



Test Report Serial Number:	45461375R2.0
Test Report Date:	23 March 2017
Project Number:	1364

## SAR Test Report - NEW CERTIFICATION

Applicant:



**Harris Corporation**  
**221 Jefferson Ridge Parkway**  
**Lynchburg, VA, 24501**  
**USA**

Maximum Reported 1g SAR			
FCC	FACE:	1.72	W/kg
	BODY:	5.36	
ISED	FACE:	1.72	
	BODY:	5.63	
Occupational Limit:		8.00	

FCC ID:

**OWDTR-0143-E**

ISED Certification Number

**3636B-0143**

Product Model Number / HVIN

**XL-PFM9M, XL-PFM9Y,  
XL-PPM9M, XL-PPM9Y,**

Product Name / PMN

**XL-185P**

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:

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**Ben Hewson, President**  
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 Canada



Test Lab Certificate: 2470.01



**Industry  
Canada**

IC Registration 3874A-1



FCC Registration: 714830

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## 1.0 DOCUMENT CONTROL

<b>Tested By:</b>	Jasmeet Gill		
<b>Prepared By:</b>	Jasmeet Gill		
<b>Reviewed By:</b>	Ben Hewson		
Issue Number	Description	By	Issue Date
1.0	Initial Release	Jasmeet Gill	21 February 2017
1.1	Correcting ID#'s	Jasmeet Gill	24 February 2017
1.2	Correcting ID#'s	Jasmeet Gill	02 March 2017
1.3	Added BLE/WLAN Reference	Jasmeet Gill	06 March 2017
1.4	Revised SAR for Table 10.0	Jasmeet Gill	20 March 2017
2.0	Removed Reference to Non-LTE Populated Radio	Jasmeet Gill	23 March 2017

## 2.0 NORMATIVE REFERENCES

Normative References*	
ANSI / ISO 17025:2005	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 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	Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Part 2
FCC KDB KDB 865664	SAR Measurement Requirements for 100MHz to 6GHz
FCC KDB KDB 447498	Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies
* When the issue number or issue date is omitted, the latest version is assumed.	

### 3.0 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):	<b>FCC ID:</b> OWDTR-0143-E
	<b>ISED:</b> 3636B-0143
Type of Equipment:	Licensed Non-Broadcast Transmitter Held to Face (TNF) FCC Part 90
	Land Mobile Radio Transmitter/Receiver (27.41-960MHz) RSS-119
Device Model(s) / HVIN:	XL-PFM9M, XL-PFM9Y, XL-PPM9M, XL-PPM9Y
Device Marketing Name / PMN:	XL-185P
Test Sample Serial No.:	T/A Sample - Identical Prototype
Transmit Frequency Range:	7/8/900: 768-776 / 798-816 / 851-861 / 896-902 / 935-944 MHz / 2402-2480 MHz / 2412-2462 MHz / 5150-5850 MHz
Number of Channels:	Programmable
Manuf. Max. Rated Output Power:	7/8/900: 34.8dBm / BLE: 8.4dBm / BT: 12.7dBm / WLAN 2.4G: 23.7dBm / WLAN 5G: 11.8dBm
Modulation:	FM
Duty Cycle:	50% PTT Duty Cycle
DUT Power Source:	7.2/7.4VDC, 22Wh Li-Ion Battery
Deviation(s) from standard/procedure:	None
Modification of DUT:	None

**4.0 STATEMENT OF COMPLIANCE**

This measurement report demonstrates that the:

Applicant: <b>Harris Corporation</b>	Model / HVIN: <b>XL-PFM9M, XL-PFM9Y, XL-PPM9M, XL-PPM9Y</b>
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complies with the SAR (Specific Absorption Rate) RF exposure requirements and limits specified in the following:

Standard(s): <b>FCC 47 CFR §2.1093</b> <b>Health Canada's Safety Code 6</b>	Measurement Procedure(s): <b>FCC KDB 865664, FCC KDB 447498, FCC KDB 643646</b> <b>Industry Canada RSS-102 Issue 5</b> <b>IEEE Standard 1528-2013, IEC 62209-2</b>
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Use Group: <input checked="" type="checkbox"/> <b>Occupational / Controlled</b>	<input type="checkbox"/> <b>General Population / Uncontrolled</b>
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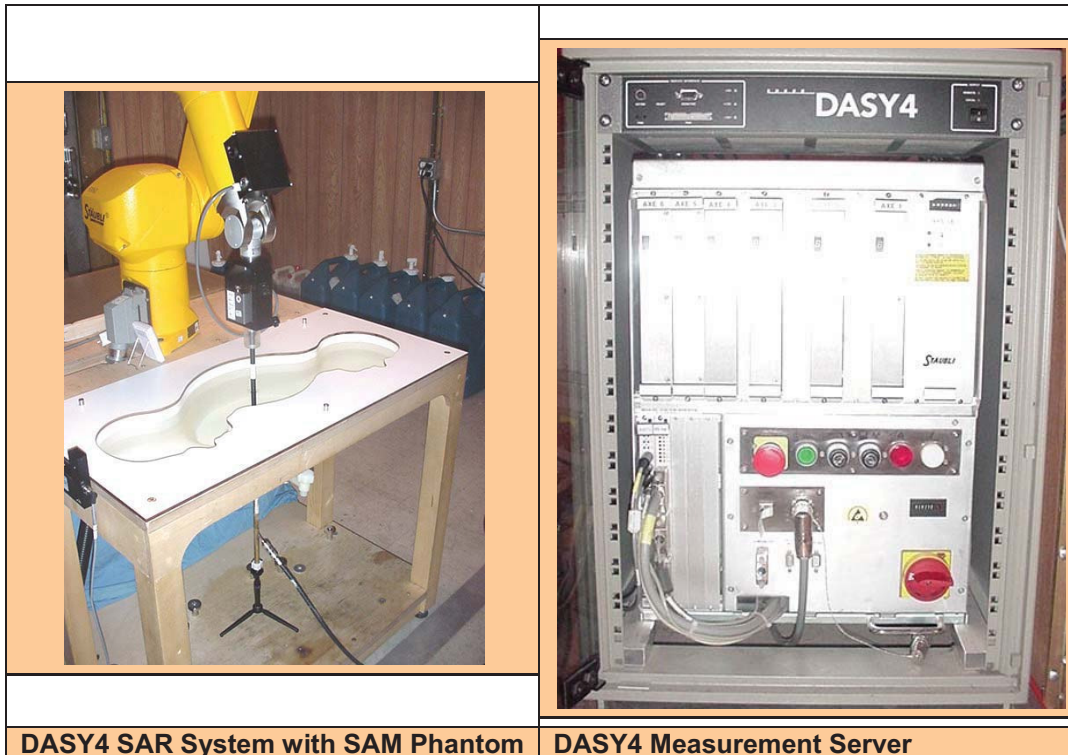
Reason for Issue: <b>New certification</b>
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The following report is of the XL-185P, modified to incorporate an LTE module (FCC ID: BV8BBPBM214). The LTE module is a passive item and does not directly impact the SAR results as it is only installed but not active.

A description of the device, operating configuration, detailed summary of the test results, methodology and procedures used during this evaluation, equipment used and the various provisions of the rules are included within this test report.

## 5.0 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 DASY4 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 DASY4 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 DASY4 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.



## 6.0 RF CONDUCTED POWER MEASUREMENT

Table 6.0

Conducted Power Measurements					
Channel	Frequency (MHz)	Measured Power (dBm)	Rated Power (dBm)	Delta (dBm)	SAR Test Channel (Y/N)
n/a	768.000	34.32	34.40	-0.08	Y
n/a	776.000	34.31	34.30	0.01	Y
n/a	798.000	34.37	34.40	-0.03	Y
n/a	806.000	35.09	35.10	-0.01	Y
n/a	816.000	35.11	35.20	-0.09	Y
n/a	851.000	35.09	35.10	-0.01	Y
n/a	861.000	35.10	35.10	0.00	Y
n/a	896.000	35.05	35.00	0.05	Y
n/a	901.000	35.07	35.00	0.07	Y
n/a	935.000	35.14	35.10	0.04	Y

## 7.0 NUMBER OF TEST CHANNELS ( $N_C$ )

Table 7.0

Number of Test Channels ( $N_C$ )			
Antenna Part Number	Antenna Type	Frequency Range (MHz)	$N_C^{(1)}$
14035-4450-01	1/2 Wave 7/800 Band	762-944 MHz	10
14035-4450-02	1/4 Wave 7/800 Band	762-944 MHz	10
KRE1011223/02	900 Band	896-941 MHz	3

(1) In accordance with FCC KDB 447498



## 8.0 ACCESSORIES EVALUATED

Table 8.1

### Manufacturer's Accessory List

Test Report ID Number	Manufacturer's Part Number	Description	UDC Group <sup>(1)</sup>	Type II Group <sup>(2)</sup>	SAR <sup>(3)</sup> Evaluated	SAR <sup>(4)</sup> Tested
<b>Antenna</b>						
T1	14035-4450-01	1/2 Wave Whip Antenna, (762-944 MHz)			Y	Y
T2	14035-4450-02	1/4 Wave Stub Antenna, (762-944 MHz)			Y	Y
T3	KRE1011223/02	900 MHz Antenna, (896-941 MHz)			Y	Y
<b>Battery</b>						
P1	14035-4010-01	Li-Ion Battery 7.2VDC, 3300mAh			Y	Y
P2	14035-4010-04	Li-Ion Battery 7.2VDC, 3100mAh, 22Wh			Y	Y
P3	14035-4010-05	Li-Ion Battery 7.2VDC, 3100mAh, 22Wh, UL			Y	-

**Table 8.2**

<b>Manufacturer's Accessory List</b>						
<b>Test Report ID Number</b>	<b>Manufacturer's Part Number</b>	<b>Description</b>	<b>UDC Group<sup>(1)</sup></b>	<b>Type II Group<sup>(2)</sup></b>	<b>SAR<sup>(3)</sup> Evaluated</b>	<b>SAR<sup>(4)</sup> Tested</b>
<b>Audio Accessory</b>						
<b>A1</b>	12082-0600-01	Standard Speaker Microphone	<b>7A</b>	<b>PB</b>	<b>Y</b>	<b>Y</b>
<b>A2</b>	12082-0600-02	Storm Speaker Microphone	<b>7A</b>	<b>PB</b>	<b>Y</b>	<b>-</b>
<b>A28</b>	12082-0600-03	Antenna Speaker Microphone, 18"	<b>7A</b>	<b>PB</b>	<b>Y</b>	<b>-</b>
<b>A29</b>	12082-0600-04	Antenna Speaker Microphone, 25.6"	<b>7A</b>	<b>PB</b>	<b>Y</b>	<b>-</b>
<b>A30</b>	12082-0600-05	Antenna Speaker Microphone, 30"	<b>7A</b>	<b>PB</b>	<b>Y</b>	<b>-</b>
<b>A3</b>	12150-1000-01	Premium Speaker MIC, Fire, NC	<b>9</b>	<b>PB</b>	<b>Y</b>	<b>Y</b>
<b>A4</b>	12082-0650-01	Microphone, Palm, 2-Wire Black	<b>7A</b>	<b>IL</b>	<b>Y</b>	<b>-</b>
<b>A5</b>	12082-0650-02	Microphone, Palm, 2-Wire Beige	<b>7A</b>	<b>IL</b>	<b>Y</b>	<b>-</b>
<b>A6</b>	12082-0650-03	Microphone, Mini Lapel, 3-Wire Black	<b>7A</b>	<b>IL</b>	<b>Y</b>	<b>-</b>
<b>A7</b>	12082-0650-04	Microphone, Mini Lapel, 3-Wire Beige	<b>7A</b>	<b>IL</b>	<b>Y</b>	<b>-</b>
<b>A8</b>	12082-0650-05	Earphone Kit, Black, XG-100P			<b>Y</b>	<b>-</b>
<b>A9</b>	12082-0650-06	Earphone Kit, Beige, XG-100P			<b>Y</b>	<b>-</b>
<b>A10</b>	12082-0650-07	Headset, In-Ear, Boom MIC, In-Line PTT	<b>7A</b>	<b>IL</b>	<b>Y</b>	<b>-</b>
<b>A11</b>	12082-0650-08	Headset, LTWT, OTH, Single Ear, IN-Line PTT	<b>7A</b>	<b>IL</b>	<b>Y</b>	<b>-</b>
<b>A12</b>	12082-0650-09	Headset, LTWT, BTH, Dual Ear, In_Line PTT	<b>7A</b>	<b>IL</b>	<b>Y</b>	<b>-</b>
<b>A13</b>	12082-0650-10	Headset, LTWT, BTH, Dual Ear, Pig Tail PTT	<b>7A</b>	<b>PT</b>	<b>Y</b>	<b>-</b>
<b>A14</b>	12082-0650-11	Headset, LTWT, BTH, Dual In-Ear, In_Line PTT	<b>7A</b>	<b>IL</b>	<b>Y</b>	<b>-</b>
<b>A15</b>	12082-0650-12	Headset, LTWT, BTH, Dual In-Ear, Pig Tail PTT	<b>7A</b>	<b>PT</b>	<b>Y</b>	<b>-</b>
<b>A16</b>	12082-0650-13	Headset, Heavy Duty, BTH, w/PTT, XG-100P	<b>7A</b>	<b>IL</b>	<b>Y</b>	<b>-</b>
<b>A17</b>	12082-0650-14	Headset, Heavy Duty, OTH, w/PTT, XG-100P	<b>7A</b>	<b>IL</b>	<b>Y</b>	<b>-</b>
<b>A18</b>	12082-0650-15	Headset, BTH, Boom MIC, Earpiece, w/PTT			<b>Y</b>	<b>-</b>
<b>A19</b>	12082-0650-16	Headset, Tactical, Boom MIC, Earpiece, w/PTT	<b>7A</b>	<b>PT</b>	<b>Y</b>	<b>-</b>
<b>A20</b>	12082-0650-17	Skull MIC, w/Body PTT, Earcup, XG-100P	<b>9</b>	<b>BB</b>	<b>Y</b>	<b>-</b>
<b>A21</b>	12082-0650-18	Throat MIC, w/Acoustic Tube, Body PTT	<b>9</b>	<b>BB</b>	<b>Y</b>	<b>-</b>
<b>A22</b>	12082-0650-19	Throat MIC, w/Acoustic Tube, Body & Ring PTT	<b>9</b>	<b>RB</b>	<b>Y</b>	<b>-</b>
<b>A23</b>	12082-0681-01	Speaker MIC, Wireless Bluetooth	<b>BT</b>	<b>PB</b>	<b>Y</b>	<b>-</b>
<b>A24</b>	12082-0684-01	BlueTooth, Covert, Earpiece, MIC, PTT	<b>BT</b>	<b>n/a</b>	<b>Y</b>	<b>-</b>
<b>A25</b>	14002-0197-01	Hirose to Unity Adapter	<b>7B</b>	<b>n/a</b>	<b>Y</b>	<b>Y</b>
<b>A26</b>	LS103239V1	Earphone, Lapel MIC, 2.5mm	<b>n/a</b>	<b>n/a</b>	<b>Y</b>	<b>-</b>
<b>A27</b>	LS103239V2	Earphone, Lapel MIC, 2.5mm, Right Angle	<b>n/a</b>	<b>n/a</b>	<b>Y</b>	<b>-</b>

**Table 8.3**

<b>Manufacturer's Accessory List</b>						
Test Report ID Number	Manufacturer's Part Number	Description	UDC Group <sup>(1)</sup>	Type II Group <sup>(2)</sup>	SAR <sup>(3)</sup> Evaluated	SAR <sup>(4)</sup> Tested
<b>Body-Worn Accessory</b>						
B1	12082-1290-01	Metal Belt Clip			Y	Y
B2	12082-3230-01	D-Swivel (Used w/ 14002-0218-01 and KRY 1011609/1 )			Y	Y
B3	14002-0218-01	Premium Belt Loop			Y	Y
B4	14035-4200-01	Holster, Leather, Radio, Premium			Y	-
B5	14035-4200-02	Holster, Leather w/Rings for Shoulder Strap, Radio, Premium			Y	-
B6	14035-4200-03	Holster, Nylon, Black, Radio, Premium			Y	-
B7	14035-4200-04	Holster, Ring, Leather, Radio, Premium			Y	-
B8	14035-4201-01	Kit, 14035-4200-01 Holster Assy w/ 14002-0218-01 Belt Loop			Y	-
B9	14035-4202-02	Kit, 14035-4200-02 Holster Assy w/ 14002-0218-01 Belt Loop			Y	-
B10	14035-4202-01	Holster, Leather, Radio, Standard			Y	-
B11	14035-4202-02	Holster, Leather w/Rings for Shoulder Strap, Radio, Standard			Y	-
B12	14035-4202-03	Holster, Nylon, Black, Radio, Standard			Y	-
B13	14035-4202-04	Holster, Ring, Leather, Radio, Standard			Y	-
B14	CC103333V1	Shoulder Strap			Y	-
B15	KRY 1011609/1	Leather Belt Loop			Y	Y

(1) UDC Group: 9 = 9 Pin, 7A = 7 Pin, 7B = 7 Pin Modified

(2) Type II Group: PB = Palm Button, IL = In-Line Pushbutton, PT = Pigtail Pushbutton, RB = Ring Pushbutton, BB = Body Button, BT = BlueTooth

(3) Accessories are categorized into groups of similar design and construction. Samples of individual groups are SAR Tested and the SAR results apply to ALL members of the Accessory Group. A "Y" in this column indicates the accessory is deemed acceptable.

(4) Accessories and/or Accessory Group members SAR Tested.

## 9.0 SAR MEASUREMENT SUMMARY

**Table 9.0**

7/8/900 Band - 14035-4450-01 BODY SAR Evaluation Results (FCC/IC)													
Date	Radio Model		Plot #	Freq (MHz)	Battery Number	Antenna	Accessories		DUT Spacing		Measured SAR 1g (W/kg)		SAR Drift (dB)
	M/N	Type							DUT	ANT	PTT Duty Cycle		
							Body	Audio	(mm)	(mm)	100%	50%	
21 Dec 2016	XL-185	PTT	B1	768	4010-01	4450-01	B1	A1	0	25	3.150	1.575	0.107
21 Dec 2016	XL-185	PTT	B2	776	4010-01	4450-01	B1	A1	0	25	4.430	2.215	-0.210
21 Dec 2016	XL-185	PTT	B3	798	4010-01	4450-01	B1	A1	0	25	3.870	1.935	0.085
21 Dec 2016	XL-185	PTT	B4	806	4010-01	4450-01	B1	A1	0	25	5.280	2.640	-0.090
21 Dec 2016	XL-185	PTT	B5	816	4010-01	4450-01	B1	A1	0	25	5.570	2.785	-0.215
21 Dec 2016	XL-185	PTT	B6	851	4010-01	4450-01	B1	A1	0	25	5.810	2.905	-0.204
21 Dec 2016	XL-185	PTT	B7	861	4010-01	4450-01	B1	A1	0	25	6.750	3.375	-0.208
21 Dec 2016	XL-185	PTT	B8	896	4010-01	4450-01	B1	A1	0	25	9.360	4.680	-0.170
21 Dec 2016	XL-185	PTT	B9	901	4010-01	4450-01	B1	A1	0	25	9.080	4.540	-0.202
21 Dec 2016	XL-185	PTT	B10	935	4010-01	4450-01	B1	A1	0	25	8.860	4.430	-0.217
21 Dec 2016	XL-185	PTT	B12	896	4010-04	4450-01	B1	A1	0	25	8.81	4.405	-0.134
SAR LIMIT(S)						Head/Body		Spatial Peak		RF Exposure Category			
FCC 47 CFR 2.1093		Health Canada Safety Code 6				8.0 W/kg		1g average		Occupational			

**Table 9.1**
**7/8/900 Band - 14035-4450-02 BODY SAR Evaluation Results (FCC/IC)**

Date	Radio Model		Plot #	Freq (MHz)	Batt. Type	Antenna	Accessories		DUT Spacing		Measured SAR 1g (W/kg)		SAR Drift (dB)
	M/N	Type					Body	Audio	DUT	ANT	PTT Duty Cycle		
									(mm)	(mm)	100%	50%	
22 Dec 2016	<b>XL-185</b>	<b>Radio1</b>	B13	768	4010-01	4450-02	B1	A1	0	25	5.300	2.650	-0.022
22 Dec 2016	<b>XL-185</b>	<b>Radio1</b>	B14	776	4010-01	4450-02	B1	A1	0	25	6.620	3.310	-0.056
22 Dec 2016	<b>XL-185</b>	<b>Radio1</b>	B15	798	4010-01	4450-02	B1	A1	0	25	7.670	3.835	0.055
22 Dec 2016	<b>XL-185</b>	<b>Radio1</b>	B16	806	4010-01	4450-02	B1	A1	0	25	9.410	4.705	-0.080
22 Dec 2016	<b>XL-185</b>	<b>Radio1</b>	B17	816	4010-01	4450-02	B1	A1	0	25	7.290	3.645	-0.126
22 Dec 2016	<b>XL-185</b>	<b>Radio1</b>	B18	851	4010-01	4450-02	B1	A1	0	25	9.890	4.945	-0.117
22 Dec 2016	<b>XL-185</b>	<b>Radio1</b>	B19	861	4010-01	4450-02	B1	A1	0	25	10.100	5.050	-0.145
22 Dec 2016	<b>XL-185</b>	<b>Radio1</b>	B20	896	4010-01	4450-02	B1	A1	0	25	10.700	5.350	-0.219
22 Dec 2016	<b>XL-185</b>	<b>Radio1</b>	B21	901	4010-01	4450-02	B1	A1	0	25	10.700	5.350	-0.200
23 Dec 2016	<b>XL-185</b>	<b>Radio1</b>	B22	935	4010-01	4450-02	B1	A1	0	25	8.820	4.410	-0.014
23 Dec 2016	<b>XL-185</b>	<b>Radio1</b>	B25	896	4010-04	4450-02	B1	A1	0	25	9.560	4.780	-0.074
23 Dec 2016	<b>XL-185</b>	<b>Radio1</b>	B26	901	4010-04	4450-02	B1	A1	0	25	8.950	4.475	-0.133
<b>SAR LIMIT(S)</b>						<b>Head/Body</b>		<b>Spatial Peak</b>		<b>RF Exposure Category</b>			
<b>FCC 47 CFR 2.1093</b>		<b>Health Canada Safety Code 6</b>				<b>8.0 W/kg</b>		<b>1g average</b>		<b>Occupational</b>			

**Table 9.2**

**7/8/900 Band - KRE1011223/02 BODY SAR Evaluation Results (FCC/IC)**

Date	Radio Model		Plot #	Freq (MHz)	Batt. Type	Antenna	Accessories		DUT Spacing		Measured SAR 1g (W/kg)		SAR Drift (dB)
	M/N	Type							DUT	ANT	PTT Duty Cycle		
									(mm)	(mm)	100%	50%	
23 Dec 2016	XL-185	Radio1	B27	896	4010-01	1223/02	B1	A1	0	25	6.780	3.390	-0.173
23 Dec 2016	XL-185	Radio1	B28	901	4010-01	1223/02	B1	A1	0	25	7.240	3.620	-0.221
23 Dec 2016	XL-185	Radio1	B29	935	4010-01	1223/02	B1	A1	0	25	9.800	4.900	-0.219
23 Dec 2016	XL-185	Radio1	B31	935	4010-04	1223/02	B1	A1	0	25	7.900	3.950	-0.198
<b>SAR LIMIT(S)</b>						<b>Head/Body</b>		<b>Spatial Peak</b>		<b>RF Exposure Category</b>			
FCC 47 CFR 2.1093		Health Canada Safety Code 6				8.0 W/kg		1g average		Occupational			

**Table 9.3**

**7/8/900 Band - w/c 4450-02 BODY SAR Evaluation w/ Accessories Results (FCC/IC)**

Date	Radio Model		Plot #	Freq (MHz)	Batt. Type	Antenna	Accessories		DUT Spacing		Measured SAR 1g (W/kg)		SAR Drift (dB)
	M/N	Type							DUT	ANT	PTT Duty Cycle		
									(mm)	(mm)	100%	50%	
28 Dec 2016	XL-185	Radio1	B32	896	4010-01	4450-02	B3	A1	0	25	2.620	1.920	0.048
28 Dec 2016	XL-185	Radio1	B33	896	4010-01	4450-02	B15	A1	0	25	2.220	1.670	0.042
28 Dec 2016	XL-185	Radio1	B34	896	4010-01	4450-02	B1	A25	0	25	10.500	6.980	0.024
28 Dec 2016	XL-185	Radio1	B35	896	4010-01	4450-02	B1	A3	0	25	10.400	6.560	-0.170
<b>SAR LIMIT(S)</b>						<b>Head/Body</b>		<b>Spatial Peak</b>		<b>RF Exposure Category</b>			
FCC 47 CFR 2.1093		Health Canada Safety Code 6				8.0 W/kg		1g average		Occupational			

**Table 9.4**
**7/8/900 Band - 14035-4450-01 FACE SAR Evaluation Results (FCC/IC)**

Date	Radio Model		Plot #	Freq (MHz)	Battery Number	Antenna	Accessories		DUT Spacing		Measured SAR 1g (W/kg)		SAR Drift (dB)
	M/N	Type					Body	Audio	DUT (mm)	ANT (mm)	PTT Duty Cycle		
											100%	50%	
29 Dec 2016	<b>XL-185</b>	<b>Radio1</b>	H1	768	4010-01	4450-01	n/a	n/a	25	50	1.390	0.695	0.087
29 Dec 2016	<b>XL-185</b>	<b>Radio1</b>	H2	776	4010-01	4450-01	n/a	n/a	25	50	1.380	0.690	0.012
29 Dec 2016	<b>XL-185</b>	<b>Radio1</b>	H3	798	4010-01	4450-01	n/a	n/a	25	50	2.550	1.275	-0.124
29 Dec 2016	<b>XL-185</b>	<b>Radio1</b>	H4	806	4010-01	4450-01	n/a	n/a	25	50	2.000	1.000	0.043
29 Dec 2016	<b>XL-185</b>	<b>Radio1</b>	H5	816	4010-01	4450-01	n/a	n/a	25	50	2.110	1.055	0.146
29 Dec 2016	<b>XL-185</b>	<b>Radio1</b>	H6	851	4010-01	4450-01	n/a	n/a	25	50	2.370	1.185	-0.217
29 Dec 2016	<b>XL-185</b>	<b>Radio1</b>	H7	861	4010-01	4450-01	n/a	n/a	25	50	2.690	1.345	-0.196
29 Dec 2016	<b>XL-185</b>	<b>Radio1</b>	H8	896	4010-01	4450-01	n/a	n/a	25	50	3.140	1.570	-0.198
29 Dec 2016	<b>XL-185</b>	<b>Radio1</b>	H9	901	4010-01	4450-01	n/a	n/a	25	50	2.740	1.370	-0.164
30 Dec 2016	<b>XL-185</b>	<b>Radio1</b>	H10	935	4010-01	4450-01	n/a	n/a	25	50	2.270	1.135	-0.136
30 Dec 2016	<b>XL-185</b>	<b>Radio1</b>	H12	896	4010-04	4450-01	n/a	n/a	25	50	2.420	1.210	-0.179
<b>SAR LIMIT(S)</b>						<b>Head/Body</b>		<b>Spatial Peak</b>		<b>RF Exposure Category</b>			
<b>FCC 47 CFR 2.1093</b>		<b>Health Canada Safety Code 6</b>				<b>8.0 W/kg</b>		<b>1g average</b>		<b>Occupational</b>			

**Table 9.5**
**7/8/900 Band - 14035-4450-02 FACE SAR Evaluation Results (FCC/IC)**

Date	Radio Model		Plot #	Freq (MHz)	Battery Number	Antenna	Accessories		DUT Spacing		Measured SAR 1g (W/kg)		SAR Drift (dB)
	M/N	Type					Body	Audio	DUT (mm)	ANT (mm)	PTT Duty Cycle		
											100%	50%	
30 Dec 2016	XL-185	Radio1	H13	768	4010-01	4450-02	n/a	n/a	25	50	2.510	1.255	-0.047
30 Dec 2016	XL-185	Radio1	H14	776	4010-01	4450-02	n/a	n/a	25	50	2.330	1.165	-0.121
30 Dec 2016	XL-185	Radio1	H15	798	4010-01	4450-02	n/a	n/a	25	50	2.710	1.355	-0.158
30 Dec 2016	XL-185	Radio1	H16	806	4010-01	4450-02	n/a	n/a	25	50	2.470	1.235	0.062
30 Dec 2016	XL-185	Radio1	H17	816	4010-01	4450-02	n/a	n/a	25	50	2.340	1.170	-0.034
30 Dec 2016	XL-185	Radio1	H18	851	4010-01	4450-02	n/a	n/a	25	50	2.130	1.065	-0.083
03 Jan 2017	XL-185	Radio1	H19	861	4010-01	4450-02	n/a	n/a	25	50	2.380	1.190	-0.134
03 Jan 2017	XL-185	Radio1	H20	896	4010-01	4450-02	n/a	n/a	25	50	3.400	1.700	-0.001
3 Jan 2017	XL-185	Radio1	H21	901	4010-01	4450-02	n/a	n/a	25	50	2.860	1.430	-0.044
3 Jan 2017	XL-185	Radio1	H22	935	4010-01	4450-02	n/a	n/a	25	50	2.990	1.495	-0.119
3 Jan 2017	XL-185	Radio1	H24	896	4010-04	4450-02	n/a	n/a	25	50	2.820	1.410	0.053
<b>SAR LIMIT(S)</b>						<b>Head/Body</b>		<b>Spatial Peak</b>		<b>RF Exposure Category</b>			
FCC 47 CFR 2.1093		Health Canada Safety Code 6				8.0 W/kg		1g average		Occupational			

**Table 9.6**
**7/8/900 Band - KRE1011223/02 FACE SAR Evaluation Results (FCC/IC)**

Date	Radio Model		Plot #	Freq (MHz)	Battery Number	Antenna	Accessories		DUT Spacing		Measured SAR 1g (W/kg)		SAR Drift (dB)
	M/N	Type					Body	Audio	DUT (mm)	ANT (mm)	PTT Duty Cycle		
											100%	50%	
3 Jan 2017	XL-185	Radio1	H25	896	4010-01	1223/02	n/a	n/a	25	50	2.310	1.155	0.139
3 Jan 2017	XL-185	Radio1	H26	901	4010-01	1223/02	n/a	n/a	25	50	2.030	1.015	0.023
3 Jan 2017	XL-185	Radio1	H27	935	4010-01	1223/02	n/a	n/a	25	50	2.310	1.155	-0.165
4 Jan 2017	XL-185	Radio1	H29	935	4010-04	1223/02	n/a	n/a	25	50	2.020	1.010	-0.217
<b>SAR LIMIT(S)</b>						<b>Head/Body</b>		<b>Spatial Peak</b>		<b>RF Exposure Category</b>			
FCC 47 CFR 2.1093		Health Canada Safety Code 6				8.0 W/kg		1g average		Occupational			



**Table 9.7**
**2.4GHz 802.11 Band - BODY SAR Evaluation Results (FCC/IC)**

Date	Radio Model		Plot #	Freq (MHz)	Battery Number	Antenna	Accessories		DUT Spacing		Measured SAR 1g (W/kg)
	M/N	Type					Body	Audio	DUT	ANT	PTT Duty Cycle 100%
									(mm)	(mm)	
5 Jan 2017	XL-185	Radio1	B36	2412	4010-04	4450-02	B1	A1	0	25	0.003
5 Jan 2017	XL-185	Radio1	B37	2437	4010-04	4450-02	B1	A1	0	25	0.003
5 Jan 2017	XL-185	Radio1	B38	2462	4010-04	4450-02	B1	A1	0	25	0.003
<b>SAR LIMIT(S)</b>						<b>Head/Body</b>		<b>Spatial Peak</b>		<b>RF Exposure Category</b>	
FCC 47 CFR 2.1093		Health Canada Safety Code 6				1.6 W/kg		1g average		General Population	

**Table 9.8**
**2.4GHz 802.11 Band - FACE SAR Evaluation Results (FCC/IC)**

Date	Radio Model		Plot #	Freq (MHz)	Battery Number	Antenna	Accessories		DUT Spacing		Measured SAR 1g (W/kg)
	M/N	Type					Body	Audio	DUT	ANT	PTT Duty Cycle 100%
									(mm)	(mm)	
9 Jan 2017	XL-185	Radio1	H30	2412	4010-04	4450-02	n/a	n/a	25	50	0.004
9 Jan 2017	XL-185	Radio1	H31	2437	4010-04	4450-02	n/a	n/a	25	50	0.003
9 Jan 2017	XL-185	Radio1	H32	2462	4010-04	4450-02	n/a	n/a	25	50	0.001
<b>SAR LIMIT(S)</b>						<b>Head/Body</b>		<b>Spatial Peak</b>		<b>RF Exposure Category</b>	
FCC 47 CFR 2.1093		Health Canada Safety Code 6				1.6 W/kg		1g average		General Population	

**Table 9.9**
**2.4GHz Bluetooth Band - BODY SAR Evaluation Results (FCC/IC)**

Date	Radio Model		Plot #	Freq (MHz)	Battery Number	Antenna	Accessories		DUT Spacing		Measured SAR 1g (W/kg)
	M/N	Type					Body	Audio	DUT	ANT	PTT Duty Cycle 100%
									(mm)	(mm)	
5 Jan 2017	XL-185	Radio1	B41	2480	4010-04	4450-02	n/a	n/a	0	25	0.001
<b>SAR LIMIT(S)</b>						<b>Head/Body</b>		<b>Spatial Peak</b>		<b>RF Exposure Category</b>	
FCC 47 CFR 2.1093		Health Canada Safety Code 6				1.6 W/kg		1g average		General Population	

2.4GHz Bluetooth Band - FACE SAR Evaluation Results (FCC/IC)											
Date	Radio Model		Plot #	Freq (MHz)	Battery Number	Antenna	Accessories		DUT Spacing		Measured SAR 1g (W/kg)
	M/N	Type					Body	Audio	DUT (mm)	ANT (mm)	PTT Duty Cycle 100%
9 Jan 2017	XL-185	Radio1	H34	2480	4010-04	4450-02	n/a	n/a	25	50	0.005
FCC 47 CFR 2.1093				Health Canada Safety Code 6		1.6 W/kg		1g average		General Population	

5GHz 802.11 Band - BODY SAR Evaluation Results (FCC/IC)											
Date	Radio Model		Plot #	Freq (MHz)	Battery Number	Antenna	Accessories		DUT Spacing		Measured SAR 1g (W/kg)
	M/N	Type					Body	Audio	DUT (mm)	ANT (mm)	PTT Duty Cycle 100%
13 Jan 2017	XL-185	Radio1	B44	5180	4010-04	4450-02	B1	A1	0	25	0.004
13 Jan 2017	XL-185	Radio1	B45	5240	4010-04	4450-02	B1	A1	0	25	0.003
13 Jan 2017	XL-185	Radio1	B46	5260	4010-04	4450-02	B1	A1	0	25	0.001
13 Jan 2017	XL-185	Radio1	B47	5300	4010-04	4450-02	B1	A1	0	25	0.004
13 Jan 2017	XL-185	Radio1	B49	5300	4010-01	4450-02	B1	A1	0	25	0.007
FCC 47 CFR 2.1093				Health Canada Safety Code 6		1.6 W/kg		1g average		General Population	

5GHz 802.11 Band - FACE SAR Evaluation Results (FCC/IC)											
Date	Radio Model		Plot #	Freq (MHz)	Battery Number	Antenna	Accessories		DUT Spacing		Measured SAR 1g (W/kg)
	M/N	Type					Body	Audio	DUT (mm)	ANT (mm)	PTT Duty Cycle 100%
16 Jan 2017	XL-185	Radio1	H36	5180	4010-04	4450-02	n/a	n/a	25	50	0.018
16 Jan 2017	XL-185	Radio1	H37	5240	4010-04	4450-02	n/a	n/a	25	50	0.007
16 Jan 2017	XL-185	Radio1	H38	5260	4010-04	4450-02	n/a	n/a	25	50	0.014
16 Jan 2017	XL-185	Radio1	H39	5300	4010-04	4450-02	n/a	n/a	25	50	0.017
FCC 47 CFR 2.1093				Health Canada Safety Code 6		1.6 W/kg		1g average		General Population	

## 10.0 SCALING OF MAXIMUM MEASURE SAR

**Table 10.0**

Scaling of Maximum Measured SAR <sup>(1)</sup>								
Plot ID	Configuration	Freq	Measured Fluid Deviation		Measured Conducted Power	Measured Drift	Measured SAR (1g)	
		(MHz)	Permittivity	Conductivity	(dBm)	(dB)	(W/kg)	
H20	FACE	896	-2.53%	-1.98%	35.1	-0.001	1.700	
B20	BODY	896	-3.72%	0.00%	35.1	-0.219	5.350	
Step 1								
Fluid Sensitivity Adjustment								
Plot ID	Scale Factor (%)	X	Measured SAR (W/kg)		=	Step 1 Adjusted SAR (1g) (W/kg)		
H20	1.000%	X	1.700		=	1.700		
B20	1.000%	X	5.350		=	5.350		
Step 2								
Manufacturer's Tune-Up Tolerance								
Plot ID	Measured Conducted Power (dBm)	Rated Power (dBm)	Delta (dB)	+	Step 1 Adjusted SAR (W/kg)	=	Step 2 Adjusted SAR (1g) (W/kg)	
H20	35.1	35.0	0.05	+	1.700	=	1.700	
B20	35.1	35.0	0.05	+	5.350	=	5.350	
Step 3								
Simultaneous Transmission – Bluetooth and/or WiFi								
Plot ID	Rated Output Power (mw)	Frequency (MHz)	Seperation Distance (mm)	Measured SAR (W/kg)	+	Step 2 Adjusted SAR (W/kg)	=	Step 3 Adjusted SAR (1g) (W/kg)
H36	15	5300	n/a	0.018	+	1.700	=	1.718
B49	15	5300	n/a	0.007	+	5.350	=	5.357
Step 4								
Drift Adjustment								
Plot ID	Measured Drift (dB)	+	Step 3 Adjusted SAR (W/kg)		=	Step 4 Adjusted SAR (1g) (W/kg)		
H20	-0.001	+	1.718		=	1.718		
B20	-0.219	+	5.357		=	5.634		
Step 5								
Reported SAR								
Plot ID	FCC From Steps 1 and 2			IC From Steps 1 through 3				
	1g SAR (W/kg)			1g SAR (W/kg)				
H20	1.718			1.718				
B20	5.357			5.634				

**NOTES to Table 10.0**

(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 identification 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 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 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 4**

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 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.

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.



Jasmeet Gill  
Test Lab Engineer  
Celltech Labs Inc.

23 March 2017

Date

## 11.0 SAR EXPOSURE LIMITS

Table 11.0

SAR RF EXPOSURE LIMITS			
FCC 47 CFR§2.1093	Health Canada Safety Code 6	General Population / Uncontrolled Exposure <sup>(4)</sup>	Occupational / Controlled Exposure <sup>(5)</sup>
Spatial Average <sup>(1)</sup> (averaged over the whole body)		0.08 W/kg	0.4 W/kg
Spatial Peak <sup>(2)</sup> (averaged over any 1 g of tissue)		1.6 W/kg	<b>8.0 W/kg</b>
Spatial Peak <sup>(3)</sup> (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.			

## 12.0 DETAILS OF SAR EVALUATION

### EVALUATION DETAILS

1	The number of test channels and test configurations performed on this accessory were based on the antenna-configuration combinations which produced the highest, or worst case, SAR from previous SAR evaluations performed on the transceiver. Table 6.0 identifies those test channels and each channel was tested in the Body and Face configuration.
2	The DUT was evaluated for SAR in accordance with the procedures described in IEEE 1528, FCC KDB 865646 and RSS-102.
3	The DUT was evaluated for SAR at the maximum conducted output power level, preset by the manufacturer, in unmodulated continuous transmit operation (Continuous Wave mode at 100% duty cycle) with the transmit key continuously depressed. For a Push-To-Talk (PTT) device, the 50% duty cycle compensation reported assumes a transmit/receive cycle of equal time base.
4	A single point SAR measurement was taken prior to the Area Scan and after the Zoom Scan and the SAR drift of the DUT was evaluated. The measured SAR drift was added to the measured SAR levels of the Maximum <b>reported</b> SAR (IC/EU only).
5	Each SAR evaluations were performed with a fully charged battery.
6	The fluid temperature remained within +/-2°C from the time of the fluid dielectric parameter measurement to the completion of the SAR evaluation.
7	The fluid temperature remained within +/-0.5°C throughout the test day.

### SCAN PROCEDURE

Maximum distance from the closest measurement point to phantom surface.	4 ± 1mm
Maximum probe angle normal to phantom surface.	5° ± 1°
Area Scan Spatial Resolution ΔX, ΔY	15mm
Zoom Scan Spatial Resolution ΔX, ΔY	7.5mm
Zoom Scan Spatial Resolution ΔZ	5mm
Zoom Scan Volume X, Y, Z	30mm x 30mm x 30mm
Phantom	ELI
Fluid Depth	150mm
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	

### 13.0 MEASUREMENT UNCERTAINTIES

**Table 13.0**
**UNCERTAINTY BUDGET FOR DEVICE EVALUATION (IEEE 1528-2013 Table 9)**

Uncertainty Component	IEEE 1528 Section	Uncertainty Value $\pm\%$	Probability Distribution	Divisor	ci 1g	ci 10g	Uncertainty Value $\pm\%$ (1g)	Uncertainty Value $\pm\%$ (10g)	$V_i$ or $V_{eff}$
<b>Measurement System</b>									
Probe Calibration*	E.2.1	6.6	Normal	1	1	1	6.60	6.60	$\infty$
Axial Isotropy*	E.2.2	4.7	Rectangular	1.732050808	0.7	0.7	1.9	1.9	$\infty$
Hemispherical Isotropy*	E.2.2	9.6	Rectangular	1.732050808	0.7	0.7	3.9	3.9	$\infty$
Boundary Effect*	E.2.3	8.3	Rectangular	1.732050808	1	1	4.8	4.8	$\infty$
Linearity*	E.2.4	4.7	Rectangular	1.732050808	1	1	2.7	2.7	$\infty$
System Detection Limits*	E.2.4	1.0	Rectangular	1.732050808	1	1	0.6	0.6	$\infty$
Modulation Response	E.2.5	4.0	Rectangular	1.732050808	1	1	2.3	2.3	$\infty$
Readout Electronics*	E.2.6	1.0	Normal	1	1	1	1.0	1.0	$\infty$
Response Time*	E.2.7	0.8	Rectangular	1.732050808	1	1	0.5	0.5	$\infty$
Integration Time*	E.2.8	1.4	Rectangular	1.732050808	1	1	0.8	0.8	$\infty$
RF Ambient Conditions - Noise	E.6.1	0.0	Rectangular	1.732050808	1	1	0.0	0.0	$\infty$
RF Ambient Conditions - Reflection	E.6.1	0.0	Rectangular	1.732050808	1	1	0.0	0.0	$\infty$
Probe Positioner Mechanical Tolerance*	E.6.2	0.4	Rectangular	1.732050808	1	1	0.2	0.2	$\infty$
Probe Positioning wrt Phantom Shell*	E.6.3	2.9	Rectangular	1.732050808	1	1	1.7	1.7	$\infty$
Extrapolation, interpolation & integration algorithms for max. SAR evaluation*	E.5	3.9	Rectangular	1.732050808	1	1	2.3	2.3	$\infty$
<b>Test Sample Related</b>									
Test Sample Positioning	E.4.2	0.3	Normal	1	1	1	0.3	0.3	5
Device Holder Uncertainty*	E.4.1	3.6	Normal	1	1	1	3.6	3.6	$\infty$
SAR Drift Measurement**	E.2.9	0.0	Rectangular	1.732050808	1	1	0.0	0.0	$\infty$
SAR Scaling***	E.6.5	2.0	Rectangular	1.732050808	1	1	1.2	1.2	$\infty$
<b>Phantom and Tissue Parameters</b>									
Phantom Uncertainty*	E.3.1	4.0	Rectangular	1.732050808	1	1	2.3	2.3	$\infty$
SAR Correction Uncertainty	E.3.2	1.2	Normal	1	1	0.84	1.2	1.0	$\infty$
Liquid Conductivity (measurement)	E.3.3	6.8	Normal	1	0.78	0.71	5.3	4.8	10
Liquid Permittivity (measurement)	E.3.3	5.3	Normal	1	0.23	0.26	1.2	1.4	10
Liquid Conductivity (Temperature)	E.3.2	0.1	Rectangular	1.732050808	0.78	0.71	0.1	0.0	$\infty$
Liquid Permittivity Temperature)	E.3.2	0.0	Rectangular	1.732050808	0.23	0.26	0.0	0.0	$\infty$
<b>Effective Degrees of Freedom<sup>(1)</sup></b>								<b><math>V_{eff} =</math></b>	<b>873.2</b>
<b>Combined Standard Uncertainty</b>			<b>RSS</b>				<b>12.59</b>	<b>12.40</b>	
<b>Expanded Uncertainty (95% Confidence Interval)</b>			<b>k=2</b>				<b>25.18</b>	<b>24.80</b>	

(1) The Effective Degrees of Freedom is > 30 therefore a coverage factor of k=2 represents an approximate confidence level of 95%.

\* Provided by SPEAG

**Table 13.1**

**Calculation of the Degrees and Effective Degrees of Freedom**

$$v_i = n - 1$$

$$v_{\text{eff}} = \frac{u_c^4}{m \sum_{i=1}^m \frac{c_i^4 u_i^4}{v_i}}$$



**14.0 FLUID DIELECTRIC PARAMETERS**

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Aprel Laboratory  
 Test Result for UIM Dielectric Parameter  
 Mon 19/Dec/2016 14:59:54  
 Freq Frequency(GHz)  
 FCC\_eH FCC Bulletin 65 Supplement C ( June 2001) Limits for Head Epsilon  
 FCC\_sH FCC Bulletin 65 Supplement C ( June 2001) Limits for Head Sigma  
 FCC\_eB FCC Limits for Body Epsilon  
 FCC\_sB FCC Limits for Body Sigma  
 Test\_e Epsilon of UIM  
 Test\_s Sigma of UIM

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Freq	FCC_eB	FCC_sB	Test_e	Test_s
0.7350	55.59	0.96	52.44	0.87
0.7450	55.55	0.96	52.61	0.89
0.7550	55.51	0.96	52.50	0.88
0.7650	55.47	0.96	52.25	0.90
0.7750	55.43	0.97	52.39	0.91
0.7850	55.39	0.97	52.14	0.92
0.7950	55.36	0.97	51.92	0.93
0.8050	55.32	0.97	52.21	0.93
0.8150	55.28	0.97	51.73	0.94
0.8250	55.24	0.97	51.95	0.96
0.8350	55.20	0.97	51.50	0.96
0.8450	55.17	0.98	51.26	0.97
0.8550	55.14	0.99	51.20	0.99
0.8650	55.11	1.01	51.60	0.99
0.8750	55.08	1.02	51.21	1.02
0.8850	55.05	1.03	51.36	1.02
0.8950	55.02	1.04	51.15	1.02
0.9050	55.00	1.05	50.87	1.05
0.9150	55.00	1.06	50.66	1.05
0.9250	54.98	1.06	50.76	1.05
0.9350	54.96	1.07	50.53	1.07

**Table 14.0**

FLUID DIELECTRIC PARAMETERS							
Date:	19 Dec 2016	Fluid Temp:	20.8	Frequency:	835MHz	Tissue:	Body
Freq (MHz)	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity	
735.0000		54.5400	0.8600	55.5900	0.96	-1.89%	-10.42%
745.0000		54.0600	0.8900	55.5500	0.96	-2.68%	-7.29%
755.0000		53.9500	0.9000	55.5100	0.96	-2.81%	-6.25%
765.0000		53.9900	0.9000	55.4700	0.96	-2.67%	-6.25%
768.0000	*	53.9930	0.9090	55.4580	0.96	-2.64%	-5.61%
775.0000		54.0000	0.9300	55.4300	0.97	-2.58%	-4.12%
776.0000	*	53.9840	0.9280	55.4260	0.97	-2.60%	-4.33%
785.0000		53.8400	0.9100	55.3900	0.97	-2.80%	-6.19%
795.0000		53.9100	0.9500	55.3600	0.97	-2.62%	-2.06%
798.0000	*	53.8200	0.9500	55.3480	0.97	-2.76%	-2.06%
805.0000		53.6100	0.9500	55.3200	0.97	-3.09%	-2.06%
806.0000	*	53.6190	0.9530	55.3160	0.97	-3.07%	-1.75%
815.0000		53.7000	0.9800	55.2800	0.97	-2.86%	1.03%
816.0000	*	53.6980	0.9780	55.2760	0.97	-2.85%	0.82%
825.0000		53.6800	0.9600	55.2400	0.97	-2.82%	-1.03%
835.0000		53.3400	0.9800	55.2000	0.97	-3.37%	1.03%
845.0000		53.3900	0.9900	55.1700	0.98	-3.23%	1.02%
851.0000	*	53.3600	0.9840	55.1520	0.99	-3.25%	-0.20%
855.0000		53.3400	0.9800	55.1400	0.99	-3.26%	-1.01%
861.0000	*	53.2020	1.0040	55.1220	1.00	-3.48%	0.20%
865.0000		53.1100	1.0200	55.1100	1.01	-3.63%	0.99%
875.0000		53.0900	1.0200	55.0800	1.02	-3.61%	0.00%
885.0000		53.0000	1.0100	55.0500	1.03	-3.72%	-1.94%
895.0000		52.9700	1.0400	55.0200	1.04	-3.73%	0.00%
896.0000	*	52.9710	1.0410	55.0180	1.04	-3.72%	0.00%
901.0000	*	52.9760	1.0460	55.0080	1.05	-3.69%	0.00%
905.0000		52.9800	1.0500	55.0000	1.05	-3.67%	0.00%
915.0000		52.4800	1.0500	55.0000	1.06	-4.58%	-0.94%
925.0000		52.7600	1.0700	54.9800	1.06	-4.04%	0.94%
935.0000	*	52.6300	1.0800	54.9600	1.07	-4.24%	0.93%

\*Channel Frequency Tested

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Aprel Laboratory  
 Test Result for UIM Dielectric Parameter  
 Wed 28/Dec/2016 11:28:06  
 Freq Frequency(GHz)  
 FCC\_eHFCC Bulletin 65 Supplement C ( June 2001) Limits for Head Epsilon  
 FCC\_sHFCC Bulletin 65 Supplement C (June 2001) Limits for Head Sigma  
 FCC\_eB FCC Limits for Body Epsilon  
 FCC\_sB FCC Limits for Body Sigma  
 Test\_e Epsilon of UIM  
 Test\_s Sigma of UIM

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Freq	FCC_eB	FCC_sB	Test_e	Test_s
0.7350	55.59	0.96	54.54	0.86
0.7450	55.55	0.96	54.06	0.89
0.7550	55.51	0.96	53.95	0.90
0.7650	55.47	0.96	53.99	0.90
0.7750	55.43	0.97	54.00	0.93
0.7850	55.39	0.97	53.84	0.91
0.7950	55.36	0.97	53.91	0.95
0.8050	55.32	0.97	53.61	0.95
0.8150	55.28	0.97	53.70	0.98
0.8250	55.24	0.97	53.68	0.96
0.8350	55.20	0.97	53.34	0.98
0.8450	55.17	0.98	53.39	0.99
0.8550	55.14	0.99	53.34	0.98
0.8650	55.11	1.01	53.11	1.02
0.8750	55.08	1.02	53.09	1.02
0.8850	55.05	1.03	53.00	1.01
0.8950	55.02	1.04	52.97	1.04
0.9050	55.00	1.05	52.98	1.05
0.9150	55.00	1.06	52.48	1.05
0.9250	54.98	1.06	52.76	1.07
0.9350	54.96	1.07	52.63	1.08

**Table 14.1**

FLUID DIELECTRIC PARAMETERS							
Date:	28 Dec 2016	Fluid Temp:	19.6	Frequency:	835MHz	Tissue:	Body
Freq (MHz)	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity	
735.0000		52.4400	0.8700	55.5900	0.96	-5.67%	-9.38%
745.0000		52.6100	0.8900	55.5500	0.96	-5.29%	-7.29%
755.0000		52.5000	0.8800	55.5100	0.96	-5.42%	-8.33%
765.0000		52.2500	0.9000	55.4700	0.96	-5.80%	-6.25%
768.0000	*	52.2920	0.9030	55.4580	0.96	-5.71%	-6.23%
775.0000		52.3900	0.9100	55.4300	0.97	-5.48%	-6.19%
776.0000	*	52.3650	0.9110	55.4260	0.97	-5.52%	-6.08%
785.0000		52.1400	0.9200	55.3900	0.97	-5.87%	-5.15%
795.0000		51.9200	0.9300	55.3600	0.97	-6.21%	-4.12%
798.0000	*	52.0070	0.9300	55.3480	0.97	-6.04%	-4.12%
805.0000		52.2100	0.9300	55.3200	0.97	-5.62%	-4.12%
806.0000	*	52.1620	0.9310	55.3160	0.97	-5.70%	-4.02%
815.0000		51.7300	0.9400	55.2800	0.97	-6.42%	-3.09%
816.0000	*	51.7520	0.9420	55.2760	0.97	-6.38%	-2.89%
825.0000		51.9500	0.9600	55.2400	0.97	-5.96%	-1.03%
835.0000		51.5000	0.9600	55.2000	0.97	-6.70%	-1.03%
845.0000		51.2600	0.9700	55.1700	0.98	-7.09%	-1.02%
851.0000	*	51.2240	0.9820	55.1520	0.99	-7.12%	-0.41%
855.0000		51.2000	0.9900	55.1400	0.99	-7.15%	0.00%
861.0000	*	51.4400	0.9900	55.1220	1.00	-6.68%	-1.20%
865.0000		51.6000	0.9900	55.1100	1.01	-6.37%	-1.98%
875.0000		51.2100	1.0200	55.0800	1.02	-7.03%	0.00%
885.0000		51.3600	1.0200	55.0500	1.03	-6.70%	-0.97%
895.0000		51.1500	1.0200	55.0200	1.04	-7.03%	-1.92%
896.0000	*	51.1220	1.0230	55.0180	1.04	-7.08%	-1.73%
901.0000	*	50.9820	1.0380	55.0080	1.05	-7.32%	-0.76%
905.0000		50.8700	1.0500	55.0000	1.05	-7.51%	0.00%
915.0000		50.6600	1.0500	55.0000	1.06	-7.89%	-0.94%
925.0000		50.7600	1.0500	54.9800	1.06	-7.68%	-0.94%
935.0000	*	50.5300	1.0700	54.9600	1.07	-8.06%	0.00%

\*Channel Frequency Tested

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Aprel Laboratory  
 Test Result for UIM Dielectric Parameter  
 Thu 29/Dec/2016 10:49:00  
 Freq Frequency(GHz)  
 FCC\_eHFCC OET 65 Supplement C (June 2001) Limits for Head Epsilon  
 FCC\_sHFCC OET 65 Supplement C (June 2001) Limits for Head Sigma  
 Test\_e Epsilon of UIM  
 Test\_s Sigma of UIM

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Freq	FCC_eH	FCC_sH	Test_e	Test_s
0.7350	42.02	0.89	43.55	0.84
0.7450	41.97	0.89	43.59	0.85
0.7550	41.92	0.89	43.01	0.86
0.7650	41.86	0.89	42.97	0.87
0.7750	41.81	0.90	43.09	0.87
0.7850	41.76	0.90	42.61	0.87
0.7950	41.71	0.90	42.48	0.89
0.8050	41.66	0.90	42.64	0.89
0.8150	41.60	0.90	42.47	0.90
0.8250	41.55	0.90	42.39	0.91
0.8350	41.50	0.90	41.94	0.93
0.8450	41.50	0.91	42.03	0.95
0.8550	41.50	0.92	41.79	0.95
0.8650	41.50	0.93	41.75	0.95
0.8750	41.50	0.94	41.65	0.96
0.8850	41.50	0.95	41.47	0.98
0.8950	41.50	0.96	41.46	0.99
0.9050	41.50	0.97	41.06	1.00
0.9150	41.50	0.98	40.91	1.01
0.9250	41.48	0.98	41.16	1.02
0.9350	41.46	0.99	40.66	1.04

**Table 14.2**

FLUID DIELECTRIC PARAMETERS							
Date:	29 Dec 2016	Fluid Temp:	19.5	Frequency:	835MHz	Tissue:	Head
Freq (MHz)	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity	
735.0000		43.5500	0.8400	42.0200	0.89	3.64%	-5.62%
745.0000		43.5900	0.8500	41.9700	0.89	3.86%	-4.49%
755.0000		43.0100	0.8600	41.9200	0.89	2.60%	-3.37%
765.0000		42.9700	0.8700	41.8600	0.89	2.65%	-2.25%
768.0000	*	43.0060	0.8700	41.8450	0.89	2.77%	-2.58%
775.0000		43.0900	0.8700	41.8100	0.90	3.06%	-3.33%
776.0000	*	43.0420	0.8700	41.8050	0.90	2.96%	-3.33%
785.0000		42.6100	0.8700	41.7600	0.90	2.04%	-3.33%
795.0000		42.4800	0.8900	41.7100	0.90	1.85%	-1.11%
798.0000	*	42.5280	0.8900	41.6950	0.90	2.00%	-1.11%
805.0000		42.6400	0.8900	41.6600	0.90	2.35%	-1.11%
806.0000	*	42.6230	0.8910	41.6540	0.90	2.33%	-1.00%
815.0000		42.4700	0.9000	41.6000	0.90	2.09%	0.00%
816.0000	*	42.4620	0.9010	41.5950	0.90	2.08%	0.11%
825.0000		42.3900	0.9100	41.5500	0.90	2.02%	1.11%
835.0000		41.9400	0.9300	41.5000	0.90	1.06%	3.33%
845.0000		42.0300	0.9500	41.5000	0.91	1.28%	4.40%
851.0000	*	41.8860	0.9500	41.5000	0.92	0.93%	3.71%
855.0000		41.7900	0.9500	41.5000	0.92	0.70%	3.26%
861.0000	*	41.7660	0.9500	41.5000	0.93	0.64%	2.59%
865.0000		41.7500	0.9500	41.5000	0.93	0.60%	2.15%
875.0000		41.6500	0.9600	41.5000	0.94	0.36%	2.13%
885.0000		41.4700	0.9800	41.5000	0.95	-0.07%	3.16%
895.0000		41.4600	0.9900	41.5000	0.96	-0.10%	3.13%
896.0000	*	41.4200	0.9910	41.5000	0.96	-0.19%	3.12%
901.0000	*	41.2200	0.9960	41.5000	0.97	-0.67%	3.11%
905.0000		41.0600	1.0000	41.5000	0.97	-1.06%	3.09%
915.0000		40.9100	1.0100	41.5000	0.98	-1.42%	3.06%
925.0000		41.1600	1.0200	41.4800	0.98	-0.77%	4.08%
935.0000	*	40.6600	1.0400	41.4600	0.99	-1.93%	5.05%

\*Channel Frequency Tested

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Aprel Laboratory  
 Test Result for UIM Dielectric Parameter  
 Tue 03/Jan/2017 11:00:15  
 Freq Frequency(GHz)  
 FCC\_eHFCC OET 65 Supplement C (June 2001) Limits for Head Epsilon  
 FCC\_sHFCC OET 65 Supplement C (June 2001) Limits for Head Sigma  
 Test\_e Epsilon of UIM  
 Test\_s Sigma of UIM

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Freq	FCC_eH	FCC_sH	Test_e	Test_s
0.7350	42.02	0.89	42.33	0.81
0.7450	41.97	0.89	42.56	0.82
0.7550	41.92	0.89	42.43	0.82
0.7650	41.86	0.89	42.36	0.83
0.7750	41.81	0.90	42.17	0.84
0.7850	41.76	0.90	41.93	0.86
0.7950	41.71	0.90	41.97	0.88
0.8050	41.66	0.90	42.01	0.87
0.8150	41.60	0.90	41.62	0.89
0.8250	41.55	0.90	41.46	0.90
0.8350	41.50	0.90	41.31	0.91
0.8450	41.50	0.91	41.43	0.91
0.8550	41.50	0.92	41.19	0.92
0.8650	41.50	0.93	40.92	0.94
0.8750	41.50	0.94	40.66	0.95
0.8850	41.50	0.95	40.47	0.94
0.8950	41.50	0.96	40.47	0.94
0.9050	41.50	0.97	40.28	0.96
0.9150	41.50	0.98	39.95	0.97
0.9250	41.48	0.98	39.92	0.98
0.9350	41.46	0.99	40.02	1.00

**Table 14.3**

<b>FLUID DIELECTRIC PARAMETERS</b>							
Date:	3 Jan 2017	Fluid Temp:	19.9	Frequency:	835MHz	Tissue:	Head
Freq (MHz)	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity	
735.0000		42.3300	0.8100	42.0200	0.89	0.74%	-8.99%
745.0000		42.5600	0.8200	41.9700	0.89	1.41%	-7.87%
755.0000		42.4300	0.8200	41.9200	0.89	1.22%	-7.87%
765.0000		42.3600	0.8300	41.8600	0.89	1.19%	-6.74%
768.0000	*	42.3030	0.8330	41.8450	0.89	1.09%	-6.72%
775.0000		42.1700	0.8400	41.8100	0.90	0.86%	-6.67%
776.0000	*	42.1460	0.8420	41.8050	0.90	0.82%	-6.44%
785.0000		41.9300	0.8600	41.7600	0.90	0.41%	-4.44%
795.0000		41.9700	0.8800	41.7100	0.90	0.62%	-2.22%
798.0000	*	41.9820	0.8770	41.6950	0.90	0.69%	-2.56%
805.0000		42.0100	0.8700	41.6600	0.90	0.84%	-3.33%
806.0000	*	41.9710	0.8720	41.6540	0.90	0.76%	-3.11%
815.0000		41.6200	0.8900	41.6000	0.90	0.05%	-1.11%
816.0000	*	41.6040	0.8910	41.5950	0.90	0.02%	-1.00%
825.0000		41.4600	0.9000	41.5500	0.90	-0.22%	0.00%
835.0000		41.3100	0.9100	41.5000	0.90	-0.46%	1.11%
845.0000		41.4300	0.9100	41.5000	0.91	-0.17%	0.00%
851.0000	*	41.2860	0.9160	41.5000	0.92	-0.52%	0.00%
855.0000		41.1900	0.9200	41.5000	0.92	-0.75%	0.00%
861.0000	*	41.0280	0.9320	41.5000	0.93	-1.14%	0.65%
865.0000		40.9200	0.9400	41.5000	0.93	-1.40%	1.08%
875.0000		40.6600	0.9500	41.5000	0.94	-2.02%	1.06%
885.0000		40.4700	0.9400	41.5000	0.95	-2.48%	-1.05%
895.0000		40.4700	0.9400	41.5000	0.96	-2.48%	-2.08%
896.0000	*	40.4510	0.9420	41.5000	0.96	-2.53%	-1.98%
901.0000	*	40.3560	0.9520	41.5000	0.97	-2.76%	-1.45%
905.0000		40.2800	0.9600	41.5000	0.97	-2.94%	-1.03%
915.0000		39.9500	0.9700	41.5000	0.98	-3.73%	-1.02%
925.0000		39.9200	0.9800	41.4800	0.98	-3.76%	0.00%
935.0000	*	40.0200	1.0000	41.4600	0.99	-3.47%	1.01%

\*Channel Frequency Tested



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Aprel Laboratory  
 Test Result for UIM Dielectric Parameter  
 Thu 05/Jan/2017 10:27:21  
 Freq Frequency(GHz)  
 FCC\_eHFCC Bulletin 65 Supplement C ( June 2001) Limits for Head Epsilon  
 FCC\_sHFCC Bulletin 65 Supplement C (June 2001) Limits for Head Sigma  
 FCC\_eBFCC Limits for Body Epsilon  
 FCC\_sBFCC Limits for Body Sigma  
 Test\_e Epsilon of UIM  
 Test\_s Sigma of UIM

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Freq	FCC_eB	FCC_sB	Test_e	Test_s
2.3500	52.83	1.85	49.85	1.87
2.3600	52.82	1.86	49.84	1.90
2.3700	52.81	1.87	49.90	1.90
2.3800	52.79	1.88	49.81	1.92
2.3900	52.78	1.89	49.65	1.94
2.4000	52.77	1.90	49.60	1.94
2.4100	52.75	1.91	49.55	1.94
2.4200	52.74	1.92	49.63	1.97
2.4300	52.73	1.93	49.68	1.98
2.4400	52.71	1.94	49.45	2.00
2.4500	52.70	1.95	49.72	2.03
2.4600	52.69	1.96	49.70	2.03
2.4700	52.67	1.98	49.64	2.03
2.4800	52.66	1.99	49.54	2.07
2.4900	52.65	2.01	49.55	2.06
2.5000	52.64	2.02	49.44	2.10
2.5100	52.62	2.04	49.26	2.11
2.5200	52.61	2.05	49.32	2.12
2.5300	52.60	2.06	49.36	2.12
2.5400	52.59	2.08	49.39	2.17
2.5500	52.57	2.09	49.24	2.18

**Table 14.4**

FLUID DIELECTRIC PARAMETERS							
Date:	5 Jan 2017	Fluid Temp:	19.9	Frequency:	2450MHz	Tissue:	Body
Freq (MHz)	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity	
2350.0000		49.8500	1.8700	52.8300	1.85	-5.64%	1.08%
2360.0000		49.8400	1.9000	52.8200	1.86	-5.64%	2.15%
2370.0000		49.9000	1.9000	52.8100	1.87	-5.51%	1.60%
2380.0000		49.8100	1.9200	52.7900	1.88	-5.65%	2.13%
2390.0000		49.6500	1.9400	52.7800	1.89	-5.93%	2.65%
2400.0000		49.6000	1.9400	52.7700	1.90	-6.01%	2.11%
2410.0000		49.5500	1.9400	52.7500	1.91	-6.07%	1.57%
2412.0000	*	49.5660	1.9460	52.7480	1.91	-6.03%	1.78%
2420.0000		49.6300	1.9700	52.7400	1.92	-5.90%	2.60%
2430.0000		49.6800	1.9800	52.7300	1.93	-5.78%	2.59%
2437.0000	*	49.5190	1.9940	52.7160	1.94	-6.06%	2.94%
2440.0000		49.4500	2.0000	52.7100	1.94	-6.18%	3.09%
2450.0000		49.7200	2.0300	52.7000	1.95	-5.65%	4.10%
2460.0000		49.7000	2.0300	52.6900	1.96	-5.67%	3.57%
2462.0000	*	49.6880	2.0300	52.6860	1.96	-5.69%	3.36%
2470.0000		49.6400	2.0300	52.6700	1.98	-5.75%	2.53%
2472.0000	*	49.6200	2.0380	52.6680	1.98	-5.79%	2.83%
2480.0000		49.5400	2.0700	52.6600	1.99	-5.92%	4.02%
2490.0000		49.5500	2.0600	52.6500	2.01	-5.89%	2.49%
2500.0000		49.4400	2.1000	52.6400	2.02	-6.08%	3.96%
2510.0000		49.2600	2.1100	52.6200	2.04	-6.39%	3.43%
2520.0000		49.3200	2.1200	52.6100	2.05	-6.25%	3.41%
2530.0000		49.3600	2.1200	52.6000	2.06	-6.16%	2.91%
2540.0000		49.3900	2.1700	52.5900	2.08	-6.08%	4.33%
2550.0000		49.2400	2.1800	52.5700	2.09	-6.33%	4.31%

\*Channel Frequency Tested

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Aprel Laboratory  
 Test Result for UIM Dielectric Parameter  
 Mon 09/Jan/2017 13:47:40  
 Freq Frequency(GHz)  
 FCC\_eHFCC OET 65 Supplement C (June 2001) Limits for Head Epsilon  
 FCC\_sHFCC OET 65 Supplement C (June 2001) Limits for Head Sigma  
 Test\_e Epsilon of UIM  
 Test\_s Sigma of UIM

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Freq	FCC_eH	FCC_sH	Test_e	Test_s
2.3500	39.38	1.71	39.98	1.79
2.3600	39.36	1.72	39.93	1.81
2.3700	39.34	1.73	39.69	1.84
2.3800	39.32	1.74	39.72	1.83
2.3900	39.31	1.75	39.69	1.86
2.4000	39.29	1.76	39.77	1.87
2.4100	39.27	1.76	39.66	1.87
2.4200	39.25	1.77	39.75	1.87
2.4300	39.24	1.78	39.57	1.90
2.4400	39.22	1.79	39.49	1.92
2.4500	39.20	1.80	39.47	1.93
2.4600	39.19	1.81	39.53	1.94
2.4700	39.17	1.82	39.39	1.95
2.4800	39.16	1.83	39.57	1.97
2.4900	39.15	1.84	39.42	1.97
2.5000	39.14	1.85	39.21	1.99
2.5100	39.12	1.87	39.21	2.01
2.5200	39.11	1.88	39.41	2.00
2.5300	39.10	1.89	39.36	2.03
2.5400	39.09	1.90	39.23	2.06
2.5500	39.07	1.91	39.22	2.03

**Table 14.5**

FLUID DIELECTRIC PARAMETERS							
Date:	9 Jan 2017	Fluid Temp:	22.7	Frequency:	2450MHz	Tissue:	Head
Freq (MHz)	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity	
2350.0000		39.9800	1.7900	39.3800	1.71	1.52%	4.68%
2360.0000		39.9300	1.8100	39.3600	1.72	1.45%	5.23%
2370.0000		39.6900	1.8400	39.3400	1.73	0.89%	6.36%
2380.0000		39.7200	1.8300	39.3200	1.74	1.02%	5.17%
2390.0000		39.6900	1.8600	39.3100	1.75	0.97%	6.29%
2400.0000		39.7700	1.8700	39.2900	1.76	1.22%	6.25%
2410.0000		39.6600	1.8700	39.2700	1.76	0.99%	6.25%
2412.0000	*	39.6780	1.8700	39.2660	1.76	1.05%	6.13%
2420.0000		39.7500	1.8700	39.2500	1.77	1.27%	5.65%
2430.0000		39.5700	1.9000	39.2400	1.78	0.84%	6.74%
2437.0000	*	39.5140	1.9140	39.2260	1.79	0.73%	7.11%
2440.0000		39.4900	1.9200	39.2200	1.79	0.69%	7.26%
2450.0000		39.4700	1.9300	39.2000	1.80	0.69%	7.22%
2460.0000		39.5300	1.9400	39.1900	1.81	0.87%	7.18%
2462.0000	*	39.5020	1.9420	39.1860	1.81	0.81%	7.17%
2470.0000		39.3900	1.9500	39.1700	1.82	0.56%	7.14%
2472.0000	*	39.4260	1.9540	39.1680	1.82	0.66%	7.24%
2480.0000		39.5700	1.9700	39.1600	1.83	1.05%	7.65%
2490.0000		39.4200	1.9700	39.1500	1.84	0.69%	7.07%
2500.0000		39.2100	1.9900	39.1400	1.85	0.18%	7.57%
2510.0000		39.2100	2.0100	39.1200	1.87	0.23%	7.49%
2520.0000		39.4100	2.0000	39.1100	1.88	0.77%	6.38%
2530.0000		39.3600	2.0300	39.1000	1.89	0.66%	7.41%
2540.0000		39.2300	2.0600	39.0900	1.90	0.36%	8.42%
2550.0000		39.2200	2.0300	39.0700	1.91	0.38%	6.28%

\*Channel Frequency Tested

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Aprel Laboratory  
 Test Result for UIM Dielectric Parameter  
 Wed 11/Jan/2017 10:53:43  
 Freq Frequency(GHz)  
 FCC\_eHFCC Bulletin 65 Supplement C ( June 2001) Limits for Head Epsilon  
 FCC\_sHFCC Bulletin 65 Supplement C (June 2001) Limits for Head Sigma  
 FCC\_eB FCC Limits for Body Epsilon  
 FCC\_sB FCC Limits for Body Sigma  
 Test\_e Epsilon of UIM  
 Test\_s Sigma of UIM

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Freq	FCC_eB	FCC_sB	Test_e	Test_s
5.1500	49.08	5.24	48.84	5.59
5.1600	49.07	5.25	48.65	5.56
5.1700	49.06	5.26	48.49	5.65
5.1800	49.04	5.28	48.50	5.62
5.1900	49.03	5.29	48.70	5.61
5.2000	49.01	5.30	48.51	5.64
5.2100	49.00	5.31	48.37	5.64
5.2200	48.99	5.32	48.64	5.57
5.2300	48.97	5.33	48.31	5.63
5.2400	48.96	5.35	48.42	5.67
5.2500	48.95	5.36	48.44	5.64
5.2600	48.93	5.37	48.09	5.76
5.2700	48.92	5.38	48.15	5.80
5.2800	48.91	5.39	48.31	5.78
5.2900	48.89	5.40	48.39	5.92
5.3000	48.88	5.42	48.69	5.83
5.3100	48.87	5.43	48.63	5.80
5.3200	48.85	5.44	48.44	5.77
5.3300	48.84	5.45	47.98	5.77
5.3400	48.82	5.46	48.01	5.75
5.3500	48.81	5.47	48.12	5.82

**Table 14.6**

FLUID DIELECTRIC PARAMETERS							
Date:	11 Jan 2017	Fluid Temp:	20.9	Frequency:	5250MHz	Tissue:	Body
Freq (MHz)	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity	
5150.0000		48.8400	5.5900	49.0800	5.24	-0.49%	6.68%
5160.0000		48.6500	5.5600	49.0700	5.25	-0.86%	5.90%
5170.0000		48.4900	5.6500	49.0600	5.26	-1.16%	7.41%
5180.0000	*	48.5000	5.6200	49.0400	5.28	-1.10%	6.44%
5190.0000		48.7000	5.6100	49.0300	5.29	-0.67%	6.05%
5200.0000		48.5100	5.6400	49.0100	5.30	-1.02%	6.42%
5210.0000		48.3700	5.6400	49.0000	5.31	-1.29%	6.21%
5220.0000		48.6400	5.5700	48.9900	5.32	-0.71%	4.70%
5230.0000		48.3100	5.6300	48.9700	5.33	-1.35%	5.63%
5240.0000	*	48.4200	5.6700	48.9600	5.35	-1.10%	5.98%
5250.0000		48.4400	5.6400	48.9500	5.36	-1.04%	5.22%
5260.0000	*	48.0900	5.7600	48.9300	5.37	-1.72%	7.26%
5270.0000		48.1500	5.8000	48.9200	5.38	-1.57%	7.81%
5280.0000		48.3100	5.7800	48.9100	5.39	-1.23%	7.24%
5290.0000		48.3900	5.9200	48.8900	5.40	-1.02%	9.63%
5300.0000	*	48.6900	5.8300	48.8800	5.42	-0.39%	7.56%
5310.0000		48.6300	5.8000	48.8700	5.43	-0.49%	6.81%
5320.0000		48.4400	5.7700	48.8500	5.44	-0.84%	6.07%
5330.0000		47.9800	5.7700	48.8400	5.45	-1.76%	5.87%
5340.0000		48.0100	5.7500	48.8200	5.46	-1.66%	5.31%
5350.0000		48.1200	5.8200	48.8100	5.47	-1.41%	6.40%

\*Channel Frequency Tested

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Aprel Laboratory  
 Test Result for UIM Dielectric Parameter  
 Mon 16/Jan/2017 11:11:54  
 Freq Frequency(GHz)  
 FCC\_eHFCC OET 65 Supplement C (June 2001) Limits for Head Epsilon  
 FCC\_sHFCC OET 65 Supplement C (June 2001) Limits for Head Sigma  
 Test\_e Epsilon of UIM  
 Test\_s Sigma of UIM

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Freq	FCC_eH	FCC_sH	Test_e	Test_s
5.1500	36.04	4.60	36.32	4.91
5.1600	36.03	4.61	35.98	4.86
5.1700	36.02	4.62	36.16	4.91
5.1800	36.01	4.63	36.12	4.92
5.1900	36.00	4.64	36.00	5.00
5.2000	35.99	4.65	36.04	4.95
5.2100	35.97	4.67	36.18	4.92
5.2200	35.96	4.68	36.06	4.94
5.2300	35.95	4.69	35.92	5.01
5.2400	35.94	4.70	36.21	4.96
5.2500	35.93	4.71	36.21	5.00
5.2600	35.92	4.72	35.97	5.00
5.2700	35.91	4.73	35.74	5.02
5.2800	35.89	4.74	35.97	5.05
5.2900	35.88	4.75	35.95	5.06
5.3000	35.87	4.76	35.90	5.01
5.3100	35.86	4.77	35.64	5.01
5.3200	35.85	4.78	35.63	5.17
5.3300	35.84	4.79	35.85	5.06
5.3400	35.83	4.80	35.97	5.08
5.3500	35.81	4.81	35.76	5.14

**Table 14.7**

FLUID DIELECTRIC PARAMETERS							
Date:	16 Jan 2017	Fluid Temp:	22	Frequency:	5250MHz	Tissue:	Head
Freq (MHz)	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity	
5150.0000		36.3200	4.9100	36.0400	4.60	0.78%	6.74%
5160.0000		35.9800	4.8600	36.0300	4.61	-0.14%	5.42%
5170.0000		36.1600	4.9100	36.0200	4.62	0.39%	6.28%
5180.0000	*	36.1200	4.9200	36.0100	4.63	0.31%	6.26%
5190.0000		36.0000	5.0000	36.0000	4.64	0.00%	7.76%
5200.0000		36.0400	4.9500	35.9900	4.65	0.14%	6.45%
5210.0000		36.1800	4.9200	35.9700	4.67	0.58%	5.35%
5220.0000		36.0600	4.9400	35.9600	4.68	0.28%	5.56%
5230.0000		35.9200	5.0100	35.9500	4.69	-0.08%	6.82%
5240.0000	*	36.2100	4.9600	35.9400	4.70	0.75%	5.53%
5250.0000		36.2100	5.0000	35.9300	4.71	0.78%	6.16%
5260.0000	*	35.9700	5.0000	35.9200	4.72	0.14%	5.93%
5270.0000		35.7400	5.0200	35.9100	4.73	-0.47%	6.13%
5280.0000		35.9700	5.0500	35.8900	4.74	0.22%	6.54%
5290.0000		35.9500	5.0600	35.8800	4.75	0.20%	6.53%
5300.0000	*	35.9000	5.0100	35.8700	4.76	0.08%	5.25%
5310.0000		35.6400	5.0100	35.8600	4.77	-0.61%	5.03%
5320.0000		35.6300	5.1700	35.8500	4.78	-0.61%	8.16%
5330.0000		35.8500	5.0600	35.8400	4.79	0.03%	5.64%
5340.0000		35.9700	5.0800	35.8300	4.80	0.39%	5.83%
5350.0000		35.7600	5.1400	35.8100	4.81	-0.14%	6.86%

\*Channel Frequency Tested



## 15.0 SYSTEM VERIFICATION TEST RESULTS

**Table 15.0**

System Verification Test Results											
Date	Frequency (MHz)	Fluid Type	Fluid Temp °C	Ambient Temp °C	Ambient Humidity (%)	Forward Power (mW)	Dipole Spacing (mm)	Validation Source			
								P/N		S/N	
19 Dec 2016	835	Body	20.8	22	11%	250	15	D835V2		4d075	
SAR						Fluid Parameters					
1 gram			10 gram			Permittivity			Conductivity		
Measured	Target	Deviation	Measured	Target	Deviation	Measured	Target	Deviation	Measured	Target	Deviation
2.39	2.42	1.26%	1.55	1.59	-2.52%	53.34	55.20	-3.37%	0.98	0.97	1.03%
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											

**Table 15.1**

System Verification Test Results											
Date	Frequency (MHz)	Fluid Type	Fluid Temp °C	Ambient Temp °C	Ambient Humidity (%)	Forward Power (mW)	Dipole Spacing (mm)	Validation Source			
								P/N		S/N	
28 Dec 2016	835	Body	19.6	22	11%	250	15	D835V2		4d075	
SAR						Fluid Parameters					
1 gram			10 gram			Permittivity			Conductivity		
Measured	Target	Deviation	Measured	Target	Deviation	Measured	Target	Deviation	Measured	Target	Deviation
2.51	2.42	3.72%	1.62	1.59	1.89%	51.50	55.20	-6.70%	0.96	0.97	-1.03%
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											

**Table 15.2**

System Verification Test Results											
Date	Frequency (MHz)	Fluid Type	Fluid Temp °C	Ambient Temp °C	Ambient Humidity (%)	Forward Power (mW)	Dipole Spacing (mm)	Validation Source			
								P/N		S/N	
29 Dec 2016	835	Head	19.5	21	12%	250	15	D835V2		4d075	
SAR						Fluid Parameters					
1 gram			10 gram			Permittivity			Conductivity		
Measured	Target	Deviation	Measured	Target	Deviation	Measured	Target	Deviation	Measured	Target	Deviation
2.50	2.41	3.73%	1.60	1.56	2.56%	41.94	41.50	1.06%	0.93	0.90	3.33%
<p>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.</p> <p>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.</p>											

**Table 15.3**

System Verification Test Results											
Date	Frequency (MHz)	Fluid Type	Fluid Temp °C	Ambient Temp °C	Ambient Humidity (%)	Forward Power (mW)	Dipole Spacing (mm)	Validation Source			
								P/N		S/N	
03 January 2017	835	Head	19.9	22	11%	250	15	D835V2		4d075	
SAR						Fluid Parameters					
1 gram			10 gram			Permittivity			Conductivity		
Measured	Target	Deviation	Measured	Target	Deviation	Measured	Target	Deviation	Measured	Target	Deviation
2.37	2.41	-1.66%	1.53	1.56	-1.92%	41.31	41.50	-0.46%	0.91	0.90	1.11%
<p>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.</p> <p>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.</p>											

**Table 15.4**

System Verification Test Results											
Date	Frequency (MHz)	Fluid Type	Fluid Temp °C	Ambient Temp °C	Ambient Humidity (%)	Forward Power (mW)	Dipole Spacing (mm)	Validation Source			
								P/N		S/N	
05 January 2017	2450	Body	19.9	22	11%	250	10	D2450V2		825	
SAR						Fluid Parameters					
1 gram			10 gram			Permittivity			Conductivity		
Measured	Target	Deviation	Measured	Target	Deviation	Measured	Target	Deviation	Measured	Target	Deviation
12.90	13.00	-0.77%	5.78	6.05	-4.46%	49.78	52.70	-5.54%	2.03	1.95	4.10%
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.											

**Table 15.5**

System Verification Test Results											
Date	Frequency (MHz)	Fluid Type	Fluid Temp °C	Ambient Temp °C	Ambient Humidity (%)	Forward Power (mW)	Dipole Spacing (mm)	Validation Source			
								P/N		S/N	
09 January 2017	2450	Head	22.7	24	11%	250	10	D2450V2		825	
SAR						Fluid Parameters					
1 gram			10 gram			Permittivity			Conductivity		
Measured	Target	Deviation	Measured	Target	Deviation	Measured	Target	Deviation	Measured	Target	Deviation
12.20	13.10	-6.87%	5.64	6.06	-6.93%	39.47	39.20	0.69%	1.93	1.80	7.22%
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.											

**Table 15.6**

System Verification Test Results											
Date	Frequency (MHz)	Fluid Type	Fluid Temp °C	Ambient Temp °C	Ambient Humidity (%)	Forward Power (mW)	Dipole Spacing (mm)	Validation Source			
								P/N		S/N	
11 January 2017	5250	Body	20.9	24	10%	100	10	D5GHzV2		1031	
SAR						Fluid Parameters					
1 gram			10 gram			Permittivity			Conductivity		
Measured	Target	Deviation	Measured	Target	Deviation	Measured	Target	Deviation	Measured	Target	Deviation
7.10	7.26	-2.20%	1.98	2.04	-2.94%	48.44	48.95	-1.04%	5.64	5.36	5.22%
<p>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.</p> <p>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.</p>											

**Table 15.7**

System Verification Test Results											
Date	Frequency (MHz)	Fluid Type	Fluid Temp °C	Ambient Temp °C	Ambient Humidity (%)	Forward Power (mW)	Dipole Spacing (mm)	Validation Source			
								P/N		S/N	
16 January 2017	5250	Head	22.0	24	10%	100	10	D5GHzV2		1031	
SAR						Fluid Parameters					
1 gram			10 gram			Permittivity			Conductivity		
Measured	Target	Deviation	Measured	Target	Deviation	Measured	Target	Deviation	Measured	Target	Deviation
8.12	7.98	1.75%	2.32	2.30	0.87%	36.21	35.93	0.78%	5.00	4.71	6.16%
<p>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.</p> <p>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.</p>											

## 16.0 MEASUREMENT SYSTEM SPECIFICATIONS

Table 16.0

### Measurement System Specification

#### Specifications

<b>Positioner</b>	Stäubli Unimation Corp. Robot Model: RX60L
<b>Repeatability</b>	0.02 mm
<b>No. of axis</b>	6

#### Data Acquisition Electronic (DAE) System

##### Cell Controller

<b>Processor</b>	AMD Athlon XP 2400+
<b>Clock Speed</b>	2.0 GHz
<b>Operating System</b>	Windows XP Professional

##### Data Converter

<b>Features</b>	Signal Amplifier, multiplexer, A/D converter, and control logic
<b>Software</b>	Measurement Software: DASY4, V4.7 Build 80
	Postprocessing Software: SEMCAD, V1.8 Build 186
<b>Connecting Lines</b>	Optical downlink for data and status info., Optical uplink for commands and clock

#### DASY4 Measurement Server

<b>Function</b>	Real-time data evaluation for field measurements and surface detection
<b>Hardware</b>	PC/104 166MHz Pentium CPU; 32 MB chipdisk; 64 MB RAM
<b>Connections</b>	COM1, COM2, DAE, Robot, Ethernet, Service Interface

#### E-Field Probe

<b>Model</b>	EX3DV4
<b>Serial No.</b>	3600
<b>Construction</b>	Triangular core fiber optic detection system
<b>Frequency</b>	10 MHz to 6 GHz
<b>Linearity</b>	±0.2 dB (30 MHz to 3 GHz)


#### Phantom

<b>Type</b>	ELI
<b>Shell Material</b>	Fiberglass
<b>Thickness</b>	2mm +/- .2mm
<b>Volume</b>	> 30 Liter

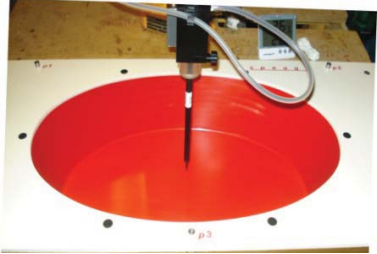
**Table 16.1**

**Measurement System Specification (Continued)**


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 $\pm 8\%$ )	
Frequency:	10 MHz to > 6 GHz; Linearity: $\pm 0.2$ dB (30 MHz to 3 GHz)	
Directivity:	$\pm 0.2$ dB in head tissue (rotation around probe axis) $\pm 0.4$ dB in head tissue (rotation normal to probe axis)	
Dynamic Range:	5 $\mu$ W/g to > 100 mW/g; Linearity: $\pm 0.2$ dB	
Surface Detect:	$\pm 0.2$ 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	<b>EX3DV4 E-Field Probe</b>

Phantom Specification

<p>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.</p>	
	<b>ELI Phantom</b>

Device Positioner Specification

<p>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°. 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.</p>	
	<b>Device Positioner</b>

## 17.0 TEST EQUIPMENT LIST

**Table 17.0**

### Test Equipment List

DESCRIPTION	ASSET NO.	SERIAL NO.	DATE CALIBRATED	CALIBRATION INTERVAL
Schmid & Partner DASY4 System	-	-	-	-
-DASY4 Measurement Server	00158	1078	CNR	CNR
-Robot	00046	599396-01	CNR	CNR
-DAE4	00019	353	20 April 2016	Annual
-EX3DV6 E-Field Probe	00213	3600	27 April 2016	Annual
-CLA150 Validation Source	00251	4007	24 Jan 2016	Triennial
-D835V2 Validation Dipole	00217	4D075	23 April 2015	Triennial
-D450V3 Validation Dipole	00221	1068	21 April 2015	Triennial
ELI Phantom	00247	-	CNR	CNR
HP 85070C Dielectric Probe Kit	00033	none	CNR	CNR
Gigatronics 8652A Power Meter	00110	1835801	29 Feb 2016	Triennial
Gigatronics 80701A Power Sensor	00248	1833687	29 Feb 2016	Triennial
HP 8753ET Network Analyzer	00134	US39170292	22 Oct 2014	Triennial
Rohde & Schwarz SMR20 Signal Generator	00006	100104	8 May 2014	Triennial
Amplifier Research 5S1G4 Power Amplifier	00106	26235	CNR	CNR

CNR = Calibration Not Required

## 18.0 FLUID COMPOSITION

Table 18.0		835MHz Head		
Tissue Simulating Liquid (TSL) Composition				
Component by Percent Weight				
Water	Sugar	Salt <sup>(1)</sup>	HEC <sup>(2)</sup>	Bacteriacide <sup>(3)</sup>
40.71	56.63	1.48	0.99	0.19

(1) Non-Iodinized

(2) HydroxyEthyl-Cellulose: Sigma-Aldrich P/N 54290-500g

(3) Dow Chemical Dowicil 75 Antimicrobial Perservative

Table 18.1		835MHz Body		
Tissue Simulating Liquid (TSL) Composition				
Component by Percent Weight				
Water	Sugar	Salt <sup>(1)</sup>	HEC <sup>(2)</sup>	Bacteriacide <sup>(3)</sup>
53.79	45.13	0.98	0.0	0.1

(1) Non-Iodinized

(2) HydroxyEthyl-Cellulose: Sigma-Aldrich P/N 54290-500g

(3) Dow Chemical Dowicil 75 Antimicrobial Perservative