

FCC SAR Test Report

Applicant: GoPro, Inc.

EUT Description: Camera

Model Tested: TPSB1

Brand: 
GoPro 

FCC ID: CNFTPSB1

Standards: FCC 47CFR §2.1093

Date of Receipt: 2025/12/08

Date of Test: 2026/01/26 to 2026/01/27

Date of Issue: 2026/02/01

TOWE. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

the results documented in this report apply only the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility assure that additional production units of the model are manufactured with identical electrical and mechanical components. All sample tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise. without written approval of TOWE, the test report shall not be reproduced except in full.



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Approved By:



Jack Li
Reviewed By:

Revision History

Rev.	Issue Date	Description	Revised by
01	2026/02/01	Original	Jack Li

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1 Summary of Test Results

Band	Highest SAR(W/kg)	
	Head/Body 1g SAR (10mm)	Extremity 10g SAR (0mm)
WIFI 2.4G	0.506	-
WIFI 5G	1.291	0.739
BT	0.068	-

2 Guidance Applied

FCC 47CFR §2.1093

ANSI/IEEE C95.1-1992

IEEE 1528-2013

FCC KDB 248227 D01 SAR Guidance for IEEE 802.11 Wi-Fi SAR v02r02

FCC KDB 648474 D04 Handset SAR v01r03

FCC KDB 447498 D01 General RF Exposure Guidance v06

FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04

FCC KDB 865664 D02 RF Exposure Reporting v01r02

3 Lab Information

3.1 Testing Location

These measurements tests were conducted at the Sushi TOWE Wireless Testing(Shenzhen) Co., Ltd. facility located at F401 and F101, Building E, Hongwei Industrial Zone, Liuxian 3rd Road, Bao'an District, Shenzhen, China. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014

Tel.: +86-755-27212361

Contact Email: info@towewireless.com

3.2 Test Facility / Accreditations

A2LA (Certificate Number: 7088.01)

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

FCC Designation No.: CN1353

Sushi TOWE Wireless Testing(Shenzhen) Co., Ltd. has been recognized as an accredited testing laboratory.

Designation Number: CN1353.

ISED CAB identifier: CN0152

Sushi TOWE Wireless Testing(Shenzhen) Co., Ltd. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0152

Company Number: 31000

3.3 Ambient Condition

Temperature: 18°C~25°C

Relative Humidity: 30%~75%

4 Client Information

4.1 Applicant

Applicant:	GoPro, Inc.
Address:	3025 Clearview Way, San Mateo, CA 94402, USA

4.2 Manufacturer

Manufacturer:	GoPro, Inc.
Address:	3025 Clearview Way, San Mateo, CA 94402, USA

5 Product Information

EUT Description	Camera	
Model	TPSB1	
Hardware Version	EVT	
Software Version	H26.01.01.09.19	
Device Capabilities:		
Band	Frequency Range (MHz)	Modulation Type
Bluetooth	2402~2480	GFSK, π/4DQPSK, 8DPSK
Wi-Fi 2.4G	2412~2462	802.11b/g/n/ax
Wi-Fi 5G	5180~5825 (except 5350-5470)	802.11a/n/ac/ax
Antenna Type	☐ External, ☒ Integrated	
Remark: The above EUT's information was declared by applicant, please refer to the specifications or user's manual for more detailed description.		

5.1 Antenna Locations

The detailed antenna location information can refer to Appendix D.

6 RF Exposure Limits

Human Exposure	Uncontrolled Environment General Population (W/kg) or (mW/g)	Controlled Environment Occupational (W/kg) or (mW/g)
Spatial Peak SAR¹ (Brain/Trunk)	1.6	8.0
Spatial Average SAR² (Whole Body)	0.08	0.4
Spatial Peak SAR³ (Hands/Feet/Ankle/Wrist)	4.0	20.0

Note:

1, The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

2, The Spatial Average value of the SAR averaged over the whole body.

3, The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

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.

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.

7 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.

7.1 SAR Definition

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

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

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

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

Where:

σ is the conductivity of the tissue material (S/m)

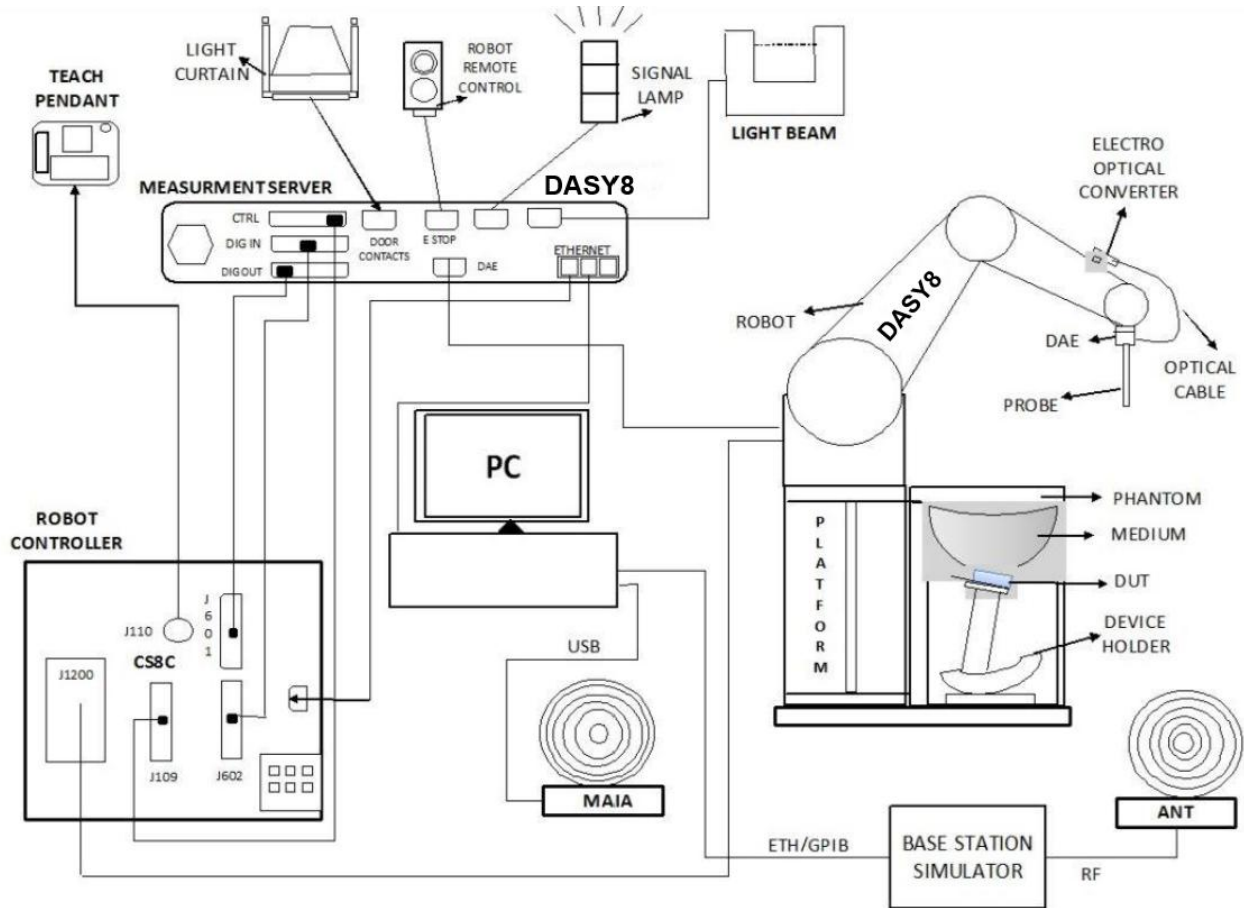
ρ is the mass density of the tissue material (kg/m³)

E is the RMS electrical field strength (V/m)

8 SAR Measurements System

8.1 The SAR Measurement Set-up

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 Windows 11 and the DASY8 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.

8.2 E-Field Probe

	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	10 MHz to > 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in TSL (rotation around probe axis) ± 0.5 dB in TSL (rotation normal to probe axis)
Dynamic Range	10 μ W/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μ W/g)
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm

8.3 Data Acquisition Electronics (DAE)

	The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock. The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.
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8.4 Phantom

SAM Twin Phantom:

Material	Vinylester, glass fiber reinforced (VE-GF)	
Shell Thickness	2 ± 0.2 mm (6 ± 0.2 mm at ear point)	
Dimensions (incl. Wooden Support)	Length: 1000 mm Width: 500 mm Height: adjustable feet	
Filling Volume	Approx. 25 liters	
Wooden Support	SPEAG standard phantom table	

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:

Material	Vinylester, glass fiber reinforced (VE-GF)	
Shell Thickness	2.0 ± 0.2 mm (bottom plate)	
Dimensions	Major axis: 600 mm Minor axis: 400 mm	
Filling Volume	approx. 30 liters	
Wooden Support	SPEAG standard phantom table	

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

8.5 Device Holder

The SAR measured in the phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source at 5mm distance, a positioning uncertainty of $\pm 0.5\text{mm}$ would produce uncertainty in the SAR of $\pm 20\%$. Accurate device positioning is therefore crucial for accurate and repeatable measurements. The positions at which the devices must be measured are defined by the standards. The DASY8 device holder along with the associated adaptors / options is designed to accommodate different types & sizes (laptops, tablets, phones) of test devices and yet provide accurate and repeatable positioning as described in the test standards.

The device holder is available in two configurations (see Figure 3.13.1): for hand held transmitters (mobile phones) – MD4HHTV5 – Mounting Device for Hand-Held Transmitters and for Body-Worn transmitters – MD4LAP5 – Mounting Device for laptops and other body worn transmitters.



(a) MD4HHTV5



(b) MD4LAPV5

Figure 3.13.1: Mounting Device for Hand-Held Devices and Laptop / Body-Worn Devices

8.6 Measurement procedure

8.6.1 Power reference measurement

The Power Reference Measurement and Power Drift Measurement jobs are useful jobs 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.

8.6.2 Area scan

Measurement procedures for evaluating SAR from wireless handsets typically start with a coarse measurement grid to determine the approximate location of the local peak SAR values. This is known as the area-scan procedure. In addition, identify the positions of any local maxima with SAR values within 2 dB of the maximum value, and that will not be within the zoom scan of other peaks. Additional zoom scans shall be measured for such peaks only when the primary peak is within 2 dB of the SAR compliance limit.

Area scan parameters measurement as below:

Parameter	DUT transmit frequency being tested	
	$f \leq 3 \text{ GHz}$	$3 \text{ GHz} < f \leq 10 \text{ GHz}$
Maximum distance between the measured points (geometric centre of the sensors) and the inner phantom surface (z_{M1} in Figure 20 in mm)	5 ± 1	$\delta \ln(2)/2 \pm 0,5^a$
Maximum spacing between adjacent measured points in mm (see O.8.3.1) ^b	20, or half of the corresponding zoom scan length, whichever is smaller	$60/f$, or half of the corresponding zoom scan length, whichever is smaller
Maximum angle between the probe axis and the phantom surface normal (α in Figure 20) ^c	5° (flat phantom only) 30° (other phantoms)	5° (flat phantom only) 20° (other phantoms)
Tolerance in the probe angle	1°	1°
^a δ is the penetration depth for a plane-wave incident normally on a planar half-space. ^b See Clause O.8 on how Δx and Δy may be selected for individual area scan requirements. ^c The probe angle relative to the phantom surface normal is restricted due to the degradation in the measurement accuracy in fields with steep spatial gradients. The measurement accuracy decreases with increasing probe angle and increasing frequency. This is the reason for the tighter probe angle restriction at frequencies above 3 GHz.		

8.6.3 Zoom Scan

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

Zoom Scan parameters measurement as below:

Parameter	DUT transmit frequency being tested	
	$f \leq 3 \text{ GHz}$	$3 \text{ GHz} < f \leq 10 \text{ GHz}$
Maximum distance between the closest measured points and the phantom surface (z_{M1} in Figure 20 and Table 3, in mm)	5	$\delta \ln(2)/2^a$
Maximum angle between the probe axis and the phantom surface normal (α in Figure 20)	5° (flat phantom only) 30° (other phantoms)	5° (flat phantom only) 20° (other phantoms)
Maximum spacing between measured points in the x - and y -directions (Δx and Δy , in mm)	8	$24/f^b$
For uniform grids: Maximum spacing between measured points in the direction normal to the phantom shell (Δz_1 in Figure 20, in mm)	5	$10/(f - 1)$
For graded grids: Maximum spacing between the two closest measured points in the direction normal to the phantom shell (Δz_1 in Figure 20, in mm)	4	$12/f$
For graded grids: Maximum incremental increase in the spacing between measured points in the direction normal to the phantom shell ($R_z = \Delta z_2/\Delta z_1$ in Figure 20)	1,5	1,5
Minimum edge length of the zoom scan volume in the x - and y -directions (L_z in O.8.3.2, in mm)	30	22
Minimum edge length of the zoom scan volume in the direction normal to the phantom shell (L_h in O.8.3.2 in mm)	30	22
Tolerance in the probe angle	1°	1°
^a δ is the penetration depth for a plane-wave incident normally on a planar half-space.		
^b This is the maximum spacing allowed, which might not work for all circumstances.		

8.6.4 Power Drift Measurement

The Power Drift Measurement job measures the field at the same location as the most recent power reference measurement job within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. Several drift measurements are possible for one reference measurement. This allows a user to monitor the power drift of the device under test that must remain within a maximum variation of $\pm 5\%$.

9 Test Equipment list

Manufacturer	Equipment Name	Model	Serial Number	Calibration Date	Due Date of calibration
SPEAG	Twin Phantom	SAM	2168	NCR	NCR
SPEAG	E-Field Probe	EX3DV4	7812	2026/01/19	2027/01/18
SPEAG	Data Acquisition Electronics	DAE4	1846	2026/01/07	2027/01/06
SPEAG	System Validation Kits	D2450V2	1099	2023/02/02	2026/02/01
SPEAG	System Validation Kits	D5GHzV2	1371	2023/02/03	2026/02/02
SPEAG	Dielectric parameter probes	DAK3.5	1341	2025/07/14	2026/07/13
Agilent	Network Analyzer	E5071B	MY42302220	2025/03/11	2026/03/10
Talent Microwave	Directional Coupler	TC-05180-10S	220420003	NCR	NCR
R&S	Signal Generator	SMR20	100648	2025/03/11	2026/03/10
QiJi	Preamplifier	YX28982302	TOWE-EQ-SR-020	NCR	NCR
QiJi	Preamplifier	YX28982301	TOWE-EQ-SR-021	NCR	NCR
R&S	Power Sensor	NRP-Z21	101651	2025/03/11	2026/03/10
R&S	Power Sensor	NRP-Z21	104189	2025/03/11	2026/03/10
HiSiDiKe	Thermometer	TP300	TOWE-EQ-SR-023	2025/03/12	2026/03/11
BingYu	Temperature and Humidity Indicator	HTC-1	TOWE-EQ-SR-024	2025/03/13	2026/03/12

Note:

1. Referring to KDB 865664 D01v01r04, the dipole calibration interval can be extended to 3 years with justification. The dipoles are also not physically damaged or repaired during the interval.
2. The justification data of dipole can be found in Appendix C. The return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration.

10 SAR measurement variability

SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue equivalent medium.

The following procedures are applied to determine if repeated measurements are required.

- 1) Repeated measurement is not required when the original highest measured SAR is < 0.80 or 2 W/kg (1-g or 10-g respectively); steps 2) through 4) do not apply.
- 2) When the original highest measured SAR is ≥ 0.80 or 2 W/kg (1-g or 10-g respectively), repeat that measurement once.
- 3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 or 3.6 W/kg ($\sim 10\%$ from the 1-g or 10-g respective SAR limit).
- 4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 or 3.75 W/kg (1-g or 10-g respectively) and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20

11 Description of Test Position

11.1 Exposure conditions

A typical example of a front-of-face device is a two-way radio that is held at a close distance from the face of the user while transmitting. Other devices that fall into this category include wireless-enabled still cameras and video cameras capable of sending data to a network or other device (Figure 11 a).

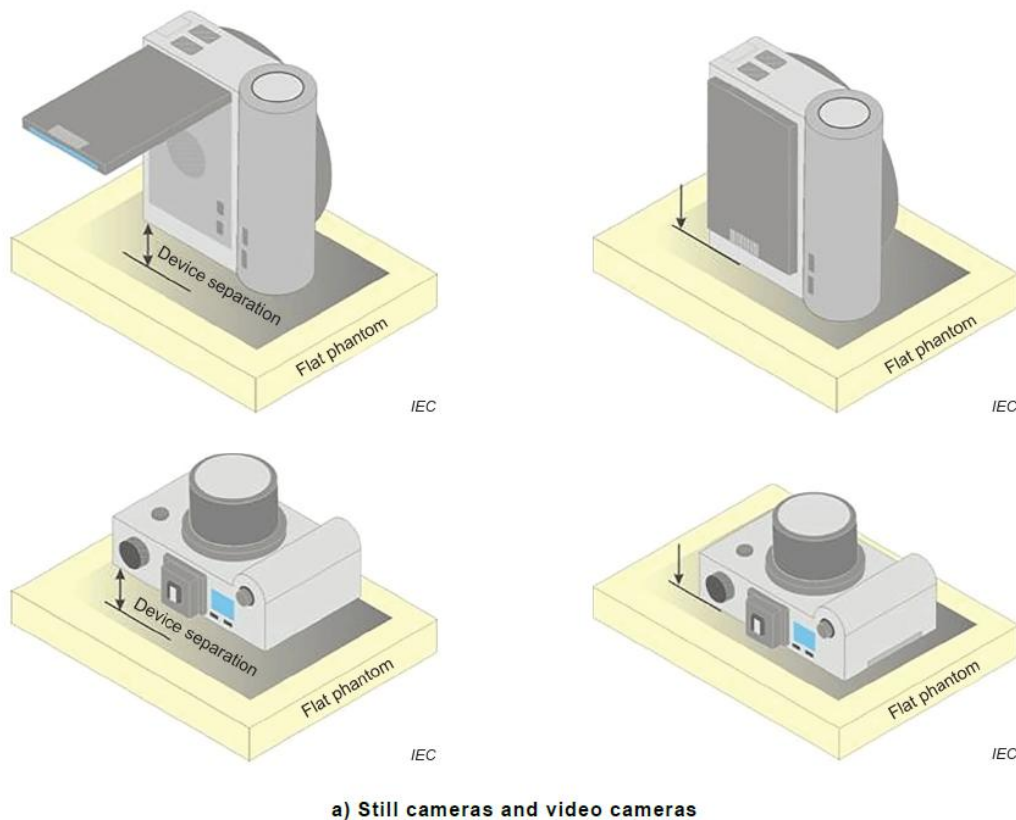


Figure 11: Test positions for front-of-face device

12 System Verification

12.1 Tissue Verification

The Conductivity (σ) and Permittivity (ρ) are listed in bellow table. The temperature variation of the Tissue Simulate Liquids was $22\pm 2^{\circ}\text{C}$, the liquid depth of the ear reference point or the flat phantom was at least 15 cm (which is shown in Figure 12-1).

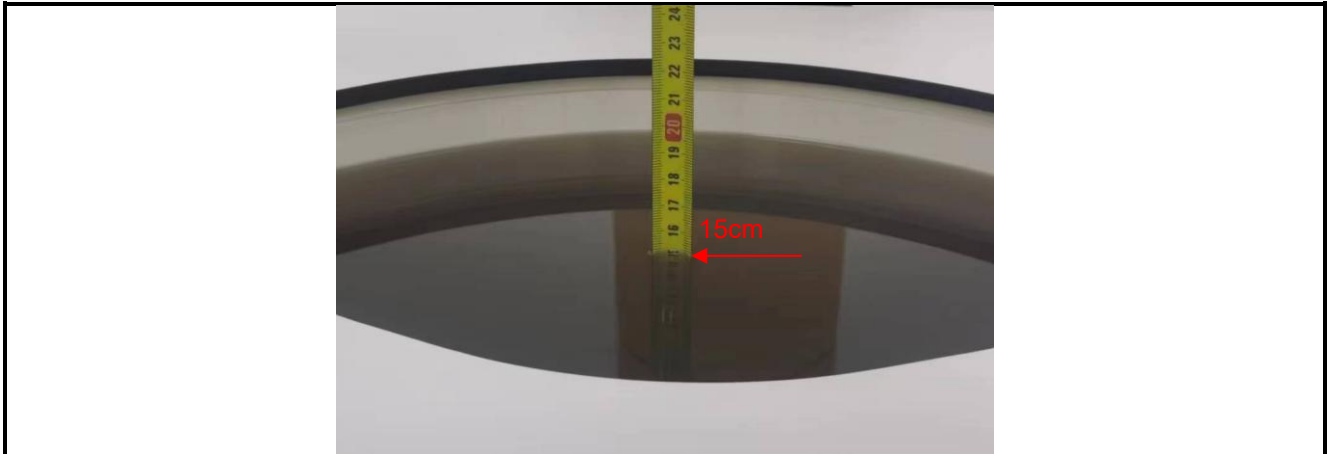


Figure 12-1 Liquid depth in the Flat Phantom

Frequency (MHz)	Tissue Type	Liquid Temp. ($^{\circ}\text{C}$)	Target Tissue		Measured Tissue		Deviation (Limit $\pm 5\%$)		Date
			Permittivity ϵ_r	Conductivity $\sigma(\text{S/m})$	Permittivity ϵ_r	Conductivity $\sigma(\text{S/m})$	$\Delta\epsilon_r$	$\Delta\sigma$	
2450	Head	21.9	39.20	1.80	39.900	1.820	1.79%	1.11%	2026/01/26
5200	Head	22.2	36.00	4.66	36.200	4.670	0.56%	0.21%	2026/01/26
5300	Head	22.2	35.90	4.76	36.200	4.770	0.84%	0.21%	2026/01/26
5600	Head	22.1	35.50	5.07	35.200	5.130	-0.85%	1.18%	2026/01/27
5800	Head	22.2	35.30	5.27	35.100	5.300	-0.57%	0.57%	2026/01/27

Table 1: Measurement Tissue Parameters

12.2 SAR System Check

Prior to SAR assessment, a SAR system Check measurement was performed to see if the measured SAR was within $\pm 10\%$ from the target SAR values. The System Performance Check Setup in Figure 12-3.

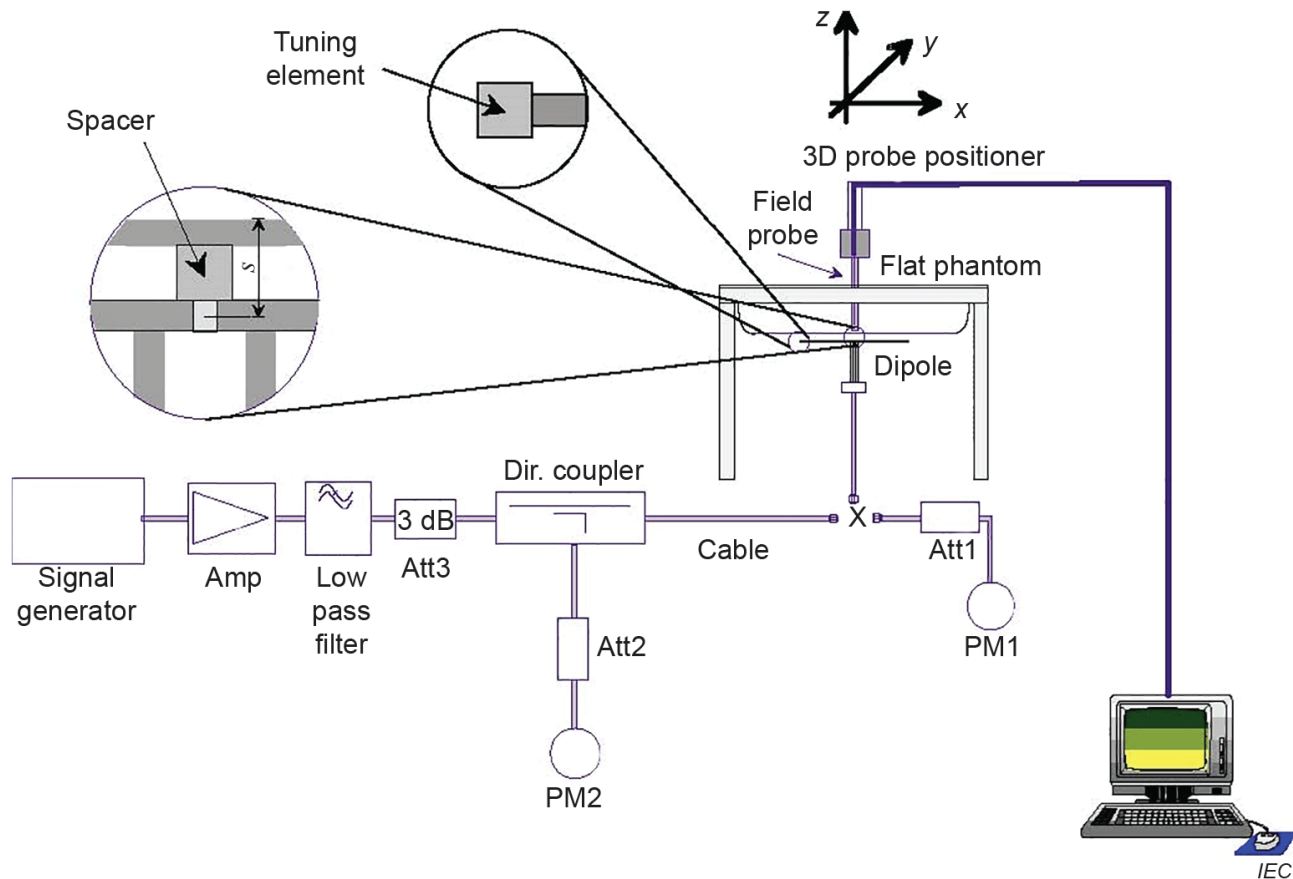


Figure 12-3 System Performance Check Setup

12.2.1 System Check Result

Frequency (MHz)	Tissue Type	Dipole	S/N	Target SAR (1W)		Measured SAR (100mW)		Measured SAR (normalized to 1W)		Deviation (Limit $\pm 10\%$)		Date
				1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	$\Delta 1g$	$\Delta 10g$	
2450	Head	D2450V2	1099	51.40	23.90	5.28	2.49	52.80	24.90	2.72%	4.18%	2026/01/26
5200	Head	D5GHzV2	1371	78.90	22.40	8.04	2.35	80.40	23.50	1.90%	4.91%	2026/01/26
5300	Head	D5GHzV2	1371	80.90	23.10	8.39	2.43	83.90	24.30	3.71%	5.19%	2026/01/26
5600	Head	D5GHzV2	1371	82.30	23.30	8.30	2.38	83.00	23.80	0.85%	2.15%	2026/01/27
5800	Head	D5GHzV2	1371	79.80	22.40	7.58	2.17	75.80	21.70	-5.01%	-3.13%	2026/01/27

Table 2: SAR System Check Result

12.2.2 Detailed System Check Result

Please see Appendix A

13 SAR General Measurement Procedures

13.1 SAR Testing with 802.11 Transmitters

The normal network operating configurations of 802.11 transmitters are not suitable for SAR measurements. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure the results are consistent and reliable. See KDB Publication 248227 D01 for more details.

A Wi-Fi device must be configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools for SAR measurement.

For WiFi SAR testing, a communication link is set up with some command for WiFi mode test. During the test, at the each test frequency channel, the EUT is operated at the RF continuous emission mode. Per KDB248227 D01, a minimum transmission duty factor of 85% is required to avoid certain hardware and device implementation issues related to wide range SAR scaling. The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

13.1.1 Initial Test Position Procedure

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. The initial test position procedure is described in the following:

1. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other (remaining) test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band. SAR is also not required for that exposure configuration in the subsequent test configuration(s).
2. When the reported SAR of the initial test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position using subsequent highest extrapolated or estimated 1-g SAR conditions determined by area scans or next closest/smallest test separation distance and maximum RF coupling test positions based on manufacturer justification, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg or all required test positions (left, right, touch, tilt or subsequent surfaces and edges) are tested.
3. For all positions/configurations tested using the initial test position and subsequent test positions, 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. a) Additional power measurements may be required for this step, which should be limited to those necessary for identifying the subsequent highest output power channels.

13.1.2 Initial Test Configuration Procedure

An initial test configuration is determined for OFDM transmission modes according to the channel bandwidth, modulation and data rate combination(s) with the highest maximum output power specified for production units in each standalone and aggregated frequency band. SAR is measured using the highest measured maximum output power channel. For configurations with the same specified or measured maximum output power, additional transmission mode and test channel selection procedures are required. SAR test reduction for subsequent highest output test channels is determined according to reported SAR of the initial test configuration.

For next to the ear, hotspot mode and UMC mini-tablet exposure configurations where multiple test positions are required, the initial test position procedure is applied to minimize the number of test positions required for SAR measurement using the initial test configuration transmission mode. For fixed exposure conditions that do not have multiple SAR test positions, SAR is measured in the transmission mode determined by the initial test configuration.

When the reported SAR of the initial test configuration is > 0.8 W/kg, SAR measurement is required for subsequent next highest measured output power channel(s) in the initial test configuration until reported SAR is ≤ 1.2 W/kg or all required channels are tested.

13.1.3 Subsequent Test Configuration Procedures

For OFDM configurations in each frequency Band and aggregated Band, SAR is evaluated for initial test configuration using the fixed test position or the initial test position on procedure. When the highest reported SAR (for the initial test configuration), adjusted by the ratio of the specified maximum output power of the subsequent test configuration to initial test configuration, is ≤ 1.2 W/kg for 1g SAR and ≤ 3.0 W/kg for 10g SAR, no additional SAR tests for the subsequent test configurations are required.

13.1.4 2.4 GHz SAR Procedures

Separate SAR procedures are applied to DSSS and OFDM configurations in the 2.4 GHz band to simplify DSSS test requirements. For 802.11b DSSS SAR measurements, DSSS SAR procedure applies to fixed exposure test position and initial test position procedure applies to multiple exposure test positions.

A) 802.11b DSSS SAR Test Requirements

SAR is measured for 2.4 GHz 802.11b DSSS using either a fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:

1. When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS is that exposure configuration.
2. When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

B) 2.4 GHz 802.11g/n OFDM SAR Test Exclusion Requirements

When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied (section 5.3 of of KDB248227 D01). SAR is not required for the following 2.4 GHz OFDM conditions.

1. When KDB Publication 447498 SAR test exclusion applies to the OFDM configuration.
2. When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

C) SAR Test Requirements for OFDM configurations

When SAR measurement is required for 802.11 g/n OFDM configurations, each standalone and frequency aggregated band is considered separately for SAR test reduction. In applying the initial test configuration and subsequent test configuration procedures, the 802.11 transmission configuration with the highest specified maximum output power and the channel within a test configuration with the highest measured maximum output power should be clearly distinguished to apply the procedures.

13.1.5 5 GHz SAR Procedures

13.1.5.1 U-NII-1 and U-NII-2A Bands

For devices that operate in only one of the U-NII-1 and U-NII-2A bands, the normally required SAR procedures for OFDM configurations are applied. For devices that operate in both U-NII bands using the same transmitter and antenna(s), SAR test reduction is determined according to the following:

- 1) When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. If the highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band for that configuration (802.11 mode and exposure condition); otherwise, both bands are tested independently for SAR.
- 2) When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration; otherwise, both bands are tested independently for SAR.
- 3) The two U-NII bands may be aggregated to support a 160 MHz channel on channel number 50. Without additional testing, the maximum output power for this is limited to the lower of the maximum output power certified for the two bands. When SAR measurement is required for at least one of the bands and the highest reported SAR adjusted by the ratio of specified maximum output power of aggregated to standalone band is > 1.2 W/kg, SAR is required for the 160 MHz channel. This procedure does not apply to an aggregated band with maximum output higher than the standalone band(s); the aggregated band must be tested independently for SAR. SAR is not required when the 160 MHz channel is operating at a reduced maximum power and also qualifies for SAR test exclusion.

13.1.5.2 U-NII-2C and U-NII-3 Bands

The frequency range covered by these bands is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. When Terminal Doppler Weather Radar (TDWR) restriction applies, all channels that operate at 5.60 – 5.65 GHz must be included to apply the SAR test reduction and measurement procedures.

When the same transmitter and antenna(s) are used for U-NII-2C band and U-NII-3 band or 5.8 GHz band of §15.247, the bands may be aggregated to enable additional channels with 20, 40 or 80 MHz bandwidth to span across the band gap, as illustrated in Appendix B. The maximum output power for the additional band gap channels is limited to the lower of those certified for the bands. Unless band gap channels are permanently disabled, they must be considered for SAR testing. The frequency range covered by these bands is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. To maintain SAR measurement accuracy and to facilitate test reduction, the channels in U-NII-2C band above 5.65 GHz may be grouped with the 5.8 GHz channels in U-NII-3 or §15.247 band to enable two SAR probe calibration frequency points to cover the bands, including the band gap channels. When band gap channels are supported and the bands are not aggregated for SAR testing, band gap channels must be considered independently in each band according to the normally required OFDM SAR measurement and probe calibration frequency points requirements.

13.1.6 OFDM Transmission Mode and SAR Test Channel Selection

When the same maximum output power was specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration with the largest channel bandwidth, lowest order modulation and lowest data rate. When the maximum output power of a channel is the same for equivalent OFDM configurations; for example, 802.11a, 802.11n and 802.11ac or 802.11g and 802.11n with the same channel bandwidth, modulation and data rate etc., the lower order 802.11 mode i.e., 802.11a, then 802.11n and 802.11ac or 802.11g then 802.11n, is used for SAR measurement. When the maximum output power are the same for multiple test channels, either according to the default or additional power measurement requirements, SAR is measured using the channel closest to the middle of the frequency band or aggregated band. When there are multiple channels with the same maximum output power, SAR is measured using the higher number channel.

13.1.7 MIMO SAR Considerations

Per KDB 248227 D01, the simultaneous SAR provisions in KDB 447498 D01v06 should be applied to determine simultaneous transmission SAR test exclusion for WIFI MIMO. If the sum of 1g single transmission chain SAR measurements is < 1.6 W/kg, no additional SAR measurements for MIMO are required. Alternatively, SAR for MIMO can be measured with all antennas transmitting simultaneously at the specified maximum output power of MIMO operation.

14 Conducted Power

Band	Mode	Channel	Frequency (MHz)	RU#+Index#	Power level setting	Conducted Power (dBm)	Tune-up Power (Conducted)	SAR Test
WIFI 2.4G	802.11b	1	2412	/	15	16.27	17.00	Yes
		6	2437	/	15	15.94		Yes
		11	2462	/	15	15.71		Yes
	802.11g	1	2412	/	17	17.29	18.00	No
		6	2437	/	17	17.18		No
		11	2462	/	17	17.47		No
	802.11n HT20	1	2412	/	17	17.57	18.00	No
		6	2437	/	17	17.87		No
		11	2462	/	16	16.71		No
	802.11n HT40	3	2422	/	15	15.47	17.00	No
		6	2437	/	16	16.26		No
		9	2452	/	12	12.55	13.00	No
	802.11ax HE20	1	2412	26RU0	9	10.66	11.00	No
				52RU37	11	12.23	13.00	No
				106RU53	14	15.27	17.00	No
				242RU61	15	15.62	17.00	No
		6	2437	26RU4	9	10.64	11.00	No
				52RU38	11	12.26	13.00	No
				106RU53	14	15.14	17.00	No
				242RU61	16	16.48	17.00	No
		11	2462	26RU8	9	10.13	11.00	No
				52RU40	11	11.91	13.00	No
				106RU54	15	16.15	17.00	No
				242RU61	15	15.76	17.00	No
	802.11ax HE40	3	2422	26RU0	7	7.69	9.00	No
				52RU37	12	12.36	13.00	No
				106RU53	15	15.14	17.00	No
				242RU61	16	16.47	17.00	No
				484RU65	14	14.86	15.00	No
		6	2437	26RU8	7	8.91	9.00	No
				52RU40	11	12.21	13.00	No
				106RU54	15	16.00	17.00	No
				242RU61	16	16.53	17.00	No
				484RU65	16	16.57	17.00	No
		9	2452	26RU17	7	7.60	9.00	No
				52RU44	12	12.57	13.00	No
				106RU56	15	15.32	17.00	No
				242RU62	16	16.36	17.00	No
				484RU65	13	13.40	15.00	No
WIFI 5G U-NII-1	802.11a	36	5180	/	14	14.27	15.00	No
	802.11a	40	5200	/	14	14.18		No
	802.11a	48	5240	/	14	13.38		No
	802.11n HT20	36	5180	/	14	14.29	15.00	No
	802.11n HT20	40	5200	/	14	14.09		No
	802.11n HT20	48	5240	/	14	13.46		No
	802.11n HT40	38	5190	/	11	12.08	13.00	No
	802.11n HT40	46	5230	/	11	12.08		No
	802.11ac VHT20	36	5180	/	14	14.24	15.00	No
	802.11ac VHT20	40	5200	/	14	14.04		No
	802.11ac VHT20	48	5240	/	14	13.44		No
	802.11ac VHT40	38	5190	/	12	13.45	14.00	No

	802.11ac VHT40	46	5230	/	12	12.57		No
	802.11ac VHT80	42	5210	/	12	13.38	15.00	Yes
	802.11ax HE20	36	5180	26RU0	8	8.98	9.00	No
				52RU37	10	11.25	12.00	No
				106RU53	14	14.28	15.00	No
				242RU61	14	14.27	15.00	No
		40	5200	26RU4	8	8.97	9.00	No
				52RU38	10	10.61	12.00	No
				106RU53	14	14.03	15.00	No
				242RU61	14	14.22	15.00	No
		48	5240	26RU8	4	3.95	5.00	No
				52RU40	7	7.44	8.00	No
				106RU54	11	11.43	12.00	No
				242RU61	14	13.27	15.00	No
	802.11ax HE40	38	5190	26RU0	7	7.70	8.00	No
				52RU37	10	10.66	11.00	No
				106RU53	14	14.25	15.00	No
				242RU61	13	13.17	14.00	No
		46	5230	484RU65	10	10.28	11.00	No
				26RU17	4	3.60	4.00	No
				52RU44	7	7.29	8.00	No
				106RU56	11	11.11	12.00	No
	802.11ax HE80	42	5210	242RU62	13	12.52	14.00	No
				484RU65	10	10.40	11.00	No
				26RU0	4	3.79	4.00	No
				52RU37	7	7.25	8.00	No
				106RU53	10	10.58	12.00	No
				242RU61	13	13.45	14.00	No
WIFI 5G U-NII-2A	802.11a	52	5260	/	13	13.54	14.00	No
								No
								No
		56	5280	/	14	14.55	15.00	Yes
								Yes
								Yes
		64	5320	/	14	14.14	12.00	No
								No
								No
		52	5260	/	14	14.48	15.00	No
								No
								No
	802.11ax HE20	52	5260	802.11ac VHT20	52	5260	12.00	No
				802.11ac VHT20	56	5280		No
				802.11ac VHT20	64	5320		No
				802.11ac VHT40	54	5270		No
		56	5280	802.11ac VHT40	62	5310	12.00	No
				26RU4	3	4.37		No
				52RU38	6	7.02		No
				106RU53	10	11.06		No
		64	5320	242RU61	13	13.61		No
				26RU8	3	3.95		No
				52RU40	6	7.48		No
				106RU54	10	10.83		No

	802.11ax HE40	54	5270	242RU61	13	13.46	14.00	No
				26RU0	3	3.86	5.00	No
				52RU37	5	6.01	7.00	No
				106RU53	8	9.11	10.00	No
				242RU61	13	13.85	14.00	No
				484RU65	10	10.41	11.00	No
		62	5310	26RU17	4	4.94	5.00	No
				52RU44	7	8.24	9.00	No
				106RU56	10	11.10	12.00	No
				242RU62	13	13.38	14.00	No
				484RU65	10	10.49	11.00	No
	802.11ax HE80	58	5290	26RU36	0	0.80	1.00	No
				52RU52	3	4.11	5.00	No
				106RU60	7	7.67	8.00	No
				242RU64	9	9.58	10.00	No
				484RU66	9	9.91	10.00	No
				996RU67	8	8.46	10.00	No
WIFI 5G U-NII-2C	802.11a	100	5500	/	14	13.81	15.00	No
	802.11a	116	5580	/	14	14.07		No
	802.11a	140	5700	/	9	9.93	11.00	No
	802.11a	144	5720	/	9	10.19		No
	802.11n HT20	100	5500	/	14	13.80	15.00	No
	802.11n HT20	116	5580	/	14	14.02		No
	802.11n HT20	140	5700	/	13	13.22		No
	802.11n HT20	144	5720	/	13	13.28		No
	802.11n HT40	102	5510	/	11	10.86	11.00	No
	802.11n HT40	110	5550	/	14	14.04	15.00	No
	802.11n HT40	134	5670	/	14	13.66		No
	802.11n HT40	142	5710	/	14	14.57		No
	802.11ac VHT20	100	5500	/	15	14.76	15.00	No
	802.11ac VHT20	116	5580	/	15	14.38		No
	802.11ac VHT20	140	5700	/	13	13.23		No
	802.11ac VHT20	144	5720	/	13	13.35		No
	802.11ac VHT40	102	5510	/	11	10.83	11.00	No
	802.11ac VHT40	110	5550	/	14	14.11	15.00	No
	802.11ac VHT40	134	5670	/	14	13.73		No
	802.11ac VHT40	142	5710	/	14	13.78		No
	802.11ac VHT80	106	5530	/	11	10.57	11.00	No
	802.11ac VHT80	122	5610	/	13	13.21	14.00	No
	802.11ac VHT80	138	5690	/	13	13.64		No
	802.11ax HE20	100	5500	26RU0	3	3.38	5.00	No
				52RU37	5	5.77	6.00	No
				106RU53	8	8.96	10.00	No
				242RU61	14	13.73	14.00	No
		116	5580	26RU4	3	3.86	5.00	No
				52RU38	5	5.71	6.00	No
				106RU53	8	8.59	10.00	No
				242RU61	14	13.85	14.00	No
		140	5700	26RU8	3	4.12	5.00	No
				52RU40	7	8.09	9.00	No
				106RU54	10	10.91	12.00	No
				242RU61	10	10.49	12.00	No
		144	5720	26RU8	3	3.81	5.00	No
				52RU40	7	8.45	9.00	No
				106RU54	10	11.23	12.00	No

	802.11ax HE40	102	5510	242RU61	10	10.78	12.00	No
				26RU0	3	2.58	4.00	No
				52RU37	7	7.00	8.00	No
				106RU53	8	8.55	9.00	No
				242RU61	14	13.71	14.00	No
				484RU65	8	8.75	9.00	No
		110	5550	26RU8	3	3.75	4.00	No
				52RU40	6	6.99	8.00	No
				106RU54	8	8.54	9.00	No
				242RU61	14	13.86	14.00	No
				484RU65	8	7.69	9.00	No
		134	5670	26RU17	2	2.71	4.00	No
				52RU44	6	6.71	8.00	No
				106RU56	8	8.76	9.00	No
				242RU62	13	13.51	14.00	No
				484RU65	11	11.01	12.00	No
		142	5710	26RU17	2	2.91	4.00	No
				52RU44	6	6.95	8.00	No
				106RU56	8	8.75	9.00	No
				242RU62	13	13.71	14.00	No
				484RU65	11	10.82	12.00	No
	802.11ax HE80	106	5530	26RU0	3	2.25	3.00	No
				52RU37	6	5.35	6.00	No
				106RU53	8	7.51	8.00	No
				242RU61	14	13.75	14.00	Yes
				484RU65	11	10.20	11.00	No
				996RU67	9	9.69	11.00	No
		122	5610	26RU8	5	5.17	6.00	No
				52RU40	8	8.58	9.00	No
				106RU54	11	11.50	12.00	No
				242RU61	15	14.66	16.00	No
				484RU65	15	14.63	16.00	No
				996RU67	15	15.03	16.00	Yes
		138	5690	26RU36	5	5.85	6.00	No
				52RU52	8	8.78	9.00	No
				106RU60	11	11.26	12.00	No
				242RU64	15	15.30	16.00	No
				484RU66	15	15.05	16.00	No
				996RU67	15	15.40	16.00	Yes
WIFI 5G U-NII-3	802.11a	149	5745	/	9	9.00	10.00	No
	802.11a	157	5785	/	9	8.95		No
	802.11a	165	5825	/	9	9.15		No
	802.11n HT20	149	5745	/	9	9.37		No
	802.11n HT20	157	5785	/	9	9.44		No
	802.11n HT20	165	5825	/	9	9.47		No
	802.11n HT40	151	5755	/	9	9.17		No
	802.11n HT40	159	5795	/	9	9.07		No
	802.11ac VHT20	149	5745	/	9	9.32		No
	802.11ac VHT20	157	5785	/	9	9.33		No
	802.11ac VHT20	165	5825	/	9	9.42		No
	802.11ac VHT40	151	5755	/	9	9.20		No
	802.11ac VHT40	159	5795	/	9	9.12		No
	802.11ac VHT80	155	5775	/	9	9.58		Yes
	802.11ax HE20	149	5745	26RU0	9	8.76	10.00	No
				52RU37	9	9.05		No

				106RU53	9	9.40		No
				242RU61	9	8.88		No
		157	5785	26RU4	9	9.19		No
				52RU38	9	9.32		No
				106RU53	9	9.30		No
				242RU61	9	9.26		No
				26RU8	8	8.05		No
		165	5825	52RU40	8	8.40		No
				106RU54	8	8.76		No
				242RU61	8	8.29		No
	802.11ax HE40	151	5755	26RU0	10	8.83	9.00	No
				52RU37	10	9.36	9.50	No
				106RU53	10	9.75	9.80	No
				242RU61	10	9.80	10.00	No
				484RU65	9	8.74	10.00	No
		159	5795	26RU17	8	7.06	9.00	No
				52RU44	8	7.59	9.50	No
				106RU56	8	7.92	9.80	No
				242RU62	8	8.45	10.00	No
				484RU65	8	8.22	10.00	No
	802.11ax HE80	155	5775	26RU0	8	6.09	8.00	No
				52RU37	8	6.51	8.00	No
				106RU53	8	6.99	8.00	No
				242RU61	8	7.40	8.00	No
				484RU65	8	7.47	8.00	No
				996RU67	8	8.07	9.00	No

Band	Mode	Frequency (MHz)	Power level setting	Conducted Power (dBm)	Tune up (dBm)
BR/EDR	DH5 (GFSK)	2402	0	7.06	8.00
		2441	0	6.50	
		2480	0	6.56	
	2DH5 ($\pi/4$ DQPSK)	2402	0	0.52	2.00
		2441	0	0.84	
		2480	0	1.19	
	3DH5 ((8DPSK))	2402	0	0.54	
		2441	0	0.86	
		2480	0	1.23	
BLE 1M	BLE (GFSK)	2402	/	6.63	7.00
		2440	/	6.70	
		2480	/	6.73	
BLE 2M	BLE (GFSK)	2402	/	6.89	
		2440	/	6.88	
		2480	/	6.87	

15 SAR Data Summary

General Notes:

- 1) The Highest measured SAR Plot refer to Appendix B.
- 2) Per KDB 447498 D01, testing of other required channels within the operating mode of a frequency band is not required when the reported 1g or 10g SAR for the mid-band or highest output power channel is:
 - $\leq 0.8\text{W/kg}$ for 1g or 2.0W/kg for 10g respectively, when the transmission band is $\leq 100\text{MHz}$.
 - $\leq 0.6\text{ W/kg}$ or 1.5 W/kg , for 1g or 10g respectively, when the transmission band is between 100 MHz and 200MHz.
 - $\leq 0.4\text{ W/kg}$ or 1.0 W/kg , for 1g or 10g respectively, when the transmission band is $\geq 200\text{MHz}$.
- 3) For Extremity 10g SAR is required only for the surfaces and edges with the 1g SAR $> 1.2\text{ W/kg}$.

15.1 SAR Measurement Result of WIFI 2.4G

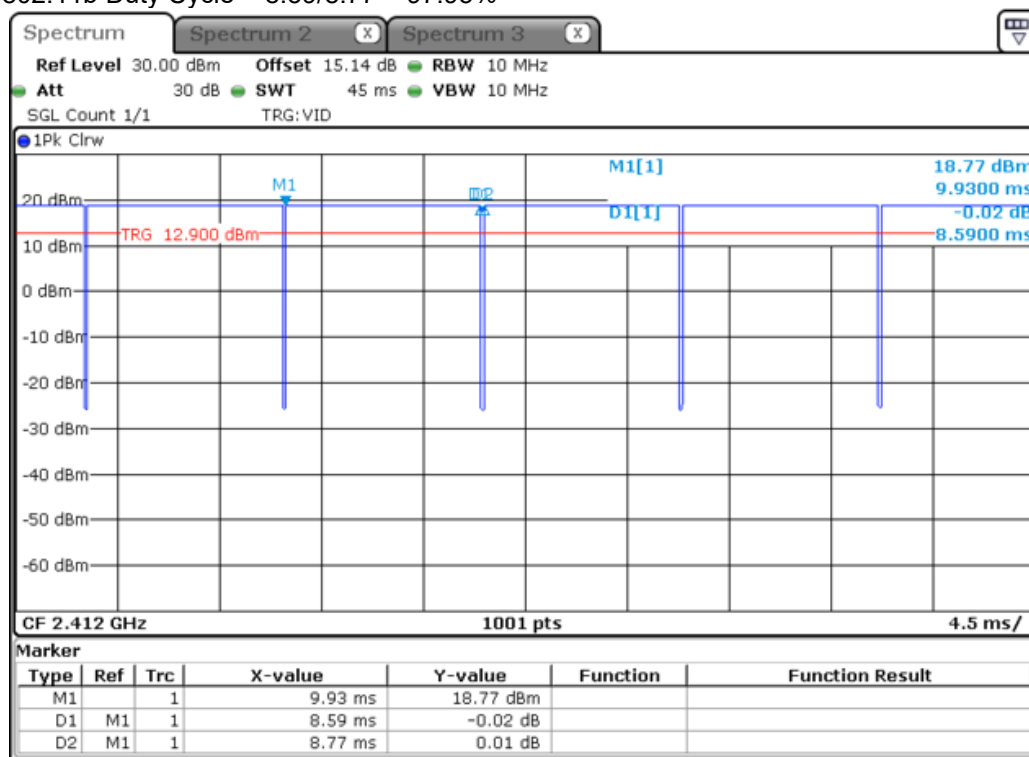
RF Exposure Conditions	Test position	Mode	Ch./Freq. (MHz)	SAR (W/kg) 1-g	Duty Cycle	Duty Cycle Scaling Factor	Conducted Power (dBm)	Tune up Limit (dBm)	Scaling Factor	Reported 1g SAR (W/kg)
WIFI 2.4G 10mm										
Head/Body	Front side	802.11b	1/2412	0.041	97.95%	1.021	16.27	17.00	1.183	0.050
Head/Body	Back side	802.11b	1/2412	0.032	97.95%	1.021	16.27	17.00	1.183	0.039
Head/Body	Left side	802.11b	1/2412	<0.001	97.95%	1.021	16.27	17.00	1.183	<0.001
Head/Body	Right side	802.11b	1/2412	0.241	97.95%	1.021	16.27	17.00	1.183	0.291
Head/Body	Top side	802.11b	1/2412	0.076	97.95%	1.021	16.27	17.00	1.183	0.092
Head/Body	Bottom side	802.11b	1/2412	<0.001	97.95%	1.021	16.27	17.00	1.183	<0.001
Head/Body	Right side	802.11b	6/2437	0.279	97.95%	1.021	15.94	17.00	1.276	0.364
Head/Body	Right side	802.11b	11/2462	0.368	97.95%	1.021	15.71	17.00	1.346	0.506

Table 3: SAR of WIFI 2.4G.

When the highest reported SAR for the initial test configuration is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR test for the other 802.11 modes are not required.

Mode	Tune-up (dBm)	Tune-up (mw)	Highest Reported SAR1-g(W/kg)	Adjusted SAR1-g(W/kg)	SAR test
802.11b	17.00	50.12	0.506	/	Yes
802.11g	18.00	63.10	/	0.637	No
802.11n 20M	18.00	63.10	/	0.637	No
802.11n 40M	17.00	50.12	/	0.506	No
802.11ax 20M	17.00	50.12	/	0.506	No
802.11ax 40M	17.00	50.12	/	0.506	No

802.11b Duty Cycle = $8.59/8.77 = 97.95\%$

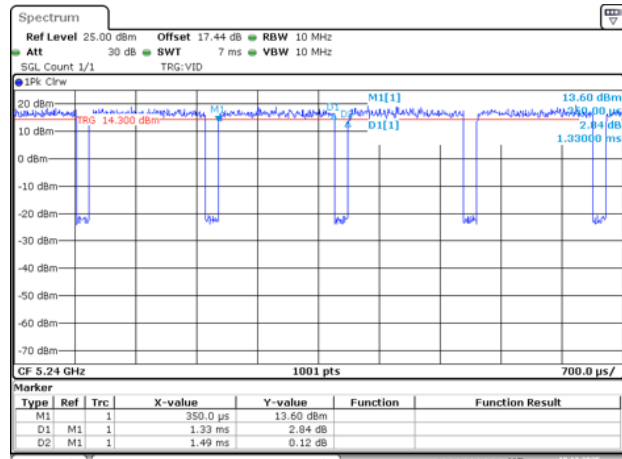
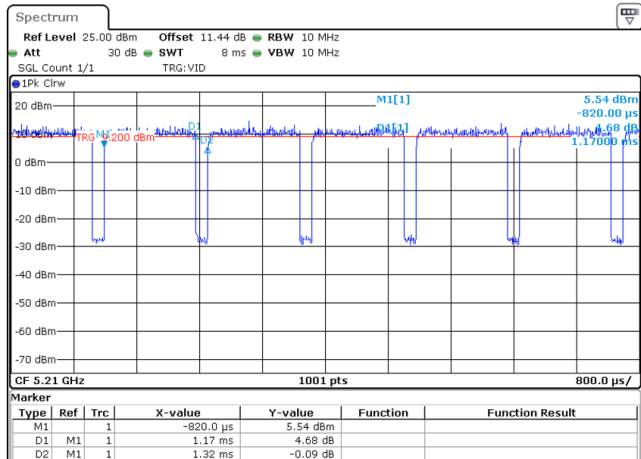
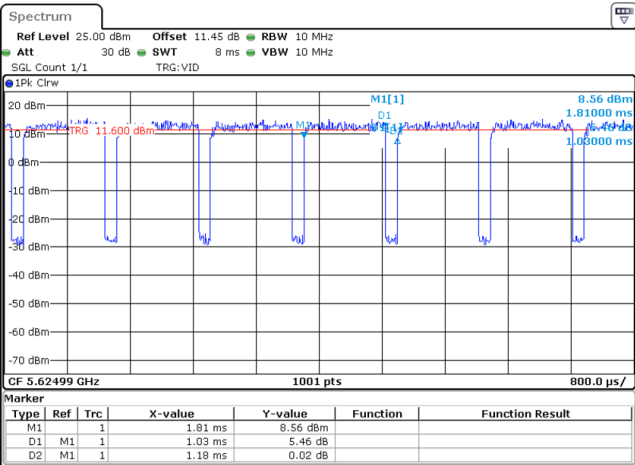


15.2 SAR Measurement Result of WIFI 5G

RF Exposure Conditions	Test position	Mode	Ch./Freq. (MHz)	SAR (W/kg) 1-g	Duty Cycle	Duty Cycle Scaling Factor	Conducted Power (dBm)	Tune up Limit (dBm)	Scaling Factor	Reported 1g SAR (W/kg)
U-NII-1 10mm										
Head/Body	Front side	802.11ac VHT80	42/5210	0.097	88.64%	1.128	13.38	15.00	1.452	0.159
Head/Body	Rear side	802.11ac VHT80	42/5210	0.124	88.64%	1.128	13.38	15.00	1.452	0.203
Head/Body	Left side	802.11ac VHT80	42/5210	0.103	88.64%	1.128	13.38	15.00	1.452	0.169
Head/Body	Right side	802.11ac VHT80	42/5210	0.267	88.64%	1.128	13.38	15.00	1.452	0.437
Head/Body	Top side	802.11ac VHT80	42/5210	0.178	88.64%	1.128	13.38	15.00	1.452	0.292
Head/Body	Bottom side	802.11ac VHT80	42/5210	0.044	88.64%	1.128	13.38	15.00	1.452	0.072
U-NII-2A 10mm										
Head/Body	Front side	802.11n HT20	52/5260	0.163	89.26%	1.120	14.55	15.00	1.109	0.202
Head/Body	Rear side	802.11n HT20	52/5260	0.073	89.26%	1.120	14.55	15.00	1.109	0.091
Head/Body	Left side	802.11n HT20	52/5260	0.053	89.26%	1.120	14.55	15.00	1.109	0.066
Head/Body	Right side	802.11n HT20	52/5260	0.397	89.26%	1.120	14.55	15.00	1.109	0.493
Head/Body	Top side	802.11n HT20	52/5260	0.080	89.26%	1.120	14.55	15.00	1.109	0.099
Head/Body	Bottom side	802.11n HT20	52/5260	0.064	89.26%	1.120	14.55	15.00	1.109	0.080
Head/Body	Right side	802.11n HT20	56/5280	0.325	89.26%	1.120	14.31	15.00	1.172	0.427
Head/Body	Right side	802.11n HT20	64/5320	0.339	89.26%	1.120	14.14	15.00	1.219	0.463
U-NII-2C 10mm										
Head/Body	Front side	802.11ax HE80	138/5690	0.136	87.29%	1.146	15.40	16.00	1.148	0.179
Head/Body	Rear side	802.11ax HE80	138/5690	0.789	87.29%	1.146	15.40	16.00	1.148	1.038
Head/Body	Left side	802.11ax HE80	138/5690	0.205	87.29%	1.146	15.40	16.00	1.148	0.270
Head/Body	Right side	802.11ax HE80	138/5690	0.981	87.29%	1.146	15.40	16.00	1.148	1.291
Head/Body	Right side Repeated	802.11ax HE80	138/5690	0.965	87.29%	1.146	15.40	16.00	1.148	1.270
Head/Body	Top side	802.11ax HE80	138/5690	0.246	87.29%	1.146	15.40	16.00	1.148	0.324
Head/Body	Bottom side	802.11ax HE80	138/5690	0.073	87.29%	1.146	15.40	16.00	1.148	0.096
Head/Body	Back side	802.11ax HE80	106/5530	0.443	87.29%	1.146	13.75	14.00	1.059	0.538
Head/Body	Back side	802.11ax HE80	122/5610	0.653	87.29%	1.146	15.03	16.00	1.250	0.936
Head/Body	Right side	802.11ax HE80	106/5530	0.466	87.29%	1.146	13.75	14.00	1.059	0.566
Head/Body	Right side	802.11ax HE80	122/5610	0.867	87.29%	1.146	15.03	16.00	1.250	1.242
U-NII-3 10mm										
Head/Body	Front side	802.11ac VHT80	155/5775	0.086	88.64%	1.128	9.58	10.00	1.102	0.107
Head/Body	Rear side	802.11ac VHT80	155/5775	0.078	88.64%	1.128	9.58	10.00	1.102	0.097
Head/Body	Left side	802.11ac VHT80	155/5775	0.070	88.64%	1.128	9.58	10.00	1.102	0.087
Head/Body	Right side	802.11ac VHT80	155/5775	0.222	88.64%	1.128	9.58	10.00	1.102	0.276
Head/Body	Top side	802.11ac VHT80	155/5775	0.122	88.64%	1.128	9.58	10.00	1.102	0.152
Head/Body	Bottom side	802.11ac VHT80	155/5775	0.045	88.64%	1.128	9.58	10.00	1.102	0.056
RF Exposure Conditions	Test position	Mode	Ch./Freq. (MHz)	SAR (W/kg) 10-g	Duty Cycle	Duty Cycle Scaling Factor	Conducted Power (dBm)	Tune up Limit (dBm)	Scaling Factor	Reported 10g SAR (W/kg)
U-NII-2C 0mm										
Extremity	Right side	802.11ax HE80	138/5690	0.562	87.29%	1.146	15.40	16.00	1.148	0.739
Extremity	Right side	802.11ax HE80	106/5530	0.322	87.29%	1.146	13.75	14.00	1.059	0.391
Extremity	Right side	802.11ax HE80	122/5610	0.540	87.29%	1.146	15.03	16.00	1.250	0.774

Table 4: SAR of WIFI 5G.

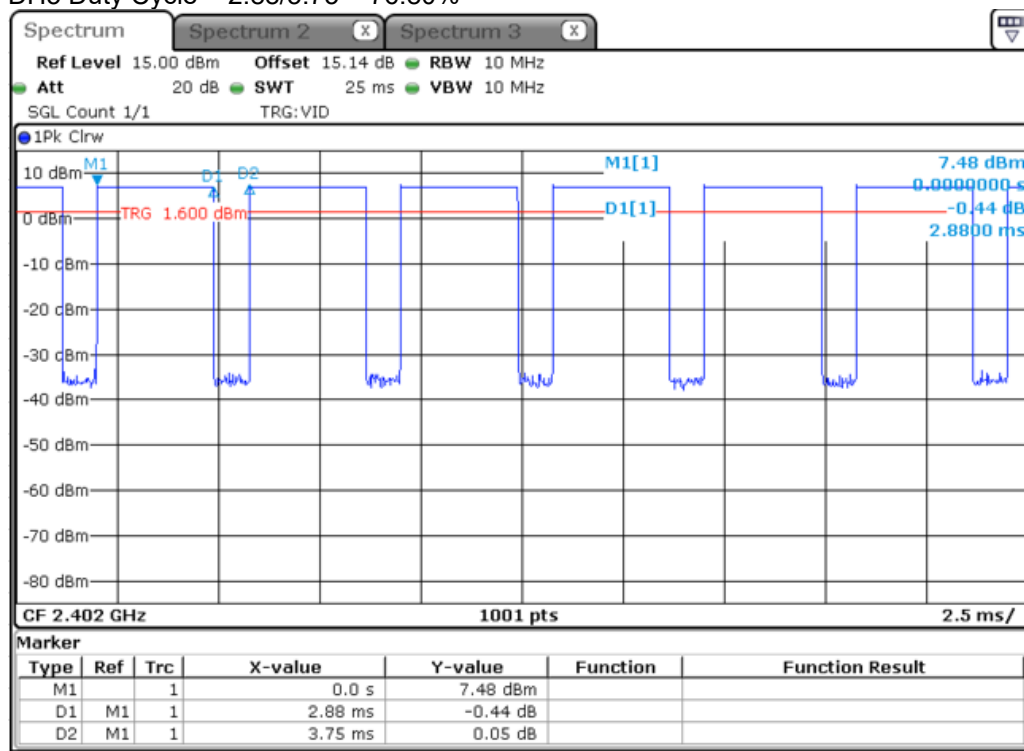
Test Position	Channel/ Frequency (MHz)	Measured SAR (1g)	1 st Repeated SAR (1g)	Ratio	2 nd Repeated SAR (1g)	3 rd Repeated SAR (1g)
Right side	138/5690	0.981	0.965	1.017	N/A	N/A
Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.						
2) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurement was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg ($\sim 10\%$ from the 1-g SAR limit).						
3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .						
4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg						

802.11n 20M Duty Cycle = $1.33/1.49 = 89.26\%$ 802.11ac 80M Duty Cycle = $1.17/1.32 = 88.64\%$ 802.11ax 80M Duty Cycle = $1.03/1.18 = 87.29\%$ 

15.3 SAR Measurement Result of BT

RF Exposure Conditions	Test position	Mode	Ch./Freq. (MHz)	SAR (W/kg) 1-g	Duty Cycle	Duty Cycle Scaling Factor	Conducted Power (dBm)	Tune up Limit (dBm)	Scaling Factor	Reported 1g SAR (W/kg)
BT 10mm										
Head/Body	Front side	DH5	0/2402	0.009	76.80%	1.302	7.06	8.00	1.242	0.015
Head/Body	Rear side	DH5	0/2402	0.014	76.80%	1.302	7.06	8.00	1.242	0.023
Head/Body	Left side	DH5	0/2402	0.004	76.80%	1.302	7.06	8.00	1.242	0.006
Head/Body	Right side	DH5	0/2402	0.031	76.80%	1.302	7.06	8.00	1.242	0.050
Head/Body	Top side	DH5	0/2402	0.005	76.80%	1.302	7.06	8.00	1.242	0.008
Head/Body	Bottom side	DH5	0/2402	0.002	76.80%	1.302	7.06	8.00	1.242	0.003
Head/Body	Right side	DH5	39/2441	0.037	76.80%	1.302	6.50	8.00	1.413	0.068
Head/Body	Right side	DH5	78/2480	0.029	76.80%	1.302	6.56	8.00	1.393	0.053

Table 5: SAR of BT.

DH5 Duty Cycle = $2.88/3.75 = 76.80\%$ 

16 Simultaneous Transmission Analysis

The Simultaneous Transmission Possibilities of this device are as below:

NO.	Simultaneous TX Combination	
1	WIFI 2.4G + BT	No
2	WIFI 5G + BT	No
3	WIFI 2.4G + WIFI 5G	No

17 Measurement Uncertainty

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 $\leq 30\%$, 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.

18 Calibration Certificate

Please see the Appendix C

19 Test Setup Photos

Please see the Appendix D

Appendix A: System Check Plots

Appendix B: SAR Test Plots

Appendix C: Calibration certificate

Appendix D: Test Setup Photos

--- The End ---