



SAR EVALUATION REPORT

**FCC 47 CFR § 2.1093
IEEE Std. 1528-2013
RSS-102 Issue 5
IEC/IEEE 62209-1528:2020**

**For
Tablet**

**FCC ID: 2AAJXQS-IQRT2
IC: 11205A-QSIQRT2
Model: IQ Remote**

Report Number: 4790411210.2-SAR-1

Issued Date: June 13, 2022

**Prepared for
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Revision History

Revision History

Rev.	Issue Date	Revisions	Revised By
V0	6/13/2022	Initial Issue	\

Note:

- 1.This test report is only published to and used by the applicant, and it is not for evidence purpose in China.
2. The measurement result for the sample received is <Pass> according to < IEEE Std. 1528>when <Accuracy Method> decision rule is applied.



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1. Attestation of Test Results

Applicant Name	Qolsys, Inc.	
Address	1919 S. Bascom Ave. Suite 600, Campbell, California, 95008 United States	
Manufacturer	Chengdu Vantron Technology Co., Ltd.	
Address	No.5 GaoPeng Road, Hi-Tech Zone, Chengdu, SiChuan, P.R. China	
EUT Name	Tablet	
Model	IQ Remote	
Sample Received Date	May 25, 2022	
Sample Status	Normal	
Sample ID	4986388	
Date of Tested	June 6, 2022 ~ June 13, 2022	
Applicable Standards	FCC 47 CFR § 2.1093 IEEE Std. 1528-2013 RSS-102 Issue 5 IEC/IEEE 62209-1528:2020 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
Body (1-g)	1.447	1.446
Simultaneous Transmission (1-g)	\	
Test Results	Pass	
Prepared By: <i>Burt Hu</i> Burt Hu Laboratory Engineer	Reviewed By: <i>Shawn Wen</i> Shawn Wen Laboratory Leader	Approved By: <i>Stephen Guo</i> 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



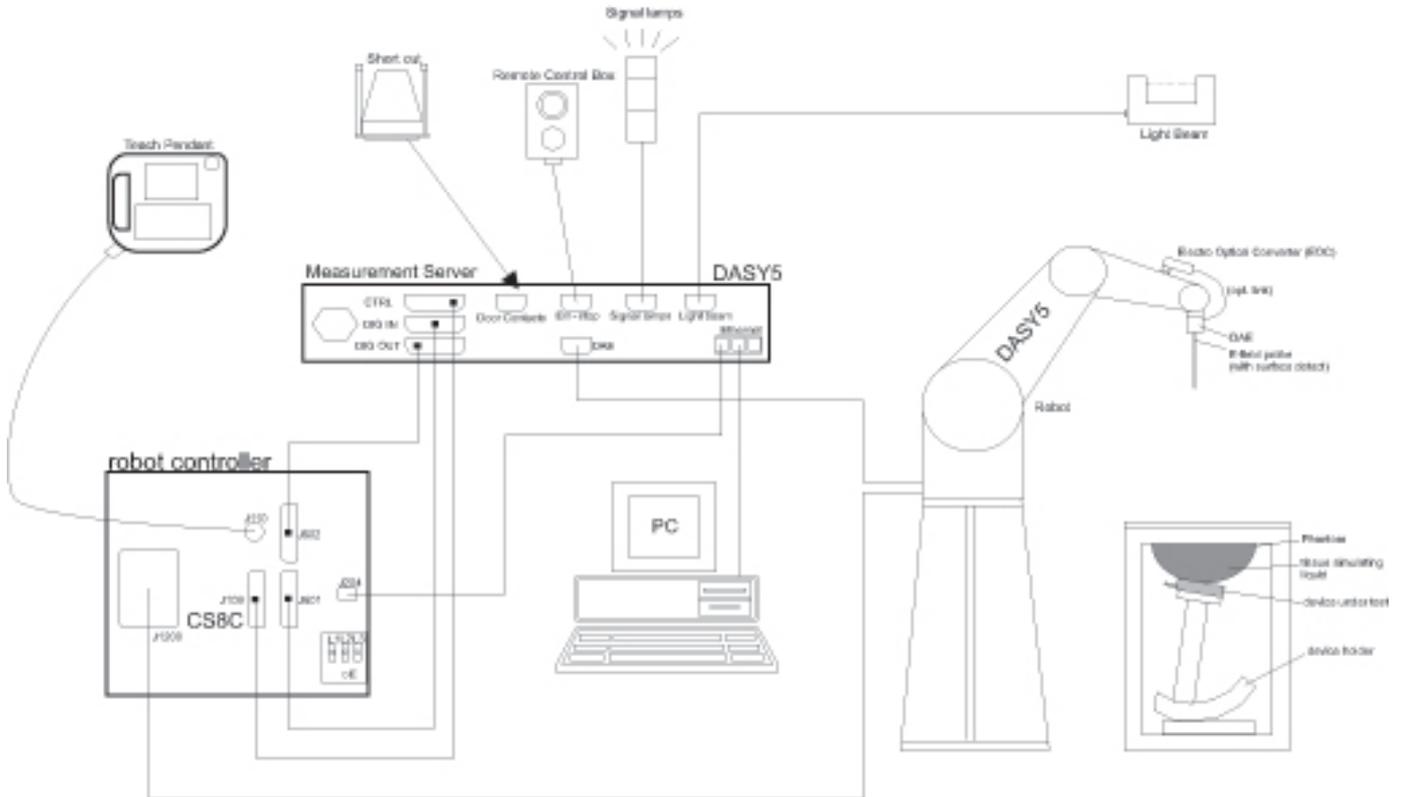
3. Facilities and Accreditation

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	<p>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.</p> <p>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</p> <p>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.</p> <p>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</p>
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

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



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: $\Delta x_{Zoom}, \Delta y_{Zoom}$		≤ 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 1 st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$ mm	
Minimum zoom scan volume	x, y, z	≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm	
<p>Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see IEEE Std 1528-2013 for details.</p> <p>* When zoom scan is required and the <i>reported</i> SAR from the <i>area scan based 1-g SAR estimation</i> procedures of KDB Publication 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.</p>				



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	2022.10.29
Dielectric Probe kit	SPEAG	SM DAK 040 SA	1155	NCR
DC power supply	Keysight	E36103A	MY55350020	2022.10.29
Signal Generator	Rohde & Schwarz	SME06	837633\001	2022.10.29
BI-Directional Coupler	WERLATONE	C8060-102	3423	2022.10.29
Peak and Average Power Sensor	Keysight	E9323A	MY55440013	2022.10.29
Peak and Average Power Sensor	Keysight	E9323A	MY55420006	2022.10.29
Dual Channel PK Power Meter	Keysight	N1912A	MY55416024	2022.10.29
Amplifier	CORAD TECHNOLOGY LTD	AMF-4D-00400600-50-30P	1983561	NCR
Dosimetric E-Field Probe	SPEAG	EX3DV4	7383	2023.1.11
Data Acquisition Electronic	SPEAG	DAE3	427	2023.4.11
Dipole Kit 2450 MHz	SPEAG	D2450V2	977	2022.12.16
Dipole Kit 5 GHz	SPEAG	D5GHzV2	1231	2022.12.15
Software	SPEAG	DASY52	N/A	NCR
Twin Phantom	SPEAG	SAM V8.0	2001	NCR
Thermometer	/	GX-138	150709653	2022.10.29
Thermometer	VICTOR	ITHX-SD-5	18470005	2022.10.29

Note:

1) Per KDB865664D01 v01r04 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) Network analyzer probe calibration against air, distilled water and a shorting block performed before measuring liquid parameters.



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, the extensive SAR measurement uncertainty analysis described in IEEE Std. 1528-2013 is not required in SAR reports submitted for equipment approval. The equivalent ratio (1.5/1.6) is applied to extremity and occupational exposure conditions.



6. Device Under Test (DUT) Information

6.1. DUT Description

The DUT is a Tablet with IEEE 802.11a/b/g/n/ac and Bluetooth.	
Dimension	Overall (Length x Width x Height): 191 mm x 116.7 mm x 19 mm

6.2. Wireless Technology

Wireless technology	Frequency band	Gain (dBi)
Wi-Fi	2.4 GHz	2.4
Wi-Fi	5 GHz	3.1
BT	2.4 GHz	2.4



7. Conducted Output Power Measurement and tune-up tolerance

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

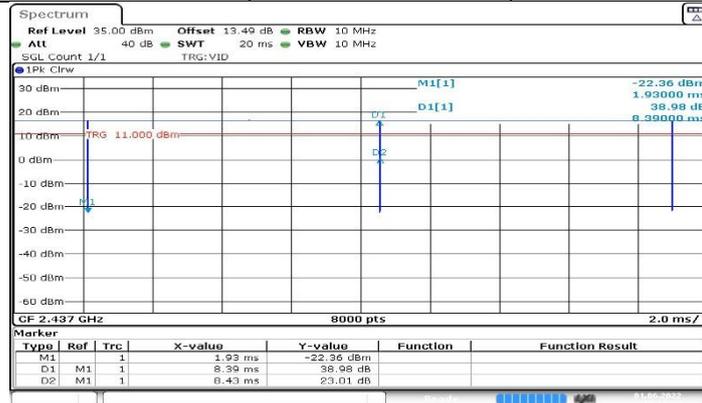
Mode	Channel	Frequency (MHz)	Data Rate	Average Power (dBm)	Tune-up Limit (dBm)	Duty Cycle (%)
802.11b	1	2412	1Mbps	14.71	15.00	99.53
	6	2437		14.74	15.00	
	11	2462		14.71	15.00	
802.11g	1	2412	6Mbps	14.45	14.50	96.50
	6	2437		14.45	14.50	
	11	2462		14.46	14.50	
802.11n20	1	2412	MCS0	14.28	14.50	97.01
	6	2437		14.39	14.50	
	11	2462		14.44	14.50	

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. The duty cycle value is derived from report NO.: 4790411210.2-3.

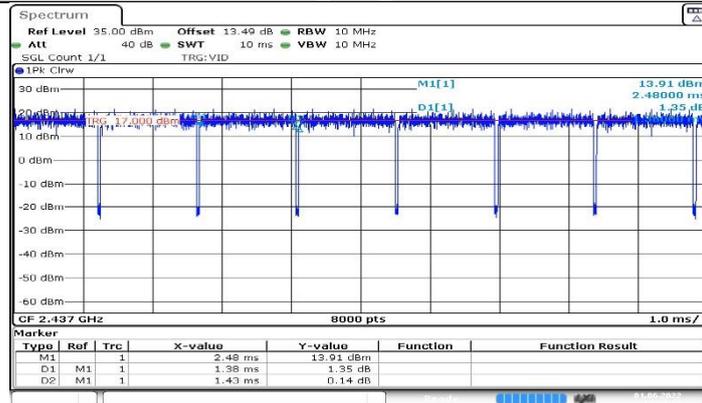


Test Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)
11B	8.39	8.43	0.9953	99.53
11G	1.38	1.43	0.9650	96.50
11N20SISO	1.30	1.34	0.9701	97.01



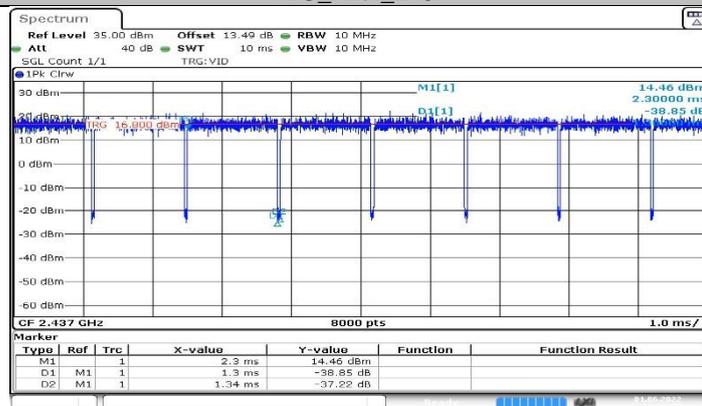
Date: 1 JUN 2022 11:16:34

11B_Ant1_2437



Date: 1 JUN 2022 11:24:20

11G_Ant1_2437



Date: 1 JUN 2022 11:35:07

11N20SISO_Ant1_2437



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

Mode	Channel	Frequency (MHz)	Data Rate	Average Power (dBm)	Tune-up Limit (dBm)	Duty Cycle (%)
802.11a-20	36	5180	6Mbps	14.23	14.50	97.18
	40	5200		14.26	14.50	
	48	5240		14.25	14.50	
802.11n-HT20	36	5180	MCS0	14.26	14.50	96.99
	40	5200		14.13	14.50	
	48	5240		14.38	14.50	
802.11n-HT40	38	5190	MCS0	Not required	12.50	94.12
	46	5230		Not required	12.50	
802.11ac-VHT20	36	5180	MCS0	14.38	14.50	96.99
	40	5200		14.43	14.50	
	48	5240		14.41	14.50	
802.11ac-VHT40	38	5190	MCS0	Not required	12.50	94.12
	46	5230		Not required	12.50	
802.11ac-VHT80	42	5210	MCS0	Not required	9.00	86.49

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. The duty cycle value is derived from report NO.: 4790411210.2-4.



7.3. Power measurement result of 5GHz Wi-Fi (U-NII-3).

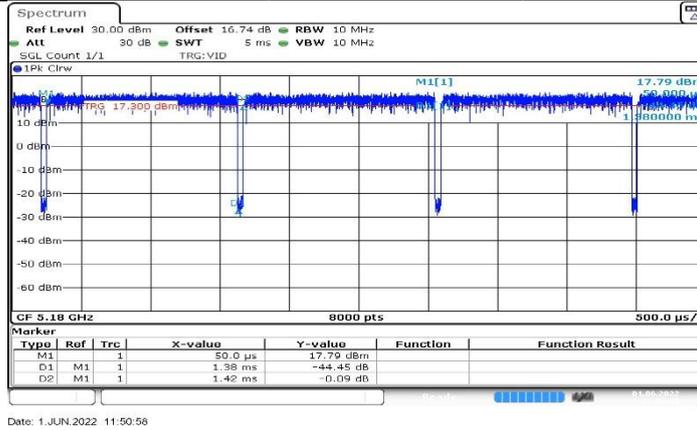
Mode	Channel	Frequency (MHz)	Data Rate	Average Power (dBm)	Tune-up Limit (dBm)	Duty Cycle (%)
802.11a-20	149	5745	6Mbps	11.53	12.00	97.18
	153	5765		11.45	12.00	
	157	5785		11.73	12.00	
	161	5805		11.41	12.00	
	165	5825		11.89	12.00	
802.11n-HT20	149	5745	MCS0	11.38	12.00	96.99
	153	5765		11.35	12.00	
	157	5785		11.43	12.00	
	161	5805		11.41	12.00	
	165	5825		12.00	12.00	
802.11n-HT40	151	5755	MCS0	11.18	11.50	94.12
	159	5795		11.28	11.50	
802.11ac-VHT20	149	5745	MCS0	11.21	11.50	96.99
	153	5765		11.19	11.50	
	157	5785		11.31	11.50	
	161	5805		11.20	11.50	
	165	5825		11.50	11.50	
802.11ac-VHT40	151	5755	MCS0	Not required	11.00	94.12
	159	5795		Not required	11.00	
802.11ac-VHT80	155	5775	MCS0	Not required	11.00	86.49

Note:

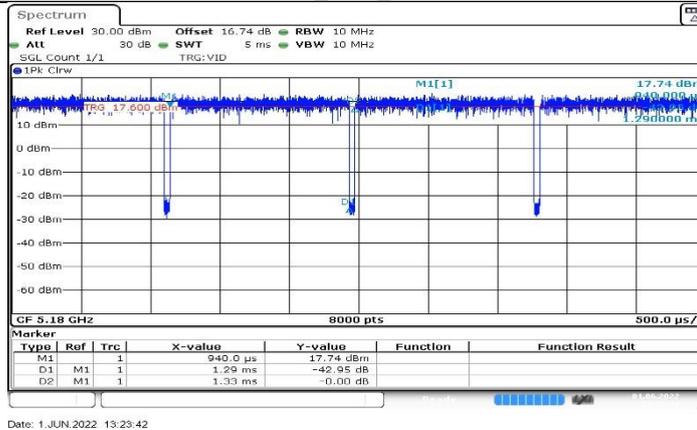
1. As per KDB 447498 sec.4.1.d) at the maximum rated output power and within the tune-up tolerance range specified for the product, but not more than 2 dB lower than the maximum tune-up tolerance limit.
2. The duty cycle value is derived from report NO.: 4790411210.2-4.



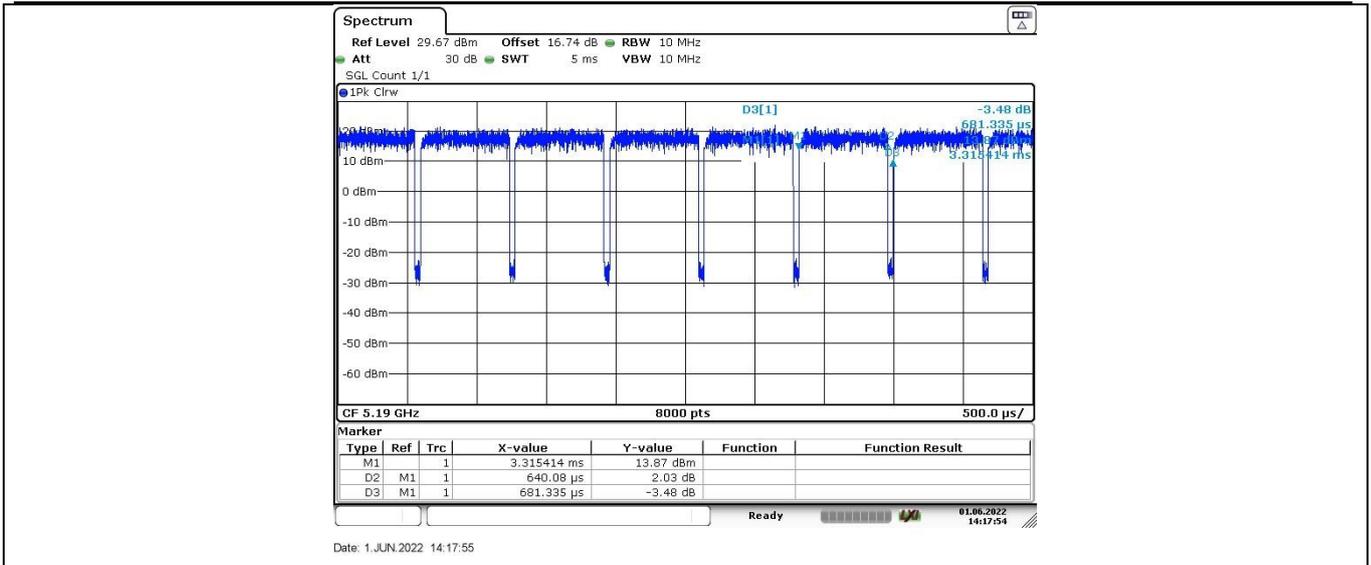
Test Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)
11A	1.38	1.42	0.9718	97.18
11N20SISO	1.29	1.33	0.9699	96.99
11N40SISO	0.64	0.68	0.9412	94.12
11AC80SISO	0.32	0.37	0.8649	86.49



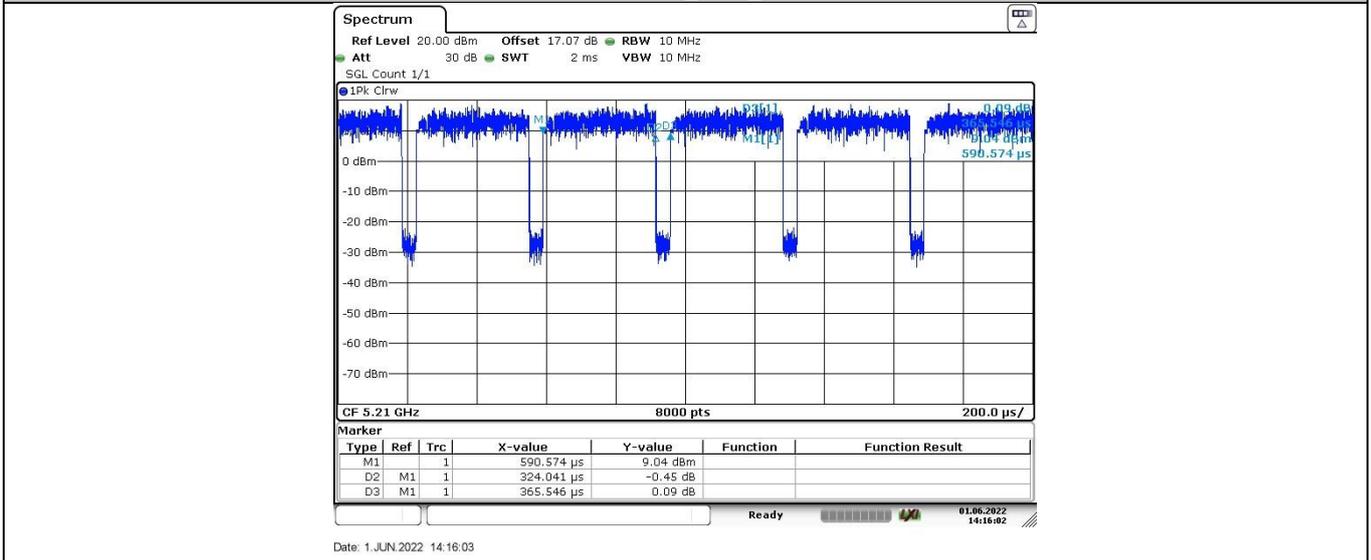
11A_Ant1_5180



11N20SISO_Ant1_5180



11N40SISO_Ant1_5190



11AC80SISO_Ant1_5210



7.4. Power measurement result BT

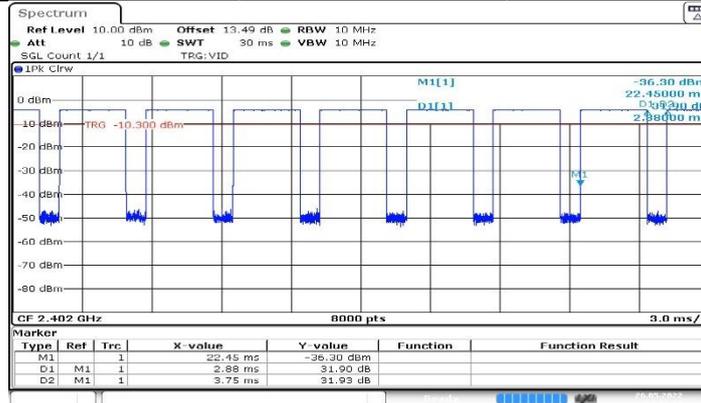
Test Mode	Channel	Average Conducted Power (dBm)	Tune-up(dBm)	Duty Cycle (%)
DH5	0	-5.47	-5.00	76.80
	39	-5.50	-5.00	
	78	-6.36	-5.00	
3DH5	0	-6.46	-6.00	77.07
	39	-6.58	-6.00	
	78	-7.31	-6.00	
BLE_1M	0	5.69	7.00	62.90
	19	5.66	7.00	
	39	5.02	7.00	
BLE_2M	0	5.23	6.00	32.26
	19	5.81	6.00	
	39	4.87	6.00	

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. As per KDB 447498, maximum tune-up of BT mode is satisfied for Stand-alone SAR evaluation exemption.
3. As per RSS-102 issue 5, maximum E.I.R.P of BT classic mode is -2.6 dBm (0.55 mW), it is less than 4 mW, so Stand-alone SAR evaluation for BT classic mode is excluded, and maximum E.I.R.P of BLE mode is 9.4 dBm (8.71 W), it is greater than 4 mW, so Stand-alone SAR evaluation for BLE mode is required.
4. The duty cycle value is derived from report NO.: 4790411210.2-1 and 4790411210.2-2.

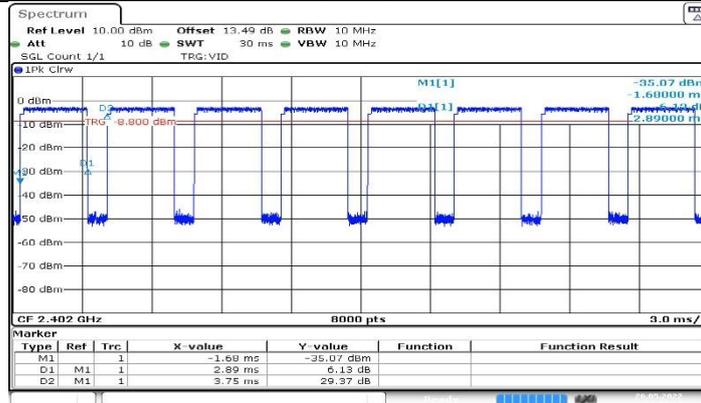


Test Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)
DH5	2.88	3.75	0.7680	76.80
3DH5	2.89	3.75	0.7707	77.07
BLE_1M	0.39	0.62	0.6290	62.90
BLE_2M	0.20	0.62	0.3226	32.26



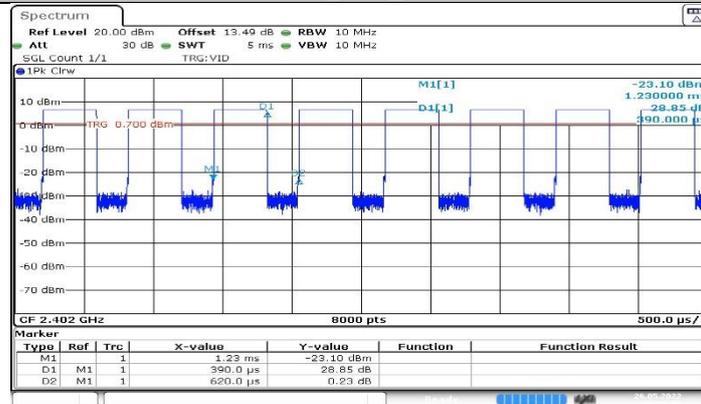
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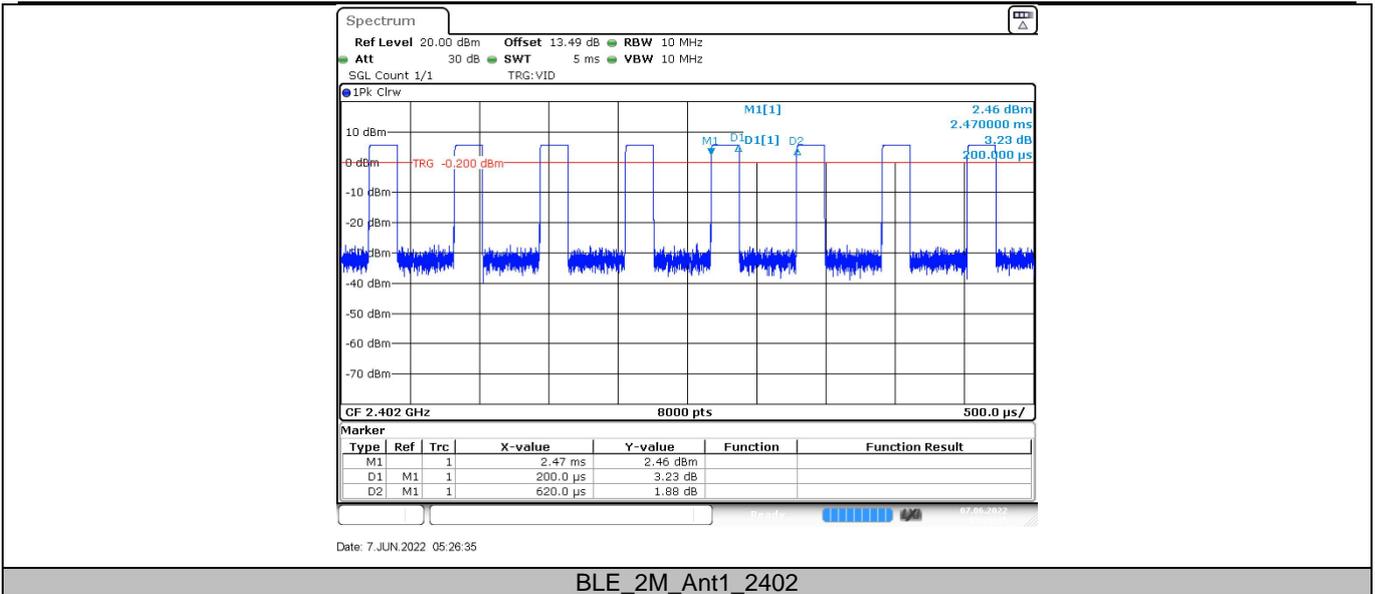
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3DH5_Ant1_2402



Date: 26.MAY.2022 05:35:03

BLE_1M_Ant1_2402





8. Test Configuration

8.1. 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 each test frequency channel, the EUT is operated at the RF continuous emission mode. The test procedures in KDB 248227D01 are applied.

8.1.1. 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 $\leq 0.4\text{W/kg}$, 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 $\leq 0.8\text{W/kg}$ 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 $> 0.8\text{ W/kg}$, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is $\leq 1.2\text{ W/kg}$ or all required channels are tested.

8.1.2. 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 $> 0.8\text{ W/kg}$, SAR measurement is required for the subsequent next highest measured output power channel(s) in the initial test configuration until the reported SAR is $\leq 1.2\text{ W/kg}$ or all required channels are tested.

8.1.3. 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 $\leq 1.2\text{ W/kg}$, SAR is not required for that subsequent test configuration.

8.1.4. 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.

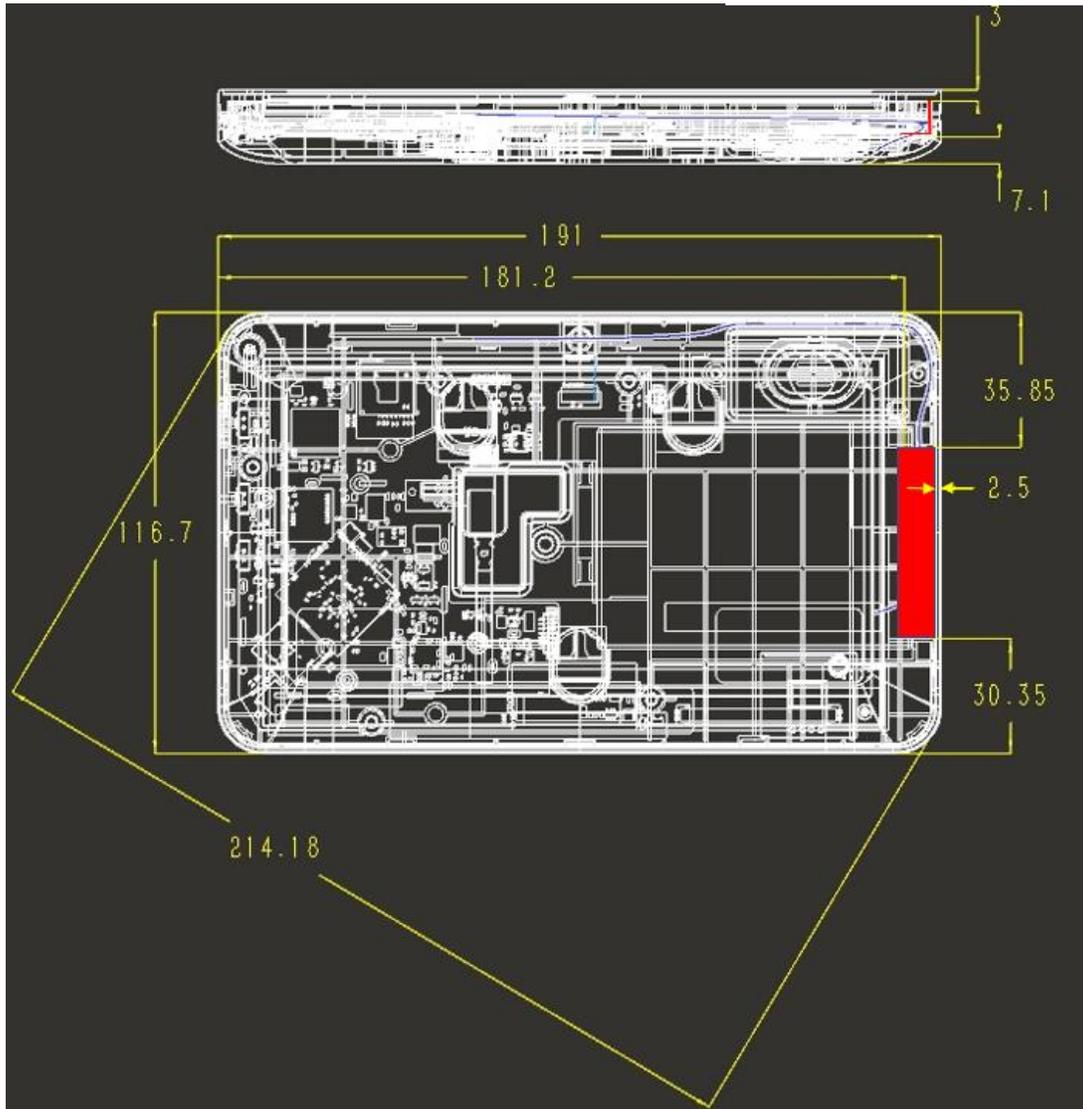
- 1) When KDB Publication 447498 SAR test exclusion applies to the OFDM configuration.
- 2) When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

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.

9. RF Exposure Conditions

Refer to the diagram of the device below for the specific details of the antenna to edges distances.



Note:

1. The figure in red indicates the antenna.



Per FCC KDB 616217 D04

The overall diagonal dimension of the display section of a tablet is > 20cm, the bottom surface and edges of the tablet should be selected for SAR evaluation at a 0mm separation distance, Exposures from antennas through the front surface of the display section of a full-size tablet, away from the edges, are generally limited to the user's hands. Exposures to hands for typical consumer transmitters used in tablets are not expected to exceed the extremity SAR limit; therefore, SAR evaluation for the front surface of tablet display screens are generally not necessary, except for tablets that are designed to require continuous operations with the hand(s) next to the antenna(s)

Per FCC KDB 447498 D01:

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:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR and ≤ 7.5 for product specific 10-g SAR, where:

- $f(\text{GHz})$ 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 $> 50\text{mm}$ is defined by the following equation, as illustrated in KDB 447498 D01 Appendix B:

a) at 100 MHz to 1500 MHz

$[\text{Power allowed at numeric threshold for } 50 \text{ mm in step 1}) + (\text{test separation distance} - 50 \text{ mm}) \cdot (f(\text{MHz})/150)] \text{ mW}$

b) at > 1500 MHz and ≤ 6 GHz

$[\text{Power allowed at numeric Threshold at } 50 \text{ mm in step 1}) + (\text{test separation distance} - 50 \text{ mm}) \cdot 10] \text{ mW}$

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. Evaluation For FCC

For 2.4GHz Wi-Fi 1-g SAR (antenna to edges separation distance less than 50mm)

Position	Frequency (MHz)	Power (dBm)	Power (mW)	Separation Distance (mm)	Calculation Result	Threshold	SAR Test
Back surface	2450	15.00	31.62	7.10	7.0	3.0	Required
Left edge	2450	15.00	31.62	5.00	9.9	3.0	Required
Right edge	2450	15.00	31.62	\	\	\	\
Top edge	2450	15.00	31.62	35.85	1.4	3.0	Excluded
Bottom edge	2450	15.00	31.62	30.35	1.6	3.0	Excluded

For 2.4GHz Wi-Fi 1-g SAR (antenna to edges separation distance greater than 50mm)

Position	Frequency (MHz)	Power (dBm)	Power (mW)	Power allowed at 50mm	Separation Distance (mm)	Calculation Result (mW)	SAR Test
Back surface	2450	15.00	31.62	95.83	\	\	\
Left edge	2450	15.00	31.62	95.83	\	\	\
Right edge	2450	15.00	31.62	95.83	181.20	2238.76	Excluded
Top edge	2450	15.00	31.62	95.83	\	\	\
Bottom edge	2450	15.00	31.62	95.83	\	\	\

Note:

1. Because the power in mW is less than the calculation result, so SAR evaluation for corresponding position is not required.

For 5GHz Wi-Fi U-NII-1 1-g SAR (antenna to edges separation distance less than 50mm)

Position	Frequency (MHz)	Power (dBm)	Power (mW)	Separation Distance (mm)	Calculation Result	Threshold	SAR Test
Back surface	5250	14.50	28.18	7.10	9.1	3.0	Required
Left edge	5250	14.50	28.18	5.00	12.9	3.0	Required
Right edge	5250	14.50	28.18	\	\	\	\
Top edge	5250	14.50	28.18	35.85	1.8	3.0	Excluded
Bottom edge	5250	14.50	28.18	30.35	2.1	3.0	Excluded

For 5GHz Wi-Fi U-NII-1 1-g SAR (antenna to edges separation distance greater than 50mm)

Position	Frequency (MHz)	Power (dBm)	Power (mW)	Power allowed at 50mm	Separation Distance (mm)	Calculation Result (mW)	SAR Test
Back surface	5250	14.50	28.18	65.47	\	\	\
Left edge	5250	14.50	28.18	65.47	\	\	\
Right edge	5250	14.50	28.18	65.47	181.20	4657.47	Excluded
Top edge	5250	14.50	28.18	65.47	\	\	\
Bottom edge	5250	14.50	28.18	65.47	\	\	\

Note:

1. Because the power in mW is less than the calculation result, so SAR evaluation for corresponding position is not required.



For 5GHz Wi-Fi U-NII-3 1-g SAR (antenna to edges separation distance less than 50mm)

Position	Frequency (MHz)	Power (dBm)	Power (mW)	Separation Distance (mm)	Calculation Result	Threshold	SAR Test
Back surface	5850	12.00	15.85	7.10	5.4	3.0	Required
Left edge	5850	12.00	15.85	5.00	7.7	3.0	Required
Right edge	5850	12.00	15.85	\	\	\	\
Top edge	5850	12.00	15.85	35.85	1.1	3.0	Excluded
Bottom edge	5850	12.00	15.85	30.35	1.3	3.0	Excluded

For 5GHz Wi-Fi U-NII-3 1-g SAR (antenna to edges separation distance greater than 50mm)

Position	Frequency (MHz)	Power (dBm)	Power (mW)	Power allowed at 50mm	Separation Distance (mm)	Calculation Result (mW)	SAR Test
Back surface	5850	12.00	15.85	62.02	\	\	\
Left edge	5850	12.00	15.85	62.02	\	\	\
Right edge	5850	12.00	15.85	62.02	181.20	5178.82	Excluded
Top edge	5850	12.00	15.85	62.02	\	\	\
Bottom edge	5850	12.00	15.85	62.02	\	\	\

Note:

1. Because the power in mW is less than the calculation result, so SAR evaluation for corresponding position is not required.



9.2. Evaluation For ISED

For 2.4GHz Wi-Fi 1-g SAR

Position	Frequency (MHz)	Power (dBm)	Power (mW)	Separation Distance (mm)	Threshold (mW)	SAR Test
Back surface	2480	17.40	54.95	7.10	5.21	Required
Left edge	2480	17.40	54.95	5.00	3.94	Required
Right edge	2480	17.40	54.95	181.20	308.46	Excluded
Top edge	2480	17.40	54.95	35.85	430.82	Excluded
Bottom edge	2480	17.40	54.95	30.35	285.60	Excluded

For 5GHz Wi-Fi U-NII-1 1-g SAR

Position	Frequency (MHz)	Power (dBm)	Power (mW)	Separation Distance (mm)	Threshold (mW)	SAR Test
Back surface	5250	17.60	57.54	7.10	3.24	Required
Left edge	5250	17.60	57.54	5.00	1.24	Required
Right edge	5250	17.60	57.54	181.20	150.00	Excluded
Top edge	5250	17.60	57.54	35.85	217.27	Excluded
Bottom edge	5250	17.60	57.54	30.35	167.11	Excluded

For 5GHz Wi-Fi U-NII-3 1-g SAR

Position	Frequency (MHz)	Power (dBm)	Power (mW)	Separation Distance (mm)	Threshold (mW)	SAR Test
Back surface	5800	15.10	32.36	7.10	3.10	Required
Left edge	5800	15.10	32.36	5.00	1.00	Required
Right edge	5800	15.10	32.36	181.20	106.00	Excluded
Top edge	5800	15.10	32.36	35.85	157.38	Excluded
Bottom edge	5800	15.10	32.36	30.35	132.05	Excluded

For BT 1-g SAR

Position	Frequency (MHz)	Power (dBm)	Power (mW)	Separation Distance (mm)	Threshold (mW)	SAR Test
Back surface	2480	9.40	8.71	7.10	5.21	Required
Left edge	2480	9.40	8.71	5.00	3.94	Required
Right edge	2480	9.40	8.71	181.20	308.46	Excluded
Top edge	2480	9.40	8.71	35.85	430.82	Excluded
Bottom edge	2480	9.40	8.71	30.35	285.60	Excluded

Note:

- As per KDB RSS-102 issue 5, output power level shall be the higher of the maximum conducted or equivalent isotropically radiated power (e.i.r.p.) source-based, time-averaged output power.
- Because the power in mW is less than the corresponding threshold, so SAR evaluation for corresponding position is not required.



10. Dielectric Property Measurements & System Check

10.1. Dielectric Property Measurements

The temperature of the tissue-equivalent medium used during measurement must also be within 18°C to 25°C and within $\pm 2^\circ\text{C}$ of the temperature when the tissue parameters are characterized.

The 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. (°C)	Test Date
		Measured		Target		ϵ_r	σ			
		ϵ_r	σ	ϵ_r	σ					
Head 2450	2412	39.62	1.82	39.27	1.77	0.89	2.82	±5	21.6	2022.6.7
	2437	39.45	1.81	39.22	1.79	0.59	1.12			
	2450	39.37	1.83	39.20	1.80	0.43	1.67			
	2462	39.32	1.84	39.18	1.81	0.36	1.66			
Head 2450	2402	39.59	1.82	39.29	1.76	0.76	3.41	±5	22.3	2022.6.13
	2440	39.48	1.78	39.22	1.79	0.66	-0.56			
	2450	39.39	1.85	39.20	1.80	0.48	2.78			
	2462	39.42	1.79	39.18	1.81	0.61	-1.10			
Head 5250	5180	36.62	4.73	36.01	4.63	1.69	2.16	±5	21.9	2022.6.8
	5200	36.45	4.76	35.99	4.66	1.28	2.15			
	5240	36.44	4.75	35.94	4.70	1.39	1.06			
	5250	36.19	4.77	35.93	4.71	0.72	1.27			
Head 5750	5745	35.62	5.32	35.36	5.21	0.74	2.11	±5	21.7	2022.6.9
	5750	35.68	5.29	35.36	5.22	0.90	1.34			
	5755	35.73	5.27	35.35	5.22	1.07	0.96			
	5785	35.67	5.31	35.32	5.25	0.99	1.14			
	5795	35.64	5.28	35.31	5.26	0.93	0.38			
	5825	35.49	5.33	35.27	5.30	0.62	0.57			



10.2. 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 \pm 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 \geq 15.0 cm for SAR measurements \leq 3 GHz and \geq 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(\leq 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} , $\Delta y_{zoom} \leq$ 2GHz - \leq 8mm, 2-4GHz - \leq 5 mm and 4-6 GHz- \leq 4mm; $\Delta z_{zoom} \leq$ 3GHz - \leq 5 mm, 3-4 GHz- \leq 4mm and 4-6GHz- \leq 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)	Delta (%)	Limit (%)	Temp. (°C)	Test Date
	Zoom Scan (W/Kg)	Normalize to 1W (W/Kg)					
Head 2450	1-g	13.300	53.20	0.00	±10	21.6	2022.6.7
	10-g	6.110	24.44	24.20			
Head 2450	1-g	13.200	52.80	53.20	±10	22.3	2022.6.13
	10-g	6.070	24.28	24.20			
Head 5250	1-g	7.940	79.40	77.90	±10	21.9	2022.6.8
	10-g	2.300	23.00	22.60			
Head 5750	1-g	7.740	77.40	78.30	±10	21.7	2022.6.9
	10-g	2.220	22.20	22.40			



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 ≥ 0.8 W/Kg; if the deviation among the repeated measurement is $\leq 20\%$, and the measured SAR < 1.45 W/Kg, only one repeated measurement is required.



KDB 248227 D01 v02r02 for Wi-Fi Devices:

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 RF signal utilized in SAR measurement has 100% duty cycle and its crest factor is 1. The test procedures in KDB 248227 D01 v02r02 are applied. (Refer to KDB 248227D01 v02r02 for more details)

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 $\leq 0.4\text{W/kg}$, 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 $\leq 0.8\text{W/kg}$ 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 $> 0.8\text{ W/kg}$, SAR is measured for these test positions /configurations on the subsequent next highest measured output power channel(s) until the reported SAR is $\leq 1.2\text{ W/kg}$ or all required channels are tested.

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 v02r02). 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 $> 0.8\text{ W/kg}$, SAR measurement is required for the subsequent next highest measured output power channel(s) in the initial test configuration until the reported SAR is $\leq 1.2\text{ W/kg}$ or all required channels are tested.

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 $\leq 1.2\text{ W/kg}$, SAR is not required for that subsequent test configuration.

Note:

The same procedure is applied to extremity SAR evaluation, and the corresponding limitation is 2.5 times of 1-g SAR.



11.1. SAR Test Results of 2.4GHz Wi-Fi.

Test Position	Test Mode	Channel/ Frequency	Power (dBm)		Measured SAR Value	Power Drift	Duty Cycle (%)	Scaled (W/Kg)
			Tune-up	Meas.	Zoom1-g (W/Kg)			
Back Surface	11b	2437	15.00	14.74	0.111	-0.07	99.53	0.118
Left Edge	11b	2437	15.00	14.74	1.330	-0.07	99.53	1.419
Left Edge	11b	2412	15.00	14.71	1.340	-0.16	99.53	1.439
Left Edge	11b	2462	15.00	14.71	1.290	-0.03	99.53	1.386
Back Surface	11g	2462	14.50	14.46	0.239	-0.06	96.50	0.250
Left Edge	11g	2462	14.50	14.46	1.340	-0.05	96.50	1.401
Left Edge	11g	2437	14.50	14.45	1.370	-0.07	96.50	1.436
Left Edge	11g	2412	14.50	14.45	1.380	-0.01	96.50	1.447
Back Surface	11n20	2462	14.50	14.44	0.192	0.05	97.01	0.201
Left Edge	11n20	2462	14.50	14.44	1.190	-0.18	97.01	1.244
Left Edge	11n20	2437	14.50	14.39	1.190	-0.02	97.01	1.258
Left Edge	11n20	2412	14.50	14.28	1.330	-0.08	97.01	1.442
Worst Case repeated								
Left Edge	11g	2412	14.50	14.45	1.370	-0.07	96.50	1.436

OFDM mode SAR evaluation exclusion analysis

Mode	Tune-up (dBm)	Tune-up (mW)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11b	15.00	31.62	1.447	\	\
802.11g	14.50	28.18	\	1.290	Required
802.11n (20M)	14.50	28.18	\	1.290	Required

Note:

- The highest reported SAR for 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 are required.



11.2. SAR Test Results of 5GHz Wi-Fi U-NII-1.

Test Position	Test Mode	Channel/ Frequency	Power (dBm)		Measured SAR Value Zoom1-g (W/Kg)	Power Drift	Duty Cycle (%)	Scaled (W/Kg)
			Tune-up	Meas.				
Back Surface	11a	5200	14.50	14.26	0.199	-0.09	97.18	0.216
Left Edge	11a	5200	14.50	14.26	1.330	-0.01	97.18	1.446
Left Edge	11a	5240	14.50	14.25	1.230	-0.04	97.18	1.341
Left Edge	11a	5180	14.50	14.23	1.320	-0.04	97.18	1.445
Back Surface	11n20	5240	14.50	14.38	0.190	-0.19	96.99	0.201
Left Edge	11n20	5240	14.50	14.38	1.120	0.05	96.99	1.187
Left Edge	11n20	5180	14.50	14.26	1.270	0.03	96.99	1.384
Left Edge	11n20	5200	14.50	14.13	1.250	-0.02	96.99	1.403
Back Surface	11ac20	5200	14.50	14.43	0.193	0.04	96.99	0.202
Left Edge	11ac20	5200	14.50	14.43	1.270	0.03	96.99	1.331
Left Edge	11ac20	5180	14.50	14.38	1.280	0.09	96.99	1.357
Left Edge	11ac20	5240	14.50	14.41	1.230	0.09	96.99	1.295
Worst Case repeated								
Left Edge	11a	5200	14.50	14.26	1.220	-0.04	97.18	1.327

Subsequent test configuration SAR evaluation exclusion analysis for U-NII-I band

Mode	Tune-up (dBm)	Tune-up (mW)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11a	14.50	28.18	1.446	\	\
802.11n 20M	14.50	28.18	\	1.446	Required
802.11n 40M	12.50	17.78	\	0.912	Excluded
802.11ac 20M	14.50	28.18	\	1.446	Required
802.11ac 40M	12.50	17.78	\	0.912	Excluded
802.11ac 80M	9.00	7.94	\	0.408	Excluded

Note:

- 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 of 802.11n 40M and 802.11ac 40M are ≤ 1.2 W/kg, SAR test for the accordingly modes are not required. The adjusted SAR of 802.11n 20M and 802.11ac 20M are > 1.2 W/kg, SAR test for the accordingly modes are required.



11.3. SAR Test Results of 5GHz Wi-Fi U-NII-3.

Test Position	Test Mode	Channel/ Frequency	Power (dBm)		Measured SAR Value Zoom1-g (W/Kg)	Power Drift	Duty Cycle (%)	Scaled (W/Kg)
			Tune-up	Meas.				
Back Surface	11a	5825	12.00	11.89	0.140	0.04	97.18	0.148
Left Edge	11a	5825	12.00	11.89	1.220	0.09	97.18	1.288
Left Edge	11a	5785	12.00	11.73	1.320	0.04	97.18	1.445
Left Edge	11a	5745	12.00	11.53	1.250	0.03	97.18	1.433
Left Edge	11a	5765	12.00	11.45	1.190	-0.01	97.18	1.390
Left Edge	11a	5805	12.00	11.41	1.160	-0.09	97.18	1.367
Back Surface	11n20	5825	12.00	12.00	1.200	0.08	96.99	1.237
Left Edge	11n20	5825	12.00	12.00	1.200	0.08	96.99	1.237
Left Edge	11n20	5785	12.00	11.43	1.210	0.20	96.99	1.423
Left Edge	11n20	5805	12.00	11.41	1.190	-0.14	96.99	1.405
Left Edge	11n20	5745	12.00	11.38	1.210	0.05	96.99	1.439
Left Edge	11n20	5765	12.00	11.35	1.160	-0.12	96.99	1.389
Back Surface	11ac20	5825	11.50	11.50	0.128	0.07	96.99	0.132
Left Edge	11ac20	5825	11.50	11.50	1.150	0.10	96.99	1.186
Left Edge	11ac20	5785	11.50	11.35	1.240	0.19	96.99	1.323
Left Edge	11ac20	5745	11.50	11.21	1.220	0.05	96.99	1.345
Left Edge	11ac20	5805	11.50	11.20	1.160	-0.19	96.99	1.282
Left Edge	11ac20	5765	11.50	11.19	1.180	-0.11	96.99	1.307
Back Surface	11n40	5795	11.50	11.28	0.142	-0.01	94.12	0.159
Left Edge	11n40	5795	11.50	11.28	1.280	-0.06	94.12	1.431
Left Edge	11n40	5755	11.50	11.18	1.260	-0.03	94.12	1.441
Worst Case repeated								
Left Edge	11a	5785	12.00	11.73	1.190	0.04	97.18	1.303

Subsequent test configuration SAR evaluation exclusion analysis for U-NII-3 band

Mode	Tune-up (dBm)	Tune-up (mW)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11a	12.00	15.85	1.445	\	\
802.11n 20M	12.00	15.85	\	1.445	Required
802.11ac 20M	11.50	14.13	\	1.288	Required
802.11n 40M	11.50	14.13	\	1.288	Required
802.11ac 40M	11.00	12.59	\	1.148	Excluded
802.11ac 80M	11.00	12.59	\	1.148	Excluded

Note:

- 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 of 802.11ac 40M and 802.11ac 80M are ≤ 1.2 W/kg, SAR test for the accordingly modes are not required. The adjusted SAR of 802.11n 20M, 802.11ac 20M and 802.11n 40M are > 1.2 W/kg, SAR test for the accordingly modes are required.



11.4. SAR Test Results of BT.

Test Position	Test Mode	Channel/ Frequency	Power (dBm)		Measured SAR Value	Power Drift	Duty Cycle (%)	Scaled (W/Kg)
			Tune-up	Meas.	Zoom 1-g (W/Kg)			
Back Surface	BLE 1M	2402	7.00	5.69	0.014	-0.02	62.90	0.030
Left Edge	BLE 1M	2402	7.00	5.69	0.100	-0.06	62.90	0.215
Left Edge	BLE 1M	2440	7.00	5.66	0.078	-0.02	62.90	0.169
Left Edge	BLE 1M	2480	7.00	5.02	0.086	-0.03	62.90	0.216



12. Simultaneous Transmission SAR Analysis

Simultaneous transmission is not supported.

Appendixes

Refer to separated files for the following appendixes.

4790411210.2-SAR-1_App A Photo

4790411210.2-SAR-1_App B System Check Plots

4790411210.2-SAR-1_App C Highest Test Plots

4790411210.2-SAR-1_App D Cal. Certificates

-----End of Report-----