SAR EVALUATION REPORT

FCC 47 CFR § 2.1093
IEEE Std 1528-2013

For
Magic Leap 2 Compute Pack and Headset

FCC ID: 2AM5N-ML2M1
Model Name: M1003000, M1004000, M1005000, M1103000, M1104000, M1105000

Report Number: 13757234-S1V2
Issue Date: 5/26/2022

Prepared for
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ACCREDITED
CERT #0751.05

Revision History

Rev.	Date	Revisions	Revised By
V1	5/19/2022	Initial Issue	--
V2	5/26/2022	Section 7: Added note Section 9.3: Added BT Duty cycle plot	Coltyce Sanders

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1. Attestation of Test Results

Applicant Name	Magic Leap Inc.		
FCC ID	2AM5N-ML2M1		
Model Name	M1003000, M1004000, M1005000, M1103000, M1104000, M1105000 Model M1003000was used for final testing All models are electronically identical. Different model names are used to differentiate the markets and regions of sale.		
Applicable Standards	FCC 47 CFR § 2.1093 Published RF exposure KDB procedures IEEE Std 1528-2013		
Exposure Category	SAR Limits (W/Kg)		
	Peak spatial-average (1g of tissue)	Extremities (hands, wrists, ankles, etc.) (10g of tissue)	
General population / Uncontrolled exposure	1.6	4	
RF Exposure Conditions	Equipment Class - Highest Reported SAR (W/kg)		
	DTS	NII	DSS
Body	0.546	0.918	0.303
Simultaneous TX	1.566	1.583	1.583
Date Tested	2/28/2022 to 5/9/2022		
Test Results	Pass		

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested can demonstrate compliance with the requirements as documented in this report.

This report contains data provided by the customer which can impact the validity of results. UL Verification Services Inc. is only responsible for the validity of results after the integration of the data provided by the customer.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not considered unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. 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 A2LA, NIST, or any agency of the U.S. Government, or any agency of the U.S. government.

Approved & Released By:	Prepared By:
	
Dave Weaver Operations Leader UL Verification Services Inc.	Coltyce Sanders Senior Test Engineer UL Verification Services Inc.

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 C63.10 the following FCC Published RF exposure KDB procedures:

- 248227 D01 802.11 Wi-Fi SAR v02r02
- 447498 D01 General RF Exposure Guidance v06
- 648474 D04 Handset SAR v01r03
- 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04
- 865664 D02 RF Exposure Reporting v01r02

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 May 2017; RF Exposure Procedures (Broadband Liquid Above 3 GHz)
- TCB Workshop April 2019; RF Exposure Procedures (Tissue Simulating Liquids (TSL))
- TCB Workshop April 2019; RF Exposure Procedures (802.11ax SAR Testing)

3. Facilities and Accreditation

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

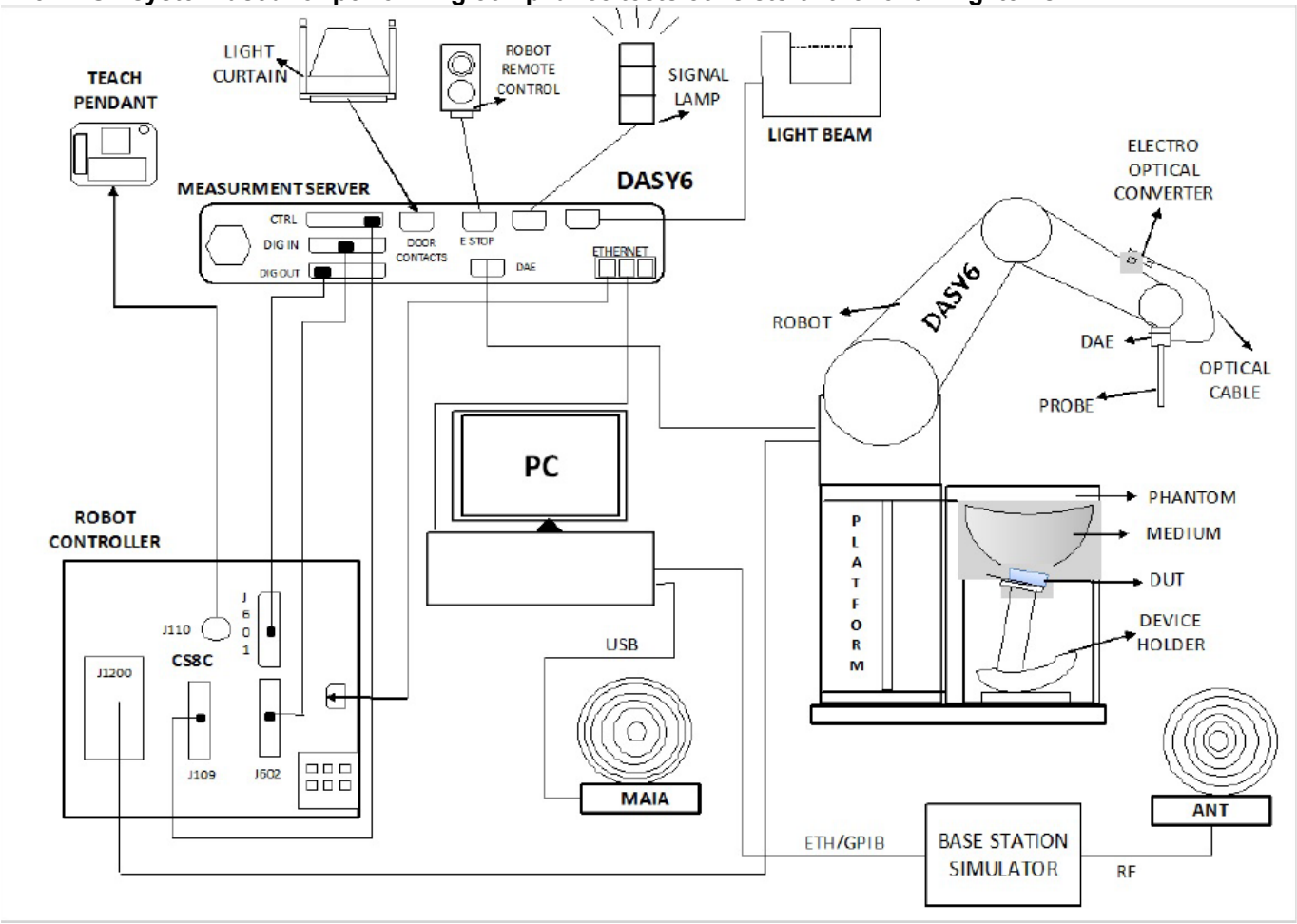
47173 Benicia Street	47266 Benicia Street
SAR Lab A	SAR Lab 1
SAR Lab B	SAR Lab 2
SAR Lab C	SAR Lab 3
SAR Lab D	SAR Lab 4
SAR Lab E	SAR Lab 5
SAR Lab F	SAR Lab 6
SAR Lab G	SAR Lab 7
SAR Lab H	SAR Lab 8

UL Verification Services Inc. is accredited by A2LA, Certificate Number 0751.05

4. SAR Measurement System & Test Equipment

4.1. SAR Measurement System

The DASY system used for performing compliance tests consists of the following items:



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running Win7, Win10 and the DASY52[1] and DASY6[2] 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.

[1] DASY52 software used: DASY52.10.4 & S 14.6.14 and older generations.

[2] DASY6 software used: DASY6.14 & S 14.6.14 and older generations.

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·$\Delta z_{Zoom}(n-1)$	
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.

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
Vector Network Analyzer	ROHDE & SCHWARZ	ZNLE6	101273-VA	2/18/2023
Dielectric Probe kit	SPEAG	DAK-3.5	1087	11/16/2022
Shorting block	SPEAG	DAK-3.5 Short	SM DAK 200 DA	11/16/2022
Thermometer	Traceable Calibration Control Co.	4242	140493798	9/1/2022
Vector Network Analyzer	ROHDE & SCHWARZ	ZNLE6	101234-mn	2/15/2023
Dielectric Probe kit	SPEAG	DAK-3.5	1082	9/19/2022
Shorting Block	SPEAG	DAK-1.2/3.5 Short	SM DAK 200 DA	11/12/2022
Thermometer	Fisher Scientific	Traceable	170064398	9/1/2022

System Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Synthesized Signal Generator	RODHE & SCHWARZ	SMB 100A	180969-yC	2/16/2023
Power Sensor	RODHE & SCHWARZ	NRP8S	109115-nc	2/16/2023
Synthesized Signal Generator	Agilent	N5181A	MY50140630	1/25/2023
Power Meter	Agilent	N1912A	MY55196007	1/25/2023
Power Sensor	Agilent	N1921A	MY52260009	1/25/2023
Power Sensor	Agilent	N1921A	MY52270022	1/25/2023
Amplifier	MITEQ	AMF-4D-00400600-50-30P	1795092	N/A
Directional coupler	Werlatone	C8060-102	2141	N/A
DC Power Supply	HP	6296A	2841A-05955	N/A
MXG Analog Signal Generator	Agilent	N5181A	MY50140610	1/26/2023
Power Meter	Agilent	N1912A	MY50001018	2/4/2023
Power Sensor	Agilent	N1921A	MY53260010	2/3/2023
Power Sensor	Agilent	N1921A	MY52200012	1/25/2023
Amplifier	Miteq	AMF-4D-00400600-50-30P	1795092	N/A
Bi-directional coupler	Werlatone	C8060-102	2141	N/A
DC Power Supply	Sorensen	XT 15-4	2680	N/A

Lab Equipment

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
E-Field Probe (SAR Lab C)	SPEAG	EX3DV4	3686	1/18/2023
E-Field Probe (SAR Lab C)	SPEAG	EX3DV4	7549	2/21/2023
E-Field Probe (SAR Lab C)	SPEAG	EX3DV4	3885	9/23/2022
E-Field Probe (SAR Lab 1)	SPEAG	EX3DV4	3991	8/20/2022
Data Acquisition Electronics (SAR Lab C)	SPEAG	DAE4ip	1621	4/20/2022*
Data Acquisition Electronics (SAR Lab 1)	SPEAG	DAE4	1359	1/7/2023
Thermometer (SAR Lab C)	TRACEABLE	14-650-118	181073773	3/2/2023
Thermometer (SAR Lab 1)	TRACEABLE	6530CC	9096	3/30/2022
System Validation Dipole	SPEAG	D2450V2	706	1/13/2023
System Validation Dipole	SPEAG	D5GHzV2	1138	8/19/2022

Note(s):

*Equipment not used past calibration due date.

Test Equipment (continued):

Other

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Pow er Meter	Keysight	N1912A	MY55196004	1/26/2023
Pow er Sensor	Agilent	N10149	MY53020038	3/2/2023
Pow er Sensor	Agilent	N10149	MY53260010	3/2/2023
Pow er Meter	Keysight	N1912A	MY55196015	1/26/2023
Pow er Sensor	Agilent	N1921A	MY53260001	1/25/2023

5. Measurement Uncertainty

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

6. Device Under Test (DUT) Information

6.1. DUT Description

Device Dimension	Overall (Length x Width): 106.0 mm x 106.0 mm Overall Diagonal: 106.0 mm		
Back Cover	The Back Cover is not removable		
Battery Options	The rechargeable battery is not user accessible.		
Test sample information	**S/N**	**Model**	**Notes**
	P552X8E0001S	M1003000	SAR Radiated & Conducted
	P552X8E0001U	M1003000	SAR Radiated & Conducted
Hardware Version	PEQ3B		
Software Version	PEQ3B		

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)	98.20% (802.11b) [1]
	5 GHz	802.11a 802.11n (HT20) 802.11n (HT40) 802.11ac (VHT20) 802.11ac (VHT40) 802.11ac (VHT80) 802.11ac (VHT160) 802.11ax (HE20) 802.11ax (HE40) 802.11ax (HE80) 802.11ax (HE160)	99.18% (802.11a) [2] 99.67% (802.11ax 20MHz BW) [3] 99.76% (802.11n/ac 40MHz BW [2] 99.76% (802.11ac 80MHz BW) [2]
	Does this device support band 5.60 ~ 5.65 GHz? ☒ Yes ☐ No		
	Does this device support band gap channel(s)? ☒ Yes ☐ No		
Bluetooth	2.4 GHz	BR, EDR and LE	76.82% (GFSK) [4]

Notes:

1. Duty cycle for Wi-Fi 2.4GHz is referenced from the DTS report (UL Report # 13757234-E8).
2. Duty cycle for Wi-Fi 5GHz is referenced from U-NII report (UL Report # 13757234-E10).
3. Duty cycle for Wi-Fi 5GHz ax mode is referenced from U-NII 11ax report (UL Report # 13757234-E11).
4. Duty cycle for Bluetooth is referenced from the BT report (UL Report # 13757234-E6). Refer to §9.3 for Duty Cycle Plot.

7. RF Exposure Conditions (Test Configurations)

Refer to “SAR Photos and Ant locations” Appendix for the specific details of the antenna-to-antenna and antenna-to-edge(s) distances.

Wireless technologies	RF Exposure Conditions	DUT-to-User Separation	Test Position	Antenna-to-edge/surface	SAR Required	Note
WLAN/BT ANT 1	Body	0	Rear	N/A	Yes	1
			Front	N/A	Yes	
WLAN ANT 2	Body	0	Rear	N/A	Yes	1
			Front	N/A	Yes	

Notes:

1. Test Positions apply to both WLAN SISO and MIMO test configurations.
2. The DUT is a body worn device that may be worn on a belt clip. The Front and Rear of the DUT were subjected to SAR testing. Refer to user manual for Body-worn details.

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.
The dielectric constant (εr) and conductivity (σ) of typical tissue-equivalent media recipes are expected to be within ± 5% of the required target values; but for SAR measurement systems that have implemented the SAR error compensation algorithms documented in IEEE Std 1528-2013, to automatically compensate the measured SAR results for deviations between the measured and required tissue dielectric parameters, the tolerance for εr and σ may be relaxed to ± 10%. This is limited to frequencies ≤ 3 GHz.

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

IEEE Std 1528-2013

Refer to Table 3 within the IEEE Std 1528-2013

IEC 62209-1

Refer to Table A.3 within the IEC 62209-1

Dielectric Property Measurements Results:

SAR Lab	Date	Band (MHz)	Tissue Type	Frequency (MHz)	Relative Permittivity (εr)			Conductivity (σ)		
					Measured	Target	Delta (%)	Measured	Target	Delta (%)
C	2/28/2022	5250	Head	5250	34.69	35.93	-3.46%	4.86	4.70	3.40%
				5150	34.79	36.05	-3.49%	4.75	4.60	3.26%
				5350	34.53	35.82	-3.60%	4.95	4.80	2.99%
C	3/3/2022	5250	Head	5250	35.55	35.93	-1.07%	4.63	4.70	-1.64%
				5150	35.80	36.05	-0.69%	4.53	4.60	-1.56%
				5350	35.34	35.82	-1.34%	4.73	4.80	-1.53%
C	3/3/2022	2450	Head	2450	39.81	39.20	1.56%	1.80	1.80	-0.11%
				2400	39.80	39.30	1.28%	1.76	1.75	0.36%
				2480	39.74	39.16	1.48%	1.81	1.83	-1.06%
C	3/7/2022	5600	Head	5600	34.63	35.53	-2.54%	4.95	5.06	-2.26%
				5500	34.80	35.65	-2.38%	4.84	4.96	-2.32%
				5725	34.32	35.39	-3.03%	5.10	5.19	-1.70%
C	3/7/2022	5800	Head	5800	34.23	35.30	-3.03%	5.19	5.27	-1.57%
				5700	34.41	35.42	-2.85%	5.07	5.16	-1.77%
				5850	34.13	35.30	-3.31%	5.23	5.27	-0.78%
C	3/10/2022	2450	Head	2450	38.34	39.20	-2.19%	1.84	1.80	2.06%
				2400	38.38	39.30	-2.33%	1.80	1.75	2.59%
				2480	38.25	39.16	-2.33%	1.85	1.83	0.96%
C	3/11/2022	5800	Head	5850	35.11	35.30	-0.54%	5.33	5.27	1.04%
				5800	35.22	35.30	-0.23%	5.30	5.27	0.51%
				5925	34.94	35.30	-1.02%	5.46	5.27	3.53%
C	3/15/2022	5800	Head	5800	34.35	35.30	-2.69%	5.27	5.27	-0.04%
				5700	34.65	35.42	-2.17%	5.18	5.16	0.30%
				5850	34.31	35.30	-2.80%	5.32	5.27	0.95%
1	5/6/2022	5800	Head	5800	34.90	35.30	-1.13%	5.16	5.27	-2.14%
				5700	35.03	35.42	-1.10%	5.04	5.16	-2.47%
				5850	34.82	35.30	-1.36%	5.19	5.32	-2.42%

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 ±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 3 mm.
  For 5 GHz band - Distance between probe sensors and phantom surface was set to 2.5 mm
- The dipole input power (forward power) was 100 mW.
- The results are normalized to 1 W input power.

System Check Results:

The 1-g and 10-g SAR measured with a reference dipole, using the required tissue-equivalent medium at the test frequency, must be within ±10% of the manufacturer calibrated dipole SAR target. Refer to Appendix B for the SAR System Check Plots.

SAR Lab	Date	Tissue Type	Dipole Type _Serial #	Dipole Cal. Due Data	Measured Results for 1g SAR				Measured Results for 10g SAR				Plot No.
					Zoom Scan to 100 mW	Normalize to 1 W	Target (Ref. Value)	Delta ±10 %	Zoom Scan to 100 mW	Normalize to 1 W	Target (Ref. Value)	Delta ±10 %	
C	2/28/2022	Head	D5GHzV2 SN:1138 (5.25 GHz)	8/19/2022	7.710	77.10	79.30	**-2.77%**	2.180	21.80	22.60	-3.54%	1
C	3/3/2022	Head	D5GHzV2 SN:1138 (5.25 GHz)	8/19/2022	7.480	74.80	79.30	**-5.67%**	2.160	21.60	22.60	-4.42%	2
C	3/3/2022	Head	D2450V2 SN:706	1/13/2023	4.960	49.60	53.80	**-7.81%**	2.290	22.90	25.00	-8.40%	3
C	3/7/2022	Head	D5GHzV2 SN:1138 (5.6 GHz)	8/19/2022	8.960	89.60	82.00	**9.27%**	2.550	25.50	23.20	9.91%	4
C	3/7/2022	Head	D5GHzV2 SN:1138 (5.8 GHz)	8/19/2022	8.720	87.20	80.10	**8.86%**	2.470	24.70	22.60	9.29%	5
C	3/10/2022	Head	D2450V2 SN:706	1/13/2023	5.490	54.90	53.80	**2.04%**	2.540	25.40	25.00	1.60%	6
C	3/11/2022	Head	D5GHzV2 SN:1138 (5.8 GHz)	8/19/2022	8.420	84.20	80.10	**5.12%**	2.390	23.90	22.60	5.75%	7
C	3/14/2022	Head	D5GHzV2 SN:1138 (5.8 GHz)	8/19/2022	8.800	88.00	80.10	**9.86%**	2.480	24.80	22.60	9.73%	8
1	5/6/2022	Head	D5GHzV2 SN:1138 (5.8 GHz)	8/19/2022	8.280	82.80	80.10	**3.37%**	2.360	23.60	22.60	4.42%	9

9. Conducted Output Power Measurements

Tune-Up Power Limits provided by the manufacturer are used to scale measured SAR values.

9.1. Wi-Fi 2.4GHz (DTS Band)

Maximum Output Power (Tune-up Limit) for Wi-Fi 2.4 GHz

The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default power measurement procedures.

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 802.11g/n/ac/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.

SAR testing is not required for OFDM(A) mode(s) when the highest reported SAR for DSSS is adjusted by the ratio of OFDM(A) to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

Band	Mode	Channel	Frequency (MHz)	Tune-up Power Limit (dBm)			
				SISO		MIMO	
				ANT 1	ANT 2	ANT 1	ANT 2
DSSS 2.4 GHz	802.11b	1	2412	16.4	15.9	13.2	13.7
		6	2437	16.3	16.0	13.1	13.8
		11	2462	16.1	16.4	12.9	13.9
OFDM 2.4 GHz	802.11g	1	2412	16.3	16.0	13.7	13.8
		6	2437	16.3	16.1	13.4	13.8
		11	2462	16.0	16.4	13.4	13.9
	802.11n (HT20)	1	2412	16.1	15.9	13.3	13.8
		6	2437	16.0	16.0	13.4	13.6
		11	2462	16.0	16.3	13.1	13.8
OFDMA 2.4 GHz	802.11ax (HE20)	1	2412	16.3	16.3	13.6	14.0
		6	2437	16.1	16.2	13.6	13.9
		11	2462	16.0	16.3	13.4	13.9

Wi-Fi 2.4GHz Measured Results SISO

Band	Mode	Ch #	Freq. (MHz)	ANT 1 Average Power (dBm)			ANT 2 Average Power (dBm)		
				Meas Pwr	Tune-Up	SAR Test (Yes/No)	Meas Pwr	Tune-Up	SAR Test (Yes/No)
DSSS 2.4 GHz	802.11b	1	2412	16.0	16.4	Yes		15.9	Yes
		6	2437		16.3			16.0	
		11	2462		16.1		15.9	16.4	
OFDM 2.4 GHz	802.11g	1	2412		16.3	No		16.0	No
		6	2437		16.3			16.1	
		11	2462		16.0			16.4	
	802.11n (HT20)	1	2412		16.1	No		15.9	No
		6	2437		16.0			16.0	
		11	2462		16.0			16.3	
OFDMA 2.4 GHz	802.11ax (HE20) 242T SU	1	2412		16.3	No		16.3	No
		6	2437		16.1			16.2	
		11	2462		16.0			16.3	

Note(s):
Per manufacturer, the DUT does not support channels 12 and 13. Refer to Operational Description for additional information.

Wi-Fi 2.4GHz Measured Results MIMO

Band	Mode	Ch #	Freq. (MHz)	ANT 1 Average Power (dBm)			ANT 2 Average Power (dBm)		
				Meas Pwr	Tune-Up	SAR Test (Yes/No)	Meas Pwr	Tune-Up	SAR Test (Yes/No)
DSSS 2.4 GHz	802.11b	1	2412		13.2	Yes		13.7	Yes
		6	2437		13.1			13.8	
		11	2462	12.2	12.9		13.0	13.9	
OFDM 2.4 GHz	802.11g	1	2412		13.7	No		13.7	No
		6	2437		13.4			13.8	
		11	2462		13.4			13.9	
	802.11n (HT20)	1	2412		13.3	No		13.8	No
		6	2437		13.4			13.6	
		11	2462		13.1			13.8	
OFDMA 2.4 GHz	802.11ax (HE20) 106T RU53	1	2412		13.6	No		14.0	No
		6	2437		13.6			13.9	
	802.11ax (HE20) 106T RU54	11	2462		13.4			13.9	

Note(s):
Per manufacturer, the DUT does not support channels 12 and 13. Refer to Operational Description for additional information.

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

Maximum Output Power (Tune-up Limit) for Wi-Fi 5 GHz

When the same transmission mode configurations have the same maximum output power on the same channel for the 802.11 a/n/ac/ax modes, the channel in the lower order/sequence 802.11 transmission mode is selected.

The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default power measurement procedures.

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/n/ac/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.

Band	Mode	Channel	Frequency (MHz)	Tune-up Power Limit (dBm)			
				SISO		MIMO	
				ANT 1	ANT 2	ANT 1	ANT 2
U-NII-1 5.2 GHz	802.11a	36	5180	14.2	14.1	13.5	13.5
		40	5200	14.5	14.1	13.4	13.8
		48	5240	14.4	14.1	13.9	14.0
	802.11n (HT20)	36	5180	14.3	13.9	13.6	13.2
		40	5200	14.1	13.8	13.1	13.4
		48	5240	14.1	13.9	13.5	13.8
	802.11ac (VHT20)	36	5180	14.3	13.9	13.6	13.2
		40	5200	14.1	13.8	13.1	13.4
		48	5240	14.1	13.9	13.5	13.8
	802.11ax (HE20)	36	5180	14.6	14.0	12.7	13.7
		40	5200	14.6	13.9	12.7	13.7
		48	5240	14.6	13.8	12.7	13.7
	802.11n (HT40)	38	5190	14.9	13.9	13.6	14.0
		46	5230	14.8	13.9	13.5	14.0
	802.11ac (VHT40)	38	5190	14.9	13.9	13.6	14.0
		46	5230	14.8	13.9	13.5	14.0
	802.11ax (HE40)	38	5190	14.5	14.0	12.7	13.7
		46	5230	14.5	13.9	12.7	13.7
	802.11ac (VHT80)	42	5210	14.8	13.8	12.8	13.3
	802.11ax (HE80)	42	5210	14.6	13.9	12.7	13.7

Maximum Output Power (Tune-up Limit) for Wi-Fi 5 GHz (continued)

Band	Mode	Channel	Frequency (MHz)	Tune-up Power Limit (dBm)			
				SISO		MIMO	
				ANT 1	ANT 2	ANT 1	ANT 2
UNII-2A 5.3 GHz	802.11a	52	5260	14.7	14.1	13.4	13.8
		60	5300	14.6	13.9	13.0	13.6
		64	5320	14.4	14.0	13.4	13.4
	802.11n (HT20)	52	5260	14.8	13.7	13.5	13.7
		60	5300	14.7	14.0	13.0	13.5
		64	5320	14.6	13.9	13.1	13.2
	802.11ac (VHT20)	52	5260	14.8	13.7	13.5	13.7
		60	5300	14.7	14.0	13.0	13.5
		64	5320	14.6	13.9	13.1	13.2
	802.11ax (HE20)	52	5260	14.9	14.1	12.7	13.7
		60	5300	14.5	14.0	12.7	13.7
		64	5320	14.8	13.9	12.7	13.7
	802.11n (HT40)	54	5270	14.9	13.8	12.8	13.7
		62	5310	14.9	13.9	13.2	13.0
	802.11ac (VHT40)	54	5270	14.9	13.8	12.8	13.7
		62	5310	14.9	13.9	13.2	13.0
	802.11ax (HE40)	54	5270	14.8	14.0	12.7	13.7
		62	5310	14.6	14.0	12.7	13.7
	802.11ac (VHT80)	58	5290	14.7	13.8	12.9	13.4
	802.11ax (HE80)	58	5290	14.7	14.0	12.7	13.7
UNII-1 & 2A	802.11ac (VHT160)	50	5250	13.6	13.2	12.5	13.2
	802.11ax (HE160)	50	5250	14.7	13.9	12.7	13.7

Maximum Output Power (Tune-up Limit) for Wi-Fi 5 GHz (continued)

Band	Mode	Channel	Frequency (MHz)	Tune-up Power Limit (dBm)			
				SISO		MIMO	
				ANT 1	ANT 2	ANT 1	ANT 2
UNII-2C 5.5 GHz	802.11a	100	5500	14.7	14.2	13.0	13.3
		116	5580	14.5	14.0	13.4	13.3
		140	5700	14.3	14.0	13.3	13.4
		144	5720	14.6	13.9	13.1	13.4
	802.11n (HT20)	100	5500	14.0	13.7	13.3	13.2
		116	5580	14.0	13.5	13.2	13.7
		140	5700	13.9	13.6	13.0	13.2
		144	5720	14.0	13.9	12.8	13.2
	802.11ac (VHT20)	100	5500	14.0	13.7	13.3	13.2
		116	5580	14.0	13.5	13.2	13.7
		140	5700	13.9	13.6	13.0	13.2
		144	5720	14.0	13.9	12.8	13.2
	802.11ax (HE20)	100	5500	14.6	14.0	12.9	13.7
		116	5580	14.6	14.1	12.9	13.7
		140	5700	14.5	14.0	12.9	13.7
		144	5720	14.5	14.0	12.9	13.7
	802.11n (HT40)	102	5510	14.7	14.1	13.0	13.3
		110	5550	14.6	14.0	13.1	13.7
		134	5670	14.6	14.0	13.0	13.4
		142	5710	14.7	14.1	12.9	13.4
	802.11ac (VHT40)	102	5510	14.7	14.1	13.0	13.3
		110	5550	14.6	14.0	13.1	13.7
		134	5670	14.6	14.0	13.0	13.4
		142	5710	14.7	14.1	12.9	13.4
	802.11ax (HE40)	102	5510	14.5	13.7	12.6	13.6
		110	5550	14.5	13.8	12.6	13.6
		134	5670	14.2	13.7	12.4	12.9
		142	5710	14.2	13.8	12.3	13.1
	802.11ac (VHT80)	106	5530	14.7	13.4	12.7	12.9
		122	5610	14.7	13.4	12.7	13.3
		138	5690	14.5	13.5	12.5	13.3
	802.11ax (HE80)	106	5530	14.7	13.9	13.0	13.6
		122	5610	14.5	14.0	13.0	13.6
		138	5690	14.5	13.9	13.0	13.6
UNII-2C 5.5 GHz	802.11ac (VHT160)	114	5570	14.4	13.1	12.4	13.0
	802.11ax (HE160)	114	5570	14.4	13.8	12.3	13.3

Maximum Output Power (Tune-up Limit) for Wi-Fi 5 GHz (continued)

Band	Mode	Channel	Frequency (MHz)	Tune-up Power Limit (dBm)			
				SISO		MIMO	
				ANT 1	ANT 2	ANT 1	ANT 2
UNII-3 5.8 GHz	802.11a	149	5745	14.1	13.9	13.0	13.4
		157	5785	14.1	14.0	13.0	13.5
		165	5825	14.3	14.1	13.1	13.6
	802.11n (HT20)	149	5745	14.3	13.8	12.9	13.4
		157	5785	14.2	13.9	12.9	13.2
		165	5825	14.2	13.7	12.6	13.5
	802.11ac (VHT20)	149	5745	14.3	13.8	12.9	13.4
		157	5785	14.2	13.9	12.9	13.2
		165	5825	14.2	13.7	12.6	13.5
	802.11ax (HE20)	149	5745	14.5	13.9	13.0	13.6
		157	5785	14.5	13.9	13.0	13.6
		165	5825	14.7	14.0	13.0	13.6
	802.11n (HT40)	151	5755	14.6	13.7	13.0	13.2
		159	5795	14.6	13.5	13.0	13.4
	802.11ac (VHT40)	151	5755	14.6	13.7	13.0	13.2
		159	5795	14.6	13.5	13.0	13.4
	802.11ax (HE40)	151	5755	14.0	13.7	13.0	13.6
		159	5795	14.0	13.6	13.0	13.6
	802.11ac (VHT80)	155	5775	14.6	13.2	13.3	13.7
	802.11ax (HE80)	155	5775	14.5	14.0	13.0	13.6

Wi-Fi 5 GHz Measured Results SISO

Band	Mode	Ch #	Freq. (MHz)	ANT 1 Average Power (dBm)			ANT 2 Average Power (dBm)		
				Meas Pwr	Tune-Up	SAR Test (Yes/No)	Meas Pwr	Tune-Up	SAR Test (Yes/No)
UNII-1 5.2 GHz	802.11a	36	5180		14.2	No		14.1	No
		40	5200		14.5			14.1	
		48	5240		14.4			14.1	
	802.11n (HT20)	36	5180		14.3	No		13.9	No
		40	5200		14.1			13.8	
		48	5240		14.1			13.9	
	802.11ac (VHT20)	36	5180		14.3	No		13.9	No
		40	5200		14.1			13.8	
		48	5240		14.1			13.9	
	802.11ax (HE20) 242T SU	36	5180		14.6	No		14.0	No
		40	5200		14.6			13.9	
		48	5240		14.6			13.8	
	802.11n (HT40)	38	5190		14.9	No		13.9	No
		46	5230		14.8			13.9	
	802.11ac (VHT40)	38	5190		14.9	No		13.9	No
		46	5230		14.8			13.9	
	802.11ax (HE40) 484T SU	38	5190		14.5	No		14.0	No
		46	5230		14.5			13.9	
	802.11ac (VHT80)	42	5210		14.8	No		13.8	No
	802.11ax (HE80) 996T SU	42	5210		14.6	No		13.9	No

Band	Mode	Ch #	Freq. (MHz)	ANT 1 Average Power (dBm)			ANT 2 Average Power (dBm)		
				Meas Pwr	Tune-Up	SAR Test (Yes/No)	Meas Pwr	Tune-Up	SAR Test (Yes/No)
UNII-2A 5.3 GHz	802.11a	52	5260		14.7	No	14.0	14.1	Yes
		60	5300		14.6			13.9	
		64	5320		14.4			14.0	
	802.11n (HT20)	52	5260		14.8	No		13.7	No
		60	5300		14.7			14.0	
		64	5320		14.6			13.9	
	802.11ac (VHT20)	52	5260		14.8	No		13.7	No
		60	5300		14.7			14.0	
		64	5320		14.6			13.9	
	802.11ax (HE20) 242T SU	52	5260		14.9	No		14.1	No
		60	5300		14.5			14.0	
		64	5320		14.8			13.9	
	802.11n (HT40)	54	5270	14.9	14.9	Yes		13.8	No
		62	5310		14.9			13.9	
	802.11ac (VHT40)	54	5270		14.9	No		13.8	No
		62	5310		14.9			13.9	
	802.11ax (HE40) 484T SU	54	5270		14.8	No		14.0	No
		62	5310		14.6			14.0	
	802.11ac (VHT80)	58	5290		14.7	No		13.8	No
	802.11ax (HE80) 996T SU	58	5290		14.7	No		14.0	No
UNII-1 & 2A	802.11ac (VHT160)	50	5250		13.6	No		13.2	No
	802.11ax (HE160) 2*996T SU	50	5250		14.7	No		13.9	No

Wi-Fi 5 GHz Measured Results SISO (continued)

Band	Mode	Ch #	Freq. (MHz)	ANT 1 Average Power (dBm)			ANT 2 Average Power (dBm)		
				Meas Pwr	Tune-Up	SAR Test (Yes/No)	Meas Pwr	Tune-Up	SAR Test (Yes/No)
UNII-2C 5.5 GHz	802.11a	100	5500		14.7	No	13.4	14.2	Yes
		116	5580		14.5			14.0	
		140	5700		14.3			14.0	
		144	5720		14.6			13.9	
	802.11n (HT20)	100	5500		14.0	No		13.7	No
		116	5580		14.0			13.5	
		140	5700		13.9			13.6	
		144	5720		14.0			13.9	
	802.11ac (VHT20)	100	5500		14.0	No		13.7	No
		116	5580		14.0			13.5	
		140	5700		13.9			13.6	
		144	5720		14.0			13.9	
	802.11ax (HE20) 242T SU	100	5500		14.6	No		14.0	No
		116	5580		14.6			14.1	
		140	5700		14.5			14.0	
		144	5720		14.5			14.0	
	802.11n (HT40)	102	5510		14.7	No		14.1	No
		110	5550		14.6			14.0	
		134	5670		14.6			14.0	
		142	5710		14.7			14.1	
	802.11ac (VHT40)	102	5510		14.7	No		14.1	No
		110	5550		14.6			14.0	
		134	5670		14.6			14.0	
		142	5710		14.7			14.1	
	802.11ax (HE40) 484T SU	102	5510		14.5	No		13.7	No
		110	5550		14.5			13.8	
		134	5670		14.2			13.7	
		142	5710		14.2			13.8	
	802.11ac (VHT80)	106	5530	14.1	14.7	Yes		13.4	No
		122	5610	14.2	14.7			13.4	
		138	5690	14.2	14.5			13.5	
	802.11ax (HE80) 996T SU	106	5530		14.7	No		13.9	No
		122	5610		14.5			14.0	
		138	5690		14.5			13.9	
UNII-2C	802.11ac (VHT160)	114	5570		14.4	No		13.1	No
	802.11ax (HE160) 2*996T SU	114	5570		14.4	No		13.8	No

Wi-Fi 5 GHz Measured Results SISO (continued)

Band	Mode	Ch #	Freq. (MHz)	ANT 1 Average Power (dBm)			ANT 2 Average Power (dBm)		
				Meas Pwr	Tune-Up	SAR Test (Yes/No)	Meas Pwr	Tune-Up	SAR Test (Yes/No)
UNII-3 5.8 GHz	802.11a	149	5745		14.1	No		13.9	Yes
		157	5785		14.1			14.0	
		165	5825		14.3		14.0	14.1	
	802.11n (HT20)	149	5745		14.3	No		13.8	No
		157	5785		14.2			13.9	
		165	5825		14.2			13.7	
	802.11ac (VHT20)	149	5745		14.3	No		13.8	No
		157	5785		14.2			13.9	
		165	5825		14.2			13.7	
	802.11ax (HE20) 242T SU	149	5745		14.5	Yes		13.9	No
		157	5785		14.5			13.9	
		165	5825	14.3	14.7			14.0	
	802.11n (HT40)	151	5755		14.6	No		13.7	No
		159	5795		14.6			13.5	
	802.11ac (VHT40)	151	5755		14.6	No		13.7	No
		159	5795		14.6			13.5	
	802.11ax (HE40) 484T SU	151	5755		14.0	No		13.7	No
		159	5795		14.0			13.6	
	802.11ac (VHT80)	155	5775		14.6	No		13.2	No
	802.11ax (HE80) 996T SU	155	5775		14.5	No		14.0	No

Wi-Fi 5 GHz Measured Results MIMO

Band	Mode	Ch #	Freq. (MHz)	ANT 1 Average Power (dBm)			ANT 2 Average Power (dBm)		
				Meas Pwr	Tune-Up	SAR Test (Yes/No)	Meas Pwr	Tune-Up	SAR Test (Yes/No)
UNII-1 5.2 GHz	802.11a	36	5180		13.5	No		13.5	No
		40	5200		13.4			13.8	
		48	5240		13.9			14.0	
	802.11n (HT20)	36	5180		13.6	No		13.2	No
		40	5200		13.1			13.4	
		48	5240		13.5			13.8	
	802.11ac (VHT20)	36	5180		13.6	No		13.2	No
		40	5200		13.1			13.4	
		48	5240		13.5			13.8	
	802.11ax (HE20) 242T SU	36	5180		12.7	No		13.7	No
		40	5200		12.7			13.7	
		48	5240		12.7			13.7	
	802.11n (HT40)	38	5190	13.3	13.6	Yes	13.4	14.0	Yes
		46	5230		13.5			14.0	
	802.11ac (VHT40)	38	5190		13.6	No		14.0	No
		46	5230		13.5			14.0	
	802.11ax (HE40) 484T SU	38	5190		12.7	No		13.7	No
		46	5230		12.7			13.7	
	802.11ac (VHT80)	42	5210		12.8	No		13.3	No
	802.11ax (HE80) 996T SU	42	5210		12.7	No		13.7	No

Band	Mode	Ch #	Freq. (MHz)	ANT 1 Average Power (dBm)			ANT 2 Average Power (dBm)		
				Meas Pwr	Tune-Up	SAR Test (Yes/No)	Meas Pwr	Tune-Up	SAR Test (Yes/No)
UNII-2A 5.3 GHz	802.11a	52	5260		13.4	No		13.8	No
		60	5300		13.0			13.6	
		64	5320		13.4			13.4	
	802.11n (HT20)	52	5260		13.5	No		13.7	No
		60	5300		13.0			13.5	
		64	5320		13.1			13.2	
	802.11ac (VHT20)	52	5260		13.5	No		13.7	No
		60	5300		13.0			13.5	
		64	5320		13.1			13.2	
	802.11ax (HE20) 242T SU	52	5260		12.7	No		13.7	No
		60	5300		12.7			13.7	
		64	5320		12.7			13.7	
	802.11n (HT40)	54	5270		12.8	No		13.7	No
		62	5310		13.2			13.0	
	802.11ac (VHT40)	54	5270		12.8	No		13.7	No
		62	5310		13.2			13.0	
	802.11ax (HE40) 484T SU	54	5270		12.7	No		13.7	No
		62	5310		12.7			13.7	
	802.11ac (VHT80)	58	5290		12.9	No		13.4	No
	802.11ax (HE80) 996T RU67	58	5290		12.7	No		13.7	No
UNII-1 & 2A	802.11ac (VHT160)	50	5250		12.5	No		13.2	No
	802.11ax (HE160) 996T RU67	50	5250		12.7	No		13.7	No

Wi-Fi 5 GHz Measured Results MIMO (continued)

Band	Mode	Ch #	Freq. (MHz)	ANT 1 Average Power (dBm)			ANT 2 Average Power (dBm)		
				Meas Pwr	Tune-Up	SAR Test (Yes/No)	Meas Pwr	Tune-Up	SAR Test (Yes/No)
UNII-2C 5.5 GHz	802.11a	100	5500		13.0	No		13.3	No
		116	5580		13.4			13.3	
		140	5700		13.3			13.4	
		144	5720		13.1			13.4	
	802.11n (HT20)	100	5500		13.3	No		13.2	No
		116	5580		13.2			13.7	
		140	5700		13.0			13.2	
		144	5720		12.8			13.2	
	802.11ac (VHT20)	100	5500		13.3	No		13.2	No
		116	5580		13.2			13.7	
		140	5700		13.0			13.2	
		144	5720		12.8			13.2	
	802.11ax (HE20) 106T RU54	100	5500		12.9	No		13.7	No
		116	5580		12.9			13.7	
		140	5700		12.9			13.7	
		144	5720		12.9			13.7	
	802.11n (HT40)	102	5510		13.0	Yes		13.3	Yes
		110	5550	12.5	13.1		12.5	13.7	
		134	5670		13.0			13.4	
		142	5710		12.9			13.4	
	802.11ac (VHT40)	102	5510		13.0	No		13.3	No
		110	5550		13.1			13.7	
		134	5670		13.0			13.4	
		142	5710		12.9			13.4	
	802.11ax (HE40) 484T SU	102	5510		12.6	No		13.6	No
		110	5550		12.6			13.6	
		134	5670		12.4			12.9	
		142	5710		12.3			13.1	
	802.11ac (VHT80)	106	5530		12.7	No		12.9	No
		122	5610		12.7			13.3	
		138	5690		12.5			13.3	
	802.11ax (HE80) 106T RU56	106	5530		13.0	No		13.6	No
		122	5610		13.0			13.6	
		138	5690		13.0			13.6	
UNII-2C	802.11ac (VHT160)	114	5570		12.4	No		13.0	No
	802.11ax (HE160) 2*996T SU	114	5570		12.3	No		13.3	No

Wi-Fi 5 GHz Measured Results MIMO (continued)

Band	Mode	Ch #	Freq. (MHz)	ANT 1 Average Power (dBm)			ANT 2 Average Power (dBm)		
				Meas Pwr	Tune-Up	SAR Test (Yes/No)	Meas Pwr	Tune-Up	SAR Test (Yes/No)
UNII-3 5.8 GHz	802.11a	149	5745		13.0	No		13.4	No
		157	5785		13.0			13.5	
		165	5825		13.1			13.6	
	802.11n (HT20)	149	5745		12.9	No		13.4	No
		157	5785		12.9			13.2	
		165	5825		12.6			13.5	
	802.11ac (VHT20)	149	5745		12.9	No		13.4	No
		157	5785		12.9			13.2	
		165	5825		12.6			13.5	
	802.11ax (HE20) 242T RU61	149	5745		13.0	No		13.6	No
		157	5785		13.0			13.6	
		165	5825		13.0			13.6	
	802.11n (HT40)	151	5755		13.0	No		13.2	No
		159	5795		13.0			13.4	
	802.11ac (VHT40)	151	5755		13.0	No		13.2	No
		159	5795		13.0			13.4	
	802.11ax (HE40) 484T SU	151	5755		13.0	No		13.6	No
		159	5795		13.0			13.6	
	802.11ac (VHT80)	155	5775	13.0	13.3	Yes	13.2	13.7	Yes
	802.11ax (HE80) 26T RU18	155	5775		13.0	No		13.6	Yes

9.3. Bluetooth

Maximum Output Power (Tune-up Limit) for Bluetooth

From October 2016 TCB workshop, Power and SAR measurements were performed with test software using DH5 modulation. The duty cycle value from the device is taken from the Duty Cycle plot below.

Band	Mode	Channel	Frequency (MHz)	Tune-up Power Limit (dBm)
				SISO
				ANT 1
Bluetooth 2.4 GHz	BR GFSK	0	2412	13.6
		39	2437	13.3
		78	2462	13.0
	EDR π/4 DQPSK	0	2412	10.2
		39	2437	10.0
		78	2462	9.6
	EDR 8DPSK	0	2412	10.0
		39	2437	9.9
		78	2462	9.5
	LE GFSK 1 Mbps	0	2402	7.4
		19	2440	7.1
		39	2480	6.6
	LE GFSK 2 Mbps	1	2402	7.4
		6	2440	7.1
		11	2480	6.6

Bluetooth Measured Results

Band	Mode	Ch #	Freq. (MHz)	ANT 1 Average Power (dBm)		
				Meas Pwr	Tune-up	SAR Test (Yes/No)
Bluetooth 2.4 GHz	BR GFSK	0	2402	13.0	13.6	Yes
		39	2441		13.3	
		78	2480		13.0	
	EDR, π/4 DQPSK	0	2402		10.2	No
		39	2441		10.0	
		78	2480		9.6	
	EDR, 8-DPSK	0	2402		10.0	No
		39	2441		9.9	
		78	2480		9.5	
	LE, GFSK 1 Mbps	0	2402		7.4	No
		19	2440		7.1	
		39	2480		6.6	
	LE, GFSK 2 Mbps	0	2402		7.4	No
		19	2440		7.1	
		39	2480		6.6	

Note(s):

SAR measurement is not required for the EDR and LE when the output power of secondary modes is ≤ ¼ dB higher than the primary mode.

Duty Factor Measured Results:

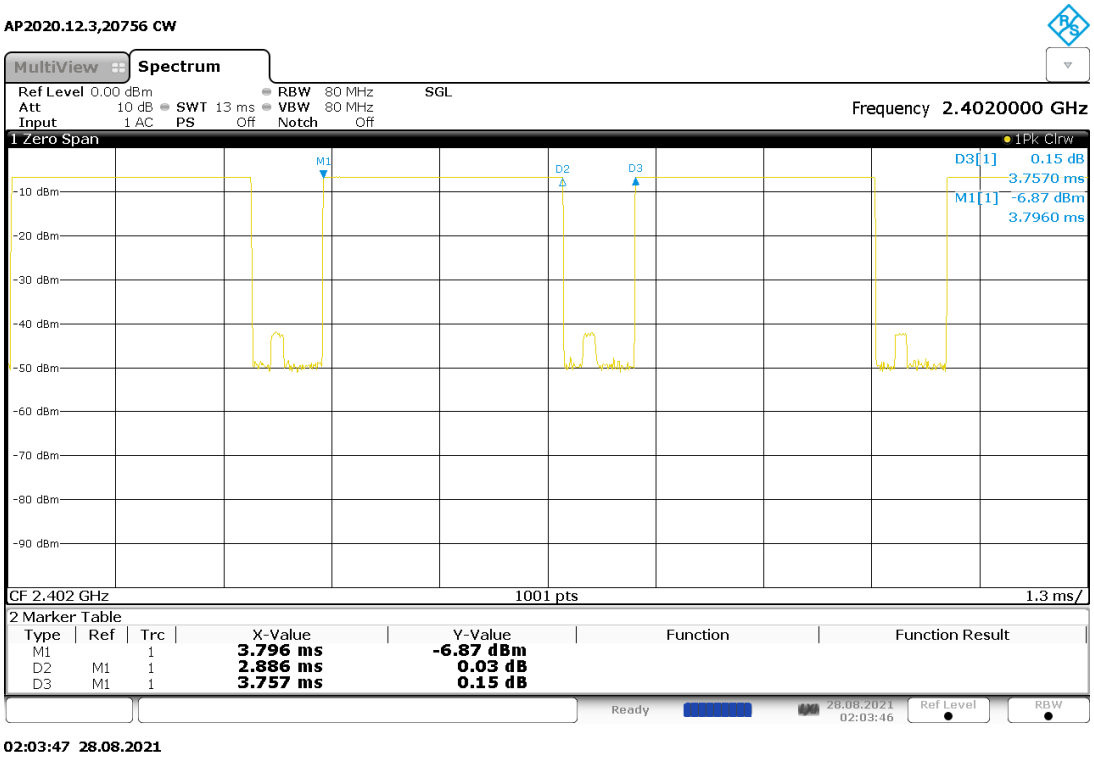
Band	Mode	Type	T on (ms)	Period (ms)	Duty Cycle	Crest Factor (1/duty cycle)
GFSK	GFSK	DH5	2.886	3.757	76.82%	1.30

Note(s):

Duty Cycle = (T on / period) * 100%

Duty Cycle plots

GFSK



10. Measured and Reported (Scaled) SAR Results

SAR Test Reduction criteria are as follows:

- Reported SAR(W/kg) for Bluetooth = Measured SAR *Tune-up Scaling Factor
- Reported SAR(W/kg) for Wi-Fi = 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 is determined according to 802.11 transmission mode configurations and certain exposure conditions with multiple test positions. In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration must be determined for each standalone and aggregated frequency band, according to the transmission mode configuration with the highest maximum output power specified for production units to perform SAR measurements. If the same highest maximum output power applies to different combinations of channel bandwidths, modulations and data rates, additional procedures are applied to determine which test configurations require SAR measurement. When applicable, an initial test position may be applied to reduce the number of SAR measurements required for next to the ear, UMPC mini-tablet or hotspot mode configurations with multiple test positions. For 2.4 GHz 802.11b DSSS, either the initial test position procedure for multiple exposure test positions or the DSSS procedure for fixed exposure position is applied; these are mutually exclusive. For 2.4 GHz and 5 GHz OFDM configurations, the initial test configuration is applied to measure SAR using either the initial test position procedure for multiple exposure test position configurations or the initial test configuration procedures for fixed exposure test conditions. Based on the reported SAR of the measured configurations and maximum output power of the transmission mode configurations that are not included in the initial test configuration, the subsequent test configuration and initial test position procedures are applied to determine if SAR measurements are required for the remaining OFDM transmission configurations. In general, the number of test channels that require SAR measurement is minimized based on maximum output power measured for the test sample(s).

10.1. Wi-Fi (DTS Band)

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up Limit	Meas.	Meas.	Scaled	
Body	802.11b	ANT 1	0	Rear	1	2412	98.20%	16.4	16.0	0.019	0.021	
				Front	1	2412	98.20%	16.4	16.0	0.489	**0.546**	1
		ANT 2	0	Rear	11	2462	98.20%	16.4	15.9	0.016	0.018	
				Front	11	2462	98.20%	16.4	15.9	0.250	**0.286**	2
Body	802.11b	MIMO ANT 1	0	Rear	11	2462	98.20%	12.9	12.2	0.025	0.030	
				Front	11	2462	98.20%	12.9	12.2	0.289	**0.346**	3
		MIMO ANT 2	0	Rear	11	2462	98.20%	13.9	13.0	0.021	0.026	
				Front	11	2462	98.20%	13.9	13.0	0.157	**0.197**	3

Adjusted SAR for OFDM(A) Modes

SAR testing is not required for OFDM(A) mode(s) when the highest reported SAR for DSSS is adjusted by the ratio of OFDM(A) to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

Tx Mode	Antenna	DSSS SAR (W/kg)	DSSS pwr (dBm)	OFDM(A) pwr (dBm)	Adjusted SAR (W/kg)	OFDM(A) Additional SAR Test
SISO	ANT 1	0.546	16.4	16.3	0.534	Not Required
	ANT 2	0.286	16.4	16.4	0.286	Not Required
MIMO	ANT 1	0.346	13.2	13.7	0.388	Not Required
	ANT 2	0.197	13.9	14.0	0.202	Not Required

Notes:

SAR testing is not required for OFDM(A) mode(s) since the adjusted SAR is ≤ 1.2 W/kg.

10.2. Wi-Fi (U-NII Band)

UNII-1 &2A

- 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.
- When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration; otherwise, each band is tested independently for SAR.

UNII 1 & UNII 2A Measured Results

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up Limit	Meas.	Meas.	Scaled	
Body	802.11n HT40	ANT 1	0	Rear	54	5270	99.76%	14.9	14.9	0.040	0.040	
				Front	54	5270	99.76%	14.9	14.9	0.609	**0.610**	4
	802.11a	ANT 2	0	Rear	52	5260	99.18%	14.1	14.0	0.012	0.013	
				Front	52	5260	99.18%	14.1	14.0	0.520	**0.537**	5
Body	802.11n HT40	MIMO ANT 1	0	Rear	38	5190	99.76%	13.6	13.3	0.017	0.018	
				Front	38	5190	99.76%	13.6	13.3	0.329	**0.353**	6
		MIMO ANT 2	0	Rear	38	5190	99.76%	14.0	13.4	0.003	0.004	
				Front	38	5190	99.76%	14.0	13.4	0.453	**0.521**	6

Adjusted SAR for UNII 1 & UNII 2A

When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power.

Tx Mode	Antenna	UNII 2A SAR (W/kg)	UNII 2A pwr (dBm)	UNII 1 pwr (dBm)	Adjusted SAR (W/kg)	UNII 1 Additional SAR Test
SISO	ANT 1	0.610	14.9	14.9	0.610	Not Required
	ANT 2	0.537	14.1	14.1	0.537	Not Required
Tx Mode	**Antenna**	**UNII 1 SAR (W/kg)**	**UNII 1 pwr (dBm)**	**UNII 2A pwr (dBm)**	**Adjusted SAR (W/kg)**	**UNII 2A Additional SAR Test**
MIMO	ANT 1	0.353	13.6	13.5	0.345	Not Required
	ANT 2	0.521	14.0	13.8	0.498	Not Required

Notes:

1. SAR testing is not required for UNII 1 SISO since the adjusted SAR is ≤ 1.2 W/kg.
2. SAR testing is not required for UNII 2A MIMO since the adjusted SAR is ≤ 1.2 W/kg.

UNII 2C Measured Results

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up Limit	Meas.	Meas.	Scaled	
Body	802.11ac VHT80	ANT 1	0	Rear	122	5610	99.76%	14.7	14.2	0.021	0.024	
				Front	106	5530	99.76%	14.7	14.1	0.702	0.808	
					122	5610	99.76%	14.7	14.2	0.812	0.913	
					138	5690	99.76%	14.5	14.2	0.855	**0.918**	7
	802.11a	ANT 2	0	Rear	100	5500	99.18%	14.2	13.4	0.020	0.024	
				Front	100	5500	99.18%	14.2	13.4	0.620	**0.752**	8
Body	802.11n HT40	MIMO ANT 1	0	Rear	110	5550	99.76%	13.1	12.5	0.008	0.010	
				Front	110	5550	99.76%	13.1	12.5	0.627	**0.722**	9
		MIMO ANT 2	0	Rear	110	5550	99.76%	13.7	12.5	0.004	0.005	
				Front	110	5550	99.76%	13.7	12.5	0.422	**0.558**	9

UNII 3 Measured Results

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Duty Cycle	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up Limit	Meas.	Meas.	Scaled	
Body	802.11ax (HE20) 242T SU	ANT 1	0	Rear	165	5825	99.67%	14.7	14.3	0.012	0.013	
				Front	165	5825	99.67%	14.7	14.3	0.527	**0.580**	10
	802.11a	ANT 2	0	Rear	165	5825	99.18%	14.1	14.0	0.002	0.002	
				Front	165	5825	99.18%	14.1	14.0	0.474	**0.489**	11
Body	802.11ac VHT80	MIMO ANT 1	0	Rear	155	5775	99.76%	13.3	13.0	0.031	0.034	
				Front	155	5775	99.76%	13.3	13.0	0.719	**0.772**	12
		MIMO ANT 2	0	Rear	155	5775	99.76%	13.7	13.2	0.024	0.027	
				Front	155	5775	99.76%	13.7	13.2	0.379	**0.426**	12

10.3. Bluetooth

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
							Tune-up Limit	Meas.	Meas.	Scaled	
Body	GFSK	ANT 1	0	Rear	0	2402	13.6	13.0	0.009	0.011	
				Front	0	2402	13.6	13.0	0.264	**0.303**	13

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.

Frequency Band (MHz)	Air Interface	RF Exposure Conditions	Test Position	Repeated SAR (Yes/No)	Highest Measured SAR (W/kg)	First Repeated	
						Measured SAR (W/kg)	Largest to Smallest SAR Ratio
5500	Wi-Fi 802.11ac VHT80	Body	Front	Yes	0.855	0.830	1.03

Note(s):
Repeated measurement is not required since the original highest measured SAR is <0.8 W/kg (1-g).

12. Simultaneous Transmission Conditions

RF Exposure Condition	Item	Capable Transmit Configurations		
Body	1	(ANT 2) Wi-Fi 2.4GHz SISO	+	(ANT 1) Bluetooth
	2	(ANT 1) Wi-Fi 2.4GHz SISO	+	(ANT 2) Wi-Fi 2.4GHz SISO
	3	Wi-Fi 2.4GHz MIMO		
	4	(ANT 1) Wi-Fi 5GHz SISO	+	(ANT 1) Bluetooth
	5	(ANT 1) Wi-Fi 2.4GHz SISO	+	(ANT 1) Wi-Fi 5GHz SISO
	6	(ANT 2) Wi-Fi 2.4GHz SISO	+	(ANT 1) Wi-Fi 5GHz SISO
	7	Wi-Fi 2.4GHz MIMO	+	(ANT 1) Wi-Fi 5GHz SISO
	8	(ANT 2) Wi-Fi 5GHz SISO	+	(ANT 1) Bluetooth
	9	(ANT 1) Wi-Fi 2.4GHz SISO	+	(ANT 2) Wi-Fi 5GHz SISO
	10	(ANT 2) Wi-Fi 2.4GHz SISO	+	(ANT 2) Wi-Fi 5GHz SISO
	11	Wi-Fi 2.4GHz MIMO	+	(ANT 2) Wi-Fi 5GHz SISO
	12	Wi-Fi 5GHz MIMO		
	13	Wi-Fi 5GHz MIMO	+	(ANT 1) Bluetooth
	14	(ANT 1) Wi-Fi 2.4GHz SISO	+	Wi-Fi 5GHz MIMO
	15	(ANT 2) Wi-Fi 2.4GHz SISO	+	Wi-Fi 5GHz MIMO
	16	Wi-Fi 2.4GHz MIMO	+	Wi-Fi 5GHz MIMO

Notes:

1. DTS Radio can transmit simultaneously with Bluetooth Radio.
2. U-NII Radio can transmit simultaneously with Bluetooth Radio.
3. U-NII Radio can transmit simultaneously with DTS Radio on the same Antenna.

12.1. 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 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

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

RF Exposure conditions	Test Position	Standalone SAR (W/kg)								
		DTS				NII				DSS
		SISO		MIMO		SISO		MIMO		
		ANT 1	ANT 2	ANT 1	ANT 2	ANT 1	ANT 2	ANT 1	ANT 2	ANT 1
		1	2	3	4	5	6	7	8	9
Body	Rear	0.021	0.018	0.030	0.026	0.040	0.024	0.034	0.027	0.011
	Front	0.546	0.286	0.346	0.197	0.918	0.752	0.722	0.558	0.303

Test Position	∑ 1-g SAR (W/kg)															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	2 + 9	1 + 2	3 + 4	5 + 9	1 + 5	2 + 5	3 + 4 + 5	6 + 9	1 + 6	2 + 6	3 + 4 + 6	7 + 8	7 + 8 + 9	1 + 7 + 8	2 + 7 + 8	3 + 4 + 7 + 8
Rear	0.029	0.039	0.056	0.051	0.061	0.058	0.096	0.035	0.045	0.042	0.080	0.061	0.072	0.082	0.079	0.117
Front	0.589	0.832	0.543	1.221	1.464	1.204	1.461	1.055	1.298	1.038	1.295	1.280	**1.583**	1.826	**1.566**	1.823

Notes:

The sum of the 1-g SAR is > 1.6 W/kg, SPLSR analysis is Required.

SAR to Peak Location Ratio (SPLSR) Analysis:

RF Exposure Conditions	Test Position	Standalone SAR (W/kg)			∑ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
		DTS	NII							
		SISO	MIMO							
		ANT 1	ANT 1	ANT 2						
		1	7	8						
Body	Front	0.546	0.722	0.558	1 + 7 + 8	1.826	57.1	0.04	No	1
		0.546		0.558	1 + 8	1.104	57.1	0.02	No	
			0.722	0.558	7 + 8	1.280	63.4	0.02	No	

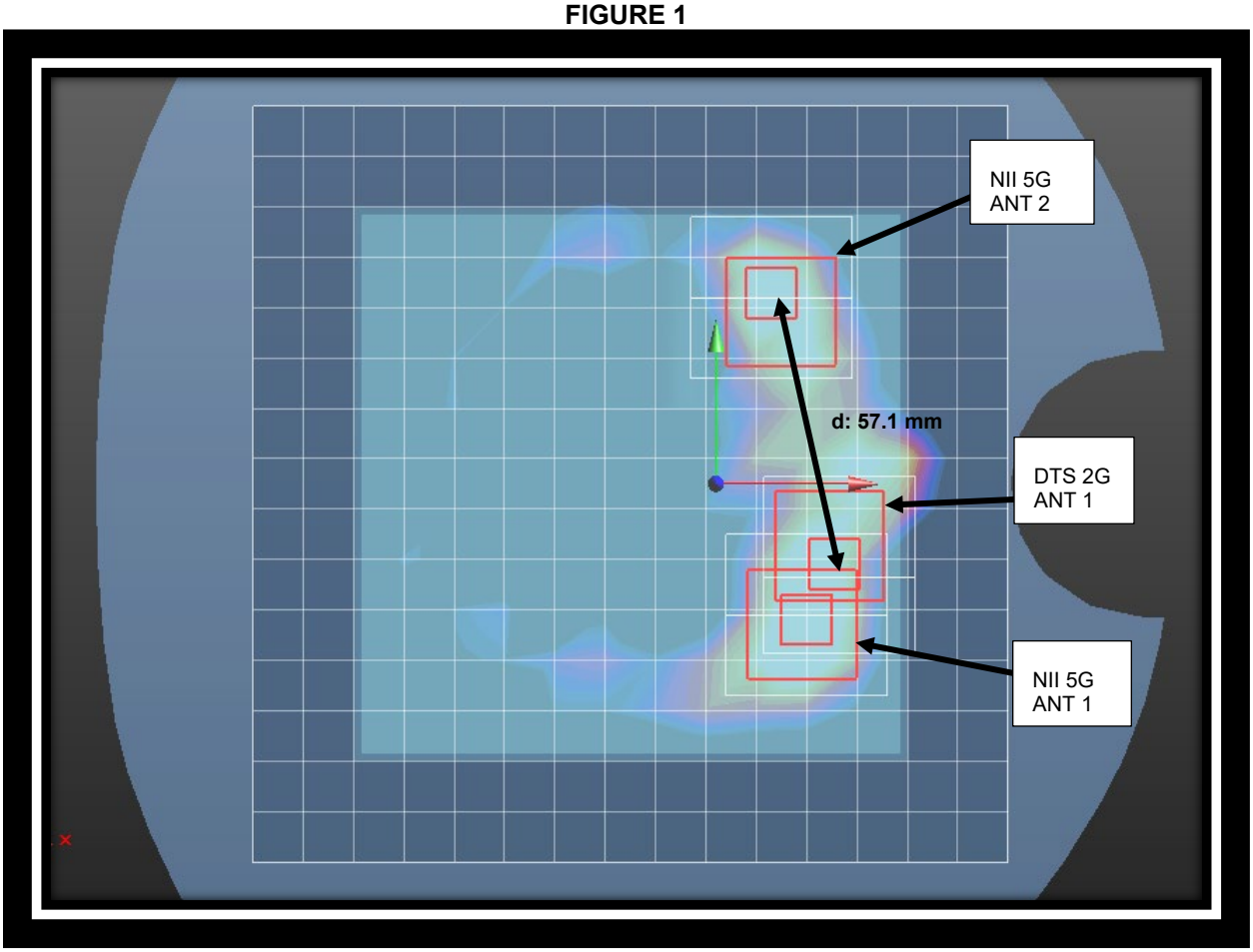
RF Exposure Conditions	Test Position	Mode	Antenna	Peak SAR	X	Y	Z	d: Calculated distance (mm)	
				W/kg	m	m	m		
Body	Front	DTS	ANT 1	0.828	0.024	-0.019	-0.208	1 + 8	57.1
		NII	ANT 2	1.260	0.011	0.037	-0.208		
		NII	ANT 1	1.490	0.018	-0.026	-0.208	7 + 8	63.4
		NII	ANT 2	1.260	0.011	0.037	-0.208		

The Peak Location Separation Distance is computed by using the formula: SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because the SPLSR is ≤ 0.04.

FIGURE 1



SAR to Peak Location Ratio (SPLSR) Analysis (continued):

RF Exposure Conditions	Test Position	Standalone SAR (W/kg)				∑ 1-g SAR (W/kg)		Calculated distance (mm)	SPLSR (≤ 0.04)	Volume Scan (Yes/ No)	Figure
		DTS		NII							
		MIMO		MIMO							
		ANT 1	ANT 2	ANT 1	ANT 2						
		3	4	7	8						
Body	Front	0.346	0.197	0.722	0.558	3 + 4 + 7 + 8	1.823	56.7	0.04	No	2
		0.346	0.197			3 + 4	0.543	62.1	0.01	No	
				0.722	0.558	7 + 8	1.280	63.4	0.02	No	
		0.346			0.558	3 + 8	0.904	56.7	0.02	No	
			0.197	0.722		4 + 7	0.919	68.6	0.01	No	

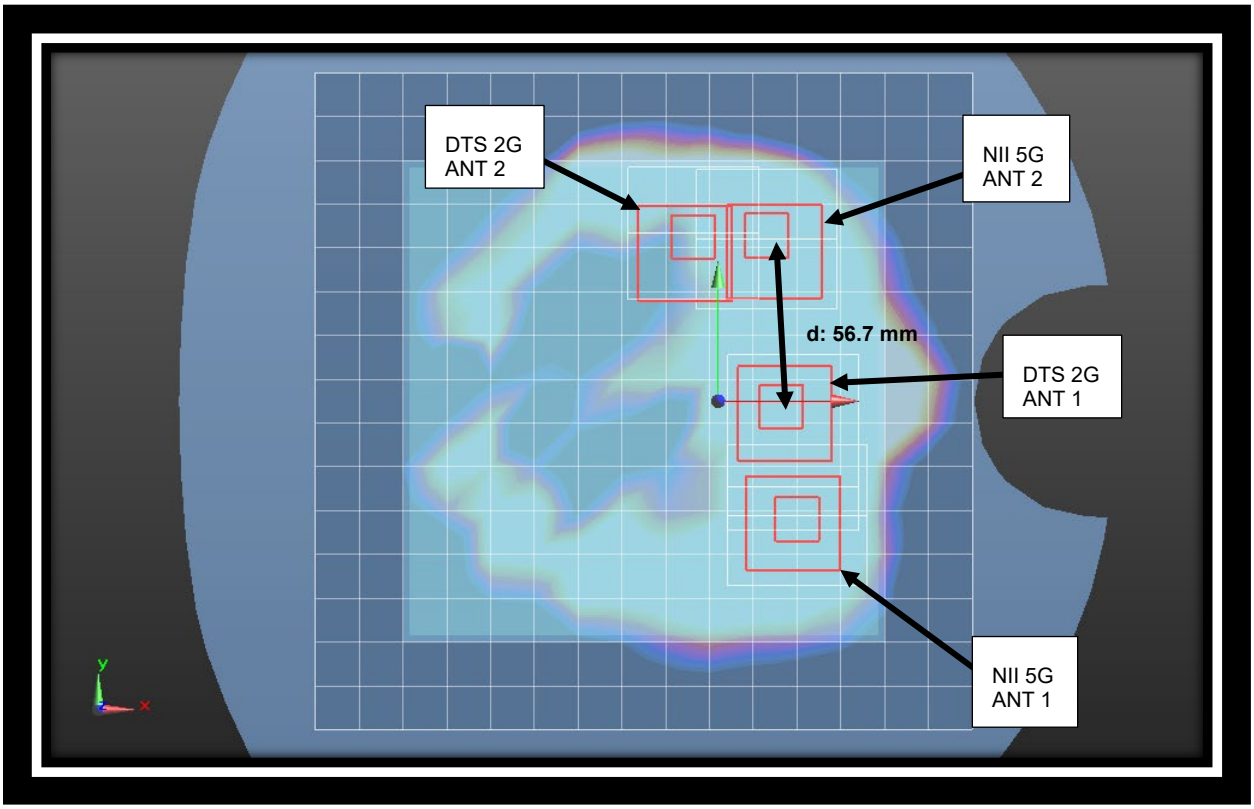
RF Exposure Conditions	Test Position	Mode	Antenna	Peak SAR	X	Y	Z	d: Calculated distance (mm)	
				W/kg	m	m	m		
Body	Front	DTS	ANT 1	0.467	0.017	-0.019	-0.209	3 + 4	62.1
		DTS	ANT 2	0.254	-0.006	0.038	-0.209		
		NII	ANT 1	1.490	0.018	-0.026	-0.208	7 + 8	63.4
		NII	ANT 2	1.260	0.011	0.037	-0.208		
		DTS	ANT 1	0.467	0.017	-0.019	-0.209	3 + 8	56.7
		NII	ANT 2	1.260	0.011	0.037	-0.208		
		DTS	ANT 2	0.254	-0.006	0.038	-0.209	4 + 7	68.6
		NII	ANT 1	1.490	0.018	-0.026	-0.208		

The Peak Location Separation Distance is computed by using the formula: SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because the SPLSR is ≤ 0.04.

FIGURE 2



Appendixes

Refer to separated files for the following appendixes.

Appendix A: SAR Setup Photos

Appendix B: SAR System Check Plots

Appendix C: SAR Highest Test Plots

Appendix D: SAR Tissue Ingredients

Appendix E: SAR Probe Certificates

Appendix F: SAR Dipole Certificates

END OF REPORT