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Stryker Medical
SAR TEST REPORT

SCOPE OF WORK
SPECIFIC ABSORPTION RATE – B7000 Badge model B7000

REPORT NUMBER
105964951LEX-040.1

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SPECIFIC ABSORBTION RATE TEST REPORT

Report Number:	105964951LEX-040.1
Project Number:	G105964951
Report Issue Date:	2/6/2025
Report Revised Date:	4/22/2025
Product Name:	B7000 Badge model B7000
Standards:	FCC Part 2.1093 RSS-102 Issue 6 IEC/IEEE 62209-1528:2020

Tested by:
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1 Introduction

At the request of Stryker Medical the B7000 Badge was evaluated for SAR in accordance with the requirements for FCC Part 2.1093, RSS-102 Issue 6, and IEC/IEEE 62209-1528. Testing was performed in accordance with IEEE Std 1528-2013, IEC/IEEE 62209-1528, and the Office of Engineering and Technology KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04 and KDB 447498 D04 Interim General RF Exposure Guidance v01. Testing was performed at the Intertek facility in Lexington, Kentucky. The FCC test site designation number was US1112. The SAR lab ISED company number was 2042M, CAB identifier US0127. The SAR lab A2LA certification number was 1926.01.

For the evaluation, the dosimetric assessment system DASY52 was used. The total uncertainty for the evaluation of the spatial peak SAR values averaged over a cube of 1-g tissue mass had been assessed for this system to be ±22.3% from 300MHz – 3GHz and 24.6% from 3GHz – 6GHz. The total uncertainty for the evaluation of the spatial peak SAR values averaged over a cube of 10-g tissue mass had been assessed for this system to be ±22.2% from 300MHz – 3GHz and 24.5% from 3GHz – 6GHz.

The B7000 Badge was tested at the maximum output power measured by Intertek. Maximum output power measurements are tabulated under Section 8 Test Results. The maximum spatial peak SAR value for the sample device averaged over 1-g and 10-g is shown below.

Based on the worst-case data presented below, the B7000 Badge were found to be **compliant** with the 1.6 W/kg requirements for general population / uncontrolled exposure.

Table 1: Worst Case Reported 1-g SAR per Exposure Condition – FCC, ISED

Device Position	Transmit Mode	Separation Distance	Channel	Conducted Output Power (dBm)	Reported 1-g SAR (W/kg)	1-g SAR Limit (W/kg)
Front	802.11b	5mm	6	17.98	1.53	1.6
Left	802.11a	5mm	120	17.35	1.15	1.6

Table 2: Worst Case Reported 10-g SAR per Exposure Condition – FCC, ISED

Device Position	Transmit Mode	Separation Distance	Channel	Conducted Output Power (dBm)	Reported 10-g SAR (W/kg)	10-g SAR Limit (W/kg)
Front	802.11b	5mm	6	17.98	0.74	4
Left	802.11a	5mm	120	17.35	0.48	4

Table 3: Worst Case Reported SAR per Exposure Condition – ICNIRP

Device Position	Transmit Mode	Separation Distance	Channel	Conducted Output Power (dBm)	Reported 10-g SAR (W/kg)	10-g SAR Limit (W/kg)
Front	802.11b	5mm	6	17.98	0.74	2
Left	802.11a	5mm	120	17.35	0.48	2

2 Test Site Description

The SAR test site located at 731 Enterprise Drive, Lexington KY 40510 is comprised of the SPEAG model DASY 5.2 automated near-field scanning system, which is a package, optimized for dosimetric evaluation of mobile radios [3]. This system is installed in an ambient-free shielded chamber. The ambient temperature is controlled to 22.0 $\pm 2^{o}$C. During the SAR evaluations, the RF ambient conditions are monitored continuously for signals that might interfere with the test results. The tissue simulating liquid is also stored in this area in order to keep it at the same constant ambient temperature as the room.

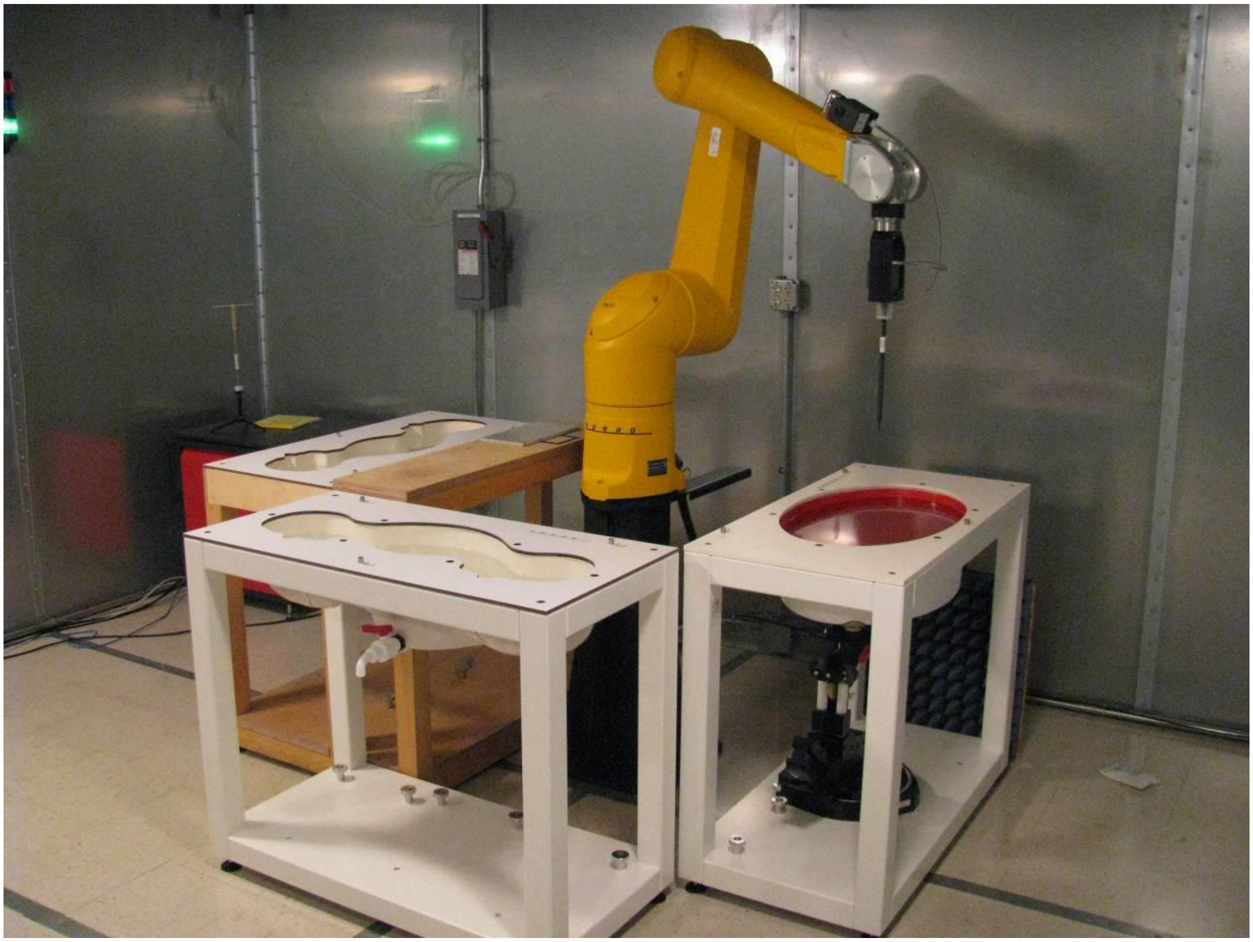


Figure 1: Intertek SAR Test Site

2.1 Measurement Equipment

The following major equipment/components were used for the SAR evaluation:

Table 4: Test Equipment Used for SAR Evaluation

Description	Asset	Manufacturer	Model	Cal. Date	Cal. Due
SAR Probe	3516	Speag	EX3DV3	11/18/2024	11/18/2025
2450MHz Dipole	3013	Speag	D2450V2	11/12/2024	11/12/2025
5GHz Dipole	3053	Speag	D5GHzV2	11/14/2024	11/14/2025
DAE	3269	Speag	DAE4	11/6/2024	11/6/2025
Vector Signal Generator	3884	Rohde&Schwarz	SMBV100A	9/21/2024	9/21/2025
Broadband Amplifier	8294	Rohde & Schwarz	BBA150	Verify at Time of Use	Verify at Time of Use
Network Analyzer	8276	Rohde & Schwarz	ZNB8	9/24/2024	9/24/2025
Average Power Sensor	3975	Rohde & Schwarz	NRP-Z31	9/22/2024	9/22/2025
Dielectric Probe Kit	3968	Speag	DAK-3.5	11/5/2024	11/5/2025
Spectrum Analyzer	8305	Rohde & Schwarz	FSW26	9/20/2024	9/20/2025
SAM Twin Phantom	3619	Speag	QD 000 P40 C	Verify at Time of Use	Verify at Time of Use
6-axis robot	3608	Staubli	RX-909	Verify at Time of Use	Verify at Time of Use

2.2 Measurement Uncertainty

The Tables below includes the uncertainty budget suggested by the IEEE Std 1528-2013 and IEC/IEEE 62209-1528 as determined by SPEAG for the DASY5 measurement System.

Error Description	Uncertainty Value	Prob. Dist.	Div.	c_i (1-g)	c_i (10-g)	Std.Unc. (1-g)	Std.Unc. (10-g)	(v_i) v_{eff}
Measurement System								
Probe Calibration	±6.0%	N	1	1	1	±6.0%	±6.0%	∞
Axial Isotropy	±4.7%	R	√3	0.7	0.7	±1.9%	±1.9%	∞
Hemispherical Isotropy	±9.6%	R	√3	0.7	0.7	±3.9%	±3.9%	∞
Boundary Effect	±1.0%	R	√3	1	1	±0.6%	±0.6%	∞
Linearity	±4.7%	R	√3	1	1	±2.7%	±2.7%	∞
System Detection Limits	±1.0%	R	√3	1	1	±0.6%	±0.6%	∞
Modulation Response	±2.4%	R	√3	1	1	±1.4%	±1.4%	∞
Readout Electronics	±0.3%	N	1	1	1	±0.3%	±0.3%	∞
Response Time	±0.8%	R	√3	1	1	±0.5%	±0.5%	∞
Integration Time	±2.6%	R	√3	1	1	±1.5%	±1.5%	∞
RF Ambient Noise	±3.0%	R	√3	1	1	±1.7%	±1.7%	∞
RF Ambient Reflections	±3.0%	R	√3	1	1	±1.7%	±1.7%	∞
Probe Positioner	±0.4%	R	√3	1	1	±0.2%	±0.2%	∞
Probe Positioning	±2.9%	R	√3	1	1	±1.7%	±1.7%	∞
Max. SAR Eval.	±2.0%	R	√3	1	1	±1.2%	±1.2%	∞
Test sample Related								
Device Positioning	±2.9%	N	1	1	1	±2.9%	±2.9%	145
Device Holder	±3.6%	N	1	1	1	±3.6%	±3.6%	5
Power Drift	±5.0%	R	√3	1	1	±2.9%	±2.9%	∞
Power Scaling	±0.0%	R	√3	1	1	±0%	±0%	∞
Phantom and Setup								
Phantom Uncertainty	±6.1%	R	√3	1	1	±3.5%	±3.5%	∞
SAR Correction	±1.9%	R	√3	1	0.84	±1.1%	±0.9%	∞
Liquid Conductivity (mea.)	±2.5%	R	√3	0.78	0.71	±1.1%	±1.0%	∞
Liquid Permittivity (mea.)	±2.5%	R	√3	0.26	0.26	±0.3%	±0.4%	∞
Temp unc. - Conductivity	±3.4%	R	√3	0.78	0.71	±1.5%	±1.4%	∞
Temp unc. - Permittivity	±0.4%	R	√3	0.23	0.26	±0.1%	±0.1%	∞
Combined Standard Uncertainty						±11.2%	±11.1%	361
Expanded STD Uncertainty						**±22.3%**	**±22.2%**	

Notes:
Worst Case uncertainty budget for DASY5 assessed according to IEEE Std 1528-2013 and IEC/IEEE 62209-1528. The budget is valid for the frequency range 300 MHz – 3 GHz and represents a worst-case analysis. For specific tests and configurations, the uncertainty could be considerably smaller.

Error Description	Uncertainty Value	Prob. Dist.	Div.	c_i (1-g)	c_i (10-g)	Std.Unc. (1-g)	Std.Unc. (10-g)	(v_i) v_{eff}
Measurement System								
Probe Calibration	±6.55%	N	1	1	1	±6.55%	±6.55%	∞
Axial Isotropy	±4.7%	R	√3	0.7	0.7	±1.9%	±1.9%	∞
Hemispherical Isotropy	±9.6%	R	√3	0.7	0.7	±3.9%	±3.9%	∞
Boundary Effect	±2.0%	R	√3	1	1	±1.2%	±1.2%	∞
Linearity	±4.7%	R	√3	1	1	±2.7%	±2.7%	∞
System Detection Limits	±1.0%	R	√3	1	1	±0.6%	±0.6%	∞
Modulation Response	±2.4%	R	√3	1	1	±1.4%	±1.4%	∞
Readout Electronics	±0.3%	N	1	1	1	±0.3%	±0.3%	∞
Response Time	±0.8%	R	√3	1	1	±0.5%	±0.5%	∞
Integration Time	±2.6%	R	√3	1	1	±1.5%	±1.5%	∞
RF Ambient Noise	±3.0%	R	√3	1	1	±1.7%	±1.7%	∞
RF Ambient Reflections	±3.0%	R	√3	1	1	±1.7%	±1.7%	∞
Probe Positioner	±0.8%	R	√3	1	1	±0.5%	±0.5%	∞
Probe Positioning	±6.7%	R	√3	1	1	±3.9%	±3.9%	∞
Max. SAR Eval.	±4.0%	R	√3	1	1	±2.3%	±2.3%	∞
Test sample Related								
Device Positioning	±2.9%	N	1	1	1	±2.9%	±2.9%	145
Device Holder	±3.6%	N	1	1	1	±3.6%	±3.6%	5
Power Drift	±5.0%	R	√3	1	1	±2.9%	±2.9%	∞
Power Scaling	±0.0%	R	√3	1	1	±0%	±0%	∞
Phantom and Setup								
Phantom Uncertainty	±6.6%	R	√3	1	1	±3.8%	±3.8%	∞
SAR Correction	±1.9%	R	√3	1	0.84	±1.1%	±0.9%	∞
Liquid Conductivity (mea.)	±2.5%	R	√3	0.78	0.71	±1.1%	±1.0%	∞
Liquid Permittivity(mea.)	±2.5%	R	√3	0.26	0.26	±0.3%	±0.4%	∞
Temp unc. - Conductivity	±3.4%	R	√3	0.78	0.71	±1.5%	±1.4%	∞
Temp unc. - Permittivity	±0.4%	R	√3	0.23	0.26	±0.1%	±0.1%	∞
Combined Standard Uncertainty						±12.3%	±12.2%	748
Expanded STD Uncertainty						**±24.6%**	**±24.5%**	

Notes:
Worst Case uncertainty budget for DASY5 assessed according to IEEE Std 1528-2013 and IEC/IEEE 62209-1528. The budget is valid for the frequency range 3 GHz – 6 GHz and represents a worst-case analysis. Probe calibration error reflects uncertainty of the EX3D probe. For specific tests and configurations, the uncertainty could be considerably smaller.

Error Description	Uncertainty Value	Prob. Dist.	Div.	c_i (1-g)	c_i (10-g)	Std.Unc. (1-g)	Std.Unc. (10-g)	(v_i) v_{eff}
Measurement System								
Probe Calibration	±6.55%	N	1	1	1	±6.55%	±6.55%	∞
Axial Isotropy	±4.7%	R	√3	0.7	0.7	±1.9%	±1.9%	∞
Hemispherical Isotropy	±9.6%	R	√3	0.7	0.7	±3.9%	±3.9%	∞
Boundary Effect	±2.0%	R	√3	1	1	±1.2%	±1.2%	∞
Linearity	±4.7%	R	√3	1	1	±2.7%	±2.7%	∞
System Detection Limits	±1.0%	R	√3	1	1	±0.6%	±0.6%	∞
Modulation Response	±2.4%	R	√3	1	1	±1.4%	±1.4%	∞
Readout Electronics	±0.3%	N	1	1	1	±0.3%	±0.3%	∞
Response Time	±0.8%	R	√3	1	1	±0.5%	±0.5%	∞
Integration Time	±2.6%	R	√3	1	1	±1.5%	±1.5%	∞
RF Ambient Noise	±3.0%	R	√3	1	1	±1.7%	±1.7%	∞
RF Ambient Reflections	±3.0%	R	√3	1	1	±1.7%	±1.7%	∞
Probe Positioner	±0.8%	R	√3	1	1	±0.5%	±0.5%	∞
Probe Positioning	±6.7%	R	√3	1	1	±3.9%	±3.9%	∞
Post-Processing	±4.0%	R	√3	1	1	±2.3%	±2.3%	∞
Test sample Related								
Device Positioning	±2.9%	N	1	1	1	±2.9%	±2.9%	145
Device Holder	±3.6%	N	1	1	1	±3.6%	±3.6%	5
Power Drift	±5.0%	R	√3	1	1	±2.9%	±2.9%	∞
Power Scaling	±0.0%	R	√3	1	1	±0%	±0%	∞
Phantom and Setup								
Phantom Uncertainty	±7.9%	R	√3	1	1	±4.6%	±4.6%	∞
SAR Correction	±1.9%	R	√3	1	0.84	±1.1%	±0.9%	∞
Liquid Conductivity (mea.)	±2.5%	R	√3	0.78	0.71	±1.1%	±1.0%	∞
Liquid Permittivity (mea.)	±2.5%	R	√3	0.26	0.26	±0.3%	±0.4%	∞
Temp unc. - Conductivity	±3.4%	R	√3	0.78	0.71	±1.5%	±1.4%	∞
Temp unc. - Permittivity	±0.4%	R	√3	0.23	0.26	±0.1%	±0.1%	∞
Combined Standard Uncertainty						±12.5%	±12.5%	748
Expanded STD Uncertainty						**±25.1%**	**±25.0%**	

Notes:
Worst Case uncertainty budget for DASY5 assessed according to IEC/IEEE 62209-1528:2020. The budget is valid for the frequency range 30MHz – 6 GHz and represents a worst-case analysis. Probe calibration error reflects uncertainty of the EX3D probe. For specific tests and configurations, the uncertainty could be considerably smaller.

3 Description of Equipment under Test

Equipment Under Test	
Product Name	B7000 Badge
Model Number	B7000
Serial Number	MA3304M58005E8
FCCID	Z7AB7000
ICID	4919E-B7000
Supported Transmit Modes[1]	802.11a/b/g/n/ac/ax + Bluetooth 5.3
Receive Date	12/12/2025
Test Start Date	12/12/2024
Test End Date	4/21/2025
Device Received Condition	Good
Test Sample Type	Production
Input Rating	USB-C: 5VDC, 0.7A Battery: 3.85VDC, 900mAH
Description of Equipment Under Test	
A small, lightweight, wearable communication device powered by a removable, rechargeable Lithium-Ion battery. It is designed to simplify hospital communication and workflow and improve staff safety. A user can "wake up" and operate the device using only their voice, to stay connected even under restrictive PPE. They can make and receive calls and listen and respond to messages and alarm notifications. The badge contains a 1.2" color display with an array of microphones, a hands-free speaker and an audio receiver. A headset can also be used with the badge either through the USB-C port or Bluetooth connection.	

[1] All radios operate independently and cannot transmit simultaneously.

Technology	Modulation	Nominal Bandwidth (MHz)	2400-2483.5 MHz	5150-5250 MHz	5250-5350 MHz	5470-5725 MHz	5725-5850 MHz
802.11a	OFDM (BPSK, QPSK, 16-QAM, 64-QAM)	20	-	17.5	17.5	17.5	17.5
802.11b	DSSS (DBPSK, CCK)	20	19.5	-	-	-	-
802.11g	DSSS (DBPSK, CCK) OFDM (BPSK, QPSK, 16-QAM, 64-QAM)	20	18.5	-	-	-	-
802.11n	OFDM (BPSK, QPSK, 16-QAM, 64-QAM)	20	17.5	15.5	15.5	15.5	15.5
		40	-	15.5	15.5	15.5	15.5
802.11ac	OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM)	20	-	15.5	15.5	15.5	15.5
		40	-	15.5	15.5	15.5	15.5
		80	-	12.5	8.5	15.5	12.5
802.11ax	OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM)	20	15.5	13.5	13.5	13.5	13.5
		40	-	13.5	13.5	13.5	13.5
		80	-	10.5	10.5	13.5	13.5

Table 5 - Nominal Maximum Output Power[2] (dBm)

[2] This information was provided by the client and may affect compliance. Intertek makes no claims of compliance for any device(s) other than those identified herein. Intertek cannot attest to the accuracy of any client-provided data.

4 System Verification

4.1 System Validation

Prior to the assessment, the system was verified to be within ±10% of the specifications by using the system validation kit. The system validation procedure tests the system against reference SAR values and the performance of probe, readout electronics and software. The test setup utilizes a phantom and reference dipole.

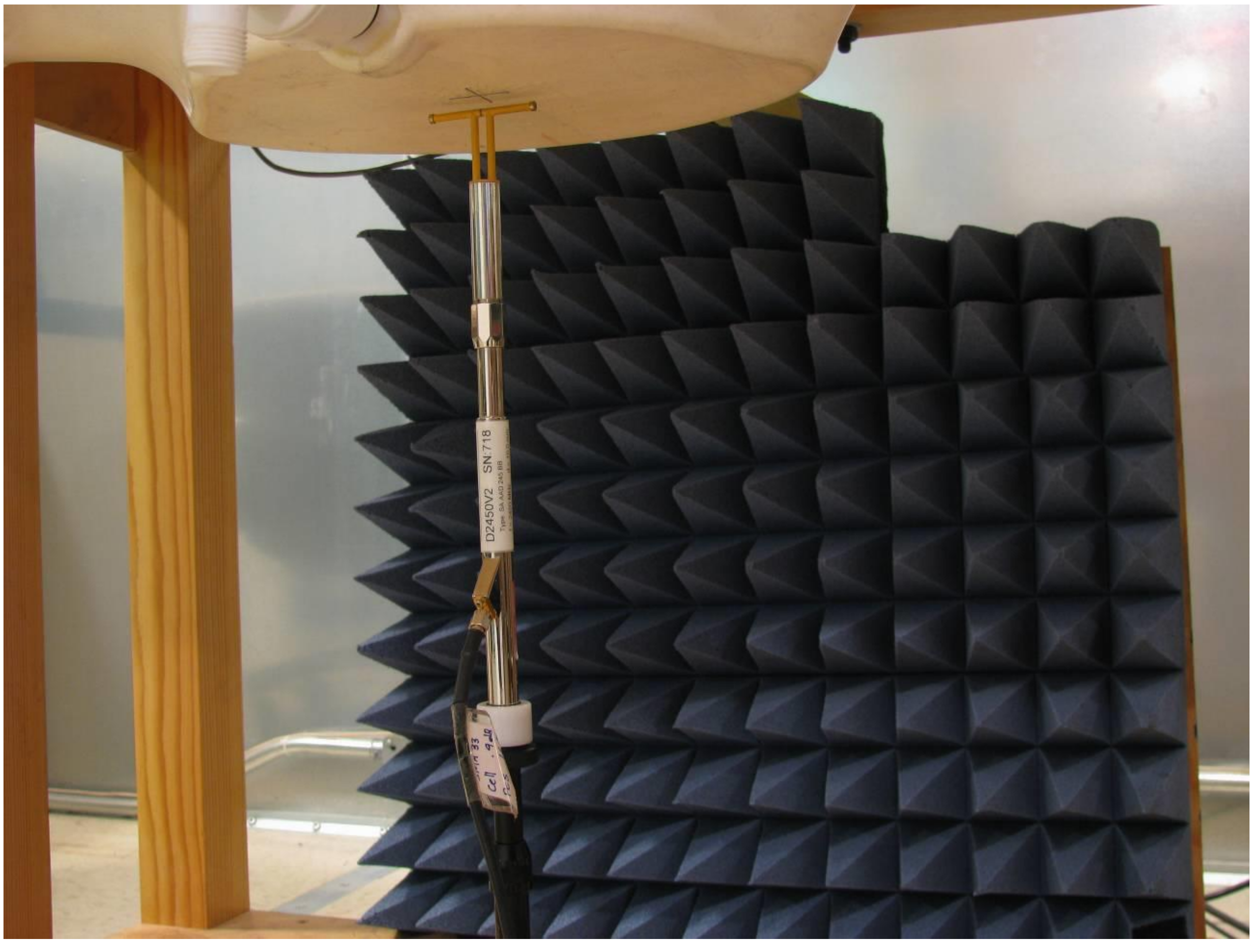


Figure 2: System Verification Setup

Table 6: Dipole Validation

Date	Ambient Temp (C)	Fluid Temp (C)	Frequency (MHz)	Dipole	Fluid Type	Phantom	Dipole Power Input (W)	Target Power (W)
12/11/2024	22.4	20.6	5200	D5GHzV2	Head	SAM Twin	0.1	1
12/11/2024	23.1	20.6	5500	D5GHzV2	Head	SAM Twin	0.1	1
12/11/2024	23.1	20.6	5800	D5GHzV2	Head	SAM Twin	0.1	1
12/17/2024	23.0	20.1	2450	D2450V2	Head	SAM Twin	0.1	1

Measured 10-g SAR (W/kg)	Adjusted 10-g SAR (W/kg)	Cal. Lab 10-g SAR (W/kg)	10-g SAR % Error	Measured 1-g SAR (W/kg)	Adjusted 1-g SAR (W/kg)	Cal. Lab 1-g SAR (W/kg)	1-g SAR % Error	Power Drift (dB)
2.27	22.7	22.8	-0.44%	8.01	80.1	79.5	0.75%	0.03
2.22	22.2	24.5	-9.39%	7.93	79.3	86.4	-8.22%	0.17
2.23	22.3	23.6	-5.51%	8.03	80.3	82.9	-3.14%	0.11
2.53	25.3	24.5	3.27%	5.49	54.9	52.2	5.17%	-0.03

4.2 Measurement Uncertainty for System Validation

Source of Uncertainty	**Value(dB)**	**Probability Distribution**	**Divisor**	**c_i**	**$u_i(y)$**	**$(u_i(y))$^2**
Measurement System						
Probe Calibration	5.50	n1	1	1	5.50	30.250
Axial Isotropy	4.70	r	1.732	0.7	2.71	7.364
Hemispherical Isotropy	9.60	r	1.732	0.7	5.54	30.722
Boundary Effect	1.00	r	1.732	1	0.58	0.333
Linearity	4.70	r	1.732	1	2.71	7.364
System Detection Limits	1.00	r	1.732	1	0.58	0.333
Readout Electronics	0.30	n1	1	1	0.30	0.090
Response Time	0.80	r	1.732	1	0.46	0.213
Integration Time	2.60	r	1.732	1	1.50	2.253
RF Ambient Noise	3.00	r	1.732	1	1.73	3.000
RF Ambient Reflections	3.00	r	1.732	1	1.73	3.000
Probe Positioner	0.40	r	1.732	1	0.23	0.053
Probe Positioning	2.90	r	1.732	1	1.67	2.803
Max. SAR Eval.	1.00	r	1.732	1	0.58	0.333
Dipole / Generator / Power Meter Related						
Dipole positioning	2.90	n1	1	1	2.90	8.410
Dipole Calibration Uncertainty	0.68	r	1.732	1	0.39	0.154
Power Meter 1 Uncertainty (+20C to +25C)	0.13	n1	1	2	0.13	0.017
Power Meter 2 Uncertainty (+20C to +25C)	0.04	n1	1	3	0.04	0.002
Sig Gen VSWR Mismatch Error	1.80	n1	1	5	1.80	3.240
Sig Gen Resolution Error	0.01	n1	1	6	0.01	0.000
Sig Gen Level Error	0.90	n1	1	1	0.90	0.810
Phantom and Setup						
Phantom Uncertainty	4.00	r	1.732	1	2.31	5.334
Liquid Conductivity (target)	5.00	r	1.732	0.43	2.89	8.334
Liquid Conductivity (meas.)	2.50	n1	1	0.43	2.50	6.250
Liquid Permittivity (target)	5.00	r	1.732	0.49	2.89	8.334
Liquid Permittivity (meas.)	2.50	n1	1	0.49	2.50	6.250
Combined Standard Uncertainty		N1	1	1	11.63	135.247
Expanded Uncertainty		Normal k=	2		**23.26**	

4.3 Tissue Simulating Liquid Description and Validation

The dielectric parameters were verified to be within 5% of the target values prior to assessment. The dielectric parameters (ε_r, σ) are shown in Table 7. A recipe for the tissue simulating fluid used is shown in Table 8.

Table 7: Dielectric Parameter Validations

Date	Temperature (C)	Tissue Type	Frequency (MHz)	ε' Target	σ Target	ε' Measured	σ Measured	ε'' Calculated	Dielectric % Deviation	Conductivity % Deviation
12/10/2024	20.6	Head	5200	35.99	4.655	36.1	5.02	17.34	0.19	7.78
12/10/2024	20.6	Head	5500	35.64	4.963	35.4	5.37	17.56	0.81	8.28
12/10/2024	20.6	Head	5800	35.3	5.27	34.5	5.76	17.84	2.15	9.20
12/17/2024	20.1	Head	2450	39.2	1.8	39.9	1.97	14.47	1.73	9.56
4/21/2025	21.1	Head	5200	35.99	4.655	33.8	4.99	17.26	5.96	7.25
4/21/2025	21.1	Head	5500	35.64	4.963	33.0	5.36	17.52	7.36	8.01
4/21/2025	21.1	Head	5800	35.3	5.27	32.3	5.73	17.76	8.59	8.74
4/21/2025	19.6	Head	2450	39.2	1.8	36.9	1.84	13.52	5.84	2.38

Table 8: Tissue Simulating Fluid Recipe

Composition of Ingredients for Liquid Tissue Phantoms (450MHz to 2450 MHz data only)												
Ingredient (% by weight)	f (MHz)											
	450		835		915		1900		2450		5500	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.45	52.4	41.05	56	54.9	70.45	62.7	68.64	65.53	78.67
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.36	0.5			
Sugar	56.32	46.78	56	45	56.5	41.76						
HEC	0.98	0.52	1	1	1	1.21						
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27						
Triton X-100									36.8		17.235	10.665
DGBE							44.92	29.18		31.37		
DGHE											17.235	10.665
Dielectric Constant	43.42	58	42.54	56.1	42	56.8	39.9	53.3	39.8	52.7		
Conductivity (S/m)	0.85	0.83	0.91	0.95	1	1.07	1.42	1.52	1.88	1.95		

Tissue Simulating Liquid for 5GHz, MBBL3500-5800V5 Manufactured by SPEAG (proprietary mixture)

Ingredients	(% by weight)
Water	78
Mineral oil	11
Emulsifiers	9
Additives and Salt	2

5 Evaluation Procedures

Prior to any testing, the appropriate fluid was used to fill the phantom to a depth of 15 cm ±0.2cm for testing ≤ 3GHz, and 10 cm ±0.2cm for testing above 3GHz. The fluid parameters were verified and the dipole validation was performed as described in the previous sections.

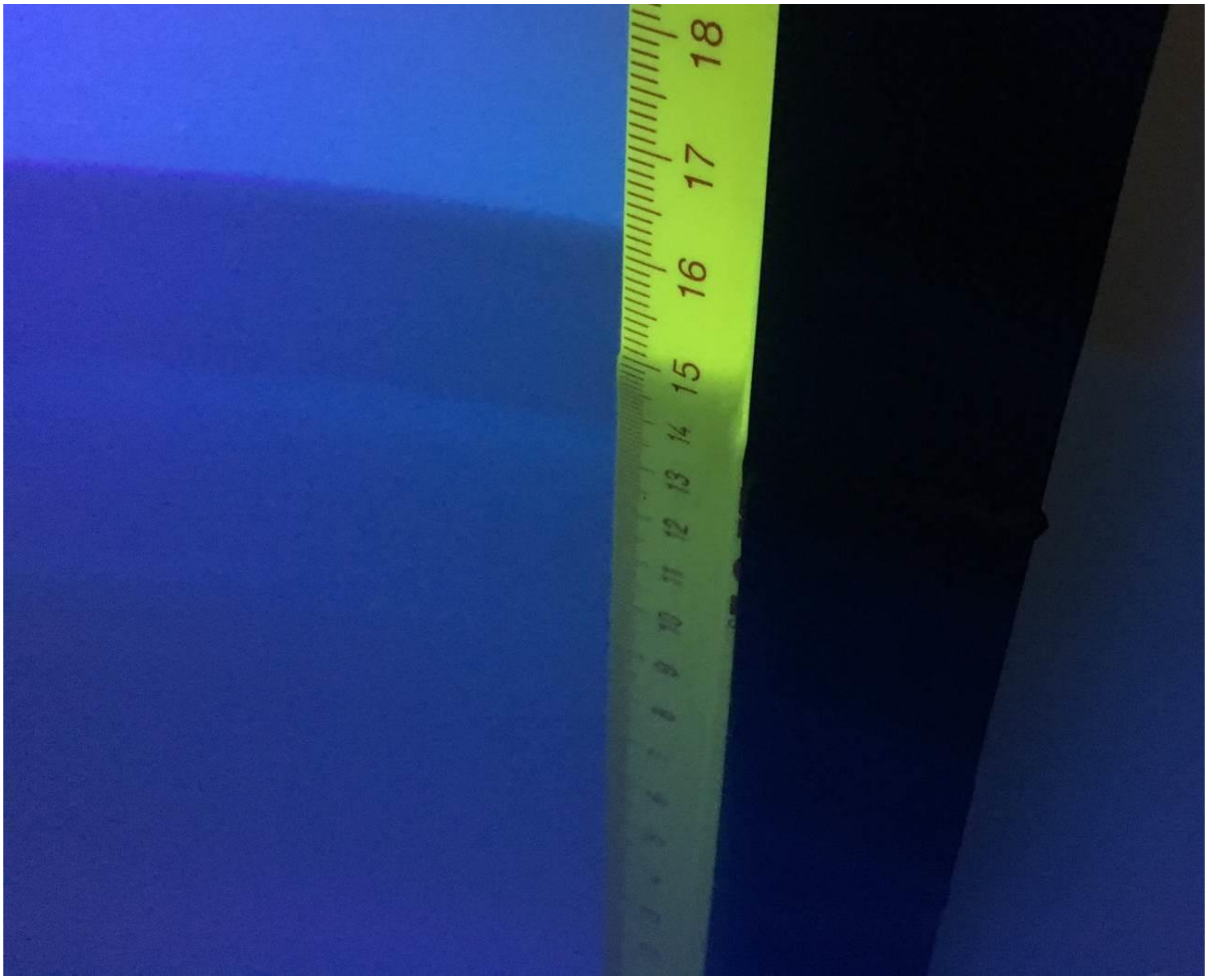


Figure 3: Fluid Depth 15cm for 2.4GHz Head Simulating Liquid

5.1 Test Positions:

The Device was positioned against the SAM phantom using the exact procedure described in IEEE Std 1528-2013, IEC/IEEE 62209-1528:2020, and the Office of Engineering and Technology KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04 and KDB 447498 D04 Interim General RF Exposure Guidance v01.

5.2 Reference Power Measurement:

The measurement probe was positioned at a fixed location above the reference point. A power measurement was made with the probe above this reference position so it could be used for assessing the power drift later in the test procedure.

5.3 Area Scan:

A coarse area scan was performed to find the approximate location of the peak SAR value. This scan was performed with the measurement probe at a constant height in the simulating fluid. A two-dimensional spline interpolation algorithm was then used to determine the peaks and gradients within the scanned area. The area scan resolution conformed to the requirements of KDB 865664 as shown in Table 9.

5.4 Zoom Scan:

A zoom scan was performed around the approximate location of the peak SAR as determined from the area scan. Based on this data set, the spatial peak SAR value was evaluated with the following procedure. The zoom scan resolution conformed to the requirements of KDB 865664 as shown in Table 9.

Table 9: SAR Area and Zoom Scan Resolutions

			≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location			30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}			≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
			When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

* When zoom scan is required and the *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

5.5 Interpolation, Extrapolation and Detection of Maxima:

The probe is calibrated at the center of the dipole sensors which is located 1 to 2.7 mm away from the probe tip. During measurements, the probe stops shortly above the phantom surface, depending on the probe and the surface detecting system. Both distances are included as parameters in the probe configuration file. The software always knows exactly how far away the measured point is from the surface. As the probe cannot directly measure at the surface, the values between the deepest measured point and the surface must be extrapolated.

In DASY5, the choice of the coordinate system defining the location of the measurement points has no influence on the uncertainty of the interpolation, Maxima Search, and extrapolation routines. The interpolation, extrapolation and maximum search routines are all based on the modified Quadratic Shepard's method.

Thereby, the interpolation scheme combines a least square fitted function method and a weighted average method which are the two basic types of computational interpolation and approximation. The DASY5 routines construct a once-continuously differentiable function that interpolates the measurement values as follows:

- For each measurement point a trivariate (3-D) / bivariate (2-D) quadratic is computed. It interpolates the measurement values at the data point and forms a least-square fit to neighboring measurement values.
- The spatial location of the quadratic with respect to the measurement values is attenuated by an inverse distance weighting. This is performed since the calculated quadratic will fit measurement values at nearby points more accurate than at points located further away.
- After the quadratics are calculated for at all measurement points, the interpolating function is calculated as a weighted average of the quadratics.

There are two control parameters that govern the behavior of the interpolation method. One specifies the number of measurement points to be used in computing the least-square fits for the local quadratics. These measurement points are the ones nearest the input point for which the quadratic is being computed. The second parameter specifies the number of measurement points that will be used in calculating the weights for the quadratics to produce the final function. The input data points used there are the ones nearest the point at which the interpolation is desired. Appropriate defaults are chosen for each of the control parameters.

The trivariate quadratics that have been previously computed for the 3-D interpolation and whose input data are at the closest distance from the phantom surface, are used to extrapolate the fields to the surface of the phantom.

To determine all the field maxima in 2-D (Area Scan) and 3-D (Zoom Scan), the measurement grid is refined by a default factor of 10 and the interpolation function is used to evaluate all field values between corresponding measurement points. Subsequently, a linear search is applied to find all the candidate maxima. In a last step, non-physical maxima are removed and only those maxima which are within 2 dB of the global maximum value are retained.

5.6 Averaging and Determination of Spatial Peak SAR

The interpolated data is used to average the SAR over the 1-g and 10-g cubes by spatially discretizing the entire measured volume. The resolution of this spatial grid used to calculate the averaged SAR is 1mm or about 42875 interpolated points. The resulting volumes are defined as cubical volumes containing the appropriate tissue parameters that are centered at the location. The location is defined as the center of the incremental volume. The spatial-peak SAR must be evaluated in cubical volumes containing a mass that is within 5% of the required mass. The cubical volume centered at each location, as defined above, should be expanded in all directions until the desired value for the mass is reached, with no surface boundaries of the averaging volume extending beyond the outermost surface of the considered region. In addition, the cubical volume should not consist of more than 10% of air. If these conditions are not satisfied, then the center of the averaging volume is moved to the next location. Otherwise, the exact size of the final sampling cube is found using an inverse polynomial approximation algorithm, leading to results with improved accuracy. If one boundary of the averaging volume reaches the boundary of the measured volume during its expansion, it will not be evaluated at all. Reference is kept of all locations used and those not used for averaging the SAR. All average SAR values are finally assigned to the centered location in each valid averaging volume.

All locations included in an averaging volume are marked to indicate that they have been used at least once. If a location has been marked as used, but has never been assigned to the center of a cube, the highest averaged SAR value of all other cubical volumes which have used this location for averaging is assigned to this location. Only those locations that are not part of any valid averaging volume should be marked as unused. For the case of an unused location, a new averaging volume must be constructed which will have the unused location centered at one surface of the cube. The remaining five surfaces are expanded evenly in all directions until the required mass is enclosed, regardless of the amount of included air. Of the six possible cubes with one surface centered on the unused location, the smallest cube is used, which still contains the required mass.

If the final cube containing the highest averaged SAR touches the surface of the measured volume, an appropriate warning is issued within the post processing engine.

5.7 Power Drift Measurement:

The probe was positioned at precisely the same reference point and the reference power measurement was repeated. The difference between the initial reference power and the final one is referred to as the power drift. This value should not exceed 5%. The power drift measurement was used to assess the output power stability of the test sample throughout the SAR scan.

5.8 RF Ambient Activity:

During the entire SAR evaluation, the RF ambient activity was monitored using a spectrum analyzer with an antenna connected to it. The spectrum analyzer was tuned to the frequency of measurement and with one trace set to max hold mode. In this way, it was possible to determine if at any point during the SAR measurement there was an interfering ambient signal. If an ambient signal was detected, then the SAR measurement was repeated.

6 Criteria

The following ANSI/IEEE C95.1 – 1992 limits for SAR apply to portable devices operating in the General Population/Uncontrolled Exposure environment. Uncontrolled environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

Exposure Type (General Population/Uncontrolled Exposure environment)	**SAR Limit (W/kg or mW/g)**
Average over the whole body	0.08
Spatial Peak (1-g)	1.60
Spatial Peak for hands, wrists, feet and ankles (10-g)	4.00

The following limits from the ICNIRP Guidelines For Limiting Exposure To Electromagnetic Fields (100 kHz To 300 GHz) for SAR apply to portable devices operating in the General Population/Uncontrolled Exposure environment.

Exposure Type (General Population/Uncontrolled Exposure environment)	**SAR Limit (W/kg or mW/g)**
Average over the whole body	0.08
Spatial Peak (10-g)	2.00
Spatial Peak for hands, wrists, feet and ankles (10-g)	4.00

7 Test Configuration

The B7000 Badge was designed to be used on a lanyard, against the body. Therefore, the flat section of the SAM Twin phantom was used.

The device was evaluated according to the specific requirements found in the following KDBs and Standards:

- FCC KDB 447498 D04 v01, General RF Exposure Guidance
- FCC KDB 865664 D01 v01r04, SAR Measurement Requirements for 100MHz to 6GHz
- FCC KDB 248227 D01 v02r02, SAR Guidance for IEEE 802.11 (Wi-Fi) Transmitters
- RSS-102 Issue 6, Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)
- IEC/IEEE 62209-1528

8 Test Results

The worst case 1-g and 10-g SAR values were less than the 1.6W/kg FCC and ISED limit and 2.0W/kg ICNIRP limit.

9 SAR Data:

The results on the following page(s) were obtained when the device was transmitting at maximum output power. The worst case plots, which reveal information about the location of the maximum SAR with respect to the device, are referenced are shown in APPENDIX B – Worst Case SAR Plot. The measured conducted output power was compared to the power declared by the manufacturer and used for scaling the measured SAR values.

9.1 Conducted Output Power

Band	Description	Raw Reading (dBm)	Cable Loss (dB)	Attenuator (dB)	Measured Average Power (dBm)	Nominal Average Power (dBm)	SAR Scaling Factor
2.4GHz	802.11b, ch1, 20MHz, 1Mbps	4.80	0.74	9.90	15.44	16.50	1.28
2.4GHz	802.11b, ch11, 20MHz, 1Mbps	4.58	0.74	9.90	15.22	16.50	1.34
2.4GHz	802.11b, ch6, 20MHz, 1Mbps	7.34	0.74	9.90	17.98	19.50	1.42
2.4GHz	802.11g, ch1, 20MHz, 6Mbps	2.70	0.74	9.90	13.34	14.50	1.31
2.4GHz	802.11g, ch11, 20MHz, 6Mbps	2.67	0.74	9.90	13.31	14.50	1.31
2.4GHz	802.11g, ch6, 20MHz, 6Mbps	6.28	0.74	9.90	16.92	18.50	1.44
2.4GHz	802.11n, ch1, 20MHz, HT MCS0	2.75	0.74	9.90	13.39	14.50	1.29
2.4GHz	802.11n, ch11, 20MHz, HT MCS0	0.95	0.74	9.90	11.59	13.50	1.55
2.4GHz	802.11n, ch6, 20MHz, HT MCS0	5.23	0.74	9.90	15.87	17.50	1.45
2.4GHz	Bluetooth[3]	-	-	-	-	4	-
U-NII-1	802.11a, ch36, 20MHz, 6Mbps	1.66	1.27	9.96	12.89	14.50	1.45
U-NII-1	802.11a, ch44, 20MHz, 6Mbps	4.73	1.27	9.96	15.96	17.50	1.43
U-NII-1	802.11a, ch48, 20MHz, 6Mbps	4.64	1.27	9.96	15.87	17.50	1.46
U-NII-1	802.11ac, ch36, 20MHz, VHT MCS0	-0.39	1.27	9.96	10.84	12.50	1.47
U-NII-1	802.11ac, ch44, 20MHz, VHT MCS0	2.52	1.27	9.96	13.75	15.50	1.50
U-NII-1	802.11ac, ch48, 20MHz, VHT MCS0	2.41	1.27	9.96	13.64	15.50	1.53
U-NII-1	802.11acVHT40, ch38, 40MHz, VHT MCS0	0.18	1.27	9.96	11.41	12.50	1.29
U-NII-1	802.11acVHT40, ch46, 40MHz, VHT MCS0	2.99	1.27	9.96	14.22	15.50	1.34
U-NII-1	802.11acVHT80, ch42, 80MHz, VHT MCS0	0.25	1.27	9.96	11.48	12.50	1.26
U-NII-1	802.11n, ch36, 20MHz, HT MCS0	-0.53	1.27	9.96	10.70	12.50	1.51
U-NII-1	802.11n, ch44, 20MHz, HT MCS0	2.53	1.27	9.96	13.76	15.50	1.49
U-NII-1	802.11n, ch48, 20MHz, HT MCS0	2.50	1.27	9.96	13.73	15.50	1.50
U-NII-1	802.11nHT40, ch38, 40MHz, HT MCS0	0.23	1.27	9.96	11.46	12.50	1.27
U-NII-1	802.11nHT40, ch46, 40MHz, HT MCS0	2.88	1.27	9.96	14.11	15.50	1.38
U-NII-2a	802.11a, ch52, 20MHz, 6Mbps	5.50	1.24	9.96	16.70	17.50	1.20
U-NII-2a	802.11a, ch60, 20MHz, 6Mbps	2.16	1.24	9.96	13.36	14.50	1.30
U-NII-2a	802.11a, ch64, 20MHz, 6Mbps	2.11	1.24	9.96	13.31	14.50	1.31
U-NII-2a	802.11ac, ch52, 20MHz, VHT MCS0	3.12	1.24	9.96	14.32	15.50	1.31
U-NII-2a	802.11ac, ch60, 20MHz, VHT MCS0	-0.02	1.24	9.96	11.18	12.50	1.35
U-NII-2a	802.11ac, ch64, 20MHz, VHT MCS0	-0.08	1.24	9.96	11.12	12.50	1.37
U-NII-2a	802.11acVHT40, ch54, 40MHz, VHT MCS0	3.10	1.24	9.96	14.30	15.50	1.32
U-NII-2a	802.11acVHT40, ch62, 40MHz, VHT MCS0	-4.02	1.24	9.96	7.18	8.50	1.35
U-NII-2a	802.11acVHT80, ch58, 80MHz, VHT MCS0	-4.05	1.24	9.96	7.15	8.50	1.36
U-NII-2a	802.11n, ch52, 20MHz, HT MCS0	3.13	1.24	9.96	14.33	15.50	1.31
U-NII-2a	802.11n, ch60, 20MHz, HT MCS0	0.10	1.24	9.96	11.30	12.50	1.32
U-NII-2a	802.11n, ch64, 20MHz, HT MCS0	0.04	1.24	9.96	11.24	12.50	1.34
U-NII-2a	802.11nHT40, ch54, 40MHz, HT MCS0	2.89	1.24	9.96	14.09	15.50	1.38
U-NII-2a	802.11nHT40, ch62, 40MHz, HT MCS0	-4.03	1.24	9.96	7.17	8.50	1.36
U-NII-2c	802.11a, ch100, 20MHz, 6Mbps	2.47	1.31	9.96	13.74	14.50	1.19
U-NII-2c	802.11a, ch120, 20MHz, 6Mbps	6.08	1.31	9.96	17.35	17.50	1.03
U-NII-2c	802.11a, ch140, 20MHz, 6Mbps	6.04	1.31	9.96	17.31	17.50	1.04
U-NII-2c	802.11ac, ch100, 20MHz, VHT MCS0	0.42	1.31	9.96	11.69	12.50	1.20
U-NII-2c	802.11ac, ch120, 20MHz, VHT MCS0	3.28	1.31	9.96	14.55	15.50	1.24
U-NII-2c	802.11ac, ch140, 20MHz, VHT MCS0	3.57	1.31	9.96	14.84	15.50	1.16
U-NII-2c	802.11acVHT40, ch102, 40MHz, VHT MCS0	-4.07	1.31	9.96	7.20	8.50	1.35
U-NII-2c	802.11acVHT40, ch118, 40MHz, VHT MCS0	3.07	1.31	9.96	14.34	15.50	1.31
U-NII-2c	802.11acVHT40, ch142, 40MHz, VHT MCS0	2.91	1.31	9.96	14.18	15.50	1.35
U-NII-2c	802.11acVHT80, ch106, 80MHz, VHT MCS0	-5.07	1.31	9.96	6.20	7.50	1.35
U-NII-2c	802.11acVHT80, ch122, 80MHz, VHT MCS0	2.93	1.31	9.96	14.20	15.50	1.35
U-NII-2c	802.11acVHT80, ch138, 80MHz, VHT MCS0	3.02	1.31	9.96	14.29	15.50	1.32
U-NII-2c	802.11n, ch100, 20MHz, HT MCS0	0.47	1.31	9.96	11.74	12.50	1.19
U-NII-2c	802.11n, ch120, 20MHz, HT MCS0	3.38	1.31	9.96	14.65	15.50	1.22
U-NII-2c	802.11n, ch140, 20MHz, HT MCS0	3.51	1.31	9.96	14.78	15.50	1.18

[3] Bluetooth radio was exempt per 47 CFR Part 2.1093, RSS-102 Issue 6, and EN IEC 62479.

U-NII-2c	802.11nHT40, ch102, 40MHz, HT MCS0	-4.14	1.31	9.96	7.13	8.50	1.37
U-NII-2c	802.11nHT40, ch118, 40MHz, HT MCS0	3.07	1.31	9.96	14.34	15.50	1.31
U-NII-2c	802.11nHT40, ch142, 40MHz, HT MCS0	3.06	1.31	9.96	14.33	15.50	1.31
U-NII-3	802.11a, ch149, 20MHz, 6Mbps	5.07	1.38	9.96	16.41	17.50	1.29
U-NII-3	802.11a, ch157, 20MHz, 6Mbps	5.20	1.38	9.96	16.54	17.50	1.25
U-NII-3	802.11a, ch165, 20MHz, 6Mbps	2.20	1.38	9.96	13.54	14.50	1.25
U-NII-3	802.11ac, ch149, 20MHz, VHT MCS0	2.71	1.38	9.96	14.05	15.50	1.40
U-NII-3	802.11ac, ch157, 20MHz, VHT MCS0	2.76	1.38	9.96	14.10	15.50	1.38
U-NII-3	802.11ac, ch165, 20MHz, VHT MCS0	0.23	1.38	9.96	11.57	12.50	1.24
U-NII-3	802.11acVHT40, ch151, 40MHz, VHT MCS0	2.92	1.38	9.96	14.26	15.50	1.33
U-NII-3	802.11acVHT40, ch159, 40MHz, VHT MCS0	0.27	1.38	9.96	11.61	12.50	1.23
U-NII-3	802.11acVHT80, ch155, 80MHz, VHT MCS0	0.29	1.38	9.96	11.63	12.50	1.22
U-NII-3	802.11n, ch149, 20MHz, HT MCS0	2.90	1.38	9.96	14.24	15.50	1.34
U-NII-3	802.11n, ch157, 20MHz, HT MCS0	2.76	1.38	9.96	14.10	15.50	1.38
U-NII-3	802.11n, ch165, 20MHz, HT MCS0	0.23	1.38	9.96	11.57	12.50	1.24
U-NII-3	802.11nHT40, ch151, 40MHz, HT MCS0	2.93	1.38	9.96	14.27	15.50	1.33
U-NII-3	802.11nHT40, ch159, 40MHz, HT MCS0	0.33	1.38	9.96	11.67	12.50	1.21

9.2 Bluetooth SAR Exemption (FCC)

The following measurements were made and reported in Intertek report 105964951MPK-052:

Mode	Frequency (MHz)	Conducted Peak Power (dBm)
GFSK, DH5	2402	1.24
	2440	1.45
	2480	1.35
π/4-DQPSK, 2DH5	2402	0.91
	2440	1.68
	2480	2.18
8-DPSK, 3DH5	2402	2.48
	2440	2.31
	2480	1.8

The threshold power for exemption was calculated using the formula from 47 CFR Part 1.1307(3)(i)(B):

$$P_{th}\text{ (mW)} = \begin{cases} ERP_{20\,cm}(d/20\text{ cm})^x & d \leq 20\text{ cm} \\ ERP_{20\,cm} & 20\text{ cm} < d \leq 40\text{ cm} \end{cases}$$

Where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\,cm}\sqrt{f}}\right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20\,cm}\text{ (mW)} = \begin{cases} 2040f & 0.3\text{ GHz} \leq f < 1.5\text{ GHz} \\ 3060 & 1.5\text{ GHz} \leq f \leq 6\text{ GHz} \end{cases}$$

d = the separation distance (cm);

The calculated threshold power was 2.8 mW at 2.402 GHz and 5 mm separation distance. The maximum reported power was 1.77 mW. Therefore, the Bluetooth mode is exempt from routine SAR evaluation.

9.3 Bluetooth SAR Exemption (ISED)

The SAR exemption threshold was taken from Table 11 of RSS-102 Issue 6:

Table 11: Power limits for exemption from routine SAR evaluation based on the separation distance

Frequency (MHz)	≤ 5 mm (mW)	10 mm (mW)	15 mm (mW)	20 mm (mW)	25 mm (mW)	30 mm (mW)	35 mm (mW)	40 mm (mW)	45 mm (mW)	> 50 mm (mW)
≤ 300	45	116	139	163	189	216	246	280	319	362
450	32	71	87	104	124	147	175	208	248	296
835	21	32	41	54	72	96	129	172	228	298
1900	6	10	18	33	57	92	138	194	257	323
2450	3	7	16	32	56	89	128	170	209	245
3500	2	6	15	29	50	72	94	114	134	158
5800	1	5	13	23	32	41	54	74	102	128

For devices operating between 2402 MHz and 2480 MHz the exemption threshold is between 2 mW and 6 mW. The maximum reported power was 1.77 mW at 2402 MHz. Therefore, the Bluetooth mode is exempt from routine SAR evaluation. The estimated SAR was calculated to be:

(1.77 mW) / (3.3 mW) x 0.25 x (1.6 W/kg) = 0.2145 W/kg

9.4 EN 62479 SAR Exemption

The maximum output power of the Bluetooth radio was less than the threshold power of 20 mW (2 W/kg x 10 g).

9.6 SAR

Mode	Channel	Position	Separation (mm)	Power Drift (dB)	Measured 1-g SAR (W/kg)	Measured 10-g SAR (W/kg)	SAR Scaling Factor	Reported 1-g SAR (W/kg)	Reported 10-g SAR (W/kg)
802.11b	1	Front	5	0.01	0.43	0.21	1.28	0.55	0.27
802.11b	6	Front	5	-0.06	1.08	0.52	1.42	1.53	0.74
802.11b	6(3)	Front	5	0.08	0.73	0.36	1.42	1.04	0.51
802.11b	6(3)	Front	5	0.07	0.73	0.36	1.42	1.04	0.51
802.11b	11	Front	5	-0.17	0.75	0.35	1.34	1.01	0.47
802.11g	1	Front	5	-0.03	0.24	0.12	1.31	0.32	0.16
802.11g	6	Front	5	0.04	0.75	0.36	1.44	1.08	0.52
802.11g	11(2)	-	-	-	-	-	-	-	-
802.11a	36(2)	-	-	-	-	-	-	-	-
802.11a	44	Left	5	0.08	0.30	0.11	1.43	0.43	0.16
802.11a	48(2)	-	-	-	-	-	-	-	-
802.11a	52	Left	5	0.05	0.46	0.16	1.20	0.55	0.19
802.11a	60(2)	-	-	-	-	-	-	-	-
802.11a	64(2)	-	-	-	-	-	-	-	-
802.11a	100	Left	5	0.07	0.38	0.13	1.19	0.45	0.16
802.11a	120	Left	5	0.11	1.11	0.38	1.03	1.15	0.48
802.11a	120(3)	Left	5	0.05	0.93	0.32	1.03	0.96	0.33
802.11a	140	Left	5	0.01	1.06	0.35	1.04	1.11	0.37
802.11a	140(3)	Left	5	0.02	0.92	0.31	1.04	0.96	0.32
802.11a	149	Left	5	0.25	0.88	0.28	1.29	1.13	0.36
802.11a	149(3)	Left	5	0.05	0.72	0.25	1.29	0.93	0.32
802.11a	149(3)	Left	5	0.01	0.72	0.25	1.29	0.92	0.32
802.11a	157	Left	5	-0.15	0.90	0.31	1.25	1.13	0.38
802.11a	157(3)	Left	5	0.07	0.65	0.23	1.25	0.81	0.29
802.11a	157(3)	Left	5	0.03	0.73	0.25	1.25	0.92	0.31
802.11a	165	Left	5	0.08	0.42	0.14	1.29	0.54	0.18

Test Personnel:	Brian Lackey	Test Date:	12/12/2024-4/21/2025
Supervising/Reviewing Engineer: (Where Applicable)	NA	Tissue Depth:	15cm
Signal Setup:	Test Commands	Ambient Temperature:	21.5 – 22.2 °C
Power Method:	ANSI C63.10	Relative Humidity:	27.0 – 34.0 %
Pretest Dipole Verification:	Yes	Atmospheric Pressure:	985.4 – 988.8 mbar

Deviations, Additions, or Exclusions:

1) Per KDB 447468 D04v01 §3.2.1 Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is SAR ≤ 0.8 W/kg for 1-g, or SAR ≤ 2.0 W/kg for 10-g, when the transmission band span is ≤ 100 MHz
2) Per KDB 248227 D01 § 5.1.1 When the reported SAR of the initial test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position using subsequent highest extrapolated or estimated 1-g SAR conditions determined by area scans or next closest/smallest test separation distance and maximum RF coupling test positions based on manufacturer justification, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg or all required test positions (left, right, touch, tilt or subsequent surfaces and edges) are tested.
3) Per KDB 865664 D01 § 2.8.1, SAR measurements are repeated for configurations where the measured 1-g SAR is > 0.8 W/kg, and repeated a second time if the first repeated measurement varies more than 20% from the original measurement.

10 APPENDIX A – System Validation Summary

Per FCC KDB 865664, a tabulated summary of the system validation status including the validation date(s), measurement frequencies, SAR probes and tissue dielectric parameters have been included in the summary table below. The validation was performed with reference dipoles using the required tissue equivalent media for system validation according to KDB 865664. Each probe calibration point was validated at a frequency within the valid frequency range of the probe calibration point. All measurements were performed using probes calibrated for CW signals. Modulations in the table above represent test configurations for which the SAR system has been validated. The SAR system was also validated with modulated signals per KDB 865664.

Table 10: SAR System Validation Summary

				Probe Calibration Point		Dielectric Properties		CW Validation			Modulation Validation		
Frequency (MHz)	Date	Probe (SN#)	Probe (Model #)	Frequency (MHz)	Fluid Type	σ	ϵ_r	Sensitivity	Probe Linearity	Probe Isotropy	Mod. Type	Duty Factor	PAR
2450	2/7/2024	3516	EX3DV3	2450	Body	50.65	2.02	Pass	Pass	Pass	OFDM	N/A	Pass
5200	2/7/2024	3516	EX3DV3	5200	Body	48.71	5.54	Pass	Pass	Pass	OFDM	N/A	Pass
5500	2/7/2024	3516	EX3DV3	5500	Body	47.68	6.29	Pass	Pass	Pass	OFDM	N/A	Pass
5800	2/7/2024	3516	EX3DV3	5800	Body	48.71	5.54	Pass	Pass	Pass	OFDM	N/A	Pass

				Probe Calibration Point		Dielectric Properties		CW Validation			Modulation Validation		
Frequency (MHz)	Date	Probe (SN#)	Probe (Model #)	Frequency (MHz)	Fluid Type	σ	ϵ_r	Sensitivity	Probe Linearity	Probe Isotropy	Mod. Type	Duty Factor	PAR
835	2/7/2024	3516	EX3DV3	835	Body	54.2	0.98	Pass	Pass	Pass	GMSK	Pass	N/A
900	2/7/2024	3516	EX3DV3	900	Body	54	1.02	Pass	Pass	Pass	GMSK	Pass	N/A
1750	2/7/2024	3516	EX3DV3	1800	Body	52.9	1.41	Pass	Pass	Pass	GMSK	Pass	N/A
1900	2/7/2024	3516	EX3DV3	1900	Body	52.7	1.48	Pass	Pass	Pass	GMSK	Pass	N/A

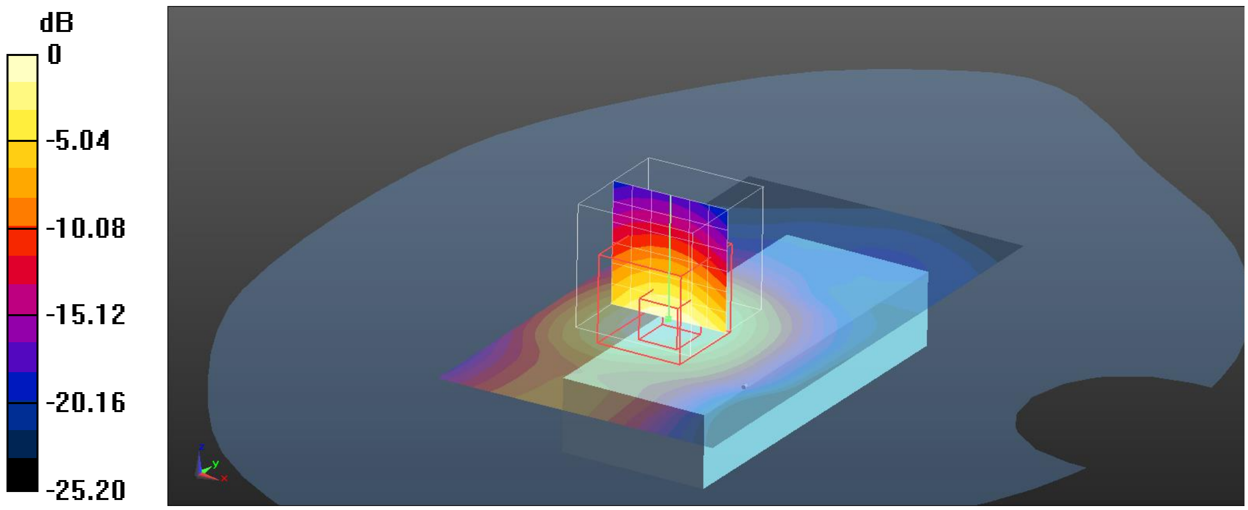
11 APPENDIX B – Worst Case SAR Plots

Date/Time: 12/18/2024 12:02:07 PM
Test Laboratory: Intertek
B7 Badge
Procedure Notes:
DUT: B7 Badge; Serial: Production Sample P3
Communication System: UID 10012 - CAB, IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps); Communication System Band: WLAN 2.4GHz (2412.0 - 2484.0 MHz); Frequency: 2437 MHz;Duty Cycle: 1:1.53886
Medium parameters used: f = 2437 MHz; σ = 1.958 S/m; ε_r = 39.947; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV3 - SN3516; ConvF(8.56, 8.56, 8.56) @ 2437 MHz; Calibrated: 11/18/2024
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn358; Calibrated: 11/6/2024
- Phantom: SAM 1 with CRP v5.0; Type: QD000P40CD; Serial: TP: 1243
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

2024-12-18 2.4GHz/802.11b ch6 front/Area Scan (61x111x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 1.27 W/kg

2024-12-18 2.4GHz/802.11b ch6 front/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 24.98 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 2.15 W/kg
SAR(1 g) = 1.08 W/kg; SAR(10 g) = 0.521 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below = 11.4 mm
Ratio of SAR at M2 to SAR at M1 = 51.3%
Maximum value of SAR (measured) = 1.22 W/kg



0 dB = 1.22 W/kg = 0.86 dBW/kg

12 APPENDIX C – Dipole Validation Plots

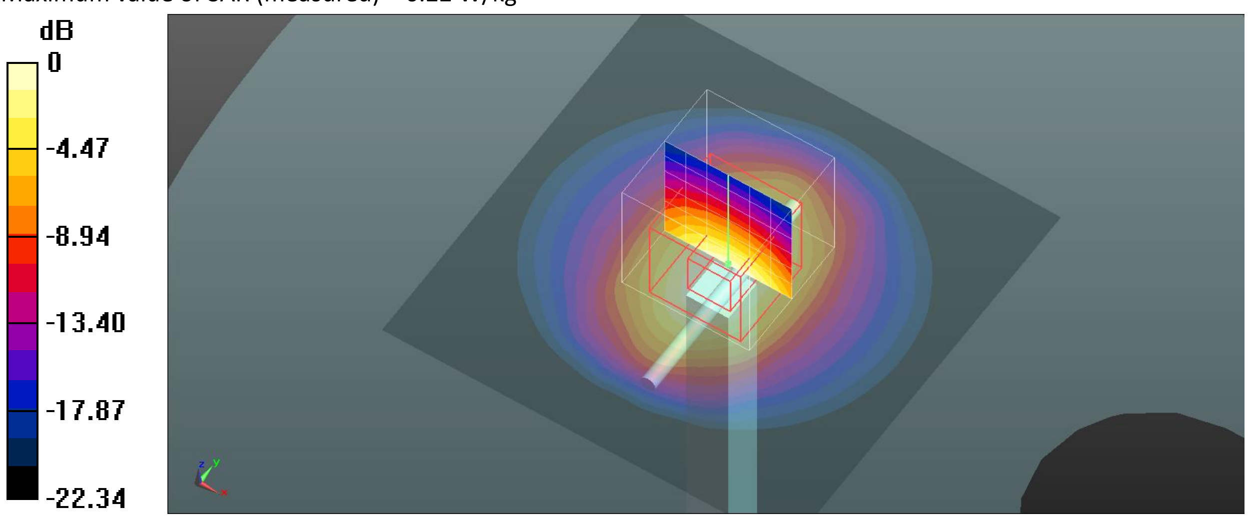
12.1 D2450V2

Date/Time: 12/17/2024 3:34:33 PM
Test Laboratory: Intertek
2024-12-17 D2450V2
Procedure Notes:
DUT: Dipole 2450 MHz D2450V2; Serial: D2450V2
Communication System: UID 0, CW (0); Communication System Band: D2450 (2450.0 MHz); Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.972 S/m; ε_r = 39.885; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV3 - SN3516; ConvF(8.56, 8.56, 8.56) @ 2450 MHz; Calibrated: 11/18/2024
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn358; Calibrated: 11/6/2024
- Phantom: SAM 1 with CRP v5.0; Type: QD000P40CD; Serial: TP: 1243
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

Configuration/Dipole Validation/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 6.27 W/kg

Configuration/Dipole Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.40 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 11.6 W/kg
SAR(1 g) = 5.49 W/kg; SAR(10 g) = 2.53 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below = 10 mm
Ratio of SAR at M2 to SAR at M1 = 48.5%
Maximum value of SAR (measured) = 6.22 W/kg



0 dB = 6.22 W/kg = 7.94 dBW/kg

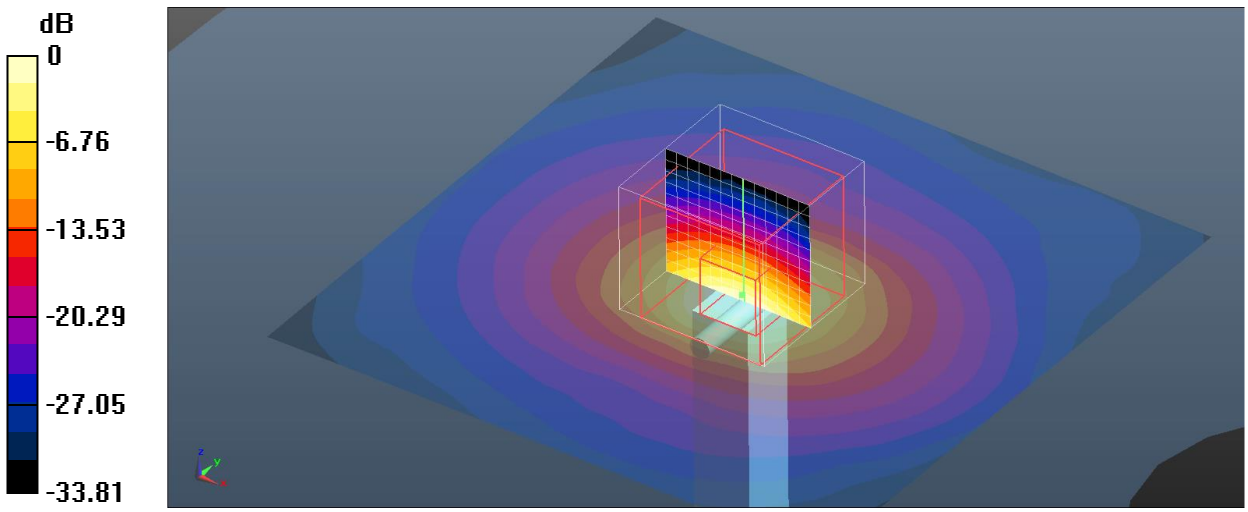
12.2 D5GHzV2, 5200MHz

Date/Time: 12/11/2024 10:31:11 AM
Test Laboratory: Intertek
2024-12-10 D5GHzV2
Procedure Notes:
DUT: Dipole D5GHzV2; Serial: D5GHzV2 - SN
Communication System: UID 0, CW (0); Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5200 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5200 MHz; σ = 5.017 S/m; ε_r = 36.065; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV3 - SN3516; ConvF(5.27, 5.27, 5.27) @ 5200 MHz; Calibrated: 11/18/2024
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn358; Calibrated: 11/6/2024
- Phantom: SAM 2 with CRP v5.0; Type: QD000P40CD; Serial: TP:1663
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

Configuration/Low Channel Verification/Area Scan (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 15.6 W/kg

Configuration/Low Channel Verification/Zoom Scan (14x14x12)/Cube 0: Measurement grid: dx=2mm, dy=2mm, dz=2mm
Reference Value = 40.05 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 34.9 W/kg
SAR(1 g) = 8.01 W/kg; SAR(10 g) = 2.27 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below = 7.4 mm
Ratio of SAR at M2 to SAR at M1 = 52.3%
Maximum value of SAR (measured) = 16.8 W/kg



0 dB = 16.8 W/kg = 12.25 dBW/kg

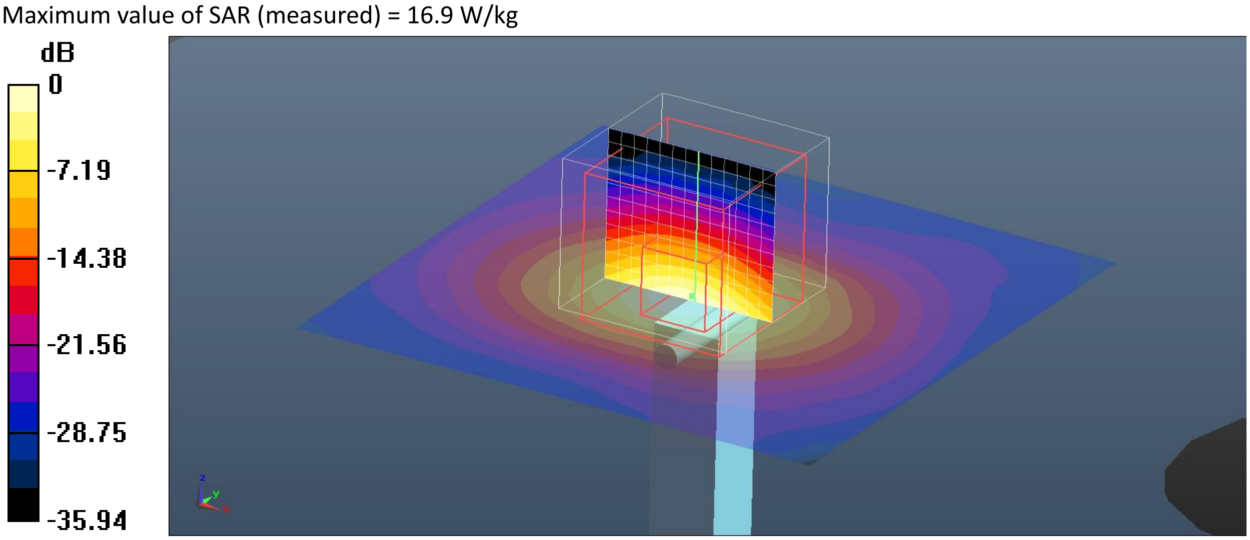
12.3 D5GHzV2, 5500MHz

Date/Time: 12/11/2024 2:00:29 PM
Test Laboratory: Intertek
2024-12-10 D5GHzV2
Procedure Notes:
DUT: Dipole D5GHzV2; Serial: D5GHzV2 - SN:xxx
Communication System: UID 0, CW (0); Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5500 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5500 MHz; σ = 5.374 S/m; ε_r = 35.352; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV3 - SN3516; ConvF(5.09, 5.09, 5.09) @ 5500 MHz; Calibrated: 11/18/2024
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn358; Calibrated: 11/6/2024
- Phantom: SAM 2 with CRP v5.0; Type: QD000P40CD; Serial: TP:1663
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

Configuration/Mid Channel Verification/Area Scan (81x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 16.3 W/kg

Configuration/Mid Channel Verification/Zoom Scan (14x14x12)/Cube 0: Measurement grid: dx=2mm, dy=2mm, dz=2mm
Reference Value = 38.31 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 37.3 W/kg
SAR(1 g) = 7.93 W/kg; SAR(10 g) = 2.22 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 = 48.8%
Maximum value of SAR (measured) = 16.9 W/kg



0 dB = 16.9 W/kg = 12.28 dBW/kg

12.4 D5GHzV2, 5800MHz

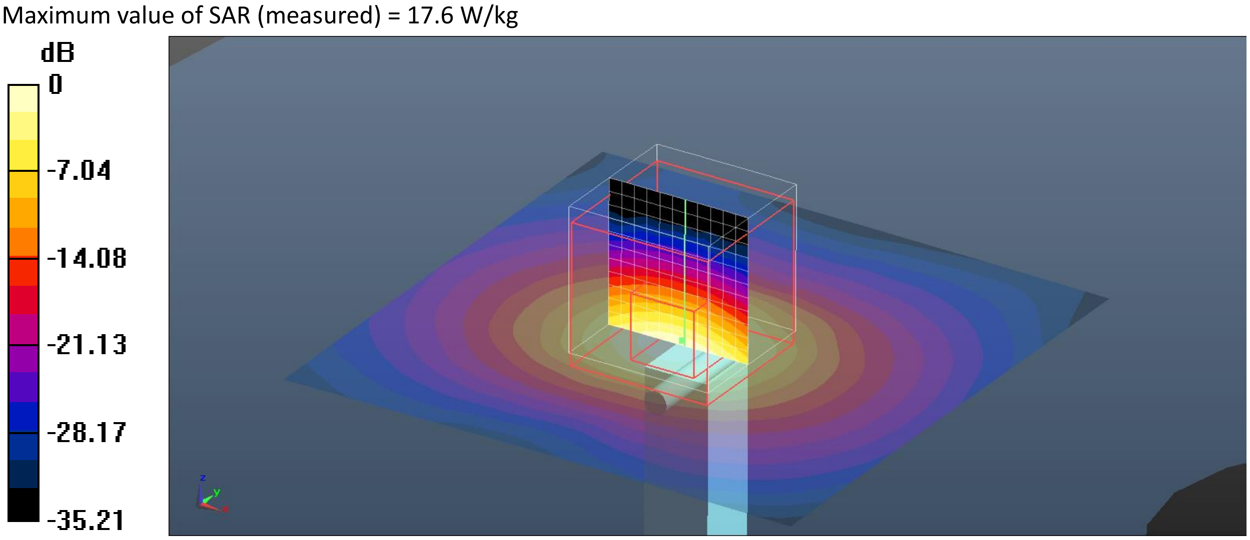
Date/Time: 12/11/2024 3:32:28 PM
Test Laboratory: Intertek
2024-12-10 D5GHzV2
Procedure Notes:
DUT: Dipole D5GHzV2; Serial: D5GHzV2 - SN:xxx
Communication System: UID 0, CW (0); Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5800 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5800 MHz; σ = 5.755 S/m; ε_r = 34.538; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5 Configuration:

- Probe: EX3DV3 - SN3516; ConvF(4.76, 4.76, 4.76) @ 5800 MHz; Calibrated: 11/18/2024
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn358; Calibrated: 11/6/2024
- Phantom: SAM 2 with CRP v5.0; Type: QD000P40CD; Serial: TP:1663
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

Configuration/High Channel Verification/Area Scan (81x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 17.0 W/kg

Configuration/High Channel Verification/Zoom Scan (12x12x12)/Cube 0: Measurement grid: dx=2mm, dy=2mm, dz=2mm
Reference Value = 36.47 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 40.6 W/kg
SAR(1 g) = 8.03 W/kg; SAR(10 g) = 2.23 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 = 46.6%

Warning: Maximum averaged SAR over 10 g is located on the boundary of the measurement cube. This cube might not incorporate the absolute averaged SAR. Please consider a refinement of the Area Scan measurement.
Maximum value of SAR (measured) = 17.6 W/kg



0 dB = 17.6 W/kg = 12.46 dBW/kg

13 APPENDIX D – Setup Photos

Figure 4 - Front Face, 5mm Separation

Figure 5 – Left Side, 5mm Separation

14 Revision History

Revision Level	Date	Report Number	Prepared By	Reviewed By	Notes
0	2/6/2025	105964951LEX-040	BL	MC	Original Issue
1	4/22/2025	105964951LEX-040.1	BL	MC	Added repeated SAR measurements. Added probe calibration documents. Added SAR exemption calculation for Bluetooth

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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
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 **Intertek**
Lexington, USA

Certificate No. **D2450V2-718_Nov24**

CALIBRATION CERTIFICATE

Object	D2450V2 - SN: 718
Calibration procedure(s)	QA CAL-05.v12 Calibration Procedure for SAR Validation Sources between 0.7 - 3 GHz
Calibration date	November 12, 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 Cal
Power Sensor R&S NRP-33T	SN: 100967	28-Mar-24 (No. 217-04038)	Mar-25
Power Sensor R&S NRP18A	SN: 101859	22-Jul-24 (No. 4030A315008547)	Jul-25
Spectrum Analyzer R&S FSV40	SN: 101832	25-Jan-24 (No. 4030-315007551)	Jan-25
Mismatch; Short [S4188] Attenuator [S4423]	SN: 1152	28-Mar-24 (No. 217-04050)	Mar-25
OCP DAK-12	SN: 1016	24-Sep-24 (No. OCP-DAK12-1016_Sep24)	Sep-25
OCP DAK-3.5	SN: 1249	23-Sep-24 (No. OCP-DAK3.5-1249_Sep24)	Sep-25
Reference Probe EX3DV4	SN: 7349	03-Jun-24 (No. EX3-7349_Jun24)	Jun-25
DAE4ip	SN: 1836	28-Oct-24 (No. DAE4ip-1836_Oct24)	Oct-25

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

	Name	Function	Signature
Calibrated by	Paulo Pina	Laboratory Technician	
Approved by	Sven Kühn	Technical Manager	

Issued: November 12, 2024

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

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

Accreditation No.: **SCS 0108**

Glossary

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

Calibration is Performed According to the Following Standards

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

Additional Documentation

- DASY System Handbook

Methods Applied and Interpretation of Parameters

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

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

Measurement Conditions

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

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

Head TSL parameters at 2450 MHz

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	38.1 ±6%	1.85 mho/m ±6%
Head TSL temperature change during test	< 0.5 °C		

SAR result with Head TSL at 2450 MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR for nominal Head TSL parameters	24 dBm input power	13.1 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	52.2 W/kg ±17.0% (k = 2)

SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR for nominal Head TSL parameters	24 dBm input power	6.16 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	24.5 W/kg ±16.5% (k = 2)

Body TSL parameters at 2450 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ±0.2)°C	52.5 ±6%	2.00 mho/m ±6%
Body TSL temperature change during test	< 0.5 °C		

SAR result with Body TSL at 2450 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR for nominal Body TSL parameters	24 dBm input power	12.2 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	48.6 W/kg ±17.0% (k = 2)

SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR for nominal Body TSL parameters	24 dBm input power	5.71 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	22.7 W/kg ±16.5% (k = 2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL at 2450 MHz

Impedance	53.9 Ω + 2.2 jΩ
Return Loss	-27.4 dB

Antenna Parameters with Body TSL at 2450 MHz

Impedance	49.8 Ω + 4.3 jΩ
Return Loss	-27.4 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.146 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.
The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard. No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

System Performance Check Report

Summary

Dipole	Frequency [MHz]	TSL	Power [dBm]
D2450V2 - SN718	2450	HSL	24

Exposure Conditions

Phantom Section, TSL	Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat	10		CW, 0--	2450, 0	7.24	1.85	38.1

Hardware Setup

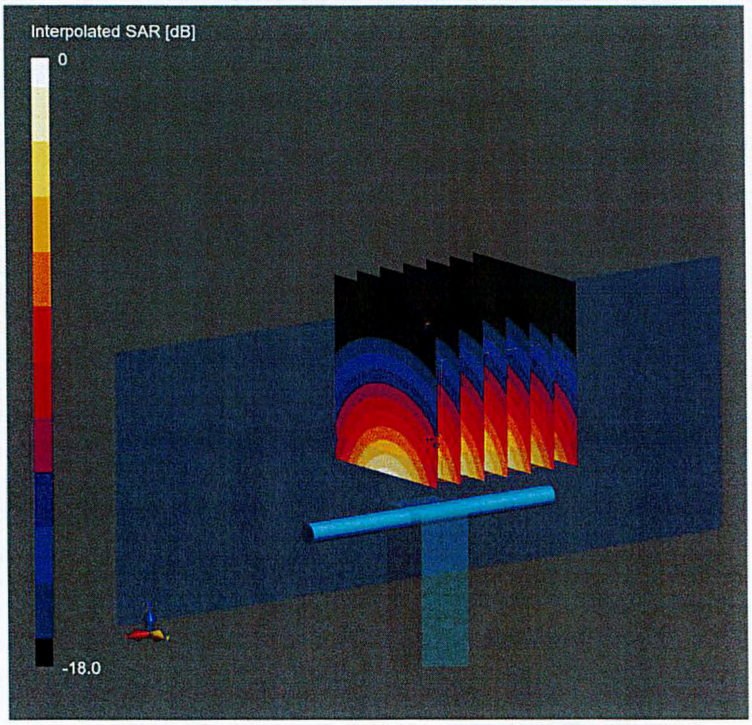
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
MFP V8.0 Right	HSL, 2024-11-07	EX3DV4 - SN7349, 2024-06-03	DAE4ip Sn1836, 2024-10-28

Scans Setup

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

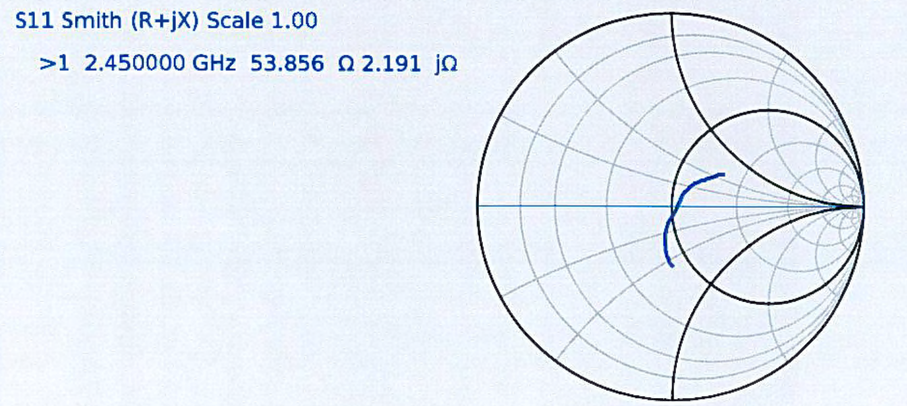
Measurement Results

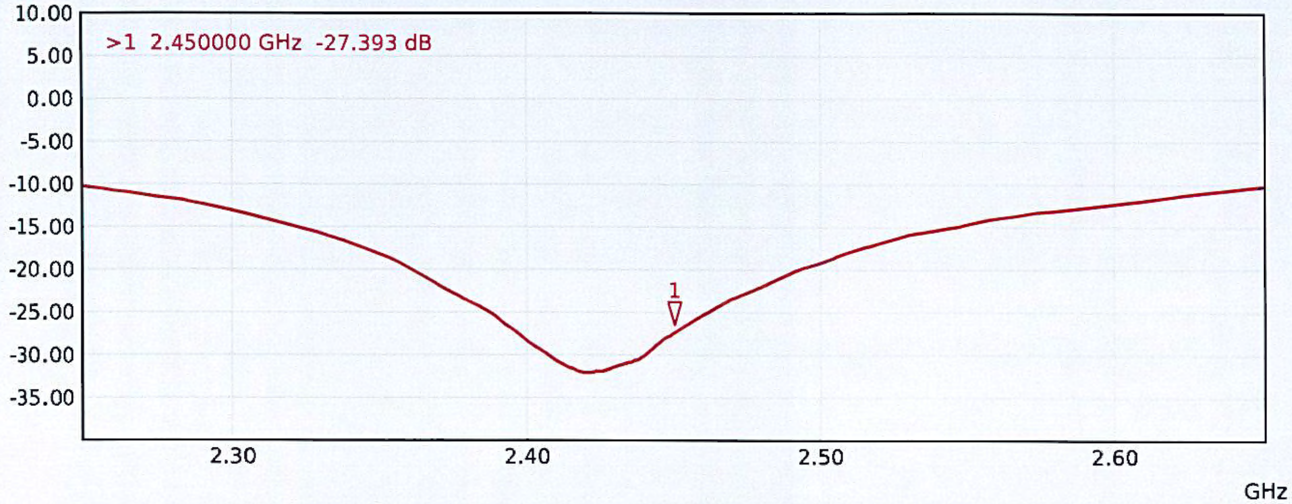
	Zoom Scan
Date	2024-11-07
psSAR1g [W/Kg]	13.1
psSAR10g [W/Kg]	6.16
Power Drift [dB]	-0.01
Power Scaling	Disabled
Scaling Factor [dB]	
TSL Correction	Positive / Negative



0 dB = 27.0 W/Kg

Impedance Measurement Plot for Head TSL





System Performance Check Report

Summary

Dipole	Frequency [MHz]	TSL	Power [dBm]
D2450V2 – SN718	2450	MSL	24

Exposure Conditions

Phantom Section, TSL	Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat	10		CW, 0--	2450, 0	7.96	2.00	52.5

Hardware Setup

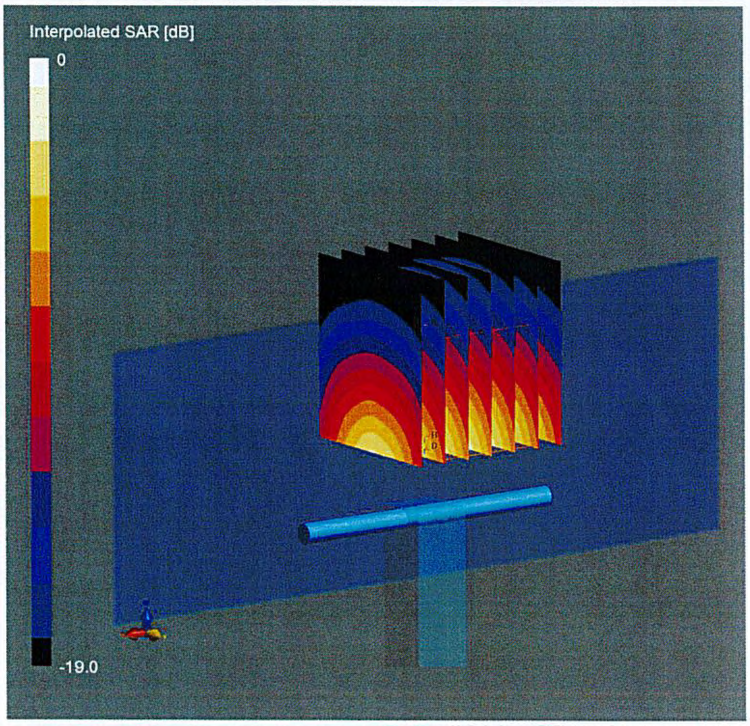
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
MFP V8.0 Right	MSL, 2024-11-12	EX3DV4 – SN7349, 2024-06-03	DAE4ip Sn1836, 2024-10-28

Scans Setup

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

Measurement Results

	Zoom Scan
Date	2024-11-12
psSAR1g [W/Kg]	12.2
psSAR10g [W/Kg]	5.71
Power Drift [dB]	-0.01
Power Scaling	Disabled
Scaling Factor [dB]	
TSL Correction	Positive / Negative



0 dB = 23.7 W/Kg