

SAR Compliance Test Report

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Tested device:	RFID reader Sled		
Related reports:	-		
Testing has been carried out in accordance with:	47CFR §2.1093 Radiofrequency Radiation Exposure Evaluation: Portable Devices FCC published RF exposure KDB procedures 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04 IEC/IEEE 62209-1528, 2020 Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices		
Documentation:	The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory		
Test Results:	The EUT complies with the requirements in respect of all parameters subject to the test. The test results relate only to devices specified in this document		
Date and signatures:	04.08.2026 Laboratory Manager <i>Miia Nurkkala</i>		

TABLE OF CONTENTS

1. SUMMARY OF SAR TEST REPORT	3
1.1 TEST DETAILS	3
1.2 MAXIMUM RESULTS	4
1.2.1 Standalone SAR	4
1.2.2 Simultaneous Transmission SAR	4
1.2.3 Maximum Drift	4
1.2.4 Measurement Uncertainty	4
2. DESCRIPTION OF THE DEVICE UNDER TEST (DUT)	5
2.1 SUPPORTED FREQUENCY BANDS AND OPERATIONAL MODES	5
2.2 SIMULTANEOUS TRANSMISSION	5
3. OUTPUT POWER	6
3.1 MAXIMUM SPECIFIED CONDUCTED OUTPUT POWER	6
3.2 TESTED CONDUCTED POWER	6
4. TEST EQUIPMENT	7
4.1 TEST EQUIPMENT LIST	8
4.1.1 Isotropic E-field Probe Type EX3DV4	9
4.2 PHANTOMS	9
4.3 TISSUE SIMULANTS	10
4.4 SYSTEM VALIDATION STATUS	10
4.5 SYSTEM CHECK	10
4.5.1 Tissue Simulant Verification	11
5. TEST PROCEDURE	12
5.1 DEVICE HOLDER	12
5.2 TEST POSITIONS	12
5.2.1 Extremity Configuration, 0mm separation distance	12
5.3 SCAN PROCEDURES	13
5.4 SAR AVERAGING METHODS	13
6. MEASUREMENT UNCERTAINTY	14
7. TEST RESULTS	16
7.1 SAR RESULTS FOR EXTREMITY CONDITION WITH 0MM SEPARATION	16
7.2 IEC/IEEE 62209-1528:2020, ZOOM SCAN EVALUATION	17
7.3 SIMULTANEOUS TRANSMISSION ANALYSIS	17
APPENDIX B: SYSTEM CHECK SCAN	18
APPENDIX C: MEASUREMENT SCANS	20
APPENDIX D: RELEVANT PAGES FROM PROBE & DAE CALIBRATION REPORTS	22
APPENDIX E: RELEVANT PAGES FROM DIPOLE CALIBRATION REPORTS	38

1. SUMMARY OF SAR TEST REPORT

1.1 Test Details

Device under Test (DUT):

Product:	RFID reader Sled
Manufacturer:	Honeywell international Inc.
Model:	CT47 SLED HF/UHF RFID Reader
Serial Number:	460101, 460102, 25136B0654(CT47 mobile computer)
Hardware Version:	F5 80
FCC ID Number:	HD5-CT47HFUHF
DUT Number:	4490, 4491, 4048 (CT47 mobile computer)
Battery Type used in testing:	Li-Ion Battery
State of the Sample:	Production sample

Testing information:

Testing performed:	11.6.2026, 15.6.2026
Notes:	This report replaces report FCC SAR report_Honeywell RF reader_ID7975b_17072026, model has been changed.
Document ID:	FCC SAR report_Honeywell RF reader_ID7975b_31072026.docx
Document history & changes:	Initial version
Temperature °C:	22±2 / Controlled
Humidity RH%:	30±20 / Controlled
Measurement performed by:	Kirsi Kyllönen
FCC Test Firm Designation Number:	FI0005

1.2 Maximum Results

The maximum reported* SAR values for Extremity exposure configuration for transmitting systems are shown in the table below. The device conforms to the requirements of the standards when the maximum reported SAR value is less than or equal to the limit. The SAR limit specified in FCC 47 CFR part 2 (2.1093) for Extremity SAR_{10g} is 4.0 W/kg.

1.2.1 Standalone SAR

System	Highest Reported* SAR _{10g} [W/kg] in Extremity Exposure Condition, 0mm separation distance	Result
UHF	3.44	PASS
HF	0.005	PASS

* Reported SAR Values are scaled to upper limit of power tuning tolerance.

1.2.2 Simultaneous Transmission SAR

Highest Simultaneous Transmission SAR	SAR _{10g} [W/kg] in Extremity Exposure Condition	Result
UHF+HF	3.44	PASS

1.2.3 Maximum Drift

Maximum Drift During Measurements	-0.57 dB*
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*Larger than 5% drifts included to scaling factors

1.2.4 Measurement Uncertainty

DASY5 System, SAR 10g: 4 MHz – 300 MHz:

Expanded Uncertainty (k=2) 95 %	±22.5 %
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DASY5 System, SAR 10g: 300 MHz – 3 GHz:

Expanded Uncertainty (k=2) 95 %	±22.5 %
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2. DESCRIPTION OF THE DEVICE UNDER TEST (DUT)

The tested device is an attachable RFID reader sled that fits over the host device. It incorporates both UHF and HF RFID readers. The UHF and HF RFID readers can transmit simultaneously. The photos of the DUT and test positions are in Appendix A.

Device Category	Portable
Exposure Environment	General population uncontrolled

2.1 Supported Frequency Bands and Operational Modes

TX Frequency bands	Modes of Operation	Transmitter Frequency Range [MHz]
	UHF RFID	915.45-927.7
	HF RFID	13.56

2.2 Simultaneous transmission

UHF and HF can be operated simultaneously.

3. OUTPUT POWER

3.1 Maximum specified conducted output power

From the customer, including tune-up tolerances;

Technology	Max Output Power [dBm]
UHF RFID	25
HF RFID	10

3.2 Tested conducted power

Measured conducted output power at transmitting antenna connector;

Technology	Output Power [dBm]			
	915.45 MHz	920 MHz	921 MHz	927.7 MHz
UHF RFID	24.29	23.78	24.03	22.36

Technology	Output Power [dBm]	
	13.56 MHz	
HF RFID	9.86	

4. TEST EQUIPMENT

Dasy near field scanning system, manufactured by SPEAG was used for SAR testing. The test system consists of high precision robotics system (Staubli), robot controller, computer, near-field probe, probe alignment sensor, and a phantom containing the tissue equivalent material. The robot is a six-axis industrial robot performing precise movements to position the probe to the location of maximum electromagnetic field.

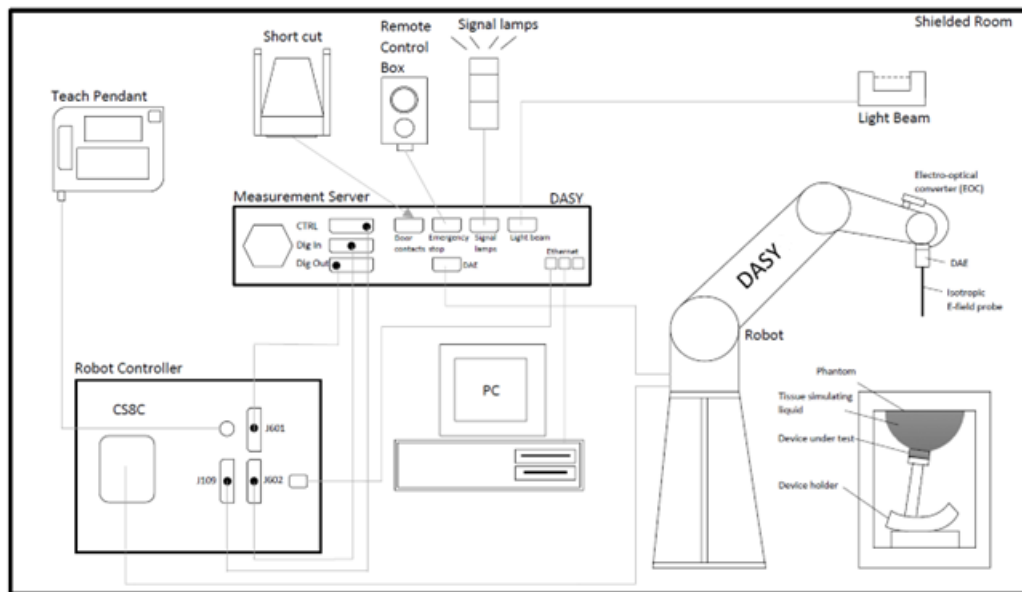


Figure 1 Schematic Laboratory Picture

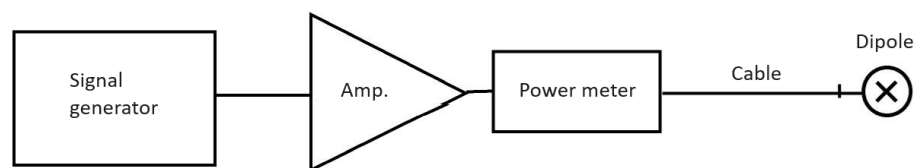


Figure 2. Signal source setup for system check

4.1 Test Equipment List

Test Equipment	Manufacturer	Model	Serial Number	Calibration Date	Interval [years]
Amplifier, 0.5-1000MHz	Mini-Circuits	TVA-R5-13A+	2202002	NA	NA
Stäubli Robot	Stäubli	RX90 BL	599395-01	NA	NA
DAE4, converter	Speag	DAE4	1332	02/2026	1
DAE4, converter	Speag	DAE4	710	10/2025	1
Inline Peak Power Sensor	Anritsu	MA24105A	2102058	11/2025	1
Isotropic DOS probe	Speag	EX3DV4	3852	10/2025	1
Isotropic DOS probe	Speag	EX3DV4	7447	02/2026	1
Power Sensor	Rohde & Schwarz	NRP8S	1419.0006K02-108508-HC	09/2025	2
System validation dipole	Speag	CLA13	1012	10/2023	3
System validation dipole	Speag	D900V2	120	03/2026	3
Vector Signal Generator	Anritsu	MG3710E	6262028675	NA	NA
DASY5 Software	Speag	52.10.4.1527	-	NA	NA
Device holder	Speag	SD HAC H01 CA	-	NA	NA
Phantom	Speag	MFP V5.1C	1159/3	NA	NA
Phantom	Speag	ELI V5.0	-	NA	NA
Temperature meter	Testo	testo 110	33993689	11/2025	1
Temperature data logger	Testo	testo 174H	36923877	11/2025	1
Verkotan Liquid	Verkotan	WB Head	2026-Jun-11 14_56_07	NA	NA
Verkotan Liquid	Verkotan	Low Head	2026-Jun-15 10_35_37	NA	NA

Main used test system components are listed above. For full equipment list and calibration intervals, please contact the testing laboratory.

Dipole calibration period supporting data:

		From calibration certificate			Measured 10/2025		
Dipole and Serial Number	Frequency [MHz]	Return Loss [dB]	Impedance [Ω]		Return Loss [dB]	Impedance [Ω]	
			R	jX		R	jX
CLA13 - SN:1012	13	-24.3	54.1	4.9	-23.0	55.0	5.6

4.1.1 Isotropic E-field Probe Type EX3DV4

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	Calibration certificate in Appendix D
Frequency	4 MHz to 10 GHz (dosimetry) Linearity: ± 0.2 dB (30 MHz to 10 GHz)
Directivity (typical)	± 0.1 dB in TSL (rotation around probe axis) ± 0.3 dB in TSL (rotation normal to probe axis)
Dynamic Range	10 μ W/g – > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μ W/g)
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 2.5 mm (body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Application	General dosimetry up to 6 GHz Compliance tests of mobile phones Fast automatic scanning in arbitrary phantoms

4.2 Phantoms

Modular flat phantom:

The Triple Modular Phantom consists of three identical modules that can be installed and removed separately without emptying the liquid. It is used for compliance testing of small wireless devices in body-worn configurations. The phantom conforms to the requirements of IEC/IEEE 62209-1528 and FCC published RF Exposure KDB Procedures. The shell thickness of the bottom plate is 2 ± 0.2 mm. The dimensions are 308x192x182 mm and filling volume is 9.2 liters giving a filling height of 155 mm.

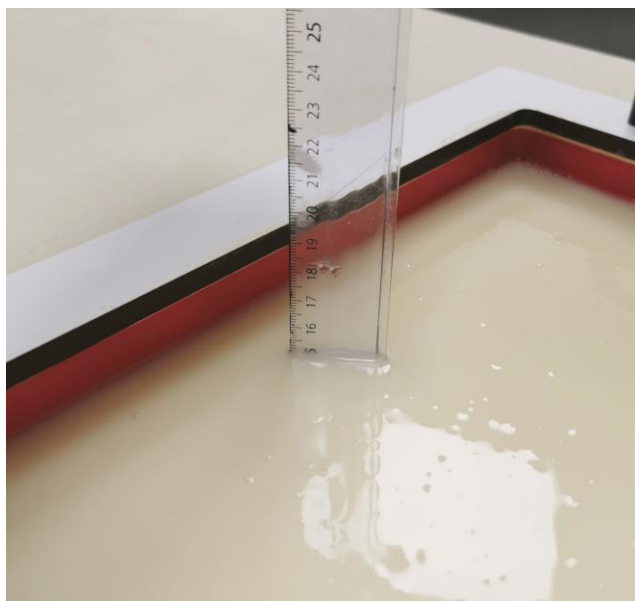


Figure 3 Tissue simulant depth

Eli Phantom:

The phantom used in SAR tests was an ELI phantom, manufactured by SPEAG. ELI phantom is used for compliance testing of handheld and body-mounted wireless devices in the frequency range of 4 MHz to 10 GHz. The phantom conforms to the requirements of IEC/IEEE 62209-1528 and FCC published RF Exposure KDB Procedures. The shell thickness of the bottom plate is 2 ± 0.2 mm.

4.3 Tissue Simulants

Recommended values for the dielectric parameters of the tissue simulants are given in IEC/IEEE 62209-1528 and FCC published RF Exposure KDB Procedures. The dielectric parameters of the used tissue simulants were within $\pm 10\%$ of the recommended values at frequencies under 3 GHz and $\pm 5\%$ at frequencies above 3 GHz. A liquid compensation algorithm was used in DASY with which measured peak average SAR values were corrected for the deviation of used liquid. Depth of the tissue simulant was at least 15.0 cm from the inner surface of the flat phantom.

Tissue simulant liquid Ingredients
Deionized Water, tween, salt

4.4 System Validation Status

Frequency [MHz]	Dipole Type / SN	Probe Type / SN	Calibrated Signal Type	DAE Unit / SN	Dielectric Constant [ϵ']	Conductivity σ [S/m]	Date
13	CLA 13 - SN: 1012	EX3DV4 - SN: 3852	CW	DAE 4 / 710	52.23	0.71	11/2025
900	D900V2-059	EX3DV4 - SN: 7447	CW	DAE 4 / 1332	42.58	1.01	03/2026

4.5 System Check

Date	Tissue Type	Tissue Temp. [°C]	Frequency [MHz]	Input Power [mW]	Measured SAR10g [W/kg]	1W Target SAR10g [W/kg]	1W Normalized SAR10g [W/kg]	Deviation [%]	Plot #
11.6.2026	WB Head	21.4	900	250	1.65	7.1	6.6	-7.0	1
15.6.2026	H300	21.2	13	250	0.0785	0.336	0.314	-6.6	2

4.5.1 Tissue Simulant Verification

Date	Tissue Type	Tissue Temp [°C]	Frequency [MHz]	Measured		Target		Deviation	
				Dielectric Constant [ε]	Conductivity σ [S/m]	Dielectric Constant [ε] Target	Conductivity σ [S/m] Target	ε [%]	σ [%]
11.06.2026	WB Head	21.8	900	41.49	0.98	41.5	0.97	-0.0	1.4
11.06.2026	WB Head	21.8	915.45	41.41	0.99	41.47	0.98	-0.2	1.3
11.06.2026	WB Head	21.8	921.7	41.37	0.99	41.46	0.98	-0.2	1.3
11.06.2026	WB Head	21.8	927.7	41.34	0.99	41.45	0.98	-0.3	1.3
15.06.2026	WB Head	22	13	52.04	0.74	55.0	0.75	-5.4	-1.3
15.06.2026	WB Head	22	13.56	52.04	0.74	55.0	0.75	-5.4	-1.3

5. TEST PROCEDURE

Test configurations for SAR testing were selected based on conducted power measurements. Low, mid and high frequency channels for the configuration with the highest SAR value were tested. For testing the Honeywell CT47 was placed inside the sled incorporating UHF and HF RFID readers.

Control software was used to set the DUT to transmit at maximum power.

5.1 Device Holder

The device was placed in the device holder (illustrated below) that is supplied by SPEAG as an integral part of the Dasy system.



Device holder supplied by SPEAG

5.2 Test Positions

5.2.1 Extremity Configuration, 0mm separation distance

Extremity SAR was tested from the six sides of the device. The back of the device was tested in two positions due to the protrusion in the back of the device. The device was placed in the SPEAG holder/on the top of a Rohacell and lifted towards the phantom until the distance between the phantom and the device was 0mm.

Photos of the test positions are presented in appendix A.

5.3 Scan Procedures

First, area scans were used for determination of the field distribution. Next, a zoom scan was performed around the highest E-field value to determine the averaged SAR value. Drift was determined by measuring the same point at the start of the area scan and again at the end of the zoom scan.

5.4 SAR Averaging Methods

The maximum SAR value was averaged over a cube of tissue using interpolation and extrapolation.

The interpolation, extrapolation and maximum search routines within Dasy are all based on the modified Quadratic Shepard's method (Robert J. Renka, "Multivariate Interpolation of Large Sets of Scattered Data", University of North Texas ACM Transactions on Mathematical Software, vol. 14, no. 2, June 1988, pp. 139-148).

The interpolation scheme combines a least-square fitted function method with a weighted average method. A trivariate 3-D / bivariate 2-D quadratic function is computed for each measurement point and fitted to neighboring points by a least-square method. For the zoom scan, inverse distance weighting is incorporated to fit distant points more accurately. The interpolating function is finally calculated as a weighted average of the quadratics.

In the zoom scan, the interpolation function is used to extrapolate the Peak SAR from the deepest measurement points to the inner surface of the phantom.

6. MEASUREMENT UNCERTAINTY

Uncertainty Budget According to IEC/IEEE 62209-1528 (Frequency band: 4MHz–300MHz range)								
Symbol	Error Description	Uncert. value	Prob. Dist.	Div.	(c) (1g)	(c) (10g)	Std. Unc. (1g)	Std. Unc. (10g)
Measurement System Errors								
CF	Probe Calibration	±13.3%	N	$\sqrt{2}$	1	1	±6.65%	±6.65%
CF _{drift}	Probe Calibration Drift	±1.7%	R	$\sqrt{3}$	1	1	±1.0%	±1.0%
LIN	Probe Linearity	±4.7%	R	$\sqrt{3}$	1	1	±2.7%	±2.7%
BBS	Broadband Signal	±0.6%	R	$\sqrt{3}$	1	1	±0.3%	±0.3%
ISO	Probe Isotropy	±7.6%	R	3	1	1	±4.4%	±4.4%
DAE	Other Probe+Electronic	±0.8%	N	1	1	1	±0.8%	±0.8%
AMB	RF Ambient	±1.8%	N	1	1	1	±1.8%	±1.8%
Δ _{sys}	Probe Positioning	±0.006mm	N	1	0.04	0.04	±0.10%	±0.10%
DAT	Data Processing	±1.2%	N	1	1	1	±1.2%	±1.2%
Phantom and Device Errors								
LIQ(σ)	Conductivity (meas.) ^{DAK}	±2.5%	N	$\sqrt{1}$	0.78	0.71	±2.0%	±1.8%
LIQ(T _σ)	Conductivity (temp.) ^{BB}	±5.4%	R	$\sqrt{3}$	0.78	0.71	±2.4%	±2.2%
EPS	Phantom Permittivity	±14.0%	R	3	0	0	±0%	±0%
DIS	Distance DUT – TSL	±2.0%	N	1	2	2	±4.0%	±4.0%
D _{xyz}	Device Positioning	±1.0%	N	1	1	1	±1.0%	±1.0%
H	Device Holder	±3.6%	N	$\sqrt{1}$	1	1	±3.6%	±3.6%
MOD	DUT Modulation ^m	±2.4%	R	$\sqrt{3}$	1	1	±1.4%	±1.4%
TAS	Time-average SAR	±1.7%	R	3	1	1	±1.0%	±1.0%
RF _{drift}	DUT drift	±2.5%	N	1	1	1	±2.5%	±2.5%
VAL	Val Antenna Unc. ^{val}	±0.0%	N	1	1	1	±0%	±0%
RF _{in}	Unc. Input Power ^{val}	±0.0%	N	1	1	1	±0%	±0%
Correction to the SAR results								
C(ε, σ)	Deviation to Target	±1.9%	N	$\sqrt{1}$	1	0.84	±1.9%	±1.6%
C(R)	SAR scaling ^p	±0.0%	R	3	1	1	±0.0%	±0.0%
u(ΔSAR)	Combined Uncertainty						±11.4%	±11.3%
U	Expanded Uncertainty						±22.8%	±22.5%

Uncertainty Budget According to IEC/IEEE 62209-1528 (Frequency band: 300MHz–3GHz range)								
Symbol	Error Description	Uncert. value	Prob. Dist.	Div.	(c) (1g)	(c) (10g)	Std. Unc. (1g)	Std. Unc. (10g)
Measurement System Errors								
CF	Probe Calibration	±13.3%	N	$\sqrt{2}$	1	1	±6.7%	±6.7%
CF _{drift}	Probe Calibration Drift	±1.7%	R	$\sqrt{3}$	1	1	±1.0%	±1.0%
LIN	Probe Linearity	±4.7%	R	$\sqrt{3}$	1	1	±2.7%	±2.7%
BBS	Broadband Signal	±2.8%	R	$\sqrt{3}$	1	1	±1.6%	±1.6%
ISO	Probe Isotropy	±7.6%	R	3	1	1	±4.4%	±4.4%
DAE	Other Probe+Electronic	±0.8%	N	1	1	1	±0.8%	±0.8%
AMB	RF Ambient	±1.8%	N	1	1	1	±1.8%	±1.8%
Δ _{sys}	Probe Positioning	±0.006mm	N	1	0.14	0.14	±0.10%	±0.10%
DAT	Data Processing	±1.2%	N	1	1	1	±1.2%	±1.2%
Phantom and Device Errors								
LIQ(σ)	Conductivity (meas.) ^{DAK}	±2.5%	N	$\sqrt{1}$	0.78	0.71	±2.0%	±1.8%
LIQ(T _σ)	Conductivity (temp.) ^{BB}	±3.3%	R	$\sqrt{3}$	0.78	0.71	±1.5%	±1.4%
EPS	Phantom Permittivity	±14.0%	R	3	0	0	±0%	±0%
DIS	Distance DUT – TSL	±2.0%	N	1	2	2	±4.0%	±4.0%
D _{xyz}	Device Positioning	±1.0%	N	1	1	1	±1.0%	±1.0%
H	Device Holder	±3.6%	N	$\sqrt{1}$	1	1	±3.6%	±3.6%
MOD	DUT Modulation ^m	±2.4%	R	$\sqrt{3}$	1	1	±1.4%	±1.4%
TAS	Time-average SAR	±1.7%	R	3	1	1	±1.0%	±1.0%
RF _{drift}	DUT drift	±2.5%	N	1	1	1	±2.5%	±2.5%
VAL	Val Antenna Unc. ^{val}	±0.0%	N	1	1	1	±0.0%	±0.0%
RF _{in}	Unc. Input Power ^{val}	±0.0%	N	1	1	1	±0.0%	±0.0%
Correction to the SAR results								
C(ε, σ)	Deviation to Target	±1.9%	N	$\sqrt{1}$	1	0.84	±1.9%	±1.6%
C(R)	SAR scaling ^p	±0.0%	R	3	1	1	±0.0%	±0.0%
u(ΔSAR)	Combined Uncertainty						±11.3%	±11.2%
U	Expanded Uncertainty						±22.6%	±22.5%

7. TEST RESULTS

7.1 SAR Results for Extremity Condition with 0mm separation

UHF RFID:

Band	Frequency [MHz]	Maximum Power [dBm]	Conducted Power [dBm]	Test position	Measured SAR _{10g} [W/kg]	Power Drift [dB]*	Duty Cycle [%]	Scaling Factor	Reported SAR _{10g} [W/kg]	Plot #
UHF RFID	915.45	25	24.29	Front	0.0317	-0.45	100	1.31	0.04	
UHF RFID	915.45	25	24.29	Back 1	2.24	-0.26	100	1.25	2.80	
UHF RFID	915.45	25	24.29	Back 2	0.409	-0.22	100	1.24	0.51	
UHF RFID	915.45	25	24.29	Left	0.044	-0.5	100	1.32	0.06	
UHF RFID	915.45	25	24.29	Right	0.214	-0.14	100	1.18	0.25	
UHF RFID	915.45	25	24.29	Top	0.262	-0.22	100	1.24	0.32	
UHF RFID	915.45	25	24.29	Bottom	0.015	-0.26	100	1.25	0.02	
UHF RFID	921.7	25	24.03	Back 1	2.6	-0.24	100	1.32	3.44	3
UHF RFID	927.7	25	22.36	Back 1	1.45	-0.21	100	1.84	2.66	
UHF RFID	921.7	25	24.03	Back 1/repeat	2.56	-0.24	100	1.32	3.38	

*Larger than 5% drifts included to scaling factors

HF RFID:

Band	Frequency [MHz]	Maximum Power [dBm]	Conducted Power [dBm]	Test position	Measured SAR _{10g} [W/kg]	Power Drift [dB]*	Duty Cycle [%]	Scaling Factor	Reported SAR _{10g} [W/kg]	Plot #
HF RFID	13.56	10	9.86	Front	0.0045	-0.12	100	1.03	0.005	4
HF RFID	13.56	10	9.86	Back 1	0	0	100	1.03	0.000	
HF RFID	13.56	10	9.86	Back 2	0.00021	-0.57	100	1.18	0.000	
HF RFID	13.56	10	9.86	Left	0	0	100	1.03	0.000	
HF RFID	13.56	10	9.86	Right	0.00000052	0	100	1.03	0.000	
HF RFID	13.56	10	9.86	Top	0	0	100	1.03	0.000	
HF RFID	13.56	10	9.86	Bottom	0.0019	0.50	100	1.16	0.002	

*Larger than 5% drifts included to scaling factors

7.2 IEC/IEEE 62209-1528:2020, Zoom Scan Evaluation

According to IEC/IEEE 62209-1528:2020, subclause 7.4.2 d.4), the zoom scan complies if the peak spatial-average SAR is below 0.1 W/kg, or if the following criteria is met:

1. The smallest horizontal distance from the local SAR peaks to all points 3 dB below the SAR peak is larger than the horizontal grid step.
2. Ratio of SAR at the second measured point (M2) to the SAR at the closest measured point (M1) at the x-y location of the measured maximum is at least 30%.

Zoom scan compliance according to IEC/IEEE 62209-1528:2020 is automatically verified by DASY software and all zoom scans in this test report do pass the criteria. The horizontal distance and Ratio between measurement points M2 and M1 of the highest SAR results are available in Appendix C.

7.3 Simultaneous Transmission Analysis

Simultaneous transmission analysis for the maximum UHF SAR and the maximum HF SAR is in the table below. Direct summation of SAR results was performed.

Extremity SAR:

	Exposure Condition	Extremity SAR _{10g} [W/kg]						
	Test Position	Front	Back 1	Back 2	Left	Right	Top	Bottom
UHF SAR		0.04	3.44	0.51	0.06	0.25	0.32	0.02
HF SAR		0.005	0	0	0	0	0	0.002
Direct Summation:		0.045	3.44	0.51	0.06	0.25	0.32	0.022

APPENDIX B: SYSTEM CHECK SCAN

Plot 1

Date/Time: 11.6.26 15:55:04

Test Laboratory: Verkotan Oy

DUT: D900V2 - SN120

Communication System: UID 0, CW (0); Communication System Band: D900 (900.0 MHz); Frequency: 900 MHz;

Communication System PAR: 0 dB;

Medium parameters used: $f = 900$ MHz; $\sigma = 0.983$ S/m; $\epsilon_r = 41.489$; $\rho = 1000$ kg/m³

Phantom section: Center Section

Measurement Standard: DASYS (IEEE/IEC)

DASY Configuration:

- Probe: EX3DV4 - SN7447; ConvF(8.83, 9.02, 9.25) @ 900 MHz; Calibrated: 11.2.26
 - Sensor-Surface: 1.4mm (Mechanical Surface Detection), $z = 31.0, -4.0$
 - Electronics: DAE4 Sn1332; Calibrated: 4.2.26
 - Phantom: SAR1_Phantom 1_triple flat right; Type: QD 000 P51 Cx;
 - DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Configuration/System check 900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

Reference Value = 53.95 V/m; Power Drift = -0.22 dB Peak SAR (extrapolated) = 3.77 W/kg

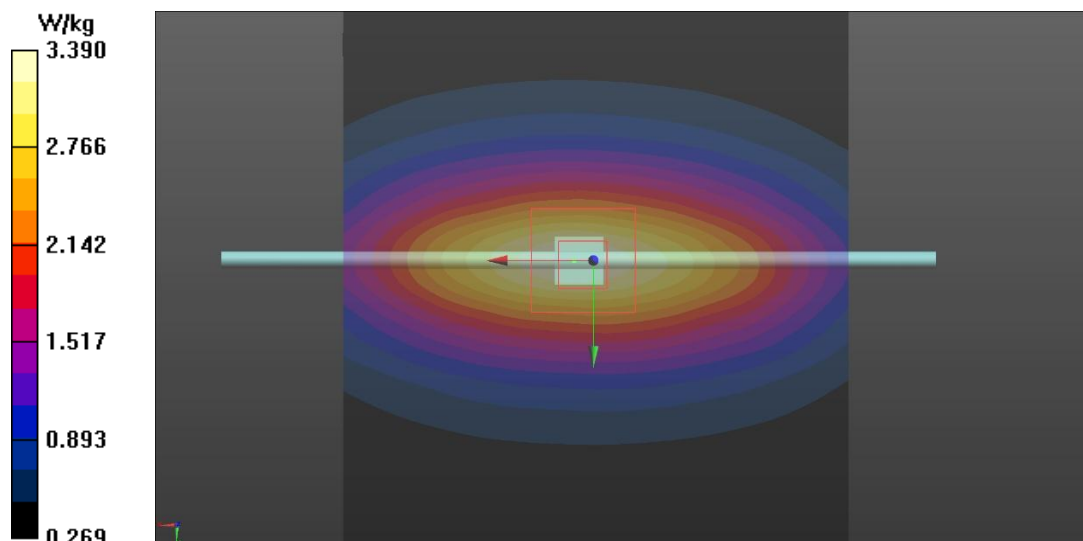
SAR(1 g) = 2.54 W/kg; SAR(10 g) = 1.65 W/kg (SAR corrected for target medium)

Smallest distance from peaks to all points 3 dB below = 16.8 mm

Ratio of SAR at M2 to SAR at M1 = 67.7% Maximum value of SAR (measured) = 3.39 W/kg

Configuration/System check 900MHz/Area Scan (71x101x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 3.44 W/kg



Plot 2

Date/Time: 15.6.26 12:08:51

Test Laboratory: Verkotan Oy

DUT: CLA-13 - SN1012

Communication System: UID 0, CW (0); Communication System Band: CLA13 (13.0MHz); Frequency: 13 MHz;

Communication System PAR: 0 dB;

Medium parameters used: $f = 13 \text{ MHz}$; $\sigma = 0.74 \text{ S/m}$; $\epsilon_r = 52.039$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC)

DASY Configuration:

- Probe: EX3DV4 - SN3852; ConvF(13.76, 14.13, 14.73) @ 13 MHz; Calibrated: 17.10.25
 - Sensor-Surface: 1.4mm (Mechanical Surface Detection), $z = 31.0, -4.0$
 - Electronics: DAE4 Sn710; Calibrated: 16.10.25
 - Phantom: SAR1_Phantom1_ELI_left; Type: QD OVA 002 AA;
 - DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Configuration/13MHz system check/Zoom Scan (6x6x7)/Cube 0: Measurement grid: $dx=7.5\text{mm}$, $dy=7.5\text{mm}$, $dz=5\text{mm}$

Reference Value = 14.72 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.231 W/kg

SAR(1 g) = 0.126 W/kg; SAR(10 g) = 0.079 W/kg (SAR corrected for target medium)

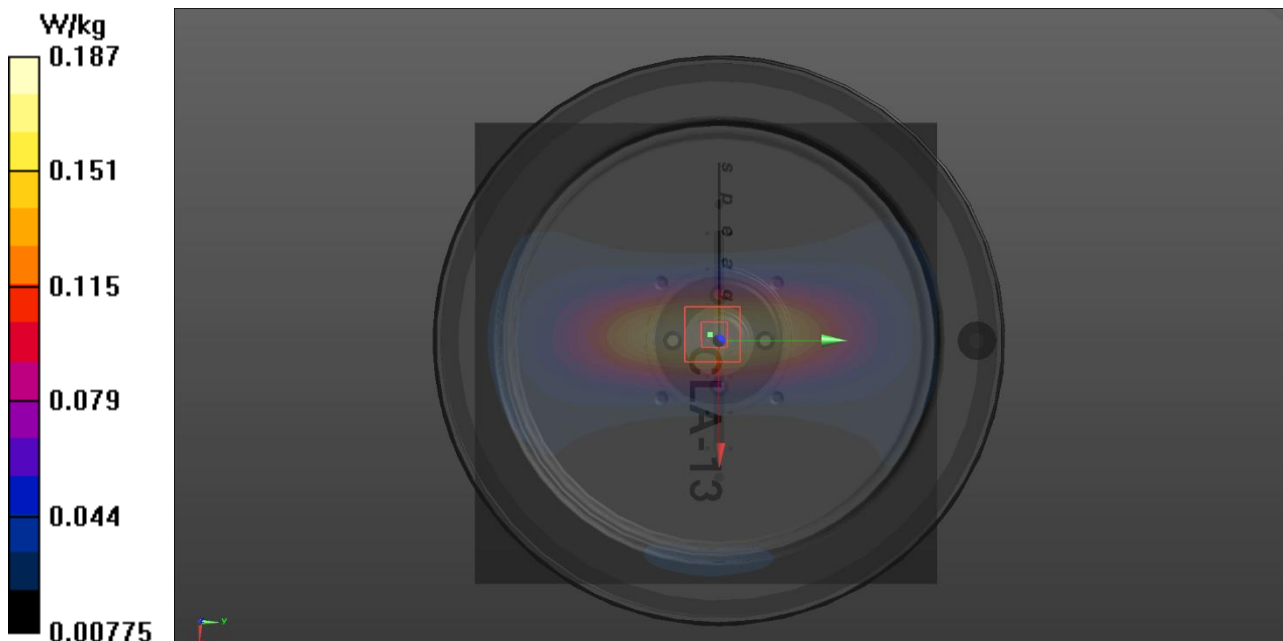
Smallest distance from peaks to all points 3 dB below = 15.1 mm

Ratio of SAR at M2 to SAR at M1 = 55.1%

Maximum value of SAR (measured) = 0.187 W/kg

Configuration/13MHz system check/Area Scan (121x121x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 0.182 W/kg



APPENDIX C: MEASUREMENT SCANS

Plot 3

Date/Time: 12.6.26 09:35:48

Test Laboratory: Verkotan Oy

DUT: Honeywell RFID reader Sled

Communication System: UID 0, UHF (0); Communication System Band: UHF; Frequency: 921.7 MHz;

Communication System PAR: 0 dB;

Medium parameters used: $f = 922$ MHz; $\sigma = 0.992$ S/m; $\epsilon_r = 41.368$; $\rho = 1000$ kg/m³

Phantom section: Center Section

Measurement Standard: DASYS (IEEE/IEC)

DASY Configuration:

- Probe: EX3DV4 - SN7447; ConvF(8.83, 9.02, 9.25) @ 921.7 MHz; Calibrated: 11.2.26
 - Sensor-Surface: 1.4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 1.4mm (Mechanical Surface Detection), $z = -4.0, 31.0$
 - Electronics: DAE4 Sn1332; Calibrated: 4.2.26
 - Phantom: SAR1_Phantom 1_triple flat right; Type: QD 000 P51 Cx;
 - DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Configuration/FCC UHF, 921MHz Back 1 /Area Scan (161x81x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm Maximum value of SAR (interpolated) = 11.3 W/kg

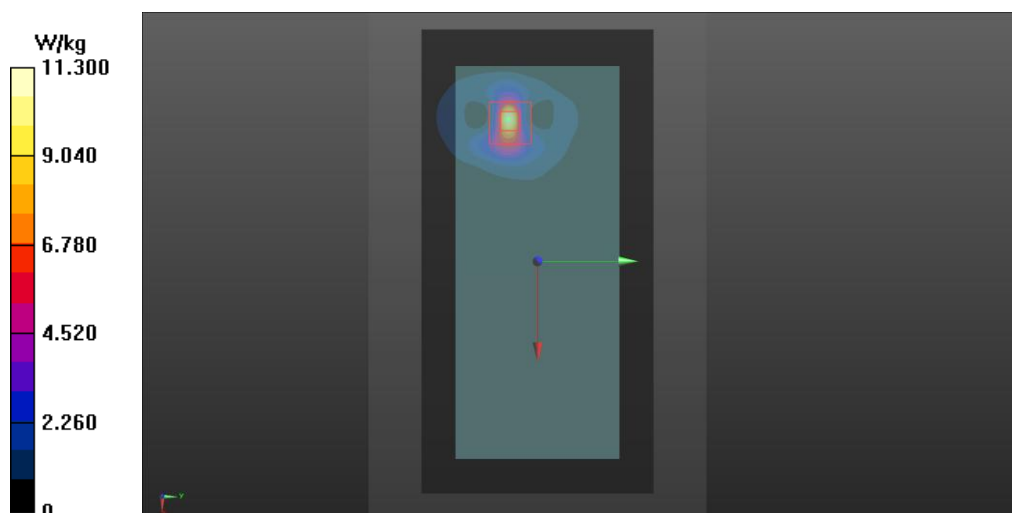
Configuration/FCC UHF, 921MHz Back 1 /Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm Reference Value = 64.19 V/m; Power Drift = -0.24 dB

Peak SAR (extrapolated) = 14.6 W/kg

SAR(1 g) = 6.37 W/kg; SAR(10 g) = 2.6 W/kg (SAR corrected for target medium)

Smallest distance from peaks to all points 3 dB below = 7.5 mm

Ratio of SAR at M2 to SAR at M1 = 47.9% Maximum value of SAR (measured) = 11.0 W/kg



Plot 4

Date/Time: 15.6.26 13:54:27

Test Laboratory: Verkotan Oy

DUT: Honeywell RFID reader Sled

Communication System: UID 0, HF (0); Communication System Band: HF; Frequency: 13.56 MHz;

Communication System PAR: 0 dB;

Medium parameters used (interpolated): $f = 13.56$ MHz; $\sigma = 0.74$ S/m; $\epsilon_r = 52.041$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/)

DASY Configuration:

- Probe: EX3DV4 - SN3852; ConvF(13.76, 14.13, 14.73) @ 13.56 MHz; Calibrated: 17.10.25
 - Sensor-Surface: 1.4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 1.4mm (Mechanical Surface Detection), $z = -4.0, 31.0$
 - Electronics: DAE4 Sn710; Calibrated: 16.10.25
 - Phantom: SAR1_Phantom1_ELI_left; Type: QD OVA 002 AA;
 - DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Configuration/FCC HF, 13.56MHz Front/Area Scan (161x81x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 0.0268 W/kg

Configuration/FCC HF, 13.56MHz Front/Zoom Scan (6x6x7)/Cube 0: Measurement grid: $dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

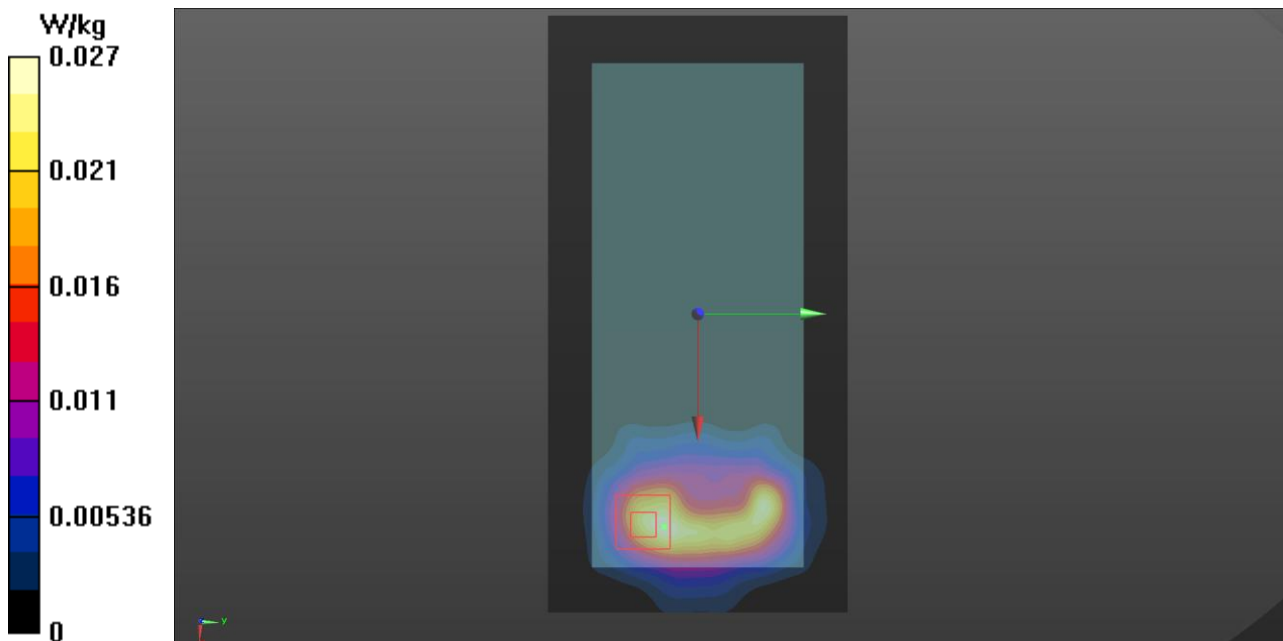
Reference Value = 3.511 V/m; Power Drift = -0.13 dB Peak SAR (extrapolated) = 0.0370 W/kg

SAR(1 g) = 0.011 W/kg; SAR(10 g) = 0.00453 W/kg (SAR corrected for target medium)

Smallest distance from peaks to all points 3 dB below: Larger than measurement grid

Ratio of SAR at M2 to SAR at M1 = 27.2%

Maximum value of SAR (measured) = 0.0233 W/kg



APPENDIX D: RELEVANT PAGES FROM PROBE & DAE CALIBRATION REPORTS

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

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 **Verkotan**
Oulu, Finland

Certificate No. **EX-3852_Oct25**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3852**

Calibration procedure(s) **QA CAL-01.v10, QA CAL-12.v10, QA CAL-14.v7, QA CAL-23.v6,
QA CAL-25.v8, QA CAL-48.v2
Calibration procedure for dosimetric E-field probes**

Calibration date **October 17, 2025**

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	Calibration Date (Certificate No.)	Sched. Cal.
Power Sensor R&S NRP-33T	SN: 100967	30-Apr-25 (No. 1020-300791789)	Apr-26
N-type mismatch combination	SN: L1119	26-Mar-25 (No. 217-04292)	Mar-26
OCP DAK-12	SN: 1016	16-Sept-25 (No. OCP-DAK12-1016_Sep25)	Sep-26
OCP DAK-3.5	SN: 1248	16-Sept-25 (No. OCP-DAK3.5-1248_Sep25)	Sep-26
Reference Probe EX3DV4	SN: 7349	10-Jan-25 (No. EX3-7349_Jan25)	Jan-26
DAE4	SN: 1301	07-Nov-24 (No. DAE4-1301_Nov24)	Nov-25

Secondary Standards	ID	Check Date (in house)	Sched. Check
ACAP 2020 Setup 1	SN: L1404	01-Oct-25 (No. IHCK_ACAP2020-1_Oct25)	Oct-26
OCP DAK-12	SN: 1029	27-Feb-25 (No. OCP-DAK12-1029_Feb25)	Feb-26
OCP DAK-3.5	SN: 1336	09-Dec-24 (No. OCP-DAK3.5-1336_Dec24)	Dec-25

	Name	Function	Signature
Calibrated by	Paulo Pina	Laboratory Technician	
Approved by	Sven Kühn	Technical Manager	
Issued: October 17, 2025			
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Certificate No: EX-3852_Oct25

Page 1 of 9

EX3DV4 - SN:3852

October 17, 2025

Parameters of Probe: EX3DV4 - SN:3852

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k = 2)
Norm ($\mu\text{V}/(\text{V}/\text{m})^2$) ^A	0.42	0.40	0.46	$\pm 10.1\%$
DCP (mV) ^B	100.4	99.5	99.6	$\pm 4.7\%$

Calibration Results for Modulation Response

UID	Communication System Name		A dB	B dB $\sqrt{\mu\text{V}}$	C	D dB	VR mV	Max dev.	Max Unc ^E k = 2
0	CW	X	0.00	0.00	1.00	0.00	142.8	$\pm 2.0\%$	$\pm 4.7\%$
		Y	0.00	0.00	1.00		134.4		
		Z	0.00	0.00	1.00		149.7		

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%.

^A The uncertainties of Norm X,Y,Z do not affect the E^2 -field uncertainty inside TSL (see Page 5).

^B Linearization parameter uncertainty for maximum specified field strength.

^E Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

EX3DV4 - SN:3852

October 17, 2025

Parameters of Probe: EX3DV4 - SN:3852

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle	-59.3°
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	12 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	1.4 mm

Note: Measurement distance from surface can be increased to 3–4 mm for an Area Scan job.

EX3DV4 - SN:3852

October 17, 2025

Parameters of Probe: EX3DV4 - SN:3852

Calibration Parameter Determined in HSL

f (MHz) ^C	Relative Permittivity ^F	Conductivity ^F (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unc ^H (k = 2)
6	55.0	0.75	14.58	14.97	15.61	0.00	1.25	±13.3%
13	55.0	0.75	13.76	14.13	14.73	0.00	1.25	±13.3%
30	55.0	0.75	12.60	12.94	13.49	0.00	1.25	±13.3%
64	54.2	0.75	11.42	11.73	12.22	0.00	1.25	±13.3%
128	52.8	0.76	10.81	11.10	11.57	0.00	1.25	±13.3%
220	49.0	0.81	10.41	10.70	11.15	0.00	1.25	±13.3%
2450	39.2	1.80	7.03	7.08	7.41	0.31	1.27	±11.0%
5250	35.9	4.71	5.31	5.35	5.60	0.28	1.27	±13.1%
5600	35.5	5.07	4.93	4.97	5.20	0.26	1.27	±13.1%
5750	35.4	5.22	4.89	4.93	5.16	0.25	1.27	±13.1%

^C Frequency validity above 300 MHz of ±100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ±50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ±10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4–9 MHz, and ConvF assessed at 13 MHz is 9–19 MHz. Above 5 GHz frequency validity can be extended to ±110 MHz.

^F The probes are calibrated using tissue simulating liquids (TSL) that deviate for ϵ and σ by less than ±5% from the target values (typically better than ±3%) and are valid for TSL with deviations of up to ±10% if SAR correction is applied.

^G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ±1% for frequencies below 3 GHz and below ±2% for frequencies between 3–6 GHz at any distance larger than half the probe tip diameter from the boundary.

^H The stated uncertainty is the total calibration uncertainty (k = 2) of Norm-ConvF. This is equivalent to the uncertainty component with the symbol CF in Table 9 of IEC/IEEE 62209-1528:2020.

**Calibration Laboratory of
Schmid & Partner
Engineering AG**

Zeughausstrasse 43, 8004 Zurich, Switzerland



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S Servizio svizzero di taratura
S Swiss Calibration Service

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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 **Verkotan**
Oulu, Finland

Certificate No. **EX-7447_Feb26**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:7447**

Calibration procedure(s) **QA CAL-01.v10, QA CAL-12.v10, QA CAL-14.v7, QA CAL-23.v6,
QA CAL-25.v8, QA CAL-48.v2
Calibration procedure for dosimetric E-field probes**

Calibration date **February 11, 2026**

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	Calibration Date (Certificate No.)	Sched. Cal.
Power Sensor R&S NRP40T	SN: 101861	29-Apr-25 (No. 2025-001450)	Apr-26
N-type mismatch combination	SN: L1119	26-Mar-25 (No. 217-04292)	Mar-26
OCP DAK-12	SN: 1016	16-Sept-25 (No. OCP-DAK12-1016_Sep25)	Sep-26
OCP DAK-3.5	SN: 1249	16-Sept-25 (No. OCP-DAK3.5-1249_Sep25)	Sep-26
Reference Probe EX3DV4	SN: 7349	29-Jan-26 (No. EX3-7349_Jan26)	Jan-27
DAE4	SN: 1301	22-Jan-26 (No. DAE4-1301_Jan26)	Jan-27
Secondary Standards	ID	Check Date (in house)	Sched. Check
ACAP 2020 Setup 1	SN: L1404	01-Oct-25 (No. IHCK_ACAP2020-1_Oct25)	Oct-26
OCP DAK-12	SN: 1029	27-Feb-25 (No. OCP-DAK12-1029_Feb25)	Feb-26
OCP DAK-3.5	SN: 1336	10-Dec-25 (No. OCP-DAK3.5-1336_Dec25)	Dec-26

	Name	Function	Signature
Calibrated by	Henrique Almeida	Laboratory Technician	<i>Henrique Almeida</i>
Approved by	Sven Kühn	Technical Manager	<i>Sven Kühn</i>
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Issued: February 11, 2026

Certificate No: EX-7447_Feb26

Page 1 of 9

EX3DV4 - SN:7447

February 11, 2026

Parameters of Probe: EX3DV4 - SN:7447

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k = 2)
Norm ($\mu\text{V}/(\text{V}/\text{m})^2$) ^A	0.41	0.43	0.42	±10.1%
DCP (mV) ^B	94.6	91.5	99.0	±4.7%

Calibration Results for Modulation Response

UID	Communication System Name		A dB	B dB $\sqrt{\mu\text{V}}$	C	D dB	VR mV	Max dev.	Max Unc ^E k = 2
0	CW	X	0.00	0.00	1.00	0.00	119.6	±1.3%	±4.7%
		Y	0.00	0.00	1.00		128.2		
		Z	0.00	0.00	1.00		125.2		

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%.

^A The uncertainties of Norm X,Y,Z do not affect the E²-field uncertainty inside TSL (see Page 5).

^B Linearization parameter uncertainty for maximum specified field strength.

^E Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

EX3DV4 - SN:7447

February 11, 2026

Parameters of Probe: EX3DV4 - SN:7447

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle	39.9°
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	12 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	1.4 mm

Note: Measurement distance from surface can be increased to 3–4 mm for an Area Scan job.

EX3DV4 - SN:7447

February 11, 2026

Parameters of Probe: EX3DV4 - SN:7447

Calibration Parameter Determined in HSL

f (MHz) ^C	Relative Permittivity ^F	Conductivity ^F (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unc ^H (k = 2)
13	55.0	0.75	17.88	12.04	17.94	0.00	1.25	±13.3%
750	41.9	0.89	9.24	9.43	9.67	0.34	1.27	±11.0%
900	41.5	0.97	8.83	9.02	9.25	0.34	1.27	±11.0%
1750	40.1	1.37	7.55	7.71	7.90	0.33	1.27	±11.0%
1950	40.0	1.40	7.44	7.59	7.78	0.33	1.27	±11.0%
2100	39.8	1.49	7.66	7.82	8.01	0.32	1.27	±11.0%
2300	39.5	1.67	7.40	7.55	7.74	0.32	1.27	±11.0%
2450	39.2	1.80	6.97	7.11	7.29	0.32	1.27	±11.0%
2600	39.0	1.96	7.25	7.40	7.59	0.32	1.27	±11.0%
5250	35.9	4.71	5.16	5.27	5.40	0.29	1.27	±13.1%
5600	35.5	5.07	4.72	4.82	4.94	0.26	1.27	±13.1%
5750	35.4	5.22	4.65	4.75	4.87	0.25	1.27	±13.1%

^C Frequency validity above 300 MHz of ±100 MHz only applies for DASV v4.4 and higher (see Page 2), else it is restricted to ±50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ±10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4–8 MHz, and ConvF assessed at 13 MHz is 9–19 MHz. Above 5 GHz frequency validity can be extended to ±110 MHz.

^F The probes are calibrated using tissue simulating liquids (TSL) that deviate for ϵ and σ by less than ±5% from the target values (typically better than ±3%) and are valid for TSL with deviations of up to ±10% if SAR correction is applied.

^G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ±1% for frequencies below 3 GHz and below ±2% for frequencies between 3–6 GHz at any distance larger than half the probe tip diameter from the boundary.

^H The stated uncertainty is the total calibration uncertainty (k = 2) of Norm-ConvF. This is equivalent to the uncertainty component with the symbol CF in Table 9 of IEC/IEEE 62209-1528:2020.

**Calibration Laboratory of
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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 **Verkotan**
Oulu - Finland

Certificate No: **DAE4-1332_Feb26**

CALIBRATION CERTIFICATE

Object **DAE4 - SD 000 D04 BM - SN: 1332**

Calibration procedure(s) **QA CAL-06.v30
Calibration procedure for the data acquisition electronics (DAE)**

Calibration date: **February 04, 2026**

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 $(22 \pm 3)^\circ\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Keithley Multimeter Type 2001	SN: 0810278	15-Aug-25 (No:43873)	Aug-26
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Auto DAE Calibration Unit	SE UWS 053 AA 1001	23-Jan-26 (in house check)	In house check: Jan-27
Calibrator Box V2.1	SE UMS 006 AA 1002	23-Jan-26 (in house check)	In house check: Jan-27

Calibrated by:	Name Adrian Gehring	Function Laboratory Technician	Signature
Approved by:	Sven Kühn	Technical Manager	

Issued: February 4, 2026

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Certificate No: DAE4-1332_Feb26

Page 1 of 5

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1 μ V, full range = -100...+300 mV

Low Range: 1LSB = 61 nV, full range = -1.....+3 mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	404.352 $\pm$ 0.02% (k=2)	403.753 $\pm$ 0.02% (k=2)	403.948 $\pm$ 0.02% (k=2)
Low Range	4.00007 $\pm$ 1.50% (k=2)	3.97309 $\pm$ 1.50% (k=2)	3.96074 $\pm$ 1.50% (k=2)

Connector Angle

Connector Angle to be used in DASY system	64.5 $^{\circ}$ $\pm$ 1 $^{\circ}$
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Appendix (Additional assessments outside the scope of SCS0108)

1. DC Voltage Linearity

High Range	Reading (μV)	Difference (μV)	Error (%)
Channel X + Input	200034.22	0.19	0.00
Channel X + Input	20006.44	2.39	0.01
Channel X - Input	-20008.28	0.79	-0.00
Channel Y + Input	200033.40	-1.13	-0.00
Channel Y + Input	20003.60	-0.33	-0.00
Channel Y - Input	-20012.38	-3.17	0.02
Channel Z + Input	200034.05	0.03	0.00
Channel Z + Input	20004.79	0.97	0.00
Channel Z - Input	-20009.28	-0.05	0.00

Low Range	Reading (μV)	Difference (μV)	Error (%)
Channel X + Input	1998.91	0.12	0.01
Channel X + Input	198.42	-0.19	-0.09
Channel X - Input	-201.54	-0.43	0.22
Channel Y + Input	1998.72	-0.02	-0.00
Channel Y + Input	197.32	-1.23	-0.62
Channel Y - Input	-202.72	-1.50	0.75
Channel Z + Input	1998.53	-0.18	-0.01
Channel Z + Input	198.11	-0.47	-0.24
Channel Z - Input	-202.28	-1.12	0.56

2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	-16.64	-16.53
	- 200	19.60	17.86
Channel Y	200	-22.58	-22.94
	- 200	21.14	20.83
Channel Z	200	-10.34	-10.25
	- 200	8.97	8.98

3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X (μV)	Channel Y (μV)	Channel Z (μV)
Channel X	200	-	-0.95	-3.76
Channel Y	200	6.50	-	1.43
Channel Z	200	9.68	4.06	-

4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	15927	15658
Channel Y	16088	16848
Channel Z	16003	15987

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Input 10M Ω

	Average (μ V)	min. Offset (μ V)	max. Offset (μ V)	Std. Deviation (μ V)
Channel X	0.36	-0.55	1.09	0.31
Channel Y	-0.72	-1.90	0.06	0.34
Channel Z	-0.26	-1.06	0.79	0.29

6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

7. Input Resistance (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

8. Low Battery Alarm Voltage (Typical values for information)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	-0.01	-8	-8

**Calibration Laboratory of
Schmid & Partner
Engineering AG**
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

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 **Verkotan**
Oulu - Finland

Certificate No: DAE4-710_Oct25

CALIBRATION CERTIFICATE

Object DAE4 - SD 000 D04 BM - SN: 710

Calibration procedure(s) QA CAL-06.v30
Calibration procedure for the data acquisition electronics (DAE)

Calibration date: October 16, 2025

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 $(22 \pm 3)^\circ\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Keithley Multimeter Type 2001	SN: 0810278	15-Aug-25 (No.43873)	Aug-26
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Auto DAE Calibration Unit	SE UWS 053 AA 1001	23-Jan-25 (in house check)	In house check: Jan-26
Calibrator Box V2.1	SE UMS 006 AA 1002	23-Jan-25 (in house check)	In house check: Jan-26

Calibrated by:	Name Adrian Gehring	Function Laboratory Technician	Signature
Approved by:	Sven Kühn	Technical Manager	

Issued: October 16, 2025

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Certificate No: DAE4-710_Oct25

Page 1 of 5

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1 μ V, full range = -100...+300 mV

Low Range: 1LSB = 61 nV, full range = -1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	403.484 $\pm$ 0.02% (k=2)	403.622 $\pm$ 0.02% (k=2)	403.781 $\pm$ 0.02% (k=2)
Low Range	3.95410 $\pm$ 1.50% (k=2)	3.95929 $\pm$ 1.50% (k=2)	3.98291 $\pm$ 1.50% (k=2)

Connector Angle

Connector Angle to be used in DASY system	348.5 $^{\circ}$ $\pm$ 1 $^{\circ}$
---	-------------------------------------

Appendix (Additional assessments outside the scope of SCS0108)

1. DC Voltage Linearity

High Range	Reading (μV)	Difference (μV)	Error (%)
Channel X + Input	200035.99	0.23	0.00
Channel X + Input	20002.43	-2.05	-0.01
Channel X - Input	-20007.81	1.13	-0.01
Channel Y + Input	200033.25	-2.60	-0.00
Channel Y + Input	20003.80	-0.64	-0.00
Channel Y - Input	-20005.23	3.93	-0.02
Channel Z + Input	200034.30	-1.72	-0.00
Channel Z + Input	20001.46	-3.02	-0.02
Channel Z - Input	-20007.59	1.50	-0.01

Low Range	Reading (μV)	Difference (μV)	Error (%)
Channel X + Input	1998.57	-0.44	-0.02
Channel X + Input	198.50	-0.48	-0.24
Channel X - Input	-201.28	-0.34	0.17
Channel Y + Input	1998.94	-0.10	-0.01
Channel Y + Input	198.55	-0.40	-0.20
Channel Y - Input	-202.27	-1.27	0.63
Channel Z + Input	1999.17	0.19	0.01
Channel Z + Input	197.99	-1.00	-0.50
Channel Z - Input	-201.55	-0.52	0.26

2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	20.82	19.35
	- 200	-19.12	-20.78
Channel Y	200	3.21	2.77
	- 200	-3.55	-4.11
Channel Z	200	7.14	7.02
	- 200	-7.53	-7.46

3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X (μV)	Channel Y (μV)	Channel Z (μV)
Channel X	200	-	-2.85	-1.52
Channel Y	200	6.92	-	-0.81
Channel Z	200	4.66	4.31	-

4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	16578	14953
Channel Y	15892	16106
Channel Z	16047	13918

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Input 10M Ω

	Average (μ V)	min. Offset (μ V)	max. Offset (μ V)	Std. Deviation (μ V)
Channel X	-0.23	-2.00	1.34	0.60
Channel Y	-1.21	-2.60	0.21	0.58
Channel Z	0.38	-0.65	2.30	0.46

6. Input Offset Current

Nominal input circuitry offset current on all channels: <25fA

7. Input Resistance (Typical values for information)

	Zeroing (k Ω m)	Measuring (M Ω m)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

8. Low Battery Alarm Voltage (Typical values for information)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	-0.01	-8	-9

APPENDIX E: RELEVANT PAGES FROM DIPOLE CALIBRATION REPORTS

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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: **Verkotan**
Oulu, Finland

Certificate No.: **CLA13-1012_Oct23**

CALIBRATION CERTIFICATE

Object: **CLA13 - SN: 1012**

Calibration procedure(s): **QA CAL-15.v10**
Calibration Procedure for SAR Validation Sources below 700 MHz

Calibration date: **October 20, 2023**

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
Power meter NRP2	SN: 104778	30-Mar-23 (No. 217-03804/03805)	Mar-24
Power sensor NRP-Z91	SN: 103244	30-Mar-23 (No. 217-03804)	Mar-24
Power sensor NRP-Z91	SN: 103245	30-Mar-23 (No. 217-03805)	Mar-24
Reference 20 dB Attenuator	SN: CC2552 (20x)	30-Mar-23 (No. 217-03809)	Mar-24
Type-N mismatch combination	SN: 310982 / 06327	30-Mar-23 (No. 217-03810)	Mar-24
Reference Probe EX3DV4	SN: 3677	06-Jan-23 (No. EX3-3677_Jan23)	Jan-24
DAE4	SN: 654	27-Jan-23 (No. DAE4-654_Jan23)	Jan-24

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter NRP2	SN: 107193	08-Nov-21 (in house check Dec-22)	In house check: Dec-24
Power sensor NRP-Z91	SN: 100922	15-Dec-09 (in house check Dec-22)	In house check: Dec-24
Power sensor NRP-Z91	SN: 100418	01-Jan-04 (in house check Dec-22)	In house check: Dec-24
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-22)	In house check: Jun-24
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-22)	In house check: Oct-24

Calibrated by: **Jeton Kastrali** (Name) **Laboratory Technician** (Function)  (Signature)

Approved by: **Sven Köhn** (Name) **Technical Manager** (Function)  (Signature)

Issued: **October 23, 2023**

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

Certificate No: CLA13-1012_Oct23 Page 1 of 6

Measurement Conditions

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

DASY Version	DASY5	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	ELI4 Flat Phantom	Shell thickness: 2 ± 0.2 mm
EUT Positioning	Touch Position	
Zoom Scan Resolution	$dx, dy = 4.0$ mm, $dz = 1.4$ mm	Graded Ratio = 1.4 (Z direction)
Frequency	13 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	55.0	0.75 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	53.8 ± 6 %	0.72 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	1 W input power	0.527 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	0.542 W/kg $\pm$ 18.4 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	1 W input power	0.327 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	0.336 W/kg $\pm$ 18.0 % (k=2)

Docusign Envelope ID: 67AE2BBB-FDE7-4279-B6AA-243768F8471E



SAR Reference Dipole Calibration Report

Ref : ACR.89.17.26.PAR.A

VERKOTAN LTD.
ELEKTRONIIKKATIE 17
90590, OULU, FINLAND
SAR REFERENCE DIPOLE
FREQUENCY: 900 MHZ
SERIAL NO.: D900V2 SN:120

Calibrated at MVG
13 Rue du Zephyr
91140 Villejust - FRANCE

Calibration date: 03/24/2026



Scope available on <https://a21a.org/>

Summary:

This document presents the method and results from an accredited SAR reference dipole calibration performed in MVG using the COMOSAR test bench. All calibration results are traceable to national metrology institutions.

Page: 1/8

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SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.89.17.26.PARA

	Name	Function	Date	Signature
Prepared by :	Pedro Ruiz	Technical Manager	3/30/2026	
Checked & approved by:	Pedro Ruiz	Technical Manager	3/30/2026	
Authorized by:	Christophe Barrot	Quality Manager	2026 March 31	

Signed by:

7587FED2BFCF046E...

	Customer Name
Distribution :	Verkotan Ltd.

Issue	Name	Date	Modifications
A	Pedro Ruiz	3/30/2026	Initial release

Page: 2/8

Template_ACR.DDD.N.YY.MVGB.ISSUE_SAR Reference Dipole v/N

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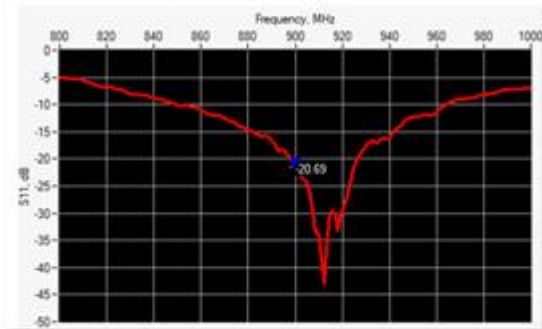


SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.89.17.26.PARA

6.2 S11 PARAMETER

6.2.1 S11 parameter in Head Liquid



Frequency (MHz)	S11 parameter (dB)	Requirement (dB)	Impedance
900	-20.69	-20	$52.4\Omega + 9.2j\Omega$

6.3 SAR

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards state that the system validation measurements must be performed using a reference dipole meeting the fore mentioned return loss and mechanical dimension requirements. The validation measurement must be performed against a liquid filled flat phantom, with the phantom constructed as outlined in the fore mentioned standards. Per the standards, the dipole shall be positioned below the bottom of the phantom, with the dipole length centered and parallel to the longest dimension of the flat phantom, with the top surface of the dipole at the described distance from the bottom surface of the phantom by using a prescribed spacer.

6.3.1 SAR with Head Liquid

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards state that the system validation measurements should produce the SAR values shown below (for phantom thickness of 2 mm), within the uncertainty for the system validation. All SAR values are normalized to 1 W forward power. In bracket, the measured SAR is given with the used input power.

Software	OPENSAR V5
Phantom	SN 13/09 SAM68
Probe	4424-EPGO-443
Liquid	Head Liquid Values: $\epsilon_{ps}' : 43.8$ $\sigma : 0.93$
Distance between dipole center and liquid	15.0 mm
Area scan resolution	$dx=8mm/dy=8mm$
Zoon Scan Resolution	$dx=8mm/dy=8mm/dz=5mm$
Frequency	900 MHz
Input power	20 dBm
Liquid Temperature	$20 \pm 1^\circ C$
Lab Temperature	$20 \pm 1^\circ C$
Lab Humidity	30-70 %

Page: 6/8

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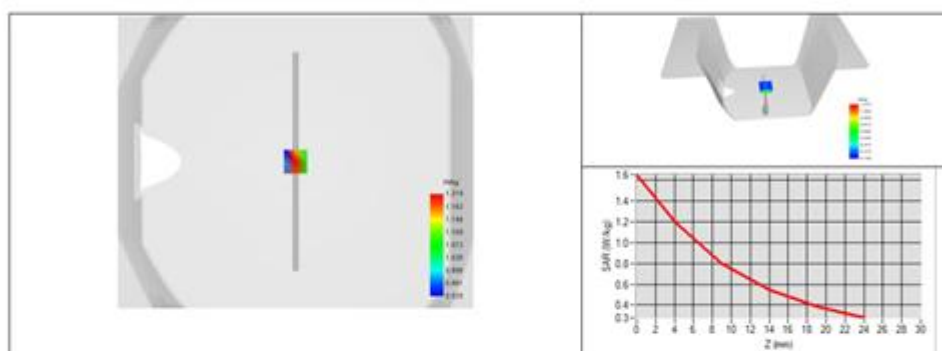
Docusign Envelope ID: 67AE28BB-FDE7-4279-B6AA-243768F8471E



SAR REFERENCE DIPOLE CALIBRATION REPORT

ReE ACR.89.17.26.PARA

Frequency	1g SAR (W/kg)			10g SAR (W/kg)		
	Measured	Measured normalized to 1W	Target normalized to 1W	Measured	Measured normalized to 1W	Target normalized to 1W
900 MHz	1.13	11.26	10.90	0.71	7.10	6.99



Page: 7/8

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