SAR Compliance Test Report

Date of Report:	31/03/2025	**Client's Contact person:**	Guido Scheibl
Number of pages:	144	**Responsible Test engineer:**	Jesper Varis
Testing laboratory:	**Verkotan Oy** Elektroniikkatie 17 90590 Oulu Finland	**Client:**	**Sirona Dental Systems GmbH** Fabrikstraße 31 64625 Bensheim Germany
Tested device:	**Primescan™ 2 Cart**		
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** **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:	31.03.2025 **Laboratory Manager** Miia Nurkkala		

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1. SUMMARY OF SAR TEST REPORT

1.1 Test Details

Device under Test (DUT):

Product:	Primescan™ 2 Cart
Manufacturer:	Sirona Dental Systems GmbH
Model:	Primescan 2 Cart
Serial Number:	100420, 100422
FCC ID Number:	2AD7W-6800457
DUT Number:	20272 (TES), 20273 (Champ Vision Display)
Battery Type used in testing:	-
State of the Sample:	Production sample

PC Information:

Product:	DELL ProSupport
Manufacturer:	Dell
Model:	00391-80000-00001-AA222
Serial Number:	20277

Testing information:

Testing performed:	14.10.2024 – 12.11.2024
Notes:	IPD Test Report by TÜV SÜD is available in Appendix F.
Document history & changes:	Initial version
Document ID:	FCC_SAR report_Primescan 2 Cart_ID6895_20032025.docx
Temperature °C	22±2 / Controlled
Humidity RH%	30±20 / Controlled
Measurement performed by:	Jesper Varis, Kirsi Kyllönen
ISED Company Number:	22218

1.2 Maximum Results

The maximum reported* SAR/IPD values for Extremity-configuration for transmitting systems are shown in a table below. The device conforms to the requirements of the standards when the maximum reported SAR/IPD 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. The IPD limit specified in FCC § 1.1310(e)(1), Table 1 for general population/uncontrolled exposure for IPD 4cm^2 is 1.0 mW/cm^2 = 10 W/m^2.

1.2.1 Standalone Test Results

System	Highest Reported* SAR_{10g}[W/kg] in Extremity Exposure Condition, 0mm separation distance	Result
2.4 GHz WLAN	0.90	PASS
5 GHz WLAN	0.85	PASS
6 GHz WLAN	0.10	PASS
Bluetooth	0.08	PASS

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

IPD results has been taken from the IPD Test Report by TÜV SÜD, available in Appendix F

System	Highest Measured IPD 4cm^2 [W/m^2] in Extremity Exposure Condition, 0mm separation distance	Result
6 GHz WLAN	7.02	PASS

1.2.2 Simultaneous Transmission

Highest Simultaneous Transmission	Extremity Exposure Condition	Result
SAR_{10g} Summation <6GHz	1.09 W/kg < 4 W/kg	PASS
IPD Summation >6GHz	9.37 W/m^2 < 10 W/m^2	PASS
IPD Antenna A + SAR Antenna B $\sum SAR_{Meas}/SAR_{Limit} + IPD_{Meas}/IPD_{Limit}$	0.75 < 1	PASS

1.2.3 Maximum Drift

Maximum Drift During Measurements	0.99dB*

*Larger than 5% drifts included to scaling factors

1.2.4 Measurement Uncertainty

DASY5:

SAR 10g: IEC/IEEE 62209-1528 (300 MHz – 3 GHz)

Expanded Uncertainty (k=2) 95 %	±21.9 %

SAR 10g: IEC/IEEE 62209-1528 (3 GHz – 6 GHz)

Expanded Uncertainty (k=2) 95 %	±23.8 %

DASY8:

SAR 10g: IEC/IEEE 62209-1528 (300 MHz – 3 GHz)

Expanded Uncertainty (k=2) 95 %	±21.8 %

SAR10g: IEC/IEEE 62209-1528 (3 GHz – 6 GHz)

Expanded Uncertainty (k=2) 95 %	±23.0 %

SAR 10g: IEC/IEEE 62209-1528 (6 GHz – 10 GHz)

Expanded Uncertainty (k=2) 95 %	±27.9 %

APD 4cm^2 (6 GHz – 10 GHz)

Expanded Uncertainty (k=2) 95 %	±31.9 %

2. DESCRIPTION OF THE DEVICE UNDER TEST (DUT)

The DUT is a Primescan 2 Cart which is a part of intraoral scanner system Primescan 2. Primescan 2 consists of Primescan 2 Cart and Single Use Sleeve Primescan 2 and it is used to create digital impressions for use in dentistry.

Primescan 2 Cart consists of the mobile stand with touch screen monitor, that has two transmitting antennas; WLAN 2.4 GHz, WLAN 5GHz and WLAN 6GHz use antennas A and B and Bluetooth uses Antenna A.

Windows PC that has the same WLAN/BT module as DUT, (Intel Wi-Fi 6E AX210(Gig+)), was used to control the WLAN/BT module via software. Transmission from the module goes through the RF cables to the DUT's antennas A or B. Power losses caused by the RF cables have been measured and considered in the SAR scaling factor.

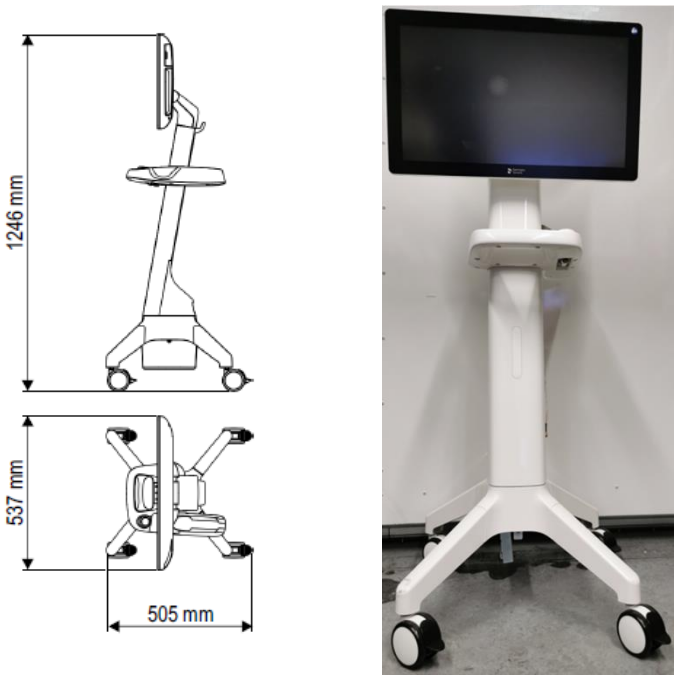


Figure 1 Primescan 2 Cart, mobile stand with monitor

Figure 2 Primescan 2 monitor, size of 537 x 330 x 60mm

Device Category	Portable
Exposure Environment	General population uncontrolled

2.1 Supported Frequency Bands and Operational Modes

	Modes of Operation	**Transmitter Frequency Range [MHz]**
TX Frequency bands	2.4 GHz WLAN	2412 – 2462
	5 GHz WLAN	5180 – 5825
	6 GHz WLAN	5995 - 7115
	Bluetooth	2402 – 2480

2.2 Test Exclusions

SAR-based test exclusion & IPD MPE test exclusion thresholds based on frequency and separation distance are calculated according to KDB 447498 D04 Interim General RF Exposure Guidance.

The DUT has two transmitting antennas, model WIFI 6E flex cabled side-fed balanced antenna, P/N 2042810300, manufactured by Molex. Antenna A locates on the left side of the DUT and Antenna B on the top side of the DUT. The separation distance between the closest antenna to each edges are following:

Right side – 225.7 mm
Bottom side – 281.9 mm
Left side – 4 mm
Top side – 4 mm

Front side of the screen is excluded from the testing based on FCC KDB 616217 D04 v01r02, Section 4.3: "Exposures to hands for typical consumer transmitters used in tablets are not expected to exceed to extremity SAR limit; therefore, SAR evaluation for the front surface of tablet display screens are generally not necessary."

Testing from the back side of the screen is not required as the screen is attached to the cart so that the cart prevents body access to close proximity of the screen.

Test positions for the testing were agreed with FCC via FCC inquiry.

According to antenna datasheet "WIFI 6E FLEX CABLED SIDE-FED BALANCED ANTENNA PRODUCT SPECIFICATION" maximum antenna gains for the DUT are following:

Frequency [GHz]	Antenna Gain [dBi]
2.4 – 2.5	1.3
5.15 – 5.85	2.3
5.925 – 7.125	3.2

2.2.1 SAR-based Exemptions based on antenna locations, 300 MHz – 6 GHz:

FCC SAR test exclusion threshold is calculated according to KDB 447498 D04 Interim General RF Exposure Guidance, equation B.2 and B.1:

$$Pth\ (mW) = \begin{cases} ERP_{20\,cm}\,(d\ /\ 20cm)^{x} & d \le 20cm \\ ERP_{20\,cm} & 20cm < d \le 40cm \end{cases} \quad \text{(Equation 1)}$$

where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\,cm}\sqrt{f}}\right) \quad \text{(Equation 2)}$$

and frequency f is in GHz, d is the separation distance (cm), and ERP20cm is per Equation (B.1) below.

$$ERP20cm\ (mW) = \begin{cases} 2040f & 0.3 \le f < 1.5GHz \\ 3060 & 1.5GHz \le f \le 6GHz \end{cases} \quad \text{(Equation 3)}$$

Test Position	Transmission mode	Frequency [GHz]	Separation distance from closest antenna to the edge [cm]	Extremity P_{th} [mW]*
Right	WLAN 2.4GHz	2462	22.6	7650
	WLAN 5 GHz	5825	22.6	7650
	WLAN 6 GHz	6000	22.6	7650
	Bluetooth	2480	22.6	7650
Bottom	WLAN 2.4GHz	2462	28.2	7650
	WLAN 5 GHz	5825	28.2	7650
	WLAN 6 GHz	6000	28.2	7650
	Bluetooth	2480	28.2	7650
Left	WLAN 2.4GHz	2462	0.5**	6.8
	WLAN 5 GHz	5825	0.5**	3.4
	WLAN 6 GHz	6000	0.5**	3.3
	Bluetooth	2480	0.5**	6.8
Top	WLAN 2.4GHz	2462	0.5**	6.8
	WLAN 5 GHz	5825	0.5**	3.4
	WLAN 6 GHz	6000	0.5**	3.3
	Bluetooth	2480	0.5**	6.8

*P_{th} is multiplied by 2.5 for 10g Extremity condition

**Calculations have been made by using a minimum separation distance 0.5 cm instead of 0.4 cm.

2.2.1.1 Maximum defined Output Power and ERP / SAR-based Test Exclusions based on antenna locations

According to Appendix A at KDB 447498 D04 Interim General RF Exposure Guidance, the equation (B.2.) defines the thresholds for available maximum time-averaged power or maximum time-averaged ERP, whichever is greater. Since the maximum output power is greater than the ERP of the DUT for WLAN 2.4GHz and Bluetooth, it is used for SAR test exclusion. For WLAN 5GHz and WLAN 6GHz, ERP is used for SAR test exclusion.

Test Position	Transmission mode	Output power [dBm]	Output power [mW]	Power Gain of Antenna, G [dBi]	ERP Output power [dBm]	ERP Output power [mW]	Extremity P_{th} [mW]	Testing required
Right	WLAN 2.4GHz	20	100	1.3	19.15	82.22	7650	No
	WLAN 5GHz	20	100	2.3	20.15	103.51	7650	No
	WLAN 6GHz	12	16	3.2	13.05	20.18	7650	No
	Bluetooth	11.2	13	1.3	10.35	10.84	7650	No
Bottom	WLAN 2.4GHz	20	100	1.3	19.15	82.22	7650	No
	WLAN 5GHz	20	100	2.3	20.15	103.51	7650	No
	WLAN 6GHz	12	16	3.2	13.05	20.18	7650	No
	Bluetooth	11.2	13	1.3	10.35	10.84	7650	No
Left	WLAN 2.4GHz	20	100	1.3	19.15	82.22	6.8	Yes
	WLAN 5GHz	20	100	2.3	20.15	103.51	3.4	Yes
	WLAN 6GHz	12	16	3.2	13.05	20.18	3.3	Yes
	Bluetooth	11.2	13	1.3	10.35	10.84	6.8	Yes
Top	WLAN 2.4GHz	20	100	1.3	19.15	82.22	6.8	Yes
	WLAN 5GHz	20	100	2.3	20.15	103.51	3.4	Yes
	WLAN 6GHz	12	16	3.2	13.05	20.18	3.3	Yes
	Bluetooth	11.2	13	1.3	10.35	10.84	6.8	Yes

Since the maximum output power & ERP is below the test exclusion threshold for the right and bottom side, testing is not required. Testing is required for the Left and Top side.

2.2.2 MPE-Based Exemptions based on antenna locations, 6 GHz – 10 GHz

FCC MPE-based Exemption thresholds in KDB 447498 D04 Interim General RF Exposure Guidance v01 are shown in a table below.

TABLE B.1—THRESHOLDS FOR SINGLE RF SOURCES SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION

RF Source Frequency			Minimum Distance			Threshold ERP
f_L MHz		f_H MHz	$\lambda_L / 2\pi$		$\lambda_H / 2\pi$	W
0.3	–	1.34	159 m	–	35.6 m	1,920 R^2
1.34	–	30	35.6 m	–	1.6 m	3,450 R^2/f^2
30	–	300	1.6 m	–	159 mm	3.83 R^2
300	–	1,500	159 mm	–	31.8 mm	0.0128 $R^2 f$
1,500	–	100,000	31.8 mm	–	0.5 mm	19.2R^2
Subscripts L and H are low and high; λ is wavelength. From § 1.1307(b)(3)(i)(C), modified by adding Minimum Distance columns.						

According to Table B.1 in KDB 447498 D04 Interim General RF Exposure Guidance v01, FCC MPE-based Exemption threshold can be calculated according to formulas:

1500 – 100 000 MHz: $19.2R^2$

where:

R = Separation distance (m)
f = Frequency (MHz)

Test Position	Transmission mode	Frequency [GHz]	Minimum Distance (λ/2*π) [m]	Separation distance from closest antenna to the edge, R [m]	Minimum Distance < Separation distance	P_{th} [mW]
Right	WLAN 6GHz	7115	0.007	0.226	PASS	980.66
Bottom	WLAN 6GHz	7115	0.007	0.282	PASS	1526.86
Left	WLAN 6GHz	7115	0.007	0.004	FAIL	N/A
Top	WLAN 6GHz	7115	0.007	0.004	FAIL	N/A

2.2.2.1 Maximum ERP / MPE-based Test Exclusions based on antenna locations

According to Appendix B at KDB 447498 D04 Interim General RF Exposure Guidance, the table B.1 defines the MPE thresholds for maximum time-averaged ERP.

Test Position	Transmission mode	Output power [dBm]	Output power [mW]	Power Gain of Antenna, G [dBi]	ERP Output power [dBm]	ERP Output power [mW]	P_{th} [mW]	Testing required
Right	WLAN 6GHz	12	16	3.2	13.05	20.18	980.66	**No**
Bottom	WLAN 6GHz	12	16	3.2	13.05	20.18	1526.86	**No**
Left	WLAN 6GHz	12	16	3.2	13.05	20.18	0.31	**Yes**
Top	WLAN 6GHz	12	16	3.2	13.05	20.18	0.31	**Yes**

Since the ERP is below the test exclusion threshold for the right and bottom side, testing is not required. Testing is required for the Left and Top side.

2.3 Simultaneous transmission

Two WLAN antennas or one WLAN antenna and Bluetooth can be operated simultaneously.

Possible simultaneous transmissions are:

2.4GHz WLAN & 2.4GHz WLAN
2.4GHz WLAN & 5GHz WLAN
2.4GHz WLAN & 6GHz WLAN
2.4GHz WLAN & Bluetooth
5GHz WLAN& 5GHz WLAN
5GHz WLAN& 6GHz WLAN
5GHz WLAN& Bluetooth
6GHz WLAN& 6GHz WLAN
6GHz WLAN& Bluetooth

3. OUTPUT POWER

3.1 Maximum specified conducted output power

From the customer, including tune-up tolerances;

The WLAN standard for conducted power and SAR testing was selected according to module datasheet "Intel® Wi-Fi 6E AX210 and Intel® Wi-Fi 6E AX1675 (Killer™) (Typhoon Peak 2)", Section 6.2.1 "Performance KPIs, Table 6-1 TyP 2x2 2230 Tx Power". The table contains specific output powers for each standard thus the WLAN standard for testing has been selected from this table.

Maximum specified output powers for 2.4GHz and 5GHz WLAN has been taken from the Performance KPIs table. Maximum output power value from 2.4GHz and 5GHz WLAN has been used for every channel. Some channels have a lower output power due to regulation limitations, thus the SAR results are conservative for these channels.

2.4GHz WLAN	Max Output Power [dBm]
802.11b	20
802.11g	20
802.11n	17.5
802.11ax	15.75

5GHz WLAN	Max Output Power [dBm]
802.11a (20MHz)	20
802.11n (20MHz)	18.5
802.11ac (20MHz)	18
802.11ax (20MHz)	16.25
802.11n (40MHz)	19
802.11ac (40MHz)	17.875
802.11ax (40MHz)	20
802.11ac (80MHz)	16.75
802.11ax (80MHz)	20
802.11ac (160MHz)	14
802.11ax (160MHz)	16

The maximum output power for WLAN 6 GHz is limited to 12 dBm by the customer.

6GHz WLAN	Channel	Frequency [MHz]	Max Output Power [dBm]
802.11ax (160MHz)	15	6025	12
	47	6185	12
	79	6345	12
	143	6665	12
	207	6985	12

Bluetooth	Max Output Power [dBm]
Bluetooth BR	11.2

3.2 Tested conducted power

Measured conducted output power at transmitting antenna connector;

2.4 GHz WLAN:

Standard	Transmission mode	Data Rate	Antenna	Output power [dBm]		
				CH 1 2412 MHz	CH 6 2437 MHz	CH 11 2462 MHz
802.11b (20MHz)	CCK	1	A	19.42	19.55	19.70
802.11b (20MHz)	CCK	1	B	19.71	19.91	19.67

5GHz WLAN:

Standard	Channel	Frequency [MHz]	Transmission mode	Data Rate [Mbps]	Antenna A Output power [dBm]	Antenna B Output power [dBm]
802.11ax (80MHz)	58	5290	OFDMA	MCS0	18.78	19.12
802.11ax (80MHz)	106	5530	OFDMA	MCS0	19.18	19.42
802.11ax (80MHz)	122	5610	OFDMA	MCS0	19.58	19.70
802.11ax (80MHz)	138	5690	OFDMA	MCS0	19.53	19.57
802.11ax (80MHz)	155	5775	OFDMA	MCS0	19.64	19.66

6GHz WLAN:

Standard	Channel	Frequency [MHz]	Transmission mode	Data Rate [Mbps]	Antenna A Output Power* [dBm]	Antenna B Output Power* [dBm]
802.11ax (160MHz)	15	6025	OFDMA	MCS0	17.53	17.98
802.11ax (160MHz)	47	6185	OFDMA	MCS0	19.90	19.98
802.11ax (160MHz)	79	6345	OFDMA	MCS0	19.89	19.92
802.11ax (160MHz)	143	6665	OFDMA	MCS0	19.88	19.79
802.11ax (160MHz)	207	6985	OFDMA	MCS0	12.40	12.35

*Measured WLAN conducted power is above maximum specified output power due to power limitation from 20 dBm to 12 dBm made by the customer after the testing has been conducted.

Bluetooth:

Standard	Output power [dBm]		
	CH 0 2402 MHz	CH 39 2441 MHz	CH 78 2480 MHz
BR	9.42	9.82	9.85

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.

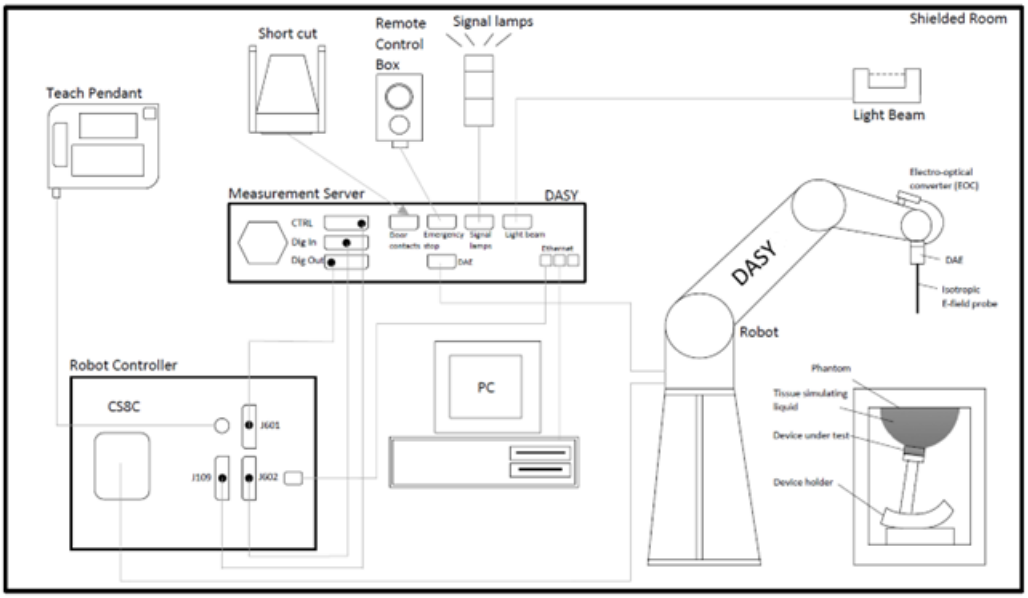


Figure 3 Schematic Laboratory Picture

4.1 Test Equipment List

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

Test Equipment	Model	Serial Number	Calibration Date	Interval [years]
Amplifier, 500-8000MHz	ZX60-83LN12+	NA	NA	NA
DAE4, converter	DAE4	705	04/2024	1
DAE4, converter	DAE4ip	1774	06/2024	1
DASY5 Software	52.8.8.1258	-	NA	NA
DASY8 Software	16.2.4.2524	-	NA	NA
Isotropic DOS probe	EX3DV4	7827	06/2024	1
Network Analyzer	E5071B	MY42301191	03/2024	1
Power Sensor	NRP8S	1419.0006K02-108508-HC	09/2023	2
Power Sensor	NRP8S	1419.0006K02-108509-Zh	03/2024	2
Power reflection meter	NRT	835065/049	02/2024	3
System validation dipole	D2450V2	729	07/2022	3
System validation dipole	D5GHzV2	1045	03/2023	3
System validation dipole	D6.5GHzV2	1097	06/2023	3
Vector Signal Generator	MG3710A	6201502519	NA	1
Vector Signal Generator	SMP02	836402/004	NA	NA
Amplifier, 500-8000MHz	ZX60-83LN12+	NA	NA	NA
DAE4, converter	DAE4	705	04/2024	1

Dipole calibration period supporting data:

		Measured on 09/2024			Calibrated		
Dipole and Serial Number	Frequency [MHz]	Return Loss [dB]	Impedance [Ω]		Return Loss [dB]	Impedance [Ω]	
D2450V2-729	2450	-32.1	50.4	-2.5	-30.1	53.1	0.8
D5GHzV2 - SN: 1045	5250	-25.5	52.2	4.9	-23.25	47.8	6.4
D5GHzV2 - SN: 1045	5600	-25.9	45.3	-1.2	-28.23	48.5	-3.5
D5GHzV2 - SN: 1045	5750	-24.1	46.6	5.0	-22.86	46.7	6.1
D6.5GHzV2 - SN: 1097	6500	-28.7	53.8	0.1	-26.89	49.6	-4.5

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 µW/g – >100 mW/g Linearity: ±0.2 dB (noise: typically <1 µW/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

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.

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.

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 ±10% of the recommended values at frequencies under 3GHz and ±5% at frequencies above 3GHz. 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
2450	D2450V2 - SN: 729	EX3DV4 - SN: 7827	SMC	DAE4ip / 1774	39.08	1.8	08/2024
5250	D5GHzV2 - SN: 1045	EX3DV4 - SN: 7827	SMC	DAE4ip / 1774	35.62	4.76	08/2024
5600	D5GHzV2 - SN: 1045	EX3DV4 - SN: 7827	SMC	DAE4ip / 1774	35.1	5.09	08/2024
5750	D5GHzV2 - SN: 1045	EX3DV4 - SN: 7827	SMC	DAE4ip / 1774	34.86	5.2	08/2024
6500	D6GHzV2 - SN: 1097	EX3DV4 - SN: 7827	SMC	DAE4ip / 1774	33.34	5.82	08/2024

4.5 System Check

Date	Tissue Type	Tissue Temp. [°C]	Frequency [MHz]	Input Power [mW]	Measured SAR_{1g} [W/kg]	1 W Target SAR_{1g} [W/kg]	1 W Normalized SAR_{1g} [W/kg]	Deviation [%]	Plot #
14.10.2024	WB Head	22	5250	100	7.92	73.09	79.2	8.36	1
14.10.2024	WB Head	22	5600	100	8	72.92	80	9.71	2
21.10.2024	WB Head	22	5750	100	7.03	69.05	70.3	1.81	3
22.10.2024	WB Head	22	2450	100	5.19	52.3	51.9	-0.76	4
04.11.2024	WB Head	22	2450	200	9.92	52.3	49.6	-5.16	5
05.11.2024	WB Head	22	5250	100	7.33	73.09	73.3	0.29	6
05.11.2024	WB Head	22	5600	100	7.97	72.92	79.7	9.30	7
06.11.2024	WB Head	22	5750	100	6.35	69.05	63.5	-8.04	8
06.11.2024	WB Head	22	6500	100	27.7	296	277	-6.42	9
08.11.2024	WB Head	22	6500	100	32.5	296	325	9.80	10
11.11.2024	WB Head	22	2450	100	12.3	52.3	49.2	-5.93	11
11.11.2024	WB Head	22	5250	100	7.91	73.09	79.1	8.22	12
11.11.2024	WB Head	22	6500	100	27.6	296	276	-6.76	13

4.6 Tissue Simulant Verification

				Measured		Target		Deviation	
Date	Tissue Type	Tissue Temp [°C]	Frequency [MHz]	Dielectric Constant [ε]	Conductivity σ [S/m]	Dielectric Constant [ε] Target	Conductivity σ [S/m] Target	ε [%]	σ [%]
14.10.2024	WB Head	22	5250	35.32	4.76	35.95	4.71	-1.7	1.0
14.10.2024	WB Head	22	5290	35.26	4.79	35.91	4.75	-1.8	0.9
14.10.2024	WB Head	22	5600	34.8	5.08	35.5	5.07	-2.0	0.3
14.10.2024	WB Head	22	5610	34.77	5.1	35.49	5.08	-2.0	0.3
21.10.2024	WB Head	22	5750	35.6	4.99	35.35	5.22	0.7	-4.5
21.10.2024	WB Head	22	5775	35.56	5.01	35.32	5.25	0.7	-4.5
22.10.2024	WB Head	21	2437	40.54	1.88	39.22	1.79	3.4	5.3
22.10.2024	WB Head	21	2450	40.52	1.89	39.2	1.8	3.4	5.2
04.11.2024	WB Head	22	2412	37.53	1.7	39.27	1.77	-4.4	-3.9
04.11.2024	WB Head	22	2437	37.48	1.71	39.22	1.79	-4.4	-4.2
04.11.2024	WB Head	22	2450	37.46	1.72	39.2	1.8	-4.4	-4.3
04.11.2024	WB Head	22	2462	37.44	1.73	39.18	1.81	-4.5	-4.5
05.11.2024	WB Head	22	5250	35.11	4.71	35.95	4.71	-2.3	-0.0
05.11.2024	WB Head	22	5290	35.05	4.75	35.91	4.75	-2.4	-0.1
05.11.2024	WB Head	22	5530	34.69	4.97	35.6	5.0	-2.6	-0.5
05.11.2024	WB Head	22	5600	34.57	5.04	35.5	5.07	-2.6	-0.6
05.11.2024	WB Head	22	5610	34.55	5.05	35.49	5.08	-2.6	-0.6
06.11.2024	WB Head	22	5690	34.94	5.15	35.41	5.16	-1.3	-0.2
06.11.2024	WB Head	22	5750	34.85	5.21	35.35	5.22	-1.4	-0.2
06.11.2024	WB Head	22	5775	34.81	5.23	35.33	5.24	-1.5	-0.2
06.11.2024	WB Head	22	6025	34.45	5.48	35.07	5.51	-1.8	-0.5
06.11.2024	WB Head	22	6185	34.2	5.65	34.88	5.7	-1.9	-0.8
06.11.2024	WB Head	22	6345	33.95	5.82	34.69	5.89	-2.1	-1.2
06.11.2024	WB Head	22	6500	33.76	5.97	34.5	6.07	-2.1	-1.7
06.11.2024	WB Head	22	6665	33.52	6.14	34.3	6.26	-2.3	-2.0
06.11.2024	WB Head	22	6985	33.07	6.45	33.92	6.63	-2.5	-2.7
08.11.2024	WB Head	22	6025	34.28	5.38	35.07	5.51	-2.2	-2.3
08.11.2024	WB Head	22	6185	34.04	5.55	34.88	5.7	-2.4	-2.7
08.11.2024	WB Head	22	6345	33.79	5.71	34.69	5.89	-2.6	-3.0
08.11.2024	WB Head	22	6500	33.6	5.85	34.5	6.07	-2.6	-3.5
08.11.2024	WB Head	22	6665	33.36	6.02	34.3	6.26	-2.7	-3.8
08.11.2024	WB Head	22	6985	32.93	6.34	33.92	6.63	-2.9	-4.5
11.11.2024	WB Head	22	2412	38.07	1.66	39.27	1.77	-3.1	-6.1
11.11.2024	WB Head	22	2437	38.03	1.67	39.22	1.79	-3.0	-6.4
11.11.2024	WB Head	22	2450	38.01	1.68	39.20	1.80	-3.0	-6.6
11.11.2024	WB Head	22	5250	36.77	4.60	35.95	4.71	2.3	-2.2
11.11.2024	WB Head	22	5290	36.71	4.64	35.91	4.75	2.2	-2.3
11.11.2024	WB Head	22	6185	35.49	5.51	34.88	5.70	1.8	-3.3
11.11.2024	WB Head	22	6500	35.07	5.82	34.50	6.07	1.7	-4.2

5. TEST PROCEDURE

Testing was carried out in accordance with FCC KDB Publications 447498 D04 Interim General RF Exposure Guidance v01.

Test configurations for SAR testing were selected based on conducted power measurements.

The WLAN transmission modes for testing were selected according to largest channel bandwidth configuration, lowest order modulation and lowest data rate.
The DUT was set to transmit at maximum power and duty cycle using test software.

Windows PC, that has the same WLAN/BT module as DUT, (Intel Wi-Fi 6E AX210(Gig+)) was used to control the WLAN/BT module via software. The transmission from the module goes through the RF cables to the DUT's antennas A or B. Power losses caused by the RF cables have been measured and considered in the SAR scaling factor.

2.4GHz WLAN was tested with 802.11b standard with data rate of 1Mbit/s, 5GHz WLAN was tested with 802.11ax standard with data rate of MCS0 and 6GHz WLAN was tested with 802.11ax standard with data rate of MCS0.

SAR/APD measurements for WLAN 6GHz were conducted for 5 channels, as per October 2020 TCB Workshop Interim Procedures and both antennas to find worst-case configuration, which was then selected for IPD measurements.

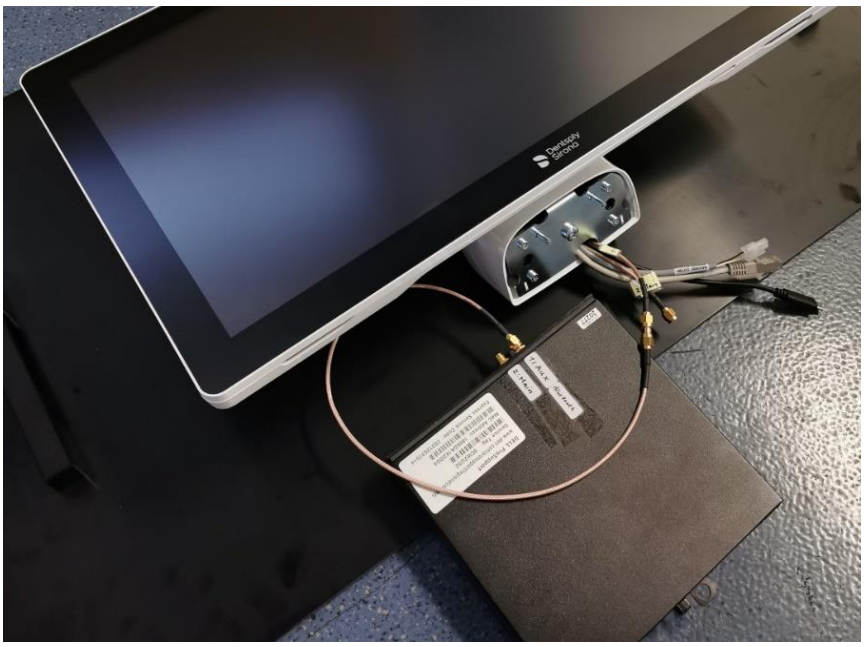


Figure 4 Conducted power measurement test setup with monitor attached to PC, in testing additional extension cables were used.

Primescan 2 Cart consists of the mobile stand with touch screen monitor. For testing the mobile stand was removed and the monitor only was tested as transmitting antennas are located inside it. A spot check was run with the mobile stand attached to determine that the results are similar with the stand and without the stand attached. Photos of the test positions are presented in appendix A.

The Primescan 2 Cart has two monitor suppliers. The monitors are manufactured based on the same specification and are identical in most respects. Parts relevant for radio communication are identical for both variants. The internal electronics driving the LCD and structural support on the backside of the DUT have differences.

The complete testing was done for the monitor manufactured by Champ Vision Display.

The compliance of the monitor manufactured by TES was determined by performing spot check measurements. The results for spot check measurements are presented below.

Spot check results:

Manufacturer	Mode	Data Rate [Mbps]	Bandwidth [MHz]	Channel	Frequency [MHz]	Antenna	Test Position	Measured SAR_{10g} [W/kg]
TES	802.11b	1	20	6	2437	A	Top	0.56
Champ Vision display	802.11b	1	20	6	2437	A	Top	0.45
TES	802.11b	1	20	1	2412	B	Left	0.10
Champ Vision display	802.11b	1	20	1	2412	B	Left	0.18

Manufacturer	Mode	Data Rate [Mbps]	Bandwidth [MHz]	Channel	Frequency [MHz]	Antenna	Test Position	Measured SAR_{10g} [W/kg]
TES	802.11ax	MCS0	80	58	5290	A	Top	0.33
Champ Vision display	802.11ax	MCS0	80	58	5290	A	Top	0.25
TES	802.11ax	MCS0	80	58	5290	B	Left	0.11
Champ Vision display	802.11ax	MCS0	80	58	5290	B	Left	0.12

Manufacturer	Mode	Data Rate [Mbps]	Bandwidth [MHz]	Channel	Frequency [MHz]	Antenna	Test Position	Measured SAR_{10g} [W/kg]
TES	802.11ax	MCS0	160	47	6185	A	Top	0.24
Champ Vision display	802.11ax	MCS0	160	47	6185	A	Top	0.20
TES	802.11ax	MCS0	160	47	6185	B	Left	0.08
Champ Vision display	802.11ax	MCS0	160	47	6185	B	Left	0.04

The maximum difference in tested results between the monitors was 0.11 which is within normal test variability, thus the SAR testing done with Champ Vision Display is representative also for the TES monitor.

IPD spot check measurements are presented in Appendix F (IPD Test Report by TÜV SÜD).

5.1 Test Positions

5.1.1 Extremity Configuration, 0mm separation distance

The device was placed on the top of a Rohacell and lifted towards the phantom until the distance between the phantom and the device was 0mm. The device was oriented in the foreseeable use cases with left and top sides facing the phantom where the antennas are located. The areas of the DUT where the antennas are located, were placed under the phantom. Test positions for the testing were agreed with FCC via FCC inquiry.

Photos of the test positions are presented in appendix A.

5.2 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. For APD testing, additional conversion factors (CF) were automatically applied by the software to calculate the psAPD from the psSAR. Conversion factors of CF1g = 10 kg/m^2 and CF8g = 20 kg/m^2 were used to calculate the 1 cm^2 and 4 cm^2 from the 1 g psSAR and the 8 g psSAR, respectively. Drift was determined by measuring the same point at the start of the area scan and again at the end of the zoom scan.

5.3 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

DASY5 Uncertainty Budget
According to IEC/IEEE 62209-1528
(Frequency band: 300MHz - 3GHz range)

Symbol	Error Description	Uncert. value	Prob. Dist.	Div.	(c_i) 1g	(c_i) 10g	Std. Unc. (1g)	Std. Unc. (10g)
Measurement System Errors								
CF	Probe Calibration	±12.0%	N	√2	1	1	±6.0%	±6.0%
CF_{drift}	Probe Calibration Drift	±1.7%	R	√3	1	1	±1.0%	±1.0%
LIN	Probe Linearity	±4.7%	R	√3	1	1	±2.7%	±2.7%
BBS	Broadband Signal	±3.0%	R	√3	1	1	±1.7%	±1.7%
ISO	Probe Isotropy	±7.6%	R	3	1	1	±4.4%	±4.4%
DAE	Data Acquisition	±0.3%	N	1	1	1	±0.3%	±0.3%
AMB	RF Ambient	±1.8%	N	1	1	1	±1.8%	±1.8%
Δ_{sys}	Probe Positioning	±3.9%	N	1	0.14	0.14	±0.5%	±0.5%
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	√1	0.78	0.71	±2.0%	±1.8%
$LIQ(T_\alpha)$	Conductivity (temp.)[BB]	±3.3%	R	√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 (±0.5mm)	±1.0%	N	1	1	1	±1.0%	±1.0%
H	Device Holder	±3.6%	N	√1	1	1	±3.6%	±3.6%
MOD	DUT Modulation[m]	±2.4%	R	√3	1	1	±1.4%	±1.4%
TAS	Time-average SAR	±2.6%	R	3	1	1	±1.5%	±1.5%
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	√1	1	0.84	±1.9%	±1.6%
C(R)	SAR scaling[p]	±0%	R	3	1	1	±0%	±0%
u(ΔSAR)	Combined Uncertainty						±11.0%	±10.9%
U	**Expanded Uncertainty**						±22.1%	±21.9%

DASY5 Uncertainty Budget

According to IEC/IEEE 62209-1528

(Frequency band: 3GHz - 6GHz range)

Symbol	Error Description	Uncert. value	Prob. Dist.	Div.	(c_i) 1g	(c_i) 10g	Std. Unc. (1g)	Std. Unc. (10g)
Measurement System Errors								
CF	Probe Calibration	±14.0%	N	√2	1	1	±7.0%	±7.0%
CF_{drift}	Probe Calibration Drift	±1.7%	N	√3	1	1	±1.0%	±1.0%
LIN	Probe Linearity	±4.7%	R	√3	1	1	±2.7%	±2.7%
BBS	Broadband Signal	±2.6%	R	√3	1	1	±1.5%	±1.5%
ISO	Probe Isotropy	±7.6%	R	3	1	1	±4.4%	±4.4%
DAE	Data Acquisition	±0.3%	N	1	1	1	±0.3%	±0.3%
AMB	RF Ambient	±1.8%	N	1	1	1	±1.8%	±1.8%
Δ_{sys}	Probe Positioning	±3.9%	N	1	0.33	0.33	±1.3%	±1.3%
DAT	Data Processing	±2.3%	N	1	1	1	±2.3%	±2.3%
Phantom and Device Errors								
LIQ(σ)	Conductivity (meas.)^{DAK}	±2.5%	N	√1	0.78	0.71	±2.0%	±1.8%
LIQ(T_σ)	Conductivity (temp.)^{BB}	±3.4%	R	√3	0.78	0.71	±1.5%	±1.4%
EPS	Phantom Permittivity	±14.0%	R	3	0.25	0.25	±2.0%	±2.0%
DIS	Distance DUT - TSL	±2.0%	N	1	2	2	±4.0%	±4.0%
D_{xyz}	Device Positioning (±0.5mm)	±1.0%	N	1	1	1	±1.0%	±1.0%
H	Device Holder	±3.6%	N	√1	1	1	±3.6%	±3.6%
MOD	DUT Modulation^{m}	±2.4%	R	√3	1	1	±1.4%	±1.4%
TAS	Time-average SAR	±2.6%	R	3	1	1	±1.5%	±1.5%
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	√1	1	0.84	±1.9%	±1.6%
C(R)	SAR scaling^{p}	±0%	R	3	1	1	±0%	±0%
u(ΔSAR)	Combined Uncertainty						±12.0%	±11.9%
U	**Expanded Uncertainty**						±24.0%	±23.8%

DASY8 Uncertainty Budget

According to IEC/IEEE 62209-1528

(Frequency band: 300 MHz–3 GHz range)

Symbol	Error Description	Uncert. value	Prob. Dist.	Div.	(c_i) (1 g)	(c_i) (10 g)	Std. Unc. (1 g)	Std. Unc. (10 g)
Measurement System Errors								
CF	Probe Calibration	±12.0%	N	2	1	1	±6.0%	±6.0%
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	±3.0%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%
ISO	Probe Isotropy	±7.6%	R	$\sqrt{3}$	1	1	±4.4%	±4.4%
DAE	Other Probe+Electronic	±0.7%	N	1	1	1	±0.7%	±0.7%
AMB	RF Ambient	±1.8%	N	1	1	1	±1.8%	±1.8%
Δ_{sys}	Probe Positioning	±0.006 mm	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	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	$\sqrt{3}$	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	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	$\sqrt{3}$	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	1	1	0.84	±1.9%	±1.6%
C(R)	SAR scaling^{p}	±0%	R	$\sqrt{3}$	1	1	±0%	±0%
u(ΔSAR)	Combined Uncertainty						±10.9%	±10.9%
U	**Expanded Uncertainty**						±21.9%	±21.8%

DASY8 Uncertainty Budget

According to IEC/IEEE 62209-1528

(Frequency band: 3 GHz–6 GHz range)

Symbol	Error Description	Uncert. value	Prob. Dist.	Div.	(c_i) (1 g)	(c_i) (10 g)	Std. Unc. (1 g)	Std. Unc. (10 g)
Measurement System Errors								
CF	Probe Calibration	±13.1%	N	2	1	1	±6.55%	±6.55%
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	±2.6%	R	$\sqrt{3}$	1	1	±1.5%	±1.5%
ISO	Probe Isotropy	±7.6%	R	$\sqrt{3}$	1	1	±4.4%	±4.4%
DAE	Other Probe+Electronic	±1.2%	N	1	1	1	±1.2%	±1.2%
AMB	RF Ambient	±1.8%	N	1	1	1	±1.8%	±1.8%
Δ_{sys}	Probe Positioning	±0.005 mm	N	1	0.29	0.29	±0.15%	±0.15%
DAT	Data Processing	±2.3%	N	1	1	1	±2.3%	±2.3%
Phantom and Device Errors								
LIQ(σ)	Conductivity (meas.)^{DAK}	±2.5%	N	1	0.78	0.71	±2.0%	±1.8%
LIQ(T_σ)	Conductivity (temp.)^{BB}	±3.4%	R	$\sqrt{3}$	0.78	0.71	±1.5%	±1.4%
EPS	Phantom Permittivity	±14.0%	R	$\sqrt{3}$	0.25	0.25	±2.0%	±2.0%
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	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	$\sqrt{3}$	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	1	1	0.84	±1.9%	±1.6%
C(R)	SAR scaling^{p}	±0%	R	$\sqrt{3}$	1	1	±0%	±0%
u(ΔSAR)	Combined Uncertainty						±11.6%	±11.5%
U	**Expanded Uncertainty**						±23.3%	±23.0%

DASY8 Uncertainty Budget

According to IEC/IEEE 62209-1528

(Frequency band: 6 GHz–10 GHz range)

Symbol	Error Description	Uncert. value	Prob. Dist.	Div.	(c_i) (1 g)	(c_i) (10 g)	Std. Unc. (1 g)	Std. Unc. (10 g)
Measurement System Errors								
CF	Probe Calibration	±18.6%	N	2	1	1	±9.3%	±9.3%
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	$\sqrt{3}$	1	1	±4.4%	±4.4%
DAE	Other Probe+Electronic	±2.4%	N	1	1	1	±2.4%	±2.4%
AMB	RF Ambient	±1.8%	N	1	1	1	±1.8%	±1.8%
Δ_{sys}	Probe Positioning	±0.005 mm	N	1	0.50	0.50	±0.25%	±0.25%
DAT	Data Processing	±3.5%	N	1	1	1	±3.5%	±3.5%
Phantom and Device Errors								
LIQ(σ)	Conductivity (meas.)^{DAK}	±2.5%	N	1	0.78	0.71	±2.0%	±1.8%
LIQ(T_σ)	Conductivity (temp.)^{BB}	±2.4%	R	$\sqrt{3}$	0.78	0.71	±1.1%	±1.0%
EPS	Phantom Permittivity	±14.0%	R	$\sqrt{3}$	0.5	0.5	±4.0%	±4.0%
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	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	$\sqrt{3}$	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	1	1	0.84	±1.9%	±1.6%
C(R)	SAR scaling^{p}	±0%	R	$\sqrt{3}$	1	1	±0%	±0%
u(ΔSAR)	Combined Uncertainty						±14.2%	±13.9%
U	**Expanded Uncertainty**						±28.4%	±27.9%

Uncertainty Budget for psSAR / psAPD Assessments

(Frequency band: 6 – 10 GHz range)

Symbol	Error Description	Uncert.	Prob. Dist.	Div.	c_i (1g) / (1 cm^2)	c_i (8 g/10 g) / (4 cm^2)	Std. Unc. (1 g) / (1 cm^2)	Std. Unc. (8 g/10 g) / (4 cm^2)
psSAR	Module SAR V16.2 (Table 6.3.3)	±14.2/13.9%	N	1	1	1	±14.2%	±13.9%
PDC	Power Density Conversion	±13.5%	R	$\sqrt{3}$	1	1	±7.8%	±7.8%
u(ΔSAR)	Combined Uncertainty						±16.2%	±15.9 %
U	**Expanded Uncertainty** *in dB*						±32.4% *±1.2 dB*	±31.9% *±1.2 dB*

7. TEST RESULTS

7.1 SAR Results for Extremity Condition with 0mm separation

Conducted Power Cable Extension = Conducted Power – Cable loss from extension cable, used for scaling the Measured SAR_{10g}.

2.4GHz WLAN:

Mode	Data Rate [Mbps]	Bandwidth [MHz]	Channel	Frequency [MHz]	Antenna	Maximum Power [dBm]	Conducted Power [dBm]	Conducted Power Cable Extension [dBm]	Test Position	Measured SAR_{10g} [W/kg]	Power Drift [dB]	Duty Cycle [%]	Scaling Factor	Reported SAR_{10g} [W/kg]	Plot #
802.11b	1	20	6	2437	Chain A	20	19.55	16.98	Left	0.003	0	99	2.00	0.01	
802.11b	1	20	6	2437	Chain A	20	19.55	16.98	Top	0.451	-0.12	99	2.00	0.90	14
802.11b	1	20	1	2412	Chain A	20	19.42	16.90	Top	0.414	0.12	99	2.04	0.84	
802.11b	1	20	11	2462	Chain A	20	19.7	17.18	Top	0.443	0.08	99	1.91	0.85	

Mode	Data Rate [Mbps]	Bandwidth [MHz]	Channel	Frequency [MHz]	Antenna	Maximum Power [dBm]	Conducted Power [dBm]	Conducted Power Cable Extension [dBm]	Test Position	Measured SAR_{10g} [W/kg]	Power Drift [dB]	Duty Cycle [%]	Scaling Factor	Reported SAR_{10g} [W/kg]	Plot #
802.11b	1	20	6	2437	Chain B	20	19.91	17.34	Left	0.124	0.21	99	1.84	0.23	
802.11b	1	20	6	2437	Chain B	20	19.91	17.34	Top	0.0502	-0.3*	99	1.98	0.10	
802.11b	1	20	1	2412	Chain B	20	19.71	17.19	Left	0.175	0.02	99	1.91	0.33	15
802.11b	1	20	11	2462	Chain B	20	19.67	17.15	Left	0.149	0.12	99	1.93	0.29	

*Larger than 5% drifts included to scaling factors

5GHz WLAN:

Mode	Data Rate [Mbps]	Bandwidth [MHz]	Channel	Frequency [MHz]	Antenna	Maximum Power [dBm]	Conducted Power [dBm]	Conducted Power Cable Extension [dBm]	Test Position	Measured SAR_{10g} [W/kg]	Power Drift [dB]	Duty Cycle [%]	Scaling Factor	Reported SAR_{10g} [W/kg]	Plot #
802.11ax	MCS0	80	58	5290	Chain A	20	18.78	14.76	Left	0.005	0.17	99	3.34	0.02	
802.11ax	MCS0	80	58	5290	Chain A	20	18.78	14.76	Top	0.253	0.21	99	3.34	0.85	16

Mode	Data Rate [Mbps]	Bandwidth [MHz]	Channel	Frequency [MHz]	Antenna	Maximum Power [dBm]	Conducted Power [dBm]	Conducted Power Cable Extension [dBm]	Test Position	Measured SAR_{10g} [W/kg]	Power Drift [dB]	Duty Cycle [%]	Scaling Factor	Reported SAR_{10g} [W/kg]	Plot #
802.11ax	MCS0	80	58	5290	Chain B	20	19.12	15.10	Left	0.116	0.1	99	3.09	0.36	17
802.11ax	MCS0	80	58	5290	Chain B	20	19.12	15.10	Top	0.036	0.99*	99	3.88	0.14	

*Larger than 5% drifts included to scaling factors

Mode	Data Rate [Mbps]	Bandwidth [MHz]	Channel	Frequency [MHz]	Antenna	Maximum Power [dBm]	Conducted Power [dBm]	Conducted Power Cable Extension [dBm]	Test Position	Measured SAR_{10g} [W/kg]	Power Drift [dB]	Duty Cycle [%]	Scaling Factor	Reported SAR_{10g} [W/kg]	Plot #
802.11ax	MCS0	80	122	5610	Chain A	20	19.58	15.53	Left	0.006	0.73*	99	3.31	0.02	
802.11ax	MCS0	80	122	5610	Chain A	20	19.58	15.53	Top	0.234	0.12	99	2.80	0.65	
802.11ax	MCS0	80	106	5530	Chain A	20	19.18	15.12	Top	0.274	0.04	99	3.07	0.84	18

*Larger than 5% drifts included to scaling factors

Mode	Data Rate [Mbps]	Bandwidth [MHz]	Channel	Frequency [MHz]	Antenna	Maximum Power [dBm]	Conducted Power [dBm]	Conducted Power Cable Extension [dBm]	Test Position	Measured SAR_{10g} [W/kg]	Power Drift [dB]	Duty Cycle [%]	Scaling Factor	Reported SAR_{10g} [W/kg]	Plot #
802.11ax	MCS0	80	122	5610	Chain B	20	19.7	15.65	Left	0.109	0.03	99	2.72	0.30	
802.11ax	MCS0	80	122	5610	Chain B	20	19.7	15.65	Top	0.059	0.72*	99	3.21	0.19	
802.11ax	MCS0	80	106	5530	Chain B	20	19.42	15.36	Left	0.118	0.04	99	2.91	0.34	19

*Larger than 5% drifts included to scaling factors

Mode	Data Rate [Mbps]	Bandwidth [MHz]	Channel	Frequency [MHz]	Antenna	Maximum Power [dBm]	Conducted Power [dBm]	Conducted Power Cable Extension [dBm]	Test Position	Measured SAR_{10g} [W/kg]	Power Drift [dB]	Duty Cycle [%]	Scaling Factor	Reported SAR_{10g} [W/kg]	Plot #
802.11ax	MCS0	80	155	5775	Chain A	20	19.64	15.47	Left	0.008	N/A*	99	2.84	0.02	
802.11ax	MCS0	80	155	5775	Chain A	20	19.64	15.47	Top	0.24	-0.18	99	2.84	0.68	
802.11ax	MCS0	80	138	5690	Chain A	20	19.53	15.49	Top	0.264	0.13	99	2.83	0.75	20

*Due to low e-field generated by DUT at the location of drift measurement, the measurements are not applicable.

Mode	Data Rate [Mbps]	Bandwidth [MHz]	Channel	Frequency [MHz]	Antenna	Maximum Power [dBm]	Conducted Power [dBm]	Conducted Power Cable Extension [dBm]	Test Position	Measured SAR_{10g} [W/kg]	Power Drift [dB]	Duty Cycle [%]	Scaling Factor	Reported SAR_{10g} [W/kg]	Plot #
802.11ax	MCS0	80	155	5775	Chain B	20	19.66	15.49	Left	0.081	-0.02	99	2.83	0.23	
802.11ax	MCS0	80	155	5775	Chain B	20	19.66	15.49	Top	0.0534	-0.5*	99	3.17	0.17	
802.11ax	MCS0	80	138	5690	Chain B	20	19.57	15.53	Left	0.088	0.23*	99	2.95	0.26	21

*Larger than 5% drifts included to scaling factors

6GHz WLAN:

Mode	Data Rate [Mbps]	Bandwidth [MHz]	Channel	Frequency [MHz]	Antenna	Maximum Power [dBm]	Conducted Power** [dBm]	Conducted Power Cable Extension [dBm]	Test Position	Measured SAR_{10g} [W/kg]	Measured $APD4cm^2$ [W/kg]	Power Drift [dB]	Duty Cycle [%]	Scaling Factor	Reported SAR_{10g} [W/kg]	Reported $APD4cm^2$ [W/kg]	Plot #
802.11ax	MCS0	160	47	6185	Chain A	12	19.90	15.40	Left	0.015	0.342	0.37*	99	0.50	0.01	0.17	
802.11ax	MCS0	160	47	6185	Chain A	12	19.90	15.40	Top	0.197	4.43	-0.03	99	0.46	0.09	2.03	
802.11ax	MCS0	160	15	6025	Chain A	12	17.53	13.15	Top	0.134	3	0.12	99	0.77	0.10	2.30	22
802.11ax	MCS0	160	79	6345	Chain A	12	19.89	15.39	Top	0.191	4.37	-0.14	99	0.46	0.09	2.00	
802.11ax	MCS0	160	143	6665	Chain A	12	19.88	15.45	Top	0.155	3.53	0.07	99	0.45	0.07	1.60	
802.11ax	MCS0	160	207	6985	Chain A	12	12.40	7.72	Top	0.035	0.796	-0.04	99	2.68	0.09	2.13	

*Larger than 5% drifts included to scaling factors
**Measured conducted power is above maximum specified output power due to power limitation from 20 dBm to 12 dBm made by the customer after the testing has been conducted.

Mode	Data Rate [Mbps]	Bandwidth [MHz]	Channel	Frequency [MHz]	Antenna	Maximum Power [dBm]	Conducted Power*** [dBm]	Conducted Power Cable Extension [dBm]	Test Position	Measured SAR_{10g} [W/kg]	Measured $APD4cm^2$ [W/kg]	Power Drift [dB]	Duty Cycle [%]	Scaling Factor	Reported SAR_{10g} [W/kg]	Reported $APD4cm^2$ [W/kg]	Plot #
802.11ax	MCS0	160	47	6185	Chain B	12	19.98	15.48	Left	0.042	1.04	-0.22*	99	0.47	0.02	0.49	
802.11ax	MCS0	160	47	6185	Chain B	12	19.98	15.48	Top	0.047	1.06	N/A**	99	0.45	0.02	0.48	
802.11ax	MCS0	160	15	6025	Chain B	12	17.98	13.60	Left	0.038	0.865	-0.8*	99	0.83	0.03	0.72	23
802.11ax	MCS0	160	79	6345	Chain B	12	19.92	15.42	Left	0.036	0.817	-0.97*	99	0.57	0.02	0.46	
802.11ax	MCS0	160	143	6665	Chain B	12	19.79	15.36	Left	0.038	0.86	-0.94*	99	0.57	0.02	0.49	
802.11ax	MCS0	160	207	6985	Chain B	12	12.35	7.67	Left	0.009	0.201	N/A**	99	2.71	0.02	0.55	

*Larger than 5% drifts included to scaling factor
**Due to low e-field generated by DUT at the location of drift measurement, the measurements are not applicable
**Measured conducted power is above maximum specified output power due to power limitation from 20 dBm to 12 dBm made by the customer after the testing has been conducted.

Bluetooth:

Mode	Packet Type	Data Rate [Mbps]	Channel	Frequency [MHz]	Antenna	Maximum Power [dBm]	Conducted Power [dBm]	Conducted Power Cable Extension [dBm]	Test Position	Measured SAR_{10g} [W/kg]	Power Drift [dB]	Duty Cycle [%]	Scaling Factor	Reported SAR_{10g} [W/kg]	Plot #
Bluetooth BR	DH5	1	78	2480	A	11.2	9.85	7.35	Left	0.02*	0**	99	2.43	0*	
Bluetooth BR	DH5	1	78	2480	A	11.2	9.85	7.35	Top	0.0225	-0.16	99	2.43	0.05	
Bluetooth BR	DH5	1	0	2402	A	11.2	9.42	6.93	Top	0.03	0.03	99	2.68	0.08	24
Bluetooth BR	DH5	1	39	2441	A	11.2	9.82	7.31	Top	0.027	0.03	99	2.45	0.07	

*Due to low e-field generated by DUT, only area scan result could be measured
**Due to low e-field generated by DUT at the location of drift measurement, the measurements are not applicable

7.2 Zoom Scan Compliance

According to IEC 62209-1528, 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 62209-1528 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 is available in Appendix C.

7.3 Simultaneous Transmission Analysis

Simultaneous transmission analysis for the maximum WLAN SAR/IPD and Bluetooth SAR are in the table below. Direct summation of SAR results was performed. In MIMO mode, the power of a single antenna chain is lower than in SISO mode. SISO mode measurement result are used for simultaneous transmission analysis overestimating MIMO mode SAR.

IPD results has been taken from the IPD Test Report by TÜV SÜD, available in Appendix F

Extremity SAR:

Exposure Condition	Extremity SAR_{10g} [W/kg]		IPD 4cm² [W/m²]	
Test Position	**Left**	**Top**	**Left**	**Top**
Bluetooth, Antenna A	0*	0.08	-	-
WLAN 2.4GHz, SISO, Antenna A	0.01	0.90	-	-
WLAN 5GHz, SISO, Antenna A	0.02	0.85	-	-
WLAN 6GHz, SISO, Antenna A	0.05	0.57	-	7.02
WLAN 2.4GHz, SISO, Antenna B	0.33	0.10	-	-
WLAN 5GHz, SISO, Antenna B	0.36	0.19	-	-
WLAN 6GHz, SISO, Antenna B	0.14	0.13	2.35	-
SAR Antenna A + SAR Antenna B / IPD Antenna A + IPD Antenna B SAR Summation:	**0.41**	**1.09**	**9.37****	**9.37****
Limit	**4.0 W/kg**		**10 W/m²**	

*Due to low e-field generated by DUT, only area scan result could be measured
**Left and top sides were summed directly resulting in overestimated simultaneous transmission IPD.

IPD + SAR Simultaneous Transmission:

IPD Antenna A + SAR Antenna B $\sum IPD_{Meas}/IPD_{Limit} + SAR_{Meas}/SAR_{Limit}$	**0.75**
IPD Antenna B + SAR Antenna A $\sum IPD_{Meas}/IPD_{Limit} + SAR_{Meas}/SAR_{Limit}$	**0.24**

Combination of SAR & IPD was taken into account by dividing the maximum result with the corresponding limit and summing the values:

Antenna A (x / y) + Antenna B (x / y) = x<1 Thus, the evaluation result is **PASS.**

APPENDIX A: PHOTOS OF THE DUT

The size of the Primescan 2 Cart and antenna locations on the monitor:

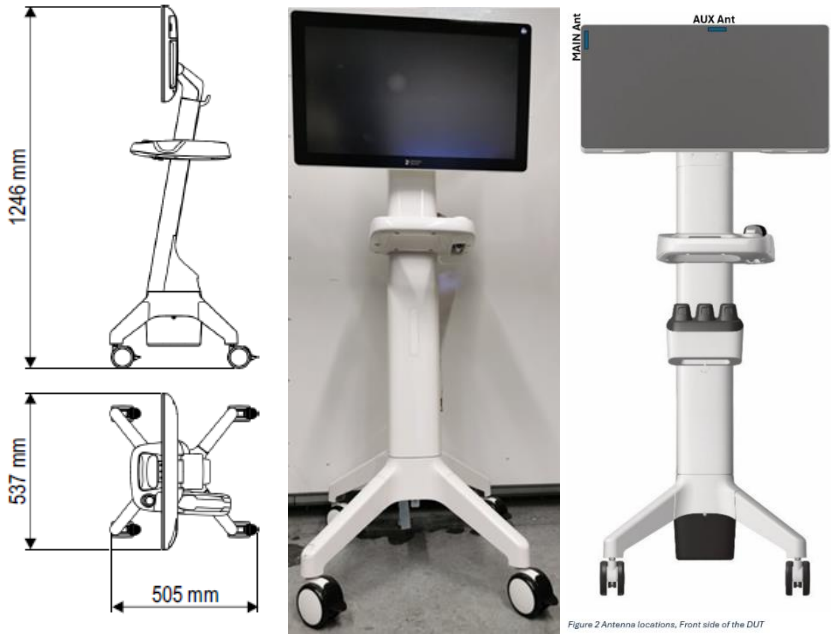


Figure 2 Antenna locations, Front side of the DUT

Primescan 2 monitor, size of 537 x 330 x 60mm

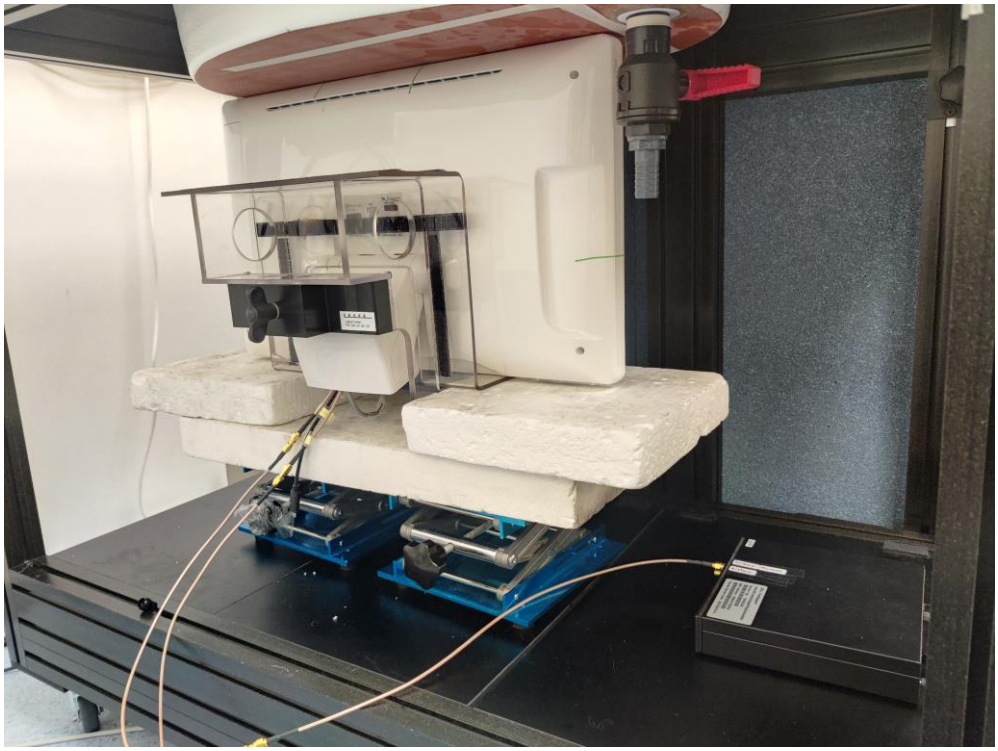


Figure 5 Top side of the device against the phantom, 0mm separation

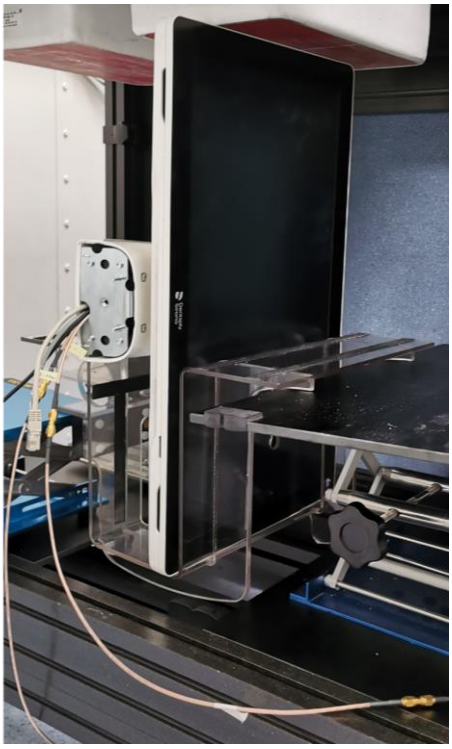


Figure 6 Left side of the device against the phantom, 0mm separation

Figure 7 The spot-check test configuration with stand, front side of the device against to phantom, 0mm separation.

APPENDIX B: SYSTEM CHECK SCAN

Plot 1
Date/Time: 2024-10-14, 09:06

Test Laboratory: Verkotan Oy

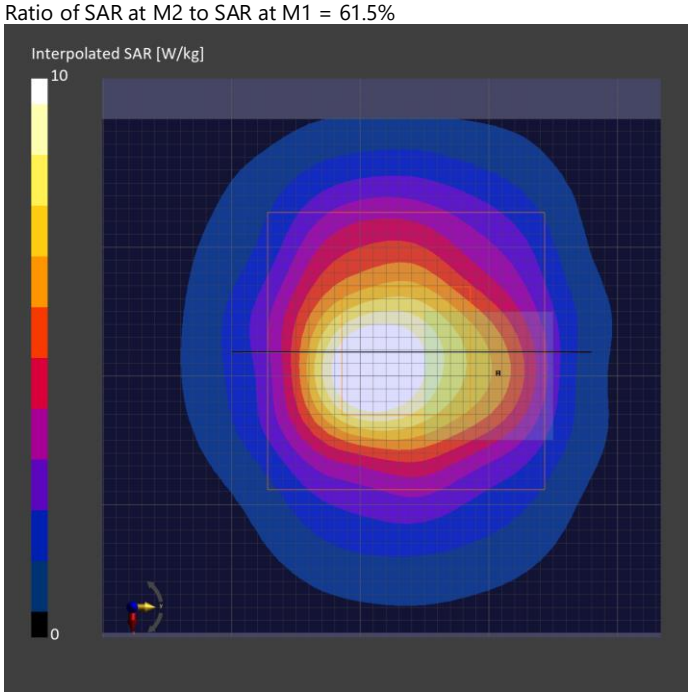
DUT: D5GHzV2 – SN1045

Communication System: UID 0, CW; Communication System Band: ; Frequency 5250.000 MHz;
Communication System PAR: ;
Medium parameters used: f= 5250.000; σ = 4.76; ε_r = 35.3; HSL;
Phantom section: Flat section
Measurement Standard: DASY8 (IEC/IECC)
DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(5.55, 5.41, 5.18); Calibrated: 2024-06-17
  - Sensor-Surface: 1.4 mm (VMS + 6p), Mother scan peak deviation: 0.06; Mother scan avg offset: 0.12;
  - Electronics: DAE4ip - SN1774; Calibrated: 2024-06-18
  - Phantom: ELI V8.0 (20deg probe tilt)
  - DASY8 16.2.4.2524

SPC Measurement Group:

Area Scan: Measurement grid: (40.0 mm x 80.0 mm)
Zoom Scan: Measurement grid: (22.0mm x 22.0mm x 22.0mm)
Reference Value = 3.13 V/m; Power Drift = 0.08 dB
SAR(1 g) = 7.92 W/kg; SAR(10 g) = 2.27 W/Kg (Positive only)
Smallest distance from peaks to all points 3dB below = 7.4mm
Ratio of SAR at M2 to SAR at M1 = 61.5%



Plot 2
Date/Time: 2024-10-14, 08:44

Test Laboratory: Verkotan Oy

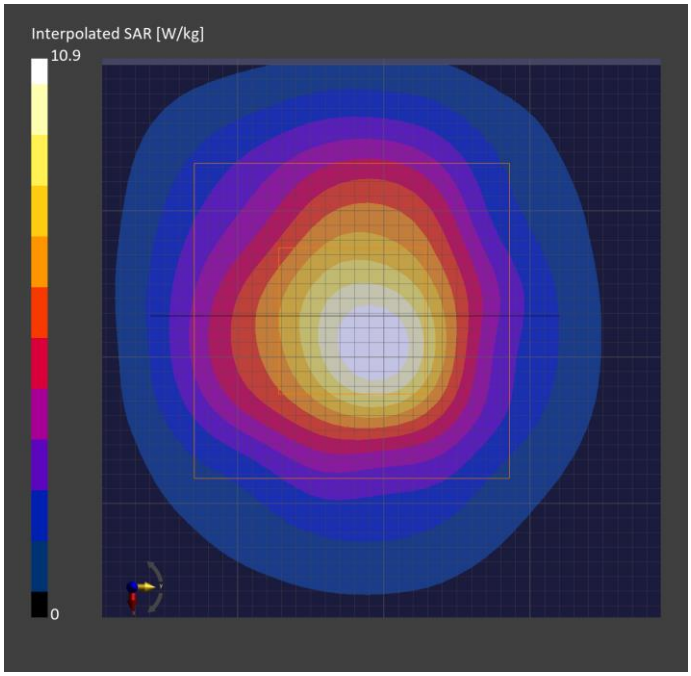
DUT: D5GHzV2 – SN1045

Communication System: UID 0, CW; Communication System Band: ; Frequency 5600.000 MHz;
Communication System PAR: ;
Medium parameters used: f= 5600.000; σ = 5.08; ε_r = 34.8; HSL;
Phantom section: Flat section
Measurement Standard: DASY8 (IEC/IECC)
DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(5.04, 4.91, 4.7); Calibrated: 2024-06-17
  - Sensor-Surface: 1.4 mm (VMS + 6p), Mother scan peak deviation: 0.07; Mother scan avg offset: 0.13;
  - Electronics: DAE4ip - SN1774; Calibrated: 2024-06-18
  - Phantom: ELI V8.0 (20deg probe tilt)
  - DASY8 16.2.4.2524

SPC Measurement Group:
, CW, CH0, , mm

Area Scan: Measurement grid: (40.0 mm x 80.0 mm)
Zoom Scan: Measurement grid: (22.0mm x 22.0mm x 22.0mm)
Reference Value = 2.68 V/m; Power Drift = 0.09 dB
SAR(1 g) = 8 W/kg; SAR(10 g) = 2.26 W/Kg (Positive only)
Smallest distance from peaks to all points 3dB below = 7.4mm
Ratio of SAR at M2 to SAR at M1 = 58.2%



Plot 3

Date/Time: 21.10.24 10:08:07

Test Laboratory: Verkotan Oy

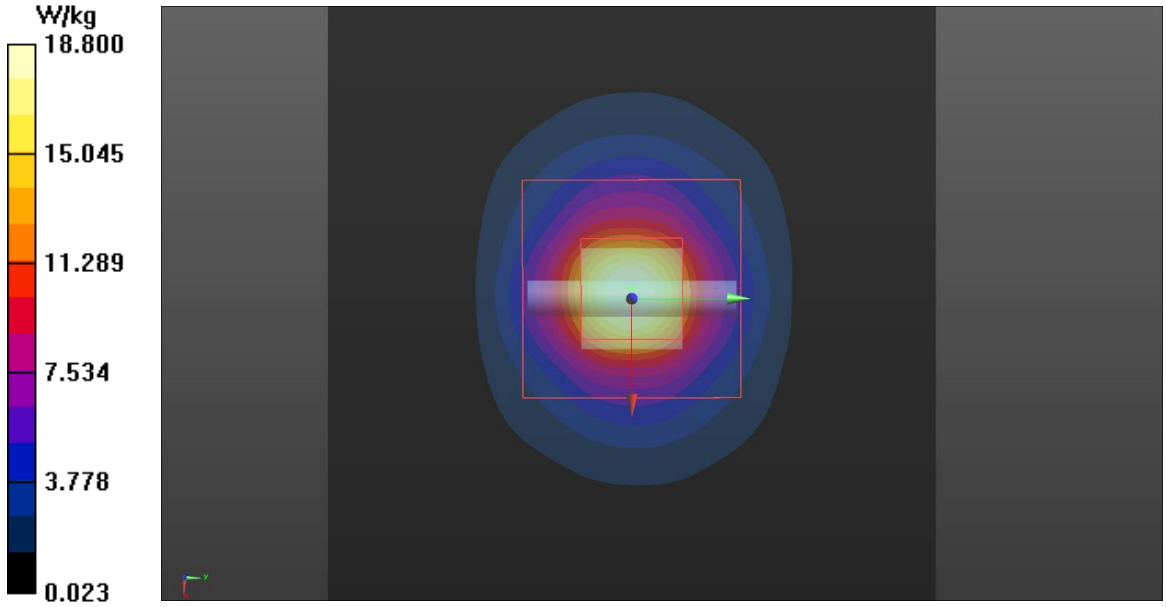
DUT: D5GHzV2 - SN1045

Communication System: UID 0, CW (0); Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5750 MHz;
Communication System PAR: 0 dB;
Medium parameters used: f = 5750 MHz; σ = 4.985 S/m; ε_r = 35.603; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(5.09, 4.96, 4.75) @ 5750 MHz; Calibrated: 17.6.24
  - Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = -4.0, 25.0
  - Electronics: DAE4 Sn705; Calibrated: 9.4.24
  - Phantom: SAR1_Phantom1_ELI_left; Type: QD OVA 002 AA;
  - DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Configuration/ Pin=100 mW/Area Scan (61x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 18.8 W/kg
Configuration/ Pin=100 mW/Zoom Scan (7x7x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 56.53 V/m; Power Drift = -0.21 dB Peak SAR (extrapolated) = 33.8 W/kg
SAR(1 g) = 7.03 W/kg; SAR(10 g) = 2 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below = 7.1 mm
Ratio of SAR at M2 to SAR at M1 = 59.1% Maximum value of SAR (measured) = 18.6 W/kg



Plot 4

Date/Time: 22.10.24 10:03:06

Test Laboratory: Verkotan Oy

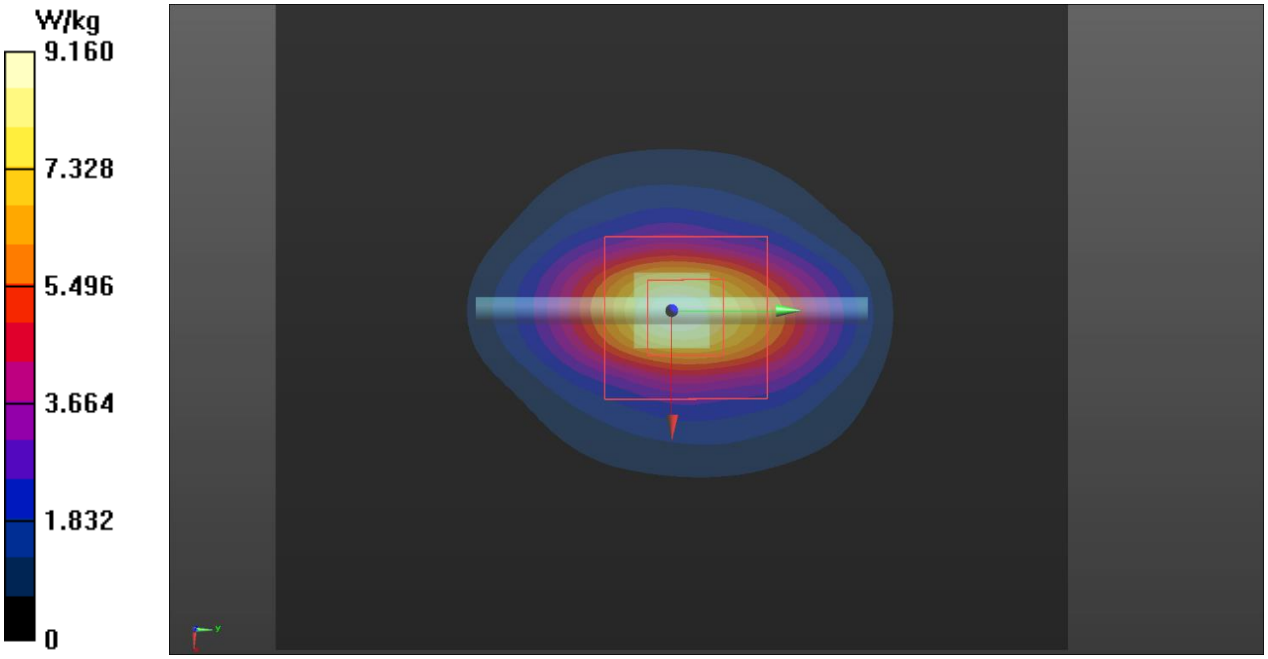
DUT: D2450V2 -729

Communication System: UID 0, CW (0); Communication System Band: D2450 (2450.0 MHz); Frequency: 2450 MHz;
Communication System PAR: 0 dB;
Medium parameters used (interpolated): f = 2450 MHz; σ = 1.893 S/m; ε_r = 40.519; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(7.38, 7.19, 6.88) @ 2450 MHz; Calibrated: 17.6.24
  - Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = -4.0, 31.0
  - Electronics: DAE4 Sn705; Calibrated: 9.4.24
  - Phantom: SAR1_Phantom1_ELI_left; Type: QD OVA 002 AA;
  - DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Configuration/System Check 2450MHz/Area Scan (71x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 9.16 W/kg
Configuration/System Check 2450MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 67.69 V/m; Power Drift = -0.18 dB Peak SAR (extrapolated) = 10.2 W/kg
SAR(1 g) = 5.19 W/kg; SAR(10 g) = 2.47 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below = 9 mm
Ratio of SAR at M2 to SAR at M1 = 51.8% Maximum value of SAR (measured) = 8.42 W/kg



Plot 5

Date/Time: 2024-11-04, 14:12

Test Laboratory: Verkotan Oy

DUT: D2450V2 -729

Communication System: UID 0, CW; Communication System Band: ; Frequency 2450.000 MHz;
Communication System PAR: ;

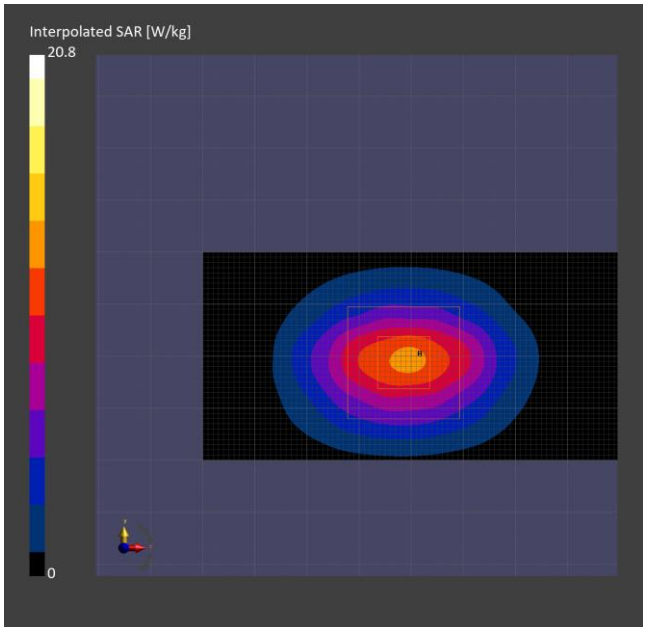
Medium parameters used: f= 2450.000; σ = 1.72 S/m; ε_r = 37.5; Head Simulating Liquid;
Phantom section: Flat section
Measurement Standard: DASY8 (IEC/IECC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(7.38, 7.19, 6.88); Calibrated: 2024-06-17
  - Sensor-Surface: 1.4 mm (VMS + 6p), Mother scan peak deviation; 0.05; Mother scan avg offset: 0.95;
  - Electronics: DAE4ip - SN1774; Calibrated: 2024-06-18
  - Phantom: MFP V8.0 Center
  - DASY8 16.4.0.5005

SPC Measurement Group

Area Scan: Measurement grid: (40.0 mm x 80.0 mm)
Zoom Scan: Measurement grid: (30.0 mm x 30.0 mm x 30.0 mm)
Reference Value = 6.46 V/m; Power Drift = 0.10 dB
SAR(1 g) = 9.92 W/kg; SAR(10g) = 4.59 W/kg (Positive only)
Smallest distance from peaks to all points 3dB below = 9.0 mm
Ratio of SAR at M2 to SAR at M1 = 79.5%



Plot 6

Date/Time: 2024-11-05, 15:47

Test Laboratory: Verkotan Oy

DUT: D5GHzV2 - SN1045

Communication System: UID 0, CW; Communication System Band: ; Frequency 5250.000 MHz;
Communication System PAR: ;

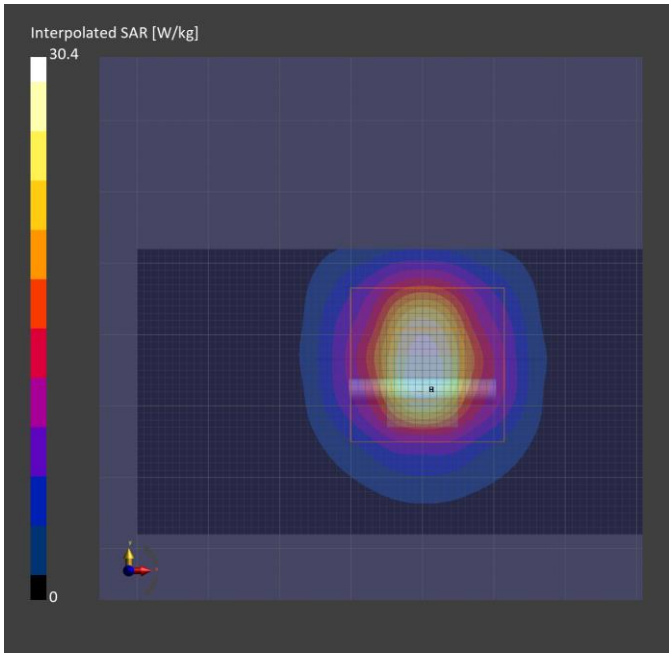
Medium parameters used: f= 5250.000; σ = 4.71 S/m; ε_r = 35.1; Head Simulating Liquid;
Phantom section: Flat section
Measurement Standard: DASY8 (IEC/IECC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(5.55, 5.41, 5.18); Calibrated: 2024-06-17
  - Sensor-Surface: 1.4 mm (VMS + 6p), Mother scan peak deviation; 0.04; Mother scan avg offset: 0.71;
  - Electronics: DAE4ip - SN1774; Calibrated: 2024-06-18
  - Phantom: MFP V8.0 Right
  - DASY8 16.4.0.5005

SPC Measurement Group:

Area Scan: Measurement grid: (40.0 mm x 80.0 mm)
Zoom Scan: Measurement grid: (22.0 mm x 22.0 mm x 22.0 mm)
Reference Value = 3.89 V/m; Power Drift = 0.03 dB
SAR(1 g) = 7.33 W/kg; SAR(10g) = 2.17 W/kg (Positive only)
Smallest distance from peaks to all points 3dB below = 7.4 mm
Ratio of SAR at M2 to SAR at M1 = 61.3%



Plot 7

Date/Time: 2024-11-05, 15:24

Test Laboratory: Verkotan Oy

DUT: D5GHzV2 - SN1045

Communication System: UID 0, CW; Communication System Band: ; Frequency 5600.000 MHz;
Communication System PAR: ;

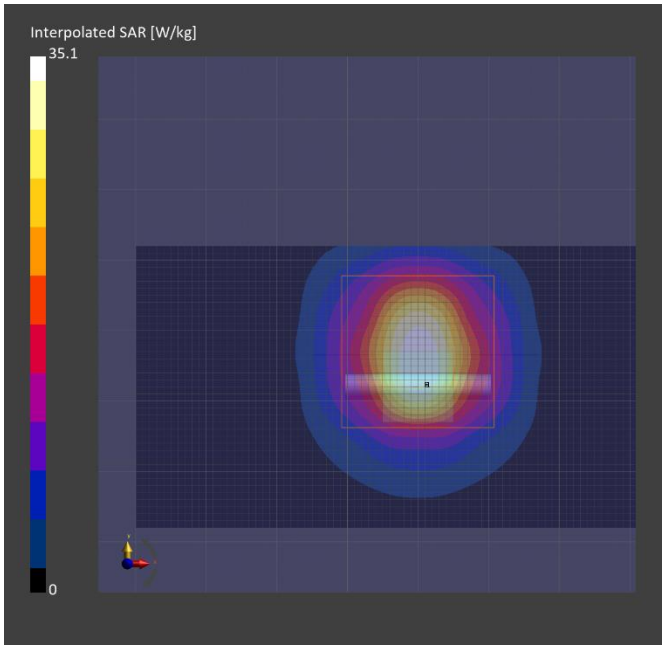
Medium parameters used: f= 5600.000; σ = 5.04 S/m; ε_r = 34.6; Head Simulating Liquid;
Phantom section: Flat section
Measurement Standard: DASY8 (IEC/IECC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(5.04, 4.91, 4.7); Calibrated: 2024-06-17
  - Sensor-Surface: 1.4 mm (VMS + 6p), Mother scan peak deviation; 0.03; Mother scan avg offset: 0.71;
  - Electronics: DAE4ip - SN1774; Calibrated: 2024-06-18
  - Phantom: MFP V8.0 Right
  - DASY8 16.4.0.5005

SPC Measurement Group:

Area Scan: Measurement grid: (40.0 mm x 80.0 mm)
Zoom Scan: Measurement grid: (22.0 mm x 22.0 mm x 22.0 mm)
Reference Value = 3.86 V/m; Power Drift = 0.03 dB
SAR(1 g) = 7.97 W/kg; SAR(10g) = 2.35 W/kg (Positive only)
Smallest distance from peaks to all points 3dB below = 7.6 mm
Ratio of SAR at M2 to SAR at M1 = 58.7%



Plot 8

Date/Time: 2024-11-06, 15:45

Test Laboratory: Verkotan Oy

DUT: D5GHzV2 - SN1045

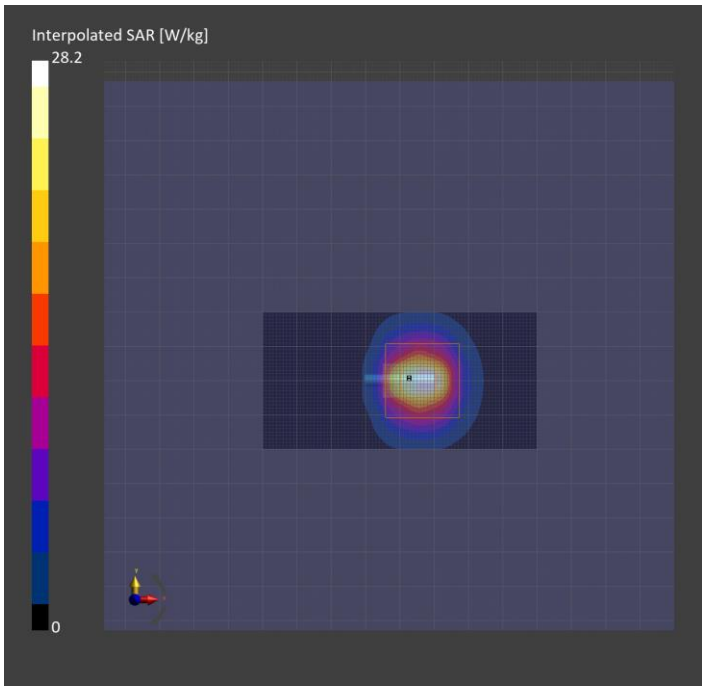
Communication System: UID 0, CW; Communication System Band: ; Frequency 5750.000 MHz;
Communication System PAR: ;

Medium parameters used: f= 5750.000; σ = 5.21 S/m; ε_r = 34.8; Head Simulating Liquid;
Phantom section: Flat section
Measurement Standard: DASY8 (IEC/IECC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(5.09, 4.96, 4.75); Calibrated: 2024-06-17
  - Sensor-Surface: 1.4 mm (VMS + 6p), Mother scan peak deviation; 0.04; Mother scan avg offset: 0.38;
  - Electronics: DAE4ip - SN1774; Calibrated: 2024-06-18
  - Phantom: MFP V8.0 Center
  - DASY8 16.4.0.5005

SPC Measurement Group:
Area Scan: Measurement grid: (40.0 mm x 80.0 mm)
Zoom Scan: Measurement grid: (22.0 mm x 22.0 mm x 22.0 mm)
Reference Value = 4.43 V/m; Power Drift = 0.03 dB
SAR(1 g) = 6.35 W/kg; SAR(10g) = 1.92 W/kg (Positive only)
Smallest distance from peaks to all points 3dB below = 8.0 mm
Ratio of SAR at M2 to SAR at M1 = 56.7%



Plot 9

Date/Time: 2024-11-06, 16:19

Test Laboratory: Verkotan Oy

DUT: D6.5GHzV2 - 1097

Communication System: UID 0, CW; Communication System Band: ; Frequency 6500.000 MHz;
Communication System PAR: ;

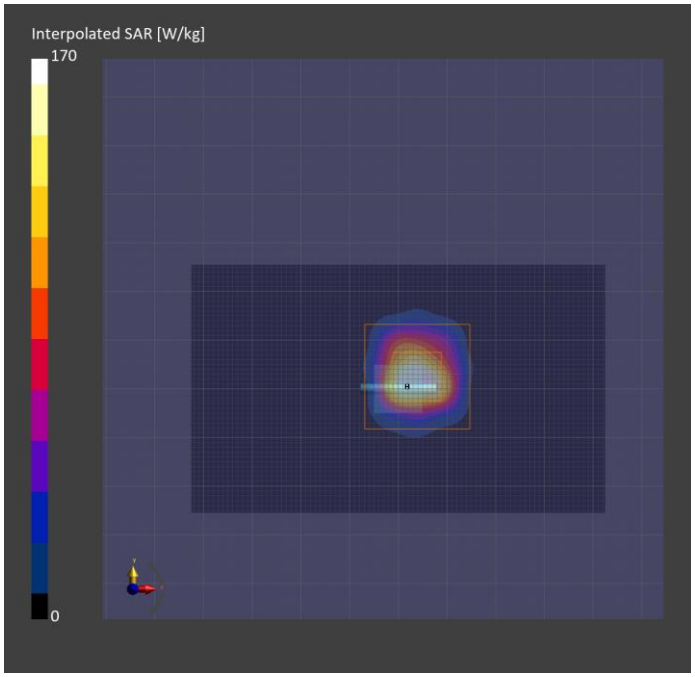
Medium parameters used: f= 6500.000; σ = 5.97 S/m; ε_r = 33.8; Head Simulating Liquid;
Phantom section: Flat section
Measurement Standard: DASY8 (IEC/IECC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(5.36, 5.22, 5.0); Calibrated: 2024-06-17
  - Sensor-Surface: 1.4 mm (VMS + 6p), Mother scan peak deviation; 0.00; Mother scan avg offset: 0.04;
  - Electronics: DAE4ip - SN1774; Calibrated: 2024-06-18
  - Phantom: MFP V8.0 Center
  - DASY8 16.4.0.5005

SPC Measurement Group:

Area Scan: Measurement grid: (51.0 mm x 85.0 mm)
Zoom Scan: Measurement grid: (22.0 mm x 22.0 mm x 22.0 mm)
Reference Value = 22.18 V/m; Power Drift = 0.03 dB
SAR(1 g) = 27.7 W/kg; SAR(10g) = 5.16 W/kg (Positive only)
Smallest distance from peaks to all points 3dB below = 4.8 mm
Ratio of SAR at M2 to SAR at M1 = 51.0%



Plot 10

Date/Time: 2024-11-08, 09:59

Test Laboratory: Verkotan Oy

DUT: D6.5GHzV2 - 1097

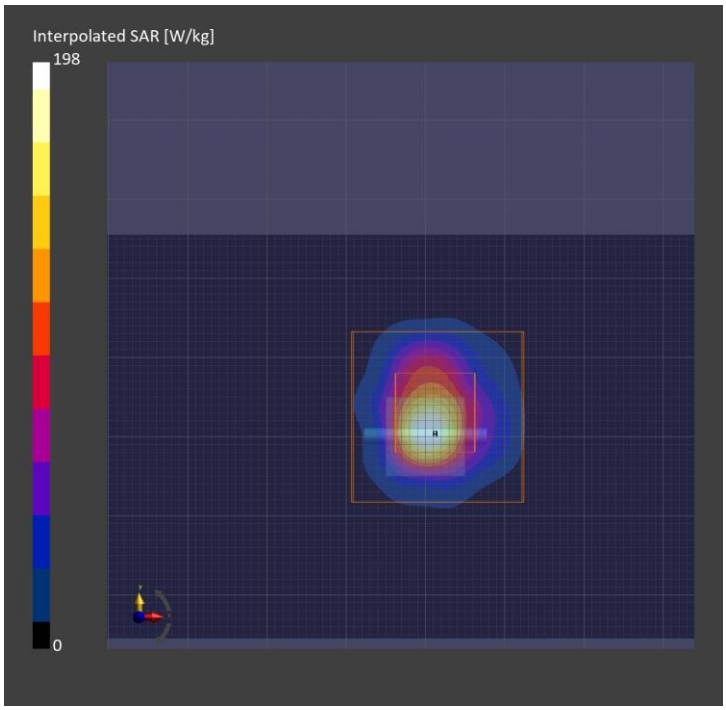
Communication System: UID 0, CW; Communication System Band: ; Frequency 6500.000 MHz;
Communication System PAR: ;

Medium parameters used: f= 6500.000; σ = 5.85 S/m; ε_r = 33.6; Head Simulating Liquid;
Phantom section: Flat section
Measurement Standard: DASY8 (IEC/IECC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(5.36, 5.22, 5.0); Calibrated: 2024-06-17
  - Sensor-Surface: 1.4 mm (All points), Mother scan peak deviation; 0.16; Mother scan avg offset: 2.00;
  - Electronics: DAE4ip - SN1774; Calibrated: 2024-06-18
  - Phantom: MFP V8.0 Center
  - DASY8 16.4.0.5005

SPC Measurement Group:
Area Scan: Measurement grid: (51.0 mm x 85.0 mm)
Zoom Scan: Measurement grid: (22.0 mm x 22.0 mm x 22.0 mm)
Reference Value = 5.09 V/m; Power Drift = 0.08 dB
SAR(1 g) = 32.5 W/kg; SAR(10g) = 5.99 W/kg (Positive only)
Smallest distance from peaks to all points 3dB below = 4.8 mm
Ratio of SAR at M2 to SAR at M1 = 51.1%



Plot 11

Date/Time: 2024-11-11, 09:50

Test Laboratory: Verkotan Oy

DUT: D2450V2 -729

Communication System: UID 0, CW; Communication System Band: ; Frequency 2450.000 MHz;
Communication System PAR: ;

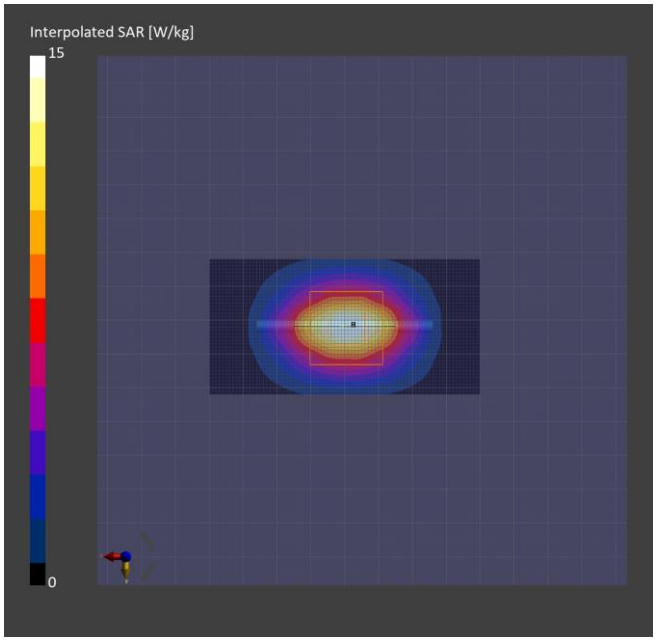
Medium parameters used: f= 2450.000; σ = 1.68 S/m; ε_r = 38.0; Head Simulating Liquid;
Phantom section: Flat section
Measurement Standard: DASY8 (IEC/IECC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(7.38, 7.19, 6.88); Calibrated: 2024-06-17
  - Sensor-Surface: 1.4 mm (All points), Mother scan peak deviation; 0.03; Mother scan avg offset: 2.30;
  - Electronics: DAE4ip - SN1774; Calibrated: 2024-06-18
  - Phantom: MFP V8.0 Right
  - DASY8 16.4.0.5005

SPC Measurement Group:

Area Scan: Measurement grid: (40.0 mm x 80.0 mm)
Zoom Scan: Measurement grid: (30.0 mm x 30.0 mm x 30.0 mm)
Reference Value = 6.85 V/m; Power Drift = -0.02 dB
SAR(1 g) = 12.3 W/kg; SAR(10g) = 5.73 W/kg (Positive only)
Smallest distance from peaks to all points 3dB below = 9.1 mm
Ratio of SAR at M2 to SAR at M1 = 80.7%



Plot 12

Date/Time: 2024-11-11, 13:51

Test Laboratory: Verkotan Oy

DUT: D5GHzV2 - SN1045

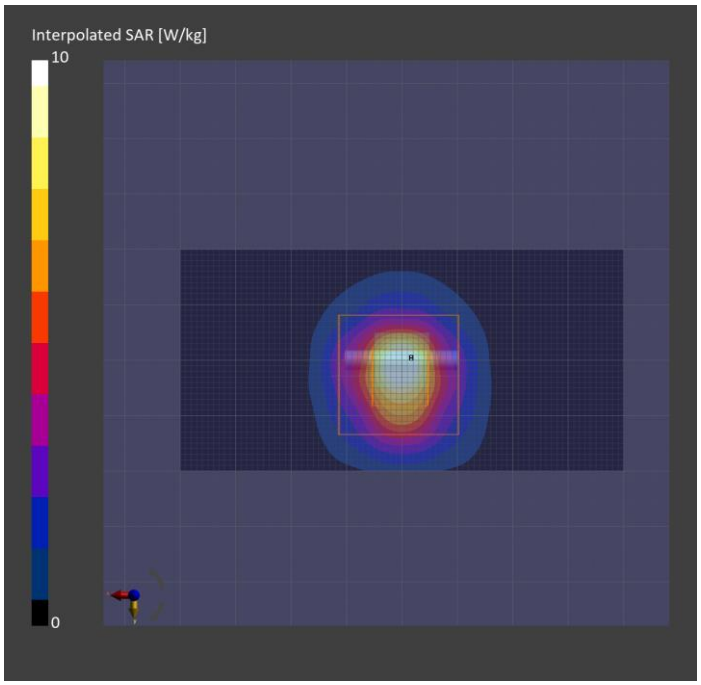
Communication System: UID 0, CW; Communication System Band: ; Frequency 5250.000 MHz;
Communication System PAR: ;

Medium parameters used: f= 5250.000; σ = 4.60 S/m; ε_r = 36.8; Head Simulating Liquid;
Phantom section: Flat section
Measurement Standard: DASY8 (IEC/IECC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(5.55, 5.41, 5.18); Calibrated: 2024-06-17
  - Sensor-Surface: 1.4 mm (All points), Mother scan peak deviation; 0.18; Mother scan avg offset: 2.15;
  - Electronics: DAE4ip - SN1774; Calibrated: 2024-06-18
  - Phantom: MFP V8.0 Center
  - DASY8 16.4.0.5005

SPC Measurement Group:
Area Scan: Measurement grid: (40.0 mm x 80.0 mm)
Zoom Scan: Measurement grid: (22.0 mm x 22.0 mm x 22.0 mm)
Reference Value = 1.79 V/m; Power Drift = 0.06 dB
SAR(1 g) = 7.91 W/kg; SAR(10g) = 2.26 W/kg (Positive only)
Smallest distance from peaks to all points 3dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 62.0%



Plot 13

Date/Time: 2024-11-11, 13:25

Test Laboratory: Verkotan Oy

DUT: D6.5GHzV2 - 1097

Communication System: UID 0, CW; Communication System Band: ; Frequency 6500.000 MHz;
Communication System PAR: ;

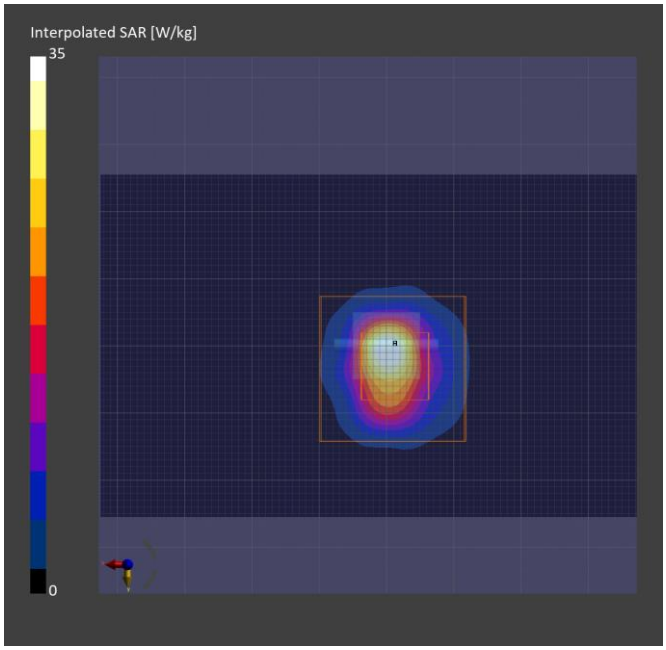
Medium parameters used: f= 6500.000; σ = 5.82 S/m; ε_r = 35.1; Head Simulating Liquid;
Phantom section: Flat section
Measurement Standard: DASY8 (IEC/IECC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(5.36, 5.22, 5.0); Calibrated: 2024-06-17
  - Sensor-Surface: 1.4 mm (All points), Mother scan peak deviation; 0.16; Mother scan avg offset: 1.78;
  - Electronics: DAE4ip - SN1774; Calibrated: 2024-06-18
  - Phantom: MFP V8.0 Center
  - DASY8 16.4.0.5005

SPC Measurement Group:

Area Scan: Measurement grid: (51.0 mm x 85.0 mm)
Zoom Scan: Measurement grid: (22.0 mm x 22.0 mm x 22.0 mm)
Reference Value = 4.23 V/m; Power Drift = 0.18 dB
SAR(1 g) = 27.6 W/kg; SAR(10g) = 5.12 W/kg (Positive only)
APD (4.0cm^2) = 125 W/m^2
Smallest distance from peaks to all points 3dB below = 4.6 mm
Ratio of SAR at M2 to SAR at M1 = 51.4%



APPENDIX C: MEASUREMENT SCANS

Plot 14

Date/Time: 22/10/2024 10:49:01

Test Laboratory: Verkotan Oy

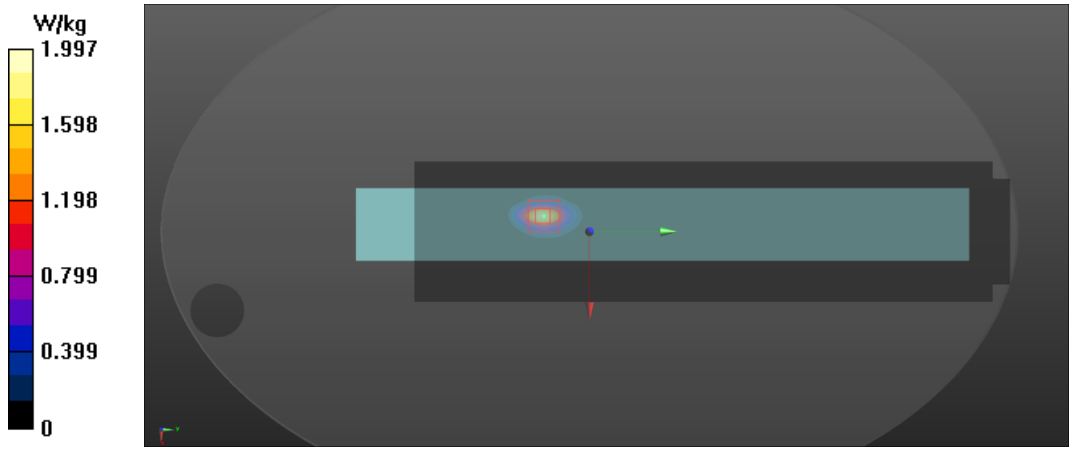
DUT: PrimeScan 2 Cart

Communication System: UID 0, WLAN 2.4 (0); Communication System Band: WLAN2.4GHz; Frequency: 2437 MHz;
Communication System PAR: 0 dB;
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.884 S/m; ε_r = 40.544; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(7.38, 7.19, 6.88) @ 2437 MHz; Calibrated: 17/06/2024
  - Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 6.0, 16.0
  - Electronics: DAE4 Sn705; Calibrated: 09/04/2024
  - Phantom: SAR1_Phantom1_ELI_left; Type: QD OVA 002 AA;
  - DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Configuration/FCC WLAN2.4GHz Top Chain A CH6 BW20/Area Scan (81x341x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 2.00 W/kg
Configuration/FCC WLAN2.4GHz Top Chain A CH6 BW20/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 23.91 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 2.28 W/kg
SAR(1 g) = 1.08 W/kg; SAR(10 g) = 0.451 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below = 7 mm
Ratio of SAR at M2 to SAR at M1 = 50.6%
Maximum value of SAR (measured) = 1.86 W/kg



Plot 15

Date/Time: 2024-11-04, 16:39

Test Laboratory: Verkotan Oy

DUT: PrimeScan 2 Cart

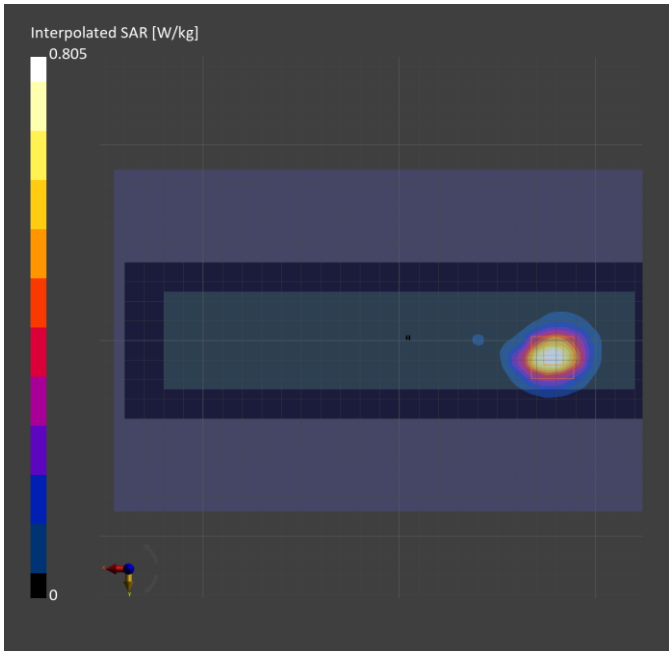
Communication System: UID 10415, WLAN; Communication System Band: WLAN 2.4GHz; Frequency 2412.000 MHz;
Communication System PAR: ;

Medium parameters used: f= 2412.000; σ = 1.70 S/m; ε_r = 37.5; Head Simulating Liquid;
Phantom section: Flat section
Measurement Standard: DASY8 (IEC/IECC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(7.38, 7.19, 6.88); Calibrated: 2024-06-17
  - Sensor-Surface: 1.4 mm (VMS + 6p), Mother scan peak deviation; 0.18; Mother scan avg offset: 0.17;
  - Electronics: DAE4ip - SN1774; Calibrated: 2024-06-18
  - Phantom: MFP V8.0 Center
  - DASY8 16.4.0.5005

Measurement Group:
WLAN 2.4GHz, IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc duty cycle), CH1, EDGE LEFT, 0.00 mm
Area Scan: Measurement grid: (80.0 mm x 280.0 mm)
Zoom Scan: Measurement grid: (30.0 mm x 30.0 mm x 30.0 mm)
Reference Value = 0.27 V/m; Power Drift = 0.02 dB
SAR(1 g) = 0.382 W/kg; SAR(10g) = 0.175 W/kg (Positive only)
Smallest distance from peaks to all points 3dB below = 9.1 mm
Ratio of SAR at M2 to SAR at M1 = 79.6%



Plot 16

Date/Time: 2024-10-14, 13:22

Test Laboratory: Verkotan Oy

DUT: PrimeScan 2 Cart

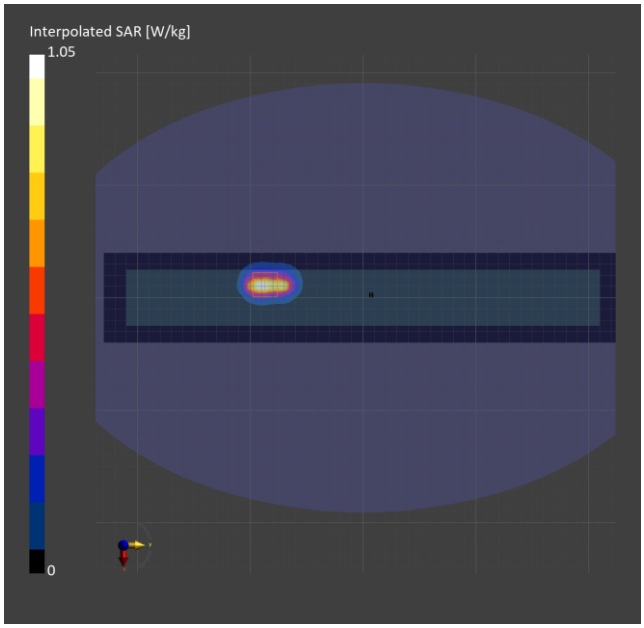
Communication System: UID 10731, WLAN; Communication System Band: U-NII-1, U-NII-2A; Frequency 5290.000 MHz;
Communication System PAR: ;

Medium parameters used: f= 5290.000; σ = 4.79 S/m; ε_r = 35.3; Head Simulating Liquid;
Phantom section: Flat section
Measurement Standard: DASY8 (IEC/IECC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(5.55, 5.41, 5.18); Calibrated: 2024-06-17
  - Sensor-Surface: 1.4 mm (VMS + 6p), Mother scan peak deviation; 0.09; Mother scan avg offset: 0.77;
  - Electronics: DAE4ip - SN1774; Calibrated: 2024-06-18
  - Phantom: ELI V8.0 (20deg probe tilt)
  - DASY8 16.4.0.5005

Chain A:
U-NII-1, U-NII-2A, IEEE 802.11ax (80MHz, MCS0, 99pc duty cycle), CH58, EDGE TOP, 0.00 mm
Area Scan: Measurement grid: (80.0 mm x 460.0 mm)
Zoom Scan: Measurement grid: (22.0 mm x 22.0 mm x 22.0 mm)
Reference Value = 0.42 V/m; Power Drift = 0.15 dB
SAR(1 g) = 0.746 W/kg; SAR(10g) = 0.253 W/kg (Positive only)
Smallest distance from peaks to all points 3dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 62.3%



Plot 17

Date/Time: 2024-11-06, 14:04

Test Laboratory: Verkotan Oy

DUT: PrimeScan 2 Cart

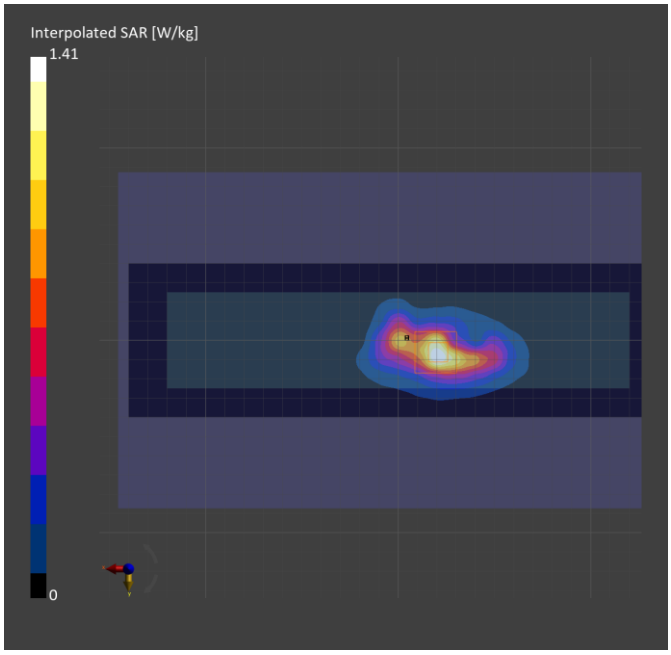
Communication System: UID 10731, WLAN; Communication System Band: WLAN 5GHz; Frequency 5290.000 MHz;
Communication System PAR: ;

Medium parameters used: f= 5290.000; σ = 4.75 S/m; ε_r = 35.0; Head Simulating Liquid;
Phantom section: Flat section
Measurement Standard: DASY8 (IEC/IECC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(5.55, 5.41, 5.18); Calibrated: 2024-06-17
  - Sensor-Surface: 1.4 mm (VMS + 6p), Mother scan peak deviation; 0.06; Mother scan avg offset: 0.23;
  - Electronics: DAE4ip - SN1774; Calibrated: 2024-06-18
  - Phantom: MFP V8.0 Center
  - DASY8 16.4.0.5005

Chain B:
WLAN 5GHz, IEEE 802.11ax (80MHz, MCS0, 99pc duty cycle), CH58, EDGE LEFT, 0.00 mm
Area Scan: Measurement grid: (80.0 mm x 280.0 mm)
Zoom Scan: Measurement grid: (22.0 mm x 22.0 mm x 22.0 mm)
Reference Value = 0.25 V/m; Power Drift = 0.10 dB
SAR(1 g) = 0.353 W/kg; SAR(10g) = 0.116 W/kg (Positive only)
Smallest distance from peaks to all points 3dB below = 7.6 mm
Ratio of SAR at M2 to SAR at M1 = 61.9%



Plot 18

Date/Time: 2024-11-06, 10:54

Test Laboratory: Verkotan Oy

DUT: PrimeScan 2 Cart

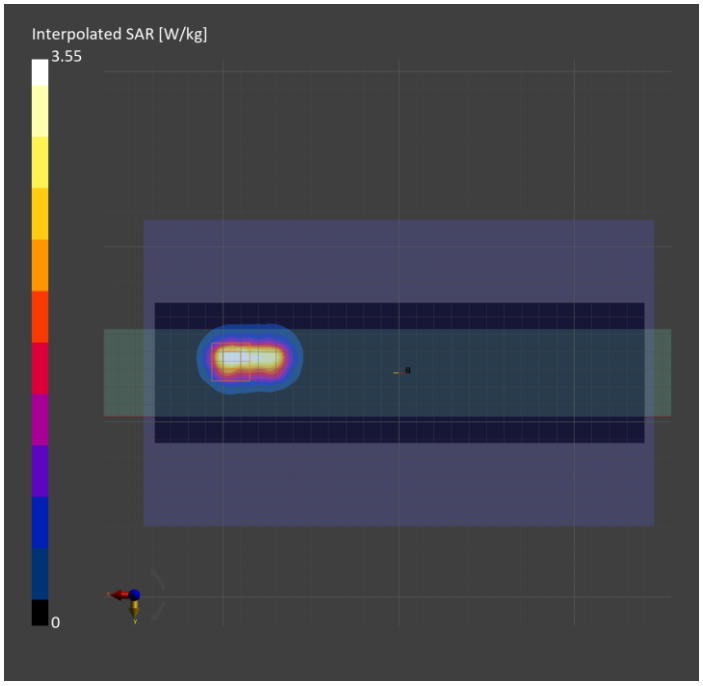
Communication System: UID 10731, WLAN; Communication System Band: U-NII-2C Standalone; Frequency 5530.000 MHz;
Communication System PAR: ;

Medium parameters used: f= 5530.000; σ = 4.97 S/m; ε_r = 34.7; Head Simulating Liquid;
Phantom section: Flat section
Measurement Standard: DASY8 (IEC/IECC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(5.04, 4.91, 4.7); Calibrated: 2024-06-17
  - Sensor-Surface: 1.4 mm (VMS + 6p), Mother scan peak deviation; 0.27; Mother scan avg offset: 0.68;
  - Electronics: DAE4ip - SN1774; Calibrated: 2024-06-18
  - Phantom: MFP V8.0 Right
  - DASY8 16.4.0.5005

Chain A:
U-NII-2C Standalone, IEEE 802.11ax (80MHz, MCS0, 99pc duty cycle), CH106, EDGE TOP, 0.00 mm
Area Scan: Measurement grid: (80.0 mm x 460.0 mm)
Zoom Scan: Measurement grid: (22.0 mm x 22.0 mm x 22.0 mm)
Reference Value = 0.86 V/m; Power Drift = 0.04 dB
SAR(1 g) = 0.859 W/kg; SAR(10g) = 0.274 W/kg (Positive only)
Smallest distance from peaks to all points 3dB below = 7.4 mm
Ratio of SAR at M2 to SAR at M1 = 60.8%



Plot 19

Date/Time: 2024-11-06, 13:35

Test Laboratory: Verkotan Oy

DUT: PrimeScan 2 Cart

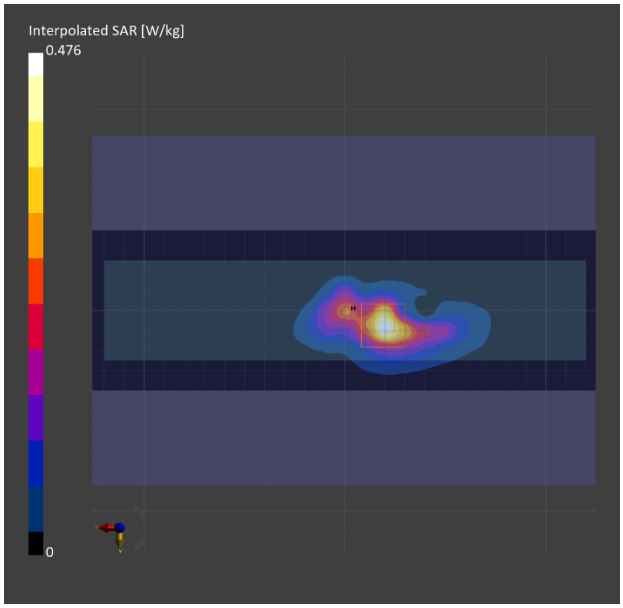
Communication System: UID 10731, WLAN; Communication System Band: WLAN 5GHz; Frequency 5530.000 MHz;
Communication System PAR: ;

Medium parameters used: f= 5530.000; σ = 4.97 S/m; ε_r = 34.7; Head Simulating Liquid;
Phantom section: Flat section
Measurement Standard: DASY8 (IEC/IECC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(5.04, 4.91, 4.7); Calibrated: 2024-06-17
  - Sensor-Surface: 1.4 mm (VMS + 6p), Mother scan peak deviation; 0.05; Mother scan avg offset: 0.22;
  - Electronics: DAE4ip - SN1774; Calibrated: 2024-06-18
  - Phantom: MFP V8.0 Center
  - DASY8 16.4.0.5005

Chain B:
WLAN 5GHz, IEEE 802.11ax (80MHz, MCS0, 99pc duty cycle), CH106, EDGE LEFT, 0.00 mm
Area Scan: Measurement grid: (80.0 mm x 280.0 mm)
Zoom Scan: Measurement grid: (22.0 mm x 22.0 mm x 22.0 mm)
Reference Value = 0.28 V/m; Power Drift = 0.04 dB
SAR(1 g) = 0.372 W/kg; SAR(10g) = 0.118 W/kg (Positive only)
Smallest distance from peaks to all points 3dB below = 7.4 mm
Ratio of SAR at M2 to SAR at M1 = 59.7%



Plot 20

Date/Time: 2024-11-07, 15:19

Test Laboratory: Verkotan Oy

DUT: PrimeScan 2 Cart

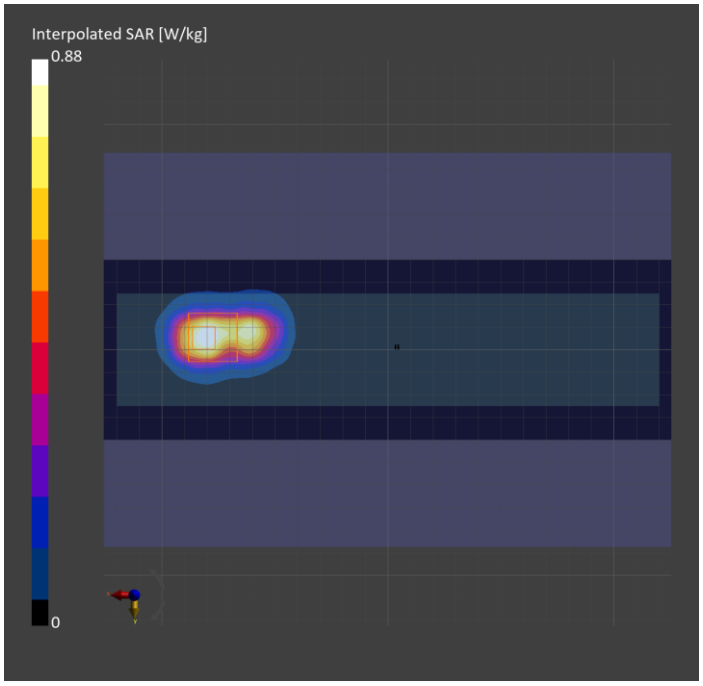
Communication System: UID 10731, WLAN; Communication System Band: U-NII-2C Standalone; Frequency 5690.000 MHz;
Communication System PAR: ;

Medium parameters used: f= 5690.000; σ = 5.15 S/m; ε_r = 34.9; Head Simulating Liquid;
Phantom section: Flat section
Measurement Standard: DASY8 (IEC/IECC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(5.09, 4.96, 4.75); Calibrated: 2024-06-17
  - Sensor-Surface: 1.4 mm (All points), Mother scan peak deviation; 0.00; Mother scan avg offset: 0.00;
  - Electronics: DAE4ip - SN1774; Calibrated: 2024-06-18
  - Phantom: MFP V8.0 Center
  - DASY8 16.4.0.5005

Chain A, Left:
U-NII-2C Standalone, IEEE 802.11ax (80MHz, MCS0, 99pc duty cycle), CH138, EDGE TOP, 0.00 mm
Area Scan: Measurement grid: (80.0 mm x 280.0 mm)
Zoom Scan: Measurement grid: (22.0 mm x 22.0 mm x 22.0 mm)
Reference Value = 0.14 V/m; Power Drift = 0.02 dB
SAR(1 g) = 0.815 W/kg; SAR(10g) = 0.264 W/kg (Positive only)
Smallest distance from peaks to all points 3dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 56.8%



Plot 21

Date/Time: 2024-11-06, 19:02

Test Laboratory: Verkotan Oy

DUT: PrimeScan 2 Cart

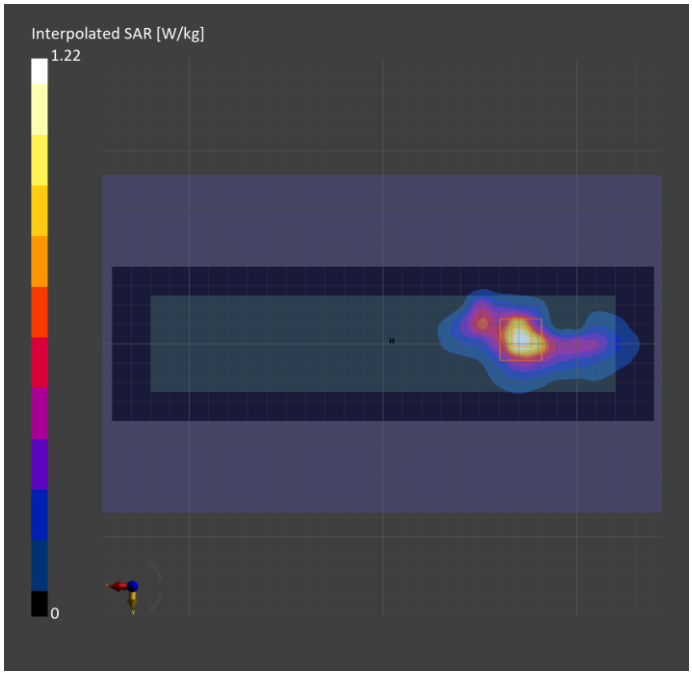
Communication System: UID 10731, WLAN; Communication System Band: WLAN 5GHz; Frequency 5690.000 MHz;
Communication System PAR: ;

Medium parameters used: f= 5690.000; σ = 5.15 S/m; ε_r = 34.9; Head Simulating Liquid;
Phantom section: Flat section
Measurement Standard: DASY8 (IEC/IECC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(5.09, 4.96, 4.75); Calibrated: 2024-06-17
  - Sensor-Surface: 1.4 mm (All points), Mother scan peak deviation; 0.00; Mother scan avg offset: 0.00;
  - Electronics: DAE4ip - SN1774; Calibrated: 2024-06-18
  - Phantom: MFP V8.0 Center
  - DASY8 16.4.0.5005

Measurement Group:
WLAN 5GHz, IEEE 802.11ax (80MHz, MCS0, 99pc duty cycle), CH138, EDGE LEFT, 0.00 mm
Area Scan: Measurement grid: (80.0 mm x 280.0 mm)
Zoom Scan: Measurement grid: (22.0 mm x 22.0 mm x 22.0 mm)
Reference Value = 0.06 V/m; Power Drift = 0.23 dB
SAR(1 g) = 0.283 W/kg; SAR(10g) = 0.088 W/kg (Positive only)
Smallest distance from peaks to all points 3dB below = 7.4 mm
Ratio of SAR at M2 to SAR at M1 = 58.7%



Plot 22

Date/Time: 2024-11-08, 15:16

Test Laboratory: Verkotan Oy

DUT: Sirona PC

Communication System: UID 10755, WLAN; Communication System Band: U-NII-5; Frequency 6025.000 MHz;
Communication System PAR: ;

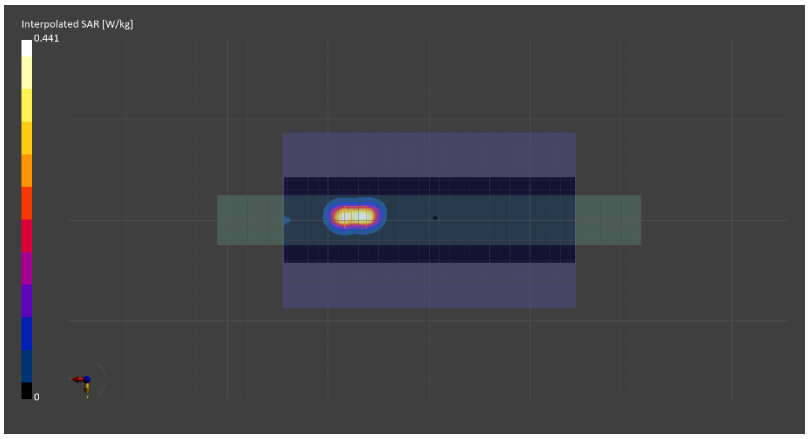
Medium parameters used: f= 6025.000; σ = 5.38 S/m; ε_r = 34.3; Head Simulating Liquid;
Phantom section: Flat section
Measurement Standard: DASY8 (IEC/IECC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(5.36, 5.22, 5.0); Calibrated: 2024-06-17
  - Sensor-Surface: 1.4 mm (All points), Mother scan peak deviation; 0.00; Mother scan avg offset: 0.00;
  - Electronics: DAE4ip - SN1774; Calibrated: 2024-06-18
  - Phantom: MFP V8.0 Center
  - DASY8 16.4.0.5005

Chain A:
U-NII-5, IEEE 802.11ax (160MHz, MCS0, 99pc duty cycle), CH15, EDGE LEFT, 0.00 mm

Area Scan: Measurement grid: (85.0 mm x 459.0 mm)
Zoom Scan: Measurement grid: (22.0 mm x 22.0 mm x 22.0 mm)
Reference Value = 0.08 V/m; Power Drift = 0.12 dB
SAR(1 g) = 0.397 W/kg; SAR(10g) = 0.134 W/kg (Positive only)
APD (4.0cm^2) = 3.00 W/m^2
Smallest distance from peaks to all points 3dB below = 6.7 mm
Ratio of SAR at M2 to SAR at M1 = 53.8%



Plot 23

Date/Time: 2024-11-07, 10:02

Test Laboratory: Verkotan Oy

DUT: Sirona PC

Communication System: UID 10755, WLAN; Communication System Band: U-NII-5; Frequency 6025.000 MHz;
Communication System PAR: ;

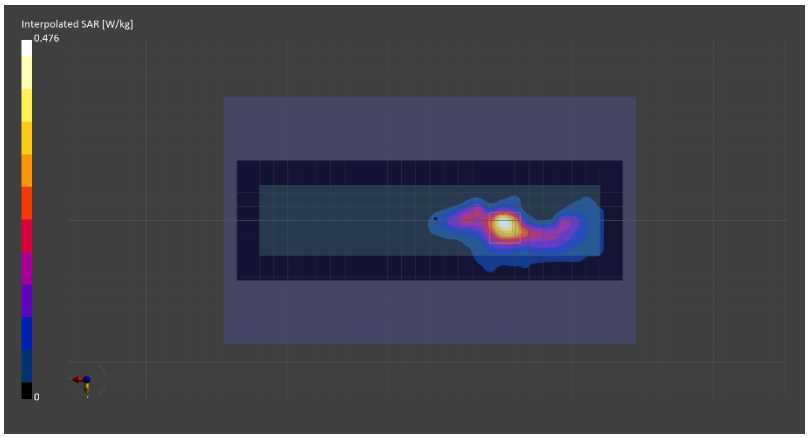
Medium parameters used: f= 6025.000; σ = 5.48 S/m; ε_r = 34.4; Head Simulating Liquid;
Phantom section: Flat section
Measurement Standard: DASY8 (IEC/IECC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(5.36, 5.22, 5.0); Calibrated: 2024-06-17
  - Sensor-Surface: 1.4 mm (All points), Mother scan peak deviation; 0.00; Mother scan avg offset: 0.00;
  - Electronics: DAE4ip - SN1774; Calibrated: 2024-06-18
  - Phantom: MFP V8.0 Center
  - DASY8 16.4.0.5005

Chain B:
U-NII-5, IEEE 802.11ax (160MHz, MCS0, 99pc duty cycle), CH15, EDGE TOP, 0.00 mm

Area Scan: Measurement grid: (85.0 mm x 272.0 mm)
Zoom Scan: Measurement grid: (22.0 mm x 22.0 mm x 22.0 mm)
Reference Value = 0.01 V/m; Power Drift = -0.80 dB
SAR(1 g) = 0.114 W/kg; SAR(10g) = 0.038 W/kg (Positive only)
APD (4.0cm^2) = 0.865 W/m^2
Smallest distance from peaks to all points 3dB below = 7.7 mm
Ratio of SAR at M2 to SAR at M1 = 56.0%



Plot 24

Date/Time: 2024-11-05, 10:52

Test Laboratory: Verkotan Oy

DUT: PrimeScan 2 Cart

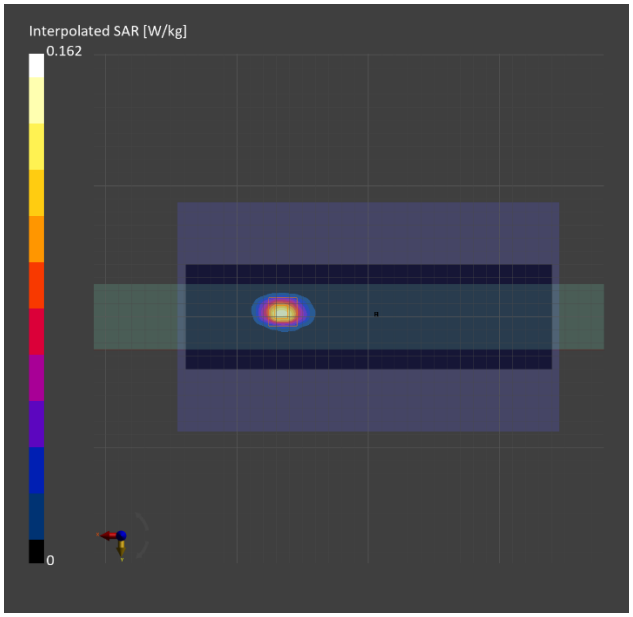
Communication System: UID 10032, Bluetooth; Communication System Band: ISM 2.4 GHz Band; Frequency 2402.000 MHz;
Communication System PAR: ;

Medium parameters used: f= 2402.000; σ = 1.69 S/m; ε_r = 37.5; Head Simulating Liquid;
Phantom section: Flat section
Measurement Standard: DASY8 (IEC/IECC)

DASY Configuration:

- Probe: EX3DV4 - SN7827; ConvF(7.38, 7.19, 6.88); Calibrated: 2024-06-17
  - Sensor-Surface: 1.4 mm (VMS + 6p), Mother scan peak deviation; 0.14; Mother scan avg offset: 0.16;
  - Electronics: DAE4ip - SN1774; Calibrated: 2024-06-18
  - Phantom: MFP V8.0 Center
  - DASY8 16.4.0.5005

Measurement Group:
ISM 2.4 GHz Band, IEEE 802.15.1 Bluetooth (GFSK, DH5), CH0, EDGE TOP, 0.00 mm
Area Scan: Measurement grid: (80.0 mm x 460.0 mm)
Zoom Scan: Measurement grid: (30.0 mm x 30.0 mm x 30.0 mm)
Reference Value = 0.06 V/m; Power Drift = 0.03 dB
SAR(1 g) = 0.075 W/kg; SAR(10g) = 0.030 W/kg (Positive only)
Smallest distance from peaks to all points 3dB below = 7.0 mm
Ratio of SAR at M2 to SAR at M1 = 80.3%



APPENDIX D: RELEVANT PAGES FROM PROBE 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-7827_Jun24

CALIBRATION CERTIFICATE

Object	EX3DV4 - SN:7827
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	June 17, 2024

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
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	05-Oct-23 (OCP-DAK3.5-1249_Oct23)	Oct-24
OCP DAK-12	SN: 1016	05-Oct-23 (OCP-DAK12-1016_Oct23)	Oct-24
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-Nov-23 (No. EX3-7349_Nov23)	Nov-24

Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-22)	In house check: Jun-24
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-22)	In house check: Jun-24
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-22)	In house check: Jun-24
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-22)	In house check: Jun-24
Network Analyzer E8358A	SN: US41080477	31-Mar-14 (in house check Oct-22)	In house check: Oct-24

	Name	Function	Signature
Calibrated by	Joanna Lleshaj	Laboratory Technician	
Approved by	Sven Kühn	Technical Manager	i.A.

Issued: June 17, 2024

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

Certificate No: EX-7827_Jun24 Page 1 of 22

Parameters of Probe: EX3DV4 - SN:7827

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc ($k = 2$)
Norm ($\mu V/(V/m)^2$) [A]	0.68	0.59	0.65	±10.1%
DCP (mV) [B]	105.2	106.7	108.2	±4.7%

Calibration Results for Modulation Response

UID	Communication System Name		A dB	B dB$\sqrt{\mu V}$	C	D dB	VR mV	Max dev.	Max Unc[E] $k = 2$
0	CW	X	0.00	0.00	1.00	0.00	125.5	±1.3%	±4.7%
		Y	0.00	0.00	1.00		139.9		
		Z	0.00	0.00	1.00		124.4		
10352	Pulse Waveform (200Hz, 10%)	X	1.50	60.42	6.26	10.00	60.0	±3.0%	±9.6%
		Y	1.76	61.64	7.01		60.0		
		Z	1.67	61.35	6.78		60.0		
10353	Pulse Waveform (200Hz, 20%)	X	0.78	60.00	4.82	6.99	80.0	±2.3%	±9.6%
		Y	0.79	60.00	5.06		80.0		
		Z	0.83	60.00	5.09		80.0		
10354	Pulse Waveform (200Hz, 40%)	X	0.00	124.15	0.75	3.98	95.0	±2.7%	±9.6%
		Y	20.00	72.00	7.00		95.0		
		Z	0.17	133.95	0.01		95.0		
10355	Pulse Waveform (200Hz, 60%)	X	14.74	159.60	1.72	2.22	120.0	±1.6%	±9.6%
		Y	10.23	158.19	15.01		120.0		
		Z	9.45	157.85	15.62		120.0		
10387	QPSK Waveform, 1 MHz	X	0.46	62.59	11.98	1.00	150.0	±2.8%	±9.6%
		Y	0.47	62.74	12.13		150.0		
		Z	0.39	60.99	10.84		150.0		
10388	QPSK Waveform, 10 MHz	X	1.23	65.53	13.42	0.00	150.0	±0.8%	±9.6%
		Y	1.22	65.57	13.18		150.0		
		Z	1.09	64.34	12.54		150.0		
10396	64-QAM Waveform, 100 kHz	X	1.51	62.93	15.25	3.01	150.0	±1.2%	±9.6%
		Y	1.66	64.17	15.59		150.0		
		Z	1.82	63.85	15.29		150.0		
10399	64-QAM Waveform, 40 MHz	X	2.73	66.19	14.99	0.00	150.0	±1.4%	±9.6%
		Y	2.75	66.45	15.04		150.0		
		Z	2.61	65.77	14.65		150.0		
10414	WLAN CCDF, 64-QAM, 40 MHz	X	3.81	66.67	15.48	0.00	150.0	±2.2%	±9.6%
		Y	3.62	66.20	15.13		150.0		
		Z	3.64	66.28	15.13		150.0		

Note: For details on UID parameters see Appendix

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 Pages 5 and 6).
[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.

Parameters of Probe: EX3DV4 - SN:7827

Sensor Model Parameters

	C1 fF	C2 fF	α V^{-1}	T1 ms V^{-2}	T2 ms V^{-1}	T3 ms	T4 V^{-2}	T5 V^{-1}	T6
x	8.1	58.60	33.51	1.11	0.00	4.90	0.00	0.00	1.00
y	7.3	52.31	32.95	1.60	0.00	4.90	0.35	0.00	1.00
z	7.6	53.89	32.48	4.50	0.00	4.92	0.53	0.00	1.00

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle	-76.1°
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:7827

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz)[C]	Relative Permittivity[F]	Conductivity[F] (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha[G]	Depth[G] (mm)	Unc[H] ($k = 2$)
750	41.9	0.89	9.79	9.54	9.13	0.37	1.27	±11.0%
900	41.5	0.97	9.35	9.11	8.72	0.37	1.27	±11.0%
1750	40.1	1.37	8.09	7.88	7.54	0.36	1.27	±11.0%
1950	40.0	1.40	7.87	7.67	7.34	0.36	1.27	±11.0%
2100	39.8	1.49	7.90	7.69	7.36	0.36	1.27	±11.0%
2300	39.5	1.67	7.64	7.44	7.12	0.36	1.27	±11.0%
2450	39.2	1.80	7.38	7.19	6.88	0.36	1.27	±11.0%
2600	39.0	1.96	7.20	7.02	6.72	0.36	1.27	±11.0%
3300	38.2	2.71	6.66	6.49	6.21	0.36	1.27	±13.1%
3500	37.9	2.91	6.71	6.53	6.26	0.36	1.27	±13.1%
3700	37.7	3.12	6.62	6.45	6.17	0.36	1.27	±13.1%
3900	37.5	3.32	6.47	6.30	6.03	0.36	1.27	±13.1%
4100	37.2	3.53	6.38	6.21	5.95	0.36	1.27	±13.1%
5250	35.9	4.71	5.55	5.41	5.18	0.31	1.27	±13.1%
5600	35.5	5.07	5.04	4.91	4.70	0.28	1.27	±13.1%
5750	35.4	5.22	5.09	4.96	4.75	0.27	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. Therefore, The uncertainty stated is equivalent to the uncertainty component with the symbol CF in Table 9 of IEC/IEEE 62209-1528:2020.

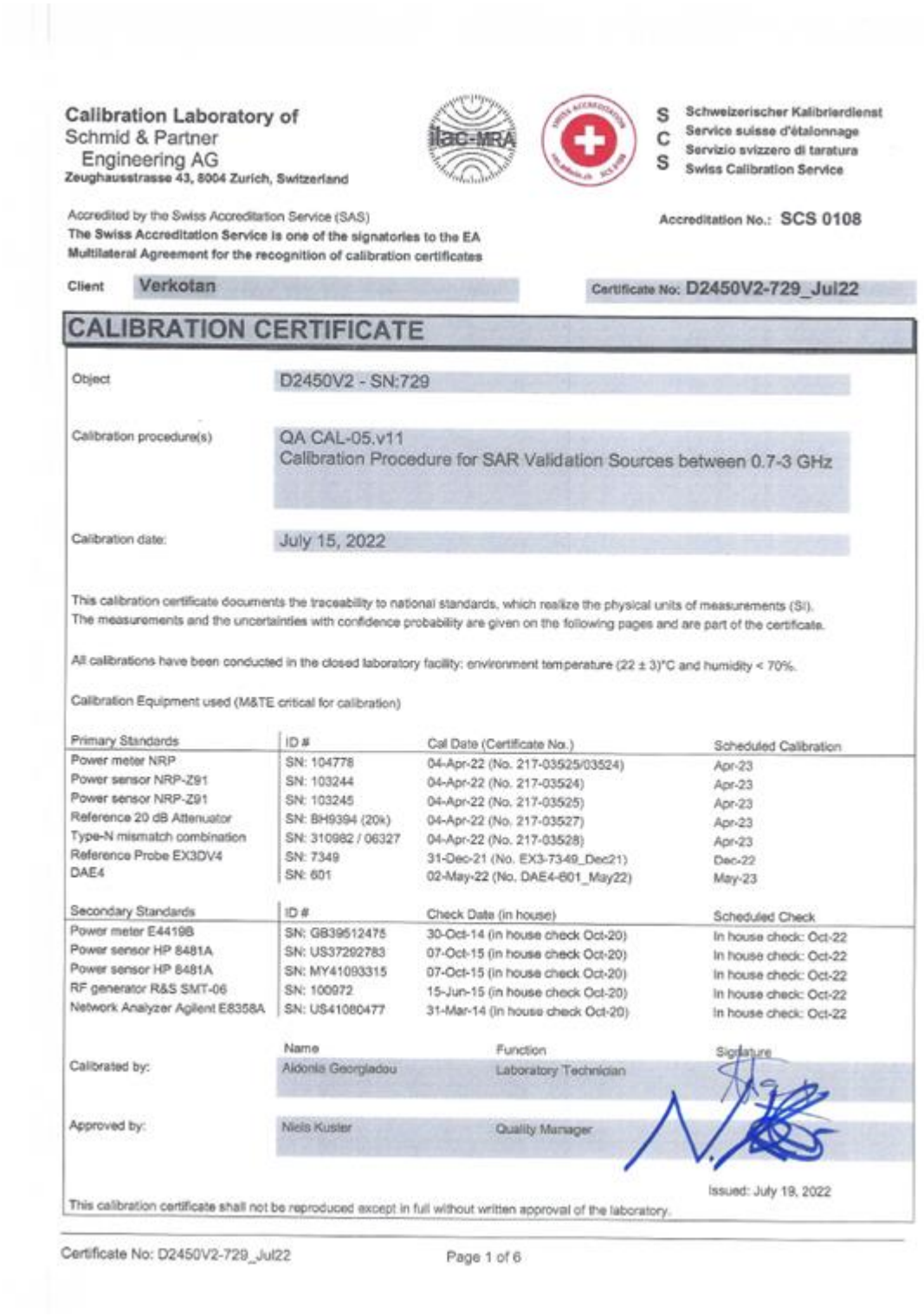
Parameters of Probe: EX3DV4 - SN:7827

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz)[C]	Relative Permittivity[F]	Conductivity[F] (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha[G]	Depth[G] (mm)	Unc[H] ($k = 2$)
6500	34.5	6.07	5.36	5.22	5.00	0.20	1.27	±18.6%

[C] Frequency validity at 6.5 GHz is −600/+700 MHz, and ±700 MHz at or above 7 GHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] The probes are calibrated using tissue simulating liquids (TSL) that deviate for ε and σ by less than ±10% from the target values (typically better than ±6%) and are valid for TSL with deviations of up to ±10%.
[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; below ±2% for frequencies between 3–6 GHz; and below ±4% for frequencies between 6–10 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. Therefore, The uncertainty stated is equivalent to the uncertainty component with the symbol CF in Table 9 of IEC/IEEE 62209-1528:2020.

APPENDIX E: RELEVANT PAGES FROM DIPOLE CALIBRATION REPORTS



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

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

Certificate No: D2450V2-729_Jul22

CALIBRATION CERTIFICATE

Object	D2450V2 - SN:729
Calibration procedure(s)	QA CAL-05.v11 Calibration Procedure for SAR Validation Sources between 0.7-3 GHz
Calibration date:	July 15, 2022

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 NRP	SN: 104778	04-Apr-22 (No. 217-03525/03524)	Apr-23
Power sensor NRP-Z91	SN: 103244	04-Apr-22 (No. 217-03524)	Apr-23
Power sensor NRP-Z91	SN: 103245	04-Apr-22 (No. 217-03525)	Apr-23
Reference 20 dB Attenuator	SN: BH9394 (20k)	04-Apr-22 (No. 217-03527)	Apr-23
Type-N mismatch combination	SN: 310982 / 06327	04-Apr-22 (No. 217-03528)	Apr-23
Reference Probe EX3DV4	SN: 7349	31-Dec-21 (No. EX3-7349_Dec21)	Dec-22
DAE4	SN: 601	02-May-22 (No. DAE4-601_May22)	May-23

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	30-Oct-14 (in house check Oct-20)	In house check: Oct-22
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-20)	In house check: Oct-22
Power sensor HP 8481A	SN: MY41093315	07-Oct-15 (in house check Oct-20)	In house check: Oct-22
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-20)	In house check: Oct-22
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-20)	In house check: Oct-22

	Name	Function	Signature
Calibrated by:	Aldonia Georgiadou	Laboratory Technician	
Approved by:	Niels Kuster	Quality Manager	

Issued: July 19, 2022

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

Certificate No: D2450V2-729_Jul22 Page 1 of 6

Measurement Conditions

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

DASY Version	DASY52	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	37.9 ± 6 %	1.85 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	---	---

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.4 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**52.3 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.21 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**24.5 W/kg ± 16.5 % (k=2)**

SAR Reference Dipole Calibration Report

Ref : ACR.68.8.23.BES.A

VERKOTAN OY
ELEKTRONIIKKATIE 17
90590, OULU, FINLAND
SAR REFERENCE DIPOLE
FREQUENCY: 5200-5800 MHZ
SERIAL NO.: 1045

Calibrated at MVG
Z.I. de la pointe du diable
Technopôle Brest Iroise – 295 avenue Alexis de Rochon
29280 PLOUZANE - FRANCE

Calibration date: 03/09/2023

Accreditations #2-6789 and #2-6814
Scope available on www.cofrac.fr

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.

mvg

SAR REFERENCE DIPOLE CALIBRATION REPORT Ref: ACR.66.8.23.BES.A

	Name	Function	Date	Signature
Prepared by :	Cyrille ONNEE	Measurement Responsible	3/9/2023	
Checked & approved by:	Jérôme Luc	Technical Manager	3/9/2023	
Authorized by:	Yann Toutain	Laboratory Director	3/9/2023	

Yann Toutain ID
Signature numérique de Yann Toutain ID
Date : 2023.03.09 15:05:03 +01'00'

	Customer Name
Distribution :	Verkotan Oy

Issue	Name	Date	Modifications
A	Cyrille ONNEE	3/9/2023	Initial release

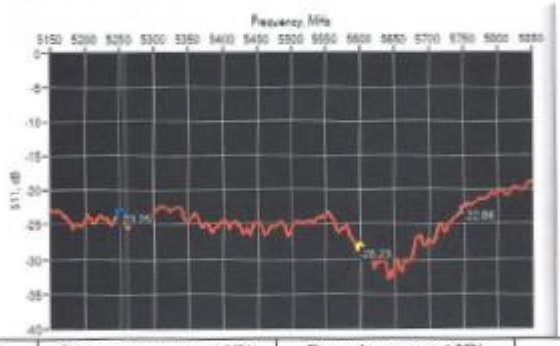
6 CALIBRATION RESULTS

6.1 MECHANICAL DIMENSIONS

L mm		h mm		d mm	
Measured	Required	Measured	Required	Measured	Required
-	20.60 +/- 2%	-	40.30 +/- 2%	-	3.60 +/- 2%

6.2 S11 PARAMETER

6.2.1 S11 parameter in Head Liquid



Frequency (MHz)	S11 parameter (dB)	Requirement (dB)	Impedance
5250	-23.25	-20	47.8Ω + 6.4jΩ
5600	-28.23	-20	48.5Ω - 3.5jΩ
5750	-22.86	-20	46.7Ω + 6.1jΩ

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.

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.

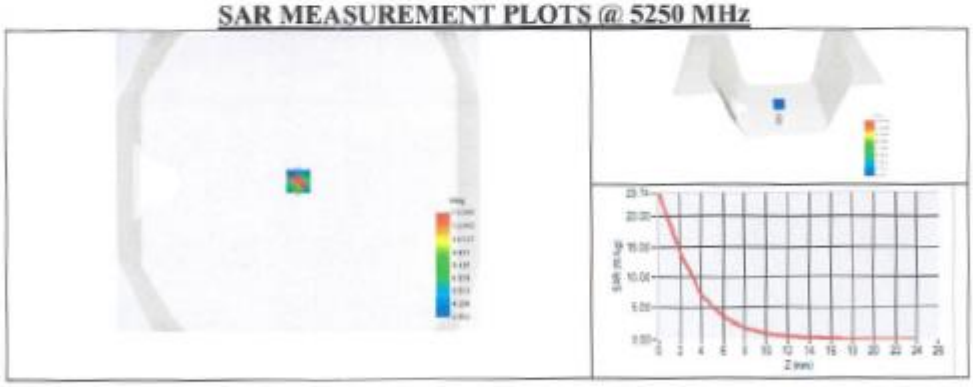
SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.68.8.23.BES.A

Software	OPENSAR V5
Phantom	SN 13/09 SAM68
Probe	SN 41/18 EPGO333
Liquid	Head Liquid Values @ 5250 MHz: eps' : 34.3 sigma : 4.67 Head Liquid Values @ 5600 MHz: eps' : 33.6 sigma : 5.05 Head Liquid Values @ 5750 MHz: eps' : 32.9 sigma : 5.46
Distance between dipole center and liquid	10.0 mm
Area scan resolution	dx=8mm/dy=8mm
Zoon Scan Resolution	dx=4mm/dy=4mm/dz=2mm
Frequency	5250 MHz 5600 MHz 5750 MHz
Input power	20 dBm
Liquid Temperature	20 +/- 1 °C
Lab Temperature	20 +/- 1 °C
Lab Humidity	30-70 %

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
5250 MHz	7.31	73.09	-	2.11	21.12	-
5600 MHz	7.29	72.92	78.30	2.13	21.29	23.20
5750 MHz	6.91	69.05	-	2.03	20.27	-

SAR MEASUREMENT PLOTS @ 5250 MHz



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

ilac-MRA

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. **D6.5GHzV2-1097_Jun23**

CALIBRATION CERTIFICATE

Object	D6.5GHzV2 - SN:1097
Calibration procedure(s)	QA CAL-22.v7 Calibration Procedure for SAR Validation Sources between 3-10 GHz
Calibration date:	June 01, 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 sensor R&S NRP33T	SN: 100967	03-Apr-23 (No. 217-03806)	Apr-24
Reference 20 dB Attenuator	SN: BH9394 (20k)	30-Mar-23 (No. 217-03809)	Mar-24
Mismatch combination	SN: 84224 / 360D	03-Apr-23 (No. 217-03812)	Apr-24
Reference Probe EX3DV4	SN: 7405	02-Jun-22 (No. EX3-7405_Jun22)	Jun-23
DAE4	SN: 908	27-Jun-22 (No. DAE4-908_Jun22)	Jun-23

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator Anapico APSIN20G	SN: 827	18-Dec-18 (in house check Dec-21)	In house check: Dec-23
Power sensor NRP-Z23	SN: 100169	10-Jan-19 (in house check Nov-22)	In house check: Nov-23
Power sensor NRP-18T	SN: 100950	28-Sep-22 (in house check Nov-22)	In house check: Nov-23
Network Analyzer Keysight E5063A	SN:MY54504221	31-Oct-19 (in house check Oct-22)	In house check: Oct-25

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

Issued: June 6, 2023

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

Measurement Conditions

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

DASY Version	DASY6	V16.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	5 mm	with Spacer
Zoom Scan Resolution	dx, dy = 3.4 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	6500 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	34.5	6.07 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.7 ± 6 %	6.10 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	29.6 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**296 W/kg ± 24.7 % (k=2)**

SAR averaged over 8 cm³ (8 g) of Head TSL	Condition	
SAR measured	100 mW input power	6.66 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**66.7 W/kg ± 24.4 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	5.46 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**54.7 W/kg ± 24.4 % (k=2)**

APPENDIX F: TÜV SÜD IPD REPORT