TEST REPORT

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1. Client

- Name : Intel Corporation SAS
- Address : 425 Rue de Goa – Le Cargo B6 – 06600 Antibes, FRANCE
- Date of Receipt : 2024-06-18

2. Use of Report : Class II Permissive Change

3. Name of Product and Model : WLAN and BT, 2X2 PCIe M.2 1216 SD adapter card
- Model Number : AX211D2W
- Manufacturer and Country of Origin : Intel Corporation SAS / FRANCE

4. Host Product Name : Notebook PC
- Host Model Name : XE550XGA
- Manufacturer : Samsung Electronics Co., Ltd.

5. FCC ID : PD9AX211D2

6. Date of Test : 2024-06-26 ~ 2024-07-04

7. Location of Test : ■ Permanent Testing Lab □ On Site Testing
(Address: 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea)

8. Test Standards : IEEE 1528-2013, ANSI/IEEE C95.1, KDB Publication

9. Test Results : Refer to the test result in the test report

	Tested by	Technical Manager
Affirmation	Name : Mungi Jeong (Signature)	Name : Jongwon Ma (Signature)

2024-07-17

Eurofins KCTL Co.,Ltd.

REPORT REVISION HISTORY

Date	Revision	Page No
2024-07-17	Originally issued	-

General remarks for test reports

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

(may be required by the product standard or client)

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

Procedure number, issue date and title:

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

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

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

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1. General information

Client	:	Intel Corporation SAS
Address	:	425 Rue de Goa – Le Cargo B6 – 06600 Antibes, FRANCE
Manufacturer	:	Intel Corporation SAS
Address	:	425 Rue de Goa – Le Cargo B6 – 06600 Antibes, FRANCE
Host Client	:	Samsung Electronics Co., Ltd.
Address	:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
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
	Model Number	AX211D2W
	Manufacturer	Intel Corporation SAS
Host	Product Name	Notebook PC
	Model Name	XE550XGA
	Derivative Model	XE551XGA, XQ550XGA, XQ551XGA
	Manufacturer	Samsung Electronics Co., Ltd.
Host Product Serial Number	Radiation	6QTS9FMX500014R
	Conduction	6QTS9FMX500014R
Mode of Operation		WLAN 802.11ax
Device Overview		U-NII-5: 5 955.0 ㎒ ~ 6 415.0 ㎒ U-NII-6: 6 435.0 ㎒ ~ 6 515.0 ㎒ U-NII-7: 6 535.0 ㎒ ~ 6 855.0 ㎒ U-NII-8: 6 875.0 ㎒ ~ 7 115.0 ㎒

2.1.1 Differences from Derivative Models

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

Main model	XE550XGA
Derivative model	XE551XGA
Differences	Marketing 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	0.55	2.97
U-NII-6	6XD	**0.74**	4.69
U-NII-7	6XD	0.62	**5.15**
U-NII-8	6XD	0.49	4.66

2.3 #Antenna information

Antenna Type		PIFA antenna			
Band		UNII-5	UNII-6	UNII-7	UNII-8
Peak gain (dBi)	Main	4.06	4.12	4.27	4.08
	Aux	2.28	3.61	4.12	2.48

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.

Band	Ant.	Mode	Channel	Output Power (dBm)	
				Target	Max. Allowed
U-NII-5	SISO (Main, Aux)	802.11ax_20 MHz SU	All Chanel	4.50	**5.50**
		802.11ax_40 MHz SU	All Chanel	7.75	**8.75**
		802.11ax_80 MHz SU	All Chanel	10.25	**11.25**
		802.11ax_160 MHz SU	All Chanel	12.00	**13.00**
	MIMO (Main, Aux)	802.11ax_20 MHz SU	All Chanel	1.50	**2.50**
		802.11ax_40 MHz SU	All Chanel	4.75	**5.75**
		802.11ax_80 MHz SU	All Chanel	7.25	**8.25**
		802.11ax_160 MHz SU	All Chanel	9.50	**10.50**
U-NII-6	SISO (Main, Aux)	802.11ax_20 MHz SU	All Chanel	3.50	**4.50**
		802.11ax_40 MHz SU	All Chanel	7.50	**8.50**
		802.11ax_80 MHz SU	All Chanel	10.25	**11.25**
		802.11ax_160 MHz SU	All Chanel	12.00	**13.00**
	MIMO (Main, Aux)	802.11ax_20 MHz SU	All Chanel	1.00	**2.00**
		802.11ax_40 MHz SU	All Chanel	4.75	**5.75**
		802.11ax_80 MHz SU	All Chanel	7.25	**8.25**
		802.11ax_160 MHz SU	All Chanel	9.50	**10.50**
U-NII-7	SISO (Main, Aux)	802.11ax_20 MHz SU	All Chanel	3.75	**4.75**
		802.11ax_40 MHz SU	115	7.50	**8.50**
			Other	7.00	**8.00**
		802.11ax_80 MHz SU	All Chanel	9.50	**10.50**
		802.11ax_160 MHz SU	All Chanel	11.00	**12.00**
	MIMO (Main, Aux)	802.11ax_20 MHz SU	All Chanel	0.75	**1.75**
		802.11ax_40 MHz SU	115	4.75	**5.75**
			Other	4.00	**5.00**
		802.11ax_80 MHz SU	All Chanel	6.50	**7.50**
		802.11ax_160 MHz SU	All Chanel	8.50	**9.50**
U-NII-8	SISO (Main, Aux)	802.11ax_20 MHz SU	233	-1.50	**-0.50**
			Other	2.75	**3.75**
		802.11ax_40 MHz SU	All Chanel	7.00	**8.00**
		802.11ax_80 MHz SU	All Chanel	9.50	**10.50**
		802.11ax_160 MHz SU	All Chanel	11.00	**12.00**
	MIMO (Main, Aux)	802.11ax_20 MHz SU	233	-5.00	**-4.00**
			Other	-1.00	**0.00**
		802.11ax_40 MHz SU	All Chanel	4.00	**5.00**
		802.11ax_80 MHz SU	All Chanel	6.50	**7.50**
		802.11ax_160 MHz SU	All Chanel	8.50	**9.50**

2.5 SAR Test Configurations

2.5.1 #DUT Antenna Locations

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

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 ㎒ to 6 ㎓ 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:

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

SAR is expressed in units of Watts per kilogram (W/kg)
SAR measurement can be either related to the temperature elevation in tissue by

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

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

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

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 λ/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 λ/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 m anufacturer 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.

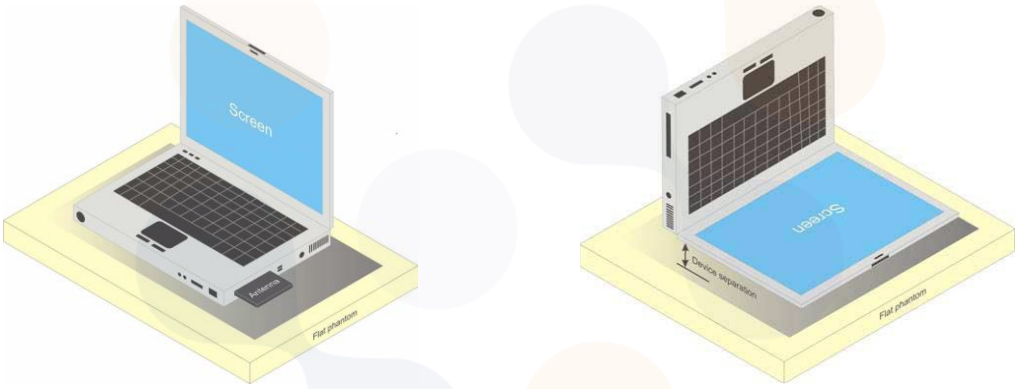


Figure 1. Notebook

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/cm^2.

Peak Spatially Averaged Power Density was evaluated over a circular area of 4 cm^2 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

Band	Mode	Freq. [MHz]	Channel	Conducted Powers (dBm)	
				Main Ant.	Aux Ant.
U-NII-5	802.11ax (160-SU)	6 025.0	15	12.22	12.24
		6 185.0	47	12.13	12.23
		6 345.0	79	12.00	12.14
U-NII-6		6 505.0	111	12.02	12.09
U-NII-7		6 665.0	143	11.02	11.00
		6 825.0	175	11.21	11.08
U-NII-8		6 985.0	207	11.31	11.27

7. System Verification

7.1 Measurement date and environment

Shield room	Date	Environment	
		Temperature (oC)	Humidity (%)
8F - 7	2024-07-02	22.4 ~ 22.6	58.3 ~ 59.2
8F - 3	2024-07-03	22.0 ~ 22.4	58.9 ~ 59.1
	2024-07-04	22.1 ~ 22.6	59.4 ~ 60.5

7.2 Tissue Verification

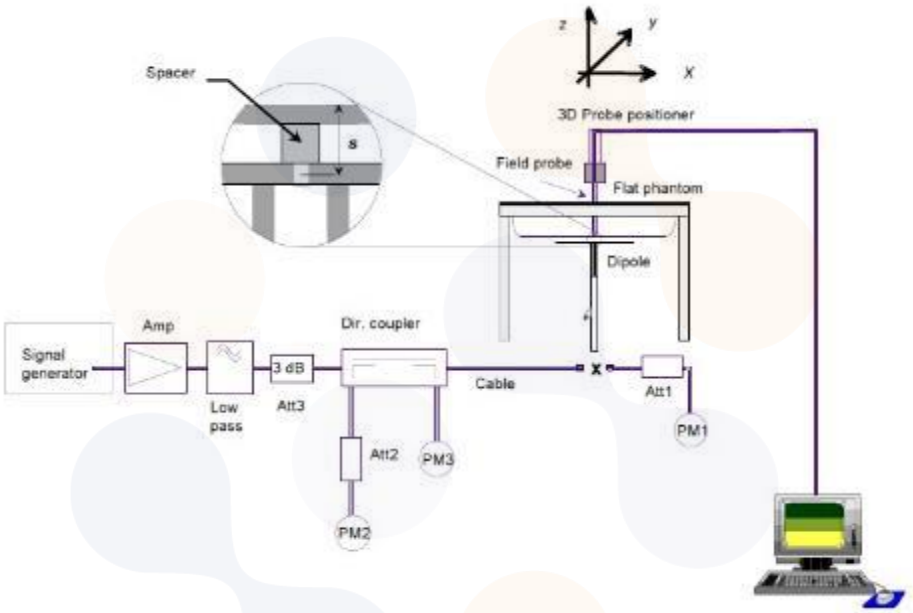
The dielectric properties for this Tissue Simulant Liquids were measured by using the SPEAG Model DAK3.5 Dielectric Probe in conjunction with Agilent E5071B Network Analyzer (300 kHz – 8 500 ㎒). The Conductivity (σ) and Permittivity (ε_r) are listed in Table 1.For the SAR measurement given in this report. The temperature variation of the Tissue Simulant Liquids was (22 ± 2) ℃.

Freq. (㎒)	Date	Recommended Limit / Measured		Temp. (°C)
		Permittivity (ε_r)	Conductivity (σ)	22 ± 2
6 500.0	2024-07-02	34.50 ± 5 % (32.78~36.23)	6.07 ± 5 % (5.77~6.37)	21.24
		34.30	5.90	
6 025.0		35.07 ± 5 % (33.32~36.82)	5.51 ± 5 % (5.23~5.79)	
		35.00	5.32	
6 185.0		34.88 ± 5 % (33.14~36.62)	5.70 ± 5 % (5.42~5.99)	
		34.70	5.51	
6 345.0		34.69 ± 5 % (32.96~36.42)	5.89 ± 5 % (5.60~6.18)	
		34.45	5.71	
6 505.0		34.49 ± 5 % (32.77~36.21)	6.08 ± 5 % (5.78~6.38)	
		34.30	5.90	
6 665.0		34.30 ± 5 % (32.59~36.02)	6.26 ± 5 % (5.95~6.57)	
		34.04	6.07	
6 825.0		34.11 ± 5 % (32.40~35.82)	6.45 ± 5 % (6.13~6.77)	
		33.80	6.24	
6 985.0		33.92 ± 5 % (32.22~35.62)	6.63 ± 5 % (6.30~6.96)	
		33.50	6.43	

<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 ± 10% from the t arget 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 ± 2) ℃, th e relative humidity was in the range(50 ± 20)% and the liquid depth Above the ear/grid refer ence 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.

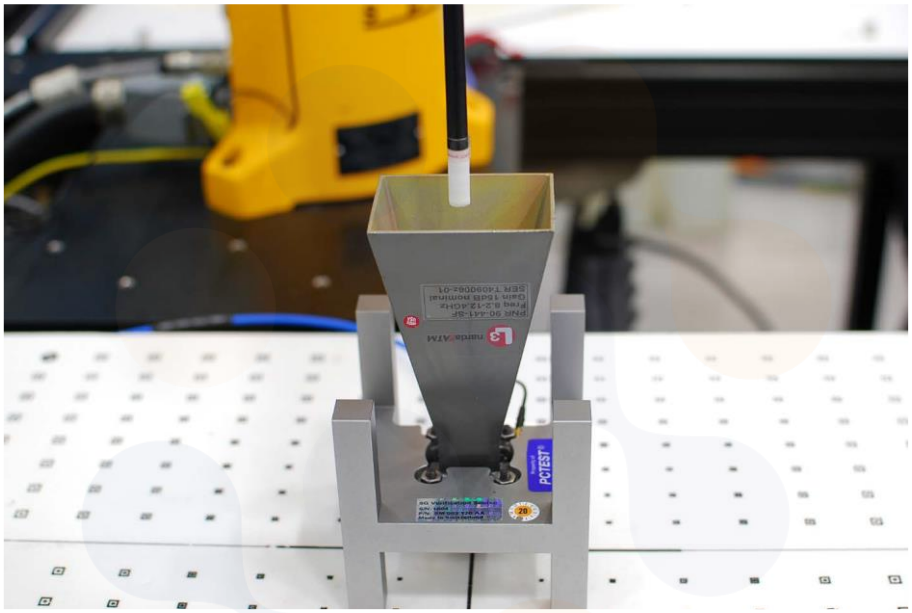


Verification Kit	Probe S/N	Frequency (㎒)	Tissue Type	Input Power (㎽)	Limit/Measured (Normalized to 1 W)	
D6.5GHzV2 SN: 1005	EX3DV4 SN: 7770	6 500.0	HSL	100	Measured	291.00 ± 10 % (261.90~320.10)
					2024-07-02	291.00

<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 cm² psPD (W/m²)		Deviation (dB)	Limit (dB)
					Target	Measured		
1023	9605	10	2024-07-03	93.3	54.6	56.9	0.18	± 0.66
1023	9605	10	2024-07-04	93.3	54.6	55.9	0.10	± 0.66

Notes
1) 10 ㎜ 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

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) 4cm^2	Plot No.
802.11ax (160-SU)	Main	Rear	0	6 025.0	12.22	13.00	1.197	1.015	0.357	0.434	2.10	
			0	6 185.0	12.13	13.00	1.222	1.015	0.441	**0.547**	2.74	1
	Aux	Rear	0	6 025.0	12.24	13.00	1.191	1.015	0.224	0.271	1.46	
			0	6 185.0	12.23	13.00	1.194	1.015	0.244	**0.296**	1.43	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) 4cm^2	Plot No.
802.11ax (160-SU)	Main	Rear	0	6 505.0	12.02	13.00	1.253	1.015	0.584	**0.743**	3.80	3
	Aux	Rear	0	6 505.0	12.09	13.00	1.233	1.015	0.348	**0.436**	2.05	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) 4cm^2	Plot No.
802.11ax (160-SU)	Main	Rear	0	6 825.0	11.21	12.00	1.199	1.015	0.511	**0.622**	3.28	5
	Aux	Rear	0	6 825.0	11.08	12.00	1.236	1.015	0.395	**0.496**	2.32	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) 4cm^2	Plot No.
802.11ax (160-SU)	Main	Rear	0	6 985.0	11.31	12.00	1.172	1.015	0.412	**0.490**	2.68	7
	Aux	Rear	0	6 985.0	11.27	12.00	1.183	1.015	0.378	**0.454**	2.20	8

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 4㎠ 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

U-NII-5											
Mode	Ant.	EUT Position	Distance (㎜)	Frequency (㎒)	Max. Tune-up Power (dBm)	iPD	Grid Step (λ)	Measurement Uncertainty	Measured Total psPD (W/m²)	Scaled Total psPD (W/m²)	Plot No.
									4㎠	4㎠	
802.11ax (160-SU)	Main	Rear	2	6 025.0	13.00	-	0.0625	1.462	2.03	**2.97**	9
			2	6 185.0	13.00	-	0.0625	1.462	1.33	1.94	

U-NII-6											
Mode	Ant.	EUT Position	Distance (㎜)	Frequency (㎒)	Max. Tune-up Power (dBm)	iPD	Grid Step (λ)	Measurement Uncertainty	Measured Total psPD (W/m²)	Scaled Total psPD (W/m²)	Plot No.
									4㎠	4㎠	
802.11ax (160-SU)	Main	Rear	2	6 505.0	13.00	-	0.0625	1.462	3.21	**4.69**	10

U-NII-7											
Mode	Ant.	EUT Position	Distance (㎜)	Frequency (㎒)	Max. Tune-up Power (dBm)	iPD	Grid Step (λ)	Measurement Uncertainty	Measured Total psPD (W/m²)	Scaled Total psPD (W/m²)	Plot No.
									4㎠	4㎠	
802.11ax (160-SU)	Aux	Rear	2	6 825.0	12.00	1.62	0.0625	1.462	3.52	**5.15**	11
			8.79	6 825.0	12.00	1.45	0.0625	1.462	1.83	2.68	
			2	6 665.0	12.00	-	0.0625	1.462	2.92	4.27	

U-NII-8											
Mode	Ant.	EUT Position	Distance (㎜)	Frequency (㎒)	Max. Tune-up Power (dBm)	iPD	Grid Step (λ)	Measurement Uncertainty	Measured Total psPD (W/m²)	Scaled Total psPD (W/m²)	Plot No.
									4㎠	4㎠	
802.11ax (160-SU)	Aux	Rear	2	6 985.0	12.00	-	0.0625	1.462	3.19	**4.66**	12

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 λ/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=2mm and d=λ/5mm 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=2mm.

10. Simultaneous Transmission

Refer to the "KR24-SPF0017" report for simultaneous transfer values.

11. Measurement Uncertainty

11.1 SAR Measurement Uncertainty

Per KDB 865664 D01 SAR measurement 100㎒ to 6㎓, 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 ≤ 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 DASY6/8 System			
Version	DASY6 mmWave: 3.0.0.841 / DASY8: 16.4.0.5005			
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	-	-
	-	8F - 7	-	-
DASY6 Robot	TX90XL speag	F/18/0004968/A/001	-	-
DASY8 Robot	TX2-60L	F/22/0040787/A/001	-	-
Phantom	mmWave Phantom	1090	-	-
	2mm Oval Phantom ELI5	1173	-	-
Mounting Device	Laptop Holder	-	-	-
mmWave Device Holder	mmWave Device Holder	1140	-	-
DAE	DAE4	1567	2024-03-14	2025-03-14
	DAE4	1759	2023-09-20	2024-09-20
Probe	EX3DV4	7770	2023-11-24	2024-11-24
Isotropic E-Field Probe	EUmmWV4	9605	2023-11-20	2024-11-20
MICROWAVE GENERATOR	SMP02	100295	2023-12-18	2024-12-18
Dual Power Meter	E4419B	GB43312301	2024-02-13	2025-02-13
Power Sensor	8481H	3318A19379	2024-02-13	2025-02-13
	8481H	3318A19377	2024-02-13	2025-02-13
Attenuator	PE7005-10	2228-7	2023-12-11	2024-12-11
	PE7005-10	2228-8	2023-12-11	2024-12-11
	PE7005-10	2228-9	2023-12-11	2024-12-11
Dual Directional Coupler	772D	MY46151145	2023-11-01	2024-11-01
	772D	2839A160504	2024-04-26	2025-04-26
Power Amplifier	AMP2027ADB	10005	2024-04-26	2025-04-26
Low Pass Filter	PE87FL1016	2213	2023-12-11	2024-12-11
	PE87FL1017	2134	2024-01-09	2025-01-09
System Verification Device	5G Verification Source 10 GHz	1023	2024-01-17	2025-01-17
Dipole Validation Kits	D6.5GHzV2	1005	2023-09-21	2025-09-21
ENA Series Network Analyzer	E5071B	MY42403524	2024-02-13	2025-02-13
Dielectric Assessment Kit	DAK-3.5	1078	2024-06-10	2025-06-10
Digital Thermometer	DTM3000	3939	2024-02-15	2025-02-15
Humidity/Temp	PC-5400TRH	PC-5400TRH-4	2023-11-06	2024-11-06
	PC-5400TRH	PC-5400TRH-3	2023-11-06	2024-11-06
MXA SIGNAL ANALYZER	N9020A	MY520900024	2023-11-01	2024-11-01

13. Test System Verification Results

13.1 SAR Test System Verification Results

Eurofins KCTL Co.,Ltd.

Measurement Report for D6.5GHzV2 - SN1005, FRONT, D6.5GHz, UID 0 -, (6500.000MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
D6.5GHzV2 - SN1005, Speag	10.0 x 10.0 x 296.0	1005	Validation Dipole

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz]	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, Head Simulating Liquid	FRONT, 5.00	D6.5GHz	CW, 0--	6500.000	4.78	5.90	34.3

Hardware Setup

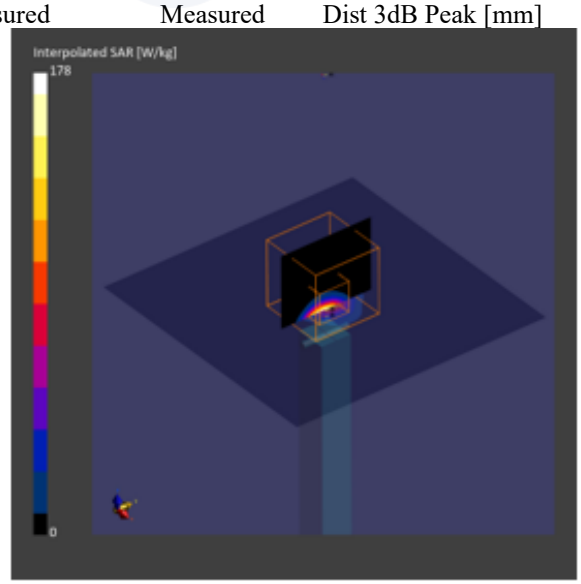
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 - 1173	HBBL-600-10000, 2024-07-02	EX3DV4 - SN7770, 2023-11-24	DAE4 Sn1759, 2023-09-20

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	80.0 x 80.0	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	2024-07-02	2024-07-02
psSAR1g [W/kg]	25.7	29.1
psSAR8g [W/kg]	6.07	6.76
psSAR10g [W/kg]	5.05	5.61
psAPD (1.0cm2, sq) [W/m2]		291
psAPD (4.0cm2, sq) [W/m2]		135
Power Drift [dB]		0.05
Peak SAR [W/kg]		178
M2/M1 [%]		51.2
Dist 3dB Peak [mm]		5.0



13.2 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

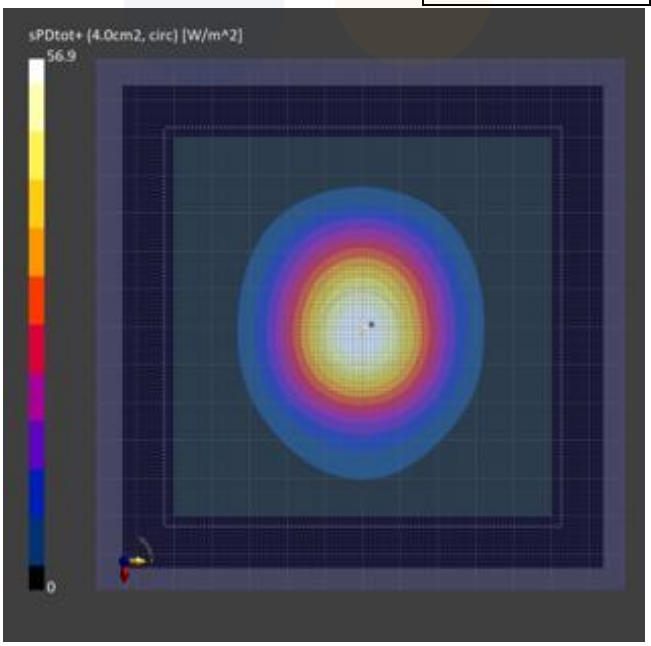
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9605_F1-55GHz, 2023-11-20	DAE4 Sn1567, 2024-03-14

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	2024-07-03
Avg. Area [cm^2]	4.00
psPDn+ [W/m^2]	56.7
psPDtot+ [W/m^2]	56.9
E_{max} [V/m]	156
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

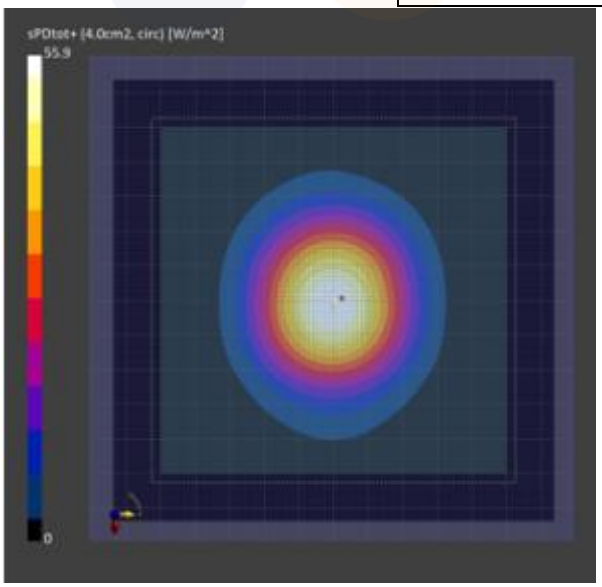
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9605_F1-55GHz, 2023-11-20	DAE4 Sn1567, 2024-03-14

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	2024-07-04
Avg. Area [cm^2]	4.00
psPDn+ [W/m^2]	55.7
psPDtot+ [W/m^2]	55.9
E_{max} [V/m]	155
Power Drift [dB]	0.09



14. Test Results

14.1 SAR Test Results

1)

Eurofins KCTL Co.,Ltd.

Measurement Report for XE550XGA, BACK, Custom Band, UID 0 -, Channel 47 (6185.000MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
XE550XGA, SAMSUNG	355.0 x 225.0 x 10.0	6QTS9FMX500014R	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, Head Simulating Liquid	BACK, 0.00	Custom Band	CW, 0--	6185.000, 47	4.78	5.51	34.7

Hardware Setup

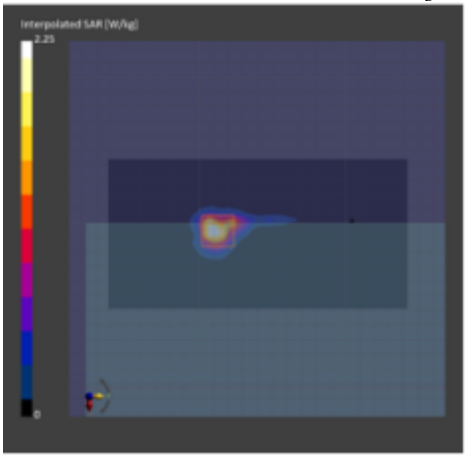
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 - 1173	HBBL-600-10000, 2024-07-02	EX3DV4 - SN7770, 2023-11-24	DAE4 Sn1759, 2023-09-20

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	100.0 x 200.0	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	2024-07-02	2024-07-02
psSAR1g [W/kg]	0.346	0.441
psSAR8g [W/kg]	0.127	0.137
psSAR10g [W/kg]	0.111	0.119
psAPD (1.0cm2, sq) [W/m2]		4.41
psAPD (4.0cm2, sq) [W/m2]		2.74
Power Drift [dB]		-0.18
Peak SAR [W/kg]		2.24
M2/M1 [%]		54.0
Dist 3dB Peak [mm]		5.7



2)
Eurofins KCTL Co.,Ltd.

Measurement Report for XE550XGA, BACK, Custom Band, UID 0 -, Channel 47 (6185.000MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
XE550XGA, SAMSUNG	355.0 x 225.0 x 10.0	6QTS9FMX500014R	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, Head Simulating Liquid	BACK, 0.00	Custom Band	CW, 0--	6185.000, 47	4.78	5.51	34.7

Hardware Setup

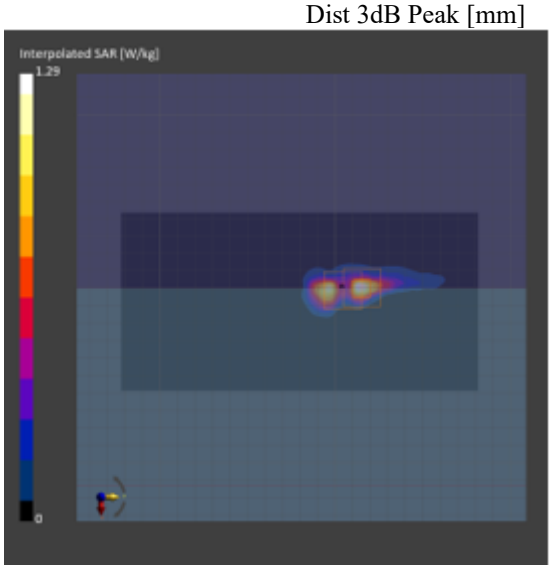
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 - 1173	HBBL-600-10000, 2024-07-02	EX3DV4 - SN7770, 2023-11-24	DAE4 Sn1759, 2023-09-20

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	100.0 x 200.0	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	2024-07-02	2024-07-02
psSAR1g [W/kg]	0.200	0.244
psSAR8g [W/kg]	0.060	0.071
psSAR10g [W/kg]	0.053	0.061
psAPD (1.0cm2, sq) [W/m2]		2.44
psAPD (4.0cm2, sq) [W/m2]		1.43
Power Drift [dB]		-0.09
Peak SAR [W/kg]		1.30
M2/M1 [%]		47.7
Dist 3dB Peak [mm]		4.0



3)

Eurofins KCTL Co.,Ltd.

Measurement Report for XE550XGA, BACK, Custom Band, UID 0 -, Channel 111 (6505.000MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
XE550XGA, SAMSUNG	355.0 x 225.0 x 10.0	6QTS9FMX500014R	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, Head Simulating Liquid	BACK, 0.00	Custom Band	CW, 0--	6505.000, 111	4.78	5.90	34.3

Hardware Setup

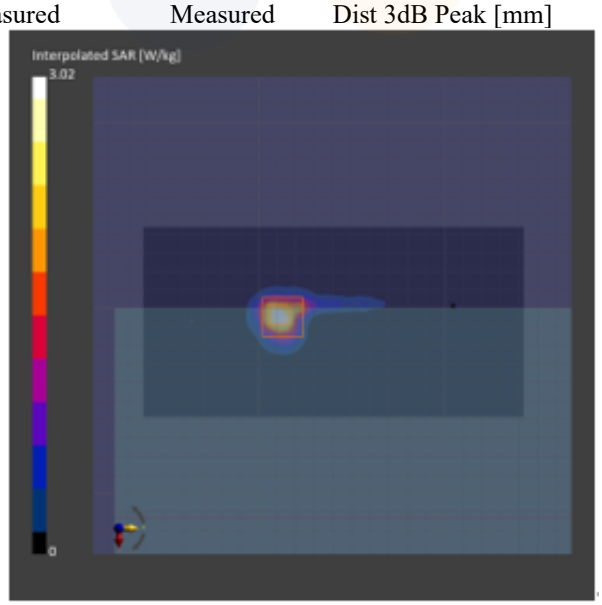
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 - 1173	HBBL-600-10000, 2024-07-02	EX3DV4 - SN7770, 2023-11-24	DAE4 Sn1759, 2023-09-20

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	100.0 x 200.0	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	2024-07-02	2024-07-02
psSAR1g [W/kg]	0.492	0.584
psSAR8g [W/kg]	0.180	0.190
psSAR10g [W/kg]	0.156	0.165
psAPD (1.0cm2, sq) [W/m2]		5.84
psAPD (4.0cm2, sq) [W/m2]		3.80
Power Drift [dB]		-0.01
Peak SAR [W/kg]		3.02
M2/M1 [%]		50.7
Dist 3dB Peak [mm]		6.1



4)

Eurofins KCTL Co.,Ltd.

Measurement Report for XE550XGA, BACK, Custom Band, UID 0 -, Channel 111 (6505.000MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
XE550XGA, SAMSUNG	355.0 x 225.0 x 10.0	6QTS9FMX500014R	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, Head Simulating Liquid	BACK, 0.00	Custom Band	CW, 0--	6505.000, 111	4.78	5.90	34.3

Hardware Setup

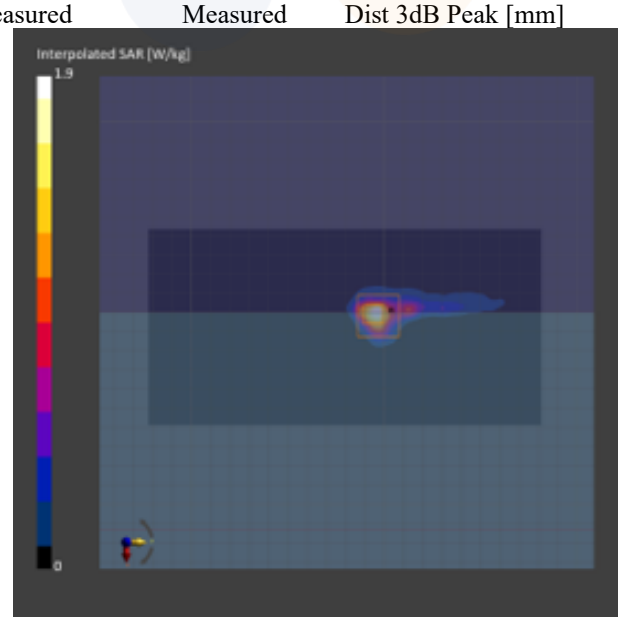
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 - 1173	HBBL-600-10000, 2024-07-02	EX3DV4 - SN7770, 2023-11-24	DAE4 Sn1759, 2023-09-20

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	100.0 x 200.0	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	2024-07-02	2024-07-02
psSAR1g [W/kg]	0.321	0.348
psSAR8g [W/kg]	0.101	0.103
psSAR10g [W/kg]	0.086	0.089
psAPD (1.0cm2, sq) [W/m2]		3.48
psAPD (4.0cm2, sq) [W/m2]		2.05
Power Drift [dB]		0.01
Peak SAR [W/kg]		1.90
M2/M1 [%]		52.5
Dist 3dB Peak [mm]		5.4



5)

Eurofins KCTL Co.,Ltd.

Measurement Report for XE550XGA, BACK, Custom Band, UID 0 -, Channel 175 (6825.000MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
XE550XGA, SAMSUNG	355.0 x 225.0 x 10.0	6QTS9FMX500014R	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, Head Simulating Liquid	BACK, 0.00	Custom Band	CW, 0--	6825.000, 175	4.78	6.24	33.8

Hardware Setup

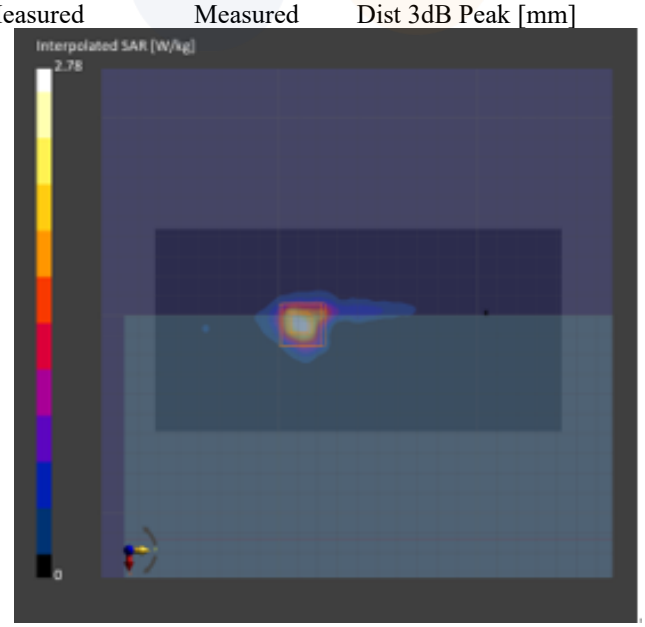
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 - 1173	HBBL-600-10000, 2024-07-02	EX3DV4 - SN7770, 2023-11-24	DAE4 Sn1759, 2023-09-20

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	100.0 x 200.0	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	2024-07-02	2024-07-02
psSAR1g [W/kg]	0.438	0.511
psSAR8g [W/kg]	0.159	0.164
psSAR10g [W/kg]	0.138	0.142
psAPD (1.0cm2, sq) [W/m2]		5.11
psAPD (4.0cm2, sq) [W/m2]		3.28
Power Drift [dB]		0.13
Peak SAR [W/kg]		2.78
M2/M1 [%]		47.3
Dist 3dB Peak [mm]		5.5



6)

Eurofins KCTL Co.,Ltd.

Measurement Report for XE550XGA, BACK, Custom Band, UID 0 -, Channel 175 (6825.000MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
XE550XGA, SAMSUNG	355.0 x 225.0 x 10.0	6QTS9FMX500014R	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, Head Simulating Liquid	BACK, 0.00	Custom Band	CW, 0--	6825.000, 175	4.78	6.24	33.8

Hardware Setup

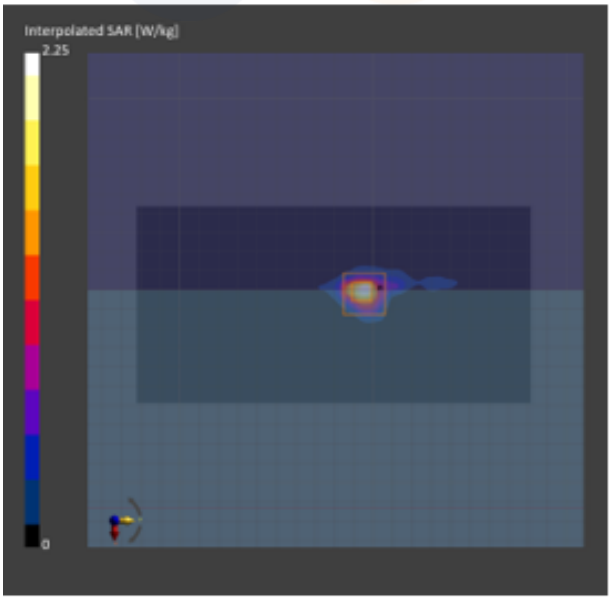
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 - 1173	HBBL-600-10000, 2024-07-02	EX3DV4 - SN7770, 2023-11-24	DAE4 Sn1759, 2023-09-20

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	100.0 x 200.0	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	2024-07-02	2024-07-02
psSAR1g [W/kg]	0.363	0.395
psSAR8g [W/kg]	0.114	0.116
psSAR10g [W/kg]	0.097	0.10
psAPD (1.0cm2, sq) [W/m2]		3.95
psAPD (4.0cm2, sq) [W/m2]		2.32
Power Drift [dB]		-0.02
Peak SAR [W/kg]		2.25
M2/M1 [%]		45.8
Dist 3dB Peak [mm]		5.2



7)

Eurofins KCTL Co.,Ltd.

Measurement Report for XE550XGA, BACK, Custom Band, UID 0 -, Channel 207 (6985.000MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
XE550XGA, SAMSUNG	355.0 x 225.0 x 10.0	6QTS9FMX500014R	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, Head Simulating Liquid	BACK, 0.00	Custom Band	CW, 0--	6985.000, 207	5.04	6.43	33.5

Hardware Setup

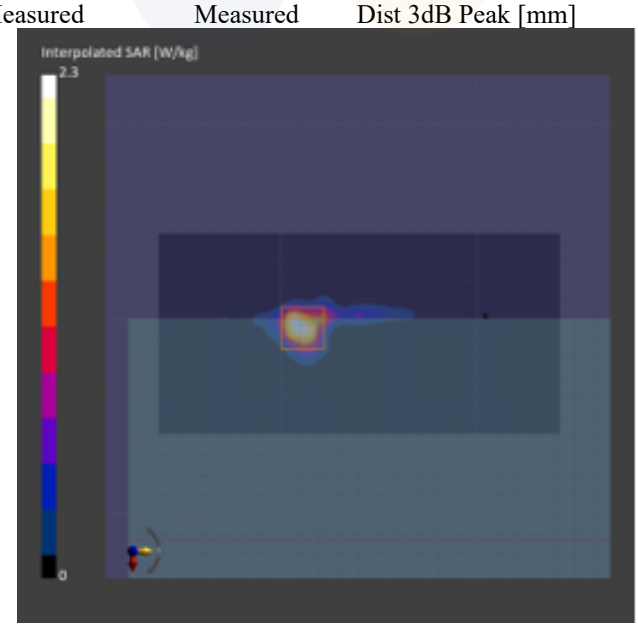
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 - 1173	HBBL-600-10000, 2024-07-02	EX3DV4 - SN7770, 2023-11-24	DAE4 Sn1759, 2023-09-20

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	100.0 x 200.0	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	2024-07-02	2024-07-02
psSAR1g [W/kg]	0.358	0.412
psSAR8g [W/kg]	0.127	0.134
psSAR10g [W/kg]	0.110	0.117
psAPD (1.0cm2, sq) [W/m2]		4.12
psAPD (4.0cm2, sq) [W/m2]		2.68
Power Drift [dB]		-0.18
Peak SAR [W/kg]		2.30
M2/M1 [%]		48.0
Dist 3dB Peak [mm]		5.5



8)

Eurofins KCTL Co.,Ltd.

Measurement Report for XE550XGA, BACK, Custom Band, UID 0 -, Channel 207 (6985.000MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
XE550XGA, SAMSUNG	355.0 x 225.0 x 10.0	6QTS9FMX500014R	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, Head Simulating Liquid	BACK, 0.00	Custom Band	CW, 0--	6985.000, 207	5.04	6.43	33.5

Hardware Setup

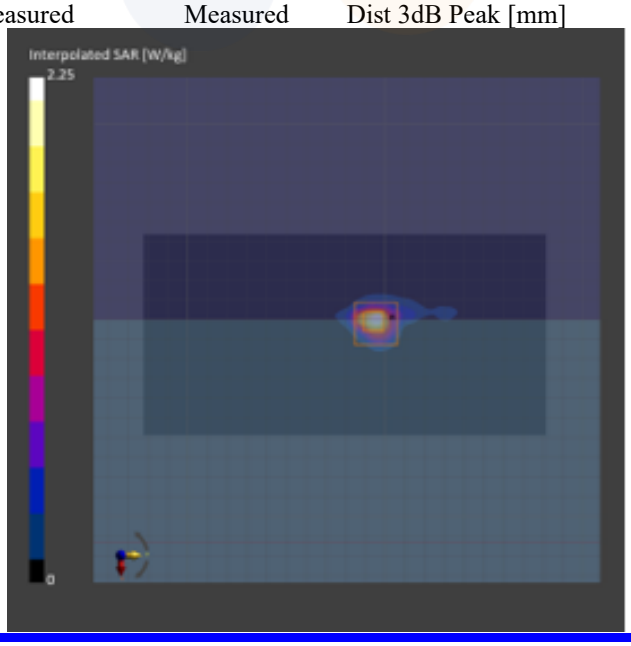
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V5.0 - 1173	HBBL-600-10000, 2024-07-02	EX3DV4 - SN7770, 2023-11-24	DAE4 Sn1759, 2023-09-20

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	100.0 x 200.0	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	2024-07-02	2024-07-02
psSAR1g [W/kg]	0.350	0.378
psSAR8g [W/kg]	0.109	0.110
psSAR10g [W/kg]	0.094	0.094
psAPD (1.0cm2, sq) [W/m2]		3.78
psAPD (4.0cm2, sq) [W/m2]		2.20
Power Drift [dB]		-0.16
Peak SAR [W/kg]		2.25
M2/M1 [%]		45.3
Dist 3dB Peak [mm]		5.2



14.2 PD Test Results

9)

Eurofins KCTL Co.,Ltd.

Measurement Report for XE550XGA, BACK, Custom Band, UID 0 -, Channel 15 (6025.0MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
XE550XGA, SAMSUNG	225.0 x 10.0 x 355.0	6QTS9FMX500014R	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

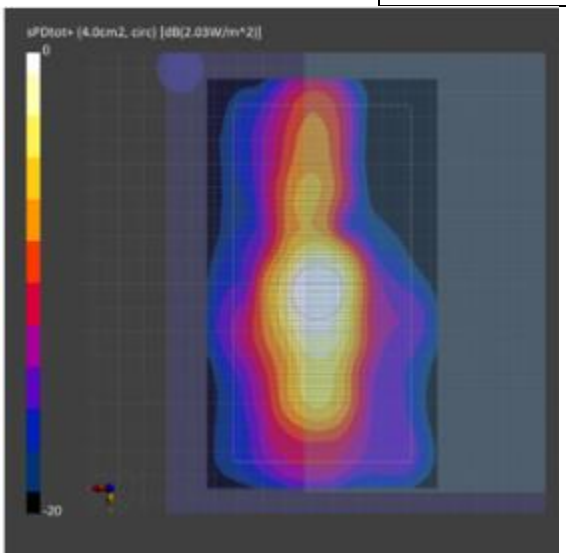
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9605_F1-55GHz, 2023-11-20	DAE4 Sn1567, 2024-03-14

Scans Setup

Measurement Results

Scan Type	5G Scan
Grid Extents [mm]	95.0 x 170.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0
MAIA	N/A

Scan Type	5G Scan
Date	2024-07-03
Avg. Area [cm^2]	4.00
psPDn+ [W/m^2]	1.45
psPDtot+ [W/m^2]	2.03
E_{max} [V/m]	46.3
Power Drift [dB]	0.12



10)
Eurofins KCTL Co.,Ltd.

Measurement Report for XE550XGA, BACK, Custom Band, UID 0 -, Channel 111 (6505.0MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
XE550XGA, SAMSUNG	225.0 x 10.0 x 355.0	6QTS9FMX500014R	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

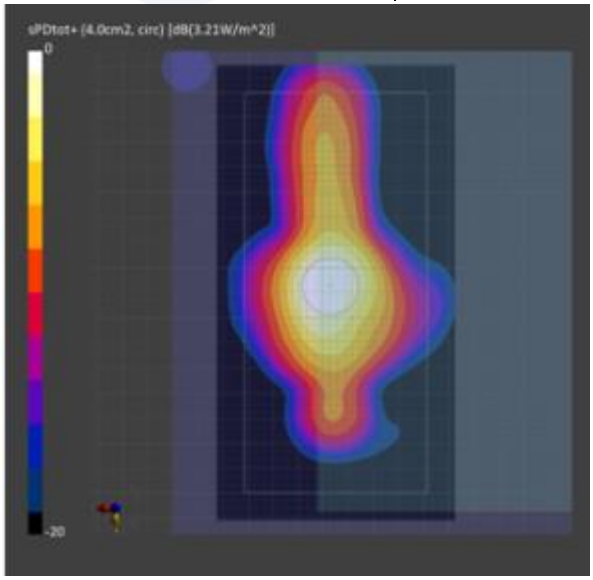
Hardware Setup

Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9605_F1-55GHz, 2023-11-20	DAE4 Sn1567, 2024-03-14

Scans Setup
Measurement Results

Scan Type	5G Scan
Grid Extents [mm]	95.0 x 180.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0
MAIA	N/A

Scan Type	5G Scan
Date	2024-07-03
Avg. Area [cm^2]	4.00
psPDn+ [W/m^2]	2.77
psPDtot+ [W/m^2]	3.21
E_{max} [V/m]	59.0
Power Drift [dB]	-0.10



11)
Eurofins KCTL Co.,Ltd.

Measurement Report for XE550XGA, BACK, Custom Band, UID 0 -, Channel 175 (6825.0MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
XE550XGA, SAMSUNG	225.0 x 10.0 x 355.0	6QTS9FMX500014R	Laptop + Main Antenna

Exposure Conditions

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

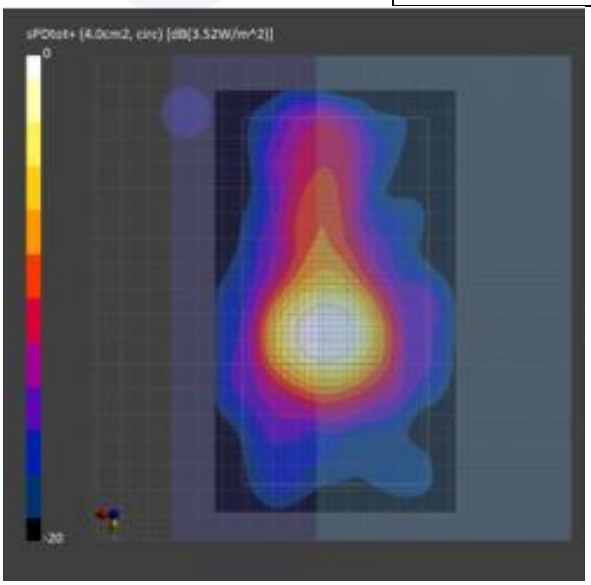
Hardware Setup

Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9605_F1-55GHz, 2023-11-20	DAE4 Sn1567, 2024-03-14

Scans Setup
Measurement Results

Scan Type	5G Scan
Grid Extents [mm]	95.0 x 165.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0
MAIA	N/A

Scan Type	5G Scan
Date	2024-07-03
Avg. Area [cm^2]	4.00
psPDn+ [W/m^2]	2.87
psPDtot+ [W/m^2]	3.52
E_{max} [V/m]	68.1
Power Drift [dB]	-0.08



12)
Eurofins KCTL Co.,Ltd.

Measurement Report for XE550XGA, BACK, Custom Band, UID 0 -, Channel 207 (6985.0MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	Serial Number	DUT Type
XE550XGA, SAMSUNG	225.0 x 10.0 x 355.0	6QTS9FMX500014R	Laptop + Main Antenna

Exposure Conditions

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

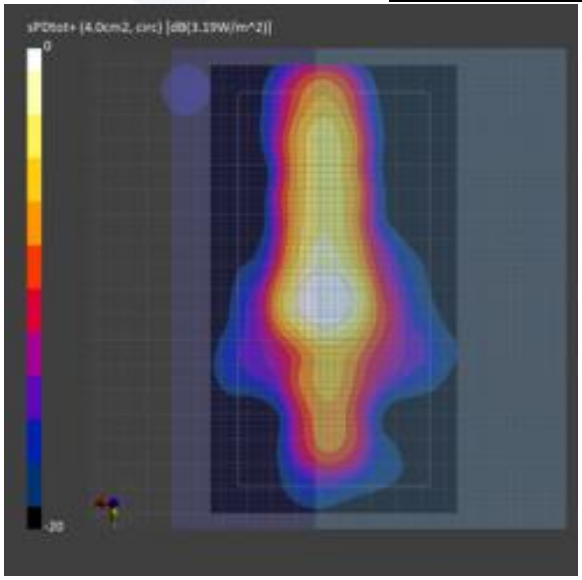
Hardware Setup

Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9605_F1-55GHz, 2023-11-20	DAE4 Sn1567, 2024-03-14

Scans Setup
Measurement Results

Scan Type	5G Scan
Grid Extents [mm]	95.0 x 175.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0
MAIA	N/A

Scan Type	5G Scan
Date	2024-07-04
Avg. Area [cm^2]	4.00
psPDn+ [W/m^2]	2.23
psPDtot+ [W/m^2]	3.19
E_{max} [V/m]	61.5
Power Drift [dB]	0.04



Appendixes List

Appendix A	A.1 Probe Calibration certificate (EX3DV4_7770) A.2 Probe Calibration certificate (EUmmWV4_9605) A.3 System Calibration certificate (5G Verification Source 10 GHz_1023) A.4 Dipole Calibration certificate (D6.5GHzV2_1005)
Appendix B	#Antenna Location & Distance
Appendix C	EUT Photo
Appendix D	Test Setup Photo