



Project No.: Report No.: TM-2405000351P TMWK2405001686KS FCC ID: W2Z-01000016

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SAR TEST REPORT

FCC 47 CFR § 2.1093 IEEE Std 1528-2013

for

Flat Panel Sensor

Model: DR-ID 1285SE

Prepared for:

Fuji Film Corporation 7-3, AKASAKA 9-CHOME, MINATO-KU, Tokyo, 107-0052, Japan

Prepared by

Compliance Certification Services Inc. Wugu Lab. No.11, Wugong 6th Rd., Wugu Dist., New Taipei City, Taiwan. Issued Date: July 9, 2024

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No.11, Wugong 6th Rd., Wugu Dist., New Taipei City , Taiwan /新北市五股區五工六路 11 號 t:(886-2) 2299-9720 f:(886-2) 2299-9721 www.sgs.com.tw



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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	July 9, 2024	Initial Issue	ALL	Peggy Tsai



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1 Attestation of Test Results

Applicant Name	Fuji Film Corporation								
Model	DR-ID 1285SE								
Applicable Standards	FCC 47 CFR § 2.1093								
	Published RF exposure KDB procedures								
	IEEE Std 1528-2013								
	SAR Limit	s (W/Kg)							
Exposure Category	Peak spatia	al-average							
	(1g of t	issue)							
General population	1.6								
PE Exposure Conditions	Equipment Class - Highest Reported SAR (W/kg)								
RF Exposure Conditions	DTS	NII							
Standalone	1.28	1.23							
Simultaneous TX	1.	3							
Receive EUT Date (Original)	01/16/2024								
Receive EUT Date (Update)	05/22/2024								
Date Tested (Original)	02/16/2024 to 02/18/2024								
Date Tested (Update)	05/25/2024	05/25/2024							
Test Results	Pass								

Compliance Certification Services Inc., tested the above equipment in accordance with the requirements set forth in the above standards. Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainy.All indications of Pass/Fail in this report are opinions expressed by Compliance Certification Services Inc, based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Approved & Released By:

Tested by:

Jack Iana Sky Zhou Jack Yang Asst. Section Manager Engineer Compliance Certification Services Inc. Compliance Certification Services Inc.



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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, the following FCC Published RF exposure <u>KDB</u> procedures:

- o 248227 D01 802.11 Wi-Fi SAR v02r02
- o 447498 D04 Interim General RF Exposure Guidance v01
- o 616217 D04 SAR for laptop and tablets v01r02
- o 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04
- o 865664 D02 RF Exposure Reporting v01r02



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3 Device Under Test (DUT) Information

3.1 DUT Description

Applicant Name	Fuji Film Corporation
Applicant Address	7-3, AKASAKA 9-CHOME, MINATO-KU, Tokyo, 107-0052, Japan
Manufacturer Name	Fuji Film Corporation
Manufacturer Address	7-3, AKASAKA 9-CHOME, MINATO-KU, Tokyo, 107-0052, Japan
Product	Flat Panel Sensor
Trade Name	FUJIFILM
Model	DR-ID 1285SE
Model Discrepancy	N/A
Device Dimension	Overall (Length x Width): 232 mm x 332 mm
Device Dimension	Overall Diagonal: 435 mm
Back Cover	⊠ Normal Battery Cover
Battery Options	⊠ Standard – Lithium-ion battery, Rating 11.4Vdc, 48Wh
Hardware Version	v2
Software Version	v120.253
Sample Stage	PVT
Class II Permissive Change	Added evaluation of WIFI 5G Band2 and Band3.



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3.2 Wireless Technologies

Wireless technologies	Frequency bands	Peak Antenna Gain (dBi)	Operating mode	Duty Cycle used for SAR testing						
	2.4 GHz	-1.84	802.11b 802.11g 802.11n (HT20) 802.11n (HT40) 802.11ac (VHT20) 802.11ac (VHT40) 802.11ax (HE20) 802.11ax (HE40)	99.9% (802.11b) 99.49% (802.11g) 99.38% (802.11n/ac/ax 20MHz BW) 98.76% (802.11n/ac/ax 40MHz BW)						
Wi-Fi (Main)	5 GHz	0.64	802.11a 802.11n (HT20) 802.11n (HT40) 802.11ac (VHT20) 802.11ac (VHT40) 802.11ac (VHT80) 802.11ax (HE20) 802.11ax (HE40) 802.11ax (HE80)	99.42% (802.11a) 99.53% (802.11n/ac/ax 20MHz BW) 98.76% (802.11n/ac/ax 40MHz BW) 97.53% (802.11ac/ax 80MHz BW)						
Antenna	Brand Name	TAOGLAS								
Specification	Туре	PCB antenn	а							
opeoineation	Parts Number	PC143.54.0360A								
	2.4 GHz	-11.01	802.11b 802.11g 802.11n (HT20) 802.11n (HT40) 802.11ac (VHT20) 802.11ac (VHT40) 802.11ax (HE20) 802.11ax (HE40)	99.9% (802.11b) 99.49% (802.11g) 99.38% (802.11n/ac/ax 20MHz BW) 98.76% (802.11n/ac/ax 40MHz BW)						
Wi-Fi (Aux)	5 GHz	-1.62	802.11a 802.11n (HT20) 802.11n (HT40) 802.11ac (VHT20) 802.11ac (VHT40) 802.11ac (VHT80) 802.11ax (HE20) 802.11ax (HE40) 802.11ax (HE80)	99.42% (802.11a) 99.53% (802.11n/ac/ax 20MHz BW) 98.76% (802.11n/ac/ax 40MHz BW) 97.53% (802.11ac/ax 80MHz BW)						
	Brand Name	TAOGLAS								
Antenna	Туре	PCB antenn	a							
Specification	Parts Number	PC143.54.0515A								

Notes:

The sample selected for test was prototype that representative to production product and was provided by manufacturer 1.

Variant information between/among model numbers / trademarks is provided by the applicant, test results of this report are applicable to 2. the sample EUT received of main test model name.

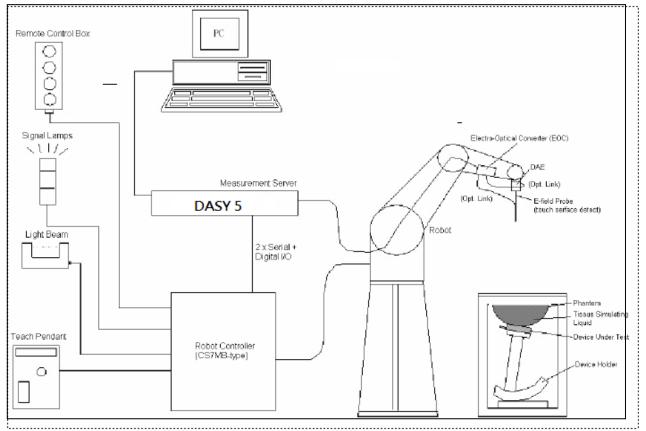
Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received Added U-NII 2A and U-NII 2C. 3.

4.



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4 SAR Measurement System

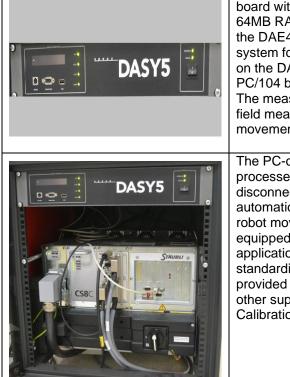


The DASY5 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot (St"aubli RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, ADconversion, 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 between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection. The EOC is connected 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.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 7 or Windows XP.
- DASY software version: NEO52 D10.3 S14.6.13.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing validating the proper functioning of the system.



4.1 System Components DASY5 Measurement Server



The DASY5 measurement server is based on a PC/104 CPU board with a 166MHz low-power Pentium, 32MB chip disk and 64MB RAM. The necessary circuits for communication with either the DAE4 electronic box as well as the 16-bit AD-converter system for optical detection and digital I/O interface are contained on the DASY5 I/O-board, which is directly connected to the PC/104 bus of the CPU board. The measurement server performs all real-time data evaluation for

field measurements and surface detection, controls robot movements and handles safety operation.

The PC-operating system cannot interfere with these time critical processes. All connections are supervised by a watchdog, and disconnection of any of the cables to the measurement server will automatically disarm the robot and disable all program-controlled robot movements. Furthermore, the measurement server is equipped with two expansion slots which are reserved for future applications. Please note that the expansion slots do not have a standardized pinout and therefore only the expansion cards provided by SPEAG can be inserted. Expansion cards from any other supplier could seriously damage the measurement server. Calibration: No calibration required.

Data Acquisition Electronics (DAE)



The data acquisition electronics (DAE4) consists of a highly sensitive electrometer grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock. The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection. The input impedance of the DAE4 box is 200MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.



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EX3DV4 Isotropic E-Field Probe	for Dosimetri	c Measurements
• • • •	Construction:	
		Built-in shielding against static charges
		PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
BKD BKD	Calibration:	Basic Broad Band Calibration in air: 10-3000 MHz. Conversion Factors (CF) for HSL 900 and HSL 1800 CF-Calibration for other liquids and frequencies upon request.
5.4	Frequency:	10 MHz to > 6 GHz; Linearity: ± 0.2 dB (30 MHz to 3 GHz)
	Directivity:	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in HSL (rotation normal to probe axis)
and the second se	Dynamic Rang	e:10 μW/g to > 100 mW/g; Linearity: ± 0.2 dB (noise: typically < 1 μW/g)
	Dimensions:	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm)
	Application:	Distance from probe tip to dipole centers: 1 mm High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.
SAM Phantom	-	
	Construction:	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE1528: 2013. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points with the robot.
	Shell Thickness	s:2 ±0.2 mm
	Filling Volume	: Approx. 25 liters
	Dimensions:	Height: 810mm; Length: 1000mm; Width: 500mm
ELI Phantom		
		Phantom for compliance testing of handheld and body- mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with the latest draft of the standard IEEE1528: 2013 and all known tissue simulating liquids. ELI4 has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is supported by software version DASY5 and higher and is compatible with all SPEAG dosimetric probes and dipoles
		s:2.0 ± 0.2 mm (sagging: <1%) : Approx. 25 liters
		· 744107. 20 111013
	Dimensions: Minor axis:	Major ellipse axis: 600 mm 400 mm 500mm



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Device Holder for SAM Twin I	Phantom	
		In combination with the Twin SAM Phantom V4.0 or Twin SAM, the Mounting Device (made from POM) enables the rotation of the mounted transmitter in spherical coordinates, whereby the rotation point is the ear opening. The devices can be easily and accurately positioned according to IEC, IEEE, CENELEC, FCC or other specifications. The device holder can be locked at different phantom locations (left head, right head, and flat phantom).
System Validation Kits for SA		• · · · · · · · · · · · · · · · · · · ·
1	Construction:	Symmetrical dipole with I/4 balun Enables measurement of feedpoint impedance with NWA Matched for use near flat phantoms filled with brain simulating solutions Includes distance holder and tripod adaptor.
	Frequency:	2450, 5300, 5600, 5800 MHz
	Return loss:	 > 20 dB at specified validation position : > 100 W (f < 1GHz); > 40 W (f > 1GHz)
	Dimensions:	D2450V2: dipole length: 51.5 mm; overall height: 290 mm D5GHzV2: dipole length: 20.6 mm; overall height: 300 mm
System Validation Kits for EL		
		Symmetrical dipole with I/4 balun Enables measurement of feedpoint impedance with NWA Matched for use near flat phantoms filled with brain simulating solutions Includes distance holder and tripod adaptor.
	• •	2450, 5300, 5600, 5800 MHz
		> 20 dB at specified validation position > 100 W (f < 1GHz): > 40 W (f > 1GHz)
	Dimensions:	> 100 W (f < 1GHz); > 40 W (f > 1GHz) D2450V2: dipole length: 51.5 mm; overall height: 290 mm D5GHzV2: dipole length: 20.6 mm; overall height: 300 mm



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4.2 SAR Scan Procedures

Step 1: Power Reference Measurement

The reference and drift jobs are useful jobs for monitoring the power drift of the device under test in the batch process. Both jobs measure the field at a specified reference position, at a selectable distance from the phantom surface. The reference position can be either the selected section's grid reference point or a user point in this section. The reference job projects the selected point onto the phantom surface, orients the probe perpendicularly to the surface, and approaches the surface using the selected detection method.

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 IEEE1528 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 abgle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: ΔxZoom,	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
ΔyZoom	measurement plane orie above, the measuremen corresponding x or y dim	on of the test device, in the ntation, is smaller than the t resolution must be \leq the test device with nt point on the test device.



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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 spa	tial resolutio	≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm	3 – 4 GHz: ≤ 5 mm 4 – 6 GHz: ≤ 4 mm			
	Unifori	m grid: Δz _{zoom} (n)	≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm		
Maximum zoom scan spatial resolution, normal to phantom surface	graded	∆z _{zoom} (1):between 1st two points losest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm		
	grid	Δz _{zoom} (n>1): between subsequent points	≤ 1.5·Δzzoom(n-1)			
Maximum zoom scan volume	x, y, z	≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm			

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



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5 Measurement Uncertainty

Per KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg and the measured 10-g SAR within a frequency band is < 3.75 W/kg. The expanded SAR measurement uncertainty must be \leq 30%, for a confidence interval of k = 2. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE1528: 2013 is not required in SAR reports submitted for equipment approval.

Therefore, the measurement uncertainty is not required.



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6 RF Exposure Conditions (Test Configurations)

Refer to Appendixes 1 for the specific details of the antenna-to-antenna and antenna-to-edge(s) distances.

6.1 Standalone SAR Test Exclusion Considerations

Since the Dedicated Host Approach is applied, the SAR-based exemption in Appendix B of KDB 447498 D04 is applied together with KDB 616217 § 4.3 to determine the minimum test separation distance:

- When the separation distance from the antenna to an adjacent edge is ≤ 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.
- When the separation distance from the antenna to an adjacent edge is > 5 mm, the actual antenna-to-edge separation distance is applied to determine SAR test exclusion.
- The available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold Pth (mW) described in the following formula.
 Pth is given by:

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

• The separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz . Pth is given by:

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

where

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

and *f* is in GHz, *d* is the separation distances (cm).



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SAR Test Exclusion Calculations for 1.5 GHz $\leq f \leq 6$ GHz

Tx	Frequency	Output	Power	Antenna Gain	ERP	ERP Threshold		Separation Distances (cm) P _{th} (mW)				Exemption result												
Interface	(GHz)	dBm	mW	(dBi)	(dBm)	(mW)	Front	Rear	Edge1	Edge2	Edge 3	Edge4	Front	Rear	Edge1	Edge 2	Edge3	Edge 4	Front	Rear	Edge1	Edge2	Edge3	Edge4
WIFi 2.4GHz(Main)	2.462	16.00	40	-1.84	12.01	15.89	0.5	0.5	15	28	24.5	0.5	3	3	22	3060	3060	3	-MEASURE-	-MEASURE-	-MEASURE-	-EXEMPT-	-EXEMPT-	-MEASURE-
WIFi 5.2GHz(Main)	5.24	9.50	9	0.64	7.99	6.30	0.5	0.5	1.5	28	24.5	0.5	1	1	14	3060	3060	1	-MEASURE-	-MEASURE-	-EXEMPT-	-EXEMPT-	-EXEMPT-	-MEASURE-
WIFi 5.3GHz(Main)	5.32	9.50	9	0.64	7.99	6.30	0.5	0.5	1.5	28	24.5	0.5	1	1	14	3060	3060	1	-MEASURE-	-MEASURE-	-EXEMPT-	-EXEMPT-	-EXEMPT-	-MEASURE-
WIFi 5.5GHz(Main)	5.7	9.50	9	0.64	7.99	6.30	0.5	0.5	1.5	28	24.5	0.5	1	1	14	3060	3060	1	-MEASURE-	-MEASURE-	-EXEMPT-	-EXEMPT-	-EXEMPT-	-MEASURE-
WIFi 5.8GHz(Main)	5.825	10.00	10	0.64	8.49	7.06	0.5	0.5	1.5	28	24.5	0.5	1	1	14	3060	3060	1	-MEASURE-	-MEASURE-	-EXEMPT-	-EXEMPT-	-EXEMPT-	-MEASURE-
WiFi 2.4GHz(Aux)	2.462	16.00	40	-11.01	2.84	1.92	0.5	0.5	33	1.5	0.5	19.5	3	3	3060	22	3	2916	-MEASURE-	-MEASURE-	-EXEMPT-	-MEASURE-	-MEASURE-	-EXEMPT-
WiFi 5.2GHz(Aux)	5.24	9.50	9	-1.62	5.73	3.74	0.5	0.5	33	1.5	0.5	19.5	1	1	3060	14	1	2904	-MEASURE-	-MEASURE-	-EXEMPT-	-EXEMPT-	-MEASURE-	-EXEMPT-
WiFi 5.3GHz(Aux)	5.32	9.50	9	0.64	7.99	6.30	0.5	0.5	33	1.5	0.5	19.5	1	1	3060	54	1	2904	-MEASURE-	-MEASURE-	-EXEMPT-	-EXEMPT-	-MEASURE-	-EXEMPT-
WiFi 5.5GHz(Aux)	5.7	9.50	9	0.64	7.99	6.30	0.5	0.5	33	1.5	0.5	19.5	1	1	3060	14	1	2903	-MEASURE-	-MEASURE-	-EXEMPT-	-EXEMPT-	-MEASURE-	-EXEMPT-
WiFi 5.8GHz(Aux)	5.825	10.00	10	-1.62	6.23	4.20	0.5	0.5	33	1.5	0.5	19.5	1	1	3060	54	1	2902	-MEASURE-	-MEASURE-	-EXEMPT-	-EXEMPT-	-MEASURE-	-EXEMPT-



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6.2 Required Test Configurations The table below identifies the standalone test configurations required for this device according to the findings in Section 6.1:

Wi-Fi Antenna Main													
Test Configurations	Front	Rear	Edge1	Edge2	Edge3	Edge4							
WiFi 2.4GHz(Main)	Yes	Yes	Yes	No	No	Yes							
WiFi 5.2GHz(Main)	Yes	Yes	No	No	No	Yes							
WiFi 5.3GHz(Main)	Yes	Yes	No	No	No	Yes							
WiFi 5.5GHz(Main)	Yes	Yes	No	No	No	Yes							
WiFi 5.8GHz(Main)	Yes	Yes	No	No	No	Yes							

Wi-Fi Antenna Aux												
Test Configurations	Front	Rear	Edge1	Edge2	Edge3	Edge4						
WiFi 2.4GHz(Aux)	Yes	Yes	No	Yes	Yes	No						
WiFi 5.2GHz(Aux)	Yes	Yes	No	No	Yes	No						
WiFi 5.3GHz(Aux)	Yes	Yes	No	No	Yes	No						
WiFi 5.5GHz(Aux)	Yes	Yes	No	No	Yes	No						
WiFi 5.8GHz(Aux)	Yes	Yes	No	No	Yes	No						
Noto(a)												

Note(s):

Yes = Testing is required.

No = Testing is not required.



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7 Dielectric Property Measurements & System Check

7.1 Dielectric Property Measurements

The temperature of the tissue-equivalent medium used during measurement must also be within 18° C to 25° C and within $\pm 2^{\circ}$ 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 (ϵ r) 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 ϵ r 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)	Н	ead	Во	dy
	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



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Typical Composition of Ingredients for Liquid Tissue Phantoms

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Ingredients					Frequen	cy (MHz)				
(% by weight)	4	50	83	35	91	15	19	00	2450	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.8	52.5
Conductivity (S/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.88	1.78

alt: 99+% Pure Sodium Chloride

Sugar: 98+% Pure Sucrose

Water: De-ionized, 16 $M\Omega^+$ resistivity HEC: Hydroxy thyl Cellulose

DGBE: 99+% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]

Triton X-100 (ultra-pure): Polyethylene glycol mono [4-(1, 1, 3, 3-tetramethylbutyl)phenyl]ether

Simulating Liquids for 5 GHz, Manufactured by SPEAG

Ingredients	(% by weight)
Water	78
Mineral oil	11
Emulsifiers	9
Additives and Salt	2



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Dielectric Property Measurements Results:

	Tissue	Frequency	Relativ	/e Permittiv	ity (ɛr)	Co	onductivity (σ)
Date	Туре	(MHz)	Measured	Target	Delta (%)	Measured	Target	Delta (%)
		2400	39.41	39.30	0.28	1.83	1.76	4.38
2024/2/16	Head	2450	39.34	39.20	0.36	1.87	1.80	4.11
		2480	39.32	39.16	0.41	1.90	1.83	3.77
		5150	35.33	36.05	-2.00	4.81	4.61	4.45
2024/2/17	Head	5200	35.16	36.00	-2.33	4.86	4.66	4.23
		5250	35.10	35.95	-2.36	4.93	4.71	4.61
		5720	34.07	35.38	-3.70	5.42	5.19	4.41
2024/2/18	Head	5750	33.97	35.35	-3.90	5.45	5.22	4.48
		5850	33.80	35.25	-4.11	5.56	5.32	4.43
		5250	35.13	35.95	-2.28	4.69	4.71	-0.53
2024/5/25	Head	5300	35.05	35.90	-2.37	4.73	4.76	-0.71
		5350	34.88	35.85	-2.71	4.80	4.81	-0.19
		5500	34.90	35.65	-2.10	4.97	4.97	0.08
2024/5/25	Head	5600	34.60	35.50	-2.54	5.04	5.07	-0.51
		5720	34.28	35.38	-3.11	5.25	5.19	1.16



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7.2 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 15 mm (below 1 GHz) and 10 mm (above 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 7x7x12 (above 3 GHz) fine cube
- Distance between probe sensors and phantom surface was set to 2 mm.
- The dipole input power (forward power) was 250 mW (below 2GHz) and 100 mW
- The results are normalized to 1 W input power.



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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 $\pm 10\%$ of the manufacturer calibrated dipole SAR target. Refer to Appendix 2 for the SAR System Check Plots.

Date	Tissue Type	Dipole S/N	Input Power (mW)	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Delta 1g ±10 (%)	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Delta 10g ±10 (%)	Plot No.
2024/2/16	Head	D2450V2-727	250	12.40	53.10	49.6	-6.59	5.71	24.80	22.84	-7.90	1
2024/2/17	Head	D5GHzV2-1349-5250	100	8.08	80.40	80.8	0.50	2.38	23.00	23.8	3.48	2
2024/2/18	Head	D5GHzV2-1349-5750	100	8.46	81.40	84.6	3.93	2.41	23.20	24.1	3.88	3
2024/5/25	Head	D5GHzV2-1349-5250	100	7.85	80.90	78.5	-2.97	2.25	23.10	22.5	-2.60	4
2024/5/25	Head	D5GHzV2-1349-5600	100	8.22	80.80	82.2	1.73	2.34	23.00	23.4	1.74	5



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8 Conducted Output Power Measurements

8.1 Wi-Fi 2.4GHz (DTS Band)

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 mode(s) when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

Band	Mode	Data Rate	Ch #	Freq.	Mea	s.AvgPwr(o	dBm)	Tur	ne-up Limit (dBm)		SAR Test	(Yes/No)	
Danu	Mode	Data Rate	Ch#	(MHz)	Main	Aux	Total	Main	Aux	Total	Main	Aux	
			1	2412	15.72	15.61	18.68	16.0	16.0	19.0			
	802.11b	1 Mbps	6	2437	15.82	15.73	18.79	16.0	16.0	19.0	Yes	Yes	
			11	2462	15.77	15.62	18.71	16.0	16.0	19.0			
			1	2412	14.99	14.44	17.73	15.5	15.5	18.5			
	802.11g	6 Mbps	6	2437	15.15	14.48	17.84	15.5	15.5	18.5	No	No	
			11	2462	14.84	14.40	17.64	15.5	15.5	18.5			
			1	2412	15.10	14.87	18.00	15.5	15.5	18.5			
	802.11n (HT20)	MCS0	6	2437	15.24	14.82	18.05	15.5	15.5	18.5	No	No	
	(11120)		11	2462	15.03	14.74	17.90	15.5	15.5	18.5			
			1	2412	15.06	14.55	17.82	15.5	15.5	18.5			
	802.11ac (VHT20)	MCS0	6	2437	15.34	14.68	18.03	15.5	15.5	18.5	No	No	
2.4GHz	(11120)		11	2462	15.15	14.63	17.91	15.5	15.5	18.5			
(DTS)			1	2412	15.20	14.76	18.00	15.5	15.5	18.5			
	802.11ax (HE20)	MCS0	6	2437	15.33	14.63	18.00	15.5	15.5	18.5	No	No	
	(11220)		11	2462	14.97	14.41	17.71	15.5	15.5	18.5			
			3	2422	14.33	13.56	16.97	14.5	14.5	17.5			
	802.11n (HT40)		MCS0	6	2437	14.36	13.44	16.93	14.5	14.5	17.5	No	No
	(9	2452	14.00	13.39	16.72	14.5	14.5	17.5			
			3	2422	13.83	13.38	16.62	14.5	14.5	17.5			
	802.11ac (VHT40)	MCS0	6	2437	14.12	13.47	16.82	14.5	14.5	17.5	No	No	
			9	2452	14.31	13.49	16.93	14.5	14.5	17.5			
			3	2422	14.13	13.41	16.80	14.5	14.5	17.5			
	802.11ax (HE40)	MCS0	6	2437	14.20	13.47	16.86	14.5	14.5	17.5	No	No	
	(112-10)		9	2452	14.05	13.31	16.71	14.5	14.5	17.5			

Measured Results



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8.2 Wi-Fi 5GHz (U-NII Bands)

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.

When the same transmission mode configurations have the same maximum output power on the same channel for the 802.11 a/g/n/ac modes, the channel in the lower order/sequence 802.11 mode (i.e. a, g, n then ac) is selected.

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. Additional output powermeasurements were not deemed necessary.

Measured Results

David	Maria	Data Data	Ch #	Freq.	Mea	s. Avg Pwr (o	dBm)	Tur	ne-up Limit (dBm)		SAR Tes	t(Yes/No)
Band	Mode	Data Rate	Ch #	(MHz)	Main	Aux	Total	Main	Aux	Total	Main	Aux
			36	5180	9.08	8.66	11.88	9.5	9.5	12.5		
	802.11a	6 Mbps	40	5200	9.14	8.71	11.94	9.5	9.5	12.5	No	No
	002.11d	0 Mbps	44	5220	8.96	8.58	11.78	9.5	9.5	12.5	NO	NU
			48	5240	8.92	8.42	11.68	9.5	9.5	12.5		
			36	5180	9.28	8.84	12.08	9.5	9.5	12.5		
	802.11n	MCS0	40	5200	9.14	8.79	11.98	9.5	9.5	12.5	No	No
	(HT20)	IVIC-50	44	5220	8.68	8.41	11.56	9.5	9.5	12.5	NU	NU
			48	5240	9.16	8.71	11.95	9.5	9.5	12.5		
			36	5180	9.10	8.65	11.89	9.5	9.5	12.5		
	802.11ac	MCS0	40	5200	8.75	8.52	11.65	9.5	9.5	12.5	No	No
	(VHT20)	IVICS0	44	5220	8.90	8.37	11.65	9.5	9.5	12.5	INO	INO
5.2GHz			48	5240	9.05	8.47	11.78	9.5	9.5	12.5		
5.2GHZ (U-NII 1)			36	5180	8.91	8.51	11.73	9.5	9.5	12.5		
	802.11ax	MCSO	40	5200	8.83	8.34	11.60	9.5	9.5	12.5	No	No
	(HE20)	MCS0	44	5220	8.70	8.31	11.52	9.5	9.5	12.5	NO	NU
			48	5240	8.69	8.37	11.54	9.5	9.5	12.5		
	802.11n	MCS0	38	5190	8.74	8.26	11.52	9.5	9.5	12.5	No	No
	(HT40)	IVICS0	46	5230	9.15	8.54	11.87	9.5	9.5	12.5	INO	INO
	802.11ac	MCS0	38	5190	9.18	8.80	12.01	9.5	9.5	12.5	No	No
	(VHT40)	IVIC-50	46	5230	9.11	8.60	11.88	9.5	9.5	12.5	NO	NU
	802.11ax		38	5190	9.07	8.71	11.91	9.5	9.5	12.5	No	No
	(HE40)	IVICOU	46	5230	9.06	8.66	11.88	9.5	9.5	12.5	NU	UNU UNI
	802.11ac (VHT80)	MCS0	42	5210	9.24	8.78	12.03	9.5	9.5	12.5	Yes	Yes
	802.11ax (HE80)	MCS0	42	5210	9.13	8.65	11.91	9.5	9.5	12.5	No	No



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Measured Results

Image matrix	neusu	rea Re	<u> 30113</u>		_	Moo			Tu	ao un Limit (di	2m)	SA P Tool	(Vac/No)
	Band	Mode	Data Rate	Ch #	Freq. (MHz)								<u> </u>
<t< td=""><td></td><td></td><td></td><td>50</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>iviain</td><td>Aux</td></t<>				50								iviain	Aux
No. No. No. No. No. No. No. No. HO.11 No. Soc.												-	
Image: border interms		802.11a	6 Mbps									No	No
94.14 (1970) 94.06 (1970) 10.06 (1970) 94.06 (1970) 94.01 (1970) 94.01 (1970) 94.01 (1970) 94.01 (1970) </td <td></td> <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>				-									
</td <td></td> <td></td> <td></td> <td>÷.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>				÷.									
				52	5260		9.11				12.5		
Intro Intro <t< td=""><td></td><td></td><td>MCS0</td><td>56</td><td>5280</td><td>9.25</td><td>9.15</td><td>12.21</td><td>9.5</td><td>9.5</td><td>12.5</td><td>No</td><td>No</td></t<>			MCS0	56	5280	9.25	9.15	12.21	9.5	9.5	12.5	No	No
Matrix (MAR2) (MAR2) Home (MAR2) (MAR2) Home (MAR2) Home (MAR2) Home (MAR2) Home (MAR2) Home (MAR2) Home (MAR2) Home (MAR2) Home (MAR2) Home (MAR2) Home (MAR2		(HT20)		60	5300	9.31	9.19	12.26	9.5	9.5	12.5		
1 + 10 + 10 + 10 + 10 + 10 + 10 + 10 +				64	5320	9.20	9.04	12.13	9.5	9.5	12.5		
Image Image <th< td=""><td></td><td></td><td></td><td>52</td><td>5260</td><td>9.18</td><td>9.05</td><td>12.13</td><td>9.5</td><td>9.5</td><td>12.5</td><td></td><td></td></th<>				52	5260	9.18	9.05	12.13	9.5	9.5	12.5		
Sector Control Bod Sector Bod		802.11ac	MCCO	56	5280	9.30	9.14	12.23	9.5	9.5	12.5	No	No
Mode (HED) Hole (HED) Hole (H		(VHT20)	INC-SU	60	5300	9.17	9.07	12.13	9.5	9.5	12.5	INO	INO
	=			64	5320	9.19	9.10	12.16	9.5	9.5	12.5		
bi in main m				52	5260	9.15	9.12	12.15	9.5	9.5	12.5		
(H20) (H20) 000 0300 0.20 0.10 0.20 0.80 0.80 0.80 0.80 80:111 MC0 64 520 0.10 0.10 0.80 0.80 0.80 0.20 0.80 0.80 0.80 0.20 0.80 0.80 0.80 0.20 0.80 0.	()	802.11ax		56	5280	9.13	9.05	12.10	9.5	9.5	12.5		
Image Image <t< td=""><td></td><td></td><td>MCS0</td><td>60</td><td>5300</td><td>9.21</td><td>9.17</td><td>12.20</td><td>9.5</td><td>9.5</td><td>12.5</td><td>No</td><td>No</td></t<>			MCS0	60	5300	9.21	9.17	12.20	9.5	9.5	12.5	No	No
80110 (0.11) (-								1	
(initia)		902.11#								9.5			
Norther No.1140;			MCS0									No	No
(\u0396 \u03													
600 147: (W12) (W12			MCS0									No	No
(rife) (W148) (W148) (W148) (W148) (W148)6865355309.989.90012.339.969.9612.52M0M0W1480 (W1480) (W1480)M63065852809.309.01012.320.550.5512.5M0M0W1480 (W1480)M630658052009.029.0712.339.859.550.5512.5M0M0M0W149 (W149)M05912.140.509.159.0712.159.559.5512.5M012.5W141 (W120)M0590.119.01012.150.550.5512.51													
Image <td></td> <td></td> <td>MCS0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>No</td> <td>No</td>			MCS0									No	No
Ivation (PER) (PER)Ivation (PER)				62	5310	9.18	9.06	12.13	9.5	9.5	12.5		
00.11m (H2) (H2) (H2) (H2)M250M20S2009.009.009.1249.059.			MCS0	58	5290	9.36	9.27	12.32	9.5	9.5	12.5	Yes	Yes
(HEB) (HEB) <th< td=""><td></td><td>802.11ax</td><td>MCSO</td><td>58</td><td>5290</td><td>9.30</td><td>9.16</td><td>12 24</td><td>9.5</td><td>95</td><td>12.5</td><td>No</td><td>No</td></th<>		802.11ax	MCSO	58	5290	9.30	9.16	12 24	9.5	95	12.5	No	No
NoNoNoNoNoNoNoNoNoNoNoNo80:11a66000.100.0712.130.500.550.5512.514067000.150.0512.110.550.5512.514467000.160.0612.110.550.5512.511055000.1112.150.550.5512.511112256000.110.110.550.5512.511112256000.160.0712.130.550.5512.511112256000.160.0712.120.550.5512.511212256000.160.0312.150.550.5512.511112455000.160.0312.110.550.5512.511112455000.160.0312.110.550.5512.511111110150011112.150.5512.51111111011011111110.550.5512.5111 <td< td=""><td></td><td>(HE80)</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>140</td><td>140</td></td<>		(HE80)										140	140
802.11a 802.11a80.8bp124 152 164090.10 1709.17 171 1709.5 171 17				-								-	
802.11a 6 Mpip 132 5660 9.19 9.10 12.15 9.5 9.5 12.5 14.5 140 5700 0.15 0.05 12.11 0.5 0.55 12.5 10.5				-									
1 1		802 11a	6 Mbps	124	5620	9.17	9.07	12.13	9.5	9.5	12.5	No	No
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Solution (H20) MCS0 100 5800 9.19 9.08 12.15 9.5 9.5 12.5 9.5 12.5 802.11n (H20) MCS0 118 5680 9.16 9.07 12.13 9.5 9.5 12.5				140	5700	9.15	9.05	12.11	9.5	9.5	12.5		
802.11n (H720) NRS0 116 5800 9.20 9.11 12.17 9.5 9.5 12.5 140 5700 9.16 9.00 12.10 9.5 9.5 12.5 140 5700 9.16 9.08 12.10 9.5 9.5 12.5 140 5700 9.16 9.08 12.15 9.5 9.5 12.5 100 5800 0.16 9.08 12.11 9.5 9.5 12.5 802.11ac 116 5800 9.16 9.05 12.11 9.5 9.5 12.5 802.11ac 116 5800 9.16 9.05 12.11 9.5 9.5 12.5 110 5800 9.05 12.11 9.5 9.5 12.5 12.5 12.5 12.5 110 5800 9.20 9.11 12.15 9.5 12.5 12.5 12.5 110 5800 9.21 9.05 12.15 9.5				144	5720	9.17	9.13	12.16	9.5	9.5	12.5	-	
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No Interface Inte		802.11ac		124	5620	9.21	9.09	12.16	9.5	9.5	12.5	1	
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5.5GHz (LNI 2C) 100 5500 9.19 9.12 12.17 9.5 9.5 12.5 802.11ax (HE20) MCS0 116 5580 9.20 9.11 12.17 9.5 9.5 12.5 124 5620 9.22 9.08 12.16 9.5 9.5 12.5 140 5700 9.20 9.08 12.15 9.5 9.5 12.5 140 5700 9.20 9.08 12.16 9.5 9.5 12.5 140 5700 9.20 9.06 12.16 9.5 9.5 12.5 110 5550 9.21 9.15 12.16 9.5 9.5 12.5 111 5550 9.21 9.15 12.16 9.5 9.5 12.5 111 5550 9.23 9.14 12.17 9.5 9.5 12.5 112 5710 9.16 9.08 12.18 9.5 9.5 12.5 118 </td <td></td>													
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S.SGHz (LFNI2C) Index		(HE20)										-	
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802.11n (HT40) MCS0 118 5590 9.18 9.14 12.17 9.5 9.5 12.5 126 5630 9.25 9.14 12.11 9.5 9.5 12.5 134 5670 9.23 9.10 12.18 9.5 9.5 12.5 142 5710 9.17 9.14 12.17 9.5 9.5 12.5 142 5710 9.17 9.14 12.17 9.5 9.5 12.5 802.11ac (VHT40) MCS0 110 5550 9.23 9.14 12.20 9.5 9.5 12.5 110 5550 9.23 9.14 12.20 9.5 9.5 12.5 118 5690 9.24 9.12 12.16 9.5 9.5 12.5 114 5670 9.24 9.12 12.16 9.5 9.5 12.5 142 5710 9.16 9.09 12.14 9.5 9.5 12.5	(U-NII 2C)			102	5510	9.22	9.06	12.16	9.5	9.5	12.5		
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Instruct of the second secon			MCS0	-								No	No
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(VIII40) 126 5630 9.17 9.10 12.15 9.5 9.5 12.5 134 5670 9.24 9.12 12.19 9.5 9.5 12.5 142 5710 9.16 9.09 12.14 9.5 9.5 12.5 102 5510 9.20 9.12 12.17 9.5 9.5 12.5 110 5550 9.23 9.11 11.218 9.5 9.5 12.5 110 5550 9.23 9.11 12.18 9.5 9.5 12.5 110 5550 9.23 9.11 12.18 9.5 9.5 12.5 1110 5550 9.23 9.11 12.18 9.5 9.5 12.5 1126 5630 9.21 9.13 12.17 9.5 9.5 12.5 1141 5670 9.17 9.07 12.13 9.5 9.5 12.5 1142 5710 9.17 <			MCS0	-								No	No
Index 142 5710 9.16 9.09 12.14 9.5 9.5 12.5 142 5710 9.16 9.09 12.14 9.5 9.5 12.5 142 5510 9.20 9.12 12.17 9.5 9.5 12.5 110 5550 9.23 9.11 12.18 9.5 9.5 12.5 118 5590 9.19 9.12 12.17 9.5 9.5 12.5 118 5590 9.19 9.12 12.17 9.5 9.5 12.5 1142 5610 9.19 9.12 12.17 9.5 9.5 12.5 1143 5670 9.19 9.12 12.17 9.5 9.5 12.5 1142 5710 9.17 9.07 12.13 9.5 9.5 12.5 802.11ac MCS0 122 5610 9.36 9.23 12.37 9.5 9.5 12.5 802.11ax		(VH140)											
MCS0 102 5510 9.20 9.12 12.17 9.5 9.5 12.5 110 5550 9.23 9.11 12.18 9.5 9.5 12.5 110 5550 9.23 9.11 12.18 9.5 9.5 12.5 118 5590 9.19 9.12 12.17 9.5 9.5 12.5 1126 5630 9.21 9.13 12.18 9.5 9.5 12.5 126 5630 9.21 9.13 12.18 9.5 9.5 12.5 134 5670 9.19 9.12 12.17 9.5 9.5 12.5 142 5710 9.17 9.07 12.13 9.5 9.5 12.5 802.11ac (VH780) MCS0 122 5610 9.36 9.32 12.31 9.5 9.5 12.5 138 5690 9.33 9.28 12.31 9.5 9.5 12.5 802.11ax (HE80		1										1	
MCS0 110 5550 9.23 9.11 12.18 9.5 9.5 12.5 118 5590 9.19 9.12 12.17 9.5 9.5 12.5 118 5590 9.21 9.13 12.17 9.5 9.5 12.5 126 5630 9.21 9.13 12.18 9.5 9.5 12.5 134 5670 9.19 9.12 12.17 9.5 9.5 12.5 142 5710 9.17 9.07 12.13 9.5 9.5 12.5 802.11ax (VHR80) MCS0 122 5610 9.36 9.32 12.35 9.5 9.5 12.5 802.11ax (HE80) MCS0 122 5610 9.28 12.31 9.5 9.5 12.5 802.11ax (HE80) MCS0 122 5610 9.26 9.17 12.22 9.5 9.5 12.5				142	5710	9.16	9.09	12.14	9.5	9.5	12.5		
802.11ax (HE40) MCS0 118 5590 9.19 9.12 12.17 9.5 9.5 12.5 126 5630 9.21 9.13 12.18 9.5 9.5 12.5 134 5670 9.19 9.12 12.17 9.5 9.5 12.5 142 5710 9.17 9.07 12.13 9.5 9.5 12.5 802.11ac (VH780) MCS0 122 5610 9.36 9.32 12.35 9.5 9.5 12.5 802.11ax (HE80) MCS0 122 5610 9.36 9.32 12.31 9.5 9.5 12.5 802.11ax (HE80) MCS0 106 5530 9.29 9.19 12.25 9.5 9.5 12.5 802.11ax (HE80) MCS0 122 5610 9.26 9.17 12.22 9.5 9.5 12.5				102	5510	9.20	9.12	12.17	9.5	9.5	12.5		
(HE40) MCS0 126 5630 9.21 9.13 12.18 9.5 9.5 12.5 134 5670 9.19 9.12 12.17 9.5 9.5 12.5 142 5710 9.17 9.07 12.13 9.5 9.5 12.5 802.11ac (VH780) MCS0 122 5610 9.36 9.32 12.31 9.5 9.5 12.5 802.11ax (VH780) MCS0 122 5610 9.36 9.32 12.31 9.5 9.5 12.5 802.11ax (VH780) MCS0 106 5530 9.29 9.19 12.21 9.5 9.5 12.5 802.11ax (VH780) MCS0 122 5610 9.26 9.17 12.22 9.5 9.5 12.5 802.11ax (HE80) MCS0 122 5610 9.26 9.17 12.22 9.5 9.5 12.5				110	5550	9.23	9.11	12.18	9.5	9.5	12.5]	
(HE40) MCS0 126 5630 9.21 9.13 12.18 9.5 9.5 12.5 134 5670 9.19 9.12 12.17 9.5 9.5 12.5 142 5710 9.17 9.07 12.13 9.5 9.5 12.5 802.11ac (VH780) MCS0 122 5610 9.36 9.32 12.31 9.5 9.5 12.5 802.11ax (VH780) MCS0 122 5610 9.36 9.32 12.31 9.5 9.5 12.5 802.11ax (VH780) MCS0 106 5530 9.29 9.19 12.21 9.5 9.5 12.5 802.11ax (VH780) MCS0 122 5610 9.26 9.17 12.22 9.5 9.5 12.5 802.11ax (HE80) MCS0 122 5610 9.26 9.17 12.22 9.5 9.5 12.5		802.11ax		118	5590	9.19	9.12	12.17	9.5	9.5	12.5	1	l
134 5670 9.19 9.12 12.17 9.5 9.5 12.5 142 5710 9.17 9.07 12.13 9.5 9.5 12.5 802.11ac (VH780) MCS0 122 5610 9.36 9.32 12.35 9.5 9.5 12.5 802.11ac (VH780) MCS0 122 5610 9.36 9.32 12.35 9.5 9.5 12.5 802.11ac (HE80) MCS0 122 5610 9.33 9.28 12.31 9.5 9.5 12.5 802.11ac (HE80) MCS0 122 5610 9.26 9.17 12.22 9.5 9.5 12.5			MCSO									No	No
Id2 5710 9.17 9.07 12.13 9.5 9.5 12.5 802.11ac (VH780) MCS0 106 5530 9.39 9.34 12.37 9.5 9.5 12.5 802.11ac (VH780) MCS0 122 5610 9.36 9.32 12.35 9.5 9.5 12.5 802.11ax (HE80) MCS0 106 5530 9.29 9.19 12.25 9.5 9.5 12.5 802.11ax (HE80) MCS0 122 5610 9.26 9.17 12.22 9.5 9.5 12.5				-								1	
B02.11ac (VH780) MCS0 106 5530 9.39 9.34 12.37 9.5 9.5 12.5 302.11ac (HEB0) MCS0 122 5610 9.36 9.32 12.35 9.5 9.5 12.5 Yes Yes Yes 802.11ac (HEB0) MCS0 106 5530 9.29 9.19 12.25 9.5 9.5 12.5		1		-								1	
802.11ac (VH780) MCS0 122 5610 9.36 9.32 12.35 9.5 9.5 12.5 Yes Yes 802.11ax (HE80) MCS0 122 5610 9.36 9.32 12.31 9.5 9.5 12.5 Yes Yes													
(VHT80) MCS0 122 5610 9.36 9.32 12.35 9.5 9.5 12.5 Yes Yes 138 5690 9.33 9.28 12.31 9.5 9.5 12.5 Yes Yes Yes 802.11ax (HE80) MCS0 106 5530 9.29 9.19 12.25 9.5 9.5 12.5		802.11ac	1000										N.S.
MCS0 106 5530 9.29 9.19 12.25 9.5 9.5 12.5 MCS0 122 5610 9.26 9.17 12.22 9.5 9.5 12.5 No No			MCS0									Yes	Yes
802.11ax (HE80) MCS0 122 5610 9.26 9.17 12.22 9.5 9.5 12.5 No No													
(HE80) MCS0 122 5610 9.26 9.17 12.22 9.5 9.5 12.5 NO NO		802 11 94										1	
138 5690 9.22 9.12 12.18 9.5 9.5 12.5			MCS0	122	5610	9.26	9.17	12.22	9.5	9.5	12.5	No	No
		/		138	5690	9.22	9.12	12.18	9.5	9.5	12.5		

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Measured Results

Band	Mode	Data Rate	Ch #	Freq.	Mea	s. Avg Pwr (o	dBm)	Tur	ne-up Limit (dBm)		SAR Test	: (Yes/No)
Danu	wode	Data Rate	Un#	(MHz)	Main	Aux	Total	Main	Aux	Total	Main	Aux
			149	5745	9.76	9.17	12.48	10.0	10.0	13.0		
	802.11a	6 Mbps	157	5785	9.69	9.22	12.47	10.0	10.0	13.0	No	No
			165	5825	9.18	9.51	12.35	10.0	10.0	13.0		
			149	5745	9.69	9.40	12.56	10.0	10.0	13.0		
	802.11n (HT20)	MCS0	157	5785	9.61	9.40	12.52	10.0	10.0	13.0	No	No
	(,		165	5825	9.77	9.48	12.64	10.0	10.0	13.0		
			149	5745	9.42	9.60	12.52	10.0	10.0	13.0		
	802.11ac (VHT20)	MCS0	157	5785	9.41	9.73	12.58	10.0	10.0	13.0	No	No
	(11120)		165	5825	9.14	9.25	12.21	10.0	10.0	13.0		
5.8GHz			149	5745	9.77	9.27	12.54	10.0	10.0	13.0		
5.8GHZ (U-NII 3)	802.11ax (HE20)	MCS0	157	5785	9.73	9.34	12.55	10.0	10.0	13.0	No	No
. ,	(165	5825	9.37	8.81	12.11	10.0	10.0	13.0		
	802.11n	MCS0	151	5755	9.50	9.27	12.40	10.0	10.0	13.0	No	No
	(HT40)	10030	159	5795	9.06	9.43	12.26	10.0	10.0	13.0	NO	NO
	802.11ac	MCS0	151	5755	9.59	9.46	12.54	10.0	10.0	13.0	No	No
	(VHT40)	INCOU	159	5795	9.21	9.03	12.14	10.0	10.0	13.0	140	140
	802.11ax	MCS0	151	5755	9.38	9.69	12.55	10.0	10.0	13.0	No	No
	(HE40)	IVICOU	159	5795	9.33	8.95	12.16	10.0	10.0	13.0	NU	NU
	802.11ac (VHT80)	MCS0	155	5775	9.74	9.20	12.49	10.0	10.0	13.0	Yes	Yes
	802.11ax (HE80)	MCS0	155	5775	9.13	8.82	11.99	10.0	10.0	13.0	No	No



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9 Measured and Reported (Scaled) SAR Results

9.1 Wi-Fi (DTS Band)

Frequency	RF			Dist.			Freq.		Pow er	(dBm)	1-g SAF	R (W/kg)	Plot
Band	Exposure Conditions	Mode	Antenna	(mm)	Test Position	Ch #.	(MHz)	Duty Cycle	Tune-up Limit	Meas.	Meas.	Scaled	No.
					Front	6	2437	99.90%	16.0	15.82	0.126	0.13	
					Rear	6	2437	99.90%	16.0	15.82	0.105	0.11	
2.4GHz	Standalone	802.11b	SISO	0	Edge 1	6	2437	99.90%	16.0	15.82	0.004	0.00	
2.40112	Stanualone	002.110	Main	0	Edge 4	1	2412	99.90%	16.0	15.72	0.822	0.88	
					Edge 4	6	2437	99.90%	16.0	15.82	1.030	1.07	
					Edge 4	11	2462	99.90%	16.0	15.77	1.150	1.21	1
					Front	6	2437	99.90%	16.0	15.73	0.077	0.08	
					Rear	6	2437	99.90%	16.0	15.73	0.072	0.08	
2.4GHz	Standalone	802.11b	SISO	0	Edge 2	6	2437	99.90%	16.0	15.73	0.000	0.00	
2.4012	Stariualone	802.110	Aux	0	Edge 3	1	2412	99.90%	16.0	15.61	0.862	0.94	
					Edge 3	6	2437	99.90%	16.0	15.73	0.970	1.03	
					Edge 3	11	2462	99.90%	16.0	15.62	1.170	1.28	2

9.2 Wi-Fi (U-NII Band)

Frequency	RF			Dist.			Freq.		Pow er	(dBm)	1-g SAI	R (W/kg)	Plot
Band	Exposure Conditions	Mode	Antenna	(mm)	Test Position	Ch #.	(MHz)	Duty Cycle	Tune-up Limit	Meas.	Meas.	Scaled	No.
					Front	42	5210	97.53%	9.5	9.24	0.064	0.07	
5.2GHz	Standalone	802.11ac	SISO	0	Rear	42	5210	97.53%	9.5	9.24	0.057	0.06	
(U-NII 1)	Stanualone	(VHT80)	Main	0	Edge 1	42	5210	97.53%	9.5	9.24	0.000	0.00	
					Edge 4	42	5210	97.53%	9.5	9.24	1.030	1.12	3
					Front	42	5210	97.53%	9.5	8.78	0.056	0.07	
5.2GHz	Standalone	802.11ac	SISO	0	Rear	42	5210	97.53%	9.5	8.78	0.028	0.03	
(U-NII 1)	Standalone	(VHT80)	Aux	0	Edge 2	42	5210	97.53%	9.5	8.78	0.000	0.00	
					Edge 3	42	5210	97.53%	9.5	8.78	1.010	1.22	4
			010.0		Front	58	5290	97.53%	9.5	9.36	0.043	0.05	
5.3 (U-NII 2A)	Standalone	802.11ac (VHT80)	SISO Main	0	Rear	58	5290	97.53%	9.5	9.36	0.042	0.04	
(U-INIIZA)		(100)	IVIAILU		Edge 4	58	5290	97.53%	9.5	9.36	0.735	0.78	7
					Front	58	5290	97.53%	9.5	9.27	0.052	0.06	
5.3 (U-NII 2A)	Standalone	802.11ac (VHT80)	SISO	0	Rear	58	5290	97.53%	9.5	9.27	0.040	0.04	
(U-INIIZA)		(100)	Aux		Edge 3	58	5290	97.53%	9.5	9.27	1.030	1.11	8
					Front	106	5530	97.53%	9.5	9.39	0.071	0.07	
			0.00		Rear	106	5530	97.53%	9.5	9.39	0.048	0.05	
5.5 (U-NII 2C)	Standalone	802.11ac (VHT80)	SISO Main	0	Edge 4	106	5530	97.53%	9.5	9.39	0.747	0.79	
(U-INII 2C)		(100)	IVIAILU		Edge 4	122	5610	97.53%	9.5	9.36	0.817	0.87	
					Edge 4	138	5690	97.53%	9.5	9.33	1.040	1.11	9
					Front	106	5530	97.53%	9.5	9.34	0.035	0.04	
			0.00		Rear	106	5530	97.53%	9.5	9.34	0.035	0.04	
5.5 (U-NII 2C)	Standalone	802.11ac (VHT80)	SISO Aux	0	Edge 3	106	5530	97.53%	9.5	9.34	0.656	0.70	
(U-INII 2C)		(100)	Aux		Edge 3	122	5610	97.53%	9.5	9.32	0.558	0.60	
					Edge 3	138	5690	97.53%	9.5	9.28	0.932	1.01	10
					Front	155	5775	97.53%	10.0	9.74	0.106	0.12	
5.8	o	802.11ac	SISO		Rear	155	5775	97.53%	10.0	9.74	0.061	0.07	
(U-NII 3)	Standalone	(VHT80)	Main	0	Edge 1	155	5775	97.53%	10.0	9.74	0.000	0.00	
					Edge 4	155	5775	97.53%	10.0	9.74	0.919	1.00	5
					Front	155	5775	97.53%	10.0	9.20	0.089	0.11	
5.8	0	802.11ac	SISO	<u>,</u>	Rear	155	5775	97.53%	10.0	9.20	0.062	0.08	
(U-NII 3)	Standalone	(VHT80)	Aux	0	Edge 2	155	5775	97.53%	10.0	9.20	0.000	0.00	
					Edge 3	155	5775	97.53%	10.0	9.20	1.000	1.23	6



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10 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.



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Wi-Fi (DTS Band)

Frequency	RF			Dist.			Freq.		Meas. SA	AR (W/kg)	Largest to
Band	Exposure Conditions	Mode	Antenna	(mm)	Test Position	Ch #.	(MHz)	Duty Cycle	Original	Repeated	Smallest SAR Ratio
2.4GHz	Standalone	802.11b	SISO Main	0	Edge 4	11	2462	99.9%	1.150	1.140	1.01
2.4GHz	Standalone	802.11b	SISO Aux	0	Edge 3	11	2462	99.9%	1.170	1.170	1.00

Wi-Fi (U-NII Band)

RF			Dist			Freq		Meas. SAR (W/kg)		Largest to
Exposure Conditions	Mode	Antenna	(mm)	Lest Position (Ch #		(MHz)	Duty Cycle	Original	Repeated	Smallest SAR Ratio
Standalone	802.11ac	SISO	0	Edge 4	42	5210	97.5%	1.030	0.927	1.11
	(VHT80)	Main	-	- 5 -						
Standalone	802.11ac	SISO	0	Edge 3	42	5210	97.5%	1.010	0.973	1.04
	(VHI80)	Aux		Ŭ						
Standalone	802.11ac	SISO	0	Edge 3	58	5290	97.53%	1.030	0.959	1.07
	(VHT80)	Aux	-	- 5						
Standalone	802.11ac	SISO	0	Edge 4	138	5690	97 53%	1 040	0.956	1.09
etandalerie	(VHT80)	Main	•	_090 .		0000	01.0070		0.000	
Standalone	802.11ac	SISO	0	Edge 3	138	5690	97 53%	0 932	0.917	1.02
otaridaloric	(VHT80)	Aux	0	Luge 0	100	0000	57.5576	0.002	0.017	1.02
Standalono	802.11ac	SISO	0	Edgo 4	155	5775	07 53%	0.010	0.043	1.03
Standalone	(VHT80)	Main	0	Luge 4	100	5//5	31.3376	0.315	0.945	1.05
Standalone	802.11ac	SISO	0	Edge 4	155	5775	07 53%	1 000	1 010	1.01
StanualOffe	(VHT80)	Aux	0	Luge 4	100	5/75	91.33%	1.000	1.010	1.01
	Exposure Conditions Standalone Standalone	Exposure ConditionsModeStandalone802.11ac (VHT80)Standalone802.11ac (VHT80)Standalone802.11ac (VHT80)Standalone802.11ac (VHT80)Standalone802.11ac (VHT80)Standalone802.11ac (VHT80)Standalone802.11ac (VHT80)Standalone802.11ac (VHT80)Standalone802.11ac (VHT80)Standalone802.11ac (VHT80)	Exposure ConditionsModeAntennaStandalone802.11acSISOStandalone(VHT80)MainStandalone802.11acSISO(VHT80)AuxAuxStandalone802.11acSISO(VHT80)AuxAuxStandalone802.11acSISO(VHT80)AuxAuxStandalone802.11acSISO(VHT80)MainMainStandalone802.11acSISO(VHT80)AuxAuxStandalone802.11acSISO(VHT80)MainMainStandalone802.11acSISO	Exposure ConditionsModeAntennaDist. (mm)Standalone802.11acSISO0(VHT80)Main0Standalone802.11acSISO0(VHT80)Aux0Standalone802.11acSISO0(VHT80)Aux0Standalone802.11acSISO0Standalone802.11acSISO0Standalone802.11acSISO0Standalone802.11acSISO0Standalone802.11acSISO0Standalone802.11acSISO0Standalone802.11acSISO0Standalone802.11acSISO0	Exposure ConditionsModeAntennaDist. (mm)Test PositionStandalone802.11ac (VHT80)SISO Main0Edge 4Standalone802.11ac (VHT80)SISO Aux0Edge 3Standalone802.11ac (VHT80)SISO Aux0Edge 3Standalone802.11ac (VHT80)SISO Aux0Edge 3Standalone802.11ac (VHT80)SISO Aux0Edge 3Standalone802.11ac (VHT80)SISO Main0Edge 4Standalone802.11ac (VHT80)SISO Aux0Edge 3Standalone802.11ac (VHT80)SISO Aux0Edge 3Standalone802.11ac (VHT80)SISO Main0Edge 4Standalone802.11ac (VHT80)SISO Main0Edge 4	Exposure ConditionsModeAntennaDist. (mm)Test PositionCh #.Standalone802.11ac (VHT80)SISO Main0Edge 442Standalone802.11ac (VHT80)SISO Aux0Edge 342Standalone802.11ac (VHT80)SISO Aux0Edge 342Standalone802.11ac (VHT80)SISO Aux0Edge 358Standalone802.11ac (VHT80)SISO Aux0Edge 4138Standalone802.11ac (VHT80)SISO Main0Edge 4138Standalone802.11ac (VHT80)SISO Aux0Edge 3138Standalone802.11ac (VHT80)SISO Main0Edge 4155Standalone802.11ac (VHT80)SISO Main0Edge 4155	Exposure ConditionsModeAntennaDist. (mm)Test PositionCh #.Freq. (MHz)Standalone802.11ac (VHT80)SISO Main0Edge 4425210Standalone802.11ac (VHT80)SISO Aux0Edge 3425210Standalone802.11ac (VHT80)SISO Aux0Edge 3425210Standalone802.11ac (VHT80)SISO Aux0Edge 3585290Standalone802.11ac (VHT80)SISO Main0Edge 41385690Standalone802.11ac (VHT80)SISO Aux0Edge 31385690Standalone802.11ac (VHT80)SISO Aux0Edge 41555775Standalone802.11ac (VHT80)SISO Main0Edge 41555775	Exposure ConditionsModeAntennaDist. (mm)Test PositionCh #.Freq. (MHz)Duty CycleStandalone802.11ac (VHT80)SISO Main0Edge 442521097.5%Standalone802.11ac (VHT80)SISO Aux0Edge 342521097.5%Standalone802.11ac (VHT80)SISO Aux0Edge 342521097.5%Standalone802.11ac (VHT80)SISO Aux0Edge 358529097.53%Standalone802.11ac (VHT80)SISO Main0Edge 4138569097.53%Standalone802.11ac (VHT80)SISO Aux0Edge 3138569097.53%Standalone802.11ac (VHT80)SISO Aux0Edge 4155577597.53%Standalone802.11ac (VHT80)SISO Main0Edge 4155577597.53%	Exposure ConditionsModeAntennaDist. (mm)Test PositionCh #.Freq. (MHz)Duty CycleOriginalStandalone802.11ac (VHT80)SISO Main0Edge 442521097.5%1.030Standalone802.11ac (VHT80)SISO Aux0Edge 342521097.5%1.010Standalone802.11ac (VHT80)SISO Aux0Edge 358529097.53%1.030Standalone802.11ac (VHT80)SISO Aux0Edge 358529097.53%1.030Standalone802.11ac (VHT80)SISO Main0Edge 4138569097.53%1.040Standalone802.11ac (VHT80)SISO Main0Edge 3138569097.53%0.932Standalone802.11ac (VHT80)SISO Main0Edge 4155577597.53%0.919Standalone802.11ac (VHT80)SISO Main0Edge 4155577597.53%1.000	Exposure ConditionsModeAntennaDist. (mm)Test PositionCh #.Freq. (MHz)Duty CycleInstruction (mg)RepeatedStandalone $802.11ac$ (VHT80)SISO Main0Edge 442521097.5%1.0300.927Standalone $802.11ac$ (VHT80)SISO Aux0Edge 342521097.5%1.0100.973Standalone $802.11ac$ (VHT80)SISO Aux0Edge 358529097.53%1.0300.959Standalone $802.11ac$ (VHT80)SISO Aux0Edge 4138569097.53%1.0400.956Standalone $802.11ac$ (VHT80)SISO Main0Edge 3138569097.53%0.9320.917Standalone $802.11ac$ (VHT80)SISO Aux0Edge 4155577597.53%0.9190.943Standalone $802.11ac$ (VHT80)SISO Aux0Edge 4155577597.53%1.0001.010

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 < 1.20.



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11 Simultaneous Transmission SAR Analysis

KDB 447498 D04 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 D04 General RF Exposure Guidance explains how to calculate the SAR to Peak Location Ratio (SPLSR) between pairs of simultaneously transmitting antennas:

SPLSR = (SAR₁ + SAR₂)^{1.5} /Ri

Where:

SAR₁ is the highest measured or estimated SAR for the first of a pair of simultaneous transmitting antennas, in a specific test operating mode and exposure condition

SAR₂ is the highest measured 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:

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

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 SAR1.or SAR2. 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



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Simultaneous Transmission Condition

RF Exposure Condition	Item	Capable Transmit Configurations							
Standalone	1	DTS (Main) + DTS (Aux)							
	2	U-NII (Main) + U-NII (Aux)							



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Estimated SAR for Simultaneous Transmission SAR Analysis Considerations for SAR estimation

- 1. When standalone SAR test exclusion applies, standalone SAR must also be estimated to determine simultaneous transmission SAR test exclusion.
- Please refer to <u>Estimated SAR Tables</u> to see which test positions are inherently compliant as they consist of only estimated SAR values for all applicable transmitters and consequently will always have sum of SAR values < 1.2 W/kg. Simultaneous transmission SAR analysis was therefore not performed for these test positions.
- 3. Refer to Appendix E of KDB 447498 D04 and multiply the corresponding ratio by the 1-g SAR limit of 1.6 W/kg SAR.

SAR_{est} is given by:

SARest = 1.6 * Pant / Pth [W/kg]

Estimated SAR for 1.5 GHz $\leq f \leq 6$ GHz

Tx	Frequency	Output	Power	Antenna Gain	ERP	ERP Threshold		S	paration D	listances (c	m)				P _{th} (r	mW)				Esti	mated 1-g S	AR Value (W	//kg)	
Interface	(GHz)	dBm	mW	(dBi)	(dBm)	(mW)	Front	Rear	Edge1	Edge2	Edge3	Edge4	Front	Rear	Edge1	Edge2	Edge3	Edge4	Front	Rear	Edge1	Edge2	Edge 3	Edge 4
WiFi 2.4GHz(Main)	2.462	16.00	40	-1.84	12.01	15.89	0.5	0.5	1.5	28	24.5	0.5	3	3	22	3060	3060	3	-MEASURE-	-MEASURE-	-MEASURE-	0.02	0.02	-MEASURE-
WiFi 5.2GHz(Main)	5.24	9.50	9	0.64	7.99	6.30	0.5	0.5	1.5	28	24.5	0.5	1	1	14	3060	3060	1	-MEASURE-	-MEASURE-	1.03	0.00	0.00	-MEASURE-
WiFi 5.3GHz(Main)	5.32	9.50	9	0.64	7.99	6.30	0.5	0.5	1.5	28	24.5	0.5	1	1	14	3060	3060	1	-MEASURE-	-MEASURE-	1.03	0.00	0.00	-MEASURE-
WiFi 5.5GHz(Main)	5.7	9.50	9	0.64	7.99	6.30	0.5	0.5	1.5	28	24.5	0.5	1	1	14	3060	3060	1	-MEASURE-	-MEASURE-	1.03	0.00	0.00	-MEASURE-
WiFi 5.8GHz(Main)	5.825	10.00	10	0.64	8.49	7.06	0.5	0.5	1.5	28	24.5	0.5	1	1	14	3060	3060	1	-MEASURE-	-MEASURE-	1.14	0.01	0.01	-MEASURE-
WIFi 2.4GHz(Aux)	2.462	16.00	40	-11.01	2.84	1.92	0.5	0.5	33	15	0.5	19.5	3	3	3060	22	3	2916	-MEASURE-	-MEASURE-	0.02	-MEASURE-	-MEASURE-	0.02
WIFi 5.2GHz(Aux)	5.24	9.50	9	-1.62	5.73	3.74	0.5	0.5	33	15	0.5	19.5	1	1	3060	14	1	2904	-MEASURE-	-MEASURE-	0.00	1.03	-MEASURE-	0.00
WIFi 5.3GHz(Aux)	5.32	9.50	9	0.64	7.99	6.30	0.5	0.5	33	15	0.5	19.5	1	1	3060	14	1	2904	-MEASURE-	-MEASURE-	0.00	1.03	-MEASURE-	0.00
WIFi 5.5GHz(Aux)	5.7	9.50	9	0.64	7.99	6.30	0.5	0.5	33	15	0.5	19.5	1	1	3060	14	1	2903	-MEASURE-	-MEASURE-	0.00	1.03	-MEASURE-	0.00
WIFi 5.8GHz(Aux)	5.825	10.00	10	-1.62	6.23	4.20	0.5	0.5	33	15	0.5	19.5	1	1	3060	14	1	2902	-MEASURE-	-MEASURE-	0.01	1.14	-MEASURE-	0.01

11.1 Sum of the SAR for Wi-Fi & Wi-Fi

	S	Standalone	SAR (W/kg	Σ 1-g SAR (W/kg)			
Test Position	D	TS	U-	NII	DTS + DTS	U-NII + U-NII	
Position	Main ①	Aux 2	Main ③	Aux ④	1+2	3+4	
Front	0.13	0.08	0.12	0.11	0.21	0.23	
Rear	0.11	0.08	0.07	0.08	0.19	0.15	
Edge 1	0.00	0.02	1.14	0.01	0.02	1.15	
Edge 2	0.02	0.00	0.01	1.14	0.02	1.15	
Edge 3	0.02	1.28	0.01	1.23	1.30	1.24	
Edge 4	1.21	0.02	1.12	0.01	1.23	1.13	



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12 Equipment List & Calibration Status

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. Date Tested: 02/16/2024 to 02/18/2024

Dielectric Property Measurements							
Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date			
Dielectric Assessment Kit	SPEAG	DAKS-3.5	1053	2024/2/26			
Thermometer	TES	TES-1306	210801061	2024/11/1			

System Check				
Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Signal Generator	Agilent	N5181A	MY 50145826	2024/9/21
Pow er Meter	Anritsu	ML2496A	2136002	2024/11/15
Pow er Sensor	Anritsu	MA2411B	1911386	2024/7/24
Pow er Sensor	Anritsu	MA2411B	1911387	2024/7/24
Dual Directional Coupler	Agilent	772D	MY 46151258	2024/9/25
Amplifier	EMCI	ZVE-8G	980190	N/A
Data Acquisition Electronice	SPEAG	DAE4	856	2024/4/25
Dosimetric E-Field Probe	SPEAG	EX3DV4	3665	2024/8/17
System Validation Dipole	SPEAG	D2450V2	727	2024/4/24
System Validation Dipole	SPEAG	D5GHzV2	1349	2024/3/19
Humidity/Temp meter	TECPEL	DTM-303A	TP131515	2024/6/1
Thermometer	TES	TES-1306	210801061	2024/11/1

Software Version
DASY NEO52 D10.3 S14.6.13
SEMCAD-X-PostPro



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Date Tested: 05/25/2024

Dielectric Property Measurements							
Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date			
Dielectric Assessment Kit	SPEAG	DAKS-3.5	1053	2025/2/20			
Thermometer	TES	TES-1306	210801061	2024/11/1			

<u>System Check</u>				
Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Signal Generator	Agilent	N5181A	MY 50145826	2024/9/21
Pow er Meter	Anritsu	ML2496A	2136002	2024/11/15
Pow er Sensor	Anritsu	MA2411B	1911386	2024/7/24
Pow er Sensor	Anritsu	MA2411B	1911387	2024/7/24
Dual Directional Coupler	Agilent	772D	MY 46151258	2024/9/25
Amplifier	EMCI	ZVE-8G	980190	N/A
Data Acquisition Electronice	SPEAG	DAE4	1751	2025/3/12
Dosimetric E-Field Probe	SPEAG	EX3DV4	3665	2024/8/17
System Validation Dipole	SPEAG	D5GHzV2	1349	2025/3/18
Humidity/Temp meter	TECPEL	DTM-303A	TP131515	2024/6/1
Thermometer	TES	TES-1306	210801061	2024/11/1

Software Version
DASY NEO52 D10.3 S14.6.13
SEMCAD-X-PostPro



13 Facilities

All measurement facilities used to collect the measurement data are located at

No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan.

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14 Appendixes

Exhibit	Content
1	SAR Setup Photos
2	SAR System Check Plots
3	Highest SAR Test Plots
4	SAR DAE and Probe Calibration Certificates
5	SAR Dipole Calibration Certificates

END OF REPORT