FCC SAR Test Report

APPLICANT	:	Amazon.com Services LLC
EQUIPMENT	:	Digital Media Device
MODEL NAME	:	RL3YT5
FCC ID	:	2A4DH-5377
STANDARD	:	FCC 47 CFR Part 2 (2.1093)

We, Sporton International Inc. (Kunshan), would like to declare that the tested sample has been evaluated in accordance with the test procedures given in 47 CFR Part 2.1093 and FCC KDB and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Kunshan), the test report shall not be reproduced except in full.

Si Zhang

Approved by: Si Zhang

ACCREDITED
Cert #5145.02

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Table of Contents

1. Statement of Compliance **4**
2. Administration Data **5**
3. Guidance Applied **5**
4. Equipment Under Test (EUT) Information **6**
4.1 General Information 6
5. RF Exposure Limits **7**
5.1 Uncontrolled Environment 7
5.2 Controlled Environment 7
6. Specific Absorption Rate (SAR) **8**
6.1 Introduction 8
6.2 SAR Definition 8
7. System Description and Setup **9**
7.1 E-Field Probe 10
7.2 Data Acquisition Electronics (DAE) 10
7.3 Phantom 11
7.4 Device Holder 12
8. Measurement Procedures **13**
8.1 Spatial Peak SAR Evaluation 13
8.2 Power Reference Measurement 14
8.3 Area Scan 14
8.4 Zoom Scan 15
8.5 Volume Scan Procedures 15
8.6 Power Drift Monitoring 15
9. Test Equipment List **16**
10. System Verification **17**
10.1 Tissue Simulating Liquids 17
10.2 Tissue Verification 18
10.3 System Performance Check Results 19
11. RF Exposure Positions **20**
11.1 SAR Testing 20
12. Conducted RF Output Power (Unit: dBm) **21**
13. Antenna Location **30**
14. SAR Test Results **31**
14.1 Body SAR 32
15. Simultaneous Transmission Analysis **33**
15.1 Body Exposure Conditions 33
16. Uncertainty Assessment **34**
17. References **35**
Appendixes **36**
Appendix A. Plots of System Performance Check 36
Appendix B. Plots of High SAR Measurement 36
Appendix C. DASY Calibration Certificate 36

Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA560445	Rev. 01	Initial issue of report	Sep. 15, 2025
FA560445	Rev. 02	Updated Equipment Name. This report is an updated version, replacing the report issued on Sep. 15, 2025.	Feb. 24, 2026

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Amazon.com Services LLC, Digital Media Device, RL3YT5,** are as follows.

Frequency Band		Highest SAR Summary Body (Separation 0mm) 1g SAR (W/kg)	Highest Body Simultaneous Transmission 1g SAR (W/kg)
WLAN	2.4GHz WLAN	0.21	
WLAN	5GHz WLAN	0.83	0.83
Bluetooth	Bluetooth	<0.10	0.83
Date of Testing:		2025/07/26 ~ 2025/08/01	

Declaration of Conformity:
The test results with all measurement uncertainty excluded are 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.

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) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications.

2. Administration Data

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Testing Laboratory			
Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	SAR07-KS	CN1257	314309

Applicant	
Company Name	Amazon.com Services LLC
Address	410 Terry Avenue N Seattle, WA 98109-5210 United States

3. Guidance Applied

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards:

- 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 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB 447498 D04 Interim General RF Exposure Guidance v01
- FCC KDB 616217 D04 SAR for laptop and tablets v01r02

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	Digital Media Device
Model Name	RL3YT5
FCC ID	2A4DH-5377
S/N	GN44PP005276003N, GN44PP005276002T
Wireless Technology and Frequency Range	WLAN 2.4GHz Band: 2412 MHz ~ 2472 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5720 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Mode	WLAN 2.4GHz 802.11b/g/n HT20 WLAN 2.4GHz 802.11ax HE20 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac/ax VHT20/VHT40/VHT80/HE20/HE40/HE80 Bluetooth BR/EDR/LE
Remark: 1. This device has no voice function. 2. The 2.4GHz/5GHz/BT WLAN can transmit in SISO mode only.	

5. RF Exposure Limits

5.1 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.

5.2 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

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.

6. Specific Absorption Rate (SAR)

6.1 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.

6.2 SAR Definition

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

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

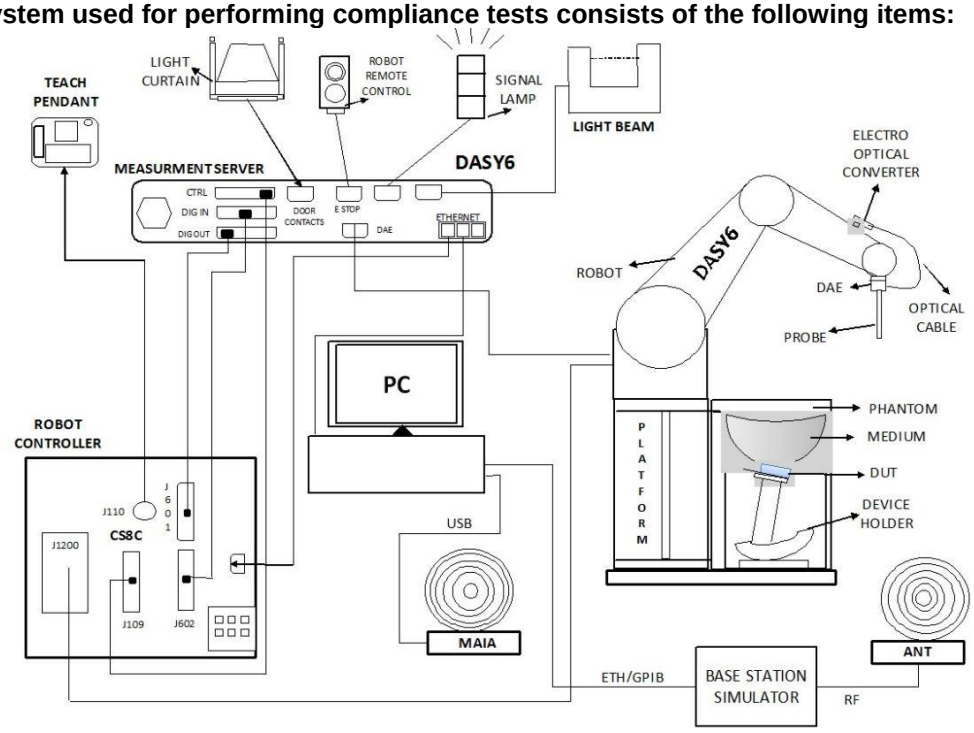
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

7. System Description and Setup

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



- 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 Win7 or Win10 and the DASY5 or DASY6 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.

7.1 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.

<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 – 10 GHz Linearity: ±0.2 dB (30 MHz – 10 GHz)	
Directivity	±0.3 dB in TSL (rotation around probe axis) ±0.5 dB in TSL (rotation normal to probe axis)	
Dynamic Range	10 µW/g – >100 mW/g Linearity: ±0.2 dB (noise: typically <1 µW/g)	
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 2.5 mm (body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm	

7.2 Data Acquisition Electronics (DAE)

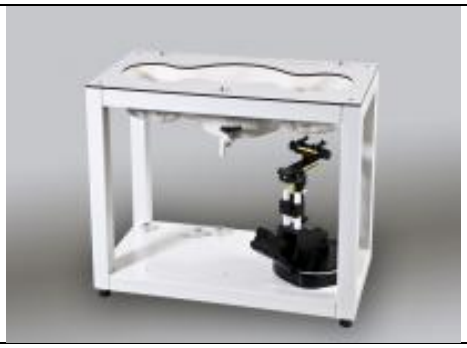
The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an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

Photo of DAE

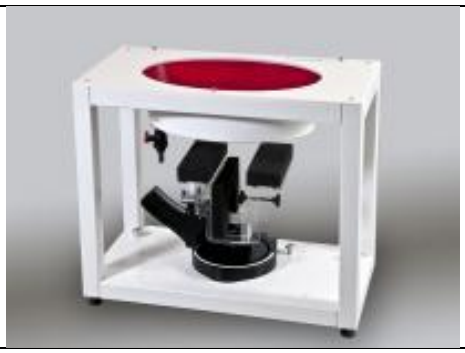
7.3 Phantom

<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 or for evaluating transmitters operating at low frequencies. ELI is fully compatible with standard and all known tissue simulating liquids.

7.4 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

8. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

(a) For WWAN power measurement, use base station simulator to configure EUT WWAN transmission in conducted connection with RF cable, at maximum power in each supported wireless interface and frequency band.
(b) Read the WWAN RF power level from the base station simulator.
(c) For WLAN/BT power measurement, use engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power in each supported wireless interface and frequency band
(d) Connect EUT RF port through RF cable to the power meter, and measure WLAN/BT output power

<SAR measurement>

(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

8.1 Spatial Peak SAR Evaluation

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

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

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

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

8.2 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.

8.3 Area Scan

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

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

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

8.4 Zoom Scan

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

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

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

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

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

8.5 Volume Scan Procedures

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

8.6 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.

9. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Last Cal.	Due Date
SPEAG	2450MHz System Validation Kit	D2450V2	1095	Feb. 08, 2024	Feb. 06, 2026
SPEAG	5000MHz System Validation Kit	D5GHzV2	1113	Sep. 23, 2022	Sep. 21, 2025
SPEAG	Data Acquisition Electronics	DAE4	1691	Jun. 04, 2025	Jun. 03, 2026
SPEAG	Dosimetric E-Field Probe	EX3DV4	7918	Mar. 24, 2025	Mar. 23, 2026
SPEAG	ELI Phantom	ELI V8.0	TP-2135	NCR	NCR
Beichuang	Thermo-Hygrometer	HTC-1	1949250	Jan. 11, 2025	Jan. 10, 2026
Beichuang	Thermo-Hygrometer	HTC-1	1949246	Jan. 11, 2025	Jan. 10, 2026
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Agilent	ENA Series Network Analyzer	E5071C	MY46112129	Jul. 02, 2025	Jul. 01, 2026
SPEAG	Dielectric Probe Kit	DAK-3.5	1071	Feb. 24, 2025	Feb. 23, 2026
Anritsu	Vector Signal Generator	MG3710A	6201682672	Jan. 03, 2025	Jan. 02, 2026
Rohde & Schwarz	Power Meter	NRVD	102081	Jul. 02, 2025	Jul. 01, 2026
Rohde & Schwarz	Power Sensor	NRV-Z5	100538	Jul. 02, 2025	Jul. 01, 2026
Rohde & Schwarz	Power Sensor	NRV-Z5	100539	Jul. 02, 2025	Jul. 01, 2026
R&S	BLUETOOTH TESTER	CBT	101246	Jul. 03, 2025	Jul. 02, 2026
Rohde & Schwarz	Spectrum Analyzer	FSV7	101631	Oct. 11, 2024	Oct. 10, 2025
TES	DIGITAC THERMOMETER	TYPE-K	220305411	Jan. 02, 2025	Jan. 01, 2026
ARRA	Power Divider	A3200-2	N/A	Note 1	
MCL	Attenuation1	BW-S10W5+	N/A	Note 1	
BONN	POWER AMPLIFIER	BLMA 0830-3	087193A	Note 1	
BONN	POWER AMPLIFIER	BLMA 2060-2	087193B	Note 1	
Agilent	Dual Directional Coupler	778D	20500	Note 1	
Agilent	Dual Directional Coupler	11691D	MY48151020	Note 1	

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.

10. System Verification

10.1 Tissue Simulating Liquids

For the measurement of the field distribution inside the SAM phantom with DASY, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 10.1.

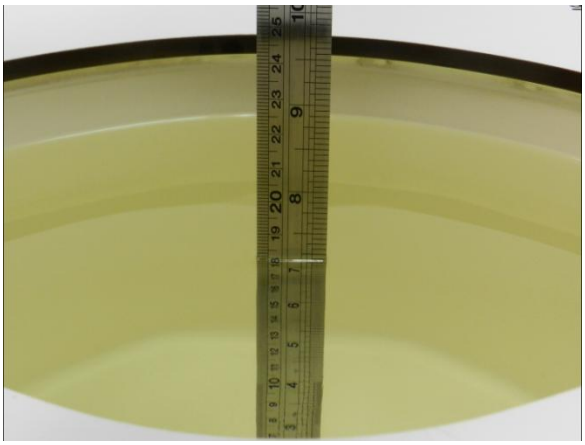


Fig 10.1 Photo of Liquid Height for Body SAR

10.2 Tissue Verification

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (εr)
For Head								
2450	55.0	0	0	0	0	45.0	1.80	39.2

Simulating Liquid for 5GHz, Manufactured by SPEAG

Ingredients	(% by weight)
Water	64~78%
Mineral oil	11~18%
Emulsifiers	9~15%
Additives and Salt	2~3%

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Liquid Temp (℃)	Conductivity (σ)	Permittivity (εr)	Conductivity Target (σ)	Permittivity Target (εr)	Delta (σ) (%)	Delta (εr) (%)	Limit (%)	Date
2450	22.7	1.76	39.2	1.8	39.2	-2.22	0.00	±5.0	2025/07/26
5250	22.8	4.65	36.2	4.71	35.95	-1.27	0.70	±5.0	2025/07/28
5600	22.8	5.03	36.0	5.07	35.5	-0.79	1.41	±5.0	2025/07/30
5750	22.8	5.16	35.5	5.22	35.35	-1.15	0.42	±5.0	2025/08/01

10.3 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.

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 (%)
2025/07/26	2450	50.00	D2450V2 - 1095	EX3DV4 - SN7918	DAE4 Sn1691	2.620	52.600	52.400	-0.38	1.340	24.700	26.800	8.50
2025/07/28	5250	50.00	D5GHzV2 - 1113	EX3DV4 - SN7918	DAE4 Sn1691	4.120	81.500	82.400	1.10	1.250	23.300	25.000	7.30
2025/07/30	5600	50.00	D5GHzV2 - 1113	EX3DV4 - SN7918	DAE4 Sn1691	4.450	82.600	89.000	7.75	1.270	23.700	25.400	7.17
2025/08/01	5750	50.00	D5GHzV2 - 1113	EX3DV4 - SN7918	DAE4 Sn1691	4.170	80.800	83.400	3.22	1.240	23.000	24.800	7.83

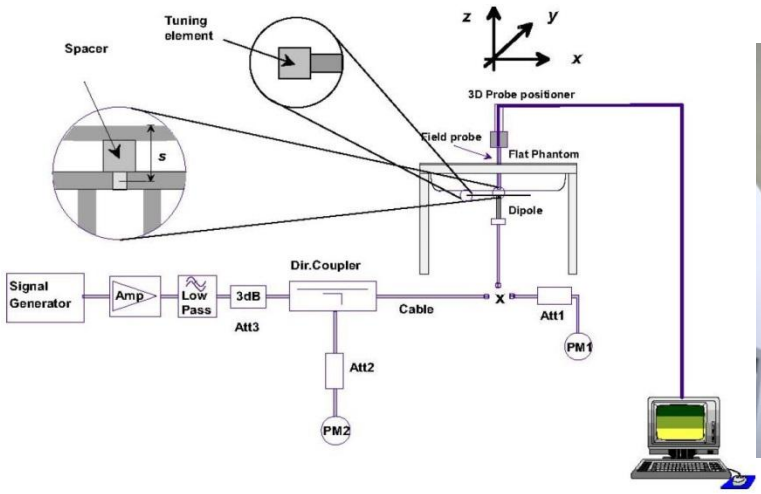


Fig 10.3.1 System Performance Check Setup

Fig 10.3.2 Setup Photo

11. RF Exposure Positions

11.1 SAR Testing

This device can be used also in full sized tablet exposure conditions, due to its size. Per FCC KDB 616217, the back surface and edges of the tablet should be tested for SAR compliance with the tablet touching the phantom. The SAR exclusion threshold in KDB 447498 D04v01 can be applied to determine SAR test exclusion for adjacent edge configurations. The closest distance from the antenna to an adjacent tablet edge is used to determine if SAR testing is required for the adjacent edges, with the adjacent edge positioned against the phantom and the edge containing the antenna positioned perpendicular to the phantom.

<EUT Setup Photos>

Please refer to the test setup photos.

12. Conducted RF Output Power (Unit: dBm)

<WLAN Conducted Power>

General Note:

1. 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.
2. 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.
3. 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).
4. 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.
5. DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures.18 The initial test position procedure is described in the following:
   a. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band.
   b. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
   c. For all positions/configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

【2.4GHz WLAN_Ant 1】

			Ant 1		
Mode	Channel	Frequency (MHz)	Average Power (dBm)	Tune-Up Limit	Duty Cycle %
802.11b 1Mbps	1	2412	13.84	14.00	99.31
	6	2437	13.65	14.00	
	11	2462	13.64	14.00	
	12	2467	13.66	14.00	
	13	2472	12.71	13.00	
802.11g 6Mbps	1	2412	12.78	13.00	96.98
	6	2437	12.79	13.00	
	11	2462	12.90	13.00	
	12	2467	11.00	11.50	
	13	2472	7.88	8.00	
802.11n-HT20 MCS0	1	2412	12.73	13.00	96.76
	6	2437	12.87	13.00	
	11	2462	12.42	12.50	
	12	2467	9.99	10.00	
	13	2472	6.86	7.00	
802.11ax-HE20 MCS0	1	2412	12.97	13.00	95.89
	6	2437	13.03	13.50	
	11	2462	11.67	12.00	
	12	2467	10.21	10.50	
	13	2472	8.01	8.50	

【2.4GHz WLAN_Ant 2】

			Ant 2		
Mode	Channel	Frequency (MHz)	Average Power (dBm)	Tune-Up Limit	Duty Cycle %
802.11b 1Mbps	1	2412	12.68	13.00	99.31
	6	2437	12.81	13.00	
	11	2462	12.85	13.00	
	12	2467	12.91	13.00	
	13	2472	12.88	13.00	
802.11g 6Mbps	1	2412	12.88	13.00	96.97
	6	2437	13.00	13.50	
	11	2462	12.56	13.00	
	12	2467	11.11	11.50	
	13	2472	7.98	8.00	
802.11n-HT20 MCS0	1	2412	12.75	13.00	96.77
	6	2437	12.96	13.00	
	11	2462	12.56	13.00	
	12	2467	10.06	10.50	
	13	2472	7.38	7.50	
802.11ax-HE20 MCS0	1	2412	13.03	13.50	95.89
	6	2437	13.07	13.50	
	11	2462	11.75	12.00	
	12	2467	9.39	9.50	
	13	2472	8.60	9.00	

【5.2GHz WLAN_Ant 1】

			Ant 1		
Mode	Channel	Frequency (MHz)	Average Power (dBm)	Tune-Up Limit	Duty Cycle %
802.11a 6Mbps	36	5180	13.94	14.00	96.98
	40	5200	13.89	14.00	
	44	5220	13.92	14.00	
	48	5240	13.90	14.00	
802.11n-HT20 MCS0	36	5180	13.92	14.00	96.77
	40	5200	13.82	14.00	
	44	5220	13.87	14.00	
	48	5240	13.86	14.00	
802.11n-HT40 MCS0	38	5190	13.82	14.00	93.75
	46	5230	13.85	14.00	
802.11ac-VHT20 MCS0	36	5180	13.46	13.50	96.81
	40	5200	13.35	13.50	
	44	5220	13.45	13.50	
	48	5240	13.48	13.50	
802.11ac-VHT40 MCS0	38	5190	12.99	13.00	94.79
	46	5230	12.92	13.00	
802.11ac-VHT80 MCS0	42	5210	12.97	13.00	98.14
802.11ax-HE20 MCS0	36	5180	10.03	10.50	95.89
	40	5200	9.94	10.00	
	44	5220	9.92	10.00	
	48	5240	9.97	10.00	
802.11ax-HE40 MCS0	38	5190	10.16	10.50	92.50
	46	5230	10.12	10.50	
802.11ax-HE80 MCS0	42	5210	10.18	10.50	97.75

【5.2GHz WLAN_Ant 2】

			Ant 2		
Mode	Channel	Frequency (MHz)	Average Power (dBm)	Tune-Up Limit	Duty Cycle %
802.11a 6Mbps	36	5180	13.97	14.00	96.98
	40	5200	14.09	14.50	
	44	5220	14.05	14.50	
	48	5240	14.03	14.50	
802.11n-HT20 MCS0	36	5180	13.99	14.00	96.76
	40	5200	14.02	14.50	
	44	5220	14.00	14.50	
	48	5240	13.98	14.00	
802.11n-HT40 MCS0	38	5190	14.04	14.50	93.68
	46	5230	14.00	14.50	
802.11ac-VHT20 MCS0	36	5180	13.62	14.00	96.81
	40	5200	13.45	13.50	
	44	5220	13.49	13.50	
	48	5240	13.52	14.00	
802.11ac-VHT40 MCS0	38	5190	13.08	13.50	93.75
	46	5230	13.03	13.50	
802.11ac-VHT80 MCS0	42	5210	12.98	13.00	98.14
802.11ax-HE20 MCS0	36	5180	10.14	10.50	95.89
	40	5200	10.04	10.50	
	44	5220	10.09	10.50	
	48	5240	10.08	10.50	
802.11ax-HE40 MCS0	38	5190	10.32	10.50	92.50
	46	5230	10.28	10.50	
802.11ax-HE80 MCS0	42	5210	10.30	10.50	97.74

【5.3GHz WLAN_Ant 1】

			Ant 1		
Mode	Channel	Frequency (MHz)	Average Power (dBm)	Tune-Up Limit	Duty Cycle %
802.11a 6Mbps	52	5260	14.11	14.50	96.98
	56	5280	13.98	14.00	
	60	5300	13.93	14.00	
	64	5320	13.99	14.00	
802.11n-HT20 MCS0	52	5260	14.06	14.50	96.77
	56	5280	13.92	14.00	
	60	5300	13.89	14.00	
	64	5320	13.93	14.00	
802.11n-HT40 MCS0	54	5270	13.96	14.00	93.75
	62	5310	14.01	14.50	
802.11ac-VHT20 MCS0	52	5260	13.59	14.00	96.81
	56	5280	13.50	14.00	
	60	5300	13.49	13.50	
	64	5320	13.39	13.50	
802.11ac-VHT40 MCS0	54	5270	13.07	13.50	94.79
	62	5310	12.94	13.00	
802.11ac-VHT80 MCS0	58	5290	13.01	13.50	98.14
802.11ax-HE20 MCS0	52	5260	10.15	10.50	95.89
	56	5280	10.13	10.50	
	60	5300	10.06	10.50	
	64	5320	10.05	10.50	
802.11ax-HE40 MCS0	54	5270	10.33	10.50	92.50
	62	5310	10.24	10.50	
802.11ax-HE80 MCS0	58	5290	10.28	10.50	97.75

【5.3GHz WLAN_Ant 2】

			Ant 2		
Mode	Channel	Frequency (MHz)	Average Power (dBm)	Tune-Up Limit	Duty Cycle %
802.11a 6Mbps	52	5260	14.26	14.50	96.98
	56	5280	14.11	14.50	
	60	5300	14.08	14.50	
	64	5320	14.09	14.50	
802.11n-HT20 MCS0	52	5260	14.04	14.50	96.76
	56	5280	14.00	14.50	
	60	5300	14.02	14.50	
	64	5320	14.10	14.50	
802.11n-HT40 MCS0	54	5270	14.18	14.50	93.68
	62	5310	14.13	14.50	
802.11ac-VHT20 MCS0	52	5260	13.64	14.00	96.81
	56	5280	13.46	13.50	
	60	5300	13.55	14.00	
	64	5320	13.57	14.00	
802.11ac-VHT40 MCS0	54	5270	13.17	13.50	93.75
	62	5310	13.13	13.50	
802.11ac-VHT80 MCS0	58	5290	13.08	13.50	98.14
802.11ax-HE20 MCS0	52	5260	10.30	10.50	95.89
	56	5280	10.18	10.50	
	60	5300	10.20	10.50	
	64	5320	10.23	10.50	
802.11ax-HE40 MCS0	54	5270	10.48	10.50	92.50
	62	5310	10.43	10.50	
802.11ax-HE80 MCS0	58	5290	10.36	10.50	97.74

【5.5GHz WLAN_Ant 1】

			Ant 1		
Mode	Channel	Frequency (MHz)	Average Power (dBm)	Tune-Up Limit	Duty Cycle %
802.11a 6Mbps	100	5500	14.06	14.50	96.98
	116	5580	13.99	14.00	
	124	5620	14.10	14.50	
	132	5660	14.06	14.50	
	144	5720	14.07	14.50	
802.11n-HT20 MCS0	100	5500	13.96	14.00	96.77
	116	5580	13.86	14.00	
	124	5620	14.02	14.50	
	132	5660	13.99	14.00	
	144	5720	14.05	14.50	
802.11n-HT40 MCS0	102	5510	13.99	14.00	93.75
	110	5550	13.84	14.00	
	126	5630	14.03	14.50	
	134	5670	13.98	14.00	
	142	5710	14.04	14.50	
802.11ac-VHT20 MCS0	100	5500	13.39	13.50	96.81
	116	5580	13.44	13.50	
	124	5620	13.49	13.50	
	132	5660	13.55	14.00	
	144	5720	13.49	13.50	
802.11ac-VHT40 MCS0	102	5510	13.08	13.50	94.79
	110	5550	12.91	13.00	
	126	5630	12.98	13.00	
	134	5670	13.01	13.50	
	142	5710	12.94	13.00	
802.11ac-VHT80 MCS0	106	5530	12.98	13.00	98.14
	122	5610	12.94	13.00	
	138	5690	12.90	13.00	
802.11ax-HE20 MCS0	100	5500	10.06	10.50	95.89
	116	5580	10.13	10.50	
	124	5620	10.16	10.50	
	132	5660	10.17	10.50	
	144	5720	10.13	10.50	
802.11ax-HE40 MCS0	102	5510	10.26	10.50	92.50
	110	5550	10.19	10.50	
	126	5630	10.40	10.50	
	134	5670	10.28	10.50	
	142	5710	10.35	10.50	
802.11ax-HE80 MCS0	106	5530	10.27	10.50	97.75
	122	5610	10.25	10.50	
	138	5690	10.32	10.50	

【5.5GHz WLAN_Ant 2】

			Ant 2		
Mode	Channel	Frequency (MHz)	Average Power (dBm)	Tune-Up Limit	Duty Cycle %
802.11a 6Mbps	100	5500	14.41	14.50	96.98
	116	5580	14.36	14.50	
	124	5620	14.45	14.50	
	132	5660	14.39	14.50	
	144	5720	14.54	15.00	
802.11n-HT20 MCS0	100	5500	14.19	14.50	96.76
	116	5580	14.30	14.50	
	124	5620	14.38	14.50	

	132	5660	14.35	14.50	
	144	5720	14.33	14.50	
802.11n-HT40 MCS0	102	5510	14.34	14.50	93.68
	110	5550	14.23	14.50	
	126	5630	14.39	14.50	
	134	5670	14.43	14.50	
	142	5710	14.41	14.50	
802.11ac-VHT20 MCS0	100	5500	13.75	14.00	96.81
	116	5580	13.77	14.00	
	124	5620	13.95	14.00	
	132	5660	13.82	14.00	
	144	5720	13.89	14.00	
802.11ac-VHT40 MCS0	102	5510	13.33	13.50	93.75
	110	5550	13.30	13.50	
	126	5630	13.46	13.50	
	134	5670	13.41	13.50	
	142	5710	13.45	13.50	
802.11ac-VHT80 MCS0	106	5530	13.31	13.50	98.14
	122	5610	13.33	13.50	
	138	5690	13.35	13.50	
802.11ax-HE20 MCS0	100	5500	10.33	10.50	95.89
	116	5580	10.50	11.00	
	124	5620	10.52	11.00	
	132	5660	10.46	10.50	
	144	5720	10.56	11.00	
802.11ax-HE40 MCS0	102	5510	10.59	11.00	92.50
	110	5550	10.57	11.00	
	126	5630	10.82	11.00	
	134	5670	10.78	11.00	
	142	5710	10.79	11.00	
802.11ax-HE80 MCS0	106	5530	10.56	11.00	97.74
	122	5610	10.65	11.00	
	138	5690	10.69	11.00	

【5.8GHz WLAN_Ant 1】

			Ant 1		
Mode	Channel	Frequency (MHz)	Average Power (dBm)	Tune-Up Limit	Duty Cycle %
802.11a 6Mbps	149	5745	14.21	14.50	96.98
	157	5785	14.03	14.50	
	165	5825	13.96	14.00	
802.11n-HT20 MCS0	149	5745	14.02	14.50	96.77
	157	5785	13.90	14.00	
	165	5825	13.87	14.00	
802.11n-HT40 MCS0	151	5755	14.06	14.50	93.75
	159	5795	13.92	14.00	
802.11ac-VHT20 MCS0	149	5745	13.60	14.00	96.81
	157	5785	13.47	13.50	
	165	5825	13.37	13.50	
802.11ac-VHT40 MCS0	151	5755	13.10	13.50	94.79
	159	5795	13.00	13.50	
802.11ac-VHT80 MCS0	155	5775	12.93	13.00	98.14
802.11ax-HE20 MCS0	149	5745	10.16	10.50	95.89
	157	5785	10.10	10.50	
	165	5825	10.02	10.50	
802.11ax-HE40 MCS0	151	5755	10.45	10.50	92.50
	159	5795	10.24	10.50	
802.11ax-HE80 MCS0	155	5775	10.35	10.50	97.75

【5.8GHz WLAN_Ant 2】

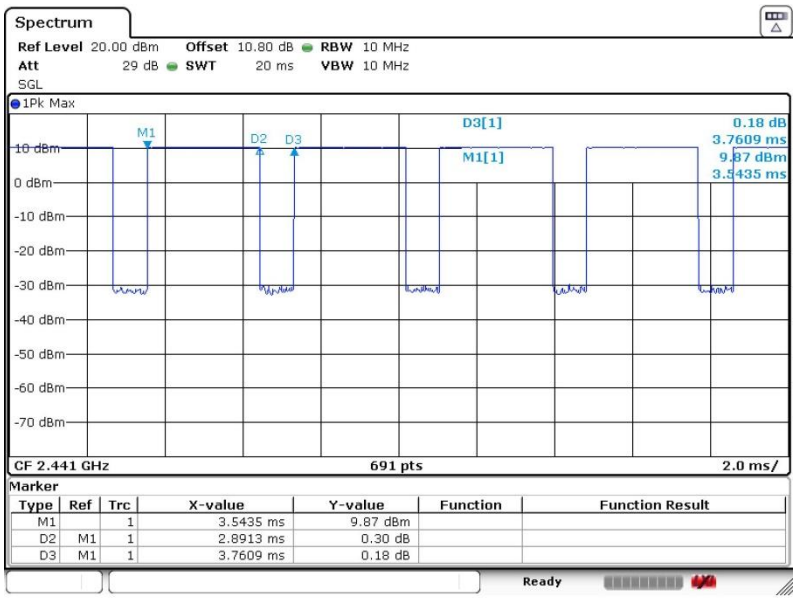
			Ant 2		
Mode	Channel	Frequency (MHz)	Average Power (dBm)	Tune-Up Limit	Duty Cycle %
802.11a 6Mbps	149	5745	14.62	15.00	96.98
	157	5785	14.53	15.00	
	165	5825	14.51	15.00	
802.11n-HT20 MCS0	149	5745	14.55	15.00	96.76
	157	5785	14.47	14.50	
	165	5825	14.43	14.50	
802.11n-HT40 MCS0	151	5755	14.62	15.00	93.68
	159	5795	14.45	14.50	
802.11ac-VHT20 MCS0	149	5745	14.05	14.50	96.81
	157	5785	14.02	14.50	
	165	5825	13.98	14.00	
802.11ac-VHT40 MCS0	151	5755	13.50	14.00	93.75
	159	5795	13.46	13.50	
802.11ac-VHT80 MCS0	155	5775	13.56	14.00	98.14
802.11ax-HE20 MCS0	149	5745	10.66	11.00	95.89
	157	5785	10.57	11.00	
	165	5825	10.50	11.00	
802.11ax-HE40 MCS0	151	5755	10.81	11.00	92.50
	159	5795	10.72	11.00	
802.11ax-HE80 MCS0	155	5775	10.80	11.00	97.74

<2.4GHz Bluetooth>

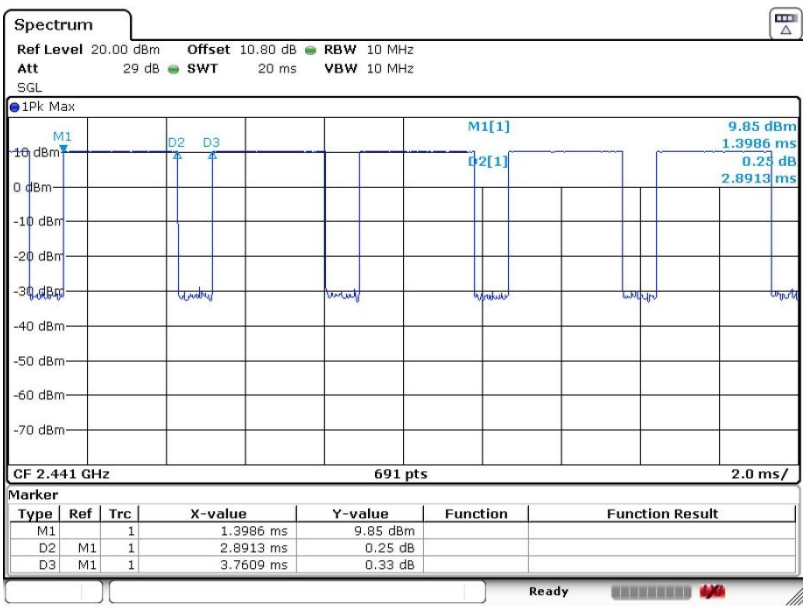
General Note:

1. For 2.4GHz Bluetooth SAR testing was selected 1Mbps, due to its highest average power.
2. The Bluetooth duty cycle is 76.88 % for Ant 1, 76.88 % for Ant 2 as following figure, Bluetooth SAR scaling need further consideration and the theoretical duty cycle is 83.3%, therefore the actual duty cycle will be scaled up to the theoretical value of Bluetooth reported SAR calculation.

Bluetooth time-domain plot Ant 1



Bluetooth time-domain plot Ant 2



【Bluetooth_Ant 1】

			Ant 1		
Mode	Channel	Frequency (MHz)	Average Power (dBm)	Tune-Up Limit	Duty Cycle %
BR / EDR 1Mbps	0	2402	4.74	5.00	76.88
	39	2441	5.61	6.00	
	78	2480	6.09	6.50	
BR / EDR 2Mbps	0	2402	2.75	3.00	31.43
	39	2441	3.60	4.00	
	78	2480	3.89	4.00	
BR / EDR 3Mbps	0	2402	2.72	3.00	31.43
	39	2441	3.57	4.00	
	78	2480	3.94	4.00	
LE 1Mbps	0	2402	-3.46	-3.00	83.86
	19	2440	-2.89	-2.50	
	39	2480	-2.61	-2.50	
LE 2Mbps	0	2402	-3.33	-3.00	56.99
	19	2440	-2.60	-2.50	
	39	2480	-1.93	-1.50	

【Bluetooth_Ant 2】

			Ant 2		
Mode	Channel	Frequency (MHz)	Average Power (dBm)	Tune-Up Limit	Duty Cycle %
BR / EDR 1Mbps	0	2402	4.95	5.00	76.88
	39	2441	5.62	6.00	
	78	2480	6.13	6.50	
BR / EDR 2Mbps	0	2402	3.10	3.50	30.64
	39	2441	3.82	4.00	
	78	2480	4.22	4.50	
BR / EDR 3Mbps	0	2402	3.10	3.50	30.64
	39	2441	3.81	4.00	
	78	2480	4.23	4.50	
LE 1Mbps	0	2402	-3.27	-3.00	84.84
	19	2440	-2.71	-2.50	
	39	2480	-2.38	-2.00	
LE 2Mbps	0	2402	-3.14	-3.00	56.99
	19	2440	-2.37	-2.00	
	39	2480	-1.88	-1.50	

13. Antenna Location

The detailed antenna location information can refer to SAR Test Setup Photos.

<SAR-based Exemption table>

General Note:

1. Per KDB 447498 D04v01, Maximum power defines the thresholds in general for either available maximum time-averaged power or maximum time-averaged ERP, whichever is greater.
2. Per KDB 447498 D04v01, the separation distance is the smallest distance from any part of the antenna or radiating structure for all persons, during operation at the applicable ERP. for larger devices, the test separation distance of adjacent edge configuration is determined by the closest separation between the antenna and the user.
3. Per KDB 447498 D04v01, the SAR-based exemption formula of § 1.1307(b)(3)(i)(B), repeated here as Formula (B.2), applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold *P*th (mW). This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). *P*th is given by Formula (B.2).
   a. This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). *P*th is given by Formula (B.2).

$$\mathrm{ERP}_{20\,cm}\ (\mathrm{mW}) = \begin{cases} 2040\mathrm{f} & 0.3\ GHz < f \le 1.5\ GHz \\ 3060 & 1.5\ GHz < f \le 6\ GHz \end{cases} \qquad [B.1]$$

$$\mathrm{P}_{th}\ (\mathrm{mW}) = \begin{cases} \mathrm{ERP}_{20\,cm}\ (\mathrm{d}/20\ \mathrm{cm})^{x} & d \le 20\ cm \\ \mathrm{ERP}_{20\,cm} & 20\ cm < d \le 40\ cm \end{cases} \qquad [B.2]$$

Where $\mathrm{x} = -\log_{10}\left(\frac{60}{ERP_{20\,cm}\sqrt{f}}\right)$ and f is in GHz

   b. and *f* is in GHz, *d* is the separation distance (cm), and *ERP*20cm is per Formula (B.1).
4. Per KDB 447498 D04v01, at 100 MHz to 6 GHz, the SAR test exclusion threshold is determined according to the following:

Exposure Position	Wireless Interface	BT ANT 1	BT ANT 2	2.4GHz WLAN ANT 1	2.4GHz WLAN ANT 2	5GHz WLAN ANT 1	5GHz WLAN ANT 2
	Calculated Frequency (MHz)	2480	2480	2462	2462	5825	5825
	Maximum power (dBm)	6.5	6.5	14.0	13.5	14.5	15.0
	Maximum rated power(mW)	4.0	4.0	25.0	22.0	28.0	32.0
Bottom Face	Separation distance(mm)	5.0	5.0	5.0	5.0	5.0	5.0
	exclusion threshold	2.7	2.7	2.7	2.7	1.4	1.4
	Testing required?	Yes	Yes	Yes	Yes	Yes	Yes
Edge 1	Separation distance(mm)	5.0	105.0	5.0	105.0	5.0	105.0
	exclusion threshold	2.7	896.8	2.7	897.7	1.4	795.8
	Testing required?	Yes	No	Yes	No	Yes	No
Edge 2	Separation distance(mm)	22.0	167.0	22.0	167.0	22.0	167.0
	exclusion threshold	45.7	2170.5	45.8	2171.1	30.3	2099.1
	Testing required?	No	No	No	No	No	No
Edge 3	Separation distance(mm)	127.0	6.0	127.0	6.0	127.0	6.0
	exclusion threshold	1288.4	3.8	1289.3	3.9	1184.3	2.0
	Testing required?	No	Yes	No	Yes	No	Yes
Edge 4	Separation distance(mm)	143.0	5.0	143.0	5.0	143.0	5.0
	exclusion threshold	1615.1	2.7	1616.0	2.7	1517.7	1.4
	Testing required?	No	Yes	No	Yes	No	Yes

14. SAR Test Results

General Note:

1. Per KDB 447498 D04v01, 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 SAR testing of Bluetooth signal with 83.3% theoretical duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle) *83.3%".
   d. For WLAN/Bluetooth: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
2. Per KDB 447498 D04v01, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
   · ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   · ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   · ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.

WLAN/Bluetooth 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, U-NII-1 SAR testing is not required when the U-NII-2A band highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 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. During SAR testing the WLAN transmission was verified using a spectrum analyzer.
6. The 2.4GHz/5GHz/BT WLAN can transmit in SISO antenna mode only.

14.1 Body SAR

【WLAN 2.4GHz_5GHz SAR】

Plot No	Band	Mode	Test Position	Gap (mm)	Antenna	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-Up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
01	WLAN2.4GHz	802.11b 1Mbps	Bottom Face	0mm	Ant 1	1	2412	13.84	14.00	1.038	99.31	1.007	0.06	0.203	0.212
	WLAN2.4GHz	802.11b 1Mbps	Edge 1	0mm	Ant 1	1	2412	13.84	14.00	1.038	99.31	1.007	0.08	0.117	0.122
	WLAN2.4GHz	802.11b 1Mbps	Edge 2	0mm	Ant 1	1	2412	13.84	14.00	1.038	99.31	1.007	0.01	0.072	0.075
	WLAN2.4GHz	802.11b 1Mbps	Edge 3	0mm	Ant 1	1	2412	13.84	14.00	1.038	99.31	1.007	0.03	0.022	0.023
	WLAN2.4GHz	802.11b 1Mbps	Edge 4	0mm	Ant 1	1	2412	13.84	14.00	1.038	99.31	1.007	-0.08	0.001	0.001
	WLAN2.4GHz	802.11b 1Mbps	Bottom Face	0mm	Ant 2	12	2467	12.91	13.00	1.021	99.31	1.007	-0.18	0.001	0.001
	WLAN2.4GHz	802.11b 1Mbps	Edge 1	0mm	Ant 2	12	2467	12.91	13.00	1.021	99.31	1.007	0.10	0.001	0.001
	WLAN2.4GHz	802.11b 1Mbps	Edge 2	0mm	Ant 2	12	2467	12.91	13.00	1.021	99.31	1.007	0.12	0.001	0.001
	WLAN2.4GHz	802.11b 1Mbps	Edge 3	0mm	Ant 2	12	2467	12.91	13.00	1.021	99.31	1.007	0.01	0.081	0.083
	WLAN2.4GHz	802.11b 1Mbps	Edge 4	0mm	Ant 2	12	2467	12.91	13.00	1.021	99.31	1.007	0.08	0.039	0.040
	WLAN5GHz	802.11n-HT40 MCS0	Bottom Face	0mm	Ant 1	46	5230	13.85	14.00	1.035	93.75	1.067	0.14	0.073	0.081
02	WLAN5GHz	802.11n-HT40 MCS0	Edge 1	0mm	Ant 1	46	5230	13.85	14.00	1.035	93.75	1.067	0.03	0.561	0.620
	WLAN5GHz	802.11n-HT40 MCS0	Edge 2	0mm	Ant 1	46	5230	13.85	14.00	1.035	93.75	1.067	0.11	0.098	0.108
	WLAN5GHz	802.11n-HT40 MCS0	Edge 3	0mm	Ant 1	46	5230	13.85	14.00	1.035	93.75	1.067	-0.05	0.043	0.047
	WLAN5GHz	802.11n-HT40 MCS0	Edge 4	0mm	Ant 1	46	5230	13.85	14.00	1.035	93.75	1.067	0.18	0.063	0.070
	WLAN5GHz	802.11n-HT40 MCS0	Bottom Face	0mm	Ant 2	38	5190	14.04	14.50	1.112	93.68	1.067	0.17	0.042	0.050
	WLAN5GHz	802.11n-HT40 MCS0	Edge 1	0mm	Ant 2	38	5190	14.04	14.50	1.112	93.68	1.067	-0.05	0.066	0.078
	WLAN5GHz	802.11n-HT40 MCS0	Edge 2	0mm	Ant 2	38	5190	14.04	14.50	1.112	93.68	1.067	0.01	0.086	0.102
	WLAN5GHz	802.11n-HT40 MCS0	Edge 3	0mm	Ant 2	38	5190	14.04	14.50	1.112	93.68	1.067	0.05	0.307	0.364
	WLAN5GHz	802.11n-HT40 MCS0	Edge 4	0mm	Ant 2	38	5190	14.04	14.50	1.112	93.68	1.067	0.10	0.052	0.062
	WLAN5GHz	802.11n-HT40 MCS0	Bottom Face	0mm	Ant 1	62	5310	14.01	14.50	1.119	93.75	1.067	-0.01	0.144	0.172
03	WLAN5GHz	802.11n-HT40 MCS0	Edge 1	0mm	Ant 1	62	5310	14.01	14.50	1.119	93.75	1.067	0.06	0.695	0.830
	WLAN5GHz	802.11n-HT40 MCS0	Edge 1	0mm	Ant 1	54	5270	13.96	14.00	1.009	93.75	1.067	0.01	0.665	0.716
	WLAN5GHz	802.11n-HT40 MCS0	Edge 2	0mm	Ant 1	62	5310	14.01	14.50	1.119	93.75	1.067	-0.08	0.226	0.270
	WLAN5GHz	802.11n-HT40 MCS0	Edge 3	0mm	Ant 1	62	5310	14.01	14.50	1.119	93.75	1.067	0.05	0.104	0.124
	WLAN5GHz	802.11n-HT40 MCS0	Edge 4	0mm	Ant 1	62	5310	14.01	14.50	1.119	93.75	1.067	0.06	0.132	0.158
	WLAN5GHz	802.11n-HT40 MCS0	Bottom Face	0mm	Ant 2	54	5270	14.18	14.50	1.076	93.68	1.067	0.13	0.073	0.084
	WLAN5GHz	802.11n-HT40 MCS0	Edge 1	0mm	Ant 2	54	5270	14.18	14.50	1.076	93.68	1.067	0.12	0.066	0.076
	WLAN5GHz	802.11n-HT40 MCS0	Edge 2	0mm	Ant 2	54	5270	14.18	14.50	1.076	93.68	1.067	0.03	0.052	0.060
	WLAN5GHz	802.11n-HT40 MCS0	Edge 3	0mm	Ant 2	54	5270	14.18	14.50	1.076	93.68	1.067	0.01	0.281	0.323
	WLAN5GHz	802.11n-HT40 MCS0	Edge 4	0mm	Ant 2	54	5270	14.18	14.50	1.076	93.68	1.067	0.18	0.066	0.076
	WLAN5GHz	802.11n-HT40 MCS0	Bottom Face	0mm	Ant 1	142	5710	14.04	14.50	1.112	93.75	1.067	0.07	0.101	0.120
04	WLAN5GHz	802.11n-HT40 MCS0	Edge 1	0mm	Ant 1	142	5710	14.04	14.50	1.112	93.75	1.067	0.03	0.559	0.663
	WLAN5GHz	802.11n-HT40 MCS0	Edge 2	0mm	Ant 1	142	5710	14.04	14.50	1.112	93.75	1.067	0.18	0.080	0.095
	WLAN5GHz	802.11n-HT40 MCS0	Edge 3	0mm	Ant 1	142	5710	14.04	14.50	1.112	93.75	1.067	-0.10	0.077	0.091
	WLAN5GHz	802.11n-HT40 MCS0	Edge 4	0mm	Ant 1	142	5710	14.04	14.50	1.112	93.75	1.067	0.01	0.128	0.152
	WLAN5GHz	802.11a 6Mbps	Bottom Face	0mm	Ant 2	144	5720	14.54	15.00	1.112	96.98	1.031	0.07	0.086	0.099
	WLAN5GHz	802.11a 6Mbps	Edge 1	0mm	Ant 2	144	5720	14.54	15.00	1.112	96.98	1.031	-0.18	0.064	0.073
	WLAN5GHz	802.11a 6Mbps	Edge 2	0mm	Ant 2	144	5720	14.54	15.00	1.112	96.98	1.031	0.03	0.059	0.068
	WLAN5GHz	802.11a 6Mbps	Edge 3	0mm	Ant 2	144	5720	14.54	15.00	1.112	96.98	1.031	0.03	0.375	0.430
	WLAN5GHz	802.11a 6Mbps	Edge 4	0mm	Ant 2	144	5720	14.54	15.00	1.112	96.98	1.031	-0.15	0.091	0.104
	WLAN5GHz	802.11n-HT40 MCS0	Bottom Face	0mm	Ant 1	151	5755	14.06	14.50	1.107	93.75	1.067	-0.08	0.153	0.181
05	WLAN5GHz	802.11n-HT40 MCS0	Edge 1	0mm	Ant 1	151	5755	14.06	14.50	1.107	93.75	1.067	-0.08	0.589	0.696
	WLAN5GHz	802.11n-HT40 MCS0	Edge 2	0mm	Ant 1	151	5755	14.06	14.50	1.107	93.75	1.067	-0.17	0.124	0.146
	WLAN5GHz	802.11n-HT40 MCS0	Edge 3	0mm	Ant 1	151	5755	14.06	14.50	1.107	93.75	1.067	-0.08	0.109	0.129
	WLAN5GHz	802.11n-HT40 MCS0	Edge 4	0mm	Ant 1	151	5755	14.06	14.50	1.107	93.75	1.067	-0.04	0.099	0.117
	WLAN5GHz	802.11n-HT40 MCS0	Bottom Face	0mm	Ant 2	151	5755	14.62	15.00	1.091	93.68	1.067	0.18	0.067	0.078
	WLAN5GHz	802.11n-HT40 MCS0	Edge 1	0mm	Ant 2	151	5755	14.62	15.00	1.091	93.68	1.067	-0.04	0.055	0.064
	WLAN5GHz	802.11n-HT40 MCS0	Edge 2	0mm	Ant 2	151	5755	14.62	15.00	1.091	93.68	1.067	-0.08	0.076	0.088
	WLAN5GHz	802.11n-HT40 MCS0	Edge 3	0mm	Ant 2	151	5755	14.62	15.00	1.091	93.68	1.067	-0.02	0.318	0.370
	WLAN5GHz	802.11n-HT40 MCS0	Edge 4	0mm	Ant 2	151	5755	14.62	15.00	1.091	93.68	1.067	-0.13	0.085	0.099

【Bluetooth SAR】

Plot No	Band	Mode	Test Position	Gap (mm)	Antenna	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-Up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
06	Bluetooth	1Mbps	Bottom Face	0mm	Ant 1	78	2480	6.09	6.50	1.099	76.88	1.084	-0.09	0.022	0.026
	Bluetooth	1Mbps	Edge 1	0mm	Ant 1	78	2480	6.09	6.50	1.099	76.88	1.084	-0.03	0.001	0.001
	Bluetooth	1Mbps	Edge 2	0mm	Ant 1	78	2480	6.09	6.50	1.099	76.88	1.084	-0.03	0.001	0.001
	Bluetooth	1Mbps	Edge 3	0mm	Ant 1	78	2480	6.09	6.50	1.099	76.88	1.084	0.08	0.001	0.001
	Bluetooth	1Mbps	Edge 4	0mm	Ant 1	78	2480	6.09	6.50	1.099	76.88	1.084	-0.07	0.001	0.001
	Bluetooth	1Mbps	Bottom Face	0mm	Ant 2	78	2480	6.13	6.50	1.089	76.88	1.084	0.03	0.001	0.001
	Bluetooth	1Mbps	Edge 1	0mm	Ant 2	78	2480	6.13	6.50	1.089	76.88	1.084	0.06	0.001	0.001
	Bluetooth	1Mbps	Edge 2	0mm	Ant 2	78	2480	6.13	6.50	1.089	76.88	1.084	0.04	0.001	0.001
	Bluetooth	1Mbps	Edge 3	0mm	Ant 2	78	2480	6.13	6.50	1.089	76.88	1.084	-0.01	0.001	0.001
	Bluetooth	1Mbps	Edge 4	0mm	Ant 2	78	2480	6.13	6.50	1.089	76.88	1.084	0.06	0.001	0.001

15. Simultaneous Transmission Analysis

No.	Simultaneous Transmission Configurations	Body
1.	WLAN5GHz + Bluetooth	Yes

General Note:

1. EUT will choose either WLAN 2.4GHz or WLAN 5GHz according to the network signal condition; therefore, 2.4GHz WLAN and 5GHz WLAN will not operate simultaneously at any moment though they have independent antenna.
2. According to the EUT characteristic, WLAN 2.4GHz and Bluetooth can't transmit simultaneously.
3. According to the EUT characteristic, WLAN 5GHz and Bluetooth can transmit simultaneously.
4. According to the EUT characteristic, when WLAN 5GHz and Bluetooth share the same antenna and can transmit simultaneously; when WLAN5GHz and Bluetooth are located on different antennas, they cannot transmit simultaneously.
5. The 2.4GHz/5GHz/BT WLAN can transmit in SISO antenna mode only.
6. Per KDB 447498 D04v01, simultaneous transmission SAR is compliant if,
   i) 1g Scalar SAR summation < 1.6W/kg.
   ii) SPLSR = (SAR1 + SAR2)^1.5 / (min. separation distance, mm), and the peak separation distance is determined from the square root of [(x1-x2)2 + (y1-y2)2 + (z1-z2)2], where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
   iii) If SPLSR ≤ 0.04 for 1g SAR, simultaneously transmission SAR measurement is not necessary.
   iv) Simultaneously transmission SAR measurement, and the reported multi-band 1g SAR < 1.6W/kg.

15.1 Body Exposure Conditions

Exposure Position	1	2	3	4	1+3 Summed 1g SAR (W/kg)	2+4 Summed 1g SAR (W/kg)
	5GHz WLAN Ant 1	5GHz WLAN Ant 2	Bluetooth Ant 1	Bluetooth Ant 2		
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)		
Bottom Face	0.181	0.099	0.026	0.001	0.207	0.100
Edge 1	0.830	0.078	0.001	0.001	**0.831**	0.079
Edge 2	0.270	0.102	0.001	0.001	0.271	0.103
Edge 3	0.129	0.430	0.001	0.001	0.130	0.431
Edge 4	0.158	0.104	0.001	0.001	0.159	0.105

Test Engineer : Martin Li, Varus Wang, Light Wang, Ricky Gu

16. Uncertainty Assessment

Per KDB 865664 D01 SAR measurement 100MHz to 6GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg and the measured 10-g SAR within a frequency band is < 3.75 W/kg. The expanded SAR measurement uncertainty must be ≤ 30%, for a confidence interval of k = 2. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. For this device, the highest measured 1-g SAR is less 1.5W/kg and highest measured 10-g SAR is less 3.75W/kg. Therefore, the measurement uncertainty table is not required in this report.

17. References

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

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

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

[4] SPEAG DASY System Handbook

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

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

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

[8] FCC KDB 447498 D04 v01, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Nov 2021

[9] FCC KDB 616217 D04 v01r02, “SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers”, Oct 2015

Appendixes

Please refer to separated files for the following appendixes

Appendix A. Plots of System Performance Check

Appendix B. Plots of High SAR Measurement

Appendix C. DASY Calibration Certificate

------THE END------