FCC SAR Test Report

Report No.	:	**W7L-P24090003SA01**
Applicant	:	**Power Idea Technology (Shenzhen) Co., Ltd.**
Address	:	**4th Floor, A Section, Languang Science&technology Building, No.7 Xinxi RD, Hi-Tech Industrial Park North, Nanshan District, ShenZhen, P.R.C.**
Manufacturer	:	**Power Idea Technology (Shenzhen) Co., Ltd.**
Address	:	**4th Floor, A Section, Languang Science&technology Building, No.7 Xinxi RD, Hi-Tech Industrial Park North, Nanshan District, ShenZhen, P.R.C.**
Product	:	**Mobile phone**
FCC ID	:	**ZLE-PSH03G**
Brand	:	**RugGear**
Model No.	:	**PSH03G**
Marketing Name	:	**RG440**
Standards	:	**FCC 47 CFR Part 2 (2.1093) / IEEE C95.1:1992 / IEEE 1528:2013 KDB 865664 D01 v01r04 / KDB 865664 D02 v01r02 / KDB 248227 D01 v02r02 KDB 447498 D01 v06 / KDB 648474 D04 v01r03 / KDB 941225 D01 v03r01 KDB 941225 D05 v02r05 / KDB 941225 D06 v02r01**
Date of Testing	:	**Sep. 13, 2024 ~ Sep. 14, 2024**
FCC Designation No.	:	**CN1171** **FCC Site Registration No. : 525120**

CERTIFICATION: The above equipment have been tested by **BV 7LAYERS COMMUNICATIONS TECHNOLOGY (SHENZHEN) 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.

Prepared By : Jerry Chen / Engineer

Approved By : Luke Lu / Manager

Table of Contents

Release Control Record

Report No.	Reason for Change	Date Issued
W7L-P24090003SA01	Initial release	Sep. 29, 2024

1. Summary of Maximum SAR Value

Equipment Class	Mode	Highest Reported Body-worn SAR_{1g} (1.0 cm Gap) (W/kg)	Highest Reported Hotspot SAR_{1g} (1.0 cm Gap) (W/kg)
PCB	LTE Band 5	0.70	0.70
	LTE Band 7	0.61	0.61
	LTE Band 12 / 17	0.55	0.55
	LTE Band 13	0.74	0.74
	LTE Band 14	0.75	0.75
	LTE Band 25 / 2	0.50	0.68
	LTE Band 26	0.69	0.69
	LTE Band 30	0.84	0.82
	LTE Band 41 / 38	0.34	0.52
	LTE Band 42(Part27Q)	0.24	0.45
	LTE Band 48 / 43 / 42	0.28	0.69
	LTE Band 66 / 4	0.29	0.64
	LTE Band 71	0.34	0.34
	NR Band n5	0.57	0.57
	NR Band n7	0.53	0.53
	NR Band n12	0.39	0.39
	NR Band n14	0.61	0.61
	NR Band n25 / n2	0.32	0.58
	NR Band n30	1.07	0.92
	NR Band n41 / n38	0.23	0.23
	NR Band n48	0.52	0.42
	NR Band n66	0.28	0.43
	NR Band n71	0.34	0.34
	NR Band n77 / n78	0.68	0.68
DTS	2.4G WLAN	0.18	0.38
NII	5G WLAN	0.24	0.19
DSS	Bluetooth	0.03	0.02
DXX	NFC	N/A	N/A

Highest Simultaneous Transmission SAR	PCB (W/kg)	DTS (W/kg)	NII (W/kg)	DSS (W/kg)
	1.59	1.59	1.59	1.44

Note:

1. The SAR limit **(Head & 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	Mobile phone
FCC ID	ZLE-PSH03G
SN	aabccd8e
Brand Name	RugGear
Model Name	PSH03G
Marketing Name	RG440
HW Version	V05
SW Version	IS440_00.00_1_20240613
Tx Frequency Bands (Unit: MHz)	LTE Band 2 : 1850.7 ~ 1909.3 LTE Band 4 : 1710.7 ~ 1754.3 LTE Band 5 : 824.7 ~ 848.3 LTE Band 7 : 2502.5 ~ 2567.5 LTE Band 12 : 699.7 ~ 715.3 LTE Band 13 : 779.5 ~ 784.5 LTE Band 14 : 790.5 ~ 795.5 LTE Band 17 : 706.5 ~ 713.5 LTE Band 26 : 814.7 ~ 848.3 LTE Band 30 : 2307.5 ~ 2312.5 LTE Band 38 : 2572.5 ~ 2617.5 LTE Band 41 : 2498.5 ~ 2687.5 LTE Band 42 : 3452.5 ~ 3547.5, 3552.5 ~ 3597.5 LTE Band 43 : 3602.5 ~ 3697.5 LTE Band 48 : 3552.5 ~ 3697.5 LTE Band 66 : 1710.7 ~ 1779.3 LTE Band 71 : 665.5 ~ 695.5 NR Band n2 : 1852.5~ 1907.5 NR Band n5 : 826.5~ 846.5 NR Band n7 : 2502.5 ~ 2567.5 NR Band n12 : 701.5~ 713.5 NR Band n14 : 790.5~ 795.5 NR Band n25 : 1852.5~ 1912.5 NR Band n30 : 2307.5 ~ 2312.5 NR Band n38 : 2582.52 ~ 2607.48 NR Band n41 : 2506.02 ~ 2679.99 NR Band n48 : 3555 ~ 3694.98 NR Band n66 : 1712.5~ 1777.5 NR Band n71 : 665.5 ~ 695.5 NR Band n77 : 3460.02 ~ 3540, 3710.01 ~ 3969.99 NR Band n78 : 3460.02 ~ 3540 WLAN : 2412 ~ 2462, 5180 ~ 5240, 5260 ~ 5320, 5500 ~ 5700, 5745 ~ 5825 Bluetooth : 2402 ~ 2480 NFC : 13.56
Uplink Modulations	LTE : QPSK, 16QAM, 64QAM, 256QAM NR : Pi/2 BPSK (DFT-s-OFDM), QPSK (DFT-s-OFDM, CP-OFDM), 16QAM (DFT-s-OFDM, CP-OFDM), 64QAM (DFT-s-OFDM, CP-OFDM), 256QAM DFT-s-OFDM, CP-OFDM) 802.11b : DSSS 802.11a/g/n/ac : OFDM 802.11ax : OFDMA Bluetooth : GFSK, π/4-DQPSK, 8-DPSK NFC : ASK
Subcarrier Spacing	15 kHz（FDD）/ 30 kHz（TDD）
Uplink Transmission Duty Cycle	40% for TDD Band
LTE Anchor Band for NR Band n2	LTE Band 5/7/12/13/14/66/71
LTE Anchor Band for NR Band n5	LTE Band 2/7/48/66
LTE Anchor Band for NR Band n7	LTE Band 2/5/12/13/66/71
LTE Anchor Band for NR Band n12	LTE Band 2/7/66
LTE Anchor Band for NR Band n25	LTE Band 12/48/66
LTE Anchor Band for NR Band n38	LTE Band 2/4/5/12/66/71
LTE Anchor Band for NR Band n41	LTE Band 2/4/5/12/25/26/66/71
LTE Anchor Band for NR Band n48	LTE Band 2/5/66

LTE Anchor Band for NR Band n66	LTE Band 2/5/7/12/13/14/48/71
LTE Anchor Band for NR Band n71	LTE Band 2/7/66
LTE Anchor Band for NR Band n77	LTE Band 5/7/12/13/14/41/66
LTE Anchor Band for NR Band n78	LTE Band 2/4/5/12/13/26/38/41/66/71
Maximum Tune-up Conducted Power (Unit: dBm)	Please refer to section 4.5.1 of this report.
Antenna Type	PIFA 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 Band 2/4/17/38 and LTE Band 25/66/12/41.Since the supported frequency span for LTE Band 2/4/17/38 falls completely within the LTE Band 25/66/12/41, they have the same target power, and share the same transmission path, therefore SAR was only assessed for LTE Band 25/66/12/41.
3. The SAR of LTE Band 42 (3552.5MHz ~ 3597.5 MHz), LTE Band 43 is covered by LTE Band 48 due to same power level and with repeated frequency range.
4. This device supports both NR Band n2/n38/n78 and NR Band n25/n41/n77. Since the supported frequency span for NR Band n2/n38/n78 falls completely within the NR Band n25/n41/n77, they have the same target power, and share the same transmission path, therefore SAR was only assessed for NR Band n25/n41/n77.
5. For LTE Band 30 and NR Band n30 of antenna 2, when the hotspot function is activated, power reduction will be activated to limit the maximum power.
6. This variant report is made for verification. All the worst SAR configurations specified in the original SAR report was repeated and verified to ensure the device remains compliant.
7. The motherboard and battery (two types) were replaced based on the original model. These changes did not affect the RF parameters and verified the worst case in the original report (Report No.: W7L-P24030018SA01, FCC ID: 2AACZ-M440A01, issued by: BV 7LAYERS COMMUNICATIONS TECHNOLOGY (SHENZHEN) CO. LTD.).

List of Accessory:

Battery 1	**Brand Name**	RugGear
	Model Name	BL240AKP
	Power Rating	3.7Vdc, 2400mAh
	Type	Li-ion
Battery 2	**Brand Name**	RugGear
	Model Name	BL480AKP
	Power Rating	3.7Vdc, 4800mAh
	Type	Li-ion

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:

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

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

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

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

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.

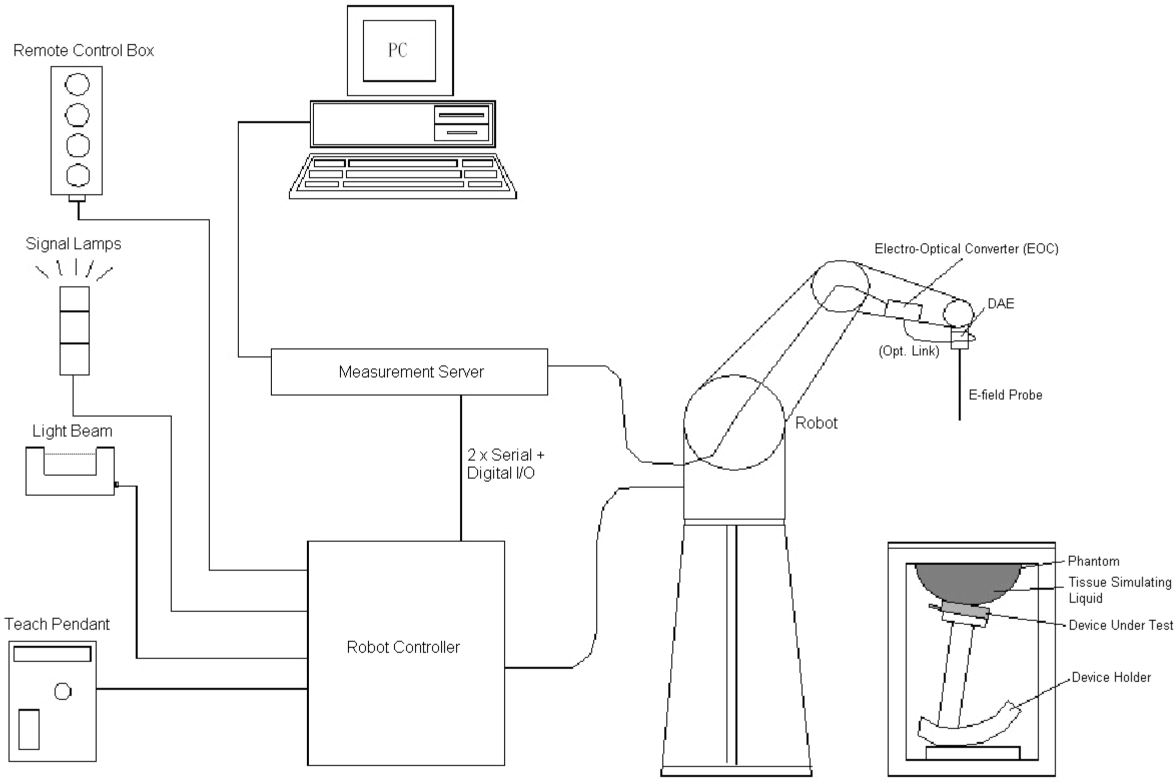


Fig-3.1 DASY System Setup

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 (DASY5: 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 DASY5

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.

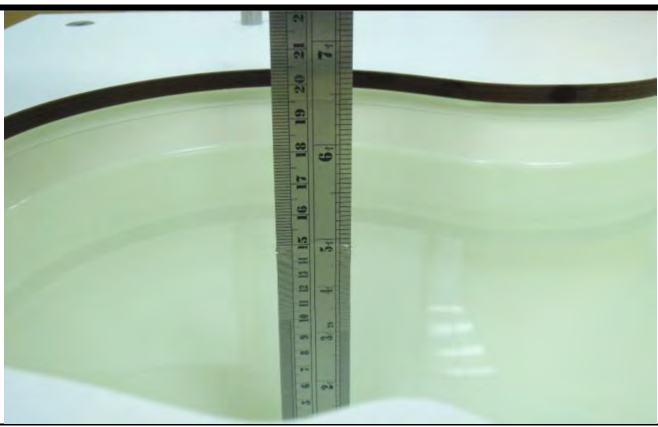


Photo of Liquid Height for Head Position

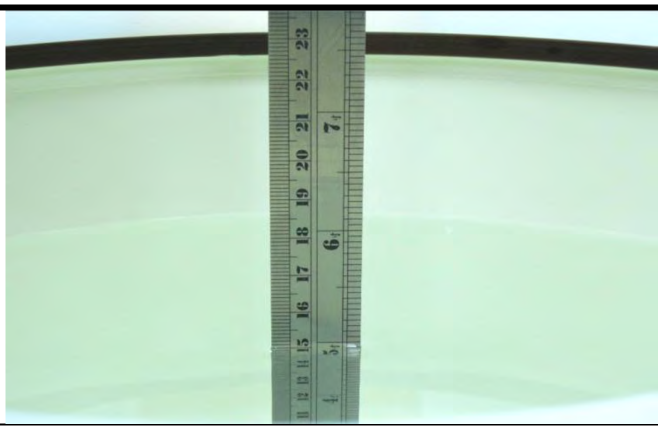


Photo of Liquid Height for Body Position

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.

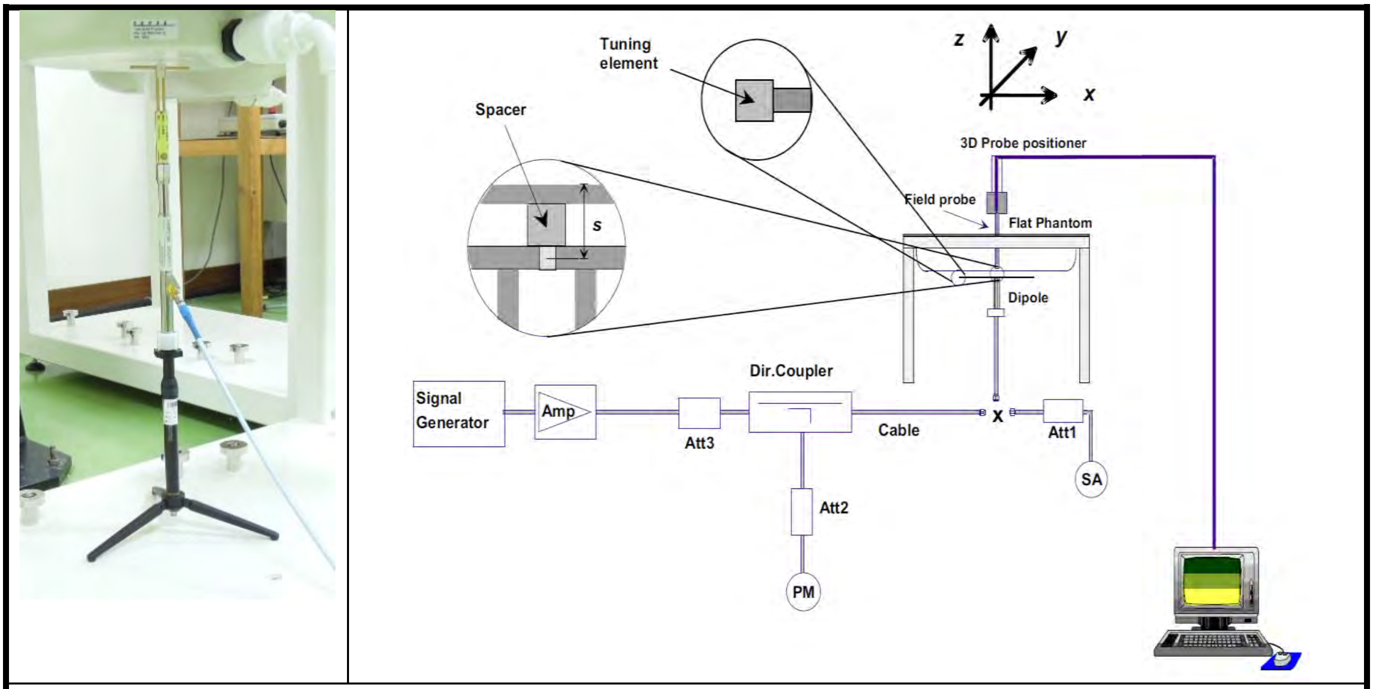


Fig-3.4 System Verification Setup

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 (Agilent E5515C is used for GSM/WCDMA/CDMA, and Anritsu MT8820C is used for 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 QPSK, 16QAM, 64QAM and 256QAM 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 QPSK, 16QAM, 64QAM and 256QAM modulation. The results please refer to section 4.5 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		
7			V	V	V	V
12	V	V	V	V		
13			V	V		
14			V	V		
17			V	V		
25	V	V	V	V	V	V
26	V	V	V	V	V	
30			V	V		
38			V	V	V	V
41			V	V	V	V
42			V	V	V	V
43			V	V	V	V
48			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.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3

Modulation	Channel bandwidth / Transmission bandwidth (N_{RB})						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3
256 QAM	≥ 1						≤ 5

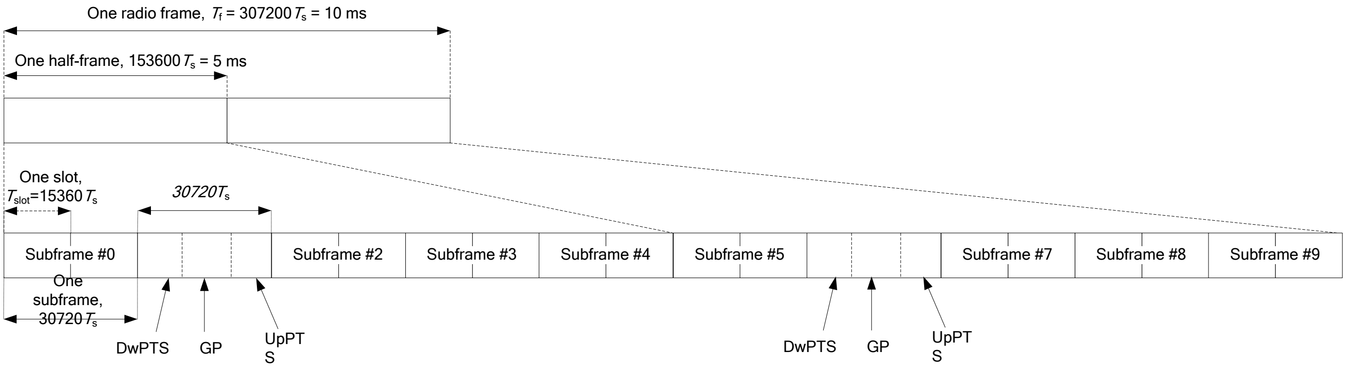
Note: MPR is according to the standard and implemented in the circuit (mandatory).

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.

TDD-LTE Setup Configurations

According to KDB 941225 D05, SAR testing for TDD-LTE device must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP TDD-LTE configurations. The TDD-LTE of this device supports frame structure type 2 defined in 3GPP TS 36.211 section 4.2, and the frame structure configuration can be referred to below.



3GPP TS 36.211 Figure 4.2-1: Frame Structure Type 2

<table>
<tr><th rowspan="3">Special Subframe Configuration</th><th colspan="3">Normal Cyclic Prefix in Downlink</th><th colspan="3">Extended Cyclic Prefix in Downlink</th></tr>
<tr><th rowspan="2">DwPTS</th><th colspan="2">UpPTS</th><th rowspan="2">DwPTS</th><th colspan="2">UpPTS</th></tr>
<tr><th>Normal Cyclic Prefix in Uplink</th><th>Extended Cyclic Prefix in Uplink</th><th>Normal Cyclic Prefix in Uplink</th><th>Extended Cyclic Prefix in Uplink</th></tr>
<tr><td>0</td><td>6592 · Ts</td><td rowspan="5">2192 · Ts</td><td rowspan="5">2560 · Ts</td><td>7680 · Ts</td><td rowspan="4">2192 · Ts</td><td rowspan="4">2560 · Ts</td></tr>
<tr><td>1</td><td>19760 · Ts</td><td>20480 · Ts</td></tr>
<tr><td>2</td><td>21952 · Ts</td><td>23040 · Ts</td></tr>
<tr><td>3</td><td>24144 · Ts</td><td>25600 · Ts</td></tr>
<tr><td>4</td><td>26336 · Ts</td><td>7680 · Ts</td><td rowspan="4">4384 · Ts</td><td rowspan="4">5120 · Ts</td></tr>
<tr><td>5</td><td>6592 · Ts</td><td rowspan="5">4384 · Ts</td><td rowspan="5">5120 · Ts</td><td>20480 · Ts</td></tr>
<tr><td>6</td><td>19760 · Ts</td><td>23040 · Ts</td></tr>
<tr><td>7</td><td>21952 · Ts</td><td>12800 · Ts</td></tr>
<tr><td>8</td><td>24144 · Ts</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>9</td><td>13168 · Ts</td><td>-</td><td>-</td><td>-</td></tr>
</table>

3GPP TS 36.211 Table 4.2-1: Configuration of Special Subframe

Uplink-Downlink Configuration	Downlink-to-Uplink Switch-Point Periodicity	Subframe Number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D

6	5 ms	D	S	U	U	U	D	S	U	U	D

3GPP TS 36.211 Table 4.2-2: Uplink-Downlink Configurations

The variety of different TD-LTE uplink-downlink configurations allows a network operator to allocate the network's capacity between uplink and downlink traffic to meet the needs of the network. The uplink duty cycle of these seven configurations can readily be computed and shown in below.

UL-DL Configuration	0	1	2	3	4	5	6
Highest Duty-Cycle	63.33%	43.33%	23.33%	31.67%	21.67%	11.67%	53.33%

Considering the highest transmission duty cycle, TDD-LTE was tested using Uplink-Downlink Configuration 0 with 6 uplink subframe and 2 special subframe. The special subframe was set to special subframe configuration 7 using extended cyclic prefix uplink. Therefore, SAR testing for TDD-LTE was performed at the maximum output power with highest transmission duty cycle of 63.33%.

LTE Downlink Carrier Aggregation (CA) Setup Configurations

EUT Supported Combinations of Downlink Carrier Aggregation							
2CC Downlink Carrier Aggregation							
CA_2A-2A	CA_2A-5A	CA_2A-7A	CA_2A-12A	CA_2A-13A	CA_2A-66A	CA_4A-12A	CA_4A-13A
CA_5A-7A	CA_5A-66A	CA_12A-66A	CA_13A-66A	CA_41A_42A			

Note:

1. LTE Carrier Aggregation (CA) was defined in 3GPP release 10 and higher. The LTE device in CA mode has one Primary Component Carrier (PCC) and one or more Secondary Component Carriers (SCC). PCC acts as the anchor carrier and can optionally cross-schedule data transmission on SCC. The RRC connection is only handled by one cell, the PCC for downlink and uplink communications. After making a data connection to the PCC, the LTE device adds the SCC on the downlink only. All uplink communications and acknowledgements remain identical to release 8 specifications on the PCC.
2. Uplink maximum output power with downlink carrier aggregation active does not show more than ¼ dB higher than the maximum output power without downlink carrier aggregation active, therefore SAR evaluation with downlink carrier aggregation active can be excluded.
3. The detailed DL CA output power measurement results, please refer to Appendix D.

LTE Uplink Carrier Aggregation (CA) Setup Configurations

EUT Supported Combinations of Uplink Carrier Aggregation
Intra-Band 2CC Uplink CA Operating Bands
CA_5B, CA_7C, CA_38C, CA_41C, CA_42C, CA_48C, 66B, 66C

Note:

1. UL CA shall be tested based on the worst-case SAR configuration determined from non-CA SAR testing result. The channel BW, channel number, RB allocation, etc. would be selected to allow contiguous CA of PCC and SCC. Uplink output power for UL CA is the total power measured across the PCC and SCC.
2. The UL CA mode power measurements represent the total power across both carriers. Measurements were made for all supported PCC bandwidths using the channel/RB combination resulting in the highest standalone output power at the least MPR (0 dB). SCC were set to use configurations similar to the PCC to establish conservative or worst-case equivalent SAR test conditions (highest maximum output power with MPR of 0 dB and RB allocation setting).

3. PCC RB allocation setting for UL CA has been adjusted based on the worst-case power.
4. According to November 2017 TCB workshop, Uplink CA SAR Test Guidance as follows:
   a) When the maximum output power for UL CA is ≤ standalone LTE mode (without CA)
      • PCC is configured according to the highest standalone SAR configuration tested
      • SCC and subsequent CCs are configured according to procedures used for power measurement and parameters (BW, RB etc.) similar to that used for the PCC
   b) When the Reported SAR for UL CA configuration, described above, is > 1.2W/kg, UL CA is also required for all required test channels(PCC based)
   c) UL CA SAR is also required for standalone SAR configurations > 1.2W/kg when they are scaled to the UL CA power level
5. PCC RB allocation setting for UL CA has been adjusted based on the worst-case power, for detailed UL CA output power measurement results, please refer to Appendix D.

<Considerations Related to 5G NR for Setup and Testing>

1. The 5G NR supports both SA and NSA modes. The details are as follows

Mode	Band	Duplex	SCS(KHz)	BW(M)
SA	5G NR n2	FDD	15	5, 10, 15, 20
	5G NR n5	FDD	15	5, 10, 15, 20
	5G NR n7	FDD	15	5, 10, 15, 20, 25, 30, 40
	5G NR n12	FDD	15	5, 10, 15
	5G NR n14	FDD	15	5, 10
	5G NR n25	FDD	15	5, 10, 15, 20, 25, 30, 40
	5G NR n30	FDD	15	5, 10
	5G NR n38	TDD	30	20, 30, 40
	5G NR n41	TDD	30	20, 30, 40, 50, 60, 80, 90, 100
	5G NR n48	TDD	30	10, 20, 40
	5G NR n66	FDD	15	5, 10, 15, 20, 30, 40
	5G NR n71	FDD	15	5, 10, 15, 20
	5G NR n77	TDD	30	10, 20, 30, 40, 50, 60, 70, 80, 90, 100
	5G NR n78	TDD	30	10, 20, 30, 40, 50, 60, 70, 80, 90, 100
NSA	5G NR n2	FDD	15	5, 10, 15, 20
	5G NR n5	FDD	15	5, 10, 15, 20
	5G NR n7	FDD	15	5, 10, 15, 20, 25, 30, 40
	5G NR n12	FDD	15	5, 10, 15
	5G NR n25	FDD	15	5, 10, 15, 20, 25, 30, 40
	5G NR n38	TDD	30	20, 30, 40
	5G NR n41	TDD	30	20, 30, 40, 50, 60, 80, 90, 100
	5G NR n48	TDD	30	10, 20, 40
	5G NR n66	FDD	15	5, 10, 15, 20, 30, 40
	5G NR n71	FDD	15	5, 10, 15, 20
	5G NR n77	TDD	30	10, 20, 30, 40, 50, 60, 70, 80, 90, 100

	5G NR n78	TDD	30	10, 20, 30, 40, 50, 60, 70, 80, 90, 100

2. For 5G NR test procedure was following step similar FCC KDB 941225 D05:

(1) For DFT-OFDM and CP-OFDM output power measurement reduction, according to 38.101 maximum power reduction for power class 3, the CP-OFDM mode will not higher than DFT-OFDM mode, therefore, similar FCC KB 941225 D05 procedure for other modulation output power for each RB allocation configuration is > not ½ dB higher than the same configuration in DFT-QPSK and the reported SAR for the DFT-QPSK configuration is ≤ 1.45 W/kg, CP-OFDM testing is not required.

(2) For DFT-OFDM and CP-OFDM output power measurement reduction, according to 38.101 maximum power reduction for power class 3, for 16QAM/64QAM/256QAM and smaller bandwidth output power will spot check largest channel bandwidth worst RB configuration to ensure the 16QAM/64QAM/256QAM and smaller bandwidth output power will not ½ dB higher than the same configuration in the largest supported bandwidth.

(3) SAR testing start with the largest channel bandwidth and measure SAR for QPSK with 1RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offset at the upper edge, middle and lower edge of each required test channel.

(4) 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.

(5) 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% RB and 1RB allocations and the highest reported SAR for 1RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel, and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

(6) Pi/2 BPSK/16QAM/64QAM/256QAM output powers according to 3GPP MPR will not ½ dB higher than the same configuration in QPSK, also reported SAR for the QPSK configuration is less than 1.45 W/kg, Pi/2 BPSK/16QAM/64QAM/256QAM SAR testing are not required.

(7) Smaller bandwidth output power for each RB allocation configuration for this device will not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg, smaller bandwidth SAR testing is not required for this device.

Table 6.2.2.3-1: Maximum power reduction (MPR) for power class 3

Modulation		MPR (dB)		
		Edge RB allocations	Outer RB allocations	Inner RB allocations
DFT-s-OFDM	Pi/2 BPSK	≤ 3.5[1]	≤ 1.2[1]	≤ 0.2[1]
		≤ 0.5[2]		0[2]
	QPSK	≤ 1		0
	16 QAM	≤ 2		≤ 1
	64 QAM	≤ 2.5		
	256 QAM	≤ 4.5		
CP-OFDM	QPSK	≤ 3		≤ 1.5
	16 QAM	≤ 3		≤ 2
	64 QAM	≤ 3.5		
	256 QAM	≤ 6.5		

NOTE 1: Applicable for UE operating in TDD mode with Pi/2 BPSK modulation and UE indicates support for UE capability *powerBoosting-pi2BPSK* and if the IE *powerBoostPi2BPSK* is set to 1 and 40 % or less slots in radio frame are used for UL transmission for bands n40, n41, n77, n78 and n79. The reference power of 0dB MPR is 26dBm.

NOTE 2: Applicable for UE operating in FDD mode, or in TDD mode in bands other than n40, n41, n77, n78 and n79 and if the IE *powerBoostPi2BPSK* is set to 0 and if more than 40% of slots in radio frame are used for UL transmission for bands n40, n41, n77, n78 and n79.

3. NSA and SA mode should perform SAR separately. For the maximum power of NSA mode is the same as SA total power level. So SA SAR can represent NSA mode SAR.

4. 5G NR NSA mode, the power level is the same as 5G NR SA mode, so 5G NR NSA mode and SA mode power table only show one time.
5. Due to test setup limitations, SAR testing for NR was performed using Factory Test Mode software to establish the connection.

ENDC Combination	Antenna TX	
	LTE TX	NR TX
DC_2A_n5A	Ant 1	Ant 2
DC_2A_n7A	Ant 3	Ant 1
DC_2A_n7A	Ant 1	Ant 3
DC_2A_n12A	Ant 1	Ant 2
DC_2A_n38A	Ant 3	Ant 1
DC_2A_n41A	Ant 3	Ant 1
DC_2A_n48A	Ant 1	Ant 4
DC_2A_n66A	Ant 1	Ant 3
DC_2A_n71A	Ant 1	Ant 2
DC_2A_n78A	Ant 3	Ant 7
DC_2A_n78A	Ant 1	Ant 4
DC_4A_n38A	Ant 1	Ant 3
DC_4A_n38A	Ant 3	Ant 1
DC_4A_n41A	Ant 3	Ant 1
DC_4A_n78A	Ant 1	Ant 4
DC_5A_n2A	Ant 2	Ant 1
DC_5A_n7A	Ant 2	Ant 1
DC_5A_n38A	Ant 2	Ant 1
DC_5A_n41A	Ant 2	Ant 1
DC_5A_n48A	Ant 2	Ant 7
DC_5A_n66A	Ant 2	Ant 1
DC_5A_n77A	Ant 2	Ant 7
DC_5A_n78A	Ant 2	Ant 7
DC_7A_n2A	Ant 1	Ant 3
DC_7A_n5A	Ant 1	Ant 2
DC_7A_n12A	Ant 1	Ant 2
DC_7A_n66A	Ant 1	Ant 3
DC_7A_n71A	Ant 1	Ant 2
DC_7A_n77A	Ant 3	Ant 7
DC_7A_n78A	Ant 3	Ant 7
DC_12A_n2A	Ant 2	Ant 1
DC_12A_n7A	Ant 2	Ant 1
DC_12A_n25A	Ant 2	Ant 1
DC_12A_n38A	Ant 2	Ant 1
DC_12A_n66A	Ant 2	Ant 1
DC_12A_n41A	Ant 2	Ant 1
DC_12A_n77A	Ant 2	Ant 7

ENDC Combination	Antenna TX	
	LTE TX	NR TX
DC_12A_n78A	Ant 2	Ant 7
DC_13A_n2A	Ant 2	Ant 1
DC_13A_n7A	Ant 2	Ant 1
DC_13A_n66A	Ant 2	Ant 1
DC_13A_n77A	Ant 2	Ant 7
DC_13A_n78A	Ant 2	Ant 7
DC_14A_n2A	Ant 2	Ant 1
DC_14A_n66A	Ant 2	Ant 1
DC_14A_n77A	Ant 2	Ant 7
DC_25A_n41A	Ant 3	Ant 1
DC_26A_n41A	Ant 2	Ant 1
DC_26A_n78A	Ant 2	Ant 7
DC_38A_n78A	Ant 3	Ant 7
DC_41A_n77A	Ant 3	Ant 7
DC_41A_n78A	Ant 3	Ant 7
DC_48A_n5A	Ant 7	Ant 2
DC_48A_n25A	Ant 7	Ant 3
DC_48A_n66A	Ant 7	Ant 3
DC_66A_n2A	Ant 1	Ant 3
DC_66A_n5A	Ant 1	Ant 2
DC_66A_n7A	Ant 1	Ant 3
DC_66A_n12A	Ant 1	Ant 2
DC_66A_n25A	Ant 1	Ant 3
DC_66A_n38A	Ant 1	Ant 3
DC_66A_n38A	Ant 3	Ant 1
DC_66A_n41A	Ant 1	Ant 3
DC_66A_n41A	Ant 3	Ant 1
DC_66A_n48A	Ant 1	Ant 4
DC_66A_n71A	Ant 1	Ant 2
DC_66A_n77A	Ant 1	Ant 4
DC_66A_n78A	Ant 1	Ant 4
DC_71A_n2A	Ant 2	Ant 1
DC_71A_n7A	Ant 2	Ant 1
DC_71A_n38A	Ant 2	Ant 1
DC_71A_n41A	Ant 2	Ant 1
DC_71A_n66A	Ant 2	Ant 1
DC_71A_n78A	Ant 2	Ant 7

Note:

1. For ENDC Simultaneous SAR analysis is performed using standalone SAR summed together and they are more conservative for ENDC.
2. The single uplink 1g SAR values for each LTE Anchors Bands and 5G NR are both less than 0.8W/kg and the algebraic summation of the 1g SAR value are less than 1.45W/kg, additional measurement are not

required according to TCB workshop guidance.

<Considerations Related to WLAN for Setup and Testing>

In general, various vendor specific external test software and chipset based internal test modes are typically used for SAR measurement. These chipset based test mode utilities are generally hardware and manufacturer dependent, and often include substantial flexibility to reconfigure or reprogram a device. A Wi-Fi device must be configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools for SAR measurement. The test frequencies established using test mode must correspond to the actual channel frequencies. When 802.11 frame gaps are accounted for in the transmission, a maximum transmission duty factor of 92 - 96% is typically achievable in most test mode configurations. A minimum transmission duty factor of 85% is required to avoid certain hardware and device implementation issues related to wide range SAR scaling. In addition, a periodic transmission duty factor is required for current generation SAR systems to measure SAR correctly. The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

According to KDB 248227 D01, this device has installed WLAN engineering testing software which can provide continuous transmitting RF signal. During WLAN SAR testing, this device was operated to transmit continuously at the maximum transmission duty with specified transmission mode, operating frequency, lowest data rate, and maximum output power.

Initial Test Configuration

An initial test configuration is determined for OFDM transmission modes in 2.4 GHz and 5 GHz bands according to the channel bandwidth, modulation and data rate combination(s) with the highest maximum output power specified for production units in each standalone and aggregated frequency band. When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band.

Subsequent Test Configuration

SAR measurement requirements for the remaining 802.11 transmission mode configurations that have not been tested in the initial test configuration are determined separately for each standalone and aggregated frequency band, in each exposure condition, according to the maximum output power specified for production units. Additional power measurements may be required to determine if SAR measurements are required for subsequent highest output power channels in a subsequent test configuration. When the highest reported SAR for the initial test configuration according to the initial test position or fixed exposure position requirements, is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for that subsequent test configuration.

SAR Test Configuration and Channel Selection

When multiple channel bandwidth configurations in a frequency band have the same specified maximum output power, the initial test configuration is using largest channel bandwidth, lowest order modulation, lowest data rate, and lowest order 802.11 mode (i.e., 802.11a is chosen over 802.11n then 802.11ac or 802.11g is chosen over 802.11n). After an initial test configuration is determined, if multiple test channels have the same measured maximum output power, the channel chosen for SAR measurement is determined according to the following.

1) The channel closest to mid-band frequency is selected for SAR measurement.

2) For channels with equal separation from mid-band frequency; for example, high and low channels or two mid-band channels, the higher frequency (number) channel is selected for SAR measurement.

Test Reduction for U-NII-1 (5.2 GHz) and U-NII-2A (5.3 GHz) Bands

For devices that operate in both U-NII bands using the same transmitter and antenna(s), SAR test reduction is determined according to the following.

1) When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. If the highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band for that configuration (802.11 mode and exposure condition).

2) When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration.

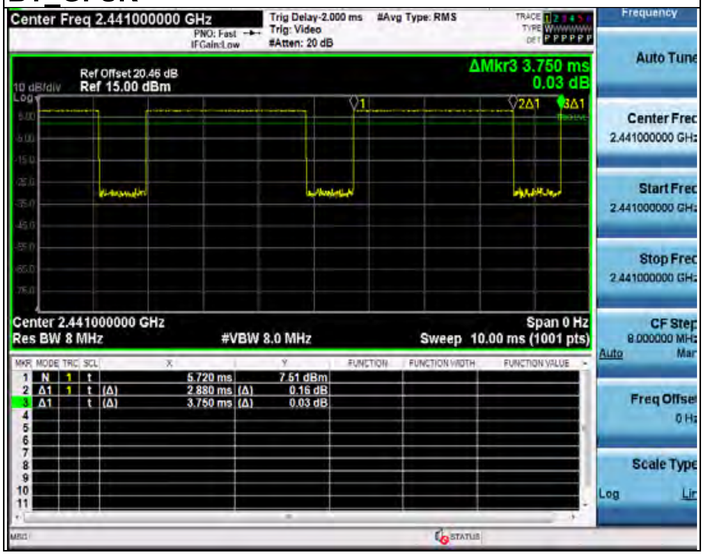
<Considerations Related to Bluetooth for Setup and Testing>

This device has installed Bluetooth engineering testing software which can provide continuous transmitting RF signal. During Bluetooth SAR testing, this device was operated to transmit continuously at the maximum transmission duty with specified transmission mode, operating frequency, lowest data rate, and maximum output power.

<Duty Cycle of BT Test Signal>

BT_GFSK: Duty cycle = 2.88 / 3.75 = 0.768

BT_GFSK



4.2 EUT Testing Position

According to KDB 648474 D04, handsets are tested for SAR compliance in body-worn accessory and other use configurations described in the following subsections.

4.2.1 Body-worn Accessory Exposure Conditions

Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in KDB 447498 D01 are used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

Body-worn accessories that do not contain metallic or conductive components may be tested according to worst-case exposure configurations, typically according to the smallest test separation distance required for the group of body-worn accessories with similar operating and exposure characteristics. All body-worn accessories containing metallic components are tested in conjunction with the host device.

Body-worn accessory SAR compliance is based on a single minimum test separation distance for all wireless and operating modes applicable to each body-worn accessory used by the host, and according to the relevant voice and/or data mode transmissions and operations. If a body-worn accessory supports voice only operations in its normal and expected use conditions, testing of data mode for body-worn compliance is not required.

A conservative minimum test separation distance for supporting off-the-shelf body-worn accessories that may be acquired by users of consumer handsets is used to test for body-worn accessory SAR compliance. This distance is determined by the handset manufacturer, according to the requirements of Supplement C 01-01. Devices that are designed to operate on the body of users using lanyards and straps, or without requiring additional body-worn accessories, will be tested using a conservative minimum test separation distance <= 5 mm to support compliance.

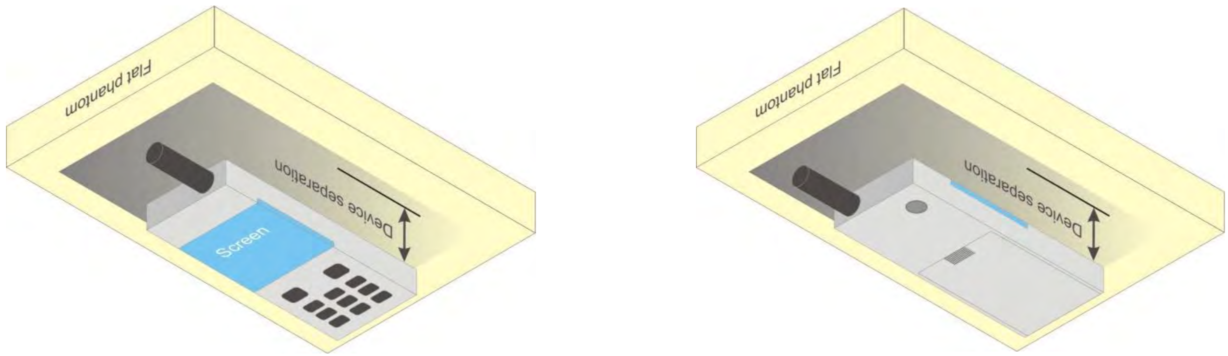
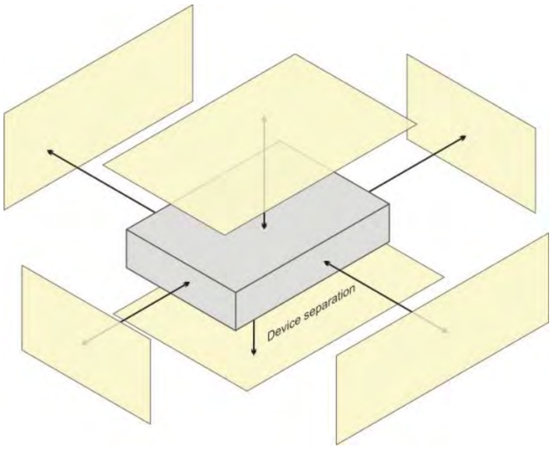


Fig-4.1 Illustration for Body Worn Position

4.2.2 Hotspot Mode Exposure Conditions

For handsets that support hotspot mode operations, with wireless router capabilities and various web browsing functions, the relevant hand and body exposure conditions are tested according to the hotspot SAR procedures in KDB 941225 D06. A test separation distance of 10 mm is required between the phantom and all surfaces and edges with a transmitting antenna located within 25 mm from that surface or edge. When the form factor of a handset is smaller than 9 cm x 5 cm, a test separation distance of 5 mm (instead of 10 mm) is required for testing hotspot mode. When the separation distance required for body-worn accessory testing is larger than or equal to that tested for hotspot mode, in the same wireless mode and for the same surface of the phone, the hotspot mode SAR data may be used to support body-worn accessory SAR compliance for that particular configuration (surface).



Based on the antenna location shown on appendix F of this report, the SAR testing required for hotspot mode is listed as below.

Antenna	Front Face	Rear Face	Left Side	Right Side	Top Side	Bottom Side
WWAN Ant 1	V	V	-	V	V	-
WWAN Ant 2	V	V	V	V	-	V
WWAN Ant 3	V	V	-	V	-	-
WWAN Ant 4	V	V	-	V	V	-
WWAN Ant 5	V	V	V	-	-	-
WWAN Ant 6	V	V	V	-	-	V
WWAN Ant 7	V	V	-	V	-	V
WLAN/BT Ant 8	V	V	V	-	V	-
WLAN Ant 9	V	V	V	-	V	-

4.2.3 SAR Text Exclusion Evaluations

For NFC：

1. Maximum output power = 2000 mW
2. Duty Cycle = 99%
3. Length of each event = 0.5 second
4. Events per observation period = 2 times
5. Observation period = 360 seconds

Based on the above data, calculated the time-averaged power: (2000*0.99*0.5*2)/360 = 5.5 mW.

According to KDB 447498 D01v06, the SAR test exclusion condition is based on source-based time-averaged maximum conducted output power, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions. The SAR exclusion threshold is determined by the following.

Mode	Max. Tune-up Power (mW)	Ant. to Surface (mm)	Exemption limit (mW)	Require SAR Testing?
NFC (13.56MHz)	5.5	5	442	No

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 (%)
Sep. 13, 2024	HSL	750	22.6	0.891	40.775	0.89	41.90	0.11	-2.68
Sep. 13, 2024	HSL	835	22.5	0.916	42.727	0.90	41.50	1.78	2.96
Sep. 13, 2024	HSL	1750	22.6	1.348	41.854	1.37	40.10	-1.61	4.37
Sep. 13, 2024	HSL	1900	22.4	1.430	40.323	1.40	40.00	2.14	0.81
Sep. 13, 2024	HSL	2300	22.6	1.665	39.075	1.67	39.50	-0.30	-1.08
Sep. 13, 2024	HSL	2450	22.3	1.795	38.824	1.80	39.20	-0.28	-0.96
Sep. 13, 2024	HSL	2600	22.7	1.989	38.319	1.96	39.00	1.48	-1.75
Sep. 14, 2024	HSL	3500	22.5	2.821	39.681	2.91	37.90	-3.06	4.70
Sep. 14, 2024	HSL	3700	22.4	3.010	39.360	3.12	37.70	-3.53	4.40
Sep. 14, 2024	HSL	3900	22.6	3.213	39.069	3.32	37.50	-3.22	4.18
Sep. 14, 2024	HSL	5250	22.5	4.631	36.197	4.71	35.90	-1.68	0.83
Sep. 14, 2024	HSL	5600	22.5	5.014	35.633	5.07	35.50	-1.10	0.37
Sep. 14, 2024	HSL	5750	22.6	5.200	35.196	5.27	35.30	-1.33	-0.29

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.

<1g SAR>

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
Sep. 13, 2024	Head	750	8.49	2.18	8.72	2.71	1067	7612	1389
Sep. 13, 2024	Head	835	9.57	2.44	9.76	1.99	4d139	7612	1389
Sep. 13, 2024	Head	1750	36.30	9.39	37.56	3.47	1071	7612	1389
Sep. 13, 2024	Head	1900	39.80	10.20	40.80	2.51	5d159	7612	1389
Sep. 13, 2024	Head	2300	49.60	12.40	49.60	0.00	1053	7612	1389
Sep. 13, 2024	Head	2450	53.10	12.50	50.00	-5.84	893	7612	1389
Sep. 13, 2024	Head	2600	55.90	13.30	53.20	-4.83	1110	7612	1389
Sep. 14, 2024	Head	3500	65.50	6.10	61.00	-6.87	1111	7612	1389
Sep. 14, 2024	Head	3700	66.80	6.18	61.80	-7.49	1082	7612	1389
Sep. 14, 2024	Head	3900	67.90	6.93	69.30	2.06	1055	7612	1389
Sep. 14, 2024	Head	5250	77.70	7.19	71.90	-7.46	1133	7612	1389
Sep. 14, 2024	Head	5600	82.40	7.61	76.10	-7.65	1133	7612	1389
Sep. 14, 2024	Head	5750	78.60	7.29	72.90	-7.25	1133	7612	1389

<10g SAR>

Test Date	Mode	Frequency (MHz)	1W Target SAR-10g (W/kg)	Measured SAR-10g (W/kg)	Normalized to 1W SAR-10g (W/kg)	Deviation (%)	Dipole S/N	Probe S/N	DAE S/N
Sep. 13, 2024	Head	750	5.59	1.45	5.80	3.76	1067	7612	1389
Sep. 13, 2024	Head	835	6.31	1.60	6.40	1.43	4d139	7612	1389
Sep. 13, 2024	Head	1750	19.50	4.91	19.64	0.72	1071	7612	1389
Sep. 13, 2024	Head	1900	20.90	5.17	20.68	-1.05	5d159	7612	1389
Sep. 13, 2024	Head	2300	24.00	5.68	22.72	-5.33	1053	7612	1389
Sep. 13, 2024	Head	2450	24.90	5.82	23.28	-6.51	893	7612	1389
Sep. 13, 2024	Head	2600	25.40	6.01	24.04	-5.35	1110	7612	1389

Test Date	Mode	Frequency (MHz)	1W Target SAR-10g (W/kg)	Measured SAR-10g (W/kg)	Normalized to 1W SAR-10g (W/kg)	Deviation (%)	Dipole S/N	Probe S/N	DAE S/N
Sep. 14, 2024	Head	3500	24.70	2.32	23.20	-6.07	1111	7612	1389
Sep. 14, 2024	Head	3700	24.40	2.27	22.70	-6.97	1082	7612	1389
Sep. 14, 2024	Head	3900	23.70	2.43	24.30	2.53	1055	7612	1389
Sep. 14, 2024	Head	5250	22.00	2.04	20.40	-7.27	1133	7612	1389
Sep. 14, 2024	Head	5600	23.20	2.15	21.50	-7.33	1133	7612	1389
Sep. 14, 2024	Head	5750	22.00	2.04	20.40	-7.27	1133	7612	1389

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 please refer to Appendix D.

4.5.2 Measured Conducted Power Result

The measuring conducted average power (Unit: dBm) please refer to Appendix D.

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 D01, 3G SAR Measurement Procedures>

The mode tested for SAR is referred to as the primary mode. The equivalent modes considered for SAR test reduction are denoted as secondary modes. Both primary and secondary modes must be in the same frequency band. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ 1/4 dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.

<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.

<KDB 941225 D05, SAR Evaluation Considerations for 5G NR Devices>

(1) For DFT-OFDM and CP-OFDM output power measurement reduction, according to 38.101 maximum power reduction for power class 3, the CP-OFDM mode will not higher than DFT-OFDM mode, therefore, similar FCC KB 941225 D05 procedure for other modulation output power for each RB allocation configuration is > not ½ dB higher than the same configuration in DFT-QPSK and the reported SAR for the DFT-QPSK configuration is ≤ 1.45 W/kg, CP-OFDM testing is not required.

(2) For DFT-OFDM and CP-OFDM output power measurement reduction, according to 38.101 maximum power reduction for power class 3, for 16QAM/64QAM/256QAM and smaller bandwidth output power will spot check largest channel bandwidth worst RB configuration to ensure the 16QAM/64QAM/256QAM and smaller bandwidth output power will not ½ dB higher than the same configuration in the largest supported bandwidth.

(3) SAR testing start with the largest channel bandwidth and measure SAR for QPSK with 1RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offset at the upper edge, middle and lower edge of each required test channel.

(4) 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.

(5) 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% RB and 1RB allocations and the highest reported SAR for 1RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel, and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

(6) Pi/2 BPSK/16QAM/64QAM/256QAM output powers according to 3GPP MPR will not ½ dB higher than the same configuration in QPSK, also reported SAR for the QPSK configuration is less than 1.45 W/kg, Pi/2 BPSK/16QAM/64QAM/256QAM SAR testing are not required.

(7) Smaller bandwidth output power for each RB allocation configuration for this device will not. ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg, smaller bandwidth SAR testing is not required for this device.

<KDB 248227 D01, SAR Guidance for Wi-Fi Transmitters>

(1) For handsets operating next to ear, hotspot mode or mini-tablet configurations, the initial test position procedures were applied. The test position with the highest extrapolated peak SAR will be used as the initial test position. When the reported SAR of initial test position is <= 0.4 W/kg, SAR testing for remaining test positions is not required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is <= 0.8 W/kg or all test positions are measured.

(2) For WLAN 2.4 GHz, the highest measured maximum output power channel for DSSS was selected for SAR measurement. When the reported SAR is <= 0.8 W/kg, no further SAR testing is required. Otherwise, SAR is evaluated at the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel. For OFDM modes (802.11g/n), SAR is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and it is <= 1.2 W/kg.

(3) For WLAN 5 GHz, the initial test configuration was selected according to the transmission mode with the highest maximum output power. When the reported SAR of initial test configuration is > 0.8 W/kg, SAR is required for the subsequent highest measured output power channel until the reported SAR result is <= 1.2 W/kg or all required channels are measured. For other transmission modes, SAR is not required when the highest reported SAR for initial test configuration is adjusted by the ratio of subsequent test configuration to initial test configuration specified maximum output power and it is <= 1.2 W/kg.

(4) For WLAN MIMO mode, the power-based standalone SAR test exclusion or the sum of SAR provision in KDB 447498 to determine simultaneous transmission SAR test exclusion should be applied. Otherwise, SAR for MIMO mode will be measured with all applicable antennas transmitting simultaneously at the specified maximum output power of MIMO operation.

4.6.2 SAR Results for Body-worn Exposure Condition (Separation Distance is 1.0 cm Gap)

Plot No.	Band	Mode	Test Position	Ch.	Antenna	Power Reduction	Battery	RB#	RB Offset	Duty Cycle %	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Power Drift (dB)	Measured SAR-1g (W/kg)	Duty Cycle Scaling Factor	Tune-up Scaling Factor	Scaled SAR-1g (W/kg)
P01	LTE 5	QPSK10M	Front Face	20600	ANT2	Full	1	1	0	-	24.00	22.60	0.00	0.508	1.000	1.380	**0.70**
P02	LTE 7	QPSK20M	Rear Face	21100	ANT1	Full	1	1	99	-	24.00	23.28	-0.11	0.514	1.000	1.180	**0.61**
P03	LTE 12/17	QPSK10M	Front Face	23130	ANT2	Full	1	1	49	-	24.00	22.43	0.00	0.383	1.000	1.435	**0.55**
P04	LTE 13	QPSK10M	Front Face	23230	ANT2	Full	1	1	0	-	24.00	22.58	0.03	0.531	1.000	1.387	**0.74**
P05	LTE 14	QPSK10M	Front Face	23330	ANT2	Full	1	1	0	-	24.00	22.64	-0.02	0.552	1.000	1.368	**0.75**
P06	LTE 25/2	QPSK20M	Rear Face	26590	ANT1	Full	1	1	0	-	24.00	23.28	0.06	0.422	1.000	1.180	**0.50**
P07	LTE 26	QPSK15M	Front Face	26865	ANT2	Full	1	1	0	-	24.00	22.38	0.01	0.476	1.000	1.452	**0.69**
P08	LTE 30	QPSK10M	Rear Face	27710	ANT2	Full	1	1	0	-	24.00	23.94	-0.01	0.831	1.000	1.014	**0.84**
P09	LTE 41/38	QPSK20M	Rear Face	40185	ANT1	Full	1	1	99	62.9	24.00	23.44	-0.07	0.297	1.006	1.138	**0.34**
P10	LTE 42 Part27Q	QPSK20M	Rear Face	42590	ANT7	Full	1	1	50	62.9	24.00	22.82	-0.15	0.184	1.006	1.312	**0.24**
P11	LTE 48/43/42	QPSK20M	Rear Face	55340	ANT7	Full	1	1	99	62.9	24.00	22.74	0.06	0.211	1.006	1.337	**0.28**
P12	LTE 66/4	QPSK20M	Front Face	132322	ANT1	Full	1	1	0	-	24.00	23.22	-0.04	0.242	1.000	1.197	**0.29**
P13	LTE 71	QPSK20M	Rear Face	133372	ANT2	Full	1	1	0	-	24.00	22.66	-0.11	0.253	1.000	1.361	**0.34**
P14	NR n5	DFT-QPSK20M	Front Face	166800	ANT2	Full	1	1	1	-	24.00	23.32	-0.12	0.487	1.000	1.169	**0.57**
P15	NR n7	DFT-QPSK40M	Rear Face	503500	ANT1	Full	1	1	1	-	24.00	23.71	-0.06	0.496	1.000	1.069	**0.53**
P16	NR n12	DFT-QPSK15M	Rear Face	141700	ANT2	Full	1	1	1	-	24.00	23.33	-0.10	0.338	1.000	1.167	**0.39**
P16-1	NR n14	DFT-QPSK10M	Front Face	158600	ANT2	Full	1	25	14	-	24.00	23.18	0.02	0.503	1.000	1.208	**0.61**
P17	NR n25/n2	DFT-QPSK40M	Front Face	376500	ANT1	Full	1	1	1	-	24.00	23.38	0.06	0.274	1.000	1.153	**0.32**
P18	NR n30	DFT-QPSK10M	Rear Face	462000	ANT2	Full	1	25	14	-	24.00	23.79	-0.06	1.020	1.000	1.050	**1.07**
	NR n30	DFT-QPSK10M	Rear Face	462000	ANT2	Full	2	25	14	-	24.00	23.79	0.11	0.324	1.000	1.050	0.34
P19	NR n41/n38	DFT-QPSK100M	Rear Face	509202	ANT1	Full	1	135	69	-	24.00	23.22	-0.10	0.194	1.000	1.197	**0.23**
P20	NR n48	DFT-QPSK40M	Rear Face	645332	ANT7	Full	1	1	1	-	24.00	23.21	-0.06	0.430	1.000	1.199	**0.52**
P21	NR n66	DFT-QPSK40M	Front Face	346000	ANT1	Full	1	1	1	-	24.00	23.52	-0.13	0.252	1.000	1.117	**0.28**
P22	NR n71	DFT-QPSK20M	Rear Face	137600	ANT2	Full	1	50	28	-	24.00	23.37	0.02	0.296	1.000	1.156	**0.34**
P23	NR n77 Part 27Q	DFT-QPSK100M	Rear Face	633334	ANT4	Full	1	1	1	-	24.00	22.22	0.09	0.450	1.000	1.507	**0.68**
P24	NR n77 Part 27O	DFT-QPSK100M	Rear Face	662000	ANT7	Full	1	135	69	-	24.00	22.51	-0.08	0.235	1.000	1.409	**0.33**
P25	WLAN2.4G	802.11b	Rear Face	11	ANT8+9	Full	1	-	-	98.51	18.00	17.13	-0.11	0.139	1.015	1.222	**0.17**
P26	WLAN5.3G	802.11a	Rear Face	64	ANT8+9	Full	1	-	-	99.05	15.00	14.42	-0.03	0.157	1.010	1.143	**0.18**
P27	WLAN5.5G	802.11a	Rear Face	116	ANT8+9	Full	1	-	-	99.05	15.00	14.26	0.09	0.204	1.010	1.186	**0.24**
P28	WLAN5.8G	802.11a	Rear Face	157	ANT8+9	Full	1	-	-	99.05	14.50	13.98	-0.02	0.167	1.010	1.127	**0.19**
P29	BT	GFSK	Front Face	39	ANT8	Full	1	-	-	76.8	8.00	7.49	0.09	0.022	1.302	1.125	**0.03**

4.6.3 SAR Results for Hotspot Exposure Condition (Separation Distance is 1.0 cm Gap)

Plot No.	Band	Mode	Test Position	Ch.	Antenna	Power Reduction	Battery	RB#	RB Offset	Duty Cycle %	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Power Drift (dB)	Measured SAR-1g (W/kg)	Duty Cycle Scaling Factor	Tune-up Scaling Factor	Scaled SAR-1g (W/kg)
P30	LTE 5	QPSK10M	Front Face	20600	ANT2	Full	1	1	0	-	24.00	22.60	0.00	0.508	1.000	1.380	**0.70**
P31	LTE 7	QPSK20M	Rear Face	21100	ANT1	Full	1	1	99	-	24.00	23.28	-0.11	0.514	1.000	1.180	**0.61**
P32	LTE 12/17	QPSK10M	Front Face	23130	ANT2	Full	1	1	49	-	24.00	22.43	0.00	0.383	1.000	1.435	**0.55**
P33	LTE 13	QPSK10M	Front Face	23230	ANT2	Full	1	1	0	-	24.00	22.58	0.03	0.531	1.000	1.387	**0.74**
P34	LTE 14	QPSK10M	Front Face	23330	ANT2	Full	1	1	0	-	24.00	22.64	-0.02	0.552	1.000	1.368	**0.75**
P35	LTE 25/2	QPSK20M	Right Side	26140	ANT1	Full	1	1	0	-	24.00	23.42	-0.13	0.592	1.000	1.143	**0.68**
P36	LTE 26	QPSK15M	Front Face	26865	ANT2	Full	1	1	0	-	24.00	22.38	0.01	0.476	1.000	1.452	**0.69**
P37	LTE 30	QPSK10M	Bottom Side	27710	ANT2	Reduce	1	1	0	-	22.00	21.93	0.14	0.811	1.000	1.016	**0.82**
P38	LTE 41/38	QPSK20M	Right Side	41055	ANT3	Full	1	1	0	62.9	21.00	19.87	0.01	0.402	1.006	1.297	**0.52**
P39	LTE 42 Part27Q	QPSK20M	Right Side	42590	ANT7	Full	1	1	50	62.9	24.00	22.82	0.17	0.342	1.006	1.312	**0.45**
P40	LTE 48/43/42	QPSK20M	Bottom Side	56640	ANT7	Full	1	1	99	62.9	24.00	23.03	0.04	0.552	1.006	1.250	**0.69**
P41	LTE 66/4	QPSK20M	Right Side	132572	ANT1	Full	1	1	0	-	24.00	23.56	-0.09	0.579	1.000	1.107	**0.64**
P42	LTE 71	QPSK20M	Rear Face	133372	ANT2	Full	1	1	0	-	24.00	22.66	-0.11	0.253	1.000	1.361	**0.34**
P43	NR n5	DFT-QPSK20M	Front Face	166800	ANT2	Full	1	1	1	-	24.00	23.32	-0.12	0.487	1.000	1.169	**0.57**
P44	NR n7	DFT-QPSK40M	Rear Face	503500	ANT1	Full	1	1	1	-	24.00	23.71	-0.06	0.496	1.000	1.069	**0.53**
P45	NR n12	DFT-QPSK15M	Rear Face	141700	ANT2	Full	1	1	1	-	24.00	23.33	-0.10	0.338	1.000	1.167	**0.39**
P45-1	NR n14	DFT-QPSK10M	Front Face	158600	ANT2	Full	1	25	14	-	24.00	23.18	0.02	0.503	1.000	1.208	**0.61**
P46	NR n25/n2	DFT-QPSK40M	Right Side	376500	ANT1	Full	1	1	1	-	24.00	23.38	0.08	0.507	1.000	1.153	**0.58**
P47	NR n30	DFT-QPSK10M	Bottom Side	462000	ANT2	Reduce	1	25	14	-	22.00	21.83	0.04	0.886	1.000	1.040	**0.92**
	NR n30	DFT-QPSK10M	Bottom Side	462000	ANT2	Reduce	1	25	14	-	22.00	21.83	0.14	0.862	1.000	1.040	0.90
P48	NR n41/n38	DFT-QPSK100M	Rear Face	509202	ANT1	Full	1	135	69	-	24.00	23.22	-0.10	0.194	1.000	1.197	**0.23**
P49	NR n48	DFT-QPSK40M	Right Side	645332	ANT7	Full	1	1	1	-	24.00	23.21	-0.03	0.352	1.000	1.199	**0.42**
P50	NR n66	DFT-QPSK40M	Right Side	346000	ANT1	Full	1	1	1	-	24.00	23.52	0.06	0.388	1.000	1.117	**0.43**
P51	NR n71	DFT-QPSK20M	Rear Face	137600	ANT2	Full	1	50	28	-	24.00	23.37	0.02	0.296	1.000	1.156	**0.34**
P52	NR n77 Part27Q	DFT-QPSK100M	Rear Face	633334	ANT4	Full	1	1	1	-	24.00	22.22	0.09	0.450	1.000	1.507	**0.68**
P53	NR n77 Part27O	DFT-QPSK100M	Left Side	662000	ANT5	Full	1	135	69	-	21.00	19.60	-0.05	0.464	1.000	1.380	**0.64**
P54	WLAN2.4G	802.11b	Left Side	6	ANT8+9	Full	1	-	-	98.51	18.00	16.41	-0.14	0.218	1.015	1.442	**0.32**
P55	WLAN5.2G	802.11a	Rear Face	48	ANT8+9	Full	1	-	-	99.05	15.00	14.49	-0.01	0.129	1.010	1.125	**0.15**
P56	WLAN5.8G	802.11a	Rear Face	157	ANT8+9	Full	1	-	-	99.05	14.50	13.98	-0.02	0.167	1.010	1.127	**0.19**
P57	BT	GFSK	Top Side	39	ANT8	Full	1	-	-	76.8	8.00	7.49	0.01	0.016	1.302	1.125	**0.02**

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	Separation Distance (cm)	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
NR n30	Rear Face	1.0	462000	1.020	0.992	1.028	N/A	N/A	N/A	N/A

4.6.5 Simultaneous Multi-band Transmission Evaluation

The simultaneous transmission possibilities for this device are listed as below.

Simultaneous TX Combination	Capable Transmit Configurations	Body worn	Hotspot
1	WWAN + BT	Yes	
2	WWAN + WLAN2.4G	Yes	
3	WWAN + WLAN5G	Yes	
4	WWAN + WLAN2.4G + WLAN5G	Yes	
5	WWAN + WLAN5G + BT	Yes	

<SAR Summation Analysis>

Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneous transmitting antenna. When the sum of SAR_{1g} of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit (SAR_{1g} 1.6 W/kg), the simultaneous transmission SAR is not required. When the sum of SAR_{1g} is greater than the SAR limit (SAR_{1g} 1.6 W/kg), SAR test exclusion is determined by the SPLSR.

Note:

1. The detail sim-tx analysis please refer to Appendix E.
2. Except for the data that was verified to be higher than the original report, all the data use for the Simultaneous Transmission analysis on this report was copied from the original report (Report No.: W7L-P24030018SA01, FCC ID: 2AACZ-M440A01, issued by: BV 7LAYERS COMMUNICATIONS TECHNOLOGY (SHENZHEN) CO. LTD.).

Test Engineer： Jiawei Tu, and Rikou Lu.

5. Calibration of Test Equipment

Equipment	Manufacturer	Model	SN	Cal. Date	Due Data
System Validation Dipole	SPEAG	D750V3	1067	Jun. 17, 2024	Jun. 16, 2025
System Validation Dipole	SPEAG	D835V2	4d139	Jun. 16, 2024	Jun. 15, 2025
System Validation Dipole	SPEAG	D1750V2	1071	Jun. 17, 2024	Jun. 16, 2025
System Validation Dipole	SPEAG	D1900V2	5d159	Jun. 15, 2024	Jun. 14, 2025
System Validation Dipole	SPEAG	D2300V2	1053	Jun. 16, 2024	Jun. 16, 2025
System Validation Dipole	SPEAG	D2450V2	893	Jun. 15, 2024	Jun. 14, 2025
System Validation Dipole	SPEAG	D2600V2	1110	Jun. 17, 2024	Jun. 16, 2025
System Validation Dipole	SPEAG	D3500V2	1111	Oct. 21, 2021	Oct. 18, 2024
System Validation Dipole	SPEAG	D3700V2	1082	Oct. 20, 2021	Oct. 17, 2024
System Validation Dipole	SPEAG	D3900V2	1055	Oct. 25, 2021	Oct. 22, 2024
System Validation Dipole	SPEAG	D5GHzV2	1133	Jun. 15, 2024	Jun. 14, 2025
Dosimetric E-Field Probe	SPEAG	EX3DV4	7612	Mar. 20, 2024	Mar. 19, 2025
Data Acquisition Electronics	SPEAG	DAE4	1389	Nov. 03, 2023	Nov. 02, 2024
Dielectric Probe Kit	SPEAG	DAK-3.5	1076	Aug. 20, 2024	Aug. 19, 2025
Radio Communication Analyzer	ANRITSU	MT8820C	6201465426	Jan. 31, 2024	Jan. 30, 2025
Wireless Communication Test Set	Agilent	E5515C	MY50260600	Apr. 28, 2024	Apr. 27, 2025
ENA Series Network Analyzer	Agilent	E5071C	MY46214638	Apr. 28, 2024	Apr. 27, 2025
Spectrum Analyzer	KEYSIGHT	N9010A	MY54510355	Jan. 31, 2024	Jan. 30, 2025
MXG Analog Signal Generator	KEYSIGHT	N5183A	MY50143024	Jan. 31, 2024	Jan. 30, 2025
Power Meter	Agilent	N1914A	MY52180044	Jan. 30, 2024	Jan. 29, 2025
Power Sensor	Agilent	E9304A H18	MY52050011	Jan. 30, 2024	Jan. 29, 2025
Power Meter	ANRITSU	ML2495A	1506002	Jan. 30, 2024	Jan. 29, 2025
Power Sensor	ANRITSU	MA2411B	1339353	Jan. 30, 2024	Jan. 29, 2025
Temp. & Humi. Recorder	HUATO	A2000TH	HE20107712	Apr. 29, 2024	Apr. 28, 2025
Electronic Thermometer	YONGFA	YF-160A	120100323	Apr. 29, 2024	Apr. 28, 2025
Coupler	Woken	0110A056020-10	COM27RW1A3	May. 20, 2024	May. 19, 2025

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

DASY5 Uncertainty Budget								
Error Description	**Uncertainty Value (±%)**	**Probability**	**Divisor**	**(Ci) 1g**	**(Ci) 10g**	**Standard Uncertainty (1g) (±%)**	**Standard Uncertainty (10g) (±%)**	**(Vi) Veff**
Measurement System								
Probe Calibration	6.0	N	1	1	1	6.0	6.0	∞
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	1.0	R	1.732	1	1	0.6	0.6	∞
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	2.9	R	1.732	1	1	1.7	1.7	∞
Max. SAR Eval.	2.0	R	1.732	1	1	1.2	1.2	∞
Test Sample Related								
Device Positioning	3.0	N	1	1	1	3.0	3.0	35
Device Holder	3.6	N	1	1	1	3.6	3.6	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	6.1	R	1.732	1	1	3.5	3.5	∞
SAR correction	0.0	R	1.732	1	0.84	0.0	0.0	∞
Liquid Conductivity Repeatability	0.2	N	1	0.78	0.71	0.1	0.1	5
Liquid Conductivity (target)	5.0	R	1.732	0.78	0.71	2.3	2.0	∞
Liquid Conductivity (mea.)	2.5	R	1.732	0.78	0.71	1.1	1.0	∞
Temp. unc. - Conductivity	3.4	R	1.732	0.78	0.71	1.5	1.4	∞
Liquid Permittivity Repeatability	0.15	N	1	0.23	0.26	0.0	0.0	5
Liquid Permittivity (target)	5.0	R	1.732	0.23	0.26	0.7	0.8	∞
Liquid Permittivity (mea.)	2.5	R	1.732	0.23	0.26	0.3	0.4	∞
Temp. unc. - Permittivity	0.83	R	1.732	0.23	0.26	0.1	0.1	∞
Combined Std. Uncertainty						11.4%	11.4%	1013
Coverage Factor for 95 %						K=2	K=2	
Expanded STD Uncertainty						22.9%	22.7%	

Uncertainty budget for frequency range 30 MHz to 3 GHz

DASY5 Uncertainty Budget								
Error Description	**Uncertainty Value (±%)**	**Probability**	**Divisor**	**(Ci) 1g**	**(Ci) 10g**	**Standard Uncertainty (1g) (±%)**	**Standard Uncertainty (10g) (±%)**	**(Vi) Veff**
Measurement System								
Probe Calibration	6.55	N	1	1	1	6.5	6.5	∞
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	3.0	N	1	1	1	3.0	3.0	35
Device Holder	3.6	N	1	1	1	3.6	3.6	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	0.2	N	1	0.78	0.71	0.1	0.1	5
Liquid Conductivity (target)	5.0	R	1.732	0.78	0.71	2.3	2.0	∞
Liquid Conductivity (mea.)	2.5	R	1.732	0.78	0.71	1.1	1.0	∞
Temp. unc. - Conductivity	3.4	R	1.732	0.78	0.71	1.5	1.4	∞
Liquid Permittivity Repeatability	0.15	N	1	0.23	0.26	0.0	0.0	5
Liquid Permittivity (target)	5.0	R	1.732	0.23	0.26	0.7	0.8	∞
Liquid Permittivity (mea.)	2.5	R	1.732	0.23	0.26	0.3	0.4	∞
Temp. unc. - Permittivity	0.83	R	1.732	0.23	0.26	0.1	0.1	∞
Combined Std. Uncertainty						12.5%	12.5%	1458
Coverage Factor for 95 %						K=2	K=2	
Expanded STD Uncertainty						25.0%	24.9%	

Uncertainty budget for frequency range 3 GHz to 6 GHz

7. Information on the Testing Laboratories

We, BV 7LAYERS COMMUNICATIONS TECHNOLOGY (SHENZHEN) CO. LTD., were founded in 2015 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

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

Add: Room B37, Warehouse A5, No.3 Chiwan 4th Road, Zhaoshang Street, Nanshan district, Shenzhen, P.R.C
Tel: 86-755-8869-6566
Fax: 86-755-8869-6577

Email: customerservice.sw@cn.bureauveritas.com
Web Site: www.bureauveritas.com

The road map of all our labs can be found in our web site also.

---END---

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: BV 7LAYERS SAR/HAC Testing Lab Date: 2024/09/13

System Check_HSL750_20240913

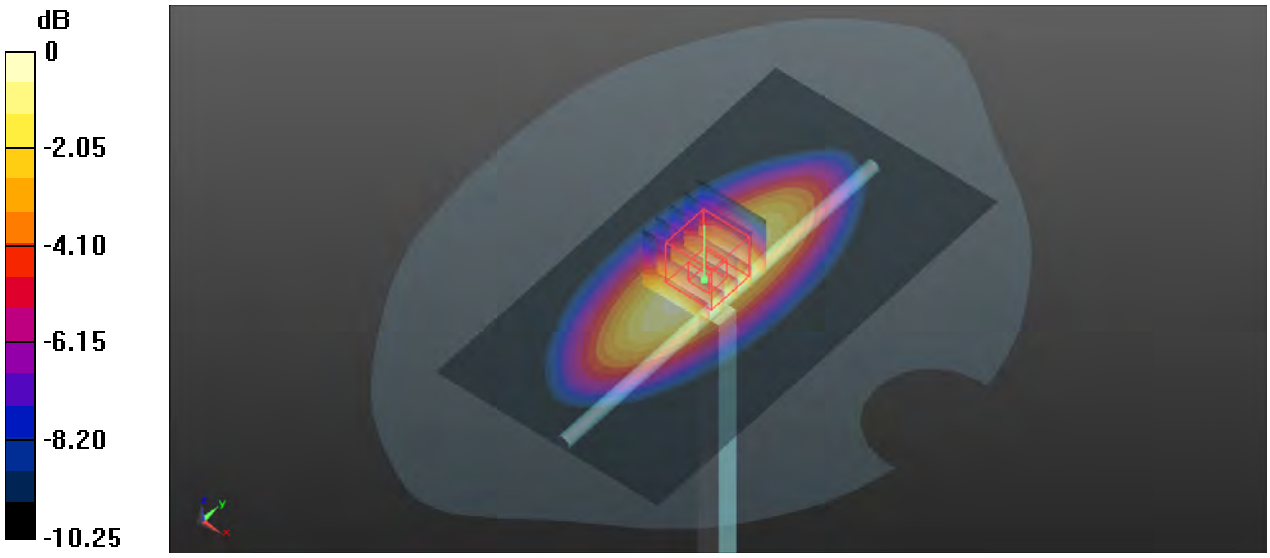
DUT: Dipole:750 MHz;Type:D750V3

Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: HSL750_0913 Medium parameters used: f = 750 MHz; σ = 0.891 S/m; ε_r = 40.775; ρ = 1000 kg/m^3
Ambient Temperature：23.4℃; Liquid Temperature：22.6℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7612; ConvF(11.4, 11.4, 11.4) @ 750 MHz; Calibrated: 2024/03/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1389; Calibrated: 2023/11/03
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1781
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=250mW/Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.88 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 = 0.09 dB
Peak SAR (extrapolated) = 3.24 W/kg
SAR(1 g) = 2.18 W/kg; SAR(10 g) = 1.45 W/kg
Smallest distance from peaks to all points 3 dB below = 17.9 mm
Ratio of SAR at M2 to SAR at M1 = 67.2%
Maximum value of SAR (measured) = 2.89 W/kg



0 dB = 2.89 W/kg

System Check_HSL835_20240913

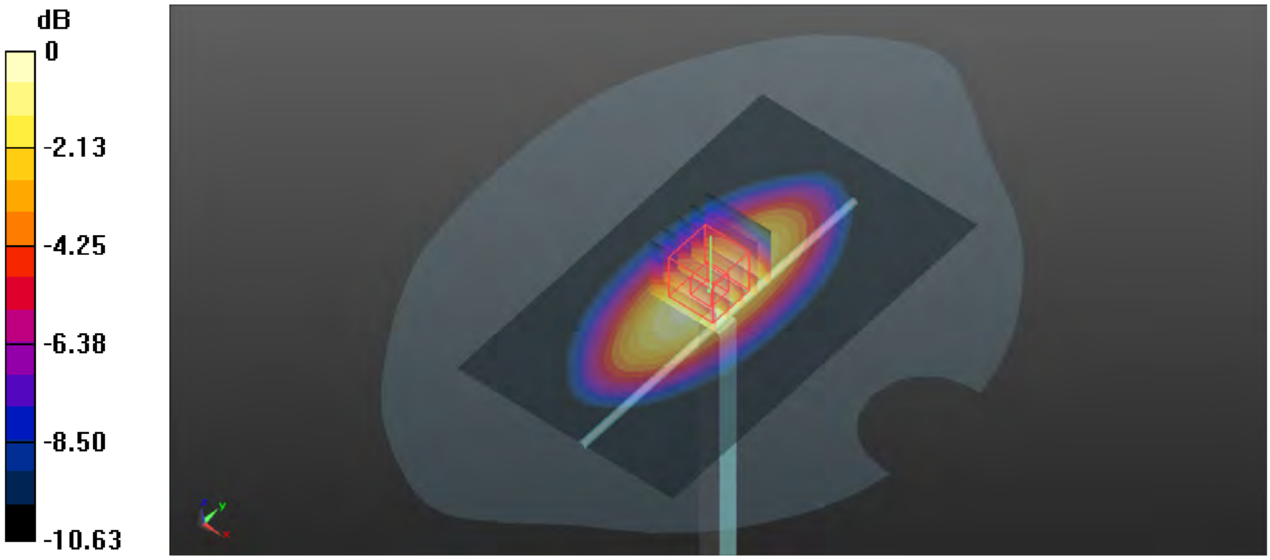
DUT: Dipole:835 MHz;Type:D835V2

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: HSL835_0913 Medium parameters used: f = 835 MHz; σ = 0.916 S/m; ε_r = 42.727; ρ = 1000 kg/m^3
Ambient Temperature：23.2℃; Liquid Temperature：22.5℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7612; ConvF(10.96, 10.96, 10.96) @ 835 MHz; Calibrated: 2024/03/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1389; Calibrated: 2023/11/03
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1781
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=250mW/Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 3.25 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 57.51 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 3.64 W/kg
SAR(1 g) = 2.44 W/kg; SAR(10 g) = 1.6 W/kg
Smallest distance from peaks to all points 3 dB below = 16 mm
Ratio of SAR at M2 to SAR at M1 = 66.7%
Maximum value of SAR (measured) = 3.25 W/kg



0 dB = 3.25 W/kg

System Check_HSL1750_20240913

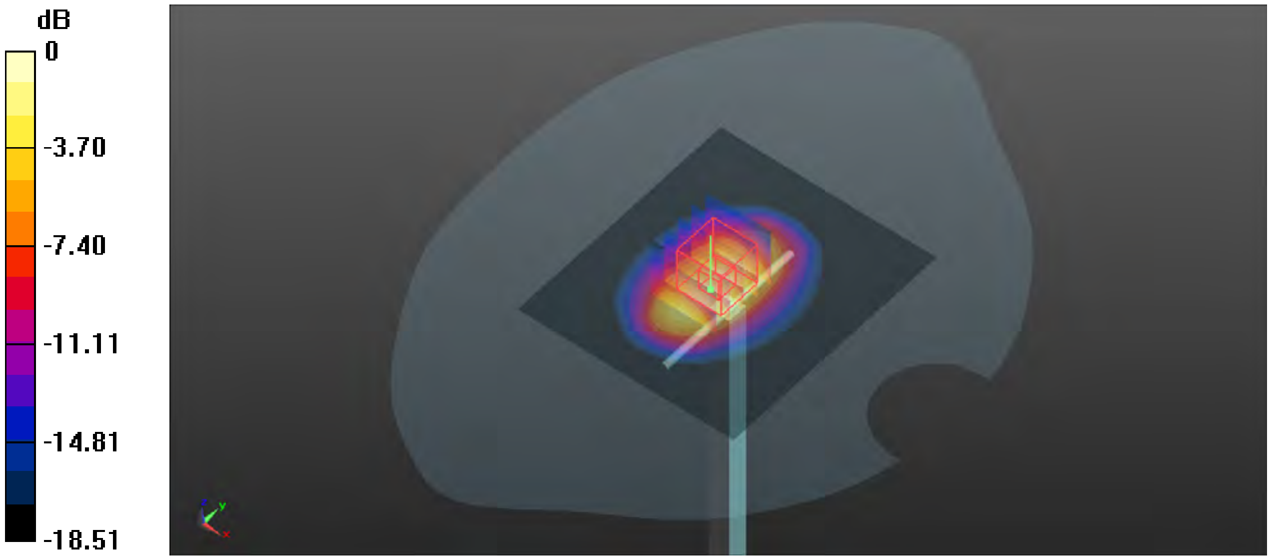
DUT: Dipole:1750 MHz;Type:D1750V2

Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: HSL1750_0913 Medium parameters used: f = 1750 MHz; σ = 1.348 S/m; ε_r = 41.854; ρ = 1000 kg/m^3
Ambient Temperature：23.4℃; Liquid Temperature：22.6℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7612; ConvF(9.2, 9.2, 9.2) @ 1750 MHz; Calibrated: 2024/03/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1389; Calibrated: 2023/11/03
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1781
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=250mW/Area Scan (71x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 14.8 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 105.0 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 17.6 W/kg
SAR(1 g) = 9.39 W/kg; SAR(10 g) = 4.91 W/kg
Smallest distance from peaks to all points 3 dB below = 10.7 mm
Ratio of SAR at M2 to SAR at M1 = 52.9%
Maximum value of SAR (measured) = 14.5 W/kg



0 dB = 14.5 W/kg

Test Laboratory: BV 7LAYERS SAR/HAC Testing Lab Date: 2024/09/13

System Check_HSL1900_20240913

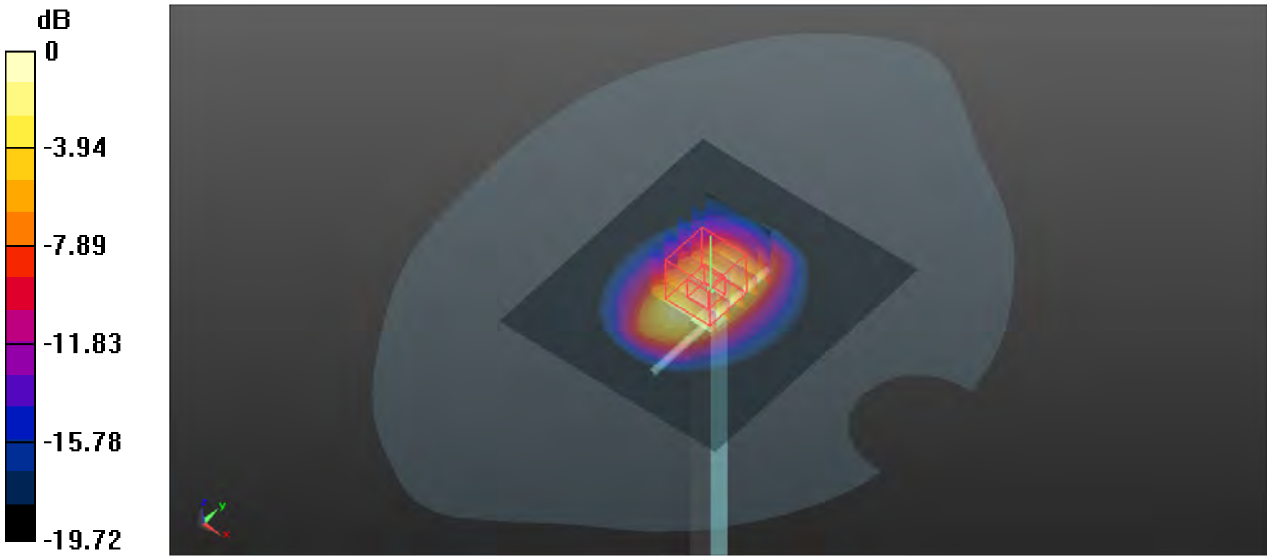
DUT: Dipole:1900MHz;Type:D1900V2

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: HSL1900_0913 Medium parameters used: f = 1900 MHz; σ = 1.43 S/m; ε_r = 40.323; ρ = 1000 kg/m^3
Ambient Temperature：23.5℃; Liquid Temperature：22.4℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7612; ConvF(8.83, 8.83, 8.83) @ 1900 MHz; Calibrated: 2024/03/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1389; Calibrated: 2023/11/03
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1781
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=250mW/Area Scan (71x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 16.0 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 102.0 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 19.6 W/kg
SAR(1 g) = 10.2 W/kg; SAR(10 g) = 5.17 W/kg
Smallest distance from peaks to all points 3 dB below = 9.7 mm
Ratio of SAR at M2 to SAR at M1 = 51.3%
Maximum value of SAR (measured) = 16.2 W/kg



0 dB = 16.2 W/kg

Test Laboratory: BV 7LAYERS SAR/HAC Testing Lab　　　　　　　　　　Date: 2024/09/13

System Check_HSL2300_20240913

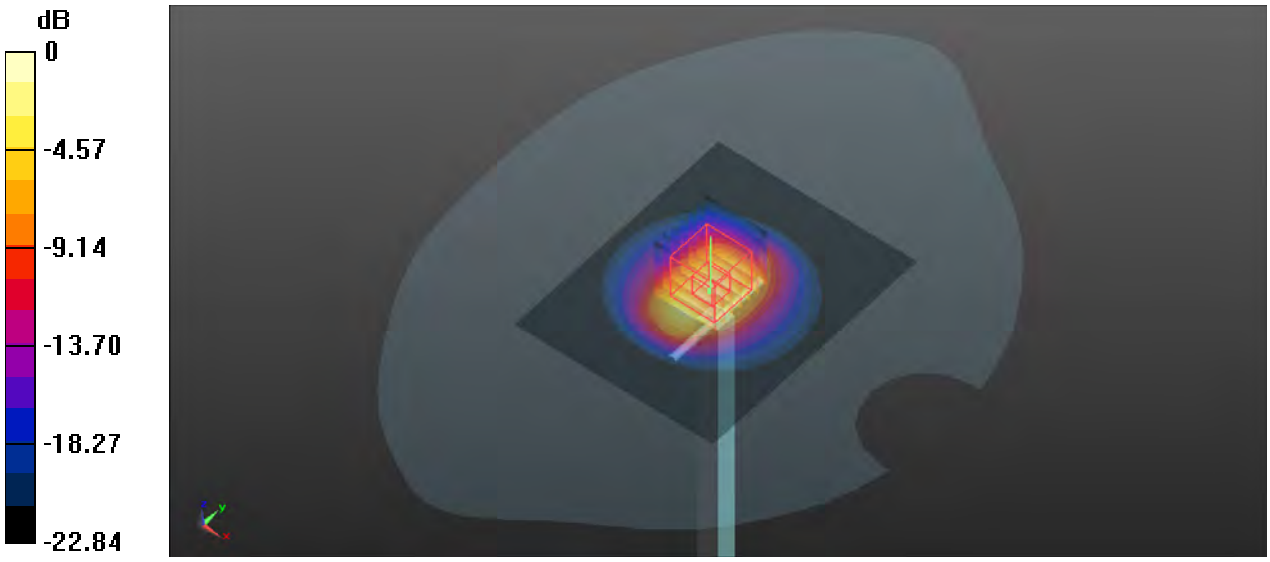
DUT: Dipole:2300 MHz;Type:D2300V2

Communication System: CW; Frequency: 2300 MHz;Duty Cycle: 1:1
Medium: HSL2300_0913 Medium parameters used: f = 2300 MHz; σ = 1.665 S/m; ε_r = 39.075; ρ = 1000 kg/m^3
Ambient Temperature：23.5℃; Liquid Temperature：22.6℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7612; ConvF(8.46, 8.46, 8.46) @ 2300 MHz; Calibrated: 2024/03/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1389; Calibrated: 2023/11/03
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1781
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=250mW/Area Scan (81x101x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 21.1 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 105.5 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 26.9 W/kg
SAR(1 g) = 12.4 W/kg; SAR(10 g) = 5.68 W/kg
Smallest distance from peaks to all points 3 dB below = 9.8 mm
Ratio of SAR at M2 to SAR at M1 = 45.7%
Maximum value of SAR (measured) = 21.4 W/kg



0 dB = 21.4 W/kg

System Check_HSL2450_20240913

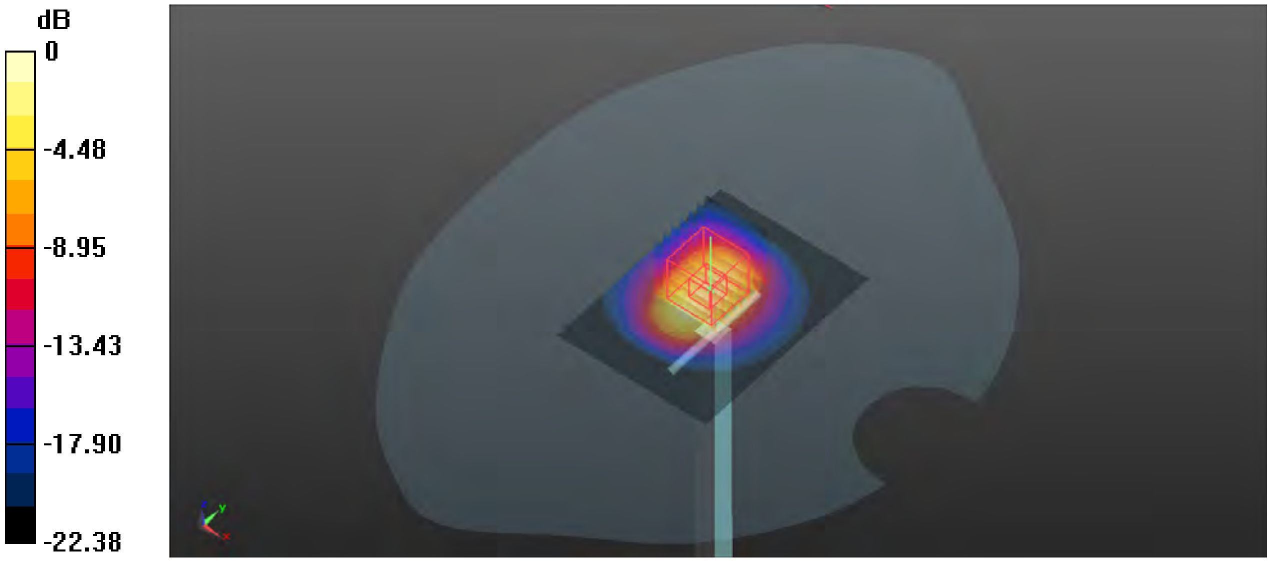
DUT: Dipole:2450 MHz;Type:D2450V2

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: HSL2450_0913 Medium parameters used: f = 2450 MHz; σ = 1.795 S/m; ε_r = 38.824; ρ = 1000 kg/m^3
Ambient Temperature：23.3℃; Liquid Temperature：22.3℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7612; ConvF(8.2, 8.2, 8.2) @ 2450 MHz; Calibrated: 2024/03/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1389; Calibrated: 2023/11/03
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1781
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=250mW/Area Scan (61x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 22.0 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 92.18 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 26.6 W/kg
SAR(1 g) = 12.5 W/kg; SAR(10 g) = 5.82 W/kg
Smallest distance from peaks to all points 3 dB below = 9 mm
Ratio of SAR at M2 to SAR at M1 = 47.6%
Maximum value of SAR (measured) = 20.9 W/kg



0 dB = 20.9 W/kg = 13.20 dBW/kg

Test Laboratory: BV 7LAYERS SAR/HAC Testing Lab Date: 2024/09/13

System Check_HSL2600_20240913

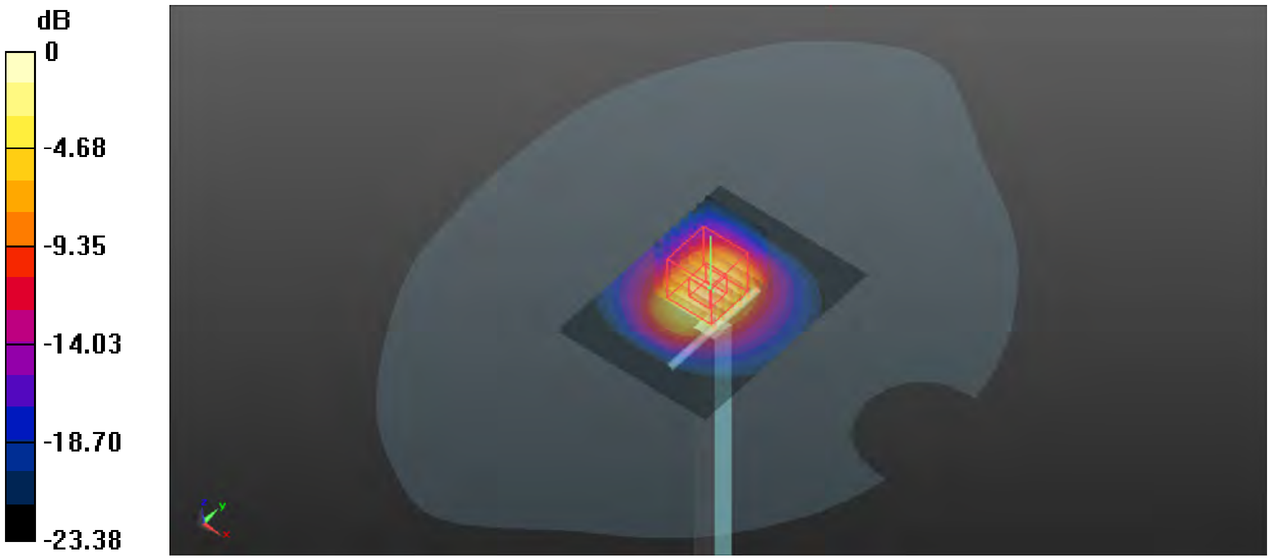
DUT: Dipole:2600 MHz;Type:D2600V2

Communication System: CW; Frequency: 2600 MHz;Duty Cycle: 1:1
Medium: HSL2600_0913 Medium parameters used: f = 2600 MHz; σ = 1.989 S/m; ε_r = 38.319; ρ = 1000 kg/m^3
Ambient Temperature：23.4℃; Liquid Temperature：22.7℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7612; ConvF(8.01, 8.01, 8.01) @ 2450 MHz; Calibrated: 2024/03/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1389; Calibrated: 2023/11/03
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1781
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=250mW/Area Scan (61x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 24.0 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 95.96 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 29.5 W/kg
SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6.01 W/kg
Smallest distance from peaks to all points 3 dB below = 9 mm
Ratio of SAR at M2 to SAR at M1 = 45.5%
Maximum value of SAR (measured) = 23.0 W/kg



0 dB = 23.0 W/kg = 13.62 dBW/kg

Test Laboratory: BV 7LAYERS SAR/HAC Testing Lab Date: 2024/09/14

System Check_HSL3500_20240914

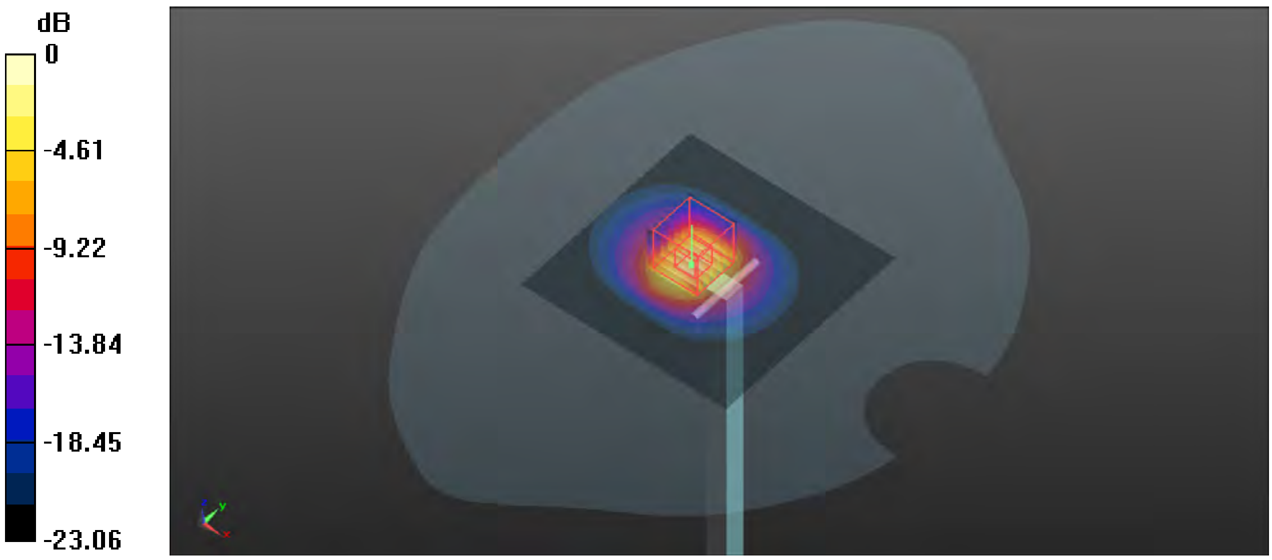
DUT: Dipole 3500 MHz;Type:D3500V2

Communication System: CW; Frequency: 3500 MHz;Duty Cycle: 1:1
Medium: HSL3500_0914 Medium parameters used: f = 3500 MHz; σ = 2.821 S/m; ε_r = 39.681; ρ = 1000 kg/m^3
Ambient Temperature：23.5℃; Liquid Temperature：22.5℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7612; ConvF(7.45, 7.45, 7.45) @ 3500 MHz; Calibrated: 2024/03/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1389; Calibrated: 2023/11/03
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1781
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=100mW/Area Scan (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 11.6 W/kg

Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 40.37 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 16.2 W/kg
SAR(1 g) = 6.1 W/kg; SAR(10 g) = 2.32 W/kg
Smallest distance from peaks to all points 3 dB below = 8 mm
Ratio of SAR at M2 to SAR at M1 = 66.7%
Maximum value of SAR (measured) = 11.9 W/kg



0 dB = 11.9 W/kg

System Check_HSL3700_20240914

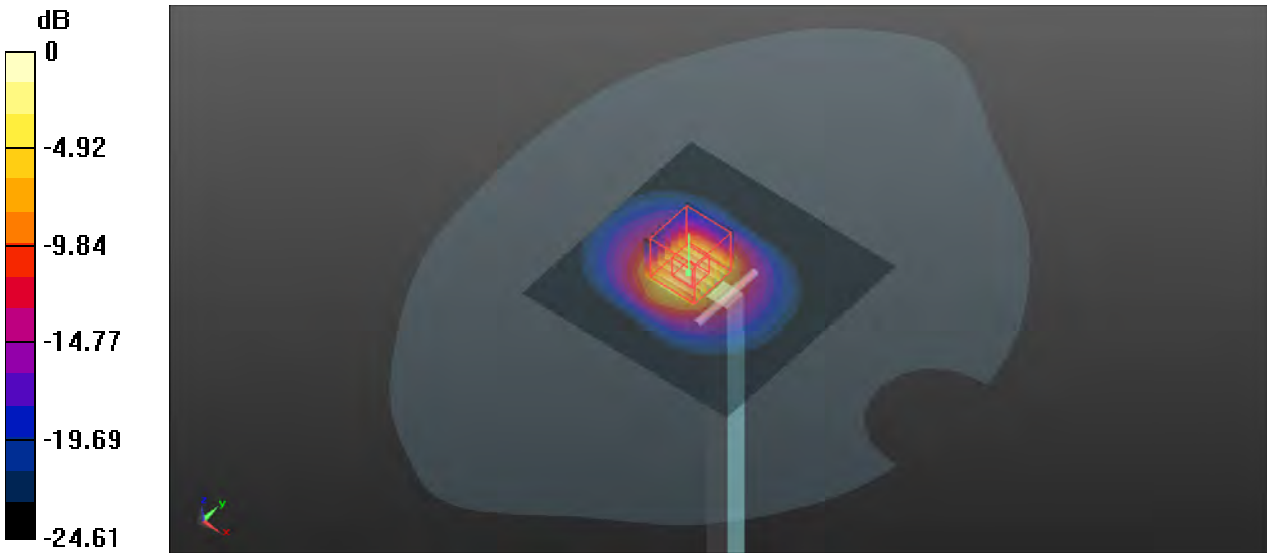
DUT: Dipole 3700 MHz;Type:D3700V2

Communication System: CW; Frequency: 3700 MHz;Duty Cycle: 1:1
Medium: HSL3700_0914 Medium parameters used: f = 3700 MHz; σ = 3.01 S/m; ε_r = 39.36; ρ = 1000 kg/m^3
Ambient Temperature：23.5℃; Liquid Temperature：22.4℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7612; ConvF(7.18, 7.18, 7.18) @ 3700 MHz; Calibrated: 2024/03/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1389; Calibrated: 2023/11/03
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1781
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=100mW/Area Scan (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 12.4 W/kg

Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 37.08 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 16.2 W/kg
SAR(1 g) = 6.18 W/kg; SAR(10 g) = 2.27 W/kg
Smallest distance from peaks to all points 3 dB below = 8.6 mm
Ratio of SAR at M2 to SAR at M1 = 66.1%
Maximum value of SAR (measured) = 12.1 W/kg



0 dB = 12.1 W/kg = 10.83 dBW/kg

Test Laboratory: BV 7LAYERS SAR/HAC Testing Lab Date: 2024/09/14

System Check_HSL3900_20240914

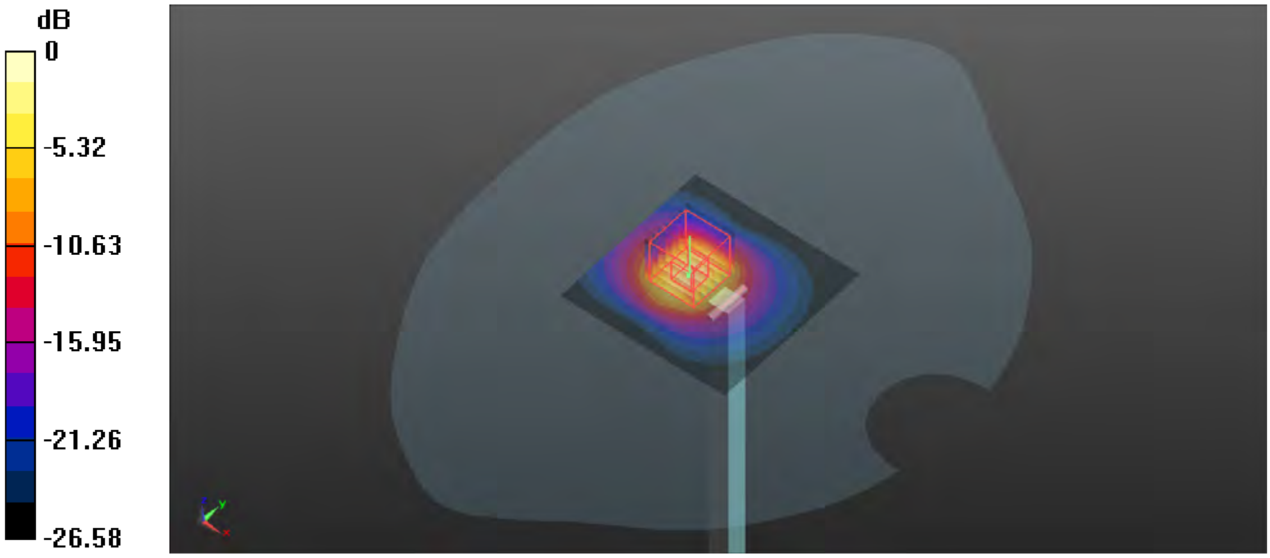
DUT: Dipole 3900 MHz;Type:D3900V2

Communication System: CW; Frequency: 3900 MHz;Duty Cycle: 1:1
Medium: HSL3900_0914 Medium parameters used: f = 3900 MHz; σ = 3.213 S/m; ε_r = 39.069; ρ = 1000 kg/m^3
Ambient Temperature：23.4℃; Liquid Temperature：22.6℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7612; ConvF(6.9, 6.9, 6.9) @ 3900 MHz; Calibrated: 2024/03/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1389; Calibrated: 2023/11/03
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1781
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=100mW/Area Scan (81x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 14.2 W/kg

Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 33.60 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 19.8 W/kg
SAR(1 g) = 6.93 W/kg; SAR(10 g) = 2.43 W/kg
Smallest distance from peaks to all points 3 dB below = 7.9 mm
Ratio of SAR at M2 to SAR at M1 = 64.5%
Maximum value of SAR (measured) = 14.3 W/kg



0 dB = 14.3 W/kg

Test Laboratory: BV 7LAYERS SAR/HAC Testing Lab Date: 2024/09/14

System Check_HSL5250_20240914

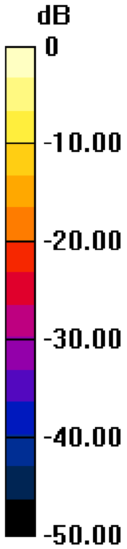
DUT: Dipole 5GHzV2;Type:D5GHzV2

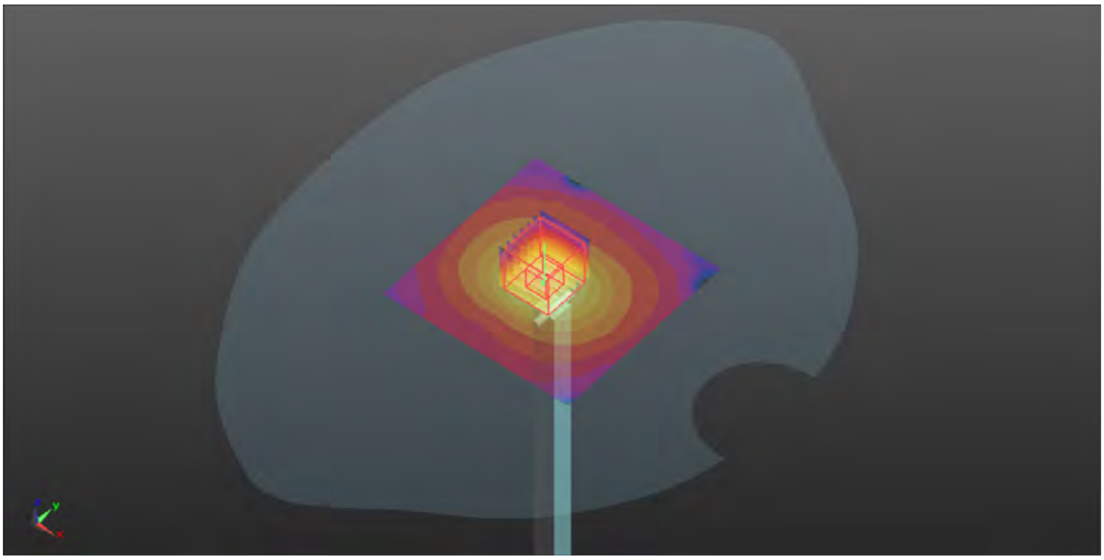
Communication System: CW; Frequency: 5250 MHz;Duty Cycle: 1:1
Medium: HSL5G_0914 Medium parameters used: f = 5250 MHz; $\sigma = 4.631$ S/m; $\varepsilon_r = 36.197$; $\rho = 1000$ kg/m^3
Ambient Temperature：23.4℃; Liquid Temperature：22.5℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7612; ConvF(5.75, 5.75, 5.75) @ 5250 MHz; Calibrated: 2024/03/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1389; Calibrated: 2023/11/03
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1781
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 13.4 W/kg

Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 57.56 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 27.6 W/kg
SAR(1 g) = 7.19 W/kg; SAR(10 g) = 2.04 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 56.6%
Maximum value of SAR (measured) = 14.5 W/kg





0 dB = 14.5 W/kg

Test Laboratory: BV 7LAYERS SAR/HAC Testing Lab Date: 2024/09/14

System Check_HSL5600_20240914

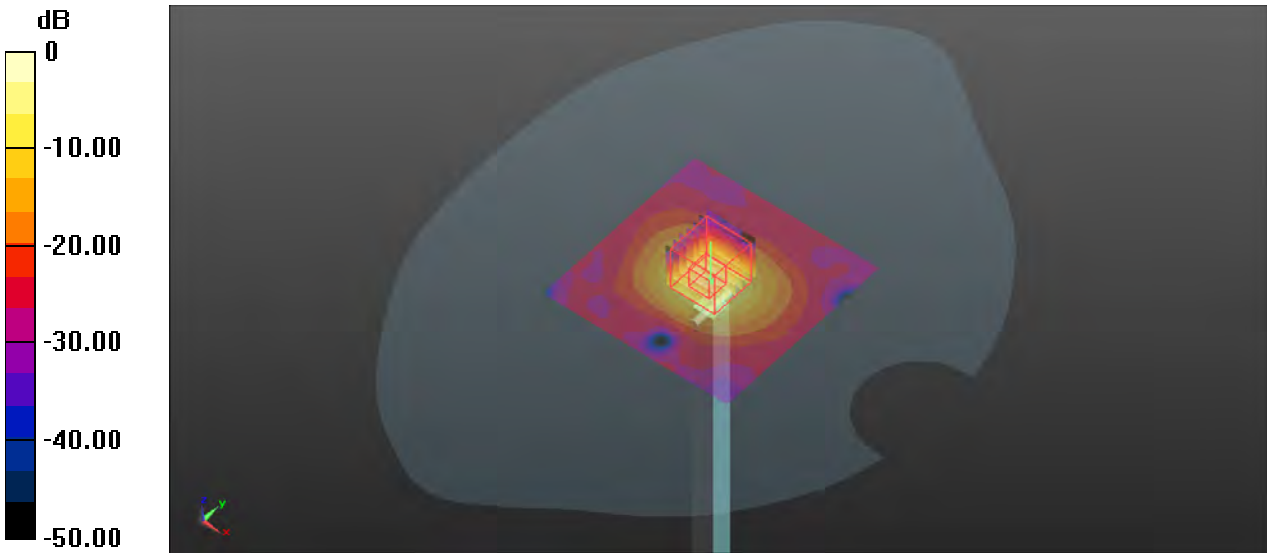
DUT: Dipole 5GHzV2;Type:D5GHzV2

Communication System: CW; Frequency: 5600 MHz;Duty Cycle: 1:1
Medium: HSL5G_0914 Medium parameters used: f = 5600 MHz; σ = 5.014 S/m; ε_r = 35.633; ρ = 1000 kg/m^3
Ambient Temperature：23.6℃; Liquid Temperature：22.5℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7612; ConvF(5.06, 5.06, 5.06) @ 5600 MHz; Calibrated: 2024/03/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1389; Calibrated: 2023/11/03
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1781
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 14.7 W/kg

Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 56.61 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 31.1 W/kg
SAR(1 g) = 7.61 W/kg; SAR(10 g) = 2.15 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 52.2%
Maximum value of SAR (measured) = 15.6 W/kg



0 dB = 15.6 W/kg

Test Laboratory: BV 7LAYERS SAR/HAC Testing Lab　　　　Date: 2024/09/14

System Check_HSL5750_20240914

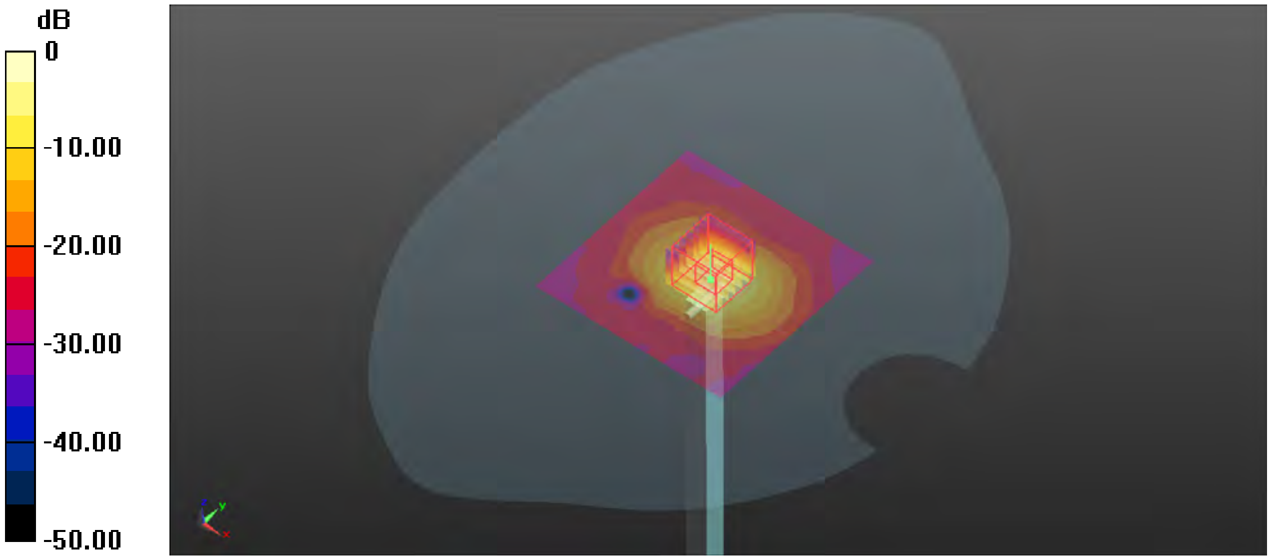
DUT: Dipole 5GHzV2;Type:D5GHzV2

Communication System: CW; Frequency: 5750 MHz;Duty Cycle: 1:1
Medium: HSL5G_0914 Medium parameters used: f = 5750 MHz; σ = 5.2 S/m; ε_r = 35.196; ρ = 1000 kg/m^3
Ambient Temperature：23.6℃; Liquid Temperature：22.6℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7612; ConvF(5.2, 5.2, 5.2) @ 5750 MHz; Calibrated: 2024/03/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1389; Calibrated: 2023/11/03
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1781
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 13.2 W/kg

Pin=100mW/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 55.24 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 29.5 W/kg
SAR(1 g) = 7.29 W/kg; SAR(10 g) = 2.04 W/kg
Smallest distance from peaks to all points 3 dB below = 7.9 mm
Ratio of SAR at M2 to SAR at M1 = 52.9%
Maximum value of SAR (measured) = 13.6 W/kg



0 dB = 13.6 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.

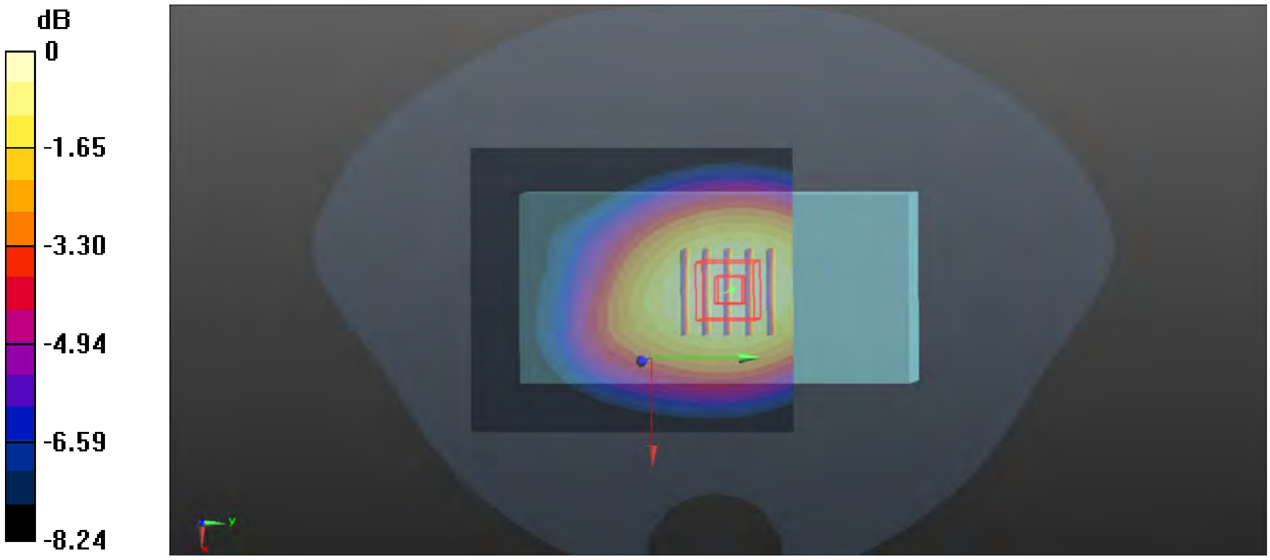
P01 LTE 5_QPSK10M_Front Face_1cm_Ch20600_1RB_OS0_Ant2

Communication System: LTE; Frequency: 844 MHz;Duty Cycle: 1:1
Medium: HSL835_0913 Medium parameters used: f = 844 MHz; σ = 0.925 S/m; ε_r = 42.612; ρ = 1000 kg/m^3
Ambient Temperature：23.2℃; Liquid Temperature：22.5℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7612; ConvF(10.96, 10.96, 10.96) @ 844 MHz; Calibrated: 2024/03/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1389; Calibrated: 2023/11/03
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1781
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

- Area Scan (71x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.533 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.09 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.638 W/kg
SAR(1 g) = 0.508 W/kg; SAR(10 g) = 0.380 W/kg
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 78%
Maximum value of SAR (measured) = 0.536 W/kg



0 dB = 0.536 W/kg

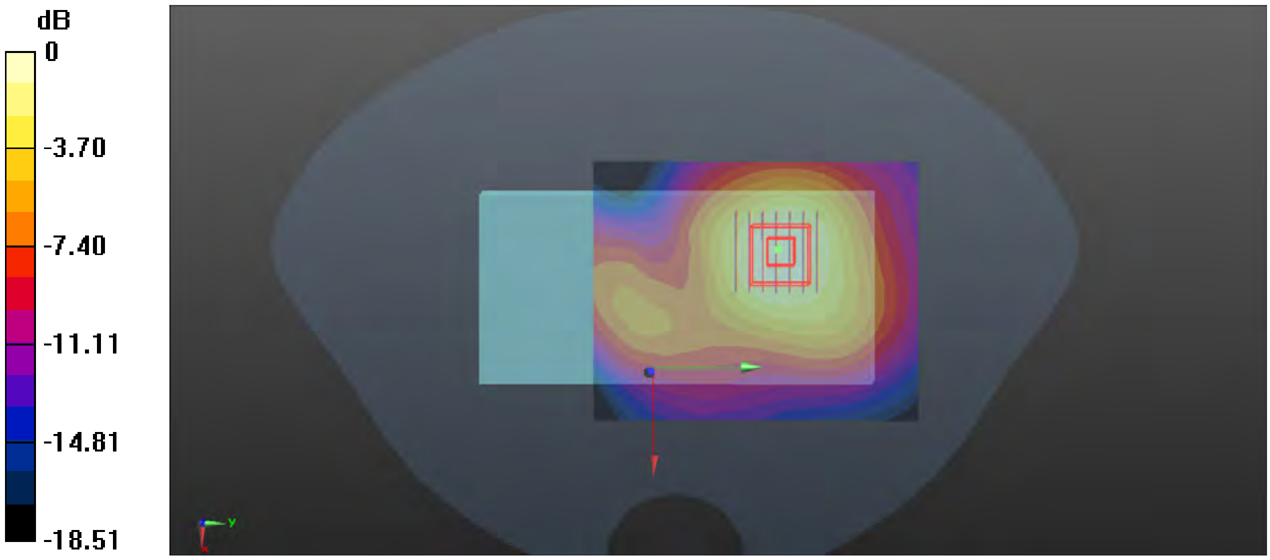
P02 LTE 7_QPSK20M_Rear Face_1cm_Ch21100_1RB_OS99_Ant1

Communication System: LTE; Frequency: 2535 MHz;Duty Cycle: 1:1
Medium: HSL2600_0913 Medium parameters used: f = 2535 MHz; σ = 1.919 S/m; ε_r = 38.558; ρ = 1000 kg/m^3
Ambient Temperature：23.4℃; Liquid Temperature：22.7℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7612; ConvF(8.01, 8.01, 8.01) @ 2535 MHz; Calibrated: 2024/03/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1389; Calibrated: 2023/11/03
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1781
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

- Area Scan (81x101x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.558 W/kg

- Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.558 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 0.916 W/kg
SAR(1 g) = 0.514 W/kg; SAR(10 g) = 0.290 W/kg
Smallest distance from peaks to all points 3 dB below = 17.9 mm
Ratio of SAR at M2 to SAR at M1 = 56.4%
Maximum value of SAR (measured) = 0.557 W/kg



0 dB = 0.557 W/kg

Test Laboratory: BV 7LAYERS SAR/HAC Testing Lab Date: 2024/09/13

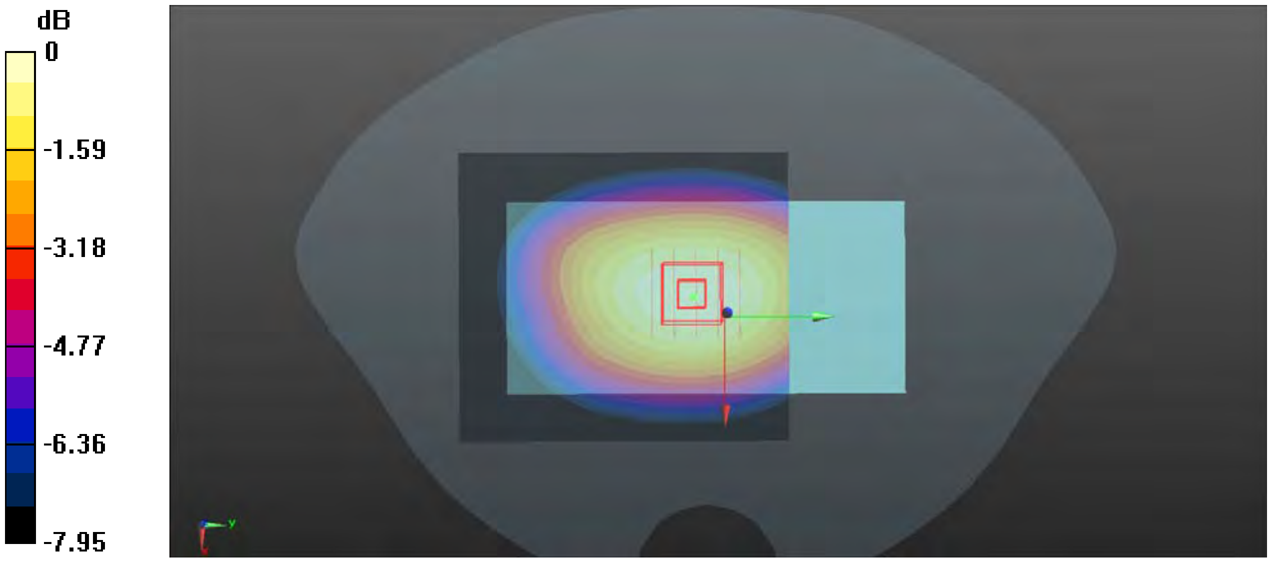
P03 LTE 12_QPSK10M_Front Face_1cm_Ch23130_1RB_OS49_Ant2

Communication System: LTE; Frequency: 711 MHz;Duty Cycle: 1:1
Medium: HSL750_0913 Medium parameters used: f = 711 MHz; $\sigma = 0.861$ S/m; $\varepsilon_r = 41.24$; $\rho = 1000$ kg/m^3
Ambient Temperature：23.4℃; Liquid Temperature：22.6℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7612; ConvF(11.4, 11.4, 11.4) @ 711 MHz; Calibrated: 2024/03/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1389; Calibrated: 2023/11/03
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1781
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

- Area Scan (71x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.402 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.81 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 0.483 W/kg
SAR(1 g) = 0.383 W/kg; SAR(10 g) = 0.287 W/kg
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 78.1%
Maximum value of SAR (measured) = 0.403 W/kg



0 dB = 0.403 W/kg

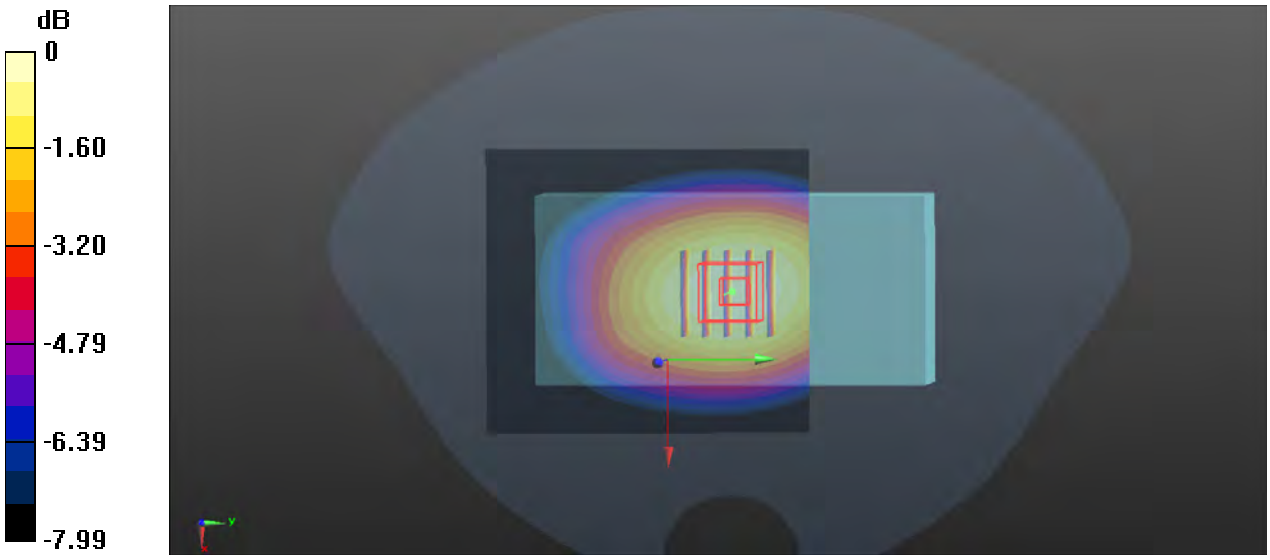
P04 LTE 13_QPSK10M_Front Face_1cm_Ch23230_1RB_OS0_Ant2

Communication System: LTE; Frequency: 782 MHz;Duty Cycle: 1:1
Medium: HSL750_0913 Medium parameters used: f = 782 MHz; σ = 0.919 S/m; ε_r = 40.485; ρ = 1000 kg/m^3
Ambient Temperature：23.4℃; Liquid Temperature：22.6℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7612; ConvF(11.4, 11.4, 11.4) @ 782 MHz; Calibrated: 2024/03/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1389; Calibrated: 2023/11/03
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1781
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

- Area Scan (71x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.559 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.97 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.662 W/kg
SAR(1 g) = 0.531 W/kg; SAR(10 g) = 0.400 W/kg
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 78.9%
Maximum value of SAR (measured) = 0.558 W/kg



0 dB = 0.558 W/kg

Test Laboratory: BV 7LAYERS SAR/HAC Testing Lab Date: 2024/09/13

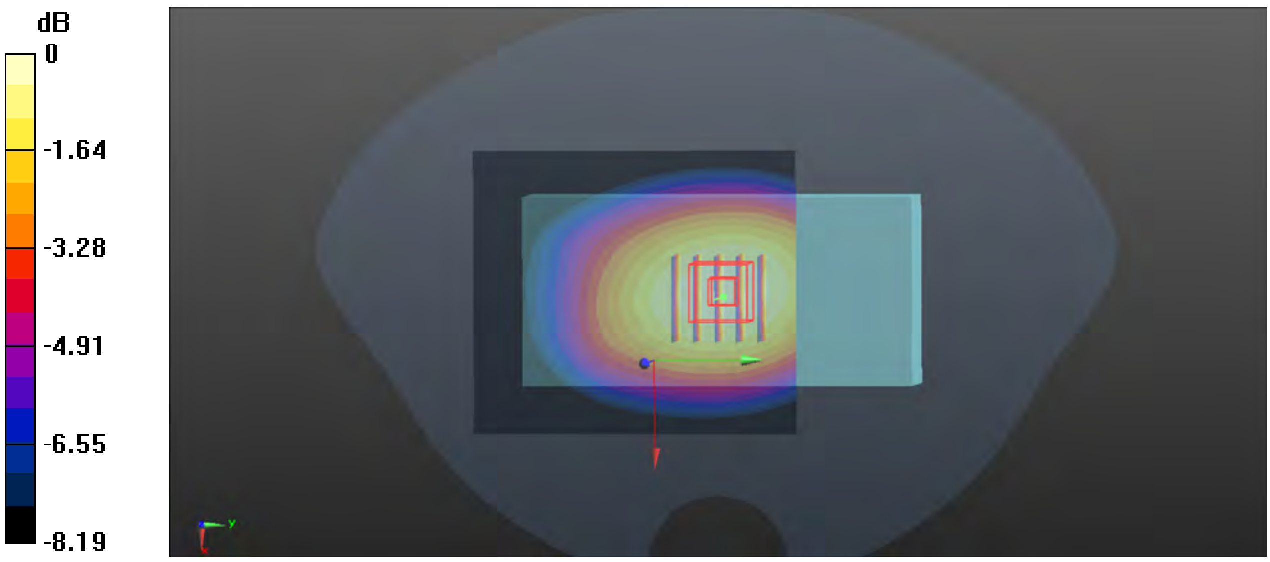
P05 LTE 14_QPSK10M_Front Face_1cm_Ch23330_1RB_OS0_Ant2

Communication System: LTE; Frequency: 793 MHz;Duty Cycle: 1:1
Medium: HSL750_0913 Medium parameters used: f = 793 MHz; σ = 0.93 S/m; ε_r = 40.334; ρ = 1000 kg/m^3
Ambient Temperature：23.4℃; Liquid Temperature：22.6℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7612; ConvF(11.4, 11.4, 11.4) @ 793 MHz; Calibrated: 2024/03/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1389; Calibrated: 2023/11/03
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1781
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

- Area Scan (71x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.575 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.29 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.692 W/kg
SAR(1 g) = 0.552 W/kg; SAR(10 g) = 0.415 W/kg
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 78.3%
Maximum value of SAR (measured) = 0.580 W/kg



0 dB = 0.580 W/kg

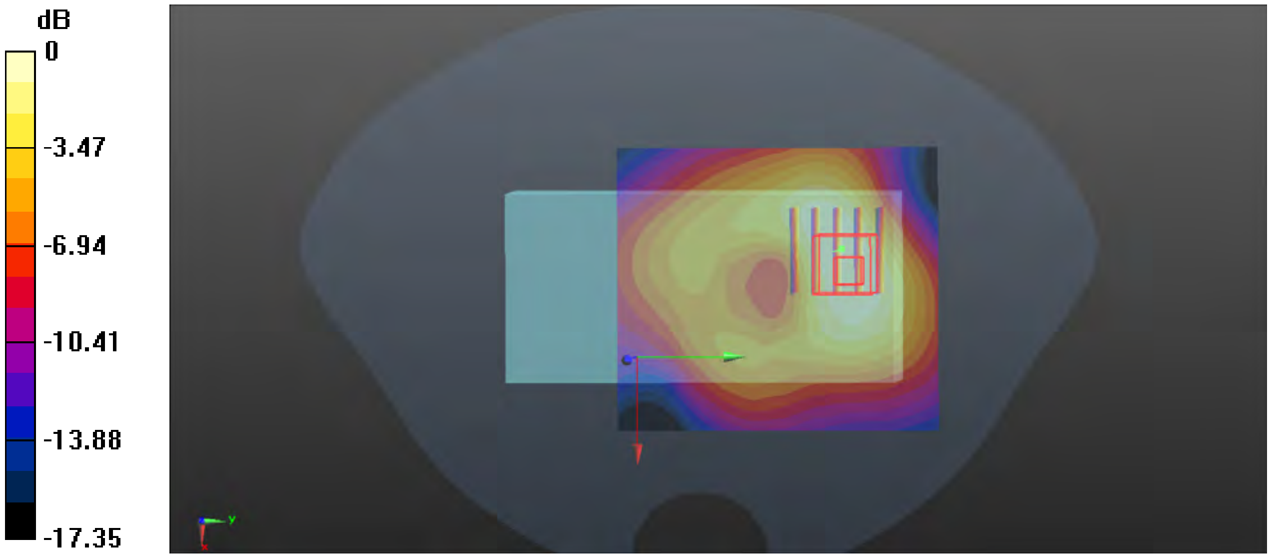
P06 LTE 25_QPSK20M_Rear Face_1cm_Ch26590_1RB_OS0_Ant1

Communication System: LTE; Frequency: 1905 MHz;Duty Cycle: 1:1
Medium: HSL1900_0913 Medium parameters used: f = 1905 MHz; σ = 1.436 S/m; ε_r = 40.308; ρ = 1000 kg/m^3
Ambient Temperature：23.5℃; Liquid Temperature：22.4℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7612; ConvF(8.83, 8.83, 8.83) @ 1905 MHz; Calibrated: 2024/03/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1389; Calibrated: 2023/11/03
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1781
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

- Area Scan (71x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.478 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.57 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.685 W/kg
SAR(1 g) = 0.422 W/kg; SAR(10 g) = 0.257 W/kg
Smallest distance from peaks to all points 3 dB below = 16.1 mm
Ratio of SAR at M2 to SAR at M1 = 60.9%
Maximum value of SAR (measured) = 0.451 W/kg



0 dB = 0.451 W/kg

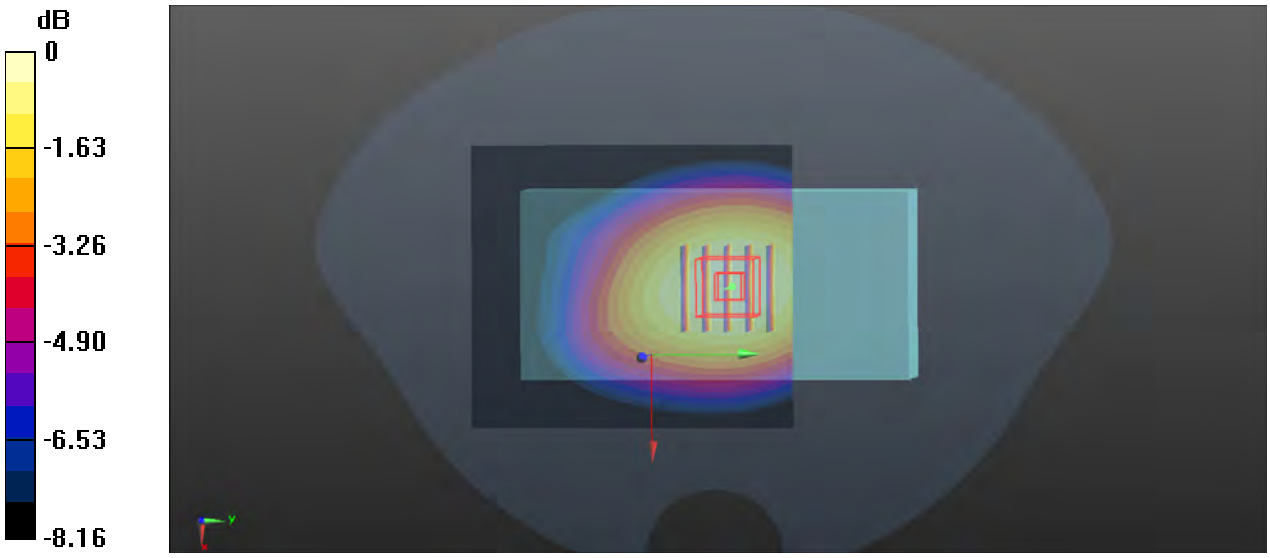
P07 LTE 26_QPSK15M_Front Face_1cm_Ch26865_1RB_OS0_Ant2

Communication System: LTE; Frequency: 831.5 MHz;Duty Cycle: 1:1
Medium: HSL835_0913 Medium parameters used: f = 831.5 MHz; σ = 0.912 S/m; ε_r = 42.774; ρ = 1000 kg/m^3
Ambient Temperature：23.2℃; Liquid Temperature：22.5℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7612; ConvF(10.96, 10.96, 10.96) @ 831.5 MHz; Calibrated: 2024/03/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1389; Calibrated: 2023/11/03
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1781
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

- Area Scan (71x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.503 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.52 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.599 W/kg
SAR(1 g) = 0.476 W/kg; SAR(10 g) = 0.358 W/kg
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 77.8%
Maximum value of SAR (measured) = 0.500 W/kg



0 dB = 0.500 W/kg

Test Laboratory: BV 7LAYERS SAR/HAC Testing Lab Date: 2024/09/13

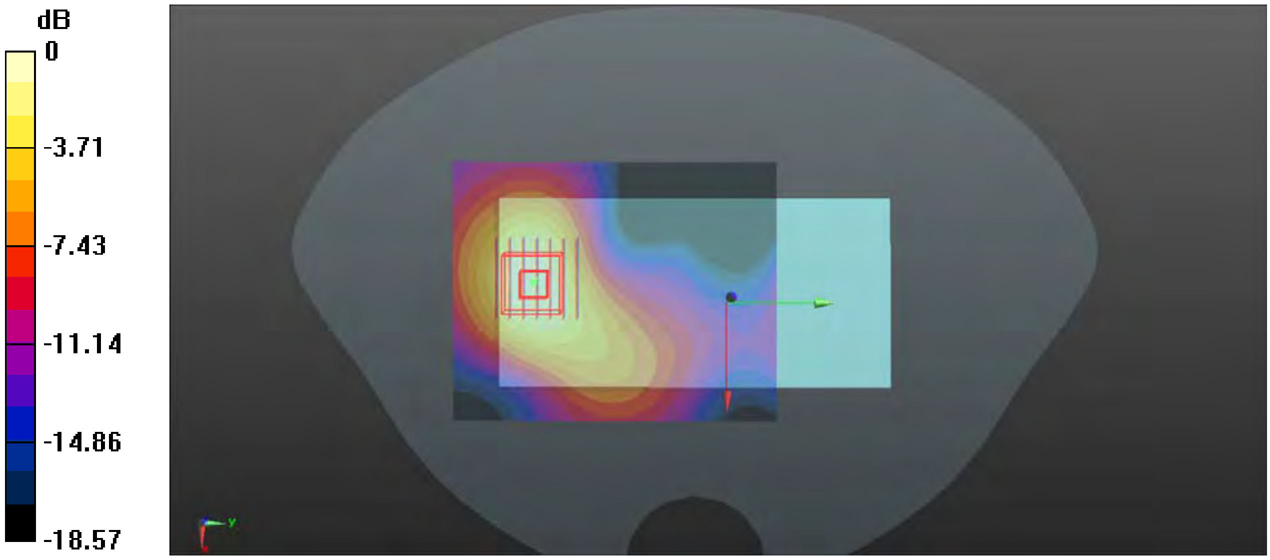
P08 LTE 30_QPSK10M_Rear Face_1cm_Ch27710_1RB_OS0_Ant2

Communication System: LTE; Frequency: 2310 MHz;Duty Cycle: 1:1
Medium: HSL2300_0913 Medium parameters used: f = 2310 MHz; σ = 1.676 S/m; ε_r = 39.037; ρ = 1000 kg/m^3
Ambient Temperature：23.5℃; Liquid Temperature：22.6℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7612; ConvF(8.46, 8.46, 8.46) @ 2310 MHz; Calibrated: 2024/03/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1389; Calibrated: 2023/11/03
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1781
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

- Area Scan (81x101x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.932 W/kg

- Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.411 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.47 W/kg
SAR(1 g) = 0.831 W/kg; SAR(10 g) = 0.455 W/kg
Smallest distance from peaks to all points 3 dB below = 13.3 mm
Ratio of SAR at M2 to SAR at M1 = 57.4%
Maximum value of SAR (measured) = 0.916 W/kg



0 dB = 0.916 W/kg

Test Laboratory: BV 7LAYERS SAR/HAC Testing Lab Date: 2024/09/13

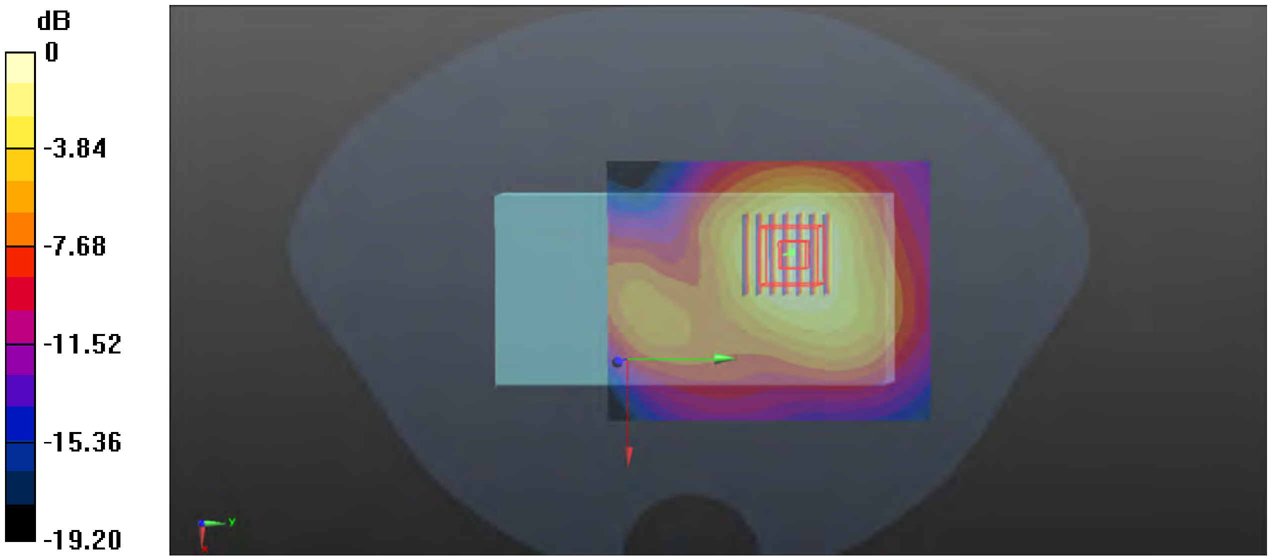
P09 LTE 41_QPSK20M_Rear Face_1cm_Ch40185_1RB_OS99_Ant1

Communication System: LTE TDD; Frequency: 2549.5 MHz;Duty Cycle: 1:1.59
Medium: HSL2600_0913 Medium parameters used: f = 2549.5 MHz; σ = 1.934 S/m; ε_r = 38.499; ρ = 1000 kg/m^3
Ambient Temperature：23.4℃; Liquid Temperature：22.7℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7612; ConvF(8.01, 8.01, 8.01) @ 2549.5 MHz; Calibrated: 2024/03/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1389; Calibrated: 2023/11/03
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1781
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

- Area Scan (81x101x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.322 W/kg

- Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.598 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.533 W/kg
SAR(1 g) = 0.297 W/kg; SAR(10 g) = 0.167 W/kg
Smallest distance from peaks to all points 3 dB below = 18.4 mm
Ratio of SAR at M2 to SAR at M1 = 55.6%
Maximum value of SAR (measured) = 0.322 W/kg



0 dB = 0.322 W/kg

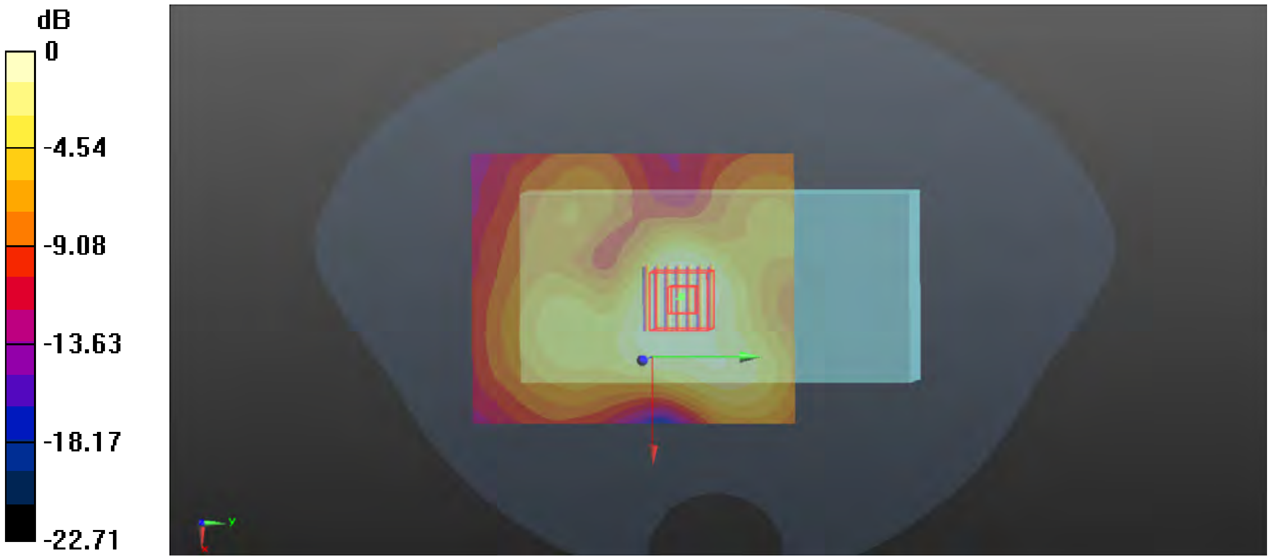
P10 LTE 42_QPSK20M_Rear Face_1cm_Ch42590_1RB_OS50_Ant7

Communication System: LTE TDD; Frequency: 3500 MHz;Duty Cycle: 1:1.59
Medium: HSL3500_0914 Medium parameters used: f = 3500 MHz; σ = 2.821 S/m; ε_r = 39.681; ρ = 1000 kg/m^3
Ambient Temperature：23.5℃; Liquid Temperature：22.5℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7612; ConvF(7.45, 7.45, 7.45) @ 3500 MHz; Calibrated: 2024/03/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1389; Calibrated: 2023/11/03
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1781
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

- Area Scan (101x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.284 W/kg

- Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 8.889 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 0.393 W/kg
SAR(1 g) = 0.184 W/kg; SAR(10 g) = 0.093 W/kg
Smallest distance from peaks to all points 3 dB below = 16.4 mm
Ratio of SAR at M2 to SAR at M1 = 71.4%
Maximum value of SAR (measured) = 0.277 W/kg



0 dB = 0.277 W/kg

Test Laboratory: BV 7LAYERS SAR/HAC Testing Lab Date: 2024/09/14

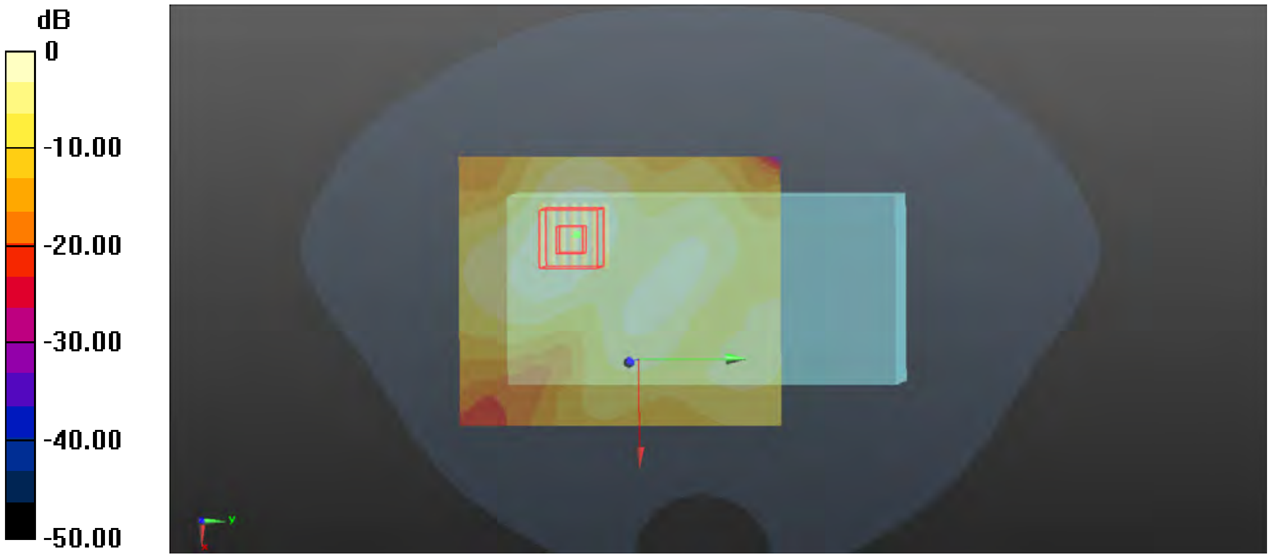
P11 LTE 48_QPSK20M_Rear Face_1cm_Ch53340_1RB_OS99_Ant7

Communication System: LTE TDD; Frequency: 3560 MHz;Duty Cycle: 1:1.59
Medium: HSL3500_0914 Medium parameters used: f = 3560 MHz; σ = 2.881 S/m; ε_r = 39.586; ρ = 1000 kg/m^3
Ambient Temperature：23.5℃; Liquid Temperature：22.5℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7612; ConvF(7.45, 7.45, 7.45) @ 3560 MHz; Calibrated: 2024/03/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1389; Calibrated: 2023/11/03
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1781
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

- Area Scan (101x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.337 W/kg

- Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 6.861 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.480 W/kg
SAR(1 g) = 0.211 W/kg; SAR(10 g) = 0.098 W/kg
Smallest distance from peaks to all points 3 dB below = 13 mm
Ratio of SAR at M2 to SAR at M1 = 69.6%
Maximum value of SAR (measured) = 0.333 W/kg



0 dB = 0.337 W/kg

Test Laboratory: BV 7LAYERS SAR/HAC Testing Lab   Date: 2024/09/13

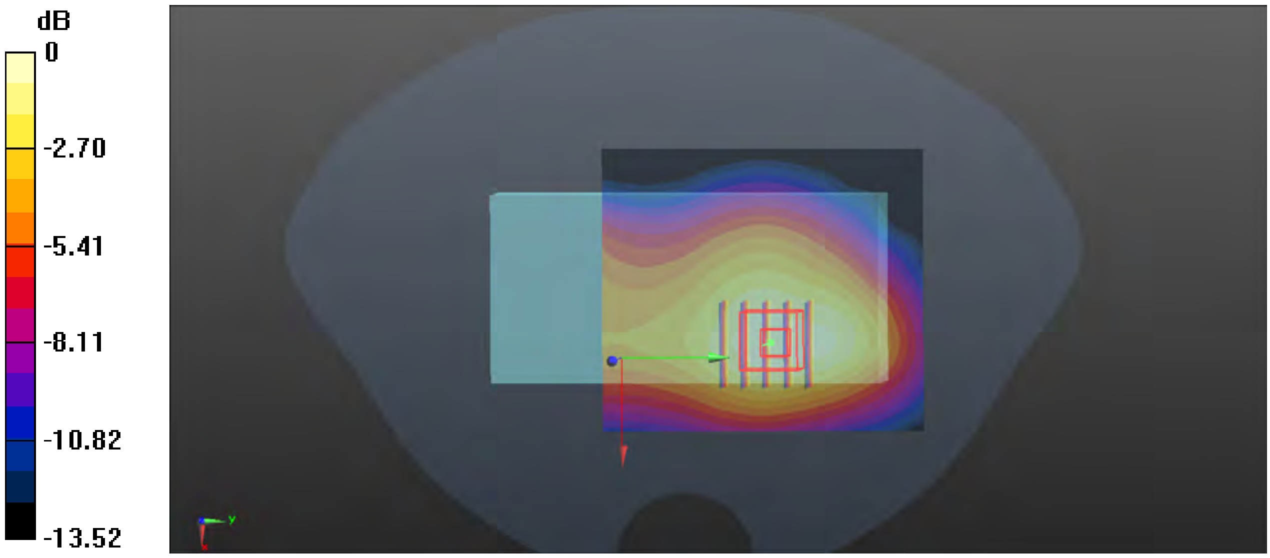
P12 LTE 66_QPSK20M_Front Face_1cm_Ch132322_1RB_OS0_Ant1

Communication System: LTE; Frequency: 1745 MHz;Duty Cycle: 1:1
Medium: HSL1750_0913 Medium parameters used: f = 1745 MHz; σ = 1.344 S/m; ε_r = 41.867; ρ = 1000 kg/m^3
Ambient Temperature：23.4℃; Liquid Temperature：22.6℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7612; ConvF(9.2, 9.2, 9.2) @ 1745 MHz; Calibrated: 2024/03/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1389; Calibrated: 2023/11/03
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1781
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

- Area Scan (71x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.261 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.896 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.367 W/kg
SAR(1 g) = 0.242 W/kg; SAR(10 g) = 0.154 W/kg
Smallest distance from peaks to all points 3 dB below = 21.5 mm
Ratio of SAR at M2 to SAR at M1 = 65.8%
Maximum value of SAR (measured) = 0.261 W/kg



0 dB = 0.261 W/kg

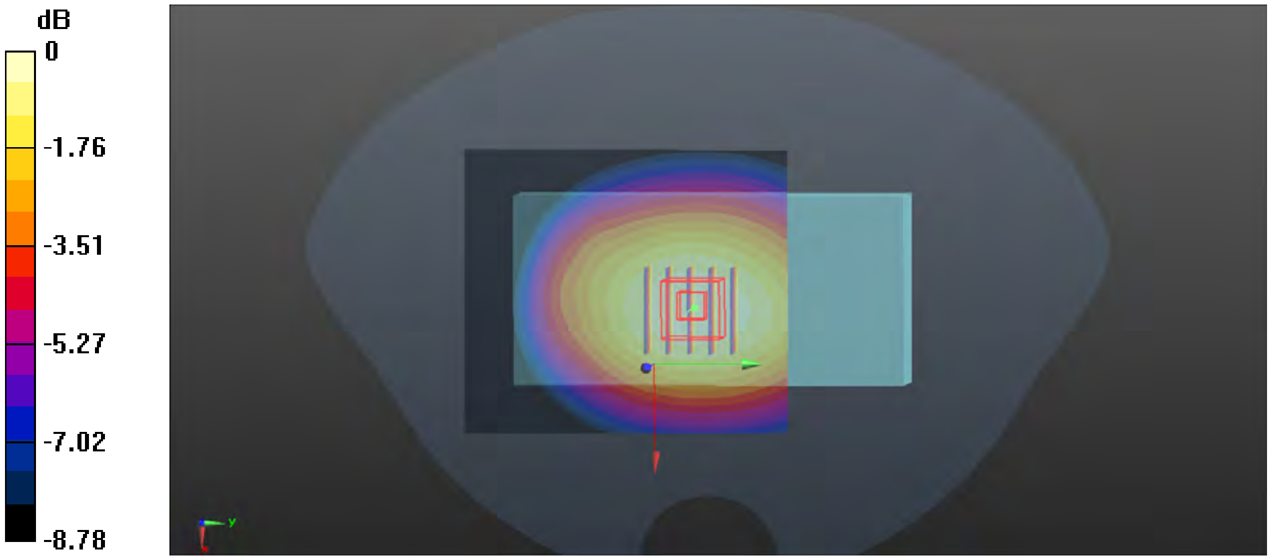
P13 LTE 71_QPSK20M_Rear Face_1cm_Ch133372_1RB_OS0_Ant2

Communication System: LTE; Frequency: 688 MHz;Duty Cycle: 1:1
Medium: HSL750_0913 Medium parameters used: f = 688 MHz; σ = 0.849 S/m; ε_r = 41.483; ρ = 1000 kg/m^3
Ambient Temperature：23.4℃; Liquid Temperature：22.6℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7612; ConvF(11.4, 11.4, 11.4) @ 688 MHz; Calibrated: 2024/03/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1389; Calibrated: 2023/11/03
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1781
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

- Area Scan (71x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.271 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.92 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 0.330 W/kg
SAR(1 g) = 0.253 W/kg; SAR(10 g) = 0.184 W/kg
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 74.9%
Maximum value of SAR (measured) = 0.267 W/kg



0 dB = 0.267 W/kg

Test Laboratory: BV 7LAYERS SAR/HAC Testing Lab Date: 2024/09/13

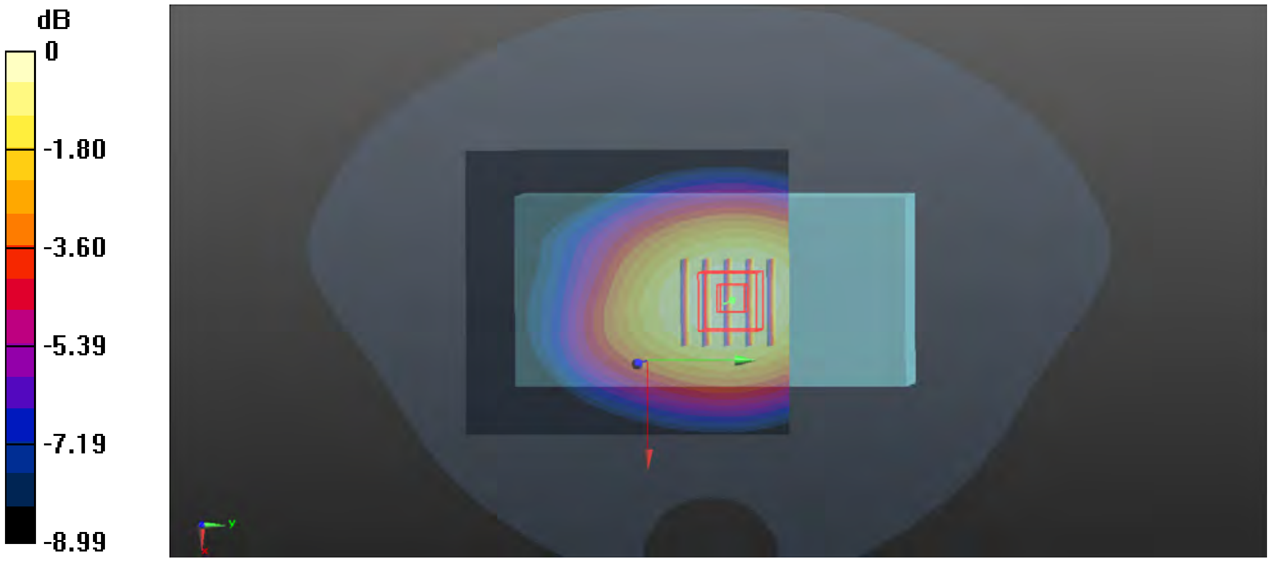
P14 n5_DFT-s-OFDM QPSK20M_Front Face_1cm_Ch166800_1RB_OS0_Ant2

Communication System: NR; Frequency: 834 MHz;Duty Cycle: 1:1
Medium: HSL835_0913 Medium parameters used: f = 834 MHz; σ = 0.915 S/m; ε_r = 42.743; ρ = 1000 kg/m^3
Ambient Temperature：23.2℃; Liquid Temperature：22.5℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7612; ConvF(10.96, 10.96, 10.96) @ 834 MHz; Calibrated: 2024/03/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1389; Calibrated: 2023/11/03
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1781
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

- Area Scan (71x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.518 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.18 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.619 W/kg
SAR(1 g) = 0.487 W/kg; SAR(10 g) = 0.357 W/kg
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 76.4%
Maximum value of SAR (measured) = 0.516 W/kg



0 dB = 0.516 W/kg

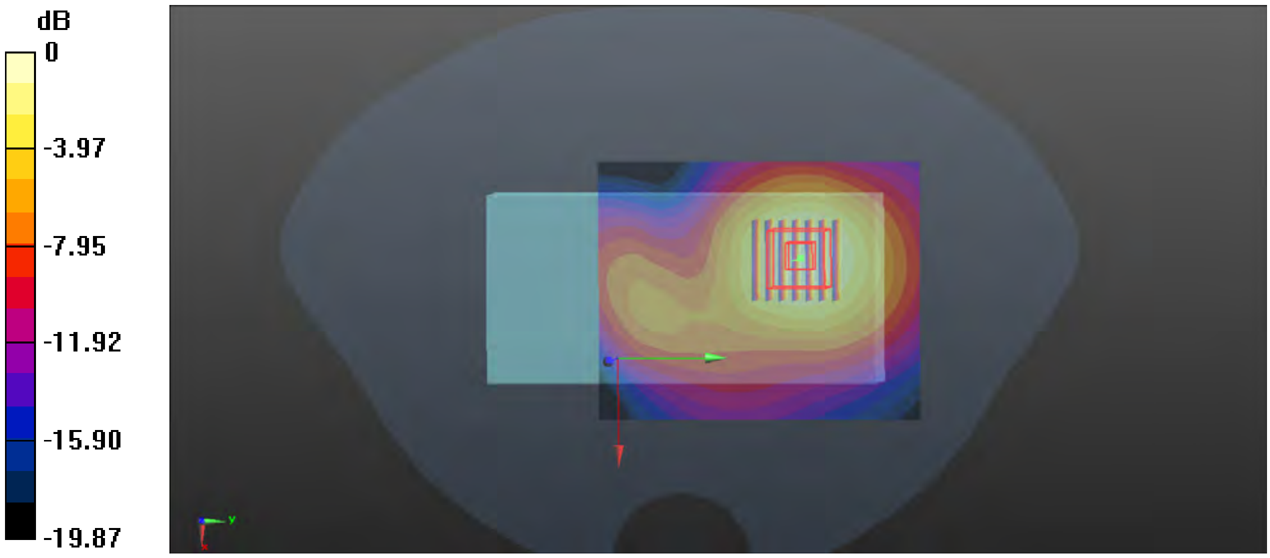
P15 n7_DFT-s-OFDM QPSK40M_Rear Face_1cm_Ch503500_1RB_OS1_Ant1

Communication System: NR; Frequency: 2517.5 MHz;Duty Cycle: 1:1
Medium: HSL2600_0913 Medium parameters used: f = 2517.5 MHz; σ = 1.9 S/m; ε_r = 38.622; ρ = 1000 kg/m^3
Ambient Temperature：23.4℃; Liquid Temperature：22.7℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7612; ConvF(8.01, 8.01, 8.01) @ 2517.5 MHz; Calibrated: 2024/03/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1389; Calibrated: 2023/11/03
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1781
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

- Area Scan (81x101x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.543 W/kg

- Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.535 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 0.919 W/kg
SAR(1 g) = 0.496 W/kg; SAR(10 g) = 0.273 W/kg
Smallest distance from peaks to all points 3 dB below = 17 mm
Ratio of SAR at M2 to SAR at M1 = 53.8%
Maximum value of SAR (measured) = 0.537 W/kg



0 dB = 0.537 W/kg