







# TEST REPORT

<b>Eurofins KCTL Co.,Ltd.</b> 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea TEL: 82-70-5008-1021 FAX: 82-505-299-8311 <a href="http://www.kctl.co.kr">www.kctl.co.kr</a>	Report No.: <b>KR23-SPF0028-C</b> Page (1) of (125)	   <b>KCTL</b>
<p><b>1. Client</b></p> <ul style="list-style-type: none"> <li>◦ Name : Samsung Electronics Co., Ltd.</li> <li>◦ Address : 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea</li> <li>◦ Date of Receipt : 2023-03-14</li> </ul> <p><b>2. Use of Report</b> : Certification</p> <p><b>3. Name of Product and Model</b> : Notebook PC</p> <ul style="list-style-type: none"> <li>◦ Model Name : NP935QNA</li> <li>◦ Manufacturer and country of Origin : Samsung Electronics Co., Ltd. / VIETNAM</li> </ul> <p><b>4. FCC ID</b> : A3LNP935QNA</p> <p><b>5. Date of Test</b> : 2023-05-03 ~ 2023-05-10</p> <p><b>6. Location of Test</b> : <input checked="" type="checkbox"/> Permanent Testing Lab <input type="checkbox"/> On Site Testing          (Address: 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea)</p> <p><b>7. Test Standards</b> : IEEE 1528-2013, ANSI/IEEE C95.1, KDB Publication</p> <p><b>8. Test Results</b> : Refer to the test result in the test report</p>		
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2023-06-07		
<p><b>Eurofins KCTL Co.,Ltd.</b></p>		
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## REPORT REVISION HISTORY

Date	Revision	Page No
2023-05-26	Originally issued	-
2023-06-02	Power Reduction Verification revised	110~116
	Antenna Location & Distance revised	117
2023-06-05	Simultaneous Transmission revised	25
2023-06-07	PD Limit unit changed	5, 13, 22, 23, 25

Note: The Report No. KR23-SPF0028-B is superseded by the report No. KR23-SPF0028-C.

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## General remarks for test reports

### Statement concerning the uncertainty of the measurement systems used for the tests

(may be required by the product standard or client)

Internal procedure used for type testing through which traceability of the measuring uncertainty has been established:

#### Procedure number, issue date and title:



Calculations leading to the reported values are on file with the testing laboratory that conducted the testing.

Statement not required by the standard or client used for type testing

**1. Identification when information is provided by the customer: Information marked " # " is provided by the customer. - Disclaimer: This information is provided by the customer and can affect the validity of results.**

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## 1. General information

Client : Samsung Electronics Co., Ltd.  
Address : 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea  
Manufacturer : Samsung Electronics Co., Ltd.  
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Accreditations : FCC Site Designation No: KR0040, FCC Site Registration No: 687132  
VCCI Registration No. : R-3327, G-198, C-3706, T-1849  
CAB Identifier: KR0040, ISED Number: 8035A  
KOLAS No.: KT231

### 1.1 Report Overview

This report details the results of testing carried out on the samples listed in section 2, 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.

This report may only be reproduced and distributed in full. If the product in this test report is used in any configuration other than that detailed in the test report, the manufacturer must ensure the new configuration complies with all relevant standards and certification requirements. Any mention of Eurofins KCTL Co.,Ltd. Wireless lab or testing done by Eurofins KCTL Co.,Ltd. Wireless lab made in connection with the distribution or use of the tested product must be approved in writing by Eurofins KCTL Co.,Ltd. Wireless lab.

## 2. Device information

### 2.1 Basic description

Product Name		Notebook PC
Product Model Number		NP935QNA
Product Manufacturer		Samsung Electronics Co., Ltd.
Host Product Serial Number	Radiation	KQZZ930W300395M
	Conduction	KQZZ930W300135V
Mode of Operation		WLAN 802.11a,b,g,n,ac,ax, Bluetooth
Device Overview		U-NII-5: 5 955.0 MHz ~ 6 415.0 MHz U-NII-6: 6 435.0 MHz ~ 6 515.0 MHz U-NII-7: 6 535.0 MHz ~ 6 855.0 MHz U-NII-8: 6 875.0 MHz ~ 7 115.0 MHz

### 2.2 Summary of SAR Test Results

Band	Equipment Class	Highest Reported	
		1g SAR (W/kg)	PD 4cm <sup>2</sup> (mW/cm <sup>2</sup> )
U-NII-5	NII	0.80	<b>0.30</b>
U-NII-6	NII	0.77	0.22
U-NII-7	NII	<b>0.89</b>	0.22
U-NII-8	NII	0.87	0.18

### 2.3 #Antenna information

Antenna Type		PIFA antenna				
Band		UNII-4	UNII-5	UNII-6	UNII-7	UNII-8
Peak gain (dBi)	Main	N/A	-3.45	-5.54	-2.51	-2.64
	Aux	N/A	-1.40	-3.34	-3.52	-4.25

## 2.4 #Maximum Tune-up power

This device operates using the following maximum output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB Publication 447498 D04v01.

When the specified maximum output power is the same for both UNII Band1 and UNII Band 2A, begins SAR measurement in UNII band 2A; and if the highest reported SAR for UNII band 2A is  $\leq 1.2\text{W/kg}$ , SAR is not required for UNII band1  $> 1.2\text{W/kg}$ , both bands should be tested independently for SAR.

### 2.4.1 #Maximum WLAN Output Power (Notebook Mode & Tablet Mode)

Band	Mode	Channel	Output Power (dBm)	
			Target	Max. Allowed
U-NII-5, U-NII-6, U-NII-7, U-NII-8 (MIMO)	802.11a	All Channel	1.5	2.5
	802.11ax SU 20 MHz	All Channel	8.5	9.5
	802.11ax SU 40 MHz	All Channel	8.5	9.5
	802.11ax SU 80 MHz	All Channel	8.0	9.0
	802.11ax SU 160 MHz	All Channel	11.0	12.0
	802.11ax RU 26T_20/40/80/160 MHz	All Channel	-7.0	-6.0
	802.11ax RU 52T_20/40/80/160 MHz	All Channel	-4.0	-3.0
	802.11ax RU 106T_20/40/80/160 MHz	All Channel	0.0	1.0
	802.11ax RU 242T_20/40/80/160 MHz	All Channel	1.5	2.5
	802.11ax RU 484T_40/80/160 MHz	All Channel	1.5	2.5
	802.11ax RU 996T_80/160 MHz	All Channel	1.5	2.5
	802.11ax RU 2x996T_160 MHz	All Channel	1.5	2.5

### 2.4.2 #Maximum WLAN Output Power (Tablet Mode Grip Sensor)

Band/Ant.	Mode	Channel	Output Power (dBm)	
			Target	Max. Allowed
Except U-NII-5 U-NII-5	802.11ax SU 160 MHz	All Channel	9.0	10.0
			10.0	11.0
U-NII-6, U-NII-7, U-NII-8 (MIMO)	802.11a	All Channel	1.5	2.5
	802.11ax SU 20 MHz	All Channel	8.5	9.5
	802.11ax SU 40 MHz	All Channel	8.5	9.5
	802.11ax SU 80 MHz	All Channel	8.0	9.0
	802.11ax RU 26T_20/40/80/160 MHz	All Channel	-7.0	-6.0
	802.11ax RU 52T_20/40/80/160 MHz	All Channel	-4.0	-3.0
	802.11ax RU 106T_20/40/80/160 MHz	All Channel	0.0	1.0
	802.11ax RU 242T_20/40/80/160 MHz	All Channel	1.5	2.5
	802.11ax RU 484T_40/80/160 MHz	All Channel	1.5	2.5
	802.11ax RU 996T_80/160 MHz	All Channel	1.5	2.5
	802.11ax RU 2x996T_160 MHz	All Channel	1.5	2.5

## 2.5 SAR Test Configurations

### 2.5.1 #DUT Antenna Locations

The device is a 2-in-1 model that operations as a laptop when folded 90 degrees and as a tablet when folded 360 degrees.

When in tablet mode the overall dimensions of this device are > 20 cm.

A diagram showing the location of the device antennas can be found in Appendix D.

### 2.5.2 SAR Test Exclusion Considerations (Tablet Mode)

Device's each edge positions consider SAR test exclusion according to Appendix B.3 of KDB 447498 D04 Interim General RF exposure guide.

Above 6GHz, Threshold ERP was calculated and exempted.

RF Source Frequency			Minimum Distance			Threshold ERP
$f_L$ MHz		$f_H$ MHz	$\lambda_L / 2\pi$		$\lambda_H / 2\pi$	W
0.3	–	1.34	159 m	–	35.6 m	1,920 R <sup>2</sup>
1.34	–	30	35.6 m	–	1.6 m	3,450 R <sup>2</sup> /f <sup>2</sup>
30	–	300	1.6 m	–	159 mm	3.83 R <sup>2</sup>
300	–	1,500	159 mm	–	31.8 mm	0.0128 R <sup>2</sup> f
1,500	–	100,000	31.8 mm	–	0.5 mm	19.2R <sup>2</sup>

Subscripts L and H are low and high;  $\lambda$  is wavelength.

From § 1.1307(b)(3)(i)(C), modified by adding Minimum Distance columns.



**[Tablet]**

Ant.	Band	Freq. [MHz]	Output Power			Separation distances [mm]					SAR Exemption				
			dBm	mW	ERP [mW]	Rear	Left	Right	Top	Bot.	Rear	Left	Right	Top	Bottom
Main	U-NII-5	6 415.0	12.00	16	4	5	112	165	192	5	Measure	241 EXEMPT	523 EXEMPT	708 EXEMPT	Measure
	U-NII 6	6 515.0	12.00	16	3	5	112	165	192	5	Measure	241 EXEMPT	523 EXEMPT	708 EXEMPT	Measure
	U-NII 7	6 855.0	12.00	16	5	5	112	165	192	5	Measure	241 EXEMPT	523 EXEMPT	708 EXEMPT	Measure
	U-NII 8	7 115.0	12.00	16	5	5	112	165	192	5	Measure	241 EXEMPT	523 EXEMPT	708 EXEMPT	Measure
Aux	U-NII-5	6 415.0	12.00	16	7	5	78	200	192	5	Measure	117 EXEMPT	768 EXEMPT	708 EXEMPT	Measure
	U-NII 6	6 515.0	12.00	16	4	5	78	200	192	5	Measure	117 EXEMPT	768 EXEMPT	708 EXEMPT	Measure
	U-NII 7	6 855.0	12.00	16	4	5	78	200	192	5	Measure	117 EXEMPT	768 EXEMPT	708 EXEMPT	Measure
	U-NII 8	7 115.0	12.00	16	4	5	78	200	192	5	Measure	117 EXEMPT	768 EXEMPT	708 EXEMPT	Measure

**[Tablet-Grip Sensor]**



Ant.	Band	Freq. [MHz]	Output Power			Separation distances [mm]					SAR Exemption				
			dBm	mW	ERP [mW]	Rear	Left	Right	Top	Bot.	Rear	Left	Right	Top	Bottom
Main	U-NII-5	6 415.0	11.00	13	3	5	112	165	192	5	Measure	241 EXEMPT	523 EXEMPT	708 EXEMPT	Measure
	U-NII 6	6 515.0	10.00	10	2	5	112	165	192	5	Measure	241 EXEMPT	523 EXEMPT	708 EXEMPT	Measure
	U-NII 7	6 855.0	10.00	10	3	5	112	165	192	5	Measure	241 EXEMPT	523 EXEMPT	708 EXEMPT	Measure
	U-NII 8	7 115.0	10.00	10	3	5	112	165	192	5	Measure	241 EXEMPT	523 EXEMPT	708 EXEMPT	Measure
Aux	U-NII-5	6 415.0	11.00	13	6	5	78	200	192	5	Measure	117 EXEMPT	768 EXEMPT	708 EXEMPT	Measure
	U-NII 6	6 515.0	10.00	10	3	5	78	200	192	5	Measure	117 EXEMPT	768 EXEMPT	708 EXEMPT	Measure
	U-NII 7	6 855.0	10.00	10	3	5	78	200	192	5	Measure	117 EXEMPT	768 EXEMPT	708 EXEMPT	Measure
	U-NII 8	7 115.0	10.00	10	2	5	78	200	192	5	Measure	117 EXEMPT	768 EXEMPT	708 EXEMPT	Measure

Note 1: For distances < 5mm, a distance of 5mm is used to determine SAR exclusion and estimated SAR value.  
 Note 2: Output power is the worst of the maximum rated power (including tune-up or manufacturing tolerances) and ERP(E.I.R.P – 2.15 dB).  
 Note 3: The exemption requirement  $R > \lambda/2 \pi$  was applied in accordance with Annex B.3 of the KDB 447498 D04 Temporary General RF Exposure Guide.  
 Note 4: Formulas round separation distance to nearest mm and power to nearest mW before calculating thresholds or exemption values.



Device Type	Ant. / Band		Device Edge for SAR Testing (Rear View)					
			Front	Rear	Left Edge	Right Edge	Top	Bottom
Notebook	WLAN		No	Yes	No	No	No	No
Tablet	Main	U-NII-5	No	Yes	No	No	No	Yes
		U-NII 6	No	Yes	No	No	No	Yes
		U-NII 7	No	Yes	No	No	No	Yes
		U-NII 8	No	Yes	No	No	No	Yes
	Aux	U-NII-5	No	Yes	No	No	No	Yes
		U-NII 6	No	Yes	No	No	No	Yes
		U-NII 7	No	Yes	No	No	No	Yes
		U-NII 8	No	Yes	No	No	No	Yes



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## 2.6 SAR Test Methods and Procedures

The tests documented in this report were performed in accordance with IEEE 1528-2013 and the following published KDB procedures:

- IEEE 1528-2013
- IEC/IEEE 62209-1528:2020
- IEC 62479:2010
- IEC TR 63170:2018
- 248227 D01 802.11 Wi-Fi SAR v02r02
- 447498 D04 General RF Exposure Guidance v01
- 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04
- 865664 D02 RF Exposure Reporting v01r02
- 616217 D04 SAR for laptop and tablets v01r02
- April 2019 TCB Workshop Notes (Tissue Simulating Liquids)
- TCB Workshop–October 2021 : RF Exposure Policies and Procedures
- SPEAG DASY6 System Handbook (June 2020)
- SPEAG DASY6 Application Note (Interim Procedures for Devices Operating at 6-10 GHz)

### 2.6.1 6-7 GHz Tested Conditions

The Device was operated utilizing proprietary software and each channel was measured using a broadband power meter to determine the maximum average power.

As per the Interim Procedures for 6-7GHz RF Exposure, explained in RF Exposure Policies and Procedures: TCB Workshop – October 2020, the testing has been performed on SAR following IEC/IEEE 62209-1528:2020 and then on Power Density for the highest SAR test configurations.

The testing has been in both chains and four considered bands U-NII-5, U-NII-6, U-NII-7 and U-NII-8 in SAR mode.

### 3. Specific Absorption Rate

#### 3.1 Introduction

The SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational / controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

#### 3.2 SAR Definition

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density ( $\rho$ ). The equation description is as below:

$$SAR = \frac{d}{dt} \left( \frac{dW}{dm} \right) = \frac{d}{dt} \left( \frac{dW}{\rho dv} \right)$$

SAR is expressed in units of Watts per kilogram (W/kg)

SAR measurement can be either related to the temperature elevation in tissue by

$$SAR = C \left( \frac{\delta T}{\delta t} \right)$$

Where: C is the specific heat capacity,  $\delta T$  is the temperature rise and  $\delta t$  is the exposure duration, or related to the electrical field in the tissue by

$$SAR = \frac{\sigma |E|^2}{\rho}$$

Where:  $\sigma$  is the conductivity of the tissue,  $\rho$  is the mass density of the tissue and E is the RMS electrical field strength. However for evaluating SAR of low power transmitter, electrical field measurement is typically applied.

### 3.3 Peak Spatially Averaged Power Density Assessment Based on E-field Measurements

Within a short distance from the transmitting source, power density was determined based on both electric and magnetic fields. Generally, the magnitude and phase of two components of either the E-field or H-field were needed on a sufficiently large surface to fully characterize the total E-field and H-field distributions. Nevertheless, solutions based on direct measurement of E-field and H-field can be used to compute power density. The general measurement approach used for this device was:

- a) The local E field on the measurement surface was measured at a reference location where the field is well above the noise level. This reference level was used at the end of this procedure to assess output power drift of the DUT during the measurement.
- b) The electric field on the measurement surface was scanned. Measurements are conducted according to the instructions provided by the measurement system manufacturer. Measurement spatial resolution can depend on the measured field characteristic and measurement methodology used by the system. The planar scan step size was configured at  $\lambda/4$ .
- c) For cDASY6, H-field was calculated from the measured E-field using a reconstruction algorithm. As the power density calculation requires knowledge of both amplitude and phase, reconstruction algorithms can also be used to obtain field information from the measured E-field data (e.g. the phase from the amplitude if only the amplitude is measured). H-field and phase data was reconstructed from repeated measurements (three per measurement point) on two measurement planes separated by  $\lambda/4$ .
- d) The total Peak spatially averaged power density (psPD) distribution on the evaluation surface is determined per the below equation. The spatial averaging area,  $A$ , is specified by the applicable exposure limits or regulatory requirements.

$$psPD = \frac{1}{2A_{av}} \iint_{A_{av}} || Re\{E \times H^*\} || dA$$

- e) The maximum spatial-average on the evaluation surface is the final quantity to determine compliance against applicable limits.
- f) The local E field reference value, at the same location as step 2, was re-measured after the scan was complete to calculate the power drift. If the drift deviated by more than 5%, the power density test and drift measurements were repeated.

## 4. RF Exposure Limits

**UNCONTROLLED ENVIRONMENTS** are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

**CONTROLLED ENVIRONMENTS** are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
<b>Partial Peak SAR</b> <sup>1)</sup> (Partial)	1.60 mW/g	8.00 mW/g
<b>Partial Average SAR</b> <sup>2)</sup> (Whole Body)	0.08 mW/g	0.40 mW/g
<b>Partial Peak SAR</b> <sup>3)</sup> (Hands/Feet/Ankle/Wrist)	4.00 mW/g	20.00 mW/g

- 1) The spatial Peak value of the SAR averaged over any 1g gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.
- 2) The spatial Average value of the SAR averaged over the whole body.
- 3) The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

### 4.1 RF Exposure Limits for Frequencies Above 6 GHz

Per §1.1310 (d)(3), the MPE limits are applied for frequencies above 6 GHz. Power Density is expressed in units of mW/cm<sup>2</sup>.

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

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
<b>Power Density</b>	1.0 mW/cm <sup>2</sup>	5.0 mW/cm <sup>2</sup>

## 5. RF Average Conducted Output Power

Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02:

- Power measurements were performed for the transmission mode configuration with the highest maximum output power specified for production units.
- For transmission modes with the same maximum output power specification, powers were measured for the largest channel bandwidth, lowest order modulation and lowest data rate.
- For transmission modes with identical maximum specified output power, channel bandwidth, modulation and data rates, power measurements were required for all identical configurations.
- For each transmission mode configuration, powers were measured for the highest and lowest channels; and at the mid-band channel(s) when there were at least 3 channels supported.

Power Measurement Setup



### 5.1 WLAN Average Conducted Output Power (Notebook Mode & Tablet Mode)

Band	Mode	Freq. [MHz]	Channel	Conducted Powers (dBm)
				MIMO Ant.
U-NII-5	802.11ax (160-SU)	6 185.0	47	10.95
		6 345.0	79	11.17
U-NII-6	802.11ax (160-SU)	6 505.0	111	10.68
U-NII-7	802.11ax (160-SU)	6 825.0	175	11.44
U-NII-8	802.11ax (160-SU)	6 985.0	207	11.69

### 5.2 WLAN Average Conducted Output Power (Tablet Mode Grip Sensor)

Band	Mode	Freq. [MHz]	Channel	Conducted Powers (dBm)
				MIMO Ant.
U-NII-5	802.11ax (160-SU)	6 185.0	47	9.23
		6 345.0	79	9.27
U-NII-6	802.11ax (160-SU)	6 505.0	111	8.75
U-NII-7	802.11ax (160-SU)	6 665.0	143	8.91
		6 825.0	175	9.74
U-NII-8	802.11ax (160-SU)	6 985.0	207	9.12

## 6. System Verification

### 6.1 Measurement date and environment

Shield room	Date	Environment	
		Temperature (oC)	Humidity (%)
8F - 4	2023-05-03	20.7 ~ 21.1	50.3
	2023-05-06	21.0 ~ 21.3	50.0
	2023-05-08	20.6 ~ 21.0	49.5
	2023-05-10	20.8 ~ 21.3	53.0
	2023-05-11	20.3 ~ 20.6	52.8
	2023-05-12	21.2 ~ 21.3	52.1
	2023-05-13	20.7 ~ 20.9	49.3

## 6.2 Tissue Verification

The dielectric properties for this Tissue Simulant Liquids were measured by using the SPEAG Model DAK3.5 Dielectric Probe in conjunction with Agilent E5071B Network Analyzer (300 kHz – 8 500 MHz). The Conductivity ( $\sigma$ ) and Permittivity ( $\rho$ ) are listed in Table 1. For the SAR measurement given in this report. The temperature variation of the Tissue Simulant Liquids was  $(22 \pm 2) ^\circ\text{C}$ .

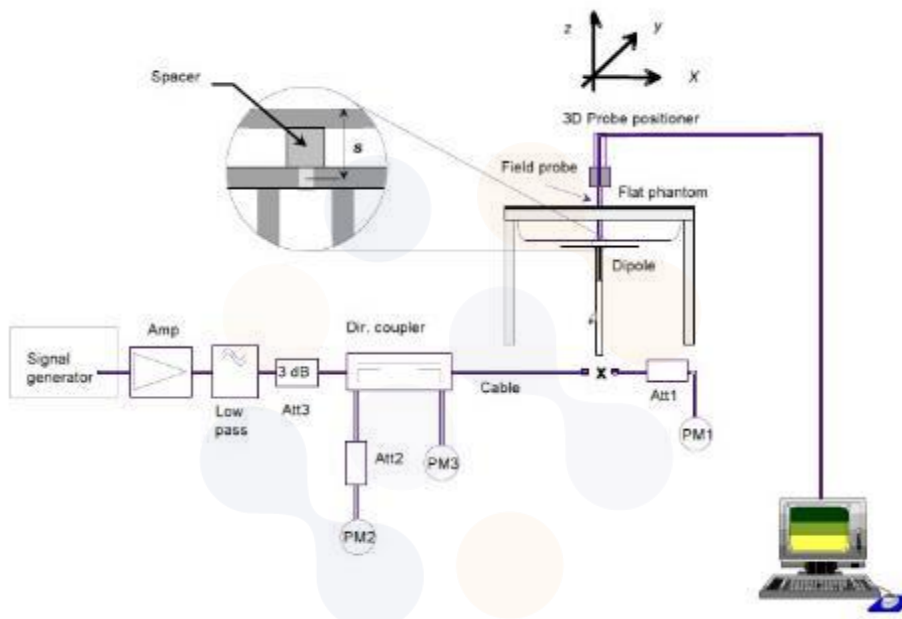
Freq. (MHz)	Limit/Measured		Permittivity ( $\rho$ )	Conductivity ( $\sigma$ )	Temp. ( $^\circ\text{C}$ )
6 500.0	Recommended Limit		$34.50 \pm 5 \%$ (32.78~36.23)	$6.07 \pm 5 \%$ (5.77~6.37)	$22 \pm 2$
	Measured	2023-05-03	33.80	6.13	20.93
	Measured	2023-05-10	33.30	6.14	20.73
6 025.0	Recommended Limit		$35.07 \pm 5 \%$ (33.32~36.82)	$5.51 \pm 5 \%$ (5.23~5.79)	$22 \pm 2$
	Measured	2023-05-03	34.92	5.57	20.93
	Measured	2023-05-10	34.20	5.61	20.73
6 185.0	Recommended Limit		$34.88 \pm 5 \%$ (33.14~36.62)	$5.70 \pm 5 \%$ (5.42~5.99)	$22 \pm 2$
	Measured	2023-05-03	34.55	5.72	20.93
	Measured	2023-05-10	33.90	5.77	20.73
6 345.0	Recommended Limit		$34.69 \pm 5 \%$ (32.96~36.42)	$5.89 \pm 5 \%$ (5.60~6.18)	$22 \pm 2$
	Measured	2023-05-03	34.10	5.92	20.93
	Measured	2023-05-10	33.57	5.96	20.73
6 505.0	Recommended Limit		$34.49 \pm 5 \%$ (32.77~36.21)	$6.08 \pm 5 \%$ (5.78~6.38)	$22 \pm 2$
	Measured	2023-05-03	33.80	6.14	20.93
	Measured	2023-05-10	33.30	6.14	20.73
6 665.0	Recommended Limit		$34.30 \pm 5 \%$ (32.59~36.02)	$6.26 \pm 5 \%$ (5.95~6.57)	$22 \pm 2$
	Measured	2023-05-03	33.55	6.37	20.93
	Measured	2023-05-10	33.00	6.31	20.73
6 825.0	Recommended Limit		$34.11 \pm 5 \%$ (32.40~35.82)	$6.45 \pm 5 \%$ (6.13~6.77)	$22 \pm 2$
	Measured	2023-05-03	33.40	6.57	20.93
	Measured	2023-05-10	32.77	6.49	20.73
6 985.0	Recommended Limit		$33.92 \pm 5 \%$ (32.22~35.62)	$6.63 \pm 5 \%$ (6.30~6.96)	$22 \pm 2$
	Measured	2023-05-03	33.20	6.74	20.93
	Measured	2023-05-10	32.50	6.67	20.73

<Table 1. Measurement result of Tissue electric parameters>



### 6.3 Test System Verification

The microwave circuit arrangement for system verification is sketched below picture. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within  $\pm 10\%$  from the target SAR values. The tests were conducted on the same days as the measurement of the EUT. The obtained results from the system accuracy verification are displayed in the Table 2. During the tests, the ambient temperature of the laboratory was in the range  $(22 \pm 2) ^\circ\text{C}$ , the relative humidity was in the range  $(50 \pm 20)\%$  and the liquid depth Above the ear/grid reference points was above 15 cm in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.



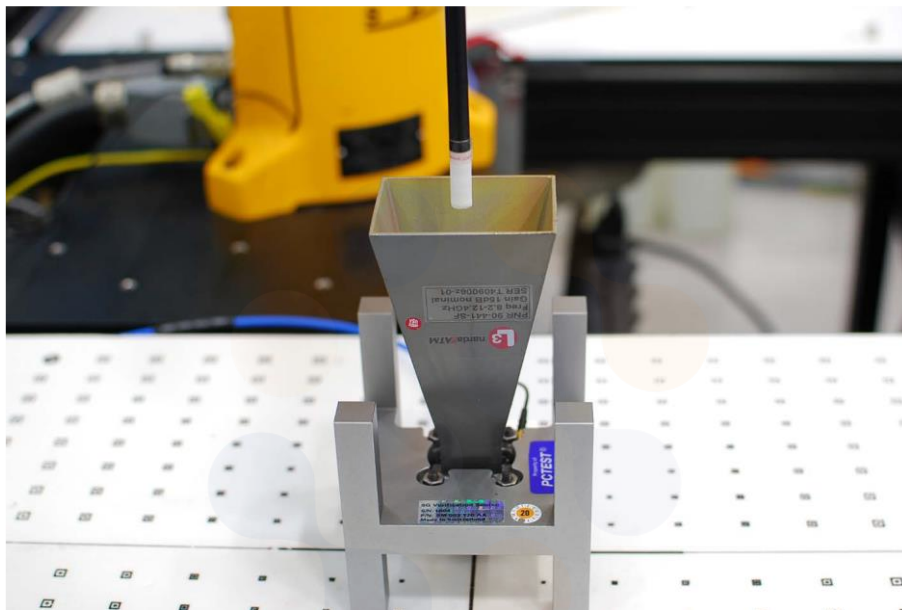
Verification Kit	Probe S/N	Frequency (MHz)	Tissue Type	Input Power (mW)	Limit/Measured (Normalized to 1 W)	
					Measured	Limit
D6.5GHzV2 SN: 1089	EX3DV4 SN: 7541	6 500.0	HSL	100	Measured	293.00 $\pm$ 10 % (263.70~322.30)
					2023-05-03	301.00
					2023-05-10	304.00

<Table 2. System Verification Result>

## 6.4 Power Density Test System Verification

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.



[Figure 3. System Verification Setup Photo]

Source (S/N)	Probe (S/N)	Frequency (GHz)	Date	Prad (mW)	Total 4 cm <sup>2</sup> psPD (W/m <sup>2</sup> )		Deviation (dB)	Limit (dB)
					Target	Measured		
1023	9489	10	2023-05-06	86.1	55.7	54.0	-0.14	$\pm 0.66$
1023	9489	10	2023-05-08	86.1	55.7	59.6	0.29	$\pm 0.66$
1023	9489	10	2023-05-11	86.1	55.7	57.0	0.10	$\pm 0.66$
1023	9489	10	2023-05-12	86.1	55.7	58.0	0.17	$\pm 0.66$

### Notes

- 1) 10 mm distance spacing was used from the reference horn antenna aperture to the probe element.
- 2) According to IEC TR 63170, the power density measurement results should be normalized to the delivered input power to an input power level of 0 dBm and compared to the appropriate target values of the calibrated reference sources.

## 7. SAR Test Results

### 7.1 Standalone Body SAR and Absorbed Power Density Test Results (Notebook Mode)

U-NII-5												
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Estimated APD (W/m <sup>2</sup> )	Plot No.
											4cm <sup>2</sup>	
802.11ax (160-SU)	MIMO	Rear	0	6 345.0	11.17	12.00	1.211	1.166	0.135	<b>0.191</b>	0.85	1
		Rear	0	6 185.0	10.95	12.00	1.274	1.166	0.088	0.131	0.53	

U-NII-6												
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Estimated APD (W/m <sup>2</sup> )	Plot No.
											4cm <sup>2</sup>	
802.11ax (160-SU)	MIMO	Rear	0	6 505.0	10.68	12.00	1.355	1.166	0.130	<b>0.205</b>	0.77	2

U-NII-7												
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Estimated APD (W/m <sup>2</sup> )	Plot No.
											4cm <sup>2</sup>	
802.11ax (160-SU)	MIMO	Rear	0	6 825.0	11.44	12.00	1.138	1.166	0.079	<b>0.105</b>	0.53	3

U-NII-8												
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Estimated APD (W/m <sup>2</sup> )	Plot No.
											4cm <sup>2</sup>	
802.11ax (160-SU)	MIMO	Rear	0	6 985.0	11.69	12.00	1.074	1.166	0.090	<b>0.113</b>	0.63	4

## 7.2 Standalone Body SAR and Absorbed Power Density Test Results (Tablet Mode)

U-NII-5												
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Estimated APD (W/m <sup>2</sup> )	Plot No.
											4cm <sup>2</sup>	
802.11ax (160-SU)	MIMO	Grip Sensor off										
		Rear	7	6 345.0	11.17	12.00	1.211	1.166	0.161	0.227	1.16	
		Rear	7	6 185.0	10.95	12.00	1.274	1.166	0.148	0.220	1.13	
		Bottom	7	6 345.0	11.17	12.00	1.211	1.166	0.119	0.168	0.82	
		Bottom	7	6 185.0	10.95	12.00	1.274	1.166	0.104	0.154	0.75	
		Grip Sensor on										
		Rear	0	6 345.0	9.27	11.00	1.489	1.166	0.340	0.590	2.02	
		Rear	0	6 185.0	9.23	11.00	1.503	1.166	0.455	<b>0.797</b>	2.65	5
		Bottom	0	6 345.0	9.27	11.00	1.489	1.166	0.138	0.240	0.86	
Bottom	0	6 185.0	9.23	11.00	1.503	1.166	0.158	0.277	0.99			

U-NII-6												
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Estimated APD (W/m <sup>2</sup> )	Plot No.
											4cm <sup>2</sup>	
802.11ax (160-SU)	MIMO	Grip Sensor off										
		Rear	7	6 505.0	10.68	12.00	1.355	1.166	0.195	0.308	1.40	
		Bottom	7	6 505.0	10.68	12.00	1.355	1.166	0.111	0.175	0.80	
		Grip Sensor on										
		Rear	0	6 505.0	8.75	10.00	1.334	1.166	0.492	<b>0.765</b>	2.91	6
		Bottom	0	6 505.0	8.75	10.00	1.334	1.166	0.105	0.163	0.70	

U-NII-7												
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Estimated APD (W/m <sup>2</sup> )	Plot No.
											4cm <sup>2</sup>	
802.11ax (160-SU)	MIMO	Grip Sensor off										
		Rear	7	6 825.0	11.44	12.00	1.138	1.166	0.206	0.273	1.49	
		Bottom	7	6 825.0	11.44	12.00	1.138	1.166	0.104	0.138	0.75	
		Grip Sensor on										
		Rear	0	6 825.0	9.74	10.00	1.062	1.166	0.690	0.854	4.03	
		Rear	0	6 665.0	8.91	10.00	1.285	1.166	0.591	<b>0.886</b>	3.46	7
		Bottom	0	6 825.0	9.74	10.00	1.062	1.166	0.132	0.163	0.90	

U-NII-8												
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Estimated APD (W/m <sup>2</sup> )	Plot No.
											4cm <sup>2</sup>	
802.11ax (160-SU)	MIMO	Grip Sensor off										
		Rear	7	6 985.0	11.69	12.00	1.074	1.166	0.173	0.217	1.23	
		Bottom	7	6 985.0	11.69	12.00	1.074	1.166	0.082	0.103	0.60	
		Grip Sensor on										
		Rear	0	6 985.0	9.12	10.00	1.225	1.166	0.610	<b>0.871</b>	3.38	8
		Bottom	0	6 985.0	9.12	10.00	1.225	1.166	0.130	0.186	0.86	

**General Notes:**

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2013, and FCC KDB Publication 447498 D04v01.
2. Batteries are fully charged at the beginning of the SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D04v01.
5. Per FCC guidance, SAR was performed using 6.5 GHz SAR probe calibration factors. Per October 2020 TCB Workshop notes, 5 channels were tested. Absorbed power density (APD) using a 4cm<sup>2</sup> averaging area is reported based on SAR measurements.
6. All modes of operation were investigated, and worst-case results are reported.
7. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.

**WLAN Notes:**

1. When the maximum reported 1g averaged SAR is ≤0.8 W/kg, SAR testing on additional channels was not required. Otherwise, SAR for the next highest output power channel was required until the reported SAR result was ≤ 1.20 W/kg for 1g evaluations or all test channels were measured.
2. The device was configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools. The reported SAR was scaled to the 100% transmission duty factor to determine compliance.
3. 6-7GHz transmission was verified using a spectrum analyzer.

## 8. Power Density Test Results

### 8.1 Standalone Body Power Density Test Results (Notebook Mode)

U-NII-5											
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	iPD	Grid Step (λ)	Measurement Uncertainty	Measured Total psPD (mW/cm <sup>2</sup> )	Scaled Total psPD (mW/cm <sup>2</sup> )	Plot No.
									4cm <sup>2</sup>	4cm <sup>2</sup>	
802.11ax (160-SU)	MIMO	Rear	2	6 345.0	12.00	-	0.0625	1.462	0.03	<b>0.05</b>	9
		Rear	2	6 185.0	12.00	-	0.0625	1.462	0.03	0.04	

U-NII-6											
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	iPD	Grid Step (λ)	Measurement Uncertainty	Measured Total psPD (mW/cm <sup>2</sup> )	Scaled Total psPD (mW/cm <sup>2</sup> )	Plot No.
									4cm <sup>2</sup>	4cm <sup>2</sup>	
802.11ax (160-SU)	MIMO	Rear	2	6 505.0	12.00	-	0.0625	1.462	0.03	<b>0.05</b>	10

U-NII-7											
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	iPD	Grid Step (λ)	Measurement Uncertainty	Measured Total psPD (mW/cm <sup>2</sup> )	Scaled Total psPD (mW/cm <sup>2</sup> )	Plot No.
									4cm <sup>2</sup>	4cm <sup>2</sup>	
802.11ax (160-SU)	MIMO	Rear	2	6 825.0	12.00	-	0.0625	1.462	0.03	<b>0.05</b>	11

U-NII-8											
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	iPD	Grid Step (λ)	Measurement Uncertainty	Measured Total psPD (mW/cm <sup>2</sup> )	Scaled Total psPD (mW/cm <sup>2</sup> )	Plot No.
									4cm <sup>2</sup>	4cm <sup>2</sup>	
802.11ax (160-SU)	MIMO	Rear	2	6 985.0	12.00	0.680	0.0625	1.462	0.05	<b>0.07</b>	12
		Rear	8.59	6 985.0	12.00	0.780	0.0625	1.462	0.01	0.02	



## 8.2 Standalone Body Power Density Test Results (Tablet Mode)

U-NII-5											
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	iPD	Grid Step (λ)	Measurement Uncertainty	Measured Total psPD (mW/cm <sup>2</sup> )	Scaled Total psPD (mW/cm <sup>2</sup> )	Plot No.
									4cm <sup>2</sup>	4cm <sup>2</sup>	
802.11ax (160-SU)	MIMO	Rear	2	6 185.0	11.00	1.66	0.0625	1.462	0.21	<b>0.30</b>	13
		Rear	9.7	6 185.0	11.00	1.71	0.0625	1.462	0.15	0.22	
		Rear	2	6 345.0	11.00	-	0.0625	1.462	0.17	0.25	

U-NII-6											
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	iPD	Grid Step (λ)	Measurement Uncertainty	Measured Total psPD (mW/cm <sup>2</sup> )	Scaled Total psPD (mW/cm <sup>2</sup> )	Plot No.
									4cm <sup>2</sup>	4cm <sup>2</sup>	
802.11ax (160-SU)	MIMO	Rear	2	6 505.0	10.00	-	0.0625	1.462	0.15	<b>0.22</b>	14

U-NII-7											
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	iPD	Grid Step (λ)	Measurement Uncertainty	Measured Total psPD (mW/cm <sup>2</sup> )	Scaled Total psPD (mW/cm <sup>2</sup> )	Plot No.
									4cm <sup>2</sup>	4cm <sup>2</sup>	
802.11ax (160-SU)	MIMO	Rear	2	6 665.0	10.00	-	0.0625	1.462	0.15	<b>0.22</b>	15

U-NII-8											
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	iPD	Grid Step (λ)	Measurement Uncertainty	Measured Total psPD (mW/cm <sup>2</sup> )	Scaled Total psPD (mW/cm <sup>2</sup> )	Plot No.
									4cm <sup>2</sup>	4cm <sup>2</sup>	
802.11ax (160-SU)	MIMO	Rear	2	6 985.0	10.00	-	0.0625	1.462	0.13	<b>0.18</b>	16

<p><b>Eurofins KCTL Co.,Ltd.</b> 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea TEL: 82-70-5008-1021 FAX: 82-505-299-8311 <a href="http://www.kctl.co.kr">www.kctl.co.kr</a></p>	<p>Report No.: KR22-SPF0028-C Page (24) of (125)</p>	<p>   </p>
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**Power Density General Notes:**

1. Batteries are fully charged at the beginning of the measurements.
2. Power density was calculated by repeated E-field measurements on two measurement planes separated by  $\lambda/4$ .
3. The device was configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools.
4. Per FCC guidance and equipment manufacturer guidance, power density results were scaled according to IEC 62479:2010 for the portion of the measurement uncertainty > 30%. Total expanded uncertainty of 2.46 dB (76.198%) was used to determine the psPD measurement scaling factor.
5. Per equipment manufacturer guidance, power density was measured at  $d=2\text{mm}$  and  $d=\lambda/5\text{mm}$  using the same grid size and grid step size for some frequencies and surfaces. The integrated Power Density (iPD) was calculated based on these measurements. Since iPD ratio between the two distances is < 1dB, the grid step was sufficient for determining compliance at  $d=2\text{mm}$ .





## 9. Simultaneous Transmission

### 9.1 #Simultaneous Transmission Configurations

No.	Scenario	Operation
1	WLAN 6 GHz MIMO + Bluetooth Aux	Yes



### 9.2 Simultaneous Transmission SAR Test Exemption with Respect to Multiple Exemption Criteria

Total exposure ratio calculated by taking ratio of reported SAR divided by SAR limit and adding it to measured power density by power density limit. Numerical sum of the two ratios should be less than 1.

Exposure Condition	WLAN 6 GHz PD 4cm <sup>2</sup> (mW/cm <sup>2</sup> )	Bluetooth 1g SAR (W/kg)	TER (PD + SAR)
Limit	1.0	1.6	0.68
Highest Reported	0.30	0.611	
<b>Ratio calculated</b>	<b>0.30</b>	<b>0.38</b>	

#### Notes

1. If the sum of ratios of all simultaneously transmitting antennas in an operating mode, as well as the total exposure ratio calculated, is equal to or less than 1.0, additional test is not required.
2. Refer to the sec 11. Simultaneous Transmission of Report No: KR23-SPF0027 SAR report for the value.

<p><b>Eurofins KCTL Co.,Ltd.</b> 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea TEL: 82-70-5008-1021 FAX: 82-505-299-8311 <a href="http://www.kctl.co.kr">www.kctl.co.kr</a></p>	<p>Report No.: KR22-SPF0028-C Page (26) of (125)</p>	<p>   </p>
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## 10. SAR Measurement Variability

Per FCC KDB Publication 865664 D01v01r04, SAR measurement variability was assessed for each frequency band, which was determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media were required for SAR measurements in a frequency band, the variability measurement procedures were applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. These additional measurements were repeated after the completion of all measurements requiring the same head or body tissue equivalent medium in a frequency band. The test device was returned to ambient conditions (normal room temperature) with the battery fully charged before it was re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

SAR Measurement Variability was assessed using the following procedures for each frequency band:

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

## 11. Measurement Uncertainty

### 11.1 SAR Measurement Uncertainty

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



## 11.2 Power Density Measurement Uncertainty

Source f uncertainty	Uncertainty Value (± dB)	Probability distribution	Div.	c <sub>i</sub>	Standard Uncertainty (± dB)	v <sub>i</sub>
<b>Measurement system</b>						
Calibration	0.49	N	1.00	1.00	0.49	∞
Probe correction	0.00	R	1.73	1.00	0.00	∞
Frequency response (BW ≤ 1 GHz)	0.20	R	1.73	1.00	0.12	∞
Sensor cross coupling	0.00	R	1.73	1.00	0.00	∞
Isotropy	0.50	R	1.73	1.00	0.29	∞
Linearity	0.20	R	1.73	1.00	0.12	∞
Probe scattering	0.00	R	1.73	1.00	0.00	∞
Probe positioning offset	0.30	R	1.73	1.00	0.17	∞
Probe positioning repeatability	0.04	R	1.73	1.00	0.02	∞
Sensor mechanical offset	0.00	R	1.73	1.00	0.00	∞
Probe spatial resolution	0.00	R	1.73	1.00	0.00	∞
Field impedance dependence	0.00	R	1.73	1.00	0.00	∞
Amplitude and phase drift	0.00	R	1.73	1.00	0.00	∞
Amplitude and phase noise	0.04	R	1.73	1.00	0.02	∞
Measurement area truncation	0.00	R	1.73	1.00	0.00	∞
Data acquisition	0.03	N	1.00	1.00	0.03	∞
Sampling	0.00	R	1.73	1.00	0.00	∞
Field reconstruction	1.77	R	1.73	1.00	1.02	∞
Forward transformation	0.00	R	1.73	1.00	0.00	∞
Power density scaling	-	R	1.73	1.00	-	∞
Spatial averaging	0.10	R	1.73	1.00	0.06	∞
System detection limit	0.04	R	1.73	1.00	0.02	∞
<b>DUT and environmental factors</b>						
Probe coupling with DUT	0.00	R	1.73	1.00	0.00	∞
Modulation response	0.40	R	1.73	1.00	0.23	∞
Integration time	0.00	R	1.73	1.00	0.00	∞
Response time	0.00	R	1.73	1.00	0.00	∞
Device holder influence	0.10	R	1.73	1.00	0.06	∞
DUT alignment	0.00	R	1.73	1.00	0.00	∞
RF ambient conditions	0.04	R	1.73	1.00	0.02	∞
Ambient reflections	0.04	R	1.73	1.00	0.02	∞
Immunity / secondary reception	0.00	R	1.73	1.00	0.00	∞
Drift of the DUT	0.22	R	1.73	1.00	0.13	∞
Combined standard uncertainty	RSS				1.23	
Expanded uncertainty (95 % confidence interval)	k = 2				2.46	

## 12. Test Equipment Information

Test Platform	SPEAG DASY5 System SPEAG DASY6 System			
Version	DASY52: 52.10.4.1535 / SEMCAD: 14.6.14 (7501) DASY6: 16.0.2.136 / DASY6 mmWave: 3.0.0.841			
Location	Eurofins KCTL Co.,Ltd., 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, Korea			
Manufacture	SPEAG			
Hardware Reference				
Equipment	Model	Serial Number	Date of Calibration	Due date of next Calibration
Shield Room	-	8F - 4	-	-
DASY6 Robot	TX60 Lspeag	F/19/0007289/A/001	-	-
Phantom	2mm Oval Phantom ELI5	2098	-	-
Phantom	mmWave Phantom	1062	-	-
Mounting Device	Laptop Holder	-	-	-
mmWave Device Holder	mmWave Device Holder	1116	-	-
DAE	DAE4	1759	2022-11-07	2023-11-07
Probe	EX3DV4	7541	2022-07-22	2023-07-22
Isotropic E-Field Probe	EUmmWV4	9489	2022-05-25	2023-05-25
MXA SIGNAL ANALYZER	N9020A	MY520900024	2022-11-22	2023-11-22
Dual Power Meter	E4419B	GB40202503	2022-11-21	2023-11-21
Power Sensor	E9301A	US39210857	2022-11-21	2023-11-21
Power Sensor	E9301A	US39212236	2022-11-21	2023-11-21
Attenuator	PE7005-10	2228-4	2022-12-15	2023-12-15
Attenuator	PE7005-10	2228-5	2022-12-15	2023-12-15
Attenuator	PE7005-10	2228-6	2022-12-15	2023-12-15
Dual Directional Coupler	772D	2839A00719	2023-02-09	2024-02-09
Low Pass Filter	PE87FL1016	1928	2022-11-04	2023-11-04
Low Pass Filter	PE87FL1017	2134	2023-01-04	2024-01-04
Dipole Validation Kits	D6.5GHzV2	1089	2022-11-01	2024-11-01
System Verification Device	5G Verification Source 10 GHz	1023	2023-01-20	2024-01-20
ENA Series Network Analyzer	E5071B	MY42403524	2023-02-09	2024-02-09
Dielectric Assessment Kit	DAK-3.5	1078	2022-05-30	2023-05-30
Humidity/Temp	MHB-382SD	46301	2023-02-14	2024-02-14
MXA SIGNAL ANALYZER	N9020A	MY520900024	2022-11-22	2023-11-22

### 13. SAR Test System Verification Results and Test Results

Eurofins KCTL Co.,Ltd.

Measurement Report for Dipole D6.5GHzV2, FRONT, Validation band, UID 0 -, Channel 6500 (6500.0MHz)

#### Device under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
Dipole D6.5GHzV2, Speag	16.0 x 6.0 x 300.0	1089	Validation Dipole

#### Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	FRONT, 5.00	Validation band	CW, 0--	6500.0, 6500	5.4	6.13	33.8

#### Hardware Setup

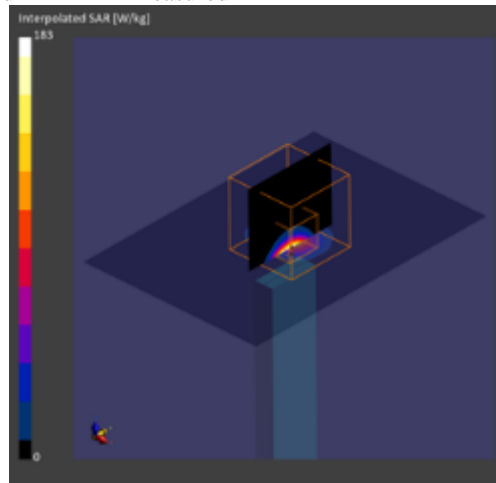
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000 , 2023-May-03	EX3DV4 - SN7541, 2022-07-22	DAE4 Sn1759, 2022-11-07

#### Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	60.0 x 85.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	6.0 x 8.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4
Graded Grid	No	Yes
Grading Ratio	N/A	1.4
MAIA	N/A	N/A
Surface Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

#### Measurement Results

	Area Scan	Zoom Scan
Date	2023-05-03	2023-05-03
psSAR1g [W/kg]	26.8	30.1
psSAR8g [W/kg]	6.43	7.00
psSAR10g [W/kg]	5.33	5.76
psAPD (1.0cm2, sq) [W/m2]		301
psAPD (4.0cm2, sq) [W/m2]		140
Power Drift [dB]		0.04



**Eurofins KCTL Co.,Ltd.**

**Measurement Report for Dipole D6.5GHzV2, FRONT, Validation band, UID 0 -, Channel 6500 (6500.0MHz)**

**Device under Test Properties**

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
Dipole D6.5GHzV2, Speag	16.0 x 6.0 x 300.0	1089	Validation Dipole

**Exposure Conditions**

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	FRONT, 5.00	Validation band	CW, 0--	6500.0, 6500	5.4	6.14	33.3

**Hardware Setup**

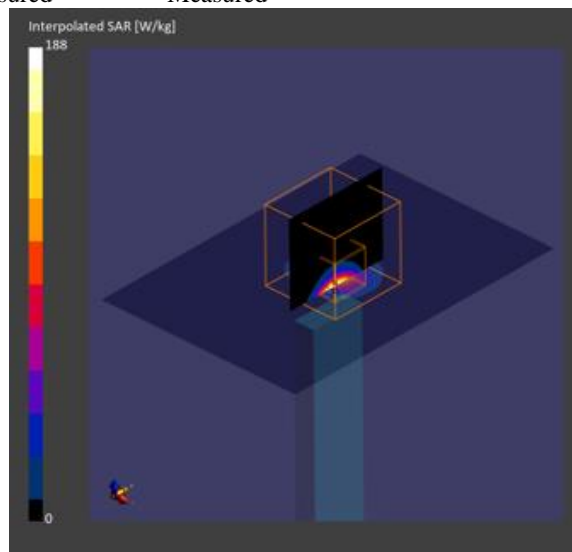
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000 , 2023-May-10	EX3DV4 - SN7541, 2022-07-22	DAE4 Sn1759, 2022-11-07

**Scan Setup**

	Area Scan	Zoom Scan
<b>Grid Extents [mm]</b>	60.0 x 85.0	22.0 x 22.0 x 22.0
<b>Grid Steps [mm]</b>	6.0 x 8.5	3.4 x 3.4 x 1.4
<b>Sensor Surface [mm]</b>	3.0	1.4
<b>Graded Grid</b>	No	Yes
<b>Grading Ratio</b>	N/A	1.4
<b>MAIA</b>	N/A	N/A
<b>Surface Detection</b>	VMS + 6p	VMS + 6p
<b>Scan Method</b>	Measured	Measured

**Measurement Results**

	Area Scan	Zoom Scan
<b>Date</b>	2023-05-10	2023-05-10
<b>psSAR1g [W/kg]</b>	27.2	30.4
<b>psSAR8g [W/kg]</b>	6.47	7.05
<b>psSAR10g [W/kg]</b>	5.36	5.80
<b>psAPD (1.0cm2, sq) [W/m2]</b>		304
<b>psAPD (4.0cm2, sq) [W/m2]</b>		141
<b>Power Drift [dB]</b>		0.05



1)

**Eurofins KCTL Co.,Ltd.**

**Measurement Report for NP935QNA, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 79 (6345.0MHz)**

**Device under Test Properties**

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP935QNA, SAMSUNG	302.0 x 202.0 x 11.0	KQZZ930W300395M	Laptop + MIMO Antenna

**Exposure Conditions**

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	BACK, 0.00	Custom Band	CW, 10755-AAC	6345.0, 79	5.4	5.92	34.1

**Hardware Setup**

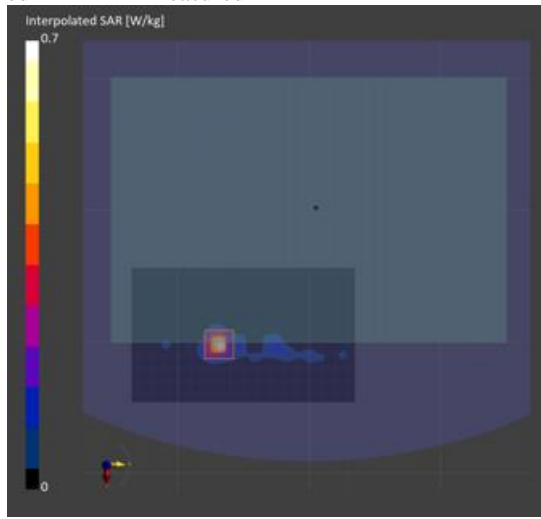
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000 , 2023-May-03	EX3DV4 - SN7541, 2022-07-22	DAE4 Sn1759, 2022-11-07

**Scan Setup**

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 170.0	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
Graded Grid	No	Yes
Grading Ratio	N/A	1.4
MAIA	N/A	N/A
Surface	VMS + 6p	VMS + 6p
Detection		
Scan Method	Measured	Measured

**Measurement Results**

	Area Scan	Zoom Scan
Date	2023-05-03	2023-05-03
psSAR1g [W/kg]	0.113	0.135
psSAR8g [W/kg]	0.036	0.043
psSAR10g [W/kg]	0.031	0.036
psAPD (1.0cm2, sq) [W/m2]		1.35
psAPD (4.0cm2, sq) [W/m2]		0.852
Power Drift [dB]		-0.05





2)

**Eurofins KCTL Co.,Ltd.**

**Measurement Report for NP935QNA, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 111 (6505.0MHz)**

**Device under Test Properties**

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP935QNA, SAMSUNG	302.0 x 202.0 x 11.0	KQZZ930W300395M	Laptop + MIMO Antenna

**Exposure Conditions**

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	BACK, 0.00	Custom Band	CW, 10755-AAC	6505.0, 111	5.4	6.14	33.8

**Hardware Setup**

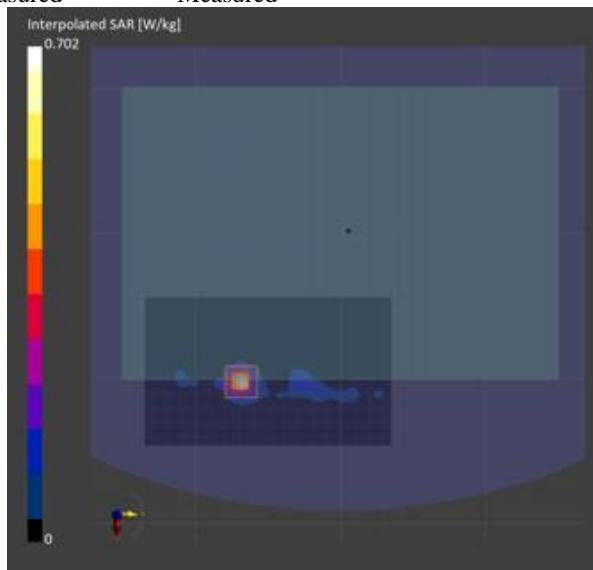
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000 , 2023-May-03	EX3DV4 - SN7541, 2022-07-22	DAE4 Sn1759, 2022-11-07

**Scan Setup**

	Area Scan	Zoom Scan
<b>Grid Extents [mm]</b>	102.0 x 170.0	22.0 x 22.0 x 22.0
<b>Grid Steps [mm]</b>	8.5 x 8.5	3.4 x 3.4 x 1.4
<b>Sensor Surface [mm]</b>	3.0	1.4
<b>Graded Grid</b>	No	Yes
<b>Grading Ratio</b>	N/A	1.4
<b>MAIA</b>	N/A	N/A
<b>Surface</b>	VMS + 6p	VMS + 6p
<b>Detection</b>		
<b>Scan Method</b>	Measured	Measured

**Measurement Results**

	Area Scan	Zoom Scan
<b>Date</b>	2023-05-03	2023-05-03
<b>psSAR1g [W/kg]</b>	0.106	0.130
<b>psSAR8g [W/kg]</b>	0.033	0.038
<b>psSAR10g [W/kg]</b>	0.028	0.032
<b>psAPD (1.0cm2, sq) [W/m2]</b>		1.30
<b>psAPD (4.0cm2, sq) [W/m2]</b>		0.765
<b>Power Drift [dB]</b>		-0.04



3)

**Eurofins KCTL Co.,Ltd.**

**Measurement Report for NP935QNA, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 175 (6825.0MHz)**

**Device under Test Properties**

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP935QNA, SAMSUNG	302.0 x 202.0 x 11.0	KQZZ930W300395M	Laptop + MIMO Antenna

**Exposure Conditions**

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	BACK, 0.00	Custom Band	CW, 10755-AAC	6825.0, 175	5.4	6.57	33.4

**Hardware Setup**

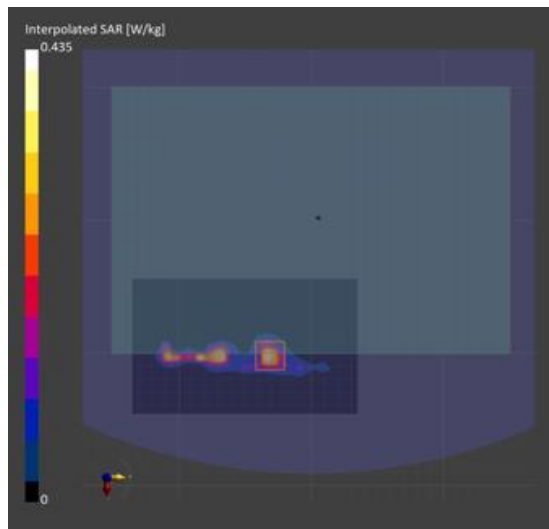
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000 , 2023-May-03	EX3DV4 - SN7541, 2022-07-22	DAE4 Sn1759, 2022-11-07

**Scan Setup**

	Area Scan	Zoom Scan
<b>Grid Extents [mm]</b>	102.0 x 170.0	22.0 x 22.0 x 22.0
<b>Grid Steps [mm]</b>	8.5 x 8.5	3.4 x 3.4 x 1.4
<b>Sensor Surface [mm]</b>	3.0	1.4
<b>Graded Grid</b>	No	Yes
<b>Grading Ratio</b>	N/A	1.4
<b>MAIA</b>	N/A	N/A
<b>Surface</b>	VMS + 6p	VMS + 6p
<b>Detection</b>		
<b>Scan Method</b>	Measured	Measured

**Measurement Results**

	Area Scan	Zoom Scan
<b>Date</b>	2023-05-03	2023-05-03
<b>psSAR1g [W/kg]</b>	0.063	0.079
<b>psSAR8g [W/kg]</b>	0.021	0.026
<b>psSAR10g [W/kg]</b>	0.019	0.023
<b>psAPD (1.0cm2, sq) [W/m2]</b>		0.794
<b>psAPD (4.0cm2, sq) [W/m2]</b>		0.527
<b>Power Drift [dB]</b>		0.13



4)

**Eurofins KCTL Co.,Ltd.**

**Measurement Report for NP935QNA, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 207**

**(6985.0MHz)**

**Device under Test Properties**

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP935QNA, SAMSUNG	302.0 x 202.0 x 11.0	KQZZ930W300395M	Laptop + MIMO Antenna

**Exposure Conditions**

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	BACK, 0.00	Custom Band	CW, 10755-AAC	6985.0, 207	4.67	6.74	33.2

**Hardware Setup**

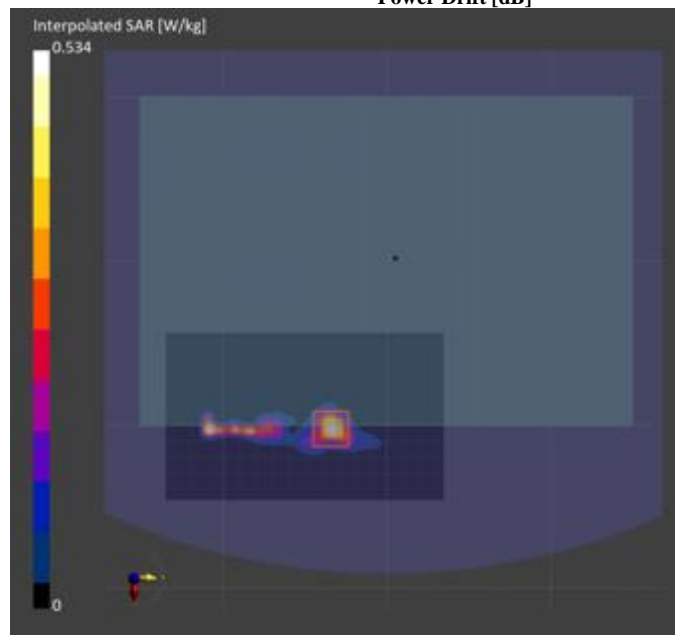
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000 , 2023-May-03	EX3DV4 - SN7541, 2022-07-22	DAE4 Sn1759, 2022-11-07

**Scan Setup**

	Area Scan	Zoom Scan
<b>Grid Extents [mm]</b>	102.0 x 170.0	22.0 x 22.0 x 22.0
<b>Grid Steps [mm]</b>	8.5 x 8.5	3.4 x 3.4 x 1.4
<b>Sensor Surface [mm]</b>	3.0	1.4
<b>Graded Grid</b>	No	Yes
<b>Grading Ratio</b>	N/A	1.4
<b>MAIA</b>	N/A	N/A
<b>Surface Detection</b>	VMS + 6p	VMS + 6p
<b>Scan Method</b>	Measured	Measured

**Measurement Results**

	Area Scan	Zoom Scan
<b>Date</b>	2023-05-03	2023-05-03
<b>psSAR1g [W/kg]</b>	0.073	0.090
<b>psSAR8g [W/kg]</b>	0.026	0.032
<b>psSAR10g [W/kg]</b>	0.023	0.027
<b>psAPD (1.0cm2, sq) [W/m2]</b>		0.905
<b>psAPD (4.0cm2, sq) [W/m2]</b>		0.632
<b>Power Drift [dB]</b>		-0.01



5)

**Eurofins KCTL Co.,Ltd.**

**Measurement Report for NP935QNA, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 47 (6185.0MHz)**

**Device under Test Properties**

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP935QNA, SAMSUNG	302.0 x 202.0 x 11.0	KQZZ930W300395M	Tablet + MIMO Antenna

**Exposure Conditions**

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	BACK, 0.00	Custom Band	CW, 10755-AAC	6185.0, 47	5.4	5.77	33.9

**Hardware Setup**

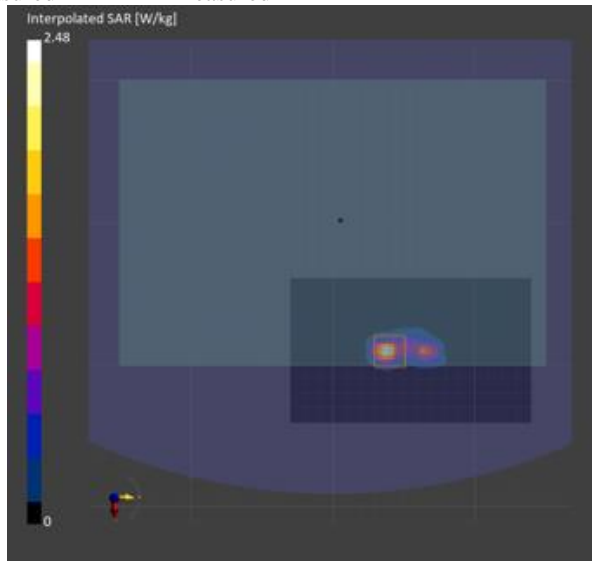
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000 , 2023-May-10	EX3DV4 - SN7541, 2022-07-22	DAE4 Sn1759, 2022-11-07

**Scan Setup**

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 170.0	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
Graded Grid	No	Yes
Grading Ratio	N/A	1.4
MAIA	N/A	N/A
Surface	VMS + 6p	VMS + 6p
Detection		
Scan Method	Measured	Measured

**Measurement Results**

	Area Scan	Zoom Scan
Date	2023-05-10	2023-05-10
psSAR1g [W/kg]	0.376	0.455
psSAR8g [W/kg]	0.114	0.133
psSAR10g [W/kg]	0.099	0.114
psAPD (1.0cm2, sq) [W/m2]		4.55
psAPD (4.0cm2, sq) [W/m2]		2.65
Power Drift [dB]		0.10



6)

**Eurofins KCTL Co.,Ltd.**

**Measurement Report for NP935QNA, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 111 (6505.0MHz)**

**Device under Test Properties**

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP935QNA, SAMSUNG	302.0 x 202.0 x 11.0	KQZZ930W300395M	Tablet + MIMO Antenna

**Exposure Conditions**

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	BACK, 0.00	Custom Band	CW, 10755-AAC	6505.0, 111	5.4	6.14	33.3

**Hardware Setup**

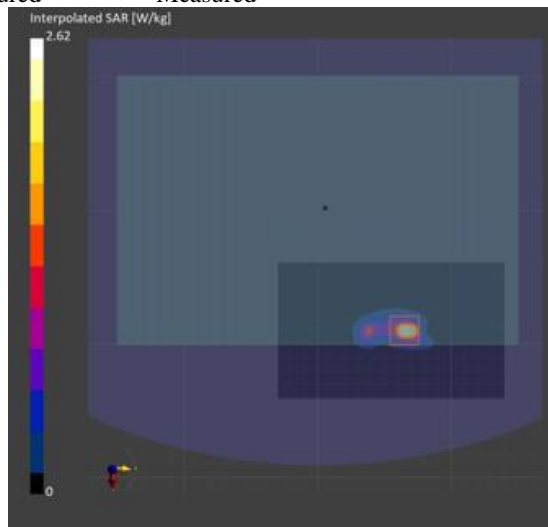
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000 , 2023-May-10	EX3DV4 - SN7541, 2022-07-22	DAE4 Sn1759, 2022-11-07

**Scan Setup**

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 170.0	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
Graded Grid	No	Yes
Grading Ratio	N/A	1.4
MAIA	N/A	N/A
Surface	VMS + 6p	VMS + 6p
Detection		
Scan Method	Measured	Measured

**Measurement Results**

	Area Scan	Zoom Scan
Date	2023-05-10	2023-05-10
psSAR1g [W/kg]	0.415	0.492
psSAR8g [W/kg]	0.131	0.146
psSAR10g [W/kg]	0.113	0.124
psAPD (1.0cm2, sq) [W/m2]		4.92
psAPD (4.0cm2, sq) [W/m2]		2.91
Power Drift [dB]		-0.04



7)

**Eurofins KCTL Co.,Ltd.**

**Measurement Report for NP935QNA, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 143 (6665.0MHz)**

**Device under Test Properties**

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP935QNA, SAMSUNG	302.0 x 202.0 x 11.0	KQZZ930W300395M	Tablet + MIMO Antenna

**Exposure Conditions**

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	BACK, 0.00	Custom Band	CW, 10755-AAC	6665.0, 143	5.4	6.31	33.0

**Hardware Setup**

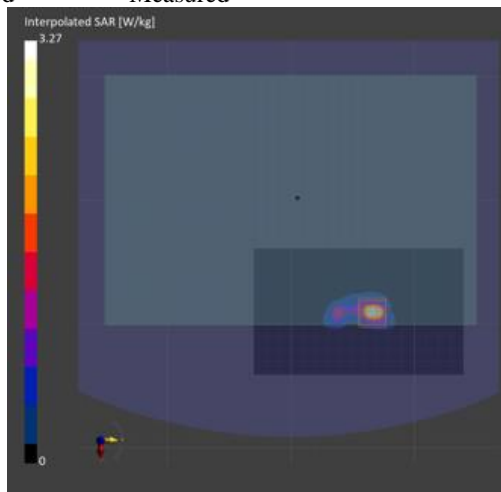
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000 , 2023-May-10	EX3DV4 - SN7541, 2022-07-22	DAE4 Sn1759, 2022-11-07

**Scan Setup**

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 170.0	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
Graded Grid	No	Yes
Grading Ratio	N/A	1.4
MAIA	N/A	N/A
Surface	VMS + 6p	VMS + 6p
Detection		
Scan Method	Measured	Measured

**Measurement Results**

	Area Scan	Zoom Scan
Date	2023-05-10	2023-05-10
psSAR1g [W/kg]	0.484	0.591
psSAR8g [W/kg]	0.151	0.173
psSAR10g [W/kg]	0.130	0.147
psAPD (1.0cm2, sq) [W/m2]		5.91
psAPD (4.0cm2, sq) [W/m2]		3.46
Power Drift [dB]		0.02



8)

KCTL Co.,Ltd.

Measurement Report for NP935QNA, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 207 (6985.0MHz)

**Device under Test Properties**

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP935QNA, SAMSUNG	302.0 x 202.0 x 11.0	KQZZ930W300395M	Tablet + MIMO Antenna

**Exposure Conditions**

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	BACK, 0.00	Custom Band	CW, 10755-AAC	6985.0, 207	4.67	6.67	32.5

**Hardware Setup**

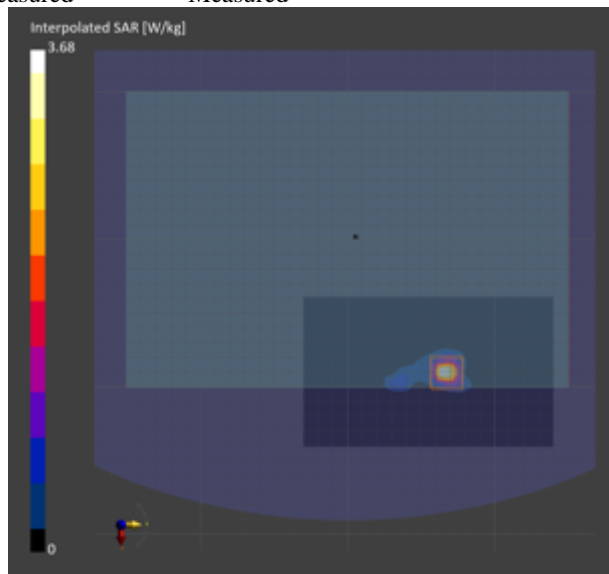
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000 , 2023-May-10	EX3DV4 - SN7541, 2022-07-22	DAE4 Sn1759, 2022-11-07

**Scan Setup**

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 170.0	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
Graded Grid	No	Yes
Grading Ratio	N/A	1.4
MAIA	N/A	N/A
Surface	VMS + 6p	VMS + 6p
Detection		
Scan Method	Measured	Measured

**Measurement Results**

	Area Scan	Zoom Scan
Date	2023-05-10	2023-05-10
psSAR1g [W/kg]	0.501	0.610
psSAR8g [W/kg]	0.152	0.169
psSAR10g [W/kg]	0.130	0.141
psAPD (1.0cm2, sq) [W/m2]		6.10
psAPD (4.0cm2, sq) [W/m2]		3.38
Power Drift [dB]		-0.03



## 14. PD Test System Verification and Test Results

Eurofins KCTL Co.,Ltd.

Measurement Report for 10 GHz Verification Source, FRONT, Validation band, UID 0 -, Channel 10000 (10000.0MHz)

### Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
10 GHz Verification Source, Speag	100.0 x 172.0 x 100.0	1023	Validation Dipole

### Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Frequency [MHz], Channel Number	Conversion Factor
5G	FRONT, 10.00	10000.0, 10000	1.0

### Hardware Setup

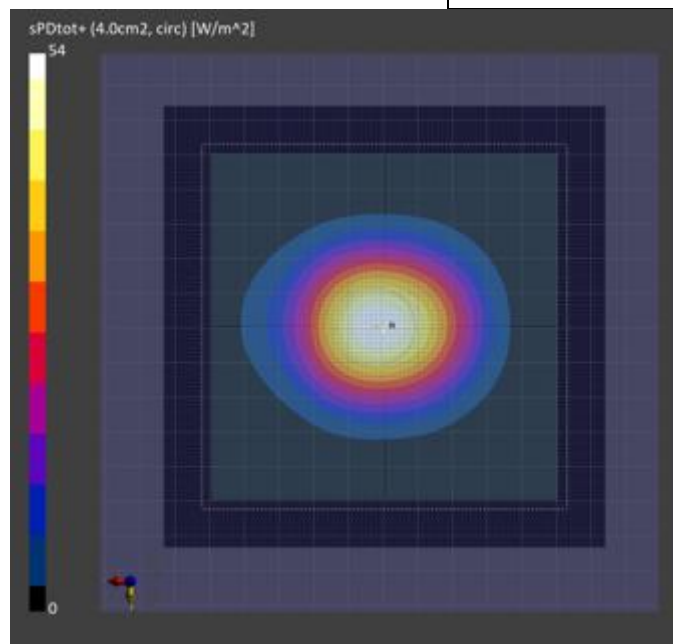
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2022-05-25	DAE4 Sn1759, 2022-11-07

### Scans Setup

#### Measurement Results

Scan Type	5G Scan
Grid Extents [mm]	120.0 x 120.0
Grid Steps [lambda]	0.25 x 0.25
Sensor Surface [mm]	10.0
MAIA	N/A

Scan Type	5G Scan
Date	2023-05-06
Avg. Area [cm <sup>2</sup> ]	4.00
psPDn+ [W/m <sup>2</sup> ]	53.8
psPDtot+ [W/m <sup>2</sup> ]	54.0
E <sub>max</sub> [V/m]	152
Power Drift [dB]	0.16





**Eurofins KCTL Co.,Ltd.**

**Measurement Report for 10 GHz Verification Source, FRONT, Validation band, UID 0 -, Channel 10000 (10000.0MHz)**

**Device Under Test Properties**

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
10 GHz Verification Source, Speag	100.0 x 172.0 x 100.0	1023	Validation Dipole

**Exposure Conditions**

Phantom Section	Position, Test Distance [mm]	Frequency [MHz], Channel Number	Conversion Factor
5G	FRONT, 10.00	10000.0, 10000	1.0

**Hardware Setup**

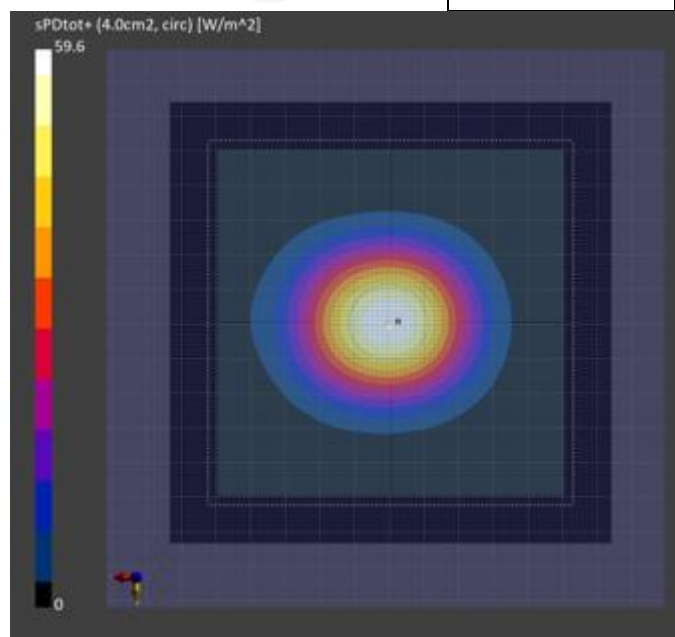
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2022-05-25	DAE4 Sn1759, 2022-11-07

**Scans Setup**

**Measurement Results**

Scan Type	5G Scan
Grid Extents [mm]	120.0 x 120.0
Grid Steps [lambda]	0.25 x 0.25
Sensor Surface [mm]	10.0
MAIA	N/A

Scan Type	5G Scan
Date	2023-05-08
Avg. Area [cm <sup>2</sup> ]	4.00
psPDn+ [W/m <sup>2</sup> ]	59.4
psPDtot+ [W/m <sup>2</sup> ]	59.6
E <sub>max</sub> [V/m]	155
Power Drift [dB]	0.16



**Eurofins KCTL Co.,Ltd.**

**Measurement Report for 10 GHz Verification Source, FRONT, Validation band, UID 0 -, Channel 10000 (10000.0MHz)**

**Device Under Test Properties**

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
10 GHz Verification Source, Speag	100.0 x 172.0 x 100.0	1023	Validation Dipole

**Exposure Conditions**

Phantom Section	Position, Test Distance [mm]	Frequency [MHz], Channel Number	Conversion Factor
5G	FRONT, 10.00	10000.0, 10000	1.0

**Hardware Setup**

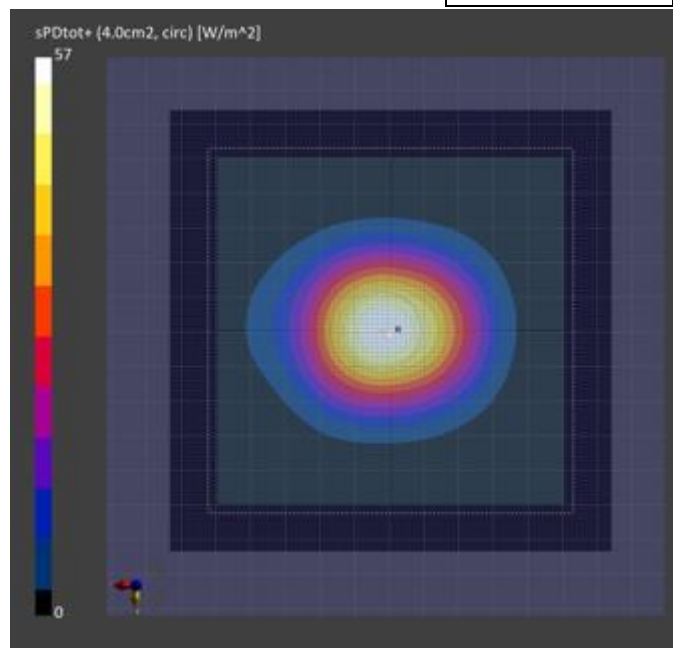
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2022-05-25	DAE4 Sn1759, 2022-11-07

**Scans Setup**

**Measurement Results**

Scan Type	5G Scan
Grid Extents [mm]	120.0 x 120.0
Grid Steps [lambda]	0.25 x 0.25
Sensor Surface [mm]	10.0
MAIA	N/A

Scan Type	5G Scan
Date	2023-05-11
Avg. Area [cm <sup>2</sup> ]	4.00
psPDn+ [W/m <sup>2</sup> ]	56.9
psPDtot+ [W/m <sup>2</sup> ]	57.0
E <sub>max</sub> [V/m]	157
Power Drift [dB]	0.11



**Eurofins KCTL Co.,Ltd.**

**Measurement Report for 10 GHz Verification Source, FRONT, Validation band, UID 0 -, Channel 10000 (10000.0MHz)**

**Device Under Test Properties**

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
10 GHz Verification Source, Speag	100.0 x 172.0 x 100.0	1023	Validation Dipole

**Exposure Conditions**

Phantom Section	Position, Test Distance [mm]	Frequency [MHz], Channel Number	Conversion Factor
5G	FRONT, 10.00	10000.0, 10000	1.0

**Hardware Setup**

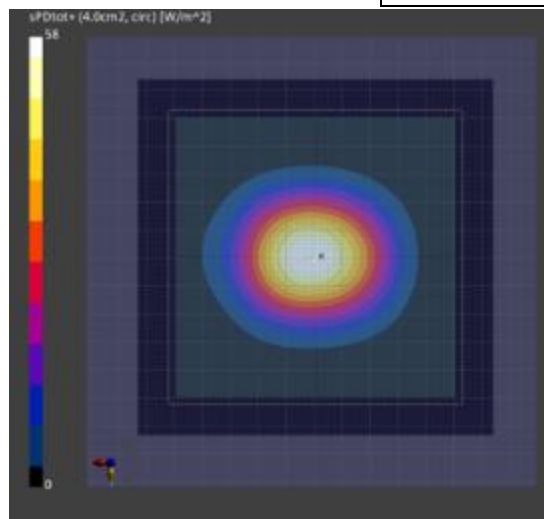
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2022-05-25	DAE4 Sn1759, 2022-11-07

**Scans Setup**

**Measurement Results**

Scan Type	5G Scan
Grid Extents [mm]	120.0 x 120.0
Grid Steps [lambda]	0.25 x 0.25
Sensor Surface [mm]	10.0
MAIA	N/A

Scan Type	5G Scan
Date	2023-05-12
Avg. Area [cm <sup>2</sup> ]	4.00
psPDn+ [W/m <sup>2</sup> ]	57.8
psPDtot+ [W/m <sup>2</sup> ]	58.0
E <sub>max</sub> [V/m]	158
Power Drift [dB]	0.04



9)  
**Eurofins KCTL Co.,Ltd.**

**Measurement Report for NP935QNA, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 79 (6345.0MHz)**

**Device Under Test Properties**

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP935QNA, SAMSUNG	202.0 x 11.0 x 302.0	KQZZ930W300395M	Laptop + MIMO Antenna

**Exposure Conditions**

Phantom Section	Position, Test Distance [mm]	Frequency [MHz], Channel Number	Conversion Factor
5G	BACK, 2.00	6345.0, 79	1.0

**Hardware Setup**

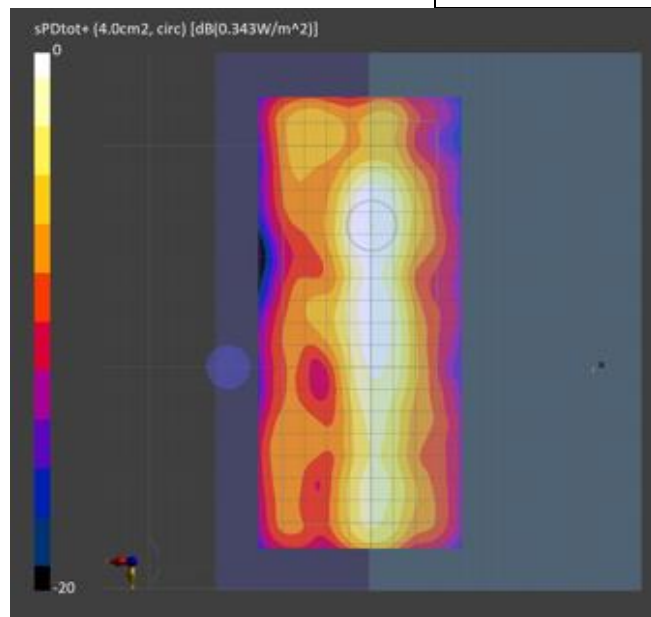
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2022-05-25	DAE4 Sn1759, 2022-11-07

**Scans Setup**

**Measurement Results**

Scan Type	5G Scan
Grid Extents [mm]	90.0 x 200.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0
MAIA	N/A

Scan Type	5G Scan
Date	2023-05-06
Avg. Area [cm <sup>2</sup> ]	4.00
psPDn+ [W/m <sup>2</sup> ]	0.276
psPDtot+ [W/m <sup>2</sup> ]	0.343
E <sub>max</sub> [V/m]	18.3
Power Drift [dB]	0.06



10)  
**Eurofins KCTL Co.,Ltd.**

**Measurement Report for NP935QNA, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 111 (6505.0MHz)**

**Device Under Test Properties**

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP935QNA, SAMSUNG	202.0 x 11.0 x 302.0	KQZZ930W300395M	Laptop + MIMO Antenna

**Exposure Conditions**

Phantom Section	Position, Test Distance [mm]	Frequency [MHz], Channel Number	Conversion Factor
5G	BACK, 2.00	6505.0, 111	1.0

**Hardware Setup**

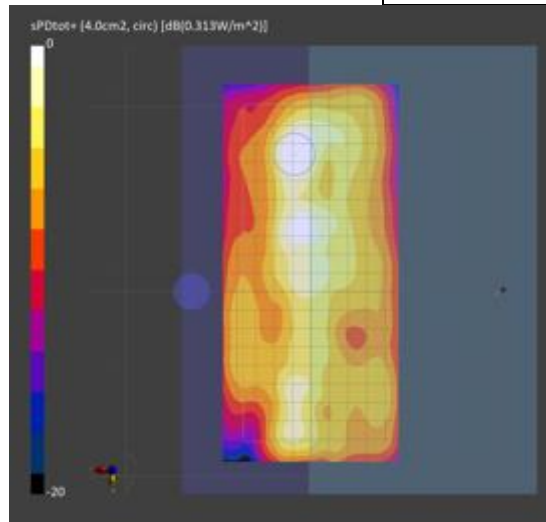
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2022-05-25	DAE4 Sn1759, 2022-11-07

**Scans Setup**

**Measurement Results**

Scan Type	5G Scan
Grid Extents [mm]	90.0 x 200.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0
MAIA	N/A

Scan Type	5G Scan
Date	2023-05-08
Avg. Area [cm <sup>2</sup> ]	4.00
psPDn+ [W/m <sup>2</sup> ]	0.273
psPDtot+ [W/m <sup>2</sup> ]	0.313
E <sub>max</sub> [V/m]	18.0
Power Drift [dB]	0.13



11)  
**Eurofins KCTL Co.,Ltd.**

**Measurement Report for NP935QNA, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 175 (6825.0MHz)**

**Device Under Test Properties**

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP935QNA, SAMSUNG	202.0 x 11.0 x 302.0	KQZZ930W300395M	Laptop + MIMO Antenna

**Exposure Conditions**

Phantom Section	Position, Test Distance [mm]	Frequency [MHz], Channel Number	Conversion Factor
5G	BACK, 2.00	6825.0, 175	1.0

**Hardware Setup**

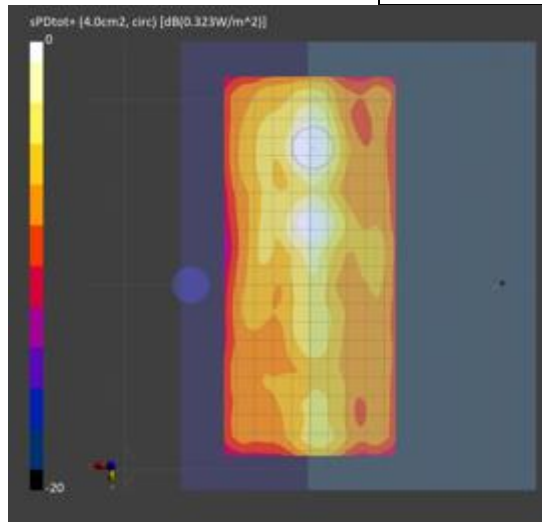
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2022-05-25	DAE4 Sn1759, 2022-11-07

**Scans Setup**

**Measurement Results**

Scan Type	5G Scan
Grid Extents [mm]	90.0 x 200.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0
MAIA	N/A

Scan Type	5G Scan
Date	2023-05-08
Avg. Area [cm <sup>2</sup> ]	4.00
psPDn+ [W/m <sup>2</sup> ]	0.294
psPDtot+ [W/m <sup>2</sup> ]	0.323
E <sub>max</sub> [V/m]	18.5
Power Drift [dB]	0.02



12)  
**Eurofins KCTL Co.,Ltd.**

**Measurement Report for NP935QNA, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 207 (6985.0MHz)**

**Device Under Test Properties**

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP935QNA, SAMSUNG	202.0 x 11.0 x 302.0	KQZZ930W300395M	Laptop + MIMO Antenna

**Exposure Conditions**

Phantom Section	Position, Test Distance [mm]	Frequency [MHz], Channel Number	Conversion Factor
5G	BACK, 2.00	6985.0, 207	1.0

**Hardware Setup**

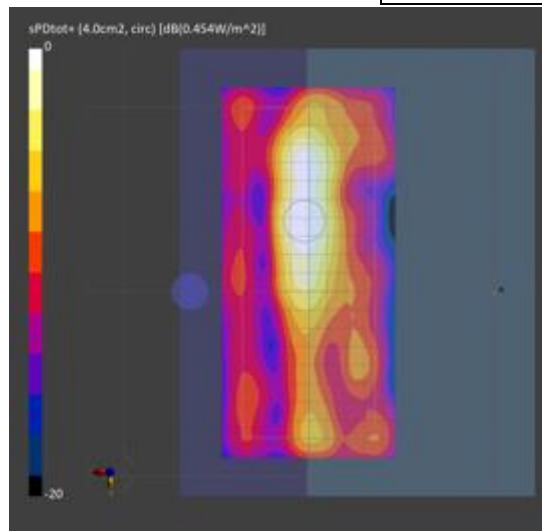
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2022-05-25	DAE4 Sn1759, 2022-11-07

**Scans Setup**

**Measurement Results**

Scan Type	5G Scan
Grid Extents [mm]	90.0 x 200.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0
MAIA	N/A

Scan Type	5G Scan
Date	2023-05-08
Avg. Area [cm <sup>2</sup> ]	4.00
psPDn+ [W/m <sup>2</sup> ]	0.408
psPDtot+ [W/m <sup>2</sup> ]	0.454
E <sub>max</sub> [V/m]	20.2
Power Drift [dB]	0.10



13)  
**Eurofins KCTL Co.,Ltd.**

**Measurement Report for NP935QNA, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 47 (6185.0MHz)**

**Device Under Test Properties**

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP935QNA, SAMSUNG	202.0 x 11.0 x 302.0	KQZZ930W300395M	Tablet + MIMO Antenna

**Exposure Conditions**

Phantom Section	Position, Test Distance [mm]	Frequency [MHz], Channel Number	Conversion Factor
5G	BACK, 2.00	6185.0, 47	1.0

**Hardware Setup**

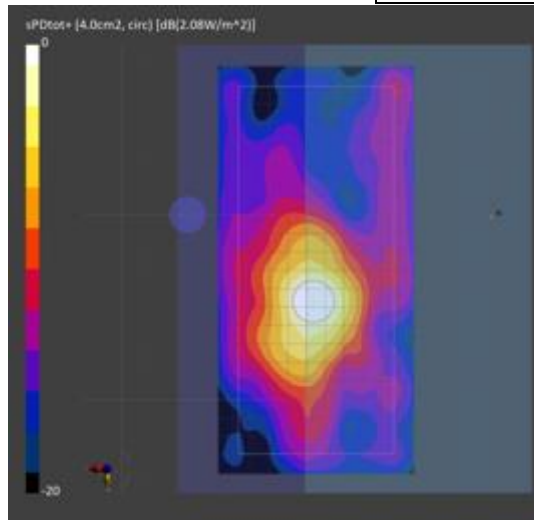
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2022-05-25	DAE4 Sn1759, 2022-11-07

**Scans Setup**

**Measurement Results**

Scan Type	5G Scan
Grid Extents [mm]	100.0 x 220.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0
MAIA	N/A

Scan Type	5G Scan
Date	2023-05-11
Avg. Area [cm <sup>2</sup> ]	4.00
psPDn+ [W/m <sup>2</sup> ]	1.69
psPDtot+ [W/m <sup>2</sup> ]	2.08
E <sub>max</sub> [V/m]	35.9
Power Drift [dB]	-0.13





14)  
**Eurofins KCTL Co.,Ltd.**

**Measurement Report for NP935QNA, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 111 (6505.0MHz)**

**Device Under Test Properties**

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP935QNA, SAMSUNG	202.0 x 11.0 x 302.0	KQZZ930W300395M	Tablet + MIMO Antenna

**Exposure Conditions**

Phantom Section	Position, Test Distance [mm]	Frequency [MHz], Channel Number	Conversion Factor
5G	BACK, 2.00	6505.0, 111	1.0

**Hardware Setup**

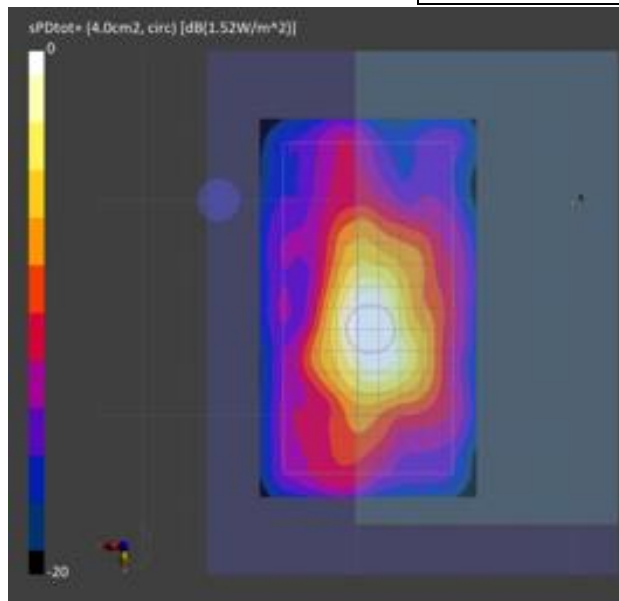
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2022-05-25	DAE4 Sn1759, 2022-11-07

**Scans Setup**

**Measurement Results**

Scan Type	5G Scan
Grid Extents [mm]	100.0 x 170.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0
MAIA	N/A

Scan Type	5G Scan
Date	2023-05-11
Avg. Area [cm <sup>2</sup> ]	4.00
psPDn+ [W/m <sup>2</sup> ]	1.34
psPDtot+ [W/m <sup>2</sup> ]	1.52
E <sub>max</sub> [V/m]	43.3
Power Drift [dB]	-0.09



15)  
**Eurofins KCTL Co.,Ltd.**

**Measurement Report for NP935QNA, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 143 (6665.0MHz)**

**Device Under Test Properties**

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP935QNA, SAMSUNG	202.0 x 11.0 x 302.0	KQZZ930W300395M	Tablet + MIMO Antenna

**Exposure Conditions**

Phantom Section	Position, Test Distance [mm]	Frequency [MHz], Channel Number	Conversion Factor
5G	BACK, 2.00	6665.0, 143	1.0

**Hardware Setup**

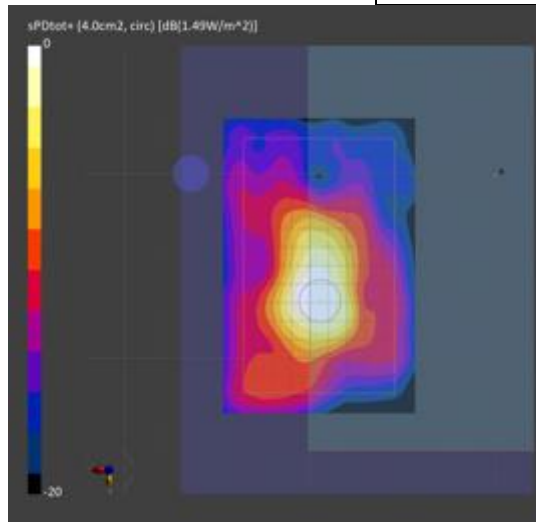
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2022-05-25	DAE4 Sn1759, 2022-11-07

**Scans Setup**

**Measurement Results**

Scan Type	5G Scan
Grid Extents [mm]	100.0 x 160.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0
MAIA	N/A

Scan Type	5G Scan
Date	2023-05-11
Avg. Area [cm <sup>2</sup> ]	4.00
psPDn+ [W/m <sup>2</sup> ]	1.34
psPDtot+ [W/m <sup>2</sup> ]	1.49
E <sub>max</sub> [V/m]	34.5
Power Drift [dB]	0.11



16)  
**Eurofins KCTL Co.,Ltd.**

**Measurement Report for NP935QNA, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 207 (6985.0MHz)**

**Device Under Test Properties**

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP935QNA, SAMSUNG	202.0 x 11.0 x 302.0	KQZZ930W300395M	Tablet + MIMO Antenna

**Exposure Conditions**

Phantom Section	Position, Test Distance [mm]	Frequency [MHz], Channel Number	Conversion Factor
5G	BACK, 2.00	6985.0, 207	1.0

**Hardware Setup**

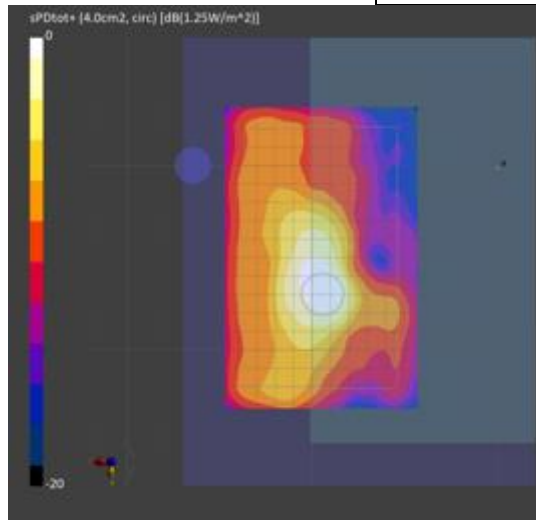
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2022-05-25	DAE4 Sn1759, 2022-11-07

**Scans Setup**

**Measurement Results**

Scan Type	5G Scan
Grid Extents [mm]	100.0 x 160.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0
MAIA	N/A

Scan Type	5G Scan
Date	2023-05-12
Avg. Area [cm <sup>2</sup> ]	4.00
psPDn+ [W/m <sup>2</sup> ]	1.16
psPDtot+ [W/m <sup>2</sup> ]	1.25
E <sub>max</sub> [V/m]	38.3
Power Drift [dB]	0.11



## Appendixes List

<b>Appendix A</b>	A.1 Probe Calibration certificate (EX3DV4_7541) A.2 Probe Calibration certificate (EUmmWV4_9489) A.3 System Calibration certificate (5G Verification Source 10 GHz _1023) A.4 Dipole Calibration certificate (D6.5GHzV2_1089)
<b>Appendix B</b>	SAR Tissue Specification
<b>Appendix C</b>	Power Reduction Verification
<b>Appendix D</b>	#Antenna Location & Distance
<b>Appendix E</b>	EUT Photo
<b>Appendix F</b>	Test Setup Photo

