FCC SAR Test Report

Report No.	:	**OT-193-RWD-050**
AGR. No.	:	**A192A-046**
Applicant	:	**Suntech International Ltd.**
Address	:	**(Gasan-dong, Greatvally), B-1506, 32, Digital-ro9-gil, Geumchon-gu, Seoul, Korea**
DUT Type	:	**Personal & Asset Tracker**
FCC ID	:	**WA2-ST4940**
Brand	:	**Suntech International Ltd.**
Model No.	:	**ST4940**
FCC Rule Part(s)	:	**CFR §2.1093**
Sample Received Date	:	**2019-02-11**
Date of Testing	:	**2019-03-11 ~ 2019-03-14**
Issue Date	:	**2019-03-18**

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. This report may only be reproduced and distribute in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of ONETECH Corp. or testing done by ONETECH Corp. In connection with distribution or use of the product described in this report must be approved by ONETECH Corp. in writing.

Tested By :

Junghun Park / Engineer

Approved By :

Jaeho Lee / Technical Manager

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1. Summary of Maximum SAR Value

Equipment Class	Band & Mode	Tx Frequency	SAR 1 g Body (W/kg)
PCB	LTE Band 2	1850 ~ 1910 MHz	0.818
	LTE Band 4	1710 ~ 1755 MHz	0.934
	LTE Band 12	699 ~ 716 MHz	0.261
	LTE Band 13	777 ~ 787 MHz	0.105

This wireless portable device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in ANSI/IEEE C95.1-1992 and has been tested in accordance with the measurement procedures specified in Section 8 of this report;

2. Device Under Test

2.1. DUT Information

DUT Type	Personal & Asset Tracker
FCC ID	WA2-ST4940
Brand Name	Suntech International Ltd.
Model Name	ST4940
Additional Model Name(s)	-
Antenna Type	Fixed Internal Antenna
DUT Stage	Identical Prototype

2.2. Device Overview

Band & Mode	Operating Modes	Tx Frequency
LTE Band 2	Data	1850 ~ 1910 MHz
LTE Band 4	Data	1710 ~ 1755 MHz
LTE Band 12	Data	699 ~ 716 MHz
LTE Band 13	Data	777 ~ 787 MHz

Notes:

1. For LTE Cat. M1, the uplink subframes are scheduled at three subframes every 10 ms for all channel bandwidths according to 3GPP 36.521 specification.

2.3. Power Reduction for SAR

There is no power reduction used for any band/mode implemented in the device for SAR purposes.

2.4. Nominal and Maximum Output Power Specifications

This device operates using the following maximum and nominal output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB Publication 447498 D01 v06.

Maximum PCB Output Power

Mode / Band		Modulated Average (dBm)
LTE Band 2	Maximum	23.0
	Nominal	22.0
LTE Band 4	Maximum	23.0
	Nominal	22.0
LTE Band 12	Maximum	22.5
	Nominal	21.5
LTE Band 13	Maximum	23.0
	Nominal	22.0

2.5. DUT Antenna Locations

This device is also operating at hand-held use near body. So, FCC KDB Publication 941225 D07 is apply to this condition. 1g SAR test is evaluated to some position (distance from to the edge/side is within 2.5 cm) at 0 mm. so 10g SAR is not required.

Table 2-1 Device Edges/Sides for SAR Testing

Mode	Top	Bottom	Front	Rear	Right	Left
LTE Band 2	Yes	No	Yes	Yes	Yes	Yes
LTE Band 4	Yes	No	Yes	Yes	Yes	Yes
LTE Band 12	Yes	No	Yes	Yes	Yes	Yes
LTE Band 13	Yes	No	Yes	Yes	Yes	Yes

Note: Particular DUT edges were not required to be evaluated for wireless router SAR or phablet SAR if the edges were greater than 2.5 cm from the transmitting antenna according to FCC KDB Publication 941225 D07 and October 2016 TCBC Workshop Note. The distances between the transmit antenna and the edges of the device are included in the filing.

2.6. Global Positioning System (GPS) Antenna

This DUT has GPS operations. The GPS antenna is integrated into the device for this model. Therefore, all SAR tests were performed with the device which already incorporates the GPS antenna. A diagram showing the location of the GPS antenna can be found in Appendix F.

2.7. Simultaneous Transmission Capabilities

According to FCC KDB Publication 447498 D01v06, transmitters are considered to be transmitting simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds. Possible transmission paths for the DUT are shown in Figure 2-1 and are color-coded to indicate communication modes which share the same path. Modes which share the same transmission path cannot transmit simultaneously with one another.

This device contains single transmitters that may not operate simultaneously, and therefore not requires a simultaneous transmission analysis.

Path 1
LTE

Figure 2-1 Simultaneous Transmission Paths

2.8. Miscellaneous SAR Test Considerations

(A) WIFI/BT
This device does not support for WIFI and Bluetooth.

(B) Licensed Transmitter(s)

This device support for LTE Category M1 and this device support only 10 MHz bandwidth for each LTE bands.

LTE SAR for the higher modulations was not tested since the maximum average output power of all required channels and configurations was not more than 0.5 dB higher than the highest bandwidth; and the reported LTE SAR for the highest bandwidth was less than 1.45 W/kg for all configurations according to FCC KDB 941225 D05v02r05.

2.9. Guidance Applied

- IEEE 1528-2013
- FCC KDB Publication 941225 D05v02r05, D07v01r02 (LTE and UMPC Mini Tablet)
- FCC KDB Publication 447498 D01v06 (General SAR Guidance)
- FCC KDB Publication 865664 D01v01r04, D02v01r02 (SAR Measurements up to 6 GHz)
- FCC KDB Publication 690783 D01v01r03 (SAR Listings on Grants)
- October 2016 TCBC Workshop Notes (SAR Testing for Non-Standard Form Factor Devices – SAR for Generic Device)

2.10. Device Serial Numbers

Several samples with identical hardware were used to support SAR testing. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units. The serial numbers used for each test are indicated alongside the results in Section 11.

3. LTE Information

<table>
<tr><th colspan="4">LTE Information</th></tr>
<tr><td>Form Factor</td><td colspan="3">Personal & Asset Tracker</td></tr>
<tr><td rowspan="4">Frequency Range of each LTE transmission band</td><td colspan="3">LTE Band 2 (1850 ~ 1910 MHz)</td></tr>
<tr><td colspan="3">LTE Band 4 (1710 ~ 1755 MHz)</td></tr>
<tr><td colspan="3">LTE Band 12 (699 ~ 716 MHz)</td></tr>
<tr><td colspan="3">LTE Band 13 (777 ~ 787 MHz)</td></tr>
<tr><td rowspan="4">Channel Bandwidths</td><td colspan="3">LTE Band 2: 10 MHz</td></tr>
<tr><td colspan="3">LTE Band 4: 10 MHz</td></tr>
<tr><td colspan="3">LTE Band 12: 10 MHz</td></tr>
<tr><td colspan="3">LTE Band 13: 10 MHz</td></tr>
<tr><td>LTE Band 2: 10 MHz</td><td>1855 (18650)</td><td>1880 (18900)</td><td>1905 (19150)</td></tr>
<tr><td>LTE Band 4: 10 MHz</td><td>1715 (20000)</td><td>1732.5 (20175)</td><td>1750 (20350)</td></tr>
<tr><td>LTE Band 12: 10 MHz</td><td>704 (23060)</td><td>707.5 (23095)</td><td>711 (23130)</td></tr>
<tr><td>LTE Band 13: 10 MHz</td><td>N/A</td><td>782 (23230)</td><td>N/A</td></tr>
<tr><td>UE Category</td><td colspan="3">LTE Category M1</td></tr>
<tr><td>Modulations Supported in UL</td><td colspan="3">QPSK, 16QAM</td></tr>
<tr><td>LTE MPR Permanently implemented per 3GPP TS 36.521 section 6.2.3~6.2.5? (manufacturer attestation to be provided)</td><td colspan="3">Table 6.2.3EA-1: Maximum Power Reduction (MPR) for Power Class 3
<table>
<tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (N_{RB})</th><th rowspan="2">MPR (dB)</th></tr>
<tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr>
<tr><td>QPSK</td><td>>2</td><td>>2</td><td>>1</td><td>>4</td><td>-</td><td>-</td><td>≤ 1</td></tr>
<tr><td>QPSK</td><td>>5</td><td>>5</td><td>-</td><td>-</td><td>-</td><td>-</td><td>≤ 2</td></tr>
<tr><td>16 QAM</td><td>≤ 2</td><td>≤ 2</td><td>>1</td><td>>3</td><td>-</td><td>-</td><td>≤ 1</td></tr>
<tr><td>16QAM</td><td>>2</td><td>>2</td><td>>3</td><td>>5</td><td>-</td><td>-</td><td>≤ 2</td></tr>
</table>
MPR Built-in by design.
The manufacturer MPR values are always within the 3GPP maximum MPR allowance but may not follow the default MPR values.</td></tr>
<tr><td>A-MPR (Additional MPR) disabled for SAR Testing?</td><td colspan="3">Yes</td></tr>
<tr><td>Power reduction</td><td colspan="3">No</td></tr>
<tr><td>Spectrum plots for RB configurations</td><td colspan="3">A properly configured base station simulator was used for the SAR and power measurements; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.</td></tr>
</table>

4. INTRODUCTION

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

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

4.1. SAR Definition

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

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

Equation 3-1 SAR Mathematical Equation

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

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

where:

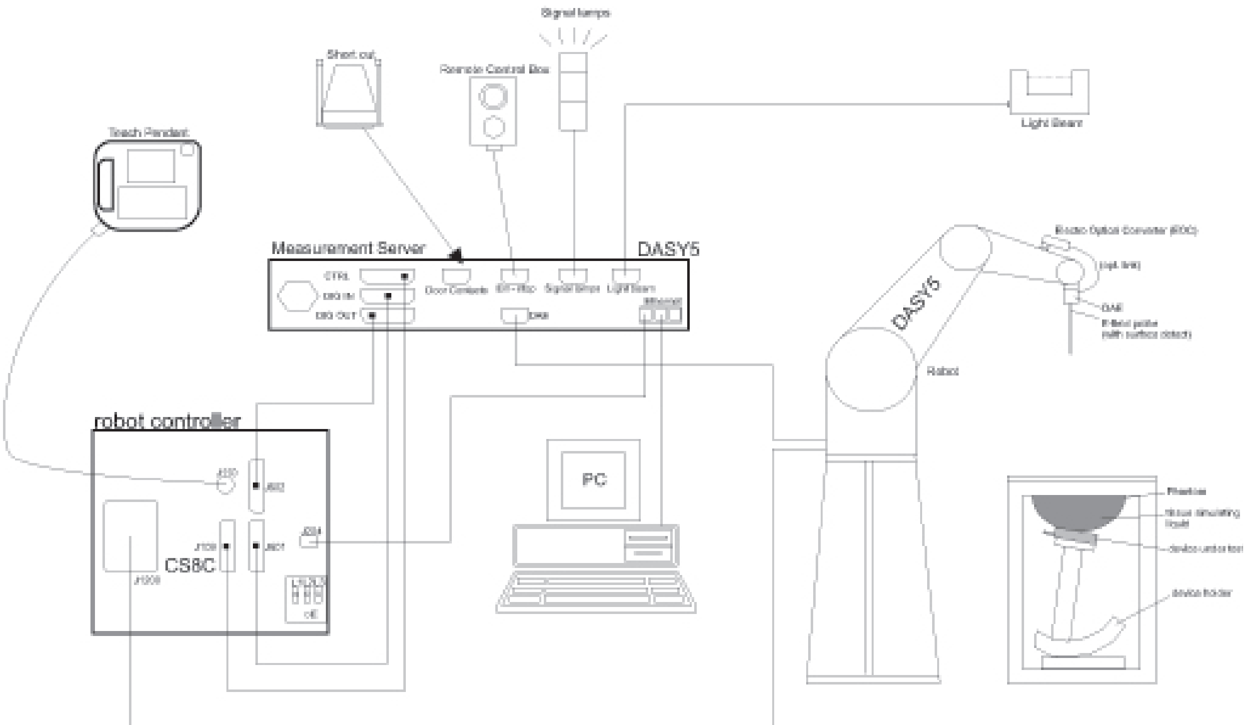
σ = conductivity of the tissue (S/m)
ρ = mass density of the tissue (kg/m^3)
E = rms electric field strength (V/m)

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

4.2. SAR Measurement Setup

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. 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, Win7 or Win10 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.



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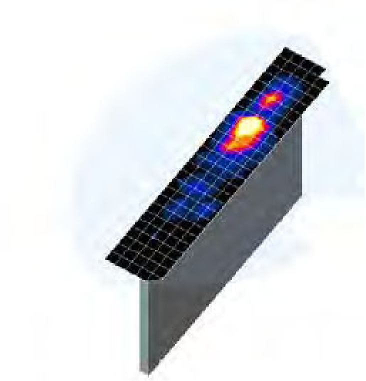
5. DOSIMETRIC ASSESSMENT

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



1. The SAR distribution at the exposed side of the head or body was measured at a distance no greater than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the device-head and body interface and the horizontal grid resolution was determined per FCC KDB Publication 865664 D01v01r04 (See Table 5-1) and IEEE 1528-2013.
2. The point SAR measurement was taken at the maximum SAR region determined from Step 1 to enable the monitoring of SAR fluctuations/drifts during the 1g/10g cube evaluation. SAR at this fixed was measured and used as a reference value.
3. Based on the area scan data, the peak of the region with maximum SAR point was determined by spline interpolation. Around this point, a volume was assessed according to the measurement resolution and volume size requirements of FCC KDB Publication 865664 D01v01r04 (See Table 4-1) and IEEE 1528-2013. On the basis of this data set, the spatial peak SAR value was evaluated with the following procedure (see references or the DASY manual online for more details):
   a) SAR values at the inner surface of the phantom are extrapolated from the measured values along the line away from the surface with spacing no greater than that in Table 4-1. The extrapolation was based on a least-squares algorithm. A polynomial of the fourth order was calculated through the points in the z-axis (normal to the phantom shell).
   b) After the maximum interpolated values were calculated between the points in the cube, the SAR was averaged over the spatial volume (1g or 10g) using a 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the "Not a knot" condition (in x, y, and z directions). The volume was then integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were obtained through interpolation, in order to calculate the averaged SAR.
   c) All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.
4. The SAR reference value, at the same location as step 2, was re-measured after the zoom scan was complete to calculate the SAR drift. If the drift deviated by more than 5%, the SAR test and drift measurements were repeated.

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

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

*Also compliant to IEEE 1528-2013 Table 6

6. TEST CONFIGURATION POSITIONS

6.1. Device Holder

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

6.2. Positioning for Testing

Based on FCC guidance and expected exposure conditions, the device was positioned with the outside of the device touching the flat phantom and such that the location of maximum SAR was captured during SAR testing. The SAR test setup photograph is included in Appendix F.

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7. RF EXPOSURE LIMITS

In order for users to be aware of the body-worn operating requirements for meeting RF exposure compliance, operating instructions and cautions statements are included in the user's manual.

7.1. 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.

7.2. Controlled Environment

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

Table 8-1 SAR Human Exposure Specified in ANSI/IEEE C95.1-1992 and Health Canada Safety Code 6

	UNCONTROLLED ENVIRONMENT General Population (W/kg) or (mW/g)	CONTROLLED ENVIROMENT Professional Population (W/kg) or (mW/g)
SPATIAL PEAK SAR[1] Brain	1.60	8.00
SPATIAL AVERAGE SAR[2] Whole Body	0.08	0.40
SPATIAL PEAK SAR[3] Hands, Feet, Ankles, Wrists	4.00	20.00

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

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8. FCC MEASUREMENT PROCEDURES

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

8.1. Measured and Reported SAR

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

Per KDB Publication 447498 D01v06, testing of other required channels within the operating mode of a frequency band is not required when the reported 1g or 10g SAR for the mid-band or highest output power channel is:

- ≤ 0.8 W/kg or 2.0 W/kg, for 1g or 10g respectively, when the transmission band is ≤ 100 MHz
- ≤ 0.6 W/kg or 1.5 W/kg, for 1g or 10g respectively, when the transmission band is between 100 MHz and 200 MHz
- ≤ 0.4 W/kg or 1.0 W/kg, for 1g or 10g respectively, when the transmission band is ≥ 200 MHz

8.2. Procedures Used to Establish RF Signal for SAR

The following procedures are according to FCC KDB Publication 941225 D05v02r05 “SAR for LTE Devices.”

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

8.3. SAR Measurement Conditions for LTE Cat. M1

LTE modes are tested according to FCC KDB 941225 D05v02r05 publication. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR. The R&S CMW500 or Anritsu MT8820C simulators are used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

8.3.1. Spectrum Plots for RB Configurations

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

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8.3.2. MPR

MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.521 Section 6.2 under Table 6.2.3EA-1.

UE Power Class: 3 (23 +/- 2 dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3EA-1 of the 3GPP TS36.521.

Table 6.2.3EA-1: Maximum Power Reduction (MPR) for Power Class 3

Modulation	Channel bandwidth / Transmission bandwidth (N_{RB})						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	>2	>2	>1	>4	-	-	≤ 1
QPSK	>5	>5	-	-	-	-	≤ 2
16 QAM	≤ 2	≤ 2	>1	>3	-	-	≤ 1
16QAM	>2	>2	>3	>5	-	-	≤ 2

8.3.3. A-MPR

A-MPR (Additional MPR) has been disabled for all SAR tests by setting NS=01 on the base station simulator. The allowed A-MPR values specified below in Table 6.2.4EA-1 of 3GPP TS36.521 are in addition to the allowed MPR requirements.

Table 6.2.4EA-1: Additional Maximum Power Reduction (A-MPR) for category M1 UE

Network Signalling value	Requirements (subclause)	E-UTRA Band	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.2-1	Table 5.4.2-1	N/A
NS_03	6.6.2.2.1	2, 4	Table 5.4.2-1	N/A
NS_04	6.6.2.2.2	41	[TBD]	[TBD]
NS_05	6.6.3.3.2	1	Table 5.4.2-1	N/A
NS_06	6.6.2.2.3	12, 13, 14	Table 5.4.2-1	N/A
NS_07	6.6.2.2.3 6.6.3.3.3	13	Table 6.2.4-2E	
NS_08	6.6.3.3.4	19	Table 5.4.2-1	N/A
NS_09	6.6.3.3.5	21	Table 5.4.2-1	N/A
NS_10		20	Table 5.4.2-1	N/A
NS_12	6.6.3.3.7	26	[TBD]	
NS_13	6.6.3.3.8	26	Table 5.4.2-1	N/A
NS_14	6.6.3.3.9	26	Table 5.4.2-1	N/A
NS_15	6.6.3.3.10	26	Table 6.2.4-9	
NS_16	6.6.3.3.11	27	Table 5.4.2-1	N/A
NS_17	6.6.3.3.12	28	Table 5.4.2-1	N/A
NS_18	6.6.3.3.13	28	Table 5.4.2-1	N/A
NS_32	-	-	-	-
NS_35	[TBD]	71	[TBD]	[TBD]
NS_38	6.6.3.3.27	74	Table 5.4.2-1	N/A
NS_39	6.6.3.3.28	74	Table 5.4.2-1	N/A

8.3.4. NB Index Configurations

NB Index configurations specified below in Table 6.2.2EA.4.1-1 of 3GPP TS36.521.

Table 6.2.2EA.4.1-1: Test Configuration Table

Initial Conditions	
Test Environment as specified in TS 36.508 [7] subclause 4.1	Normal, TL/VL, TL/VH, TH/VL, TH/VH
Test Frequencies as specified in TS 36.508 [7] subclause 4.3.1	Low range, Mid range, High range
Test Channel Bandwidths as specified in TS 36.508 [7] subclause 4.3.1	Highest

Test Parameters for Channel Bandwidths				
	Downlink Configuration	Uplink Configuration		
Ch BW	N/A for Max UE output power testing	Mod'n	RB allocation	
			FDD and HD-FDD	TDD
5MHz		QPSK	1	1
5MHz		QPSK	3(Note 5)	3(Note 5)
10MHz		QPSK	1	1
10MHz		QPSK	4(Note 4), 5 (Note 5)	4(Note 4), 5(Note 5)
15MHz		QPSK	1	1
15MHz		QPSK	6	6
20MHz		QPSK	1	1
20MHz		QPSK	6	6

Note 1: Test Channel Bandwidth is checked separately for each E-UTRA band, the applicable channel bandwidths are specified in Table 5.4.2.1-1.

Note 2: The 1 RB allocation shall be tested at RB#0 with narrowband index 0 for low and mid range, RB #5 with max narrowband index for high range test frequency. For E-UTRA bands applied with Note 2 in Table 6.2.2 EA -1 and when channel bandwidth is larger than 4 MHz, for 5 MHz channel bandwidth the 1 RB allocation shall additionally be tested at RB#2 with narrowband index [3] for low range, RB #3 with narrowband index 0 for high range test frequency, for 10 MHz channel bandwidth the 1 RB allocation shall additionally be tested at RB#1 with narrowband index 3 for low range, RB #4 with narrowband index 4 for high range test frequency, for 15 MHz channel bandwidth the 1 RB allocation shall additionally be tested at RB#0 with narrowband index 3 for low range, RB #5 with narrowband index 8 for high range test frequency, for 20 MHz channel bandwidth the 1 RB allocation shall additionally be tested at RB#3 with narrowband index 2 for low range, RB #2 with narrowband index 13 for high range test frequency.

Note 3: The RBstart of non-1RB allocation shall be RB #0 with narrowband index 0 for low and mid range, RB# (6 - RB allocation) with max narrowband index for high range test frequency.

Note 4: Only applicable for Power class 3

Note 5: Only applicable for Power class 5

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8.3.5. Required RB Size and RB Offsets for SAR Testing

According to FCC KDB 941225 D05v02r05:

a. Per Section 5.2.1, SAR is required for QPSK 1 RB Allocation for the largest bandwidth
   i. The required channel and offset combination with the highest maximum output power is required for SAR.
   ii. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required. Otherwise, SAR is required for the remaining required test channels using the RB offset configuration with highest output power for that channel.
   iii. When the reported SAR for a required test channel is > 1.45 W/kg, SAR is required for all RB offset configurations for that channel.

b. Per Section 5.2.2, SAR is required for 50% RB allocation using the largest bandwidth following the same procedures outlined in Section 5.2.1.

c. Per Section 5.2.3, QPSK SAR is not required for the 100% allocation when the highest maximum output power for the 100% allocation is less than the highest maximum output power of the 1 RB and 50% RB allocations and the reported SAR for the 1 RB and 50% RB allocations is < 0.8 W/kg.

d. Per Section 5.2.4 and 5.3, SAR tests for higher order modulations and lower bandwidths configurations are not required when the conducted power of the required test configurations determined by Sections 5.2.1 through 5.2.3 is less than or equal to ½ dB higher than the equivalent configuration using QPSK modulation and when the QPSK SAR for those configurations is <1.45 W/kg.

9. RF CONDUCTED POWERS

9.1. LTE Conducted Powers

9.1.1. LTE Band 2 – Cat. M1

Table 9-1 LTE Band 2 – Cat. M1 Conducted Powers – 10 MHz Bandwidth

LTE Band 2 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Narrow Index	Low Channel 18650 (1855 MHz)	Mid Channel 18900 (1880 MHz)	High Channel 19150 (1905 MHz)	MPR Allowed Power 3GPP [dB]
				Conducted Power [dBm]			
QPSK	1	0	0	22.80	**22.83**	22.58	0
	1	5	0	22.64	22.74	22.57	
	1	0	3	22.61	22.72	22.54	
	1	5	3	22.68	22.69	22.53	
	1	0	7	22.72	22.71	22.54	
	1	5	7	22.69	22.73	22.57	
	3	0	0	22.53	**22.59**	22.48	
	3	3	7	22.46	22.59	22.41	
	6	0	0	22.45	22.51	22.45	0-1
	6	0	7	22.43	22.49	22.40	
16QAM	1	0	0	22.08	22.13	22.12	0
	1	5	0	21.99	22.08	21.91	
	1	0	3	21.98	22.05	21.81	
	1	5	3	21.96	22.02	21.90	
	1	0	7	21.96	22.02	22.08	
	1	5	7	22.00	21.99	22.09	
	3	0	0	21.98	22.04	21.94	
	3	3	7	21.89	22.02	21.97	
	6	0	0	21.94	21.99	21.98	0-2
	6	0	7	21.98	21.91	21.97	

9.1.2. LTE Band 4 – Cat. M1

Table 9-2 LTE Band 4 – Cat. M1 Conducted Powers – 10 MHz Bandwidth

LTE Band 4 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Narrow Index	Low Channel 20000 (1715 MHz)	Mid Channel 20175 (1732.5 MHz)	High Channel 20350 (1750 MHz)	MPR Allowed Power 3GPP [dB]
				Conducted Power [dBm]			
QPSK	1	0	0	22.51	**22.74**	22.61	0
	1	5	0	22.46	22.69	22.58	
	1	0	3	22.48	22.68	22.59	
	1	5	3	22.47	22.72	22.57	
	1	0	7	22.45	22.69	22.57	
	1	5	7	22.46	22.65	22.58	
	3	0	0	22.47	**22.61**	22.56	
	3	3	7	22.45	22.59	22.51	
	6	0	0	22.45	22.60	22.52	0-1
	6	0	7	22.44	22.57	22.50	
16QAM	1	0	0	21.77	21.87	21.76	0
	1	5	0	21.76	21.84	21.73	
	1	0	3	21.76	21.85	21.75	
	1	5	3	21.71	21.83	21.74	
	1	0	7	21.71	21.85	21.74	
	1	5	7	21.75	21.84	21.75	
	3	0	0	21.76	21.76	21.65	
	3	3	7	21.74	21.75	21.66	
	6	0	0	21.72	21.72	21.68	0-2
	6	0	7	21.73	21.73	21.67	

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9.1.3. LTE Band 12 – Cat. M1

Table 9-3 LTE Band 12 – Cat. M1 Conducted Powers – 10 MHz Bandwidth

LTE Band 12 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Narrow Index	Low Channel 23060 (704 MHz)	Mid Channel 23095 (707.5 MHz)	High Channel 23130 (711 MHz)	MPR Allowed Power 3GPP [dB]
				Conducted Power [dBm]			
QPSK	1	0	0	22.15	**22.26**	22.21	0
	1	5	0	22.09	22.24	22.17	
	1	0	3	22.12	22.17	22.18	
	1	5	3	22.11	22.23	22.19	
	1	0	7	22.07	22.15	22.11	
	1	5	7	22.09	22.19	22.14	
	3	0	0	22.01	**22.10**	22.09	
	3	3	7	22.00	22.06	22.07	
	6	0	0	21.98	22.08	22.03	0-1
	6	0	7	22.03	22.04	22.04	
16QAM	1	0	0	21.47	21.55	21.52	0
	1	5	0	21.46	21.51	21.48	
	1	0	3	21.39	21.48	21.47	
	1	5	3	21.42	21.49	21.45	
	1	0	7	21.42	21.45	21.49	
	1	5	7	21.40	21.35	21.51	
	3	0	0	21.38	21.49	21.48	
	3	3	7	21.41	21.47	21.47	
	6	0	0	21.37	21.37	21.48	0-2
	6	0	7	21.39	21.36	21.46	

9.1.4. LTE Band 13 – Cat. M1

Table 9-4 LTE Band 13 – Cat. M1 Conducted Powers – 10 MHz Bandwidth

LTE Band 13 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Narrow Index	Mid Channel 23095 (707.5 MHz) Conducted Power [dBm]	MPR Allowed Power 3GPP [dB]
QPSK	1	0	0	**22.86**	0
	1	5	0	22.84	
	1	0	3	22.85	
	1	5	3	22.83	
	1	0	7	22.80	
	1	5	7	22.79	
	3	0	0	**22.73**	
	3	3	7	22.72	
	6	0	0	22.71	0-1
	6	0	7	22.69	
16QAM	1	0	0	22.19	0
	1	5	0	22.15	
	1	0	3	22.15	
	1	5	3	22.14	
	1	0	7	22.15	
	1	5	7	22.16	
	3	0	0	22.12	
	3	3	7	22.11	
	6	0	0	22.14	0-2
	6	0	7	22.11	

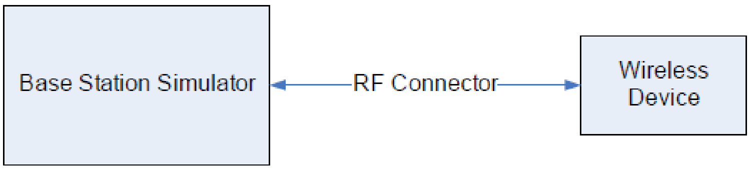


Figure 9-1 LTE Power Measurement Setup

10. SYSTEM VERIFICATION

10.1. Tissue Verification

Table 10-1 Measured Body Tissue Properties

Tissue Type	Frequency (MHz)	Liquid Temp. (℃)	Measured Conductivity (σ)	Measured Permittivity (ε_r)	Target Conductivity (σ)	Target Permittivity (ε_r)	Conductivity Deviation (%)	Permittivity Deviation (%)	Test Date
B750	750	21.7	0.966	54.697	0.96	55.5	0.63	-1.45	2019.03.14
	782		0.989	54.387	0.96	55.4	3.02	-1.83	
B750	750	21.5	0.997	55.933	0.96	55.5	3.85	0.78	2019.03.13
	704		0.965	56.496	0.95	55.7	1.56	1.43	
	707.5		0.969	56.529	0.96	55.7	0.94	1.49	
	711		0.972	56.549	0.96	55.6	1.24	1.71	
B1750	1750	21.7	1.485	54.389	1.49	53.4	-0.34	1.85	2019.03.12
	1715		1.447	54.553	1.47	53.5	-1.56	1.97	
	1732.5		1.465	54.474	1.48	53.5	-1.01	1.82	
	1750		1.485	54.389	1.49	53.4	-0.34	1.85	
B1950	1950	21.8	1.583	53.483	1.52	53.3	4.14	0.34	2019.03.11
	1855		1.486	53.801	1.52	53.3	-2.24	0.94	
	1880		1.494	53.540	1.52	53.3	-1.71	0.45	
	1905		1.526	53.342	1.52	53.3	0.39	0.08	

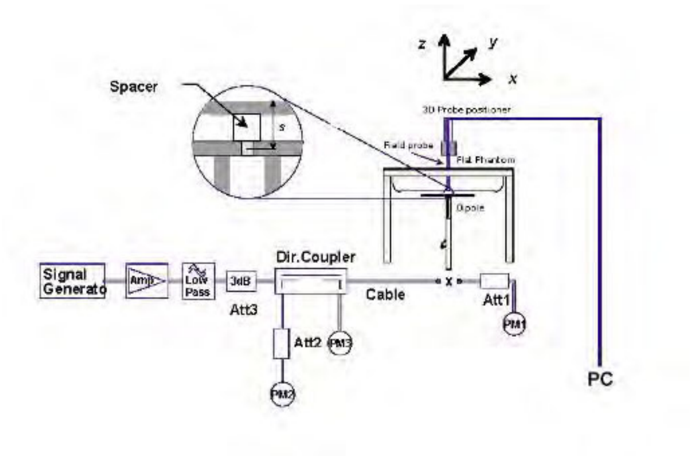
The above measured tissue parameters were used in the DASY software. The DASY software was used to perform interpolation to determine the dielectric parameters at the SAR test device frequencies (per KDB Publication 865664 D01v01r04 and IEEE 1528-2013 6.6.1.2). The tissue parameters listed in the SAR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

10.2. Test System Verification

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

Table 10-2 System Verification Results – 1 g

SAR System #	Amb. Temp (℃)	Liquid Temp. (℃)	Test Date	Tissue Type	Frequency (MHz)	Input Power (mW)	1W Target SAR-1 g (W/kg)	Measured SAR-1 g (W/kg)	Normalized to 1W SAR-1 g (W/kg)	Deviation (%)	Dipole S/N	Probe S/N
4	22.2	21.7	2019.03.14	Body	750	100	8.59	0.807	8.07	-6.05	1181	3832
4	22.0	21.5	2019.03.13	Body	750	100	8.59	0.840	8.40	-2.21	1181	3832
4	22.4	21.7	2019.03.12	Body	1750	100	36.30	3.75	37.50	3.31	1122	3832
4	22.2	21.8	2019.03.11	Body	1950	100	39.60	3.96	39.60	0.00	1156	3832



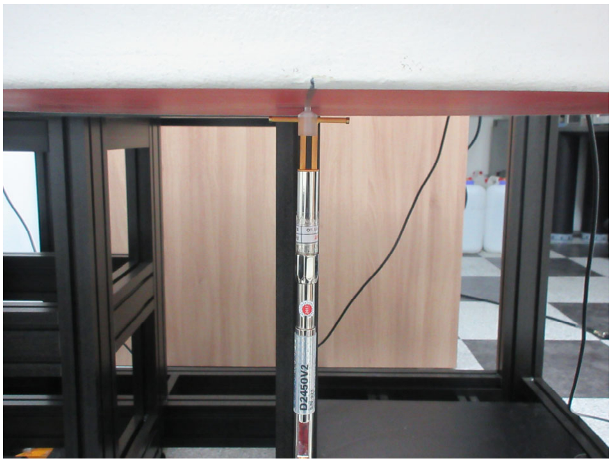


Figure 11-1 System Verification Setup Diagram and Photo

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11. SAR TEST DATA SUMMARY

11.1. Standalone Body SAR Data

Table 11-1 LTE Band 2 – Cat. M1 Body SAR

Plot No.	Device Serial Number	Frequency MHz	Ch.		Band	Modulation	BW [MHz]	RB Size	RB Offset	Narrow Index	Test Position	Separation Distance (cm)	MPR [dB]	Maximum Allowed Power (dBm)	Measured Conducted Power (dBm)	Duty Cycle	Scaling Factor	Power Drift (dB)	Measured SAR 1 g (W/kg)	Reported SAR 1 g (W/kg)
	SAR#1	1880	18900	Mid	LTE 2	QPSK	10	1	0	0	Top	0	0	23.0	22.83	1:1	1.040	-0.090	0.643	0.669
	SAR#1	1880	18900	Mid	LTE 2	QPSK	10	3	0	0	Top	0	0	23.0	22.59	1:1	1.099	-0.150	0.665	0.731
	SAR#1	1880	18900	Mid	LTE 2	QPSK	10	1	0	0	Front	0	0	23.0	22.83	1:1	1.040	0.000	0.428	0.445
	SAR#1	1880	18900	Mid	LTE 2	QPSK	10	3	0	0	Front	0	0	23.0	22.59	1:1	1.099	0.020	0.432	0.475
	SAR#1	1880	18900	Mid	LTE 2	QPSK	10	1	0	0	Rear	0	0	23.0	22.83	1:1	1.040	-0.190	0.721	0.750
6	**SAR#1**	**1880**	**18900**	**Mid**	**LTE 2**	**QPSK**	**10**	**3**	**0**	**0**	**Rear**	**0**	**0**	**23.0**	**22.59**	**1:1**	**1.099**	**0.000**	**0.744**	**0.818**
	SAR#1	1880	18900	Mid	LTE 2	QPSK	10	1	0	0	Right	0	0	23.0	22.83	1:1	1.040	0.020	0.353	0.367
	SAR#1	1880	18900	Mid	LTE 2	QPSK	10	3	0	0	Right	0	0	23.0	22.59	1:1	1.099	0.010	0.357	0.392
	SAR#1	1880	18900	Mid	LTE 2	QPSK	10	1	0	0	Left	0	**0**	23.0	22.83	1:1	1.040	-0.020	0.608	0.632
	SAR#1	1880	18900	Mid	LTE 2	QPSK	10	3	0	0	Left	0	0	23.0	22.59	1:1	1.099	-0.010	0.612	0.673
	SAR#1	1855	18650	Low	LTE 2	QPSK	10	3	0	0	Rear	0	0	23.0	22.53	1:1	1.114	0.060	0.722	0.805
	SAR#1	1905	19150	High	LTE 2	QPSK	10	3	0	0	Rear	0	0	23.0	22.48	1:1	1.127	0.030	0.647	0.729
ANSI / IEEE C95.1 1992 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure / General Population												**Body 1.6 W/kg (mW/g) Averaged over 1 gram**								

Table 11-2 LTE Band 4 – Cat. M1 Body SAR

Plot No.	Device Serial Number	Frequency MHz	Ch.		Band	Modulation	BW [MHz]	RB Size	RB Offset	Narrow Index	Test Position	Separation Distance (cm)	MPR [dB]	Maximum Allowed Power (dBm)	Measured Conducted Power (dBm)	Duty Cycle	Scaling Factor	Power Drift (dB)	Measured SAR 1 g (W/kg)	Reported SAR 1 g (W/kg)
	SAR#1	1732.5	20175	Mid	LTE 4	QPSK	10	1	0	0	Top	0	0	23.0	22.74	1:1	1.062	-0.180	0.714	0.758
	SAR#1	1732.5	20175	Mid	LTE 4	QPSK	10	3	0	0	Top	0	0	23.0	22.61	1:1	1.094	0.010	0.709	0.776
	SAR#1	1732.5	20175	Mid	LTE 4	QPSK	10	1	0	0	Front	0	0	23.0	22.74	1:1	1.062	0.000	0.681	0.723
	SAR#1	1732.5	20175	Mid	LTE 4	QPSK	10	3	0	0	Front	0	0	23.0	22.61	1:1	1.094	-0.040	0.695	0.760
	SAR#1	1732.5	20175	Mid	LTE 4	QPSK	10	1	0	0	Rear	0	0	23.0	22.74	1:1	1.062	-0.080	0.753	0.799
	SAR#1	1732.5	20175	Mid	LTE 4	QPSK	10	3	0	0	Rear	0	0	23.0	22.61	1:1	1.094	-0.040	0.793	0.868
	SAR#1	1732.5	20175	Mid	LTE 4	QPSK	10	1	0	0	Right	0	0	23.0	22.74	1:1	1.062	0.040	0.365	0.388
	SAR#1	1732.5	20175	Mid	LTE 4	QPSK	10	3	0	0	Right	0	0	23.0	22.61	1:1	1.094	-0.150	0.364	0.398
	SAR#1	1732.5	20175	Mid	LTE 4	QPSK	10	1	0	0	Left	0	0	23.0	22.74	1:1	1.062	-0.090	0.787	0.836
22	**SAR#1**	**1732.5**	**20175**	**Mid**	**LTE 4**	**QPSK**	**10**	**3**	**0**	**0**	**Left**	**0**	**0**	**23.0**	**22.61**	**1:1**	**1.094**	**-0.030**	**0.854**	**0.934**
	SAR#1	1715	20000	Low	LTE 4	QPSK	10	3	0	0	Rear	0	0	23.0	22.47	1:1	1.130	0.040	0.782	0.884
	SAR#1	1750	20350	High	LTE 4	QPSK	10	3	0	0	Rear	0	0	23.0	22.56	1:1	1.107	-0.000	0.765	0.847
	SAR#1	1715	20000	Low	LTE 4	QPSK	10	1	0	0	Left	0	0	23.0	22.51	1:1	1.119	-0.050	0.786	0.880
	SAR#1	1750	20350	High	LTE 4	QPSK	10	1	0	0	Left	0	0	23.0	22.61	1:1	1.094	0.190	0.785	0.859
	SAR#1	1715	20000	Low	LTE 4	QPSK	10	3	0	0	Left	0	0	23.0	22.47	1:1	1.130	0.130	0.815	0.921
	SAR#1	1750	20350	High	LTE 4	QPSK	10	3	0	0	Left	0	0	23.0	22.56	1:1	1.107	-0.070	0.824	0.912
	SAR#1	1732.5	20175	Mid	LTE 4	QPSK	10	3	0	0	Left	0	0	23.0	22.61	1:1	1.094	-0.030	0.845	0.924
ANSI / IEEE C95.1 1992 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure / General Population												**Body 1.6 W/kg (mW/g) Averaged over 1 gram**								

Note: Blue entry represents variability measurement.

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Table 11-3 LTE Band 12 – Cat. M1 Body SAR

Plot No.	Device Serial Number	Frequency MHz	Ch.		Band	Modulation	BW [MHz]	RB Size	RB Offset	Narrow Index	Test Position	Separation Distance (cm)	MPR [dB]	Maximum Allowed Power (dBm)	Measured Conducted Power (dBm)	Duty Cycle	Scaling Factor	Power Drift (dB)	Measured SAR 1 g (W/kg)	Reported SAR 1 g (W/kg)
	SAR#1	707.5	23095	Mid	LTE 12	QPSK	10	1	0	0	Top	0	0	22.5	22.26	1:1	1.057	-0.180	0.138	0.146
	SAR#1	707.5	23095	Mid	LTE 12	QPSK	10	3	0	0	Top	0	0	22.5	22.10	1:1	1.096	0.170	0.145	0.159
	SAR#1	707.5	23095	Mid	LTE 12	QPSK	10	1	0	0	Front	0	0	22.5	22.26	1:1	1.057	-0.080	0.188	0.199
	SAR#1	707.5	23095	Mid	LTE 12	QPSK	10	3	0	0	Front	0	0	22.5	22.10	1:1	1.096	-0.010	0.196	0.215
	SAR#1	707.5	23095	Mid	LTE 12	QPSK	10	1	0	0	Rear	0	0	22.5	22.26	1:1	1.057	-0.010	0.175	0.185
	SAR#1	707.5	23095	Mid	LTE 12	QPSK	10	3	0	0	Rear	0	0	22.5	22.10	1:1	1.096	0.020	0.178	0.195
	SAR#1	707.5	23095	Mid	LTE 12	QPSK	10	1	0	0	Right	0	0	22.5	22.26	1:1	1.057	0.070	0.228	0.241
37	**SAR#1**	**707.5**	**23095**	**Mid**	**LTE 12**	**QPSK**	**10**	**3**	**0**	**0**	**Right**	**0**	**0**	**22.5**	**22.10**	**1:1**	**1.096**	**0.060**	**0.238**	**0.261**
	SAR#1	707.5	23095	Mid	LTE 12	QPSK	10	1	0	0	Left	0	0	22.5	22.26	1:1	1.057	-0.050	0.233	0.246
	SAR#1	707.5	23095	Mid	LTE 12	QPSK	10	3	0	0	Left	0	0	22.5	22.10	1:1	1.096	-0.100	0.235	0.258
ANSI / IEEE C95.1 1992 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure / General Population												**Body 1.6 W/kg (mW/g) Averaged over 1 gram**								

Table 11-4 LTE Band 13 – Cat. M1 Body SAR

Plot No.	Device Serial Number	Frequency MHz	Ch.		Band	Modulation	BW [MHz]	RB Size	RB Offset	Narrow Index	Test Position	Separation Distance (cm)	MPR [dB]	Maximum Allowed Power (dBm)	Measured Conducted Power (dBm)	Duty Cycle	Scaling Factor	Power Drift (dB)	Measured SAR 1 g (W/kg)	Reported SAR 1 g (W/kg)
	SAR#1	782	23230	Mid	LTE 13	QPSK	10	1	0	0	Top	0	0	23.0	22.86	1:1	1.033	-0.180	0.083	0.086
	SAR#1	782	23230	Mid	LTE 13	QPSK	10	3	0	0	Top	0	0	23.0	22.73	1:1	1.064	-0.160	0.087	0.093
	SAR#1	782	23230	Mid	LTE 13	QPSK	10	1	0	0	Front	0	0	23.0	22.86	1:1	1.033	-0.090	0.101	0.104
43	**SAR#1**	**782**	**23230**	**Mid**	**LTE 13**	**QPSK**	**10**	**3**	**0**	**0**	**Front**	**0**	**0**	**23.0**	**22.73**	**1:1**	**1.064**	**-0.070**	**0.099**	**0.105**
	SAR#1	782	23230	Mid	LTE 13	QPSK	10	1	0	0	Rear	0	0	23.0	22.86	1:1	1.033	0.090	0.061	0.063
	SAR#1	782	23230	Mid	LTE 13	QPSK	10	3	0	0	Rear	0	0	23.0	22.73	1:1	1.064	0.090	0.064	0.068
	SAR#1	782	23230	Mid	LTE 13	QPSK	10	1	0	0	Right	0	0	23.0	22.86	1:1	1.033	0.070	0.074	0.076
	SAR#1	782	23230	Mid	LTE 13	QPSK	10	3	0	0	Right	0	0	23.0	22.73	1:1	1.064	0.010	0.073	0.078
	SAR#1	782	23230	Mid	LTE 13	QPSK	10	1	0	0	Left	0	0	23.0	22.86	1:1	1.033	-0.030	0.059	0.061
	SAR#1	782	23230	Mid	LTE 13	QPSK	10	3	0	0	Left	0	0	23.0	22.73	1:1	1.064	0.130	0.060	0.064
ANSI / IEEE C95.1 1992 – SAFETY LIMIT Spatial Peak Uncontrolled Exposure / General Population												**Body 1.6 W/kg (mW/g) Averaged over 1 gram**								

11.2. SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2013, and FCC KDB Publication 447498 D01v06.
2. Batteries are fully charged at the beginning of the SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v06.
6. Device was tested using a fixed spacing for body testing. A separation distance of 0 mm was considered because the manufacturer has determined that there will be body available in the marketplace for users to support this separation distance.
7. Per FCC KDB 865664 D01v01r04, variability SAR tests were performed when the measured SAR results for a frequency band were greater than or equal to 0.8 W/kg. Repeated SAR measurements are highlighted in the tables above for clarity. Please see Section 13 for variability analysis.

LTE Notes:

1. This device does support only 10 MHz bandwidths for LTE Category M1.
2. LTE Considerations: LTE test configurations are determined according to SAR Evaluation Considerations for LTE Devices in FCC KDB Publication 941225 D05v02r05. The general test procedures used for testing can be found in Section 8.3.5.
3. MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.521 Section 6.2 under Table 6.2.3EA-1.
4. A-MPR was disabled for all SAR tests by setting NS=01 and MCC=001 on the base station simulator. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

12. FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

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

This device does support only LTE category M1 bands. So, it not supports simultaneous transmission. Therefore, simultaneous transmission is not considered.

13. SAR MEASUREMENT VARIABILITY

13.1. Measurement Variability

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

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

1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.
2) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1g SAR limit).
3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.
4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg.
5) When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

Table 13-1 Body SAR Measurement Variability Results

BODY VARIABLITY RESULTS													
Band	Frequency		Mode	Service	Test Position	Separation Distance (cm)	Measured SAR (1g)	1st Repeated SAR (1g)	Ratio	2nd Repeated SAR (1g)	Ratio	3rd Repeated SAR (1g)	Ratio
	MHz	Ch.					(W/kg)	(W/kg)		(W/kg)		(W/kg)	
1750	1732.5	20175	LTE Band 4, 10 MHz Bandwidth	QPSK, 3 RB, 0 RB Offset, 0 Narrow Index	Left	0	0.854	0.845	1.01	N/A	N/A	N/A	N/A

13.2. Measurement Uncertainty

The measured SAR was < 1.5 W/kg for 1g and < 3.75 W/kg for 10g for all frequency bands. Therefore, per KDB Publication 865664 D01v01r04, the extended measurement uncertainty analysis per IEEE 1528-2013 was not required.

14. EQUIPMENT LIST

Manufacturer	Model	Description	Cal. Date	Cal. Interval	CaL.Due	Serial No.
SY Corp.	SAR ROOM #4	SAR Shield Room	N/A	N/A	N/A	N/A
STAUBLI	TX90XL	DASY6 Robot	N/A	N/A	N/A	F17/59RBA1/A/01
STAUBLI	CS8C Speag TX90	DASY6 Controller	N/A	N/A	N/A	F17/59RBA1/C/01
Speag	SE UMS 028 BB	DASY6 Measurement Server	N/A	N/A	N/A	1544
STAUBLI	SP1	Robot Remote Control	N/A	N/A	N/A	D 211 426 06B
Speag	SE UKS 030 AA	LightBeam SAR #4	N/A	N/A	N/A	1040
Speag	QD OVA 004 AA	ELI4 Phantom V8.0	N/A	N/A	N/A	TP-2056
Speag	MD4HHTV5	Mounting Device	N/A	N/A	N/A	N/A
Speag	EX3DV4	SAR Probe	2019-02-27	Annual	2020-02-27	3832
Speag	DAE4	Data Acquisition Electronics	2019-02-28	Annual	2020-02-28	557
Speag	D750V3	Dipole Antenna	2018-02-23	Biennial	2020-02-23	1181
Speag	D1750V2	Dipole Antenna	2018-07-20	Biennial	2020-07-20	1122
Speag	D1950V3	Dipole Antenna	2018-07-24	Biennial	2020-07-24	1156
HP	8665B	RF Signal Generator	2018-08-28	Annual	2019-08-28	3744A01349
EMPOWER	BBS3Q7ECK-2001	RF Power Amplifier	2018-08-28	Annual	2019-08-28	1045D/C0536
SUNGSAN	M1001	RF Power Amplifier	2018-08-28	Annual	2019-08-28	1
Agilent	E4419B	Power Meter	2018-08-27	Annual	2019-08-27	MY45100284
Agilent	E4419B	Power Meter	2018-08-27	Annual	2019-08-27	MY45100286
HP	8481H	Power Sensor	2018-08-27	Annual	2019-08-27	3318A17600
HP	8481A	Power Sensor	2018-08-27	Annual	2019-08-27	US37290447
HP	8481A	Power Sensor	2018-08-27	Annual	2019-08-27	3318A89373
HP	778D	Dual Directional Coupler	2018-08-27	Annual	2019-08-27	16500
Bird	50-6A-MFN-30	Attenuator	2018-08-27	Annual	2019-08-27	N/A
HP	8491A	Attenuator	2018-08-28	Annual	2019-08-28	63272
WAINWRIGHT	WLJS3000-6EF	Low Pass Filter	2018-08-28	Annual	2019-08-28	1
ANRITSU	MT8821C	Radio Communication Analyzer	2018-08-22	Annual	2019-08-22	6261849029
Speag	DAK-3.5	Dielectric Assessment Kit	2018-11-20	Annual	2019-11-20	1140
Agilent	E8357A	Network Analyzer	2018-08-27	Annual	2019-08-27	US41070399
ROHDE & SCHWARZ	FSP	Spectrum Analyzer	2018-08-23	Annual	2019-08-23	100017
LKM Electronic GmbH	DTM3000-Spezial	Hand-Held Thermometers	2018-08-28	Annual	2019-08-28	3247
CAS	TE-201	Temperature hygrometer	2018-08-28	Annual	2019-08-28	14011777-1
KIKUSHI	PAS40-9	DC POWER SUPPLY	2018-04-06	Annual	2019-04-06	QK000851

Notes:

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

15. MEASUREMENT UNCERTAINTIES

Table 15-1 Uncertainty of SAR equipment for measurement Body 0.3 GHz to 3 GHz

No.		Error Description	Uncertainty Value (1 g) (%)	Uncertainty Value (10 g) (%)	Probe Dist.	Div.	C_i (1 g)	C_i (10 g)	$U_i(y)$ (1 g)	$U_i(y)$ (10 g)	V_i or V_{eff}
1	$U(PR_C)$	Probe Calibration	6.30	6.30	N	1.00	1.00	1.00	6.30	6.30	∞
2	$U(PR_I)$	Isotropy	1.87	1.87	R	$\sqrt{3}$	1.00	1.00	1.08	1.08	∞
3	$U(L)$	Linearity	0.60	0.60	R	$\sqrt{3}$	1.00	1.00	0.35	0.35	∞
4	$U(PR_{MR})$	Probe modulation response	2.40	2.40	R	$\sqrt{3}$	1.00	1.00	1.39	1.39	∞
6	$U(DL)$	Detection Limits	1.00	1.00	R	$\sqrt{3}$	1.00	1.00	0.58	0.58	∞
5	$U(BE)$	Boundary effect	1.00	1.00	R	$\sqrt{3}$	1.00	1.00	0.58	0.58	∞
7	$U(RE)$	Readout Electronics	0.30	0.30	N	1.00	1.00	1.00	0.30	0.30	∞
8	$U(T_{RT})$	Response Time	0.80	0.80	R	$\sqrt{3}$	1.00	1.00	0.46	0.46	∞
9	$U(T_{IT})$	Integration Time	2.60	2.60	R	$\sqrt{3}$	1.00	1.00	1.50	1.50	∞
10	$U(A_{NO})$	RF ambient conditions–noise	3.00	3.00	R	$\sqrt{3}$	1.00	1.00	1.73	1.73	∞
11	$U(A_{RF})$	RF ambient conditions–reflections	3.00	3.00	R	$\sqrt{3}$	1.00	1.00	1.73	1.73	∞
12	$U(PR_{PT})$	Probe positioner mech. Restrictions	0.40	0.40	R	$\sqrt{3}$	1.00	1.00	0.23	0.23	∞
13	$U(PR_{PP})$	Probe positioning with respect to phantom shell	2.90	2.90	R	$\sqrt{3}$	1.00	1.00	1.67	1.67	∞
14	$U(PP_{MSE})$	Post-processing(for max. SAR evaluation)	2.00	2.00	R	$\sqrt{3}$	1.00	1.00	1.15	1.15	∞
15	$U(DU)$	Device Holder Uncertainty	3.60	3.60	N	1.00	1.00	1.00	3.60	3.60	5.00
16	$U(PO_{EUT})$	Test sample positioning	0.92	0.94	N	1.00	1.00	1.00	0.92	0.94	9.00
17	$U(PS)$	Power scaling	0.00	0.00	R	$\sqrt{3}$	1.00	1.00	0.00	0.00	∞
18	$U(PD)$	Drift of output power(measured SAR drift)	5.00	5.00	R	$\sqrt{3}$	1.00	1.00	2.89	2.89	∞
19	$U(PU)$	Phantom Uncertainty	6.10	6.10	R	$\sqrt{3}$	1.00	1.00	3.52	3.52	∞
20	$U(CS_{DPC})$	Algorithm for correcting SAR for deviations in permittivity and conductivity	1.90	1.90	N	1.00	1.00	0.84	1.90	1.60	∞
21	$U(LC_M)$	Liquid Conductivity (meas.)	1.39	1.26	N	1.00	0.78	0.71	1.08	0.89	5.00
22	$U(LP_M)$	Liquid Permittivity (meas.)	0.34	0.38	N	1.00	0.23	0.26	0.08	0.10	5.00
23	$U(LC_{TU})$	Liquid conductivity(temperature uncertainty)	1.87	1.71	R	$\sqrt{3}$	0.78	0.71	0.84	0.70	∞
24	$U(LP_{TU})$	Liquid permittivity(temperature uncertainty)	0.11	0.13	R	$\sqrt{3}$	0.23	0.26	0.01	0.02	∞
		Uc(sar) **Combined standard uncertainty (%)**							9.82	9.73	275
		Extended uncertainty *U*(%)							19.63	19.47	

16. CONCLUSION

16.1. Measurement Conclusion

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

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

16.2. Information on the Testing Laboratories

We, Onetech Corp. Laboratory were founded in 1989 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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APPENDIX A: SYSTEM VERIFICATION

Test Laboratory: ONETECH CO., LTD. Lab Date: 3/14/2019

System Verification for 750 MHz

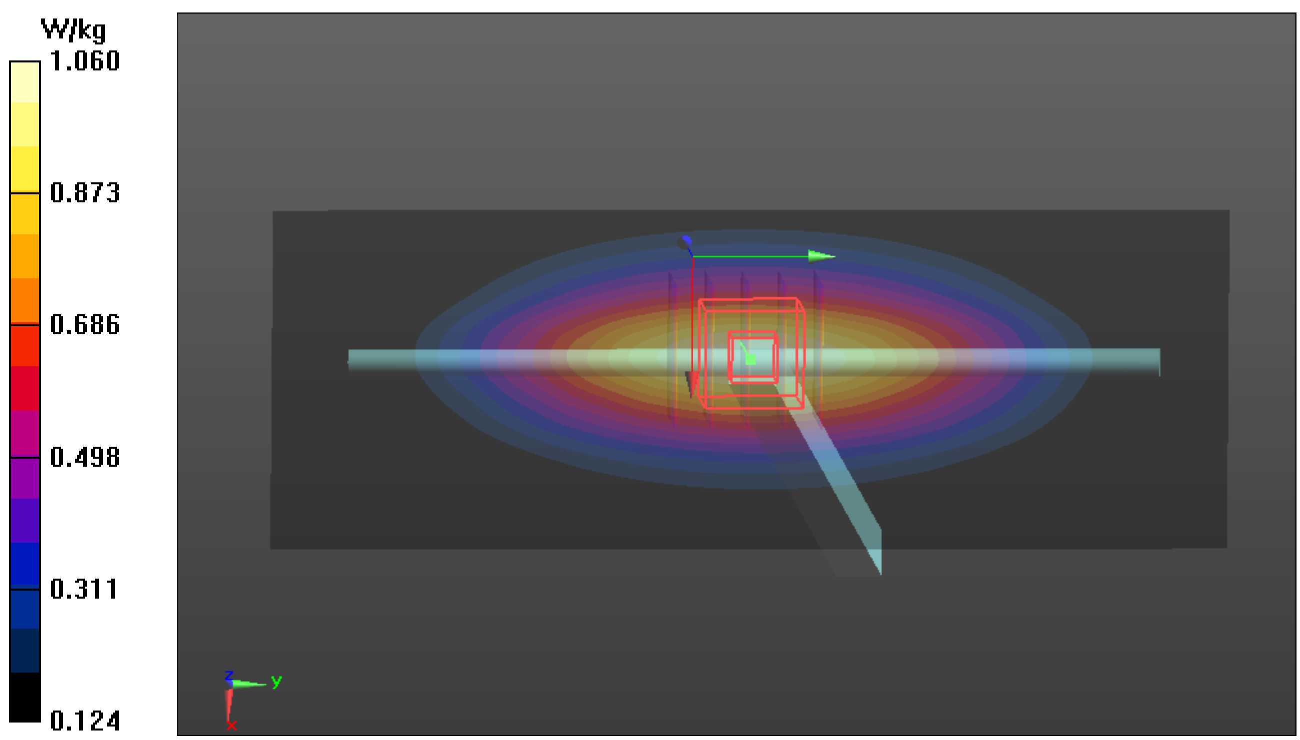
DUT: D750V3 - SN: 1181

Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: MSL750 Medium parameters used: f = 750 MHz; σ = 0.966 S/m; ε_r = 54.697; ρ = 1000 kg/m^3
Ambient Temperature：22.2 °C; Liquid Temperature：21.7 °C

DASY5 Configuration:
- Probe: EX3DV4 - SN3832; ConvF(9.36, 9.36, 9.36); Calibrated: 2/27/2019;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn557; Calibrated: 2/28/2019
- Phantom: ELI V8.0_20170913; Type: QD OVA 004 AA; Serial: 2056
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Pin=100mW/Area Scan (51x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.04 W/kg

Pin=100mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 34.81 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.17 W/kg
SAR(1 g) = 0.807 W/kg; SAR(10 g) = 0.548 W/kg
Maximum value of SAR (measured) = 1.06 W/kg



System Verification for 750 MHz

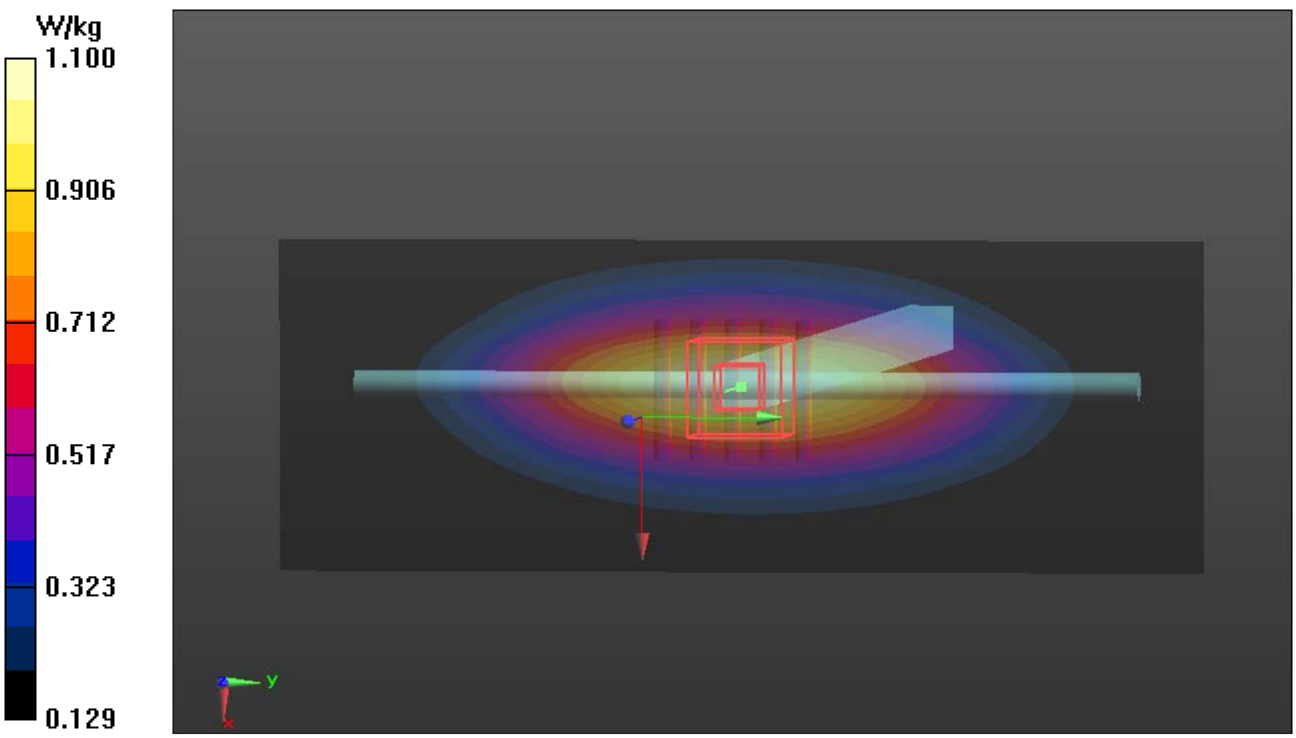
DUT: D750V3 - SN: 1181

Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: MSL750 Medium parameters used: f = 750 MHz; σ = 0.997 S/m; ε_r = 55.933; ρ = 1000 kg/m^3
Ambient Temperature：22.0 °C; Liquid Temperature：21.5 °C

DASY5 Configuration:
- Probe: EX3DV4 - SN3832; ConvF(9.36, 9.36, 9.36); Calibrated: 2/27/2019;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn557; Calibrated: 2/28/2019
- Phantom: ELI V8.0_20170913; Type: QD OVA 004 AA; Serial: 2056
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Pin=100mW/Area Scan (51x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.10 W/kg

Pin=100mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 35.11 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 1.22 W/kg
SAR(1 g) = 0.840 W/kg; SAR(10 g) = 0.571 W/kg
Maximum value of SAR (measured) = 1.10 W/kg



System Verification for 1750 MHz

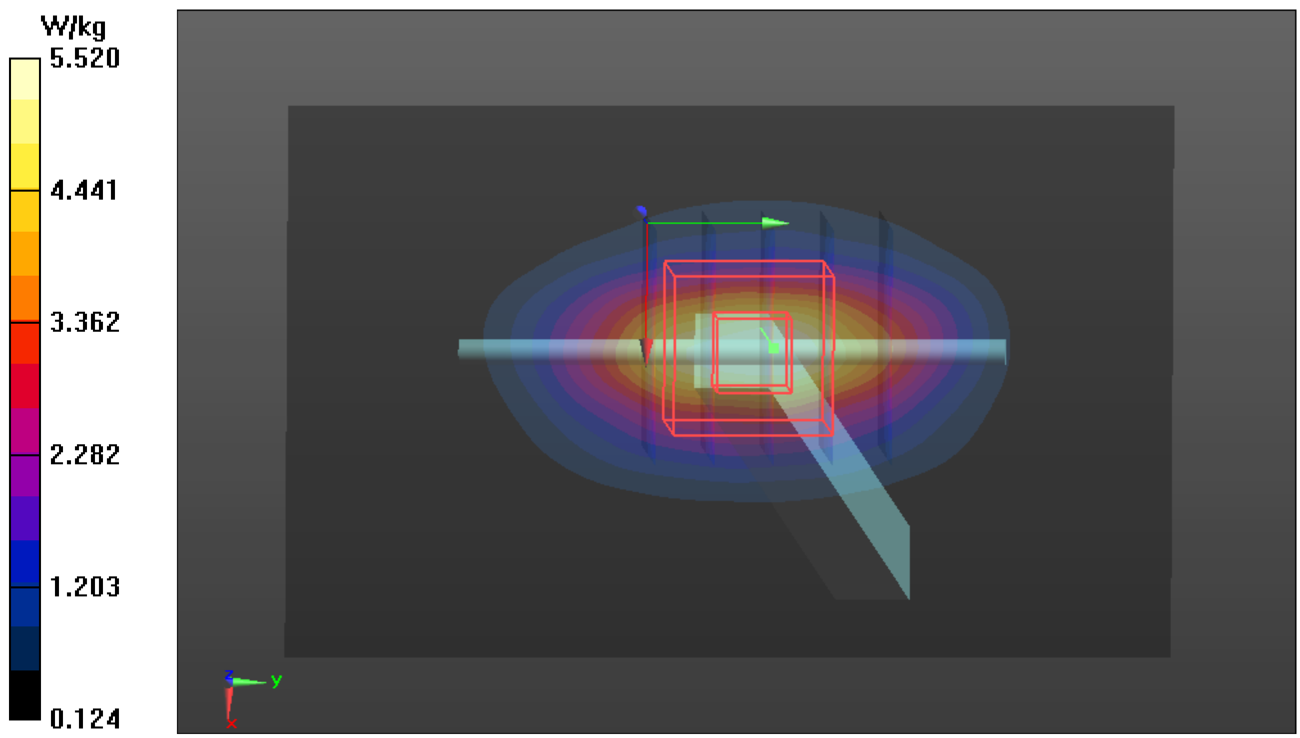
DUT: D1750V2-SN: 1122

Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: MSL1750 Medium parameters used: f = 1750 MHz; σ = 1.485 S/m; ε_r = 54.389; ρ = 1000 kg/m^3
Ambient Temperature : 22.4 °C; Liquid Temperature : 21.7 °C

DASY5 Configuration:
- Probe: EX3DV4 - SN3832; ConvF(7.62, 7.62, 7.62); Calibrated: 2/27/2019;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn557; Calibrated: 2/28/2019
- Phantom: ELI V8.0_20170913; Type: QD OVA 004 AA; Serial: 2056
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Pin=100mW/Area Scan (51x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 5.72 W/kg

Pin=100mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 63.68 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 6.47 W/kg
SAR(1 g) = 3.75 W/kg; SAR(10 g) = 2.04 W/kg
Maximum value of SAR (measured) = 5.52 W/kg



System Verification for 1950 MHz

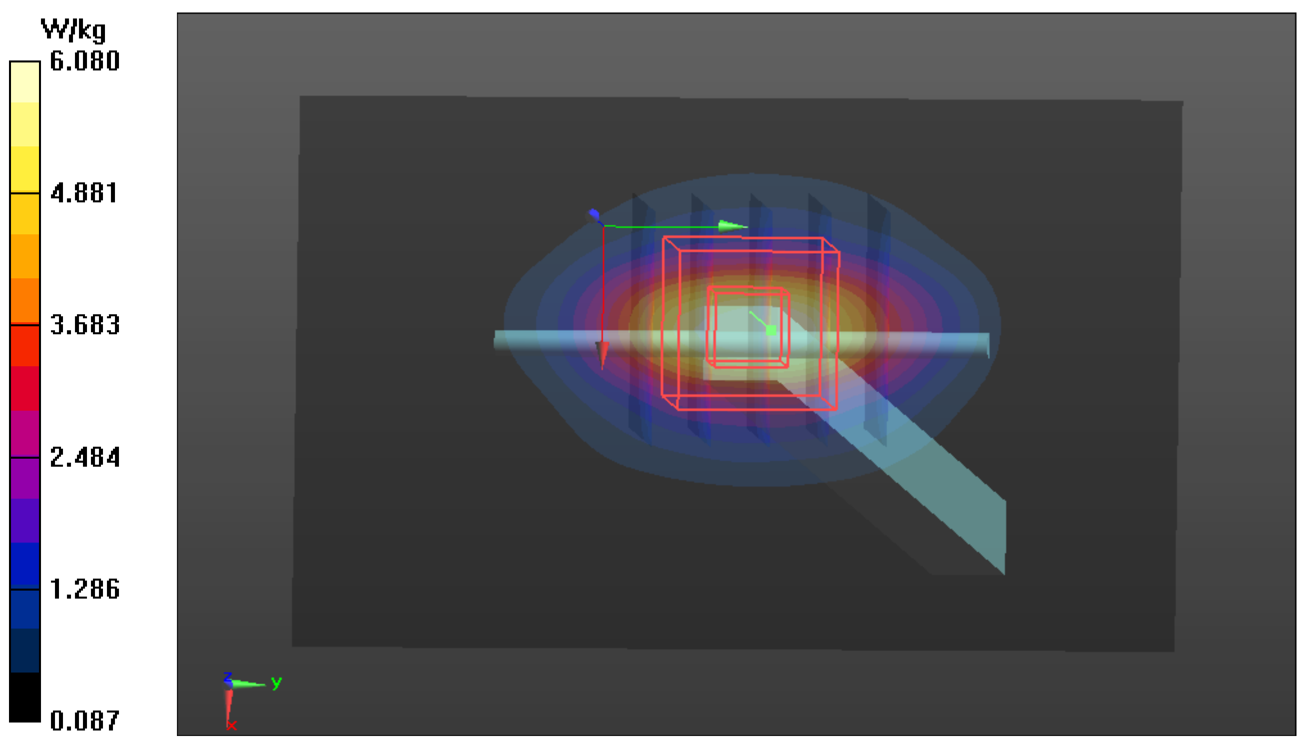
DUT: D1950V3-SN: 1156

Communication System: CW; Frequency: 1950 MHz;Duty Cycle: 1:1
Medium: MSL1900 Medium parameters used: f = 1950 MHz; σ = 1.583 S/m; ε_r = 53.483; ρ = 1000 kg/m^3
Ambient Temperature : 22.2 ℃; Liquid Temperature : 21.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3832; ConvF(7.57, 7.57, 7.57); Calibrated: 2/27/2019;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn557; Calibrated: 2/28/2019
- Phantom: ELI V8.0_20170913; Type: QD OVA 004 AA; Serial: 2056
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Pin=100mW/Area Scan (51x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 6.25 W/kg

Pin=100mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 64.16 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 7.23 W/kg
SAR(1 g) = 3.96 W/kg; SAR(10 g) = 2.04 W/kg
Maximum value of SAR (measured) = 6.08 W/kg



APPENDIX B: SAR TEST DATA

P06_LTE 2_QPSK10M_Rear_0 cm_Ch.18900_3 RB_OS 0_NI 0

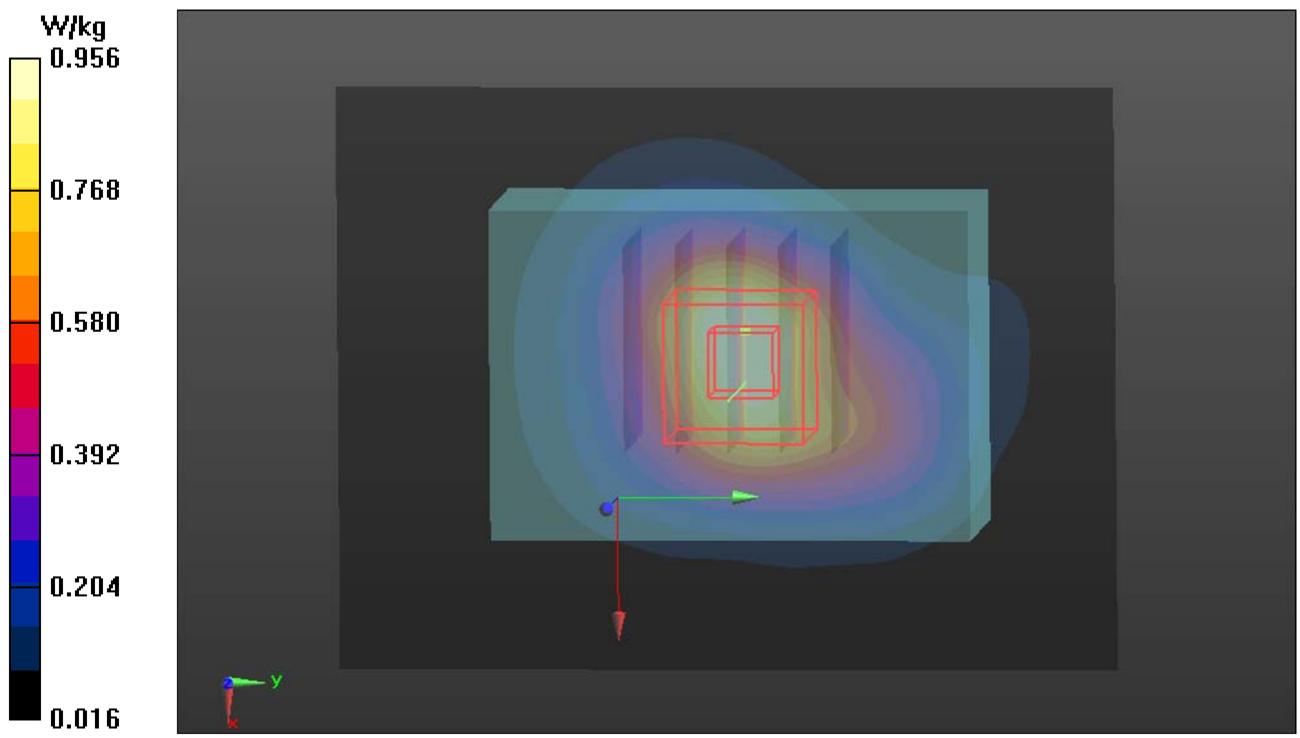
DUT: ST4940

Communication System: LTE FCC; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: MSL1900 Medium parameters used: f = 1880 MHz; σ = 1.494 S/m; ε_r = 53.54; ρ = 1000 kg/m^3
Ambient Temperature : 22.2 °C; Liquid Temperature : 21.8 °C

DASY5 Configuration:
- Probe: EX3DV4 - SN3832; ConvF(7.57, 7.57, 7.57); Calibrated: 2/27/2019;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn557; Calibrated: 2/28/2019
- Phantom: ELI V8.0_20170913; Type: QD OVA 004 AA; Serial: 2056
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

- Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.01 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.58 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 1.09 W/kg
SAR(1 g) = 0.744 W/kg; SAR(10 g) = 0.450 W/kg
Maximum value of SAR (measured) = 0.956 W/kg



Test Laboratory: ONETECH CO., LTD. Lab Date: 3/12/2019

P22_LTE 4_QPSK10M_Left_0 cm_Ch.20175_3 RB_OS 0_NI 0

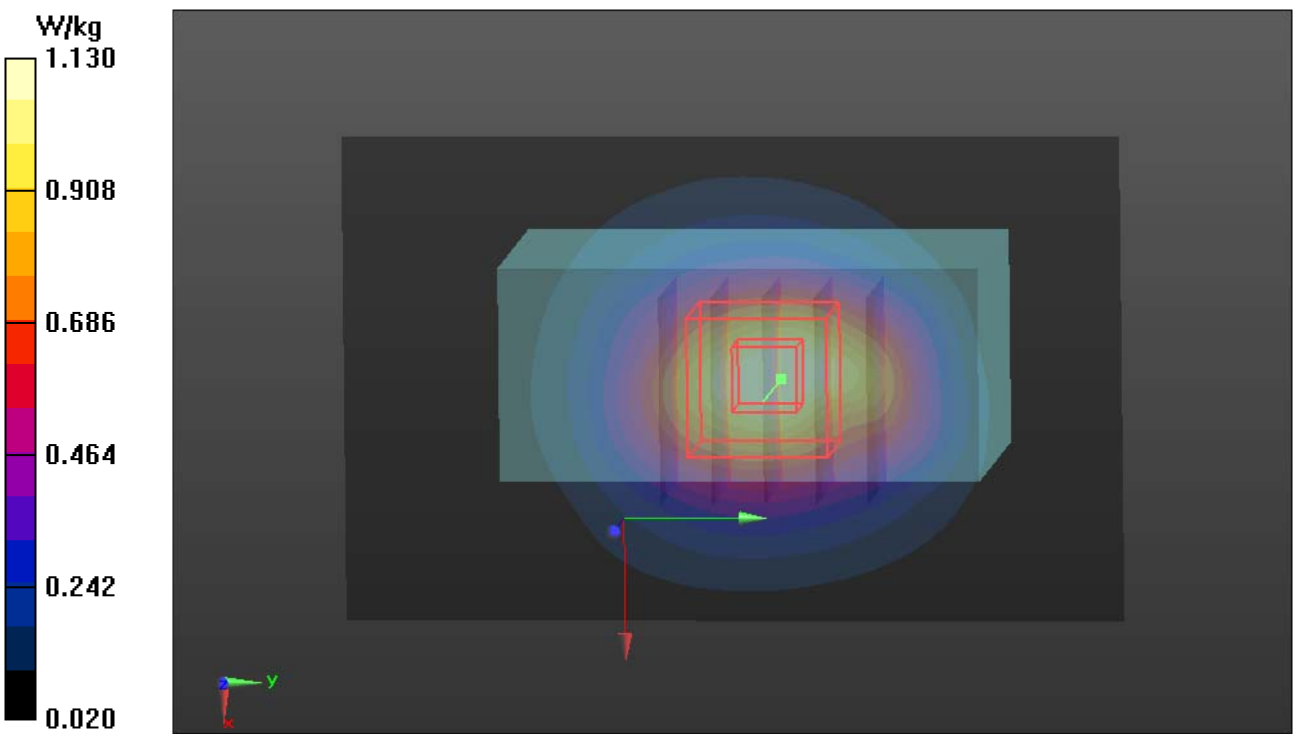
DUT: ST4940

Communication System: LTE FCC; Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium: MSL1750 Medium parameters used: f = 1732.5 MHz; σ = 1.465 S/m; ε_r = 54.474; ρ = 1000 kg/m^3
Ambient Temperature：22.4 °C; Liquid Temperature：21.7 °C

DASY5 Configuration:
- Probe: EX3DV4 - SN3832; ConvF(7.62, 7.62, 7.62); Calibrated: 2/27/2019;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn557; Calibrated: 2/28/2019
- Phantom: ELI V8.0_20170913; Type: QD OVA 004 AA; Serial: 2056
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

- Area Scan (51x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.17 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.13 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.27 W/kg
SAR(1 g) = 0.854 W/kg; SAR(10 g) = 0.515 W/kg
Maximum value of SAR (measured) = 1.13 W/kg



P37_LTE 12_QPSK10M_Right_0 cm_Ch.23095_3 RB_OS 0_NI 0

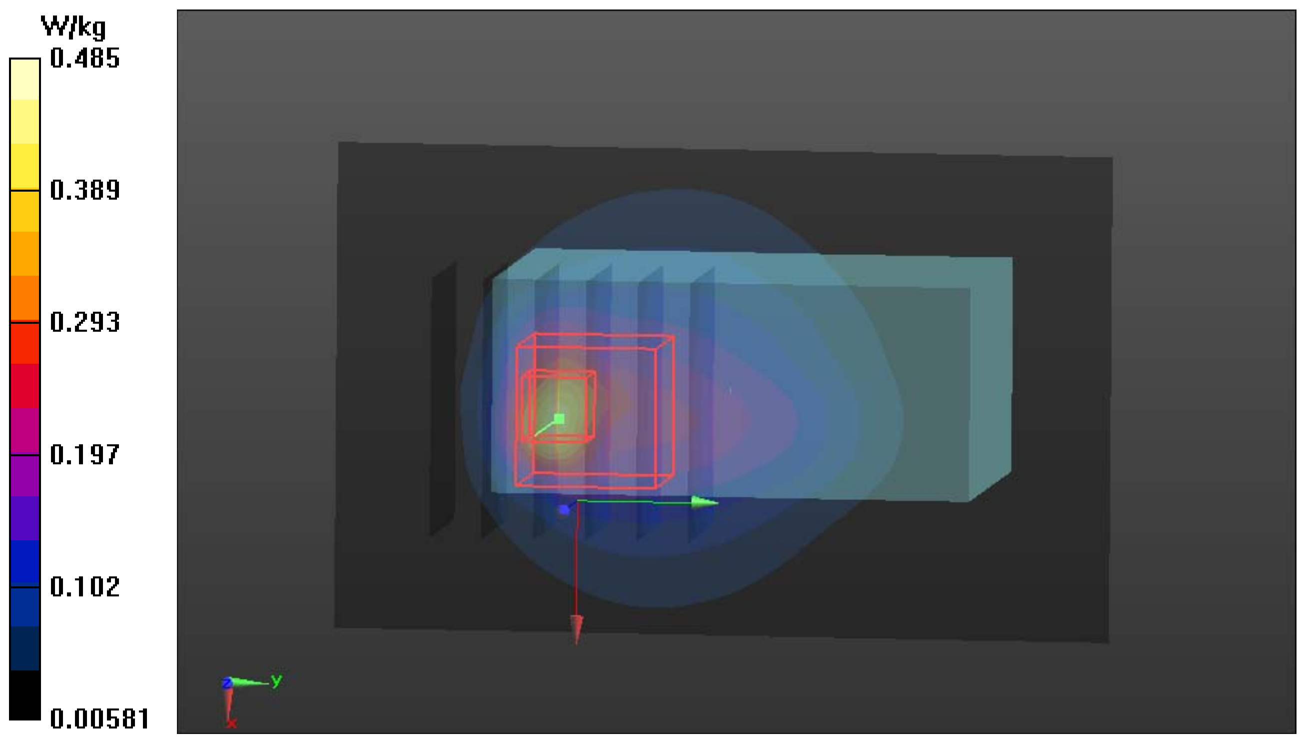
DUT: ST4940

Communication System: LTE FCC; Frequency: 707.5 MHz;Duty Cycle: 1:1
Medium: MSL750 Medium parameters used: f = 707.5 MHz; σ = 0.969 S/m; ε_r = 56.529; ρ = 1000 kg/m^3
Ambient Temperature : 22.0 °C; Liquid Temperature : 21.5 °C

DASY5 Configuration:
- Probe: EX3DV4 - SN3832; ConvF(9.36, 9.36, 9.36); Calibrated: 2/27/2019;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn557; Calibrated: 2/28/2019
- Phantom: ELI V8.0_20170913; Type: QD OVA 004 AA; Serial: 2056
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

- Area Scan (51x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.416 W/kg

- Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.82 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.686 W/kg
SAR(1 g) = 0.238 W/kg; SAR(10 g) = 0.123 W/kg
Maximum value of SAR (measured) = 0.485 W/kg



P43_LTE 13_QPSK10M_Front_0 cm_Ch.23230_3 RB_OS 0_NI 0

DUT: ST4940

Communication System: LTE FCC ; Frequency: 782 MHz;Duty Cycle: 1:1
Medium: MSL750 Medium parameters used: f = 782 MHz; σ = 0.989 S/m; ε_r = 54.387; ρ = 1000 kg/m^3
Ambient Temperature : 22.2 °C; Liquid Temperature : 21.7 °C

DASY5 Configuration:
- Probe: EX3DV4 - SN3832; ConvF(9.36, 9.36, 9.36); Calibrated: 2/27/2019;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn557; Calibrated: 2/28/2019
- Phantom: ELI V8.0_20170913; Type: QD OVA 004 AA; Serial: 2056
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

- Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.131 W/kg

- Zoom Scan (8x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.11 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.155 W/kg
SAR(1 g) = 0.099 W/kg; SAR(10 g) = 0.067 W/kg
Maximum value of SAR (measured) = 0.133 W/kg