

 MOTOROLA SOLUTIONS	    SMM 826 CERTIFICATE 2518.05																																																		
DECLARATION OF COMPLIANCE SAR PCII Test Report																																																			
Motorola Solutions Inc. EME Test Laboratory Motorola Solutions Malaysia Sdn Bhd Plot 2A, Medan Bayan Lepas, Mukim 12 SWD 11900 Bayan Lepas Penang, Malaysia.	Date of Report: 10/03/2025 Report Revision: A																																																		
<table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Responsible Engineer:</td> <td>Alfred Hoe Kean Loon (EME Senior Engineer)</td> </tr> <tr> <td>Report Author:</td> <td>Muhammad Hizami bin Ismail (Senior Technician)</td> </tr> <tr> <td>Date/s Tested:</td> <td>09/25/2025 – 10/01/2025</td> </tr> <tr> <td>Test Location:</td> <td>Penang EME Laboratory</td> </tr> <tr> <td>Manufacturer:</td> <td>Motorola Solutions Malaysia Sdn Bhd.</td> </tr> <tr> <td>Manufacturer Location:</td> <td>Plot 2A, Medan Bayan Lepas, Mukim 12 SWD, 11900 Bayan Lepas, Penang, Malaysia</td> </tr> <tr> <td>DUT Description:</td> <td>Handheld Portable – APX N70 Single Band VHF Portable Radio, Model 4.5</td> </tr> <tr> <td>Test TX mode(s):</td> <td>CW (PTT), WLAN2.4GHz, WLAN5GHz, LTE, NFC</td> </tr> <tr> <td>Max. Power output:</td> <td>Refer table 3</td> </tr> <tr> <td>Tx Frequency Bands:</td> <td>Refer table 3</td> </tr> <tr> <td>Signaling type:</td> <td>Refer table 3</td> </tr> <tr> <td>Model(s) Tested:</td> <td>H35KET9PW8AN</td> </tr> <tr> <td>Model(s) Certified:</td> <td>Refer 1.0 Introduction</td> </tr> <tr> <td>(HVIN/PMN)</td> <td></td> </tr> <tr> <td>Serial Number(s):</td> <td>022TBH1387</td> </tr> <tr> <td>Classification:</td> <td>Occupational/Controlled Environment</td> </tr> <tr> <td>Applicant Name:</td> <td>Motorola Solutions Inc.</td> </tr> <tr> <td>Applicant Address:</td> <td>Plot 2A, Medan Bayan Lepas Mukim, 12 SWD, 11900 Bayan Lepas, Penang, Malaysia</td> </tr> <tr> <td>Firmware Version (FVIN):</td> <td>D04.18.53</td> </tr> <tr> <td>FCC ID:</td> <td>AZ489FT7149</td> </tr> <tr> <td></td> <td>Add the following when applicable - This report contains results that are immaterial for FCC equipment approval, which are clearly identified.</td> </tr> <tr> <td>FCC Test Firm Registration Number:</td> <td>823256</td> </tr> <tr> <td>IC:</td> <td>109U-89FT7149</td> </tr> <tr> <td></td> <td>This report contains results that are immaterial for ISED equipment approval, which are clearly identified.</td> </tr> <tr> <td>ISED Test Site registration:</td> <td>24843</td> </tr> </table> The test results clearly demonstrate compliance with Occupational/Controlled RF Exposure limits of 8 W/kg averaged over 1 gram per the requirements of FCC 47 CFR § 2.1093 and RSS-102 (Issue 6) Based on the information and the testing results provided herein, the undersigned certifies that when used as stated in the operating instructions supplied, said product complies with the national and international reference standards and guidelines listed in section 4.0 of this report (no deviation from standard methods). This report shall not be reproduced without written approval from an officially designated representative of the Motorola Solutions Inc EME Laboratory. I attest to the accuracy of the data and assume full responsibility for the completeness of these measurements. The results and statements contained in this report pertain only to the device(s) evaluated.  Saw Sun Hock (Approval Signatory) Approved Date: 12/09/2025		Responsible Engineer:	Alfred Hoe Kean Loon (EME Senior Engineer)	Report Author:	Muhammad Hizami bin Ismail (Senior Technician)	Date/s Tested:	09/25/2025 – 10/01/2025	Test Location:	Penang EME Laboratory	Manufacturer:	Motorola Solutions Malaysia Sdn Bhd.	Manufacturer Location:	Plot 2A, Medan Bayan Lepas, Mukim 12 SWD, 11900 Bayan Lepas, Penang, Malaysia	DUT Description:	Handheld Portable – APX N70 Single Band VHF Portable Radio, Model 4.5	Test TX mode(s):	CW (PTT), WLAN2.4GHz, WLAN5GHz, LTE, NFC	Max. Power output:	Refer table 3	Tx Frequency Bands:	Refer table 3	Signaling type:	Refer table 3	Model(s) Tested:	H35KET9PW8AN	Model(s) Certified:	Refer 1.0 Introduction	(HVIN/PMN)		Serial Number(s):	022TBH1387	Classification:	Occupational/Controlled Environment	Applicant Name:	Motorola Solutions Inc.	Applicant Address:	Plot 2A, Medan Bayan Lepas Mukim, 12 SWD, 11900 Bayan Lepas, Penang, Malaysia	Firmware Version (FVIN):	D04.18.53	FCC ID:	AZ489FT7149		Add the following when applicable - This report contains results that are immaterial for FCC equipment approval, which are clearly identified.	FCC Test Firm Registration Number:	823256	IC:	109U-89FT7149		This report contains results that are immaterial for ISED equipment approval, which are clearly identified.	ISED Test Site registration:	24843
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Report Revision History

Date	Revision	Comments
10/03/2025	A	Initial release
12/09/2025	B	Update the section 1.0, 2.0 & 17.0

1.0 Introduction

This report details the utilization, test setup, test equipment, and test results of the Specific Absorption Rate (SAR) measurements performed at the Motorola Solutions Inc. EME Test Laboratory for handheld portable model number H35KET9PW8AN. The information herein is to show evidence of Class II Permissive Change compliance due to the addition of new antenna AN000471A01 and this antenna will be use with approved wired audio accessories. This device is classify as Occupational/Controlled Environment and model certified is lists as below:

Models	Hardware Version ID Number (HVIN)	Product Marketing Name (PMN)	Description
H35KET9PW8AN	H35KET9PW8AN	APX N70	APX N70 VHF MODEL 4.5 PORTABLE
H35KET9PW8AN-H	H35KET9PW8AN-H	APX N70	APX N70 VHF MODEL 4.5 PORTABLE (UL Model)

2.0 FCC SAR Summary

Table 1

Equipment Class	Frequency band (MHz)	Max Calc at Body (W/kg)	Max Calc at Face (W/kg)
		1g-SAR	1g-SAR
TNF	150.8 – 173.4MHz (LMR)	4.15 ¹	2.36
PCF	LTE B12	0.091	0.057
	LTE B13	0.081	0.064
	LTE B14	0.102	0.068
	LTE B4	0.019	0.287
	LTE B2	0.025	0.188
*DSS	2402-2480MHz (Bluetooth)	N/A	N/A
DTS	2412-2462MHz (WLAN 2.4GHz)	0.035	0.253
NII	5180 – 5825MHz (WLAN 5GHz)	0.036	0.677
Highest Simultaneous Results		4.25 ²	3.04

Note:

* denotes results not required per KDB (refer to section 14.1, 16.1).

¹ indicates the new reported SAR value at LMR. Previous filed reported SAR value at LMR for body is 2.66 W/kg.

² indicates the new simultaneous transmission SAR. Previous filed reported SAR value for body is 2.76 W/kg.

³ the Face SAR result can refer to Previous filed report

3.0 Abbreviations / Definitions

BT:	Bluetooth
CNR:	Calibration Not Required
CW:	Continuous Wave
DSS	Part 15 Spread Spectrum Transmitter
DUT:	Device Under Test
DTS	Digital Transmission System
EME:	Electromagnetic Energy
FHSS:	Frequency Hopping Spread Spectrum
FM:	Frequency Modulation
LMR:	Land Mobile Radio
LTE:	Long Term Evolution
NA:	Not Applicable
OFDM:	Orthogonal Frequency Division Multiplexing
PTT:	Push to Talk
QPSK:	Quadrature Pulse Shift Key
RB:	Resource Blocks
RSM:	Remote Speaker Microphone
SAR:	Specific Absorption Rate
TDMA:	Time Division Multiple Access
TNF:	Licensed Non-Broadcast Transmitter Held to Face
16QAM:	16 State Quadrature Amplitude Modulation
NFC:	Near Field Communication

Audio accessories: These accessories allow communication while the DUT is worn on the body.

Body worn accessories: These accessories allow the DUT to be worn on the body of the user.

Maximum Power: Defined as the upper limit of the production line final test station

4.0 Referenced Standards and Guidelines

This product is designed to comply with the following applicable national and international standards and guidelines.

- Federal Communications Commission, “Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields”, OET Bulletin 65, FCC, Washington, D.C.: 1997.
- Institute of Electrical and Electronics Engineers (IEEE) C95.1-2019
- Ministry of Health (Canada) Safety Code 6 (2015), Limits of Human Exposure to Radio frequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz
- RSS-102 (Issue 6) – Radio Frequency (RF) Exposure Compliance of Radio communication Apparatus (All Frequency Bands)
- ANATEL, Brazil Regulatory Authority, Resolution No 700 of September 28, 2018 "Approves the Regulation on the Assessment of Human Exposure to Electric, Magnetic and Electromagnetic Fields Associated with the Operation of Radio communication Transmitting Stations.
- 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 - Part 1528: Human models, instrumentation, and procedures (Frequency range of 4 MHz to 10 GHz)
-
- FCC KDB – 643646 D01 SAR Test for PTT Radios v01r03
- FCC KDB – 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB – 865664 D02 RF Exposure Reporting v01r02
- FCC KDB – 447498 D01 General RF Exposure Guidance v06
- FCC KDB – 941225 D05 SAR for LTE Devices v02r05
- FCC KDB – 941225 D01 3G SAR Procedures v03r01
- FCC KDB – 248227 D01 802.11 Wi-Fi SAR v02r02

5.0 SAR Limits

Table 2

EXPOSURE LIMITS	SAR (W/kg)	
	(General Population / Uncontrolled Exposure Environment)	(Occupational / Controlled Exposure Environment)
Spatial Average - ANSI - (averaged over the whole body)	0.08	0.4
Spatial Peak - ANSI - (averaged over any 1-g of tissue)	1.6	8.0
Spatial Peak – ICNIRP/ANSI - (hands/wrists/feet/ankles averaged over 10-g)	4.0	20.0
Spatial Peak - ICNIRP - (Head and Trunk 10-g)	2.0	10.0

6.0 Description of Device Under Test (DUT)

This portable device operates in the LMR bands using frequency modulation (FM) incorporating traditional simplex two-way radio transmission protocol. This device also contains WLAN, LTE technologies for data applications and Bluetooth technology for short-range wireless devices.

The LMR bands in this device operate in a half-duplex system. A half-duplex system only allows the user to transmit or receive. This device cannot transmit and receive simultaneously. The user must stop transmitting in order to receive a signal or listen for a response, regardless of PTT button or use of voice activated audio accessories. This type of operation, along with the RF safety booklet, which instructs the user to transmit no more than 50% of the time, justifies the use of 50% duty factor for this device.

This device also incorporates GFSK Bluetooth transmission device, which is a Frequency Hopping Spread Spectrum (FHSS) technology. The Bluetooth radio modem is used to wireless link audio accessories. The Bluetooth imposes the maximum actual transmission duty cycle. Table 3 below summarizes the technologies, bands, maximum duty cycles and maximum output powers. Maximum output powers are defined as upper limit of the production line final test station.

Table 3 below summarizes the technologies, bands, maximum duty cycles and maximum output powers. Maximum output powers are defined as upper limit of the production line final test station.

Table 3

Technologies	Band (MHz)	Transmission	Duty Cycle (%)	Conducted (Average Detector) Max Power
LMR	136-174	FM	*50	6.6 W
WLAN 802.11 b (22 MHz)	2412-2462	DSSS	99.97	56.2 mW
WLAN 802.11 g (20 MHz)		OFDM	99.80	44.6 mW
WLAN 802.11 n (20 MHz)			94.36	
WLAN 802.11 n (40 MHz)	2422-2452		99.80	
WLAN 802.11 a (20 MHz)	5180-5825	OFDM	99.80	(UNII-1, UNII-2A, UNII-3) 79.43mW (UNII-2C) 79.43mW (Chn 100 – 56.23mW)
WLAN 802.11 n/ac (20 MHz)			95.59	(UNII-1, UNII-2A, UNII-2C, UNII-3) 79.43mW

Note –

* includes 50% PTT operation

Table 3 (Continued)

Technologies	Band (MHz)	Transmission	Duty Cycle (%)	Conducted (Average Detector) Max Power
WLAN 802.11 n/ac (40 MHz)	5180-5825	OFDM	99.60	(UNII-1) 79.43mW (Chn 38 – 19.95mW) (UNII-2A) 79.43mW (Chn 62 – 15.84mW) (UNII-2C) 79.43mW (Chn 102 – 39.81mW, Chn 104 – 31.62mW) (UNII-3) 79.43mW
WLAN 802.11 ac (80 MHz)			96.15	(UNII-1) 19.95mW (UNII-2A) 10mW (UNII-2C) 79.43mW (Chn 106 - 19.95mW) (UNII-3) 79.43mW
LTE Band 2	1850-1910	QPSK, 16QAM	100	252 mW
LTE Band 4	1710-1755	QPSK, 16QAM	100	
LTE Band 12	699-716	QPSK, 16QAM	100	
LTE Band 13	777-787	QPSK, 16QAM	100	
LTE Band 14	788-798	QPSK, 16QAM	100	
LTE Band 17	704-716	QPSK, 16QAM	100	
NFC	13.56	NFC	100	35 mW
BT 1.5	2400-2485	GFSK	78	19.95 mW
BT LE	2400-2485	GFSK	62.68	5.01 mW

The intended operating positions are “at the face” with the DUT at least 2.5 cm from the mouth, and “at the body” by means of the offered body worn accessories. Body worn audio and PTT operation is accomplished by means of optional remote accessories that are connected to the radio. Operation at the body without an audio accessory attached is possible by means of BT accessories.

7.0 Optional Accessories and Test Criteria

This device is offered with optional accessories. The following sections identify the test criteria and details for each accessory category applicable for this PCII filing only. Detail listing of all approved offered accessories available in the original filing report.

7.1 Antenna

Table 4

Antenna No.	Antenna Model	Description	Selected for test	Tested	Comments
1	*AN000471A01	VHF ¼ wave Whip Antenna (136-174MHz), 0 dBi gain	Yes	Yes	

Note: * New antenna is recommend to use with spacer for body position used only

7.2 Battery

Table 5

Battery No.	Battery Model	Description	Selected for test	Tested	Comments
1	PMNN4818A	UL 3650Mah (using RN 2170 Li-Ion cell) UL battery	Yes	Yes	

7.3 Body worn Accessories

None of the body worn accessory is applicable for this PCII filing.

7.4 Audio Accessories

Table 6

Audio No.	Audio Acc. Models	Description	Selected for test	Tested	Comments
1	PMMN4128A	UL RM 780 Gcai mini RSM , wind porting RSM with buttons	Yes	Yes	

8.0 Description of Test System

DASY5™ Test System



8.1 Descriptions of Robotics/Probes/Readout Electronics

Table 7

Dosimetric System type	System version	DAE type	Probe Type
Schmid & Partner Engineering AG SPEAG DASY 5	52.10.4.1527	DAE4	EX3DV4 (E-Field)

The **DASY5™** system is operated per the instructions in the DASY5 Users Manual. The complete manual is available directly from SPEAG™. All measurement equipment used to assess SAR compliance was calibrated according to ISO/IEC 17025 A2LA guidelines. Section 9.0 presents additional test equipment information. Appendices B and C present the applicable calibration certificates.

8.2 Description of Phantom(s)

Table 8

Phantom Type	Phantom(s) Used	Material Parameters	Phantom Dimensions LxWxD (mm)	Material Thickness (mm)	Support Structure Material	Loss Tangent (wood)
Triple Flat	NA	200MHz -6GHz; Er = 3-5, Loss Tangent = ≤ 0.05	280x175x175	2mm +/- 0.2mm	Wood	< 0.05
SAM	NA	300MHz -6GHz; Er = < 5, Loss Tangent = ≤ 0.05	Human Model			
Oval Flat	√	300MHz -6GHz; Er = 4+/- 1, Loss Tangent = ≤ 0.05	600x400x190			

8.3 Description of Simulated Tissue

The sugar based simulate tissue is produced by placing the correct measured amount of De-ionized water into a large container. Each of the dried ingredients are weighed and added to the water carefully to avoid clumping. If the solution has a high sugar concentration the water is pre-heated to aid in dissolving the ingredients. The solution is mixed thoroughly, covered, and allowed to sit overnight prior to use.

The simulated tissue mixture was mixed based on the Simulated Tissue Composition indicated in Table 9. During the daily testing of this product, the applicable mixture was used to measure the Di-electric parameters at each of the tested frequencies to verify that the Di-electric parameters were within the tolerance of the tissue specifications.

Simulated Tissue Composition (percent by mass)

Table 9

Ingredients	150MHz
	Head
Sugar	55.4
Diacetin	NA
De ionized-Water	38.35
Salt	5.15
HEC	1
Bact.	0.1

9.0 Additional Test Equipment

The Table below lists additional test equipment used during the SAR assessment.

Table 10

Equipment Type	Model Number	Serial Number	Calibration Date	Calibration Due Date
Speag Probe	EX3DV4	7486	01/19/2024	01/19/2027
Speag DAE	DAE4	10/10/2022	10/10/2025	10/10/2022
AMPLIFIER POWER	10W1000C	312859	CNR	CNR
POWER METER	E4419B	MY45102105	10/24/2024	10/24/2025
POWER METER	E4417A	MY45100552	10/10/2024	10/10/2025
POWER METER	E4419B	GB42420608	12/19/2024	12/19/2025
POWER SENSOR	E4412A	MY61060011	05/23/2025	05/23/2026
POWER SENSOR	E4412A	MY61050006	05/23/2025	05/23/2026
POWER SENSOR	E9301B	MY50280001	07/18/2025	07/18/2026
VECTOR SIGNAL GENERATOR	E4438C	MY47272101	12/04/2024	12/04/2025
BI-DIRECTIONAL COUPLER	3022	77115	08/27/2025	08/27/2026
THERMOMETER	HH806AU	080307	08/29/2025	08/29/2026
NETWORK ANALYZER	E5071B	MY42403218	12/09/2024	12/09/2025
DIELECTRIC ASSESSMENT KIT	DAK-12	1051	07/28/2025	07/28/2026
DATA LOGGER	DSB	16326820	12/08/2024	12/08/2025
SPEAG DIPOLE	CLA150	4010	07/16/2024	07/16/2027

10.0 SAR Measurement System Validation and Verification

DASY output files of the probe/dipole calibration certificates and system verification test results are included in appendices B, C & D respectively.

10.1 System Validation

The SAR measurement system was validated according to procedures in KDB 865664. The validation status summary Table is below.

Table 11

Dates	Probe Calibration Point		Probe SN	Measured Tissue Parameters		Validation		
				σ	ϵ_r	Sensitivity	Linearity	Isotropy
CW								
02/27/2025	Head	150	7486	0.78	50.67	Pass	Pass	Pass

10.2 System Verification

System verification checks were conducted each day during the SAR assessment. The results are normalized to 1W. Appendix D includes DASY plots with the largest deviation from the qualified source SAR target for each dipole. The Table below summarizes the daily system check results used for the SAR assessment.

Table 12

Probe Serial #	Tissue Type	Dipole Kit / Serial #	Ref SAR @ 1W (W/kg)	System Check Results Measured (W/kg)	System Check Test Results when normalized to 1W (W/kg)	Tested Date	Deviation (%)
7486	IEEE/IEC Head	SPEAG CLA150 / 4010	3.59 +/- 10%	3.70	3.70	09/25/2025@	3.06
				3.50	3.50	09/27/2025	-2.51
				3.82	3.82	09/30/2025@	6.41

Note: '@' indicates that system verification check covers next test day

10.3 Equivalent Tissue Test Results

Simulated tissue prepared for SAR measurements is measured daily and within 24 hours prior to actual SAR testing to verify that the tissue is within +/- 5% of target parameters at the center of the transmit band. This measurement is done using the applicable equipment indicated in section 9.0. The Table below summarizes the measured tissue parameters used for the SAR assessment.

Table 13

Frequency (MHz)	Tissue Type	Conductivity Target (S/m)	Dielectric Constant Target	Conductivity Meas. (S/m)	Dielectric Constant Meas.	Tested Date
138.0000	IEEE/ IEC Head	0.75 (0.71-0.79)	52.9 (50.2-55.5)	0.74	52.7	09/27/2025
150.0000		0.76 (0.72-0.80)	52.3 (49.7-54.9)	0.74	52.1	09/25/2025@
				0.75	52.3	09/27/2025
				0.78	52.5	09/30/2025@
158.3000		0.77 (0.73-0.80)	51.9 (49.3-54.5)	0.74	51.8	09/25/2025@
				0.78	52.2	09/30/2025@
173.4000		0.78 (0.74-0.82)	51.2 (48.6-53.8)	0.77	51.4	09/27/2025

Note: '@' indicates that tissue test result covers next test day (within 24 hours)

11.0 Environmental Test Conditions

The EME Laboratory's ambient environment is well controlled resulting in very stable simulated tissue temperature and therefore stable dielectric properties. Simulated tissue temperature is measured prior to each scan to insure it is within $\pm 2^{\circ}\text{C}$ of the temperature at which the dielectric properties were determined. The liquid depth within the phantom used for measurements was at least 15cm. Additional precautions are routinely taken to ensure the stability of the simulated tissue such as covering the phantoms when scans are not actively in process in order to minimize evaporation. The lab environment is continuously monitored. The Table below presents the range and average environmental conditions during the SAR tests reported herein:

Table 14

	Target	Measured
Ambient Temperature	18 – 25 °C	Range: 22.2 – 23.0°C Avg. 22.6 °C
Tissue Temperature	18 – 25 °C	Range: 22.0-23.1°C Avg. 22.5°C

Relative humidity target range is a recommended target

The EME Lab RF environment uses a Spectrum Analyzer to monitor for extraneous large signal RF contaminants that could possibly affect the test results. If such unwanted signals are discovered the SAR scans are repeated.

12.0 DUT Test Setup and Methodology

12.1 Measurements

SAR measurements were performed using the DASY system described in section 8.0 using zoom scans. Oval flat phantoms filled with applicable simulated tissue were used for body and face testing.

The Table below includes the step sizes and resolution of area and zoom scans per KDB 865664 requirements.

Table 15

Description		≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface		5 ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ 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
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.			

12.2 DUT Configuration(s)

The DUT is a portable device operational at the body and face as described in section 6.0 while using the applicable accessories listed in section 7.0. All accessories listed in section 7.0 of this report were considered when implementing the guidelines specified in KDB 643646. KDB 941225 was applied to LTE test configurations and KDB 248227 was applied to WLAN test configurations.

12.3 DUT Positioning Procedures

The positioning of the device for each body location is described below and illustrated in Appendix G.

12.3.1 Body

The DUT was positioned in normal use configuration against the phantom with the offered body worn accessory as well as with and without the offered audio accessories as applicable.

12.3.2 Head

Not applicable.

12.3.3 Face

The DUT was positioned with its' front and back sides separated 2.5cm from the phantom.

12.4 DUT Test Channels

The number of test channels was determined by using the following IEEE 1528 equation. The use of this equation produces the same or more test channels compared to the FCC KDB 447498 number of test channels formula.

$$N_c = 2 * \text{roundup}[10 * (f_{\text{high}} - f_{\text{low}}) / f_c] + 1$$

Where

N_c = Number of channels

F_{high} = Upper channel

F_{low} = Lower channel

F_c = Center channel

12.5 SAR Result Scaling Methodology

The calculated 1-gram averaged SAR results indicated as “Max Calc. 1g-SAR” in the data Tables is determined by scaling the measured SAR to account for power leveling variations and drift. Appendix F includes a shortened scan to justify SAR scaling for drift. For this device the “Max Calc. 1g-SAR” are scaled using the following formula:

$$\text{Max_Calc} = \text{SAR_meas} \cdot 10^{\frac{-\text{Drift}}{10}} \cdot \frac{P_{\text{max}}}{P_{\text{int}}} \cdot \text{DC}$$

P_{max} = Maximum Power (W)

P_{int} = Initial Power (W)

Drift = DASY drift results (dB)

SAR_meas = Measured 1-g Avg. SAR (W/kg)

DC = Transmission mode duty cycle in % where applicable
50% duty cycle is applied for PTT operation

Note: for conservative results, the following are applied:

If $P_{\text{int}} > P_{\text{max}}$, then $P_{\text{max}}/P_{\text{int}} = 1$.

Drift = 1 for positive drift

Additional SAR scaling was applied using the methodologies outlined in FCC KDB 865664 using tissue sensitivity values. SAR was scaled for conditions where the tissue permittivity was measured above the nominal target and for tissue conductivity that was measured below the nominal target. Negative or reduced SAR scaling is not permitted.

12.6 DUT Test Plan

The guidelines and requirements outlined in section 4.0 were used to assess compliance of this device. All modes of operation identified in section 6.0 were considered during the development of the test plan. All tests were performed in CW and LTE modes and 50% duty cycle was applied to PTT configurations in the final results.

13.0 DUT Test Data

13.1 Assessments for FCC LMR

The DUT was assessed at the highest applicable configuration at the body found during the initial compliance assessment on filed with the FCC. Testing at the face is not required due to the face is not intended user configuration. SAR plots of the highest SAR results are present in Appendix E. Test at the face configuration is not required.

Table 16

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
Body Configuration									
AN000471A01	PMNN4818A	None @ Back Antenna base	PMMN4128A	158.3000	6.12	-0.08	3.74	2.05	MFR(MHY)-AB-250925-06
		None @ Back Antenna tip			6.12	-0.10	7.52	4.15	MHN-AB-250926-07@

13.2 Assessment for ISED, Canada

Since SAR degradation is observed for body, as per ISED Notice 2016-DRS001, additional tests were required for low, mid and high frequency channels. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 17

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
Body Configuration									
AN000471A01	PMNN4818A	None @ Back Antenna tip	PMMN4128A	138.0000	6.19	-0.27	0.49	0.28	MFR-AB-250927-03
				158.3000	6.12	-0.10	7.52	4.15	MHN-AB-250926-07@
				173.4000	6.22	-0.52	4.13	2.47	MHN-AB-250927-05

14.0 Simultaneous Transmission

14.1 FCC Assessments for Standalone BT

Per guidelines in KDB 447498, the following formula was used to determine the test exclusion for standalone Bluetooth transmitter;



$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] * [\sqrt{F_{(\text{GHz})}}] = 0.6$, which is ≤ 3 for 1-g SAR or 7.5 for 10-g extremity

Where:

Max. power = 15.56mW (19.95mW*78% duty cycle)

Min. test separation distance = 44mm

F(GHz) = 2.48 GHz

Per the result from the calculation above, the standalone SAR assessment was not required for Bluetooth band. Therefore, SAR results for Bluetooth are not reported herein.

14.2 ISED Assessments for BT

The closest separation distance from the Bluetooth Antenna to the phantom is 44mm with PMLN4651A (Belt Clip), as indicated in the following picture:



By referring to RSS-102 (Issue 6) Section 7.1.8 SAR estimation for exempted transmitters

$$SAR_{estimated} = \frac{P_{max}}{P_{max,exemption}} \times 0.25 \times SAR_{limit} \text{ W/kg}$$

Where:

$P_{max} = 15.56\text{mW}$ ($19.95\text{mW} \times 78\%$ duty cycle)

$P_{max,exemption} = 201.2 \text{ mW}$ (refer to Table 11 below)

Distance: 44 mm

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

$$SAR_{estimated} = (15.56/201.2) \times (0.25 \times 1.6) = 0.03 \text{ W/kg}$$

15.0 Shortened Scan Assessment

A “shortened” scan using the highest SAR configuration overall from above was performed to validate the SAR drift of the full DASY5™ coarse and zoom scans. Note that the shortened scan represents the zoom scan performance result; this is obtained by first running a coarse scan to find the peak area and then, using a newly charged battery, a zoom scan only was performed. The results of the shortened cube scan presented in Appendix D demonstrate that the scaling methodology used to determine the calculated SAR results presented herein are valid. The SAR result from the Table below is provided in Appendix F.

Table 18

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
AN000471A01	PMNN4818A	None @ Back Antenna tip	PMMN4128A	158.3000	6.12	-0.08	7.14	3.92	MHN-AB-251001-01@

16.0 Simultaneous Transmission

The Table below summarizes the simultaneous transmission conditions for this device.

Table 19

Exposure Conditions	Item	Capable Simultaneous Transmit Configurations
Body-Worn	1	LMR + WLAN 2.4 GHz
	2	LMR + WLAN 5 GHz + BT
	3	LMR + BT
	4	LMR + LTE
	5	LMR + BT + LTE
	6	BT + LTE
Face	1	LMR + WLAN 2.4 GHz
	2	LMR + WLAN 5 GHz + BT
	3	LMR + BT
	4	LMR + LTE
	5	LMR + BT + LTE
	6	BT + LTE

BT, WLAN 2.4 GHz and 5GHz are sharing the same antenna, only one technology to transmit at a single time. Except the WLAN 5GHz with BT.

16.1 FCC Simultaneous Transmission Exclusion for BT

Per guidelines in KDB 447498, the following formula was used to determine the test exclusion to an antenna that transmits simultaneously with other antennas for test distances $\leq 50\text{mm}$:

The closest separation distance from the Bluetooth Antenna to the phantom is 44mm with a belt clip, as indicated in the picture below.



$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] * [\sqrt{F(\text{GHz})/X}] = 0.1 \text{ W/kg}$, which is $\leq 0.4 \text{ W/kg}$ (1g)

Where:

$X = 7.5$ for 1g-SAR; 18.75 for 10g

Max. Power = 15.56 mW ($19.95 \text{ mW} * 78\%$ duty cycle)

Min. test separation distance = 44mm

$F(\text{GHz}) = 2.48 \text{ GHz}$

Per the result from the calculation above, simultaneous exclusion is applied and therefore SAR results are not reported herein.

16.2 Simultaneous Transmission for LMR, BT, WLAN 2.4GHz and 5GHz

Table 20 – Simultaneous Transmission for FCC

Exposure condition	Standalone SAR (W/kg)					Sum of SAR (W/kg)					
	LMR	2.4GHz	5GHz	LTE	BT	LMR + 2.4GHz	LMR + 5GHz + BT	LMR + BT	LMR + LTE	LMR + BT + LTE	BT + LTE
Body worn Exposure	4.15	0.035	0.036	0.102	N/A	4.19	4.19	4.15	4.25	4.25	0.102
Face Exposure	2.36	0.253	0.677	0.287	N/A	2.61	3.04	2.36	2.65	2.65	0.287

Note: BT is excluded for simultaneous transmission

Table 21 – Simultaneous Transmission for ISED

Exposure condition	Standalone SAR (W/kg)					Sum of SAR (W/kg)					
	LMR	2.4GHz	5GHz	LTE	BT	LMR + 2.4GHz	LMR + 5GHz + BT	LMR + BT	LMR + LTE	LMR + BT + LTE	BT + LTE
Body worn Exposure	4.15	0.035	0.036	0.102	0.03	4.19	4.22	4.18	4.25	4.28	0.132
Face Exposure	2.36	0.253	0.677	0.287	0.03	2.61	3.07	2.39	2.65	2.68	0.317

Table 22 – Simultaneous Transmission for Overall

Exposure condition	Standalone SAR (W/kg)					Sum of SAR (W/kg)					
	LMR	2.4GHz	5GHz	LTE	BT	LMR + 2.4GHz	LMR + 5GHz + BT	LMR + BT	LMR + LTE	LMR + BT + LTE	BT + LTE
Body worn Exposure	4.15	0.035	0.036	0.102	0.03	4.19	4.22	4.18	4.25	4.28	0.132
Face Exposure	2.36	0.253	0.677	0.287	0.03	2.61	3.07	2.39	2.65	2.68	0.317

17.0 Results Summary

Based on the test guidelines from section 4.0 and satisfying frequencies within FCC bands and ISSED Canada Frequency bands, the highest Operational Maximum Calculated 1-gram average SAR values found for this filing:

Table 23

Designator	Frequency band (MHz)	Max Calc at Body (W/kg)	Max Calc at Face (W/kg)
		1g-SAR	1g-SAR
FCC US			
LMR	150.8 – 173.4	4.15 ¹	2.36
LTE B12	699 – 716	0.091	0.057
LTE B13	777 – 787	0.081	0.064
LTE B14	788 - 798	0.102	0.068
LTE B4	1710 – 1755	0.019	0.287
LTE B2	1850 - 1910	0.025	0.188
WLAN 2.4 GHz	2412 - 2462	0.035	0.253
WLAN 5 GHz	5180 - 5825	0.036	0.677
*BT	2402 - 2480	N/A	N/A
Highest Simultaneous Transmission SAR	Sum of SAR (W/kg)	4.25 ²	3.04
ISED Canada			
LMR	138 – 173.4	4.15 ¹	2.36
LTE B12	699 – 716	0.091	0.057
LTE B13	777 – 787	0.081	0.064
LTE B14	788 - 798	0.102	0.068
LTE B4	1710 – 1755	0.019	0.287
LTE B2	1850 - 1910	0.025	0.188
WLAN 2.4 GHz	2412 - 2462	0.035	0.253
WLAN 5 GHz	5180 - 5825	0.036	0.677
BT	2402 - 2480	0.030	0.030
Highest Simultaneous Transmission SAR	Sum of SAR (W/kg)	4.28 ³	3.07 ⁴
Overall			
LMR	138 – 173.4	4.15 ¹	2.36
LTE B12	699 – 716	0.091	0.057
LTE B13	777 – 787	0.081	0.064
LTE B14	788 - 798	0.102	0.068
LTE B4	1710 – 1755	0.019	0.287
LTE B2	1850 - 1910	0.025	0.188
WLAN 2.4 GHz	2412 - 2462	0.035	0.253
WLAN 5 GHz	5180 - 5825	0.036	0.677
BT	2402 - 2480	0.030	0.030
Highest Simultaneous Transmission SAR	Sum of SAR (W/kg)	4.28 ³	3.07 ⁴

Note:

* denotes results not required per KDB (refer to section 14.1 & 16.1).

¹ indicates the new reported SAR value for FCC at body LMR. Previous filed reported SAR value at LMR for is 2.66 W/kg.

² indicates the new simultaneous transmission SAR for FCC at body. Previous filed reported SAR value for body is 2.76 W/kg.

³ indicates the new simultaneous transmission SAR for ISSED at body. Previous filed reported SAR value for body is 2.76 W/kg.

⁴ indicates the new simultaneous transmission SAR for ISSED at face. Previous filed reported SAR value for face is 3.04 W/kg.

⁵ the Face SAR result can refer to Previous filed report

The test results clearly demonstrate compliance with FCC/ISED Occupational/Controlled RF Exposure limits of 8 W/kg averaged over 1 gram per the requirements of FCC 47 CFR § 2.1093 and ISED RSS-102 (Issue 6).

18.0 Variability Assessment

Per the guidelines in KDB 865664 SAR variability assessment is not required because SAR results are below 4.0 W/kg (Occupational).

19.0 System Uncertainty

A system uncertainty analysis is not required for this report per KDB 865664 because the highest report SAR value for Occupational exposure is less than 7.5W/kg.

Per the guidelines of ISO/IEC 17025 a reported system uncertainty is required and therefore measurement uncertainty budget is included in Appendix A.

Appendix A

Measurement Uncertainty Budget

Uncertainty Budget for Device Under Test, for 150MHz

Input quantity X_i (source of uncertainty)	IEEE 1528 section (2020)	Tol. ($\pm$ %)	Prob Dist	Div. ^a q_i	c_i (1 g)	c_i (10 g)	1 g u_i ($\pm$ %)	10 g u_i ($\pm$ %)
Measurement System								
Probe Calibration	8.4.1.1	6.7	N ($k = 2$)	2.00	1	1	3.4	3.4
Probe Calibration Drift	8.4.1.2	5.0	R	1.73	1	1	2.9	2.9
Probe linearity and detection limit	8.4.1.3	4.7	R	1.73	1	1	2.7	2.7
Broadband signal	8.4.1.4	0.6	R	1.73	1	1	0.3	0.3
Probe isotropy	8.4.1.5	7.6	R	1.73	1	1	4.4	4.4
Other probe and data acquisition errors	8.4.1.6	0.8	N	1.00	1	1	0.8	0.8
RF ambient and noise	8.4.1.7	1.8	N	1.00	1	1	1.8	1.8
Probe positioning errors	8.4.1.8	0.006 mm	N	1.00	0.04	0.04	0.1	0.1
Data processing errors	8.4.1.9	1.2	N	1.00	1	1	1.2	1.2
Phantom and Device								
Measurement of phantom conductivity(σ)	8.4.2.1	2.5	N	1.00	0.78	0.71	2.0	1.8
Temperature effects (medium)	8.4.2.2	5.4	R	1.73	0.78	0.71	2.4	2.2
Shell permittivity	8.4.2.3	14	R	1.73	0	0	0.0	0.0
Distance between the radiating element of the DUT and the phantom medium	8.4.2.4	2	N	1.00	2	2	4.0	4.0
Repeatability of positioning the DUT or source against the phantom	8.4.2.5	2.8	N	1.00	1	1	2.8	2.8
Device holder effects	8.4.2.6	4.55	N	1.00	1	1	4.6	4.6
Effect of operating mode on probe sensitivity	8.4.2.7	2.4	R	1.73	1	1	1.4	1.4
Time-average SAR	8.4.2.8	1.7	R	1.73	1	1	1.0	1.0
Variation in SAR due to drift in output of DUT	8.4.2.9	5	R	1.73	1	1	2.9	2.9
Validation antenna uncertainty (validation measurement only)	8.4.2.10	0	N	1.00	1	1	0.0	0.0
Uncertainty in accepted power (validation measurement only)	8.4.2.11	0	N	1.00	1	1	0.0	0.0
Corrections to the SAR result (if applied)								
Phantom deviation from target (ϵ' , σ)	8.4.3.1	1.9	N	1.00	1	0.84	1.9	1.6
SAR scaling	8.4.3.2	0	R	1.73	1	1	0.0	0.0
Combined Standard Uncertainty			RSS				11.0	10.9
Expanded Uncertainty (95% CONFIDENCE LEVEL)			$k=2$				22.0	21.7

Notes for uncertainty budget Tables:

- a) Column headings $a-k$ are given for reference.
- b) Tol. - tolerance in influence quantity.
- c) Prob. Dist. – Probability distribution
- d) N, R - normal, rectangular probability distributions
- e) Div. - divisor used to translate tolerance into normally distributed standard uncertainty
- f) c_i - sensitivity coefficient that should be applied to convert the variability of the uncertainty component into a variability of SAR.
- g) u_i – SAR uncertainty
- h) ν_i - degrees of freedom for standard uncertainty and effective degrees of freedom for the expanded uncertainty

Uncertainty Budget for System Validation (dipole & flat phantom) for 150 MHz

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e = f(d,k)</i>	<i>f</i>	<i>g</i>	<i>h = c x f / e</i>	<i>i = c x g / e</i>
Uncertainty Component	IEEE 1528 section (2020)	Tol. (± %)	Prob Dist	Div. ^a q_i	c_i (1 g)	c_i (10 g)	1 g u_i (±%)	10 g u_i (±%)
Measurement System								
Probe Calibration	8.4.1.1	6.7	N	2.00	1	1	3.4	3.4
Probe Calibration Drift	8.4.1.2	1.7	R	1.73	1	1	1.0	1.0
Probe linearity and detection limit	8.4.1.3	4.7	R	1.73	1	1	2.7	2.7
Broadband signal	8.4.1.4	0.0	R	1.73	1	1	0.0	0.0
Probe isotropy	8.4.1.5	4.7	R	1.73	1	1	2.7	2.7
Other probe and data acquisition errors	8.4.1.6	0.8	N	1.00	1	1	0.8	0.8
RF ambient and noise	8.4.1.7	0.6	N	1.00	1	1	0.6	0.6
Probe positioning errors	8.4.1.8	0.006 mm	N	1.00	0.04	0.04	0.1	0.1
Data processing errors	8.4.1.9	0.6	N	1.00	1	1	0.6	0.6
Phantom and Device								
Measurement of phantom conductivity(σ)	8.4.2.1	2.5	N	1.00	0.78	0.71	2.0	1.8
Temperature effects (medium)	8.4.2.2	5.4	R	1.73	0.78	0.71	2.4	2.2
Shell permittivity	8.4.2.3	14	R	1.73	0	0	0.0	0.0
Distance between the radiating element of the DUT and the phantom medium	8.4.2.4	1	N	1.00	2	2	2.0	2.0
Effect of operating mode on probe sensitivity	8.4.2.7	0	R	1.73	1	1	0.0	0.0
Time-average SAR	8.4.2.8	0	R	1.73	1	1	0.0	0.0
Validation antenna uncertainty (validation measurement only)	8.4.2.10	3.2	N	1.00	1	1	3.2	3.2
Uncertainty in accepted power (validation measurement only)	8.4.2.11	2	N	1.00	1	1	2.0	2.0
Corrections to the SAR result (if applied)								
Phantom deviation from target (ϵ', σ)	8.4.3.1	1.9	N	1.00	1	0.84	1.9	1.6
Combined Standard Uncertainty			RSS				7.7	7.6
Expanded Uncertainty (95% CONFIDENCE LEVEL)			$k=2$				15.5	15.1

Notes for uncertainty budget Tables:

a) Column headings *a-k* are given for reference.

b) Tol. - tolerance in influence quantity.

c) Prob. Dist. – Probability distribution

d) N, R - normal, rectangular probability distributions

e) Div. - divisor used to translate tolerance into normally distributed standard uncertainty

f) c_i - sensitivity coefficient that should be applied to convert the variability of the uncertainty component into a variability of SAR.

g) u_i – SAR uncertainty

h) vi - degrees of freedom for standard uncertainty and effective degrees of freedom for the expanded uncertainty

Appendix B

Probe Calibration Certificates

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 **Motorola Solutions**
Bayan Lepas, Malaysia

Certificate No. **EX-7486_Jan24**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:7486**

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 **March 19, 2024 (additional ConvF HM5800MHz and 6500MHz)**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.
All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3) °C and humidity < 70%.
Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP2	SN: 104778	30-Mar-23 (No. 217-03804/03805)	Mar-24
Power sensor NRP-Z91	SN: 103244	30-Mar-23 (No. 217-03804)	Mar-24
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)	30-Mar-23 (No. 217-03809)	Mar-24
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	Jeton Kastrati	Laboratory Technician	
Approved by	Sven Kühn	Technical Manager	

Issued: March 19, 2024

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

Certificate No: EX-7486_Jan24

Page 1 of 11

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



S Schweizerischer Kalibrierdienst
S Service suisse d'étalonnage
C 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**

Glossary

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

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}**: Assessed for E-field polarization $\theta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not affect the E²-field uncertainty inside TSL (see below ConvF).
- NORM(f)_{x,y,z}** = NORM_{x,y,z} * frequency_response (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCP_{x,y,z}**: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal. DCP does not depend on frequency nor media.
- PAR**: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- A_{x,y,z}; B_{x,y,z}; C_{x,y,z}; D_{x,y,z}; VR_{x,y,z}**: A, B, C, D are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{x,y,z} * ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle**: The angle is assessed using the information gained by determining the NORM_x (no uncertainty required).

EX3DV4 - SN:7486

March 19, 2024 (additional ConvF HM5800MHz and 6500MHz)

Parameters of Probe: EX3DV4 - SN:7486**Basic Calibration Parameters**

	Sensor X	Sensor Y	Sensor Z	Unc (k = 2)
Norm ($\mu V/(V/m)^2$) ^A	0.38	0.47	0.49	±10.1%
DCP (mV) ^B	99.5	91.0	98.7	±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	161.3	±3.0%	±4.7%
		Y	0.00	0.00	1.00		176.3		
		Z	0.00	0.00	1.00		162.8		
10352	Pulse Waveform (200Hz, 10%)	X	8.51	78.58	15.21	10.00	60.0	±2.6%	±9.6%
		Y	20.00	92.88	21.55		60.0		
		Z	20.00	88.92	19.08		60.0		
10353	Pulse Waveform (200Hz, 20%)	X	20.00	88.54	17.15	6.99	80.0	±1.8%	±9.6%
		Y	20.00	97.21	22.44		80.0		
		Z	20.00	92.24	19.60		80.0		
10354	Pulse Waveform (200Hz, 40%)	X	20.00	102.86	22.41	3.98	95.0	±1.8%	±9.6%
		Y	20.00	115.00	29.35		95.0		
		Z	20.00	106.27	24.97		95.0		
10355	Pulse Waveform (200Hz, 60%)	X	7.29	160.00	50.37	2.22	120.0	±1.8%	±9.6%
		Y	4.95	160.00	55.51		120.0		
		Z	20.00	145.54	41.09		120.0		
10387	QPSK Waveform, 1 MHz	X	2.61	76.53	19.85	1.00	150.0	±3.5%	±9.6%
		Y	2.99	78.70	21.36		150.0		
		Z	2.29	73.55	18.80		150.0		
10388	QPSK Waveform, 10 MHz	X	2.70	73.00	18.75	0.00	150.0	±2.5%	±9.6%
		Y	3.45	77.16	20.83		150.0		
		Z	2.71	72.53	18.53		150.0		
10396	64-QAM Waveform, 100 kHz	X	2.36	69.62	19.47	3.01	150.0	±2.6%	±9.6%
		Y	3.05	78.15	27.09		150.0		
		Z	3.46	76.54	22.65		150.0		
10399	64-QAM Waveform, 40 MHz	X	3.66	68.65	16.96	0.00	150.0	±2.4%	±9.6%
		Y	3.93	69.71	17.81		150.0		
		Z	3.69	68.54	16.92		150.0		
10414	WLAN CCDF, 64-QAM, 40 MHz	X	4.79	66.32	16.18	0.00	150.0	±3.5%	±9.6%
		Y	5.08	66.82	16.78		150.0		
		Z	4.87	66.29	16.18		150.0		

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

^A The uncertainties of Norm X,Y,Z do not affect the E²-field uncertainty inside TSL (see Pages 5 to 7).

^B Linearization parameter uncertainty for maximum specified field strength.

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

EX3DV4 - SN:7486

March 19, 2024 (additional ConvF HM5800MHz and 6500MHz)

Parameters of Probe: EX3DV4 - SN:7486**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	32.5	241.67	35.62	6.18	0.00	5.02	0.54	0.12	1.01
y	40.7	324.06	40.40	9.76	0.30	5.10	0.00	0.07	1.04
z	36.4	273.63	36.32	10.44	0.00	5.05	1.89	0.00	1.01

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle	16.7°
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.

EX3DV4 - SN:7486

March 19, 2024 (additional ConvF HM5800MHz and 6500MHz)

Parameters of Probe: EX3DV4 - SN:7486

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 (k = 2)
5800	35.3	5.27	4.84	4.84	4.84	0.40	1.80	±13.1%

^C Frequency validity above 300 MHz of ±100MHz 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 300MHz 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 13MHz 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.

EX3DV4 - SN:7486

March 19, 2024 (additional ConvF HM5800MHz and 6500MHz)

Parameters of Probe: EX3DV4 - SN:7486

Calibration Parameter Determined in Body 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 (k = 2)
5800	48.2	6.00	4.11	4.11	4.11	0.50	1.90	±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.

EX3DV4 - SN:7486

March 19, 2024 (additional ConvF HM5800MHz and 6500MHz)

Parameters of Probe: EX3DV4 - SN:7486

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 (k = 2)
6500	34.5	6.07	5.20	5.20	5.20	0.20	2.50	±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%.

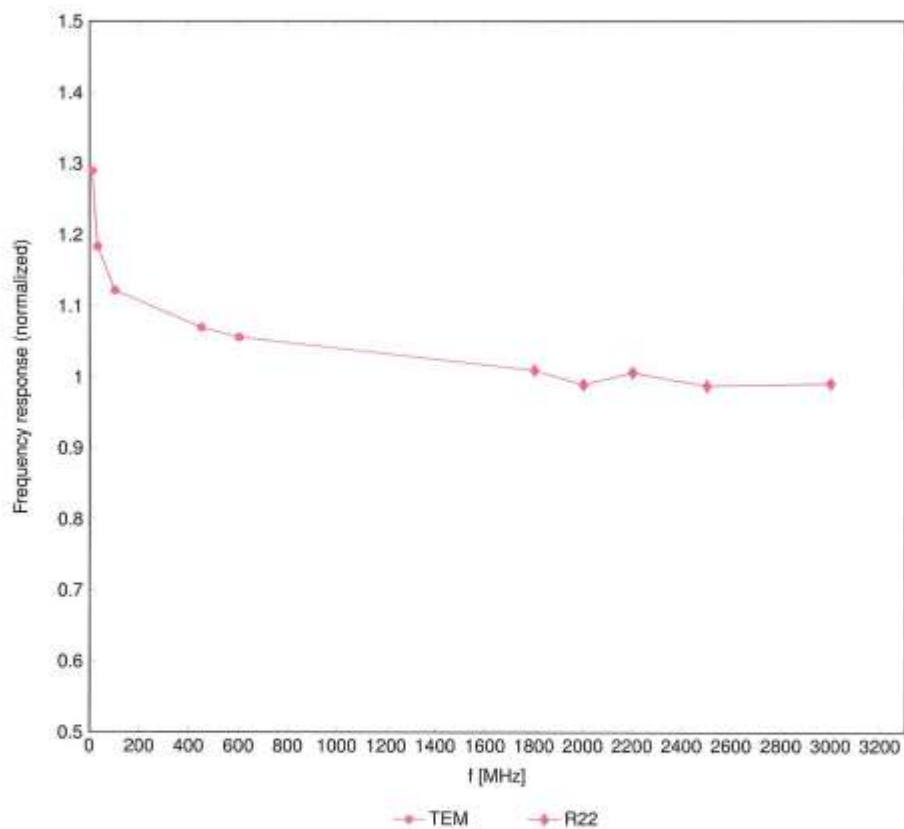
^G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ±1% for frequencies below 3 GHz; below ±2% for frequencies between 3–8 GHz; and below ±4% for frequencies between 8–10 GHz at any distance larger than half the probe tip diameter from the boundary.

EX3DV4 - SN:7486

March 19, 2024 (additional ConvF HM5800MHz and 6500MHz)

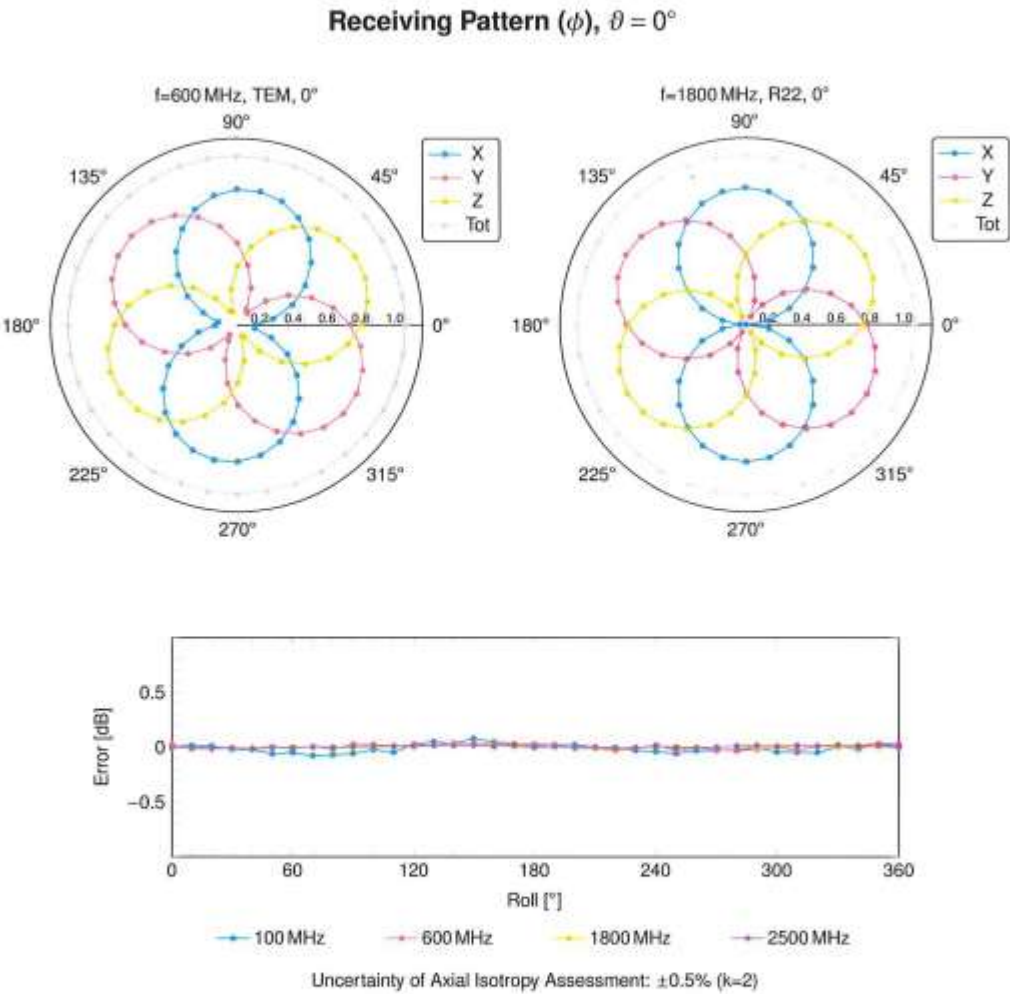
Frequency Response of E-Field

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

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

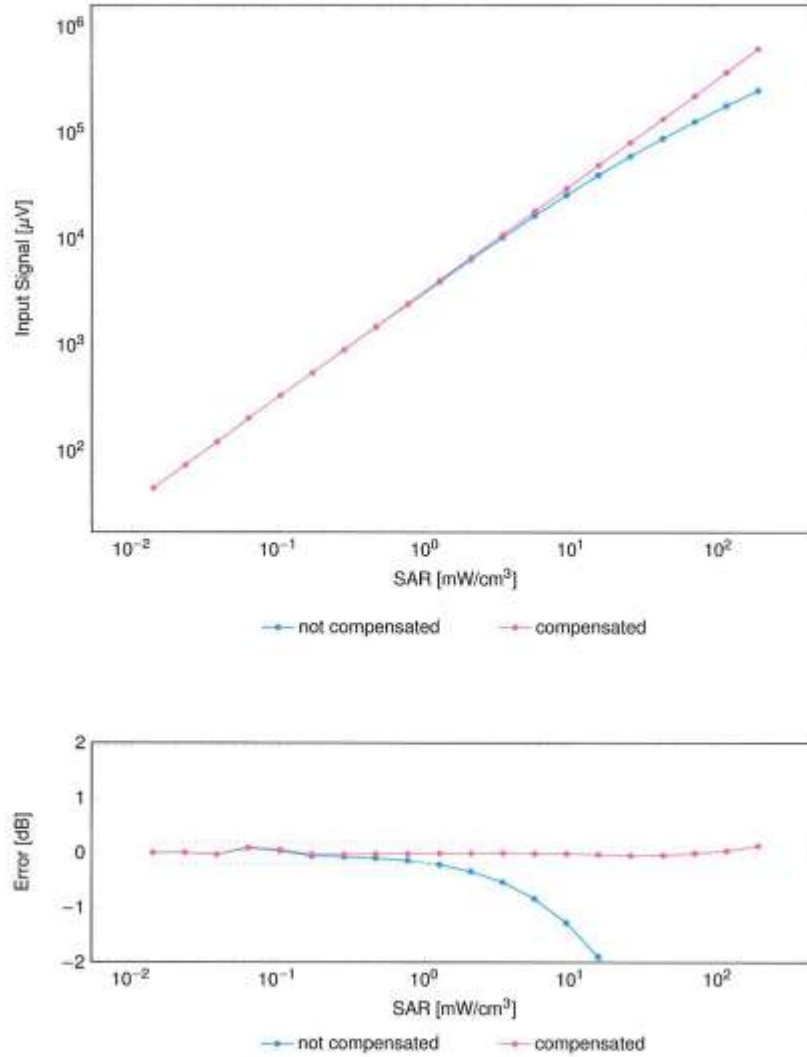
EX3DV4 - SN:7486

March 19, 2024 (additional CorvF HM5800MHz and 6500MHz)



EX3DV4 - SN:7486

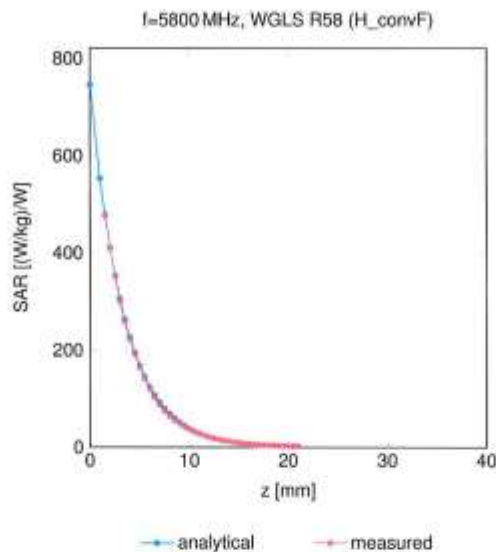
March 19, 2024 (additional ConvF HM5800MHz and 6500MHz)

Dynamic Range f(SAR_{head})(TEM cell, $f_{\text{eval}} = 1900\text{MHz}$)Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

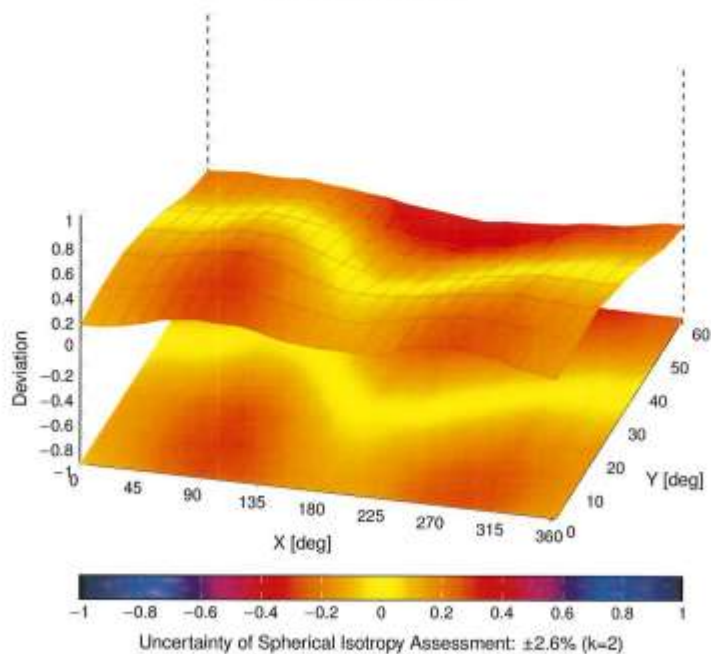
EX3DV4 - SN:7486

March 19, 2024 (additional ConvF HM5800MHz and 6500MHz)

Conversion Factor Assessment



Deviation from Isotropy in Liquid

Error (ϕ, θ), $f=900\text{ MHz}$ 

Certificate No: EX-7486_Jan24

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Appendix C

Dipole Calibration Certificates

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 **Motorola Solutions**
Bayan Lepas, Malaysia

Certificate No. **CLA150-4010_Jul24**

CALIBRATION CERTIFICATE

Object **CLA150 - SN: 4010**

Calibration procedure(s) **QA CAL-15.v11**
Calibration Procedure for SAR Validation Sources below 700 MHz

Calibration date: **July 16, 2024**

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

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 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
Power sensor NRP-Z91	SN: 103245	26-Mar-24 (No. 217-04037)	Mar-25
Reference 20 dB Attenuator	SN: CC2552 (20x)	26-Mar-24 (No. 217-04046)	Mar-25
Type-N mismatch combination	SN: 310982 / 06327	26-Mar-24 (No. 217-04047)	Mar-25
Reference Probe EX3DV4	SN: 3877	10-Jan-24 (No. EX3-3877_Jan24)	Jan-25
DAE4	SN: 654	15-Jan-24 (No. DAE4-654_Jan24)	Jan-25
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter NRP2	SN: 107193	08-Nov-21 (in house check Dec-22)	In house check: Dec-24
Power sensor NRP-Z91	SN: 100822	15-Dec-09 (in house check Dec-22)	In house check: Dec-24
Power sensor NRP-Z91	SN: 100418	01-Jan-04 (in house check Dec-22)	In house check: Dec-24
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-24)	In house check: Jun-26
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-22)	In house check: Oct-24

Calibrated by: **Name** **Krešimir Franjić** **Function** **Laboratory Technician**

Signature

Approved by: **Sven Kühn** **Technical Manager**

i. A. A. K. Kühn

Issued: July 16, 2024

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

Certificate No: CLA150-4010_Jul24

Page 1 of 8

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



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

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

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 source is mounted in a touch configuration below the center marking of the flat phantom.
- Return Loss:** This parameter is measured with the source positioned under the liquid filled phantom (as described in the measurement condition clause). The Return Loss ensures low reflected power. 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	DASY5	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	ELI4 Flat Phantom	Shell thickness: 2 ± 0.2 mm
EUT Positioning	Touch Position	
Zoom Scan Resolution	$dx, dy = 4.0$ mm, $dz = 1.4$ mm	Graded Ratio = 1.4 (Z direction)
Frequency	150 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	52.3	0.76 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	$50.9 \pm 6 \%$	$0.78 \text{ mho/m} \pm 6 \%$
Head TSL temperature change during test	< 0.5 °C	---	----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	1 W input power	3.68 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	3.59 W/kg $\pm$ 18.4 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	1 W input power	2.44 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	2.38 W/kg $\pm$ 18.0 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	61.9	0.80 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	$62.9 \pm 6 \%$	$0.81 \text{ mho/m} \pm 6 \%$
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	1 W input power	3.86 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	3.84 W/kg $\pm$ 18.4 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	1 W input power	2.57 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	2.55 W/kg $\pm$ 18.0 % (k=2)

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

Impedance, transformed to feed point	48.0 Ω - 8.1 j Ω
Return Loss	- 21.4 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.8 Ω - 8.9 j Ω
Return Loss	- 21.1 dB

Additional EUT Data

Manufactured by	SPEAG
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DASY5 Validation Report for Head TSL

Date: 16.07.2024

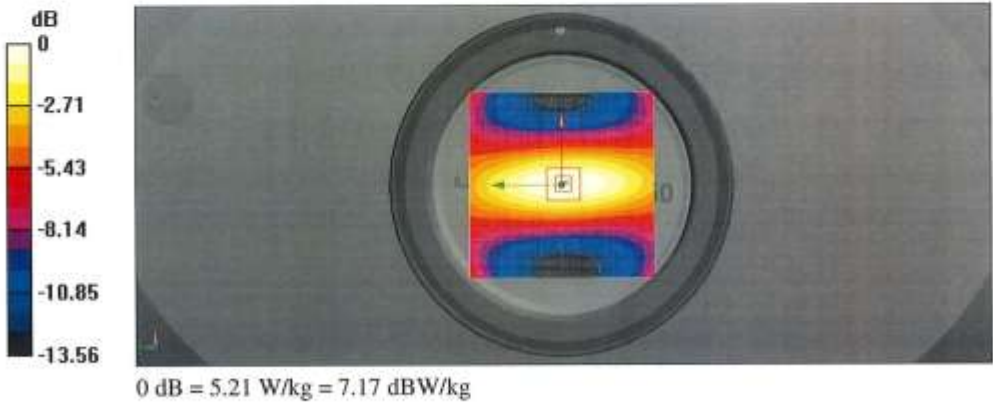
Test Laboratory: SPEAG, Zurich, Switzerland

DUT: CLA150; Type: CLA150; Serial: CLA150 - SN: 4010

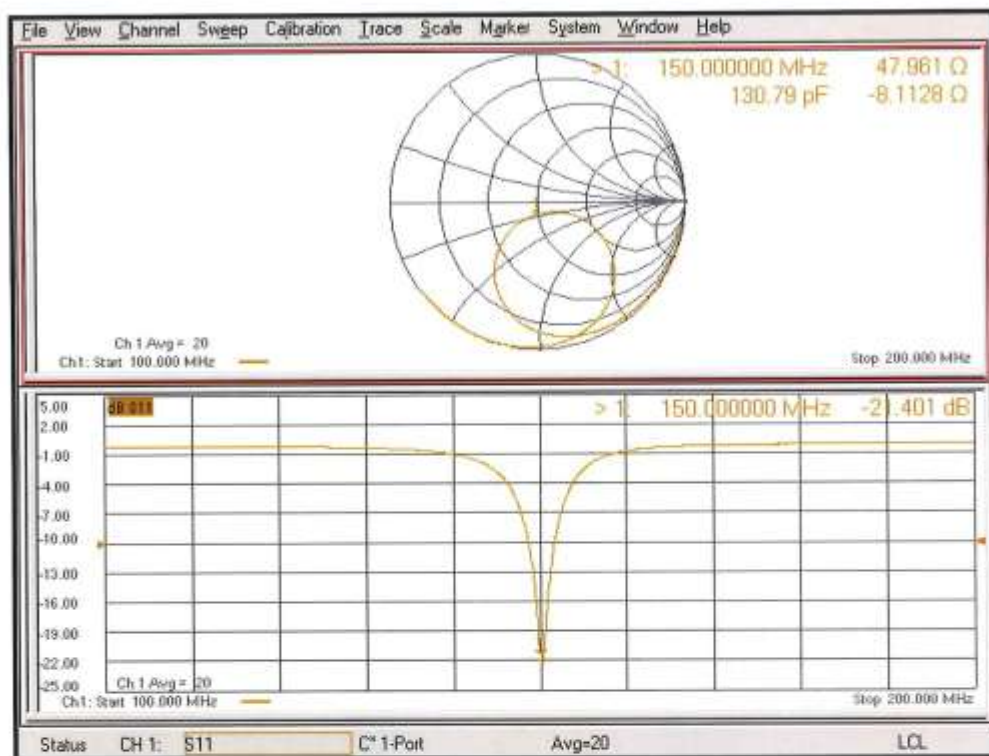
Communication System: UID 0 - CW; Frequency: 150 MHz
Medium parameters used: $f = 150\text{ MHz}$; $\sigma = 0.78\text{ S/m}$; $\epsilon_r = 50.9$; $\rho = 1000\text{ kg/m}^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

- DASY52 Configuration:
- Probe: EX3DV4 - SN3877; ConvF(12.11, 12.11, 12.11) @ 150 MHz; Calibrated: 10.01.2024
 - Sensor-Surface: 1.4mm (Mechanical Surface Detection)
 - Electronics: DAE4 Sn654; Calibrated: 15.01.2024
 - Phantom: ELI v6.0; Type: QDOVA003AA; Serial: TP:2034
 - DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

CLA Calibration for HSL-LF Tissue/CLA150, touch configuration, Pin=1W/Zoom Scan, dist=1.4mm (8x10x8)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$
Reference Value = 81.87 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 7.03 W/kg
SAR(1 g) = 3.68 W/kg; SAR(10 g) = 2.44 W/kg
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid (> 14 mm)
Ratio of SAR at M2 to SAR at M1 = 80.1%
Maximum value of SAR (measured) = 5.21 W/kg



Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 16.07.2024

Test Laboratory: SPEAG, Zurich, Switzerland

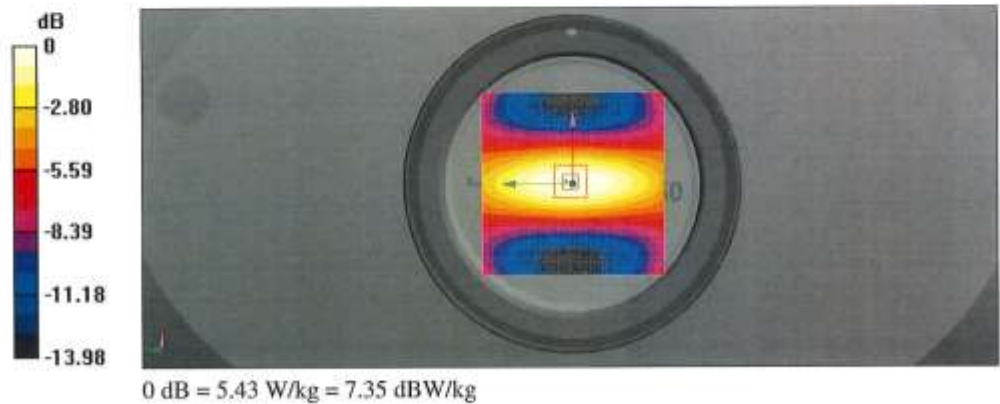
DUT: CLA150; Type: CLA150; Serial: CLA150 - SN: 4010

Communication System: UID 0 - CW; Frequency: 150 MHz
Medium parameters used: $f = 150\text{ MHz}$; $\sigma = 0.81\text{ S/m}$; $\epsilon_r = 62.9$; $\rho = 1000\text{ kg/m}^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

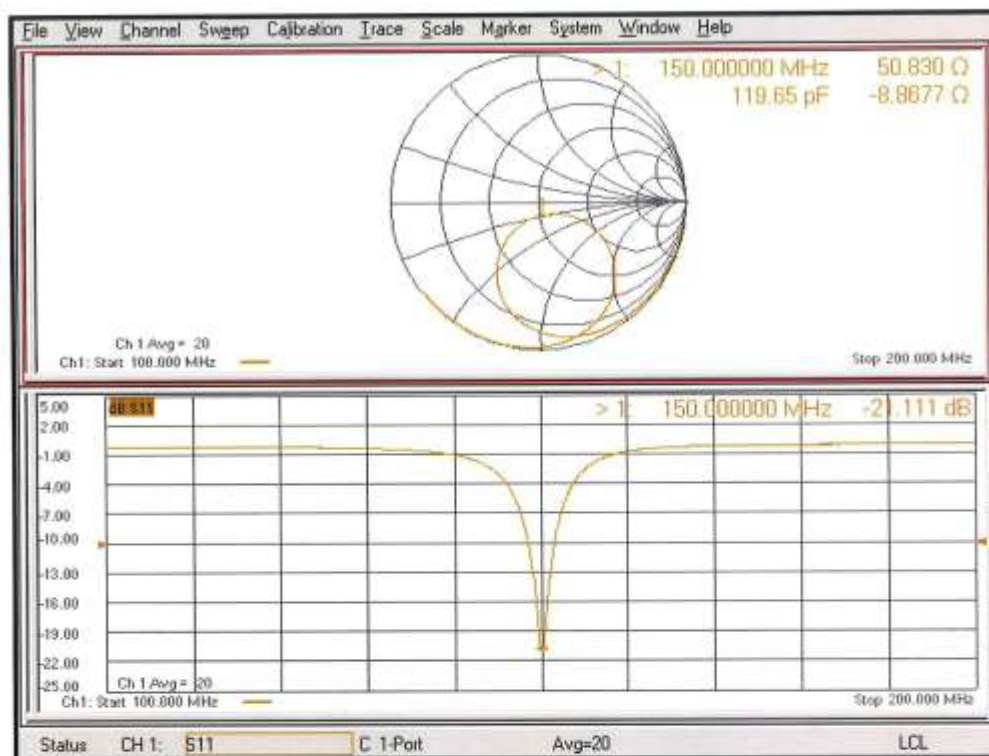
DASY52 Configuration:

- Probe: EX3DV4 - SN3877; ConvF(11.56, 11.56, 11.56) @ 150 MHz; Calibrated: 10.01.2024
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn654; Calibrated: 15.01.2024
- Phantom: ELI v6.0; Type: QDOVA003AA; Serial: TP:2034
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

CLA Calibration for MSL-LF Tissue/CLA150, touch configuration, Pin=1W/Zoom Scan, dist=1.4mm (8x10x8)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$
Reference Value = 82.29 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 7.31 W/kg
SAR(1 g) = 3.86 W/kg; SAR(10 g) = 2.57 W/kg
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid (> 14 mm)
Ratio of SAR at M2 to SAR at M1 = 80.1 %
Maximum value of SAR (measured) = 5.43 W/kg



Impedance Measurement Plot for Body TSL



Dipole Data

The table below includes dipole impedance and return loss measurement data measured by Motorola Solutions' EME lab. The results meet the requirements stated in KDB 865664.

Dipole 150-4010	Head			Body		
	Impedance		Return Loss	Impedance		Return Loss
Date Measured	real Ω	imag $j\Omega$	dB	real Ω	imag $j\Omega$	dB
08/16/2024	50.12	-3.90	-22.64	50.00	-5.21	-20.75
07/14/2025	51.93	-2.67	-21.27	51.70	-3.05	-20.62

Appendix D

System Verification Check Scans

Motorola Solutions, Inc. EME Laboratory

Date/Time: 9/30/2025 10:29:36 PM

Robot#: DASY5-PG-3 | Run#: MHN-SYSP-150H-250930-03
 Dipole Model#: CLA-150
 Phantom#: ELI4 1103
 Tissue Temp: 22.1 (C)
 Serial#: 4010
 Test Freq: 150.0000(MHz)
 Start Power: 1000 (mW)
 Rotation (1D): 0.068 dB
 Adjusted SAR (1W): 3.82 mW/g (1g)

Comments:

Communication System Band: CLA150, Communication System UID: 0, Duty Cycle: 1:1,
 Medium parameters used: $f = 150$ MHz; $\sigma = 0.778$ S/m; $\epsilon_r = 52.519$; $\rho = 1000$ kg/m³
 Probe: EX3DV4 - SN7486, Calibrated: 1/19/2024, Frequency: 150 MHz, ConvF(13.4, 13.4, 13.4) @ 150 MHz
 Electronics: DAE3 Sn374, Calibrated: 7/18/2024

Below 2 GHz-Rev.3/System Performance Check/Dipole Area Scan 2 (81x81x1):

Interpolated grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 85.17 V/m; Power Drift = -0.02 dB

Fast SAR: SAR(1 g) = 4.6 W/kg; SAR(10 g) = 3.25 W/kg (SAR corrected for target medium)

Maximum value of SAR (interpolated) = 5.70 W/kg

Below 2 GHz-Rev.3/System Performance Check/0-Degree Cube (5x5x7)/Cube 0:

Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 85.17 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 7.03 W/kg

SAR(1 g) = 3.82 W/kg; SAR(10 g) = 2.44 W/kg (SAR corrected for target medium)

Smallest distance from peaks to all points 3 dB below = 16.5 mm

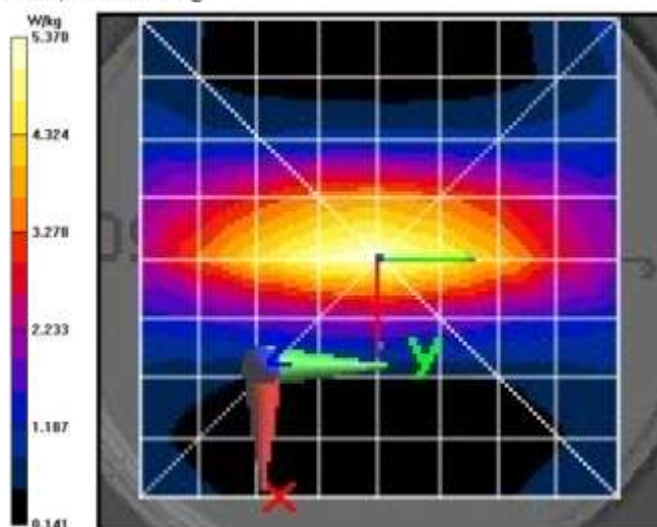
Ratio of SAR at M2 to SAR at M1 = 56.7%

Maximum value of SAR (measured) = 5.62 W/kg

Below 2 GHz-Rev.3/System Performance Check/Z-Axis Retraction (1x1x17): Measurement

grid: dx=20mm, dy=20mm, dz=10mm

Maximum value of SAR (measured) = 5.66 W/kg



Appendix E

DUT Scans

Assessments at the Highest FCC LMR - Table 16

Motorola Solutions, Inc. EME Laboratory

Date/Time: 9/26/2025 9:40:50 AM

Robot#: DASY5-PG-3 | Run#: MHN-AB-250926-07@
 Model#: H35KET9PW8AN
 Phantom#: EL14 1103
 Tissue Temp: 22.1 (C)
 Serial#: 022TBH1387
 Antenna: AN000471A01
 Test Freq: 158.3000 (MHz)
 Battery: PMNN4818A
 Carry Acc: None @ Back Antenna tip
 Audio Acc: PMMN4128A
 Start Power: 6.12 (W)

Comments:

Communication System Band: Aloha VHF, Communication System UID: 0, Duty Cycle: 1:1,
 Medium parameters used: $f = 158.3$ MHz; $\sigma = 0.744$ S/m; $\epsilon_r = 51.822$; $\rho = 1000$ kg/m³
 Probe: EX3DV4 - SN7486, Calibrated: 1/19/2024, Frequency: 158.3 MHz, ConvF(13.4, 13.4, 13.4) @ 158.3 MHz
 Electronics: DAE3 Sn374, Calibrated: 7/18/2024

Below 2 GHz-Rev.3/Ab Scan/1-Area Scan (71x281x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 114.7 V/m; Power Drift = -0.09 dB

Fast SAR: SAR(1 g) = 9.04 W/kg; SAR(10 g) = 6.61 W/kg (SAR corrected for target medium)

Maximum value of SAR (interpolated) = 10.8 W/kg

Below 2 GHz-Rev.3/Ab Scan/3-Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 114.7 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 13.9 W/kg

SAR(1 g) = 7.52 W/kg; SAR(10 g) = 5.05 W/kg (SAR corrected for target medium)

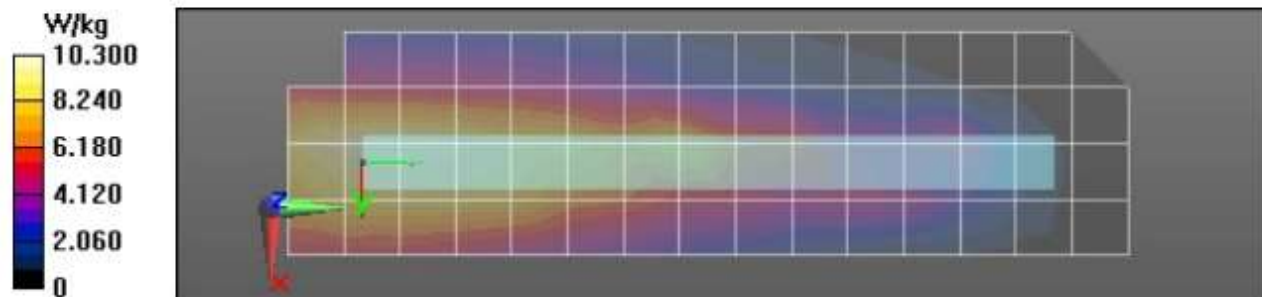
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid

Ratio of SAR at M2 to SAR at M1 = 55.8%

Maximum value of SAR (measured) = 10.7 W/kg

Below 2 GHz-Rev.3/Ab Scan/4-Z-Axis Scan (1x1x17): Measurement grid: dx=20mm, dy=20mm, dz=10mm

Maximum value of SAR (measured) = 10.7 W/kg



Assessments at the Highest ISED LMR - Table 17

Motorola Solutions, Inc. EME Laboratory

Date/Time: 9/26/2025 9:40:50 AM

Robot#: DASY5-PG-3 | Run#: MHN-AB-250926-07@
 Model#: H35KET9PW8AN
 Phantom#: EL14 1103
 Tissue Temp: 22.1 (C)
 Serial#: 022TBH1387
 Antenna: AN000471A01
 Test Freq: 158.3000 (MHz)
 Battery: PMNN4818A
 Carry Acc: None @ Back Antenna tip
 Audio Acc: PMMN4128A
 Start Power: 6.12 (W)

Comments:

Communication System Band: Aloha VHF, Communication System UID: 0, Duty Cycle: 1:1,
 Medium parameters used: $f = 158.3$ MHz; $\sigma = 0.744$ S/m; $\epsilon_r = 51.822$; $\rho = 1000$ kg/m³
 Probe: EX3DV4 - SN7486, Calibrated: 1/19/2024, Frequency: 158.3 MHz, ConvF(13.4, 13.4, 13.4) @ 158.3 MHz
 Electronics: DAE3 Sn374, Calibrated: 7/18/2024

Below 2 GHz-Rev.3/Ab Scan/1-Area Scan (71x281x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Reference Value = 114.7 V/m; Power Drift = -0.09 dB

Fast SAR: SAR(1 g) = 9.04 W/kg; SAR(10 g) = 6.61 W/kg (SAR corrected for target medium)

Maximum value of SAR (interpolated) = 10.8 W/kg

Below 2 GHz-Rev.3/Ab Scan/3-Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 114.7 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 13.9 W/kg

SAR(1 g) = 7.52 W/kg; SAR(10 g) = 5.05 W/kg (SAR corrected for target medium)

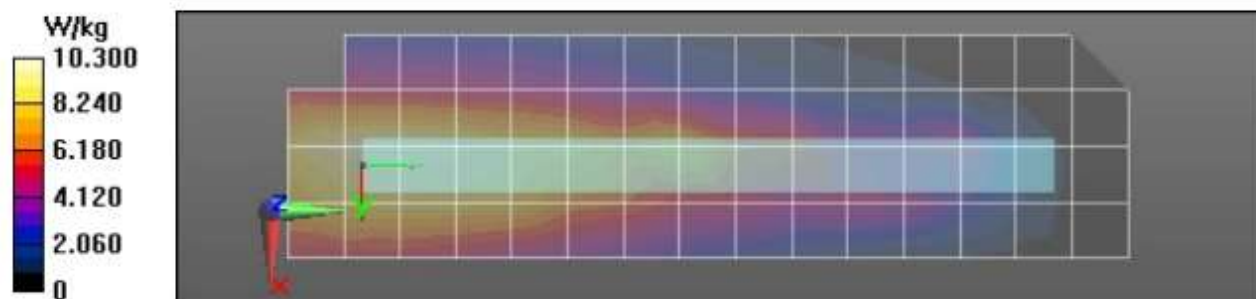
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid

Ratio of SAR at M2 to SAR at M1 = 55.8%

Maximum value of SAR (measured) = 10.7 W/kg

Below 2 GHz-Rev.3/Ab Scan/4-Z-Axis Scan (1x1x17): Measurement grid: dx=20mm, dy=20mm, dz=10mm

Maximum value of SAR (measured) = 10.7 W/kg



APPENDIX F

Shortened Scan of Highest SAR configuration

Shortened Scan

Table 18
Motorola Solutions, Inc. EME Laboratory
Date/Time: 10/1/2025 12:08:37 AM

Robot#: DASY5-PG-3 | Run#: MHN-AB-251001-01@
Model#: H35KET9PW8AN
Phantom#: EL14 1103
Tissue Temp: 22.9 (C)
Serial#: 022TBH1387
Antenna: AN000471A01
Test Freq: 158.3000 (MHz)
Battery: PMNN4818A
Carry Acc: None @ Back Antenna tip
Audio Acc: PMMN4128A
Start Power: 6.12 (W)

Comments:

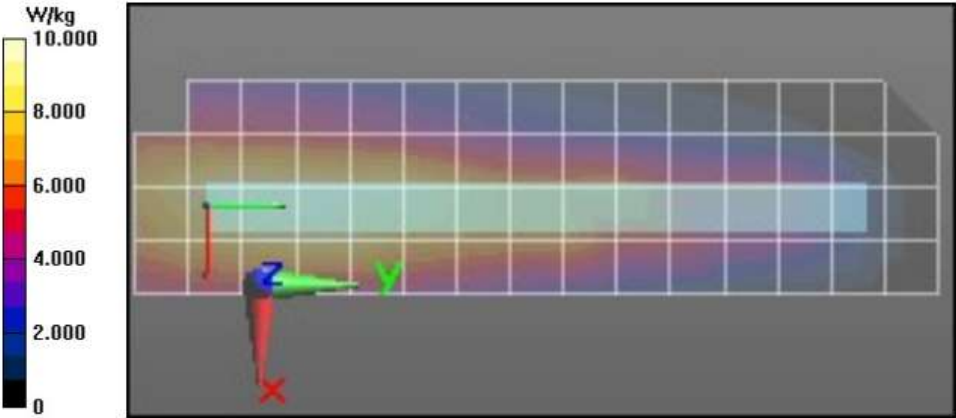
Communication System Band: Aloha VHF, Communication System UID: 0, Duty Cycle: 1:1,
Medium parameters used: f = 158.3 MHz; $\sigma = 0.783$ S/m; $\epsilon_r = 52.221$; $\rho = 1000$ kg/m³
Probe: EX3DV4 - SN7486, Calibrated: 1/19/2024, Frequency: 158.3 MHz, ConvF(13.4, 13.4, 13.4) @ 158.3 MHz
Electronics: DAE3 Sn374, Calibrated: 7/18/2024

Below 2 GHz-Rev.3/Ab Scan/1-Area Scan (71x281x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 110.6 V/m; Power Drift = -0.20 dB
Fast SAR: SAR(1 g) = 8.56 W/kg; SAR(10 g) = 6.31 W/kg (SAR corrected for target medium)
Maximum value of SAR (interpolated) = 10.6 W/kg

Below 2 GHz-Rev.3/Ab Scan/2-Volume 2D Scan (41x41x1): Interpolated grid: dx=0.7500 mm, dy=0.7500 mm, dz=1.000 mm
Reference Value = 110.6 V/m; Power Drift = -0.22 dB
Fast SAR: SAR(1 g) = 8.65 W/kg; SAR(10 g) = 6.2 W/kg (SAR corrected for target medium)
Maximum value of SAR (interpolated) = 11.4 W/kg

Below 2 GHz-Rev.3/Ab Scan/3-Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 115.4 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 13.8 W/kg
SAR(1 g) = 7.14 W/kg; SAR(10 g) = 4.79 W/kg (SAR corrected for target medium)
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 54.7%
Maximum value of SAR (measured) = 10.7 W/kg

Below 2 GHz-Rev.3/Ab Scan/4-Z-Axis Scan (1x1x17): Measurement grid: dx=20mm, dy=20mm, dz=10mm
Maximum value of SAR (measured) = 11.4 W/kg



Shortened scan reflects highest SAR producing configuration and is compared to the full scan.

Scan Description	Referenced Table	Test Time (min.)	SAR 1g (W/kg)
Shorten scan (zoom)	18	10	3.92
Full scan (area & zoom)	16	30	4.15

APPENDIX G

DUT Test Position Photos

Please refer to Ex7b

APPENDIX H

DUT, Body worn and Audio accessories Photos

Please refer to original report for all the accessories