FCC SAR TEST REPORT

FCC ID	:	**UZ7TC7301**
Equipment	:	**Touch Computer**
Brand Name	:	**Zebra**
Model Name	:	**TC7301**
Applicant	:	**Zebra Technologies Corporation 1 Zebra Plaza, Holtsville, NY 11742**
Manufacturer	:	**Zebra Technologies Corporation 1 Zebra Plaza, Holtsville, NY 11742**
Standard	:	**FCC 47 CFR Part 2 (2.1093)**

The product was received on Jul. 18, 2022 and testing was started from Aug. 09, 2022 and completed on Aug. 14, 2022. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample provide by manufacturer and the test data has been evaluated in accordance with the test procedures given in 47 CFR Part 2.1093 and FCC KDB and has been pass the FCC requirement.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. Laboratory, the test report shall not be reproduced except in full.

Approved by: Cona Huang / Deputy Manager

Sporton International Inc. EMC & Wireless Communications Laboratory
No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan

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History of this test report

Report No.	Version	Description	Issued Date
FA271537	01	Initial issue of report	Oct. 12, 2022

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) for Zebra Technologies Corporation, Touch Computer, TC7301, are as follows.

Equipment Class	Frequency Band	Highest SAR Summary				Highest Simultaneous Transmission 1g SAR (W/kg)	Highest Simultaneous Transmission 10g SAR (W/kg)
		Head (Separation 0mm)	Body-worn (Separation 15mm)	Hotspot (Separation 10mm)	Product Specific (Separation 0mm)		
		1g SAR (W/kg)			10g SAR (W/kg)		
DTS	2.4GHz WLAN	1.16	0.36	0.65		1.55	1.12
NII	5GHz WLAN	0.73	0.68		1.12	1.55	1.12
DSS	Bluetooth	< 0.01	< 0.01	< 0.01		1.55	1.12
Date of Testing:		2022/8/9 ~ 2022/8/14					

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation and the FCC designation No. TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC test. This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg for Partial-Body 1g SAR, 4.0 W/kg for Product Specific 10g SAR) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications.

Reviewed by: Jason Wang
Report Producer: Paula Chen

2. Guidance Applied

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards, the below KDB standard may not including in the TAF code without accreditation.

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 648474 D04 SAR Evaluation Considerations for Wireless Handsets v01r03
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB 941225 D06 Hotspot Mode SAR v02r01

3. Equipment Under Test (EUT) Information

3.1 General Information

Product Feature & Specification	
Equipment Name	Touch Computer
Brand Name	Zebra
Model Name	TC7301
FCC ID	UZ7TC7301
Wireless Technology and Frequency Range	WLAN 2.4 GHz Band: 2400 MHz ~ 2483.5 MHz WLAN 5.2 GHz Band: 5150 MHz ~ 5250 MHz WLAN 5.3 GHz Band: 5250 MHz ~ 5350 MHz WLAN 5.6 GHz Band: 5470 MHz ~ 5725 MHz WLAN 5.8 GHz Band: 5725 MHz ~ 5850 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz RFID : 13.56 MHz
Mode	WLAN: 802.11a/b/g/n/ac/ax HT20/HT40/VHT20/VHT40/VHT80/VHT160/HE20/HE40/HE80/HE160 Bluetooth BR/EDR/LE RFID: ASK
HW Version	EV2
SW Version	11-11-28.00-RG-U00-PRD-ATH-04 356 test-keys
FW Version	FUSION_QA_4_1.2.0.001_R
MFD	10Jun22
EUT Stage	Identical Prototype

Remark:

1. There are three kinds of samples as below. RF exposure is selected sample 1 to evaluate and sample 2 and 3 spot check worst case found sample 1.
2. The device support DBS mode (Dual band simultaneous) for WLAN operation, when the DBS mode is active the device will limit different maximum power for Sim-Tx SAR compliance, Details about the power management decision are provided in the operational description.
3. The device 2.4GHz support hotspot operation via 5GHz receive signal, when the device 2.4GHz operate hotspot function that the Bluetooth cannot transmit with 2.4GHz WLAN.
4. This device has RFID operations, the RFID antenna is integrated into the device for this model, therefore, all SAR test were performed with the device which already incorporates the RFID antenna.
5. According to FCC KDB publication 447498 D01v06, transmitters are consider to be operating simultaneously when there is overlapping transmission, with the exception of transmission during network hand-offs with maximum hand-off duration less than 30 seconds.

Sample list	
Sample1	Lowell + Premium config
Sample2	SE4720 + Base config
Sample3	Lowell + Base config

Specification of Accessories				
Adapter	Brand Name	Zebra	Model	SAWA-65-20005A
			Part Number	PWR-WUA5V12W0US
Battery 1X	Brand Name	Zebra	Model	BT-000442
			Part Number	BT-000442-0020
Battery 1.5X	Brand Name	Zebra	Model	BT-000442A
			Part Number	BT-000442-0820
Wireless Battery	Brand Name	Zebra	Model	BT-000442
			Part Number	BT-000442-002A
USB TYPE A to TYPE C cable	Brand Name	Zebra	Part Number	CBL-TC5X-USBC2A-01
USB TYPE C to 3.5mm audio connector	Brand Name	Zebra	Part Number	ADP-USBC-35MM1-01
3.5mm Earphone	Brand Name	Zebra	Part Number	HDST-35MM-PTVP-01
USB TYPE C Earphone	Brand Name	Zebra	Part Number	HPST-USBC-PTT1-01
Trigger Handle	Brand Name	Zebra	Part Number	TRG-NGTC5-ELEC-01
Soft Holster	Brand Name	Zebra	Part Number	SG-NGTC5TC7-HLSTR-01
TC53/TC58 RUGGED BOOT	Brand Name	Zebra	Part Number	SG-NGTC5EXO1-01

4. RF Exposure Limits

4.1 Uncontrolled Environment

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

4.2 Controlled Environment

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

Limits for Occupational/Controlled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.4	8.0	20.0

Limits for General Population/Uncontrolled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.08	1.6	4.0

1. Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.

5. Specific Absorption Rate (SAR)

5.1 Introduction

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

5.2 SAR Definition

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

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

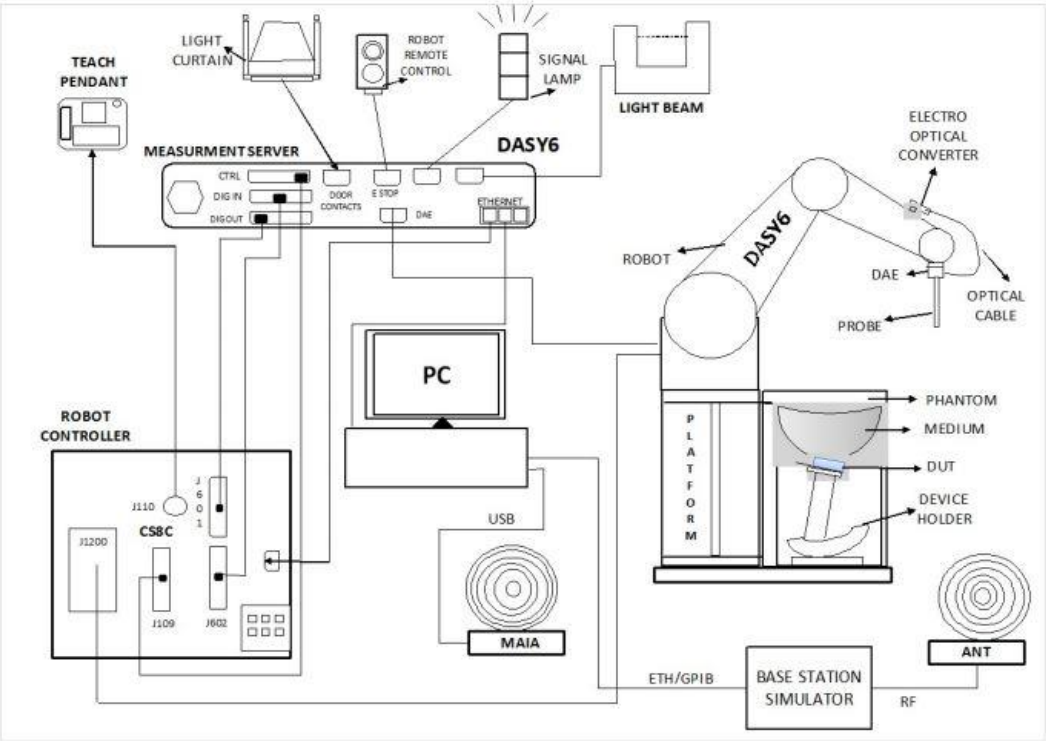
SAR is expressed in units of Watts per kilogram (W/kg)

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

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength.

6. System Description and Setup

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



- The DASY system in SAR Configuration is shown above
- A standard high precision 6-axis robot 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 amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- 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 windows software and the DASY 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.

6.1 Test Site Location

The SAR measurement facilities used to collect data are within both Sporton Lab list below test site location are accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190 and 3786) and the FCC designation No. TW1190 and TW3786 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC test.

Test Site	EMC & Wireless Communications Laboratory		Wensan Laboratory		
Test Site Location	TW1190 No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan		TW3786 No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan		
Test Site No.	SAR01-HY	SAR03-HY	SAR08-HY	SAR09-HY	SAR15-HY
	SAR04-HY	SAR05-HY	SAR11-HY	SAR12-HY	
	SAR06-HY	SAR10-HY	SAR13-HY	SAR14-HY	

6.2 E-Field Probe

The SAR measurement is conducted with the dosimetric probe (manufactured by SPEAG).The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency. This probe has a built in optical surface detection system to prevent from collision with phantom.

<ES3DV3 Probe>

Construction	Symmetric design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	10 MHz – 4 GHz; Linearity: ±0.2 dB (30 MHz – 4 GHz)	
Directivity	±0.2 dB in TSL (rotation around probe axis) ±0.3 dB in TSL (rotation normal to probe axis)	
Dynamic Range	5 µW/g – >100 mW/g; Linearity: ±0.2 dB	
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 3.9 mm (body: 12 mm) Distance from probe tip to dipole centers: 3.0 mm	

<EX3DV4 Probe>

Construction	Symmetric design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	10 MHz – >6 GHz Linearity: ±0.2 dB (30 MHz – 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 – >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	

6.3 Data Acquisition Electronics (DAE)

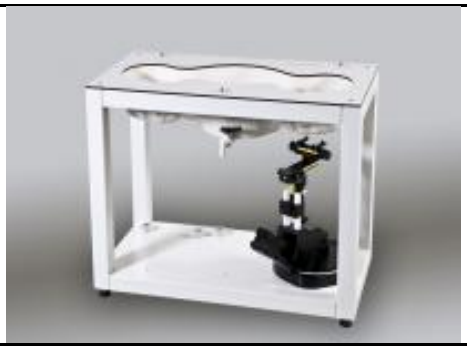
The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an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

The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Fig 5.1 Photo of DAE

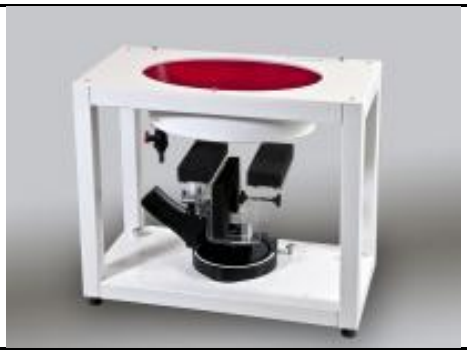
6.4 Phantom

<SAM Twin Phantom>

Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm	
Filling Volume	Approx. 25 liters	
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet	
Measurement Areas	Left Hand, Right Hand, Flat Phantom	

The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

<ELI Phantom>

Shell Thickness	2 ± 0.2 mm (sagging: <1%)	
Filling Volume	Approx. 30 liters	
Dimensions	Major ellipse axis: 600 mm Minor axis: 400 mm	

The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.

6.5 Device Holder

<Mounting Device for Hand-Held Transmitter>

In combination with the Twin SAM V5.0/V5.0c or ELI phantoms, the Mounting Device for Hand-Held Transmitters enables rotation of the mounted transmitter device to specified spherical coordinates. At the heads, the rotation axis is at the ear opening. Transmitter devices can be easily and accurately positioned according to IEC 62209-1, IEEE 1528, FCC, or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat). And upgrade kit to Mounting Device to enable easy mounting of wider devices like big smart-phones, e-books, small tablets, etc. It holds devices with width up to 140 mm.

Mounting Device for Hand-Held Transmitters

Mounting Device Adaptor for Wide-Phones

<Mounting Device for Laptops and other Body-Worn Transmitters>

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the mounting device in place of the phone positioned. The extension is fully compatible with the SAM Twin and ELI phantoms.

Mounting Device for Laptops

7. Measurement Procedures

The measurement procedures are as follows:

(a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power, in the highest power channel.
(b) Place the EUT in the positions as Appendix D demonstrates.
(c) Set scan area, grid size and other setting on the DASY software.
(d) Measure SAR results for the highest power channel on each testing position.
(e) Find out the largest SAR result on these testing positions of each band
(f) Measure SAR results for other channels in worst SAR testing position if the reported SAR of highest power channel is larger than 0.8 W/kg

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

(a) Power reference measurement
(b) Area scan
(c) Zoom scan
(d) Power drift measurement

7.1 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

(a) Extraction of the measured data (grid and values) from the Zoom Scan
(b) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
(c) Generation of a high-resolution mesh within the measured volume
(d) Interpolation of all measured values form the measurement grid to the high-resolution grid
(e) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
(f) Calculation of the averaged SAR within masses of 1g and 10g

7.2 Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

7.3 Area Scan

The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum found in the scanned area, within a range of the global maximum. The range (in dB0 is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan), if only one zoom scan follows the area scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of zoom scans has to be increased accordingly.

Area scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

7.4 Zoom Scan

Zoom scans are used assess the peak spatial SAR values within a cubic averaging volume containing 1 gram and 10 gram of simulated tissue. The zoom scan measures points (refer to table below) within a cube shoes base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the zoom scan evaluates the averaged SAR for 1 gram and 10 gram and displays these values next to the job's label.

Zoom scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

			≤ 3 GHz	> 3 GHz
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

* When zoom scan is required and the *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

7.5 Volume Scan Procedures

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the EUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing. When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

7.6 Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In DASY measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drifts more than 5%, the SAR will be retested.

8. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	2450MHz System Validation Kit(2)	D2450V2	929	Nov. 21, 2019	Nov. 18, 2022
SPEAG	5GHz System Validation Kit	D5GHzV2	1006	Sep. 15, 2021	Sep. 14, 2022
SPEAG	Data Acquisition Electronics	DAE4	376	Nov. 22, 2021	Nov. 21, 2022
SPEAG	Data Acquisition Electronics	DAE4	853	Jul. 20, 2022	Jul. 19, 2023
SPEAG	Dosimetric E-Field Probe	EX3DV4	3925	Apr. 29, 2022	Apr. 28, 2023
SPEAG	Dosimetric E-Field Probe	EX3DV4	7306	Jul. 28, 2022	Jul. 27, 2023
RCPTWN	Thermometer	HTC-1	TM685-1	Jun. 27, 2022	Jun. 26, 2023
RCPTWN	Thermometer	HTC-1	TM560-2	Mar. 15, 2022	Mar. 14, 2023
R&S	BT Base Station	CBT32	101136	Oct. 17, 2021	Oct. 16, 2022
SPEAG	Device Holder	N/A	N/A	N/A	N/A
Anritsu	Signal Generator	MG3710A	6201502524	Oct. 24, 2021	Oct. 23, 2022
Keysight	ENA Network Analyzer	E5071C	MY46316648	Jul. 25, 2022	Jul. 24, 2023
SPEAG	Dielectric Probe Kit	DAK-3.5	1146	Jul. 25, 2022	Jul. 24, 2023
LINE SEIKI	Digital Thermometer	DTM3000-spezial	2942	Oct. 26, 2021	Oct. 25, 2022
Anritsu	Power Meter	ML2495A	1804003	Oct. 09, 2021	Oct. 08, 2022
Anritsu	Power Meter	ML2496A	2119003	Jun. 22, 2022	Jun. 21, 2023
Anritsu	Power Sensor	MA2411B	1726150	Oct. 09, 2021	Oct. 08, 2022
Anritsu	Power Sensor	MA2411B	1911334	Jun. 22, 2022	Jun. 21, 2023
Anritsu	Spectrum Analyzer	MS2830A	6201396378	Jul. 21, 2022	Jul. 20, 2023
Anritsu	Spectrum Analyzer	N9010A	MY53470118	Jan. 12, 2022	Jan. 11, 2023
Mini-Circuits	Power Amplifier	ZVE-8G+	6418	Oct. 12, 2021	Oct. 11, 2022
Mini-Circuits	Power Amplifier	ZHL-42W+	715701915	May. 12, 2022	May. 11, 2023
ATM	Dual Directional Coupler	C122H-10	P610410z-02	Note 1	
Woken	Attenuator 1	WK0602-XX	N/A	Note 1	
PE	Attenuator 2	PE7005-10	N/A	Note 1	
PE	Attenuator 3	PE7005- 3	N/A	Note 1	

General Note:

1. Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check source.
2. The dipole calibration interval can be extended to 3 years with justification according to KDB 865664 D01. The dipoles are also not physically damaged, or repaired during the interval. The justification data in appendix C can be found which the return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration for each dipole.

9. System Verification

9.1 Tissue Verification

The tissue dielectric parameters of tissue-equivalent media used for SAR measurements must be characterized within a temperature range of 18℃ to 25℃, measured with calibrated instruments and apparatuses, such as network analyzers and temperature probes. The temperature of the tissue-equivalent medium during SAR measurement must also be within 18℃ to 25℃ and within ± 2℃ of the temperature when the tissue parameters are characterized. The tissue dielectric measurement system must be calibrated before use. The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements.
The liquid tissue depth was at least 15cm in the phantom for all SAR testing.

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
2450	22.3	1.798	39.885	1.80	39.20	-0.11	1.75	±5	2022/8/9
2450	22.4	1.810	39.766	1.80	39.20	0.56	1.44	±5	2022/8/10
2450	22.5	1.780	39.764	1.80	39.20	-1.11	1.44	±5	2022/8/11
5250	22.5	4.717	36.709	4.71	35.95	0.15	2.11	±5	2022/8/10
5250	22.7	4.771	36.616	4.71	35.95	1.30	1.85	±5	2022/8/13
5600	22.5	5.059	36.240	5.07	35.50	-0.22	2.08	±5	2022/8/10
5600	22.7	5.120	36.086	5.07	35.50	0.99	1.65	±5	2022/8/13
5750	22.5	5.223	36.004	5.22	35.35	0.06	1.85	±5	2022/8/10
5750	22.7	5.297	35.895	5.22	35.35	1.48	1.54	±5	2022/8/14

9.2 System Performance Check Results

Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10 %. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the plots can be referred to Appendix A of this report.

Test Site	Date	Frequency (MHz)	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (%)
SAR05	2022/8/9	2450	50	D2450V2-929	EX3DV4 - SN3925	DAE4 Sn376	2.54	53.1	50.8	-4.33	1.19	24.7	23.8	-3.64
SAR05	2022/8/10	2450	50	D2450V2-929	EX3DV4 - SN3925	DAE4 Sn376	2.52	53.1	50.4	-5.08	1.17	24.7	23.4	-5.26
SAR03	2022/8/11	2450	250	D2450V2-929	EX3DV4 - SN7306	DAE4 Sn853	13.6	53.1	54.4	2.45	6.26	24.7	25.04	1.38
SAR03	2022/8/10	5250	50	D5GHzV2-1006-5250	EX3DV4 - SN7306	DAE4 Sn853	3.92	81.7	78.4	-4.04	1.12	23.2	22.4	-3.45
SAR03	2022/8/13	5250	50	D5GHzV2-1006-5250	EX3DV4 - SN7306	DAE4 Sn853	3.97	81.7	79.4	-2.82	1.13	23.2	22.6	-2.59
SAR03	2022/8/10	5600	50	D5GHzV2-1006-5600	EX3DV4 - SN7306	DAE4 Sn853	4.07	85.1	81.4	-4.35	1.15	24.0	23	-4.17
SAR03	2022/8/13	5600	50	D5GHzV2-1006-5600	EX3DV4 - SN7306	DAE4 Sn853	4.12	85.1	82.4	-3.17	1.16	24.0	23.2	-3.33
SAR03	2022/8/10	5750	50	D5GHzV2-1006-5750	EX3DV4 - SN7306	DAE4 Sn853	3.87	81.4	77.4	-4.91	1.09	22.9	21.8	-4.80
SAR03	2022/8/14	5750	100	D5GHzV2-1006-5750	EX3DV4 - SN7306	DAE4 Sn853	8.29	81.4	82.9	1.84	2.38	22.9	23.8	3.93

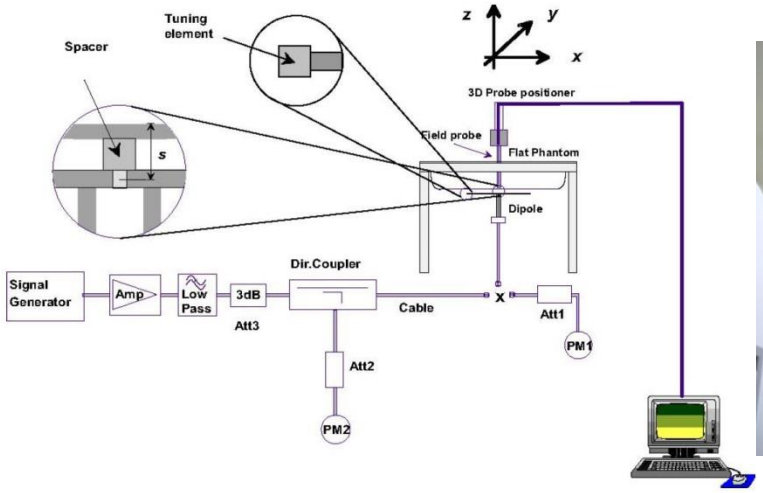


Fig 8.3.1 System Performance Check Setup

Fig 8.3.2 Setup Photo

10. RF Exposure Positions

10.1 Ear and handset reference point

Figure 9.1.1 shows the front, back, and side views of the SAM phantom. The center-of-mouth reference point is labeled “M,” the left ear reference point (ERP) is marked “LE,” and the right ERP is marked “RE.” Each ERP is 15 mm along the B-M (back-mouth) line behind the entrance-to-ear-canal (EEC) point, as shown in Figure 9.1.2 The Reference Plane is defined as passing through the two ear reference points and point M. The line N-F (neck-front), also called the reference pivoting line, is normal to the Reference Plane and perpendicular to both a line passing through RE and LE and the B-M line (see Figure 9.1.3). Both N-F and B-M lines should be marked on the exterior of the phantom shell to facilitate handset positioning. Posterior to the N-F line the ear shape is a flat surface with 6 mm thickness at each ERP, and forward of the N-F line the ear is truncated, as illustrated in Figure 9.1.2. The ear truncation is introduced to preclude the ear lobe from interfering with handset tilt, which could lead to unstable positioning at the cheek.

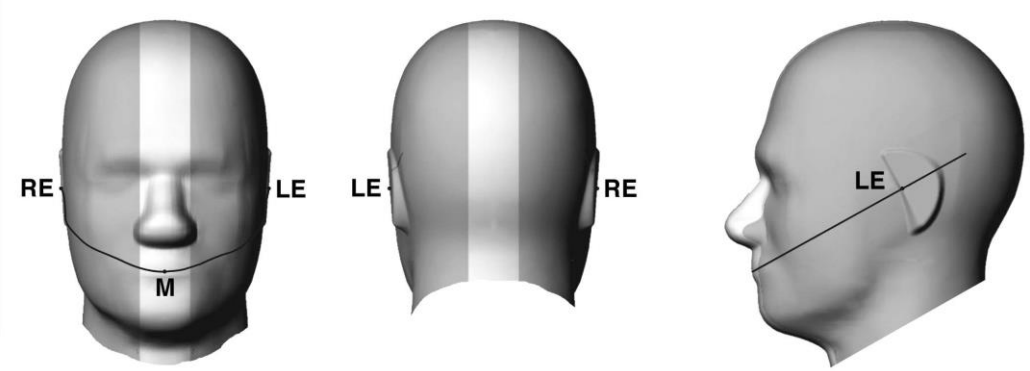


Fig 9.1.1 Front, back, and side views of SAM twin phantom

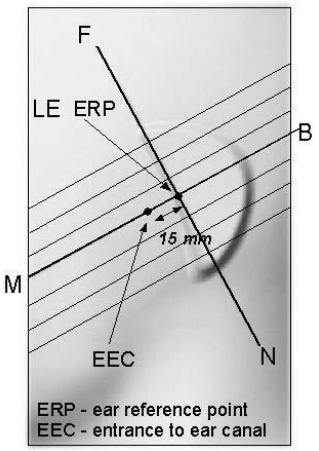


Fig 9.1.2 Close-up side view of phantom showing the ear region.

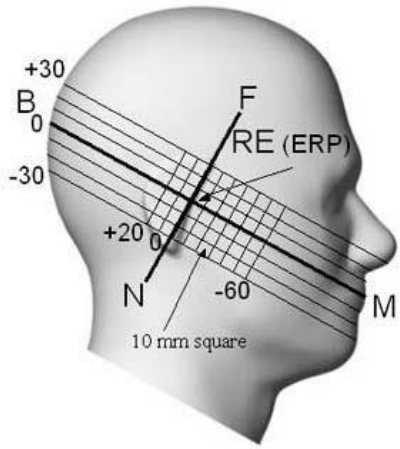


Fig 9.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

10.2 Definition of the cheek position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. Define two imaginary lines on the handset—the vertical centerline and the horizontal line. The vertical centerline passes through two points on the front side of the handset—the midpoint of the width wt of the handset at the level of the acoustic output (point A in Figure 9.2.1 and Figure 9.2.2), and the midpoint of the width wb of the bottom of the handset (point B). The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output (see Figure 9.2.1). The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset (see Figure 9.2.2), especially for clamshell handsets, handsets with flip covers, and other irregularly-shaped handsets.
3. Position the handset close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 9.2.3), such that the plane defined by the vertical centerline and the horizontal line of the handset is approximately parallel to the sagittal plane of the phantom.
4. Translate the handset towards the phantom along the line passing through RE and LE until handset point A touches the pinna at the ERP.
5. While maintaining the handset in this plane, rotate it around the LE-RE line until the vertical centerline is in the plane normal to the plane containing B-M and N-F lines, i.e., the Reference Plane.
6. Rotate the handset around the vertical centerline until the handset (horizontal line) is parallel to the N-F line.
7. While maintaining the vertical centerline in the Reference Plane, keeping point A on the line passing through RE and LE, and maintaining the handset contact with the pinna, rotate the handset about the N-F line until any point on the handset is in contact with a phantom point below the pinna on the cheek. See Figure 9.2.3. The actual rotation angles should be documented in the test report.

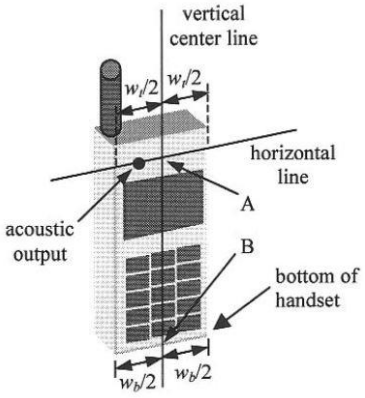


Fig 9.2.1 Handset vertical and horizontal reference lines—"fixed case

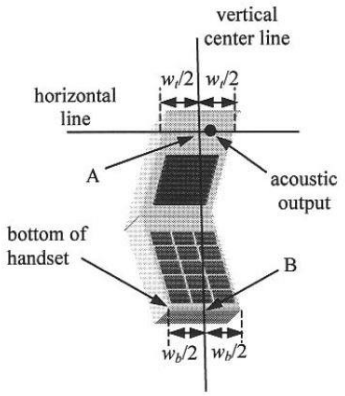


Fig 9.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

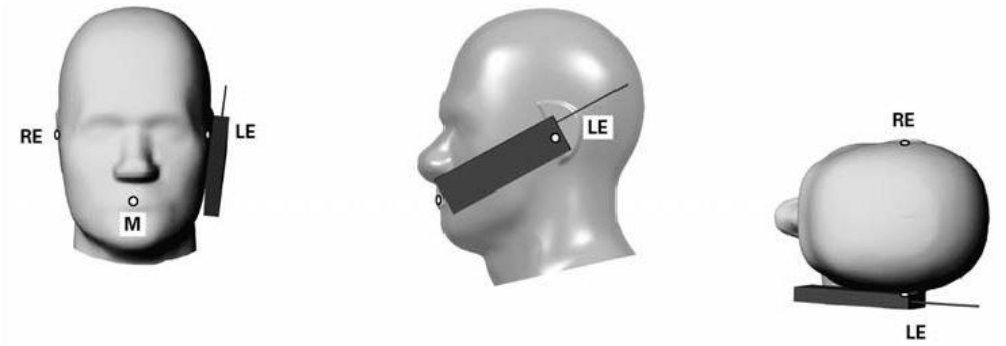


Fig 9.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

10.3 Definition of the tilt position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. While maintaining the orientation of the handset, move the handset away from the pinna along the line passing through RE and LE far enough to allow a rotation of the handset away from the cheek by 15°.
3. Rotate the handset around the horizontal line by 15°.
4. While maintaining the orientation of the handset, move the handset towards the phantom on the line passing through RE and LE until any part of the handset touches the ear. The tilt position is obtained when the contact point is on the pinna. See Figure 9.3.1. If contact occurs at any location other than the pinna, e.g., the antenna at the back of the phantom head, the angle of the handset should be reduced. In this case, the tilt position is obtained if any point on the handset is in contact with the pinna and a second point

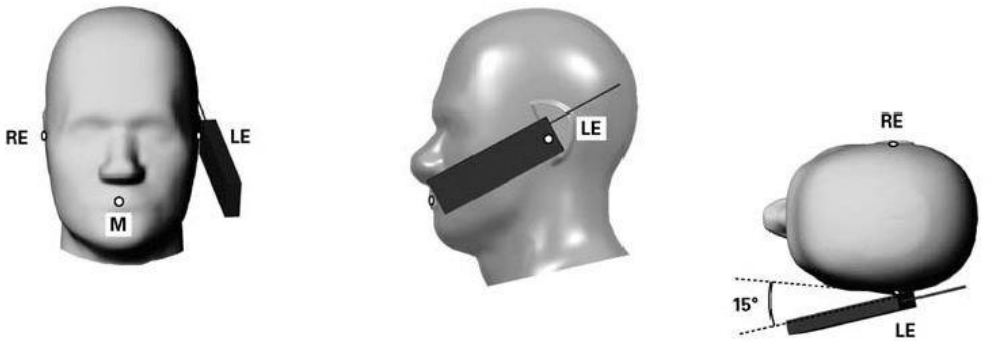


Fig 9.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

10.4 Body Worn Accessory

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 9.4). Per KDB648474 D04v01r03, body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB 447498 D01v06 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for body-worn accessory, measured without a headset connected to the handset is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a handset attached to the handset.

Accessories for body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are test with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-chip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

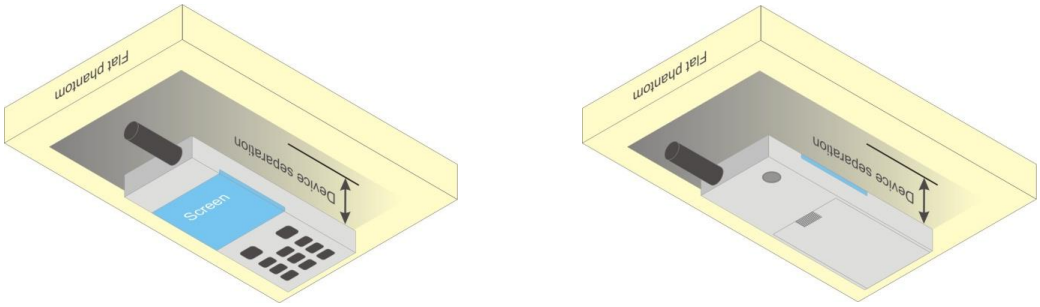


Fig 9.4 Body Worn Position

10.5 Product Specific Exposure

For smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, According to KDB648474 D04v01r03, the following phablet procedures should be applied to evaluate SAR compliance for each applicable wireless modes and frequency band. Devices marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance

1. The normally required head and body-worn accessory SAR test procedures for handsets, including hotspot mode, must be applied.

2. The UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge, in direct contact with a flat phantom, for 10-g extremity SAR according to the body-equivalent tissue dielectric parameters in KDB 865664 to address interactive hand use exposure conditions.6 The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.

10.6 Wireless Router

Some battery-operated handsets have the capability to transmit and receive user through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06 v02r01 where SAR test considerations for handsets (L x W ≥ 9 cm x 5 cm) are based on a composite test separation distance of 10mm from the front, back and edges of the device containing transmitting antennas within 2.5cm of their edges, determined form general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each frequency transmission and mode separately and spatially summed with the WIFI transmitter according to FCC KDB Publication 447498 D01v06 publication procedures. The “Portable Hotspot” feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

11. WiFi/Bluetooth Output Power (Unit: dBm)

General Note:

1. For each antenna, transmit power in MIMO operation is equal to the power in SISO operation, RF exposure is performed MIMO operation only except 2.4GHz WLAN.
2. The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default power measurement procedures. For “Not required”, SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1, b), 1) 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 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, additional output power measurements were not necessary.
3. Per KDB 248227 D01v02r02, SAR test reduction is determined according to 802.11 transmission mode configurations and certain exposure conditions with multiple test positions. In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration must be determined for each standalone and aggregated frequency band, according to the transmission mode configuration with the highest maximum output power specified for production units to perform SAR measurements. If the same highest maximum output power applies to different combinations of channel bandwidths, modulations and data rates, additional procedures are applied to determine which test configurations require SAR measurement. When applicable, an initial test position may be applied to reduce the number of SAR measurements required for next to the ear, UMPC mini-tablet or hotspot mode configurations with multiple test positions.
4. For 2.4 GHz 802.11b DSSS, either the initial test position procedure for multiple exposure test positions or the DSSS procedure for fixed exposure position is applied; these are mutually exclusive. For 2.4 GHz and 5 GHz OFDM configurations, the initial test configuration is applied to measure SAR using either the initial test position procedure for multiple exposure test position configurations or the initial test configuration procedures for fixed exposure test conditions. Based on the reported SAR of the measured configurations and maximum output power of the transmission mode configurations that are not included in the initial test configuration, the subsequent test configuration and initial test position procedures are applied to determine if SAR measurements are required for the remaining OFDM transmission configurations. In general, the number of test channels that require SAR measurement is minimized based on maximum output power measured for the test sample(s).
5. For OFDM transmission configurations in the 2.4 GHz and 5 GHz bands, 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 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel for each frequency band.
6. DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures.18 The initial test position procedure is described in the following:
    a. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band.
    b. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
    c. For all positions/configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.
7. Per 201904 TCBC workshops, General principles of FCC KDB Publication 248227 D01 can be applied to determine the SAR Initial Test Configurations and test reduction for 802.11ax SAR testing. For the table below the 802.11ax maximum power is SU (non-OFDMA), and the SU maximum power also higher than RU (OFDMA)
8. In applying the test guidance, the IEEE 802.11 mode with the maximum output power (out of all modes) should be considered for testing
9. For modes with the same maximum output power, the guidance from section 5.3.2 a) of FCC KDB Publication 248227 D01 should be applied, with 802.11ax being considered as the highest 802.11 mode for the appropriate frequency bands
10. When SAR testing for 802.11ax is required
    a. If the maximum output power is highest for OFDMA scenarios, choose the tone size with the maximum number of tones and the highest maximum output power
    b. Otherwise, consider the fully allocated channel for SAR testing
    c. When SAR testing is required on RU sizes less than the fully allocated channel, use the RU number closest to the middle of the channel, choosing the higher RU number when two RUs are equidistant to the middle of the channel

Non-Beamforming Mode

<WLAN 2.4GHz Non-DBS>

2.4GHz WLAN				Ant 9			Ant 8			Ant 9+8(9)		Ant 9+8(8)		Ant 9+8		
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	21.10	21.50	100.00	21.30	21.50	100.00	21.30	21.50	21.10	21.50	24.21	24.50	100.00
		6	2437	21.10	21.50		21.20	21.50		20.80	21.50	20.90	21.50	23.86	24.50	
		11	2462	21.10	21.50		21.00	21.50		20.80	21.50	20.70	21.50	23.76	24.50	
	802.11g 6Mbps	1	2412	Not Required	19.00	Not Required	Not Required	19.00	Not Required	Not Required	18.50	Not Required	18.50	Not Required	21.50	Not Required
		6	2437		19.50			19.50			19.50		19.50		22.50	
		11	2462		18.00			18.00			18.00		18.00		21.00	
	802.11n-HT20 MCS0	1	2412		19.00			19.00			19.00		19.00		22.00	
		6	2437		19.50			19.50			19.50		19.50		22.50	
		11	2462		18.50			18.50			18.50		18.50		21.50	
	802.11n-HT40 MCS0	3	2422		19.00			19.00			19.00		19.00		22.00	
		6	2437		19.00			19.00			19.00		19.00		22.00	
		9	2452		17.00			17.00			17.00		17.00		20.00	
	802.11ac-VHT20 MCS0	1	2412		19.00			19.00			19.00		19.00		22.00	
		6	2437		19.50			19.50			19.50		19.50		22.50	
		11	2462		18.50			18.50			18.50		18.50		21.50	
	802.11ac-VHT40 MCS0	3	2422		19.00			19.00			19.00		19.00		22.00	
		6	2437		19.00			19.00			19.00		19.00		22.00	
		9	2452		17.00			17.00			17.00		17.00		20.00	
	802.11ax-HE20 MCS0	1	2412		19.00			19.00			19.00		19.00		22.00	
		6	2437		19.50			19.50			19.50		19.50		22.50	
		11	2462		17.50			17.50			17.50		17.50		20.50	
	802.11ax-HE40 MCS0	3	2422		19.00			19.00			19.00		19.00		22.00	
		6	2437		19.50			19.50			19.50		19.50		22.50	
		9	2452		17.00			17.00			17.00		17.00		20.00	

<WLAN 2.4GHz DBS>

2.4GHz WLAN				Ant 9			Ant 8			Ant 9+8(9)		Ant 9+8(8)		Ant 9+8		
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	18.90	19.50	99.70	19.10	19.50	99.70	19.00	19.50	19.20	19.50	22.11	22.50	99.90
		6	2437	18.50	19.00		18.50	19.00		18.60	19.00	18.60	19.00	21.61	22.00	
		11	2462	18.60	19.00		18.60	19.00		18.70	19.00	18.70	19.00	21.71	22.00	
	802.11g 6Mbps	1	2412	Not Required	19.00	Not Required	Not Required	19.00	Not Required	Not Required	19.00	Not Required	19.00	Not Required	22.00	Not Required
		6	2437		19.50			19.50			19.50		19.50		22.50	
		11	2462		18.00			18.00			18.00		18.00		21.00	
	802.11n-HT20 MCS0	1	2412		19.00			19.00			19.00		19.00		22.00	
		6	2437		19.50			19.50			19.50		19.50		22.50	
		11	2462		18.50			18.50			18.50		18.50		21.50	
	802.11n-HT40 MCS0	3	2422		19.00			19.00			19.00		19.00		22.00	
		6	2437		19.00			19.00			19.00		19.00		22.00	
		9	2452		17.00			17.00			17.00		17.00		20.00	
	802.11ac-VHT20 MCS0	1	2412		19.00			19.00			19.00		19.00		22.00	
		6	2437		19.50			19.50			19.50		19.50		22.50	
		11	2462		18.50			18.50			18.50		18.50		21.50	
	802.11ac-VHT40 MCS0	3	2422		19.00			19.00			19.00		19.00		22.00	
		6	2437		19.00			19.00			19.00		19.00		22.00	
		9	2452		17.00			17.00			17.00		17.00		20.00	
	802.11ax-HE20 MCS0	1	2412		19.00			19.00			19.00		19.00		22.00	
		6	2437		19.50			19.50			19.50		19.50		22.50	
		11	2462		17.50			17.50			17.50		17.50		20.50	
	802.11ax-HE40 MCS0	3	2422		19.00			19.00			19.00		19.00		22.00	
		6	2437		19.50			19.50			19.50		19.50		22.50	
		9	2452		17.00			17.00			17.00		17.00		20.00	

<WLAN 5.2GHz Non-DBS / DBS>

5.2GHz WLAN				Ant 9			Ant 8			Ant 9+8(9)		Ant 9+8(8)		Ant 9+8		
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	Not Required	14.50	Not Required	Not Required	14.50	Not Required	Not Required	14.50	Not Required	14.50	Not Required	17.50	Not Required
		40	5200		18.00			18.00			18.00		18.00		21.00	
		44	5220		18.00			18.00			18.00		18.00		21.00	
		48	5240		18.00			18.00			18.00		18.00		21.00	
	802.11n-HT20 MCS0	36	5180		15.50			15.50			15.50		15.50		18.50	
		40	5200		18.00			18.00			18.00		18.00		21.00	
		44	5220		18.00			18.00			18.00		18.00		21.00	
		48	5240		18.00			18.00			18.00		18.00		21.00	
	802.11n-HT40 MCS0	38	5190		14.50			14.50			14.50		14.50		17.50	
		46	5230		17.00			17.00			17.00		17.00		20.00	
	802.11ac-VHT20 MCS0	36	5180		15.50			15.50			15.50		15.50		18.50	
		40	5200		18.00			18.00			18.00		18.00		21.00	
		44	5220		18.00			18.00			18.00		18.00		21.00	
		48	5240		18.00			18.00			18.00		18.00		21.00	
	802.11ac-VHT40 MCS0	38	5190		14.50			14.50			14.50		14.50		17.50	
		46	5230		17.00			17.00			17.00		17.00		20.00	
	802.11ac-VHT80 MCS0	42	5210		14.00			14.00			14.00		14.00		17.00	
	802.11ax-HE20 MCS0	36	5180		15.50			15.50			15.50		15.50		18.50	
		40	5200		18.00			18.00			18.00		18.00		21.00	
		44	5220		18.00			18.00			18.00		18.00		21.00	
		48	5240		18.00			18.00			18.00		18.00		21.00	
	802.11ax-HE40 MCS0	38	5190		14.50			14.50			14.50		14.50		17.50	
		46	5230		17.00			17.00			17.00		17.00		20.00	
	802.11ax-HE80 MCS0	42	5210		14.00			14.00			14.00		14.00		17.00	

<WLAN 5.3GHz Non-DBS / DBS>

5.3GHz WLAN				Ant 9			Ant 8			Ant 9+8(9)		Ant 9+8(8)		Ant 9+8		
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	52	5260	Not Required	18.00	Not Required	Not Required	18.00	Not Required	17.70	18.00	17.20	18.00	20.47	21.00	100.00
		56	5280		18.00			18.00		17.50	18.00	16.90	18.00	20.22	21.00	
		60	5300		18.00			18.00		17.80	18.00	17.20	18.00	20.52	21.00	
		64	5320		16.50			16.50		16.20	16.50	15.90	16.50	19.06	19.50	
	802.11n-HT20 MCS0	52	5260		18.00			18.00		Not Required	18.00	Not Required	18.00	Not Required	21.00	Not Required
		56	5280		18.00			18.00			18.00		18.00		21.00	
		60	5300		18.00			18.00			18.00		18.00		21.00	
		64	5320		16.50			16.50			16.50		16.50		19.50	
	802.11n-HT40 MCS0	54	5270		17.00			17.00			17.00		17.00		20.00	
		62	5310		17.00			17.00			17.00		17.00		20.00	
	802.11ac-VHT20 MCS0	52	5260		18.00			18.00			18.00		18.00		21.00	
		56	5280		18.00			18.00			18.00		18.00		21.00	
		60	5300		18.00			18.00			18.00		18.00		21.00	
		64	5320		16.50			16.50			16.50		16.50		19.50	
	802.11ac-VHT40 MCS0	54	5270		17.00			17.00			17.00		17.00		20.00	
		62	5310		17.00			17.00			17.00		17.00		20.00	
	802.11ac-VHT80 MCS0	58	5290		15.00			15.00			15.00		15.00		18.00	
	802.11ac-VHT160 MCS0	50	5250		12.50			12.50			12.5		12.5		15.50	
	802.11ax-HE20 MCS0	52	5260		18.00			18.00			18.00		18.00		21.00	
		56	5280		18.00			18.00			18.00		18.00		21.00	
		60	5300		18.00			18.00			18.00		18.00		21.00	
		64	5320		16.50			16.50			16.50		16.50		19.50	
	802.11ax-HE40 MCS0	54	5270		17.50			17.50			17.50		17.50		20.50	
		62	5310		16.50			16.50			16.50		16.50		19.50	
	802.11ax-HE80 MCS0	58	5290		15.00			15.00			15.00		15.00		18.00	
	802.11ax-HE160 MCS0	50	5250		13.00			13.00			13		13		16.00	

<WLAN 5.5GHz Non-DBS / DBS>

5.5GHz WLAN				Ant 9			Ant 8			Ant 9+8(9)		Ant 9+8(8)		Ant 9+8		
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11a 6Mbps	100	5500	Not Required	16.50	Not Required	Not Required	16.50	Not Required	Not Required	16.50	Not Required	16.50	Not Required	19.50	Not Required
		116	5580		18.50			18.50			18.50		18.50		21.50	
		124	5620		18.50			18.50			18.50		18.50		21.50	
		132	5660		18.50			18.50			18.50		18.50		21.50	
		144	5720		18.50			18.50			18.50		18.50		21.50	
	802.11n-HT20 MCS0	100	5500		16.50			16.50			16.50		16.50		19.50	
		116	5580		18.50			18.50			18.50		18.50		21.50	
		124	5620		18.50			18.50			18.50		18.50		21.50	
		132	5660		18.50			18.50			18.50		18.50		21.50	
		144	5720		18.50			18.50			18.50		18.50		21.50	
	802.11n-HT40 MCS0	102	5510		14.50			14.50		14.30	14.50	13.90	14.50	17.11	17.50	100.00
		110	5550		17.50			17.50		17.30	17.50	16.50	17.50	19.93	20.50	
		126	5630		17.50			17.50		17.40	17.50	16.60	17.50	20.03	20.50	
		134	5670		15.50			15.50		15.20	15.50	14.90	15.50	18.06	18.50	
		142	5710		18.50			18.50		18.20	18.50	17.90	18.50	21.06	21.50	
	802.11ac-VHT20 MCS0	100	5500		16.50			16.50			16.50		16.50		19.50	
		116	5580		18.50			18.50			18.50		18.50		21.50	
		124	5620		18.50			18.50			18.50		18.50		21.50	
		132	5660		18.50			18.50			18.50		18.50		21.50	
		144	5720		18.50			18.50			18.50		18.50		21.50	
	802.11ac-VHT40 MCS0	102	5510		14.50			14.50			14.50		14.50		17.50	
		110	5550		17.50			17.50			17.50		17.50		20.50	
		126	5630		17.50			17.50			17.50		17.50		20.50	
		134	5670		15.50			15.50			15.50		15.50		18.50	
		142	5710		18.50			18.50			18.50		18.50		21.50	
	802.11ac-VHT80 MCS0	106	5530		14.50			14.50			14.50		14.50		17.50	
		122	5610		16.50			16.50			16.50		16.50		19.50	
		138	5690		17.00			17.00			17.00		17.00		20.00	
	802.11ac-VHT160 MCS0	114	5570		13.50			13.50			13.50		13.50		16.50	
	802.11ax-HE20 MCS0	100	5500		16.50			16.50			16.50		16.50		19.50	
		116	5580		18.50			18.50			18.50		18.50		21.50	
		124	5620		18.50			18.50			18.50		18.50		21.50	
		132	5660		18.50			18.50			18.50		18.50		21.50	
		144	5720		18.50			18.50			18.50		18.50		21.50	
	802.11ax-HE40 MCS0	102	5510		14.50			14.50			14.50		14.50		17.50	
		110	5550		17.50			17.50			17.50		17.50		20.50	
		126	5630		17.50			17.50			17.50		17.50		20.50	
		134	5670		15.50			15.50			15.50		15.50		18.50	
		142	5710		18.50			18.50			18.50		18.50		21.50	
	802.11ax-HE80 MCS0	106	5530		15.00			15.00			15.00		15.00		18.00	
		122	5610		16.50			16.50			16.50		16.50		19.50	
		138	5690		17.50			17.50			17.50		17.50		20.50	
	802.11ax-HE160 MCS0	114	5570		14.00			14.00			14.00		14.00		17.00	

<WLAN 5.8GHz Non-DBS / DBS>

5.8GHz WLAN				Ant 9			Ant 8			Ant 9+8(9)		Ant 9+8(8)		Ant 9+8		
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a 6Mbps	149	5745	Not Required	19.00	Not Required	Not Required	19.00	Not Required	18.60	19.00	18.10	19.00	21.37	22.00	99.20
		157	5785		19.00			19.00		18.60	19.00	18.10	19.00	21.37	22.00	
		165	5825		19.00			19.00		18.70	19.00	18.50	19.00	21.61	22.00	
	802.11n-HT20 MCS0	149	5745		18.50			18.50		Not Required	18.50	Not Required	18.50	Not Required	21.50	Not Required
		157	5785		18.50			18.50			18.50		18.50		21.50	
		165	5825		18.50			18.50			18.50		18.50		21.50	
	802.11n-HT40 MCS0	151	5755		17.00			17.00			17.00		17.00		20.00	
		159	5795		18.50			18.50			18.50		18.50		21.50	
	802.11ac-VHT20 MCS0	149	5745		18.50			18.50			18.50		18.50		21.50	
		157	5785		18.50			18.50			18.50		18.50		21.50	
		165	5825		18.50			18.50			18.50		18.50		21.50	
	802.11ac-VHT40 MCS0	151	5755		17.00			17.00			17.00		17.00		20.00	
		159	5795		18.50			18.50			18.50		18.50		21.50	
	802.11ac-VHT80 MCS0	155	5775		16.00			16.00			16.00		16.00		19.00	
	802.11ax-HE20 MCS0	149	5745		19.00			19.00			19.00		19.00		22.00	
		157	5785		19.00			19.00			19.00		19.00		22.00	
		165	5825		19.00			19.00			19.00		19.00		22.00	
	802.11ax-HE40 MCS0	151	5755		17.00			17.00			17.00		17.00		20.00	
		159	5795		18.50			18.50			18.50		18.50		21.50	
	802.11ax-HE80 MCS0	155	5775		16.00			16.00			16.00		16.00		19.00	

Beamforming Mode

<WLAN 2.4GHz Non-DBS / DBS>										
2.4GHz WLAN				Ant 9+8(9)		Ant 9+8(8)		Ant 9+8		
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11n-HT20 MCS0	1	2412	Not Required	15.50	Not Required	15.50	Not Required	18.50	Not Required
		6	2437		19.00		19.00		22.00	
		11	2462		15.00		15.00		18.00	
	802.11n-HT40 MCS0	3	2422		15.50		15.50		18.50	
		6	2437		18.50		18.50		21.50	
		9	2452		14.50		14.50		17.50	
	802.11ac-VHT20 MCS0	1	2412		15.50		15.50		18.50	
		6	2437		19.00		19.00		22.00	
		11	2462		15.00		15.00		18.00	
	802.11ac-VHT40 MCS0	3	2422		15.50		15.50		18.50	
		6	2437		18.50		18.50		21.50	
		9	2452		14.50		14.50		17.50	
	802.11ax-HE20 MCS0	1	2412		15.50		15.50		18.50	
		6	2437		19.50		19.50		22.50	
		11	2462		15.00		15.00		18.00	
	802.11ax-HE40 MCS0	3	2422		16.00		16.00		19.00	
		6	2437		19.00		19.00		22.00	
		9	2452		14.50		14.50		17.50	

<WLAN 5.2GHz Non-DBS / DBS>										
5.2GHz WLAN				Ant 9+8(9)		Ant 9+8(8)		Ant 9+8		
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11n-HT20 MCS0	36	5180	Not Required	15.50	Not Required	15.50	Not Required	18.50	Not Required
		40	5200		15.50		15.50		18.50	
		44	5220		17.50		17.50		20.50	
		48	5240		17.50		17.50		20.50	
	802.11n-HT40 MCS0	38	5190		12.50		12.50		15.50	
		46	5230		14.50		14.50		17.50	
	802.11ac-VHT20 MCS0	36	5180		15.50		15.50		18.50	
		40	5200		15.50		15.50		18.50	
		44	5220		17.50		17.50		20.50	
		48	5240		17.50		17.50		20.50	
	802.11ac-VHT40 MCS0	38	5190		12.50		12.50		15.50	
		46	5230		14.50		14.50		17.50	
	802.11ac-VHT80 MCS0	42	5210		12.00		12.00		15.00	
	802.11ax-HE20 MCS0	36	5180		15.50		15.50		18.50	
		40	5200		15.50		15.50		18.50	
		44	5220		17.50		17.50		20.50	
		48	5240		17.50		17.50		20.50	
	802.11ax-HE40 MCS0	38	5190		12.50		12.50		15.50	
		46	5230		14.50		14.50		17.50	
	802.11ax-HE80 MCS0	42	5210		12.00		12.00		15.00	

<WLAN 5.3GHz Non-DBS / DBS>

5.3GHz WLAN				Ant 9+8(9)		Ant 9+8(8)		Ant 9+8		
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11n-HT20 MCS0	52	5260	Not Required	18.00	Not Required	18.00	Not Required	21.00	Not Required
		56	5280		18.00		18.00		21.00	
		60	5300		17.00		17.00		20.00	
		64	5320		16.50		16.50		19.50	
	802.11n-HT40 MCS0	54	5270		15.00		15.00		18.00	
		62	5310		13.50		13.50		16.50	
	802.11ac-VHT20 MCS0	52	5260		18.00		18.00		21.00	
		56	5280		18.00		18.00		21.00	
		60	5300		17.00		17.00		20.00	
		64	5320		16.50		16.50		19.50	
	802.11ac-VHT40 MCS0	54	5270		15.00		15.00		18.00	
		62	5310		13.50		13.50		16.50	
	802.11ac-VHT80 MCS0	58	5290		13.50		13.50		16.50	
	802.11ac-VHT160 MCS0	50	5250		10.50		10.50		13.50	
	802.11ax-HE20 MCS0	52	5260		18.00		18.00		21.00	
		56	5280		18.00		18.00		21.00	
		60	5300		17.00		17.00		20.00	
		64	5320		16.50		16.50		19.50	
	802.11ax-HE40 MCS0	54	5270		15.00		15.00		18.00	
		62	5310		13.50		13.50		16.50	
	802.11ax-HE80 MCS0	58	5290		13.50		13.50		16.50	
	802.11ax-HE160 MCS0	50	5250		10.50		10.50		13.50	

<WLAN 5.5GHz Non-DBS / DBS>

5.5GHz WLAN				Ant 9+8(9)		Ant 9+8(8)		Ant 9+8		
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11n-HT20 MCS0	100	5500	Not Required	16.00	Not Required	16.00	Not Required	19.00	Not Required
		116	5580		18.50		18.50		21.50	
		124	5620		18.50		18.50		21.50	
		132	5660		18.50		18.50		21.50	
		144	5720		18.50		18.50		21.50	
	802.11n-HT40 MCS0	102	5510		11.50		11.50		14.50	
		110	5550		17.00		17.00		20.00	
		126	5630		17.00		17.00		20.00	
		134	5670		11.50		11.50		14.50	
		142	5710		18.00		18.00		21.00	
	802.11ac-VHT20 MCS0	100	5500		16.00		16.00		19.00	
		116	5580		18.50		18.50		21.50	
		124	5620		18.50		18.50		21.50	
		132	5660		18.50		18.50		21.50	
		144	5720		18.50		18.50		21.50	
	802.11ac-VHT40 MCS0	102	5510		12.00		12.00		15.00	
		110	5550		17.50		17.50		20.50	
		126	5630		17.50		17.50		20.50	
		134	5670		12.00		12.00		15.00	
		142	5710		18.00		18.00		21.00	
	802.11ac-VHT80 MCS0	106	5530		14.00		14.00		17.00	
		122	5610		16.50		16.50		19.50	
		138	5690		16.00		16.00		19.00	
	802.11ac-VHT160 MCS0	114	5570		10.50		10.50		13.50	
	802.11ax-HE20 MCS0	100	5500		16.00		16.00		19.00	
		116	5580		18.50		18.50		21.50	
		124	5620		18.50		18.50		21.50	
		132	5660		18.50		18.50		21.50	
		144	5720		18.50		18.50		21.50	
	802.11ax-HE40 MCS0	102	5510		12.00		12.00		15.00	
		110	5550		17.50		17.50		20.50	
		126	5630		17.50		17.50		20.50	
		134	5670		12.00		12.00		15.00	
		142	5710		18.00		18.00		21.00	
	802.11ax-HE80 MCS0	106	5530		14.00		14.00		17.00	
		122	5610		16.50		16.50		19.50	
		138	5690		16.50		16.50		19.50	
	802.11ax-HE160 MCS0	114	5570		10.50		10.50		13.50	

<WLAN 5.8GHz Non-DBS / DBS >										
5.8GHz WLAN				Ant 9+8(9)		Ant 9+8(8)		Ant 9+8		
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11n-HT20 MCS0	149	5745	Not Required	18.00	Not Required	18.00	Not Required	21.00	Not Required
		157	5785		17.00		17.00		20.00	
		165	5825		18.00		18.00		21.00	
	802.11n-HT40 MCS0	151	5755		17.50		17.50		20.50	
		159	5795		17.50		17.50		20.50	
	802.11ac-VHT20 MCS0	149	5745		18.00		18.00		21.00	
		157	5785		17.00		17.00		20.00	
		165	5825		18.00		18.00		21.00	
	802.11ac-VHT40 MCS0	151	5755		17.50		17.50		20.50	
		159	5795		17.50		17.50		20.50	
	802.11ac-VHT80 MCS0	155	5775		15.50		15.50		18.50	
	802.11ax-HE20 MCS0	149	5745		18.00		18.00		21.00	
		157	5785		17.00		17.00		20.00	
		165	5825		18.00		18.00		21.00	
	802.11ax-HE40 MCS0	151	5755		18.00		18.00		21.00	
		159	5795		17.50		17.50		20.50	
	802.11ax-HE80 MCS0	155	5775		15.50		15.50		18.50	

<2.4GHz Bluetooth>

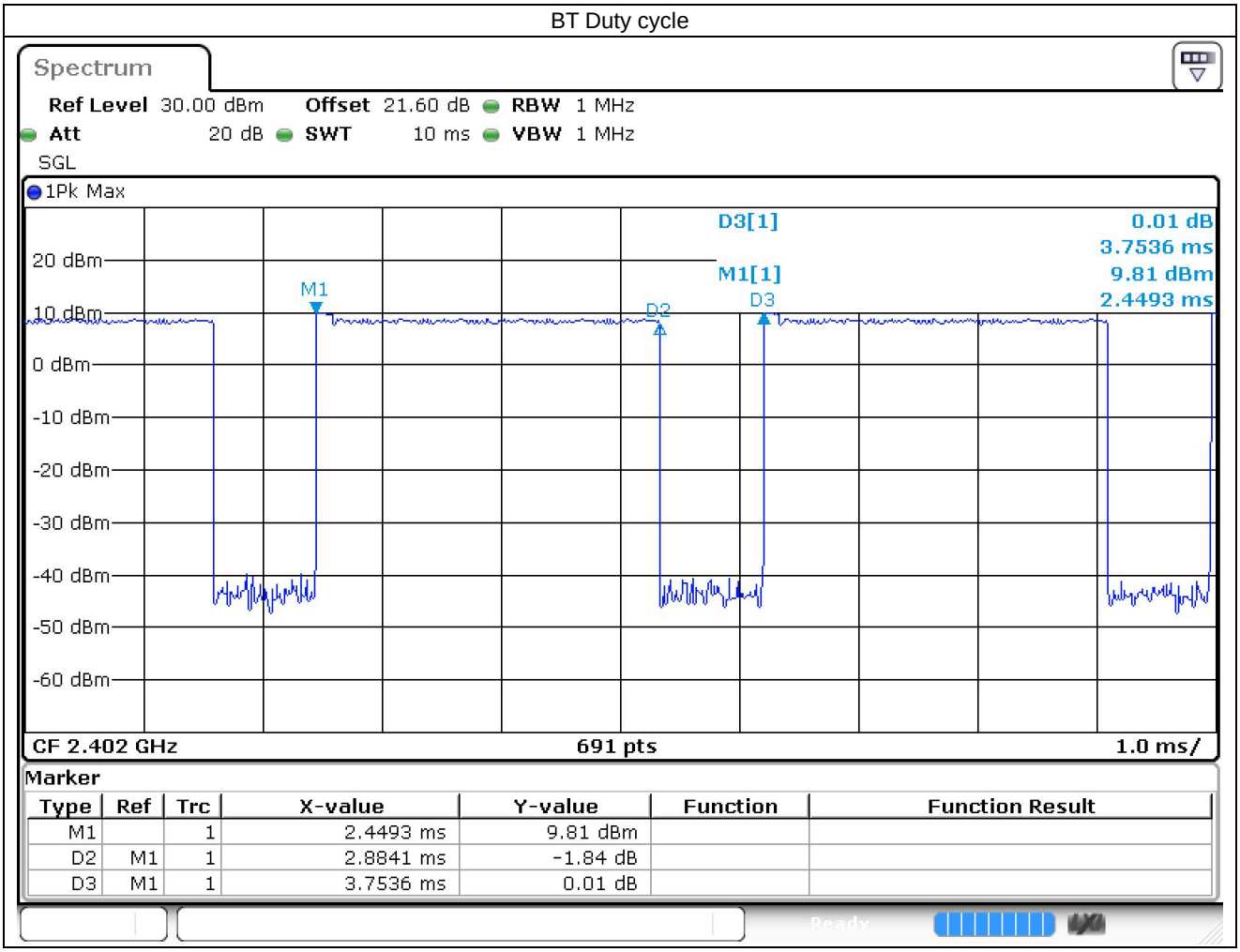
Ant 9					
Mode	Channel	Frequency (MHz)	Average power (dBm)		
			1Mbps	2Mbps	3Mbps
BR / EDR	CH 00	2402	1.82	0.30	0.12
	CH 39	2441	2.30	0.45	0.60
	CH 78	2480	2.18	0.15	0.33
Tune-up Limit			2.50	1.00	1.00

Ant 9				
Mode	Channel	Frequency (MHz)	Average power (dBm)	
			1Mbps	2Mbps
LE	CH 00	2402	1.80	1.80
	CH 19	2440	1.90	1.90
	CH 39	2480	2.10	2.10
Tune-up Limit			2.50	2.50

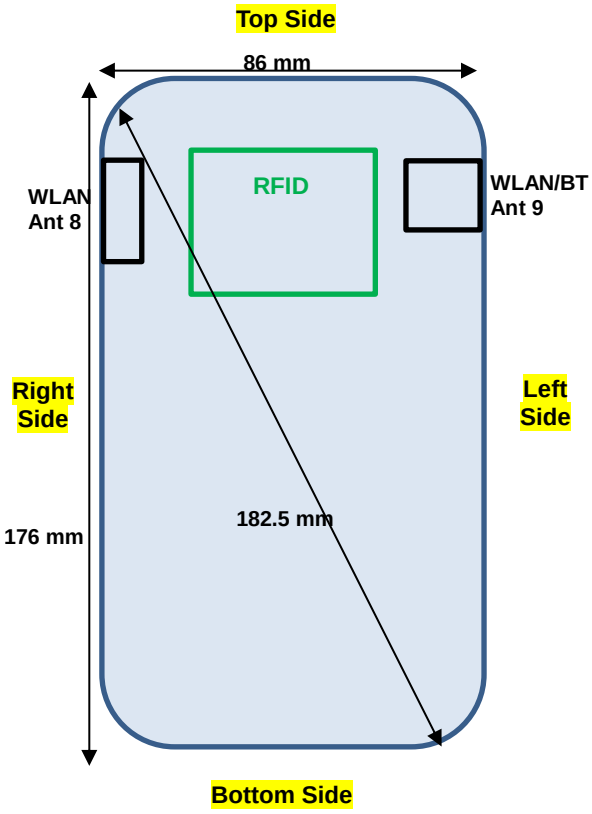
General Note:

1. For 2.4GHz Bluetooth SAR testing was selected 1Mbps due to its highest average power and duty cycle is 76.83% considered in SAR testing, and the duty cycle would be scaled to theoretical 83.3% in reported SAR calculation.

BT Duty cycle



12. Antenna Location



Back View

13. SAR Test Results

General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For SAR testing of 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)"
   c. For WLAN/Bluetooth: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
4. Per KDB 648474 D04v01r03, when the reported SAR for a body-worn accessory measured without a headset connected to the handset is ≤ 1.2 W/kg, SAR testing with a headset connected to the handset is not required.
5. For 5.3GHz / 5.5GHz WLAN product specific SAR is necessary too, due to an overall diagonal dimension is > 16cm.

WLAN Note:

1. Per KDB 248227 D01v02r02, for 2.4GHz 802.11g/n SAR testing is not required 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.
2. Per KDB 248227 D01v02r02, WLAN5.2GHz SAR testing is not required when the WLAN5.3GHz band highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for WLAN5.2GHz band.
3. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
4. For all positions / configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions / configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.
5. For determination of the scaling factor for report SAR of MIMO mode, if the hot spots are separated the scaling factors are individually determined from each transmit chain. If the hot spots are not spatially separated, the scaling factor is determined from the worst number of each transmit chain.
6. Additional SISO operation for 2.4GHz WLAN is performed Sim-Tx analysis.
7. During SAR testing the WLAN transmission was verified using a spectrum analyzer.

13.1 Head SAR

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Sample	Battery	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Sample 1	Battery 1	Ant 9+8(9)	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	0.09	0.673	0.705
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	0mm	Sample 1	Battery 1	Ant 9+8(9)	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	0.18	0.419	0.439
01	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 1	Battery 1	Ant 9+8(9)	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	-0.17	1.110	1.162
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 1	Battery 1	Ant 9+8(9)	Non-DBS	6	2437	20.80	21.50	1.175	100	1.000	0.15	0.715	0.840
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS	11	2462	20.70	21.50	1.202	100	1.000	-0.08	0.725	0.872
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Sample 1	Battery 1	Ant 9+8(9)	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	-0.06	0.838	0.877
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Sample 1	Battery 1	Ant 9+8(9)	Non-DBS	6	2437	20.80	21.50	1.175	100	1.000	-0.11	0.624	0.733
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS	11	2462	20.70	21.50	1.202	100	1.000	0.15	0.652	0.784
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 1	Battery 2	Ant 9+8(9)	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	0.08	1.020	1.068
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 1	Battery 3	Ant 9+8(9)	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	-0.1	1.050	1.099
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 2	Battery 1	Ant 9+8(9)	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	0.05	0.798	0.836
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 3	Battery 1	Ant 9+8(9)	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	0.18	0.831	0.870
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Sample 1	Battery 1	Ant 9+8(9)	DBS	1	2412	19.00	19.50	1.122	99.90	1.001	-0.16	0.416	0.467
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	0mm	Sample 1	Battery 1	Ant 9+8(9)	DBS	1	2412	19.00	19.50	1.122	99.90	1.001	-0.05	0.259	0.291
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 1	Battery 1	Ant 9+8(9)	DBS	1	2412	19.00	19.50	1.122	99.90	1.001	0.09	0.605	0.679
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 1	Battery 1	Ant 9+8(9)	DBS	6	2437	18.60	19.00	1.096	99.90	1.001	0	0.442	0.485
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 1	Battery 1	Ant 9+8(8)	DBS	11	2462	18.70	19.00	1.072	99.90	1.001	-0.01	0.448	0.481
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Sample 1	Battery 1	Ant 9+8(9)	DBS	1	2412	19.00	19.50	1.122	99.90	1.001	-0.02	0.518	0.582
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 1	Battery 2	Ant 9+8(9)	DBS	1	2412	19.00	19.50	1.122	99.90	1.001	-0.04	0.558	0.627
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 1	Battery 3	Ant 9+8(9)	DBS	1	2412	19.00	19.50	1.122	99.90	1.001	0.03	0.563	0.632
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 2	Battery 1	Ant 9+8(9)	DBS	1	2412	19.00	19.50	1.122	99.90	1.001	0.03	0.435	0.489
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 3	Battery 1	Ant 9+8(9)	DBS	1	2412	19.00	19.50	1.122	99.90	1.001	-0.06	0.453	0.509
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Sample 1	Battery 1	Ant 8	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	0.14	0.618	0.647
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	0mm	Sample 1	Battery 1	Ant 8	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	-0.02	0.415	0.435
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 1	Battery 1	Ant 8	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	0.08	0.866	0.907
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 1	Battery 1	Ant 8	Non-DBS	6	2437	21.20	21.50	1.072	100	1.000	-0.12	0.620	0.664
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 1	Battery 1	Ant 8	Non-DBS	11	2462	21.00	21.50	1.122	100	1.000	0.01	0.586	0.658
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Sample 1	Battery 1	Ant 8	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	-0.09	0.676	0.708
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 1	Battery 2	Ant 8	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	-0.11	0.847	0.887
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 1	Battery 3	Ant 8	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	0.08	0.855	0.895
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 2	Battery 1	Ant 8	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	-0.03	0.841	0.881
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 3	Battery 1	Ant 8	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	0.02	0.858	0.898
	WLAN2.4GHz	802.11b 1Mbps	Right Cheek	0mm	Sample 1	Battery 1	Ant 8	DBS	1	2412	19.10	19.50	1.096	99.70	1.003	-0.15	0.535	0.588
	WLAN2.4GHz	802.11b 1Mbps	Right Tilted	0mm	Sample 1	Battery 1	Ant 8	DBS	1	2412	19.10	19.50	1.096	99.70	1.003	0.11	0.359	0.395
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 1	Battery 1	Ant 8	DBS	1	2412	19.10	19.50	1.096	99.70	1.003	-0.07	0.750	0.825
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 1	Battery 1	Ant 8	DBS	6	2437	18.50	19.00	1.122	99.70	1.003	-0.03	0.537	0.604
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 1	Battery 1	Ant 8	DBS	11	2462	18.60	19.00	1.096	99.70	1.003	0.13	0.507	0.558
	WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0mm	Sample 1	Battery 1	Ant 8	DBS	1	2412	19.10	19.50	1.096	99.70	1.003	-0.18	0.586	0.644
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 1	Battery 2	Ant 8	DBS	1	2412	19.10	19.50	1.096	99.70	1.003	0.07	0.741	0.815
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 1	Battery 3	Ant 8	DBS	1	2412	19.10	19.50	1.096	99.70	1.003	0.09	0.739	0.813
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 2	Battery 1	Ant 8	DBS	1	2412	19.10	19.50	1.096	99.70	1.003	0.12	0.729	0.802
	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 3	Battery 1	Ant 8	DBS	1	2412	19.10	19.50	1.096	99.70	1.003	-0.16	0.743	0.817

Plot No.	Band	Mode	Test Position	Gap (mm)	Sample	Battery	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN5GHz	802.11a 6Mbps	Right Cheek	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	60	5300	17.20	18.00	1.202	100	1.000	0.17	0.332	0.399
	WLAN5GHz	802.11a 6Mbps	Right Tilted	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	60	5300	17.20	18.00	1.202	100	1.000	0.14	0.280	0.337
02	WLAN5GHz	802.11a 6Mbps	Left Cheek	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	60	5300	17.20	18.00	1.202	100	1.000	-0.05	0.504	0.606
	WLAN5GHz	802.11a 6Mbps	Left Cheek	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	52	5260	17.20	18.00	1.202	100	1.000	-0.12	0.478	0.575
	WLAN5GHz	802.11a 6Mbps	Left Cheek	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	56	5280	16.90	18.00	1.288	100	1.000	0.11	0.437	0.563
	WLAN5GHz	802.11a 6Mbps	Left Cheek	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	64	5320	15.90	16.50	1.148	100	1.000	0.13	0.389	0.447
	WLAN5GHz	802.11a 6Mbps	Left Tilted	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	60	5300	17.20	18.00	1.202	100	1.000	0.07	0.366	0.440
	WLAN5GHz	802.11a 6Mbps	Left Cheek	0mm	Sample 1	Battery 2	Ant 9+8(8)	Non-DBS/DBS	60	5300	17.20	18.00	1.202	100	1.000	0.01	0.493	0.593
	WLAN5GHz	802.11a 6Mbps	Left Cheek	0mm	Sample 1	Battery 3	Ant 9+8(8)	Non-DBS/DBS	60	5300	17.20	18.00	1.202	100	1.000	0.04	0.488	0.587
	WLAN5GHz	802.11a 6Mbps	Left Cheek	0mm	Sample 2	Battery 1	Ant 9+8(8)	Non-DBS/DBS	60	5300	17.20	18.00	1.202	100	1.000	-0.14	0.396	0.476
	WLAN5GHz	802.11a 6Mbps	Left Cheek	0mm	Sample 3	Battery 1	Ant 9+8(8)	Non-DBS/DBS	60	5300	17.20	18.00	1.202	100	1.000	-0.14	0.423	0.509
	WLAN5GHz	802.11n-HT40 MCS0	Right Cheek	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	142	5710	17.90	18.50	1.148	100	1.000	0.06	0.376	0.432
	WLAN5GHz	802.11n-HT40 MCS0	Right Tilted	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	142	5710	17.90	18.50	1.148	100	1.000	0.14	0.426	0.489
03	WLAN5GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	142	5710	17.90	18.50	1.148	100	1.000	-0.13	0.488	0.560
	WLAN5GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	102	5510	13.90	14.50	1.148	100	1.000	0.19	0.208	0.239
	WLAN5GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	110	5550	16.50	17.50	1.259	100	1.000	0.17	0.442	0.556
	WLAN5GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	126	5630	16.60	17.50	1.230	100	1.000	0.03	0.439	0.540
	WLAN5GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	134	5670	14.90	15.50	1.148	100	1.000	0.12	0.280	0.321
	WLAN5GHz	802.11n-HT40 MCS0	Left Tilted	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	142	5710	17.90	18.50	1.148	100	1.000	-0.11	0.407	0.467
	WLAN5GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Sample 1	Battery 2	Ant 9+8(8)	Non-DBS/DBS	142	5710	17.90	18.50	1.148	100	1.000	0.03	0.471	0.541
	WLAN5GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Sample 1	Battery 3	Ant 9+8(8)	Non-DBS/DBS	142	5710	17.90	18.50	1.148	100	1.000	-0.07	0.465	0.534
	WLAN5GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Sample 2	Battery 1	Ant 9+8(8)	Non-DBS/DBS	142	5710	17.90	18.50	1.148	100	1.000	0.02	0.364	0.418
	WLAN5GHz	802.11n-HT40 MCS0	Left Cheek	0mm	Sample 3	Battery 1	Ant 9+8(8)	Non-DBS/DBS	142	5710	17.90	18.50	1.148	100	1.000	0	0.445	0.511
	WLAN5GHz	802.11a 6Mbps	Right Cheek	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	165	5825	18.50	19.00	1.122	99.20	1.008	0.19	0.483	0.546
	WLAN5GHz	802.11a 6Mbps	Right Tilted	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	165	5825	18.50	19.00	1.122	99.20	1.008	0.05	0.542	0.613
04	WLAN5GHz	802.11a 6Mbps	Left Cheek	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	165	5825	18.50	19.00	1.122	99.20	1.008	-0.06	0.641	0.725
	WLAN5GHz	802.11a 6Mbps	Left Cheek	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	149	5745	18.10	19.00	1.230	99.20	1.008	-0.04	0.573	0.711
	WLAN5GHz	802.11a 6Mbps	Left Cheek	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	157	5785	18.10	19.00	1.230	99.20	1.008	-0.02	0.541	0.671
	WLAN5GHz	802.11a 6Mbps	Left Tilted	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	165	5825	18.50	19.00	1.122	99.20	1.008	0.18	0.593	0.671
	WLAN5GHz	802.11a 6Mbps	Left Cheek	0mm	Sample 1	Battery 2	Ant 9+8(8)	Non-DBS/DBS	165	5825	18.50	19.00	1.122	99.20	1.008	0.02	0.628	0.710
	WLAN5GHz	802.11a 6Mbps	Left Cheek	0mm	Sample 1	Battery 3	Ant 9+8(8)	Non-DBS/DBS	165	5825	18.50	19.00	1.122	99.20	1.008	-0.01	0.625	0.707
	WLAN5GHz	802.11a 6Mbps	Left Cheek	0mm	Sample 2	Battery 1	Ant 9+8(8)	Non-DBS/DBS	165	5825	18.50	19.00	1.122	99.20	1.008	-0.03	0.494	0.559
	WLAN5GHz	802.11a 6Mbps	Left Cheek	0mm	Sample 3	Battery 1	Ant 9+8(8)	Non-DBS/DBS	165	5825	18.50	19.00	1.122	99.20	1.008	-0.11	0.584	0.661

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Sample	Battery	Antenna	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	Bluetooth	1Mbps	Right Cheek	0mm	Sample 1	Battery 1	Ant 9	39	2441	2.30	2.50	1.047	76.90	1.083	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Right Tilted	0mm	Sample 1	Battery 1	Ant 9	39	2441	2.30	2.50	1.047	76.90	1.083	0	< 0.001	< 0.001
05	Bluetooth	1Mbps	Left Cheek	0mm	Sample 1	Battery 1	Ant 9	39	2441	2.30	2.50	1.047	76.90	1.083	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Left Tilted	0mm	Sample 1	Battery 1	Ant 9	39	2441	2.30	2.50	1.047	76.90	1.083	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Left Cheek	0mm	Sample 1	Battery 1	Ant 9	0	2402	1.82	2.50	1.169	76.90	1.083	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Left Cheek	0mm	Sample 1	Battery 1	Ant 9	78	2480	2.18	2.50	1.076	76.90	1.083	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Left Cheek	0mm	Sample 1	Battery 2	Ant 9	39	2441	2.30	2.50	1.047	76.90	1.083	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Left Cheek	0mm	Sample 1	Battery 3	Ant 9	39	2441	2.30	2.50	1.047	76.90	1.083	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Left Cheek	0mm	Sample 2	Battery 1	Ant 9	39	2441	2.30	2.50	1.047	76.90	1.083	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Left Cheek	0mm	Sample 3	Battery 1	Ant 9	39	2441	2.30	2.50	1.047	76.90	1.083	0	< 0.001	< 0.001

13.2 Hotspot SAR

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Sample	Battery	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	Sample 1	Battery 1	Ant 9+8(9)	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	0.03	0.345	0.361
	WLAN2.4GHz	802.11b 1Mbps	Back	10mm	Sample 1	Battery 1	Ant 9+8(9)	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	0.09	0.413	0.432
	WLAN2.4GHz	802.11b 1Mbps	Left Side	10mm	Sample 1	Battery 1	Ant 9+8(9)	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	-0.06	0.234	0.245
06	WLAN2.4GHz	802.11b 1Mbps	Right Side	10mm	Sample 1	Battery 1	Ant 9+8(9)	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	-0.03	0.621	0.650
	WLAN2.4GHz	802.11b 1Mbps	Right Side	10mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS	6	2437	20.90	21.50	1.148	100	1.000	0.12	0.497	0.571
	WLAN2.4GHz	802.11b 1Mbps	Right Side	10mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS	11	2462	20.70	21.50	1.202	100	1.000	-0.05	0.361	0.434
	WLAN2.4GHz	802.11b 1Mbps	Top Side	10mm	Sample 1	Battery 1	Ant 9+8(9)	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	-0.19	0.249	0.261
	WLAN2.4GHz	802.11b 1Mbps	Right Side	10mm	Sample 1	Battery 2	Ant 9+8(8)	Non-DBS	1	2412	21.10	21.50	1.096	100	1.000	0.11	0.608	0.667
	WLAN2.4GHz	802.11b 1Mbps	Right Side	10mm	Sample 1	Battery 3	Ant 9+8(8)	Non-DBS	1	2412	21.10	21.50	1.096	100	1.000	0.08	0.612	0.671
	WLAN2.4GHz	802.11b 1Mbps	Right Side	10mm	Sample 2	Battery 1	Ant 9+8(8)	Non-DBS	1	2412	21.10	21.50	1.096	100	1.000	0.02	0.302	0.331
	WLAN2.4GHz	802.11b 1Mbps	Right Side	10mm	Sample 3	Battery 1	Ant 9+8(8)	Non-DBS	1	2412	21.10	21.50	1.096	100	1.000	-0.17	0.373	0.409
	WLAN2.4GHz	802.11b 1Mbps	Front	10mm	Sample 1	Battery 1	Ant 9+8(8)	DBS	1	2412	19.20	19.50	1.072	99.90	1.001	0.16	0.200	0.215
	WLAN2.4GHz	802.11b 1Mbps	Back	10mm	Sample 1	Battery 1	Ant 9+8(8)	DBS	1	2412	19.20	19.50	1.072	99.90	1.001	-0.11	0.240	0.257
	WLAN2.4GHz	802.11b 1Mbps	Left Side	10mm	Sample 1	Battery 1	Ant 9+8(9)	DBS	1	2412	19.00	19.50	1.122	99.90	1.001	-0.14	0.136	0.153
	WLAN2.4GHz	802.11b 1Mbps	Right Side	10mm	Sample 1	Battery 1	Ant 9+8(8)	DBS	1	2412	19.20	19.50	1.072	99.90	1.001	0.15	0.370	0.397
	WLAN2.4GHz	802.11b 1Mbps	Right Side	10mm	Sample 1	Battery 1	Ant 9+8(8)	DBS	6	2437	18.60	19.00	1.096	99.90	1.001	-0.18	0.288	0.316
	WLAN2.4GHz	802.11b 1Mbps	Right Side	10mm	Sample 1	Battery 1	Ant 9+8(8)	DBS	11	2462	18.70	19.00	1.072	99.90	1.001	-0.12	0.210	0.225
	WLAN2.4GHz	802.11b 1Mbps	Top Side	10mm	Sample 1	Battery 1	Ant 9+8(8)	DBS	1	2412	19.20	19.50	1.072	99.90	1.001	0.15	0.145	0.156
	WLAN2.4GHz	802.11b 1Mbps	Right Side	10mm	Sample 1	Battery 2	Ant 9+8(8)	DBS	1	2412	19.20	19.50	1.072	99.90	1.001	0.04	0.358	0.384
	WLAN2.4GHz	802.11b 1Mbps	Right Side	10mm	Sample 1	Battery 3	Ant 9+8(8)	DBS	1	2412	19.20	19.50	1.072	99.90	1.001	0.07	0.355	0.381
	WLAN2.4GHz	802.11b 1Mbps	Right Side	10mm	Sample 2	Battery 1	Ant 9+8(8)	DBS	1	2412	19.20	19.50	1.072	99.90	1.001	-0.11	0.180	0.193
	WLAN2.4GHz	802.11b 1Mbps	Right Side	10mm	Sample 3	Battery 1	Ant 9+8(8)	DBS	1	2412	19.20	19.50	1.072	99.90	1.001	0.07	0.222	0.238

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Sample	Battery	Antenna	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	Bluetooth	1Mbps	Front	10mm	Sample 1	Battery 1	Ant 9	39	2441	2.30	2.50	1.047	76.90	1.083	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Back	10mm	Sample 1	Battery 1	Ant 9	39	2441	2.30	2.50	1.047	76.90	1.083	0	< 0.001	< 0.001
07	Bluetooth	1Mbps	Left Side	10mm	Sample 1	Battery 1	Ant 9	39	2441	2.30	2.50	1.047	76.90	1.083	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Left Side	10mm	Sample 1	Battery 1	Ant 9	0	2402	1.82	2.50	1.169	76.90	1.083	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Left Side	10mm	Sample 1	Battery 1	Ant 9	78	2480	2.18	2.50	1.076	76.90	1.083	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Right Side	10mm	Sample 1	Battery 1	Ant 9	39	2441	2.30	2.50	1.047	76.90	1.083	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Top Side	10mm	Sample 1	Battery 1	Ant 9	39	2441	2.30	2.50	1.047	76.90	1.083	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Left Side	10mm	Sample 1	Battery 2	Ant 9	39	2441	2.30	2.50	1.047	76.90	1.083	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Left Side	10mm	Sample 1	Battery 3	Ant 9	39	2441	2.30	2.50	1.047	76.90	1.083	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Left Side	10mm	Sample 2	Battery 1	Ant 9	39	2441	2.30	2.50	1.047	76.90	1.083	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Left Side	10mm	Sample 3	Battery 1	Ant 9	39	2441	2.30	2.50	1.047	76.90	1.083	0	< 0.001	< 0.001

13.3 Body-Worn Accessory SAR

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Sample	Battery	Holster	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Front	15mm	Sample 1	Battery 1	-	Ant 9+8(9)	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	-0.08	0.259	0.271
08	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Sample 1	Battery 1	-	Ant 9+8(9)	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	-0.11	0.339	0.355
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Sample 1	Battery 1	-	Ant 9+8(9)	Non-DBS	6	2437	20.80	21.50	1.175	100	1.000	0	0.222	0.261
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Sample 1	Battery 1	-	Ant 9+8(8)	Non-DBS	11	2462	20.70	21.50	1.202	100	1.000	0.07	0.195	0.234
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Sample 1	Battery 2	-	Ant 9+8(9)	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	0.02	0.325	0.340
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Sample 1	Battery 3	-	Ant 9+8(9)	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	0.01	0.321	0.336
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Sample 1	Battery 1	Soft Holster	Ant 9+8(9)	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	0.11	0.207	0.217
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Sample 2	Battery 1	-	Ant 9+8(9)	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	-0.11	0.130	0.136
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Sample 3	Battery 1	-	Ant 9+8(9)	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	0.16	0.168	0.176
	WLAN2.4GHz	802.11b 1Mbps	Front	15mm	Sample 1	Battery 1	-	Ant 9+8(9)	DBS	1	2412	19.00	19.50	1.122	99.90	1.001	-0.05	0.155	0.174
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Sample 1	Battery 1	-	Ant 9+8(9)	DBS	1	2412	19.00	19.50	1.122	99.90	1.001	-0.1	0.254	0.285
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Sample 1	Battery 1	-	Ant 9+8(9)	DBS	6	2437	18.60	19.00	1.096	99.90	1.001	0.19	0.133	0.146
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Sample 1	Battery 1	-	Ant 9+8(8)	DBS	11	2462	18.70	19.00	1.072	99.90	1.001	0.18	0.116	0.124
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Sample 1	Battery 2	-	Ant 9+8(9)	DBS	1	2412	19.00	19.50	1.122	99.90	1.001	0.05	0.235	0.264
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Sample 1	Battery 3	-	Ant 9+8(9)	DBS	1	2412	19.00	19.50	1.122	99.90	1.001	-0.01	0.232	0.261
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Sample 1	Battery 1	Soft Holster	Ant 9+8(9)	DBS	1	2412	19.00	19.50	1.122	99.90	1.001	-0.11	0.124	0.139
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Sample 2	Battery 1	-	Ant 9+8(9)	DBS	1	2412	19.00	19.50	1.122	99.90	1.001	-0.12	0.084	0.094
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Sample 3	Battery 1	-	Ant 9+8(9)	DBS	1	2412	19.00	19.50	1.122	99.90	1.001	0.04	0.101	0.113
	WLAN2.4GHz	802.11b 1Mbps	Front	15mm	Sample 1	Battery 1	-	Ant 8	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	0.02	0.145	0.152
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Sample 1	Battery 1	-	Ant 8	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	-0.17	0.299	0.313
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Sample 1	Battery 1	-	Ant 8	Non-DBS	6	2437	21.20	21.50	1.072	100	1.000	0.05	0.139	0.149
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Sample 1	Battery 1	-	Ant 8	Non-DBS	11	2462	21.00	21.50	1.122	100	1.000	-0.16	0.125	0.140
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Sample 1	Battery 2	-	Ant 8	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	0.02	0.275	0.288
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Sample 1	Battery 3	-	Ant 8	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	0.01	0.281	0.294
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Sample 1	Battery 1	Soft Holster	Ant 8	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	-0.04	0.121	0.127
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Sample 2	Battery 1	-	Ant 8	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	0.11	0.095	0.099
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Sample 3	Battery 1	-	Ant 8	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	0.09	0.093	0.097
	WLAN2.4GHz	802.11b 1Mbps	Front	15mm	Sample 1	Battery 1	-	Ant 8	DBS	1	2412	19.10	19.50	1.096	99.90	1.001	0.02	0.145	0.159
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Sample 1	Battery 1	-	Ant 8	DBS	1	2412	19.10	19.50	1.096	99.90	1.001	0.17	0.212	0.233
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Sample 1	Battery 1	-	Ant 8	DBS	6	2437	18.50	19.00	1.122	99.90	1.001	0.05	0.139	0.156
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Sample 1	Battery 1	-	Ant 8	DBS	11	2462	18.60	19.00	1.096	99.90	1.001	-0.16	0.125	0.137
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Sample 1	Battery 2	-	Ant 8	DBS	1	2412	19.10	19.50	1.096	99.90	1.001	-0.08	0.198	0.217
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Sample 1	Battery 3	-	Ant 8	DBS	1	2412	19.10	19.50	1.096	99.90	1.001	0.05	0.201	0.221
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Sample 1	Battery 1	Soft Holster	Ant 8	DBS	1	2412	19.10	19.50	1.096	99.90	1.001	-0.04	0.121	0.133
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Sample 2	Battery 1	-	Ant 8	DBS	1	2412	19.10	19.50	1.096	99.90	1.001	0.11	0.095	0.104
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Sample 3	Battery 1	-	Ant 8	DBS	1	2412	19.10	19.50	1.096	99.90	1.001	0.09	0.093	0.102

Plot No.	Band	Mode	Test Position	Gap (mm)	Sample	Battery	Holster	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN5GHz	802.11a 6Mbps	Front	15mm	Sample 1	Battery 1	-	Ant 9+8(8)	Non-DBS/DBS	60	5300	17.20	18.00	1.202	100	1.000	0.15	0.127	0.153
09	WLAN5GHz	802.11a 6Mbps	Back	15mm	Sample 1	Battery 1	-	Ant 9+8(8)	Non-DBS/DBS	60	5300	17.20	18.00	1.202	100	1.000	-0.07	0.354	0.426
	WLAN5GHz	802.11a 6Mbps	Back	15mm	Sample 1	Battery 1	-	Ant 9+8(8)	Non-DBS/DBS	52	5260	17.20	18.00	1.202	100	1.000	-0.02	0.312	0.375
	WLAN5GHz	802.11a 6Mbps	Back	15mm	Sample 1	Battery 1	-	Ant 9+8(8)	Non-DBS/DBS	56	5280	16.90	18.00	1.288	100	1.000	0.05	0.307	0.395
	WLAN5GHz	802.11a 6Mbps	Back	15mm	Sample 1	Battery 1	-	Ant 9+8(8)	Non-DBS/DBS	64	5320	15.90	16.50	1.148	100	1.000	0.12	0.298	0.342
	WLAN5GHz	802.11a 6Mbps	Back	15mm	Sample 1	Battery 2	-	Ant 9+8(8)	Non-DBS/DBS	60	5300	17.20	18.00	1.202	100	1.000	0.01	0.338	0.406
	WLAN5GHz	802.11a 6Mbps	Back	15mm	Sample 1	Battery 3	-	Ant 9+8(8)	Non-DBS/DBS	60	5300	17.20	18.00	1.202	100	1.000	0.08	0.325	0.391
	WLAN5GHz	802.11a 6Mbps	Back	0mm	Sample 1	Battery 1	Soft Holster	Ant 9+8(8)	Non-DBS/DBS	60	5300	17.20	18.00	1.202	100	1.000	-0.13	0.238	0.286
	WLAN5GHz	802.11a 6Mbps	Back	15mm	Sample 2	Battery 1	-	Ant 9+8(8)	Non-DBS/DBS	60	5300	17.20	18.00	1.202	100	1.000	0.15	0.243	0.292
	WLAN5GHz	802.11a 6Mbps	Back	15mm	Sample 3	Battery 1	-	Ant 9+8(8)	Non-DBS/DBS	60	5300	17.20	18.00	1.202	100	1.000	0.13	0.225	0.271
	WLAN5GHz	802.11n-HT40 MCS0	Front	15mm	Sample 1	Battery 1	-	Ant 9+8(8)	Non-DBS/DBS	142	5710	17.90	18.50	1.148	100	1.000	-0.04	0.127	0.146
10	WLAN5GHz	802.11n-HT40 MCS0	Back	15mm	Sample 1	Battery 1	-	Ant 9+8(8)	Non-DBS/DBS	142	5710	17.90	18.50	1.148	100	1.000	-0.06	0.593	0.681
	WLAN5GHz	802.11n-HT40 MCS0	Back	15mm	Sample 1	Battery 1	-	Ant 9+8(8)	Non-DBS/DBS	102	5510	13.90	14.50	1.148	100	1.000	0.13	0.338	0.388
	WLAN5GHz	802.11n-HT40 MCS0	Back	15mm	Sample 1	Battery 1	-	Ant 9+8(8)	Non-DBS/DBS	110	5550	16.50	17.50	1.259	100	1.000	-0.11	0.532	0.670
	WLAN5GHz	802.11n-HT40 MCS0	Back	15mm	Sample 1	Battery 1	-	Ant 9+8(8)	Non-DBS/DBS	126	5630	16.60	17.50	1.230	100	1.000	-0.03	0.487	0.599
	WLAN5GHz	802.11n-HT40 MCS0	Back	15mm	Sample 1	Battery 1	-	Ant 9+8(8)	Non-DBS/DBS	134	5670	14.90	15.50	1.148	100	1.000	0.04	0.303	0.348
	WLAN5GHz	802.11n-HT40 MCS0	Back	15mm	Sample 1	Battery 2	-	Ant 9+8(8)	Non-DBS/DBS	142	5710	17.90	18.50	1.148	100	1.000	0.02	0.578	0.664
	WLAN5GHz	802.11n-HT40 MCS0	Back	15mm	Sample 1	Battery 3	-	Ant 9+8(8)	Non-DBS/DBS	142	5710	17.90	18.50	1.148	100	1.000	-0.14	0.585	0.672
	WLAN5GHz	802.11n-HT40 MCS0	Back	0mm	Sample 1	Battery 1	Soft Holster	Ant 9+8(8)	Non-DBS/DBS	142	5710	17.90	18.50	1.148	100	1.000	-0.02	0.543	0.623
	WLAN5GHz	802.11n-HT40 MCS0	Back	15mm	Sample 2	Battery 1	-	Ant 9+8(8)	Non-DBS/DBS	142	5710	17.90	18.50	1.148	100	1.000	-0.14	0.576	0.661
	WLAN5GHz	802.11n-HT40 MCS0	Back	15mm	Sample 3	Battery 1	-	Ant 9+8(8)	Non-DBS/DBS	142	5710	17.90	18.50	1.148	100	1.000	0	0.554	0.636
	WLAN5GHz	802.11a 6Mbps	Front	15mm	Sample 1	Battery 1	-	Ant 9+8(8)	Non-DBS/DBS	165	5825	18.50	19.00	1.122	99.20	1.008	0	0.158	0.179
11	WLAN5GHz	802.11a 6Mbps	Back	15mm	Sample 1	Battery 1	-	Ant 9+8(8)	Non-DBS/DBS	165	5825	18.50	19.00	1.122	99.20	1.008	-0.06	0.528	0.597
	WLAN5GHz	802.11a 6Mbps	Back	15mm	Sample 1	Battery 1	-	Ant 9+8(8)	Non-DBS/DBS	149	5745	18.10	19.00	1.230	99.20	1.008	-0.17	0.467	0.579
	WLAN5GHz	802.11a 6Mbps	Back	15mm	Sample 1	Battery 1	-	Ant 9+8(8)	Non-DBS/DBS	157	5785	18.10	19.00	1.230	99.20	1.008	0.12	0.411	0.510
	WLAN5GHz	802.11a 6Mbps	Back	15mm	Sample 1	Battery 2	-	Ant 9+8(8)	Non-DBS/DBS	165	5825	18.50	19.00	1.122	99.20	1.008	0.04	0.488	0.552
	WLAN5GHz	802.11a 6Mbps	Back	15mm	Sample 1	Battery 3	-	Ant 9+8(8)	Non-DBS/DBS	165	5825	18.50	19.00	1.122	99.20	1.008	0.018	0.495	0.560
	WLAN5GHz	802.11a 6Mbps	Back	0mm	Sample 1	Battery 1	Soft Holster	Ant 9+8(8)	Non-DBS/DBS	165	5825	18.50	19.00	1.122	99.20	1.008	-0.19	0.276	0.312
	WLAN5GHz	802.11a 6Mbps	Back	15mm	Sample 2	Battery 1	-	Ant 9+8(8)	Non-DBS/DBS	165	5825	18.50	19.00	1.122	99.20	1.008	-0.15	0.330	0.373
	WLAN5GHz	802.11a 6Mbps	Back	15mm	Sample 3	Battery 1	-	Ant 9+8(8)	Non-DBS/DBS	165	5825	18.50	19.00	1.122	99.20	1.008	-0.13	0.318	0.360

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Sample	Battery	Holster	Antenna	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	Bluetooth	1Mbps	Front	15mm	Sample 1	Battery 1	-	Ant 9	39	2441	2.30	2.50	1.047	76.90	1.083	0.01	< 0.001	< 0.001
12	Bluetooth	1Mbps	Back	15mm	Sample 1	Battery 1	-	Ant 9	39	2441	2.30	2.50	1.047	76.90	1.083	-0.11	< 0.001	< 0.001
	Bluetooth	1Mbps	Back	15mm	Sample 1	Battery 1	-	Ant 9	0	2402	1.82	2.50	1.169	76.90	1.083	0.03	< 0.001	< 0.001
	Bluetooth	1Mbps	Back	15mm	Sample 1	Battery 1	-	Ant 9	78	2480	2.18	2.50	1.076	76.90	1.083	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Back	15mm	Sample 1	Battery 2	-	Ant 9	39	2441	2.30	2.50	1.047	76.90	1.083	0.08	< 0.001	< 0.001
	Bluetooth	1Mbps	Back	15mm	Sample 1	Battery 3	-	Ant 9	39	2441	2.30	2.50	1.047	76.90	1.083	0.04	< 0.001	< 0.001
	Bluetooth	1Mbps	Back	0mm	Sample 1	Battery 1	Soft Holster	Ant 9	39	2441	2.30	2.50	1.047	76.90	1.083	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Back	15mm	Sample 2	Battery 1	-	Ant 9	39	2441	2.30	2.50	1.047	76.90	1.083	0.06	< 0.001	< 0.001
	Bluetooth	1Mbps	Back	15mm	Sample 3	Battery 1	-	Ant 9	39	2441	2.30	2.50	1.047	76.90	1.083	0	< 0.001	< 0.001

13.4 Product Specific SAR

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Sample	Battery	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	WLAN5GHz	802.11a 6Mbps	Front	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	60	5300	17.20	18.00	1.202	100	1.000	-0.11	0.162	0.195
	WLAN5GHz	802.11a 6Mbps	Back	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	60	5300	17.20	18.00	1.202	100	1.000	-0.01	0.446	0.536
	WLAN5GHz	802.11a 6Mbps	Left Side	0mm	Sample 1	Battery 1	Ant 9+8(9)	Non-DBS/DBS	60	5300	17.80	18.00	1.047	100	1.000	0.12	0.404	0.423
13	WLAN5GHz	802.11a 6Mbps	Right Side	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	60	5300	17.20	18.00	1.202	100	1.000	-0.1	0.933	1.122
	WLAN5GHz	802.11a 6Mbps	Right Side	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	52	5260	17.20	18.00	1.202	100	1.000	-0.18	0.876	1.053
	WLAN5GHz	802.11a 6Mbps	Right Side	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	56	5280	16.90	18.00	1.288	100	1.000	-0.03	0.776	1.000
	WLAN5GHz	802.11a 6Mbps	Right Side	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	64	5320	15.90	16.50	1.148	100	1.000	0.07	0.643	0.738
	WLAN5GHz	802.11a 6Mbps	Top Side	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	60	5300	17.20	18.00	1.202	100	1.000	0.13	0.149	0.179
	WLAN5GHz	802.11a 6Mbps	Right Side	0mm	Sample 1	Battery 2	Ant 9+8(8)	Non-DBS/DBS	60	5300	17.20	18.00	1.202	100	1.000	0.19	0.905	1.088
	WLAN5GHz	802.11a 6Mbps	Right Side	0mm	Sample 1	Battery 3	Ant 9+8(8)	Non-DBS/DBS	60	5300	17.20	18.00	1.202	100	1.000	0.06	0.911	1.095
	WLAN5GHz	802.11a 6Mbps	Right Side	0mm	Sample 2	Battery 1	Ant 9+8(8)	Non-DBS/DBS	60	5300	17.20	18.00	1.202	100	1.000	0.04	0.831	0.999
	WLAN5GHz	802.11a 6Mbps	Right Side	0mm	Sample 3	Battery 1	Ant 9+8(8)	Non-DBS/DBS	60	5300	17.20	18.00	1.202	100	1.000	0.12	0.809	0.973
	WLAN5GHz	802.11n-HT40 MCS0	Front	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	142	5710	17.90	18.50	1.148	100	1.000	-0.16	0.248	0.285
	WLAN5GHz	802.11n-HT40 MCS0	Back	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	142	5710	17.90	18.50	1.148	100	1.000	0.06	0.530	0.609
	WLAN5GHz	802.11n-HT40 MCS0	Left Side	0mm	Sample 1	Battery 1	Ant 9+8(9)	Non-DBS/DBS	142	5710	18.20	18.50	1.072	100	1.000	0.1	0.523	0.560
14	WLAN5GHz	802.11n-HT40 MCS0	Right Side	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	142	5710	17.90	18.50	1.148	100	1.000	0.14	0.863	0.991
	WLAN5GHz	802.11n-HT40 MCS0	Right Side	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	102	5510	13.90	14.50	1.148	100	1.000	-0.01	0.393	0.451
	WLAN5GHz	802.11n-HT40 MCS0	Right Side	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	110	5550	16.50	17.50	1.259	100	1.000	-0.01	0.783	0.986
	WLAN5GHz	802.11n-HT40 MCS0	Right Side	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	126	5630	16.60	17.50	1.230	100	1.000	-0.18	0.801	0.985
	WLAN5GHz	802.11n-HT40 MCS0	Right Side	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	134	5670	14.90	15.50	1.148	100	1.000	-0.14	0.527	0.605
	WLAN5GHz	802.11n-HT40 MCS0	Top Side	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	142	5710	17.90	18.50	1.148	100	1.000	-0.14	0.314	0.361
	WLAN5GHz	802.11n-HT40 MCS0	Right Side	0mm	Sample 1	Battery 2	Ant 9+8(8)	Non-DBS/DBS	142	5710	17.90	18.50	1.148	100	1.000	0.07	0.842	0.967
	WLAN5GHz	802.11n-HT40 MCS0	Right Side	0mm	Sample 1	Battery 3	Ant 9+8(8)	Non-DBS/DBS	142	5710	17.90	18.50	1.148	100	1.000	0.01	0.849	0.975
	WLAN5GHz	802.11n-HT40 MCS0	Right Side	0mm	Sample 2	Battery 1	Ant 9+8(8)	Non-DBS/DBS	142	5710	17.90	18.50	1.148	100	1.000	-0.16	0.779	0.894
	WLAN5GHz	802.11n-HT40 MCS0	Right Side	0mm	Sample 3	Battery 1	Ant 9+8(8)	Non-DBS/DBS	142	5710	17.90	18.50	1.148	100	1.000	0.01	0.806	0.925
	WLAN5GHz	802.11a 6Mbps	Front	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	165	5825	18.50	19.00	1.122	99.20	1.008	-0.04	0.218	0.247
	WLAN5GHz	802.11a 6Mbps	Back	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	165	5825	18.50	19.00	1.122	99.20	1.008	-0.02	0.394	0.446
	WLAN5GHz	802.11a 6Mbps	Left Side	0mm	Sample 1	Battery 1	Ant 9+8(9)	Non-DBS/DBS	165	5825	18.70	19.00	1.072	99.20	1.008	0.02	0.512	0.553
15	WLAN5GHz	802.11a 6Mbps	Right Side	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	165	5825	18.50	19.00	1.122	99.20	1.008	0.14	0.636	0.719
	WLAN5GHz	802.11a 6Mbps	Right Side	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	149	5745	18.10	19.00	1.230	99.20	1.008	0.11	0.567	0.703
	WLAN5GHz	802.11a 6Mbps	Right Side	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	157	5785	18.10	19.00	1.230	99.20	1.008	0.09	0.573	0.711
	WLAN5GHz	802.11a 6Mbps	Top Side	0mm	Sample 1	Battery 1	Ant 9+8(8)	Non-DBS/DBS	165	5825	18.50	19.00	1.122	99.20	1.008	0.03	0.610	0.690
	WLAN5GHz	802.11a 6Mbps	Right Side	0mm	Sample 1	Battery 2	Ant 9+8(8)	Non-DBS/DBS	165	5825	18.50	19.00	1.122	99.20	1.008	-0.08	0.607	0.687
	WLAN5GHz	802.11a 6Mbps	Right Side	0mm	Sample 1	Battery 3	Ant 9+8(8)	Non-DBS/DBS	165	5825	18.50	19.00	1.122	99.20	1.008	0.14	0.572	0.647
	WLAN5GHz	802.11a 6Mbps	Right Side	0mm	Sample 2	Battery 1	Ant 9+8(8)	Non-DBS/DBS	165	5825	18.50	19.00	1.122	99.20	1.008	-0.04	0.584	0.661
	WLAN5GHz	802.11a 6Mbps	Right Side	0mm	Sample 3	Battery 1	Ant 9+8(8)	Non-DBS/DBS	165	5825	18.50	19.00	1.122	99.20	1.008	0.14	0.572	0.647

13.5 Repeated SAR Measurement

No.	Band	Mode	Test Position	Gap (mm)	Sample	Battery	Antenna	Power State	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 1	Battery 1	Ant 9+8(9)	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	-0.17	1.110	-	1.162
2nd	WLAN2.4GHz	802.11b 1Mbps	Left Cheek	0mm	Sample 1	Battery 1	Ant 9+8(9)	Non-DBS	1	2412	21.30	21.50	1.047	100	1.000	0.08	1.090	1.018	1.141

General Note:

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
2. Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is ≤ 1.2 and the measured SAR <1.45W/kg, only one repeated measurement is required.
3. The ratio is the difference in percentage between original and repeated *measured SAR*.
4. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

14. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	Head	Body-worn	Hotspot	Product Specific
Non-DBS					
1.	2.4GHz WLAN Ant 9+8 (5GHz WLAN Rx)			Yes	
2.	2.4GHz WLAN Ant 8 + Bluetooth Ant 9	Yes	Yes		Yes
3.	5GHz WLAN Ant 9+8 + Bluetooth Ant 9	Yes	Yes		Yes
DBS					
4.	2.4GHz WLAN Ant 9+8 + 5GHz WLAN Ant 9+8	Yes	Yes		Yes
5.	2.4GHz WLAN Ant 8+ 5GHz WLAN Ant 9+8 + Bluetooth Ant 9	Yes	Yes		Yes

General Note:

1. The device 2.4GHz support hotspot operation via 5GHz receive signal, when the device 2.4GHz operate hotspot function that the Bluetooth cannot transmit with 2.4GHz WLAN.
2. This device WLAN 2.4GHz supports Hotspot operation and Bluetooth support tethering applications.
3. The worst case WLAN reported SAR for each configuration was used for SAR summation. Therefore, the following summations represent the absolute worst cases for simultaneous transmission with WLAN.
4. The Scaled SAR summation is calculated based on the same configuration and test position.
5. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
   i) Scalar SAR summation < 1.6W/kg.
   ii) SPLSR = (SAR1 + SAR2)^1.5 / (min. separation distance, mm), and the peak separation distance is determined from the square root of $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$, where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
   iii) If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary.
   iv) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg.

14.1 Head Exposure Conditions

<Non-DBS>

Exposure Position	1	2	3	5	3+5 Summed 1g SAR (W/kg)	1+5 Summed 1g SAR (W/kg)
	WLAN2.4GHz Ant 8	WLAN2.4GHz Ant 9+8	WLAN5GHz Ant 9+8	Bluetooth Ant 9		
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)		
Right Cheek	0.647	0.705	0.546	0.001	**0.547**	**0.648**
Right Tilted	0.435	0.439	0.613	0.001	**0.614**	**0.436**
Left Cheek	0.907	1.162	0.725	0.001	**0.726**	**0.908**
Left Tilted	0.708	0.877	0.671	0.001	**0.672**	**0.709**

<DBS>

Exposure Position	1	2	3	5	2+3 Summed 1g SAR (W/kg)	1+3+5 Summed 1g SAR (W/kg)
	WLAN2.4GHz Ant 8	WLAN2.4GHz Ant 9+8	WLAN5GHz Ant 9+8	Bluetooth Ant 9		
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)		
Right Cheek	0.588	0.467	0.546	0.001	**1.013**	**1.135**
Right Tilted	0.395	0.291	0.613	0.001	**0.904**	**1.009**
Left Cheek	0.825	0.679	0.725	0.001	**1.404**	**1.551**
Left Tilted	0.644	0.582	0.671	0.001	**1.253**	**1.316**

14.2 Hotspot Exposure Conditions

<Non-DBS>

Exposure Position	1	2	3	5	2+3 Summed 1g SAR (W/kg)
	WLAN2.4GHz Ant 8	WLAN2.4GHz Ant 9+8	WLAN5GHz Ant 9+8	Bluetooth Ant 9	
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	
Front		0.361		0.001	**0.361**
Back		0.432		0.001	**0.432**
Left side		0.245		0.001	**0.245**
Right side		0.650		0.001	**0.650**
Top side		0.261		0.001	**0.261**

14.3 Body-Worn Accessory Exposure Conditions

<Non-DBS>

Exposure Position	1	2	3	5	3+5 Summed 1g SAR (W/kg)	1+5 Summed 1g SAR (W/kg)
	WLAN2.4GHz Ant 8	WLAN2.4GHz Ant 9+8	WLAN5GHz Ant 9+8	Bluetooth Ant 9		
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)		
Front	0.152	0.271	0.179	0.001	**0.180**	**0.153**
Back	0.313	0.355	0.681	0.001	**0.682**	**0.314**
Back with Soft Holster	0.127	0.217	0.623	0.001	**0.624**	**0.128**

<DBS>

Exposure Position	1	2	3	5	2+3 Summed 1g SAR (W/kg)	1+3+5 Summed 1g SAR (W/kg)
	WLAN2.4GHz Ant 8	WLAN2.4GHz Ant 9+8	WLAN5GHz Ant 9+8	Bluetooth Ant 9		
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)		
Front	0.159	0.174	0.179	0.001	**0.353**	**0.339**
Back	0.233	0.285	0.681	0.001	**0.966**	**0.915**
Back with Soft Holster	0.133	0.139	0.623	0.001	**0.762**	**0.757**

14.4 Product Specific Exposure Conditions

<Non-DBS>

Exposure Position	1 WLAN2.4GHz Ant 8 10g SAR (W/kg)	2 WLAN2.4GHz Ant 9+8 10g SAR (W/kg)	3 WLAN5GHz Ant 9+8 10g SAR (W/kg)	5 Bluetooth Ant 9 10g SAR (W/kg)	3+5 Summed 10g SAR (W/kg)	1+5 Summed 10g SAR (W/kg)
Front			0.285		**0.285**	**0.000**
Back			0.609		**0.609**	**0.000**
Left side			0.560		**0.560**	**0.000**
Right side			1.122		**1.122**	**0.000**
Top side			0.361		**0.361**	**0.000**

<DBS>

Exposure Position	1 WLAN2.4GHz Ant 8 10g SAR (W/kg)	2 WLAN2.4GHz Ant 9+8 10g SAR (W/kg)	3 WLAN5GHz Ant 9+8 10g SAR (W/kg)	5 Bluetooth Ant 9 10g SAR (W/kg)	2+3 Summed 10g SAR (W/kg)	1+3+5 Summed 10g SAR (W/kg)
Front			0.285		**0.285**	**0.285**
Back			0.609		**0.609**	**0.609**
Left side			0.560		**0.560**	**0.560**
Right side			1.122		**1.122**	**1.122**
Top side			0.361		**0.361**	**0.361**

Test Engineer： Shane Song, Randy Lin and Jeff Tsao

15. Uncertainty Assessment

Per KDB 865664 D01 SAR measurement 100MHz to 6GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg and the measured 10-g SAR within a frequency band is < 3.75 W/kg. The expanded SAR measurement uncertainty must be ≤ 30%, for a confidence interval of k = 2. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. For this device, the highest measured 1-g SAR is less 1.5W/kg and highest measured 10-g SAR is less 3.75W/kg. Therefore, the measurement uncertainty table is not required in this report.
Declaration of Conformity:
The test results with all measurement uncertainty excluded is presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

16. References

[1] FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”

[2] ANSI/IEEE Std. C95.1-1992, “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz”, September 1992

[3] IEEE Std. 1528-2013, “IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”, Sep 2013

[4] SPEAG DASY System Handbook

[5] FCC KDB 248227 D01 v02r02, “SAR Guidance for IEEE 802.11 (WiFi) Transmitters”, Oct 2015.

[6] FCC KDB 447498 D01 v06, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Oct 2015

[7] FCC KDB 648474 D04 v01r03, “SAR Evaluation Considerations for Wireless Handsets”, Oct 2015.

[8] FCC KDB 941225 D06 v02r01, "SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities", Oct 2015.

[9] FCC KDB 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.

[10] FCC KDB 865664 D02 v01r02, “RF Exposure Compliance Reporting and Documentation Considerations” Oct 2015.