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 NFC

MODEL NUMBER: SM-T630

FCC ID: A3LSMT630

REPORT NUMBER: 4790406775-S1V1

ISSUE DATE: 7/26/2022

Prepared for
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IAS ACCREDITED

Testing Laboratory

TL-637

Revision History

Rev.	Date	Revisions	Revised By
V1	7/26/2022	Initial Issue	--

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1. Attestation of Test Results

Applicant Name	SAMSUNG ELECTRONICS CO.,LTD.			
FCC ID	A3LSMT630			
Model Number	SM-T630			
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	NFC
Standalone	0.94	1.14	0.72	< 0.10
Simultaneous TX	1.59	1.59	1.46	1.46
Date Tested	6/30/2022 to 7/22/2022			
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	Seungyeon Kim 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	**0.941**
UNII	5GHz WLAN	All	**1.143**
DSS	Bluetooth	All	**0.722**
NFC	NFC	NFC Ant.	**0.049**

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, IEC_IEEE STD 62209-1528 : 2020, 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 October, 2016; RF Exposure Procedures (DUT Holder Perturbations)
- TCB workshop April, 2019; RF Exposure Procedures (Tissue Simulating Liquids (TSL))
- TCB workshop April, 2022; RF Exposure Procedures (Sum-Peak Location Separation Ratio)

3. Facilities and Accreditation

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

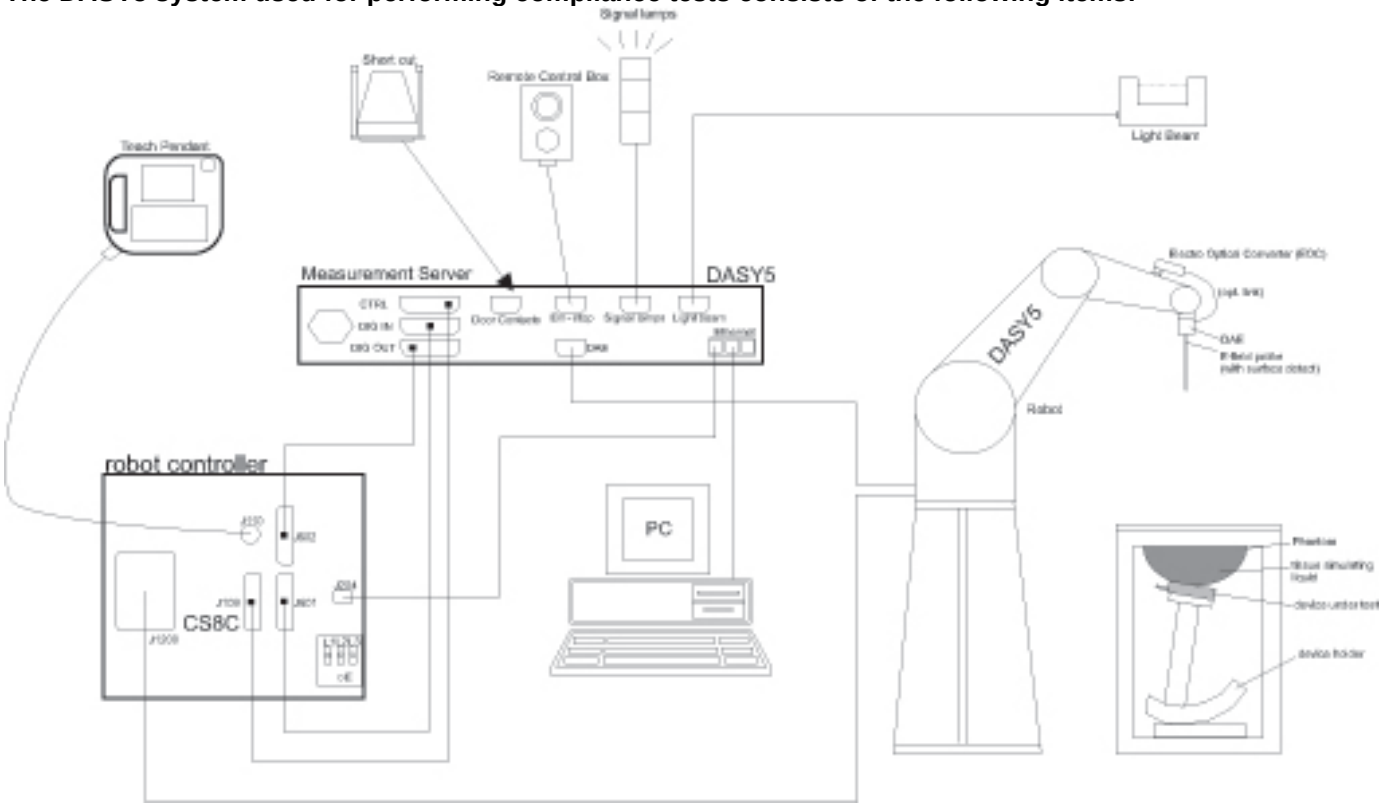
Suwon
SAR 4 Room
SAR 7 Room
SAR 9 Room

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. SAR Measurement System & Test Equipment

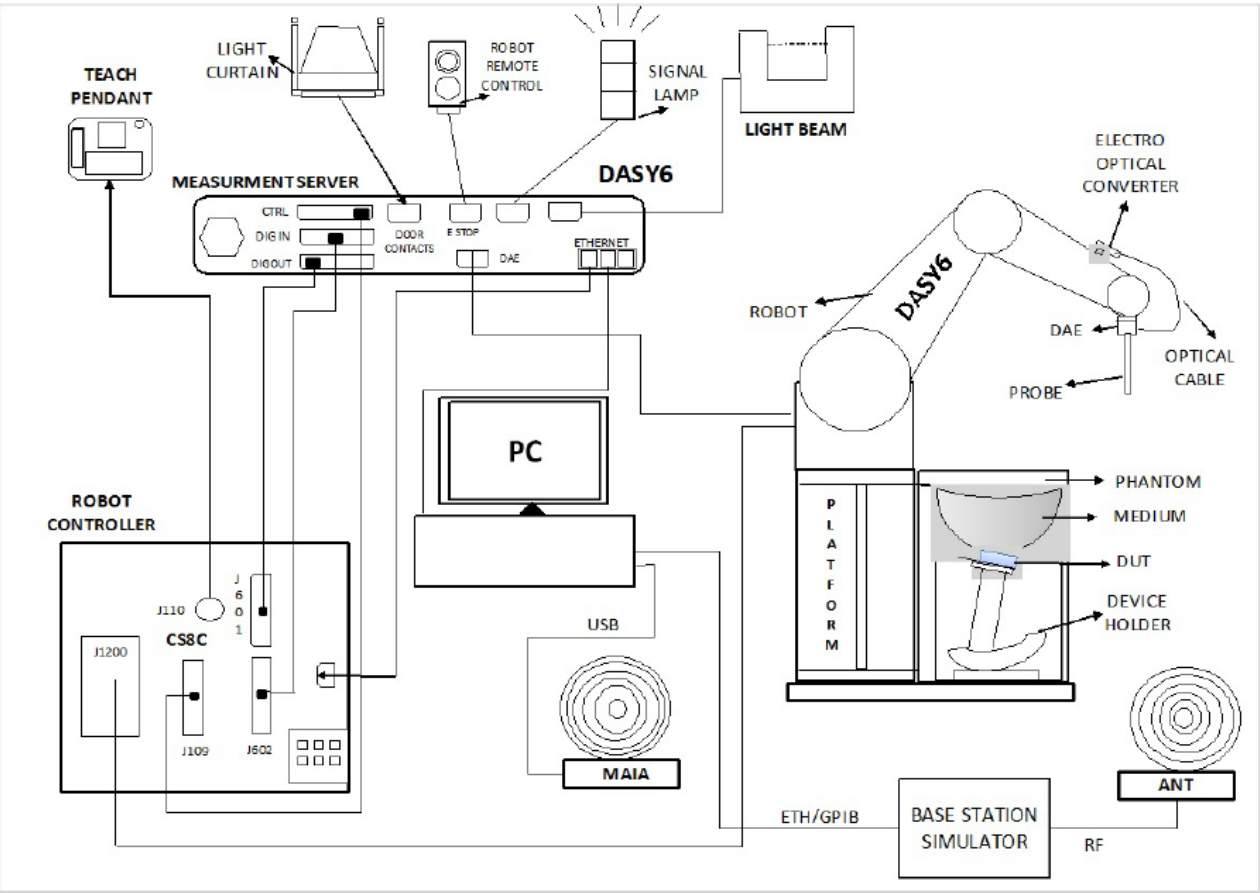
4.1. SAR Measurement System

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 WinXP or Win7 and the DASY5 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.

The DASY6 & 8 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 Win10 and the DASY6 or 8 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 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	½·δ·ln(2) ± 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.	

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

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

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

Step 4: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

Step 5: Z-Scan (FCC only)

The Z Scan measures points along a vertical straight line. The line runs along the Z-axis of a one-dimensional grid. In order to get a reasonable extrapolation the extrapolated distance should not be 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
Network Analyzer	ROHDE & SCHWARZ	ZNB 20	102256	8-6-2022
Dielectric Assessment Kit	SPEAG	DAK-3.5	1133	3-28-2023
Shorting block	SPEAG	DAK-3.5 Short	SM DAK 200 BA	N/A
Thermometer	LKM	DTM3000	3851	8-4-2022
Thermometer	LKM	DTM3000	3862	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
MXG Analog Signal Generator	Keysight	N5181B	MY59100587	8-4-2022
MXG Analog Signal Generator	Keysight	N5173B	MY59101083	8-4-2022
Power Sensor	Keysight	U2000A	MY60180020	8-4-2022
Power Sensor	Agilent	U2000A	MY54260007	8-4-2022
Power Sensor	Agilent	U2000A	MY54260010	8-4-2022
Power Sensor	Keysight	U2000A	MY60490008	8-4-2022
Power Sensor	Keysight	U2000A	MY61060004	8-4-2022
Power Sensor	Keysight	U2000A	MY61010006	8-4-2022
Power Sensor	Keysight	U2000A	MY61010010	8-4-2022
Power Amplifier	EXODUS	AMP2027	1410025-AMP2027-10003	8-4-2022
Power Amplifier	EXODUS	AMP2027ADB	10002	8-4-2022
Directional Coupler	Agilent	772D	MY52180193	8-3-2022
Directional Coupler	H.P	778D	16133	8-3-2022
Directional Coupler	MINI-CIRCUITS	ZUDC20-183+	N/A	8-3-2022
Directional Coupler	MINI-CIRCUITS	ZUDC20-183+	N/A	8-3-2022
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	8-3-2022
Low Pass Filter	MINI-CIRCUITS	NLP-1200	VUU19301915	8-4-2022
Attenuator	KEYSIGHT	8491B/003	VE2017A0283	8-4-2022
Attenuator	KEYSIGHT	8491B/010	MY39271981	8-4-2022
Attenuator	KEYSIGHT	8491B/010	MY39272011	8-4-2022
Attenuator	KEYSIGHT	8491B/020	MY39271973	8-4-2022
E-Field Probe	SPEAG	EX3DV4	7330	1-28-2023
E-Field Probe	SPEAG	EX3DV4	7313	3-2-2023
Data Acquisition Electronics	SPEAG	DAE4	1670	6-7-2023
Data Acquisition Electronics	SPEAG	DAE4	1468	9-27-2022
Data Acquisition Electronics	SPEAG	DAE4	1668	4-27-2023
System Validation Dipole	SPEAG	D2450V2	939	7-21-2022
System Validation Dipole	SPEAG	D2450V2	960	3-24-2023
System Validation Dipole	SPEAG	D5GHzV2	1209	11-24-2022
System Validation Dipole	SPEAG	CLA-13	1015	10-12-2022
Thermometer	Lutron	MHB-382SD	AH.91463	8-4-2022
Thermometer	Lutron	MHB-382SD	AH.50215	8-3-2022
Thermometer	Lutron	MHB-382SD	AH.50213	8-4-2022
Thermometer	Lutron	MHB-382SD	AH.45903	8-3-2022
Thermometer	Lutron	MHB-382SD	AK.18789	8-4-2022
Thermometer	Lutron	MHB-382SD	AK.12102	8-3-2022

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

Measurement Uncertainty of 100MHz to 6GHz

Per KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg and the measured 10-g SAR within a frequency band is < 3.75 W/kg. The expanded SAR measurement uncertainty must be ≤ 30%, for a confidence interval of k = 2. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval.

Measurement Uncertainty of 4MHz to 30MHz

Measurement uncertainty for 4 MHz to 30 MHz

(According to IEEE 62209-1528)

a	b	c		d	e	f	g	h =	l =	k
								c×f/e	*c×g/e*	
Uncertainty component	Reference	Tol. 1 g (±%)	Tol. 10 g (±%)	Prob. Dist.	Div.	*ci* (1 g)	*ci* (10 g)	1 g *ui* (± %)	10 g *ui* (± %)	vi
Measurement System Errors										
Probe Calibration	8.4.1.1	13.3		Normal	2	1	1	6.7	6.7	∞
Probe Calibration Drift	8.4.1.2	1.7		Rectangular	1.732	1	1	1.0	1.0	∞
Probe Linearity	8.4.1.3	4.7		Rectangular	1.732	1	1	2.7	2.7	∞
Broadband Signal	8.4.1.4	0.8		Rectangular	1.732	1	1	0.5	0.5	∞
Probe Isotropy	8.4.1.5	7.6		Rectangular	1.732	1	1	4.4	4.4	∞
Data Acquisition	8.4.1.6	0.3		Normal	1	1	1	0.3	0.3	∞
RF Ambient	8.4.1.7	1.8		Normal	1	1	1	1.8	1.8	∞
Probe Positioning	8.4.1.8	0.006		Normal	1	0.14	0.14	0.10	0.10	∞
Data Processing	8.4.1.9	1.2		Normal	1	1	1	1.2	1.2	∞
Phantom and Device Errors										
Conductivity (meas.)DAK	8.4.2.1	2.5		Normal	1	0.78	0.71	2.0	1.8	∞
Conductivity (temp.)BB	8.4.2.2	5.4		Rectangular	1.732	0.78	0.71	2.4	2.2	∞
Phantom Permittivity	8.4.2.3	14.0		Rectangular	1.732	0	0	0.0	0.0	∞
Distance DUT -TSL	8.4.2.4	2.0		Normal	1	2	2	4.0	4.0	∞
Device Positioning	8.4.2.5	0.5	0.6	Normal	1	1	1	0.5	0.6	40
Device Holder	8.4.2.6	3.6		Normal	1	1	1	3.6	3.6	∞
DUT Modulation	8.4.2.7	2.4		Rectangular	1.732	1	1	1.4	1.4	∞
Time-average SAR	8.4.2.8	1.7		Rectangular	1.732	1	1	1.0	1.0	∞
DUT drift	8.4.2.9	5.0		Normal	1	1	1	5.0	5.0	∞
Correction to the SAR results										
Deviation to Target	8.4.3.1	1.9		Normal	1	1	0.84	1.9	1.6	∞
Combined Standard Uncertainty Uc(y) =				RSS				12.13	12.02	
Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence =								**24.26**	**24.05**	

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	☒ Normal Battery cover.
Battery Options	☒ Standard – Li-ion battery, Rating 3.8 V, 28.88Wh
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 / R32T5006YBL / Wi-Fi & BT Conducted 2 / 64194010fa337ece / Wi-Fi & BT Conducted 3 / R32T5006SED / SAR 4 / R32T5006XBH / SAR 5 / R32T5006YAD / SAR 6 / R32T5006YBL / SAR 7 / R32T5006XJJ / 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)	99.4% (802.11b)
	5 GHz	802.11a 802.11n (HT20) & (HT40) 802.11ac (VHT20) & (VHT40) & (VHT80) 802.11ax (HE20) & (HE40) & (HE80)	SISO & MIMO : 96.7% (802.11a) 94.5% (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 5.1 LE	76.7% (DH5)
NFC	13.56 MHz	Type A/B/F	100%

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

WLAN-Maximum power

Band	Mode	SISO Ant.1 & Ant.2 (dBm)						MIMO (Ant.1 + Ant.2) (dBm)					
		a	b	g	n	ac	ax	a	b	g	n	ac	ax
2.4GHz	Ch1 - Ch11		20	19 17 (Ch1) 16 (Ch11)	18 15 (Ch1, 11)		18 15 (Ch1, 11)			22 20 (Ch1) 19 (Ch11)	21 18 (Ch1, 11)		21 18 (Ch1, 11)
	Ch12		9	9	9		9			9	9		9
	Ch13		3	3	3		3			3	3		3
5GHz (20MHz)	UNII-1	18			17	17	17	21			20	20	20
	UNII-2A	18			17	17	17	21			20	20	20
	UNII-2C	18			17	17	17	21			20	20	20
	UNII-3	18			17	17	17	21			20	20	20
5GHz (40MHz)	UNII-1				17 (ch38:16)	15	17 (ch 38:16)				20 (ch38:19)	18	20 (ch 38:19)
	UNII-2A				17 (ch 62:16)	15	17 (ch 62:16)				20 (ch62:19)	18	20 (ch62:19)
	UNII-2C				17	15	17				20	18	20
	UNII-3				17	15	17				20	18	20
5GHz (80MHz)	UNII-1					14	16					17	18
	UNII-2A					14	16					17	19
	UNII-2C					14	16					17	19
	UNII-3					14	16					17	19

WLAN-Reduced power

Band	Mode	SISO / MIMO Ant.1 & Ant.2 (dBm)						MIMO (Ant.1 + Ant.2) (dBm)					
		a	b	g	n	ac	ax	a	b	g	n	ac	ax
2.4GHz	Ch1 - Ch11		11	11	11		11			14	14		14
	Ch12		9	9	9		9			9	9		9
	Ch13		3	3	3		3			3	3		3
5GHz (20MHz)	UNII-1	8			8	8	8	11			11	11	11
	UNII-2A	8			8	8	8	11			11	11	11
	UNII-2C	8			8	8	8	11			11	11	11
	UNII-3	8			8	8	8	11			11	11	11
5GHz (40MHz)	UNII-1				8	8	8				11	11	11
	UNII-2A				8	8	8				11	11	11
	UNII-2C				8	8	8				11	11	11
	UNII-3				8	8	8				11	11	11
5GHz (80MHz)	UNII-1					8	8					11	11
	UNII-2A					8	8					11	11
	UNII-2C					8	8					11	11
	UNII-3					8	8					11	11

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	19	19	8.5	8.5
2.4GHz	Bluetooth_EDR	17.5	17.5	9.5	9.5
2.4GHz	Bluetooth_LE (1Mbps)	9.5		9.5	
2.4GHz	Bluetooth_LE (2Mbps)	9.5		9.5	

Note(s):.

1. This device uses an independent fixed level power reduction mechanism for WLAN & Bluetooth mode operations Detailed descriptions of the power reduction mechanism are included in the operational description.
2. BLE mode is not support in BT Ant.2

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			
	Wi-Fi 5GHz							
	Bluetooth							
WiFi/BT Ant.2	Wi-Fi 2.4GHz	Proximity sensor.4	Proximity sensor triggering	O			O	
	Wi-Fi 5GHz							
	Bluetooth							

Note(s):

1. Please refer to Section.9 for all power measurements, and Proximity sensor verification is mentioned 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.

7.1. Standalone SAR Test Exclusion Considerations

Tablet device's each positions (Rear/Edge1/Edge2/Edge3/Edge4) consider SAR test exclusion according to Appendix B.4 of KDB 447498 D04 Interim General RF exposure guide.
If Each antenna operate to between 0.3GHz to 6GHz, and Antenna to DUT surface's distance are within 20 cm to 40cm, then below Formula can use for SAR test exclusion;

$$P_{\text{th}}\,(\text{mW}) = ERP_{20\text{ cm}}\,(\text{mW}) = \begin{cases} 2040f & 0.3\text{ GHz} \le f < 1.5\text{ GHz} \\ 3060 & 1.5\text{ GHz} \le f \le 6\text{ GHz} \end{cases} \quad \text{(B.1)}$$

$$P_{\text{th}}\,(\text{mW}) = \begin{cases} ERP_{20\text{ cm}}(d/20\text{ cm})^{x} & d \le 20\text{ cm} \\ ERP_{20\text{ cm}} & 20\text{ cm} < d \le 40\text{ cm} \end{cases} \quad \text{(B.2)}$$

where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\text{ cm}}\sqrt{f}}\right)$$

and f is in GHz, d is the separation distance (cm), and $ERP_{20\text{cm}}$ is per Formula (B.1).
The example values shown in Table B.2 are for illustration only.

7.2. Estimated SAR

When an antenna qualifies for test exemption in single transmitter/antenna mode of each test positions, its actual SAR value may not be available, because it was not required to be measured. In this case, the SAR contribution of that antenna to simultaneous transmission must be estimated relative to the SAR based exemption criteria, by multiplying the corresponding ratio by the SAR limit of 1.6 W/kg for 1-g SAR. This is referred to as estimated SAR.
For instance, a given antenna may qualify for a SAR-based exemption according to Appendix B.4 of KDB 447498 D04, with $P_{ant} < P_{th}$, where P_{ant} is maximum time-averaged power, and P_{th} is defined in Section 7.1. Then, per the preceding paragraph, the estimated SAR is computed as $SAR_{est} = 1.6 * P_{ant} / P_{th}$ [W/kg].

SAR Test Exclusion Calculation for WLAN/BT

Antenna	Tx Interface	Frequency (MHz)	Output Power		Separation Distances (mm)						Estimated 1-g SAR Value (W/kg)					
			dBm	mW	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Front
Full Power, Proximity Sensor Off. A sensor triggering of 14 mm is included for both Rear and Edge 1																
Ant.1	Bluetooth	2480	18.50	71	14	16	198	160	0		-Measure-	-Measure-	0.038	0.057	-Measure-	
Ant.1	Wi-Fi 2.4 GHz	2462	20.00	100	14	16	198	160	0		-Measure-	-Measure-	0.053	0.080	-Measure-	
Ant.1	Wi-Fi 5.2 GHz	5240	18.00	63	14	16	198	160	0		-Measure-	-Measure-	0.034	0.052	-Measure-	
Ant.1	Wi-Fi 5.3 GHz	5320	18.00	63	14	16	198	160	0		-Measure-	-Measure-	0.034	0.052	-Measure-	
Ant.1	Wi-Fi 5.5 GHz	5720	18.00	63	14	16	198	160	0		-Measure-	-Measure-	0.034	0.052	-Measure-	
Ant.1	Wi-Fi 5.8 GHz	5825	18.00	63	14	16	198	160	0		-Measure-	-Measure-	0.034	0.053	-Measure-	
Ant.2	Bluetooth	2480	18.50	71	14	157	201	13	0		-Measure-	0.059	0.037	-Measure-	-Measure-	
Ant.2	Wi-Fi 2.4 GHz	2462	20.00	100	14	157	201	13	0		-Measure-	0.083	0.052	-Measure-	-Measure-	
Ant.2	Wi-Fi 5.2 GHz	5240	18.00	63	14	157	201	13	0		-Measure-	0.054	0.033	-Measure-	-Measure-	
Ant.2	Wi-Fi 5.3 GHz	5320	18.00	63	14	157	201	13	0		-Measure-	0.054	0.033	-Measure-	-Measure-	
Ant.2	Wi-Fi 5.5 GHz	5720	18.00	63	14	157	201	13	0		-Measure-	0.055	0.033	-Measure-	-Measure-	
Ant.2	Wi-Fi 5.8 GHz	5825	18.00	63	14	157	201	13	0		-Measure-	0.055	0.033	-Measure-	-Measure-	
Second Stage Power Back-off, Proximity Sensor On																
Ant.1	Bluetooth	2480	10.00	10	0	0					-Measure-	-Measure-				
Ant.1	Wi-Fi 2.4 GHz	2462	11.00	13	0	0					-Measure-	-Measure-				
Ant.1	Wi-Fi 5.2 GHz	5240	9.00	8	0	0					-Measure-	-Measure-				
Ant.1	Wi-Fi 5.3 GHz	5320	9.00	8	0	0					-Measure-	-Measure-				
Ant.1	Wi-Fi 5.5 GHz	5720	9.00	8	0	0					-Measure-	-Measure-				
Ant.1	Wi-Fi 5.8 GHz	5825	9.00	8	0	0					-Measure-	-Measure-				
Ant.2	Bluetooth	2480	10.00	10	0			0			-Measure-			-Measure-		
Ant.2	Wi-Fi 2.4 GHz	2462	11.00	13	0			0			-Measure-			-Measure-		
Ant.2	Wi-Fi 5.2 GHz	5240	9.00	8	0			0			-Measure-			-Measure-		
Ant.2	Wi-Fi 5.3 GHz	5320	9.00	8	0			0			-Measure-			-Measure-		
Ant.2	Wi-Fi 5.5 GHz	5720	9.00	8	0			0			-Measure-			-Measure-		
Ant.2	Wi-Fi 5.8 GHz	5825	9.00	8	0			0			-Measure-			-Measure-		

Note(s):

1. When some device surfaces (Rear/Edge1/Edge2/Edge3/Edge4) has Standalone SAR test Exclusion according to Section 7.1, Estimated SAR were calculated to the surfaces according to Section 7.2.

7.3. Required Test configurations

The table below identifies the standalone test configurations required for this device accordant to the findings in SAR Test Exclusion Calculation table.

Antenna	Tx Interface	Proximity sensor (On/Off)	Rear	Edge 1 (Top Edge)	Edge 2 (Right Edge)	Edge 3 (Bottom Edge)	Edge 4 (Left Edge)
2.4GHz Ant.1	DTS & BT	OFF	Yes	Yes	No	No	Yes
		ON	Yes	Yes			
2.4GHz Ant.2	DTS & BT	OFF	Yes	No	No	Yes	Yes
		ON	YEs			Yes	
5GHz Ant.1	UNII	OFF	Yes	Yes	No	No	Yes
		ON	Yes	Yes			
5GHz Ant.2	UNII	OFF	Yes	No	No	Yes	Yes
		ON	Yes			Yes	
NFC Ant.	NFC	N/A	Yes	Yes	Yes	Yest	Yes

Note(s):

1. Yes = Testing is required. No = Testing is not required.
2. NFC SAR test is considered in all test positions.

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

1. Tissue Dielectric Parameters (100MHz to 6GHz)

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

2. Tissue Dielectric Parameters (4MHz to 30MHz)

Target Frequency (MHz)	Head	
	ε_r	σ (S/m)
4	55.0	0.75
13	55.0	0.75
30	55.0	0.75

IEC_IEEE Std 62209-1528 : 2020

Refer to Table 2 within the IEC_IEEE Std 62209-1528 : 2020.

Dielectric Property Measurements Results:

SAR 4 Room

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
7/5/2022	Head 2450	e'	40.1100	Relative Permittivity (ϵ_r):	40.11	39.20	2.32	5
		e''	13.1500	Conductivity (σ):	1.79	1.80	-0.48	5
	Head 2400	e'	40.2900	Relative Permittivity (ϵ_r):	40.29	39.30	2.53	5
		e''	13.2400	Conductivity (σ):	1.77	1.75	0.87	5
	Head 2480	e'	40.0400	Relative Permittivity (ϵ_r):	40.04	39.16	2.24	5
		e''	13.1900	Conductivity (σ):	1.82	1.83	-0.74	5

SAR 7 Room

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
7/12/2022	Head 5250	e'	35.2700	Relative Permittivity (ϵ_r):	35.27	35.93	-1.85	5
		e''	16.0600	Conductivity (σ):	4.69	4.70	-0.30	5
	Head 5260	e'	35.2400	Relative Permittivity (ϵ_r):	35.24	35.92	-1.90	5
		e''	16.0200	Conductivity (σ):	4.69	4.71	-0.57	5
	Head 5600	e'	34.2500	Relative Permittivity (ϵ_r):	34.25	35.53	-3.61	5
		e''	15.9600	Conductivity (σ):	4.97	5.06	-1.79	5
	Head 5800	e'	34.6600	Relative Permittivity (ϵ_r):	34.66	35.30	-1.81	5
		e''	16.1900	Conductivity (σ):	5.22	5.27	-0.93	5
	Head 5825	e'	34.5800	Relative Permittivity (ϵ_r):	34.58	35.30	-2.04	5
		e''	15.8500	Conductivity (σ):	5.13	5.27	-2.59	5
7/18/2022	Head 5250	e'	36.6700	Relative Permittivity (ϵ_r):	36.67	35.93	2.05	5
		e''	15.7900	Conductivity (σ):	4.61	4.70	-1.97	5
	Head 5260	e'	36.6200	Relative Permittivity (ϵ_r):	36.62	35.92	1.94	5
		e''	15.7900	Conductivity (σ):	4.62	4.71	-2.00	5
	Head 5600	e'	36.0600	Relative Permittivity (ϵ_r):	36.06	35.53	1.48	5
		e''	15.9500	Conductivity (σ):	4.97	5.06	-1.85	5
	Head 5800	e'	35.6500	Relative Permittivity (ϵ_r):	35.65	35.30	0.99	5
		e''	16.0700	Conductivity (σ):	5.18	5.27	-1.66	5
	Head 5825	e'	35.5800	Relative Permittivity (ϵ_r):	35.58	35.30	0.79	5
		e''	16.0100	Conductivity (σ):	5.19	5.27	-1.60	5

SAR 9 Room

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
7/18/2022	Head 13	e'	53.7400	Relative Permittivity (εr):	53.74	55	-2.29	5
		e''	1033.6000	Conductivity (σ):	0.75	0.75	-0.38	5
	Head 12	e'	53.6800	Relative Permittivity (εr):	53.68	55	-2.40	5
		e''	1119.4800	Conductivity (σ):	0.75	0.75	-0.41	5
	Head 14	e'	53.6900	Relative Permittivity (εr):	53.69	55	-2.38	5
		e''	960.0300	Conductivity (σ):	0.75	0.75	-0.36	5
7/19/2022	Head 2450	e'	38.7700	Relative Permittivity (ϵ_r):	38.77	39.20	-1.10	5
		e''	13.4300	Conductivity (σ):	1.83	1.80	1.64	5
	Head 2400	e'	38.8500	Relative Permittivity (ϵ_r):	38.85	39.30	-1.14	5
		e''	13.4300	Conductivity (σ):	1.79	1.75	2.32	5
	Head 2480	e'	38.7200	Relative Permittivity (ϵ_r):	38.72	39.16	-1.13	5
		e''	13.4400	Conductivity (σ):	1.85	1.83	1.14	5
7/19/2022	Head 5250	e'	35.2900	Relative Permittivity (ϵ_r):	35.29	35.93	-1.79	5
		e''	15.8200	Conductivity (σ):	4.62	4.70	-1.79	5
	Head 5260	e'	35.2700	Relative Permittivity (ϵ_r):	35.27	35.92	-1.81	5
		e''	15.8600	Conductivity (σ):	4.64	4.71	-1.57	5
	Head 5600	e'	34.6000	Relative Permittivity (ϵ_r):	34.60	35.53	-2.63	5
		e''	16.0000	Conductivity (σ):	4.98	5.06	-1.55	5
	Head 5800	e'	34.6700	Relative Permittivity (ϵ_r):	34.67	35.30	-1.78	5
		e''	16.0400	Conductivity (σ):	5.17	5.27	-1.84	5
	Head 5825	e'	34.6300	Relative Permittivity (ϵ_r):	34.63	35.30	-1.90	5
		e''	16.0000	Conductivity (σ):	5.18	5.27	-1.67	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 (100MHz to 6GHz):

- The measurements were performed in the flat section of the TWIN SAM or ELI phantom, shell thickness: 2.0 ±0.2 mm (bottom plate) filled with Body or Head simulating liquid of the following parameters.
- The depth of tissue-equivalent liquid in a phantom must be ≥ 15.0 cm for SAR measurements ≤ 3 GHz and ≥ 10.0 cm for measurements > 3 GHz.
- The DASY system with an E-Field Probe was used for the measurements.
- The dipole was mounted on the small tripod so that the dipole feed point was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 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.

System Performance Check Measurement Conditions (4MHz to 30MHz):

- The measurements were performed in the flat section of the TWIN SAM or ELI phantom, shell thickness: 2.0 ±0.2 mm (bottom plate) filled with Body or Head simulating liquid of the following parameters.
- The depth of tissue-equivalent liquid in a phantom must be ≥ 15.0 cm for SAR measurements
- The DASY system with an E-Field Probe was used for the measurements.
- The CLA(Confined Loop Antennas) was mounted on the small tripod so that the CLA feed point was positioned below the center marking of the flat phantom section and the CLA was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 0 mm separation distance from CLA center to the Phantom surface.
- The CLA 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	Cal. Due Date	Target SAR Values (W/kg)	
				1g/10g	Head
D2450V2	939	7/21/2022	7/21/2023	1g	53.00
				10g	24.70
D2450V2	960	3/24/2022	3/24/2023	1g	51.90
				10g	24.00
D5GHzV2	1209	11/24/2021	11/24/2022	1g	78.00
				10g	22.40
				1g	80.90
				10g	23.10
				1g	79.00
				10g	22.40
CLA-13 (13MHz)	1015	10/12/2021	10/12/2022	1g	0.54
				10g	0.34

Note(s):

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

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 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			
7-5-2022	D2450V2	939	Head	1g	5.06	50.6	53.00	-4.53	1
				10g	2.37	23.7	24.70	-4.05	

SAR 7 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			
7/12/2022	D5GHzV2 (5250)	1209	Head	1g	7.77	77.7	78.00	-0.38	
				10g	2.21	22.1	22.40	-1.34	
7/12/2022	D5GHzV2 (5600)	1209	Head	1g	8.56	85.6	80.90	5.81	
				10g	2.43	24.3	23.10	5.19	
7/12/2022	D5GHzV2 (5800)	1209	Head	1g	8.38	83.8	79.00	6.08	
				10g	2.36	23.6	22.40	5.36	
7/18/2022	D5GHzV2 (5250)	1209	Head	1g	8.33	83.3	78.00	6.79	2
				10g	2.42	24.2	22.40	8.04	
7/18/2022	D5GHzV2 (5600)	1209	Head	1g	8.53	85.3	80.90	5.44	
				10g	2.45	24.5	23.10	6.06	
7/18/2022	D5GHzV2 (5800)	1209	Head	1g	7.88	78.8	79.00	-0.25	
				10g	2.26	22.6	22.40	0.89	

SAR 9 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			
7-18-2022	CLA-13	1015	Head	1g	0.053	0.5	0.54	-2.39	3
				10g	0.033	0.3	0.34	-2.08	
7-19-2022	D2450V2	960	Head	1g	5.05	50.5	51.90	-2.70	
				10g	2.36	23.6	24.00	-1.67	
7-19-2022	D5GHzV2 (5250)	1209	Head	1g	8.25	82.5	78.00	5.77	
				10g	2.37	23.7	22.40	5.80	
7-19-2022	D5GHzV2 (5600)	1209	Head	1g	8.80	88.0	80.90	8.78	4
				10g	2.50	25.0	23.10	8.23	
7-19-2022	D5GHzV2 (5800)	1209	Head	1g	8.36	83.6	79.00	5.82	
				10g	2.35	23.5	22.40	4.91	

9. Conducted Output Power Measurements

9.1. Wi-Fi 2.4 GHz (DTS Band)

WLAN SISO output power results

Antenna	Mode	Data Rate	Ch #	Freq. (MHz)	Max.Average Power (dBm)			Reduced Average Power (dBm)		
					Meas. Avg Pwr	Max. Tune-up Limit	SAR Test (Yes/No)	Meas. Avg Pwr	Max. Tune-up Limit	SAR Test (Yes/No)
WiFi 2.4G Ant.1	802.11b	1 Mbps	1	2412.0	19.34	20.00	Yes	10.62	11.00	Yes
			6	2437.0	19.66			10.32		
			11	2462.0	19.49			10.97		
			12	2467.0	8.04	9.00	No			
			13	2472.0	1.84	3.00				
	802.11g	6 Mbps	1 - 13	2412 - 2472	Not Required	19.00	No	Not Required	11.00	No
	802.11n	6.5 Mbps	1 - 13	2412 - 2472	Not Required	19.00	No	Not Required	11.00	No
Antenna	Mode	Data Rate	Ch #	Freq. (MHz)	Reduced 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.2	802.11b	1 Mbps	1	2412.0	19.46	20.00	Yes	10.74	11.00	Yes
			6	2437.0	19.71			10.89		
			11	2462.0	19.44			10.47		
			12	2467.0	8.05	9.00	No			
			13	2472.0	2.17	3.00				
	802.11g	6 Mbps	1 - 13	2412 - 2472	Not Required	19.00	No	Not Required	11.00	No
	802.11n	6.5 Mbps	1 - 13	2412 - 2472	Not Required	19.00	No	Not Required	11.00	No

Note(s):

1. SAR is not required for 802.11g/n modes when the adjusted SAR for 802.11b is < 1.2 W/kg.
2. 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.
3. 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.

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

WLAN SISO 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)
WiFi 5GHz Ant.1	5.3 (UNII 2A)	802.11a	6 Mbps	52	5260.0	17.52	18.0	Yes	Not Required	8.0	No
				56	5280.0	17.66					
				60	5300.0	17.56					
				64	5320.0	17.51					
		802.11n (HT20)	6.5 Mbps	Not Required			17.0	No	Not Required	8.0	No
		802.11n (HT40)	13.5 Mbps	Not Required			17.0	No	Not Required	8.0	No
		802.11ac (VHT20)	6.5 Mbps	Not Required			17.0	No	Not Required	8.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Required			15.0	No	Not Required	8.0	No
		802.11ac (VHT80)	29.3 Mbps	58	5290.0	Not Required	14.0	No	7.35	8.0	Yes
	5.5 (U-NII 2C)	802.11a	6 Mbps	100	5500.0	17.80	18.0	Yes	Not Required	8.0	No
				120	5600.0	17.51					
				124	5620.0	17.46					
				144	5720.0	17.61					
		802.11n (HT20)	6.5 Mbps	Not Required			17.0	No	Not Required	8.0	No
		802.11n (HT40)	13.5 Mbps	Not Required			17.0	No	Not Required	8.0	No
		802.11ac (VHT20)	6.5 Mbps	Not Required			17.0	No	Not Required	8.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Required			15.0	No	Not Required	8.0	No
		802.11ac (VHT80)	29.3 Mbps	106	5530.0	Not Required	14.0	No	7.85	8.0	Yes
				122	5610.0	Not Required			7.55		
				138	5690.0	Not Required			7.69		
	5.8 (U-NII 3)	802.11a	6 Mbps	149	5745.0	17.64	18.0	Yes	Not Required	8.0	No
				157	5785.0	17.34					
				165	5825.0	17.86					
		802.11n (HT20)	6.5 Mbps	Not Required			17.0	No	Not Required	8.0	No
		802.11n (HT40)	13.5 Mbps	Not Required			17.0	No	Not Required	8.0	No
		802.11ac (VHT20)	6.5 Mbps	Not Required			17.0	No	Not Required	8.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Required			15.0	No	Not Required	8.0	No
		802.11ac (VHT80)	29.3 Mbps	155	5775.0	Not Required	14.0	No	7.87	8.0	Yes

Note(s):

1. 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.
2. 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.
3. 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.

WLAN SISO 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)
WiFi 5GHz Ant.2	5.3 (UNII 2A)	802.11a	6 Mbps	52	5260.0	17.54	18.0	Yes	Not Required	8.0	No
				56	5280.0	17.52					
				60	5300.0	17.61					
				64	5320.0	17.33					
		802.11n (HT20)	6.5 Mbps	Not Required			17.0	No	Not Required	8.0	No
		802.11n (HT40)	13.5 Mbps	Not Required			17.0	No	Not Required	8.0	No
		802.11ac (VHT20)	6.5 Mbps	Not Required			17.0	No	Not Required	8.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Required			15.0	No	Not Required	8.0	No
		802.11ac (VHT80)	29.3 Mbps	58	5290.0	Not Required	14.0	No	8.62	8.0	Yes
	5.5 (U-NII 2C)	802.11a	6 Mbps	100	5500.0	17.57	18.0	Yes	Not Required	8.0	No
				120	5600.0	17.81					
				124	5620.0	17.88					
				144	5720.0	17.78					
		802.11n (HT20)	6.5 Mbps	Not Required			17.0	No	Not Required	8.0	No
		802.11n (HT40)	13.5 Mbps	Not Required			17.0	No	Not Required	8.0	No
		802.11ac (VHT20)	6.5 Mbps	Not Required			17.0	No	Not Required	8.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Required			15.0	No	Not Required	8.0	No
		802.11ac (VHT80)	29.3 Mbps	106	5530.0	Not Required	14.0	No	7.28	8.0	Yes
				122	5610.0	Not Required			7.24		
				138	5690.0	Not Required			7.59		
	5.8 (U-NII 3)	802.11a	6 Mbps	149	5745.0	17.86	18.0	Yes	Not Required	8.0	No
				157	5785.0	17.50					
				165	5825.0	17.48					
		802.11n (HT20)	6.5 Mbps	Not Required			17.0	No	Not Required	8.0	No
		802.11n (HT40)	13.5 Mbps	Not Required			17.0	No	Not Required	8.0	No
		802.11ac (VHT20)	6.5 Mbps	Not Required			17.0	No	Not Required	8.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Required			15.0	No	Not Required	8.0	No
		802.11ac (VHT80)	29.3 Mbps	155	5775.0	Not Required	14.0	No	7.67	8.0	Yes

Note(s):

1. 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.
2. 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.
3. 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.

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	52	5260.0	17.63	18.0	Yes	Not Required	8.0	No
				56	5280.0	17.81					
				60	5300.0	17.71					
				64	5320.0	17.63					
		802.11n (HT20)	6.5 Mbps	Not Required			17.0	No	Not Required	8.0	No
		802.11n (HT40)	13.5 Mbps	Not Required			17.0	No	Not Required	8.0	No
		802.11ac (VHT20)	6.5 Mbps	Not Required			17.0	No	Not Required	8.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Required			15.0	No	Not Required	8.0	No
		802.11ac (VHT80)	29.3 Mbps	58	5290.0	Not Required	14.0	No	7.35	8.0	Yes
	5.5 (U-NII 2C)	802.11a	6 Mbps	100	5500.0	17.81	18.0	Yes	Not Required	8.0	No
				120	5600.0	17.63					
				124	5620.0	17.57					
				144	5720.0	17.61					
		802.11n (HT20)	6.5 Mbps	Not Required			17.0	No	Not Required	8.0	No
		802.11n (HT40)	13.5 Mbps	Not Required			17.0	No	Not Required	8.0	No
		802.11ac (VHT20)	6.5 Mbps	Not Required			17.0	No	Not Required	8.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Required			15.0	No	Not Required	8.0	No
		802.11ac (VHT80)	29.3 Mbps	106	5530.0	Not Required	14.0	No	7.65	8.0	Yes
				122	5610.0	Not Required			7.94		
				138	5690.0	Not Required			7.45		
	5.8 (U-NII 3)	802.11a	6 Mbps	149	5745.0	16.67	18.0	Yes	Not Required	8.0	No
				157	5785.0	16.93					
				165	5825.0	17.45					
		802.11n (HT20)	6.5 Mbps	Not Required			17.0	No	Not Required	8.0	No
		802.11n (HT40)	13.5 Mbps	Not Required			17.0	No	Not Required	8.0	No
		802.11ac (VHT20)	6.5 Mbps	Not Required			17.0	No	Not Required	8.0	No
		802.11ac (VHT40)	13.5 Mbps	Not Required			15.0	No	Not Required	8.0	No
		802.11ac (VHT80)	29.3 Mbps	155	5775.0	Not Required	14.0	No	7.54	8.0	Yes

Note(s):

1. 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.
2. 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.
3. 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.
4. UNII MIMO SAR additionally tested due to satisfy simultaneous transmission analysis.

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	52	5260.0	17.51	18.00	Yes	Not Required	8.00	No
				56	5280.0	17.53					
				60	5300.0	17.61					
				64	5320.0	17.37					
		802.11n (HT20)	6.5 Mbps	Not Required			17.00	No	Not Required	8.00	No
		802.11n (HT40)	13.5 Mbps	Not Required			17.00	No	Not Required	8.00	No
		802.11ac (VHT20)	6.5 Mbps	Not Required			17.00	No	Not Required	8.00	No
		802.11ac (VHT40)	13.5 Mbps	Not Required			15.00	No	Not Required	8.00	No
		802.11ac (VHT80)	29.3 Mbps	58	5290.0	Not Required	14.00	No	6.86	8.00	Yes
	5.5 (U-NII 2C)	802.11a	6 Mbps	100	5500.0	17.60	18.00	Yes	Not Required	8.00	No
				120	5600.0	16.87					
				124	5620.0	17.08					
				144	5720.0	17.84					
		802.11n (HT20)	6.5 Mbps	Not Required			17.00	No	Not Required	8.00	No
		802.11n (HT40)	13.5 Mbps	Not Required			17.00	No	Not Required	8.00	No
		802.11ac (VHT20)	6.5 Mbps	Not Required			17.00	No	Not Required	8.00	No
		802.11ac (VHT40)	13.5 Mbps	Not Required			15.00	No	Not Required	8.00	No
		802.11ac (VHT80)	29.3 Mbps	106	5530.0	Not Required	14.00	No	7.18	8.00	Yes
				122	5610.0	Not Required			7.35		
				138	5690.0	Not Required			6.36		
	5.8 (U-NII 3)	802.11a	6 Mbps	149	5745.0	17.48	18.00	Yes	Not Required	8.00	No
				157	5785.0	17.55					
				165	5825.0	17.61					
		802.11n (HT20)	6.5 Mbps	Not Required			17.00	No	Not Required	8.00	No
		802.11n (HT40)	13.5 Mbps	Not Required			17.00	No	Not Required	8.00	No
		802.11ac (VHT20)	6.5 Mbps	Not Required			17.00	No	Not Required	8.00	No
		802.11ac (VHT40)	13.5 Mbps	Not Required			15.00	No	Not Required	8.00	No
		802.11ac (VHT80)	29.3 Mbps	155	5775.0	Not Required	14.00	No	7.19	8.00	Yes

Note(s):

1. 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.
2. 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.
3. 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.
4. UNII MIMO SAR additionally tested due to satisfy 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 Pwr	Tune-up Limit	Meas Pwr	Tune-up Limit
2.4	BT SISO Ant.1	BDR	0	2402	18.62	19.00	7.58	8.50
			39	2441	18.91		8.02	
			78	2480	17.34		7.23	
		EDR	0	2402	16.14	17.50	8.00	9.50
			39	2441	16.42		8.33	
			78	2480	14.68		6.46	
		LE, GFSK-1M	0	2402	7.94	9.50	7.94	9.50
			19	2440	8.38		8.38	
			39	2480	7.47		7.47	
		LE, GFSK-2M	0	2402	7.93	9.50	7.93	9.50
			19	2440	8.59		8.59	
			39	2480	7.59		7.59	
	BT SISO Ant.2	BDR	0	2402	17.96	19.00	6.50	8.50
			39	2441	18.35		7.65	
			78	2480	16.11		6.39	
		EDR	0	2402	15.59	17.50	7.59	9.50
			39	2441	15.86		7.84	
			78	2480	13.45		5.33	

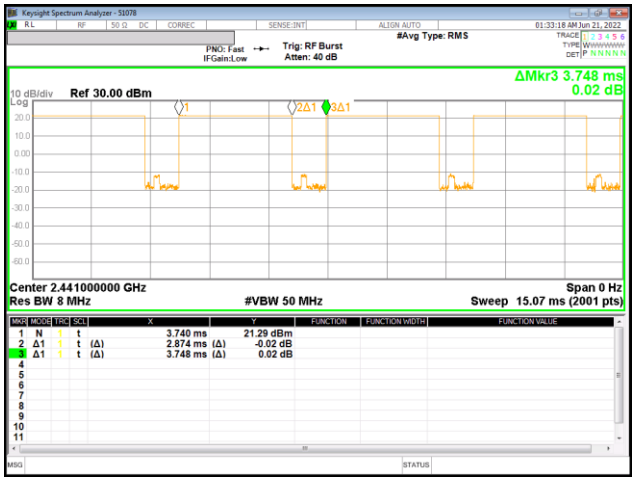
Note(s):

SAR test is evaluated at BDR mode in Bluetooth using Max power condition and EDR mode in Bluetooth using Reduced power condition.

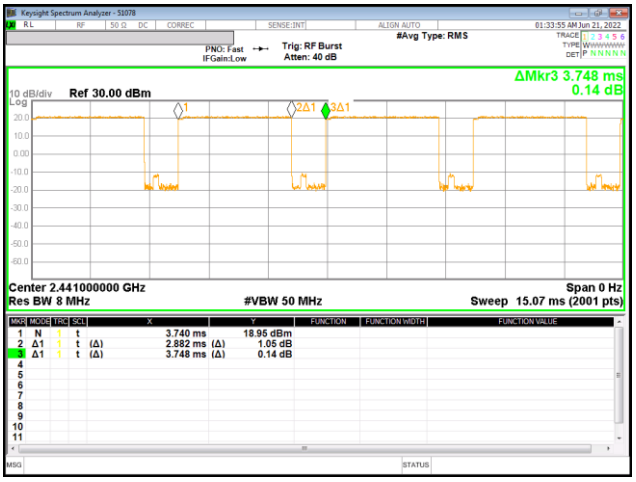
Duty Factor Measured Results

Mode	Type	T on (ms)	Period (ms)	Duty Cycle	Crest Factor (1/duty cycle)
BDR	DH5	2.874	3.748	76.68%	1.30
EDR	DH5	2.882	3.748	76.89%	1.30

Duty Cycle plots



BDR



EDR

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)

DTS 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 1Mbps	Standanloe	Off	14	Rear	6	2437.0	99.4%	20.00	19.66	0.255	0.278		
					16	Edge 1	6	2437.0	99.4%	20.00	19.66	0.122	0.133		
					0	Edge 4	6	2437.0	99.4%	20.00	19.66	0.289	0.315		
				On	0	Rear	11	2462.0	99.4%	11.00	10.97	0.585	0.593		1
					0	Edge 1	11	2462.0	99.4%	11.00	10.97	0.136	0.138		
	WLAN SISO Ant.2	802.11b 1Mbps	Standanloe	Off	14	Rear	6	2437.0	99.4%	20.00	19.71	0.738	0.794		
					13	Edge 3	1	2412.0	99.4%	20.00	19.46	0.695	0.792	1	
							6	2437.0	99.4%	20.00	19.71	0.875	0.941		2
					0	Edge 4	6	2437.0	99.4%	20.00	19.71	0.140	0.151		
				On	0	Rear	6	2437.0	99.4%	11.00	10.89	0.447	0.461		
					0	Edge 3	6	2437.0	99.4%	11.00	10.89	0.567	0.585		

10.2. Wi-Fi (U-NII Bands)

U-NII 2A 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		
5.3 GHz U-NII 2A	WLAN SISO Ant.1	802.11a 6 Mbps	Standalone	Off	14	Rear	56	5280.0	96.65%	18.00	17.66	0.260	0.291		
					16	Edge 1	56	5280.0	96.65%	18.00	17.66	0.615	0.688		
					0	Edge 4	56	5280.0	96.65%	18.00	17.66	0.231	0.258		
		802.11ac VHT80 29.3 Mbps	Standalone	On	0	Rear	58	5290.0	94.54%	8.00	7.35	0.523	0.643		
					0	Edge 1	58	5290.0	94.54%	8.00	7.35	0.601	0.738		3
	WLAN SISO Ant.2	802.11a 6 Mbps	Standalone	Off	14	Rear	60	5300.0	96.65%	18.00	17.61	0.508	0.575		
					13	Edge 3	60	5300.0	96.65%	18.00	17.61	0.163	0.184		
					0	Edge 4	60	5300.0	96.65%	18.00	17.61	0.200	0.226		
		802.11ac VHT80 29.3 Mbps	Standalone	On	0	Rear	58	5290.0	94.54%	8.00	8.62	0.592	0.543		4
					0	Edge 3	58	5290.0	94.54%	8.00	8.62	0.133	0.122		
5.3 GHz U-NII 2A	WLAN MIMO Ant.1	802.11a 6 Mbps	Standalone	Off	14	Rear	56	5280.0	96.65%	18.00	17.81	0.336	0.363		
		802.11ac VHT80 29.3 Mbps	Standalone	On	0	Rear	58	5290.0	94.54%	8.00	7.35				
	WLAN MIMO Ant.2	802.11a 6 Mbps	Standalone	Off	14	Rear	60	5300.0	96.65%	18.00	17.61				
		802.11ac VHT80 29.3 Mbps	Standalone	On	0	Rear	58	5290.0	94.54%	8.00	6.86	0.565	0.777		5

Note(s):

1. 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). If second channel SAR is not over 1.2 or 3.0 W/kg (1-g or 10-g respectively), remain channels SAR test are not required.
2. UNII MIMO SAR additionally evaluated at Rear (0mm & 14mm) due to satisfy simultaneous transmission criteria

Wi-Fi (U-NII Bands) (Continued)

U-NII 2C 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		
5.5 GHz U-NII 2C	WLAN SISO Ant.1	802.11a 6 Mbps	Standalone	Off	14	Rear	100	5500.0	96.65%	18.00	17.80	0.602	0.652		
					16	Edge 1	100	5500.0	96.65%	18.00	17.80	0.905	0.980		
							144	5720.0	96.65%	18.00	17.61	1.010	1.143	1	6
					0	Edge 4	100	5500.0	96.65%	18.00	17.80	0.143	0.155		
		802.11ac VHT80 29.3 Mbps	Standalone	On	0	Rear	106	5500.0	94.54%	8.00	7.85	0.924	1.012		
							138	5690.0	94.54%	8.00	7.69	0.870	0.988	1	
					0	Edge 1	106	5500.0	94.54%	8.00	7.85	0.610	0.668		
	WLAN SISO Ant.2	802.11a 6 Mbps	Standalone	Off	14	Rear	124	5620.0	96.65%	18.00	17.88	0.943	1.003		7
							144	5720.0	96.65%	18.00	17.78	0.855	0.931	1	
					13	Edge 3	124	5620.0	96.65%	18.00	17.88	0.263	0.280		
					0	Edge 4	124	5620.0	96.65%	18.00	17.88	0.529	0.563		
		802.11ac VHT80 29.3 Mbps	Standalone	On	0	Rear	106	5530.0	94.54%	8.00	7.28	0.758	0.946	1	
							138	5690.0	94.54%	8.00	7.59	0.824	0.958		
					0	Edge 3	138	5690.0	94.54%	8.00	7.59	0.173	0.201		
	WLAN MIMO Ant.1	802.11a 6 Mbps	Standalone	Off	14	Rear	100	5500.0	96.65%	18.00	17.81	0.602	0.651		
							144	5720.0	96.65%	18.00	17.61	0.788	0.892	1	
		802.11ac VHT80 29.3 Mbps	Standalone	On	0	Rear	106	5530.0	94.54%						
							122	5610.0	94.54%	8.00	7.94	0.925	0.992		8
	WLAN MIMO Ant.2	802.11a 6 Mbps	Standalone	Off	14	Rear	100	5500.0	96.65%						
							144	5720.0	96.65%						
		802.11ac VHT80 29.3 Mbps	Standalone	On	0	Rear	106	5530.0	94.54%	8.00	7.18	0.657	0.839	1	
							122	5610.0	94.54%						

U-NII 3 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		
5.8 GHz U-NII 3	WLAN SISO Ant.1	802.11a 6 Mbps	Standalone	Off	14	Rear	165	5825.0	96.65%	18.00	17.86	0.637	0.681		
					16	Edge 1	149	5745.0	96.65%	18.00	17.64	0.884	0.994	1	
							165	5825.0	96.65%	18.00	17.86	0.800	0.855		
					0	Edge 4	165	5825.0	96.65%	18.00	17.86	0.569	0.608		
		802.11ac VHT80 29.3 Mbps	Standalone	On	0	Rear	155	5775.0	94.54%	8.00	7.87	0.927	1.010		9
					0	Edge 1	155	5775.0	94.54%	8.00	7.87	0.574	0.626		
	WLAN SISO Ant.2	802.11a 6 Mbps	Standalone	Off	14	Rear	149	5745.0	96.65%	18.00	17.86	0.906	0.968		10
							165	5825.0	96.65%	18.00	17.48	0.766	0.893	1	
					13	Edge 3	149	5745.0	96.65%	18.00	17.86	0.219	0.234		
					0	Edge 4	149	5745.0	96.65%	18.00	17.86	0.025	0.027		
		802.11ac VHT80 29.3 Mbps	Standalone	On	0	Rear	155	5775.0	94.54%	8.00	7.67	0.599	0.684		
					0	Edge 3	155	5775.0	94.54%	8.00	7.67	0.156	0.178		
	WLAN MIMO Ant.1	802.11a 6 Mbps	Standalone	Off	14	Rear	165	5825.0	96.65%						
		802.11ac VHT80 29.3 Mbps	Standalone	On	0	Rear	155	5775.0	94.54%	8.00	7.54	0.729	0.857		11
	WLAN MIMO Ant.2	802.11a 6 Mbps	Standalone	Off	14	Rear	165	5825.0	96.65%	18.00	17.61	0.678	0.767		
		802.11ac VHT80 29.3 Mbps	Standalone	On	0	Rear	155	5775.0	94.54%						

Note(s):

1. 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). If second channel SAR is not over 1.2 or 3.0 W/kg (1-g or 10-g respectively), remain channels SAR test are not required.
2. UNII MIMO SAR additionally evaluated at Rear (0mm & 14mm) 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	BDR DH5	Standalone	Off	14	Rear	39	2441.0	76.7%	19.00	18.91	0.172	0.229	
					16	Edge 1	39	2441.0	76.7%	19.00	18.91	0.072	0.096	
					0	Edge 4	39	2441.0	76.7%	19.00	18.91	0.215	0.286	
		EDR DH5		On	0	Rear	39	2441.0	76.9%	9.50	8.33	0.207	0.352	12
					0	Edge 1	39	2441.0	76.9%	9.50	8.33	0.066	0.112	
2.4 GHz	BT SISO Ant.2	BDR DH5	Standalone	Off	14	Rear	39	2441.0	76.7%	19.00	18.35	0.477	0.722	13
					13	Edge 3	39	2441.0	76.7%	19.00	18.35	0.376	0.570	
					0	Edge 4	39	2441.0	76.7%	19.00	18.35	0.100	0.151	
		EDR DH5		On	0	Rear	39	2441.0	76.9%	9.50	7.84	0.138	0.263	
					0	Edge 3	39	2441.0	76.9%	9.50	7.84	0.228	0.435	

10.4. NFC

Antenna	Mode	RF Exposure Conditions	Dist. (mm)	Test Position	Test setup		Freq. (MHz)	1-g SAR (W/kg)	Plot No.
					Type	Bitrate		Meas.	
NFC	PBRS	Standalone	0	Rear	A	106	13.6	0.046	
					B	106	13.6	0.049	14
					F	106	13.6	0.000	
					B	212	13.6	0.043	
					B	424	13.6	0.043	
				Edge 1	B	106	13.6	0.000	
				Edge 2	B	106	13.6	0.000	
				Edge 3	B	106	13.6	0.000	
				Edge 4	B	106	13.6	0.000	

11. SAR Masurement 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 3	Yes	0.875	0.869	-1.00
	Bluetooth	Standalone	Rear	No	0.477	N/A	N/A
5300	Wi-Fi 802.11a/n/ac	Standalone	Edge 1	No	0.615	N/A	N/A
5500	Wi-Fi 802.11a/n/ac	Standalone	Edge 1	Yes	1.010	0.997	-1.00
5800	Wi-Fi 802.11a/n/ac	Standalone	Rear	Yes	0.927	0.910	-2.00

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 Ant.1	+	DTS Ant.2			Non-RSDB Scenarios
	2	UNII MIMO					
	3	DTS Ant.2	+	BT Ant.1			
	4, 5	UNII MIMO	+	BT Ant.1	or	BT Ant.2	
	6	DTS MIMO	+	UNII MIMO			RSDB Scenarios
	7	DTS Ant.2	+	UNII MIMO	+	BT Ant.1	
	All scenarios (1 - 7) + NFC						

Notes:

1. DTS supports Wi-Fi Direct, Hotspot and VoIP.
2. U-NII supports Wi-Fi Direct, Hotspot and VoIP.
3. U-NII Radio can transmit simultaneously with Bluetooth Radio in certain scenario.
4. DTS Radio can transmit simultaneously with Bluetooth Radio in certain scenario.
5. BT tethering is considered about each RF exposure conditions.
6. NFC Radio can transmit simultaneously with all transmitter radio according simultaneous transmission scenarios.

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.

SAR to Peak Location Separation Ratio (SPLSR)

KDB 447498 D01 General RF Exposure Guidance explains how to calculate the SAR to Peak Location Ratio (SPLSR) between pairs of simultaneously transmitting antennas:

$$SPLSR = (SAR_1 + SAR_2)^{1.5} / Ri$$

Where:

SAR_1 is the highest reported or estimated SAR for the first of a pair of simultaneous transmitting antennas, in a specific test operating mode and exposure condition

SAR_2 is the highest reported or estimated SAR for the second of a pair of simultaneous transmitting antennas, in the same test operating mode and exposure condition as the first

Ri is the separation distance between the pair of simultaneous transmitting antennas. When the SAR is measured, for both antennas in the pair, it is determined by the actual x, y and z coordinates in the 1-g SAR for each SAR peak location, based on the extrapolated and interpolated result in the zoom scan measurement, using the formula of

$$[(x_1-x_2)^2 + (y_1-y_2)^2 + (z_1-z_2)^2]$$

In order for a pair of simultaneous transmitting antennas with the sum of 1-g SAR > 1.6 W/kg to qualify for exemption from Simultaneous Transmission SAR measurements, it has to satisfy the condition of:

$$(SAR_1 + SAR_2)^{1.5} / Ri \leq 0.04$$

When an individual antenna transmits at on two bands simultaneously, the sum of the highest *reported* SAR for the frequency bands should be used to determine SAR_1.or SAR_2. When SPLSR is necessary, the smallest distance between the peak SAR locations for the antenna pair with respect to the peaks from each antenna should be used.

The antennas in all antenna pairs that do not qualify for simultaneous transmission SAR test exclusion must be tested for SAR compliance, according to the enlarged zoom scan and volume scan post-processing procedures in KDB Publication 865664 D01

The antennas for the unlicensed transmitters are closely situated. As a result, the associated SAR hotspots are also closely situated. Some of the sum of SAR calculations yielded results over 1.6 W/kg. The SPSLR calculations for these situations were performed by treating the unlicensed SAR values as a single transmitter. The most conservative distance between all the unlicensed hotspots to the licensed hotspot was used for the value of *d* in the SPSLR calculation.

Sum to Peak Location Separation Ratio

Instead of doing a small volume scan over a co-located antenna pair (Hybrid SPLSR guide), Simultaneous transmission SAR test exclusion may algebraically sum the SAR values of the co-located pair and use that value in SPLSR calculation;

-In the calculation Separation distance must use the minimum distance between the spatially separated antenna and the closest antenna of the co-located antenna pair to be conservative.

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

RF Exposure	Test Position	Standalone SAR (W/kg)								Sum of SAR (W/kg)					
		DTS Ant.1	DTS Ant.2	BT Ant.1	BT Ant.2	UNII Ant.1	UNII Ant.2	UNII MIMO (5GHz)	NFC	DTS Ant.1 + DTS Ant.2 + NFC	DTS Ant.2 + BT Ant.1 + NFC	UNII MIMO + BT Ant.1 + NFC	UNII MIMO + BT Ant.2 + NFC	DTS MIMO + UNII MIMO + NFC	DTS Ant.2 + UNII MIMO + BT Ant.1 + NFC
		1	2	3	4	5	6	7	8	1+2+8	2+3+8	3+7+8	4+5+6	1+2+7+8	2+3+7+8
Standalone	Rear_14 mm	0.278	0.794	0.229	0.722	0.681	1.003	0.892	0.049	1.121	1.072	1.170	1.663	2.013	1.964
	Rear_0 mm	0.593	0.461	0.352	0.263	1.012	0.958	0.992	0.049	1.103	0.862	1.393	1.304	2.095	1.854
	Edge 1	0.138	0.083	0.112	0.059	1.149	0.055	1.204	0.000	0.221	0.195	1.316	1.263	1.425	1.399
	Edge 2	0.053	0.052	0.038	0.037	0.034	0.033	0.067	0.000	0.105	0.090	0.105	0.104	0.172	0.157
	Edge 3	0.080	0.941	0.057	0.570	0.053	0.280	0.333	0.000	1.021	0.998	0.390	0.903	1.354	1.331
	Edge 4	0.315	0.151	0.286	0.151	0.608	0.563	1.171	0.000	0.466	0.437	1.457	1.322	1.637	1.608

SPLSR criteria

RF Exposure	Test Position	UNII MIMO	BT Ant.2	NFC	Sum of SAR (W/kg) (1-g)		Calculated Distance (mm)	1-g SPLSR (=<0.04)	Volume Scan (Yes/No)	Figure
		1	2	3						
Standalone	Rear	0.892	0.722	0.049	1+2+3	1.663				1
		0.892	0.722		1+2	1.614	159.2	0.01	No	
			0.722	0.049	2+3	0.771	60.8	0.01	No	
		0.892		0.049	1+3	0.941	99.0	0.01	No	

RF Exposure	Test Position	DTS Ant.1	UNII MIMO	DTS Ant.2	NFC	Sum of SAR (W/kg) (1-g)		Calculated Distance (mm)	1-g SPLSR (=<0.04)	Volume Scan (Yes/No)	Figure
		1	2	3	4						
Standalone	Rear	0.278	0.892	0.794	0.049	1+2+3+4	2.013				2
				0.794	0.049	3+4	0.843	52.0	0.01	No	
		1.170		0.794		(1+2)+3	1.964	149.8	0.02	No	
		1.170			0.049	(1+2)+4	1.219	99.0	0.01	No	
Sum-Peak Location Separation Ratio Note.3		1.170				1+2	1.170				

RF Exposure	Test Position	BT Ant.1	UNII MIMO	DTS Ant.2	NFC	Sum of SAR (W/kg) (1-g)		Calculated Distance (mm)	1-g SPLSR (=<0.04)	Volume Scan (Yes/No)	Figure
		1	2	3	4						
Standalone	Rear	0.229	0.892	0.794	0.049	1+2+3+4	1.964				3
				0.794	0.049	3+4	0.843	52.0	0.01	No	
		1.121		0.794		(1+2)+3	1.915	147.2	0.02	No	
		1.121			0.049	(1+2)+4	1.170	96.5	0.01	No	
Sum-Peak Location Separation Ratio Note.3		1.121				1+2	1.121				

RF Exposure	Test Position	DTS Ant.1	UNII MIMO	DTS Ant.2	NFC	Sum of SAR (W/kg) (1-g)		Calculated Distance (mm)	1-g SPLSR (=<0.04)	Volume Scan (Yes/No)	Figure
		1	2	3	4						
Standalone	Rear	0.593	0.992	0.461	0.049	1+2+3+4	2.095				4
				0.461	0.049	3+4	0.510	52.6	0.01	No	
		1.585		0.461		(1+2)+3	2.046	151.5	0.02	No	
		1.585			0.049	(1+2)+4	1.634	101.0	0.02	No	
Sum-Peak Location Separation Ratio Note.3		1.585				1+2	1.585				

RF Exposure	Test Position	BT Ant.1	UNII MIMO	DTS Ant.2	NFC	Sum of SAR (W/kg) (1-g)		Calculated Distance (mm)	1-g SPLSR (=<0.04)	Volume Scan (Yes/No)	Figure
		1	2	3	4						
Standalone	Rear	0.352	0.992	0.461	0.049	1+2+3+4	1.854				5
				0.461	0.049	3+4	0.510	52.6	0.01	No	
		1.344		0.461		(1+2)+3	1.805	147.0	0.02	No	
		1.344			0.049	(1+2)+4	1.393	96.5	0.02	No	
Sum-Peak Location Separation Ratio Note.3		1.344				1+2	1.344				

Note(s):

1. Green value is estimated SAR according to calculate of KDB 447498 D04. Please refer to Section.7.
2. Blue value is sum SAR of each UNII Ant.1 & UNII Ant.2.
3. According to 2022 Apr TCBC Workshop, SPLSR (Sum-Peak Location Separation Ratio) can algebraically sum the SAR values of the co-located pair and use that value in SPLSR calculation. Use the minimum distance between the spatially separated antenna and the closest antenna of the co-located antenna pair to be conservative.

Sum of the SAR for Wi-Fi & BT & NFC (Continued)

SPLSR criteria

RF Exposure	Test Position	DTS Ant.1	UNII Ant.1	DTS Ant.2	UNII Ant.2	NFC	Sum of SAR (W/kg) (1-g)		Calculated Distance (mm)	1-g SPLSR (=<0.04)	Volume Scan (Yes/No)	Figure
		1	2	3	4	5						
Standalone	Edge 4	0.315	0.608	0.151	0.563	0.000	1+2+3+4+5	1.637				6
		0.923		0.714			(1+2)+(3+4)	1.637	134.9	0.02	No	
Sum-Peak Location Separation Ratio Note.3		0.923					1+2	0.923				
				0.714			3+4	0.714				

RF Exposure	Test Position	DTS Ant.2	UNII Ant.2	UNII Ant.1	BT Ant.1	NFC	Sum of SAR (W/kg) (1-g)		Calculated Distance (mm)	1-g SPLSR (=<0.04)	Volume Scan (Yes/No)	Figure
		1	2	3	4	5						
Standalone	Edge 4	0.151	0.563	0.608	0.286	0.000	1+2+3+4+5	1.608				7
		0.714		0.894			(1+2)+(3+4)	1.608	139.9	0.01	No	
Sum-Peak Location Separation Ratio Note.3		0.714					1+2	0.714				
				0.894			3+4	0.894				

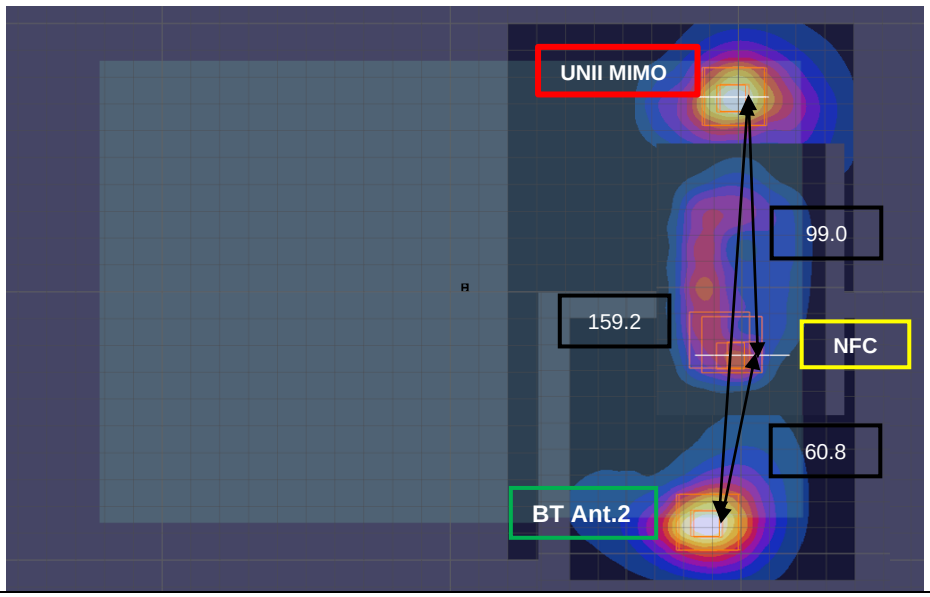
Note(s):

1. Green value is estimated SAR according to calculate of KDB 447498 D04. Please refer to Section.7.
2. Blue value is sum SAR of each UNII Ant.1 & UNII Ant.2.
3. According to 2022 Apr TCBC Workshop, SPLSR (Sum-Peak Location Separation Ratio) can algebraically sum the SAR values of the co-located pair and use that value in SPLSR calculation. Use the minimum distance between the spatially separated antenna and the closest antenna of the co-located antenna pair to be conservative.

Conclusion:

Simultaneous Transmission SAR analysis results is satisfied the FCC Limit requirement according to follow procedures with “Sum of SAR” or “Sum-Peak Location Separation Ratio”

Figure (1)

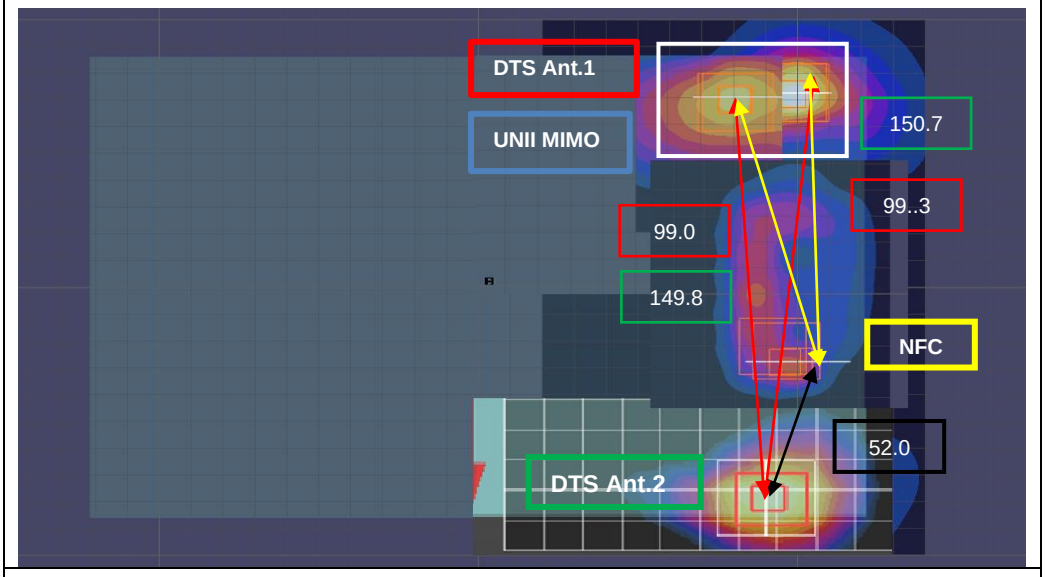


Mode		SAR	X	Y	d: Calculated distance (mm)	
		W/kg	m	m		
UNII MIMO	1	0.892	-0.0709	0.0977	1 + 2	159.2
BT Ant.2	2	0.722	0.0880	0.0875	1 + 3	99.0
NFC	3	0.049	0.0281	0.0979	2 + 3	60.8

The Peak Location Separation Distance is computed by using the formula below:

SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)

Figure (2)

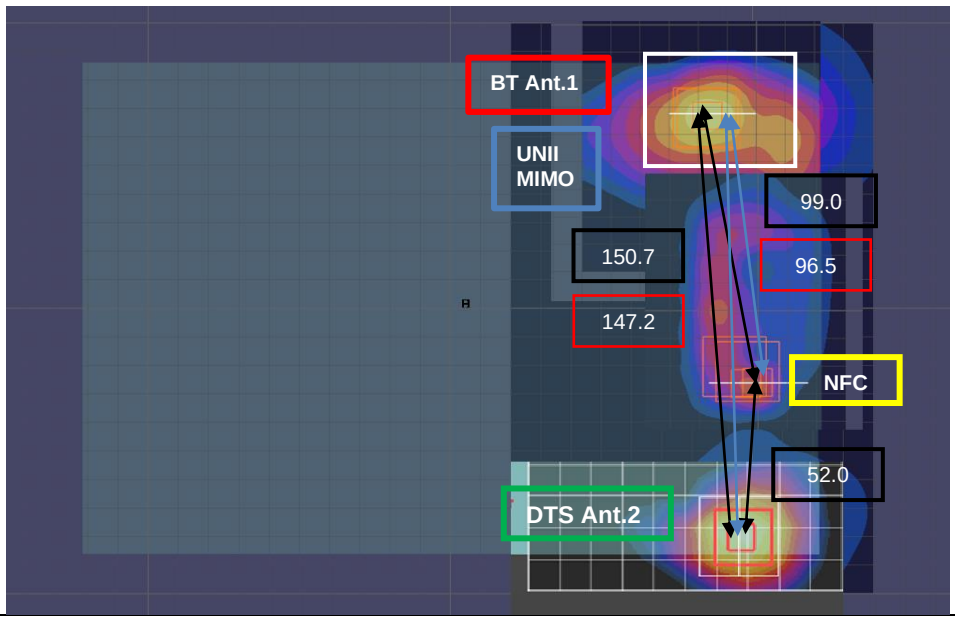


Mode		SAR	X	Y	d: Calculated distance (mm)		
		W/kg	m	m			
DTS Ant.2	1	0.794	0.0796	0.0904	1 + 2	1 + 2	52.0
NFC	2	0.049	0.0281	0.0979	1 + (3 + 4)	1 + 3	149.8
DTS Ant.1	3	0.278	-0.0700	0.0825		1 + 4	150.7
UNII MIMO	4	0.892	-0.0709	0.0977	2 + (3 + 4)	2 + 3	99.3
						2 + 4	99.0

The Peak Location Separation Distance is computed by using the formula below:

SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)

Figure (3)

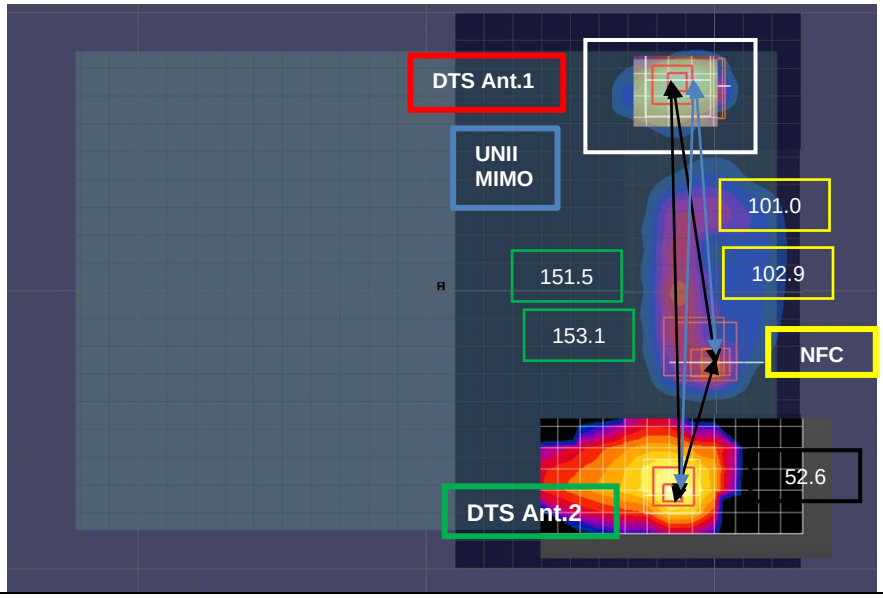


Mode		SAR W/kg	X m	Y m	d: Calculated distance (mm)		
DTS Ant.2	1	0.794	0.0796	0.0904	1 + 2	1 + 2	52.0
NFC	2	0.049	0.0281	0.0979	1 + (3 + 4)	1 + 3	147.2
BT Ant.1	3	0.229	-0.0675	0.0850		1 + 4	150.7
UNII MIMO	4	0.892	-0.0709	0.0977	2 + (3 + 4)	2 + 3	96.5
						2 + 4	99.0

The Peak Location Separation Distance is computed by using the formula below:

SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)

Figure (4)

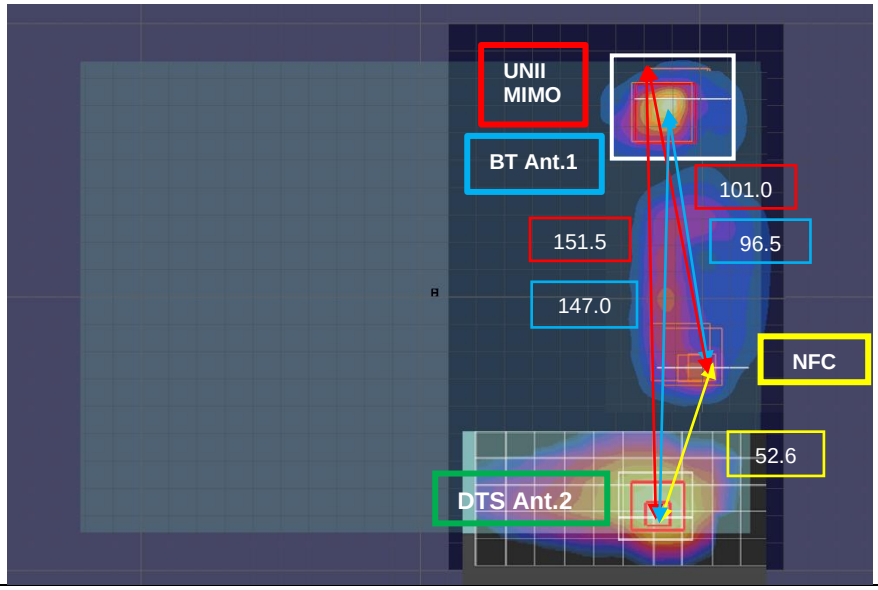


Mode		SAR W/kg	X m	Y m	d: Calculated distance (mm)		
DTS Ant.2	1	0.461	0.0786	0.0832	1 + 2	1 + 2	52.6
NFC	2	0.049	0.0281	0.0979	1 + (3 + 4)	1 + 3	153.1
DTS Ant.1	3	0.593	-0.0744	0.0892		1 + 4	151.5
UNII MIMO	4	0.992	-0.0727	0.0911	2 + (3 + 4)	2 + 3	102.9
						2 + 4	101.0

The Peak Location Separation Distance is computed by using the formula below:

SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)

Figure (5)

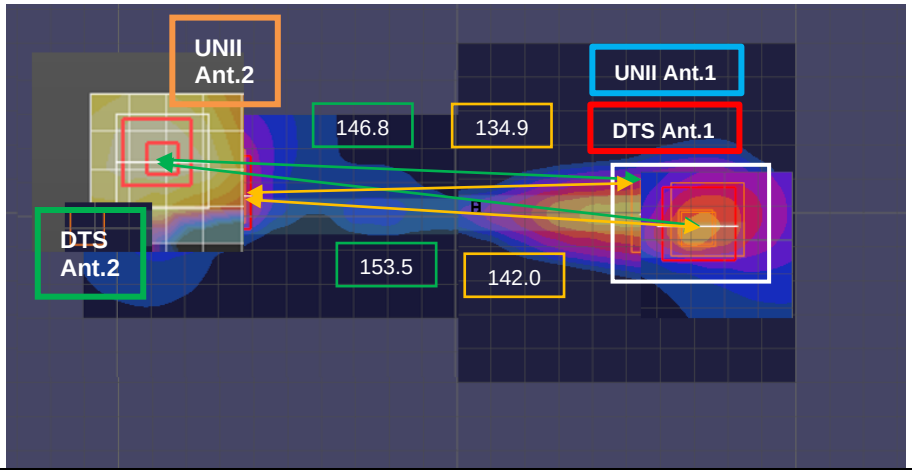


Mode		SAR	X	Y	d: Calculated distance (mm)		
		W/kg	m	m			
DTS Ant.2	1	0.461	0.0786	0.0832	1 + 2	1 + 2	52.6
NFC	2	0.049	0.0281	0.0979	1 + (3 + 4)	1 + 3	147.0
BT Ant.1	3	0.352	-0.0682	0.0912		1 + 4	151.5
UNII MIMO	4	0.992	-0.0727	0.0911	2 + (3 + 4)	2 + 3	96.5
						2 + 4	101.0

The Peak Location Separation Distance is computed by using the formula below:

SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)

Figure (6)

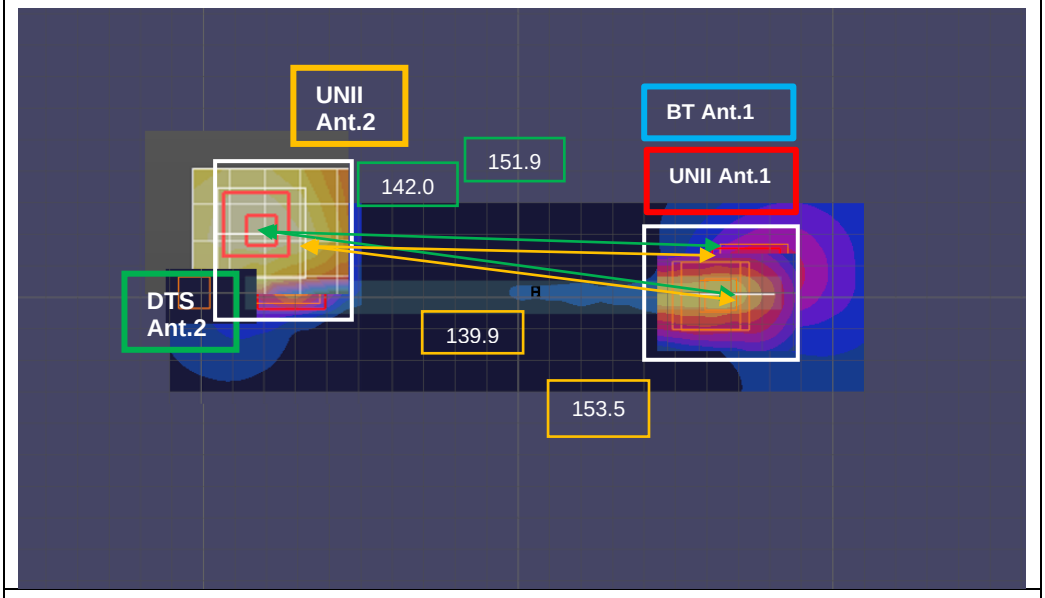


Mode		SAR	X	Y	d: Calculated distance (mm)		
		W/kg	m	m			
DTS Ant.1	1	0.315	0.0015	0.0640	(1 + 2)+(3 + 4)	1 + 3	146.8
UNII Ant.1	2	0.608	-0.0024	0.0712		2 + 3	153.5
DTS Ant.2	3	0.151	-0.0204	-0.0812		1 + 4	134.9
UNII Ant.2	4	0.563	-0.0036	-0.0708		2 + 4	142.0

The Peak Location Separation Distance is computed by using the formula below :

SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)

Figure (7)



Mode		SAR	X	Y	d: Calculated distance (mm)		
		W/kg	m	m			
BT Ant.1	1	0.286	0.0020	0.0690	(1 + 2)+(3 + 4)	1 + 3	151.9
UNII Ant.1	2	0.608	-0.0024	0.0712		2 + 3	153.5
DTS Ant.2	3	0.151	-0.0204	-0.0812		1 + 4	139.9
UNII Ant.2	4	0.563	-0.0036	-0.0708		2 + 4	142.0

The Peak Location Separation Distance is computed by using the formula below :

SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)

Appendixes

Refer to separated files for the following appendixes.

4790406775-S1 FCC Report SAR_App A_Photos & Ant. Locations

4790406775-S1 FCC Report SAR_App B_Highest SAR Test Plots

4790406775-S1 FCC Report SAR_App C_System Check Plots

4790406775-S1 FCC Report SAR_App D_SAR Tissue Ingredients

4790406775-S1 FCC Report SAR_App E_Probe Cal. Certificates

4790406775-S1 FCC Report SAR_App F_Dipole Cal. Certificates

4790406775-S1 FCC Report SAR_App G_Proximity Sensor feature

END OF REPORT