SAR EVALUATION REPORT

FCC 47 CFR § 2.1093
IEEE Std. 1528-2013

For
IEEE 802.11 2X2 MIMO a/b/g/n/ac Wireless LAN + Bluetooth + NFC NGFF Module

FCC ID: TLZ-CM389NF
Model Name: AW-CM389NF

Report Number: 4788808986.2-SAR-2

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Revision History

Rev.	Date	Revisions	Revised By
V1.0	January 14, 2019	Initial Issue	\
V2.0	January 30, 2019	Report revised based in Reviewer's comments: 1. Sec. 6: Added module dimension information. 2. Sec. 9: Updated the diagram. 3. Sec. 8: Added the Wi-Fi duty cycle reference report NO. 4. Sec. 11: Deleted the SAR result of rear screen surface. 5. Updated the power table and corresponding SAR result table	James Qin

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1. Attestation of Test Results

Applicant Name	AzureWave Technologies, Inc.
Address	8 F., No. 94, Baozhong Rd., Xindian, Taipei, Taiwan 231
EUT Name	IEEE 802.11 2X2 MIMO a/b/g/n/ac Wireless LAN + Bluetooth + NFC NGFF Module
Model Name	AW-CM389NF
Sample Status	Normal
Brand Name	AzureWave
Host Equipment	Notebook Computer
Brand Name	Lenovo
Host Model	Lenovo 300e Chromebook 2nd Gen MTK, 81QC
Sample Received Date	December 23, 2018
Date of Tested	January 2, 2019 to January 30, 2019
Applicable Standards	FCC 47 CFR § 2.1093 IEEE Std. 1528-2013 KDB publication

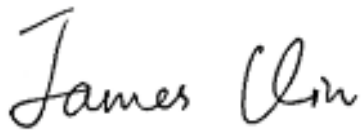
SAR Limits (W/Kg)

Exposure Category	Peak spatial-average(1g of tissue)	Extremities (hands, wrists, ankles, etc.) (10g of tissue)
General population / Uncontrolled exposure	1.6	4

The Highest Reported SAR (W/kg)

RF Exposure Conditions	Equipment Class		
	DTS	**U-NII**	**DSS**
Body (1-g)	0.129	1.055	0.148
Simultaneous Transmission (1-g)	1.569		
Test Results	Pass		

Prepared By:



James Qin
Engineer Project Associate

Approved By:

Stephen Guo
Laboratory Manager

2. Test Specification, Methods and Procedures

The tests documented in this report were performed in accordance with IEEE Std. 1528-2013, the following FCC Published RF exposure KDB procedures:

- 248227 D01 802.11 Wi-Fi SAR
- 447498 D01 General RF Exposure Guidance
- 690783 D01 SAR Listings on Grants
- 865664 D01 SAR measurement 100 MHz to 6 GHz
- 865664 D02 RF Exposure Reporting
- 616217 D04 SAR for laptop and tablets

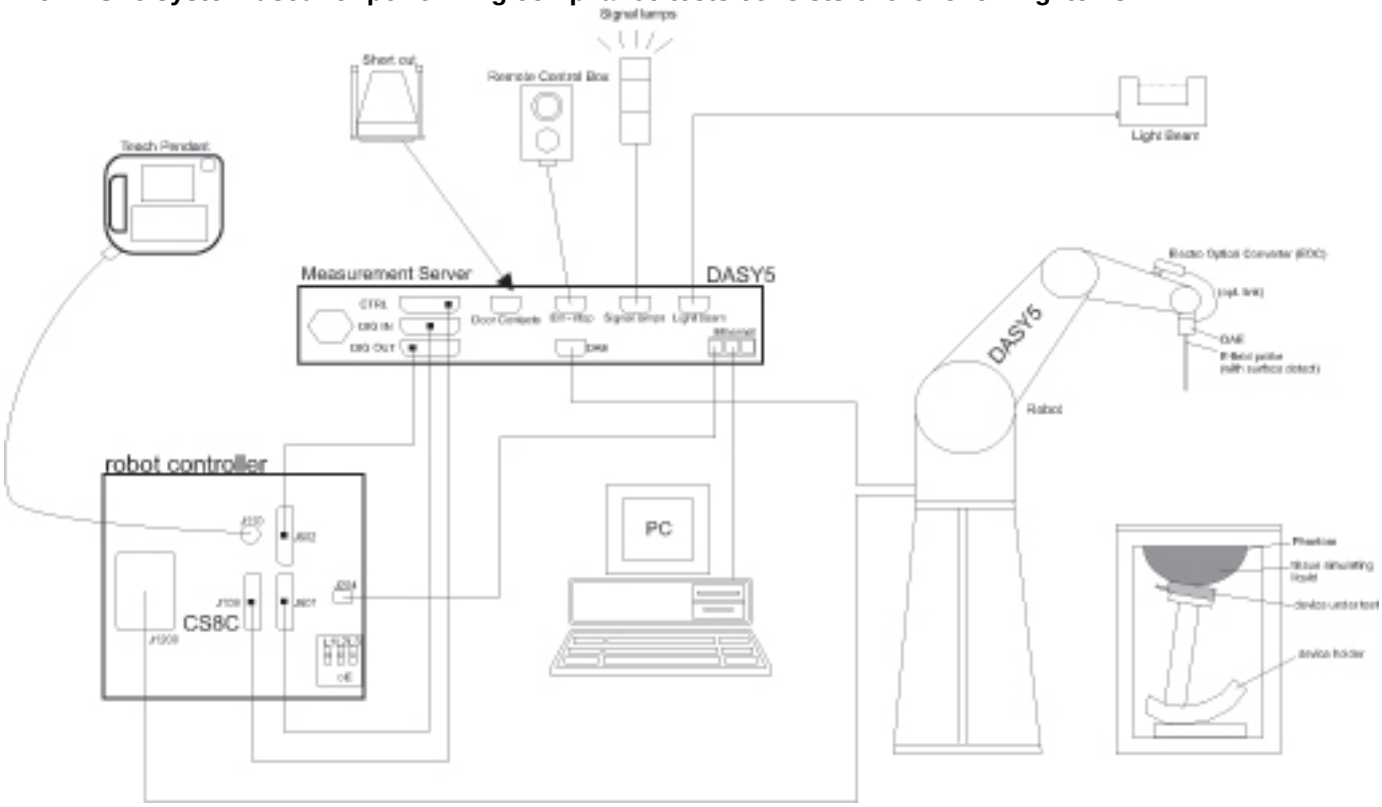
3. Facilities and Accreditation

Test Location	UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch.
Address	Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China
Accreditation Certificate	**A2LA (Certificate No.: 4102.01)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch has been assessed and proved to be in compliance with A2LA. **FCC (FCC Recognized No.: CN1187)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules **IC(Company No.: 21320)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch has been registered and fully described in a report filed with Industry Canada. The Company Number is 21320. **VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch has been assessed and proved to be in compliance with VCCI, the Membership No. is 3793. Facility Name: Chamber D, the VCCI registration No. is G-20019 and R-20004 Shielding Room B , the VCCI registration No. is C-20012 and T-20011
Description	All measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China

4. SAR Measurement System & Test Equipment

4.1. SAR Measurement System

The DASY5 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 and the DASY52 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.

4.2. SAR Scan Procedures

Step 1: 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. The minimum distance of probe sensors to surface is 2.1 mm. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

Step 2: 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 locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in dB) 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 KDB 865664 D01 v01r04 SAR Measurement 100 MHz to 6 GHz

<table>
<tr><td></td><td>≤ 3 GHz</td><td>> 3 GHz</td></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>

Step 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 extracted from KDB 865664 D01 v01r04 SAR Measurement 100 MHz to 6 GHz

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

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

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

Step 4: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement 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. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

Step 5: Z-Scan (FCC only)

The Z Scan measures points along a vertical straight line. The line runs along the Z-axis of a one-dimensional grid. In order to get a reasonable extrapolation the extrapolated distance should not be greater than the step size in Z-direction.

4.3. Test Equipment

The measuring equipment used to perform the tests documented in this report has been calibrated in accordance with the manufacturers' recommendations, and is traceable to recognized national standards.

	Name of equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
☒	ENA Network Analyzer	Keysight	E5080A	MY55100583	December 10, 2019
☒	Dielectric Assessment Kit	SPEAG	SM DAK 040 SA	1155	NCR
☒	DC power supply	Keysight	E36103A	MY55350020	December 10, 2019
☒	Signal Generator	Rohde & Schwarz	SME06	837633\001	December 10, 2019
☒	BI-Directional Coupler	WERLATONE	C8060-102	3423	December 10, 2019
☒	Peak and Average Power Sensor	Keysight	E9323A	MY55440013	December 10, 2019
☒	Peak and Average Power Sensor	Keysight	E9323A	MY55420006	December 10, 2019
☒	Dual Channel PK Power Meter	Keysight	N1912A	MY55416024	December 10, 2019
☒	Amplifier	CORAD TECHNOLOGY LTD	AMF-4D-00400600-50-30P	1983561	NCR
□	Base Station Simulator	Rohde & Schwarz	CMW500	155523	December 10, 2019
☒	Dosimetric E-Field Probe	SPEAG	EX3DV4	7383	December 19, 2019
☒	Data Acquisition Electronic	SPEAG	DAE3	427	December 11, 2019
□	Dipole Kit 750 MHz	SPEAG	D750V3	1153	December 6, 2021
□	Dipole Kit 835 MHz	SPEAG	D835V2	4d206	December 5, 2021
□	Dipole Kit 900 MHz	SPEAG	D900V2	1d190	December 5, 2021
□	Dipole Kit 1800 MHz	SPEAG	D1800V2	2d212	December 6, 2021
□	Dipole Kit 1900 MHz	SPEAG	D1900V2	5d212	December 7, 2021
□	Dipole Kit 2300 MHz	SPEAG	D2300V2	1065	December 4, 2021
☒	Dipole Kit 2450 MHz	SPEAG	D2450V2	977	December 4, 2021
□	Dipole Kit 2600 MHz	SPEAG	D2600V2	1117	December 7, 2021
☒	Dipole Kit 5 GHz	SPEAG	D5GHzV2	1231	December 14, 2021
☒	Software	SPEAG	DASY52	N/A	NCR
☒	Twin Phantom	SPEAG	SAM V5.0	1805	NCR
□	ELI Phantom	SPEAG	ELI V5.0	1235	NCR
☒	Thermometer	Control Company	4242	150709653	December 6, 2019
☒	Hygrometer	\	GX-138	\	September 5, 2019

Note:

1) As per KDB865664D01 requirements for dipole calibration, the test laboratory has adopted three-year extended calibration interval. Each measured dipole is expected to evaluate with the following criteria at least on annual interval in Appendix C.
   a) There is no physical damage on the dipole;
   b) System check with specific dipole is within 10% of calibrated value;
   c) The most recent return-loss result, measured at least annually, deviates by no more than 20% from the previous measurement.
   d) The most recent measurement of the real or imaginary parts of the impedance, measured at least annually is within 5Ω from the previous measurement.
2) Dielectric assessment kit is calibrated against air, distilled water and a shorting block performed before measuring liquid parameters.
3) NCR is short for “No Calibration Requirement”.

5. Measurement Uncertainty

Per KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz, 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.

6. Device Under Test (DUT) Information

6.1. DUT Description

The DUT is a wireless module with IEEE 802.11a/b/g/n/ac, and BT radio.	
DUT dimension	Overall (Length x Width x Height): 16mm x 11mm x 1.5mm
Host information	Overall (Length x Width x Height): 290 mm x 204mm x 20.35 Note: The host supports tablet use conditions, there are two different pair of antenna assembled into the host, one is SKU-3 (NDX), another is SKU-4 (INPAQ).

6.2. Wireless Technology

Wireless technology	Frequency band
Wi-Fi	2.4 GHz
Wi-Fi	5 GHz
BT	2.4 GHz

7. SAR Test Configuration

As per KDB 616217 D04, when antennas are incorporated in the screen section of a laptop computer, SAR is required for the bottom surface of the keyboard. Provided tablet use conditions are not supported by the laptop computer, SAR tests for bystander exposure from the edges of the keyboard and display screen of laptop computers are generally not required.

7.1. Wi-Fi Test Configuration

For Wi-Fi SAR testing, a communication link is set up with the testing software for Wi-Fi mode test. During the test, at the each test frequency channel, the EUT is operated at the RF continuous emission mode. The test procedures in KDB 248227D01 are applied.

7.1.1. Initial Test Position Procedure

For exposure condition with multiple test position, such as handsets operating next to the ear, devices with hotspot mode or UMPC mini-tablet, procedures for initial test position can be applied. Using the transmission mode determined by the DSSS procedure or initial test configuration, area scans are measured for all position in an exposure condition. The test position with the highest extrapolated (peak) SAR is used as the initial test position. When reported SAR for the initial test position is ≤ 0.4W/kg, no additional testing for the remaining test position is required. Otherwise, SAR is evaluated at the subsequent highest peak SAR position until the reported SAR result is ≤ 0.8W/kg or all test position are measured. 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.

7.1.2. 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 (see section 5.3.2 of KDB 248227D01). SAR test reduction of subsequent highest output test channels is based on the 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 the subsequent next highest measured output power channel(s) in the initial test configuration until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

7.1.3. Sub Test Configuration Procedure

SAR measurement requirements for the remaining 802.11 transmission mode configurations that have not been tested in the initial test configuration are determined separately for each standalone and aggregated frequency band, in each exposure condition, according to the maximum output power specified for production units.

When the highest reported SAR for the initial test configuration, according to the initial test position or fixed exposure position requirements, 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 is not required for that subsequent test configuration.

7.1.4. 2.4GHz Wi-Fi SAR Test 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 (section 3.1 of KDB 248227D01) for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in 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) 2.4GHz 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 KDB 248227D01). 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.

7.1.5. 5GHz Wi-Fi SAR Test Procedures

A) 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.

B) 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.

C) OFDM Transmission Mode SAR Test Configuration and Channel Selection Requirements

The initial test configuration for 5 GHz OFDM transmission modes is determined by the 802.11 configuration with the highest maximum output power specified for production units, including tune-up tolerance, in each standalone and aggregated frequency band. SAR for the initial test configuration is measured using the highest maximum output power channel determined by the default power measurement procedures. When multiple configurations in a frequency band have the same specified maximum output power, the initial test configuration is determined according to the following steps applied sequentially.

1) The largest channel bandwidth configuration is selected among the multiple configurations with the same specified maximum output power.
2) If multiple configurations have the same specified maximum output power and largest channel bandwidth, the lowest order modulation among the largest channel bandwidth configurations is selected.
3) If multiple configurations have the same specified maximum output power, largest channel bandwidth and lowest order modulation, the lowest data rate configuration among these configurations is selected. When multiple transmission modes (802.11a/g/n/ac) have the same specified maximum output power, largest channel bandwidth, lowest order modulation and lowest data rate, the lowest order 802.11 mode is selected; i.e., 802.11a is chosen over 802.11n then 802.11ac or 802.11g is chosen over 802.11n.

After an initial test configuration is determined, if multiple test channels have the same measured maximum output power, the channel chosen for SAR measurement is determined according to the following. These channel selection procedures apply to both the initial test configuration and subsequent test configuration(s), with respect to the default power measurement procedures or additional power measurements required for further SAR test reduction. The same procedures also apply to subsequent highest output power channel(s) selection.

1) The channel closest to mid-band frequency is selected for SAR measurement.
2) For channels with equal separation from mid-band frequency; for example, high and low channels

D) SAR Test Requirements for OFDM configurations

When SAR measurement is required for 802.11 a/n/ac OFDM configurations, each standalone and frequency aggregated band is considered separately for SAR test reduction. When the same transmitter and antenna(s) are used for U-NII-1 and U-NII-2A bands, additional SAR test reduction applies. When band gap channels between U-NII-2C band and 5.8 GHz U-NII-3 or §15.247 band are supported, the highest maximum output power transmission mode configuration and maximum output power channel across the bands must be used to determine SAR test reduction, according to the initial test configuration and subsequent test configuration requirements. 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.

8. Conducted Output Power Measurement

General note:

1) As per KDB 447498 sec.4.1.d) at the maximum rated output power and within the tune-up tolerance range specified for the product, but not more than 2 dB lower than the maximum tune-up tolerance limit.
2) NM is short for “Not Measured”

8.1. Power measurement result of 2.4GHz Wi-Fi.

Mode	Channel	Frequency (MHz)	Data Rate	Average Power of Main ANT (dBm)	Average Power of Aux ANT (dBm)	SUM	SAR Test
802.11b	1	2412	1Mbps	12.45	12.46	15.47	Required
	6	2437		12.39	12.35	15.38	
	11	2462		10.26	10.39	13.34	
802.11g	1	2412	6Mbps	NM	NM	NM	Excluded
	6	2437		NM	NM	NM	
	11	2462		NM	NM	NM	
802.11n-HT20	1	2412	MCS0	NM	NM	NM	Excluded
	6	2437		NM	NM	NM	
	11	2462		NM	NM	NM	
802.11n-HT40	3	2422	MCS0	NM	NM	NM	Excluded
	6	2437		NM	NM	NM	
	9	2452		NM	NM	NM	

8.2. Power measurement result of 5GHz Wi-Fi (U-NII-1).

Mode	Channel	Frequency (MHz)	Data Rate	Average Power of Main ANT (dBm)	Average Power of Aux ANT (dBm)	SUM	SAR Test
802.11a	36	5180	6Mbps	NM	NM	NM	Excluded
	40	5200		NM	NM	NM	
	44	5220		NM	NM	NM	
	48	5240		NM	NM	NM	
802.11n-HT20	36	5180	MCS0	NM	NM	NM	Excluded
	40	5200		NM	NM	NM	
	44	5220		NM	NM	NM	
	48	5240		NM	NM	NM	
802.11n-HT40	38	5190	MCS0	NM	NM	NM	Excluded
	46	5230		NM	NM	NM	
802.11ac-VHT20	36	5180	MCS0	NM	NM	NM	Excluded
	40	5200		NM	NM	NM	
	44	5220		NM	NM	NM	
	48	5240		NM	NM	NM	
802.11ac-VHT40	38	5190	MCS0	NM	NM	NM	Excluded
	46	5230		NM	NM	NM	
802.11ac-VHT80	42	5210	MCS0	NM	NM	NM	Excluded

8.3. Power measurement result of 5GHz Wi-Fi (U-NII-2A).

Mode	Channel	Frequency (MHz)	Data Rate	Average Power of Main ANT (dBm)	Average Power of Aux ANT (dBm)	SUM	SAR Test
802.11a	52	5260	6Mbps	12.73	12.84	15.80	Required
	56	5280		13.00	12.95	15.99	
	60	5300		12.86	12.68	15.78	
	64	5320		12.68	12.61	15.66	
802.11n-HT20	52	5260	MCS0	NM	NM	NM	Excluded
	56	5280		NM	NM	NM	
	60	5300		NM	NM	NM	
	64	5320		NM	NM	NM	
802.11n-HT40	54	5270	MCS0	NM	NM	NM	Excluded
	62	5310		NM	NM	NM	
802.11ac-VHT20	52	5260	MCS0	NM	NM	NM	Excluded
	56	5280		NM	NM	NM	
	60	5300		NM	NM	NM	
	64	5320		NM	NM	NM	
802.11ac-VHT40	54	5270	MCS0	NM	NM	NM	Excluded
	62	5310		NM	NM	NM	
802.11ac-VHT80	58	5290	MCS0	NM	NM	NM	Excluded

8.4. Power measurement result of 5GHz Wi-Fi (U-NII-2C).

Mode	Channel	Frequency (MHz)	Data Rate	Average Power of Main ANT (dBm)	Average Power of Aux ANT (dBm)	SUM	SAR Test
802.11a	100	5500	6Mbps	12.58	12.41	15.51	Required
	104	5520		12.37	12.56	15.48	
	108	5540		12.47	12.68	15.59	
	112	5560		12.49	12.76	15.64	
	116	5580		12.65	12.88	15.78	
	120	5600		12.41	12.69	15.56	
	124	5620		12.47	12.81	15.65	
	128	5640		12.77	12.91	15.85	
	132	5660		12.68	12.93	15.82	
	136	5680		12.98	12.99	16.00	
	140	5700		12.81	12.98	15.91	
802.11n-HT20	100	5500	MCS0	NM	NM	NM	Excluded
	104	5520		NM	NM	NM	
	108	5540		NM	NM	NM	
	112	5560		NM	NM	NM	
	116	5580		NM	NM	NM	
	120	5600		NM	NM	NM	
	124	5620		NM	NM	NM	
	128	5640		NM	NM	NM	
	132	5660		NM	NM	NM	
	136	5680		NM	NM	NM	
	140	5700		NM	NM	NM	
802.11n-HT40	102	5510	MCS0	NM	NM	NM	Excluded
	110	5550		NM	NM	NM	
	118	5590		NM	NM	NM	
	126	5630		NM	NM	NM	
	134	5670		NM	NM	NM	
802.11ac-VHT20	100	5500	MCS0	NM	NM	NM	Excluded
	104	5520		NM	NM	NM	
	108	5540		NM	NM	NM	
	112	5560		NM	NM	NM	
	116	5580		NM	NM	NM	
	120	5600		NM	NM	NM	
	124	5620		NM	NM	NM	
	128	5640		NM	NM	NM	
	132	5660		NM	NM	NM	
	136	5680		NM	NM	NM	
	140	5700		NM	NM	NM	
802.11ac-VHT40	102	5510	MCS0	NM	NM	NM	Excluded
	110	5550		NM	NM	NM	
	118	5590		NM	NM	NM	
	126	5630		NM	NM	NM	
	134	5670		NM	NM	NM	
802.11ac-VHT80	106	5530	MCS0	NM	NM	NM	Excluded
	122	5610		NM	NM	NM	

	138	5690		NM	NM	NM	

8.5. Power measurement result of 5GHz Wi-Fi (U-NII-3) for Main ANT.

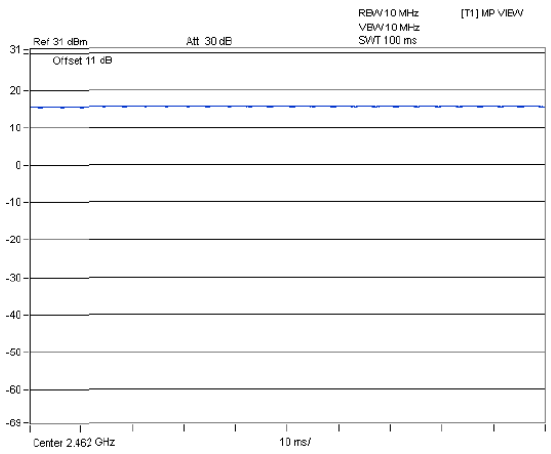
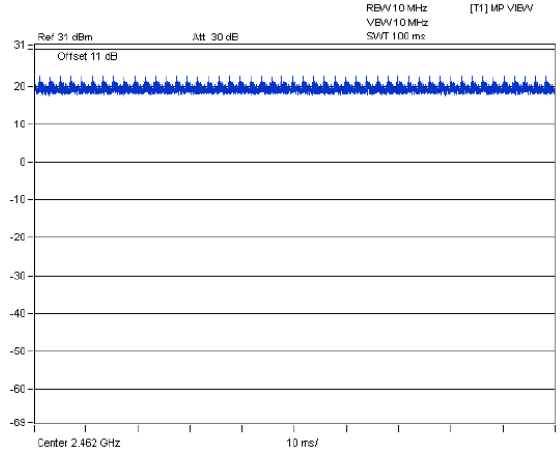
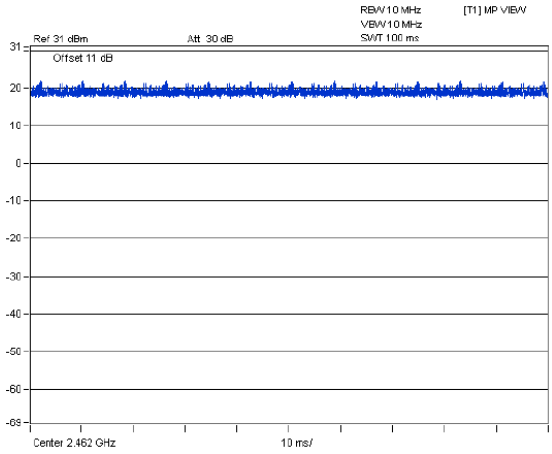
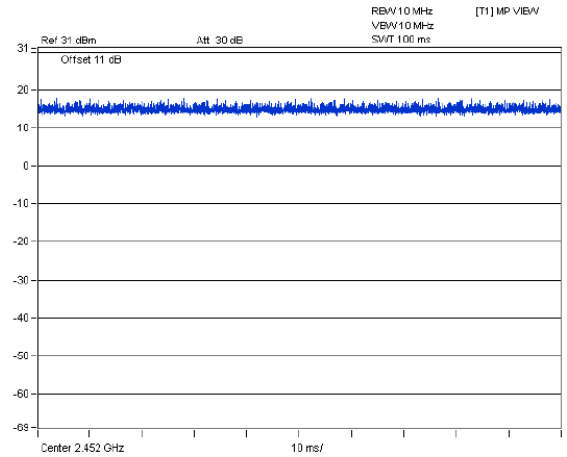
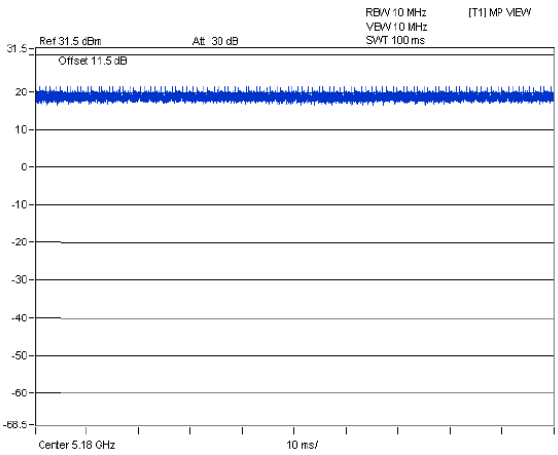
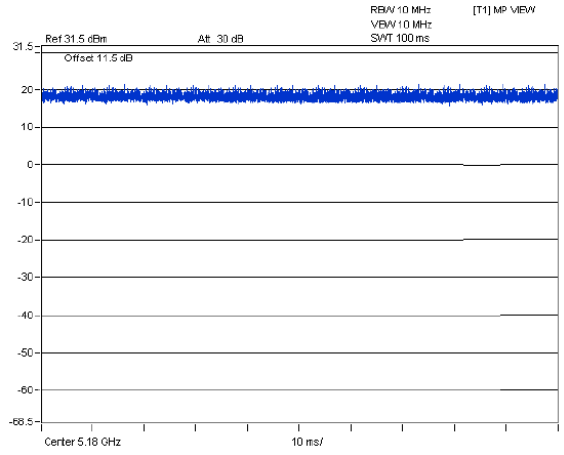
Mode	Channel	Frequency (MHz)	Data Rate	Average Power of Main ANT (dBm)	Average Power of Aux ANT (dBm)	SUM	SAR Test
802.11a	149	5745	6Mbps	14.36	14.39	17.39	Required
	153	5765		14.45	14.41	17.44	
	157	5785		14.48	14.29	17.40	
	161	5805		14.47	14.21	17.35	
	165	5825		14.42	13.85	17.15	
802.11n-HT20	149	5745	MCS0	NM	NM	NM	Excluded
	153	5765		NM	NM	NM	
	157	5785		NM	NM	NM	
	161	5805		NM	NM	NM	
	165	5825		NM	NM	NM	
802.11n-HT40	151	5755	MCS0	NM	NM	NM	Excluded
	159	5795		NM	NM	NM	
802.11ac-VHT20	149	5745	MCS0	NM	NM	NM	Excluded
	153	5765		NM	NM	NM	
	157	5785		NM	NM	NM	
	161	5805		NM	NM	NM	
	165	5825		NM	NM	NM	
802.11ac-VHT40	151	5755	MCS0	NM	NM	NM	Excluded
	159	5795		NM	NM	NM	
802.11ac-VHT80	155	5775	MCS0	NM	NM	NM	Excluded

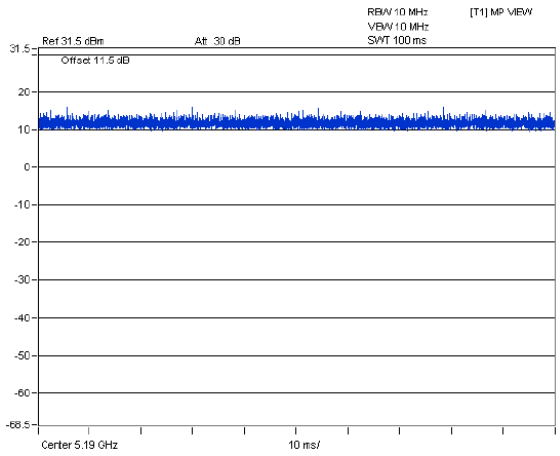
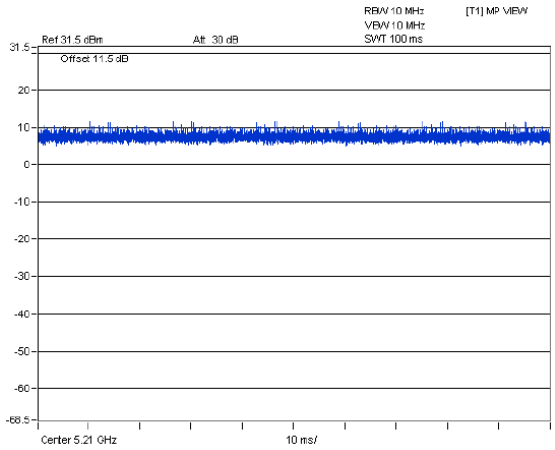
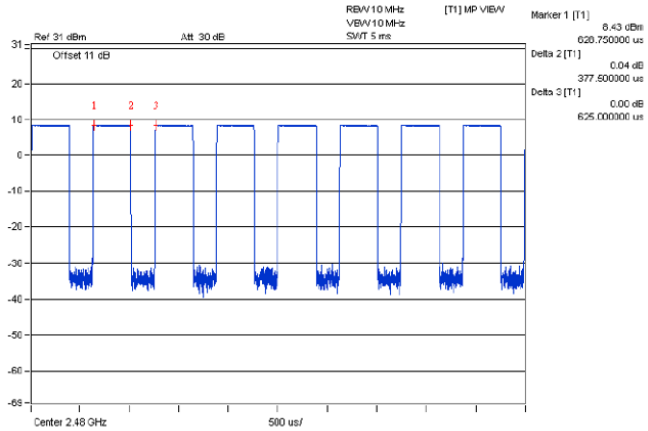
8.6. Power measurement result BT

Band	Mode	Antenna	Average Conducted Power (dBm)			Tune-up
			0CH	39CH	78CH	
2.4G	DH5	Aux	9.13	8.91	8.65	10.0
	3DH5	Aux	5.89	5.91	5.95	6.0

Band	Mode	Antenna	Average Conducted Power (dBm)			Tune-up
			0CH	19CH	39CH	
2.4G	BLE	Aux	8.65	8.73	8.59	9

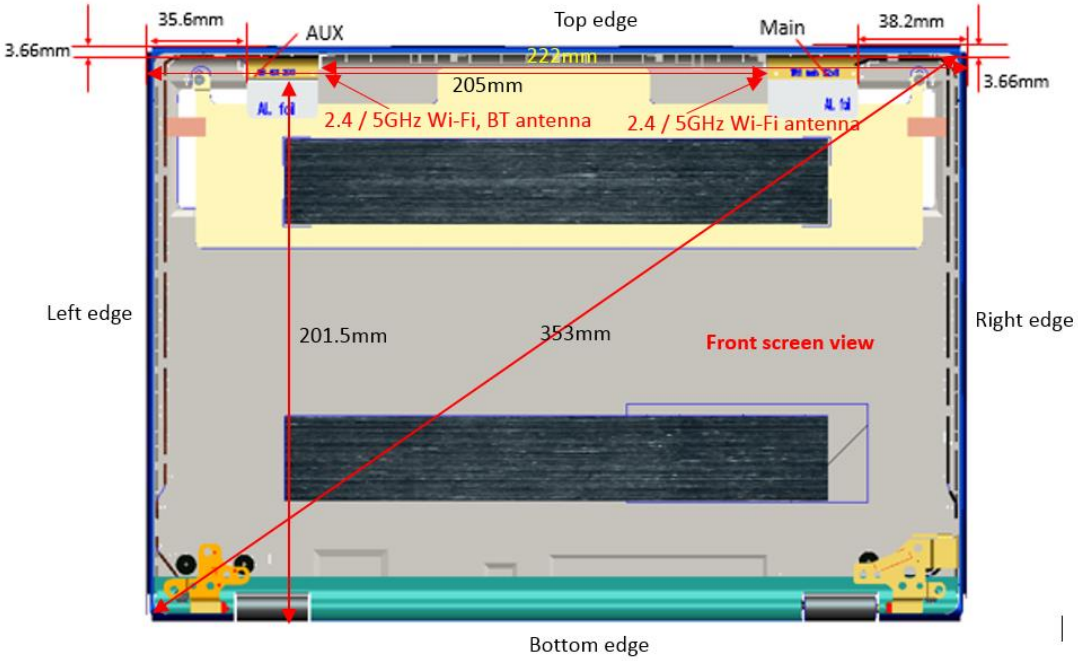
8.7. Duty cycel measurement plots

802.11b	802.11g
	
802.11n HT20	**802.11n HT40**
	
802.11a	**802.11ac VHT20**
	

802.11ac VHT40	802.11ac VHT80
	
BT	N/A
Duty cycle = 0.3775 ms/0.625 ms = 0.604 	N/A

9. RF Exposure Conditions

Refer to the diagram inside the device which attached below for the specific details of the antenna-to-edges distances. The product supports notebook mode, stand mode, tent mode and tablet mode, SAR evaluation for tablet mode covers the other three mode.



Per FCC KDB 447498D01:
1. The 1-g SAR and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)]·[√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for product specific 10-g SAR, where:

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

2. The SAR exclusion threshold for distances >50mm is defined by the following equation, as illustrated in KDB 447498 D01 Appendix B:
a) at 100 MHz to 1500 MHz
[Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm)·(f(MHz)/150)] mW
b) at > 1500 MHz and ≤ 6 GHz
[Power allowed at numeric Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·10] mW

3. The test separation distances required for a device to demonstrate SAR or MPE compliance must be sufficiently conservative to support the operational separation distances required by the device and its antennas and radiating structures. For devices such as tablets and transmitters embedded in keyboard sections of laptop computers that are typically used in close proximity to users, the test separation distance is determined by the smallest distance between the outer surface of the device and the user. For larger devices, as the antenna operational separation distance increases to where the SAR characteristics of the device and its antennas are not directly influenced by the user, such as antennas along the top and upper side edges of laptop computer displays or opposite and adjacent edges of tablets, the test separation distance is normally determined by the closest separation between the antenna and the user.

9.1. SAR evaluation exclusion analysis for Bluetooth

For 2.4GHz Wi-Fi SISO mode 1-g SAR (aux antenna to outer surface separation distance ≤ 50mm)

Position	Frequency (MHz)	Power (dBm)	Power (mW)	Separation Distance (mm)	Calculation Result	Threshold	SAR Test
Front keyboard surface	2480	10.00	10.00	5.00	3.1	3.0	Required
Top edge	2480	10.00	10.00	5.00	3.1	3.0	Required
Left edge	2480	10.00	10.00	35.60	0.4	3.0	Excluded

For 2.4GHz Wi-Fi SISO mode 1-g SAR (aux antenna to outer surface separation distance > 50mm)

Position	Frequency (MHz)	Power (dBm)	Power (mW)	Power allowed at 50mm	Separation Distance (mm)	Calculation Result (mW)	SAR Test
Bottom surface	2480	10.00	10.00	95.25	201.5	1610.25	Excluded
Right edge	2480	10.00	10.00	95.25	222.00	1815.25	Excluded

9.2. SAR evaluation exclusion analysis for 2.4GHz Wi-Fi

For 2.4GHz Wi-Fi SISO mode 1-g SAR (main antenna to outer surface separation distance ≤ 50mm)

Position	Frequency (MHz)	Power (dBm)	Power (mW)	Separation Distance (mm)	Calculation Result	Threshold	SAR Test
Front keyboard surface	2462	12.50	17.78	5.00	5.6	3.0	Required
Top edge	2462	12.50	17.78	5.00	5.6	3.0	Required
Right edge	2462	12.50	17.78	38.20	0.7	3.0	Excluded

For 2.4GHz Wi-Fi SISO mode 1-g SAR (main antenna to outer surface separation distance > 50mm)

Position	Frequency (MHz)	Power (dBm)	Power (mW)	Power allowed at 50mm	Separation Distance (mm)	Calculation Result (mW)	SAR Test
Bottom surface	2462	12.50	17.78	95.60	201.5	1610.60	Excluded
Left edge	2462	12.50	17.78	95.60	205.00	1645.60	Excluded

For 2.4GHz Wi-Fi SISO mode 1-g SAR (aux antenna to outer surface separation distance ≤ 50mm)

Position	Frequency (MHz)	Power (dBm)	Power (mW)	Separation Distance (mm)	Calculation Result	Threshold	SAR Test
Front keyboard surface	2462	12.50	17.78	5.00	5.6	3.0	Required
Top edge	2462	12.50	17.78	5.00	5.6	3.0	Required
Left edge	2462	12.50	17.78	35.60	0.8	3.0	Excluded

For 2.4GHz Wi-Fi SISO mode 1-g SAR (aux antenna to outer surface separation distance > 50mm)

Position	Frequency (MHz)	Power (dBm)	Power (mW)	Power allowed at 50mm	Separation Distance (mm)	Calculation Result (mW)	SAR Test
Bottom surface	2462	12.50	17.78	95.60	201.5	1610.60	Excluded
Right edge	2462	12.50	17.78	95.60	222.00	1815.60	Excluded

9.3. SAR evaluation exclusion analysis for 5GHz Wi-Fi

For 5GHz Wi-Fi SISO mode 1-g SAR (main antenna to outer surface separation distance ≤ 50mm)

Position	Frequency (MHz)	Power (dBm)	Power (mW)	Separation Distance (mm)	Calculation Result	Threshold	SAR Test
Front keyboard surface	5825	14.50	28.18	5.00	13.6	3.0	Required
Top edge	5825	14.50	28.18	5.00	13.6	3.0	Required
Right edge	5825	14.50	28.18	38.20	1.8	3.0	Excluded

For 5GHz Wi-Fi SISO mode 1-g SAR (main antenna to outer surface separation distance > 50mm)

Position	Frequency (MHz)	Power (dBm)	Power (mW)	Power allowed at 50mm	Separation Distance (mm)	Calculation Result (mW)	SAR Test
Bottom surface	5825	14.50	28.18	62.15	201.5	1577.15	Excluded
Left edge	5825	14.50	28.18	62.15	205.00	1612.15	Excluded

For 5GHz Wi-Fi SISO mode 1-g SAR (aux antenna to outer surface separation distance ≤ 50mm)

Position	Frequency (MHz)	Power (dBm)	Power (mW)	Separation Distance (mm)	Calculation Result	Threshold	SAR Test
Front keyboard surface	5825	14.50	28.18	5.00	13.6	3.0	Required
Top edge	5825	14.50	28.18	5.00	13.6	3.0	Required
Left edge	5825	14.50	28.18	35.60	1.9	3.0	Excluded

For 5GHz Wi-Fi SISO mode 1-g SAR (aux antenna to outer surface separation distance > 50mm)

Position	Frequency (MHz)	Power (dBm)	Power (mW)	Power allowed at 50mm	Separation Distance (mm)	Calculation Result (mW)	SAR Test
Bottom surface	5825	14.50	28.18	62.15	201.5	1577.15	Excluded
Right edge	5825	14.50	28.18	62.15	222.00	1782.15	Excluded

10. Dielectric Property Measurements & System Check

10.1. System Validation

Frequency	Date	Probe S/N	Probe type	Probe cal. Point		Perm.	Cond.	CW Validation			Mode Validation		
						(σ)	(ε_r)	Sensitivity	Probe Linearity	Probe Isotropy	Mode Type	Duty Factor	PAR
2450	December 25, 2018	7383	EX3DV4	2450	Body	51.94	2.02	Pass	Pass	Pass	OFDM	N/A	Pass
5250	December 25, 2018	7383	EX3DV4	5250	Body	48.34	5.42	Pass	Pass	Pass	OFDM	N/A	Pass
5600	December 25, 2018	7383	EX3DV4	5600	Body	47.57	5.94	Pass	Pass	Pass	OFDM	N/A	Pass
5750	December 25, 2018	7383	EX3DV4	5750	Body	47.30	6.00	Pass	Pass	Pass	OFDM	N/A	Pass

10.2. Dielectric Property Measurements

The temperature of the tissue-equivalent medium used during measurement must also be within 18°C to 25°C and within ± 2°C of the temperature when the tissue parameters are characterized.
The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements. The parameters should be re-measured after each 3 – 4 days of use; or earlier if the dielectric parameters can become out of tolerance; for example, when the parameters are marginal at the beginning of the measurement series.
Tissue dielectric parameters were measured at the low, middle and high frequency of each operating frequency range of the test device.

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

Target Frequency (MHz)	Head		Body	
	ε_r	σ (S/m)	ε_r	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800 – 2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5000	36.2	4.45	49.3	5.07
5100	36.1	4.55	49.1	5.18
5200	36.0	4.66	49.0	5.30
5300	35.9	4.76	48.9	5.42
5400	35.8	4.86	48.7	5.53
5500	35.6	4.96	48.6	5.65
5600	35.5	5.07	48.5	5.77
5700	35.4	5.17	48.3	5.88
5800	35.3	5.27	48.2	6.00

IEEE Std 1528-2013
Refer to Table 3 within the IEEE Std 1528-2013

Dielectric Property Measurements Results:

Liquid	Freq.	Liquid Parameters				Deviation (%)		Limit (%)	Temp. (℃)	Test Date
		Measured		Target						
		ϵ_r	σ	ϵ_r	σ	ϵ_r	σ			
Body 2450	2400	51.56	1.92	52.77	1.90	-2.29	0.92	±5	20.7	January 2, 2019
	2450	51.46	1.96	52.70	1.95	-2.35	0.72			
	2540	51.15	2.07	52.59	2.08	-2.74	-0.48			
Body 2450	2400	51.61	1.90	52.77	1.90	-2.20	-0.21	±5	22.4	January 29, 2019
	2450	51.77	1.95	52.70	1.95	-1.76	0.15			
	2540	51.34	2.07	52.59	2.08	-2.38	-0.58			
Body 5250	5160	48.69	5.18	49.07	5.25	-0.77	-1.26	±5	21.3	January 30, 2019
	5250	48.56	5.28	48.95	5.36	-0.80	-1.51			
	5340	48.38	5.39	48.96	5.46	-1.18	-1.30			
Body 5600	5500	48.21	5.76	48.61	5.65	-0.82	1.88	±5	21.9	January 30, 2019
	5600	48.08	5.88	48.47	5.77	-0.80	1.96			
	5700	47.89	6.02	48.34	5.88	-0.93	2.41			
Body 5750	5660	47.19	5.93	48.39	5.84	-2.48	1.54	±5	21.8	January 5, 2019
	5750	47.08	6.07	48.27	5.94	-2.47	2.21			
	5840	46.86	6.25	48.16	6.03	-2.70	3.67			

10.3. System Check

SAR system verification is required to confirm measurement accuracy, according to the tissue dielectric media, probe calibration points and other system operating parameters required for measuring the SAR of a test device. The system verification must be performed for each frequency band and within the valid range of each probe calibration point required for testing the device. The same SAR probe(s) and tissue-equivalent media combinations used with each specific SAR system for system verification must be used for device testing. When multiple probe calibration points are required to cover substantially large transmission bands, independent system verifications are required for each probe calibration point. A system verification must be performed before each series of SAR measurements using the same probe calibration point and tissue-equivalent medium. Additional system verification should be considered according to the conditions of the tissue-equivalent medium and measured tissue dielectric parameters, typically every three to four days when the liquid parameters are re-measured or sooner when marginal liquid parameters are used at the beginning of a series of measurements.

System Performance Check Measurement Conditions:

- The measurements were performed in the flat section of the TWIN SAM or ELI phantom, shell thickness: 2.0 ±0.2 mm (bottom plate) filled with Body or Head simulating liquid of the following parameters.
- The depth of tissue-equivalent liquid in a phantom must be ≥ 15.0 cm for SAR measurements ≤ 3 GHz and ≥ 10.0 cm for measurements > 3 GHz.
- The DASY system with an E-Field Probe was used for the measurements.
- The dipole was mounted on the small tripod so that the dipole feed point was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 10mm (above 1GHZ) and 15mm (below 1GHz) from dipole center to the simulating liquid surface.
- For area scan, standard grid spacing for head measurements is 15 mm in x- and y- dimension(≤2GHz), 12 mm in x- and y-dimension(2-4 GHz) and 10mm in x- and y- dimension(4-6GHz).
- For zoom scan, Δx_{zoom}, Δy_{zoom}≤ 2GHz - ≤8mm, 2-4GHz - ≤5 mm and 4-6 GHz-≤4mm; Δz_{zoom} ≤3GHz - ≤5 mm, 3-4 GHz- ≤4mm and 4-6GHz-≤2mm.
- Distance between probe sensors and phantom surface was set to 3 mm except for 5 GHz band. For 5GHz band, Distance between probe sensors and phantom surface was set to 2.5 mm
- The dipole input power (forward power) was set to 100 mW or 250 mW depend on the certificate of the dipoles.
- The results are normalized to 1 W input power.

System Check Results

The 1-g and 10-g SAR measured with a reference dipole, using the required tissue-equivalent medium at the test frequency, must be within 10% of the manufacturer calibrated dipole SAR target.

T.S. Liquid		Measured Results		Target (Ref. value)	Deviation (%)	Limit (%)	Temp. (℃)	Test Date
		Zoom Scan (W/Kg)	Normalize to 1W (W/Kg)					
Body 2450	1-g	12.400	49.60	51.60	-3.88	±10	20.7	January 2, 2019
	10-g	5.590	22.36	24.10	-7.22			
Body 2450	1-g	12.300	49.20	51.60	-4.65	±10	22.4	January 29, 2019
	10-g	5.640	22.56	24.10	-6.39			
Body 5250	1-g	7.470	74.70	74.20	0.67	±10	21.3	January 30, 2019
	10-g	2.070	20.70	21.10	-1.90			
Body 5600	1-g	7.570	75.70	77.50	-2.32	±10	21.9	January 30, 2019
	10-g	2.070	20.70	22.10	-6.33			
Body 5750	1-g	7.150	71.50	74.90	-4.54	±10	21.8	January 5, 2019
	10-g	1.960	19.60	21.10	-7.11			

11. Measured and Reported (Scaled) SAR Results

As per KDB 447498 sec.4.1.e), When SAR or MPE is measured at or scaled to the maximum tune-up tolerance limit, the results are referred to as reported.

Scaled SAR calculation formula:

Scaled SAR = Tune-up in mW / Conducted power in mW * Duty cycle (if available) * SAR value

SAR Test Reduction criteria are as follows:

KDB 447498 D01 General RF Exposure Guidance:
A）Per KDB447498 D01 v06, all SAR measurement results are scaled to the maximum tune-up tolerance limit to demonstrate SAR compliance.
B）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.

Per KDB865664 D01 v01r04:
For each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/Kg; if the deviation among the repeated measurement is ≤ 20%, and the measured SAR <1.45W/Kg, only one repeated measurement is required.

11.1. SAR Test Results of Bluetooth with SKU-3 antenna platform

Test Position	Test Mode	Channel/ Frequency	Power (dBm)		SAR Value	Power Drift	Duty Factor (%)	Scaled (W/Kg)
			Tune-up	Meas.	1-g (Zoom Scan)			
Top edge	DH5	0/2402	10.00	9.13	0.065	-0.13	60.40	0.132
Front keyboard surface	DH5	0/2402	10.00	9.13	0.027	-0.06	60.40	0.055

11.2. SAR Test Results of Bluetooth with SKU-4 antenna platform

Test Position	Test Mode	Channel/ Frequency	Power (dBm)		SAR Value	Power Drift	Duty Factor (%)	Scaled (W/Kg)
			Tune-up	Meas.	1-g (Zoom Scan)			
Top edge	DH5	0/2402	10.00	9.13	0.073	-0.11	60.40	0.148
Front keyboard surface	DH5	0/2402	10.00	9.13	0.007	0.18	60.40	0.015

11.3. SAR Test Results of 2.4GHz Wi-Fi with SKU-3 antenna platform

Test Position	Test Mode	Channel/ Frequency	Power (dBm)		SAR Value	Power Drift	Duty Factor (%)	Scaled (W/Kg)
			Tune-up	Meas.	1-g (Zoom Scan)			
SISO-Main antenna								
Top edge	802.11b	1/2414	12.50	12.45	0.113	0.05	100.00	0.114
Front keyboard surface	802.11b	1/2412	12.50	12.45	0.015	-0.05	100.00	0.015
SISO-Aux antenna								
Top edge	802.11b	1/2414	12.50	12.46	0.121	0.17	100.00	0.122
Front keyboard surface	802.11b	1/2412	12.50	12.46	0.082	0.18	100.00	0.083

OFDM mode SAR evaluation exclusion analysis for 1-g SAR for main antenna.

Mode	Tune-up (dBm)	Tune-up (mW)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11b	12.5	17.78	0.114	\	\
802.11g	16	39.81	\	0.255	Excluded
802.11n HT20	16	39.81	\	0.255	Excluded
802.11n HT40	12.5	17.78	\	0.114	Excluded

Note:

1) The highest reported SAR of DSSS adjusted by the ratio of OFDM 802.11g/n to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, so SAR evaluation for 802.11g/n is not required.

OFDM mode SAR evaluation exclusion analysis for 1-g SAR for aux antenna.

Mode	Tune-up (dBm)	Tune-up (mW)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11b	12.5	17.78	0.122	\	\
802.11g	16	39.81	\	0.273	Excluded
802.11n HT20	16	39.81	\	0.273	Excluded
802.11n HT40	12.5	17.78	\	0.122	Excluded

Note:

1) The highest reported SAR of DSSS adjusted by the ratio of OFDM 802.11g/n to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, so SAR evaluation for 802.11g/n is not required.
2) The highest SUM SAR value of corresponding position is regard as the MIMO SAR value. For SKU-3 antenna platform, the MIMO SAR value is 0.236 W/kg.

11.4. SAR Test Results of 2.4GHz Wi-Fi with SKU-4 antenna platform

Test Position	Test Mode	Channel/ Frequency	Power (dBm)		SAR Value	Power Drift	Duty Factor (%)	Scaled (W/Kg)
			Tune-up	Meas.	1-g (Zoom Scan)			
SISO-Main antenna								
Top edge	802.11b	1/2414	12.50	12.45	0.115	0.13	100.00	0.116
Front keyboard surface	802.11b	1/2415	12.50	12.45	0.020	-0.15	100.00	0.020
SISO-Aux antenna								
Top edge	802.11b	1/2414	12.50	12.46	0.128	0.12	100.00	0.129
Front keyboard surface	802.11b	1/2415	12.50	12.46	0.024	-0.14	100.00	0.024

OFDM mode SAR evaluation exclusion analysis for 1-g SAR for main antenna.

Mode	Tune-up (dBm)	Tune-up (mW)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11b	12.5	17.78	0.116	\	\
802.11g	16	39.81	\	0.260	Excluded
802.11n HT20	16	39.81	\	0.260	Excluded
802.11n HT40	12.5	17.78	\	0.116	Excluded

Note:

1) The highest reported SAR of DSSS adjusted by the ratio of OFDM 802.11g/n to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, so SAR evaluation for 802.11g/n is not required.

OFDM mode SAR evaluation exclusion analysis for 1-g SAR for aux antenna.

Mode	Tune-up (dBm)	Tune-up (mW)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11b	12.5	17.78	0.129	\	\
802.11g	16	39.81	\	0.289	Excluded
802.11n HT20	16	39.81	\	0.289	Excluded
802.11n HT40	12.5	17.78	\	0.129	Excluded

Note:

1) The highest reported SAR of DSSS adjusted by the ratio of OFDM 802.11g/n to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, so SAR evaluation for 802.11g/n is not required.
2) The highest SUM SAR value of corresponding position is regard as the MIMO SAR value. For SKU-4 antenna platform, the MIMO SAR value is 0.245 W/kg.

11.5. SAR Test Results of 5GHz Wi-Fi with SKU-3 antenna platform

Test Position	Test Mode	Channel/ Frequency	Power (dBm)		SAR Value	Power Drift	Duty Factor (%)	Scaled (W/Kg)
			Tune-up	Meas.	1-g (Zoom Scan)			
SISO								
U-NII-2A_Main antenna								
Top edge	802.11a	56/5280	13.0	13.00	0.634	0.18	100.00	0.634
Front keyboard surface	802.11a	56/5280	13.0	13.00	0.017	0.11	100.00	0.017
U-NII-2C_Main antenna								
Top edge	802.11a	136/5680	13.0	12.98	0.648	-0.14	100.00	0.651
Top edge	802.11a	136/5680	13.0	12.98	0.020	-0.16	100.00	0.020
U-NII-3_Main antenna								
Top edge	802.11a	157/5785	14.5	14.48	0.769	-0.19	100.00	0.773
Front keyboard surface	802.11a	157/5785	14.5	14.48	0.029	0.09	100.00	0.029
U-NII-2A_Aux antenna								
Top edge	802.11a	56/5280	13.0	12.95	0.516	0.16	100.00	0.522
Front keyboard surface	802.11a	56/5280	13.0	12.95	0.109	-0.15	100.00	0.110
U-NII-2C_Aux antenna								
Top edge	802.11a	136/5680	13.0	12.99	0.749	-0.12	100.00	0.751
Top edge	802.11a	136/5680	13.0	12.99	0.099	-0.14	100.00	0.099
U-NII-3_Aux antenna								
Top edge	802.11a	153/5765	14.5	14.41	0.780	-0.18	100.00	0.796
Front keyboard surface	802.11a	153/5765	14.5	14.41	0.160	-0.05	100.00	0.163

Subsequent test configuration SAR evaluation exclusion analysis for 1-g SAR for main antenna (U-NII-2A).

Mode	Tune-up (dBm)	Tune-up (mW)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11a	13	19.95	0.634	\	\
802.11n 20M	13	19.95	\	0.634	Excluded
802.11n 40M	11.5	14.13	\	0.449	Excluded
802.11ac 20M	13	19.95	\	0.634	Excluded
802.11ac 40M	11.5	14.13	\	0.449	Excluded
802.11ac 80M	8	6.31	\	0.200	Excluded

Note:

1) The 802.11a mode is selected as Initial Test Configuration for SAR test according to the specified maximum output power. As 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.

Subsequent test configuration SAR evaluation exclusion analysis for 1-g SAR for main antenna (U-NII-2C).

Mode	Tune-up (dBm)	Tune-up (mW)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11a	13	19.95	0.650	\	\
802.11n 20M	12	15.85	\	0.516	Excluded
802.11n 40M	9.5	8.91	\	0.290	Excluded
802.11ac 20M	12	15.85	\	0.516	Excluded
802.11ac 40M	9.5	8.91	\	0.290	Excluded
802.11ac 80M	7	5.01	\	0.163	Excluded

Note:

1) The 802.11a mode is selected as Initial Test Configuration for SAR test according to the specified maximum output power. As 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.

Subsequent test configuration SAR evaluation exclusion analysis for 1-g SAR for main antenna (U-NII-3).

Mode	Tune-up (dBm)	Tune-up (mW)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11a	14.5	28.18	0.773	\	\
802.11n 20M	14.5	28.18	\	0.773	Excluded
802.11n 40M	14	25.12	\	0.689	Excluded
802.11ac 20M	14.5	28.18	\	0.773	Excluded
802.11ac 40M	14	25.12	\	0.689	Excluded
802.11ac 80M	12	15.85	\	0.435	Excluded

Note:

1) The 802.11a mode is selected as Initial Test Configuration for SAR test according to the specified maximum output power. As 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.

Subsequent test configuration SAR evaluation exclusion analysis for 1-g SAR for aux antenna (U-NII-2A).

Mode	Tune-up (dBm)	Tune-up (mW)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11a	13	19.95	0.522	\	\
802.11n 20M	13	19.95	\	0.522	Excluded
802.11n 40M	11.5	14.13	\	0.370	Excluded
802.11ac 20M	13	19.95	\	0.522	Excluded
802.11ac 40M	11.5	14.13	\	0.370	Excluded
802.11ac 80M	8	6.31	\	0.165	Excluded

Note:

1) The 802.11a mode is selected as Initial Test Configuration for SAR test according to the specified maximum output power. As 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.

Subsequent test configuration SAR evaluation exclusion analysis for 1-g SAR for aux antenna (U-NII-2C).

Mode	Tune-up (dBm)	Tune-up (mW)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11a	13	19.95	0.751	\	\
802.11n 20M	12	15.85	\	0.597	Excluded
802.11n 40M	9.5	8.91	\	0.335	Excluded
802.11ac 20M	12	15.85	\	0.597	Excluded
802.11ac 40M	9.5	8.91	\	0.335	Excluded
802.11ac 80M	7	5.01	\	0.189	Excluded

Note:

1) The 802.11a mode is selected as Initial Test Configuration for SAR test according to the specified maximum output power. As 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.

Subsequent test configuration SAR evaluation exclusion analysis for 1-g SAR for aux antenna (U-NII-3).

Mode	Tune-up (dBm)	Tune-up (mW)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11a	14.5	28.18	0.796	\	\
802.11n 20M	14.5	28.18	\	0.796	Excluded
802.11n 40M	14	25.12	\	0.709	Excluded
802.11ac 20M	14.5	28.18	\	0.796	Excluded
802.11ac 40M	14	25.12	\	0.709	Excluded
802.11ac 80M	12	15.85	\	0.448	Excluded

Note:

1) The 802.11a mode is selected as Initial Test Configuration for SAR test according to the specified maximum output power. As 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.
2) The highest SUM SAR value of corresponding position is regard as the MIMO SAR value. For SKU-3 antenna platform, the MIMO SAR value is 1.569 W/kg.

11.6. SAR Test Results of 5GHz Wi-Fi with SKU-4 antenna platform

Test Position	Test Mode	Channel/ Frequency	Power (dBm)		SAR Value	Power Drift	Duty Factor (%)	Scaled (W/Kg)
			Tune-up	Meas.	1-g (Zoom Scan)			
SISO								
U-NII-2A_Main antenna								
Top edge	802.11a	56/5280	13.0	13.00	0.594	0.00	100.00	0.594
Front keyboard surface	802.11a	56/5280	13.0	13.00	0.020	0.16	100.00	0.020
U-NII-2C_Main antenna								
Top edge	802.11a	136/5680	13.0	12.98	0.760	0.04	100.00	0.764
Front keyboard surface	802.11a	136/5680	13.0	12.98	0.031	0.00	100.00	0.031
U-NII-3_Main antenna								
Top edge	802.11a	157/5785	14.5	14.48	1.030	-0.06	100.00	1.035
Top edge	802.11a	161/5805	14.5	14.47	0.922	-0.17	100.00	0.928
Front keyboard surface	802.11a	157/5785	14.5	14.48	0.038	0.15	100.00	0.039
Top edge-repeated	802.11a	157/5785	14.5	14.48	1.050	-0.11	100.00	1.055
U-NII-2A_Aux antenna								
Top edge	802.11a	56/5280	13.0	12.95	0.850	-0.14	100.00	0.860
Top edge	802.11a	52/5260	13.0	12.84	0.880	0.11	100.00	0.913
Front keyboard surface	802.11a	56/5280	13.0	12.95	0.021	-0.16	100.00	0.021
Top edge-repeated	802.11a	52/5260	13.0	12.84	0.890	-0.10	100.00	0.923
U-NII-2C_Aux antenna								
Top edge	802.11a	136/5680	13.0	12.99	0.552	-0.16	100.00	0.553
Front keyboard surface	802.11a	136/5680	13.0	12.99	0.022	0.02	100.00	0.022
U-NII-3_Aux antenna								
Top edge	802.11a	153/5765	14.5	14.41	0.898	0.15	100.00	0.917
Top edge	802.11a	149/5745	14.5	14.39	0.996	0.18	100.00	1.022
Front keyboard surface	802.11a	153/5765	14.5	14.41	0.068	0.05	100.00	0.069
Top edge-repeated	802.11a	149/5745	14.5	14.39	0.990	0.13	100.00	1.015

Subsequent test configuration SAR evaluation exclusion analysis for 1-g SAR for main antenna (U-NII-2A).

Mode	Tune-up (dBm)	Tune-up (mW)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11a	13	19.95	0.594	\	\
802.11n 20M	13	19.95	\	0.594	Excluded
802.11n 40M	11.5	14.13	\	0.421	Excluded
802.11ac 20M	13	19.95	\	0.594	Excluded
802.11ac 40M	11.5	14.13	\	0.421	Excluded
802.11ac 80M	8	6.31	\	0.188	Excluded

Note:

1) The 802.11a mode is selected as Initial Test Configuration for SAR test according to the specified maximum output power. As 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.

Subsequent test configuration SAR evaluation exclusion analysis for 1-g SAR for main antenna (U-NII-2C).

Mode	Tune-up (dBm)	Tune-up (mW)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11a	13	19.95	0.764	\	\
802.11n 20M	12	15.85	\	0.607	Excluded
802.11n 40M	9.5	8.91	\	0.341	Excluded
802.11ac 20M	12	15.85	\	0.607	Excluded
802.11ac 40M	9.5	8.91	\	0.341	Excluded
802.11ac 80M	7	5.01	\	0.192	Excluded

Note:

1) The 802.11a mode is selected as Initial Test Configuration for SAR test according to the specified maximum output power. As 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.

Subsequent test configuration SAR evaluation exclusion analysis for 1-g SAR for main antenna (U-NII-3).

Mode	Tune-up (dBm)	Tune-up (mW)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11a	14.5	28.18	1.055	\	\
802.11n 20M	14.5	28.18	\	1.055	Excluded
802.11n 40M	14	25.12	\	0.940	Excluded
802.11ac 20M	14.5	28.18	\	1.055	Excluded
802.11ac 40M	14	25.12	\	0.940	Excluded
802.11ac 80M	12	15.85	\	0.593	Excluded

Note:

1) The 802.11a mode is selected as Initial Test Configuration for SAR test according to the specified maximum output power. As 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.

Subsequent test configuration SAR evaluation exclusion analysis for 1-g SAR for aux antenna (U-NII-2A).

Mode	Tune-up (dBm)	Tune-up (mW)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11a	13	19.95	0.923	\	\
802.11n 20M	13	19.95	\	0.923	Excluded
802.11n 40M	11.5	14.13	\	0.653	Excluded
802.11ac 20M	13	19.95	\	0.923	Excluded
802.11ac 40M	11.5	14.13	\	0.653	Excluded
802.11ac 80M	8	6.31	\	0.292	Excluded

Note:

1) The 802.11a mode is selected as Initial Test Configuration for SAR test according to the specified maximum output power. As 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.

Subsequent test configuration SAR evaluation exclusion analysis for 1-g SAR for aux antenna (U-NII-2C).

Mode	Tune-up (dBm)	Tune-up (mW)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11a	13	19.95	0.553	\	\
802.11n 20M	12	15.85	\	0.439	Excluded
802.11n 40M	9.5	8.91	\	0.247	Excluded
802.11ac 20M	12	15.85	\	0.439	Excluded
802.11ac 40M	9.5	8.91	\	0.247	Excluded
802.11ac 80M	7	5.01	\	0.139	Excluded

Note:

1) The 802.11a mode is selected as Initial Test Configuration for SAR test according to the specified maximum output power. As 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.

Subsequent test configuration SAR evaluation exclusion analysis for 1-g SAR for aux antenna (U-NII-3).

Mode	Tune-up (dBm)	Tune-up (mW)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11a	14.5	28.18	1.022	\	\
802.11n 20M	14.5	28.18	\	1.022	Excluded
802.11n 40M	14	25.12	\	0.911	Excluded
802.11ac 20M	14.5	28.18	\	1.022	Excluded
802.11ac 40M	14	25.12	\	0.911	Excluded
802.11ac 80M	12	15.85	\	0.575	Excluded

Note:

1) The 802.11a mode is selected as Initial Test Configuration for SAR test according to the specified maximum output power. As 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.
2) The highest SUM SAR value of corresponding position is regard as the MIMO SAR value. For SKU-4 antenna platform, the MIMO SAR value is 2.077 W/kg. It is > 1.6 W/kg, so SPLSR analysis is required.

12. Simultaneous Transmission SAR Analysis

Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneous transmitting antenna.

The main antenna supports 2.4GHz Wi-Fi, 5GHz Wi-Fi, the aux antenna supports 2.4GHz Wi-Fi, 5GHz Wi-Fi and BT, when in MIMO mode, the BT technology is dismissed.

Coexistence mode

Combination	Mode
1	2.4GHz Wi-Fi (main ANT) + BT (aux ANT)
2	5GHz Wi-Fi (main ANT) + BT (aux ANT)
3	2.4GHz Wi-Fi (main ANT) + 2.4GHz Wi-Fi (aux ANT)
4	5GHz Wi-Fi (main ANT) + 5GHz Wi-Fi (aux ANT)

12.1. Simultaneous Transmission calculation for SKU-3 antenna platform

For Combination NO.1

Test Position	2.4GHz Wi-Fi (main ANT) 1-g SAR (W/Kg)	BT (aux ANT) 1-g SAR (W/Kg)	SUM 1-g SAR (W/Kg)	SPLSR
Top edge	0.114	0.132	0.246	Excluded

Note:
1) Because the maximum SUM 1-g SAR ≤ 1.6 W/Kg, so the SPLSR analysis is not required.

For Combination NO.2

Test Position	5GHz Wi-Fi (main ANT) 1-g SAR (W/Kg)	BT (aux ANT) 1-g SAR (W/Kg)	SUM 1-g SAR (W/Kg)	SPLSR
Top edge	0.773	0.132	0.905	Excluded

Note:
1) Because the maximum SUM 1-g SAR ≤ 1.6 W/Kg, so the SPLSR analysis is not required.

For Combination NO.3

Test Position	2.4GHz Wi-Fi (main ANT) 1-g SAR (W/Kg)	2.4GHz Wi-Fi (aux ANT) 1-g SAR (W/Kg)	SUM 1-g SAR (W/Kg)	SPLSR
Top edge	0.114	0.122	0.236	Excluded

Note:
1) Because the maximum SUM 1-g SAR ≤ 1.6 W/Kg, so the SPLSR analysis is not required.

For Combination NO.4 (U-NII-2A)

Test Position	5GHz Wi-Fi (main ANT) 1-g SAR (W/Kg)	5GHz Wi-Fi (aux ANT) 1-g SAR (W/Kg)	SUM 1-g SAR (W/Kg)	SPLSR
Top edge	0.634	0.522	1.156	Excluded

Note:
1) Because the maximum SUM 1-g SAR ≤ 1.6 W/Kg, so the SPLSR analysis is not required.

For Combination NO.4 (U-NII-2C)

Test Position	5GHz Wi-Fi (main ANT) 1-g SAR (W/Kg)	5GHz Wi-Fi (aux ANT) 1-g SAR (W/Kg)	SUM 1-g SAR (W/Kg)	SPLSR
Top edge	0.651	0.751	1.402	Excluded

Note:
1) Because the maximum SUM 1-g SAR ≤ 1.6 W/Kg, so the SPLSR analysis is not required.

For Combination NO.4 (U-NII-3)

Test Position	5GHz Wi-Fi (main ANT) 1-g SAR (W/Kg)	5GHz Wi-Fi (aux ANT) 1-g SAR (W/Kg)	SUM 1-g SAR (W/Kg)	SPLSR
Top edge	0.773	0.796	1.569	Excluded

Note:
1) Because the maximum SUM 1-g SAR ≤ 1.6 W/Kg, so the SPLSR analysis is not required.

12.2. Simultaneous Transmission calculation for SKU-4 antenna platform

For Combination NO.1

Test Position	2.4GHz Wi-Fi (main ANT) 1-g SAR (W/Kg)	BT (aux ANT) 1-g SAR (W/Kg)	SUM 1-g SAR (W/Kg)	SPLSR
Top edge	0.116	0.148	0.264	Excluded

Note:
1) Because the maximum SUM 1-g SAR ≤ 1.6 W/Kg, so the SPLSR analysis is not required.

For Combination NO.2

Test Position	5GHz Wi-Fi (main ANT) 1-g SAR (W/Kg)	BT (aux ANT) 1-g SAR (W/Kg)	SUM 1-g SAR (W/Kg)	SPLSR
Top edge	1.055	0.148	1.203	Excluded

Note:
1) Because the maximum SUM 1-g SAR ≤ 1.6 W/Kg, so the SPLSR analysis is not required.

For Combination NO.3

Test Position	2.4GHz Wi-Fi (main ANT) 1-g SAR (W/Kg)	2.4GHz Wi-Fi (aux ANT) 1-g SAR (W/Kg)	SUM 1-g SAR (W/Kg)	SPLSR
Top edge	0.116	0.129	0.245	Excluded

Note:
1) Because the maximum SUM 1-g SAR ≤ 1.6 W/Kg, so the SPLSR analysis is not required.

For Combination NO.4 (U-NII-2A)

Test Position	5GHz Wi-Fi (main ANT) 1-g SAR (W/Kg)	5GHz Wi-Fi (aux ANT) 1-g SAR (W/Kg)	SUM 1-g SAR (W/Kg)	SPLSR
Top edge	0.594	0.923	1.517	Excluded

Note:
1) Because the maximum SUM 1-g SAR ≤ 1.6 W/Kg, so the SPLSR analysis is not required.

For Combination NO.4 (U-NII-2C)

Test Position	5GHz Wi-Fi (main ANT) 1-g SAR (W/Kg)	5GHz Wi-Fi (aux ANT) 1-g SAR (W/Kg)	SUM 1-g SAR (W/Kg)	SPLSR
Top edge	0.764	0.553	1.417	Excluded

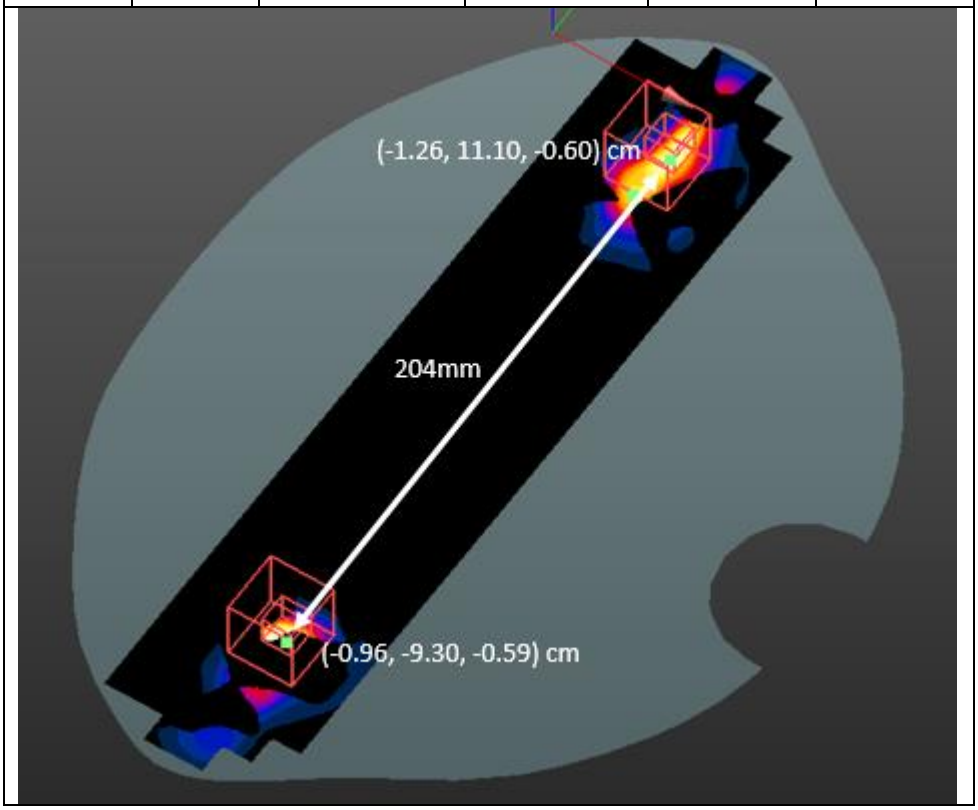
Note:
1) Because the maximum SUM 1-g SAR ≤ 1.6 W/Kg, so the SPLSR analysis is not required.

For Combination NO.4 (U-NII-3)

Test Position	5GHz Wi-Fi (main ANT) 1-g SAR (W/Kg)	5GHz Wi-Fi (aux ANT) 1-g SAR (W/Kg)	SUM 1-g SAR (W/Kg)	SPLSR
Top edge	1.055	1.022	2.077	Required

Note:
1) Because the maximum SUM 1-g SAR > 1.6 W/Kg, so the SPLSR analysis is required.

SPLSR analysis					
SAR1 (W/Kg)	SAR2 (W/Kg)	Separation Distance (mm)	Calculation Result	Threshold	Volume Scan
1.055	1.022	204	0.015	0.04	Excluded



Note:
1) Because the calculation result is ≤ 0.04 W/Kg, so the volume scan is not required.

Appendixes

Refer to separated files for the following appendixes.

4788808986.2-SAR-2_App A Photo

4788808986.2-SAR-2_App B System Check Plots

4788808986.2-SAR-2_App C Highest Test Plots

4788808986.2-SAR-2_App D Cal. Certificates

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