
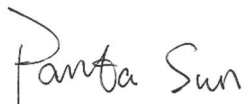


FCC SAR TEST REPORT

Application No.: SEWM2205000044RG
Applicant: DT Research, Inc.
Manufacturer: DT Research, Inc.
Product Name: Mobile Tablet
Model No.(EUT): 316xxxx(x= 0-9, A-Z, - or null, or .,or /), 316T, 316T/MD
Trade Mark: 
FCC ID: YE3600-AX200NG
Standards: FCC 47CFR §2.1093
Date of Receipt: 2022-05-01
Date of Test: 2021-05-03 to 2022-06-08
Date of Issue: 2022-06-08
Test Result: **PASS ***

* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Authorized Signature:



Panta Sun

Wireless Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.



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REVISION HISTORY

Report Number	Revision	Description	Issue Date
SEWM2205000044RG01	01	Original	2022-06-08



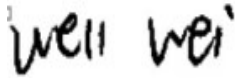
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TEST SUMMARY

Frequency Band	Test position	Max Report SAR1-g (W/kg)	SAR limit (W/kg)
WI-FI (2.4GHz)	Body	1.04	1.6
WI-FI (5GHz)	Body	1.19	1.6
BT	Body	0.20	1.6
Maximum Simultaneous Transmission SAR (W/kg)		1.59	1.6

Reviewed by



Well Wei

Prepared by



Nick Hu



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CONTENTS

1	GENERAL INFORMATION	6
1.1	DETAILS OF CLIENT	6
1.2	TEST LOCATION	6
1.3	TEST FACILITY	7
1.4	GENERAL DESCRIPTION OF EUT	8
1.5	TEST SPECIFICATION	9
1.6	RF EXPOSURE LIMITS	9
2	SAR MEASUREMENTS SYSTEM CONFIGURATION	10
2.1	THE SAR MEASUREMENT SYSTEM	10
2.2	ISOTROPIC E-FIELD PROBE EX3DV4	11
2.3	DATA ACQUISITION ELECTRONICS (DAE)	12
2.4	SAM TWIN PHANTOM	12
2.5	ELI PHANTOM	13
2.6	DEVICE HOLDER FOR TRANSMITTERS	14
2.7	MEASUREMENT PROCEDURE	15
2.7.1	Scanning procedure	15
2.7.2	Data Storage	17
2.7.3	Data Evaluation by SEMCAD	17
3	DESCRIPTION OF TEST POSITION	19
3.1	THE BODY TEST POSITION	19
4	SAR SYSTEM VERIFICATION PROCEDURE	20
4.1	TISSUE SIMULATE LIQUID	20
4.1.1	Recipes for Tissue Simulate Liquid	20
4.1.2	Measurement for Tissue Simulate Liquid	21
4.2	SAR SYSTEM CHECK	22
4.2.1	Justification for Extended SAR Dipole Calibrations	23
4.2.2	Summary System Validation Result(s)	24
4.2.3	Detailed System Check Results	24
5	TEST RESULTS AND MEASUREMENT DATA	25
5.1	OPERATION CONFIGURATIONS	25



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5.1.1 WiFi Test Configuration25

5.1.2 DUT Antenna Locations(Back Veiw)31

5.1.3 EUT side for SAR Testing32

5.2 MEASUREMENT OF RF CONDUCTED POWER.....34

5.2.1 Conducted Power of WIFI and BT34

5.3 MEASUREMENT OF SAR DATA46

5.3.1 SAR Result of WIFI 2.4G47

5.3.2 SAR Result of WIFI 5G.....48

5.3.1 SAR Result of BT51

5.4 MULTIPLE TRANSMITTER EVALUATION.....52

5.4.1 Simultaneous SAR SAR test evaluation52

5.4.2 Simultaneous Transmission SAR Summation Scenario.....52

6 EQUIPMENT LIST53

7 MEASUREMENT UNCERTAINTY54

8 CALIBRATION CERTIFICATE54

9 PHOTOGRAPHS.....54

APPENDIX A: DETAILED SYSTEM CHECK RESULTS55

APPENDIX B: DETAILED TEST RESULTS55

APPENDIX C: & CALIBRATION CERTIFICATE.....55

APPENDIX D: PHOTOGRAPHS55



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1 General Information

1.1 Details of Client

Applicant:	DT Research, Inc.
Address:	3RD FL NO 36 WUQUAN 7TH RD WUGU DISTRICT, NEW TAIPEI, Taiwan
Manufacturer:	DT Research, Inc.
Address:	2000 Concourse Drive, San Jose, CA 95131, USA

1.2 Test Location

Company:	SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd.
Address:	South of No. 6 Plant, No. 1, Runsheng Road, Suzhou Industrial Park, Suzhou Area, China (Jiangsu) Pilot Free Trade Zone
Post code:	215000
Test Engineer :	Leon Xu



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1.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• **A2LA (Certificate No. 6336.01)**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6336.01.

• **Innovation, Science and Economic Development Canada**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0120.

IC#: 27594.

• **FCC –Designation Number: CN1312**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized as an accredited testing laboratory.


Designation Number: CN1312.

Test Firm Registration Number: 717327



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1.4 General Description of EUT

Product Name:	Mobile Tablet		
Model No.(EUT):	316xxxx(x= 0-9, A-Z, - or null, or .,or /), 316T, 316T/MD		
Trade Mark:			
Product Phase:	production unit		
Device Type:	portable device		
Exposure Category:	uncontrolled environment / general population		
SN:	16TW12206D278		
FCC ID:	YE3600-AX200NG		
Hardware Version:	R1.2		
Software Version:	Window 10		
Antenna Type:	PIFA Antenna		
Device Operating Configurations:			
Modulation Mode:	WIFI: DSSS, OFDM, OFDMA; BT: GFSK, $\pi/4$ DQPSK,8DPSK		
Frequency Bands:	Band	Tx (MHz)	Rx (MHz)
	WIFI(2.4GHz)	2412-2472	2412-2472
	WIFI(5GHz)	5150-5250	5150-5250
		5250-5350	5250-5350
		5470-5725	5470-5725
BT	2402-2480	2402-2480	
Battery Information:	Battery Model:	ACC-006-60K(3ICP9/36/115)	
	Nominal Voltage:	11.4V	
	Rated capacity:	5400mAh	
	Manufacture	Guangdong pow-Tech New power Co., Ltd.	



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1.5 Test Specification

Identity	Document Title
FCC 47CFR §2.1093	Radiofrequency Radiation Exposure Evaluation: Portable Devices
ANSI/IEEE Std C95.1 – 1992	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz.
IEEE 1528-2013	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
KDB 248227 D01 v02r02	802.11 Wi-Fi SAR
KDB 616217 D04 v01r02	SAR for laptop and tablets
KDB 447498 D01	General RF Exposure Guidance v06
KDB 447498 D03 v01	Supplement C Cross-Reference
KDB 865664 D01 v01r04	SAR Measurement 100 MHz to 6 GHz
KDB 865664 D02 v01r02	RF Exposure Reporting

1.6 RF exposure limits

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Spatial Peak SAR* (Brain*Trunk)	1.60 mW/g	8.00 mW/g
Spatial Average SAR** (Whole Body)	0.08 mW/g	0.40 mW/g
Spatial Peak SAR*** (Hands/Feet/Ankle/Wrist)	4.00 mW/g	20.00 mW/g

Notes:

- * The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time
 - ** The Spatial Average value of the SAR averaged over the whole body.
 - *** The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.
- Uncontrolled Environments** are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.
- Controlled Environments** are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation.)



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2 SAR Measurements System Configuration

2.1 The SAR Measurement System

This SAR Measurement System uses a Computer-controlled 3-D stepper motor system (SPEAG DASY5 professional system). A E-field probe is used to determine the internal electric fields. The SAR can be obtained from the equation $SAR = \sigma (|E|^2) / \rho$ where σ and ρ are the conductivity and mass density of the tissue-Simulate.

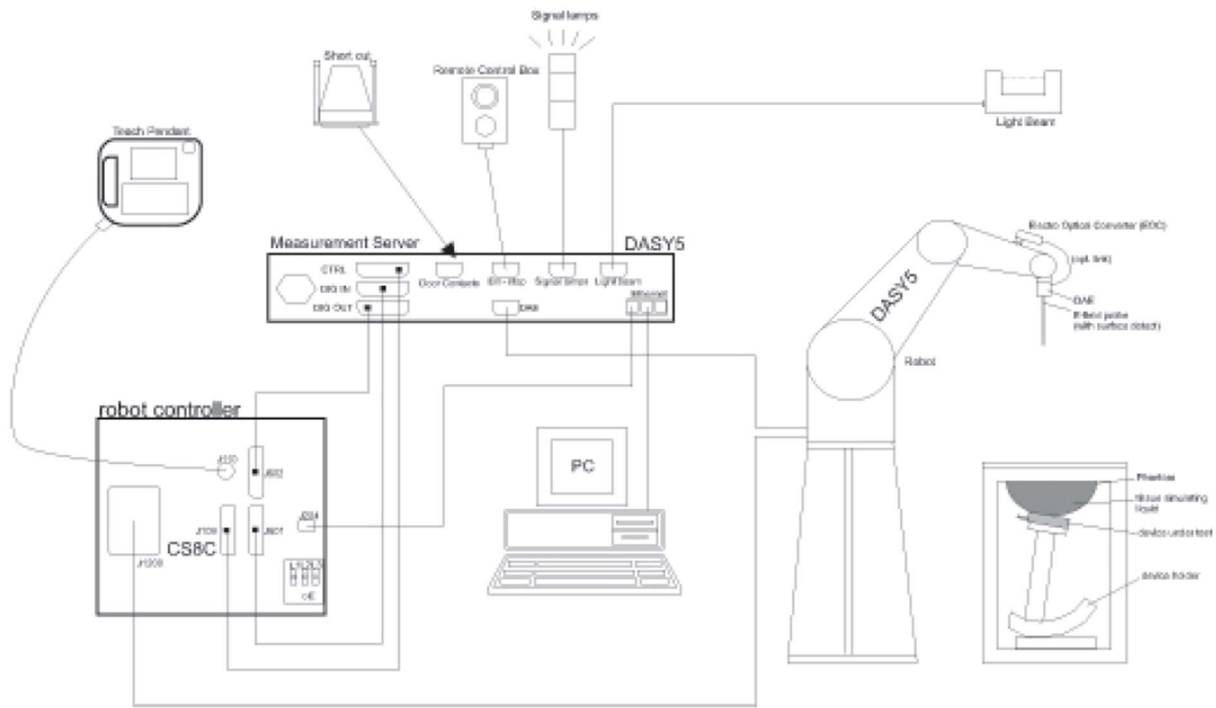
The DASY5 system for performing compliance tests consists of the following items:

A standard high precision 6-axis robot (Stabile RX family) with controller, teach pendant and software .An arm extension for accommodation 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, 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 between optical and electrical of the signals for the digital communication to DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.



F-1. SAR Measurement System Configuration




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- 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.
- DASY5 software.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand, right-hand and Body Worn usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing to validating the proper functioning of the system.

2.2 Isotropic E-field Probe EX3DV4

	<p>Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)</p>
<p>Calibration</p>	<p>ISO/IEC 17025 calibration service available.</p>
<p>Frequency</p>	<p>10 MHz to > 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)</p>
<p>Directivity</p>	<p>± 0.3 dB in TSL (rotation around probe axis) ± 0.5 dB in TSL (rotation normal to probe axis)</p>
<p>Dynamic Range</p>	<p>10 μW/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μW/g)</p>
<p>Dimensions</p>	<p>Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm</p>
<p>Application</p>	<p>High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields); the only probe that enables compliance testing for frequencies up to 6 GHz with precision of better 30%.</p>
<p>Compatibility</p>	<p>DASY3, DASY4, DASY52 SAR and higher, EASY4/MRI</p>



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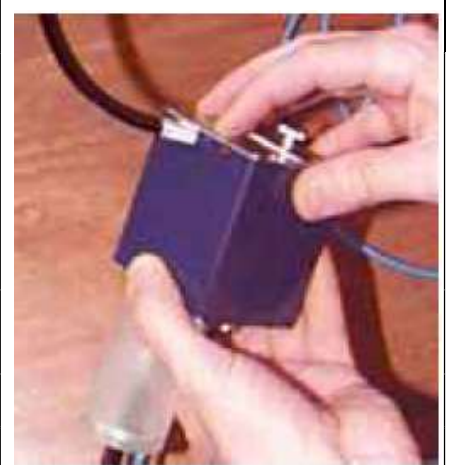
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2.3 Data Acquisition Electronics (DAE)

Model	DAE4
Construction	Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY4/5 embedded system (fully remote controlled). Two step probe touch detector for mechanical surface detection and emergency robot stop.
Measurement Range	-100 to +300 mV (16 bit resolution and two range settings: 4mV,400mV)
Input Offset Voltage	< 5µV (with auto zero)
Input Bias Current	< 50 f A
Dimensions	60 x 60 x 68 mm



2.4 SAM Twin Phantom

Material	Vinylester, glass fiber reinforced (VE-GF)
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)
Shell Thickness	2 ± 0.2 mm (6 ± 0.2 mm at ear point)
Dimensions (incl. Wooden Support)	Length: 1000 mm Width: 500 mm Height: adjustable feet
Filling Volume	approx. 25 liters
Wooden Support	SPEAG standard phantom table



The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. 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 teaching three points with the robot.

Twin SAM V5.0 has the same shell geometry and is manufactured from the same material as Twin SAM V4.0, but has reinforced top structure.




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2.5 ELI Phantom

Material	Vinylester, glass fiber reinforced (VE-GF)	
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)	
Shell Thickness	2.0 ± 0.2 mm (bottom plate)	
Dimensions	Major axis: 600 mm Minor axis: 400 mm	
Filling Volume	approx. 30 liters	
Wooden Support	SPEAG standard phantom table	

Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI 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 compatible with all SPEAG dosimetric probes and dipoles.

ELI V5.0 has the same shell geometry and is manufactured from the same material as ELI4, but has reinforced top structure.



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2.6 Device Holder for Transmitters



F-2. Device Holder for Transmitters

- The DASY device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation centres for both scales are the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.
- The DASY device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity $\epsilon=3$ and loss tangent $\delta=0.02$. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

2.7 Measurement procedure

2.7.1 Scanning procedure

Step 1: Power reference measurement

The “reference” and “drift” measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure.

Step 2: Area scan

The SAR distribution at the exposed side of the head was measured at a distance of 4mm from the inner surface of the shell. The area covered the entire dimension of the head and the horizontal grid spacing was 15mm*15mm or 12mm*12mm or 10mm*10mm. Based on the area scan data, the area of the maximum absorption was determined by spline interpolation.

Step 3: Zoom scan

Around this point, a volume of 30mm*30mm*30mm (fine resolution volume scan, zoom scan) was assessed by measuring 5x5x7 points ($\leq 2\text{GHz}$) and 7x7x7 points ($\geq 2\text{GHz}$). On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

The data at the surface was extrapolated, since the centre of the dipoles is 2.0mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2mm. (This can be variable. Refer to the probe specification). The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1g or 10g) were computed using the 3D-Spline interpolation algorithm. The volume was integrated with the trapezoidal algorithm. One thousand points were interpolated to calculate the average. All neighbouring volumes were evaluated until no neighboring volume with a higher average value was found.

The area and zoom scan resolutions specified in the table below must be applied to the SAR measurements. Probe boundary effect error compensation is required for measurements with the probe tip closer than half a probe tip diameter to the phantom surface. Both the probe tip diameter and sensor offset distance must satisfy measurement protocols; to ensure probe boundary effect errors are minimized and the higher fields closest to the phantom surface can be correctly measured and extrapolated to the phantom surface for computing 1-g SAR. Tolerances of the post-processing algorithms must be verified by the test laboratory for the scan resolutions used in the SAR measurements, according to the reference distribution functions specified in IEEE Std. 1528-2013.



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		≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface		5 ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location		30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area} , Δy_{Area}		≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
		When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	
Maximum zoom scan spatial resolution: Δx_{Zoom} , Δy_{Zoom}		≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$	≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1 st two points closest to phantom surface	≤ 4 mm 3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ 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 reference measurement (drift)

The Power Drift Measurement job measures the field at the same location as the most recent power reference measurement job within the same procedure, and with the same settings. The indicated drift is mainly the variation of the DUT's output power and should vary max. ± 5 %



2.7.2 Data Storage

The DASY software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension “DAE”. The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated. The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [m W/g], [m W/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

2.7.3 Data Evaluation by SEMCAD

The SEMCAD software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

Probe parameters:	- Sensitivity	Normi, ai0, ai1, ai2
	- Conversion factor	ConvFi
	- Diode compression point	Dcpi
Device parameters:	- Frequency	f
	- Crest factor	cf
Media parameters:	- Conductivity	ε
	- Density	ρ

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics.

If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power.

The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot cf / dcp_i$$

With V_i = compensated signal of channel i ($i = x, y, z$)

U_i = input signal of channel i ($i = x, y, z$)

cf = crest factor of exciting field (DASY parameter)

dcp i = diode compression point (DASY parameter)



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From the compensated input signals the primary field data for each channel can be evaluated:

E-field probes:

$$E_i = (V_i / Norm_i \cdot ConvF)^{1/2}$$

H-field probes:

$$H_i = (V_i)^{1/2} \cdot (a_{i0} + a_{i1}f + a_{i2}f^2) / f$$

With V_i = compensated signal of channel i ($i = x, y, z$)

$Norm_i$ = sensor sensitivity of channel i ($i = x, y, z$)

[mV/(V/m)²] for E-field Probes

ConvF = sensitivity enhancement in solution

a_{ij} = sensor sensitivity factors for H-field probes

f = carrier frequency [GHz]

E_i = electric field strength of channel i in V/m

H_i = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude):

$$E_{tot} = (E_x^2 + E_y^2 + E_z^2)^{1/2}$$

The primary field data are used to calculate the derived field units.

$$SAR = (E_{tot}^2 \cdot \sigma) / (\epsilon \cdot 1000)$$

with SAR = local specific absorption rate in mW/g

E_{tot} = total field strength in V/m

σ = conductivity in [mho/m] or [Siemens/m]

ϵ = equivalent tissue density in g/cm³

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid. The power flow density is calculated assuming the excitation field to be a free space field.

$$P_{pwe} = E_{tot}^2 / 3770 \text{ or } P_{pwe} = H_{tot}^2 \cdot 37.7$$

with P_{pwe} = equivalent power density of a plane wave in mW/cm²

E_{tot} = total electric field strength in V/m

H_{tot} = total magnetic field strength in A/m



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3 Description of Test Position

3.1 The Body Test Position

The overall diagonal dimension of the display section of a tablet is > 20 cm, Per FCC KDB 616217, the back surface and edges of the tablet should be tested for SAR compliance with the tablet touching the phantom. SAR evaluation for the front surface of tablet display screens are generally not necessary. The SAR Exclusion Threshold in KDB 447498 D01 can be applied to determine SAR test exclusion for adjacent edge configurations. The closest distance from the antenna to an adjacent tablet edge is used to determine if SAR testing is required for the adjacent edges, with the adjacent edge positioned against the phantom and the edge containing the antenna positioned perpendicular to the phantom.



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4 SAR System Verification Procedure

4.1 Tissue Simulate Liquid

4.1.1 Recipes for Tissue Simulate Liquid

The following tables give the recipes for tissue simulating liquids to be used in different frequency bands:

Ingredients (% by weight)	Frequency (MHz)				
	450	700-900	1800-2000	2300-2500	2500-2700
Water	38.56	40.30	55.24	55.00	54.92
Salt (NaCl)	3.95	1.38	0.31	0.2	0.23
Sucrose	56.32	57.90	0	0	0
HEC	0.98	0.24	0	0	0
Bactericide	0.19	0.18	0	0	0
Tween	0	0	44.45	44.80	44.85
Salt: 99+% Pure Sodium Chloride		Sucrose: 98+% Pure Sucrose			
Water: De-ionized, 16 MΩ ⁺ resistivity		HEC: Hydroxyethyl Cellulose			
Tween: Polyoxyethylene (20) sorbitan monolaurate					
HSL5GHz is composed of the following ingredients:					
Water: 50-65%					
Mineral oil: 10-30%					
Emulsifiers: 8-25%					
Sodium salt: 0-1.5%					

Table 1 : Recipe of Tissue Simulate Liquid



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4.1.2 Measurement for Tissue Simulate Liquid

The Conductivity (σ) and Permittivity (ρ) are listed in Table 2. For the SAR measurement given in this report. The temperature variation of the Tissue Simulate Liquids was $22\pm 2^{\circ}\text{C}$.

Tissue Type	Measured Frequency (MHz)	Target Tissue ($\pm 5\%$)		Measured Tissue		Liquid Temp. ($^{\circ}\text{C}$)	Measured Date
		ϵ_r	$\sigma(\text{S/m})$	ϵ_r	$\sigma(\text{S/m})$		
2450 Head	2450	39.20 (37.24~41.16)	1.80 (1.71~1.89)	39.683	1.790	22.3	2022/5/3
2450 Head	2450	39.20 (37.24~41.16)	1.80 (1.71~1.89)	40.530	1.815	22.6	2022/6/8
5250 Head	5250	35.9 (34.11~37.70)	4.66 (4.47~4.95)	35.408	4.581	22.5	2022/5/5
5600 Head	5600	35.5 (33.73~37.30)	5.07 (4.82~5.32)	34.480	4.910	22.5	2022/5/5
5750 Head	5750	35.4 (33.63~37.17)	5.22 (4.96~5.48)	35.522	5.423	22.5	2022/5/5

Table 2 : Measurement result of Tissue electric parameters

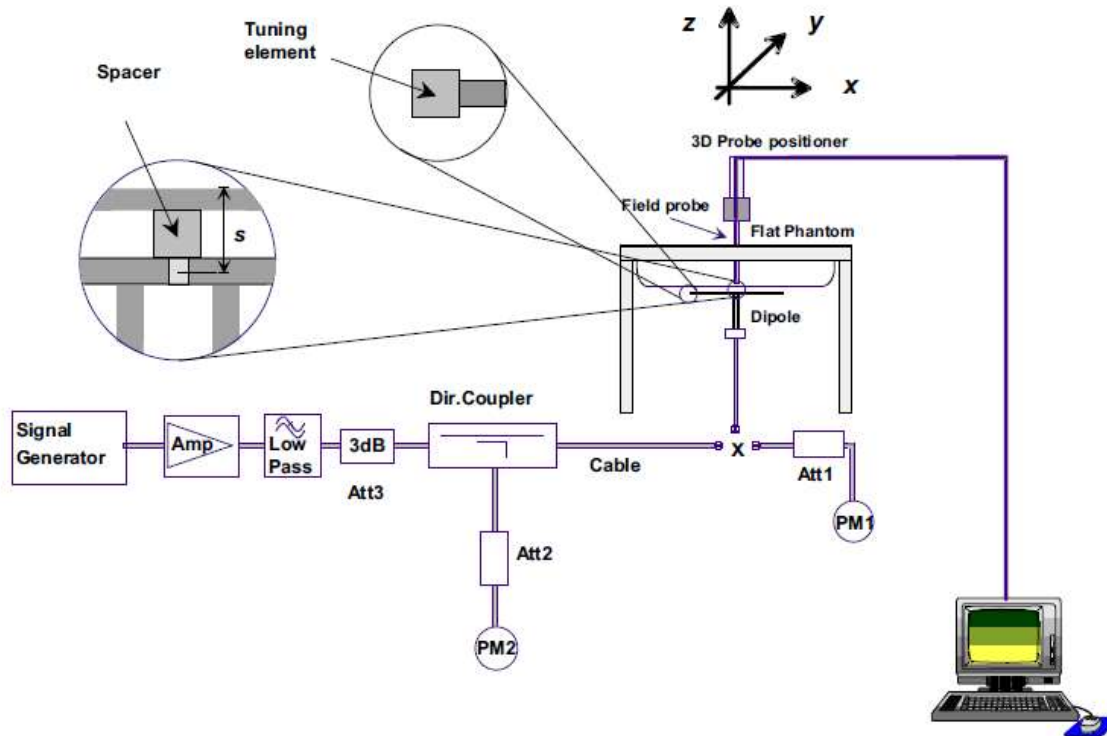


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4.2 SAR System Check

The microwave circuit arrangement for system Check is sketched in F-3. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within +/- 10% from the target SAR values. The tests were conducted on the same days as the measurement of the EUT. The obtained results from the system accuracy verification are displayed in the following table (A power level of 250mW (below 3GHz) or 100mW (3-6GHz) was input to the dipole antenna). During the tests, the ambient temperature of the laboratory was in the range 22±2°C, the relative humidity was in the range 60% and the liquid depth above the ear reference points was above 15±0.5 cm in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.



F-3. the microwave circuit arrangement used for SAR system check

4.2.1 Justification for Extended SAR Dipole Calibrations

1) Referring to KDB865664 D01 requirements for dipole calibration, instead of the typical annual calibration recommended by measurement standards, longer calibration intervals of up to three years may be considered when it is demonstrated that the SAR target, impedance and return loss of a dipole have remain stable according to the following requirements. Each measured dipole is expected to evaluate with the following criteria at least on annual interval in Appendix C.

- a) There is no physical damage on the dipole;
- b) System check with specific dipole is within 10% of calibrated value;
- c) Return-loss is within 10% of calibrated measurement;
- d) Impedance is within 5Ω from the previous measurement.

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



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4.2.2 Summary System Validation Result(s)

Validation Kit		Measured SAR 250mW	Measured SAR 250mW	Measured SAR normalized to 1W	Measured SAR (normalized to 1W)	Target SAR (normalized to 1W) (±10%)	Target SAR (normalized to 1W) (±10%)	Liquid Temp. (°C)	Measured Date
		1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	1-g(W/kg)	10-g(W/kg)		
D2450V2	Head	12.30	5.65	49.20	22.60	52.2 (46.98~57.42)	24.5 (22.05~26.95)	22.3	2022/5/3
D2450V2	Head	13.30	6.13	53.20	24.52	52.2 (46.98~57.42)	24.5 (22.05~26.95)	22.6	2022/6/8
Validation Kit		Measured SAR 100mW	Measured SAR 100mW	Measured SAR (normalized to 1W)	Measured SAR (normalized to 1W)	Target SAR (normalized to 1W) (±10%)	Target SAR (normalized to 1W) (±10%)	Liquid Temp. (°C)	Measured Date
		1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	1-g(W/kg)	10-g(W/kg)		
D5GHzV2	Head(5.25GHz)	7.32	2.24	73.20	22.40	78 (70.2~85.8)	21.8 (19.62~23.98)	22.5	2022/5/5
	Head(5.6GHz)	7.54	2.13	75.40	21.30	79.9 (71.91~87.89)	22.5 (20.25~24.75)	22.5	2022/5/5
	Head(5.75GHz)	8.37	2.31	83.70	23.10	76.4 (68.76~84.04)	21.2 (19.08~23.32)	22.5	2022/5/5

Table 3 : SAR System Check Result

4.2.3 Detailed System Check Results

Please see the Appendix A



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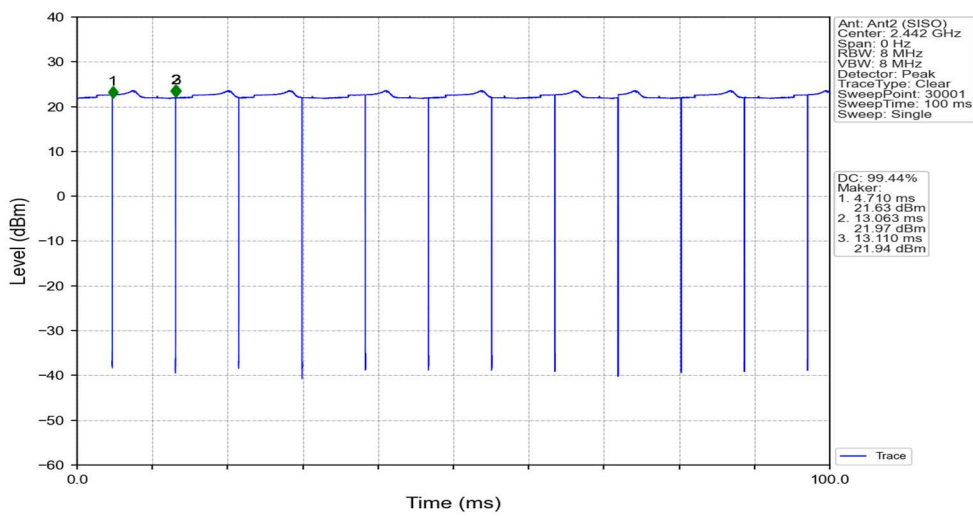
5 Test results and Measurement Data

5.1 Operation Configurations

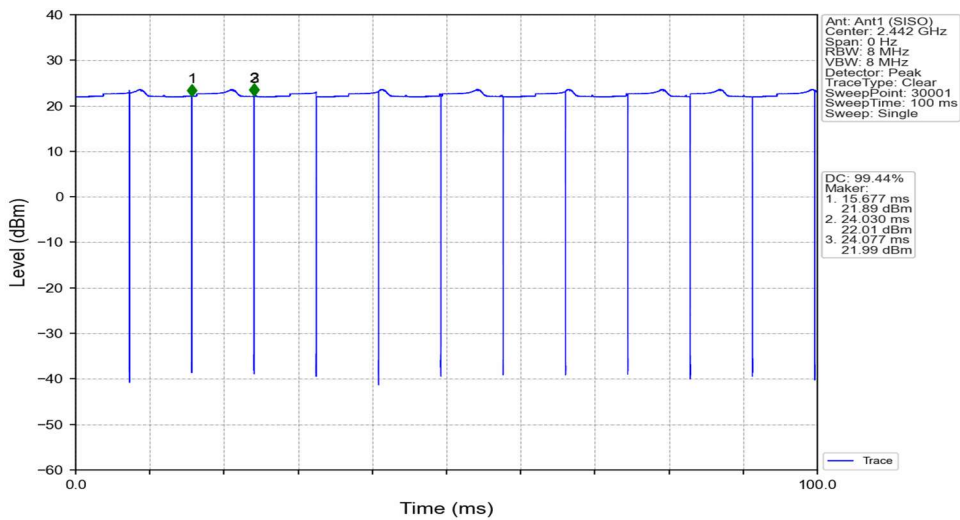
5.1.1 WiFi Test Configuration

A Wi-Fi device must be configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools for SAR measurement.

- 2.4G WIFI
Ant 0 Duty cycle=99.44%



Ant 1 Duty cycle=99.44%



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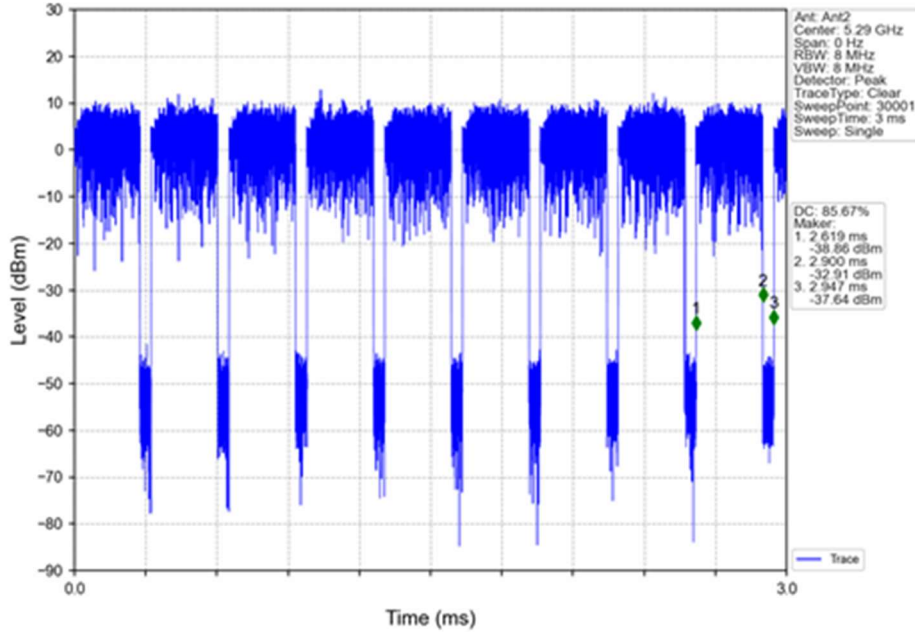
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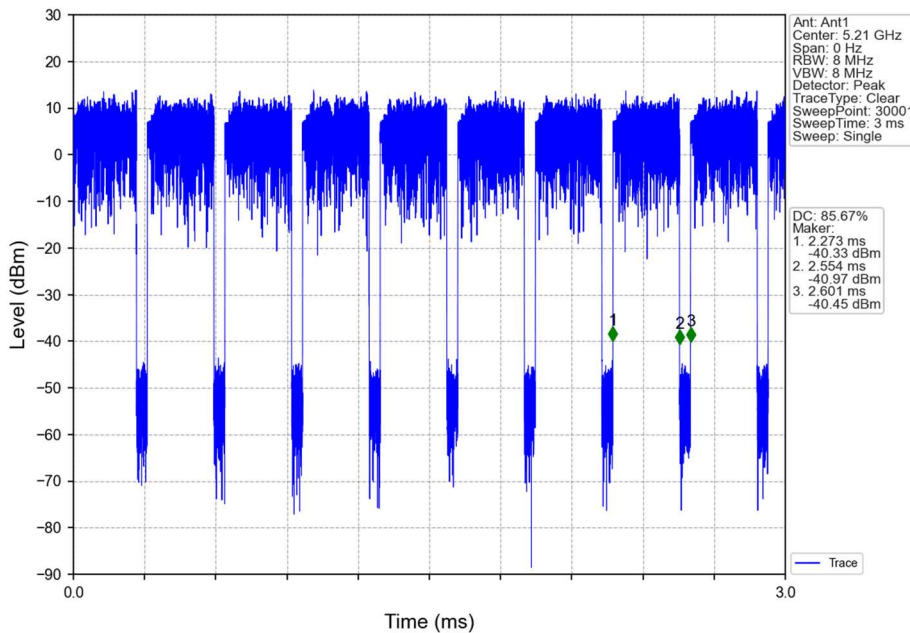
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- 5G WIFI 802.11ac 80M
Ant 0 Duty cycle=85.67%



Ant 1 Duty cycle=85.67%



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5.1.1.1 Initial Test Position SAR Test Reduction Procedure

DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures. The initial test position procedure is described in the following:

- 1) . When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other (remaining) test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band. SAR is also not required for that exposure configuration in the subsequent test configuration(s).
- 2) . When the reported SAR of the initial test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position using subsequent highest extrapolated or estimated 1-g SAR conditions determined by area scans or next closest/smallest test separation distance and maximum RF coupling test positions based on manufacturer justification, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg or all required test positions (left, right, touch, tilt or subsequent surfaces and edges) are tested.
- 3) . For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested. a) Additional power measurements may be required for this step, which should be limited to those necessary for identifying the subsequent highest output power channels.

5.1.1.2 Initial Test Configuration Procedures

An initial test configuration is determined for OFDM transmission modes according to the channel bandwidth, modulation and data rate combination(s) with the highest maximum output power specified for production units in each standalone and aggregated frequency band. SAR is measured using the highest measured maximum output power channel. For configurations with the same specified or measured maximum output power, additional transmission mode and test channel selection procedures are required. SAR test reduction for subsequent highest output test channels is determined according to *reported* SAR of the initial test configuration. For next to the ear, hotspot mode and UMC mini-tablet exposure configurations where multiple test positions are required, the initial test position procedure is applied to minimize the number of test positions required for SAR measurement using the initial test configuration transmission mode. For fixed exposure conditions that do not have multiple SAR test positions, SAR is measured in the transmission mode determined by the initial test configuration.

When the *reported* SAR of the initial test configuration is > 0.8 W/kg, SAR measurement is required for subsequent next highest measured output power channel(s) in the initial test configuration until *reported* SAR is ≤ 1.2 W/kg or all required channels are tested.

5.1.1.3 Subsequent Test Configuration Procedures

SAR measurement requirements for the remaining 802.11 transmission mode configurations that have not been tested in the initial test configuration are determined separately for each standalone and aggregated frequency band, in each exposure condition, according to the maximum output power specified for production units. The initial test position procedure is applied to next to the ear, UMPC mini-tablet and hotspot mode configurations. When the same maximum output power is specified for multiple transmission modes, additional power measurements may be required to determine if SAR measurements are required for subsequent highest output power channels in a subsequent test configuration. The subsequent test configuration and SAR measurement procedures are described in the following.

- 1) . When SAR test exclusion provisions of KDB Publication 447498 are applicable and SAR measurement is not required for the initial test configuration, SAR is also not required for the next highest maximum output power transmission mode subsequent test configuration(s) in that frequency band or aggregated band and exposure configuration.



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- 2) . When the highest *reported* SAR for the initial test configuration (when applicable, include subsequent highest output channels), according to the initial test position or fixed exposure position requirements, is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for that subsequent test configuration.
- 3) . The number of channels in the initial test configuration and subsequent test configuration can be different due to differences in channel bandwidth. When SAR measurement is required for a subsequent test configuration and the channel bandwidth is smaller than that in the initial test configuration, all channels in the subsequent test configuration that overlap with the larger bandwidth channel tested in the initial test configuration should be used to determine the highest maximum output power channel. This step requires additional power measurement to identify the highest maximum output power channel in the subsequent test configuration to determine SAR test reduction.
 - a) SAR should first be measured for the channel with highest measured output power in the subsequent test configuration.
 - b) SAR for subsequent highest measured maximum output power channels in the subsequent test configuration is required only when the *reported* SAR of the preceding higher maximum output power channel(s) in the subsequent test configuration is > 1.2 W/kg or until all required channels are tested. i) For channels with the same measured maximum output power, SAR should be measured using the channel closest to the center frequency of the larger channel bandwidth channel in the initial test configuration.
- 4) . SAR measurements for the remaining highest specified maximum output power OFDM transmission mode configurations that have not been tested in the initial test configuration (highest maximum output) or subsequent test configuration(s) (subsequent next highest maximum output power) is determined by recursively applying the subsequent test configuration procedures in this section to the remaining configurations according to the following:
 - a) replace “subsequent test configuration” with “next subsequent test configuration” (i.e., subsequent next highest specified maximum output power configuration)
 - b) replace “initial test configuration” with “all tested higher output power configurations”

5.1.1.4 2.4 GHz SAR Procedures

Separate SAR procedures are applied to DSSS and OFDM configurations in the 2.4 GHz band to simplify DSSS test requirements. For 802.11b DSSS SAR measurements, DSSS SAR procedure applies to fixed exposure test position and initial test position procedure applies to multiple exposure test positions. When SAR measurement is required for an OFDM configuration, the initial test configuration, subsequent test configuration and initial test position procedures are applied. The SAR test exclusion requirements for 802.11g/n OFDM configurations are described in following.

• 802.11b DSSS SAR Test Requirements

SAR is measured for 2.4 GHz 802.11b DSSS using either a fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:

- 1) . When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
- 2) . When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

• 2.4 GHz 802.11g/n OFDM SAR Test Exclusion Requirements

When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied (section 5.3, including sub-sections). SAR is not required for the following 2.4 GHz OFDM conditions.

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



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5.1.1.5 WiFi 5G SAR Test Procedures

5.1.1.5.1 U-NII-1 and U-NII-2A Bands

For devices that operate in only one of the U-NII-1 and U-NII-2A bands, the normally required SAR procedures for OFDM configurations are applied. For devices that operate in both U-NII bands using the same transmitter and antenna(s), SAR test reduction is determined according to the following:

- 1) When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. If the highest *reported* SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band for that configuration (802.11 mode and exposure condition); otherwise, both bands are tested independently for SAR.
- 2) 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, both bands are tested independently for SAR.
- 3) The two U-NII bands may be aggregated to support a 160 MHz channel on channel number 50. Without additional testing, the maximum output power for this is limited to the lower of the maximum output power certified for the two bands. When SAR measurement is required for at least one of the bands and the highest *reported* SAR adjusted by the ratio of specified maximum output power of aggregated to standalone band is > 1.2 W/kg, SAR is required for the 160 MHz channel. This procedure does not apply to an aggregated band with maximum output higher than the standalone band(s); the aggregated band must be tested independently for SAR. SAR is not required when the 160 MHz channel is operating at a reduced maximum power and also qualifies for SAR test exclusion.

5.1.1.5.2 U-NII-2C and U-NII-3 Bands

The frequency range covered by these bands is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. when Terminal Doppler Weather Radar (TDWR) restriction applies, all channels that operate at 5.60 – 5.65 GHz must be included to apply the SAR test reduction and measurement procedures.

When the same transmitter and antenna(s) are used for U-NII-2C band and U-NII-3 band or 5.8 GHz band of §15.247, the bands may be aggregated to enable additional channels with 20, 40 or 80 MHz bandwidth to span across the band gap, as illustrated in Appendix B. The maximum output power for the additional band gap channels is limited to the lower of those certified for the bands. Unless band gap channels are permanently disabled, they must be considered for SAR testing. The frequency range covered by these bands is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. To maintain SAR measurement accuracy and to facilitate test reduction, the channels in U-NII-2C band above 5.65 GHz may be grouped with the 5.8 GHz channels in U-NII-3 or §15.247 band to enable two SAR probe calibration frequency points to cover the bands, including the band gap channels. When band gap channels are supported and the bands are not aggregated for SAR testing, band gap channels must be considered independently in each band according to the normally required OFDM SAR measurement and probe calibration frequency points requirements.



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5.1.1.5.3 OFDM Transmission Mode SAR Test Configuration and Channel Selection Requirements

The initial test configuration for 5 GHz OFDM transmission modes is determined by the 802.11 configuration with the highest maximum output power specified for production units, including tune-up tolerance, in each standalone and aggregated frequency band. SAR for the initial test configuration is measured using the highest maximum output power channel determined by the default power measurement procedures. When multiple configurations in a frequency band have the same specified maximum output power, the initial test configuration is determined according to the following steps applied sequentially.

- 1) The largest channel bandwidth configuration is selected among the multiple configurations with the same specified maximum output power.
- 2) If multiple configurations have the same specified maximum output power and largest channel bandwidth, the lowest order modulation among the largest channel bandwidth configurations is selected.
- 3) If multiple configurations have the same specified maximum output power, largest channel bandwidth and lowest order modulation, the lowest data rate configuration among these configurations is selected.
- 4) When multiple transmission modes (802.11a/g/n/ac) have the same specified maximum output power, largest channel bandwidth, lowest order modulation and lowest data rate, the lowest order 802.11 mode is selected; i.e., 802.11a is chosen over 802.11n then 802.11ac or 802.11g is chosen over 802.11n. After an initial test configuration is determined, if multiple test channels have the same measured maximum output power, the channel chosen for SAR measurement is determined according to the following. These channel selection procedures apply to both the initial test configuration and subsequent test configuration(s), with respect to the default power measurement procedures or additional power measurements required for further SAR test reduction. The same procedures also apply to subsequent highest output power channel(s) selection.
 - The channel closest to mid-band frequency is selected for SAR measurement.
 - For channels with equal separation from mid-band frequency; for example, high and low channels or two mid-band channels, the higher frequency (number) channel is selected for SAR measurement.

5.1.1.5.4 SAR Test Requirements for OFDM configurations

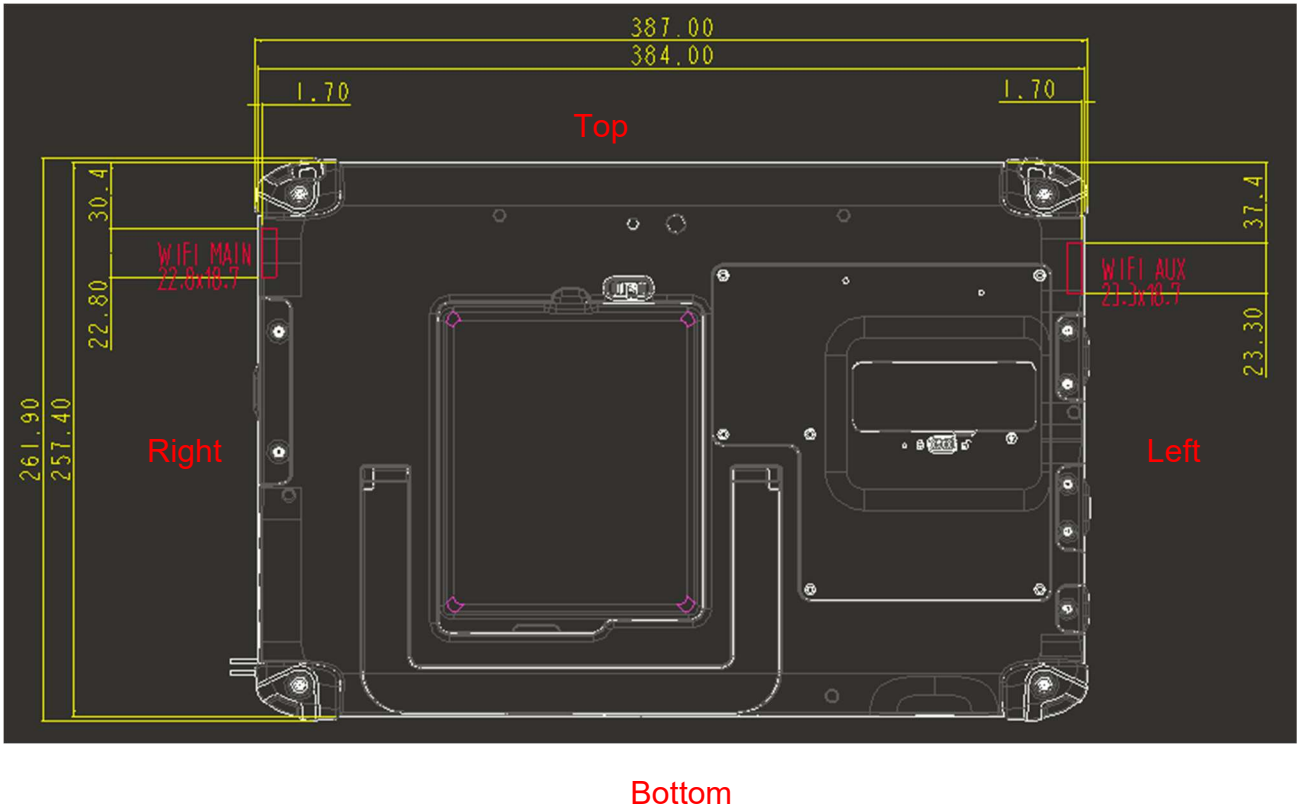
When SAR measurement is required for 802.11 a/n/ac OFDM configurations, each standalone and frequency aggregated band is considered separately for SAR test reduction. When the same transmitter and antenna(s) are used for U-NII-1 and U-NII-2A bands, additional SAR test reduction applies. When band gap channels between U-NII-2C band and 5.8 GHz U-NII-3 or §15.247 band are supported, the highest maximum output power transmission mode configuration and maximum output power channel across the bands must be used to determine SAR test reduction, according to the initial test configuration and subsequent test configuration requirements. In applying the initial test configuration and subsequent test configuration procedures, the 802.11 transmission configuration with the highest specified maximum output power and the channel within a test configuration with the highest measured maximum output power should be clearly distinguished to apply the procedures.



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5.1.2 DUT Antenna Locations(Back Veiw)



Note:

Ant 0=AUX, support WIFI and BT

Ant 1=MIAN, support WIFI

Per KDB 616217, the diagonal length is > 200mm, the device is considered a “tablet” device and needed to test 0mm 1-g body SAR.



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5.1.3 EUT side for SAR Testing

• **Stand-alone SAR test evaluation**

- 1) Per FCC KDB 447498D01, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$$
for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where:
 - f(GHz) is the RF channel transmit frequency in GHz
 - Power and distance are rounded to the nearest mW and mm before calculation
 - The result is rounded to one decimal place for comparison
When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.
- 2) At 100 MHz to 6 GHz and for test separation distances > 50 mm, the SAR test exclusion threshold is determined according to the following:
 - a) [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm) · (f(MHz)/150)] mW, at 100 MHz to 1500 MHz
 - b) [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm) · 10] mW at > 1500 MHz and ≤ 6 GHz

Ant 0 Standalone SAR exclusion calculation

Band	Exposure Condition	f (GHz)	Pmax (dBm)	Pmax (mw)	separation distance(mm)				Calculated Value				SAR Test (Yes or No)							
					Back Side	Left side	Right side	Top side	Bottom side	Back Side	Left side	Right side	Top side	Bottom side	Back Side	Left side	Right side	Top side	Bottom side	
WLAN2.4G	Body 0mm	2.472	16	39.81	5	5	368.3	37.4	201.2	12.60	12.60	3278.00	1.70	1607.00	Yes	Yes	No	No	No	No
WLAN5.2G	Body 0mm	5.240	15	31.62	5	5	368.3	37.4	201.2	14.48	14.48	3249.00	1.94	1578.00	Yes	Yes	No	No	No	No
WLAN5.3G	Body 0mm	5.320	15	31.62	5	5	368.3	37.4	201.2	14.59	14.59	3248.00	1.95	1577.00	Yes	Yes	No	No	No	No
WLAN5.5G	Body 0mm	5.720	15	31.62	5	5	368.3	37.4	201.2	15.12	15.12	3246.00	2.02	1575.00	Yes	Yes	No	No	No	No
WLAN5.8G	Body 0mm	5.805	15	31.62	5	5	368.3	37.4	201.2	15.24	15.24	3245.00	2.04	1574.00	Yes	Yes	No	No	No	No
BT	Body 0mm	2.480	10	10.00	5	5	368.3	37.4	201.2	3.15	15.24	3278.00	0.42	1607.00	Yes	Yes	No	No	No	No

Ant 1 Standalone SAR exclusion calculation

Band	Exposure Condition	f (GHz)	Pmax (dBm)	Pmax (mw)	separation distance(mm)				Calculated Value				Calculated Value							
					Back Side	Left side	Right side	Top side	Bottom side	Back Side	Left side	Right side	Top side	Bottom side	Back Side	Left side	Right side	Top side	Bottom side	
WLAN2.4G	Body 0mm	2.472	16	39.81	5	368.3	5	30.4	208.7	12.60	3278.00	12.60	2.10	1682.00	Yes	No	Yes	No	No	No
WLAN5.2G	Body 0mm	5.240	13	19.95	5	368.3	5	30.4	208.7	9.13	3249.00	9.13	1.50	1653.00	Yes	No	Yes	No	No	No
WLAN5.3G	Body 0mm	5.320	13	19.95	5	368.3	5	30.4	208.7	9.20	3248.00	9.20	1.51	1652.00	Yes	No	Yes	No	No	No
WLAN5.5G	Body 0mm	5.720	13	19.95	5	368.3	5	30.4	208.7	9.54	3246.00	9.54	1.57	1650.00	Yes	No	Yes	No	No	No
WLAN5.8G	Body 0mm	5.805	13	19.95	5	368.3	5	30.4	208.7	9.61	3245.00	9.61	1.58	1649.00	Yes	No	Yes	No	No	No

According to the table above, the standalone test configurations required for this device are as below:

Test configurations	WiFi 2.4G		WiFi 5G		BT
	Ant0	Ant1	Ant0	Ant1	Ant0
Front side	No	No	No	No	No
Back side	Yes	Yes	Yes	Yes	Yes
Left side	Yes	No	Yes	No	Yes
Right side	No	Yes	No	Yes	No
Top side	No	No	No	No	No
Bottom side	No	No	No	No	No

When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:

- 1) $(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm}) \cdot [\sqrt{f(\text{GHz})} / x] \leq 1.0$ W/kg for test separation distances ≤ 50 mm, where x = 7.5 for 1-g SAR and x = 18.75 for 10-g SAR. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion



2) 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the test separation distance is > 50 mm.

Band	Exposure Condition	f (GHz)	Pmax (dBm)	Pmax (mw)	Ant 0 Test separation distance					Estimated SAR(W/Kg)				
					Back Side	Left side	Right side	Top side	Bottom side	Back Side	Left side	Right side	Top side	Bottom side
WLAN2.4G	Body 0mm	2.472	16	39.81	5	5	368.3	37.4	201.2	Measure	Measure	0.40	0.40	0.40
WLAN5.2G	Body 0mm	5.240	15	31.62	5	5	368.3	37.4	201.2	Measure	Measure	0.40	0.40	0.40
WLAN5.3G	Body 0mm	5.320	15	31.62	5	5	368.3	37.4	201.2	Measure	Measure	0.40	0.40	0.40
WLAN5.5G	Body 0mm	5.720	15	31.62	5	5	368.3	37.4	201.2	Measure	Measure	0.40	0.40	0.40
WLAN5.8G	Body 0mm	5.805	15	31.62	5	5	368.3	37.4	201.2	Measure	Measure	0.40	0.40	0.40
BT	Body 0mm	2.480	10	10.00	5	5	368.3	37.4	201.2	Measure	Measure	0.40	0.40	0.40

Band	Exposure Condition	f (GHz)	Pmax (dBm)	Pmax (mw)	Ant 1 Test separation distance					Estimated SAR(W/Kg)				
					Back Side	Left side	Right side	Top side	Bottom side	Back Side	Left side	Right side	Top side	Bottom side
WLAN2.4G	Body 0mm	2.472	16	39.81	5	368.3	5	30.4	208.7	Measure	0.40	Measure	0.40	0.40
WLAN5.2G	Body 0mm	5.240	13	19.95	5	368.3	5	30.4	208.7	Measure	0.40	Measure	0.40	0.40
WLAN5.3G	Body 0mm	5.320	13	19.95	5	368.3	5	30.4	208.7	Measure	0.40	Measure	0.40	0.40
WLAN5.5G	Body 0mm	5.720	13	19.95	5	368.3	5	30.4	208.7	Measure	0.40	Measure	0.40	0.40
WLAN5.8G	Body 0mm	5.805	13	19.95	5	368.3	5	30.4	208.7	Measure	0.40	Measure	0.40	0.40

Table 4: Estimated SAR calculation for WiFi and BT

Note:

1) * - maximum possible output power declared by manufacturer



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5.2 Measurement of RF conducted Power

5.2.1 Conducted Power of WIFI and BT

Ant 0						
Mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test
802.11b	1	2412	1	15.15	16.00	Yes
	7	2442		14.76	16.00	Yes
	13	2472		15.27	16.00	Yes
802.11g	1	2412	6	13.01	14.00	No
	7	2442		13.84	14.00	No
	13	2472		12.43	14.00	No
802.11n HT20	1	2412	6.5	12.54	14.00	No
	7	2442		13.37	14.00	No
	13	2472		12.96	14.00	No
802.11n HT40	3	2422	6.5	13.66	15.00	No
	7	2442		14.49	15.00	No
	11	2462		14.08	15.00	No
802.11ax HT20	1	2412	MCS0	13.28	15.00	No
	7	2442		14.11	15.00	No
	13	2472		13.70	15.00	No
802.11ax HT40	3	2422	MCS0	13.36	15.00	No
	7	2442		14.19	15.00	No
	11	2462		13.78	15.00	No

Ant 1						
Mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test
802.11b	1	2412	1	15.27	16.00	Yes
	7	2442		15.44	16.00	Yes
	13	2472		15.34	16.00	Yes
802.11g	1	2412	6	14.33	15.00	No
	7	2442		14.46	15.00	No
	13	2472		13.87	15.00	No
802.11n HT20	1	2412	6.5	13.86	14.00	No
	7	2442		13.99	14.00	No
	13	2472		12.60	14.00	No
802.11n HT40	3	2422	6.5	13.98	15.00	No
	7	2442		14.11	15.00	No
	11	2462		14.72	15.00	No
802.11ax HT20	1	2412	MCS0	14.60	15.00	No
	7	2442		13.73	15.00	No
	13	2472		14.34	15.00	No
802.11ax HT40	3	2422	MCS0	13.68	15.00	No
	7	2442		13.81	15.00	No
	11	2462		14.42	15.00	No



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MIMO						
Mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test
802.11n HT20	1	2412	6.5	16.26	17.00	No
	7	2442		16.70	17.00	No
	13	2472		15.79	17.00	No
802.11n HT40	3	2422	6.5	16.83	18.00	No
	7	2442		17.31	18.00	No
	11	2462		17.42	18.00	No
802.11ax HT20	1	2412	MCS0	17.00	18.00	No
	7	2442		16.93	18.00	No
	13	2472		17.04	18.00	No
802.11ax HT40	3	2422	MCS0	16.53	18.00	No
	7	2442		17.01	18.00	No
	11	2462		17.12	18.00	No

Ant 0								
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test	
802.11a	U-NII-1	36	5180	6	14.26	15.00	No	
		40	5200		14.33	15.00	No	
		44	5220		14.32	15.00	No	
		48	5240		14.29	15.00	No	
	U-NII-2A	52	5260		14.38	15.00	No	
		56	5280		14.27	15.00	No	
		60	5300		14.43	15.00	No	
		64	5320		14.15	15.00	No	
		U-NII-2C	100		5500	14.33	15.00	No
			104		5520	14.26	15.00	No
	108		5540		14.27	15.00	No	
	112		5560		14.31	15.00	No	
	116		5580		14.32	15.00	No	
	120		5600		14.34	15.00	No	
	124		5620		14.31	15.00	No	
	128		5640		14.36	15.00	No	
	132		5660		14.28	15.00	No	
	136		5680		14.16	15.00	No	
	U-NII-3	140	5700		14.27	15.00	No	
		144	5720		14.22	15.00	No	
149		5745	13.97	14.00	No			
153		5765	13.78	14.00	No			
		157	5785	13.89	14.00	No		
		161	5805	13.84	14.00	No		
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test	
802.11n- HT20	U-NII-1	36	5180	MCS0	14.06	15.00	No	
		40	5200		14.00	15.00	No	
		44	5220		14.13	15.00	No	
		48	5240		14.09	15.00	No	
	U-NII-2A	52	5260		14.18	15.00	No	
		56	5280		14.07	15.00	No	
		60	5300		14.23	15.00	No	
		64	5320		14.11	15.00	No	



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5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test		
802.11n-HT40	U-NII-2C	100	5500	MCS0	14.05	15.00	No		
		104	5520		14.13	15.00	No		
		108	5540		14.12	15.00	No		
		112	5560		14.22	15.00	No		
		116	5580		14.27	15.00	No		
		120	5600		14.22	15.00	No		
		124	5620		14.06	15.00	No		
		128	5640		14.34	15.00	No		
	U-NII-3	132	5660		14.16	15.00	No		
		136	5680		14.21	15.00	No		
		140	5700		14.45	15.00	No		
		144	5720		14.32	15.00	No		
		149	5745		13.79	14.00	No		
		153	5765		13.88	14.00	No		
		157	5785		13.66	14.00	No		
		161	5805		13.52	14.00	No		
802.11ac-20	U-NII-1	38	5190	MCS0	13.78	15.00	No		
		46	5230		13.95	15.00	No		
		U-NII-2A	54		5270	13.84	15.00	No	
			62		5310	14.27	15.00	No	
	U-NII-2C		102		5510	14.32	15.00	No	
			110		5550	14.31	15.00	No	
		118	5590		14.26	15.00	No		
		126	5630		14.22	15.00	No		
	U-NII-3	134	5670		14.17	15.00	No		
		142	5710		14.23	15.00	No		
		151	5755		13.79	14.00	No		
		159	5795		13.68	14.00	No		
		U-NII-1	36		5180	MCS0	14.11	15.00	No
			40		5200		14.06	15.00	No
			44		5220		14.11	15.00	No
			48		5240		14.04	15.00	No
U-NII-2A	52	5260	14.14	15.00	No				
	56	5280	14.21	15.00	No				
	60	5300	14.21	15.00	No				
	64	5320	14.15	15.00	No				
U-NII-2C	100	5500	14.11	15.00	No				
	104	5520	14.12	15.00	No				
	108	5540	14.14	15.00	No				
	112	5560	14.20	15.00	No				
	116	5580	14.24	15.00	No				
	120	5600	14.26	15.00	No				
	124	5620	14.13	15.00	No				
	128	5640	14.27	15.00	No				
	132	5660	14.21	15.00	No				
	136	5680	14.26	15.00	No				
	140	5700	14.37	15.00	No				
	144	5720	14.35	15.00	No				
U-NII-3	149	5745	13.56	14.00	No				



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		153	5765		13.72	14.00	No		
		157	5785		13.74	14.00	No		
		161	5805		13.65	14.00	No		
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test		
802.11ac-40	U-NII-1	38	5190	MCS0	13.72	15.00	No		
		46	5230		13.91	15.00	No		
	U-NII-2A	54	5270		13.85	15.00	No		
		62	5310		14.24	15.00	No		
	U-NII-2C	102	5510		14.35	15.00	No		
		110	5550		14.35	15.00	No		
		118	5590		14.22	15.00	No		
		126	5630		14.28	15.00	No		
		134	5670		14.12	15.00	No		
	U-NII-3	142	5710		14.25	15.00	No		
		151	5755		13.86	14.00	No		
			159		5795	13.77	14.00	No	
	5GHz	mode	Channel		Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test
	802.11ac 80M	U-NII-1	42		5210	MCS0	14.22	15.00	No
U-NII-2A		58	5290	14.20	15.00		Yes		
U-NII-2C		106	5530	14.04	15.00		Yes		
		122	5610	14.11	15.00		Yes		
U-NII-3		138	5690	14.03	15.00		Yes		
		155	5775	14.17	15.00		Yes		
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test		
802.11ac 160M	U-NII-1	/	/	MCS0	/	/	/		
	U-NII-2A	50	5250		14.77	15.00	No		
	U-NII-2C	114	5570		14.59	15.00	No		
	U-NII-3	/	/		/	/	/		
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test		
802.11ax-20	U-NII-1	36	5180	MCS0	13.69	15.00	No		
		40	5200		13.54	15.00	No		
		44	5220		13.76	15.00	No		
		48	5240		13.72	15.00	No		
	U-NII-2A	52	5260		13.81	15.00	No		
		56	5280		13.77	15.00	No		
		60	5300		13.86	15.00	No		
		64	5320		13.59	15.00	No		
	U-NII-2C	100	5500		13.44	15.00	No		
		104	5520		13.51	15.00	No		
		108	5540		13.46	15.00	No		
		112	5560		13.55	15.00	No		
		116	5580		13.43	15.00	No		
		120	5600		13.27	15.00	No		
		124	5620		13.33	15.00	No		
		128	5640		13.42	15.00	No		
		132	5660		13.48	15.00	No		
		136	5680		13.37	15.00	No		
	U-NII-3	140	5700		14.17	15.00	No		
		144	5720		14.39	15.00	No		
			149		5745	13.28	14.00	No	



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5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test
802.11ax-40	U-NII-1	153	5765	MCS0	13.34	14.00	No
		157	5785		13.21	14.00	No
		161	5805		13.11	14.00	No
	U-NII-2A	38	5190		13.58	14.00	No
		46	5230		13.75	14.00	No
		54	5270		13.64	14.00	No
		62	5310		13.67	14.00	No
		102	5510		13.49	14.00	No
		110	5550		13.48	14.00	No
		118	5590		13.27	14.00	No
		126	5630		13.36	14.00	No
	U-NII-2C	134	5670		13.29	14.00	No
		142	5710		13.25	14.00	No
		151	5755		13.99	14.00	No
		159	5795		13.62	14.00	No
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test
802.11ax 80M	U-NII-1	42	5210	MCS0	13.84	14.00	No
		58	5290		13.69	14.00	No
	U-NII-2C	106	5530		13.77	14.00	No
		122	5610		13.64	14.00	No
		138	5690		13.59	14.00	No
	U-NII-3	155	5775		13.69	14.00	No
	5GHz	mode	Channel		Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)
802.11ax 160M	U-NII-1	/	/	MCS0	/	/	/
	U-NII-2A	50	5250		14.55	15.00	No
	U-NII-2C	114	5570		14.34	15.00	No
	U-NII-3	/	/		/	/	/

Ant 1							
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test
802.11a	U-NII-1	36	5180	6	12.54	13.00	No
		40	5200		12.55	13.00	No
		44	5220		12.61	13.00	No
		48	5240		12.57	13.00	No
	U-NII-2A	52	5260		12.66	13.00	No
		56	5280		12.59	13.00	No
		60	5300		12.71	13.00	No
		64	5320		12.27	13.00	No
		100	5500		11.64	13.00	No
		104	5520		11.75	13.00	No
	U-NII-2C	108	5540		11.59	13.00	No
		112	5560		11.49	13.00	No
		116	5580		11.65	13.00	No
		120	5600		11.58	13.00	No
		124	5620		11.62	13.00	No
		128	5640		11.56	13.00	No
		132	5660		11.63	13.00	No
		136	5680		11.58	13.00	No



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5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test	
802.11n-HT20	U-NII-3	140	5700	MCS0	11.72	13.00	No	
		144	5720		11.68	13.00	No	
		149	5745		11.55	13.00	No	
		153	5765		11.52	13.00	No	
		157	5785		11.64	13.00	No	
		161	5805		11.69	13.00	No	
	802.11n-HT40	U-NII-1	36		5180	12.34	13.00	No
			40		5200	12.29	13.00	No
			44		5220	12.41	13.00	No
			48		5240	12.37	13.00	No
		U-NII-2A	52		5260	12.46	13.00	No
			56		5280	12.45	13.00	No
			60		5300	12.51	13.00	No
			64		5320	12.21	13.00	No
		U-NII-2C	100		5500	11.54	13.00	No
			104		5520	11.52	13.00	No
			108		5540	11.46	13.00	No
			112		5560	11.48	13.00	No
116			5580	11.51	13.00	No		
120			5600	11.42	13.00	No		
124			5620	11.46	13.00	No		
128			5640	11.55	13.00	No		
132			5660	11.58	13.00	No		
136			5680	11.49	13.00	No		
U-NII-3	140	5700	11.29	13.00	No			
	144	5720	11.32	13.00	No			
	149	5745	11.12	13.00	No			
	153	5765	11.24	13.00	No			
802.11n-HT40	U-NII-1	38	5190	12.21	13.00	No		
		46	5230	12.38	13.00	No		
	U-NII-2A	54	5270	12.27	13.00	No		
		62	5310	11.97	13.00	No		
	U-NII-2C	102	5510	11.57	13.00	No		
		110	5550	11.56	13.00	No		
118		5590	11.44	13.00	No			
126		5630	11.51	13.00	No			
U-NII-3	134	5670	11.36	13.00	No			
	142	5710	11.47	13.00	No			
	151	5755	11.53	13.00	No			
159	5795	11.42	13.00	No				
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test	
802.11ac-20	U-NII-1	36	5180	MCS0	12.45	13.00	No	
		40	5200		12.31	13.00	No	
		44	5220		12.46	13.00	No	
		48	5240		12.32	13.00	No	
	U-NII-2A	52	5260		12.41	13.00	No	



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	U-NII-2C	56	5280	MCS0	12.46	13.00	No	
		60	5300		12.57	13.00	No	
		64	5320		12.25	13.00	No	
		100	5500		11.58	13.00	No	
		104	5520		11.54	13.00	No	
		108	5540		11.42	13.00	No	
		112	5560		11.46	13.00	No	
		116	5580		11.54	13.00	No	
		120	5600		11.46	13.00	No	
		124	5620		11.48	13.00	No	
		128	5640		11.53	13.00	No	
		132	5660		11.52	13.00	No	
		136	5680		11.44	13.00	No	
		140	5700		11.24	13.00	No	
		144	5720		11.38	13.00	No	
		U-NII-3	149		5745	11.24	13.00	No
			153		5765	11.32	13.00	No
			157		5785	11.36	13.00	No
			161		5805	11.14	13.00	No
		5GHz	mode		Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)
802.11ac-40	U-NII-1	38	5190	MCS0	12.27	13.00	No	
		46	5230		12.33	13.00	No	
	U-NII-2A	54	5270		12.32	13.00	No	
		62	5310		12.18	13.00	No	
	U-NII-2C	102	5510		11.27	13.00	No	
		110	5550		11.74	13.00	No	
		118	5590		11.68	13.00	No	
		126	5630		11.45	13.00	No	
		134	5670		11.57	13.00	No	
		142	5710		11.39	13.00	No	
U-NII-3	151	5755	11.69	13.00	No			
	159	5795	11.58	13.00	No			
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test	
802.11ac 80M	U-NII-1	42	5210	MCS0	12.77	13.00	No	
		58	5290		12.64	13.00	Yes	
	U-NII-2C	106	5530		12.38	13.00	Yes	
		122	5610		12.27	13.00	Yes	
		138	5690		12.34	13.00	Yes	
	U-NII-3	155	5775		12.32	13.00	Yes	
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test	
802.11ac 160M	U-NII-1	/	/	MCS0	/	/	/	
	U-NII-2A	50	5250		12.58	13.00	No	
	U-NII-2C	114	5570		12.14	13.00	No	
	U-NII-3	/	/		/	/	/	
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test	
802.11ax-20	U-NII-1	36	5180	MCS0	12.14	13.00	No	
		40	5200		12.16	13.00	No	
		44	5220		12.23	13.00	No	
		48	5240		12.19	13.00	No	
	U-NII-2A	52	5260		12.28	13.00	No	



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		56	5280		12.24	13.00	No
		60	5300		12.31	13.00	No
		64	5320		12.07	13.00	No
	U-NII-2C	100	5500		12.11	13.00	No
		104	5520		12.07	13.00	No
		108	5540		12.21	13.00	No
		112	5560		12.18	13.00	No
		116	5580		12.10	13.00	No
		120	5600		12.12	13.00	No
		124	5620		12.06	13.00	No
		128	5640		12.14	13.00	No
		132	5660		12.16	13.00	No
		136	5680		12.17	13.00	No
		140	5700		11.74	13.00	No
		144	5720		11.85	13.00	No
	U-NII-3	149	5745		11.57	13.00	No
		153	5765		11.66	13.00	No
		157	5785		11.66	13.00	No
		161	5805		11.71	13.00	No
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test
802.11ax-40	U-NII-1	38	5190	MCS0	12.23	13.00	No
		46	5230		12.40	13.00	No
	U-NII-2A	54	5270		12.29	13.00	No
		62	5310		11.77	13.00	No
	U-NII-2C	102	5510		11.95	13.00	No
		110	5550		11.91	13.00	No
		118	5590		11.78	13.00	No
		126	5630		11.67	13.00	No
		134	5670		11.45	13.00	No
		142	5710		11.44	13.00	No
	U-NII-3	151	5755		11.63	13.00	No
		159	5795		11.52	13.00	No
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test
802.11ax 80M	U-NII-1	42	5210	MCS0	12.12	13.00	No
	U-NII-2A	58	5290		11.78	13.00	No
	U-NII-2C	106	5530		11.54	13.00	No
		122	5610		11.37	13.00	No
		138	5690		11.42	13.00	No
	U-NII-3	155	5775		11.39	13.00	No
	5GHz	mode	Channel		Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)
802.11ax 160M	U-NII-1	/	/	MCS0	/	/	/
	U-NII-2A	50	5250		12.29	13.00	No
	U-NII-2C	114	5570		12.33	13.00	No
	U-NII-3	/	/		/	/	/



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MIMO							
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test
802.11n-HT20	U-NII-1	36	5180	MCS0	16.29	17.00	No
		40	5200		16.24	17.00	No
		44	5220		16.36	17.00	No
		48	5240		16.32	17.00	No
	U-NII-2A	52	5260		16.41	17.00	No
		56	5280		16.35	17.00	No
		60	5300		16.46	17.00	No
		64	5320		16.27	17.00	No
	U-NII-2C	100	5500		15.98	17.00	No
		104	5520		16.03	17.00	No
		108	5540		16.00	17.00	No
		112	5560		16.07	17.00	No
		116	5580		16.12	17.00	No
		120	5600		16.05	17.00	No
		124	5620		15.96	17.00	No
		128	5640		16.18	17.00	No
		132	5660		16.07	17.00	No
		136	5680		16.07	17.00	No
	U-NII-3	140	5700		16.16	17.00	No
		144	5720		16.08	17.00	No
149		5745	15.67	16.00	No		
153		5765	15.77	16.00	No		
		157	5785	15.62	16.00	No	
		161	5805	15.55	16.00	No	
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test
802.11n-HT40	U-NII-1	38	5190	MCS0	16.08	17.00	No
		46	5230		16.25	17.00	No
	U-NII-2A	54	5270		16.14	17.00	No
		62	5310		16.28	17.00	No
	U-NII-2C	102	5510		16.17	17.00	No
		110	5550		16.16	17.00	No
		118	5590		16.09	17.00	No
		126	5630		16.08	17.00	No
		134	5670		16.00	17.00	No
		142	5710		16.08	17.00	No
	U-NII-3	151	5755		15.82	16.00	No
		159	5795		15.71	16.00	No
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test
802.11ac-20	U-NII-1	36	5180	MCS0	16.37	17.00	No
		40	5200		16.28	17.00	No
		44	5220		16.37	17.00	No
		48	5240		16.27	17.00	No
	U-NII-2A	52	5260		16.37	17.00	No
		56	5280		16.43	17.00	No
		60	5300		16.48	17.00	No
		64	5320		16.31	17.00	No
	U-NII-2C	100	5500		16.04	17.00	No
		104	5520		16.03	17.00	No



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		108	5540		16.00	17.00	No
		112	5560		16.05	17.00	No
		116	5580		16.11	17.00	No
		120	5600		16.09	17.00	No
		124	5620		16.01	17.00	No
		128	5640		16.12	17.00	No
		132	5660		16.08	17.00	No
		136	5680		16.09	17.00	No
		140	5700		16.09	17.00	No
		144	5720		16.12	17.00	No
	U-NII-3	149	5745		15.56	16.00	No
		153	5765		15.69	16.00	No
		157	5785		15.72	16.00	No
		161	5805		15.58	16.00	No
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test
802.11ac-40	U-NII-1	38	5190	MCS0	16.07	17.00	No
		46	5230		16.20	17.00	No
	U-NII-2A	54	5270		16.16	17.00	No
		62	5310		16.34	17.00	No
	U-NII-2C	102	5510		16.09	17.00	No
		110	5550		16.25	17.00	No
		118	5590		16.14	17.00	No
		126	5630		16.10	17.00	No
		134	5670		16.04	17.00	No
		142	5710		16.06	17.00	No
	U-NII-3	151	5755		15.92	16.00	No
		159	5795		15.82	16.00	No
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test
802.11ac 80M	U-NII-1	42	5210	MCS0	16.57	17.00	No
	U-NII-2A	58	5290		16.49	17.00	No
	U-NII-2C	106	5530		16.30	17.00	No
		122	5610		16.30	17.00	No
	U-NII-3	138	5690		16.28	17.00	No
		155	5775		16.35	17.00	No
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test
802.11ac 160M	U-NII-1	/	/	MCS0	/	/	/
	U-NII-2A	50	5250		14.77	16.00	No
	U-NII-2C	114	5570		14.59	16.00	No
	U-NII-3	/	/		/	/	/
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test
802.11ax-20	U-NII-1	36	5180	MCS0	15.99	17.00	No
		40	5200		15.91	17.00	No
		44	5220		16.07	17.00	No
		48	5240		16.03	17.00	No
	U-NII-2A	52	5260		16.12	17.00	No
		56	5280		16.08	17.00	No
		60	5300		16.16	17.00	No
		64	5320		15.91	17.00	No
	U-NII-2C	100	5500		15.84	17.00	No
		104	5520		15.86	17.00	No



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		108	5540		15.89	17.00	No
		112	5560		15.93	17.00	No
		116	5580		15.83	17.00	No
		120	5600		15.74	17.00	No
		124	5620		15.75	17.00	No
		128	5640		15.84	17.00	No
		132	5660		15.88	17.00	No
		136	5680		15.82	17.00	No
		140	5700		16.13	17.00	No
		144	5720		16.31	17.00	No
	U-NII-3	149	5745		15.52	16.00	No
		153	5765		15.59	16.00	No
		157	5785		15.51	16.00	No
		161	5805		15.48	16.00	No
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test
802.11ax-40	U-NII-1	38	5190	MCS0	15.97	17.00	No
		46	5230		16.14	17.00	No
	U-NII-2A	54	5270		16.03	17.00	No
		62	5310		15.83	17.00	No
	U-NII-2C	102	5510		15.80	17.00	No
		110	5550		15.78	17.00	No
		118	5590		15.60	17.00	No
		126	5630		15.61	17.00	No
		134	5670		15.48	17.00	No
		142	5710		15.45	17.00	No
	U-NII-3	151	5755		15.98	16.00	No
		159	5795		15.71	16.00	No
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test
802.11ax 80M	U-NII-1	42	5210		16.07	17.00	No
	U-NII-2A	58	5290		15.85	17.00	No
	U-NII-2C	106	5530	MCS0	15.81	17.00	No
		122	5610		15.66	17.00	No
		138	5690		15.65	17.00	No
	U-NII-3	155	5775		15.70	16.00	No
5GHz	mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	SAR Test
802.11ax 160M	U-NII-1	/	/	MCS0	/	/	No
	U-NII-2A	50	5250		14.55	16.00	No
	U-NII-2C	114	5570		14.34	16.00	No
	U-NII-3	/	/		/	/	No

Table 5: Conducted Power of WIFI.



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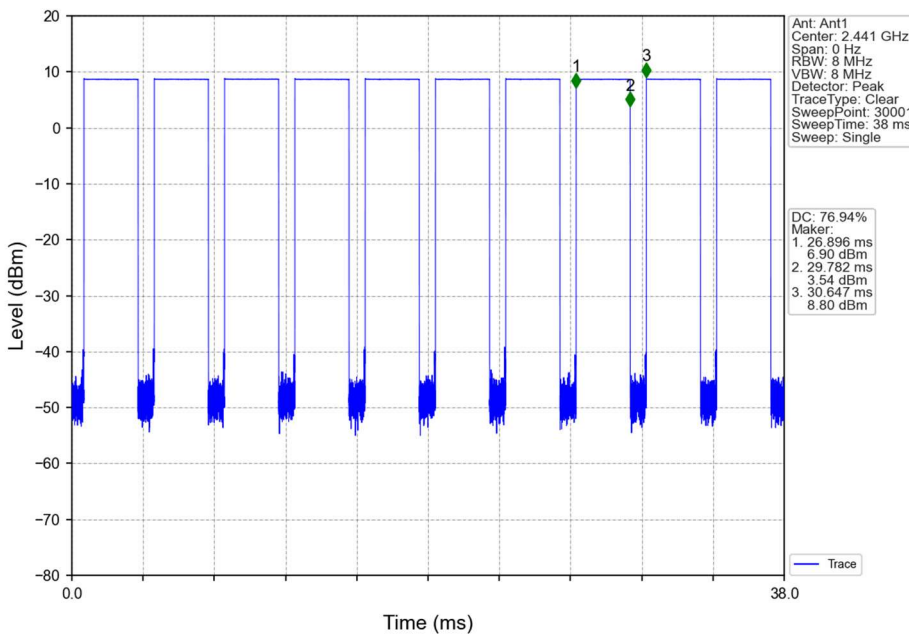
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BT		Average Conducted Power(dBm)			
Band	Channel	0	39	78	Tune up
BT	GFSK	9.55	9.34	9.39	10.00
	$\pi/4$ DQPSK	6.75	7.03	7.11	8.00
	8DPSK	6.77	6.94	6.68	7.00
Band	Channel	0	19	39	Tune up
BLE 1M	GFSK	5.59	4.38	5.11	6.00

Table 6: Conducted Power of BT.

BT DH5 Duty cycle=76.94%



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5.3 Measurement of SAR Data

Note:

- 1) The maximum Variant Scaled SAR value is marked in bold. Graph Results refer to Appendix B
- 2) If the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).



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5.3.1 SAR Result of WIFI 2.4G

Test Record Ant 0(AUX)											
Test position	Test mode	Test ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Body Test data (Separate 0mm)											
Back side	802.11b	13/2472	99.44%	1.006	0.335	0.05	15.27	16.00	1.183	0.399	22.3
Left side	802.11b	13/2472	99.44%	1.006	0.637	0.04	15.27	16.00	1.183	0.758	22.3
Left side	802.11b	1/2412	99.44%	1.006	0.633	0.03	15.15	16.00	1.216	0.774	22.3
Left side	802.11b	7/2442	99.44%	1.006	0.776	0.04	14.76	16.00	1.330	1.038	22.3
Test Record Ant1(MAIN)											
Test position	Test mode	Test ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(°C)
Body Test data (Separate 0mm)											
Back side	802.11b	13/2472	99.44%	1.006	0.160	0.01	15.44	16.00	1.138	0.183	22.3
Right side	802.11b	13/2472	99.44%	1.006	0.182	-0.02	15.44	16.00	1.138	0.208	22.3
Right side	802.11b	1/2412	99.44%	1.006	0.158	0.05	15.27	16.00	1.183	0.188	22.3
Right side	802.11b	7/2442	99.44%	1.006	0.189	-0.07	15.34	16.00	1.164	0.221	22.3

Table 7: SAR of WIFI 2.4G.

Note:

- Per KDB 248227 D01, for Body SAR test of WiFi 2.4G, SAR is measured for 2.4 GHz 802.11b DSSS using the initial test position procedure. The highest reported SAR for DSSS is adjusted by the ratio of OFDM 802.11g/n to DSSS specified maximum output power and the adjusted SAR is < 1.2 W/kg, so SAR for 802.11g/n is not required.

Mode	Tune-up (dBm)	Tune-up (mw)	Max Reported SAR1-g(W/kg)	Adjusted SAR1-g(W/kg)	SAR test
Body Ant 0 Test data(Separate 0mm)					
802.11b	16.00	39.81	1.038	/	Yes
802.11g	14.00	25.12	/	0.655	No
802.1n HT20	14.00	25.12	/	0.655	No
802.1n HT40	15.00	31.62	/	0.825	No
802.1ax HT20	15.00	31.62	/	0.825	No
802.1ax HT40	15.00	31.62	/	0.825	No
Mode	Tune-up (dBm)	Tune-up (mw)	Max Reported SAR1-g(W/kg)	Adjusted SAR1-g(W/kg)	SAR test
Body Ant 1 Test data(Separate 0mm)					
802.11b	16.00	39.81	0.221	/	Yes
802.11g	15.00	31.62	/	0.176	No
802.1n HT20	14.00	25.12	/	0.139	No
802.1n HT40	15.00	31.62	/	0.176	No
802.1ax HT20	15.00	31.62	/	0.176	No
802.1ax HT40	15.00	31.62	/	0.176	No



5.3.2 SAR Result of WIFI 5G

Wi-Fi 5G SAR Test Record											
Test Record Ant 0(AUX)											
Test position	Test mode	Test ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 10-g (W/kg)	Liquid Temp.(°C)
Body Test data of U-NII-2A(Separate 0mm)											
Back side	802.11ac VHT80 MCS0	58/5290	85.67%	1.167	0.157	-0.03	14.20	15.00	1.202	0.220	22.5
Left side	802.11ac VHT80 MCS0	58/5290	85.67%	1.167	0.850	-0.05	14.20	15.00	1.202	1.193	22.5
Left side-repeat	802.11ac VHT80 MCS0	58/5290	85.67%	1.167	0.830	0.01	14.20	15.00	1.202	1.165	22.5
Body Test data of U-NII-2C(Separate 0mm)											
Back side	802.11ac VHT80 MCS0	122/5610	85.67%	1.167	0.282	0.01	14.11	15.00	1.227	0.404	22.5
Left side	802.11ac VHT80 MCS0	122/5610	85.67%	1.167	0.828	0.03	14.11	15.00	1.227	1.186	22.5
Left side-repeat	802.11ac VHT80 MCS0	122/5610	85.67%	1.167	0.805	0.04	14.11	15.00	1.227	1.153	22.5
Left side	802.11ac VHT80 MCS0	106/5530	85.67%	1.167	0.678	0.02	14.04	15.00	1.247	0.987	22.5
Left side	802.11ac VHT80 MCS0	138/5690	85.67%	1.167	0.681	0.04	14.03	15.00	1.250	0.994	22.5
Body Test data of U-NII-3 (Separate 0mm)											
Back side	802.11ac VHT80 MCS0	155/5775	85.67%	1.167	0.190	0.03	14.17	15.00	1.211	0.268	22.5
Left side	802.11ac VHT80 MCS0	155/5775	85.67%	1.167	0.601	0.06	14.17	15.00	1.211	0.849	22.5
Wi-Fi 5G SAR Test Record											
Test Record Ant 1(MAIN)											
Test position	Test mode	Test ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 10-g (W/kg)	Liquid Temp.(°C)
Body Test data of U-NII-2A(Separate 0mm)											
Back side	802.11ac VHT80 MCS0	58/5290	85.67%	1.167	0.115	0.08	12.64	13.00	1.086	0.146	22.5
Right side	802.11ac VHT80 MCS0	58/5290	85.67%	1.167	0.495	0.06	12.64	13.00	1.086	0.628	22.5
Body Test data of U-NII-2C(Separate 0mm)											
Back side	802.11ac VHT80 MCS0	106/5530	85.67%	1.167	0.112	0.04	12.38	13.00	1.153	0.151	22.5
Right side	802.11ac VHT80 MCS0	106/5530	85.67%	1.167	0.403	-0.13	12.38	13.00	1.153	0.543	22.5
Right side	802.11ac VHT80 MCS0	122/5610	85.67%	1.167	0.512	0.05	12.27	13.00	1.183	0.707	22.5
Right side	802.11ac VHT80 MCS0	138/5690	85.67%	1.167	0.415	0.07	12.34	13.00	1.164	0.564	22.5
Body Test data of U-NII-3 (Separate 0mm)											
Back side	802.11ac VHT80 MCS0	155/5775	85.67%	1.167	0.133	0.03	12.32	13.00	1.169	0.182	22.5
Right side	802.11ac VHT80 MCS0	155/5775	85.67%	1.167	0.356	0.06	12.32	13.00	1.169	0.486	22.5

Table 8: SAR of WIFI 5G.

Note:

1) When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. As the highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band for that configuration;

Ant	Mode	Tune-up (dBm)	Tune-up (mw)	Highest Reported SAR1-g(W/kg)	Adjusted SAR1-g(W/kg)	SAR test
Ant0	802.11ac VHT80 (U-NII-2A)	15.00	31.62	1.193	/	
	802.11ac HT80 (U-NII-1)	15.00	31.62	/	1.193	No
Ant1	802.11ac VHT80 (U-NII-2A)	13.00	19.95	0.628	/	
	802.11ac HT80 (U-NII-1)	13.00	19.95	/	0.628	No



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2) Per KDB248227D01, as the highest reported SAR for the initial test configuration is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR test for the other 802.11 modes are not required.

Ant 0					
Mode	Tune-up (dBm)	Tune-up (mw)	Highest Reported SAR1-g(W/kg)	Adjusted SAR1-g(W/kg)	SAR test
U-NII-2A					
802.11ac 80M	15.00	31.62	1.193	/	Yes
802.11a 20M	15.00	31.62	/	1.193	No
802.11n 20M	15.00	31.62	/	1.193	No
802.11n 40M	15.00	31.62	/	1.193	No
802.11ac 20M	15.00	31.62	/	1.193	No
802.11ac 40M	15.00	31.62	/	1.193	No
802.11ax 20M	15.00	31.62	/	1.193	No
802.11ax 40M	14.00	25.12	/	0.948	No
802.11ax 80M	14.00	25.12	/	0.948	No
U-NII-2C					
802.11ac 80M	15.00	31.62	1.186	/	Yes
802.11a 20M	15.00	31.62	/	1.186	No
802.11n 20M	15.00	31.62	/	1.186	No
802.11n 40M	15.00	31.62	/	1.186	No
802.11ac 20M	15.00	31.62	/	1.186	No
802.11ac 40M	15.00	31.62	/	1.186	No
802.11ax 20M	15.00	31.62	/	1.186	No
802.11ax 40M	14.00	25.12	/	0.942	No
802.11ax 80M	14.00	25.12	/	0.942	No
U-NII-3					
802.11ac 80M	15.00	31.62	0.849	/	Yes
802.11a 20M	14.00	25.12	/	0.674	No
802.11n 20M	14.00	25.12	/	0.674	No
802.11n 40M	14.00	25.12	/	0.674	No
802.11ac 20M	14.00	25.12	/	0.674	No
802.11ac 40M	14.00	25.12	/	0.674	No
802.11ax 20M	14.00	25.12	/	0.674	No
802.11ax 40M	14.00	25.12	/	0.674	No
802.11ax 80M	14.00	25.12	/	0.674	No



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Ant 1					
Mode	Tune-up (dBm)	Tune-up (mw)	Max Reported SAR1-g(W/kg)	Adjusted SAR1-g(W/kg)	SAR test
U-NII-2A					
802.11ac 80M	13.00	19.95	0.628	/	Yes
802.11a 20M	13.00	19.95	/	0.628	No
802.11n 20M	13.00	19.95	/	0.628	No
802.11n 40M	13.00	19.95	/	0.628	No
802.11ac 20M	13.00	19.95	/	0.628	No
802.11ac 40M	13.00	19.95	/	0.628	No
802.11ax 20M	13.00	19.95	/	0.628	No
802.11ax 40M	13.00	19.95	/	0.628	No
802.11ax 80M	13.00	19.95	/	0.628	No
U-NII-2C					
802.11ac 80M	13.00	19.95	0.707	/	Yes
802.11a 20M	13.00	19.95	/	0.707	No
802.11n 20M	13.00	19.95	/	0.707	No
802.11n 40M	13.00	19.95	/	0.707	No
802.11ac 20M	13.00	19.95	/	0.707	No
802.11ac 40M	13.00	19.95	/	0.707	No
802.11ax 20M	13.00	19.95	/	0.707	No
802.11ax 40M	13.00	19.95	/	0.707	No
802.11ax 80M	13.00	19.95	/	0.707	No
U-NII-3					
802.11ac 80M	13.00	19.95	0.486	/	Yes
802.11a 20M	13.00	19.95	/	0.486	No
802.11n 20M	13.00	19.95	/	0.486	No
802.11n 40M	13.00	19.95	/	0.486	No
802.11ac 20M	13.00	19.95	/	0.486	No
802.11ac 40M	13.00	19.95	/	0.486	No
802.11ax 20M	13.00	19.95	/	0.486	No
802.11ax 40M	13.00	19.95	/	0.486	No
802.11ax 80M	13.00	19.95	/	0.486	No

U-NII-2A						
Test Position	Channel/ Frequency	Measured SAR (1g)	1 st Repeated	Ratio	2 nd Repeated	3 rd Repeated
	(MHz)		SAR (1g)		SAR (1g)	SAR (1g)
Left side	58/5290	0.850	0.830	1.024	N/A	N/A

Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.
 2) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).
 3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .
 4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg



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5.3.1 SAR Result of BT

Test position	Test mode	Test Ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg)1-g	Power drift (dB)	Conducted power (dBm)	Tune up Limit (dBm)	Scaled factor	Scaled SAR (W/kg)	Liquid Temp. (°C)
Body Test data(Separate 0mm)											
Back side	DH5	0/2402	76.94%	1.300	0.015	0.01	9.55	10.00	1.109	0.021	22.3
Left side	DH5	0/2402	76.94%	1.300	0.085	-0.10	9.55	10.00	1.109	0.123	22.3
Left side	DH5	39/2441	76.94%	1.300	0.092	-0.05	9.34	10.00	1.164	0.139	22.3
Left side	DH5	78/2480	76.94%	1.300	0.135	-0.02	9.39	10.00	1.151	0.202	22.3

Table 9: SAR of BT



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5.4 Multiple Transmitter Evaluation

5.4.1 Simultaneous SAR test evaluation

1) Simultaneous Transmission

NO.	Simultaneous Transmission Configuration	Body
1	WIFI 2.4G Ant1 + BT	Yes
2	WIFI 5G Ant1 + BT	Yes
3	WIFI 2.4G Ant0 + WIFI 2.4G Ant1	Yes
4	WIFI 5G Ant0 + WIFI 5G Ant1	Yes

5.4.2 Simultaneous Transmission SAR Summation Scenario

Test position	WiFi 2.4G	WiFi 2.4G	WiFi 5G	WiFi 5G	BT	Summed SAR			
	Ant0	Ant1	Ant0	Ant1	Ant0	1+2	2+5	3+4	3+5
Back side	0.399	0.183	0.404	0.182	0.021	2.399	0.204	0.586	0.203
Left side	1.038	0.400	1.193	0.400	0.202	3.038	0.602	1.593	0.602
Right side	0.400	0.221	0.400	0.628	0.400	2.400	0.621	1.028	1.028
Top side	0.400	0.400	0.400	0.400	0.400	2.400	0.800	0.800	0.800
Bottom side	0.400	0.400	0.400	0.400	0.400	2.400	0.800	0.800	0.800

Note:

WIFI 2.4G MIMO: Ant0+Ant1

WIFI 5G MIMO: Ant0+Ant1

For the MIMO SAR, each antenna SAR will be evaluated independently. Then the conservative “max + max” multi-Tx method should be used to combine the scaled SAR value of each antenna as the MIMO SAR



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6 Equipment list

Test Platform		SPEAG DASY5 Professional				
Description		SAR Test System (Frequency range 300MHz-6GHz)				
Software Reference		DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)				
Hardware Reference						
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Due date of calibration	
<input checked="" type="checkbox"/> Twin Phantom	SPEAG	SAM2	1563	NCR	NCR	
<input checked="" type="checkbox"/> DAE	SPEAG	DAE4	1324	2021-06-22	2022-06-21	
<input checked="" type="checkbox"/> E-Field Probe	SPEAG	EX3DV4	3982	2021-12-29	2022-12-28	
<input checked="" type="checkbox"/> Validation Kits	SPEAG	D2450V2	1038	2020-04-08	2023-04-07	
<input checked="" type="checkbox"/> Validation Kits	SPEAG	D5GHzV2	1313	2022-01-25	2025-01-24	
<input checked="" type="checkbox"/> Dielectric parameter probes	SPEAG	DAKS-3.5	0005	2021-07-15	2022-07-14	
<input checked="" type="checkbox"/> Vector Network Analyzer and Vector Reflectometer	SPEAG	DAKS_VNA R140	0140913	2021-07-22	2022-07-21	
<input checked="" type="checkbox"/> RF Bi-Directional Coupler	Agilent	86205-60001	MY31400031	NCR	NCR	
<input checked="" type="checkbox"/> Signal Generator	R&S	SMB100A	100379	2021-12-04	2022-12-03	
<input checked="" type="checkbox"/> Preamplifier	Qiji	YX28980933	202104001	NCR	NCR	
<input checked="" type="checkbox"/> Power Meter	Anritsu	ML2495A	2136003	2021-12-4	2022-12-3	
<input checked="" type="checkbox"/> Power Sensor	Anritsu	MA2411B	1911376	2021-12-4	2022-12-3	
<input checked="" type="checkbox"/> Attenuator	SHX	TS2-3dB	30704	NCR	NCR	
<input checked="" type="checkbox"/> Coaxial low pass filter	Mini-Circuits	VLF-2500(+)	NA	NCR	NCR	
<input checked="" type="checkbox"/> Coaxial low pass filter	Microlab Fxr	LA-F13	NA	NCR	NCR	
<input checked="" type="checkbox"/> DC POWER SUPPLY	SAKO	SK1730SL5A	NA	NCR	NCR	
<input checked="" type="checkbox"/> Speed reading thermometer	LKM	DTM3000	SUW201-30-01	2021-10-09	2022-10-08	
<input checked="" type="checkbox"/> Humidity and Temperature Indicator	MingGao	MingGao	NA	2021-06-16	2022-06-15	

Note: All the equipments are within the valid period when the tests are performed.



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7 Measurement Uncertainty

Per KDB865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. The equivalent ratio (1.5/1.6) is applied to extremity and occupational exposure conditions.

8 Calibration certificate

Please see the Appendix C

9 Photographs

Please see the Appendix D



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Appendix A: Detailed System Check Results

Appendix B: Detailed Test Results

Appendix C: Calibration certificate

Appendix D: Photographs

---END---



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