Test Report Serial Number:	45461754 R5.0
Test Report Date:	24 April 2023
Project Number:	1604

SAR Test Report - New Certification

Applicant:

L3HARRIS™
FAST. FORWARD.

Maximum *reported* 1g SAR			
TNF	FACE:	3.15	W/kg
	BODY:	5.77	
Simultaneous:		5.77	
Occupationnal Limit:		8.00	

L3Harris Corporation
221 Jefferson Ridge Parkway
Lynchburg, VA, 24501
USA

FCC ID:	ISED Registration Number
OWDTR-0166-E	3636B-0166
Product Name / PMN	Product Model Number / HVIN
XL-95P XL-45P	XL-x5-V/U

In Accordance With:

FCC 47 CFR §2.1093
Radiofrequency Radiation Exposure Evaluation: Portable Devices

IC RSS-102 Issue 5
Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)

Approved By:

Ben Hewson, President
Celltech Labs Inc.
21-364 Lougheed Rd.
Kelowna, BC, V1X 7R8
Canada

Test Lab Certificate: 2470.01

Industry Canada

IC Registration 3874A

FCC Registration: 714830

Table of Contents

1.0 REVISION HISTORY

Revision History				
Samples Tested By:	Ben Hewson Trevor Whillock	**Date(s) of Evaluation:**		26 Aug - 2 Sep, 2022
Report Prepared By:	Art Voss, P.Eng.	**Report Reviewed By:**		Art Voss
Report Revision	**Description of Revision**	**Revised Section**	**Revised By**	**Revision Date**
0.1	Draft	n/a	Art Voss	20 September 2022
0.2	Corrected reference to Audio Device evaluated, Tables 8.1, 9.1, 9.4	8.0, 9.0	Art Voss	23 September 2022
	Corrected DUT Photos Appendic C	App. C		
	Added Test Reduction note to Table 6.1	6.0		
1.0	Initial Release	n/a	Art Voss	29 September 2022
2.0	Revised Rated Power	2.0, 6.0	Art Voss	23 October 2022
	Removed Reference to U-NII-II Band	6.0,9.0		
	Revised *reported* SAR	Cover, 10.0		
	Added Validation Source Extended Cal Information	19.0		
2.1	Corrected WiFi/BT Conducted Power	2.0, 6.0	Art Voss	26 October 2022
3.0	Corrected WiFi/BT Conducted Power	6.0, 9.0	Art Voss	1 February 2023
	Added B3 measurement to reported SAR results	9.0		
	Added Validation Source Extended Cal Information	19.0		
4.0	Revised for DTS/DSS/UNII Certification	2.0, 6.0, 9.0	Art Voss	22 March 2023
4.0	Corrected UNII Conducted Power	2.0, 6.0, 9.0	Art Voss	24 April 2023

2.0 CLIENT AND DEVICE INFORMATION

Client Information		
Applicant Name	**Harris Corporation**	
Applicant Address	221 Jefferson Ridge Parkway	
	Lynchburg, VA, 24501	
	USA	
DUT Information		
Device Identifier(s):	**FCC ID:**	**OWDTR-0166-E**
	ISED:	**3636B-0166**
Device Marketing Name / PMN:	XL-95P, XL-45P	
Device Model(s) / HVIN:	XL-x5-V/U	
Test Sample Serial No.:	A40199E2A003	
Equipment Class (FCC):	Licensed Non-Broadcast Transmitter Held to Face (TNF) FCC Part 90 - LMRS	
	Digital Transmission System (DTS) FCC Part 15C - WiFi	
	Spread Spectrum Transmitter (DSS) FCC Part 15C - BT	
	Unlicensed National Information Infrastructure (NII) FCC Part 15E - WiFi	
Equipment Class (ISED):	Land Mobile Radio - Portable (27.41-960MHz) RSS-119	
	Other - WiFi (RSS-247)	
	Other - BT (RSS-247)	
	Wireless Local Area Network - (RSS-247)	
Transmit Frequency Range:	VHF: 136-174MHz	
	UHF: 378-522MHz	
	BT: 2402-2480MHz	
	WiFI 2.4G: 2412-2462MHz	
	WiFi 5G: 5180-5240MHz, 5745-5825MHz	
Number of Channels:	Programmable	
Transmitter Rated Power With Tune-Up Tolerance:	VHF: 38.1dBm +0.1dB	
	UHF: 37.3dBm +0.1dB	
	BT: 0.0016W (2dBm) + 0.5 / -3dB	
	WLAN 2.4G: 0.0083W (9.2dBm) +0.5 / -3dB	
	WLAN 5G: 5180-5240MHz: 0.004W (6.3dBm) +0.5 / -3dB	
	WLAN 5G: 5745-5825MHz: 0.002W (3.3dBm) +0.5 / -3dB	
Duty Cycle:	BT/WLAN: 100%, LMR: 50% PTT Duty Cycle	
DUT Power Source:	7.4VDC Li-Ion Rechargeable Battery, AA Alkaline Battery	
Deviation(s) from standard/procedure:	None	
Modification of DUT:	None	

3.0 SCOPE OF EVALUATION/DATA REUSE

This Certification Report was prepared on behalf of:

Harris Corporation

,(the '*Applicant*"), in accordance with the applicable Federal Communications Commission (FCC) CFR 47 and Innovation, Scientific and Economic Development (ISED) Canada rules parts and regulations (the '*Rules*'). The scope of this investigation was limited to only the equipment, devices and accessories (the '*Equipment*') supplied by the *Applicant*. The tests and measurements performed on this *Equipment* were only those set forth in the applicable *Rules* and/or the Test and Measurement Standards they reference. The *Rules* applied and the Test and Measurement Standards used during this evaluation appear in the Normative References section of this report. The limits set forth in the technical requirements of the applicable *Rules* were applied to the measurement results obtained during this evaluation and ,unless otherwise noted, these limits were used as the Pass/Fail criteria. The Pass/Fail statements made in this report apply to only the tests and measurements performed on only the *Equipment* tested during this evaluation. Where applicable and permissible, information including test and measurement data and/or results from previous evaluations of same or similar equipment, devices and/or accessories may be cited in this report.

As per FCC 47 CFR Part §2.1091 and §2.1093, an RF Exposure evaluation report is required for this *Equipment* and the results of the RF Exposure evaluation appear in this report.

The XL-x5-V/U, FCC ID: **OWDTR-0166-E** , IC ID: **3636B-0166**, is a dual band VHF/UHF Push-To-Talk (PTT), Licensed Mobile Radio Service (LMRS) transceiver intended for Occupational Use. This "host" employs WiFi and Bluetooth transceivers. The XL-x5-V/U is similar to the XG-75P (FCC ID: OWDTR-0074-E, IC ID: 3636B-0074) and XL-x5-7/8 (FCC ID: OWDTR-0162-E IC ID: 3636B-0162), which have been previously evaluated for SAR and the results of those previous evaluations were taken into consideration when developing the XL-x5-V/U SAR Test Plan. The XL-x5-V/U uses the same accessories as the XG-75P and XL-x5-V/U and these accessories and additional accessories were also taken into consideration and/or evaluated. The XL-x5-V/U form-factor, PCB and WiFi/BT transmitter are identical to the XL-x5-7/8 with the exception of LMR component values. SAR measurement data from the XL-x5-7/8 WiFi/BT transmitters have also been taken into consideration.

Application:

This is an application for a new device certification.

Scope:

The scope of this investigation is to evaluate the SAR for intended use applications. It will include an extensive evaluation of the LMR transmitter and all simultaneous transmission conditions that can occur with this host device. The analysis of the Standalone and Simultaneous Transmission SAR if found in Section 11.0 of this report.

The Test Plan developed for this evaluation is based on the required test channels and configurations which produced the highest worst case SAR and where applicable, SAR test reduction and/or SAR test exclusion may be utilized. The DUT was evaluated for SAR at the maximum tune up tolerance and conducted output power level, preset by the manufacturer and in accordance with the procedures described in IEC/IEEE 62209-1528, FCC KDB 447498 D01v06r02, 643646, 248227, and RSS 102.

4.0 NORMATIVE REFERENCES

Normative References*	
ANSI / ISO 17025:2017	General Requirements for competence of testing and calibration laboratories
FCC CFR Title 47 Part 2 Title 47: Part 2.1093:	Code of Federal Regulations Telecommunication Radiofrequency Radiation Exposure Evaluation: Portable Devices
Health Canada Safety Code 6 (2015)	Limits of Human Exposure to Radiofrequency Electromagnetic Energy in the Frequency Range from 3kHz to 300GHz
Industry Canada Spectrum Management & Telecommunications Policy RSS-102 Issue 5:	Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)
IEEE International Committee on Electromagnetic Safety IEC/IEEE 62209-1528	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 KDB 248227 D01v02r02	SAR Guidance for IEEE 802.11 (WiFi) Transmitters
FCC KDB KDB 447498 D01v06	Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies
FCC KDB KDB 643646 D01v01r03	SAR Test Reduction Considerations for Occupational PTT Radios
FCC KDB KDB 690783 D01v01r03	SAR Listings on Equipment Authorization Grants
FCC KDB KDB 865664 D01v01r04	SAR Measurement Requirements for 100MHz to 6GHz
* When the issue number or issue date is omitted, the latest version is assumed.	

5.0 STATEMENT OF COMPLIANCE

This measurement report demonstrates that samples of the product model(s) were evaluated for Specific Absorption Rate (SAR) on the date(s) shown, in accordance with the Measurement Procedures cited and were found to comply with the Standard(s) Applied based on the Exposure Limits of the Use Group indicated for which the product is intended to be used.

Applicant:	Model Name / PMN:	
Harris Corporation	XL-95P, XL-45P	
Standard(s) Applied:	**Measurement Procedure(s):**	
FCC 47 CFR §2.1093 Health Canada's Safety Code 6	FCC KDB 865664, FCC KDB 447498, FCC KDB 643646, FCC KDB 248227 Industry Canada RSS-102 Issue 5 IEC/IEEE 62209-1528	
Reason For Issue:	**Use Group:**	**Limits Applied:**
[X] New Certification [ ] Class I Permissive Change [ ] Class II Permissive Change	[ ] General Population / Uncontrolled [X] Occupational / Controlled	[ ] 1.6W/kg - 1g Volume [X] 8.0W/kg - 1g Volume [ ] 4.0W/kg - 10g Volume
Reason for Change:		**Date(s) Evaluated:**
Original Filing		26 August - 2 September, 2022

The results of this investigation are based solely on the test sample(s) provided by the applicant which was not adjusted, modified or altered in any manner whatsoever except as required to carry out specific tests or measurements. A description of the device, operating configuration, detailed summary of the test results, methodologies and procedures used during this evaluation, the equipment used and the various provisions of the rules are included in this test report.

I attest that the data reported herein is true and accurate within the tolerance of the Measurement Instrument Uncertainty; that all tests and measurements were performed in accordance with accepted practices or procedures; and that all tests and measurements were performed by me or by trained personnel under my direct supervision. The results of this investigation are based solely on the test sample(s) provided by the client which were not adjusted, modified or altered in any manner whatsoever, except as required to carry out specific tests or measurements. This test report has been completed in accordance with ISO/IEC 17025.

Art Voss, P.Eng.
Technical Manager
Celltech Labs Inc.

20 September 2022
Date

6.0 RF CONDUCTED POWER MEASUREMENT

Table 6.1 Conducted Power – VHF/UHF

Conducted Power Measurements							
Channel	Frequency (MHz)	Mode	Measured Power (dBm)	Rated Power (dBm)	Rated Power (W)	Delta (dBm)	SAR Test Channel (Y/N)
LMRS VHF	136.000	CW	37.99	38.20	6.61	-0.21	y
	138.000		37.94	38.20	6.61	-0.26	
	141.000		37.93	38.20	6.61	-0.27	
	144.000		37.88	38.20	6.61	-0.32	
	148.000		37.88	38.20	6.61	-0.32	
	150.000		37.91	38.20	6.61	-0.29	
	156.800		37.91	38.20	6.61	-0.29	
	162.000		37.88	38.20	6.61	-0.32	y
	174.000		37.83	38.20	6.61	-0.37	
LMRS UHF	378.000	CW	37.20	37.40	5.50	-0.20	y
	406.000		37.20	37.40	5.50	-0.20	y
	418.000		37.21	37.40	5.50	-0.19	y
	430.000		37.19	37.40	5.50	-0.21	y
	450.000		37.19	37.40	5.50	-0.21	y
	454.000		37.16	37.40	5.50	-0.24	y
	456.000		37.16	37.40	5.50	-0.24	y
	459.025		37.19	37.40	5.50	-0.21	y
	459.975		37.19	37.40	5.50	-0.21	y
	470.000		37.19	37.40	5.50	-0.21	y
	512.000		37.17	37.40	5.50	-0.23	y
	522.000		37.18	37.40	5.50	-0.22	y

SAR Test Reduction consideration in accordance with FCC KDB 643646 D01v01r03 1)

I) When the head SAR of an antenna tested in A) is:

a) ≤ 3.5 W/kg, testing of all other required channels is not necessary for that antenna

b) > 3.5 W/kg and ≤ 4.0 W/kg, testing of the required immediately adjacent channel(s) is not necessary; testing of the other required channels may still be required

c) > 4.0 W/kg and ≤ 6.0 W/kg, head SAR should be measured for that antenna on the required immediately adjacent channels; testing of the other required channels still needs consideration

d) > 6.0 W/kg, test all required channels for that antenna

e) for the remaining channels that cannot be excluded in b) and c), which still require consideration, the 3.5 W/kg exclusion in a) and 4.0 W/kg exclusion in b) may be applied recursively with respect to the highest output power channel among the remaining channels; measure the SAR for the remaining channels that cannot be excluded

i) if an immediately adjacent channel measured in c) or a remaining channel measured in e) is > 6.0 W/kg, test all required channels for that antenna

Table 6.2 Conducted Power – WiFi/BT

Conducted Power Measurements							
Channel	**Frequency** ***(MHz)***	**Mode**	**Measured Power** ***(dBm)***	**Rated Power*** ***(dBm)***	**Rated Power*** ***(W)***	**Delta** ***(dBm)***	**SAR Test Channel** ***(Y/N)***
WiFi	2412.000	802.11b 11Mbps	8.35	9.70	0.0093	-1.35	**y**
	2437.000		9.65	9.70	0.0093	-0.05	**y**
	2462.000		8.62	9.70	0.0093	-1.08	**y**
	2412.000	802.11g 24Mbps	8.46	9.70	0.0093	-1.24	
	2437.000		8.68	9.70	0.0093	-1.02	
	2462.000		9.45	9.70	0.0093	-0.25	
	2412.000	802.11n 19.5Mbps	8.15	9.70	0.0093	-1.55	
	2437.000		8.39	9.70	0.0093	-1.31	
	2462.000		8.50	9.70	0.0093	-1.20	
BT	2402.000	GFSK	2.54	2.54	0.0018	0.00	**y**
	2440.000		2.50	2.54	0.0018	-0.04	**y**
	2480.000		2.53	2.54	0.0018	-0.01	**y**
	2402.000	2-EDR	-1.09	2.54	0.0018	-3.63	
	2440.000		0.30	2.54	0.0018	-2.24	
	2480.000		0.86	2.54	0.0018	-1.68	
	2402.000	3-EDR	-0.48	2.54	0.0018	-3.02	
	2440.000		0.60	2.54	0.0018	-1.94	
	2480.000		1.19	2.54	0.0018	-1.35	
U-NII-1	5180.000	802.11a	6.22	6.80	0.0048	-0.58	**y**
	5220.000		5.99	6.80	0.0048	-0.81	**y**
	5260.000		5.39	6.80	0.0048	-1.41	**y**
U-NII-3	5745.000	802.11a	3.78	3.80	0.0024	-0.02	**y**
	5785.000		1.85	3.80	0.0024	-1.95	**y**
	5825.000		1.30	3.80	0.0024	-2.50	**y**

*Includes Tune-up Tolerance

7.0 NUMBER OF TEST CHANNELS (N_C)

The number of test channels and test configurations were determined in accordance with FCC KDB 447498, FCC KDB 643646 and FCC KDB 248227. When applicable, SAR Test Reduction was exercised in accordance with FCC KDB 643646 and FCC KDB 248227.

8.0 ACCESSORIES EVALUATED

Table 8.1 Manufacturer's Accessory List

Change History				
Change ID	Date	Change Type	Description of Change	Test Report Serial Number
1	21 Sep 2022	New Cert	Initial Filing	45461754

Manufacturer's Accessory List						
Test Report ID Number	Manufacturer's Part Number	Description	Change ID[1]	Type II Group[3]	SAR[4] Evaluated	SAR[5] Tested
Antenna						
T1	14035-4000-01	Antenna, 136-870MHz, Helical Flex	1		Y	Y
T2	KRE1011219/1	Antenna, 136-151MHz, Helical Coil	1		Y	Y
T3	KRE1011219/2	Antenna, 146-162MHz, Helical Coil	1		Y	Y
T4	KRE1011219/21	Antenna, 150-174MHz, Wide Band, Helical	1		Y	Y
T5	14035-4420-01	Antenna, Dual Band UHF/700/800MHz, Whip	1		Y	Y
T6	KRE1011219/9	Antenna, 378-403MHz, Helical Coil	1		Y	Y
T7	KRE1011219/10	Antenna, 378-440MHz, Helical Coil	1		Y	Y
T8	KRE1011219/12	Antenna, 440-494MHz, Helical Coil	1		Y	Y
T9	KRE1011219/14	Antenna, 470-512MHz, Helical Coil	1		Y	Y
T10	KRE1011223/10	Antenna, 378-430MHz, Quarter-w ave Whip	1		Y	Y
T11	KRE1011223/12	Antenna, 450-512MHz, Quarter-w ave Whip	1		Y	Y

Manufacturer's Accessory List						
Test Report ID Number	Manufacturer's Part Number	Description	Change ID[1]	Type II Group[3]	SAR[4] Evaluated	SAR[5] Tested
Battery						
P1	BT-023436-001	Battery,Li-Polymer,3600 mAH	1		Y	N
P2	14002-0199-01	BATTERY,AA CLAMSHELL	1		Y	N
P3	14002-0214-01	BATTERY, LI-ION,21WH	1		Y	Y
P4	14002-0214-02	BATTERY,LI-ION,15WH,SERPART,HAZLOC,UL	1		Y	N
P5	14002-0214-03	BATTERY, LI-ION,21WH	1		Y	Y
P6	14002-0214-04	BATTERY, LI-ION,21WH	1		Y	N

Manufacturer's Accessory List						
Test Report ID Number	Manufacturer's Part Number	Description	Change ID[1]	Type II Group[3]	SAR[4] Evaluated	SAR[5] Tested
		Audio Accessory				
A1	EA-009580-001	Earphone Kit, Black	1	Y	Y	N
A2	EA-009580-002	Earphone Kit, Beige	1	Y	Y	N
A3	EA-009580-003	2-Wire Kit, Palm mic, Black	1	Y	Y	N
A4	EA-009580-004	2-Wire Kit, Palm mic, Beige	1	Y	Y	N
A5	EA-009580-005	3-Wire Kit, Mini-Lapel Mic, Black	1	Y	Y	N
A6	EA-009580-006	3-Wire Kit, Mini-Lapel Mic, Beige	1	Y	Y	N
A7	EA-009580-007	Explorer Headset w / PTT	1	Y	Y	N
A8	EA-009580-008	Lightw eight headset single spkr w / PTT	1	Y	Y	N
A9	EA-009580-009	Breeze Headset w / PTT	1	Y	Y	N
A10	EA-009580-010	Headset, heavy duty, N/C behind the head, w / PTT	1	Y	Y	N
A11	EA-009580-011	Ranger Headset w / PTT	1	Y	Y	N
A12	EA-009580-012	Skull mic w /body PTT & earcup	1	Y	Y	N
A13	EA-009580-013	Headset, heavy duty, N/C over the head, w / PTT	1	Y	Y	N
A14	EA-009580-014	Throat mic w /acoustic tube & body PTT	1	Y	Y	N
A15	EA-009580-015	Throat mic w /acoustic tube, body PTT, & ring PTT	1	Y	Y	N
A16	EA-009580-016	Breeze headset w / PTT & pigtail jack	1	Y	Y	N
A17	EA-009580-017	Hurricane headset w / PTT	1	Y	Y	N
A18	EA-009580-018	Hurricane headset w / PTT & pigtail jack	1	Y	Y	N
A19	EA-009580-031	Tac4 Headset	1	Y	Y	N
A20	LS103239V2	Earphone for speaker/mic	1	Y	Y	N
A21	LS103239V1	Earphone for Speaker-Mic <IS>	1	Y	Y	N
A22	MC-009104-002	Speaker-Mic, GPS, non-IS	1	Y	Y	N
A23	MC-011617-601	Ruggedized Speaker Mic-Coil Cord	1	Y	Y	N
A24	MC-011617-611	Speaker-Microphone	1	Y	Y	N
A25	MC-011617-701	Standard Speaker Mic - Non Ant	1	Y	Y	N
A26	MC-011617-651	Rugged Speaker-Microphone w / man-dow n	1	Y	Y	N
A27	MC-023933-001	Speaker-Mic, No Ant. (cc), <IS>	1	Y	Y	N
A28	MC-023933-002	Speaker-Mic, W/ Ant. (cc) provision, <IS>	1	Y	Y	N
A29	12082-0660-02	Push-To-Talk Pushbutton for Hazardous Locations, 60mm, Nexus, Mushroom Top, 4Pin	1	Y	Y	N
A30	12082-0660-04	Push-To-Talk Pushbutton for Hazardous Locations, 60mm, Nexus, Flat Top, 4Pin	1	Y	Y	N
A31	12150-4001-03	Fire Speaker MIC	1	Y	Y	N
A32	12150-4001-04	Fire Speaker MIC	1	Y	Y	N
A50	MC-011617-730	Spkrmic,Antenna,Straight,30in	1	Y	Y	N
A51	MC-011617-703	Spkrmic,Straight Cord,25.6in,Antenna	1	Y	Y	N
A52	MC-011617-718	Spkrmic,Antenna,Straight,18in	1	Y	Y	N
A53	MC-011617-606	Spkrmic,Rugged,Coiled Cord,Yellow	1	Y	Y	Y
A54	MC-011617-602	Spkrmic,Rugged,Antenna,Straight,P7300	1	Y	Y	N
A55	12150-1000-03	SPKR MIC,PREMIUM,FIRE,XG FAMILY,BLK	1	Y	Y	N
A56	12150-1000-07	SPKR MIC,PREMIUM,FIRE,XG FAMILY,YLW	1	Y	Y	N
A57	12082-0800-02	MIC,WIRELESS,BLUETOOTH,ADVANCED,NA	1	Y	Y	N
A58	12082-0684-01	BLUETOOTH, COVERT, EARPIECE /MIC /PTT	1	Y	Y	N

Manufacturer's Accessory List					
Manufacturer's Part Number	Description	Change ID[1]	Type II Group[3]	SAR[4] Evaluated	SAR[5] Tested
Below Requires UDC to 6-pin Hirose Adapter					
14002-0197-02	UDC to 6-pin Hirose adapter	1	Y	Y	N
V1-10168	1 Wire Earphone Kit Black (Receive only no transmit)	1	Y	Y	N
V1-10167	1 Wire Earphone Kit Beige (Receive only no transmit)	1	Y	Y	N
V1-10166	2 Wire Palm Microphone Kit Black	1	Y	Y	N
V1-10165	2 Wire Palm Microphone Kit Beige	1	Y	Y	N
V1-10164	3 Wire Mini Lapel Microphone Kit Black	1	Y	Y	N
V1-10163	3 Wire Mini Lapel Microphone Kit Beige	1	Y	Y	N
V4-BA2MD1	Breeze, lightw eight, behind-the-head, single spkr w ith std PTT	1	Y	Y	N
V4-BA2MD3B	Breeze, lightw eight, behind-the-head, single spkr w /std. PTT & 2.5mm pigtail for PTT	1	Y	Y	N
V4-10190	Lightw eight Single Spkr Padded Headband w ith std PTT	1	Y	Y	N
V4-NR2MD1	Ranger Single Speaker behind-the-head w ith std PTT	1	Y	Y	N
V4-10148	Over-the-head Dual Speaker Heavy Duty w ith std PTT	1	Y	Y	N
V4-10148-S	Over-the-head Dual Speaker Heavy Duty w ith std PTT-IS/ATEX	1	Y	Y	N
V4-10001	Behind-the-Head Dual Speaker Heavy Duty w ith std PTT	1	Y	Y	N
V4-10001-S	Behind-the-Head Dual Speaker Heavy Duty w ith std PTT-IS/ATEX	1	Y	Y	N
V1-T12MD137	Professional Throat Mic w ith Acoustic Tube & 80mm PTT	1	Y	Y	N
V4-10279	Professional Skull Mic w ith Earcup, Aviation Quality & 80 MM PTT	1	Y	Y	N

Manufacturer's Accessory List						
Test Report ID Number	Manufacturer's Part Number	Description	Change ID[1]	Type II Group[3]	SAR[4] Evaluated	SAR[5] Tested
		Body-Worn Accessory				
B1	CC-014527	Belt Loop, Leather (BEE)	1	Y	Y	N
B2	CC23894	Metal Belt Clip	1	(6)	Y	Y
B3	KT-016201-001 (kit)	Kit containing: FM-016199-001 P7300 BEE Nylon case (Black) (with radio retaining strap) & CC-014527 BEE Leather Belt Loop	1	Y	Y	N
B4	KT-016201-002 (kit)	Kit contains: FM-016199-002 P7300 BEE Nylon case (Orange) (with radio retaining strap) & CC-014527 BEE Leather Belt Loop	1	Y	Y	N
B5	KT-016201-003 (kit)	Kit contains: FM-016199-003 P7300 BEE Leather Case (with radio retaining strap) w/o Shoulder Strap D-rings, KRY1011608/2 Swivel Mount & CC-014527 BEE Leather Belt Loop	1	Y	Y	N
B6	KT-016201-004 (kit)	Kit contains: FM-016199-004 P7300 BEE Leather Case with Shoulder Strap D-rings (with radio retaining strap), KRY1011608/2 Swivel Mount & CC-014524-001 BEE Shoulder Strap	1	Y	Y	N
B7	FM-017262-001	Swivel Mount	1	Y	Y	N
B8	14002-0187-09	Premium Leather Case Elastic Strap	1	Y	Y	N
B9	14002-0215-01	Premium Leather Case Kit containing: 14002-0187-01 Leather case, KRY1011609/1 Leather Belt Loop, FM-017262-001 D-swivel.	1	Y	Y	N
B10	14002-0215-02	Premium Shoulder Strap Leather Case Kit containing: 14002-0187-02 Leather case with D-rings, CC103333V1 Shoulder strap, FM-017262-001 D-swivel.	1	Y	Y	N
B11	14002-0215-03	Premium Black Nylon Case Kit containing: 14002-0187-03 black nylon case, KRY1011609/1 Leather Belt Loop.	1	Y	Y	N
B12	14002-0215-04	Premium Orange Nylon Case Kit containing: 14002-0187-04 orange nylon case, KRY1011609/1 Leather Belt Loop.	1	Y	Y	N
B13	14002-0217-01	Olive Drab Nylon Case	1	Y	Y	N
B14	14002-0218-01	BELT LOOP, LEATHER, PREMIUM	1	Y	Y	N
B15	14011-0012-01	Black Nylon Case with Belt Loop Kit (BEE)	1	Y	Y	N
B16	14011-0012-02	Orange Nylon Case with Belt Loop Kit (BEE)	1	Y	Y	N
B17	14011-0012-03	Leather Case with Belt Loop Kit (BEE)	1	Y	Y	N
B18	14011-0012-04	Leather Case with Shoulder Strap Kit (BEE)	1	Y	Y	N
B26	14002-0215-01	CASE,LEATHER,PREMIUM,XG75/25,BELT LOOP	1	Y	Y	N
B27	CC-014524-002	Strap,Stnd,Retaining,Use w/ Shlder Strap	1	Y	Y	N

Manufacturer's Accessory List						
Test Report ID Number	Manufacturer's Part Number	Description	Change ID[1]	Type II Group[3]	SAR[4] Evaluated	SAR[5] Tested
Merzon Combinations						
B19	KRY1011609/1 or 14002-0218-0	Leather Belt Loop	1	Y	Y	N
	FM-017262-001	Swivel Mount	1	Y	Y	N
B20	14011-0011-01	Nylon Case (Black)	1	Y	Y	N
	KRY1011609/1 or 14002-0218-0	Leather Belt Loop	1	Y	Y	N
B21	14011-0011-02	Nylon Case (Orange)	1	Y	Y	N
	KRY1011609/1 or 14002-0218-0	Leather Belt Loop	1	Y	Y	N
B22	14011-0011-03	Nylon Case	1	Y	Y	N
	KRY1011609/1 or 14002-0218-0	Leather Belt Loop	1	Y	Y	N
	FM-017262-001	Swivel Mount	1	Y	Y	N
B23	FM-016199-001	Nylon Case (Black)	1	Y	Y	N
	KRY1011609/1 or 14002-0218-0	Leather Belt Loop	1	Y	Y	N
B24	FM-016199-002	Nylon Case (Orange)	1	Y	Y	N
	KRY1011609/1 or 14002-0218-0	Leather Belt Loop	1	Y	Y	N
B25	FM-016199-003	Nylon Case	1	Y	Y	N
	KRY1011609/1 or 14002-0218-0	Leather Belt Loop	1	Y	Y	N
	FM-017262-001	Swivel Mount	1	Y	Y	N

(1) Change ID: Indicates the change number in which the accessory was added.
(3) Type II Group: "y" indicates that this accessory was evaluated with similar devices and found to have no significant contribution to the *reported SAR*
(4) SAR Evaluated: Indicates the accessory was visually evaluated and may or may not have tested.
(5) SAR Tested: Indicates the accessory was SAR tested during the course of this investigation.
(6) These accessories produced the highest SAR in previous evaluations.
(7) These antennas are similar physically, electrically and frequency response.

9.0 SAR MEASUREMENT SUMMARY

Table 9.1: Measured Results LMR VHF/UHF – BODY

Measured 1g SAR Results - BODY Configuration																
Date	Plot ID	Test Frequency (*MHz*)	DUT Configuration					Accessories				DUT Spacing		Measured SAR (*W/kg*)	50% SAR (W/kg)	SAR Drift (*dB*)
			Pos	Mode	BW	Mod	BR	Antenna ID	Battery ID	Body ID	Audio ID	DUT (*mm*)	Antenna (*mm*)			
26 Aug 2022	B1	418	Body Touch	UHF	HOPC	CW	HOPC	T1	P5	B2	A53	0	20	5.300	2.650	-0.870
28 Aug 2022	B4	418	Body Touch	UHF	HOPC	CW	HOPC	T1	P3	B2	A53	0	20	4.780	2.390	-0.710
29 Aug 2022	B5	418	Body Touch	UHF	HOPC	CW	HOPC	T5	P5	B2	A53	0	20	6.970	3.485	-0.120
29 Aug 2022	B6	430	Body Touch	UHF	HOPC	CW	HOPC	T5	P5	B2	A53	0	20	5.860	2.930	0.020
29 Aug 2022	B7	418	Body Touch	UHF	HOPC	CW	HOPC	T10	P5	B2	A53	0	20	6.470	3.235	-0.160
29 Aug 2022	B8	378	Body Touch	UHF	HOPC	CW	HOPC	T6	P5	B2	A53	0	20	1.570	0.785	-0.280
30 Aug 2022	B9	418	Body Touch	UHF	HOPC	CW	HOPC	T7	P5	B2	A53	0	20	5.350	2.675	-0.490
30 Aug 2022	B10	459.025	Body Touch	UHF	HOPC	CW	HOPC	T11	P5	B2	A53	0	20	8.860	**4.430**	-0.910
30 Aug 2022	B11	459.975	Body Touch	UHF	HOPC	CW	HOPC	T11	P5	B2	A53	0	20	7.450	3.725	-0.940
30 Aug 2022	B12	470	Body Touch	UHF	HOPC	CW	HOPC	T11	P5	B2	A53	0	20	7.930	3.965	-1.110
30 Aug 2022	B13	450	Body Touch	UHF	HOPC	CW	HOPC	T11	P5	B2	A53	0	20	6.580	3.290	-0.930
30 Aug 2022	B14	512	Body Touch	UHF	HOPC	CW	HOPC	T11	P5	B2	A53	0	20	6.840	3.420	-0.210
30 Aug 2022	B15	459.025	Body Touch	UHF	HOPC	CW	HOPC	T8	P5	B2	A53	0	20	4.460	2.230	-1.840
30 Aug 2022	B16	470	Body Touch	UHF	HOPC	CW	HOPC	T9	P5	B2	A53	0	20	9.670	**4.835**	-0.150
30 Aug 2022	B17	512	Body Touch	UHF	HOPC	CW	HOPC	T9	P5	B2	A53	0	20	8.100	4.050	-0.550
1 Sep 2022	B20	136	Body Touch	VHF	HOPC	CW	HOPC	T1	P5	B2	A53	0	20	1.680	0.840	-0.230
1 Sep 2022	B21	136	Body Touch	VHF	HOPC	CW	HOPC	T1	P3	B2	A53	0	20	2.170	1.085	0.260
2 Sep 2022	B22	156.8	Body Touch	VHF	HOPC	CW	HOPC	T4	P3	B2	A53	0	20	3.070	1.535	-0.160
2 Sep 2022	B23	156.8	Body Touch	VHF	HOPC	CW	HOPC	T3	P3	B2	A53	0	20	1.740	0.870	-0.160
2 Sep 2022	B24	136	Body Touch	VHF	HOPC	CW	HOPC	T2	P3	B2	A53	0	20	2.530	1.265	-0.620
Applicable SAR Limit								Use Group						Limit		
FCC CFR 2.1093			Health Canada Safety Code 6					Occupational/User Aware						8 W/kg		

Note: Plot B16 had the highest measured SAR however Plot B10 produced the highest *reported* SAR.

Table 9.2: Measured Results WLAN 2.4G & BT Band – BODY

From Previous Evaluation of XL-x5-7/8

Measured SAR Results (1g) - BODY Configuration (FCC/ISED)															
Date	Plot ID	DUT		Test Frequency (MHz)	Modulation	Accessories				DUT Spacing		Conducted Power (dBm)	Measured SAR (1g)		SAR Drift (dB)
		M/N	Type			Antenna ID	Battery ID	Body ID	Audio ID	DUT (mm)	Antenna (mm)		100% DC (W/kg)	50% DC (W/kg)	
19 Jan 2021	B1	XL-95	PTT	2412	DSSS 6Mbps	T2	P1	B2	A53	0		8.35	0.000	[redacted]	0.000
19 Jan 2021	B2	XL-95	PTT	2437	DSSS 6Mbps	T2	P1	B2	A53	0		9.65	0.000		0.000
19 Jan 2021	B3	XL-95	PTT	2462	DSSS 6Mbps	T2	P1	B2	A53	0		8.62	0.000		0.000
19 Jan 2021	B4	XL-95	PTT	2437	HT20 MCS12	T2	P1	B2	A53	0		8.39	0.000		0.000
19 Jan 2021	B5	XL-95	PTT	2437	DSSS 6Mbps	T2	P1	n/a	A53	0		9.65	0.000		0.000
19 Jan 2021	B6	XL-95	PTT	2402	GFSK	T2	P1	B2	A53	0		2.54	0.001		0.000
SAR Limit							Spatial Peak			Head/Body		RF Exposure Category			
FCC 47 CFR 2.1093				Health Canada Safety Code 6			1 Gram Average			1.6 W/kg		General Population/User Unaware			

Table 9.3: Measured Results WLAN 5G Band – BODY

From Previous Evaluation of XL-x5-7/8

Measured SAR Results (1g) - BODY Configuration (FCC/ISED)															
Date	Plot ID	DUT		Test Frequency (MHz)	Modulation	Accessories				DUT Spacing		Conducted Power (dBm)	Measured SAR (1g)		SAR Drift (dB)
		M/N	Type			Antenna ID	Battery ID	Body ID	Audio ID	DUT (mm)	Antenna (mm)		100% DC (W/kg)	50% DC (W/kg)	
21 Jan 2021	B1	XL-95	PTT	5220	OFDM 6Mbps	T2	P1	B2	A53	0		5.99	0.000	[redacted]	0.000
21 Jan 2021	B1	XL-95	PTT	5785	OFDM 6Mbps	T2	P1	B2	A53	0		1.85	0.000		0.000
21 Jan 2021	B3	XL-95	PTT	5745	OFDM 6Mbps	T2	P1	B2	A53	0		3.78	0.000		0.000
SAR Limit							Spatial Peak			Head/Body		RF Exposure Category			
FCC 47 CFR 2.1093				Health Canada Safety Code 6			1 Gram Average			1.6 W/kg		General Population/User Unaware			

Table 9.4: Measured Results LMR VHF/UHF – FACE

Measured 1g SAR Results - FACE Configuration																
Date	Plot ID	Test Frequency (*MHz*)	DUT Configuration					Accessories				DUT Spacing		Measured SAR (*W/kg*)	50% SAR (W/kg)	SAR Drift (*dB*)
			Pos	Mode	BW	Mod	BR	Antenna ID	Battery ID	Body ID	Audio ID	DUT (*mm*)	Antenna (*mm*)			
28 Aug 2022	F1	418	Face	UHF	HOPC	CW	HOPC	T1	P5	B2	A53	25	65	2.930	1.465	-0.660
28 Aug 2022	F3	418	Face	UHF	HOPC	CW	HOPC	T1	P3	B2	A53	25	65	2.370	1.185	-0.770
29 Aug 2022	F4	418	Face	UHF	HOPC	CW	HOPC	T5	P5	B2	A53	25	65	3.290	1.645	-0.250
29 Aug 2022	F5	418	Face	UHF	HOPC	CW	HOPC	T10	P5	B2	A53	25	65	3.010	1.505	-0.510
29 Aug 2022	F6	378	Face	UHF	HOPC	CW	HOPC	T6	P5	B2	A53	25	65	0.923	0.462	-0.890
30 Aug 2022	F7	418	Face	UHF	HOPC	CW	HOPC	T7	P5	B2	A53	25	65	3.420	1.710	-0.180
30 Aug 2022	F8	459.025	Face	UHF	HOPC	CW	HOPC	T11	P5	B2	A53	25	65	2.850	1.425	-0.960
30 Aug 2022	F9	459.025	Face	UHF	HOPC	CW	HOPC	T8	P3	B2	A53	25	65	2.750	1.375	-0.910
30 Aug 2022	F10	470	Face	UHF	HOPC	CW	HOPC	T9	P5	B2	A53	25	65	5.620	2.810	-0.280
1 Sep 2022	F20	136	Face	VHF	HOPC	CW	HOPC	T1	P5	B2	A53	25	65	1.550	0.775	-1.670
1 Sep 2022	F21	136	Face	VHF	HOPC	CW	HOPC	T1	P3	B2	A53	25	65	1.500	0.750	2.720
2 Sep 2022	F22	156.8	Face	VHF	HOPC	CW	HOPC	T4	P5	B2	A53	25	65	2.890	1.445	-0.160
2 Sep 2022	F23	156.8	Face	VHF	HOPC	CW	HOPC	T3	P5	B2	A53	25	65	2.780	1.390	-0.110
2 Sep 2022	F24	136	Face	VHF	HOPC	CW	HOPC	T2	P5	B2	A1	25	65	0.274	0.137	-1.210
Applicable SAR Limit								Use Group						Limit		
FCC CFR 2.1093			Health Canada Safety Code 6					Occupational/User Aware						8 W/kg		

Table 9.5: Measured Results WLAN 2.4G & BT Band – FACE

From Previous Evaluation of XL-x5-7/8

Measured SAR Results (1g) - FACE Configuration (FCC/ISED)															
Date	Plot ID	DUT		Test Frequency (MHz)	Modulation	Accessories				DUT Spacing		Conducted Power (dBm)	Measured SAR (1g)		SAR Drift (dB)
		M/N	Type			Antenna ID	Battery ID	Body ID	Audio ID	DUT (mm)	Antenna (mm)		100% DC (W/kg)	50% DC (W/kg)	
19 Jan 2021	F1	XL-95	PTT	2437	DSSS 6Mbps	T2	P1	n/a	n/a	25		9.65	0.000	[redacted]	0.000
19 Jan 2021	F2*	XL-95	PTT	2437	DSSS 6Mbps	T2	P1	n/a	n/a	0		9.65	0.010		0.000
19 Jan 2021	F3	XL-95	PTT	2402	GFSK	T2	P1	n/a	n/a	25		2.54	0.000		0.000
19 Jan 2021	F4*	XL-95	PTT	2402	GFSK	T2	P1	n/a	n/a	0		2.54	0.004		0.000
SAR Limit							Spatial Peak			Head/Body		RF Exposure Category			
FCC 47 CFR 2.1093				Health Canada Safety Code 6			1 Gram Average			1.6 W/kg		General Population/User Unaware			

Table 9.6: Measured Results WLAN 5G Band – FACE

From Previous Evaluation of XL-x5-7/8

Measured SAR Results (1g) - FACE Configuration (FCC/ISED)															
Date	Plot ID	DUT		Test Frequency (MHz)	Modulation	Accessories				DUT Spacing		Conducted Power (dBm)	Measured SAR (1g)		SAR Drift (dB)
		M/N	Type			Antenna ID	Battery ID	Body ID	Audio ID	DUT (mm)	Antenna (mm)		100% DC (W/kg)	50% DC (W/kg)	
20 Jan 2021	F1*	XL-95	PTT	5220	OFDM 6Mbps	T2	P1	n/a	n/a	0		5.99	0.166	[redacted]	0.000
20 Jan 2021	F2	XL-95	PTT	5220	OFDM 6Mbps	T2	P1	n/a	n/a	25		5.99	0.013		0.000
21 Jan 2021	F3	XL-95	PTT	5180	OFDM 6Mbps	T2	P1	n/a	n/a	25		6.22	0.017		0.000
21 Jan 2021	F5*	XL-95	PTT	5180	OFDM 6Mbps	T2	P1	n/a	n/a	0		6.22	0.145		0.000
21 Jan 2021	F1*	XL-95	PTT	5785	OFDM 6Mbps	T2	P1	n/a	n/a	0		1.85	0.069		0.000
21 Jan 2021	F2	XL-95	PTT	5785	OFDM 6Mbps	T2	P1	n/a	n/a	25		1.85	0.016		0.000
21 Jan 2021	F3	XL-95	PTT	5745	OFDM 6Mbps	T2	P1	n/a	n/a	25		3.78	0.018		0.000
21 Jan 2021	F4	XL-95	PTT	5825	OFDM 6Mbps	T2	P1	n/a	n/a	25		1.30	0.001		0.000
21 Jan 2021	F5*	XL-95	PTT	5745	OFDM 6Mbps	T2	P1	n/a	n/a	0		3.78	0.084		0.000
SAR Limit							Spatial Peak			Head/Body		RF Exposure Category			
FCC 47 CFR 2.1093				Health Canada Safety Code 6			1 Gram Average			1.6 W/kg		General Population/User Unaware			

* Due to the low conducted power and the extremely low SAR, these measurements were made with a 0mm separation as verification of DUT operation. Since this was an exceptional test configuration, these measurement values will not be used as the *reported* SAR.

10.0 SCALING OF MAXIMUM MEASURE SAR

Table 10.1 SAR Scaling – LMR

Scaling of Maximum Measured SAR (1g)					
Measured Parameters		Configuration			
		Body	Face		
Plot ID		B10	F10		
Maximum Measured SAR_M		4.430	2.810		(W/kg)
Frequency		459.025	470		(MHz)
Drift	Power Drift	-0.910	-0.280		(dB)
Conducted Power		37.190	37.190		(dBm)
DC	Transmit Duty Cycle	100.000	100.0		(%)
Fluid Deviation from Target					
Δe	Permitivity	7.10%	7.10%		
Δσ	Conductivity	1.15%	3.45%		

Fluid Sensitivity Calculation (1g)			IEC 62209-2 Annex F		
Delta SAR = Ce * Δe + Cσ * Δσ					(F.1)
$Ce = (-0.0007854*f^3) + (0.009402*f^2) - (0.02742*f) - 0.2026$					(F.2)
$C\sigma = (0.009804*f^3) - (0.08661*f^2) + (0.02981*f) + 0.7829$					(F.3)
f	Frequency (GHz)	0.459025	0.47		
Ce		-0.213	-0.213		
Cσ		0.779	0.779		
Ce * Δe		-0.015	-0.015		
Cσ * Δσ		0.009	0.027		
ΔSAR		-0.006	0.012 (3)		(%)

Note(3): Delta SAR is Positive, SAR Adjustment for Fluid Sensitivity is not Required, in accordance with ISED Notice 2012-DRS0529

Manufacturer's Tuneup Tolerance				
Measured Conducted Power	37.190	37.190		(dBm)
Rated Conducted Power	37.400	37.400		(dBm)
ΔP	-0.210	-0.210		(dB)

Note(4): SAR was Evaluated at the Maximum Tuneup Tolerance. SAR Adjustment is not Required.

Crest Factor				
Transmit Duty Cycle (DC)	100.000	100.0		(%)
CF (1/DC)	1.000 (5)	1.00 (5)		

Note(5): Crest Factor = 1 (100% Duty Cycle), Crest Factor Adjustment not Required.

Table 10.1 SAR Scaling – LMR (Cont.)

Scaling of Maximum Measured SAR (1g)				
Measured Parameters	Configuration			
	Body	Face		
Plot ID	B10	F10		
Maximum Measured SAR_M	4.430	2.810		(W/kg)
Frequency	459.025	470		(MHz)
SAR Adjustment for Fluid Sensitivity				
$SAR_1 = SAR_M$ X [ΔSAR]	4.457	2.810		(W/kg)
SAR Adjustment for Tuneup Tolerance				
$SAR_2 = SAR_1$ + [ΔP]	4.678	2.949		(W/kg)
SAR Adjustment for Drift				
$SAR_3 = SAR_2$ + [Drift]	5.769	3.146		(W/kg)
SAR Adjustment for Crest Factor				
$SAR_4 = SAR_3$ x [CF]	5.769	3.146		(W/kg)
***reported* 1g SAR**				
SAR_4	**5.77**	**3.15**		(W/kg)

NOTES to Table
(1) Scaling of the Maximum Measured SAR is based on the highest, 100% duty cycle, Face, Body and/or Head SAR measured of ALL test channels, configurations and accessories used during THIS evaluation. The Measured Fluid Deviation parameters apply only to deviation of the tissue equivalent fluids used at the frequencies which produced the highest measured SAR. The Measured Conducted Power applies to the Conducted Power measured at the frequencies producing the highest Face, Body and/or Head SAR. The Measured Drift is the SAR drift associated with that specific SAR measurement. The Reported SAR is the accumulation of all SAR Adjustments from the applicable Steps 1 through 3. The Plot ID is for indentification of the SAR Measurement Plots in the Annexes of this report. NOTE: Some of the scaling factors in Steps 1 through 3 may not apply and are identified by grayed fields.
Step 1
Per IEC-62209-1 and FCC KDB 865664. Scaling required only when Measured Fluid Deviation is greater than 5%. If the Measured Fluid Deviation is greater than 5%, Table 10.1 will be shown and will indicate the SAR scaling factor in percent (%). SAR is MULTIPLIED by this scaling factor only when the scaling factor is positive (+).
Step 2
Per KDB 447498. Scaling required only when the difference (Delta) between the Measured Conducted Power and the Manufacturer's Rated Conducted Power is (-) Negative. The absolute value of Delta is ADDED to the SAR.
Step 3
Per IEC 62209-1. Scaling required only when Measured Drift is (-) Negative. The absolute value of Measured Drift is added to Reported.
Step 4
The Reported SAR is the Maximum Final Adjusted SAR from the applicable Steps 1 through 3 and are reported on Page 1 of this report.

11.0 ANALYSIS OF SIMULTANEOUS TRANSMISSION

Simultaneous Transmission Analysis

The XL-95P employs Wi-Fi and BlueTooth capable of simultaneously transmitting with the LMR transmitter. The Wi-Fi and BlueTooth transmitters share the same antenna and the transmissions are interleaved such that only one transmitter is transmitting at a time. As per FCC KDB 447498, simultaneous transmission analysis is required for devices capable of simultaneous transmission. The Wi-Fi and BT SAR are subject to General Population limits of 1.6W/kg. The LMR SAR is subject to Occupational limits of 8.0W/kg. To determine Simultaneous Transmission SAR Test Exclusion when different SAR limits are applied to the different transmit modes, the Sum-of-the-Ratios of the SAR to the respective SAR limit is applied. When the Sum-of-the-Ratios is ≤ 1.0, Simultaneous Transmission SAR Test Exclusion may be applied.

When the Sum-of-the-Ratios exceeds 1.0, the SAR to Peak Location Separation Ration (SPLSR) may be used to determine simultaneous transmission SAR test exclusion. However, the equation for determining this exclusion applies to General Population limits only. Reference Operation Description Part 2. When mixed Occupational and General Population exposure limits are used, the SAR of the Occupational configuration is normalize to the General Population limit. For example if $SAR_{Occupational}$ = 6.4W/kg and SAR_{GenPop} = 0.65W/kg, normalizing the Occupational SAR to General Population limits yields $SAR_{OccNorm}$ = 1.28W/kg. The SPLSR equation of KDB 447498 4.3.2 c) becomes

$$(SAR_1 + SAR_2)^{1.5}/R_i \leq 0.04 = (SAR_{OccNorm} + SAR_{GenPop})^{1.5}/R_i = (1.28 + 0.65)^{1.5}/R_i \leq 0.04$$

SAR for each transmission band, transmission mode and/or equipment class was evaluated with Body-Worn and Audio Accessories in the BODY configuration and with no Accessories in the HEAD configurations. The DUT was configured with the maximum Transmit Time Invertal (TTI) at 100% trasmit duty cycle. Only the Maximum *reported* SAR for BODY and HEAD configuration is used in the Sum-of-the-Ratios or SPLSR calculation and the worst case of all possible combinations is considered.

Table 11.1 List of Possible Transmitters

List of Possible Transmitters				
Type	Class	Frequency Range		Rated Output Power (dBm)
		Lower (MHz)	Upper (MHz)	
LMR VHF	TNF	136.0	174.0	37.80
LMR UHF		378.0	522.0	37.00
BlueTooth	DSS	2402.0	2480.0	2.04
WiFi 2.4	DTS	2412.0	2462.0	9.20
WiFi 5	NII	5150.0	5240.0	11.76
WiFi 5	NII	5745.0	5825.0	4.77

Table 11.2 List of Possible Transmitters Combinations

Simultaneous Transmitter Combinations				
Configuration Number	Transmitter			
	LMR 7/800	BlueTooth	WiFi 2.4	WiFi 5
1	X	X		
2	X		X	
3	X			X

Indicates this configuration is not supported

Table 11.3 Analysis of Sum-of-the-Ratios

Analysis of Sum-of-the-Ratios
For All Transmitters and Configurations

Configuration Number	Configuration	Transmitter Type								Sum of Ratios	Sum of SARs
		LMR Band		BlueTooth		WiFi 2.4		WiFi 5			
		stand-alone SAR (W/kg)	Ratio to Limit	*stand-alone* SAR (W/kg)	Ratio to Limit	*stand-alone* SAR (W/kg)	Ratio to Limit	*stand-alone* SAR (W/kg)	Ratio to Limit		
		SAR Limit = 8.0W/kg (Occupational)		*SAR Limit = 1.6W/kg (General Population)*							*(W/kg)*
1	BODY	5.770	0.721	0.004	0.003					0.724	**5.774**
2						0.000	0.000			0.721	5.770
3								0.000	0.000	0.721	5.770
1	HEAD	3.150	0.394	0.001	0.001					0.394	3.151
2						0.010	0.006			0.400	3.160
3								0.018	0.011	0.405	**3.168**

Indicates this combination is not supported

Simultaneous Transmission SAR Test Exclusion may be determined by applying the Sum-of-the-Ratios for the worst-case combinations of all simultaneously transmitting transmitters. From the above table, none of the stand-alone transmitters exceed their respective limit. Additionally, the Sum-of-the-Ratios for the worst-case combinations of the transmitters with General Population limits do not exceed 1.0.

12.0 SAR EXPOSURE LIMITS

Table 12.1 Exposure Limits

SAR RF EXPOSURE LIMITS			
FCC 47 CFR§2.1093	**Health Canada Safety Code 6**	**General Population / Uncontrolled Exposure(4)**	**Occupational / Controlled Exposure(5)**
Spatial Average(1) (averaged over the whole body)		0.08 W/kg	0.4 W/kg
Spatial Peak(2) (Head and Trunk averaged over any 1 g of tissue)		1.6 W/kg	**8.0 W/kg**
Spatial Peak(3) (Hands/Wrists/Feet/Ankles averaged over 10 g)		4.0 W/kg	20.0 W/kg
(1) The Spatial Average value of the SAR averaged over the whole body.			
(2) The Spatial Peak value of the SAR averaged over any 1 gram of tissue, defined as a tissue volume in the shape of a cube and over the appropriate averaging time.			
(3) The Spatial Peak value of the SAR averaged over any 10 grams of tissue, defined as a tissue volume in the shape of a cube and over the appropriate averaging time.			
(4) Uncontrolled environments are defined as locations where there is potential exposure to individuals who have no knowledge or control of their potential exposure.			
(5) Controlled environments are defined as locations where there is potential exposure to individuals who have knowledge of their potential exposure and can exercise control over their exposure.			

13.0 DETAILS OF SAR EVALUATION

Table 13.1 Day Log

DAY LOG								
Date	Ambient Temp (°C)	Fluid Temp (°C)	Relative Humidity (%)	Barometric Pressure (kPa)	Fluid Dielectric	SPC	Test	TSL
26 Aug 2022	25.2	24.7	41%	100.4	X	X	X	450H
27 Aug 2022	22.2	20.2	41%	101.1			X	450H
28 Aug 2022	19.4	18.6	42%	101.5			X	450H
29 Aug 2022	22.2	23.2	42%	101.5	X	X	X	450H
30 Aug 2022	19.4	18.6	42%	101.5			X	450H
1 Sep 2022	23.0	22.5	42%	101.6	X	X	X	150H
2 Sep 2022	23.5	23.6	30%	101.0			X	150H

Table 13.2 DUT Positioning

DUT Positioning
Positioning
The DUT Positioner was securely fastened to the Phantom Platform. Registration marks were placed on the DUT and the Positioner to ensure consistent positioning of the DUT for each test evaluation.
FACE Configuration
The DUT was securely clamped into the device holder with the surface of the DUT normally held to the user's face facing the phantom. The device holder was adjusted to ensure that the horizontal axis of the DUT was parallel to the bottom of the phantom. A 25mm spacer block was used to set the separation distance between the DUT and the phantom to 25mm. When applicable and unless by design, the antenna of the DUT was prevented from sagging away from the phantom. The spacer block was removed before testing.
BODY Configuration
Body-Worn and Audio Accessories were affixed to the DUT in the manner in which they are intended to be used. The DUT, with its accessories, were securely clamped into the device holder with the surface of the DUT normally in contact with the body in direct contact with the bottom of the phantom, or 0mm separation from the DUT's accessory to the phantom. Body-Worn Accessory straps, linkages, etc. were positioned in a fashion resembling that for which they were intended to be used. Audio Accessory cables, etc., were positioned in a fashion resembling that for which they were intended to be used.
HEAD Configuration
This device is not intended to be held to the ear and was not tested in the HEAD configuration.

Table 13.3 General Procedures and Report

General Procedures and Reporting
General Procedures
The fluid dielectric parameters of the Active Tissue Simulating Liquid (TSL) were measured as described in this Section, recorded and entered into the DASY Measurement Server. Active meaning the TSL used during the SAR evaluation of the DUT. The temperature of the Active TSL was measured and recorded prior to performing a System Performance Check (SPC). An SPC was performed with the Active TSL prior to the start of the test series. The temperature of the Active TSL was measured throughout the day and the Active TSL temperature was maintained to ± 0.5°C. The Active TSL temperature was maintained to within ±1.0°C throughout the test series. TSL analysis and SPC were repeated when the Active TSL use exceeded 84 hours. An Area Scan exceeding the length and width of the DUT projection was performed and the locations of all maximas within 2dB of the Peak SAR recorded. A Zoom Scan centered over the Peak SAR location(s) was performed and the 1g and 10g SAR values recorded. The resolutions of the Area Scan and Zoom Scan are described in the Scan Resolution table(s) in this Section. A Power Reference Measurement was taken at the phantom reference point immediately prior to the Area Scan. A Power Drift measurement was taken at the phantom reference point immediately following the Zoom Scan to determine the power drift. A Z-Scan from the *Maximum Distance to Phantom Surface* to the fluid surface was performed following the power drift measurement.
Reporting
The 1g SAR, 10g SAR and power drift measurements are recorded in the SAR Measurement Summary tables in the SAR Measurement Summary Section of this report. The SAR values shown in the 100% DC (Duty Cycle) column are the SAR values reported by the SAR Measurement Server with the DUT operating at 100% transmit duty cycle. The SAR values in the 50% DC column have been scaled by 50% for 50% Push-To-Talk duty cycle compensation. These tables also include other information such as transmit channel and frequency, modulation, accessories tested and DUT-phantom separation distance. In the Scaling of Maximum Measured SAR Section of this report, the highest measured SAR in the BODY and FACE configurations, within the entire scope of this assessment, are, when applicable, scaled for Fluid Sensitivity, Manufacturer's Tune-Up Tolerance, Simultaneous Transmission and Drift. With the exception of Duty Cycle correction/compensation, SAR values are ONLY scaled up, not down. The final results of this scaling is the *reported SAR* which appears on the Cover Page of this report.

Table 13.4 Fluid Dielectric and Systems Performance Check

Fluid Dielectric and Systems Performance Check
Fluid Dielectric Measurement Procedure
The fluid dielectric parameters of the Tissue Simulating Liquid (TSL) are measured using the Open-Ended Coax Method connected to an Agilent 8753ET Network Analyzer connected to a measurement server running Aprel Dielectric Property Measurement System. A frequency range of ± 100MHz for frequencies > 300MHz and ± 50MHz for frequencies ≤ 300MHz with frequency step size of 10MHz is used. The center frequency is centered around the SAR measurement probe's calibration point for that TSL frequency range. A calibration of the setup is performed using a short-open-deionized water (at 23°C in a 300ml beaker) method. A sample of the TSL is placed in a 300ml beaker and the open-ended coax is submerged approximately 8mm below the fluid surface in the approximate center of the beaker. A check of the setup is made to ensure no air is trapped under the open-ended coax. The sample of TSL is measured and compared to the FCC OET Bulletin 65 Supplement C targets for HEAD or BODY for the entire fluid measurement range. Fluid adjustment are made if the dielectric parameters are > 5% in range that the DUT is to be tested. If the adjustments fail to bring the parameters to ≤ 5% but are < 10%, the SAR Fluid Sensitivity as per IEC 62201-1 and FCC KDB 865664 are applied to the highest measured SAR. A TSL with dielectric parameters > 10% in the DUT test frequency range are not used.
Systems Performance Check
The fluid dielectric parameters of the Active TSL are entered into the DASY Measurement Server at each of the 10MHz step size intervals. Active meaning the TSL used during the SAR evaluation of the DUT. The DASY Measurement System will automatically interpolate the dielectric parameters for DUT test frequencies that fall between the 10MHz step intervals. A Systems Performance Check (SPC) is performed in accordance with IEEE 1528 "System Check" and FCC KDB 865664 "System Verification". A validation source, dipole or Confined Loop Antenna (CLA), is placed under the geometric center of the phantom and separated from the phantom in accordance to the validation source's Calibration Certificate data. A CW signal set to the frequency of the validate source's and SAR measurement probe's calibration frequency with a forward power set to the validation source's Calibration Certificate data power setting is applied to the validation source. An Area Scan is centered over the projection of the validation source's feed point and an Area Scan is taken. A Zoom Scan centered over the Peak SAR measurement of the Area Scan and the 1g and 10g SAR is measured. The measured 1g and 10g SAR is compared to the 1g and 10g SAR measurements from the validation source's Calibration Certificate. When required, the measured SAR is normalized to 1.0W and compared to the normalized SAR indicated on the validation source's Calibration Certificate. The SPC is considered valid when the measured and normalized SAR is ≤ 10% of the measured and normalize SAR of the validation source's Calibration Certificate. The fluid dielectric parameters of the Active TSL and SPC are repeated when the Active TSL has been in use for greater than 84 hours or if the Active TSL temperature has exceed ± 1°C of the initial fluid analysis.

Table 13.5 Scan Resolution 100MHz to 2GHz

Scan Resolution 100MHz to 2GHz	
Maximum distance from the closest measurement point to phantom surface: (Geometric Center of Probe Center)	**4 ± 1 mm**
Maximum probe angle normal to phantom surface. (Flat Section ELI Phantom)	**5° ± 1°**
Area Scan Spatial Resolution ΔX, ΔY	**15 mm**
Zoom Scan Spatial Resolution ΔX, ΔY	**7.5 mm**
Zoom Scan Spatial Resolution ΔZ (Uniform Grid)	**5 mm**
Zoom Scan Volume X, Y, Z	**30 mm**
Phantom	**ELI**
Fluid Depth	**150 ± 5 mm**
An Area Scan with an area extending beyond the device was used to locate the candidate maximas within 2dB of the global maxima.	
A Zoom Scan centered over the peak SAR location(s) determined by the Area Scan was used to determine the 1-gram and 10-gram peak spatial-average SAR	

Table 13.6 Scan Resolution 2GHz to 3GHz

Scan Resolution 2GHz to 3GHz	
Maximum distance from the closest measurement point to phantom surface: (Geometric Center of Probe Center)	**4 ± 1 mm**
Maximum probe angle normal to phantom surface. (Flat Section ELI Phantom)	**5° ± 1°**
Area Scan Spatial Resolution ΔX, ΔY	**12 mm**
Zoom Scan Spatial Resolution ΔX, ΔY	**5 mm**
Zoom Scan Spatial Resolution ΔZ (Uniform Grid)	**5 mm**
Zoom Scan Volume X, Y, Z	**30 mm**
Phantom	**ELI**
Fluid Depth	**150 ± 5 mm**
An Area Scan with an area extending beyond the device was used to locate the candidate maximas within 2dB of the global maxima.	
A Zoom Scan centered over the peak SAR location(s) determined by the Area Scan was used to determine the 1-gram and 10-gram peak spatial-average SAR	

Table 13.7 Scan Resolution 5GHz to 6GHz

Scan Resolution 5GHz to 6GHz	
Maximum distance from the closest measurement point to phantom surface: (Geometric Center of Probe Center)	**4 ± 1 mm**
Maximum probe angle normal to phantom surface. (Flat Section ELI Phantom)	**5° ± 1°**
Area Scan Spatial Resolution ΔX, ΔY	**10 mm**
Zoom Scan Spatial Resolution ΔX, ΔY	**4 mm**
Zoom Scan Spatial Resolution ΔZ (Uniform Grid)	**2 mm**
Zoom Scan Volume X, Y, Z	**22 mm**
Phantom	**ELI**
Fluid Depth	**100 ± 5 mm**
An Area Scan with an area extending beyond the device was used to locate the candidate maximas within 2dB of the global maxima.	
A Zoom Scan centered over the peak SAR location(s) determined by the Area Scan was used to determine the 1-gram and 10-gram peak spatial-average SAR	

14.0 MEASUREMENT UNCERTAINTIES

Table 14.1 Measurement Uncertainty

IEEE 1528 Table E.9

UNCERTAINTY BUDGET FOR DEVICE EVALUATION (IEEE 1528-2013 Table 9)

Source of Uncertainty	IEEE 1528 Section	Toler ±%	Prob Dist	Div	Div	c_i	c_i	Stand Unct ±%	Stand Unct ±%	V_i or V_{eff}
Measurement System						(1g)	(10g)	(1g)	(10g)	
EX3DV4 Probe Calibration** (*k*=1)	E.2.1	6.7	N	1.00	1	1	1	**6.7**	**6.7**	∞
Axial Isotropy** (*k*=1)	E.2.2	0.6	R	1.73	√3	0.7	0.7	**0.2**	**0.2**	∞
Hemispherical Isotropy** (*k*=1)	E.2.2	3.2	R	1.73	√3	0.7	0.7	**1.3**	**1.3**	∞
Boundary Effect*	E.2.3	1.0	R	1.73	√3	1	1	0.6	0.6	∞
Linearity** (*k*=1)	E.2.4	**0.5**	R	1.73	√3	1	1	**0.3**	**0.3**	∞
System Detection Limits*	E.2.4	1.0	R	1.73	√3	1	1	0.6	0.6	∞
Modulation Response** (*k*=1)	E.2.5	**8.3**	R	1.73	√3	1	1	**4.8**	**4.8**	∞
Readout Electronics*	E.2.6	0.3	N	1.00	1	1	1	0.3	0.3	∞
Response Time*	E.2.7	0.8	R	1.73	√3	1	1	0.5	0.5	∞
Integration Time*	E.2.8	2.6	R	1.73	√3	1	1	1.5	1.5	∞
RF Ambient Conditions - Noise	E.6.1	**0.0**	R	1.73	√3	1	1	0.0	0.0	**10**
RF Ambient Conditions - Reflection	E.6.1	**0.0**	R	1.73	√3	1	1	0.0	0.0	**10**
Probe Positioner Mechanical Tolerance*	E.6.2	0.0	R	1.73	√3	1	1	0.0	0.0	∞
Probe Positioning wrt Phantom Shell*	E.6.3	0.4	R	1.73	√3	1	1	0.2	0.2	∞
Post-processing*	E.5	2.0	R	1.73	√3	1	1	1.2	1.2	∞
Test Sample Related										
Test Sample Positioning	E.4.2	**2.2**	N	1.00	1	1	1	2.2	2.2	**5**
Device Holder Uncertainty*	E.4.1	3.6	N	1.00	1	1	1	3.6	3.6	∞
SAR Drift Measurement[2]	E.2.9	0.0	R	1.73	√3	1	1	0.0	0.0	∞
SAR Power Scaling[3]	E.6.5	0.0	R	1.73	√3	1	1	0.0	0.0	∞
Phantom and Tissue Parameters										
Phantom Uncertainty*	E.3.1	6.1	R	1.73	√3	1	1	3.5	3.5	∞
SAR Correction Uncertainty	E.3.2	**1.6**	N	1.00	1	1	0.84	1.6	1.3	∞
Liquid Conductivity (measurement)	E.3.3	**5.0**	N	1.00	1	0.78	0.71	3.9	3.6	**10**
Liquid Permittivity (measurement)	E.3.3	**5.0**	N	1.00	1	0.23	0.26	1.2	1.3	**10**
Liquid Conductivity (Temperature)	E.3.2	**0.4**	R	1.73	√3	0.78	0.71	0.2	0.2	**10**
Liquid Permittivity Temperature)	E.3.2	**0.2**	R	1.73	√3	0.23	0.26	0.0	0.0	**10**
Effective Degrees of Freedom[1]									V_{eff} =	**1141**
Combined Standard Uncertainty			**RSS**					**11.1**	**11.0**	
Expanded Uncertainty (95% Confidence Interval)			**k=2**					**22.2**	**21.9**	

Measurement Uncertainty Table in accordance with IEEE Standard 1528-2003

(1) The Effective Degrees of Freedom is > 30

Therefore a coverage factor of k=2 represents an approximate confidence level of 95%.

(2) The SAR Value is compensated for Drift

(3) SAR Power Scaling not Required

* Provided by SPEAG for DASY4

** Standard Uncertainty Calibration Data Provided by SPEAG for EX3DEV4 Probe

Table 14.2 Calculation of Degrees of Freedom

Table 14.2	
Calculation of the Degrees and Effective Degrees of Freedom	
$v_i = n - 1$	$v_{eff} = \frac{u_c^4}{\sum_{i=1}^{m} \frac{c_i^A u_i^A}{v_i}}$

15.0 FLUID DIELECTRIC PARAMETERS

Note: Effective February 19, 2019 TCB Workshop: FCC has permitted the use of single head-tissue simulating liquid specified in IEC/IEEE 62209-1528 for all SAR tests.

Table 15.1 Fluid Dielectric Parameters 450MHz HEAD TSL, 26 August 2022

****
Aprel Laboratory
Test Result for UIM Dielectric Parameter
Fri 26/Aug/2022 16:29:46
Freq Frequency(GHz)
FCC_eH FCC OET 65 Supplement C (June 2001) Limits for Head Epsilon
FCC_sH FCC OET 65 Supplement C (June 2001) Limits for Head Sigma
Test_e Epsilon of UIM
Test_s Sigma of UIM
****

Freq	FCC_eH	FCC_sH	Test_e	Test_s
0.3500	44.70	0.87	47.59	0.79
0.3600	44.58	0.87	48.32	0.80
0.3700	44.46	0.87	47.63	0.80
0.3800	44.34	0.87	47.12	0.83
0.3900	44.22	0.87	47.04	0.83
0.4000	44.10	0.87	47.18	0.84
0.4100	43.98	0.87	46.80	0.84
0.4200	43.86	0.87	46.87	0.83
0.4300	43.74	0.87	46.35	0.86
0.4400	43.62	0.87	45.79	0.87
0.4500	43.50	0.87	45.82	0.88
0.4600	43.45	0.87	45.42	0.88
0.4700	43.40	0.87	45.70	0.91
0.4800	43.34	0.87	45.75	0.91
0.4900	43.29	0.87	45.03	0.91
0.5000	43.24	0.87	45.29	0.93
0.5100	43.19	0.87	45.16	0.93
0.5200	43.14	0.88	45.08	0.95
0.5300	43.08	0.88	44.17	0.94
0.5400	43.03	0.88	44.69	0.95
0.5500	42.98	0.88	43.71	0.96

FLUID DIELECTRIC PARAMETERS

Date:	26 Aug 2022	Fluid Temp:	24.7	Frequency:	450MHz	Tissue:	Head

Freq (MHz)		Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity
350.0000		47.5900	0.7900	44.7000	0.87	6.47%	-9.20%
360.0000		48.3200	0.8000	44.5800	0.87	8.39%	-8.05%
370.0000		47.6300	0.8000	44.4600	0.87	7.13%	-8.05%
378.0000	*	47.2220	0.8240	44.3640	0.87	6.44%	-5.29%
380.0000		47.1200	0.8300	44.3400	0.87	6.27%	-4.60%
390.0000		47.0400	0.8300	44.2200	0.87	6.38%	-4.60%
400.0000		47.1800	0.8400	44.1000	0.87	6.98%	-3.45%
406.0000	*	46.9520	0.8400	44.0280	0.87	6.64%	-3.45%
410.0000		46.8000	0.8400	43.9800	0.87	6.41%	-3.45%
418.0000	*	46.8560	0.8320	43.8840	0.87	6.77%	-4.37%
420.0000		46.8700	0.8300	43.8600	0.87	6.86%	-4.60%
430.0000	*	46.3500	0.8600	43.7400	0.87	5.97%	-1.15%
440.0000		45.7900	0.8700	43.6200	0.87	4.97%	0.00%
450.0000	*	45.8200	0.8800	43.5000	0.87	5.33%	1.15%
454.0000	*	45.6600	0.8800	43.4800	0.87	5.01%	1.15%
456.0000	*	45.5800	0.8800	43.4700	0.87	4.85%	1.15%
459.0250	*	45.4590	0.8800	43.4549	0.87	4.61%	1.15%
459.9750	*	45.4210	0.8800	43.4501	0.87	4.54%	1.15%
460.0000		45.4200	0.8800	43.4500	0.87	4.53%	1.15%
470.0000	*	45.7000	0.9100	43.4000	0.87	5.30%	4.60%
480.0000		45.7500	0.9100	43.3400	0.87	5.56%	4.60%
490.0000		45.0300	0.9100	43.2900	0.87	4.02%	4.60%
500.0000		45.2900	0.9300	43.2400	0.87	4.74%	6.90%
510.0000		45.1600	0.9300	43.1900	0.87	4.56%	6.90%
512.0000	*	45.1440	0.9340	43.1800	0.87	4.55%	7.11%
520.0000		45.0800	0.9500	43.1400	0.88	4.50%	7.95%
522.0000	*	44.8980	0.9480	43.1280	0.88	4.10%	7.73%
530.0000		44.1700	0.9400	43.0800	0.88	2.53%	6.82%
540.0000		44.6900	0.9500	43.0300	0.88	3.86%	7.95%
550.0000		43.7100	0.9600	42.9800	0.88	1.70%	9.09%

*Channel Frequency Tested

Table 15.2 Fluid Dielectric Parameters 450MHz HEAD TSL, 29 August 2022

****
Aprel Laboratory
Test Result for UIM Dielectric Parameter
Mon 29/Aug/2022 10:24:56
Freq Frequency(GHz)
FCC_eH FCC OET 65 Supplement C (June 2001) Limits for Head Epsilon
FCC_sH FCC OET 65 Supplement C (June 2001) Limits for Head Sigma
Test_e Epsilon of UIM
Test_s Sigma of UIM
****

Freq	FCC_eH	FCC_sH	Test_e	Test_s
0.3500	44.70	0.87	49.63	0.77
0.3600	44.58	0.87	49.22	0.79
0.3700	44.46	0.87	48.70	0.78
0.3800	44.34	0.87	48.19	0.80
0.3900	44.22	0.87	48.18	0.80
0.4000	44.10	0.87	48.19	0.82
0.4100	43.98	0.87	48.03	0.83
0.4200	43.86	0.87	47.92	0.84
0.4300	43.74	0.87	46.70	0.85
0.4400	43.62	0.87	47.44	0.87
0.4500	43.50	0.87	46.80	0.88
0.4600	43.45	0.87	46.51	0.88
0.4700	43.40	0.87	46.48	0.90
0.4800	43.34	0.87	46.38	0.90
0.4900	43.29	0.87	45.91	0.89
0.5000	43.24	0.87	45.85	0.91
0.5100	43.19	0.87	45.82	0.94
0.5200	43.14	0.88	45.27	0.93
0.5300	43.08	0.88	45.14	0.95
0.5400	43.03	0.88	44.75	0.95
0.5500	42.98	0.88	44.48	0.96

FLUID DIELECTRIC PARAMETERS

Date:	29 Aug 2022	Fluid Temp:	22.2	Frequency:	450MHz	Tissue:	Head

Freq (MHz)		Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity
350.0000		49.6300	0.7700	44.7000	0.87	11.03%	-11.49%
360.0000		49.2200	0.7900	44.5800	0.87	10.41%	-9.20%
370.0000		48.7000	0.7800	44.4600	0.87	9.54%	-10.34%
378.0000	*	48.2920	0.7960	44.3640	0.87	8.85%	-8.51%
380.0000		48.1900	0.8000	44.3400	0.87	8.68%	-8.05%
390.0000		48.1800	0.8000	44.2200	0.87	8.96%	-8.05%
400.0000		48.1900	0.8200	44.1000	0.87	9.27%	-5.75%
406.0000	*	48.0940	0.8260	44.0280	0.87	9.24%	-5.06%
410.0000		48.0300	0.8300	43.9800	0.87	9.21%	-4.60%
418.0000	*	47.9420	0.8380	43.8840	0.87	9.25%	-3.68%
420.0000		47.9200	0.8400	43.8600	0.87	9.26%	-3.45%
430.0000	*	46.7000	0.8500	43.7400	0.87	6.77%	-2.30%
440.0000		47.4400	0.8700	43.6200	0.87	8.76%	0.00%
450.0000	*	46.8000	0.8800	43.5000	0.87	7.59%	1.15%
454.0000	*	46.6840	0.8800	43.4800	0.87	7.37%	1.15%
456.0000	*	46.6260	0.8800	43.4700	0.87	7.26%	1.15%
459.0250	*	46.5383	0.8800	43.4549	0.87	7.10%	1.15%
459.9750	*	46.5107	0.8800	43.4501	0.87	7.04%	1.15%
460.0000		46.5100	0.8800	43.4500	0.87	7.04%	1.15%
470.0000	*	46.4800	0.9000	43.4000	0.87	7.10%	3.45%
480.0000		46.3800	0.9000	43.3400	0.87	7.01%	3.45%
490.0000		45.9100	0.8900	43.2900	0.87	6.05%	2.30%
500.0000		45.8500	0.9100	43.2400	0.87	6.04%	4.60%
510.0000		45.8200	0.9400	43.1900	0.87	6.09%	8.05%
512.0000	*	45.7100	0.9380	43.1800	0.87	5.86%	7.57%
520.0000		45.2700	0.9300	43.1400	0.88	4.94%	5.68%
522.0000	*	45.2440	0.9340	43.1280	0.88	4.91%	6.14%
530.0000		45.1400	0.9500	43.0800	0.88	4.78%	7.95%
540.0000		44.7500	0.9500	43.0300	0.88	4.00%	7.95%
550.0000		44.4800	0.9600	42.9800	0.88	3.49%	9.09%

*Channel Frequency Tested

Table 15.3 Fluid Dielectric Parameters 150MHz HEAD TSL, 1 September 2022

****
Aprel Laboratory
Test Result for UIM Dielectric Parameter
Thu 01/Sep/2022 09:07:03
Freq Frequency(GHz)
FCC_eH FCC OET 65 Supplement C (June 2001) Limits for Head Epsilon
FCC_sH FCC OET 65 Supplement C (June 2001) Limits for Head Sigma
Test_e Epsilon of UIM
Test_s Sigma of UIM
****

Freq	FCC_eH	FCC_sH	Test_e	Test_s
0.1000	54.63	0.72	66.30	0.79
0.1100	54.17	0.73	57.30	0.77
0.1200	53.70	0.74	59.01	0.77
0.1300	53.23	0.75	53.50	0.81
0.1400	52.77	0.75	54.16	0.80
0.1500	52.30	0.76	55.90	0.83
0.1600	51.83	0.77	52.17	0.80
0.1700	51.37	0.77	53.17	0.82
0.1800	50.90	0.78	52.45	0.83
0.1900	50.43	0.79	52.42	0.85
0.2000	49.97	0.80	50.69	0.85

FLUID DIELECTRIC PARAMETERS

Date:	1 Sep 2022	Fluid Temp:	22.5	Frequency:	150MHz	Tissue:	Head

Freq (MHz)		Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity
100.0000		66.3000	0.7900	54.6300	0.72	21.36%	9.72%
110.0000		57.3000	0.7700	54.1700	0.73	5.78%	5.48%
120.0000		59.0100	0.7700	53.7000	0.74	9.89%	4.05%
130.0000		53.5000	0.8100	53.2300	0.75	0.51%	8.00%
136.0000	*	53.8960	0.8040	52.9540	0.75	1.78%	7.20%
140.0000		54.1600	0.8000	52.7700	0.75	2.63%	6.67%
150.0000		55.9000	0.8300	52.3000	0.76	6.88%	9.21%
156.8000	*	53.3636	0.8096	51.9804	0.77	2.66%	5.58%
160.0000		52.1700	0.8000	51.8300	0.77	0.66%	3.90%
170.0000		53.1700	0.8200	51.3700	0.77	3.50%	6.49%
180.0000		52.4500	0.8300	50.9000	0.78	3.05%	6.41%
190.0000		52.4200	0.8500	50.4300	0.79	3.95%	7.59%
200.0000		50.6900	0.8500	49.9700	0.80	1.44%	6.25%

*Channel Frequency Tested

16.0 SYSTEM VERIFICATION TEST RESULTS

Table 16.1 System Verification Results 450MHz HEAD TSL, 26 August 2022

System Verification Test Results

Date		Frequency (MHz)	Validation Source		
			P/N		S/N
26 Aug 2022		450	D450V3		1068
Fluid Type	**Fluid Temp °C**	**Ambient Temp °C**	**Ambient Humidity (%)**	**Forward Power (mW)**	**Source Spacing (mm)**
Head	24.7	25	41%	250	15
Fluid Parameters					
Permittivity			**Conductivity**		
Measured	**Target**	**Deviation**	**Measured**	**Target**	**Deviation**
45.82	43.50	5.33%	**0.88**	0.87	1.15%
Measured SAR					
1 gram			**10 gram**		
Measured	**Target**	**Deviation**	**Measured**	**Target**	**Deviation**
1.11	1.20	-7.77%	**0.75**	0.79	-5.44%
Measured SAR Normalized to 1.0W					
1 gram			**10 gram**		
Normalized	**Target**	**Deviation**	**Normalized**	**Target**	**Deviation**
4.44	4.81	-7.77%	**2.99**	3.16	-5.44%

Prior to the SAR evaluations, system checks were performed on the planar section of the phantom and a SPEAG validation dipole in accordance with the procedures described in IEEE 1528-2013, FCC KDB 846224, IEC 62209-1 and IEC 62209-1528.

The dielectric parameters of the simulated tissue mixture were measured prior to the system performance check using a Dielectric Probe Kit and a Network Analyzer.

The forward power was applied to the dipole and the system was verified to a tolerance of +10% from the system manufacturer's dipole calibration target SAR value.

The forward power applied was same forward power applied by the calibration lab during the calibration of this validation source.

Table 16.2 System Verification Results 450MHz HEAD TSL, 29 August 2022

System Verification Test Results

Date		Frequency (MHz)	Validation Source		
			P/N		S/N
29 Aug 2022		450	D450V3		1068
Fluid Type	Fluid Temp °C	Ambient Temp °C	Ambient Humidity (%)	Forward Power (mW)	Source Spacing (mm)
Head	23.2	22	42%	250	15
Fluid Parameters					
Permittivity			Conductivity		
Measured	Target	Deviation	Measured	Target	Deviation
46.80	43.50	7.59%	0.88	0.87	1.15%
Measured SAR					
1 gram			10 gram		
Measured	Target	Deviation	Measured	Target	Deviation
1.14	1.20	-5.28%	0.78	0.79	-1.14%
Measured SAR Normalized to 1.0W					
1 gram			10 gram		
Normalized	Target	Deviation	Normalized	Target	Deviation
4.56	4.81	-5.28%	3.12	3.16	-1.14%

Prior to the SAR evaluations, system checks were performed on the planar section of the phantom and a SPEAG validation dipole in accordance with the procedures described in IEEE 1528-2013, FCC KDB 846224, IEC 62209-1 and IEC 62209-1528.

The dielectric parameters of the simulated tissue mixture were measured prior to the system performance check using a Dielectric Probe Kit and a Network Analyzer.

The forward power was applied to the dipole and the system was verified to a tolerance of +10% from the system manufacturer's dipole calibration target SAR value.

The forward power applied was same forward power applied by the calibration lab during the calibration of this validation source.

Table 16.3 System Verification Results 150MHz HEAD TSL, 1 September 2022

System Verification Test Results

Date		Frequency (MHz)	Validation Source		
			P/N		S/N
1 Sep 2022		150	CLA-150		4007
Fluid Type	Fluid Temp °C	Ambient Temp °C	Ambient Humidity (%)	Forward Power (mW)	Source Spacing (mm)
Head	22.5	23	42%	1000	0
Fluid Parameters					
Permittivity			Conductivity		
Measured	Target	Deviation	Measured	Target	Deviation
55.90	52.30	6.88%	0.83	0.76	9.21%
Measured SAR					
1 gram			10 gram		
Measured	Target	Deviation	Measured	Target	Deviation
4.14	3.89	6.43%	2.75	2.57	7.00%
Measured SAR Normalized to 1.0W					
1 gram			10 gram		
Normalized	Target	Deviation	Normalized	Target	Deviation
4.14	3.87	6.98%	2.75	2.56	7.42%

Prior to the SAR evaluations, system checks were performed on the planar section of the phantom and a SPEAG validation dipole in accordance with the procedures described in IEEE 1528-2013, FCC KDB 846224, IEC 62209-1 and IEC 62209-1528.

The dielectric parameters of the simulated tissue mixture were measured prior to the system performance check using a Dielectric Probe Kit and a Network Analyzer.

The forward power was applied to the dipole and the system was verified to a tolerance of +10% from the system manufacturer's dipole calibration target SAR value.

The forward power applied was same forward power applied by the calibration lab during the calibration of this validation source.

17.0 MEASUREMENT SYSTEM SPECIFICATIONS

Table 17.1 Measurement System

SAR Measurement System	
Celltech Labs Inc. SAR measurement facility employs a Dosimetric Assessment System (DASY™) manufactured by Schmid & Partner Engineering AG (SPEAG™) of Zurich, Switzerland. The DASY6 measurement system is comprised of the measurement server, a robot controller, a computer, a near-field probe, a probe alignment sensor, an Elliptical Planar Phantom (ELI) phantom and a specific anthropomorphic mannequin (SAM) phantom for Head and/or Body SAR evaluations. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF). A cell controller system contains the power supply, robot controller and a teach pendant (Joystick) to control the robot's servo motors. The Staubli robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical form the DAE to digital electronic signal and transfers data to the DASY6 measurement server. The DAE4 utilizes a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16-bit AD-converter, a command decoder and a control logic unit. Transmission to the DASY6 measurement server is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe-mounting device includes two different sensor systems for frontal and sidewise probe contacts. The sensor systems are also used for mechanical surface detection and probe collision detection. The robot utilizes a controller with built in VME-bus computer.	
	
DASY 6 SAR System with SAM Phantom	**DASY 6 Measurement Controller**

Table 17.2 Measurement System Specifications

Measurement System Specification	
Specifications	
Positioner	Stäubli Unimation Corp. Robot Model: TX90XL
Repeatability	+/- 0.035 mm
No. of axis	6.0
Data Acquisition Electronic (DAE) System	
Cell Controller	
Processor	Intel(R) Core(TM) i7-7700
Clock Speed	3.60 GHz
Operating System	Windows 10 Professional
Data Converter	
Features	Signal Amplifier, multiplexer, A/D converter, and control logic
Software	Measurement Software: DASY6, V 6.4.0.12171 / DASY52 V10.2(1504)
	Postprocessing Software: SEMCAD X, V14.6.12(7470)
Connecting Lines	Optical downlink for data and status info., Optical uplink for commands and clock
DASY Measurement Server	
Function	Real-time data evaluation for field measurements and surface detection
Hardware	Intel ULV Celeron CPU 400 MHz; 128 MB chip disk; 128 MB RAM
Connections	COM1, COM2, DAE, Robot, Ethernet, Service Interface
E-Field Probe	
Model	EX3DV4
Serial No.	3600
Construction	Triangular core fiber optic detection system
Frequency	10 MHz to 6 GHz
Linearity	±0.2 dB (30 MHz to 3 GHz)
Phantom	
Type	ELI Elliptical Planar Phantom
Shell Material	Fiberglass
Thickness	2mm +/- .2mm
Volume	> 30 Liter

Measurement System Specification

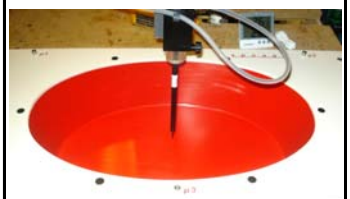
Probe Specification

Construction:	Symmetrical design with triangular core; Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, glycol)
Calibration:	In air from 10 MHz to 2.5 GHz In head simulating tissue at frequencies of 900 MHz and 1.8 GHz (accuracy ± 8%)
Frequency:	10 MHz to > 6 GHz; Linearity: ± 0.2 dB (30 MHz to 3 GHz)
Directivity:	± 0.2 dB in head tissue (rotation around probe axis) ± 0.4 dB in head tissue (rotation normal to probe axis)
Dynamic Range:	5 µW/g to > 100 mW/g; Linearity: ± 0.2 dB
Surface Detect:	± 0.2 mm repeatability in air and clear liquids over diffuse reflecting surfaces
Dimensions:	Overall length: 330 mm; Tip length: 16 mm; Body diameter: 12 mm; Tip diameter: 6.8 mm Distance from probe tip to dipole centers: 2.7 mm
Application:	General dosimetry up to 3 GHz; Compliance tests of mobile phone

EX3DV4 E-Field Probe

Phantom Specification

The SAM V5.0 phantom is an elliptical planar fiberglass shell phantom with a shell thickness of 2.0mm +/- .2mm at the planar area. This phantom conforms to OET Bulletin 65, Supplement C, IEEE 1528-2013, IEC 62209-1 and IEC 62209-2.



ELI Phantom

Device Positioner Specification

The DASY4 device positioner has two scales for device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear openings). The plane between the ear openings and the mouth tip has a rotation angle of 65^{O}. The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections.

Device Positioner

18.0 TEST EQUIPMENT LIST

Table 18.1 Equipment List and Calibration

Test Equipment List				
DESCRIPTION	**ASSET NO.**	**SERIAL NO.**	**DATE CALIBRATED**	**CALIBRATION DUE**
Schmid & Partner DASY 6 System	-	-	-	-
-DASY Measurement Server	00158	1078	CNR	CNR
-Robot	00046	599396-01	CNR	CNR
-DAE4	00019	353	14-Apr-22	14-Apr-23
-EX3DV4 E-Field Probe	00213	3600	20-Apr-22	20-Apr-23
-CLA 30 Validation Dipole	00300	1005	18-Mar-20	18-Mar-23
-CLA150 Validation Dipole	00251	4007	18-Mar-20	18-Mar-23
-D450V3 Validation Dipole	00221	1068	27-Apr-21	27-Apr-24
-D750V3 Validation Dipole	00238	1061	14-Apr-22	14-Apr-25
-D835V2 Validation Dipole	00217	4D075	27-Apr-21	27-Apr-24
-D900V2 Validation Dipole	00020	54	16-Mar-20	16-Mar-23
ALS-D-01640-S-2	00299	207-00102	15-Dec-20	15-Dec-23
-D1800V2 Validation Dipole	00222	247	16-Mar-20	16-Mar-23
-D1900V2 Validation Dipole	00218	5d107	16-Mar-20	16-Mar-23
ALS-D-2300-S-2	00328	218-00201	18-Jan-22	18-Jan-25
-D2450V2 Validation Dipole	00219	825	24-Apr-21	24-Apr-24
ALS-D-2600-S-2	00327	225-00926	18-Jan-22	18-Jan-25
-D5GHzV2 Validation Dipole	00126	1031	27-Apr-21	27-Apr-24
ELI Phantom	00247	1234	CNR	CNR
SAM Phantom	00154	1033	CNR	CNR
HP 85070C Dielectric Probe Kit	00033	none	CNR	CNR
Gigatronics 8652A Power Meter	00007	1835801	13-May-22	13-May-25
Gigatronics 80701A Power Sensor	00186	1837002	13-May-22	13-May-25
Gigatronics 80334A Power Sensor	00237	1837001	13-May-22	13-May-25
HP 8753ET Network Analyzer	00134	US39170292	6-Jan-21	6-Jan-24
Rohde & Schwarz SMR20 Signal Generator	00006	100104	11-Aug-20	11-Aug-23
Amplifier Research 10W1000C Power Amplifier	00041	27887	CNR	CNR
Amplifier Research 5S1G4 Power Amplifier	00106	26235	CNR	CNR
Narda Directional Coupler 3020A	00064	-	CNR	CNR
Kangaroo VWR Humidity/Thermometer	00334	192385455	5-Aug-19	6-Aug-22
Digital Multi Meter DMR-1800	00250	TE182	23-Jun-20	23-Jun-23
Bipolar Power Supply 6299A	00086	1144A02155	CNR	CNR
DC-18G 10W 30db Attenuator	00102	-	COU	COU
R&S FSP40 Spectrum Analyzer	00241	100500	9-Aug-21	9-Aug-24
HP 8566B Spectrum Analyzer	00051	2747A055100	29-Jun-20	29-Jun-23
RF Cable-SMA	00311	-	CNR	CNR
HP Calibration Kit	00145	-	CNR	CNR

CNR = Calibration Not Required

COU = Calibrate on Use

19.0 SYSTEM VALIDATION SUMMARY

SAR Validation SummaryChart					
Validation Date	Validation Source	Validation Frequency	Linearity	Isotropy	Extrapolation
✓	= Complete	✓	= Not Required		
27-May-22	CLA150	150	✓	✓	✓
14-Jul-22	D450V2	450	✓	✓	✓

20.0 FLUID COMPOSITION

Table 20.1 Fluid Composition 150MHz HEAD TSL

Tissue Simulating Liquid (TSL) Composition				150MHz Head
Component by Percent Weight				
Water	Sugar	Salt(1)	HEC(2)	Bacteriacide(3)
38.35	55.5	5.15	0.9	0.1

(1) Non-Iodinized
(2) **H**ydroxy**E**thyl-**C**ellulose: Sigma-Aldrich P/N 54290-500g
(3) Dow Chemical Dowicil 75 Antimicrobial Perservative

Table 20.1 Fluid Composition 50MHz HEAD TSL

Tissue Simulating Liquid (TSL) Composition				150MHz Head
Component by Percent Weight				
Water	Sugar	Salt(1)	HEC(2)	Bacteriacide(3)
38.35	55.5	5.15	0.9	0.1

(1) Non-Iodinized
(2) **H**ydroxy**E**thyl-**C**ellulose: Sigma-Aldrich P/N 54290-500g
(3) Dow Chemical Dowicil 75 Antimicrobial Perservative

APPENDIX A – SYSTEM VERIFICATION PLOTS

Plot A.1 System Verification Plot, 450MHz, 26 August 2022

DUT: Dipole 450 MHz D450V3; Type: D450V3; Serial: D450V3 - SN:1068
Procedure Name: SPC 450H, Input 250mW, Taget[1.08315][1.2035][1.32385] W/kg_

Communication System: UID 0, CW (0); Frequency: 450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 450 MHz; σ = 0.88 S/m; ε_r = 45.82; ρ = 1000 kg/m^3
Phantom section: Flat Section

Date/Time: 8/26/2022 5:16:25 PM

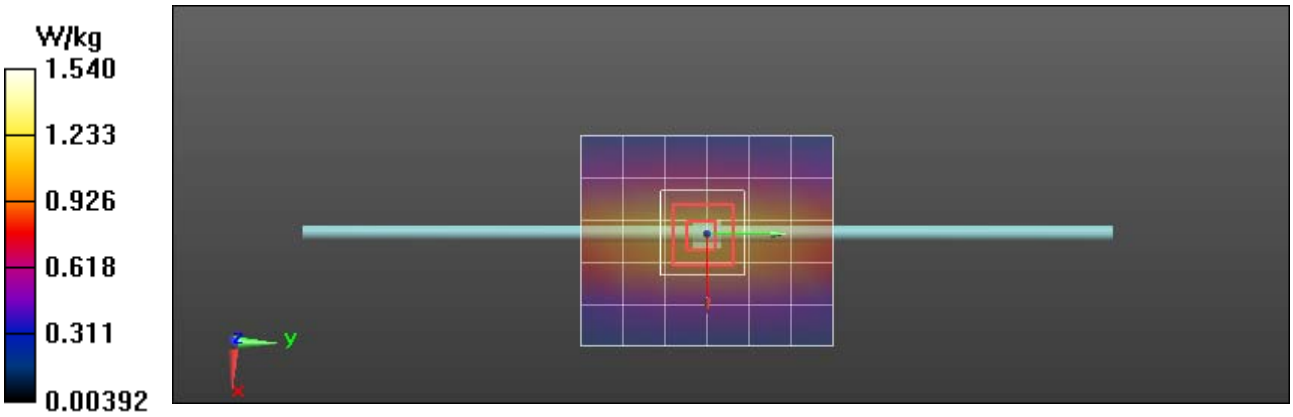
DASY5 Configuration:

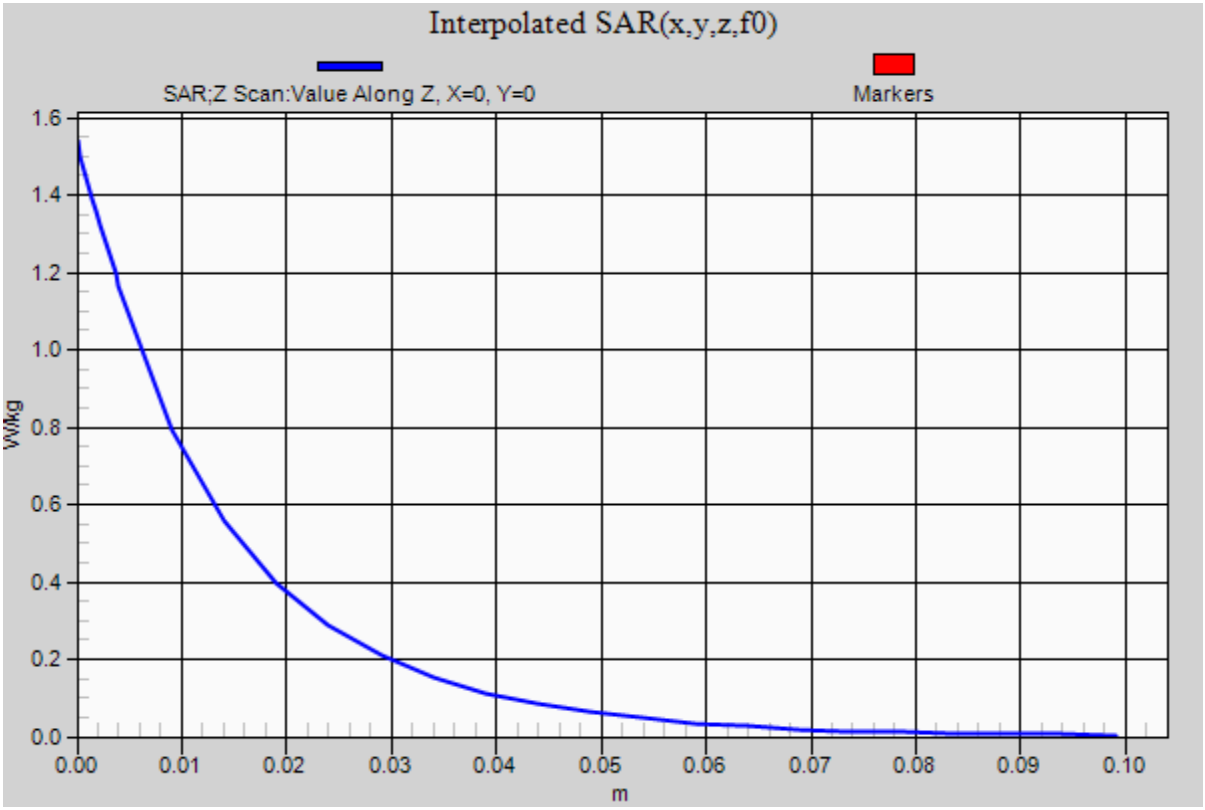
- Probe: EX3DV4 - SN3600; ConvF(8.78, 8.78, 8.78) @ 450 MHz; Calibrated: 4/20/2022
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 4/14/2022
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 Ax; Serial: 1234
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

SPC/SPC 450H, Input 250mW, Taget[1.08315][1.2035][1.32385] W/kg_/Area Scan (6x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.16 W/kg

SPC/SPC 450H, Input 250mW, Taget[1.08315][1.2035][1.32385] W/kg_/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 38.29 V/m; Power Drift = -0.43 dB
Peak SAR (extrapolated) = 1.62 W/kg
SAR(1 g) = 1.11 W/kg; SAR(10 g) = 0.747 W/kg
Ratio of SAR at M2 to SAR at M1 = 68.3%
Maximum value of SAR (measured) = 1.19 W/kg

SPC/SPC 450H, Input 250mW, Taget[1.08315][1.2035][1.32385] W/kg_/Z Scan (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Penetration depth = 14.05 (13.04, 14.71) [mm]
Maximum value of SAR (interpolated) = 1.54 W/kg





Plot A.2 System Verification Plot, 450MHz, 29 August 2022

DUT: Dipole 450 MHz D450V3; Type: D450V3; Serial: D450V3 - SN:1068
Procedure Name: SPC 450H, Input 250mW, Taget[1.08315][1.2035][1.32385] W/kg_ 2 2

Communication System: UID 0, CW (0); Frequency: 450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 450 MHz; σ = 0.88 S/m; ε_r = 46.8; ρ = 1000 kg/m^3
Phantom section: Flat Section

Date/Time: 8/29/2022 11:22:03 AM

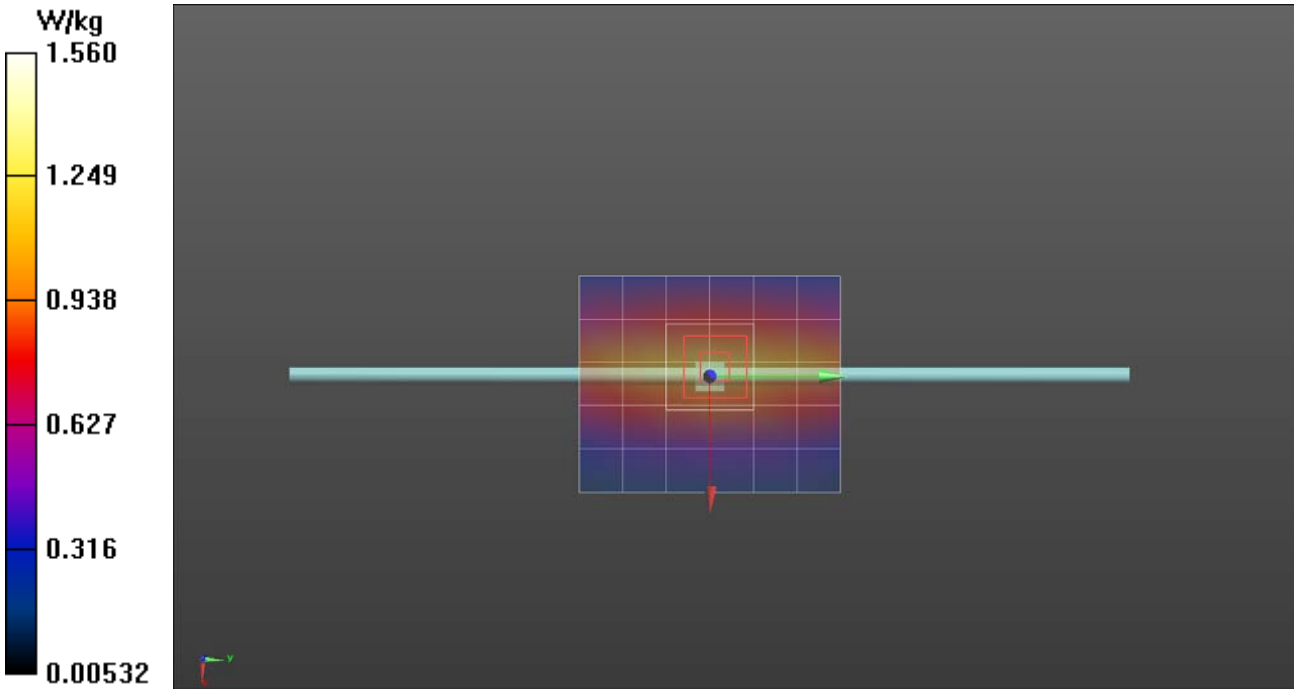
DASY5 Configuration:

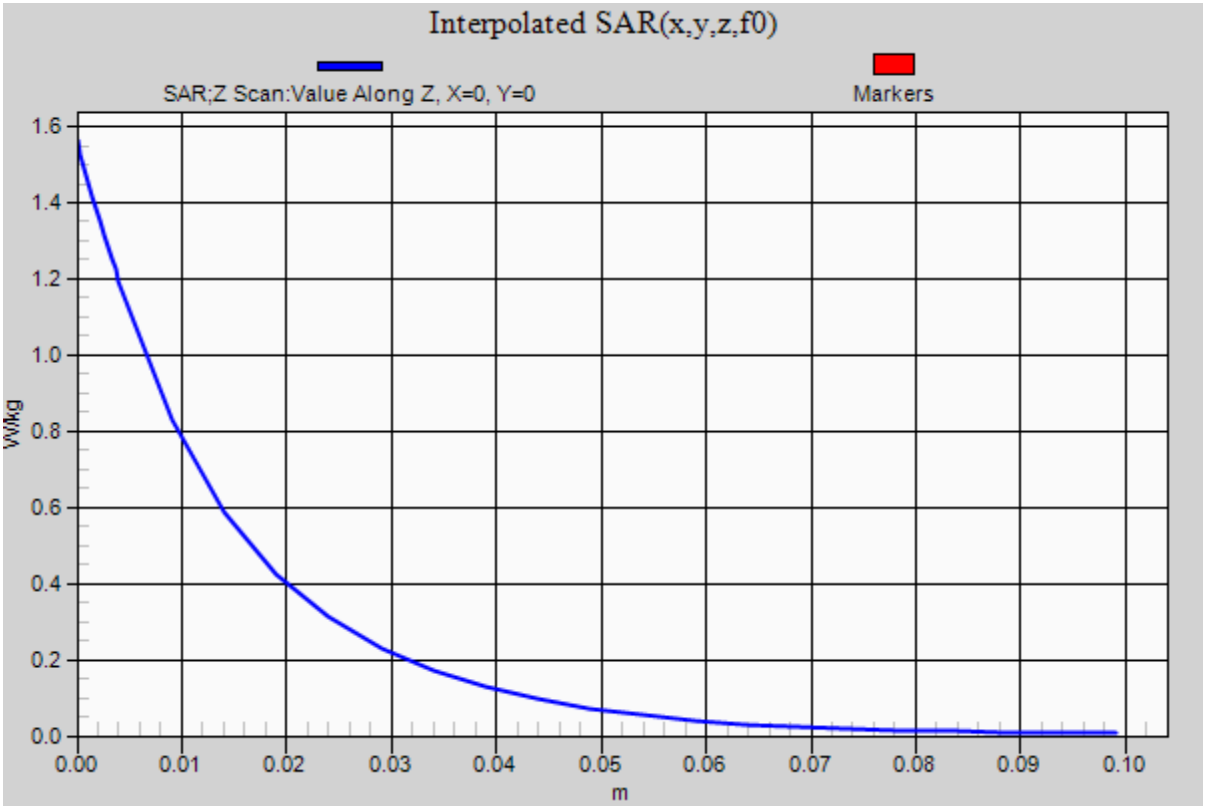
- Probe: EX3DV4 - SN3600; ConvF(8.78, 8.78, 8.78) @ 450 MHz; Calibrated: 4/20/2022
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 4/14/2022
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 Ax; Serial: 1234
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

SPC/SPC 450H, Input 250mW, Taget[1.08315][1.2035][1.32385] W/kg_ 2 2/Area Scan (6x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.22 W/kg

SPC/SPC 450H, Input 250mW, Taget[1.08315][1.2035][1.32385] W/kg_ 2 2/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 37.08 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.66 W/kg
SAR(1 g) = 1.14 W/kg; SAR(10 g) = 0.781 W/kg
Ratio of SAR at M2 to SAR at M1 = 69.2%
Maximum value of SAR (measured) = 1.22 W/kg

SPC/SPC 450H, Input 250mW, Taget[1.08315][1.2035][1.32385] W/kg_ 2 2/Z Scan (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Penetration depth = 14.63 (13.78, 15.42) [mm]
Maximum value of SAR (interpolated) = 1.56 W/kg





Plot A.3 System Verification Plot, 150MHz, 1 September 2022

DUT: CLA-150; Type: CLA-150; Serial: 4007
Procedure Name: SPC 150H Input=1.0W, Target[3.5][3.89][4.3]W/kg_ 2 2 2

Communication System: UID 0, CW (0); Frequency: 150 MHz;Duty Cycle: 1:1
Medium parameters used: f = 150 MHz; σ = 0.83 S/m; ε_r = 55.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

Date/Time: 9/1/2022 10:15:06 AM

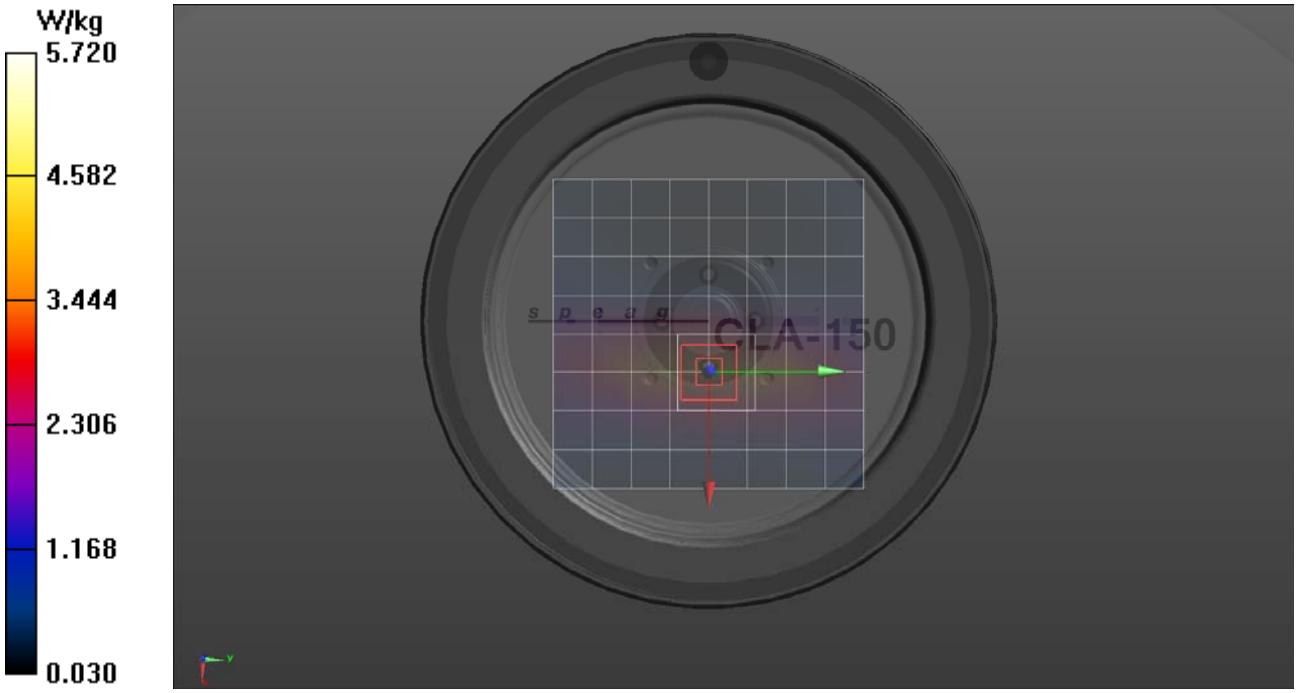
DASY5 Configuration:

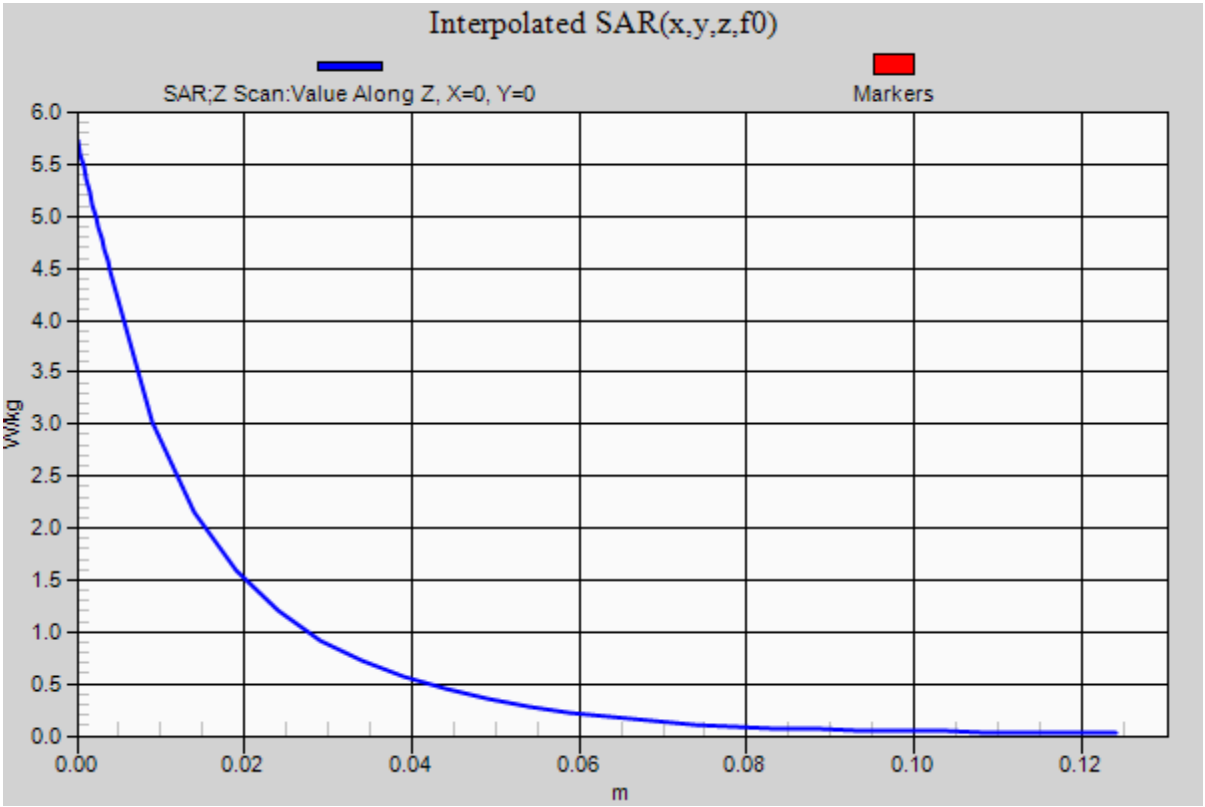
- Probe: EX3DV4 - SN3600; ConvF(9.65, 9.65, 9.65) @ 150 MHz; Calibrated: 4/20/2022
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 4/14/2022
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 Ax; Serial: 1234
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

SPC/SPC 150H Input=1.0W, Target[3.5][3.89][4.3]W/kg_ 2 2 2/Area Scan (9x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 4.46 W/kg

SPC/SPC 150H Input=1.0W, Target[3.5][3.89][4.3]W/kg_ 2 2 2/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 74.09 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 6.39 W/kg
SAR(1 g) = 4.14 W/kg; SAR(10 g) = 2.75 W/kg
Ratio of SAR at M2 to SAR at M1 = 67.6%
Maximum value of SAR (measured) = 4.43 W/kg

SPC/SPC 150H Input=1.0W, Target[3.5][3.89][4.3]W/kg_ 2 2 2/Z Scan (1x1x36): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Penetration depth = 14.80 (12.77, 16.37) [mm]
Maximum value of SAR (interpolated) = 5.72 W/kg





APPENDIX B – MEASUREMENT PLOTS OF MAXIMUM MEASURED SAR

Plot B10 Measurement Plot

DUT: Harris XL-95; Type: PTT; Serial: A40199E2A003
Procedure Name: B10-Harris XL-95, 459.025MHz Body Config, Ant 1011223/12,Bat-P3, A1,B1

Communication System: UID 0, CW (0); Frequency: 459.025 MHz;Duty Cycle: 1:1
Medium parameters used: f = 460 MHz; σ = 0.88 S/m; ε_r = 46.51; ρ = 1000 kg/m^3
Phantom section: Flat Section

Date/Time: 8/30/2022 11:49:15 AM

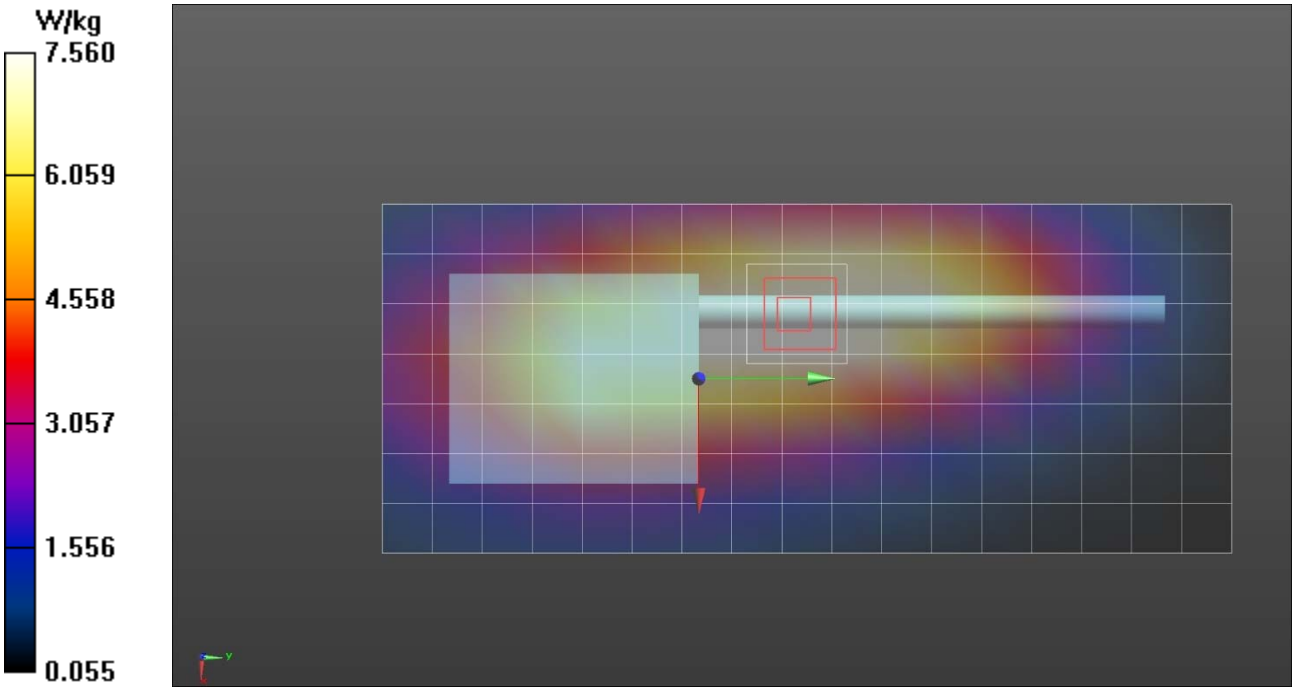
DASY5 Configuration:

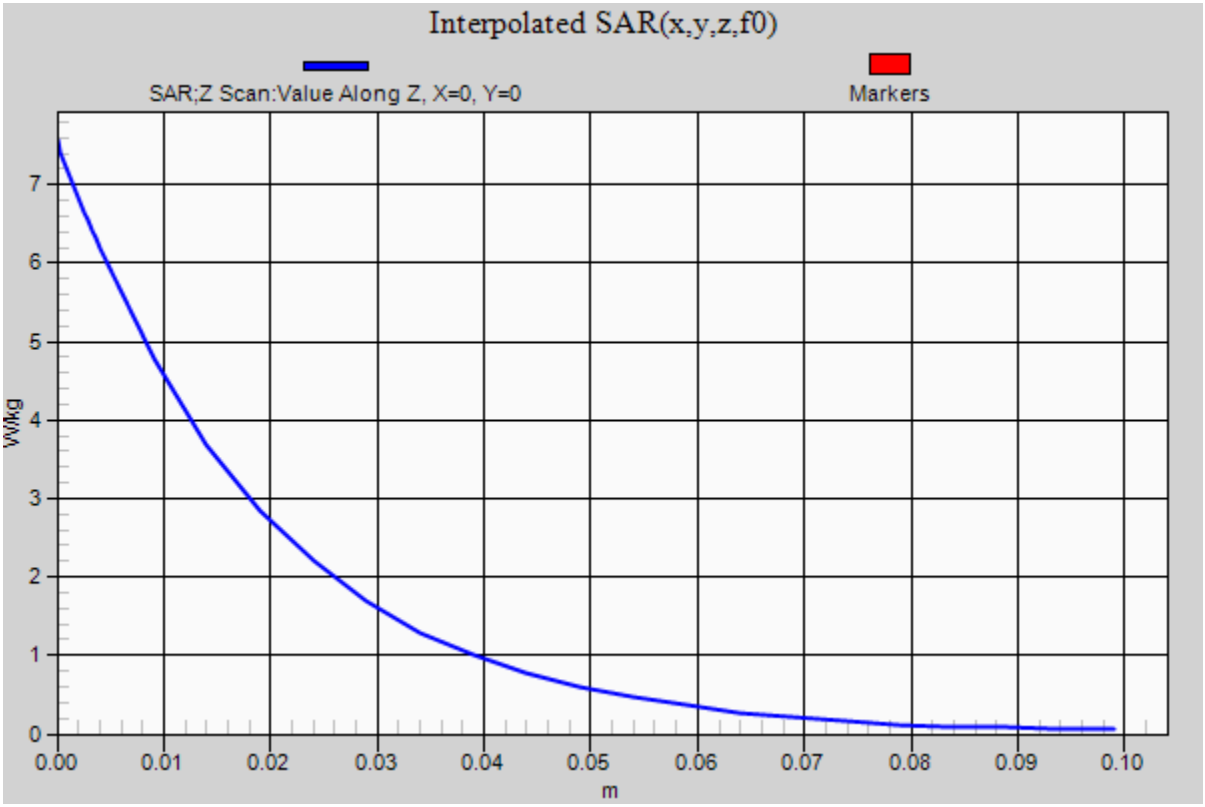
- Probe: EX3DV4 - SN3600; ConvF(8.78, 8.78, 8.78) @ 459.025 MHz; Calibrated: 4/20/2022
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 4/14/2022
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 Ax; Serial: 1234
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

450H/B10-Harris XL-95, 459.025MHz Body Config, Ant 1011223/12,Bat-P3, A1,B1/Area Scan (8x18x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 9.82 W/kg

450H/B10-Harris XL-95, 459.025MHz Body Config, Ant 1011223/12,Bat-P3, A1,B1/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 96.36 V/m; Power Drift = -0.91 dB
Peak SAR (extrapolated) = 12.3 W/kg
SAR(1 g) = 8.86 W/kg; SAR(10 g) = 6.28 W/kg
Ratio of SAR at M2 to SAR at M1 = 72%
Maximum value of SAR (measured) = 9.41 W/kg

450H/B10-Harris XL-95, 459.025MHz Body Config, Ant 1011223/12,Bat-P3, A1,B1/Z Scan (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Penetration depth = 19.33 (19.54, 19.22) [mm]
Maximum value of SAR (interpolated) = 7.56 W/kg





Plot F10 Measurement Plot

DUT: Harris XL-95; Type: PTT; Serial: A40199E2A003
Procedure Name: F10-Harris XL-95,470MHz, Face Config 25mm, Ant 1219/14,Bat-P3

Communication System: UID 0, CW (0); Frequency: 470 MHz;Duty Cycle: 1:1
Medium parameters used: f = 470 MHz; σ = 0.9 S/m; ε_r = 46.48; ρ = 1000 kg/m^3
Phantom section: Flat Section

Date/Time: 8/30/2022 8:45:02 PM

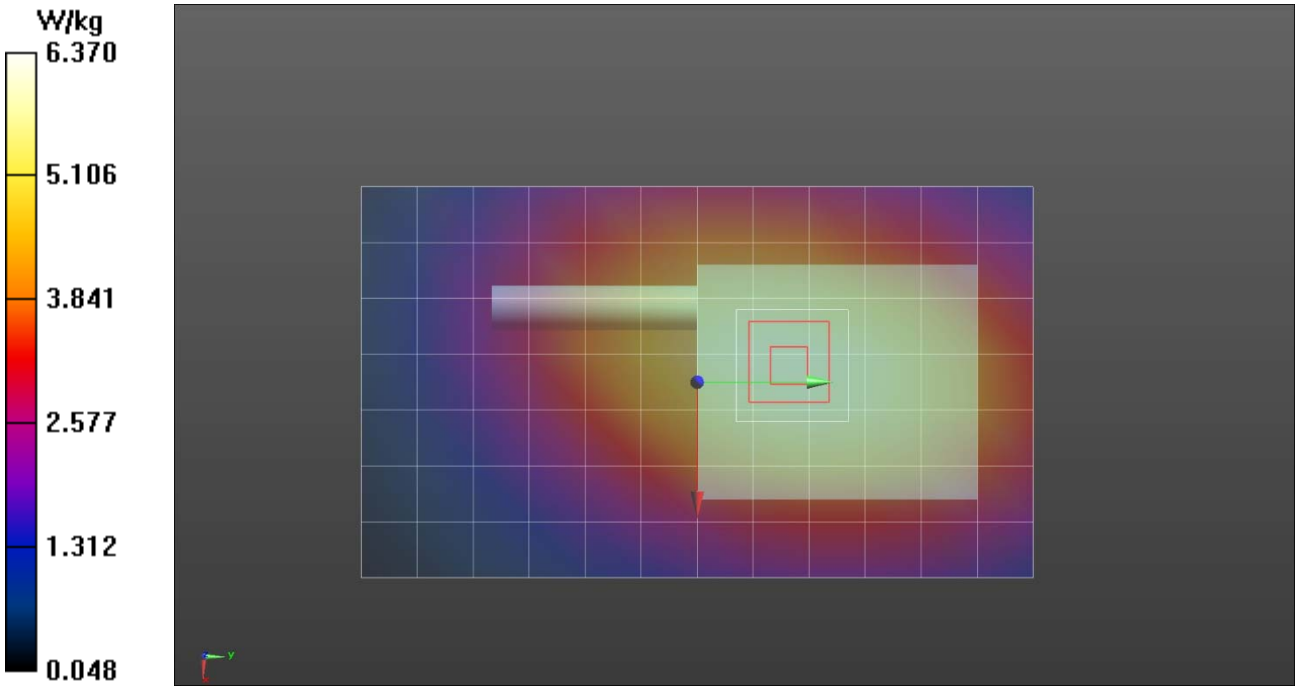
DASY5 Configuration:

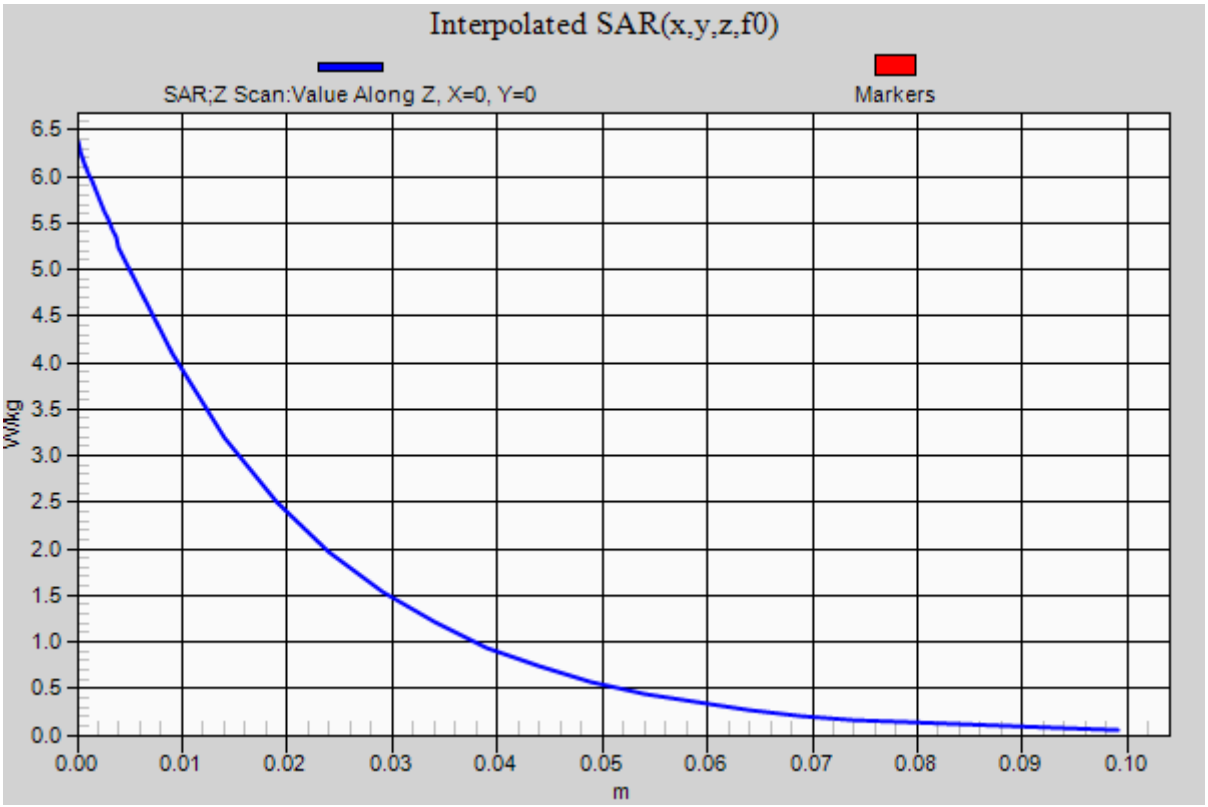
- Probe: EX3DV4 - SN3600; ConvF(8.78, 8.78, 8.78) @ 470 MHz; Calibrated: 4/20/2022
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 4/14/2022
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 Ax; Serial: 1234
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

450H/F10-Harris XL-95,470MHz, Face Config 25mm, Ant 1219/14,Bat-P3/Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 5.81 W/kg

450H/F10-Harris XL-95,470MHz, Face Config 25mm, Ant 1219/14,Bat-P3/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 79.39 V/m; Power Drift = -0.28 dB
Peak SAR (extrapolated) = 7.07 W/kg
SAR(1 g) = 5.62 W/kg; SAR(10 g) = 4.33 W/kg
Ratio of SAR at M2 to SAR at M1 = 78.2%
Maximum value of SAR (measured) = 5.88 W/kg

450H/F10-Harris XL-95,470MHz, Face Config 25mm, Ant 1219/14,Bat-P3/Z Scan (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Penetration depth = 20.22 (20.15, 20.25) [mm]
Maximum value of SAR (interpolated) = 6.37 W/kg





Plot B16 Measurement Plot

DUT: Harris XL-95; Type: PTT; Serial: A40199E2A003
Procedure Name: B16-Harris XL-95,470MHz Body Config, Ant 1219/14,Bat-P3, A1,B1_

Communication System: UID 0, CW (0); Frequency: 470 MHz;Duty Cycle: 1:1
Medium parameters used: f = 470 MHz; σ = 0.9 S/m; ε_r = 46.48; ρ = 1000 kg/m^3
Phantom section: Flat Section

Date/Time: 8/31/2022 9:08:01 AM

DASY5 Configuration:

- Probe: EX3DV4 - SN3600; ConvF(8.78, 8.78, 8.78) @ 470 MHz; Calibrated: 4/20/2022
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 4/14/2022
- Phantom: ELI V5.0 (20deg probe tilt); Type: QD OVA 002 Ax; Serial: 1234
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

450H/B16-Harris XL-95,470MHz Body Config, Ant 1219/14,Bat-P3, A1,B1_/Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 10.2 W/kg

450H/B16-Harris XL-95,470MHz Body Config, Ant 1219/14,Bat-P3, A1,B1_/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 99.96 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 13.2 W/kg
SAR(1 g) = 9.67 W/kg; SAR(10 g) = 7.03 W/kg
Ratio of SAR at M2 to SAR at M1 = 74%
Maximum value of SAR (measured) = 10.2 W/kg

450H/B16-Harris XL-95,470MHz Body Config, Ant 1219/14,Bat-P3, A1,B1_/Z Scan (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Penetration depth = 19.21 (19.28, 19.03) [mm]
Maximum value of SAR (interpolated) = 10.4 W/kg