

TEST REPORT

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Report Number : SZNS220518-21374E-SA
FCC ID: 2A3FP-PC007

Test Standard (s)

FCC Part 2.1093

Sample Description

Product Type: Tablet PC
Model No.: TB-JS101A
Multiple Model(s) No.: S31, S31T, JS31 (Please refer to DOS for Model difference)
Trade Mark: N/A
Date Received: 2022/05/18
Report Date: 2022/07/25

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:



Lance Li
EMC Engineer

Approved By:



Candy Li
EMC Engineer

Note: This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "*".

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Attestation of Test Results			
MODE		Max. SAR Level(s) Reported(W/kg)	Limit (W/kg)
2.4Gwifi	1g Body SAR	1.28	1.6
5..2Gwifi	1g Body SAR	1.02	
5.8Gwifi	1g Body SAR	1.56	
Bluetooth	1g Body SAR	0.14	

Applicable Standards	FCC 47 CFR part 2.1093 Radiofrequency radiation exposure evaluation: portable devices
	IEEE1528:2013 IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
	IEC 62209-1:2016 Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Part 1: Devices used next to the ear (Frequency range of 300 MHz to 6 GHz)
	KDB procedures KDB 447498 D04 Interim General RF Exposure Guidance v01 KDB 648474 D04 Handset SAR v01r03 KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04 KDB 865664 D02 RF Exposure Reporting v01r02 KDB 248227 D01 802.11 Wi-Fi SAR v02r02 KDB 616217 D04 SAR for laptop and tablets v01r02
<p>Note: This wireless device has been shown to be capable of compliance for localized specific absorption rate (SAR) for General Population/Uncontrolled Exposure limits specified in FCC 47 CFR part 2.1093 and has been tested in accordance with the measurement procedures specified in IEEE 1528-2013 and RF exposure KDB procedures.</p> <p>The results and statements contained in this report pertain only to the device(s) evaluated.</p>	

TABLE OF CONTENTS

DOCUMENT REVISION HISTORY	4
EUT DESCRIPTION	5
TECHNICAL SPECIFICATION	5
REFERENCE, STANDARDS, AND GUIDELINES	6
SAR LIMITS.....	7
FACILITIES	8
DESCRIPTION OF TEST SYSTEM	9
EQUIPMENT LIST AND CALIBRATION	15
EQUIPMENTS LIST & CALIBRATION INFORMATION.....	15
SAR MEASUREMENT SYSTEM VERIFICATION	16
LIQUID VERIFICATION	16
SYSTEM ACCURACY VERIFICATION.....	17
SAR SYSTEM VALIDATION DATA.....	18
EUT TEST STRATEGY AND METHODOLOGY	21
TEST POSITIONS FOR BODY SUPPORTED AND OTHER CONFIGURATIONS	21
TEST DISTANCE FOR SAR EVALUATION.....	22
SAR EVALUATION PROCEDURE	23
CONDUCTED OUTPUT POWER MEASUREMENT	24
MAXIMUM TARGET OUTPUT POWER	24
STANDALONE SAR TEST EXCLUSION CONSIDERATIONS	27
ANTENNA DISTANCE TO EDGE	27
STANDALONE SAR TEST EXCLUSION CONSIDERATIONS	29
SAR TEST EXCLUSION FOR THE EUT EDGE CONSIDERATIONS RESULT	29
SAR MEASUREMENT RESULTS	30
SAR TEST DATA	30
SAR MEASUREMENT VARIABILITY	33
SAR SIMULTANEOUS TRANSMISSION DESCRIPTION	34
SAR PLOTS	35
APPENDIX A MEASUREMENT UNCERTAINTY	36
APPENDIX B EUT TEST POSITION PHOTOS	38
APPENDIX C PROBE CALIBRATION CERTIFICATES	39
APPENDIX D DIPOLE CALIBRATION CERTIFICATES	40

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	SZNS220518-21374E-SA	Original Report	2022-07-25

EUT DESCRIPTION

This report has been prepared on behalf of **Shenzhen Junge Yunchuang Technology Co., Ltd.** and their product **Tablet PC**, Model: **TB-JS101A**, FCC ID: **2A3FP-PC007** or the EUT (Equipment under Test) as referred to in the rest of this report.

Technical Specification

Device Type:	Portable
Exposure Category:	Population / Uncontrolled
Antenna Type(s):	Internal Antenna
Power Sensor	None
Proximity Sensor:	None
Operation Mode :	Wi-Fi and Bluetooth
Frequency Band:	Wi-Fi 2.4G: 2412 -2462 MHz Wi-Fi 5.2G:5150-5250MHz Wi-Fi 5.8G:5725-5850MHz Bluetooth: 2402 -2480 MHz BLE: 2402 -2480 MHz
Power Source:	Rechargeable Battery
Normal Operation:	Body

REFERENCE, STANDARDS, AND GUIDELINES

FCC:

The Report and Order requires routine SAR evaluation prior to equipment authorization of portable transmitter devices, including portable telephones. For consumer products, the applicable limit is 1.6 mW/g as recommended by the ANSI/IEEE standard C95.1-1992 [6] for an uncontrolled environment (Paragraph 65). According to the Supplement C of OET Bulletin 65 "Evaluating Compliance with FCC Guide-lines for Human Exposure to Radio frequency Electromagnetic Fields", released on Jun 29, 2001 by the FCC, the device should be evaluated at maximum output power (radiated from the antenna) under "worst-case" conditions for normal or intended use, incorporating normal antenna operating positions, device peak performance frequencies and positions for maximum RF energy coupling.

This report describes the methodology and results of experiments performed on wireless data terminal. The objective was to determine if there is RF radiation and if radiation is found, what is the extent of radiation with respect to safety limits. SAR (Specific Absorption Rate) is the measure of RF exposure determined by the amount of RF energy absorbed by human body (or its parts) – to determine how the RF energy couples to the body or head which is a primary health concern for body worn devices. The limit below which the exposure to RF is considered safe by regulatory bodies in North America is 1.6 mW/g average over 1 gram of tissue mass.

CE:

The order requires routine SAR evaluation prior to equipment authorization of portable transmitter devices, including portable telephones. For consumer products, the applicable limit is 2 mW/g as recommended by EN62209-1 for an uncontrolled environment. According to the Standard, the device should be evaluated at maximum output power (radiated from the antenna) under "worst-case" conditions for normal or intended use, incorporating normal antenna operating positions, device peak performance frequencies and positions for maximum RF energy coupling.

This report describes the methodology and results of experiments performed on wireless data terminal. The objective was to determine if there is RF radiation and if radiation is found, what is the extent of radiation with respect to safety limits. SAR (Specific Absorption Rate) is the measure of RF exposure determined by the amount of RF energy absorbed by human body (or its parts) – to determine how the RF energy couples to the body or head which is a primary health concern for body worn devices. The limit below which the exposure to RF is considered safe by regulatory bodies in Europe is 2 mW/g average over 10 gram of tissue mass.

The test configurations were laid out on a specially designed test fixture to ensure the reproducibility of measurements. Each configuration was scanned for SAR. Analysis of each scan was carried out to characterize the above effects in the device.

SAR Limits**FCC Limit(1g Tissue)**

EXPOSURE LIMITS	SAR (W/kg)	
	(General Population / Uncontrolled Exposure Environment)	(Occupational / Controlled Exposure Environment)
Spatial Average (averaged over the whole body)	0.08	0.4
Spatial Peak (averaged over any 1 g of tissue)	1.60	8.0
Spatial Peak (hands/wrists/feet/ankles averaged over 10 g)	4.0	20.0

CE Limit(10g Tissue)

EXPOSURE LIMITS	SAR (W/kg)	
	(General Population / Uncontrolled Exposure Environment)	(Occupational / Controlled Exposure Environment)
Spatial Average (averaged over the whole body)	0.08	0.4
Spatial Peak (averaged over any 10 g of tissue)	2.0	10
Spatial Peak (hands/wrists/feet/ankles averaged over 10 g)	4.0	20.0

Population/Uncontrolled Environments are defined as locations where there is the exposure of individual who have no knowledge or control of their exposure.

Occupational/Controlled Environments are defined as locations where there is exposure that may be incurred by people who are aware of the potential for exposure (i.e. as a result of employment or occupation).

General Population/Uncontrolled environments Spatial Peak limit 1.6W/kg (FCC) applied to the EUT.

FACILITIES

The test site used by Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 708358, the FCC Designation No.: CN1189. Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 4297.01

Listed by Innovation, Science and Economic Development Canada (ISED), the Registration Number is 5077A.

The test site has been registered with ISED Canada under ISED Canada Registration Number CN0016.

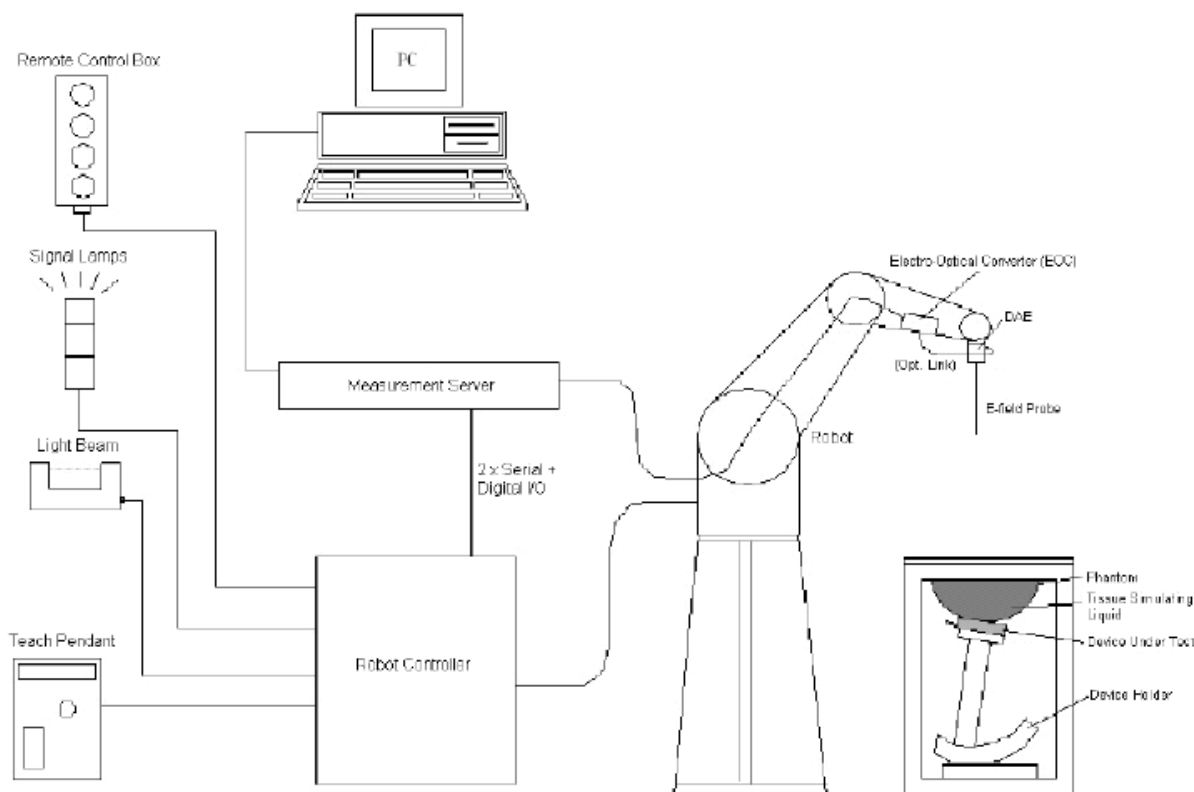
DESCRIPTION OF TEST SYSTEM

These measurements were performed with the automated near-field scanning system DASY5 from Schmid & Partner Engineering AG (SPEAG) which is the Fifth generation of the system shown in the figure hereinafter:



DASY5 System Description

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



- A standard high precision 6-axis robot (Staubli TX=RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal application, 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.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running Win7 professional operating system and the DASY52 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

DASY5 Measurement Server

The DASY5 measurement server is based on a PC/104 CPU board with a 400 MHz Intel ULV Celeron, 128 MB chip-disk and 128 MB RAM. The necessary circuits for communication with the DAE4 (or DAE3) electronics box, as well as the 16-bit AD converter system for optical detection and digital I/O interface are contained on the DASY6 I/O board, which is directly connected to the PC/104 bus of the CPU board.

The measurement server performs all real-time data evaluations of field measurements and surface detection, controls robot movements, and handles safety operations. The PC operating system cannot interfere with these time-critical processes. All connections are supervised by a watchdog, and disconnection of any of the cables to the measurement server will automatically disarm the robot and disable all program- controlled robot movements. Furthermore, the measurement server is equipped with an expansion port, which is reserved for future applications. Please note that this expansion port does not have a standardized pinout, and therefore only devices provided by SPEAG can be connected. Connection of devices from any other supplier could seriously damage the measurement server.

Data Acquisition Electronics

The data acquisition electronics (DAE4) consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter 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.

The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection.

The input impedance of both the DAE4 as well as of the DAE3 box is 200M Ω ; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

EX3DV4 E-Field Probes

Frequency	10 MHz to > 6 GHz Linearity: ±0.2 dB (30 MHz to 6 GHz)
Directivity	±0.3 dB in TSL (rotation around probe axis) ±0.5 dB in TSL (rotation normal to probe axis)
Dynamic Range	10 µW/g to > 100 mW/g Linearity: ±0.2 dB (noise: typically < 1 µW/g)
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields); the only probe that enables compliance testing for frequencies up to 6 GHz with precision of better 30%.
Compatibility	DASY3, DASY4, DASY52 SAR and higher, EASY4/MRI

SAM Twin Phantom

The SAM Twin Phantom (shown in front of DASY5) is a fiberglass shell phantom with shell thickness 2 mm, except in the ear region where the thickness is increased to 6 mm..

When the phantom is mounted inside allocated slot of the DASY5 platform, phantom reference points can be taught directly in the DASY5 V5.2 software. When the DASY5 platform is used to mount the

Phantom, some of the phantom teaching points cannot be reached by the robot in DASY5 V5.2. A special tool called P1a-P2aX-Former is provided to transform two of the three points, P1 and P2, to reachable locations. To use these new teaching points, a revised phantom configuration file is required.

In addition to our standard broadband liquids, the phantom can be used with the following tissue simulating liquids:

Sugar-water-based liquids can be left permanently in the phantom.

Always cover the liquid when the system is not in use to prevent changes in liquid parameters due to water evaporation.

DGBE-based liquids should be used with care. As DGBE is a softener for most plastics, the liquid should be taken out of the phantom, and the phantom should be dried when the system is not in use (desirable at least once a week).

Do not use other organic solvents without previously testing the solvent resistivity of the phantom. Approximately 25 liters of liquid is required to fill the SAM Twin phantom.



Calibration Frequency Points for EX3DV4 E-Field Probes SN: 7441 Calibrated: 2022/05/16

Calibration Frequency Point(MHz)	Frequency Range(MHz)		Conversion Factor		
	From	To	X	Y	Z
750 Head	650	850	10.04	10.04	10.04
900 Head	850	1000	9.61	9.61	9.61
1450 Head	1350	1550	8.52	8.52	8.52
1750 Head	1650	1850	8.32	8.32	8.32
1900 Head	1850	1950	7.94	7.94	7.94
2000 Head	1950	2100	7.99	7.99	7.99
2300 Head	2200	2400	7.78	7.78	7.78
2450 Head	2400	2550	7.54	7.54	7.54
2600 Head	2550	2700	7.30	7.30	7.30
3300 Head	3200	3400	7.09	7.09	7.09
3500 Head	3400	3600	6.89	6.89	6.89
3700 Head	3600	3800	6.55	6.55	6.55
3900 Head	3800	4000	6.60	6.60	6.60
4400 Head	4300	4500	6.34	6.34	6.34
4600 Head	4500	4700	6.26	6.26	6.26
4800 Head	4700	4900	6.16	6.16	6.16
4950 Head	4900	5050	5.85	5.85	5.85
5250 Head	5140	5360	5.35	5.35	5.35
5600 Head	5490	5700	4.85	4.85	4.85
5750 Head	5700	5860	4.83	4.83	4.83

Area Scans

Parameter	DUT transmit frequency being tested	
	$f \leq 3$ GHz	3 GHz < $f \leq 10$ GHz
Maximum distance between the measured points (geometric centre of the sensors) and the inner phantom surface (z_{M1} in Figure 20 in mm)	5 ± 1	$\delta \ln(2)/2 \pm 0,5^a$
Maximum spacing between adjacent measured points in mm (see O.8.3.1) ^b	20, or half of the corresponding zoom scan length, whichever is smaller	$60/f$, or half of the corresponding zoom scan length, whichever is smaller
Maximum angle between the probe axis and the phantom surface normal (α in Figure 20) ^c	5° (flat phantom only) 30° (other phantoms)	5° (flat phantom only) 20° (other phantoms)
Tolerance in the probe angle	1°	1°

^a δ is the penetration depth for a plane-wave incident normally on a planar half-space.

^b See Clause O.8 on how Δx and Δy may be selected for individual area scan requirements.

^c The probe angle relative to the phantom surface normal is restricted due to the degradation in the measurement accuracy in fields with steep spatial gradients. The measurement accuracy decreases with increasing probe angle and increasing frequency. This is the reason for the tighter probe angle restriction at frequencies above 3 GHz.

Zoom Scan (Cube Scan Averaging)

Parameter	DUT transmit frequency being tested	
	$f \leq 3$ GHz	$3 \text{ GHz} < f \leq 10$ GHz
Maximum distance between the closest measured points and the phantom surface (z_{M1} in Figure 20 and Table 3, in mm)	5	$\delta \ln(2)/2^a$
Maximum angle between the probe axis and the phantom surface normal (α in Figure 20)	5° (flat phantom only) 30° (other phantoms)	5° (flat phantom only) 20° (other phantoms)
Maximum spacing between measured points in the x- and y-directions (Δx and Δy , in mm)	8	$24/f^b$
For uniform grids: Maximum spacing between measured points in the direction normal to the phantom shell (Δz_1 in Figure 20, in mm)	5	$10/(f - 1)$
For graded grids: Maximum spacing between the two closest measured points in the direction normal to the phantom shell (Δz_1 in Figure 20, in mm)	4	$12/f$
For graded grids: Maximum incremental increase in the spacing between measured points in the direction normal to the phantom shell ($R_z = \Delta z_2/\Delta z_1$ in Figure 20)	1,5	1,5
Minimum edge length of the zoom scan volume in the x- and y-directions (L_z in O.8.3.2, in mm)	30	22
Minimum edge length of the zoom scan volume in the direction normal to the phantom shell (L_h in O.8.3.2 in mm)	30	22
Tolerance in the probe angle	1°	1°
^a δ is the penetration depth for a plane-wave incident normally on a planar half-space.		
^b This is the maximum spacing allowed, which might not work for all circumstances.		

Tissue Dielectric Parameters for Head

The head tissue dielectric parameters recommended by the IEC 62209-1:2016

Recommended Tissue Dielectric Parameters for Head

Table A.3 – Dielectric properties of the head tissue-equivalent liquid

Frequency MHz	Relative permittivity ϵ_r	Conductivity (σ) S/m
300	45,3	0,87
450	43,5	0,87
<i>750</i>	<i>41,9</i>	<i>0,89</i>
835	41,5	0,90
900	41,5	0,97
1 450	40,5	1,20
<i>1 500</i>	<i>40,4</i>	<i>1,23</i>
<i>1 640</i>	<i>40,2</i>	<i>1,31</i>
<i>1 750</i>	<i>40,1</i>	<i>1,37</i>
1 800	40,0	1,40
1 900	40,0	1,40
2 000	40,0	1,40
<i>2 100</i>	<i>39,8</i>	<i>1,49</i>
<i>2 300</i>	<i>39,5</i>	<i>1,67</i>
2 450	39,2	1,80
<i>2 600</i>	<i>39,0</i>	<i>1,96</i>
3 000	38,5	2,40
<i>3 500</i>	<i>37,9</i>	<i>2,91</i>
<i>4 000</i>	<i>37,4</i>	<i>3,43</i>
<i>4 500</i>	<i>36,8</i>	<i>3,94</i>
<i>5 000</i>	<i>36,2</i>	<i>4,45</i>
<i>5 200</i>	<i>36,0</i>	<i>4,66</i>
<i>5 400</i>	<i>35,8</i>	<i>4,86</i>
<i>5 600</i>	<i>35,5</i>	<i>5,07</i>
<i>5 800</i>	<i>35,3</i>	<i>5,27</i>
6 000	35,1	5,48

NOTE For convenience, permittivity and conductivity values at those frequencies which are not part of the original data provided by Drossos et al. [33] or the extension to 5 800 MHz are provided (i.e. the values shown *in italics*). These values were linearly interpolated between the values in this table that are immediately above and below these values, except the values at 6 000 MHz that were linearly extrapolated from the values at 3 000 MHz and 5 800 MHz.

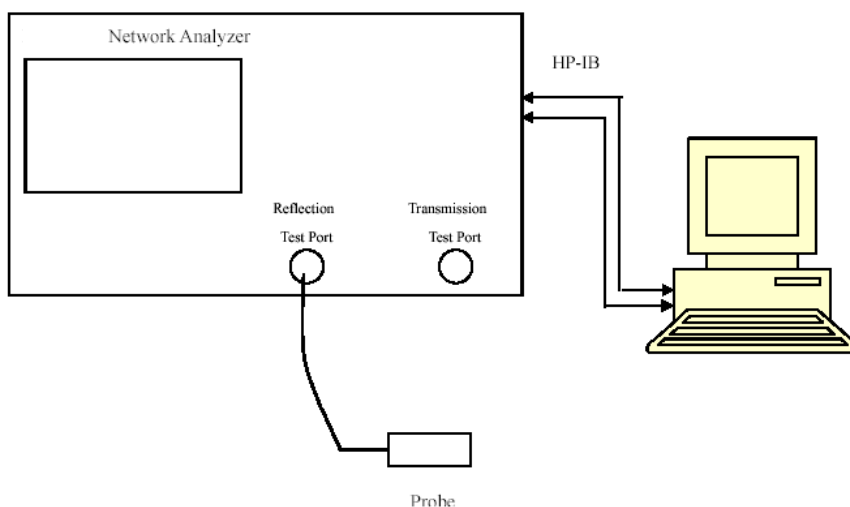
EQUIPMENT LIST AND CALIBRATION

Equipments List & Calibration Information

Equipment	Model	S/N	Calibration Date	Calibration Due Date
DASY5 Test Software	DASY52 52.10.4	N/A	NCR	NCR
DASY5 Measurement Server	DASY5 6.0.31	N/A	NCR	NCR
Data Acquisition Electronics	DAE4	1211	2022/03/01	2023/02/28
E-Field Probe	EX3DV4	7441	2022/05/16	2023/05/15
Mounting Device	MD4HHTV5	SD 000 H01 KA	NCR	NCR
SAM Twin Phantom	SAM-Twin V5.0	1744	NCR	NCR
Dipole,2450MHz	D2450V2	751	2020/10/13	2023/10/12
Dipole,5GHz	D5GHZV2	1301	2020/01/10	2023/01/09
Simulated Tissue Liquid Head(500-9500MHz)	HBBL600-10000V6	180622-2	Each Time	
Network Analyzer	8753D	3410A08288	2022/07/05	2023/07/04
Dielectric Assessment Kit	DAK-3.5	1248	NCR	NCR
Signal Generator	SMB100A	108362	2021/12/23	2022/12/22
USB wideband power sensor	U2021XA	MY52350001	2021/12/23	2022/12/22
Power Amplifier	CBA 1G-070	T44328	2021/12/23	2022/12/22
Linear Power Amplifier	AS0860-40/45	1060913	2021/12/23	2022/12/22
Directional Coupler	4223-20	3.113.277	2021/12/23	2022/12/22
6dB Attenuator	8493B 6dB Attenuator	2708A 04769	2021/12/23	2022/12/22
Spectrum Analyzer	FSV40	101949	2021/12/13	2022/12/12

SAR MEASUREMENT SYSTEM VERIFICATION

Liquid Verification



Liquid Verification Setup Block Diagram

Liquid Verification Results

Frequency (MHz)	Liquid Type	Liquid Parameter		Target Value		Delta (%)		Tolerance (%)
		ϵ_r	σ (S/m)	ϵ_r	σ (S/m)	$\Delta\epsilon_r$	$\Delta\sigma$	
2402	Simulated Tissue Liquid Head	39.727	1.736	39.30	1.76	1.09	-1.36	± 5
2412	Simulated Tissue Liquid Head	39.702	1.747	39.28	1.77	1.07	-1.30	± 5
2437	Simulated Tissue Liquid Head	39.689	1.769	39.23	1.79	1.17	-1.17	± 5
2441	Simulated Tissue Liquid Head	39.677	1.771	39.22	1.79	1.17	-1.06	± 5
2450	Simulated Tissue Liquid Head	39.651	1.782	39.20	1.80	1.15	-1.00	± 5
2462	Simulated Tissue Liquid Head	39.618	1.786	39.18	1.81	1.12	-1.33	± 5
2480	Simulated Tissue Liquid Head	39.609	1.812	39.16	1.83	1.15	-0.98	± 5

*Liquid Verification above was performed on 2022/07/13.

Frequency (MHz)	Liquid Type	Liquid Parameter		Target Value		Delta (%)		Tolerance (%)
		ϵ_r	σ (S/m)	ϵ_r	σ (S/m)	$\Delta\epsilon_r$	$\Delta\sigma$	
5180	Simulated Tissue Liquid Head	37.167	4.723	36.02	4.64	3.18	1.79	± 5
5200	Simulated Tissue Liquid Head	36.953	4.755	36.00	4.66	2.65	2.04	± 5
5240	Simulated Tissue Liquid Head	36.949	4.785	35.96	4.70	2.75	1.81	± 5
5250	Simulated Tissue Liquid Head	36.937	4.808	35.95	4.71	2.75	2.08	± 5
5745	Simulated Tissue Liquid Head	36.021	5.328	35.36	5.22	1.87	2.07	± 5
5785	Simulated Tissue Liquid Head	36.078	5.354	35.32	5.26	2.15	1.79	± 5
5800	Simulated Tissue Liquid Head	36.028	5.366	35.30	5.27	2.06	1.82	± 5
5825	Simulated Tissue Liquid Head	35.923	5.414	35.28	5.30	1.82	2.15	± 5

*Liquid Verification above was performed on 2022/07/13.

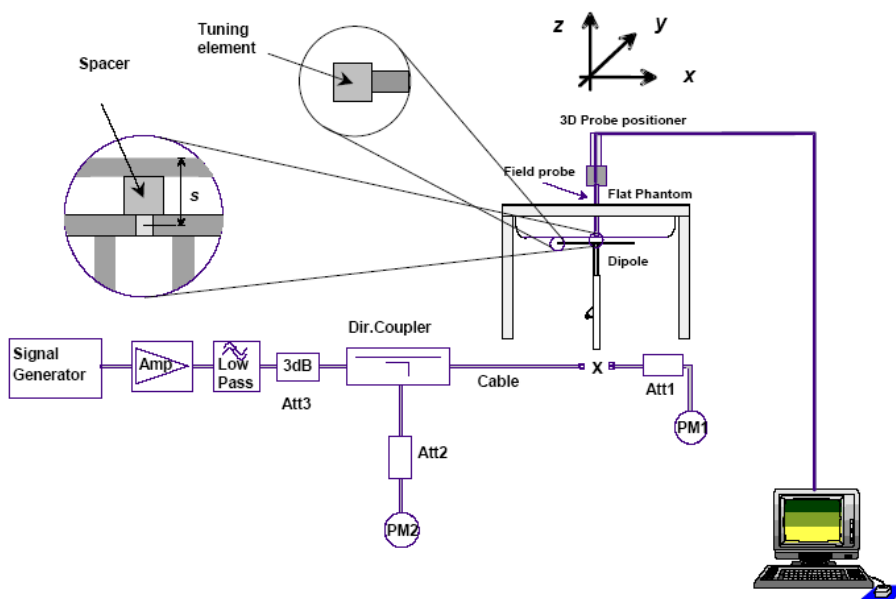
System Accuracy Verification

Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of $\pm 10\%$. The validation results are tabulated below. And also the corresponding SAR plot is attached as well in the SAR plots files.

The spacing distances in the **System Verification Setup Block Diagram** is given by the following:

- a) $s = 15 \text{ mm} \pm 0,2 \text{ mm}$ for $300 \text{ MHz} \leq f \leq 1 \text{ 000 MHz}$;
- b) $s = 10 \text{ mm} \pm 0,2 \text{ mm}$ for $1 \text{ 000 MHz} < f \leq 3 \text{ 000 MHz}$;
- c) $s = 10 \text{ mm} \pm 0,2 \text{ mm}$ for $3 \text{ 000 MHz} < f \leq 6 \text{ 000 MHz}$.

System Verification Setup Block Diagram



System Accuracy Check Results

Date	Frequency Band	Liquid Type	Input Power (mW)	Measured SAR (W/kg)		Normalized to 1W (W/kg)	Target Value (W/kg)	Delta (%)	Tolerance (%)
2022/07/13	2450 MHz	Head	100	1g	5.55	55.5	53.0	4.717	± 10
2022/07/13	5250 MHz	Head	100	1g	7.79	77.9	80.7	-3.470	± 10
2022/07/13	5800 MHz	Head	100	1g	7.68	76.8	80.2	-4.239	± 10

*The SAR values above are normalized to 1 Watt forward power.

SAR SYSTEM VALIDATION DATA**System Performance 2450MHz****DUT: D2450V2; Type: 2450 MHz; Serial: 751**

Communication System: UID 0, CW (0); Frequency: 2450 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.782$ S/m; $\epsilon_r = 39.651$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7441; ConvF(7.54, 7.54, 7.54); Calibrated: 2022/05/16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1211; Calibrated: 2022/03/01
- Phantom: Twin SAM; Type: QD000P40CD; Serial: TP:1744
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

System Performance Check at 2450MHz/d=10mm, Pin=100mw/Area Scan (101x111x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 6.43 W/kg

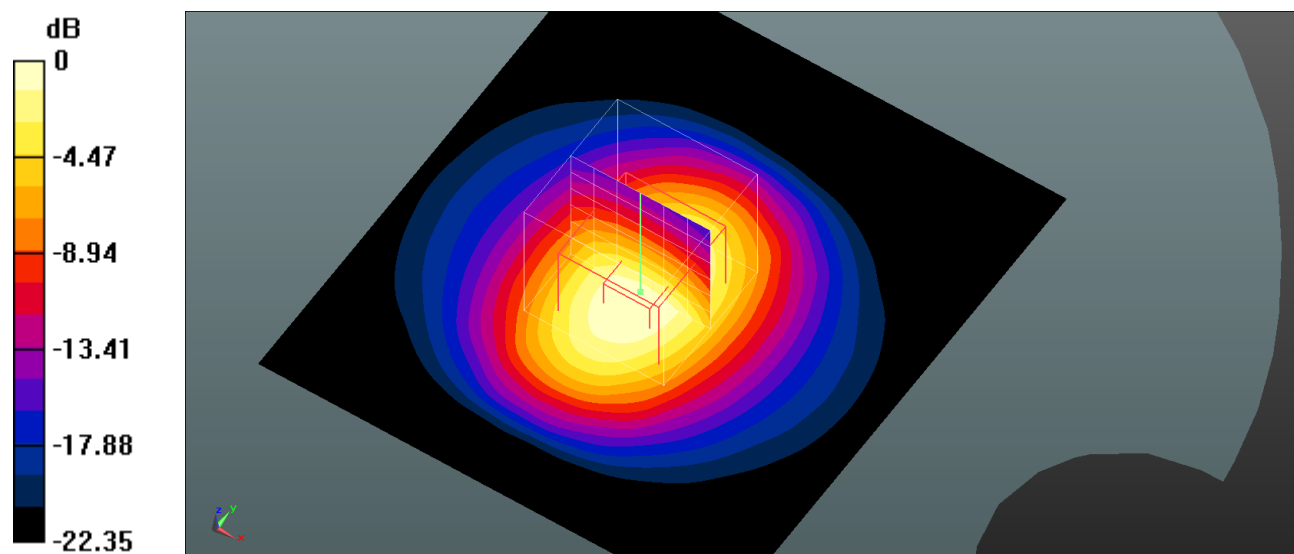
System Performance Check at 2450MHz/d=10mm, Pin=100mw/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 52.96 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 11.1 W/kg

SAR(1 g) = 5.55 W/kg; SAR(10 g) = 2.58 W/kg

Maximum value of SAR (measured) = 6.37 W/kg



0 dB = 6.37 W/kg = 8.04 dBW/kg

System Performance 5250 MHz

DUT: Dipole 5GHz Type: D5GHZV2; Serial: 1301

Communication System: UID 0, CW (0); Frequency: 5250 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5250 \text{ MHz}$; $\sigma = 4.808 \text{ S/m}$; $\epsilon_r = 36.937$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7441; ConvF(5.35, 5.35, 5.35); Calibrated: 2022/05/16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1211; Calibrated: 2022/03/01
- Phantom: Twin SAM; Type: QD000P40CD; Serial: TP:1744
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

System Performance Check at 5250MHz/d=10mm, Pin=100mw/Area Scan (61x81x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 17.3 W/kg

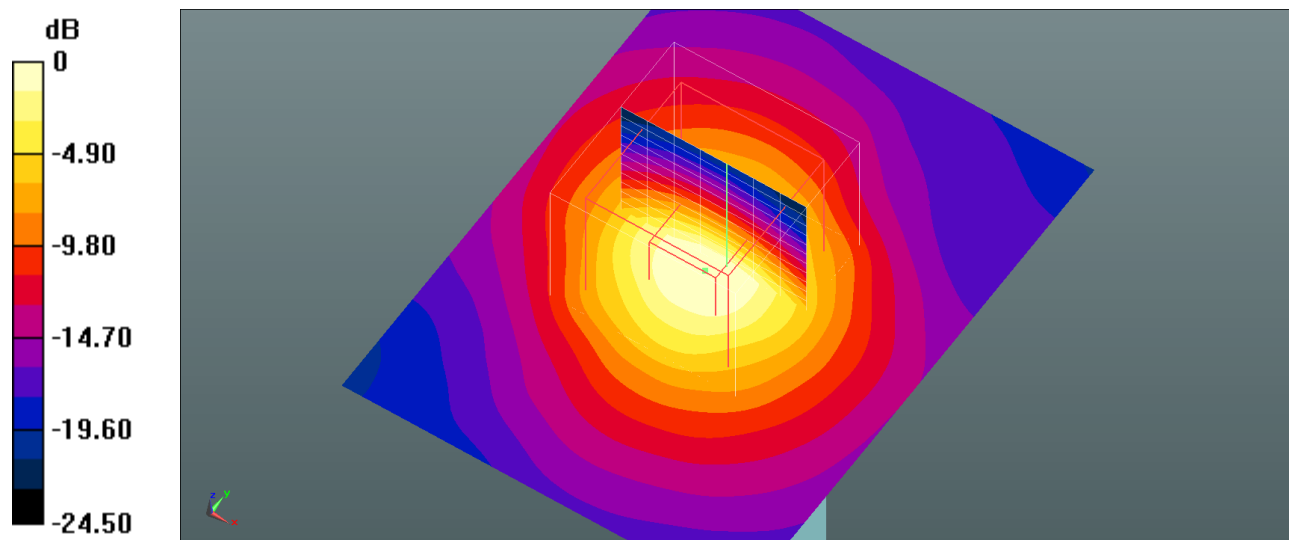
System Performance Check at 5250MHz/d=10mm, Pin=100mw/Zoom Scan (8x8x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 46.82 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 30.6 W/kg

SAR(1 g) = 7.79 W/kg; SAR(10 g) = 2.18 W/kg

Maximum value of SAR (measured) = 16.1 W/kg



0 dB = 16.1 W/kg = 12.07 dBW/kg

System Performance 5800 MHz

DUT: Dipole 5GHz Type: D5GHZV2; Serial: 1301

Communication System: UID 0, CW (0); Frequency: 5800 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 5800 \text{ MHz}$; $\sigma = 5.366 \text{ S/m}$; $\epsilon_r = 36.028$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7441; ConvF(4.83, 4.83, 4.83); Calibrated: 2022/05/16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1211; Calibrated: 2022/03/01
- Phantom: Twin SAM; Type: QD000P40CD; Serial: TP:1744
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

System Performance Check at 5800MHz/d=10mm, Pin=100mw/Area Scan (61x81x1): Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 15.8 W/kg

System Performance Check at 5800MHz/d=10mm, Pin=100mw/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

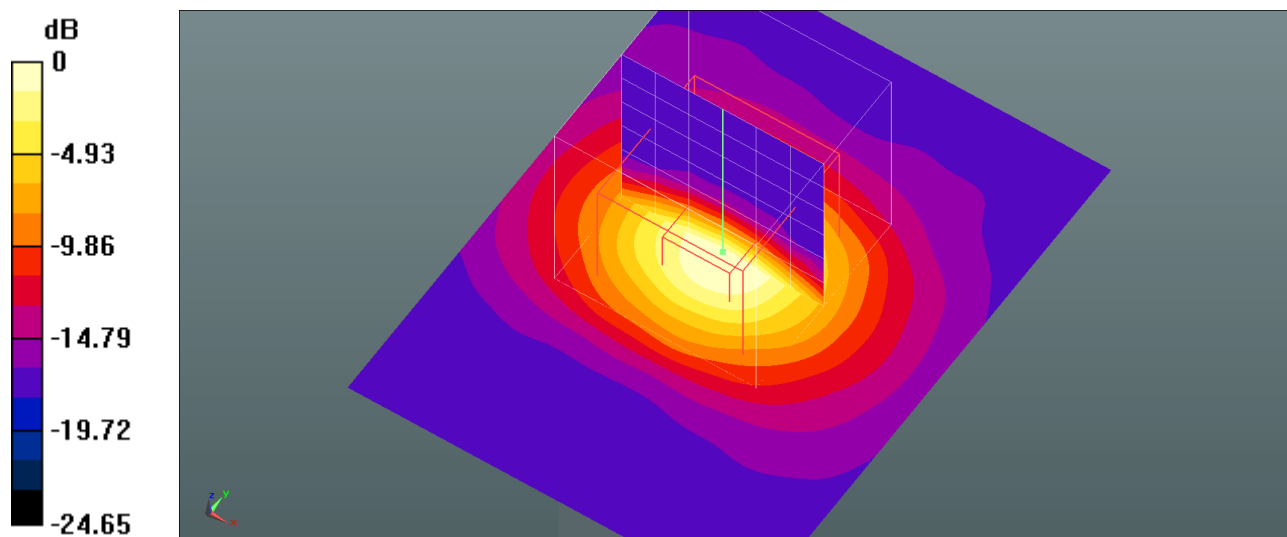
dx=4mm, dy=4mm, dz=2mm

Reference Value = 45.38 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 27.2 W/kg

SAR(1 g) = 7.68 W/kg; SAR(10 g) = 2.13 W/kg

Maximum value of SAR (measured) = 15.2 W/kg



0 dB = 15.2 W/kg = 11.82 dBW/kg

EUT TEST STRATEGY AND METHODOLOGY

Test positions for body Supported and other configurations

A typical example of a body supported device is a wireless enabled laptop device that among other orientations may be supported on the thighs of a sitting user. To represent this orientation, the device shall be positioned with its base against the flat phantom. Other orientations may be specified by the manufacturer in the user instructions. If the intended use is not specified, the device shall be tested directly against the flat phantom in all usable orientations

The screen portion of the device shall be in an open position at a 90 ° angle as seen in Figure 7a (left side), or at an operating angle specified for intended use by the manufacturer in the operating instructions. Where a body supported device has an integral screen required for normal operation, then the screen-side will not need to be tested if it ordinarily remains 200 mm from the body. Where a screen mounted antenna is present, this position shall be repeated with the screen against the flat phantom as shown in Figure 7a) (right side), if this is consistent with the intended use.

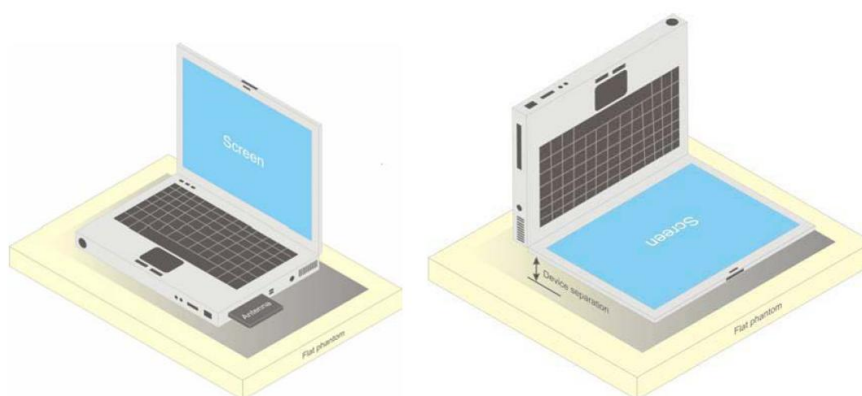
Other devices that fall into this category include tablet type portable computers and credit card transaction authorisation terminals, point-of-sale and/or inventory terminals. Where these devices may be torso or limb-supported, the same principles for body-supported devices are applied. The example in Figure 7b) shows a tablet form factor portable computer for which SAR should be separately assessed with

d) each surface and

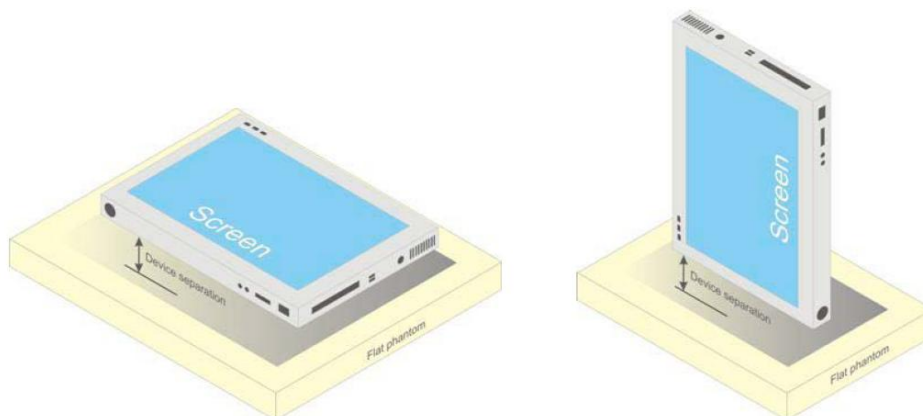
e) the separation distances positioned against the flat phantom that correspond to the intended use as specified by the manufacturer. If the intended use is not specified in the user instructions, the device shall be tested directly against the flat phantom in all usable orientations.

Some body-supported devices may allow testing with an external power supply (e.g. a.c.adapter) supplemental to the battery, but it shall be verified and documented in the measurement report that SAR is still conservative.

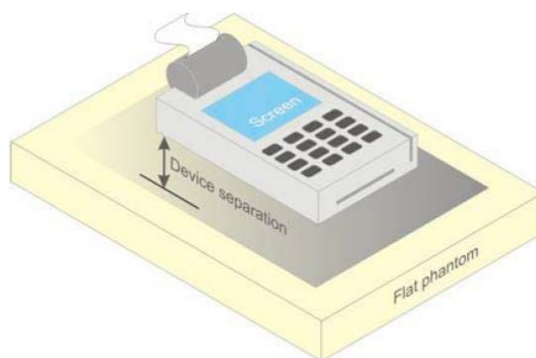
For devices that employ an external antenna with variable positions (e.g. swivel antenna), see 6.1.4.5 and Figure 6.



a) Portable computer with external antenna plug-in-radio-card (left side) or with internal antenna located in screen section (right side)



b) Tablet form factor portable computer



c) Wireless credit card transaction authorisation terminal

Figure 7 – Test positions for body supported devices

Test Distance for SAR Evaluation

For this case the EUT(Equipment Under Test) is set 0mm away from the phantom, the test distance is 0mm.

SAR Evaluation Procedure

The evaluation was performed with the following procedure:

Step 1: Measurement of the SAR value at a fixed location above the ear point or central position was used as a reference value for assessing the power drop. The SAR at this point is measured at the start of the test and then again at the end of the testing.

Step 2: The SAR distribution at the exposed side of the head was measured at a distance of 4 mm from the inner surface of the shell. The area covered the entire dimension of the head or radiating structures of the EUT, the horizontal grid spacing was 15 mm x 15 mm, and the SAR distribution was determined by integrated grid of 1.5mm x 1.5mm. Based on these data, the area of the maximum absorption was determined by spline interpolation. The first Area Scan covers the entire dimension of the EUT to ensure that the hotspot was correctly identified.

Step 3: Around this point, a volume of 30 mm x 30 mm x 30 mm was assessed by measuring 7x 7 x 7 points. On the basis of this data set, the spatial peak SAR value was evaluated under the following procedure:

- 1) The data at the surface were extrapolated, since the center of the dipoles is 1.2 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.3 mm. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.
- 2) The maximum interpolated value was searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g or 10 g) were computed by the 3D-Spline interpolation algorithm. The 3D-Spline is composed of three one dimensional splines with the "Not a knot"-condition (in x, y and z-directions). The volume was integrated with the trapezoidal-algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the averages.

All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

Step 4: Re-measurement of the SAR value at the same location as in Step 1. If the value changed by more than 5%, the evaluation was repeated.

CONDUCTED OUTPUT POWER MEASUREMENT**Maximum Target Output Power**

Max Target Power(dBm)			
Mode/Band	Channel		
	Low	Middle	High
WLAN 2.4G	16.2	16.2	16.2
WLAN 5.2G	11.5	11.5	11.5
WLAN 5.8G	10.5	10.5	10.5
Bluetooth BDR/EDR	12.0	12.0	12.0
BLE	-3.0	-3.0	-3.0

Bluetooth:

Mode	Channel frequency (MHz)	RF Output Power (dBm)
BDR(GFSK)	2402	10.63
	2441	11.83
	2480	9.34
EDR($\pi/4$ -DQPSK)	2402	10.03
	2441	11.17
	2480	8.52
EDR(8DPSK)	2402	10.04
	2441	11.20
	2480	8.41
BLE(1M)	2402	-3.91
	2440	-3.05
	2480	-5.32
BLE(2M)	2402	-4.00
	2440	-3.08
	2480	-5.39

Note:

- The BDR (GFSK) Duty Cycle is 76.73 %.

Wi-Fi 2.4G:

Mode	Channel frequency (MHz)	Data Rate	Conducted Average Output
802.11b	2412	1Mbps	16.05
	2437		16.11
	2462		15.77
802.11g	2412	6Mbps	13.51
	2437		13.71
	2462		13.28
802.11n HT20	2412	MCS0	13.56
	2437		13.76
	2462		13.18
802.11n HT40	2422	MCS0	12.89
	2437		12.72
	2452		12.30

Note:

- The 802.11b Duty Cycle is 99.51%.

LAN 5G:

Mode	Channel frequency	Data Rate	RF Output Power(dBm)
802.11a	5180	6Mbps	11.08
	5200		11.15
	5240		11.27
802.11n HT20	5180	MCS0	10.89
	5200		10.90
	5240		11.03
802.11n HT40	5190	MCS0	11.05
	5230		11.10
802.11AC20	5180	MCS0	10.95
	5200		11.13
	5240		11.09
802.11AC40	5190	MCS0	11.05
	5230		11.12
802.11AC80	5210	MCS0	11.10

Note:

1. The 802.11a Duty Cycle is 96.22%.

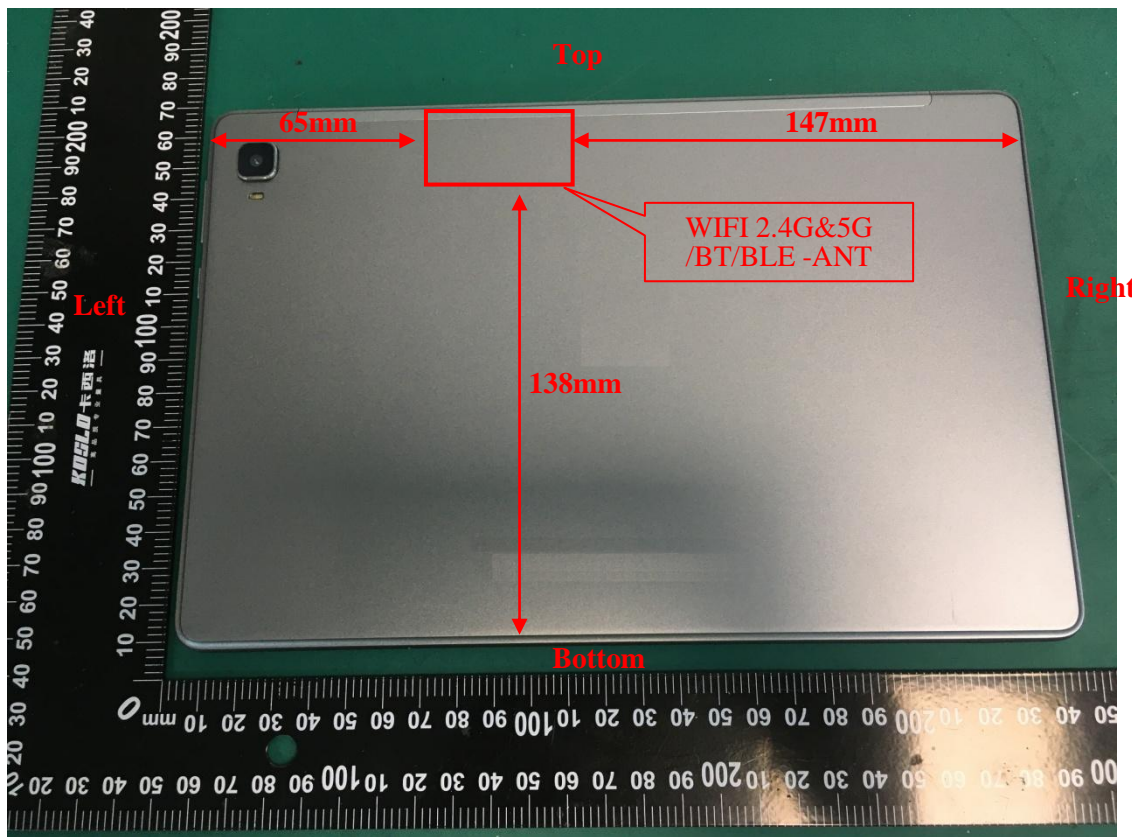
Mode	Channel frequency	Data Rate	RF Output Power(dBm)
802.11a	5745	6Mbps	10.06
	5785		10.27
	5825		10.16
802.11n HT20	5745	MCS0	10.01
	5785		10.07
	5825		10.03
802.11n HT40	5755	MCS0	10.04
	5795		10.13
802.11AC20	5745	MCS0	9.93
	5785		10.03
	5825		10.01
802.11AC40	5755	MCS0	10.05
	5795		10.12
802.11AC80	5775	MCS0	10.01

Note:

1. The 802.11a Duty Cycle is 96.55%.

Standalone SAR test exclusion considerations

Antennas Location:



EUT Back View

Antenna Distance To Edge

Antenna Distance To Edge(mm)						
Antenna	Front	Back	Left	Right	Top	Bottom
WLAN&BT	< 5	< 5	65	147	< 5	138

[KDB 447498 D04]

Table B.2—Example Power Thresholds (mW)

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

The formula for calculating P_{th} is given below, with distances from 20cm to 40cm.

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases} \tag{B.1}$$

The formula for calculating P_{th} is given below, with distances ranging from 0.5cm to 40cm.

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases} \tag{B.2}$$

where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right)$$

and f is in GHz, d is the separation distance (cm), and $ERP_{20\text{cm}}$ is per Formula (B.1).

Standalone SAR test exclusion considerations

Position	Distance (mm)	Mode	Frequency (MHz)	Output Power (dBm)	Antenna gain (dBi)	P _{Max} (mW)	Test exclusion Threshold (mW)	SAR test Exclusion
Back/Top	<5	Bluetooth	2480	12.0	0.5	15.849	2.72	No
		2.4G Wi-Fi	2462	16.2	0.5	41.687	2.73	No
		5.2G Wi-Fi	5240	11.5	0.5	14.125	1.49	No
		5.8G Wi-Fi	5825	10.5	0.5	11.220	1.37	No
Left	65	Bluetooth	2480	12.0	0.5	15.849	359.72	Yes
		2.4G Wi-Fi	2462	16.2	0.5	41.687	360.36	Yes
		5.2G Wi-Fi	5240	11.5	0.5	14.125	299.69	Yes
		5.8G Wi-Fi	5825	10.5	0.5	11.220	292.05	Yes
Right	147	Bluetooth	2480	12.0	0.5	15.849	1702.26	Yes
		2.4G Wi-Fi	2462	16.2	0.5	41.687	1703.09	Yes
		5.2G Wi-Fi	5240	11.5	0.5	14.125	1620.05	Yes
		5.8G Wi-Fi	5825	10.5	0.5	11.220	1607.80	Yes
Bottom	138	Bluetooth	2480	12.0	0.5	15.849	1509.25	Yes
		2.4G Wi-Fi	2462	16.2	0.5	41.687	1510.14	Yes
		5.2G Wi-Fi	5240	11.5	0.5	14.125	1420.97	Yes
		5.8G Wi-Fi	5825	10.5	0.5	11.220	1408.90	Yes

NOTE:

1. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test Exclusion.
2. The Bluetooth based peak power for calculation, and Wi-Fi based average power for calculation.
3. ERP= Max Target Power+ Antenna gain-2.15
4. P_{Max} refers to the greater value in the Max Target Power and ERP.

SAR test exclusion for the EUT edge considerations Result

Exclusion Result						
Mode	Front	Back	Left	Right	Top	Bottom
Bluetooth	Required	Required	Exclusion	Exclusion	Required	Exclusion
2.4GWi-Fi	Required	Required	Exclusion	Exclusion	Required	Exclusion
5.2GWi-Fi	Required	Required	Exclusion	Exclusion	Required	Exclusion
5.8GWi-Fi	Required	Required	Exclusion	Exclusion	Required	Exclusion

Note:

- Exclusion:** testing is not required.
- Required:** testing is required.

SAR MEASUREMENT RESULTS

This page summarizes the results of the performed dosimetric evaluation.

SAR Test Data

Environmental Conditions

Temperature:	22.1-23.0 °C
Relative Humidity:	43-55 %
ATM Pressure:	101.3 kPa
Test Date:	2022/07/13

Testing was performed by Seven Liang, Jacky Yang, Fake ou.

WLAN:

EUT Position	Frequency (MHz)	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/Kg), Limited=1.6 W/kg					
				Power Scaled Factor	duty cycle %	Duty cycle Scaled Factor	Meas.	Scaled SAR	Plot
Body Front (0mm)	2412	16.05	16.2	1.035	99.51	1.005	1.160	1.21	1#
	2437	16.11	16.2	1.021	99.51	1.005	1.180	1.21	2#
	2462	15.77	16.2	1.104	99.51	1.005	1.050	1.16	3#
Body Back (0mm)	2412	16.05	16.2	1.035	99.51	1.005	1.230	1.28	4#
	2437	16.11	16.2	1.021	99.51	1.005	1.110	1.14	5#
	2462	15.77	16.2	1.104	99.51	1.005	0.945	1.05	6#
Body Top (0mm)	2412	/	/	/	/	/	/	/	/
	2437	16.11	16.2	1.021	99.51	1.005	0.742	0.77	7#
	2462	/	/	/	/	/	/	/	/

Note:

1. When the 1-g SAR is $\leq 0.8W/Kg$, testing for other channels are optional.
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 $\leq 1.2 W/kg$, OFDM SAR is not required.
3. When SAR or MPE is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance.
4. When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 80211b/g/n mode is use for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band.
5. According 2016 Oct. TCB, for SAR testing 2.4G WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)".

EUT Position	Frequency (MHz)	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/Kg), Limited=1.6 W/kg					
				Power Scaled Factor	duty cycle %	Duty cycle Scaled Factor	Meas.	Scaled SAR	Plot
Body Front (0mm)	5180	/	/	/	/	/	/	/	/
	5200	11.15	11.5	1.084	96.22	1.04	0.904	1.02	8#
	5240	/	/	/	/	/	/	/	/
Body Back (0mm)	5180	/	/	/	/	/	/	/	/
	5200	11.15	11.5	1.084	96.22	1.04	0.216	0.25	9#
	5240	/	/	/	/	/	/	/	/
Body Top (0mm)	5180	/	/	/	/	/	/	/	/
	5200	11.15	11.5	1.084	96.22	1.04	0.383	0.44	10#
	5240	/	/	/	/	/	/	/	/

EUT Position	Frequency (MHz)	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/Kg), Limited=1.6 W/kg					
				Power Scaled Factor	duty cycle %	Duty cycle Scaled Factor	Meas.	Scaled SAR	Plot
Body Front (0mm)	5745	10.06	10.5	1.107	96.55	1.036	1.35	1.55	11#
	5785	10.27	10.5	1.054	96.55	1.036	1.43	1.56	12#
	5825	10.16	10.5	1.081	96.55	1.036	1.15	1.29	13#
Body Back (0mm)	5745	10.06	10.5	1.107	96.55	1.036	1.11	1.28	14#
	5785	10.27	10.5	1.054	96.55	1.036	1.35	1.48	15#
	5825	10.16	10.5	1.081	96.55	1.036	1.18	1.33	16#
Body Top (0mm)	5745	10.06	10.5	1.107	96.55	1.036	1.05	1.21	17#
	5785	10.27	10.5	1.054	96.55	1.036	1.10	1.21	18#
	5825	10.16	10.5	1.081	96.55	1.036	1.17	1.32	19#

Note:

1. When the SAR value is less than half of the limit, testing for other channels are optional.
2. When SAR or MPE is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance
3. According 2016 Oct. TCB, for SAR testing 5G WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)".

Bluetooth:

EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/Kg), Limited=1.6 W/kg					
					Power Scaled Factor	duty cycle %	Duty cycle Scaled Factor	Meas.	Scaled SAR	Plot
Body Front (0mm)	2402	BDR(GFSK)	/	/	/	/	/	/	/	/
	2441	BDR(GFSK)	11.83	12.0	1.040	76.73	1.303	0.083	0.12	20#
	2480	BDR(GFSK)	/	/	/	/	/	/	/	/
Body Back (0mm)	2402	BDR(GFSK)	/	/	/	/	/	/	/	/
	2441	BDR(GFSK)	11.83	12.0	1.040	76.73	1.303	0.103	0.14	21#
	2480	BDR(GFSK)	/	/	/	/	/	/	/	/
Body Top (0mm)	2402	BDR(GFSK)	/	/	/	/	/	/	/	/
	2441	BDR(GFSK)	11.83	12.0	1.040	76.73	1.303	0.050	0.08	22#
	2480	BDR(GFSK)	/	/	/	/	/	/	/	/

Note:

1. When the SAR value is less than half of the limit, testing for other channels are optional.
2. When SAR or MPE is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance

SAR Measurement Variability

In accordance with published RF Exposure KDB procedure 865664 D01 SAR measurement 100 MHz to 6 GHz v01. 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

- 1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.
- 2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
- 3) 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).
- 4) 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.

Note: The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.

The Highest Measured SAR Configuration in Each Frequency Band

Body

SAR probe calibration point	Frequency Band	Freq.(MHz)	EUT Position	Meas. SAR (W/kg)		Largest to Smallest SAR Ratio
				Original	Repeated	
2450MHz (2400MHz-2550MHz)	WLAN 2.4G	2437	Body Front	1.18	1.16	1.02
2450MHz (2400MHz-2550MHz)	WLAN 2.4G	2412	Body Back	1.23	1.18	1.04
5750MHz (5700MHz-5860MHz)	WLAN 5.2G	5200	Body Front	0.904	0.887	1.02
5750MHz (5700MHz-5860MHz)	WLAN 5.8G	5785	Body Front	1.43	1.38	1.04
5750MHz (5700MHz-5860MHz)	WLAN 5.8G	5785	Body Back	1.35	1.29	1.05
5750MHz (5700MHz-5860MHz)	WLAN 5.8G	5825	Body Top	1.17	1.12	1.04

Note:

1. Second Repeated Measurement is not required since the ratio of the largest to smallest SAR for the original and first repeated measurement is not > 1.20.
2. The measured SAR results **do not** have to be scaled to the maximum tune-up tolerance to determine if repeated measurements are required.
3. SAR measurement variability must be assessed for each frequency band, which is determined by the **SAR probe calibration point and tissue-equivalent medium** used for the device measurements..

SAR SIMULTANEOUS TRANSMISSION DESCRIPTION

Simultaneous Transmission:

Description of Simultaneous Transmit Capabilities		
Transmitter Combination	Simultaneous?	Hotspot?
2.4G WLAN + Bluetooth	×	×
5G WLAN + Bluetooth	×	×

SAR Plots

Please Refer to the Attachment.

APPENDIX A MEASUREMENT UNCERTAINTY

The uncertainty budget has been determined for the measurement system and is given in the following Table.

Measurement uncertainty evaluation for IEEE1528-2013 SAR test

Source of uncertainty	Tolerance/uncertainty y ± %	Probability distribution	Divisor	ci (1 g)	ci (10 g)	Standard uncertainty ± %, (1 g)	Standard uncertainty ± %, (10 g)
Measurement system							
Probe calibration	6.55	N	1	1	1	6.6	6.6
Axial Isotropy	4.7	R	$\sqrt{3}$	1	1	2.7	2.7
Hemispherical Isotropy	9.6	R	$\sqrt{3}$	0	0	0.0	0.0
Boundary effect	1.0	R	$\sqrt{3}$	1	1	0.6	0.6
Linearity	4.7	R	$\sqrt{3}$	1	1	2.7	2.7
Detection limits	1.0	R	$\sqrt{3}$	1	1	0.6	0.6
Readout electronics	0.3	N	1	1	1	0.3	0.3
Response time	0.0	R	$\sqrt{3}$	1	1	0.0	0.0
Integration time	0.0	R	$\sqrt{3}$	1	1	0.0	0.0
RF ambient conditions – noise	1.0	R	$\sqrt{3}$	1	1	0.6	0.6
RF ambient conditions–reflections	1.0	R	$\sqrt{3}$	1	1	0.6	0.6
Probe positioner mech. Restrictions	0.8	R	$\sqrt{3}$	1	1	0.5	0.5
Probe positioning with respect to phantom shell	6.7	R	$\sqrt{3}$	1	1	3.9	3.9
Post-processing	2.0	R	$\sqrt{3}$	1	1	1.2	1.2
Test sample related							
Test sample positioning	2.8	N	1	1	1	2.8	2.8
Device holder uncertainty	6.3	N	1	1	1	6.3	6.3
Drift of output power	5.0	R	$\sqrt{3}$	1	1	2.9	2.9
Phantom and set-up							
Phantom uncertainty (shape and thickness tolerances)	4.0	R	$\sqrt{3}$	1	1	2.3	2.3
Liquid conductivity target)	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2
Liquid conductivity meas.)	2.5	N	1	0.64	0.43	1.6	1.1
Liquid permittivity target)	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4
Liquid permittivity meas.)	2.5	N	1	0.6	0.49	1.5	1.2
Combined standard uncertainty		RSS				12.2	12.0
Expanded uncertainty 95 % confidence interval)						24.3	23.9

Measurement uncertainty evaluation for IEC 62209-2 SAR test

Source of uncertainty	Tolerance/uncertainty ± %	Probability distribution	Divisor	ci (1 g)	ci (10 g)	Standard uncertainty ± %, (1 g)	Standard uncertainty ± %, (10 g)
Measurement system							
Probe calibration	6.55	N	1	1	1	6.6	6.6
Axial Isotropy	4.7	R	$\sqrt{3}$	1	1	2.7	2.7
Hemispherical Isotropy	9.6	R	$\sqrt{3}$	0	0	0.0	0.0
Linearity	4.7	R	$\sqrt{3}$	1	1	2.7	2.7
Modulation Response	0.0	R	$\sqrt{3}$	1	1	0.0	0.0
Detection limits	1.0	R	$\sqrt{3}$	1	1	0.6	0.6
Boundary effect	1.0	R	$\sqrt{3}$	1	1	0.6	0.6
Readout electronics	0.3	N	1	1	1	0.3	0.3
Response time	0.0	R	$\sqrt{3}$	1	1	0.0	0.0
Integration time	0.0	R	$\sqrt{3}$	1	1	0.0	0.0
RF ambient conditions – noise	1.0	R	$\sqrt{3}$	1	1	0.6	0.6
RF ambient conditions–reflections	1.0	R	$\sqrt{3}$	1	1	0.6	0.6
Probe positioner mech. Restrictions	0.8	R	$\sqrt{3}$	1	1	0.5	0.5
Probe positioning with respect to phantom shell	6.7	R	$\sqrt{3}$	1	1	3.9	3.9
Post-processing	2.0	R	$\sqrt{3}$	1	1	1.2	1.2
Test sample related							
Device holder Uncertainty	6.3	N	1	1	1	6.3	6.3
Test sample positioning	2.8	N	1	1	1	2.8	2.8
Power scaling	4.5	R	$\sqrt{3}$	1	1	2.6	2.6
Drift of output power	5.0	R	$\sqrt{3}$	1	1	2.9	2.9
Phantom and set-up							
Phantom uncertainty (shape and thickness tolerances)	4.0	R	$\sqrt{3}$	1	1	2.3	2.3
Algorithm for correcting SAR for deviations in permittivity and conductivity	1.9	N	1	1	0.84	1.1	0.9
Liquid conductivity (meas.)	2.5	N	1	0.64	0.43	1.6	1.1
Liquid permittivity (meas.)	2.5	N	1	0.6	0.49	1.5	1.2
Temp. unc. - Conductivity	1.7	R	$\sqrt{3}$	0.78	0.71	0.8	0.7
Temp. unc. - Permittivity	0.3	R	$\sqrt{3}$	0.23	0.26	0.0	0.0
Combined standard uncertainty		RSS				12.2	12.1
Expanded uncertainty 95 % confidence interval)						24.5	24.2

APPENDIX B EUT TEST POSITION PHOTOS

Please Refer to the Attachment.

APPENDIX C PROBE CALIBRATION CERTIFICATES

Please Refer to the Attachment.

APPENDIX D DIPOLE CALIBRATION CERTIFICATES

Please Refer to the Attachment.

******* END OF REPORT *******