TEST REPORT

Product Name:	Portable Computer
FCC ID:	2BEMH-N151S
Trademark:	N/A
Model Number:	N151S, N151R, N151B
Prepared For:	YEAHER INC.
Address:	51 Steel Dr,Unit A, New Castle,Delaware,19720
Manufacturer:	YEAHER INC.
Address:	51 Steel Dr,Unit A, New Castle,Delaware,19720
Prepared By:	Shenzhen CTB Testing Technology Co., Ltd.
Address:	1&2/F., Building A, No.26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China
Sample Received Date:	Dec. 29, 2023
Sample tested Date:	Dec. 29, 2023 to Jan. 22, 2024
Issue Date:	Jan. 22, 2024
Report No.:	CTB240123018RHX
Test Standards	FCC 47 CFR Part2(2.1093), FCC 47 CFR Part1(1.1310) FCC 47 CFR Part1(1.1307), ANSI/IEEE C95.1-2019 IEEE 1528-2013 & Published RF Exposure KDB Procedures
Test Results	PASS
Remark:	This is SAR test report.

Compiled by:	Reviewed by:	Approved by:
Zhang Mao cheng	Martin Feng	Rita Xiao / Director

Note: If there is any objection to the inspection results in this report, please submit a written report to the company within 15 days from the date of receiving the report. The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen CTB Testing Technology Co., Ltd. this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client. "*" indicates the testing items were fulfilled by subcontracted lab. "#" indicates the items are not in CNAS accreditation scope.

Contents

1. Version

Report No.	Issue Date	Description	Approved
CTB240123018RHX	Jan. 22, 2024	Original	Valid

2. PRODUCT INFORMATION AND TEST SETUP

2.1 Product Information

Model(s):	N151S, N151R, N151B
Model Description:	All the model are the same circuit and RF module, only different for model name. Test sample model: N151S
Bluetooth Version:	Bluetooth 5.0
Wi-Fi Specification:	WIFI(2.4G): IEEE 802.11b/g/n/ax WIFI(5G): IEEE 802.11a/b/g/n/ac/ax
Hardware Version:	V1.0
Software Version:	V1.0
Operation Frequency:	Bluetooth: 2402-2480MHz WiFi: IEEE 802.11b/g/n 20: 2412-2462MHz/ 11 channel IEEE 802.11n 40: 2422-2452MHz/ 7 channel IEEE 802.11a/n/ac(20M): 5150MHz ~5250MHz/ 4 channel IEEE 802.11n/ac(40M): 5150MHz ~5250MHz/ 2 channel IEEE 802.11ac(80M): 5150MHz ~5250MHz/ 1 channel IEEE 802.11a/n/ac(20M): 5725MHz ~5850MHz/ 5 channel IEEE 802.11n/ac(40M): 5725MHz ~5850MHz/ 2 channel IEEE 802.11ac(80M): 5725MHz ~5850MHz/ 1 channel
Max. RF output power:	Bluetooth: 8.624dBm WiFi (2.4G) : 17.444dBm WiFi (5G): 17.552dBm
Max.SAR:	0.91 W/Kg 1g Body Tissue
Max Simultaneous SAR	1.56 W/Kg
Type of Modulation:	Bluetooth: GFSK, π/4 DQPSK, 8DPSK WiFi(2.4G): DSSS, OFDM WiFi(5G): OFDM
Antenna installation:	FPC antenna
Antenna Gain:	Bluetooth: 3.33dBi WiFi (2.4G): Ant1: 3.33dBi,Ant2: 4.17dBi WiFi (5.2G): Ant1: 2.31dBi, Ant2: 4.01dBi WiFi (5.8G): Ant1:3.61dBi, Ant2: 3.47dBi
Ratings:	Adapter: Input: 100-240V~50/60Hz 1.5A Output: 12V⎓3000mA DC 7.6V by battery

3 Equipment Used during Test

3.1 Equipment List

Name of Equipment	Manufacturer	Type/Model	Serial Number	Calibration Date	Calibration Due
Data acquisition electronics	SPEAG	DAE4	881	2023/7/14	2024/7/13
Dosimetric E-field Probes	SPEAG	ES3DV3	3089	2023/7/14	2024/7/13
Dosimetric E-field Probes	SPEAG	EX3DV4	7769	2023/9/10	2024/9/9
SAR test software	SPEAG	DASY 52	52.10.3.1513	/	/
Dipole	SPEAG	D2450V2	801	2022/9/19	2025/9/18
Dipole	SPEAG	D5GHzV2	1190	2022/9/16	2025/9/15
Communication test set	R&S	CMW500	108058	2023/7/5	2024/7/04
Network analyzer	R&S	ZVB 8	100348	2023/7/5	2024/7/04
Dielectric Assessment Kit	SPEAG	DAK-3.5	1076	/	/
power meter	Agilent	E4419B	N10149	2023/7/5	2024/7/04
MXA signal analyzer	Agilent	N5181A	MY49060920	2023/7/5	2024/7/04
RF Power Meter	Agilent	E9301A	MY41495675	2023/7/5	2024/7/04
Amplifier 300-4200MHz	SHW	SHWPA-00300420P3040-S	22110401	2023/7/5	2024/7/04
Amplifier 2-8GHz	SHW	SHWPA-02000800P3035-S	202211040001	2023/7/5	2024/7/04

3.2 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R.China.

FCC Test Firm Registration Number: 292923

IC Registered No.:25587

CAB identifier: CN0098

4 SAR Introduction

4.1 Introduction

This measurement report shows compliance of the EUT with ANSI/IEEE C95.1-2006 and FCC 47 CFR Part2 (2.1093).The test procedures, as described in IEEE 1528-2013 Standard for IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques(300MHz~6GHz) and Published RF Exposure KDB Procedures

4.2 SAR Definition

- SAR : Specific Absorption Rate
- The SAR characterize the absorption of energy by a quantity of tissue
- This is related to a increase of the temperature of these tissues during a time period.

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

$$\mathrm{DAS} = \frac{\mathrm{d}}{\mathrm{d}t}\left(\frac{\mathrm{d}W}{\mathrm{d}m}\right) = \frac{\mathrm{d}}{\mathrm{d}t}\left(\frac{\mathrm{d}W}{\rho \mathrm{d}V}\right)$$

$$\mathrm{DAS} = c_h \left.\frac{\mathrm{d}T}{\mathrm{d}t}\right|_{t=0}$$

SAR definition

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

- SAR : Specific Absorption Rate
  - σ : Liquid conductivity
    - $\varepsilon_r = \varepsilon' - j\varepsilon''$ (complex permittivity of liquid)
    - $\sigma = \frac{\varepsilon'' \omega}{\varepsilon_0}$
  - ρ: Liquid density
    - ρ = 1000 g/L = 1000Kg/m³

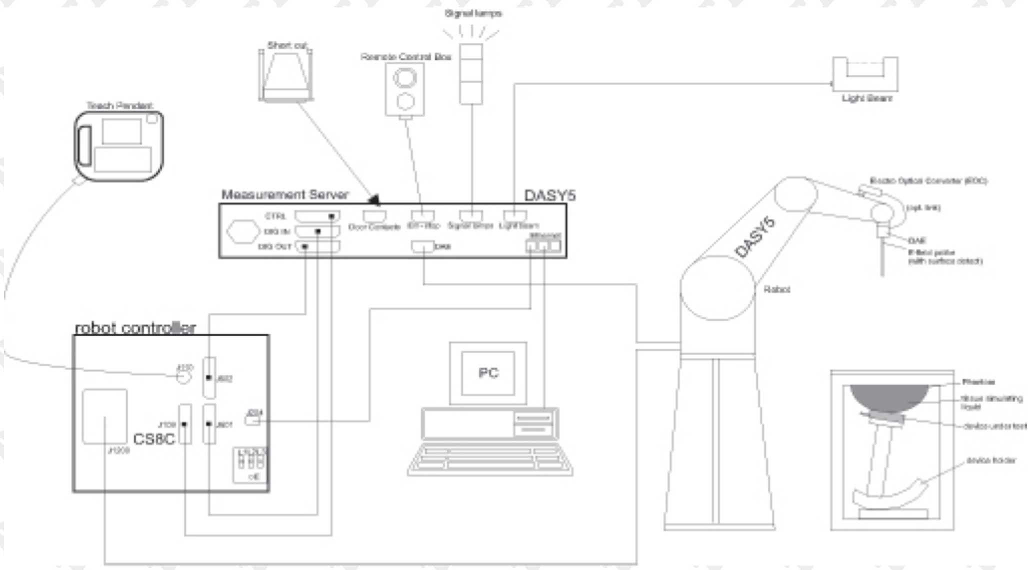
where:

σ = conductivity of the tissue (S/m)
ρ = mass density of the tissue (kg/m3)
E = rms electric field strength (V/m)

5 SAR Measurement Setup

5.1 SAR MEASUREMENT SETUP

The DASY5 system for performing compliance tests consists of the following items:
A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).
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.
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.
A unit to operate the optical surface detector which is connected to the EOC.
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.
The DASY5 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows 2003.
DASY5 software and SEMCAD data evaluation software.
Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc. The generic twin phantom enabling the testing of left-hand and right-hand usage.
The device holder for handheld Mobile Phones.
Tissue simulating liquid mixed according to the given recipes.
System validation dipoles allowing to validate the proper functioning of the system.



5.2 DASY5 E-field Probe System

The SAR measurements were conducted with the dosimetric probe EX3DV4 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation.

5.3 Probe Specification

Construction Symmetrical design with triangular core
Interleaved sensors
Built-in shielding against static charges
PEEK enclosure material (resistant to organic solvents, e.g., DGBE)

Calibration ISO/IEC 17025 calibration service available.

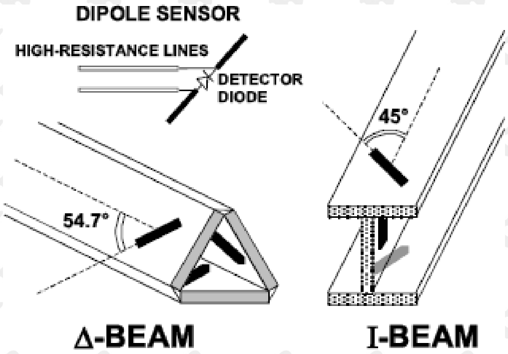
Frequency 4 MHz – 10 GHz
Linearity: ±0.2 dB (30 MHz – 10 GHz)
Directivity ±0.1 dB in TSL (rotation around probe axis)
±0.3 dB in TSL (rotation normal to probe axis)
Dynamic Range 10 µW/g – >100 W/kg
Linearity: ±0.2 dB (noise: typically <1 µW/g)

Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 2.5 mm (body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Application	General dosimetry up to 10 GHz Dosimetry in strong gradient fields Compliance tests of Mobile Phones
Compatibility	DASY3, DASY4, DASY52 SAR and higher, EASY4/MRI

5.4 Isotropic E-Field Probe

The isotropic E-Field probe has been fully calibrated and assessed for isotropicity, and boundary effect within a controlled environment. Depending on the frequency for which the probe is calibrated the method utilized for calibration will change.

The E-Field probe utilizes a triangular sensor arrangement as detailed in the diagram below:



5.5 Phantoms

The phantom used for all tests i.e. for both system checks and device testing, was the twin-headed "SAM Phantom", manufactured by SPEAG. The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region, where shell thickness increases to 6mm).

System checking was performed using the flat section, whilst Head SAR tests used the left and right head profile sections. Body SAR testing also used the flat section between the head profiles.

SAM Twin Phantom

5.6 Device Holder

The device was placed in the device holder (illustrated below) that is supplied by SPEAG as an integral part of the DASY system.

The DASY device holder is designed to cope with the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.


Device holder supplied by SPEAG

6 SAR Test Procedure

6.1 Scanning Procedure

The DASY5 installation includes predefined files with recommended procedures for measurements and validation. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

The “reference” and “drift” measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure. The indicated drift is mainly the variation of the DUT’s output power and should vary max. ± 5 %.

The “surface check” measurement tests the optical surface detection system of the DASY5 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above ± 0.1mm). To prevent wrong results tests are only executed when the liquid is free of air bubbles. The difference between the optical surface detection and the actual surface depends on the probe and is specified with each probe (It does not depend on the surface reflectivity or the probe angle to the surface within ± 30°.)

Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values before running a detailed measurement around the hot spot.Before starting the area scan a grid spacing of 15 mm x 15 mm is set. During the scan the distance of the probe to the phantom remains unchanged. After finishing area scan, the field maxima within a range of 2 dB will be ascertained.

Zoom Scan

Zoom Scans are used to estimate the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The default Zoom Scan is done by 7x7x5 points within a cube whose base is centered around the maxima found in the preceding area scan.

Spatial Peak Detection

The procedure for spatial peak SAR evaluation has been implemented and can determine values of masses of 1g and 10g, as well as for user-specific masses.The DASY5 system allows evaluations that combine measured data and robot positions, such as: • maximum search • extrapolation • boundary correction • peak search for averaged SAR During a maximum search, global and local maxima searches are automatically performed in 2-D after each Area Scan measurement with at least 6 measurement points. It is based on the evaluation of the local SAR gradient calculated by the Quadratic Shepard’s method. The algorithm will find the global maximum and all local maxima within -2 dB of the global maxima for all SAR distributions.

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. Several measurements at different distances are necessary for the extrapolation. Extrapolation routines require at least 10 measurement points in 3-D space. They are used in the Zoom Scan to obtain SAR values between the lowest measurement points and the inner phantom surface. The routine uses the modified Quadratic Shepard’s method for extrapolation. For a grid using 7x7x5 measurement points with 5mm resolution amounting to 343 measurement points, the uncertainty of the extrapolation routines is less than 1% for 1g and 10g cubes.

A Z-axis scan measures the total SAR value at the x-and y-position of the maximum SAR value found during the cube 7x7x5 scan. The probe is moved away in z-direction from the bottom of the SAM phantom in 5mm steps.

Data Storage and Evaluation

Data Storage

The DASY5 software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension ".DA4". The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [W/kg], [mW/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

Data Evaluation

The SEMCAD software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

Probe parameters:	Sensitivity:	Normi, ai0, ai1, ai2
	Conversion factor:	ConvFi
	Diode compression point:	Dcpi
Device parameters:	Frequency:	f
	Crest factor:	cf
Media parameters:	Conductivity:	σ
	Density:	ρ

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY5 components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot \frac{cf}{dcp_i}$$

Vi: compensated signal of channel (i = x, y, z) Ui: input signal of channel (i = x, y, z)
cf: crest factor of exciting field (DASY parameter) dcpi: diode compression point (DASY parameter)

From the compensated input signals the primary field data for each channel can be evaluated:

$$\mathrm{E-fieldprobes:} \qquad E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}$$

$$\mathrm{H-fieldprobes:} \qquad H_i = \sqrt{V_i} \cdot \frac{a_{i0} + a_{i1} f + a_{i2} f^2}{f}$$

Vi: compensated signal of channel (i = x, y, z) Normi: sensor sensitivity of channel (i = x, y, z), [mV/(V/m)2] for E-field Probes ConvF:sensitivity enhancement in solution
aij: sensor sensitivity factors for H-field probes f: carrier frequency [GHz]
Ei: electric field strength of channel i in V/m Hi: magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude):

$$E_{tot} = \sqrt{E_x^2 + E_y^2 + E_z^2}$$

The primary field data are used to calculate the derived field units.

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1'000}$$

SAR: local specific absorption rate in W/kg Etot: total field strength in V/m
σ: conductivity in [mho/m] or [Siemens/m] ρ: equivalent tissue density in g/cm3

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid.

6.2 Extrapolation

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. Several measurements at different distances are necessary for the extrapolation.
They are used in the Cube Scan to obtain SAR values between the lowest measurement points and the inner phantom surface. The routine uses the fourth order least square polynomial method for extrapolation. For a grid using 5x5x7 measurement points with 5mm resolution amounting to 343 measurement points, the uncertainty of the extrapolation routines is less than 1% for 1 g and 10 g cubes.

6.3 Ear Reference Point

Figure 6.2 shows the front, back and side views of the SAM Phantom. The point “M” is the reference point for the center of the mouth, “LE” is the left ear reference point (ERP), and “RE” is the right ERP. The ERPs are 15mm posterior to the entrance to the ear canal (EEC) along the B-M line (Back-Mouth), as shown in Figure 6.1. The plane passing through the two ear canals and M is defined as the Reference Plane. The line N-F (Neck-Front) is perpendicular to the reference plane and passing through the RE (or LE) is called the Reference Pivoting Line (see Figure 6.1). Line B-M is perpendicular to the N-F line. Both N-F and B-M lines are marked on the external phantom shell to facilitate handset positioning [5].

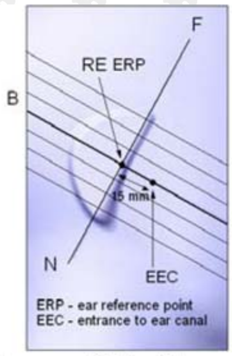


Figure 6.1 Close-up side view of ERP’s

Figure 6.2 Front, back and side view of SAM

6.4 Device Reference Points

Two imaginary lines on the device need to be established: the vertical centerline and the horizontal line. The test device is placed in a normal operating position with the “test device reference point” located along the “vertical centerline” on the front of the device aligned to the “ear reference point” (See Fig. 6.3). The “test device reference point” is than located at the same level as the center of the ear reference point. The test device is positioned so that the “vertical centerline” is bisecting the front surface of the device at it’s top and bottom edges, positioning the “ear reference point” on the outer surface of both the left and right head phantoms on the ear reference point [5].

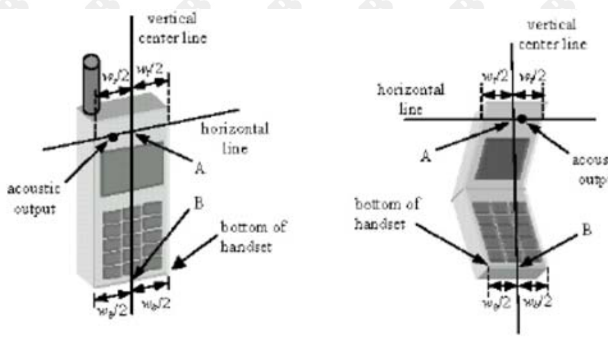


Figure 6.3 Handset Vertical Center & Horizontal Line Reference Points

6.5 Test Configuration – Positioning for Cheek / Touch

1. Position the device close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure below), such that the plane

defined by the vertical center line and the horizontal line of the device is approximately parallel to the sagittal plane of the phantom

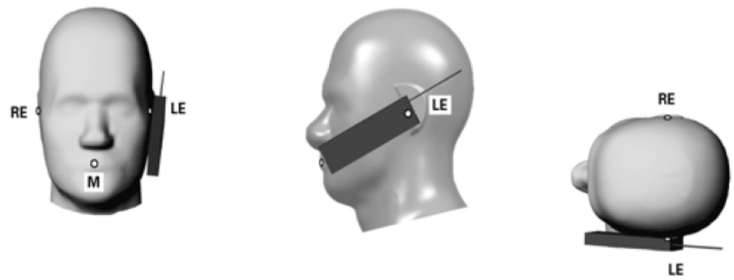


Figure 7.1 Front, Side and Top View of Cheek/Touch Position

2. Translate the device towards the phantom along the line passing through RE and LE until the device touches the ear.

3. While maintaining the device in this plane, rotate it around the LE-RE line until the vertical centerline is in the plane normal to MB-NF including the line MB (called the reference plane).
4. Rotate the device around the vertical centerline until the device (horizontal line) is symmetrical with respect to the line NF.

5. While maintaining the vertical centerline in the reference plane, keeping point A on the line passing through RE and LE and maintaining the device contact with the ear, rotate the device about the line NF until any point on the device is in contact with a phantom point below the ear (cheek). See Figure below.

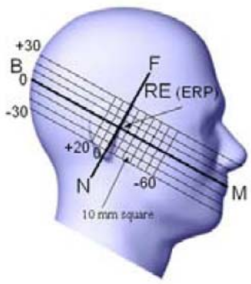


Figure 7.2 Side view w/ relevant markings

6.6 Test Configuration – Positioning for Ear / 15° Tilt

With the test device aligned in the Cheek/Touch Position":

1. While maintaining the orientation of the device, retracted the device parallel to the reference plane far enough to enable a rotation of the device by 15 degrees.

2. Rotate the device around the horizontal line by 15 degrees.

3. While maintaining the orientation of the device, move the device parallel to the reference plane until any part of the device touches the head. (In this position, point A is located on the line RE-LE). The tilted position is obtained when the contact is on the pinna. If the contact is at any location other than the pinna, the angle of the device shall be reduced. The tilted position is obtained when any part of the device is in contact with the ear as well as a second part of the device is in contact with the head (see Figure below).

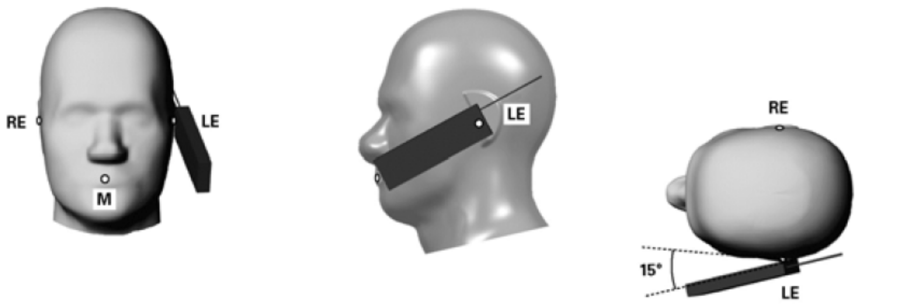
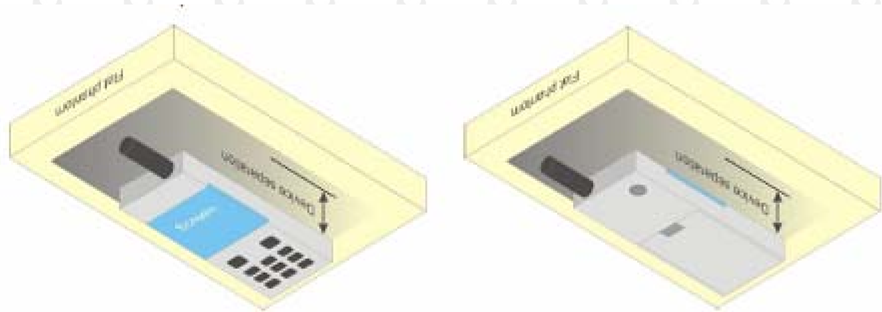


Figure 7.3 Front, Side and Top View of Ear/15˚ Tilt Position

6.7 Test Position – Body Configurations

Body Worn Position
(a) To position the device parallel to the phantom surface with either keypad up or down.
(b) To adjust the device parallel to the flat phantom.
(c) To adjust the distance between the device surface and the flat phantom to 1.0 cm or holster surface and the flat phantom to 0 cm.



7 Exposure limit

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

7.1 Uncontrolled Environment

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

7.2 Controlled Environment

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

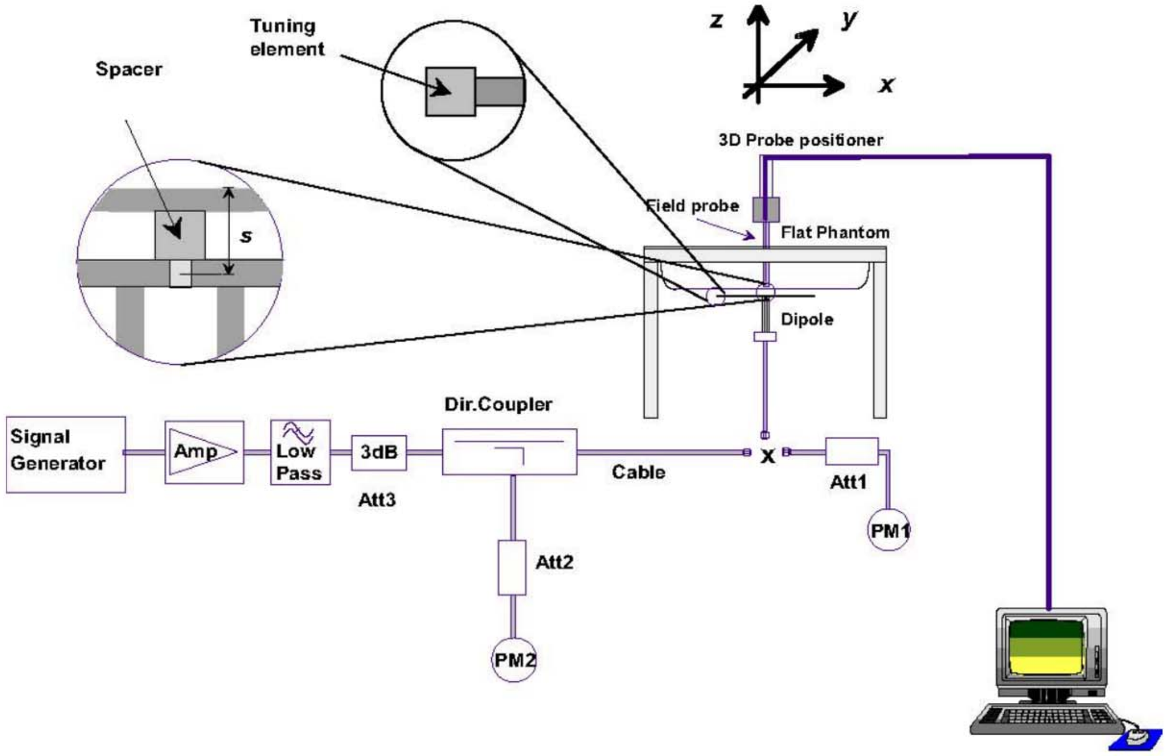
Table 8.1 Human Exposure Limits

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

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

8 System and liquid validation

8.1 System validation



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.

In the simplified setup for system evaluation, the DUT 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:

1. Signal Generator
2. Amplifier
3. Directional Coupler
4. Power Meter
5. Calibrated Dipole

The output power on dipole port must be calibrated to 30 dBm (1000 mW) before dipole is connected.

Numerical reference SAR values (W/kg) for reference dipole and flat phantom

Frequency (MHz)	1g SAR	10g SAR	Local SAR at surface(above feed-point)	Local SAR at surface(y = 2 cm offset from feedpoint)
2450	52.4	24.0	104	7.70
5200	55.3	24.6	113	8.29
5800	63.8	25.7	140	9.50

Table 1: system validation (1g)

Measurement Date	Frequency (MHz)	Liquid Type (head/body)	Target SAR1g (W/kg)	Measured SAR1g (W/kg)	Normalized SAR1g (W/kg)	Deviation (±10%)
2024-1-19	2450	head	24.4	14	56	1.30
2024-1-19	5200	head	22.0	7.8	78	2.55
2024-1-20	5800	head	22.7	7.91	79.1	2.51

Note: system check input power: 250mW, above 5GHz the input power is 100mW ..

8.2 liquid validation

The dielectric parameters were checked prior to assessment using the HP85070C dielectric probe kit. The dielectric parameters measured are reported in each correspondent section.

KDB 865664 recommended Tissue Dielectric Parameters

The head and body tissue parameters given in this below table should be used to measure the SAR of transmitters operating in 100 MHz to 6 GHz frequency range. The tissue dielectric parameters of the tissue medium at the test frequency should be within the tolerance required in this document. The dielectric parameters should be linearly interpolated between the closest pair of target frequencies to determine the applicable dielectric parameters corresponding to the device test frequency.

The head tissue dielectric parameters recommended by IEEE Std 1528-2013 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head and body tissue parameters that have not been specified in 1528 are derived from tissue dielectric parameters computed from the 4-Cole-Cole equations described above and extrapolated according to the head parameters specified in 1528.

Target Frequency	Head/Body Tissue	
MHz	εr	σ (S/m)
150	52.3	0.76
300	45.3	0.87
450	43.5	0.87
835	41.5	0.90
900	41.5	0.97
915	41.5	0.98
1450	40.5	1.20
1610	40.3	1.29
1800-2000	40.0	1.40
2450	39.2	1.80
2600	39.0	1.96
3000	38.5	2.40
5800	35.3	5.27

8.3 Tissue Dielectric Parameters for Head and Body Phantoms

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in P1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness Power drifts in a human head. Other head and body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations described in Reference [12] and extrapolated according to the head parameters specified in P1528.

Table 2: Recommended Dielectric Performance of Tissue

Recommended Dielectric Performance of Tissue												
Ingredients (% by weight)	**Frequency (MHz)**											
	750		**835**		**1800**		**1900**		**2450**		**2600**	
Tissue	**Head**	**Body**	**Head**	**Body**	**Head**	**Body**	**Head**	**Body**	**Head**	**Body**	**Head**	**Body**
Water	40.52	51.83	41.45	52.4	55.2	70.2	54.9	40.4	62.7	73.2	54.8	68.1
Salt (Nacl)	1.61	1.52	1.45	1.4	0.3	0.4	0.18	0.5	0.5	0.04	0.1	0.01
Sugar	57.67	46.45	56.0	45.0	0.0	0.0	0.0	58.0	0.0	0.0	0.0	0.0
HEC	0.1	0.1	1.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Bactericide	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Triton x-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0	0.0	0.0
DGBE	0.0	0.0	0.0	0.0	44.5	29.4	44.92	0.0	0.0	26.7	45.1	31.8
Dielectric	40.93	54.32	42.54	56.1	40.0	53.3	39.9	54.0	39.8	52.5	39.0	52.5
Conductivity	0.87	0.95	0.91	0.95	1.40	1.52	1.42	1.45	1.88	1.78	1.96	2.15

Table 3: Dielectric Performance of Head Tissue Simulating Liquid

Temperature: 21°C , Relative humidity: 57%				
Frequency(MHz)	**Measured Date**	**Description**	**Dielectric Parameters**	
			εr	**σ(s/m)**
2450	2024-1-19	Target Value ±5% window	39.2 37.24— 41.16	1.80 1.71 — 1.89
		Measurement Value	37.97	1.88
5200	2024-1-19	Target Value ±5% window	35.3 33.54 — 37.07	5.27 5.01 — 5.53
		Measurement Value	35.919	5.02
5800	2024-1-20	Target Value ±5% window	35.3 33.54 — 37.07	5.27 5.01 — 5.53
		Measurement Value	35.819	5.03

9 System Verification Plots

System Check-2450
DUT: Dipole 2450 MHz D2450V2; Type: D2450V2; Serial: D2450V2 - SN:xxx

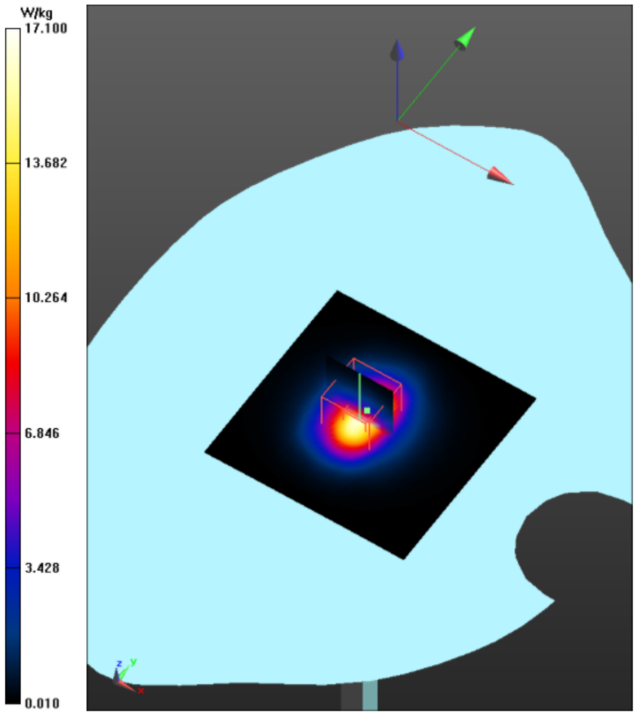
Communication System: UID 0, CW (0); Communication System Band: D2450 (2450.0 MHz); Frequency: 2450 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 2450 MHz; σ = 1.88 S/m; εr = 37.97; ρ = 1000 kg/m3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY Configuration:

Probe: ES3DV3 - SN3089; ConvF(4.7, 4.7, 4.7) @ 2450 MHz; Calibrated: 2023/7/14
Modulation Compensation:
Sensor-Surface: 4mm (Mechanical Surface Detection), z = 2.0, 32.0
Electronics: DAE4 Sn881; Calibrated: 2023/7/14
Phantom: SAM 1; Type: QD000P40CD; Serial: TP:xxxx
DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

System Performance Check at 2450MHz/d=5mm, Pin=250mW, dist=4.0mm (ES-Probe)/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 17.1 W/kg

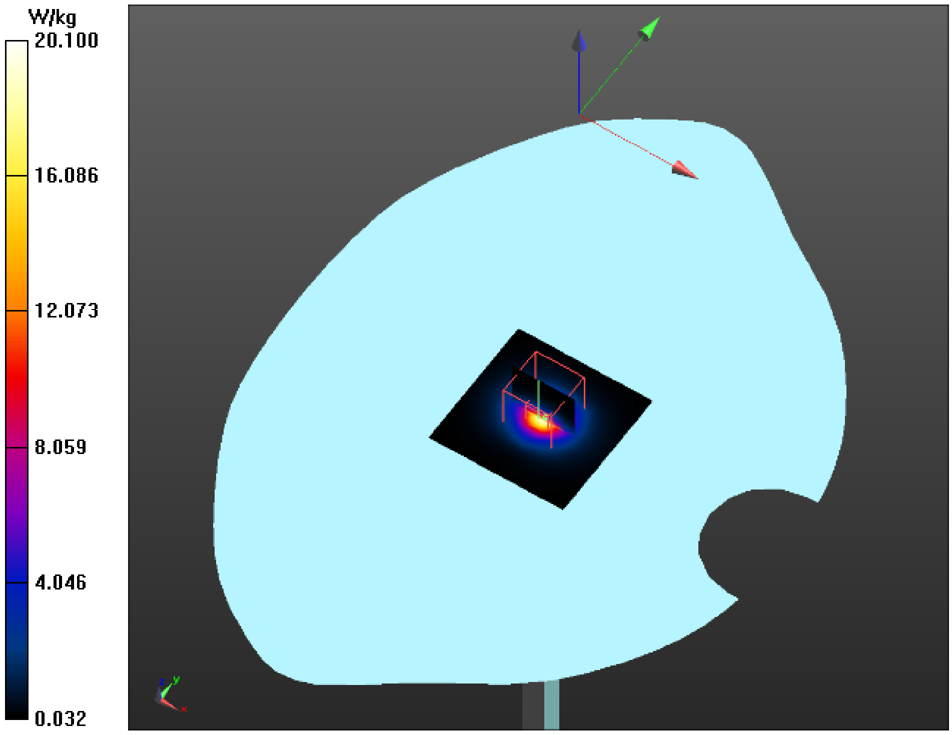
System Performance Check at 2450MHz/d=5mm, Pin=250mW, dist=4.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 95.01 V/m; Power Drift = -0.20 dB
Peak SAR (extrapolated) = 30.3 W/kg
SAR(1 g) = 14 W/kg; SAR(10 g) = 6.49 W/kg
Smallest distance from peaks to all points 3 dB below = 10 mm
Ratio of SAR at M2 to SAR at M1 = 48.5%
Maximum value of SAR (measured) = 16.0 W/kg



System Check-5200
DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:xxx
Communication System: UID 0, CW; Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5200 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 5200 MHz; σ = 5.020 S/m; ε r = 35.919; ρ = 1000 kg/m3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY Configuration:
Probe: EX3DV4 - SN7769; ConvF(5.35, 5.35, 5.35) @ 5200 MHz; Calibrated: 2023/9/10
Modulation Compensation:
Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0
Electronics: DAE4 Sn881; Calibrated: 2023/7/14
Phantom: SAM 1; Type: QD000P40CD; Serial: TP:xxxx
DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

System Performance Check with D5GHzV2 Dipole/d=5mm, Pin=100mW, f=5200 MHz/Area Scan (61x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 20.1 W/kg

System Performance Check with D5GHzV2 Dipole/d=5mm, Pin=100mW, f=5200 MHz/Zoom Scan (4x4x1.4mm, graded), dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 71.47 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 30.0 W/kg
SAR(1 g) = 7.8 W/kg; SAR(10 g) = 2.22 W/kg
Smallest distance from peaks to all points 3 dB below = 7.1 mm
Ratio of SAR at M2 to SAR at M1 = 66.3%
Maximum value of SAR (measured) = 18.4 W/kg



System Check-5800
DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:xxx

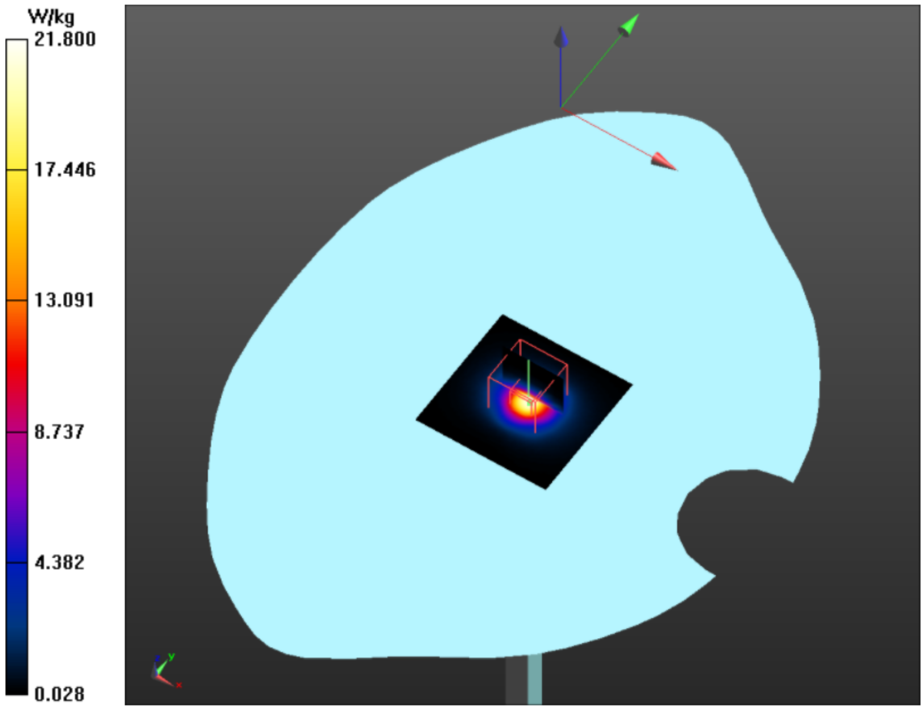
Communication System: UID 0, CW (0); Communication System Band: D5GHz (5000.0 - 6000.0 MHz);
Frequency: 5800 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 5800 MHz; σ =5.034 S/m; εr = 35.819; ρ = 1000 kg/m3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

Probe: EX3DV4 - SN7769; ConvF(4.85, 4.85, 4.85) @ 5800 MHz; Calibrated: 2023/9/10
Modulation Compensation:
Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0
Electronics: DAE4 Sn881; Calibrated: 2023/7/14
Phantom: SAM 1; Type: QD000P40CD; Serial: TP:xxxx
DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

System Performance Check with D5GHzV2 Dipole/d=5mm, Pin=100mW, f=5800 MHz/Area Scan (61x61x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 21.8 W/kg

System Performance Check with D5GHzV2 Dipole/d=5mm, Pin=100mW, f=5800 MHz/Zoom Scan (4x4x1.4mm, graded), dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 72.19 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 35.6 W/kg
SAR(1 g) = 7.91 W/kg; SAR(10 g) = 2.24 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 60.6%
Maximum value of SAR (measured) = 19.4 W/kg



10 Type a Measurement Uncertainty

The component of uncertainly may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainly by the statistical analysis of a series of observations is termed a Type An evaluation of uncertainty. The evaluation of uncertainty by means other than the statistical analysis of a series of observation is termed a Type B evaluation of uncertainty. Each component of uncertainty, however evaluated, is represented by an estimated standard deviation, termed standard uncertainty, which is determined by the positive square root of the estimated variance

A Type A evaluation of standard uncertainty may be based on any valid statistical method for treating data. This includes calculating the standard deviation of the mean of a series of independent observations; using the method of least squares to fit a curve to the data in order to estimate the parameter of the curve and their standard deviations; or carrying out an analysis of variance in order to identify and quantify random effects in certain kinds of measurement.

A type B evaluation of standard uncertainty is typically based on scientific judgment using all of the relevant information available. These may include previous measurement data, experience and specification, data provided in calibration reports and uncertainties assigned to reference data taken from handbooks. Broadly speaking, the uncertainty is either obtained from an outdoor source or obtained from an assumed distribution, such as the normal distribution, rectangular or triangular distributions indicated in Table below :

Uncertainty Distribution	Normal	Rectangle	Triangular	U Shape
Multi-plying Factor(a)	1/k(b)	$1 / \sqrt{3}$	$1 / \sqrt{6}$	$1 / \sqrt{2}$

(a) standard uncertainty is determined as the product of the multiplying factor and the estimated range of variations in the measured quantity
(b) κ is the coverage factor

Standard Uncertainty for Assumed Distribution

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type -sum-by taking the positive square root of the estimated variances.

Expanded uncertainty is a measure of uncertainty that defines an interval about the measurement result within which the measured value is confidently believed to lie. It is obtained by multiplying the combined standard uncertainty by a coverage factor. Typically, the coverage factor ranges from 2 to 3. Using a coverage factor allows the true value of a measured quantity to be specified with a defined probability within the specified uncertainty range. For purpose of this document, a coverage factor two is used, which corresponds to confidence interval of about 95 %.

The COMOSAR Uncertainty Budget is show in below table:

DASY5 Uncertainty

Measurement uncertainty for 300MHz to 3GHz averaged over 1 gram/ 10 gram

Error Description	Uncert. value	Prob. Dist.	Div.	(ci) 1g	(ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	(vi) vef f
Measurement System								
Probe Calibration	±6.0 %	N	1	1	1	±6.0 %	±6.0 %	∞
Axial Isotropy	±4.7 %	R	√3	0.7	0.7	±1.9 %	±1.9 %	∞
Hemispherical Isotropy	±9.6 %	R	√3	0.7	0.7	±3.9 %	±3.9 %	∞
Boundary Effects	±1.0 %	R	√3	1	1	±0.6 %	±0.6 %	∞
Linearity	±4.7 %	R	√3	1	1	±2.7 %	±2.7 %	∞
System Detection Limits	±1.0 %	R	√3	1	1	±0.6 %	±0.6 %	∞
Modulation Responsem	±2.4 %	R	√3	1	1	±1.4 %	±1.4 %	∞
Readout Electronics	±0.3 %	N	1	1	1	±0.3 %	±0.3 %	∞
Response Time	±0.8 %	R	√3	1	1	±0.5 %	±0.5 %	∞
Integration Time	±2.6 %	R	√3	1	1	±1.5 %	±1.5 %	∞
RF Ambient Noise	±3.0 %	R	√3	1	1	±1.7 %	±1.7 %	∞
RF Ambient Reflections	±3.0 %	R	√3	1	1	±1.7 %	±1.7 %	∞
Probe Positioner	±0.4 %	R	√3	1	1	±0.2 %	±0.2 %	∞
Probe Positioning	±2.9 %	R	√3	1	1	±1.7 %	±1.7 %	∞
Max. SAR Eval.	±2.0 %	R	√3	1	1	±1.2 %	±1.2 %	∞
Test Sample Related								
Device Positioning	±2.9 %	N	1	1	1	±2.9 %	±2.9 %	145
Device Holder	±3.6 %	N	1	1	1	±3.6 %	±3.6 %	5
Power Drift	±5.0 %	R	√3	1	1	±2.9 %	±2.9 %	∞
Power Scalingp	±0 %	R	√3	1	1	±0.0 %	±0.0 %	∞
Phantom and Setup								
Phantom Uncertainty	±6.1 %	R	√3	1	1	±3.5 %	±3.5 %	∞
SAR correction	±1.9 %	R	√3	1	0.84	±1.1 %	±0.9 %	∞
Liquid Conductivity (mea.)DAK	±2.5 %	R	√3	0.78	0.71	±1.1 %	±1.0 %	∞
Liquid Permittivity (mea.) DAK	±2.5 %	R	√3	0.26	0.26	±0.3 %	±0.4 %	∞
Temp. unc. - Conductivity BB	±3.4 %	R	√3	0.78	0.71	±1.5 %	±1.4 %	∞
Temp. unc. - Permittivity BB	±0.4 %	R	√3	0.23	0.26	±0.1 %	±0.1 %	∞
Combined Std. Uncertainty						±11.2 %	±11.1 %	361
Expanded STD Uncertainty						±22.3 %	±22.2 %	

11 Output Power Verification

11.1 Test Condition:

1. Conducted Measurement
   EUT was set for low, mid, high channel with modulated mode and highest RF output power.
   The base station simulator was connected to the antenna terminal.
2. Conducted Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 40GHz is ±1.5dB.
3. Environmental Conditions

Temperature	23^{o}C
Relative Humidity	53%
Atmospheric Pressure	1019mbar

4. Tested By : Martin Feng

11.2 Test Procedures:

Mobile Phone radio output power measurement

1. The transmitter output port was connected to base station emulator.
2. Establish communication link between emulator and EUT and set EUT to operate at maximum output power all the time.
3. Select lowest, middle, and highest channels for each band and different possible test mode.
4. Measure the conducted peak burst power and conducted average burst power from EUT antenna port.

Other radio output power measurement:

The output power was measured using power meter at low, mid, and hi channels.

Source-based Time Averaged Burst Power Calculation:

For TDMA, the following duty cycle factor was used to calculate the source-based time average power

Number of Time slot	1	2	3	4
Duty Cycle	1:8	1:4	1:2.66	1:2
Duty cycle factor	-9.03 dB	-6.02 dB	-4.26 dB	-3.01 dB
Crest Factor	8	4	2.66	2

Remark: *Time slot duty cycle factor = 10 * log (Time Slot Duty Cycle)*
Source based time averaged power = Maximum burst averaged power (1 Uplink) – 9.03 dB
Source based time averaged power = Maximum burst averaged power (2 Uplink) – 6.02 dB
Source based time averaged power = Maximum burst averaged power (3 Uplink) – 4.26 dB
Source based time averaged power = Maximum burst averaged power (4 Uplink) – 3.01 dB

Test Result:

WIFI Mode (2.4G) ANT 1

Mode	Channel number	Frequency (MHz)	Data rate(Mbps)	Average Output Power(dBm)	Average Tune up limited(dBm)
802.11b	1	2412	1	14.576	14.0±1
	6	2437	1	14.482	14.0±1
	11	2462	1	14.821	14.0±1
802.11g	1	2412	6	13.585	13.0±1
	6	2437	6	13.977	13.0±1
	11	2462	6	14.527	14.0±1
802.11n(HT20)	1	2412	MCS0	13.636	13.0±1
	6	2437	MCS0	14.065	14.0±1
	11	2462	MCS0	14.637	14.0±1
802.11n(HT40)	3	2422	MCS0	13.067	13.0±1
	6	2437	MCS0	13.19	13.0±1
	9	2452	MCS0	13.724	13.0±1
802.11ax(HT20)	1	2412	MCS0	13.64	13.0±1
	6	2437	MCS0	14.034	14.0±1
	11	2462	MCS0	14.579	14.0±1
802.11ax(HT40)	3	2422	MCS0	13.46	13.0±1
	6	2437	MCS0	13.617	13.0±1
	9	2452	MCS0	14.123	14.0±1

WIFI Mode (2.4G) ANT 2

Mode	Channel number	Frequency (MHz)	Data rate(Mbps)	Average Output Power(dBm)	Average Tune up limited(dBm)
802.11b	1	2412	1	14.199	14.0±1
	6	2437	1	13.396	13.0±1
	11	2462	1	13.58	13.0±1
802.11g	1	2412	6	13.909	13.0±1
	6	2437	6	13.969	13.0±1
	11	2462	6	13.939	13.0±1
802.11n(HT20)	1	2412	MCS0	13.939	13.0±1
	6	2437	MCS0	13.986	13.0±1
	11	2462	MCS0	14.221	14.0±1
802.11n(HT40)	3	2422	MCS0	13.127	13.0±1
	6	2437	MCS0	13.097	13.0±1
	9	2452	MCS0	13.22	13.0±1
802.11ax(HT20)	1	2412	MCS0	13.408	13.0±1
	6	2437	MCS0	13.46	13.0±1
	11	2462	MCS0	13.588	13.0±1
802.11ax(HT40)	3	2422	MCS0	13.473	13.0±1
	6	2437	MCS0	13.473	13.0±1
	9	2452	MCS0	13.673	13.0±1

Bluetooth Measurement Result

Mode	Frequency (MHz)	Average Output Power(dBm)	Tune up limited(dBm)
GFSK	2402	6.058	6.0±1
	2441	5.826	5.0±1
	2480	5.484	5.0±1
π/4DQPSK	2402	6.682	6.0±1
	2441	6.734	6.0±1
	2480	6.9	6.0±1
8DPSK	2402	8.624	8.0±1
	2441	5.954	6.0±1
	2480	5.613	5.0±1

BLE Measurement Result (1M)

Channel number	Frequency (MHz)	Average Output Power(dBm)	Tune up limited(dBm)
0	2402	5.096	-5.0±1
19	2440	4.838	-5.0±1
39	2480	4.847	-5.0±1

BLE Measurement Result (2M)

Channel number	Frequency (MHz)	Average Output Power(dBm)	Tune up limited(dBm)
0	2402	5.096	-5.0±1
19	2440	4.896	-5.0±1
39	2480	4.864	-5.0±1

WIFI Mode (5.2G) ANT 1

Mode	Channel number	Frequency (MHz)	Average Output Power(dBm)	Average Tune up limited(dBm)
802.11a	36	5180	13.597	13.0±1
	40	5200	13.925	13.0±1
	48	5240	13.814	13.0±1
802.11n (HT20)	36	5180	13.662	13.0±1
	40	5200	13.957	13.0±1
	48	5240	13.881	13.0±1
802.11n (HT40)	38	5190	13.978	13.0±1
	46	5230	13.934	13.0±1
802.11ac (VHT20)	36	5180	13.623	13.0±1
	40	5200	13.921	13.0±1
	48	5240	13.803	13.0±1
802.11ac (VHT40)	38	5190	13.921	13.0±1
	46	5230	13.993	13.0±1
802.11ac (VHT80)	42	5210	14.203	14.0±1
802.11ax20	36	5180	14.233	14.0±1
	40	5200	14.368	14.0±1
	48	5240	8.677	8.0±1
802.11ax40	38	5190	14.523	14.0±1
	46	5230	14.536	14.0±1
802.11ax80	42	5210	14.736	14.0±1

WIFI Mode (5.2G) ANT 2

Mode	Channel number	Frequency (MHz)	Average Output Power(dBm)	Average Tune up limited(dBm)
802.11a	36	5180	13.347	13.0±1
	40	5200	13.355	13.0±1
	48	5240	13.119	13.0±1
802.11n (HT20)	36	5180	13.215	13.0±1
	40	5200	13.048	13.0±1
	48	5240	13.028	13.0±1
802.11n (HT40)	38	5190	13.708	13.0±1
	46	5230	13.352	13.0±1
802.11ac (VHT20)	36	5180	13.237	13.0±1
	40	5200	13.466	13.0±1
	48	5240	13.378	13.0±1
802.11ac (VHT40)	38	5190	13.636	13.0±1
	46	5230	13.355	13.0±1
802.11ac (VHT80)	42	5210	13.866	13.0±1
802.11ax20	36	5180	14.147	14.0±1
	40	5200	14.08	14.0±1
	48	5240	13.973	14.0±1
802.11ax40	38	5190	14.276	14.0±1
	46	5230	14.042	14.0±1
802.11ax80	42	5210	14.339	14.0±1

WIFI Mode (5.8G) ANT 1

Mode	Channel number	Frequency (MHz)	Average Output Power(dBm)	Average Tune up limited(dBm)
802.11a	147	5745	12.153	12.0±1
	157	5785	11.864	11.0±1
	165	5825	13.142	13.0±1
802.11n (HT20)	147	5745	12.158	12.0±1
	157	5785	11.747	11.0±1
	165	5825	12.983	12.0±1
802.11n (HT40)	151	5755	12.757	12.0±1
	159	5795	12.198	12.0±1
802.11ac (VHT20)	147	5745	12.093	12.0±1
	157	5785	11.624	11.0±1
	165	5825	12.974	12.0±1
802.11ac (VHT40)	151	5755	12.797	12.0±1
	159	5795	12.151	12.0±1
802.11ac (VHT80)	155	5775	12.454	12.0±1
802.11ax20	147	5745	12.751	12.0±1
	157	5785	12.383	12.0±1
	165	5825	13.602	13.0±1
802.11ax40	151	5755	13.072	13.0±1
	159	5795	12.486	12.0±1
802.11ax80	155	5775	12.88	12.0±1

WIFI Mode (5.8G) ANT 2

Mode	Channel number	Frequency (MHz)	Average Output Power(dBm)	Average Tune up limited(dBm)
802.11a	147	5745	12.256	12.0±1
	157	5785	12.271	12.0±1
	165	5825	13.331	13.0±1
802.11n (HT20)	147	5745	12.651	12.0±1
	157	5785	12.518	12.0±1
	165	5825	13.674	13.0±1
802.11n (HT40)	151	5755	13.049	13.0±1
	159	5795	12.875	12.0±1
802.11ac (VHT20)	147	5745	12.621	12.0±1
	157	5785	12.631	12.0±1
	165	5825	13.706	13.0±1
802.11ac (VHT40)	151	5755	13.127	13.0±1
	159	5795	12.753	12.0±1
802.11ac (VHT80)	155	5775	12.935	12.0±1
802.11ax20	147	5745	13.06	13.0±1
	157	5785	12.992	12.0±1
	165	5825	14.07	14.0±1
802.11ax40	151	5755	13.535	13.0±1
	159	5795	13.171	13.0±1
802.11ax80	155	5775	13.419	13.0±1

12 Exposure Conditions Consideration

EUT antenna location:

Test position consideration:

Distance of EUT antenna-to-edge/surface(mm), Test distance:0mm						
Antennas	Back side	Front side	Left Edge	Right Edge	Top Edge	Bottom Edge
WIFI/Bluetooth ANT1	<25	<25	30	295	220	<25
WIFI ANT 2	<25	<25	275	45	220	<25

Test distance:0mm						
Antennas	Back side	Front side	Left Edge	Right Edge	Top Edge	Bottom Edge
WWAN	YES	NO	NO	NO	NO	YES
WIFI/Bluetooth	YES	NO	NO	NO	NO	YES

Note:
1. Body SAR assessments are required.
2. Per KDB 447498 D01v06, for handsets the test separation distance is determined by the smallest distance between the outer surface of the device and the user, which is 0 mm for body SAR.
3. Per to KDB 616217 D04 v01r02,KDB 248227 D01 v02r02 and KDB 447498 D01 v06,SAR test for bystander exposure from the edges of the keyboard and display screen of laptop computers are genrally not required.

13 RF Exposure

Standard Requirement:

According to §15.247 (i) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

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*)] · [$\sqrt{f_{(GHz)}}$] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR,[16] where

- $f_{(GHz)}$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation[17]
- The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum *test separation distance* is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum *test separation distance* is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

Routine SAR evaluation refers to that specifically required by § 2.1093, using measurements or computer simulation. When routine SAR evaluation is not required, portable transmitters with output power greater than the applicable low threshold require SAR evaluation to qualify for TCB approval.

Exclusion Thresholds = $P\sqrt{F}/D$

P= Maximum turn-up power in mW

F= Channel frequency in GHz

D= Minimum test separation distance in mm

Test Distance (5mm)

Mode	MAX Power (dBm)	Tune Up Power (dBm)	Max Tune Up Power (dBm)	Max Tune Up Power (mW)	Exclusion Thresholds	Limit
2.4G WIFI	14.821	14.0±1	15	31.62	9.923	3
5.2G WIFI	14.736	14.0±1	15	31.62	14.435	3
5.8G WIFI	14.07	14.0±1	15	31.62	15.263	3
Bluetooth	8.624	8.0±1	9	7.94	2.461	3
BLE	5.096	5.0±1	6	3.98	1.234	3

Result:BT SAR measurement is not required, 2.4G WIFI and 5G WIFI SAR test are required.

14 SAR Test Results

14.1 Test Condition:

1. SAR Measurement
   The distance between the EUT and the antenna of the emulator is more than 50 cm and the output power radiated from the emulator antenna is at least 30 dB less than the output power of EUT.

2	Environmental Conditions	Temperature	23°C
		Relative Humidity	57%
		Atmospheric Pressure	1019mbar
3	Tested By : Martin Feng		

14.2 Generally Test Procedures:

1. Establish communication link between EUT and base station emulation by air link.
2. Place the EUT in the selected test position. (Cheek, tilt or flat)
3. Perform SAR testing at middle or highest output power channel under the selected test mode. If the measured 1-g SAR is ≤ 0.8 W/kg, then testing for the other channel will not be performed.
4. When SAR is<0.8W/kg, no repeated SAR measurement is required

For WCDMA test:

1. KDB941225 D01-Body SAR is not required for HSDPA when the average output of each RF channel with HSDPA active is less than 0.25dB higher than measured without HSDPA using 12.2kbps RMC or the maximum SAR for 12.2kbps RMC<75% of the SAR limit.
2. KDB941225 D01-Body SAR is not required for handset with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than 0.25dB higher than that measure without HSUPA/HSDPA using 12.2kbps RMC AND THE maximum SAR for 12.2kbps RMC is<75% of the SAR limit

For LTE test:

1. According to FCC KDB 941225 D05v02r05:
   a. Per Section 5.2.1, SAR is required for QPSK 1 RB Allocation for the largest bandwidth
      i. The required channel and offset combination with the highest maximum output power is required for SAR.
      ii. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required. Otherwise, SAR is required for the remaining required test channels using the RB offset configuration with highest output power for that channel.
      iii. When the reported SAR for a required test channel is > 1.45 W/kg, SAR is required for all RB offset configurations for that channel.
   b. Per Section 5.2.2, SAR is required for 50% RB allocation using the largest bandwidth following the same procedures outlined in Section 5.2.1.
   c. Per Section 5.2.3, QPSK SAR is not required for the 100% allocation when the highest maximum output power for the 100% allocation is less than the highest maximum output power of the 1 RB and 50% RB allocations and the reported SAR for the 1 RB and 50% RB allocations is < 0.8 W/kg.
   d. Per Section 5.2.4 and 5.3, SAR tests for higher order modulations and lower bandwidths configurations are not required when the conducted power of the required test configurations determined by Sections 5.2.1 through 5.2.3 is less than or equal to ½ dB higher than the equivalent configuration using QPSK modulation and when the QPSK SAR for those configurations is <1.45 W/kg.
   e. A-MPR was disabled for all SAR tests by setting NS=01 on the base station simulator. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

14.3 SAR Summary Test Result:

Table 4: SAR Values of 2.4G WIFI ANT 1

Test Positions		Channel		Test Mode	Power(dBm)		SAR 1g(W/Kg), Limit(1.6W/kg)		Plot No.
		CH.	MHz		Maximum Turn-up Power(dBm)	Measured output power(dBm)	Measured SAR 1g(W/kg)	Scaled SAR 1g(W/kg)	
Body (0mm Separation)	Back side	High	2462	DSSS	15	14.821	0.878	0.91	1
	Back side	High	2462	DSSS	15	14.821	0.870	0.91	--
	Back side	Low	2412	DSSS	15	14.576	0.741	0.82	--
	Back side	Mid	2437	DSSS	15	14.482	0.778	0.88	--
	Bottom edge	High	2462	DSSS	15	14.821	0.631	0.66	--

Note：Scaled SAR=SAR Value*10(0.1*Tune up Power-Conducted Power)

Table 5: SAR Values of 5.2G WIFI ANT1

Test Positions		Channel		Test Mode	Power(dBm)		SAR 1g(W/Kg), Limit(1.6W/kg)		Plot No.
		CH.	MHz		Maximum Turn-up Power(dBm)	Measured output power(dBm)	Measured SAR 1g(W/kg)	Scaled SAR 1g(W/kg)	
Body(0mm Separation)	Back side	Mid	5200	802.11 a	14	13.925	0.606	0.62	2
	Bottom edge	Mid	5200	802.11 a	15	14.736	0.502	0.53	--
	Back side	Mid	5210	802.11 ax80	15	14.736	0.515	0.55	--
	Bottom edge	Mid	5210	802.11 ax80	15	14.736	0.566	0.60	--

Note：Scaled SAR=SAR Value*10(0.1*Tune up Power-Conducted Power)

Table 6: SAR Values of 5.8G WIFI ANT1

Test Positions		Channel		Test Mode	Power(dBm)		SAR 1g(W/Kg), Limit(1.6W/kg)		Plot No.
		CH.	MHz		Maximum Turn-up Power(dBm)	Measured output power(dBm)	Measured SAR 1g(W/kg)	Scaled SAR 1g(W/kg)	
Body(0mm Separation)	Back side	High	5825	802.11 a	14	13.142	0.599	0.73	3
	Bottom edge	High	5825	802.11 a	14	13.142	0.512	0.62	--
	Back side	High	5825	802.11 ax20	14	13.602	0.523	0.57	--
	Bottom edge	High	5825	802.11 ax20	14	13.602	0.414	0.45	--

Note：Scaled SAR=SAR Value*10(0.1*Tune up Power-Conducted Power)

Table 7: SAR Values of 2.4G WIFI ANT 2

Test Positions		Channel CH.	Channel MHz	Test Mode	Power(dBm) Maximum Turn-up Power(dBm)	Power(dBm) Measured output power(dBm)	SAR 1g(W/Kg), Limit(1.6W/kg) Measured SAR 1g(W/kg)	SAR 1g(W/Kg), Limit(1.6W/kg) Scaled SAR 1g(W/kg)	Plot No.
Body (0mm Separation)	Back side	Low	2412	DSSS	15	14.199	0.541	0.65	--
	Bottom edge	Low	2412	DSSS	15	14.199	0.520	0.63	--

Note：Scaled SAR=SAR Value*10(0.1*Tune up Power-Conducted Power)

Table 8: SAR Values of 5.2G WIFI ANT2

Test Positions		Channel CH.	Channel MHz	Test Mode	Power(dBm) Maximum Turn-up Power(dBm)	Power(dBm) Measured output power(dBm)	SAR 1g(W/Kg), Limit(1.6W/kg) Measured SAR 1g(W/kg)	SAR 1g(W/Kg), Limit(1.6W/kg) Scaled SAR 1g(W/kg)	Plot No.
Body(0mm Separation)	Back side	Mid	5200	802.11a	14	13.355	0.501	0.58	--
	Bottom edge	Mid	5200	802.11a	14	13.355	0.500	0.58	--
	Back side	Mid	5210	802.11ax80	15	14.339	0.420	0.49	--
	Bottom edge	Mid	5210	802.11ax80	15	14.339	0.399	0.46	--

Note：Scaled SAR=SAR Value*10(0.1*Tune up Power-Conducted Power)

Table 9: SAR Values of 5.8G WIFI ANT2

Test Positions		Channel CH.	Channel MHz	Test Mode	Power(dBm) Maximum Turn-up Power(dBm)	Power(dBm) Measured output power(dBm)	SAR 1g(W/Kg), Limit(1.6W/kg) Measured SAR 1g(W/kg)	SAR 1g(W/Kg), Limit(1.6W/kg) Scaled SAR 1g(W/kg)	Plot No.
Body(0mm Separation)	Back side	High	5825	802.11a	14	13.331	0.423	0.49	--
	Bottom edge	High	5825	802.11a	14	13.331	0.415	0.48	--
	Back side	High	5825	802.11ax20	15	14.07	0.411	0.51	--
	Bottom edge	High	5825	802.11ax20	15	14.07	0.366	0.45	--

Note：Scaled SAR=SAR Value*10(0.1*Tune up Power-Conducted Power)

Note:1. KDB941225 D01-Body SAR is not required for HSDPA when the average output of each RF channel with HSDPA active is less than 0.25dB higher than measured without HSDPA using 12.2kbps RMC or the maximum SAR for 12.2kbps RMC<75% of the SAR limit.

3. KDB941225 D01-Body SAR is not required for handset with HSUPA/HSDPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than 0.25dB higher than that measure without HSUPA/HSDPA using 12.2kbps RMC and The maximum SAR for 12.2kbps RMC is<75% of the SAR limit

14.4 Measurement variability consideration

Refer to FCC KDB 248227 section 5.2.1~5.2.2:

802.11b DSSS SAR Test Requirements:

SAR is measured for 2.4 GHz 802.11b DSSS using either a fixed test position or, when applicable, the initial test position procedure.

SAR test reduction is determined according to the following:

1) When the reported SAR of the highest measured maximum output power channel (section 3.1) for the exposure configuration is ≤ 0.8 W/kg,

no further SAR testing is required for 802.11b DSSS in that exposure configuration.

2) When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg,

SAR is required for the third channel; i.e., all channels require testing.

2.4 GHz 802.11g/n OFDM SAR Test Exclusion Requirements

When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied (section 5.3).

SAR is not required for the following 2.4 GHz OFDM conditions.

1) When KDB Publication 447498 SAR test exclusion applies to the OFDM configuration.

2) 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.

Note:802.1 b DSSS SAR test is required. The highest reported SAR for DSSS* the ratio of OFDM to DSSS(Max output power) is 0.959*0.878=0.842W/Kg<1.2 W/Kg.so the OFDM SAR test is not required.

For 5G WiFi

1. Output Power and SAR measurement is not required for 802.11n/ac HT20/HT40/HT80 channels when the specified tune-up tolerances for 802.11n HT20/HT40 are lower than 802.11a by more than ½ dB and the measured SAR is ≤ 1.2 W/Kg.

2. When the same transmission mode configurations have the same maximum output power on the same channel for the 802.11 a/g/n/ac modes, the channel in the lower order/sequence 802.11 mode (i.e. a, g, n then ac) is selected.

3. When the specified maximum output power is the same for both UNII band I and UNII band 2A, begin SAR measurement in UNII band 2A; and if the highest reported SAR for UNII band 2A is ≤ 1.2 W/kg, SAR is not required for UNII band I, if SAR for UNII band 2A > 1.2 W/kg, both bands should be tested independently for SAR.

According to KDB 865664 D01v01r04 section 2.8.1, repeated measurements are required following the procedures as below:

Repeated measurement is not required when the original highest measured SAR is < 0.80W/kg; steps 2) through 4) do not apply.

When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.

Perform a second repeated measurement only 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 (~ 10% from the 1-g SAR limit).

Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

Repeated SAR

Band	**Position**	**Channel**	**Mode**	**measured SAR(W/kg)**				
				Original	1st Repeated		2nd Repeated	
					Value	Ratio	Value	Ratio
2.4G WIFI ANT 1	Back side	2462	DSSS	0.878	0.870	1.009	NA	NA

14.5 Simultaneous Transmission SAR Analysis.
List of Mode for Simultaneous Multi-band Transmission:

No.	Configurations	Head SAR	Body SAR	Hotspot SAR
1	WLAN 2.4GHz(ANT1)+ WLAN 2.4GHz(ANT2)	-	Yes	-
2	WLAN 2.4GHz(ANT1)+ WLAN 5GHz(ANT2)	-	Yes	-
3	BT+ WLAN 2.4GHz(ANT2)	-	Yes	-
4	BT+ WLAN 5GHz(ANT2)	-	Yes	-
5	WLAN 5GHz(ANT1)+ WLAN 2.4GHz(ANT2)	-	Yes	-
6	WLAN 5GHz(ANT1)+ WLAN 5GHz(ANT2)	-	Yes	-

Remark:
1. GSM/ WCDMA/LTE share the same antenna, and cannot transmit simultaneously.
2. WLAN and Bluetooth share the same antenna, and cannot transmit simultaneously.
3. According to the KDB 447498 D01 v06, when standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:
(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)]·[√f(GHz)/x] W/kg for test separation distances ≤50 mm;
where x = 7.5 for 1-g SAR, and x = 18.75 for 10-g SAR.
For simultaneous transmission analysis, Bluetooth SAR is estimated per KDB 447498 D01 v06 as below:
Bluetooth:

Tune-Up Power (dBm)	Max. Power (mW)	Distance (mm)	Frequency (GHz)	X	SAR(1g) 5mm
9	7.94	5/10	2.402	7.5	0.33

5. The maximum SAR summation is calculated based on the same configuration and test position

Body SAR Simultaneous

2.4G WIFI(ANT1)+2.4G WIFI(ANT 2)

Position	WWAN（maximum）		2.4G WIFI	Summed SAR (W/kg)
	Band	Scaled SAR (W/kg)	Scaled SAR (W/kg)	
Back	2.4G WIFI	0.91	0.65	1.56
Bottom		0.66	0.63	1.29

2.4G WIFI(ANT1)+5G WIFI(ANT 2)

Position	WWAN（maximum）		5G WIFI	Summed SAR (W/kg)
	Band	Scaled SAR (W/kg)	Scaled SAR (W/kg)	
Back	2.4G WIFI	0.91	0.58	1.49
Bottom		0.66	0.46	1.12

BT(ANT1)+2.4G WIFI(ANT 2)

Position	WWAN（maximum）		2.4G WIFI	Summed SAR (W/kg)
	Band	Scaled SAR (W/kg)	Scaled SAR (W/kg)	
Back	BT	0.33	0.65	0.98
Bottom		0.33	0.63	0.96

BT(ANT1)+5G WIFI(ANT 2)

Position	WWAN（maximum）		5G WIFI	Summed SAR (W/kg)
	Band	Scaled SAR (W/kg)	Scaled SAR (W/kg)	
Back	BT	0.33	0.58	0.91
Bottom		0.33	0.46	0.79

2.4G WIFI(ANT2)+5G WIFI(ANT 1)

Position	WWAN（maximum）		5G WIFI	Summed SAR (W/kg)
	Band	Scaled SAR (W/kg)	Scaled SAR (W/kg)	
Back	2.4G WIFI	0.65	0.62	1.27
Bottom		0.63	0.60	1.23

5G WIFI(ANT2)+5G WIFI(ANT 1)

Position	WWAN（maximum）		5G WIFI	Summed SAR (W/kg)
	Band	Scaled SAR (W/kg)	Scaled SAR (W/kg)	
Back	5G WIFI	0.58	0.62	1.20
Bottom		0.46	0.60	1.06

Remark: BT the 1g SAR value is not being captured by the measurement system, the 1g-SAR value is conservatively used for simultaneous transmission analysis.

15 SAR Measurement Reference

References

1. FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”
2. IEEE Std. C95.1-2005, “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3kHz to 300GHz”, 2005
3. IEEE Std. 1528-2013, “IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices:Measurement Techniques”, June 2013
4. IEC 62209-2, “Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices—Human models, instrumentation, and procedures – Part 2: Procedure to determine the specific absorption rate(SAR) for wireless communication devices used in close proximity to the human body(frequency range of 30MHz to 6GHz)”, April 2010
5. FCC KDB 447498 D01 v06, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Oct 23th, 2015
6. FCC KDB 941225 D01 v03r01, “3G SAR Measurement Procedures”, Oct 23th, 2015
7. FCC KDB 941225 D05 v02r05, “SAR Evaluation Considerations for LTE Devices”, Dec 16th, 2015
8. FCC KDB 941225 D06 v02r01, “SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities”, Oct 23th, 2015
9. FCC KDB865664 D01 v01r04, “SAR Measurement Requirements 100MHz to 6GHz”, Aug 7th, 2015
10. FCC KDB865664 D02 v01r02, “RF Exposure Compliance Reporting and Documentation Considerations ”, Oct 23th", 2015
11. FCC KDB648474 D04 v01r03, “SAR Evaluation Considerations for Wireless Handsets”, Oct 23th", 2015

16 Maximum SAR measurement Plots

Plot 1

DUT: DUT Sample; Type: Sample; Serial: Not Specified

Communication System: UID 0, 2.4G WIFI (0); Communication System Band: FCC 2.4G WIFI 11B;
Frequency: 2462 MHz;Communication System PAR: 0 dB; PMF: 1.12202e-005
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.883 S/m; εr = 37.97; ρ = 1000 kg/m3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

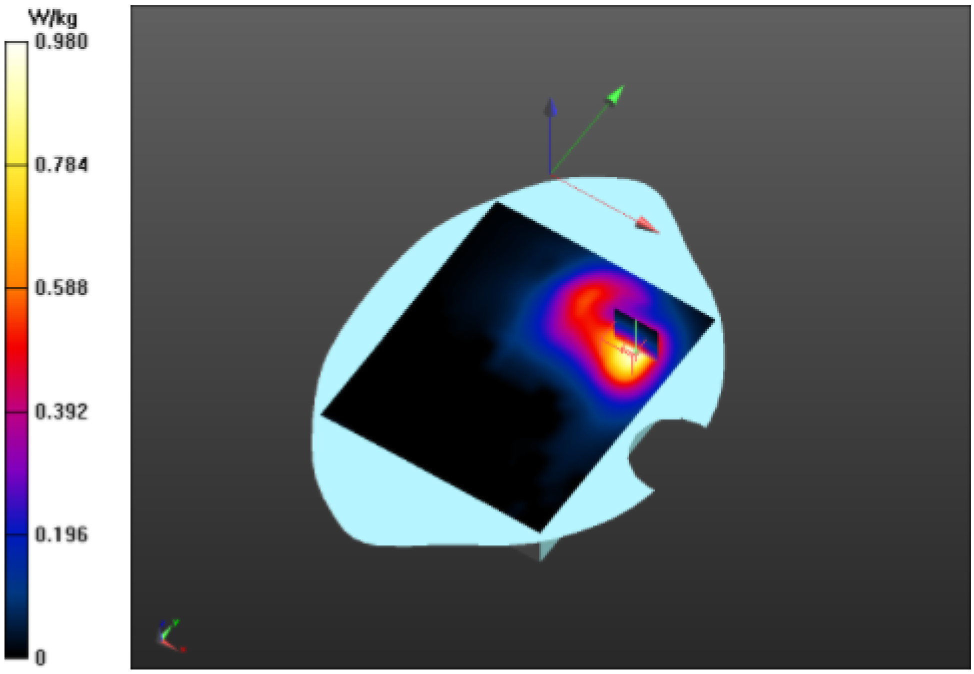
DASY Configuration:

Probe: ES3DV3 - SN3089; ConvF(4.7, 4.7, 4.7) @ 2462 MHz; Calibrated: 2023/7/14
Modulation Compensation:
Sensor-Surface: 4mm (Mechanical Surface Detection), z = 2.0, 32.0
Electronics: DAE4 Sn881; Calibrated: 2023/7/14
Phantom: SAM 1; Type: QD000P40CD; Serial: TP:xxxx
DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

KA231229028X Portable Computer/Back/Area Scan (151x181x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.980 W/kg

KA231229028X Portable Computer/Back/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.973 V/m; Power Drift = 0.40 dB
Peak SAR (extrapolated) = 1.65 W/kg
SAR(1 g) = 0.878 W/kg; SAR(10 g) = 0.496 W/kg
Smallest distance from peaks to all points 3 dB below = 13 mm
Ratio of SAR at M2 to SAR at M1 = 54.6%

Maximum value of SAR (measured) = 0.973 W/kg



Plot 2
DUT: DUT Sample; Type: Sample; Serial: Not Specified

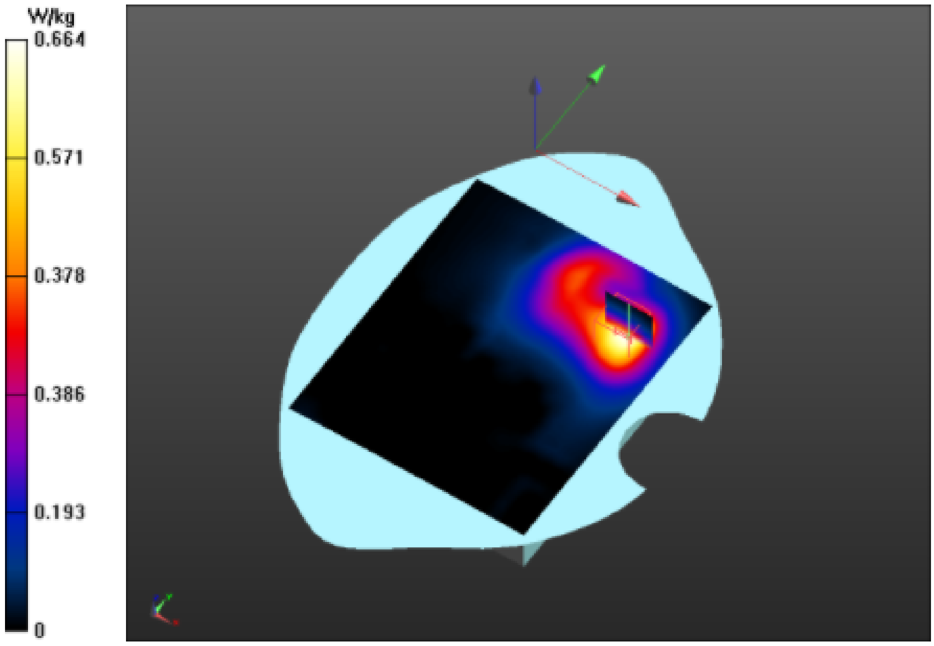
Communication System: UID 0, 5.2G WIFI (0); Communication System Band: 5.2G WIFI 11 a; Frequency: 5200MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used (interpolated): f = 5200MHz; σ = 5.02 S/m; εr = 35.919; ρ = 1000 kg/m3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY Configuration:
Probe: EX3DV4 - SN7769; ConvF(4.85, 4.85, 4.85) @ 5200 MHz; Calibrated: 2023/9/10
Modulation Compensation:
Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0
Electronics: DAE4 Sn881; Calibrated: 2023/7/14
Phantom: SAM 1; Type: QD000P40CD; Serial: TP:xxxx
DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

KA231229028X Portable Computer/Back/Area Scan (151x181x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.664 W/kg

KA231229028X Portable Computer/Back/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.239 V/m; Power Drift = 1.72 dB
Peak SAR (extrapolated) = 1.62 W/kg
SAR(1 g) = 0.606 W/kg; SAR(10 g) = 0.400 W/kg
Smallest distance from peaks to all points 3 dB below = 12.6 mm
Ratio of SAR at M2 to SAR at M1 = 55.4%

Maximum value of SAR (measured) = 0.655 W/kg



Plot 3
DUT: DUT Sample; Type: Sample; Serial: Not Specified

Communication System: UID 0, 5.8G WIFI (0); Communication System Band: FCC 5.8G WIFI 11a;
Frequency: 5825 MHz;Communication System PAR: 0 dB; PMF: 1.12202e-005
Medium parameters used (interpolated): f = 5825 MHz; σ = 5.03 S/m; εr = 35.919; ρ = 1000 kg/m3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

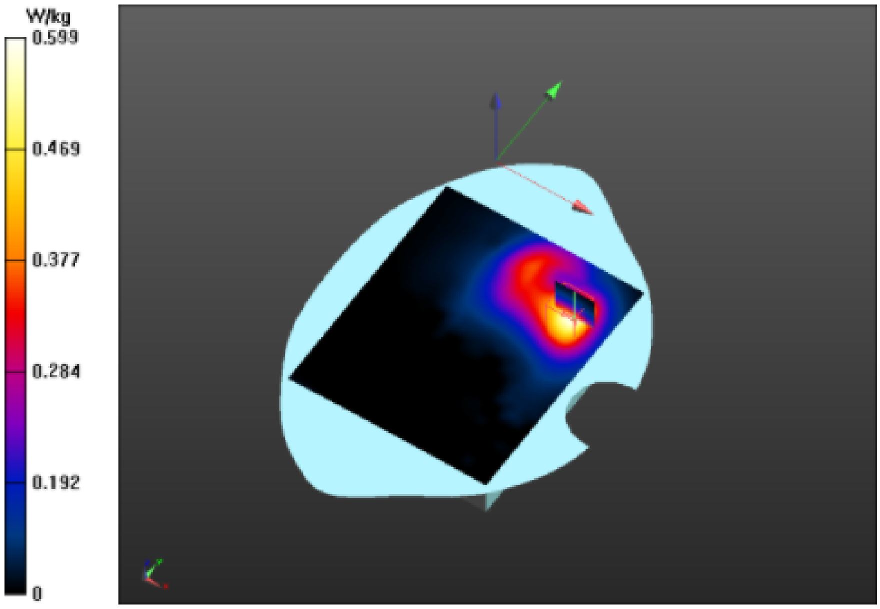
Probe: EX3DV4 - SN7769; ConvF(4.85, 4.85, 4.85) @ 5825 MHz; Calibrated: 2023/9/10
Modulation Compensation:
Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0
Electronics: DAE4 Sn881; Calibrated: 2023/7/14
Phantom: SAM 1; Type: QD000P40CD; Serial: TP:xxxx
DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

KA231229028X Portable Computer/Back/Area Scan (151x181x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.661 W/kg

KA231229028X Portable Computer/Back/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.321 V/m; Power Drift = 0.71 dB
Peak SAR (extrapolated) = 1.63 W/kg
SAR(1 g) = 0.599 W/kg; SAR(10 g) = 0.399 W/kg
Smallest distance from peaks to all points 3 dB below = 12.4 mm
Ratio of SAR at M2 to SAR at M1 = 55.3%

Maximum value of SAR (measured) = 0.655 W/kg

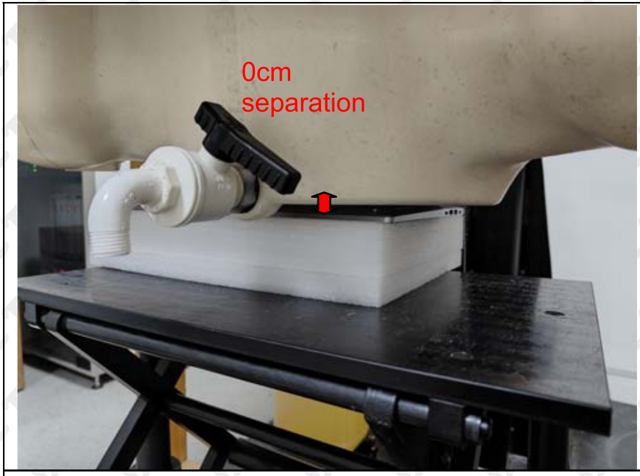


17 Calibration Reports-Probe and Dipole

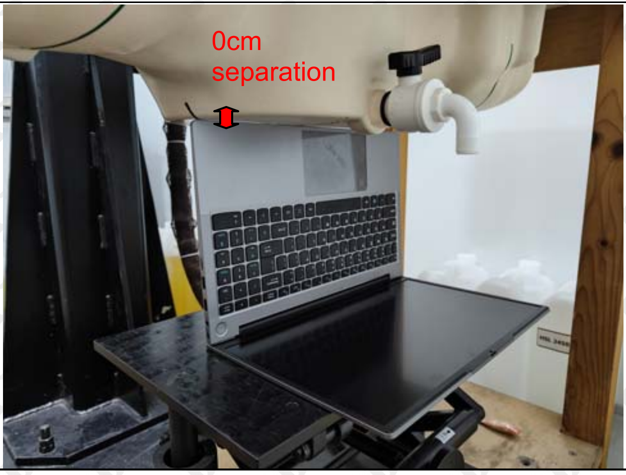
The Probe, Dipole and DAE calibration please refer to the Attachment.

18 SAR System Photos

19 Setup Photo



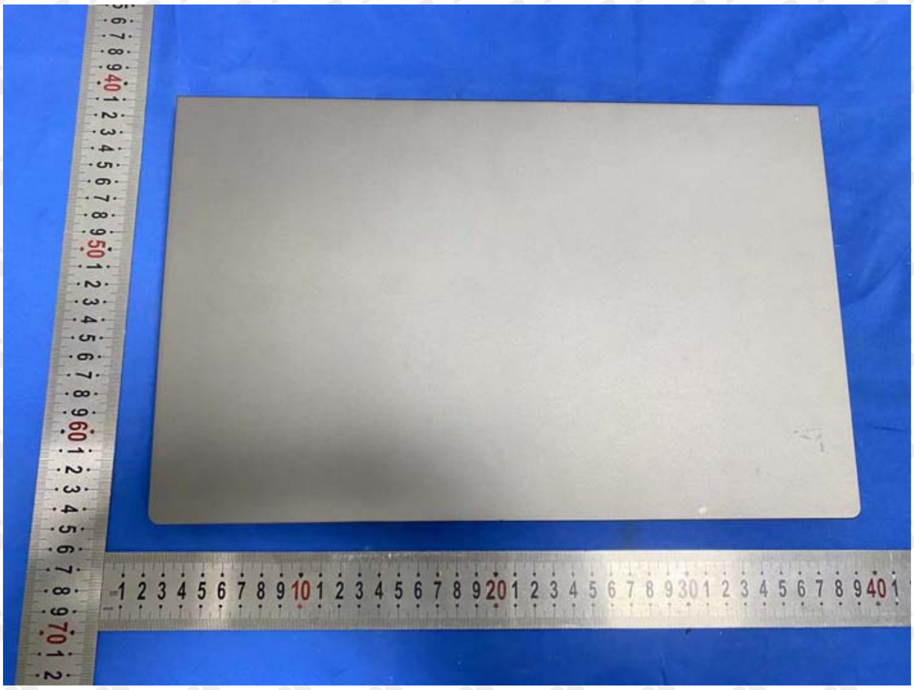
Body(Back side)



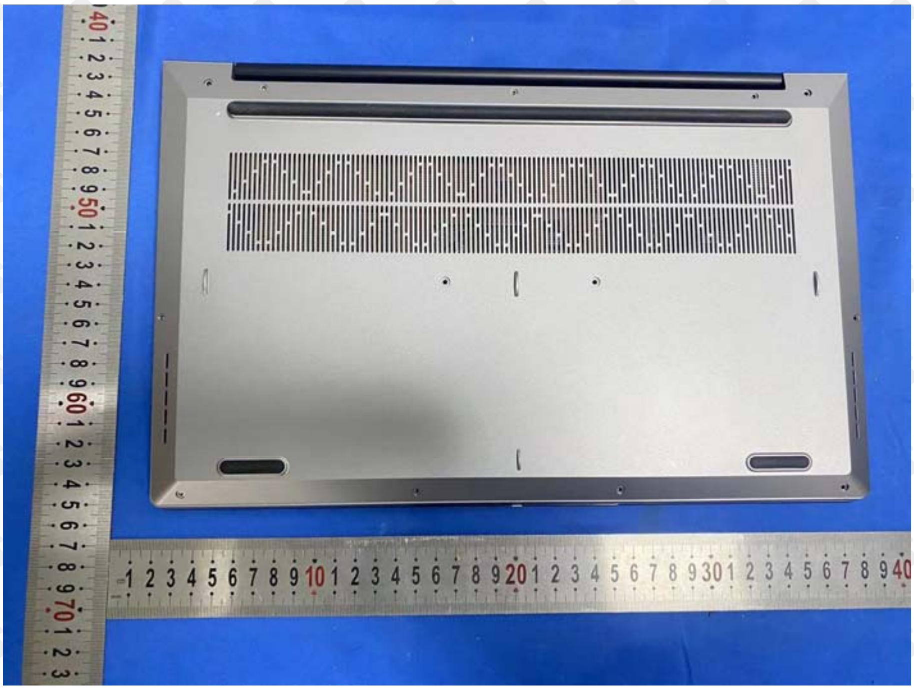
Body(Bottom edge)

20 EUT Photos

Front Side



Back Side



======End of report======