



**FCC 47 CFR § 2.1093
IEEE Std 1528-2013**

SAR EVALUATION REPORT

FOR

DTS/UNII a/b/g/n/ac/ax Tablet + BT/BLE and WPT

MODEL NUMBER: SM-X900

FCC ID: A3LSMX900

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Testing Laboratory

TL-637

Revision History

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V1	11/29/2021	Initial Issue	--
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1. Attestation of Test Results

Applicant Name	SAMSUNG ELECTRONICS CO.,LTD.		
FCC ID	A3LSMX900		
Model Number	SM-X900		
Applicable Standards	FCC 47 CFR § 2.1093 IEEE Std 1528-2013 Published RF exposure KDB procedures		
Exposure Category	SAR Limits (W/Kg)		
	Peak spatial-average (1g of tissue)		
General population / Uncontrolled exposure	1.6		
RF Exposure Conditions	Equipment Class - The Highest Reported SAR (W/kg)		
	DTS	NII	DSS
Standalone	0.73	0.96	0.52
Simultaneous TX	1.40	1.46	1.46
Date Tested	11/16/2021 to 11/26/2021		
Test Results	Pass		
UL Korea, Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Korea, Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report. Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Korea, Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Korea, Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by IAS, any agency of the Federal Government, or any agency of any government.			
Approved & Released By:		Prepared By:	
			
Justin Park Operations Leader UL Korea, Ltd. Suwon Laboratory		Jeongyeon Won Senior Laboratory technician UL Korea, Ltd. Suwon Laboratory	

1.1. The Highest Reported SAR for RF exposure conditions for each bands

Equipment Class	Band	Antenna	The Highest Reported SAR (W/kg)
			1g of tissue
			Standalone exposure condition
DTS	2.4GHz WLAN	All	0.728
UNII	5GHz WLAN	All	0.964
DSS	Bluetooth	All	0.521

2. Test Specification, Methods and Procedures

The tests documented in this report were performed in accordance with FCC 47 CFR § 2.1093, IEEE STD 1528-2013, ANSI C63.26-2015 the following FCC Published RF exposure [KDB](#) procedures:

- 248227 D01 802.11 Wi-Fi SAR v02r02
- 447498 D01 General RF Exposure Guidance v06
- 616217 D04 SAR for laptop and tablets v01r02
- 690783 D01 SAR Listings on Grants v01r03
- 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04

In addition to the above, the following information was used:

- [TCB workshop](#) October, 2016; RF Exposure Procedures (Bluetooth Duty Factor)
- [TCB workshop](#) April, 2019; RF Exposure Procedures (Tissue Simulating Liquids (TSL))

3. Facilities and Accreditation

The test sites and measurement facilities used to collect data are located at

Suwon
SAR 1 Room
SAR 2 Room
SAR 3 Room
SAR 4 Room

UL Korea, Ltd. is accredited by IAS, Laboratory Code TL-637.

The full scope of accreditation can be viewed at <https://www.iasonline.org/wp-content/uploads/2017/05/TL-637-cert-New.pdf>.

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 SAR Measurement 100 MHz to 6 GHz

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	$30^\circ \pm 1^\circ$	$20^\circ \pm 1^\circ$
Maximum area scan spatial resolution: $\Delta x_{\text{Area}}, \Delta y_{\text{Area}}$	≤ 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 $\leq$ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

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 SAR Measurement 100 MHz to 6 GHz

			≤ 3 GHz	> 3 GHz
Maximum zoom scan spatial resolution: $\Delta x_{\text{Zoom}}, \Delta y_{\text{Zoom}}$			≤ 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: $\Delta z_{\text{Zoom}}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{\text{Zoom}}(1)$: 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
		$\Delta z_{\text{Zoom}}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{\text{Zoom}}(n-1)$	
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 <i>reported</i> SAR from the <i>area scan based 1-g SAR estimation</i> 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 larger 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.

Dielectric Property Measurements

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Network Analyzer	Agilent	E5071C	MY46522054	8-6-2022
Dielectric Assessment Kit	SPEAG	DAK-3.5	1196	7-21-2022
Shorting block	SPEAG	DAK-3.5 Short	SM DAK 200 BA	N/A
Thermometer	LKM	DTM3000	3851	8-4-2022

System Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
MXG Analog Signal Generator	Agilent	N5181A	MY50145882	8-4-2022
Power Sensor	Agilent	U2000A	MY54260007	8-4-2022
Power Sensor	Agilent	U2000A	MY60180020	8-4-2022
Power Amplifier	EXODUS	1410025-AMP2027-10003	10003	8-4-2022
Directional Coupler	Agilent	772D	MY52180193	8-3-2022
Directional Coupler	Agilent	778D	MY52180432	8-3-2022
Low Pass Filter	MINI-CIRCUITS	NLP-1200	VUU19301915	8-4-2022
Low Pass Filter	MICROLAB	LA-15N	3943	8-3-2022
Low Pass Filter	FILTRON	L14012FL	1410003S	8-3-2022
Low Pass Filter	MICROLAB	LA-60N	3942	8-4-2022
Attenuator	MINI-CIRCUITS	BW-N3W5+	N/A	8-4-2022
Attenuator	Agilent	8491B/003	MY39272275	8-17-2022
Attenuator	Agilent	8491B/010	MY39272011	8-4-2022
Attenuator	Agilent	8491B/020	MY39271973	8-4-2022
E-Field Probe	SPEAG	EX3DV4	7314	5-31-2022
E-Field Probe	SPEAG	EX3DV4	7645	4-15-2022
E-Field Probe	SPEAG	EX3DV4	7330	9-29-2022
E-Field Probe	SPEAG	EX3DV4	3697	3-22-2022
E-Field Probe	SPEAG	EX3DV4	7376	7-30-2022
Data Acquisition Electronics	SPEAG	DAE4	1591	3-26-2022
Data Acquisition Electronics	SPEAG	DAE4	1343	8-23-2022
Data Acquisition Electronics	SPEAG	DAE4	1468	9-27-2022
Data Acquisition Electronics	SPEAG	DAE4	1447	2022-03-23
System Validation Dipole	SPEAG	D2450V2	960	3-20-2022
System Validation Dipole	SPEAG	D5GHzV2	1184	12-3-2022
System Validation Dipole	SPEAG	D5GHzV2	1293	2023-07-22
Thermometer	Lutron	MHB-382SD	AH.50213	8-4-2022
Thermometer	Lutron	MHB-382SD	AJ.45903	8-3-2022
Thermometer	Lutron	MHB-382SD	AK.12123	8-3-2022

Others

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Base Station Simulator	R & S	CMW500	169803	2022-01-28

Note(s):

1. For System Validation Dipole, Calibration interval applied every 2 years according to referencing KDB 865664 guidance.
2. Refer to Appendix F that mentioned about justification for Extended SAR Dipole Calibrations. (for blue box items)
3. All equipments were used until Cal.Due data.

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 $\leq 30\%$, for a confidence interval of $k = 2$. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval.

5.1. DECISION RULE

Decision rule for statement(s) of conformity is based on Procedures 1, Clause 4.4.2 in IEC Guide 115:2007.

6. Device Under Test (DUT) Information

6.1. DUT Description

Device Dimension	Refer to Appendix A.		
Back Cover	☒ The Back Cover is not removable.		
Battery Options	☒ The rechargeable battery is not user accessible		
Wireless Router (Hotspot)	Wi-Fi Hotspot mode permits the device to share its cellular data connection with other Wi-Fi-enabled devices. ☒ Mobile Hotspot (Wi-Fi 2.4 GHz) ☒ Mobile Hotspot (Wi-Fi 5.8 GHz)		
Wi-Fi Direct	Wi-Fi Direct enabled devices transfer data directly between each other ☒ Wi-Fi Direct (Wi-Fi 2.4 GHz) ☒ Wi-Fi Direct (Wi-Fi 5.2 GHz_UNII-1, Wi-Fi 5.8 GHz_UNII-3)		
Test Sample Information	No.	S/N	Notes
	1	R32R90041WE	Wi-Fi & BT Conducted
	2	R32RA006VAY	Wi-Fi & BT Conducted
	3	R32RA006V1M	SAR
	4	R32RA006V5X	SAR
	5	R32RB00B40E	SAR
	6	R32RB00B3YR	SAR
	7	R32RB00B58V	SAR
	8	R32RB00B3WH	SAR
	9	R32RB00B7AT	SAR
	10	R32RB00B3XZ	SAR

6.2. Wireless Technologies

Wireless technologies	Frequency bands	Operating mode	Duty Cycle used for SAR testing
Wi-Fi	2.4 GHz	802.11b 802.11g 802.11n (HT20) 802.11ax (HE20)	SISO mode 99.3% (802.11b) 96.3% (802.11g) MIMO mode 99.3% (802.11b) 96.3% (802.11g)
	5 GHz	802.11a 802.11n (HT20) & (HT40) 802.11ac (VHT20) & (VHT40) & (VHT80) & (VHT160) 802.11ax (HE20) & (HE40) & (HE80) & (HE160)	MIMO mode 96.1% (802.11n HT40) 94.6% (802.11ac VHT80)
	Does this device support bands 5.60 ~ 5.65 GHz? ☒ Yes ☐ No		
	Does this device support Band gap channel(s)? ☒ Yes ☐ No		
Bluetooth	2.4 GHz	Version 5.0 LE	76.7% (DH5)

Notes:

1. The Bluetooth protocol is considered source-based averaging. Bluetooth GFSK (DH5) was verified to have the highest duty cycle of 76.7% and was considered and used for SAR Testing.
2. Duty cycle for Wi-Fi is referenced from the DTS and UNII report.

6.3 Nominal and Maximum Output Power

KDB 447498 sec.4.1. 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

Normal WLAN-Maximum power

Band	Mode	SISO/MIMO Ant.1 & Ant.2 (dBm)				MIMO Ant.1 & Ant.2 (dBm)				MIMO (Ant.1 + Ant.2) (dBm)					
		b	g	n	ax	a	n	ac	ax	b	a	g	n	ac	ax
2.4GHz	Ch1 - Ch11	16	18 16 (Ch1) 16.5 (Ch11)	18 16 (Ch1) 16.5 (Ch11)	18 15 (Ch1) 15.5 (Ch11)					19		21 19 (Ch1) 19.5 (Ch11)	21 19 (Ch1) 19.5 (Ch11)		21 18 (Ch1) 18.5 (Ch11)
2.4GHz	Ch12	9	9	9	9					9		9	9		9
2.4GHz	Ch13	-2	-2	-2	-2					-2		-2	-2		-2
5GHz (20MHz)	UNII-1					17	17	17	17		20		20	20	20
	UNII-2A					17	17	17	17		20		20	20	20
	UNII-2C					17	17	17	17		20		20	20	20
	UNII-3					17	17	17	17		20		20	20	20
	UNII-4					17	17	17	17		20		20	20	20
5GHz (40MHz)	UNII-1						17	17	17 16 (Ch 38)				20	20	20 19 (Ch 38)
	UNII-2A						17	17	17				20	20	20
	UNII-2C						17	17	17				20	20	20
	UNII-3						17	17	17				20	20	20
	UNII-4						17	17	17				20	20	20
5GHz (80MHz)	UNII-1							16	16 15 (Ch 42)					19	19 18 (Ch 42)
	UNII-2A							16	16					19	19
	UNII-2C							16	16					19	19
	UNII-3							16	16					19	19
	UNII-4							16	16					19	19
5GHz (160MHz)	UNII-1 & UNII-2A							15	15					18	18
	UNII-2C							15	15					18	18
	UNII-3 & UNII-4							15	15					18	18

Normal WLAN-Reduced power

Band	Mode	SISO / MIMO Ant.1 & Ant.2 (dBm)				MIMO Ant.1 & Ant.2 (dBm)				MIMO (Ant.1 + Ant.2) (dBm)					
		b	g	n	ax	a	n	ac	ax	b	a	g	n	ac	ax
2.4GHz	Ch1 - Ch11	13	13	13	13					16		16	16		16
2.4GHz	Ch12														
2.4GHz	Ch13														
5GHz (20MHz)	UNII-1					9	9	9	9		12		12	12	12
	UNII-2A					9	9	9	9		12		12	12	12
	UNII-2C					9	9	9	9		12		12	12	12
	UNII-3					7	7	7	7		10		10	10	10
	UNII-4					7	7	7	7		10		10	10	10
5GHz (40MHz)	UNII-1						9	9	9				12	12	12
	UNII-2A						9	9	9				12	12	12
	UNII-2C						9	9	9				12	12	12
	UNII-3						7	7	7				10	10	10
	UNII-4						7	7	7				10	10	10
5GHz (80MHz)	UNII-1							9	9					12	12
	UNII-2A							9	9					12	12
	UNII-2C							9	9					12	12
	UNII-3							7	7					10	10
	UNII-4							7	7					10	10
5GHz (160MHz)	UNII-1 & UNII-2A							8.5	8.5					11.5	11.5
	UNII-2C							8.5	8.5					11.5	11.5
	UNII-3 & UNII-4							6.5	6.5					9.5	9.5

RSDB WLAN Maximum power

Band	Mode	SISO / MIMO Ant.1 & Ant.2 (dBm)				MIMO Ant.1 & Ant.2 (dBm)				MIMO (Ant.1 + Ant.2) (dBm)					
		b	g	n	ax	a	n	ac	ax	b	a	g	n	ac	ax
2.4GHz	Ch1 - Ch11	11	11	11	11					14		14	14		14
2.4GHz	Ch12														
2.4GHz	Ch13														
5GHz (20MHz)	UNII-1					7	7	7	7		10		10	10	10
	UNII-2A					7	7	7	7		10		10	10	10
	UNII-2C					7	7	7	7		10		10	10	10
	UNII-3					7	7	7	7		10		10	10	10
	UNII-4					7	7	7	7		10		10	10	10
5GHz (40MHz)	UNII-1						7	7	7				10	10	10
	UNII-2A						7	7	7				10	10	10
	UNII-2C						7	7	7				10	10	10
	UNII-3						7	7	7				10	10	10
	UNII-4						7	7	7				10	10	10
5GHz (80MHz)	UNII-1							7	7					10	10
	UNII-2A							7	7					10	10
	UNII-2C							7	7					10	10
	UNII-3							7	7					10	10
	UNII-4							7	7					10	10
5GHz (160MHz)	UNII-1 & UNII-2A							6.5	6.5					9.5	9.5
	UNII-2C							6.5	6.5					9.5	9.5
	UNII-3 & UNII-4							6.5	6.5					9.5	9.5

Bluetooth Maximum & Reduced power

Band	Mode	Maximum output power (dBm)		Reduced output power (dBm)	
		BT Ant.1	BT Ant.2	BT Ant.1	BT Ant.2
2.4GHz	Bluetooth_BDR	18	18	12	12
2.4GHz	Bluetooth_EDR	16	16	12	12
2.4GHz	Bluetooth_LE (High power)	16	16	12	12
2.4GHz	Bluetooth_LE (Low power)	11	11	11	11

Note(s):

1. 2.4GHz(DTS) mode are support both SISO and MIMO mode.
2. 5GHz(UNII) mode are support only MIMO mode.
3. Bluetooth mode are support only SISO mode.
4. WLAN has specific target power, when RSDB operation.
5. WLAN and Bluetooth are support power reduction mode during proximity sensor active.
6. WLAN (including RSDB) and Bluetooth simultaneous transmission scenarios are refer to section.12.

6.4. Power Back-off Operation

This device supports power back-off modes using triggering proximity sensor. For full details on how power back-off mode operates, refer to the Operational Description.

Antenna	Technologies Supported	Proximity sensor	Power Back-off mode	Standalone Exposure Conditions				
				Rear	Edge 1	Edge 2	Edge 3	Edge 4
WiFi/BT Ant.1	Wi-Fi 2.4GHz	Proximity sensor.3	Proximity sensor triggering	O	O			O
	Wi-Fi 5GHz							
	Bluetooth							
WiFi/BT Ant.2	Wi-Fi 2.4GHz	Proximity sensor.1	Proximity sensor triggering	O			O	O
	Wi-Fi 5GHz							
	Bluetooth							

Note(s):

1. Please refer to Section.9 for all power measurements, and Proximity sensor verification is mention at Appendix G.

7. RF Exposure Conditions (Test Configurations)

Refer to Appendix A for the specific details of the antenna-to-antenna and antenna-to-edge(s) distances.

WLAN & Bluetooth Bands

Antenna	Tx Interface	Pwr Back-off	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Corner A	Corner B
				(Left Edge)	(Bottom Edge)	(Right Edge)	(Top Edge)	Note 3	
WLAN/BT SISO Ant.1	2.4GHz DTS	OFF	Yes	Yes	No	No	Yes	Yes	
		ON	Yes	Yes	No	No	Yes	No	
	Bluetooth	OFF	Yes	Yes	No	No	Yes	Yes	
		ON	Yes	Yes	No	No	Yes	No	
WLAN SISO Ant.2	2.4GHz DTS	OFF	Yes	No	No	Yes	Yes		Yes
		ON	Yes	No	No	Yes	Yes		No
	Bluetooth	OFF	Yes	No	No	Yes	Yes		Yes
		ON	Yes	No	No	Yes	Yes		No
WLAN MIMO (Ant.1 + Ant.2)	2.4GHz DTS	OFF	Yes	Yes	No	Yes	Yes	Yes	Yes
		ON	Yes	Yes	No	Yes	Yes	No	No
	5GHz UNII	OFF	Yes	Yes	No	Yes	Yes	Yes	Yes
		ON	Yes	Yes	No	Yes	Yes	No	No

Note(s):

1. Yes = Testing is required. No = Testing is not required.
2. Estimated SAR (0.4 W/kg) is applied for WLAN/BT SISO Ant.1's Edge 3 and WLAN/BT SISO Ant.2's Edge 1 due to Separation distance is over 50 mm. Detail of the Separation distance from antenna to Edge's are refer to Appendix A.
3. Corner SAR additionally evaluated using max power with triggering distance. (Corner A = between Edge.1 and Edge.4 / Corner B = between Edge 3 and Edge 4).

8. Dielectric Property Measurements & System Check

8.1. 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 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

SAR test were performed in All RF exposure conditions using Head tissue according to TCB workshop note of April. 2019.

IEEE Std 1528-2013

Refer to Table 3 within the IEEE Std 1528-2013

Dielectric Property Measurements Results:**SAR 1 Room**

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
11/25/2021	Head 2450	e'	38.8200	Relative Permittivity (ϵ_r):	38.82	39.20	-0.97	5
		e"	13.3800	Conductivity (σ):	1.82	1.80	1.26	5
	Head 2400	e'	38.9500	Relative Permittivity (ϵ_r):	38.95	39.30	-0.88	5
		e"	13.3900	Conductivity (σ):	1.79	1.75	2.01	5
	Head 2480	e'	38.7600	Relative Permittivity (ϵ_r):	38.76	39.16	-1.03	5
		e"	13.4000	Conductivity (σ):	1.85	1.83	0.84	5

SAR 2 Room

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
11/16/2021	Head 5250	e'	35.9400	Relative Permittivity (ϵ_r):	35.94	35.93	0.02	5
		e"	16.2000	Conductivity (σ):	4.73	4.70	0.57	5
	Head 5260	e'	35.9200	Relative Permittivity (ϵ_r):	35.92	35.92	0.00	5
		e"	16.2100	Conductivity (σ):	4.74	4.71	0.61	5
	Head 5600	e'	35.5700	Relative Permittivity (ϵ_r):	35.57	35.53	0.10	5
		e"	16.2200	Conductivity (σ):	5.05	5.06	-0.19	5
	Head 5750	e'	35.3000	Relative Permittivity (ϵ_r):	35.30	35.36	-0.18	5
		e"	16.2600	Conductivity (σ):	5.20	5.21	-0.29	5
	Head 5825	e'	35.1400	Relative Permittivity (ϵ_r):	35.14	35.30	-0.45	5
		e"	16.2800	Conductivity (σ):	5.27	5.27	0.06	5
11/18/2021	Head 5250	e'	36.5100	Relative Permittivity (ϵ_r):	36.51	35.93	1.61	5
		e"	15.8800	Conductivity (σ):	4.64	4.70	-1.41	5
	Head 5260	e'	36.5100	Relative Permittivity (ϵ_r):	36.51	35.92	1.64	5
		e"	15.8800	Conductivity (σ):	4.64	4.71	-1.44	5
	Head 5600	e'	35.9800	Relative Permittivity (ϵ_r):	35.98	35.53	1.26	5
		e"	16.0200	Conductivity (σ):	4.99	5.06	-1.42	5
	Head 5750	e'	35.7700	Relative Permittivity (ϵ_r):	35.77	35.36	1.15	5
		e"	16.1400	Conductivity (σ):	5.16	5.21	-1.03	5
	Head 5800	e'	35.7200	Relative Permittivity (ϵ_r):	35.72	35.30	1.19	5
		e"	16.1800	Conductivity (σ):	5.22	5.27	-0.99	5
	Head 5925	e'	35.5500	Relative Permittivity (ϵ_r):	35.55	35.20	0.99	5
		e"	16.2500	Conductivity (σ):	5.35	5.40	-0.86	5
11/21/2021	Head 5250	e'	35.5300	Relative Permittivity (ϵ_r):	35.53	35.93	-1.12	5
		e"	16.3600	Conductivity (σ):	4.78	4.70	1.57	5
	Head 5260	e'	35.5100	Relative Permittivity (ϵ_r):	35.51	35.92	-1.15	5
		e"	16.3700	Conductivity (σ):	4.79	4.71	1.60	5
	Head 5600	e'	34.9500	Relative Permittivity (ϵ_r):	34.95	35.53	-1.64	5
		e"	16.5600	Conductivity (σ):	5.16	5.06	1.90	5
	Head 5750	e'	34.7000	Relative Permittivity (ϵ_r):	34.70	35.36	-1.87	5
		e"	16.6500	Conductivity (σ):	5.32	5.21	2.10	5
	Head 5800	e'	34.6200	Relative Permittivity (ϵ_r):	34.62	35.30	-1.93	5
		e"	16.6800	Conductivity (σ):	5.38	5.27	2.07	5
Head 5925	e'	34.4200	Relative Permittivity (ϵ_r):	34.42	35.20	-2.22	5	
	e"	16.7400	Conductivity (σ):	5.51	5.40	2.13	5	

SAR 3 Room

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
11/25/2021	Head 2450	e'	39.3000	Relative Permittivity (ϵ_r):	39.30	39.20	0.26	5
		e''	13.7200	Conductivity (σ):	1.87	1.80	3.84	5
	Head 2400	e'	39.4100	Relative Permittivity (ϵ_r):	39.41	39.30	0.29	5
		e''	13.6900	Conductivity (σ):	1.83	1.75	4.30	5
	Head 2480	e'	39.2200	Relative Permittivity (ϵ_r):	39.22	39.16	0.15	5
		e''	13.7000	Conductivity (σ):	1.89	1.83	3.10	5

SAR 4 Room

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
11/22/2021	Head 2450	e'	38.3500	Relative Permittivity (ϵ_r):	38.35	39.20	-2.17	5
		e''	13.6700	Conductivity (σ):	1.86	1.80	3.46	5
	Head 2400	e'	38.4900	Relative Permittivity (ϵ_r):	38.49	39.30	-2.05	5
		e''	13.6900	Conductivity (σ):	1.83	1.75	4.30	5
	Head 2480	e'	38.3100	Relative Permittivity (ϵ_r):	38.31	39.16	-2.18	5
		e''	13.7000	Conductivity (σ):	1.89	1.83	3.10	5
11/25/2021	Head 2450	e'	38.1000	Relative Permittivity (ϵ_r):	38.10	39.20	-2.81	5
		e''	13.5100	Conductivity (σ):	1.84	1.80	2.25	5
	Head 2400	e'	38.2400	Relative Permittivity (ϵ_r):	38.24	39.30	-2.69	5
		e''	13.5100	Conductivity (σ):	1.80	1.75	2.92	5
	Head 2480	e'	38.0300	Relative Permittivity (ϵ_r):	38.03	39.16	-2.89	5
		e''	13.4900	Conductivity (σ):	1.86	1.83	1.52	5

8.2. 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 10 mm (above 1 GHz) and 15 mm (below 1 GHz) from dipole center to the simulating liquid surface.
- The coarse grid with a grid spacing of 15 mm was aligned with the dipole.
For 5 GHz band - The coarse grid with a grid spacing of 10 mm was aligned with the dipole.
- Special 7x7x7 (below 3 GHz) and/or 8x8x7 (above 3 GHz) fine cube was chosen for the cube.
- Distance between probe sensors and phantom surface was set to 2.5 mm.
For 5 GHz band - Distance between probe sensors and phantom surface was set to 1.4 mm
- The dipole input power (forward power) was 100 mW.
- The results are normalized to 1 W input power.

Reference Target SAR Values

The reference SAR values can be obtained from the calibration certificate of system validation dipoles.

System Dipole	Serial No.	Cal. Date	Freq. (MHz)	Target SAR Values (W/kg)	
				1g/10g	Head
D2450V2	960	3/20/2020	2450	1g	53.20
				10g	24.80
D5GHzV2	1184	12/3/2020	5250	1g	79.10
				10g	22.70
			5600	1g	82.40
				10g	23.30
			5750	1g	79.90
				10g	22.60
D5GHzV2	1293	7/22/2021	5800	1g	80.60
				10g	22.90

Note(s):

Refer to Appendix F that mentioned about justification for Extended SAR Dipole Calibrations.

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.

SAR 1 Room

Date Tested	System Dipole		T.S. Liquid	Measured Results		Target (Ref. Value)	Delta ±10 %	Plot No.
	Type	Serial #		Zoom Scan to 100 mW	Normalize to 1 W			
11/25/2021	D2450V2	960	Head	1g	5.61	56.1	53.20	1, 2
				10g	2.63	26.3	24.80	

SAR 2 Room

Date Tested	System Dipole		T.S. Liquid	Measured Results		Target (Ref. Value)	Delta ±10 %	Plot No.
	Type	Serial #		Zoom Scan to 100 mW	Normalize to 1 W			
11/16/2021	D5GHzV2	1184	Head	1g	8.46	84.6	79.10	
				10g	2.46	24.6	22.70	
11/16/2021	D5GHzV2	1184	Head	1g	8.18	81.8	82.40	
				10g	2.34	23.4	23.30	
11/16/2021	D5GHzV2	1184	Head	1g	8.41	84.1	79.90	
				10g	2.41	24.1	22.60	
11/18/2021	D5GHzV2	1293	Head	1g	7.57	75.7	80.60	3, 4
				10g	2.13	21.3	22.90	
11/21/2021	D5GHzV2	1184	Head	1g	8.48	84.8	79.10	5, 6
				10g	2.42	24.2	22.70	
11/21/2021	D5GHzV2	1184	Head	1g	8.81	88.1	82.40	
				10g	2.50	25.0	23.30	
11/21/2021	D5GHzV2	1184	Head	1g	8.49	84.9	79.90	
				10g	2.42	24.2	22.60	

SAR 3 Room

Date Tested	System Dipole		T.S. Liquid	Measured Results		Target (Ref. Value)	Delta ±10 %	Plot No.
	Type	Serial #		Zoom Scan to 100 mW	Normalize to 1 W			
11/25/2021	D2450V2	960	Head	1g	5.73	57.3	53.20	7, 8
				10g	2.66	26.6	24.80	

SAR 4 Room

Date Tested	System Dipole		T.S. Liquid	Measured Results		Target (Ref. Value)	Delta ±10 %	Plot No.
	Type	Serial #		Zoom Scan to 100 mW	Normalize to 1 W			
11/22/2021	D2450V2	960	Head	1g	5.19	51.9	53.20	
				10g	2.40	24.0	24.80	
11/25/2021	D2450V2	960	Head	1g	5.17	51.7	53.20	9, 10
				10g	2.39	23.9	24.80	

9. Conducted Output Power Measurements

9.1. Wi-Fi 2.4 GHz (DTS Band)

Normal WLAN SISO output power results

Antenna	Mode	Data Rate	Ch #	Freq. (MHz)	WLAN mode power						
					Max.Average Power			Reduced Average Power			
					Meas. Avg Pwr (dBm)	Max. Tune-up Limit (dBm)	SAR Test (Yes/No)	Meas. Avg Pwr (dBm)	Max. Tune-up Limit (dBm)	SAR Test (Yes/No)	
WiFi 2.4G Ant.1	802.11b	1 Mbps	1	2412.0	Not Required	16.0	No	12.5	13.0	Yes	
			6	2437.0				12.6			
			11	2462.0				12.5			
			12	2467.0							
			13	2472.0							
	802.11g	6 Mbps	1	2412.0	Not Required	16.0	Yes	Not Required	13.0	No	
			2	2417.0	17.5						
			6	2437.0	17.9						
			10	2457.0	17.3						
			11	2462.0	Not Required	16.5	No				
			12	2467.0	Not Required	9.0					
			13	2472.0	Not Required	-2.0					
WiFi 2.4G Ant.2	802.11b	1 Mbps	1	2412.0	Not Required	16.0	No	12.3	13.0	Yes	
			6	2437.0				12.6			
			11	2462.0				12.8			
			12	2467.0				Not Required		9.0	No
			13	2472.0				Not Required		-2.0	
	802.11g	6 Mbps	1	2412.0	Not Required	16.0	Yes	Not Required	13.0	No	
			2	2417.0	17.4						
			6	2437.0	17.3						
			10	2457.0	17.7						
			11	2462.0	Not Required	16.5	No				
			12	2467.0	Not Required	9.0					
			13	2472.0	Not Required	-2.0					

Normal WLAN MIMO output power results

Antenna	Mode	Data Rate	Ch #	Freq. (MHz)	WLAN mode power					
					Max.Average Power			Reduced Average Power		
					Meas. Avg Pwr (dBm)	Max. Tune-up Limit (dBm)	SAR Test (Yes/No)	Meas. Avg Pwr (dBm)	Max. Tune-up Limit (dBm)	SAR Test (Yes/No)
WiFi 2.4G Ant.1	802.11b	1 Mbps	1	2412.0	Not Required	16.0	No	12.3	13.0	Yes
			6	2437.0				13.0		
			11	2462.0				12.8		
			12	2467.0						
			13	2472.0						
	802.11g	6 Mbps	1	2412.0	Not Required	16.0	No		13.0	No
			2	2417.0						
			6	2437.0	Not Required	18.0	Yes			
			10	2457.0						
			11	2462.0	Not Required	16.5	No			
			12	2467.0						
			13	2472.0						
			1	2412.0						
	802.11n	6.5 Mbps	2	2417.0	Not Required	18.0	No		13.0	No
			6	2437.0						
			10	2457.0						
			11	2462.0						
			12	2467.0						
			13	2472.0						
			1	2412.0						
	802.11ax	7.3 Mbps	2	2417.0	Not Required	18.0	No		13.0	No
			6	2437.0						
			10	2457.0						
			11	2462.0						
			12	2467.0						
			13	2472.0						
			1	2412.0						
WiFi 2.4G Ant.2	802.11b	1 Mbps	1	2412.0	Not Required	16.0	No	11.8	13.0	Yes
			6	2437.0				11.9		
			11	2462.0				11.2		
			12	2467.0						
			13	2472.0						
	802.11g	6 Mbps	1	2412.0	Not Required	16.0	No		13.0	No
			2	2417.0						
			6	2437.0	Not Required	18.0	Yes			
			10	2457.0						
			11	2462.0	Not Required	16.5	No			
			12	2467.0						
			13	2472.0						
			1	2412.0						
	802.11n	6.5 Mbps	2	2417.0	Not Required	18.0	No		13.0	No
			6	2437.0						
			10	2457.0						
			11	2462.0						
			12	2467.0						
			13	2472.0						
			1	2412.0						
	802.11ax	7.3 Mbps	2	2417.0	Not Required	18.0	No		13.0	No
			6	2437.0						
			10	2457.0						
			11	2462.0						
			12	2467.0						
			13	2472.0						
			1	2412.0						

Note(s):

- SAR is not required for 802.11g/n modes when the adjusted SAR for 802.11b is < 1.2 W/kg.
- For "Not required", SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1, b), 1) when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11n/g/ax mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band. Additional output power measurements were not deemed necessary.
- Additionally, SAR is not required for Channels 12 and 13 because the tune-up limit and the measured output power for these two channels are no greater than those for the default test channels. Refer to §6.3.
- Normal WLAN MIMO SAR additionally were evaluated for satisfy to simultaneous transmission analysis.

RSDB WLAN SISO output power results

Antenna	Mode	Data Rate	Ch #	Freq. (MHz)	WLAN mode power		
					Max.Average Power		
					Meas. Avg Pwr (dBm)	Max. Tune-up Limit (dBm)	SAR Test (Yes/No)
WiFi 2.4G Ant.1	802.11b	1 Mbps	1	2412.0	10.0	11.0	Yes
			6	2437.0	10.3		
			11	2462.0	9.8		
WiFi 2.4G Ant.2	802.11b	1 Mbps	1	2412.0	9.9	11.0	Yes
			6	2437.0	11.0		
			11	2462.0	10.4		

RSDB WLAN MIMO output power results

Antenna	Mode	Data Rate	Ch #	Freq. (MHz)	WLAN mode power		
					Max.Average Power		
					Meas. Avg Pwr (dBm)	Max. Tune-up Limit (dBm)	SAR Test (Yes/No)
WiFi 2.4G Ant.1	802.11b	1 Mbps	1	2412.0	11.0	11.0	Yes
			6	2437.0	11.0		
			11	2462.0	11.0		
	802.11g	6 Mbps	1	2412.0	Not Required	11.0	Yes
			6	2437.0			
			11	2462.0			
	802.11n	6.5 Mbps	1	2412.0	Not Required	11.0	Yes
			6	2437.0			
			11	2462.0			
	802.11ax	7.3 Mbps	1	2412.0	Not Required	11.0	Yes
			6	2437.0			
			11	2462.0			
WiFi 2.4G Ant.2	802.11b	1 Mbps	1	2412.0	10.5	11.0	Yes
			6	2437.0	9.4		
			11	2462.0	9.1		
	802.11g	6 Mbps	1	2412.0	Not Required	11.0	Yes
			6	2437.0			
			11	2462.0			
	802.11n	6.5 Mbps	1	2412.0	Not Required	11.0	Yes
			6	2437.0			
			11	2462.0			
	802.11ax	7.3 Mbps	1	2412.0	Not Required	11.0	Yes
			6	2437.0			
			11	2462.0			

Note(s):

- SAR is not required for 802.11g/n modes when the adjusted SAR for 802.11b is < 1.2 W/kg.
- For "Not required", SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1, b), 1) when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11n/g/ax mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band. Additional output power measurements were not deemed necessary.
- RSDB WLAN SISO & MIMO SAR additionally were evaluated for satisfy to simultaneous transmission analysis.

9.2. Wi-Fi 5GHz (U-NII Bands)

Normal WLAN MIMO Ant.1 output power Results

Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	WLAN mode power					
						Max. Average Power			Reduced Average Power		
						Avg Pwr (dBm)	Max. Tune-up Limit (dBm)	SAR Test (Yes/No)	Avg Pwr (dBm)	Max. Tune-up Limit (dBm)	SAR Test (Yes/No)
5GHz MIMO Ant.1	5.3 (UNII 2A)	802.11a	6 Mbps	Not Required			17.0	No	Not Required	9.0	No
		802.11n (HT20)	6.5 Mbps	Not Required			17.0	No	Not Required	9.0	No
		802.11n (HT40)	13.5 Mbps	54	5270.0	15.6	17.0	Yes	Not Required	9.0	No
				62	5310.0	15.9					
		802.11ac (VHT20)	6.5 Mbps	Not Required			17.0	No	Not Required	9.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Required			17.0	No	Not Required	9.0	No
		802.11ac (VHT80)	29.3 Mbps	58	5290.0	Not Required	16.0	No	8.8	9.0	Yes
		802.11ac (VHT160)	58.5 Mbps	Not Required			15.0	No	Not Required	8.5	No
		802.11ax (HE20)	7.3 Mbps	Not Required			17.0	No	Not Required	9.0	No
		802.11ax (HE40)	14.6 Mbps	Not Required			17.0	No	Not Required	9.0	No
		802.11ax (HE80)	36.0 Mbps	Not Required			16.0	No	Not Required	9.0	No
		802.11ax (HE160)	72.0 Mbps	Not Required			15.0	No	Not Required	8.5	No
	5.5 (U-NII 2C)	802.11a	6 Mbps	Not Required			17.0	No	Not Required	9.0	No
		802.11n (HT20)	6.5 Mbps	Not Required			17.0	No	Not Required	9.0	No
		802.11n (HT40)	13.5 Mbps	102	5510.0	16.0	17.0	Yes	Not Required	9.0	No
				118	5590.0	15.8					
				126	5630.0	15.0					
				142	5710.0	15.3					
		802.11ac (VHT20)	6.5 Mbps	Not Required			17.0	No	Not Required	9.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Required			17.0	Yes	Not Required	9.0	No
		802.11ac (VHT80)	29.3 Mbps	106	5530.0	Not Required	16.0	No	8.7	9.0	Yes
				122	5610.0				8.4		
				138	5690.0				8.6		
		802.11ac (VHT160)	58.5 Mbps	Not Required			15.0	No	Not Required	8.5	No
		802.11ax (HE20)	7.3 Mbps	Not Required			17.0	No	Not Required	9.0	No
		802.11ax (HE40)	14.6 Mbps	Not Required			17.0	No	Not Required	9.0	No
		802.11ax (HE80)	36.0 Mbps	Not Required			16.0	No	Not Required	9.0	No
		802.11ax (HE160)	72.0 Mbps	Not Required			15.0	No	Not Required	8.5	No

Note(s):

- For "Not required", SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1, b), 1) when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band.
- When the same transmission mode configurations have the same maximum output power on the same channel for the 802.11 a/g/n/ac/ax modes, the channel in the lower order/sequence 802.11 mode (i.e. a, g, n ac then ax) is selected.
- When the specified maximum output power is the same for both UNII band I and UNII band 2A, begin SAR measurement in UNII band 2A; and if the highest reported SAR for UNII band 2A is
 - ≤ 1.2 W/kg, SAR is not required for UNII band I
 - > 1.2 W/kg, both bands should be tested independently for SAR.

Normal WLAN MIMO Ant.1 output power Results (continued)

Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	WLAN mode power					
						Max. Average Power			Reduced Average Power		
						Avg Pwr (dBm)	Max. Tune-up Limit (dBm)	SAR Test (Yes/No)	Avg Pwr (dBm)	Max. Tune-up Limit (dBm)	SAR Test (Yes/No)
5GHz MIMO Ant.1	5.8 (UNII 3)	802.11a	6 Mbps	Not Required			17.0	No	Not Required	7.0	No
		802.11n (HT20)	6.5 Mbps	Not Required			17.0	No	Not Required	7.0	No
		802.11n (HT40)	13.5 Mbps	151	5755.0	15.7	17.0	Yes	Not Required	7.0	No
				159	5795.0	15.4					
		802.11ac (VHT20)	6.5 Mbps	Not Required			17.0	No	Not Required	7.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Required			17.0	No	Not Required	7.0	No
		802.11ac (VHT80)	29.3 Mbps	155	5775.0	Not Required	16.0	No	6.2	7.0	Yes
		802.11ax (HE20)	7.3 Mbps	Not Required			17.0	No	Not Required	7.0	No
		802.11ax (HE40)	14.6 Mbps	Not Required			17.0	No	Not Required	7.0	No
	802.11ax (HE80)	36.0 Mbps	Not Required			16.0	No	Not Required	7.0	No	
	5.9 (U-NII 4)	802.11a	6 Mbps	Not Required			17.0	Yes	Not Required	7.0	No
		802.11n (HT20)	6.5 Mbps	Not Required			17.0	No	Not Required	7.0	No
		802.11n (HT40)	13.5 Mbps	167	5835.0	15.3	17.0	Yes	Not Required	7.0	No
				175	5875.0	15.2					
		802.11ac (VHT20)	6.5 Mbps	Not Required			17.0	No	Not Required	7.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Required			17.0	No	Not Required	7.0	No
		802.11ac (VHT80)	29.3 Mbps	171	5855.0	Not Required	16.0	No	6.4	7.0	Yes
		802.11ax (HE20)	7.3 Mbps	Not Required			17.0	No	Not Required	7.0	No
		802.11ax (HE40)	14.6 Mbps	Not Required			17.0	No	Not Required	7.0	No
	802.11ax (HE80)	30.6 Mbps	Not Required			16.0	No	Not Required	7.0	No	
	UNII 3 & UNII 4	802.11ac (VHT160)	58.5 Mbps	Not Required			15.0	No	Not Required	6.5	No
		802.11ax (HE160)	72.0 Mbps	Not Required			15.0	No	Not Required	6.5	No

Note(s):

- For "Not required", SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1, b), 1) when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band.
- When the same transmission mode configurations have the same maximum output power on the same channel for the 802.11 a/g/n/ac/ax modes, the channel in the lower order/sequence 802.11 mode (i.e. a, g, n ac then ax) is selected.
- When the specified maximum output power is the same for both UNII band 1 and UNII band 2A, begin SAR measurement in UNII band 2A; and if the highest reported SAR for UNII band 2A is
 - ≤ 1.2 W/kg, SAR is not required for UNII band 1
 - > 1.2 W/kg, both bands should be tested independently for SAR.

Normal WLAN MIMO Ant.2 output power Results

Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	WLAN mode power					
						Max. Average Power			Reduced Average Power		
						Avg Pwr (dBm)	Max. Tune-up Limit (dBm)	SAR Test (Yes/No)	Avg Pwr (dBm)	Max. Tune-up Limit (dBm)	SAR Test (Yes/No)
5GHz MIMO Ant.2	5.3 (UNII 2A)	802.11a	6 Mbps	Not Required			17.0	No	Not Required	9.0	No
		802.11n (HT20)	6.5 Mbps	Not Required			17.0	No	Not Required	9.0	No
		802.11n (HT40)	13.5 Mbps	54	5270.0	16.1	17.0	Yes	Not Required	9.0	No
				62	5310.0	16.6					
		802.11ac (VHT20)	6.5 Mbps	Not Required			17.0	No	Not Required	9.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Required			17.0	No	Not Required	9.0	No
		802.11ac (VHT80)	29.3 Mbps	58	5290.0	Not Required	16.0	No	8.3	9.0	Yes
		802.11ac (VHT160)	58.5 Mbps	Not Required			15.0	No	Not Required	8.5	No
		802.11ax (HE20)	7.3 Mbps	Not Required			17.0	No	Not Required	9.0	No
		802.11ax (HE40)	14.6 Mbps	Not Required			17.0	No	Not Required	9.0	No
		802.11ax (HE80)	36.0 Mbps	Not Required			16.0	No	Not Required	9.0	No
		802.11ax (HE160)	72.0 Mbps	Not Required			15.0	No	Not Required	8.5	No
	5.5 (UNII 2C)	802.11a	6 Mbps	Not Required			17.0	No	Not Required	9.0	No
		802.11n (HT20)	6.5 Mbps	Not Required			17.0	No	Not Required	9.0	No
		802.11n (HT40)	13.5 Mbps	102	5510.0	16.3	17.0	Yes	Not Required	9.0	No
				118	5590.0	15.9					
				126	5630.0	16.0					
				142	5710.0	16.2					
		802.11ac (VHT20)	6.5 Mbps	Not Required			17.0	No	Not Required	9.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Required			17.0	Yes	Not Required	9.0	No
		802.11ac (VHT80)	29.3 Mbps	106	5530.0	Not Required	16.0	No	8.6	9.0	Yes
				122	5610.0				8.1		
				138	5690.0				7.8		
		802.11ac (VHT160)	58.5 Mbps	Not Required			15.0	No	Not Required	8.5	No
		802.11ax (HE20)	7.3 Mbps	Not Required			17.0	No	Not Required	9.0	No
		802.11ax (HE40)	14.6 Mbps	Not Required			17.0	No	Not Required	9.0	No
		802.11ax (HE80)	36.0 Mbps	Not Required			16.0	No	Not Required	9.0	No
		802.11ax (HE160)	72.0 Mbps	Not Required			15.0	No	Not Required	8.5	No

Note(s):

- For "Not required", SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1, b), 1) when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band.
- When the same transmission mode configurations have the same maximum output power on the same channel for the 802.11 a/g/n/ac/ax modes, the channel in the lower order/sequence 802.11 mode (i.e. a, g, n ac then ax) is selected.
- When the specified maximum output power is the same for both UNII band I and UNII band 2A, begin SAR measurement in UNII band 2A; and if the highest reported SAR for UNII band 2A is
 - ≤ 1.2 W/kg, SAR is not required for UNII band I
 - > 1.2 W/kg, both bands should be tested independently for SAR.

Normal WLAN MIMO Ant.2 output power Results (continued)

Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	WLAN mode power					
						Max. Average Power			Reduced Average Power		
						Avg Pwr (dBm)	Max. Tune-up Limit (dBm)	SAR Test (Yes/No)	Avg Pwr (dBm)	Max. Tune-up Limit (dBm)	SAR Test (Yes/No)
5GHz MIMO Ant.2	5.8 (UNII 3)	802.11a	6 Mbps	Not Required			17.0	No	Not Required	7.0	No
		802.11n (HT20)	6.5 Mbps	Not Required			17.0	No	Not Required	7.0	No
		802.11n (HT40)	13.5 Mbps	151	5755.0	16.5	17.0	Yes	Not Required	7.0	No
				159	5795.0	16.5					
		802.11ac (VHT20)	6.5 Mbps	Not Required			17.0	No	Not Required	7.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Required			17.0	No	Not Required	7.0	No
		802.11ac (VHT80)	29.3 Mbps	155	5775.0	Not Required	16.0	No	6.8	7.0	Yes
		802.11ax (HE20)	7.3 Mbps	Not Required			17.0	No	Not Required	7.0	No
		802.11ax (HE40)	14.6 Mbps	Not Required			17.0	No	Not Required	7.0	No
		802.11ax (HE80)	36.0 Mbps	Not Required			16.0	No	Not Required	7.0	No
	5.9 (UNII 4)	802.11a	6 Mbps	Not Required			17.0	Yes	Not Required	7.0	No
		802.11n (HT20)	6.5 Mbps	Not Required			17.0	No	Not Required	7.0	No
		802.11n (HT40)	13.5 Mbps	167	5835.0	16.0	17.0	Yes	Not Required	7.0	No
				175	5875.0	16.0					
		802.11ac (VHT20)	6.5 Mbps	Not Required			17.0	No	Not Required	7.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Required			17.0	No	Not Required	7.0	No
		802.11ac (VHT80)	29.3 Mbps	171	5855.0	Not Required	16.0	No	6.9	7.0	Yes
		802.11ax (HE20)	7.3 Mbps	Not Required			17.0	No	Not Required	7.0	No
		802.11ax (HE40)	14.6 Mbps	Not Required			17.0	No	Not Required	7.0	No
		802.11ax (HE80)	30.6 Mbps	Not Required			16.0	No	Not Required	7.0	No
	UNII 3 & UNII 4	802.11ac (VHT160)	58.5 Mbps	Not Required			15.0	No	Not Required	6.5	No
		802.11ax (HE160)	72.0 Mbps	Not Required			15.0	No	Not Required	6.5	No

Note(s):

- For "Not required", SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1, b), 1) when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band.
- When the same transmission mode configurations have the same maximum output power on the same channel for the 802.11 a/g/n/ac/ax modes, the channel in the lower order/sequence 802.11 mode (i.e. a, g, n ac then ax) is selected.
- When the specified maximum output power is the same for both UNII band 1 and UNII band 2A, begin SAR measurement in UNII band 2A; and if the highest reported SAR for UNII band 2A is
 - ≤ 1.2 W/kg, SAR is not required for UNII band 1
 - > 1.2 W/kg, both bands should be tested independently for SAR.

RSDB WLAN MIMO Ant 1 & 2 output power Results

Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	RSDB WLAN mode power		
						Max Average Power		
						Avg Pwr (dBm)	Max. Tune-up Limit (dBm)	SAR Test (Yes/No)
5GHz MIMO Ant.1	5.3 (UNII 2A)	802.11a	6 Mbps	Not Required		Not Required	7.0	No
		802.11n (HT20)	6.5 Mbps	Not Required		Not Required	7.0	No
		802.11n (HT40)	13.5 Mbps	Not Required		Not Required	7.0	No
		802.11ac (VHT20)	6.5 Mbps	Not Required		Not Required	7.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Required		Not Required	7.0	No
		802.11ac (VHT80)	29.3 Mbps	58	5290.0	6.7	7.0	Yes
		802.11ac (VHT160)	58.5 Mbps	Not Required		Not Required	6.5	No
		802.11ax (HE20)	7.3 Mbps	Not Required		Not Required	7.0	No
		802.11ax (HE40)	14.6 Mbps	Not Required		Not Required	7.0	No
		802.11ax (HE80)	36.0 Mbps	Not Required		Not Required	7.0	No
		802.11ax (HE160)	72.0 Mbps	Not Required		Not Required	6.5	No
	5.5 (U-NII 2C)	802.11a	6 Mbps	Not Required		Not Required	7.0	No
		802.11n (HT20)	6.5 Mbps	Not Required		Not Required	7.0	No
		802.11n (HT40)	13.5 Mbps	Not Required		Not Required	7.0	No
		802.11ac (VHT20)	6.5 Mbps	Not Required		Not Required	7.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Required		Not Required	7.0	No
		802.11ac (VHT80)	29.3 Mbps	106	5530.0	6.7	7.0	Yes
			122	5610.0	6.4			
			138	5690.0	6.6			
		802.11ac (VHT160)	58.5 Mbps	Not Required		Not Required	6.5	No
		802.11ax (HE20)	7.3 Mbps	Not Required		Not Required	7.0	No
		802.11ax (HE40)	14.6 Mbps	Not Required		Not Required	7.0	No
		802.11ax (HE80)	36.0 Mbps	Not Required		Not Required	7.0	No
		802.11ax (HE160)	72.0 Mbps	Not Required		Not Required	6.5	No
5GHz MIMO Ant.2	5.3 (UNII 2A)	802.11a	6 Mbps	Not Required		Not Required	7.0	No
		802.11n (HT20)	6.5 Mbps	Not Required		Not Required	7.0	No
		802.11n (HT40)	13.5 Mbps	Not Required		Not Required	7.0	No
		802.11ac (VHT20)	6.5 Mbps	Not Required		Not Required	7.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Required		Not Required	7.0	No
		802.11ac (VHT80)	29.3 Mbps	Not Required		6.2	7.0	Yes
		802.11ac (VHT160)	58.5 Mbps	Not Required		Not Required	6.5	No
		802.11ax (HE20)	7.3 Mbps	Not Required		Not Required	7.0	No
		802.11ax (HE40)	14.6 Mbps	Not Required		Not Required	7.0	No
		802.11ax (HE80)	36.0 Mbps	Not Required		Not Required	7.0	No
		802.11ax (HE160)	72.0 Mbps	Not Required		Not Required	6.5	No
	5.5 (U-NII 2C)	802.11a	6 Mbps	Not Required		Not Required	7.0	No
		802.11n (HT20)	6.5 Mbps	Not Required		Not Required	7.0	No
		802.11n (HT40)	13.5 Mbps	Not Required		Not Required	7.0	No
		802.11ac (VHT20)	6.5 Mbps	Not Required		Not Required	7.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Required		Not Required	7.0	No
		802.11ac (VHT80)	29.3 Mbps	106	5530.0	6.5	7.0	Yes
			122	5610.0	6.3			
			138	5690.0	6.3			
		802.11ac (VHT160)	58.5 Mbps	Not Required		Not Required	6.5	No
		802.11ax (HE20)	7.3 Mbps	Not Required		Not Required	7.0	No
		802.11ax (HE40)	14.6 Mbps	Not Required		Not Required	7.0	No
		802.11ax (HE80)	36.0 Mbps	Not Required		Not Required	7.0	No
		802.11ax (HE160)	72.0 Mbps	Not Required		Not Required	6.5	No

Note(s):

- For "Not required", SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1, b), 1) when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band.
- When the same transmission mode configurations have the same maximum output power on the same channel for the 802.11 a/g/n/ac/ax modes, the channel in the lower order/sequence 802.11 mode (i.e. a, g, n ac then ax) is selected.
- When the specified maximum output power is the same for both UNII band I and UNII band 2A, begin SAR measurement in UNII band 2A; and if the highest reported SAR for UNII band 2A is
 - ≤ 1.2 W/kg, SAR is not required for UNII band I
 - > 1.2 W/kg, both bands should be tested independently for SAR.
- RSDB WLAN MIMO SAR additionally were evaluated for satisfy to simultaneous transmission analysis.

RSDB WLAN MIMO Ant 1 & 2 output power Results (Continued)

Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	RSDB WLAN mode power		
						Max Average Power		
						Avg Pwr (dBm)	Max. Tune-up Limit (dBm)	SAR Test (Yes/No)
5GHz MIMO Ant.1	5.8 (UNII 3)	802.11a	6 Mbps	Not Required		Not Required	7.0	No
		802.11n (HT20)	6.5 Mbps	Not Required		Not Required	7.0	No
		802.11n (HT40)	13.5 Mbps	Not Required		Not Required	7.0	No
		802.11ac (VHT20)	6.5 Mbps	Not Required		Not Required	7.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Required		Not Required	7.0	No
		802.11ac (VHT80)	29.3 Mbps	155	5775.0	6.2	7.0	Yes
		802.11ax (HE20)	7.3 Mbps	Not Required		Not Required	7.0	No
		802.11ax (HE40)	14.6 Mbps	Not Required		Not Required	7.0	No
		802.11ax (HE80)	30.6 Mbps	Not Required		Not Required	7.0	No
	5.9 (UNII 4)	802.11a	6 Mbps	Not Required		Not Required	7.0	No
		802.11n (HT20)	6.5 Mbps	Not Required		Not Required	7.0	No
		802.11n (HT40)	13.5 Mbps	Not Required		Not Required	7.0	No
		802.11ac (VHT20)	6.5 Mbps	Not Required		Not Required	7.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Required		Not Required	7.0	No
		802.11ac (VHT80)	29.3 Mbps	171	5855.0	6.4	7.0	Yes
		802.11ax (HE20)	7.3 Mbps	Not Required		Not Required	7.0	No
		802.11ax (HE40)	14.6 Mbps	Not Required		Not Required	7.0	No
		802.11ax (HE80)	30.6 Mbps	Not Required		Not Required	7.0	No
	UNII 3 & UNII 4	802.11ac (VHT160)	14.6 Mbps	Not Required		Not Required	6.5	No
		802.11ax (HE160)	30.6 Mbps	Not Required		Not Required	6.5	No

Antenna	Band (GHz)	Mode	Data Rate	Ch #	Freq. (MHz)	RSDB WLAN mode power		
						Max Average Power		
						Avg Pwr (dBm)	Max. Tune-up Limit (dBm)	SAR Test (Yes/No)
5GHz MIMO Ant.2	5.8 (UNII 3)	802.11a	6 Mbps	Not Required		Not Required	7.0	No
		802.11n (HT20)	6.5 Mbps	Not Required		Not Required	7.0	No
		802.11n (HT40)	13.5 Mbps	Not Required		Not Required	7.0	No
		802.11ac (VHT20)	6.5 Mbps	Not Required		Not Required	7.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Required		Not Required	7.0	No
		802.11ac (VHT80)	29.3 Mbps	155.0	5775.0	6.8	7.0	Yes
		802.11ax (HE20)	7.3 Mbps	Not Required		Not Required	7.0	No
		802.11ax (HE40)	14.6 Mbps	Not Required		Not Required	7.0	No
		802.11ax (HE80)	30.6 Mbps	Not Required		Not Required	7.0	No
	5.9 (UNII 4)	802.11a	6 Mbps	Not Required		Not Required	7.0	No
		802.11n (HT20)	6.5 Mbps	Not Required		Not Required	7.0	No
		802.11n (HT40)	13.5 Mbps	Not Required		Not Required	7.0	No
		802.11ac (VHT20)	6.5 Mbps	Not Required		Not Required	7.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Required		Not Required	7.0	No
		802.11ac (VHT80)	29.3 Mbps	171	5855.0	6.9	7.0	Yes
		802.11ax (HE20)	7.3 Mbps	Not Required		Not Required	7.0	No
		802.11ax (HE40)	14.6 Mbps	Not Required		Not Required	7.0	No
		802.11ax (HE80)	30.6 Mbps	Not Required		Not Required	7.0	No
	UNII 3 & UNII 4	802.11ac (VHT160)	14.6 Mbps	Not Required		Not Required	6.5	No
		802.11ax (HE160)	30.6 Mbps	Not Required		Not Required	6.5	No

Note(s):

- For "Not required", SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1, b), 1) when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band.
- When the same transmission mode configurations have the same maximum output power on the same channel for the 802.11 a/g/n/ac/ax modes, the channel in the lower order/sequence 802.11 mode (i.e. a, g, n ac then ax) is selected.
- When the specified maximum output power is the same for both UNII band I and UNII band 2A, begin SAR measurement in UNII band 2A; and if the highest reported SAR for UNII band 2A is
 - ≤ 1.2 W/kg, SAR is not required for UNII band I
 - > 1.2 W/kg, both bands should be tested independently for SAR.
- RSDB WLAN MIMO SAR additionally were evaluated for satisfy to simultaneous transmission analysis.

9.3. Bluetooth

Bluetooth SISO Measured Results

Band (GHz)	Antenna	Mode	Ch #	Freq. (MHz)	Maximum Average Power (dBm)		Reduced Average Power (dBm)	
					Meas Pw r	Tune-up Limit	Meas Pw r	Tune-up Limit
2.4	BT SISO Ant.1	GFSK	0	2402	16.4	18.0	10.6	12.0
			39	2441	16.7		11.9	
			78	2480	15.0		9.3	
		EDR	0	2402	Not required	16.0	Not required	12.0
			39	2441				
			78	2480				
		LE	0	2402		16.0		12.0
			19	2440				
			39	2480				
2.4	BT SISO Ant.2	GFSK	0	2402	16.5	18.0	10.0	12.0
			39	2441	17.3		11.5	
			78	2480	16.1		9.4	
		EDR	0	2402	Not required	16.0	Not required	12.0
			39	2441				
			78	2480				
		LE	0	2402		16.0		12.0
			19	2440				
			39	2480				

Note(s):

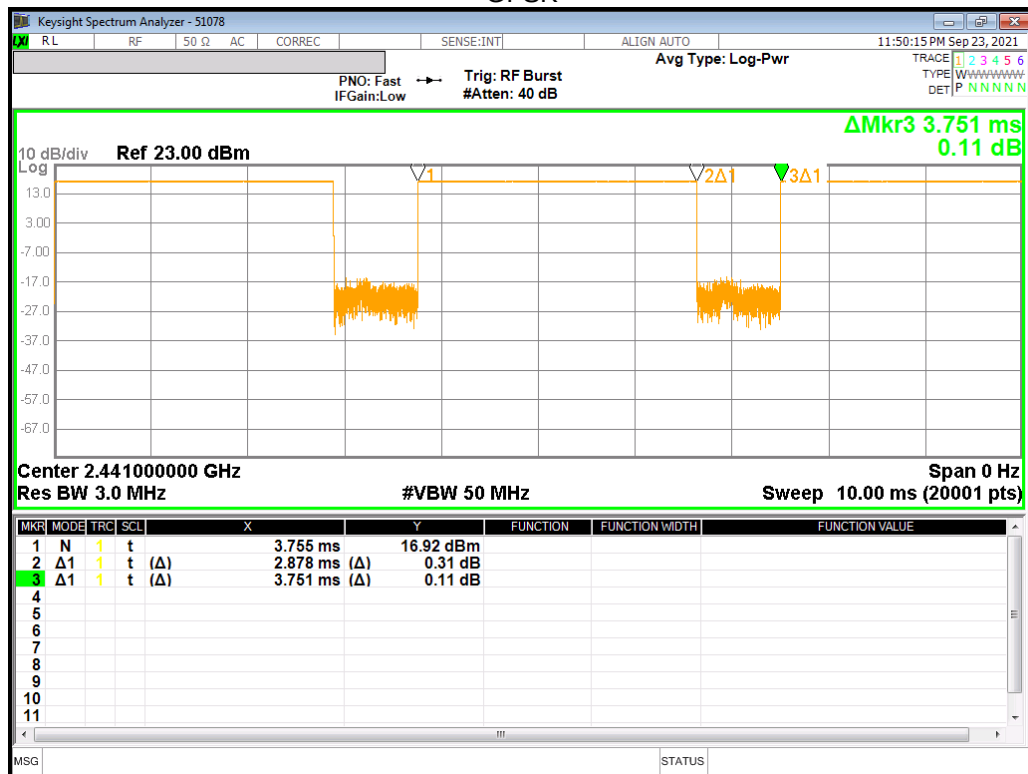
For All exposure conditions, SAR test is evaluated at GFSK mode in Bluetooth using maximum power condition.

Duty Factor Measured Results

Mode	Type	T on (ms)	Period (ms)	Duty Cycle	Crest Factor (1/duty cycle)
GFSK	DH5	2.878	3.751	76.7%	1.30

Duty Cycle plots

GFSK



10. Measured and Reported (Scaled) SAR Results

SAR Test Reduction criteria are as follows:

- Reported SAR(W/kg) for WWAN= Measured SAR *Tune-up Scaling Factor
- Reported SAR(W/kg) for Wi-Fi and Bluetooth= Measured SAR * Tune-up scaling factor * Duty Cycle scaling factor
- Duty Cycle scaling factor = 1 / Duty cycle (%)

KDB 447498 D01 General RF Exposure Guidance:

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

KDB 248227 D01 SAR meas for 802.11:

SAR test reduction for 802.11 Wi-Fi transmission mode configurations are considered separately for DSSS and OFDM. An initial test position is determined to reduce the number of tests required for certain exposure configurations with multiple test positions. An initial test configuration is determined for each frequency band and aggregated band according to maximum output power, channel bandwidth, wireless mode configurations and other operating parameters to streamline the measurement requirements. For 2.4 GHz DSSS, either the initial test position or DSSS procedure is applied to reduce the number of SAR tests; these are mutually exclusive. For OFDM, an initial test position is only applicable to next to the ear, UMPC mini-tablet and hotspot mode configurations, which is tested using the initial test configuration to facilitate test reduction. For other exposure conditions with a fixed test position, SAR test reduction is determined using only the initial test configuration.

The multiple test positions require SAR measurements in head, hotspot mode or UMPC mini-tablet configurations may be reduced according to the highest reported SAR determined using the initial test position(s) by applying the DSSS or OFDM SAR measurement procedures in the required wireless mode test configuration(s). The initial test position(s) is measured using the highest measured maximum output power channel in the required wireless mode test configuration(s). When the reported SAR for the initial test position is:

- ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and wireless mode combination within the frequency band or aggregated band. DSSS and OFDM configurations are considered separately according to the required SAR procedures.
- > 0.4 W/kg, SAR is repeated using the same wireless mode test configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg or all required test positions are tested.
 - For subsequent test positions with equivalent test separation distance or when exposure is dominated by coupling conditions, the position for maximum coupling condition should be tested.
 - When it is unclear, all equivalent conditions must be tested.
- For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, measure the SAR for these positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required test channels are considered.
 - The additional power measurements required for this step should be limited to those necessary for identifying subsequent highest output power channels to apply the test reduction.
- When the specified maximum output power is the same for both UNII 1 and UNII 2A, begin SAR measurements in UNII 2A with the channel with the highest measured output power. If the reported SAR for UNII 2A is ≤ 1.2 W/kg, SAR is not required for UNII 1; otherwise treat the remaining bands separately and test them independently for SAR.
- When the specified maximum output power is different between UNII 1 and UNII 2A, begin SAR with the band that has the higher specified maximum output. If the highest reported SAR for the band with the highest specified power is ≤ 1.2 W/kg, testing for the band with the lower specified output power is not required; otherwise test the remaining bands independently for SAR.

To determine the initial test position, Area Scans were performed to determine the position with the *Maximum Value of SAR (measured)*. The position that produced the highest *Maximum Value of SAR* is considered the worst case position; thus used as the initial test position.

10.1. Wi-Fi (DTS Band)

Normal WLAN SISO SAR results

Frequency Band	Antenna	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Note	Plot No.
										Tune-up limit	Meas.	Meas.	Scaled		
2.4GHz	WLAN SISO Ant.1	802.11g 6Mbps	Standanloe	Off	16	Rear	6	2437.0	96.3%	18.0	17.9	0.040	0.043		
					7	Edge 1	6	2437.0	96.3%	18.0	17.9	0.247	0.261		
					20	Edge 4	6	2437.0	96.3%	18.0	17.9	0.068	0.072		
					9	Corner A	6	2437.0	96.3%	18.0	17.9	0.071	0.075		
	WLAN SISO Ant.1	802.11b 1 Mbps	Standanloe	On	0	Rear	6	2437.0	99.3%	13.0	12.6	0.290	0.324		
					0	Edge 1	6	2437.0	99.3%	13.0	12.6	0.398	0.444		1
					0	Edge 4	6	2437.0	99.3%	13.0	12.6	0.159	0.178		
	WLAN SISO Ant.2	802.11g 6Mbps	Standanloe	Off	14	Rear	10	2457.0	96.3%	18.0	17.7	0.072	0.081		
					9	Edge 3	10	2457.0	96.3%	18.0	17.7	0.180	0.203		
					17	Edge 4	10	2457.0	96.3%	18.0	17.7	0.077	0.087		
					11	Corner B	10	2457.0	96.3%	18.0	17.7	0.047	0.052		
		802.11b 1 Mbps	Standanloe	On	0	Rear	11	2462.0	99.3%	13.0	12.8	0.668	0.712		2
					0	Edge 3	11	2462.0	99.3%	13.0	12.8	0.473	0.504		
					0	Edge 4	11	2462.0	99.3%	13.0	12.8	0.211	0.225		

Normal WLAN MIMO SAR results

Frequency Band	Antenna	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Note	Plot No.
										Tune-up limit	Meas.	Meas.	Scaled		
2.4GHz	WLAN MIMO Ant.1	802.11g 6Mbps	Standanloe	Off	14	Rear	2	2417.0	96.3%	18.0	17.4				
					7	Edge 1	2	2417.0	96.3%	18.0	17.4	0.388	0.458		
					9	Edge 3	2	2417.0	96.3%	18.0	17.4	0.285	0.337		
					17	Edge 4	2	2417.0	96.3%	18.0	17.4	0.095	0.112		
					9	Corner A	2	2417.0	96.3%	18.0	17.4	0.082	0.097		
		11		Corner B	2	2417.0	96.3%	18.0	17.4						
		802.11b 1Mbps		On	0	Rear	6	2437.0	99.3%	13.0	13.0	0.502	0.508		
					11		2462.0	99.3%	13.0	12.8	0.418	0.438			
					0	Edge 1	6	2437.0	99.3%	13.0	13.0	0.567	0.573		
					0	Edge 3	6	2437.0	99.3%	13.0	13.0				
	0		Edge 4		6	2437.0	99.3%	13.0	13.0	0.340	0.344				
	WLAN MIMO Ant.2	802.11g 6Mbps	Standanloe	Off	14	Rear	2	2417.0	96.3%	18.0	18.0	0.146	0.153		
					7	Edge 1	2	2417.0	96.3%	18.0	18.0				
					9	Edge 3	2	2417.0	96.3%	18.0	18.0				
					17	Edge 4	2	2417.0	96.3%	18.0	18.0				
					9	Corner A	2	2417.0	96.3%	18.0	18.0				
		11		Corner B	2	2417.0	96.3%	18.0	18.0	0.063	0.066				
		802.11b 1Mbps		On	0	Rear	6	2437.0	99.3%	13.0	11.9				
					11		2462.0	99.3%	13.0	11.2					
					0	Edge 1	6	2437.0	99.3%	13.0	11.9				
					0	Edge 3	6	2437.0	99.3%	13.0	11.9	0.560	0.728		3
0					Edge 4	6	2437.0	99.3%	13.0	11.9					

Note(s):

- When the Highest reported SAR is ≤ 0.4 or 1.0 W/kg (1-g or 10-g respectively). Therefore, further SAR measurements within this exposure condition are not required.
- Highest reported SAR is > 0.4 or 1.0 W/kg (1-g or 10-g respectively). Due to the highest reported SAR for this test position, other test positions in this exposure condition were evaluated until a SAR ≤ 0.8 or 2.0 W/kg (1-g or 10-g respectively) was reported.
- Testing for a second channel was required because the reported SAR for this test position was > 0.8 or 2.0 W/kg (1-g or 10-g respectively).
- Additional testing required in order satisfying FCC simultaneous transmission limit criteria.
- SAR testing is not required for OFDM mode(s) 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.
- Normal WLAN MIMO SAR additionally evaluated due to satisfy simultaneous transmission criteria.

Wi-Fi (DTS Band) (Continued)**RSDB WLAN SISO SAR results**

Frequency Band	Antenna	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Note	Plot No.
										Tune-up limit	Meas.	Meas.	Scaled		
2.4GHz	WLAN SISO Ant.1	802.11b 1 Mbps	Standanloe	N/A	0	Rear	6	2437.0	99.3%	11.0	10.3	0.237	0.282		
					0	Edge 1	6	2437.0	99.3%	11.0	10.3	0.256	0.304		
					0	Edge 4	6	2437.0	99.3%	11.0	10.3	0.107	0.127		
	WLAN SISO Ant.2	802.11b 1 Mbps	Standanloe	N/A	0	Rear	6	2437.0	99.3%	11.0	11.0	0.533	0.541		
					0	Edge 3	6	2437.0	99.3%	11.0	11.0	0.375	0.381		
					0	Edge 4	6	2437.0	99.3%	11.0	11.0	0.177	0.180		

RSDB WLAN MIMO SAR results

Frequency Band	Antenna	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Note	Plot No.
										Tune-up limit	Meas.	Meas.	Scaled		
2.4GHz	WLAN MIMO Ant.1	802.11b 1 Mbps	Standanloe	N/A	0	Rear	1	2412.0	99.3%	11.0	11.0				
					0	Edge 1	1	2412.0	99.3%	11.0	11.0	0.365	0.369		
					0	Edge 3	1	2412.0	99.3%	11.0	11.0				
					0	Edge 4	1	2412.0	99.3%	11.0	11.0				
	WLAN MIMO Ant.2	802.11b 1 Mbps	Standanloe	N/A	0	Rear	1	2412.0	99.3%	11.0	9.4	0.377	0.550		
					0	Edge 1	1	2412.0	99.3%	11.0	9.4				
					0	Edge 3	1	2412.0	99.3%	11.0	9.4	0.267	0.389		
					0	Edge 4	1	2412.0	99.3%	11.0	9.4	0.173	0.252		

Note(s):

1. When the Highest reported SAR is ≤ 0.4 or 1.0 W/kg (1-g or 10-g respectively). Therefore, further SAR measurements within this exposure condition are not required.
2. Highest reported SAR is > 0.4 or 1.0 W/kg (1-g or 10-g respectively). Due to the highest reported SAR for this test position, other test positions in this exposure condition were evaluated until a SAR ≤ 0.8 or 2.0 W/kg (1-g or 10-g respectively) was reported.
3. Testing for a second channel was required because the reported SAR for this test position was > 0.8 or 2.0 W/kg (1-g or 10-g respectively).
4. Additional testing required in order satisfying FCC simultaneous transmission limit criteria.
5. SAR testing is not required for OFDM mode(s) 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.
6. RSDB WLAN SISO & MIMO SAR additionally evaluated due to satisfy simultaneous transmission criteria.

10.2. Wi-Fi (U-NII Bands)

Normal U-NII 2A Results

Frequency Band	Antenna	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Duty Cycle (%)	Power (dBm)		1-g SAR (W/kg)		Note	Plot No.
										Tune-up limit	Meas.	Meas.	Scaled		
5.3 GHz U-NII 2A	WLAN MIMO Ant.1	802.11n HT40 13.5 Mbps	Standalone	Off	14	Rear	62	5310.0	96.1%	17.0	15.9	0.043	0.058		
					7	Edge 1	62	5310.0	96.1%	17.0	15.9	0.160	0.214		4
					9	Edge 3	62	5310.0	96.1%	17.0	15.9				
					17	Edge 4	62	5310.0	96.1%	17.0	15.9	0.034	0.045		
					9	Corner A	62	5310.0	96.1%	17.0	15.9	0.040	0.053		
		802.11ac VHT80 29.3 Mbps	Standalone	On	11	Corner B	62	5310.0	96.1%	17.0	15.9				
					0	Rear	58	5290.0	94.6%	9.0	8.8				
					0	Edge 1	58	5290.0	94.6%	9.0	8.8	0.156	0.172		
					0	Edge 3	58	5290.0	94.6%	9.0	8.8				
					0	Edge 4	58	5290.0	94.6%	9.0	8.8	0.074	0.082		
	WLAN MIMO Ant.2	802.11n HT40 13.5 Mbps	Standalone	Off	14	Rear	62	5310.0	96.1%	17.0	16.6				
					7	Edge 1	62	5310.0	96.1%	17.0	16.6				
					9	Edge 3	62	5310.0	96.1%	17.0	16.6	0.281	0.324		
					17	Edge 4	62	5310.0	96.1%	17.0	16.6				
					9	Corner A	62	5310.0	96.1%	17.0	16.6				
		802.11ac VHT80 29.3 Mbps	Standalone	On	11	Corner B	62	5310.0	96.1%	17.0	16.6	0.115	0.132		
					0	Rear	58	5290.0	94.6%	9.0	8.3	0.397	0.494		
					0	Edge 1	58	5290.0	94.6%	9.0	8.3				
					0	Edge 3	58	5290.0	94.6%	9.0	8.3	0.774	0.964		5
					0	Edge 4	58	5290.0	94.6%	9.0	8.3				

RSDB U-NII 2A Results

Frequency Band	Antenna	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Duty Cycle (%)	Power (dBm)		1-g SAR (W/kg)		Note	Plot No.
										Tune-up limit	Meas.	Meas.	Scaled		
5.3 GHz U-NII 2A	WLAN MIMO Ant.1	802.11ac VHT80 29.3 Mbps	Standalone	N/A	0	Rear	58	5290.0	94.6%	7.0	6.7				
					0	Edge 1	58	5290.0	94.6%	7.0	6.7	0.058	0.066		
					0	Edge 3	58	5290.0	94.6%	7.0	6.7				
					0	Edge 4	58	5290.0	94.6%	7.0	6.7	0.034	0.039		
	WLAN MIMO Ant.2	802.11ac VHT80 29.3 Mbps	Standalone	N/A	0	Rear	58	5290.0	94.6%	7.0	6.2	0.203	0.259		
					0	Edge 1	58	5290.0	94.6%	7.0	6.2				
					0	Edge 3	58	5290.0	94.6%	7.0	6.2	0.513	0.655		
					0	Edge 4	58	5290.0	94.6%	7.0	6.2				

Note(s):

1. When the Highest reported SAR is ≤ 0.4 or 1.0 W/kg (1-g or 10-g respectively). Therefore, further SAR measurements within this exposure condition are not required.
2. Highest reported SAR is > 0.4 or 1.0 W/kg (1-g or 10-g respectively). Due to the highest reported SAR for this test position, other test positions in this exposure condition were evaluated until a SAR ≤ 0.8 or 2.0 W/kg (1-g or 10-g respectively) was reported.
3. Testing for a second channel was required because the reported SAR for this test position was > 0.8 or 2.0 W/kg (1-g or 10-g respectively).
4. Additional testing required in order satisfying FCC simultaneous transmission limit criteria.
5. RSDB WLAN SAR additionally evaluated due to satisfy simultaneous transmission criteria.

Normal U-NII 2C Results

Frequency Band	Antenna	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Duty Cycle (%)	Power (dBm)		1-g SAR (W/kg)		Note	Plot No.
										Tune-up limit	Meas.	Meas.	Scaled		
5.5 GHz U-NII 2C	WLAN MIMO Ant.1	802.11n HT40 13.5 Mbps	Standalone	Off	14	Rear	102	5510.0	96.1%	17.0	16.0				
					7	Edge 1	102	5510.0	96.1%	17.0	16.0	0.126	0.166		
					9	Edge 3	102	5510.0	96.1%	17.0	16.0				
					17	Edge 4	102	5510.0	96.1%	17.0	16.0				
					9	Corner A	102	5510.0	96.1%	17.0	16.0	0.073	0.096		
					11	Corner B	102	5510.0	96.1%	17.0	16.0				
		802.11ac VHT80 29.3 Mbps	Standalone	On	0	Rear	106	5530.0	94.6%	9.0	8.7				
					0	Edge 1	106	5530.0	94.6%	9.0	8.7	0.170	0.195		6
					0	Edge 3	106	5530.0	94.6%	9.0	8.7				
					0	Edge 4	106	5530.0	94.6%	9.0	8.7				
					14	Rear	102	5510.0	96.1%	17.0	16.3	0.044	0.054		
	WLAN MIMO Ant.2	802.11n HT40 13.5 Mbps	Standalone	Off	7	Edge 1	102	5510.0	96.1%	17.0	16.3				
					9	Edge 3	102	5510.0	96.1%	17.0	16.3	0.242	0.297		
					17	Edge 4	102	5510.0	96.1%	17.0	16.3	0.014	0.018		
					9	Corner A	102	5510.0	96.1%	17.0	16.3				
					11	Corner B	102	5510.0	96.1%	17.0	16.3	0.097	0.119		
		802.11ac VHT80 29.3 Mbps	Standalone	On	0	Rear	106	5530.0	94.6%	9.0	8.6	0.375	0.434		
					0	Edge 1	106	5530.0	94.6%	9.0	8.6				
					0	Edge 3	106	5530.0	94.6%	9.0	8.6	0.631	0.730		7
					0	Edge 4	106	5530.0	94.6%	9.0	8.6	0.058	0.067		

RSDB U-NII 2C Results

Frequency Band	Antenna	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Duty Cycle (%)	Power (dBm)		1-g SAR (W/kg)		Note	Plot No.
										Tune-up limit	Meas.	Meas.	Scaled		
5.5 GHz U-NII 2C	WLAN MIMO Ant.1	802.11ac VHT80 29.3 Mbps	Standalone	N/A	0	Rear	106	5530.0	94.6%	7.0	6.7				
					0	Edge 1	106	5530.0	94.6%	7.0	6.7	0.189	0.216		
					0	Edge 3	106	5530.0	94.6%	7.0	6.7				
					0	Edge 4	106	5530.0	94.6%	7.0	6.7	0.040	0.045		
	WLAN MIMO Ant.2	802.11ac VHT80 29.3 Mbps	Standalone	N/A	0	Rear	106	5530.0	94.6%	7.0	6.5	0.278	0.331		
					0	Edge 1	106	5530.0	94.6%	7.0	6.5				
					0	Edge 3	106	5530.0	94.6%	7.0	6.5	0.410	0.489		
					0	Edge 4	106	5530.0	94.6%	7.0	6.5				

Note(s):

1. When the Highest reported SAR is ≤ 0.4 or 1.0 W/kg (1-g or 10-g respectively). Therefore, further SAR measurements within this exposure condition are not required.
2. Highest reported SAR is > 0.4 or 1.0 W/kg (1-g or 10-g respectively). Due to the highest reported SAR for this test position, other test positions in this exposure condition were evaluated until a SAR ≤ 0.8 or 2.0 W/kg (1-g or 10-g respectively) was reported.
3. Testing for a second channel was required because the reported SAR for this test position was > 0.8 or 2.0 W/kg (1-g or 10-g respectively).
4. Additional testing required in order satisfying FCC simultaneous transmission limit criteria.
5. RSDB WLAN SAR additionally evaluated due to satisfy simultaneous transmission criteria.

Normal & RSDB U-NII 3 Results

Frequency Band	Antenna	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Duty Cycle (%)	Power (dBm)		1-g SAR (W/kg)		Note	Plot No.
										Tune-up limit	Meas.	Meas.	Scaled		
5.8 GHz U-NII 3	WLAN MIMO Ant.1	802.11n HT40 13.5 Mbps	Standalone	Off	14	Rear	159	5795.0	96.1%	17.0	15.4				
					7	Edge 1	159	5795.0	96.1%	17.0	15.4	0.303	0.459		8
					9	Edge 3	159	5795.0	96.1%	17.0	15.4				
					17	Edge 4	159	5795.0	96.1%	17.0	15.4	0.051	0.077		
					9	Corner A	159	5795.0	96.1%	17.0	15.4	0.168	0.254		
		802.11ac VHT80 29.3 Mbps	Standalone	On	11	Corner B	159	5795.0	96.1%	17.0	15.4				
					0	Rear	155	5775.0	94.6%	7.0	6.2				
					0	Edge 1	155	5775.0	94.6%	7.0	6.2	0.295	0.378		
					0	Edge 3	155	5775.0	94.6%	7.0	6.2				
					0	Edge 4	155	5775.0	94.6%	7.0	6.2	0.099	0.126		
	WLAN MIMO Ant.2	802.11n HT40 13.5 Mbps	Standalone	Off	14	Rear	159	5795.0	96.1%	17.0	16.5	0.086	0.100		
					7	Edge 1	159	5795.0	96.1%	17.0	16.5				
					9	Edge 3	159	5795.0	96.1%	17.0	16.5	0.535	0.626		9
					17	Edge 4	159	5795.0	96.1%	17.0	16.5				
					9	Corner A	159	5795.0	96.1%	17.0	16.5				
		802.11ac VHT80 29.3 Mbps	Standalone	On	11	Corner B	159	5795.0	96.1%	17.0	16.5	0.218	0.255		
					0	Rear	155	5775.0	94.6%	7.0	6.7	0.407	0.465		
					0	Edge 1	155	5775.0	94.6%	7.0	6.7				
					0	Edge 3	155	5775.0	94.6%	7.0	6.7	0.511	0.584		
					0	Edge 4	155	5775.0	94.6%	7.0	6.7				

Note(s):

1. When the Highest reported SAR is ≤ 0.4 or 1.0 W/kg (1-g or 10-g respectively). Therefore, further SAR measurements within this exposure condition are not required.
2. Highest reported SAR is > 0.4 or 1.0 W/kg (1-g or 10-g respectively). Due to the highest reported SAR for this test position, other test positions in this exposure condition were evaluated until a SAR ≤ 0.8 or 2.0 W/kg (1-g or 10-g respectively) was reported.
3. Testing for a second channel was required because the reported SAR for this test position was > 0.8 or 2.0 W/kg (1-g or 10-g respectively).
4. Additional testing required in order satisfying FCC simultaneous transmission limit criteria.
5. RSDB WLAN SAR additionally evaluated due to satisfy simultaneous transmission criteria.

Normal & RSDB U-NII 4 Results

Frequency Band	Antenna	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Duty Cycle (%)	Power (dBm)		1-g SAR (W/kg)		Note	Plot No.
										Tune-up limit	Meas.	Meas.	Scaled		
5.9 GHz U-NII 4	WLAN MIMO Ant.1	802.11n HT40 13.5 Mbps	Standalone	Off	14	Rear	175	5875.0	96.1%	17.0	15.2				
					7	Edge 1	175	5875.0	96.1%	17.0	15.2	0.327	0.516		10
					9	Edge 3	175	5875.0	96.1%	17.0	15.2				
					17	Edge 4	175	5875.0	96.1%	17.0	15.2				
					9	Corner A	175	5875.0	96.1%	17.0	15.2	0.108	0.171		
		802.11ac VHT80 29.3 Mbps	Standalone	On	11	Corner B	175	5875.0	96.1%	17.0	15.2				
					0	Rear	171	5855.0	94.6%	7.0	6.4				
					0	Edge 1	171	5855.0	94.6%	7.0	6.4	0.253	0.310		
					0	Edge 3	171	5855.0	94.6%	7.0	6.4				
					0	Edge 4	171	5855.0	94.6%	7.0	6.4				
	WLAN MIMO Ant.2	802.11n HT40 13.5 Mbps	Standalone	Off	14	Rear	175	5875.0	96.1%	17.0	16.0	0.071	0.093		
					7	Edge 1	175	5875.0	96.1%	17.0	16.0				
					9	Edge 3	175	5875.0	96.1%	17.0	16.0	0.366	0.477		
					17	Edge 4	175	5875.0	96.1%	17.0	16.0	0.054	0.070		
					9	Corner A	175	5875.0	96.1%	17.0	16.0				
		802.11ac VHT80 29.3 Mbps	Standalone	On	11	Corner B	175	5875.0	96.1%	17.0	16.0	0.154	0.201		
					0	Rear	171	5855.0	94.6%	7.0	6.9	0.444	0.486		11
					0	Edge 1	171	5855.0	94.6%	7.0	6.9				
					0	Edge 3	171	5855.0	94.6%	7.0	6.9	0.306	0.335		
					0	Edge 4	171	5855.0	94.6%	7.0	6.9	0.084	0.091		

Note(s):

1. When the Highest reported SAR is ≤ 0.4 or 1.0 W/kg (1-g or 10-g respectively). Therefore, further SAR measurements within this exposure condition are not required.
2. Highest reported SAR is > 0.4 or 1.0 W/kg (1-g or 10-g respectively). Due to the highest reported SAR for this test position, other test positions in this exposure condition were evaluated until a SAR ≤ 0.8 or 2.0 W/kg (1-g or 10-g respectively) was reported.
3. Testing for a second channel was required because the reported SAR for this test position was > 0.8 or 2.0 W/kg (1-g or 10-g respectively).
4. Additional testing required in order satisfying FCC simultaneous transmission limit criteria.
5. RSDB WLAN SAR additionally evaluated due to satisfy simultaneous transmission criteria.

10.3. Bluetooth

Frequency Band	Antenna	Mode	RF Exposure Conditions	PWR Back-off	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Duty Cycle (%)	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up limit	Meas.	Meas.	Scaled	
2.4 GHz	BT SISO Ant.1	GFSK	Standalone	Off	16	Rear	39	2441.0	76.7%	18.0	16.7	0.057	0.099	
					7	Edge 1	39	2441.0	76.7%	18.0	16.7	0.208	0.363	12
					20	Edge 4	39	2441.0	76.7%	18.0	16.7	0.049	0.085	
					9	Corner A	39	2441.0	76.7%	18.0	16.7	0.072	0.126	
				On	0	Rear	39	2441.0	76.7%	12.0	11.9	0.224	0.298	
					0	Edge 1	39	2441.0	76.7%	12.0	11.9	0.230	0.306	
					0	Edge 4	39	2441.0	76.7%	12.0	11.9	0.090	0.120	
2.4 GHz	BT SISO Ant.2	GFSK	Standalone	Off	16	Rear	39	2441.0	76.7%	18.0	17.3	0.065	0.101	
					9	Edge 3	39	2441.0	76.7%	18.0	17.3	0.143	0.221	
					17	Edge 4	39	2441.0	76.7%	18.0	17.3	0.060	0.093	
					11	Corner B	39	2441.0	76.7%	18.0	17.3	0.049	0.076	
				On	0	Rear	39	2441.0	76.7%	12.0	11.5	0.360	0.521	13
					0	Edge 3	39	2441.0	76.7%	12.0	11.5	0.342	0.495	
					0	Edge 4	39	2441.0	76.7%	12.0	11.5	0.112	0.162	

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11. SAR Measurement Variability

In accordance with published RF Exposure KDB 865664 D01 SAR measurement 100 MHz to 6 GHz. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

- 1) Repeated measurement is not required when the original highest measured SAR is <0.8 or 2 W/kg (1-g or 10-g respectively); steps 2) through 4) do not apply.
- 2) When the original highest measured SAR is ≥ 0.8 or 2 W/kg (1-g or 10-g respectively), repeat that measurement once.
- 3) Perform a second repeated measurement only if the **ratio of largest to smallest SAR** for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 or 3.6 W/kg (~ 10% from the 1-g or 10-g respective SAR limit).
- 4) Perform a third repeated measurement only if the original, first, or second repeated measurement is ≥ 1.5 or 3.75 W/kg (1-g or 10-g respectively) and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .

Peak spatial-average (1g of tissue)

Frequency Band (MHz)	Air Interface	RF Exposure Conditions	Test Position	Repeated SAR (Yes/No)	Highest Measured SAR (W/kg)	Repeated Measured SAR (W/kg)	Largest to Smallest SAR Ratio
2450	Wi-Fi 802.11b/g/n	Standalone	Edge 1	No	0.567	N/A	N/A
	Bluetooth	Standalone	Rear	No	0.360	N/A	N/A
5300	Wi-Fi 802.11a/n	Standalone	Edge 3	No	0.774	N/A	N/A
5500	Wi-Fi 802.11a/n	Standalone	Edge 3	No	0.631	N/A	N/A
5800	Wi-Fi 802.11a/n	Standalone	Edge 3	No	0.535	N/A	N/A
5900	Wi-Fi 802.11a/n	Standalone	Rear	No	0.444	N/A	N/A

Note(s):

Second Repeated Measurement is not required since the ratio of the largest to smallest SAR for the original and first repeated measurement is not > 1.20 .

12. Simultaneous Transmission SAR Analysis

Simultaneous Transmission Condition

RF Exposure Condition	Item		
Standalone	1	DTS MIMO	
	2	DTS Ant.2 + BT Ant.1	Non-RSDB Scenarios
	3	UNII MIMO	
	4, 5	UNII MIMO + BT Ant.1 or BT Ant.2	
	6	DTS Ant.1 + UNII MIMO	RSDB Scenarios
	7	DTS MIMO + UNII MIMO	
	8	DTS Ant.2 + UNII MIMO + BT Ant.1	

Notes:

1. DTS supports Wi-Fi Direct, Hotspot and VoIP.
2. U-NII supports Wi-Fi Direct, Hotspot and VoIP.
3. DTS supports SISO (Only Ant.2) and MIMO mode, U-NII only supports MIMO mode.
4. U-NII Radio can transmit simultaneously with Bluetooth Radio.
5. DTS Radio can transmit simultaneously with Bluetooth Radio in only RSDB Scenarios
6. DTS Radio can transmit simultaneously with U-NII Radio in only RSDB Scenarios
7. BT supports only SISO mode.

Simultaneous transmission SAR test exclusion considerations

KDB 447498 D01 General RF Exposure Guidance provides two procedures for determining simultaneous transmission SAR test exclusion: Sum of SAR and SAR to Peak Location Ratio (SPLSR)

Sum of SAR

To qualify for simultaneous transmission SAR test exclusion based upon Sum of SAR the sum of the reported standalone SARs for all simultaneously transmitting antennas shall be below the applicable standalone SAR limit. If the sum of the SARs is above the applicable limit then simultaneous transmission SAR test exclusion may still apply if the requirements of the SAR to Peak Location Ratio (SPLSR) evaluation are met.

12.1. Sum of the SAR for Wi-Fi & BT

Non-RSDB scenarios

RF Exposure	Test Position	Standalone SAR (W/kg)						Sum of SAR (W/kg)				
		Non-RSDB scenarios						DTS Ant.2 + BT Ant.1	UNI MIMO + BT Ant.1	UNI MIMO + BT Ant.2	UNI MIMO + BT Ant.1	UNI MIMO + BT Ant.2
		DTS Ant.2	DTS MIMO	BT Ant.1	BT Ant.2	UNI MIMO (5GHz)	UNI MIMO (6GHz)					
		1	2	3	4	5	6	1+3	3+5	4+5	3+6	4+6
Standalone	Rear	0.712	0.508	0.298	0.521	0.494	0.501	1.220	0.792	1.015	0.799	1.022
	Edge 1	0.712	0.573	0.363	0.521	0.516	0.019	1.285	0.879	1.037	0.382	0.540
	Edge 3	0.504	0.728	0.363	0.495	0.964	0.104	1.232	1.327	1.459	0.467	0.599
	Edge 4	0.225	0.344	0.120	0.162	0.126	0.006	0.569	0.246	0.288	0.126	0.168

RSDB scenarios

RF Exposure	Test Position	Standalone SAR (W/kg)						Sum of SAR (W/kg)							
		RSDB scenarios						DTS Ant.1 + UNI MIMO	DTS MIMO + UNI MIMO	BT Ant.1 DTS Ant.2 + UNI MIMO	DTS Ant.1 + UNI MIMO	DTS MIMO + UNI MIMO	BT Ant.1 DTS Ant.2 + UNI MIMO	RSDB SUM (DTS MIMO + UNI MIMO)	RSDB SUM (DTS MIMO + UNI MIMO)
		DTS Ant.1	DTS Ant.2	DTS MIMO	BT Ant.1	UNI MIMO (5GHz)	UNI MIMO (6GHz)								
		1	2	3	4	5	6	1+5	3+5	2+4+5	1+6	3+6	2+4+6	3+5	3+6
Standalone	Rear	0.282	0.541	0.550	0.298	0.486	0.501	0.768	1.036	1.325	0.783	1.051	1.340	1.036	1.051
	Edge 1	0.304	0.541	0.369	0.363	0.378	0.019	0.682	0.747	1.282	0.323	0.388	0.923	0.747	0.388
	Edge 3	0.304	0.381	0.389	0.363	0.655	0.104	0.959	1.044	1.399	0.408	0.493	0.848	1.044	0.493
	Edge 4	0.127	0.180	0.252	0.120	0.126	0.006	0.253	0.378	0.426	0.133	0.258	0.306	0.378	0.258

Note(s):

- Green value is estimated SAR value according to Sec.4.3.2.b).2) in KDB 447498 D01.

Conclusion:

Simultaneous Transmission SAR analysis results is satisfied the FCC Limit requirement according to follow procedures with "Sum of SAR"

Appendixes

Refer to separated files for the following appendixes.

4790101669-S1 FCC Report SAR_App A_Photos & Ant. Locations

4790101669-S1 FCC Report SAR_App B_Highest SAR Test Plots

4790101669-S1 FCC Report SAR_App C_System Check Plots

4790101669-S1 FCC Report SAR_App D_SAR Tissue Ingredients

4790101669-S1 FCC Report SAR_App E_Probe Cal. Certificates

4790101669-S1 FCC Report SAR_App F_Dipole Cal. Certificates

4790101669-S1 FCC Report SAR_App G_Proximity Sensor feature

END OF REPORT