FCC SAR Test Report

Equipment	:	**LTE Module**
Brand Name	:	**Gemtek**
Model No.	:	**ME936**
FCC ID	:	**MXF-WRTD303NME936**
Standard	:	**FCC 47 CFR Part 2 (2.1093)** **ANSI/IEEE C95.1-1992** **IEEE 1528-2003**
Applicant	:	**Gemtek Technology Co., Ltd.** **No.15-1 Zhonghua Road, Hsinchu Industrial Park, Hukou, Hsinchu, Taiwan, 30352**

The product sample received on Nov. 27, 2014 and completely tested on Dec. 17, 2014. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown the 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 INC., the test report shall not be reproduced except in full.

Reviewed by:

Gary Chang / Manager

Testing Laboratory
1190

Table of Contents

APPENDIX A. Plots of System Performance Check

APPENDIX B. Plots of SAR Measurement

APPENDIX C. DASY Calibration Certificate

APPENDIX D. Test setup Photos

Revision History

Report No.	Version	Description	Issued Date
FA4N1912	Rev. 01	Initial issue of report	Jan. 21, 2015

1 Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing as follows.

Exposure Position	Frequency Band	Reported 1g SAR (W/kg)	Equipment Class	Highest Reported 1g SAR (W/kg)
Body	WCDMA Band 2	0.98	PCB	1.14
	WCDMA Band 4	0.61		
	WCDMA Band 5	0.43		
	LTE Band 2	1.14		
	LTE Band 4	0.51		
	LTE Band 5	0.30		
	LTE Band 7	0.29		
	LTE Band 13	0.32		
	LTE Band 17	0.27		

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.

1.1 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 941225 D01 3G SAR Procedures v03
- FCC KDB 941225 D05 SAR for LTE Devices v02r03
- FCC KDB 941225 D06 Hotspot Mode v02

1.2 Testing Location Information

Testing Location		
Wen	ADD	: No. 13-1, Ln. 19, Wen 33rd St., Kwei-Shan Hsiag, Tao Yuan Hsien, Taiwan, R.O.C.
	TEL	: 886-3-3180792

2 Equipment Under Test (EUT)

2.1 General Information

Product Feature & Specification	
Equipment Name	LTE Module
Brand Name	Gemtek
Model Name	ME936
FCC ID	MXF-WRTD303NME936
Frequency Range	<WCDMA> Uplink : 826.4~846.6 MHz 1712.4 ~ 1752.6 MHz 1852.4~1907.6 MHz Downlink: 871.4~891.6 MHz 2112.4~2152.6 MHz 1932.4~1987.6 MHz <LTE> Uplink : 1850.7 ~ 1909.3 MHz 1710.7 ~ 1754.3 MHz 824.7 ~ 848.3 MHz 2502.5 ~ 2567.5 MHz 779.5 ~ 784.5 MHz 706.5 ~ 713.5 MHz Downlink: 1930.7 ~ 1989.3 MHz 2110.7 ~ 2154.3 MHz 869.7 ~ 893.3 MHz 2622.5 ~ 2687.5 MHz 748.5 ~ 753.5 MHz 736.5 ~ 743.5 MHz
Channel Bandwidth	<WCDMA> Band 2 / 4 / 5 : 5MHz <LTE> Band 2: 1.4 / 3 / 5 / 10 / 15 / 20 Band 4: 1.4 / 3 / 5 / 10 / 15 / 20 Band 5: 3 / 5 / 10 Band 7: 5 / 10 / 15 / 20 Band 13: 5 / 10 Band 17: 5 / 10
Antenna type gain	PIFA Antenna 1.2 dBi @ 704 ~ 716 MHz 1.4 dBi @ 777 ~ 787 MHz 1.3 dBi @ 824~ 849 MHz 1.4 dBi @ 1710 ~ 1755 MHz 1.6 dBi @ 1850 ~ 1910 MHz 3 dBi @ 2500 ~ 2570 MHz
EUT Stage	Identical Prototype

The EUT is a LTE module which will be installed in below specific platform (next page). Thus, SAR test configuration is LTE module with this platform.

Information of Platform

Platform information	
Brand Name	Gemtek
Product Name	Easy Connect
Model No.	WRTD-303N
FCC ID	MXF-WRTD303N

Specification of Accessory for platform		
Battery	Brand Name	WTE Battery
	Model Name	303N
	Power Rating	7.4V, 4050mAh, 29.97Wh

3 RF Exposure Limits

3.1 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.

3.2 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
14.02	13.20	13.13

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.

4 Specific Absorption Rate (SAR)

4.1 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.

4.2 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:

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

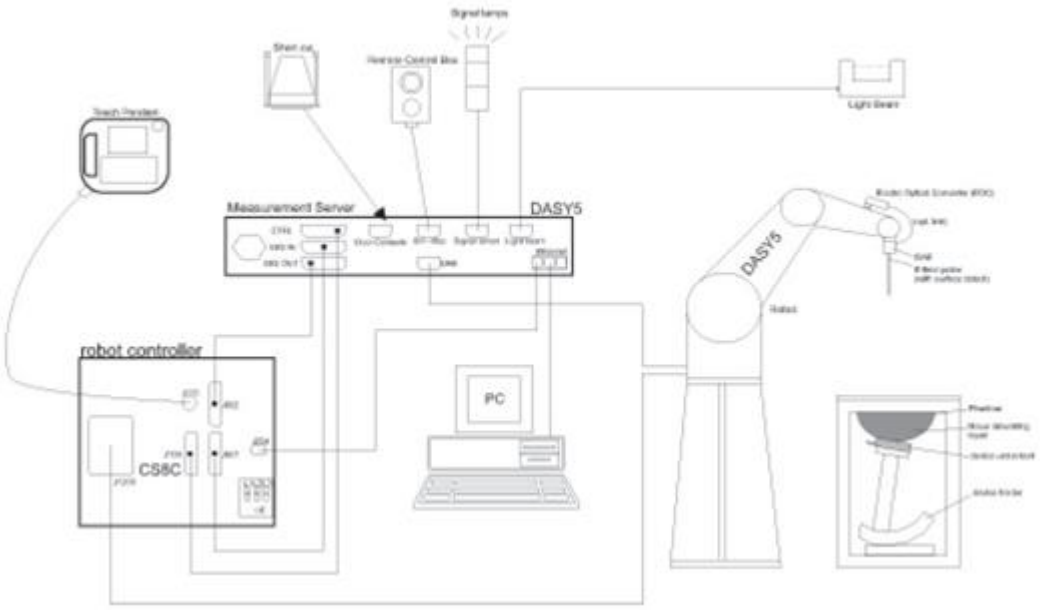
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

5 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.

6 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

6.1 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
(g) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
(b) Generation of a high-resolution mesh within the measured volume
(c) Interpolation of all measured values form the measurement grid to the high-resolution grid
(d) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
(e) Calculation of the averaged SAR within masses of 1g and 10g

6.2 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.

6.3 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 v01r01.

	≤ 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.	

6.4 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 v01r01.

			≤ 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	≤ $1.5 \cdot \Delta z_{Zoom}(n-1)$	
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.

6.5 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.

6.6 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.

7 Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	Data Acquisition Electronics	DAE4	1424	2014/2/11	2015/2/10
SPEAG	Dosimetric E-Field Probe	EX3DV4	3976_01	2014/2/17	2015/2/16
SPEAG	750MHz System Validation Kit	D750V3	1107_01	2014/2/6	2015/2/5
SPEAG	835MHz System Validation Kit	D835V2	4d167_01	2014/2/6	2015/2/5
SPEAG	1750MHz System Validation Kit	D1750V2	1112_01	2014/2/11	2015/2/10
SPEAG	1900MHz System Validation Kit	D1900V2	5d185_01	2014/2/7	2015/2/6
SPEAG	2600MHz System Validation Kit	D2600V2	1078_01	2014/2/12	2015/2/11
SPEAG	Device Holder	N/A	N/A	NCR	NCR
Mini-Circuits	Power Amplifier	ZHL-42W+	15542	NCR	NCR
Mini-Circuits	Power Amplifier	ZVE-8G+	605601404	NCR	NCR
Agilent	ENA Series Network Analyzer	E5071C	MY46419201	2014/1/15	2015/1/14
Agilent	EXA Signal Analyzer	N9010A	MY54200432	2014/8/16	2015/8/15
Agilent	Wireless communication test Set	8960	MY53202225	2014/7/7	2015/7/6
Agilent	MXG-B RF Vector Signal Generator	N5182B	MY53050081	2014/4/8	2015/4/7
SPEAG	Dielectric Probe Kit	SM DAK 040CA	1146	NCR	NCR
Anritsu	Power Meter	ML2495A	949003	2014/1/28	2015/1/27
Anritsu	Power sensor	MA2411B	917017	2014/1/28	2015/1/27
Anritsu	Radio Communication Analyzer	MT8820C	6201240341	2014/3/18	2015/3/17
SPEAG	SAM Phantom	QD 000 P40 CD	1815	NCR	NCR
SPEAG	Flat Phantom ELI5.0	QD OVA 002 AA	1238	NCR	NCR
Wisewind	Themometer	HTC1	HTC1	2014/12/25	2015/12/24
Wisewind	Themometer	YF-160A	130504609	2014/12/25	2015/12/24

General Note:

1. The calibration certificate of DASY can be referred to appendix C of this report.
2. The Insertion Loss calibration of Dual Directional Coupler and Attenuator were characterized via the network analyzer and compensated during system check.
3. In system check we need to monitor the level on the power meter, and adjust the power amplifier level to have precise power level to the dipole; the measured SAR will be normalized to 1W input power according to the ratio of 1W to the input power to the dipole. For system check, the calibration of the power amplifier is deemed not critically required for correct measurement; the power meter is critical and we do have calibration for it
4. Attenuator 1 insertion loss is calibrated by the network Analyzer, which the calibration is valid, before system check.
5. NCR: No calibration request.

8 System Verification

8.1 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 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
1750	70.2	0	0	0.4	0	29.4	1.49	53.4
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
2600	68.1	0	0	0.1	0	31.8	2.16	52.5

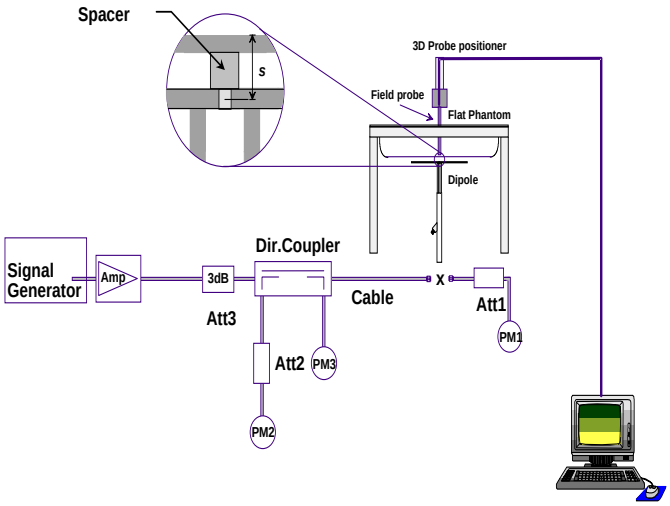
<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (εr)	Conductivity Target (σ)	Permittivity Target (εr)	Delta (σ) (%)	Delta (εr) (%)	Limit (%)	Date
750	22.8	0.969	55.447	0.96	55.5	0.94	-0.10	±5	2014/12/16
835	22.8	0.997	56.967	0.97	55.2	2.78	3.20	±5	2014/12/10
835	23.0	0.987	56.289	0.97	55.2	1.75	1.97	±5	2014/12/16
1750	22.9	1.451	52.888	1.49	53.4	-2.62	-0.96	±5	2014/12/10
1750	22.8	1.45	53.046	1.49	53.4	-2.68	-0.66	±5	2014/12/12
1900	22.7	1.533	53.834	1.52	53.3	0.86	1.00	±5	2014/12/9
1900	22.7	1.534	54.122	1.52	53.3	0.92	1.54	±5	2014/12/11
2600	22.9	2.185	52.038	2.16	52.5	1.16	-0.88	±5	2014/12/17

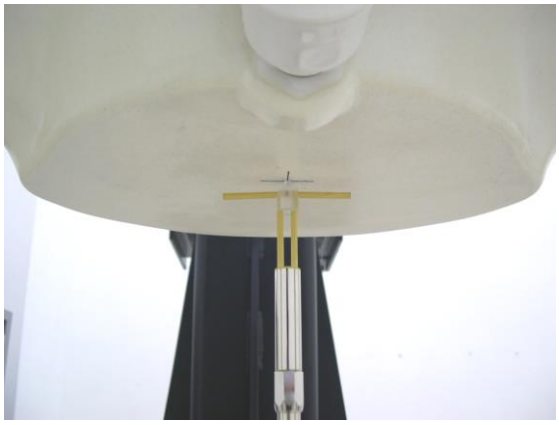
8.2 System Performance Check Results

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 (%)
2014/12/16	750	Body	250	1107	3976	1424	2.11	8.54	8.44	-1.171
2014/12/10	835	Body	250	4d167	3976	1424	2.39	9.38	9.56	1.919
2014/12/16	835	Body	250	4d167	3976	1424	2.32	9.38	9.28	-1.066
2014/12/10	1750	Body	250	1112	3976	1424	8.97	36.3	35.88	-1.157
2014/12/12	1750	Body	250	1112	3976	1424	9.13	36.3	36.52	0.606
2014/12/9	1900	Body	250	5d185	3976	1424	10	40.1	40.00	-0.249
2014/12/11	1900	Body	250	5d185	3976	1424	9.77	40.1	39.08	-2.544
2014/12/17	2600	Body	250	1078	3976	1424	13.9	56.2	55.60	-1.068



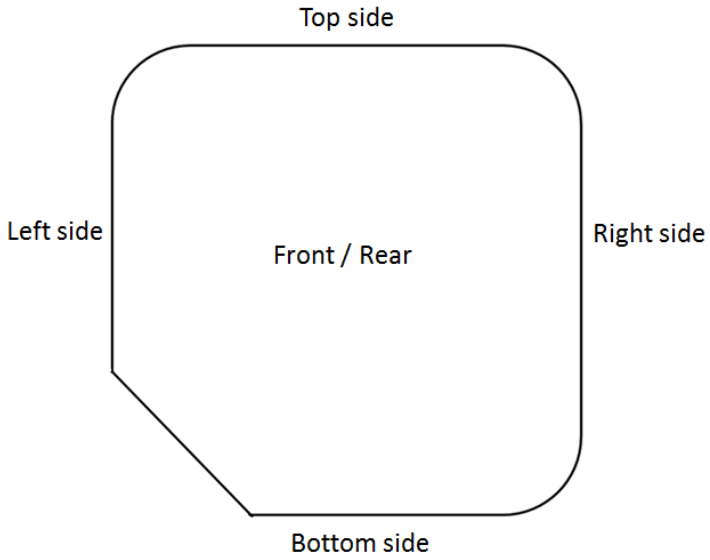
System Performance Check Setup



Setup Photo

9 RF Exposure Positions

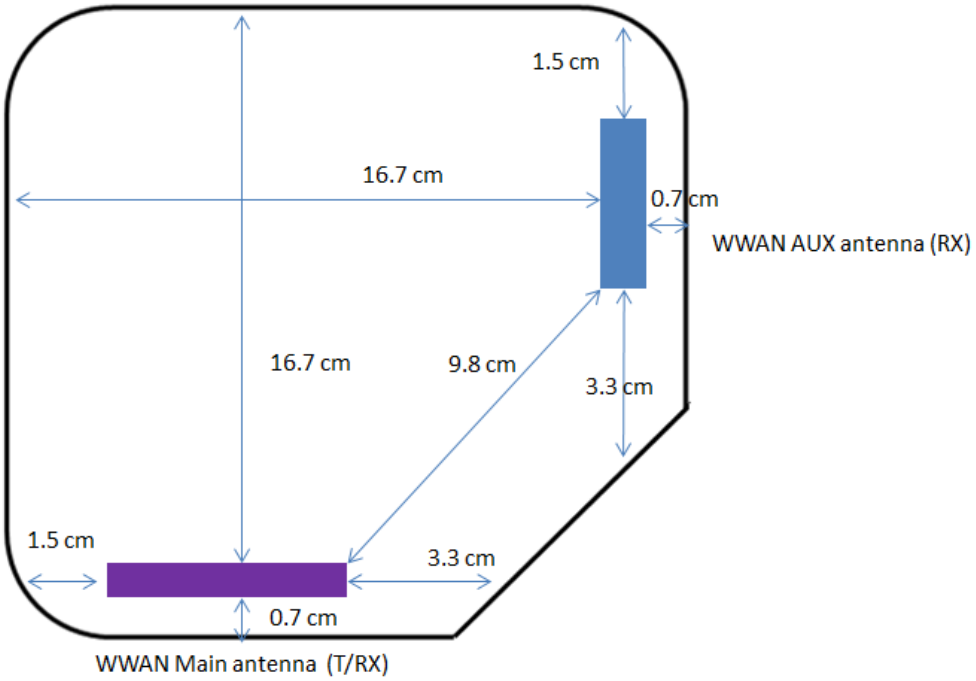
9.1 SAR Testing Position



Please refer to Appendix D. for the test setup photos.

10 Antenna Location and Separation Distance

Rear View



11 Conducted RF Output Power (Unit: dBm)

<WCDMA Conducted Power>

General Note:

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.

A summary of these settings are illustrated below:

HSDPA Setup Configuration:

a. The EUT was connected to Base Station Agilent 8960 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:

1. Set Gain Factors (βc and βd) and parameters were set according to each
2. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
3. Set RMC 12.2Kbps + HSDPA mode.
4. Set Cell Power = -86 dBm
5. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
6. Select HSDPA Uplink Parameters
7. Set Delta ACK, Delta NACK and Delta CQI = 8
8. Set Ack-Nack Repetition Factor to 3
9. Set CQI Feedback Cycle (k) to 4 ms
10. Set CQI Repetition Factor to 2
11. Power Ctrl Mode = All Up bits

d. The transmitted maximum output power was recorded.

Setup Configuration

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 β_{hs} = 30/15 * β_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 β_{hs} = 30/15 * β_c, and Δ_{CQI} = 24/15 with β_{hs} = 24/15 * β_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.

HSDPA Setup Configuration:

a. The EUT was connected to Base Station Agilent 8960 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 * :

1. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
2. Set the Gain Factors (βc and βd) 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
3. Set Cell Power = -86 dBm
4. Set Channel Type = 12.2k + HSPA
5. Set UE Target Power
6. Power Ctrl Mode= Alternating bits
7. Set and observe the E-TFCI
8. 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.

Setup Configuration

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.

< WCDMA Conducted Power Table>

Band	WCDMA II			WCDMA IV			WCDMA V		
Channel	9262	9400	9538	1312	1413	1513	4132	4182	4233
Frequency	1852.4	1880	1907.6	1712.4	1732.6	1752.6	826.4	836.4	846.6
RMC 12.2K	22.93	23.02	22.94	23.12	23.10	23.13	22.71	23.10	23.32
HSDPA Subtest-1	22.90	22.91	22.93	22.98	22.94	23.11	22.74	23.05	23.24
HSDPA Subtest-2	22.61	22.65	22.54	22.75	22.69	22.80	22.25	22.76	22.79
HSDPA Subtest-3	22.07	22.17	22.04	22.28	22.25	22.28	21.82	22.26	22.43
HSDPA Subtest-4	21.84	21.93	21.80	21.99	21.97	22.01	21.46	21.88	22.21
HSUPA Subtest-1	22.03	21.73	21.62	22.23	21.74	21.75	22.28	22.22	22.47
HSUPA Subtest-2	20.32	20.32	20.20	20.54	20.41	20.55	20.49	20.91	21.16
HSUPA Subtest-3	21.35	21.39	21.28	21.63	21.50	21.53	21.57	21.99	22.21
HSUPA Subtest-4	20.60	20.58	20.48	20.86	20.71	20.77	20.73	21.25	21.45
HSUPA Subtest-5	22.70	22.70	22.60	22.70	22.61	22.71	22.65	22.92	23.18
Tune-Up Limit for RMC 12.2K	23.5			23.5			23.5		

<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 Conducted Power Table>

LTE Band 2								
BW	Modulation	RB	RB Offset	Measured Power Low	Measured Power Mid	Measured Power High	Tune Up Limit (dBm)	MPR
Channel				18607	18900	19193		
Frequency(MHz)				1850.7	1880	1977.5		
1.4M	QPSK	1	0	22.19	22.33	22.44	23	0
		1	2	22.24	22.38	22.23		0
		1	5	22.46	22.59	22.33		0
		3	0	22.28	22.38	22.46		0
		3	1	22.29	22.56	22.3		0
		3	3	22.29	22.39	22.29		0
		6	0	21.78	21.83	21.76		1
	16QAM	1	0	21.84	21.77	21.88		1
		1	2	21.77	21.88	21.63		1
		1	5	21.63	21.65	21.9		1
		3	0	21.66	21.73	21.6		1
		3	1	21.61	21.61	21.68		1
		3	3	21.59	21.71	21.62		1
		6	0	20.6	20.67	20.62		2
Channel				18615	18900	19185	Tune Up Limit (dBm)	MPR
Frequency(MHz)				1851.5	1880	1908.5		
3M	QPSK	1	0	22.19	22.5	22.39	23	0
		1	7	22.39	22.25	22.34		0
		1	14	22.34	22.52	22.35		0
		8	0	21.53	21.69	21.56		1
		8	3	21.56	21.62	21.61		1
		8	7	21.54	21.58	21.55		1
		15	0	21.54	21.59	21.56		1
	16QAM	1	0	21.53	22.02	21.81		1
		1	7	21.53	21.63	21.58		1
		1	14	21.84	21.53	21.8		1
		8	0	20.55	20.63	20.52		2
		8	3	20.63	20.59	20.55		2
		8	7	20.57	20.63	20.56		2
		15	0	20.56	20.6	20.57		2
Channel				18625	18900	19175	Tune Up Limit (dBm)	MPR
Frequency(MHz)				1852.5	1880	1907.5		
5M	QPSK	1	0	22.23	22.38	22.47	23	0
		1	12	22.34	22.3	22.41		0
		1	24	22.35	22.32	22.49		0
		12	0	21.49	21.67	21.62		1
		12	6	21.49	21.56	21.49		1
		12	13	21.5	21.56	21.53		1
		25	0	21.56	21.53	21.51		1
	16QAM	1	0	21.83	21.67	21.57		1
		1	12	21.53	21.6	21.86		1
		1	24	21.86	21.59	21.52		1
		12	0	20.53	20.57	20.5		2
		12	6	20.59	20.66	20.52		2
		12	13	20.51	20.66	20.51		2
		25	0	20.53	20.61	20.51		2

LTE Band 2								
BW	Modulation	RB	RB Offset	Measured Power Low	Measured Power Mid	Measured Power High	Tune Up Limit (dBm)	MPR
Channel				18650	18900	19150		
Frequency(MHz)				1855	1880	1905		
10M	QPSK	1	0	22.52	22.58	22.45	23	0
		1	24	22.25	22.33	22.38		0
		1	49	22.54	22.63	22.59		0
		25	0	21.66	21.74	21.64		1
		25	12	21.69	21.68	21.63		1
		25	25	21.65	21.69	21.64		1
		50	0	21.68	21.71	21.66		1
	16QAM	1	0	22.06	21.94	22.09		1
		1	24	21.99	21.67	21.92		1
		1	49	21.65	22.11	21.72		1
		25	0	20.69	20.71	20.7		2
		25	12	20.65	20.69	20.64		2
		25	25	20.64	20.7	20.68		2
		50	0	20.68	20.71	20.64		2
Channel				18675	18900	19125	Tune Up Limit (dBm)	MPR
Frequency(MHz)				1857.5	1880	1902.5		
15M	QPSK	1	0	22.42	22.52	22.35	23	0
		1	37	22.46	22.36	22.36		0
		1	74	22.53	22.61	22.49		0
		36	0	21.64	21.68	21.62		1
		36	19	21.66	21.7	21.65		1
		36	39	21.69	21.72	21.71		1
		75	0	21.7	21.71	21.64		1
	16QAM	1	0	21.78	21.71	21.82		1
		1	37	21.86	21.69	21.72		1
		1	74	21.66	21.84	21.85		1
		36	0	20.82	20.7	20.65		2
		36	19	20.66	20.69	20.67		2
		36	39	20.66	20.69	20.63		2
		75	0	20.68	20.66	20.63		2
Channel				18700	18900	19100	Tune Up Limit (dBm)	MPR
Frequency(MHz)				1860	1880	1900		
20M	QPSK	1	0	22.76	22.78	22.68	23	0
		1	50	22.47	22.48	22.58		0
		1	99	22.79	22.81	22.73		0
		50	0	21.83	21.86	21.82		1
		50	25	21.88	21.89	21.83		1
		50	50	21.87	21.88	21.84		1
		100	0	21.85	21.86	21.82		1
	16QAM	1	0	22.01	22.08	22.03		1
		1	50	21.82	21.98	21.89		1
		1	99	22.06	22.16	22.12		1
		50	0	20.84	20.98	20.87		2
		50	25	20.83	20.88	20.84		2
		50	50	20.87	20.92	20.85		2
		100	0	20.84	20.87	20.82		2

LTE Band 4								
BW	Modulation	RB	RB Offset	Measured Power Low	Measured Power Mid	Measured Power High	Tune Up Limit (dBm)	MPR
Channel				19957	20175	20393		
Frequency(MHz)				1710.7	1732.5	1754.3		
1.4M	QPSK	1	0	22.51	22.41	22.49	23	0
		1	2	22.3	22.42	22.5		0
		1	5	22.68	22.75	22.82		0
		3	0	22.42	22.57	22.51		0
		3	1	22.46	22.52	22.61		0
		3	3	22.3	22.3	22.72		0
		6	0	21.89	21.87	21.96		1
	16QAM	1	0	21.87	21.86	21.92		1
		1	2	21.83	21.89	21.91		1
		1	5	21.91	21.83	22.04		1
		3	0	21.92	21.85	21.94		1
		3	1	21.85	21.89	21.93		1
		3	3	21.89	21.86	21.9		1
		6	0	20.84	20.83	20.88		2
Channel				19965	20175	20385	Tune Up Limit (dBm)	MPR
Frequency(MHz)				1711.5	1732.5	1753.5		
3M	QPSK	1	0	22.47	22.44	22.48	23	0
		1	7	22.48	22.41	22.53		0
		1	14	22.43	22.56	22.66		0
		8	0	21.68	21.69	21.72		1
		8	3	21.68	21.74	21.76		1
		8	7	21.84	21.89	21.91		1
		15	0	21.72	21.73	21.77		1
	16QAM	1	0	21.74	21.82	21.77		1
		1	7	21.92	21.71	22.16		1
		1	14	21.87	21.91	22.07		1
		8	0	20.69	20.72	20.79		2
		8	3	20.68	20.7	20.82		2
		8	7	20.73	20.77	20.79		2
		15	0	20.69	20.71	20.8		2
Channel				19975	20175	20375	Tune Up Limit (dBm)	MPR
Frequency(MHz)				1712.5	1732.5	1752.5		
5M	QPSK	1	0	22.32	22.49	22.57	23	0
		1	12	22.24	22.38	22.44		0
		1	24	22.47	22.58	22.68		0
		12	0	21.71	21.78	21.85		1
		12	6	21.69	21.75	21.81		1
		12	13	21.84	21.88	21.89		1
		25	0	21.75	21.77	21.8		1
	16QAM	1	0	22	21.92	22.17		1
		1	12	21.86	21.95	21.94		1
		1	24	21.81	21.98	22.07		1
		12	0	20.72	20.7	20.79		2
		12	6	20.73	20.76	20.78		2
		12	13	20.71	20.75	20.81		2
		25	0	20.69	20.71	20.74		2

LTE Band 4								
BW	Modulation	RB	RB Offset	Measured Power Low	Measured Power Mid	Measured Power High	Tune Up Limit (dBm)	MPR
Channel				20000	20175	20350		
Frequency(MHz)				1715	1732.5	1750		
10M	QPSK	1	0	22.56	22.56	22.62	23	0
		1	24	22.4	22.44	22.47		0
		1	49	22.58	22.61	22.71		0
		25	0	21.75	21.76	21.8		1
		25	12	21.78	21.75	21.83		1
		25	25	21.81	21.86	21.99		1
		50	0	21.74	21.78	21.81		1
	16QAM	1	0	21.9	21.88	22.09		1
		1	24	21.76	21.83	21.79		1
		1	49	21.73	21.75	21.84		1
		25	0	20.73	20.79	20.87		2
		25	12	20.77	20.78	20.83		2
		25	25	20.84	20.86	20.89		2
		50	0	20.72	20.77	20.8		2
Channel				20025	20175	20325	Tune Up Limit (dBm)	MPR
Frequency(MHz)				1717.5	1732.5	1747.5		
15M	QPSK	1	0	22.43	22.5	22.68	23	0
		1	37	22.41	22.51	22.69		0
		1	74	22.51	22.65	22.75		0
		36	0	21.76	21.8	21.81		1
		36	19	21.84	21.88	21.92		1
		36	39	21.87	21.89	21.96		1
		75	0	21.76	21.79	21.83		1
	16QAM	1	0	22.02	22.04	22.08		1
		1	37	21.84	21.81	21.9		1
		1	74	22.04	22.05	22.13		1
		36	0	20.84	20.91	20.96		2
		36	19	20.76	20.82	20.87		2
		36	39	20.93	20.99	21.02		2
		75	0	20.81	20.83	20.86		2
Channel				20050	20175	20300	Tune Up Limit (dBm)	MPR
Frequency(MHz)				1720	1732.5	1745		
20M	QPSK	1	0	22.74	22.76	22.79	23	0
		1	50	22.23	22.31	22.4		0
		1	99	22.69	22.72	22.83		0
		50	0	21.96	21.92	21.98		1
		50	25	21.87	21.84	21.86		1
		50	50	21.88	21.87	21.93		1
		100	0	21.84	21.86	21.9		1
	16QAM	1	0	22.09	22.02	22.03		1
		1	50	21.86	22	22.01		1
		1	99	21.89	22.03	22.06		1
		50	0	20.94	20.84	20.96		2
		50	25	20.86	20.87	20.95		2
		50	50	20.84	20.88	20.9		2
		100	0	20.86	20.92	20.98		2

LTE Band 5								
BW	Modulation	RB	RB Offset	Measured Power Low	Measured Power Mid	Measured Power High	Tune Up Limit (dBm)	MPR
Channel				20415	20525	20635		
Frequency(MHz)				825.5	836.5	847.5		
3M	QPSK	1	0	22.75	22.58	22.52	23	0
		1	7	22.64	22.47	22.61		0
		1	14	22.79	22.59	22.45		0
		8	0	21.99	21.8	21.91		1
		8	3	21.91	21.79	21.85		1
		8	7	22	21.79	21.93		1
		15	0	21.98	21.81	21.89		1
	16QAM	1	0	22.33	21.8	21.97		1
		1	7	22.07	22.21	21.82		1
		1	14	21.86	21.98	21.96		1
		8	0	20.8	20.83	20.82		2
		8	3	20.91	20.8	20.8		2
		8	7	20.94	20.84	20.88		2
		15	0	21.04	20.85	20.96		2
Channel				20425	20525	20625	Tune Up Limit (dBm)	MPR
Frequency(MHz)				826.5	836.5	846.5		
5M	QPSK	1	0	22.59	22.42	22.53	23	0
		1	12	22.53	22.58	22.62		0
		1	24	22.63	22.58	22.59		0
		12	0	21.95	21.89	21.93		1
		12	6	21.91	21.75	21.96		1
		12	13	21.92	21.84	21.76		1
		25	0	21.96	21.79	21.84		1
	16QAM	1	0	21.73	22.08	21.68		1
		1	12	21.95	21.89	21.79		1
		1	24	22.14	22.05	21.64		1
		12	0	20.68	20.79	20.67		2
		12	6	20.91	20.75	20.83		2
		12	13	20.73	20.66	20.82		2
		25	0	20.81	20.74	20.69		2
Channel				20450	20525	20600	Tune Up Limit (dBm)	MPR
Frequency(MHz)				829	836.5	844		
10M	QPSK	1	0	22.86	22.49	22.87	23	0
		1	24	22.73	22.4	22.4		0
		1	49	22.45	22.52	22.91		0
		25	0	22	21.96	22.12		1
		25	12	21.97	21.92	21.99		1
		25	25	21.94	21.92	21.96		1
		50	0	21.96	21.94	21.97		1
	16QAM	1	0	21.99	21.95	21.96		1
		1	24	21.92	21.91	22.25		1
		1	49	22.19	21.95	22.03		1
		25	0	20.97	20.96	20.98		2
		25	12	20.95	20.92	21.08		2
		25	25	21.06	20.94	21.12		2
		50	0	20.98	20.97	21.06		2

LTE Band 7								
BW	Modulation	RB	RB Offset	Measured Power Low	Measured Power Mid	Measured Power High	Tune Up Limit (dBm)	MPR
Channel				20775	21100	21425		
Frequency(MHz)				2502.5	2535	2567.5		
5M	QPSK	1	0	22.38	22.43	22.45	23	0
		1	12	22.27	22.45	22.27		0
		1	24	22.32	22.51	22.45		0
		12	0	21.67	21.64	21.86		1
		12	6	21.53	21.64	21.77		1
		12	13	21.54	21.59	21.72		1
		25	0	21.65	21.55	21.77		1
	16QAM	1	0	21.72	21.52	21.83		1
		1	12	21.74	22.08	21.89		1
		1	24	21.53	21.75	21.71		1
		12	0	20.68	20.78	20.9		2
		12	6	20.63	20.74	20.82		2
		12	13	20.6	20.64	20.76		2
		25	0	20.59	20.69	20.73		2
Channel				20800	21100	21400	Tune Up Limit (dBm)	MPR
Frequency(MHz)				2505	2535	2565		
10M	QPSK	1	0	22.5	22.68	22.57	23	0
		1	24	22.35	22.2	22.33		0
		1	49	22.55	22.73	22.66		0
		25	0	21.76	21.97	21.74		1
		25	12	21.76	21.92	21.74		1
		25	25	21.79	21.89	21.8		1
		50	0	21.76	21.87	21.79		1
	16QAM	1	0	22.05	21.89	22.32		1
		1	24	21.87	21.9	21.96		1
		1	49	21.82	21.93	21.79		1
		25	0	20.87	20.99	20.94		2
		25	12	20.81	20.88	20.78		2
		25	25	20.76	20.86	20.81		2
		50	0	20.75	20.84	20.82		2
Channel				20825	21100	21375	Tune Up Limit (dBm)	MPR
Frequency(MHz)				2507.5	2535	2562.5		
15M	QPSK	1	0	22.72	22.68	22.83	23	0
		1	37	22.69	22.63	22.77		0
		1	74	22.78	22.69	22.85		0
		36	0	21.88	21.92	22.03		1
		36	19	21.87	21.96	21.99		1
		36	39	21.96	21.89	22.02		1
		75	0	21.93	21.89	22.01		1
	16QAM	1	0	22.24	21.97	22.16		1
		1	37	21.97	22.02	22.06		1
		1	74	21.89	21.99	21.97		1
		36	0	20.98	20.99	21.06		2
		36	19	20.86	20.92	20.98		2
		36	39	20.85	20.88	20.99		2
		75	0	20.86	20.88	20.91		2

LTE Band 7								
BW	Modulation	RB	RB Offset	Measured Power Low	Measured Power Mid	Measured Power High	Tune Up Limit (dBm)	MPR
Channel				20850	21100	21350		
Frequency(MHz)				2510	2535	2560		
20M	QPSK	1	0	22.74	22.92	22.96	23	0
		1	50	22.75	22.73	22.79		0
		1	99	22.78	22.98	22.86		0
		50	0	22.06	22.14	22.16		1
		50	25	22.01	21.99	22.06		1
		50	50	22.05	22.01	22.13		1
		100	0	22.16	22.12	22.24		1
	16QAM	1	0	22.16	22.28	22.32		1
		1	50	22.02	22.07	22.13		1
		1	99	22.16	22.36	22.21		1
		50	0	21.12	21.02	21.03		2
		50	25	20.99	21.1	21.15		2
		50	50	21.06	21.01	21.13		2
		100	0	21.03	20.98	21.06		2

LTE Band 13								
BW	Modulation	RB	RB Offset	Measured Power Low	Measured Power Mid	Measured Power High	Tune Up Limit (dBm)	MPR
Channel				23205	23230	23255		
Frequency(MHz)				779.5	782	784.5		
5M	QPSK	1	0	22.66	22.64	22.87	23	0
		1	12	22.78	22.84	22.83		0
		1	24	22.79	22.91	22.82		0
		12	0	22.08	22.06	22.15		1
		12	6	22.03	22.07	21.92		1
		12	13	21.98	21.99	21.95		1
		25	0	22.11	22	21.99		1
	16QAM	1	0	22.13	22.26	22.35		1
		1	12	22.17	22	22.23		1
		1	24	22.26	22.27	22.13		1
		12	0	20.96	20.92	20.96		2
		12	6	20.92	21.05	20.98		2
		12	13	20.96	21.02	20.99		2
		25	0	21.1	20.98	20.94		2
Channel				-	23230	-	Tune Up Limit (dBm)	MPR
Frequency(MHz)				-	782	-		
10M	QPSK	1	0	-	22.91	-	23	0
		1	24	-	22.67	-		0
		1	49	-	22.94	-		0
		25	0	-	22.11	-		1
		25	12	-	22.17	-		1
		25	25	-	22.05	-		1
		50	0	-	22.11	-		1
	16QAM	1	0	-	22.35	-		1
		1	24	-	22.64	-		1
		1	49	-	22.17	-		1
		25	0	-	21.1	-		2
		25	12	-	21.02	-		2
		25	25	-	21.03	-		2
		50	0	-	21.03	-		2

LTE Band 17								
BW	Modulation	RB	RB Offset	Measured Power Low	Measured Power Mid	Measured Power High	Tune Up Limit (dBm)	MPR
Channel				23755	23790	23825		
Frequency(MHz)				706.5	710	713.5		
5M	QPSK	1	0	22.55	22.5	22.38	23	0
		1	12	22.4	22.49	22.45		0
		1	24	22.65	22.34	22.14		0
		12	0	21.91	21.84	21.79		1
		12	6	21.86	21.79	21.84		1
		12	13	21.91	21.8	21.87		1
		25	0	21.86	21.76	21.74		1
	16QAM	1	0	21.85	21.84	21.71		1
		1	12	21.9	21.89	21.68		1
		1	24	21.91	21.75	21.66		1
		12	0	20.98	20.99	20.81		2
		12	6	20.91	20.84	20.71		2
		12	13	20.9	20.82	20.76		2
		25	0	20.9	20.86	20.88		2
Channel				23780	23790	23800	Tune Up Limit (dBm)	MPR
Frequency(MHz)				709	710	711		
10M	QPSK	1	0	22.57	22.44	22.64	23	0
		1	24	22.47	22.55	22.64		0
		1	49	22.58	22.67	22.73		0
		25	0	21.91	21.93	21.87		1
		25	12	21.92	21.79	21.87		1
		25	25	21.89	21.86	21.81		1
		50	0	21.92	21.99	21.89		1
	16QAM	1	0	21.91	21.76	21.88		1
		1	24	21.76	21.79	21.82		1
		1	49	21.76	21.83	21.96		1
		25	0	20.87	20.82	20.8		2
		25	12	20.91	20.82	20.76		2
		25	25	20.86	20.83	20.75		2
		50	0	20.89	20.78	20.83		2

12 SAR Test Results

General Note:

1. Per KDB 447498 D01v05r02, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   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.
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
3. Per KDB 941225 D01v03, when maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA is ≦ 1/4 dB higher than RMC 12.2 kbps or when the highest reported SAR of the RMC 12.2 kpbs is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA/HSUPA to RMC 12.2 kpbs and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the HSDPA / HSUPA.
4. Per KDB 865664 D01 v01r03, for each frequency band, repeated SAR measurement is required only wheh the measured SAR is ≧ 0.8 W/kg
5. 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.
6. Per KDB 941225 D05v02r03, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
7. 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
8. 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.
9. 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.

12.1 Body SAR

<WCDMA Test Result>

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)
1	2	RMC12.2k	Front Face	1	9400	1880	23.02	23.5	1.12	-0.03	0.843	0.94
2		RMC12.2k	Rear Face	1	9400	1880	23.02	23.5	1.12	0	0.328	0.37
3		RMC12.2k	Left Side	1	9400	1880	23.02	23.5	1.12	-0.06	0.033	0.04
4		RMC12.2k	Right Side	1	9400	1880	23.02	23.5	1.12	-0.02	0.040	0.04
5		RMC12.2k	Top Side	1	9400	1880	23.02	23.5	1.12	-0.02	0.230	0.26
6		RMC12.2k	Bottom Side	1	9400	1880	23.02	23.5	1.12	-0.07	0.471	0.53
7		RMC12.2k	Front Face	1	9262	1852.4	23.02	23.5	1.12	-0.01	0.764	0.85
8		RMC12.2k	Front Face	1	9538	1907.6	23.02	23.5	1.12	-0.01	0.881	**0.98**

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)
11	4	RMC12.2k	Front Face	1	1513	1752.6	23.13	23.5	1.09	-0.03	0.560	**0.61**
12		RMC12.2k	Rear Face	1	1513	1752.6	23.13	23.5	1.09	-0.06	0.163	0.18
13		RMC12.2k	Left Side	1	1513	1752.6	23.13	23.5	1.09	-0.03	0.024	0.03
14		RMC12.2k	Right Side	1	1513	1752.6	23.13	23.5	1.09	-0.17	0.056	0.06
15		RMC12.2k	Top Side	1	1513	1752.6	23.13	23.5	1.09	-0.18	0.028	0.03
16		RMC12.2k	Bottom Side	1	1513	1752.6	23.13	23.5	1.09	0.1	0.197	0.21

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)
19	5	RMC12.2k	Front Face	1	4233	846.6	23.32	23.5	1.04	-0.03	0.359	0.37
20		RMC12.2k	Rear Face	1	4233	846.6	23.32	23.5	1.04	0.01	0.416	**0.43**
21		RMC12.2k	Left Side	1	4233	846.6	23.32	23.5	1.04	-0.02	0.037	0.04
22		RMC12.2k	Right Side	1	4233	846.6	23.32	23.5	1.04	-0.07	0.050	0.05
23		RMC12.2k	Top Side	1	4233	846.6	23.32	23.5	1.04	-0.05	0.026	0.03
24		RMC12.2k	Bottom Side	1	4233	846.6	23.32	23.5	1.04	0	0.123	0.13

Test Engineer：Tom Hsu / Rory Cheng

<LTE Test Result>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	RB	RB offset	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
25	2	QPSK_20M	Front Face	1	18900	1880	1	99	22.81	23	1.04	0	0.858	0.90
26	2	QPSK_20M	Rear Face	1	18900	1880	1	99	22.81	23	1.04	-0.02	0.220	0.23
27	2	QPSK_20M	Left Side	1	18900	1880	1	99	22.81	23	1.04	-0.09	0.028	0.03
28	2	QPSK_20M	Right Side	1	18900	1880	1	99	22.81	23	1.04	0.03	0.037	0.04
29	2	QPSK_20M	Top Side	1	18900	1880	1	99	22.81	23	1.04	-0.04	0.023	0.02
30	2	QPSK_20M	Bottom Side	1	18900	1880	1	99	22.81	23	1.04	-0.01	0.46	0.48
37	2	QPSK_20M	Front Face	1	18700	1860	1	99	22.29	23	1.18	-0.03	0.829	0.98
38	2	QPSK_20M	Front Face	1	19100	1900	1	99	22.23	23	1.19	-0.05	0.951	**1.14**
31	2	QPSK_20M	Front Face	1	18900	1880	50	25	21.89	23	1.29	-0.02	0.832	1.07
32	2	QPSK_20M	Rear Face	1	18900	1880	50	25	21.89	23	1.29	-0.04	0.184	0.24
33	2	QPSK_20M	Left Side	1	18900	1880	50	25	21.89	23	1.29	0.06	0.030	0.04
34	2	QPSK_20M	Right Side	1	18900	1880	50	25	21.89	23	1.29	-0.02	0.035	0.05
35	2	QPSK_20M	Top Side	1	18900	1880	50	25	21.89	23	1.29	-0.05	0.021	0.03
36	2	QPSK_20M	Bottom Side	1	18900	1880	50	25	21.89	23	1.29	-0.05	0.416	0.54
39	2	QPSK_20M	Front Face	1	18700	1860	50	25	21.88	23	1.29	0.01	0.777	1.01
40	2	QPSK_20M	Front Face	1	19100	1900	50	25	21.83	23	1.31	-0.04	0.846	1.11
41	2	QPSK_20M	Front Face	1	18900	1880	100	0	21.86	23	1.30	0	0.696	0.90
43	4	QPSK_20M	Front Face	1	20300	1745	1	99	22.83	23	1.04	-0.05	0.469	0.49
44	4	QPSK_20M	Rear Face	1	20300	1745	1	99	22.83	23	1.04	-0.18	0.150	0.16
45	4	QPSK_20M	Left Side	1	20300	1745	1	99	22.83	23	1.04	0.01	0.023	0.02
46	4	QPSK_20M	Right Side	1	20300	1745	1	99	22.83	23	1.04	0.01	0.059	0.06
47	4	QPSK_20M	Top Side	1	20300	1745	1	99	22.83	23	1.04	-0.04	0.022	0.02
48	4	QPSK_20M	Bottom Side	1	20300	1745	1	99	22.83	23	1.04	0.09	0.174	0.18
49	4	QPSK_20M	Front Face	1	20300	1745	50	0	21.98	23	1.26	-0.07	0.402	**0.51**
50	4	QPSK_20M	Rear Face	1	20300	1745	50	0	21.98	23	1.26	0.02	0.134	0.17
51	4	QPSK_20M	Left Side	1	20300	1745	50	0	21.98	23	1.26	-0.05	0.019	0.02
52	4	QPSK_20M	Right Side	1	20300	1745	50	0	21.98	23	1.26	-0.1	0.056	0.07
53	4	QPSK_20M	Top Side	1	20300	1745	50	0	21.98	23	1.26	-0.03	0.021	0.03
54	4	QPSK_20M	Bottom Side	1	20300	1745	50	0	21.98	23	1.26	0.04	0.137	0.17
55	5	QPSK_10M	Front Face	1	20600	844	1	49	22.91	23	1.02	0.04	0.280	0.29
56	5	QPSK_10M	Rear Face	1	20600	844	1	49	22.91	23	1.02	-0.02	0.283	0.29
57	5	QPSK_10M	Left Side	1	20600	844	1	49	22.91	23	1.02	-0.11	0.011	0.01
58	5	QPSK_10M	Right Side	1	20600	844	1	49	22.91	23	1.02	0.01	0.055	0.06
59	5	QPSK_10M	Top Side	1	20600	844	1	49	22.91	23	1.02	-0.08	0.012	0.01
60	5	QPSK_10M	Bottom Side	1	20600	844	1	49	22.91	23	1.02	0.01	0.079	0.08
61	5	QPSK_10M	Front Face	1	20600	844	25	0	22.12	23	1.22	0.03	0.244	**0.30**
62	5	QPSK_10M	Rear Face	1	20600	844	25	0	22.12	23	1.22	0.04	0.221	0.27
63	5	QPSK_10M	Left Side	1	20600	844	25	0	22.12	23	1.22	0.09	0.013	0.02
64	5	QPSK_10M	Right Side	1	20600	844	25	0	22.12	23	1.22	0.01	0.047	0.06
65	5	QPSK_10M	Top Side	1	20600	844	25	0	22.12	23	1.22	-0.09	0.013	0.02
66	5	QPSK_10M	Bottom Side	1	20600	844	25	0	22.12	23	1.22	-0.04	0.067	0.08

Test Engineer : Tom Hsu / Rory Cheng

<LTE Test Result>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	RB	RB offset	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
67	7	QPSK_20M	Front Face	1	21100	2535	1	99	22.98	23	1.00	0.11	0.248	0.25
68	7	QPSK_20M	Rear Face	1	21100	2535	1	99	22.98	23	1.00	-0.05	0.222	0.22
69	7	QPSK_20M	Left Side	1	21100	2535	1	99	22.98	23	1.00	0.13	0.024	0.02
70	7	QPSK_20M	Right Side	1	21100	2535	1	99	22.98	23	1.00	0.03	0.072	0.07
71	7	QPSK_20M	Top Side	1	21100	2535	1	99	22.98	23	1.00	-0.09	0.023	0.02
72	7	QPSK_20M	Bottom Side	1	21100	2535	1	99	22.98	23	1.00	0.05	0.148	0.15
73	7	QPSK_20M	Front Face	1	21100	2535	50	0	22.14	23	1.22	-0.07	0.241	**0.29**
74	7	QPSK_20M	Rear Face	1	21100	2535	50	0	22.14	23	1.22	0.07	0.211	0.26
75	7	QPSK_20M	Left Side	1	21100	2535	50	0	22.14	23	1.22	-0.06	0.023	0.03
76	7	QPSK_20M	Right Side	1	21100	2535	50	0	22.14	23	1.22	0.09	0.07	0.09
77	7	QPSK_20M	Top Side	1	21100	2535	50	0	22.14	23	1.22	0.01	0.023	0.03
78	7	QPSK_20M	Bottom Side	1	21100	2535	50	0	22.14	23	1.22	0.03	0.142	0.17
79	13	QPSK_10M	Front Face	1	23230	782	1	49	22.94	23	1.01	0.03	0.266	0.27
80	13	QPSK_10M	Rear Face	1	23230	782	1	49	22.94	23	1.01	0.05	0.243	0.25
81	13	QPSK_10M	Left Side	1	23230	782	1	49	22.94	23	1.01	-0.03	0.02	0.02
82	13	QPSK_10M	Right Side	1	23230	782	1	49	22.94	23	1.01	-0.02	0.043	0.04
83	13	QPSK_10M	Top Side	1	23230	782	1	49	22.94	23	1.01	-0.05	0.00495	0.01
84	13	QPSK_10M	Bottom Side	1	23230	782	1	49	22.94	23	1.01	0.12	0.119	0.12
85	13	QPSK_10M	Front Face	1	23230	782	25	12	22.17	23	1.21	0.02	0.266	**0.32**
86	13	QPSK_10M	Rear Face	1	23230	782	25	12	22.17	23	1.21	0.02	0.253	0.31
87	13	QPSK_10M	Left Side	1	23230	782	25	12	22.17	23	1.21	0.02	0.018	0.02
88	13	QPSK_10M	Right Side	1	23230	782	25	12	22.17	23	1.21	0.01	0.045	0.05
89	13	QPSK_10M	Top Side	1	23230	782	25	12	22.17	23	1.21	-0.09	0.000695	0.00
90	13	QPSK_10M	Bottom Side	1	23230	782	25	12	22.17	23	1.21	-0.07	0.118	0.14
91	17	QPSK_10M	Front Face	1	23800	711	1	49	22.73	23	1.06	-0.05	0.258	**0.27**
92	17	QPSK_10M	Rear Face	1	23800	711	1	49	22.73	23	1.06	0	0.21	0.22
93	17	QPSK_10M	Left Side	1	23800	711	1	49	22.73	23	1.06	-0.1	0.015	0.02
94	17	QPSK_10M	Right Side	1	23800	711	1	49	22.73	23	1.06	-0.06	0.066	0.07
95	17	QPSK_10M	Top Side	1	23800	711	1	49	22.73	23	1.06	0.18	0.00183	0.00
96	17	QPSK_10M	Bottom Side	1	23800	711	1	49	22.73	23	1.06	0.03	0.112	0.12
97	17	QPSK_10M	Front Face	1	23790	710	25	0	21.93	23	1.28	0.02	0.201	0.26
98	17	QPSK_10M	Rear Face	1	23790	710	25	0	21.93	23	1.28	0.01	0.17	0.22
99	17	QPSK_10M	Left Side	1	23790	710	25	0	21.93	23	1.28	0.06	0.016	0.02
100	17	QPSK_10M	Right Side	1	23790	710	25	0	21.93	23	1.28	-0.04	0.053	0.07
101	17	QPSK_10M	Top Side	1	23790	710	25	0	21.93	23	1.28	-0.06	0.00145	0.00
102	17	QPSK_10M	Bottom Side	1	23790	710	25	0	21.93	23	1.28	-0.01	0.074	0.09

Test Engineer：Tom Hsu / Rory Cheng

12.2 Repeated SAR Measurement

<WCDMA>

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)
10	2	RMC12.2k	Front Face	1	9538	1907.6	23.02	23.5	1.12	-0.04	0.83	0.93

Note: Original Measured SAR / Repeated Measured SAR = 0.98 / 0.93 = 1.05

<LTE>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	RB	RB offset	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
42	2	QPSK_20M	Front Face	1	19100	1900	1	99	22.23	23	1.19	-0.08	0.903	1.08

Note: Original Measured SAR / Repeated Measured SAR = 1.14 / 1.08 = 1.06

Test Engineer：Rory Cheng

12.3 Simultaneous Transmission SAR

The EUT is installed in a specific host an approved wireless device (FCC ID: MXF-WRTD303N).
The host can support WWAN and Wi-Fi function to transmit simultaneously. SAR test value of Wi-Fi comes from Sporton test report, report No.FA473072. Blow measured SAR results are the worst value of each position.

Position	WCDMA SAR (W/kg)	2.4 GHz W-FI SAR (W/kg)	Summed SAR (W/kg)	SPLSR	Case No
Front Face	0.98	0.77 (Cube0)	**1.75**	0.013	1
Front Face	0.98	0.58 (Cube1)	1.56	-	-
Rear Face	0.43	0.43	0.86	-	-
Left Side	0.04	0.07	0.11	-	-
Right Side	0.06	0.17	0.23	-	-
Top Side	0.26	0.38	0.64	-	-
Bottom Side	0.53	0.023	0.553	-	-

Position	WCDMA SAR (W/kg)	5 GHz W-FI SAR (W/kg)	Summed SAR (W/kg)	SPLSR	Case No
Front Face	0.98	0.28	1.26	-	-
Rear Face	0.43	0.20	0.63	-	-
Left Side	0.04	0.045	0.085	-	-
Right Side	0.06	0.54	0.60	-	-
Top Side	0.26	0.61	0.87	-	-
Bottom Side	0.53	0.03	0.56	-	-

Position	LTE SAR (W/kg)	2.4 GHz W-FI SAR (W/kg)	Summed SAR (W/kg)	SPLSR	Case No
Front Face	1.14	0.77 (Cube0)	**1.91**	0.015	2
Front Face	1.14	0.58 (Cube1)	**1.72**	0.018	3
Rear Face	0.31	0.43	0.74	-	-
Left Side	0.04	0.07	0.11	-	-
Right Side	0.09	0.17	0.26	-	-
Top Side	0.03	0.38	0.41	-	-
Bottom Side	0.54	0.023	0.563	-	-

Position	LTE SAR (W/kg)	5 GHz W-FI SAR (W/kg)	Summed SAR (W/kg)	SPLSR	Case No
Front Face	1.14	0.28	1.42	-	-
Rear Face	0.31	0.2	0.51	-	-
Left Side	0.04	0.045	0.085	-	-
Right Side	0.09	0.54	0.63	-	-
Top Side	0.03	0.61	0.64	-	-
Bottom Side	0.54	0.03	0.57	-	-

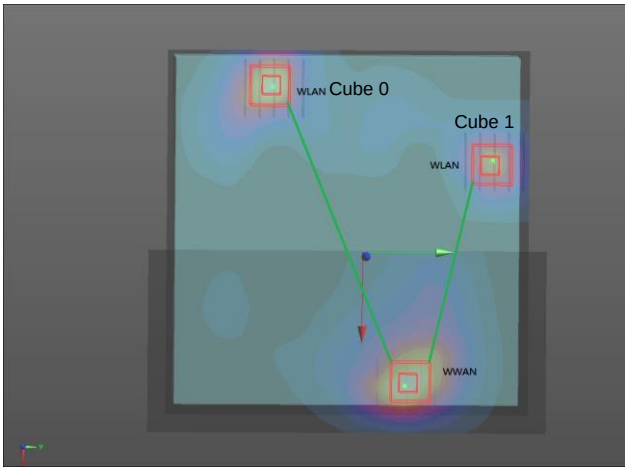
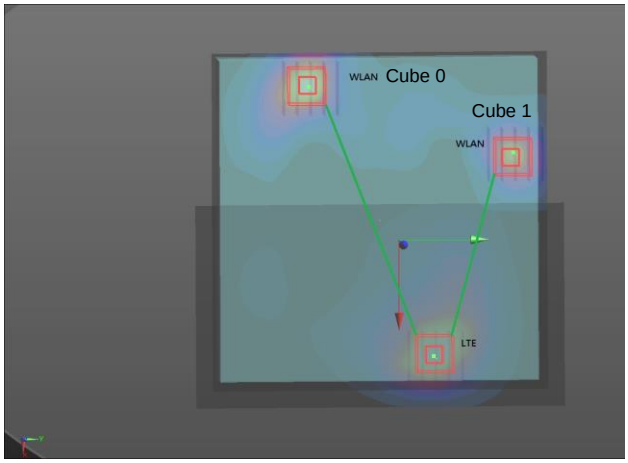
Note 1: SPLSR evaluation is not required when summed SAR value is < 1.6 W/kg
Note 2: Refer to section 12.4 for SPLSR evaluation and analysis

Conclusion
Simultaneous Transmission SAR is not required since SPLSR < 0.04

12.4 SPLSR Evaluation and Analysis

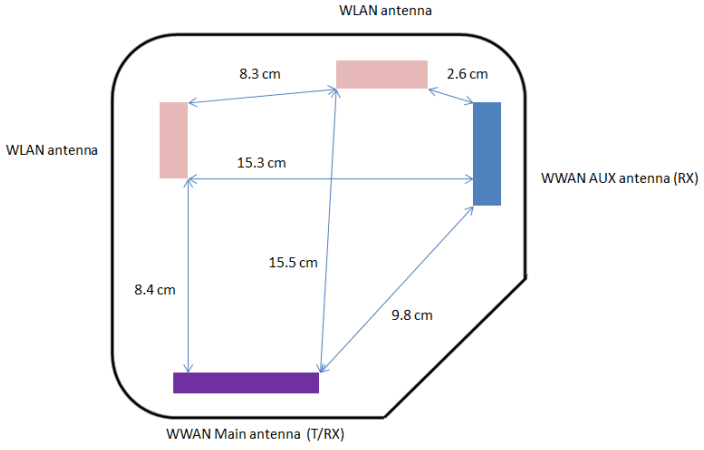
This evaluation is for case 1 of section 12.2 since summed SAR value is > 1.6 W/kg.
Follow below formula to calculate SPLSR ratio. SPLSR = $(SAR_1 + SAR_2)^{1.5} / R_i$,
R_i is the separation distance between the peak SAR locations for the antenna pair in mm.

Case	Mode	Position	1g-SAR (W/kg)	SAR Peak Location			Gap (cm)	R_i,3D distance (mm)	Summed SAR (W/kg)	SPLSR	Simultaneous Transmission SAR
				X(cm)	Y(cm)	Z(cm)					
1	WCDMA	Front Face	0.98	8.24	3.36	-0.26	1	179.13	1.75	0.013	No
	WLAN 2.4GHz (Cube 0)	Front Face	0.77	-8	-4.2	-0.3	1				
2	LTE	Front Face	1.14	7.84	3.2	-0.24	1	174.83	1.91	0.015	No
	WLAN 2.4GHz (Cube 0)	Front Face	0.77	-8	-4.2	-0.3	1				
3	LTE	Front Face	1.14	7.84	3.2	-0.24	1	124.20	1.72	0.018	No
	WLAN 2.4GHz (Cube 1)	Front Face	0.58	-3.68	7.84	-0.32	1				

SAR Peak Location	SAR Peak Location
Case 1: WCDMA + WLAN	Case 2 / 3: LTE + WLAN
	

Refer to Sporton SAR report (Report No. FA473072) for WLAN antenna location.

Rear View



13 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 14.1

Uncertainty Distributions	Normal	Rectangular	Triangular	U-Shape
Multi-plying Factor[(a)]	1/k[(b)]	$1/\sqrt{3}$	$1/\sqrt{6}$	$1/\sqrt{2}$

(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

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)	Standard Uncertainty (±%) (1g)
Measurement System					
Probe Calibration	6.0	Normal	1.0	1.0	6.0
Axial Isotropy	4.7	Rectangular	√3	0.7	1.9
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	3.9
Boundary effects	1.0	Rectangular	√3	1.0	0.6
Linearity	4.7	Rectangular	√3	1.0	2.7
System Detection Limits	1.0	Rectangular	√3	1.0	0.6
Modulation Response	2.4	Rectangular	√3	1.0	1.4
Readout Electronics	0.3	Normal	1.0	1.0	0.3
Response Time	0.8	Rectangular	√3	1.0	0.5
Integration Time	2.6	Rectangular	√3	1.0	1.5
RF Ambient Noise	3.0	Rectangular	√3	1.0	1.7
RF Ambient Reflections	3.0	Rectangular	√3	1.0	1.7
Probe Positioner	0.4	Rectangular	√3	1.0	0.2
Probe Positioning	2.9	Rectangular	√3	1.0	1.7
Max. SAR Eval.	2.0	Rectangular	√3	1.0	1.2
Dipole Related					
Device Positioning	2.9	Normal	1.0	1.0	2.9
Device Holder	3.6	Normal	1.0	1.0	3.6
Power Drift	5.0	Rectangular	√3	1.0	2.9
Power Scaling	0.0	Rectangular	√3	1.0	0.0
Phantom and Tissue parameters					
Phantom Uncertainty	6.1	Rectangular	√3	1.0	3.5
SAR corrction	1.9	Normal	1.0	1.0	1.9
Liquid Conductivity (measurement)	2.0	Normal	1.0	0.8	1.6
Liquid Permittivity (measurement)	2.1	Normal	1.0	0.3	0.5
Temp. unc. - Conduct	3.4	Rectangular	√3	0.8	1.5
Temp. unc. - Permittivity	0.4	Rectangular	√3	0.2	0.1
Combined Standard Uncertainty					11.2
Coverage Factor for 95 %					Kp=2
Expanded Uncertainty					22.4

Uncertainty Budget for frequency range 30 MHz to 3 GHz

Error Description	Uncertainty Value (±%)	Probability Distribution	Divisor	Ci (1g)	Standard Uncertainty (±%) (1g)
Measurement System					
Probe Calibration	6.6	Normal	1.0	1.0	6.6
Axial Isotropy	4.7	Rectangular	√3	0.7	1.9
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	3.9
Boundary effects	2.0	Rectangular	√3	1.0	1.2
Linearity	4.7	Rectangular	√3	1.0	2.7
System Detection Limits	1.0	Rectangular	√3	1.0	0.6
Modulation Response	2.4	Rectangular	√3	1.0	1.4
Readout Electronics	0.3	Normal	1.0	1.0	0.3
Response Time	0.8	Rectangular	√3	1.0	0.5
Integration Time	2.6	Rectangular	√3	1.0	1.5
RF Ambient Noise	3.0	Rectangular	√3	1.0	1.7
RF Ambient Reflections	3.0	Rectangular	√3	1.0	1.7
Probe Positioner	0.8	Rectangular	√3	1.0	0.5
Probe Positioning	6.7	Rectangular	√3	1.0	3.9
Max. SAR Eval.	4.0	Rectangular	√3	1.0	2.3
Dipole Related					
Device Positioning	2.9	Normal	1.0	1.0	2.9
Device Holder	3.6	Normal	1.0	1.0	3.6
Power Drift	5.0	Rectangular	√3	1.0	2.9
Power Scaling	0.0	Rectangular	√3	1.0	0.0
Phantom and Tissue parameters					
Phantom Uncertainty	6.6	Rectangular	√3	1.0	3.8
SAR corrction	1.9	Normal	1.0	1.0	1.9
Liquid Conductivity (measurement)	2.0	Normal	1.0	0.8	1.6
Liquid Permittivity (measurement)	2.1	Normal	1.0	0.3	0.5
Temp. unc. - Conduct	3.4	Rectangular	√3	0.8	1.5
Temp. unc. - Permittivity	0.4	Rectangular	√3	0.2	0.1
Combined Standard Uncertainty					12.3
Coverage Factor for 95 %					Kp=2
Expanded Uncertainty					24.7

Uncertainty Budget for frequency range 3 GHz to 6 GHz

14 References

[1] FCC 47CFR Part 2 , “FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS”

[2] 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”

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

[4] SPEAG DASY System Handbook

[5] 447498 D01 General RF Exposure Guidance v05r02, “Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies”

[6] 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r03, “SAR Measurement Requirements for 100 MHz to 6 GHz”

[7] 865664 D02 RF Exposure Reporting v01r01, “RF Exposure Compliance Reporting and Documentation Considerations”

[8] 941225 D01 3G SAR Procedures v03,” 3G SAR MEAUREMENT PROCEDURES”

[9] 941225 D05 SAR for LTE Devices v02r03,” SAR Evaluation Considerations for LTE Devices”

[10] 941225 D06 Hotspot Mode v02,”SAR evaluation procedure for portable devices with wireless router capabilities”

APPENDIX A. Plots of System Performance Check

System Check_B750_141216

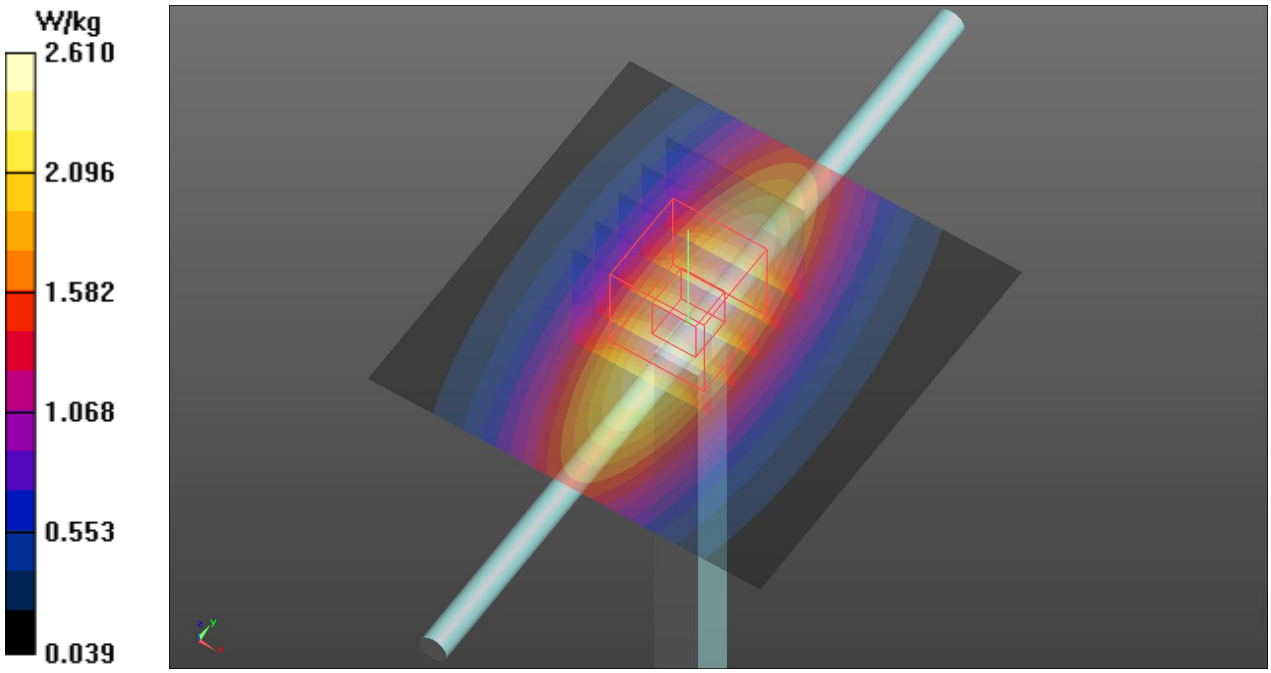
DUT: Dipole 750 MHz_SN: 1107

Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: B750_141216 Medium parameters used: f = 750 MHz; σ = 0.969 S/m; ε_r = 55.447; ρ = 1000 kg/m^3
Ambient Temperature：23.0 ℃; **Liquid Temperature**：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(10.12, 10.12, 10.12); Calibrated: 2014/2/17;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1424; Calibrated: 2014/2/11
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1238
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.61 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 50.35 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 3.00 W/kg
SAR(1 g) = 2.11 W/kg; SAR(10 g) = 1.44 W/kg
Maximum value of SAR (measured) = 2.61 W/kg



System Check_B835_141210

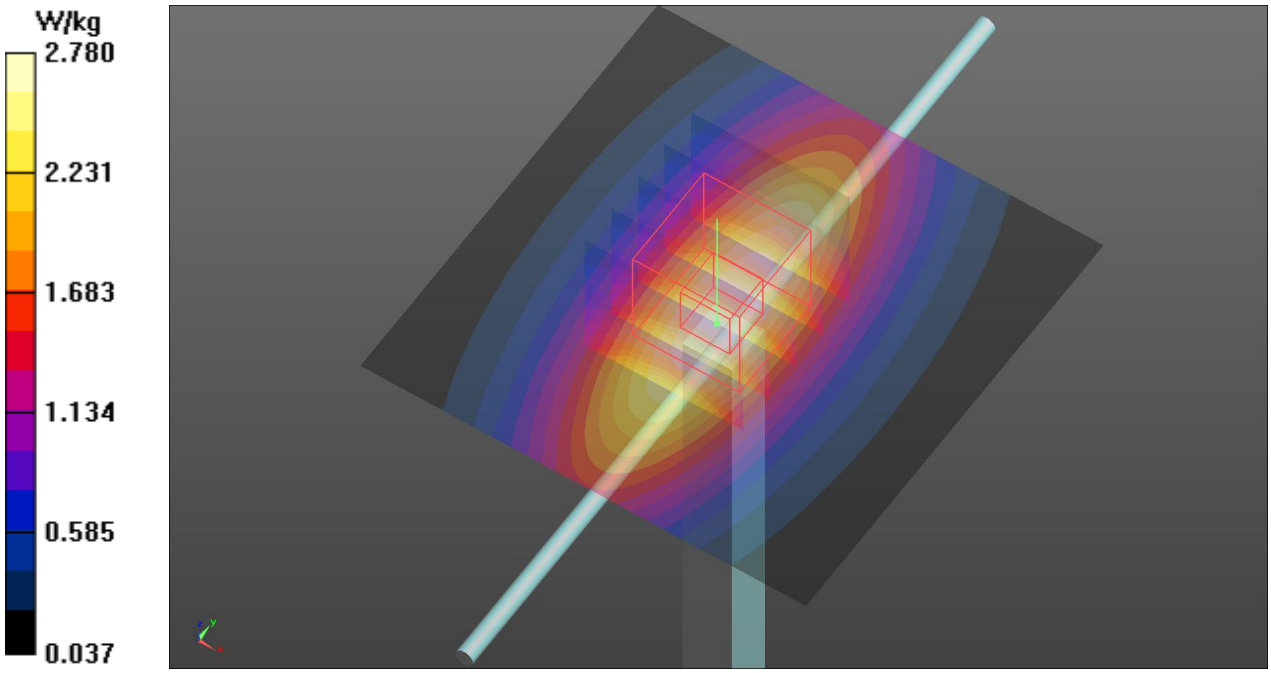
DUT: Dipole 835 MHz_SN: 4d167

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: B835_141210 Medium parameters used: f = 835 MHz; σ = 0.997 S/m; ε_r = 56.967; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; **Liquid Temperature**：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(10, 10, 10); Calibrated: 2014/2/17;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1424; Calibrated: 2014/2/11
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1238
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.78 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 52.93 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 3.49 W/kg
SAR(1 g) = 2.39 W/kg; SAR(10 g) = 1.59 W/kg
Maximum value of SAR (measured) = 2.77 W/kg



System Check_B835_141216

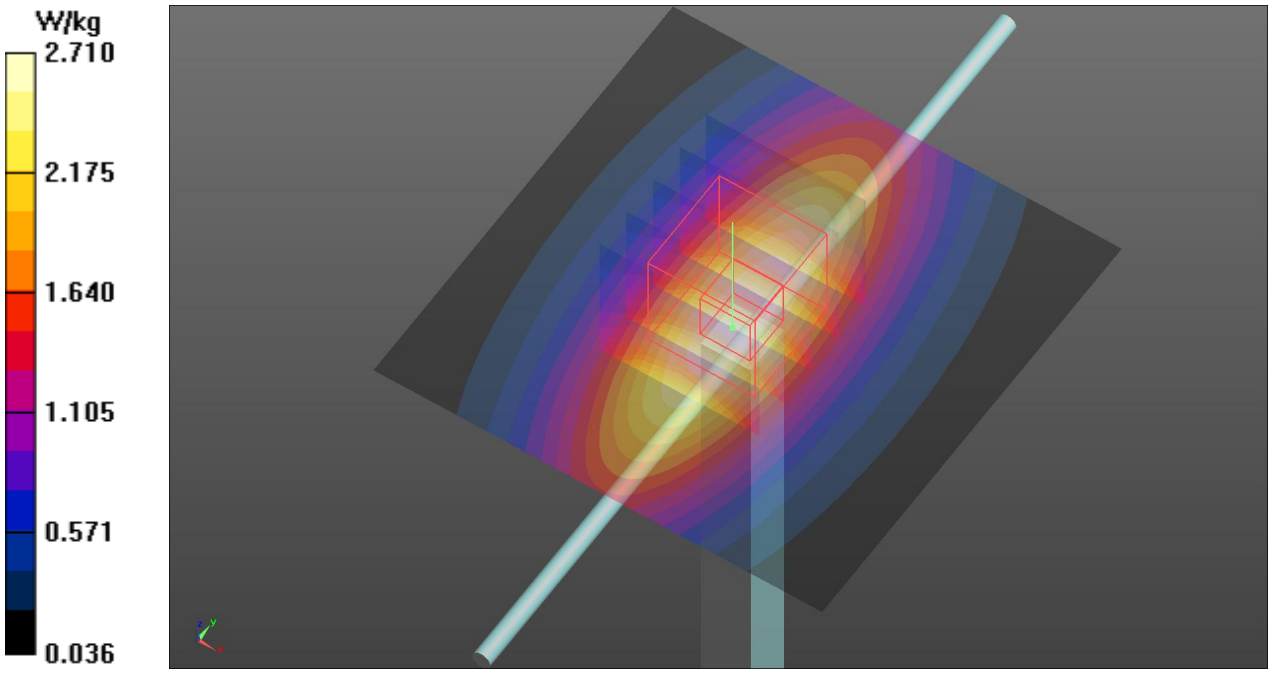
DUT: Dipole 835 MHz_SN: 4d167

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: B835_141216 Medium parameters used: f = 835 MHz; σ = 0.987 S/m; ε_r = 56.289; ρ = 1000 kg/m^3
Ambient Temperature：23.0 ℃; **Liquid Temperature**：23.0 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(10, 10, 10); Calibrated: 2014/2/17;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1424; Calibrated: 2014/2/11
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1238
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.71 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 52.52 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 3.41 W/kg
SAR(1 g) = 2.32 W/kg; SAR(10 g) = 1.55 W/kg
Maximum value of SAR (measured) = 2.70 W/kg



System Check_B1750_141210

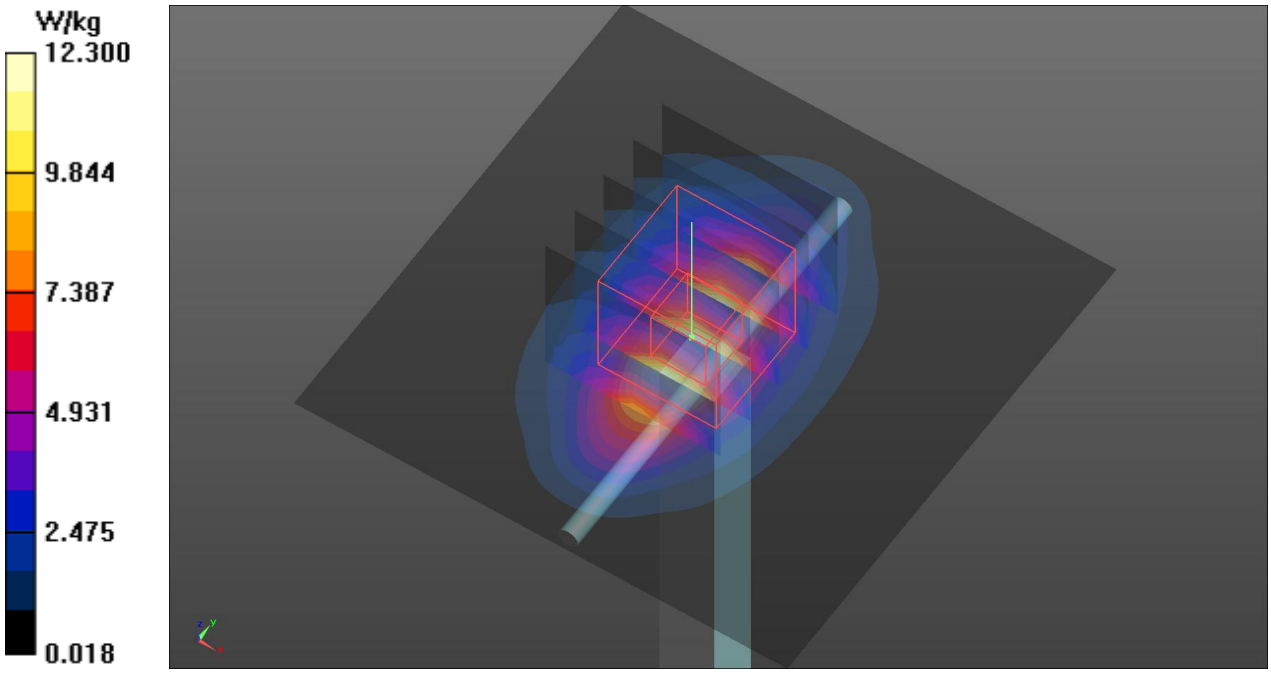
DUT: Dipole 1750 MHz_SN: 1112

Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: B1750_141210 Medium parameters used: f = 1750 MHz; σ = 1.451 S/m; ε_r = 52.888; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; **Liquid Temperature**：22.9 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(8.21, 8.21, 8.21); Calibrated: 2014/2/17;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1424; Calibrated: 2014/2/11
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1238
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 12.3 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 93.11 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 15.2 W/kg
SAR(1 g) = 8.97 W/kg; SAR(10 g) = 4.89 W/kg
Maximum value of SAR (measured) = 12.4 W/kg



System Check_B1750_141212

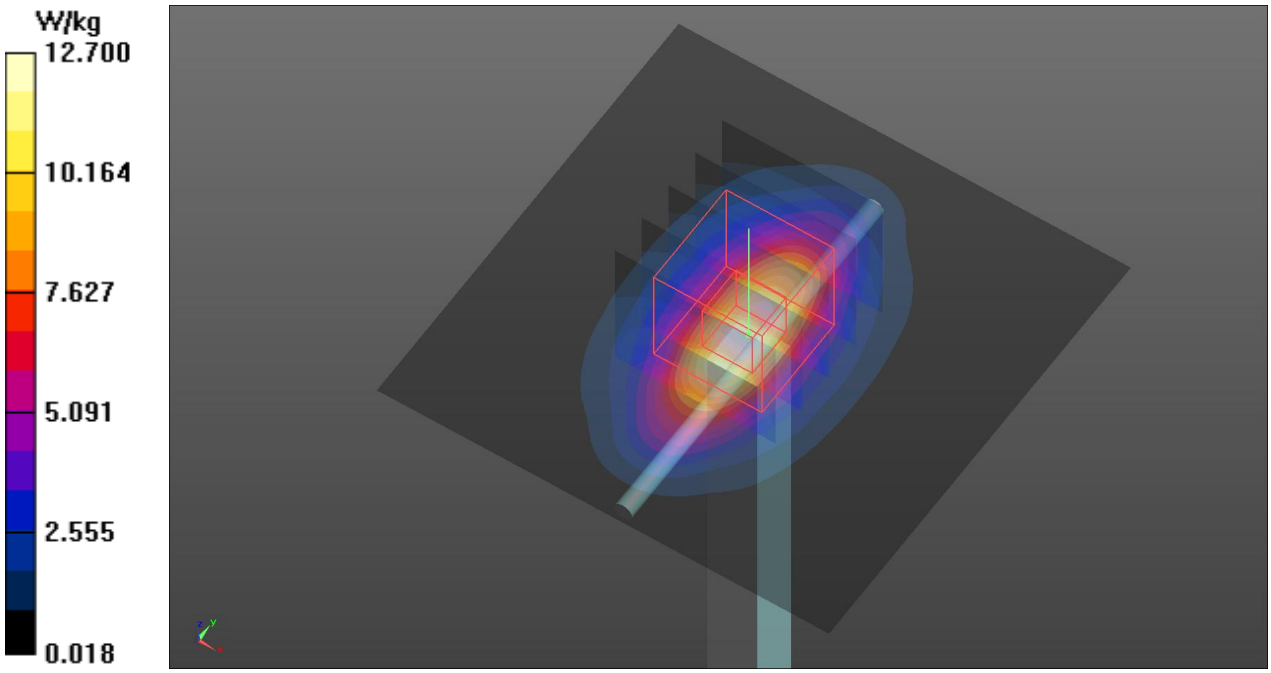
DUT: Dipole 1750 MHz_SN: 1112

Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: B1750_141212 Medium parameters used: f = 1750 MHz; σ = 1.45 S/m; ε_r = 53.046; ρ = 1000 kg/m^3
Ambient Temperature：22.9 ℃; **Liquid Temperature**：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(8.21, 8.21, 8.21); Calibrated: 2014/2/17;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1424; Calibrated: 2014/2/11
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1238
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 12.7 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 95.25 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 15.5 W/kg
SAR(1 g) = 9.13 W/kg; SAR(10 g) = 4.97 W/kg
Maximum value of SAR (measured) = 12.7 W/kg



System Check_B1900_141209

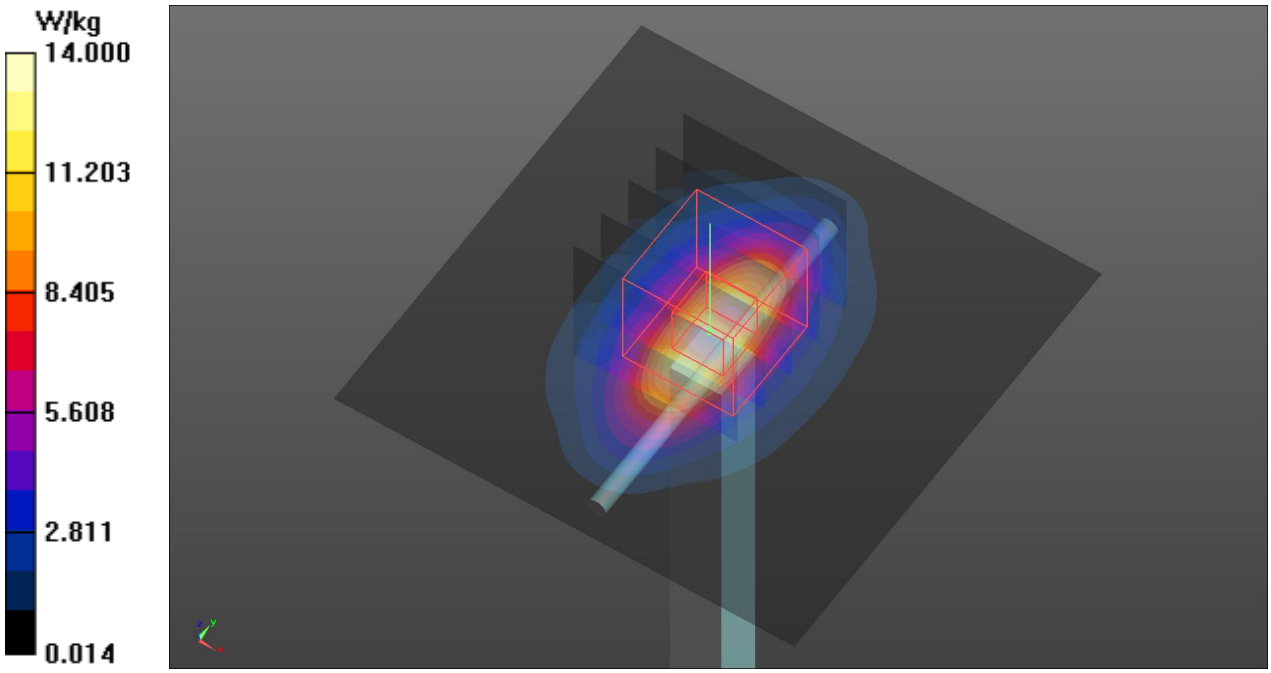
DUT: Dipole 1900 MHz_SN: 5d185

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: B1900_141209 Medium parameters used: f = 1900 MHz; σ = 1.533 S/m; ε_r = 53.834; ρ = 1000 kg/m^3
Ambient Temperature：23.1 ℃; **Liquid Temperature**：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(7.89, 7.89, 7.89); Calibrated: 2014/2/17;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1424; Calibrated: 2014/2/11
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1238
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 14.0 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 97.19 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 17.3 W/kg
SAR(1 g) = 10 W/kg; SAR(10 g) = 5.34 W/kg
Maximum value of SAR (measured) = 14.1 W/kg



System Check_B1900_141211

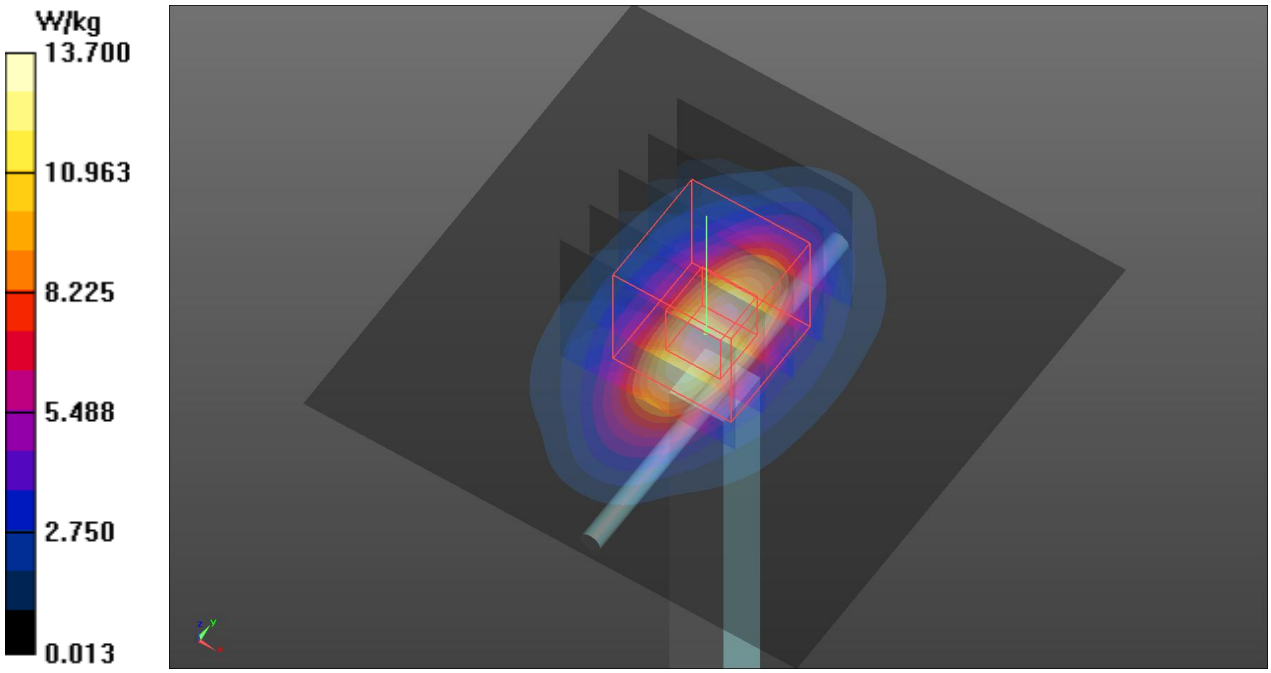
DUT: Dipole 1900 MHz_SN: 5d185

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: B1900_141211 Medium parameters used: f = 1900 MHz; σ = 1.534 S/m; ε_r = 54.122; ρ = 1000 kg/m^3
Ambient Temperature：23.0 ℃; **Liquid Temperature**：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(7.89, 7.89, 7.89); Calibrated: 2014/2/17;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1424; Calibrated: 2014/2/11
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1238
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 13.7 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 96.49 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 16.8 W/kg
SAR(1 g) = 9.77 W/kg; SAR(10 g) = 5.19 W/kg
Maximum value of SAR (measured) = 13.7 W/kg



System Check_B2600_141217

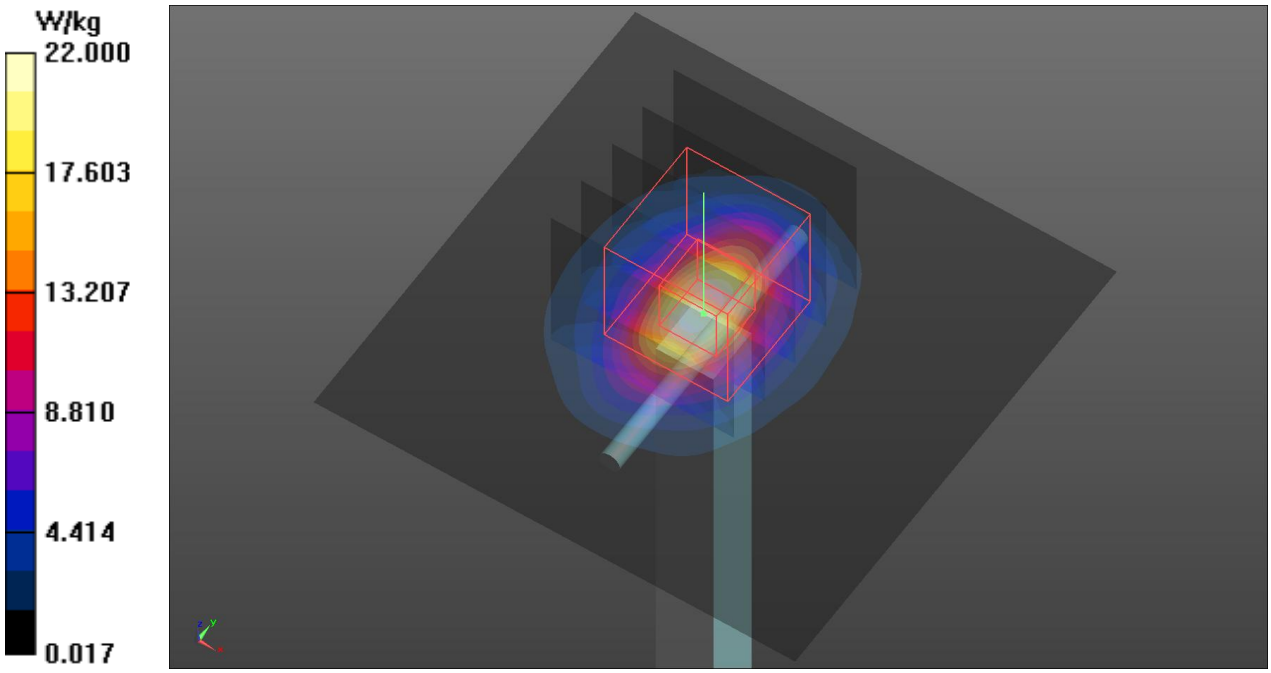
DUT: Dipole 2600 MHz_SN: 1078

Communication System: CW; Frequency: 2600 MHz;Duty Cycle: 1:1
Medium: B2600_141217 Medium parameters used: f = 2600 MHz; σ = 2.185 S/m; ε_r = 52.038; ρ = 1000 kg/m^3
Ambient Temperature：23.1 ℃; **Liquid Temperature**：22.9 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(7.03, 7.03, 7.03); Calibrated: 2014/2/17;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1424; Calibrated: 2014/2/11
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1238
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (71x71x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 22.0 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 101.0 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 30.4 W/kg
SAR(1 g) = 13.9 W/kg; SAR(10 g) = 6.09 W/kg
Maximum value of SAR (measured) = 22.0 W/kg



APPENDIX B. Plots of SAR Measurement

P08 WCDMA II_RMC12.2K_Front Face_1cm_Ch9538

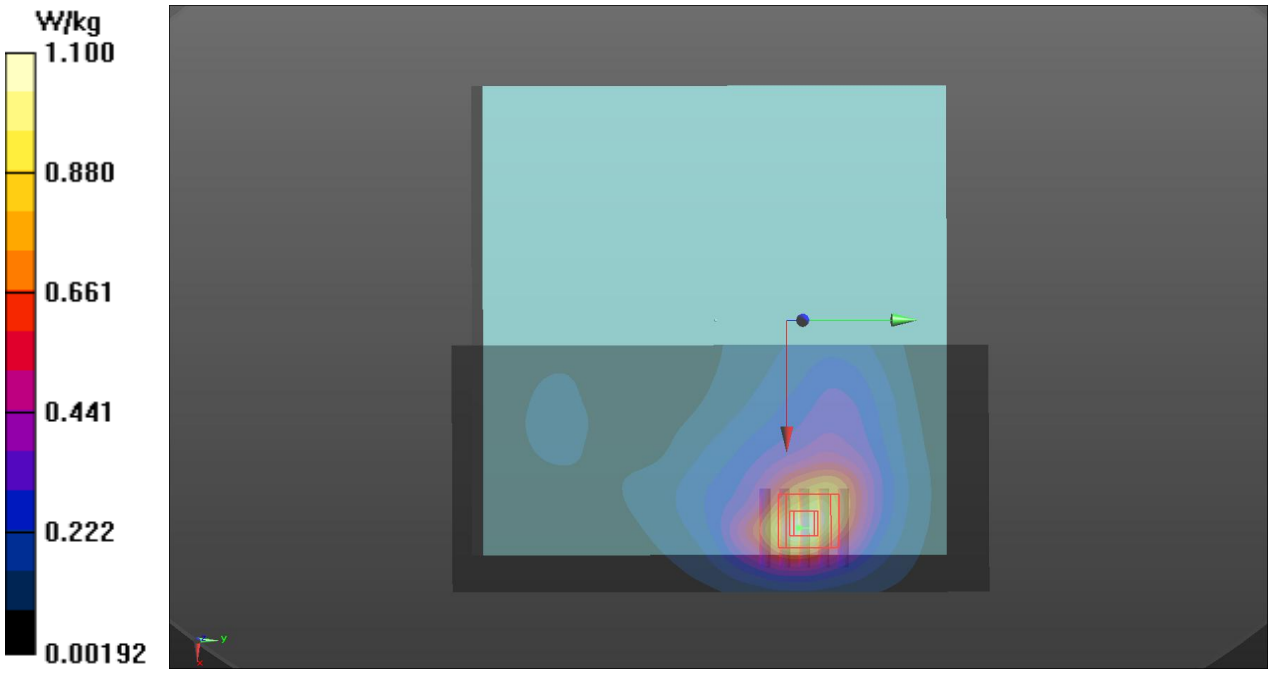
DUT: 4N1201

Communication System: WCDMA; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium: B1900_141209 Medium parameters used: f = 1908 MHz; σ = 1.541 S/m; ε_r = 53.807; ρ = 1000 kg/m^3
Ambient Temperature：23.1 ℃; **Liquid Temperature**：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(7.89, 7.89, 7.89); Calibrated: 2014/2/17;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1424; Calibrated: 2014/2/11
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1238
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch9538/Area Scan (71x151x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.10 W/kg

Ch9538/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.11 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.41 W/kg
SAR(1 g) = 0.881 W/kg; SAR(10 g) = 0.518 W/kg
Maximum value of SAR (measured) = 1.15 W/kg



P11 WCDMA IV_RMC12.2K_Front Face_1cm_Ch1513

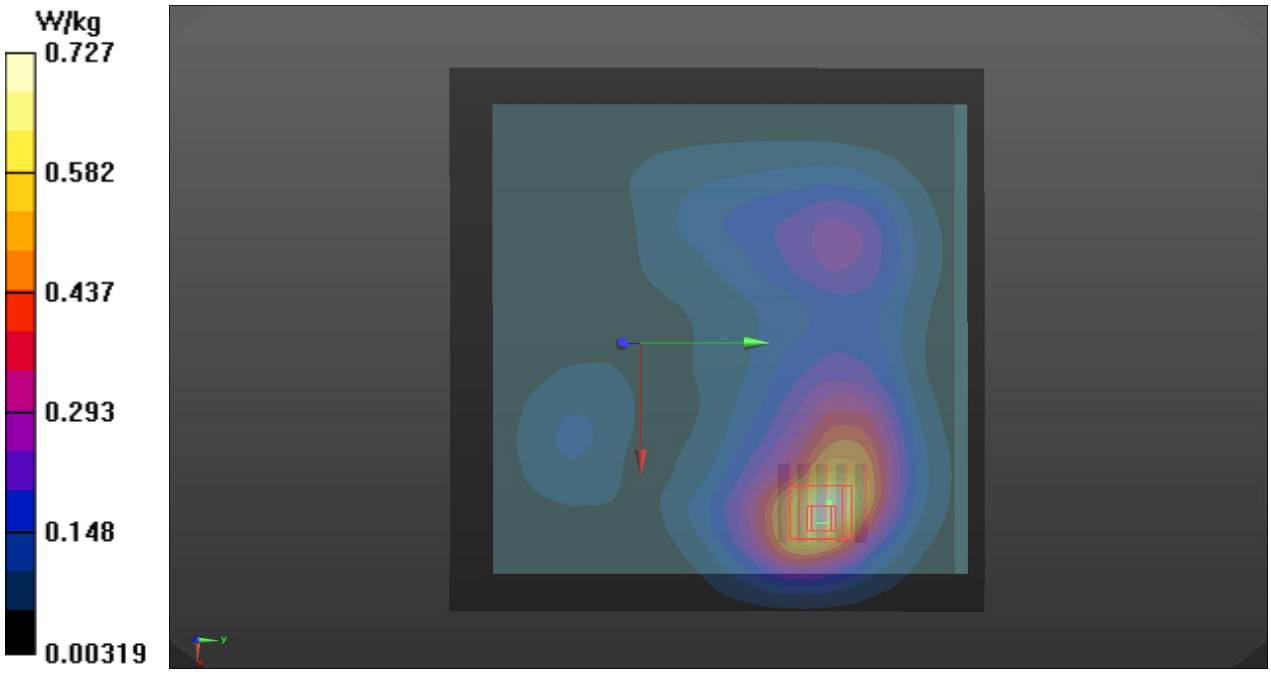
DUT: 4N1201

Communication System: WCDMA; Frequency: 1752.6 MHz;Duty Cycle: 1:1
Medium: B1750_141210 Medium parameters used: f = 1753 MHz; σ = 1.453 S/m; ε_r = 52.874; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; **Liquid Temperature**：22.9 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(8.21, 8.21, 8.21); Calibrated: 2014/2/17;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1424; Calibrated: 2014/2/11
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1238
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch1513/Area Scan (151x151x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.727 W/kg

Ch1513/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.10 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.856 W/kg
SAR(1 g) = 0.560 W/kg; SAR(10 g) = 0.356 W/kg
Maximum value of SAR (measured) = 0.707 W/kg



P20 WCDMA V_RMC12.2K_Rear Face_1cm_Ch4233

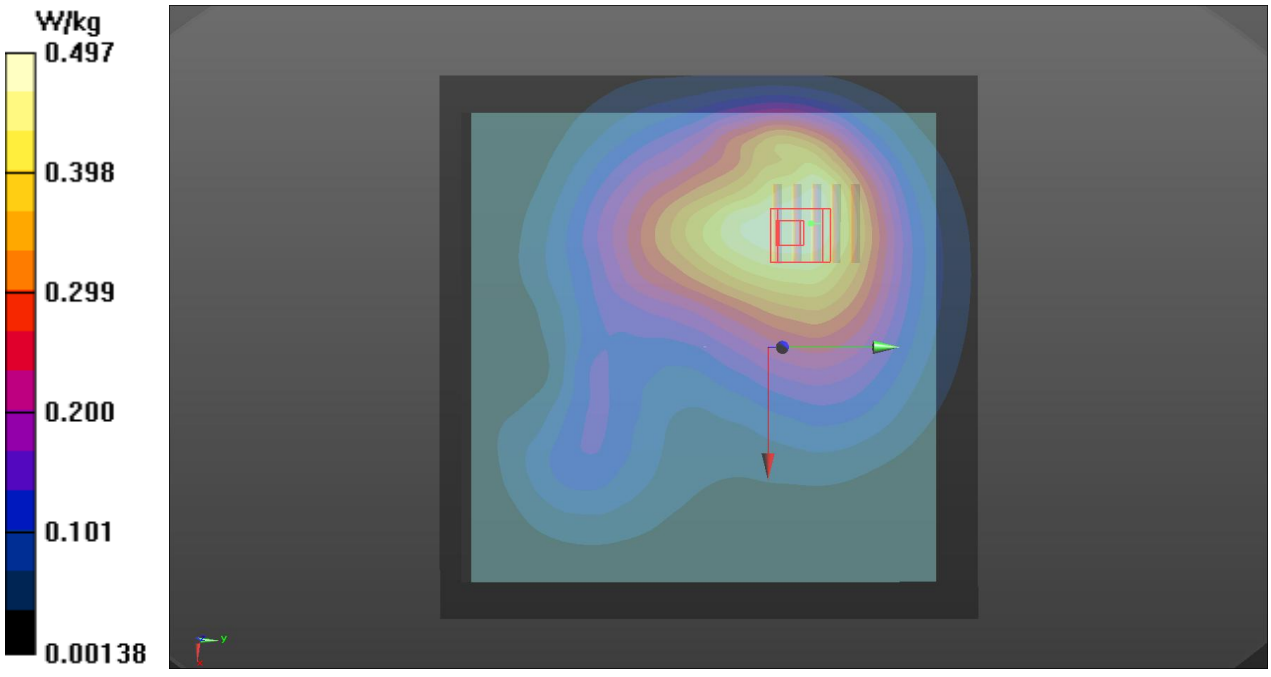
DUT: 4N1201

Communication System: WCDMA; Frequency: 846.6 MHz;Duty Cycle: 1:1
Medium: B835_141210 Medium parameters used: f = 847 MHz; σ = 1.009 S/m; ε_r = 56.872; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; **Liquid Temperature**：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(10, 10, 10); Calibrated: 2014/2/17;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1424; Calibrated: 2014/2/11
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1238
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch4233/Area Scan (151x151x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.497 W/kg

Ch4233/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.37 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.553 W/kg
SAR(1 g) = 0.416 W/kg; SAR(10 g) = 0.307 W/kg
Maximum value of SAR (measured) = 0.489 W/kg



P38 LTE 2_QPSK_20M_Front Face_1cm_Ch19100_1RB_Offset 99

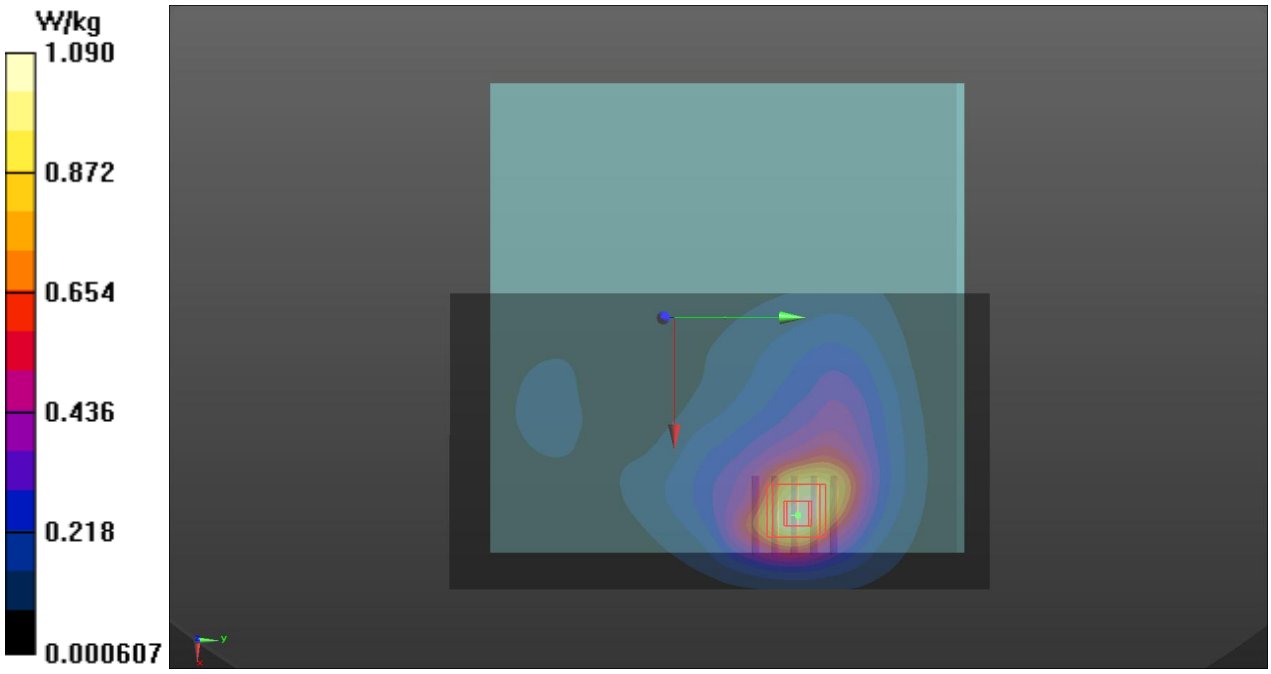
DUT: 4N1201

Communication System: LTE; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: B1900_141211 Medium parameters used: f = 1900 MHz; σ = 1.534 S/m; ε_r = 54.122; ρ = 1000 kg/m^3
Ambient Temperature：23.0 ℃; **Liquid Temperature**：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(7.89, 7.89, 7.89); Calibrated: 2014/2/17;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1424; Calibrated: 2014/2/11
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1238
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch19100/Area Scan (81x151x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.09 W/kg

Ch19100/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.54 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 1.52 W/kg
SAR(1 g) = 0.951 W/kg; SAR(10 g) = 0.561 W/kg
Maximum value of SAR (measured) = 1.26 W/kg



P40 LTE 2_QPSK_20M_Front Face_1cm_Ch19100_50RB_Offset 25

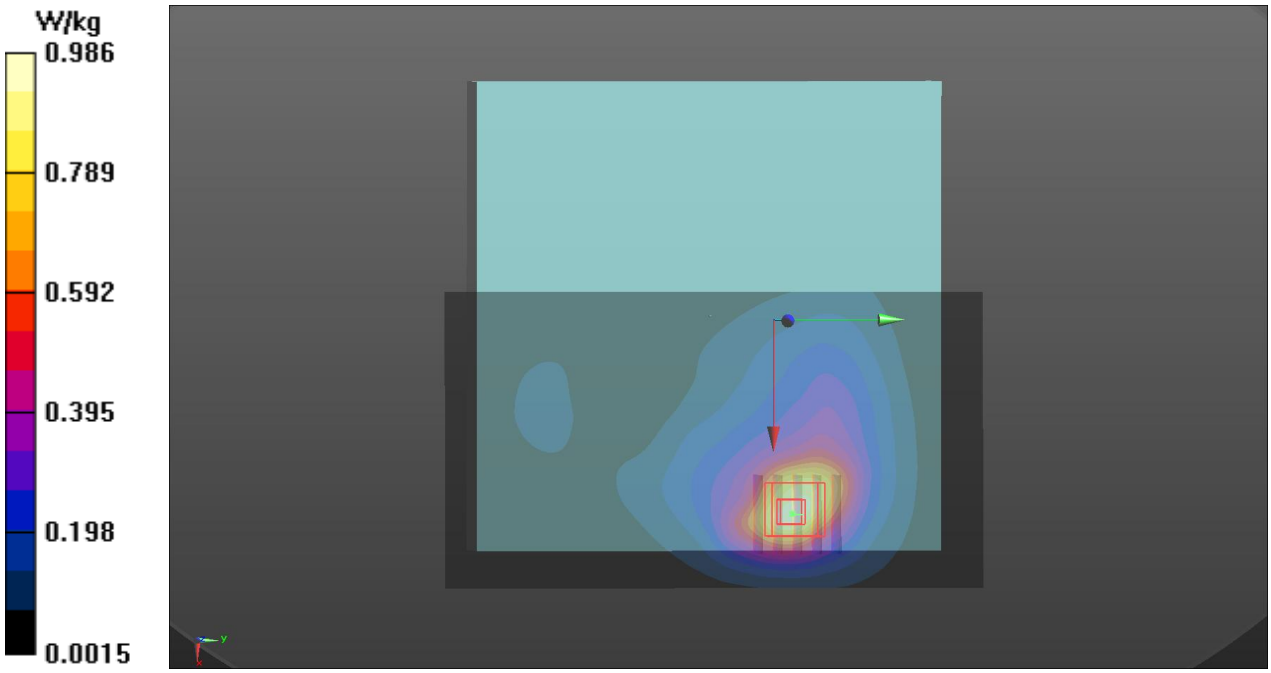
DUT: 4N1201

Communication System: LTE; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: B1900_141211 Medium parameters used: f = 1900 MHz; σ = 1.534 S/m; ε_r = 54.122; ρ = 1000 kg/m^3
Ambient Temperature：23.0 ℃; **Liquid Temperature**：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(7.89, 7.89, 7.89); Calibrated: 2014/2/17;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1424; Calibrated: 2014/2/11
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1238
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch19100/Area Scan (81x151x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.986 W/kg

Ch19100/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.95 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.36 W/kg
SAR(1 g) = 0.846 W/kg; SAR(10 g) = 0.495 W/kg
Maximum value of SAR (measured) = 1.12 W/kg



P43 LTE 4_QPSK_20M_Front Face_1cm_Ch20300_1RB_Offset 99

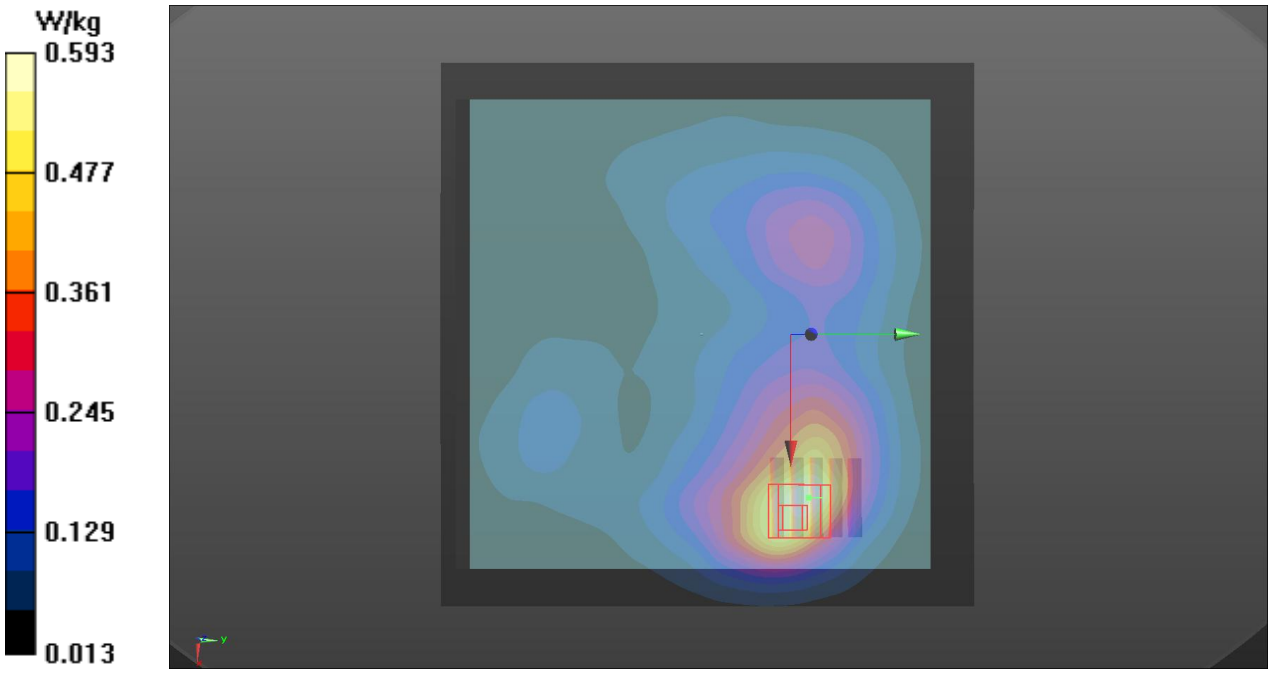
DUT: 4N1201

Communication System: LTE; Frequency: 1745 MHz;Duty Cycle: 1:1
Medium: B1750_141212 Medium parameters used: f = 1745 MHz; σ = 1.445 S/m; ε_r = 53.069; ρ = 1000 kg/m^3
Ambient Temperature：22.9 ℃; **Liquid Temperature**：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(8.21, 8.21, 8.21); Calibrated: 2014/2/17;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1424; Calibrated: 2014/2/11
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1238
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch20300/Area Scan (151x151x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.593 W/kg

Ch20300/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.83 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.704 W/kg
SAR(1 g) = 0.469 W/kg; SAR(10 g) = 0.306 W/kg
Maximum value of SAR (measured) = 0.599 W/kg



P49 LTE 4_QPSK_20M_Front Face_1cm_Ch20300_50RB_Offset 0

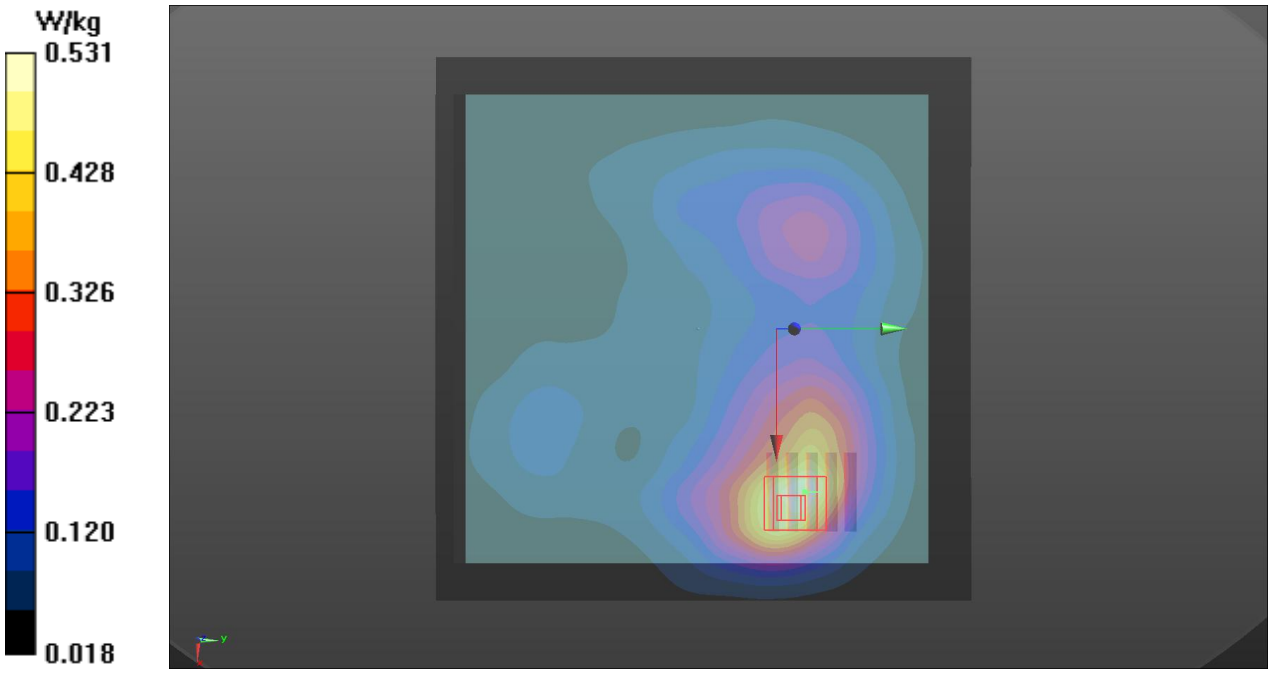
DUT: 4N1201

Communication System: LTE; Frequency: 1745 MHz;Duty Cycle: 1:1
Medium: B1750_141212 Medium parameters used: f = 1745 MHz; σ = 1.445 S/m; ε_r = 53.069; ρ = 1000 kg/m^3
Ambient Temperature：22.9 ℃; **Liquid Temperature**：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(8.21, 8.21, 8.21); Calibrated: 2014/2/17;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1424; Calibrated: 2014/2/11
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1238
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch20300/Area Scan (151x151x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.531 W/kg

Ch20300/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.63 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.599 W/kg
SAR(1 g) = 0.402 W/kg; SAR(10 g) = 0.265 W/kg
Maximum value of SAR (measured) = 0.507 W/kg



P56 LTE 5_QPSK_10M_Rear Face_1cm_Ch20600_1RB_Offset 49

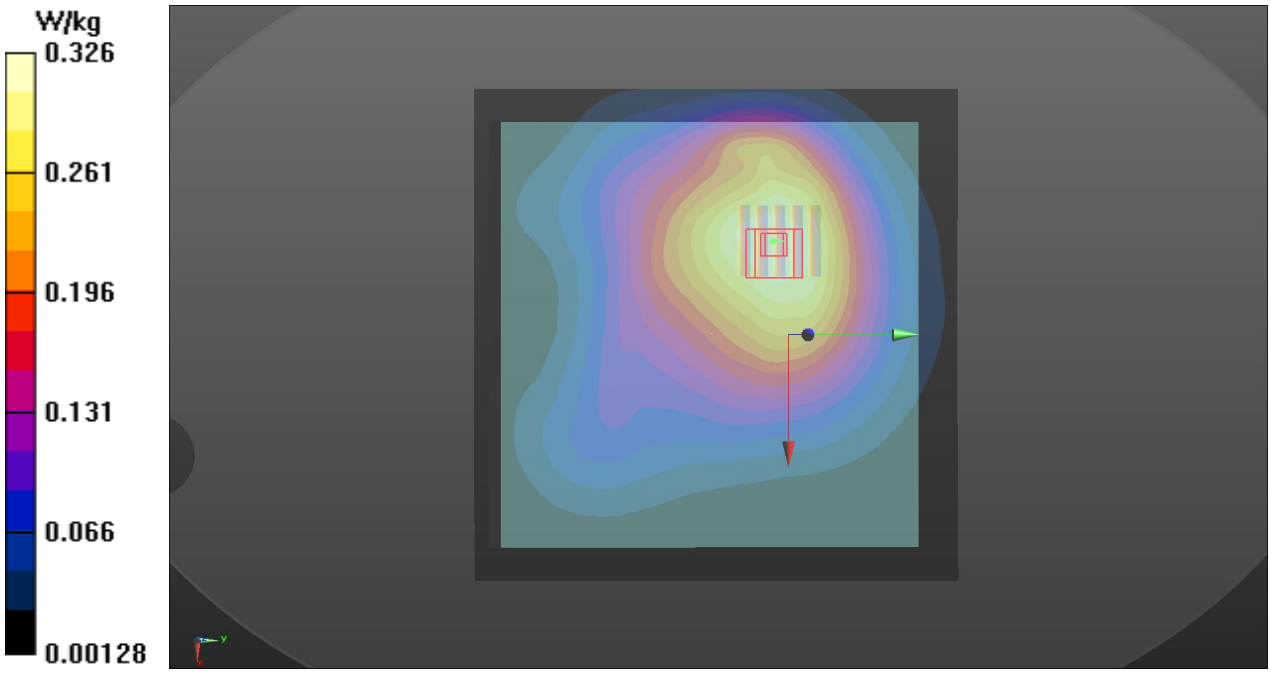
DUT: 4N1201

Communication System: LTE; Frequency: 844 MHz;Duty Cycle: 1:1
Medium: B835_141216 Medium parameters used: f = 844 MHz; σ = 0.996 S/m; ε_r = 56.221; ρ = 1000 kg/m^3
Ambient Temperature：23.0 ℃; **Liquid Temperature**：23.0 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(10, 10, 10); Calibrated: 2014/2/17;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1424; Calibrated: 2014/2/11
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1238
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch20600/Area Scan (151x151x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.326 W/kg

Ch20600/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.22 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.370 W/kg
SAR(1 g) = 0.283 W/kg; SAR(10 g) = 0.214 W/kg
Maximum value of SAR (measured) = 0.332 W/kg



P61 LTE 5_QPSK_10M_Front Face_1cm_Ch20600_25RB_Offset 0

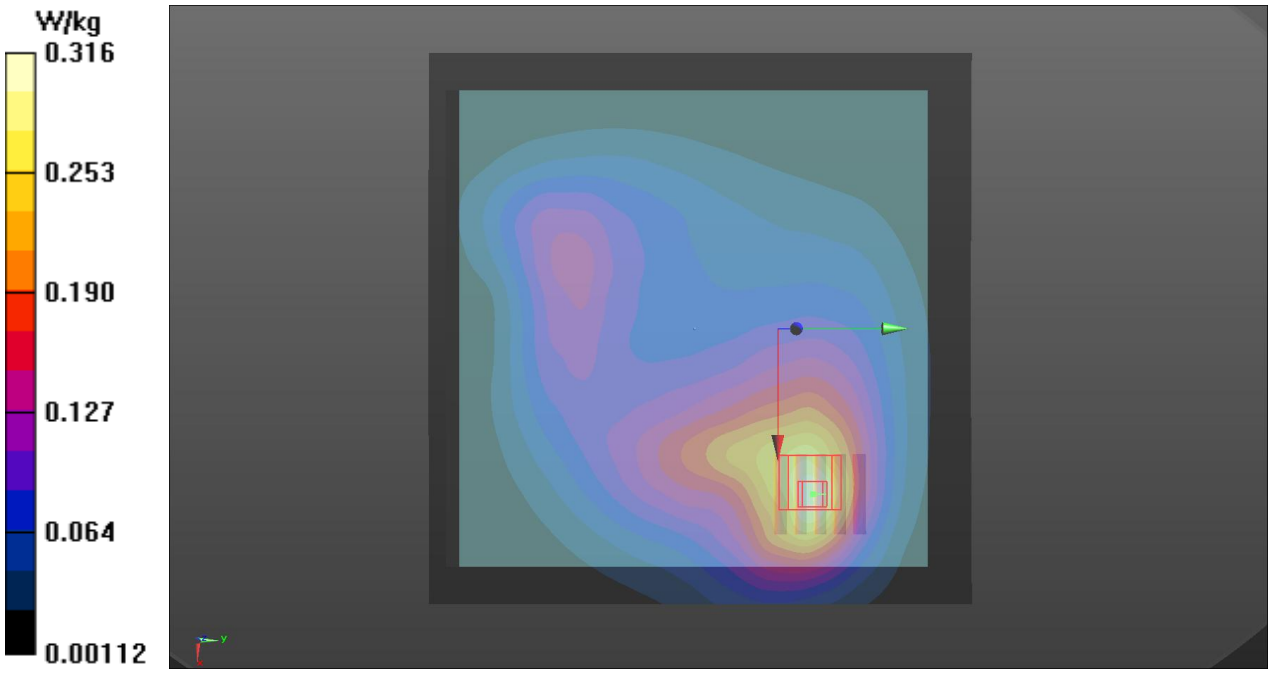
DUT: 4N1201

Communication System: LTE; Frequency: 844 MHz;Duty Cycle: 1:1
Medium: B835_141216 Medium parameters used: f = 844 MHz; σ = 0.996 S/m; ε_r = 56.221; ρ = 1000 kg/m^3
Ambient Temperature：23.1 ℃; **Liquid Temperature**：22.9 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(10, 10, 10); Calibrated: 2014/2/17;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1424; Calibrated: 2014/2/11
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1238
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch20600/Area Scan (151x151x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.316 W/kg

Ch20600/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.29 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.346 W/kg
SAR(1 g) = 0.244 W/kg; SAR(10 g) = 0.171 W/kg
Maximum value of SAR (measured) = 0.299 W/kg



P67 LTE 7_QPSK_20M_Front Face_1cm_Ch21100_1RB_Offset 99

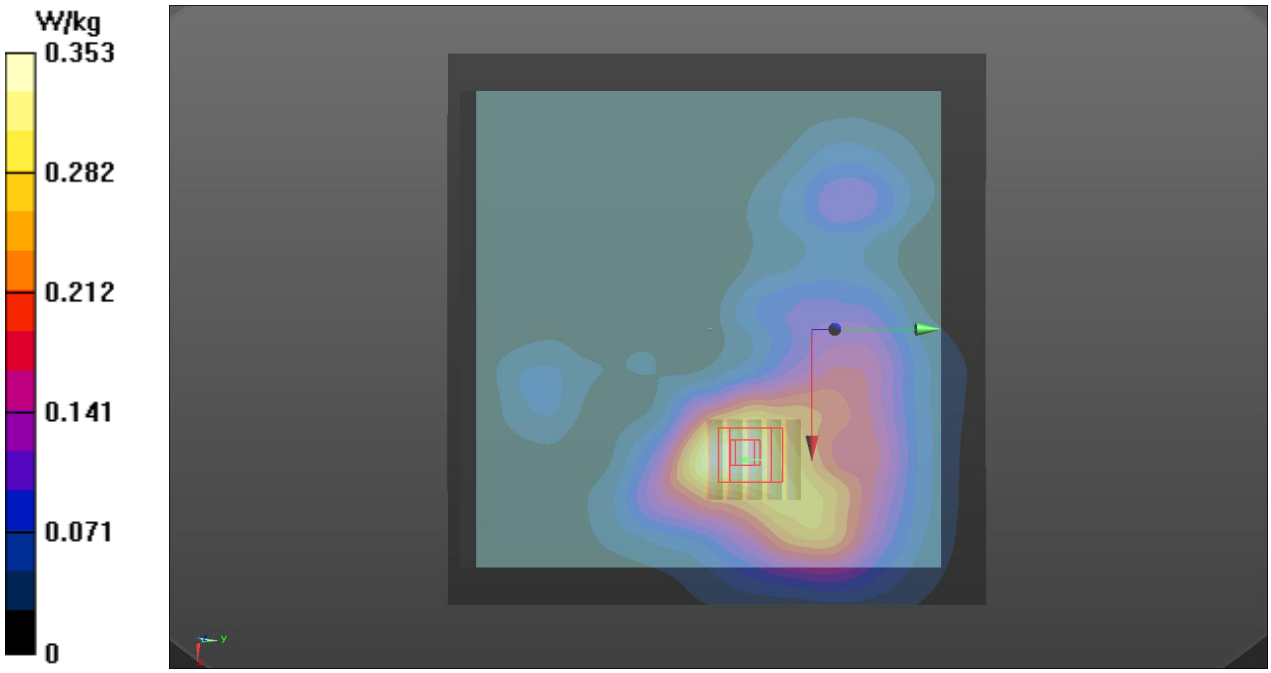
DUT: 4N1201

Communication System: LTE; Frequency: 2535 MHz;Duty Cycle: 1:1
Medium: B2600_141217 Medium parameters used: f = 2535 MHz; σ = 2.099 S/m; ε_r = 52.24; ρ = 1000 kg/m^3
Ambient Temperature：23.1 ℃; **Liquid Temperature**：22.9 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(7.03, 7.03, 7.03); Calibrated: 2014/2/17;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1424; Calibrated: 2014/2/11
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1238
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch21100/Area Scan (191x191x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.353 W/kg

Ch21100/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.67 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.452 W/kg
SAR(1 g) = 0.248 W/kg; SAR(10 g) = 0.146 W/kg
Maximum value of SAR (measured) = 0.337 W/kg



P73 LTE 7_QPSK_20M_Front Face_1cm_Ch21100_50RB_Offset 0

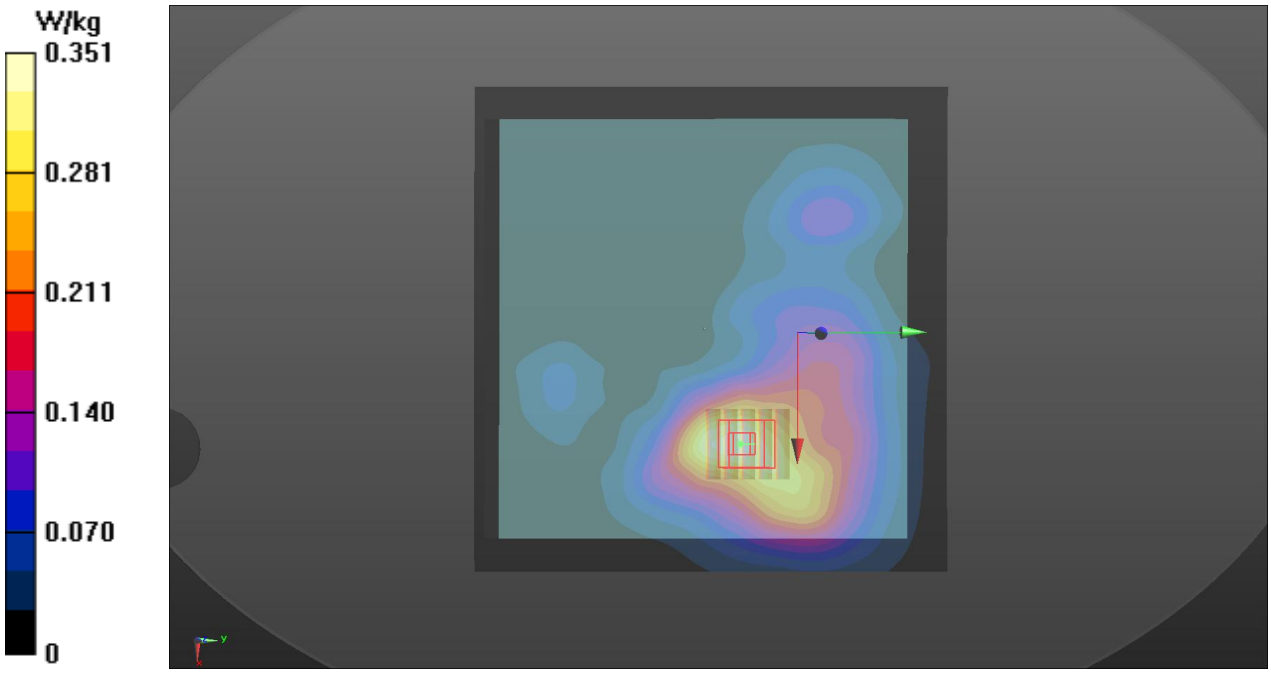
DUT: 4N1201

Communication System: LTE; Frequency: 2535 MHz;Duty Cycle: 1:1
Medium: B2600_141217 Medium parameters used: f = 2535 MHz; σ = 2.099 S/m; ε_r = 52.24; ρ = 1000 kg/m^3
Ambient Temperature：23.1 ℃; **Liquid Temperature**：22.9 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(7.03, 7.03, 7.03); Calibrated: 2014/2/17;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1424; Calibrated: 2014/2/11
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1238
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch21100/Area Scan (111x111x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.351 W/kg

Ch21100/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.84 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.434 W/kg
SAR(1 g) = 0.241 W/kg; SAR(10 g) = 0.143 W/kg
Maximum value of SAR (measured) = 0.331 W/kg



P79 LTE 13_QPSK_10M_Front Face_1cm_Ch23230_1RB_Offset 49

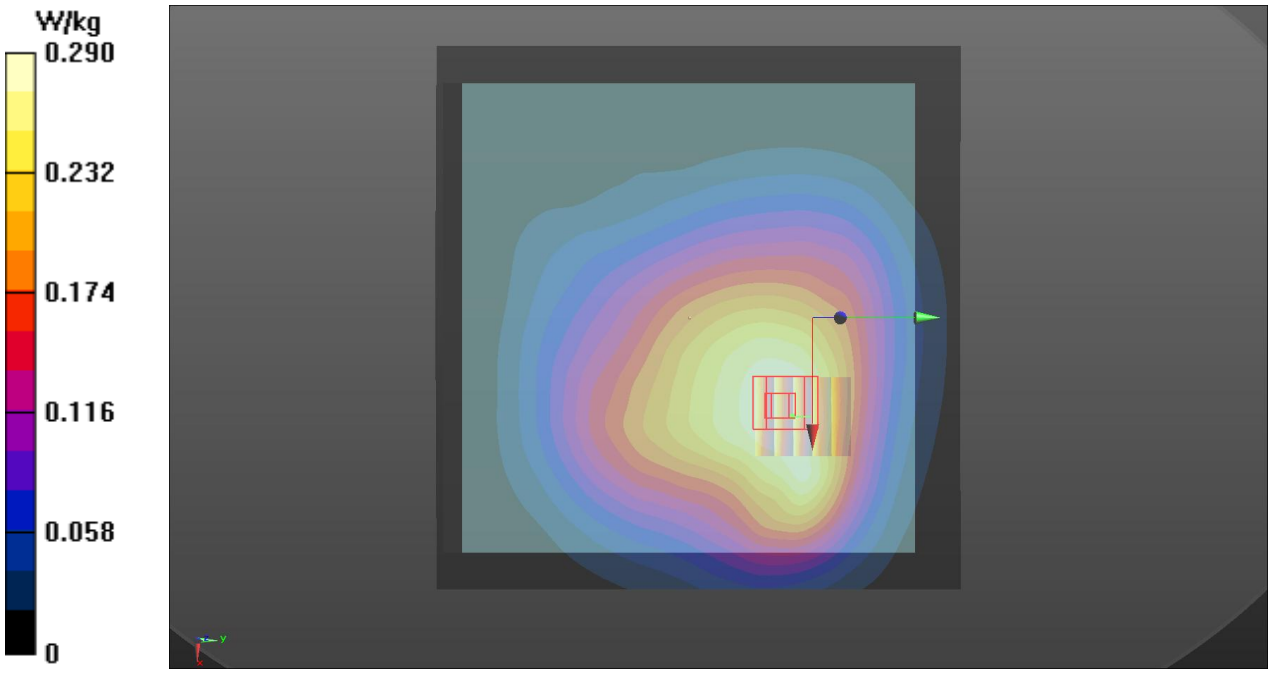
DUT: 4N1201

Communication System: LTE; Frequency: 782 MHz;Duty Cycle: 1:1
Medium: B750_141216 Medium parameters used: f = 782 MHz; σ = 0.994 S/m; ε_r = 55.13; ρ = 1000 kg/m^3
Ambient Temperature：23.0 ℃; **Liquid Temperature**：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(10.12, 10.12, 10.12); Calibrated: 2014/2/17;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1424; Calibrated: 2014/2/11
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1238
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch23230/Area Scan (151x151x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.290 W/kg

Ch23230/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.72 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.330 W/kg
SAR(1 g) = 0.266 W/kg; SAR(10 g) = 0.208 W/kg
Maximum value of SAR (measured) = 0.302 W/kg



P85 LTE 13_QPSK_10M_Front Face_1cm_Ch23230_25RB_Offset 12

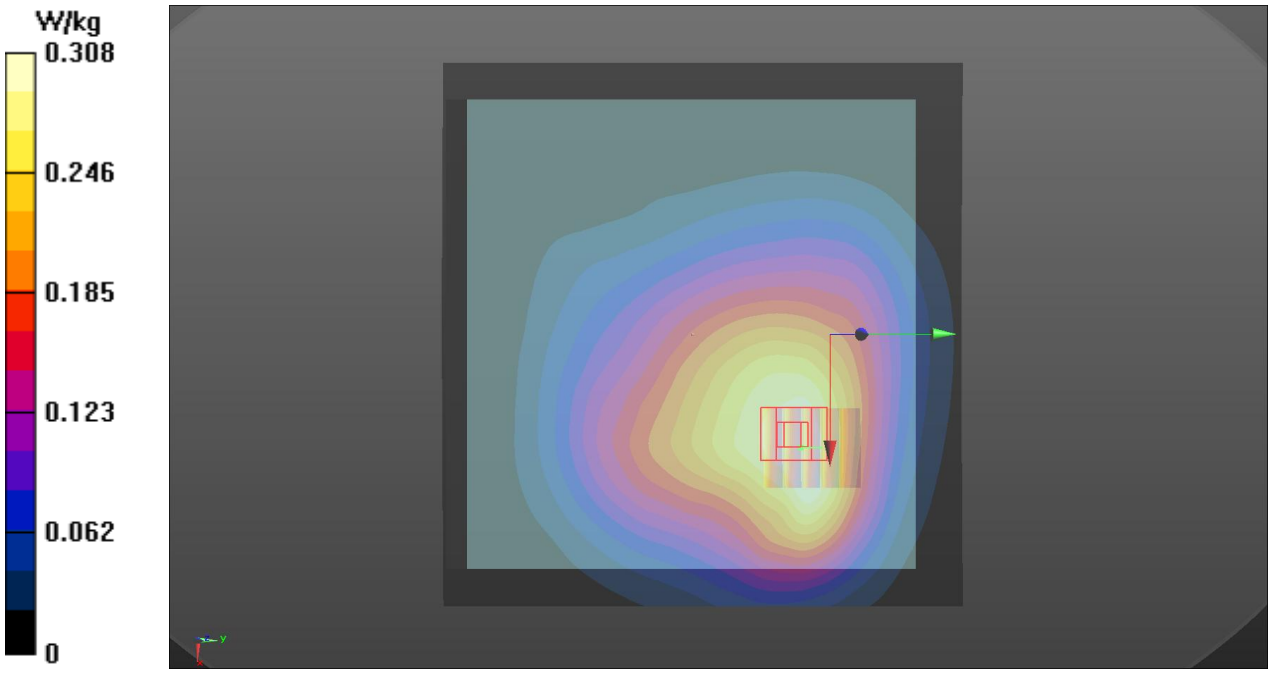
DUT: 4N1201

Communication System: LTE; Frequency: 782 MHz;Duty Cycle: 1:1
Medium: B750_141216 Medium parameters used: f = 782 MHz; σ = 0.994 S/m; ε_r = 55.13; ρ = 1000 kg/m^3
Ambient Temperature：23.0 ℃; **Liquid Temperature**：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(10.12, 10.12, 10.12); Calibrated: 2014/2/17;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1424; Calibrated: 2014/2/11
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1238
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch23230/Area Scan (151x151x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.308 W/kg

Ch23230/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.54 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.332 W/kg
SAR(1 g) = 0.266 W/kg; SAR(10 g) = 0.207 W/kg
Maximum value of SAR (measured) = 0.302 W/kg



P91 LTE 17_QPSK_10M_Front Face_1cm_Ch23800_1RB_Offset 49

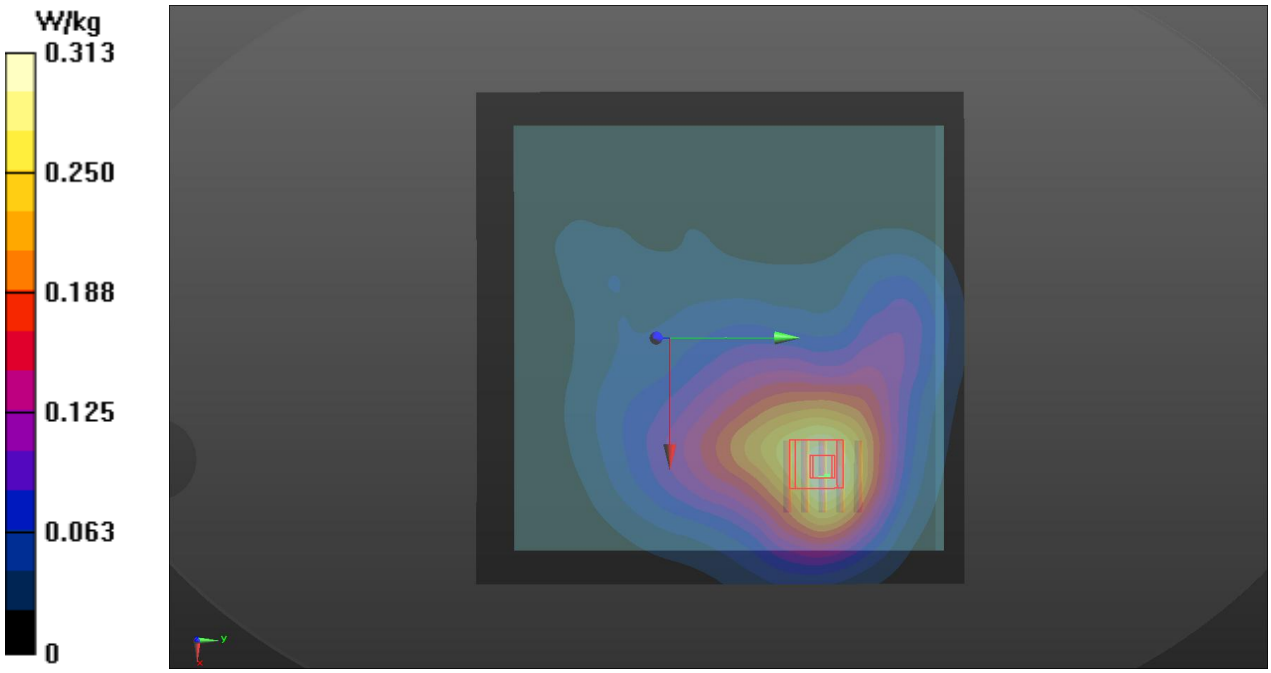
DUT: 4N1201

Communication System: LTE; Frequency: 711 MHz;Duty Cycle: 1:1
Medium: B750_141216 Medium parameters used: f = 711 MHz; σ = 0.936 S/m; ε_r = 55.765; ρ = 1000 kg/m^3
Ambient Temperature：23.0 ℃; **Liquid Temperature**：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(10.12, 10.12, 10.12); Calibrated: 2014/2/17;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1424; Calibrated: 2014/2/11
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1238
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch23800/Area Scan (151x151x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.313 W/kg

Ch23800/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.92 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.335 W/kg
SAR(1 g) = 0.258 W/kg; SAR(10 g) = 0.193 W/kg
Maximum value of SAR (measured) = 0.300 W/kg



P97 LTE 17_QPSK_10M_Front Face_1cm_Ch23790_25RB_Offset 0

DUT: 4N1201

Communication System: LTE; Frequency: 710 MHz;Duty Cycle: 1:1
Medium: B750_141216 Medium parameters used: f = 710 MHz; σ = 0.935 S/m; ε_r = 55.773; ρ = 1000 kg/m^3
Ambient Temperature：23.0 ℃; **Liquid Temperature**：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3976; ConvF(10.12, 10.12, 10.12); Calibrated: 2014/2/17;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1424; Calibrated: 2014/2/11
- Phantom: ELI v5.0; Type: QDOVA002AA; Serial: TP:1238
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch23790/Area Scan (151x151x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.242 W/kg

Ch23790/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.87 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.262 W/kg
SAR(1 g) = 0.201 W/kg; SAR(10 g) = 0.149 W/kg
Maximum value of SAR (measured) = 0.235 W/kg