

Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China
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Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY6	V17.0.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	5 mm	with Spacer
Frequency	6500 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	34.5	6.07 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	34.0 $\pm$ 6 %	5.99 mho/m $\pm$ 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	30.9 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	308 W/kg $\pm$ 27 % (k=2)

SAR averaged over 8 cm³ (8 g) of Head TSL	Condition	
SAR measured	100 mW input power	6.94 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	69.1 W/kg $\pm$ 26 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	Condition	
SAR measured	100 mW input power	5.71 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	56.9 W/kg $\pm$ 26 % (k=2)

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Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.6Ω- 5.17jΩ
Return Loss	- 24.4dB

APD (Absorbed Power Density)

APD averaged over 1cm ²	Condition	
APD Measured	100 mW input power	309 W/m ²
APD Measured	normalized to 1W	3090 W/m ² ± 31 % (k=2)
APD averaged over 4cm ²	Condition	
APD Measured	100 mW input power	139 W/m ²
APD Measured	normalized to 1W	1390 W/m ² ± 30 % (k=2)

*The reported APD values have been derived using psSAR8g.

General Antenna Parameters and Design

After long term use with 100W radiated power, only a slight warming of the dipole near the feed-point can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feed-point may be damaged.

Additional EUT Data

Manufactured by	SPEAG
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DASY6 Validation Report for Head TSL
 Test Laboratory: CTTL, Beijing, China

Date: 2026-05-15

Summary

Dipole	Frequency [MHz]	TSL	Power [dBm]
D6.5GHzV2 – SN 1096	6500	HSL	20

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band Group, UID	Frequency [MHz]	Conversion Factor	TSL Cond. [S/m]	TSL Permittivity
Flat	5	CW,	6500	5.28	5.99	34.0

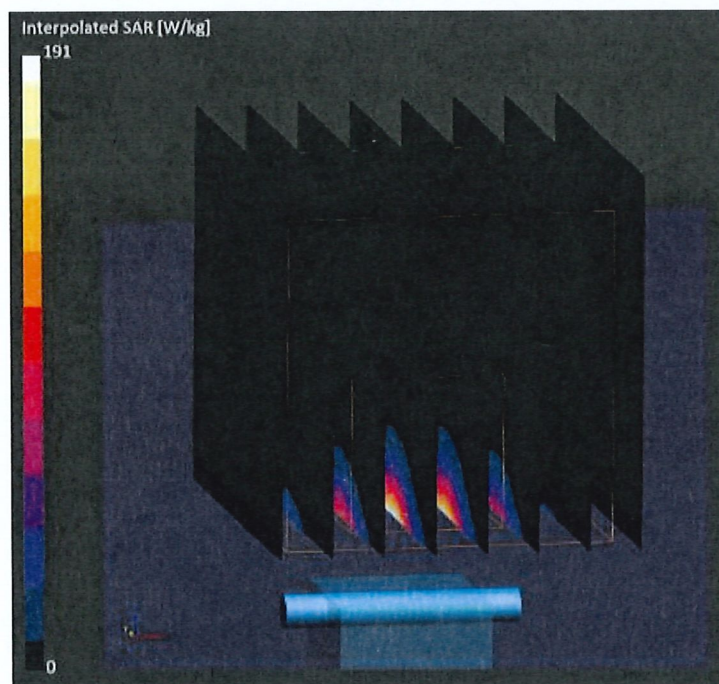
Hardware Setup

Phantom	TSL	Probe, Calibration Date	DAE, Calibration Date
MFP V8.0 Center	HSL6500	EX3DV4 - SN7464, 2026-01-26	DAE4 Sn1588, 2025-08-29

Scan Setup

Measurement Results

	Zoom Scan		Zoom Scan
Grid Extents [mm]	22.0×22.0×22.0	psSAR1g [W/kg]	30.9
Grid Steps [mm]	3.4 x 3.4 x 1.4	psSAR8g [W/kg]	6.94
Sensor Surface [mm]	1.4	psSAR10g [W/kg]	5.71
Graded Grid	Yes	Power Drift [dB]	-0.02
Grading Ratio	1.4	Power Scaling	Disabled
MAIA	N/A	Scaling Factor [dB]	
Surface Detection	All points	TSL Correction	No correction
Scan Method	Measured	M2/M1 [%]	50.4
		Dist 3dB Peak [mm]	4.8



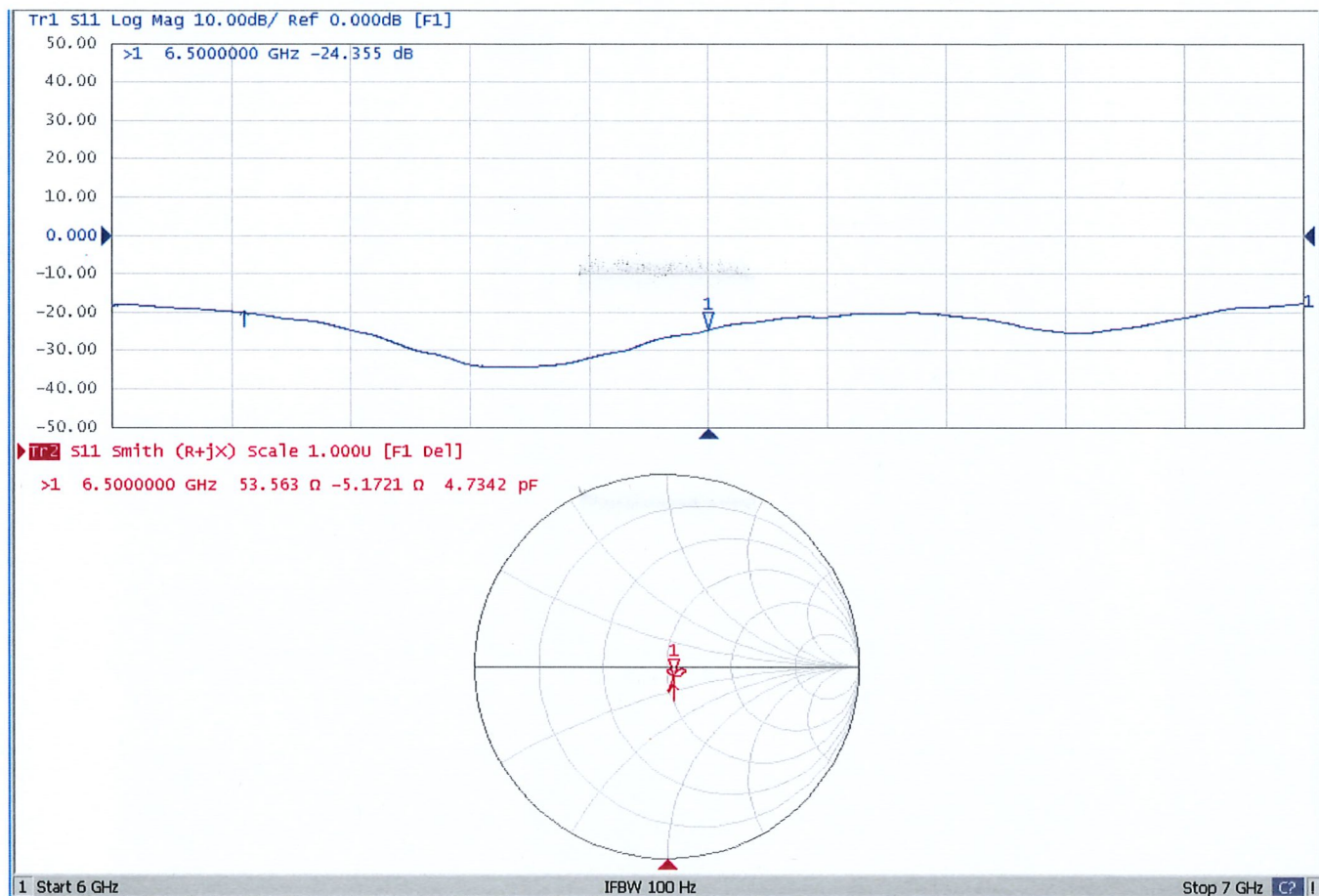


In Collaboration with
s p e a g
CALIBRATION LABORATORY



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Impedance Measurement Plot for Head TSL





Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client **DEKRA**
Suzhou

Certificate No. **5G-Veri10-1055_Sep24**

CALIBRATION CERTIFICATE

Object **5G Verification Source 10 GHz - SN: 1055**

Calibration procedure(s) **QA CAL-45.v5**
Calibration procedure for sources in air above 6 GHz

Calibration date: **September 16, 2024**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Reference Probe EUmmWV3	SN: 9374	28-Aug-24 (No. EUmm-9374_Aug24)	Aug-25
DAE4ip	SN: 1602	08-Nov-23 (No. DAE4ip-1602_Nov23)	Nov-24
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMF100A	SN: 100184	29-Nov-23 (in house check Nov-23)	In house check: Nov-24
Power sensor R&S NRP18S-10	SN: 101258	29-Nov-23 (in house check Nov-23)	In house check: Nov-24
Network Analyzer Keysight E5063A	SN: MY54504221	31-Oct-19 (in house check Oct-22)	In house check: Oct-25

Calibrated by:	Name Joanna Lleshaj	Function Laboratory Technician
Approved by:	Sven Kühn	Technical Manager

Signature

Issued: September 17, 2024

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



Glossary

Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 0108**

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CW Continuous wave

Calibration is Performed According to the Following Standards

- Internal procedure QA CAL-45, Calibration procedure for sources in air above 6 GHz.
- IEC/IEEE 63195-1, "Assessment of power density of human exposure to radio frequency fields from wireless devices in close proximity to the head and body (frequency range of 6 GHz to 300 GHz)", May 2022

Methods Applied and Interpretation of Parameters

- *Coordinate System:* z-axis in the waveguide horn boresight, x-axis is in the direction of the E-field, y-axis normal to the others in the field scanning plane parallel to the horn flare and horn flange.
- *Measurement Conditions:* (1) 10 GHz: The radiated power is the forward power to the horn antenna minus ohmic and mismatch loss. The forward power is measured prior and after the measurement with a power sensor. During the measurements, the horn is directly connected to the cable and the antenna ohmic and mismatch losses are determined by far-field measurements. (2) 30, 45, 60 and 90 GHz: The verification sources are switched on for at least 30 minutes. Absorbers are used around the probe cub and at the ceiling to minimize reflections.
- *Horn Positioning:* The waveguide horn is mounted vertically on the flange of the waveguide source to allow vertical positioning of the EUmmW probe during the scan. The plane is parallel to the phantom surface. Probe distance is verified using mechanical gauges positioned on the flare of the horn.
- *E- field distribution:* E field is measured in two x-y-plane (10mm, 10mm + $\lambda/4$) with a vectorial E-field probe. The E-field value stated as calibration value represents the E-field-maxima and the averaged (1cm² and 4cm²) power density values at 10mm in front of the horn.
- *Field polarization:* Above the open horn, linear polarization of the field is expected. This is verified graphically in the field representation.

Calibrated Quantity

- Local peak E-field (V/m) and average of peak spatial components of the poynting vector (W/m²) averaged over the surface area of 1 cm² and 4cm² at the nominal operational frequency of the verification source. Both square and circular averaging results are listed.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY8 Module mmWave	V3.2
Phantom	5G Phantom	
Distance Horn Aperture - plane	10 mm	
Number of measured planes	2 (10mm, 10mm + $\lambda/4$)	
Frequency	10 GHz $\pm$ 10 MHz	

Calibration Parameters, 10 GHz

Circular Averaging

Distance Horn Aperture to Measured Plane	<i>Prad¹</i> (mW)	Max E-field (V/m)	Uncertainty (k = 2)	Avg Power Density Avg (psPDn+, psPDtot+, psPDmod+) (W/m ²)		Uncertainty (k = 2)
				1 cm ²	4 cm ²	
10 mm	93.3	152	1.27 dB	60.4	56.2	1.28 dB

Distance Horn Aperture to Measured Plane	<i>Prad¹</i> (mW)	Max E-field (V/m)	Uncertainty (k = 2)	Power Density psPDn+, psPDtot+, psPDmod+ (W/m ²)		Uncertainty (k = 2)
				1 cm ²	4 cm ²	
10 mm	93.3	152	1.27 dB	60.0, 60.6, 60.7	55.6, 56.4, 56.6	1.28 dB

Square Averaging

Distance Horn Aperture to Measured Plane	<i>Prad¹</i> (mW)	Max E-field (V/m)	Uncertainty (k = 2)	Avg Power Density Avg (psPDn+, psPDtot+, psPDmod+) (W/m ²)		Uncertainty (k = 2)
				1 cm ²	4 cm ²	
10 mm	93.3	152	1.27 dB	60.4	56.1	1.28 dB

Distance Horn Aperture to Measured Plane	<i>Prad¹</i> (mW)	Max E-field (V/m)	Uncertainty (k = 2)	Power Density psPDn+, psPDtot+, psPDmod+ (W/m ²)		Uncertainty (k = 2)
				1 cm ²	4 cm ²	
10 mm	93.3	152	1.27 dB	60.0, 60.5, 60.7	55.5, 56.2, 56.5	1.28 dB

Max Power Density

Distance Horn Aperture to Measured Plane	<i>Prad¹</i> (mW)	Max E-field (V/m)	Uncertainty (k = 2)	Max Power Density Sn, Stot, Stot (W/m ²)	Uncertainty (k = 2)
10 mm	93.3	152	1.27 dB	61.7, 62.1, 62.2	1.28 dB

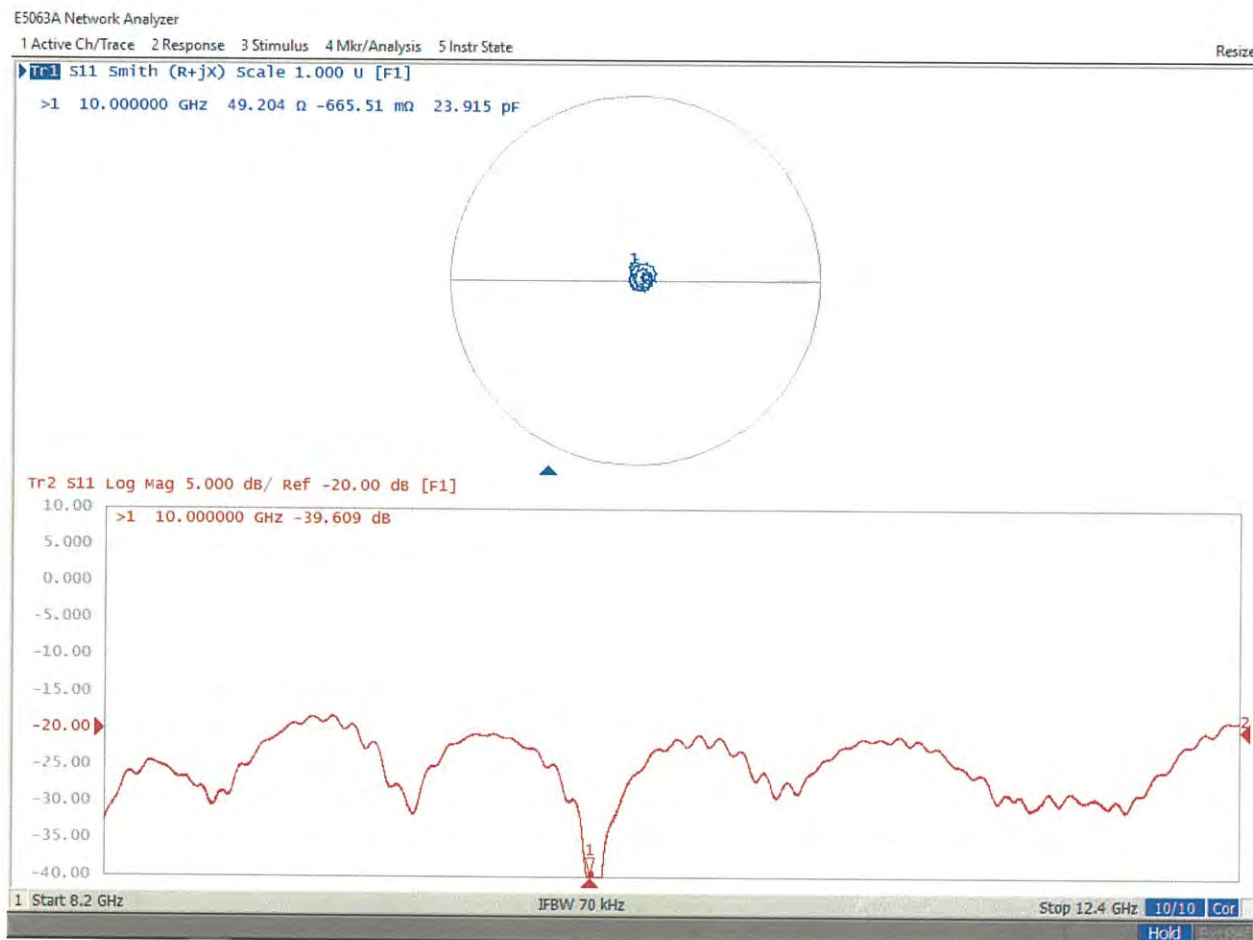
¹ Assessed ohmic and mismatch loss plus numerical offset: 0.30 dB

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters

Impedance, transformed to feed point	49.2 Ω - 0.7 j Ω
Return Loss	- 39.6 dB

Impedance Measurement Plot



DASY Report

Measurement Report for 5G Verification Source 10 GHz, UID 0 -, Channel 10000 (10000.0MHz)

Device under Test Properties

Name, Manufacturer	Dimensions [mm]	IMEI	DUT Type
5G Verification Source 10 GHz	100.0 x 100.0 x 172.0	SN: 1055	-

Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Band	Group,	Frequency [MHz], Channel Number	Conversion Factor
5G -	10.0 mm	Validation band	CW	10000.0, 10000	1.0

Hardware Setup

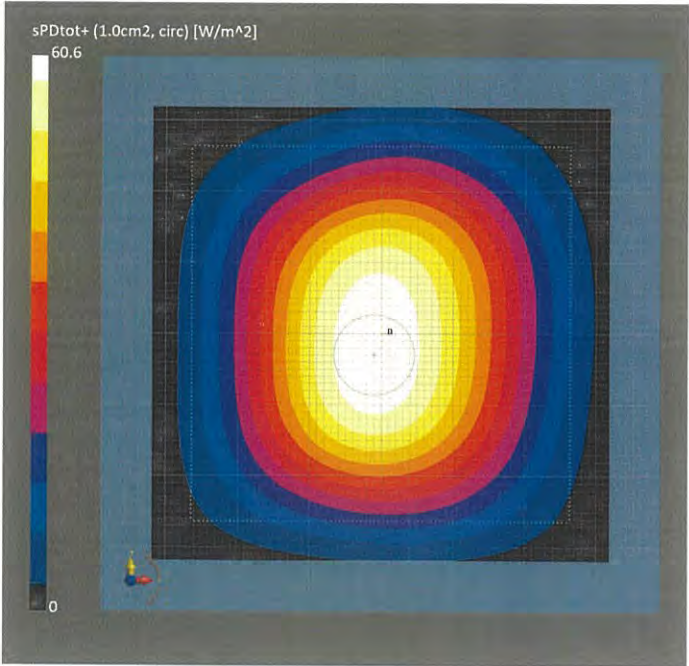
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave Phantom - 1002	Air	EUmmWV3 - SN9374_F1-55GHz, 2024-08-28	DAE4ip Sn1602, 2023-11-08

Scan Setup

Sensor Surface [mm]	5G Scan
MAIA	10.0
	MAIA not used

Measurement Results

Date	5G Scan
Avg. Area [cm²]	2024-09-16, 15:15
Avg. Type	1.00
psPDn+ [W/m²]	Circular Averaging
psPDtot+ [W/m²]	60.0
psPDmod+ [W/m²]	60.6
Max(Sn) [W/m²]	60.7
Max(Stot) [W/m²]	61.7
Max(Stot) [W/m²]	62.1
E _{max} [V/m]	62.2
Power Drift [dB]	152
	0.01



DASY Report

Measurement Report for 5G Verification Source 10 GHz, UID 0 -, Channel 10000 (10000.0MHz)

Device under Test Properties

Name, Manufacturer	Dimensions [mm]	IMEI	DUT Type
5G Verification Source 10 GHz	100.0 x 100.0 x 172.0	SN: 1055	-

Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Band	Group,	Frequency [MHz], Channel Number	Conversion Factor
5G -	10.0 mm	Validation band	CW	10000.0, 10000	1.0

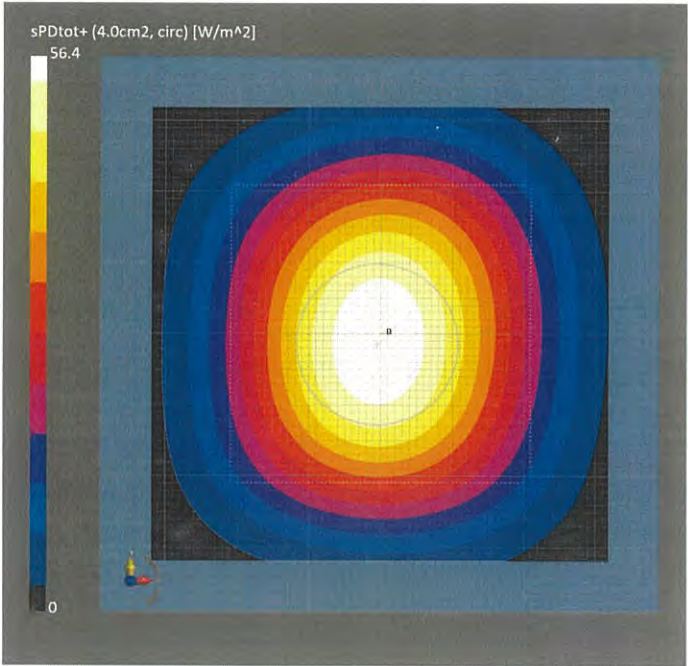
Hardware Setup

Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave Phantom - 1002	Air	EUmmWV3 - SN9374_F1-55GHz, 2024-08-28	DAE4ip Sn1602, 2023-11-08

Scan Setup

Sensor Surface [mm]	5G Scan	Date	5G Scan
MAIA	10.0	2024-09-16, 15:15	
	MAIA not used	Avg. Area [cm ²]	4.00
		Avg. Type	Circular Averaging
		psPDn+ [W/m ²]	55.6
		psPDtot+ [W/m ²]	56.4
		psPDmod+ [W/m ²]	56.6
		Max(Sn) [W/m ²]	61.7
		Max(Stot) [W/m ²]	62.1
		Max(Stot) [W/m ²]	62.2
		E _{max} [V/m]	152
		Power Drift [dB]	0.01

Measurement Results



DASY Report

Measurement Report for 5G Verification Source 10 GHz, UID 0 -, Channel 10000 (10000.0MHz)

Device under Test Properties

Name, Manufacturer	Dimensions [mm]	IMEI	DUT Type
5G Verification Source 10 GHz	100.0 x 100.0 x 172.0	SN: 1055	-

Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Band	Group,	Frequency [MHz], Channel Number	Conversion Factor
5G -	10.0 mm	Validation band	CW	10000.0, 10000	1.0

Hardware Setup

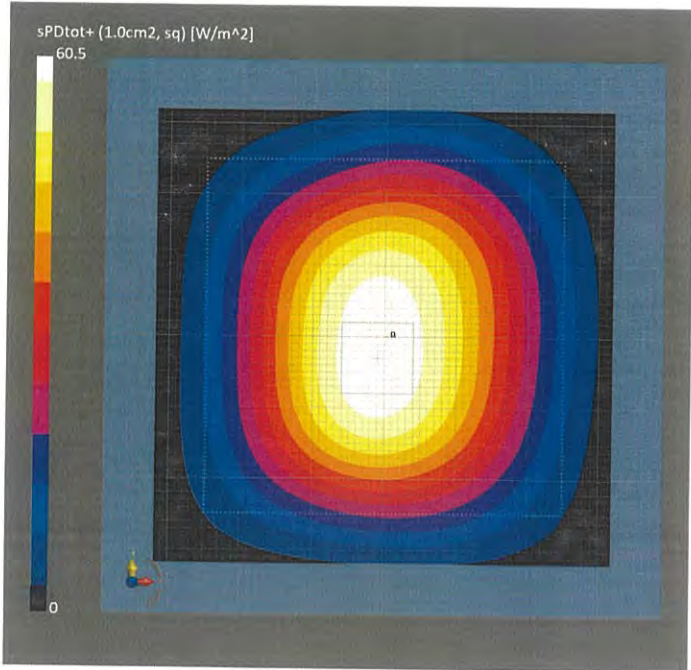
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave Phantom - 1002	Air	EUmmWV3 - SN9374_F1-55GHz, 2024-08-28	DAE4ip Sn1602, 2023-11-08

Scan Setup

Sensor Surface [mm]	5G Scan
MAIA	10.0 MAIA not used

Measurement Results

Date	5G Scan
Avg. Area [cm ²]	2024-09-16, 15:15
Avg. Type	1.00
psPDn+ [W/m ²]	Square Averaging
psPDtot+ [W/m ²]	60.0
psPDmod+ [W/m ²]	60.5
Max(Sn) [W/m ²]	60.7
Max(Stot) [W/m ²]	61.7
Max(Stot) [W/m ²]	62.1
E _{max} [V/m]	62.2
Power Drift [dB]	152
	0.01



DASY Report

Measurement Report for 5G Verification Source 10 GHz, UID 0 -, Channel 10000 (10000.0MHz)

Device under Test Properties

Name, Manufacturer	Dimensions [mm]	IMEI	DUT Type
5G Verification Source 10 GHz	100.0 x 100.0 x 172.0	SN: 1055	-

Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Band	Group,	Frequency [MHz], Channel Number	Conversion Factor
5G -	10.0 mm	Validation band	CW	10000.0, 10000	1.0

Hardware Setup

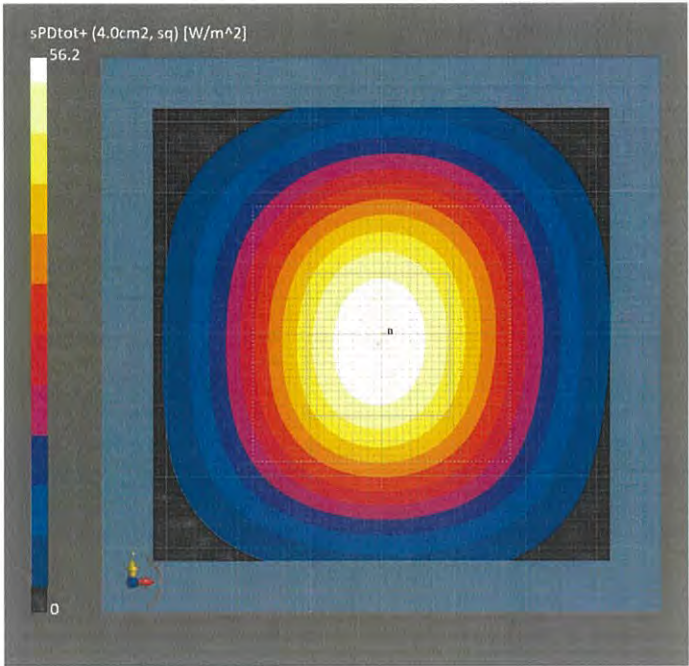
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave Phantom - 1002	Air	EUmmWV3 - SN9374_F1-55GHz, 2024-08-28	DAE4ip Sn1602, 2023-11-08

Scan Setup

Sensor Surface [mm]	5G Scan
MAIA	10.0
	MAIA not used

Measurement Results

Date	5G Scan
2024-09-16, 15:15	
Avg. Area [cm²]	4.00
Avg. Type	Square Averaging
psPDn+ [W/m²]	55.5
psPDtot+ [W/m²]	56.2
psPDmod+ [W/m²]	56.5
Max(Sn) [W/m²]	61.7
Max(Stot) [W/m²]	62.1
Max(Stot) [W/m²]	62.2
E _{max} [V/m]	152
Power Drift [dB]	0.01



10GHz SN 1055 Extended Dipole Calibrations

Referring to KDB 865664, if dipoles are verified in return loss ($< -20\text{dB}$, within 20% of prior calibration), and in impedance (within 5 ohm of prior calibration), the annual calibration is not necessary, and the calibration interval can be extended.

10GHz (SN 1055)						
Measurement	Return Loss(dB)	$\Delta \%$	Real Impedance (Ω)	$\Delta \Omega$	Imaginary Impedance (Ω)	$\Delta \Omega$
Cal. Report	-39.609	/	49.204	/	-0.66551	/
Extended	-38.834	-1.96	47.081	-2.123	-0.10471	0.5608

The return loss is $< -20\text{dB}$, within 20% of prior calibration; the impedance is within 5 ohm of prior calibration. Therefore the verification result should support extended calibration.

