

## RF Exposure report



The following samples were submitted and identified on behalf of the client as:

**Product Name** Headset  
**Brand Name** VIVE  
**Model No.** 2QBB100  
**Applicant** HTC Corporation  
No. 88, Section 3, Zhongxing Rd. Xindian Dist., New Taipei  
City 231, Taiwan  
**Standards** IEEE/ANSI C95.1-1992, IEEE 1528-2013  
**FCC ID** NM82QBB100  
**Date of EUT Receipt** Sep. 06, 2022  
**Date of Test(s)** Sep. 19, 2022 ~ Sep. 22, 2022  
**Date of Issue** Nov. 08, 2022

In the configuration tested, the EUT complied with the standards specified above.

**Remarks:**

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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**Signed on behalf of SGS**

Clerk / Kimmy Chiou	PM / Kiki Lin	Approved By / John Yeh

**Date: Nov. 08, 2022**

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## Revision History

Report Number	Revision	Description	Issue Date	Revised By	Remark
TESA2207000216ES	00	Initial creation of document	Nov. 08, 2022	Kimmy Chiou	

Note:

1. The mark " \* " is the revised version of the report due to comments submitted by the certification.

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## 1 GENERAL INFORMATION

### 1.1 Test Methodology

The SAR testing method and procedure for this device is in accordance with the following standards:

IEEE/ANSI C95.1-1992

IEEE 1528-2013

KDB447498D01v06

KDB865664D01v01r04

KDB865664D02v01r02

KDB248227D01v02r01

IEC/IEEE 62209-1528:2020

SPEAG DASY6 System Handbook

SPEAG DASY6 Application Note (Interim Procedure for Device Operation at 6GHz-10GHz)

IEC TR 63170:2018

IEC 62479:2010

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## 1.2 Description of EUT

Product Name	Headset	
Brand Name	VIVE	
Model No.	2QBB100	
FCC ID	NM82QBB100	
Mode	WLAN: 802.11a/b/g/n/ac/ax HT20/HT40/VHT20/VHT40/VHT80/VHT160/HE20/HE40/HE80/ HE160 Bluetooth BR/EDR/LE	
Duty Cycle	WLAN802.11	Please refer to section 42~45
	Bluetooth	Please refer to section 42
Supported radios (TX Frequency Range, MHz)	802.11 b/g/n/ax	2.4GHz (2400.0 – 2483.5 MHz)
	802.11a/n/ac/ax	5.2GHz (5150.0 – 5350.0 MHz)
		5.6GHz (5470.0 – 5725.0 MHz)
		5.8GHz (5725.0 – 5850.0 MHz)
	802.11ax	6.2GHz (5925.0 – 6425.0 MHz)
		6.5GHz (6425.0 – 6525.0 MHz)
		6.7GHz (6525.0 – 6875.0 MHz)
	Bluetooth 5.2	7.0GHz (6875.0 – 7125.0 MHz)
		2.4GHz (2400.0 – 2483.5 MHz)

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### 1.3 Maximum value

Summary of Maximum SAR and Power Density Value			
Mode	Highest SAR 1g Body (W/kg)	Highest APD (W/m <sup>2</sup> )	Highest PD (W/m <sup>2</sup> )
Bluetooth(GFSK)	0.06	N/A	N/A
2.4G WLAN	0.2	N/A	N/A
5G WLAN	0.33	N/A	N/A
6G WLAN	0.23	1.84	3.26

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## 2 MEASUREMENT SYSTEM

### 2.1 Test Facility

Laboratory	Test Site Address	Test Site Name	FCC Designation number	IC CAB identifier
SGS Taiwan Ltd. Central RF Lab. (TAF code 3702)	1F, No. 8, Alley 15, Lane 120, Sec. 1, NeiHu Road, NeiHu District, Taipei City, 11493, Taiwan.	SAR 2	TW0029	TW3702
		SAR 6		
	No. 2, Keji 1st Rd., Guishan Township, Taoyuan County, 33383, Taiwan	SAR 1	TW0028	
		SAR 4		
	<b>No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City. Taiwan</b>	SAR 3	TW0027	
		SAR 7		

**Note:** Test site name is remarked on the equipment list in each section of this report as an indication where measurements occurred in specific test site and address.

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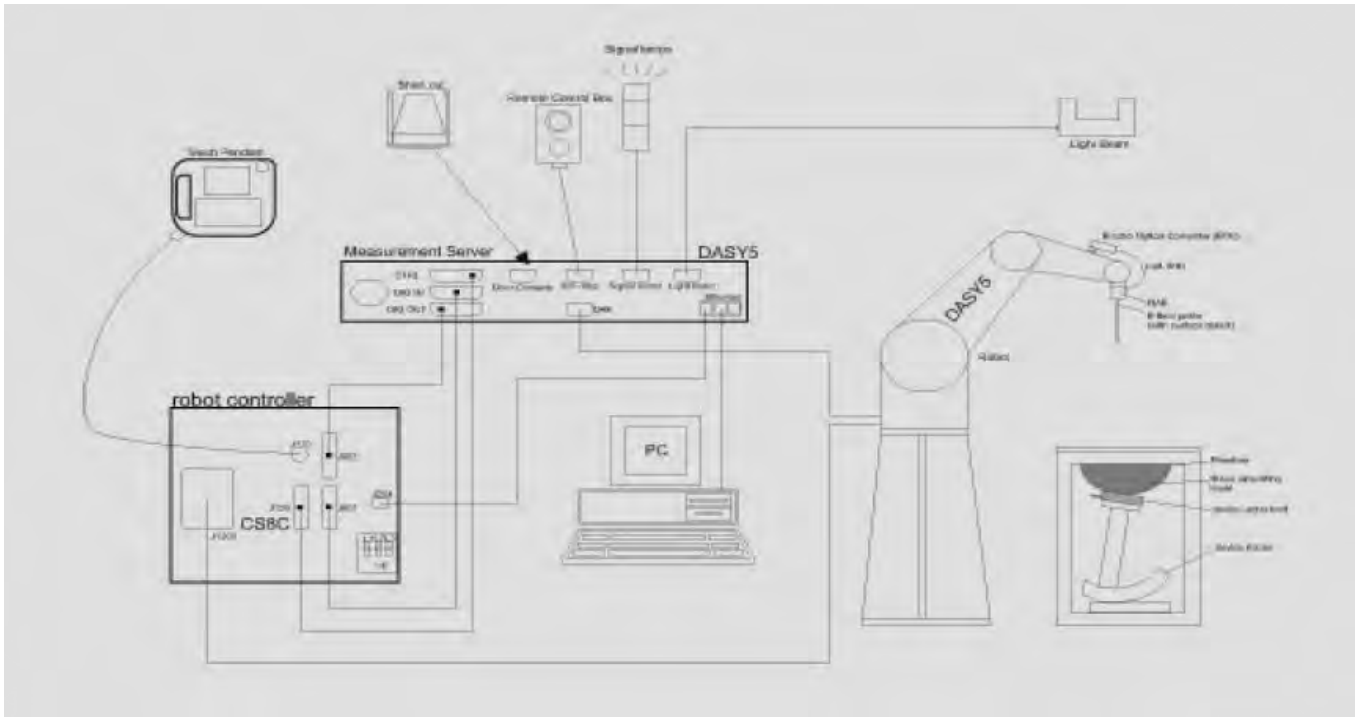
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## 2.2 SAR System

### Block Diagram (DASY5)

A block diagram of the SAR measurement System is given in below. This SAR measurement system uses a computer-controlled 3-D stepper motor system (SPEAG DASY 5 professional system). The model EX3DV4 field probe is used to determine the internal electric fields. The SAR can be obtained from the equation  $SAR = \sigma (|E_i|^2) / \rho$  where  $\sigma$  and  $\rho$  are the conductivity and mass density of the tissue-simulant.



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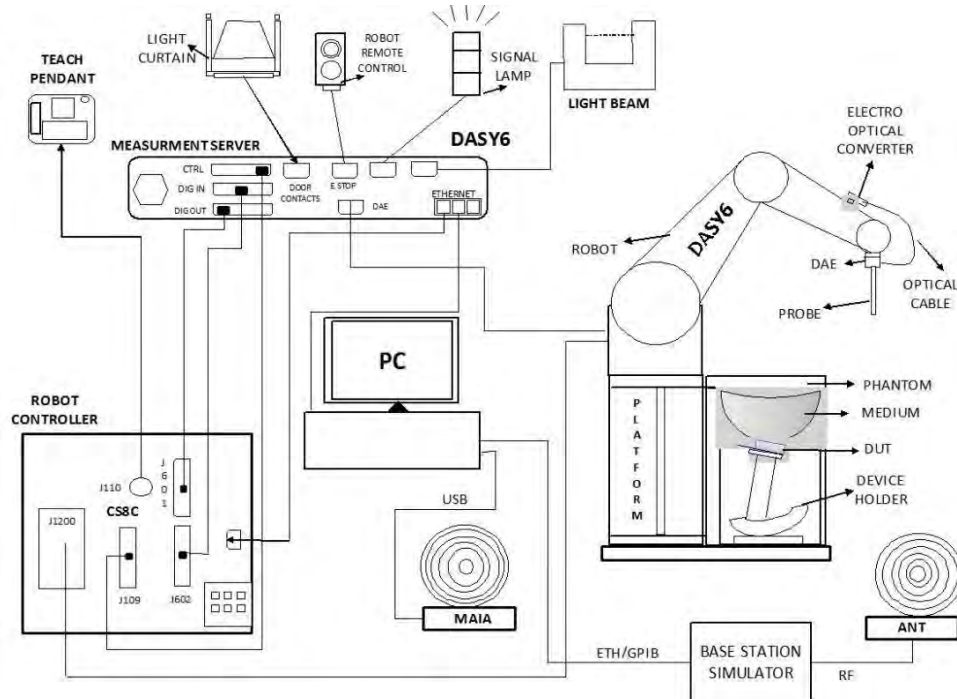
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## Block Diagram (DASY6)

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




- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running Windows 10 and the DASY6 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

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## EX3DV4 E-Field Probe

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)		
Calibration	Basic Broad Band Calibration in air Conversion Factors (CF) for HSL 2450/5250/5600/5750/6500/7000 MHz Additional CF for other liquids and frequencies upon request		
Frequency	10 MHz to > 6 GHz		
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)		
Dynamic Range	10 µW/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 µW/g)		
Dimensions	Tip diameter: 2.5 mm		
Application	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%.		

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## PHANTOM (ELI)

Model	ELI	
Construction	The ELI phantom is used 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.	
Shell Thickness	2 ± 0.2 mm	
Filling Volume	Approx. 30 liters	
Dimensions	Major axis: 600 mm Minor axis: 400 mm	

## DEVICE HOLDER (ELI)

Construction	The device holder (Supporter) for Notebook is made by POM (polyoxymethylene resin), which is non-metal and non-conductive. The height can be adjusted to fit various kind of notebooks.	
		Device Holder

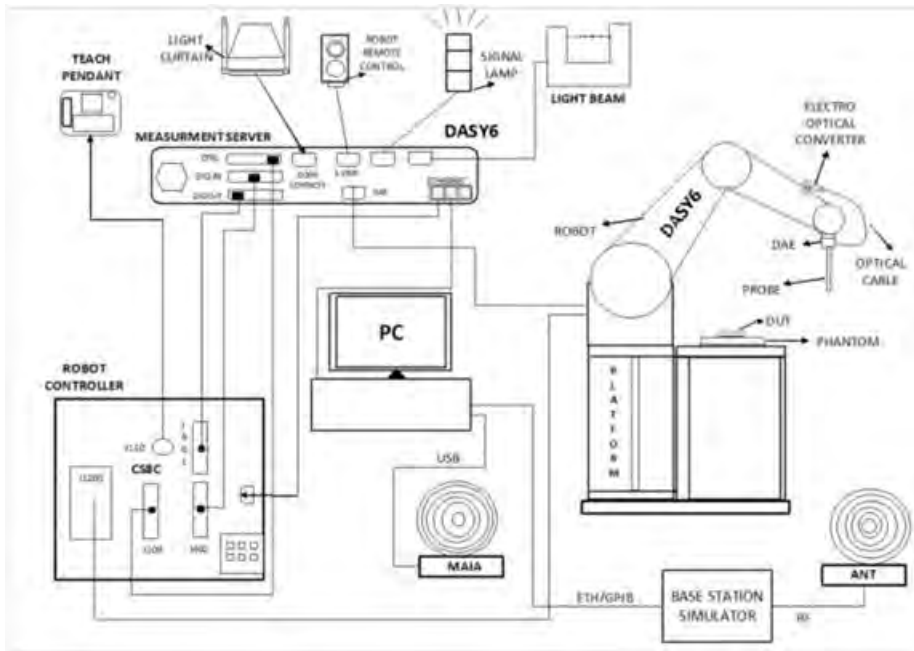
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## 2.3 PD system

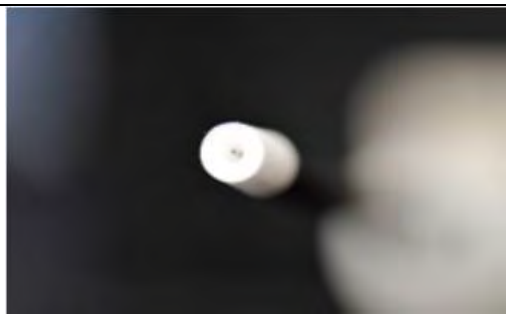
### Block Diagram (DASY6)

Power density measurements for mmWave frequencies were performed using SPEAG DASY6 with cDASY6 5G module. The DASY6 included a high precision robotics system (Staubli), robot controller, desktop computer, near-field probe, probe alignment sensor, and the 5G phantom cover.



### EUmmWVx probe

The EUmmWVx probe is based on the pseudo-vector probe design, which not only measures the field magnitude but also derives its polarization ellipse. The design entails two small 0.8mm dipole sensors mechanically protected by high-density foam, printed on both sides of a 0.9mm wide and 0.12mm thick glass substrate. The body of the probe is specifically constructed to minimize distortion by the scattered fields. The probe consist of two sensors with different angles (1 and 2) arranged in the same plane in the probe axis. Three or more measurements of the two sensors are taken for different probe rotational angles to derive the amplitude and polarization information. The probe design allows measurements at distances as small as 2mm from the sensors to the surface of the device under test (DUT). The typical sensor to probe tip distance is 1.5 mm. The exact distance is calibrated.

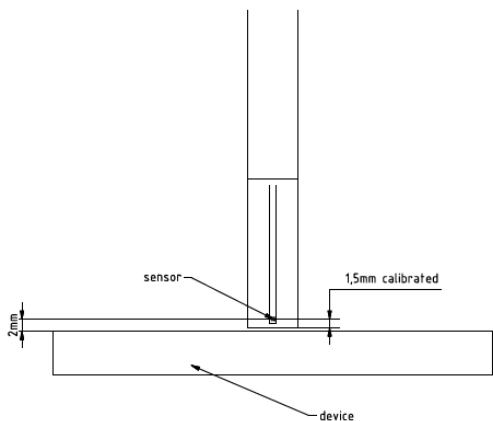


Two dipoles optimally arranged to obtain pseudo-vector information. Minimum 3 measurements/ point, 120° rotated around probe axis. Sensors (0.8mm length) printed on glass substrate protected by high density foam. Low perturbation of the measured field. Requires positioner which can do accurate probe rotation.

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Frequency Range	750 MHz – 110 GHz
Dynamic Range	< 20 V/m – 10,000 V/m with PRE-10 (min < 50 V/m - 3000 V/m)
Position Precision	< 0.2 mm (DASY6)
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: encapsulation 8 mm (internal sensor < 1mm) Distance from probe tip to dipole centers: < 2 mm. Sensor displacement to probe's calibration point: < 0.3 mm
Applications	E-field measurements of 5G devices and other mm-wave transmitters operating above 10GHz in < 2 mm distance from device (free-space). Power density, H-field and far-field analysis using total field reconstruction (cDASY6 5G module required) 
Compatibility	cDASY6 + 5G-Module SW1.0 and higher

## mmWave Phantom

The mmWave Phantom approximates free-space conditions, allowing for the evaluation of the antenna side of the device and the front (screen) side or any opposite-radiating side of wireless devices operating above 10 GHz without distorting the RF field. It consists of a 40mm thick Rohacell plate used as a test bed, which has a loss tangent ( $\tan \delta$ )  $\leq 0.05$  and a relative permittivity ( $\epsilon_r$ )  $\leq 1.2$ . High-performance RF absorbers are placed below the foam.

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### 3 SAR SYSTEM VERIFICATION

#### 3.1 Tissue Simulating Liquid

For the measurement of the field distribution inside the SAM phantom with DASY, the phantom must be filled with homogeneous tissue simulating liquid. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15cm. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15cm.

#### 3.2 Tissue Simulant Liquid measurement

The dielectric properties for this Head-simulant fluid were measured by using the SPEAG Dielectric Assessment Kit (DAKS-3.5)

All dielectric parameters of tissue simulates were measured within 24 hours of SAR measurements. The measured conductivity and permittivity are all within  $\pm 5\%$  of the target values.

#### 3.3 Measurement results of Tissue Simulant Liquid

Measured Frequency (MHz)	Liquid Temp. (°C)	Target Dielectric Constant, $\epsilon_r$	Target Conductivity, $\sigma$ (S/m)	Measured Dielectric Constant, $\epsilon_r$	Measured Conductivity, $\sigma$ (S/m)	% dev $\epsilon_r$	% dev $\sigma$	Limit	Measurement Date
2402	22.4°C	39.282	1.757	39.718	1.797	1.11%	2.25%	$\pm 5\%$	Sep. 19, 2022
2412	22.4°C	39.265	1.766	39.698	1.807	1.10%	2.30%	$\pm 5\%$	Sep. 19, 2022
2437	22.4°C	39.222	1.788	39.651	1.829	1.09%	2.27%	$\pm 5\%$	Sep. 19, 2022
2441	22.4°C	39.215	1.792	39.638	1.833	1.08%	2.29%	$\pm 5\%$	Sep. 19, 2022
2450	22.4°C	39.200	1.800	39.629	1.841	1.09%	2.28%	$\pm 5\%$	Sep. 19, 2022
2462	22.4°C	39.184	1.813	39.614	1.854	1.10%	2.27%	$\pm 5\%$	Sep. 19, 2022
2480	22.4°C	39.160	1.832	39.594	1.873	1.11%	2.24%	$\pm 5\%$	Sep. 19, 2022
5250	22.2°C	35.950	4.710	36.449	4.774	1.39%	1.36%	$\pm 5\%$	Sep. 20, 2022
5270	22.2°C	35.930	4.730	36.278	4.836	0.97%	2.24%	$\pm 5\%$	Sep. 20, 2022
5310	22.2°C	35.890	4.770	36.180	4.885	0.81%	2.41%	$\pm 5\%$	Sep. 20, 2022
5530	22.2°C	35.605	4.997	36.113	5.133	1.43%	2.73%	$\pm 5\%$	Sep. 21, 2022
5570	22.2°C	35.545	5.039	35.936	5.150	1.10%	2.21%	$\pm 5\%$	Sep. 21, 2022
5600	22.2°C	35.500	5.070	35.931	5.161	1.21%	1.79%	$\pm 5\%$	Sep. 21, 2022
5690	22.2°C	35.410	5.160	35.530	5.281	0.34%	2.34%	$\pm 5\%$	Sep. 21, 2022
5750	22.2°C	35.350	5.220	35.442	5.337	0.26%	2.24%	$\pm 5\%$	Sep. 21, 2022
5775	22.2°C	35.325	5.245	35.299	5.397	-0.07%	2.90%	$\pm 5\%$	Sep. 21, 2022
6025	22.1°C	35.070	5.510	35.027	5.662	-0.12%	2.77%	$\pm 5\%$	Sep. 22, 2022
6185	22.1°C	34.878	5.698	34.790	5.854	-0.25%	2.73%	$\pm 5\%$	Sep. 22, 2022
6345	22.1°C	34.686	5.887	34.583	6.026	-0.30%	2.36%	$\pm 5\%$	Sep. 22, 2022
6500	22.1°C	34.500	6.070	34.471	6.194	-0.08%	2.04%	$\pm 5\%$	Sep. 22, 2022
6505	22.1°C	34.494	6.076	34.466	6.224	-0.08%	2.44%	$\pm 5\%$	Sep. 22, 2022
6665	22.1°C	34.302	6.261	34.295	6.393	-0.02%	2.10%	$\pm 5\%$	Sep. 22, 2022
6825	22.1°C	34.110	6.447	34.077	6.569	-0.10%	1.89%	$\pm 5\%$	Sep. 22, 2022
6985	22.1°C	33.918	6.633	33.782	6.775	-0.40%	2.15%	$\pm 5\%$	Sep. 22, 2022
7000	22.1°C	33.900	6.650	33.671	6.818	-0.68%	2.53%	$\pm 5\%$	Sep. 22, 2022

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### 3.4 The composition of the tissue simulating liquid:

Simulating Liquids for 600 MHz -10 GHz, Manufactured by SPEAG:

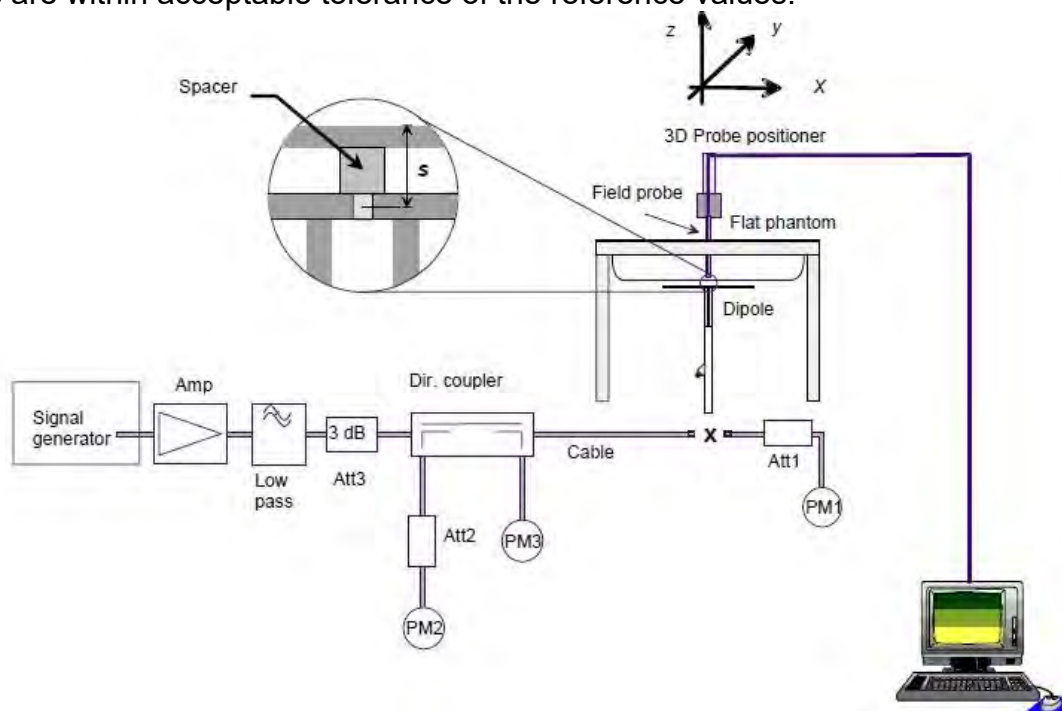
Broad-band head tissue simulating liquids	SPEAG Product	Frequency range (MHz)	Main Ingredients
	HBBL600-10000V6	600 - 10000	Water, Oil

### 3.5 System check

The microwave circuit arrangement for system check is sketched in below. The daily system accuracy verification occurs within the flat section of the SAM phantom and ELI 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 DUT. The obtained results from the system accuracy verification are displayed with SAR values normalized to 1W forward power delivered to the dipole.

During the tests, the liquid depth from the center of the flat phantom to the liquid top surface was 15 cm above 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.



The block diagram of system check

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### 3.6 System check results

Validation Kit	S/N	Frequency (MHz)	1W Target 1g-SAR (W/kg)	pin=250mW Measured 1g-SAR (W/kg)	Normalized to 1W 1g-SAR (W/kg)	Deviation (%)	Limit	Measurement Date
D2450V2	727	2450	52.8	14	56	6.06	± 10%	Sep.19,2022
Validation Kit	S/N	Frequency (MHz)	1W Target 1g-SAR (W/kg)	pin=100mW Measured 1g-SAR (W/kg)	Normalized to 1W 1g-SAR (W/kg)	Deviation (%)	Limit	Measurement Date
D5GHzV2	1023	5250	81	7.66	76.6	-5.43	± 10%	Sep.20,2022
D5GHzV2	1023	5600	84.4	8.22	82.2	-2.61	± 10%	Sep.21,2022
D5GHzV2	1023	5750	81	8.49	84.9	4.81	± 10%	Sep.21,2022
Validation Kit	S/N	Frequency (MHz)	1W Target 1g-SAR (W/kg)	pin=100mW Measured 1g-SAR (W/kg)	Normalized to 1W 1g-SAR (W/kg)	Deviation (%)	Limit	Measurement Date
D6.5GHzV2	1006	6500	292	28.7	287	-1.71	± 10%	Sep.22,2022
D7GHzV2	1007	7000	278	26.3	263	-5.40	± 10%	Sep.22,2022

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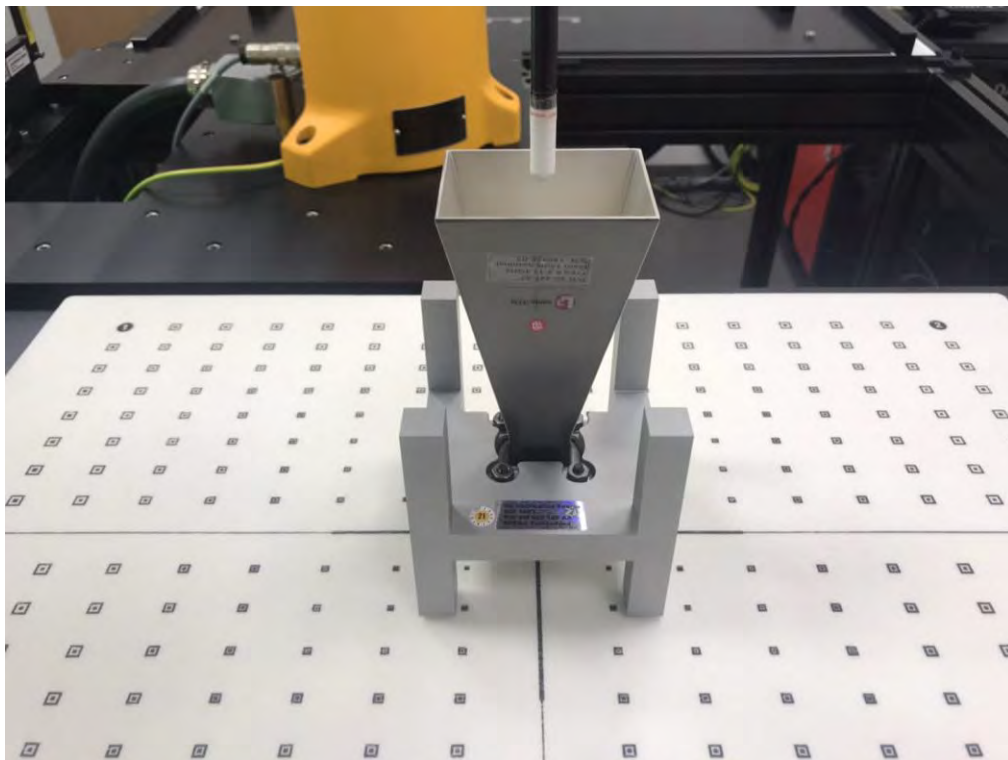
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## 4 PD SYSTEM VERIFICATION

### 4.1 System check

The system was verified to be within  $\pm 0.66$  dB of the power density targets on the calibration certificate according to the test system specification in the user's manual and calibration facility recommendation. The 0.66 dB deviation threshold represents the expanded uncertainty for system performance checks using SPEAG's mmWave verification sources. The same spatial resolution and measurement region used in the source calibration was applied during the system check.

The measured power density distribution of verification source was also confirmed through visual inspection to have no noticeable differences, both spatially (shape) and numerically (level) from the distribution provided by the manufacturer, per November 2017 TCBC Workshop Notes.



System Verification Setup Photo

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## 4.2 System check result

The system was verified to be within  $\pm 0.66$  dB of the power density targets on the calibration certificate according to the test system specification in the user's manual and calibration facility recommendation. The 0.66 dB deviation threshold represents the expanded uncertainty for system performance checks using SPEAG's mmWave verification sources. The same spatial resolution and measurement region used in the source calibration was applied during the system check. The measured power density distribution of verification source was also confirmed through visual inspection to have no noticeable differences, both spatially (shape) and numerically (level) from the distribution provided by the manufacturer, per November 2017 TCBC Workshop Notes.

Frequency (MHz)	PD Verification Source (MHz)	Probe S/N	DAE S/N	Distance (mm)	Prad (mW)	Measured $4\text{cm}^2$ ( $\text{W}/\text{m}^2$ )	Target $4\text{cm}^2$ ( $\text{W}/\text{m}^2$ )	Deviation (dB)	Date
10000	10000	9399	1665	2	86.1	51	51.7	-0.06	Sep.22,2022

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## 5 TEST CONFIGURATIONS

### 5.1 Test Environment

Ambient Temperature:  $22 \pm 2^{\circ}\text{C}$

Tissue Simulating Liquid:  $22 \pm 2^{\circ}\text{C}$

### 5.2 Test Note

- **General:** Measurements are performed respectively on the lowest, middle and highest channels of the operating band(s).
- **General:** The EUT is set to maximum power level during all tests, and at the beginning of each test the battery is fully charged.
- **General:** During the SAR testing, the DASY system checks power drift by comparing the e-field strength of one specific location measured at the beginning with that measured at the end of the SAR testing.
- **General:** According to KDB447498D01v06, testing of other required channels is not required when the reported 1-g SAR for the highest output channel is  $\leq 0.8\text{ W/kg}$ , when the transmission band is  $\leq 100\text{ MHz}$ .
- **General:** According to KDB865664D01v01r04, SAR measurement variability must be assessed for each frequency band. When the original highest measured SAR is  $\geq 0.8\text{ W/kg}$ , repeated that measurement once. 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  $\geq 1.45\text{ W/kg}$  ( $\sim 10\%$  from the 1-g SAR limit).
- **WLAN 2.4GHz:** 802.11b DSSS SAR Test Requirements: SAR is measured for 2.4 GHz 802.11b DSSS mode using the highest measured maximum output power channel, when the reported SAR of the highest measured maximum output power channel for the exposure configuration is  $\leq 0.8\text{ W/kg}$ , no further SAR testing is required for 802.11b DSSS in that exposure configuration. When the reported SAR is  $> 0.8\text{ W/kg}$ , SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is  $> 1.2\text{ W/kg}$ , SAR is required for the third channel; i.e., all channels require testing.
- **WLAN 2.4GHz:** 802.11g/n OFDM SAR Test Exclusion Requirements: SAR is not required for 802.11g/n since the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is  $\leq 1.2\text{ W/kg}$ .
- **WLAN 5GHz:** Initial Test Configuration: 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. When the reported SAR of the initial test configuration is  $> 0.8\text{ W/kg}$ , SAR measurement is required for the subsequent next highest measured output power channel(s) in the initial test configuration until the reported SAR is  $\leq 1.2\text{ W/kg}$  or all required channels are tested. Since the highest reported SAR for the initial test configuration is adjusted by the ratio of the subsequent test configuration to initial test configuration

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specified maximum output power and the adjusted SAR is  $\leq 1.2$  W/kg, SAR is not required for subsequent test configuration.

- **WLAN 5GHz:** Based on FCC guidance, general principles of KDB248227D01 can be applied to 802.11ax to determine initial test configuration with 802.11ax being considered as the highest 802.11 mode for the appropriate frequency band.

- **WLAN 6GHz:** Per October 2020 & April 2021 TCB Workshop Interim procedures and FCC guidance, start instead with a minimum of 5 test channels across the full band, then adapt and apply conducted power and SAR test reduction procedures of KDB Pub. 248227 v02r02. WIFI 6E SAR is measured by using 6-7GHz parameters per IEC/IEEE62209-1528:2020 and report also estimated absorbed PD (for reference purposes only, not specifically for compliance). For the highest SAR test configurations also measure incident PD (total) using mmW near-field probe and total-field/power-density reconstruction method.

- **WLAN 6GHz:** Per equipment manufacturer guidance, power density was measured at  $d=2\text{mm}$  with the grid step ( $0.0625\lambda$ ) for determining compliance at  $d=2\text{mm}$ .

- **WLAN 6GHz:** According to October 2020 TCB Workshop Interim procedures, power density results were scaled according to IEC 62479:2010 for the portion of the measurement uncertainty  $> 30\%$ . Total expanded uncertainty of 2.67 dB (85%) was used to determine the psPD measurement scaling factor.

- **WLAN 6GHz:** Per FCC guidance, for simultaneous transmission evaluation, using SAR sum and SPLSR for simultaneous transmit exclusion analyses and evaluations.

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### 5.3 Test position

#### Back surface (0mm)

The device was tested based on FCC guidance via KDB inquiry.

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## 5.4 Test limit

### [§ 2.1093\(d\)\(1\)](#)

Applications for equipment authorization of portable RF sources subject to routine environmental evaluation must contain a statement confirming compliance with the limits specified in [§ 1.1310](#) as part of their application. Technical information showing the basis for this statement must be submitted to the Commission upon request. The SAR limits specified in [§ 1.1310\(a\)](#) through [\(c\) of this chapter](#) shall be used for evaluation of portable devices transmitting in the frequency range from 100 kHz to 6 GHz. Portable devices that transmit at frequencies above 6 GHz shall be evaluated in terms of the MPE limits specified in Table 1 to [§ 1.1310\(e\)\(1\)](#). A minimum separation distance applicable to the operating configurations and exposure conditions of the device shall be used for the evaluation. In general, maximum time-averaged power levels must be used for evaluation. All unlicensed personal communications service (PCS) devices and unlicensed NII devices shall be subject to the limits for general population/uncontrolled exposure.

Radiofrequency radiation exposure limits.

### [§ 1.1310\(a\)](#)

Specific absorption rate (SAR) shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in § 1.1307(b) within the frequency range of 100 kHz to 6 GHz (inclusive).

### [§ 1.1310\(b\)](#)

The SAR limits for occupational/controlled exposure are 0.4 W/kg, as averaged over the whole body, and a peak spatial-average SAR of 8 W/kg, averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the parts of the human body treated as extremities, such as hands, wrists, feet, ankles, and pinnae, where the peak spatial-average SAR limit for occupational/controlled exposure is 20 W/kg, averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). Exposure may be averaged over a time period not to exceed 6 minutes to determine compliance with occupational/controlled SAR limits.

### [§ 1.1310\(c\)](#)

The SAR limits for general population/uncontrolled exposure are 0.08 W/kg, as averaged over the whole body, and a peak spatial-average SAR of 1.6 W/kg, averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the parts of the human body treated as extremities, such as hands, wrists, feet, ankles, and pinnae, where the peak spatial-average SAR limit is 4 W/kg, averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). Exposure may be averaged over a time period not to exceed 30 minutes to determine compliance with general population/uncontrolled SAR limits.

Note to paragraphs (a) through (c):

SAR is a measure of the rate of energy absorption due to exposure to RF electromagnetic energy. These SAR limits to be used for evaluation are based generally on criteria published by the American National Standards Institute (ANSI) for localized SAR in [Section 4.2](#) of "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz," ANSI/IEEE Std C95.1-1992, copyright 1992 by the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017. These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in "Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields," NCRP Report No. 86, [Section 17.4.5](#), copyright 1986 by NCRP, Bethesda, Maryland 20814. Limits for whole body SAR and peak spatial-average SAR are based

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on recommendations made in both of these documents. The MPE limits in Table 1 are based generally on criteria published by the NCRP in "Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields," NCRP Report No. 86, Sections 17.4.1, 17.4.1.1, 17.4.2 and 17.4.3, copyright 1986 by NCRP, Bethesda, Maryland 20814. In the frequency range from 100 MHz to 1500 MHz, these MPE exposure limits for field strength and power density are also generally based on criteria recommended by the ANSI in [Section 4.1](#) of "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz," ANSI/IEEE Std C95.1-1992, copyright 1992 by the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017.

Portable devices that transmit at frequencies above 6 GHz shall be evaluated in terms of the MPE limits specified in Table 1 to [§ 1.1310\(e\)\(1\)](#).

According to ANSI/IEEE C95.1-1992, the criteria listed in the following Table shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Peak Spatially Averaged Power Density was evaluated over a circular area of 4cm<sup>2</sup> per interim FCC Guidance for near-field power density evaluations per October 2018 TCB Workshop notes

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Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
(i) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*(100)	≤6
3.0-30	1842/f	4.89/f	*(900/f <sup>2</sup> )	<6
30-300	61.4	0.163	1.0	<6
300-1,500			f/300	<6
1,500-100,000			5	<6
(ii) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	<30
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	<30
30-300	27.5	0.073	0.2	<30
300-1,500			f/1500	<30
1,500-100,000			1.0	<30

f = frequency in MHz. \* = Plane-wave equivalent power density.

Table 1 to § 1.1310(e)(1) - Limits for Maximum Permissible Exposure (MPE)

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## 6 MAXIMUM OUTPUT POWER

### 6.1 WLAN

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Band	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
2.45GHz	802.11b	1	2412	1Mbps	15.50	15.33
		6	2437		18.50	18.11
		11	2462		13.00	12.75
	802.11g	1	2412	6Mbps	17.00	16.75
		6	2437		17.00	16.92
		11	2462		17.00	16.84
	802.11n20-HT0	1	2412	MCS0	17.00	16.88
		6	2437		17.00	16.79
		11	2462		17.00	16.80
	802.11ax20-HE0	1	2412	MCS0	16.50	16.27
		6	2437		17.00	16.82
		11	2462		16.50	16.11
	802.11n40-HT0	3	2422	MCS0	15.50	15.37
		6	2437		17.00	16.92
		9	2452		15.00	14.88
	802.11ax40-HE0	3	2422	MCS0	15.50	15.35
		6	2437		17.00	16.90
		9	2452		14.50	14.21

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Band	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
5.15-5.25 GHz	802.11a	36	5180	6Mbps	14.00	13.77
		40	5200		14.00	13.76
		44	5220		14.00	13.67
		48	5240		14.00	13.72
	802.11n20-HT0	36	5180	MCS0	14.00	13.63
		40	5200		14.00	13.78
		44	5220		14.00	13.78
		48	5240		14.00	13.61
	802.11ac20-VHT0	36	5180	MCS0	14.00	13.72
		40	5200		14.00	13.71
		44	5220		14.00	13.67
		48	5240		14.00	13.71
	802.11ax20-HE0	36	5180	MCS0	15.00	14.74
		40	5200		15.00	14.77
		44	5220		15.00	14.72
		48	5240		15.00	14.73
	802.11n40-HT0	38	5190	MCS0	15.00	14.69
		46	5230		15.00	14.67
	802.11ac40-VHT0	38	5190	MCS0	15.00	14.78
		46	5230		15.00	14.65
	802.11ax40-HE0	38	5190	MCS0	15.00	14.68
		46	5230		15.00	14.68
	802.11ac80-VHT0	42	5210	MCS0	15.00	14.75
	802.11ax80-HE0	42	5210	MCS0	15.00	14.70
	802.11ac160-VHT0	50	5250	MCS0	14.50	14.22
	802.11ax160-HE0	50	5250	MCS0	15.50	15.25

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Band	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
5.25-5.35 GHz	802.11a	52	5260	6Mbps	17.00	16.63
		56	5280		17.00	16.65
		60	5300		17.00	16.61
		64	5320		17.00	16.67
	802.11n20-HT0	52	5260	MCS0	17.00	16.74
		56	5280		17.00	16.62
		60	5300		17.00	16.57
		64	5320		17.00	16.66
	802.11ac20-VHT0	52	5260	MCS0	17.00	16.58
		56	5280		17.00	16.69
		60	5300		17.00	16.73
		64	5320		17.00	16.66
	802.11ax20-HE0	52	5260	MCS0	17.00	16.62
		56	5280		17.00	16.57
		60	5300		17.00	16.74
		64	5320		17.00	16.61
	802.11n40-HT0	54	5270	MCS0	17.00	16.86
		62	5310		17.00	16.98
	802.11ac40-VHT0	54	5270	MCS0	17.00	16.59
		62	5310		17.00	16.69
	802.11ax40-HE0	54	5270	MCS0	17.00	16.64
		62	5310		17.00	16.63
	802.11ac80-VHT0	58	5290	MCS0	16.50	16.20
	802.11ax80-HE0	58	5290	MCS0	16.00	15.75

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Band	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
5.6GHz	802.11a	100	5500	6Mbps	17.00	16.70
		120	5600		17.00	16.74
		140	5700		17.00	16.69
		144	5720		17.00	16.85
	802.11n20-HT0	100	5500	MCS0	17.00	16.84
		120	5600		17.00	16.86
		140	5700		17.00	16.69
		144	5720		17.00	16.70
	802.11ac20-VHT0	100	5500	MCS0	17.00	16.79
		120	5600		17.00	16.72
		140	5700		17.00	16.85
		144	5720		17.00	16.76
	802.11ax20-HE0	100	5500	MCS0	17.00	16.79
		120	5600		17.00	16.85
		140	5700		16.50	16.30
		144	5720		17.00	16.81
	802.11n40-HT0	102	5510	MCS0	17.00	16.85
		118	5590		17.00	16.75
		134	5670		17.00	16.78
		142	5710		17.00	16.67
	802.11ac40-VHT0	102	5510	MCS0	17.00	16.70
		118	5590		17.00	16.83
		134	5670		17.00	16.84
		142	5710		17.00	16.68
	802.11ax40-HE0	102	5510	MCS0	17.00	16.85
		118	5590		17.00	16.84
		134	5670		17.00	16.70
		142	5710		17.00	16.85
	802.11ac80-VHT0	106	5530	MCS0	15.50	15.19
		122	5610		17.00	16.94
		138	5690		17.00	16.98
	802.11ax80-HE0	106	5530	MCS0	15.00	14.58
		122	5610		17.00	16.74
		138	5690		17.00	16.77
	802.11ac160-VHT0	114	5570	MCS0	14.50	14.07
	802.11ax160-HE0	114	5570	MCS0	15.00	14.66

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Ant 0						
Mode	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
5.8GHz	802.11a	149	5745	6Mbps	17.00	16.82
		157	5785		17.00	16.70
		165	5825		17.00	16.78
	802.11n20-HT0	149	5745	MCS0	17.00	16.69
		157	5785		17.00	16.86
		165	5825		17.00	16.85
	802.11ac20-VHT0	149	5745	MCS0	17.00	16.81
		157	5785		17.00	16.74
		165	5825		17.00	16.76
	802.11ax20-HE0	149	5745	MCS0	17.00	16.83
		157	5785		17.00	16.78
		165	5825		17.00	16.70
	802.11n40-HT0	151	5755	MCS0	17.00	16.76
		159	5795		17.00	16.72
	802.11ac40-VHT0	151	5755	MCS0	17.00	16.78
		159	5795		17.00	16.85
	802.11ax40-HE0	151	5755	MCS0	17.00	16.81
		159	5795		17.00	16.80
	802.11ac80-VHT0	155	5775	MCS0	17.00	16.87
	802.11ax80-HE0	155	5775	MCS0	17.00	16.75

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Band	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
2.45GHz	802.11b	1	2412	1Mbps	15.50	15.16
		6	2437		18.50	17.99
		11	2462		13.00	12.55
	802.11g	1	2412	6Mbps	17.00	16.78
		6	2437		17.00	16.89
		11	2462		17.00	16.81
	802.11n20-HT0	1	2412	MCS0	17.00	16.89
		6	2437		17.00	16.89
		11	2462		17.00	16.78
	802.11ax20-HE0	1	2412	MCS0	16.50	16.19
		6	2437		17.00	16.92
		11	2462		16.50	16.09
	802.11n40-HT0	3	2422	MCS0	15.50	15.31
		6	2437		17.00	16.89
		9	2452		15.00	14.77
	802.11ax40-HE0	3	2422	MCS0	15.50	15.38
		6	2437		17.00	16.92
		9	2452		14.50	14.15

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Band	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
5.15-5.25 GHz	802.11a	36	5180	6Mbps	14.00	13.76
		40	5200		14.00	13.60
		44	5220		14.00	13.77
		48	5240		14.00	13.73
	802.11n20-HT0	36	5180	MCS0	14.00	13.79
		40	5200		14.00	13.78
		44	5220		14.00	13.76
		48	5240		14.00	13.62
	802.11ac20-VHT0	36	5180	MCS0	14.00	13.68
		40	5200		14.00	13.78
		44	5220		14.00	13.64
		48	5240		14.00	13.61
	802.11ax20-HE0	36	5180	MCS0	15.00	14.75
		40	5200		15.00	14.74
		44	5220		15.00	14.70
		48	5240		15.00	14.71
	802.11n40-HT0	38	5190	MCS0	15.00	14.78
		46	5230		15.00	14.63
	802.11ac40-VHT0	38	5190	MCS0	15.00	14.75
		46	5230		15.00	14.78
	802.11ax40-HE0	38	5190	MCS0	15.00	14.73
		46	5230		15.00	14.70
	802.11ac80-VHT0	42	5210	MCS0	15.00	14.79
	802.11ax80-HE0	42	5210	MCS0	15.00	14.74
	802.11ac160-VHT0	50	5250	MCS0	14.50	14.12
	802.11ax160-HE0	50	5250	MCS0	15.50	15.17

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Band	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
5.25-5.35 GHz	802.11a	52	5260	6Mbps	17.00	16.77
		56	5280		17.00	16.84
		60	5300		17.00	16.81
		64	5320		17.00	16.90
	802.11n20-HT0	52	5260	MCS0	17.00	16.83
		56	5280		17.00	16.77
		60	5300		17.00	16.83
		64	5320		17.00	16.89
	802.11ac20-VHT0	52	5260	MCS0	17.00	16.79
		56	5280		17.00	16.87
		60	5300		17.00	16.88
		64	5320		17.00	16.93
	802.11ax20-HE0	52	5260	MCS0	17.00	16.79
		56	5280		17.00	16.88
		60	5300		17.00	16.86
		64	5320		17.00	16.81
	802.11n40-HT0	54	5270	MCS0	17.00	16.75
		62	5310		17.00	16.68
	802.11ac40-VHT0	54	5270	MCS0	17.00	16.81
		62	5310		17.00	16.91
	802.11ax40-HE0	54	5270	MCS0	17.00	16.89
		62	5310		17.00	16.76
	802.11ac80-VHT0	58	5290	MCS0	16.50	16.16
	802.11ax80-HE0	58	5290	MCS0	16.00	15.63

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Band	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
5.6GHz	802.11a	100	5500	6Mbps	17.00	16.78
		120	5600		17.00	16.77
		140	5700		17.00	16.91
		144	5720		17.00	16.81
	802.11n20-HT0	100	5500	MCS0	17.00	16.94
		120	5600		17.00	16.80
		140	5700		17.00	16.87
		144	5720		17.00	16.88
	802.11ac20-VHT0	100	5500	MCS0	17.00	16.84
		120	5600		17.00	16.93
		140	5700		17.00	16.83
		144	5720		17.00	16.87
	802.11ax20-HE0	100	5500	MCS0	17.00	16.96
		120	5600		17.00	16.92
		140	5700		16.50	16.22
		144	5720		17.00	16.82
	802.11n40-HT0	102	5510	MCS0	17.00	16.93
		118	5590		17.00	16.84
		134	5670		17.00	16.89
		142	5710		17.00	16.88
	802.11ac40-VHT0	102	5510	MCS0	17.00	16.81
		118	5590		17.00	16.87
		134	5670		17.00	16.92
		142	5710		17.00	16.86
	802.11ax40-HE0	102	5510	MCS0	17.00	16.88
		118	5590		17.00	16.83
		134	5670		17.00	16.86
		142	5710		17.00	16.79
	802.11ac80-VHT0	106	5530	MCS0	15.50	15.06
		122	5610		17.00	16.99
		138	5690		17.00	16.73
	802.11ax80-HE0	106	5530	MCS0	15.00	14.70
		122	5610		17.00	16.79
		138	5690		17.00	16.81
	802.11ac160-VHT0	114	5570	MCS0	14.50	14.07
	802.11ax160-HE0	114	5570	MCS0	15.00	14.62

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Mode	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
5.8GHz	802.11a	149	5745	6Mbps	17.00	16.87
		157	5785		17.00	16.88
		165	5825		17.00	16.91
	802.11n20-HT0	149	5745	MCS0	17.00	16.94
		157	5785		17.00	16.86
		165	5825		17.00	16.92
	802.11ac20-VHT0	149	5745	MCS0	17.00	16.92
		157	5785		17.00	16.87
		165	5825		17.00	16.92
	802.11ax20-HE0	149	5745	MCS0	17.00	16.79
		157	5785		17.00	16.88
		165	5825		17.00	16.90
	802.11n40-HT0	151	5755	MCS0	17.00	16.87
		159	5795		17.00	16.94
	802.11ac40-VHT0	151	5755	MCS0	17.00	16.89
		159	5795		17.00	16.92
	802.11ax40-HE0	151	5755	MCS0	17.00	16.74
		159	5795		17.00	16.89
	802.11ac80-VHT0	155	5775	MCS0	17.00	16.95
	802.11ax80-HE0	155	5775	MCS0	17.00	16.87

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## 2.4GHz SRD\_ant2

Mode	Channel	Frequency (MHz)	GFSK	
			Max. Rated Avg.Power + Max. Tolerance (dBm)	Average Output Power (dBm)
2.4GHz SRD	CH 00	2402	5	4.11
	CH 19	2440		4.05
	CH 39	2480		4.04

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## 6.2 WIFI 6E

Ant 0						
Band	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
U-NII-5 6.2GHz	802.11ax20-HE0	1	5955	MCS0	4.00	3.87
		45	6175		4.00	3.83
		93	6415		4.00	3.81
	802.11ax40-HE0	3	5965	MCS0	6.00	5.96
		43	6165		6.00	5.89
		91	6405		6.00	5.91
	802.11ax80-HE0	7	5985	MCS0	9.00	8.93
		39	6145		9.00	8.83
		87	6385		9.00	8.89
	802.11ax160-HE0	15	6025	MCS0	11.00	10.98
		47	6185		11.00	10.85
		79	6345		11.00	10.81

Ant 0						
Band	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
U-NII-6 6.5GHz	802.11ax20-HE0	97	6435	MCS0	4.00	3.83
		105	6475		4.00	3.86
		113	6515		4.00	3.81
	802.11ax40-HE0	99	6445	MCS0	6.00	5.88
		107	6485		6.00	5.83
	802.11ax80-HE0	103	6465	MCS0	10.00	9.91
		119	6545		10.00	9.86
	802.11ax160-HE0	111	6505	MCS0	14.00	13.75

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Ant 0						
Band	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
U-NII-7 6.7GHz	802.11ax20-HE0	117	6535	MCS0	4.00	3.86
		149	6695		4.00	3.97
		181	6855		4.00	3.91
	802.11ax40-HE0	115	6525	MCS0	9.00	8.78
		147	6685		7.00	6.79
		179	6845		4.00	3.77
	802.11ax80-HE0	135	6625	MCS0	10.00	9.79
		151	6705		10.00	9.89
		167	6785		10.00	9.87
	802.11ax160-HE0	143	6665	MCS0	13.00	12.73
		175	6825		13.00	12.82

Ant 0						
Mode	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
U-NII-8 7.0GHz	802.11ax20-HE0	185	6875	MCS0	6.00	5.92
		209	6995		4.00	3.82
		233	7115		4.00	3.92
	802.11ax40-HE0	187	6885	MCS0	8.00	7.93
		227	7085		6.00	5.95
	802.11ax80-HE0	183	6865	MCS0	12.00	11.95
		199	6945		9.00	8.77
		215	7025		9.00	8.88
	802.11ax160-HE0	207	6985	MCS0	13.00	12.98

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Ant 1						
Band	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
U-NII-5 6.2GHz	802.11ax20-HE0	1	5955	MCS0	4.00	3.90
		45	6175		4.00	3.95
		93	6415		4.00	3.82
	802.11ax40-HE0	3	5965	MCS0	6.00	5.84
		43	6165		6.00	5.93
		91	6405		6.00	5.91
	802.11ax80-HE0	7	5985	MCS0	9.00	8.85
		39	6145		9.00	8.92
		87	6385		9.00	8.91
	802.11ax160-HE0	15	6025	MCS0	11.00	10.99
		47	6185		11.00	10.97
		79	6345		11.00	10.95

Ant 1						
Band	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
U-NII-6 6.5GHz	802.11ax20-HE0	97	6435	MCS0	4.00	3.96
		105	6475		4.00	3.88
		113	6515		4.00	3.85
	802.11ax40-HE0	99	6445	MCS0	6.00	5.77
		107	6485		6.00	5.84
	802.11ax80-HE0	103	6465	MCS0	10.00	9.82
		119	6545		10.00	9.94
	802.11ax160-HE0	111	6505	MCS0	14.00	13.95

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Ant 1						
Band	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
U-NII-7 6.7GHz	802.11ax20-HE0	117	6535	MCS0	4.00	3.83
		149	6695		4.00	3.91
		181	6855		4.00	3.87
	802.11ax40-HE0	115	6525	MCS0	9.00	8.86
		147	6685		7.00	6.77
		179	6845		4.00	3.95
	802.11ax80-HE0	135	6625	MCS0	10.00	9.79
		151	6705		10.00	9.94
		167	6785		10.00	9.80
	802.11ax160-HE0	143	6665	MCS0	13.00	12.75
		175	6825		13.00	12.70

Ant 1						
Mode	Mode	Channel	Frequency (MHz)	Data Rate	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
U-NII-8 7.0GHz	802.11ax20-HE0	185	6875	MCS0	6.00	5.82
		209	6995		4.00	3.85
		233	7115		4.00	3.95
	802.11ax40-HE0	187	6885	MCS0	8.00	7.95
		227	7085		6.00	5.96
	802.11ax80-HE0	183	6865	MCS0	12.00	11.90
		199	6945		9.00	8.95
		215	7025		9.00	8.91
	802.11ax160-HE0	207	6985	MCS0	13.00	12.93

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### 6.3 Bluetooth

Mode	Channel	Frequency (MHz)	1Mbps		2Mbps		3Mbps	
			Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Average power (dBm)
BR/EDR	CH 00	2402	9.00	8.55	9.00	8.23	9.00	8.37
	CH 39	2441		8.89		8.55		8.42
	CH 78	2480		8.46		8.32		8.12

### 6.4 BLE

Mode	Channel	Frequency (MHz)	GFSK	
			Max. Rated Avg. Power + Max. Tolerance (dBm)	Average Output Power (dBm)
BLE_1M	CH 00	2402	9	7.91
	CH 19	2440		8.14
	CH 39	2480		7.73
Mode	Channel	Frequency (MHz)	GFSK	
			Max. Rated Avg. Power + Max. Tolerance (dBm)	Average Output Power (dBm)
BLE_2M	CH 00	2402	9	8.07
	CH 19	2440		8.13
	CH 39	2480		7.95

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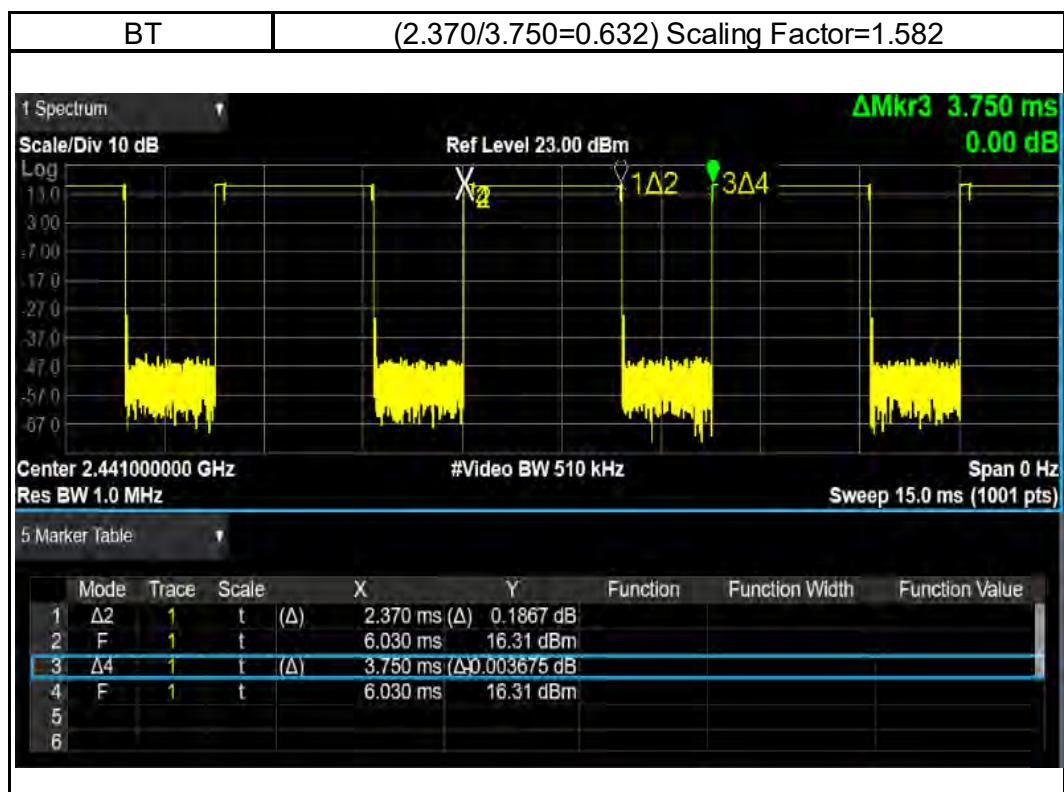
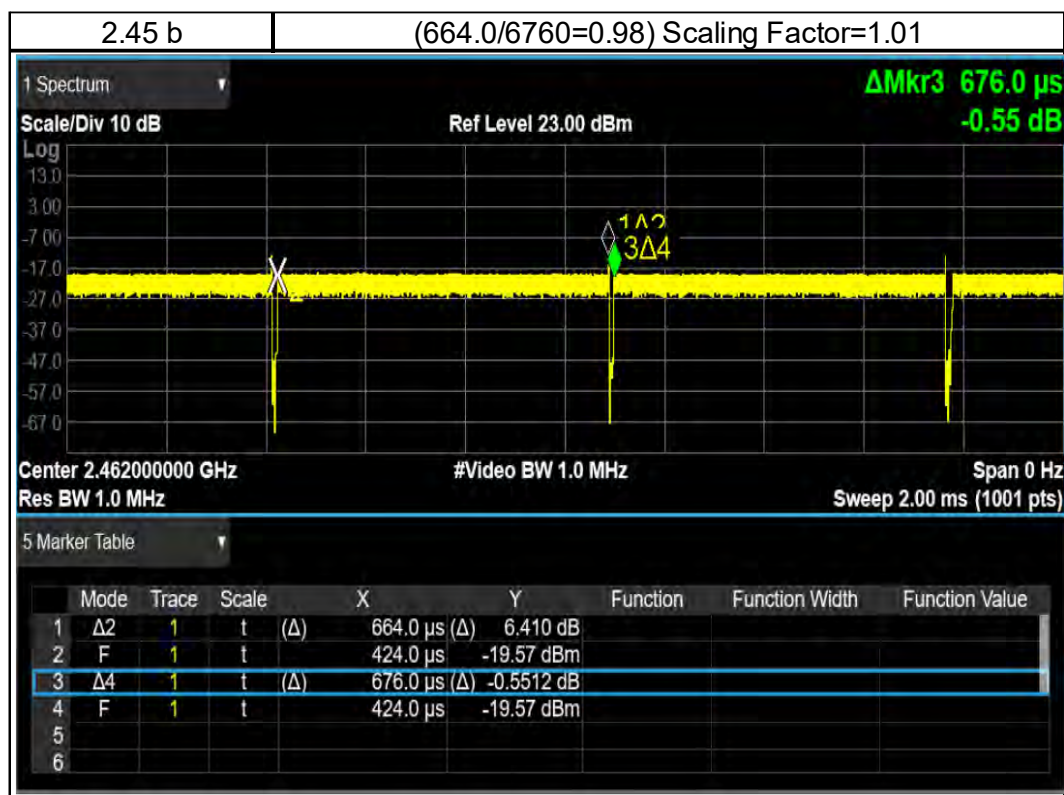
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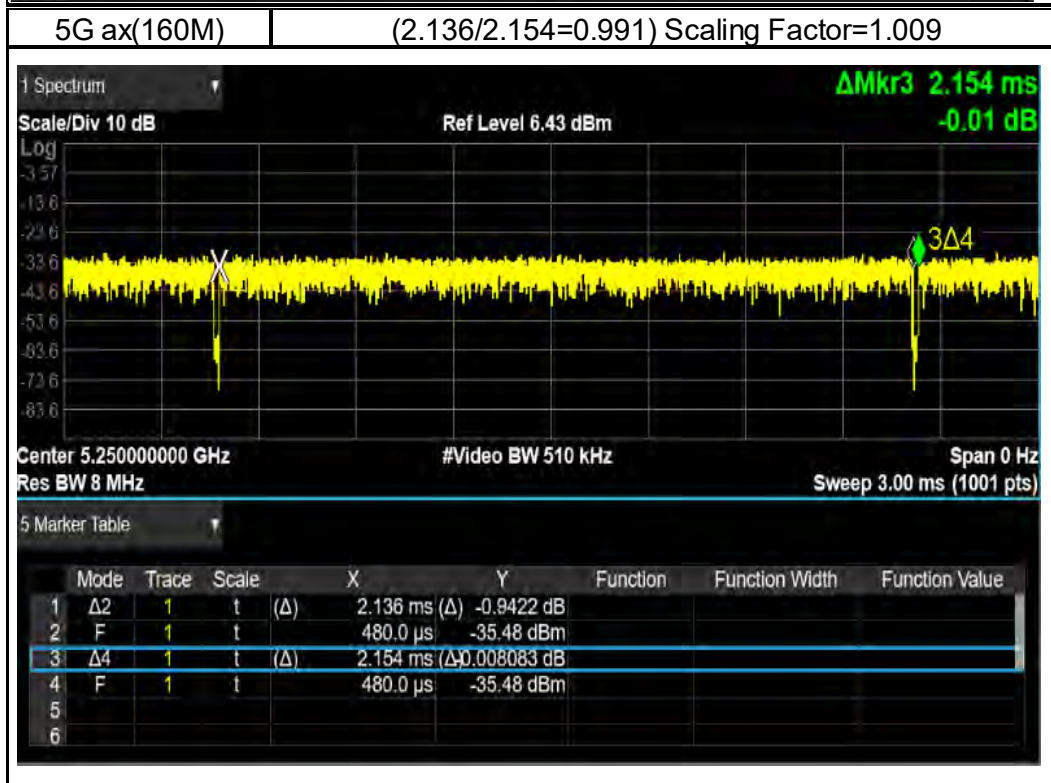
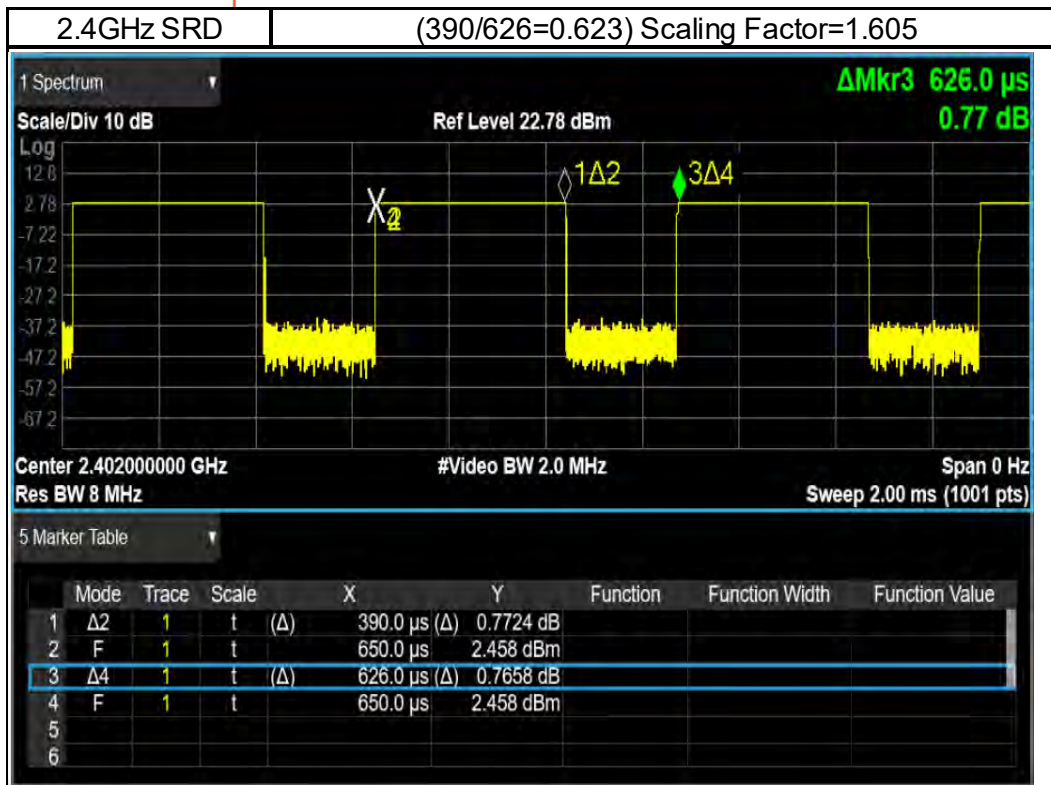
## 7 DUTY CYCLE



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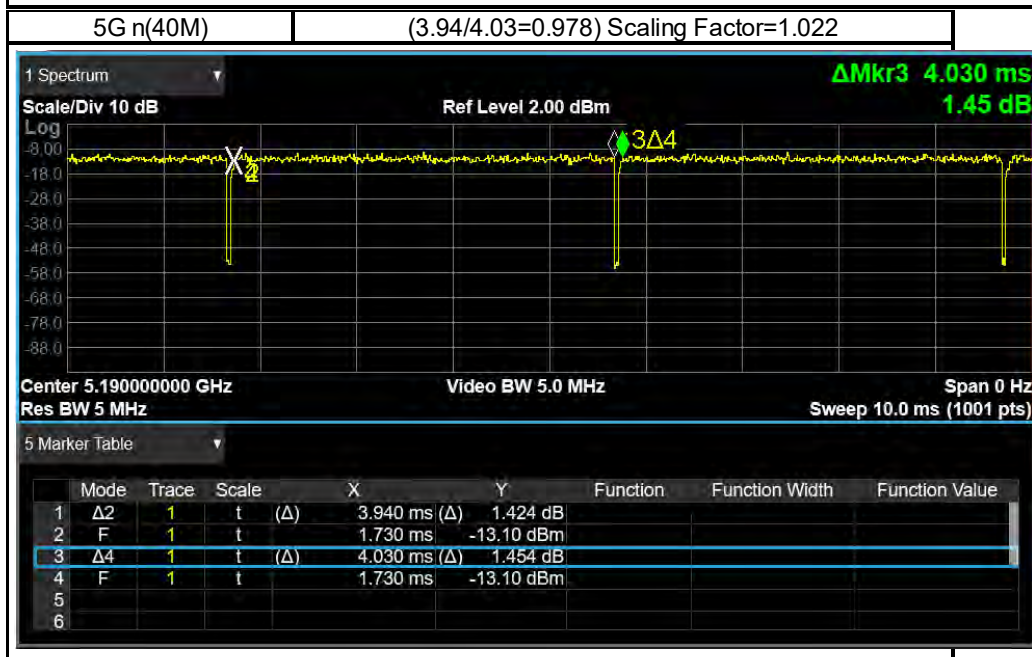
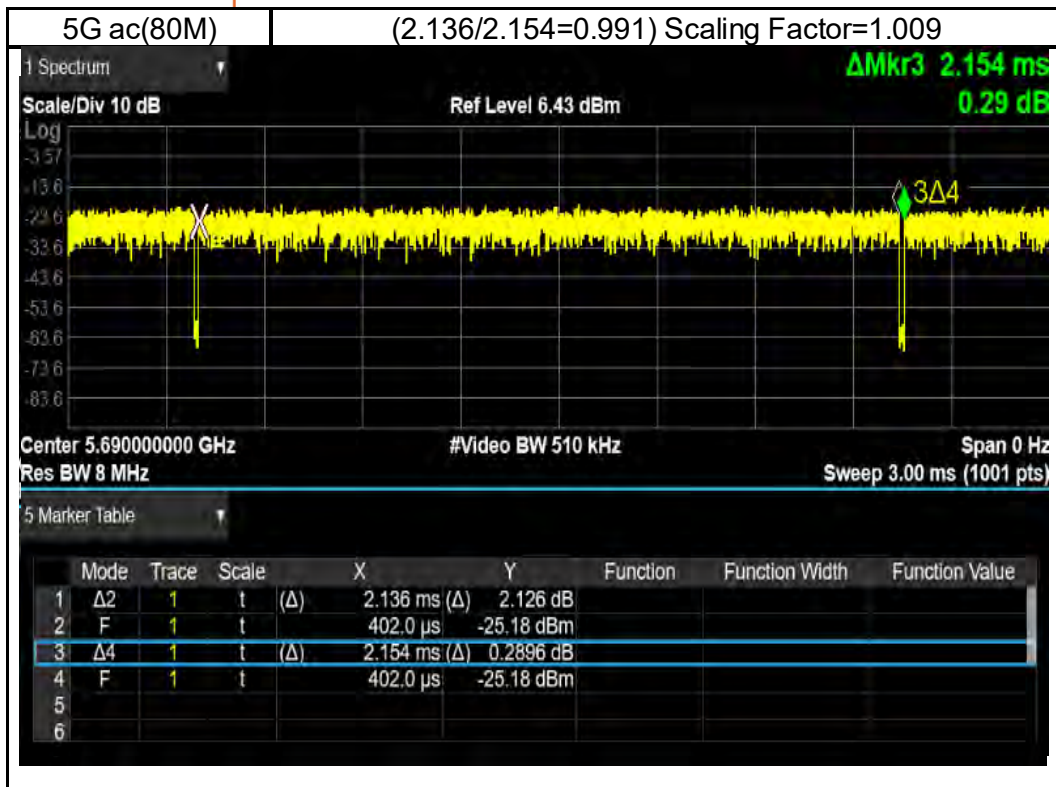
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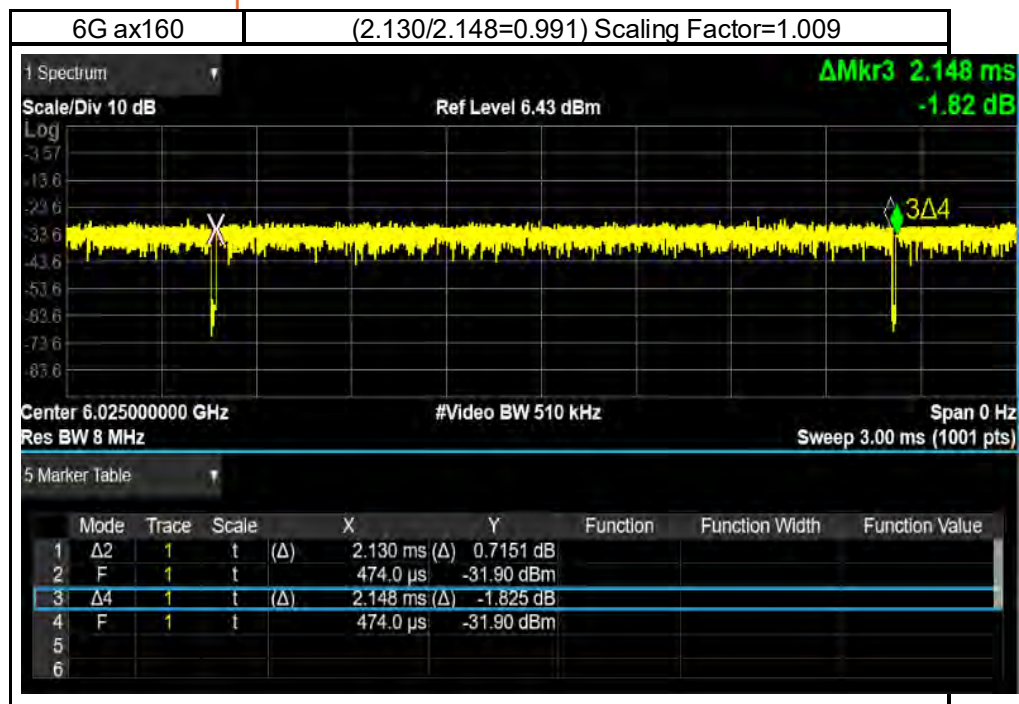
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## 8 SUMMARY OF RESULTS

### 8.1 Decision rules

Reported measurement data comply with Test Methodology in section 1.1.

Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

### 8.2 Summary of SAR Results

Mode	Antenna	Position	Distance (mm)	Channel	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Duty cycle scaling	Power scaling	Averaged SAR over 1g (W/kg)		ID
										Measured	Reported	
WLAN 802.11b	Ant 0	Back Surface	0	1	2412	15.50	15.33	1.02	103.99%	0.165	0.175	-
WLAN 802.11b	Ant 0	Back Surface	0	6	2437	18.50	18.11	1.02	109.40%	0.181	0.202	001
WLAN 802.11b	Ant 0	Back Surface	0	11	2462	13.00	12.75	1.02	105.93%	0.171	0.185	-
Mode	Antenna	Position	Distance (mm)	Channel	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Duty cycle scaling	Power scaling	Averaged SAR over 1g (W/kg)		ID
										Measured	Reported	
Bluetooth(GFSK)	Ant 0	Back Surface	0	39	2441	9.00	8.89	1.58	102.57%	0.034	0.055	002
Mode	Antenna	Position	Distance (mm)	Channel	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Duty cycle scaling	Power scaling	Averaged SAR over 1g (W/kg)		ID
										Measured	Reported	
WLAN 802.11ax(160M) 5.2G	Ant 0	Back Surface	0	50	5250	15.50	15.25	1.01	105.93%	0.304	0.325	003
Mode	Antenna	Position	Distance (mm)	Channel	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Duty cycle scaling	Power scaling	Averaged SAR over 1g (W/kg)		ID
										Measured	Reported	
WLAN 802.11n(40M) 5.3G	Ant 0	Back Surface	0	62	5310	17.00	16.98	1.02	100.46%	0.300	0.308	004
Mode	Antenna	Position	Distance (mm)	Channel	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Duty cycle scaling	Power scaling	Averaged SAR over 1g (W/kg)		ID
										Measured	Reported	
WLAN 802.11ac(80M) 5.6G	Ant 0	Back Surface	0	138	5690	17.00	16.98	1.01	100.46%	0.260	0.264	005
Mode	Antenna	Position	Distance (mm)	Channel	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Duty cycle scaling	Power scaling	Averaged SAR over 1g (W/kg)		ID
										Measured	Reported	
WLAN 802.11ac(80M) 5.8G	Ant 0	Back Surface	0	155	5775	17.00	16.87	1.01	103.04%	0.302	0.314	006
Mode	Antenna	Position	Distance (mm)	Channel	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Duty cycle scaling	Power scaling	Averaged SAR over 1g (W/kg)		ID
										Measured	Reported	
WLAN 802.11b	Ant 1	Back Surface	0	1	2412	15.50	15.16	1.02	108.14%	0.119	0.131	-
WLAN 802.11b	Ant 1	Back Surface	0	6	2437	18.50	17.99	1.02	112.46%	0.164	0.188	007
WLAN 802.11b	Ant 1	Back Surface	0	11	2462	13.00	12.55	1.02	110.92%	0.127	0.144	-
Mode	Antenna	Position	Distance (mm)	Channel	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Duty cycle scaling	Power scaling	Averaged SAR over 1g (W/kg)		ID
										Measured	Reported	
WLAN 802.11ax(160M) 5.2G	Ant 1	Back Surface	0	50	5250	15.50	15.17	1.01	107.89%	0.068	0.074	008
Mode	Antenna	Position	Distance (mm)	Channel	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Duty cycle scaling	Power scaling	Averaged SAR over 1g (W/kg)		ID
										Measured	Reported	
WLAN 802.11n(40M) 5.3G	Ant 1	Back Surface	0	54	5270	17.00	16.75	1.02	105.93%	0.084	0.091	009
Mode	Antenna	Position	Distance (mm)	Channel	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Duty cycle scaling	Power scaling	Averaged SAR over 1g (W/kg)		ID
										Measured	Reported	
WLAN 802.11ac(80M) 5.6G	Ant 1	Back Surface	0	138	5690	17.00	16.73	1.01	106.41%	0.045	0.048	010
Mode	Antenna	Position	Distance (mm)	Channel	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Duty cycle scaling	Power scaling	Averaged SAR over 1g (W/kg)		ID
										Measured	Reported	
WLAN 802.11ac(80M) 5.8G	Ant 1	Back Surface	0	155	5775	17.00	16.95	1.01	101.16%	0.053	0.054	011

Ant 2

Mode	Position	Distance (mm)	Channel	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Duty cycle scaling	Power scaling	Averaged SAR over 1g (W/kg)		ID
									Measured	Reported	
2.4GHz SRD	Back Surface	0	0	2402	5.00	4.11	1.61	122.74%	0.003	0.006	012
2.4GHz SRD	Back Surface	0	39	2441	5.00	4.05	1.61	124.45%	0.002	0.004	-
2.4GHz SRD	Back Surface	0	78	2480	5.00	4.04	1.61	124.74%	0.002	0.004	-

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## WIFI 6E

Mode	Antenna	Position	Distance (mm)	Channel	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Duty cycle scaling	Power scaling	Averaged SAR over 1g (W/kg)		Estimated Measured APD W/m <sup>2</sup> (4cm <sup>2</sup> )	Estimated Reported APD W/m <sup>2</sup> (4cm <sup>2</sup> )	ID
										Measured	Reported			
U-NII-5 6.2GHz802.11ax(160M)	Ant 0	Back Surface	0	15	6025	11.00	10.98	1.01	100.46%	0.111	0.113	1.01	1.024	013
U-NII-5 6.2GHz802.11ax(160M)	Ant 0	Back Surface	0	47	6185	11.00	10.85	1.01	103.51%	0.134	0.140	1.12	1.170	014
Mode	Antenna	Position	Distance (mm)	Channel	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Duty cycle scaling	Power scaling	Averaged SAR over 1g (W/kg)		Estimated Measured APD W/m <sup>2</sup> (4cm <sup>2</sup> )	Estimated Reported APD W/m <sup>2</sup> (4cm <sup>2</sup> )	ID
										Measured	Reported			
U-NII-6 6.5GHz802.11ax(160M)	Ant 0	Back Surface	0	111	6505	14.00	13.75	1.01	105.93%	0.123	0.131	1.05	1.122	015
Mode	Antenna	Position	Distance (mm)	Channel	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Duty cycle scaling	Power scaling	Averaged SAR over 1g (W/kg)		Estimated Measured APD W/m <sup>2</sup> (4cm <sup>2</sup> )	Estimated Reported APD W/m <sup>2</sup> (4cm <sup>2</sup> )	ID
										Measured	Reported			
U-NII-7 6.7GHz802.11ax(160M)	Ant 0	Back Surface	0	175	6825	13.00	12.82	1.01	104.23%	0.219	0.230	1.75	1.840	016
Mode	Antenna	Position	Distance (mm)	Channel	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Duty cycle scaling	Power scaling	Averaged SAR over 1g (W/kg)		Estimated Measured APD W/m <sup>2</sup> (4cm <sup>2</sup> )	Estimated Reported APD W/m <sup>2</sup> (4cm <sup>2</sup> )	ID
										Measured	Reported			
U-NII-8 7.0GHz 802.11ax (160M)	Ant 0	Back Surface	0	207	6985	13.00	12.98	1.02	100.46%	0.196	0.201	1.58	1.619	017
Mode	Antenna	Position	Distance (mm)	Channel	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Duty cycle scaling	Power scaling	Averaged SAR over 1g (W/kg)		Estimated Measured APD W/m <sup>2</sup> (4cm <sup>2</sup> )	Estimated Reported APD W/m <sup>2</sup> (4cm <sup>2</sup> )	ID
										Measured	Reported			
U-NII-5 6.2GHz802.11ax(160M)	Ant 1	Back Surface	0	15	6025	11.00	10.99	1.01	100.23%	0.017	0.017	0.095	0.096	018
U-NII-5 6.2GHz802.11ax(160M)	Ant 1	Back Surface	0	47	6185	11.00	10.97	1.01	100.69%	0.029	0.029	0.154	0.156	019
Mode	Antenna	Position	Distance (mm)	Channel	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Duty cycle scaling	Power scaling	Averaged SAR over 1g (W/kg)		Estimated Measured APD W/m <sup>2</sup> (4cm <sup>2</sup> )	Estimated Reported APD W/m <sup>2</sup> (4cm <sup>2</sup> )	ID
										Measured	Reported			
U-NII-6 6.5GHz802.11ax(160M)	Ant 1	Back Surface	0	111	6505	14.00	13.95	1.01	101.16%	0.059	0.060	0.281	0.287	020
Mode	Antenna	Position	Distance (mm)	Channel	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Duty cycle scaling	Power scaling	Averaged SAR over 1g (W/kg)		Estimated Measured APD W/m <sup>2</sup> (4cm <sup>2</sup> )	Estimated Reported APD W/m <sup>2</sup> (4cm <sup>2</sup> )	ID
										Measured	Reported			
U-NII-7 6.7GHz802.11ax(160M)	Ant 1	Back Surface	0	143	6665	13.00	12.75	1.01	105.93%	0.040	0.043	0.335	0.358	021
Mode	Antenna	Position	Distance (mm)	Channel	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Duty cycle scaling	Power scaling	Averaged SAR over 1g (W/kg)		Estimated Measured APD W/m <sup>2</sup> (4cm <sup>2</sup> )	Estimated Reported APD W/m <sup>2</sup> (4cm <sup>2</sup> )	ID
										Measured	Reported			
U-NII-8 7.0GHz 802.11ax (160M)	Ant 1	Back Surface	0	207	6985	13.00	12.93	1.02	101.62%	0.043	0.045	0.371	0.385	022

**Note:**

Reported SAR = measured SAR \* Power scaling \* Duty cycle scaling

Reported APD = measured APD \* Power scaling \* Duty cycle scaling

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### 8.3 Summary of PD Results

Mode	Position	Distance (mm)	Channel	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Tune-up Scaling	Duty cycle scaling	Measurement uncertainty	PD result(4cm)				ID
										Measured Total psPD (W/m <sup>2</sup> )	Reported Total psPD (W/m <sup>2</sup> )	Measured Normal psPD (W/m <sup>2</sup> )	Reported Normal psPD (W/m <sup>2</sup> )	
WLAN 6E 802.11ax(160M) U-NII-5	Back Surface	2	15	6025	11.00	10.98	100.46%	1.01	1.55	0.594	0.933	0.567	0.891	023
	Back Surface	2	47	6185	11.00	10.85	103.51%	1.01	1.55	0.535	0.866	0.502	0.813	024
WLAN 6E 802.11ax(160M)	Back Surface	2	111	6505	14.00	13.75	105.93%	1.01	1.55	1.970	3.264	1.880	3.114	025
WLAN 6E 802.11ax(160M)	Back Surface	2	175	6825	13.00	12.82	104.23%	1.01	1.55	0.747	1.218	0.684	1.115	026
WLAN 6E 802.11ax(160M) U-NII-5	Back Surface	2	207	6985	13.00	12.98	100.46%	1.01	1.55	0.678	1.065	0.573	0.900	027
Mode	Position	Distance (mm)	Channel	Freq. (MHz)	Max. Rated Avg. Power + Max. Tolerance (dBm)	Measured Avg. Power (dBm)	Tune-up Scaling	Duty cycle scaling	Measurement uncertainty	PD result(4cm)				ID
										Measured Total psPD (W/m <sup>2</sup> )	Reported Total psPD (W/m <sup>2</sup> )	Measured Normal psPD (W/m <sup>2</sup> )	Reported Normal psPD (W/m <sup>2</sup> )	
WLAN 6E 802.11ax(160M) U-NII-5	Back Surface	2	15	6025	11.00	10.99	100.23%	1.01	1.55	0.376	0.589	0.370	0.580	028
	Back Surface	2	47	6185	11.00	10.97	100.69%	1.01	1.55	0.208	0.328	0.200	0.315	029
WLAN 6E 802.11ax(160M)	Back Surface	2	111	6505	14.00	13.95	101.16%	1.01	1.55	0.355	0.562	0.334	0.528	030
WLAN 6E 802.11ax(160M)	Back Surface	2	143	6665	13.00	12.75	105.93%	1.01	1.55	1.860	3.081	1.830	3.032	031
WLAN 6E 802.11ax(160M) U-NII-5	Back Surface	2	207	6985	13.00	12.93	101.62%	1.01	1.55	2.010	3.195	1.980	3.147	032

Note:

Reported PD = measured PD \* Power scaling \* Duty cycle scaling \* Uncertainty scaling

### 8.4 Reporting statements of conformity

The conformity statement in this report is based solely on the test results, measurement uncertainty is excluded.

### 8.5 Conclusion

The device is compliant because all the standalone results are less than their corresponding criteria.

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f (886-2) 2298-0488

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## 9 SIMULTANEOUS TRANSMISSION ANALYSIS

### 9.1 Simultaneous Transmission Scenarios:

Simultaneous Transmit Configurations	Body
WLAN 2.4GHz Ant0 + WLAN 2.4GHz Ant1 + SRD 2.4GHz Ant2	Yes
WLAN 2.4GHz Ant0 + WLAN 5GHz Ant1 + SRD 2.4GHz Ant2	Yes
WLAN 5GHz Ant0 + WLAN 2.4GHz Ant1 + SRD 2.4GHz Ant2	Yes
WLAN 2.4GHz Ant0 + WLAN 6E Ant1 + SRD 2.4GHz Ant2	Yes
WLAN 6E Ant0 + WLAN 2.4GHz Ant1 + SRD 2.4GHz Ant2	Yes
WLAN 5GHz Ant0 + WLAN 5GHz Ant1 + SRD 2.4GHz Ant2	Yes
BT 2.4GHz Ant0 + WLAN 5GHz Ant1 + SRD 2.4GHz Ant2	Yes
BT 2.4GHz Ant0 + WLAN 6E Ant1 + SRD 2.4GHz Ant2	Yes

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## 9.2 Estimated SAR calculation

According to KDB447498 D01v06 – 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:

$$\text{Estimated SAR} = \frac{\text{Max. tune up power (mW)}}{\text{Min. test separation distance (mm)}} \times \frac{\sqrt{f(\text{GHz})}}{7.5}$$

If the minimum test separation distance is < 5mm, a distance of 5mm is used for estimated SAR calculation. When the test separation distance is >50mm, the 0.4W/kg is used for SAR-1g.

## 9.3 SPLSR evaluation and analysis

Per KDB447498D01, when the sum of SAR is larger than the limit, SAR test exclusion is determined by the SAR sum to peak location separation ratio(SPLSR).

The simultaneous transmitting antennas in each operating mode and exposure condition combination must be considered one pair at a time to determine the SAR to peak location separation ratio to qualify for test exclusion.

The ratio is determined by  $(\text{SAR1} + \text{SAR2})^{1.5}/R_i$ , rounded to two decimal digits, and must be  $\leq 0.04$  for all antenna pairs in the configuration to qualify for 1-g SAR test exclusion.

SAR1 and SAR2 are the highest reported or estimated SAR for each antenna in the pair, and  $R_i$  is the separation distance between the peak SAR locations for the antenna pair in mm.

When standalone test exclusion applies, SAR is estimated; the peak location is assumed to be at the feed-point or geometric center of the antenna.

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## Simultaneous Transmission Combination

		FCC Reported SAR								Scenario1	Scenario2	Scenario3	Scenario4	Scenario5	Scenario6	Scenario7	Scenario8
		1	2	3	4	5	6	8	9	1+2+3	1+2+5	1+3+4	1+2+9	1+3+8	1+4+5	1+5+6	1+6+9
Exposure Position		2.4GHz SRD Ant 2	2.4GHz WLAN Ant 0	2.4GHz WLAN Ant 1	5GHz WLAN Ant 0	5GHz WLAN Ant 1	Bluetooth Ant 0	6GHz WLAN Ant 0	6GHz WLAN Ant 1	Summed	Summed	Summed	Summed	Summed	Summed	Summed	Summed
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)
Back Surface	0	0.006	0.202	0.188	0.325	0.091	0.055	0.230	0.060	0.396	0.299	0.519	0.268	0.424	0.422	0.152	0.121

## 9.4 Conclusion

The simultaneous transmission is compliant because both SAR sum and/or SPLSR are less than their corresponding criteria.

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## 10 INSTRUMENTS LIST

Equipment List					
Manufacturer	Device	Type	Serial number	Date of last calibration	Date of next calibration
SPEAG	Data acquisition Electronics	DAE4	1665	Feb/28/2022	Feb/27/2023
SPEAG	Dosimetric E-Field Probe	EX3DV4	7642	Mar/02/2022	Mar/01/2023
SPEAG	E-field Probe for Near Field Application	EUmmWV3	9399	Jan/26/2022	Jan/25/2023
SPEAG	System Validation Dipole	D2450V2	727	Apr/25/2022	Apr/24/2023
SPEAG	System Validation Dipole	D5GHzV2	1023	Jan/27/2022	Jan/26/2023
SPEAG	System Validation Dipole	D6.5GHzV2	1006	Aug/23/2022	Aug/22/2023
SPEAG	System Validation Dipole	D7GHzV2	1007	Aug/24/2022	Aug/23/2023
SPEAG	5G Verification Source 10GHz	5G-Veri10	1021	Jan/24/2022	Jan/23/2023
SPEAG	Dielectric Assessment Kit	DAKS-3.5	1146	Feb/21/2022	Feb/20/2023
R&S	MXG Analog Signal Generator	SMB100A03	182012	Jun/13/2022	Jun/12/2023
Agilent	Dual-directional coupler	772D	MY52180142	Nov/02/2021	Nov/01/2022
Agilent	Dual-directional coupler	778D	MY52180302	Oct/29/2021	Oct/28/2022
EMCI	Amplifier	ZHL-42	980189	Calibration not required	Calibration not required
EMCI	Amplifier	ZVE-8G	980190	Calibration not required	Calibration not required
R&S	Power Meter	NRX	102034	Dec/28/2021	Dec/27/2022
R&S	Power Sensor	NRP18S	101974	Oct/12/2021	Oct/11/2022
R&S	Power Sensor	NRP18S	109066	Oct/12/2021	Oct/11/2022
SPEAG	Software	DASY 6 V16.0.2.136	N/A	Calibration not required	Calibration not required
SPEAG	Software	DASY 52 V52.10.4.152 7	N/A	Calibration not required	Calibration not required
SPEAG	Software	DASY 6 mmWave V2.4.2.62	N/A	Calibration not required	Calibration not required
SPEAG	Phantom	ELI	N/A	Calibration not required	Calibration not required
SPEAG	Phantom	mmWave Phantom	N/A	Calibration not required	Calibration not required
LKM	Digital thermometer	DTM3000	Nr3192	Nov/09/2021	Nov/08/2022
TECPEL	Digital thermometer	DTM-303A	TP130077	Oct/28/2021	Oct/27/2022

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## 11 UNCERTAINTY BUDGET

Measurement Uncertainty evaluation template for DUT SAR test (3-6G)

A	c	D	e		f	g	h=c * f / e	i=c * g / e	k
Source of Uncertainty	Tolerance/ Uncertainty	Probability Distributio	Div	Div Value	ci (1g)	ci (10g)	Standard uncertainty	Standard uncertainty	vi, or Veff
<b>Measurement system</b>									
Probe calibration	6.55%	N	1	1	1	1	6.55%	6.55%	∞
<i>Isotropy, Axial</i>	3.50%	R	√3	1.732	1	1	2.02%	2.02%	∞
<i>Isotropy, Hemispherical</i>	9.60%	R	√3	1.732	1	1	5.54%	5.54%	∞
Modulation Response	2.40%	R	√3	1.732	1	1	1.40%	1.40%	∞
Boundary Effect	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Linearity	4.70%	R	√3	1.732	1	1	2.71%	2.71%	∞
Detection Limits	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Readout Electronics	0.30%	N	1	1	1	1	0.30%	0.30%	∞
Response time	0.80%	R	√3	1.732	1	1	0.46%	0.46%	∞
Integration Time	2.60%	R	√3	1.732	1	1	1.50%	1.50%	∞
<b>Measurement drift (class A evaluation)</b>	1.75%	R	√3	1.732	1	1	1.01%	1.01%	∞
RF ambient condition - noise	3.00%	R	√3	1.732	1	1	1.73%	1.73%	∞
RF ambient conditions - reflections	3.00%	R	√3	1.732	1	1	1.73%	1.73%	∞
Probe positioner Mechanical restrictions	0.40%	R	√3	1.732	1	1	0.23%	0.23%	∞
Probe Positioning with respect to phantom shell	2.90%	R	√3	1.732	1	1	1.67%	1.67%	∞
Post-processing	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
Max SAR Eval	1.00%	R	√3	1.732	1	1	0.58%	0.58%	∞
<b>Test Sample related</b>									
Test sample positioning	2.90%	N	1	1	1	1	2.90%	2.90%	M-1
Device Holder Uncertainty	3.60%	N	1	1	1	1	3.60%	3.60%	M-1
Drift of output power	5.00%	R	√3	1.732	1	1	2.89%	2.89%	∞
<b>Phantom and Setup</b>									
Phantom Uncertainty	4.00%	R	√3	1.732	1	1	2.31%	2.31%	∞
Liquid permittivity (mea.)	1.43%	N	1	1	0.64	0.43	0.92%	0.61%	M
Liquid Conductivity (mea.)	2.90%	N	1	1	0.6	0.49	1.74%	1.42%	M
Combined standard uncertainty		RSS					11.88%	11.81%	
Expan uncertainty (95% confidence interval), K=2							23.76%	23.62%	

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Measurement Uncertainty evaluation template for DUT SAR test (0.3-3G)

A	c	D	e		f	g	h=c * f / e	i=c * g / e	k
Source of Uncertainty	Tolerance/ Uncertainty	Probability Distribution	Div	Div Value	ci (1g)	ci (10g)	Standard uncertainty	Standard uncertainty	vi, or Veff
<b>Measurement system</b>									
Probe calibration	6.00%	N	1	1	1	1	6.00%	6.00%	∞
<i>Isotropy, Axial</i>	3.50%	R	$\sqrt{3}$	1.732	1	1	2.02%	2.02%	∞
<i>Isotropy, Hemispherical</i>	9.60%	R	$\sqrt{3}$	1.732	1	1	5.54%	5.54%	∞
Modulation Response	2.40%	R	$\sqrt{3}$	1.732	1	1	1.40%	1.40%	∞
Boundary Effect	1.00%	R	$\sqrt{3}$	1.732	1	1	0.58%	0.58%	∞
Linearity	4.70%	R	$\sqrt{3}$	1.732	1	1	2.71%	2.71%	∞
Detection Limits	1.00%	R	$\sqrt{3}$	1.732	1	1	0.58%	0.58%	∞
Readout Electronics	0.30%	N	1	1	1	1	0.30%	0.30%	∞
Response time	0.80%	R	$\sqrt{3}$	1.732	1	1	0.46%	0.46%	∞
Integration Time	2.60%	R	$\sqrt{3}$	1.732	1	1	1.50%	1.50%	∞
<b>Measurement drift (class A evaluation)</b>	1.75%	R	$\sqrt{3}$	1.732	1	1	1.01%	1.01%	∞
RF ambient condition - noise	3.00%	R	$\sqrt{3}$	1.732	1	1	1.73%	1.73%	∞
RF ambient conditions - reflections	3.00%	R	$\sqrt{3}$	1.732	1	1	1.73%	1.73%	∞
Probe positioner	0.40%	R	$\sqrt{3}$	1.732	1	1	0.23%	0.23%	∞
Mechanical restrictions									
Probe Positioning with respect to phantom shell	2.90%	R	$\sqrt{3}$	1.732	1	1	1.67%	1.67%	∞
Post-processing	1.00%	R	$\sqrt{3}$	1.732	1	1	0.58%	0.58%	∞
Max SAR Eval	1.00%	R	$\sqrt{3}$	1.732	1	1	0.58%	0.58%	∞
<b>Test Sample related</b>									
Test sample positioning	2.90%	N	1	1	1	1	2.90%	2.90%	M-1
Device Holder Uncertainty	3.60%	N	1	1	1	1	3.60%	3.60%	M-1
Drift of output power	5.00%	R	$\sqrt{3}$	1.732	1	1	2.89%	2.89%	∞
<b>Phantom and Setup</b>									
Phantom Uncertainty	4.00%	R	$\sqrt{3}$	1.732	1	1	2.31%	2.31%	∞
Liquid permittivity (mea.)	1.11%	N	1	1	0.64	0.43	0.71%	0.48%	M
Liquid Conductivity (mea.)	2.30%	N	1	1	0.6	0.49	1.38%	1.13%	M
Combined standard uncertainty		RSS					11.52%	11.47%	
Expart uncertainty (95% confidence interval), K=2							23.05%	22.95%	

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t (886-2) 2299-3279

f (886-2) 2298-0488

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**DASY6 Uncertainty Budget**  
**According to IEC/IEEE 62209-1528**  
**(Frequency band: 6GHz - 10GHz range)**

a	b	c	d		e	e	f=b * e / d	f=b * e / d
Source of Uncertainty	Uncertainty Value (±%)	Probability Distribution	Div.	Div. Value	(ci) 1g	(ci) 10g	Std. uncertainty (1g) (±%)	Std. uncertainty (10g) (±%)
<b>Measurement system errors</b>								
Probe calibration	18.6	N	2	2	1	1	9.3	9.3
Probe Calibration Drift	1.7	R	√3	1.732	1	1	1.0	1.0
Probe Linearity	4.7	R	√3	1.732	1	1	2.7	2.7
Broadband Signal	2.8	R	√3	1.732	1	1	1.6	1.6
Probe Isotropy	7.6	R	√3	1.732	1	1	4.4	4.4
Data Acquisition	0.3	N	1	1	1	1	0.3	0.3
RF Ambient	1.8	N	1	1	1	1	1.8	1.8
Probe positioning	0.2	N	1	1	0.67	0.67	0.1	0.1
Data Processing	3.5	N	1	1	1	1	3.5	3.5
<b>Phantom and device errors</b>								
Conductivity (meas.)DAK	2.5	N	1	1	0.78	0.71	2.0	1.8
Conductivity (temp.)BB	2.4	R	√3	1.732	0.78	0.71	1.1	1.0
Phantom Permittivity	14.0	R	√3	1.732	0.5	0.5	4.0	4.0
Distance DUT - TSL	2.0	N	1	1	2	2	4.0	4.0
Device Positioning (±0.5mm)	1.0	N	1	1	1	1	1.0	1.0
Device Holder	3.6	N	1	1	1	1	3.6	3.6
DUT Modulationm	2.4	R	√3	1.732	1	1	1.4	1.4
Time-average SAR	0.0	R	√3	1.732	1	1	0.0	0.0
DUT drift	2.5	N	1	1	1	1	2.5	2.5
Val Antenna Unc.	0.0	N	1	1	1	1	0.0	0.0
Unc. Input Power	0.0	N	1	1	1	1	0.0	0.0
<b>Correction to the SAR results</b>								
Deviation to Target	1.90	N	1	1	1	0.84	1.9	1.6
SAR scaling	0.230	R	√3	1.732	1	1	0.1	0.1
Combined Std. uncertainty							14.0	13.9
Expanded Std. uncertainty (95% confidence interval), K=2							28.0	27.8

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f (886-2) 2298-0488

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## cDASY6 Module mmWave Uncertainty Budget for PD Evaluation Distances to the Antennas $\geq \lambda / 5$ In Compliance with IEC/IEEE 63195

a	b	c	d		e	f=b * e / d	g
Source of Uncertainty	Uncertainty Value (+dB)	Probability Distribution	Div.	Div. Value	ci	Std. uncertainty (+dB)	(vi) Veff
<b>Uncertainty terms dependent on the measurement system</b>							
Probe calibration	0.49	N	1	1	1	0.49	$\infty$
Probe correction	0.00	R	$\sqrt{3}$	1.732	1	0.00	$\infty$
Frequency response (BW $\leq$ 1GHz)	0.20	R	$\sqrt{3}$	1.732	1	0.12	$\infty$
Sensor cross coupling	0.00	R	$\sqrt{3}$	1.732	1	0.00	$\infty$
Isotropy	0.50	R	$\sqrt{3}$	1.732	1	0.29	$\infty$
Linearity	0.20	R	$\sqrt{3}$	1.732	1	0.12	$\infty$
Probe scattering	0.00	R	$\sqrt{3}$	1.732	1	0.00	$\infty$
Probe positioning offset	0.30	R	$\sqrt{3}$	1.732	1	0.17	$\infty$
Probe positioning repeatability	0.04	R	$\sqrt{3}$	1.732	1	0.02	$\infty$
Sensor mechanical offset	0.00	R	$\sqrt{3}$	1.732	1	0.00	$\infty$
Probe spatial resolution	0.00	R	$\sqrt{3}$	1.732	1	0.00	$\infty$
Field impedance dependence	0.00	R	$\sqrt{3}$	1.732	1	0.00	$\infty$
Amplitude and phase drift	0.00	R	$\sqrt{3}$	1.732	1	0.00	$\infty$
Amplitude and phase noise	0.04	R	$\sqrt{3}$	1.732	1	0.02	$\infty$
Measurement area truncation	0.00	R	$\sqrt{3}$	1.732	1	0.00	$\infty$
Data acquisition	0.03	N	1	1	1	0.03	$\infty$
Sampling	0.00	R	$\sqrt{3}$	1	1	0.00	$\infty$
Field reconstruction	2.00	R	$\sqrt{3}$	1.732	1	1.15	$\infty$
Forward transformation	0.00	R	$\sqrt{3}$	1.732	1	0.00	$\infty$
Power density scaling	-	R	$\sqrt{3}$	1.732	1	-	$\infty$
Spatial averaging	0.10	R	$\sqrt{3}$	1.732	1	0.06	$\infty$
System detection limit	0.04	R	$\sqrt{3}$	1.732	1	0.02	$\infty$
<b>Uncertainty terms dependent on the DUT and environmental factors</b>							
Probe coupling with DUT	0.00	R	$\sqrt{3}$	1.732	1	0.00	$\infty$
Modulation response	0.40	R	$\sqrt{3}$	1.732	1	0.23	$\infty$
Integration time	0.00	R	$\sqrt{3}$	1.732	1	0.00	$\infty$
Response time	0.00	R	$\sqrt{3}$	1.732	1	0.00	$\infty$
Device holder influence	0.10	R	$\sqrt{3}$	1.732	1	0.06	$\infty$
DUT alignment	0.00	R	$\sqrt{3}$	1.732	1	0.00	$\infty$
RF ambient conditions	0.04	R	$\sqrt{3}$	1.732	1	0.02	$\infty$
Ambient reflections	0.04	R	$\sqrt{3}$	1.732	1	0.02	$\infty$
Immunity / secondary reception	0.00	R	$\sqrt{3}$	1.732	1	0.00	$\infty$
Drift of the DUT	-	R	$\sqrt{3}$	1.732	1	-	$\infty$
Combined Std. uncertainty						1.33	
Expanded Std. uncertainty (95% confidence interval), K=2						2.67	

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## 12 SAR MEASUREMENT RESULTS

Date: 2022/9/19

ID: 001

Report No. :TESA2207000216ES

WLAN 802.11b\_Body\_Back Surface\_CH 6\_0mm\_Ant0

Communication System: WLAN; Frequency: 2437 MHz;Duty Cycle: 1:1.02

Medium parameters used:  $f = 2437$  MHz;  $\sigma = 1.829$  S/m;  $\epsilon_r = 39.651$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Ambient temperature: 22.3°C; Liquid temperature: 22.4°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7642; ConvF(8.12, 8.12, 8.12); Calibrated: 2022/03/02
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1665; Calibrated: 2022/02/28
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

**Area Scan (81x81x1):** Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.260 W/kg

**Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.745 V/m; Power Drift = 0.17 dB

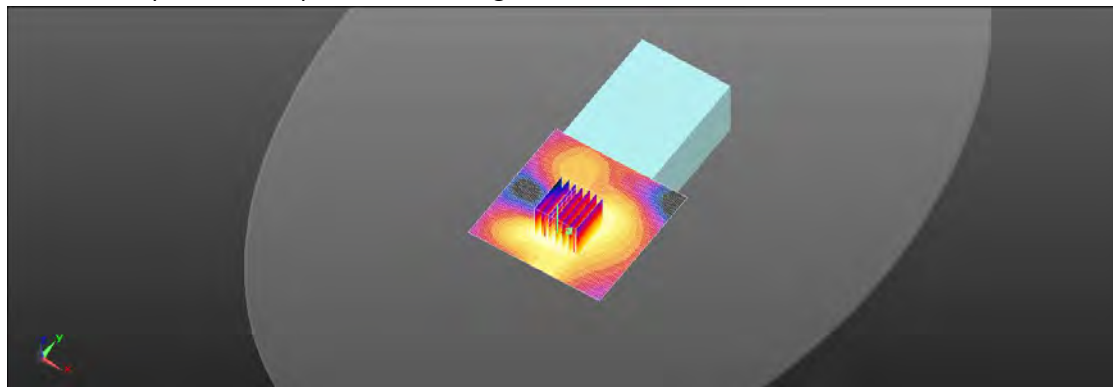
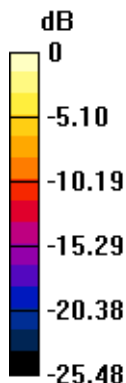
Peak SAR (extrapolated) = 0.375 W/kg

**SAR(1 g) = 0.181 W/kg; SAR(10 g) = 0.093 W/kg**

Smallest distance from peaks to all points 3 dB below = 8.9 mm

Ratio of SAR at M2 to SAR at M1 = 47.2%

Maximum value of SAR (measured) = 0.271 W/kg



0 dB = 0.271 W/kg = -5.67 dBW/kg

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Date: 2022/9/19

ID: 002

Report No. :TESA2207000216ES

Bluetooth(GFSK)\_Body\_Back Surface\_CH 39\_0mm\_Ant0

Communication System: Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1.582

Medium parameters used:  $f = 2441 \text{ MHz}$ ;  $\sigma = 1.833 \text{ S/m}$ ;  $\epsilon_r = 39.638$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Ambient temperature: 22.3°C; Liquid temperature: 22.4°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7642; ConvF(8.12, 8.12, 8.12); Calibrated: 2022/03/02
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1665; Calibrated: 2022/02/28
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

**Area Scan (81x81x1):** Interpolated grid:  $dx=12 \text{ mm}$ ,  $dy=12 \text{ mm}$ 

Maximum value of SAR (interpolated) = 0.0483 W/kg

**Zoom Scan (7x7x7)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$ 

Reference Value = 0.7425 V/m; Power Drift = 0.14 dB

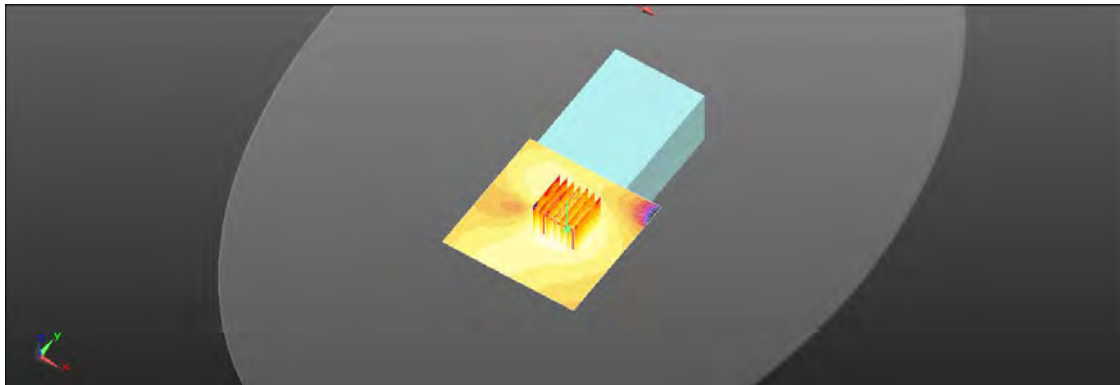
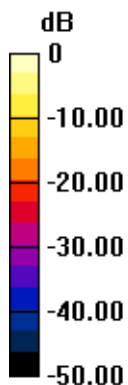
Peak SAR (extrapolated) = 0.0640 W/kg

**SAR(1 g) = 0.034 W/kg; SAR(10 g) = 0.018 W/kg**

Smallest distance from peaks to all points 3 dB below = 12 mm

Ratio of SAR at M2 to SAR at M1 = 53.9%

Maximum value of SAR (measured) = 0.0485 W/kg



0 dB = 0.0485 W/kg = -13.14 dBW/kg

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Date: 2022/9/20

ID: 003

Report No. :TESA2207000216ES

**WLAN 802.11ax(160M) 5.2G\_Body\_Back Surface\_CH 50\_0mm\_Ant0**

Communication System: WLAN; Frequency: 5250 MHz;Duty Cycle: 1:1.009

Medium parameters used:  $f = 5250 \text{ MHz}$ ;  $\sigma = 4.774 \text{ S/m}$ ;  $\epsilon_r = 36.449$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Ambient temperature: 22.1°C; Liquid temperature: 22.2°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7642; ConvF(5.69, 5.69, 5.69); Calibrated: 2022/03/02
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1665; Calibrated: 2022/02/28
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

**Area Scan (111x111x1):** Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 0.351 W/kg

**Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 3.912 V/m; Power Drift = 0.03 dB

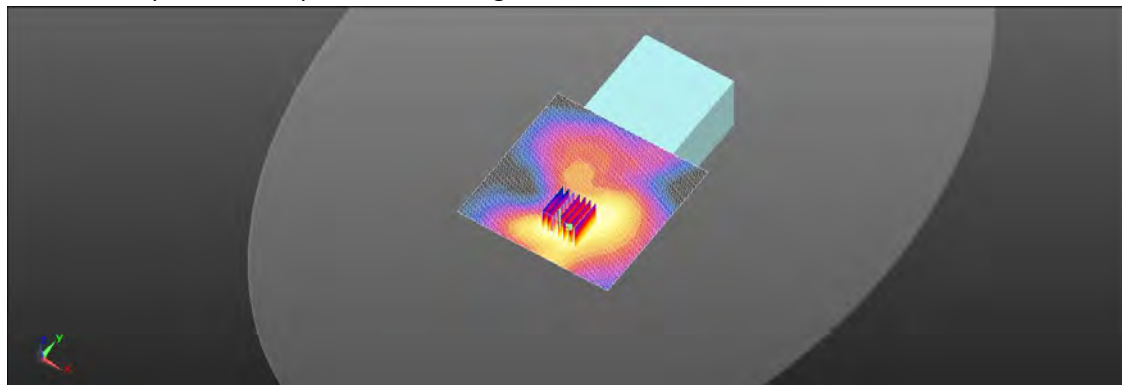
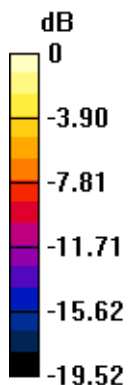
Peak SAR (extrapolated) = 0.525 W/kg

**SAR(1 g) = 0.304 W/kg; SAR(10 g) = 0.178 W/kg**

Smallest distance from peaks to all points 3 dB below = 8.9 mm

Ratio of SAR at M2 to SAR at M1 = 72.3%

Maximum value of SAR (measured) = 0.371 W/kg



0 dB = 0.371 W/kg = -4.30 dBW/kg

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Date: 2022/9/20

ID: 004

Report No. :TESA2207000216ES

WLAN 802.11n(40M) 5.3G\_Body\_Back Surface\_CH 62\_0mm\_Ant0

Communication System: WLAN; Frequency: 5310 MHz;Duty Cycle: 1:1.022

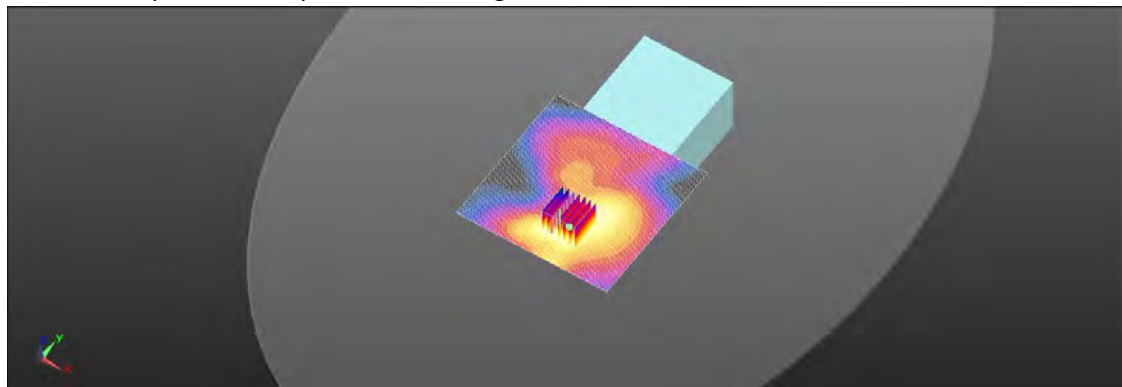
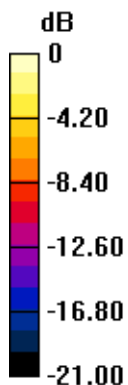
Medium parameters used:  $f = 5310 \text{ MHz}$ ;  $\sigma = 4.885 \text{ S/m}$ ;  $\epsilon_r = 36.18$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Ambient temperature:  $22.1^\circ\text{C}$ ; Liquid temperature:  $22.2^\circ\text{C}$ 

DASY5 Configuration:

- Probe: EX3DV4 - SN7642; ConvF(5.69, 5.69, 5.69); Calibrated: 2022/03/02
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1665; Calibrated: 2022/02/28
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

**Area Scan (111x111x1):** Interpolated grid:  $dx=10 \text{ mm}$ ,  $dy=10 \text{ mm}$ Maximum value of SAR (interpolated) =  $0.328 \text{ W/kg}$ **Zoom Scan (7x7x12)/Cube 0:** Measurement grid:  $dx=4\text{mm}$ ,  $dy=4\text{mm}$ ,  $dz=2\text{mm}$ Reference Value =  $4.430 \text{ V/m}$ ; Power Drift =  $0.01 \text{ dB}$ Peak SAR (extrapolated) =  $0.526 \text{ W/kg}$ **SAR(1 g) =  $0.300 \text{ W/kg}$ ; SAR(10 g) =  $0.176 \text{ W/kg}$** Smallest distance from peaks to all points 3 dB below =  $8.9 \text{ mm}$ Ratio of SAR at M2 to SAR at M1 =  $70.2\%$ Maximum value of SAR (measured) =  $0.351 \text{ W/kg}$ 0 dB =  $0.351 \text{ W/kg}$  =  $-4.54 \text{ dBW/kg}$ 

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Date: 2022/9/21

ID: 005

Report No. :TESA2207000216ES

WLAN 802.11ac(80M) 5.6G\_Body\_Back Surface\_CH 138\_0mm\_Ant0

Communication System: WLAN; Frequency: 5690 MHz;Duty Cycle: 1:1.009

Medium parameters used:  $f = 5690$  MHz;  $\sigma = 5.281$  S/m;  $\epsilon_r = 35.53$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Ambient temperature: 21.9°C; Liquid temperature: 22.2°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7642; ConvF(5.15, 5.15, 5.15); Calibrated: 2022/03/02
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1665; Calibrated: 2022/02/28
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

**Area Scan (111x111x1):** Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 0.469 W/kg

**Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 2.711 V/m; Power Drift = 0.06 dB

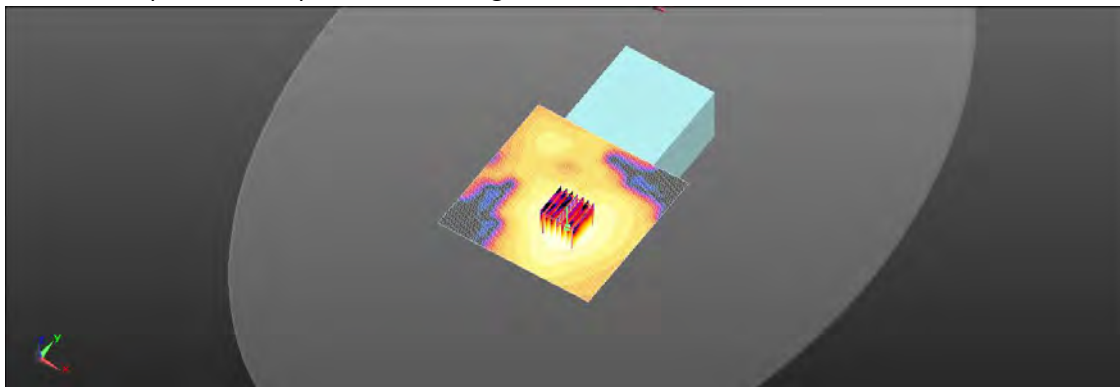
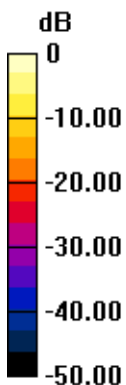
Peak SAR (extrapolated) = 0.933 W/kg

**SAR(1 g) = 0.260 W/kg; SAR(10 g) = 0.104 W/kg**

Smallest distance from peaks to all points 3 dB below = 10.4 mm

Ratio of SAR at M2 to SAR at M1 = 54.2%

Maximum value of SAR (measured) = 0.474 W/kg



0 dB = 0.474 W/kg = -3.24 dBW/kg

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Date: 2022/9/21

ID: 006

Report No. :TESA2207000216ES

WLAN 802.11ac(80M) 5.8G\_Body\_Back Surface\_CH 155\_0mm\_Ant0

Communication System: WLAN; Frequency: 5775 MHz;Duty Cycle: 1:1.009

Medium parameters used:  $f = 5775 \text{ MHz}$ ;  $\sigma = 5.397 \text{ S/m}$ ;  $\epsilon_r = 35.299$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Ambient temperature: 21.9°C; Liquid temperature: 22.2°C

## DASY5 Configuration:

- Probe: EX3DV4 - SN7642; ConvF(5.15, 5.15, 5.15); Calibrated: 2022/03/02
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1665; Calibrated: 2022/02/28
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

**Area Scan (111x111x1):** Interpolated grid:  $dx=10 \text{ mm}$ ,  $dy=10 \text{ mm}$ 

Maximum value of SAR (interpolated) = 0.544 W/kg

**Zoom Scan (7x7x12)/Cube 0:** Measurement grid:  $dx=4\text{mm}$ ,  $dy=4\text{mm}$ ,  $dz=2\text{mm}$ 

Reference Value = 2.923 V/m; Power Drift = 0.16 dB

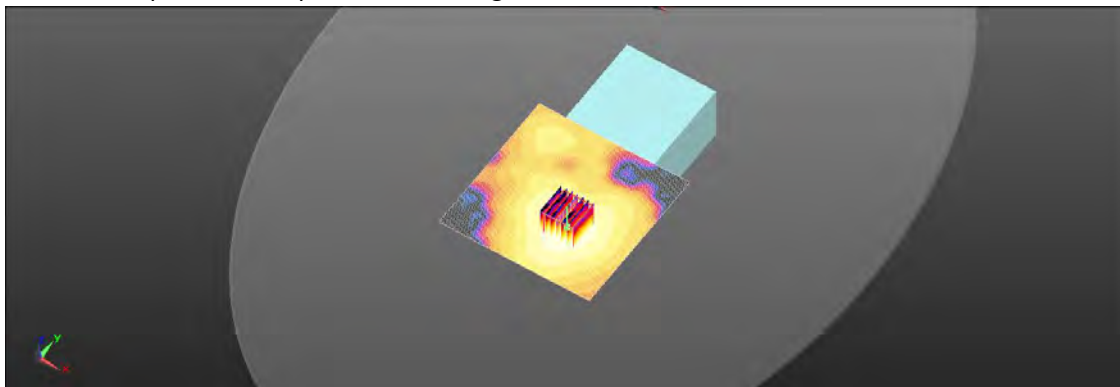
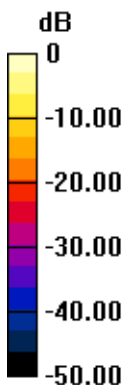
Peak SAR (extrapolated) = 1.11 W/kg

**SAR(1 g) = 0.302 W/kg; SAR(10 g) = 0.122 W/kg**

Smallest distance from peaks to all points 3 dB below = 12 mm

Ratio of SAR at M2 to SAR at M1 = 53%

Maximum value of SAR (measured) = 0.548 W/kg



0 dB = 0.548 W/kg = -2.61 dBW/kg

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Date: 2022/9/19

ID: 007

Report No. :TESA2207000216ES

WLAN 802.11b\_Body\_Back Surface\_CH 6\_0mm\_Ant1

Communication System: WLAN; Frequency: 2437 MHz;Duty Cycle: 1:1.01

Medium parameters used:  $f = 2437$  MHz;  $\sigma = 1.829$  S/m;  $\epsilon_r = 39.651$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Ambient temperature: 22.3°C; Liquid temperature: 22.4°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7642; ConvF(8.12, 8.12, 8.12); Calibrated: 2022/03/02
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1665; Calibrated: 2022/02/28
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

**Area Scan (101x111x1):** Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.235 W/kg

**Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.233 V/m; Power Drift = 0.11 dB

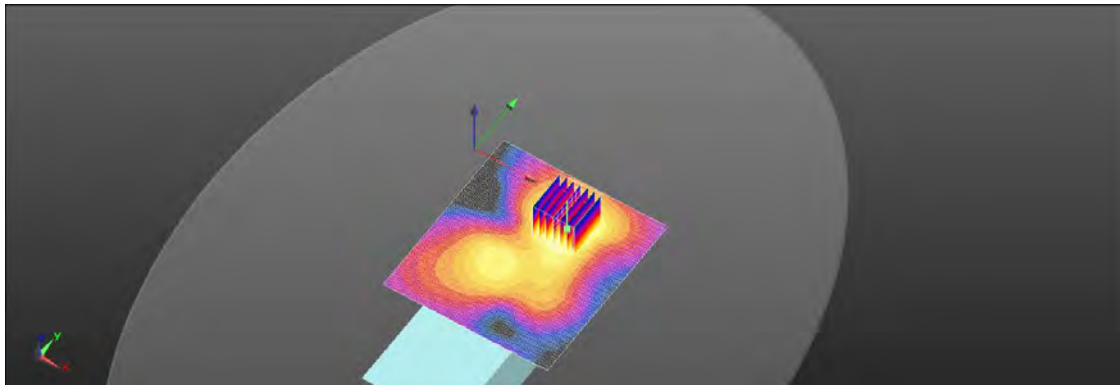
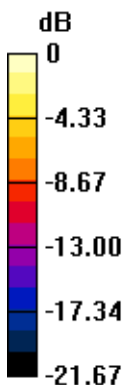
Peak SAR (extrapolated) = 0.299 W/kg

**SAR(1 g) = 0.164 W/kg; SAR(10 g) = 0.088 W/kg**

Smallest distance from peaks to all points 3 dB below = 13 mm

Ratio of SAR at M2 to SAR at M1 = 54.1%

Maximum value of SAR (measured) = 0.232 W/kg



0 dB = 0.232 W/kg = -6.35 dBW/kg

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Date: 2022/9/20

ID: 008

Report No. :TESA2207000216ES

WLAN 802.11ax(160M) 5.2G\_Body\_Back Surface\_CH 50\_0mm\_Ant1

Communication System: WLAN; Frequency: 5250 MHz;Duty Cycle: 1:1.009

Medium parameters used:  $f = 5250$  MHz;  $\sigma = 4.774$  S/m;  $\epsilon_r = 36.449$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Ambient temperature: 22.1°C; Liquid temperature: 22.2°C

## DASY5 Configuration:

- Probe: EX3DV4 - SN7642; ConvF(5.69, 5.69, 5.69); Calibrated: 2022/03/02
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1665; Calibrated: 2022/02/28
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

**Area Scan (121x131x1):** Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 0.113 W/kg

**Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 2.521 V/m; Power Drift = 0.15 dB

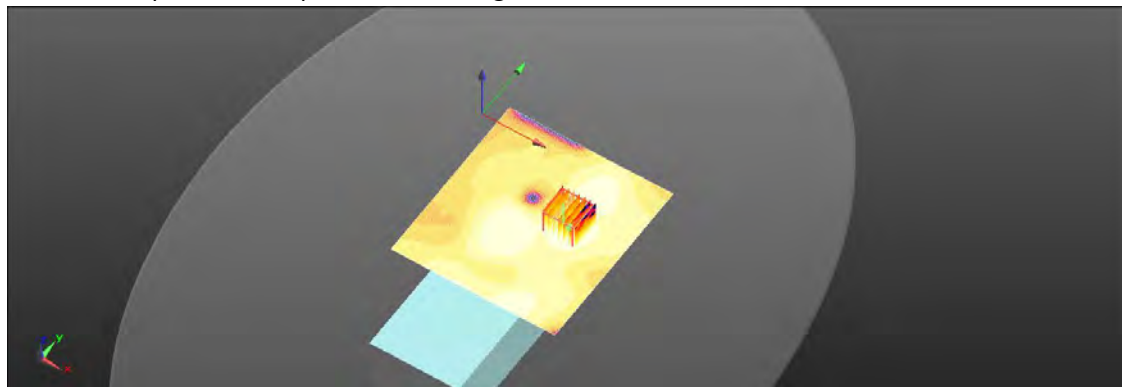
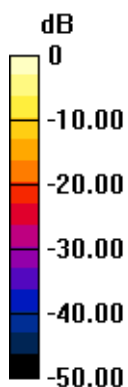
Peak SAR (extrapolated) = 0.182 W/kg

**SAR(1 g) = 0.068 W/kg; SAR(10 g) = 0.030 W/kg**

Smallest distance from peaks to all points 3 dB below = 11.1 mm

Ratio of SAR at M2 to SAR at M1 = 65.8%

Maximum value of SAR (measured) = 0.111 W/kg



0 dB = 0.111 W/kg = -9.56 dBW/kg

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Date: 2022/9/20

ID: 009

Report No. :TESA2207000216ES

WLAN 802.11n(40M) 5.3G\_Body\_Back Surface\_CH 54\_0mm\_Ant1

Communication System: WLAN 5G; Frequency: 5270 MHz;Duty Cycle: 1:1.022

Medium parameters used:  $f = 5270$  MHz;  $\sigma = 4.836$  S/m;  $\epsilon_r = 36.278$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Ambient temperature: 22.1°C; Liquid temperature: 22.2°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7642; ConvF(5.69, 5.69, 5.69); Calibrated: 2022/03/02
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1665; Calibrated: 2022/02/28
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

**Area Scan (121x131x1):** Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 0.146 W/kg

**Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 2.760 V/m; Power Drift = 0.13 dB

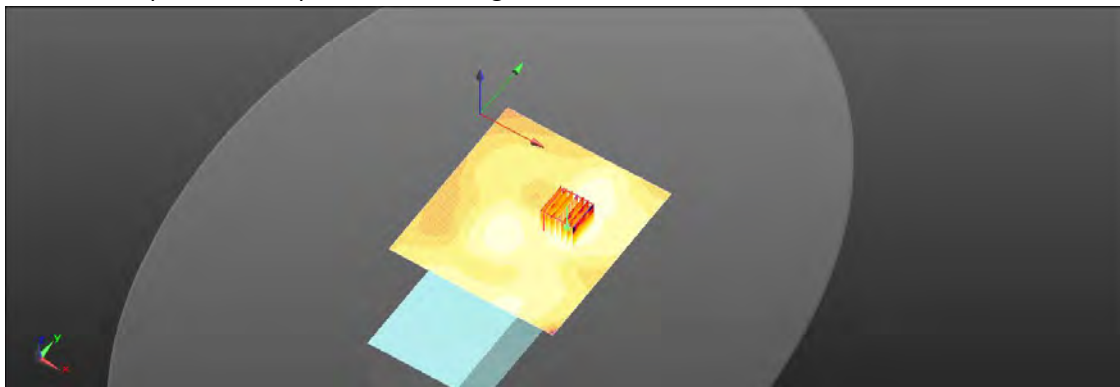
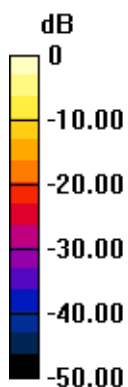
Peak SAR (extrapolated) = 0.249 W/kg

**SAR(1 g) = 0.084 W/kg; SAR(10 g) = 0.037 W/kg**

Smallest distance from peaks to all points 3 dB below = 13.2 mm

Ratio of SAR at M2 to SAR at M1 = 61.6%

Maximum value of SAR (measured) = 0.142 W/kg



0 dB = 0.142 W/kg = -8.48 dBW/kg

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Date: 2022/9/21

ID: 010

Report No. :TESA2207000216ES

WLAN 802.11ac(80M) 5.6G\_Body\_Back Surface\_CH 138\_0mm\_Ant1\_IC

Communication System: WLAN; Frequency: 5690 MHz;Duty Cycle: 1:1.009

Medium parameters used:  $f = 5690$  MHz;  $\sigma = 5.281$  S/m;  $\epsilon_r = 35.53$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Ambient temperature: 21.9°C; Liquid temperature: 22.2°C

## DASY5 Configuration:

- Probe: EX3DV4 - SN7642; ConvF(5.15, 5.15, 5.15); Calibrated: 2022/03/02
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1665; Calibrated: 2022/02/28
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

**Area Scan (121x131x1):** Interpolated grid: dx=10 mm, dy=10 mm

Maximum value of SAR (interpolated) = 0.105 W/kg

**Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 2.038 V/m; Power Drift = -0.14 dB

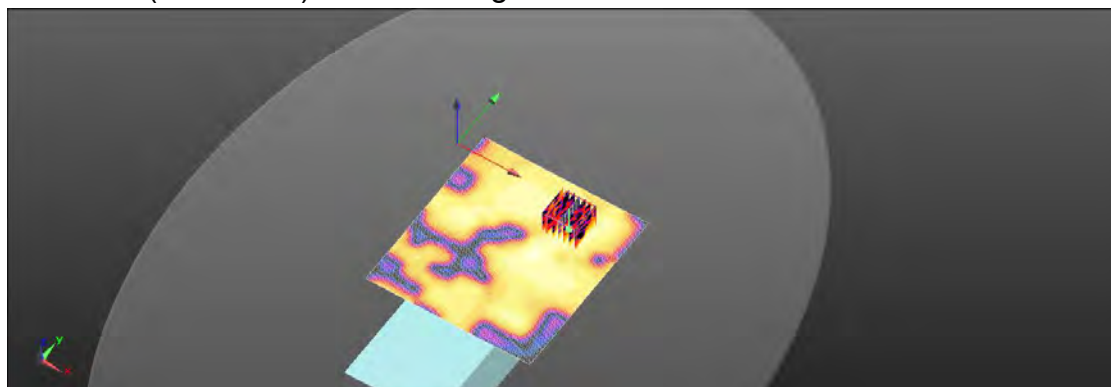
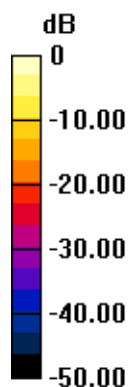
Peak SAR (extrapolated) = 0.211 W/kg

**SAR(1 g) = 0.045 W/kg; SAR(10 g) = 0.014 W/kg**

Smallest distance from peaks to all points 3 dB below = 6.4 mm

Ratio of SAR at M2 to SAR at M1 = 46.5%

Maximum value of SAR (measured) = 0.109 W/kg



0 dB = 0.109 W/kg = -9.64 dBW/kg

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Date: 2022/9/21

ID: 011

Report No. :TESA2207000216ES

WLAN 802.11ac(80M) 5.8G\_Body\_Back Surface\_CH 155\_0mm\_Ant1

Communication System: WLAN; Frequency: 5775 MHz;Duty Cycle: 1:1.009

Medium parameters used:  $f = 5775 \text{ MHz}$ ;  $\sigma = 5.397 \text{ S/m}$ ;  $\epsilon_r = 35.299$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Ambient temperature: 21.9°C; Liquid temperature: 22.2°C

## DASY5 Configuration:

- Probe: EX3DV4 - SN7642; ConvF(5.15, 5.15, 5.15); Calibrated: 2022/03/02
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1665; Calibrated: 2022/02/28
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

**Area Scan (121x131x1):** Interpolated grid:  $dx=10 \text{ mm}$ ,  $dy=10 \text{ mm}$ 

Maximum value of SAR (interpolated) = 0.140 W/kg

**Zoom Scan (7x7x12)/Cube 0:** Measurement grid:  $dx=4\text{mm}$ ,  $dy=4\text{mm}$ ,  $dz=2\text{mm}$ 

Reference Value = 2.236 V/m; Power Drift = 0.11 dB

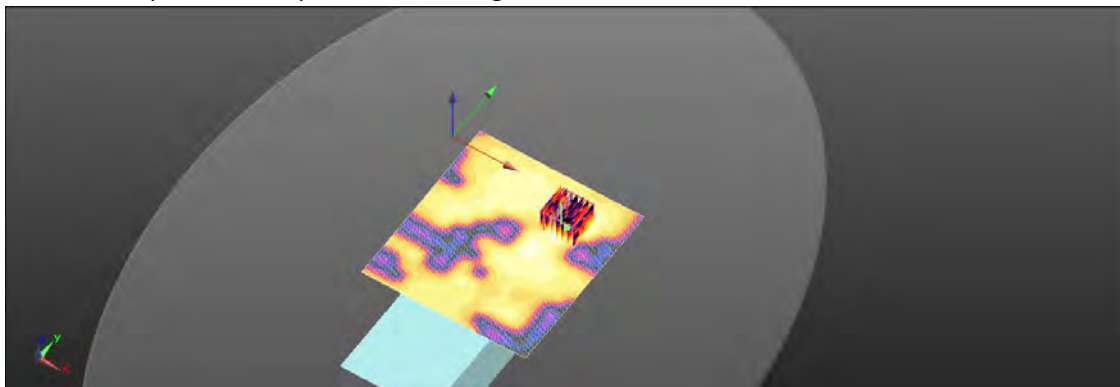
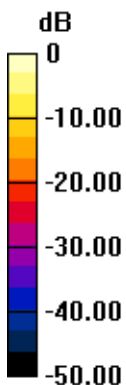
Peak SAR (extrapolated) = 0.237 W/kg

**SAR(1 g) = 0.053 W/kg; SAR(10 g) = 0.018 W/kg**

Smallest distance from peaks to all points 3 dB below = 6.4 mm

Ratio of SAR at M2 to SAR at M1 = 46.4%

Maximum value of SAR (measured) = 0.121 W/kg



0 dB = 0.121 W/kg = -9.16 dBW/kg

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Date: 2022/9/19

ID: 012

Report No.: TESA2207000216ES

SRD\_Body\_Back Surface\_CH 0\_0mm\_Ant2

Communication System: SRD; Frequency: 2402 MHz; Duty Cycle: 1:1.61

Medium parameters used:  $f = 2402$  MHz;  $\sigma = 1.797$  S/m;  $\epsilon_r = 39.718$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Ambient temperature: 22.3°C; Liquid temperature: 22.4°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7642; ConvF(8.12, 8.12, 8.12) ; Calibrated: 2022/03/02
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1665; Calibrated: 2022/02/28
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

**Area Scan (101x171x1):** Interpolated grid: dx=12 mm, dy=12 mm

Maximum value of SAR (interpolated) = 0.00939 W/kg

**Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 0.1250 V/m; Power Drift = 0.01 dB

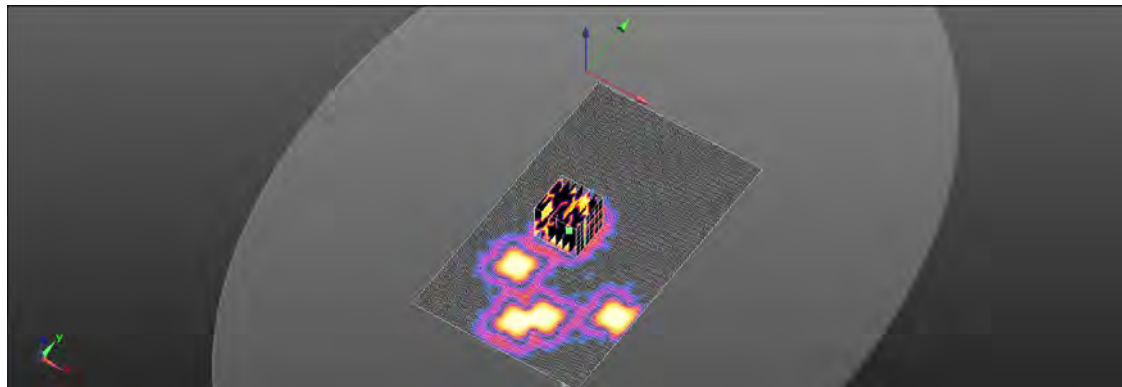
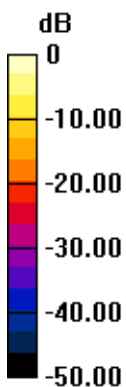
Peak SAR (extrapolated) = 0.0000629 W/kg

**SAR(1 g) = 0.00281 W/kg; SAR(10 g) = 0.00116 W/kg**

Smallest distance from peaks to all points 3 dB below: Larger than measurement grid

Ratio of SAR at M2 to SAR at M1 = 46.5%

Maximum value of SAR (measured) = 0.000547 W/kg



0 dB = 0.000547 W/kg = -32.62 dBW/kg

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ID: 013

Report No. :TESA2207000218ES

Measurement Report for Device, BACK SURFACE, U-NII-5, 0mm, Ant 0

IEEE 802.11ax (160MHz, MCS0, 99pc duty cycle), Channel 15 (6025.0 MHz)

Ambient temperature: 21.8; Liquid temperature: 22.1

**Exposure Conditions**

Phantom Section, TSL	Position, Test Distance [mm]	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	BACK SURFACE, 0.00	5.8	5.662	35.027

**Hardware Setup**

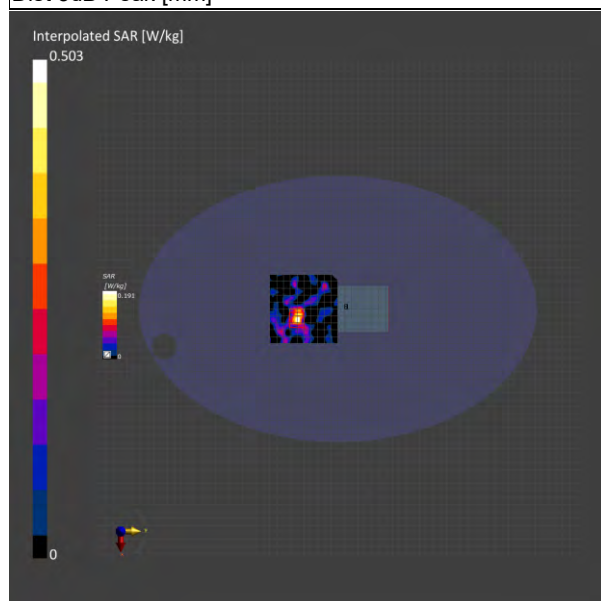
Phantom	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1141	EX3DV4 - SN7642, 2022-03-02	DAE4 Sn1665, 2022-02-28

**Scans Setup**

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 102.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4

**Measurement Results**

	Area Scan	Zoom Scan
Date	2022-09-22	2022-09-22
psSAR1g [W/kg]	0.045	0.111
psSAR8g [W/kg]	0.015	0.052
psSAR10g [W/kg]	0.013	0.047
psPDab (4.0cm2, sq) [W/m2]		1.01
Power Drift [dB]	0.14	0.11
M2/M1 [%]		57.8
Dist 3dB Peak [mm]		11.2



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f (886-2) 2298-0488

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ID: 014

Report No. :TESA2207000218ES

Measurement Report for Device, BACK SURFACE, U-NII-5, 0mm, Ant 0

IEEE 802.11ax (160MHz, MCS0, 99pc duty cycle), Channel 47 (6185.0MHz)

Ambient temperature: 21.8; Liquid temperature: 22.1

**Exposure Conditions**

Phantom Section, TSL	Position, Test Distance [mm]	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	BACK SURFACE, 0.00	5.8	5.854	34.79

**Hardware Setup**

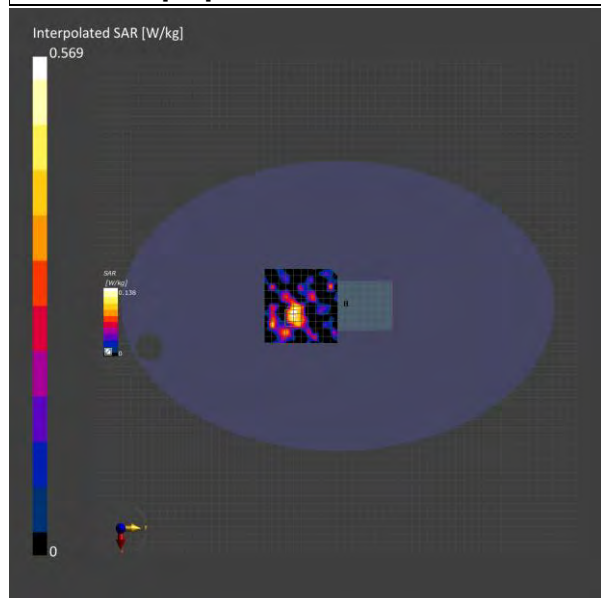
Phantom	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1141	EX3DV4 - SN7642, 2022-03-02	DAE4 Sn1665, 2022-02-28

**Scans Setup**

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 102.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4

**Measurement Results**

	Area Scan	Zoom Scan
Date	2022-09-22	2022-09-22
psSAR1g [W/kg]	0.127	0.134
psSAR8g [W/kg]	0.054	0.056
psSAR10g [W/kg]	0.048	0.050
psPDab (4.0cm2, sq) [W/m2]		1.12
Power Drift [dB]	-0.16	0.13
M2/M1 [%]		55.5
Dist 3dB Peak [mm]		10.8



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ID: 015

Report No. :TESA2207000218ES

Measurement Report for Device, BACK SURFACE, U-NII-6, 0mm, Ant 0

IEEE 802.11ax (160MHz, MCS0, 99pc duty cycle), Channel 111 (6505.0 MHz)

Ambient temperature: 21.8; Liquid temperature: 22.1

**Exposure Conditions**

Phantom Section, TSL	Position, Test Distance [mm]	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	BACK SURFACE, 0.00	5.8	6.224	34.466

**Hardware Setup**

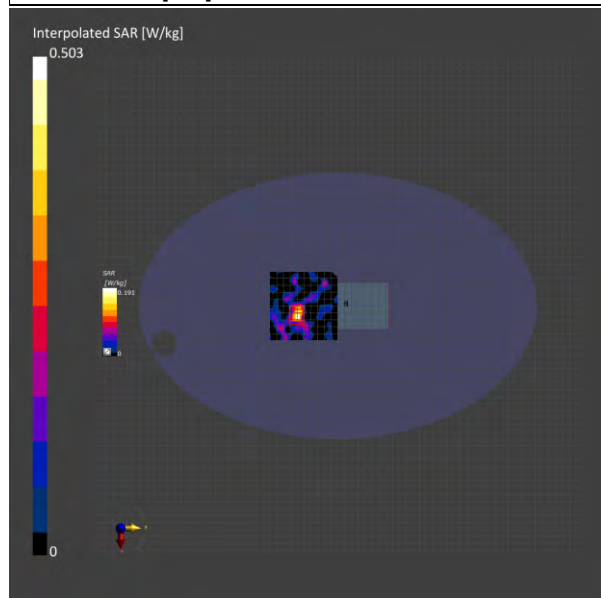
Phantom	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1141	EX3DV4 - SN7642, 2022-03-02	DAE4 Sn1665, 2022-02-28

**Scans Setup**

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 102.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4

**Measurement Results**

	Area Scan	Zoom Scan
Date	2022-09-22	2022-09-22
psSAR1g [W/kg]	0.045	0.123
psSAR8g [W/kg]	0.015	0.052
psSAR10g [W/kg]	0.013	0.047
psPDab (4.0cm2, sq) [W/m2]		1.05
Power Drift [dB]	0.14	0.11
M2/M1 [%]		57.8
Dist 3dB Peak [mm]		11.2



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ID: 016

Report No. :TESA2207000218ES

Measurement Report for Device, BACK SURFACE, U-NII-7, 0mm, Ant 0

IEEE 802.11ax (160MHz, MCS0, 99pc duty cycle), Channel 175 (6825.0 MHz)

Ambient temperature: 21.8; Liquid temperature: 22.1

**Exposure Conditions**

Phantom Section, TSL	Position, Test Distance [mm]	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	BACK SURFACE, 0.00	5.8	6.569	34.077

**Hardware Setup**

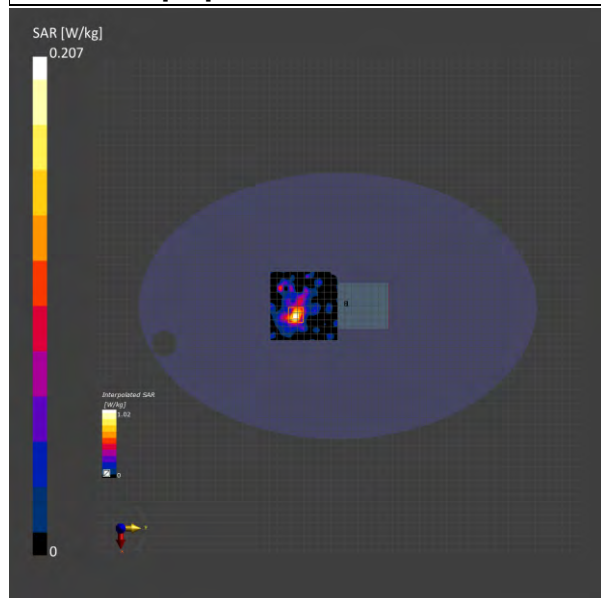
Phantom	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1141	EX3DV4 - SN7642, 2022-03-02	DAE4 Sn1665, 2022-02-28

**Scans Setup**

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 102.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4

**Measurement Results**

	Area Scan	Zoom Scan
Date	2022-09-22	2022-09-22
psSAR1g [W/kg]	0.220	0.219
psSAR8g [W/kg]	0.088	0.088
psSAR10g [W/kg]	0.078	0.077
psPDab (4.0cm2, sq) [W/m2]		1.75
Power Drift [dB]	-0.15	0.18
M2/M1 [%]		49.9
Dist 3dB Peak [mm]		10.0



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ID: 017

Report No. :TESA2207000218ES

Measurement Report for Device, BACK SURFACE, U-NII-8, 0mm, Ant 0

IEEE 802.11ax (160MHz, MCS0, 99pc duty cycle), Channel 207 (6985.0 MHz)

Ambient temperature: 21.8; Liquid temperature: 22.1

**Exposure Conditions**

Phantom Section, TSL	Position, Test Distance [mm]	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	BACK SURFACE, 0.00	5.7	6.775	33.782

**Hardware Setup**

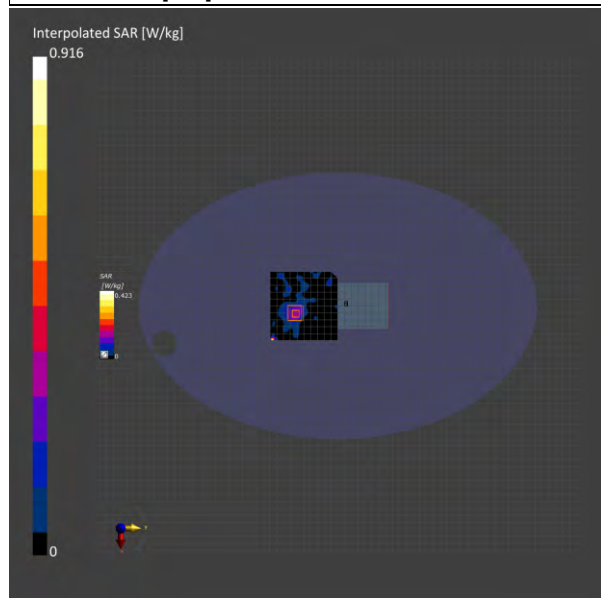
Phantom	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1141	EX3DV4 - SN7642, 2022-03-02	DAE4 Sn1665, 2022-02-28

**Scans Setup**

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 102.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4

**Measurement Results**

	Area Scan	Zoom Scan
Date	2022-09-22	2022-09-22
psSAR1g [W/kg]	0.206	0.196
psSAR8g [W/kg]	0.082	0.079
psSAR10g [W/kg]	0.073	0.070
psPDab (4.0cm2, sq) [W/m2]		1.58
Power Drift [dB]	-0.10	0.13
M2/M1 [%]		50.3
Dist 3dB Peak [mm]		10.1



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t (886-2) 2299-3279

f (886-2) 2298-0488

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ID: 018

Measurement Report for Device, BACK SURFACE, U-NII-5, 0mm, Ant 1  
IEEE 802.11ax (160MHz, MCS0, 99pc duty cycle), Channel 15 (6025.0 MHz)

Ambient temperature: 21.8; Liquid temperature: 22.1

**Exposure Conditions**

Phantom Section, TSL	Position, Test Distance [mm]	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	BACK SURFACE, 0.00	5.8	5.662	35.027

**Hardware Setup**

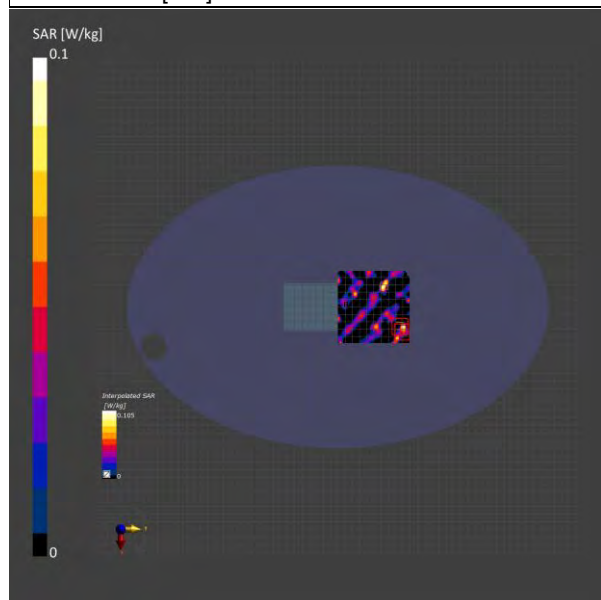
Phantom	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1141	EX3DV4 - SN7642, 2022-03-02	DAE4 Sn1665, 2022-02-28

**Scans Setup**

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 102.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4

**Measurement Results**

	Area Scan	Zoom Scan
Date	2022-09-22	2022-09-22
psSAR1g [W/kg]	0.016	0.017
psSAR8g [W/kg]	0.005	0.005
psSAR10g [W/kg]	0.005	0.004
psPDab (4.0cm2, sq) [W/m2]		0.095
Power Drift [dB]	-0.17	0.09
M2/M1 [%]		55.6
Dist 3dB Peak [mm]		> 11.0



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t (886-2) 2299-3279

f (886-2) 2298-0488

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ID: 019

Report No. :TESA2207000218ES

Measurement Report for Device, BACK SURFACE, U-NII-5, 0mm, Ant 1

IEEE 802.11ax (160MHz, MCS0, 99pc duty cycle), Channel 47 (6185.0 MHz)

Ambient temperature: 21.8; Liquid temperature: 22.1

**Exposure Conditions**

Phantom Section, TSL	Position, Test Distance [mm]	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	BACK SURFACE, 0.00	5.8	5.854	34.79

**Hardware Setup**

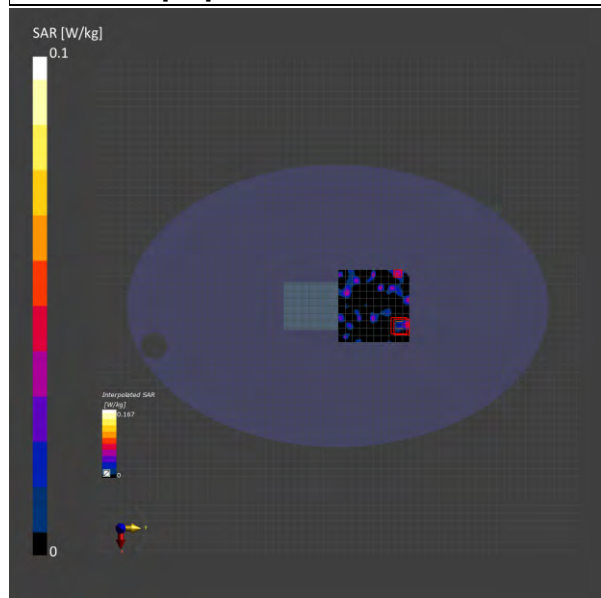
Phantom	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1141	EX3DV4 - SN7642, 2022-03-02	DAE4 Sn1665, 2022-02-28

**Scans Setup**

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 102.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4

**Measurement Results**

	Area Scan	Zoom Scan
Date	2022-09-22	2022-09-22
psSAR1g [W/kg]	0.023	0.029
psSAR8g [W/kg]	0.006	0.008
psSAR10g [W/kg]	0.005	0.006
psPDab (4.0cm2, sq) [W/m2]		0.154
Power Drift [dB]	-0.15	0.13
M2/M1 [%]		48.9
Dist 3dB Peak [mm]		11.0



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f (886-2) 2298-0488

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ID: 020

Report No. :TESA2207000218ES

Measurement Report for Device, BACK SURFACE, U-NII-6, 0mm, Ant 1

IEEE 802.11ax (160MHz, MCS0, 99pc duty cycle), Channel 111 (6505.0 MHz)

Ambient temperature: 21.8; Liquid temperature: 22.1

**Exposure Conditions**

Phantom Section, TSL	Position, Test Distance [mm]	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	BACK SURFACE, 0.00	5.8	6.224	34.466

**Hardware Setup**

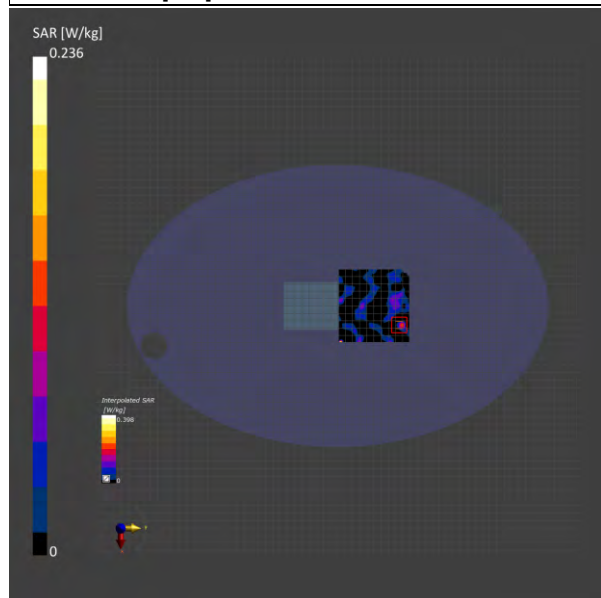
Phantom	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1141	EX3DV4 - SN7642, 2022-03-02	DAE4 Sn1665, 2022-02-28

**Scans Setup**

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 102.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4

**Measurement Results**

	Area Scan	Zoom Scan
Date	2022-09-22	2022-09-22
psSAR1g [W/kg]	0.047	0.059
psSAR8g [W/kg]	0.020	0.014
psSAR10g [W/kg]	0.018	0.012
psPDab (4.0cm2, sq) [W/m2]		0.281
Power Drift [dB]	0.18	0.16
M2/M1 [%]		51.3
Dist 3dB Peak [mm]		3.4



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f (886-2) 2298-0488

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ID: 021

Report No. :TESA2207000218ES

Measurement Report for Device, BACK SURFACE, U-NII-7, 0mm, Ant 1

IEEE 802.11ax (160MHz, MCS0, 99pc duty cycle), Channel 143 (6665.0 MHz)

Ambient temperature: 21.8; Liquid temperature: 22.1

**Exposure Conditions**

Phantom Section, TSL	Position, Test Distance [mm]	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	BACK SURFACE, 0.00	5.8	6.393	34.295

**Hardware Setup**

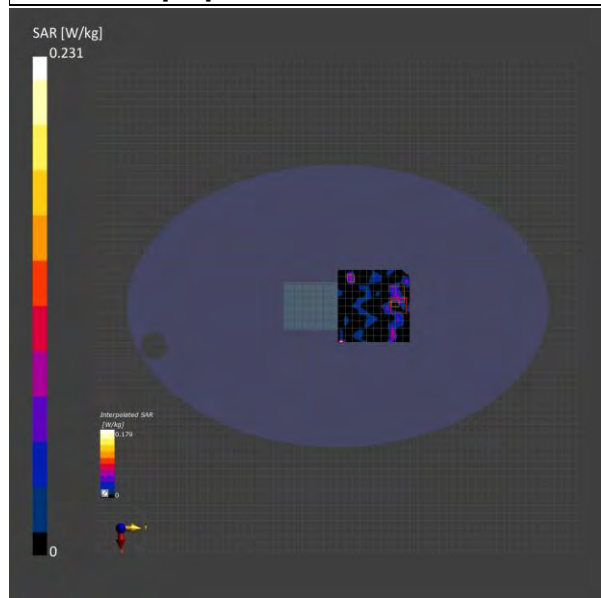
Phantom	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1141	EX3DV4 - SN7642, 2022-03-02	DAE4 Sn1665, 2022-02-28

**Scans Setup**

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 102.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4

**Measurement Results**

	Area Scan	Zoom Scan
Date	2022-09-22	2022-09-22
psSAR1g [W/kg]	0.039	0.040
psSAR8g [W/kg]	0.017	0.017
psSAR10g [W/kg]	0.016	0.015
psPDab (4.0cm2, sq) [W/m2]		0.335
Power Drift [dB]	-0.16	0.14
M2/M1 [%]		54.0
Dist 3dB Peak [mm]		10.9



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f (886-2) 2298-0488

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ID: 022

Report No. :TESA2207000218ES

Measurement Report for Device, BACK SURFACE, U-NII-8, 0mm, Ant 1

IEEE 802.11ax (160MHz, MCS0, 99pc duty cycle), Channel 207 (6985.0 MHz)

Ambient temperature: 21.8; Liquid temperature: 22.1

**Exposure Conditions**

Phantom Section, TSL	Position, Test Distance [mm]	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	BACK SURFACE, 0.00	5.7	6.775	33.782

**Hardware Setup**

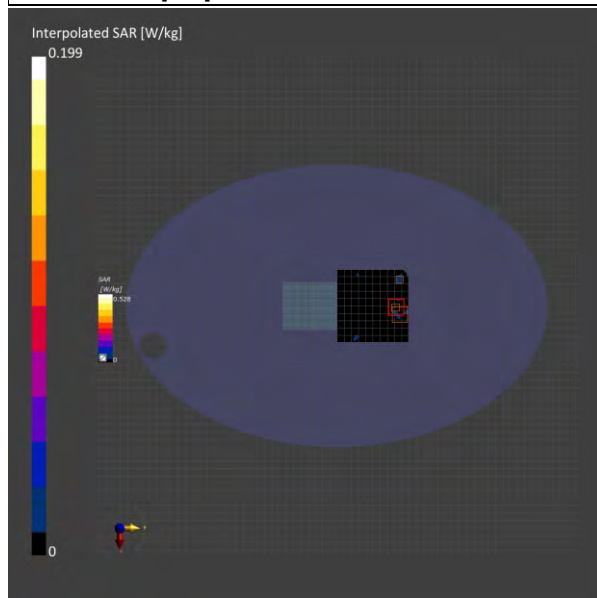
Phantom	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1141	EX3DV4 - SN7642, 2022-03-02	DAE4 Sn1665, 2022-02-28

**Scans Setup**

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 102.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4

**Measurement Results**

	Area Scan	Zoom Scan
Date	2022-09-22	2022-09-22
psSAR1g [W/kg]	0.044	0.043
psSAR8g [W/kg]	0.018	0.019
psSAR10g [W/kg]	0.016	0.017
psPDab (4.0cm2, sq) [W/m2]		0.371
Power Drift [dB]	-0.18	-0.08
M2/M1 [%]		57.2
Dist 3dB Peak [mm]		10.0



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f (886-2) 2298-0488

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## 13 PD MEASUREMENT RESULTS

ID: 023

Report No. :TESA2207000216ES

Measurement Report for Device, BACK SURFACE, U-NII-5, 2mm, Ant 0

IEEE 802.11ax (160MHz, MCS0, 99pc duty cycle), Channel 15 (6025.0 MHz)

### Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Conversion Factor
5G	BACK SURFACE, 2.00	1.0

### Hardware Setup

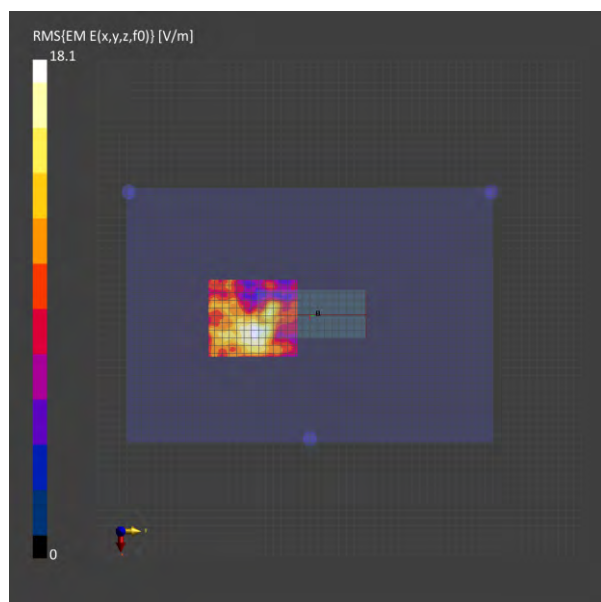
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave - 1076	Air -	EUmmWV3 - SN9399_F1-55GHz, 2022-01-26	DAE4 Sn1665, 2022-02-28

### Scans Setup

Scan Type	5G Scan
Grid Extents [mm]	100.0 x 120.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0

### Measurement Results

Scan Type	5G Scan
Date	2022-09-22
Avg. Area [cm <sup>2</sup> ]	4.00
psPDn+ [W/m <sup>2</sup> ]	0.567
psPDtot+ [W/m <sup>2</sup> ]	0.594
psPDmod+ [W/m <sup>2</sup> ]	0.630
E <sub>max</sub> [V/m]	18.1
Power Drift [dB]	0.18



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f (886-2) 2298-0488

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ID: 024

**Measurement Report for Device, BACK SURFACE, U-NII-5, 2mm, Ant 0  
IEEE 802.11ax (160MHz, MCS0, 99pc duty cycle), Channel 47 (6185.0 MHz)****Exposure Conditions**

Phantom Section	Position, Test Distance [mm]	Conversion Factor
5G	BACK SURFACE, 2.00	1.0

**Hardware Setup**

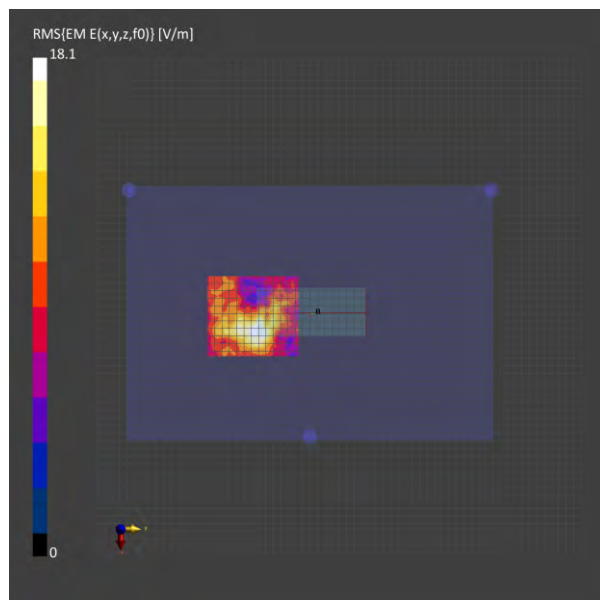
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave - 1076	Air -	EUmmWV3 - SN9399_F1-55GHz, 2022-01-26	DAE4 Sn1665, 2022-02-28

**Scans Setup**

Scan Type	5G Scan
Grid Extents [mm]	100.0 x 120.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0

**Measurement Results**

Scan Type	5G Scan
Date	2022-09-22
Avg. Area [cm <sup>2</sup> ]	4.00
psPDn+ [W/m <sup>2</sup> ]	0.502
psPDtot+ [W/m <sup>2</sup> ]	0.535
psPDmod+ [W/m <sup>2</sup> ]	0.596
E <sub>max</sub> [V/m]	18.0
Power Drift [dB]	0.12



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f (886-2) 2298-0488

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ID: 025

Report No. :TESA2207000216ES

Measurement Report for Device, BACK SURFACE, U-NII-6, 2mm, Ant 0

IEEE 802.11ax (160MHz, MCS0, 99pc duty cycle), Channel 111 (6505.0 MHz)

**Exposure Conditions**

Phantom Section	Position, Test Distance [mm]	Conversion Factor
5G	BACK SURFACE, 2.00	1.0

**Hardware Setup**

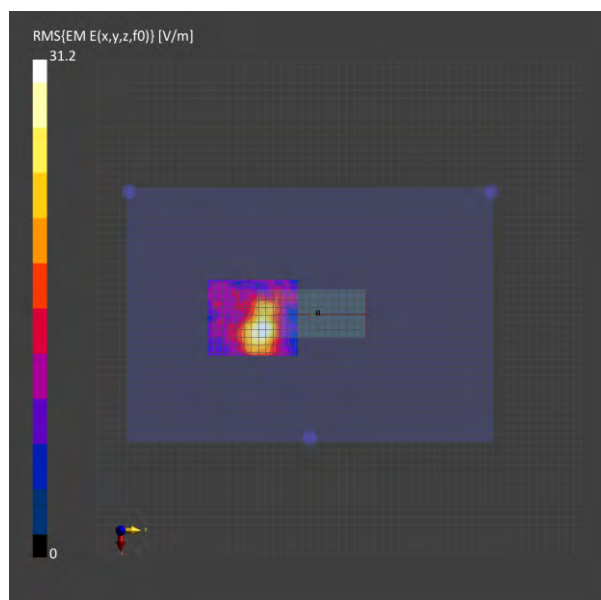
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave - 1076	Air -	EUmmWV3 - SN9399_F1-55GHz, 2022-01-26	DAE4 Sn1665, 2022-02-28

**Scans Setup**

Scan Type	5G Scan
Grid Extents [mm]	100.0 x 120.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0

**Measurement Results**

Scan Type	5G Scan
Date	2022-09-22
Avg. Area [cm <sup>2</sup> ]	4.00
psPDn+ [W/m <sup>2</sup> ]	1.88
psPDtot+ [W/m <sup>2</sup> ]	1.97
psPDmod+ [W/m <sup>2</sup> ]	2.02
E <sub>max</sub> [V/m]	31.2
Power Drift [dB]	-0.14



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f (886-2) 2298-0488

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ID: 026

Report No. :TESA2207000216ES

Measurement Report for Device, BACK SURFACE, U-NII-7, 2mm, Ant 0

IEEE 802.11ax (160MHz, MCS0, 99pc duty cycle), Channel 175 (6825.0 MHz)

**Exposure Conditions**

Phantom Section	Position, Test Distance [mm]	Conversion Factor
5G	BACK SURFACE, 2.00	1.0

**Hardware Setup**

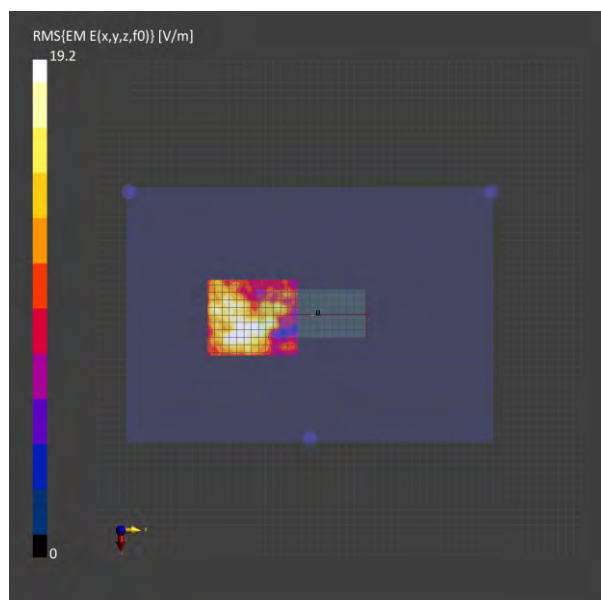
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave - 1076	Air -	EUmmWV3 - SN9399_F1-55GHz, 2022-01-26	DAE4 Sn1665, 2022-02-28

**Scans Setup**

Scan Type	5G Scan
Grid Extents [mm]	100.0 x 120.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0

**Measurement Results**

Scan Type	5G Scan
Date	2022-09-22
Avg. Area [cm <sup>2</sup> ]	4.00
psPDn+ [W/m <sup>2</sup> ]	0.684
psPDtot+ [W/m <sup>2</sup> ]	0.747
psPDmod+ [W/m <sup>2</sup> ]	0.792
E <sub>max</sub> [V/m]	19.2
Power Drift [dB]	-0.15



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ID: 027

Report No. :TESA2207000216ES

Measurement Report for Device, BACK SURFACE, U-NII-8, 2mm, Ant 0

IEEE 802.11ax (160MHz, MCS0, 99pc duty cycle), Channel 207 (6985.0 MHz)

**Exposure Conditions**

Phantom Section	Position, Test Distance [mm]	Conversion Factor
5G	BACK SURFACE, 2.00	1.0

**Hardware Setup**

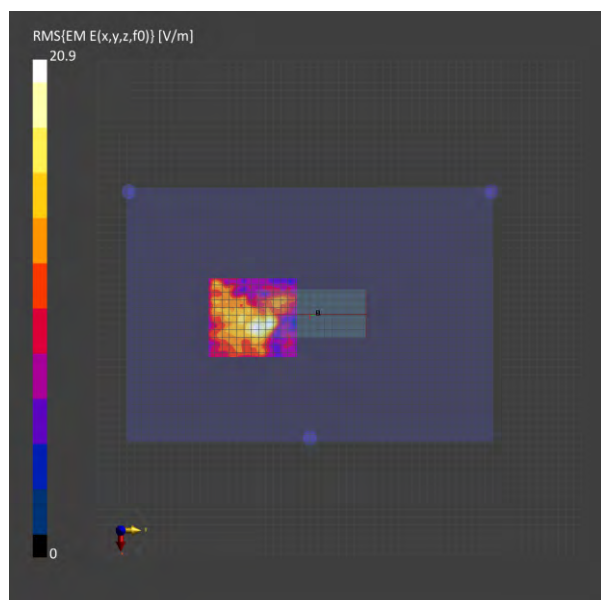
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave - 1076	Air -	EUmmWV3 - SN9399_F1-55GHz, 2022-01-26	DAE4 Sn1665, 2022-02-28

**Scans Setup**

Scan Type	5G Scan
Grid Extents [mm]	100.0 x 120.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0

**Measurement Results**

Scan Type	5G Scan
Date	2022-09-22
Avg. Area [cm <sup>2</sup> ]	4.00
psPDn+ [W/m <sup>2</sup> ]	0.573
psPDtot+ [W/m <sup>2</sup> ]	0.678
psPDmod+ [W/m <sup>2</sup> ]	0.775
E <sub>max</sub> [V/m]	20.9
Power Drift [dB]	0.12



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ID: 028

Report No. :TESA2207000216ES

Measurement Report for Device, BACK SURFACE, U-NII-5, 2mm, Ant 1

IEEE 802.11ax (160MHz, MCS0, 99pc duty cycle), Channel 15 (6025.0 MHz)

**Exposure Conditions**

Phantom Section	Position, Test Distance [mm]	Conversion Factor
5G	BACK SURFACE, 2.00	1.0

**Hardware Setup**

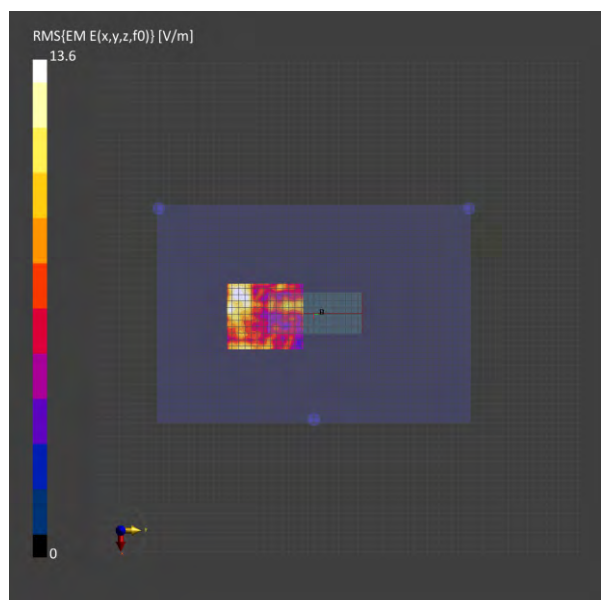
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave - 1076	Air -	EUmmWV3 - SN9399_F1-55GHz, 2022-01-26	DAE4 Sn1665, 2022-02-28

**Scans Setup**

Scan Type	5G Scan
Grid Extents [mm]	100.0 x 120.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0

**Measurement Results**

Scan Type	5G Scan
Date	2022-09-22
Avg. Area [cm <sup>2</sup> ]	4.00
psPDn+ [W/m <sup>2</sup> ]	0.370
psPDtot+ [W/m <sup>2</sup> ]	0.376
psPDmod+ [W/m <sup>2</sup> ]	0.388
E <sub>max</sub> [V/m]	13.6
Power Drift [dB]	-0.14



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ID: 029

**Measurement Report for Device, BACK SURFACE, U-NII-5, 2mm, Ant 1  
IEEE 802.11ax (160MHz, MCS0, 99pc duty cycle), Channel 47 (6185.0 MHz)****Exposure Conditions**

Phantom Section	Position, Test Distance [mm]	Conversion Factor
5G	BACK SURFACE, 2.00	1.0

**Hardware Setup**

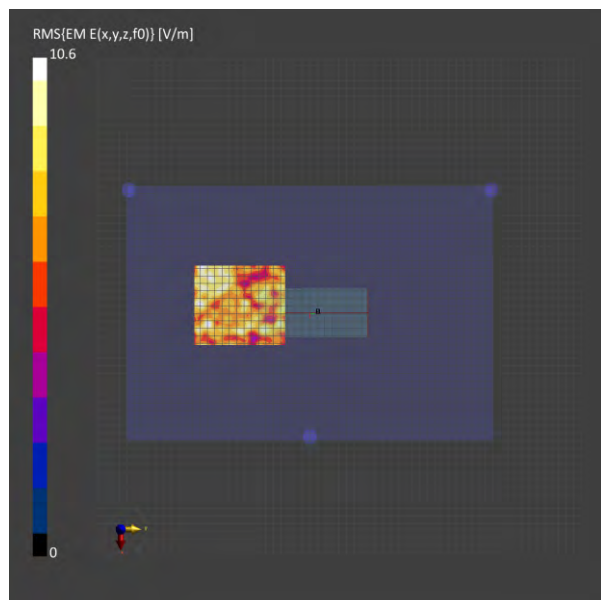
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave - 1076	Air -	EUmmWV3 - SN9399_F1-55GHz, 2022-01-26	DAE4 Sn1665, 2022-02-28

**Scans Setup**

Scan Type	5G Scan
Grid Extents [mm]	100.0 x 120.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0

**Measurement Results**

Scan Type	5G Scan
Date	2022-09-22
Avg. Area [cm <sup>2</sup> ]	4.00
psPDn+ [W/m <sup>2</sup> ]	0.200
psPDtot+ [W/m <sup>2</sup> ]	0.208
psPDmod+ [W/m <sup>2</sup> ]	0.214
E <sub>max</sub> [V/m]	10.6
Power Drift [dB]	-0.08



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ID: 030

Report No. :TESA2207000216ES

Measurement Report for Device, BACK SURFACE, U-NII-6, 2mm, Ant 1

IEEE 802.11ax (160MHz, MCS0, 99pc duty cycle), Channel 111 (6505.0 MHz)

**Exposure Conditions**

Phantom Section	Position, Test Distance [mm]	Conversion Factor
5G	BACK SURFACE, 2.00	1.0

**Hardware Setup**

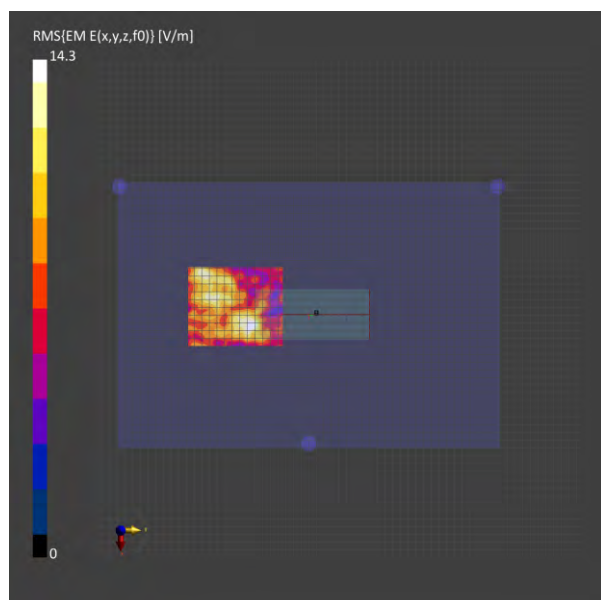
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave - 1076	Air -	EUmmWV3 - SN9399_F1-55GHz, 2022-01-26	DAE4 Sn1665, 2022-02-28

**Scans Setup**

Scan Type	5G Scan
Grid Extents [mm]	100.0 x 120.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0

**Measurement Results**

Scan Type	5G Scan
Date	2022-09-22
Avg. Area [cm <sup>2</sup> ]	4.00
psPDn+ [W/m <sup>2</sup> ]	0.334
psPDtot+ [W/m <sup>2</sup> ]	0.355
psPDmod+ [W/m <sup>2</sup> ]	0.380
E <sub>max</sub> [V/m]	14.3
Power Drift [dB]	0.11



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ID: 031

Report No. :TESA2207000216ES

Measurement Report for Device, BACK SURFACE, U-NII-7, 2mm, Ant 1

IEEE 802.11ax (160MHz, MCS0, 99pc duty cycle), Channel 143 (6665.0 MHz)

**Exposure Conditions**

Phantom Section	Position, Test Distance [mm]	Conversion Factor
5G	BACK SURFACE, 2.00	1.0

**Hardware Setup**

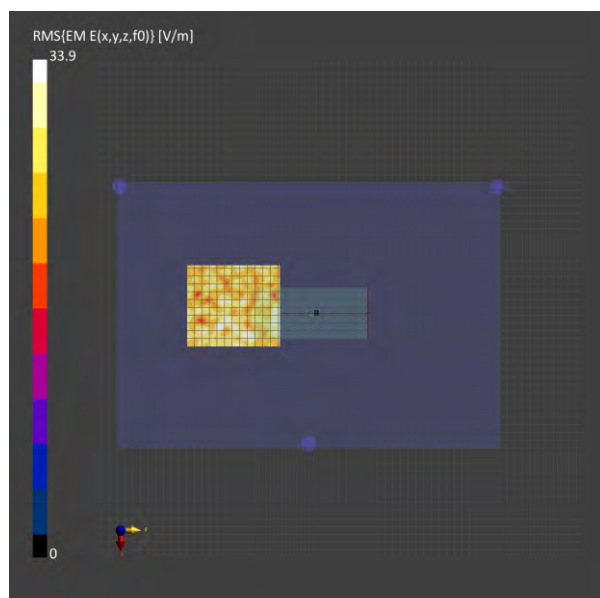
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave - 1076	Air -	EUmmWV3 - SN9399_F1-55GHz, 2022-01-26	DAE4 Sn1665, 2022-02-28

**Scans Setup**

Scan Type	5G Scan
Grid Extents [mm]	100.0 x 120.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0

**Measurement Results**

Scan Type	5G Scan
Date	2022-09-22
Avg. Area [cm <sup>2</sup> ]	4.00
psPDn+ [W/m <sup>2</sup> ]	1.83
psPDtot+ [W/m <sup>2</sup> ]	1.86
psPDmod+ [W/m <sup>2</sup> ]	2.03
E <sub>max</sub> [V/m]	33.9
Power Drift [dB]	-0.12



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ID: 032

Report No. :TESA2207000216ES

Measurement Report for Device, BACK SURFACE, U-NII-8, 2mm, Ant 1

IEEE 802.11ax (160MHz, MCS0, 99pc duty cycle), Channel 207 (6985.0 MHz)

**Exposure Conditions**

Phantom Section	Position, Test Distance [mm]	Conversion Factor
5G	BACK SURFACE, 2.00	1.0

**Hardware Setup**

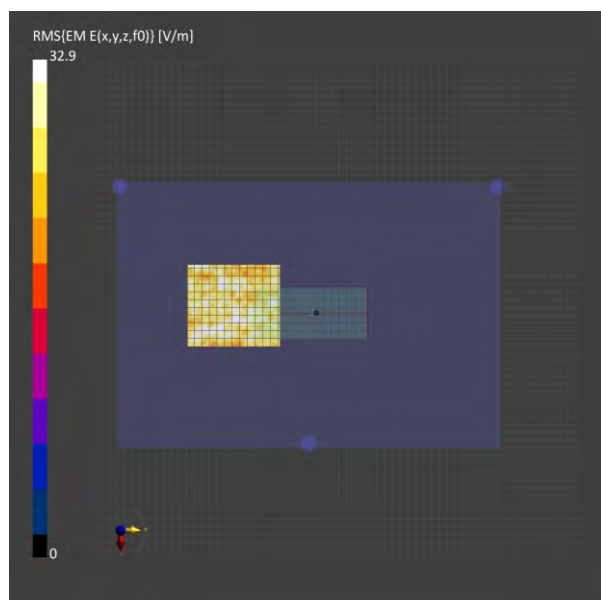
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave - 1076	Air -	EUmmWV3 - SN9399_F1-55GHz, 2022-01-26	DAE4 Sn1665, 2022-02-28

**Scans Setup**

Scan Type	5G Scan
Grid Extents [mm]	100.0 x 120.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0

**Measurement Results**

Scan Type	5G Scan
Date	2022-09-22
Avg. Area [cm <sup>2</sup> ]	4.00
psPDn+ [W/m <sup>2</sup> ]	1.98
psPDtot+ [W/m <sup>2</sup> ]	2.01
psPDmod+ [W/m <sup>2</sup> ]	2.16
E <sub>max</sub> [V/m]	32.9
Power Drift [dB]	-0.19



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## 14 SAR SYSTEM CHECK RESULTS

Date: 2022/9/19

Report No. :TESA2207000216ES

Dipole 2450 MHz\_SN:727

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1

Medium parameters used:  $f = 2450 \text{ MHz}$ ;  $\sigma = 1.841 \text{ S/m}$ ;  $\epsilon_r = 39.629$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Ambient temperature:  $22.3^\circ\text{C}$ ; Liquid temperature:  $22.4^\circ\text{C}$ 

DASY5 Configuration:

- Probe: EX3DV4 - SN7642; ConvF(8.12, 8.12, 8.12); Calibrated: 2022/03/02
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1665; Calibrated: 2022/02/28
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

**Area Scan (51x61x1):** Interpolated grid:  $dx=12 \text{ mm}$ ,  $dy=12 \text{ mm}$ 

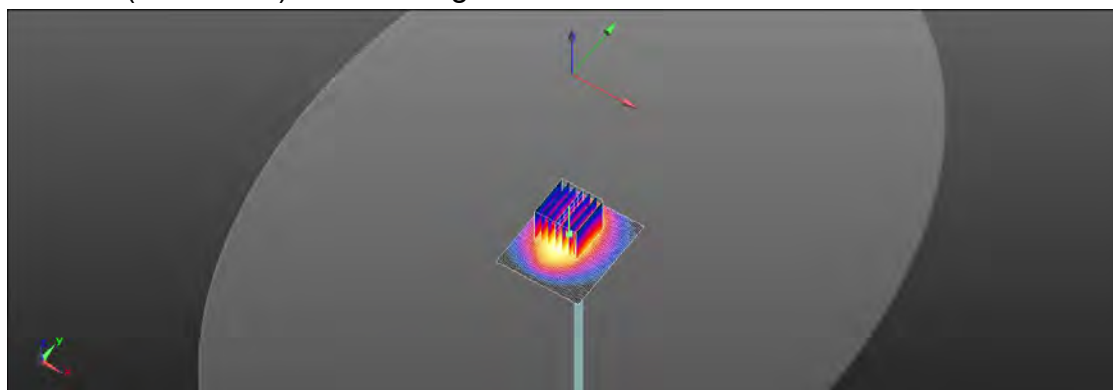
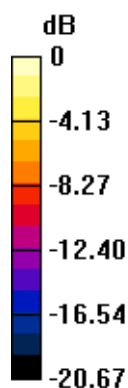
Maximum value of SAR (interpolated) =  $22.4 \text{ W/kg}$ 
**Zoom Scan (7x7x7)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$ 

Reference Value =  $97.65 \text{ V/m}$ ; Power Drift =  $0.02 \text{ dB}$ 

Peak SAR (extrapolated) =  $28.0 \text{ W/kg}$ 
**SAR(1 g) =  $14 \text{ W/kg}$ ; SAR(10 g) =  $6.82 \text{ W/kg}$** 

Smallest distance from peaks to all points 3 dB below =  $10 \text{ mm}$ 

Ratio of SAR at M2 to SAR at M1 =  $49.5\%$ 

Maximum value of SAR (measured) =  $21.0 \text{ W/kg}$ 

 $0 \text{ dB} = 21.0 \text{ W/kg} = 13.22 \text{ dBW/kg}$ 

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Date: 2022/9/20

Report No. :TESA2207000216ES

Dipole 5250 MHz\_SN:1023

Communication System: CW; Frequency: 5250 MHz;Duty Cycle: 1:1

Medium parameters used:  $f = 5250 \text{ MHz}$ ;  $\sigma = 4.774 \text{ S/m}$ ;  $\epsilon_r = 36.449$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Ambient temperature: 22.1°C; Liquid temperature: 22.2°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7642; ConvF(5.69, 5.69, 5.69); Calibrated: 2022/03/02
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1665; Calibrated: 2022/02/28
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

**Area Scan (51x51x1):** Interpolated grid:  $dx=10 \text{ mm}$ ,  $dy=10 \text{ mm}$ 

Maximum value of SAR (interpolated) = 15.4 W/kg

**Zoom Scan (7x7x12)/Cube 0:** Measurement grid:  $dx=4\text{mm}$ ,  $dy=4\text{mm}$ ,  $dz=2\text{mm}$ 

Reference Value = 55.92 V/m; Power Drift = 0.14 dB

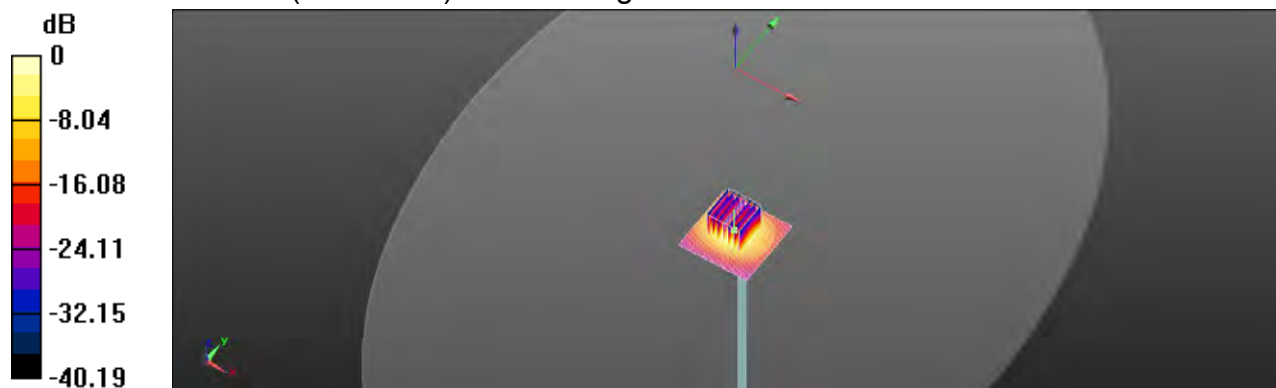
Peak SAR (extrapolated) = 30.1 W/kg

**SAR(1 g) = 7.66 W/kg; SAR(10 g) = 2.18 W/kg**

Smallest distance from peaks to all points 3 dB below = 7.2 mm

Ratio of SAR at M2 to SAR at M1 = 56.1%

Maximum value of SAR (measured) = 16.0 W/kg



0 dB = 16.0 W/kg = 12.04 dBW/kg

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Date: 2022/9/21

Report No. :TESA2207000216ES

Dipole 5600 MHz\_SN:1023

Communication System: CW; Frequency: 5600 MHz;Duty Cycle: 1:1

Medium parameters used:  $f = 5600 \text{ MHz}$ ;  $\sigma = 5.161 \text{ S/m}$ ;  $\epsilon_r = 35.931$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Ambient temperature: 21.9°C; Liquid temperature: 22.2°C

DASY5 Configuration:

- Probe: EX3DV4 - SN7642; ConvF(5.05, 5.05, 5.05); Calibrated: 2022/03/02
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1665; Calibrated: 2022/02/28
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

**Area Scan (61x91x1):** Interpolated grid:  $dx=10 \text{ mm}$ ,  $dy=10 \text{ mm}$ 

Maximum value of SAR (interpolated) = 18.4 W/kg

**Zoom Scan (7x7x12)/Cube 0:** Measurement grid:  $dx=4\text{mm}$ ,  $dy=4\text{mm}$ ,  $dz=2\text{mm}$ 

Reference Value = 63.17 V/m; Power Drift = -0.01 dB

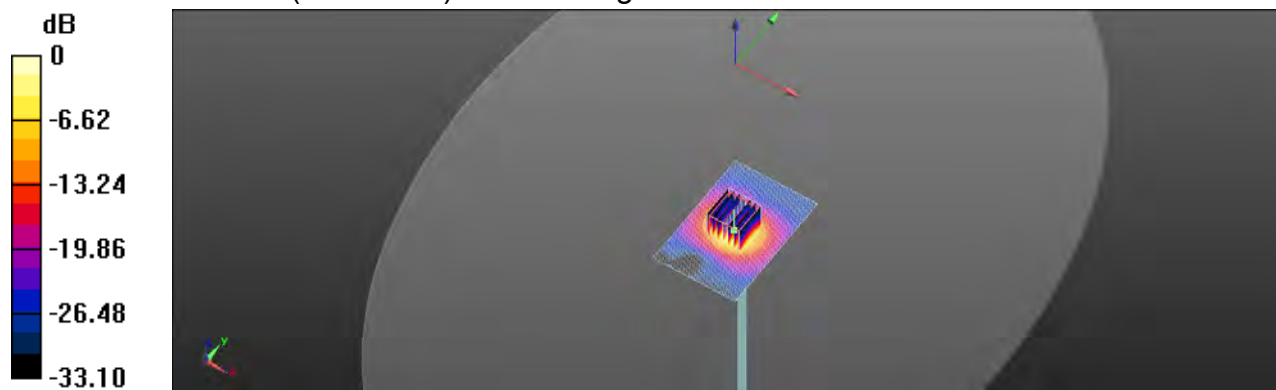
Peak SAR (extrapolated) = 35.5 W/kg

**SAR(1 g) = 8.22 W/kg; SAR(10 g) = 2.29 W/kg**

Smallest distance from peaks to all points 3 dB below = 7.4 mm

Ratio of SAR at M2 to SAR at M1 = 53.3%

Maximum value of SAR (measured) = 17.5 W/kg



0 dB = 17.5 W/kg = 12.43 dBW/kg

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Date: 2022/9/21

Report No. :TESA2207000216ES

Dipole 5750 MHz\_SN:1023

Communication System: CW; Frequency: 5750 MHz;Duty Cycle: 1:1

Medium parameters used:  $f = 5750 \text{ MHz}$ ;  $\sigma = 5.337 \text{ S/m}$ ;  $\epsilon_r = 35.442$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Ambient temperature:  $21.9^\circ\text{C}$ ; Liquid temperature:  $22.2^\circ\text{C}$ 

DASY5 Configuration:

- Probe: EX3DV4 - SN7686; ConvF(5.3, 5.3, 5.3); Calibrated: 2021/10/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1665; Calibrated: 2022/02/28
- Phantom: ELI
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

**Area Scan (61x91x1):** Interpolated grid:  $dx=10 \text{ mm}$ ,  $dy=10 \text{ mm}$ 

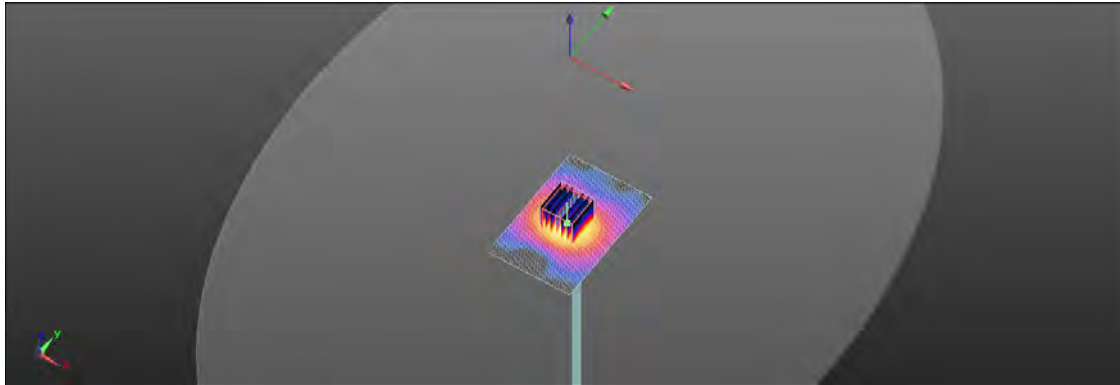
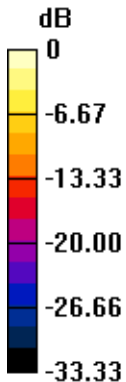
Maximum value of SAR (interpolated) =  $19.2 \text{ W/kg}$ 
**Zoom Scan (7x7x12)/Cube 0:** Measurement grid:  $dx=4\text{mm}$ ,  $dy=4\text{mm}$ ,  $dz=2\text{mm}$ 

Reference Value =  $61.01 \text{ V/m}$ ; Power Drift =  $0.03 \text{ dB}$ 

Peak SAR (extrapolated) =  $39.4 \text{ W/kg}$ 
**SAR(1 g) =  $8.49 \text{ W/kg}$ ; SAR(10 g) =  $2.35 \text{ W/kg}$** 

Smallest distance from peaks to all points 3 dB below =  $7.2 \text{ mm}$ 

Ratio of SAR at M2 to SAR at M1 =  $50.7\%$ 

Maximum value of SAR (measured) =  $18.3 \text{ W/kg}$ 

 $0 \text{ dB} = 18.3 \text{ W/kg} = 12.63 \text{ dBW/kg}$ 

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f (886-2) 2298-0488

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Report No. :TESA2207000216ES

Measurement Report for Device, FRONT, Validation band,  
CW, Channel 6500 (6500.0 MHz)\_SN:1006

Ambient temperature: 21.8; Liquid temperature: 22.1

**Exposure Conditions**

Phantom Section, TSL	Position, Test Distance [mm]	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	FRONT, 0.00	5.8	6.194	34.471

**Hardware Setup**

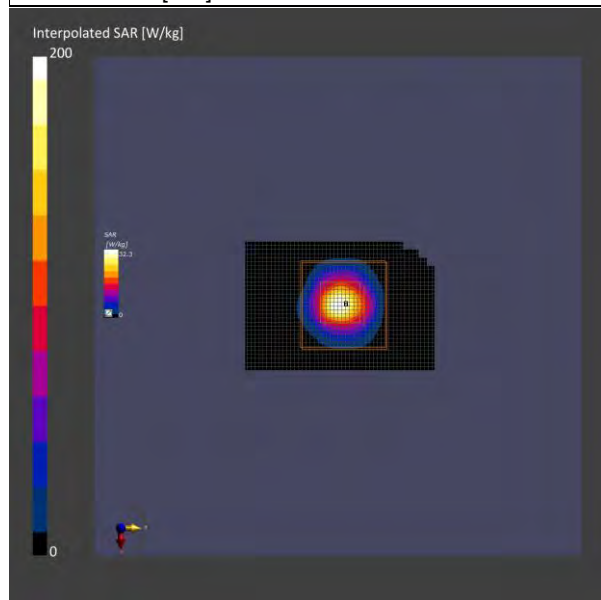
Phantom	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1141	EX3DV4 - SN7642, 2022-03-02	DAE4 Sn1665, 2022-02-28

**Scans Setup**

	Area Scan	Zoom Scan
Grid Extents [mm]	36.0 x 51.0	28.0 x 28.0 x 24.0
Grid Steps [mm]	6.0 x 8.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4

**Measurement Results**

	Area Scan	Zoom Scan
Date	2022-09-22	2022-09-22
psSAR1g [W/kg]	24.4	28.7
psSAR8g [W/kg]	6.17	6.55
psSAR10g [W/kg]	4.95	5.28
psPDab (4.0cm2, sq) [W/m2]		129
Power Drift [dB]	-0.08	-0.04
M2/M1 [%]		51.6
Dist 3dB Peak [mm]		4.8



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Report No. :TESA2207000216ES

Measurement Report for Device, FRONT, Validation band,  
CW, Channel 7000 (7000.0 MHz)\_SN:1007

Ambient temperature: 21.8; Liquid temperature: 22.1

**Exposure Conditions**

Phantom Section, TSL	Position, Test Distance [mm]	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	FRONT, 0.00	5.7	6.818	33.671

**Hardware Setup**

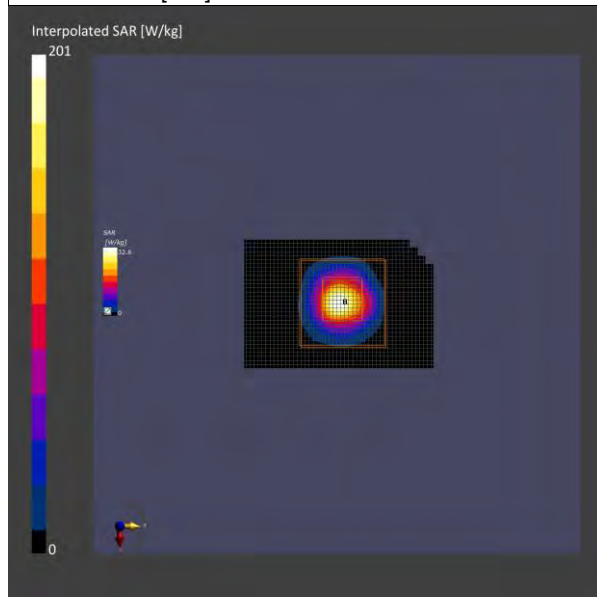
Phantom	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 (20deg probe tilt) - 1141	EX3DV4 - SN7642, 2022-03-02	DAE4 Sn1665, 2022-02-28

**Scans Setup**

	Area Scan	Zoom Scan
Grid Extents [mm]	36.0 x 45.0	28.0 x 28.0 x 24.0
Grid Steps [mm]	6.0 x 7.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4

**Measurement Results**

	Area Scan	Zoom Scan
Date	2022-09-22	2022-09-22
psSAR1g [W/kg]	25.0	26.3
psSAR8g [W/kg]	5.56	5.64
psSAR10g [W/kg]	4.58	4.62
psPDab (4.0cm2, sq) [W/m2]		113
Power Drift [dB]	0.04	0.04
M2/M1 [%]		48.5
Dist 3dB Peak [mm]		4.6



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## 15 PD SYSTEM CHECK RESULTS

Report No. :TESA2207000216ES

Measurement Report for Device, FRONT, Validation band,  
CW, Channel 10000 (10000.0 MHz)\_SN:1021

### Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Conversion Factor
5G	FRONT, 2.00	1.0

### Hardware Setup

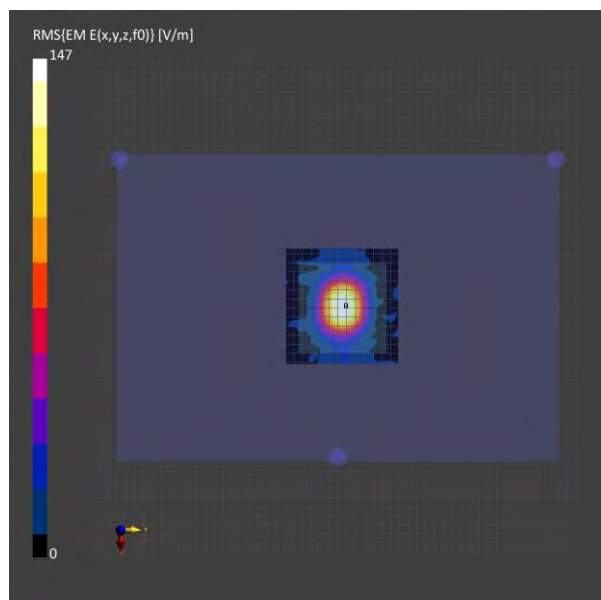
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave - 1076	Air -	EUmmWV3 - SN9399_F1-55GHz, 2022-01-26	DAE4 Sn1665, 2022-02-28

### Scans Setup

Scan Type	5G Scan
Grid Extents [mm]	120.0 x 120.0
Grid Steps [lambda]	0.25 x 0.25
Sensor Surface [mm]	2.0

### Measurement Results

Scan Type	5G Scan
Date	2022-09-22
Avg. Area [cm <sup>2</sup> ]	1.00
psPDn+ [W/m <sup>2</sup> ]	50.9
psPDtot+ [W/m <sup>2</sup> ]	51.0
psPDmod+ [W/m <sup>2</sup> ]	51.2
E <sub>max</sub> [V/m]	144
Power Drift [dB]	0.11



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**Refer to separated files for the following appendixes.**

**16.1 SAR\_Appendix A Photographs**

**16.2 SAR\_Appendix B DAE & Probe Cal. Certificate**

**16.3 SAR\_Appendix C Phantom Description & Dipole Cal. Certificate**

**- End of report -**

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