

FCC SAR TEST REPORT

FCC ID : UZ7TC530E
Equipment : Touch Computer
Brand Name : Zebra
Model Name : TC530E
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 Dec. 06, 2023 and testing was started from Mar. 19, 2024 and completed on Mar. 21, 2024. 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



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History of this test report

Report No.	Version	Description	Issued Date
FA3D0601-04	01	Initial issue of report	Mar. 29, 2024



1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) for Zebra Technologies Corporation, Touch Computer, TC530E, 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)		
DXX	NFC				< 0.01		3.90
DTS	2.4GHz WLAN	1.09	0.67	1.15	3.15	1.56	3.90
NII	5GHz WLAN	1.18	1.19		3.15	1.56	3.15
6CD	6GHz WLAN	0.51	0.15		0.48	1.56	3.15
DSS	Bluetooth	0.03	< 0.01	0.03		1.35	
Equipment Class	Frequency Band	Head Reported APD (mW/cm^2)	Body-worn Reported APD (mW/cm^2)	Product Specific Reported APD (mW/cm^2)		Reported PD (mW/cm^2)	
6CD	6GHz WLAN	0.39	0.13	1.16		0.78	
Date of Testing:		2024/3/19 ~ 2024/3/21					

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), Human Exposure to RF Radiation Limits (1.0 mW/cm²=10 W/m²) specified in FCC 47 CFR part 1.1310 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: Wan Liu

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
- FCC KDB 941225 D07 UMPC Mini Tablet v01r02
- IEC/IEEE 62209-1528:2020
- SPEAG DASY6 System Handbook
- SPEAG DASY6 Application Note (Interim Procedure for Device Operation at 6GHz-10GHz)

3. Equipment Under Test (EUT) Information

3.1 General Information

Product Feature & Specification	
Equipment Name	Touch Computer
Brand Name	Zebra
Model Name	TC530E
FCC ID	UZ7TC530E
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 WLAN 6E: 5925 MHz~6425 MHz, 6425 MHz~6525 MHz, 6525 MHz~6875 MHz, 6875 MHz~7125 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz NFC : 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 NFC: ASK
HW Version	DV1-1
SW Version	13-11-28.00-TN-U00-PRD-NEM-04
FW Version(WLAN)	FUSION_QA_4_1.2.0.001_R
FW Version(NFC)	PN7160_AR_11.02.00
MFD	13NOV23
EUT Stage	Identical Prototype
Remark: - Based on original Sporton SAR Report no.: FA3D0601 to update 2.4GHz/5GHz output power for body-worn and product specific condition, and re-evaluation body-worn separation distance at 15mm for WLAN/BT operation. - There are two kinds of samples as below. RF exposure evaluation selects sample 1 as the main test and sample 2 spot check worst case found in sample 1. - The device implements motion sensor detection for SAR compliance at different exposure conditions and the power verification include in original Sporton SAR Report No.: FA3D0601 appendix F. - Since RF devices that use motion sensors to detect a "on-body" use conditions, in order to control the RF conducted power to maintain RF exposure compliance. For these cases, it is also necessary to address "off-body, but close" use condition, such as the device on a stationary surface (e.g., a table), thus with the motion sensors not triggered and therefore operating at maximum power, but close enough to a person's body to pose RF exposure compliance concerns, therefore the supplemental 25mm SAR results was verify include in original Sporton SAR Report No.: FA3D0601 section 13.5. - There are four batteries. RF exposure evaluation selects battery 1 as the main test and battery 2/3/4 spot check worst case found in battery 1. - 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. - The device 2.4GHz support hotspot operation via 5/6GHz receive signal.	

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



Specification of Accessories				
Adapter	Brand Name	Zebra	Model	SAWA-65-20005A
			Part Number	PWR-WUA5V12W0US
Battery 1 (1x)	Brand Name	Zebra	Model	BT-000442
			Part Number	BT-000442-0020
Battery 2 (1.5x)	Brand Name	Zebra	Model	BT-000442A
			Part Number	BT-000442-0820
Battery 3 (Wireless Battery)	Brand Name	Zebra	Model	BT-000442
			Part Number	BT-000442-002B
Battery 4 (1x)	Brand Name	Zebra	Model	BT-000442
			Part Number	BT-000442-1020
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-PTT1-01
Rugged Headset	Brand Name	Zebra	Part Number	HS2100-OTH
USB TYPE C Earphone	Brand Name	Zebra	Part Number	HDST-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
3.5mm to 3.5mm audio connector	Brand Name	Zebra	Part Number	CBL-HS2100-3MS1-01

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.

4.3 RF Exposure limit for above 6GHz

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Peak Spatially Averaged Power Density was evaluated over a circular area of 4cm² per interim FCC Guidance for near-field power density evaluations per October 2018 TCB Workshop notes

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f ²)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

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:

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

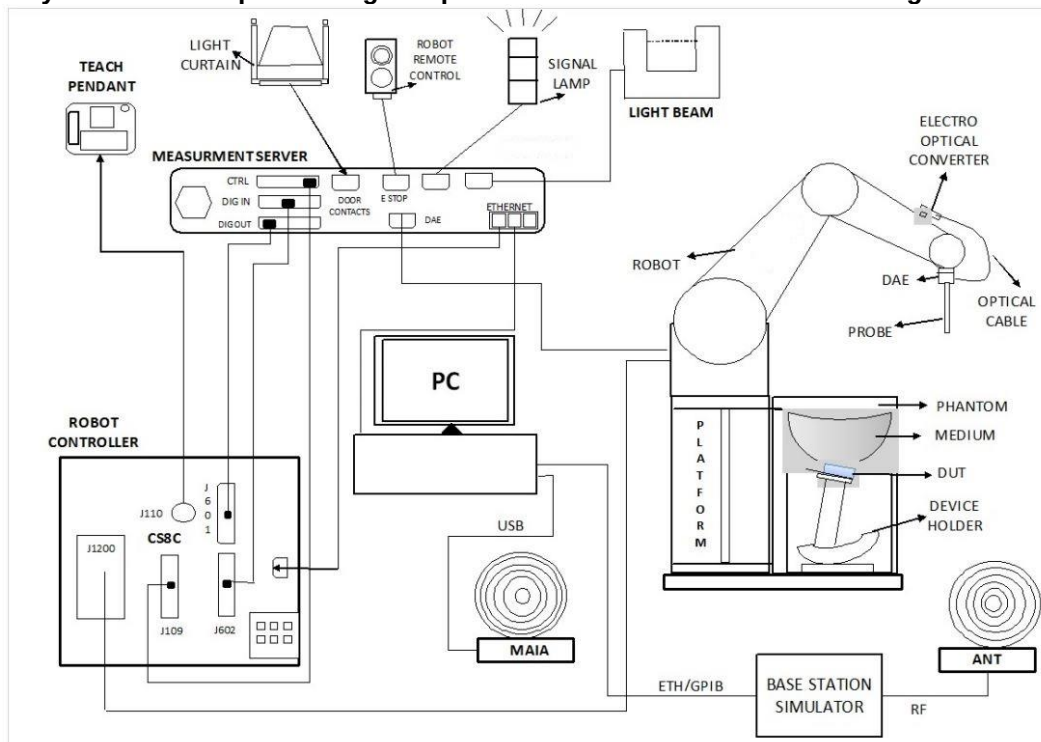
SAR is expressed in units of Watts per kilogram (W/kg)

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

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.

Laboratory	EMC & Wireless Communications Laboratory			Wensan Laboratory				
Test Site Location	TW1190			TW3786				
	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan			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	SAR18-HY	SAR21-HY
	SAR04-HY	SAR05-HY		SAR11-HY	SAR12-HY	SAR16-HY	SAR19-HY	SAR22-HY
	SAR06-HY	SAR10-HY		SAR13-HY	SAR14-HY	SAR17-HY	SAR20-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	4 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 μ W/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	4 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 μ W/g – >100 mW/g Linearity: ± 0.2 dB (noise: typically <1 μ W/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 from 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	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	$30^\circ \pm 1^\circ$	$20^\circ \pm 1^\circ$
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 $\leq$ 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 to 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 whose 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: $\Delta x_{\text{Zoom}}, \Delta y_{\text{Zoom}}$			≤ 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: $\Delta z_{\text{Zoom}}(n)$		≤ 5 mm	$3 - 4$ GHz: ≤ 4 mm $4 - 5$ GHz: ≤ 3 mm $5 - 6$ GHz: ≤ 2 mm
	graded grid	$\Delta z_{\text{Zoom}}(1)$: between 1 st two points closest to phantom surface	≤ 4 mm	$3 - 4$ GHz: ≤ 3 mm $4 - 5$ GHz: ≤ 2.5 mm $5 - 6$ GHz: ≤ 2 mm
		$\Delta z_{\text{Zoom}}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{\text{Zoom}}(n-1)$	
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 <i>reported</i> SAR from the <i>area scan based 1-g SAR estimation</i> 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 to 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, 2022	Nov. 18, 2025
SPEAG	5GHz System Validation Kit ⁽²⁾	D5GHzV2	1006	May. 25, 2023	May. 23, 2025
SPEAG	6500MHz System Validation Kit	D6.5GHzV2	1083	Oct. 20, 2023	Oct. 19, 2024
SPEAG	Data Acquisition Electronics	DAE4	1311	Sep. 13, 2023	Sep. 12, 2024
SPEAG	Dosimetric E-Field Probe	EX3DV4	7692	Jul. 18, 2023	Jul. 17, 2024
Testo	Hygro meter	608-H1	45196600	Nov. 02, 2023	Nov. 01, 2024
R&S	BT Base Station	CBT	101136	Oct. 22, 2023	Oct. 21, 2024
SPEAG	Device Holder	N/A	N/A	N/A	N/A
Anritsu	Signal Generator	MG3710A	6201502524	Sep. 27, 2023	Sep. 26, 2024
Keysight	ENA Network Analyzer	E5071C	MY46104758	Oct. 30, 2023	Oct. 29, 2024
SPEAG	Dielectric Probe Kit	DAK-3.5	1126	Sep. 19, 2023	Sep. 18, 2024
LINE SEIKI	Digital Thermometer	DTM3000-spezial	3690	Aug. 09, 2023	Aug. 08, 2024
Anritsu	Power Meter	ML2495A	1419002	Aug. 17, 2023	Aug. 16, 2024
Anritsu	Power Sensor	MA2411B	1911176	Aug. 18, 2023	Aug. 17, 2024
Anritsu	Spectrum Analyzer	MS2830A	6201396378	Jul. 10, 2023	Jul. 09, 2024
Mini-Circuits	Power Amplifier	ZVE-8G+	6418	Oct. 16, 2023	Oct. 15, 2024
ATM	Dual Directional Coupler	C122H-10	P610410z-02	Note 1	
Warison	Directional Coupler	WCOU-10-50S-10	WR889BMC4B1	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°C to 25°C, 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°C to 25°C and within $\pm 2^\circ\text{C}$ 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. (°C)	Conductivity (σ)	Permittivity (ϵ_r)	Conductivity Target (σ)	Permittivity Target (ϵ_r)	Delta (σ) (%)	Delta (ϵ_r) (%)	Limit (%)	Date
2450	22.7	1.842	39.147	1.80	39.20	2.33	-0.14	± 5	2024/3/19
5250	22.6	4.775	37.210	4.71	35.95	1.38	3.50	± 5	2024/3/20
5600	22.6	5.116	36.729	5.07	35.50	0.91	3.46	± 5	2024/3/20
5750	22.5	5.304	36.004	5.22	35.35	1.61	1.85	± 5	2024/3/21
6500	22.5	6.150	35.700	6.07	34.50	1.32	3.48	± 5	2024/3/21

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 (%)
SAR-06	2024/3/19	2450	50	D2450V2-929	EX3DV4 - SN7692	DAE4 Sn1311	2.620	52.400	52.4	0.00	1.220	24.700	24.4	-1.21
SAR-06	2024/3/20	5250	50	D5GHzV2-1006-5250	EX3DV4 - SN7692	DAE4 Sn1311	3.720	81.200	74.4	-8.37	1.060	23.200	21.2	-8.62
SAR-06	2024/3/20	5600	50	D5GHzV2-1006-5600	EX3DV4 - SN7692	DAE4 Sn1311	3.930	84.700	78.6	-7.20	1.120	24.200	22.4	-7.44
SAR-06	2024/3/21	5750	50	D5GHzV2-1006-5750	EX3DV4 - SN7692	DAE4 Sn1311	3.710	80.900	74.2	-8.28	1.050	22.900	21	-8.30
SAR-06	2024/3/21	6500	100	D6.5GHzV2-1083	EX3DV4 - SN7692	DAE4 Sn1311	29.900	292.000	299	2.40	5.610	54.000	56.1	3.89

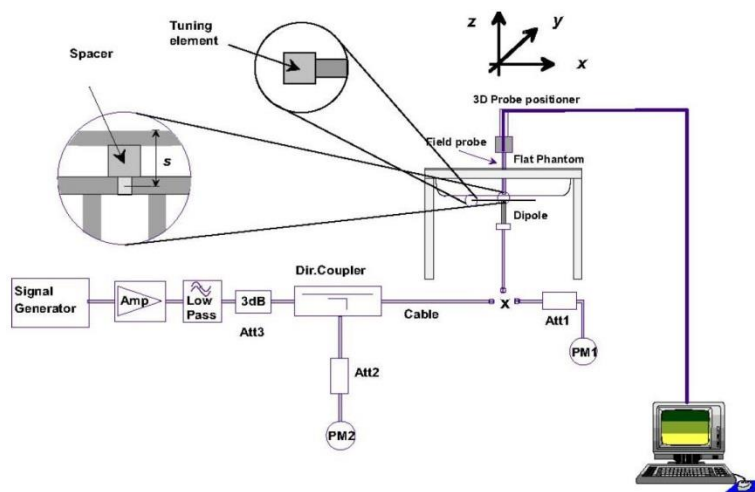


Fig 8.3.1 System Performance Check Setup



Fig 8.3.2 Setup Photo

10. RF Exposure Positions

10.1 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 $> 1.2 \text{ W/kg}$, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset 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. 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 tested 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.

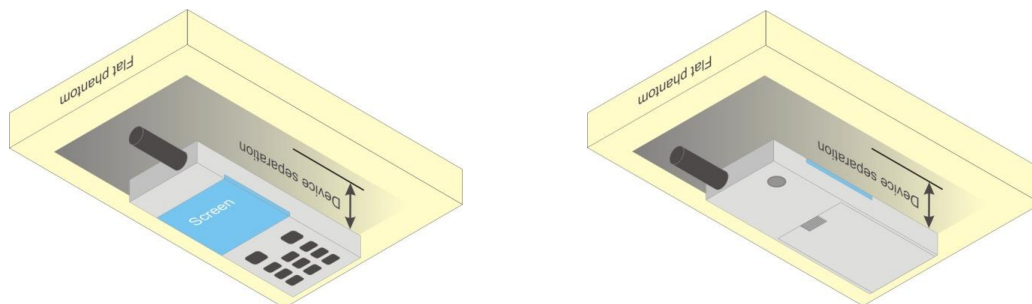


Fig 9.4 Body Worn Position

10.2 Product Specific Exposure

For smart phones with a display diagonal dimension $> 15.0 \text{ cm}$ or an overall diagonal dimension $> 16.0 \text{ cm}$ 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 $\leq 25 \text{ mm}$ 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 $> 1.2 \text{ W/kg}$.

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 for 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 closest/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

<2.4GHz WLAN Power table 1 Non-DBS>

	Mode	Channel	Frequency (MHz)	Ant 1			Ant 2			Ant 1+2 (1)		Ant 1+2 (2)		Ant 1+2		
				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	18.10	19.00	85.83	18.20	19.00	85.83	18.50	19.00	18.40	19.00	21.46	22.00	85.83
		6	2437	18.10	19.00		18.20	19.00		18.20	19.00	18.30	19.00	21.26	22.00	
		11	2462	18.10	19.00		18.20	19.00		19.00	19.00	19.00	19.00	22.00	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		19.00			19.00			19.00		19.00		22.00	
		11	2462		16.00			16.00			16.00		16.00		19.00	
	802.11n-HT20 MCS0	1	2412		19.00			19.00			19.00		19.00		22.00	
		6	2437		19.00			19.00			19.00		19.00		22.00	
		11	2462		13.00			13.00			13.00		13.00		16.00	
	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		13.00			13.00			13.00		13.00		16.00	
	802.11ac-VHT20 MCS0	1	2412		19.00			19.00			19.00		19.00		22.00	
		6	2437		19.00			19.00			19.00		19.00		22.00	
		11	2462		13.00			13.00			13.00		13.00		16.00	
	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		13.00			13.00			13.00		13.00		16.00	
	802.11ax-HE20 MCS0	1	2412		19.00			19.00			19.00		19.00		22.00	
		6	2437		19.00			19.00			19.00		19.00		22.00	
		11	2462		13.00			13.00			13.00		13.00		16.00	
	802.11ax-HE40 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		13.00			13.00			13.00		13.00		16.00	

<2.4GHz WLAN_Power table 1_DB>

	Mode	Channel	Frequency (MHz)	Ant 1			Ant 2			Ant 1+2 (1)		Ant 1+2 (2)		Ant 1+2		
				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	16.80	17.00	85.83	16.50	17.00	85.83	16.80	17.00	16.70	17.00	19.76	20.00	85.83
		6	2437	16.60	17.00		16.60	17.00		16.50	17.00	16.70	17.00	19.61	20.00	
		11	2462	16.50	17.00		16.70	17.00		16.90	17.00	16.90	17.00	19.91	20.00	
	802.11g 6Mbps	1	2412	not required	17.00	not required	not required	17.00	not required	not required	17.00	not required	17.00	not required	20.00	not required
		6	2437		17.00			17.00			17.00		17.00		20.00	
		11	2462		16.00			16.00			16.00		16.00		19.00	
	802.11n-HT20 MCS0	1	2412		17.00			17.00			17.00		17.00		20.00	
		6	2437		17.00			17.00			17.00		17.00		20.00	
		11	2462		13.00			13.00			13.00		13.00		16.00	
	802.11n-HT40 MCS0	3	2422		17.00			17.00			17.00		17.00		20.00	
		6	2437		17.00			17.00			17.00		17.00		20.00	
		9	2452		13.00			13.00			13.00		13.00		16.00	
	802.11ac-VHT20 MCS0	1	2412		17.00			17.00			17.00		17.00		20.00	
		6	2437		17.00			17.00			17.00		17.00		20.00	
		11	2462		13.00			13.00			13.00		13.00		16.00	
	802.11ac-VHT40 MCS0	3	2422		17.00			17.00			17.00		17.00		20.00	
		6	2437		17.00			17.00			17.00		17.00		20.00	
		9	2452		13.00			13.00			13.00		13.00		16.00	
	802.11ax-HE20 MCS0	1	2412		17.00			17.00			17.00		17.00		20.00	
		6	2437		17.00			17.00			17.00		17.00		20.00	
		11	2462		13.00			13.00			13.00		13.00		16.00	
	802.11ax-HE40 MCS0	3	2422		17.00			17.00			17.00		17.00		20.00	
		6	2437		17.00			17.00			17.00		17.00		20.00	
		9	2452		13.00			13.00			13.00		13.00		16.00	

<5GHz WLAN_Power table 1_Non-DBS>

	Mode	Channel	Frequency (MHz)	Ant 1			Ant 2			Ant 1+2 (1)		Ant 1+2 (2)		Ant 1+2		
				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	19.00	not required	not required	19.00	not required	not required	19.00	not required	19.00	not required	22.00	not required
		40	5200		19.00			19.00			19.00		19.00		22.00	
		44	5220		19.00			19.00			19.00		19.00		22.00	
		48	5240		18.50			18.50			18.50		18.50		21.50	
	802.11n-HT20 MCS0	36	5180		19.00			19.00			19.00		19.00		22.00	
		40	5200		19.00			19.00			19.00		19.00		22.00	
		44	5220		19.00			19.00			19.00		19.00		22.00	
		48	5240		19.00			19.00			19.00		19.00		22.00	
	802.11n-HT40 MCS0	38	5190		18.00			18.00			18.00		18.00		21.00	
		46	5230		19.00			19.00			19.00		19.00		22.00	
	802.11ac-VHT20 MCS0	36	5180		19.00			19.00			19.00		19.00		22.00	
		40	5200		19.00			19.00			19.00		19.00		22.00	
		44	5220		19.00			19.00			19.00		19.00		22.00	
	802.11ac-VHT40 MCS0	38	5190		18.00			18.00			18.00		18.00		21.00	
		46	5230		19.00			19.00			19.00		19.00		22.00	
	802.11ac-VHT80 MCS0	42	5210		18.00			18.00			18.00		18.00		21.00	
		36	5180		19.00			19.00			19.00		19.00		22.00	
	802.11ax-HE20 MCS0	40	5200		19.00			19.00			19.00		19.00		22.00	
		44	5220		19.00			19.00			19.00		19.00		22.00	
		48	5240		19.00			19.00			19.00		19.00		22.00	
	802.11ax-HE40 MCS0	38	5190		18.00			18.00			18.00		18.00		21.00	
		46	5230		19.00			19.00			19.00		19.00		22.00	
	802.11ax-HE80 MCS0	42	5210		18.00			18.00			18.00		18.00		21.00	



				Ant 1			Ant 2			Ant 1+2 (1)		Ant 1+2 (2)		Ant 1+2		
	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	18.50	not required	18.50	18.50	not required	not required	18.50	not required	18.50	not required	21.50	86.00
		56	5280								18.50		18.50		21.50	
		60	5300								18.60		18.10		21.37	
		64	5320								18.60		18.10		21.37	
	802.11n-HT20 MCS0	52	5260					19.00	not required	not required	19.00	not required	19.00	not required	22.00	not required
		56	5280					19.00			19.00		19.00		22.00	
		60	5300					19.00			19.00		19.00		22.00	
		64	5320					18.00			18.00		18.00		21.00	
	802.11n-HT40 MCS0	54	5270					19.00		18.70	19.00	18.50	19.00	21.61	22.00	85.87
		62	5310					17.00		16.50	17.00	16.70	17.00	19.61	20.00	
	802.11ac-VHT20 MCS0	52	5260					19.00		not required	19.00	not required	19.00	not required	22.00	not required
		56	5280					19.00			19.00		19.00		22.00	
		60	5300					19.00			19.00		19.00		22.00	
		64	5320					18.00			18.00		18.00		21.00	
	802.11ac-VHT40 MCS0	54	5270					19.00			19.00		19.00		22.00	
		62	5310					17.00			17.00		17.00		20.00	
	802.11ac-VHT80 MCS0	58	5290					17.50			17.50		17.50		20.50	
	802.11ac-VHT160 MCS0	50	5250					13.5			13.5		13.5		16.50	
	802.11ax-HE20 MCS0	52	5260					19.00			19.00		19.00		22.00	
		56	5280					19.00			19.00		19.00		22.00	
		60	5300					19.00			19.00		19.00		22.00	
		64	5320					18.00			18.00		18.00		21.00	
	802.11ax-HE40 MCS0	54	5270					19.00			19.00		19.00		22.00	
		62	5310					17.00			17.00		17.00		20.00	
	802.11ax-HE80 MCS0	58	5290					17.50			17.50		17.50		20.50	
	802.11ax-HE160 MCS0	50	5250					13.5			13.5		13.5		16.50	



				Ant 1			Ant 2			Ant 1+2 (1)		Ant 1+2 (2)		Ant 1+2		
	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	18.50	not required	not required	18.50	not required	not required	18.50	not required	18.50	not required	21.50	not required
		116	5580		18.50			18.50			18.50		21.50			
		124	5620		18.50			18.50			18.50		21.50			
		132	5660		18.50			18.50			18.50		21.50			
		144	5720		18.50			18.50			18.50		21.50			
	802.11n-HT20 MCS0	100	5500		18.50			18.50			18.50		18.50		21.50	
		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		18.50			18.50			18.50		18.50		21.50	
		110	5550		18.50			18.50			18.50		18.50		21.50	
		126	5630		18.50			18.50			not required	18.50	not required	18.50	21.50	
		134	5670		18.50			18.50			not required	18.50	not required	18.50	21.50	
	802.11ac-VHT20 MCS0	100	5500		18.50			18.50			18.50	18.50	21.50			
		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		18.50			18.50			18.50	18.50	21.50			
		110	5550		18.50			18.50			18.50	18.50	21.50			
		126	5630		18.50			18.50			18.50	18.50	21.50			
		134	5670		18.50			18.50			18.50	18.50	21.50			
	802.11ac-VHT80 MCS0	106	5530		17.50			17.50			17.20	17.50	17.00	17.50	20.11	20.50
		122	5610		18.50			18.50			18.10	18.50	17.80	18.50	20.96	21.50
		138	5690		18.50			18.50			18.00	18.50	18.40	18.50	21.21	21.50
		802.11ac-VHT160 MCS0	114		5570			15.50			15.50	not required	15.50	not required	15.50	not required
	802.11ax-HE20 MCS0	100	5500		18.50			18.50			18.50		18.50		21.50	
		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		18.50			18.50			18.50		18.50		21.50	
		110	5550		18.50			18.50			18.50		18.50		21.50	
		126	5630		18.50			18.50			18.50		18.50		21.50	
		134	5670		18.50			18.50			18.50		18.50		21.50	
	802.11ax-HE80 MCS0	106	5530		17.50			17.50			17.50		17.50		20.50	
		122	5610		18.50			18.50			18.50		18.50		21.50	
		138	5690		18.50			18.50			18.50		18.50		21.50	
	802.11ax-HE160 MCS0	114	5570		15.50			15.50			15.50		15.50		18.50	

	Mode	Channel	Frequency (MHz)	Ant 1			Ant 2			Ant 1+2 (1)		Ant 1+2 (2)		Ant 1+2		
				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	18.50	not required	not required	18.50	not required	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-HT20 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	
	802.11n-HT40 MCS0	151	5755		18.50			18.50		18.30	18.50	18.30	18.50	21.31	21.50	85.87
		159	5795		18.50			18.50		18.50	18.50	18.20	18.50	21.36	21.50	
	802.11ac-VHT20 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	
	802.11ac-VHT40 MCS0	151	5755		18.50			18.50			18.50		18.50		21.50	
		159	5795		18.50			18.50			18.50		18.50		21.50	
	802.11ac-VHT80 MCS0	155	5775		18.50			18.50		17.90	18.50	18.30	18.50	21.11	21.50	85.77
	802.11ax-HE20 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	
	802.11ax-HE40 MCS0	151	5755		18.50			18.50			18.50		18.50		21.50	
		159	5795		18.50			18.50			18.50		18.50		21.50	
	802.11ax-HE80 MCS0	155	5775		18.50			18.50			18.50		18.50		21.50	

<5GHz WLAN_Power table 1_DBS>

	Mode	Channel	Frequency (MHz)	Ant 1			Ant 2			Ant 1+2 (1)		Ant 1+2 (2)		Ant 1+2		
				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	17.50	not required	not required	17.50	not required	not required	17.50	not required	17.50	not required	20.50	not required
		40	5200		17.50			17.50			17.50		17.50		20.50	
		44	5220		17.50			17.50			17.50		17.50		20.50	
		48	5240		17.50			17.50			17.50		17.50		20.50	
	802.11n-HT20 MCS0	36	5180		17.50			17.50			17.50		17.50		20.50	
		40	5200		17.50			17.50			17.50		17.50		20.50	
		44	5220		17.50			17.50			17.50		17.50		20.50	
		48	5240		17.50			17.50			17.50		17.50		20.50	
	802.11n-HT40 MCS0	38	5190		17.50			17.50			17.50		17.50		20.50	
		46	5230		17.50			17.50			17.50		17.50		20.50	
	802.11ac-VHT20 MCS0	36	5180		17.50			17.50			17.50		17.50		20.50	
		40	5200		17.50			17.50			17.50		17.50		20.50	
		44	5220		17.50			17.50			17.50		17.50		20.50	
	802.11ac-VHT40 MCS0	38	5190		17.50			17.50			17.50		17.50		20.50	
		46	5230		17.50			17.50			17.50		17.50		20.50	
		42	5210		17.50			17.50			17.50		17.50		20.50	
	802.11ax-HE20 MCS0	36	5180		17.50			17.50			17.50		17.50		20.50	
		40	5200		17.50			17.50			17.50		17.50		20.50	
		44	5220		17.50			17.50			17.50		17.50		20.50	
		48	5240		17.50			17.50			17.50		17.50		20.50	
	802.11ax-HE40 MCS0	38	5190		17.50			17.50			17.50		17.50		20.50	
		46	5230		17.50			17.50			17.50		17.50		20.50	
	802.11ax-HE80 MCS0	42	5210		17.50			17.50			17.50		17.50		20.50	

	Mode	Channel	Frequency (MHz)	Ant 1			Ant 2			Ant 1+2 (1)		Ant 1+2 (2)		Ant 1+2		
				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	17.50	not required	17.50	17.50	not required	not required	17.50	not required	17.50	not required	20.50	not required
		56	5280								17.50		17.50		20.50	
		60	5300								17.50		17.50		20.50	
		64	5320								17.50		17.50		20.50	
	802.11n-HT20 MCS0	52	5260							not required	17.50	not required	17.50	not required	20.50	not required
		56	5280								17.50		17.50		20.50	
		60	5300								17.50		17.50		20.50	
		64	5320								17.50		17.50		20.50	
	802.11n-HT40 MCS0	54	5270							17.20	17.50	17.30	17.50	20.26	20.50	85.87
		62	5310							16.50	17.00	16.70	17.00	19.61	20.00	
	802.11ac-VHT20 MCS0	52	5260							not required	17.50	not required	17.50	not required	20.50	not required
		56	5280								17.50		17.50		20.50	
		60	5300								17.50		17.50		20.50	
		64	5320								17.50		17.50		20.50	
	802.11ac-VHT40 MCS0	54	5270							not required	17.50	not required	17.50	not required	20.50	not required
		62	5310								17.00		17.00		20.00	
	802.11ac-VHT80 MCS0	58	5290							17.10	17.50	17.00	17.50	20.06	20.50	85.77
	802.11ac-VHT160 MCS0	50	5250							not required	13.5	not required	13.5	not required	16.50	not required
	802.11ax-HE20 MCS0	52	5260								17.50		17.50		20.50	
		56	5280								17.50		17.50		20.50	
		60	5300								17.50		17.50		20.50	
		64	5320								17.50		17.50		20.50	
	802.11ax-HE40 MCS0	54	5270								17.50		17.50		20.50	
		62	5310								17.00		17.00		20.00	
	802.11ax-HE80 MCS0	58	5290								17.50		17.50		20.50	
	802.11ax-HE160 MCS0	50	5250								13.5		13.5		16.50	

	Mode	Channel	Frequency (MHz)	Ant 1			Ant 2			Ant 1+2 (1)		Ant 1+2 (2)		Ant 1+2		
				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	17.50	not required	17.50	17.50	not required	not required	17.50	not required	17.50	not required	20.50	not required
		116	5580													
		124	5620													
		132	5660													
		144	5720													
	802.11n-HT20 MCS0	100	5500													
		116	5580													
		124	5620													
		132	5660													
		144	5720													
	802.11n-HT40 MCS0	102	5510													
		110	5550													
		126	5630													
		134	5670													
		142	5710													
	802.11ac-VHT20 MCS0	100	5500													
		116	5580													
		124	5620													
		132	5660													
		144	5720													
	802.11ac-VHT40 MCS0	102	5510													
		110	5550													
		126	5630													
		134	5670													
		142	5710													
	802.11ac-VHT80 MCS0	106	5530								16.20	17.50	16.00	17.50	19.11	20.50
		122	5610								16.40	17.50	16.50	17.50	19.46	20.50
		138	5690								16.50	17.50	16.70	17.50	19.61	20.50
	802.11ac-VHT160 MCS0	114	5570								not required	15.50	not required	15.50	18.50	not required
	802.11ax-HE20 MCS0	100	5500													
		116	5580													
		124	5620													
		132	5660													
		144	5720													
	802.11ax-HE40 MCS0	102	5510													
		110	5550													
		126	5630													
		134	5670													
		142	5710													
	802.11ax-HE80 MCS0	106	5530													
		122	5610													
		138	5690													
	802.11ax-HE160 MCS0	114	5570													

	Mode	Channel	Frequency (MHz)	Ant 1			Ant 2			Ant 1+2 (1)		Ant 1+2 (2)		Ant 1+2		
				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	17.00	not required	not required	17.00	not required	not required	17.00	not required	17.00	not required	20.00	not required
		157	5785		17.00			17.00			17.00		17.00		20.00	
		165	5825		17.00			17.00			17.00		17.00		20.00	
	802.11n-HT20 MCS0	149	5745		17.00			17.00			17.00		17.00		20.00	
		157	5785		17.00			17.00			17.00		17.00		20.00	
		165	5825		17.00			17.00			17.00		17.00		20.00	
	802.11n-HT40 MCS0	151	5755		17.00			17.00		16.60	17.00	16.80	17.00	19.71	20.00	85.87
		159	5795		17.00			17.00		16.70	17.00	16.80	17.00	19.76	20.00	
	802.11ac-VHT20 MCS0	149	5745		17.00			17.00		not required	17.00	not required	17.00	not required	20.00	not required
		157	5785		17.00			17.00			17.00		17.00		20.00	
		165	5825		17.00			17.00			17.00		17.00		20.00	
	802.11ac-VHT40 MCS0	151	5755		17.00			17.00			17.00		17.00		20.00	
		159	5795		17.00			17.00			17.00		17.00		20.00	
	802.11ac-VHT80 MCS0	155	5775		17.00			17.00		16.80	17.00	16.90	17.00	19.86	20.00	85.77
	802.11ax-HE20 MCS0	149	5745		17.00			17.00		not required	17.00	not required	17.00	not required	20.00	not required
		157	5785		17.00			17.00			17.00		17.00		20.00	
		165	5825		17.00			17.00			17.00		17.00		20.00	
	802.11ax-HE40 MCS0	151	5755		17.00			17.00			17.00		17.00		20.00	
		159	5795		17.00			17.00			17.00		17.00		20.00	
	802.11ax-HE80 MCS0	155	5775		17.00			17.00			17.00		17.00		20.00	

<WiFi 6E_Power table 1_Non-DBS>

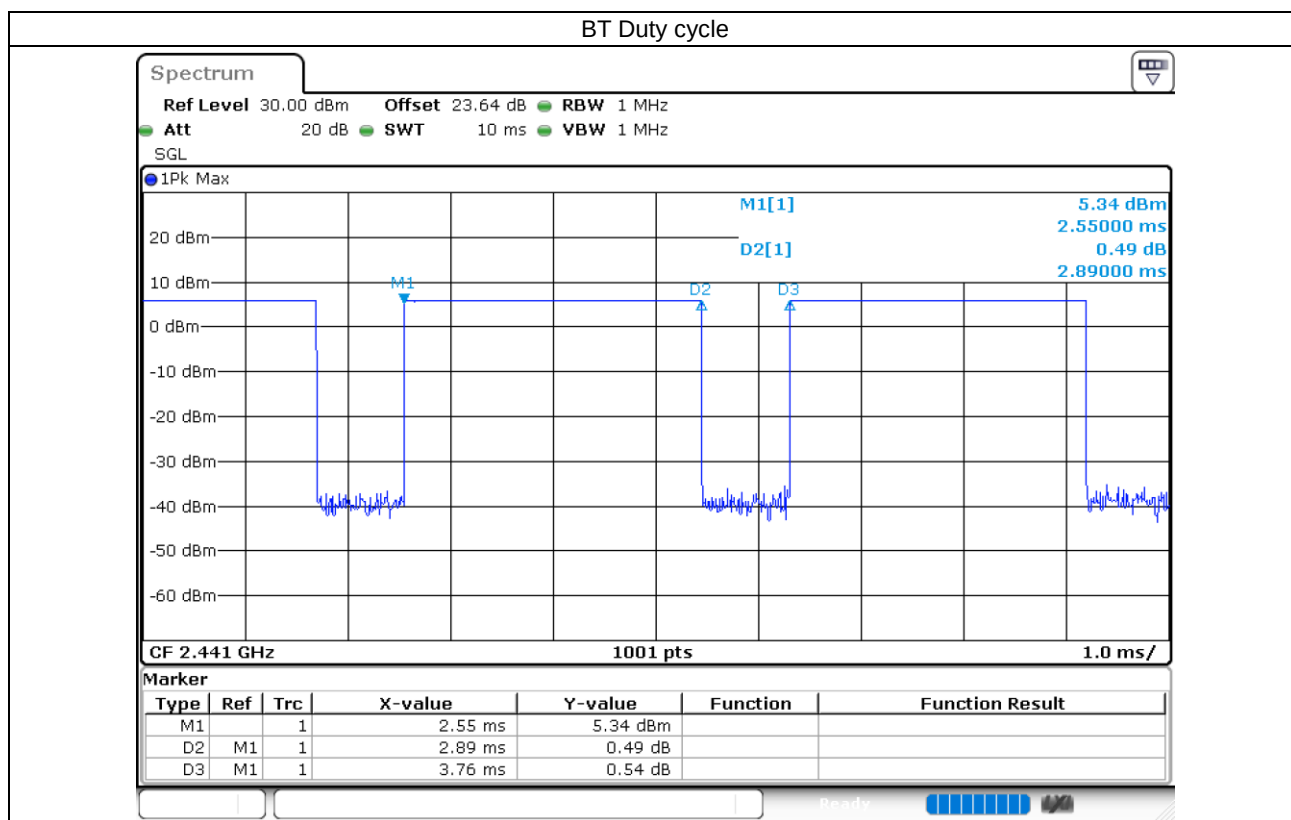
	Mode	Channel	Frequency (MHz)	Ant 1			Ant 2			Ant 1+2 (1)		Ant 1+2 (2)		Ant 1+2		
				Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Duty Cycle %
WiFi 6E	802.11a 6Mbps	1	5955	not required	10.50	not required	not required	10.50	not required	not required	10.50	not required	10.50	not required	13.50	not required
		57	6235		10.50			10.50			10.50		10.50		13.50	
		113	6515		1.50			1.50			1.50		1.50		4.50	
		173	6815		10.00			10.00			10.00		10.00		13.00	
		233	7115		2.00			2.00			2.00		2.00		5.00	
	802.11ax-HE20 MCS0	1	5955		10.50			10.50			10.50		10.50		13.50	
		57	6235		10.50			10.50			10.50		10.50		13.50	
		113	6515		4.00			4.00			4.00		4.00		7.00	
		173	6815		10.00			10.00			10.00		10.00		13.00	
		233	7115		5.00			5.00			5.00		5.00		8.00	
	802.11ax-HE40 MCS0	3	5965		10.50			10.50			10.50		10.50		13.50	
		59	6245		10.50			10.50			10.50		10.50		13.50	
		107	6485		7.50			7.50			7.50		7.50		10.50	
		171	6805		10.00			10.00			10.00		10.00		13.00	
		227	7085		8.50			8.50			8.50		8.50		11.50	
	802.11ax-HE80 MCS0	7	5985		10.50			10.50			10.50		10.50		13.50	
		71	6305		10.50			10.50			10.50		10.50		13.50	
		119	6545		9.00			9.00			9.00		9.00		12.00	
		167	6785		10.00			10.00			10.00		10.00		13.00	
		215	7025		9.00			9.00			9.00		9.00		12.00	
	802.11ax-HE160 MCS0	15	6025		10.50			10.50			10.20	10.50	10.10	10.50	13.16	13.50
		47	6185		10.50			10.50			9.80	10.50	9.50	10.50	12.66	13.50
		111	6505		9.00			9.00			8.30	9.00	8.30	9.00	11.31	12.00
		143	6665		10.00			10.00			9.90	10.00	9.70	10.00	12.81	13.00
		207	6985		9.00			9.00			8.80	9.00	8.90	9.00	11.86	12.00

<2.4GHz Bluetooth>

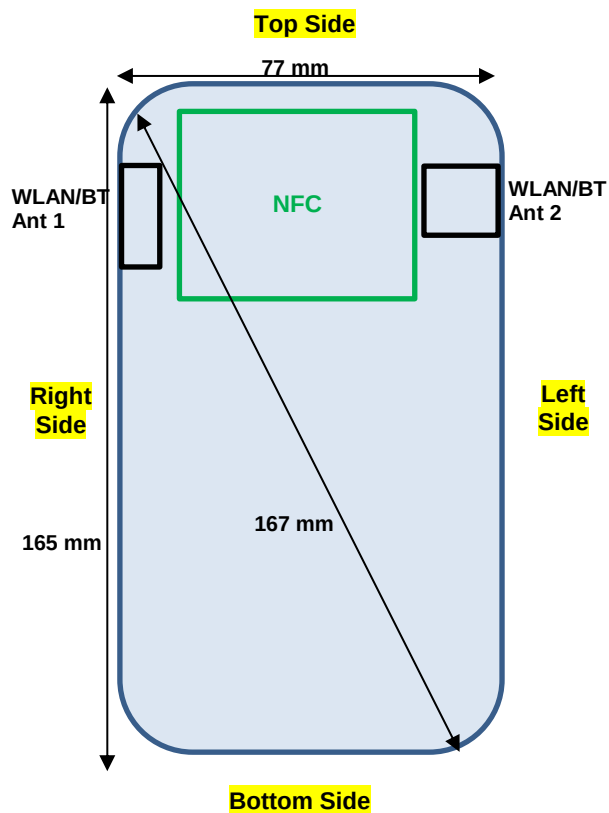
	Mode	Channel	Frequency (MHz)	Ant 1			Ant 2		
				Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %
Bluetooth	BR / EDR 1Mbps	0	2402	6.09	6.50	76.86	4.74	6.00	76.86
		39	2441	6.11	6.50		5.43	6.00	
		78	2480	6.39	6.50		5.65	6.00	
	BR / EDR 2Mbps	0	2402	Not Required	5.00	Not Required	Not Required	4.00	Not Required
		39	2441		5.00			4.00	
		78	2480		5.00			4.00	
	BR / EDR 3Mbps	0	2402		5.00			4.00	
		39	2441		5.00			4.00	
		78	2480		5.00			4.00	
	LE 1Mbps	0	2402		6.50			5.50	
		19	2440		6.50			5.50	
		39	2480		6.50			5.50	
	LE 2Mbps	0	2402		6.50			5.50	
		19	2440		6.50			5.50	
		39	2480		6.50			5.50	

General Note:

- For 2.4GHz Bluetooth SAR testing was selected 1Mbps due to its highest average power and duty cycle is 76.86% considered in SAR testing, and the duty cycle would be scaled to theoretical 83.3% in reported SAR calculation.



12. Antenna Location



Back View

Distance of the Antenna to the EUT surface/edge						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WLAN/BT Antenna 1	≤ 25mm	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	≤ 25mm
WLAN/BT Antenna 2	≤ 25mm	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	≤ 25mm

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 ≥ 0.8 W/kg.
4. The 2.4GHz in SISO operation product specific SAR is not required, due to hotspot mode the measured SAR scaled to the maximum output power, including tolerance is less than 1.2 W/kg .
5. For 5.3GHz / 5.5GHz /6GHz WLAN product specific SAR is necessary too, due to an overall diagonal dimension is > 16 cm.

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. The device support DBS mode (Dual band simultaneous) for WLAN operation, for RF Exposure was performed at non-DBS power level to do DBS Sim-Tx analysis, if some exposure position does not meet simultaneous transmission requirement additional SAR at DBS power level to meet Sim-Tx compliance.
8. During SAR testing the WLAN transmission was verified using a spectrum analyzer.

**13.1 Body Worn Accessory SAR****<WLAN SAR>**

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Holster	Power Status	Non-DBS / DBS	Ch.	Freq. (MHz)	Sample	Battery	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	Ant 1	-	Power table 1	Non-DBS	1	2412	Sample 1	Battery 1	18.10	19.00	1.230	85.83	1.165	0.19	0.032	0.046
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Ant 1	-	Power table 1	Non-DBS	1	2412	Sample 1	Battery 1	18.10	19.00	1.230	85.83	1.165	0.13	0.403	0.578
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Ant 1	Holster	Power table 1	Non-DBS	1	2412	Sample 1	Battery 1	18.10	19.00	1.230	85.83	1.165	0.05	0.275	0.394
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Ant 1	-	Power table 1	Non-DBS	1	2412	Sample 1	Battery 2	18.10	19.00	1.230	85.83	1.165	0.13	0.372	0.533
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Ant 1	-	Power table 1	Non-DBS	1	2412	Sample 1	Battery 3	18.10	19.00	1.230	85.83	1.165	0.08	0.355	0.509
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Ant 1	-	Power table 1	Non-DBS	1	2412	Sample 1	Battery 4	18.10	19.00	1.230	85.83	1.165	-0.13	0.366	0.525
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Ant 1	-	Power table 1	Non-DBS	1	2412	Sample 2	Battery 1	18.10	19.00	1.230	85.83	1.165	-0.09	0.374	0.536
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Ant 1	-	Power table 1	DBS	1	2412	Sample 1	Battery 1	16.80	17.00	1.047	85.83	1.165	-0.14	0.322	0.393
	WLAN2.4GHz	802.11b 1Mbps	Front	15mm	Ant 2	-	Power table 1	Non-DBS	11	2462	Sample 1	Battery 1	18.20	19.00	1.202	85.83	1.165	-0.02	0.092	0.129
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Ant 2	-	Power table 1	Non-DBS	11	2462	Sample 1	Battery 1	18.20	19.00	1.202	85.83	1.165	-0.02	0.156	0.218
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Ant 2	Holster	Power table 1	Non-DBS	11	2462	Sample 1	Battery 1	18.20	19.00	1.202	85.83	1.165	-0.12	0.106	0.148
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Ant 2	-	Power table 1	Non-DBS	11	2462	Sample 1	Battery 2	18.20	19.00	1.202	85.83	1.165	-0.04	0.132	0.185
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Ant 2	-	Power table 1	Non-DBS	11	2462	Sample 1	Battery 3	18.20	19.00	1.202	85.83	1.165	-0.12	0.116	0.162
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Ant 2	-	Power table 1	Non-DBS	11	2462	Sample 1	Battery 4	18.20	19.00	1.202	85.83	1.165	-0.17	0.111	0.155
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Ant 2	-	Power table 1	Non-DBS	11	2462	Sample 2	Battery 1	18.20	19.00	1.202	85.83	1.165	0.02	0.133	0.186
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Ant 2	-	Power table 1	DBS	11	2462	Sample 1	Battery 1	16.70	17.00	1.072	85.83	1.165	-0.06	0.112	0.140
	WLAN2.4GHz	802.11b 1Mbps	Front	15mm	Ant 1+2(1)	-	Power table 1	Non-DBS	11	2462	Sample 1	Battery 1	19.00	19.00	1.000	85.83	1.165	-0.03	0.079	0.092
01	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Ant 1+2(1)	-	Power table 1	Non-DBS	11	2462	Sample 1	Battery 1	19.00	19.00	1.000	85.83	1.165	-0.11	0.575	0.670
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Ant 1+2(1)	Holster	Power table 1	Non-DBS	11	2462	Sample 1	Battery 1	19.00	19.00	1.000	85.83	1.165	-0.12	0.432	0.503
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Ant 1+2(1)	-	Power table 1	Non-DBS	11	2462	Sample 1	Battery 2	19.00	19.00	1.000	85.83	1.165	-0.13	0.542	0.631
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Ant 1+2(1)	-	Power table 1	Non-DBS	11	2462	Sample 1	Battery 3	19.00	19.00	1.000	85.83	1.165	0.02	0.506	0.589
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Ant 1+2(1)	-	Power table 1	Non-DBS	11	2462	Sample 1	Battery 4	19.00	19.00	1.000	85.83	1.165	0.04	0.521	0.607
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Ant 1+2(1)	-	Power table 1	Non-DBS	11	2462	Sample 2	Battery 1	19.00	19.00	1.000	85.83	1.165	-0.04	0.533	0.621
	WLAN2.4GHz	802.11b 1Mbps	Back	15mm	Ant 1+2(1)	-	Power table 1	DBS	11	2462	Sample 1	Battery 1	16.90	17.00	1.023	85.83	1.165	0.02	0.407	0.485



FCC SAR TEST REPORT

Report No. : FA3D0601-04

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Holster	Power Status	Non-DBS / DBS	Ch.	Freq. (MHz)	Sample	Battery	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)
02	WLAN5GHz	802.11n-HT40 MCS0	Front	15mm	Ant 1+2(2)	-	Power table 1	Non-DBS	54	5270	Sample 1	Battery 1	18.50	19.00	1.122	85.87	1.165	0.1	0.184	0.241
	WLAN5GHz	802.11n-HT40 MCS0	Back	15mm	Ant 1+2(2)	-	Power table 1	Non-DBS	54	5270	Sample 1	Battery 1	18.50	19.00	1.122	85.87	1.165	-0.08	0.908	1.187
	WLAN5GHz	802.11n-HT40 MCS0	Back	0mm	Ant 1+2(2)	Holster	Power table 1	Non-DBS	54	5270	Sample 1	Battery 1	18.50	19.00	1.122	85.87	1.165	0.18	0.732	0.957
	WLAN5GHz	802.11n-HT40 MCS0	Back	15mm	Ant 1+2(2)	-	Power table 1	Non-DBS	62	5310	Sample 1	Battery 1	16.70	17.00	1.072	85.87	1.165	-0.15	0.701	0.875
	WLAN5GHz	802.11a 6Mbps	Back	15mm	Ant 1+2(2)	-	Power table 1	Non-DBS	60	5300	Sample 1	Battery 1	18.10	19.00	1.230	86	1.163	-0.01	0.806	1.153
	WLAN5GHz	802.11n-HT40 MCS0	Back	15mm	Ant 1+2(2)	-	Power table 1	Non-DBS	54	5270	Sample 1	Battery 2	18.50	19.00	1.122	85.87	1.165	0	0.842	1.101
	WLAN5GHz	802.11n-HT40 MCS0	Back	15mm	Ant 1+2(2)	-	Power table 1	Non-DBS	54	5270	Sample 1	Battery 3	18.50	19.00	1.122	85.87	1.165	-0.12	0.852	1.114
	WLAN5GHz	802.11n-HT40 MCS0	Back	15mm	Ant 1+2(2)	-	Power table 1	Non-DBS	54	5270	Sample 1	Battery 4	18.50	19.00	1.122	85.87	1.165	-0.01	0.816	1.067
	WLAN5GHz	802.11n-HT40 MCS0	Back	15mm	Ant 1+2(2)	-	Power table 1	Non-DBS	54	5270	Sample 2	Battery 1	18.50	19.00	1.122	85.87	1.165	0.12	0.804	1.051
	WLAN5GHz	802.11n-HT40 MCS0	Back	15mm	Ant 1+2(2)	-	Power table 1	Non-DBS	62	5310	Sample 2	Battery 1	16.70	17.00	1.072	85.87	1.165	-0.02	0.688	0.859
	WLAN5GHz	802.11a 6Mbps	Back	15mm	Ant 1+2(2)	-	Power table 1	Non-DBS	60	5300	Sample 2	Battery 1	18.10	19.00	1.230	86	1.163	-0.09	0.814	1.165
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 1+2(2)	-	Power table 1	DBS	58	5290	Sample 1	Battery 1	17.00	17.50	1.122	85.77	1.166	-0.09	0.452	0.591
03	WLAN5GHz	802.11ac-VHT80 MCS0	Front	15mm	Ant 1+2(1)	-	Power table 1	Non-DBS	138	5690	Sample 1	Battery 1	18.00	18.50	1.122	85.77	1.166	0.1	0.152	0.199
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 1+2(1)	-	Power table 1	Non-DBS	138	5690	Sample 1	Battery 1	18.00	18.50	1.122	85.77	1.166	-0.04	0.765	1.001
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	0mm	Ant 1+2(1)	Holster	Power table 1	Non-DBS	138	5690	Sample 1	Battery 1	18.00	18.50	1.122	85.77	1.166	-0.09	0.561	0.734
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 1+2(2)	-	Power table 1	Non-DBS	106	5530	Sample 1	Battery 1	17.00	17.50	1.122	85.77	1.166	0.06	0.625	0.818
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 1+2(2)	-	Power table 1	Non-DBS	122	5610	Sample 1	Battery 1	17.80	18.50	1.175	85.77	1.166	0.04	0.614	0.841
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 1+2(1)	-	Power table 1	Non-DBS	138	5690	Sample 1	Battery 2	18.00	18.50	1.122	85.77	1.166	0.11	0.752	0.984
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 1+2(1)	-	Power table 1	Non-DBS	138	5690	Sample 1	Battery 3	18.00	18.50	1.122	85.77	1.166	0.12	0.739	0.967
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 1+2(1)	-	Power table 1	Non-DBS	138	5690	Sample 1	Battery 4	18.00	18.50	1.122	85.77	1.166	0.14	0.722	0.945
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 1+2(1)	-	Power table 1	Non-DBS	138	5690	Sample 2	Battery 1	18.00	18.50	1.122	85.77	1.166	0.14	0.761	0.996
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 1+2(1)	-	Power table 1	DBS	138	5690	Sample 1	Battery 1	16.50	17.50	1.259	85.77	1.166	0.02	0.433	0.636
	WLAN5GHz	802.11ac-VHT80 MCS0	Front	15mm	Ant 1+2(1)	-	Power table 1	Non-DBS	155	5775	Sample 1	Battery 1	17.90	18.50	1.148	85.77	1.166	0.13	0.182	0.244
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 1+2(1)	-	Power table 1	Non-DBS	155	5775	Sample 1	Battery 1	17.90	18.50	1.148	85.77	1.166	-0.05	0.806	1.079
04	WLAN5GHz	802.11ac-VHT80 MCS0	Back	0mm	Ant 1+2(1)	Holster	Power table 1	Non-DBS	155	5775	Sample 1	Battery 1	17.90	18.50	1.148	85.77	1.166	-0.08	0.632	0.846
	WLAN5GHz	802.11n-HT40 MCS0	Back	15mm	Ant 1+2(2)	-	Power table 1	Non-DBS	159	5795	Sample 1	Battery 1	18.20	18.50	1.072	85.87	1.165	0.09	0.773	0.965
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 1+2(1)	-	Power table 1	Non-DBS	155	5775	Sample 1	Battery 2	17.90	18.50	1.148	85.77	1.166	-0.16	0.785	1.051
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 1+2(1)	-	Power table 1	Non-DBS	155	5775	Sample 1	Battery 3	17.90	18.50	1.148	85.77	1.166	0.13	0.776	1.039
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 1+2(1)	-	Power table 1	Non-DBS	155	5775	Sample 1	Battery 4	17.90	18.50	1.148	85.77	1.166	-0.13	0.732	0.980
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 1+2(1)	-	Power table 1	Non-DBS	155	5775	Sample 2	Battery 1	17.90	18.50	1.148	85.77	1.166	-0.14	0.804	1.076
	WLAN5GHz	802.11n-HT40 MCS0	Back	15mm	Ant 1+2(2)	-	Power table 1	Non-DBS	159	5795	Sample 2	Battery 1	18.20	18.50	1.072	85.87	1.165	0.14	0.801	1.000
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 1+2(1)	-	Power table 1	DBS	155	5775	Sample 1	Battery 1	16.80	17.00	1.047	85.77	1.166	0.14	0.512	0.625
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 1+2(1)	-	Power table 1	DBS	155	5775	Sample 1	Battery 1	16.80	17.00	1.047	85.77	1.166	0.14	0.512	0.625
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 1+2(1)	-	Power table 1	DBS	155	5775	Sample 1	Battery 1	16.80	17.00	1.047	85.77	1.166	0.14	0.512	0.625
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 1+2(1)	-	Power table 1	DBS	155	5775	Sample 1	Battery 1	16.80	17.00	1.047	85.77	1.166	0.14	0.512	0.625
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 1+2(1)	-	Power table 1	DBS	155	5775	Sample 1	Battery 1	16.80	17.00	1.047	85.77	1.166	0.14	0.512	0.625

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Holster	Power Status	Non-DBS / DBS	Ch.	Freq. (MHz)	Sample	Battery	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)	Measured APD (W/m^2)	Reported APD (W/m^2)
05	WLAN6GHz	802.11ax-HE160 MCS0	Front	15mm	Ant 1+2(2)	-	Power table 1	Non-DBS	15	6025	Sample 1	Battery 1	10.10	10.50	1.096	85.8	1.166	0.03	0.027	0.034	0.233	0.298
	WLAN6GHz	802.11ax-HE160 MCS0	Back	15mm	Ant 1+2(2)	-	Power table 1	Non-DBS	15	6025	Sample 1	Battery 1	10.10	10.50	1.096	85.8	1.166	-0.19	0.114	0.146	0.999	1.277
	WLAN6GHz	802.11ax-HE160 MCS0	Back	0mm	Ant 1+2(2)	Holster	Power table 1	Non-DBS	15	6025	Sample 1	Battery 1	10.10	10.50	1.096	85.8	1.166	0.04	0.058	0.074	0.508	0.649
	WLAN6GHz	802.11ax-HE160 MCS0	Back	15mm	Ant 1+2(2)	-	Power table 1	Non-DBS	47	6185	Sample 1	Battery 1	9.50	10.50	1.259	85.8	1.166	-0.01	0.091	0.134	0.798	1.171
	WLAN6GHz	802.11ax-HE160 MCS0	Back	15mm	Ant 1+2(2)	-	Power table 1	Non-DBS	111	6505	Sample 1	Battery 1	8.30	9.00	1.175	85.8	1.166	-0.17	0.081	0.111	0.708	0.970
	WLAN6GHz	802.11ax-HE160 MCS0	Back	15mm	Ant 1+2(2)	-	Power table 1	Non-DBS	143	6665	Sample 1	Battery 1	9.70	10.00	1.072	85.8	1.166	0.18	0.080	0.100	0.702	0.877
	WLAN6GHz	802.11ax-HE160 MCS0	Back	15mm	Ant 1+2(1)	-	Power table 1	Non-DBS	207	6985	Sample 1	Battery 1	8.80	9.00	1.047	85.8	1.166	-0.08	0.041	0.051	0.364	0.444
	WLAN6GHz	802.11ax-HE160 MCS0	Back	15mm	Ant 1+2(2)	-	Power table 1	Non-DBS	15	6025	Sample 1	Battery 2	10.10	10.50	1.096	85.8	1.166	-0.05	0.107	0.137	0.942	1.204
	WLAN6GHz	802.11ax-HE160 MCS0	Back	15mm	Ant 1+2(2)	-	Power table 1	Non-DBS	15	6025	Sample 1	Battery 3	10.10	10.50	1.096	85.8	1.166	0.14	0.109	0.139	0.954	1.220
	WLAN6GHz	802.11ax-HE160 MCS0	Back	15mm	Ant 1+2(2)	-	Power table 1	Non-DBS	15	6025	Sample 1	Battery 4	10.10	10.50	1.096	85.8	1.166	0.15	0.103	0.132	0.906	1.158
	WLAN6GHz	802.11ax-HE160 MCS0	Back	15mm	Ant 1+2(2)	-	Power table 1	Non-DBS	15	6025	Sample 2	Battery 1	10.10	10.50	1.096	85.8	1.166	0.13	0.100	0.128	0.876	1.120
	WLAN6GHz	802.11ax-HE160 MCS0	Back	15mm	Ant 1+2(2)	-	Power table 1	Non-DBS	15	6025	Sample 2	Battery 1	10.10	10.50	1.096	85.8	1.166	0.13	0.100	0.128	0.876	1.120

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Holster	Ch.	Freq. (MHz)	Sample	Battery	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)
06	Bluetooth	1Mbps	Front	15mm	Ant 1	-	78	2480	Sample 1	Battery 1	6.39	6.50	1.026	76.86	1.084	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Back	15mm	Ant 1	-	78	2480	Sample 1	Battery 1	6.39	6.50	1.026	76.86	1.084	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Back	0mm	Ant 1	Holster	78	2480	Sample 1	Battery 1	6.39	6.50	1.026	76.86	1.084	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Back	15mm	Ant 1	-	78	2480	Sample 1	Battery 2	6.39	6.50	1.026	76.86	1.084	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Back	15mm	Ant 1	-	78	2480	Sample 1	Battery 3	6.39	6.50	1.026	76.86	1.084	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Back	15mm	Ant 1	-	78	2480	Sample 1	Battery 4	6.39	6.50	1.026	76.86	1.084	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Back	15mm	Ant 1	-	78	2480	Sample 2	Battery 1	6.39	6.50	1.026	76.86	1.084	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Front	15mm	Ant 2	-	78	2480	Sample 1	Battery 1	5.65	6.00	1.084	76.86	1.084	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Back	15mm	Ant 2	-	78	2480	Sample 1	Battery 1	5.65	6.00	1.084	76.86	1.084	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Back	0mm	Ant 2	Holster	78	2480	Sample 1	Battery 1	5.65	6.00	1.084	76.86	1.084	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Back	15mm	Ant 2	-	78	2480	Sample 1	Battery 2	5.65	6.00	1.084	76.86	1.084	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Back	15mm	Ant 2	-	78	2480	Sample 1	Battery 3	5.65	6.00	1.084	76.86	1.084	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Back	15mm	Ant 2	-	78	2480	Sample 1	Battery 4	5.65	6.00	1.084	76.86	1.084	0	< 0.001	< 0.001
	Bluetooth	1Mbps	Back	15mm	Ant 2	-	78	2480	Sample 2	Battery 1	5.65	6.00	1.084	76.86	1.084	0	< 0.001	< 0.001

13.2 Product Specific SAR<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Status	Non-DBS / DBS	Ch.	Freq. (MHz)	Sample	Battery	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)
07	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Ant 1+2(1)	Power table 1	Non-DBS	11	2462	Sample 1	Battery 1	19.00	19.00	1.000	85.83	1.165	-0.02	2.150	2.505
	WLAN2.4GHz	802.11b 1Mbps	Right Side	0mm	Ant 1+2(1)	Power table 1	Non-DBS	11	2462	Sample 1	Battery 1	19.00	19.00	1.000	85.83	1.165	0.11	2.700	3.146
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Ant 1+2(2)	Power table 1	Non-DBS	1	2412	Sample 1	Battery 1	18.40	19.00	1.148	85.83	1.165	0.09	1.820	2.434
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Ant 1+2(1)	Power table 1	Non-DBS	6	2437	Sample 1	Battery 1	18.20	19.00	1.202	85.83	1.165	0.07	1.750	2.451
	WLAN2.4GHz	802.11b 1Mbps	Right Side	0mm	Ant 1+2(2)	Power table 1	Non-DBS	1	2412	Sample 1	Battery 1	18.40	19.00	1.148	85.83	1.165	0.05	2.110	2.822
	WLAN2.4GHz	802.11b 1Mbps	Right Side	0mm	Ant 1+2(1)	Power table 1	Non-DBS	6	2437	Sample 1	Battery 1	18.20	19.00	1.202	85.83	1.165	0.09	2.060	2.885
	WLAN2.4GHz	802.11b 1Mbps	Right Side	0mm	Ant 1+2(2)	Power table 1	Non-DBS	11	2462	Sample 1	Battery 2	19.00	19.00	1.000	85.83	1.165	0.05	2.620	3.052
	WLAN2.4GHz	802.11b 1Mbps	Right Side	0mm	Ant 1+2(1)	Power table 1	Non-DBS	11	2462	Sample 1	Battery 3	19.00	19.00	1.000	85.83	1.165	0.09	2.550	2.971
	WLAN2.4GHz	802.11b 1Mbps	Right Side	0mm	Ant 1+2(2)	Power table 1	Non-DBS	11	2462	Sample 1	Battery 4	19.00	19.00	1.000	85.83	1.165	0.05	2.600	3.029
	WLAN2.4GHz	802.11b 1Mbps	Right Side	0mm	Ant 1+2(1)	Power table 1	Non-DBS	11	2462	Sample 2	Battery 1	19.00	19.00	1.000	85.83	1.165	0.09	2.320	2.703
	WLAN2.4GHz	802.11b 1Mbps	Right Side	0mm	Ant 1+2(2)	Power table 1	Non-DBS	1	2412	Sample 2	Battery 1	18.40	19.00	1.148	85.83	1.165	0.05	1.920	2.568
	WLAN2.4GHz	802.11b 1Mbps	Right Side	0mm	Ant 1+2(1)	Power table 1	Non-DBS	6	2437	Sample 2	Battery 1	18.20	19.00	1.202	85.83	1.165	0.09	2.120	2.969
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Ant 1+2(1)	Power table 1	DBS	11	2462	Sample 1	Battery 1	16.90	17.00	1.023	85.83	1.165	0.01	1.410	1.681
	WLAN2.4GHz	802.11b 1Mbps	Right Side	0mm	Ant 1+2(1)	Power table 1	DBS	11	2462	Sample 1	Battery 1	16.90	17.00	1.023	85.83	1.165	-0.13	1.490	1.776



FCC SAR TEST REPORT

Report No. : FA3D0601-04

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Status	Non-DBS / DBS	Ch.	Freq. (MHz)	Sample	Battery	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)
08	WLAN5GHz	802.11n-HT40 MCS0	Front	0mm	Ant 1+2(2)	Power table 1	Non-DBS	54	5270	Sample 1	Battery 1	18.50	19.00	1.122	85.87	1.165	-0.07	0.272	0.356
	WLAN5GHz	802.11n-HT40 MCS0	Back	0mm	Ant 1+2(2)	Power table 1	Non-DBS	54	5270	Sample 1	Battery 1	18.50	19.00	1.122	85.87	1.165	-0.15	1.700	2.222
	WLAN5GHz	802.11n-HT40 MCS0	Left Side	0mm	Ant 1+2(2)	Power table 1	Non-DBS	54	5270	Sample 1	Battery 1	18.50	19.00	1.122	85.87	1.165	-0.16	1.910	2.497
	WLAN5GHz	802.11n-HT40 MCS0	Right Side	0mm	Ant 1+2(2)	Power table 1	Non-DBS	54	5270	Sample 1	Battery 1	18.50	19.00	1.122	85.87	1.165	-0.09	2.150	2.810
	WLAN5GHz	802.11n-HT40 MCS0	Top Side	0mm	Ant 1+2(2)	Power table 1	Non-DBS	54	5270	Sample 1	Battery 1	18.50	19.00	1.122	85.87	1.165	-0.14	0.425	0.556
	WLAN5GHz	802.11n-HT40 MCS0	Back	0mm	Ant 1+2(2)	Power table 1	Non-DBS	62	5310	Sample 1	Battery 1	16.70	17.00	1.072	85.87	1.165	0.09	1.320	1.648
	WLAN5GHz	802.11a 6Mbps	Back	0mm	Ant 1+2(2)	Power table 1	Non-DBS	60	5300	Sample 1	Battery 1	18.10	19.00	1.230	86	1.163	0.14	1.550	2.218
	WLAN5GHz	802.11n-HT40 MCS0	Left Side	0mm	Ant 1+2(2)	Power table 1	Non-DBS	62	5310	Sample 1	Battery 1	16.70	17.00	1.072	85.87	1.165	0.08	1.420	1.773
	WLAN5GHz	802.11a 6Mbps	Left Side	0mm	Ant 1+2(2)	Power table 1	Non-DBS	60	5300	Sample 1	Battery 1	18.10	19.00	1.230	86	1.163	0.04	1.610	2.304
	WLAN5GHz	802.11n-HT40 MCS0	Right Side	0mm	Ant 1+2(2)	Power table 1	Non-DBS	62	5310	Sample 1	Battery 1	16.70	17.00	1.072	85.87	1.165	-0.14	1.250	1.560
	WLAN5GHz	802.11a 6Mbps	Right Side	0mm	Ant 1+2(2)	Power table 1	Non-DBS	60	5300	Sample 1	Battery 1	18.10	19.00	1.230	86	1.163	0	1.940	2.776
	WLAN5GHz	802.11n-HT40 MCS0	Right Side	0mm	Ant 1+2(2)	Power table 1	Non-DBS	54	5270	Sample 1	Battery 2	18.50	19.00	1.122	85.87	1.165	-0.08	1.980	2.588
	WLAN5GHz	802.11n-HT40 MCS0	Right Side	0mm	Ant 1+2(2)	Power table 1	Non-DBS	54	5270	Sample 1	Battery 3	18.50	19.00	1.122	85.87	1.165	-0.19	2.040	2.667
	WLAN5GHz	802.11n-HT40 MCS0	Right Side	0mm	Ant 1+2(2)	Power table 1	Non-DBS	54	5270	Sample 1	Battery 4	18.50	19.00	1.122	85.87	1.165	0.15	1.950	2.549
	WLAN5GHz	802.11n-HT40 MCS0	Right Side	0mm	Ant 1+2(2)	Power table 1	Non-DBS	54	5270	Sample 2	Battery 1	18.50	19.00	1.122	85.87	1.165	0.16	1.920	2.510
	WLAN5GHz	802.11a 6Mbps	Right Side	0mm	Ant 1+2(2)	Power table 1	Non-DBS	60	5300	Sample 2	Battery 1	18.10	19.00	1.230	86	1.163	0.07	1.850	2.647
	WLAN5GHz	802.11n-HT40 MCS0	Right Side	0mm	Ant 1+2(2)	Power table 1	Non-DBS	62	5310	Sample 2	Battery 1	16.70	17.00	1.072	85.87	1.165	0.15	1.420	1.773
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 1+2(2)	Power table 1	DBS	58	5290	Sample 1	Battery 1	17.00	17.50	1.122	85.77	1.166	-0.13	1.450	1.897
	WLAN5GHz	802.11ac-VHT80 MCS0	Front	0mm	Ant 1+2(1)	Power table 1	Non-DBS	138	5690	Sample 1	Battery 1	18.00	18.50	1.122	85.77	1.166	0.11	0.255	0.334
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	0mm	Ant 1+2(1)	Power table 1	Non-DBS	138	5690	Sample 1	Battery 1	18.00	18.50	1.122	85.77	1.166	-0.07	1.200	1.570
09	WLAN5GHz	802.11ac-VHT80 MCS0	Left Side	0mm	Ant 1+2(1)	Power table 1	Non-DBS	138	5690	Sample 1	Battery 1	18.00	18.50	1.122	85.77	1.166	-0.17	1.620	2.119
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 1+2(1)	Power table 1	Non-DBS	138	5690	Sample 1	Battery 1	18.00	18.50	1.122	85.77	1.166	-0.1	2.410	3.153
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Side	0mm	Ant 1+2(1)	Power table 1	Non-DBS	138	5690	Sample 1	Battery 1	18.00	18.50	1.122	85.77	1.166	-0.05	0.372	0.487
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Side	0mm	Ant 1+2(2)	Power table 1	Non-DBS	106	5530	Sample 1	Battery 1	17.00	17.50	1.122	85.77	1.166	0.11	1.320	1.727
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Side	0mm	Ant 1+2(2)	Power table 1	Non-DBS	122	5610	Sample 1	Battery 1	17.80	18.50	1.175	85.77	1.166	0.15	1.980	2.712
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 1+2(2)	Power table 1	Non-DBS	106	5530	Sample 1	Battery 1	17.00	17.50	1.122	85.77	1.166	0.09	1.450	1.897
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 1+2(2)	Power table 1	Non-DBS	122	5610	Sample 1	Battery 1	17.80	18.50	1.175	85.77	1.166	0.07	2.010	2.754
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 1+2(1)	Power table 1	Non-DBS	138	5690	Sample 1	Battery 2	18.00	18.50	1.122	85.77	1.166	-0.18	2.240	2.931
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 1+2(1)	Power table 1	Non-DBS	138	5690	Sample 1	Battery 3	18.00	18.50	1.122	85.77	1.166	-0.18	2.160	2.826
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 1+2(1)	Power table 1	Non-DBS	138	5690	Sample 1	Battery 4	18.00	18.50	1.122	85.77	1.166	0.01	2.110	2.760
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 1+2(1)	Power table 1	Non-DBS	138	5690	Sample 2	Battery 1	18.00	18.50	1.122	85.77	1.166	0.03	2.140	2.800
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 1+2(2)	Power table 1	Non-DBS	122	5610	Sample 2	Battery 1	17.80	18.50	1.175	85.77	1.166	0.15	1.850	2.534
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 1+2(2)	Power table 1	Non-DBS	106	5530	Sample 2	Battery 1	17.00	17.50	1.122	85.77	1.166	0.09	1.330	1.740
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 1+2(1)	Power table 1	DBS	138	5690	Sample 1	Battery 1	16.50	17.50	1.259	85.77	1.166	0.1	1.330	1.952
	WLAN5GHz	802.11ac-VHT80 MCS0	Front	0mm	Ant 1+2(1)	Power table 1	Non-DBS	155	5775	Sample 1	Battery 1	17.90	18.50	1.148	85.77	1.166	0.09	0.322	0.431
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	0mm	Ant 1+2(1)	Power table 1	Non-DBS	155	5775	Sample 1	Battery 1	17.90	18.50	1.148	85.77	1.166	0.01	1.370	1.834
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Side	0mm	Ant 1+2(1)	Power table 1	Non-DBS	155	5775	Sample 1	Battery 1	17.90	18.50	1.148	85.77	1.166	0.07	1.750	2.343
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 1+2(1)	Power table 1	Non-DBS	155	5775	Sample 1	Battery 1	17.90	18.50	1.148	85.77	1.166	0.12	2.210	2.959
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Side	0mm	Ant 1+2(1)	Power table 1	Non-DBS	155	5775	Sample 1	Battery 1	17.90	18.50	1.148	85.77	1.166	-0.02	0.422	0.565
	WLAN5GHz	802.11n-HT40 MCS0	Left Side	0mm	Ant 1+2(2)	Power table 1	Non-DBS	159	5795	Sample 1	Battery 1	18.20	18.50	1.072	85.87	1.165	0.13	1.660	2.072
10	WLAN5GHz	802.11n-HT40 MCS0	Right Side	0mm	Ant 1+2(2)	Power table 1	Non-DBS	159	5795	Sample 1	Battery 1	18.20	18.50	1.072	85.87	1.165	-0.12	2.100	2.621
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 1+2(1)	Power table 1	Non-DBS	155	5775	Sample 1	Battery 2	17.90	18.50	1.148	85.77	1.166	-0.02	2.060	2.758
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 1+2(1)	Power table 1	Non-DBS	155	5775	Sample 1	Battery 3	17.90	18.50	1.148	85.77	1.166	-0.02	2.110	2.825
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 1+2(1)	Power table 1	Non-DBS	155	5775	Sample 1	Battery 4	17.90	18.50	1.148	85.77	1.166	0.07	1.990	2.664
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 1+2(1)	Power table 1	Non-DBS	155	5775	Sample 2	Battery 1	17.90	18.50	1.148	85.77	1.166	0.03	2.010	2.691
	WLAN5GHz	802.11n-HT40 MCS0	Right Side	0mm	Ant 1+2(2)	Power table 1	Non-DBS	159	5795	Sample 2	Battery 1	18.20	18.50	1.072	85.87	1.165	0.15	2.100	2.621
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 1+2(1)	Power table 1	DBS	155	5775	Sample 1	Battery 1	16.80	17.00	1.047	85.77	1.166	-0.02	1.630	1.990

13.3 Repeated SAR Measurement

No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Status	Non-DBS / DBS	Ch.	Freq. (MHz)	Sample	Battery	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	WLAN5GHz	802.11n-HT40 MCS0	Back	15mm	Ant 1+2(2)	Power table 1	Non-DBS	54	5270	Sample 1	Battery 1	18.50	19.00	1.122	85.87	1.165	-0.08	0.908	-	1.187
2nd	WLAN5GHz	802.11n-HT40 MCS0	Back	15mm	Ant 1+2(2)	Power table 1	Non-DBS	54	5270	Sample 1	Battery 1	18.50	19.00	1.122	85.87	1.165	0.11	0.859	1.06	1.123
1st	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 1+2(1)	Power table 1	Non-DBS	155	5775	Sample 1	Battery 1	17.90	18.50	1.148	85.77	1.166	-0.05	0.806	-	1.079
2nd	WLAN5GHz	802.11ac-VHT80 MCS0	Back	15mm	Ant 1+2(1)	Power table 1	Non-DBS	155	5775	Sample 1	Battery 1	17.90	18.50	1.148	85.77	1.166	0.15	0.792	1.02	1.060

No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Status	Non-DBS / DBS	Ch.	Freq. (MHz)	Sample	Battery	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)	Ratio	Reported 10g SAR (W/kg)
1st	WLAN2.4GHz	802.11b 1Mbps	Right Side	0mm	Ant 1+2(1)	Power table 1	Non-DBS	11	2462	Sample 1	Battery 1	19.00	19.00	1.000	85.83	1.165	0.11	2.700	-	3.146
2nd	WLAN2.4GHz	802.11b 1Mbps	Right Side	0mm	Ant 1+2(1)	Power table 1	Non-DBS	11	2462	Sample 1	Battery 1	19.00	19.00	1.000	85.83	1.165	0.13	2.510	1.08	2.924
1st	WLAN5GHz	802.11n-HT40 MCS0	Right Side	0mm	Ant 1+2(2)	Power table 1	Non-DBS	54	5270	Sample 1	Battery 1	18.50	19.00	1.122	85.87	1.165	-0.09	2.150	-	2.810
2nd	WLAN5GHz	802.11n-HT40 MCS0	Right Side	0mm	Ant 1+2(2)	Power table 1	Non-DBS	54	5270	Sample 1	Battery 1	18.50	19.00	1.122	85.87	1.165	0.17	1.980	1.09	2.588
1st	WLAN5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 1+2(1)	Power table 1	Non-DBS	138	5690	Sample 1	Battery 1	18.00	18.50	1.122	85.77	1.166	-0.1	2.410	-	3.153
2nd	WLAN5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 1+2(1)	Power table 1	Non-DBS	138	5690	Sample 1	Battery 1	18.00	18.50	1.122	85.77	1.166	0.15	2.250	1.07	2.944
1st	WLAN5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 1+2(1)	Power table 1	Non-DBS	155	5775	Sample 1	Battery 1	17.90	18.50	1.148	85.77	1.166	0.12	2.210	-	2.959
2nd	WLAN5GHz	802.11ac-VHT80 MCS0	Right Side	0mm	Ant 1+2(1)	Power table 1	Non-DBS	155	5775	Sample 1	Battery 1	17.90	18.50	1.148	85.77	1.166	0.11	2.110	1.05	2.825

General Note:

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is $\geq 0.8\text{W/kg}$.
2. Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is ≤ 1.2 and the measured SAR $< 1.45\text{W/kg}$, 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 1+2 (5/6GHz WLAN Rx)			Yes	
2.	2.4GHz WLAN Ant 2 + Bluetooth Ant 1 (5/6GHz WLAN Rx)			Yes	
3.	2.4GHz WLAN Ant 1 + Bluetooth Ant 2 (5/6GHz WLAN Rx)			Yes	
4.	2.4GHz WLAN Ant 2 + Bluetooth Ant 1 + NFC	Yes	Yes		Yes
5.	2.4GHz WLAN Ant 1 + Bluetooth Ant 2 + NFC	Yes	Yes		Yes
6.	5/6GHz WLAN Ant 1+2 + Bluetooth Ant 1 / 2 + NFC	Yes	Yes		Yes
DBS					
7.	WLAN2.4GHz Ant 1+2 + WLAN5/6GHz Ant 1+2 + NFC	Yes	Yes		Yes
8.	WLAN2.4GHz Ant 1 + WLAN5/6GHz Ant 1+2 + Bluetooth Ant 2 + NFC	Yes	Yes		Yes
9.	WLAN2.4GHz Ant 2 + WLAN5/6GHz Ant 1+2 + Bluetooth Ant 1 + NFC	Yes	Yes		Yes

General Note:

- The device 2.4GHz support hotspot operation via 5/6GHz receive signal.
- The worst case reported SAR for each configuration was used for SAR summation. Therefore, the following summations represent the absolute worst cases for simultaneous transmission.
- The Scaled SAR summation is calculated based on the same configuration and test position.
- Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
 - Scalar SAR summation < 1.6W/kg.
 - $SPLSR = (SAR1 + SAR2)^{1.5} / (\text{min. separation distance, mm})$, 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.
 - If $SPLSR \leq 0.04$, simultaneously transmission SAR measurement is not necessary.
 - 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	4	5	6	1+6 Summed 1g SAR (W/kg)	2+5 Summed 1g SAR (W/kg)	4+5 Summed 1g SAR (W/kg)	4+6 Summed 1g SAR (W/kg)
	WLAN2.4GHz Ant 1 1g SAR (W/kg)	WLAN2.4GHz Ant 2 1g SAR (W/kg)	WLAN2.4GHz Ant 1+2 1g SAR (W/kg)	WLAN5/6GHz Ant 1+2 1g SAR (W/kg)	Bluetooth Ant 1 1g SAR (W/kg)	Bluetooth Ant 2 1g SAR (W/kg)				
Right Cheek at 0mm	0.080	0.938	1.089	0.799	0.001	0.033	0.113	0.939	0.800	0.832
Right Tilted at 0mm	0.052	0.527	0.467	0.789	0.001	0.001	0.053	0.528	0.790	0.790
Left Cheek at 0mm	0.460	0.453	0.772	1.178	0.013	0.001	0.461	0.466	1.191	1.179
Left Tilted at 0mm	0.069	0.324	0.480	0.972	0.001	0.001	0.070	0.325	0.973	0.973

<DBS>

Exposure Position	1	2	3	4	5	6	3+4 Summed 1g SAR (W/kg)	1+4+6 Summed 1g SAR (W/kg)	2+4+5 Summed 1g SAR (W/kg)
	WLAN2.4GHz Ant 1 1g SAR (W/kg)	WLAN2.4GHz Ant 2 1g SAR (W/kg)	WLAN2.4GHz Ant 1+2 1g SAR (W/kg)	WLAN5/6GHz Ant 1+2 1g SAR (W/kg)	Bluetooth Ant 1 1g SAR (W/kg)	Bluetooth Ant 2 1g SAR (W/kg)			
Right Cheek at 0mm	0.080	0.502	0.727	0.799	0.001	0.033	1.526	0.912	1.302
Right Tilted at 0mm	0.052	0.527	0.467	0.789	0.001	0.001	1.256	0.842	1.317
Left Cheek at 0mm	0.263	0.453	0.772	0.790	0.013	0.001	1.562	1.054	1.256
Left Tilted at 0mm	0.069	0.324	0.480	0.972	0.001	0.001	1.452	1.042	1.297

14.2 Hotspot Exposure Conditions

Exposure Position	1	2	3	5	6	1+6 Summed 1g SAR (W/kg)	2+5 Summed 1g SAR (W/kg)
	WLAN2.4GHz Ant 1 1g SAR (W/kg)	WLAN2.4GHz Ant 2 1g SAR (W/kg)	WLAN2.4GHz Ant 1+2 1g SAR (W/kg)	Bluetooth Ant 1 1g SAR (W/kg)	Bluetooth Ant 2 1g SAR (W/kg)		
Front at 10mm	0.024	0.073	0.106	0.001	0.001	0.025	0.074
Back at 10mm	0.432	0.183	1.148	0.028	0.013	0.445	0.211
Left side at 10mm	0.084	0.023	0.242	0.001	0.001	0.085	0.024
Right side at 10mm	0.332	0.100	0.983	0.001	0.001	0.333	0.101
Top side at 10mm	0.047	0.122	0.136	0.001	0.001	0.048	0.123

14.3 Body-Worn Accessory Exposure Conditions

<Non-DBS>

Exposure Position	1	2	3	4	5	6	1+6 Summed 1g SAR (W/kg)	2+5 Summed 1g SAR (W/kg)	4+5 Summed 1g SAR (W/kg)	4+6 Summed 1g SAR (W/kg)
	WLAN2.4GHz Ant 1 1g SAR (W/kg)	WLAN2.4GHz Ant 2 1g SAR (W/kg)	WLAN2.4GHz Ant 1+2 1g SAR (W/kg)	WLAN5/6GHz Ant 1+2 1g SAR (W/kg)	Bluetooth Ant 1 1g SAR (W/kg)	Bluetooth Ant 2 1g SAR (W/kg)				
Front at 15mm	0.046	0.129	0.092	0.244	0.001	0.001	0.047	0.130	0.245	0.245
Back at 15mm	0.578	0.218	0.670	1.187	0.001	0.001	0.579	0.219	1.188	1.188
Back at 0mm Holster	0.394	0.148	0.503	0.957	0.001	0.001	0.395	0.149	0.958	0.958

<DBS>

Exposure Position	1	2	3	4	5	6	3+4 Summed 1g SAR (W/kg)	1+4+6 Summed 1g SAR (W/kg)	2+4+5 Summed 1g SAR (W/kg)
	WLAN2.4GHz Ant 1 1g SAR (W/kg)	WLAN2.4GHz Ant 2 1g SAR (W/kg)	WLAN2.4GHz Ant 1+2 1g SAR (W/kg)	WLAN5/6GHz Ant 1+2 1g SAR (W/kg)	Bluetooth Ant 1 1g SAR (W/kg)	Bluetooth Ant 2 1g SAR (W/kg)			
Front at 15mm	0.046	0.129	0.092	0.244	0.001	0.001	0.336	0.291	0.374
Back at 15mm	0.393	0.140	0.485	0.636	0.001	0.001	1.121	1.030	0.777
Back at 0mm Holster	0.394	0.148	0.503	0.957	0.001	0.001	1.460	1.352	1.106

14.4 Product Specific Exposure Conditions

<Non-DBS>

Exposure Position	1	2	3	1+3 Summed 10g SAR (W/kg)	2+3 Summed 10g SAR (W/kg)
	WLAN2.4GHz Ant 1+2	WLAN5/6GHz Ant 1+2	NFC		
	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)		
Front at 0mm		0.431	0.001	0.001	0.432
Back at 0mm	2.505	2.222	0.001	2.506	2.223
Left side at 0mm		2.712	0.001	0.001	2.713
Right side at 0mm	3.146	3.153	0.001	3.147	3.154
Top side at 0mm		0.565	0.001	0.001	0.566

<DBS>

Exposure Position	1	2	3	1+3 Summed 10g SAR (W/kg)	2+3 Summed 10g SAR (W/kg)
	WLAN2.4GHz Ant 1+2	WLAN5/6GHz Ant 1+2	NFC		
	10g SAR (W/kg)	10g SAR (W/kg)	10g SAR (W/kg)		
Front at 0mm		0.431	0.001	0.001	0.432
Back at 0mm	1.681	2.222	0.001	3.904	2.223
Left side at 0mm		2.712	0.001	2.713	2.713
Right side at 0mm	1.776	1.990	0.001	3.767	1.991
Top side at 0mm		0.565	0.001	0.566	0.566

Test Engineer : Carter Jhuang and Mood Huang

15. Uncertainty Assessment

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.

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

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

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

Uncertainty Distributions	Normal	Rectangular	Triangular	U-Shape
Multi-plying Factor ^(a)	1/k ^(b)	1/√3	1/√6	1/√2

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

(b) k is the coverage factor

Standard Uncertainty for Assumed Distribution

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type B evaluation using the usual "root-sum-squares" (RSS) methods of combining standard deviations by taking the positive square root of the estimated variances.

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

The judgment of conformity in the report is based on the measurement results excluding the measurement uncertainty.

Applicable for SAR Measurements:

Uncertainty Budget (4 MHz - 10 GHz range)							
Error Description	Uncertainty Value (±%)	Probability	Divisor	(Ci) 1g	(Ci) 10g	Standard Uncertainty (1g) (±%)	Standard Uncertainty (10g) (±%)
Measurement System							
Probe Calibration	18.60	N	2	1	1	9.3	9.3
Axial Isotropy	4.70	R	1.732	0.7	0.7	1.9	1.9
Hemispherical Isotropy	9.60	R	1.732	0.7	0.7	3.9	3.9
Linearity	4.70	R	1.732	1	1	2.7	2.7
Modulation Response	4.68	R	1.732	1	1	2.7	2.7
System Detection Limits	1.00	R	1.732	1	1	0.6	0.6
Boundary Effects	2.00	R	1.732	1	1	1.2	1.2
Readout Electronics	0.30	N	1	1	1	0.3	0.3
Response Time	0.00	R	1.732	1	1	0.0	0.0
Integration Time	2.60	R	1.732	1	1	1.5	1.5
RF Ambient Noise	3.00	R	1.732	1	1	1.7	1.7
RF Ambient Reflections	3.00	R	1.732	1	1	1.7	1.7
Probe Positioner	0.40	R	1.732	1	1	0.2	0.2
Probe Positioning	6.70	R	1.732	1	1	3.9	3.9
Post-processing	4.00	R	1.732	1	1	2.3	2.3
Test Sample Related							
Device Holder	3.60	N	1	1	1	3.6	3.6
Test sample Positioning	3.03	N	1	1	1	3.0	3.0
Power Scaling	0.00	R	1.732	1	1	0.0	0.0
Power Drift	5.00	R	1.732	1	1	2.9	2.9
Phantom and Setup							
Phantom Uncertainty	7.60	R	1.732	1	1	4.4	4.4
SAR correction	0.00	R	1.732	1	0.84	0.0	0.0
Liquid Conductivity Repeatability	0.03	N	1	0.78	0.77	0.0	0.0
Liquid Conductivity (target)	5.00	R	1.732	0.78	0.77	2.3	2.2
Liquid Conductivity (mea.)	2.50	R	1.732	0.78	0.77	1.1	1.1
Temp. unc. - Conductivity	3.68	R	1.732	0.78	0.77	1.7	1.6
Liquid Permittivity Repeatability	0.02	N	1	0.23	0.26	0.0	0.0
Liquid Permittivity (target)	5.00	R	1.732	0.23	0.26	0.7	0.8
Liquid Permittivity (mea.)	2.50	R	1.732	0.23	0.26	0.3	0.4
Temp. unc. - Permittivity	0.84	R	1.732	0.23	0.26	0.1	0.1
Combined Std. Uncertainty						14.5%	14.2%
Coverage Factor for 95 %						K=2	K=2
Expanded STD Uncertainty						29.0%	28.4%

Applicable for Power Density Measurements:

Error Description	Uncertainty Value (±dB)	Probability	Divisor	(Ci)	Standard Uncertainty (±dB)
Probe Calibration	0.49	N	1	1	0.49
Probe correction	0.00	R	1.732	1	0.00
Frequency response (BW ≤ 1 GHz)	0.20	R	1.732	1	0.12
Sensor cross coupling	0.00	R	1.732	1	0.00
Isotropy	0.50	R	1.732	1	0.29
Linearity	0.20	R	1.732	1	0.12
Probe scattering	0.00	R	1.732	1	0.00
Probe positioning offset	0.30	R	1.732	1	0.17
Probe positioning repeatability	0.04	R	1.732	1	0.02
Sensor mechanical offset	0.00	R	1.732	1	0.00
Probe spatial resolution	0.00	R	1.732	1	0.00
Field impedance dependance	0.00	R	1.732	1	0.00
Amplitude and phase drift	0.00	R	1.732	1	0.00
Amplitude and phase noise	0.04	R	1.732	1	0.02
Measurement area truncation	0.00	R	1.732	1	0.00
Data acquisition	0.03	N	1	1	0.03
Sampling	0.00	R	1.732	1	0.00
Field reconstruction	2.00	R	1.732	1	1.15
Forward transformation	0.00	R	1.732	1	0.00
Power density scaling	0.00	R	1.732	1	0.00
Spatial averaging	0.10	R	1.732	1	0.06
System detection limit	0.04	R	1.732	1	0.02
Uncertainty terms dependent on the DUT and environmental factors					
Probe coupling with DUT	0.00	R	1.732	1	0.0
Modulation response	0.40	R	1.732	1	0.2
Integration time	0.00	R	1.732	1	0.0
Response time	0.00	R	1.732	1	0.0
Device holder influence	0.10	R	1.732	1	0.1
DUT alignment	0.00	R	1.732	1	0.0
RF ambient conditions	0.04	R	1.732	1	0.0
Ambient reflections	0.04	R	1.732	1	0.0
Immunity / secondary reception	0.00	R	1.732	1	0.0
Drift of the DUT		R	1.732	1	
Combined Std. Uncertainty					1.34
Expanded STD Uncertainty (95%)					2.68

16. References

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