

**Appendix 1 – System Performance Check Plots**

Test Laboratory: JAPAN QUALITY ASSURANCE ORGANIZATION

## System Performance Check

**DUT: D2450V2 - SN714; Type: D2450V2; Serial: SN714**

Frequency: 2450 MHz; Duty Cycle: 1:1

Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.748$  S/m;  $\epsilon_r = 39.154$ ;  $\rho = 1000$  kg/m<sup>3</sup>

DASY5 Configuration:

- Probe: EX3DV4 - SN7321; ConvF(6.27, 6.99, 6.94); Calibrated: 10/11/2024;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn508; Calibrated: 10/10/2024
- Phantom: ELI v4.0 (20deg probe tilt); Type: QDOVA001BB; Serial: TP:1063
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Dipole/Input 250 mW/Area Scan (9x9x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 18.9 W/kg

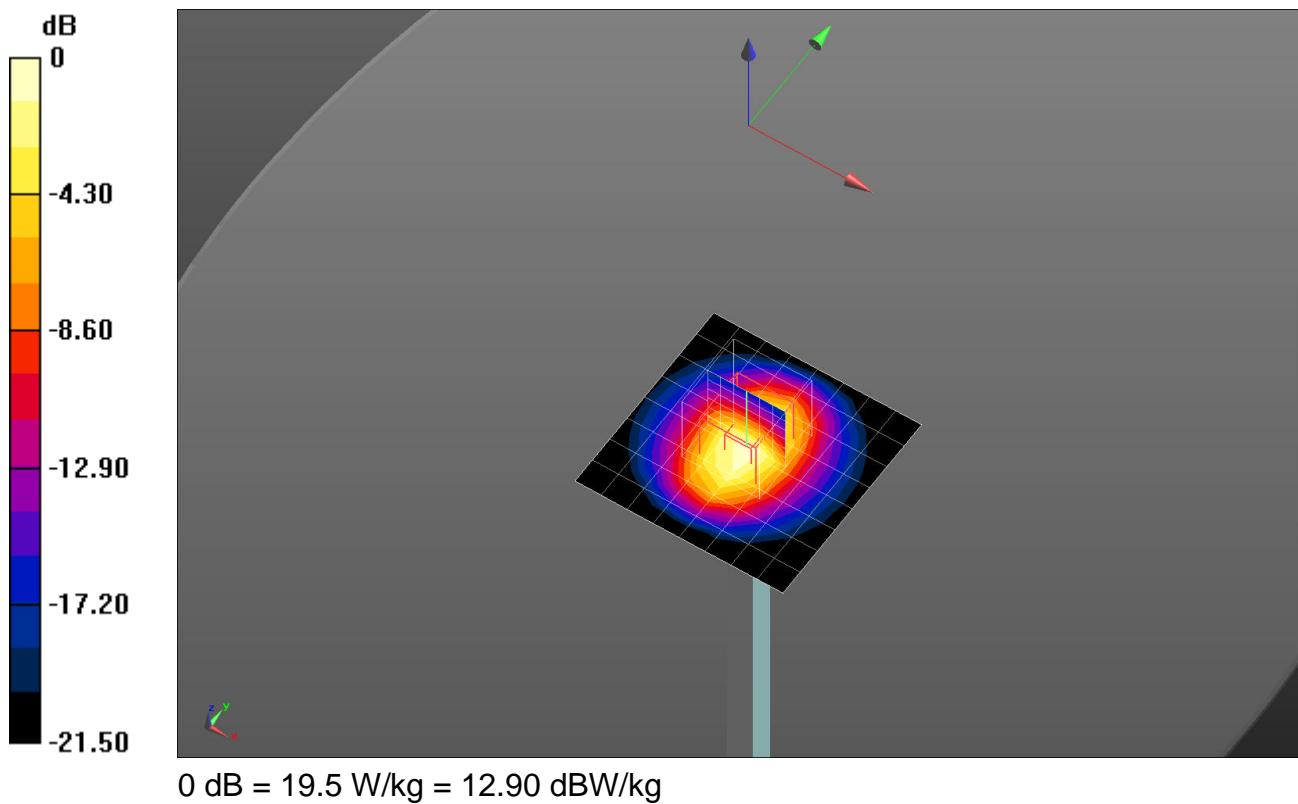
**Dipole/Input 250 mW/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 109.1 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 25.1 W/kg

**SAR(1 g) = 13.1 W/kg; SAR(10 g) = 6.18 W/kg**

Maximum value of SAR (measured) = 19.5 W/kg



Test Laboratory: JAPAN QUALITY ASSURANCE ORGANIZATION

## System Performance Check

**DUT: D2450V2 - SN714; Type: D2450V2; Serial: SN714**

Frequency: 2450 MHz; Duty Cycle: 1:1

Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.789$  S/m;  $\epsilon_r = 38.863$ ;  $\rho = 1000$  kg/m<sup>3</sup>

DASY5 Configuration:

- Probe: EX3DV4 - SN7321; ConvF(6.27, 6.99, 6.94); Calibrated: 10/11/2024;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn508; Calibrated: 10/10/2024
- Phantom: ELI v4.0 (20deg probe tilt); Type: QDOVA001BB; Serial: TP:1063
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Dipole/Input 250 mW/Area Scan (9x9x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 19.1 W/kg

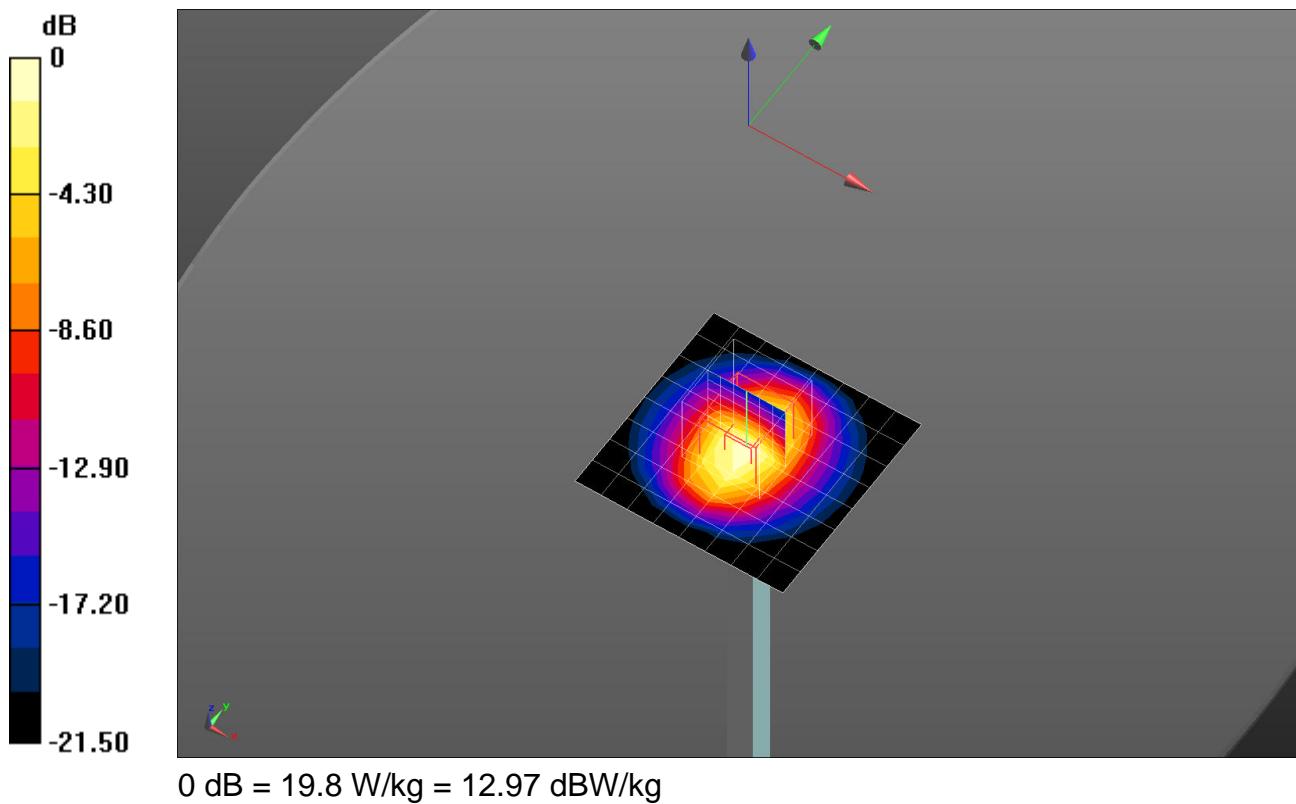
**Dipole/Input 250 mW/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 108.0 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 25.4 W/kg

**SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6.29 W/kg**

Maximum value of SAR (measured) = 19.8 W/kg



Test Laboratory: JAPAN QUALITY ASSURANCE ORGANIZATION

## System Performance Check

**DUT: D2450V2 - SN714; Type: D2450V2; Serial: SN714**

Frequency: 2450 MHz; Duty Cycle: 1:1

Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.804$  S/m;  $\epsilon_r = 38.723$ ;  $\rho = 1000$  kg/m<sup>3</sup>

DASY5 Configuration:

- Probe: EX3DV4 - SN7321; ConvF(6.27, 6.99, 6.94); Calibrated: 10/11/2024;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn508; Calibrated: 10/10/2024
- Phantom: ELI v4.0 (20deg probe tilt); Type: QDOVA001BB; Serial: TP:1063
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Dipole/Input 250 mW/Area Scan (9x9x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 18.9 W/kg

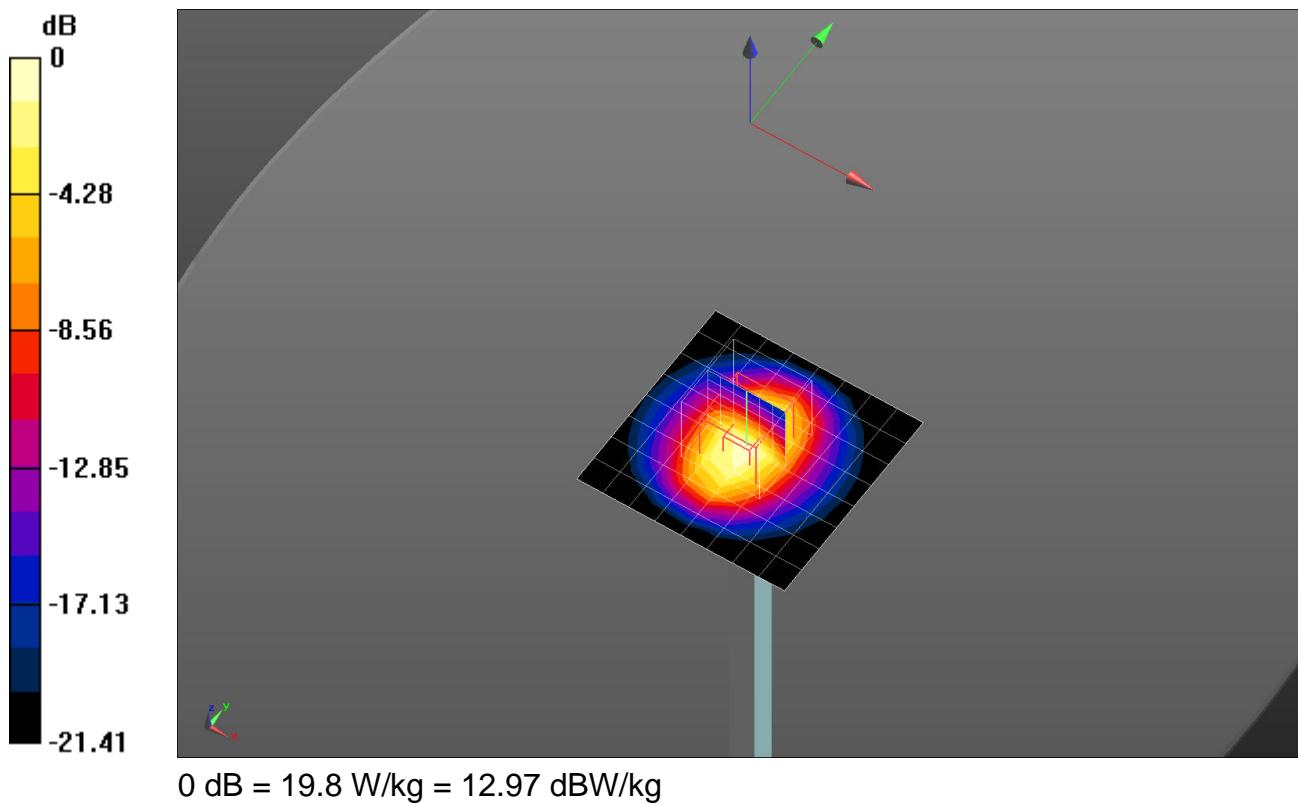
**Dipole/Input 250 mW/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 106.5 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 25.5 W/kg

**SAR(1 g) = 13.2 W/kg; SAR(10 g) = 6.27 W/kg**

Maximum value of SAR (measured) = 19.8 W/kg



**Appendix 2 – Highest SAR Test Plots**

Test Laboratory: JAPAN QUALITY ASSURANCE ORGANIZATION

802.11b 6ch (Chain 0)

**DUT: Gas Camera; Type: GMPC03; Serial: C00006**

Frequency: 2437 MHz; Duty Cycle: 1:1

Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C

Medium parameters used:  $f = 2437$  MHz;  $\sigma = 1.784$  S/m;  $\epsilon_r = 38.863$ ;  $\rho = 1000$  kg/m<sup>3</sup>

DASY5 Configuration:

- Probe: EX3DV4 - SN7321; ConvF(6.27, 6.99, 6.94); Calibrated: 10/11/2024;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn508; Calibrated: 10/10/2024
- Phantom: ELI v4.0 (20deg probe tilt); Type: QDOVA001BB; Serial: TP:1063
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Dipole/Right/Area Scan (19x18x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 0.216 W/kg

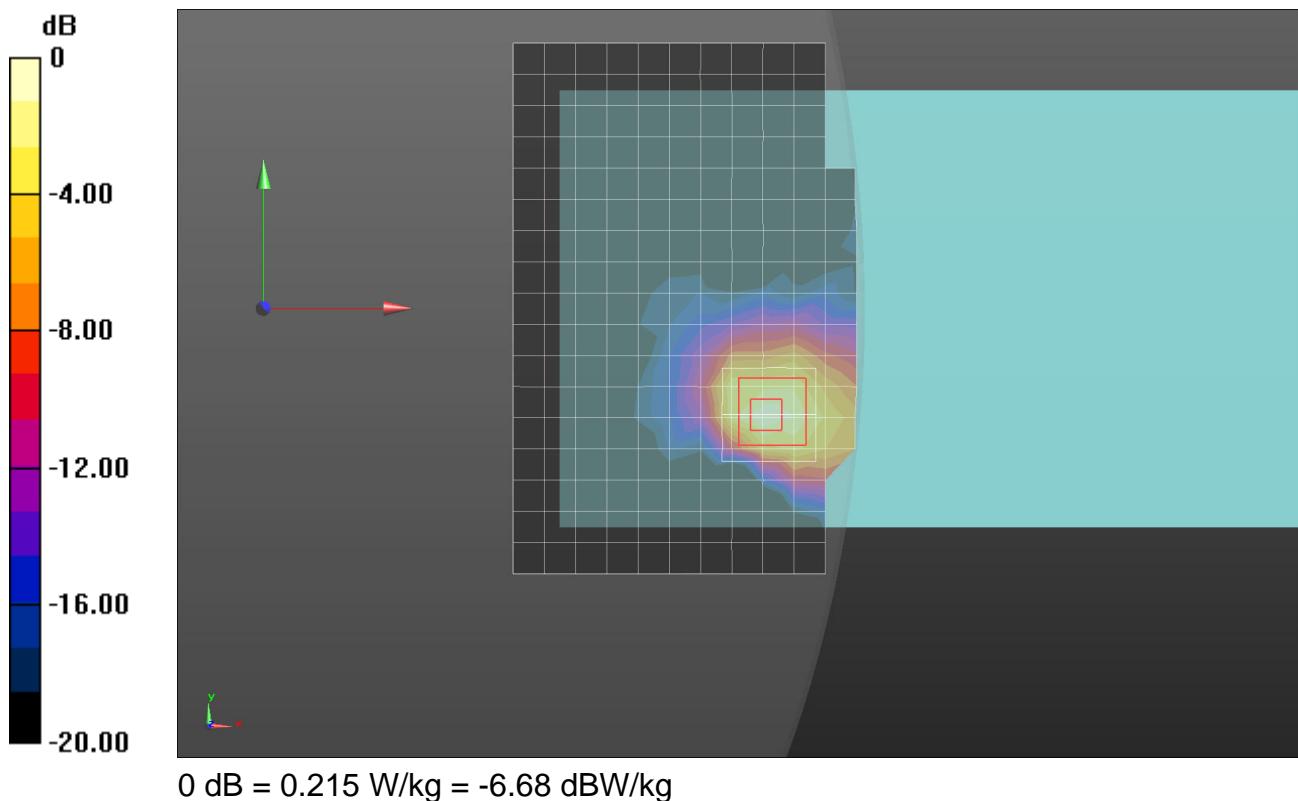
**Dipole/Right/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.981 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 0.295 W/kg

**SAR(1 g) = 0.137 W/kg; SAR(10 g) = 0.063 W/kg**

Maximum value of SAR (measured) = 0.215 W/kg



Test Laboratory: JAPAN QUALITY ASSURANCE ORGANIZATION

802.11b 1ch (Chain 1)

**DUT: Gas Camera; Type: GMPC03; Serial: C00006**

Frequency: 2412 MHz; Duty Cycle: 1:1

Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C

Medium parameters used:  $f = 2412$  MHz;  $\sigma = 1.726$  S/m;  $\epsilon_r = 39.242$ ;  $\rho = 1000$  kg/m<sup>3</sup>

DASY5 Configuration:

- Probe: EX3DV4 - SN7321; ConvF(6.27, 6.99, 6.94); Calibrated: 10/11/2024;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn508; Calibrated: 10/10/2024
- Phantom: ELI v4.0 (20deg probe tilt); Type: QDOVA001BB; Serial: TP:1063
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Dipole/Top/Area Scan (18x13x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 0.767 W/kg

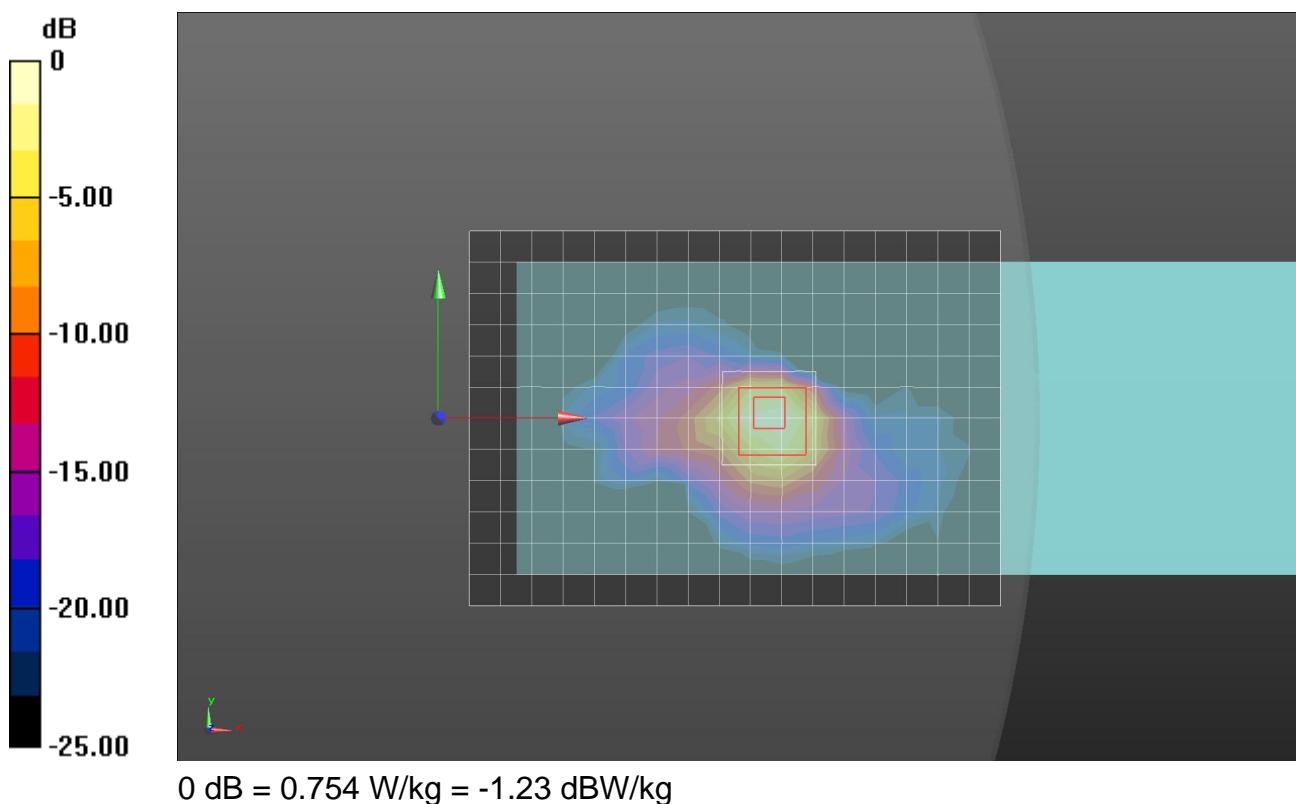
**Dipole/Top/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 22.02 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 1.21 W/kg

**SAR(1 g) = 0.477 W/kg; SAR(10 g) = 0.189 W/kg**

Maximum value of SAR (measured) = 0.754 W/kg



**Appendix 3 – Dosimetric E-Field Probe Calibration Data**



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 **JQA**  
 Osaka, Japan

Certificate No.

**EX-7321\_Oct24**

## CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:7321**

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

Calibration date **October 11, 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  $(22 \pm 3)^\circ\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP2	SN: 104778	26-Mar-24 (No. 217-04036/04037)	Mar-25
Power sensor NRP-Z91	SN: 103244	26-Mar-24 (No. 217-04036)	Mar-25
OCP DAK-3.5 (weighted)	SN: 1249	23-Sep-24 (OCP-DAK3.5-1249_Sep24)	Sep-25
OCP DAK-12	SN: 1016	24-Sep-24 (OCP-DAK12-1016_Sep24)	Sep-25
Reference 20 dB Attenuator	SN: CC2552 (20x)	26-Mar-24 (No. 217-04046)	Mar-25
DAE4	SN: 660	23-Feb-24 (No. DAE4-660_Feb24)	Feb-25
Reference Probe EX3DV4	SN: 7349	03-Jun-24 (No. EX3-7349_Jun24)	Jun-25

Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-24)	In house check: Jun-26
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-24)	In house check: Jun-26
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-24)	In house check: Jun-26
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-24)	In house check: Jun-26
Network Analyzer E8358A	SN: US41080477	31-Mar-14 (in house check Sep-24)	In house check: Sep-26

Calibrated by	Name Krešimir Franjić	Function Laboratory Technician	Signature 
Approved by	Sven Kühn	Technical Manager	

Issued: October 11, 2024

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



## Glossary

TS	tissue simulating liquid
NORM <sub>x,y,z</sub>	sensitivity in free space
ConvF	sensitivity in TS / NORM <sub>x,y,z</sub>
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C, D	modulation dependent linearization parameters
Polarization $\varphi$	$\varphi$ rotation around probe axis
Polarization $\theta$	$\theta$ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\theta = 0$ is normal to probe axis
Connector Angle	information used in DASY system to align probe sensor X to the robot coordinate system

## Calibration is Performed According to the Following Standards:

- IEC/IEEE 62209-1528, "Measurement Procedure For The Assessment Of Specific Absorption Rate Of Human Exposure To Radio Frequency Fields From Hand-Held And Body-Worn Wireless Communication Devices – Part 1528: Human Models, Instrumentation And Procedures (Frequency Range of 4 MHz to 10 GHz)", October 2020.
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

## Methods Applied and Interpretation of Parameters:

- NORM<sub>x,y,z</sub>**: Assessed for E-field polarization  $\theta = 0$  ( $f \leq 900$  MHz in TEM-cell;  $f > 1800$  MHz: R22 waveguide). NORM<sub>x,y,z</sub> are only intermediate values, i.e., the uncertainties of NORM<sub>x,y,z</sub> does not affect the E<sup>2</sup>-field uncertainty inside TS (see below *ConvF*).
- NORM(f)x,y,z = NORM<sub>x,y,z</sub> \* frequency\_response** (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCPx,y,z**: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal. DCP does not depend on frequency nor media.
- PAR**: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- A<sub>x,y,z</sub>; B<sub>x,y,z</sub>; C<sub>x,y,z</sub>; D<sub>x,y,z</sub>; VR<sub>x,y,z</sub>**: A, B, C, D are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for  $f \leq 800$  MHz) and inside waveguide using analytical field distributions based on power measurements for  $f > 800$  MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TS corresponds to  $NORM<sub>x,y,z</sub> * ConvF$  whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from  $\pm 50$  MHz to  $\pm 100$  MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle**: The angle is assessed using the information gained by determining the NORM<sub>x</sub> (no uncertainty required).

## Parameters of Probe: EX3DV4 - SN:7321

### Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k = 2)
Norm ( $\mu\text{V}/(\text{V}/\text{m})^2$ ) <sup>A</sup>	0.49	0.55	0.28	$\pm 10.1\%$
DCP (mV) <sup>B</sup>	99.9	97.3	95.2	$\pm 4.7\%$

### 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 <sup>E</sup> k = 2
0	CW	X	0.00	0.00	1.00	0.00	122.2	$\pm 1.4\%$	$\pm 4.7\%$
		Y	0.00	0.00	1.00		137.8		
		Z	0.00	0.00	1.00		135.7		

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%.

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

<sup>B</sup> Linearization parameter uncertainty for maximum specified field strength.

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

**Parameters of Probe: EX3DV4 - SN:7321****Other Probe Parameters**

Sensor Arrangement	Triangular
Connector Angle	-15.6°
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 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.

## Parameters of Probe: EX3DV4 - SN:7321

### Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) <sup>C</sup>	Relative Permittivity <sup>F</sup>	Conductivity <sup>F</sup> (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha <sup>G</sup>	Depth <sup>G</sup> (mm)	Unc <sup>H</sup> (k = 2)
900	41.5	0.97	8.69	9.69	9.61	0.38	1.27	±11.0%
2450	39.2	1.80	6.27	6.99	6.94	0.40	1.27	±11.0%
5250	35.9	4.71	5.03	5.61	5.56	0.35	1.27	±13.1%
5600	35.5	5.07	4.59	5.12	5.08	0.31	1.27	±13.1%
5750	35.4	5.22	4.57	5.10	5.06	0.29	1.27	±13.1%

<sup>C</sup> 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.

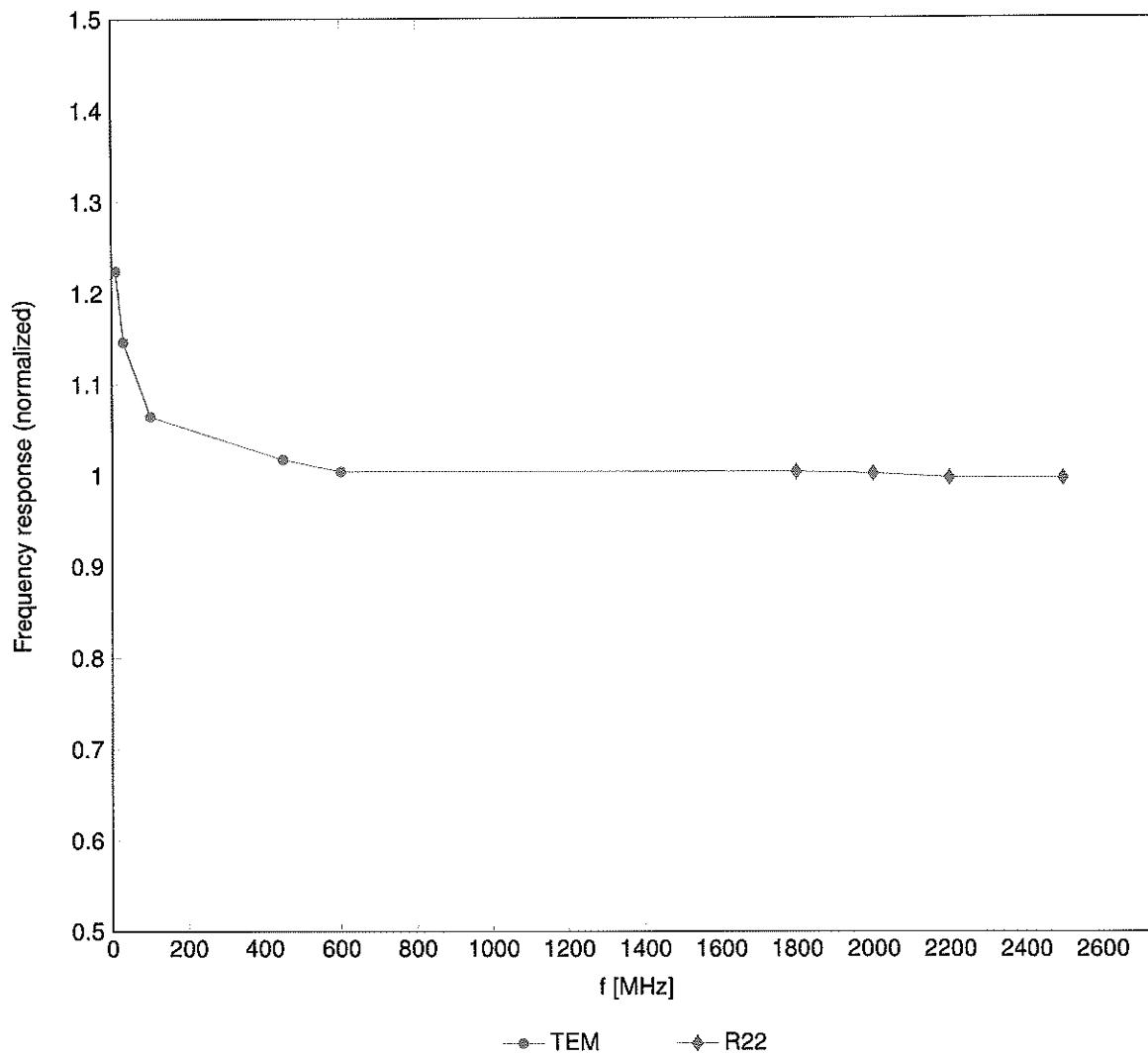
<sup>F</sup> The probes are calibrated using tissue simulating liquids (TSL) that deviate for  $\epsilon$  and  $\sigma$  by less than ±5% from the target values (typically better than ±3%) and are valid for TSL with deviations of up to ±10% if SAR correction is applied.

<sup>G</sup> 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.

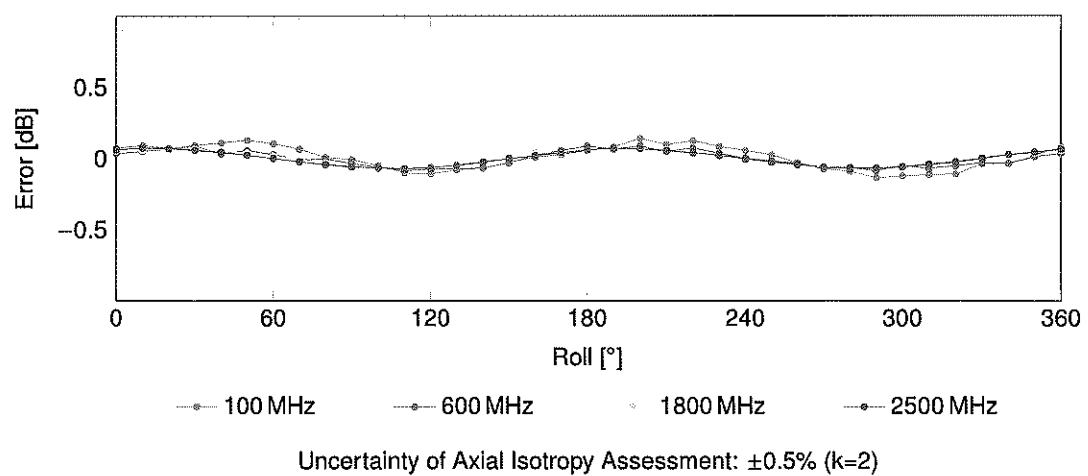
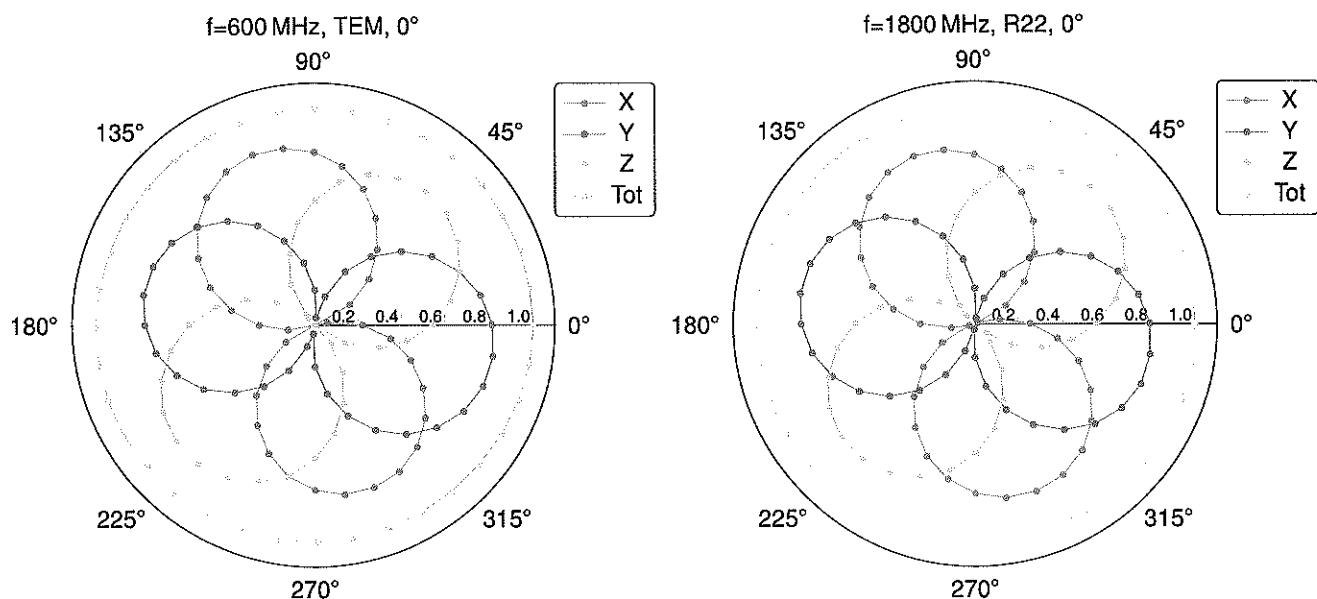
<sup>H</sup> The stated uncertainty is the total calibration uncertainty (k = 2) of Norm-ConvF. This is equivalent to the uncertainty component with the symbol CF in Table 9 of IEC/IEEE 62209-1528:2020.

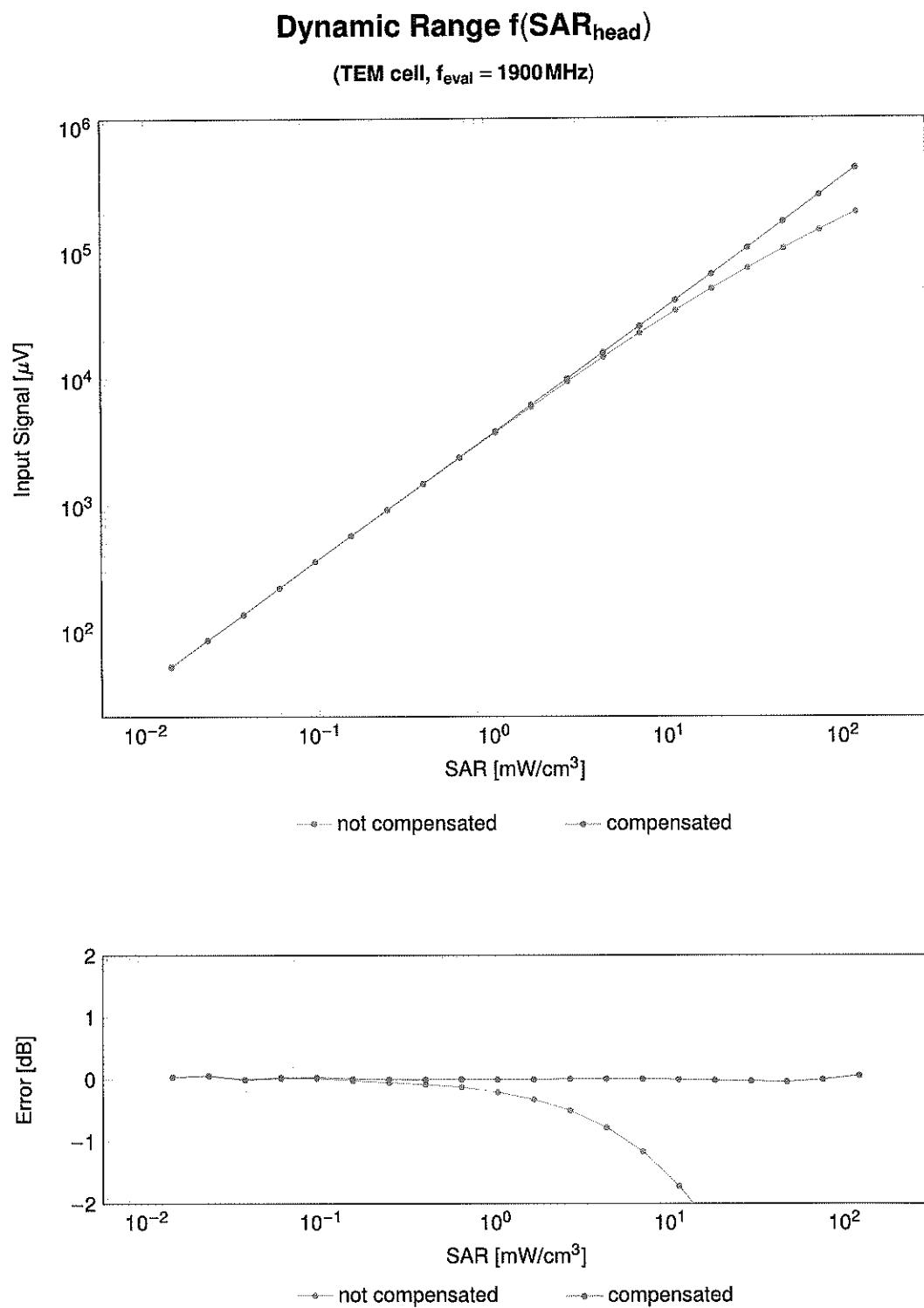
## Frequency Response of E-Field

(TEM-Cell:ifi110 EXX, Waveguide:R22)



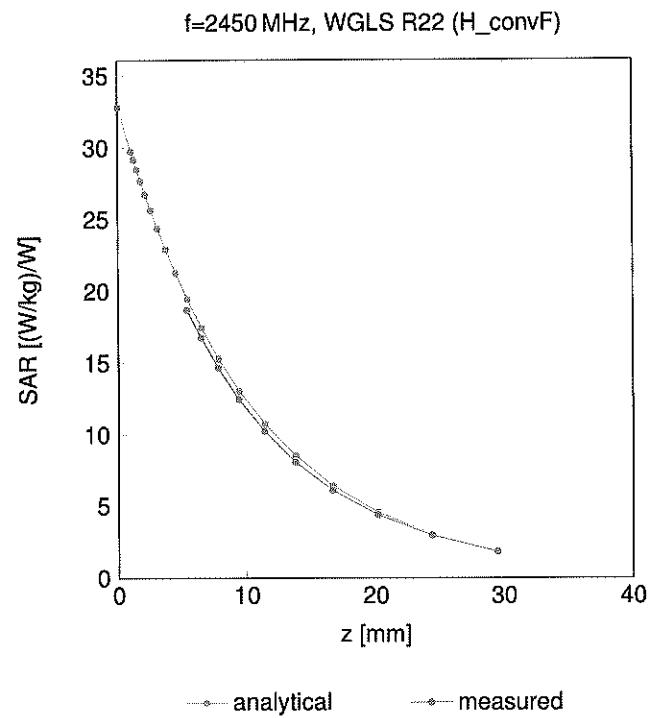
Uncertainty of Frequency Response of E-field:  $\pm 6.3\%$  ( $k=2$ )

**Receiving Pattern ( $\phi$ ),  $\vartheta = 0^\circ$** 



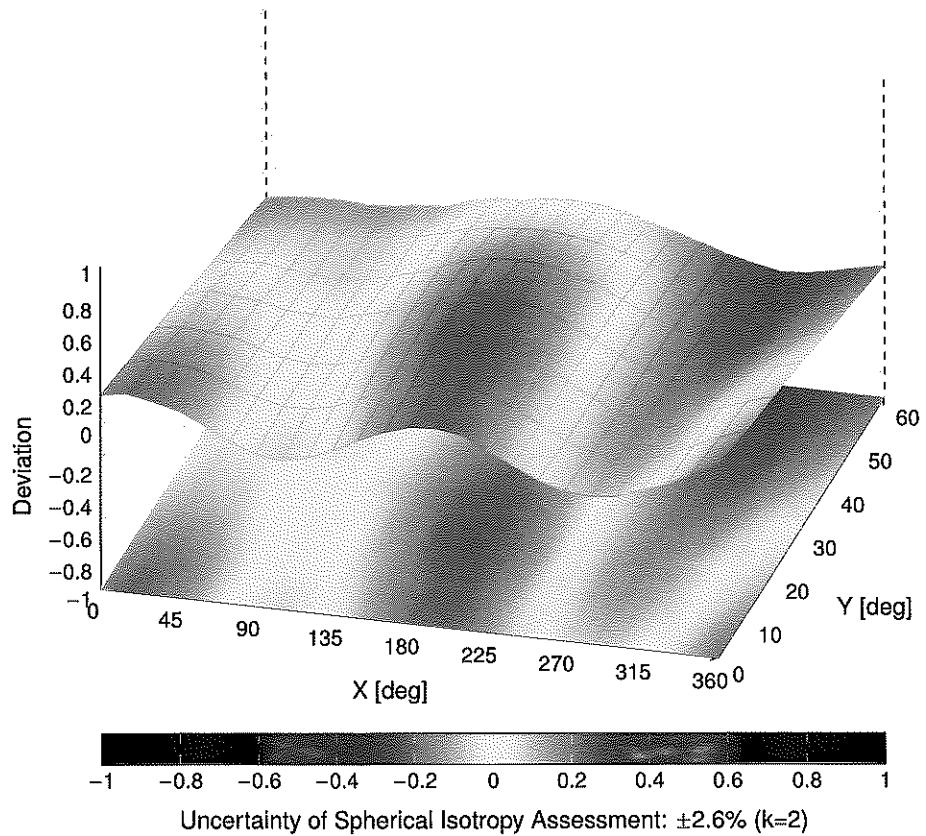
Uncertainty of Linearity Assessment:  $\pm 0.6\%$  ( $k=2$ )

## Conversion Factor Assessment



## Deviation from Isotropy in Liquid

Error  $(\phi, \theta)$ ,  $f = 900\text{ MHz}$



**Appendix 4 – System Validation Dipole Calibration Data**



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 **JQA**  
 Osaka, Japan

Certificate No.

**D2450V2-714\_Oct24**

## CALIBRATION CERTIFICATE

Object **D2450V2 - SN: 714**

Calibration procedure(s) **QA CAL-05.v12**  
 Calibration Procedure for SAR Validation Sources between 0.7 - 3 GHz

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Cal
Power Sensor R&S NRP-33T	SN: 100967	28-Mar-24 (No. 217-04038)	Mar-25
Power Sensor R&S NRP18A	SN: 101859	22-Jul-24 (No. 4030A315008547)	Jul-25
Spectrum Analyzer R&S FSV40	SN: 101832	25-Jan-24 (No. 4030-315007551)	Jan-25
Mismatch; Short [S4188] Attenuator [S4423]	SN: 1152	28-Mar-24 (No. 217-04050)	Mar-25
OCP DAK-12	SN: 1016	24-Sep-24 (No. OCP-DAK12-1016_Sep24)	Sep-25
OCP DAK-3.5	SN: 1249	23-Sep-24 (No. OCP-DAK3.5-1249_Sep24)	Sep-25
Reference Probe EX3DV4	SN: 7349	03-Jun-24 (No. EX3-7349_Jun24)	Jun-25
DAE4ip	SN: 1836	10-Jan-24 (No. DAE4ip-1836_Jan24)	Jan-25

Secondary Standards	ID	Check Date (in house)	Scheduled Check
ACAD Source Box	SN: 1000	28-May-24 (No. 675-ACAD_Source_Box-240528)	May-25
Signal Generator R&S SMB100A	SN: 182081	28-May-24 (No. 675-CAL16-S4588-240528)	May-25
Mismatch; SMA	SN: 1102	22-May-24 (No. 675-Mismatch_SMA-240522)	May-25

	Name	Function	Signature
Calibrated by	Leif Klysner	Laboratory Technician	
Approved by	Sven Kühn	Technical Manager	

Issued: October 16, 2024

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



## Glossary

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

## Calibration is Performed According to the Following Standards

- IEC/IEEE 62209-1528, "Measurement Procedure For The Assessment Of Specific Absorption Rate Of Human Exposure To Radio Frequency Fields From Hand-Held And Body-Worn Wireless Communication Devices - Part 1528: Human Models, Instrumentation And Procedures (Frequency Range of 4 MHz to 10 GHz)", October 2020.
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

## Additional Documentation

- DASY System Handbook

## Methods Applied and Interpretation of Parameters

- *Measurement Conditions*: Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL*: The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss*: These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay*: One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured*: SAR measured at the stated antenna input power.
- *SAR normalized*: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters*: The measured TSL parameters are used to calculate the nominal SAR result.

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.

<b>DASY Version</b>	DASY8 Module SAR		16.4.0
<b>Extrapolation</b>	Advanced Extrapolation		
<b>Phantom</b>	Modular Flat Phantom		
<b>Distance Dipole Center - TSL</b>	10 mm		with spacer
<b>Zoom Scan Resolution</b>	dx, dy = 5mm, dz = 1.5mm		Graded Ratio = 1.5 mm (Z direction)
<b>Frequency</b>	2450MHz $\pm$ 1MHz		

## Head TSL parameters at 2450 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
<b>Nominal Head TSL parameters</b>	22.0 °C	39.2	1.80 mho/m
<b>Measured Head TSL parameters</b>	(22.0 $\pm$ 0.2)°C	37.7 $\pm$ 6%	1.82 mho/m $\pm$ 6%
<b>Head TSL temperature change during test</b>	< 0.5 °C		

## SAR result with Head TSL at 2450 MHz

<b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b>	Condition	
SAR for nominal Head TSL parameters	24 dBm input power	13.1 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	52.2 W/kg $\pm$ 17.0% (k = 2)

<b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b>	Condition	
SAR for nominal Head TSL parameters	24 dBm input power	6.12 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	24.4 W/kg $\pm$ 16.5% (k = 2)

**Appendix (Additional assessments outside the scope of SCS 0108)****Antenna Parameters with Head TSL at 2450 MHz**

Impedance	53.4 $\Omega$ + 2.9 $j\Omega$
Return Loss	-27.3 dB

**General Antenna Parameters and Design**

Electrical Delay (one direction)	1.162 ns
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After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint 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 feedpoint may be damaged.

**Additional EUT Data**

Manufactured by	SPEAG
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## System Performance Check Report

## Summary

Dipole	Frequency [MHz]	TSL	Power [dBm]
D2450V2 - SN714	2450	HSL	24

## Exposure Conditions

Phantom Section, TSL	Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat	10	CW, 0--		2450, 0	7.24	1.82	37.7

## Hardware Setup

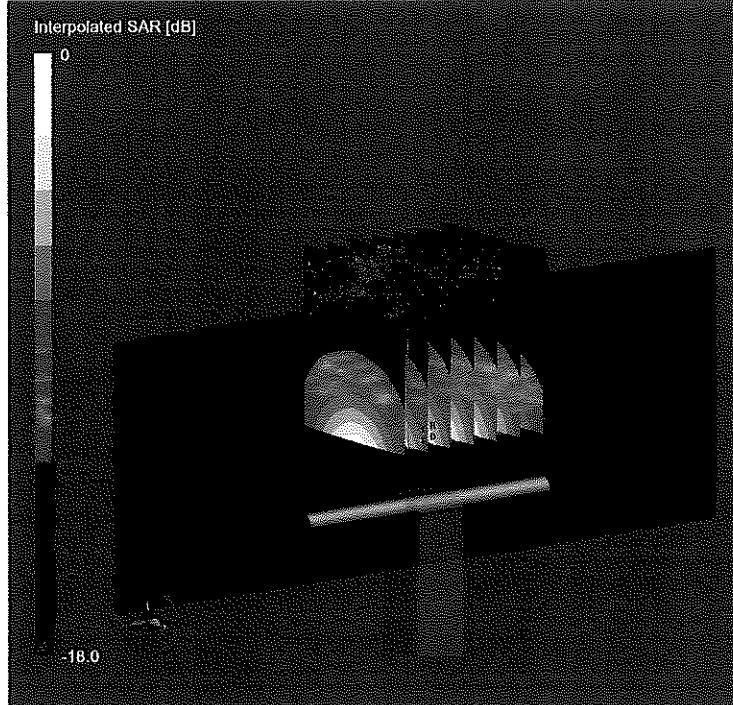
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
MFP V8.0 Center	HSL, 2024-10-16	EX3DV4 - SN7349, 2024-06-03	DAE4ip Sn1836, 2024-01-10

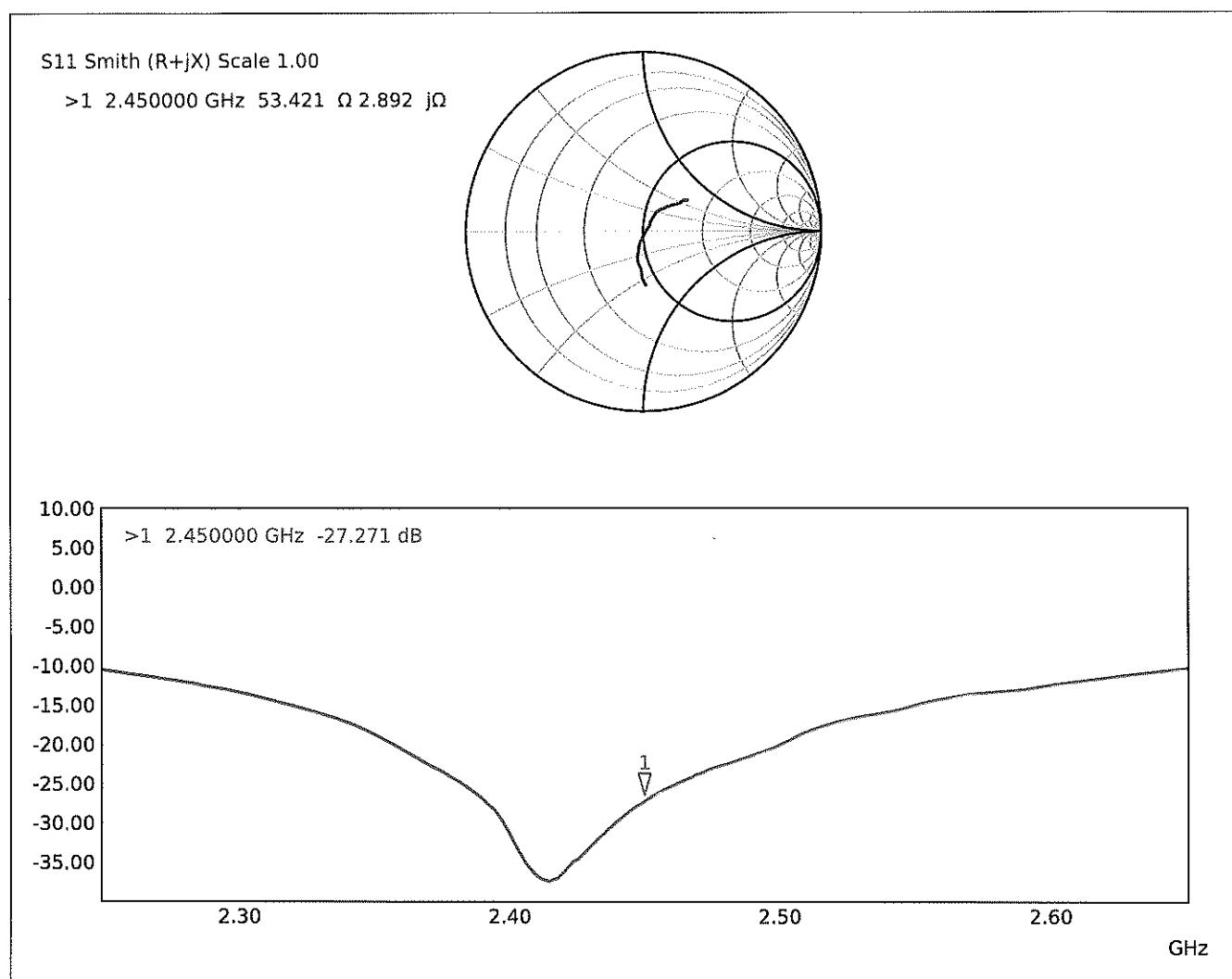
## Scans Setup

	Zoom Scan
Grid Extents [mm]	30 x 30 x 30
Grid Steps [mm]	5.0 x 5.0 x 1.5
Sensor Surface [mm]	1.4
Graded Grid	Yes
Grading Ratio	1.5
MAIA	N/A
Surface Detection	VMS + 6p
Scan Method	Measured

## Measurement Results

	Zoom Scan
Date	2024-10-16
psSAR1g [W/Kg]	13.1
psSAR10g [W/Kg]	6.12
Power Drift [dB]	0.01
Power Scaling	Disabled
Scaling Factor [dB]	
TSL Correction	Positive / Negative



**Impedance Measurement Plot for Head TSL**

**Appendix 5 – Test Setup Photographs**

– Front (Chain 0) –



– Right (Chain 0) –



– Top (Chain 1) –



– Left (Chain 1) –