

TEST REPORT

Test Report No.: 1-0249-25-01-02_TR1-R01

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Accredited Testing Laboratory:

The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2018-03) by the Deutsche Akkreditierungsstelle GmbH (DAkkS).

The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number:

D-PL-12047-01-00.

ISED Testing Laboratory Recognized Listing Number: DE0001

FCC designation number: DE0002

Applicant

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Manufacturer

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Test Standard/s

KDB 447498D01v06

KDB 680106 D01v04

IEC/IEEE 63195 ED1

Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies

Equipment Authorization of Wireless Power Transfer devices

Measurement Procedure for the assessment of power density of human exposure to radio frequency fields from wireless devices operating in close proximity to the head and body – Frequency range of 6 GHz to 300 GHz

For further applied test standards please refer to section 3 of this test report.

Test Item

Kind of test item:

Model name:

FCC ID:

Serial number:

Frequency:

Antenna:

Power supply:

Test sample status:

Exposure category:

SRD for RTTT and other vehicle or fixed installation

SRR6-B

OAYSRR6B

A2C782065160000224A0200032 (DUT 21)

76 to 77 GHz

77 to 81 GHz

Integrated patch antenna

9 V to 18 V DC by external power supply (battery)

identical prototype

general population / uncontrolled environment

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2 General information

2.1 Notes and disclaimer

The test results of this test report relate exclusively to the test item specified in this test report. cetecom advanced GmbH does not assume responsibility for any conclusions and generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of cetecom advanced GmbH.

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In no case this test report can be considered as a Letter of Approval.

2.2 Application details

Date of receipt of order:	2025-11-05
Date of receipt of test item:	2025-11-10
Start of test:	2025-11-20
End of test:	2025-12-17

2.3 Statement of compliance

The APD values found for the SRR6-B SRD for RTTT and other vehicle or fixed installation are below the maximum allowed levels according to the standards listed in section 4.

3 Test standard/s:

Test Standard	Version	Test Standard Description
IEEE Std. C95-3	2021	IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields – RF and Microwave
IEC/IEEE 63195 ED1	2019-03	Measurement Procedure for the assessment of power density of human exposure to radio frequency fields from wireless devices operating in close proximity to the head and body – Frequency range of 6 GHz to 300 GHz
FCC KDBs:		
KDB 865664D02v01	October 23, 2015	RF Exposure Compliance Reporting and Documentation Considerations
KDB 447498D01v06	October 23, 2015	Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies

3.1 Maximum Permissible exposure limits according CFR 47 – Part 1, §1.1310

Maximum Permissible Exposure levels according CFR 47 – Part 1, §1.1310:

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
1500-100000 MHz	10 W/m²	50 W/m ²

Table 1: Maximum Permissible exposure limits (1500 kHz to 100 GHz)

The limit applied in this test report is shown in bold letters

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

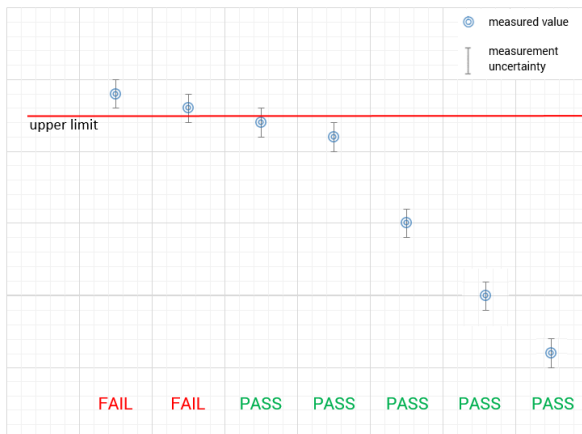
Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation).

4 Reporting statements of conformity – decision rule

Only the measured values related to their corresponding limits will be used to decide whether the equipment under test meets the requirements of the test standards listed in chapter 3.

The measurement uncertainty is mentioned in this test report, see chapter 9, but is not taken into account - neither to the limits nor to the measurement results. Measurement results with a smaller margin to the corresponding limits than the measurement uncertainty have a potential risk of more than 5% that the decision might be wrong."

measured value, measurement uncertainty, verdict



5 Summary of Measurement Results

☒	No deviations from the technical specifications ascertained	
☐	Deviations from the technical specifications ascertained	
Maximum APD value (W/m²)		
	reported	limit
76.5 GHz mode 1 25 mm distance for 4 cm²	8.87	10
78.7 GHz mode 4(c0) 5 mm distance for 4 cm²	9.52	10

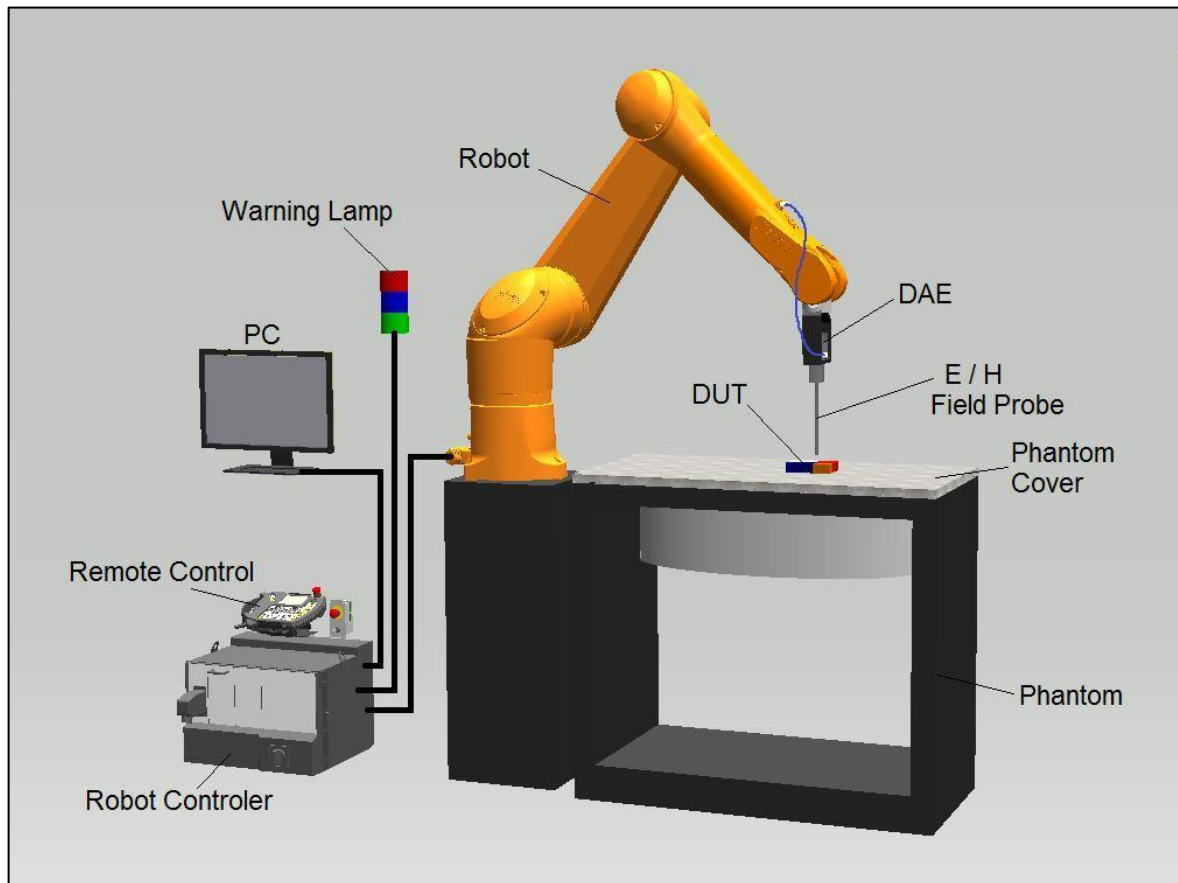
6 Test Environment

Ambient temperature:	20 – 24 °C
Relative humidity content:	40 – 50 %
Air pressure:	not relevant for this kind of testing
Power supply:	230 V / 50 Hz

7 Test Set-up

7.1 Measurement system

7.1.1 System Description



- The DASY system for performing compliance tests consists of the following items:
- A standard high precision 6-axis robot (Stäubli RX/TX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).
- A pseudo probe, which measures the field magnitude and derives its polarization ellipse to reduce field distortions by the substrate.
- A data acquisition electronic (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY measurement server.
- The DASY measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows.
- DASY software and SEMCAD data evaluation software.
- Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.
- The mmWave Phantom
- The device holder
- System check dipoles allowing to validate the proper functioning of the system.

7.1.1.1 Workflow for Power Density Compliance Testing

Compliance testing an accurate method ensuring no overestimation of the exposure. The workflow implemented in DASY8 Module consists of the following steps:

1. Project generation,
2. teaching of the DUT position,
3. parallel and perpendicular scan with automated grid optimization,
4. algorithmic reconstruction

Additionally, the system performance is routinely verified using the standard verification sources as DUT's.

7.1.1.2 Compatibility with IEC/IEEE 63195-1

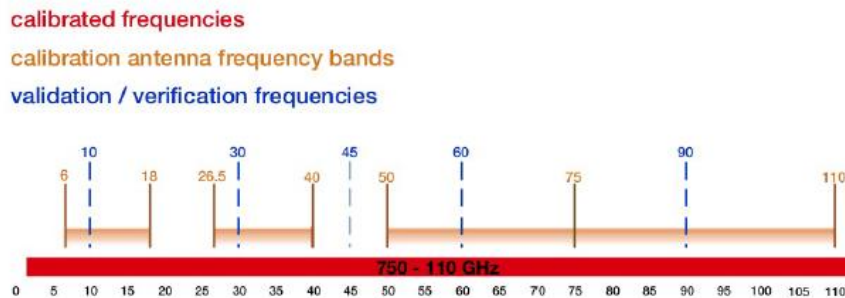
DASY8 mmWave Module is fully compliant with IEC PAS 63184:2021 and evaluates the reference values and basic restrictions according to All international and national standards for incident PD above 6 GHz, e.g., IEC/IEEE 63195-1, and Base station standards, e.g., IEC 62232

7.1.1.3 Probe description

The EU mmWV4 probe is based on the pseudo-vector probe design, which not only measures the field magnitude but also derives its polarization ellipse. This probe concept is advantageous because the sensor angle errors or distortions of the field by the substrate can be largely nullified by calibration. This is particularly important as field distortions by the substrate are dependent on the wavelength at these very high frequencies.

The probe contains two small 0.8mm dipole sensors mechanically protected by high-density foam, printed on both sides of a 0.9mm wide and 0.12mm thick glass substrate. The body of the probe is specifically constructed to minimize distortion by the scattered fields.

The sensitivity of the probe sensors, which is dependent on frequency, is calibrated during exposure to E-fields of known amplitude. The frequency response of the sensor is smooth over the entire frequency and can be approximated with a lumped element model of five elements. During a pre-calibration step using the same setup as for calibration, we determine the values of the lumped elements. The evaluation method is based on a least-squares optimization and it increases the precision of the calibration. It also provides reliable sensitivity parameters over the entire calibration frequency range, covering the gaps between the calibration bands. The stated uncertainty is therefore also valid for the entire frequency range from 750MHz to 110 GHz.



Calibration bands and frequencies from 6-110 GHz, as shown in DASY8 module mmWave manual

The probe consists of two sensors with different angles (γ_1 and γ_2) arranged in the same plane in the probe axis. Three measurements of the two sensors are taken for different probe rotational angles to derive the amplitude and polarization information.

The probe design allows measurements at distances as small as 2 mm from the sensors to the surface of the DUT. The typical sensor to the probe tip distance is 1.5 mm. The exact distance is calibrated.

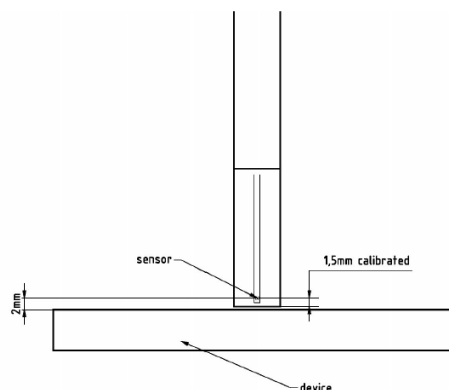
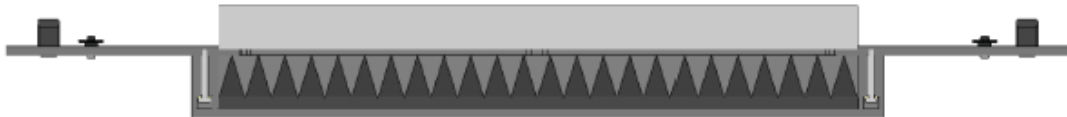


Illustration of the distance sensor to the DUT surface from DASY8 module mmWave manual

7.1.1.4 Phantom Description

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



Cross section of the mmWave phantom, as shown in the DASY8 module mmWave manual

The reflectivity performance of the mmWave phantom has been evaluated in comparison to the predecessor 5G Phantom and a total reflective backside of the foam.

The reflectivity of both phantoms was measured with a method similar to the NRL arch approach, except that the phantoms under study were placed in the near-fields of the transmitting antenna and the receiving antenna.

The reflectivity measurement was performed at 10, 30, 60, and 90 GHz. At each frequency, a corresponding pair of pyramidal horns was used as the transmitting antenna and the receiving antenna. The continuous-wave (CW) signal fed into the transmitting antenna was generated by a signal generator at 10 GHz and a Gunn oscillator at 30, 60, and 90 GHz. The power captured by the receiving antenna was measured by a thermal power sensor. The transmitting antenna and the receiving antenna were placed symmetrically to the normal of the metal plate. The antennas were further oriented to provide perpendicular polarization and to roughly meet the specular-reflection law (since either the transmitting antenna or the receiving antenna may be moved slightly around their initial positions to capture the maximum reflected power and/or the casing of the antennas and the power sensor makes it impossible to move the antennas close enough for very small incident angles). Three incident angles, varying from $< 10^\circ$ to approx. 45° , were studied at each frequency. The reflectivity of the phantom is quantified by the difference between the reflected power exclusively from the metal plate and the reflected power from the phantom placed on the same metal plate.

The results demonstrate that the reflectivity of the mmWave phantom is reduced by more than 20 dB between 10 and 90 GHz compared to the predecessor 5G phantom and better than 20 dB with respect to a phantom with total reflections (i.e., the foam with a large metal plate on its backside).

The mmWave phantom meets all the requirements for accurate exposure evaluations of any device operating at >10 GHz. The 5G phantom should only be used if the device radiates away from the phantom.

7.1.1.5 mmWave Device Holder (mmWDH)

mmWave Device Holder (mmWDH) is designed to ease positioning of the DUT of various sizes when measuring PD along an edge. It is made of low loss Rohacell material and meets the standard requirements. It is provided with an additional spacer to accommodate devices with smaller form factors.

Figure 3.13.1 shows a DASY8 system setup for PD compliance testing at mmWave frequencies (e.g., for testing a laptop positioned within the mmWDH). The DUT is held with a mmWDH placed on top of the mmWave phantom.



Figure 3.13.1: Test Setup with the mmWave Device Holder

Test Setup with the mmWave Device Holder (Side/Edge position of the DUT)

7.1.2 Scanning procedure

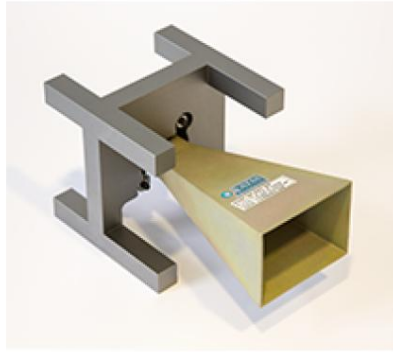
The DASY installation includes predefined files with recommended procedures for measurements and system check. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

The „reference“ and „drift“ measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure. The indicated drift is mainly the variation of the DUT's output power and should vary max. +/- 5 %.

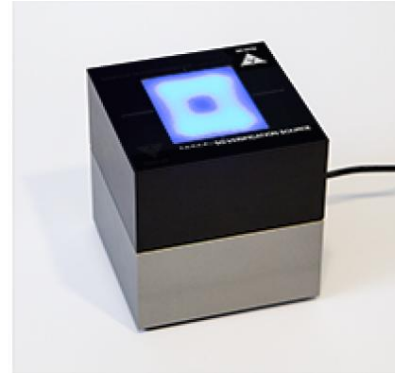
The highest integrated PD value is the main concern in compliance test applications. These values can mostly be found at the inner surface of the phantom and cannot be measured directly due to the sensor offset in the probe. To extrapolate the surface values, the measurement distances to the surface must be known accurately.

7.1.3 mmWave Verification and Validation Sources

The horn antenna-based verification sources are used for regular system verification. They are available at five different frequencies: 10 GHz, 30 GHz, 45 GHz, 60 GHz, and 90 GHz (see Figure 3.14.1. The 10 GHz source has a SMA connector and can be connected to any supply generator. The other sources comprise a Gunn oscillator.



(a) 10 GHz Source



(b) 30/45/60 and 90 GHz source

Verification sources at mmWave frequencies

The validation sources are used for in-depth performance evaluations and software validation according to the IEC/IEEE 63195-1. Two types of sources are available:

- Cavity-backed array of dipoles arranged in an offset lattice according to the modes generated in the resonant cavity. The dipoles are printed onto one face of a low-loss dielectric substrate and excited by non-resonant rectangular slots located on the opposite face of the substrate.
- Pyramidal horn loaded with an array of rectangular slot antennas on the aperture. Each source type is available for 10 GHz, 30 GHz, 60 GHz, and 90 GHz.

Grid settings:

Frequency [GHz]	Grid step	Grid extent X/Y [mm]	Measurement points
10	0.125 $\left(\frac{\lambda}{8}\right)$	60/60	18×18
30	0.25 $\left(\frac{\lambda}{4}\right)$	60/60	26×26
45	0.25 $\left(\frac{\lambda}{4}\right)$	42/42	28×28
60	0.25 $\left(\frac{\lambda}{4}\right)$	32.5/32.5	28×28
90	0.25 $\left(\frac{\lambda}{4}\right)$	30/30	38×38

Table 5.1.1: Recommended settings for the measurement of verification sources

Recommended settings for the measurement of verification sources advised in DASY8 module mmWave manual

The measured psPD_{n+} , $\text{psPD}_{\text{tot}+}$, and $\text{psPD}_{\text{mod}+}$ values over 1 cm² or 4 cm² for the desired averaging geometry are compared to the calibrated value and expected to be below 0.66 dB.

7.1.4 Uncertainties

The probe uncertainties stated by the manufacturer are considered to be the main relevant and dominant issues.

7.1.5 Measurement uncertainty evaluation for SAR test

DASY8 Uncertainty Budget for PD (avg $\geq 1 \text{ cm}^2$) Evaluation Distances to the Antennas $\geq \lambda/25$ in Compliance with IEC/IEEE 63195							
Error Description		Unc. Value ($\pm \text{dB}$)	Probab. Distri.	Div.	(c_i)	Std. Unc. ($\pm \text{dB}$)	(v_i) v_{eff}
Uncertainty terms dependent on the measurement system							
CAL	Calibration	0.49	N	1	1	0.49	∞
COR	Probe correction	0	R	$\sqrt{3}$	1	0	∞
FRS	Frequency response ($\text{BW} \leq 1 \text{ GHz}$)	0.20	R	$\sqrt{3}$	1	0.12	∞
SCC	Sensor cross coupling	0	R	$\sqrt{3}$	1	0	∞
ISO	Isotropy	0.50	R	$\sqrt{3}$	1	0.29	∞
LIN	Linearity	0.20	R	$\sqrt{3}$	1	0.12	∞
PSC	Probe scattering	0	R	$\sqrt{3}$	1	0	∞
PPO	Probe positioning offset	0.30	R	$\sqrt{3}$	1	0.17	∞
PPR	Probe positioning repeatability	0.04	R	$\sqrt{3}$	1	0.02	∞
SMO	Sensor mechanical offset	0	R	$\sqrt{3}$	1	0	∞
PSR	Probe spatial resolution	0	R	$\sqrt{3}$	1	0	∞
FLD	Field impedance dependence	0	R	$\sqrt{3}$	1	0	∞
MED	Measurement drift	0.05	R	$\sqrt{3}$	1	0.03	∞
APN	Amplitude and phase noise	0.04	R	$\sqrt{3}$	1	0.02	∞
TR	Measurement area truncation	0	R	$\sqrt{3}$	1	0	∞
DAQ	Data acquisition	0.03	N	1	1	0.03	∞
SMP	Sampling	0	R	$\sqrt{3}$	1	0	∞
REC	Field reconstruction	0.60	R	$\sqrt{3}$	1	0.35	∞
SNR	Signal-to-Noise Ratio	0	R	$\sqrt{3}$	1	0	∞
TRA	FTE/MEO	0	R	$\sqrt{3}$	1	0 (0)	∞
SCA	Power density scaling	–	R	$\sqrt{3}$	1	–	∞
SAV	Spatial averaging	0.10	R	$\sqrt{3}$	1	0.06	∞
Uncertainty terms dependent on the DUT and environmental factors							
PC	Probe coupling with DUT	0	R	$\sqrt{3}$	1	0	∞
MOD	Modulation response	0.40	R	$\sqrt{3}$	1	0.23	∞
IT	Integration time	0	R	$\sqrt{3}$	1	0	∞
RT	Response time	0	R	$\sqrt{3}$	1	0	∞
DH	Device holder influence	0.10	R	$\sqrt{3}$	1	0.06	∞
DA	DUT alignment	0	R	$\sqrt{3}$	1	0	∞
AC	RF ambient conditions	0.04	R	$\sqrt{3}$	1	0.02	∞
TEM	Laboratory Temperature	0.05	R	$\sqrt{3}$	1	0.03	∞
REF	Laboratory Reflections	0.04	R	$\sqrt{3}$	1	0.02	∞
MSI	Immunity / secondary reception	0	R	$\sqrt{3}$	1	0	∞
DRI	Drift of the DUT	–	R	$\sqrt{3}$	1	–	∞
Combined Std Uncertainty (w/ FTE/MEO)						0.75	∞
Expanded Std Uncertainty (w/ FTE/MEO)						1.51	

Table 2: Uncertainty budget for DASY8 for Power Density (PD) complies with IEC/IEEE 63195. The budget is valid for evaluation distances $\geq \lambda/25$. The uncertainty budget shown in parentheses is valid for the assessment using the Options FTE/MEO for the evaluation anywhere. For specific tests and configurations, the uncertainty could be considerably smaller.

DASY8 Uncertainty Budget for relative PD ($\text{avg} \geq 1 \text{ cm}^2$) Evaluation Distances to the Antennas $\geq \lambda/25$ in Compliance with IEC/IEEE 63195							
Error Description	Unc. Value ($\pm \text{dB}$)	Probab. Distri.	Div.	(c_i)	Std. Unc. ($\pm \text{dB}$)	(u_i)	u_{eff}
Uncertainty terms dependent on the measurement system							
CAL	Calibration	0.49	N	1	0	0.0	∞
COR	Probe correction	0	R	$\sqrt{3}$	1	0	∞
FRS	Frequency response ($\text{BW} \leq 1 \text{ GHz}$)	0.20	R	$\sqrt{3}$	0	0.0	∞
SCC	Sensor cross coupling	0	R	$\sqrt{3}$	1	0	∞
ISO	Isotropy	0.50	R	$\sqrt{3}$	0.5	0.14	∞
LIN	Linearity	0.20	R	$\sqrt{3}$	0.5	0.06	∞
PSC	Probe scattering	0	R	$\sqrt{3}$	1	0	∞
PPO	Probe positioning offset	0.30	R	$\sqrt{3}$	0	0.0	∞
PPR	Probe positioning repeatability	0.04	R	$\sqrt{3}$	1	0.02	∞
SMO	Sensor mechanical offset	0	R	$\sqrt{3}$	1	0	∞
PSR	Probe spatial resolution	0	R	$\sqrt{3}$	1	0	∞
FLD	Field impedance dependence	0	R	$\sqrt{3}$	1	0	∞
MED	Measurement drift	0.05	R	$\sqrt{3}$	1	0.03	∞
APN	Amplitude and phase noise	0.04	R	$\sqrt{3}$	1	0.02	∞
TR	Measurement area truncation	0	R	$\sqrt{3}$	1	0	∞
DAQ	Data acquisition	0.03	N	1	1	0.03	∞
SMP	Sampling	0	R	$\sqrt{3}$	1	0	∞
REC	Field reconstruction	0.6	R	$\sqrt{3}$	0.5	0.17	∞
SNR	Signal-to-Noise Ratio	0	R	$\sqrt{3}$	1	0	∞
TRA	FTE/MEO	0 (0)	R	$\sqrt{3}$	0.5	0	∞
SCA	Power density scaling	–	R	$\sqrt{3}$	1	–	∞
SAV	Spatial averaging	0.10	R	$\sqrt{3}$	1	0.06	∞
Uncertainty terms dependent on the DUT and environmental factors							
PC	Probe coupling with DUT	0	R	$\sqrt{3}$	1	0	∞
MOD	Modulation response	0.40	R	$\sqrt{3}$	1	0.23	∞
IT	Integration time	0	R	$\sqrt{3}$	1	0	∞
RT	Response time	0	R	$\sqrt{3}$	1	0	∞
DH	Device holder influence	0.10	R	$\sqrt{3}$	0	0.0	∞
DA	DUT alignment	0	R	$\sqrt{3}$	1	0	∞
AC	RF ambient conditions	0.04	R	$\sqrt{3}$	1	0.02	∞
TEM	Laboratory Temperature	0.05	R	$\sqrt{3}$	1	0.03	∞
REF	Laboratory Reflections	0.04	R	$\sqrt{3}$	1	0.02	∞
MSI	Immunity / secondary reception	0	R	$\sqrt{3}$	1	0	∞
DRI	Drift of the DUT	–	R	$\sqrt{3}$	1	–	∞
Combined Std Uncertainty (w/ FTE/MEO)					0.34	∞	
Expanded Std Uncertainty (w/ FTE/MEO)					0.68		

Table 3: Uncertainty budget for DASY8 for the relative Power Density (PD) is in compliance with IEC/IEEE 63195. The budget is valid for evaluating the same device at different power levels and modulations (evaluation distances $\geq \lambda/25$). The uncertainty budget shown in parentheses is valid for the assessment using the Options FTE/MEO for the evaluation anywhere. For specific tests and configurations, the uncertainty could be considerably smaller.

7.1.6 Measurement uncertainty evaluation for System Check

DASY8 mmWave Uncertainty Budget System Performance Check using mmWave Verification Sources							
Error Description		Unc. Value (±dB)	Probab. Distri.	Div.	(c_k)	Std. Unc. (±dB)	(v_k) v_{eff}
Uncertainty terms dependent on the measurement system							
CAL	Calibration Repeatability	0.21	N	1	1	0.21	∞
COR	Probe correction	0	R	$\sqrt{3}$	1	0	∞
FRS	Frequency response (BW ≤1 GHz)	0.20	R	$\sqrt{3}$	0	0	∞
SCC	Sensor cross coupling	0	R	$\sqrt{3}$	1	0	∞
ISO	Isotropy	0.30	R	$\sqrt{3}$	1	0.17	∞
LIN	Linearity	0.20	R	$\sqrt{3}$	1	0.12	∞
PSC	Probe scattering	0	R	$\sqrt{3}$	1	0	∞
PPO	Probe positioning offset	0.11	R	$\sqrt{3}$	1	0.06	∞
PPR	Probe positioning repeatability	0.04	R	$\sqrt{3}$	1	0.02	∞
SMO	Sensor mechanical offset	0	R	$\sqrt{3}$	1	0	∞
PSR	Probe spatial resolution	0	R	$\sqrt{3}$	1	0	∞
FLD	Field impedance dependence	0	R	$\sqrt{3}$	1	0	∞
MED	Measurement drift drift	0.05	R	$\sqrt{3}$	1	0.03	∞
APN	Amplitude and phase noise	0.04	R	$\sqrt{3}$	0	0	∞
TR	Measurement area truncation	0	R	$\sqrt{3}$	1	0	∞
DAQ	Data acquisition	0.03	N	1	1	0.03	∞
SMP	Sampling	0	R	$\sqrt{3}$	1	0	∞
REC	Field reconstruction	0.60	R	$\sqrt{3}$	0.3	0.10	∞
SNR	Signal-to-Noise Ratio	0.0	R	$\sqrt{3}$	1	0.0	∞
TRA	Forward transformation	0	R	$\sqrt{3}$	1	0	∞
SCA	Power density scaling	–	R	$\sqrt{3}$	1	0	∞
SAV	Spatial averaging	0.10	R	$\sqrt{3}$	0	0	∞
Uncertainty terms dependent on the DUT and environmental factors							
PC	Probe coupling with DUT	0	R	$\sqrt{3}$	1	0	∞
MOD	Modulation response	0.40	R	$\sqrt{3}$	0	0	∞
IT	Integration time	0	R	$\sqrt{3}$	1	0	∞
RT	Response time	0	R	$\sqrt{3}$	1	0	∞
DH	Device holder influence	0.10	R	$\sqrt{3}$	0	0	∞
DA	DUT alignment	0	R	$\sqrt{3}$	1	0	∞
AC	RF ambient conditions	0.04	R	$\sqrt{3}$	1	0.02	∞
TEM	Laboratory temperature	0.05	R	$\sqrt{3}$	1	0.03	∞
AR	Ambient Reflections	0.04	R	$\sqrt{3}$	1	0.02	∞
MSI	Immunity / secondary reception	0	R	$\sqrt{3}$	0	0	∞
DRI	Drift of the DUT	0.10	R	$\sqrt{3}$	1	0.06	∞
Combined Standard Uncertainty						0.33	∞
Expanded Standard Uncertainty (95%)						0.66	

Table 4: Uncertainty budget for system verification using mmWave sources for the evaluation plane at 10mm from the horn antenna

NOTE:

System is fully compliant to IEC/IEEE 63195

DASY8 mmWave Uncertainty Budget Relative System Performance Check using mmWave Verification Sources							
Error Description		Unc. Value (±dB)	Probab. Distri.	Div.	(c_i)	Std. Unc. (±dB)	(v_i) v_{eff}
Uncertainty terms dependent on the measurement system							
CAL	Calibration Repeatability	0.21	N	1	0	0	∞
COR	Probe correction	0	R	$\sqrt{3}$	1	0	∞
FRS	Frequency response (BW ≤1 GHz)	0.20	R	$\sqrt{3}$	0	0	∞
SCC	Sensor cross coupling	0	R	$\sqrt{3}$	1	0	∞
ISO	Isotropy	0.30	R	$\sqrt{3}$	1	0.17	∞
LIN	Linearity	0.20	R	$\sqrt{3}$	0	0	∞
PSC	Probe scattering	0	R	$\sqrt{3}$	1	0	∞
PPO	Probe positioning offset	0.11	R	$\sqrt{3}$	1	0.06	∞
PPR	Probe positioning repeatability	0.04	R	$\sqrt{3}$	1	0.02	∞
SMO	Sensor mechanical offset	0	R	$\sqrt{3}$	1	0	∞
PSR	Probe spatial resolution	0	R	$\sqrt{3}$	1	0	∞
FLD	Field impedance dependence	0	R	$\sqrt{3}$	1	0	∞
MED	Measurement drift	0.05	R	$\sqrt{3}$	1	0.03	∞
APN	Amplitude and phase noise	0.04	R	$\sqrt{3}$	0	0	∞
TR	Measurement area truncation	0	R	$\sqrt{3}$	1	0	∞
DAQ	Data acquisition	0.03	N	1	1	0.03	∞
SMP	Sampling	0	R	$\sqrt{3}$	1	0	∞
REC	Field reconstruction	0.60	R	$\sqrt{3}$	0.15	0.05	∞
SNR	Signal-to-Noise Ratio	0.0	R	$\sqrt{3}$	1	0.0	∞
TRA	Forward transformation	0	R	$\sqrt{3}$	1	0	∞
SCA	Power density scaling	–	R	$\sqrt{3}$	1	0	∞
SAV	Spatial averaging	0.10	R	$\sqrt{3}$	0	0	∞
Uncertainty terms dependent on the DUT and environmental factors							
PC	Probe coupling with DUT	0	R	$\sqrt{3}$	1	0	∞
MOD	Modulation response	0.40	R	$\sqrt{3}$	0	0	∞
IT	Integration time	0	R	$\sqrt{3}$	1	0	∞
RT	Response time	0	R	$\sqrt{3}$	1	0	∞
DH	Device holder influence	0.10	R	$\sqrt{3}$	0	0	∞
DA	DUT alignment	0	R	$\sqrt{3}$	1	0	∞
AC	RF ambient conditions	0.04	R	$\sqrt{3}$	1	0.02	∞
TEM	Laboratory temperature	0.05	R	$\sqrt{3}$	1	0.03	∞
AR	Ambient Reflections	0.04	R	$\sqrt{3}$	1	0.02	∞
MSI	Immunity / secondary reception	0	R	$\sqrt{3}$	0	0	∞
DRI	Drift of the DUT	0.10	R	$\sqrt{3}$	1	0.06	∞
Combined Standard Uncertainty						0.21	∞
Expanded Standard Uncertainty (95%)						0.42	

Table 5: Uncertainty budget for relative system verification using mmWave sources for the evaluation plane at 10 mm from the horn antenna

7.1.6.1 System Check

A system check was performed prior to measuring the DUT. The results were within the combined confidence interval of 0.33 dB (k=1) stated for the DASY8 module mmWave.

System performance check										
System validation Kit	DAE S/N	Distance	Frequency	Target 1 cm ²	Target 4 cm ²	Measured 1 cm ²	Dev. %	Measured 4 cm ²	Dev. %	Measured date
		mm	GHz	W/m ²		W/m ²		W/m ²		
H60GV2 S/N: 1072	413	10	60	123.0	81.0	120.00	-2.4%	78.10	-3.6%	2025-12-17
H90GV2 S/N: 1023	413	10	90	249.0	108.0	248.00	-0.4%	109.00	0.9%	2025-12-17

Probe: EUmWV (S/N: 9551)

NOTE: System check description was performed according IEC/IEEE 62209-1528:2020 Annex A.

7.2 Test results

5G Scan									
Square Averaging	Mod.	Mode	Frequency	Test Position	Gap	Limit	4 cm ²		
			GHz		mm	W/m ²	psPD _{n+}	psPD _{tot+}	psPD _{mod+}
							W/m ²	W/m ²	W/m ²
	FMCW	1	76.5	Front	25	10.0	8.51	8.62	8.87
	FMCW	4(c0)	78.7	Front	5	10.0	8.15	8.37	9.52

SPD _{n+}	-	surface normal propagating power flux density into the phantom
SPD _{tot+}	-	total propagating power flux density into the phantom
SPD_{mod+}	-	total power flux density into the phantom considering near-field exposure.

Note: Detailed result plots are shown in Annex B.

8 Test equipment and ancillaries used for tests

To simplify the identification of the test equipment and/or ancillaries which were used, the reporting of the relevant test cases only refer to the test item number as specified in the table below.

Equipment	Type	Manufacturer	Serial No.	Last Calibration	Frequency (months)
EUmmWave Probe	EUmmWV4	Schmid & Partner Engineering AG	9551	2025-07-08	12
Data acquisition electronics	DAE4	Schmid & Partner Engineering AG	413	2025-01-14	12
Verification Source 60 GHz	H60GV2	Schmid & Partner Engineering AG	1072	2025-07-04	12
Verification Source 90 GHz	H90GV2	Schmid & Partner Engineering AG	1023	2025-07-04	12
DASY8 Module mmWave (Software)	SW – Version 3.2.2.2358	Schmid & Partner Engineering AG	---	--	--

9 Observations

No observations exceeding those reported with the single test cases have been made.

Annex A: mmWave System Check Plots

Measurement Report for Device, FRONT, Custom Band, CW, Channel 60000000 (60000.0 MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
Device, H60GV2	100.0 x 100.0 x 100.0		Verification Source

Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor
5G	FRONT, 5.55	Custom Band	CW, 0--	60000.0, 60000000	1.0

Hardware Setup

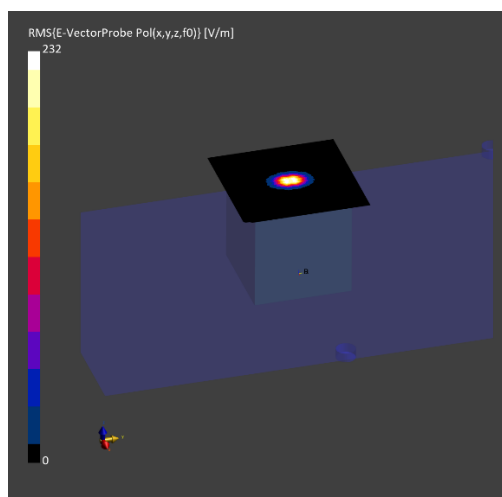
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave - 1127	Air -	EUmmWV4 - SN9551_F55-110GHz, 2025-07-08	DAE4ip Sn1842, 2025-11-12

Scans Setup

Scan Type	5G Scan
Grid Extents [mm]	32.5 x 32.5
Grid Steps [lambda]	0.25 x 0.25
Sensor Surface [mm]	5.55
MAIA	N/A

Measurement Results

Scan Type	5G Scan
Date	2025-12-17, 17:30
Avg. Area [cm ²]	1.00
psPDn+ [W/m ²]	119
psPDtot+ [W/m ²]	120
psPDmod+ [W/m ²]	120
E _{max} [V/m]	245
Power Drift [dB]	-0.10



Measurement Report for Device, FRONT, Custom Band, CW, Channel 60000000 (60000.0 MHz)
Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
Device, H60GV2	100.0 x 100.0 x 100.0		Verification Source

Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor
5G	FRONT, 5.55	Custom Band	CW, 0--	60000.0, 60000000	1.0

Hardware Setup

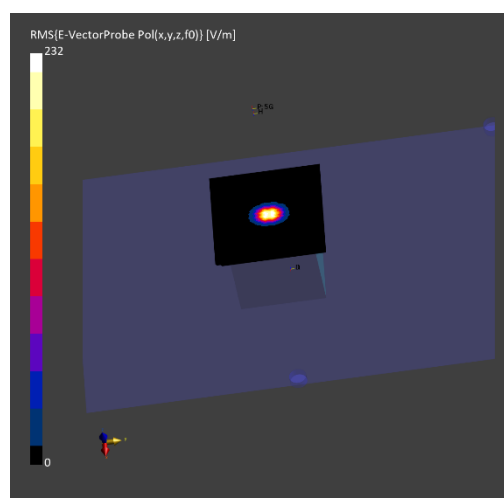
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave - 1127	Air -	EUmmWV4 - SN9551_F55-110GHz, 2025-07-08	DAE3 Sn413, 2025-01-08

Scans Setup

Scan Type	5G Scan
Grid Extents [mm]	32.5 x 32.5
Grid Steps [lambda]	0.25 x 0.25
Sensor Surface [mm]	5.55
MAIA	N/A

Measurement Results

Scan Type	5G Scan
Date	2025-12-17, 17:30
Avg. Area [cm ²]	4.00
psPDn+ [W/m ²]	77.4
psPDtot+ [W/m ²]	77.9
psPDmod+ [W/m ²]	78.1
E _{max} [V/m]	245
Power Drift [dB]	-0.10



Measurement Report for Device, FRONT, Custom Band, CW, Channel 90000000 (90000.0 MHz)
Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
Device, H90GV2	100.0 x 100.0 x 100.0		Verification Source

Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor
5G	FRONT, 5.55	Custom Band	CW, 0--	90000.0, 90000000	1.0

Hardware Setup

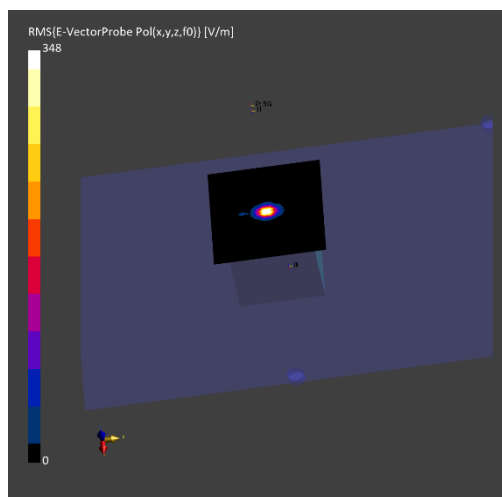
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave - 1127	Air -	EUmmWV4 - SN9551_F55-110GHz, 2025-07-08	DAE3 Sn413, 2025-01-08

Scans Setup

Scan Type	5G Scan
Grid Extents [mm]	30.0 x 30.0
Grid Steps [lambda]	0.25 x 0.25
Sensor Surface [mm]	5.55
MAIA	N/A

Measurement Results

Scan Type	5G Scan
Date	2025-12-17, 19:53
Avg. Area [cm ²]	1.00
psPDn+ [W/m ²]	246
psPDtot+ [W/m ²]	247
psPDmod+ [W/m ²]	248
E _{max} [V/m]	375
Power Drift [dB]	-0.44



Measurement Report for Device, FRONT, Custom Band, CW, Channel 90000000 (90000.0 MHz)
Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
Device, H90GV2	100.0 x 100.0 x 100.0		Verification Source

Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor
5G	FRONT, 5.55	Custom Band	CW, 0--	90000.0, 90000000	1.0

Hardware Setup

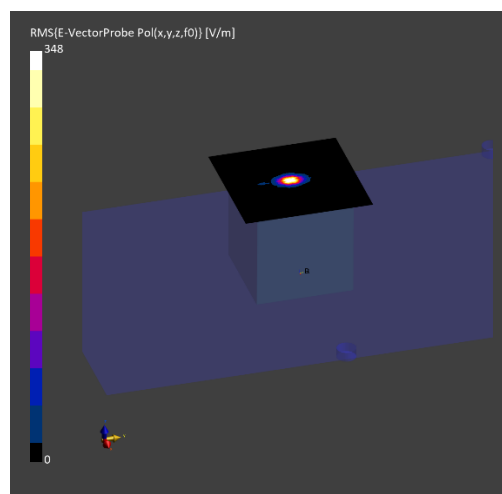
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave - 1127	Air -	EUmmWV4 - SN9551_F55-110GHz, 2025-07-08	DAE4ip Sn1842, 2025-11-12

Scans Setup

Scan Type	5G Scan
Grid Extents [mm]	30.0 x 30.0
Grid Steps [lambda]	0.25 x 0.25
Sensor Surface [mm]	5.55
MAIA	N/A

Measurement Results

Scan Type	5G Scan
Date	2025-12-17, 19:53
Avg. Area [cm ²]	4.00
psPDn+ [W/m ²]	107
psPDtot+ [W/m ²]	109
psPDmod+ [W/m ²]	109
E _{max} [V/m]	375
Power Drift [dB]	-0.44



Annex B: mmWave measurement Plots

Measurement Report for SRD for RTTT and other vehicle or fixed installation, FRONT, Custom Band, CW, Channel 76492000 (76492.0 MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
SRD for RTTT and other vehicle or fixed installation, RSS-102.PD.MEAS	92.0 x 55.0 x 20.0	-/-	SRD

Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor
5G	FRONT, 23.00	Custom Band	CW, 0--	76492.0, 76492000	1.0

Hardware Setup

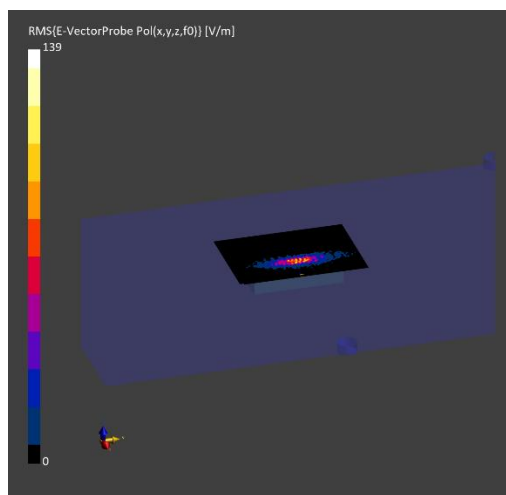
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave - 1127	Air -	EUmmWV4 - SN9551_F55-110GHz, 2025-07-08	DAE4ip Sn1842, 2025-11-12

Scans Setup

Scan Type	5G Scan
Grid Extents [mm]	27.0 x 27.0
Grid Steps [lambda]	0.25 x 0.25
Sensor Surface [mm]	23.0
MAIA	N/A

Measurement Results

Scan Type	5G Scan
Date	2025-12-18, 10:57
Avg. Area [cm ²]	4.00
psPDn+ [W/m ²]	8.51
psPDtot+ [W/m ²]	8.62
psPDmod+ [W/m ²]	8.87
E _{max} [V/m]	81.5
Power Drift [dB]	-0.14



Measurement Report for SRD for RTTT and other vehicle or fixed installation, FRONT, Custom Band, CW, Channel 78720000 (78720.0 MHz)
Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT
SRD for RTTT and other vehicle or fixed installation, RSS-102.PD.MEAS	92.0 x 55.0 x 20.0	-/-	SRD

Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor
5G	FRONT, 3.00	Custom Band	CW, 0--	78720.0, 78720000	1.0

Hardware Setup

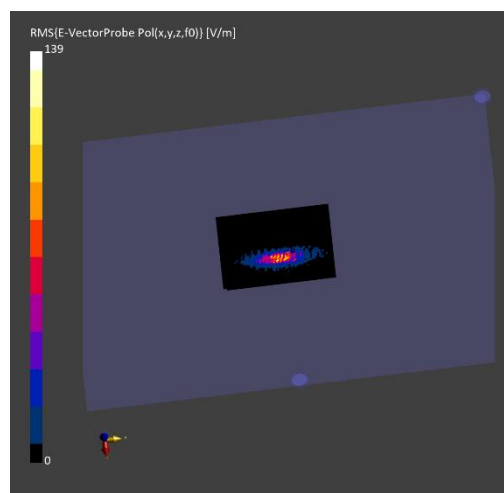
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave - 1127	Air -	EUmmWV4 - SN9551_F55-110GHz, 2025-07-08	DAE3 Sn413, 2025-01-08

Scans Setup

Scan Type	5G Scan
Grid Extents [mm]	27.0 x 27.0
Grid Steps [lambda]	0.25 x 0.25
Sensor Surface [mm]	2.0
MAIA	N/A

Measurement Results

Scan Type	5G Scan
Date	2025-12-18, 14:10
Avg. Area [cm ²]	4.00
psPDn+ [W/m ²]	8.15
psPDtot+ [W/m ²]	8.37
psPDmod+ [W/m ²]	9.52
E _{max} [V/m]	96.4
Power Drift [dB]	-0.07



Annex C: Photo documentation

Photo 1: Measurement System DASY

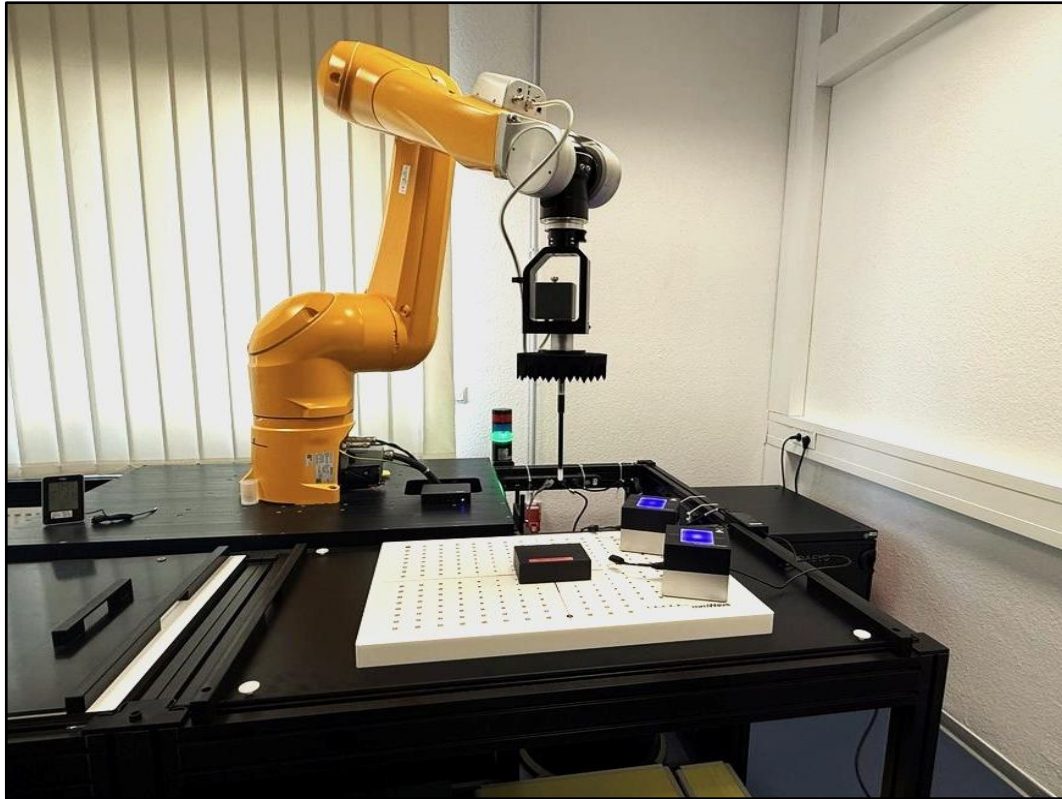


Photo 2: EUT - Front view



Photo 3: EUT - Back view



Photo 4: EUT – Side view (Label)



Photo 5: Test position – Front side with 2mm offset

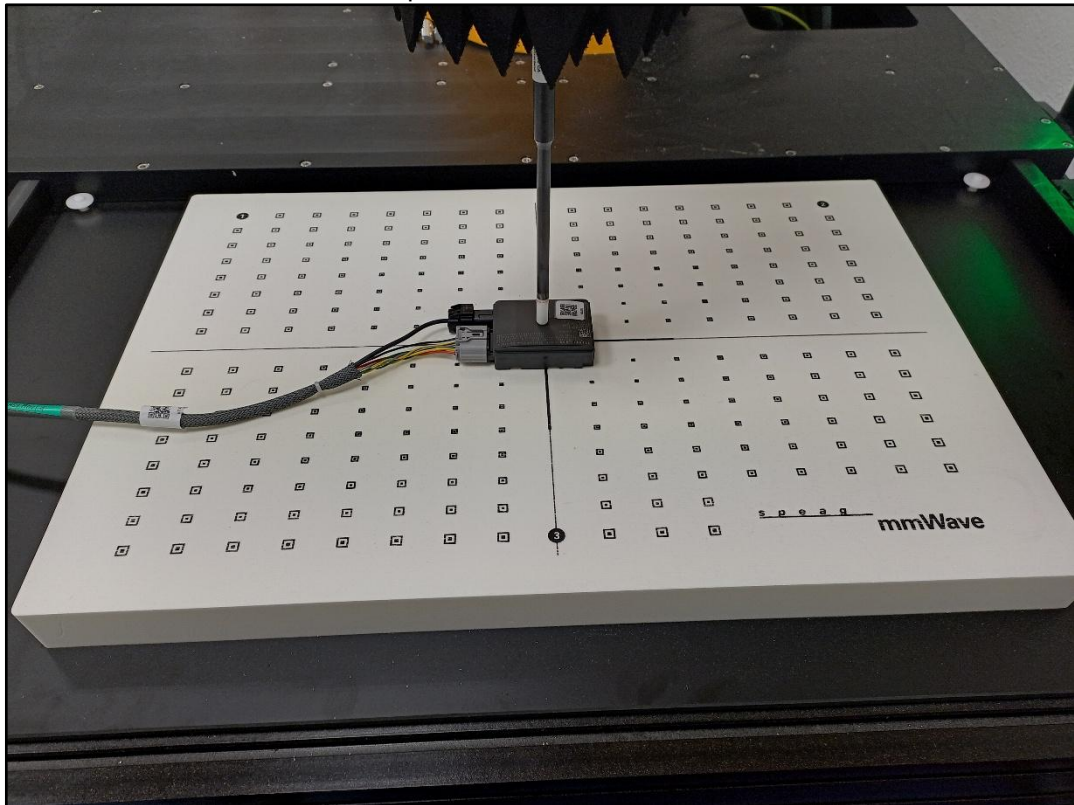


Photo 6: Test position – Front side with 2mm offset

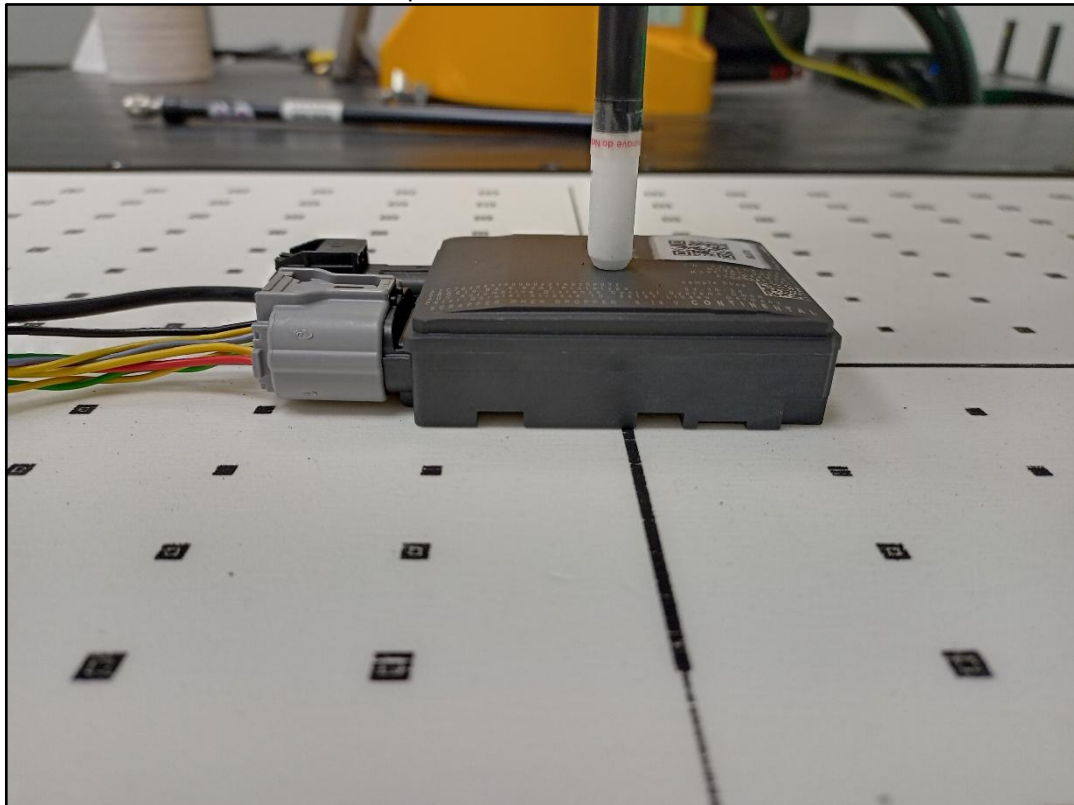
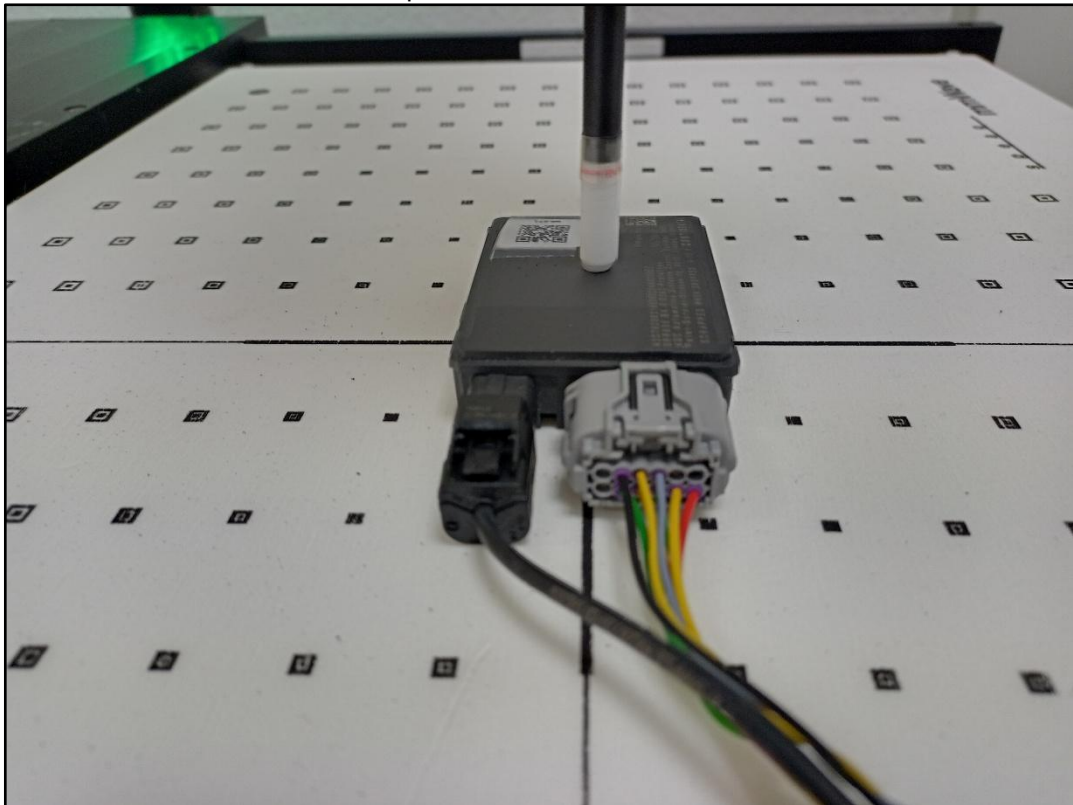


Photo 7: Test position – Front side with 2mm offset



Annex D: Document History

Version	Applied Changes	Date of Release
	Initial Release	2026-02-20

Annex E: Further Information

Glossary

DUT	-	Device under Test
EUT	-	Equipment under Test
FCC	-	Federal Communication Commission
FCC ID	-	Company Identifier at FCC
HW	-	Hardware
ISED	-	Innovation, Science and Economic Development Canada
N/A	-	not applicable
S/N	-	Serial Number
SW	-	Software