FCC SAR Test Report

APPLICANT	:	**RealWear, Inc.**
EQUIPMENT	:	**Head Mounted Tablet**
BRAND NAME	:	**realwear**
MODEL NAME	:	**A31G**
FCC ID	:	**2AJOR3101GAA**
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

ilac-MRA

ACCREDITED Cert #5145.02

Sporton International Inc. (Kunshan)
No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA560322	Rev. 01	Initial issue of report	Jul. 24, 2025

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **RealWear, Inc., Head Mounted Tablet, A31G**, are as follows.

Equipment Class	Frequency Band		Highest SAR Summary		
			Head (Separation 0mm)	Body-worn (Separation 0mm)	Extremity (Separation 0mm)
			1g SAR (W/kg)	1g SAR (W/kg)	10g SAR (W/kg)
DTS	WLAN	2.4GHz WLAN	**0.10**	1.19	1.29
NII		5GHz WLAN	<0.10	**1.25**	**2.18**
DSS	Bluetooth	Bluetooth	<0.10	0.61	0.56
Date of Testing: 2025/06/12 ~ 2025/06/17					

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, 4.0 W/kg for Product Specific 10g SAR) specified in FCC 47 CFR part 2 (2.1093), and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications.

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.
	SAR04-KS	CN1257	314309

Applicant	
Company Name	RealWear, Inc.
Address	600 Hatheway Road, Vancouver, WA, 98661

Manufacturer	
Company Name	RealWear, Inc.
Address	600 Hatheway Road, Vancouver, WA, 98661

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 447498 D01 General RF Exposure Guidance v06
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r02

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	Head Mounted Tablet
Brand Name	realwear
Model Name	A31G
FCC ID	2AJOR3101GAA
S/N Code	D1E6R414D2563850
Wireless Technology and Frequency Range	WLAN 2.4GHz Band: 2412 MHz ~ 2462 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/HT40 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE
HW Version	A
SW Version	1.0.5-15-T.ARC3.G
EUT Stage	Identical Prototype

Remark:
1. This device has no voice function.
2. The A31G include a dedicated accessory that enables zero-gap (0mm) body-worn testing when attached.

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:

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

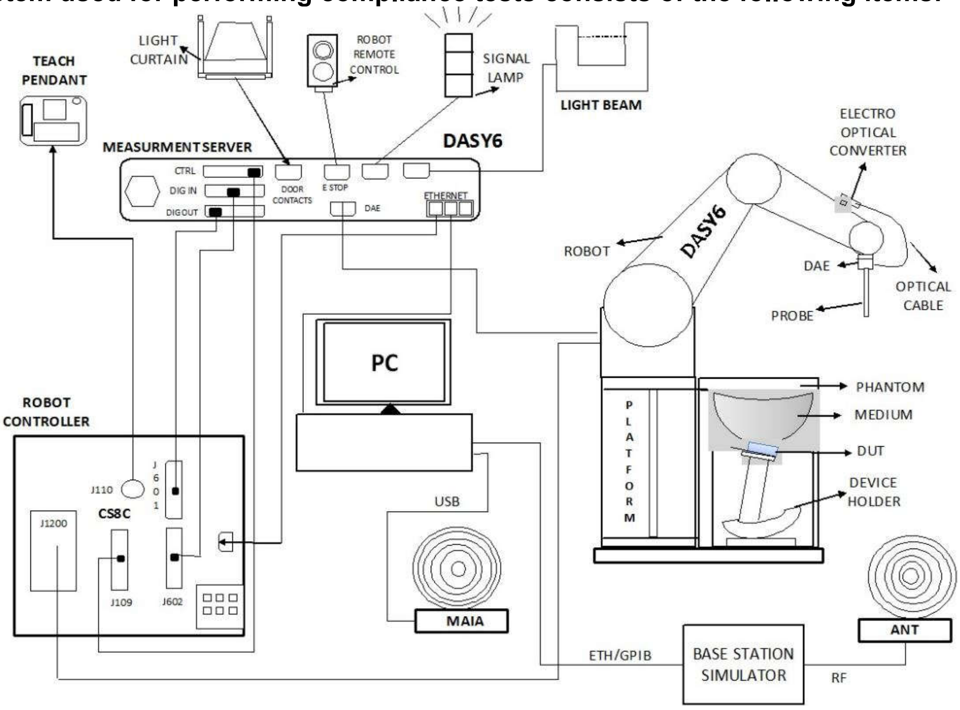
SAR is expressed in units of Watts per kilogram (W/kg)

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

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.

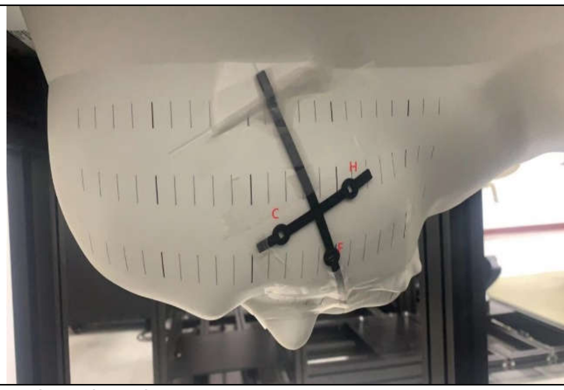
<ELI Phantom>

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.

<SAM Face-Down Phantom>

Liquid Compatibility	The phantom shell is compatible with SPEAG's tissue simulating liquids both sugar and oil-based. Other liquids may be used however liquids that are corrosive, including liquids containing DGBE, must not be used as they will cause damage to the phantom and render the warranty void (see note or consult SPEAG support).
Shell Thickness	2 ± 0.2 mm (6 mm at ear point)
Head Shape	Standard compatible SAM head.



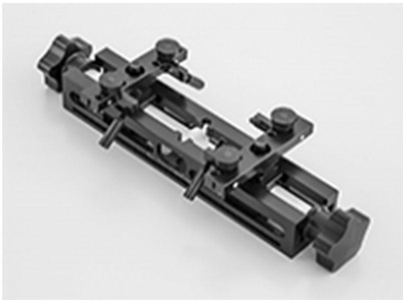
The SAM Face-Down phantom is a SAM head phantom with the front of the face facing downward. This phantom is truncated along a plane behind the ear reference point. Above this plane, an upper extension is added to ensure that the tissue simulating liquid is deep enough to measure in the relevant regions of the phantom. The upper extension is flanged to allow measurement probe access.

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.

<table>
<tr><th></th><th>≤ 3 GHz</th><th>> 3 GHz</th></tr>
<tr><td>Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5 ± 1 mm</td><td>½·δ·ln(2) ± 0.5 mm</td></tr>
<tr><td>Maximum probe angle from probe axis to phantom surface normal at the measurement location</td><td>30° ± 1°</td><td>20° ± 1°</td></tr>
<tr><td rowspan="2">Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}</td><td>≤ 2 GHz: ≤ 15 mm
2 – 3 GHz: ≤ 12 mm</td><td>3 – 4 GHz: ≤ 12 mm
4 – 6 GHz: ≤ 10 mm</td></tr>
<tr><td colspan="2">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.</td></tr>
</table>

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.

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

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	5000MHz System Validation Kit	D5GHzV2	1365	Feb. 13, 2024	Feb. 11, 2026
SPEAG	Data Acquisition Electronics	DAE4	1650	Nov. 25, 2024	Nov. 24, 2025
SPEAG	Dosimetric E-Field Probe	EX3DV4	7630	Aug. 22, 2024	Aug. 21, 2025
SPEAG	SAM Face-Down	V10.0	1050	NCR	NCR
SPEAG	SAM Twin Phantom	SAM Twin	TP-2074	NCR	NCR
Beichuang	Thermo-Hygrometer	HTC-1	1949250	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	1144	Aug. 20, 2024	Aug. 19, 2025
Anritsu	Vector Signal Generator	MG3710A	6201682672	Jan. 03, 2025	Jan. 02, 2026
Rohde & Schwarz	Power Meter	NRVD	102081	Jul. 04, 2024	Jul. 03, 2025
Rohde & Schwarz	Power Sensor	NRV-Z5	100538	Jul. 04, 2024	Jul. 03, 2025
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 head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 10.1. 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. 10.2.

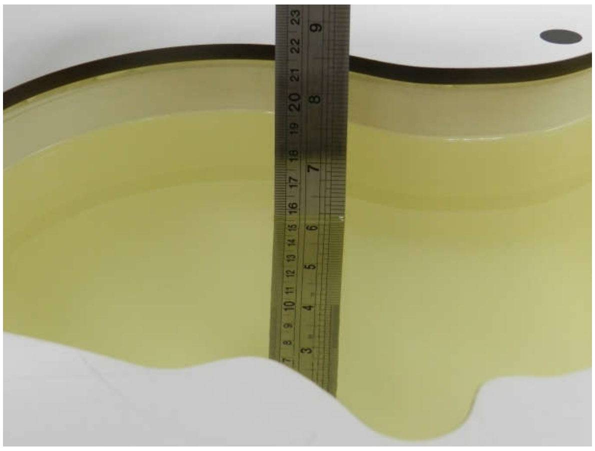


Fig 10.1Photo of Liquid Height for Head SAR

Fig 10.2 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	22.8	1.77	39.3	1.8	39.2	-1.67	0.26	±5.0	2025/06/12
5250	22.7	4.67	36.3	4.71	35.95	-0.85	0.97	±5.0	2025/06/14
5600	22.8	5.00	35.8	5.07	35.5	-1.38	0.85	±5.0	2025/06/15
5750	22.6	5.17	35.6	5.22	35.35	-0.96	0.71	±5.0	2025/06/16

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 (%)
2025/06/12	2450	50.00	1095	7630	1650	2.84	52.6	56.8	7.98	1.29	24.7	25.8	4.45
2025/06/14	5250	50.00	1113	7630	1650	4.02	81.5	80.4	-1.35	1.2	23.3	24.0	3.0
2025/06/15	5600	50.00	1113	7630	1650	4.37	82.6	87.4	5.81	1.28	23.7	25.6	8.02
2025/06/16	5750	50.00	1113	7630	1650	3.97	80.8	79.4	-1.73	1.17	23.0	23.4	1.74

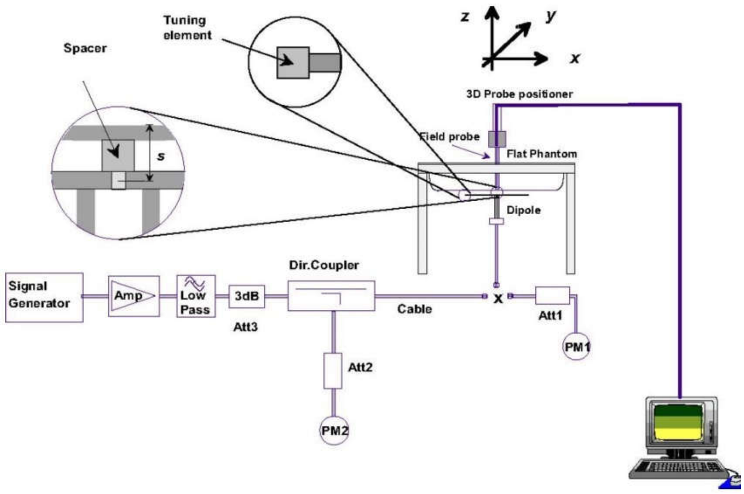


Fig 10.3.1 System Performance Check Setup

Fig 10.3.2 Setup Photo

10.4 Additional System Check on SAM Face-down phantom

When using DASY6 with Face-down phantom, additional system verifications were performed using the Face-down phantom itself. As recommended by the SAR system manufacture and confirmed as appropriate through KDB inquiry with the FCC, i.e. the Face-down Phantoms, is performed according to the validation points described in the SPEAG's DASY SAR manual. The locations of the nine points are shown in Figure below.

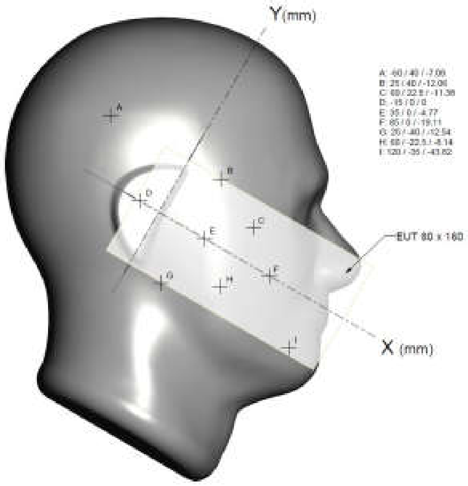


Fig 10.4.1 System check and validation locations for the head phantom

The target values vary slightly based on what angle the dipole is oriented in. The three possible dipole arm orientations for which target values are defined are shown below. The dipoles were placed in the orientation defined as 90º.

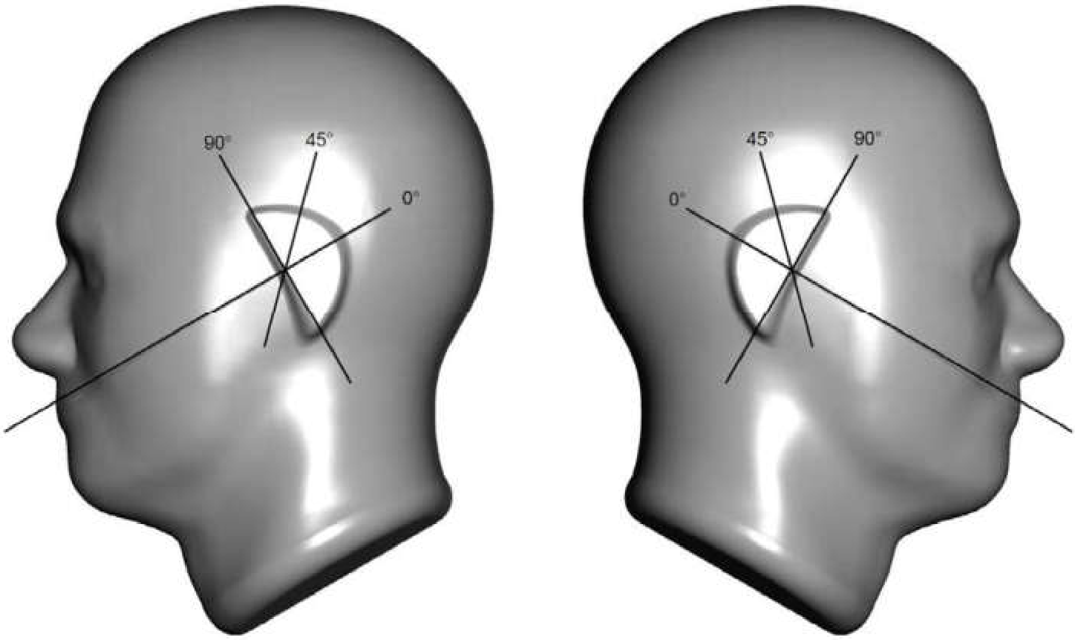


Fig 10.4.2 Definition of rotation angles for dipoles

Point C/F/H was chosen as it is the closest point to the portion of the phantom which is utilized for the EUT measurements, respectively. Since SPEAG dipole calibration does not provide system check target values for specific phantoms, the target values in Table 7.4.3 from SPEAG's DASY6/DASY8 SAR Manual and "AppNote Specific Phantom 20200114" (shown in Fig. 10.4.3) are used and tabulated in Table below. The detailed please refer to KDB inquiry with the FCC.

Point	Freq [MHz]	Rot [°]	d [mm]	Meas [W/kg] 1 g	Meas [W/kg] 10 g	Target [W/kg] 1 g	Target [W/kg] 10 g	Dev [dB] 1 g	Dev [dB] 10 g	Probe Angle [°] Max	Probe Angle [°] Avg
C	900	90	15	9.86	6.42	11.2	7.25	−0.54	−0.52	40.0	31.1
E	900	90	15	9.98	6.54	10.9	7.06	−0.37	−0.33	55.0	48.3
H	900	90	15	9.68	6.32	11.1	7.21	−0.60	−0.57	60.0	47.4
I	900	0	15	9.52	6.17	11.1	7.20	−0.66	−0.67	35.0	26.5
I	900	90	15	10.7	7.04	9.26	6.03	0.63	0.67	35.0	26.4
C	1750	90	10	35.5	18.8	39.3	20.5	−0.44	−0.38	40.0	32.8
E	1750	90	10	34.9	18.6	37.9	19.9	−0.36	−0.30	55.0	49.2
H	1750	90	10	35.3	18.7	39.6	20.6	−0.51	−0.42	60.0	46.4
I	1750	90	10	30.6	16.4	34.4	17.9	−0.50	−0.39	35.0	24.4
F	1950	90	10	46.4	24.0	42.2	21.5	0.39	0.47	35.0	24.9
B	2450	0	10	49.5	23.1	54.0	25.1	−0.38	−0.35	45.0	39.3
B	2450	90	10	49.1	22.9	53.8	24.3	−0.40	−0.25	50.0	40.6
C	2450	0	10	48.9	22.7	52.8	24.4	−0.33	−0.32	40.0	31.5
C	2450	90	10	52.7	24.3	54.8	24.8	−0.17	−0.09	40.0	32.2
E	2450	0	10	48.5	22.9	51.8	23.9	−0.29	−0.19	55.0	48.8
E	2450	90	10	50.7	23.7	51.8	24.0	−0.09	−0.05	55.0	48.5
F	2450	0	10	51.7	23.9	53.2	24.0	−0.13	−0.01	35.0	25.0
F	2450	90	10	56.5	26.4	54.8	24.9	0.14	0.25	35.0	25.0
H	2450	0	10	48.3	22.3	51.4	23.5	−0.27	−0.23	60.0	51.1
H	2450	90	10	53.7	24.5	56.0	27.5	−0.18	−0.51	60.0	47.8
I	2450	0	10	59.1	27.9	56.0	26.0	0.23	0.31	40.0	26.7
I	2450	90	10	47.1	21.9	53.0	24.0	−0.51	−0.39	35.0	24.3
G	5800	90	25	14.1	5.29	15.9	5.97	−0.52	−0.53	55.0	48.9
I	5800	90	25	18.0	6.31	15.6	5.73	0.62	0.42	60.0	45.4

Position	Frequency [MHz]	Orientation [°]	d [mm]	psSAR1g [W/kg/W]	psSAR10g [W/kg/W]
Top (C)	835	0	15	9.77	6.48
Mouth (F)	835	90	15	9.80	6.49
Ear (D)	835	90	15	7.80	5.28
Neck (H)	835	0	15	9.64	6.53
Top (C)	1950	0	10	42.6	21.7
Mouth (F)	1950	90	10	42.2	21.5
Ear (D)	1950	90	10	28.5	15.6
Neck (H)	1950	0	10	41.3	21.1
Top (C)	2450	0	10	53.0	24.0
Mouth (F)	2450	90	10	54.8	24.9
Ear (D)	2450	90	10	32.2	16.0
Neck (H)	2450	0	10	51.0	24.0
Top (C)	5800	0	10	80.0	19.9
Mouth (F)	5800	90	10	83.2	20.8
Ear (D)	5800	90	10	64.0	21.0
Neck (H)	5800	0	10	79.1	19.9

Fig 10.4.3 Target Values for System Check on SAM Face-down Phantom

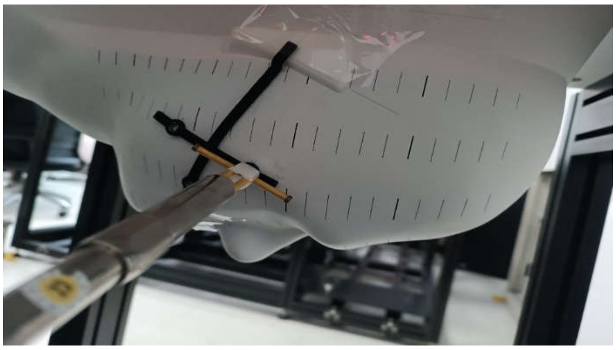
As confirmed as appropriate through KDB inquiry with the FCC and confirmation with the manufacturer, since SPEAG has not yet developed the specific phantom SAR system check target values for the 7 GHz band. Only the system checks using the Head Stand Phantom are to be performed using one frequency in the 2.4 GHz band and one frequency in the 5 GHz band.

Dipole Placed at Location C in 0º Orientation (10mm Spacer)

Dipole Placed at Location F in 90º Orientation (10mm Spacer)

Dipole Placed at Location H in 0º Orientation (10mm Spacer)

Dipole Placed at Location C in 90º Orientation (10mm Spacer)



Dipole Placed at Location H in 90º Orientation (10mm Spacer)

10.5 System Performance Check Results on SAM Face-down phantom

Below table shows the target SAR and measured SAR after normalized to 1W input power. The dipole target values please refer to Fig. 10.4.3 in section 10.4. 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.

Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Date	Distance (mm	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (dB)	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (dB)	Position	Rot [°]
2450	Head	50	1095	7630	1650	2025/6/12	10	2.780	54.80	55.6	0.06	1.330	24.80	26.6	0.30	C-Right	90
2450	Head	50	1095	7630	1650	2025/6/12	10	2.440	54.80	48.8	-0.50	1.190	24.90	23.8	-0.20	F-Right	90
2450	Head	50	1095	7630	1650	2025/6/12	10	2.730	56.00	54.6	-0.11	1.320	27.50	26.4	-0.18	H-Right	90
2450	Head	50	1095	7630	1650	2025/6/12	10	2.810	54.80	56.2	0.11	1.330	24.80	26.6	0.30	C-Left	90
2450	Head	50	1095	7630	1650	2025/6/12	10	2.670	54.80	53.4	-0.11	1.280	24.90	25.6	0.12	F-Left	90
2450	Head	50	1095	7630	1650	2025/6/12	10	2.810	56.00	56.2	0.02	1.340	27.50	26.8	-0.11	H-Left	90
5800	Head	250	1365	7630	1650	2025/6/17	10	18.200	80.00	72.8	-0.41	4.930	19.90	19.72	-0.04	C-Right	0
5800	Head	250	1365	7630	1650	2025/6/17	10	18.900	83.20	75.6	-0.42	5.260	20.80	21.04	0.05	F-Right	90
5800	Head	250	1365	7630	1650	2025/6/17	10	18.300	79.10	73.2	-0.34	5.090	19.90	20.36	0.10	H-Right	0
5800	Head	250	1365	7630	1650	2025/6/17	10	18.000	80.00	72	-0.46	4.870	19.90	19.48	-0.09	C-Left	0
5800	Head	250	1365	7630	1650	2025/6/17	10	18.000	83.20	72	-0.63	4.830	20.80	19.32	-0.32	F-Left	90
5800	Head	250	1365	7630	1650	2025/6/17	10	17.500	79.10	70	-0.53	4.780	19.90	19.12	-0.17	H-Left	0

Note: The Expanded Uncertainty for measurement on a specific phantom of the measuring system (DASY6/DASY8). To be conservative, the smaller Expanded Uncertainty, which is from DASY6 – 1g SAR: 29.8%, 1.1 dB (k=2) – is used. Target values in Fig. 10.4.3 have an uncertainty of 0.4 dB (k=2). All Values are Normalized to 1 W Forward Power. The maximum deviation of 0.67 dB is well within the combined uncertainty of target values and the measurement uncertainty. The Combined Uncertainty of target values (0.67 dB) and system uncertainty (1.1 dB) is 1.3 dB (k=2). All deviations between normalized SAR values and target values should be within this 1.2 dB measurement uncertainty to demonstrate a successful system check on the SAM Face-down Phantom.

11. RF Exposure Positions

11.1 Head SAR Testing for Head Mounted Tablet

The device was mounted on the SAM Face-down Phantom as it is intended to be worn, the detailed please refer to KDB inquiry with the FCC.

11.2 Body SAR Testing for Head Mounted Tablet

(a) To position the device parallel to the phantom surface with all surfaces of the device.
(b) To adjust the device parallel to the flat phantom.
(c) To adjust the distance between the device surface and the flat phantom to 0mm.

11.3 Extremity SAR Testing for Head Mounted Tablet

(a) The device shall be placed directly against the flat phantom, for those sides of the device that are in contact with the hand during intended use.
(b) To adjust the device parallel to the flat phantom.
(c) To adjust the distance between the device surface and the flat phantom to 0 cm.

<EUT Setup Photos>

Please refer to Appendix D for the test setup photos.

12. Conducted RF Output Power (Unit: dBm)

The detailed conducted power table can refer to Appendix E.

<WLAN Conducted Power>

General Note:

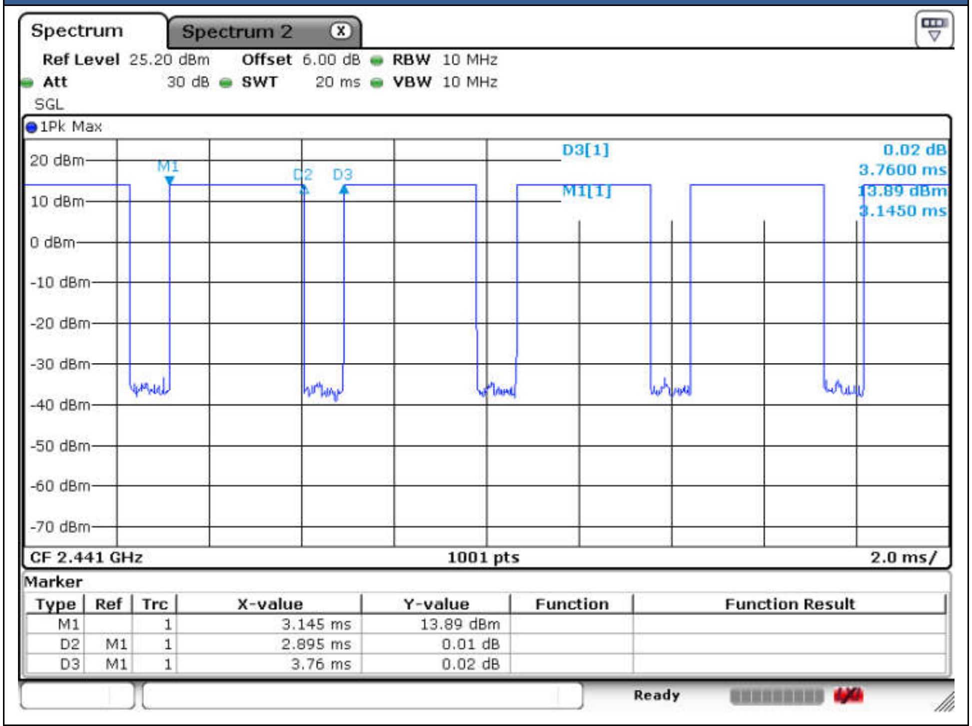
1. The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default 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.
6. In applying the test guidance, the IEEE 802.11 mode with the maximum output power (out of all modes) should be considered for testing

<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 76.99 %, 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



14. Antenna Location

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

15. 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 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 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg. Per KDB 865664 D01v01r04, if the extremity repeated SAR is necessary, the same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.
4. A non-standard setup was used for SAR testing based on guidance from the FCC. The inquiry document contains additional information.
5. The device head SAR is performed against SAM Face-Down Phantom. The device Body/extremity SAR is performed against flat section of SAM Twin phantom.

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.

15.1 Head 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	Inner face	0mm	Ant 1	11	2462.0	14.89	15.50	1.151	98.72	1.013	-0.04	0.083	0.097
	WLAN2.4GHz	802.11b 1Mbps	Inner face	0mm	Ant 1	1	2412.0	14.63	15.50	1.222	98.72	1.013	-0.07	0.041	0.051
	WLAN2.4GHz	802.11b 1Mbps	Inner face	0mm	Ant 1	6	2437.0	14.76	15.50	1.186	98.72	1.013	0.03	0.052	0.062
02	WLAN5.3GHz	802.11a 6Mbps	Inner face	0mm	Ant 1	52	5260.0	12.34	13.00	1.164	97.94	1.021	0.01	0.053	0.063
03	WLAN5.5GHz	802.11a 6Mbps	Inner face	0mm	Ant 1	100	5500.0	13.90	15.00	1.288	97.94	1.021	0.06	0.049	0.064
04	WLAN5.8GHz	802.11a 6Mbps	Inner face	0mm	Ant 1	165	5825.0	13.84	15.00	1.306	97.94	1.021	-0.04	0.027	0.036

【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)
05	Bluetooth	1Mbps	Inner face	0mm	Ant 1	39	2441.0	14.30	15.00	1.175	76.99	1.082	0.01	0.023	0.029

15.2 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)
	WLAN2.4GHz	802.11b 1Mbps	Front	0mm	Ant 1	11	2462.0	14.89	15.50	1.151	98.72	1.013	0.03	0.244	0.284
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Ant 1	11	2462.0	14.89	15.50	1.151	98.72	1.013	0.01	0.018	0.021
	WLAN2.4GHz	802.11b 1Mbps	Left Edge	0mm	Ant 1	11	2462.0	14.89	15.50	1.151	98.72	1.013	-0.07	0.036	0.042
	WLAN2.4GHz	802.11b 1Mbps	Top Edge	0mm	Ant 1	11	2462.0	14.89	15.50	1.151	98.72	1.013	-0.02	0.302	0.352
06	WLAN2.4GHz	802.11b 1Mbps	Top View Cross-Section	0mm	Ant 1	11	2462.0	14.89	15.50	1.151	98.72	1.013	-0.09	1.020	1.189
	WLAN2.4GHz	802.11b 1Mbps	Top View Cross-Section	0mm	Ant 1	1	2412.0	14.63	15.50	1.222	98.72	1.013	0.04	0.876	1.084
	WLAN2.4GHz	802.11b 1Mbps	Top View Cross-Section	0mm	Ant 1	6	2437.0	14.76	15.50	1.186	98.72	1.013	0.07	0.884	1.062
	WLAN2.4GHz	802.11b 1Mbps	Bottom Edge	0mm	Ant 1	11	2462.0	14.89	15.50	1.151	98.72	1.013	0.06	0.012	0.014
	WLAN5.3GHz	802.11a 6Mbps	Front	0mm	Ant 1	52	5260.0	12.34	13.00	1.164	97.94	1.021	-0.02	0.195	0.232
	WLAN5.3GHz	802.11a 6Mbps	Back	0mm	Ant 1	52	5260.0	12.34	13.00	1.164	97.94	1.021	0.07	0.038	0.045
	WLAN5.3GHz	802.11a 6Mbps	Left Edge	0mm	Ant 1	52	5260.0	12.34	13.00	1.164	97.94	1.021	0.04	0.028	0.033
	WLAN5.3GHz	802.11a 6Mbps	Top Edge	0mm	Ant 1	52	5260.0	12.34	13.00	1.164	97.94	1.021	0.01	0.556	0.661
	WLAN5.3GHz	802.11a 6Mbps	Top View Cross-Section	0mm	Ant 1	52	5260.0	12.34	13.00	1.164	97.94	1.021	0.02	0.924	1.098
	WLAN5.3GHz	802.11a 6Mbps	Top View Cross-Section	0mm	Ant 1	56	5280.0	12.02	13.00	1.253	97.94	1.021	0.01	0.903	1.155
	WLAN5.3GHz	802.11a 6Mbps	Top View Cross-Section	0mm	Ant 1	60	5300.0	11.46	12.50	1.271	97.94	1.021	0.07	0.811	1.052
07	WLAN5.3GHz	802.11a 6Mbps	Top View Cross-Section	0mm	Ant 1	64	5320.0	11.55	12.50	1.245	97.94	1.021	0.02	0.942	1.197
	WLAN5.3GHz	802.11a 6Mbps	Bottom Edge	0mm	Ant 1	52	5260.0	12.34	13.00	1.164	97.94	1.021	-0.01	0.030	0.036
	WLAN5.5GHz	802.11a 6Mbps	Front	0mm	Ant 1	100	5500.0	13.90	15.00	1.288	97.94	1.021	-0.07	0.112	0.147
	WLAN5.5GHz	802.11a 6Mbps	Back	0mm	Ant 1	100	5500.0	13.90	15.00	1.288	97.94	1.021	0.05	0.057	0.075
	WLAN5.5GHz	802.11a 6Mbps	Left Edge	0mm	Ant 1	100	5500.0	13.90	15.00	1.288	97.94	1.021	0.02	0.023	0.030
	WLAN5.5GHz	802.11a 6Mbps	Top Edge	0mm	Ant 1	100	5500.0	13.90	15.00	1.288	97.94	1.021	-0.01	0.444	0.584
	WLAN5.5GHz	802.11a 6Mbps	Top View Cross-Section	0mm	Ant 1	100	5500.0	13.90	15.00	1.288	97.94	1.021	-0.10	0.864	1.136
08	WLAN5.5GHz	802.11a 6Mbps	Top View Cross-Section	0mm	Ant 1	116	5580.0	13.83	15.00	1.309	97.94	1.021	0.01	0.914	1.222
	WLAN5.5GHz	802.11a 6Mbps	Top View Cross-Section	0mm	Ant 1	124	5620.0	13.73	15.00	1.340	97.94	1.021	-0.07	0.782	1.070
	WLAN5.5GHz	802.11a 6Mbps	Top View Cross-Section	0mm	Ant 1	132	5660.0	13.7	15.00	1.349	97.94	1.021	0.02	0.884	1.218
	WLAN5.5GHz	802.11a 6Mbps	Top View Cross-Section	0mm	Ant 1	144	5720.0	13.46	14.50	1.271	97.94	1.021	0.04	0.935	1.213
	WLAN5.5GHz	802.11a 6Mbps	Bottom Edge	0mm	Ant 1	100	5500.0	13.90	15.00	1.288	97.94	1.021	0.05	0.010	0.013
	WLAN5.8GHz	802.11a 6Mbps	Front	0mm	Ant 1	165	5825.0	13.84	15.00	1.306	97.94	1.021	0.04	0.112	0.149
	WLAN5.8GHz	802.11a 6Mbps	Back	0mm	Ant 1	165	5825.0	13.84	15.00	1.306	97.94	1.021	0.01	0.059	0.079

	WLAN5.8GHz	802.11a 6Mbps	Left Edge	0mm	Ant 1	165	5825.0	13.84	15.00	1.306	97.94	1.021	0.02	0.014	0.019
	WLAN5.8GHz	802.11a 6Mbps	Top Edge	0mm	Ant 1	165	5825.0	13.84	15.00	1.306	97.94	1.021	0.08	0.564	0.752
09	WLAN5.8GHz	802.11a 6Mbps	Top View Cross-Section	0mm	Ant 1	165	5825.0	13.84	15.00	1.306	97.94	1.021	-0.17	0.940	**1.253**
	WLAN5.8GHz	802.11a 6Mbps	Top View Cross-Section	0mm	Ant 1	149	5745.0	13.74	15.00	1.337	97.94	1.021	0.05	0.587	0.801
	WLAN5.8GHz	802.11a 6Mbps	Top View Cross-Section	0mm	Ant 1	157	5785	13.63	15.00	1.371	97.94	1.021	-0.03	0.661	0.925
	WLAN5.8GHz	802.11a 6Mbps	Bottom Edge	0mm	Ant 1	165	5825.0	13.84	15.00	1.306	97.94	1.021	-0.17	0.018	0.024

【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)
10	Bluetooth	1Mbps	Top View Cross-Section	0mm	Ant 1	39	2441.0	14.30	15.00	1.175	76.99	1.082	0.03	0.481	**0.612**

15.3 Extremity 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 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Front	0mm	Ant 1	11	2462.0	14.89	15.50	1.151	98.72	1.013	0.01	0.341	0.398
11	WLAN2.4GHz	802.11b 1Mbps	Front Veiw Cross-section	0mm	Ant 1	11	2462.0	14.89	15.50	1.151	98.72	1.013	-0.04	1.110	**1.294**
	WLAN2.4GHz	802.11b 1Mbps	Left Edge	0mm	Ant 1	11	2462.0	14.89	15.50	1.151	98.72	1.013	-0.07	0.058	0.068
	WLAN2.4GHz	802.11b 1Mbps	Top Edge	0mm	Ant 1	11	2462.0	14.89	15.50	1.151	98.72	1.013	-0.09	0.319	0.372
	WLAN2.4GHz	802.11b 1Mbps	Bottom Edge	0mm	Ant 1	11	2462.0	14.89	15.50	1.151	98.72	1.013	0.01	0.195	0.227
	WLAN5.3GHz	802.11a 6Mbps	Front	0mm	Ant 1	52	5260.0	12.34	13.00	1.164	97.94	1.021	-0.01	1.330	1.581
	WLAN5.3GHz	802.11a 6Mbps	Front Veiw Cross-section	0mm	Ant 1	52	5260.0	12.34	13.00	1.164	97.94	1.021	-0.05	1.800	2.139
	WLAN5.3GHz	802.11a 6Mbps	Front Veiw Cross-section	0mm	Ant 1	56	5280.0	12.02	13.00	1.253	97.94	1.021	-0.07	1.660	2.124
12	WLAN5.3GHz	802.11a 6Mbps	Front Veiw Cross-section	0mm	Ant 1	60	5300.0	11.46	12.50	1.271	97.94	1.021	-0.01	1.68	**2.180**
	WLAN5.3GHz	802.11a 6Mbps	Front Veiw Cross-section	0mm	Ant 1	64	5320.0	11.55	12.50	1.245	97.94	1.021	-0.01	1.7	2.161
	WLAN5.3GHz	802.11a 6Mbps	Left Edge	0mm	Ant 1	52	5260.0	12.34	13.00	1.164	97.94	1.021	-0.09	0.044	0.052
	WLAN5.3GHz	802.11a 6Mbps	Top Edge	0mm	Ant 1	52	5260.0	12.34	13.00	1.164	97.94	1.021	0.08	0.125	0.149
	WLAN5.3GHz	802.11a 6Mbps	Bottom Edge	0mm	Ant 1	52	5260.0	12.34	13.00	1.164	97.94	1.021	0.02	0.335	0.398
	WLAN5.5GHz	802.11a 6Mbps	Front	0mm	Ant 1	100	5500.0	13.90	15.00	1.288	97.94	1.021	0.01	0.814	1.070
13	WLAN5.5GHz	802.11a 6Mbps	Front Veiw Cross-section	0mm	Ant 1	100	5500.0	13.90	15.00	1.288	97.94	1.021	0.02	1.310	**1.723**
	WLAN5.5GHz	802.11a 6Mbps	Left Edge	0mm	Ant 1	100	5500.0	13.90	15.00	1.288	97.94	1.021	-0.03	0.005	0.007
	WLAN5.5GHz	802.11a 6Mbps	Top Edge	0mm	Ant 1	100	5500.0	13.90	15.00	1.288	97.94	1.021	0.06	0.121	0.159
	WLAN5.5GHz	802.11a 6Mbps	Bottom Edge	0mm	Ant 1	100	5500.0	13.90	15.00	1.288	97.94	1.021	-0.04	0.330	0.434
	WLAN5.8GHz	802.11a 6Mbps	Front	0mm	Ant 1	165	5825.0	13.84	15.00	1.306	97.94	1.021	-0.05	0.513	0.684
14	WLAN5.8GHz	802.11a 6Mbps	Front Veiw Cross-section	0mm	Ant 1	165	5825.0	13.84	15.00	1.306	97.94	1.021	0.01	1.090	**1.453**
	WLAN5.8GHz	802.11a 6Mbps	Left Edge	0mm	Ant 1	165	5825.0	13.84	15.00	1.306	97.94	1.021	0.03	0.001	0.001
	WLAN5.8GHz	802.11a 6Mbps	Top Edge	0mm	Ant 1	165	5825.0	13.84	15.00	1.306	97.94	1.021	0.02	0.116	0.155
	WLAN5.8GHz	802.11a 6Mbps	Bottom Edge	0mm	Ant 1	165	5825.0	13.84	15.00	1.306	97.94	1.021	0.06	0.278	0.371

【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 10g SAR (W/kg)	Reported 10g SAR (W/kg)
15	Bluetooth	1Mbps	Front Veiw Cross-section	0mm	Ant 1	39	2441.0	14.30	15.00	1.175	76.99	1.082	-0.19	0.440	**0.559**

15.4 Repeated SAR Measurement

<1g>

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)	Ratio	Reported 1g SAR (W/kg)
1st	WLAN2.4GHz	802.11b 1Mbps	Top View Cross-Section	0mm	Ant 1	11	2462.0	14.89	15.50	1.151	98.72	1.013	-0.09	1.020	1	1.189
2nd	WLAN2.4GHz	802.11b 1Mbps	Top View Cross-Section	0mm	Ant 1	11	2462.0	14.89	15.50	1.151	98.72	1.013	0.03	0.965	1.057	1.125
1st	WLAN5.3GHz	802.11a 6Mbps	Top View Cross-Section	0mm	Ant 1	64	5320.0	11.55	12.50	1.245	97.94	1.021	0.02	0.942	1	1.197
2nd	WLAN5.3GHz	802.11a 6Mbps	Top View Cross-Section	0mm	Ant 1	64	5320.0	11.55	12.50	1.245	97.94	1.021	0.08	0.865	1.089	1.100
1st	WLAN5.5GHz	802.11a 6Mbps	Top View Cross-Section	0mm	Ant 1	144	5720.0	13.46	14.50	1.271	97.94	1.021	0.04	0.935	1	1.213
2nd	WLAN5.5GHz	802.11a 6Mbps	Top View Cross-Section	0mm	Ant 1	144	5720.0	13.46	14.50	1.271	97.94	1.021	-0.01	0.859	1.088	1.115
1st	WLAN5.8GHz	802.11a 6Mbps	Top View Cross-Section	0mm	Ant 1	165	5825.0	13.84	15.00	1.306	97.94	1.021	-0.17	0.940	1	1.253
2nd	WLAN5.8GHz	802.11a 6Mbps	Top View Cross-Section	0mm	Ant 1	165	5825.0	13.84	15.00	1.306	97.94	1.021	0.09	0.911	1.032	1.215

General Note:

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

16. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations
1.	None

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.
2. According to the EUT characteristic, WLAN 5GHz and Bluetooth can’t transmit simultaneously.
3. According to the EUT characteristic, WLAN 2.4GHz and Bluetooth can’t transmit simultaneously.

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

17. 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.

18. References

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

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

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

[4] SPEAG DASY System Handbook

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

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

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

[8] FCC KDB 865664 D02 v01r02, “RF Exposure Compliance Reporting and Documentation Considerations” 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

Appendix D. Test Setup Photos

Appendix E. Conducted RF Output Power Table

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