FCC SAR Test Report

Report No.	:	**PSU-NQN2212070110SA01**
Applicant	:	**MUNIC**
Address	:	**100 Avenue de Stalingrad 94800 Villejuif – France**
Manufacturer	:	**MUNIC**
Address	:	**100 Avenue de Stalingrad 94800 Villejuif – France**
Product	:	**Telematics Embedded System**
FCC ID	:	**A6GC4D-4G4USV8-4**
Brand	:	**MUNIC**
Model No.	:	**C4D-4G4USAD_V8+**
Standards	:	**FCC 47 CFR Part 2 (2.1093) / IEEE C95.1:1992 / IEEE 1528:2013** **KDB 865664 D01 v01r04 / KDB 865664 D02 v01r02 / KDB 447498 D04 v01** **KDB 941225 D05 v02r05**
Sample Received Date	:	**Dec. 06, 2022**
Date of Testing	:	**Dec. 08, 2022 ~ Dec. 15, 2022**
FCC Designation No.	:	**CN1325** **FCC Site Registration No. : 434559**

CERTIFICATION: The above equipment have been tested by **Huarui 7layers High Technology (Suzhou) Co., Ltd.**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's SAR characteristics under the conditions specified in this report. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product certification, approval, or endorsement by A2LA or any government agencies.

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Release Control Record

Report No.	Reason for Change	Date Issued
PSU-NQN2212070110SA01	Initial release	Dec. 21, 2022

1. Summary of Maximum SAR Value

Equipment Class	Mode	Highest Reported Body-worn SAR_{1g} (2.0 cm Gap) (W/kg)	Highest Reported Extremity SAR_{10g} (0 cm Gap) (W/kg)
PCB	LTE 2	1.12	3.60
	LTE 5	0.06	0.42
	LTE 12	0.32	0.88
	LTE 66 / 4	1.05	3.59
	LTE 71	0.22	0.76

Note:

1. The SAR limit **(Body: SAR_{1g} 1.6 W/kg, Extremity: SAR_{10g} 4.0 W/kg)** for general population / uncontrolled exposure is specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992.

2. Description of Equipment Under Test

EUT Type	Telematics Embedded System
FCC ID	A6GC4D-4G4USV8-4
Brand Name	MUNIC
Model Name	C4D-4G4USAD_V8+
IMEI Code	IMEI 1:861041050017443
HW Version	D3
SW Version	SW.018
Tx Frequency Bands (Unit: MHz)	LTE Band 2 : 1850 ~ 1910 LTE Band 4 : 1710 ~ 1755 LTE Band 5 : 824 ~ 849 LTE Band 12 : 699 ~ 716 LTE Band 66 : 1710 ~ 1780 LTE Band 71 : 663 ~ 698
Uplink Modulations	LTE : QPSK, 16QAM
Maximum Tune-up Conducted Power (Unit: dBm)	Please refer to section 4.5.1 of this report.
Antenna Type	WWAN: Fixed Internal Antenna
EUT Stage	Identical Prototype

Note:

1. The above EUT information is declared by manufacturer and for more detailed features description please refers to the manufacturer's specifications or User's Manual.
2. This device supports both LTE B4 and B66.Since the supported frequency span for LTE B4 falls completely within the LTE B66, they have the same target power, and share the same transmission path, therefore SAR was only assessed for B66.

3. SAR Measurement System

3.1 Definition of Specific Absorption Rate (SAR)

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.

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)

SAR measurement can be related to the electrical field in the tissue by

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

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

3.2 SPEAG DASY System

DASY system consists of high precision robot, probe alignment sensor, phantom, robot controller, controlled measurement server and near-field probe. The robot includes six axes that can move to the precision position of the DASY5 software defined. The DASY software can define the area that is detected by the probe. The robot is connected to controlled box. Controlled measurement server is connected to the controlled robot box. The DAE includes amplifier, signal multiplexing, AD converter, offset measurement and surface detection. It is connected to the Electro-optical coupler (ECO). The ECO performs the conversion form the optical into digital electric signal of the DAE and transfers data to the PC.

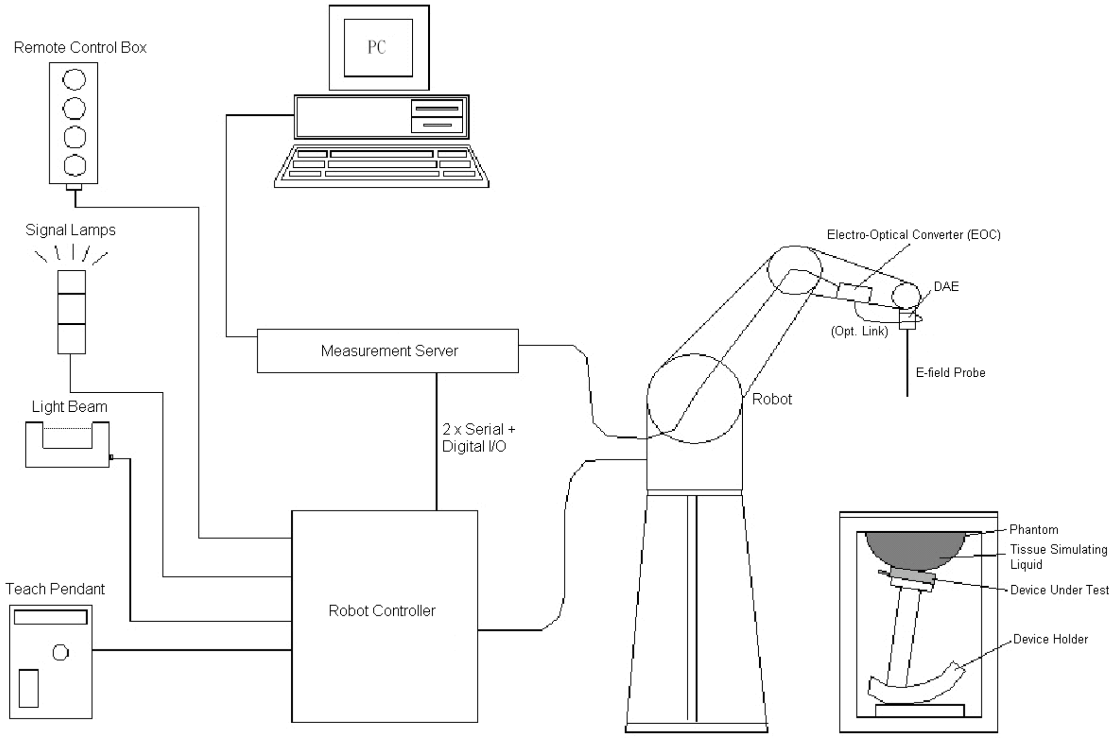


Fig-3.1 DASY System Setup

3.2.1 Robot

The DASY system uses the high precision robots from Stäubli SA (France). For the 6-axis controller system, the robot controller version (DASY6 : CS8c) from Stäubli is used. The Stäubli robot series have many features that are important for our application:

- High precision (repeatability ±0.035 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)

Fig-3.2 DASY6

3.2.2 Probes

The SAR measurement is conducted with the dosimetric probe. The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency.

Model	EX3DV4
Construction	Symmetrical design with triangular core. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE).
Frequency	10 MHz to 6 GHz Linearity: ± 0.2 dB
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 μW/g to 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μW/g)
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm

Model	ES3DV3
Construction	Symmetrical design with triangular core. Interleaved sensors. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE).
Frequency	10 MHz to 4 GHz Linearity: ± 0.2 dB
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in tissue material (rotation normal to probe axis)
Dynamic Range	5 μW/g to 100 mW/g Linearity: ± 0.2 dB
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 3.9 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.0 mm

3.2.3 Data Acquisition Electronics (DAE)

Model	DAE3, DAE4
Construction	Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY embedded system (fully remote controlled). Two step probe touch detector for mechanical surface detection and emergency robot stop.
Measurement Range	-100 to +300 mV (16 bit resolution and two range settings: 4mV, 400mV)
Input Offset Voltage	< 5μV (with auto zero)
Input Bias Current	< 50 fA
Dimensions	60 x 60 x 68 mm

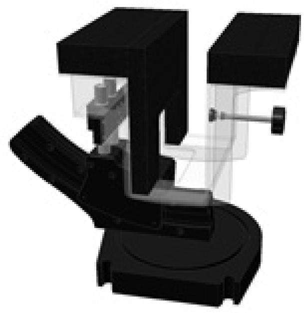
3.2.4 Phantoms

Model	Twin SAM
Construction	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.
Material	Vinylester, glass fiber reinforced (VE-GF)
Shell Thickness	2 ± 0.2 mm (6 ± 0.2 mm at ear point)
Dimensions	Length: 1000 mm Width: 500 mm Height: adjustable feet
Filling Volume	approx. 25 liters

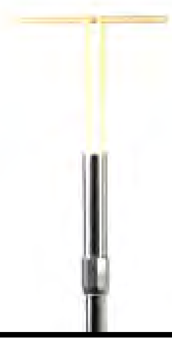
Model	ELI
Construction	Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles.
Material	Vinylester, glass fiber reinforced (VE-GF)
Shell Thickness	2.0 ± 0.2 mm (bottom plate)
Dimensions	Major axis: 600 mm Minor axis: 400 mm
Filling Volume	approx. 30 liters

3.2.5 Device Holder

Model	Mounting Device	
Construction	In combination with the Twin SAM Phantom or ELI4, the Mounting Device enables the rotation of the mounted transmitter device in spherical coordinates. Rotation point is the ear opening point. Transmitter devices can be easily and accurately positioned according to IEC, IEEE, FCC or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat).	
Material	POM	

Model	Laptop Extensions Kit	
Construction	Simple but effective and easy-to-use extension for Mounting Device that facilitates the testing of larger devices according to IEC 62209-2 (e.g., laptops, cameras, etc.). It is lightweight and fits easily on the upper part of the Mounting Device in place of the phone positioner.	
Material	POM, Acrylic glass, Foam	

3.2.6 System Validation Dipoles

Model	D-Serial	
Construction	Symmetrical dipole with l/4 balun. Enables measurement of feed point impedance with NWA. Matched for use near flat phantoms filled with tissue simulating solutions.	
Frequency	750 MHz to 5800 MHz	
Return Loss	> 20 dB	
Power Capability	> 100 W (f < 1GHz), > 40 W (f > 1GHz)	

3.2.7 Tissue Simulating Liquids

For SAR measurement of the field distribution inside the phantom, the phantom must be filled with homogeneous tissue simulating liquid to a depth of at least 15 cm. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm. The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5% are listed in Table-3.1.

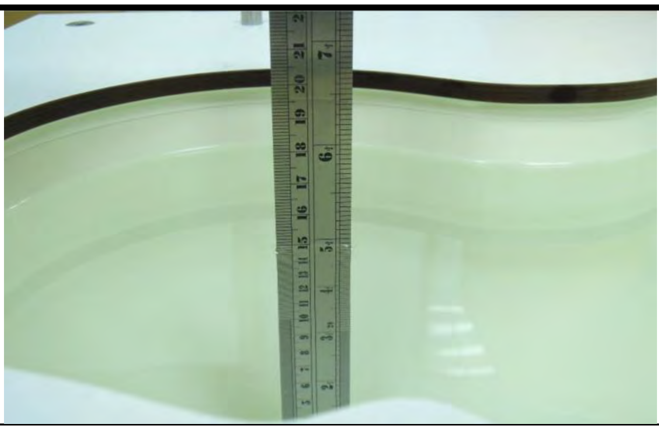
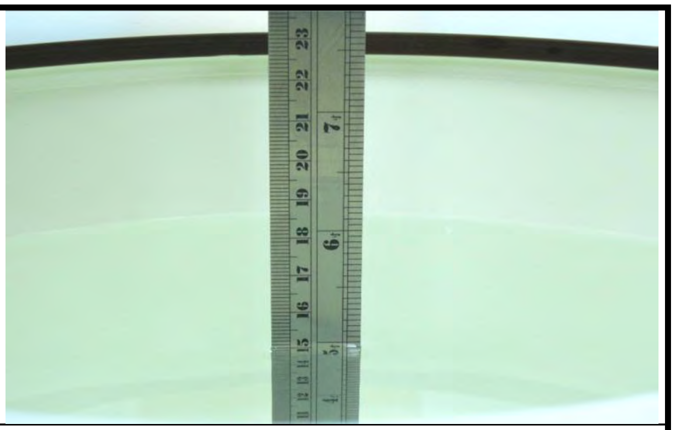
	

Photo of Liquid Height for Head Position	**Photo of Liquid Height for Body Position**

The dielectric properties of the head tissue simulating liquids are defined in IEEE 1528, and KDB 865664 D01 Appendix A. For the body tissue simulating liquids, the dielectric properties are defined in KDB 865664 D01 Appendix A. The dielectric properties of the tissue simulating liquids were verified prior to the SAR evaluation using a dielectric assessment kit and a network analyzer.

Table-3.1 Targets of Tissue Simulating Liquid

Frequency (MHz)	Target Permittivity	Range of ±5%	Target Conductivity	Range of ±5%
For Head				
750	41.9	39.8 ~ 44.0	0.89	0.85 ~ 0.93
835	41.5	39.4 ~ 43.6	0.90	0.86 ~ 0.95
900	41.5	39.4 ~ 43.6	0.97	0.92 ~ 1.02
1450	40.5	38.5 ~ 42.5	1.20	1.14 ~ 1.26
1640	40.3	38.3 ~ 42.3	1.29	1.23 ~ 1.35
1750	40.1	38.1 ~ 42.1	1.37	1.30 ~ 1.44
1800	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
1900	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
2000	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
2300	39.5	37.5 ~ 41.5	1.67	1.59 ~ 1.75
2450	39.2	37.2 ~ 41.2	1.80	1.71 ~ 1.89
2600	39.0	37.1 ~ 41.0	1.96	1.86 ~ 2.06
3500	37.9	36.0 ~ 39.8	2.91	2.76 ~ 3.06
5200	36.0	34.2 ~ 37.8	4.66	4.43 ~ 4.89
5300	35.9	34.1 ~ 37.7	4.76	4.52 ~ 5.00
5500	35.6	33.8 ~ 37.4	4.96	4.71 ~ 5.21
5600	35.5	33.7 ~ 37.3	5.07	4.82 ~ 5.32
5800	35.3	33.5 ~ 37.1	5.27	5.01 ~ 5.53

The following table gives the recipes for tissue simulating liquids.

Table-3.2 Recipes of Tissue Simulating Liquid

Tissue Type	Bactericide	DGBE	HEC	NaCl	Sucrose	Triton X-100	Water	Diethylene Glycol Mono-hexylether
H750	0.2	-	0.2	1.5	56.0	-	42.1	-
H835	0.2	-	0.2	1.5	57.0	-	41.1	-
H900	0.2	-	0.2	1.4	58.0	-	40.2	-
H1450	-	43.3	-	0.6	-	-	56.1	-
H1640	-	45.8	-	0.5	-	-	53.7	-
H1750	-	47.0	-	0.4	-	-	52.6	-
H1800	-	44.5	-	0.3	-	-	55.2	-
H1900	-	44.5	-	0.2	-	-	55.3	-
H2000	-	44.5	-	0.1	-	-	55.4	-
H2300	-	44.9	-	0.1	-	-	55.0	-
H2450	-	45.0	-	0.1	-	-	54.9	-
H2600	-	45.1	-	0.1	-	-	54.8	-
H3500	-	28.0	-	0.2	-	20.0	71.8	-
H5G	-	-	-	-	-	17.2	65.5	17.3

3.3 SAR System Verification

The system check verifies that the system operates within its specifications. It is performed daily or before every SAR measurement. The system check uses normal SAR measurements in the flat section of the phantom with a matched dipole at a specified distance. The system verification setup is shown as below.

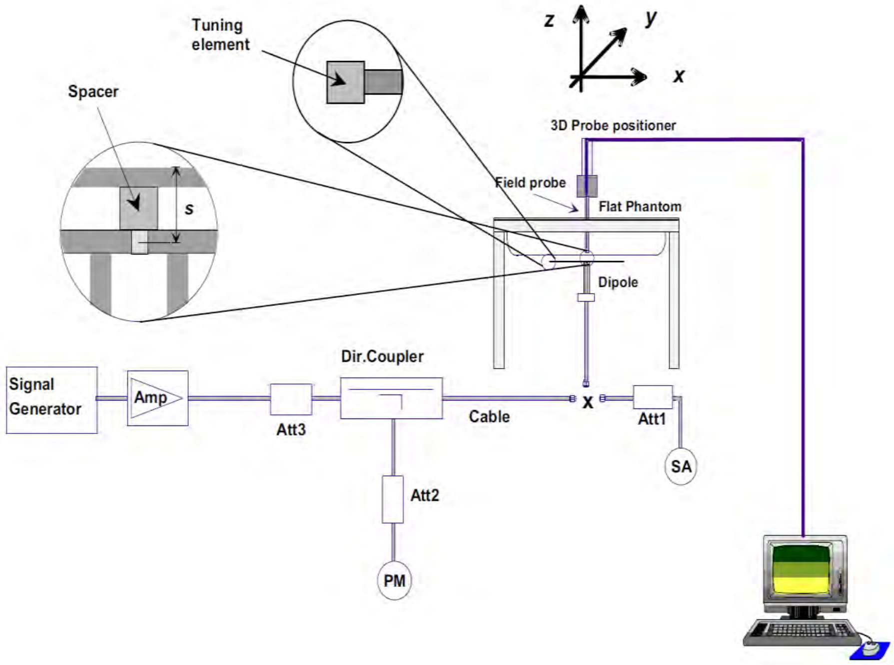


Fig-3.4 System Verification Setup

The validation dipole is placed beneath the flat phantom with the specific spacer in place. The distance spacer is touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The spectrum analyzer measures the forward power at the location of the system check dipole connector. The signal generator is adjusted for the desired forward power (250 mW is used for 700 MHz to 3 GHz, 100 mW is used for 3.5 GHz to 6 GHz) at the dipole connector and the power meter is read at that level. After connecting the cable to the dipole, the signal generator is readjusted for the same reading at power meter.

After system check testing, the SAR result will be normalized to 1W forward input power and compared with the reference SAR value derived from validation dipole certificate report. The deviation of system check should be within 10 %.

3.4 SAR Measurement Procedure

According to the SAR 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

The SAR measurement procedures for each of test conditions are as follows:

(a) Make EUT to transmit maximum output power
(b) Measure conducted output power through RF cable
(c) Place the EUT in the specific position of phantom
(d) Perform SAR testing steps on the DASY system
(e) Record the SAR value

3.4.1 Area & Zoom Scan Procedure

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g. According to KDB 865664 D01, the resolution for Area and Zoom scan is specified in the table below.

Items	<= 2 GHz	2-3 GHz	3-4 GHz	4-5 GHz	5-6 GHz
Area Scan (Δx, Δy)	<= 15 mm	<= 12 mm	<= 12 mm	<= 10 mm	<= 10 mm
Zoom Scan (Δx, Δy)	<= 8 mm	<= 5 mm	<= 5 mm	<= 4 mm	<= 4 mm
Zoom Scan (Δz)	<= 5 mm	<= 5 mm	<= 4 mm	<= 3 mm	<= 2 mm
Zoom Scan Volume	>= 30 mm	>= 30 mm	>= 28 mm	>= 25 mm	>= 22 mm

Note:

When zoom scan is required and report SAR is <= 1.4 W/kg, the zoom scan resolution of Δx / Δy (2-3GHz: <= 8 mm, 3-4GHz: <= 7 mm, 4-6GHz: <= 5 mm) may be applied.

3.4.2 Volume Scan Procedure

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.

3.4.3 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 drift more than 5%, the SAR will be retested.

3.4.4 Spatial Peak SAR Evaluation

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

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

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

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

3.4.5 SAR Averaged Methods

In DASY, the interpolation and extrapolation are both based on the modified Quadratic Shepard’s method. The interpolation scheme combines a least-square fitted function method and a weighted average method which are the two basic types of computational interpolation and approximation.

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5 mm.

4. SAR Measurement Evaluation

4.1 EUT Configuration and Setting

<Connections between EUT and System Simulator>

For WWAN SAR testing, the EUT was linked and controlled by base station emulator (CMW500 is used for GSM/WCDMA/and LTE). Communication between the EUT and the emulator was established by air link. The distance between the EUT and the communicating antenna of the emulator is larger than 50 cm and the output power radiated from the emulator antenna is at least 30 dB smaller than the output power of EUT. The EUT was set from the emulator to radiate maximum output power during SAR testing.

<Considerations Related to LTE for Setup and Testing>

This device contains LTE transmitter which follows 3GPP standards, supports both QPSK 16QAM and modulations, and supported LTE band and channel bandwidth is listed in below. The output power was tested per 3GPP TS 36.521-1 maximum transmit procedures for both QPSK 16QAM modulation. The results please refer to section 4.6 of this report.

EUT Supported LTE Band and Channel Bandwidth						
LTE Band	BW 1.4 MHz	BW 3 MHz	BW 5 MHz	BW 10 MHz	BW 15 MHz	BW 20 MHz
2	V	V	V	V	V	V
4	V	V	V	V	V	V
5	V	V	V	V		
12	V	V	V	V		
66	V	V	V	V	V	V
71			V	V	V	V

The LTE maximum power reduction (MPR) in accordance with 3GPP TS 36.101 is active all times during LTE operation. The allowed MPR for the maximum output power is specified in below.

Modulation	Channel Bandwidth / RB Configurations						LTE MPR Setting (dB)
	BW 1.4 MHz	BW 3 MHz	BW 5 MHz	BW 10 MHz	BW 15 MHz	BW 20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	1
16QAM	<= 5	<= 4	<= 8	<= 12	<= 16	<= 18	1
16QAM	> 5	> 4	> 8	> 12	> 16	> 18	2

Note: MPR is according to the standard and implemented in the circuit (mandatory).

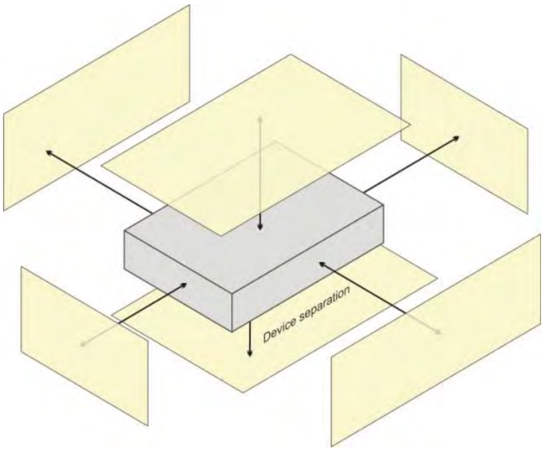
In addition, the device is compliant with additional maximum power reduction (A-MPR) requirements defined in 3GPP TS 36.101 section 6.2.4 that was disabled for all FCC compliance testing.

During LTE SAR testing, the related parameters of operating band, channel bandwidth, uplink channel number, modulation type, and RB was set in base station simulator. When the EUT has registered and communicated to base station simulator, the simulator set to make EUT transmitting the maximum radiated power.

4.2 EUT Testing Position

4.2.1 Body Exposure Conditions

This EUT was tested for all the close to the human body of intended use surfaces of the EUT. The separation distance between this EUT and phantom is 2 cm.



4.2.2 Extremity Exposure Conditions

Devices that are designed or intended for use on extremities or mainly operated in extremity only exposure conditions; i.e., hands, wrists, feet and ankles, may require extremity SAR evaluation. When the device also operates in close proximity to the user's body, SAR compliance for the body is also required. When extremity SAR testing is required, a flat phantom must be used if the exposure condition is more conservative than the actual use conditions; otherwise, a KDB inquiry is required to determine the phantom and test requirements. Body SAR compliance is also tested with a flat phantom. For devices with irregular shapes or form factors that do not conform to a flat phantom, and/or unusual operating configurations and exposure conditions, a KDB inquiry is also required to determine the appropriate SAR measurement procedures.

4.3 Tissue Verification

The measuring results for tissue simulating liquid are shown as below.

Test Date	Tissue Type	Frequency (MHz)	Liquid Temp. (℃)	Measured Conductivity (σ)	Measured Permittivity (ε_r)	Target Conductivity (σ)	Target Permittivity (ε_r)	Conductivity Deviation (%)	Permittivity Deviation (%)
Dec. 13, 2022	Head	750	22.5	0.910	43.671	0.89	41.90	2.25	4.23
Dec. 13, 2022	Head	835	22.5	0.938	43.405	0.90	41.50	4.22	4.59
Dec. 14, 2022	Head	1750	22.2	1.422	41.089	1.37	40.10	3.80	2.47
Dec. 14, 2022	Head	1900	22.2	1.411	40.371	1.40	40.00	0.79	0.93

Note:

The dielectric properties of the tissue simulating liquid must be measured within 24 hours before the SAR testing and within ±5% of the target values. Liquid temperature during the SAR testing must be within ±2 ℃.

4.4 System Verification

The measuring result for system verification is tabulated as below.

Test Date	Mode	Frequency (MHz)	1W Target SAR-1g (W/kg)	Measured SAR-1g (W/kg)	Normalized to 1W SAR-1g (W/kg)	Deviation (%)	Dipole S/N	Probe S/N	DAE S/N
Dec. 13, 2022	Head	750	8.45	2.15	8.60	1.78	1200	3268	1288
Dec. 13, 2022	Head	835	9.6	2.48	9.92	3.33	4d265	3268	1288
Dec. 14, 2022	Head	1750	36.6	9.4	37.60	2.73	1176	3268	1288
Dec. 14, 2022	Head	1900	39.7	9.56	38.24	-3.68	5d159	3268	1288

Note:

Comparing to the reference SAR value provided by SPEAG, the validation data should be within its specification of 10 %. The result indicates the system check can meet the variation criterion and the plots can be referred to Appendix A of this report.

4.5 Maximum Output Power

4.5.1 Maximum Conducted Power

The maximum conducted average power (Unit: dBm) including tune-up tolerance is shown as below.

Mode	LTE 2	LTE 4	LTE 5
QPSK	23.5	24.5	24.5
16QAM	22.5	23.5	23.5

Mode	LTE 12	LTE 66	LTE 71
QPSK	25	24.5	23.5
16QAM	24	23.5	22.5

4.5.2 Measured Conducted Power Result

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 18607	Mid CH 18900	High CH 19193		Low CH 18607	Mid CH 18900	High CH 19193	
			Frequency 1850.7 MHz	Frequency 1880.0 MHz	Frequency High CH 19193		Frequency 1850.7 MHz	Frequency 1880.0 MHz	Frequency High CH 19193	
2 / 1.4M	1	0	22.67	22.89	22.73	0	21.93	22.19	21.97	1
	1	2	22.88	23.04	23.02	0	22.21	22.29	22.18	1
	1	5	22.63	22.70	22.67	0	22.10	21.91	21.88	1
	3	0	22.72	22.87	22.79	0	21.53	21.65	21.71	1
	3	1	22.56	22.84	22.64	0	21.53	21.73	21.73	1
	3	3	22.55	22.79	22.59	0	21.63	21.74	21.69	1
	6	0	21.38	21.85	21.53	1	20.42	20.79	20.58	2

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 18615	Mid CH 18900	High CH 19185		Low CH 18615	Mid CH 18900	High CH 19185	
			Frequency 1851.5 MHz	Frequency 1880 MHz	Frequency 1908.5 MHz		Frequency 1851.5 MHz	Frequency 1880 MHz	Frequency 1908.5 MHz	
2 / 3M	1	0	22.69	22.91	22.72	0	21.90	22.25	22.00	1
	1	7	22.84	23.05	23.02	0	22.18	22.32	22.16	1
	1	14	22.59	22.70	22.67	0	22.13	21.91	21.88	1
	8	0	21.71	21.90	21.79	1	20.49	20.66	20.71	2
	8	3	21.49	21.84	21.66	1	20.58	20.68	20.76	2
	8	7	21.52	21.86	21.63	1	20.65	20.72	20.65	2
	15	0	21.35	21.86	21.47	1	20.42	20.73	20.61	2

LTE Band / BW	RB Size	RB Offset	QPSK Low CH 18625 Frequency 1852.5 MHz	QPSK Mid CH 18900 Frequency 1880 MHz	QPSK High CH 19175 Frequency 1907.5 MHz	3GPP MPR (dB)	16QAM Low CH 18625 Frequency 1852.5 MHz	16QAM Mid CH 18900 Frequency 1880 MHz	16QAM High CH 19175 Frequency 1907.5 MHz	3GPP MPR (dB)
2 / 5M	1	0	22.70	22.86	22.73	0	21.91	22.21	22.00	1
	1	12	22.89	23.02	23.02	0	22.15	22.35	22.15	1
	1	24	22.60	22.69	22.71	0	22.13	21.91	21.87	1
	12	0	21.74	21.90	21.76	1	20.49	20.64	20.68	2
	12	6	21.49	21.85	21.67	1	20.55	20.72	20.72	2
	12	13	21.56	21.82	21.64	1	20.60	20.74	20.68	2
	25	0	21.33	21.89	21.50	1	20.42	20.74	20.58	2

LTE Band / BW	RB Size	RB Offset	QPSK Low CH 18650 Frequency 1855 MHz	QPSK Mid CH 18900 Frequency 1880 MHz	QPSK High CH 19150 Frequency 1905 MHz	3GPP MPR (dB)	16QAM Low CH 18650 Frequency 1855 MHz	16QAM Mid CH 18900 Frequency 1880 MHz	16QAM High CH 19150 Frequency 1905 MHz	3GPP MPR (dB)
2 / 10M	1	0	22.67	22.89	22.73	0	21.91	22.18	21.96	1
	1	24	22.89	23.02	23.03	0	22.20	22.31	22.18	1
	1	49	22.57	22.73	22.67	0	22.13	21.92	21.84	1
	25	0	21.75	21.89	21.79	1	20.51	20.62	20.74	2
	25	12	21.55	21.79	21.67	1	20.59	20.66	20.77	2
	25	25	21.54	21.79	21.63	1	20.59	20.75	20.65	2
	50	0	21.38	21.89	21.47	1	20.46	20.73	20.62	2

LTE Band / BW	RB Size	RB Offset	QPSK Low CH 18675 Frequency 1857.5 MHz	QPSK Mid CH 18900 Frequency 1880 MHz	QPSK High CH 19125 Frequency 1902.5 MHz	3GPP MPR (dB)	16QAM Low CH 18675 Frequency 1857.5 MHz	16QAM Mid CH 18900 Frequency 1880 MHz	16QAM High CH 19125 Frequency 1902.5 MHz	3GPP MPR (dB)
2 / 15M	1	0	22.74	22.89	22.70	0	21.95	22.25	21.96	1
	1	37	22.87	23.07	22.98	0	22.19	22.32	22.18	1
	1	74	22.63	22.76	22.68	0	22.09	21.97	21.86	1
	36	0	21.72	21.90	21.80	1	20.55	20.62	20.75	2
	36	19	21.56	21.84	21.67	1	20.53	20.70	20.73	2
	36	39	21.52	21.80	21.63	1	20.64	20.73	20.68	2
	75	0	21.38	21.87	21.52	1	20.47	20.76	20.55	2

LTE Band / BW	RB Size	RB Offset	QPSK Low CH 18700 Frequency 1860 MHz	QPSK Mid CH 18900 Frequency 1880 MHz	QPSK High CH 19100 Frequency 1900 MHz	3GPP MPR (dB)	16QAM Low CH 18700 Frequency 1860 MHz	16QAM Mid CH 18900 Frequency 1880 MHz	16QAM High CH 19100 Frequency 1900 MHz	3GPP MPR (dB)
2 / 20M	1	0	22.75	22.93	22.78	0	21.98	22.26	22.02	1
	1	50	22.91	**23.10**	23.04	0	22.23	22.37	22.20	1
	1	99	22.65	22.77	22.72	0	22.15	21.99	21.89	1
	50	0	21.78	21.95	21.81	1	20.57	20.70	20.76	2
	50	25	21.57	21.86	21.72	1	20.61	20.74	20.78	2
	50	50	21.60	21.87	21.65	1	20.67	20.79	20.70	2
	100	0	21.39	21.91	21.55	1	20.48	20.81	20.63	2

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 19957	Mid CH 20175	High CH 20393		Low CH 19957	Mid CH 20175	High CH 20393	
			Low CH 19957	Mid CH 20175	High CH 20393		Low CH 19957	Mid CH 20175	High CH 20393	
4 / 1.4M	1	0	23.46	23.40	23.29	0	22.22	22.25	22.28	1
	1	2	23.61	23.55	23.60	0	22.01	22.28	22.59	1
	1	5	23.33	23.32	23.25	0	21.99	22.41	22.43	1
	3	0	23.34	23.42	23.49	0	22.47	22.47	22.43	1
	3	1	23.52	23.55	23.22	0	22.32	22.47	22.39	1
	3	3	23.55	23.51	23.38	0	22.31	22.46	22.35	1
	6	0	22.26	22.44	22.34	1	21.31	21.53	21.36	2

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 19965	Mid CH 20175	High CH 20385		Low CH 19965	Mid CH 20175	High CH 20385	
			Frequency 1711.5 MHz	Frequency 1732.5 MHz	Frequency 1753.5 MHz		Frequency 1711.5 MHz	Frequency 1732.5 MHz	Frequency 1753.5 MHz	
4 / 3M	1	0	23.48	23.42	23.28	0	22.19	22.31	22.31	1
	1	7	23.57	23.56	23.60	0	21.98	22.31	22.57	1
	1	14	23.29	23.32	23.25	0	22.02	22.41	22.43	1
	8	0	22.33	22.45	22.49	1	21.43	21.48	21.43	2
	8	3	22.45	22.55	22.24	1	21.37	21.42	21.42	2
	8	7	22.52	22.58	22.42	1	21.33	21.44	21.31	2
	15	0	22.23	22.45	22.28	1	21.31	21.47	21.39	2

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 19975	Mid CH 20175	High CH 20375		Low CH 19975	Mid CH 20175	High CH 20375	
			Frequency 1712.5 MHz	Frequency 1732.5 MHz	Frequency 1752.5 MHz		Frequency 1712.5 MHz	Frequency 1732.5 MHz	Frequency 1752.5 MHz	
4 / 5M	1	0	23.49	23.37	23.29	0	22.20	22.27	22.31	1
	1	12	23.62	23.53	23.60	0	21.95	22.34	22.56	1
	1	24	23.30	23.31	23.29	0	22.02	22.41	22.42	1
	12	0	22.36	22.45	22.46	1	21.43	21.46	21.40	2
	12	6	22.45	22.56	22.25	1	21.34	21.46	21.38	2
	12	13	22.56	22.54	22.43	1	21.28	21.46	21.34	2
	25	0	22.21	22.48	22.31	1	21.31	21.48	21.36	2

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 20000	Mid CH 20175	High CH 20350		Low CH 20000	Mid CH 20175	High CH 20350	
			Frequency 1715 MHz	Frequency 1732.5 MHz	Frequency 1750 MHz		Frequency 1715 MHz	Frequency 1732.5 MHz	Frequency 1750 MHz	
4 / 10M	1	0	23.46	23.40	23.29	0	22.20	22.24	22.27	1
	1	24	23.62	23.53	23.61	0	22.00	22.30	22.59	1
	1	49	23.27	23.35	23.25	0	22.02	22.42	22.39	1
	25	0	22.37	22.44	22.49	1	21.45	21.44	21.46	2
	25	12	22.51	22.50	22.25	1	21.38	21.40	21.43	2
	25	25	22.54	22.51	22.42	1	21.27	21.47	21.31	2
	50	0	22.26	22.48	22.28	1	21.35	21.47	21.40	2

LTE Band / BW	RB Size	RB Offset	QPSK Low CH 20025 Frequency 1717.5 MHz	QPSK Mid CH 20175 Frequency 1732.5 MHz	QPSK High CH 20325 Frequency 1747.5 MHz	3GPP MPR (dB)	16QAM Low CH 20025 Frequency 1717.5 MHz	16QAM Mid CH 20175 Frequency 1732.5 MHz	16QAM High CH 20325 Frequency 1747.5 MHz	3GPP MPR (dB)
4 / 15M	1	0	23.53	23.40	23.26	0	22.24	22.31	22.27	1
	1	37	23.60	23.58	23.56	0	21.99	22.31	22.59	1
	1	74	23.33	23.38	23.26	0	21.98	22.47	22.41	1
	36	0	22.34	22.45	22.50	1	21.49	21.44	21.47	2
	36	19	22.52	22.55	22.25	1	21.32	21.44	21.39	2
	36	39	22.52	22.52	22.42	1	21.32	21.45	21.34	2
	75	0	22.26	22.46	22.33	1	21.36	21.50	21.33	2

LTE Band / BW	RB Size	RB Offset	QPSK Low CH 20050 Frequency 1720 MHz	QPSK Mid CH 20175 Frequency 1732.5 MHz	QPSK High CH 20300 Frequency 1745 MHz	3GPP MPR (dB)	16QAM Low CH 20050 Frequency 1720 MHz	16QAM Mid CH 20175 Frequency 1732.5 MHz	16QAM High CH 20300 Frequency 1745 MHz	3GPP MPR (dB)
4 / 20M	1	0	23.54	23.44	23.34	0	22.27	22.32	22.33	1
	1	50	**23.64**	23.61	23.62	0	22.03	22.36	22.61	1
	1	99	23.35	23.39	23.30	0	22.04	22.49	22.44	1
	50	0	22.40	22.50	22.51	1	21.51	21.52	21.48	2
	50	25	22.53	22.57	22.30	1	21.40	21.48	21.44	2
	50	50	22.60	22.59	22.44	1	21.35	21.51	21.36	2
	100	0	22.27	22.50	22.36	1	21.37	21.55	21.41	2

LTE Band / BW	RB Size	RB Offset	QPSK Low CH 20407 Frequency 824.7 MHz	QPSK Mid CH 20525 Frequency 836.5 MHz	QPSK High CH 20643 Frequency 848.3 MHz	3GPP MPR (dB)	16QAM Low CH 20407 Frequency 824.7 MHz	16QAM Mid CH 20525 Frequency 836.5 MHz	16QAM High CH 20643 Frequency 848.3 MHz	3GPP MPR (dB)
5 / 1.4M	1	0	23.31	23.40	23.80	0	22.61	22.69	22.50	1
	1	2	23.28	23.12	23.56	0	22.95	22.66	22.48	1
	1	5	23.22	23.17	23.27	0	22.78	22.51	22.21	1
	3	0	23.30	23.18	23.53	0	22.31	22.31	22.41	1
	3	1	23.30	23.21	23.29	0	22.32	22.32	22.36	1
	3	3	23.34	23.12	23.46	0	22.45	22.23	22.54	1
	6	0	22.42	22.27	22.47	1	21.25	21.26	21.41	2

LTE Band / BW	RB Size	RB Offset	QPSK Low CH 20415 Frequency 825.5 MHz	QPSK Mid CH 20525 Frequency 836.5 MHz	QPSK High CH 20635 Frequency 847.5 MHz	3GPP MPR (dB)	16QAM Low CH 19965 Frequency 1711.5 MHz	16QAM Mid CH 20175 Frequency 1732.5 MHz	16QAM High CH 20385 Frequency 1753.5 MHz	3GPP MPR (dB)
5 / 3M	1	0	23.33	23.42	23.79	0	22.58	22.75	22.53	1
	1	7	23.24	23.13	23.56	0	22.92	22.69	22.46	1
	1	14	23.18	23.17	23.27	0	22.81	22.51	22.21	1
	8	0	22.29	22.21	22.53	1	21.27	21.32	21.41	2
	8	3	22.23	22.21	22.31	1	21.37	21.27	21.39	2
	8	7	22.31	22.19	22.50	1	21.47	21.21	21.50	2
	15	0	22.39	22.28	22.41	1	21.25	21.20	21.44	2

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 20425	Mid CH 20525	High CH 20625		Low CH 20425	Mid CH 20525	High CH 20625	
			Frequency 826.5 MHz	Frequency 836.5 MHz	Frequency 846.5 MHz		Frequency 826.5 MHz	Frequency 836.5 MHz	Frequency 846.5 MHz	
5 / 5M	1	0	23.34	23.37	23.80	0	22.59	22.71	22.53	1
	1	12	23.29	23.10	23.56	0	22.89	22.72	22.45	1
	1	24	23.19	23.16	23.31	0	22.81	22.51	22.20	1
	12	0	22.32	22.21	22.50	1	21.27	21.30	21.38	2
	12	6	22.23	22.22	22.32	1	21.34	21.31	21.35	2
	12	13	22.35	22.15	22.51	1	21.42	21.23	21.53	2
	25	0	22.37	22.31	22.44	1	21.25	21.21	21.41	2

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 20450	Mid CH 20525	High CH 20600		Low CH 20450	Mid CH 20525	High CH 20600	
			Frequency 829.0 MHz	Frequency 836.5 MHz	Frequency 844.0 MHz		Frequency 829.0 MHz	Frequency 836.5 MHz	Frequency 844.0 MHz	
5 / 10M	1	0	23.39	23.44	**23.85**	0	22.66	22.76	22.55	1
	1	24	23.31	23.18	23.58	0	22.97	22.74	22.50	1
	1	49	23.24	23.24	23.32	0	22.83	22.59	22.22	1
	25	0	22.36	22.26	22.55	1	21.35	21.36	21.46	2
	25	12	22.31	22.23	22.37	1	21.40	21.33	21.41	2
	25	25	22.39	22.20	22.52	1	21.49	21.28	21.55	2
	50	0	22.43	22.33	22.49	1	21.31	21.28	21.46	2

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 23017	Mid CH 23095	High CH 23173		Low CH 23017	Mid CH 23095	High CH 23173	
			Frequency 699.7 MHz	Frequency 707.5 MHz	Frequency 715.3 MHz		Frequency 699.7 MHz	Frequency 707.5 MHz	Frequency 715.3 MHz	
12 / 1.4M	1	0	23.90	23.93	24.10	0	23.10	22.80	22.92	1
	1	2	24.14	24.21	24.15	0	23.24	22.91	23.06	1
	1	5	24.06	24.12	24.09	0	23.19	22.75	23.28	1
	3	0	24.08	24.17	24.22	0	22.81	22.98	23.28	1
	3	1	24.10	24.15	24.06	0	22.96	23.14	23.23	1
	3	3	24.15	24.03	24.16	0	23.11	23.18	23.16	1
	6	0	23.18	23.20	23.18	1	21.86	22.04	22.00	2

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 23025	Mid CH 23095	High CH 23165		Low CH 23025	Mid CH 23095	High CH 23165	
			Frequency 700.5 MHz	Frequency 707.5 MHz	Frequency 714.5 MHz		Frequency 700.5 MHz	Frequency 707.5 MHz	Frequency 714.5 MHz	
12 / 3M	1	0	23.92	23.95	24.09	0	23.07	22.86	22.95	1
	1	7	24.10	24.22	24.15	0	23.21	22.94	23.04	1
	1	14	24.02	24.12	24.09	0	23.22	22.75	23.28	1
	8	0	23.07	23.20	23.22	1	21.77	21.99	22.28	2
	8	3	23.03	23.15	23.08	1	22.01	22.09	22.26	2
	8	7	23.12	23.10	23.20	1	22.13	22.16	22.12	2
	15	0	23.15	23.21	23.12	1	21.86	21.98	22.03	2

LTE Band / BW	RB Size	RB Offset	QPSK Low CH 23035 Frequency 701.5 MHz	QPSK Mid CH 23095 Frequency 707.5 MHz	QPSK High CH 23155 Frequency 713.5 MHz	3GPP MPR (dB)	16QAM Low CH 23035 Frequency 701.5 MHz	16QAM Mid CH 23095 Frequency 707.5 MHz	16QAM High CH 23155 Frequency 713.5 MHz	3GPP MPR (dB)
12 / 5M	1	0	23.93	23.90	24.10	0	23.08	22.82	22.95	1
	1	12	24.15	24.19	24.15	0	23.18	22.97	23.03	1
	1	24	24.03	24.11	24.13	0	23.22	22.75	23.27	1
	12	0	23.10	23.20	23.19	1	21.77	21.97	22.25	2
	12	6	23.03	23.16	23.09	1	21.98	22.13	22.22	2
	12	13	23.16	23.06	23.21	1	22.08	22.18	22.15	2
	25	0	23.13	23.24	23.15	1	21.86	21.99	22.00	2

LTE Band / BW	RB Size	RB Offset	QPSK Low CH 23060 Frequency 704 MHz	QPSK Mid CH 23095 Frequency 707.5 MHz	QPSK High CH 23130 Frequency 711 MHz	3GPP MPR (dB)	16QAM Low CH 23060 Frequency 704 MHz	16QAM Mid CH 23095 Frequency 707.5 MHz	16QAM High CH 23130 Frequency 711 MHz	3GPP MPR (dB)
12 / 10M	1	0	23.98	23.97	24.15	0	23.15	22.87	22.97	1
	1	24	24.17	**24.27**	24.16	0	23.26	22.99	23.08	1
	1	49	24.08	24.19	24.14	0	23.24	22.83	23.29	1
	25	0	23.14	23.25	23.24	1	21.85	22.03	22.33	2
	25	12	23.11	23.17	23.14	1	22.04	22.15	22.28	2
	25	25	23.20	23.11	23.22	1	22.15	22.23	22.17	2
	50	0	23.19	23.26	23.20	1	21.92	22.06	22.05	2

LTE Band / BW	RB Size	RB Offset	QPSK Low CH 131979 Frequency 1710.7MHz	QPSK Mid CH 132322 Frequency 1745MHz	QPSK High CH 132665 Frequency 1779.3MHz	3GPP MPR (dB)	16QAM Low CH 131979 Frequency 1710.7MHz	16QAM Mid CH 132322 Frequency 1745MHz	16QAM High CH 132665 Frequency 1779.3MHz	3GPP MPR (dB)
66 / 1.4M	1	0	23.82	23.81	24.14	0	22.07	22.42	22.32	1
	1	2	23.60	23.74	24.11	0	22.45	22.58	22.61	1
	1	5	23.81	23.64	23.72	0	22.54	22.40	22.50	1
	3	0	23.82	23.84	23.93	0	22.83	22.77	23.09	1
	3	1	23.75	23.81	23.85	0	22.82	22.72	22.97	1
	3	3	23.79	23.57	23.75	0	22.78	22.59	23.00	1
	6	0	22.87	22.65	22.87	1	21.62	21.76	21.86	2

LTE Band / BW	RB Size	RB Offset	QPSK Low CH 131987 Frequency 1711.5MHz	QPSK Mid CH 132322 Frequency 1745MHz	QPSK High CH 132657 Frequency 1778.5MHz	3GPP MPR (dB)	16QAM Low CH 131987 Frequency 1711.5MHz	16QAM Mid CH 132322 Frequency 1745MHz	16QAM High CH 132657 Frequency 1778.5MHz	3GPP MPR (dB)
66 / 3M	1	0	23.84	23.83	24.13	0	22.04	22.48	22.35	1
	1	7	23.56	23.75	24.11	0	22.42	22.61	22.59	1
	1	14	23.77	23.64	23.72	0	22.57	22.40	22.50	1
	8	0	22.81	22.87	22.93	1	21.79	21.78	22.09	2
	8	3	22.68	22.81	22.87	1	21.87	21.67	22.00	2
	8	7	22.76	22.64	22.79	1	21.80	21.57	21.96	2
	15	0	22.84	22.66	22.81	1	21.62	21.70	21.89	2

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 131997 Frequency 1712.5MHz	Mid CH 132322 Frequency 1745MHz	High CH 132647 Frequency 1777.5MHz		Low CH 131997 Frequency 1712.5MHz	Mid CH 132322 Frequency 1745MHz	High CH 132647 Frequency 1777.5MHz	
66 / 5M	1	0	23.85	23.78	24.14	0	22.05	22.44	22.35	1
	1	12	23.61	23.72	24.11	0	22.39	22.64	22.58	1
	1	24	23.78	23.63	23.76	0	22.57	22.40	22.49	1
	12	0	22.84	22.87	22.90	1	21.79	21.76	22.06	2
	12	6	22.68	22.82	22.88	1	21.84	21.71	21.96	2
	12	13	22.80	22.60	22.80	1	21.75	21.59	21.99	2
	25	0	22.82	22.69	22.84	1	21.62	21.71	21.86	2

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 132022 Frequency 1715MHz	Mid CH 132322 Frequency 1745MHz	High CH 132622 Frequency 1775MHz		Low CH 132022 Frequency 1715MHz	Mid CH 132322 Frequency 1745MHz	High CH 132622 Frequency 1775MHz	
66 / 10M	1	0	23.82	23.81	24.14	0	22.05	22.41	22.31	1
	1	24	23.61	23.72	24.12	0	22.44	22.60	22.61	1
	1	49	23.75	23.67	23.72	0	22.57	22.41	22.46	1
	25	0	22.85	22.86	22.93	1	21.81	21.74	22.12	2
	25	12	22.74	22.76	22.88	1	21.88	21.65	22.01	2
	25	25	22.78	22.57	22.79	1	21.74	21.60	21.96	2
	50	0	22.87	22.69	22.81	1	21.66	21.70	21.90	2

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 132072 Frequency 1720MHz	Mid CH 132322 Frequency 1745MHz	High CH 132572 Frequency 1770MHz		Low CH 132072 Frequency 1720MHz	Mid CH 132322 Frequency 1745MHz	High CH 132572 Frequency 1770MHz	
66 / 15M	1	0	23.89	23.81	24.11	0	22.09	22.48	22.31	1
	1	37	23.59	23.77	24.07	0	22.43	22.61	22.61	1
	1	74	23.81	23.70	23.73	0	22.53	22.46	22.48	1
	36	0	22.82	22.87	22.94	1	21.85	21.74	22.13	2
	36	19	22.75	22.81	22.88	1	21.82	21.69	21.97	2
	36	39	22.76	22.58	22.79	1	21.79	21.58	21.99	2
	75	0	22.87	22.67	22.86	1	21.67	21.73	21.83	2

LTE Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 132072 Frequency 1720MHz	Mid CH 132322 Frequency 1745MHz	High CH 132572 Frequency 1770MHz		Low CH 132072 Frequency 1720MHz	Mid CH 132322 Frequency 1745MHz	High CH 132572 Frequency 1770MHz	
66 / 20M	1	0	23.90	23.85	**24.19**	0	22.12	22.49	22.37	1
	1	50	23.63	23.80	24.13	0	22.47	22.66	22.63	1
	1	99	23.83	23.71	23.77	0	22.59	22.48	22.51	1
	50	0	22.88	22.92	22.95	1	21.87	21.82	22.14	2
	50	25	22.76	22.83	22.93	1	21.90	21.73	22.02	2
	50	50	22.84	22.65	22.81	1	21.82	21.64	22.01	2
	100	0	22.88	22.71	22.89	1	21.68	21.78	21.91	2

LTE Band / BW	RB Size	RB Offset	QPSK Low CH 133147 Frequency 665.5MHz	QPSK Mid CH 133247 Frequency 675.5MHz	QPSK High CH 133447 Frequency 695.5MHz	3GPP MPR (dB)	16QAM Low CH 133147 Frequency 665.5MHz	16QAM Mid CH 133247 Frequency 675.5MHz	16QAM High CH 133447 Frequency 695.5MHz	3GPP MPR (dB)
71 / 5M	1	0	22.58	22.45	22.60	0	21.89	21.71	22.11	1
	1	12	22.96	22.74	22.65	0	21.61	22.23	22.21	1
	1	24	22.47	22.55	22.61	0	22.03	21.72	22.10	1
	12	0	21.72	21.62	21.54	1	20.63	20.54	20.46	2
	12	6	21.62	21.59	21.43	1	21.72	20.75	20.56	2
	12	13	21.47	21.60	21.56	1	20.47	20.54	20.53	2
	25	0	21.56	21.49	21.55	1	20.61	20.33	20.46	2

LTE Band / BW	RB Size	RB Offset	QPSK Low CH 133172 Frequency 668MHz	QPSK Mid CH 133272 Frequency 678MHz	QPSK High CH 133422 Frequency 693MHz	3GPP MPR (dB)	16QAM Low CH 133172 Frequency 668MHz	16QAM Mid CH 133272 Frequency 678MHz	16QAM High CH 133422 Frequency 693MHz	3GPP MPR (dB)
71 / 10M	1	0	22.55	22.48	22.60	0	21.89	21.68	22.07	1
	1	24	22.96	22.74	22.66	0	21.66	22.19	22.24	1
	1	49	22.44	22.59	22.57	0	22.03	21.73	22.07	1
	25	0	21.73	21.61	21.57	1	20.65	20.52	20.52	2
	25	12	21.68	21.53	21.43	1	21.76	20.69	20.61	2
	25	25	21.45	21.57	21.55	1	20.46	20.55	20.50	2
	50	0	21.61	21.49	21.52	1	20.65	20.32	20.50	2

LTE Band / BW	RB Size	RB Offset	QPSK Low CH 133197 Frequency 670.5MHz	QPSK Mid CH 133297 Frequency 680.5MHz	QPSK High CH 133397 Frequency 690.5MHz	3GPP MPR (dB)	16QAM Low CH 133197 Frequency 670.5MHz	16QAM Mid CH 133297 Frequency 680.5MHz	16QAM High CH 133397 Frequency 690.5MHz	3GPP MPR (dB)
71 / 15M	1	0	22.62	22.48	22.57	0	21.93	21.75	22.07	1
	1	37	22.94	22.79	22.61	0	21.65	22.20	22.24	1
	1	74	22.50	22.62	22.58	0	21.99	21.78	22.09	1
	36	0	21.70	21.62	21.58	1	20.69	20.52	20.53	2
	36	19	21.69	21.58	21.43	1	21.70	20.73	20.57	2
	36	39	21.43	21.58	21.55	1	20.51	20.53	20.53	2
	75	0	21.61	21.47	21.57	1	20.66	20.35	20.43	2

LTE Band / BW	RB Size	RB Offset	QPSK Low CH 133222 Frequency 673MHz	QPSK Mid CH 133322 Frequency 683MHz	QPSK High CH 133372 Frequency 688MHz	3GPP MPR (dB)	16QAM Low CH 133222 Frequency 673MHz	16QAM Mid CH 133322 Frequency 683MHz	16QAM High CH 133372 Frequency 688MHz	3GPP MPR (dB)
71 / 20M	1	0	22.63	22.52	22.65	0	21.96	21.76	22.13	1
	1	50	**22.98**	22.82	22.67	0	21.69	22.25	22.26	1
	1	99	22.52	22.63	22.62	0	22.05	21.80	22.12	1
	50	0	21.76	21.67	21.59	1	20.71	20.60	20.54	2
	50	25	21.70	21.60	21.48	1	21.78	20.77	20.62	2
	50	50	21.51	21.65	21.57	1	20.54	20.59	20.55	2
	100	0	21.62	21.51	21.60	1	20.67	20.40	20.51	2

4.6 SAR Testing Results

4.6.1 SAR Test Reduction Considerations

<KDB 447498 D01, General RF Exposure Guidance>

Testing of other required channels within the operating mode of a frequency band is not required when the reported SAR for the mid-band or highest output power channel is:

(1) ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz

(2) ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz

(3) ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

<KDB 941225 D05, SAR Evaluation Considerations for LTE Devices>

(1) QPSK with 1 RB and 50% RB allocation

Start with the largest channel bandwidth and measure SAR, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle and lower edge of each required test channel. 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 and only for the RB offset configuration with the highest output power for that channel. When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

(2) 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.

(3) Higher order modulations

SAR is required only when the highest maximum output power for the configuration in the higher order modulation is > 1/2 dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

(4) Other channel bandwidth

SAR is required when the highest maximum output power of the smaller channel bandwidth is > 1/2 dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.

4.6.2 SAR Results for Body-worn Exposure Condition (Separation Distance is 2.0 cm Gap)

Plot No.	Band	Mode	Test Position	Ch.	RB#	RB Offset	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Power Drift (dB)	Measured SAR-1g (W/kg)	Tune-up Scaling Facto	Scaled SAR-1g (W/kg)
	LTE 2	QPSK20M	Front Face	18900	1	50	23.5	23.1	0.07	0.566	1.10	0.62
	LTE 2	QPSK20M	Rear Face	18900	1	50	23.5	23.1	0.15	0.219	1.10	0.24
	LTE 2	QPSK20M	Left Side	18900	1	50	23.5	23.1	0.09	0.922	1.10	1.01
	LTE 2	QPSK20M	Right Side	18900	1	50	23.5	23.1	0.07	0.000	1.10	0.00
	LTE 2	QPSK20M	Top Side	18900	1	50	23.5	23.1	0.03	0.173	1.10	0.19
	LTE 2	QPSK20M	Front Face	18900	50	0	22.5	21.95	0.05	0.446	1.14	0.51
	LTE 2	QPSK20M	Rear Face	18900	50	0	22.5	21.95	0.11	0.163	1.14	0.19
	LTE 2	QPSK20M	Left Side	18900	50	0	22.5	21.95	0.06	0.695	1.14	0.79
	LTE 2	QPSK20M	Right Side	18900	50	0	22.5	21.95	0.17	0.000	1.14	0.00
	LTE 2	QPSK20M	Top Side	18900	50	0	22.5	21.95	0.19	0.140	1.14	0.16
	LTE 2	QPSK20M	Left Side	18700	1	50	23.5	22.91	0.2	0.827	1.15	0.95
P01	LTE 2	QPSK20M	Left Side	19100	1	50	23.5	23.04	0.02	1.010	1.11	**1.12**
	LTE 2	QPSK20M	Left Side	18900	100	0	22.5	21.91	0.15	0.804	1.15	0.92
	LTE 5	QPSK10M	Front Face	20600	1	0	24.5	23.85	0.01	0.044	1.16	0.05
	LTE 5	QPSK10M	Rear Face	20600	1	0	24.5	23.85	0.05	0.000	1.16	0.00
	LTE 5	QPSK10M	Left Side	20600	1	0	24.5	23.85	0.09	0.000	1.16	0.00
	LTE 5	QPSK10M	Right Side	20600	1	0	24.5	23.85	0.03	0.000	1.16	0.00
	LTE 5	QPSK10M	Top Side	20600	1	0	24.5	23.85	0.11	0.000	1.16	0.00
	LTE 5	QPSK10M	Front Face	20600	25	0	23.5	22.55	0.09	0.000	1.24	0.00
	LTE 5	QPSK10M	Rear Face	20600	25	0	23.5	22.55	-0.11	0.000	1.24	0.00
	LTE 5	QPSK10M	Left Side	20600	25	0	23.5	22.55	-0.04	0.000	1.24	0.00
	LTE 5	QPSK10M	Right Side	20600	25	0	23.5	22.55	0.13	0.000	1.24	0.00
	LTE 5	QPSK10M	Top Side	20600	25	0	23.5	22.55	0.05	0.000	1.24	0.00
P02	LTE 5	QPSK10M	Front Face	20450	1	0	24.5	23.39	0.08	0.049	1.29	**0.06**
	LTE 5	QPSK10M	Front Face	20525	1	0	24.5	23.44	0.06	0.048	1.28	0.06
	LTE 12	QPSK10M	Front Face	23095	1	24	25	24.27	0.06	0.219	1.18	0.26
	LTE 12	QPSK10M	Rear Face	23095	1	24	25	24.27	0.11	0.192	1.18	0.23
	LTE 12	QPSK10M	Left Side	23095	1	24	25	24.27	-0.09	0.048	1.18	0.06
	LTE 12	QPSK10M	Right Side	23095	1	24	25	24.27	0.14	0.000	1.18	0.00
	LTE 12	QPSK10M	Top Side	23095	1	24	25	24.27	0.03	0.123	1.18	0.15
	LTE 12	QPSK10M	Front Face	23095	25	0	24	23.25	0.09	0.246	1.19	0.29
	LTE 12	QPSK10M	Rear Face	23095	25	0	24	23.25	0.06	0.137	1.19	0.16
	LTE 12	QPSK10M	Left Side	23095	25	0	24	23.25	-0.11	0.000	1.19	0.00
	LTE 12	QPSK10M	Right Side	23095	25	0	24	23.25	0.08	0.000	1.19	0.00
	LTE 12	QPSK10M	Top Side	23095	25	0	24	23.25	-0.03	0.083	1.19	0.10
P03	LTE 12	QPSK10M	Front Face	23060	1	24	25	24.17	0.09	0.268	1.21	**0.32**
	LTE 12	QPSK10M	Front Face	23130	1	24	25	24.16	-0.11	0.266	1.21	0.32
	LTE 66	QPSK20M	Front Face	132572	1	0	24.5	24.19	-0.13	0.371	1.07	0.40
	LTE 66	QPSK20M	Rear Face	132572	1	0	24.5	24.19	0.16	0.265	1.07	0.28
	LTE 66	QPSK20M	Left Side	132572	1	0	24.5	24.19	0.02	0.947	1.07	1.02
	LTE 66	QPSK20M	Right Side	132572	1	0	24.5	24.19	-0.05	0.075	1.07	0.08
	LTE 66	QPSK20M	Top Side	132572	1	0	24.5	24.19	0.04	0.142	1.07	0.15
	LTE 66	QPSK20M	Front Face	132572	50	0	23.5	22.95	0.01	0.351	1.14	0.40
	LTE 66	QPSK20M	Rear Face	132572	50	0	23.5	22.95	0.08	0.225	1.14	0.26
	LTE 66	QPSK20M	Left Side	132572	50	0	23.5	22.95	-0.02	0.761	1.14	0.86
	LTE 66	QPSK20M	Right Side	132572	50	0	23.5	22.95	-0.13	0.081	1.14	0.09
	LTE 66	QPSK20M	Top Side	132572	50	0	23.5	22.95	0.18	0.116	1.14	0.13
	LTE 66	QPSK20M	Left Side	132072	1	0	24.5	23.9	-0.05	0.817	1.15	0.94
P04	LTE 66	QPSK20M	Left Side	132322	1	0	24.5	23.85	0.04	0.907	1.16	**1.05**
	LTE 66	QPSK20M	Left Side	132572	100	0	23.5	22.89	-0.02	0.826	1.15	0.95
P05	LTE 71	QPSK20M	Front Face	133222	1	50	23.5	22.98	0.01	0.197	1.13	**0.22**
	LTE 71	QPSK20M	Rear Face	133222	1	50	23.5	22.98	0.09	0.111	1.13	0.13
	LTE 71	QPSK20M	Left Side	133222	1	50	23.5	22.98	0.14	0.000	1.13	0.00
	LTE 71	QPSK20M	Right Side	133222	1	50	23.5	22.98	0.03	0.000	1.13	0.00
	LTE 71	QPSK20M	Top Side	133222	1	50	23.5	22.98	-0.05	0.059	1.13	0.07
	LTE 71	QPSK20M	Front Face	133222	50	0	22.5	21.76	0.18	0.149	1.19	0.18
	LTE 71	QPSK20M	Rear Face	133222	50	0	22.5	21.76	0.14	0.080	1.19	0.09
	LTE 71	QPSK20M	Left Side	133222	50	0	22.5	21.76	-0.15	0.000	1.19	0.00
	LTE 71	QPSK20M	Right Side	133222	50	0	22.5	21.76	0.16	0.000	1.19	0.00
	LTE 71	QPSK20M	Top Side	133222	50	0	22.5	21.76	0.07	0.048	1.19	0.06
	LTE 71	QPSK20M	Front Face	133322	1	50	23.5	22.82	0.09	0.182	1.17	0.21
	LTE 71	QPSK20M	Front Face	133372	1	50	23.5	22.67	0.05	0.183	1.21	0.22

4.6.3 SAR Results for Extremity Exposure Condition (Separation Distance is 0 cm Gap)

Plot No.	Band	Mode	Test Position	Ch.	RB#	RB Offset	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Power Drift (dB)	Measured SAR-10g (W/kg)	Tune-up Scaling Facto	Scaled SAR-10g (W/kg)
	LTE 2	QPSK20M	Front Face	18900	1	50	23.5	23.1	-0.03	3.220	1.10	3.53
	LTE 2	QPSK20M	Rear Face	18900	1	50	23.5	23.1	0.04	1.020	1.10	1.12
	LTE 2	QPSK20M	Left Side	18900	1	50	23.5	23.1	0.05	1.080	1.10	1.18
	LTE 2	QPSK20M	Right Side	18900	1	50	23.5	23.1	0.01	0.192	1.10	0.21
	LTE 2	QPSK20M	Top Side	18900	1	50	23.5	23.1	-0.03	0.894	1.10	0.98
	LTE 2	QPSK20M	Front Face	18900	50	0	22.5	21.95	0.14	2.500	1.14	2.84
	LTE 2	QPSK20M	Rear Face	18900	50	0	22.5	21.95	0.11	0.825	1.14	0.94
	LTE 2	QPSK20M	Left Side	18900	50	0	22.5	21.95	0.17	0.864	1.14	0.98
	LTE 2	QPSK20M	Right Side	18900	50	0	22.5	21.95	0.18	0.194	1.14	0.22
	LTE 2	QPSK20M	Top Side	18900	50	0	22.5	21.95	0.12	0.684	1.14	0.78
	LTE 2	QPSK20M	Front Face	18700	1	50	23.5	22.91	-0.06	2.960	1.15	3.39
P06	LTE 2	QPSK20M	Front Face	19100	1	50	23.5	23.04	0.02	3.240	1.11	**3.60**
	LTE 2	QPSK20M	Front Face	18700	50	0	22.5	21.78	0.02	2.220	1.18	2.62
	LTE 2	QPSK20M	Front Face	19100	50	0	22.5	21.81	0.05	2.570	1.17	3.01
	LTE 2	QPSK20M	Front Face	18900	100	0	22.5	21.91	0.06	2.440	1.15	2.80
	LTE 5	QPSK10M	Front Face	20600	1	0	24.5	23.85	0.03	0.318	1.16	0.37
	LTE 5	QPSK10M	Rear Face	20600	1	0	24.5	23.85	0.07	0.091	1.16	0.11
	LTE 5	QPSK10M	Left Side	20600	1	0	24.5	23.85	0.04	0.186	1.16	0.22
	LTE 5	QPSK10M	Right Side	20600	1	0	24.5	23.85	0.17	0.000	1.16	0.00
	LTE 5	QPSK10M	Top Side	20600	1	0	24.5	23.85	-0.18	0.068	1.16	0.08
	LTE 5	QPSK10M	Front Face	20600	25	0	23.5	22.55	0.15	0.258	1.24	0.32
	LTE 5	QPSK10M	Rear Face	20600	25	0	23.5	22.55	0.11	0.072	1.24	0.09
	LTE 5	QPSK10M	Left Side	20600	25	0	23.5	22.55	-0.08	0.138	1.24	0.17
	LTE 5	QPSK10M	Right Side	20600	25	0	23.5	22.55	0.16	0.000	1.24	0.00
	LTE 5	QPSK10M	Top Side	20600	25	0	23.5	22.55	0.07	0.060	1.24	0.07
P07	LTE 5	QPSK10M	Front Face	20450	1	0	24.5	23.39	0.03	0.325	1.29	**0.42**
	LTE 5	QPSK10M	Front Face	20525	1	0	24.5	23.44	0.06	0.306	1.28	0.39
P08	LTE 12	QPSK10M	Front Face	23095	1	24	25	24.27	0.03	0.746	1.18	**0.88**
	LTE 12	QPSK10M	Rear Face	23095	1	24	25	24.27	0.12	0.542	1.18	0.64
	LTE 12	QPSK10M	Left Side	23095	1	24	25	24.27	0.04	0.336	1.18	0.40
	LTE 12	QPSK10M	Right Side	23095	1	24	25	24.27	-0.06	0.225	1.18	0.27
	LTE 12	QPSK10M	Top Side	23095	1	24	25	24.27	0.17	0.542	1.18	0.64
	LTE 12	QPSK10M	Front Face	23095	25	0	24	23.25	0.02	0.580	1.19	0.69
	LTE 12	QPSK10M	Rear Face	23095	25	0	24	23.25	0.11	0.434	1.19	0.52
	LTE 12	QPSK10M	Left Side	23095	25	0	24	23.25	0.15	0.229	1.19	0.27
	LTE 12	QPSK10M	Right Side	23095	25	0	24	23.25	-0.17	0.161	1.19	0.19
	LTE 12	QPSK10M	Top Side	23095	25	0	24	23.25	0.18	0.368	1.19	0.44
	LTE 12	QPSK10M	Front Face	23060	1	24	25	24.17	0.06	0.613	1.21	0.74
	LTE 12	QPSK10M	Front Face	23130	1	24	25	24.16	0.05	0.552	1.21	0.67
	LTE 66	QPSK20M	Front Face	132572	1	0	24.5	24.19	0.04	3.110	1.07	3.34
	LTE 66	QPSK20M	Rear Face	132572	1	0	24.5	24.19	0.18	1.120	1.07	1.20
	LTE 66	QPSK20M	Left Side	132572	1	0	24.5	24.19	-0.03	2.820	1.07	3.03
	LTE 66	QPSK20M	Right Side	132572	1	0	24.5	24.19	0.13	0.279	1.07	0.30
	LTE 66	QPSK20M	Top Side	132572	1	0	24.5	24.19	0.05	0.723	1.07	0.78
	LTE 66	QPSK20M	Front Face	132572	50	0	23.5	22.95	0.12	2.450	1.14	2.78
	LTE 66	QPSK20M	Rear Face	132572	50	0	23.5	22.95	0.07	0.930	1.14	1.06
	LTE 66	QPSK20M	Left Side	132572	50	0	23.5	22.95	0.12	1.670	1.14	1.90
	LTE 66	QPSK20M	Right Side	132572	50	0	23.5	22.95	-0.07	0.240	1.14	0.27
	LTE 66	QPSK20M	Top Side	132572	50	0	23.5	22.95	0.03	0.554	1.14	0.63
	LTE 66	QPSK20M	Front Face	132072	1	0	24.5	23.9	0.12	2.390	1.15	2.74
	LTE 66	QPSK20M	Front Face	132322	1	0	24.5	23.85	0.03	2.750	1.16	3.19
	LTE 66	QPSK20M	Left Side	132072	1	0	24.5	23.9	-0.07	2.640	1.15	3.03
P09	LTE 66	QPSK20M	Left Side	132322	1	0	24.5	23.85	-0.1	3.090	1.16	**3.59**
	LTE 66	QPSK20M	Front Face	132072	50	0	23.5	22.88	0.14	2.080	1.15	2.40
	LTE 66	QPSK20M	Front Face	132322	50	0	23.5	22.92	0.11	2.470	1.14	2.82
	LTE 66	QPSK20M	Front Face	132572	100	0	23.5	22.89	0.03	2.430	1.15	2.80
	LTE 66	QPSK20M	Left Side	132572	100	0	23.5	22.89	-0.12	2.090	1.15	2.41
P10	LTE 71	QPSK20M	Front Face	133222	1	50	23.5	22.98	0.07	0.670	1.13	**0.76**
	LTE 71	QPSK20M	Rear Face	133222	1	50	23.5	22.98	0.01	0.437	1.13	0.49
	LTE 71	QPSK20M	Left Side	133222	1	50	23.5	22.98	0.11	0.251	1.13	0.28
	LTE 71	QPSK20M	Right Side	133222	1	50	23.5	22.98	0.12	0.304	1.13	0.34

Plot No.	Band	Mode	Test Position	Ch.	RB#	RB Offset	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Power Drift (dB)	Measured SAR-10g (W/kg)	Tune-up Scaling Facto	Scaled SAR-10g (W/kg)
	LTE 71	QPSK20M	Top Side	133222	1	50	23.5	22.98	-0.09	0.532	1.13	0.60
	LTE 71	QPSK20M	Front Face	133222	50	0	22.5	21.76	0.16	0.573	1.19	0.68
	LTE 71	QPSK20M	Rear Face	133222	50	0	22.5	21.76	0.01	0.313	1.19	0.37
	LTE 71	QPSK20M	Left Side	133222	50	0	22.5	21.76	-0.11	0.195	1.19	0.23
	LTE 71	QPSK20M	Right Side	133222	50	0	22.5	21.76	-0.15	0.144	1.19	0.17
	LTE 71	QPSK20M	Top Side	133222	50	0	22.5	21.76	0.07	0.398	1.19	0.47
	LTE 71	QPSK20M	Front Face	133322	1	50	23.5	22.82	0.13	0.607	1.17	0.71
	LTE 71	QPSK20M	Front Face	133372	1	50	23.5	22.67	0.16	0.578	1.21	0.70

4.6.4 SAR Measurement Variability

According to KDB 865664 D01, SAR measurement variability was assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. Alternatively, if the highest measured SAR for both head and body tissue-equivalent media are ≤ 1.45 W/kg and the ratio of these highest SAR values, i.e., largest divided by smallest value, is ≤ 1.10, the highest SAR configuration for either head or body tissue-equivalent medium may be used to perform the repeated measurement. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

SAR repeated measurement procedure:

1. When the highest measured SAR is < 0.80 W/kg, repeated measurement is not required.
2. When the highest measured SAR is >= 0.80 W/kg, repeat that measurement once.
3. If the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20, or when the original or repeated measurement is >= 1.45 W/kg, perform a second repeated measurement.
4. If the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20, and the original, first or second repeated measurement is >= 1.5 W/kg, perform a third repeated measurement.

Band	Test Position	Ch.	Original Measured SAR-1g (W/kg)	1st Repeated SAR-1g (W/kg)	L/S Ratio	2nd Repeated SAR-1g (W/kg)	L/S Ratio	3rd Repeated SAR-1g (W/kg)	L/S Ratio
LTE 2	Left Side	19100	1.01	0.987	1.02	N/A	N/A	N/A	N/A
LTE 66	Left Side	132322	0.907	0.873	1.04	N/A	N/A	N/A	N/A

Band	Test Position	Ch.	Original Measured SAR-10g (W/kg)	1st Repeated SAR-10g (W/kg)	L/S Ratio	2nd Repeated SAR-10g (W/kg)	L/S Ratio	3rd Repeated SAR-10g (W/kg)	L/S Ratio
LTE 2	Front Face	19100	3.24	3.13	1.04	N/A	N/A	N/A	N/A
LTE 66	Left Side	132322	3.09	2.89	1.07	N/A	N/A	N/A	N/A

Test Engineer：Shunxin Hou, and Zixiao Xia.

5. Calibration of Test Equipment

Equipment	Manufacturer	Model	SN	Cal. Date	Cal. Interval
System Validation Dipole	SPEAG	D750V3	1200	Oct. 26, 2021	3 Years
System Validation Dipole	SPEAG	D835V2	4d265	Oct. 17, 2021	3 Years
System Validation Dipole	SPEAG	D1750V2	1176	Oct. 18, 2021	3 Years
System Validation Dipole	SPEAG	D1900V2	5d159	Sep. 16, 2021	3 Years
Data Acquisition Electronics	SPEAG	DAE4	1288	Aug. 29, 2022	1 Year
Dosimetric E-field Probe	SPEAG	ES3DV3	3268	Sep. 08, 2022	1 Year
Magnetic Field Probe	SPEAG	DAKS-3.5	1119	Feb. 27, 2022	1 Year
Wideband Radio Communication Tester	Rohde&Schwarz	CMW 500	169210	Jun. 27, 2022	1 Year
Power Amplifier	Mimi-Circuits	ZHL-42w	ZHL-42w	N/A	N/A
Power Amplifier	Mimi-Circuits	ZVE-8G+	ZVE-8G+	N/A	N/A
Power Meter	Rohde&Schwarz	NRX	NRX	Feb. 14, 2022	1 Year
Power Sensor	Rohde&Schwarz	NRP6A	NRP6A	Feb. 14, 2022	1 Year
Power Sensor	Rohde&Schwarz	NRP6A	NRP6A	Feb. 14, 2022	1 Year
ESG Analog Signal Generator	Rohde&Schwarz	SMB100A03	SMB100A03	Feb. 15, 2022	1 Year
Coupler	Woken	0110A056020-10	COM27RW1A3	May. 11, 2022	1 Year
Temp.&Humi.Recorder	ANYMETER	JR912	SZ01	MAy. 29, 2021	1 Year

Note:

1. Referring to KDB 865664 D01 v01r04, the dipole calibration interval can be extended to 3 years with justification. The dipole are also not physically damaged, or repaired during the interval. The dipole justification can be found in appendix C.
   The return loss is ＜ -20dB, within 20% of prior calibration, the impedance is with 5ohm of prior calibration.

6. Measurement Uncertainty

DASY6 Uncertainty Budget								
Error Description	**Uncertainty Value (±%)**	**Probability**	**Divisor**	**(Ci) 1g**	**(Ci) 10g**	**Standard Uncertainty (1g) (±%)**	**Standard Uncertainty (10g) (±%)**	**(Vi) Veff**
Measurement System								
Probe Calibration	6.05	N	1	1	1	6.1	6.1	∞
Axial Isotropy	4.7	R	1.732	0.7	0.7	1.9	1.9	∞
Hemispherical Isotropy	9.6	R	1.732	0.7	0.7	3.9	3.9	∞
Boundary Effects	2.0	R	1.732	1	1	1.2	1.2	∞
Linearity	4.7	R	1.732	1	1	2.7	2.7	∞
System Detection Limits	1.0	R	1.732	1	1	0.6	0.6	∞
Modulation Response	3.2	R	1.732	1	1	1.8	1.8	∞
Readout Electronics	0.3	N	1	1	1	0.3	0.3	∞
Response Time	0.0	R	1.732	1	1	0.0	0.0	∞
Integration Time	2.6	R	1.732	1	1	1.5	1.5	∞
RF Ambient Noise	3.0	R	1.732	1	1	1.7	1.7	∞
RF Ambient Reflections	3.0	R	1.732	1	1	1.7	1.7	∞
Probe Positioner	0.4	R	1.732	1	1	0.2	0.2	∞
Probe Positioning	6.7	R	1.732	1	1	3.9	3.9	∞
Max. SAR Eval.	4.0	R	1.732	1	1	2.3	2.3	∞
Test Sample Related								
Device Positioning	4.0	N	1	1	1	4.0	4.0	35
Device Holder	4.9	N	1	1	1	4.9	4.9	12
Power Drift	5.0	R	1.732	1	1	2.9	2.9	∞
Power Scaling	0.0	R	1.732	1	1	0.0	0.0	∞
Phantom and Setup								
Phantom Uncertainty	6.6	R	1.732	1	1	3.8	3.8	∞
SAR correction	0.0	R	1.732	1	0.84	0.0	0.0	∞
Liquid Conductivity Repeatability	0.14	N	1	0.78	0.71	0.1	0.1	5
Liquid Conductivity (target)	10.0	R	1.732	0.78	0.71	4.5	4.1	∞
Liquid Conductivity (mea.)	2.5	R	1.732	0.78	0.71	1.1	1.0	∞
Temp. unc. - Conductivity	2.61	R	1.732	0.78	0.71	1.2	1.1	∞
Liquid Permittivity Repeatability	0.03	N	1	0.23	0.26	0.0	0.0	5
Liquid Permittivity (target)	10.0	R	1.732	0.23	0.26	1.3	1.5	∞
Liquid Permittivity (mea.)	2.5	R	1.732	0.23	0.26	0.3	0.4	∞
Temp. unc. - Permittivity	1.78	R	1.732	0.23	0.26	0.2	0.3	∞
Combined Std. Uncertainty						13.6%	13.5%	578
Coverage Factor for 95 %						K=2	K=2	
Expanded STD Uncertainty						27.2%	26.9%	

Uncertainty budget for frequency range 300 MHz to 3 GHz

7. Information on the Testing Laboratories

We, Huarui Saiwei (Suzhou) Technology Co., LTD., were founded in 2020 to provide our best service in EMC, Radio, Telecom and Safety consultation.

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

Add: Tower N, Innovation Center, 88 Zuyi Road, High-tech District, Suzhou City, Anhui Province
Tel: +86 (0557) 368 1008

The road map of all our labs can be found in our web site also
Web: http://www.7Layers.com

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Appendix A. SAR Plots of System Verification

The plots for system verification with largest deviation for each SAR system combination are shown as follows.

Test Laboratory: ritt 7 Layers SAR/HAC Testing Lab   Date: 12/13/2022

System Check_HSL750_221213

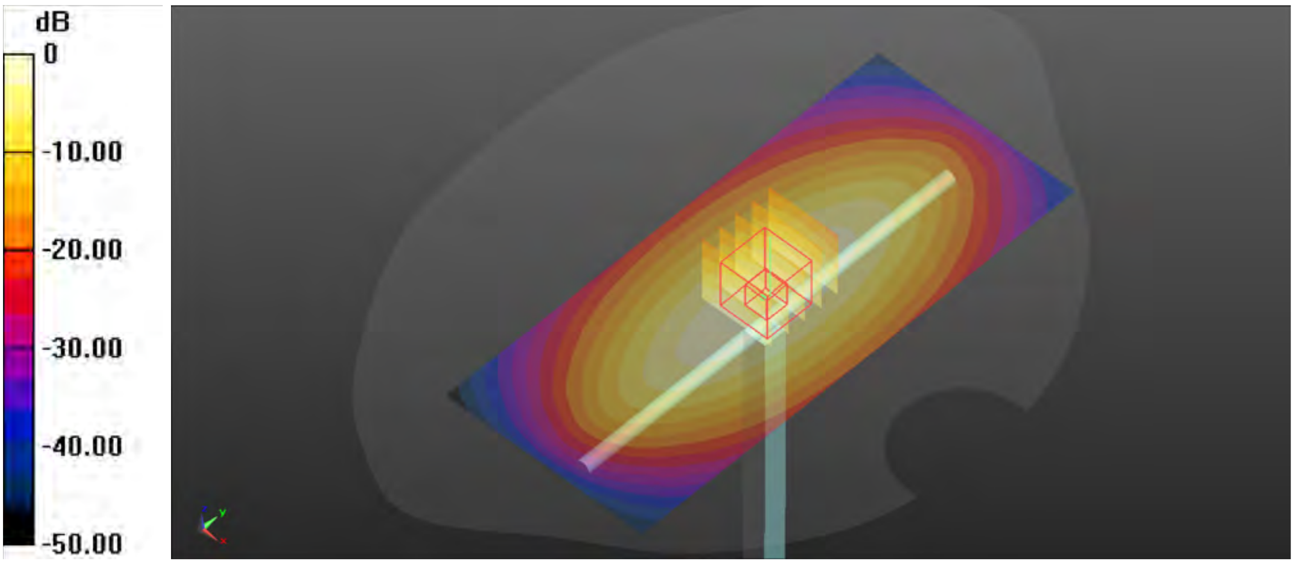
DUT: Dipole 750 MHz D750V3

Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: HSL750_1213 Medium parameters used: f = 750 MHz; σ = 0.91 S/m; ε_r = 43.671; ρ = 1000 kg/m^3
Ambient Temperature：23.3℃; Liquid Temperature：22.5℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3268; ConvF(6.58, 6.58, 6.58) @ 750 MHz; Calibrated: 09/08/2022
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1288; Calibrated: 08/29/2022
- Phantom: Twin-SAM; Type: QD 000 P41 Ax; Serial: 2018
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=250mW/Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.30 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 49.79 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 3.18 W/kg
SAR(1 g) = 2.15 W/kg; SAR(10 g) = 1.41 W/kg
Maximum value of SAR (measured) = 2.31 W/kg



0 dB = 2.31 W/kg

Test Laboratory: ritt 7 Layers SAR/HAC Testing Lab Date: 12/13/2022

System Check_HSL835_221213

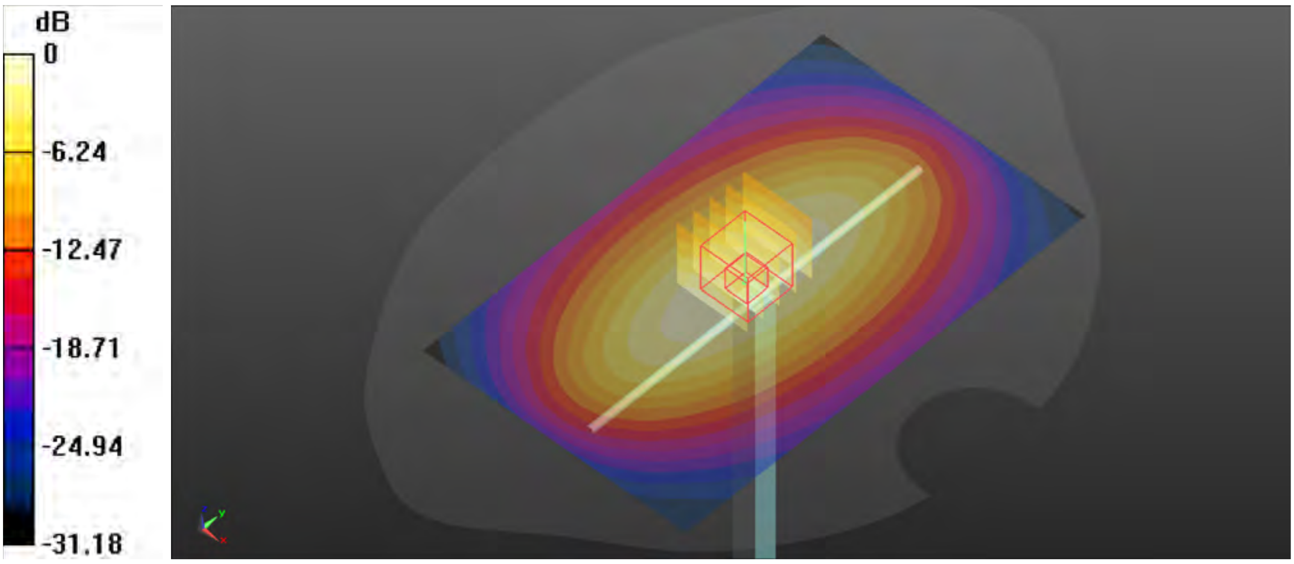
DUT: Dipole 835 MHz D835V2

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: HSL835_1213 Medium parameters used: f = 835 MHz; σ = 0.938 S/m; ε_r = 43.405; ρ = 1000 kg/m^3
Ambient Temperature：23.3℃; Liquid Temperature：22.5℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3268; ConvF(6.35, 6.35, 6.35) @ 835 MHz; Calibrated: 09/08/2022
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1288; Calibrated: 08/29/2022
- Phantom: Twin-SAM; Type: QD 000 P41 Ax; Serial: 2018
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=250mW/Area Scan (81x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.74 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 53.54 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 3.77 W/kg
SAR(1 g) = 2.48 W/kg; SAR(10 g) = 1.62 W/kg
Maximum value of SAR (measured) = 2.74 W/kg



0 dB = 2.74 W/kg

Test Laboratory: ritt 7 Layers SAR/HAC Testing Lab   Date: 12/14/2022

System Check_HSL1750_221214

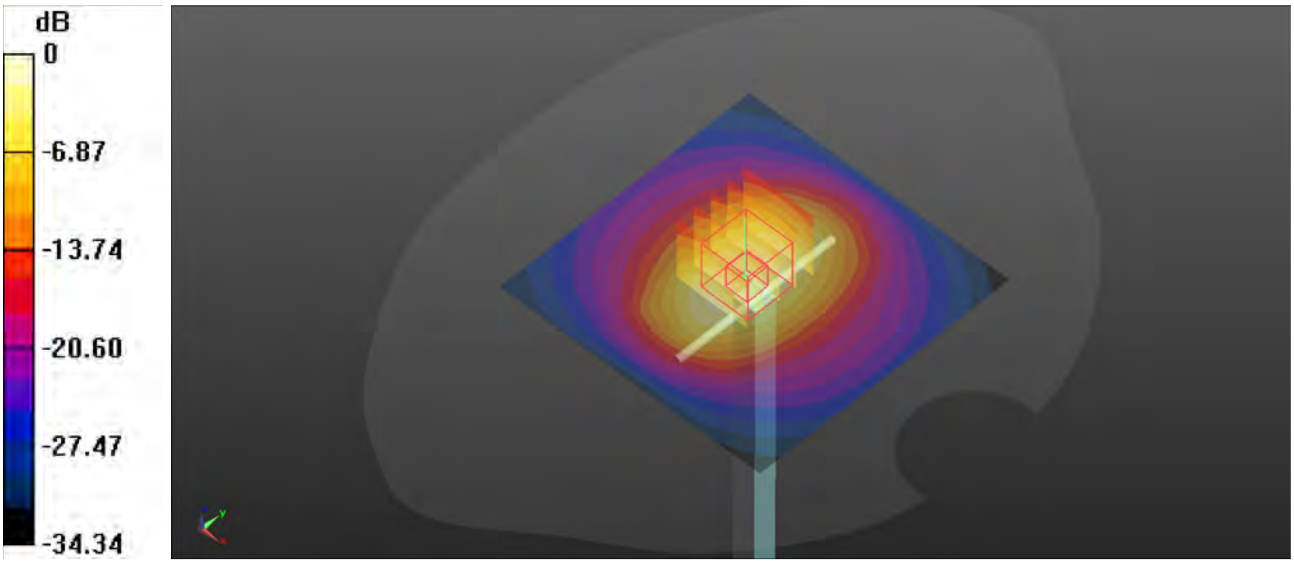
DUT: Dipole 1750 MHz D1750V2

Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: HSL1750_1214 Medium parameters used: f = 1750 MHz; σ = 1.422 S/m; ε_r = 41.089; ρ = 1000 kg/m^3
Ambient Temperature：23.5℃; Liquid Temperature：22.2℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3268; ConvF(5.38, 5.38, 5.38) @ 1750 MHz; Calibrated: 09/08/2022
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1288; Calibrated: 08/29/2022
- Phantom: Twin-SAM; Type: QD 000 P41 Ax; Serial: 2018
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=250mW/Area Scan (81x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 10.5 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 83.16 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 16.7 W/kg
SAR(1 g) = 9.4 W/kg; SAR(10 g) = 4.93 W/kg
Maximum value of SAR (measured) = 10.5 W/kg



0 dB = 10.5 W/kg

System Check_HSL1900_221214

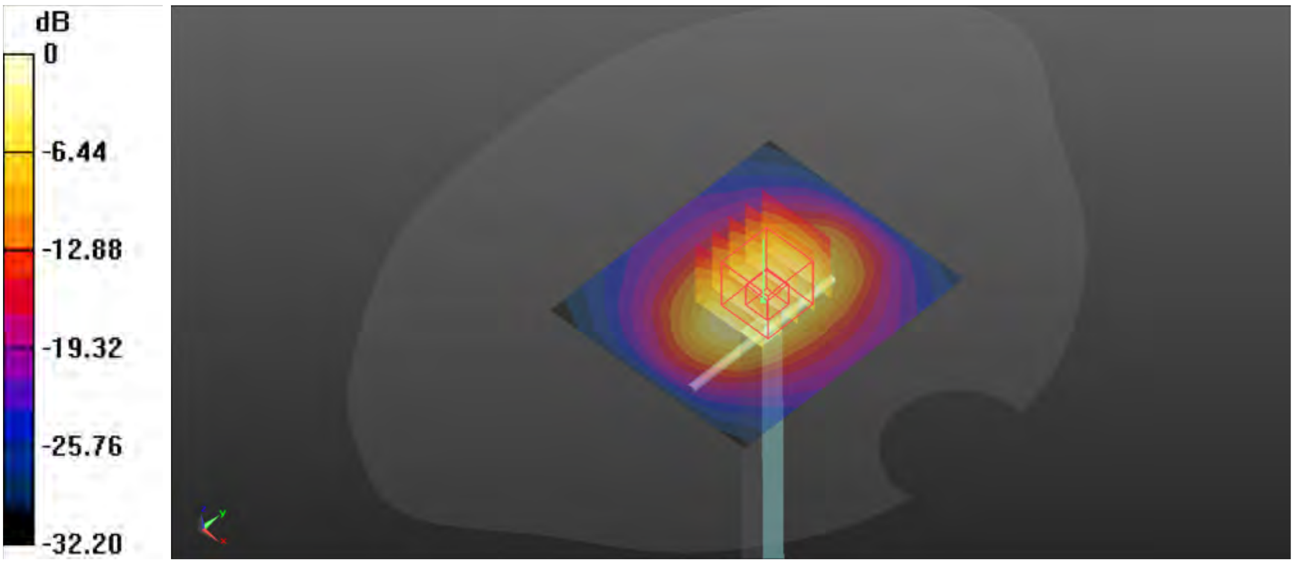
DUT: Dipole:1900MHz;D1900V2

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: HSL1900_1214 Medium parameters used: f = 1900 MHz; σ = 1.411 S/m; ε_r = 40.371; ρ = 1000 kg/m^3
Ambient Temperature：23.5℃; Liquid Temperature：22.2℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3268; ConvF(5.1, 5.1, 5.1) @ 1900 MHz; Calibrated: 09/08/2022
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1288; Calibrated: 08/29/2022
- Phantom: Twin-SAM; Type: QD 000 P41 Ax; Serial: 2018
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=250mW/Area Scan (61x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 11.6 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 85.41 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 17.8 W/kg
SAR(1 g) = 9.56 W/kg; SAR(10 g) = 4.97 W/kg
Maximum value of SAR (measured) = 10.7 W/kg



0 dB = 10.7 W/kg

Appendix B. SAR Plots of SAR Measurement

The SAR plots for highest measured SAR in each exposure configuration, wireless mode and frequency band combination, and measured SAR > 1.5 W/kg are shown as follows.

Test Laboratory: ritt 7 Layers SAR/HAC Testing Lab Date: 12/14/2022

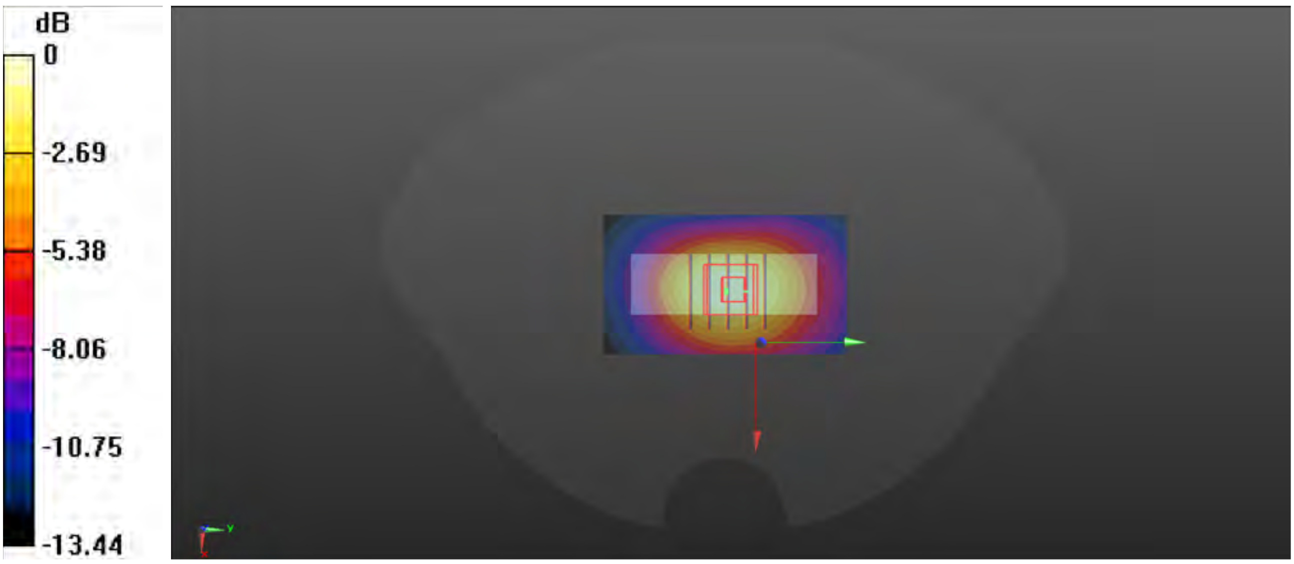
P01 LTE 2_QPSK20M_Left Side_2cm_Ch19100_1RB_OS50

Communication System: LTE; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: HSL1900_1214 Medium parameters used: f = 1900 MHz; σ = 1.411 S/m; ε_r = 40.371; ρ = 1000 kg/m^3
Ambient Temperature：23.5°C; Liquid Temperature：22.2°C

DASY5 Configuration:
- Probe: ES3DV3 - SN3268; ConvF(5.1, 5.1, 5.1) @ 1900 MHz; Calibrated: 09/08/2022
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1288; Calibrated: 08/29/2022
- Phantom: Twin-SAM; Type: QD 000 P41 Ax; Serial: 2018
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

-Area Scan (41x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.08 W/kg

-Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.67 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.64 W/kg
SAR(1 g) = 1.01 W/kg; SAR(10 g) = 0.598 W/kg
Maximum value of SAR (measured) = 1.08 W/kg



0 dB = 1.08 W/kg

Test Laboratory: ritt 7 Layers SAR/HAC Testing Lab Date: 12/13/2022

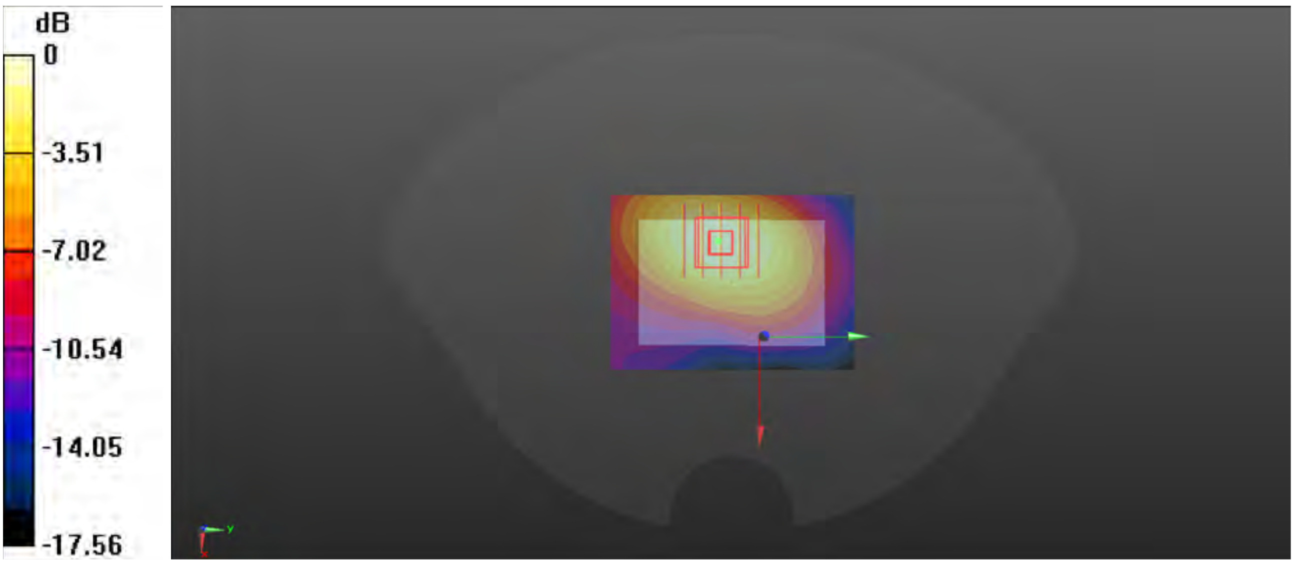
P02 LTE 5_QPSK10M_Front Face_2cm_Ch20450_1RB_OS0

Communication System: LTE; Frequency: 829 MHz;Duty Cycle: 1:1
Medium: HSL835_1213 Medium parameters used: f = 829 MHz; σ = 0.936 S/m; ε_r = 43.458; ρ = 1000 kg/m^3
Ambient Temperature：23.3℃; Liquid Temperature：22.5℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3268; ConvF(6.35, 6.35, 6.35) @ 829 MHz; Calibrated: 09/08/2022
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1288; Calibrated: 08/29/2022
- Phantom: Twin-SAM; Type: QD 000 P41 Ax; Serial: 2018
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

-Area Scan (51x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.0551 W/kg

-Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.303 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.0730 W/kg
SAR(1 g) = 0.049 W/kg; SAR(10 g) = 0.031 W/kg
Maximum value of SAR (measured) = 0.0536 W/kg



0 dB = 0.0536 W/kg

Test Laboratory: ritt 7 Layers SAR/HAC Testing Lab Date: 12/13/2022

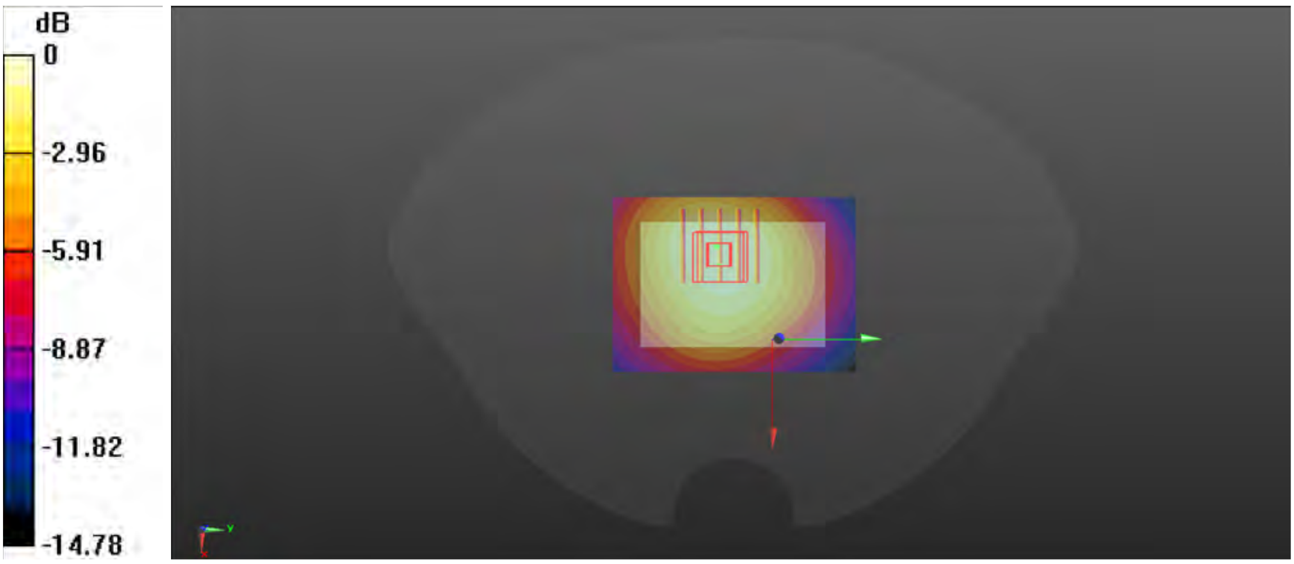
P03 LTE 12_QPSK10M_Front Face_2cm_Ch23060_1RB_OS24

Communication System: LTE; Frequency: 704 MHz;Duty Cycle: 1:1
Medium: HSL750_1213 Medium parameters used: f = 704 MHz; σ = 0.896 S/m; ε_r = 43.776; ρ = 1000 kg/m^3
Ambient Temperature：23.3℃; Liquid Temperature：22.5℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3268; ConvF(6.58, 6.58, 6.58) @ 704 MHz; Calibrated: 09/08/2022
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1288; Calibrated: 08/29/2022
- Phantom: Twin-SAM; Type: QD 000 P41 Ax; Serial: 2018
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

-Area Scan (51x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.294 W/kg

-Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.56 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.371 W/kg
SAR(1 g) = 0.268 W/kg; SAR(10 g) = 0.184 W/kg
Maximum value of SAR (measured) = 0.281 W/kg



0 dB = 0.281 W/kg

Test Laboratory: ritt 7 Layers SAR/HAC Testing Lab Date: 12/14/2022

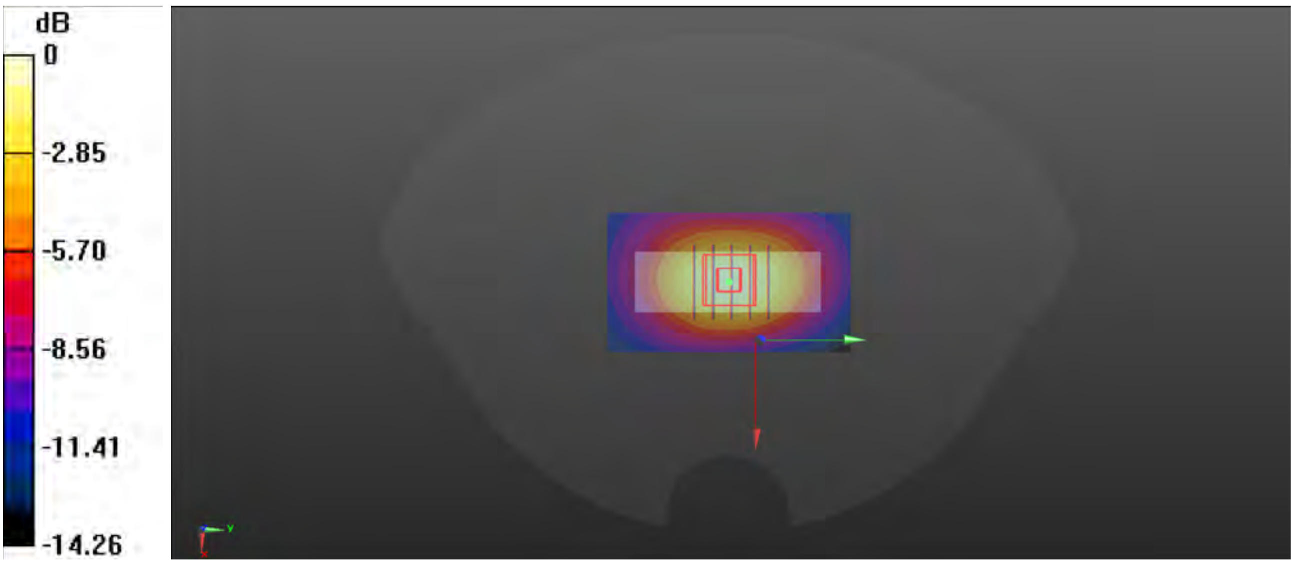
P04 LTE 66_QPSK20M_Left Side_2cm_Ch132322_1RB_OS0

Communication System: LTE; Frequency: 1745 MHz;Duty Cycle: 1:1
Medium: HSL1750_1214 Medium parameters used: f = 1745 MHz; σ = 1.419 S/m; ε_r = 41.098; ρ = 1000 kg/m^3
Ambient Temperature：23.5℃; Liquid Temperature：22.2℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3268; ConvF(5.38, 5.38, 5.38) @ 1745 MHz; Calibrated: 09/08/2022
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1288; Calibrated: 08/29/2022
- Phantom: Twin-SAM; Type: QD 000 P41 Ax; Serial: 2018
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

-Area Scan (41x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.977 W/kg

-Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.06 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 1.46 W/kg
SAR(1 g) = 0.907 W/kg; SAR(10 g) = 0.539 W/kg
Maximum value of SAR (measured) = 0.987 W/kg



0 dB = 0.987 W/kg

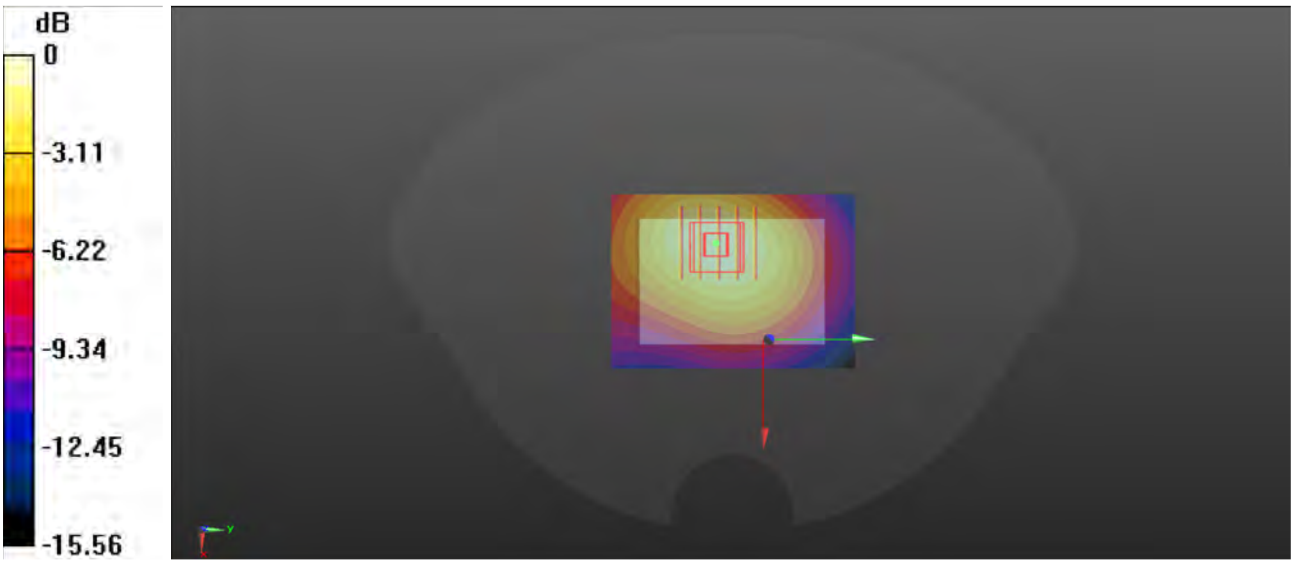
P05 LTE 71_QPSK20M_Front Face_2cm_Ch133222_1RB_OS50

Communication System: LTE; Frequency: 673 MHz;Duty Cycle: 1:1
Medium: HSL750_1213 Medium parameters used: f = 673 MHz; σ = 0.884 S/m; ε_r = 43.783; ρ = 1000 kg/m^3
Ambient Temperature：23.3℃; Liquid Temperature：22.5℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3268; ConvF(6.58, 6.58, 6.58) @ 673 MHz; Calibrated: 09/08/2022
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1288; Calibrated: 08/29/2022
- Phantom: Twin-SAM; Type: QD 000 P41 Ax; Serial: 2018
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

-Area Scan (51x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.206 W/kg

-Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.08 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.283 W/kg
SAR(1 g) = 0.197 W/kg; SAR(10 g) = 0.132 W/kg
Maximum value of SAR (measured) = 0.212 W/kg



0 dB = 0.212 W/kg

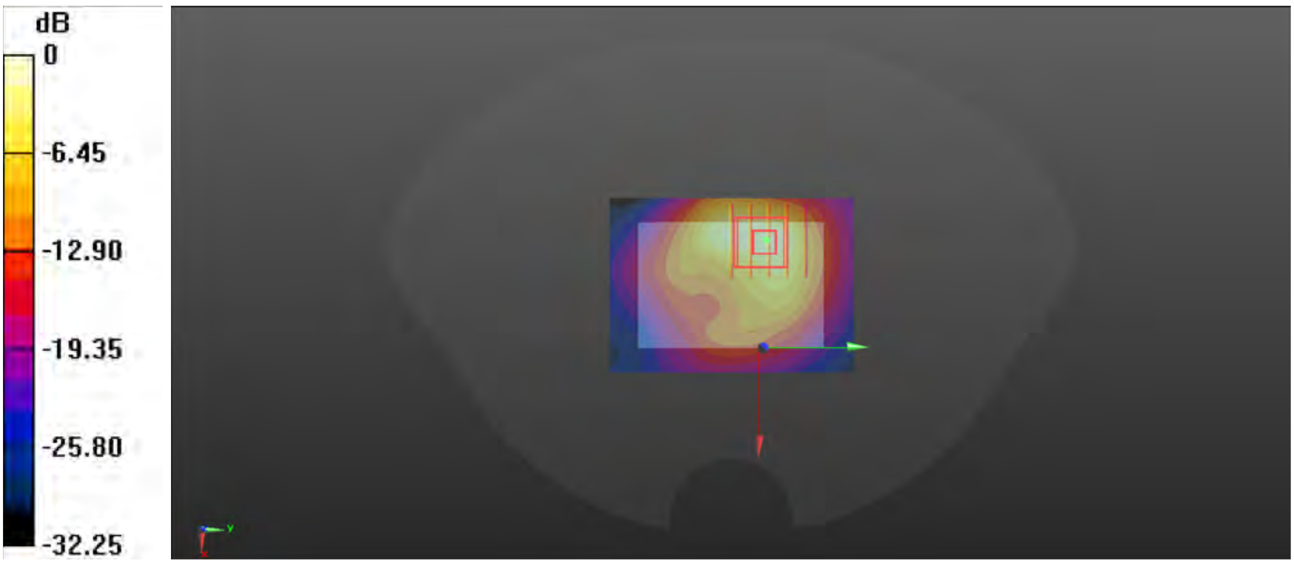
P06 LTE 2_QPSK20M_Front Face_0cm_Ch19100_1RB_OS50

Communication System: LTE; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: HSL1900_1214 Medium parameters used: f = 1900 MHz; $\sigma = 1.411$ S/m; $\varepsilon_r = 40.371$; $\rho = 1000$ kg/m^3
Ambient Temperature：23.5℃; Liquid Temperature：22.2℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3268; ConvF(5.1, 5.1, 5.1) @ 1900 MHz; Calibrated: 09/08/2022
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1288; Calibrated: 08/29/2022
- Phantom: Twin-SAM; Type: QD 000 P41 Ax; Serial: 2018
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

-Area Scan (51x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 8.26 W/kg

-Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.63 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 16.6 W/kg
SAR(1 g) = 7.29 W/kg; SAR(10 g) = 3.24 W/kg
Maximum value of SAR (measured) = 8.59 W/kg



0 dB = 8.59 W/kg

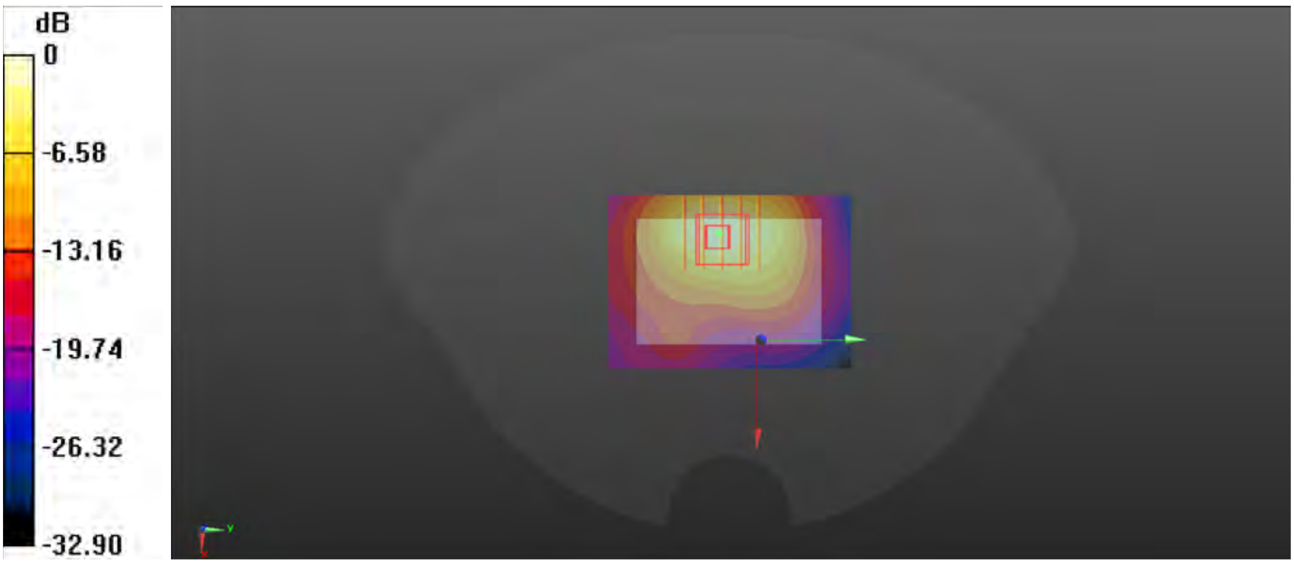
P07 LTE 5_QPSK10M_Front Face_0cm_Ch20450_1RB_OS0

Communication System: LTE; Frequency: 829 MHz;Duty Cycle: 1:1
Medium: HSL835_1213 Medium parameters used: f = 829 MHz; σ = 0.936 S/m; ε_r = 43.458; ρ = 1000 kg/m^3
Ambient Temperature：23.3℃; Liquid Temperature：22.5℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3268; ConvF(6.35, 6.35, 6.35) @ 829 MHz; Calibrated: 09/08/2022
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1288; Calibrated: 08/29/2022
- Phantom: Twin-SAM; Type: QD 000 P41 Ax; Serial: 2018
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

-Area Scan (51x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.787 W/kg

-Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.74 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.82 W/kg
SAR(1 g) = 0.729 W/kg; SAR(10 g) = 0.325 W/kg
Maximum value of SAR (measured) = 0.854 W/kg



0 dB = 0.854 W/kg

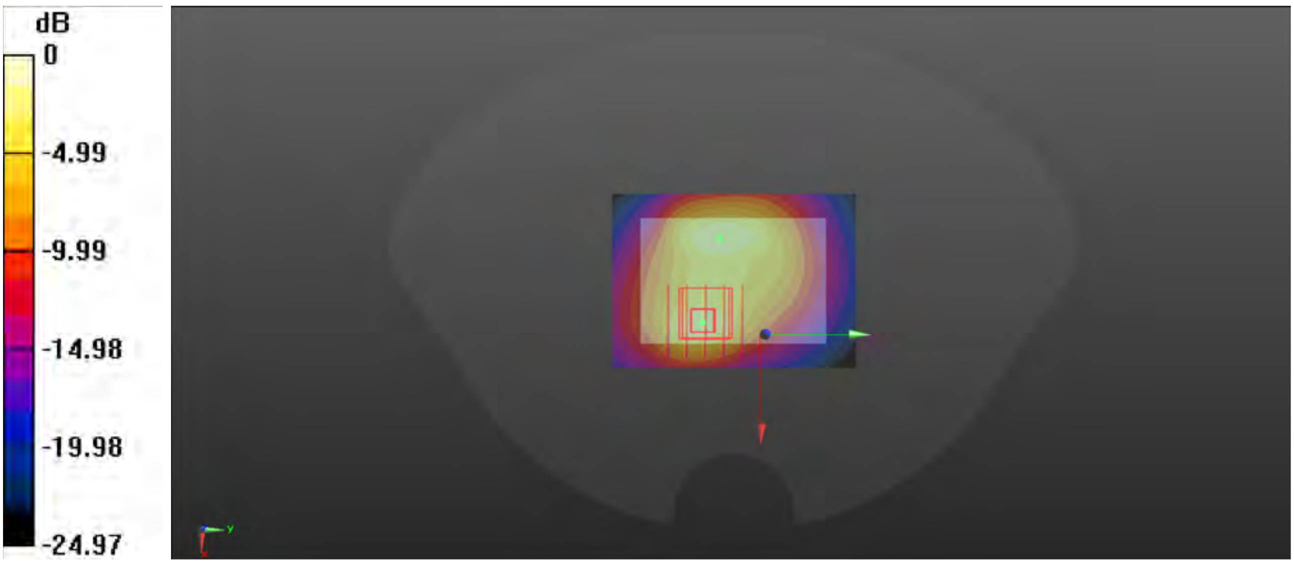
P08 LTE 12_QPSK10M_Front Face_0cm_Ch23095_1RB_OS24

Communication System: LTE; Frequency: 707.5 MHz;Duty Cycle: 1:1
Medium: HSL750_1213 Medium parameters used: f = 707.5 MHz; σ = 0.897 S/m; ε_r = 43.767; ρ = 1000 kg/m^3
Ambient Temperature：23.3℃; Liquid Temperature：22.5℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3268; ConvF(6.58, 6.58, 6.58) @ 707.5 MHz; Calibrated: 09/08/2022
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1288; Calibrated: 08/29/2022
- Phantom: Twin-SAM; Type: QD 000 P41 Ax; Serial: 2018
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

-Area Scan (51x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.41 W/kg

-Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.94 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 4.85 W/kg
SAR(1 g) = 1.71 W/kg; SAR(10 g) = 0.746 W/kg
Maximum value of SAR (measured) = 2.10 W/kg



0 dB = 2.10 W/kg

Test Laboratory: ritt 7 Layers SAR/HAC Testing Lab   Date: 12/14/2022

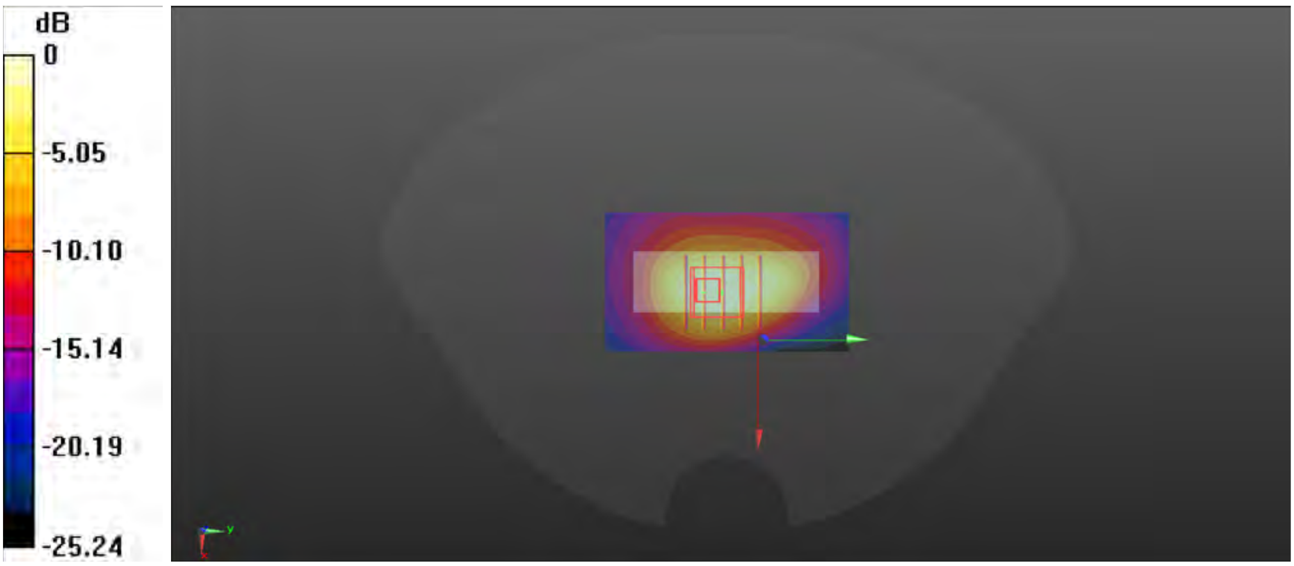
P09 LTE 66_QPSK20M_Left Side_0cm_Ch132322_1RB_OS0

Communication System: LTE; Frequency: 1745 MHz;Duty Cycle: 1:1
Medium: HSL1750_1214 Medium parameters used: f = 1745 MHz; σ = 1.419 S/m; ε_r = 41.098; ρ = 1000 kg/m^3
Ambient Temperature：23.5℃; Liquid Temperature：22.2℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3268; ConvF(5.38, 5.38, 5.38) @ 1745 MHz; Calibrated: 09/08/2022
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1288; Calibrated: 08/29/2022
- Phantom: Twin-SAM; Type: QD 000 P41 Ax; Serial: 2018
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

-Area Scan (41x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 7.47 W/kg

-Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 60.59 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 12.6 W/kg
SAR(1 g) = 6.1 W/kg; SAR(10 g) = 3.09 W/kg
Maximum value of SAR (measured) = 6.63 W/kg



0 dB = 6.63 W/kg

Test Laboratory: ritt 7 Layers SAR/HAC Testing Lab   Date: 12/13/2022

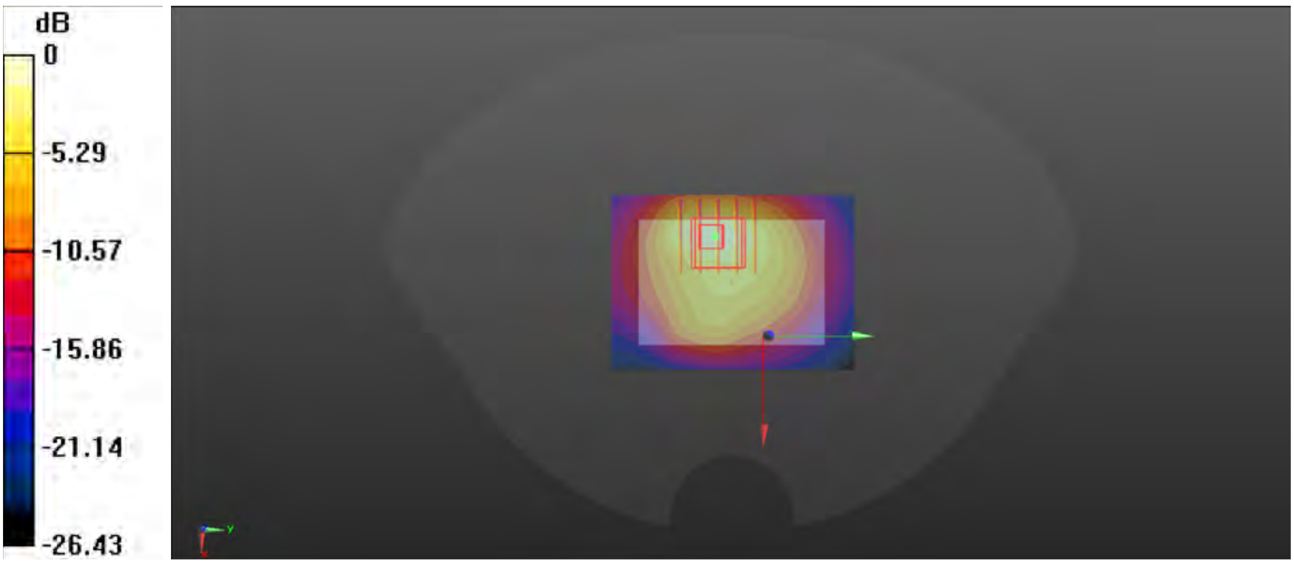
P10 LTE 71_QPSK20M_Front Face_0cm_Ch133222_1RB_OS50

Communication System: LTE; Frequency: 673 MHz;Duty Cycle: 1:1
Medium: HSL750_1213 Medium parameters used: f = 673 MHz; $\sigma = 0.884$ S/m; $\varepsilon_r = 43.783$; $\rho = 1000\ kg/m^3$
Ambient Temperature：23.3℃; Liquid Temperature：22.5℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3268; ConvF(6.58, 6.58, 6.58) @ 673 MHz; Calibrated: 09/08/2022
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1288; Calibrated: 08/29/2022
- Phantom: Twin-SAM; Type: QD 000 P41 Ax; Serial: 2018
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

-Area Scan (51x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.61 W/kg

-Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.06 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 3.69 W/kg
SAR(1 g) = 1.44 W/kg; SAR(10 g) = 0.670 W/kg
Maximum value of SAR (measured) = 1.67 W/kg



0 dB = 1.67 W/kg

Appendix C. Calibration Certificate for Probe and Dipole

The SPEAG calibration certificates are shown as follows.

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Client : **7layers**

Certificate No: Z22-60340

CALIBRATION CERTIFICATE

Object	DAE4 - SN: 1288
Calibration Procedure(s)	FF-Z11-002-01 Calibration Procedure for the Data Acquisition Electronics (DAEx)
Calibration date:	August 29, 2022

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Process Calibrator 753	1971018	14-Jun-22 (CTTL, No.J22X04180)	Jun-23

	Name	Function	Signature
Calibrated by:	Yu Zongying	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: September 03, 2022

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Glossary:

DAE	data acquisition electronics
Connector angle	information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters:

- *DC Voltage Measurement*: Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The report provide only calibration results for DAE, it does not contain other performance test results.

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DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1μV , full range = -100...+300 mV

Low Range: 1LSB = 61nV , full range = -1.......+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	403.973 ± 0.15% (k=2)	404.159 ± 0.15% (k=2)	404.187 ± 0.15% (k=2)
Low Range	3.97699 ± 0.7% (k=2)	3.98470 ± 0.7% (k=2)	3.93235 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	107° ± 1 °

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Client **7layers** **Certificate No: Z22-60339**

CALIBRATION CERTIFICATE

Object	ES3DV3 - SN : 3268
Calibration Procedure(s)	FF-Z11-004-02 Calibration Procedures for Dosimetric E-field Probes
Calibration date:	September 08, 2022

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	101919	14-Jun-22(CTTL, No.J22X04181)	Jun-23
Power sensor NRP-Z91	101547	14-Jun-22(CTTL, No.J22X04181)	Jun-23
Power sensor NRP-Z91	101548	14-Jun-22(CTTL, No.J22X04181)	Jun-23
Reference 10dBAttenuator	18N50W-10dB	20-Jan-21(CTTL, No.J21X00486)	Jan-23
Reference 20dBAttenuator	18N50W-20dB	20-Jan-21(CTTL, No.J21X00485)	Jan-23
Reference Probe EX3DV4	SN 3846	20-May-22(SPEAG, No.EX3-3846_May22)	May-23
DAE4	SN 771	20-Jan-22(SPEAG, No.DAE4-771_Jan22)	Jan-23
Secondary Standards	**ID #**	**Cal Date(Calibrated by, Certificate No.)**	**Scheduled Calibration**
SignalGenerator MG3700A	6201052605	14-Jun-22(CTTL, No.J22X04182)	Jun-23
Network Analyzer E5071C	MY46110673	14-Jan-22(CTTL, No.J22X00406)	Jan-23

	Name	Function	Signature
Calibrated by:	Yu Zongying	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: September 13, 2022

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Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A,B,C,D	modulation dependent linearization parameters
Polarization Φ	Φ rotation around probe axis
Polarization θ	θ rotation around an axis that is in the plane normal to probe axis (at measurement center), i θ=0 is normal to probe axis
Connector Angle	information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013

b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016

c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010

d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization θ=0 (f≤900MHz in TEM-cell; f>1800MHz: waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below ConvF).
- *NORM(f)x,y,z = NORMx,y,z* frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics.
- *Ax,y,z; Bx,y,z; Cx,y,z;VRx,y,z:*A,B,C are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f≤800MHz) and inside waveguide using analytical field distributions based on power measurements for f >800MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty valued are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORMx,y,z* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from±50MHz to±100MHz.
- *Spherical isotropy (3D deviation from isotropy):* in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset:* The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- *Connector Angle:* The angle is assessed using the information gained by determining the *NORMx* (no uncertainty required).

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DASY/EASY – Parameters of Probe: ES3DV3 – SN: 3268

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm(μV/(V/m)^2)[A]	1.14	1.22	1.22	±10.0%
DCP(mV)[B]	105.0	105.5	104.6	

Calibration Results for Modulation Response

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Max Dev.	Max Unc[E] (k=2)
0	CW	X	0.0	0.0	1.0	0.00	247.8	±2.1%	±4.7%
		Y	0.0	0.0	1.0		266.8		
		Z	0.0	0.0	1.0		257.3		
10352-AAA	Pulse Waveform (200Hz, 10%)	X	11.39	83.87	22.06		60	±3.4%	±9.6%
		Y	14.02	87.15	23.18	10.00	60		
		Z	10.23	79.09	21.02		60		
10353-AAA	Pulse Waveform (200Hz, 20%)	X	19.11	92.25	23.23		80	±1.9%	±9.6%
		Y	20.00	92.67	23.30	6.99	80		
		Z	12.38	83.30	21.04		80		
10354-AAA	Pulse Waveform (200Hz, 40%)	X	20.00	93.16	21.58		95	±3.7%	±9.6%
		Y	20.00	93.46	21.76	3.98	95		
		Z	16.08	88.53	20.96		95		
10355-AAA	Pulse Waveform (200Hz, 60%)	X	20.00	94.18	20.42		120	±4.0%	±9.6%
		Y	20.00	94.93	20.83	2.22	120		
		Z	20.00	92.71	20.75		120		
10387-AAA	QPSK Waveform, 1 MHz	X	1.79	65.74	14.66		150	±1.9%	±9.6%
		Y	1.81	66.01	14.85	1.00	150		
		Z	1.92	65.96	15.16		150		
10388-AAA	QPSK Waveform, 10 MHz	X	2.35	68.13	15.21		150	±1.2%	±9.6%
		Y	2.39	68.45	15.44	0.00	150		
		Z	2.50	68.77	15.58		150		
10396-AAA	64-QAM Waveform, 100 kHz	X	3.93	74.76	21.10		150	±0.5%	±9.6%
		Y	3.99	75.21	21.35	3.01	150		
		Z	4.21	74.53	21.01		150		
10414-AAA	WLAN CCDF, 64-QAM, 40MHz	X	4.97	65.66	15.33		150	±3.3%	±9.6%
		Y	4.97	65.70	15.35	0.00	150		
		Z	5.08	65.62	15.35		150		

Note: For details on UID parameters see Appendix

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor k=2, which for a normal distribution Corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of Norm X, Y, Z do not affect the E^2-field uncertainty inside TSL (see Page 5).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainly is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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DASY/EASY – Parameters of Probe: ES3DV3 – SN: 3268

Sensor Model Parameters

	C1 fF	C2 fF	α V^{-1}	T1 $ms.V^{-2}$	T2 $ms.V^{-1}$	T3 ms	T4 V^{-2}	T5 V^{-1}	T6
X	61.80	439.32	34.52	29.63	0.26	5.10	0.65	0.45	1.02
Y	60.83	430.07	34.23	29.34	0.26	5.10	0.72	0.43	1.02
Z	77.59	555.96	35.07	55.20	0.43	5.10	0.00	0.71	1.02

Other Probe Parameters

Sensor Arrangement	**Triangular**
Connector Angle (°)	**34.8**
Mechanical Surface Detection Mode	**enabled**
Optical Surface Detection Mode	**disable**
Probe Overall Length	**337mm**
Probe Body Diameter	**10mm**
Tip Length	**10mm**
Tip Diameter	**4mm**
Probe Tip to Sensor X Calibration Point	**2mm**
Probe Tip to Sensor Y Calibration Point	**2mm**
Probe Tip to Sensor Z Calibration Point	**2mm**
Recommended Measurement Distance from Surface	**3mm**

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DASY/EASY – Parameters of Probe: ES3DV3 – SN:3268

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz][C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha[G]	Depth[G] (mm)	Unct. (k=2)
750	41.9	0.89	6.58	6.58	6.58	0.33	1.57	±12.1%
835	41.5	0.90	6.35	6.35	6.35	0.38	1.49	±12.1%
900	41.5	0.97	6.28	6.28	6.28	0.38	1.55	±12.1%
1750	40.1	1.37	5.38	5.38	5.38	0.60	1.24	±12.1%
1900	40.0	1.40	5.10	5.10	5.10	0.67	1.22	±12.1%
2300	39.5	1.67	4.92	4.92	4.92	0.90	1.12	±12.1%
2450	39.2	1.80	4.70	4.70	4.70	0.90	1.12	±12.1%
2600	39.0	1.96	4.52	4.52	4.52	0.90	1.12	±12.1%

[C] Frequency validity above 300 MHz of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

[F] At frequency below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for the frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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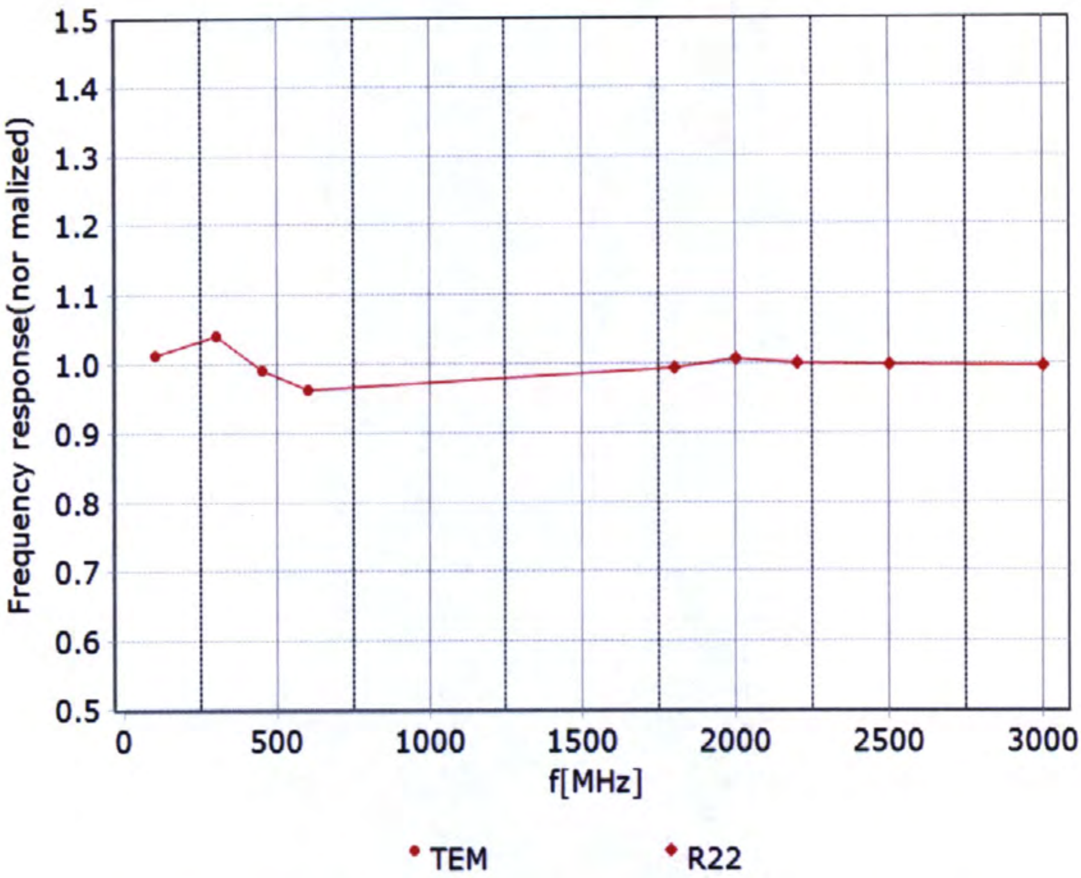
Frequency Response of E-Field
(TEM-Cell: ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: ±7.4% (*k*=2)

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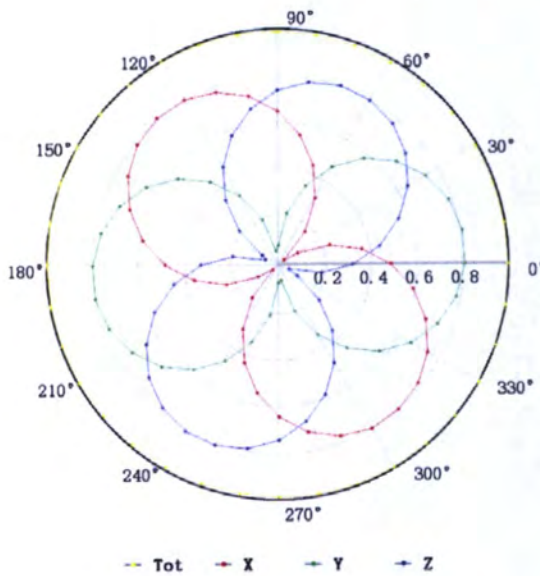
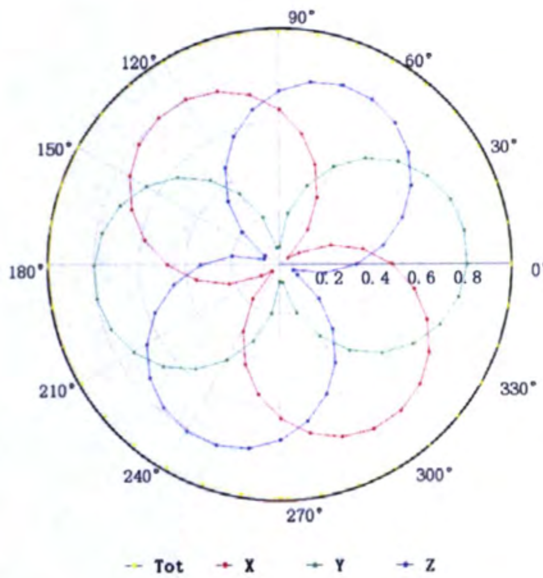
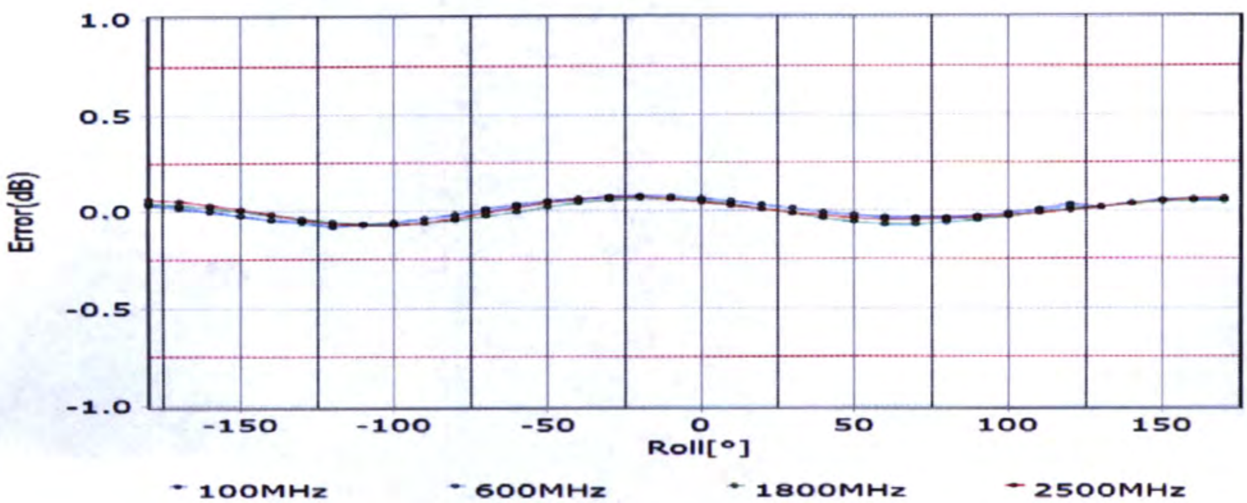
Receiving Pattern (Φ), θ=0°

f=600 MHz, TEM



f=1800 MHz, R22





Uncertainty of Axial Isotropy Assessment: ±1.2% (k=2)

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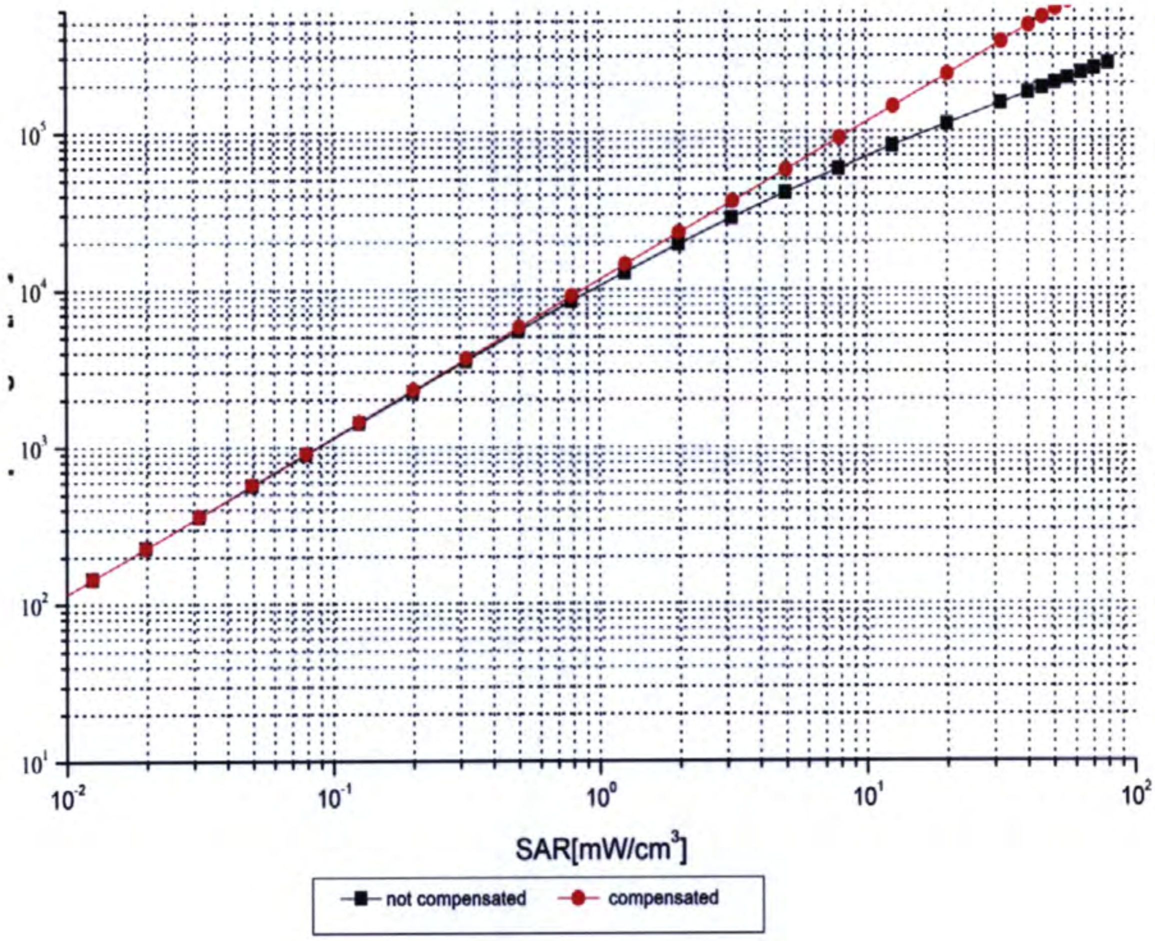
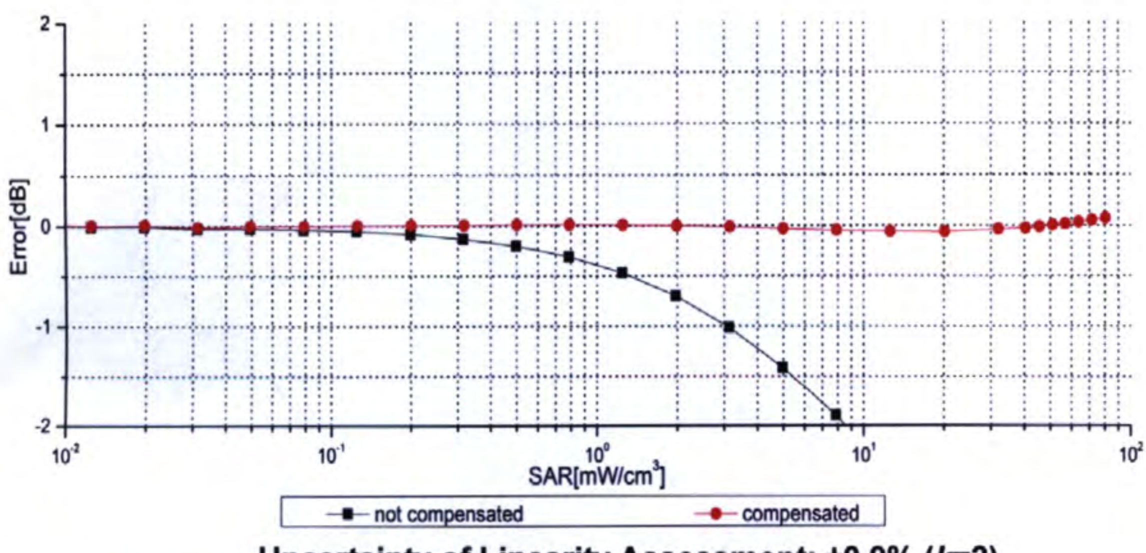
Dynamic Range f(SAR$_{head}$)
(TEM cell, f = 900 MHz)





Uncertainty of Linearity Assessment: ±0.9% (*k*=2)

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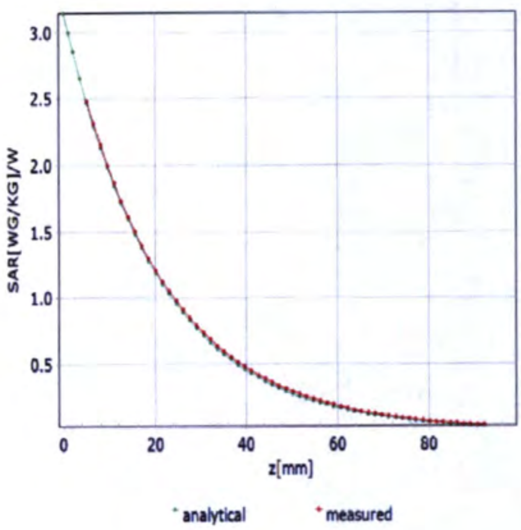
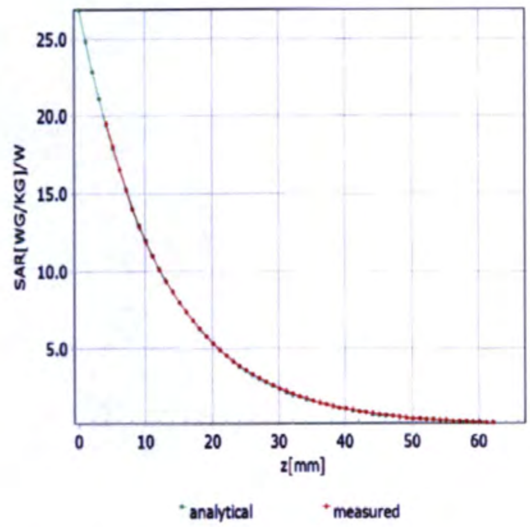
Conversion Factor Assessment

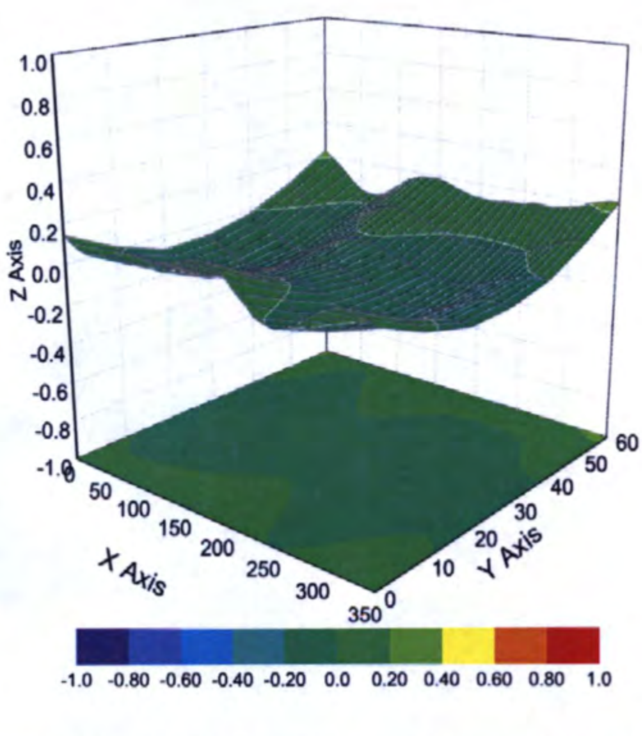
f=750 MHz,WGLS R9(H_convF)



f=1750 MHz,WGLS R22(H_convF)



Deviation from Isotropy in Liquid



Uncertainty of Spherical Isotropy Assessment: ±3.2% (*k*=2)

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Appendix: Modulation Calibration Parameters

UID	Rev	Communication System Name	Group	PAR (dB)	UncE (k=2)
0		CW	CW	0.00	± 4.7 %
10010	CAA	SAR Validation (Square, 100ms, 10ms)	Test	10.00	± 9.6 %
10011	CAB	UMTS-FDD (WCDMA)	WCDMA	2.91	± 9.6 %
10012	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps)	WLAN	1.87	± 9.6 %
10013	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps)	WLAN	9.46	± 9.6 %
10021	DAC	GSM-FDD (TDMA, GMSK)	GSM	9.39	± 9.6 %
10023	DAC	GPRS-FDD (TDMA, GMSK, TN 0)	GSM	9.57	± 9.6 %
10024	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1)	GSM	6.56	± 9.6 %
10025	DAC	EDGE-FDD (TDMA, 8PSK, TN 0)	GSM	12.62	± 9.6 %
10026	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1)	GSM	9.55	± 9.6 %
10027	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2)	GSM	4.80	± 9.6 %
10028	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)	GSM	3.55	± 9.6 %
10029	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2)	GSM	7.78	± 9.6 %
10030	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH1)	Bluetooth	5.30	± 9.6 %
10031	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH3)	Bluetooth	1.87	± 9.6 %
10032	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH5)	Bluetooth	1.16	± 9.6 %
10033	CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1)	Bluetooth	7.74	± 9.6 %
10034	CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3)	Bluetooth	4.53	± 9.6 %
10035	CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5)	Bluetooth	3.83	± 9.6 %
10036	CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH1)	Bluetooth	8.01	± 9.6 %
10037	CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH3)	Bluetooth	4.77	± 9.6 %
10038	CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH5)	Bluetooth	4.10	± 9.6 %
10039	CAB	CDMA2000 (1xRTT, RC1)	CDMA2000	4.57	± 9.6 %
10042	CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Halfrate)	AMPS	7.78	± 9.6 %
10044	CAA	IS-91/EIA/TIA-553 FDD (FDMA, FM)	AMPS	0.00	± 9.6 %
10048	CAA	DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24)	DECT	13.80	± 9.6 %
10049	CAA	DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12)	DECT	10.79	± 9.6 %
10056	CAA	UMTS-TDD (TD-SCDMA, 1.28 Mcps)	TD-SCDMA	11.01	± 9.6 %
10058	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3)	GSM	6.52	± 9.6 %
10059	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps)	WLAN	2.12	± 9.6 %
10060	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps)	WLAN	2.83	± 9.6 %
10061	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps)	WLAN	3.60	± 9.6 %
10062	CAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps)	WLAN	8.68	± 9.6 %
10063	CAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps)	WLAN	8.63	± 9.6 %
10064	CAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps)	WLAN	9.09	± 9.6 %
10065	CAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps)	WLAN	9.00	± 9.6 %
10066	CAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps)	WLAN	9.38	± 9.6 %
10067	CAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps)	WLAN	10.12	± 9.6 %
10068	CAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps)	WLAN	10.24	± 9.6 %
10069	CAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps)	WLAN	10.56	± 9.6 %
10071	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps)	WLAN	9.83	± 9.6 %
10072	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps)	WLAN	9.62	± 9.6 %
10073	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps)	WLAN	9.94	± 9.6 %
10074	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps)	WLAN	10.30	± 9.6 %
10075	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps)	WLAN	10.77	± 9.6 %
10076	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps)	WLAN	10.94	± 9.6 %
10077	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps)	WLAN	11.00	± 9.6 %
10081	CAB	CDMA2000 (1xRTT, RC3)	CDMA2000	3.97	± 9.6 %
10082	CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate)	AMPS	4.77	± 9.6 %
10090	DAC	GPRS-FDD (TDMA, GMSK, TN 0-4)	GSM	6.56	± 9.6 %
10097	CAC	UMTS-FDD (HSDPA)	WCDMA	3.98	± 9.6 %
10098	DAC	UMTS-FDD (HSUPA, Subtest 2)	WCDMA	3.98	± 9.6 %
10099	CAC	EDGE-FDD (TDMA, 8PSK, TN 0-4)	GSM	9.55	± 9.6 %
10100	CAC	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	5.67	± 9.6 %
10101	CAB	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	LTE-FDD	6.42	± 9.6 %