Test Report Serial Number:	45461706 R1.0
Test Report Date:	31 August 2022
Project Number:	1563

SAR Test Report - New Certification

Applicant:

Maximum *reported* 1g SAR			
FCC/ISED	BODY	1.15	W/kg
	HEAD (FACE)	0.19	
	Simultaneous	1.33	
General Pop. Limit		1.60	

FCC Applicant:
ICOM Incorporated
1-1-32, Kamiminami
Hirano-Ku
Osaka 547-0003, Japan

ISED Applicant:
ICOM Canada
150-6165 Highway 17
Glenwood Ctr., Delta
BC, Canada V4K 5B8

FCC ID:	ISED ID:
AFJ293100	202D-293100
Product Model Number / HVIN	Product Name / PMN
293100-01	IP504H

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 **IC Registration 3874A-1** **FCC Registration: CA3874**

Table of Contents

1.0 DOCUMENT CONTROL

Revision History				
Samples Tested By:	Trevor Whillock/Ben Hewson	**Date(s) of Evaluation:**		19-22, 24-26, 28-30 Nov & 1 Dec 2021
Report Prepared By:	Ben Hewson	**Report Reviewed By:**		Art Voss
Report Revision	**Description of Revision**	**Revised Section**	**Revised By**	**Revision Date**
0.1	Draft	n/a	Ben Hewson	11 February 2022

2.0 CLIENT AND DEVICE INFORMATION

Applicant Information	
Applicant Name (FCC)	**ICOM Incorporated**
Applicant Address (FCC)	1-1-32, Kamiminami
	Hirano-Ku
	Osaka 547-0003, Japan
Applicant Name (ISED)	**ICOM Canada**
Applicant Address (ISED)	150-6165 Highway 17A
	Glenwood Center
	Delta, BC, V4K 5B8 Canada
DUT (Host) Information	
Device Identifier(s):	**FCC ID:** **AFJ293100**
	ISED ID: **202D-293100**
Device Type:	Portable LTE & B;uetooth Transceiver
Host Device Model(s) / HVIN:	293100-01
Host Marketing Name / HMN:	IPH504H
Host Firmware Version ID Number / FVIN:	-
Test Sample Serial No.:	374032000005
Transmit Frequency Range:	2402 - 2480MHz
Manuf. Max. Rated Output Power:	6.41dBm
Antenna Make and Model: *	Bluetooth: Circuit Board Multilayer Monopole
Antenna Type and Gain:	n/a
DUT Power Source:	Rechargeable Li-Ion Battery Pack, 7.4VDC, 1880mAh, 14Wh
DUT Dimensions [HxWxD] (mm)	H x W x D:150mm x 55mm x 25mm
Deviation(s) from standard/procedure:	None
Modification of DUT:	None

Integrated Module Information	
Module Manufacturer:	SIMCom
Device Identifier(s):	**FCC ID:** 2AJYU-8PYA006
	IC ID: 23761-8PYA007
Device Type:	LTE / GNSS Transceiver Module
Module Device Model(s) / HVIN:	SIM7600NA
Module Product Marketing Name / PMN:	LTE/GNSS Module
Host Firmware Version ID Number / FVIN:	SIM7600NA_V2.0.1
Equipment Class (FCC):	PCS Licensed Transmitter
Equipment Class (ISED):	Cellular Network - Other Portable Device
Transmit Frequency Range:	LTE B2: 1850-1910MHz
	LTE B4: 1710-1755MHz
	LTE B5: 824-849MHz
	LTE B12: 699-716MHz
	LTE B13: 777-787MHz
	LTE B14: 788-798MHz
	LTE B25: 1850-1915MHz
	LTE B26: 814-949MHz
	LTE B41: 2496-2690MHz
	LTE B66:1710-1780MHz
	LTE B71: 663-698MHz
Test Channels:	LTE Bands: B2, B4, B5, B12, B13, B14, B25, B26, B41, B66, B71
Manuf. Max. Rated Output Power:	23dBm Nominal

3.0 SCOPE OF EVALUATION

This Certification Report was prepared on behalf of:

ICOM Incorporated (FCC Applicant)

ICOM Canada (ISED applicant)

,(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.

Device Description:

The IP504H is a portable handheld Push-To-Talk (PTT) LTE and Bluetooth transceiver. The FHSS Bluetooth operates between 2402 and 2480MHz using GFSK π/4 dqpsl & 8DPSK modulations. The LTE is a pre-certified module, FCC ID: **AFJ293100**, IC ID: **202D-293100**, operating on bands B2, B4, B5, B12, B13, B24, B25, B26, B41, B66, B77, using QPSK and 16QAM. Both transmitters are capable of simultaneous transmission. A variety of batteries, audio and body-worn accessories are available for this device and the device is capable of Voice Activated (VOX) transmission.

Regulatory Requirement:

As per FCC 47 CFR Part §2.1093 and Health Canada Safety Code 6, an RF Exposure evaluation report is required for this *Equipment* and the results of the RF Exposure evaluation appear in this report.

Filing:

This is an application for new certification.

Scope:

The scope of this investigation is limited to the evaluation SAR for intended use for all required RF exposure configurations and accessories types. The Test Plan developed for this evaluation is based on the required test channels and configurations producing the highest worst case SAR. Where applicable, SAR test reduction and/or SAR test exclusion may be utilized. Test procedures are based on the requirements IEC/EEE 62209-1528, FCC KDB 865646, 447498, 247228 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)
IEC International Standard /IEEE International Committee on Electromagnetic Safety IEC/IEEE 62209-1528-2020:	Measurement procudeure for the assessment of sepcific absorption rate of human expoure to radio frequency fields from hand-held and body-mounted wireless communication devices - Part 1528; Human models, insturmentation, and procedures (Frequency range of 4 MHz to 10 GHz)
IEEE International Committee on Electromagnetic Safety IEEE 1528-2013:	IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
IEC International Standard IEC 62209-2 2010	Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Part 2
FCC KDB KDB 865664 D01v01r04	SAR Measurement Requirements for 100MHz to 6GHz
FCC KDB KDB 447498 D01v06	Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies
FCC KDB KDB 248227 D01v02r02	SAR Test Guidane for IEEE 802.11 (WiFI) Transmitters
* 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:	Date(s) Evaluated:
ICOM Incorporated ICOM Canada	19-22, 24-26, 28-30 Nov & 1 Dec 2021
Module Product Name / PMN:	**Module Product Model Number / HVIN:**
IP504H	IP504H

Standard(s) Applied:

FCC 47 CFR §2.1093
Health Canada's Safety Code 6

Measurement Procedures:

FCC KDB 865664, FCC KDB 447498, FCC KDB 865646, FCC KDB 247228
Industry Canada RSS-102 Issue 5
IEC/IEEE Standard 62209-1528, IEC 62209-2

Use Group:	Limits Applied:
[X] General Population / User Unaware	[X] 1.6W/kg - 1g Volume - Body/Head/Face
[ ] Occupational / User Aware	[ ] 8.0W/kg - 1g Volume - Body/Head/Face
	[ ] 4.0W/kg - 10g Volume - Extremity

Reason for Issue:

[X] New Certification
[ ] Class II Permissive Change

Reason for Change:

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.

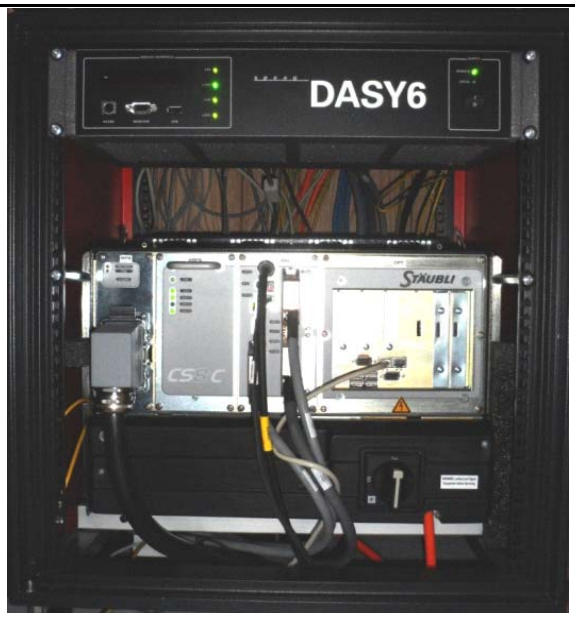
Art Voss, P.Eng.
Technical Manager
Celltech Labs Inc.
31 August 2022
Date

6.0 SAR 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

7.0 RF CONDUCTED POWER MEASUREMENT

Table 7.1 Conducted Power Measurement Results, LTE Band 2

LTE Conducted Power Measurement									
LTE Band:		26	Channel Bandwidth:					15MHz	
Lower Band Edge		814(MHz)	Upper Band Edge:					849(MHz)	
Modulation	RB Size	RB Offset	Low 26765 821.5(MHz)		Mid 26865 831.5(MHz)		High 26965 841.5(MHz)		Chan Pos EARFCN Chan Freq RB Pos
			Conducted Power (dBm)						
				X		X		X	
QPSK	1	0	**24.77**	X	24.18		24.40		Low
	1	36	24.51		24.26		24.81		Mid
	1	74	24.09		**24.51**	X	**24.82**	X	High
	36	0	24.38		**24.56**	X	24.68		Low
	36	37	**24.56**	X	24.47		**24.78**	X	High
	75	0	24.53	-	24.60	-	**24.63**	X	Mid
16QAM(1)(2)	1	0	24.37		24.10		24.30		Low
	1	12	24.12		23.81		24.06		Mid
	1	24	23.84		23.52		23.79		High
	12	0	23.62		23.3		23.53		Low
	12	11	23.15		22.78		22.95		High
	25	0	22.95		22.55		22.67		Mid
64QAM(3)	1	0	-		-		-		Low
	1	36	-		-		-		Mid
	1	74	-		-		-		High
	36	0	-		-		-		Low
	36	18	-		-		-		Mid
	36	37	-		-		-		High
	75	0	-		-		-		Mid

"X" = Required Test Channel
(1) All 16QAM measurements were performed at 5MHz Channel Bandwidth.
(2) 16QAM measurement data obtained from original filing.
(3) DUT is not capable of 64QAM

Table 7.2 Conducted Power Measurement Results, LTE Band 4

LTE Conducted Power Measurement									
LTE Band:		4			Channel Bandwidth:				20MHz
Lower Band Edge		1710(MHz)			Upper Band Edge:				1755(MHz)
Modulation	RB Size	RB Offset	Low 20050 1720(MHz)		Mid 20175 1732.5(MHz)		High 20300 1745(MHz)		Chan Pos EARFCN Chan Freq
			Conducted Power (dBm)						RB Pos
				X		X		X	
QPSK	1	0	**23.17**	X	22.78		22.74		Low
	1	50	22.81		**22.81**	X	**23.55**	X	Mid
	1	99	22.66		22.21		22.63		High
	50	0	**22.82**	X	22.29		22.89		Low
	50	50	22.23		**22.63**	X	**23.30**	X	High
	100	0	22.49		22.60		**23.04**	X	Mid
16QAM(1)(2)	1	0	22.96		22.97		22.94		Low
	1	12	22.72		22.7		22.67		Mid
	1	24	22.52		22.5		22.42		High
	12	0	22.27		22.22		22.2		Low
	12	11	21.8		21.7		21.66		High
	25	0	21.53		21.41		21.4		Mid
64QAM(3)	1	0	-		-		-		Low
	1	50	-		-		-		Mid
	1	99	-		-		-		High
	50	0	-		-		-		Low
	50	25	-		-		-		Mid
	50	50	-		-		-		High
	100	0	-		-		-		Mid

"X" = Required Test Channel
(1) All 16QAM measurements were performed at 5MHz Channel Bandwidth.
(2) 16QAM measurement data obtained from original filing.
(3) DUT is not capable of 64QAM

Table 7.3 Conducted Power Measurement Results, LTE Band 5

LTE Conducted Power Measurement									
LTE Band:		5			Channel Bandwidth:				10MHz
Lower Band Edge		824(MHz)			Upper Band Edge:				849(MHz)
Modulation	RB Size	RB Offset	Low 20450 829(MHz)		Mid 20525 836.5(MHz)		High 20600 844(MHz)		Chan Pos EARFCN Chan Freq
			Conducted Power (dBm)						RB Pos
				X		X		X	
QPSK	1	0	**24.73**	X	24.31		24.63		Low
	1	25	24.72		**24.48**	X	24.65		Mid
	1	49	24.40		24.41		**24.83**	X	High
	25	0	24.46		**24.56**	X	24.42		Low
	25	25	**24.58**	X	24.44		**24.57**	X	High
	50	0	**24.61**	X	**24.53**	X	**24.48**	X	Mid
16QAM(1)(2)	1	0	24.37		24.10		24.30		Low
	1	12	24.12		23.81		24.06		Mid
	1	24	23.84		23.52		23.79		High
	12	0	23.62		23.3		23.53		Low
	12	11	23.15		22.78		22.95		High
	25	0	22.95		22.55		22.67		Mid
64QAM(3)	1	0	-		-		-		Low
	1	25	-		-		-		Mid
	1	49	-		-		-		High
	25	0	-		-		-		Low
	25	12	-		-		-		Mid
	25	25	-		-		-		High
	50	0	-		-		-		Mid

"X" = Required Test Channel
(1) All 16QAM measurements were performed at 5MHz Channel Bandwidth.
(2) 16QAM measurement data obtained from original filing.
(3) DUT is not capable of 64QAM

Table 7.4 Conducted Power Measurement Results, LTE Band 12

LTE Conducted Power Measurement									
LTE Band:		12			Channel Bandwidth:				10MHz
Lower Band Edge		699(MHz)			Upper Band Edge:				716(MHz)
Modulation	RB Size	RB Offset	Low 23060 704(MHz)		Mid 23095 707.5(MHz)		High 23130 711(MHz)		Chan Pos EARFCN Chan Freq
			Conducted Power (dBm)						RB Pos
				X		X		X	
QPSK	1	0	**24.80**	X	24.12		23.72		Low
	1	25	24.10		24.24		**25.35**	X	Mid
	1	49	24.15		**24.27**	X	23.66		High
	25	0	**24.47**	X	23.05		**24.83**	X	Low
	25	25	23.13		**25.12**	X	24.13		High
	50	0	23.95		24.32		**24.57**	X	Mid
16QAM(1)(2)	1	0	24.56		24.59		24.60		Low
	1	12	24.29		24.31		24.39		Mid
	1	24	24.06		24.02		24.12		High
	12	0	23.79		23.76		23.87		Low
	12	11	23.27		23.24		23.36		High
	25	0	23.05		22.97		23.11		Mid
64QAM(3)	1	0	-		-		-		Low
	1	25	-		-		-		Mid
	1	49	-		-		-		High
	25	0	-		-		-		Low
	25	12	-		-		-		Mid
	25	25	-		-		-		High
	50	0	-		-		-		Mid

"X" = Required Test Channel
(1) All 16QAM measurements were performed at 5MHz Channel Bandwidth.
(2) 16QAM measurement data obtained from original filing.
(3) DUT is not capable of 64QAM

Table 7.5 Conducted Power Measurement Results, LTE Band 13

LTE Conducted Power Measurement									
LTE Band:		13			Channel Bandwidth:				10MHz
Lower Band Edge		777(MHz)			Upper Band Edge:				787(MHz)
Modulation	RB Size	RB Offset	Low 23230 782(MHz)		Mid 23230 782(MHz)		High 23230 782(MHz)		Chan Pos EARFCN Chan Freq
			Conducted Power (dBm)						RB Pos
				X		X		X	
QPSK	1	0	n/a		**23.24**	X	n/a		Low
	1	25	n/a		22.87		n/a		Mid
	1	49	n/a		22.94		n/a		High
	25	0	n/a		**23.12**	X	n/a		Low
	25	25	n/a		23.09		n/a		High
	50	0	n/a		**23.01**	X	n/a		Mid
16QAM(1)(2)	1	0	22.87		22.80		22.81		Low
	1	12	22.61		22.58		22.54		Mid
	1	24	22.31		22.3		22.33		High
	12	0	22.09		22.07		22.09		Low
	12	11	21.69		21.56		21.62		High
	25	0	21.43		21.32		21.35		Mid
64QAM(3)	1	0	-		-		-		Low
	1	25	-		-		-		Mid
	1	49	-		-		-		High
	25	0	-		-		-		Low
	25	12	-		-		-		Mid
	25	25	-		-		-		High
	50	0	-		-		-		Mid

"X" = Required Test Channel

(1) All 16QAM measurements were performed at 5MHz Channel Bandwidth.

(2) 16QAM measurement data obtained from original filing.

(3) DUT is not capable of 64QAM

Table 7.6 Conducted Power Measurement Results, LTE Band 14

LTE Conducted Power Measurement									
LTE Band:		14			Channel Bandwidth:				10MHz
Lower Band Edge		788(MHz)			Upper Band Edge:				798(MHz)
Modulation	RB Size	RB Offset	Low 23330 793(MHz)		Mid 23330 793(MHz)		High 23330 793(MHz)		Chan Pos EARFCN Chan Freq
			Conducted Power (dBm)						RB Pos
				X		X		X	
QPSK	1	0	n/a		20.71		n/a		Low
	1	25	n/a		21.15		n/a		Mid
	1	49	n/a		**21.20**	X	n/a		High
	25	0	n/a		**21.10**	X	n/a		Low
	25	25	n/a		20.20		n/a		High
	50	0	n/a		**20.31**	X	n/a		Mid
16QAM[(1)(2)]	1	0	20.9		20.87		20.74		Low
	1	12	20.7		20.6		20.49		Mid
	1	24	20.49		20.32		20.21		High
	12	0	20.25		20.05		20		Low
	12	11	19.75		19.53		19.48		High
	25	0	19.54		19.27		19.25		Mid
64QAM[(3)]	1	0	-		-		-		Low
	1	25	-		-		-		Mid
	1	49	-		-		-		High
	25	0	-		-		-		Low
	25	12	-		-		-		Mid
	25	25	-		-		-		High
	50	0	-		-		-		Mid

"X" = Required Test Channel
(1) All 16QAM measurements were performed at 5MHz Channel Bandwidth.
(2) 16QAM measurement data obtained from original filing.
(3) DUT is not capable of 64QAM

Table 7.7 Conducted Power Measurement Results, LTE Band 25

LTE Conducted Power Measurement									
LTE Band:		25	Channel Bandwidth:						20MHz
Lower Band Edge		1850(MHz)	Upper Band Edge:						1915(MHz)
Modulation	RB Size	RB Offset	Low 26140 1860(MHz)		Mid 26365 1882.5(MHz)		High 26590 1905(MHz)		Chan Pos EARFCN Chan Freq
			Conducted Power (dBm)						RB Pos
				X		X		X	
QPSK	1	0	21.70		**22.47**	X	**22.00**	X	Low
	1	50	**22.85**	X	22.44		21.25		Mid
	1	99	22.78		21.40		19.40		High
	50	0	22.38		**22.75**	X	**21.80**	X	Low
	50	50	**22.75**	X	21.79		20.44		High
	100	0	**22.45**	X	22.32		21.24		Mid
16QAM(1)(2)	1	0	22.15		22.07		22.07		Low
	1	12	21.94		21.78		21.83		Mid
	1	24	21.73		21.58		21.54		High
	12	0	21.46		21.31		21.34		Low
	12	11	20.95		20.86		20.79		High
	25	0	20.74		20.62		20.51		Mid
64QAM(3)	1	0	-		-		-		Low
	1	50	-		-		-		Mid
	1	99	-		-		-		High
	50	0	-		-		-		Low
	50	25	-		-		-		Mid
	50	50	-		-		-		High
	100	0	-		-		-		Mid

"X" = Required Test Channel
(1) All 16QAM measurements were performed at 5MHz Channel Bandwidth.
(2) 16QAM measurement data obtained from original filing.
(3) DUT is not capable of 64QAM

Table 7.8 Conducted Power Measurement Results, LTE Band 26

LTE Conducted Power Measurement									
LTE Band:		26	Channel Bandwidth:					15MHz	
Lower Band Edge		814(MHz)	Upper Band Edge:					849(MHz)	
Modulation	RB Size	RB Offset	Low 26765 821.5(MHz)		Mid 26865 831.5(MHz)		High 26965 841.5(MHz)		Chan Pos EARFCN Chan Freq
			Conducted Power (dBm)						RB Pos
				X		X		X	
QPSK	1	0	**24.77**	X	24.18		24.40		Low
	1	36	24.51		24.26		24.81		Mid
	1	74	24.09		**24.51**	X	**24.82**	X	High
	36	0	24.38		**24.56**	X	24.68		Low
	36	37	**24.56**	X	24.47		**24.78**	X	High
	75	0	24.53	-	24.60	-	**24.63**	X	Mid
16QAM(1)(2)	1	0	24.37		24.10		24.30		Low
	1	12	24.12		23.81		24.06		Mid
	1	24	23.84		23.52		23.79		High
	12	0	23.62		23.3		23.53		Low
	12	11	23.15		22.78		22.95		High
	25	0	22.95		22.55		22.67		Mid
64QAM(3)	1	0	-		-		-		Low
	1	36	-		-		-		Mid
	1	74	-		-		-		High
	36	0	-		-		-		Low
	36	18	-		-		-		Mid
	36	37	-		-		-		High
	75	0	-		-		-		Mid

"X" = Required Test Channel
(1) All 16QAM measurements were performed at 5MHz Channel Bandwidth.
(2) 16QAM measurement data obtained from original filing.
(3) DUT is not capable of 64QAM

Table 7.9 Conducted Power Measurement Results, LTE Band 66

LTE Conducted Power Measurement									
LTE Band:		66			Channel Bandwidth:		20MHz		
Lower Band Edge		1710(MHz)			Upper Band Edge:		1780(MHz)		
Modulation	RB Size	RB Offset	Low 132072 1720(MHz)		Mid 132322 1745(MHz)		High 132572 1770(MHz)		Chan Pos EARFCN Chan Freq RB Pos
			Conducted Power (dBm)						
				X		X		X	
QPSK	1	0	23.09		22.60		21.99		Low
	1	50	**23.16**	X	**22.85**	X	**22.73**	X	Mid
	1	99	22.36		22.35		22.18		High
	50	0	22.34		22.93		22.36		Low
	50	50	**22.38**	X	**23.24**	X	**22.63**	X	High
	100	0	22.46	-	**23.54**	X	22.47	-	Mid
16QAM(1)(2)	1	0	22.96		22.97		22.94		Low
	1	12	22.72		22.7		22.67		Mid
	1	24	22.52		22.5		22.42		High
	12	0	22.27		22.22		22.2		Low
	12	11	21.8		21.7		21.66		High
	25	0	21.53		21.41		21.4		Mid
64QAM(3)	1	0	-		-		-		Low
	1	50	-		-		-		Mid
	1	99	-		-		-		High
	50	0	-		-		-		Low
	50	25	-		-		-		Mid
	50	50	-		-		-		High
	100	0	-		-		-		Mid

"X" = Required Test Channel
(1) All 16QAM measurements were performed at 5MHz Channel Bandwidth.
(2) 16QAM measurement data obtained from original filing.
(3) DUT is not capable of 64QAM

Table 7.10 Conducted Power Measurement Results, LTE Band 71

LTE Conducted Power Measurement									
LTE Band:		71			Channel Bandwidth:				20MHz
Lower Band Edge		663(MHz)			Upper Band Edge:				698(MHz)
Modulation	RB Size	RB Offset	Low 133222 673(MHz)		Mid 133297 680.5(MHz)		High 133372 688(MHz)		Chan Pos EARFCN Chan Freq
			Conducted Power (dBm)						RB Pos
				X		X		X	
QPSK	1	0	21.41		**21.59**	X	21.30		Low
	1	50	21.34		21.20		21.32		Mid
	1	99	**21.47**	X	21.21		**22.09**	X	High
	50	0	21.06		21.08		21.04		Low
	50	50	**21.07**	X	**21.14**	X	**21.08**	X	High
	100	0	21.03	-	21.06	-	**21.07**	X	Mid
16QAM[1][2]	1	0	21.58		21.60		21.67		Low
	1	12	21.32		21.35		21.39		Mid
	1	24	21.11		21.09		21.12		High
	12	0	20.81		20.86		20.91		Low
	12	11	20.29		20.39		20.46		High
	25	0	20.01		20.18		20.18		Mid
64QAM[3]	1	0	-		-		-		Low
	1	50	-		-		-		Mid
	1	99	-		-		-		High
	50	0	-		-		-		Low
	50	25	-		-		-		Mid
	50	50	-		-		-		High
	100	0	-		-		-		Mid

"X" = Required Test Channel
(1) All 16QAM measurements were performed at 5MHz Channel Bandwidth.
(2) 16QAM measurement data obtained from original filing.
(3) DUT is not capable of 64QAM

Table 7.11 Conducted Power Measurement Results, Bluetooth

Bluetooth Conducted Power Measurements			
Data Rate	Frequency (MHz)	Peak (dBm)	Peak (mW)
BDR DM1	2402.00	6.36	4.33
BDR DM1	2441.00	**6.41**	**4.38**
BDR DM1	2480.00	6.25	4.21
BDR DH3	2402.00	6.15	4.12
BDR DH3	2441.00	6.33	4.30
BDR DH3	2480.00	6.16	4.13
BDR DH5	2402.00	6.09	4.07
BDR DH5	2441.00	6.14	4.11
BDR DH5	2480.00	6.13	4.10
EDR DM1	2402.00	4.55	2.85
EDR DM1	2441.00	4.40	2.76
EDR DM1	2480.00	4.04	2.53
EDR 2-DH3	2402.00	5.11	3.24
EDR 2-DH3	2441.00	5.05	3.20
EDR 2-DH3	2480.00	4.65	2.91
EDR 3-DH3	2402.00	5.18	3.30
EDR 3-DH3	2441.00	5.22	3.33
EDR 3-DH3	2480.00	4.97	3.14
EDR 2-DH5	2402.00	5.06	3.21
EDR 2-DH5	2441.00	4.99	3.16
EDR 2-DH5	2480.00	4.59	2.87
EDR 3-DH5	2402.00	5.21	3.32
EDR 3-DH5	2441.00	5.29	3.38
EDR 3-DH5	2480.00	5.06	3.20

The rated power and tolerance are stated for typical transmission modes and data rates. Some modes and data rates may produce lower than rated conducted power levels. Power measurements taken across the various channels, modes and data rates did not produce levels in excess of the Rated Power plus Tolerance. SAR was evaluated using the power level setting and duty cycle specified by the manufacturer to be the max output power and produce the most conservative SAR. SAR was evaluated at the *maximum average* tune up tolerance. See section 2.0 Client and Device Information for details. The *reported* SAR was not scaled down.

8.0 NUMBER OF TEST CHANNELS (N_C)

In accordance with FCC KDB 941225 D05v02r05:

4.1. Frequency range and channel bandwidth

The frequency range and channel bandwidths (1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, and 20 MHz) used in each LTE band must be listed. When multiple channel bandwidths are available in a frequency band and if the channel selection is unclear, a KDB inquiry may be necessary. If a transmission band is > 100 MHz, the channel selection criteria in 4.1 g) of KDB Publication 447498 D01 must be applied; otherwise, the high, middle, and low (H, M, L) channel should be used(3) These are referred to in this document as the required test channels.

(3) For LTE bands that do not support at least three non-overlapping channels in certain channel bandwidths, test the available non-overlapping channels instead. When a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing; therefore, the requirement for H, M, and L channels may not fully apply.

5.2. Largest channel bandwidth standalone SAR test requirements

5.2.1. QPSK with 1 RB allocation

Start with the largest channel bandwidth then measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle, and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel.6 When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

5.2.2. QPSK with 50% RB allocation

The procedures required for 1 RB allocation in 5.2.1 are applied to measure the SAR for QPSK with 50% RB allocation.7

5.2.3. QPSK with 100% RB allocation

For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations, and the highest reported SAR for 1 RB and 50% RB allocation in 5.2.1 and 5.2.2 are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

5.2.4. Higher order modulations

For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in 5.2.1, 5.2.2, and 5.2.3 to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is > ½ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

5.3. Other channel bandwidth standalone SAR test requirements

For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in 5.2 to determine the channels and RB configurations that need SAR testing, then only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is > ½ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration, or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg. The equivalent channel configuration for the RB allocation, RB offset and modulation, etc., is determined for the smaller channel bandwidth according to the same number of RB allocated in the largest channel bandwidth. For example, 50 RB in 10 MHz channel bandwidth does not apply to 5 MHz channel bandwidth; therefore, this cannot be tested in the smaller channel bandwidth. However, 50% RB allocation in 10 MHz channel bandwidth is equivalent to 100% RB allocation in 5 MHz channel bandwidth; therefore, these are the equivalent configurations to be compared to determine the specific channel and configuration in the smaller channel bandwidth that need SAR testing.

9.0 ACCESSORIES EVALUATED

IP504H Manufacturers Parts and Accessories Evaluated					
Test Report ID Number	Bar code labeling	Manufacturer's Part Number	Description	SAR Eval	SAR Test
DUT					
D1	548-1563-01	IP504H	Radio No 3	x	Yes
Antenna					
T1	548-1563-02	Antenna	Supplied antenna with IP504H radio	x	Yes
Battery					
P1	548-1563-03	BP-307	7.4V Battery Pack (3050 mAH)	x	Yes
P2	548-1563-04	BP-272	7.4V Battery Pack (1880 mAH)	x	Yes
C1	548-1563-22	BC-211	Battery charger with BC157S AC adaptor	-	No
C2	548-1563-22	BC-157S	AC Adapter	-	No
Body Accessory					
B1	548-1563-05	MB-135	Supplied Belt Clip with IP504H Radio	x	Yes
B2	548-1563-06	MB-57L	Shoulder strap (used with LC-185)	x	Yes
B3	548-1563-07	Hand Strap	Supplied Nyron strap with IP504H radio	x	No
B4	548-1563-21	LC-185	Radio Case (fits BP-272 only)	x	Yes
Audio Accessory					
A1	548-1563-08	HM-183LS	Speaker Microphone	x	Yes
A2	548-1563-09	HM186LS	Speaker MIcrophone	x	No
A3	548-1563-10	HM222HLS	Speaker Microphone	x	No
A4	548-1563-11	HM-153LS	Earphone Microphone	x	Yes
A5	548-1563-12	HM-166LS	Earphone Microphone	x	No
A6	548-1563-13	HS-94	Headset (Ear Hook)	x	Yes
A7	548-1563-14	HS-95	Headset (Neck)	x	No
A8	548-1563-15	HS-97	Throat Microphone	x	No
A9	548-1563-16	HS-102	Headset (Ear Phone)	x	Yes
A10	548-1563-17	VS-3	Bluetooth Headset	x	Yes
A11	548-1563-18	OPC-2359	PTT switch for headsets - Req'd w/ A9	x	Yes
A12	548-1563-19	OPC-2328	PTT switch for headsets - Req'd w/ A6, A7, A8	x	Yes
A13	548-1563-20	OPC-2006LS	Plug Adapter cable for headsets - Req'd w/ A6, A7, A8	x	Yes

10.0 SAR MEASUREMENT SUMMARY

Table 10.1: Measured Results – Body

Measured SAR Results (1g) - BODY Configuration (FCC/ISED)																
Date	Plot ID	DUT Configuration	LTE Band	Frequency (MHz)	Channel BW (MHz)	Resouce Blocks	RB Offset	Accessories				DUT Spacing		Conducted Power (dBm)	Measured SAR (1g) 75% DC (W/kg)	SAR Drift (dB)
								Antenna ID	Battery ID	Body ID	Audio ID	DUT (mm)	Antenna (mm)			
19 Nov 2021	B5	Body- Back	26	841.5	15	1	High	T1	P2	B2/B4	A1	0	0	24.83	0.228	-0.410
20 Nov 2021	B6	Body- Back	26	841.5	15	1	High	T1	P2	B2/B4	A1	0	0	24.83	0.358	0.340
20 Nov 2021	B9	Body- Back	26	841.5	15	1	High	T1	P2	B1	A1	0	0	24.83	0.172	-0.530
20 Nov 2021	B10	Body- Back	26	841.5	15	1	High	T1	P2	B2/B4	A4	0	0	24.83	0.376	-0.340
20 Nov 2021	B11	Body- Back	26	841.5	15	1	High	T1	P2	B2/B4	A6+OPC2006LS	0	0	24.83	0.404	0.190
20 Nov 2021	B13	Body- Back	26	841.5	15	1	High	T1	P2	B2/B4	A9+OPC-2359	0	0	24.83	0.305	-0.280
20 Nov 2021	B14	Body- Back	26	841.5	15	1	High	T1	P2	B2/B4	A10	0	0	24.83	0.410	-0.170
30 Nov 2021	B62	Body- Back	26	841.5	15	1	High	T1	P2	-	A10	5	5	24.83	0.065	-0.400
30 Nov 2021	B63	Body- Back	26	841.5	15	1	High	T1	P1	-	A10	5	5	24.83	0.069	0.020
30 Nov 2021	B64	Body-Front	26	841.5	15	1	High	T1	P2	-	A10	5	5	24.83	0.154	-0.040
30 Nov 2021	B65	Body-Front	26	841.5	15	1	High	T1	P1	-	A10	5	5	24.83	0.101	-0.190
30 Nov 2021	B66	Body-Front	26	841.5	15	36	High	T1	P2 (W/C)	-	A10	5	5	24.78	0.153	-0.160
30 Nov 2021	B67	Body-Front	12	711	10	1	Mid	T1	P2	-	A10	5	5	25.35	0.170	-3.120
30 Nov 2021	B68	Body-Front	12	711	10	1	Mid	T1	P1	-	A10	5	5	25.35	0.125	-0.260
30 Nov 2021	B69	Body-Front	12	707.5	10	25	High	T1	P2	-	A10	5	5	25.12	0.196	-0.050
30 Nov 2021	B70	Body- Back	12	711	10	1	Mid	T1	P2	-	A10	5	5	25.35	0.140	-0.210
01 Dec 2021	B71	Body-Front	13	782	10	1	Mid	T1	P2	-	A10	5	5	23.14	0.174	-0.030
01 Dec 2021	B72	Body- Back	13	782	10	25	Low	T1	P2	-	A10	5	5	23.12	0.188	0.030
01 Dec 2021	B73	Body-Front	14	793	10	1	High	T1	P2	-	A10	5	5	21.20	0.213	-0.190
01 Dec 2021	B74	Body-Front	14	793	10	25	Low	T1	P2	-	A10	5	5	21.10	0.237	-0.230
30 Nov 2021	B60	Body- Back	71	688	20	1	High	T1	P2	B3 /none	A10	5	5	22.09	0.162	0.340
30 Nov 2021	B61	Body- Back	71	680.5	20	50	High	T1	P2	B3 /none	A10	5	5	21.14	0.135	0.390
SAR Limit									Spatial Peak			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 10.1: Measured Results – Body (continued)

Measured SAR Results (1g) - BODY Configuration (FCC/ISED)																
Date	Plot ID	DUT Configuration	LTE Band	Frequency (MHz)	Channel BW (MHz)	Resouce Blocks	RB Offset	Accessories				DUT Spacing		Conducted Power (dBm)	Measured SAR (1g) 75% DC (W/kg)	SAR Drift (dB)
								Antenna ID	Battery ID	Body ID	Audio ID	DUT (mm)	Antenna (mm)			
27 Nov 2021	B51	Body- Back	4	1745	20	1	Mid	T1	P2	-	A10	5	5	23.55	**0.775**	-0.470
27 Nov 2021	B52	Body-Front	4	1745	20	1	Mid	T1	P2	-	A10	5	5	23.55	0.715	-0.200
27 Nov 2021	B53	Body- Back	4	1745	20	1	Mid	T1	P1	-	A10	5	5	23.55	0.352	-0.280
27 Nov 2021	B54	Body- Back	4	1745	20	1	Mid	T1	P2	B2/B4	A10	0	0	23.55	0.655	-0.650
27 Nov 2021	B55	Body- Back	4	1745	20	1	Mid	T1	P2	B1	A10	0	0	23.55	0.374	-0.410
27 Nov 2021	B56	Body- Back	4	1745	20	50	High	T1	P2	-	A10	5	0	23.30	0.412	-0.630
27 Nov 2021	B57	Body- Back	66	1720	20	1	Mid	T1	P2	-	A10	5	5	23.16	0.449	-0.900
27 Nov 2021	B58	Body- Back	66	1745	20	50	High	T1	P2	-	A10	5	5	23.24	0.685	0.050
27 Nov 2021	B59	Body- Back	66	1745	20	100	Mid	T1	P2	-	A10	5	5	23.54	0.697	0.020
28 Nov 2021	B71b	Body- Back	2	1860	20	1	Mid	T1	P2	-	A10	5	5	22.75	0.303	0.150
28 Nov 2021	B72b	Body- Back	2	1860	20	50	Low	T1	P2	-	A10	5	5	22.65	0.414	-0.620
28 Nov 2021	B73b	Body- Back	2	1860	20	100	Mid	T1	P2	-	A10	5	5	22.35	0.438	-0.070
28 Nov 2021	B74b	Body- Back	25	1860	20	1	Mid	T1	P2	-	A10	5	5	22.85	0.298	0.090
28 Nov 2021	B75	Body- Back	25	1860	20	50	High	T1	P2	-	A10	5	5	22.85	0.410	0.020
28 Nov 2021	B76	Body- Back	2	1860	20	1	Mid	T1	P1	-	A10	5	5	22.75	0.301	0.320
28 Nov 2021	B77	Body- Back	2	1860	20	1	Mid	T1	P2	B1	A10	0	0	22.75	0.165	-0.100
28 Nov 2021	B78	Body- Back	2	1860	20	1	Mid	T1	P2	B2/B4	A10	0	0	22.75	0.381	-0.160
28 Nov 2021	B84	Body-Front	2	1860	20	100	Mid	T1	P2	-	A10	5	5	22.35	0.405	-0.020
28 Nov 2021	B79	Body- Back	2	1860	20	100	Mid	T1	P2	B2/B4	A1	0	0	22.35	0.434	-0.030
28 Nov 2021	B80	Body- Back	2	1860	20	100	Mid	T1	P2	B2/B4	A4	0	0	22.35	0.462	-0.150
28 Nov 2021	B81	Body- Back	2	1860	20	100	Mid	T1	P2	B2/B4	A6+OPC2006LS	0	0	22.35	0.395	0.030
28 Nov 2021	B82	Body- Back	2	1860	20	100	Mid	T1	P2	B2/B4	A9+OPC-2359	0	0	22.35	0.519	-0.090
28 Nov 2021	B83	Body- Back	2	1860	20	100	Mid	T1	P2	B2/B4	A8+OPC-2328	0	0	22.35	0.433	-0.020
SAR Limit									**Spatial Peak**			**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 10.2: Measured Results - Face

Measured SAR Results (1g) - FACE Configuration (FCC/ISED)																
Date	Plot ID	DUT Configuration	LTE Band	Frequency (MHz)	Channel BW (MHz)	Resouce Blocks	RB Offset	Accessories				DUT Spacing		Conducted Power (dBm)	Measured SAR (1g) 75% DC (W/kg)	SAR Drift (dB)
								Antenna ID	Battery ID	Body ID	Audio ID	DUT (mm)	Antenna (mm)			
21 Nov 2021	F1	Face	26	841.5	15	1	High	T1	P2	N/A	N/A	25mm	25mm	24.92	0.146	-0.050
21 Nov 2021	F2	Face	26	841.5	15	36	High	T1	P2	N/A	N/A	25mm	25mm	24.78	0.162	-0.010
21 Nov 2021	F5	Face	26	841.5	15	36	High	T1	P1	N/A	N/A	25mm	25mm	24.78	0.157	-0.120
24 Nov 2021	F6	Face	12	711	10	1	Mid	T1	P2	N/A	N/A	25mm	25mm	25.35	0.236	0.440
24 Nov 2021	F7	Face	12	707.5	10	25	High	T1	P2	N/A	N/A	25mm	25mm	25.12	0.230	-0.150
24 Nov 2021	F8	Face	13	782	10	1	Low	T1	P2	N/A	N/A	25mm	25mm	23.14	**0.243**	-0.140
24 Nov 2021	F9	Face	13	782	10	25	Low	T1	P2	N/A	N/A	25mm	25mm	23.12	0.190	0.130
24 Nov 2021	F10	Face	14	793	10	1	High	T1	P2	N/A	N/A	25mm	25mm	21.20	0.206	-0.190
24 Nov 2021	F11	Face	14	793	10	25	Low	T1	P2	N/A	N/A	25mm	25mm	21.10	0.218	-0.050
30 Nov 2021	F24	Face	71	688	20	1	High	T1	P2	N/A	N/A	25mm	25mm	22.09	0.154	-1.150
30 Nov 2021	F25	Face	71	680.5	20	50	High	T1	P2	N/A	N/A	25mm	25mm	21.14	0.176	0.180
28 Nov 2021	F12	Face	4	1745	20	1	Mid	T1	P1	N/A	N/A	25mm	25mm	23.55	0.226	-0.280
28 Nov 2021	F13	Face	4	1745	20	1	Mid	T1	P2	N/A	N/A	25mm	25mm	23.55	0.170	-0.340
28 Nov 2021	F14	Face	4	1745	20	50	High	T1	P1	N/A	N/A	25mm	25mm	23.30	0.151	-0.510
28 Nov 2021	F15	Face	66	1720	20	1	Mid	T1	P1	N/A	N/A	25mm	25mm	23.16	0.227	-0.380
28 Nov 2021	F16	Face	66	1745	20	50	High	T1	P1	N/A	N/A	25mm	25mm	23.24	0.234	-0.020
28 Nov 2021	F17	Face	66	1745	20	100	Mid	T1	P1	N/A	N/A	25mm	25mm	23.54	0.230	-0.040
29 Nov 2021	F18	Face	2	1860	20	1	Mid	T1	P2	N/A	N/A	25mm	25mm	22.75	0.205	0.060
29 Nov 2021	F19	Face	2	1860	20	1	Mid	T1	P1	N/A	N/A	25mm	25mm	22.75	0.150	0.340
29 Nov 2021	F20	Face	2	1860	20	50	Low	T1	P2	N/A	N/A	25mm	25mm	22.65	0.171	-0.580
29 Nov 2021	F21	Face	2	1860	20	100	Mid	T1	P2	N/A	N/A	25mm	25mm	22.35	0.161	-0.080
29 Nov 2021	F22	Face	25	1860	20	1	Mid	T1	P2	N/A	N/A	25mm	25mm	22.85	0.171	0.190
29 Nov 2021	F23	Face	25	1860	20	50	High	T1	P2	N/A	N/A	25mm	25mm	22.75	0.155	0.010
SAR Limit									Spatial Peak			Face		RF Exposure Category		
FCC 47 CFR 2.1093			Health Canada Safety Code 6						1 Gram Average			1.6 W/kg		General Population /User Unaware		

11.0 SCALING OF MAXIMUM MEASURED SAR

Table 11.1 SAR Scaling

Scaling of Maximum Measured SAR (1g)					
Measured Parameters		Configuration			
		Face	Body	Head	
Plot ID		F8	B51	n/a	
Maximum Measured SAR_M		0.182	0.775	n/a	(W/kg)
Frequency		782	1745	n/a	(MHz)
Power Drift		-0.140	-0.470	n/a	(dB)
Conducted Power		23.240	21.860	n/a	(dBm)
Fluid Deviation from Target					
Δe	Permitivity	-6.90%	-7.72%	n/a	
Δσ	Conductivity	-5.11%	1.22%	n/a	

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)
$Cσ = (0.009804*f^3) - (0.08661*f^2) + (0.02981*f) + 0.7829$					(F.3)
f	Frequency (GHz)	0.782	1.745	n/a	
Ce		-0.219	-0.226	n/a	
Cσ		0.758	0.623	n/a	
Ce * Δe		0.015	0.017	n/a	
Cσ * Δσ		-0.039	0.008	n/a	
ΔSAR		-0.024 (3)	0.025	n/a	(%)

Note(3): Delta SAR is negative, SAR Adjustment for Fluid Sensitivity is not Required.

Manufacturer's Tuneup Tolerance				
Measured Conducted Power	23.140	21.860	n/a	(dBm)
Rated Conducted Power	23.150	23.000	n/a	(dBm)
ΔP	-0.010	-1.140	n/a	(dB)

SAR Adjustment for Fluid Sensitivity				
$SAR_1 = SAR_M * ΔSAR$	0.182	0.794	n/a	(W/kg)

SAR Adjustment for Tuneup Tolerance				
$SAR_2 = SAR_1 + [ΔP]$	0.182	1.033	n/a	(W/kg)

SAR Adjustment for Drift				
$SAR_3 = SAR_2 + Drift$	0.188	1.151	n/a	(W/kg)

reported SAR				
$FCC/ISED = SAR_3$	**0.19**	**1.15**	n/a	(W/kg)

NOTES to Table 11.0
(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 and Body 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 4. The Plot ID is for indentification of the SAR Measurement Plots in Annex A of this report. NOTE: Some of the scaling factors in Steps 1 through 4 may not apply and are identified by light gray text.
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 9.1 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 or Simultaneous Reported SAR.
Step 4
Per KDB 447498 4.3.2. The SAR, either measured or calculated, of ANY and ALL simultaneous transmitters must be added together and includes all contributors.
Step 5
The Reported SAR is the Maximum Final Adjusted Cumulative SAR from the applicable Steps 1 through 4 and are reported on Page 1 of this report.

11.2 Simultaneous SAR

The estimated Bluetooth SAR, in accordance with FCC KDB 447498 D01v06 4.3.2 (b)(1), is given by:

$$SAR = \frac{P}{d}\ X\ \frac{\sqrt{f}}{x}$$

Where P is power, *mW*, d is separation distance, *mm*, f is frequency, *GHz* and x = 7.5 for 1g SAR.
P = 6.41dBm = 4.38mW, d = 5mm, f = 2.480GHz

***Standalone* Bluetooth SAR = 0.184W/kg**

Simultaneous SAR = SAR_1 + SAR_2

Where SAR_1 = highest measured *reported* SAR, SAR_2 = *Standalone* Bluetooth SAR
SAR_1 = 1.15W/kg, SAR_2 = 0.184W/kg

Simultaneous *reported* SAR = 1.334W/kg

12.0 SAR EXPOSURE LIMITS

Table 12.0 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

13.1 Day Log

DAY LOG								
Date	Ambient Temp (° C)	Fluid Temp (° C)	Relative Humidity (%)	Barometric Pressure (kPa)	Fluid Dielectric	SPC	Test	Task
19 Nov 2021	26.5	22.8	21%	102.3	X	X	X	835H Fluid, SPC, SAR Testing
20 Nov 2021	25.5	22.5	22%	102.5			X	835H SAR Testing
21 Nov 2021	25.2	22.9	22%	103.2			X	835H SAR Testing
21 Nov 2021	26.5	22.7	22%	103.0	X	X		750H Fluid, SPC
22 Nov 2021	24.7	22.3	24%	102.0			X	750H SAR Testing
24 Nov 2021	24.1	21.2	25%	103.0			X	750H SAR Testing
25 Nov 2021	25.5	21.1	25%	102.0	X	X		1800H Fluid
26 Nov 2021	24.4	22.5	26%	101.8		X	X	1800H SPC, SAR Testing
28 Nov 2021	23.2	22.0	28%	101.6			X	1800H SAR Testing
29 Nov 2021	24.9	23.2	27%	102.2			X	1800H SAR Testing
29 Nov 2021	24.9	23.6	27%	102.2	X	X		750H Fluid, SPC
30 Nov 2021	25.5	22.3	29%	101.7			X	750H SAR Testing
01 Dec 2021	25.4	22.7	30%	101.1			X	750H SAR Testing

*

13.2 DUT Setup and Configuration

DUT Setup and Configuration
Overview
The DUT was evaluated for *Face* SAR at the maximum conducted output power level, preset by the manufacturer, with a fully charged battery in unmodulated continuous transmit operation (FM mode at 100% duty cycle) with the transmit key continuously depressed. For a Push-To-Talk (PTT) device with a manually operated transmit pushbutton, a 50% duty cycle compensation for the *reported SAR* was used, as per FCC KDB 447498 (6.1). The manufacturer does offer Audio Accessories to be used with this device. Therefore, Audio Accessories were evaluated during the course of this investigation. Since the nature of the device does not inhibit the ability to transmit while worn on the body; the DUT was tested in F*ace* configuration only. The test procedures outlined in FCC KDB 447498 " General SAR Test Reduction Considerations for " as well as FCC KDB 865664, and IEEE 1528 were used throughout the evaluation of this device.

13.3 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.

13.4 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 ±2.0°C throughout the test series. The liquid parameters shall be measured within 24 hours before the start of a test series and if it takes longer than 48 hours, the liquid parameters shall also be measured at the end of the test series. 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. 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 configuration, 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.

13.5 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 KDB 865664 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.

13.6 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	

13.7 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	

13.8 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 14.0 Measurement Uncertainty

UNCERTAINTY BUDGET FOR DEVICE EVALUATION (IEEE 1528-2013 Table 9)									
Source of Uncertainty	**IEEE 1528 Section**	**Toler ±%**	**Prob Dist**	**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	1	1	**6.7**	**6.7**	∞
Axial Isotropy** (*k* =1)	E.2.2	0.6	R	√3	0.7	0.7	**0.2**	**0.2**	∞
Hemispherical Isotropy** (*k* =1)	E.2.2	3.2	R	√3	0.7	0.7	**1.3**	**1.3**	∞
Boundary Effect*	E.2.3	1.0	R	√3	1	1	0.6	0.6	∞
Linearity** (*k* =1)	E.2.4	**0.5**	R	√3	1	1	**0.3**	**0.3**	∞
System Detection Limits*	E.2.4	1.0	R	√3	1	1	0.6	0.6	∞
Modulation Response** (*k* =1)	E.2.5	**8.3**	R	√3	1	1	**4.8**	**4.8**	∞
Readout Electronics*	E.2.6	0.3	N	1	1	1	0.3	0.3	∞
Response Time*	E.2.7	0.8	R	√3	1	1	0.5	0.5	∞
Integration Time*	E.2.8	2.6	R	√3	1	1	1.5	1.5	∞
RF Ambient Conditions - Noise	E.6.1	**0.0**	R	√3	1	1	0.0	0.0	**10**
RF Ambient Conditions - Reflection	E.6.1	**0.0**	R	√3	1	1	0.0	0.0	**10**
Probe Positioner Mechanical Tolerance*	E.6.2	0.0	R	√3	1	1	0.0	0.0	∞
Probe Positioning w rt Phantom Shell*	E.6.3	0.4	R	√3	1	1	0.2	0.2	∞
Post-processing*	E.5	2.0	R	√3	1	1	1.2	1.2	∞
Test Sample Related									
Test Sample Positioning	E.4.2	**2.2**	N	1	1	1	2.2	2.2	**5**
Device Holder Uncertainty*	E.4.1	3.6	N	1	1	1	3.6	3.6	∞
SAR Drift Measurement(2)	E.2.9	0.0	R	√3	1	1	0.0	0.0	∞
SAR Pow er Scaling(3)	E.6.5	0.0	R	√3	1	1	0.0	0.0	∞
Phantom and Tissue Parameters									
Phantom Uncertainty*	E.3.1	6.1	R	√3	1	1	3.5	3.5	∞
SAR Correction Uncertainty	E.3.2	**1.9**	N	1	1	0.84	1.9	1.6	∞
Liquid Conductivity (measurement)	E.3.3	**5.0**	N	1	0.78	0.71	3.9	3.6	**10**
Liquid Permittivity (measurement)	E.3.3	**5.0**	N	1	0.23	0.26	1.2	1.3	**10**
Liquid Conductivity (Temperature)	E.3.2	**0.4**	R	√3	0.78	0.71	0.2	0.2	**10**
Liquid Permittivity Temperature)	E.3.2	**0.2**	R	√3	0.23	0.26	0.0	0.0	**10**
Effective Degrees of Freedom(1)								**V_{eff} =**	**1161**
Combined Standard Uncertainty			**RSS**				**11.1**	**11.0**	
Expanded Uncertainty (95% Confidence Interval)			**k=2**				**22.3**	**22.0**	
Measurement Uncertainty Table in accordance with IEEE Standard 1528-2013									

(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 Pow er Scaling not Required

* Provided by SPEAG for DASY

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

Table 14.1 Calculation of Degrees of Freedom

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

15.0 FLUID DIELECTRIC PARAMETERS

Table 15.1 Fluid Dielectric Parameters 835MHz HEAD TSL

****

Aprel Laboratory
Test Result for UIM Dielectric Parameter
Fri 19/Nov/2021 10:55:05
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
0.7350	42.02	0.89	40.33	0.84
0.7450	41.97	0.89	39.86	0.83
0.7550	41.92	0.89	40.30	0.86
0.7650	41.86	0.89	39.94	0.87
0.7750	41.81	0.90	39.76	0.86
0.7850	41.76	0.90	39.57	0.87
0.7950	41.71	0.90	39.54	0.89
0.8050	41.66	0.90	39.42	0.88
0.8150	41.60	0.90	39.08	0.89
0.8250	41.55	0.90	38.88	0.89
0.8350	41.50	0.90	38.88	0.93
0.8450	41.50	0.91	38.62	0.94
0.8550	41.50	0.92	38.42	0.97
0.8650	41.50	0.93	38.52	0.97
0.8750	41.50	0.94	38.54	0.97
0.8850	41.50	0.95	38.23	0.96
0.8950	41.50	0.96	38.28	0.98
0.9050	41.50	0.97	38.13	0.99
0.9150	41.50	0.98	38.10	0.98
0.9250	41.48	0.98	37.91	0.99
0.9350	41.46	0.99	37.99	1.01

FLUID DIELECTRIC PARAMETERS

Date:	19 Nov 2021	Fluid Temp:	22.8	Frequency:	835MHz	Tissue:	Head

Freq (MHz)	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity
735.0000	40.3300	0.8400	42.0200	0.89	-4.02%	-5.62%
745.0000	39.8600	0.8300	41.9700	0.89	-5.03%	-6.74%
755.0000	40.3000	0.8600	41.9200	0.89	-3.86%	-3.37%
765.0000	39.9400	0.8700	41.8600	0.89	-4.59%	-2.25%
775.0000	39.7600	0.8600	41.8100	0.90	-4.90%	-4.44%
785.0000	39.5700	0.8700	41.7600	0.90	-5.24%	-3.33%
795.0000	39.5400	0.8900	41.7100	0.90	-5.20%	-1.11%
805.0000	39.4200	0.8800	41.6600	0.90	-5.38%	-2.22%
815.0000	39.0800	0.8900	41.6000	0.90	-6.06%	-1.11%
825.0000	38.8800	0.8900	41.5500	0.90	-6.43%	-1.11%
835.0000	38.8800	0.9300	41.5000	0.90	-6.31%	3.33%
845.0000	38.6200	0.9400	41.5000	0.91	-6.94%	3.30%
855.0000	38.4200	0.9700	41.5000	0.92	-7.42%	5.43%
865.0000	38.5200	0.9700	41.5000	0.93	-7.18%	4.30%
875.0000	38.5400	0.9700	41.5000	0.94	-7.13%	3.19%
885.0000	38.2300	0.9600	41.5000	0.95	-7.88%	1.05%
895.0000	38.2800	0.9800	41.5000	0.96	-7.76%	2.08%
905.0000	38.1300	0.9900	41.5000	0.97	-8.12%	2.06%
915.0000	38.1000	0.9800	41.5000	0.98	-8.19%	0.00%
925.0000	37.9100	0.9900	41.4800	0.98	-8.61%	1.02%
935.0000	37.9900	1.0100	41.4600	0.99	-8.37%	2.02%

*Channel Frequency Tested

Table 15.2 Fluid Dielectric Parameters 750MHz HEAD TSL

****

Aprel Laboratory
Test Result for UIM Dielectric Parameter
Sun 21/Nov/2021 14:26:32
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
0.6500	42.46	0.89	40.57	0.75
0.6600	42.41	0.89	40.61	0.75
0.6700	42.36	0.89	40.39	0.77
0.6800	42.31	0.89	40.28	0.77
0.6900	42.25	0.89	39.86	0.78
0.7000	42.20	0.89	39.86	0.80
0.7100	42.15	0.89	39.97	0.80
0.7200	42.10	0.89	39.86	0.82
0.7300	42.05	0.89	39.69	0.82
0.7400	41.99	0.89	39.14	0.84
0.7500	41.94	0.89	39.00	0.84
0.7600	41.89	0.89	39.27	0.85
0.7700	41.84	0.89	39.20	0.85
0.7800	41.79	0.90	39.01	0.85
0.7900	41.73	0.90	38.44	0.87
0.8000	41.68	0.90	38.51	0.89
0.8100	41.63	0.90	38.45	0.90
0.8200	41.58	0.90	38.48	0.90
0.8300	41.53	0.90	38.45	0.93
0.8400	41.50	0.91	38.05	0.92
0.8500	41.50	0.92	38.05	0.92

FLUID DIELECTRIC PARAMETERS							
Date:	21 Nov 2021	Fluid Temp:	22.7	Frequency:	750MHz	Tissue:	Head
Freq (MHz)		Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity
650.0000		40.5700	0.7500	42.4600	0.89	-4.45%	-15.73%
660.0000		40.6100	0.7500	42.4100	0.89	-4.24%	-15.73%
670.0000		40.3900	0.7700	42.3600	0.89	-4.65%	-13.48%
680.0000		40.2800	0.7700	42.3100	0.89	-4.80%	-13.48%
690.0000		39.8600	0.7800	42.2500	0.89	-5.66%	-12.36%
700.0000		39.8600	0.8000	42.2000	0.89	-5.55%	-10.11%
710.0000		39.9700	0.8000	42.1500	0.89	-5.17%	-10.11%
720.0000		39.8600	0.8200	42.1000	0.89	-5.32%	-7.87%
730.0000		39.6900	0.8200	42.0500	0.89	-5.61%	-7.87%
740.0000		39.1400	0.8400	41.9900	0.89	-6.79%	-5.62%
750.0000		39.0000	0.8400	41.9400	0.89	-7.01%	-5.62%
760.0000		39.2700	0.8500	41.8900	0.89	-6.25%	-4.49%
770.0000		39.2000	0.8500	41.8400	0.89	-6.31%	-4.49%
780.0000		39.0100	0.8500	41.7900	0.90	-6.65%	-5.56%
790.0000		38.4400	0.8700	41.7300	0.90	-7.88%	-3.33%
800.0000		38.5100	0.8900	41.6800	0.90	-7.61%	-1.11%
810.0000		38.4500	0.9000	41.6300	0.90	-7.64%	0.00%
820.0000		38.4800	0.9000	41.5800	0.90	-7.46%	0.00%
830.0000		38.4500	0.9300	41.5300	0.90	-7.42%	3.33%
840.0000		38.0500	0.9200	41.5000	0.91	-8.31%	1.10%
850.0000		38.0500	0.9200	41.5000	0.92	-8.31%	0.00%

*Channel Frequency Tested

Table 15.3 Fluid Dielectric Parameters 1800MHz HEAD TSL

****

Aprel Laboratory
Test Result for UIM Dielectric Parameter
Thu 25/Nov/2021 17:24:44
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
1.7100	40.14	1.35	37.27	1.25
1.7200	40.13	1.35	37.09	1.26
1.7300	40.11	1.36	37.13	1.26
1.7400	40.09	1.37	36.99	1.27
1.7500	40.08	1.37	37.00	1.29
1.7600	40.06	1.38	36.96	1.31
1.7700	40.05	1.38	36.99	1.32
1.7800	40.03	1.39	37.05	1.34
1.7900	40.02	1.39	36.92	1.34
1.8000	40.00	1.40	36.88	1.34
1.8100	40.00	1.40	36.82	1.35
1.8200	40.00	1.40	36.79	1.37
1.8300	40.00	1.40	36.91	1.38
1.8400	40.00	1.40	36.75	1.38
1.8500	40.00	1.40	36.72	1.38
1.8600	40.00	1.40	36.73	1.41
1.8700	40.00	1.40	36.75	1.40
1.8800	40.00	1.40	36.63	1.42
1.8900	40.00	1.40	36.51	1.44
1.9000	40.00	1.40	36.36	1.44
1.9100	40.00	1.40	36.43	1.46

FLUID DIELECTRIC PARAMETERS

Date:	29 Nov 2021	Fluid Temp:	23.6	Frequency:	750MHz	Tissue:	Head

Freq (MHz)	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity
650.0000	42.9000	0.7900	42.4600	0.89	1.04%	-11.24%
660.0000	42.5800	0.8100	42.4100	0.89	0.40%	-8.99%
670.0000	42.5500	0.8100	42.3600	0.89	0.45%	-8.99%
680.0000	42.3000	0.8300	42.3100	0.89	-0.02%	-6.74%
690.0000	42.4800	0.8300	42.2500	0.89	0.54%	-6.74%
700.0000	42.0000	0.8500	42.2000	0.89	-0.47%	-4.49%
710.0000	41.7100	0.8600	42.1500	0.89	-1.04%	-3.37%
720.0000	41.9000	0.8700	42.1000	0.89	-0.48%	-2.25%
730.0000	41.4300	0.8700	42.0500	0.89	-1.47%	-2.25%
740.0000	41.5100	0.8800	41.9900	0.89	-1.14%	-1.12%
750.0000	41.2900	0.9000	41.9400	0.89	-1.55%	1.12%
760.0000	41.2500	0.9100	41.8900	0.89	-1.53%	2.25%
770.0000	41.2500	0.9300	41.8400	0.89	-1.41%	4.49%
780.0000	41.2600	0.9100	41.7900	0.90	-1.27%	1.11%
790.0000	40.8900	0.9400	41.7300	0.90	-2.01%	4.44%
800.0000	41.0100	0.9300	41.6800	0.90	-1.61%	3.33%
810.0000	40.5600	0.9400	41.6300	0.90	-2.57%	4.44%
820.0000	40.4200	0.9500	41.5800	0.90	-2.79%	5.56%
830.0000	40.6600	0.9700	41.5300	0.90	-2.09%	7.78%
840.0000	40.3000	0.9900	41.5000	0.91	-2.89%	8.79%
850.0000	40.2100	0.9900	41.5000	0.92	-3.11%	7.61%

*Channel Frequency Tested

Table 15.4 Fluid Dielectric Parameters 750MHz HEAD TSL

****

Aprel Laboratory
Test Result for UIM Dielectric Parameter
Mon 29/Nov/2021 16:19:40
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
0.6500	42.46	0.89	42.90	0.79
0.6600	42.41	0.89	42.58	0.81
0.6700	42.36	0.89	42.55	0.81
0.6800	42.31	0.89	42.30	0.83
0.6900	42.25	0.89	42.48	0.83
0.7000	42.20	0.89	42.00	0.85
0.7100	42.15	0.89	41.71	0.86
0.7200	42.10	0.89	41.90	0.87
0.7300	42.05	0.89	41.43	0.87
0.7400	41.99	0.89	41.51	0.88
0.7500	41.94	0.89	41.29	0.90
0.7600	41.89	0.89	41.25	0.91
0.7700	41.84	0.89	41.25	0.93
0.7800	41.79	0.90	41.26	0.91
0.7900	41.73	0.90	40.89	0.94
0.8000	41.68	0.90	41.01	0.93
0.8100	41.63	0.90	40.56	0.94
0.8200	41.58	0.90	40.42	0.95
0.8300	41.53	0.90	40.66	0.97
0.8400	41.50	0.91	40.30	0.99
0.8500	41.50	0.92	40.21	0.99

FLUID DIELECTRIC PARAMETERS

Date:	29 Nov 2021	Fluid Temp:	23.6	Frequency:	750MHz	Tissue:	Head

Freq (MHz)		Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity
650.0000		42.9000	0.7900	42.4600	0.89	1.04%	-11.24%
660.0000		42.5800	0.8100	42.4100	0.89	0.40%	-8.99%
670.0000		42.5500	0.8100	42.3600	0.89	0.45%	-8.99%
680.0000		42.3000	0.8300	42.3100	0.89	-0.02%	-6.74%
690.0000		42.4800	0.8300	42.2500	0.89	0.54%	-6.74%
700.0000		42.0000	0.8500	42.2000	0.89	-0.47%	-4.49%
710.0000		41.7100	0.8600	42.1500	0.89	-1.04%	-3.37%
720.0000		41.9000	0.8700	42.1000	0.89	-0.48%	-2.25%
730.0000		41.4300	0.8700	42.0500	0.89	-1.47%	-2.25%
740.0000		41.5100	0.8800	41.9900	0.89	-1.14%	-1.12%
750.0000		41.2900	0.9000	41.9400	0.89	-1.55%	1.12%
760.0000		41.2500	0.9100	41.8900	0.89	-1.53%	2.25%
770.0000		41.2500	0.9300	41.8400	0.89	-1.41%	4.49%
780.0000		41.2600	0.9100	41.7900	0.90	-1.27%	1.11%
790.0000		40.8900	0.9400	41.7300	0.90	-2.01%	4.44%
800.0000		41.0100	0.9300	41.6800	0.90	-1.61%	3.33%
810.0000		40.5600	0.9400	41.6300	0.90	-2.57%	4.44%
820.0000		40.4200	0.9500	41.5800	0.90	-2.79%	5.56%
830.0000		40.6600	0.9700	41.5300	0.90	-2.09%	7.78%
840.0000		40.3000	0.9900	41.5000	0.91	-2.89%	8.79%
850.0000		40.2100	0.9900	41.5000	0.92	-3.11%	7.61%

*Channel Frequency Tested

16.0 SYSTEM VERIFICATION TEST RESULTS

Table 16.1 System Verification Results 835MHz HEAD TSL

System Verification Test Results					
Date		Frequency (MHz)	Validation Source		
			P/N		S/N
19 Nov 2021		835	D835V2		4d075
Fluid Type	Fluid Temp °C	Ambient Temp °C	Ambient Humidity (%)	Forward Power (mW)	Source Spacing (mm)
Head	22.8	27	21%	250	15
Fluid Parameters					
Permittivity			Conductivity		
Measured	Target	Deviation	Measured	Target	Deviation
38.88	41.50	-6.31%	0.93	0.90	3.33%
Measured SAR					
1 gram			10 gram		
Measured	Target	Deviation	Measured	Target	Deviation
2.28	2.41	-5.39%	1.47	1.55	-5.16%
Measured SAR Normalized to 1.0W					
1 gram			10 gram		
Normalized	Target	Deviation	Normalized	Target	Deviation
9.12	9.45	-3.49%	5.88	6.11	-3.76%

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 and IEC 62209-1.

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 750MHz HEAD TSL

System Verification Test Results					
Date		Frequency (MHz)	Validation Source		
			P/N		S/N
21 Nov 2021		750	D750V3		1061
Fluid Type	Fluid Temp °C	Ambient Temp °C	Ambient Humidity (%)	Forward Power (mW)	Source Spacing (mm)
Head	22.7	27	22%	250	15
Fluid Parameters					
Permittivity			Conductivity		
Measured	Target	Deviation	Measured	Target	Deviation
39.00	41.94	-7.01%	0.84	0.89	-5.62%
Measured SAR					
1 gram			10 gram		
Measured	Target	Deviation	Measured	Target	Deviation
2.12	2.08	1.92%	1.40	1.37	2.19%
Measured SAR Normalized to 1.0W					
1 gram			10 gram		
Normalized	Target	Deviation	Normalized	Target	Deviation
8.48	8.33	1.80%	5.60	5.48	2.19%

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 and IEC 62209-1.

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 1800MHz HEAD TSL

System Verification Test Results					
Date		Frequency (MHz)	Validation Source		
			P/N		S/N
26 Nov 2021		1800	D1800V2		247
Fluid Type	Fluid Temp °C	Ambient Temp °C	Ambient Humidity (%)	Forward Power (mW)	Source Spacing (mm)
Head	22.5	24	26%	250	10
Fluid Parameters					
Permittivity			Conductivity		
Measured	Target	Deviation	Measured	Target	Deviation
36.88	40.00	-7.80%	1.34	1.40	-4.29%
Measured SAR					
1 gram			10 gram		
Measured	Target	Deviation	Measured	Target	Deviation
9.49	9.75	-2.67%	5.05	5.10	-0.98%
Measured SAR Normalized to 1.0W					
1 gram			10 gram		
Normalized	Target	Deviation	Normalized	Target	Deviation
37.96	39.60	-4.14%	20.20	20.60	-1.94%

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 and IEC 62209-1.

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 16.4 System Verification Results 750MHz HEAD TSL

System Verification Test Results					
Date		Frequency (MHz)	Validation Source		
			P/N		S/N
29 Nov 2021		750	D750V3		1061
Fluid Type	Fluid Temp °C	Ambient Temp °C	Ambient Humidity (%)	Forward Power (mW)	Source Spacing (mm)
Head	23.2	25	27%	250	15
Fluid Parameters					
Permittivity			Conductivity		
Measured	Target	Deviation	Measured	Target	Deviation
41.29	41.94	-1.55%	0.90	0.89	1.12%
Measured SAR					
1 gram			10 gram		
Measured	Target	Deviation	Measured	Target	Deviation
2.15	2.08	3.37%	1.43	1.37	4.38%
Measured SAR Normalized to 1.0W					
1 gram			10 gram		
Normalized	Target	Deviation	Normalized	Target	Deviation
8.60	8.33	3.24%	5.72	5.48	4.38%

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 and IEC 62209-1.

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 SYSTEM VALIDATION SUMMARY

Table 17.1 System Validation Summary

System Validation Summary											
Frequency (MHz)	Validation Date	Probe Model	Probe S/N	Validation Source	Source S/N	Tissue	Tissue Dielectrics		Validation Results		
							Permitivity	Conductivity	Sensitivity	Linearity	Isotropy
750	21-Nov-21	EX3DV4	3600	D750V3	1061	Head	44.27	0.83	Pass	Pass	Pass
835	19-Nov-21	EX3DV4	3600	D835V2	4d075	Head	40.60	0.87	Pass	Pass	Pass
1800	25-Nov-21	EX3DV4	3600	D1800V2	247	Head	54.77	1.53	Pass	Pass	Pass

18.0 MEASUREMENT SYSTEM SPECIFICATIONS

Table 18.1 Measurement System Specifications

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 ELI 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 DASY 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**

19.0 TEST EQUIPMENT LIST

Table 19.1 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	22-Apr-21	22-Apr-22
-EX3DV4 E-Field Probe	00213	3600	20-Apr-21	20-Apr-22
-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	21-Mar-19	21-Mar-22
-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	26-Feb-19	26-Feb-22
-D2450V2 Validation Dipole	00219	825	24-Apr-21	24-Apr-24
ALS-D-2600-S-2	00327	225-00926	26-Feb-19	26-Feb-22
-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	26-Mar-19	26-Mar-22
Gigatronics 80701A Power Sensor	00186	1837002	COU	COU
Gigatronics 80334A Power Sensor	00237	1837001	26-Mar-19	26-Mar-22
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

Note: Per KDB 865664, Dipoles are evaluated annually for return loss and impedance. The dipole's SAR target can only be assessed by the SAR equipment manufacturer and remains the target until the dipole is recalibrated by the manufacturer. The dipole's SAR is evaluated and compared to this target during each and every System Verification which is performed prior to and/or during each DUT SAR evaluation. The results of these verifications are shown in Section 17.0

20.0 FLUID COMPOSITION

Table 20.1 Fluid Composition 835MHz HEAD TSL

Tissue Simulating Liquid (TSL) Composition				835MHz Head
Component by Percent Weight				
Water	Sugar	Salt(1)	HEC(2)	Bacteriacide(3)
40.71	56.63	1.48	0.99	0.19

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

Table 20.2 Fluid Composition 750MHz HEAD TSL

Tissue Simulating Liquid (TSL) Composition				750MHz Head
Component by Percent Weight				
Water	Sugar	Salt(1)	HEC(2)	Bacteriacide(3)
40.71	56.63	1.48	0.99	0.19

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

Table 20.3 Fluid Composition 1800MHz HEAD TSL

Tissue Simulating Liquid (TSL) Composition				1800MHz Head
Component by Percent Weight				
Water	Glycol	Salt(1)	HEC(2)	Bacteriacide(3)
54.8	44.9	0.3	0.0	0.0

(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

DUT: Dipole 835 MHz D835V2; Type: D835V2; Serial: D835V2 - SN:4d075
Procedure Name: SPC 835H, 1W Target=9.319W/kg ,6.011W/kg ,Input 250mW Target=2.33, 1.50

Communication System: UID 0, CW (0); Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.93 S/m; ε_r = 38.88; ρ = 1000 kg/m^3
Phantom section: Flat Section

Date/Time: 11/19/2021 12:28:05 PM

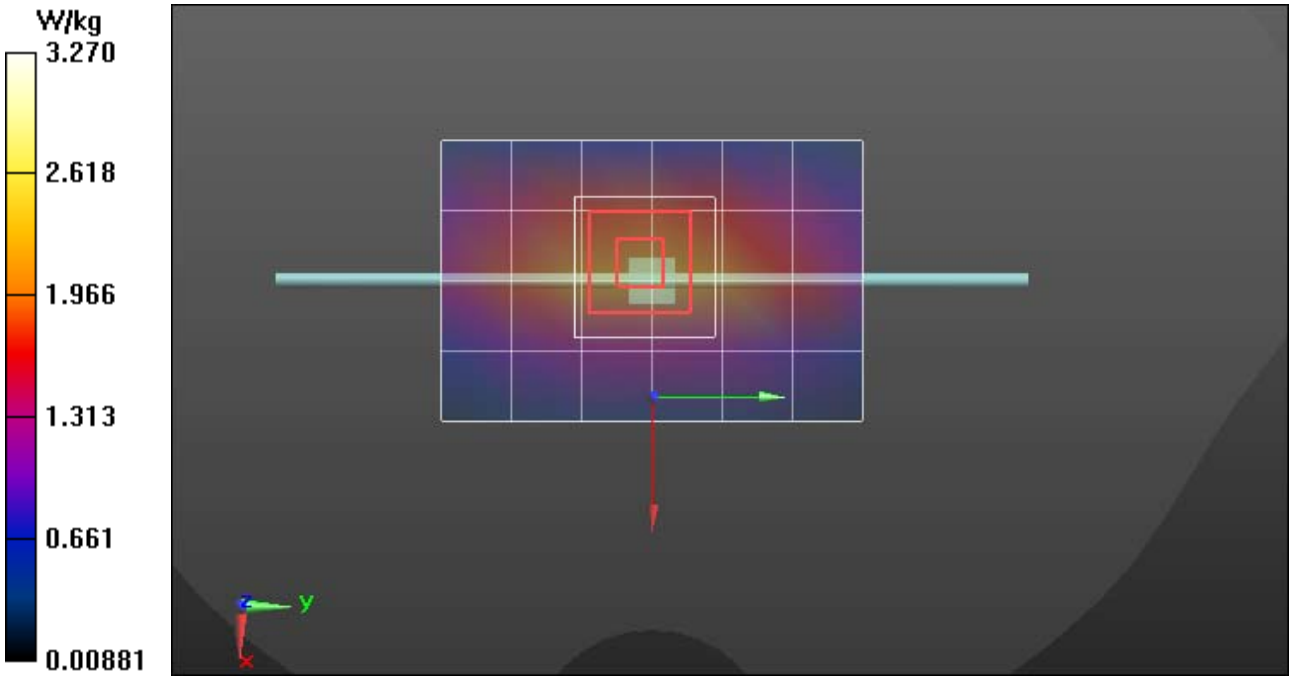
DASY5 Configuration:

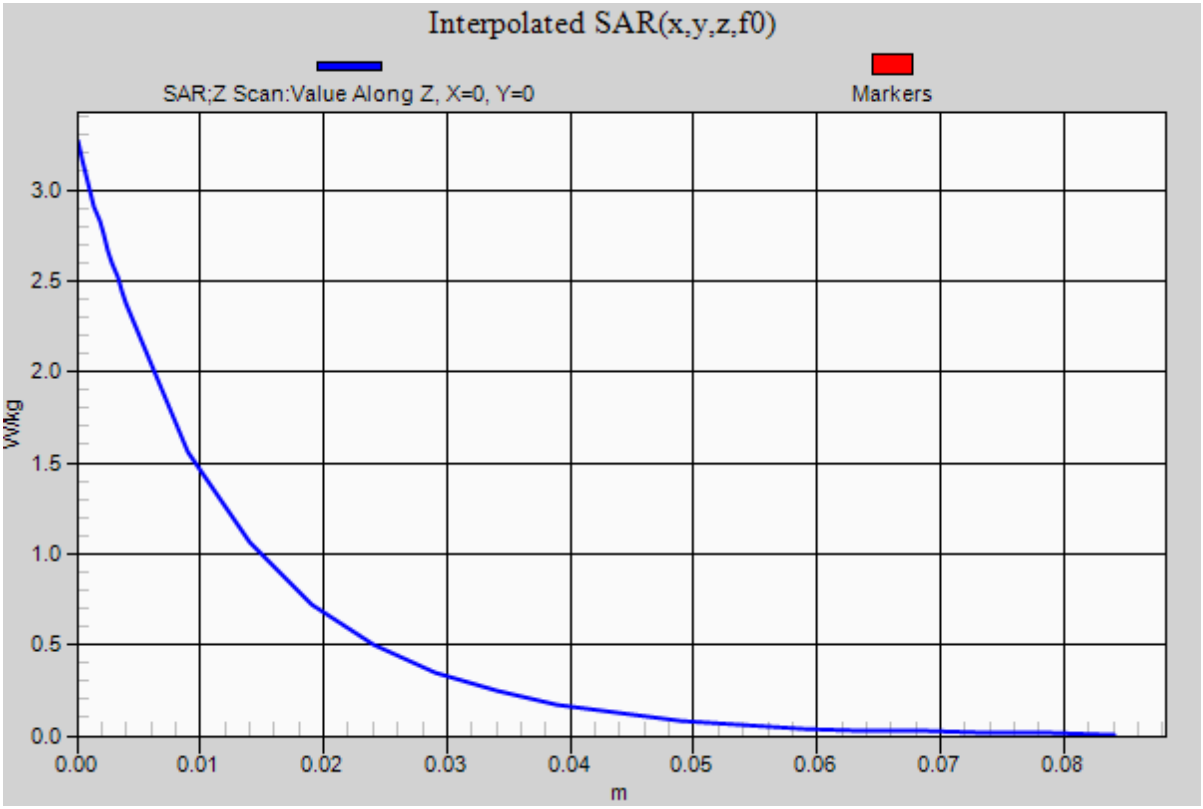
- Probe: EX3DV4 - SN3600; ConvF(7.92, 7.92, 7.92) @ 835 MHz; Calibrated: 4/28/2021
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 4/22/2021
- Phantom: Twin-SAM V4.0 (30deg probe tilt); Type: QD 000 P40 CC; Serial: xxxx
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

SPC/SPC 835H, 1W Target=9.319W/kg ,6.011W/kg ,Input 250mW Target=2.33, 1.50/Area Scan (5x7x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.39 W/kg

SPC/SPC 835H, 1W Target=9.319W/kg ,6.011W/kg ,Input 250mW Target=2.33, 1.50/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 50.89 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 3.50 W/kg
SAR(1 g) = 2.28 W/kg; SAR(10 g) = 1.47 W/kg
Ratio of SAR at M2 to SAR at M1 = 65.3%
Maximum value of SAR (measured) = 2.46 W/kg

SPC/SPC 835H, 1W Target=9.319W/kg ,6.011W/kg ,Input 250mW Target=2.33, 1.50/Z Scan (1x1x28): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Penetration depth = 12.83 (11.99, 13.32) [mm]
Maximum value of SAR (interpolated) = 3.27 W/kg





DUT: Dipole 750 MHz D750V3; Type: D750V3; Serial: D750V3 - SN:1061
Procedure Name: SPC 750H,Target=[1.82][2.08] [2.28] W/kg,Input_250mW

Communication System: UID 0, CW (0); Frequency: 750 MHz;Duty Cycle: 1:1
Medium parameters used: f = 750 MHz; σ = 0.84 S/m; ε_r = 39; ρ = 1000 kg/m^3
Phantom section: Flat Section

Date/Time: 11/21/2021 2:57:59 PM

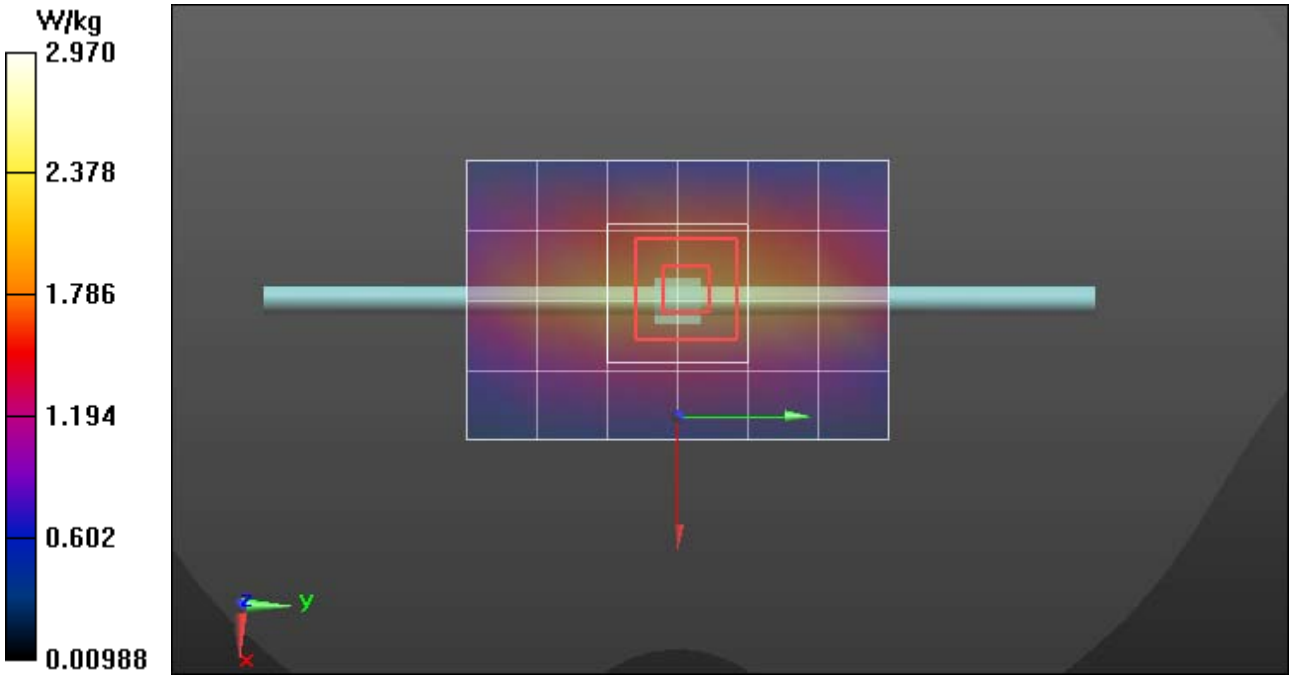
DASY5 Configuration:

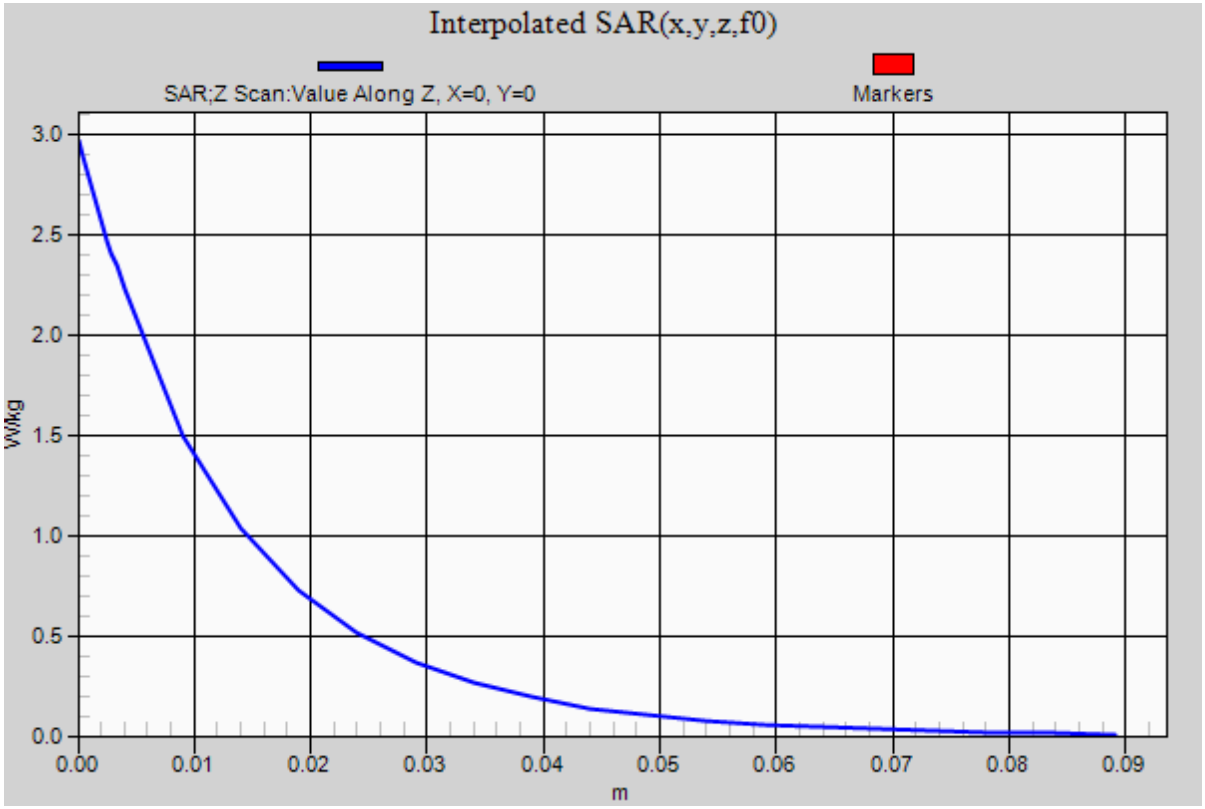
- Probe: EX3DV4 - SN3600; ConvF(8.06, 8.06, 8.06) @ 750 MHz; Calibrated: 4/28/2021
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 4/22/2021
- Phantom: Twin-SAM V4.0 (30deg probe tilt); Type: QD 000 P40 CC; Serial: xxxx
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

SPC/SPC 750H,Target=[1.82][2.08] [2.28] W/kg,Input_250mW/Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.30 W/kg

SPC/SPC 750H,Target=[1.82][2.08] [2.28] W/kg,Input_250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 52.79 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 3.18 W/kg
SAR(1 g) = 2.12 W/kg; SAR(10 g) = 1.4 W/kg
Ratio of SAR at M2 to SAR at M1 = 67%
Maximum value of SAR (measured) = 2.28 W/kg

SPC/SPC 750H,Target=[1.82][2.08] [2.28] W/kg,Input_250mW/Z Scan (1x1x29): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Penetration depth = 13.49 (12.71, 14.12) [mm]
Maximum value of SAR (interpolated) = 2.97 W/kg





DUT: Dipole 1800 MHz D1800V2; Type: D1800V2; Serial: D1800V2 - SN:247
Procedure Name: SPC 1800H Input=250mW, Target=[9.75][5.10]W/kg 2

Communication System: UID 0, CW (0); Frequency: 1800 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1800 MHz; σ = 1.34 S/m; ε_r = 36.88; ρ = 1000 kg/m^3
Phantom section: Flat Section

Date/Time: 11/26/2021 9:28:58 AM

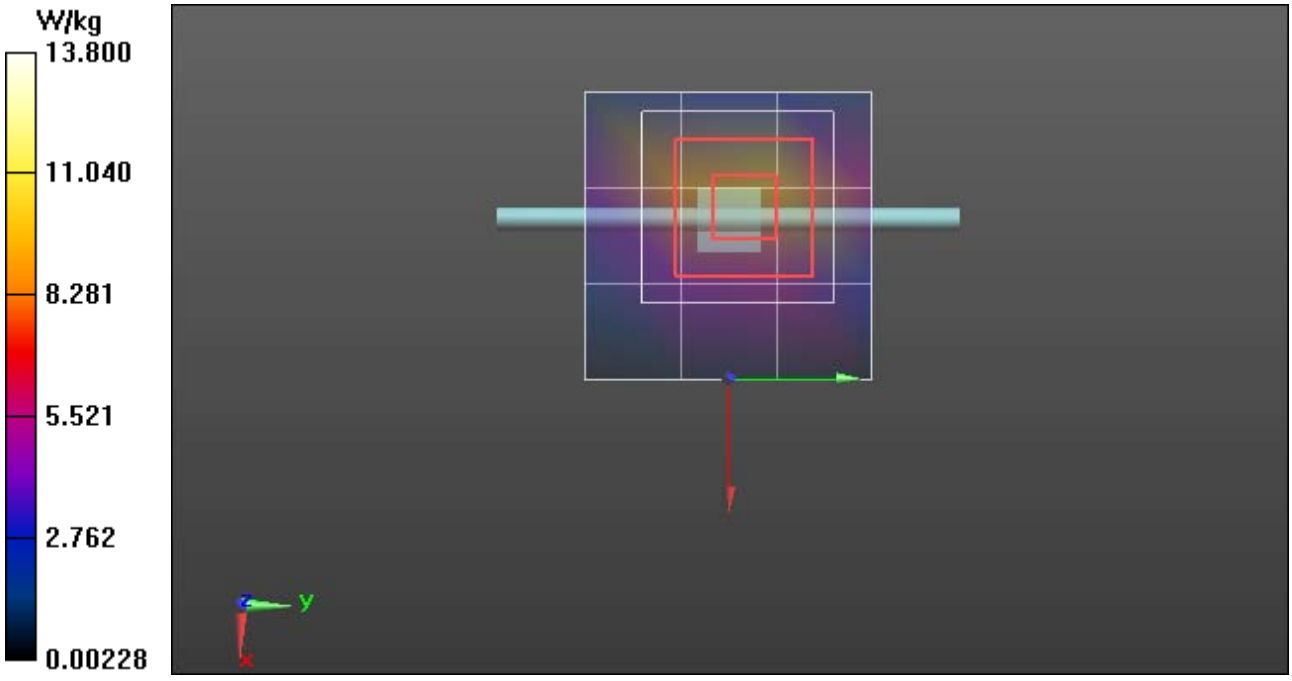
DASY5 Configuration:

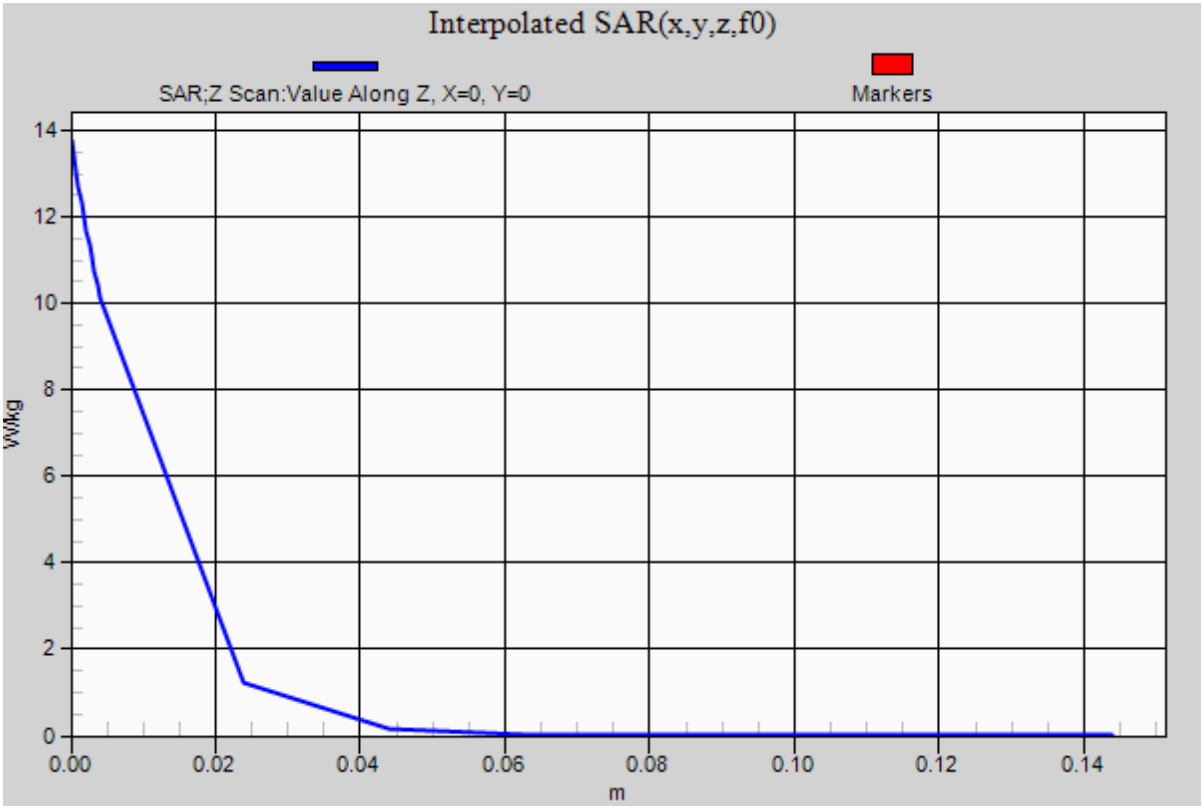
- Probe: EX3DV4 - SN3600; ConvF(7.23, 7.23, 7.23) @ 1800 MHz; Calibrated: 4/28/2021
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 4/22/2021
- Phantom: Twin-SAM V4.0 (30deg probe tilt); Type: QD 000 P40 CC; Serial: xxxx
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

SPC/SPC 1800H Input=250mW, Target=[9.75][5.10]W/kg 2/Area Scan (4x4x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 9.88 W/kg

SPC/SPC 1800H Input=250mW, Target=[9.75][5.10]W/kg 2/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 87.57 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 17.2 W/kg
SAR(1 g) = 9.49 W/kg; SAR(10 g) = 5.05 W/kg
Smallest distance from peaks to all points 3 dB below = 12 mm
Ratio of SAR at M2 to SAR at M1 = 56.3%
Maximum value of SAR (measured) = 10.6 W/kg

SPC/SPC 1800H Input=250mW, Target=[9.75][5.10]W/kg 2/Z Scan (1x1x19): Measurement grid: dx=20mm, dy=20mm, dz=20mm
Penetration depth = n/a (n/a, 9.399) [mm]
Maximum value of SAR (interpolated) = 13.8 W/kg





DUT: Dipole 750 MHz D750V3; Type: D750V3; Serial: D750V3 - SN:1061
Procedure Name: SPC 750H,Target=[1.82][2.08] [2.28] W/kg,Input_250mW 3 2

Communication System: UID 0, CW (0); Frequency: 750 MHz;Duty Cycle: 1:1
Medium parameters used: f = 750 MHz; σ = 0.9 S/m; ε_r = 41.29; ρ = 1000 kg/m^3
Phantom section: Flat Section

Date/Time: 11/29/2021 5:40:11 PM

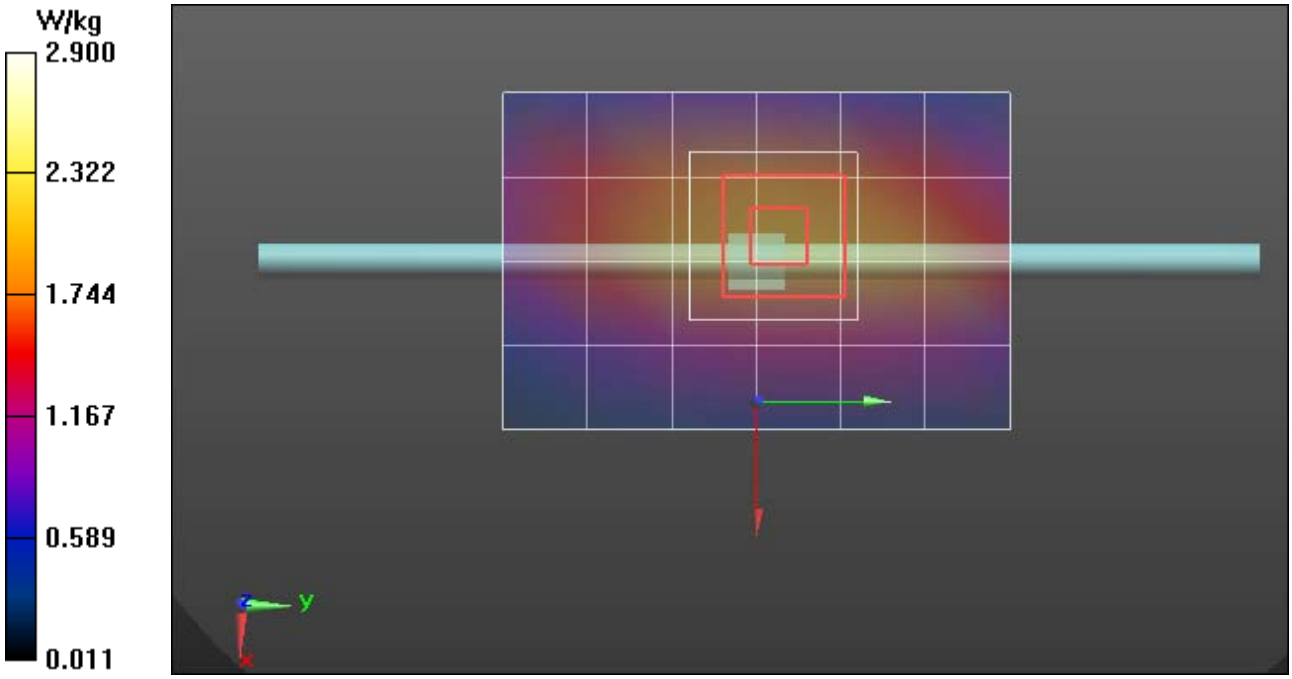
DASY5 Configuration:

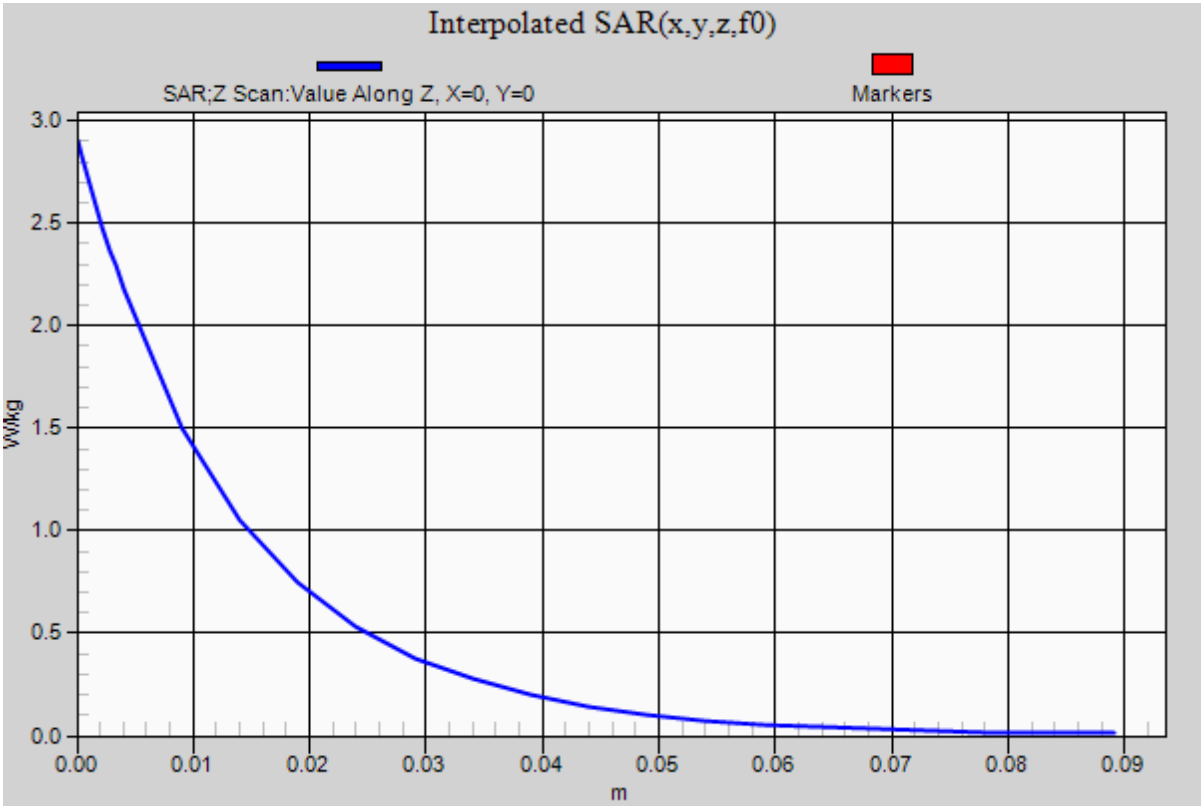
- Probe: EX3DV4 - SN3600; ConvF(8.06, 8.06, 8.06) @ 750 MHz; Calibrated: 4/28/2021
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 4/22/2021
- Phantom: Twin-SAM V4.0 (30deg probe tilt); Type: QD 000 P40 CC; Serial: xxxx
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

SPC/SPC 750H,Target=[1.82][2.08] [2.28] W/kg,Input_250mW 3 2/Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.18 W/kg

SPC/SPC 750H,Target=[1.82][2.08] [2.28] W/kg,Input_250mW 3 2/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 49.33 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 3.16 W/kg
SAR(1 g) = 2.15 W/kg; SAR(10 g) = 1.43 W/kg
Ratio of SAR at M2 to SAR at M1 = 68%
Maximum value of SAR (measured) = 2.31 W/kg

SPC/SPC 750H,Target=[1.82][2.08] [2.28] W/kg,Input_250mW 3 2/Z Scan (1x1x29): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Penetration depth = 13.98 (13.38, 14.63) [mm]
Maximum value of SAR (interpolated) = 2.90 W/kg





APPENDIX B – MEASUREMENT PLOTS OF MAXIMUM MEASURED SAR

Plot B52

DUT: ICOM; Type: PTT; Serial: Sample Proto Type D1
Procedure Name: B51 -ICOM IP504 backside 15mm ch 20300,1745MHz CB20MHz RB01 Mid P2 A10 5mm

Communication System: UID 0, CW (0); Frequency: 1745 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1745 MHz; σ = 1.28 S/m; ε_r = 36.995; ρ = 1000 kg/m^3
Phantom section: Flat Section

Date/Time: 11/27/2021 11:09:09 AM

DASY5 Configuration:

- Probe: EX3DV4 - SN3600; ConvF(7.23, 7.23, 7.23) @ 1745 MHz; Calibrated: 4/28/2021
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 4/22/2021
- Phantom: Twin-SAM V4.0 (30deg probe tilt); Type: QD 000 P40 CC; Serial: xxxx
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

1810H TSL/B51 -ICOM IP504 backside 15mm ch 20300,1745MHz CB20MHz RB01 Mid P2 A10 5mm/Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm

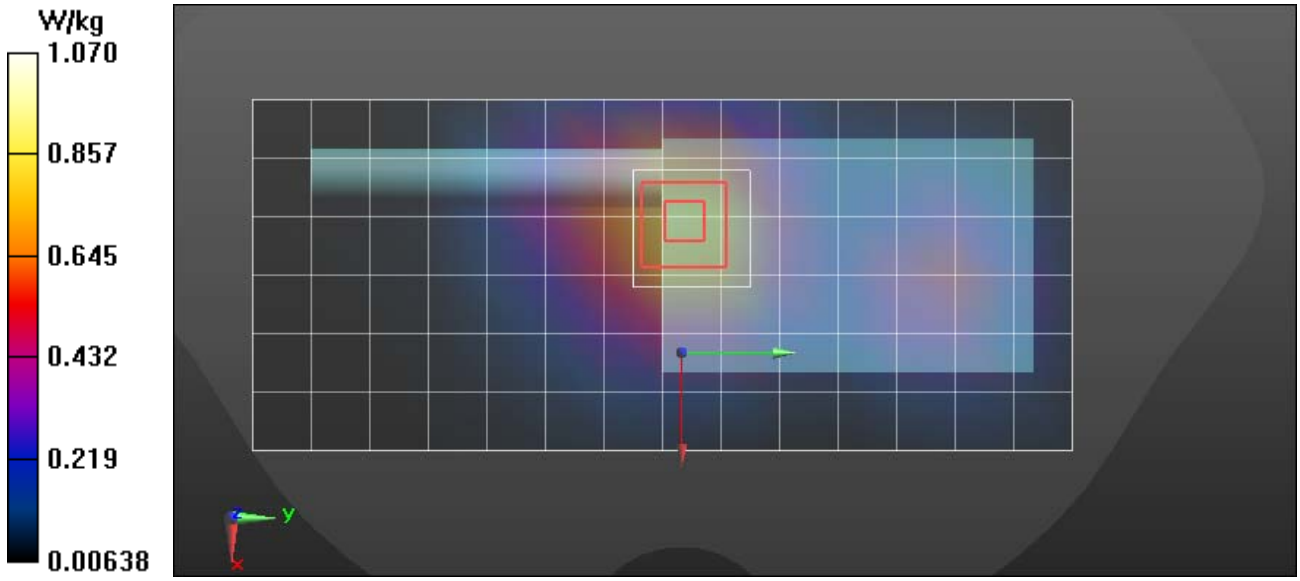
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.847 W/kg

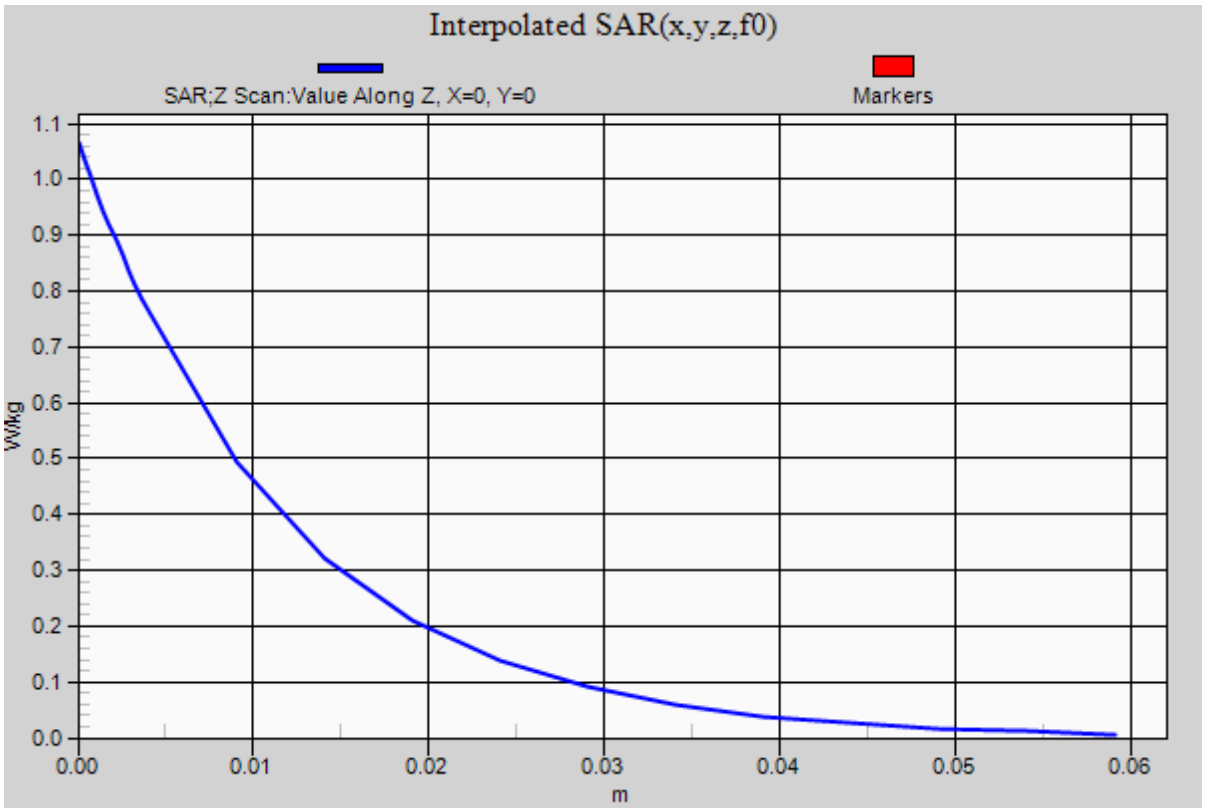
1810H TSL/B51 -ICOM IP504 backside 15mm ch 20300,1745MHz CB20MHz RB01 Mid P2 A10 5mm/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 25.90 V/m; Power Drift = -0.47 dB
Peak SAR (extrapolated) = 1.19 W/kg
SAR(1 g) = 0.775 W/kg; SAR(10 g) = 0.493 W/kg
Ratio of SAR at M2 to SAR at M1 = 64.7%

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.827 W/kg

1810H TSL/B51 -ICOM IP504 backside 15mm ch 20300,1745MHz CB20MHz RB01 Mid P2 A10 5mm/Z Scan (1x1x23): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Info: Interpolated medium parameters used for SAR evaluation.
Penetration depth = 11.72 (11.44, 11.83) [mm]
Maximum value of SAR (interpolated) = 1.07 W/kg





Plot F12

DUT: ICOM; Type: PTT; Serial: Sample Proto Type D1
Procedure Name: F12 - ICOM IP504 Front Side 15mm ch20300,1745MHz Mid RB01 P1 25mm

Communication System: UID 0, CW (0); Frequency: 1745 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1745 MHz; σ = 1.28 S/m; ε_r = 36.995; ρ = 1000 kg/m^3
Phantom section: Flat Section

Date/Time: 11/28/2021 4:52:53 PM

DASY5 Configuration:

- Probe: EX3DV4 - SN3600; ConvF(7.23, 7.23, 7.23) @ 1745 MHz; Calibrated: 4/28/2021
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 4/22/2021
- Phantom: Twin-SAM V4.0 (30deg probe tilt); Type: QD 000 P40 CC; Serial: xxxx
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

1810H TSL/F12 - ICOM IP504 Front Side 15mm ch20300,1745MHz Mid RB01 P1 25mm/Area Scan (7x15x1):
Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.237 W/kg

1810H TSL/F12 - ICOM IP504 Front Side 15mm ch20300,1745MHz Mid RB01 P1 25mm/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 12.99 V/m; Power Drift = -0.28 dB
Peak SAR (extrapolated) = 0.342 W/kg
SAR(1 g) = 0.226 W/kg; SAR(10 g) = 0.148 W/kg
Ratio of SAR at M2 to SAR at M1 = 64.2%

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.242 W/kg

1810H TSL/F12 - ICOM IP504 Front Side 15mm ch20300,1745MHz Mid RB01 P1 25mm/Z Scan (1x1x23):
Measurement grid: dx=20mm, dy=20mm, dz=5mm

Info: Interpolated medium parameters used for SAR evaluation.
Penetration depth = 11.89 (11.49, 12.72) [mm]
Maximum value of SAR (interpolated) = 0.282 W/kg