SAR TEST REPORT

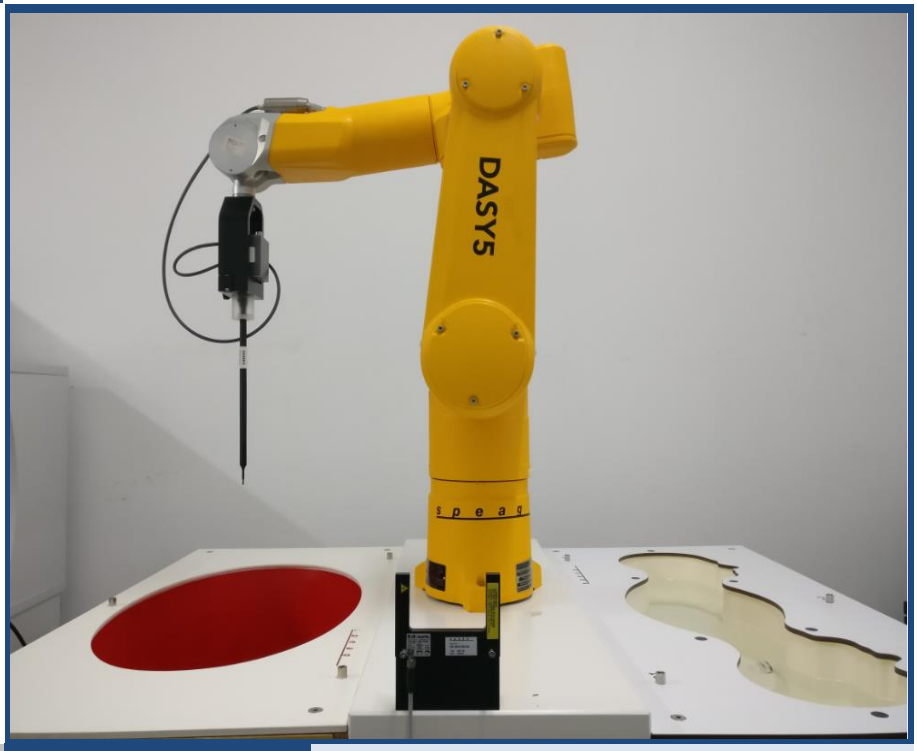
ISSUED BY
Shenzhen BALUN Technology Co., Ltd.

FOR

LAPTOP

ISSUED TO
E&S International Enterprises, Inc.

7801 Hayvenhurst Avenue, Van Nuys, CA 91406



Report No.:	BL-SZ21C1014-701
EUT Name:	LAPTOP
Model Name:	VWNC71419-BK (refer section 2.4)
Brand Name:	VAIO
FCC ID:	2AYPE-VWNC71419
Test Standard:	FCC 47 CFR Part 2.1093 (refer section 3.1)
Maximum SAR:	Body 2.4GHz(1 g): 0.973 W/kg Body 5GHz(1 g): 1.106 W/kg
Test Conclusion:	Pass
Test Date:	Jan. 02, 2022 ~ Jan. 05, 2022
Date of Issue:	Jan. 24, 2022

Tested by: Miao Yan
Miao Yan
Date Jan. 24, 2022

Approved by:
Wei Yanquan
(Chief Engineer)
Date Jan. 24, 2022

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Revision History

Version	Issue Date	Revisions Content
Rev. 01	Jan. 24, 2022	Initial Issue

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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 organizatin 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℃ to 23℃
Ambient Relative Humidity	32% to 49%
Ambient Pressure	100KPa to 102KPa

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	E&S International Enterprises, Inc.
Address	7801 Hayvenhurst Avenue, Van Nuys, CA 91406

2.2 Manufacturer Information

Manufacturer	E&S International Enterprises, Inc.
Address	7801 Hayvenhurst Avenue, Van Nuys, CA 91406

2.3 Factory Information

Factory	Shenzhen Bmorn Technology Co., Ltd
Address	6001, 6th Floor, West Building, Hengfang Veterans Industrial City, No.3012, Xingye Road, Yongfeng Community, Xixiang Street, Baoan District, Shenzhen, Guangdong Province, P.R. China

2.4 General Description for Equipment under Test (EUT)

EUT Name	LAPTOP
Model Name Under Test	VWNC71419-BK
Series Model Name	VWNC71419-SL, VWNC71419, N14TP6
Description of Model name differentiation	All models are same with electrical parameters and internal circuit structure, but only different on shell color and model name.
Hardware Version	EM_TG528_V2.0
Software Version	21H2
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.5 Ancillary Equipment

Ancillary Equipment 1	Battery	
	Brand Name	Ganfeng
	Model No.	575983
	Serial No.	N/A
	Capacity	4780 mAh
	Rated Voltage	11.55 V
	Limit Charge Voltage	13.2 V

2.6 Technical Information

Network and Wireless connectivity	Bluetooth (BR+EDR+BLE) WIFI 802.11a, 802.11b, 802.11g, 802.11n, 802.11ac and 802.11ax U-NII-1/2A/2C/3

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

Operating Mode	2.4G WLAN; 5G WLAN; Bluetooth	
Frequency Range	802.11b/g/n(HT20/HT40)	2412 MHz ~ 2462 MHz
	802.11ax(HE20/HE40)	2412 MHz ~ 2462 MHz
	802.11 a/n(HT20/HT40)	5150 MHz ~ 5250 MHz
		5250 MHz ~ 5350 MHz
		5470 MHz ~ 5725 MHz
		5725 MHz ~ 5850 MHz
	802.11 ac(VHT20/VHT40/VHT80)	5150 MHz ~ 5250 MHz
		5250 MHz ~ 5350 MHz
		5470 MHz ~ 5725 MHz
		5725 MHz ~ 5850 MHz
	802.11 ax(HE20/HE40/HE80)	5150 MHz ~ 5250 MHz
		5250 MHz ~ 5350 MHz
		5470 MHz ~ 5725 MHz
		5725 MHz ~ 5850 MHz
	Bluetooth	2400 ~ 2483.5 MHz
Antenna Type	WLAN	PIFA
	Bluetooth	PIFA
Hotspot Function	N/A	
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 v07	Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies
5	FCC KDB 865664 D01 v01r04	SAR Measurement 100 MHz to 6 GHz
6	FCC KDB 865664 D02 v01r02	RF Exposure Reporting
7	KDB 248227 D01 v02r02	SAR Guidance for IEEE 802.11 (Wi-Fi) Transmitters
8	KDB 616217 D04v01r02	SAR for laptop and tablets

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)

Frequency Band		Maximum Scaled SAR (W/kg)	Maximum Report SAR (W/kg)
		Body	Body
WIFI	2.4 G Aux. Antenna	0.125	**1.106**
	2.4 G Main Antenna	0.973	
	5.2&5.3 G Aux. Antenna	0.278	
	5.2&5.3 G Main Antenna	1.016	
	5.6 G Aux. Antenna	0.484	
	5.6 G Main Antenna	1.037	
	5.8 G Aux. Antenna	0.838	
	5.8 G Main Antenna	**1.106**	
Bluetooth	DH5 Aux. Antenna	0.818	
Limits (W/kg)		1.6	
Test Verdict		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 1.106 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:

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

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

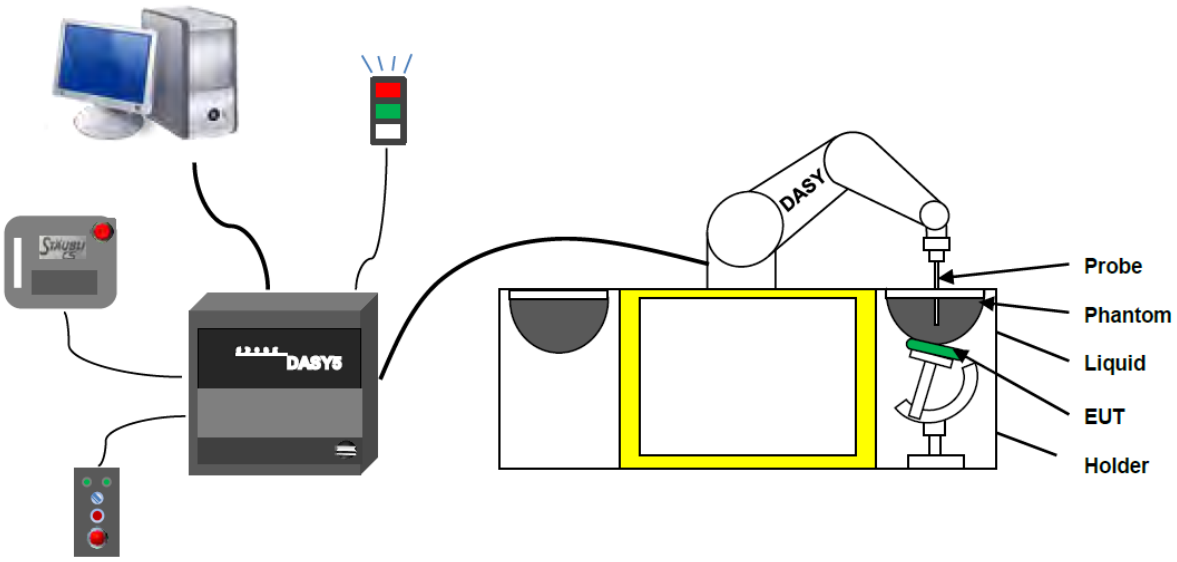
$$\mathbf{SAR} = \frac{\boldsymbol{\sigma}\mathbf{E}^{2}}{\boldsymbol{\rho}}$$

Where: σ is the conductivity of the tissue,

ρis 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:7607 with following specifications is used.

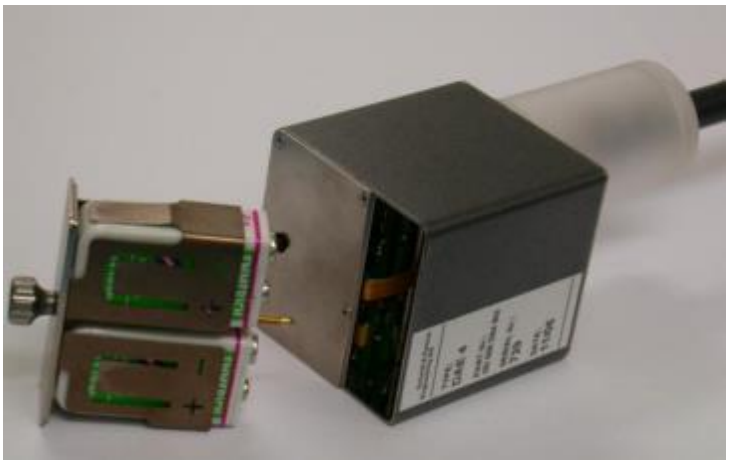
Construction	Symmetrical design with triangular core Built-in optical fiber for surface detection systemBuilt-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., glycolether)
Calibration	ISO/IEC 17025 calibration service available
Frequency	10 MHz to 6 GHz; 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

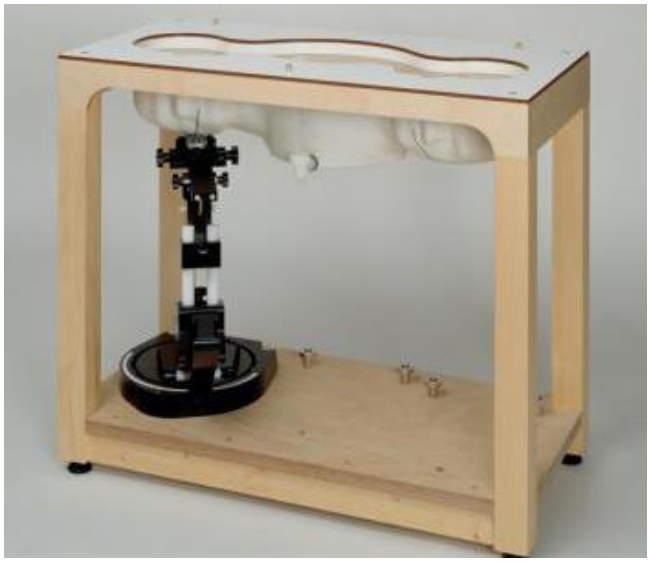
The data acquisition electronics (DAE) consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converte and a command decoder with a control logic unit. Transmission to the measurement server is accomplished through an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

Serial Number	Material	Length	Height
SN 1857 SAM	Vinylester, glass fiber reinforced	1000	500

Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with the latest draft of the standard IEC 62209 Part II and all known tissue simulating liquids. ELI4 has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points.

·Flat phantom

Photo of Phantom SN1012

Serial Number	Shell Thickness (mm)	Major ellipse axis (mm)	Minor axis (mm)
SN 1012 ELI4	2.0 ± 0.2	600	500

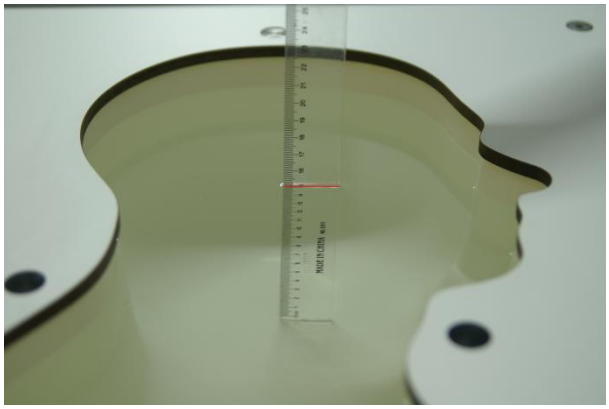
4.2.6 Device Holder

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

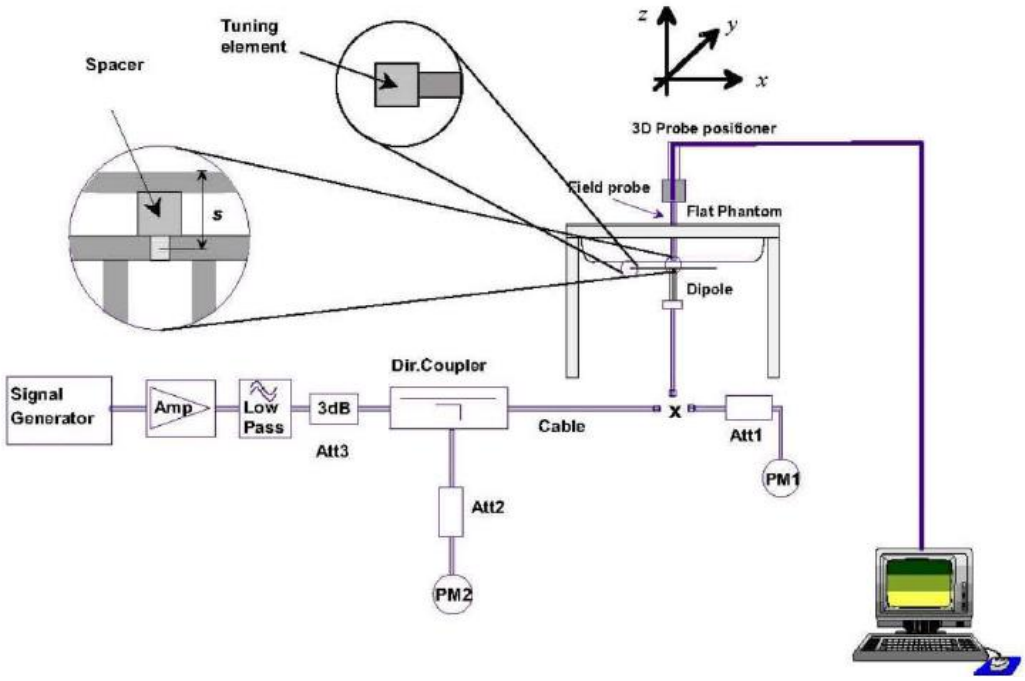
5 SYSTEM VERIFICATION

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

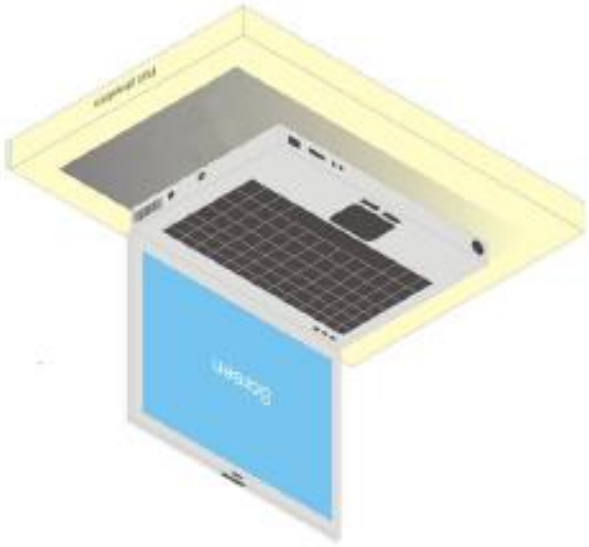
In the simplified setup for system evaluation, the EUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave that comes from a signal generator. The calibrated dipole must be placed beneath the flat phantom section of the SAM twin phantom with the correct distance holder. 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

6.1 Laptop Exposure Condition

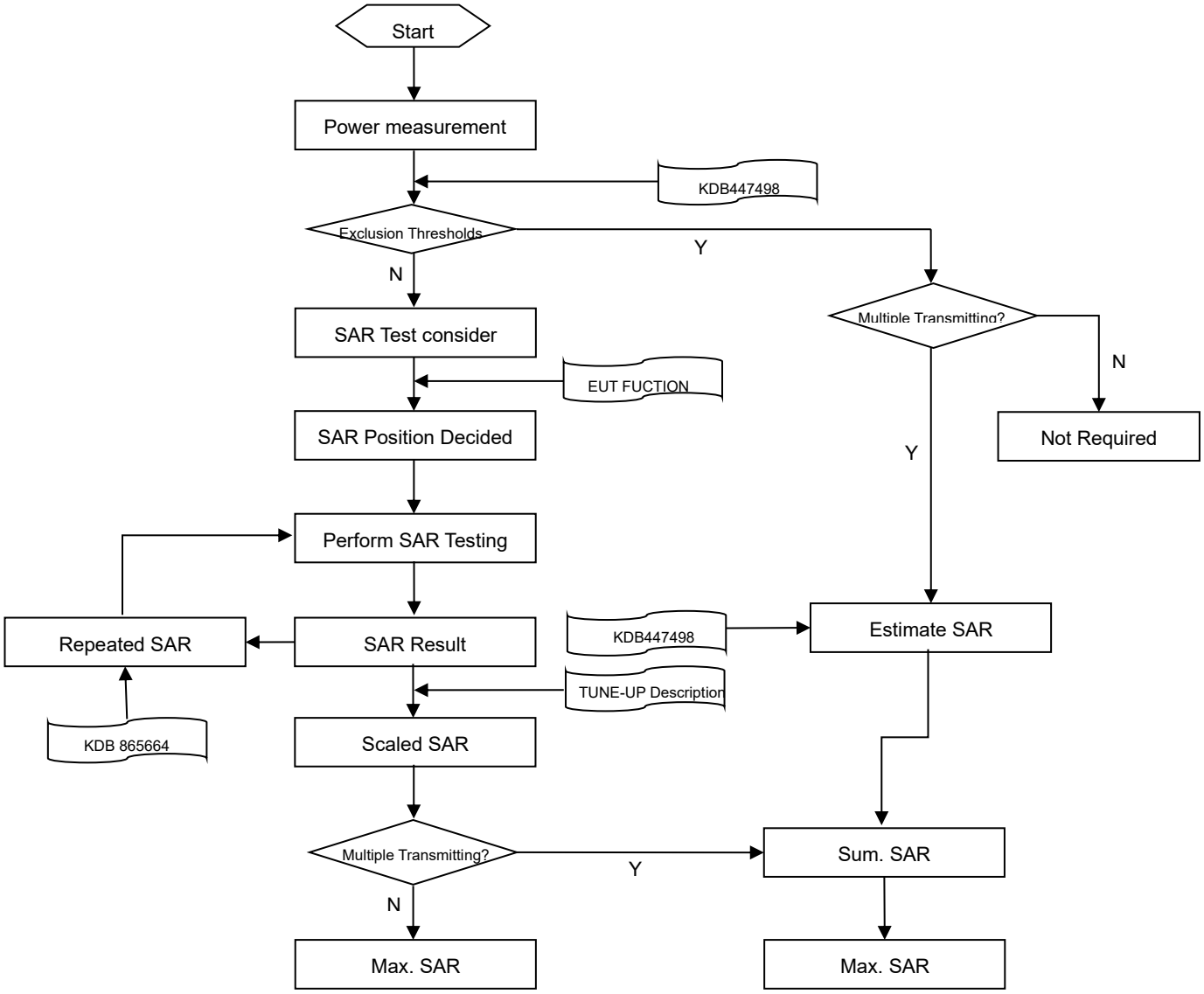
This DUT should consider one position which is bottom of laptop touching with phantom 0 mm air gap and the screen portion of the device shall be an open position at a 90° angle.



Note: For feet in Laptop, the antenna location can be positioned against the user during normal use and the additional separation introduced by such protrusions between the outer housing and a flat phantom is <5mm;

7 MEASUREMENT PROCEDURE

7.1 Measurement Process Diagram



7.2 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="5">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="2">graded grid</td><td>Δz Zoom (1): between 1st two points closest to phantom surface</td><td rowspan="2">≤ 4 mm</td><td>3–4 GHz: ≤ 3 mm
4–5 GHz: ≤ 2.5 mm
5–6 GHz: ≤ 2 mm</td></tr>
<tr><td>Δz Zoom (n>1): between subsequent points</td><td colspan="2">≤ 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>

7.3 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.

7.4 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.

8 CONDUCTED RF OUPUT POWER

8.1 WIFI

8.1.1 2.4G WIFI (SISO-Aux. Antenna)

Band (GHz)	Mode	Channel	Freq. (MHz)	Conducted Power (dBm)	Tune-up Power Limit (dBm)	SAR Test Require.
2.4 (2.4~2.4835)	802.11b	1	2412	19.39	20.00	Yes
		6	2437	**20.01**	20.50	Yes
		11	2462	19.20	20.00	Yes
	802.11g	1	2412	16.54	17.00	No
		6	2437	19.10	19.50	No
		11	2462	16.11	17.00	No
	802.11n(HT20)	1	2412	16.44	17.00	No
		6	2437	18.95	20.00	No
		11	2462	15.93	17.00	No
	802.11n(HT40)	3	2422	15.95	17.00	No
		6	2437	17.02	18.50	No
		9	2452	15.85	17.00	No
	802.11ax(HE20) (SU)	1	2412	16.29	17.00	No
		6	2437	18.79	20.00	No
		11	2462	15.85	17.00	No
	802.11ax(HE40) (SU)	3	2422	15.91	17.00	No
		6	2437	16.74	18.00	No
		9	2452	15.56	17.00	No
	802.11ax(HE20) (RU26)	1	2412	12.78	13.00	No
		6	2437	12.49	13.00	No
		11	2462	12.83	13.00	No
	802.11ax(HE40) (RU26)	3	2422	12.54	13.00	No
		6	2437	12.72	13.00	No
		9	2452	12.69	13.00	No

Note：According KDB 248227 D01 SAR is not required for the following 2.4 GHz OFDM conditions. 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.

Adjusted SAR = Report SAR * (max power (OFDM)/ max power (DSSS)) = 0.973 * (112.20 mw)/(100.00 mw) =1.091706 W/kg, so the 2.4GHz OFDM SAR test is not required.

8.1.2 2.4G WIFI (SISO-Main Antenna)

Band (GHz)	Mode	Channel	Freq. (MHz)	Conducted Power (dBm)	Tune-up Power Limit (dBm)	SAR Test Require.
2.4 (2.4~2.4835)	802.11b	1	2412	19.23	20.00	Yes
		6	2437	**20.13**	20.50	Yes
		11	2462	18.97	20.00	Yes
	802.11g	1	2412	16.57	17.00	No
		6	2437	19.18	19.50	No
		11	2462	15.69	17.00	No
	802.11n(HT20)	1	2412	16.52	17.00	No
		6	2437	19.12	20.00	No
		11	2462	15.59	17.00	No
	802.11n(HT40)	3	2422	16.17	17.00	No
		6	2437	17.07	18.50	No
		9	2452	15.43	17.00	No
	802.11ax(HE20) (SU)	1	2412	16.35	17.00	No
		6	2437	18.90	20.00	No
		11	2462	15.42	17.00	No
	802.11ax(HE40) (SU)	3	2422	15.87	17.00	No
		6	2437	16.78	18.00	No
		9	2452	15.15	17.00	No
	802.11ax(HE20) (RU26)	1	2412	12.63	13.00	No
		6	2437	12.70	13.00	No
		11	2462	12.52	13.00	No
	802.11ax(HE40) (RU26)	3	2422	12.79	13.00	No
		6	2437	12.67	13.00	No
		9	2452	12.53	13.00	No

Note：According KDB 248227 D01 SAR is not required for the following 2.4 GHz OFDM conditions. 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.

Adjusted SAR = Report SAR * (max power (OFDM)/ max power (DSSS)) = 0.973 * (112.20 mw)/(100.00 mw) =1.091706 W/kg, so the 2.4GHz OFDM SAR test is not required.

8.1.3 2.4G WIFI (MIMO-Aux. Antenna)

Band (GHz)	Mode	Channel	Freq. (MHz)	Conducted Power (dBm)	Tune-up Power Limit (dBm)	SAR Test Require.
2.4 (2.4~2.4835)	802.11n(HT20)	1	2412	13.51	14.00	No
		6	2437	16.73	17.00	No
		11	2462	13.08	14.00	No
	802.11n(HT40)	3	2422	13.27	14.00	No
		6	2437	14.94	15.50	No
		9	2452	12.90	14.00	No
	802.11ax(HE20) (SU)	1	2412	13.36	14.00	No
		6	2437	16.54	17.00	No
		11	2462	12.86	14.00	No
	802.11ax(HE40) (SU)	3	2422	13.04	14.00	No
		6	2437	14.64	15.00	No
		9	2452	12.52	14.00	No
	802.11ax(HE20) (RU26)	1	2412	12.83	13.00	No
		6	2437	12.53	13.00	No
		11	2462	12.82	13.00	No
	802.11ax(HE40) (RU26)	3	2422	12.81	13.00	No
		6	2437	12.68	13.00	No
		9	2452	12.65	13.00	No

8.1.4 2.4G WIFI (MIMO-Main Antenna)

Band (GHz)	Mode	Channel	Freq. (MHz)	Conducted Power (dBm)	Tune-up Power Limit (dBm)	SAR Test Require.
2.4 (2.4~2.4835)	802.11n(HT20)	1	2412	13.50	14.00	No
		6	2437	16.94	17.00	No
		11	2462	13.02	14.00	No
	802.11n(HT40)	3	2422	13.48	14.00	No
		6	2437	15.27	15.50	No
		9	2452	13.02	14.00	No
	802.11ax(HE20) (SU)	1	2412	13.27	14.00	No
		6	2437	16.74	17.00	No
		11	2462	12.82	14.00	No
	802.11ax(HE40) (SU)	3	2422	13.17	14.00	No
		6	2437	14.91	15.00	No
		9	2452	12.64	14.00	No
	802.11ax(HE20) (RU26)	1	2412	12.56	13.00	No
		6	2437	12.64	13.00	No
		11	2462	12.34	13.00	No
	802.11ax(HE40) (RU26)	3	2422	12.69	13.00	No
		6	2437	12.46	13.00	No
		9	2452	12.88	13.00	No

8.1.5 5G WIFI (SISO-Aux. Antenna)

Band (GHz)	Mode	Channel	Freq. (MHz)	Conducted Power (dBm)	Tune-up Power Limit (dBm)	SAR Test Require.
5.2 (5.15~5.25)	802.11a	36	5180	16.46	17.00	No
		40	5200	16.72	17.00	No
		48	5240	16.86	17.00	No
	802.11n(HT20)	36	5180	16.41	17.00	No
		40	5200	16.71	17.00	No
		48	5240	16.83	17.00	No
	802.11n(HT40)	38	5190	16.60	17.00	No
		46	5230	16.67	17.00	No
	802.11ac(VHT20)	36	5180	16.42	17.00	No
		40	5200	16.60	17.00	No
		48	5240	16.84	17.00	No
	802.11ac(VHT40)	38	5190	16.62	17.00	No
		46	5230	16.61	17.00	No
	802.11ac(VHT80)	42	5210	16.59	17.00	No
	802.11ax(HE20) (SU)	36	5180	16.69	17.00	No
		40	5200	16.36	17.00	No
		48	5240	16.62	17.00	No
	802.11ax(HE40) (SU)	38	5190	16.72	17.00	No
		46	5230	16.76	17.00	No
	802.11ax(HE80) (SU)	42	5210	16.75	17.00	No
	802.11ax(HE20) (RU26)	36	5180	12.52	13.00	No
		40	5200	12.53	13.00	No
		48	5240	12.65	13.00	No
	802.11ax(HE40) (RU26)	38	5190	12.53	13.00	No
		46	5230	12.80	13.00	No
	802.11ax(HE80) (RU26)	42	5210	12.75	13.00	No
5.3 (5.25~5.35)	802.11a	52	5260	**16.72**	17.00	Yes
		60	5300	16.49	17.00	Yes
		64	5320	16.59	17.00	Yes
	802.11n(HT20)	52	5260	16.63	17.00	No
		60	5300	16.42	17.00	No
		64	5320	16.60	17.00	No
	802.11n(HT40)	54	5270	16.45	17.00	No
		62	5310	16.85	17.00	No
	802.11ac(VHT20)	52	5260	16.50	17.00	No
		60	5300	16.80	17.00	No
		64	5320	16.89	17.00	No
	802.11ac(VHT40)	54	5270	16.48	17.00	No
		62	5310	16.85	17.00	No

	802.11ac(VHT80)	58	5290	16.94	17.00	No
	802.11ax(HE20) (SU)	52	5260	16.57	17.00	No
		60	5300	16.79	17.00	No
		64	5320	16.42	17.00	No
	802.11ax(HE40) (SU)	54	5270	16.63	17.00	No
		62	5310	16.55	17.00	No
	802.11ax(HE80) (SU)	58	5290	16.66	17.00	No
	802.11ax(HE20) (RU26)	52	5260	12.42	13.00	No
		60	5300	12.72	13.00	No
		64	5320	12.65	13.00	No
	802.11ax(HE40) (RU26)	54	5270	12.58	13.00	No
		62	5310	12.82	13.00	No
	802.11ax(HE80) (RU26)	58	5290	12.61	13.00	No
5.6 (5.47~5.725)	802.11a	100	5500	16.71	17.00	No
		116	5580	16.75	17.00	No
		140	5700	16.56	17.00	No
	802.11n(HT20)	100	5500	16.78	17.00	No
		116	5580	16.62	17.00	No
		140	5700	16.41	17.00	No
	802.11n(HT40)	102	5510	16.54	17.00	No
		110	5550	16.51	17.00	No
		134	5670	16.64	17.00	No
	802.11ac(VHT20)	100	5500	16.68	17.00	No
		116	5580	16.69	17.00	No
		140	5700	16.50	17.00	No
	802.11ac(VHT40)	102	5510	16.63	17.00	No
		110	5550	16.59	17.00	No
		134	5670	16.56	17.00	No
	802.11ac(VHT80)	106	5530	16.25	17.00	Yes
		122	5610	**16.83**	17.00	Yes
		138	5690	16.69	17.00	Yes
	802.11ax(HE20) (SU)	100	5500	16.53	17.00	No
		116	5580	16.61	17.00	No
		140	5700	16.86	17.00	No
	802.11ax(HE40) (SU)	102	5510	16.84	17.00	No
		110	5550	16.66	17.00	No
		134	5670	16.82	17.00	No
	802.11ax(HE80) (SU)	106	5530	16.46	17.00	No
		122	5610	16.56	17.00	No
		138	5690	16.88	17.00	No
	802.11ax(HE20) (RU26)	100	5500	12.41	13.00	No
		116	5580	12.46	13.00	No
		140	5700	12.74	13.00	No

	802.11ax(HE40) (RU26)	102	5510	12.73	13.00	No
		110	5550	12.88	13.00	No
		134	5670	12.72	13.00	No
	802.11ax(HE80) (RU26)	106	5530	12.46	13.00	No
		122	5610	12.65	13.00	No
		138	5690	12.44	13.00	No
5.8 (5.725~5.850)	802.11a	149	5745	**16.81**	17.00	Yes
		157	5785	16.34	17.00	Yes
		165	5825	16.42	17.00	Yes
	802.11n(HT20)	149	5745	16.77	17.00	No
		157	5785	16.33	17.00	No
		165	5825	16.37	17.00	No
	802.11n(HT40)	151	5755	16.86	17.00	No
		159	5795	16.12	17.00	No
	802.11ac(VHT20)	149	5745	16.77	17.00	No
		157	5785	16.36	17.00	No
		165	5825	16.37	17.00	No
	802.11ac(VHT40)	151	5755	16.85	17.00	No
		159	5795	16.61	17.00	No
	802.11ac(VHT80)	155	5775	16.68	17.00	No
	802.11ax(HE20) (SU)	149	5745	16.56	17.00	No
		157	5785	16.07	17.00	No
		165	5825	16.99	17.00	No
	802.11ax(HE40) (SU)	151	5755	16.41	17.00	No
		159	5795	16.72	17.00	No
	802.11ax(HE80) (SU)	155	5775	16.30	17.00	No
	802.11ax(HE20) (RU26)	149	5745	12.44	13.00	No
		157	5785	12.43	13.00	No
		165	5825	12.62	13.00	No
	802.11ax(HE40) (RU26)	151	5755	12.62	13.00	No
		159	5795	12.89	13.00	No
	802.11ax(HE80) (RU26)	155	5775	12.55	13.00	No

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

8.1.6 5G WIFI (SISO-Main Antenna)

Band (GHz)	Mode	Channel	Freq. (MHz)	Conducted Power (dBm)	Tune-up Power Limit (dBm)	SAR Test Require.
5.2 (5.15~5.25)	802.11a	36	5180	16.65	17.00	No
		40	5200	16.67	17.00	No
		48	5240	16.73	17.00	No
	802.11n(HT20)	36	5180	16.61	17.00	No
		40	5200	16.55	17.00	No
		48	5240	16.62	17.00	No
	802.11n(HT40)	38	5190	16.81	17.00	No
		46	5230	16.49	17.00	No
	802.11ac(VHT20)	36	5180	16.84	17.00	No
		40	5200	16.76	17.00	No
		48	5240	16.81	17.00	No
	802.11ac(VHT40)	38	5190	16.77	17.00	No
		46	5230	16.60	17.00	No
	802.11ac(VHT80)	42	5210	16.44	17.00	No
	802.11ax(HE20) (SU)	36	5180	16.72	17.00	No
		40	5200	16.54	17.00	No
		48	5240	16.58	17.00	No
	802.11ax(HE40) (SU)	38	5190	16.66	17.00	No
		46	5230	16.80	17.00	No
	802.11ax(HE80) (SU)	42	5210	16.80	17.00	No
	802.11ax(HE20) (RU26)	36	5180	12.53	13.00	No
		40	5200	12.53	13.00	No
		48	5240	12.63	13.00	No
	802.11ax(HE40) (RU26)	38	5190	12.76	13.00	No
		46	5230	12.39	13.00	No
	802.11ax(HE80) (RU26)	42	5210	12.78	13.00	No
5.3 (5.25~5.35)	802.11a	52	5260	16.72	17.00	Yes
		60	5300	16.60	17.00	Yes
		64	5320	**16.87**	17.00	Yes
	802.11n(HT20)	52	5260	16.67	17.00	No
		60	5300	16.45	17.00	No
		64	5320	16.69	17.00	No
	802.11n(HT40)	54	5270	16.47	17.00	No
		62	5310	16.84	17.00	No
	802.11ac(VHT20)	52	5260	16.68	17.00	No
		60	5300	16.45	17.00	No
		64	5320	16.76	17.00	No
	802.11ac(VHT40)	54	5270	16.40	17.00	No
		62	5310	16.85	17.00	No

	802.11ac(VHT80)	58	5290	16.74	17.00	No
	802.11ax(HE20) (SU)	52	5260	16.47	17.00	No
		60	5300	16.81	17.00	No
		64	5320	16.55	17.00	No
	802.11ax(HE40) (SU)	54	5270	16.60	17.00	No
		62	5310	16.54	17.00	No
	802.11ax(HE80) (SU)	58	5290	16.56	17.00	No
	802.11ax(HE20) (RU26)	52	5260	12.41	13.00	No
		60	5300	12.64	13.00	No
		64	5320	12.79	13.00	No
	802.11ax(HE40) (RU26)	54	5270	12.81	13.00	No
		62	5310	12.45	13.00	No
	802.11ax(HE80) (RU26)	58	5290	12.74	13.00	No
5.6 (5.47~5.725)	802.11a	100	5500	16.53	17.00	No
		116	5580	16.41	17.00	No
		140	5700	16.74	17.00	No
	802.11n(HT20)	100	5500	16.42	17.00	No
		116	5580	16.83	17.00	No
		140	5700	16.88	17.00	No
	802.11n(HT40)	102	5510	16.71	17.00	No
		110	5550	16.63	17.00	No
		134	5670	16.89	17.00	No
	802.11ac(VHT20)	100	5500	16.76	17.00	No
		116	5580	16.79	17.00	No
		140	5700	16.84	17.00	No
	802.11ac(VHT40)	102	5510	16.67	17.00	No
		110	5550	16.60	17.00	No
		134	5670	16.85	17.00	No
	802.11ac(VHT80)	106	5530	**16.67**	17.00	Yes
		122	5610	**16.67**	17.00	Yes
		138	5690	16.64	17.00	Yes
	802.11ax(HE20) (SU)	100	5500	16.75	17.00	No
		116	5580	16.58	17.00	No
		140	5700	16.62	17.00	No
	802.11ax(HE40) (SU)	102	5510	16.88	17.00	No
		110	5550	16.81	17.00	No
		134	5670	16.53	17.00	No
	802.11ax(HE80) (SU)	106	5530	16.75	17.00	No
		122	5610	16.39	17.00	No
		138	5690	16.56	17.00	No
	802.11ax(HE20) (RU26)	100	5500	12.80	13.00	No
		116	5580	12.33	13.00	No
		140	5700	12.63	13.00	No

	802.11ax(HE40) (RU26)	102	5510	12.58	13.00	No
		110	5550	12.96	13.00	No
		134	5670	12.60	13.00	No
	802.11ax(HE80) (RU26)	106	5530	12.44	13.00	No
		122	5610	12.43	13.00	No
		138	5690	12.53	13.00	No
5.8 (5.725~5.850)	802.11a	149	5745	16.57	17.00	Yes
		157	5785	**16.69**	17.00	Yes
		165	5825	16.31	17.00	Yes
	802.11n(HT20)	149	5745	17.00	17.00	No
		157	5785	16.61	17.00	No
		165	5825	16.26	17.00	No
	802.11n(HT40)	151	5755	16.12	17.00	No
		159	5795	16.13	17.00	No
	802.11ac(VHT20)	149	5745	17.00	17.00	No
		157	5785	16.62	17.00	No
		165	5825	16.25	17.00	No
	802.11ac(VHT40)	151	5755	16.61	17.00	No
		159	5795	16.62	17.00	No
	802.11ac(VHT80)	155	5775	16.83	17.00	No
	802.11ax(HE20) (SU)	149	5745	16.77	17.00	No
		157	5785	16.42	17.00	No
		165	5825	16.53	17.00	No
	802.11ax(HE40) (SU)	151	5755	16.86	17.00	No
		159	5795	16.84	17.00	No
	802.11ax(HE80) (SU)	155	5775	16.58	17.00	No
	802.11ax(HE20) (RU26)	149	5745	12.86	13.00	No
		157	5785	12.66	13.00	No
		165	5825	12.62	13.00	No
	802.11ax(HE40) (RU26)	151	5755	12.89	13.00	No
		159	5795	12.69	13.00	No
	802.11ax(HE80) (RU26)	155	5775	12.45	13.00	No

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

8.1.7 5G WIFI (MIMO-Aux. Antenna)

Band (GHz)	Mode	Channel	Freq. (MHz)	Conducted Power (dBm)	Tune-up Power Limit (dBm)	SAR Test Require.
5.2 (5.15~5.25)	802.11n(HT20)	36	5180	13.44	14.00	No
		40	5200	13.76	14.00	No
		48	5240	13.87	14.00	No
	802.11n(HT40)	38	5190	13.53	14.00	No
		46	5230	13.68	14.00	No
	802.11ac(VHT20)	36	5180	13.90	14.00	No
		40	5200	13.69	14.00	No
		48	5240	13.85	14.00	No
	802.11ac(VHT40)	38	5190	13.55	14.00	No
		46	5230	13.69	14.00	No
	802.11ac(VHT80)	42	5210	13.55	14.00	No
	802.11ax(HE20) (SU)	36	5180	13.56	14.00	No
		40	5200	13.36	14.00	No
		48	5240	13.47	14.00	No
	802.11ax(HE40) (SU)	38	5190	13.74	14.00	No
		46	5230	13.85	14.00	No
	802.11ax(HE80) (SU)	42	5210	13.81	14.00	No
	802.11ax(HE20) (RU26)	36	5180	9.82	10.00	No
		40	5200	9.35	10.00	No
		48	5240	9.38	10.00	No
	802.11ax(HE40) (RU26)	38	5190	9.69	10.00	No
		46	5230	9.58	10.00	No
	802.11ax(HE80) (RU26)	42	5210	9.39	10.00	No
5.3 (5.25~5.35)	802.11n(HT20)	52	5260	13.84	14.00	No
		60	5300	13.60	14.00	No
		64	5320	13.74	14.00	No
	802.11n(HT40)	54	5270	13.55	14.00	No
		62	5310	13.42	14.00	No
	802.11ac(VHT20)	52	5260	13.78	14.00	No
		60	5300	13.60	14.00	No
		64	5320	13.55	14.00	No
	802.11ac(VHT40)	54	5270	13.63	14.00	No
		62	5310	13.87	14.00	No
	802.11ac(VHT80)	58	5290	13.75	14.00	No
	802.11ax(HE20) (SU)	52	5260	13.62	14.00	No
		60	5300	13.42	14.00	No
		64	5320	13.52	14.00	No
	802.11ax(HE40) (SU)	54	5270	13.40	14.00	No
		62	5310	13.68	14.00	No

	802.11ax(HE80) (SU)	58	5290	13.69	14.00	No
	802.11ax(HE20) (RU26)	52	5260	9.84	10.00	No
		60	5300	9.70	10.00	No
		64	5320	9.65	10.00	No
	802.11ax(HE40) (RU26)	54	5270	9.81	10.00	No
		62	5310	9.65	10.00	No
	802.11ax(HE80) (RU26)	58	5290	9.53	10.00	No
5.6 (5.47~5.725)	802.11n(HT20)	100	5500	13.71	14.00	No
		116	5580	13.50	14.00	No
		140	5700	13.85	14.00	No
	802.11n(HT40)	102	5510	13.58	14.00	No
		110	5550	13.83	14.00	No
		134	5670	13.48	14.00	No
	802.11ac(VHT20)	100	5500	13.64	14.00	No
		116	5580	13.60	14.00	No
		140	5700	13.83	14.00	No
	802.11ac(VHT40)	102	5510	13.62	14.00	No
		110	5550	13.46	14.00	No
		134	5670	13.53	14.00	No
	802.11ac(VHT80)	106	5530	13.56	14.00	No
		122	5610	13.77	14.00	No
		138	5690	13.48	14.00	No
	802.11ax(HE20) (SU)	100	5500	13.68	14.00	No
		116	5580	13.45	14.00	No
		140	5700	13.77	14.00	No
	802.11ax(HE40) (SU)	102	5510	13.43	14.00	No
		110	5550	13.78	14.00	No
		134	5670	13.72	14.00	No
	802.11ax(HE80) (SU)	106	5530	13.54.	14.00	No
		122	5610	13.51	14.00	No
		138	5690	13.82	14.00	No
	802.11ax(HE20) (RU26)	100	5500	9.47	10.00	No
		116	5580	9.45	10.00	No
		140	5700	9.69	10.00	No
	802.11ax(HE40) (RU26)	102	5510	9.57	10.00	No
		110	5550	9.62	10.00	No
		134	5670	9.39	10.00	No
	802.11ax(HE80) (RU26)	106	5530	9.35	10.00	No
		122	5610	9.39	10.00	No
		138	5690	9.66	10.00	No
5.8 (5.725~5.850)	802.11n(HT20)	149	5745	13.64	14.00	No
		157	5785	13.72	14.00	No
		165	5825	13.68	14.00	No

	802.11n(HT40)	151	5755	13.74	14.00	No
		159	5795	13.51	14.00	No
	802.11ac(VHT20)	149	5745	13.67	14.00	No
		157	5785	13.73	14.00	No
		165	5825	13.69	14.00	No
	802.11ac(VHT40)	151	5755	13.70	14.00	No
		159	5795	13.56	14.00	No
	802.11ac(VHT80)	155	5775	13.57	14.00	No
	802.11ax(HE20) (SU)	149	5745	13.45	14.00	No
		157	5785	13.52	14.00	No
		165	5825	13.47	14.00	No
	802.11ax(HE40) (SU)	151	5755	13.41	14.00	No
		159	5795	13.76	14.00	No
	802.11ax(HE80) (SU)	155	5775	13.81	14.00	No
	802.11ax(HE20) (RU26)	149	5745	9.42	10.00	No
		157	5785	9.43	10.00	No
		165	5825	9.55	10.00	No
	802.11ax(HE40) (RU26)	151	5755	9.37	10.00	No
		159	5795	9.76	10.00	No
	802.11ax(HE80) (RU26)	155	5775	9.32	10.00	No

8.1.8 5G WIFI (MIMO-Main Antenna)

Band (GHz)	Mode	Channel	Freq. (MHz)	Conducted Power (dBm)	Tune-up Power Limit (dBm)	SAR Test Require.
5.2 (5.15~5.25)	802.11n(HT20)	36	5180	13.82	14.00	No
		40	5200	13.62	14.00	No
		48	5240	13.69	14.00	No
	802.11n(HT40)	38	5190	13.70	14.00	No
		46	5230	13.69	14.00	No
	802.11ac(VHT20)	36	5180	13.70	14.00	No
		40	5200	13.60	14.00	No
		48	5240	13.66	14.00	No
	802.11ac(VHT40)	38	5190	13.70	14.00	No
		46	5230	13.67	14.00	No
	802.11ac(VHT80)	42	5210	13.88	14.00	No
	802.11ax(HE20) (SU)	36	5180	13.57	14.00	No
		40	5200	13.44	14.00	No
		48	5240	13.47	14.00	No
	802.11ax(HE40) (SU)	38	5190	13.90	14.00	No
		46	5230	13.41	14.00	No
	802.11ax(HE80) (SU)	42	5210	13.58	14.00	No
	802.11ax(HE20) (RU26)	36	5180	9.68	10.00	No
		40	5200	9.71	10.00	No
		48	5240	9.40	10.00	No
	802.11ax(HE40) (RU26)	38	5190	9.45	10.00	No
		46	5230	9.46	10.00	No
	802.11ax(HE80) (RU26)	42	5210	9.89	10.00	No
5.3 (5.25~5.35)	802.11n(HT20)	52	5260	13.53	14.00	No
		60	5300	13.85	14.00	No
		64	5320	13.65	14.00	No
	802.11n(HT40)	54	5270	13.68	14.00	No
		62	5310	13.55	14.00	No
	802.11ac(VHT20)	52	5260	13.51	14.00	No
		60	5300	13.91	14.00	No
		64	5320	13.64	14.00	No
	802.11ac(VHT40)	54	5270	13.59	14.00	No
		62	5310	13.48	14.00	No
	802.11ac(VHT80)	58	5290	13.55	14.00	No
	802.11ax(HE20) (SU)	52	5260	13.82	14.00	No
		60	5300	13.65	14.00	No
		64	5320	13.40	14.00	No
	802.11ax(HE40) (SU)	54	5270	13.83	14.00	No
		62	5310	13.70	14.00	No

	802.11ax(HE80) (SU)	58	5290	13.77	14.00	No
	802.11ax(HE20) (RU26)	52	5260	9.59	10.00	No
		60	5300	9.46	10.00	No
		64	5320	9.51	10.00	No
	802.11ax(HE40) (RU26)	54	5270	9.43	10.00	No
		62	5310	9.54	10.00	No
	802.11ax(HE80) (RU26)	58	5290	9.84	10.00	No
5.6 (5.47~5.725)	802.11n(HT20)	100	5500	13.79	14.00	No
		116	5580	13.65	14.00	No
		140	5700	13.66	14.00	No
	802.11n(HT40)	102	5510	13.85	14.00	No
		110	5550	13.67	14.00	No
		134	5670	13.41	14.00	No
	802.11ac(VHT20)	100	5500	13.79	14.00	No
		116	5580	13.65	14.00	No
		140	5700	13.65	14.00	No
	802.11ac(VHT40)	102	5510	13.84	14.00	No
		110	5550	13.67	14.00	No
		134	5670	13.42	14.00	No
	802.11ac(VHT80)	106	5530	13.41	14.00	No
		122	5610	13.35	14.00	No
		138	5690	12.63	14.00	No
	802.11ax(HE20) (SU)	100	5500	13.63	14.00	No
		116	5580	13.43	14.00	No
		140	5700	13.47	14.00	No
	802.11ax(HE40) (SU)	102	5510	13.55	14.00	No
		110	5550	13.39	14.00	No
		134	5670	13.64	14.00	No
	802.11ax(HE80) (SU)	106	5530	13.63	14.00	No
		122	5610	13.66	14.00	No
		138	5690	13.71	14.00	No
	802.11ax(HE20) (RU26)	100	5500	9.64	10.00	No
		116	5580	9.44	10.00	No
		140	5700	9.89	10.00	No
	802.11ax(HE40) (RU26)	102	5510	9.64	10.00	No
		110	5550	9.46	10.00	No
		134	5670	9.68	10.00	No
	802.11ax(HE80) (RU26)	106	5530	9.60	10.00	No
		122	5610	9.48	10.00	No
		138	5690	9.32	10.00	No
5.8 (5.725~5.850)	802.11n(HT20)	149	5745	13.89	14.00	No
		157	5785	13.64	14.00	No
		165	5825	13.69	14.00	No

	802.11n(HT40)	151	5755	13.89	14.00	No
		159	5795	13.48	14.00	No
	802.11ac(VHT20)	149	5745	13.32	14.00	No
		157	5785	13.63	14.00	No
		165	5825	13.69	14.00	No
	802.11ac(VHT40)	151	5755	13.75	14.00	No
		159	5795	13.47	14.00	No
	802.11ac(VHT80)	155	5775	13.72	14.00	No
	802.11ax(HE20) (SU)	149	5745	13.65	14.00	No
		157	5785	13.48	14.00	No
		165	5825	13.45	14.00	No
	802.11ax(HE40) (SU)	151	5755	13.57	14.00	No
		159	5795	13.63	14.00	No
	802.11ax(HE80) (SU)	155	5775	13.45	14.00	No
	802.11ax(HE20) (RU26)	149	5745	9.54	10.00	No
		157	5785	9.40	10.00	No
		165	5825	9.81	10.00	No
	802.11ax(HE40) (RU26)	151	5755	9.49	10.00	No
		159	5795	9.43	10.00	No
	802.11ax(HE80) (RU26)	155	5775	9.64	10.00	No

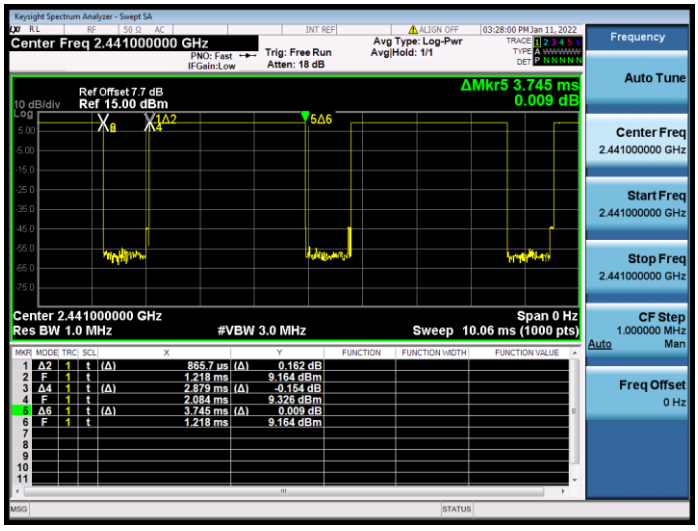
8.2 Bluetooth (Aux. Antenna)

Mode	GFSK			π/4-DQPSK		
Channel	0	39	78	0	39	78
Frequency (MHz)	2402	2441	2480	2402	2441	2480
Peak Power (dBm)	9.02	9.40	**9.64**	7.60	7.95	8.26
Tune-up Power Limit (dBm)	10.00			9.00		
Mode	8-DPSK			-		
Channel	0	39	78	-	-	-
Frequency (MHz)	2402	2441	2480	-	-	-
Peak Power (dBm)	7.72	8.08	8.41	-	-	-
Tune-up Power Limit (dBm)	9.00					
Mode	BLE (1Mbps)			BLE (2Mbps)		
Channel	0	39	78	0	19	39
Frequency (MHz)	2402	2440	2480	2402	2440	2480
Peak Power (dBm)	8.15	8.38	8.59	8.13	8.37	8.74
Tune-up Power Limit (dBm)	9.00			9.00		

Note: The Bluetooth duty cycle is 76.88% 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.

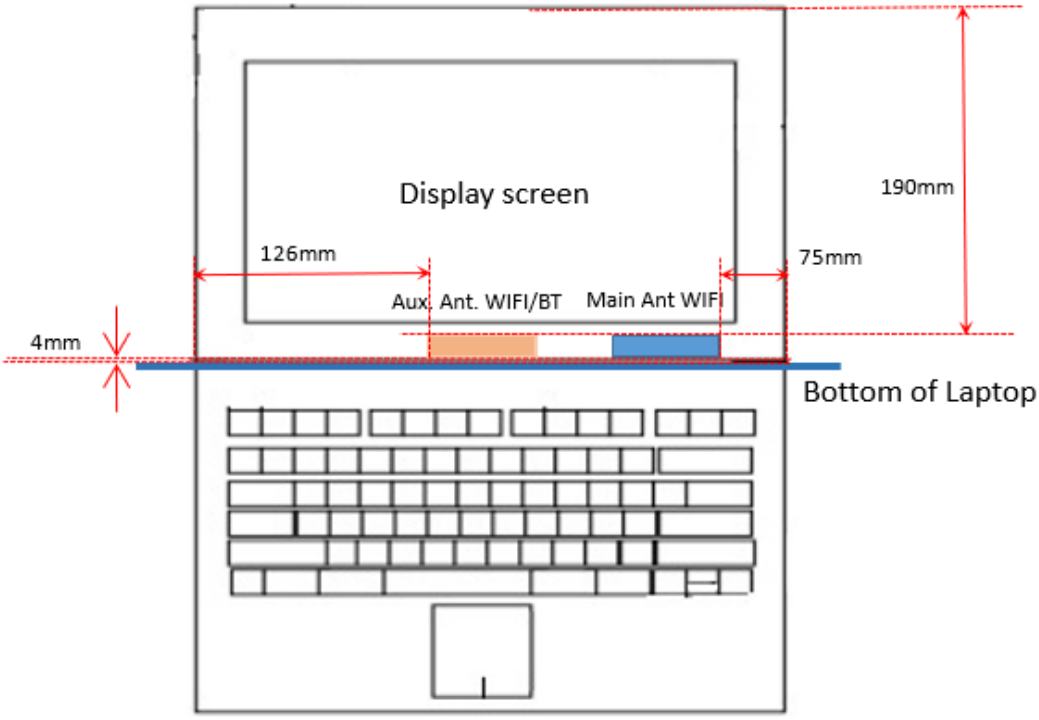
Duty Cycle

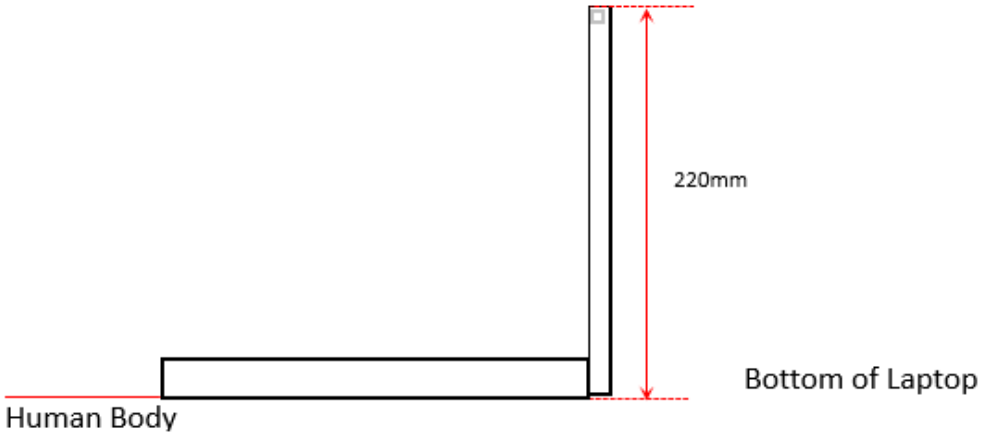
GFSK



9 TEST EXCLUSION CONSIDERATION

9.1 Laptop Mode antenna location sketch





9.2 SAR Test Consideration Table

According with FCC KDB 447498 D01, Appendix B, The SAR-based exemption formula applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold Pth (mW).

This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). The following table shows the power threshold from 5mm to 50mm.

Power Thresholds (mW)					
Frequency (MHz)	At separation distance of ≤5 mm	At separation distance of 10 mm	At separation distance of 15 mm	At separation distance of 20 mm	At separation distance of 25 mm
300	39 mW	65 mW	88 mW	110 mW	129 mW
450	22 mW	44 mW	67 mW	89 mW	112 mW
835	9 mW	25 mW	44 mW	66 mW	90 mW
1900	3 mW	12 mW	26 mW	44 mW	66 mW
2450	3 mW	10 mW	22 mW	38 mW	59 mW
3600	2 mW	8 mW	18 mW	32 mW	49 mW
5800	1 mW	6 mW	14 mW	25 mW	40 mW
Frequency (MHz)	At separation distance of 30 mm	At separation distance of 35 mm	At separation distance of 40 mm	At separation distance of 45 mm	At separation distance of 50 mm
300	148 mW	166 mW	184 mW	201 mW	217 mW
450	135 mW	158 mW	180 mW	203 mW	226 mW
835	116 mW	145 mW	175 mW	207 mW	240 mW
1900	92 mW	122 mW	157 mW	195 mW	236 mW
2450	83 mW	111 mW	143 mW	179 mW	219 mW
3600	71 mW	96 mW	125 mW	158 mW	195 mW
5800	58 mW	80 mW	106 mW	136 mW	169 mW

Aux. Antenna

Test Position Configurations	Mode	Bluetooth	WLAN 2.4GHz	WLAN 5.2&5.3GHz	WLAN 5.6GHz	WLAN 5.8GHz
Bottom of Laptop	Distance to User (mm)	<5				
	Max. Peak Power (dBm)	10.00	20.50	17.00	17.00	17.00
	Max. Peak Power (mW)	10.00	112.20	50.12	50.12	50.12
	Exclusion Threshold	3.00	3.00	1.00	1.00	1.00
	SAR Test Required	Yes	Yes	Yes	Yes	Yes

Main Antenna

Test Position Configurations	Mode	WLAN 2.4GHz	WLAN 5.2&5.3GHz	WLAN 5.6GHz	WLAN 5.8GHz
Bottom of Laptop	Distance to User (mm)	<5			
	Max. Peak Power (dBm)	20.50	17.00	17.00	17.00
	Max. Peak Power (mW)	112.20	50.12	50.12	50.12
	Exclusion Threshold (mW)	3.00	1.00	1.00	1.00
	SAR Test Required	Yes	Yes	Yes	Yes

10 TEST RESULT

10.1Bluetooth

Mode	Antenna	Position	Dist. (mm)	Ch.	Freq. (MHz)	Power Drift (dB)	1g Meas SAR (W/kg)	Meas. Power (dBm)	Max. tune-up power (dBm)	Scaling Factor	Duty cycle (%)	Duty cycle Factor	1g Scaled SAR (W/kg)	Meas. No.
Body														
DH5	Aux.	Bottom Side	0	78	2480	0.09	0.089	9.64	10.00	1.086	76.88	1.301	**0.125**	1#
Note: Refer to ANNEX C for the detailed test data for each test configuration.														

10.2WIFI 2.4GHz

Mode	Antenna	Position	Dist. (mm)	Ch.	Freq. (MHz)	Power Drift (dB)	1g 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.
Body														
802.11 b	Aux.	Bottom Side	0	6	2437	0.12	0.863	20.01	20.50	1.119	99.32	1.007	**0.973**	2#
		Bottom Side	0	1	2412	0.07	0.704	19.39	20.00	1.151	99.32	1.007	0.816	/
		Bottom Side	0	11	2462	0.15	0.758	19.20	20.00	1.202	99.32	1.007	0.918	/
	Main	Bottom Side	0	6	2437	0.05	0.254	20.13	20.50	1.089	99.32	1.007	**0.278**	3#
Note: Refer to ANNEX C for the detailed test data for each test configuration.														

10.3WIFI 5GHz

Fre. Band	Mode	Antenna	Position	Dist. (mm)	Ch.	Freq. (MHz)	Power Drift (dB)	1g 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.
Body															
5.3G	802.11 a	Aux.	Bottom Side	0	58	5290	0.08	0.985	16.94	17.00	1.014	98.28	1.018	**1.016**	4#
		Main	Bottom Side	0	58	5290	-0.04	0.448	16.74	17.00	1.062	98.28	1.018	**0.484**	5#
5.6G	802.11 ac (VHT80)	Aux.	Bottom Side	0	122	5610	0.09	0.768	16.83	17.00	1.040	98.28	1.018	0.813	/
				0	106	5530	-0.12	0.814	16.25	17.00	1.189	98.28	1.018	0.984	/
				0	138	5690	0.02	0.949	16.69	17.00	1.074	98.28	1.018	**1.037**	6#
		Main	Bottom Side	0	122	5610	0.11	0.662	16.67	17.00	1.079	98.28	1.018	0.727	/
				0	106	5530	0.08	0.668	16.67	17.00	1.079	98.28	1.018	0.733	/
				0	138	5690	0.13	0.758	16.64	17.00	1.086	98.28	1.018	**0.838**	7#
5.8G	802.11 a	Aux.	Bottom Side	0	155	5775	0.04	1.010	16.68	17.00	1.076	98.28	1.018	**1.106**	8#
		Main	Bottom Side	0	155	5775	-0.12	0.773	16.83	17.00	1.040	98.28	1.018	**0.818**	9#
Note: Refer to ANNEX C for the detailed test data for each test configuration.															

11 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.

Frequency Band (MHz)	Wireless Band	Antenna	RF Exposure Conditions	Test Position	Highest Measured SAR (W/kg)	Repeated SAR (Yes/No)	Highest Measured SAR (W/kg)	Largest to Smallest SAR Radio
2437	802.11 b	Aux.	Body	Bottom Side	0.863	Yes	0.831	1.04
5290	802.11 a	Aux.	Body	Bottom Side	0.985	Yes	0.937	1.05
5690	802.11 ac(VHT80)	Aux.	Body	Bottom Side	0.949	Yes	0.931	1.02
5775	802.11 a	Aux.	Body	Bottom Side	1.010	Yes	0.994	1.02
Note: The ratio of largest to smallest SAR for the original and first repeated measurements is < 1.20, the second repeated measurement is not required.								

12 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).

According KDB 447498 D01v06, simultaneous transmission:

a) SPLSR = (SAR1 + SAR2)^1.5 / R_i (min. separation distance, mm), and the peak separation distance is determined from the square root of [$(x1-x2)^2$ + $(y1-y2)^2$ + $(z1-z2)^2$], where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
SAR1 is the highest reported or estimated SAR for the first of a pair of simultaneous transmitting antennas, in a specific test operating mode and exposure condition.
SAR2 is the highest reported or estimated SAR for the second of a pair of simultaneous transmitting antennas, in a specific test operating mode and exposure condition as the first.

b) If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary.

c) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg.

12.1 Simultaneous Transmission Mode Considerations

NO.	Mode	Body
1	2.4 G WLAN (Main Antenna)	+ 2.4 G WLAN (Auxiliary Antenna)
2	2.4 G WLAN (Main Antenna)	+ Bluetooth (Auxiliary Antenna)
3	5 G WLAN (Main Antenna)	+ 5 G WLAN (Auxiliary Antenna)
4	5 G WLAN (Main Antenna)	+ Bluetooth (Auxiliary Antenna)
5	5 G WLAN (Main Antenna)	+ 5 G WLAN (Auxiliary Antenna) + Bluetooth (Auxiliary Antenna)
Note: 1. The EUT supports the Auxiliary antenna with TX/RX diversity function for WLAN and Bluetooth, the Main antenna with TX/RX diversity function for WLAN. 2. WLAN 2.4GHz and Bluetooth will not be transmitting from the Auxiliary antenna at same time.		

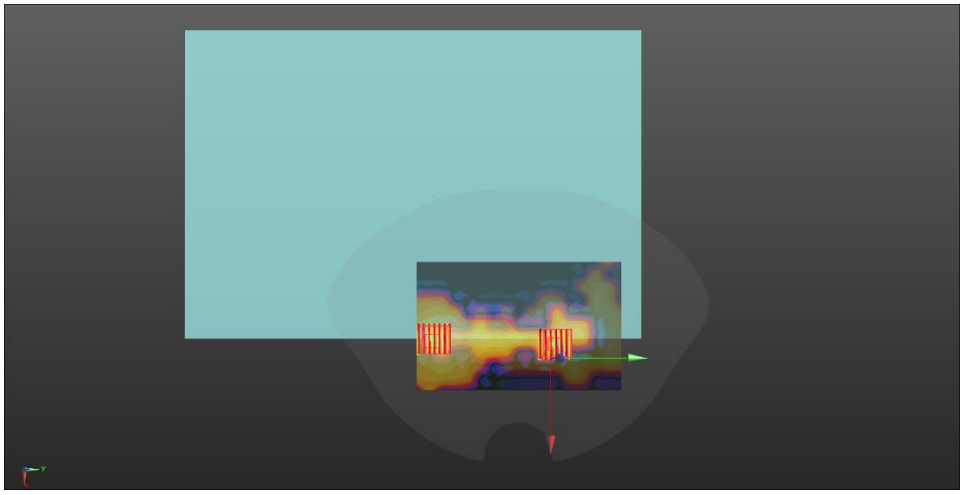
12.2Sum SAR of Simultaneous Transmission

12.2.1 Highest Bluetooth and WLAN Sum Body SAR of Simultaneous Transmission

Test Mode	Position	Mode	Max. 1g SAR (W/kg)	1g Sum SAR (W/kg)	SPLSR (Yes/No)	SPLSR Num.
Body (Separation 0 mm)						
Laptop	Bottom of Laptop	2.4 G WLAN (Main Antenna)	0.278	1.251	No	/
		2.4 G WLAN (Auxiliary Antenna)	0.973			
		2.4 G WLAN (Main Antenna)	0.278	0.403	No	/
		Bluetooth (Auxiliary Antenna)	0.125			
		5.3 G WLAN (Main Antenna)	0.484	1.500	No	/
		5.3 G WLAN (Auxiliary Antenna)	1.016			
		5.6 G WLAN (Main Antenna)	0.838	1.875	Yes	1#
		5.6 G WLAN (Auxiliary Antenna)	1.037			
		5.8 G WLAN (Main Antenna)	0.818	1.924	Yes	2#
		5.8 G WLAN (Auxiliary Antenna)	1.106			
		5.3 G WLAN (Main Antenna)	0.484	0.609	No	/
		Bluetooth (Auxiliary Antenna)	0.125			
		5.6 G WLAN (Main Antenna)	0.838	0.963	No	/
		Bluetooth (Auxiliary Antenna)	0.125			
		5.8 G WLAN (Main Antenna)	0.818	0.943	No	/
		Bluetooth (Auxiliary Antenna)	0.125			
		5.3 G WLAN (Main Antenna)	0.484	1.625	Yes	3#
		5.3 G WLAN (Auxiliary Antenna)	1.016			
		Bluetooth (Auxiliary Antenna)	0.125			
		5.6 G WLAN (Main Antenna)	0.838	2.000	Yes	4#
		5.6 G WLAN (Auxiliary Antenna)	1.037			
		Bluetooth (Auxiliary Antenna)	0.125			
		5.8 G WLAN (Main Antenna)	0.818	2.049	Yes	5#
		5.8 G WLAN (Auxiliary Antenna)	1.106			
		Bluetooth (Auxiliary Antenna)	0.125			

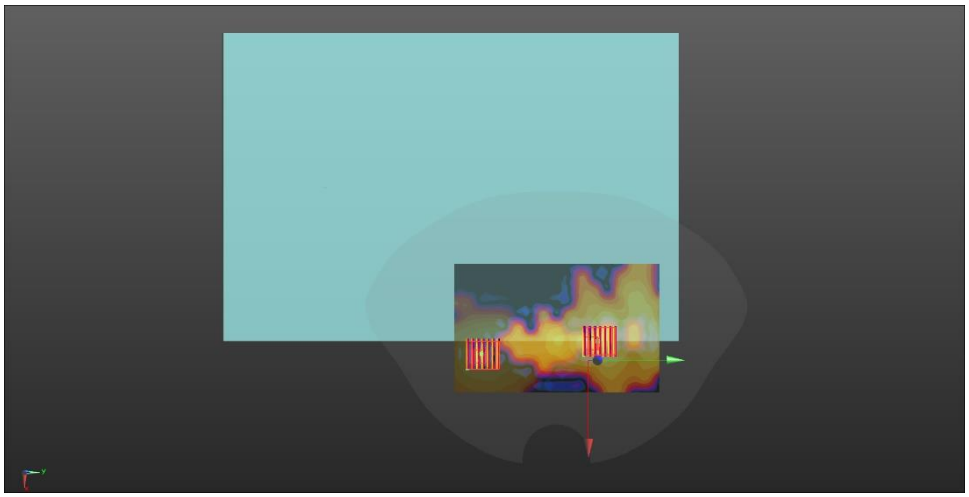
SPLSR Analysis 1#

Test Mode	Position	Antenna	Reported 1g Max. SAR (W/kg)	Coordinates (m)			1g Sum SAR (W/kg)	3D Distance (mm)	SPLSR	Simultaneous SAR Test (Yes/No)
				X	Y	Z				
Laptop	Bottom Side	5.6 G WLAN (Auxiliary Antenna)	1.037	-0.014	-0.066	-0.207	93.0	1.88	0.03	No
		5.6 G WLAN (Main Antenna)	0.838	-0.011	0.027	-0.207				



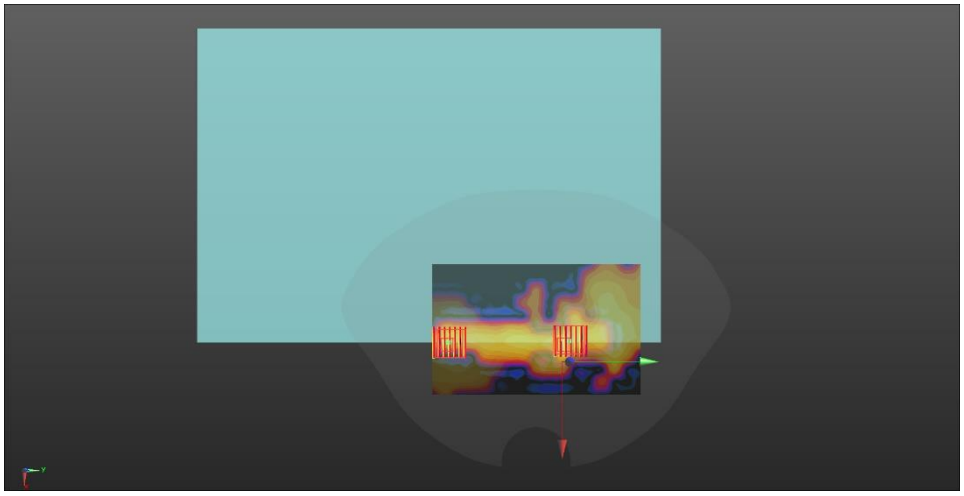
SPLSR Analysis 2#

Test Mode	Position	Antenna	Reported 1g Max. SAR (W/kg)	Coordinates (m)			1g Sum SAR (W/kg)	3D Distance (mm)	SPLSR	Simultaneous SAR Test (Yes/No)
				X	Y	Z				
Laptop	Bottom Side	5.8 G WLAN (Auxiliary Antenna)	1.106	-0.08	-0.063	-0.207	111.8	1.92	0.02	No
		5.8 G WLAN (Main Antenna)	0.818	-0.015	0.028	-0.208				



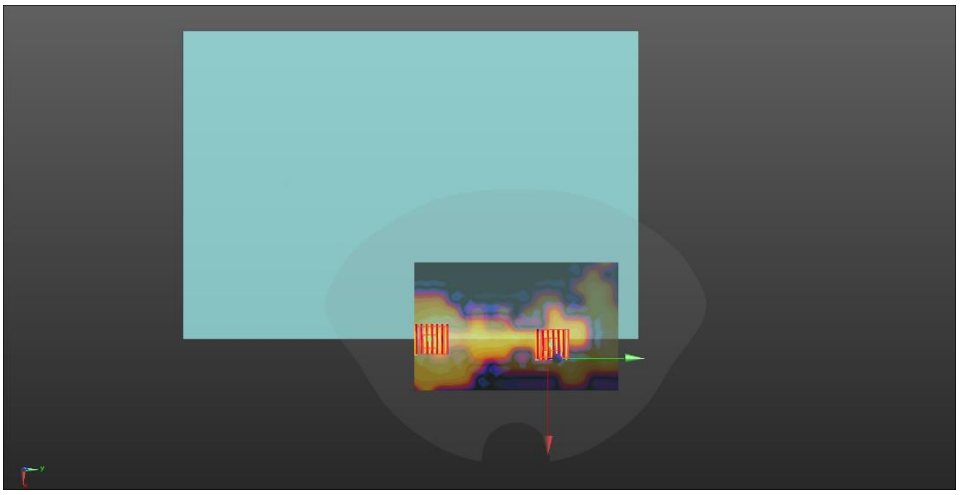
SPLSR Analysis 3#

Test Mode	Position	Antenna	Reported 1g Max. SAR (W/kg)	Coordinates (m)			1g Sum SAR (W/kg)	3D Distance (mm)	SPLSR	Simultaneous SAR Test (Yes/No)
				X	Y	Z				
Laptop	Bottom Side	5.3 G WLAN (Auxiliary Antenna)+ Bluetooth (Auxiliary Antenna)	1.141	-0.015	-0.068	-0.207	89.1	1.63	0.02	No
		5.3 G WLAN (Main Antenna)	0.484	-0.012	0.021	-0.208				



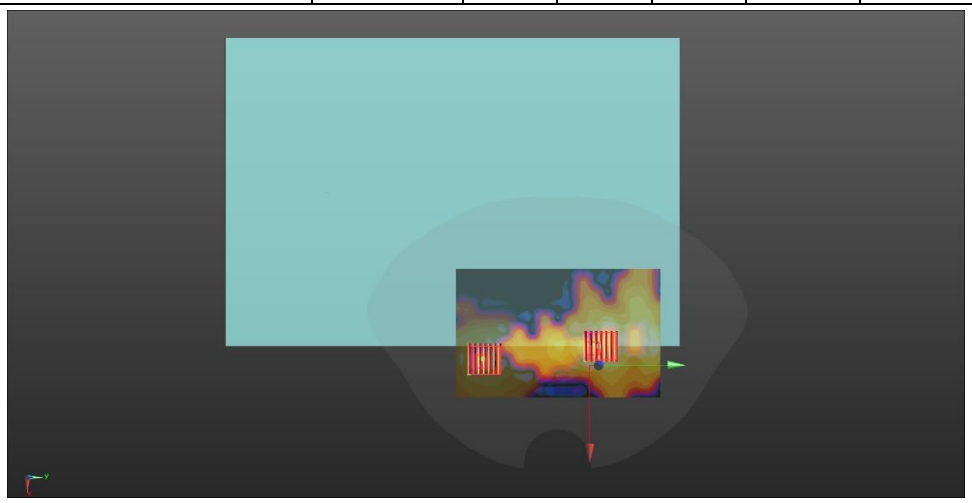
SPLSR Analysis 4#

Test Mode	Position	Antenna	Reported 1g Max. SAR (W/kg)	Coordinates (m)			1g Sum SAR (W/kg)	3D Distance (mm)	SPLSR	Simultaneous SAR Test (Yes/No)
				X	Y	Z				
Laptop	Bottom Side	5.6 G WLAN (Auxiliary Antenna)+ Bluetooth (Auxiliary Antenna)	1.162	-0.014	-0.066	-0.207	93.0	2.00	0.03	No
		5.6 G WLAN (Main Antenna)	0.838	-0.011	0.027	-0.207				



SPLSR Analysis 5#

Test Mode	Position	Antenna	Reported 1g Max. SAR (W/kg)	Coordinates (m)			1g Sum SAR (W/kg)	3D Distance (mm)	SPLSR	Simultaneous SAR Test (Yes/No)
				X	Y	Z				
Laptop	Bottom Side	5.8 G WLAN (Auxiliary Antenna)+ Bluetooth (Auxiliary Antenna)	1.231	-0.08	-0.063	-0.207	111.8	2.05	0.03	No
		5.8 G WLAN (Main Antenna)	0.818	-0.015	0.028	-0.208				



13 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	52.8.8.1222	N/A	N/A
2450MHz Validation Dipole	Speag	D2450V2	SN: 952	2021/05/19	2024/05/18
5GHz Validation Dipole	Speag	D5GHzV2	SN: 1200	2021/05/18	2024/05/17
E-Field Probe	Speag	EX3DV4	SN: 7607	2021/08/12	2022/08/11
Data Acquisition Electronics	Speag	DAE4	SN: 1454	2021/11/05	2022/11/04
Signal Generator	R&S	SMB100A	182396	2021/12/20	2022/12/19
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
Network Analyzer	Agilent	E5071B	MY42404001	2021/04/01	2022/03/31
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: 1857	N/A	N/A
Phantom2	Speag	ELI4	SN: 1012	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 (%)
2022.01.02	Head	2450	21.4	1.77	38.19	1.80	39.20	-1.67	-2.58
2022.01.03	Head	5250	21.5	4.68	36.95	4.71	35.93	-0.64	2.84
2022.01.04	Head	5600	21.6	5.09	35.34	5.07	35.53	0.39	-0.53
2022.01.05	Head	5750	21.4	5.29	33.94	5.22	35.36	1.34	-4.02
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).

Date	Liquid Type	Freq. (MHz)	Power (mW)	Measured SAR (W/kg)	Normalized SAR (W/kg)	Dipole SAR (W/kg)	Tolerance (%)
2022.01.02	Head	2450	100	5.210	52.10	53.00	-1.70
2022.01.03	Head	5250	100	7.910	79.10	77.80	1.67
2022.01.04	Head	5600	100	8.330	83.30	81.20	2.59
2022.01.05	Head	5750	100	7.390	73.90	77.20	-4.27
Note: The tolerance limit of System validation ±10%.							

System Performance Check Data (2450MHz)

Date: 2022.01.02

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

Medium parameters used: f = 2450 MHz; σ = 1.771 S/m; ε_r = 38.196; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient Temperature:22.7 Liquid Temperature:21.4

DASY5 Configuration:

- Probe: EX3DV4 - SN7607; ConvF(7.68, 7.68, 7.68); Calibrated: 2021.08.12;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 2021.11.05
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

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

Maximum value of SAR (interpolated) = 5.78 W/kg

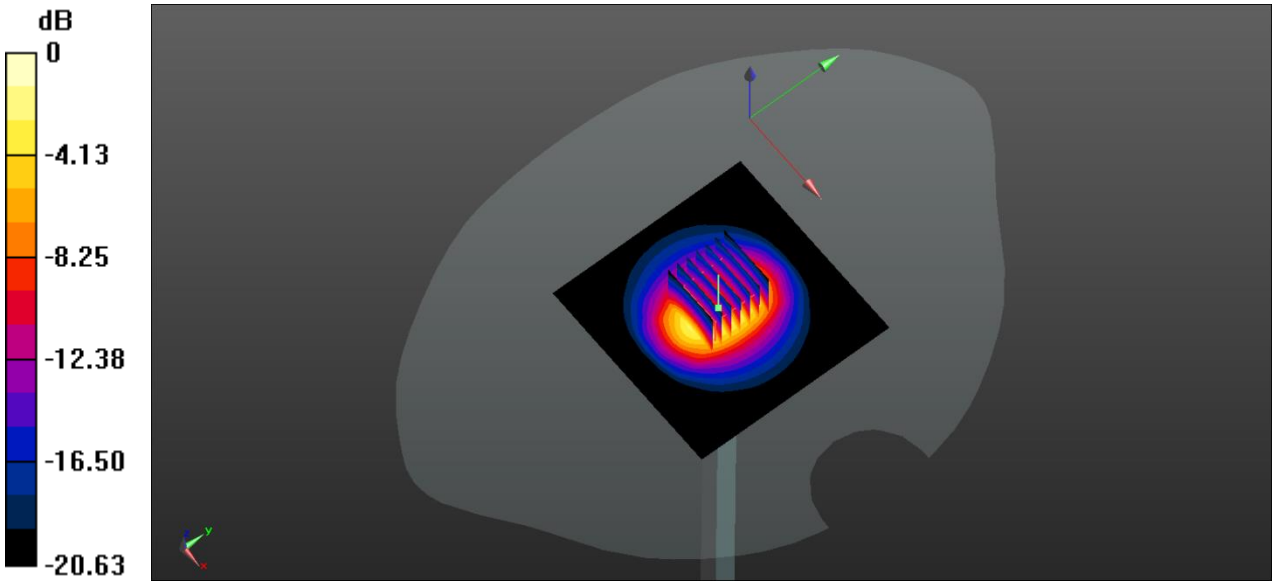
CW2450 HEAD 100mw/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 56.72 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 11.1 W/kg

SAR(1 g) = 5.21 W/kg; SAR(10 g) = 2.34 W/kg

Maximum value of SAR (measured) = 5.87 W/kg



0 dB = 5.87 W/kg

System Performance Check Data (5250MHz)

Date: 2022.01.03

Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5250 MHz;Duty Cycle: 1:1

Medium parameters used: f = 5250 MHz; σ = 4.677 S/m; ε_r = 36.949; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient Temperature:22.5 Liquid Temperature:21.5

DASY5 Configuration:

- Probe: EX3DV4 - SN7607; ConvF(5.46, 5.46, 5.46); Calibrated: 2021.08.12;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 2021.11.05
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

CW 5250 100mW/Area Scan (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 14.3 W/kg

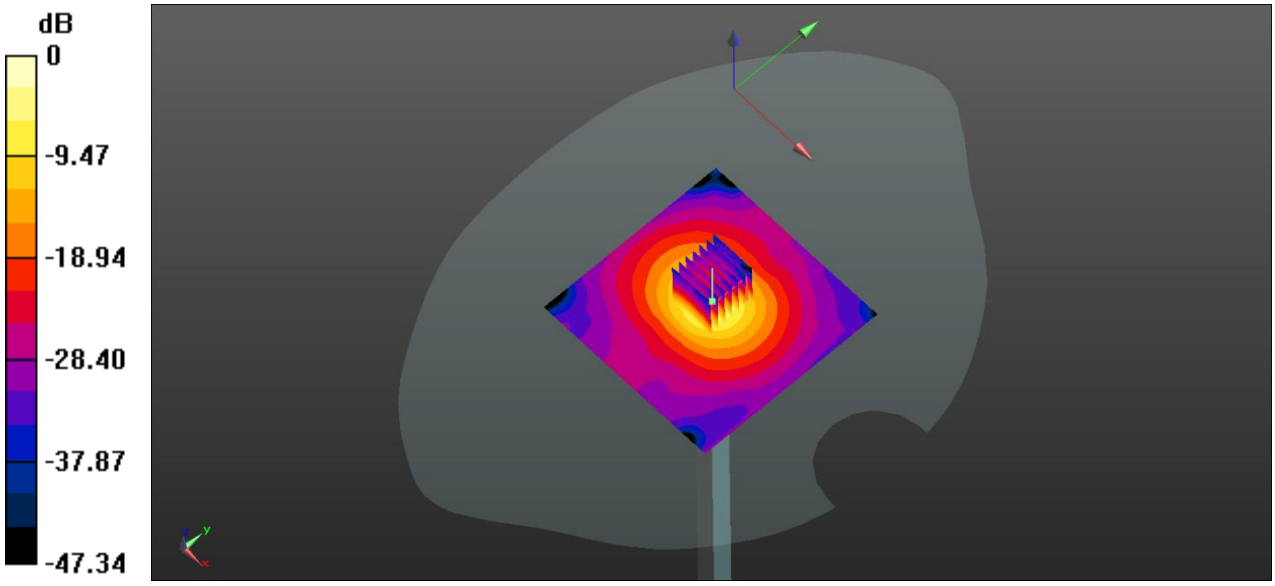
CW 5250 100mW/Zoom Scan (7x7x21)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 37.78 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 31.9 W/kg

SAR(1 g) = 7.91 W/kg; SAR(10 g) = 2.24 W/kg

Maximum value of SAR (measured) = 18.7 W/kg



0 dB = 18.7 W/kg

System Performance Check Data (5600MHz)

Date: 2022.01.04

Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5600 MHz;Duty Cycle: 1:1

Medium parameters used: f = 5600 MHz; σ = 5.085 S/m; ε_r = 35.343; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient Temperature:22.5 Liquid Temperature:21.6

DASY5 Configuration:

- Probe: EX3DV4 - SN7607; ConvF(4.88, 4.88, 4.88); Calibrated: 2021.08.12;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 2021.11.05
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

CW 5600 100mW /Area Scan (81x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 9.13 W/kg

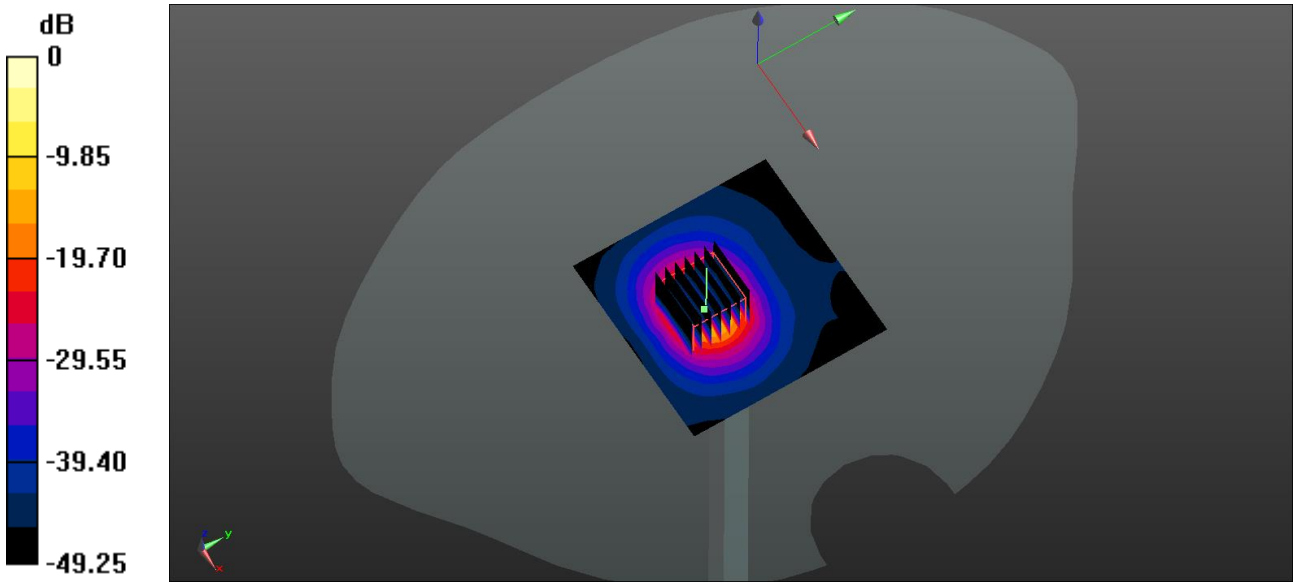
CW 5600 100mW /Zoom Scan (7x7x15)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 22.84 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 38.21 W/kg

SAR(1 g) = 8.33 W/kg; SAR(10 g) = 2.42 W/kg

Maximum value of SAR (measured) = 21.9 W/kg



0 dB = 21.9 W/kg

System Performance Check Data (5750MHz)

Date: 2022.01.05

Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5750 MHz;Duty Cycle: 1:1

Medium parameters used: f = 5750 MHz; σ = 5.287 S/m; ε_r = 33.944; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient Temperature:22.6 Liquid Temperature:21.4

DASY5 Configuration:

- Probe: EX3DV4 - SN7607; ConvF(4.92, 4.92, 4.92); Calibrated: 2021.08.12;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 2021.11.05
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

CW5750 HEAD 100mW/Area Scan (81x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 8.48 W/kg

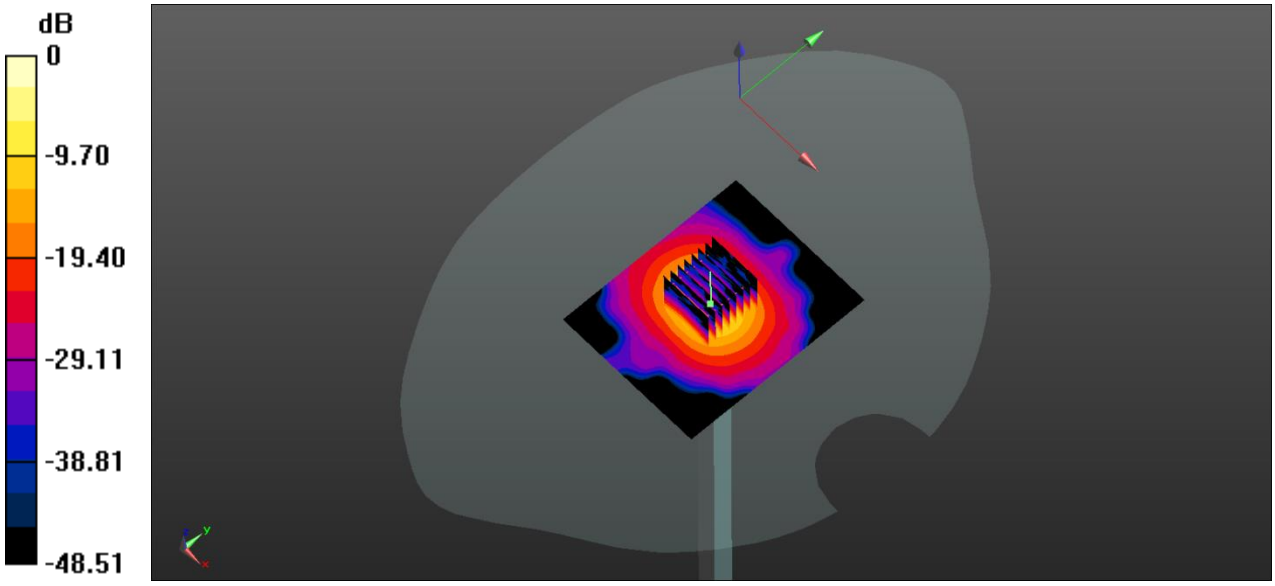
CW5750 HEAD 100mW/Zoom Scan (8x8x21)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 36.33 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 35.42 W/kg

SAR(1 g) = 7.39 W/kg; SAR(10 g) = 2.09 W/kg

Maximum value of SAR (measured) = 17.2 W/kg



0 dB = 17.2 W/kg

ANNEX C TEST DATA

MEAS.1 Body Plane with Bottom Side 0mm on High Channel in Bluetooth mode with Antenna Auxiliary

Date: 2022.01.02

Communication System Band: Bluetooth; Frequency: 2480 MHz;Duty Cycle: 1:1.301

Medium parameters used (interpolated): f = 2480 MHz; σ = 1.809 S/m; ε_r = 37.777; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient Temperature:22.7 Liquid Temperature:21.4

DASY5 Configuration:

- Probe: EX3DV4 - SN7607; ConvF(7.68, 7.68, 7.68); Calibrated: 2021.08.12;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 2021.11.05
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch78/Area Scan (81x131x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.166 W/kg

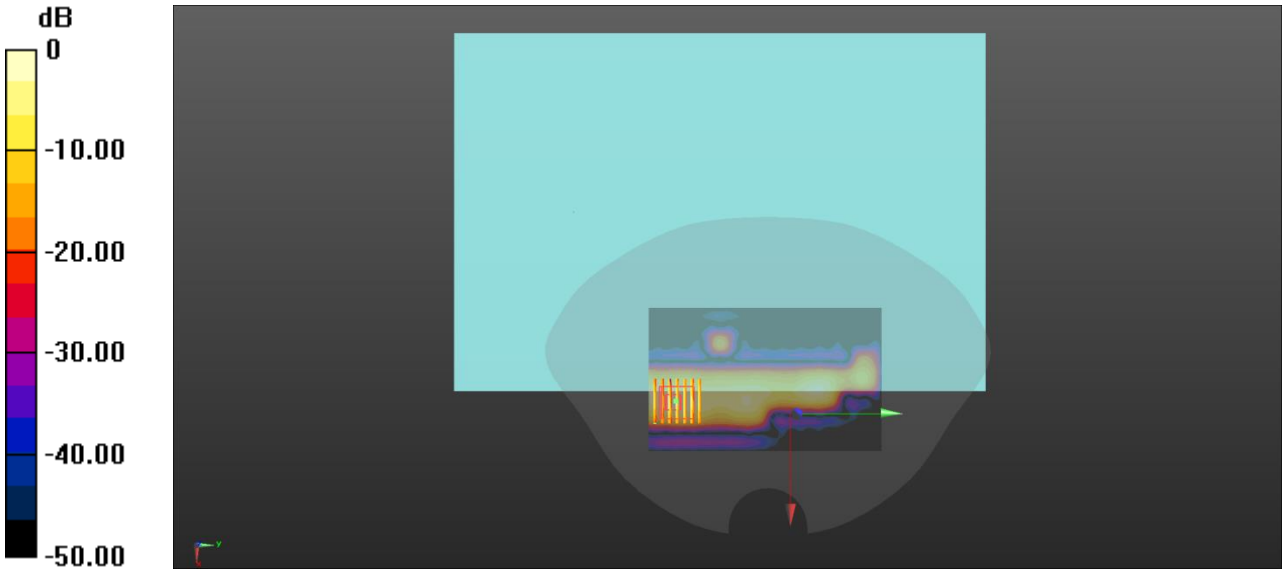
Ch78/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.315 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.213 W/kg

SAR(1 g) = 0.089 W/kg; SAR(10 g) = 0.031 W/kg

Maximum value of SAR (measured) = 0.156 W/kg



0 dB = 0.156 W/kg

MEAS.2 Body Plane with Bottom Side 0mm on Middle Channel in 802.11b mode with Antenna Auxiliary

Date: 2022.01.02

Communication System Band: WLAN(b); Frequency: 2437 MHz;Duty Cycle: 1:1.007

Medium parameters used (interpolated): f = 2437 MHz; σ = 1.756 S/m; ε_r = 38.504; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient Temperature:22.7 Liquid Temperature:21.4

DASY5 Configuration:

- Probe: EX3DV4 - SN7607; ConvF(7.68, 7.68, 7.68); Calibrated: 2021.08.12;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 2021.11.05
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch6/Area Scan (81x131x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

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

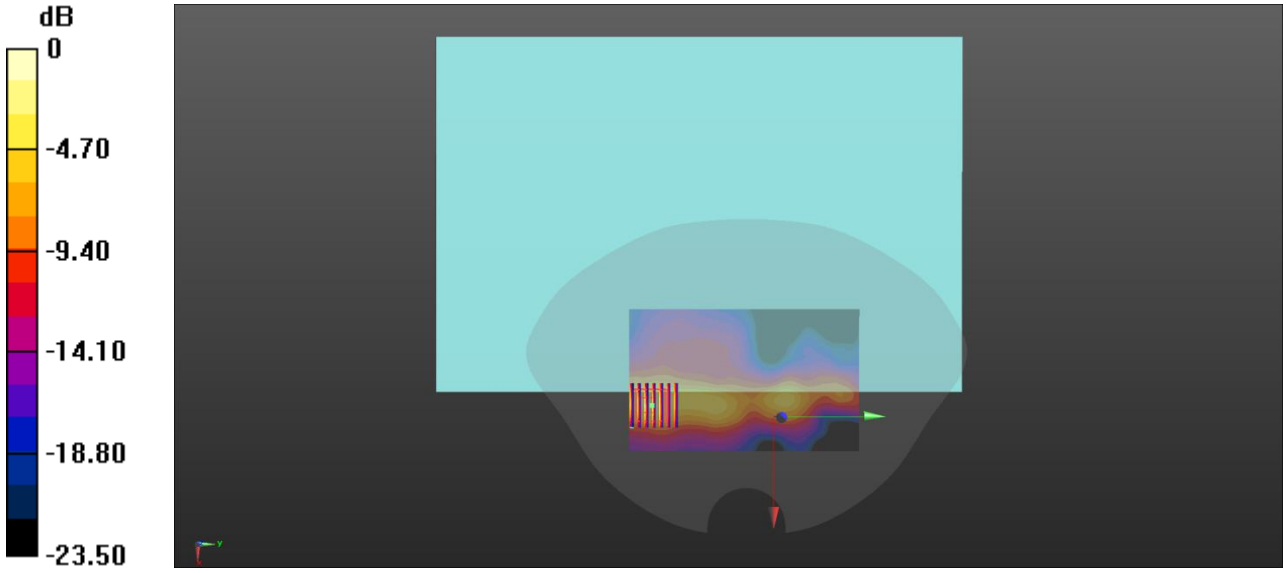
Ch6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.017 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 2.10 W/kg

SAR(1 g) = 0.863 W/kg; SAR(10 g) = 0.368 W/kg

Maximum value of SAR (measured) = 1.49 W/kg



0 dB = 1.49 W/kg

MEAS.3 Body Plane with Bottom Side 0mm on Middle Channel in 802.11b mode with Antenna Main

Date: 2022.01.02

Communication System Band: WLAN(b); Frequency: 2437 MHz;Duty Cycle: 1:1.007

Medium parameters used (interpolated): f = 2437 MHz; σ = 1.756 S/m; ε_r = 38.504; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient Temperature:22.7 Liquid Temperature:21.4

DASY5 Configuration:

- Probe: EX3DV4 - SN7607; ConvF(7.68, 7.68, 7.68); Calibrated: 2021.08.12;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 2021.11.05
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch6/Area Scan (81x131x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.358 W/kg

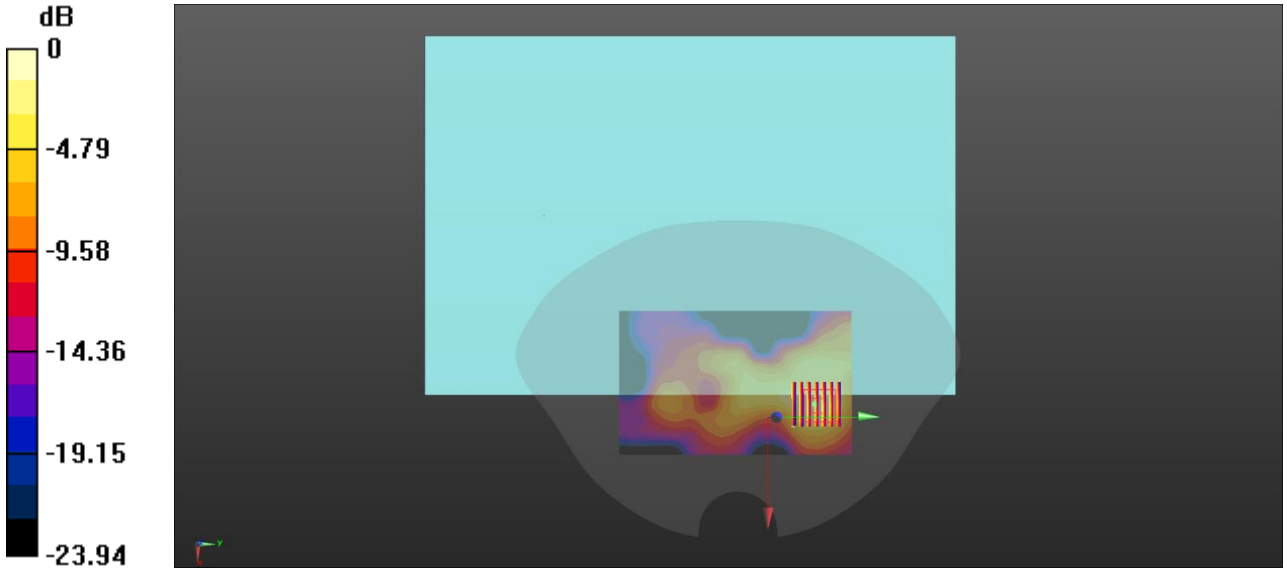
Ch6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.594 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.474 W/kg

SAR(1 g) = 0.254 W/kg; SAR(10 g) = 0.126 W/kg

Maximum value of SAR (measured) = 0.366 W/kg



0 dB = 0.366 W/kg

Meas.4 Body Plane with Bottom Side 0mm on 58 Channel in 802.11ac80 mode with Antenna Auxiliary

Date: 2022.01.03

Communication System Band: WLAN(ac) 80Mhz; Frequency: 5290 MHz;Duty Cycle: 1:1.018

Medium parameters used (interpolated): f = 5290 MHz; σ = 4.752 S/m; εr = 36.459; ρ = 1000 kg/m3

Phantom section: Flat Section

Ambient Temperature:22.5 Liquid Temperature:21.5

DASY5 Configuration:

- Probe: EX3DV4 - SN7607; ConvF(5.46, 5.46, 5.46); Calibrated: 2021.08.12;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 2021.11.05
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch58/Area Scan (101x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 2.09 W/kg

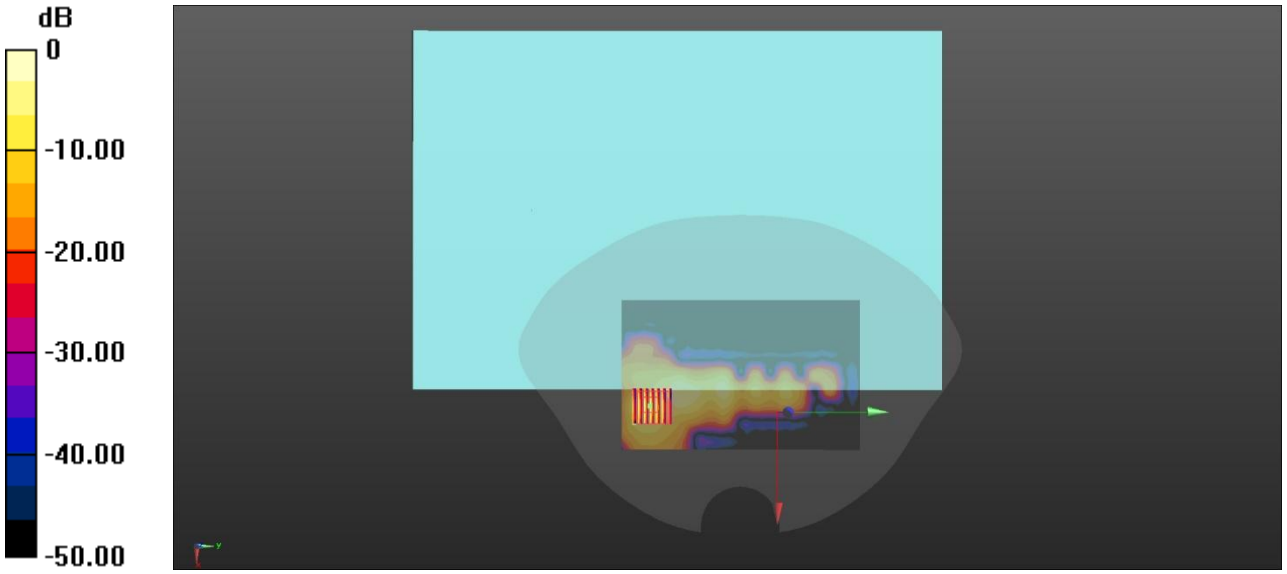
Ch58Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 1.144 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 4.59 W/kg

SAR(1 g) = 0.985 W/kg; SAR(10 g) = 0.249 W/kg

Maximum value of SAR (measured) = 2.01 W/kg



0 dB = 2.01 W/kg

Meas.5 Body Plane with Bottom Side 0mm on 58 Channel in 802.11ac80 mode with Antenna Main

Date: 2022.01.03

Communication System Band: WLAN(ac) 80Mhz; Frequency: 5290 MHz;Duty Cycle: 1:1.018

Medium parameters used (interpolated): f = 5290 MHz; σ = 4.752 S/m; εr = 36.459; ρ = 1000 kg/m3

Phantom section: Flat Section

Ambient Temperature:22.5 Liquid Temperature:21.5

DASY5 Configuration:

- Probe: EX3DV4 - SN7607; ConvF(5.46, 5.46, 5.46); Calibrated: 2021.08.12;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 2021.11.05
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch58/Area Scan (101x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.914 W/kg

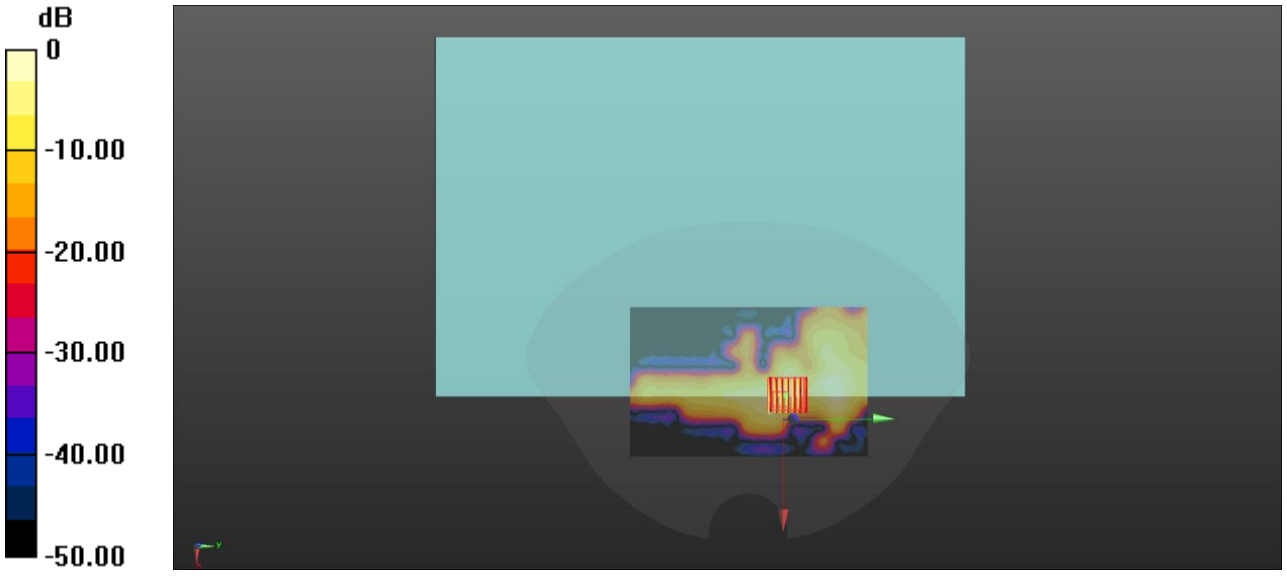
Ch58/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 3.577 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 1.89 W/kg

SAR(1 g) = 0.448 W/kg; SAR(10 g) = 0.139 W/kg

Maximum value of SAR (measured) = 0.918 W/kg



0 dB = 0.918 W/kg

Meas.6 Body Plane with Bottom Side 0mm on 138 Channel in 802.11ac80 mode with Antenna Auxiliary

Date: 2022.01.04

Communication System Band: WLAN(ac) 80Mhz; Frequency: 5690 MHz;Duty Cycle: 1:1.018

Medium parameters used (interpolated): f = 5690 MHz; σ = 5.209 S/m; εr = 34.672; ρ = 1000 kg/m3

Phantom section: Flat Section

Ambient Temperature:22.5 Liquid Temperature:21.6

DASY5 Configuration:

- Probe: EX3DV4 - SN7607; ConvF(4.88, 4.88, 4.88); Calibrated: 2021.08.12;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 2021.11.05
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch138/Area Scan (101x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.70 W/kg

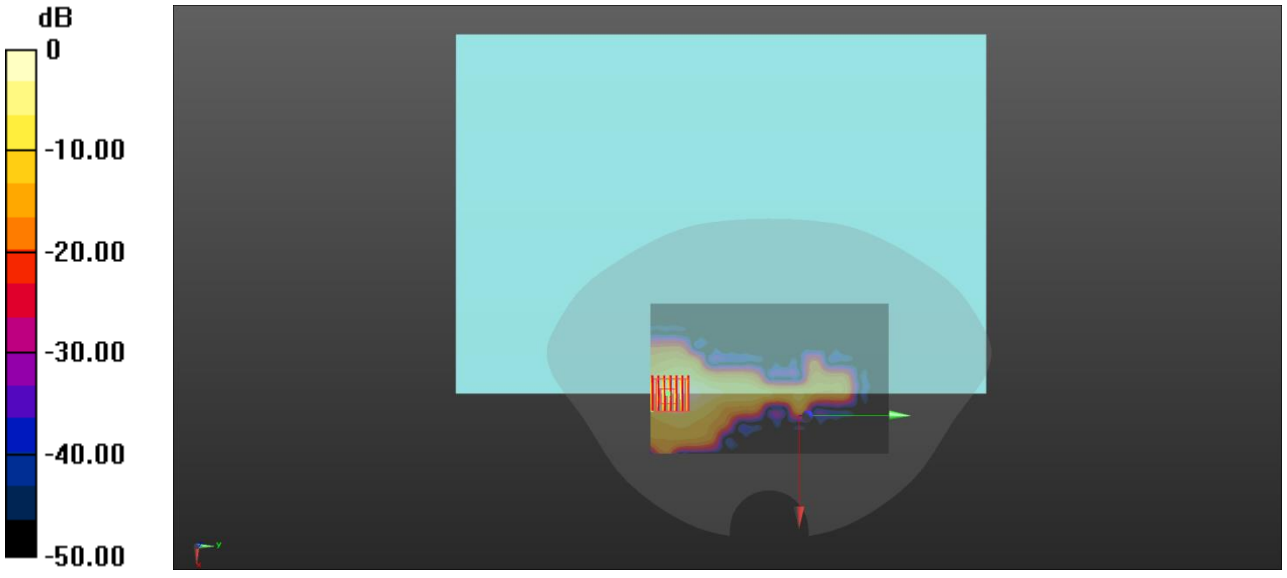
Ch138/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 2.157 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 4.59 W/kg

SAR(1 g) = 0.949 W/kg; SAR(10 g) = 0.272 W/kg

Maximum value of SAR (measured) = 1.97 W/kg



0 dB = 1.63 W/kg

Meas.7 Body Plane with Bottom Side 0mm on 138 Channel in 802.11ac80 mode with Antenna Main

Date: 2022.01.04

Communication System Band: WLAN(ac) 80Mhz; Frequency: 5690 MHz;Duty Cycle: 1:1.018

Medium parameters used (interpolated): f = 5690 MHz; σ = 5.209 S/m; εr = 34.672; ρ = 1000 kg/m3

Phantom section: Flat Section

Ambient Temperature:22.5 Liquid Temperature:21.6

DASY5 Configuration:

- Probe: EX3DV4 - SN7607; ConvF(4.88, 4.88, 4.88); Calibrated: 2021.08.12;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 2021.11.05
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch138/Area Scan (101x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.32 W/kg

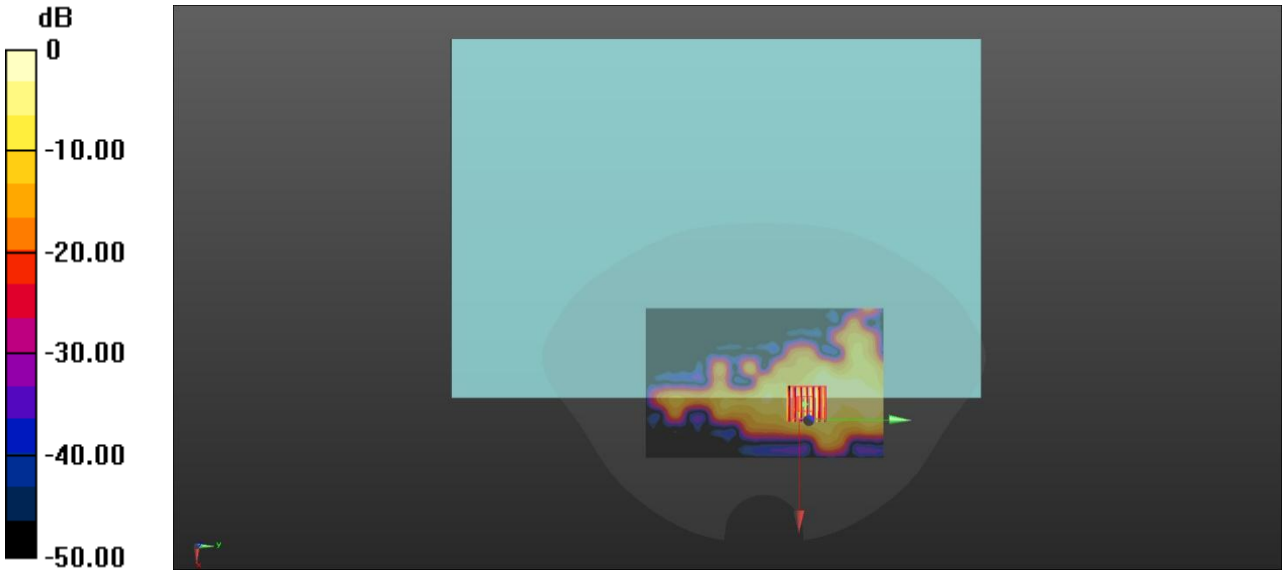
Ch138/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 3.632 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 3.40 W/kg

SAR(1 g) = 0.758 W/kg; SAR(10 g) = 0.236 W/kg

Maximum value of SAR (measured) = 1.58 W/kg



0 dB = 1.58 W/kg

Meas.8 Body Plane with Bottom Side 0mm on 155 Channel in 802.11ac80 mode with Antenna Auxiliary

Date: 2022.01.05

Communication System Band: WLAN(ac) 80MHz; Frequency: 5775 MHz;Duty Cycle: 1:1.018

Medium parameters used (interpolated): f = 5775 MHz; σ = 5.098 S/m; ε_r = 36.063; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient Temperature:22.6 Liquid Temperature:21.4

DASY5 Configuration:

- Probe: EX3DV4 - SN7607; ConvF(4.92, 4.92, 4.92); Calibrated: 2021.08.12;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 2021.11.05
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch155/Area Scan (101x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 2.17 W/kg

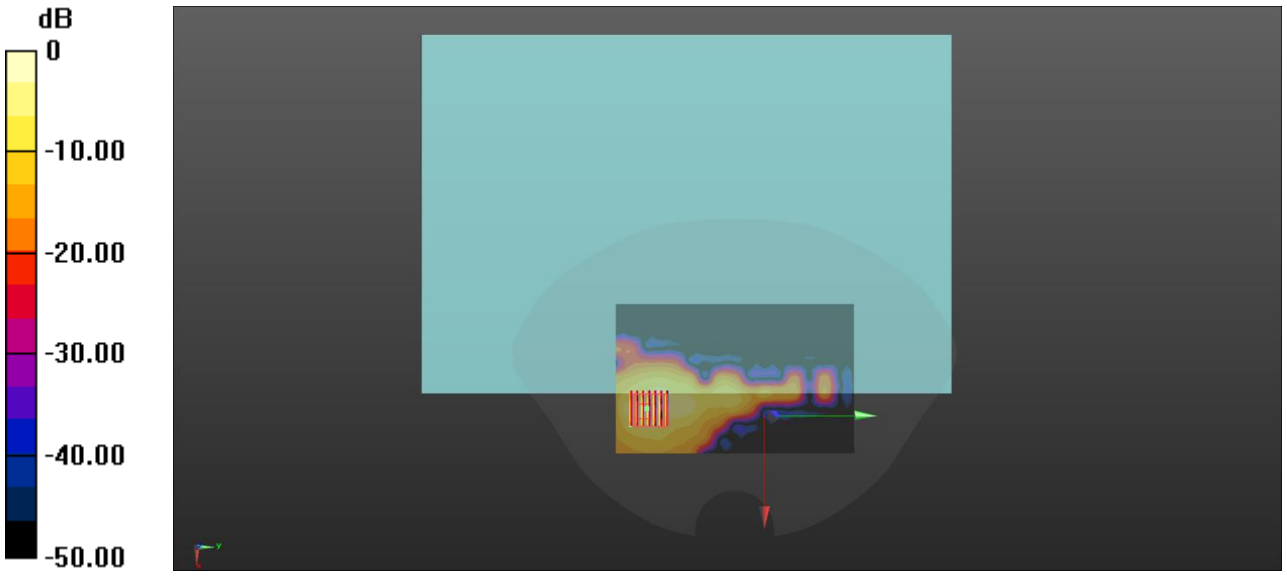
Ch155/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 1.747 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 5.11 W/kg

SAR(1 g) = 1.01 W/kg; SAR(10 g) = 0.298 W/kg

Maximum value of SAR (measured) = 2.15 W/kg



0 dB = 2.15 W/kg

Meas.9 Body Plane with Bottom Side 0mm on 155 Channel in 802.11ac80 mode with Antenna Main

Date: 2022.01.05

Communication System Band: WLAN(ac) 80MHz; Frequency: 5775 MHz;Duty Cycle: 1:1.018

Medium parameters used (interpolated): f = 5775 MHz; σ = 5.098 S/m; ε_r = 36.063; ρ = 1000 kg/m^3

Phantom section: Flat Section

Ambient Temperature:22.6 Liquid Temperature:21.4

DASY5 Configuration:

- Probe: EX3DV4 - SN7607; ConvF(4.92, 4.92, 4.92); Calibrated: 2021.08.12;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 2021.11.05
- Phantom: SAM (20deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CC; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch155/Area Scan (101x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.45 W/kg

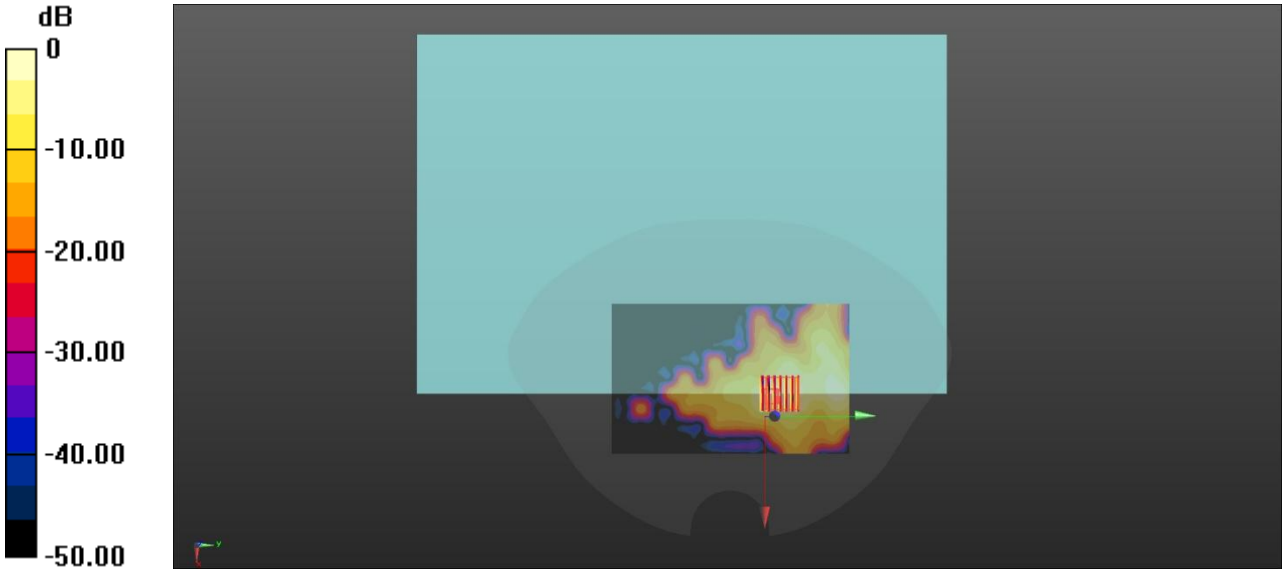
Ch155/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 3.518 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 3.59 W/kg

SAR(1 g) = 0.773 W/kg; SAR(10 g) = 0.250 W/kg

Maximum value of SAR (measured) = 1.54 W/kg



0 dB = 1.54 W/kg

ANNEX D EUT EXTERNAL PHOTOS

Please refer the document “BL-SZ21C1014-AW.pdf”.

ANNEX E SAR TEST SETUP PHOTOS

Please refer the document “BL-SZ21C1014-AS.pdf”.

ANNEX F CALIBRATION REPORT

Please refer the document “CALIBRATION REPORT.pdf”.

--END OF REPORT--