SAR TEST REPORT

ISSUED BY
Shenzhen BALUN Technology Co., Ltd.

FOR

Mobile Phone

ISSUED TO
mMax Communications, Inc.

5151 California Ave. Suite 100, Irvine, CA 92617 US

Report No.:	BL-SZ21B0604-701
EUT Name:	Mobile Phone
Model Name:	M55
Brand Name:	mMax
FCC ID:	2AWVS-M55
Test Standard:	FCC 47 CFR Part 2.1093 (refer section 3.1)
Maximum SAR:	Head (1 g): 0.91 W/kg Body-worn (1 g): 0.89 W/kg Hotspot (1 g): 0.89 W/kg
Test Conclusion:	Pass
Test Date:	Nov. 17, 2021 ~ Dec. 27, 2021
Date of Issue:	Feb. 16, 2022

Tested by: Xu Rui
Xu Rui
Date Feb. 16, 2022

Approved by:
Liao Jianming
(Technical Director)
Date Feb. 16, 2022

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Revision History

Version	Issue Date	Revisions Content
Rev. 01	Feb. 16, 2022	Initial Issue

TABLE OF CONTENTS

1 GENERAL INFORMATION

1.1 Identification of the Testing Laboratory

Company Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100
Fax Number	+86 755 6182 4271

1.2 Identification of the Responsible Testing Location

Test Location	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196.
Description	All measurement facilities used to collect the measurement data are located at Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055

1.3 Test Environment Condition

Ambient Temperature	21.5℃ to 23℃
Ambient Relative Humidity	35% to 46%
Ambient Pressure	100 KPa to 102 KPa

1.4 Announce

(1) The test report reference to the report template version v2.2.

(2) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.

(3) The test report is invalid if there is any evidence and/or falsification.

(4) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.

(5) This document may not be altered or revised in any way unless done so by BALUN and all revisions are duly noted in the revisions section.

(6) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

(7) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	mMax Communications, Inc.
Address	5151 California Ave. Suite 100, Irvine, CA 92617 US

2.2 Manufacturer Information

Manufacturer	mMax Communications, Inc.
Address	5151 California Ave. Suite 100, Irvine, CA 92617 US

2.3 Factory Information

Factory	Sichuan Lingge Zhigu Technology Co., Ltd
Address	Lingge Industrial Park, No. 1, section 4, west section of Changjiang North Road, Lingang Economic Development Zone, Yibin City, Sichuan Province

2.4 General Description for Equipment under Test (EUT)

EUT Name	Mobile Phone
Model Name Under Test	M55
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	M55-MB-1V0
Software Version	LTE_S0211_N_M55_0.010.08
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.5 Ancillary Equipment

Ancillary Equipment	Battery	
	Brand Name	N/A
	Model No.	BP-2330
	Serial No.	N/A
	Capacity	2300 mAh
	Rated Voltage	3.8 V
	Limit Charge Voltage	4.35 V

2.6 Technical Information

Network and Wireless connectivity	4G Network FDD LTE Band 2/4/5/13 Bluetooth (BR+EDR+BLE) WIFI 802.11b, 802.11g, 802.11n(HT20) GPS, GLONASS, FM Receiver
Note : The EUT is a mobile phone, which supports dual SIM card under the same transceiver. Each SIM supports LTE, and both SIM share the same transmitting electro circuit, NV parameters, so only SIM1 was tested in this report.	

The requirement for the following technical information of the EUT was tested in this report:

Operating Mode	LTE, 2.4G WLAN, Bluetooth		
Frequency Range	LTE Band 2	TX: 1850 ~ 1910 MHz	RX: 1930 ~ 1990 MHz
	LTE Band 4	TX: 1710 ~ 1755 MHz	RX: 2110 ~ 2155 MHz
	LTE Band 5	TX: 824 ~ 849 MHz	RX: 869 ~ 894 MHz
	LTE Band 13	TX: 777 ~ 787 MHz	RX: 746 ~ 756 MHz
	802.11b/g/n (HT20)	2412 ~ 2462 MHz	
	Bluetooth	2402 ~ 2480 MHz	
Antenna Type	WWAN: PIFA Antenna WLAN: PIFA Antenna Bluetooth: PIFA Antenna		
DTM	N/A		
Hotspot Function	Support		
Power Reduction	Not support		
Exposure Category	General Population/Uncontrolled exposure		
EUT Stage	Portable Device		
Product	Type		
	☒ Production unit	☐ Identical prototype	

3 SUMMARY OF TEST RESULT

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 2.1093	Radiofrequency radiation exposure evaluation: portable devices
2	ANSI C95.1-1992	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz
3	IEEE Std. 1528-2013	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
4	FCC KDB 447498 D01 v06	Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies
5	FCC KDB 941225 D05 v02r05	SAR Evaluation Considerations for LTE Devices
6	FCC KDB 941225 D06 v02r01	SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities
7	FCC KDB 865664 D01 v01r04	SAR Measurement 100 MHz to 6 GHz
8	FCC KDB 865664 D02 v01r02	RF Exposure Reporting

3.2 Device Category and SAR Limit

This device belongs to portable device category because its radiating structure is allowed to be used within 20 centimeters of the body of the user.

Limit for General Population/Uncontrolled exposure should be applied for this device, it is 1.6 W/kg as averaged over any 1 gram of tissue.

Table of Exposure Limits:

Body Position	SAR Value (W/Kg)	
	General Population/ Uncontrolled Exposure	Occupational/ ControlledExposure
Whole-Body SAR (averaged over the entire body)	0.08	0.4
Partial-Body SAR (averaged over any 1 gram of tissue)	1.60	8.0
SAR for hands, wrists, feet and ankles (averaged over any 10 grams of tissue)	4.0	20.0

NOTE:

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

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

3.3 Test Result Summary

3.3.1 Highest SAR (1 g Value)

Band	Maximum Scaled SAR (W/kg)			Maximum Report SAR (W/kg)		
	Head	Body-worn Accessory	Hotspot	Head	Body-worn Accessory	Hotspot
LTE Band 2	0.36	**0.89**	**0.89**	0.91	0.89	0.89
LTE Band 4	0.40	0.65	0.65			
LTE Band 5	0.32	0.38	0.38			
LTE Band 13	0.28	0.46	0.46			
2.4G WLAN	**0.91**	0.30	0.30			
Bluetooth	0.06	0.06	0.06			
Limit (W/kg)	1.6			1.6		
Verdict	PASS					

3.3.2 Highest Simultaneous SAR

Position	Simultaneous Configuration	Simultaneous SAR (W/kg)	Limit (W/kg)	Verdict
Head (1g)	WWAN + 2.4G WIFI +Bluetooth	**1.366**	1.6	Pass
Body-worn Accessory (1g)	WWAN + 2.4G WIFI +Bluetooth	1.200	1.6	Pass
Hotspot (1g)	WWAN + 2.4G WIFI +Bluetooth	1.200	1.6	Pass

3.4 Test Uncertainty

According to KDB 865664 D01, When the highest measured 1 g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis is not required in SAR reports submitted for equipment approval.

The maximum 1 g SAR for the EUT in this report is 0.908 W/kg, which is lower than 1.5 W/kg, so the extensive SAR measurement uncertainty analysis is not required in this report.

4 MEASUREMENT SYSTEM

4.1 Specific Absorption Rate (SAR) Definition

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

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

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

SAR is expressed in units of Watts per kilogram (W/kg) SAR measurement can be related to the electrical field in the tissue by

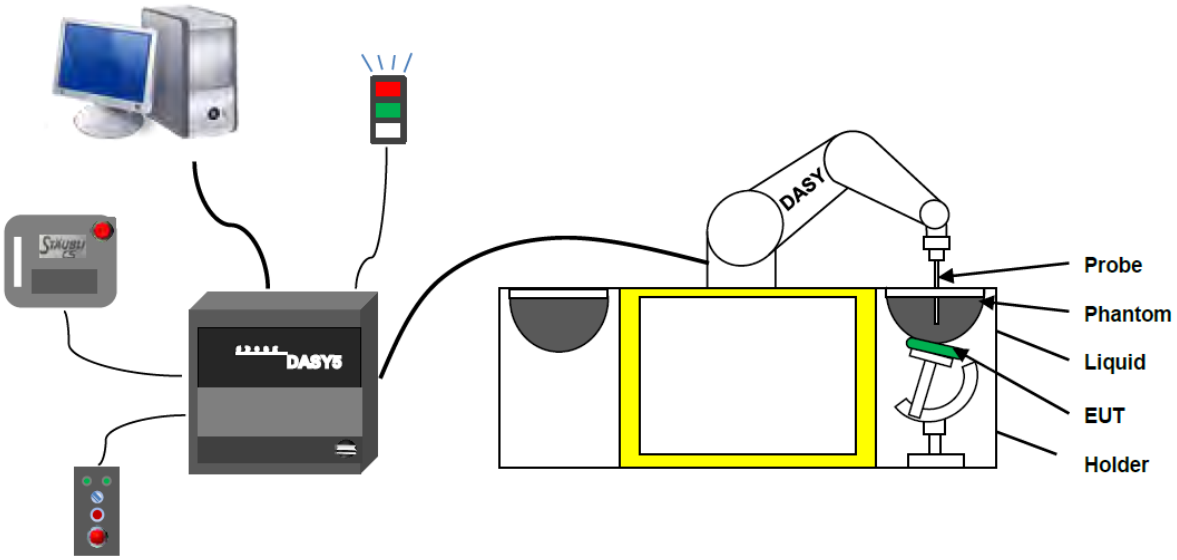
$$\mathbf{SAR} = \frac{\boldsymbol{\sigma}\mathbf{E}^2}{\boldsymbol{\rho}}$$

Where: σ is the conductivity of the tissue,

ρ is the mass density of the tissue and E is the RMS electrical field strength.

4.2 DASY SAR System

4.2.1 DASY SAR System Diagram



The DASY5 system for performing compliance tests consists of the following items:

1. A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).
2. A dosimetric probe, i.e. an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
3. A data acquisition electronic (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
4. A unit to operate the optical surface detector which is connected to the EOC.
5. The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY5 measurement server.
6. The DASY5 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation.
7. DASY5 software and SEMCAD data evaluation software.
8. Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.
9. The generic twin phantom enabling the testing of left-hand and right-hand usage.
10. The device holder for handheld mobile phones.
11. Tissue simulating liquid mixed according to the given recipes.
12. System validation dipoles allowing to validate the proper functioning of the system.

4.2.2 Robot

The Dasy SAR system uses the high precision robots. Symmetrical design with triangular core Built-in optical fiber for surface detection system For the 6-axis controller system, Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents). The robot series have many features that are important for our application:

- High precision
  (repeatability ±0.02 mm)
- High reliability
  (industrial design)
- Low maintenance costs
  (virtually maintenance free due to direct drive gears; no belt drives)
- Jerk-free straight movements
  (brush less synchron motors; no stepper motors)
- Low ELF interference
  (motor control _elds shielded via the closed metallic construction shields)

4.2.3 E-Field Probe

The probe is specially designed and calibrated for use in liquids with high permittivities for the measurements the Specific Dosimetric E-Field Probe EX3DV4-SN:7663 with following specifications is used.

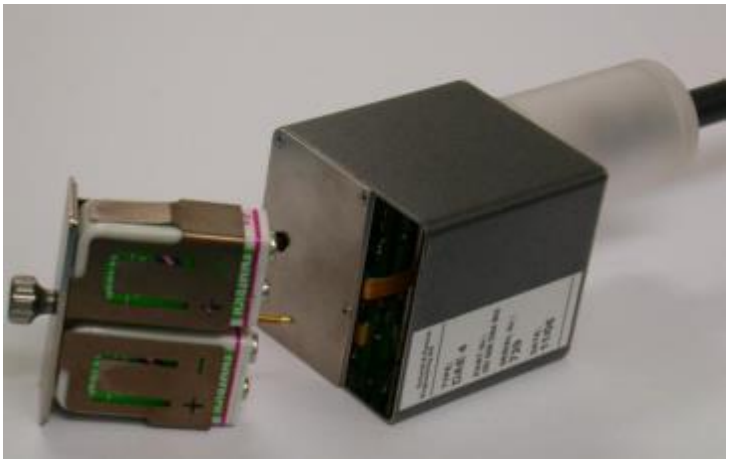
Construction	Symmetrical design with triangular core Built-in optical fiber for surface detection systemBuilt-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., glycolether)
Calibration	ISO/IEC 17025 calibration service available
Frequency	10 MHz to 6 GHz; Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.2 dB in HSL (rotation around probe axis) ; ± 0.4 dB in HSL (rotation normal to probe axis)
Dynamic range	5 µW/g to > 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 337 mm (Tip: 9 mm) Tip diameter: 2.5 mm (Body: 10 mm) Distance from probe tip to dipole centers: 1.0 mm
Application	General dosimetry up to 3 GHz Compliance tests of mobile phones Fast automatic scanning in arbitrary phantoms (EX3DV4)

E-Field Probe Calibration Process

Probe calibration is realized, in compliance with CENELEC EN 62209-1/-2 and IEEE 1528 std, with CALISAR, Antennessa proprietary calibration system. The calibration is performed with the EN 62209-1/2 annexe technique using reference guide at the five frequencies.

4.2.4 Data Acquisition Electronics

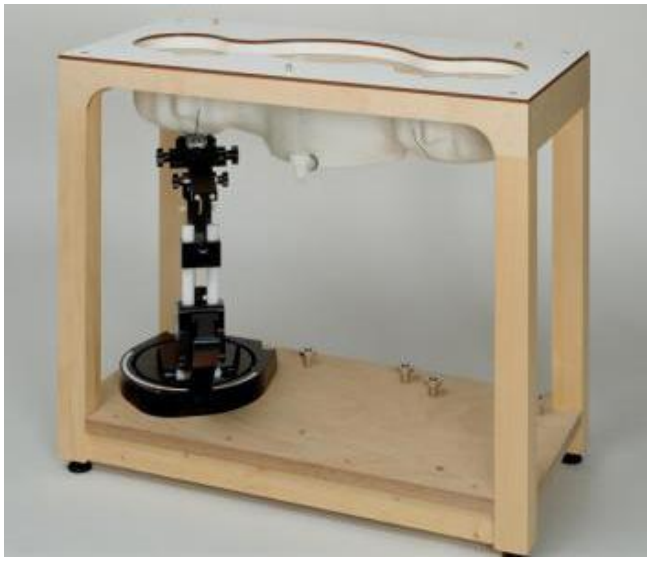
The data acquisition electronics (DAE) consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converte and a command decoder with a control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information, as well as an optical uplink for commands and the clock.



- Input Impedance: 200MOhm
- The Inputs: Symmetrical and Floating
- Commom Mode Rejection: Above 80dB

4.2.5 Phantoms

For the measurements the Specific Anthropomorphic Mannequin (SAM) defined by the IEEE SCC-34/SC2 group is used. The phantom is a polyurethane shell integrated in a wooden table. The thickness of the phantom amounts to 2mm +/- 0.2mm. It enables the dosimetric evaluation of left and right phone usage and includes an additional flat phantom part for the simplified performance check. The phantom set-up includes a cover, which prevents the evaporation of the liquid.



- Left hand
- Right hand
- Flat phantom

Photo of Phantom SN1857

Photo of Phantom SN1859

Serial Number	Material	Length	Height
SN 1857 SAM1	Vinylester, glass fiber reinforced	1000	500
SN 1859 SAM2	Vinylester, glass fiber reinforced	1000	500

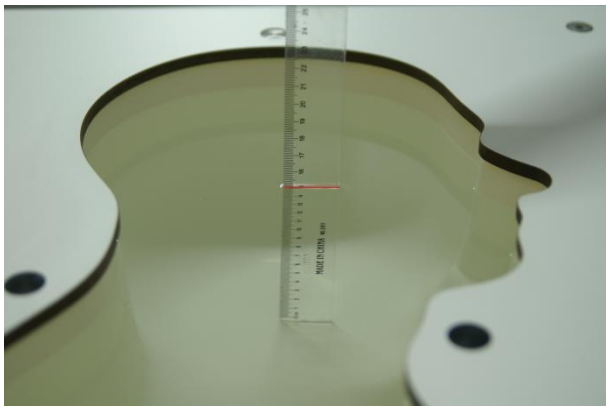
4.2.6 Device Holder

The DASY5 device holder has two scales for device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear openings). The plane between the ear openings and the mouth tip has a rotation angle of 65°. The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. This device holder is used for standard mobile phones or PDA"s only. If necessary an additional support of polystyrene material is used. Larger DUT"s (e.g. notebooks) cannot be tested using this device holder. Instead a support of bigger polystyrene cubes and thin polystyrene plates is used to position the DUT in all relevant positions to find and measure spots with maximum SAR values. Therefore those devices are normally only tested at the flat part of the SAM.

The positioning system allows obtaining cheek and tilting position with a very good accuracy. Incompliance with CENELEC, the tilt angle uncertainty is lower than 1°.

4.2.7 Simulating Liquid

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%.

Head Liquid Depth	Body Liquid Depth
	

The following table gives the recipes for tissue simulating liquid and the theoretical Conductivity/Permittivity.

Head (Reference IEEE1528)								
Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity σ (S/m)	Permittivity ε
750	41.1	57.0	0.2	1.4	0.2	0	0.89	41.9
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
900	40.3	57.9	0.2	1.4	0.2	0	0.97	41.5
1800, 1900, 2000	55.2	0	0	0.3	0	44.5	1.4	40.0
2450	55.0	0	0	0.1	0	44.9	1.80	39.2
2600	54.9	0	0	0.1	0	45.0	1.96	39.0
Frequency (MHz)	Water (%)	Hexyl Carbitol (%)			Triton X-100 (%)		Conductivity σ (S/m)	Permittivity ε
5200	62.52	17.24			17.24		4.66	36.0
5800	62.52	17.24			17.24		5.27	35.3
Body (From instrument manufacturer)								
Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity σ (S/m)	Permittivity ε
750	51.7	47.2	0	0.9	0.1	0	0.96	55.5
835	50.8	48.2	0	0.9	0.1	0	0.97	55.2
900	50.8	48.2	0	0.9	0.1	0	1.05	55.0
1800, 1900, 2000	70.2	0	0	0.4	0	29.4	1.52	53.3
2450	68.6	0	0	0.1	0	31.3	1.95	52.7
2600	68.2	0	0	0.1	0	31.7	2.16	52.5
Frequency(MHz)	Water	DGBE (%)			Salt (%)		Conductivity σ (S/m)	Permittivity ε
5200	78.60	21.40			/		5.54	47.86
5800	78.50	21.40			0.1		6.0	48.20

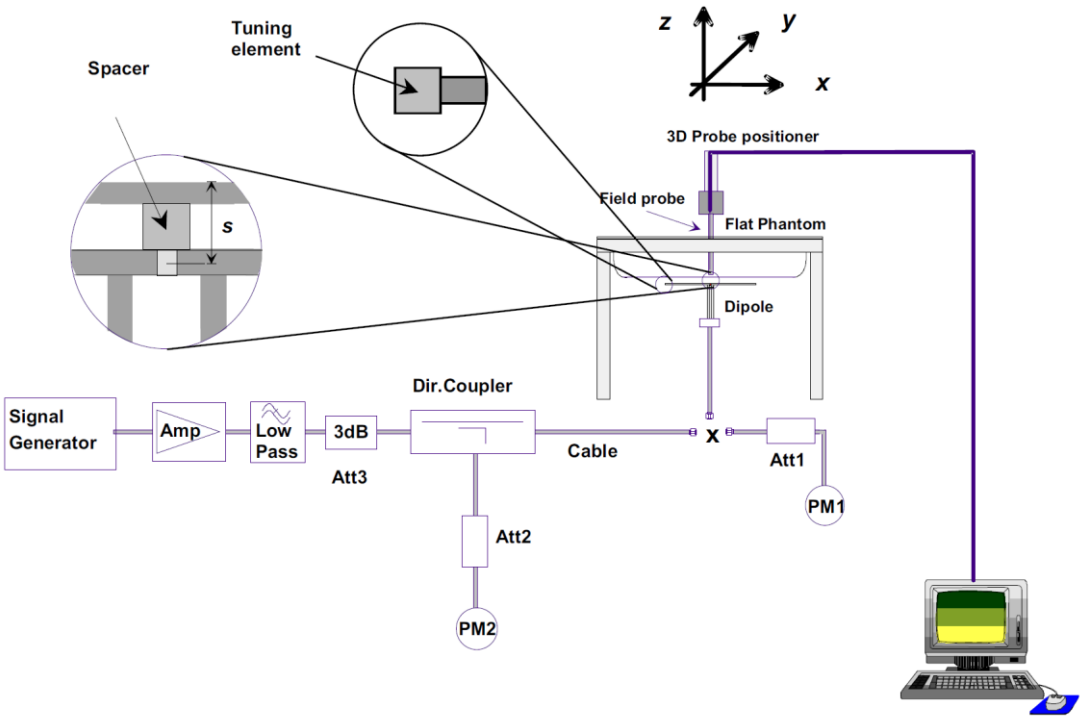
5 SYSTEM VERIFICATION

5.1 Purpose of System Check

The system performance check verifies that the system operates within its specifications. System and operator errors can be detected and corrected. It is recommended that the system performance check be performed prior to any usage of the system in order to guarantee reproducible results. The system performance check uses normal SAR measurements in a simplified setup with a well characterized source.This setup was selected to give a high sensitivity to all parameters that might fail or vary over time. The system check does not intend to replace the calibration of the components, but indicates situations where the system uncertainty is exceeded due to drift or failure.

5.2 System Check Setup

In the simplified setup for system evaluation, the EUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave that comes from a signal generator. The calibrated dipole must be placed beneath the flat phantom section of the SAM twin phantom with the correct distance holder. The distance holder should touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The equipment setup is shown below:



6 TEST POSITION CONFIGURATIONS

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

6.1 Head Exposure Conditions

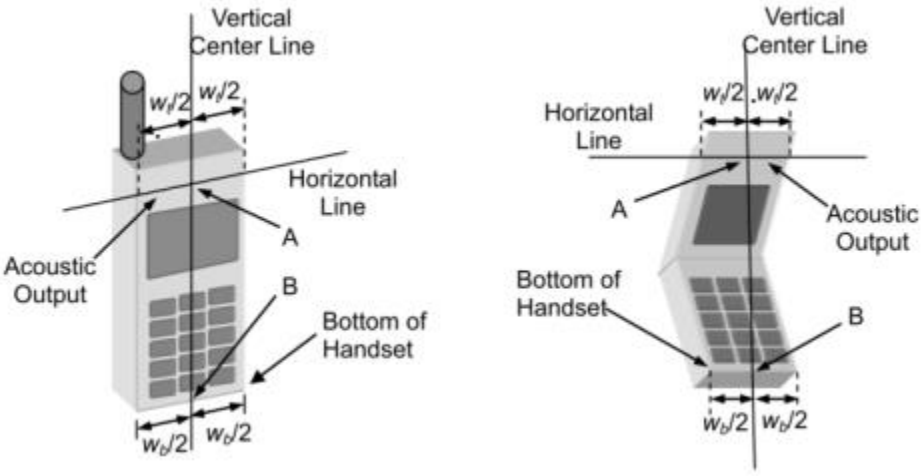
Head exposure is limited to next to the ear voice mode operations. Head SAR compliance is tested according to the test positions defined in IEEE Std 1528-2013 using the SAM phantom illustrated as below.

6.1.1 Two Imaginary Lines on the Handset

(a) The vertical center line passes through two points on the front side of the handset - the midpoint of the width w t of the handset at the level of the acoustic output, and the midpoint of the width w b of the bottom of the handset.

(b) The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output. The horizontal line is also tangential to the face of the handset at point A.

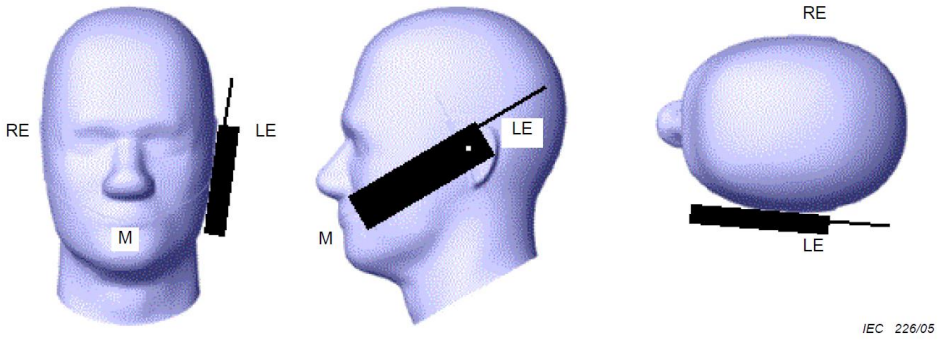
(c) The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical center line is not necessarily parallel to the front face of the handset, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.



6.1.2 Cheek Position

(a) To position the device with the vertical center line of the body of the device and the horizontal line crossing the center piece in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, align the vertical center line with the reference plane containing the three ear and mouth reference point (M: Mouth, RE: Right Ear, and LE: Left Ear) and align the center of the ear piece with the line RE-LE.

(b) To move the device towards the phantom with the ear piece aligned with the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the phone until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost.



6.1.3 Tilted Position

(a) To position the device in the “cheek” position described above.

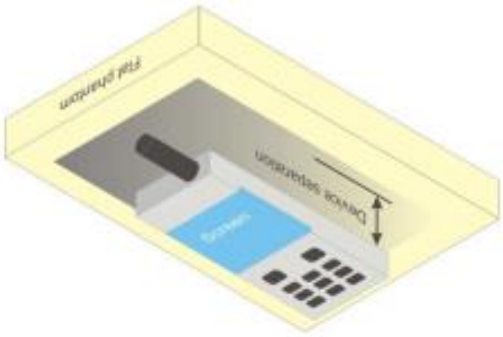
(b) While maintaining the device the reference plane described above and pivoting against the ear, moves it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost.

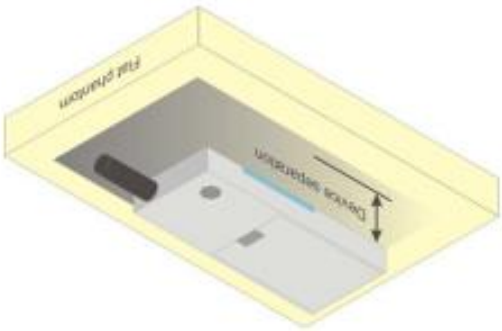
6.2 Body-worn Position Conditions

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 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.

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.

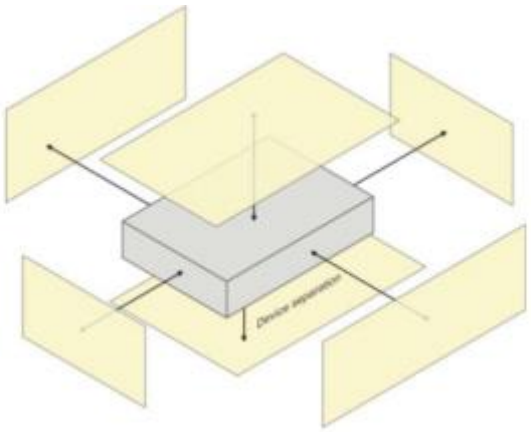
Body-worn accessory SAR compliance is based on a single minimum test separation distance for all wireless and operating modes applicable to each body-worn accessory used by the host, and according to the relevant voice and/or data mode transmissions and operations. If a body-worn accessory supports voice 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.





6.3 Hotspot Mode Exposure Position 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. 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).



6.4 Product Specific 10g Exposure Consideration

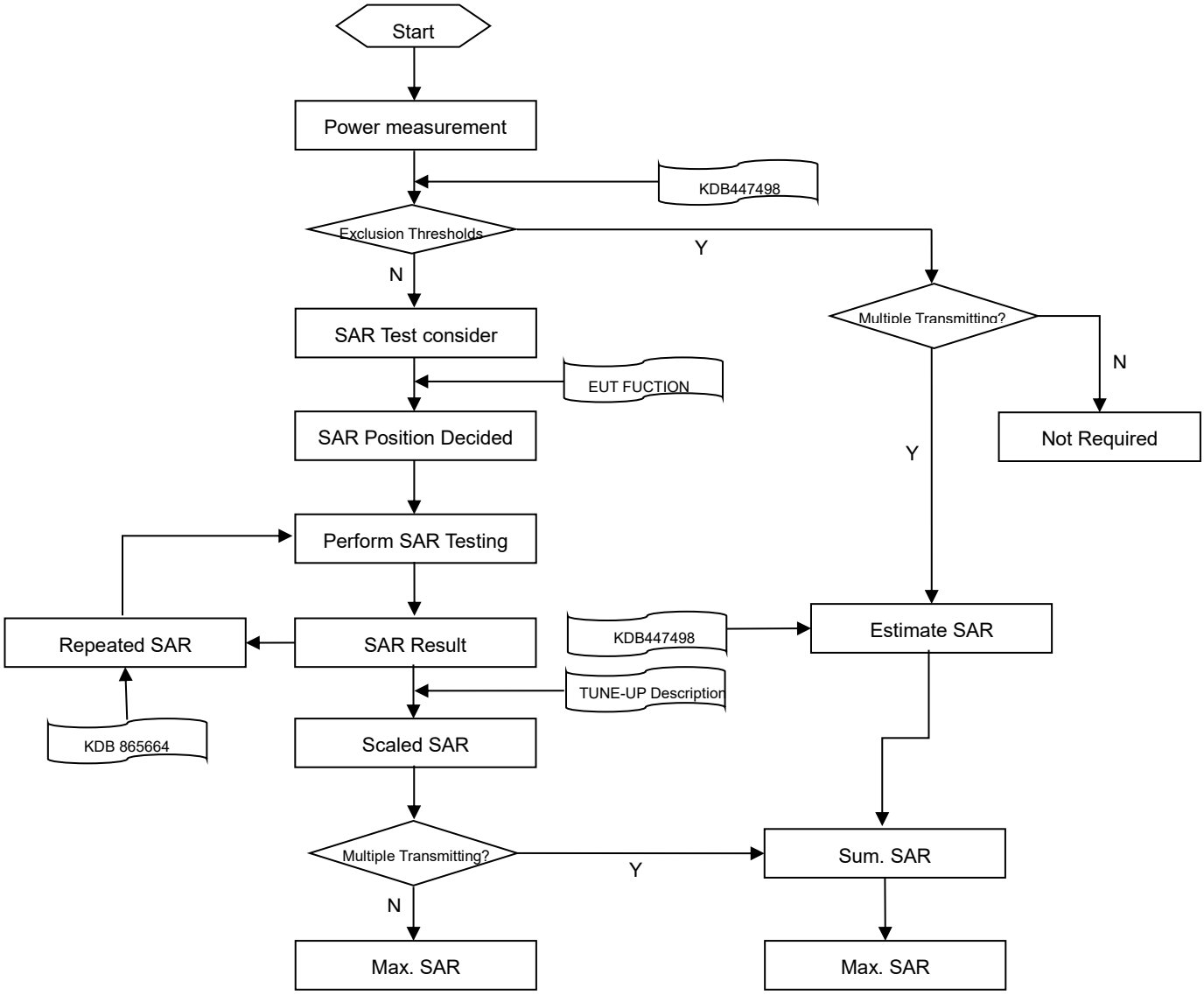
According with FCC KDB 648474 D04, for smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, unless it is confirmed otherwise through KDB inquiries, the following phablet procedures should be applied to evaluate SAR compliance for each applicable wireless modes and frequency band. Devices marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance;

The UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge, in direct contact with a flat phantom, for 10-g extremity SAR according to the body-equivalent tissue dielectric parameters in KDB 865664 to address interactive hand use exposure conditions. The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.

Note: The maximum hotspot SAR for this product is 0.890W/Kg, so the product specific for 10g SAR is not required.

MEASUREMENT PROCEDURE

6.5 Measurement Process Diagram



6.6 SAR Scan General Requirement

Probe boundary effect error compensation is required for measurements with the probe tip closer than half a probe tip diameter to the phantom surface. Boththe probe tip diameter and sensor offset distance must satisfy measurement protocols; to ensure probe boundary effect errors are minimized and the higher fields closest to the phantom surface can be correctly measured and extrapolated to the phantom surface for computing 1 g SAR. Tolerances of the post-processing algorithms must be verified by the test laboratory for the scan resolutions used in the SAR measurements, according to the reference distribution functions specified in IEEE Std 1528-2013.

<table>
<tr><th colspan="3"></th><th>≤3GHz</th><th>>3GHz</th></tr>
<tr><td colspan="3">Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5±1 mm</td><td>½·δ·ln(2)±0.5 mm</td></tr>
<tr><td colspan="3">Maximum probe angle from probe axis to phantom surface normal at the measurement location</td><td>30°±1°</td><td>20°±1°</td></tr>
<tr><td colspan="3" rowspan="2">Maximum area scan spatial resolution: Δx Area , Δy Area</td><td>≤ 2 GHz: ≤ 15 mm
2 – 3 GHz: ≤ 12 mm</td><td>3–4 GHz: ≤ 12 mm
4 – 6 GHz: ≤ 10 mm</td></tr>
<tr><td colspan="2">When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.</td></tr>
<tr><td colspan="3">Maximum zoom scan spatial resolution: Δx Zoom , Δy Zoom</td><td>≤ 2 GHz: ≤ 8 mm
2 –3 GHz: ≤ 5 mm*</td><td>3–4 GHz: ≤ 5 mm*
4 – 6 GHz: ≤ 4 mm*</td></tr>
<tr><td rowspan="6">Maximum zoom scan spatial resolution, normal to phantom surface</td><td colspan="2" rowspan="3">uniform grid: Δz Zoom (n)</td><td rowspan="3">≤ 5 mm</td><td>3–4 GHz: ≤ 4 mm</td></tr>
<tr><td>4–5 GHz: ≤ 3 mm</td></tr>
<tr><td>5–6 GHz: ≤ 2 mm</td></tr>
<tr><td rowspan="3">graded grid</td><td rowspan="2">Δz Zoom (1): between 1st two points closest to phantom surface</td><td rowspan="2">≤ 4 mm</td><td>3–4 GHz: ≤ 3 mm</td></tr>
<tr><td>4–5 GHz: ≤ 2.5 mm</td></tr>
<tr><td>Δz Zoom (n>1): between subsequent points</td><td>5–6 GHz: ≤ 2 mm</td><td>≤ 1.5·Δz Zoom (n-1)</td></tr>
<tr><td rowspan="3">Minimum zoom scan volume</td><td colspan="2" rowspan="3">x, y, z</td><td rowspan="3">≥30 mm</td><td>3–4 GHz: ≥ 28 mm</td></tr>
<tr><td>4–5 GHz: ≥ 25 mm</td></tr>
<tr><td>5–6 GHz: ≥ 22 mm</td></tr>
<tr><td colspan="5">Note:
1. δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.
2. * When zoom scan is required and the reported SAR from the area scan based 1 g SAR estimation procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.</td></tr>
</table>

6.7 Measurement Procedure

The following steps are used for each test position

a. Establish a call with the maximum output power with a base station simulator. The connection between the mobile and the base station simulator is established via air interface

b. Measurement of the local E-field value at a fixed location. This value serves as a reference value for calculating a possible power drift.

c. Measurement of the SAR distribution with a grid of 8 to 16mm * 8 to16 mm and a constant distance to the inner surface of the phantom. Since the sensors cannot directly measure at the inner phantom surface, the values between the sensors and the inner phantom surface are extrapolated. With these values the area of the maximum SAR is calculated by an interpolation scheme.

d. Around this point, a cube of 30 * 30 * 30 mm or 32 * 32 *32 mm is assessed by measuring 5 or 8 * 5 or 8*4 or 5 mm. With these data, the peak spatial-average SAR value can be calculated.

6.8 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. Area scan and zoom scan resolution setting follows KDB 865664 D01v01r04 quoted below.

When the 1 g SAR of the highest peak is within 2 dB of the SAR limit, additional zoom scans are required for other peaks within 2 dB of the highest peak that have not been included in any zoom scan to ensure there is no increase in SAR.

7 CONDUCTED RF OUPUT POWER

7.1 LTE

7.1.1 LTE Band 2

FDD LTE Band 2							
Bandwidth (MHz)	RB Set Channel	RB offest	Modulation	Power (dBm) 18607	18900	19193	Tune up limit (dBm)
1.4 MHz	1	LOW	QPSK	**24.36**	23.97	23.87	25.00
		MIDDLE	QPSK	24.19	23.87	23.95	25.00
		HIGH	QPSK	24.03	23.90	24.15	25.00
	3	LOW	QPSK	23.83	23.98	23.91	25.00
		MIDDLE	QPSK	24.00	24.09	23.96	25.00
		HIGH	QPSK	24.09	24.00	23.88	25.00
	6	LOW	QPSK	23.91	24.03	23.81	24.50
1.4 MHz	1	LOW	16QAM	24.26	23.97	23.88	24.50
		MIDDLE	16QAM	24.30	23.94	23.82	24.50
		HIGH	16QAM	24.27	23.90	23.81	24.50
	3	LOW	16QAM	23.67	23.68	24.08	24.50
		MIDDLE	16QAM	23.73	23.68	24.31	24.50
		HIGH	16QAM	23.71	23.84	24.22	24.50
	6	LOW	16QAM	22.79	22.93	22.73	23.50
Bandwidth (MHz)	RB Set Channel	RB offest	Modulation	Power (dBm) 18615	18900	19185	Tune up limit (dBm)
3 MHz	1	LOW	QPSK	24.21	24.06	24.08	25.00
		MIDDLE	QPSK	24.04	23.92	23.91	25.00
		HIGH	QPSK	23.79	24.07	23.78	25.00
	8	LOW	QPSK	24.04	24.20	23.89	24.50
		MIDDLE	QPSK	23.98	24.24	23.86	24.50
		HIGH	QPSK	23.95	24.15	23.80	24.50
	15	LOW	QPSK	23.94	24.13	23.93	25.00
3 MHz	1	LOW	16QAM	24.20	**24.26**	24.01	25.00
		MIDDLE	16QAM	24.19	**24.26**	23.79	25.00
		HIGH	16QAM	23.72	23.55	23.76	25.00
	8	LOW	16QAM	22.99	23.05	22.83	24.00
		MIDDLE	16QAM	23.05	23.27	22.91	24.00
		HIGH	16QAM	22.87	23.06	22.69	24.00
	15	LOW	16QAM	22.96	23.13	22.82	24.00
Bandwidth (MHz)	RB Set Channel	RB offest	Modulation	Power (dBm) 18625	18900	19175	Tune up limit (dBm)
5 MHz	1	LOW	QPSK	23.86	23.99	24.02	25.00
		MIDDLE	QPSK	23.80	23.95	23.92	25.00

		HIGH	QPSK	23.57	23.74	23.77	25.00
	12	LOW	QPSK	23.99	24.05	23.96	24.50
		MIDDLE	QPSK	23.88	24.08	23.86	24.50
		HIGH	QPSK	23.72	24.05	23.79	24.50
	25	LOW	QPSK	23.79	**24.10**	23.83	24.50
5 MHz	1	LOW	16QAM	23.89	23.97	24.08	24.50
		MIDDLE	16QAM	23.79	24.01	23.54	24.50
		HIGH	16QAM	23.60	23.99	23.18	24.50
	12	LOW	16QAM	23.11	22.96	22.86	23.50
		MIDDLE	16QAM	23.01	22.82	22.62	23.50
		HIGH	16QAM	22.87	22.81	22.58	23.50
	25	LOW	16QAM	22.92	23.20	22.68	23.50

Bandwidth (MHz)	RB Set	RB offest	Modulation	Power (dBm)			
	Channel			18607	18900	19193	Tune up limit (dBm)
10 MHz	1	LOW	QPSK	23.95	24.01	23.93	25.00
		MIDDLE	QPSK	24.14	24.36	24.11	25.00
		HIGH	QPSK	23.76	23.73	23.89	25.00
	25	LOW	QPSK	23.89	24.19	24.07	24.50
		MIDDLE	QPSK	23.83	24.23	23.94	24.50
		HIGH	QPSK	23.73	23.99	23.91	24.50
	50	LOW	QPSK	23.75	24.13	24.02	24.50
10 MHz	1	LOW	16QAM	23.65	**24.49**	23.16	24.50
		MIDDLE	16QAM	23.86	23.96	24.04	24.50
		HIGH	16QAM	23.66	23.37	24.34	24.50
	25	LOW	16QAM	22.87	23.13	22.88	23.50
		MIDDLE	16QAM	22.85	23.32	22.94	23.50
		HIGH	16QAM	22.83	23.17	22.66	23.50
	50	LOW	16QAM	22.74	23.13	22.91	23.50

Bandwidth (MHz)	RB Set	RB offest	Modulation	Power (dBm)			
	Channel			18615	18900	19185	Tune up limit (dBm)
15 MHz	1	LOW	QPSK	24.02	24.12	24.00	25.00
		MIDDLE	QPSK	23.96	24.04	23.83	25.00
		HIGH	QPSK	23.95	23.36	23.72	25.00
	36	LOW	QPSK	23.78	24.19	24.00	24.50
		MIDDLE	QPSK	23.83	24.17	23.84	24.50
		HIGH	QPSK	23.69	23.78	23.81	24.50
	75	LOW	QPSK	23.81	24.06	23.88	24.50
15 MHz	1	LOW	16QAM	23.86	24.28	24.06	24.50
		MIDDLE	16QAM	23.83	24.06	23.94	24.50
		HIGH	16QAM	24.09	23.33	**24.45**	24.50
	36	LOW	16QAM	22.70	23.24	22.86	23.50
		MIDDLE	16QAM	22.72	23.23	22.77	23.50
		HIGH	16QAM	22.67	22.91	22.74	23.50

	75	LOW	16QAM	22.81	23.03	22.86	23.50
Bandwidth (MHz)	RB Set	RB offest	Modulation	Power (dBm)			
	Channel			18625	18900	19175	Tune up limit (dBm)
20 MHz	1	LOW	QPSK	23.85	24.24	23.79	25.00
		MIDDLE	QPSK	23.88	**24.38**	24.33	25.00
		HIGH	QPSK	23.90	23.77	23.59	25.00
	50	LOW	QPSK	23.82	24.22	23.84	24.50
		MIDDLE	QPSK	23.91	24.17	23.90	24.50
		HIGH	QPSK	23.97	23.72	23.93	24.50
	100	LOW	QPSK	23.84	24.07	23.86	24.50
20 MHz	1	LOW	16QAM	23.99	24.20	23.59	24.50
		MIDDLE	16QAM	24.13	24.25	23.97	24.50
		HIGH	16QAM	23.88	23.20	23.34	24.50
	50	LOW	16QAM	22.83	23.21	22.85	23.50
		MIDDLE	16QAM	22.95	23.11	22.78	23.50
		HIGH	16QAM	22.91	22.60	22.85	23.50
	100	LOW	16QAM	22.86	23.00	22.95	23.50

7.1.2 LTE Band 4

FDD LTE Band 4							
Bandwidth (MHz)	RB Set Channel	RB offest	Modulation	Power (dBm) 19957	20175	20393	Tune up limit (dBm)
1.4 MHz	1	LOW	QPSK	25.36	24.78	24.57	26.00
		MIDDLE	QPSK	24.99	24.65	24.84	26.00
		HIGH	QPSK	**25.51**	24.60	24.76	26.00
	3	LOW	QPSK	24.95	24.70	24.78	26.00
		MIDDLE	QPSK	25.04	24.76	24.80	26.00
		HIGH	QPSK	24.94	24.62	24.75	26.00
	6	LOW	QPSK	24.89	24.71	24.76	25.50
1.4 MHz	1	LOW	16QAM	25.10	25.42	24.85	25.50
		MIDDLE	16QAM	24.87	25.36	24.92	25.50
		HIGH	16QAM	24.84	25.35	24.75	25.50
	3	LOW	16QAM	25.09	24.91	24.90	25.50
		MIDDLE	16QAM	25.06	24.88	24.98	25.50
		HIGH	16QAM	25.20	24.51	24.86	25.50
	6	LOW	16QAM	24.08	23.39	23.86	24.50
Bandwidth (MHz)	RB Set Channel	RB offest	Modulation	Power (dBm) 19965	20175	20385	Tune up limit (dBm)
3 MHz	1	LOW	QPSK	**25.45**	24.74	24.63	26.00
		MIDDLE	QPSK	24.92	24.71	24.93	26.00
		HIGH	QPSK	24.82	24.69	24.94	26.00
	8	LOW	QPSK	24.94	24.80	24.69	25.00
		MIDDLE	QPSK	24.99	24.85	24.68	25.00
		HIGH	QPSK	24.94	24.75	24.60	25.00
	15	LOW	QPSK	24.93	24.80	24.69	25.50
3 MHz	1	LOW	16QAM	24.98	25.20	24.80	25.50
		MIDDLE	16QAM	24.79	24.88	24.66	25.50
		HIGH	16QAM	24.74	25.00	24.67	25.50
	8	LOW	16QAM	23.86	23.79	23.26	24.50
		MIDDLE	16QAM	23.82	23.76	23.84	24.50
		HIGH	16QAM	24.04	23.86	23.85	24.50
	15	LOW	16QAM	23.89	23.83	23.75	24.50
Bandwidth (MHz)	RB Set Channel	RB offest	Modulation	Power (dBm) 19975	20175	20375	Tune up limit (dBm)
5 MHz	1	LOW	QPSK	24.94	24.71	24.76	26.00
		MIDDLE	QPSK	24.99	24.79	24.82	26.00
		HIGH	QPSK	24.96	24.62	24.82	26.00
	12	LOW	QPSK	**25.02**	24.74	24.93	25.50
		MIDDLE	QPSK	24.90	24.72	24.82	25.50
		HIGH	QPSK	24.93	24.65	24.81	25.50

	25	LOW	QPSK	24.98	24.64	24.83	25.50
5 MHz	1	LOW	16QAM	24.72	24.83	24.49	25.50
		MIDDLE	16QAM	24.43	24.64	24.94	25.50
		HIGH	16QAM	24.66	24.56	24.87	25.50
	12	LOW	16QAM	23.99	23.82	23.74	24.50
		MIDDLE	16QAM	23.81	23.83	23.73	24.50
		HIGH	16QAM	23.96	23.75	23.77	24.50
	25	LOW	16QAM	23.90	23.81	23.82	24.50
Bandwidth (MHz)	RB Set	RB offest	Modulation	Power (dBm)			
	Channel			20000	20175	20350	Tune up limit (dBm)
10 MHz	1	LOW	QPSK	24.95	24.74	24.64	26.00
		MIDDLE	QPSK	24.95	24.84	24.60	26.00
		HIGH	QPSK	24.64	24.39	25.04	26.00
	25	LOW	QPSK	24.95	24.77	24.70	26.00
		MIDDLE	QPSK	24.86	24.78	24.74	26.00
		HIGH	QPSK	24.79	24.58	24.61	26.00
	50	LOW	QPSK	24.90	24.55	24.68	25.50
10 MHz	1	LOW	16QAM	25.21	24.57	24.69	25.50
		MIDDLE	16QAM	**25.27**	25.14	24.65	25.50
		HIGH	16QAM	24.46	24.23	24.70	25.50
	25	LOW	16QAM	23.82	23.72	23.86	24.50
		MIDDLE	16QAM	23.92	23.77	23.68	24.50
		HIGH	16QAM	23.75	23.66	23.74	24.50
	50	LOW	16QAM	23.76	23.65	23.71	24.50
Bandwidth (MHz)	RB Set	RB offest	Modulation	Power (dBm)			
	Channel			20025	20175	20325	Tune up limit (dBm)
15 MHz	1	LOW	QPSK	25.02	24.86	24.58	26.00
		MIDDLE	QPSK	24.82	24.71	24.46	26.00
		HIGH	QPSK	24.73	24.29	24.58	26.00
	36	LOW	QPSK	24.98	24.57	24.75	26.00
		MIDDLE	QPSK	24.80	24.74	24.75	26.00
		HIGH	QPSK	24.61	24.55	24.56	26.00
	75	LOW	QPSK	24.60	24.50	24.64	25.50
15 MHz	1	LOW	16QAM	24.97	25.03	25.09	25.50
		MIDDLE	16QAM	24.80	25.04	**25.33**	25.50
		HIGH	16QAM	25.03	24.55	24.75	25.50
	36	LOW	16QAM	23.91	23.58	23.81	24.50
		MIDDLE	16QAM	23.86	23.78	23.73	24.50
		HIGH	16QAM	23.53	23.68	23.48	24.50
	75	LOW	16QAM	23.65	23.62	23.67	24.50
Bandwidth (MHz)	RB Set	RB offest	Modulation	Power (dBm)			
	Channel			20050	20175	20300	Tune up limit (dBm)

20 MHz	1	LOW	QPSK	**25.17**	24.82	24.71	26.00
		MIDDLE	QPSK	24.94	24.71	24.84	26.00
		HIGH	QPSK	24.67	24.55	24.47	26.00
	50	LOW	QPSK	24.80	24.53	24.76	25.50
		MIDDLE	QPSK	24.73	24.75	24.76	25.50
		HIGH	QPSK	24.72	24.47	24.56	25.50
	100	LOW	QPSK	24.75	24.57	24.60	25.50
20 MHz	1	LOW	16QAM	24.63	24.84	24.47	25.50
		MIDDLE	16QAM	24.87	24.69	24.83	25.50
		HIGH	16QAM	24.40	24.21	24.33	25.50
	50	LOW	16QAM	23.90	23.51	23.71	24.50
		MIDDLE	16QAM	23.73	23.85	23.73	24.50
		HIGH	16QAM	23.80	23.66	23.64	24.50
	100	LOW	16QAM	23.79	23.66	23.71	24.00

7.1.3 LTE Band 5

FDD LTE Band 5							
Bandwidth (MHz)	RB Set Channel	RB offest	Modulation	Power (dBm) 20407	20525	20643	Tune up limit (dBm)
1.4 MHz	1	LOW	QPSK	24.39	24.25	24.32	26.00
		MIDDLE	QPSK	**24.51**	24.32	24.21	26.00
		HIGH	QPSK	24.18	24.25	24.15	26.00
	3	LOW	QPSK	24.20	24.29	24.22	26.00
		MIDDLE	QPSK	24.29	24.22	24.26	26.00
		HIGH	QPSK	24.28	24.11	24.23	26.00
	6	LOW	QPSK	23.13	23.22	23.10	25.00
1.4 MHz	1	LOW	16QAM	23.29	23.32	23.07	25.00
		MIDDLE	16QAM	23.22	23.39	23.15	25.00
		HIGH	16QAM	23.14	23.32	23.17	25.00
	3	LOW	16QAM	23.23	23.34	23.45	25.00
		MIDDLE	16QAM	23.16	23.30	23.46	25.00
		HIGH	16QAM	23.17	23.22	23.30	25.00
	6	LOW	16QAM	22.26	22.25	22.03	24.00
Bandwidth (MHz)	RB Set Channel	RB offest	Modulation	Power (dBm) 20415	20525	20635	Tune up limit (dBm)
3 MHz	1	LOW	QPSK	24.41	24.25	24.35	26.00
		MIDDLE	QPSK	**24.42**	24.16	24.27	26.00
		HIGH	QPSK	24.24	24.00	24.32	26.00
	8	LOW	QPSK	23.22	23.29	23.14	25.00
		MIDDLE	QPSK	23.38	23.25	23.12	25.00
		HIGH	QPSK	23.33	23.19	23.03	25.00
	15	LOW	QPSK	23.32	23.25	23.07	25.00
3 MHz	1	LOW	16QAM	23.56	22.85	23.05	24.50
		MIDDLE	16QAM	23.52	22.75	22.97	24.50
		HIGH	16QAM	23.29	22.77	23.06	24.50
	8	LOW	16QAM	22.41	22.07	22.09	24.00
		MIDDLE	16QAM	22.49	22.13	22.01	24.00
		HIGH	16QAM	22.36	22.11	22.03	24.00
	15	LOW	16QAM	22.22	22.08	22.05	24.00
Bandwidth (MHz)	RB Set Channel	RB offest	Modulation	Power (dBm) 20425	20525	20625	Tune up limit (dBm)
5 MHz	1	LOW	QPSK	**24.45**	24.03	24.02	26.00
		MIDDLE	QPSK	24.34	24.14	24.33	26.00
		HIGH	QPSK	24.18	24.01	24.09	26.00
	12	LOW	QPSK	23.22	23.21	23.09	24.50
		MIDDLE	QPSK	23.29	23.17	23.23	24.50
		HIGH	QPSK	23.23	23.21	23.05	24.50

	25	LOW	QPSK	23.21	23.21	23.20	24.50
5 MHz	1	LOW	16QAM	22.92	23.02	23.16	24.50
		MIDDLE	16QAM	22.87	23.05	22.90	24.50
		HIGH	16QAM	22.70	22.78	22.52	24.50
	12	LOW	16QAM	22.24	22.10	22.07	24.00
		MIDDLE	16QAM	22.39	22.09	22.27	24.00
		HIGH	16QAM	22.31	22.16	22.14	24.00
	25	LOW	16QAM	22.45	22.35	22.13	24.00

Bandwidth (MHz)	RB Set	RB offest	Modulation	Power (dBm)			
	Channel			20450	20525	20600	Tune up limit (dBm)
10 MHz	1	LOW	QPSK	**24.50**	24.11	24.25	26.00
		MIDDLE	QPSK	24.33	24.39	24.37	26.00
		HIGH	QPSK	24.12	24.26	24.24	26.00
	25	LOW	QPSK	23.27	23.30	23.21	25.00
		MIDDLE	QPSK	23.23	23.19	23.27	25.00
		HIGH	QPSK	23.18	23.17	23.15	25.00
	50	LOW	QPSK	23.30	23.24	23.26	25.00
10 MHz	1	LOW	16QAM	23.52	22.95	23.14	24.50
		MIDDLE	16QAM	23.74	23.20	23.15	24.50
		HIGH	16QAM	23.33	23.57	22.96	24.50
	25	LOW	16QAM	22.29	22.33	22.46	24.00
		MIDDLE	16QAM	22.22	22.42	22.40	24.00
		HIGH	16QAM	22.08	22.25	22.18	24.00
	50	LOW	16QAM	22.28	22.14	22.19	24.00

7.1.4 LTE Band 13

FDD LTE Band 13							
Bandwidth (MHz)	RB Set	RB offest	Modulation	Power (dBm)			
	Channel			23205	23230	23255	Tune up limit (dBm)
5 MHz	1	LOW	QPSK	24.13	24.13	24.32	25.00
		MIDDLE	QPSK	24.14	**24.36**	**24.36**	25.00
		HIGH	QPSK	24.25	24.32	23.92	25.00
	12	LOW	QPSK	23.37	23.19	23.27	24.00
		MIDDLE	QPSK	23.26	23.44	23.42	24.00
		HIGH	QPSK	23.32	23.34	23.12	24.00
	25	LOW	QPSK	23.24	23.21	23.21	24.00
5 MHz	1	LOW	16QAM	22.76	22.93	**23.21**	24.00
		MIDDLE	16QAM	22.66	23.04	23.07	24.00
		HIGH	16QAM	22.79	23.02	22.52	24.00
	12	LOW	16QAM	22.38	22.14	22.37	23.00
		MIDDLE	16QAM	22.24	22.39	22.17	23.00
		HIGH	16QAM	22.33	22.35	22.12	23.00
	25	LOW	16QAM	22.10	22.16	22.23	23.00
Bandwidth (MHz)	RB Set	RB offest	Modulation	Power (dBm)			
	Channel			23230			Tune up limit (dBm)
10 MHz	1	LOW	QPSK	24.24			25.00
		MIDDLE	QPSK	**24.36**			25.00
		HIGH	QPSK	24.22			25.00
	25	LOW	QPSK	23.18			24.00
		MIDDLE	QPSK	23.23			24.00
		HIGH	QPSK	23.33			24.00
	50	LOW	QPSK	23.19			24.00
10 MHz	1	LOW	16QAM	23.51			24.00
		MIDDLE	16QAM	**23.66**			24.00
		HIGH	16QAM	23.39			24.00
	25	LOW	16QAM	22.18			23.00
		MIDDLE	16QAM	22.21			23.00
		HIGH	16QAM	22.10			23.00
	50	LOW	16QAM	22.18			23.00

7.2 WIFI

7.2.1 2.4G WIFI

Band (GHz)	Mode	Channel	Freq. (MHz)	Average Power (dBm)	Tune-up Limit (dBm)	SAR Test Require.
2.4 (2.4~2.4835)	802.11b	1	2412	**19.13**	20.00	Yes
		6	2437	18.04	20.00	Yes
		11	2462	18.11	20.00	Yes
	802.11g	1	2412	16.59	17.00	No
		6	2437	15.00	17.00	No
		11	2462	16.14	17.00	No
	802.11n(HT20)	1	2412	14.54	15.00	No
		6	2437	13.13	15.00	No
		11	2462	13.26	15.00	No

Note: When multiple channel bandwidth configurations in a frequency band have the same maximum tune-up output power, the test configuration is determined by applying the following steps sequentially.

1) The largest channel bandwidth configuration is selected between the multiple configurations in a frequency band with the same maximum tune-up output power.

2) When multiple transmission modes (802.11b/g/n) have the same maximum tune-up output power, largest channel bandwidth, lowest order modulation and lowest data rate, the lowest order 802.11 mode is selected; i.e., 802.11b is chosen over 802.11g, and 802.11g chosen over 802.11n.

3) According KDB 247228, when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, OFDM SAR test is not required.

Adjusted SAR = 0.905 * (50.12mW/100mW) = 0.454 W/Kg, so 2.4G OFDM SAR test is not required.

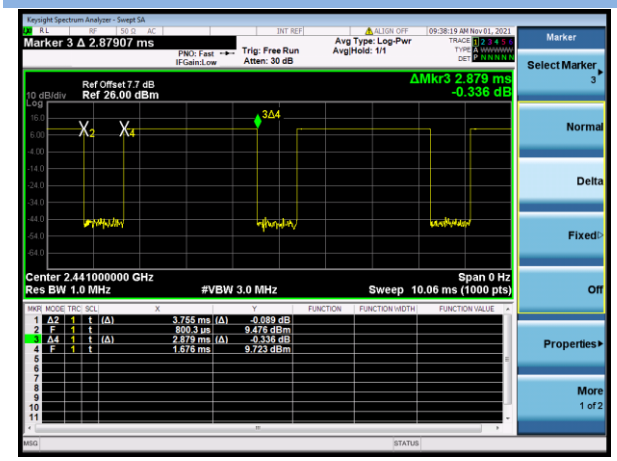
7.3 Bluetooth

Mode	GFSK			π/4-DQPSK		
Channel	0	39	78	0	39	78
Frequency (MHz)	2402	2441	2480	2402	2441	2480
Average Power (dBm)	10.75	**11.68**	10.34	9.26	10.19	8.82
Tune-Up Limit (dBm)	12.00			11.00		
Mode	8-DPSK			BLE		
Channel	0	39	78	0	19	39
Frequency (MHz)	2402	2441	2480	2402	2440	2480
Average Power (dBm)	9.34	10.22	8.85	-1.09	-0.04	-1.23
Tune-Up Limit (dBm)	11.00			0.50		

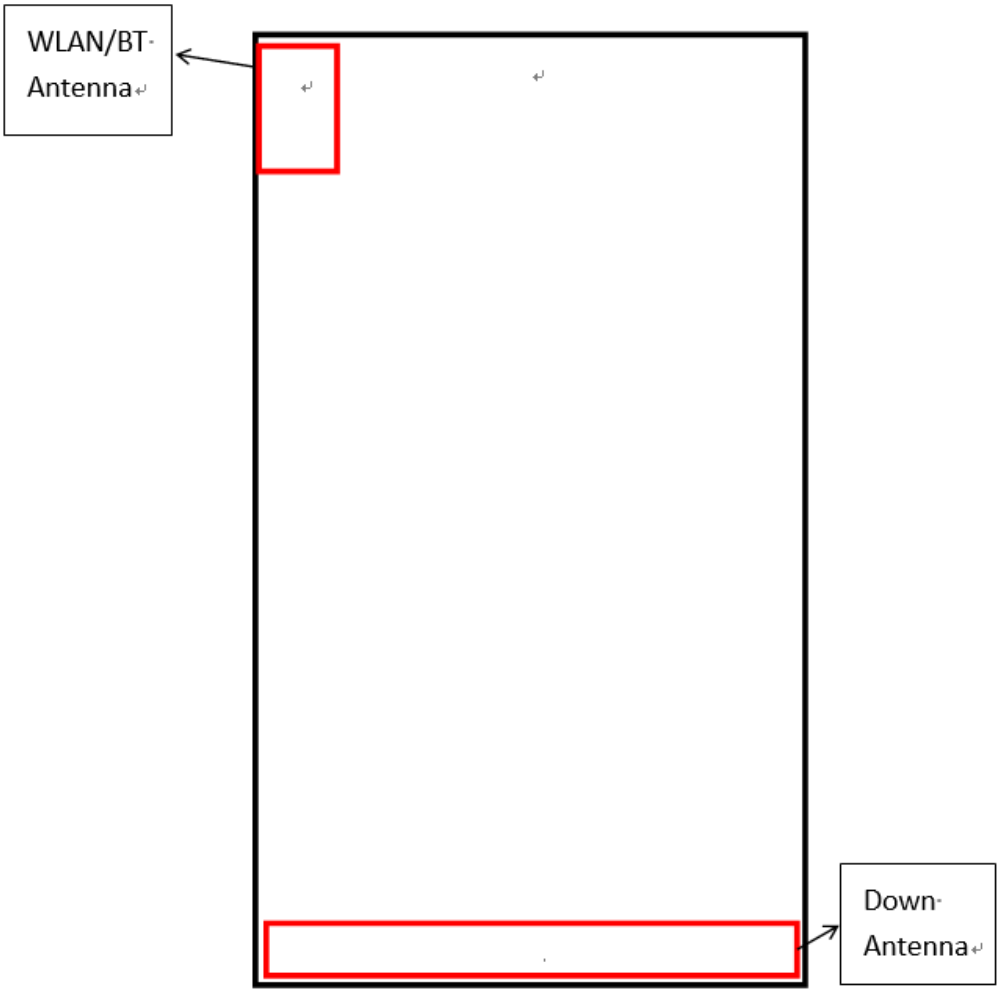
Note: The Bluetooth duty cycle is 76.67 % as following figure, according to 2016 Oct. TCB workshop for Bluetooth SAR scaling need further consideration and the maximum duty cycle is 100%, therefore the actual duty cycle will be scaled up to 100% for Bluetooth reported SAR calculation.

Duty Cycle

GFSK



8 TEST EXCLUSION CONSIDERATION



Antenna	Description	Support Bands
Down Antenna	2/3/4G TX Antenna	LTE B2/4/5/13
WLAN/BT Antenna	WLAN 2.4G/Antenna Bluetooth TX Antenna	2.4G WLAN Bluetooth

Antenna	Front Side(mm)	Back Side(mm)	Left Edge(mm)	Right Edge(mm)	Top Edge(mm)	Bottom Edge(mm)
Down	<5	<5	<5	<5	141.05	<5
WLAN/BT	<5	<5	<5	45.42	<5	141.05

8.1 SAR Test Exclusion Consideration Table

According with FCC KDB 447498 D01, Appendix A, <SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and ≤ 50 mm> Table, this Device SAR test configurations consider as following :

Down Antenna

Band	Mode	Max. Peak Power		Test Position Configurations					
		dBm	mW	Head	Front/ Back	Left Edge	Right Edge	Top Edge	Bottom Edge
LTE Band 2	Distance to User			<5mm	<5mm	<5mm	<5mm	141.05mm	<5mm
	QPSK	25.00	316.23	Yes	Yes	Yes	Yes	No	Yes
LTE Band 4	Distance to User			<5mm	<5mm	<5mm	<5mm	141.05mm	<5mm
	QPSK	26.00	398.11	Yes	Yes	Yes	Yes	No	Yes
LTE Band 5	Distance to User			<5mm	<5mm	<5mm	<5mm	141.05mm	<5mm
	QPSK	26.00	398.11	Yes	Yes	Yes	Yes	No	Yes
LTE Band 13	Distance to User			<5mm	<5mm	<5mm	<5mm	141.05mm	<5mm
	QPSK	25.00	316.23	Yes	Yes	Yes	Yes	No	Yes

WLAN/BT Antenna

Band	Mode	Max. Peak Power		Test Position Configurations					
		dBm	mW	Head	Front/ Back	Left Edge	Right Edge	Top Edge	Bottom Edge
WLAN 2.4 G	Distance to User			<5mm	<5mm	<5mm	45.2 mm	<5mm	141.05 mm
	802.11b	20.00	100.00	Yes	Yes	Yes	Yes	Yes	Yes
	802.11g	17.00	50.12	No	No	No	No	No	No
	802.11n(HT20)	15.00	31.62	No	No	No	No	No	No
Bluetooth	Distance to User			<5mm	<5mm	<5mm	45.2 mm	<5mm	141.05 mm
	BT	12.00	15.85	Yes	Yes	Yes	Yes	Yes	Yes

Note:

1. Maximum power is the source-based time-average power and represents the maximum RF output power including tune-up tolerance among production units
2. Per KDB 447498 D01, for larger devices, the test separation distance of adjacent edge configuration is determined by the closest separation between the antenna and the user.
3. Per KDB 447498 D01, standalone SAR test exclusion threshold is applied; If the distance of the antenna to the user is < 5mm, 5mm is used to determine SAR exclusion threshold
4. Per KDB 447498 D01, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:
   [(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] ·[√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR
   a. f(GHz) is the RF channel transmit frequency in GHz
   b. Power and distance are rounded to the nearest mW and mm before calculation
   c. The result is rounded to one decimal place for comparison
   d. For < 50 mm distance, we just calculate mW of the exclusion threshold value (3.0) to do compare.
   This formula is [3.0] / [√f(GHz)] ·[(min. test separation distance, mm)] = exclusion threshold of mW.
5. Per KDB 447498 D01, at 100 MHz to 6 GHz and for test separation distances > 50 mm, the SAR test exclusion threshold is determined according to the following
   a. [Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·(f(MHz)/150)] mW, at 100 MHz to 1500 MHz
   b. [Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·10] mW at > 1500 MHz and ≤ 6 GHz
6. Per KDB 941225 D01, RMC 12.2kbps setting is used to evaluate SAR. If HSDPA /HSUPA /DC-HSDPA output power is < 0.25dB higher than RMC12.2Kbps, or reported SAR with RMC 12.2kbps setting is ≤ 1.2W/kg, HSDPA/HSUPA/DC-HSDPA SAR evaluation can be excluded.
7. Per KDB 248227 D01, choose the highest output power channel to test SAR and determine further SAR exclusion.8. For each frequency band, testing at higher data rates and higher order modulations is not required when the maximum average output power for each of these configurations is less than 1/4dB higher than those measured at the lowest data rate
8. Per KDB 248227 D01 SAR is not required for the following 2.4 GHz OFDM conditions.
   a. When KDB Publication 447498 D01 SAR test exclusion applies to the OFDM configuration.
   b. When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

9 TEST RESULT

9.1 LTE Band 2 (20MHz Bandwidth)

Antenna	Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	RB Num.	RB Start	Power Drift (dB)	1 g Meas SAR (W/kg)	Meas. Power (dBm)	Max. tune-up power (dBm)	Scaling Factor	1g Scaled SAR (W/kg)	Meas. No.
Head														
Down	QPSK	Left Cheek	0	18900	1880	1	Mid	0.04	0.312	24.38	25.00	1.153	**0.360**	1#
			0	18900	1880	50	Low	0.17	0.307	24.22	24.50	1.067	0.327	/
		Left Tilt	0	18900	1880	1	Mid	-0.03	0.116	24.38	25.00	1.153	0.134	/
			0	18900	1880	50	Low	-0.12	0.101	24.22	24.50	1.067	0.108	/
		Right Cheek	0	18900	1880	1	Mid	0.17	0.161	24.38	25.00	1.153	0.186	/
			0	18900	1880	50	Low	0.19	0.125	24.22	24.50	1.067	0.133	/
		Right Tilt	0	18900	1880	1	Mid	-0.01	0.079	24.38	25.00	1.153	0.091	/
			0	18900	1880	50	Low	-0.12	0.063	24.22	24.50	1.067	0.067	/
Body-worn Accessory and Hotspot														
Down	QPSK	Front Side	10	18900	1880	1	Mid	-0.19	0.675	24.38	25.00	1.153	0.779	/
			10	18900	1880	50	Low	0.14	0.597	24.22	24.50	1.067	0.637	/
		Back Side	10	18900	1880	1	Mid	-0.16	0.694	24.38	25.00	1.153	0.800	/
			10	18700	1860	1	High	-0.16	0.689	23.90	25.00	1.288	0.888	/
			10	19100	1900	1	Mid	-0.07	0.763	24.33	25.00	1.167	**0.890**	2#
			10	18900	1880	50	Low	0.04	0.621	24.22	24.50	1.067	0.662	/
			10	18700	1860	50	High	-0.17	0.584	23.97	24.50	1.130	0.660	/
			10	19100	1900	50	High	0.18	0.628	23.93	24.50	1.140	0.716	/
			10	18900	1880	100	Low	-0.08	0.574	24.07	24.50	1.104	0.634	/
		Left Edge	10	18900	1880	1	Mid	-0.07	0.124	24.38	25.00	1.153	0.143	/
			10	18900	1880	50	Low	-0.07	0.114	24.22	24.50	1.067	0.122	/
		Right Edge	10	18900	1880	1	Mid	0.08	0.478	24.38	25.00	1.153	0.551	/
			10	18900	1880	50	Low	0.14	0.410	24.22	24.50	1.067	0.437	/
		Bottom Edge	10	18900	1880	1	Mid	0.11	0.355	24.38	25.00	1.153	0.409	/
			10	18900	1880	50	Low	-0.03	0.347	24.22	24.50	1.067	0.370	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.														

9.2 LTE Band 4 (20MHz Bandwidth)

Antenna	Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	RB Num.	RB Start	Power Drift (dB)	1 g Meas SAR (W/kg)	Meas. Power (dBm)	Max. tune-up power (dBm)	Scaling Factor	1g Scaled SAR (W/kg)	Meas. No.
Head														
Down	QPSK	Left Cheek	0	20050	1720	1	Low	0.07	0.326	25.17	26.00	1.211	**0.395**	3#
			0	20050	1720	50	Low	0.04	0.221	24.80	25.50	1.175	0.260	/
		Left Tilt	0	20050	1720	1	Low	-0.17	0.248	25.17	26.00	1.211	0.300	/
			0	20050	1720	50	Low	0.18	0.221	24.80	25.50	1.175	0.260	/
		Right Cheek	0	20050	1720	1	Low	-0.08	0.264	25.17	26.00	1.211	0.320	/
			0	20050	1720	50	Low	-0.07	0.216	24.80	25.50	1.175	0.254	/
		Right Tilt	0	20050	1720	1	Low	-0.07	0.203	25.17	26.00	1.211	0.246	/
			0	20050	1720	50	Low	0.08	0.160	24.80	25.50	1.175	0.188	/
Body-worn Accessory and Hotspot														
Down	QPSK	Front Side	10	20050	1720	1	Low	-0.04	0.498	25.17	26.00	1.211	0.603	/
			10	20050	1720	50	Low	-0.07	0.424	24.80	25.50	1.175	0.498	/
		Back Side	10	20050	1720	1	Low	0.02	0.537	25.17	26.00	1.211	**0.650**	4#
			10	20050	1720	50	Low	0.05	0.398	24.80	25.50	1.175	0.468	/
		Left Edge	10	20050	1720	1	Low	-0.04	0.026	25.17	26.00	1.211	0.031	/
			10	20050	1720	50	Low	-0.19	0.021	24.80	25.50	1.175	0.025	/
		Right Edge	10	20050	1720	1	Low	0.18	0.335	25.17	26.00	1.211	0.406	/
			10	20050	1720	50	Low	-0.11	0.291	24.80	25.50	1.175	0.342	/
		Bottom Edge	10	20050	1720	1	Low	0.18	0.251	25.17	26.00	1.211	0.304	/
			10	20050	1720	50	Low	0.07	0.184	24.80	25.50	1.175	0.216	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.														

9.3 LTE Band 5 (10MHz Bandwidth)

Antenna	Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	RB Num.	RB Start	Power Drift (dB)	1 g Meas SAR (W/kg)	Meas. Power (dBm)	Max. tune-up power (dBm)	Scaling Factor	1g Scaled SAR (W/kg)	Meas. No.
Head														
Down	QPSK	Left Cheek	0	20450	829	1	Low	0.14	0.186	24.50	26.00	1.413	0.263	/
			0	20525	836.5	25	Low	0.02	0.164	23.30	25.00	1.479	0.243	/
		Left Tilt	0	20450	829	1	Low	0.14	0.096	24.50	26.00	1.413	0.136	/
			0	20525	836.5	25	Low	0.12	0.091	23.30	25.00	1.479	0.135	/
		Right Cheek	0	20450	829	1	Low	0.14	0.228	24.50	26.00	1.413	**0.322**	5#
			0	20525	836.5	25	Low	0.08	0.174	23.30	25.00	1.479	0.257	/
		Right Tilt	0	20450	829	1	Low	0.12	0.101	24.50	26.00	1.413	0.143	/
			0	20525	836.5	25	Low	0.1	0.094	23.30	25.00	1.479	0.139	/
Body-worn Accessory and Hotspot														
Down	QPSK	Front Side	10	20450	829	1	Low	0.02	0.182	24.50	26.00	1.413	0.257	/
			10	20525	836.5	25	Low	0.08	0.165	23.30	25.00	1.479	0.244	/
		Back Side	10	20450	829	1	Low	-0.09	0.267	24.50	26.00	1.413	**0.377**	6#
			10	20525	836.5	25	Low	-0.07	0.239	23.30	25.00	1.479	0.354	/
		Left Edge	10	20450	829	1	Low	-0.04	0.143	24.50	26.00	1.413	0.202	/
			10	20525	836.5	25	Low	-0.12	0.129	23.30	25.00	1.479	0.191	/
		Right Edge	10	20450	829	1	Low	-0.17	0.114	24.50	26.00	1.413	0.161	/
			10	20525	836.5	25	Low	-0.12	0.103	23.30	25.00	1.479	0.152	/
		Bottom Edge	10	20450	829	1	Low	0.15	0.066	24.50	26.00	1.413	0.093	/
			10	20525	836.5	25	Low	0.16	0.058	23.30	25.00	1.479	0.086	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.														

9.4 LTE Band 13 (10MHz Bandwidth)

Antenna	Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	RB Num.	RB Start	Power Drift (dB)	1 g Meas SAR (W/kg)	Meas. Power (dBm)	Max. tune-up power (dBm)	Scaling Factor	1g Scaled SAR (W/kg)	Meas. No.
Head														
Down	QPSK	Left Cheek	0	23230	782	1	Mid	0.08	0.231	24.36	25.00	1.159	0.268	/
			0	23230	782	25	High	0.05	0.186	23.33	24.00	1.167	0.217	/
		Left Tilt	0	23230	782	1	Mid	0.17	0.171	24.36	25.00	1.159	0.198	/
			0	23230	782	25	High	-0.08	0.140	23.33	24.00	1.167	0.163	/
		Right Cheek	0	23230	782	1	Mid	0.02	0.245	24.36	25.00	1.159	**0.284**	7#
			0	23230	782	25	High	0.11	0.212	23.33	24.00	1.167	0.247	/
		Right Tilt	0	23230	782	1	Mid	-0.09	0.183	24.36	25.00	1.159	0.212	/
			0	23230	782	25	High	0.18	0.148	23.33	24.00	1.167	0.173	/
Body-worn Accessory and Hotspot														
Down	QPSK	Front Side	10	23230	782	1	Mid	0.18	0.276	24.36	25.00	1.159	0.320	/
			10	23230	782	25	High	0.05	0.223	23.33	24.00	1.167	0.260	/
		Back Side	10	23230	782	1	Mid	-0.07	0.395	24.36	25.00	1.159	**0.458**	8#
			10	23230	782	25	High	0.15	0.350	23.33	24.00	1.167	0.408	/
		Left Edge	10	23230	782	1	Mid	-0.11	0.314	24.36	25.00	1.159	0.364	/
			10	23230	782	25	High	0.14	0.267	23.33	24.00	1.167	0.312	/
		Right Edge	10	23230	782	1	Mid	0.13	0.219	24.36	25.00	1.159	0.254	/
			10	23230	782	25	High	-0.07	0.176	23.33	24.00	1.167	0.205	/
		Bottom Edge	10	23230	782	1	Mid	-0.03	0.087	24.36	25.00	1.159	0.101	/
			10	23230	782	25	High	-0.09	0.075	23.33	24.00	1.167	0.088	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.														

9.5 WIFI 2.4GHz

Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	Power Drift (dB)	1 g Meas SAR (W/kg)	Meas. Power (dBm)	Max. tune-up power (dBm)	Scaling Factor	Duty cycle (%)	Duty Factor	1g Scaled SAR (W/kg)	Meas. No.
Head													
802.11 b	Left Cheek	0	1	2412	0.02	0.588	19.13	20.00	1.222	97.55	1.025	0.736	/
		0	6	2437	-0.18	0.564	18.04	20.00	1.570	97.55	1.025	**0.908**	9#
		0	11	2462	0.01	0.374	18.11	20.00	1.545	97.55	1.025	0.592	/
	Left Tilt	0	1	2412	-0.14	0.423	19.13	20.00	1.222	97.55	1.025	0.530	/
	Right Cheek	0	1	2412	0.13	0.149	19.13	20.00	1.222	97.55	1.025	0.187	/
	Right Tilt	0	1	2412	0.05	0.159	19.13	20.00	1.222	97.55	1.025	0.199	/
Body-worn Accessory and Hotspot													
802.11 b	Front Side	10	1	2412	0.03	0.136	19.13	20.00	1.222	97.55	1.025	0.170	/
	Back Side	10	1	2412	-0.02	0.189	19.13	20.00	1.222	97.55	1.025	**0.237**	10#
	Left Edge	10	1	2412	0.01	0.131	19.13	20.00	1.222	97.55	1.025	0.164	/
	Right Edge	10	1	2412	0.06	0.002	19.13	20.00	1.222	97.55	1.025	0.003	/
	Top Edge	10	1	2412	0.13	0.069	19.13	20.00	1.222	97.55	1.025	0.086	/
	Bottom Edge	10	1	2412	0.13	0.009	19.13	20.00	1.222	97.55	1.025	0.011	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.													

9.6 Bluetooth

Mode	Position	Dist. (mm)	Ch.	Freq. (MHz)	Power Drift (dB)	1 g Meas SAR (W/kg)	Meas. Power (dBm)	Max. tune-up power (dBm)	Scaling Factor	Duty cycle (%)	Duty Factor	1g Scaled SAR (W/kg)	Meas. No.
Head													
DH5	Left Cheek	0	39	2441	-0.06	0.045	77.14	1.296	11.68	12.00	1.076	**0.063**	11#
	Left Tilt	0	39	2441	0.02	0.037	77.14	1.296	11.68	12.00	1.076	0.052	/
	Right Cheek	0	39	2441	-0.12	0.025	77.14	1.296	11.68	12.00	1.076	0.035	/
	Right Tilt	0	39	2441	0.1	0.012	77.14	1.296	11.68	12.00	1.076	0.017	/
Body-worn Accessory and Hotspot													
DH5	Front Side	10	39	2441	0.19	0.032	77.14	1.296	11.68	12.00	1.076	0.034	/
	Back Side	10	39	2441	0.12	0.058	77.14	1.296	11.68	12.00	1.076	**0.062**	12#
	Left Edge	10	39	2441	0.03	0.012	77.14	1.296	11.68	12.00	1.076	0.013	/
	Right Edge	10	39	2441	0.01	0.003	77.14	1.296	11.68	12.00	1.076	0.003	/
	Top Edge	10	39	2441	0.08	0.042	77.14	1.296	11.68	12.00	1.076	0.045	/
	Bottom Edge	10	39	2441	0.08	0.002	77.14	1.296	11.68	12.00	1.076	0.002	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.													

10 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.

Note: For 1g SAR, the highest measured 1g SAR is 0.763 < 0.80 W/kg, repeated measurement is not required.

11 SIMULTANEOUS TRANSMISSION

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 SAR to Peak Location Ratio (SPLSR).

11.1 Simultaneous Transmission Mode Consider

No.	Simultaneous Tx Combination	Head	Body-worn	Hotspot
1	LTE + WiFi 2.4G	Yes	Yes	Yes
2	LTE + Bluetooth	Yes	Yes	Yes

Note:

1. 2.4G WLAN cantransmit simultaneously with Bluetooth.
2. The maximum SAR summation is calculated based on the same configuration and test position.

11.2 Sum SAR of Simultaneous Transmission

11.2.1 Head Simultaneous Transmission SAR Evaluation for WWAN Antenna with WLAN and Bluetooth

Band	Position	Stand alone SAR			SUM SAR	
		1	2	3		
		WWAN	2.4GWIFI	Bluetooth	Sum SAR (1+2)	Sum SAR (1+2+3)
LTE B2	Left Cheek	0.360	0.908	0.063	1.268	1.331
	Left Tilt	0.158	0.530	0.052	0.688	0.739
	Right Cheek	0.210	0.187	0.035	0.397	0.431
	Right Tilt	0.091	0.199	0.017	0.290	0.307
LTE B4	Left Cheek	0.395	0.908	0.063	1.303	**1.366**
	Left Tilt	0.300	0.530	0.052	0.830	0.882
	Right Cheek	0.320	0.187	0.035	0.506	0.541
	Right Tilt	0.246	0.199	0.017	0.445	0.462
LTE B5	Left Cheek	0.263	0.908	0.063	1.171	1.233
	Left Tilt	0.136	0.530	0.052	0.665	0.717
	Right Cheek	0.322	0.187	0.035	0.509	0.544
	Right Tilt	0.143	0.199	0.017	0.342	0.359
LTE B13	Left Cheek	0.268	0.908	0.063	1.176	1.238
	Left Tilt	0.198	0.530	0.052	0.728	0.780
	Right Cheek	0.284	0.187	0.035	0.471	0.505
	Right Tilt	0.212	0.199	0.017	0.411	0.428

Note:

1: The simultaneous transmission combinations of the three antennas contain combinations of two antennas, so only the worst simultaneous transmission combinations was shown in this table.

2: The highest Summed 1g SAR is 1.366 W/Kg < 1.6 W/kg, so Simultaneous Transmission SAR test is not required.

11.2.2 Body-worna and Hotspot Simultaneous Transmission SAR Evaluation for WWAN Antenna with WLAN and Bluetooth

Band	Position	Stand alone SAR			SUM SAR	
		1	2	3		
		WWAN	2.4GWIFI	Bluetooth	Sum SAR (1+2)	Sum SAR (1+2+3)
LTE B2	Front Side 10mm	0.779	0.170	0.034	0.949	0.984
	Back Side 10mm	0.890	0.237	0.073	1.127	**1.200**
	Left Edge 10mm	0.143	0.164	0.013	0.307	0.320
	Right Edge 10mm	0.551	0.003	0.003	0.554	0.557
	Bottom Edge 10mm	0.409	0.011	0.002	0.420	0.422
LTE B4	Front Side 10mm	0.603	0.170	0.034	0.773	0.808
	Back Side 10mm	0.650	0.237	0.073	0.887	0.960
	Left Edge 10mm	0.031	0.164	0.013	0.195	0.208
	Right Edge 10mm	0.406	0.003	0.003	0.409	0.412
	Bottom Edge 10mm	0.304	0.011	0.002	0.315	0.317
LTE B5	Front Side 10mm	0.257	0.170	0.034	0.427	0.462
	Back Side 10mm	0.377	0.237	0.073	0.614	0.687
	Left Edge 10mm	0.202	0.164	0.013	0.366	0.379
	Right Edge 10mm	0.161	0.003	0.003	0.164	0.167
	Bottom Edge 10mm	0.093	0.011	0.002	0.104	0.106
LTE B13	Front Side 10mm	0.320	0.170	0.034	0.490	0.525
	Back Side 10mm	0.458	0.237	0.073	0.695	0.768
	Left Edge 10mm	0.364	0.164	0.013	0.528	0.541
	Right Edge 10mm	0.254	0.003	0.003	0.257	0.260
	Bottom Edge 10mm	0.101	0.011	0.002	0.112	0.114

Note:

1: The simultaneous transmission combinations of the three antennas contain combinations of two antennas, so only the worst simultaneous transmission combinations was shown in this table.

2: The highest Summed 1g SAR is 1.200 W/Kg < 1.6 W/kg, so Simultaneous Transmission SAR test is not required.

12 TEST EQUIPMENTS LIST

Description	Manufacturer	Model	Serial No./Version	Cal. Date	Cal. Due
PC	Dell	N/A	N/A	N/A	N/A
Test Software	Speag	DASY5	52.10	N/A	N/A
750MHz Validation Dipole	Speag	D750V3	SN: 1201	2020/11/11	2023/11/10
835MHz Validation Dipole	Speag	D835V2	SN: 4d187	2021/05/17	2024/05/16
1750MHz Validation Dipole	Speag	D1750V2	SN: 1130	2021/05/17	2024/05/16
1900MHz Validation Dipole	Speag	D1900V2	SN: 5d193	2021/05/20	2024/05/19
2450MHz Validation Dipole	Speag	D2450V2	SN: 952	2021/05/19	2024/05/18
E-Field Probe	Speag	EX3DV4	SN: 7663	2021/07/23	2022/07/22
Data Acquisition Electronics	Speag	DAE4	SN: 878	2021/07/15	2022/07/14
Signal Generator	R&S	SMB100A	177746	2021/08/24	2022/08/23
Power Meter	R&S	NRVD-B2	7250BJ-0112/2011	2021/09/08	2022/09/07
Power Sensor	R&S	NRV-Z4	100381	2021/09/08	2022/09/07
Power Sensor	R&S	NRV-Z2	100211	2021/09/08	2022/09/07
Wireless Communication Test Set	Anritsu	MT8820C	6201502974	2021/03/16	2022/03/15
Network Analyzer	Agilent	E5071B	MY42404001	2021/04/01	2022/03/31
Thermometer	Elitech	RC-4HC	EF720B004801	2020/12/24	2021/12/23
Thermometer	Elitech	RC-4HC	EF720B004820	2021/12/01	2022/11/30
Power Amplifier	SATIMO	6552B	22374	N/A	N/A
Dielectric Probe Kit	SATIMO	SCLMP	SN 25/13 OCPG56	N/A	N/A
Phantom1	Speag	SAM	SN: 1859	N/A	N/A
Phantom2	Speag	SAM	SN: 1857	N/A	N/A
Attenuator	COM-MW	ZA-S1-31	1305003187	N/A	N/A
Directional coupler	AA-MCS	AAMCS-UDC	000272	N/A	N/A

Note: For dipole antennas, BALUN has adopted 3 years as calibration intervals, and on annual basis, every measurement dipole has been evaluated and is in compliance with the following criteria:

1. There is no physical damage on the dipole;
2. System validation with specific dipole is within 10% of calibrated value;
3. Return-loss in within 20% of calibrated measurement.
4. Impedance (real or imaginary parts) in within 5 Ohms of calibrated measurement.

ANNEX A SIMULATING LIQUID VERIFICATION RESULT

The dielectric parameters of the liquids were verified prior to the SAR evaluation using an SCLMP Dielectric Probe Kit.

Head Liquid

Date	Liquid Type	Fre. (MHz)	Temp. (℃)	Meas. Conductivity (σ) (S/m)	Meas. Permittivity (ε)	Target Conductivity (σ) (S/m)	Target Permittivity (ε)	Conductivity Tolerance (%)	Permittivity Tolerance (%)
2021.11.17	Head	750	21.1	0.91	41.89	0.89	41.94	2.25	-0.12
2021.11.19	Head	835	21.6	0.92	41.76	0.90	41.50	2.22	0.63
2021.11.21	Head	1750	21.2	1.38	40.20	1.37	40.08	0.73	0.30
2021.11.23	Head	1900	21.7	1.40	39.82	1.40	40.00	0.00	-0.45
2021.12.27	Head	2450	21.4	1.80	39.53	1.80	39.20	0.00	0.84
Note: The tolerance limit of Conductivity and Permittivity is± 5%.									

ANNEX B SYSTEM CHECK RESULT

Comparing to the original SAR value provided by SPEAG, the validation data should be within itsspecification of 10 %(for 1 g).

Head liquid 1g

Date	Liquid Type	Freq. (MHz)	Power (mW)	Measured SAR (W/kg)	Normalized SAR (W/kg)	Dipole SAR (W/kg)	Tolerance (%)
2021.11.17	Head	750	100	0.849	8.49	8.29	2.41
2021.11.19	Head	835	100	0.949	9.49	9.76	-2.77
2021.11.21	Head	1750	100	3.680	36.80	36.70	0.27
2021.11.23	Head	1900	100	4.400	44.00	40.30	9.18
2021.12.27	Head	2450	100	5.240	52.40	53.00	-1.13
Note: The tolerance limit of System validation ±10%.							

System Performance Check Data (750MHz Head)

Date: 2021.11.17

Communication System Band: D750 (750.0 MHz); Frequency: 750 MHz;Duty Cycle: 1:1

Medium parameters used: f = 750 MHz; σ = 0.905 S/m; ε_r = 41.894; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient Temperature:22.8 Liquid Temperature:21.1

DASY5 Configuration:

- Probe: EX3DV4 - SN7663; ConvF(10.41, 10.41, 10.41); Calibrated: 2021.07.23;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn878; Calibrated: 2021.07.15
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.10 (7331)

CW 750 100mW/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.917 W/kg

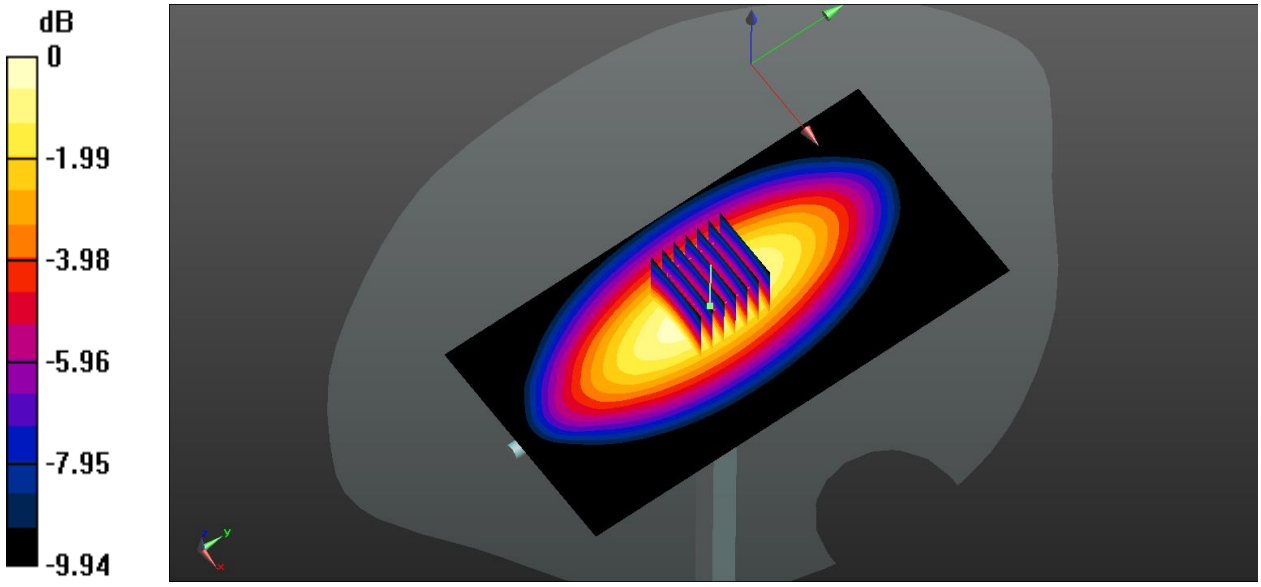
CW 750 100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 31.25 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 1.24 W/kg

SAR(1 g) = 0.849 W/kg; SAR(10 g) = 0.558 W/kg

Maximum value of SAR (measured) = 0.935 W/kg



0 dB = 0.935 W/kg

System Performance Check Data (835MHz Head)

Date: 2021.11.19

Communication System Band: D835 (835.0 MHz); Frequency: 835 MHz;Duty Cycle: 1:1

Medium parameters used: f = 898 MHz; σ = 0.921 S/m; ε_r = 41.76; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient Temperature:22.5 Liquid Temperature:21.6

DASY5 Configuration:

- Probe: EX3DV4 - SN7663; ConvF(10.1, 10.1, 10.1); Calibrated: 2021.07.23;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn878; Calibrated: 2021.07.15
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.10 (7331)

CW 835 100mW/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.02 W/kg

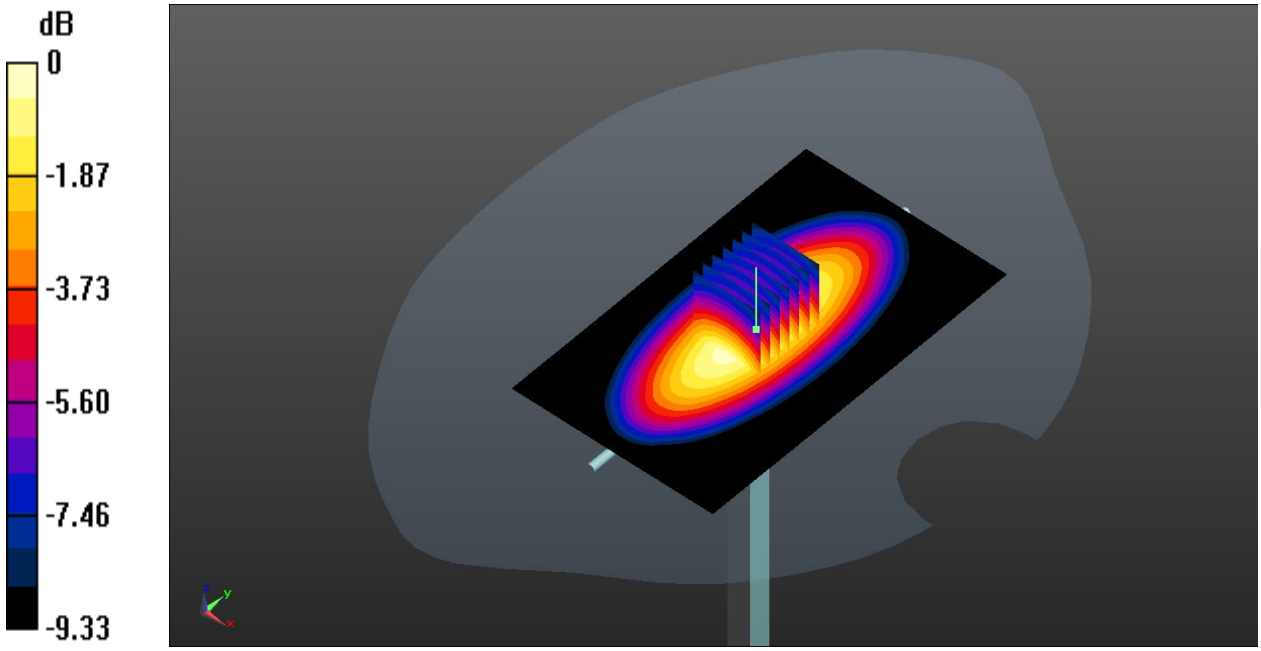
CW 835 100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 31.95 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 1.29 W/kg

SAR(1 g) = 0.949 W/kg; SAR(10 g) = 0.631 W/kg

Maximum value of SAR (measured) = 1.00 W/kg



0 dB = 1.00 W/kg

System Performance Check Data (1750MHz Head)

Date: 2021.11.21

Communication System Band: D1750 (1750.0 MHz); Frequency: 1750 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1750 MHz; σ = 1.378 S/m; ε_r = 40.198; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient Temperature:22.6 Liquid Temperature:21.2

DASY5 Configuration:

- Probe: EX3DV4 - SN7663; ConvF(8.71, 8.71, 8.71); Calibrated: 2021.07.23;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn878; Calibrated: 2021.07.15
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.10 (7331)

CW1750 100mW /Area Scan (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 4.03 W/kg

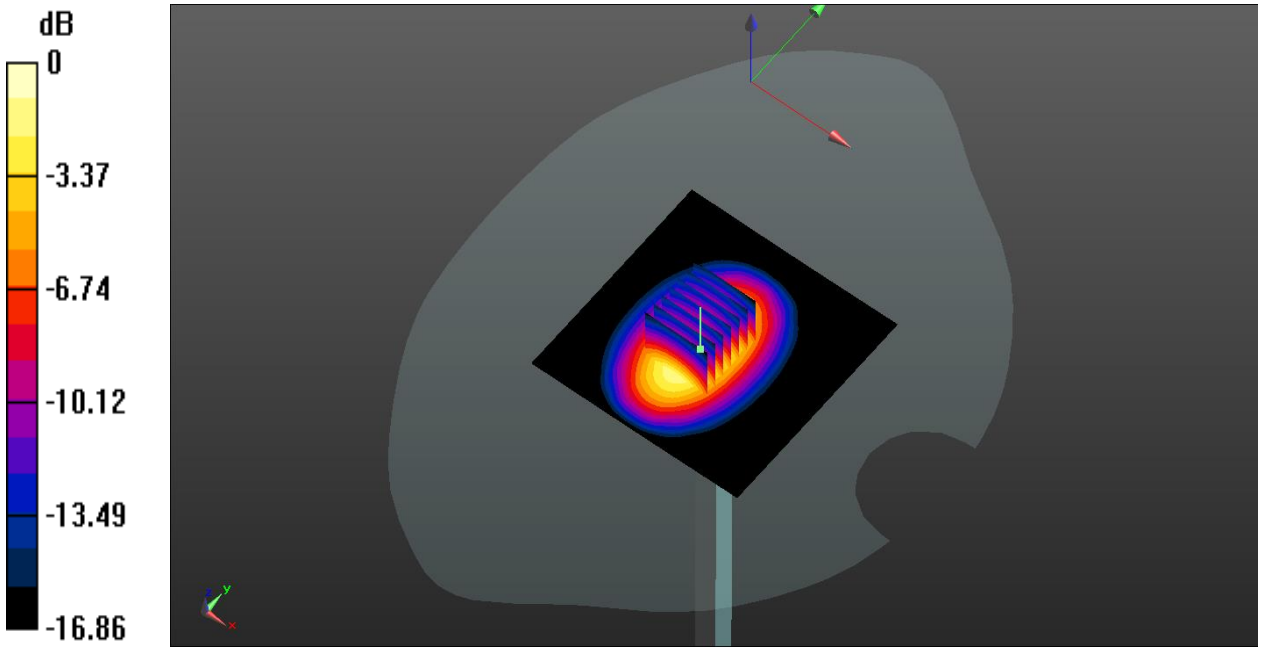
CW1750 100mW /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 51.66 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 6.83 W/kg

SAR(1 g) = 3.68 W/kg; SAR(10 g) = 1.92 W/kg

Maximum value of SAR (measured) = 4.33 W/kg



0 dB = 4.33 W/kg

System Performance Check Data (1900MHz Head)

Date: 2021.11.23

Communication System Band: D1900 (1900.0 MHz); Frequency: 1900 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1900 MHz; σ = 1.396 S/m; ε_r = 39.815; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient Temperature:22.3 Liquid Temperature:21.7

DASY5 Configuration:

- Probe: EX3DV4 - SN7663; ConvF(8.57, 8.57, 8.57); Calibrated: 2021.07.23;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn878; Calibrated: 2021.07.15
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.10 (7331)

CW1900 100mW /Area Scan (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 4.64 W/kg

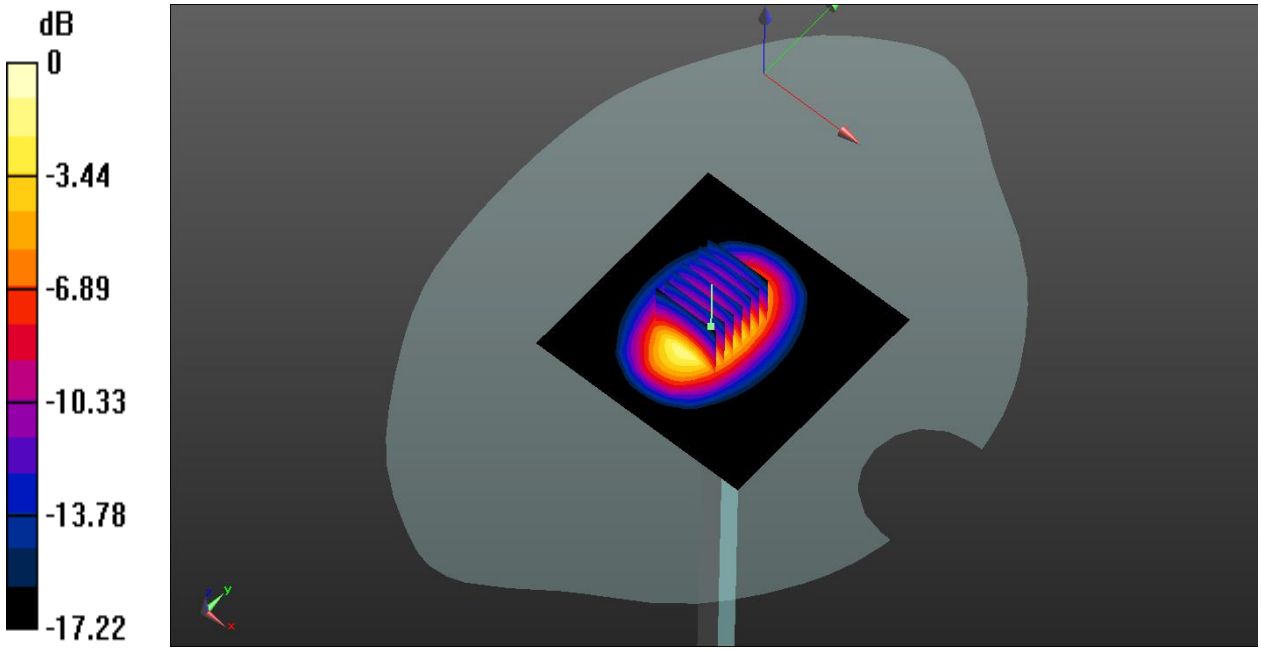
CW1900 100mW /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 52.35 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 7.47 W/kg

SAR(1 g) = 4.40 W/kg; SAR(10 g) = 2.04 W/kg

Maximum value of SAR (measured) = 4.78 W/kg



0 dB = 4.78 W/kg

System Performance Check Data (2450MHz Head)

Date: 2021.12.27

Communication System Band: D2450 (2450.0 MHz); Frequency: 2450 MHz;Duty Cycle: 1:1

Medium parameters used: f = 2450 MHz; σ = 1.802 S/m; ε_r = 39.533; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient Temperature:22.7 Liquid Temperature:21.4

DASY5 Configuration:

- Probe: EX3DV4 - SN7663; ConvF(8.19, 8.19, 8.19); Calibrated: 2021.07.23;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn878; Calibrated: 2021.07.15
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.10 (7331)

CW2450 100mW/Area Scan (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 6.08 W/kg

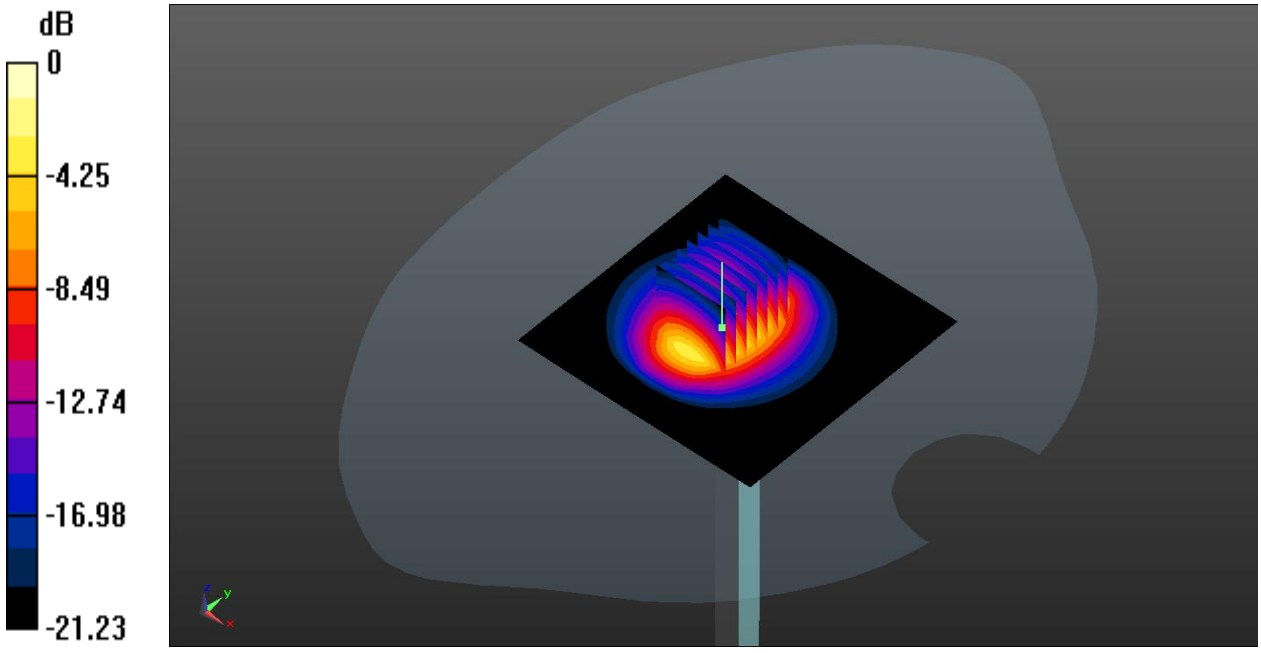
CW2450 100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 49.84 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 10.5 W/kg

SAR(1 g) = 5.24 W/kg; SAR(10 g) = 2.39 W/kg

Maximum value of SAR (measured) = 5.72 W/kg



0 dB = 5.72 W/kg

ANNEX C TEST DATA

MEAS.1-Left Head with Cheek on Middle Channel in LTE Band 2 mode

Date: 2021.11.23

Communication System Band: Band 2 ; Frequency: 1880 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1880 MHz; σ = 1.386 S/m; ε_r = 40.007; ρ = 1000 kg/m^3

Phantom section: Left Section

Ambient Temperature:22.3 Liquid Temperature:21.7

DASY5 Configuration:

- Probe: EX3DV4 - SN7663; ConvF(8.57, 8.57, 8.57); Calibrated: 2021.07.23;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn878; Calibrated: 2021.07.15
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.10 (7331)

Ch18900/Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.341 W/kg

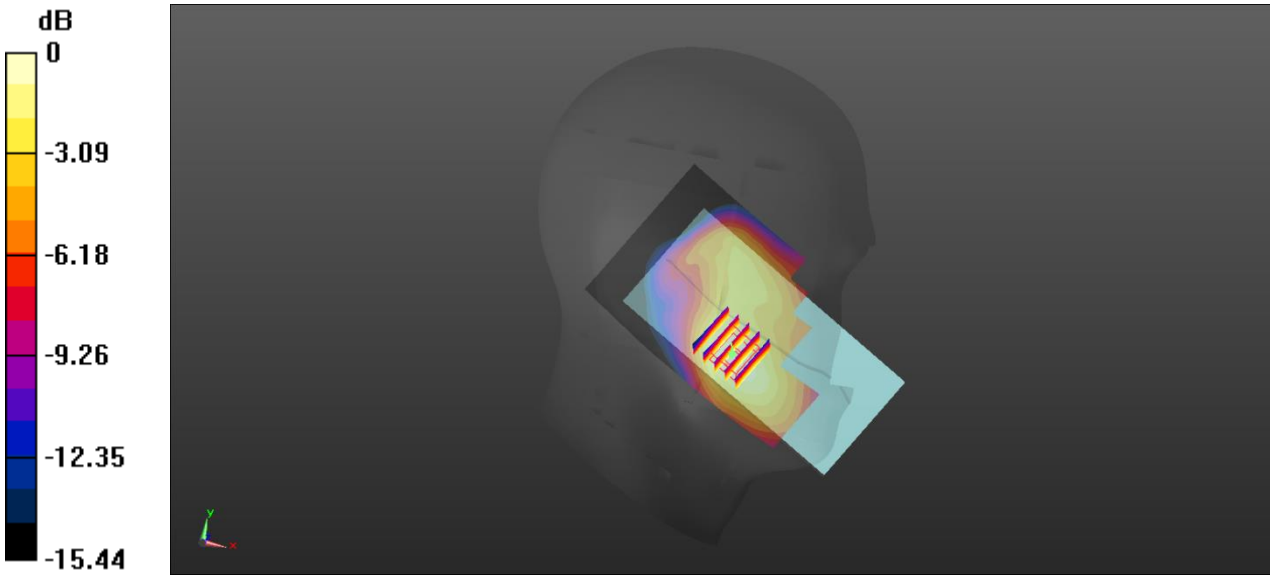
Ch18900/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.329 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.462 W/kg

SAR(1 g) = 0.312 W/kg; SAR(10 g) = 0.197 W/kg

Maximum value of SAR (measured) = 0.330 W/kg



0 dB = 0.330 W/kg

MEAS.2-Body Plane with Back Side 10mm on High Channel in LTE Band 2 mode

Date: 2021.11.23

Communication System Band: Band 2 : 1900 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1900 MHz; σ = 1.396 S/m; ε_r = 39.815; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient Temperature:22.3 Liquid Temperature:21.7

DASY5 Configuration:

- Probe: EX3DV4 - SN7663; ConvF(8.57, 8.57, 8.57); Calibrated: 2021.07.23;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn878; Calibrated: 2021.07.15
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.10 (7331)

Ch19100/Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.02 W/kg

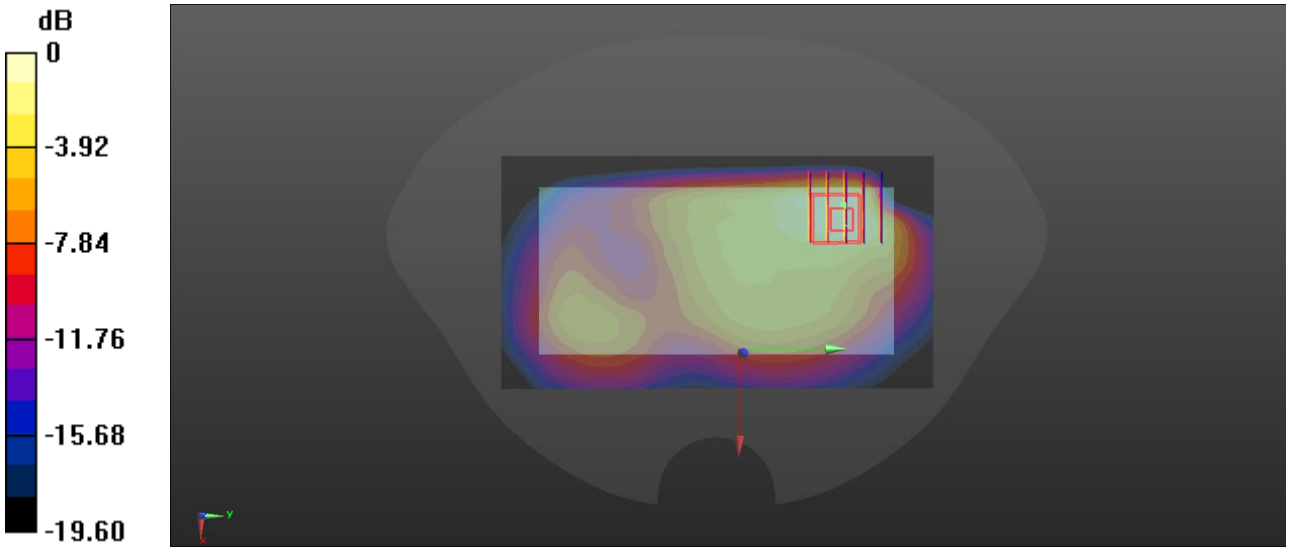
Ch19100/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 15.41 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 1.33 W/kg

SAR(1 g) = 0.763 W/kg; SAR(10 g) = 0.426 W/kg

Maximum value of SAR (measured) = 0.837 W/kg



0 dB = 0.837 W/kg

MEAS.3-Left Head with Cheek on Middle Channel in LTE Band 4 mode

Date: 2021.11.21

Communication System Band: Band 4 ; Frequency: 1720 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1720 MHz; σ = 1.375 S/m; ε_r = 40.239; ρ = 1000 kg/m^3

Phantom section: Left Section

Ambient Temperature:22.6 Liquid Temperature:21.2

DASY5 Configuration:

- Probe: EX3DV4 - SN7663; ConvF(8.71, 8.71, 8.71); Calibrated: 2021.07.23;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn878; Calibrated: 2021.07.15
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.10 (7331)

Ch20050/Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.418 W/kg

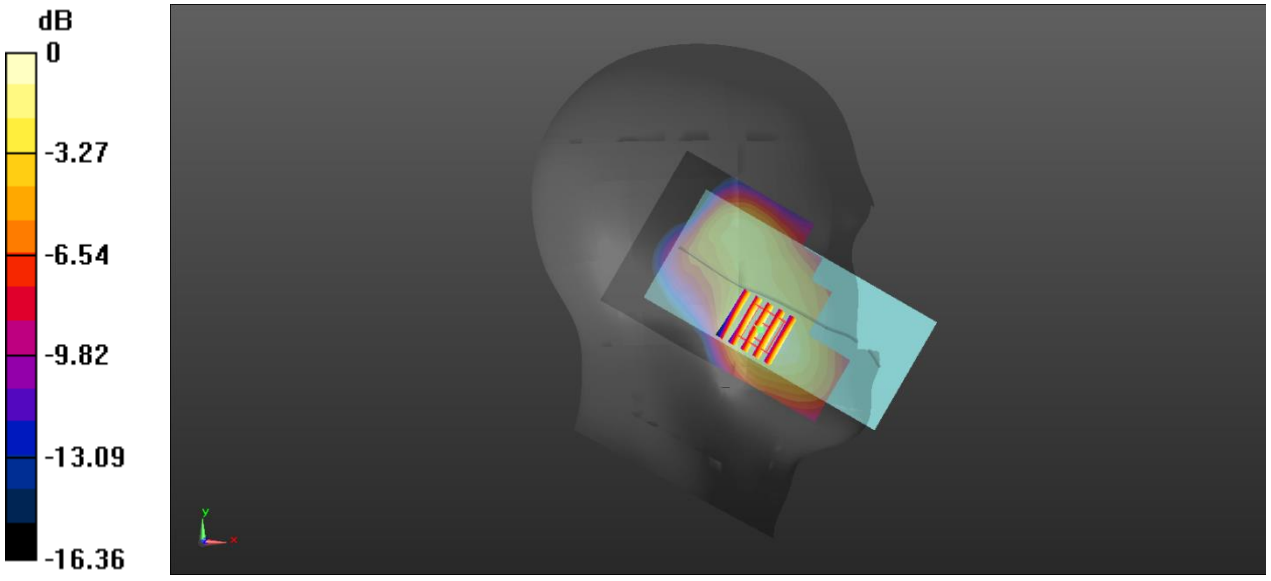
Ch20050/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.084 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.522 W/kg

SAR(1 g) = 0.326 W/kg; SAR(10 g) = 0.239 W/kg

Maximum value of SAR (measured) = 0.385 W/kg



0 dB = 0.385 W/kg

MEAS.4-Body Plane with Back Side 10mm on Low Channel in LTE Band 4 mode

Date: 2021.11.21

Communication System Band: Band 4, ; Frequency: 1720 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1720 MHz; σ = 1.375 S/m; ε_r = 40.239; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient Temperature:22.6 Liquid Temperature:21.2

DASY5 Configuration:

- Probe: EX3DV4 - SN7663; ConvF(8.71, 8.71, 8.71); Calibrated: 2021.07.23;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn878; Calibrated: 2021.07.15
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.10 (7331)

Ch20050/Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.595 W/kg

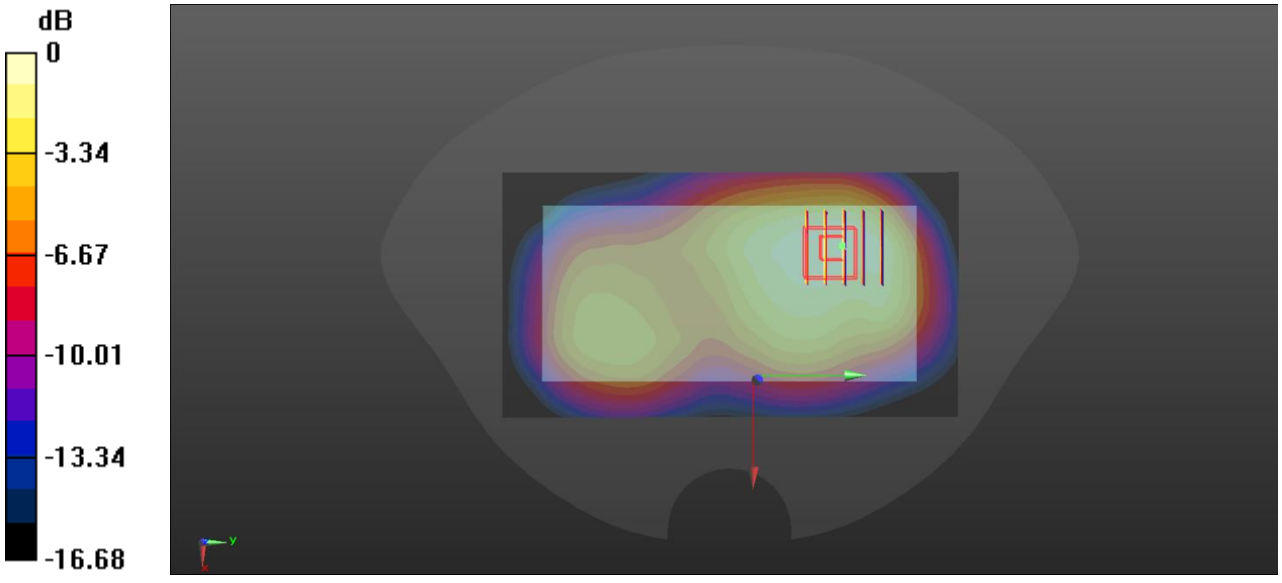
Ch20050/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.56 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.815 W/kg

SAR(1 g) = 0.537 W/kg; SAR(10 g) = 0.347 W/kg

Maximum value of SAR (measured) = 0.572 W/kg



0 dB = 0.572 W/kg

MEAS.5-Right Head with Cheek on Low Channel in LTE Band 5 mode

Date: 2021.11.19

Communication System Band: Band 5 ; Frequency: 829 MHz;Duty Cycle: 1:1

Medium parameters used: f = 829 MHz; σ = 0.894 S/m; ε_r = 41.906; ρ = 1000 kg/m^3

Phantom section: Right Section

Ambient Temperature:22.5 Liquid Temperature:21.6

DASY5 Configuration:

- Probe: EX3DV4 - SN7663; ConvF(10.1, 10.1, 10.1); Calibrated: 2021.07.23;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn878; Calibrated: 2021.07.15
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.10 (7331)

Ch20450/Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.230 W/kg

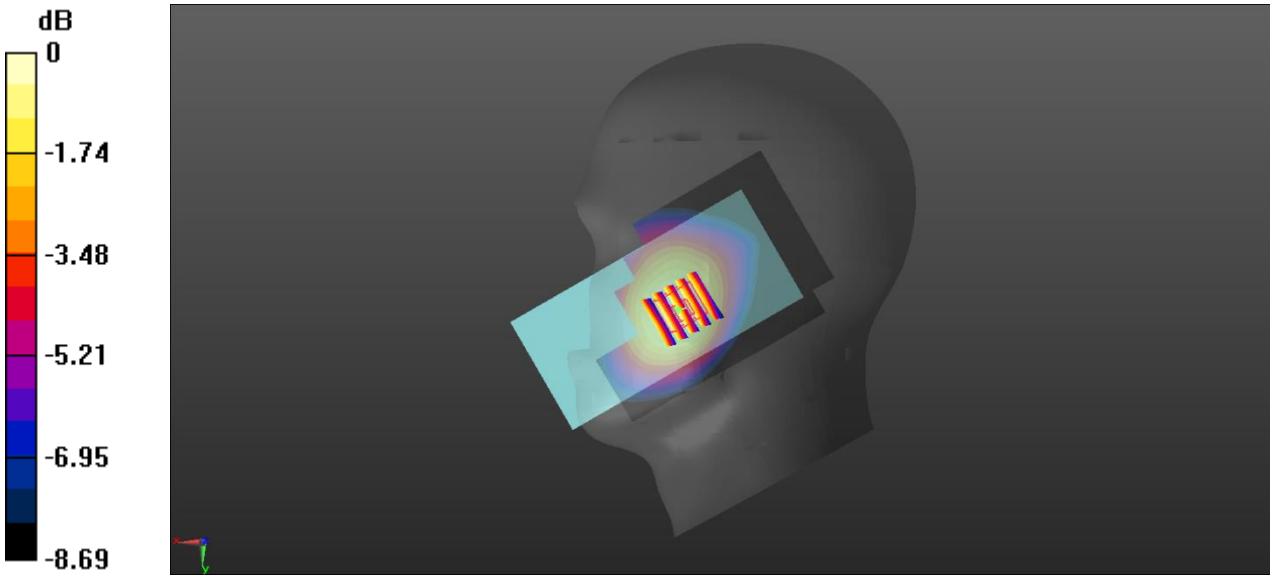
Ch20450/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.401 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 0.284 W/kg

SAR(1 g) = 0.228 W/kg; SAR(10 g) = 0.175 W/kg

Maximum value of SAR (measured) = 0.237 W/kg



0 dB = 0.237 W/kg

MEAS.6-Body Plane with Back Side 10mm on Low Channel in LTE Band 5 mode

Date: 2021.11.19

Communication System Band: Band 5; Frequency: 829 MHz;Duty Cycle: 1:1

Medium parameters used: f = 829 MHz; σ = 0.894 S/m; ε_r = 41.906; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient Temperature:22.5 Liquid Temperature:21.6

DASY5 Configuration:

- Probe: EX3DV4 - SN7663; ConvF(10.1, 10.1, 10.1); Calibrated: 2021.07.23;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn878; Calibrated: 2021.07.15
- Phantom: Twin-SAM Right V5.0 (20deg probe tilt); Type: QD 000 P40 CE; Serial: xxxx
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.10 (7331)

Ch20450/Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.281 W/kg

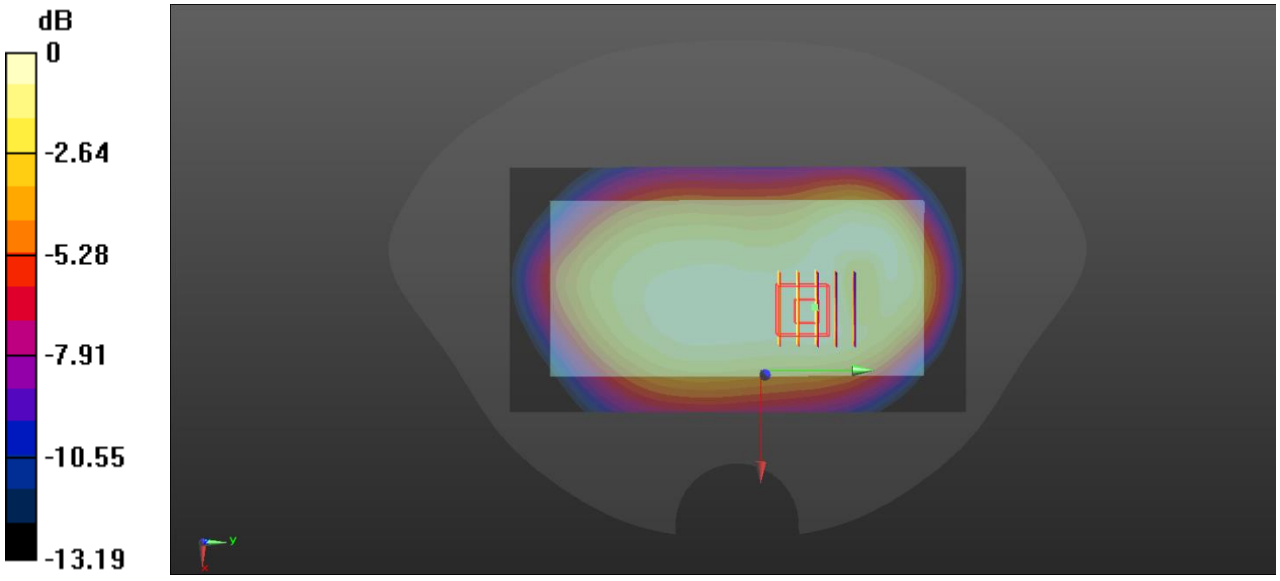
Ch20450/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 17.03 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 0.346 W/kg

SAR(1 g) = 0.267 W/kg; SAR(10 g) = 0.195 W/kg

Maximum value of SAR (measured) = 0.279 W/kg



0 dB = 0.279 W/kg

MEAS.7-Right Head with Cheek on Low Channel in LTE Band 13 mode

Date: 2021.11.17

Communication System Band: Band 13; Frequency: 782 MHz;Duty Cycle: 1:1

Medium parameters used: f = 782 MHz; σ = 0.896 S/m; ε_r = 41.774; ρ = 1000 kg/m^3

Phantom section: Right Section

Ambient Temperature:22.8 Liquid Temperature:21.1

DASY5 Configuration:

- Probe: EX3DV4 - SN7663; ConvF(10.41, 10.41, 10.41); Calibrated: 2021.07.23;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn878; Calibrated: 2021.07.15
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.10 (7331)

Ch23230/Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.266 W/kg

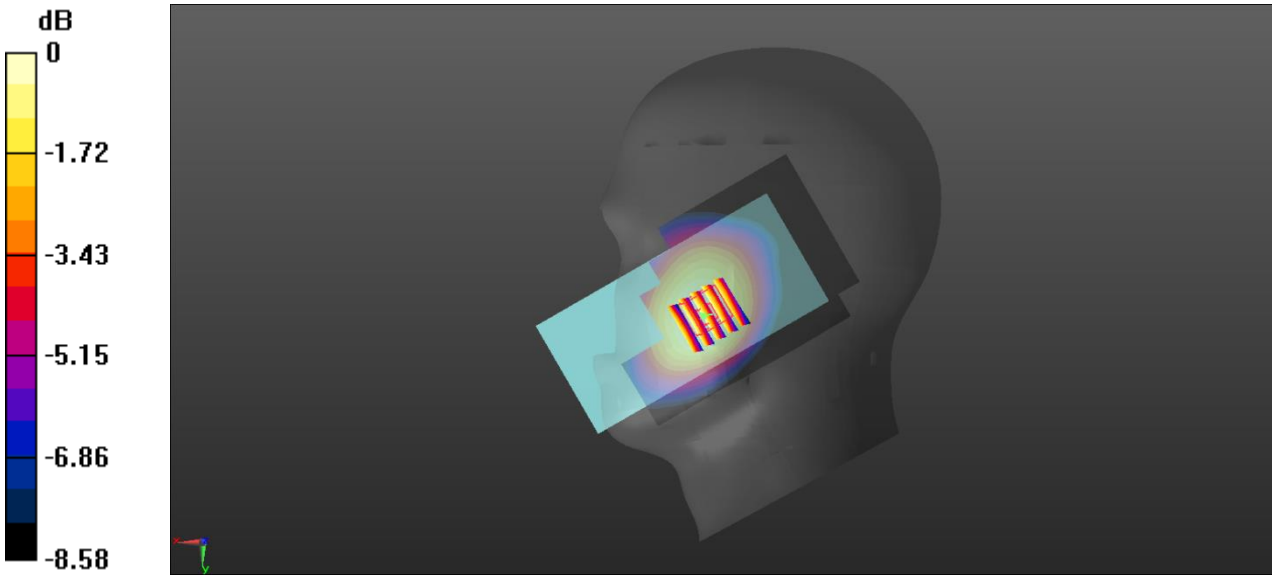
Ch23230/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.688 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.296 W/kg

SAR(1 g) = 0.245 W/kg; SAR(10 g) = 0.191 W/kg

Maximum value of SAR (measured) = 0.254 W/kg



0 dB = 0.254 W/kg

MEAS.8-Body Plane with Back Side 10mm on Low Channel in LTE Band 13 mode

Date: 2021.11.17

Communication System Band: Band 13; Frequency: 782 MHz;Duty Cycle: 1:1

Medium parameters used: f = 782 MHz; σ = 0.896 S/m; ε_r = 41.774; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient Temperature:22.8 Liquid Temperature:21.1

DASY5 Configuration:

- Probe: EX3DV4 - SN7663; ConvF(10.41, 10.41, 10.41); Calibrated: 2021.07.23;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn878; Calibrated: 2021.07.15
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.10 (7331)

Ch23230/Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.412 W/kg

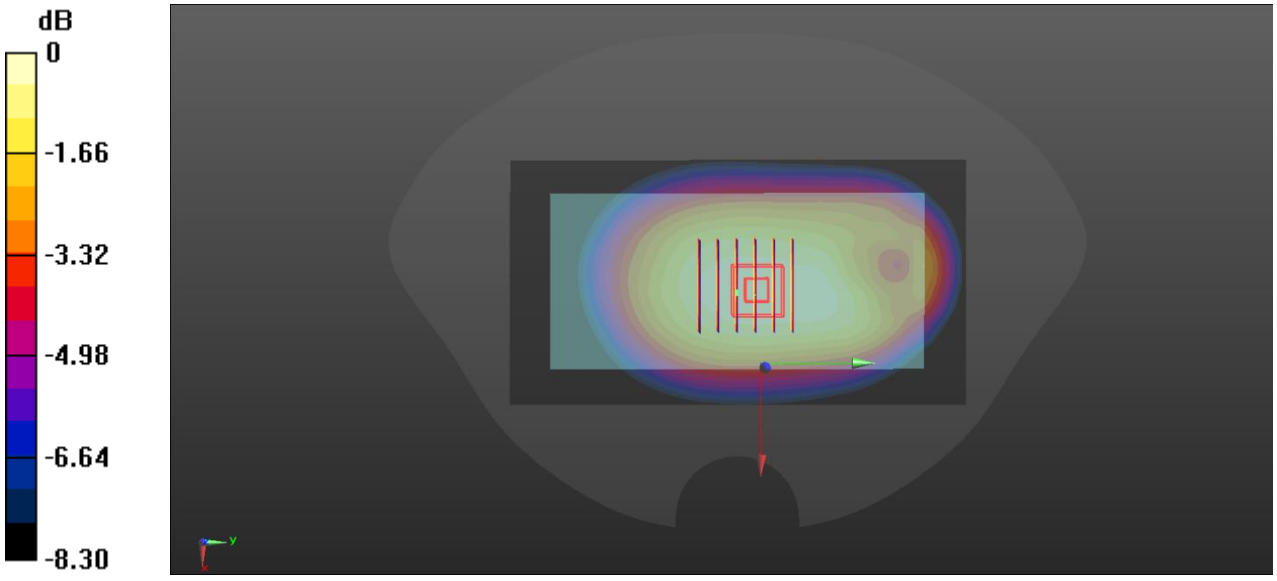
Ch23230/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 21.31 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 0.489 W/kg

SAR(1 g) = 0.395 W/kg; SAR(10 g) = 0.306 W/kg

Maximum value of SAR (measured) = 0.415 W/kg



0 dB = 0.415 W/kg

MEAS.9-Left Head with Cheek on Middle Channel in 8002.11b mode

Date: 2021.12.27

Communication System Band: WLAN(b); Frequency: 2437 MHz;Duty Cycle: 1:1.025

Medium parameters used: f = 2437 MHz; σ = 1.784 S/m; ε_r = 39.607; ρ = 1000 kg/m^3

Phantom section: Left Section

Ambient Temperature:22.7 Liquid Temperature:21.4

DASY5 Configuration:

- Probe: EX3DV4 - SN7663; ConvF(8.19, 8.19, 8.19); Calibrated: 2021.07.23;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn878; Calibrated: 2021.07.15
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.10 (7331)

Ch6/Area Scan (91x161x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 1.14 W/kg

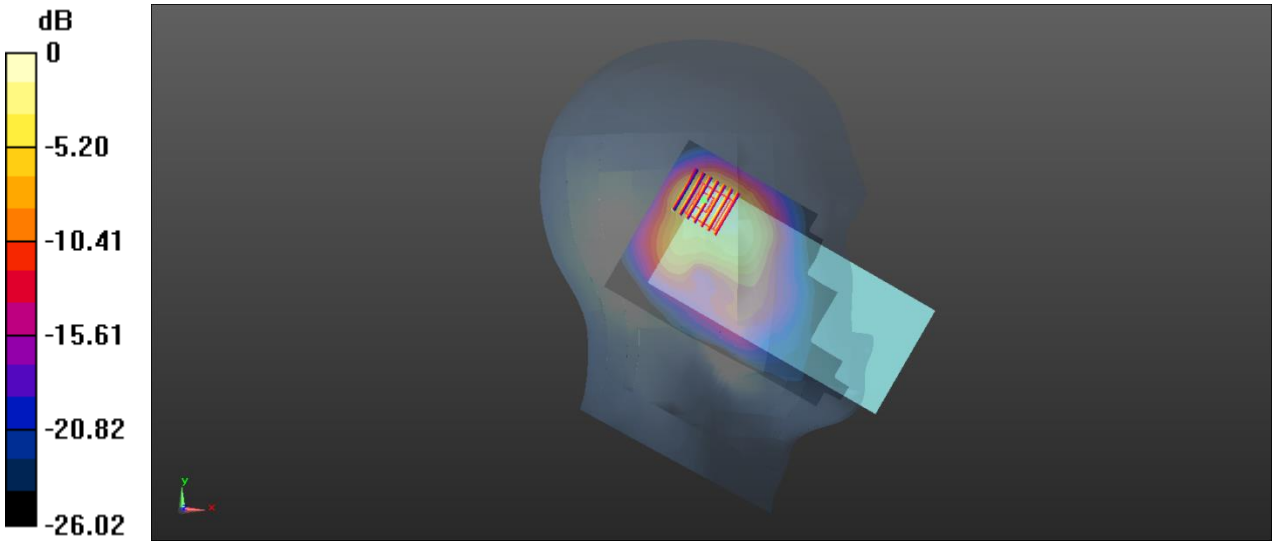
Ch6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.64 V/m; Power Drift = -0.18 dB

Peak SAR (extrapolated) = 1.99 W/kg

SAR(1 g) = 0.564 W/kg; SAR(10 g) = 0.358 W/kg

Maximum value of SAR (measured) = 1.03 W/kg



0 dB = 1.03 W/kg

MEAS.10-Body Plan with Back Side 10mm on Middle Channel in 8002.11b mode with

Date: 2021.12.27

Communication System Band: WLAN(b); Frequency: 2437 MHz;Duty Cycle: 1:1.025

Medium parameters used: f = 2437 MHz; σ = 1.784 S/m; ε_r = 39.607; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient Temperature:22.7 Liquid Temperature:21.4

DASY5 Configuration:

- Probe: EX3DV4 - SN7663; ConvF(8.19, 8.19, 8.19); Calibrated: 2021.07.23;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn878; Calibrated: 2021.07.15
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.10 (7331)

Ch6/Area Scan (91x161x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.246 W/kg

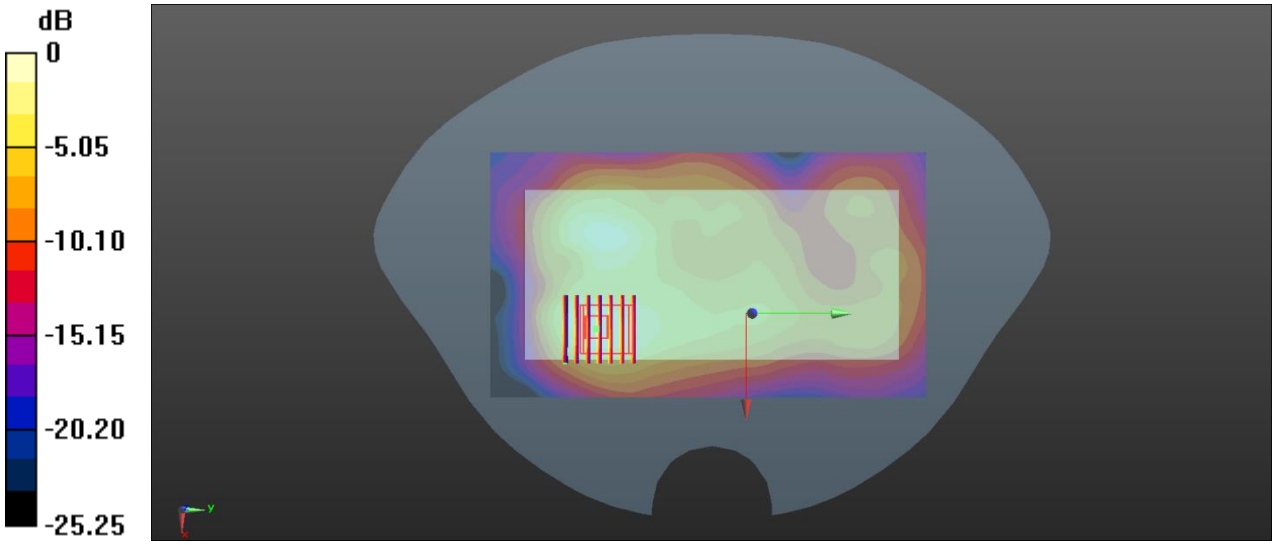
Ch6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.432 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.493 W/kg

SAR(1 g) = 0.189 W/kg; SAR(10 g) = 0.106 W/kg

Maximum value of SAR (measured) = 0.244 W/kg



0 dB = 0.244 W/kg

MEAS.11-Left Head with Cheek on Middle Channel in Bluetooth mode

Date: 2021.12.27

Communication System Band: Bluetooth; Frequency: 2441 MHz;Duty Cycle: 1:1.296

Medium parameters used: f = 2441 MHz; σ = 1.792 S/m; ε_r = 39.623; ρ = 1000 kg/m^3

Phantom section: Left Section

Ambient Temperature:22.7 Liquid Temperature:21.4

DASY5 Configuration:

- Probe: EX3DV4 - SN7663; ConvF(8.19, 8.19, 8.19); Calibrated: 2021.07.23;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn878; Calibrated: 2021.07.15
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.10 (7331)

Ch39/Area Scan (91x161x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.105 W/kg

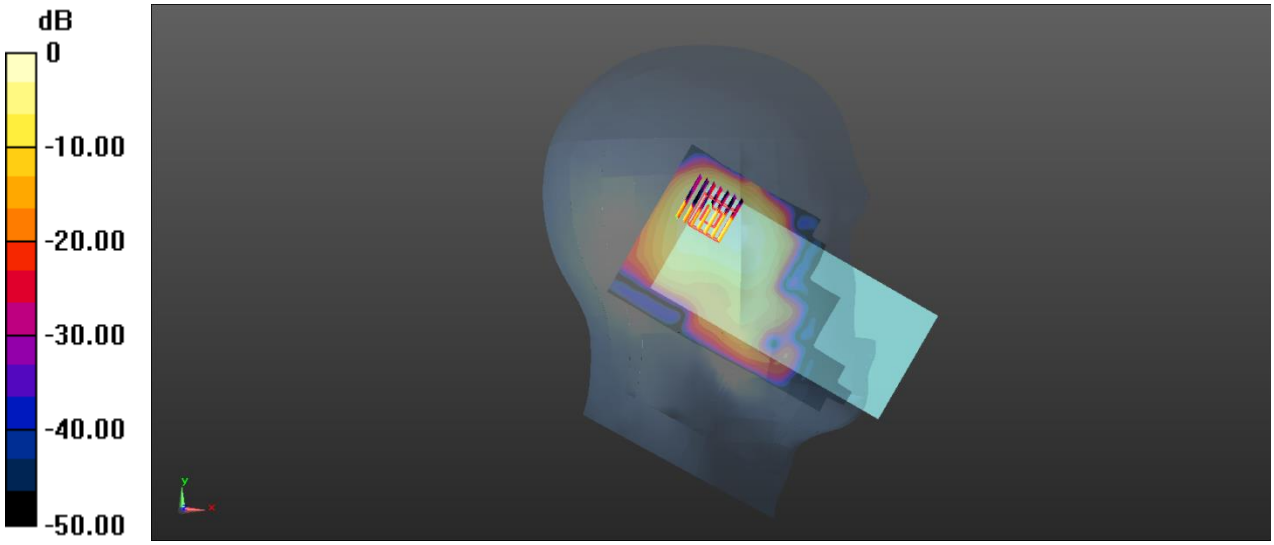
Ch39/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.966 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 0.442 W/kg

SAR(1 g) = 0.045 W/kg; SAR(10 g) = 0.030 W/kg

Maximum value of SAR (measured) = 0.0955 W/kg



0 dB = 0.0955 W/kg

MEAS.12-Body Plan with Back Side 10mm on Middle Channel in Bluetooth mode

Date: 2021.12.27

Communication System Band: Bluetooth; Frequency: 2441 MHz;Duty Cycle: 1:1.296

Medium parameters used: f = 2441 MHz; σ = 1.792 S/m; ε_r = 39.623; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient Temperature:22.7 Liquid Temperature:21.4

DASY5 Configuration:

- Probe: EX3DV4 - SN7663; ConvF(8.19, 8.19, 8.19); Calibrated: 2021.07.23;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn878; Calibrated: 2021.07.15
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.10 (7331)

Ch39/Area Scan (91x161x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.0800 W/kg

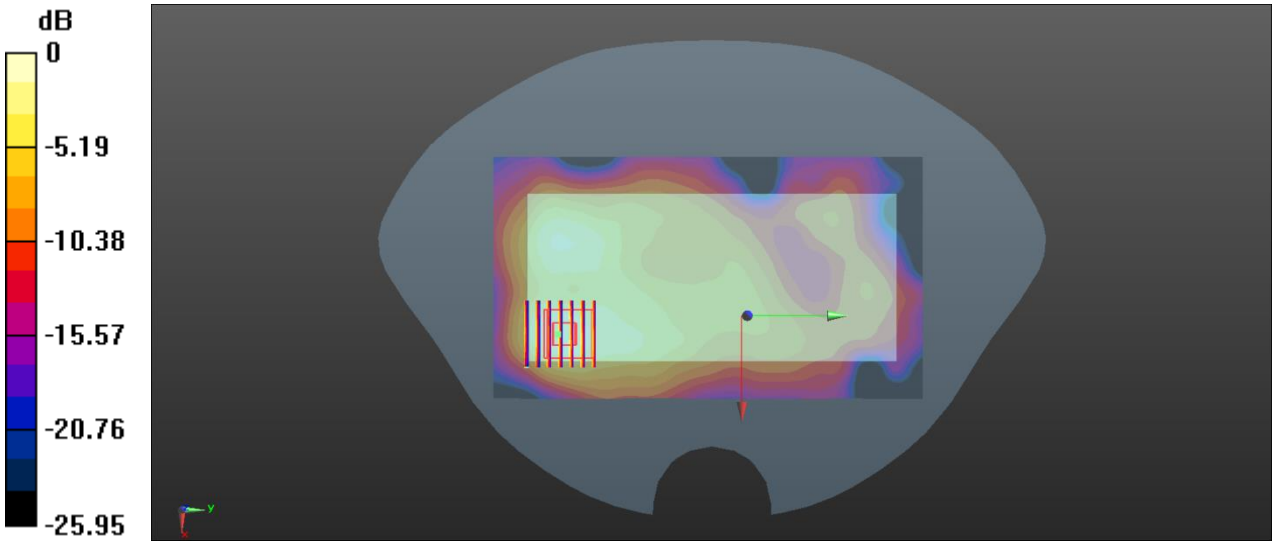
Ch39/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.743 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 0.156 W/kg

SAR(1 g) = 0.058 W/kg; SAR(10 g) = 0.032 W/kg

Maximum value of SAR (measured) = 0.0735 W/kg



0 dB = 0.0735 W/kg

ANNEX D EUT EXTERNAL PHOTOS

Please refer the document “BL-SZ21B0604-AW.pdf”.

ANNEX E SAR TEST SETUP PHOTOS

Please refer the document “BL-SZ21B0604-AS.pdf”.

ANNEX F CALIBRATION REPORT

ANNEX G Please refer the document “CALIBRATION REPORT.pdf”.

--END OF REPORT--