






TEST REPORT

Eurofins KCTL Co.,Ltd. 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea TEL: 82-70-5008-1021 FAX: 82-505-299-8311 www.kctl.co.kr	Report No.: KR23-SPF0049-A Page (1) of (131)	 KCTL
<p>1. Client</p> <ul style="list-style-type: none"> ◦ Name : Samsung Electronics Co., Ltd. ◦ Address : 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677 Rep. of Korea ◦ Date of Receipt : 2023-10-11 <p>2. Use of Report : Class II Permissive Change</p> <p>3. Name of Product and Model : WLAN and BT, 2X2 PCIe M.2 1216 SD adapter card</p> <ul style="list-style-type: none"> ◦ Model Number : AX211D2W ◦ Manufacturer and Country of Origin : Intel Corporation SAS / FRANCE <p>4. Host Product Name : Notebook PC</p> <ul style="list-style-type: none"> ◦ Host Model Name : NP750QGK ◦ Manufacturer : Samsung Electronics Co., Ltd. <p>5. FCC ID : A3LAX211D</p> <p>6. Date of Test : 2023-11-25 ~ 2023-11-29</p> <p>7. Location of Test : <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>8. Test Standards : IEEE 1528-2013, ANSI/IEEE C95.1, KDB Publication</p> <p>9. Test Results : Refer to the test result in the test report</p>		
Affirmation	Tested by Name : Dongkyu Kim (Signature) 	Technical Manager Name : Jongwon Ma (Signature) 
2024-01-09		
Eurofins KCTL Co.,Ltd.		
As a test result of the sample which was submitted from the client, this report does not guarantee the whole product quality. This test report should not be used and copied without a written agreement by Eurofins KCTL Co.,Ltd.		

REPORT REVISION HISTORY

Date	Revision	Page No
2023-12-04	Originally issued	-
2024-01-09	Changed the PD unit	Overall

Note: The Report No. KR23-SPF0049 is superseded by the report No. KR23-SPF0049-A

This report shall not be reproduced except in full, without the written approval of Eurofins KCTL Co.,Ltd. This document may be altered or revised by Eurofins KCTL Co.,Ltd. personnel only, and shall be noted in the revision section of the document. Any alteration of this document not carried out by Eurofins KCTL Co.,Ltd. will constitute fraud and shall nullify the document. This test report is a general report that does not use the KOLAS accreditation mark and is not related to KS Q ISO/IEC 17025 and KOLAS accreditation.

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.

CONTENTS

1.	General information.....	4
2.	Device information.....	5
3.	Specific Absorption Rate	13
4.	SAR Measurement Configurations.....	15
5.	RF Exposure Limits.....	16
6.	RF Average Conducted Output Power.....	17
7.	System Verification	18
8.	SAR Test Results	22
9.	Power Density Test Results	25
10.	Simultaneous Transmission	28
11.	Measurement Uncertainty.....	31
12.	Test Equipment Information	33
13.	SAR Test System Verification Results and Test Results.....	34
14.	PD Test System Verification and Test Results	52
	Appendixes List.....	63
	Appendix A. Calibration certificate	64
	Appendix B. Power Reduction Verification	117
	Appendix C. #Antenna Location & Distance.....	122
	Appendix D. EUT Photo.....	123
	Appendix E. Test Setup Photo.....	127
	End of test report	131

<p>Eurofins KCTL Co.,Ltd. 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea TEL: 82-70-5008-1021 FAX: 82-505-299-8311 www.kctl.co.kr</p>	<p>Report No.: KR23-SPF0049-A Page (4) of (131)</p>	 KCTL
--	--	---

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.
Address : 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
Factory : SAMSUNG ELECTRONICS VIETNAM CO.,LTD.
Address : Khu Cong nghiep Yen Phong 1, Yen Trung, Yen Phong, Bac Ninh, Viet Nam
Laboratory : Eurofins KCTL Co.,Ltd.
Address : 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea
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	WLAN and BT, 2X2 PCIe M.2 1216 SD adapter card	
Product Model Number	AX211D2W	
Product Manufacturer	Intel Corporation SAS	
Host Product Name	Notebook PC	
Host Model Name	NP750QGK	
Host Derivative Model	NP754QGK	
Host Manufacturer	Samsung Electronics Co., Ltd.	
Host Product Serial Number	Radiation	1Q6991ZWA00147D
	Conduction	1Q6991ZWA00018L
Mode of Operation	WLAN 802.11ax	
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	

2.1.1 Differences from Derivative Models

The difference between Main model and Derivative model is as below.

Main model	NP750QGK
Derivative model	NP754QGK
Differences	Maketing and logistic Difference

2.2 Summary of SAR Test Results

Band	Equipment Class	Highest Reported	
		1g SAR (W/kg)	PD 4cm ² (W/m ²)
U-NII-5	6XD	0.58	1.87
U-NII-6	6XD	0.93	3.33
U-NII-7	6XD	0.79	2.16
U-NII-8	6XD	0.71	3.00

2.3 #Antenna information

Antenna Type		PIFA antenna			
Band		UNII-5	UNII-6	UNII-7	UNII-8
Peak gain (dBi)	Main	1.01	2.86	3.97	2.94
	Aux	0.19	4.00	2.85	3.23

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.



2.4.1 #Maximum WLAN Output Power (Notebook Mode)

WLAN only supported Main in Grip sensor.

Band	Ant.	Mode	Channel	Output Power (dBm)			
				Normal		Grip Sensor	
				Target	Max. Allowed	Target	Max. Allowed
U-NII-5	Main	802.11ax SU 20 MHz	All Channel	4.50	5.50	Not supported	
		802.11ax SU 40 MHz	All Channel	7.75	8.75	7.50	8.50
		802.11ax SU 80 MHz	All Channel	10.25	11.25	7.50	8.50
		802.11ax SU 160 MHz	All Channel	12.50	13.50	7.50	8.50
	Aux	802.11ax SU 20 MHz	All Channel	4.50	5.50	Not supported	
		802.11ax SU 40 MHz	All Channel	7.50	8.50		
		802.11ax SU 80 MHz	All Channel	7.50	8.50		
		802.11ax SU 160 MHz	All Channel	7.50	8.50		
	MIMO	802.11ax SU 20 MHz	All Channel	4.50	5.50	Not supported	
		802.11ax SU 40 MHz	All Channel	7.75	8.75		
		802.11ax SU 80 MHz	All Channel	9.50	10.50		
		802.11ax SU 160 MHz	All Channel	11.00	12.00		
U-NII-6	Main	802.11ax SU 20 MHz	All Channel	3.50	4.50	Not supported	
		802.11ax SU 40 MHz	All Channel	7.50	8.50		
		802.11ax SU 80 MHz	All Channel	10.25	11.25	7.50	8.50
		802.11ax SU 160 MHz	All Channel	12.50	13.50	7.50	8.50
	Aux	802.11ax SU 20 MHz	All Channel	3.50	4.50	Not supported	
		802.11ax SU 40 MHz	All Channel	7.50	8.50		
		802.11ax SU 80 MHz	All Channel	7.50	8.50		
		802.11ax SU 160 MHz	All Channel	7.50	8.50		
	MIMO	802.11ax SU 20 MHz	All Channel	4.00	5.00	Not supported	
		802.11ax SU 40 MHz	All Channel	7.75	8.75		
		802.11ax SU 80 MHz	All Channel	9.50	10.50		
		802.11ax SU 160 MHz	All Channel	11.00	12.00		

Band	Ant.	Mode	Channel	Output Power (dBm)			
				Normal		Grip Sensor	
				Target	Max. Allowed	Target	Max. Allowed
U-NII-7	Main	802.11ax SU 20 MHz	All Channel	3.75	4.75	Not supported	
		802.11ax SU 40 MHz	Other ch.	7.00	8.00		
			115	7.50	8.50		
		802.11ax SU 80 MHz	All Channel	9.50	10.50	7.50	8.50
	802.11ax SU 160 MHz	All Channel	12.25	13.25	7.50	8.50	
	Aux	802.11ax SU 20 MHz	All Channel	3.75	4.75	Not supported	
		802.11ax SU 40 MHz	Other ch.	7.00	8.00		
			115	7.50	8.50		
		802.11ax SU 80 MHz	All Channel	7.50	8.50		
	802.11ax SU 160 MHz	All Channel	7.50	8.50			
	MIMO	802.11ax SU 20 MHz	All Channel	3.75	4.75	Not supported	
		802.11ax SU 40 MHz	Other ch.	7.00	8.00		
			115	7.75	8.75		
		802.11ax SU 80 MHz	All Channel	9.00	10.00		
	802.11ax SU 160 MHz	All Channel	10.50	11.50			
	U-NII-8	Main	802.11ax SU 20 MHz	Other ch.	-1.50	-0.50	Not supported
233				2.75	3.75		
802.11ax SU 40 MHz			All Channel	7.00	8.00		
802.11ax SU 80 MHz			All Channel	9.50	10.50	7.50	
802.11ax SU 160 MHz		All Channel	12.25	13.25	7.50	8.50	
Aux		802.11ax SU 20 MHz	Other ch.	-1.50	-0.50	Not supported	
			233	2.75	3.75		
		802.11ax SU 40 MHz	All Channel	7.00	8.00		
		802.11ax SU 80 MHz	All Channel	7.50	8.50		
802.11ax SU 160 MHz		All Channel	7.50	8.50			
MIMO		802.11ax SU 20 MHz	Other ch.	2.00	3.00	Not supported	
			233	-2.00	-1.00		
	802.11ax SU 40 MHz	All Channel	7.00	8.00			
	802.11ax SU 80 MHz	All Channel	9.00	10.00			
802.11ax SU 160 MHz	All Channel	10.50	11.50				

2.4.2 #Maximum WLAN Output Power (Tablet Mode)

Band	Ant.	Mode	Channel	Output Power (dBm)	
				Normal	
				Target	Max. Allowed
U-NII-5	Main, Aux	802.11ax SU 20 MHz	All Channel	4.50	5.50
		802.11ax SU 40 MHz	All Channel	7.75	8.75
		802.11ax SU 80 MHz	All Channel	10.25	11.25
		802.11ax SU 160 MHz	All Channel	12.50	13.50
	MIMO	802.11ax SU 20 MHz	All Channel	4.50	5.50
		802.11ax SU 40 MHz	All Channel	7.75	8.75
		802.11ax SU 80 MHz	All Channel	10.25	11.25
		802.11ax SU 160 MHz	All Channel	13.00	14.00
U-NII-6	Main, Aux	802.11ax SU 20 MHz	All Channel	3.50	4.50
		802.11ax SU 40 MHz	All Channel	7.50	8.50
		802.11ax SU 80 MHz	All Channel	10.25	11.25
		802.11ax SU 160 MHz	All Channel	12.50	13.50
	MIMO	802.11ax SU 20 MHz	All Channel	4.00	5.00
		802.11ax SU 40 MHz	All Channel	7.75	8.75
		802.11ax SU 80 MHz	All Channel	10.25	11.25
		802.11ax SU 160 MHz	All Channel	13.00	14.00
U-NII-7	Main, Aux	802.11ax SU 20 MHz	All Channel	3.75	4.75
		802.11ax SU 40 MHz	Other ch.	7.00	8.00
			115	7.50	8.50
		802.11ax SU 80 MHz	All Channel	9.50	10.50
	802.11ax SU 160 MHz	All Channel	12.25	13.25	
	MIMO	802.11ax SU 20 MHz	All Channel	3.75	4.75
		802.11ax SU 40 MHz	Other ch.	7.00	8.00
			115	7.75	8.75
802.11ax SU 80 MHz		All Channel	9.50	10.50	
802.11ax SU 160 MHz	All Channel	12.25	13.25		
U-NII-8	Main, Aux	802.11ax SU 20 MHz	Other ch.	-1.50	-0.50
			233	2.75	3.75
		802.11ax SU 40 MHz	All Channel	7.00	8.00
		802.11ax SU 80 MHz	All Channel	9.50	10.50
	802.11ax SU 160 MHz	All Channel	12.25	13.25	
	MIMO	802.11ax SU 20 MHz	Other ch.	2.00	3.00
			233	-2.00	-1.00
		802.11ax SU 40 MHz	All Channel	7.00	8.00
802.11ax SU 80 MHz		All Channel	9.50	10.50	
802.11ax SU 160 MHz	All Channel	12.25	13.25		

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 C.

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 ²
1.34	–	30	35.6 m	–	1.6 m	3,450 R ² /f ²
30	–	300	1.6 m	–	159 mm	3.83 R ²
300	–	1,500	159 mm	–	31.8 mm	0.0128 R ² f
1,500	–	100,000	31.8 mm	–	0.5 mm	19.2R ²



Subscripts L and H are low and high; λ is wavelength.
From § 1.1307(b)(3)(i)(C), modified by adding Minimum Distance columns.

[Tablet Mode]

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	13.50	22	17	5	5	330	82	113	Measure	Measure	2091 EXEMPT	129 EXEMPT	245 EXEMPT
	U-NII 6	6 515.0	13.50	22	26						Measure	Measure	2091 EXEMPT	129 EXEMPT	245 EXEMPT
	U-NII 7	6 855.0	13.25	21	32						Measure	Measure	2091 EXEMPT	129 EXEMPT	245 EXEMPT
	U-NII 8	7 115.0	13.25	21	25						Measure	Measure	2091 EXEMPT	129 EXEMPT	245 EXEMPT
Aux	U-NII-5	6 415.0	13.50	22	14	5	330	5	82	113	Measure	2091 EXEMPT	Measure	129 EXEMPT	245 EXEMPT
	U-NII 6	6 515.0	13.50	22	34						Measure	2091 EXEMPT	Measure	129 EXEMPT	245 EXEMPT
	U-NII 7	6 855.0	13.25	21	25						Measure	2091 EXEMPT	Measure	129 EXEMPT	245 EXEMPT
	U-NII 8	7 115.0	13.25	21	27						Measure	2091 EXEMPT	Measure	129 EXEMPT	245 EXEMPT

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	Yes	No	No	No
		U-NII 6	No	Yes	Yes	No	No	No
		U-NII 7	No	Yes	Yes	No	No	No
		U-NII 8	No	Yes	Yes	No	No	No
	Aux	U-NII-5	No	Yes	No	Yes	No	No
		U-NII 6	No	Yes	No	Yes	No	No
		U-NII 7	No	Yes	No	Yes	No	No
		U-NII 8	No	Yes	No	Yes	No	No

<p>Eurofins KCTL Co.,Ltd. 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea TEL: 82-70-5008-1021 FAX: 82-505-299-8311 www.kctl.co.kr</p>	<p>Report No.: KR23-SPF0049-A Page (12) of (131)</p>	 
--	---	---

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 (ρ). The equation description is as below:

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

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

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

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

Where: C is the specific heat capacity, δT is the temperature rise and δt is the exposure duration, or related to the electrical field in the tissue by

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

Where: σ is the conductivity of the tissue, ρ 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. SAR Measurement Configurations

4.1 Body-supported device

A typical example of a body supported device is a wireless enabled laptop device that among other orientations may be supported on the thighs of a sitting user. To represent this orientation, the device shall be positioned with its base against the flat phantom. Other orientations may be specified by the manufacturer in the user instructions. If the intended use is not specified, the device shall be tested directly against the flat phantom in all usable orientations.

The screen portion of the device shall be in an open position at a 90° angle as seen in Figure 1 (left side), or at an operating angle specified for intended use by the manufacturer in the operating instructions. Where a body supported device has an integral screen required for normal operation, then the screen-side will not need to be tested if the antenna(s) integrated in it ordinarily remain(s) 200 mm from the body. Where a screen mounted antenna is present, the measurement shall be performed with the screen against the flat phantom as shown in Figure 1 (right side), if operating the screen against the body is consistent with the intended use.

Other devices that fall into this category include table type portable computers and credit card transaction authorisation terminals, point-of sale and/or inventory terminals. Where these devices may be torso or limb-supported, the same principles for body-supported devices are applied.

The example in Figure 2) shows a tablet form factor portable computer for which SAR should be separately assessed with
d) each surface and
e) the separation distances
positional against the flat phantom that correspond to the intended use as specified by the manufacturer. If the intended use is not specified in the user instructions, the device shall be tested directly the flat phantom in all usable orientations.



Figure 1. Notebook

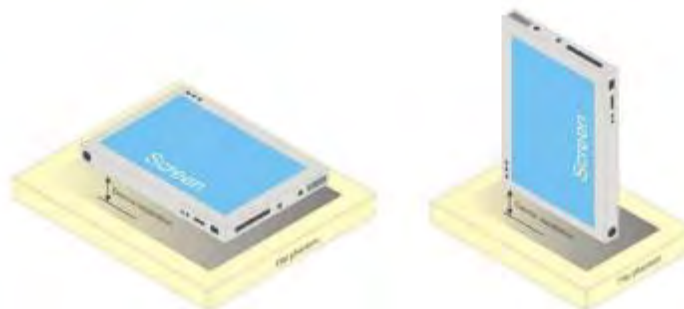


Figure 2. Tablet form factor portable computer

5. 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
Partial Peak SAR ¹⁾ (Partial)	1.60 mW/g	8.00 mW/g
Partial Average SAR ²⁾ (Whole Body)	0.08 mW/g	0.40 mW/g
Partial Peak SAR ³⁾ (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.

5.1 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/cm².

Peak Spatially Averaged Power Density was evaluated over a circular area of 4 cm² 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
Power Density	1.0 mW/cm ²	5.0 mW/cm ²

6. 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



6.1 WLAN Average Conducted Output Power (Notebook Mode)

Band	Mode	Freq. [MHz]	Channel	Conducted Powers (dBm)			
				Normal		Grip sensor	
				Main Ant.	Aux Ant.	Main Ant.	Aux Ant.
U-NII-5	802.11ax (160-SU)	6 025.0	15	12.51	7.61	7.72	Not supported
		6 185.0	47	12.49	7.60	7.68	
		6 345.0	79	12.48	7.50	7.64	
U-NII-6		6 505.0	111	12.52	7.50	7.54	
U-NII-7		6 665.0	143	12.33	7.41	7.47	
		6 825.0	175	12.29	7.39	7.69	
U-NII-8		6 985.0	207	12.33	7.61	7.66	

Note: About verification of grip sensor, refer to Appendix B.

6.2 WLAN Average Conducted Output Power (Tablet Mode)

Band	Mode	Freq. [MHz]	Channel	Conducted Powers (dBm)	
				Normal	
				Main Ant.	Aux Ant.
U-NII-5	802.11ax (160-SU)	6 025.0	15	12.51	12.47
		6 185.0	47	12.49	12.50
		6 345.0	79	12.48	12.45
U-NII-6		6 505.0	111	12.52	12.46
U-NII-7		6 665.0	143	12.33	12.25
		6 825.0	175	12.29	12.22
U-NII-8		6 985.0	207	12.33	12.20

7. System Verification

7.1 Measurement date and environment

Shield room	Date	Environment	
		Temperature (oC)	Humidity (%)
8F - 4	2023-11-25	21.3 ~ 22.0	57.6 ~ 58.9
	2023-11-26	21.4 ~ 21.9	58.3 ~ 60.2
	2023-11-27	21.1 ~ 21.7	59.3 ~ 59.6
	2023-11-28	21.5 ~ 21.8	57.6 ~ 58.5
	2023-11-29	21.2 ~ 21.6	58.4 ~ 59.8

7.2 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 (σ) and Permittivity (ρ) are listed in Table 1. For the SAR measurement given in this report. The temperature variation of the Tissue Simulant Liquids was $(22 \pm 2) ^\circ\text{C}$.

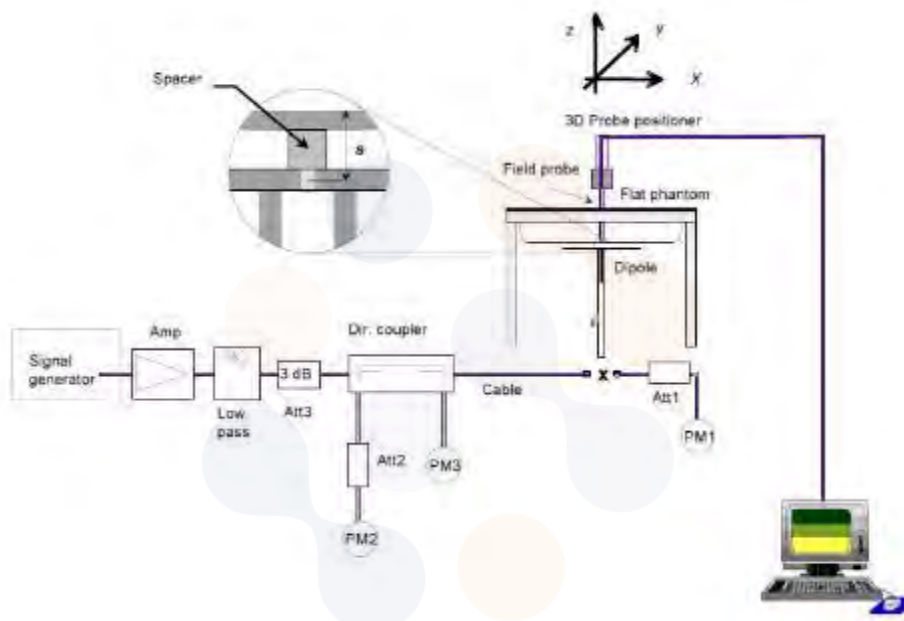
Freq. (MHz)	Limit/Measured		Permittivity (ρ)	Conductivity (σ)	Temp. ($^\circ\text{C}$)
6 500.0	Recommended Limit		34.50 \pm 5 % (32.78~36.23)	6.07 \pm 5 % (5.77~6.37)	22 \pm 2
	Measured	2023-11-25	33.40	6.09	21.03
6 025.0	Recommended Limit		35.07 \pm 5 % (33.32~36.82)	5.51 \pm 5 % (5.23~5.79)	22 \pm 2
	Measured	2023-11-25	34.40	5.54	21.03
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	2023-11-25	34.00	5.72	21.03
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	2023-11-25	33.69	5.91	21.03
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	2023-11-25	33.40	6.10	21.03
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	2023-11-25	33.20	6.27	21.03
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	2023-11-25	32.95	6.43	21.03
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	2023-11-25	32.70	6.60	21.03

Freq. (MHz)	Limit/Measured		Permittivity (ρ)	Conductivity (σ)	Temp. (°C)
6 500.0	Recommended Limit		34.50 ± 5 % (32.78~36.23)	6.07 ± 5 % (5.77~6.37)	22 ± 2
	Measured	2023-11-26	33.70	6.10	20.97
6 025.0	Recommended Limit		35.07 ± 5 % (33.32~36.82)	5.51 ± 5 % (5.23~5.79)	22 ± 2
	Measured	2023-11-26	34.60	5.55	20.97
6 185.0	Recommended Limit		34.88 ± 5 % (33.14~36.62)	5.70 ± 5 % (5.42~5.99)	22 ± 2
	Measured	2023-11-26	34.30	5.74	20.97
6 345.0	Recommended Limit		34.69 ± 5 % (32.96~36.42)	5.89 ± 5 % (5.60~6.18)	22 ± 2
	Measured	2023-11-26	33.92	5.92	20.97
6 505.0	Recommended Limit		34.49 ± 5 % (32.77~36.21)	6.08 ± 5 % (5.78~6.38)	22 ± 2
	Measured	2023-11-26	33.70	6.11	20.97
6 665.0	Recommended Limit		34.30 ± 5 % (32.59~36.02)	6.26 ± 5 % (5.95~6.57)	22 ± 2
	Measured	2023-11-26	33.40	6.28	20.97
6 825.0	Recommended Limit		34.11 ± 5 % (32.40~35.82)	6.45 ± 5 % (6.13~6.77)	22 ± 2
	Measured	2023-11-26	33.18	6.45	20.97
6 985.0	Recommended Limit		33.92 ± 5 % (32.22~35.62)	6.63 ± 5 % (6.30~6.96)	22 ± 2
	Measured	2023-11-26	32.90	6.62	20.97

<Table 1. Measurement result of Tissue electric parameters>

7.3 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.



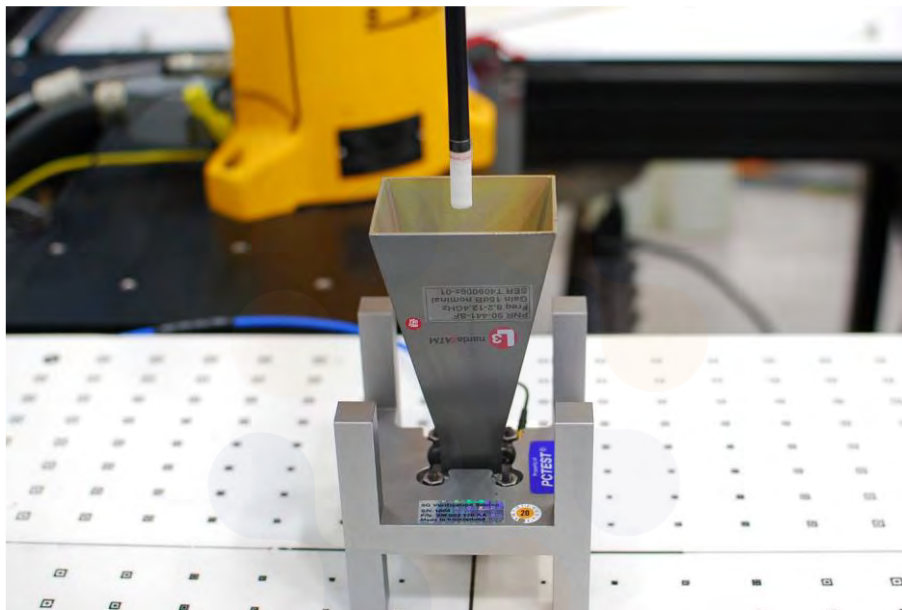
Verification Kit	Probe S/N	Frequency (MHz)	Tissue Type	Input Power (mW)	Limit/Measured (Normalized to 1 W)	
					Measured	Limit
D6.5GHzV2 SN: 1005	EX3DV4 SN: 7840	6 500.0	HSL	100	Measured	291.00 \pm 10 % (261.90~320.10)
					2023-11-25	288.00
					2023-11-26	292.00

<Table 2. System Verification Result>

7.4 Power Density Test System Verification

The system was verified to be within ± 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 ² psPD (W/m ²)		Deviation (dB)	Limit (dB)
					Target	Measured		
1023	9489	10	2023-11-27	86.1	55.7	52.5	-0.26	± 0.66
1023	9489	10	2023-11-28	86.1	55.7	54.0	-0.14	± 0.66
1023	9489	10	2023-11-29	86.1	55.7	54.6	-0.09	± 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.

8. SAR Test Results

8.1 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 ²)	Plot No.
											4cm ²	
802.11ax (160-SU)	Main	Grip Sensor off										
		Rear	9	6 025.0	12.51	13.50	1.256	1.015	0.189	0.241	1.48	
			9	6 185.0	12.49	13.50	1.262	1.015	0.157	0.201	1.20	
		Grip Sensor on										
	Rear	0	6 025.0	7.72	8.50	1.197	1.015	0.440	0.535	2.57	1	
		0	6 185.0	7.68	8.50	1.208	1.015	0.419	0.514	2.46		
Aux	Rear	0	6 025.0	7.61	8.50	1.227	1.015	0.361	0.450	2.19		
		0	6 185.0	7.60	8.50	1.230	1.015	0.405	0.506	2.22	2	

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 ²)	Plot No.
											4cm ²	
802.11ax (160-SU)	Main	Grip Sensor off										
		Rear	9	6 505.0	12.52	13.50	1.253	1.015	0.298	0.379	2.28	
			Grip Sensor on									
	Rear	0	6 505.0	7.54	8.50	1.247	1.015	0.568	0.719	3.27	3	
Aux	Rear	0	6 505.0	7.50	8.50	1.259	1.015	0.515	0.658	3.03	4	

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 ²)	Plot No.
											4cm ²	
802.11ax (160-SU)	Main	Grip Sensor off										
		Rear	9	6 665.0	12.33	13.25	1.236	1.015	0.608	0.763	4.87	5
			Grip Sensor on									
	Rear	0	6 825.0	7.69	8.50	1.205	1.015	0.547	0.669	3.23		
Aux	Rear	0	6 665.0	7.41	8.50	1.285	1.015	0.606	0.790	3.70	6	

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 ²)	Plot No.
											4cm ²	
802.11ax (160-SU)	Main	Grip Sensor off										
		Rear	9	6 985.0	12.33	13.25	1.236	1.015	0.553	0.694	4.47	7
			Grip Sensor on									
	Rear	0	6 985.0	7.66	8.50	1.213	1.015	0.461	0.568	2.55		
Aux	Rear	0	6 985.0	7.61	8.50	1.227	1.015	0.569	0.709	3.37	8	



8.2 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 ²)	Plot No.
											4cm ²	
802.11ax (160-SU)	Main	Rear	0	6 025.0	12.51	13.50	1.256	1.015	0.005	0.006	0.05	
			0	6 185.0	12.49	13.50	1.262	1.015	0.040	0.051	0.31	
		Left	0	6 025.0	12.51	13.50	1.256	1.015	0.117	0.149	0.42	
			0	6 185.0	12.49	13.50	1.262	1.015	0.452	0.579	2.16	
	Aux	Rear	0	6 185.0	12.50	13.50	1.259	1.015	0.000	0.000	0.01	
			0	6 025.0	12.47	13.50	1.268	1.015	0.020	0.026	0.13	
		Right	0	6 185.0	12.50	13.50	1.259	1.015	0.222	0.284	1.13	
			0	6 025.0	12.47	13.50	1.268	1.015	0.235	0.302	1.23	

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 ²)	Plot No.
											4cm ²	
802.11ax (160-SU)	Main	Rear	0	6 505.0	12.52	13.50	1.253	1.015	0.068	0.086	0.51	
		Left	0	6 505.0	12.52	13.50	1.253	1.015	0.733	0.932	3.57	
	Aux	Rear	0	6 505.0	12.46	13.50	1.271	1.015	0.000	0.000	0.01	
		Right	0	6 505.0	12.46	13.50	1.271	1.015	0.277	0.357	1.51	

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 ²)	Plot No.
											4cm ²	
802.11ax (160-SU)	Main	Rear	0	6 665.0	12.33	13.25	1.236	1.015	0.022	0.028	0.17	
		Left	0	6 665.0	12.33	13.25	1.236	1.015	0.276	0.346	1.23	
	Aux	Rear	0	6 665.0	12.25	13.25	1.259	1.015	0.005	0.006	0.02	
		Right	0	6 665.0	12.25	13.25	1.259	1.015	0.101	0.129	0.58	

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 ²)	Plot No.
											4cm ²	
802.11ax (160-SU)	Main	Rear	0	6 985.0	12.33	13.25	1.236	1.015	0.001	0.001	0.01	
		Left	0	6 985.0	12.33	13.25	1.236	1.015	0.103	0.129	0.43	
	Aux	Rear	0	6 985.0	12.20	13.25	1.274	1.015	0.002	0.003	0.01	
		Right	0	6 985.0	12.20	13.25	1.274	1.015	0.170	0.220	0.81	

<p>Eurofins KCTL Co.,Ltd. 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea TEL: 82-70-5008-1021 FAX: 82-505-299-8311 www.kctl.co.kr</p>	<p>Report No.: KR23-SPF0049-A Page (24) of (131)</p>	<p> </p>
--	--	--

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 4cm² 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.

9. Power Density Test Results

9.1 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 (W/m ²)	Scaled Total psPD (W/m ²)	Plot No.
									4cm ²	4cm ²	
802.11ax (160-SU)	Main	Rear	2	6 025.0	8.50	-	0.0625	1.462	1.28	1.87	17
			2	6 185.0	8.50	-	0.0625	1.462	0.66	0.97	

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 (W/m ²)	Scaled Total psPD (W/m ²)	Plot No.
									4cm ²	4cm ²	
802.11ax (160-SU)	Main	Rear	2	6 505.0	8.50	-	0.0625	1.462	1.51	2.21	18

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 (W/m ²)	Scaled Total psPD (W/m ²)	Plot No.
									4cm ²	4cm ²	
802.11ax (160-SU)	Aux	Rear	2	6 665.0	8.50	-	0.0625	1.462	1.48	2.16	19

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 (W/m ²)	Scaled Total psPD (W/m ²)	Plot No.
									4cm ²	4cm ²	
802.11ax (160-SU)	Aux	Rear	2	6 985.0	8.50	1.85	0.0625	1.462	2.05	3.00	20
			8.59	6 985.0	8.50	2.22	0.0625	1.462	1.21	1.77	



9.2 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 (W/m ²)	Scaled Total psPD (W/m ²)	Plot No.
									4cm ²	4cm ²	
802.11ax (160-SU)	Main	Left	2	6 025.0	13.50	-	0.0625	1.462	0.39	0.57	21
			2	6 185.0	13.50	-	0.0625	1.462	1.01	1.48	

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 (W/m ²)	Scaled Total psPD (W/m ²)	Plot No.
									4cm ²	4cm ²	
802.11ax (160-SU)	Main	Left	2	6 505.0	13.50	1.27	0.0625	1.462	2.28	3.33	22
		Left	9.22	6 505.0	13.50	1.36	0.0625	1.462	1.47	2.15	

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 (W/m ²)	Scaled Total psPD (W/m ²)	Plot No.
									4cm ²	4cm ²	
802.11ax (160-SU)	Main	Left	2	6 665.0	13.25	-	0.0625	1.462	0.92	1.35	23

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 (W/m ²)	Scaled Total psPD (W/m ²)	Plot No.
									4cm ²	4cm ²	
802.11ax (160-SU)	Aux	Right	2	6 985.0	13.25	-	0.0625	1.462	0.85	1.24	24

<p>Eurofins KCTL Co.,Ltd. 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea TEL: 82-70-5008-1021 FAX: 82-505-299-8311 www.kctl.co.kr</p>	<p>Report No.: KR23-SPF0049-A Page (27) of (131)</p>	<p> </p>
--	--	--

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 $d=2\text{mm}$.



10. Simultaneous Transmission

10.1 #Simultaneous Transmission Configurations

No.	Scenario	Operation
1	WLAN 2.4 GHz Main + WLAN 2.4 GHz Aux	Yes
2	WLAN 2.4 GHz Main + Bluetooth Aux	Yes
3	WLAN 2.4 GHz Aux + Bluetooth Aux	No
4	WLAN 2.4 GHz Main + WLAN 2.4 GHz Aux + Bluetooth Aux	No
5	WLAN 5 GHz Main + WLAN 5 GHz Aux	Yes
6	WLAN 5 GHz Main + Bluetooth Aux	Yes
7	WLAN 5 GHz Aux + Bluetooth Aux	Yes
8	WLAN 5 GHz Main + WLAN 5 GHz Aux + Bluetooth Aux	Yes
9	WLAN 6 GHz Main + WLAN 6 GHz Aux	Yes
10	WLAN 6 GHz Main + Bluetooth Aux	Yes
11	WLAN 6 GHz Aux + Bluetooth Aux	Yes
12	WLAN 6 GHz Main + WLAN 6 GHz Aux + Bluetooth Aux	Yes
13	WLAN 2.4 GHz Main + WLAN 5 GHz Aux + Bluetooth Aux (RSDB scenario)	No
14	WLAN 5 GHz Main + WLAN 2.4 GHz Aux + Bluetooth Aux (RSDB scenario)	No
15	WLAN 2.4/5 GHz Main + WLAN 6 GHz Aux + Bluetooth Aux (RSDB scenario)	No
16	WLAN 6 GHz Main + WLAN 2.4/5 GHz Aux + Bluetooth Aux (RSDB scenario)	No

Notes:

- It does not transmit simultaneously the Bluetooth and WLAN 2.4 GHz.
- It is to use the Bluetooth and WLAN same antenna path.

10.2 Estimated SAR (Tablet Mode)

TER was calculated by applying 447498 D04 Annex C to satisfy simultaneous transmission in the case of over 6GHz where SAR measurement is not required.

Ant.	Band	Freq. [MHz]	Output Power			Separation distances [mm]					ERP_j / ERP_{th}				
			dBm	mW	ERP [mW]	Rear	Left	Right	Top	Bottom	Rear	Left	Right	Top	Bottom
Main	U-NII-5	6415	13.50	22	17	5	5	330	82	113	Measure	Measure	0.011	0.171	0.090
	U-NII-6	6515	13.50	22	26						Measure	Measure	0.012	0.202	0.106
	U-NII-7	6855	13.25	21	32						Measure	Measure	0.015	0.248	0.131
	U-NII-8	7115	13.25	21	25						Measure	Measure	0.012	0.194	0.102
Aux	U-NII-5	6415	13.50	22	14	5	330	5	82	113	Measure	0.011	Measure	0.171	0.090
	U-NII-6	6515	13.50	22	34						Measure	0.016	Measure	0.264	0.139
	U-NII-7	6855	13.25	21	25						Measure	0.012	Measure	0.194	0.102
	U-NII-8	7115	13.25	21	27						Measure	0.013	Measure	0.209	0.110

Notes:

- For distances < 5mm, a distance of 5mm is used to determine SAR exclusion and estimated SAR value.
- 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).
- ERP TER Ratio according to 447498 D04 Appendix C Calculated as $ERP_j(\text{Output Power}) / ERP_{th}$.

Formulas round separation distance to nearest mm and power to nearest mW before calculating estimated SAR or determining if SAR is excluded.

10.3 Simultaneous Transmission Analysis

Exposure Condition /Position			WLAN								Bluetooth Aux
			2.4 GHz Main	2.4 GHz Aux	5 GHz Main	5 GHz Aux	6 GHz Main		6 GHz Aux		
			[①]	[②]	[③]	[④]	[⑤]		[⑥]		
Mode	Applicable Limit		1.6	1.6	1.6	1.6	1.6	ERP_{th}	1.6	ERP_{th}	1.6
Body (Notebook)	Rear	Reported Value	1.162	0.798	0.971	0.699	0.763	-	0.790	-	0.461
		Ratio	-	-	-	-	-	-	-	-	-
Body (Tablet)	Rear	Reported Value	0.158	0.040	0.064	0.045	0.086	-	0.026	-	0.008
		Ratio	-	-	-	-	-	-	-	-	-
	Left	Reported Value	0.247	0.011	0.322	0.003	0.932	-	-	-	0.002
		Ratio	-	-	-	-	0.583	-	-	0.016	0.001
	Right	Reported Value	0.010	0.299	0.003	0.377	-	-	0.357	-	0.011
		Ratio	-	-	-	-	-	0.015	0.223	-	0.007
	Top	Reported Value	0.056	0.061	0.022	0.021	-	-	-	-	0.009
		Ratio	-	-	-	-	-	0.248	-	0.264	0.006
	Bottom	Reported Value	0.031	0.033	0.011	0.011	-	-	-	-	0.005
		Ratio	-	-	-	-	-	0.131	-	0.139	0.003


Notes:

- Green entries are the estimated SAR.
- Pink entries are TER Ratio.

Summation												
Exposure Condition /Position			[①+②]	[①+⑦]	[③+④]	[③+⑦]	[④+⑦]	[③+④+⑦]	[⑤+⑥]	[⑤+⑦]	[⑥+⑦]	[⑤+⑥+⑦]
			Body (Notebook)	Rear	Reported Value	1.960	1.623	1.670	1.432	1.160	2.131	1.553
	TER	-	-		-	-	-	-	-	-	-	-
Body (Tablet)	Rear	Reported Value	0.198	0.166	0.109	0.072	0.053	0.117	0.112	0.094	0.034	0.120
		TER	-	-	-	-	-	-	-	-	-	-
	Left	Reported Value	0.258	0.249	0.325	0.324	0.005	0.327	-	-	-	-
		TER	-	-	-	-	-	-	0.599	0.584	0.017	0.600
	Right	Reported Value	0.309	0.021	0.380	0.014	0.388	0.391	-	-	-	-
		TER	-	-	-	-	-	-	0.238	0.022	0.230	0.245
	Top	Reported Value	0.117	0.065	0.043	0.031	0.030	0.052	-	-	-	-
		TER	-	-	-	-	-	-	0.512	0.254	0.270	0.518
	Bottom	Reported Value	0.064	0.036	0.022	0.016	0.016	0.027	-	-	-	-
		TER	-	-	-	-	-	-	0.270	0.134	0.142	0.273

Notes:

- Simultaneous transmission SAR test exclusion considerations
 Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneously transmitting antenna. When the sum of 1-g or 10-g SAR of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit, SAR test exclusion applies to that simultaneous transmission configuration. Per KDB Publication 447498 D04v01.
- When the sum of SAR1g of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit (SAR1g 1.6 W/kg), the SPLSR procedures is not required. When the sum of SAR1g is greater than the SAR limit (SAR1g 1.6 W/kg), SAR test exclusion is determined by the SPLSR.
- Pink entries were verified with TER Limit =< 1.0.
- Refer to the "KR23-SPF0048" report for values other than WLAN 6 GHz and the yellow entries SPLSR

<p>Eurofins KCTL Co.,Ltd. 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea TEL: 82-70-5008-1021 FAX: 82-505-299-8311 www.kctl.co.kr</p>	<p>Report No.: KR23-SPF0049-A Page (31) of (131)</p>	<p> KCTL</p>
--	--	--

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 _i	Standard Uncertainty (± dB)	v _i
Measurement system						
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 dependance 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	∞
DUT and environmental factors						
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 DASY6 System			
Version	DASY6: 16.2.2.1588 / 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 - 3	-	-
DASY6 Robot	TX90XL speag	F/18/0004968/A/001	-	-
Phantom	2mm Oval Phantom ELI5	2097	-	-
Mounting Device	Laptop Holder	-	-	-
Phantom	mmWave Phantom	1090	-	-
mmWave Device Holder	mmWave Device Holder	1140	-	-
DAE	DAE4	1758	2023-08-24	2024-08-24
Probe	EX3DV4	7840	2023-08-25	2024-08-25
Isotropic E-Field Probe	EUmmWV4	9489	2023-06-20	2024-06-20
MICROWAVE GENERATOR	SMP02	100295	2022-12-29	2023-12-29
Dual Power Meter	E4419B	GB43312301	2023-02-09	2024-02-09
Power Sensor	8481H	3318A19379	2023-02-09	2024-02-09
	8481H	3318A19377	2023-02-09	2024-02-09
Attenuator	PE7005-10	2228-4	2022-12-15	2023-12-15
	PE7005-10	2228-5	2022-12-15	2023-12-15
	PE7005-10	2228-6	2022-12-15	2023-12-15
Power Amplifier	AMP2027ADB	10005	2023-04-26	2024-04-26
Low Pass Filter	PE87FL1016	1928	2023-11-01	2024-11-01
	PE87FL1017	2134	2023-01-04	2024-01-04
Directional Coupler	772D	2839A160504	2023-04-26	2024-04-26
System Verification Device	5G Verification Source 10 GHz	1023	2023-01-20	2024-01-20
Dipole Validation Kits	D6.5GHzV2	1005	2023-09-21	2025-09-21
Network Analyzer	E5071B	MY42403524	2023-02-09	2024-02-09
Dielectric Assessment Kit	DAK-3.5	1078	2023-05-24	2024-05-24
Humidity/Temp	MHB-382SD	46307	2023-02-13	2024-02-13
Spectrum Analyzer	FSQ40	200062	2023-04-25	2024-04-25

13. SAR Test System Verification Results and Test Results

13.1 SAR Test System Verification 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	1005	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	4.96	6.09	33.4

Hardware Setup

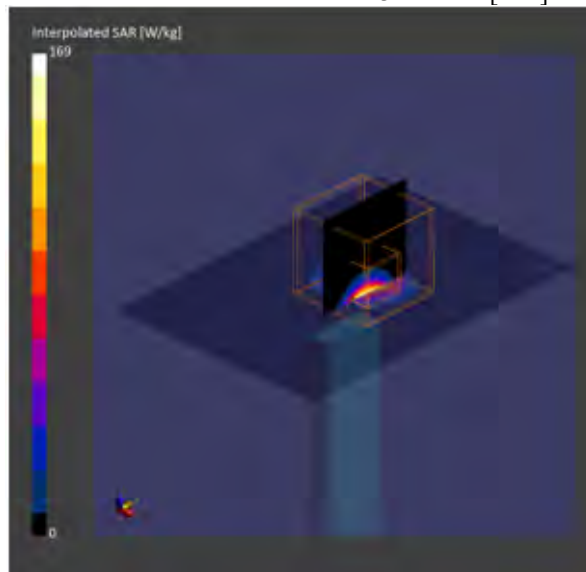
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2097	HBBL-600-10000, 2023-Nov-25	EX3DV4 - SN7840, 2023-08-25	DAE4 Sn1758, 2023-08-24

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	VMS + 6p	VMS + 6p
Detection		
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2023-11-25	2023-11-25
psSAR1g [W/kg]	24.8	28.8
psSAR8g [W/kg]	6.48	6.88
psSAR10g [W/kg]	5.37	5.67
psAPD (1.0cm2, sq) [W/m2]		288
psAPD (4.0cm2, sq) [W/m2]		138
Power Drift [dB]		0.00
M2/M1 [%]		53.4
Dist 3dB Peak [mm]		5.2



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	1005	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	4.96	6.10	33.7

Hardware Setup

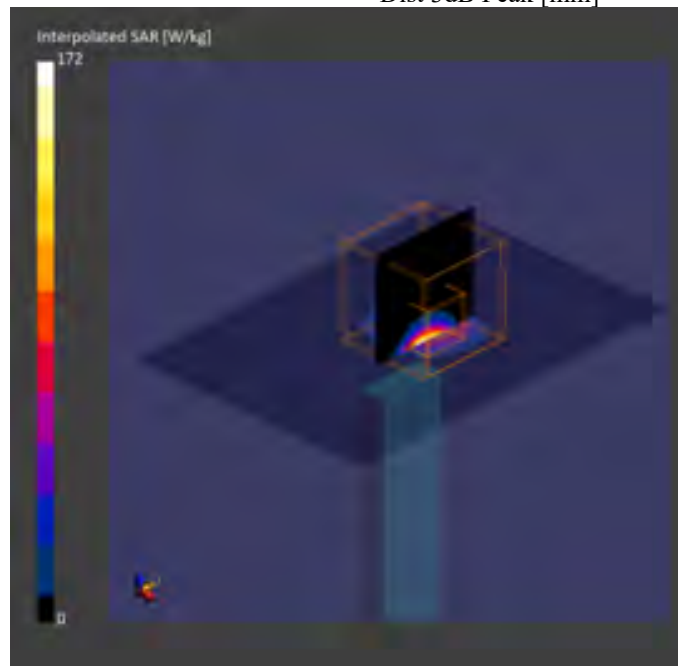
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2097	HBBL-600-10000, 2023-Nov-26	EX3DV4 - SN7840, 2023-08-25	DAE4 Sn1758, 2023-08-24

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	VMS + 6p	VMS + 6p
Detection		
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2023-11-26	2023-11-26
psSAR1g [W/kg]	25.5	29.2
psSAR8g [W/kg]	6.64	6.96
psSAR10g [W/kg]	5.50	5.74
psAPD (1.0cm ² , sq) [W/m ²]		292
psAPD (4.0cm ² , sq) [W/m ²]		139
Power Drift [dB]		0.03
M2/M1 [%]		53.3
Dist 3dB Peak [mm]		5.2



13.2 SAR Test Results

1)

Eurofins KCTL Co.,Ltd.

Measurement Report for NP750QGK, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 15 (6025.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP750QGK, SAMSUNG	356.0 x 230.0 x 12.0	1Q6991ZWA00147D	Laptop + Main 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	6025.0, 15	4.96	5.54	34.4

Hardware Setup

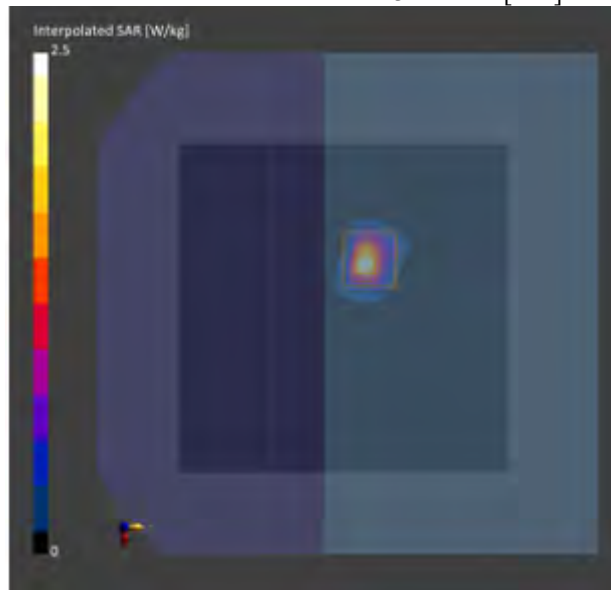
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2097	HBBL-600-10000, 2023-Nov-25	EX3DV4 - SN7840, 2023-08-25	DAE4 Sn1758, 2023-08-24

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	136.0 x 136.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	2.9 x 2.9 x 1.2
Sensor Surface [mm]	3.0	1.4
Graded Grid	No	Yes
Grading Ratio	N/A	1.2
MAIA Surface	N/A	N/A
Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2023-11-25	2023-11-25
psSAR1g [W/kg]	0.413	0.440
psSAR8g [W/kg]	0.125	0.129
psSAR10g [W/kg]	0.107	0.109
psAPD (1.0cm2, sq) [W/m2]		4.40
psAPD (4.0cm2, sq) [W/m2]		2.57
Power Drift [dB]		-0.02
M2/M1 [%]		57.7
Dist 3dB Peak [mm]		3.9



2)
Eurofins KCTL Co.,Ltd.

Measurement Report for NP750QGK, 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
NP750QGK, SAMSUNG	356.0 x 230.0 x 12.0	1Q6991ZWA00147D	Laptop + Aux 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	4.96	5.72	34.0

Hardware Setup

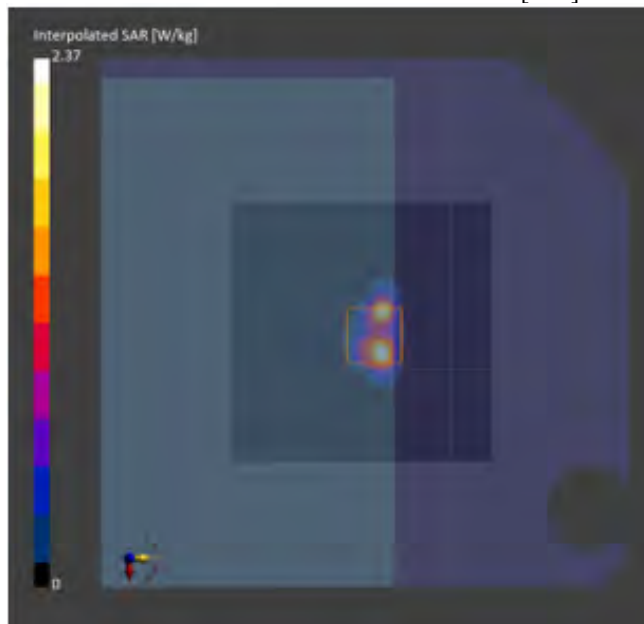
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2097	HBBL-600-10000, 2023-Nov-25	EX3DV4 - SN7840, 2023-08-25	DAE4 Sn1758, 2023-08-24

Scan 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	2.9 x 2.9 x 1.2
Sensor Surface [mm]	3.0	1.4
Graded Grid	No	Yes
Grading Ratio	N/A	1.2
MAIA	N/A	N/A
Surface	VMS + 6p	VMS + 6p
Detection		
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2023-11-25	2023-11-25
psSAR1g [W/kg]	0.333	0.405
psSAR8g [W/kg]	0.102	0.111
psSAR10g [W/kg]	0.090	0.097
psAPD (1.0cm ² , sq) [W/m ²]		4.05
psAPD (4.0cm ² , sq) [W/m ²]		2.22
Power Drift [dB]		0.01
M2/M1 [%]		59.9
Dist 3dB Peak [mm]		4.2



3)

Eurofins KCTL Co.,Ltd.

Measurement Report for NP750QGK, 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
NP750QGK, SAMSUNG	356.0 x 230.0 x 12.0	1Q6991ZWA00147D	Laptop + Main 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	4.96	6.10	33.4

Hardware Setup

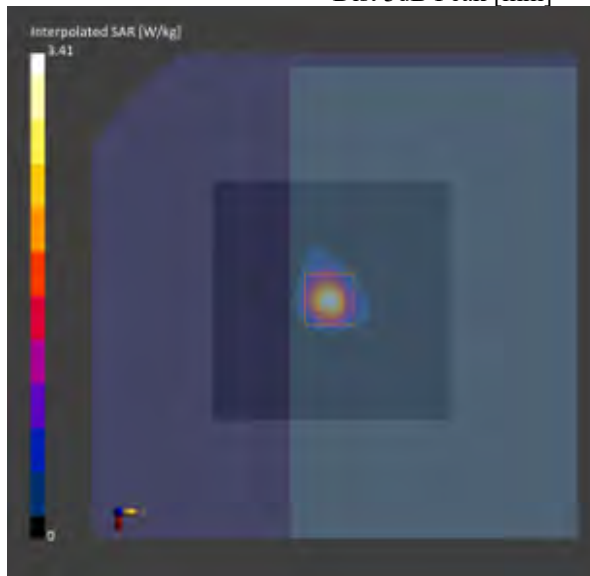
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2097	HBBL-600-10000, 2023-Nov-25	EX3DV4 - SN7840, 2023-08-25	DAE4 Sn1758, 2023-08-24

Scan 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	2.9 x 2.9 x 1.2
Sensor Surface [mm]	3.0	1.4
Graded Grid	No	Yes
Grading Ratio	N/A	1.2
MAIA	N/A	N/A
Surface Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2023-11-25	2023-11-25
psSAR1g [W/kg]	0.450	0.568
psSAR8g [W/kg]	0.148	0.164
psSAR10g [W/kg]	0.127	0.138
psAPD (1.0cm2, sq) [W/m2]		5.68
psAPD (4.0cm2, sq) [W/m2]		3.27
Power Drift [dB]		-0.11
M2/M1 [%]		55.7
Dist 3dB Peak [mm]		4.3



4)

Eurofins KCTL Co.,Ltd.

Measurement Report for NP750QGK, 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
NP750QGK, SAMSUNG	356.0 x 230.0 x 12.0	1Q6991ZWA00147D	Laptop + Aux 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	4.96	6.10	33.4

Hardware Setup

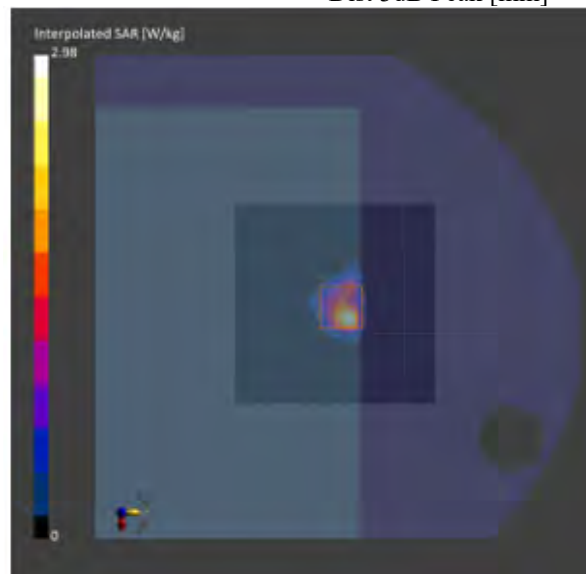
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2097	HBBL-600-10000, 2023-Nov-25	EX3DV4 - SN7840, 2023-08-25	DAE4 Sn1758, 2023-08-24

Scan 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
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	2023-11-25	2023-11-25
psSAR1g [W/kg]	0.426	0.515
psSAR8g [W/kg]	0.141	0.151
psSAR10g [W/kg]	0.122	0.130
psAPD (1.0cm2, sq) [W/m2]		5.15
psAPD (4.0cm2, sq) [W/m2]		3.03
Power Drift [dB]		-0.03
M2/M1 [%]		52.6
Dist 3dB Peak [mm]		4.4



5)

Eurofins KCTL Co.,Ltd.

Measurement Report for NP750QGK, 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
NP750QGK, SAMSUNG	356.0 x 230.0 x 12.0	1Q6991ZWA00147D	Laptop + Main 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, 9.00	Custom Band	CW, 10755-AAC	6665.0, 143	4.96	6.27	33.2

Hardware Setup

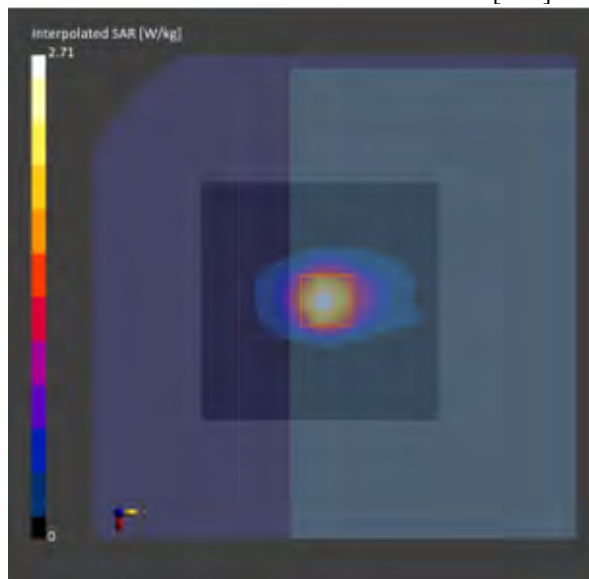
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2097	HBBL-600-10000, 2023-Nov-25	EX3DV4 - SN7840, 2023-08-25	DAE4 Sn1758, 2023-08-24

Scan 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
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	2023-11-25	2023-11-25
psSAR1g [W/kg]	0.578	0.608
psSAR8g [W/kg]	0.234	0.243
psSAR10g [W/kg]	0.209	0.215
psAPD (1.0cm2, sq) [W/m2]		6.08
psAPD (4.0cm2, sq) [W/m2]		4.87
Power Drift [dB]		-0.13
M2/M1 [%]		52.9
Dist 3dB Peak [mm]		10.4



6)

Eurofins KCTL Co.,Ltd.

Measurement Report for NP750QGK, 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
NP750QGK, SAMSUNG	356.0 x 230.0 x 12.0	1Q6991ZWA00147D	Laptop + Aux 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	4.96	6.27	33.2

Hardware Setup

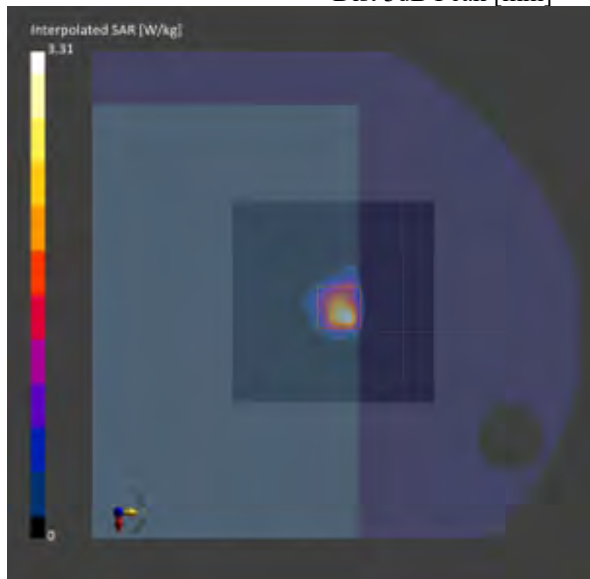
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2097	HBBL-600-10000, 2023-Nov-25	EX3DV4 - SN7840, 2023-08-25	DAE4 Sn1758, 2023-08-24

Scan 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
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	2023-11-25	2023-11-25
psSAR1g [W/kg]	0.500	0.606
psSAR8g [W/kg]	0.171	0.185
psSAR10g [W/kg]	0.148	0.159
psAPD (1.0cm2, sq) [W/m2]		6.06
psAPD (4.0cm2, sq) [W/m2]		3.70
Power Drift [dB]		-0.04
M2/M1 [%]		51.0
Dist 3dB Peak [mm]		5.7



7)

Eurofins KCTL Co.,Ltd.

Measurement Report for NP750QGK, 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
NP750QGK, SAMSUNG	356.0 x 230.0 x 12.0	1Q6991ZWA00147D	Laptop + Main 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, 9.00	Custom Band	CW, 10755-AAC	6985.0, 207	5.26	6.60	32.7

Hardware Setup

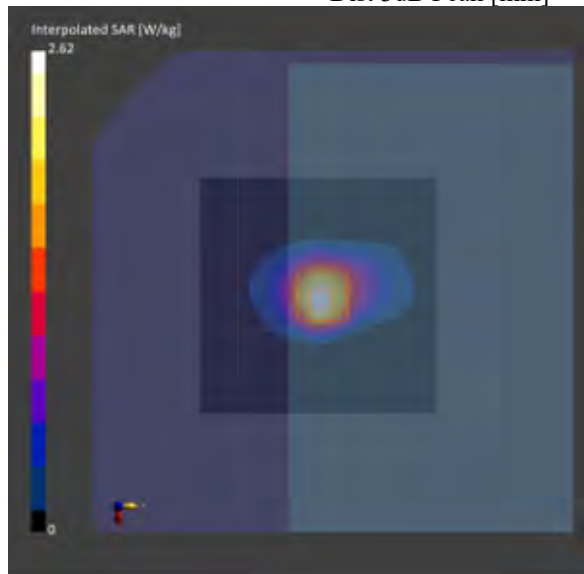
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2097	HBBL-600-10000, 2023-Nov-25	EX3DV4 - SN7840, 2023-08-25	DAE4 Sn1758, 2023-08-24

Scan 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
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	2023-11-25	2023-11-25
psSAR1g [W/kg]	0.527	0.553
psSAR8g [W/kg]	0.218	0.224
psSAR10g [W/kg]	0.195	0.199
psAPD (1.0cm2, sq) [W/m2]		5.53
psAPD (4.0cm2, sq) [W/m2]		4.47
Power Drift [dB]		0.13
M2/M1 [%]		50.4
Dist 3dB Peak [mm]		9.6



8)

Eurofins KCTL Co.,Ltd.

Measurement Report for NP750QGK, 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
NP750QGK, SAMSUNG	356.0 x 230.0 x 12.0	1Q6991ZWA00147D	Laptop + Aux 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	5.26	6.60	32.7

Hardware Setup

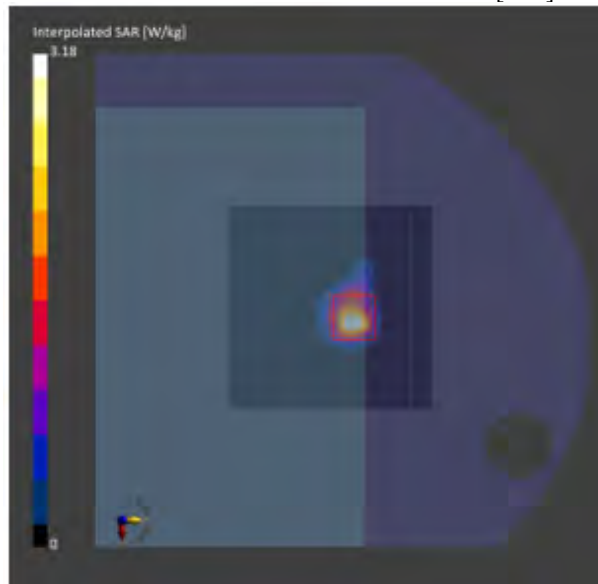
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2097	HBBL-600-10000, 2023-Nov-25	EX3DV4 - SN7840, 2023-08-25	DAE4 Sn1758, 2023-08-24

Scan 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
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	2023-11-25	2023-11-25
psSAR1g [W/kg]	0.477	0.569
psSAR8g [W/kg]	0.164	0.168
psSAR10g [W/kg]	0.143	0.142
psAPD (1.0cm2, sq) [W/m2]		5.69
psAPD (4.0cm2, sq) [W/m2]		3.37
Power Drift [dB]		-0.07
M2/M1 [%]		48.6
Dist 3dB Peak [mm]		5.9



9)

Eurofins KCTL Co.,Ltd.

Measurement Report for NP750QGK, EDGE LEFT, Custom Band 802.11 ax, UID 10755 AAC, Channel 47 (6185.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP750QGK, SAMSUNG	230.0 x 356.0 x 12.0	1Q6991ZWA00147D	Tablet + Main 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	EDGE LEFT, 0.00	Custom Band	CW, 10755-AAC	6185.0, 47	4.96	5.74	34.3

Hardware Setup

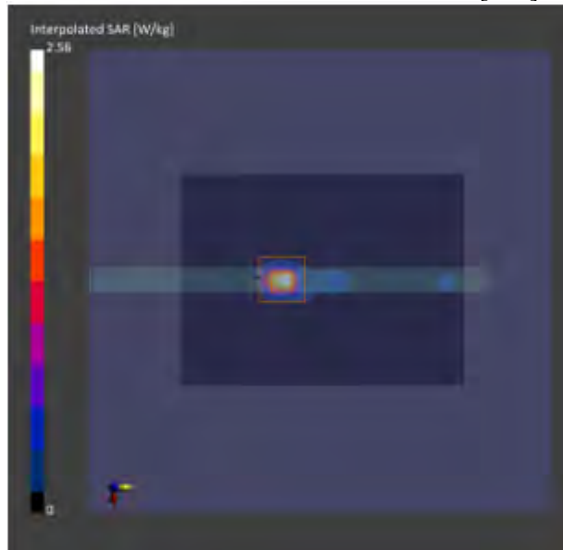
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2097	HBBL-600-10000, 2023-Nov-26	EX3DV4 - SN7840, 2023-08-25	DAE4 Sn1758, 2023-08-24

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 136.0	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 Surface	N/A	N/A
Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2023-11-26	2023-11-26
psSAR1g [W/kg]	0.388	0.452
psSAR8g [W/kg]	0.10	0.108
psSAR10g [W/kg]	0.083	0.089
psAPD (1.0cm2, sq) [W/m2]		4.52
psAPD (4.0cm2, sq) [W/m2]		2.16
Power Drift [dB]		-0.03
M2/M1 [%]		50.6
Dist 3dB Peak [mm]		4.6



10)

Eurofins KCTL Co.,Ltd.

Measurement Report for NP750QGK, EDGE RIGHT, Custom Band 802.11 ax, UID 10755 AAC, Channel 15 (6025.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP750QGK, SAMSUNG	230.0 x 356.0 x 12.0	1Q6991ZWA00147D	Tablet + Aux 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	EDGE RIGHT, 0.00	Custom Band	CW, 10755-AAC	6025.0, 15	4.96	5.55	34.6

Hardware Setup

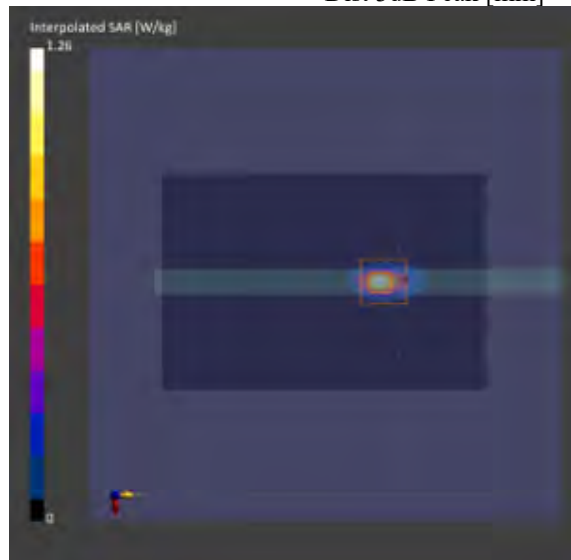
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2097	HBBL-600-10000, 2023-Nov-26	EX3DV4 - SN7840, 2023-08-25	DAE4 Sn1758, 2023-08-24

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 153.0	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 Surface	N/A	N/A
Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2023-11-26	2023-11-26
psSAR1g [W/kg]	0.224	0.235
psSAR8g [W/kg]	0.061	0.061
psSAR10g [W/kg]	0.051	0.051
psAPD (1.0cm2, sq) [W/m2]		2.35
psAPD (4.0cm2, sq) [W/m2]		1.23
Power Drift [dB]		-0.15
M2/M1 [%]		50.4
Dist 3dB Peak [mm]		4.8



11)

Eurofins KCTL Co.,Ltd.

Measurement Report for NP750QGK, EDGE LEFT, Custom Band 802.11 ax, UID 10755 AAC, Channel 111

(6505.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP750QGK, SAMSUNG	230.0 x 356.0 x 12.0	1Q6991ZWA00147D	Tablet + Main 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	EDGE LEFT, 0.00	Custom Band	CW, 10755-AAC	6505.0, 111	4.96	6.11	33.7

Hardware Setup

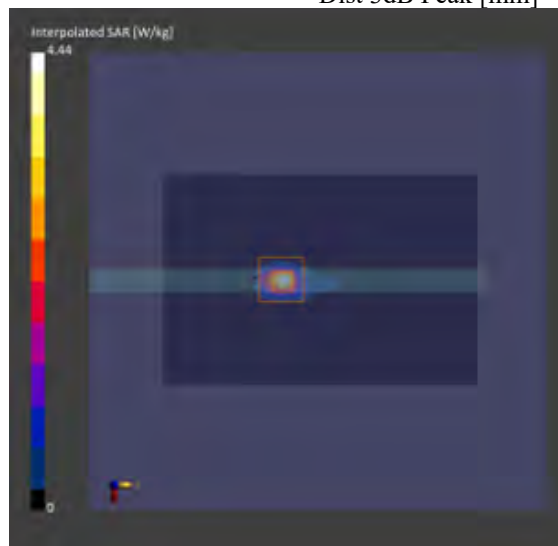
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2097	HBBL-600-10000, 2023-Nov-26	EX3DV4 - SN7840, 2023-08-25	DAE4 Sn1758, 2023-08-24

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 153.0	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 Surface	N/A	N/A
Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2023-11-26	2023-11-26
psSAR1g [W/kg]	0.634	0.733
psSAR8g [W/kg]	0.165	0.179
psSAR10g [W/kg]	0.138	0.147
psAPD (1.0cm2, sq) [W/m2]		7.33
psAPD (4.0cm2, sq) [W/m2]		3.57
Power Drift [dB]		-0.06
M2/M1 [%]		48.9
Dist 3dB Peak [mm]		4.6



12)

Eurofins KCTL Co.,Ltd.

Measurement Report for NP750QGK, EDGE RIGHT, Custom Band 802.11 ax, UID 10755 AAC, Channel 111 (6505.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP750QGK, SAMSUNG	230.0 x 356.0 x 12.0	1Q6991ZWA00147D	Tablet + Aux 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	EDGE RIGHT, 0.00	Custom Band	CW, 10755-AAC	6505.0, 111	4.96	6.11	33.7

Hardware Setup

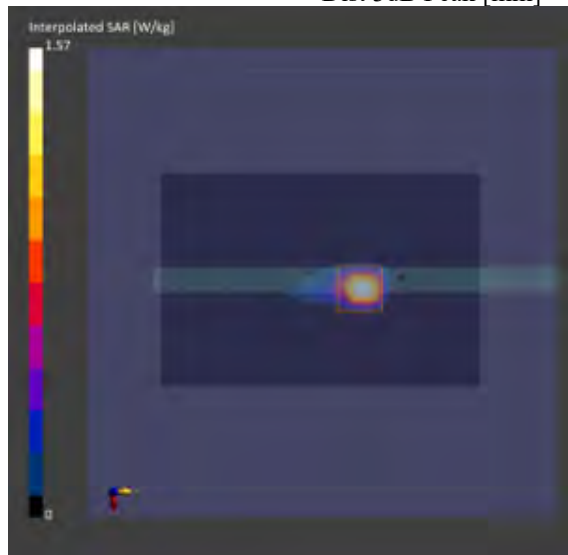
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2097	HBBL-600-10000, 2023-Nov-26	EX3DV4 - SN7840, 2023-08-25	DAE4 Sn1758, 2023-08-24

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 153.0	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 Surface	N/A	N/A
Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2023-11-26	2023-11-26
psSAR1g [W/kg]	0.209	0.277
psSAR8g [W/kg]	0.066	0.076
psSAR10g [W/kg]	0.056	0.063
psAPD (1.0cm2, sq) [W/m2]		2.77
psAPD (4.0cm2, sq) [W/m2]		1.51
Power Drift [dB]		0.01
M2/M1 [%]		49.2
Dist 3dB Peak [mm]		5.0



13)

Eurofins KCTL Co.,Ltd.

Measurement Report for NP750QGK, EDGE LEFT, Custom Band 802.11 ax, UID 10755 AAC, Channel 143 (6665.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP750QGK, SAMSUNG	230.0 x 356.0 x 12.0	1Q6991ZWA00147D	Tablet + Main 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	EDGE LEFT, 0.00	Custom Band	CW, 10755-AAC	6665.0, 143	4.96	6.28	33.4

Hardware Setup

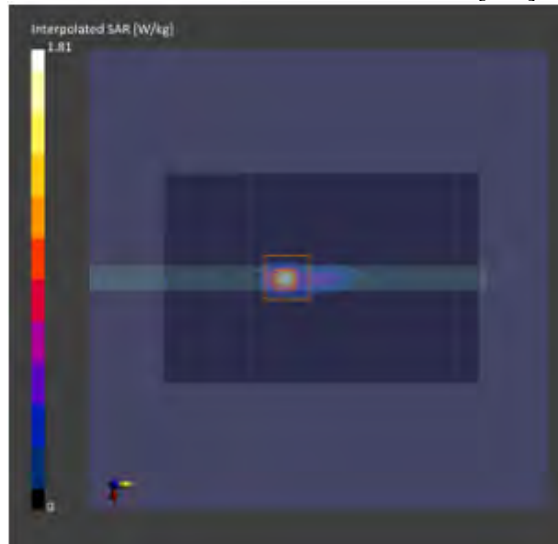
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2097	HBBL-600-10000, 2023-Nov-26	EX3DV4 - SN7840, 2023-08-25	DAE4 Sn1758, 2023-08-24

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 153.0	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 Surface	N/A	N/A
Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2023-11-26	2023-11-26
psSAR1g [W/kg]	0.248	0.276
psSAR8g [W/kg]	0.061	0.061
psSAR10g [W/kg]	0.051	0.050
psAPD (1.0cm2, sq) [W/m2]		2.76
psAPD (4.0cm2, sq) [W/m2]		1.23
Power Drift [dB]		-0.09
M2/M1 [%]		43.1
Dist 3dB Peak [mm]		4.4



14)

Eurofins KCTL Co.,Ltd.

Measurement Report for NP750QGK, EDGE RIGHT, Custom Band 802.11 ax, UID 10755 AAC, Channel 143 (6665.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP750QGK, SAMSUNG	230.0 x 356.0 x 12.0	1Q6991ZWA00147D	Tablet + Aux 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	EDGE RIGHT, 0.00	Custom Band	CW, 10755-AAC	6665.0, 143	4.96	6.28	33.4

Hardware Setup

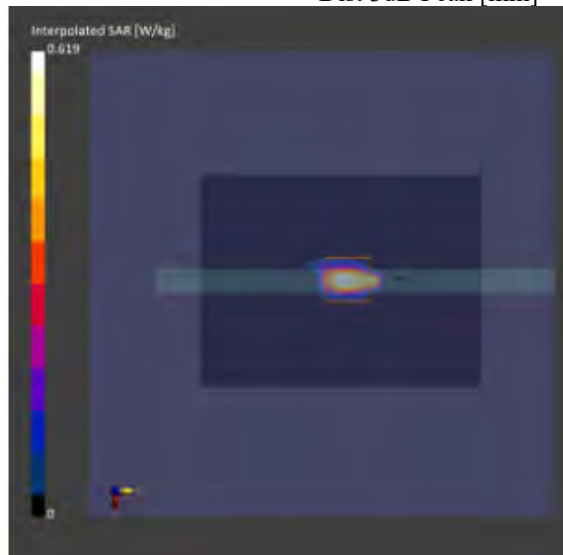
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2097	HBBL-600-10000, 2023-Nov-26	EX3DV4 - SN7840, 2023-08-25	DAE4 Sn1758, 2023-08-24

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 136.0	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 Surface	N/A	N/A
Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2023-11-26	2023-11-26
psSAR1g [W/kg]	0.092	0.101
psSAR8g [W/kg]	0.028	0.029
psSAR10g [W/kg]	0.024	0.025
psAPD (1.0cm2, sq) [W/m2]		1.01
psAPD (4.0cm2, sq) [W/m2]		0.583
Power Drift [dB]		0.05
M2/M1 [%]		43.8
Dist 3dB Peak [mm]		5.5



15)

Eurofins KCTL Co.,Ltd.

Measurement Report for NP750QGK, EDGE LEFT, Custom Band 802.11 ax, UID 10755 AAC, Channel 207 (6985.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP750QGK, SAMSUNG	230.0 x 356.0 x 12.0	1Q6991ZWA00147D	Tablet + Main 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	EDGE LEFT, 0.00	Custom Band	CW, 10755-AAC	6985.0, 207	5.26	6.62	32.9

Hardware Setup

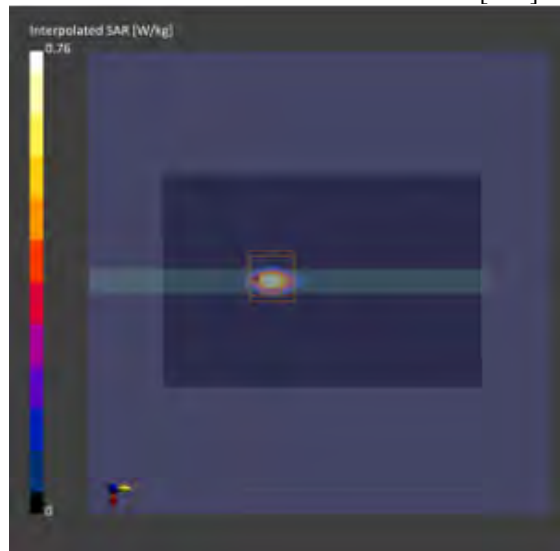
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2097	HBBL-600-10000, 2023-Nov-26	EX3DV4 - SN7840, 2023-08-25	DAE4 Sn1758, 2023-08-24

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 153.0	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 Surface	N/A	N/A
Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2023-11-26	2023-11-26
psSAR1g [W/kg]	0.099	0.103
psSAR8g [W/kg]	0.023	0.022
psSAR10g [W/kg]	0.019	0.017
psAPD (1.0cm2, sq) [W/m2]		1.03
psAPD (4.0cm2, sq) [W/m2]		0.431
Power Drift [dB]		0.16
M2/M1 [%]		53.1
Dist 3dB Peak [mm]		4.1



16)

Eurofins KCTL Co.,Ltd.

Measurement Report for NP750QGK, EDGE RIGHT, Custom Band 802.11 ax, UID 10755 AAC, Channel 207 (6985.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP750QGK, SAMSUNG	230.0 x 356.0 x 12.0	1Q6991ZWA00147D	Tablet + Aux 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	EDGE RIGHT, 0.00	Custom Band	CW, 10755-AAC	6985.0, 207	5.26	6.62	32.9

Hardware Setup

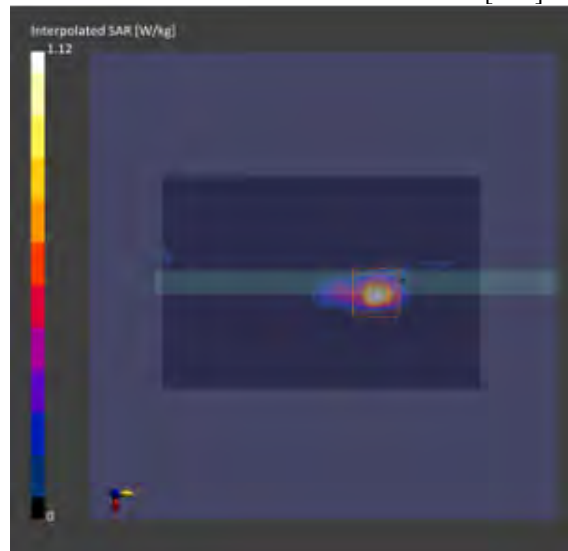
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2097	HBBL-600-10000, 2023-Nov-26	EX3DV4 - SN7840, 2023-08-25	DAE4 Sn1758, 2023-08-24

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 153.0	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 Surface	N/A	N/A
Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2023-11-26	2023-11-26
psSAR1g [W/kg]	0.134	0.170
psSAR8g [W/kg]	0.038	0.040
psSAR10g [W/kg]	0.032	0.033
psAPD (1.0cm2, sq) [W/m2]		1.70
psAPD (4.0cm2, sq) [W/m2]		0.807
Power Drift [dB]		-0.09
M2/M1 [%]		47.9
Dist 3dB Peak [mm]		4.4



14. PD Test System Verification and Test Results

14.1 PD Test System Verification

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

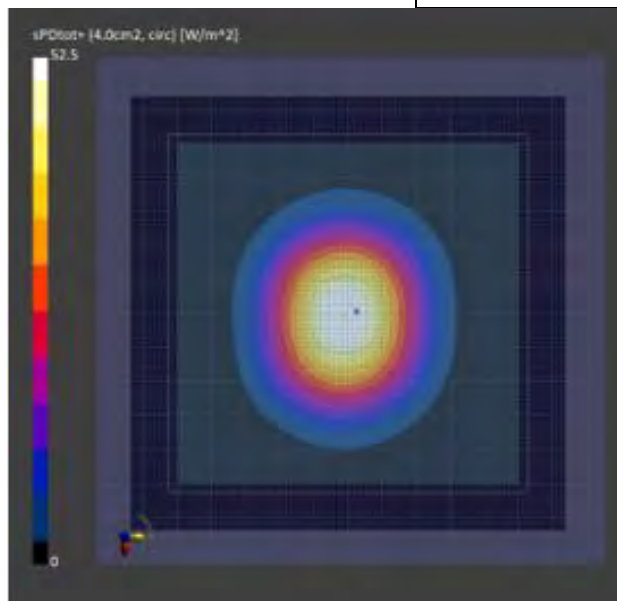
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2023-06-20	DAE4 Sn1758, 2023-08-24

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	2023-11-27
Avg. Area [cm ²]	4.00
psPDn+ [W/m ²]	52.2
psPDtot+ [W/m ²]	52.5
E _{max} [V/m]	152
Power Drift [dB]	0.17



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

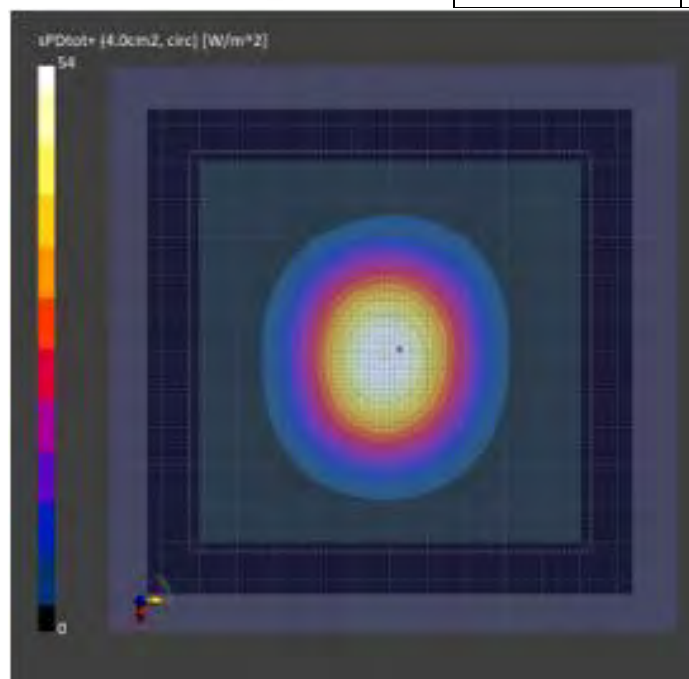
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2023-06-20	DAE4 Sn1758, 2023-08-24

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	2023-11-28
Avg. Area [cm ²]	4.00
psPDn+ [W/m ²]	53.7
psPDtot+ [W/m ²]	54.0
E _{max} [V/m]	155
Power Drift [dB]	0.10



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

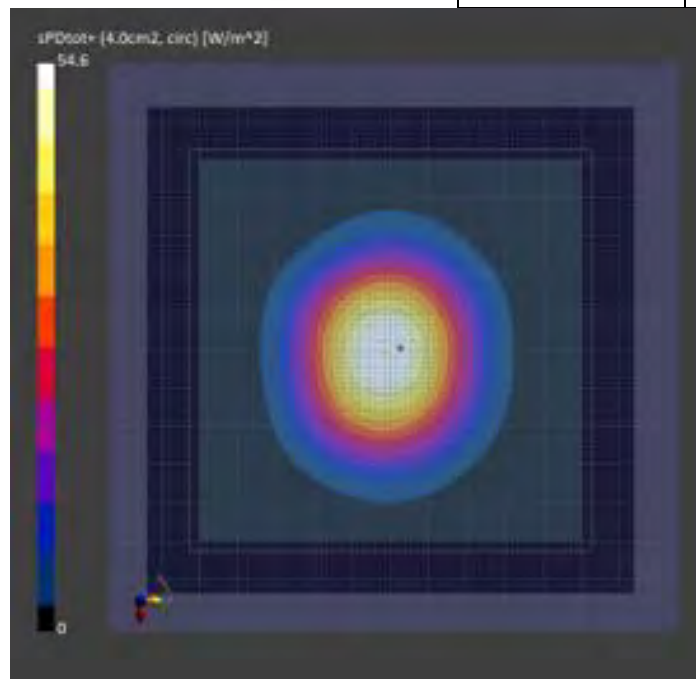
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2023-06-20	DAE4 Sn1758, 2023-08-24

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	2023-11-29
Avg. Area [cm ²]	4.00
psPDn+ [W/m ²]	54.3
psPDtot+ [W/m ²]	54.6
E _{max} [V/m]	156
Power Drift [dB]	0.03



14.2 PD Test Results

17)

Eurofins KCTL Co.,Ltd.

Measurement Report for NP750QGK, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 15 (6025.0MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP750QGK, SAMSUNG	230.0 x 12.0 x 356.0	1Q6991ZWA00147D	Laptop + Main Antenna

Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Frequency [MHz], Channel Number	Conversion Factor
5G	BACK, 2.00	6025.0, 15	1.0

Hardware Setup

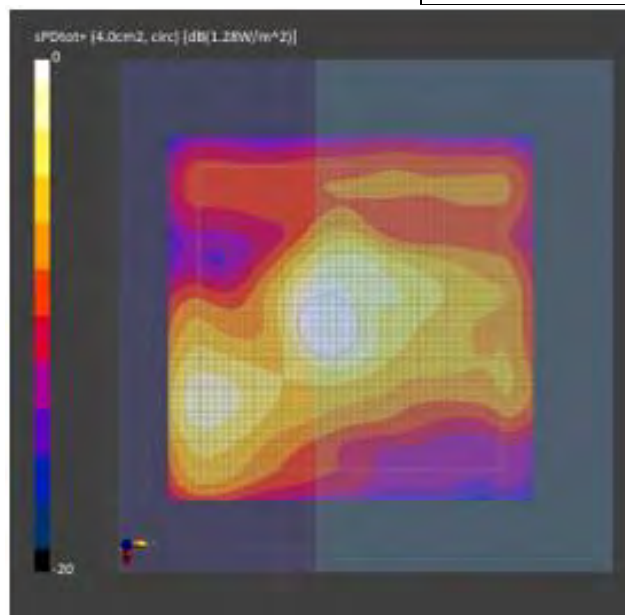
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2023-06-20	DAE4 Sn1758, 2023-08-24

Scans Setup

Measurement Results

Scan Type	5G Scan
Grid Extents [mm]	130.0 x 130.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0
MAIA	N/A

Scan Type	5G Scan
Date	2023-11-27
Avg. Area [cm ²]	4.00
psPDn+ [W/m ²]	1.19
psPDtot+ [W/m ²]	1.28
E _{max} [V/m]	35.0
Power Drift [dB]	0.06



18)
Eurofins KCTL Co.,Ltd.

Measurement Report for NP750QGK, 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
NP750QGK, SAMSUNG	230.0 x 12.0 x 356.0	1Q6991ZWA00147D	Laptop + Main 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

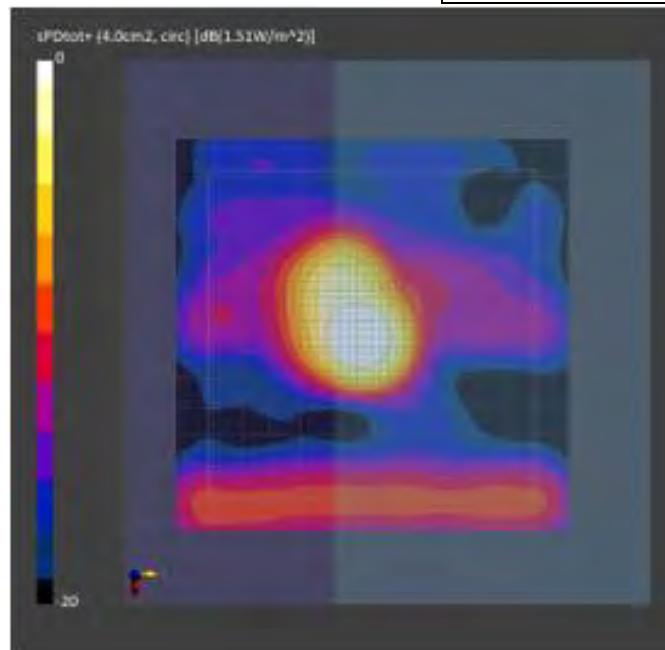
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2023-06-20	DAE4 Sn1758, 2023-08-24

Scans Setup

Measurement Results

Scan Type	5G Scan
Grid Extents [mm]	130.0 x 130.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0
MAIA	N/A

Scan Type	5G Scan
Date	2023-11-27
Avg. Area [cm ²]	4.00
psPDn+ [W/m ²]	1.35
psPDtot+ [W/m ²]	1.51
E _{max} [V/m]	39.2
Power Drift [dB]	0.12



19)
Eurofins KCTL Co.,Ltd.

Measurement Report for NP750QGK, 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
NP750QGK, SAMSUNG	230.0 x 12.0 x 356.0	1Q6991ZWA00147D	Laptop + Aux 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

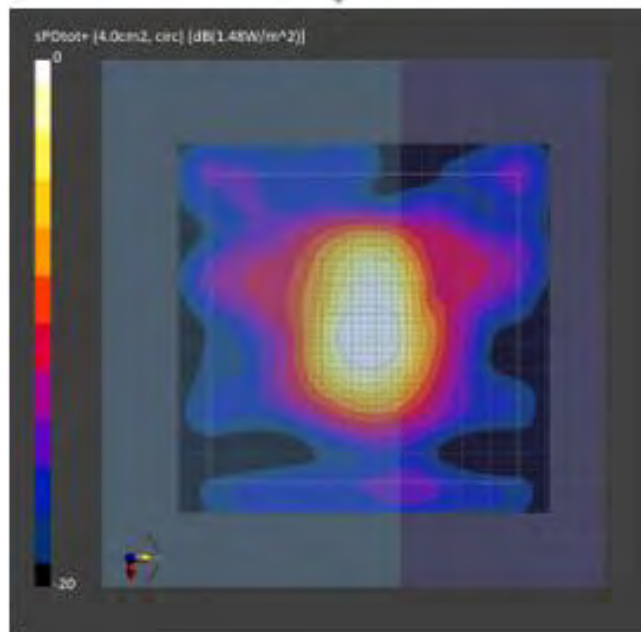
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2023-06-20	DAE4 Sn1758, 2023-08-24

Scans Setup

Measurement Results

Scan Type	5G Scan
Grid Extents [mm]	130.0 x 130.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0
MAIA	N/A

Scan Type	5G Scan
Date	2023-11-27
Avg. Area [cm ²]	4.00
psPDn+ [W/m ²]	1.25
psPDtot+ [W/m ²]	1.48
E _{max} [V/m]	41.8
Power Drift [dB]	-0.09



20)
Eurofins KCTL Co.,Ltd.

Measurement Report for NP750QGK, 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
NP750QGK, SAMSUNG	230.0 x 12.0 x 356.0	1Q6991ZWA00147D	Laptop + Aux 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

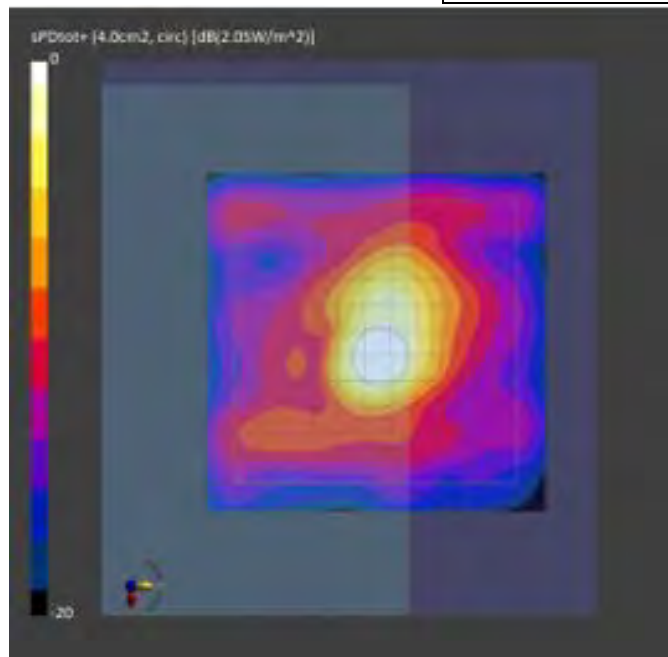
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2023-06-20	DAE4 Sn1758, 2023-08-24

Scans Setup

Measurement Results

Scan Type	5G Scan
Grid Extents [mm]	130.0 x 130.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0
MAIA	N/A

Scan Type	5G Scan
Date	2023-11-27
Avg. Area [cm ²]	4.00
psPDn+ [W/m ²]	1.77
psPDtot+ [W/m ²]	2.05
E _{max} [V/m]	49.9
Power Drift [dB]	0.03



21)
Eurofins KCTL Co.,Ltd.

Measurement Report for , EDGE LEFT, Custom Band 802.11 ax, UID 10755 AAC, Channel 47 (6185.0MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP750QGK, SAMSUNG	356.0 x 12.0 x 230.0	1Q6991ZWA00147D	Tablet + Main Antenna

Exposure Conditions

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

Hardware Setup

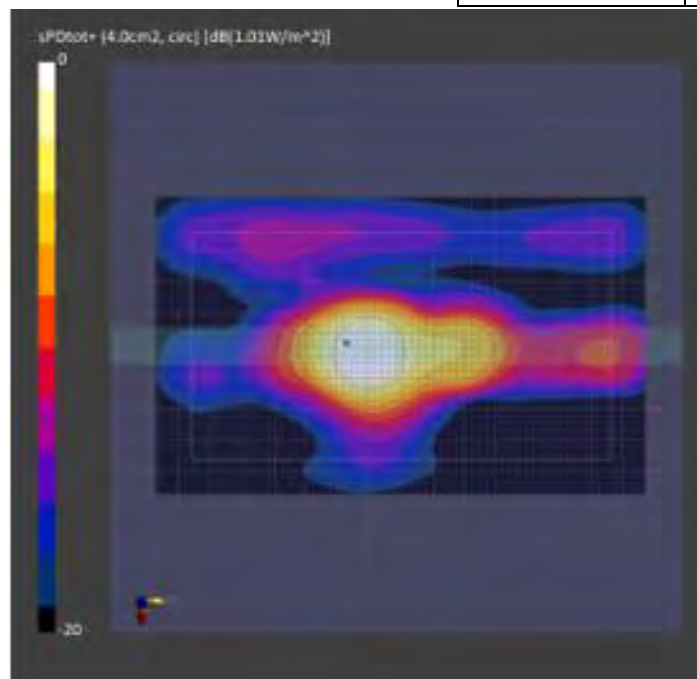
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2023-06-20	DAE4 Sn1758, 2023-08-24

Scans Setup

Measurement Results

Scan Type	5G Scan
Grid Extents [mm]	90.0 x 150.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0
MAIA	N/A

Scan Type	5G Scan
Date	2023-11-28
Avg. Area [cm ²]	4.00
psPDn+ [W/m ²]	0.808
psPDtot+ [W/m ²]	1.01
E _{max} [V/m]	38.5
Power Drift [dB]	0.08



22)
Eurofins KCTL Co.,Ltd.

Measurement Report for NP750QGK, EDGE LEFT, Custom Band 802.11 ax, UID 10755 AAC, Channel 111 (6505.0MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP750QGK, SAMSUNG	356.0 x 12.0 x 230.0	1Q6991ZWA00147D	Tablet + Main Antenna

Exposure Conditions

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

Hardware Setup

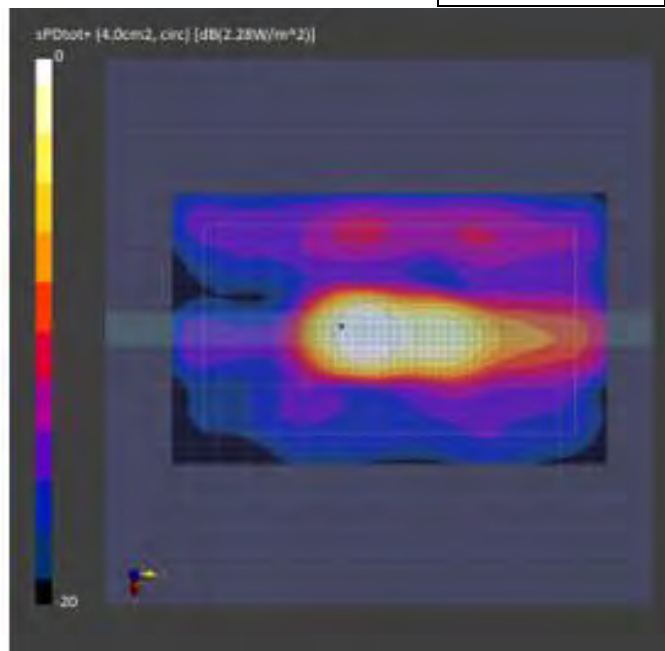
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2023-06-20	DAE4 Sn1758, 2023-08-24

Scans Setup

Measurement Results

Scan Type	5G Scan
Grid Extents [mm]	90.0 x 150.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0
MAIA	N/A

Scan Type	5G Scan
Date	2023-11-29
Avg. Area [cm ²]	4.00
psPDn+ [W/m ²]	1.97
psPDtot+ [W/m ²]	2.28
E _{max} [V/m]	51.8
Power Drift [dB]	0.09



23)
Eurofins KCTL Co.,Ltd.

Measurement Report for NP750QGK, EDGE LEFT, Custom Band 802.11 ax, UID 10755 AAC, Channel 143 (6665.0MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP750QGK, SAMSUNG	356.0 x 12.0 x 230.0	1Q6991ZWA00147D	Tablet + Main Antenna

Exposure Conditions

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

Hardware Setup

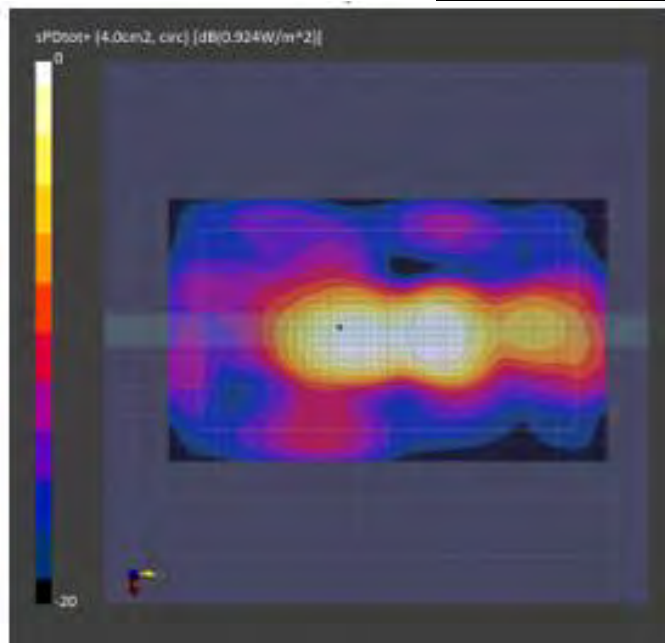
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2023-06-20	DAE4 Sn1758, 2023-08-24

Scans Setup

Measurement Results

Scan Type	5G Scan
Grid Extents [mm]	90.0 x 150.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0
MAIA	N/A

Scan Type	5G Scan
Date	2023-11-29
Avg. Area [cm ²]	4.00
psPDn+ [W/m ²]	0.700
psPDtot+ [W/m ²]	0.924
E _{max} [V/m]	38.6
Power Drift [dB]	-0.10



24)
Eurofins KCTL Co.,Ltd.

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

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
NP750QGK, SAMSUNG	356.0 x 12.0 x 230.0	1Q6991ZWA00147D	Tablet + Aux Antenna

Exposure Conditions

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

Hardware Setup

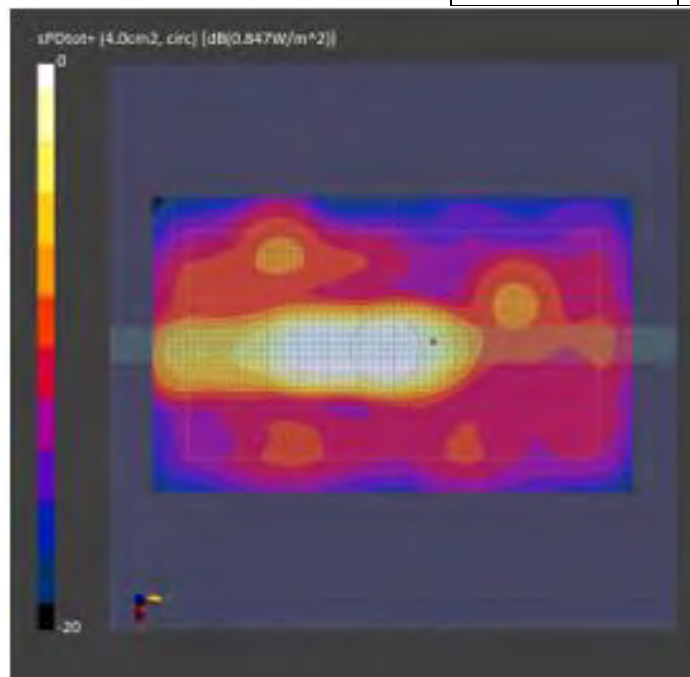
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2023-06-20	DAE4 Sn1758, 2023-08-24

Scans Setup

Measurement Results

Scan Type	5G Scan
Grid Extents [mm]	90.0 x 150.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0
MAIA	N/A

Scan Type	5G Scan
Date	2023-11-28
Avg. Area [cm ²]	4.00
psPDn+ [W/m ²]	0.748
psPDtot+ [W/m ²]	0.847
E _{max} [V/m]	31.9
Power Drift [dB]	-0.15



Appendixes List

Appendix A	A.1 Probe Calibration certificate (EX3DV4_7840) 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_1005)
Appendix B	SAR Tissue Specification
Appendix C	Power Reduction Verification
Appendix D	#Antenna Location & Distance
Appendix E	EUT Photo
Appendix F	Test Setup Photo

