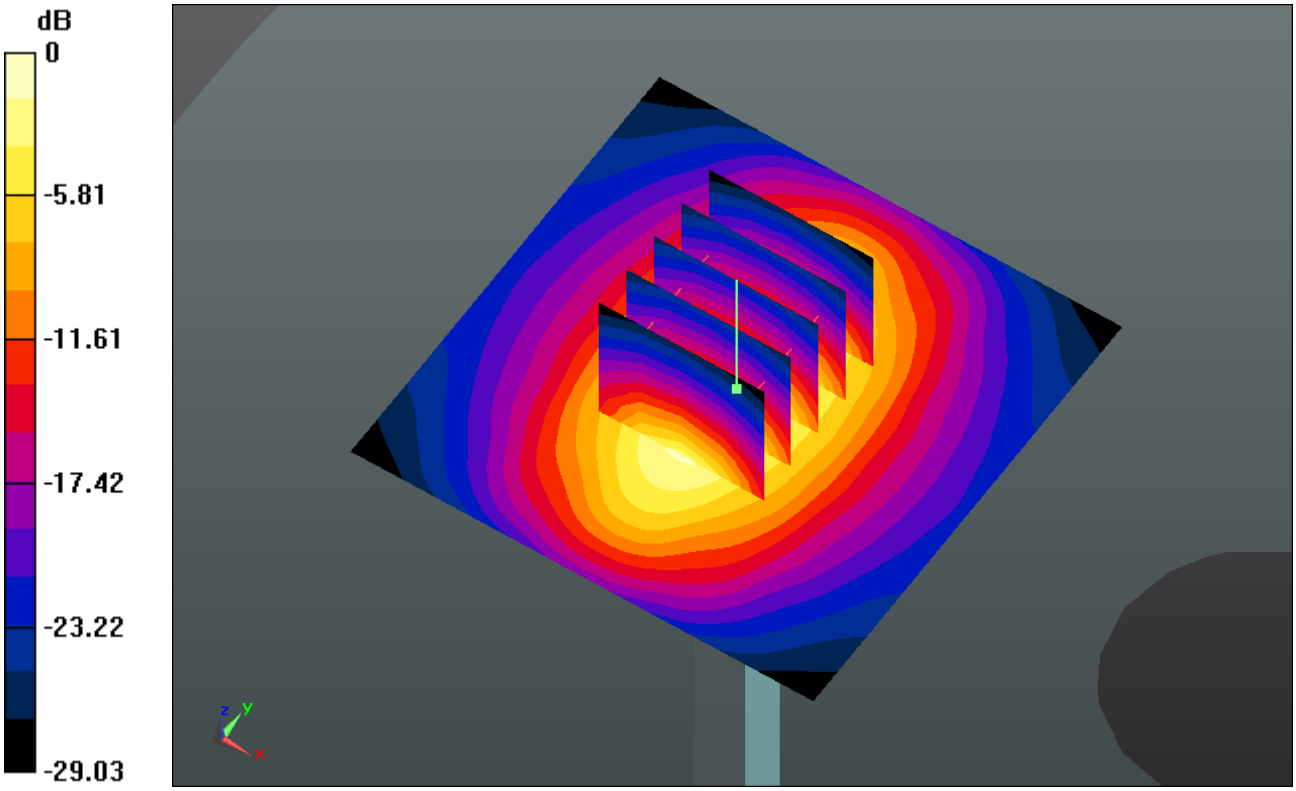
DUT: D1900V2 - SN:5d118

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: HSL_1900_150404 Medium parameters used: f = 1900 MHz; σ = 1.424 mho/m; ε_r = 39.075; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(8.4, 8.4, 8.4); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 13.564 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 86.745 V/m; Power Drift = -0.0021 dB
Peak SAR (extrapolated) = 17.070 W/kg
SAR(1 g) = 9.43 mW/g; SAR(10 g) = 4.96 mW/g
Maximum value of SAR (measured) = 13.534 mW/g



0 dB = 13.560mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015.04.24

System Check_Head_2450MHz_150424

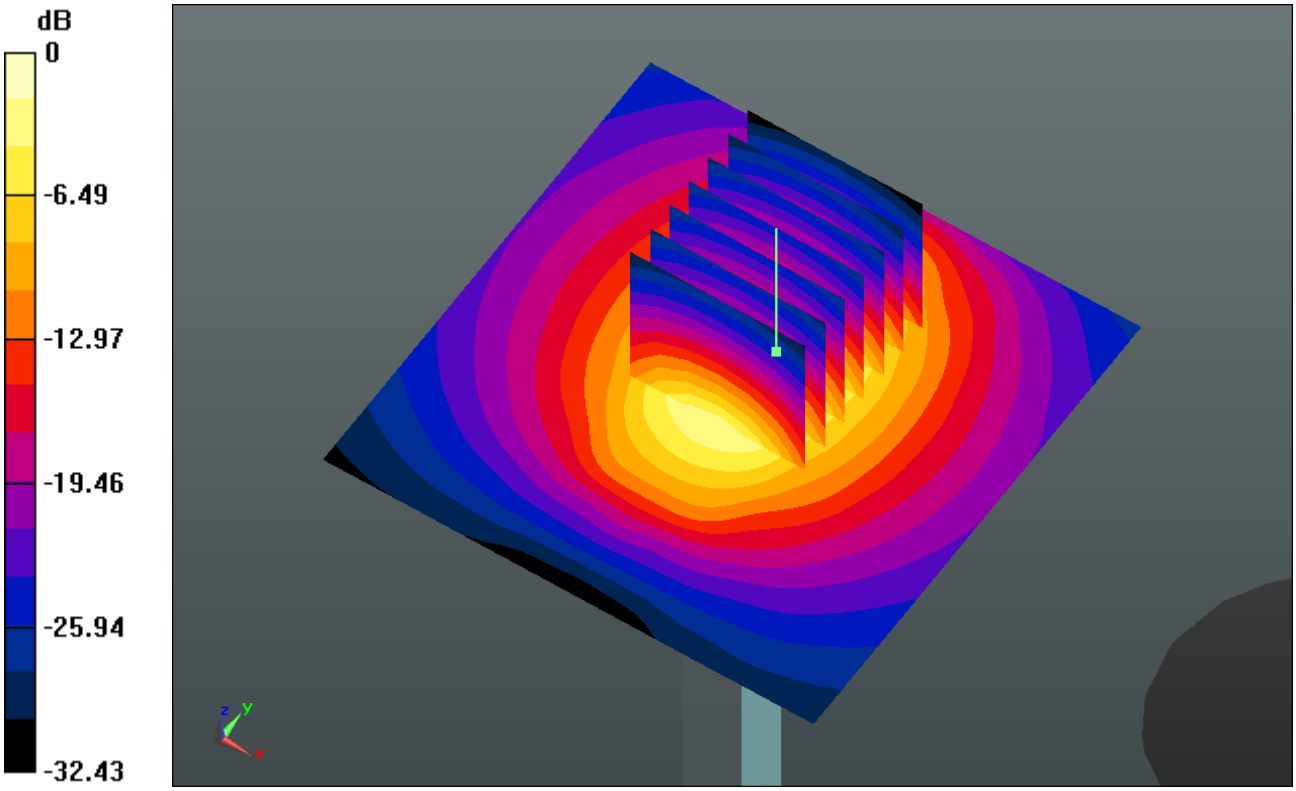
DUT: D2450V2 - SN:840

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: HSL_2450_150424 Medium parameters used: f = 2450 MHz; σ = 1.828 mho/m; ε_r = 39.18; ρ = 1000 kg/m^3
Ambient Temperature：23.8 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.48, 7.48, 7.48); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Pin=250mW/Area Scan (71x71x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (interpolated) = 20.729 mW/g

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 84.474 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 29.282 W/kg
SAR(1 g) = 13.3 mW/g; SAR(10 g) = 5.95 mW/g
Maximum value of SAR (measured) = 20.846 mW/g



0 dB = 20.730mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015.03.29

System Check_Body_750MHz_150329

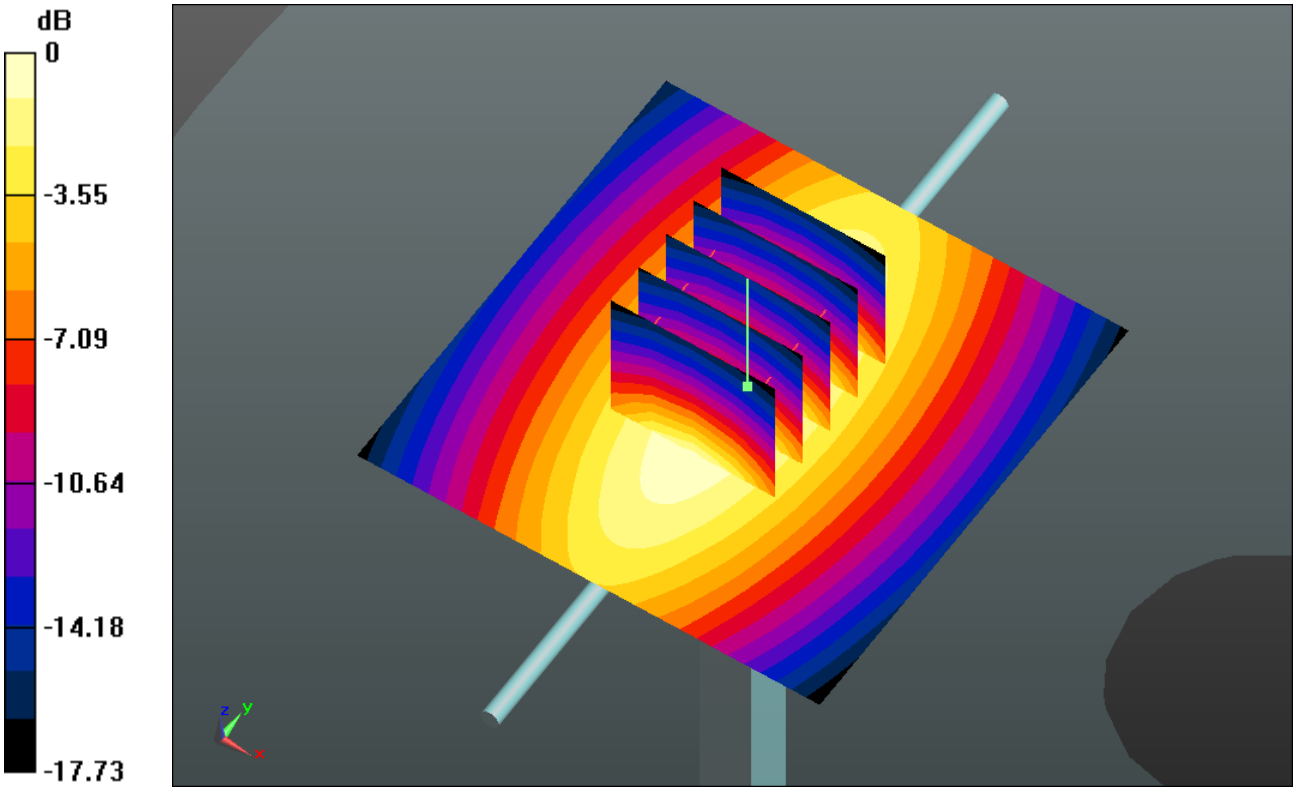
DUT: D750V2 - SN:1065

Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: MSL_750_150329 Medium parameters used: f = 750 MHz; σ = 0.963 mho/m; ε_r = 54.242; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃; Liquid Temperature：22.9 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.46, 9.46, 9.46); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.630 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 48.722 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 3.026 W/kg
SAR(1 g) = 2.11 mW/g; SAR(10 g) = 1.41 mW/g
Maximum value of SAR (measured) = 2.623 mW/g



0 dB = 2.630mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015.03.29

System Check_Body_835MHz_150329

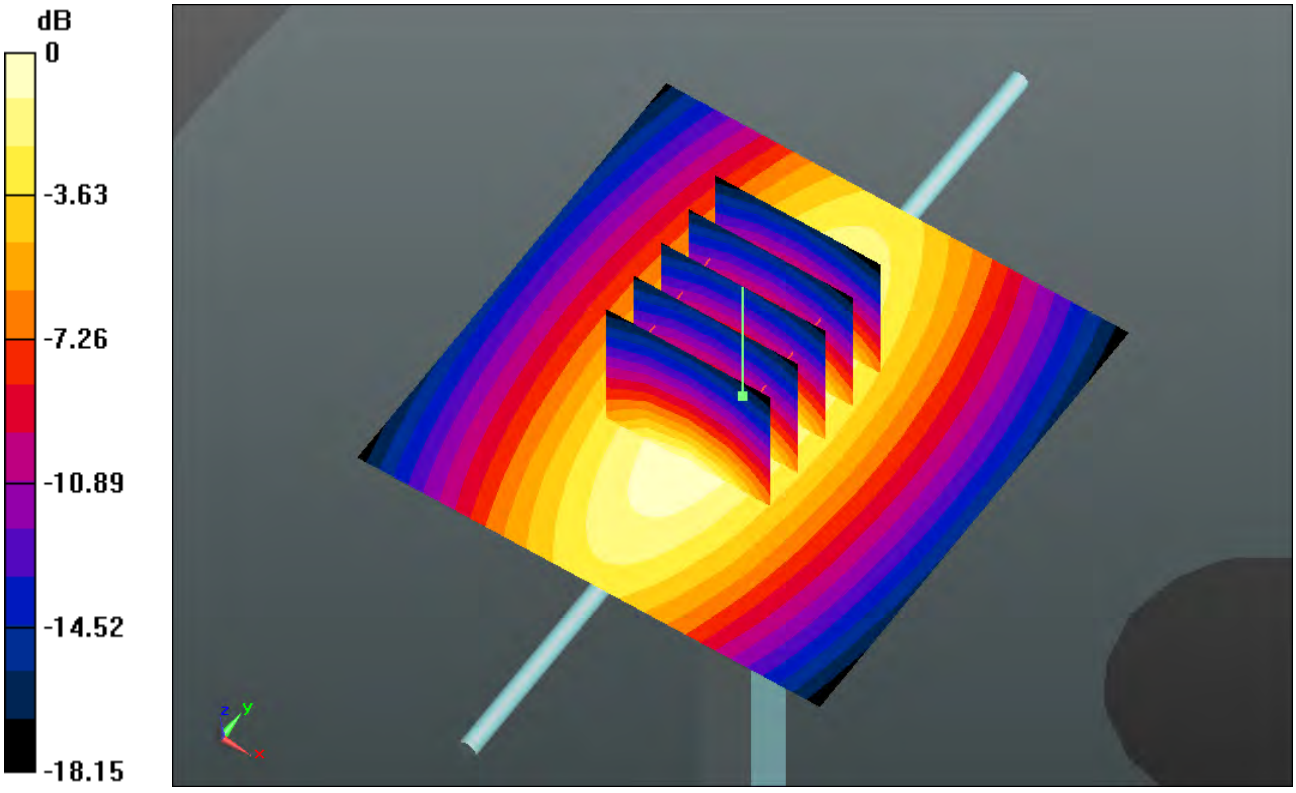
DUT: D835V2 - SN:4d091

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: MSL_835_150329 Medium parameters used: f = 835 MHz; σ = 0.98 mho/m; ε_r = 54.484; ρ = 1000 kg/m^3
Ambient Temperature：23.8 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.31, 9.31, 9.31); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.831 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 49.906 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 3.340 W/kg
SAR(1 g) = 2.27 mW/g; SAR(10 g) = 1.49 mW/g
Maximum value of SAR (measured) = 2.871 mW/g



0 dB = 2.830mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015.03.28

System Check_Body_1750MHz_150328

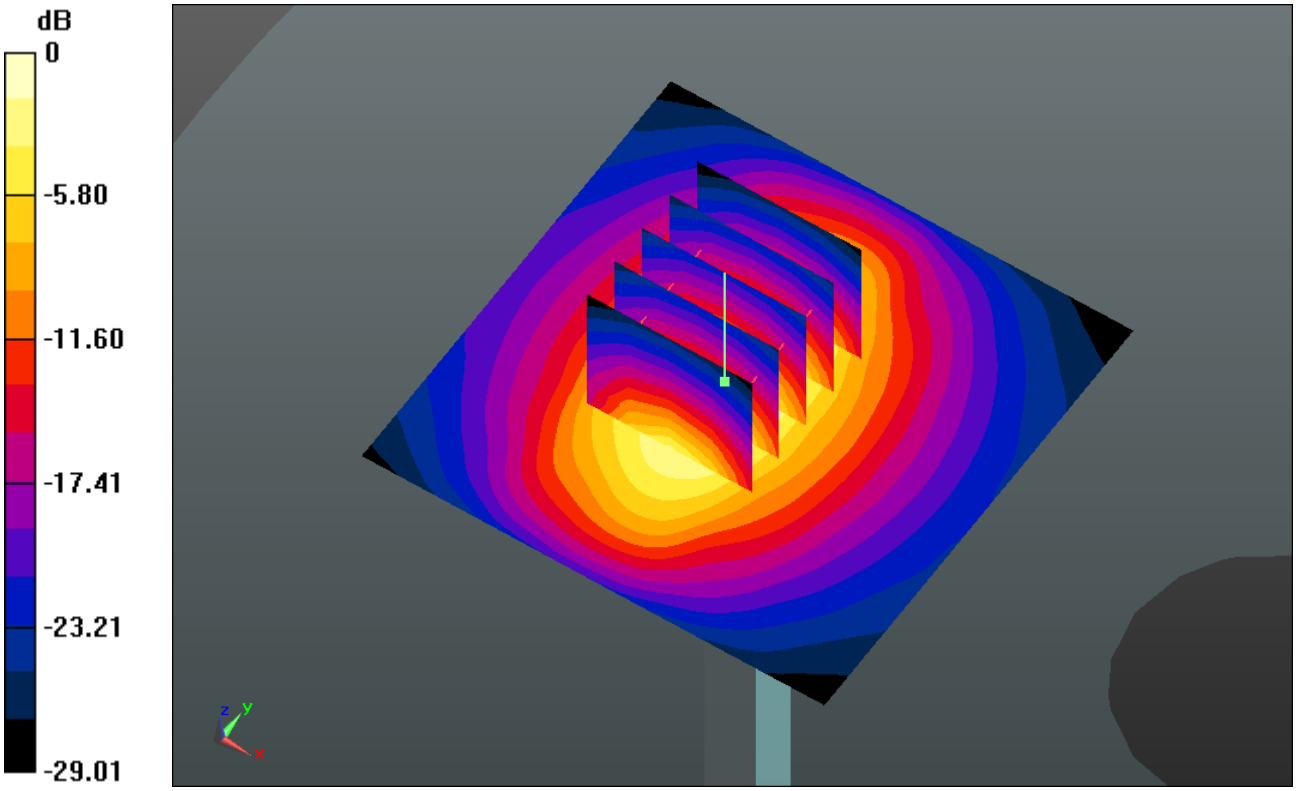
DUT: D1750V2 - SN:1069

Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: MSL_1750_150328 Medium parameters used: f = 1750 MHz; σ = 1.515 mho/m; ε_r = 55.246; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃; Liquid Temperature：22.9 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.89, 7.89, 7.89); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 12.341 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 77.904 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 15.691 W/kg
SAR(1 g) = 8.88 mW/g; SAR(10 g) = 4.69 mW/g
Maximum value of SAR (measured) = 12.571 mW/g



0 dB = 12.340mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015.03.28

System Check_Body_1900MHz_150328

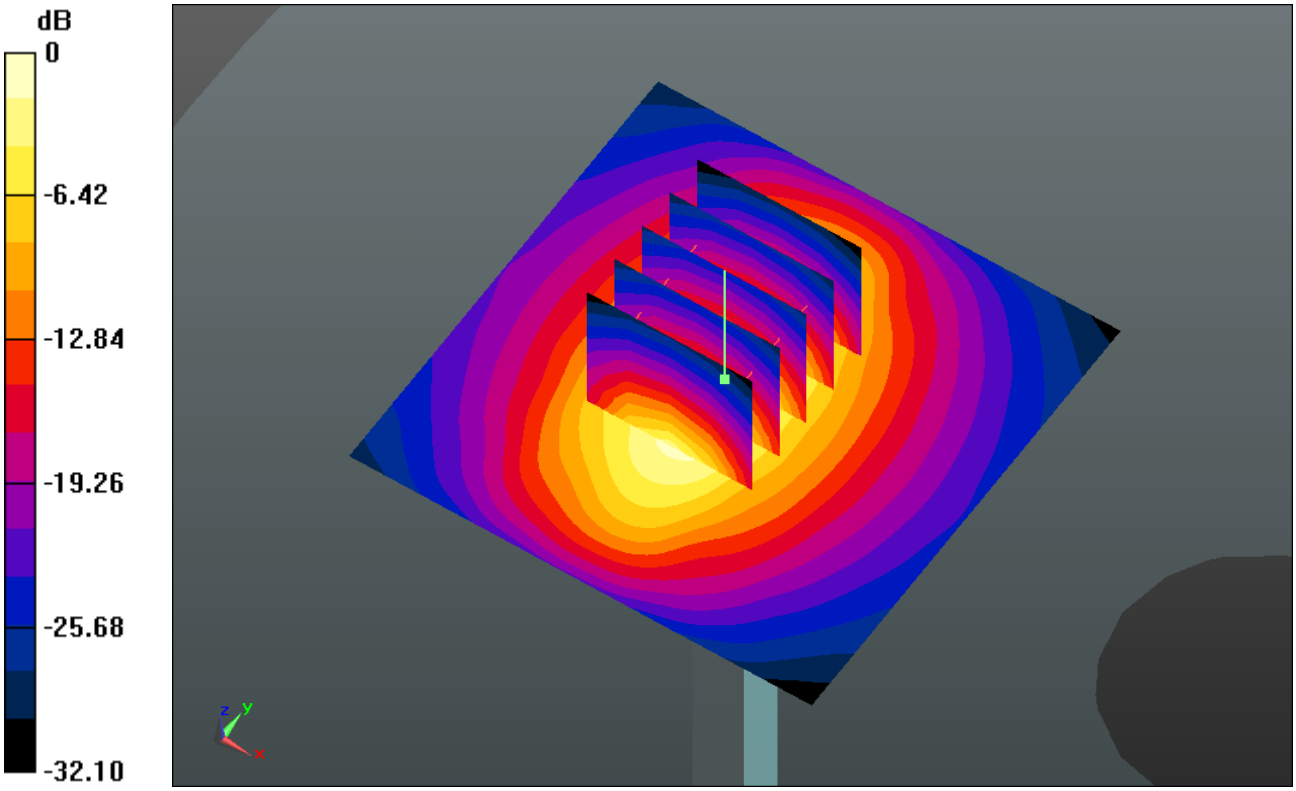
DUT: D1900V2 - SN:5d118

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: MSL_1900_150328 Medium parameters used: f = 1900 MHz; σ = 1.552 mho/m; ε_r = 53.391; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.56, 7.56, 7.56); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 14.667 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 84.627 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 18.688 W/kg
SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.43 mW/g
Maximum value of SAR (measured) = 14.958 mW/g



0 dB = 14.670mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015.04.24

System Check_Body_2450MHz_150424

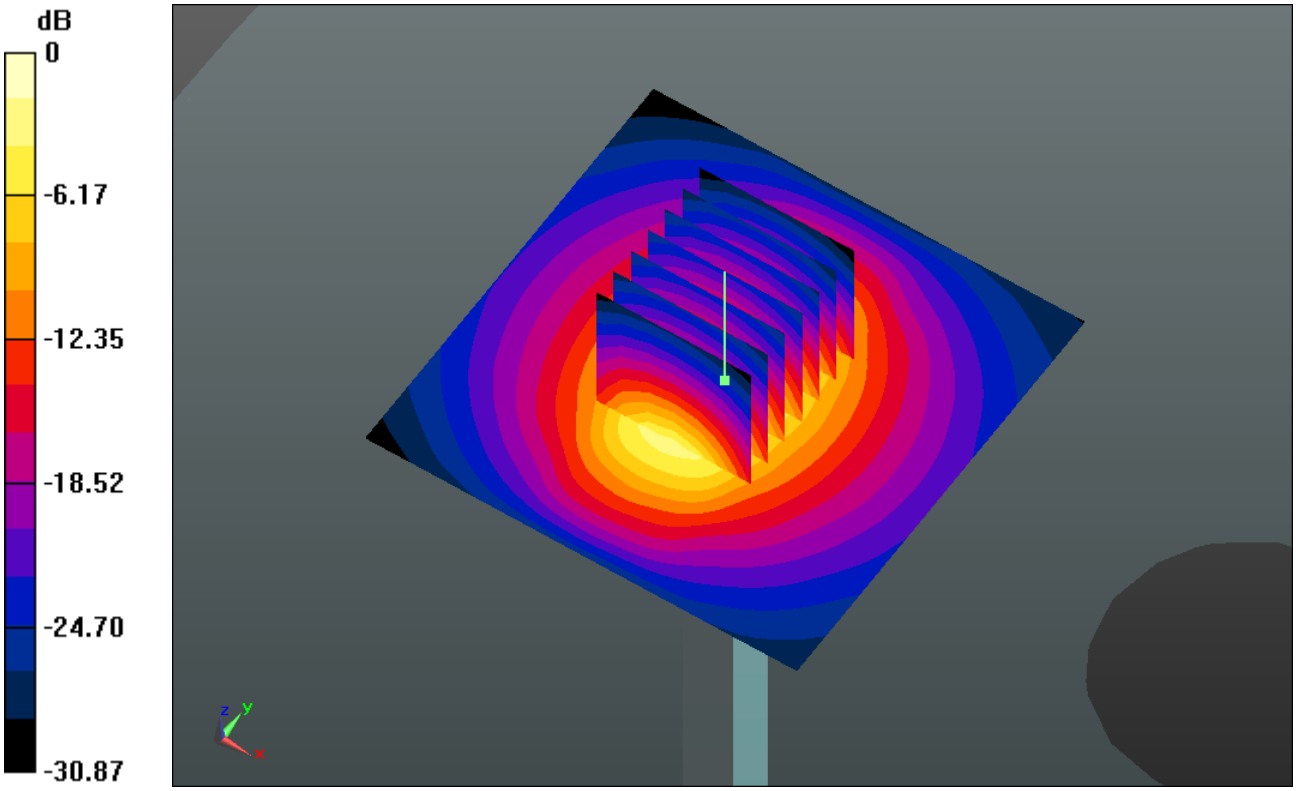
DUT: D2450V2 - SN:840

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: MSL_2450_150424 Medium parameters used: f = 2450 MHz; σ = 1.943 mho/m; ε_r = 50.964; ρ = 1000 kg/m^3
Ambient Temperature：23.8 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.14, 7.14, 7.14); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Pin=250mW/Area Scan (71x71x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (interpolated) = 18.984 mW/g

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 85.106 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 24.751 W/kg
SAR(1 g) = 12.2 mW/g; SAR(10 g) = 5.65 mW/g
Maximum value of SAR (measured) = 18.519 mW/g



0 dB = 18.980mW/g

Appendix B. Plots of High SAR Measurement

The plots are shown as follows.

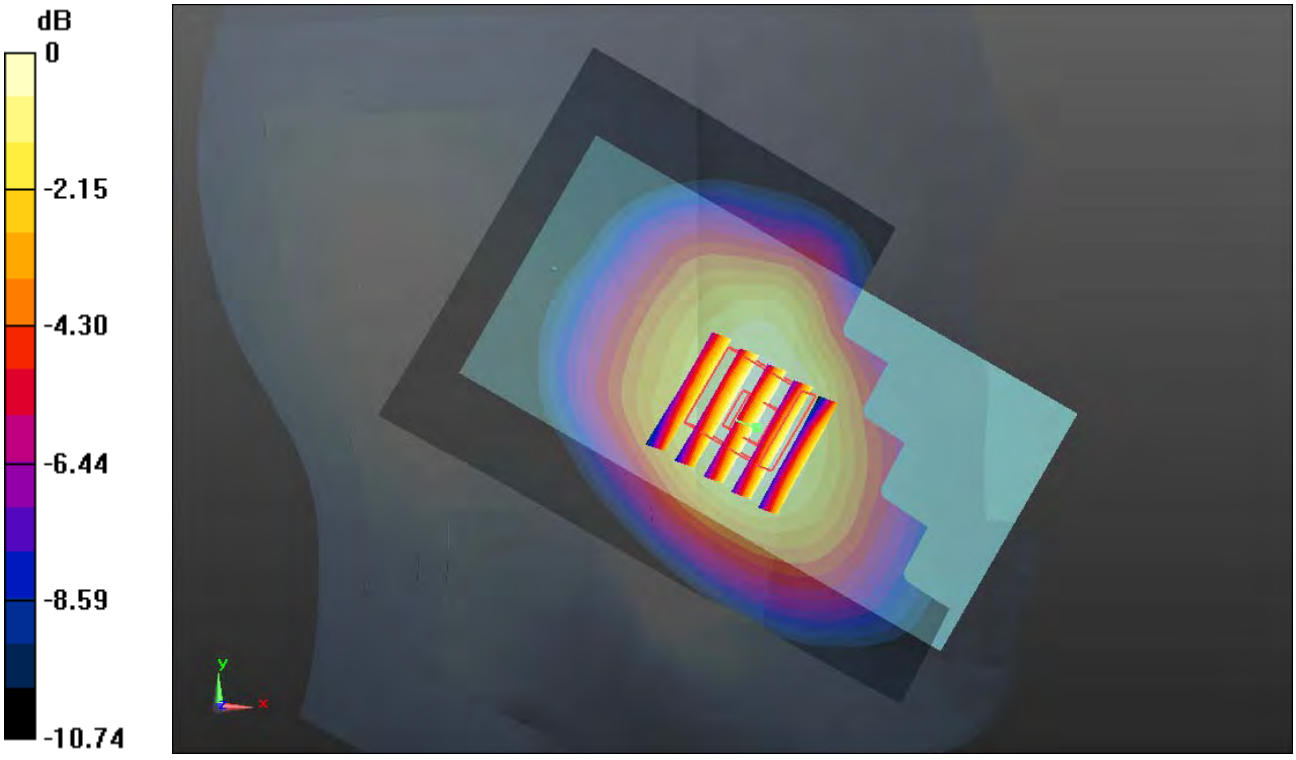
#01_GSM850_GPRS (4 Tx slots)_Left Cheek_Ch189

Communication System: GPRS/EDGE (4 Tx slots) (0); Frequency: 836.4 MHz;Duty Cycle: 1:2.08
Medium: HSL_835_150331 Medium parameters used: f = 836.4 MHz; σ = 0.895 mho/m; ε_r = 41.362; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃; Liquid Temperature：22.9 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.41, 9.41, 9.41); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Ch189/Area Scan (71x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.360 mW/g

Ch189/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.245 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.393 W/kg
SAR(1 g) = 0.311 mW/g; SAR(10 g) = 0.235 mW/g
Maximum value of SAR (measured) = 0.359 mW/g



0 dB = 0.360mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015.04.04

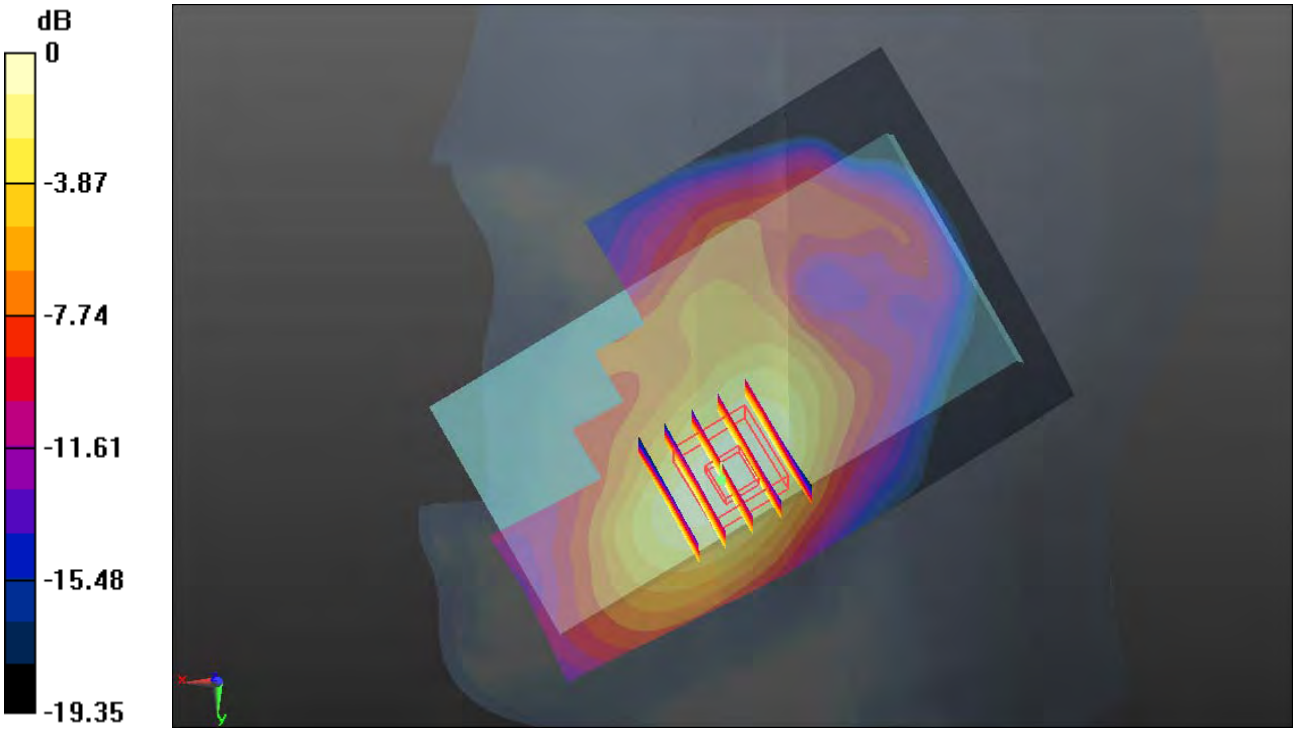
#02_GSM1900_GPRS (4 Tx slots)_Right Cheek_Ch810

Communication System: GPRS/EDGE (4 Tx slots) (0); Frequency: 1909.8 MHz;Duty Cycle: 1:2.08
Medium: HSL_1900_150404 Medium parameters used: f = 1909.8 MHz; σ = 1.435 mho/m; ε_r = 39.029; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(8.4, 8.4, 8.4); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Ch810/Area Scan (71x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.305 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.817 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.361 W/kg
SAR(1 g) = 0.230 mW/g; SAR(10 g) = 0.137 mW/g
Maximum value of SAR (measured) = 0.296 mW/g



0 dB = 0.300mW/g

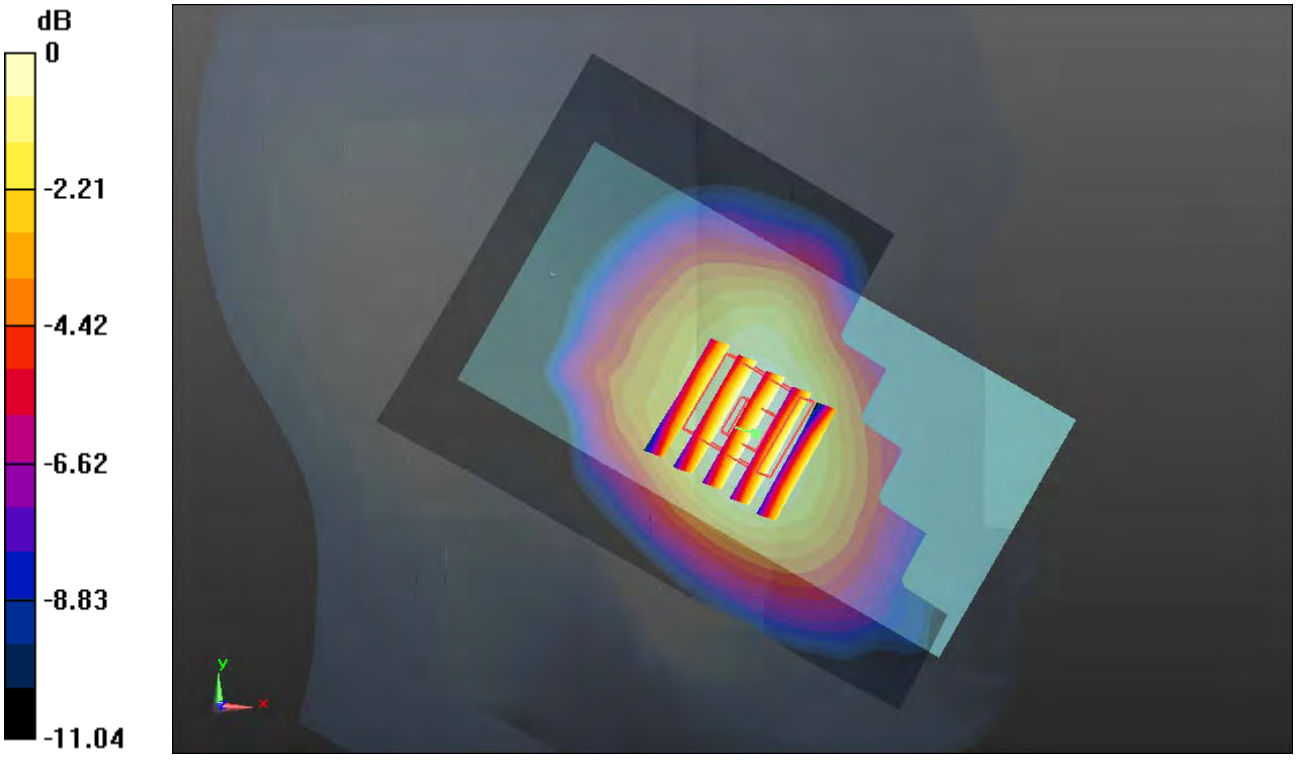
#03_WCDMA Band V_RMC 12.2Kbps_Left Cheek_Ch4233

Communication System: UMTS (0); Frequency: 846.6 MHz;Duty Cycle: 1:1
Medium: HSL_835_150331 Medium parameters used: f = 846.6 MHz; σ = 0.904 mho/m; ε_r = 41.219; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃; Liquid Temperature：22.9 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.41, 9.41, 9.41); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Ch4233/Area Scan (71x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.114 mW/g

Ch4233/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.230 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.125 W/kg
SAR(1 g) = 0.099 mW/g; SAR(10 g) = 0.075 mW/g
Maximum value of SAR (measured) = 0.114 mW/g



0 dB = 0.110mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015.04.04

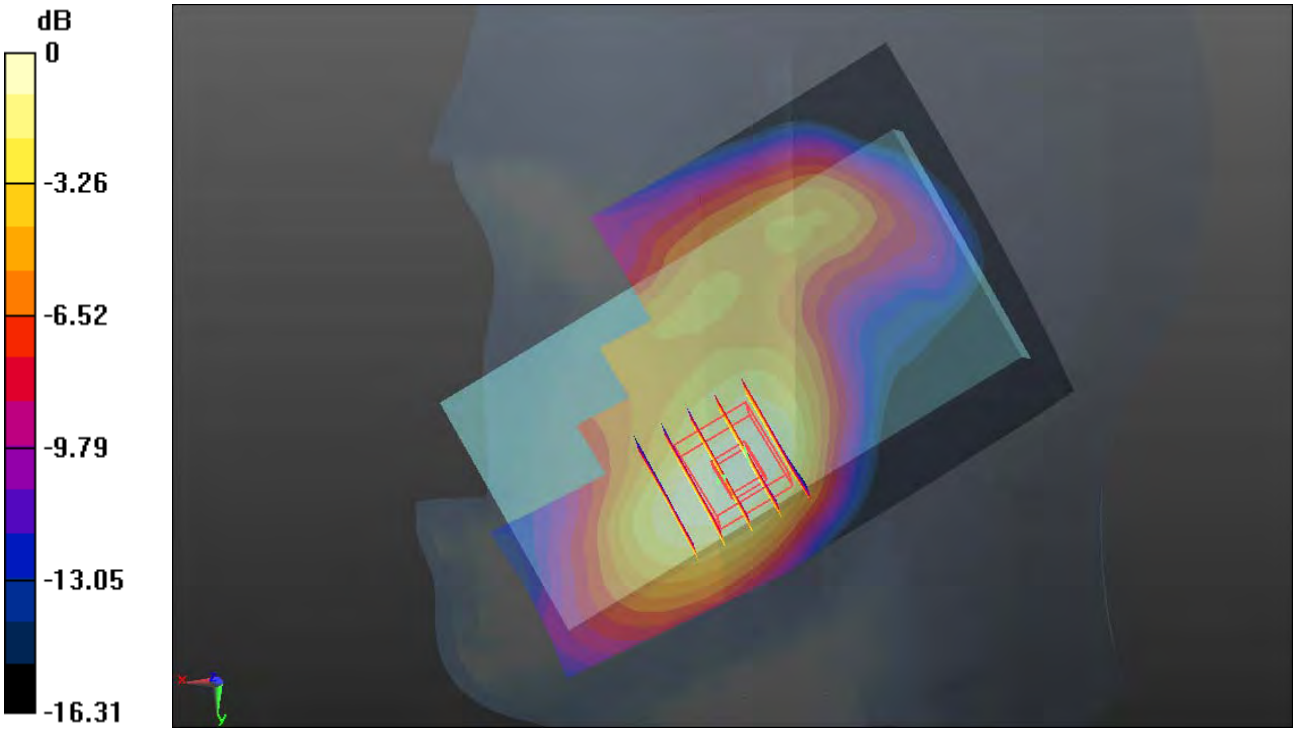
#04_WCDMA Band IV_RMC 12.2Kbps_Right Cheek_Ch1312

Communication System: UMTS (0); Frequency: 1712.4 MHz;Duty Cycle: 1:1
Medium: HSL_1750_150404 Medium parameters used: f = 1712.4 MHz; σ = 1.335 mho/m; ε_r = 41.565; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(8.55, 8.55, 8.55); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Ch1312/Area Scan (71x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.569 mW/g

Ch1312/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.051 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.661 W/kg
SAR(1 g) = 0.447 mW/g; SAR(10 g) = 0.287 mW/g
Maximum value of SAR (measured) = 0.554 mW/g



0 dB = 0.550mW/g

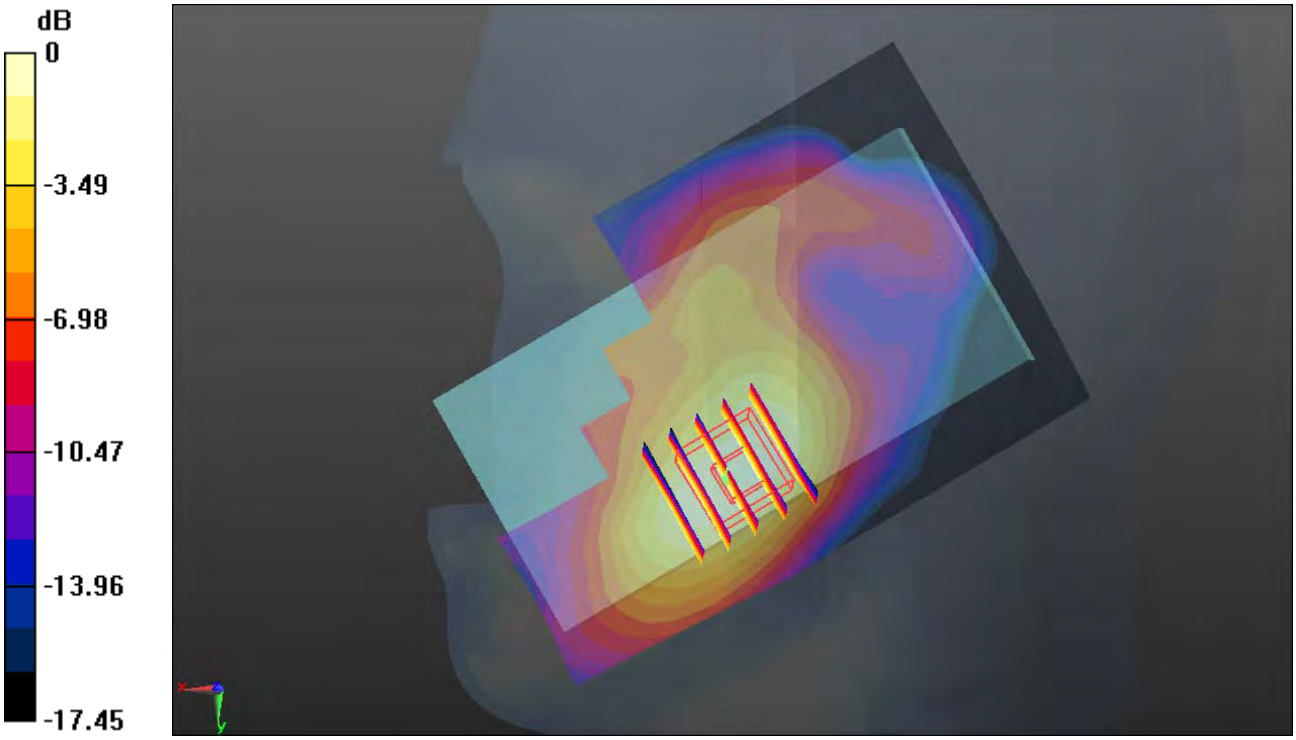
#05_WCDMA Band II_RMC 12.2Kbps_Right Cheek_Ch9262

Communication System: UMTS (0); Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium: HSL_1900_150404 Medium parameters used: f = 1852.4 MHz; σ = 1.377 mho/m; ε_r = 39.257; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(8.4, 8.4, 8.4); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Ch9262/Area Scan (71x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.308 mW/g

Ch9262/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.109 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.364 W/kg
SAR(1 g) = 0.235 mW/g; SAR(10 g) = 0.144 mW/g
Maximum value of SAR (measured) = 0.300 mW/g



0 dB = 0.300mW/g

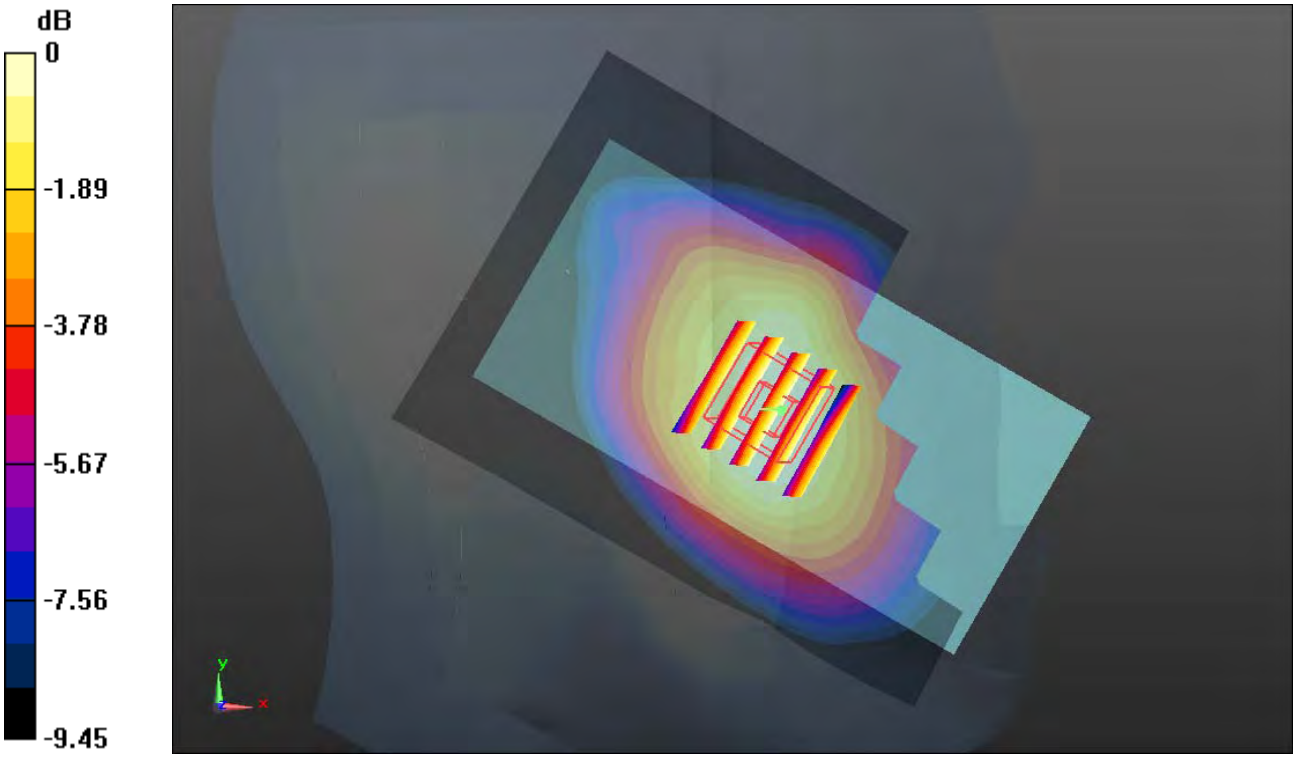
#06_LTE Band12_10M_QPSK(25,24)_Left Cheek_Ch23095

Communication System: FDD_LTE (0); Frequency: 707.5 MHz;Duty Cycle: 1:1
Medium: HSL_750_150331 Medium parameters used: f = 707.5 MHz; σ = 0.857 mho/m; ε_r = 41.674; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.92, 9.92, 9.92); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Ch23095/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.416 mW/g

Ch23095/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.960 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 0.445 W/kg
SAR(1 g) = 0.371 mW/g; SAR(10 g) = 0.293 mW/g
Maximum value of SAR (measured) = 0.412 mW/g



0 dB = 0.410mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015.04.04

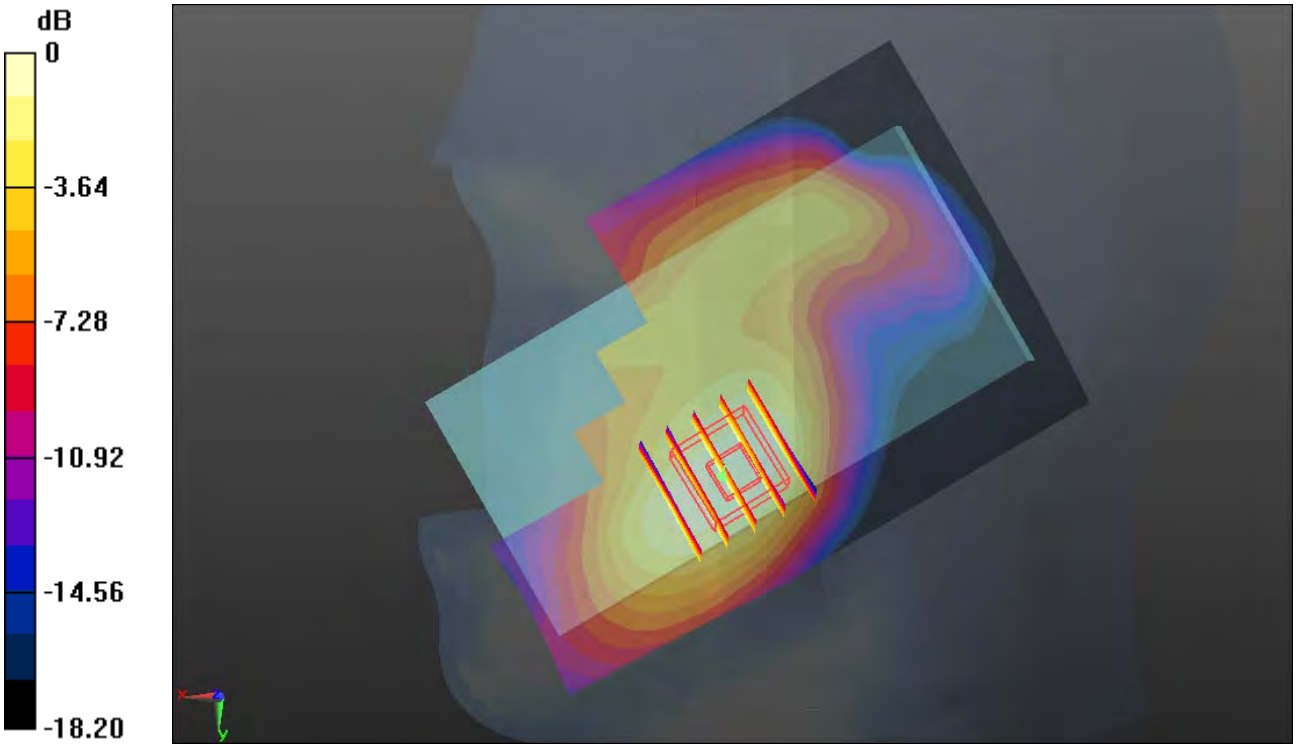
#07_LTE Band4_20M_QPSK(50,0)_Right Cheek_Ch20050

Communication System: FDD_LTE (0); Frequency: 1720 MHz;Duty Cycle: 1:1
Medium: HSL_1750_150404 Medium parameters used: f = 1720 MHz; σ = 1.343 mho/m; ε_r = 41.528; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(8.55, 8.55, 8.55); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Ch20050/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.476 mW/g

Ch20050/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.244 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.545 W/kg
SAR(1 g) = 0.371 mW/g; SAR(10 g) = 0.240 mW/g
Maximum value of SAR (measured) = 0.457 mW/g



0 dB = 0.460mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015.04.04

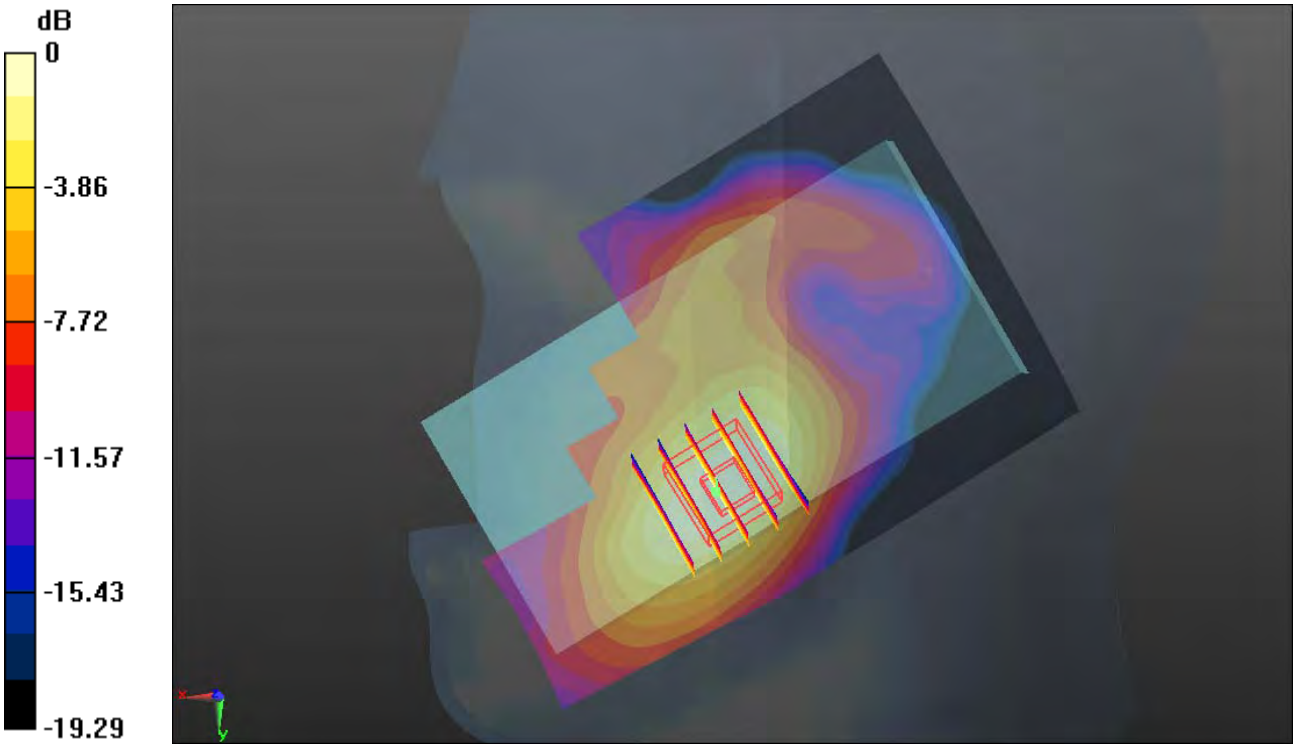
#08_LTE Band2_20M_QPSK(50,0)_Right Cheek_Ch18900

Communication System: FDD_LTE (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: HSL_1900_150404 Medium parameters used: f = 1880 MHz; σ = 1.404 mho/m; ε_r = 39.161; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(8.4, 8.4, 8.4); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Ch18900/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.245 mW/g

Ch18900/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.126 V/m; Power Drift = 0.028 dB
Peak SAR (extrapolated) = 0.289 W/kg
SAR(1 g) = 0.186 mW/g; SAR(10 g) = 0.113 mW/g
Maximum value of SAR (measured) = 0.238 mW/g



0 dB = 0.240mW/g

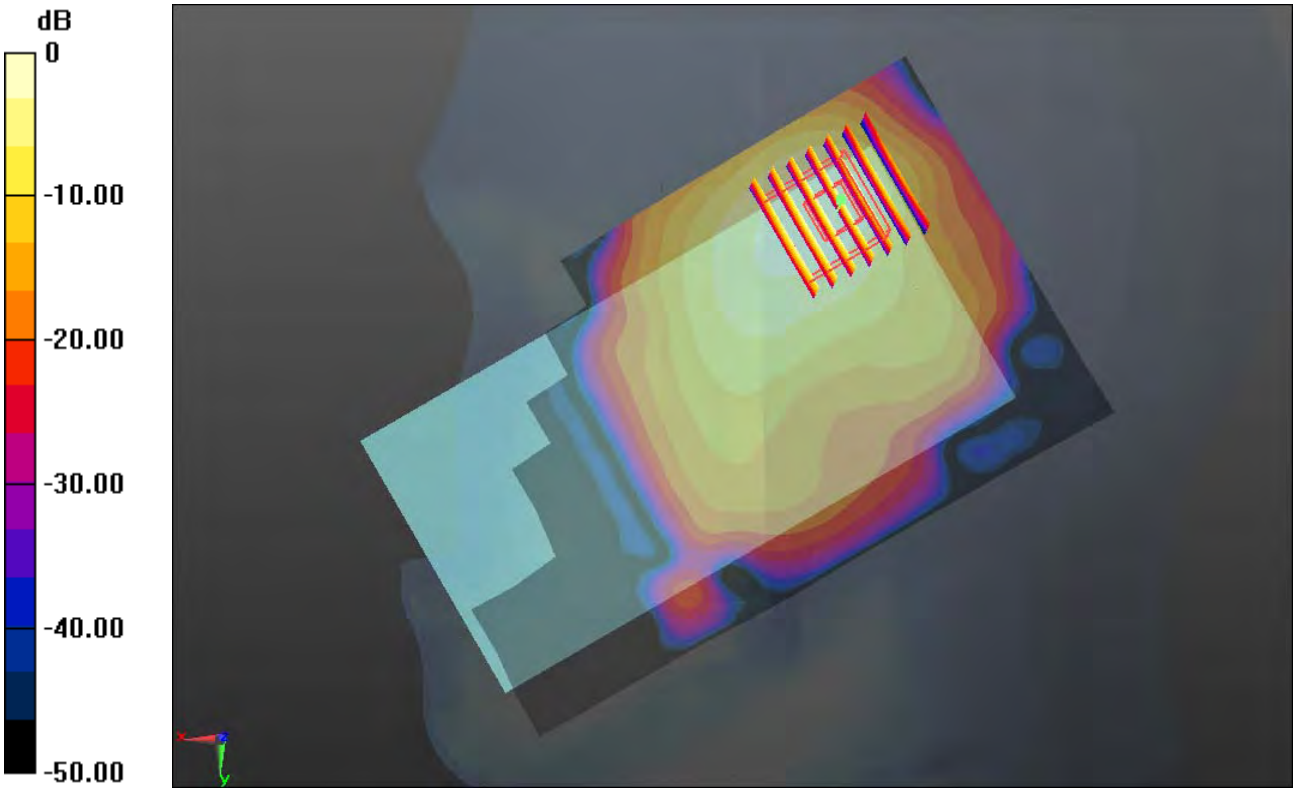
#09_WLAN 2.4GHz_802.11b 1Mbps_Right Cheek_Ch6

Communication System: WIFI (0); Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: HSL_2450_150424 Medium parameters used: f = 2437 MHz; σ = 1.812 mho/m; ε_r = 39.233; ρ = 1000 kg/m^3
Ambient Temperature：23.8 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.48, 7.48, 7.48); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Ch6/Area Scan (81x141x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (interpolated) = 1.198 mW/g

Ch6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.684 V/m; Power Drift = 0.021 dB
Peak SAR (extrapolated) = 1.670 W/kg
SAR(1 g) = 0.738 mW/g; SAR(10 g) = 0.326 mW/g
Maximum value of SAR (measured) = 1.146 mW/g



0 dB = 1.200mW/g

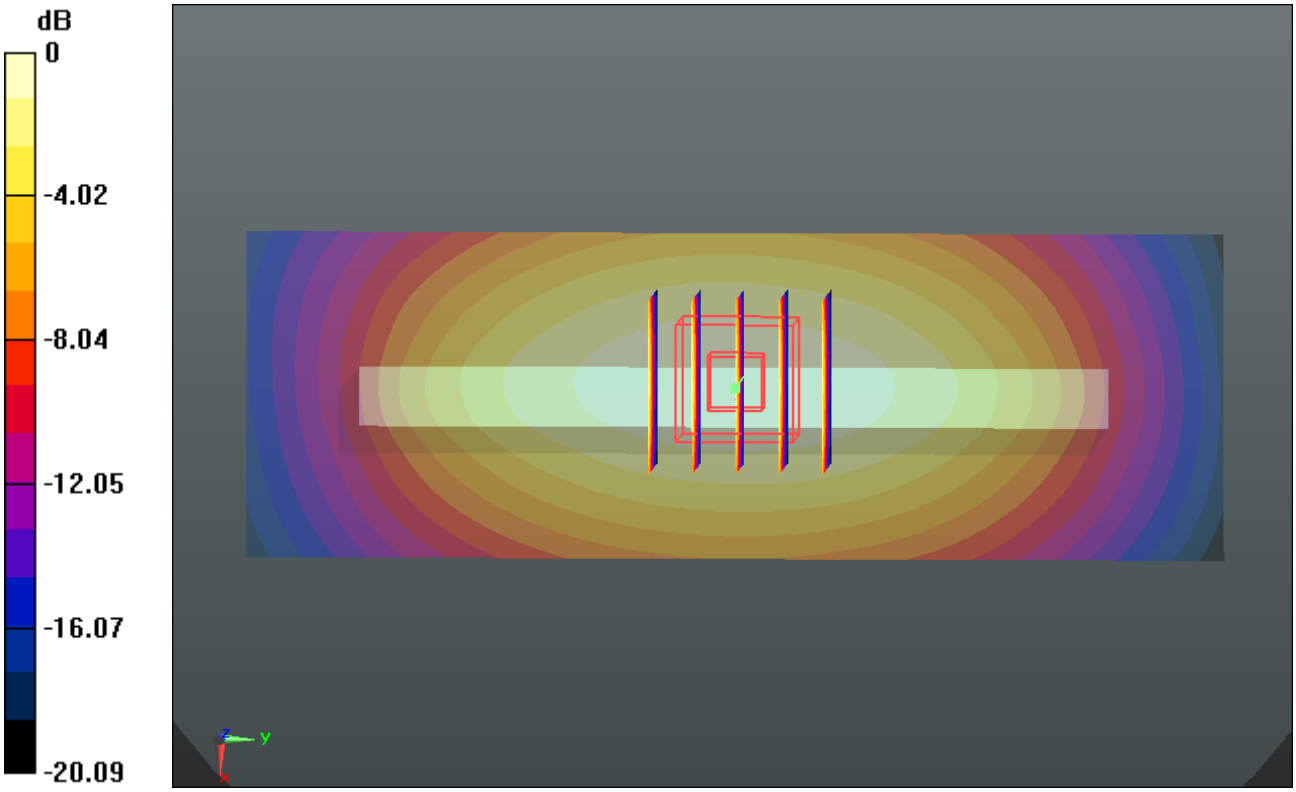
#10_GSM850_GPRS (4 Tx slots)_Left Side 1cm_Ch128

Communication System: GPRS/EDGE (4 Tx slots) (0); Frequency: 824.2 MHz;Duty Cycle: 1:2.08
Medium: MSL_850_150329 Medium parameters used: f = 824.2 MHz; σ = 0.969 mho/m; ε_r = 54.585; ρ = 1000 kg/m^3
Ambient Temperature：23.8 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.31, 9.31, 9.31); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Ch128/Area Scan (41x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.914 mW/g

Ch128/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.649 V/m; Power Drift = 0.0052 dB
Peak SAR (extrapolated) = 1.029 W/kg
SAR(1 g) = 0.741 mW/g; SAR(10 g) = 0.518 mW/g
Maximum value of SAR (measured) = 0.904 mW/g



0 dB = 0.910mW/g

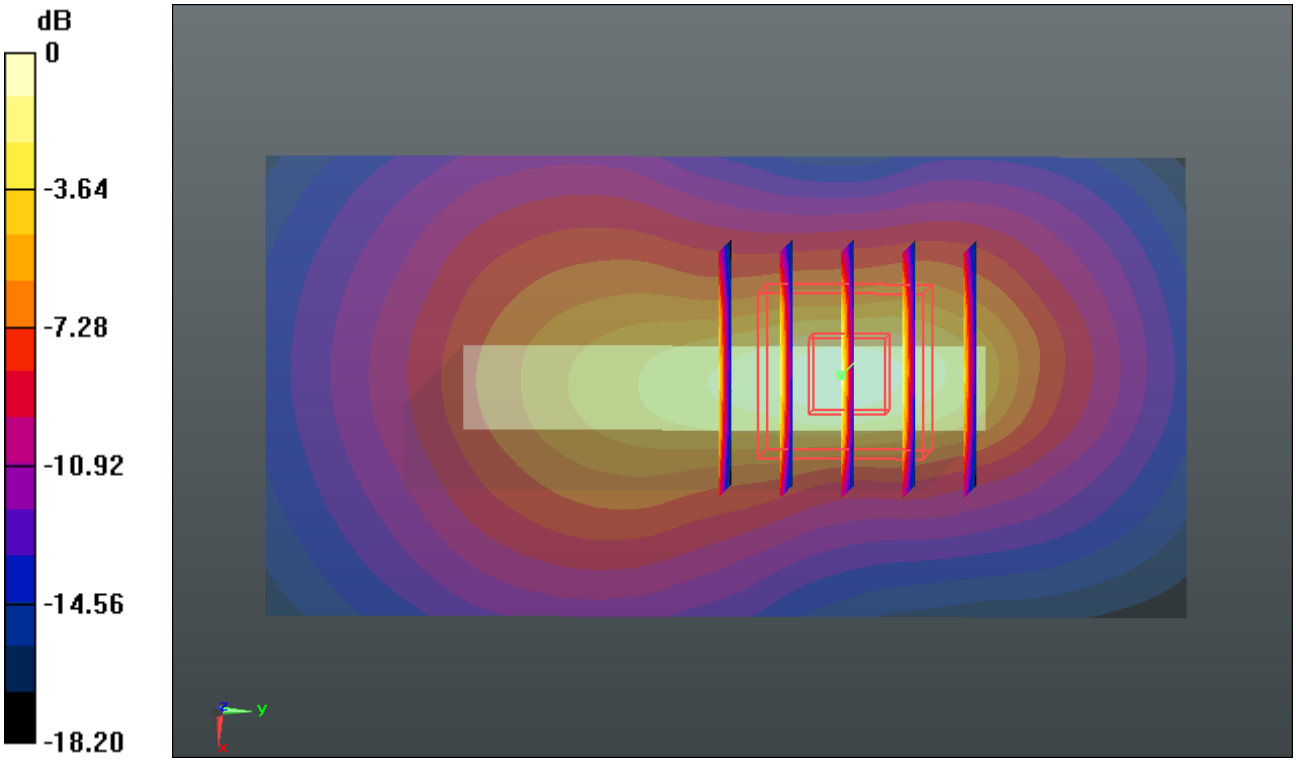
#11_GSM1900_GPRS (4 Tx slots)_Bottom Side 1cm_Ch810

Communication System: GPRS/EDGE (4 Tx slots) (0); Frequency: 1909.8 MHz;Duty Cycle: 1:2.08
Medium: MSL_1900_150328 Medium parameters used: f = 1909.8 MHz; σ = 1.562 mho/m; ε_r = 53.359; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.56, 7.56, 7.56); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Ch810/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.944 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.536 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 1.174 W/kg
SAR(1 g) = 0.675 mW/g; SAR(10 g) = 0.336 mW/g
Maximum value of SAR (measured) = 0.966 mW/g



0 dB = 0.970mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015.03.29

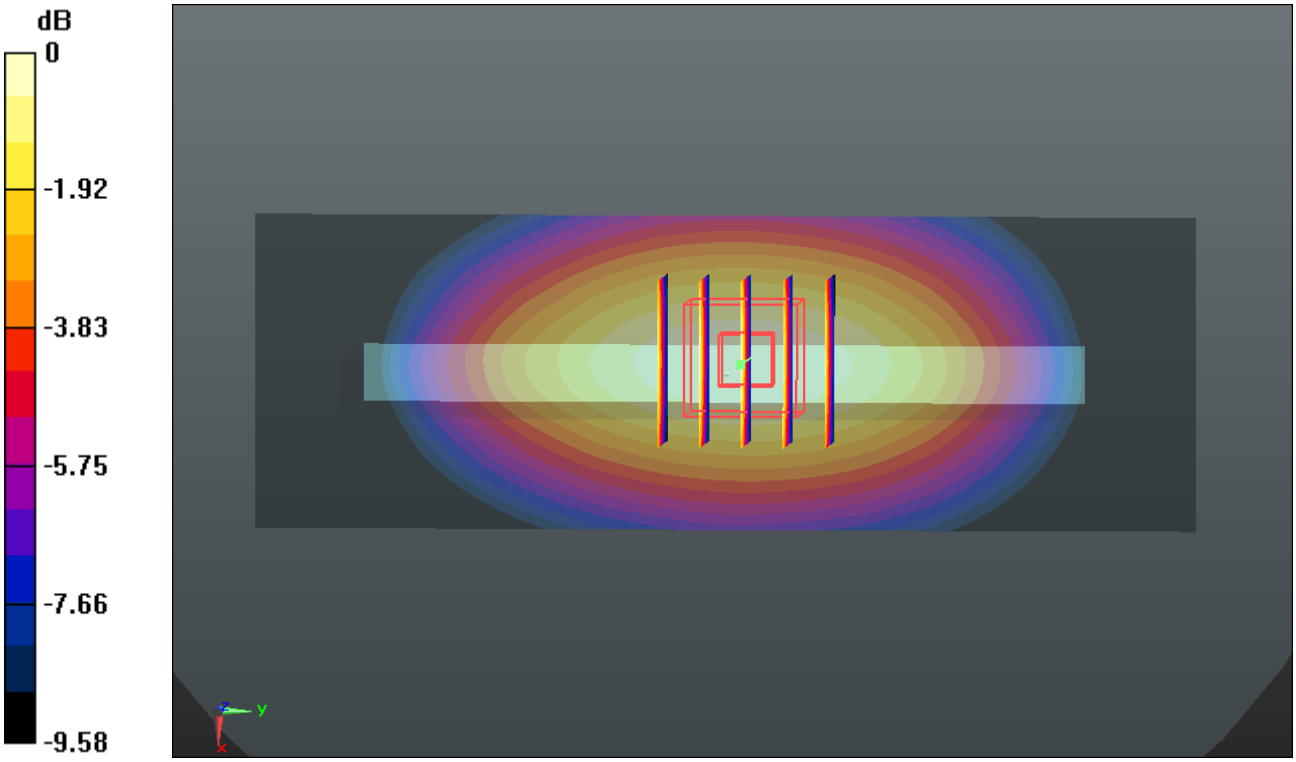
#12_WCDMA Band V_RMC 12.2Kbps_Left Side 1cm_Ch4233

Communication System: UMTS (0); Frequency: 846.6 MHz;Duty Cycle: 1:1
Medium: MSL_850_150329 Medium parameters used: f = 846.6 MHz; σ = 0.992 mho/m; ε_r = 54.358; ρ = 1000 kg/m^3
Ambient Temperature：23.8 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.31, 9.31, 9.31); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Ch4233/Area Scan (41x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.302 mW/g

Ch4233/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.260 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.346 W/kg
SAR(1 g) = 0.247 mW/g; SAR(10 g) = 0.171 mW/g
Maximum value of SAR (measured) = 0.302 mW/g



0 dB = 0.300mW/g

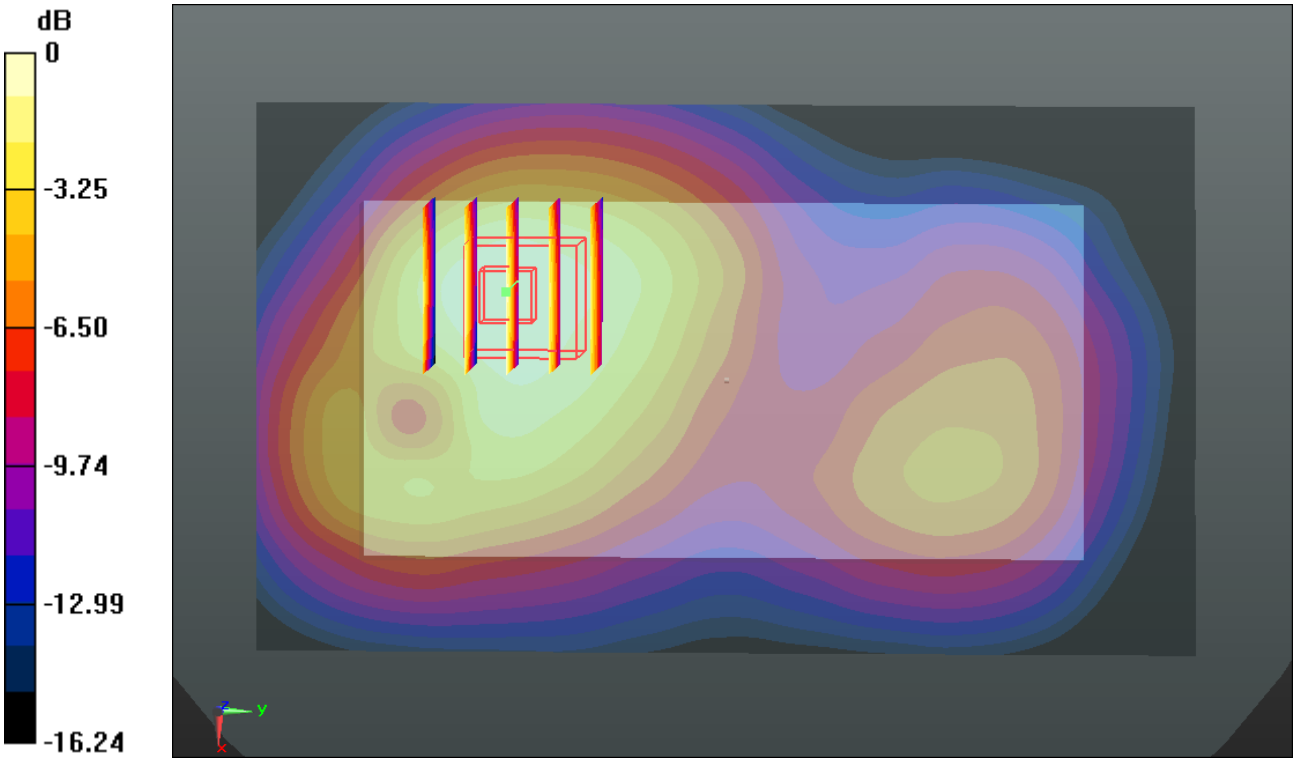
#13_WCDMA Band IV_RMC 12.2Kbps_Back 1cm_Ch1312

Communication System: UMTS (0); Frequency: 1712.4 MHz;Duty Cycle: 1:1
Medium: MSL_1750_150328 Medium parameters used: f = 1712.4 MHz; σ = 1.474 mho/m; ε_r = 55.318; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃; Liquid Temperature：22.9 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.89, 7.89, 7.89); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Ch1312/Area Scan (71x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.914 mW/g

Ch1312/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.155 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 1.022 W/kg
SAR(1 g) = 0.681 mW/g; SAR(10 g) = 0.443 mW/g
Maximum value of SAR (measured) = 0.859 mW/g



0 dB = 0.860mW/g

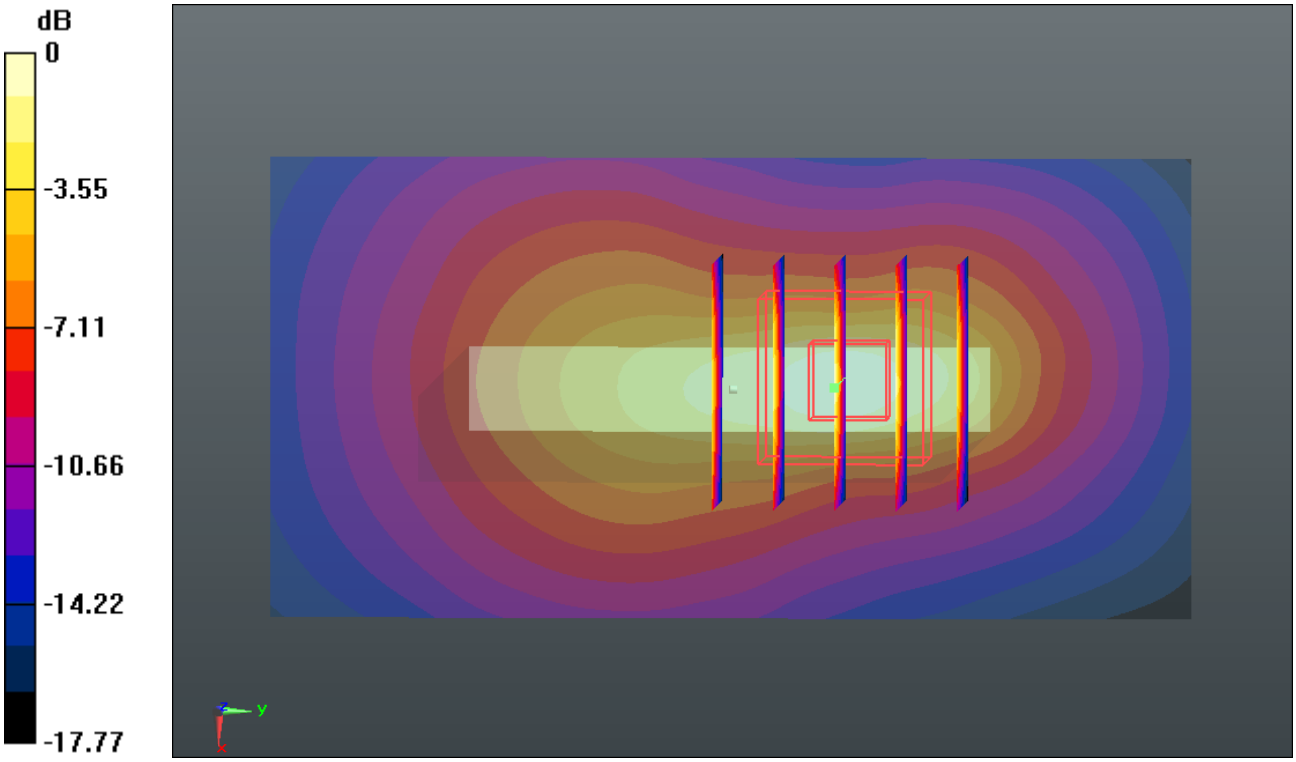
#14_WCDMA Band II_RMC 12.2Kbps_Bottom Side 1cm_Ch9262

Communication System: UMTS (0); Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium: MSL_1900_150328 Medium parameters used: f = 1852.4 MHz; σ = 1.495 mho/m; ε_r = 53.498; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.56, 7.56, 7.56); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Ch9262/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.893 mW/g

Ch9262/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.134 V/m; Power Drift = 0.0048 dB
Peak SAR (extrapolated) = 1.083 W/kg
SAR(1 g) = 0.637 mW/g; SAR(10 g) = 0.325 mW/g
Maximum value of SAR (measured) = 0.888 mW/g



0 dB = 0.890mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015.03.29

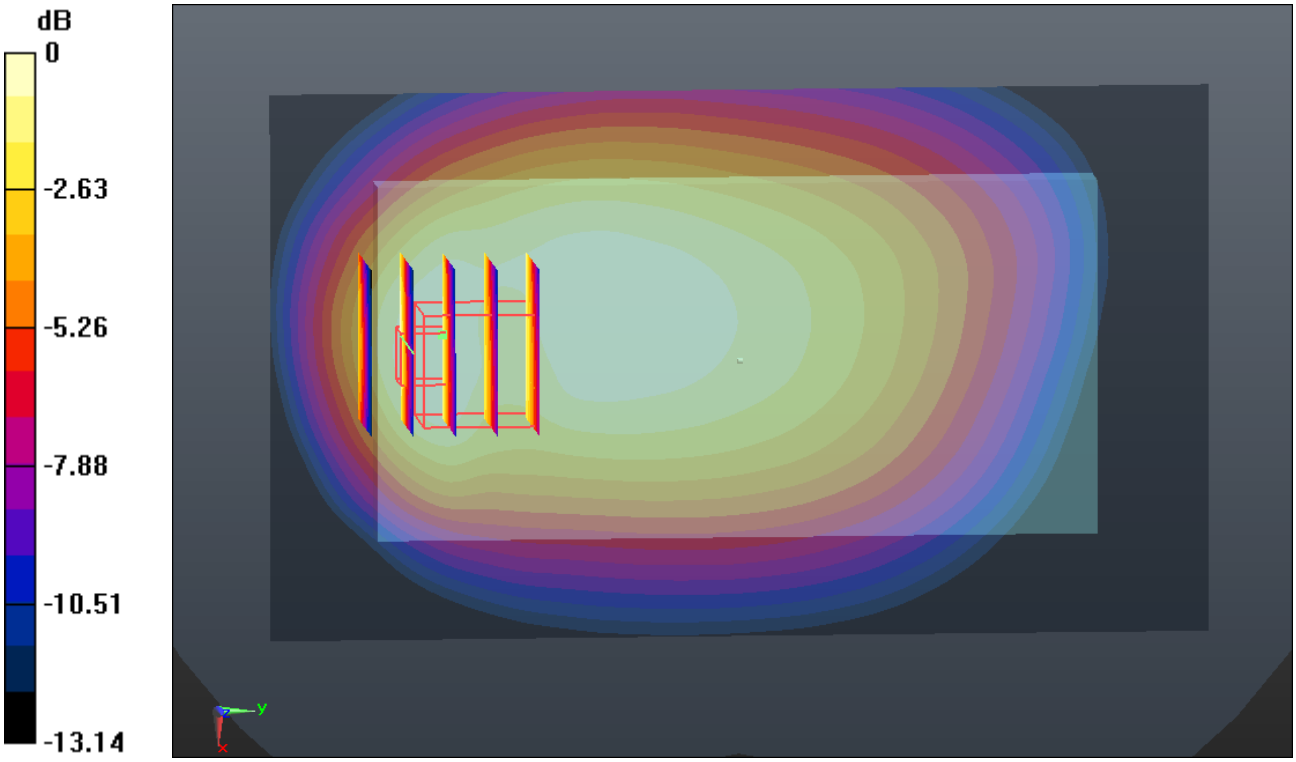
#15_LTE Band12_10M_QPSK(25,24)_Back 1cm_Ch23095

Communication System: FDD_LTE (0); Frequency: 707.5 MHz;Duty Cycle: 1:1
Medium: MSL_750_150329 Medium parameters used: f = 707.5 MHz; σ = 0.933 mho/m; ε_r = 55.206; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃; Liquid Temperature：22.9 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.46, 9.46, 9.46); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Ch23095/Area Scan (71x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.711 mW/g

Ch23095/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.831 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.869 W/kg
SAR(1 g) = 0.513 mW/g; SAR(10 g) = 0.327 mW/g
Maximum value of SAR (measured) = 0.667 mW/g



0 dB = 0.670mW/g

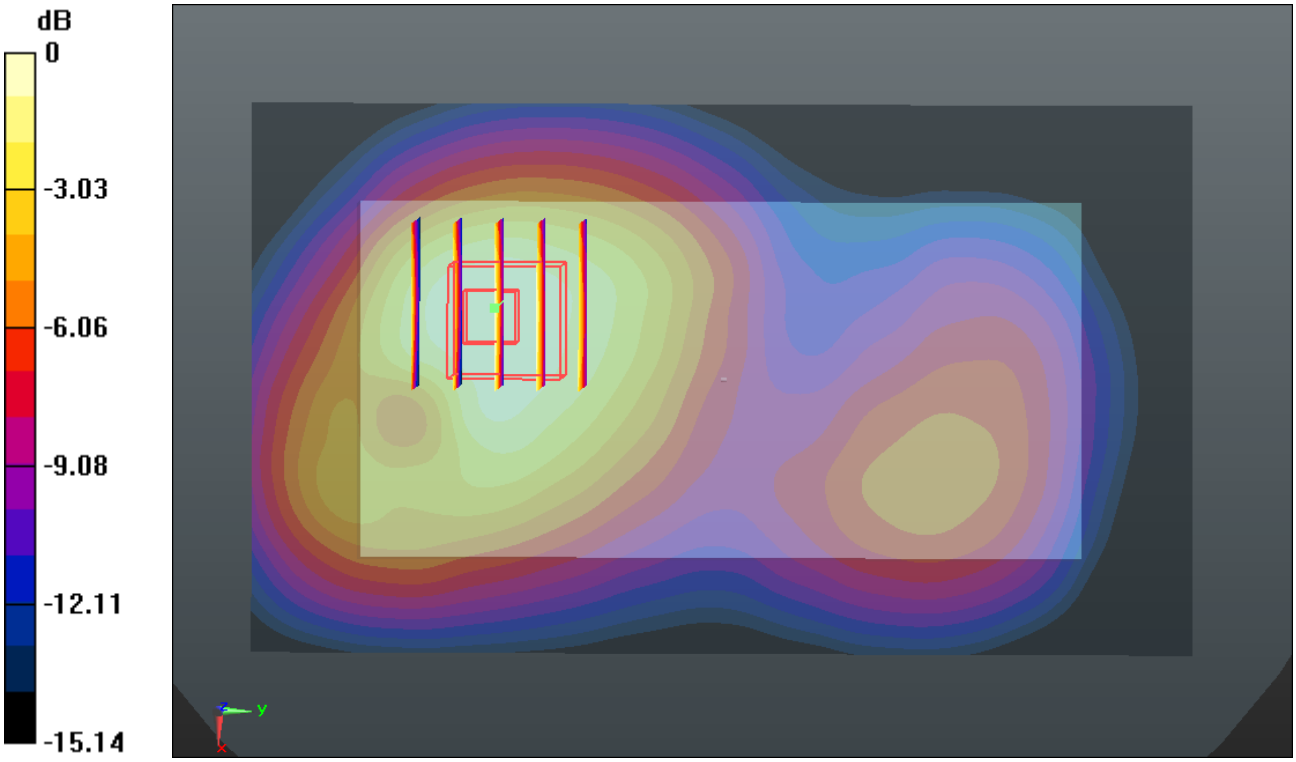
#16_LTE Band4_20M_QPSK(1,0)_Back 1cm_Ch20050

Communication System: FDD_LTE (0); Frequency: 1720 MHz;Duty Cycle: 1:1
Medium: MSL_1750_150328 Medium parameters used: f = 1720 MHz; σ = 1.482 mho/m; ε_r = 55.302; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃; Liquid Temperature：22.9 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.89, 7.89, 7.89); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Ch20050/Area Scan (71x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.865 mW/g

Ch20050/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.500 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 1.001 W/kg
SAR(1 g) = 0.672 mW/g; SAR(10 g) = 0.440 mW/g
Maximum value of SAR (measured) = 0.836 mW/g



0 dB = 0.840mW/g

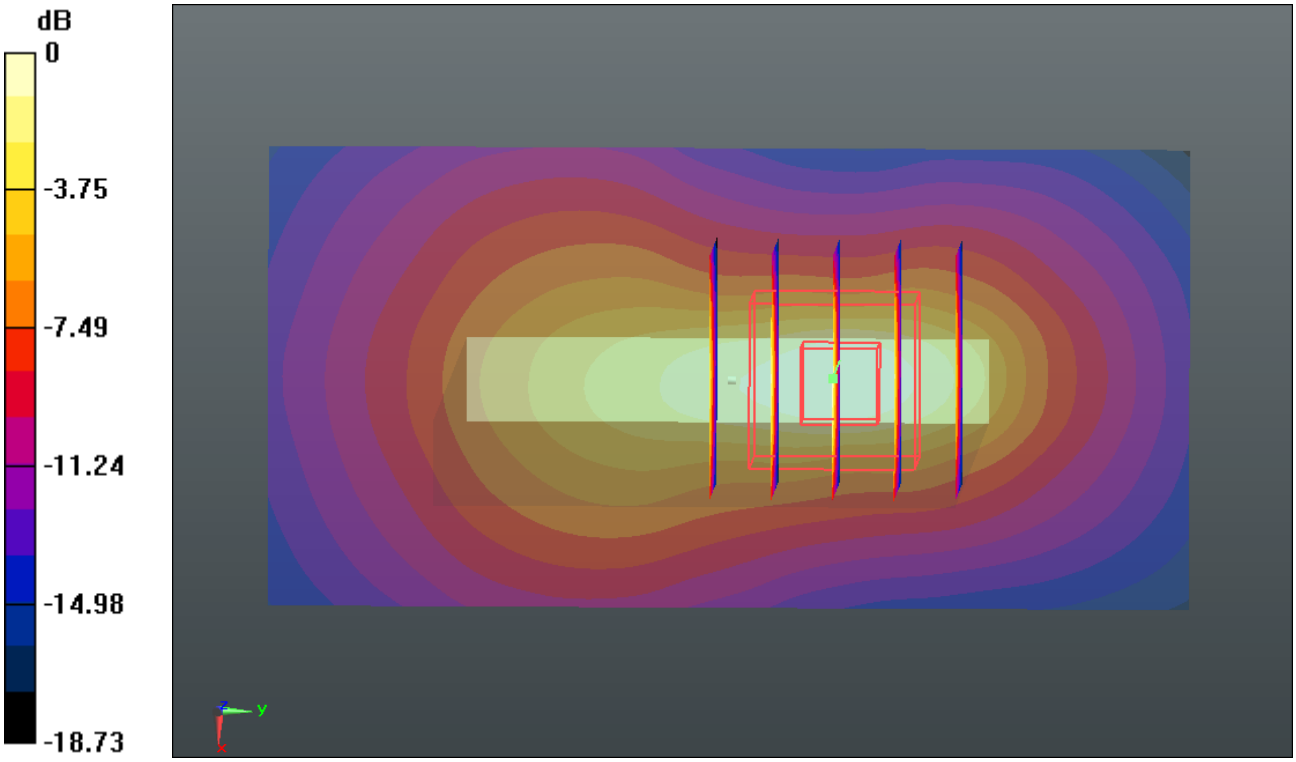
#17_LTE Band2_20M_QPSK(1,0)_Bottom Side 1cm_Ch18900

Communication System: FDD_LTE (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: MSL_1900_150328 Medium parameters used: f = 1880 MHz; σ = 1.528 mho/m; ε_r = 53.444; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.56, 7.56, 7.56); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Ch18900/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.886 mW/g

Ch18900/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.974 V/m; Power Drift = -0.046 dB
Peak SAR (extrapolated) = 0.961 W/kg
SAR(1 g) = 0.551 mW/g; SAR(10 g) = 0.276 mW/g
Maximum value of SAR (measured) = 0.790 mW/g



0 dB = 0.790mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015.04.24

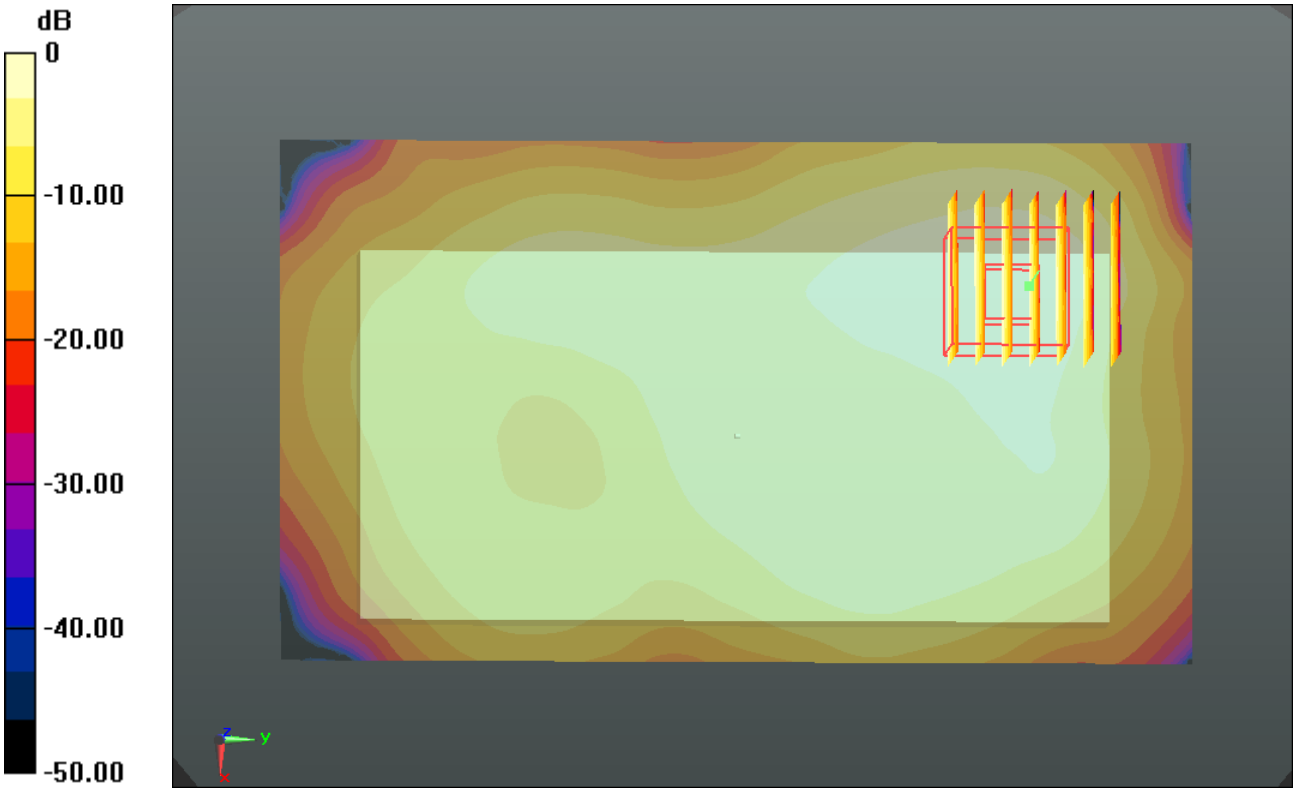
#18_WLAN 2.4GHz_802.11b 1Mbps_1M_Front 1cm_Ch11

Communication System: WIFI (0); Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: MSL_2450_150424 Medium parameters used: f = 2462 MHz; σ = 1.959 mho/m; ε_r = 50.915; ρ = 1000 kg/m^3
Ambient Temperature：23.8 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.14, 7.14, 7.14); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Ch11/Area Scan (81x141x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (interpolated) = 0.263 mW/g

Ch11/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.150 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.358 W/kg
SAR(1 g) = 0.186 mW/g; SAR(10 g) = 0.097 mW/g
Maximum value of SAR (measured) = 0.263 mW/g



0 dB = 0.260mW/g

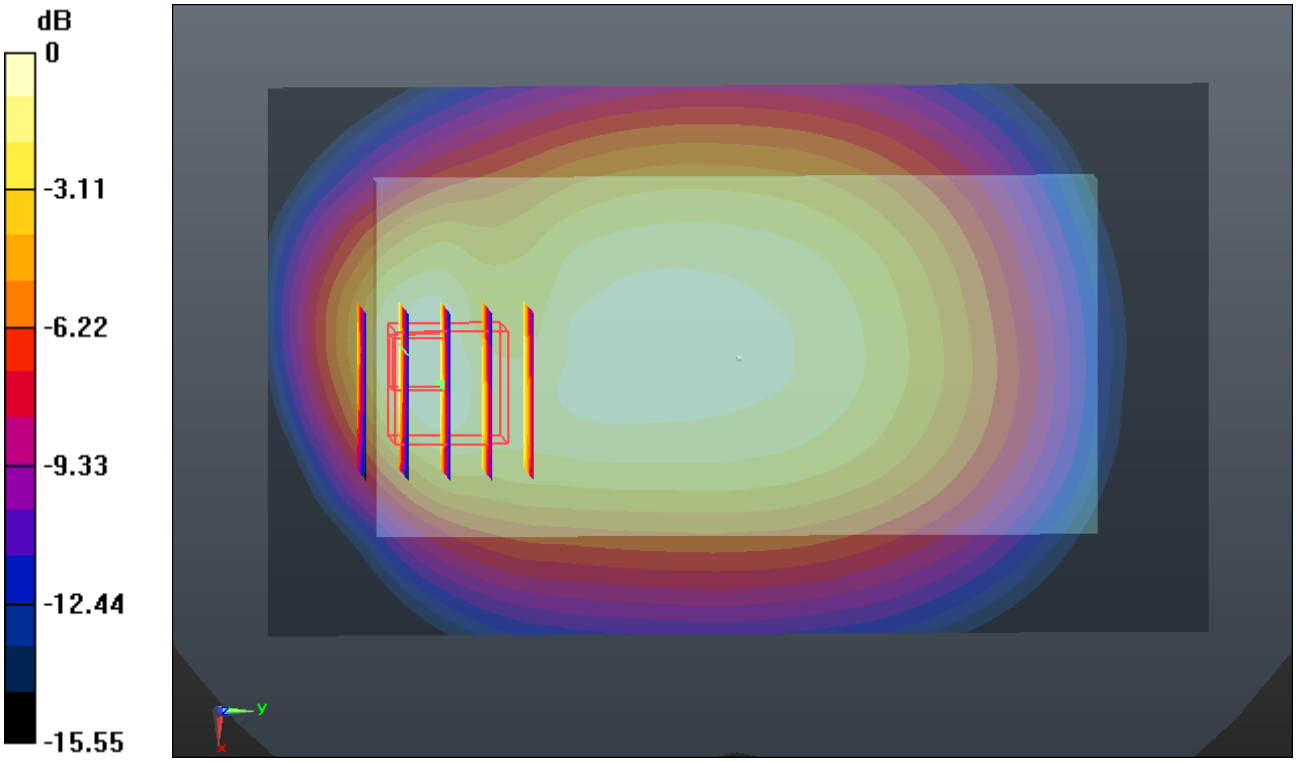
#19_GSM850_GPRS (4 Tx slots)_Back 1cm_Ch189

Communication System: GPRS/EDGE (4 Tx slots) (0); Frequency: 836.4 MHz;Duty Cycle: 1:2.08
Medium: MSL_850_150329 Medium parameters used: f = 836.4 MHz; σ = 0.982 mho/m; ε_r = 54.468; ρ = 1000 kg/m^3
Ambient Temperature：23.8 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.31, 9.31, 9.31); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Ch189/Area Scan (71x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.638 mW/g

Ch189/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.149 V/m; Power Drift = 0.0049 dB
Peak SAR (extrapolated) = 0.810 W/kg
SAR(1 g) = 0.445 mW/g; SAR(10 g) = 0.255 mW/g
Maximum value of SAR (measured) = 0.607 mW/g



0 dB = 0.610mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015.03.28

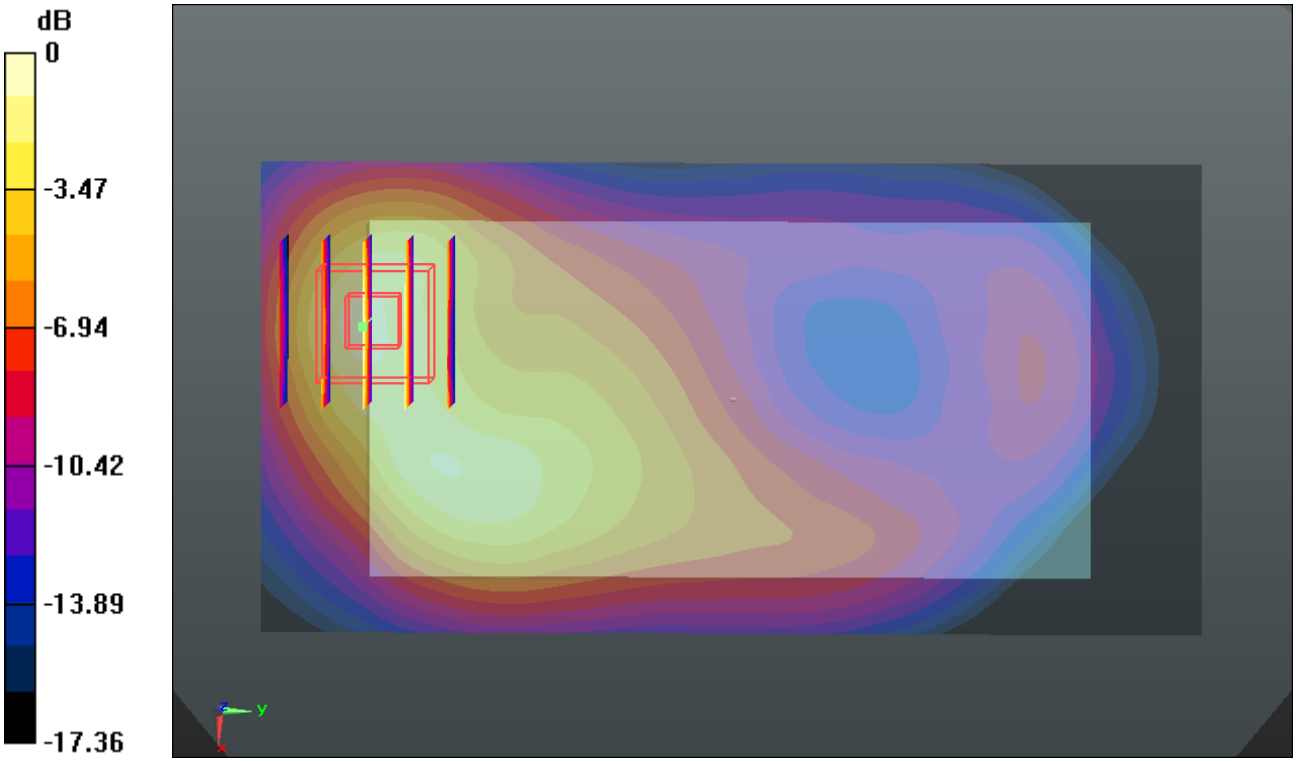
#20_GSM1900_GPRS (4 Tx slots)_Front 1cm_Ch810

Communication System: GPRS/EDGE (4 Tx slots) (0); Frequency: 1909.8 MHz;Duty Cycle: 1:2.08
Medium: MSL_1900_150328 Medium parameters used: f = 1909.8 MHz; σ = 1.562 mho/m; ε_r = 53.359; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.56, 7.56, 7.56); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Ch810/Area Scan (61x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.609 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.379 V/m; Power Drift = -0.023 dB
Peak SAR (extrapolated) = 0.843 W/kg
SAR(1 g) = 0.510 mW/g; SAR(10 g) = 0.276 mW/g
Maximum value of SAR (measured) = 0.682 mW/g



0 dB = 0.680mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2015.03.29

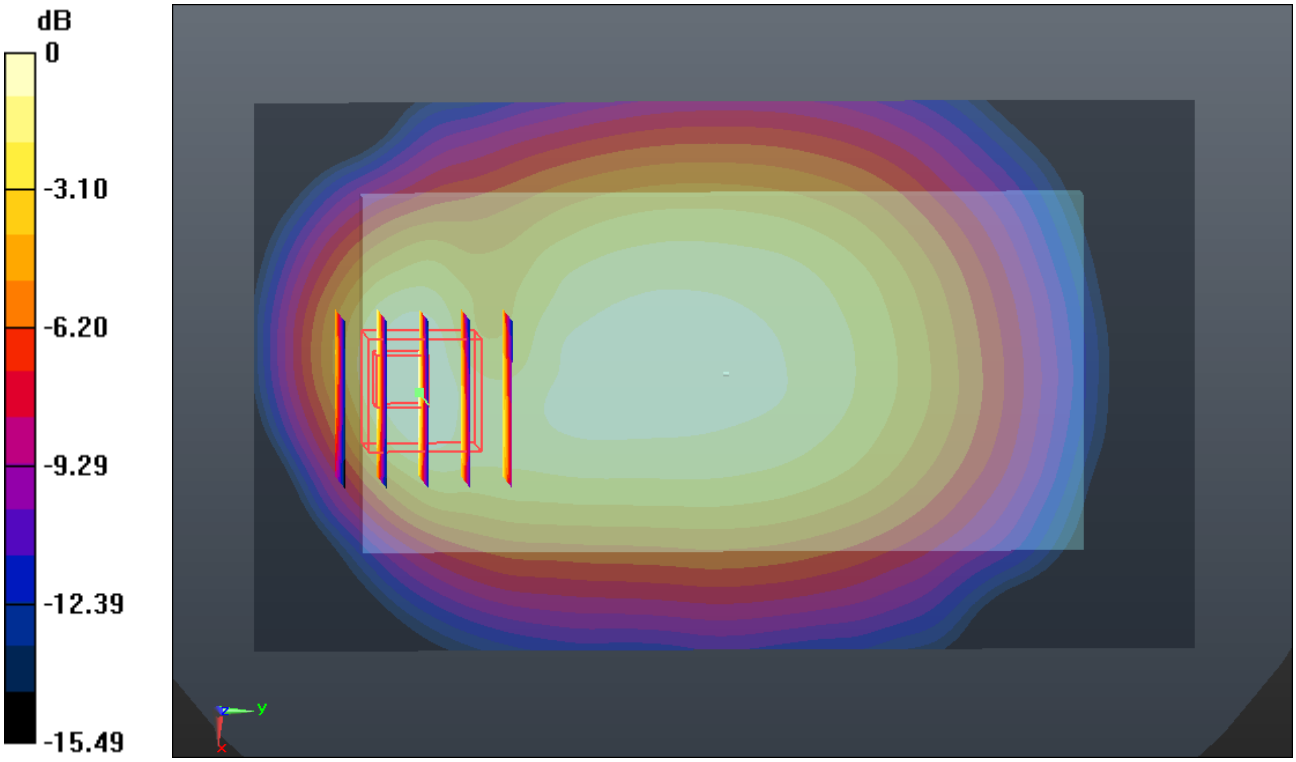
#21_WCDMA Band V_RMC 12.2Kbps_Back 1cm_Ch4233

Communication System: UMTS (0); Frequency: 846.6 MHz;Duty Cycle: 1:1
Medium: MSL_850_150329 Medium parameters used: f = 846.6 MHz; σ = 0.992 mho/m; ε_r = 54.358; ρ = 1000 kg/m^3
Ambient Temperature：23.8 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.31, 9.31, 9.31); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Ch4233/Area Scan (71x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.235 mW/g

Ch4233/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.309 V/m; Power Drift = 0.0042 dB
Peak SAR (extrapolated) = 0.304 W/kg
SAR(1 g) = 0.166 mW/g; SAR(10 g) = 0.091 mW/g
Maximum value of SAR (measured) = 0.220 mW/g



0 dB = 0.220mW/g

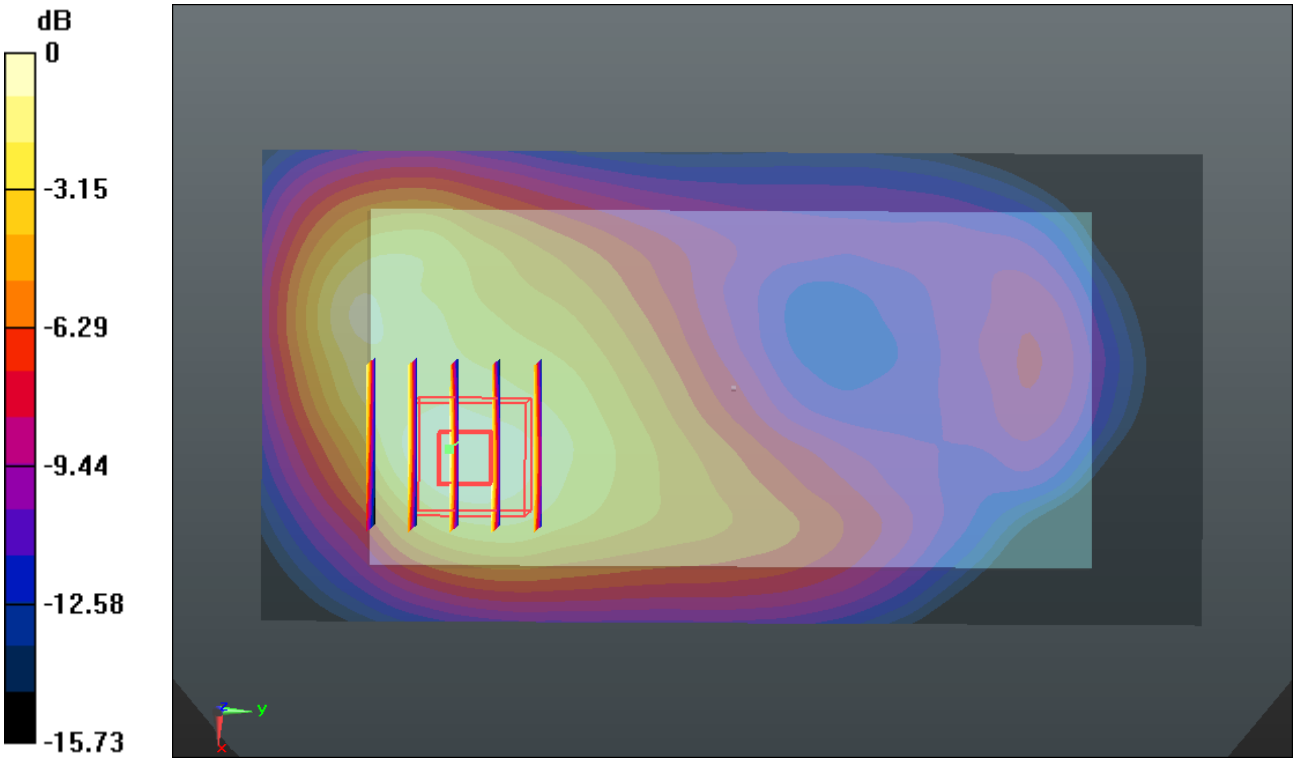
#22_WCDMA Band II_RMC 12.2Kbps_Front 1cm_Ch9262

Communication System: UMTS (0); Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium: MSL_1900_150328 Medium parameters used: f = 1852.4 MHz; σ = 1.495 mho/m; ε_r = 53.498; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.56, 7.56, 7.56); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Ch9262/Area Scan (61x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.662 mW/g

Ch9262/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.736 V/m; Power Drift = -0.021 dB
Peak SAR (extrapolated) = 0.799 W/kg
SAR(1 g) = 0.504 mW/g; SAR(10 g) = 0.304 mW/g
Maximum value of SAR (measured) = 0.658 mW/g



0 dB = 0.660mW/g

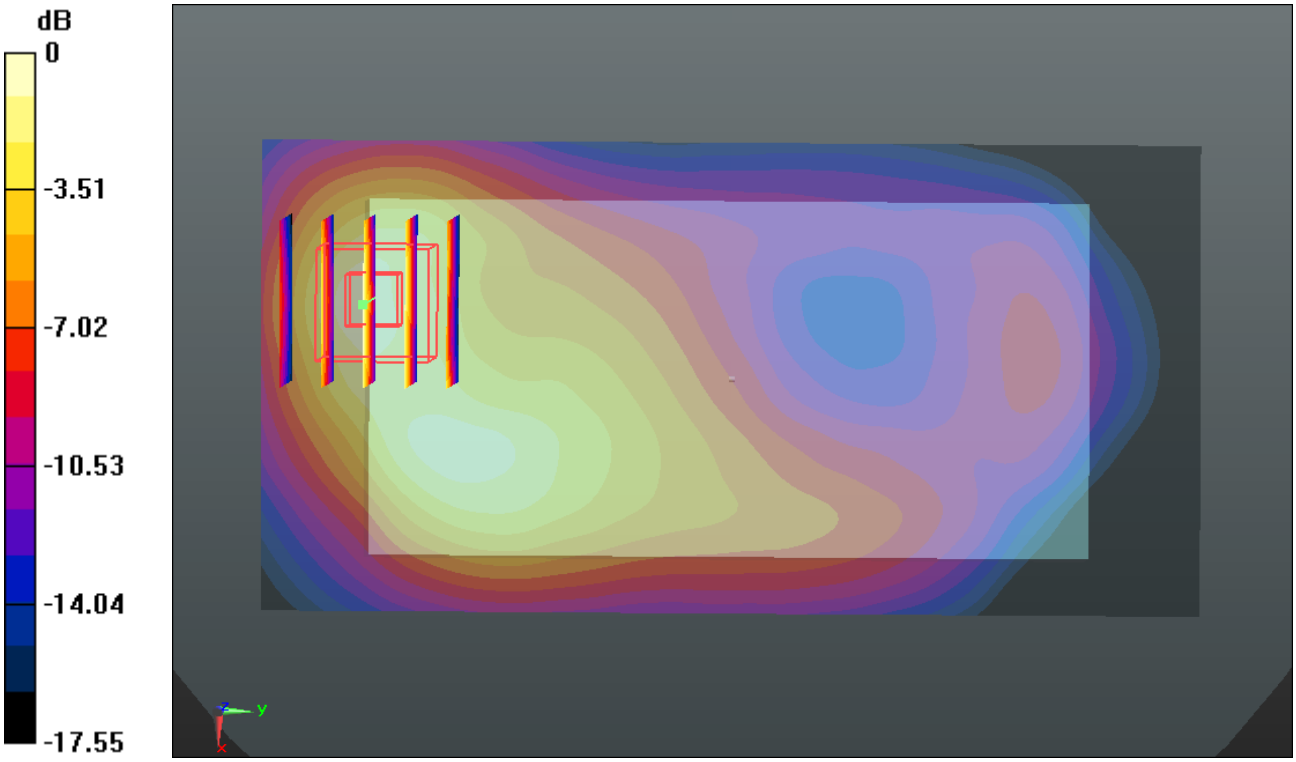
#23_LTE Band2_20M_QPSK(1,0)_Front 1cm_Ch18900

Communication System: FDD_LTE (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: MSL_1900_150328 Medium parameters used: f = 1880 MHz; σ = 1.528 mho/m; ε_r = 53.444; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.56, 7.56, 7.56); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Ch18900/Area Scan (61x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.513 mW/g

Ch18900/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.557 V/m; Power Drift = -0.024 dB
Peak SAR (extrapolated) = 0.664 W/kg
SAR(1 g) = 0.399 mW/g; SAR(10 g) = 0.217 mW/g
Maximum value of SAR (measured) = 0.536 mW/g



0 dB = 0.540mW/g