TEST REPORT

Applicant Name : Fanvil Technology Co., LTD.
Address : 10/F Block A, Dualshine Global Science Innovation, Honglang North 2nd Road, Bao'an District,Shenzhen, 518101, China
Report Number : SZNS220815-37077E-SA
FCC ID: 2APPZ-W611W

Test Standard (s)

FCC Part 2.1093

Sample Description

Product Type: Portable Wi-Fi Phone
Model No.: W611W
Multiple Model(s) No.: N/A
Trade Mark: LINKVIL
Date Received: 2022/08/31
Date of Test: 2022/09/01-2022/09/02
Report Date: 2022/09/26

Test Result:	Pass*

* 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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<table>
<tr><th colspan="4">Attestation of Test Results</th></tr>
<tr><th colspan="2">MODE</th><th>Max. SAR Level(s) Reported(W/kg)</th><th>Limit (W/kg)</th></tr>
<tr><td rowspan="2">2.4G Wi-Fi</td><td>1g Head SAR</td><td>0.79</td><td rowspan="10">1.6</td></tr>
<tr><td>1g Body SAR</td><td>0.72</td></tr>
<tr><td rowspan="2">5..2G Wi-Fi</td><td>1g Head SAR</td><td>0.16</td></tr>
<tr><td>1g Body SAR</td><td>0.79</td></tr>
<tr><td rowspan="2">5.8G Wi-Fi</td><td>1g Head SAR</td><td>0.17</td></tr>
<tr><td>1g Body SAR</td><td>0.72</td></tr>
<tr><td rowspan="2">Bluetooth</td><td>1g Head SAR</td><td>0.03</td></tr>
<tr><td>1g Body SAR</td><td>0.03</td></tr>
<tr><td rowspan="2">Simultaneous</td><td>1g Head SAR</td><td>0.91</td></tr>
<tr><td>1g Body SAR</td><td>1.26</td></tr>
<tr><td rowspan="5">Applicable Standards</td><td colspan="3">FCC 47 CFR part 2.1093
Radiofrequency radiation exposure evaluation: portable devices</td></tr>
<tr><td colspan="3">RF Exposure Procedures: TCB Workshop October 2016(Bluetooth Duty Factor)</td></tr>
<tr><td colspan="3">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</td></tr>
<tr><td colspan="3">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)</td></tr>
<tr><td colspan="3">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</td></tr>
<tr><td colspan="4">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.
The results and statements contained in this report pertain only to the device(s) evaluated.</td></tr>
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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	SZNS220815-37077E-SA	Original Report	2022/09/26

EUT DESCRIPTION

This report has been prepared on behalf of ***Fanvil Technology Co., LTD.*** and their product ***Portable Wi-Fi Phone***, Model: **W611W**, FCC ID: **2APPZ-W611W** 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
Body-Worn Accessories:	Headset
Face-Head Accessories:	None
Hotspots:	None
Operation Mode :	Wi-Fi and Bluetooth
Frequency Band:	Wi-Fi 2.4G: 2412 -2462 MHz(TX&RX) Wi-Fi 5.2G:5150-5250MHz(TX&RX) Wi-Fi 5.8G:5725-5850MHz(TX&RX) Bluetooth: 2402 -2480 MHz(TX&RX) BLE: 2402 -2480 MHz(TX&RX)
Power Source:	Rechargeable Battery
Normal Operation:	Head and Body-worn

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 (ISEDC), the Registration Number is 5077A.

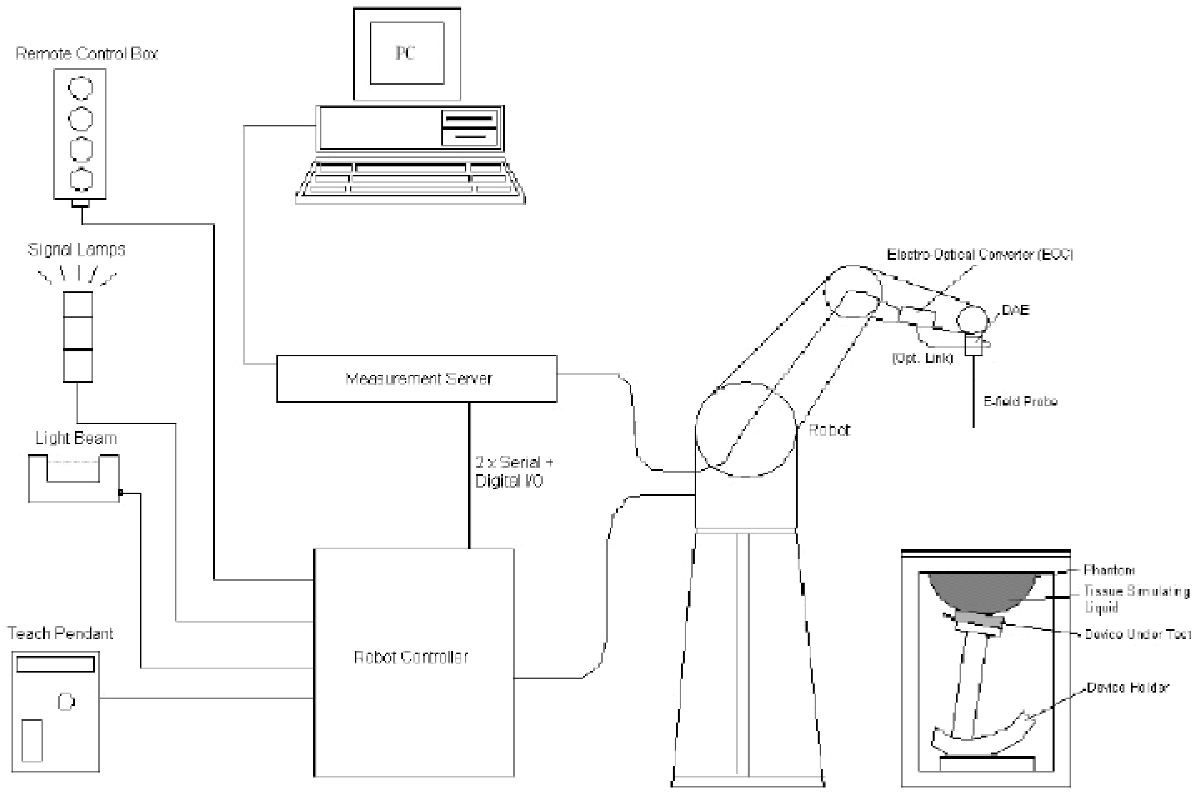
The test site has been registered with ISED Canada under ISED Canada Registration Number CN0016.

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 200MOhm; 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
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	$3 \text{ GHz} < f \leq 10$ 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 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	δ 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
750	*41,9*	*0,89*
835	41,5	0,90
900	41,5	0,97
1 450	40,5	1,20
1 500	*40,4*	*1,23*
1 640	*40,2*	*1,31*
1 750	*40,1*	*1,37*
1 800	40,0	1,40
1 900	40,0	1,40
2 000	40,0	1,40
2 100	*39,8*	*1,49*
2 300	*39,5*	*1,67*
2 450	39,2	1,80
2 600	*39,0*	*1,96*
3 000	38,5	2,40
3 500	*37,9*	*2,91*
4 000	*37,4*	*3,43*
4 500	*36,8*	*3,94*
5 000	*36,2*	*4,45*
5 200	*36,0*	*4,66*
5 400	*35,8*	*4,86*
5 600	*35,5*	*5,07*
5 800	*35,3*	*5,27*
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.

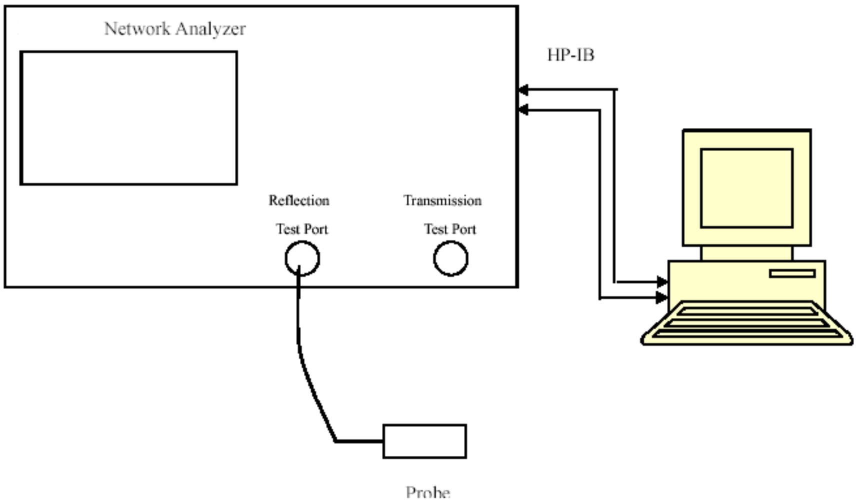
EQUIPMENT LIST AND CALIBRATION

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	HBBL600-10000V6	SL AAH U16 BC	Each Time	
Network Analyzer	8753D	3410A08288	2022/07/06	2023/07/05
Dielectric Assessment Kit	DAK-3.5	1320	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	Ơ (S/m)	ε_r	Ơ (S/m)	$\Delta\varepsilon_r$	ΔƠ	
2402	Simulated Tissue Liquid Head	40.379	1.738	39.30	1.76	2.75	-1.25	±5
2412	Simulated Tissue Liquid Head	40.302	1.757	39.26	1.78	2.65	-1.29	±5
2437	Simulated Tissue Liquid Head	40.223	1.762	39.22	1.79	2.56	-1.56	±5
2441	Simulated Tissue Liquid Head	40.239	1.761	39.22	1.79	2.60	-1.62	±5
2450	Simulated Tissue Liquid Head	40.147	1.778	39.20	1.80	2.42	-1.22	±5
2462	Simulated Tissue Liquid Head	40.177	1.785	39.18	1.81	2.54	-1.38	±5
2480	Simulated Tissue Liquid Head	40.066	1.804	39.16	1.83	2.31	-1.42	±5

**Liquid Verification above was performed on 2022/09/01.*

Frequency (MHz)	Liquid Type	Liquid Parameter		Target Value		Delta (%)		Tolerance (%)
		ε_r	Ơ (S/m)	ε_r	Ơ (S/m)	$\Delta\varepsilon_r$	ΔƠ	
5180	Simulated Tissue Liquid Head	34.981	4.605	36.02	4.65	-2.88	-0.97	±5
5200	Simulated Tissue Liquid Head	35.357	4.623	36.00	4.66	-1.79	-0.79	±5
5240	Simulated Tissue Liquid Head	35.406	4.662	35.96	4.70	-1.54	-0.81	±5
5250	Simulated Tissue Liquid Head	35.286	4.677	35.95	4.71	-1.85	-0.7	±5
5745	Simulated Tissue Liquid Head	34.591	5.192	35.36	5.21	-2.17	-0.35	±5
5785	Simulated Tissue Liquid Head	34.598	5.227	35.32	5.26	-2.04	-0.63	±5
5800	Simulated Tissue Liquid Head	34.496	5.263	35.30	5.27	-2.28	-0.13	±5
5825	Simulated Tissue Liquid Head	34.502	5.259	35.28	5.29	-2.21	-0.59	±5

**Liquid Verification above was performed on 2022/09/02.*

System Accuracy Verification

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

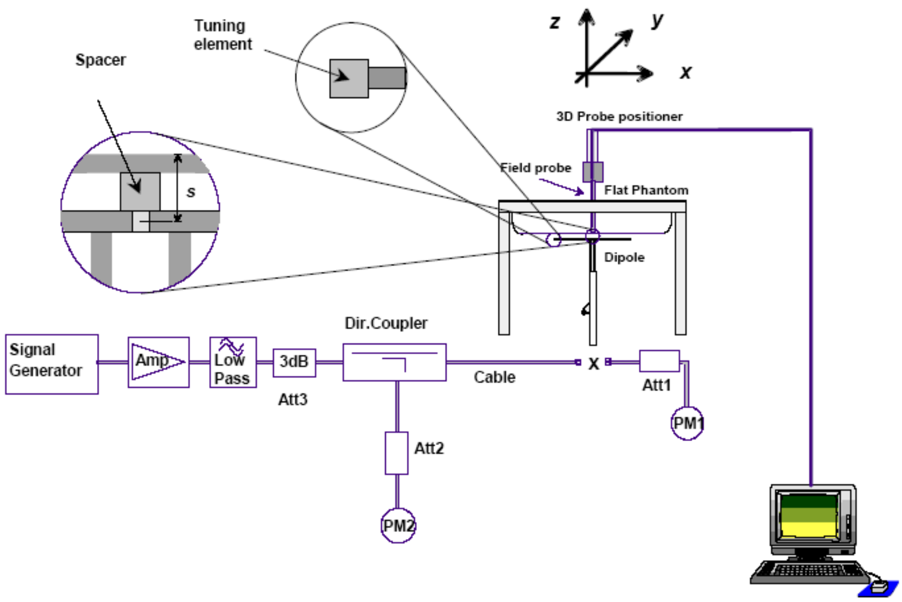
The spacing distances in the **System Verification Setup Block Diagram** is given by the following:

a) s = 15 mm ± 0,2 mm for 300 MHz ≤ f ≤ 1 000 MHz;

b) s = 10 mm ± 0,2 mm for 1 000 MHz < f ≤ 3 000 MHz;

c) s = 10 mm ± 0,2 mm for 3 000 MHz < f ≤ 6 000 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 (%)
2022/09/01	2450 MHz	Head	100	1g	5.58	55.8	53.0	5.283	±10
2022/09/02	5250 MHz	Head	100	1g	7.74	77.4	80.7	-4.089	±10
2022/09/02	5800 MHz	Head	100	1g	7.65	76.5	80.2	-4.613	±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

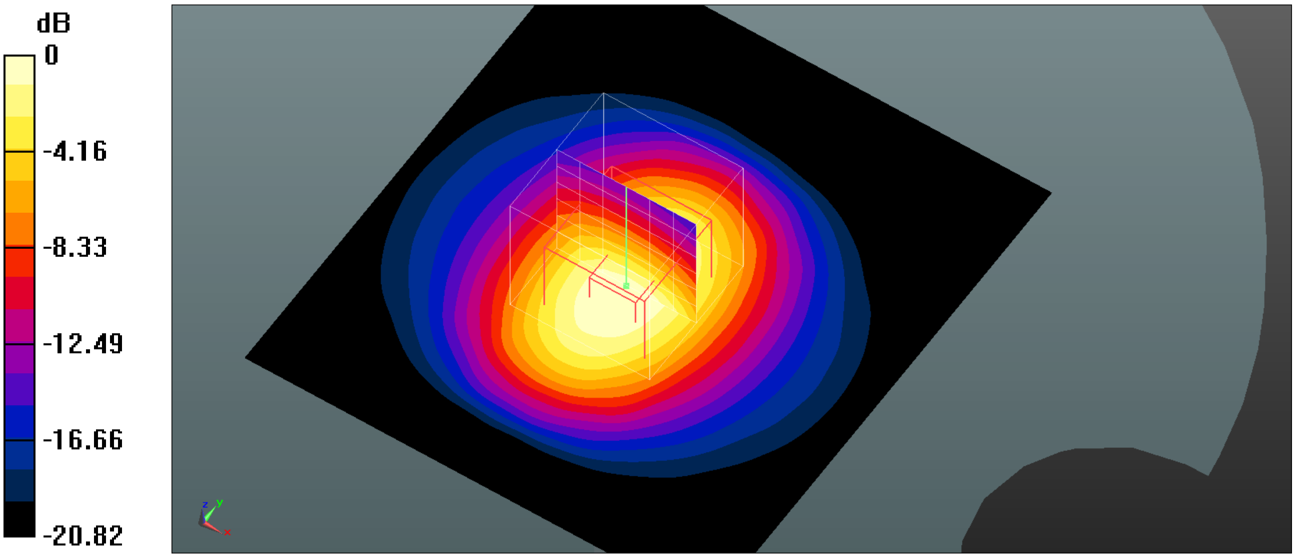
Communication System: UID 0, CW (0); Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.778 S/m; ε_r = 40.147; ρ = 1000 kg/m^3
Phantom section: Flat Section

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 Cheek at 2450MHz/d=10mm, Pin=100mw/Area Scan (101x111x1): Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 6.38 W/kg

System Performance Cheek at 2450MHz/d=10mm, Pin=100mw/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.84 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 11.4 W/kg
SAR(1 g) = 5.58 W/kg; SAR(10 g) = 2.56 W/kg
Maximum value of SAR (measured) = 6.36 W/kg



0 dB = 6.36 W/kg = 8.03 dBW/kg

System Performance 5250 MHz

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

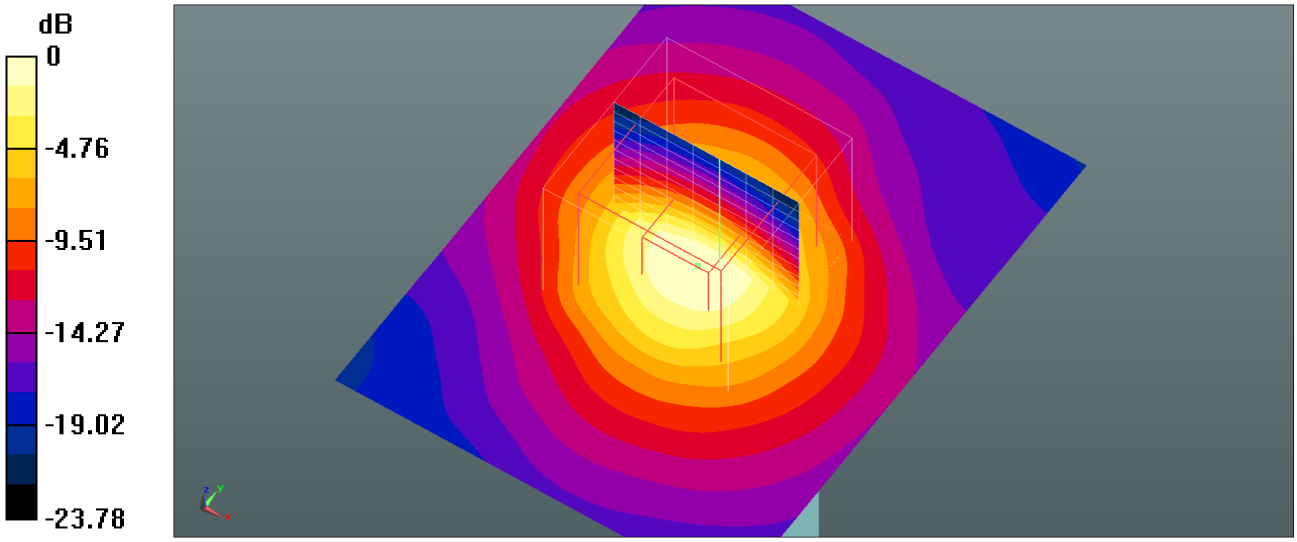
Communication System: UID 0, CW (0); Frequency: 5250 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5250 MHz; σ = 4.677 S/m; ε_r = 35.286; ρ = 1000 kg/m^3
Phantom section: Flat Section

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 Cheek at 5250MHz/d=10mm, Pin=100mw/Area Scan (61x81x1): Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 16.5 W/kg

System Performance Cheek at 5250MHz/d=10mm, Pin=100mw/Zoom Scan (8x8x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 48.12 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 29.8 W/kg
SAR(1 g) = 7.74 W/kg; SAR(10 g) = 2.22 W/kg
Maximum value of SAR (measured) = 15.1 W/kg



0 dB = 15.1 W/kg = 11.79 dBW/kg

System Performance 5800 MHz

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

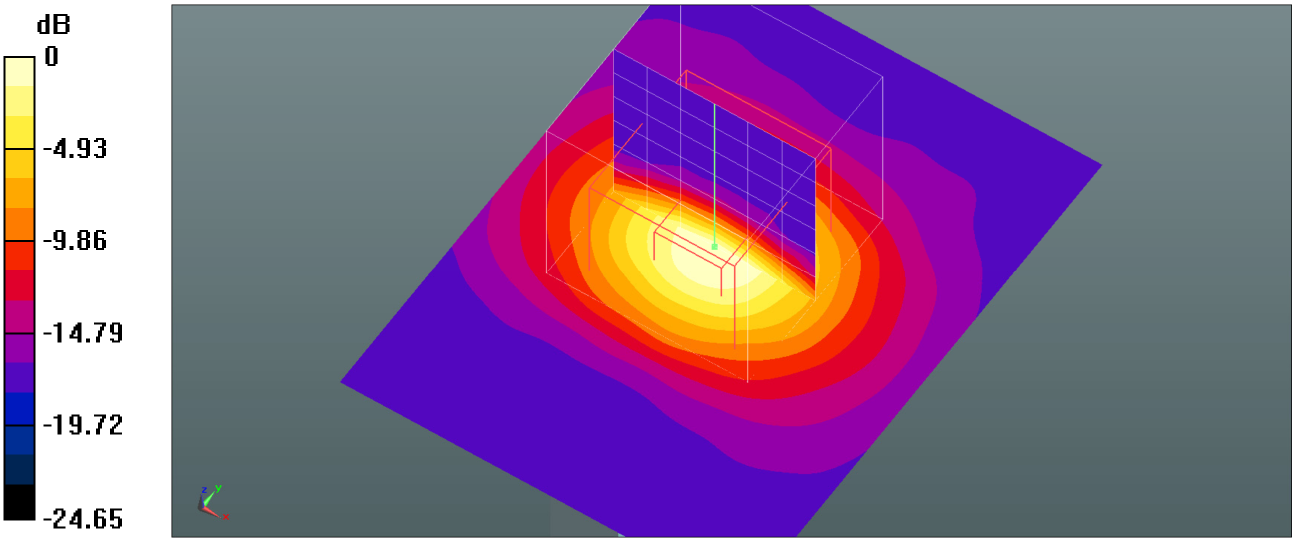
Communication System: UID 0, CW (0); Frequency: 5800 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5800 MHz; σ = 5.263 S/m; ε_r = 34.496; ρ = 1000 kg/m^3
Phantom section: Flat Section

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 Cheek at 5800MHz/d=10mm, Pin=100mw/Area Scan (61x81x1): Measurement grid: dx=10 mm, dy=10 mm
Maximum value of SAR (interpolated) = 15.2 W/kg

System Performance Cheek at 5800MHz/d=10mm, Pin=100mw/Zoom Scan (8x8x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 45.04 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 26.4 W/kg
SAR(1 g) = 7.65 W/kg; SAR(10 g) = 2.16 W/kg
Maximum value of SAR (measured) = 14.6 W/kg



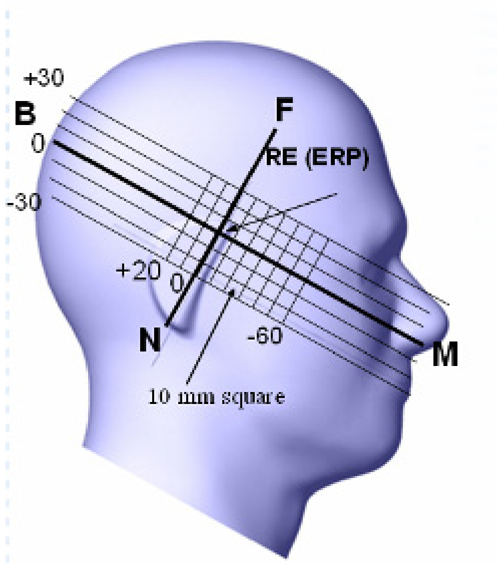
0 dB = 14.6 W/kg = 11.64 dBW/kg

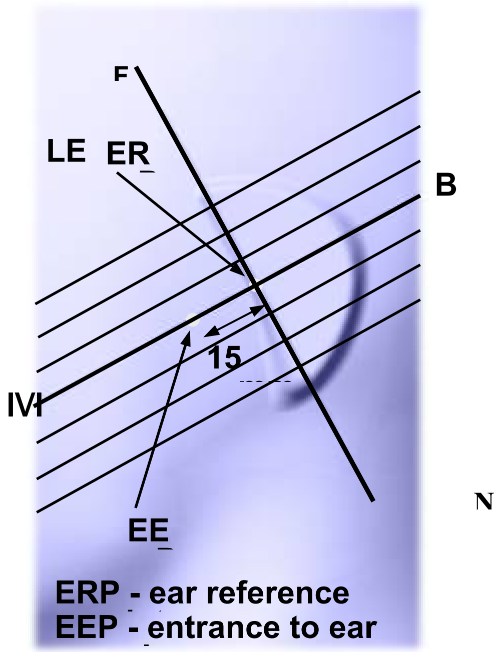
EUT TEST STRATEGY AND METHODOLOGY

Test Positions for Device Operating Next to a Person's Ear

This category includes most wireless handsets with fixed, retractable or internal antennas located toward the top half of the device, with or without a foldout, sliding or similar keypad cover. The handset should have its earpiece located within the upper ¼ of the device, either along the centerline or off-centered, as perceived by its users. This type of handset should be positioned 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". The "test device reference point" should be located at the same level as the center of the earpiece region. The "vertical centerline" should bisect the front surface of the handset at its top and bottom edges. A "ear reference point" is located on the outer surface of the head phantom on each ear spacer. It is located 1.5 cm above the center of the ear canal entrance in the "phantom reference plane" defined by the three lines joining the center of each "ear reference point" (left and right) and the tip of the mouth.

A handset should be initially positioned with the earpiece region pressed against the ear spacer of a head phantom. For the SCC-34/SC-2 head phantom, the device should be positioned parallel to the "N-F" line defined along the base of the ear spacer that contains the "ear reference point". For interim head phantoms, the device should be positioned parallel to the cheek for maximum RF energy coupling. The "test device reference point" is aligned to the "ear reference point" on the head phantom and the "vertical centerline" is aligned to the "phantom reference plane". This is called the "initial ear position". While maintaining these three alignments, the body of the handset is gradually adjusted to each of the following positions for evaluating SAR:





Cheek/Touch Position

The device is brought toward the mouth of the head phantom by pivoting against the "ear reference point" or along the "N-F" line for the SCC-34/SC-2 head phantom.

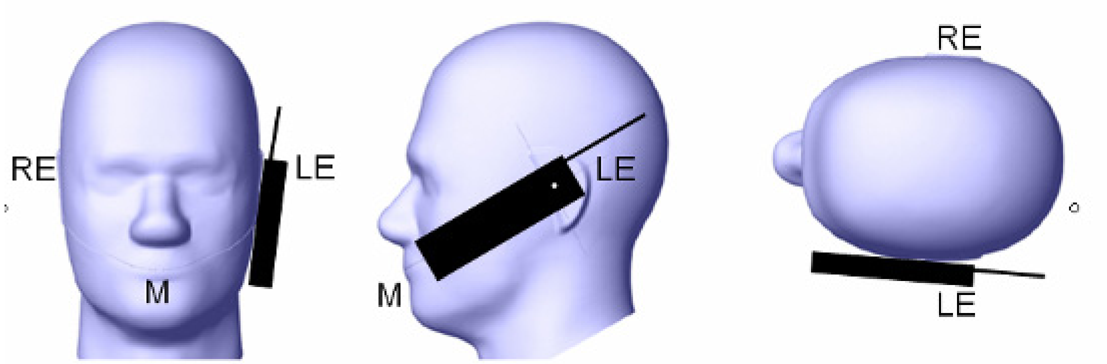
This test position is established:

When any point on the display, keypad or mouthpiece portions of the handset is in contact with the phantom.

(or) When any portion of a foldout, sliding or similar keypad cover opened to its intended self-adjusting normal use position is in contact with the cheek or mouth of the phantom.

For existing head phantoms – when the handset loses contact with the phantom at the pivoting point, rotation should continue until the device touches the cheek of the phantom or breaks its last contact from the ear spacer.

Cheek /Touch Position



Ear/Tilt Position

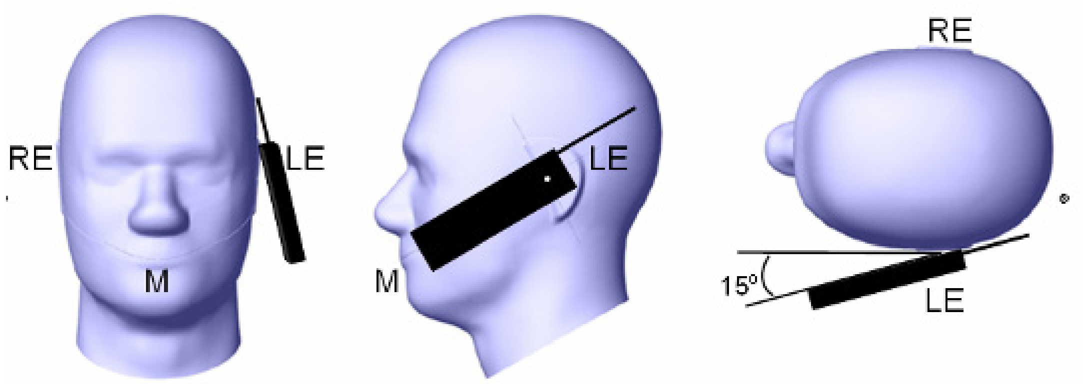
With the handset aligned in the "Cheek/Touch Position":

1) If the earpiece of the handset is not in full contact with the phantom's ear spacer (in the "Cheek/Touch position") and the peak SAR location for the "Cheek/Touch" position is located at the ear spacer region or corresponds to the earpiece region of the handset, the device should be returned to the "initial ear position" by rotating it away from the mouth until the earpiece is in full contact with the ear spacer.

2) (otherwise) The handset should be moved (translated) away from the cheek perpendicular to the line passes through both "ear reference points" (note: one of these ear reference points may not physically exist on a split head model) for approximate 2-3 cm. While it is in this position, the device handset is tilted away from the mouth with respect to the "test device reference point" until the inside angle between the vertical centerline on the front surface of the phone and the horizontal line passing through the ear reference point is by 15 80°. After the tilt, it is then moved (translated) back toward the head perpendicular to the line passes through both "ear reference points" until the device touches the phantom or the ear spacer. If the antenna touches the head first, the positioning process should be repeated with a tilt angle less than 15° so that the device and its antenna would touch the phantom simultaneously. This test position may require a device holder or positioner to achieve the translation and tilting with acceptable positioning repeatability.

If a device is also designed to transmit with its keypad cover closed for operating in the head position, such positions should also be considered in the SAR evaluation. The device should be tested on the left and right side of the head phantom in the "Cheek/Touch" and "Ear/Tilt" positions. When applicable, each configuration should be tested with the antenna in its fully extended and fully retracted positions. These test configurations should be tested at the high, middle and low frequency channels of each operating mode; for example, AMPS, CDMA, and TDMA. If the SAR measured at the middle channel for each test configuration (left, right, Cheek/Touch, Tilt/Ear, extended and retracted) is at least 2.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s). If the transmission band of the test device is less than 10 MHz, testing at the high and low frequency channels is optional.

Ear /Tilt 15° Position



Test positions for body-worn and other configurations

Body-worn operating configurations should be tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in normal use configurations. Devices with a headset output should be tested with a headset connected to the device. When multiple accessories that do not contain metallic components are supplied with the device, the device may be tested with only the accessory that dictates the closest spacing to the body. When multiple accessories that contain metallic components are supplied with the device, the device must be tested with each accessory that contains a unique metallic component. If multiple accessories share an identical metallic component (e.g., the same metallic belt-clip used with different holsters with no other metallic components), only the accessory that dictates the closest spacing to the body must be tested.

Body-worn accessories may not always be supplied or available as options for some devices that are intended to be authorized for body-worn use. A separation distance of 1.5 cm between the back of the device and a flat phantom is recommended for testing body-worn SAR compliance under such circumstances. Other separation distances may be used, but they should not exceed 2.5 cm. In these cases, the device may use body-worn accessories that provide a separation distance greater than that tested for the device provided however that the accessory contains no metallic components.

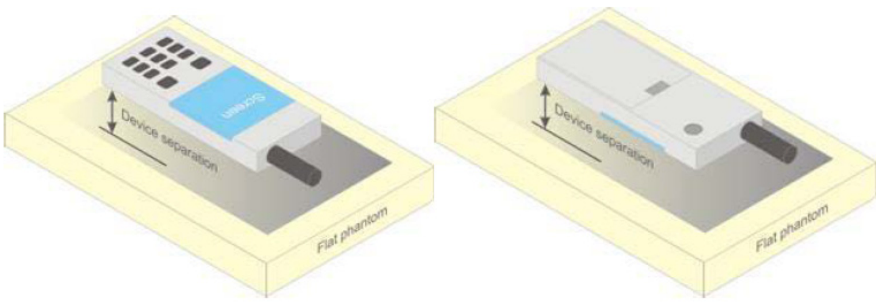


Figure 5 – Test positions for body-worn devices

Test Distance for SAR Evaluation

For this case the EUT(Equipment Under Test) is set 5mm away from the phantom, the test distance is 5mm.

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(ANT 1)	20.0	20.0	20.0
WLAN 2.4G(ANT 2)	18.0	18.0	18.0
WLAN 5.2G(ANT 2)	17.5	17.5	17.5
WLAN 5.8G(ANT 2)	16.5	17.0	18.0
Bluetooth BDR (ANT 2)	8.0	6.5	6.0
Bluetooth EDR(ANT 2)	9.0	7.5	7.5
BLE(ANT 2)	8.5	8.0	7.0

Test Results:

Bluetooth:

Mode	Antenna	Channel frequency (MHz)	RF Output Power (dBm)
BDR(GFSK)	Ant2	2402	7.90
	Ant2	2441	6.32
	Ant2	2480	5.78
EDR(π/4-DQPSK)	Ant2	2402	8.25
	Ant2	2441	6.67
	Ant2	2480	6.82
EDR(8DPSK)	Ant2	2402	8.66
	Ant2	2441	7.16
	Ant2	2480	7.32
BLE(1M)	Ant2	2402	8.18
	Ant2	2440	7.39
	Ant2	2480	6.44
BLE(2M)	Ant2	2402	8.25
	Ant2	2440	7.44
	Ant2	2480	6.78

Wi-Fi 2.4G:

Test Mode	Antenna	Channel	Conducted Average Power[dBm]
802.11b	Ant1	2412	19.18
	Ant2	2412	17.91
	Ant1	2437	19.42
	Ant2	2437	17.97
	Ant1	2462	19.40
	Ant2	2462	17.71
802.11g	Ant1	2412	15.07
	Ant2	2412	15.23
	total	2412	18.22
	Ant1	2437	15.03
	Ant2	2437	13.22
	total	2437	17.21
	Ant1	2462	14.97
	Ant2	2462	12.69
	total	2462	17.03
802.11n HT20	Ant1	2412	15.01
	Ant2	2412	14.24
	total	2412	17.66
	Ant1	2437	14.96
	Ant2	2437	13.37
	total	2437	17.32
	Ant1	2462	14.91
	Ant2	2462	12.84
	total	2462	17.01

Test Mode	Antenna	Frequency [MHz]	Ru Size	Ru Index	Conducted Average Power[dBm]
802.11ax	Ant1	2412	26Tone	RU0	14.14
				RU8	15.38
			52Tone	RU37	14.39
				RU40	15.31
			106Tone	RU53	14.42
				RU54	15.02
			242Tone	RU61	14.91
	Ant2	2412	26Tone	RU0	14.24
				RU8	14.68
			52Tone	RU37	12.44
				RU40	12.77
			106Tone	RU53	12.65
				RU54	12.71
			242Tone	RU61	11.74
	total	2412	26Tone	RU0	17.14
				RU8	18.06
			52Tone	RU37	16.48
				RU40	17.18
			106Tone	RU53	16.61
				RU54	17.07
			242Tone	RU61	16.68
	Ant1	2437	26Tone	RU0	14.40
				RU8	15.17
			52Tone	RU37	14.42
				RU40	15.09
			106Tone	RU53	14.57
				RU54	15.19
			242Tone	RU61	14.21
	Ant2	2437	26Tone	RU0	13.63
				RU8	14.05
			52Tone	RU37	12.86
				RU40	12.03
			106Tone	RU53	11.78
				RU54	13.02
			242Tone	RU61	11.76
	total	2437	26Tone	RU0	17.07
				RU8	17.59
			52Tone	RU37	16.70
				RU40	16.78
			106Tone	RU53	16.41
				RU54	17.27
			242Tone	RU61	16.05
	Ant1	2462	26Tone	RU0	14.59
				RU8	15.56
			52Tone	RU37	14.94
				RU40	15.52
			106Tone	RU53	14.83
				RU54	15.53
			242Tone	RU61	14.62
	Ant2	2462	26Tone	RU0	12.05
				RU8	12.64
			52Tone	RU37	11.03
				RU40	11.64
			106Tone	RU53	11.34
				RU54	11.67
			242Tone	RU61	11.77
	total	2462	26Tone	RU0	16.62
				RU8	17.37

			52Tone	RU37	16.35
				RU40	16.98
			106Tone	RU53	16.40
				RU54	17.06
			242Tone	RU61	16.41

WLAN 5G:

Test Mode	Antenna	Channel	Conducted Average Power[dBm]
802.11a	Ant2	5180	17.21
		5200	17.13
		5240	16.89
		5745	16.13
		5785	16.76
		5825	17.54
802.11n20	Ant2	5180	16.81
		5200	16.81
		5240	16.76
		5745	15.89
		5785	16.62
		5825	17.51
802.11n40	Ant2	5190	16.95
		5230	17.10
		5755	14.88
		5795	15.39
802.11ac20	Ant2	5180	17.00
		5200	16.77
		5240	16.68
		5745	16.06
		5785	16.68
		5825	17.56
802.11ac40	Ant2	5190	16.91
		5230	17.14
		5755	15.08
		5795	15.48
802.11ac80	Ant2	5210	17.13
		5775	15.94

Test Mode	Antenna	Frequency[MHz]	Ru Size	Ru Index	Result [dBm]
802.11ax	Ant2	5180	26Tone	RU0	12.66
				RU8	12.50
			52Tone	RU37	12.63
				RU40	12.33
			106Tone	RU53	12.43
				RU54	12.29
			242Tone	RU61	12.46
		5200	26Tone	RU0	12.03
				RU8	12.65
			52Tone	RU37	12.19
				RU40	12.39
			106Tone	RU53	12.19
				RU54	12.31
			242Tone	RU61	12.45
		5240	26Tone	RU0	12.21
				RU8	12.12
			52Tone	RU37	12.39
				RU40	12.28
			106Tone	RU53	12.22
				RU54	12.37
			242Tone	RU61	12.44
		5745	26Tone	RU0	11.22
				RU8	11.22
			52Tone	RU37	11.36
				RU40	11.13
			106Tone	RU53	11.18
				RU54	11.19
			242Tone	RU61	8.80
		5785	26Tone	RU0	11.91
				RU8	11.56
			52Tone	RU37	11.82
				RU40	11.58
			106Tone	RU53	11.86
				RU54	11.70
			242Tone	RU61	9.77
		5825	26Tone	RU0	12.64
				RU8	12.29
			52Tone	RU37	12.68
				RU40	12.57
			106Tone	RU53	12.71
				RU54	12.48
			242Tone	RU61	10.50

11AX40SISO	Ant2	5190	26Tone	RU0	12.34
				RU17	12.23
			52Tone	RU37	12.50
				RU44	12.40
			106Tone	RU53	12.76
				RU56	12.51
			242Tone	RU61	12.77
				RU62	12.69
			484Tone	RU65	12.18
		5230	26Tone	RU0	12.36
				RU17	12.12
			52Tone	RU37	12.80
				RU44	12.18
			106Tone	RU53	12.85
				RU56	12.43
			242Tone	RU61	13.02
				RU62	12.53
			484Tone	RU65	12.47
		5755	26Tone	RU0	10.96
				RU17	11.63
			52Tone	RU37	11.05
				RU44	11.74
			106Tone	RU53	11.10
				RU56	11.58
			242Tone	RU61	11.24
				RU62	11.73
			484Tone	RU65	8.74
		5795	26Tone	RU0	12.27
				RU17	12.43
			52Tone	RU37	12.35
				RU44	11.69
			106Tone	RU53	11.67
				RU56	11.85
			242Tone	RU61	12.02
				RU62	12.10
			484Tone	RU65	9.23
11AX80SISO	Ant2	5210	26Tone	RU0	11.61
				RU36	11.03
			52Tone	RU37	11.85
				RU52	11.19
			106Tone	RU53	11.56
				RU60	11.47
			242Tone	RU61	11.83
				RU64	11.69

			484Tone	RU65	11.20
				RU66	11.36
			996Tone	RU67	11.81
		5775	26Tone	RU0	10.99
				RU36	12.02
			52Tone	RU37	11.02
				RU52	11.92
			106Tone	RU53	11.27
				RU60	11.94
			242Tone	RU61	11.29
				RU64	12.05
			484Tone	RU65	10.84
				RU66	11.29
			996Tone	RU67	10.44

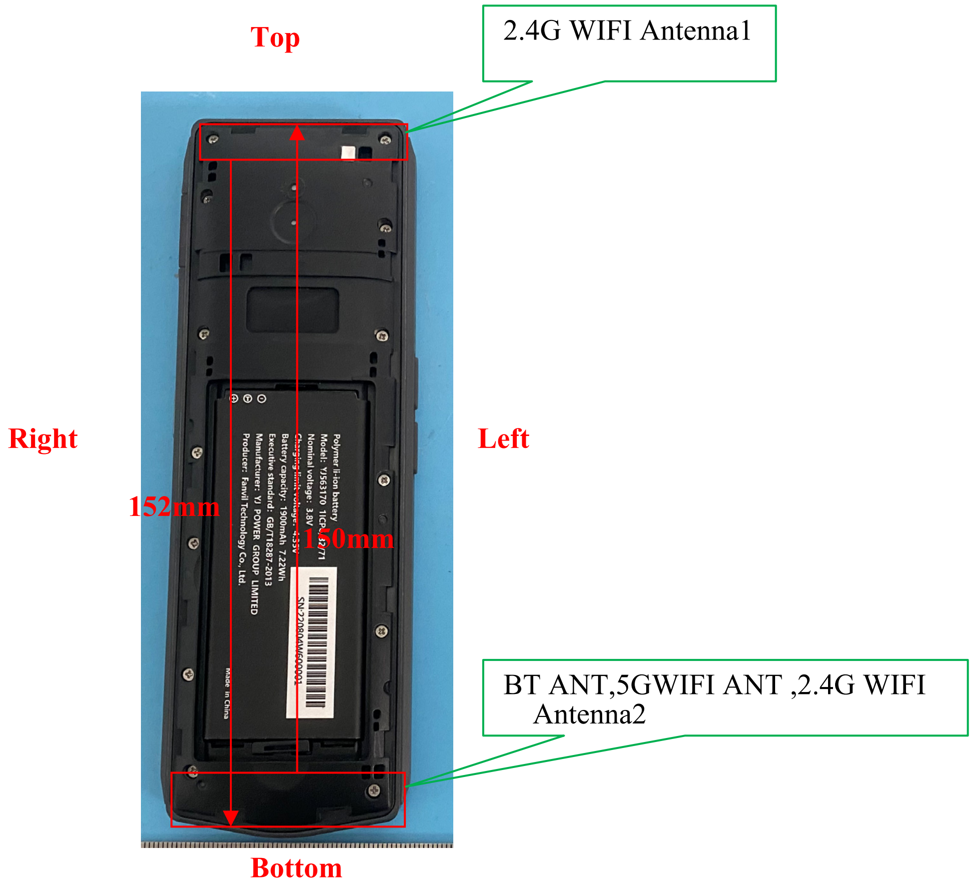
Duty Cycle:

Test Mode	Antenna	Channel	Duty Cycle [%]
11B	Ant1	2412	100.00
	Ant2	2412	100.00
	Ant1	2437	99.76
	Ant2	2437	100.00
	Ant1	2462	100.00
	Ant2	2462	100.00
11G-CDD	Ant1	2412	99.04
	Ant2	2412	75.74
	Ant1	2437	49.88
	Ant2	2437	77.21
	Ant1	2462	76.92
	Ant2	2462	76.92
11N20MIMO	Ant1	2412	100.00
	Ant2	2412	100.00
	Ant1	2437	100.00
	Ant2	2437	100.00
	Ant1	2462	100.00
	Ant2	2462	100.00
BDR	Ant2	2441	76.74
EDR	Ant2	2441	76.74
BLE_1M	Ant2	2440	59.68
BLE_2M	Ant2	2440	30.16
11A	Ant2	5180	100
		5200	99.04
		5240	99.04
		5745	100
		5785	99.04

		5825	100
11N20SISO	Ant2	5180	98.98
		5200	98.97
		5240	98.97
		5745	98.98
		5785	98.98
		5825	98.98
11N40SISO	Ant2	5190	98.72
		5230	98.72
		5755	98.72
		5795	98.09
11AC20SISO	Ant2	5180	98.47
		5200	98.97
		5240	98.98
		5745	98.98
		5785	98.97
		5825	98.97
11AC40SISO	Ant2	5190	100
		5230	98.72
		5755	100
		5795	100
11AC80SISO	Ant2	5210	100
		5775	100

Standalone SAR test exclusion considerations

Antennas Location:



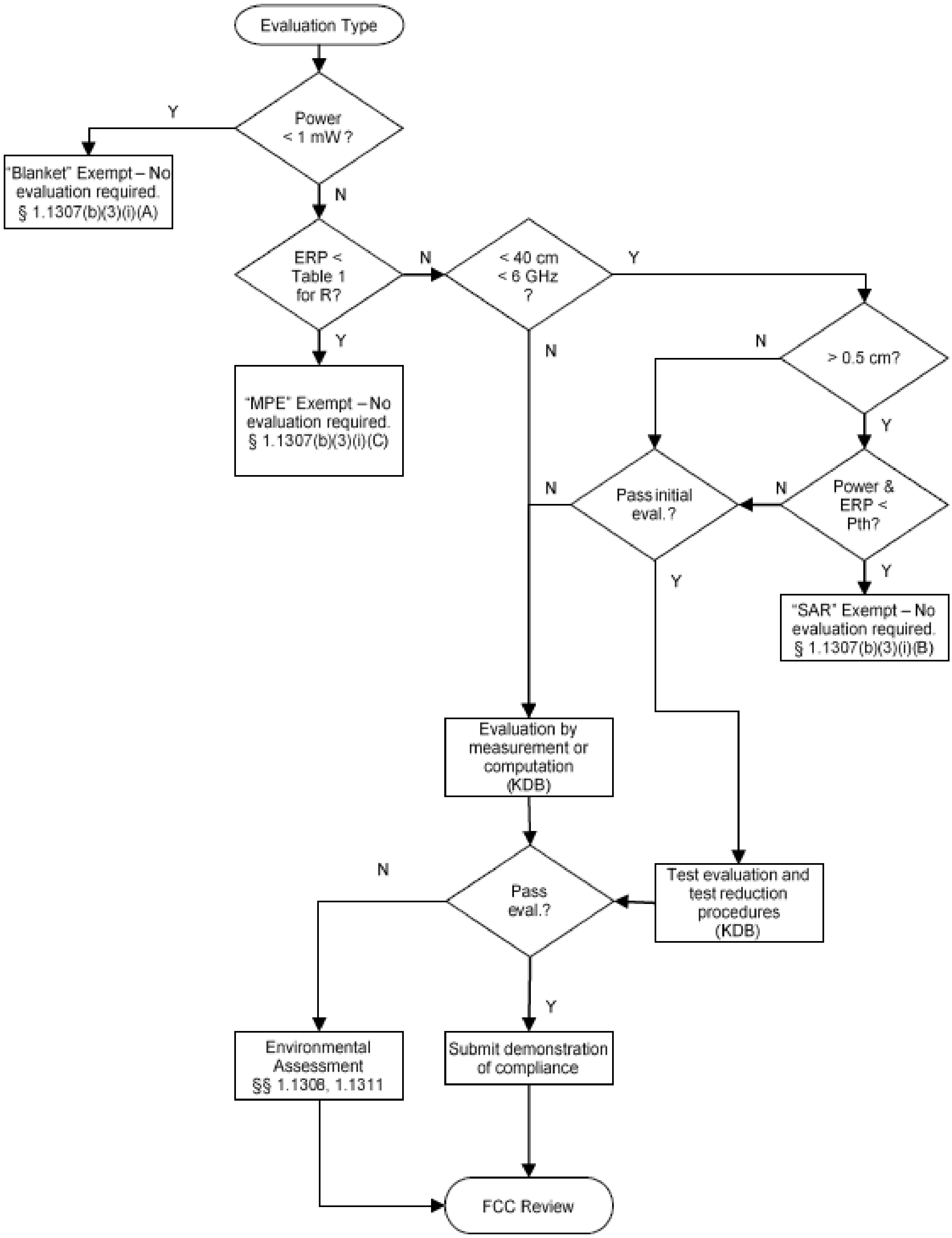
EUT Back View

Antenna Distance To Edge

Antenna Distance To Edge(mm)						
Antenna	**Front**	**Back**	**Left**	**Right**	**Top**	**Bottom**
ANT 1	< 5	< 5	< 5	< 5	< 5	152
ANT 2	< 5	< 5	< 5	< 5	150	< 5

Standalone SAR test exclusion considerations:

General Sequence for Determination of Procedure (exemption or evaluation) to Establish Compliance with Exposure Limits for a Single RF Source:



Mode	Frequency (MHz)	Max Target Power (dBm)	Antenna gain (dBi)	P_{Max} (dBm)	P_{Max} (mW)	Distance (mm)	P_{th} (mW)	SAR Test Exclusion?
WLAN(ANT1)	2462	20.0	4.3	22.15	164.06	< 5	2.73	No
WLAN(ANT2)	2462	18.0	1.8	18.0	63.10	< 5	2.73	No
WLAN(ANT2)	5240	17.5	2.0	17.5	56.23	< 5	1.49	No
WLAN(ANT2)	5825	18.0	2.0	18.0	63.10	< 5	1.37	No
Bluetooth(ANT2)	2480	9.0	1.8	9.0	7.94	< 5	2.72	No

Note:
1. ERP= Max Target Power+ Antenna gain-2.15
2. P_{Max} refers to the greater value in the Max Target Power and ERP.
3. The formula for calculating P_{th} is given below, with distances ranging from 20cm to 40cm.

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

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

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

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_{20cm} is per Formula (Note 3).
5. When the separation distance is less than 0.5cm, 0.5cm is used as the calculation distance

SAR MEASUREMENT RESULTS

This page summarizes the results of the performed dosimetric evaluation.

SAR Test Data

Environmental Conditions

Temperature:	23.0-23.9 ℃	22.3-23.2 ℃
Relative Humidity:	54-65 %	48-59 %
ATM Pressure:	101.3 kPa	101.3 kPa
Test Date:	2022/09/01	2022/09/02

Testing was performed by Seven Liang, Jacky Yang, Ryse Chai..

ANT1:

EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	Scaled Factor	1g SAR (W/kg)			
						Duty Cycle (%)	Meas. SAR	Scaled SAR	Plot
Head Left Cheek	2412	802.11b	/	/	/	/	/	/	/
	2437	802.11b	19.42	20.0	1.143	99.76	0.687	0.79	1#
	2462	802.11b	/	/	/	/	/	/	/
Head Left Tilt	2412	802.11b	/	/	/	/	/	/	/
	2437	802.11b	19.42	20.0	1.143	99.76	0.428	0.49	2#
	2462	802.11b	/	/	/	/	/	/	/
Head Right Cheek	2412	802.11b	/	/	/	/	/	/	/
	2437	802.11b	19.42	20.0	1.143	99.76	0.549	0.63	3#
	2462	802.11b	/	/	/	/	/	/	/
Head Right Tilt	2412	802.11b	/	/	/	/	/	/	/
	2437	802.11b	19.42	20.0	1.143	99.76	0.383	0.44	4#
	2462	802.11b	/	/	/	/	/	/	/
Body Back (5mm)	2412	802.11b	/	/	/	/	/	/	/
	2437	802.11b	19.42	20.0	1.143	99.76	0.630	0.72	5#
	2462	802.11b	/	/	/	/	/	/	/

ANT2:

EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	Scaled Factor	1g SAR (W/kg)			
						Duty Cycle (%)	Meas. SAR	Scaled SAR	Plot
Head Left Cheek	2412	802.11b	/	/	/	/	/	/	/
	2437	802.11b	17.97	18.0	1.007	100	0.116	0.12	6#
	2462	802.11b	/	/	/	/	/	/	/
Head Left Tilt	2412	802.11b	/	/	/	/	/	/	/
	2437	802.11b	17.97	18.0	1.007	100	0.032	0.03	7#
	2462	802.11b	/	/	/	/	/	/	/
Head Right Cheek	2412	802.11b	/	/	/	/	/	/	/
	2437	802.11b	17.97	18.0	1.007	100	0.102	0.10	8#
	2462	802.11b	/	/	/	/	/	/	/
Head Right Tilt	2412	802.11b	/	/	/	/	/	/	/
	2437	802.11b	17.97	18.0	1.007	100	0.042	0.04	9#
	2462	802.11b	/	/	/	/	/	/	/
Body Back (5mm)	2412	802.11b	/	/	/	/	/	/	/
	2437	802.11b	17.97	18.0	1.007	100	0.540	0.54	10#
	2462	802.11b	/	/	/	/	/	/	/

Note:
1. When the 1-g SAR is≤ 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 ≤ 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 of 2.4G WIFI 802.11b 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)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	Scaled Factor	1g SAR (W/kg)			
						Duty Cycle (%)	Meas. SAR	Scaled SAR	Plot
Head Left Cheek	5180	802.11a	/	/	/	/	/	/	/
	5200	802.11a	17.13	17.5	1.089	99.04	0.147	0.16	11#
	5240	802.11a	/	/	/	/	/	/	/
Head Left Tilt	5180	802.11a	/	/	/	/	/	/	/
	5200	802.11a	17.13	17.5	1.089	99.04	0.047	0.05	12#
	5240	802.11a	/	/	/	/	/	/	/
Head Right Cheek	5180	802.11a	/	/	/	/	/	/	/
	5200	802.11a	17.13	17.5	1.089	99.04	0.058	0.06	13#
	5240	802.11a	/	/	/	/	/	/	/
Head Right Tilt	5180	802.11a	/	/	/	/	/	/	/
	5200	802.11a	17.13	17.5	1.089	99.04	0.045	0.05	14#
	5240	802.11a	/	/	/	/	/	/	/
Body Back (5mm)	5180	802.11a	/	/	/	/	/	/	/
	5200	802.11a	17.13	17.5	1.089	99.04	0.721	0.79	15#
	5240	802.11a	/	/	/	/	/	/	/

EUT Position	Frequency (MHz)	Test Mode	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	Scaled Factor	1g SAR (W/kg)			
						Duty Cycle (%)	Meas. SAR	Scaled SAR	Plot
Head Left Cheek	5745	802.11a	/	/	/	/	/	/	/
	5785	802.11a	/	/	/	/	/	/	/
	5825	802.11a	17.54	18.0	1.112	100	0.156	0.17	16#
Head Left Tilt	5745	802.11a	/	/	/	/	/	/	/
	5785	802.11a	/	/	/	/	/	/	/
	5825	802.11a	17.54	18.0	1.112	100	0.039	0.04	17#
Head Right Cheek	5745	802.11a	/	/	/	/	/	/	/
	5785	802.11a	/	/	/	/	/	/	/
	5825	802.11a	17.54	18.0	1.112	100	0.108	0.12	18#
Head Right Tilt	5745	802.11a	/	/	/	/	/	/	/
	5785	802.11a	/	/	/	/	/	/	/
	5825	802.11a	17.54	18.0	1.112	100	0.018	0.02	19#
Body Back (5mm)	5745	802.11a	/	/	/	/	/	/	/
	5785	802.11a	/	/	/	/	/	/	/
	5825	802.11a	17.54	18.0	1.112	100	0.647	0.72	20#

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 of 5G WIFI 802.11a 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)	Scaled Factor	1g SAR (W/kg)			
						Duty Cycle (%)	Meas. SAR	Scaled SAR	Plot
Head Left Cheek	2402	EDR(GFSK)	8.66	9.0	1.081	76.74	0.021	0.03	21#
	2441	EDR(GFSK)	/	/	/	/	/	/	/
	2480	EDR(GFSK)	/	/	/	/	/	/	/
Head Left Tilt	2402	EDR(GFSK)	8.66	9.0	1.081	76.74	0.00758	0.01	22#
	2441	EDR(GFSK)	/	/	/	/	/	/	/
	2480	EDR(GFSK)	/	/	/	/	/	/	/
Head Right Cheek	2402	EDR(GFSK)	8.66	9.0	1.081	76.74	0.013	0.02	23#
	2441	EDR(GFSK)	/	/	/	/	/	/	/
	2480	EDR(GFSK)	/	/	/	/	/	/	/
Head Right Tilt	2402	EDR(GFSK)	8.66	9.0	1.081	76.74	0.00721	0.01	24#
	2441	EDR(GFSK)	/	/	/	/	/	/	/
	2480	EDR(GFSK)	/	/	/	/	/	/	/
Body Back (5mm)	2402	EDR(GFSK)	8.66	9.0	1.081	76.74	0.024	0.03	25#
	2441	EDR(GFSK)	/	/	/	/	/	/	/
	2480	EDR(GFSK)	/	/	/	/	/	/	/

Note:
1. When the 1-g SAR is≤ 0.8W/Kg, 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 of BT 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)”.

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.

The Highest Measured SAR Configuration in Each Frequency Band

Head

SAR probe calibration point	Frequency Band	Freq.(MHz)	EUT Position	Meas. SAR (W/kg)		Largest to Smallest SAR Ratio
				Original	Repeated	
/	/	/	/	/	/	/

Body

SAR probe calibration point	Frequency Band	Freq.(MHz)	EUT Position	Meas. SAR (W/kg)		Largest to Smallest SAR Ratio
				Original	Repeated	
/	/	/	/	/	/	/

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(ANT1) + 2.4G WLAN(ANT2)	√	×
5G WLAN(ANT1) + 2.4G WLAN(ANT2)	×	×
Bluetooth(ANT1) + 2.4G WLAN(ANT2)	×	×

Simultaneous and Hotspot SAR test exclusion considerations:

Mode	Position	Reported SAR(W/kg)		ΣSAR < 1.6W/kg
		SAR1	SAR2	
2.4G WLAN(ANT1) + 2.4G WLAN(ANT2)	Head Left Cheek	0.79	0.12	**0.91**
	Head Left Tilt	0.49	0.03	0.52
	Head Right Cheek	0.63	0.10	0.73
	Head Right Tilt	0.44	0.04	0.48
	Body Back	0.72	0.54	**1.26**

Conclusion:

Sum of SAR: **Σ SAR ≤ 1.6 W/kg** therefore simultaneous transmission SAR with Volume Scans is **not required**.

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 ± %**	**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	√3	1	1	2.7	2.7
Hemispherical Isotropy	9.6	R	√3	0	0	0.0	0.0
Boundary effect	1.0	R	√3	1	1	0.6	0.6
Linearity	4.7	R	√3	1	1	2.7	2.7
Detection limits	1.0	R	√3	1	1	0.6	0.6
Readout electronics	0.3	N	1	1	1	0.3	0.3
Response time	0.0	R	√3	1	1	0.0	0.0
Integration time	0.0	R	√3	1	1	0.0	0.0
RF ambient conditions – noise	1.0	R	√3	1	1	0.6	0.6
RF ambient conditions–reflections	1.0	R	√3	1	1	0.6	0.6
Probe positioner mech. Restrictions	0.8	R	√3	1	1	0.5	0.5
Probe positioning with respect to phantom shell	6.7	R	√3	1	1	3.9	3.9
Post-processing	2.0	R	√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	√3	1	1	2.9	2.9
Phantom and set-up							
Phantom uncertainty (shape and thickness tolerances)	4.0	R	√3	1	1	2.3	2.3
Liquid conductivity target)	5.0	R	√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	√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	√3	1	1	2.7	2.7
Hemispherical Isotropy	9.6	R	√3	0	0	0.0	0.0
Linearity	4.7	R	√3	1	1	2.7	2.7
Modulation Response	0.0	R	√3	1	1	0.0	0.0
Detection limits	1.0	R	√3	1	1	0.6	0.6
Boundary effect	1.0	R	√3	1	1	0.6	0.6
Readout electronics	0.3	N	1	1	1	0.3	0.3
Response time	0.0	R	√3	1	1	0.0	0.0
Integration time	0.0	R	√3	1	1	0.0	0.0
RF ambient conditions – noise	1.0	R	√3	1	1	0.6	0.6
RF ambient conditions–reflections	1.0	R	√3	1	1	0.6	0.6
Probe positioner mech. Restrictions	0.8	R	√3	1	1	0.5	0.5
Probe positioning with respect to phantom shell	6.7	R	√3	1	1	3.9	3.9
Post-processing	2.0	R	√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	√3	1	1	2.6	2.6
Drift of output power	5.0	R	√3	1	1	2.9	2.9
Phantom and set-up							
Phantom uncertainty (shape and thickness tolerances)	4.0	R	√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	√3	0.78	0.71	0.8	0.7
Temp. unc. - Permittivity	0.3	R	√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 *******