

	Date(s) of Evaluation December 08, 2009	Test Report Serial No. 102809AQZ-T991-S15B	Test Report Revision No. Rev. 1.1 (2nd Release)	
	Test Report Issue Date December 23, 2009	Description of Test(s) Specific Absorption Rate	RF Exposure Category Occupational (Controlled)	

## FCC/IC SAR TEST REPORT - CLASS 1 BLUETOOTH

RF EXPOSURE EVALUATION	SPECIFIC ABSORPTION RATE		
APPLICANT / MANUFACTURER	HARRIS CORPORATION - RF COMMUNICATIONS DIVISION		
DEVICE UNDER TEST (DUT)	PORTABLE PTT MULTI-BAND RADIO TRANSCEIVER WITH CO-LOCATED CLASS 1 BLUETOOTH TRANSMITTER (v2.0)		
DEVICE MODEL(S)	UNITY XG-100P		
FREQUENCY RANGE	2402 - 2480 MHz (ISM Band)		
MANUF. RATED OUTPUT POWER	20 dBm	100 mW	DH5 (SDR) Average Conducted
DEVICE MODES OF OPERATION	DH5 (SDR)	2-DH5 (EDR)	3-DH5 (EDR)
DEVICE IDENTIFIER(S)	FCC ID: AQZ-XG-100P00	IC: 122D-XG100P00	
APPLICATION TYPE	FCC/IC Certification		
APPLICABLE RULE PART(S)	FCC Part 15 Subpart C		
	IC RSS-210 Issue 7		
STANDARD(S) APPLIED	FCC 47 CFR §2.1093		
	Health Canada Safety Code 6		
PROCEDURE(S) APPLIED	FCC OET Bulletin 65, Supplement C (01-01)		
	FCC KDB 447498 D01v04		
	Industry Canada RSS-102 Issue 3		
	IEEE 1528-2003		
	IEC 62209-1:2005		
FCC DEVICE CLASSIFICATION	Licensed Non-Broadcast Transmitter Held to Face (TNF)		
IC DEVICE CLASSIFICATION	Land Mobile Radio Transmitter/Receiver (27.41-960 MHz)		
DUT RF EXPOSURE CATEGORY	Occupational / Controlled (Part 90 Licensed PTT Transmitter)		
RF EXPOSURE LIMIT(S) APPLIED	Uncontrolled / General Population (Unlicensed Bluetooth)		
RF EXPOSURE EVALUATION(S)	Face-held & Body-worn		
DATE(S) OF EVALUATION	December 08, 2009		
TEST REPORT SERIAL NO.	102809AQZ-T991-S15B		
TEST REPORT REVISION NO.	Revision 1.1	See Revision List (Pg. 4)	December 23, 2009
	Revision 1.0	Initial Release	December 22, 2009
TEST REPORT SIGNATORIES	Testing Performed By		Test Report Prepared By
	Sean Johnston - Celltech Labs		Jon Hughes - Celltech Labs
TEST LAB AND LOCATION	Celltech Compliance Testing and Engineering Lab		
	21-364 Loughheed Road, Kelowna, B.C. V1X 7R8 Canada		
TEST LAB CONTACT INFO.	Tel.: 250-765-7650		Fax: 250-765-7645
	info@celltechlabs.com		www.celltechlabs.com
TEST LAB ACCREDITATION(S)	ISO/IEC 17025:2005 (A2LA Test Lab Certificate No. 2470.01)		

Applicant:	HARRIS CORPORATION	FCC ID:	AQZ-XG-100P00	IC:	122D-XG100P00	
DUT Type:	Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth	Model:	Unity XG-100P			
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<u>Test Report Issue Date</u> December 23, 2009	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)





## DECLARATION OF COMPLIANCE SAR RF EXPOSURE EVALUATION

<b>Test Lab Information</b>	<b>Name</b>	CELLTECH LABS INC.				
	<b>Address</b>	21-364 Lougheed Road, Kelowna, B.C. V1X 7R8 Canada				
<b>Applicant Information</b>	<b>Name</b>	HARRIS CORPORATION - RF COMMUNICATIONS DIVISION				
	<b>Address</b>	1680 University Avenue, Rochester, NY 14610 United States				
<b>Standard(s) Applied</b>	<b>FCC</b>	47 CFR §2.1093	<b>IC</b>	Health Canada Safety Code 6		
<b>Procedure(s) Applied</b>	<b>FCC</b>	OET Bulletin 65, Supplement C	<b>FCC</b>	KDB 447498 D01v04		
	<b>IC</b>	RSS-102 Issue 3	<b>IEEE</b>	1528-2003		
	<b>IEC</b>	62209-1:2005	<b>IEC</b>	62209-2 (Draft)		
<b>Device Identifier(s)</b>	<b>FCC ID:</b>	AQZ-XG-100P00	<b>IC:</b>	122D-XG100P00		
<b>Device Model(s)</b>	UNITY XG-100P	<b>Test Sample Serial No.</b>	EM067 (Identical Prototype)			
<b>Device Description</b>	Portable Push-To-Talk (PTT) Multi-Band Radio Transceiver with Class 1 Bluetooth (v2.0)					
<b>Transmitter Under Test</b>	Class 1 Bluetooth (Output Power > 60/f <sub>(GHz)</sub> mW per FCC KDB 447498 D01v04 Section 1)c)					
<b>Hardware / Software Revision No.(s)</b>	Version SW Platform 12082-8900_0.1.8			Version SW Build Nov 9 2009 - 11:58:03		
	Version HW FPGA LMR_091509_1358			Version HW FPGA_PN 12082-4030-01		
<b>Spread Spectrum Method</b>	Frequency Hopping					
<b>Transmit Modes and Modulations</b>	DH5 (SDR) - GFSK		2-DH5 (EDR) - DQPSK		3-DH5 (EDR) - 8DPSK	
<b>Transmit Frequency Range Tested</b>	2402 - 2480 MHz (ISM Band)					
<b>Manufacturer's Rated Output Power</b>	20 dBm		100 mW		DH5 (SDR) Average Conducted	
<b>Measured RF Output Power Levels</b>	Mode	Freq. MHz	Channel	dBm	mW	Method
	DH5 (SDR)	2402	0	19.3	85.1	Average Conducted
		2441	39	19.7	93.3	
		2480	78	20.1	102.3	
<b>Antenna Type(s) Tested</b>	Internal (Ceramic Chip Antenna - Manufacturer: Pulse Engineering - Part No.: W3008C)					
	Supports simultaneous transmission - PTT antenna to Bluetooth antenna distance = ~ 130 mm					
<b>Battery Type(s) Tested</b>	Lithium-ion		7.4 V	3650 mAh		P/N: 12082-0308-01
	Alkaline Case		1.5 V (x6 AA)	Energizer Industrial		P/N: 12082-0309-01
<b>Body-worn Accessories Tested</b>	Metal Belt-Clip		1.2 cm Spacing	Contains Metal		P/N: 12082-1291-01
<b>Audio Accessories Tested</b>	Speaker-Microphone					P/N: 12082-0600-01
<b>Max. SAR Level(s) Evaluated</b>	Face-held	0.114 W/kg		1g average		General Population / Uncontrolled Exposure
	Body-worn	0.033 W/kg		Peak SAR from Area Scan		
<b>FCC/IC Spatial Peak SAR Limit</b>	Head/Body	1.6 W/kg		1g average		
Celltech Labs Inc. declares under its sole responsibility that this wireless portable device has demonstrated compliance with the Specific Absorption Rate (SAR) RF exposure measurement standards and procedures as listed above. All measurements were performed in accordance with the SAR system manufacturer recommendations.						
I attest to the accuracy of data. All measurements were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.						
The results and statements contained in this report pertain only to the device(s) evaluated.						
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<b>Test Report Approved By</b>			<b>Sean Johnston</b>		<b>Celltech Labs Inc.</b>	


<b>Applicant:</b>	HARRIS CORPORATION	<b>FCC ID:</b>	AQZ-XG-100P00	<b>IC:</b>	122D-XG100P00	
<b>DUT Type:</b>	Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth			<b>Model:</b>	Unity XG-100P	
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	<u>Test Report Issue Date</u> December 23, 2009	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

### REVISION HISTORY


REVISION NO.	DESCRIPTION	RELEASE DATE
1.0	Initial Release	December 22, 2009
1.1	1. Corrected IC ID (all pages) 2. Corrected Bluetooth antenna part no. (page 2)	December 23, 2009



<b>Applicant:</b>	<b>HARRIS CORPORATION</b>	<b>FCC ID:</b>	<b>AQZ-XG-100P00</b>	<b>IC:</b>	<b>122D-XG100P00</b>	
<b>DUT Type:</b>	<b>Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth</b>	<b>Model:</b>	<b>Unity XG-100P</b>			
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## 1.0 DUT ACCESSORY LISTING

Part Number	Accessory Type	Inc. in SAR Eval.
12082-0250-01	ANTENNA, UNITY, 136-870 MHz, HELICAL	No (installed but not transmitting)
12082-0308-01	BATTERY, LITHIUM-ION	Yes
12082-0600-01	STANDARD SPEAKER MICROPHONE	Yes
12082-0309-01	BATTERY, AA CLAMSHELL	Yes
12082-1291-01	BELT CLIP, METAL	Yes
12082-0504-01	STRAP, NYLON	No
12082-0505-01	STRAP, LEATHER	No
12082-0512-01	CASE, NYLON, WINDOW, T-STRAP	No
12082-0510-01	CASE, NYLON, FULL, T-STRAP	No
12082-0507-02	CASE, LEATHER, HALF, 3" LOOP	No
12082-0507-01	CASE, LEATHER, HALF, 2.5" LOOP	No
12082-0502-02	CASE, LEATHER, FULL, 3" LOOP	No
12082-0502-01	CASE, LEATHER, FULL, 2.5" LOOP	No
12082-0501-01	CASE, LEATHER, HALF, T-STRAP	No
12082-0500-01	CASE, LEATHER, FULL, T-STRAP	No
12082-0310-01	CHARGER, 1-BAY, TRI-CHEMISTRY	n/a
12082-0314-01	CHARGER, 6-BAY, TRI-CHEMISTRY	n/a
12082-0410-A1	CABLE, USB Programming	n/a
12082-0400-A1	CABLE, KVL Key Loading	n/a
<b>Notes</b>		
1. For the body-worn SAR evaluations the DUT was evaluated with the metal belt-clip accessory which provided the minimum separation distance between the back of the DUT and the planar phantom - the metal belt-clip accessory was the maximum SAR accessory from the PTT evaluations.		

<b>Applicant:</b>	<b>HARRIS CORPORATION</b>	<b>FCC ID:</b>	<b>AQZ-XG-100P00</b>	<b>IC:</b>	<b>122D-XG100P00</b>		
<b>DUT Type:</b>	<b>Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth</b>	<b>Model:</b>	<b>Unity XG-100P</b>				
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## 2.0 INTRODUCTION

This measurement report demonstrates that the Harris Corporation Model: XG-100P Portable Analog/Digital PTT Multi-Band Radio Transceiver (Class 1 Bluetooth transmitter portion) complies with the SAR (Specific Absorption Rate) RF exposure requirements specified in FCC 47 CFR §2.1093 (see reference [1]) and Health Canada's Safety Code 6 (see reference [2]) under the General Population / Uncontrolled Exposure limit. The measurement procedures described in FCC OET Bulletin 65, Supplement C 01-01 (see reference [3]), IC RSS-102 Issue 3 (see reference [4]), IEEE Standard 1528-2003 (see reference [5]), IEC Standard 62209-1:2005 (see reference [6]) and Draft Standard IEC 62209-2 (see reference [7]) were employed. A description of the device, operating configuration, detailed summary of the test results, methodology and procedures used in the evaluation, equipment used and the various provisions of the rules are included within this test report.

## 3.0 SAR MEASUREMENT SYSTEM

Celltech Labs Inc. SAR measurement facility utilizes the Dosimetric Assessment System (DASY™) manufactured by Schmid & Partner Engineering AG (SPEAG™) of Zurich, Switzerland. The DASY4 measurement system is comprised of the measurement server, robot controller, computer, near-field probe, probe alignment sensor, specific anthropomorphic mannequin (SAM) phantom, and various planar phantoms 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, teach pendant (Joystick), and remote control, is used to drive the robot 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 into digital electric signal of the DAE 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 and a command decoder and 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 uses a controller with a built in VME-bus computer.


## 4.0 RF CONDUCTED OUTPUT POWER MEASUREMENTS



### MEASURED RF CONDUCTED AVERAGE OUTPUT POWER LEVELS & SETTINGS

Freq. (MHz)	Average Cond.		Mode	TXDATA1		CFG_FREQ			CFG_PKT		TX_PA Atten
	dBm	mW		Ext_Pow	Int_Pwr	TXRX_Int	Loopback_Int	Report_Int	Pkt_Type	Pkt_Size	
2402	19.3	85.1	DH5 (SDR)	0	63	1250	1875	1	15	339	0
2441	19.7	93.3									
2480	20.1	102.3									

#### Notes

- The RF conducted output power levels of the DUT were measured by Celltech at the RF connector connected to the Bluetooth (installed by Harris Corp. after the SAR evaluations) using a Gigatronics 8652A Universal Power Meter.
- The 2-DH5 (EDR) and 3-DH5 (EDR) modes were also measured and were 4-5 dB lower than DH5 (SDR) mode.
- The power level settings were prescribed by the customer.

<b>Applicant:</b>	HARRIS CORPORATION	<b>FCC ID:</b>	AQZ-XG-100P00	<b>IC:</b>	122D-XG100P00	
<b>DUT Type:</b>	Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth	<b>Model:</b>	Unity XG-100P			
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## 5.0 SAR PROBE CALIBRATION & MEASUREMENT FREQUENCIES

The following procedures are recommended for measurements at 150 MHz - 3 GHz to minimize probe calibration and tissue dielectric parameter discrepancies. In general, SAR measurements below 300 MHz should be within  $\pm 50$  MHz of the probe calibration frequency. At 300 MHz to 3 GHz, measurements should be within  $\pm 100$  MHz of the probe calibration frequency. Measurements exceeding 50% of these intervals,  $\pm 25$  MHz < 300 MHz and  $\pm 50$  MHz  $\geq 300$  MHz, require additional steps (per FCC KDB 450824 D01 v01r01, SAR Probe Calibration and System Verification Considerations for Measurements at 150 MHz - 3 GHz - see reference [9]).

Probe Calibration Freq.	Device Measurement Freq.	Frequency Interval	$\pm 50$ MHz $\geq 300$ MHz
2450 MHz	2402 MHz	48 MHz	< 50 MHz
	2441 MHz	9 MHz	< 50 MHz
	2480 MHz	30 MHz	< 50 MHz

The probe calibration and measurement frequency interval is < 50 MHz; therefore the additional steps are not required.


## 6.0 SIMULATED EQUIVALENT TISSUES

The simulated equivalent tissue recipes in the table below are derived from the SAR system manufacturer's suggested recipes in the DASY4 manual (see reference [10] and [11]) in accordance with the procedures and requirements specified in IEEE Standard 1528-2003 (see reference [5]) and IEC Standard 62209-1:2005 (see reference [6]). The ingredient percentage may have been adjusted minimally in order to achieve the appropriate target dielectric parameters within the specified tolerance.

SIMULATED EQUIVALENT TISSUE MIXTURE		
INGREDIENT	2450 MHz HEAD	2450 MHz BODY
Water	55.00 %	69.98 %
Glycol Monobutyl	45.00 %	30.00 %
Salt	-	0.02 %

## 7.0 SAR LIMITS

SAR RF EXPOSURE LIMITS			
FCC 47 CFR 2.1093	Health Canada Safety Code 6	(General Population / Uncontrolled Exposure)	(Occupational / Controlled Exposure)
Spatial Average (averaged over the whole body)		0.08 W/kg	0.4 W/kg
Spatial Peak (averaged over any 1 g of tissue)		<b>1.6 W/kg</b>	8.0 W/kg
Spatial Peak (hands/wrists/feet/ankles averaged over 10 g)		4.0 W/kg	20.0 W/kg
The Spatial Average value of the SAR averaged over the whole body.			
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.			
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.			
Uncontrolled environments are defined as locations where there is potential exposure of individuals who have no knowledge or control of their potential exposure.			
Controlled environments are defined as locations where there is potential exposure of individuals who have knowledge of their potential exposure and can exercise control over their exposure.			



Applicant:	HARRIS CORPORATION	FCC ID:	AQZ-XG-100P00	IC:	122D-XG100P00	
DUT Type:	Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth	Model:	Unity XG-100P			
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## 8.0 SAR MEASUREMENT SUMMARY

SAR MEASUREMENT SUMMARY													
Test Mode	Freq.	Ch.	Data Rate		Test Config.	Battery Type	Body-worn Accessory	Device Distance to Planar Phantom		Cond. Power Before Test	SAR Drift During Test	Measured SAR	
			Mbps	Mode				DUT	Antenna			dBm	dB
Modulated GFSK Fixed Frequency	2441	39	1	DH5 (SDR)	Face-held	Alkaline	n/a	2.5 cm	3.5 cm	19.7	-0.123 <sup>3</sup>	0.100	1g
Modulated GFSK Fixed Frequency	2441	39	1	DH5 (SDR)	Face-held	Li-ion	n/a	2.5 cm	3.5 cm	19.7	0.064 <sup>3</sup>	0.100	1g
Modulated GFSK Fixed Frequency	2402	0	1	DH5 (SDR)	Face-held	Li-ion	n/a	2.5 cm	3.5 cm	19.3	-0.072 <sup>3</sup>	0.033	1g
Modulated GFSK Fixed Frequency	2480	78	1	DH5 (SDR)	Face-held	Li-ion	n/a	2.5 cm	3.5 cm	20.1	0.103 <sup>3</sup>	0.114	1g
Modulated GFSK Fixed Frequency	2441	39	1	DH5 (SDR)	Body-worn	Alkaline	Belt-Clip	1.2 cm	4.8 cm	19.7	-- <sup>4</sup>	0.033	Pk <sup>2</sup>
Modulated GFSK Fixed Frequency	2441	39	1	DH5 (SDR)	Body-worn	Li-ion	Belt-Clip	1.2 cm	4.8 cm	19.7	-- <sup>4</sup>	0.016	Pk <sup>2</sup>
Modulated GFSK Fixed Frequency	2402	0	1	DH5 (SDR)	Body-worn	Li-ion	Belt-Clip	1.2 cm	4.8 cm	19.3	-- <sup>4</sup>	0.014	Pk <sup>2</sup>
Modulated GFSK Fixed Frequency	2480	78	1	DH5 (SDR)	Body-worn	Li-ion	Belt-Clip	1.2 cm	4.8 cm	20.1	-- <sup>4</sup>	0.027	Pk <sup>2</sup>
<b>SAR LIMIT(S)</b>				<b>HEAD &amp; 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			averaged over 1 gram			General Population / Uncontrolled			
<b>Test Date(s)</b>		December 08, 2009					<b>SAR Evaluation Type</b>		<b>Face</b>	<b>Body</b>	<b>Unit</b>		
<b>Measured Fluid Type(s)</b>		2450 MHz Head			2450 MHz Body		<b>Ambient Temperature</b>		24.1	24.2	°C		
<b>Fluid Dielectric Parameters</b>		<b>IEEE Target - 2450 MHz</b>			<b>Measured</b>	<b>Deviation</b>	<b>Fluid Temperature</b>		23.1	23.3	°C		
<b>Dielectric Constant ε<sub>r</sub></b>		<b>HEAD</b>	<b>39.2</b>	<b>±5%</b>	38.3	-2.3%	<b>Fluid Depth</b>		≥ 15	≥ 15	cm		
		<b>BODY</b>	<b>52.7</b>	<b>±5%</b>	52.5	-0.4%	<b>Relative Humidity</b>		35	35	%		
<b>Conductivity σ (mho/m)</b>		<b>HEAD</b>	<b>1.80</b>	<b>±5%</b>	1.89	+5.0%	<b>Atmospheric Pressure</b>		101.1	101.1	kPa		
		<b>BODY</b>	<b>1.95</b>	<b>±5%</b>	2.03	+4.1%	<b>ρ (Kg/m<sup>3</sup>)</b>		1000				
<b>Notes</b>													
1.	Detailed measurement data and plots showing the maximum SAR location of the DUT are reported in Appendix A.												
2.	The SAR levels measured and reported are the Peak SAR levels measured from the area scan. The 1g-averaged SAR is not measured when the peak SAR value from the area scan evaluation is less than 1% of the 1g average limit. The mathematical formula used to extrapolate the SAR value at the surface from the zoom scan SAR values measured at 5 mm steps leading away from the surface assumes a curving slope (i.e. the SAR values gradually decrease as the probe moves away from the surface). When the peak SAR of a device is so low that the RF noise level is competing with the SAR level, the zoom scan measurements leading away from the surface are no longer a curving slope and the extrapolation formula cannot accurately estimate the 1g average SAR. Therefore the peak value from the area scan is reported in place of the 1g averaged SAR value whenever the peak values are less than 1% of the average limit. This avoids gross uncertainties in the 1g average SAR calculation while maintaining a conservative estimation of the SAR level.												
3.	The power drift of the DUT was measured by the DASY4 system during the SAR evaluations and the drift was < 5% from the start power.												
4.	The power drift of the DUT during the SAR evaluations was measured at the reference point of the phantom with low SAR. The resulting drift values were inaccurate due to the SAR value at the reference point was close to the measurement noise floor and are therefore not reported.												
5.	The face-held and body-worn SAR evaluations were firstly evaluated at the center frequency with the alkaline and Lithium-ion batteries and the remaining low and high channels were evaluated with the Lithium-ion battery only.												




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## 9.0 DETAILS OF SAR EVALUATION

- The DUT was evaluated in a face-held configuration with the front of the radio placed parallel to the outer surface of the planar phantom. A 2.5 cm spacing was maintained between the front side of the DUT and the outer surface of the planar phantom.
- The DUT was evaluated in a body-worn configuration with the back of the radio facing the outer surface of the planar phantom. The Metal Belt-Clip accessory was attached the radio and touching the planar phantom. The Metal Belt-Clip accessory provided a 1.2 cm separation distance from the back of the DUT to the planar phantom. The Speaker-Microphone audio accessory was connected to the DUT (note: PTT key not utilized for Bluetooth SAR evaluations).
- The DUT was evaluated for SAR with the battery pack fully charged prior to each SAR evaluation with the Li-ion battery. New alkaline batteries were utilized for the SAR evaluations with alkaline battery case.
- Simultaneous transmission of the multi-band PTT antenna and the Bluetooth antenna is addressed in the multi-band PTT SAR reports. The antenna-to-antenna separation distance is ~ 130 mm.
- The Bluetooth transmitter was placed in test mode using the proprietary Blue Suite test software and CSR Blue test application provided by the customer. The test software enabled the Bluetooth in modulated continuous transmit operation on a fixed frequency with the frequency hopping disabled. The maximum power level settings were prescribed by the customer.
- The fluid temperature was measured prior to and after the SAR evaluations and the temperature remained within +/- 2°C of the fluid temperature reported during the dielectric parameter measurements.
- The dielectric parameters of the simulated tissue mixtures were measured prior to the SAR evaluations using a Dielectric Probe Kit and a Network Analyzer (see Appendix C).

## 10.0 SAR EVALUATION PROCEDURES

- The evaluation was performed in the applicable area of the phantom depending on the type of device being tested. For devices held to the ear during normal operation, both the left and right ear positions were evaluated using the SAM phantom.
  - For body-worn and face-held devices a planar phantom was used.
- The SAR was determined by a pre-defined procedure within the DASY4 software. Upon completion of a reference and optical surface check, the exposed region of the phantom was scanned near the inner surface with a grid spacing of 15mm x 15mm.
- An area scan was determined as follows:
- Based on the defined area scan grid, a more detailed grid is created to increase the points by a factor of 10. The interpolation function then evaluates all field values between corresponding measurement points.
- A linear search is applied to find all the candidate maxima. Subsequently, all maxima are removed that are >2 dB from the global maximum. The remaining maxima are then used to position the cube scans.  
A 1g and 10g spatial peak SAR was determined as follows:
- Extrapolation is used to determine the values between the dipole center of the probe and the surface of the phantom. This data cannot be measured because the center of the dipole sensors is 1.0 mm away from the probe tip and the distance between the probe and the boundary must be larger than 25% of the probe diameter. The probe diameter is 2.4 mm. In the DASY4 software, the distance between the sensor center and phantom surface is set to 2.0 mm. This provides a distance of 1.0 mm between the probe tip and the surface. The extrapolation of the values between the dipole center and the surface of the phantom was based on trivariate quadratics computed from the previously calculated 3D interpolated points nearest the phantom surface.
- Interpolated data is used to calculate the average SAR over 1g and 10g cubes by spatially discretizing the entire measured cube. The volume used to determine the averaged SAR is a 1mm grid (42875 interpolated points).
- For frequencies < 3 GHz a zoom scan volume of 24 mm x 24 mm x 24 mm (7x7x7 points) centered at the peak SAR location determined from the area scan was used and a zoom scan resolution of 5 mm x 5 mm x 5 mm was used.

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<b>DUT Type:</b>	<b>Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth</b>	<b>Model:</b>	<b>Unity XG-100P</b>			
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## 11.0 SYSTEM PERFORMANCE CHECK

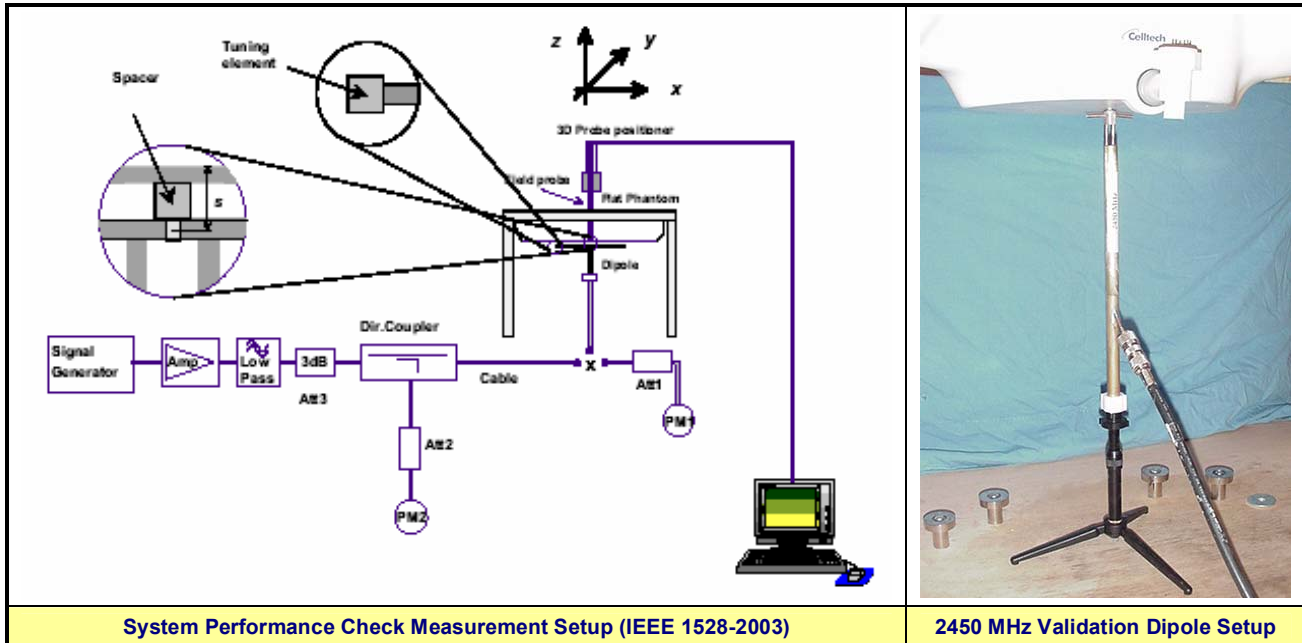
Prior to the SAR evaluations, daily system checks were performed at the planar section of the SAM phantom with a 2450MHz SPEAG dipole (see Appendix B for system performance check test plots) in accordance with the procedures described in IEEE Standard 1528-2003 (see reference [5]) and International Standard IEC 62209-1:2005 (see reference [6]). A forward power of 250 mW was applied to the dipole and the system was verified to a tolerance of  $\pm 10\%$  from the system manufacturer's dipole calibration target SAR value (see Appendix E for system manufacturer's dipole calibration procedures).



### SYSTEM PERFORMANCE CHECK EVALUATION SUMMARY

Test Date	Equiv. Tissue	SAR (1g) (W/kg)			Dielectric Constant $\epsilon_r$			Conductivity $\sigma$ (mho/m)			$\rho$ (Kg/m <sup>3</sup> )	Amb. Temp. (°C)	Fluid Temp. (°C)	Fluid Depth (cm)	Humid. (%)	Barom. Press. (kPa)
		2450 MHz	SPEAG Target	Meas.	Dev.	SPEAG Target	Meas.	Dev.	SPEAG Target	Meas.						
Dec-08	HEAD	13.6 $\pm 10\%$	12.8	-6.0%	38.0 $\pm 5\%$	38.3	+0.8%	1.82 $\pm 5\%$	1.89	+3.9%	1000	24.1	23.1	$\geq 15$	35	101.1
Dec-08	BODY	12.9 $\pm 10\%$	12.4	-3.8%	54.4 $\pm 5\%$	52.5	-3.5%	1.98 $\pm 5\%$	2.03	+2.5%	1000	24.2	23.3	$\geq 15$	35	101.1


Notes	1. The target SAR values are the measured values from the dipole calibration performed by SPEAG (see Appendix E).
	2. The target dielectric parameters are the measured values from the dipole calibration performed by SPEAG (see Appendix E).
	3. The fluid temperature was measured prior to and after the system performance check to ensure the temperature remained within $\pm 2^\circ\text{C}$ of the fluid temperature reported during the dielectric parameter measurements.
	4. 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 (see Appendix C).





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## 12.0 ROBOT SYSTEM SPECIFICATIONS

<b><u>Specifications</u></b>	
<b>Positioner</b>	Stäubli Unimation Corp. Robot Model: RX60L
<b>Repeatability</b>	0.02 mm
<b>No. of axis</b>	6
<b><u>Data Acquisition Electronic (DAE) System</u></b>	
<b><u>Cell Controller</u></b>	
<b>Processor</b>	AMD Athlon XP 2400+
<b>Clock Speed</b>	2.0 GHz
<b>Operating System</b>	Windows XP Professional
<b><u>Data Converter</u></b>	
<b>Features</b>	Signal Amplifier, multiplexer, A/D converter, and control logic
<b>Software</b>	Measurement Software: DASY4, V4.7 Build 44
	Postprocessing Software: SEMCAD, V1.8 Build 171
<b>Connecting Lines</b>	Optical downlink for data and status info.; Optical uplink for commands and clock
<b><u>DASY4 Measurement Server</u></b>	
<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
<b><u>E-Field Probe</u></b>	
<b>Model</b>	EX3DV4
<b>Serial No.</b>	3600
<b>Construction</b>	Symmetrical design with triangular core
<b>Frequency</b>	10 MHz to 6 GHz
<b>Linearity</b>	±0.2 dB (30 MHz to 3 GHz)
<b><u>Phantom(s)</u></b>	
<b>Type</b>	SAM V4.0C
<b>Shell Material</b>	Fiberglass
<b>Thickness</b>	2.0 ±0.1 mm
<b>Volume</b>	Approx. 25 liters


<b>Applicant:</b>	<b>HARRIS CORPORATION</b>	<b>FCC ID:</b>	<b>AQZ-XG-100P00</b>	<b>IC:</b>	<b>122D-XG100P00</b>	
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### 13.0 PROBE SPECIFICATIONS (EX3DV4)


<p><b>Construction:</b> Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g. DGBE)</p> <p><b>Calibration:</b> Basic Broadband Calibration in air: 10-3000 MHz Conversion Factors (CF) for HSL 900 and HSL 1750</p> <p><b>Frequency:</b> 10 MHz to &gt;6 GHz; Linearity: <math>\pm 0.2</math> dB (30 MHz to 3 GHz)</p> <p><b>Directivity:</b> <math>\pm 0.3</math> dB in HSL (rotation around probe axis) <math>\pm 0.5</math> dB in tissue material (rotation normal to probe axis)</p> <p><b>Dynamic Range:</b> 10 <math>\mu</math>W/g to &gt;100 mW/g; Linearity: <math>\pm 0.2</math> dB (noise: typically &lt; 1 <math>\mu</math>W/g)</p> <p><b>Dimensions:</b> Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1.0 mm</p> <p><b>Application:</b> High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better than 30%.</p>	
	<b>EX3DV4 E-Field Probe</b>



### 14.0 SAM TWIN PHANTOM V4.0C

<p>The SAM Twin Phantom V4.0C is a fiberglass shell phantom with a 2.0 mm (+/-0.2 mm) shell thickness for left and right head and flat planar area integrated in a wooden table. The shape of the fiberglass shell corresponds to the phantom defined by SCC34-SC2. The device holder positions are adjusted to the standard measurement positions in the three sections (see Appendix G for specifications of the SAM Twin Phantom V4.0C).</p>	
	<b>SAM Twin Phantom V4.0C</b>

### 15.0 DEVICE HOLDER


<p>The DASY4 device holder 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 Holder</b>



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## 16.0 TEST EQUIPMENT LIST


TEST EQUIPMENT		ASSET NO.	SERIAL NO.	PREVIOUS CALIBRATION	CALIBRATION DUE DATE
USED	DESCRIPTION				
x	Schmid & Partner DASY4 System	-	-	-	-
x	-DASY4 Measurement Server	00158	1078	CNR	CNR
x	-Robot	00046	599396-01	CNR	CNR
x	-DAE4	00019	353	28Apr09	28Apr10
x	-EX3DV4 E-Field Probe	00213	3600	28Apr09	28Apr10
x	-D2450V2 Validation Dipole	00219	825	17Apr09	17Apr10
x	-SAM Twin Phantom V4.0C	00154	1033	CNR	CNR
x	HP 85070C Dielectric Probe Kit	00033	none	CNR	CNR
x	HP E4408B Spectrum Analyzer	00015	US39240170	23Apr08	28Apr10
x	Gigatronics 8652A Power Meter	00007	1835272	23Apr08	28Apr10
x	Gigatronics 80701A Power Sensor	00014	1833699	23Apr08	28Apr10
x	HP 8753ET Network Analyzer	00134	US39170292	28Apr08	28Apr10
x	Rohde & Schwarz SMR20 Signal Generator	00006	100104	CNR	CNR
x	Amplifier Research 5S1G4 Power Amplifier	00106	26235	CNR	CNR
Abbr.	CNR = Calibration Not Required				

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## 17.0 MEASUREMENT UNCERTAINTIES

UNCERTAINTY BUDGET FOR DEVICE EVALUATION									
Uncertainty Component	IEEE 1528 Section	Uncertainty Value ±%	Probability Distribution	Divisor	ci 1g	ci 10g	Uncertainty Value ±% (1g)	Uncertainty Value ±% (10g)	V <sub>i</sub> or V <sub>eff</sub>
<b>Measurement System</b>									
Probe Calibration (2450 MHz)	E.2.1	5.5	Normal	1	1	1	5.5	5.5	∞
Axial Isotropy	E.2.2	4.7	Rectangular	1.732050808	0.7	0.7	1.9	1.9	∞
Hemispherical Isotropy	E.2.2	9.6	Rectangular	1.732050808	0.7	0.7	3.9	3.9	∞
Boundary Effect	E.2.3	1	Rectangular	1.732050808	1	1	0.6	0.6	∞
Linearity	E.2.4	4.7	Rectangular	1.732050808	1	1	2.7	2.7	∞
System Detection Limits	E.2.5	1	Rectangular	1.732050808	1	1	0.6	0.6	∞
Readout Electronics	E.2.6	0.3	Normal	1	1	1	0.3	0.3	∞
Response Time	E.2.7	0.8	Rectangular	1.732050808	1	1	0.5	0.5	∞
Integration Time	E.2.8	2.6	Rectangular	1.732050808	1	1	1.5	1.5	∞
RF Ambient Conditions	E.6.1	3	Rectangular	1.732050808	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.4	Rectangular	1.732050808	1	1	0.2	0.2	∞
Probe Positioning wrt Phantom Shell	E.6.3	2.9	Rectangular	1.732050808	1	1	1.7	1.7	∞
Extrapolation, interpolation & integration algorithms for max. SAR evaluation	E.5	1	Rectangular	1.732050808	1	1	0.6	0.6	∞
<b>Test Sample Related</b>									
Test Sample Positioning	E.4.2	2.9	Normal	1	1	1	2.9	2.9	12
Device Holder Uncertainty	E.4.1	3.6	Normal	1	1	1	3.6	3.6	8
SAR Drift Measurement	6.6.2	5	Rectangular	1.732050808	1	1	2.9	2.9	∞
<b>Phantom and Tissue Parameters</b>									
Phantom Uncertainty	E.3.1	4	Rectangular	1.732050808	1	1	2.3	2.3	∞
Liquid Conductivity (target)	E.3.2	5	Rectangular	1.732050808	0.64	0.43	1.8	1.2	∞
Liquid Conductivity (measured)	E.3.3	5	Normal	1	0.64	0.43	3.2	2.2	∞
Liquid Permittivity (target)	E.3.2	5	Rectangular	1.732050808	0.6	0.49	1.7	1.4	∞
Liquid Permittivity (measured)	E.3.3	2.3	Normal	1	0.6	0.49	1.4	1.1	∞
<b>Combined Standard Uncertainty</b>			<b>RSS</b>				<b>10.92</b>	<b>10.50</b>	
<b>Expanded Uncertainty (95% Confidence Interval)</b>			<b>k=2</b>				<b>21.84</b>	<b>20.99</b>	
Measurement Uncertainty Table in accordance with IEEE Standard 1528-2003									


Applicant:	HARRIS CORPORATION	FCC ID:	AQZ-XG-100P00	IC:	122D-XG100P00	
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## 18.0 REFERENCES



- [1] Federal Communications Commission - "Radiofrequency radiation exposure evaluation: portable devices", Rule Part 47 CFR §2.1093.
- [2] Health Canada - "Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz", Safety Code 6: 1999.
- [3] Federal Communications Commission - "Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields", OET Bulletin 65, Supplement C (Edition 01-01), FCC, Washington, D.C.: June 2001.
- [4] Industry Canada - "Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)", Radio Standards Specification RSS-102 Issue 3: June 2009.
- [5] IEEE Standard 1528-2003 - "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques": December 2003.
- [6] IEC International Standard 62209-1:2005 - "Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Human models, instrumentation, and procedures."
- [7] International Standard IEC 62209-2 Draft (106-62209-2-CDV\_090323) - "Human exposure to radio frequency fields from hand-held & body-mounted wireless comm. devices - Part 2: Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (30 MHz to 6 GHz)".
- [8] Federal Communications Commission, Office of Engineering and Technology - "Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies"; KDB 447498 D01v04: November 2009.
- [9] Federal Communications Commission, Office of Engineering and Technology - "Application Note: SAR Probe Calibration and System Verification Considerations for Measurements at 150 MHz - 3 GHz"; KDB 450824 D01 v01r01: January 2007.
- [10] Schmid & Partner Engineering AG - DASY4 Manual V4.6, Chapter 16 Application Note, Head Tissue Recipe: Sept. 2005.
- [11] Schmid & Partner Engineering AG - DASY4 Manual V4.6, Chapter 17 Application Note, Body Tissue Recipe: Sept. 2005.

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**APPENDIX A - SAR MEASUREMENT DATA**

<b>Applicant:</b>	<b>HARRIS CORPORATION</b>	<b>FCC ID:</b>	<b>AQZ-XG-100P00</b>	<b>IC:</b>	<b>122D-XG100P00</b>	
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Date Tested: 12/08/2009

## Face-held SAR - Alkaline Battery Case - Class 1 Bluetooth - DH5 (SDR) - 2441 MHz

**DUT: HARRIS Unity XG-100P; Type: Multi-band PTT Radio Transceiver with Class 1 Bluetooth; Serial: EM067**

Ambient Temp: 24.1°C; Fluid Temp: 23.1°C; Barometric Pressure: 101.1 kPa; Humidity: 35%

Communication System: GFSK

Frequency: 2441 MHz; Duty Cycle: 1:1

Medium: HSL2450 Medium parameters used:  $f = 2441 \text{ MHz}$ ;  $\sigma = 1.89 \text{ mho/m}$ ;  $\epsilon_r = 38.3$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: EX3DV4 - SN3600; ConvF(6.3, 6.3, 6.3); Calibrated: 28/04/2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 28/04/2009
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASy4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

### Face-held SAR - 2.5 cm Spacing from Front Side of DUT to Planar Phantom Section

**Area Scan (8x14x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (measured) = 0.117 mW/g

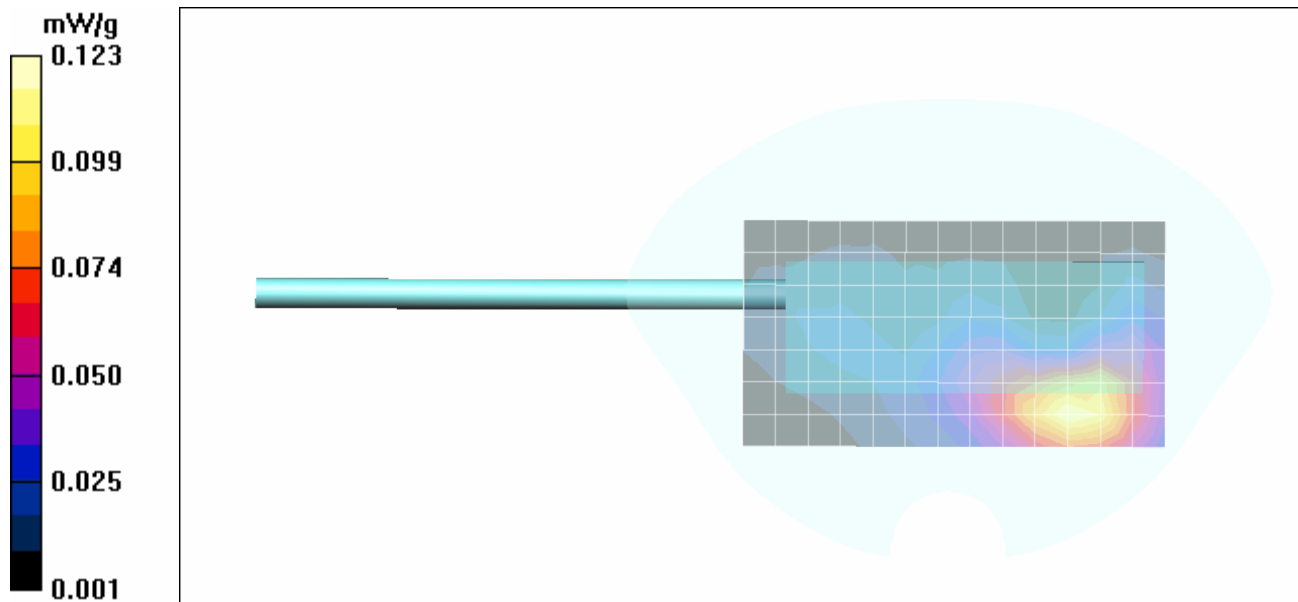
**Zoom Scan (7x7x7)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$


Reference Value = 3.61 V/m; Power Drift = -0.123 dB



Peak SAR (extrapolated) = 0.174 W/kg

**SAR(1 g) = 0.100 mW/g; SAR(10 g) = 0.057 mW/g**

Maximum value of SAR (measured) = 0.123 mW/g



Applicant:	HARRIS CORPORATION	FCC ID:	AQZ-XG-100P00	IC:	122D-XG100P00	
DUT Type:	Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth	Model:	Unity XG-100P			
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Date Tested: 12/08/2009

## Face-held SAR - Lithium-ion Battery Pack - Class 1 Bluetooth - DH5 (SDR) - 2441 MHz

**DUT: HARRIS Unity XG-100P; Type: Multi-band PTT Radio Transceiver with Class 1 Bluetooth; Serial: EM067**

Ambient Temp: 24.1°C; Fluid Temp: 23.1°C; Barometric Pressure: 101.1 kPa; Humidity: 35%

Communication System: GFSK

Frequency: 2441 MHz; Duty Cycle: 1:1

Medium: HSL2450 Medium parameters used:  $f = 2441 \text{ MHz}$ ;  $\sigma = 1.89 \text{ mho/m}$ ;  $\epsilon_r = 38.3$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: EX3DV4 - SN3600; ConvF(6.3, 6.3, 6.3); Calibrated: 28/04/2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 28/04/2009
- Phantom: SAM 4.0; Type: Fibreglas; Serial: 1033
- Measurement SW: DASy4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

### Face-held SAR - 2.5 cm Spacing from Front Side of DUT to Planar Phantom Section

**Mid Channel/Area Scan (8x14x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (measured) = 0.114 mW/g

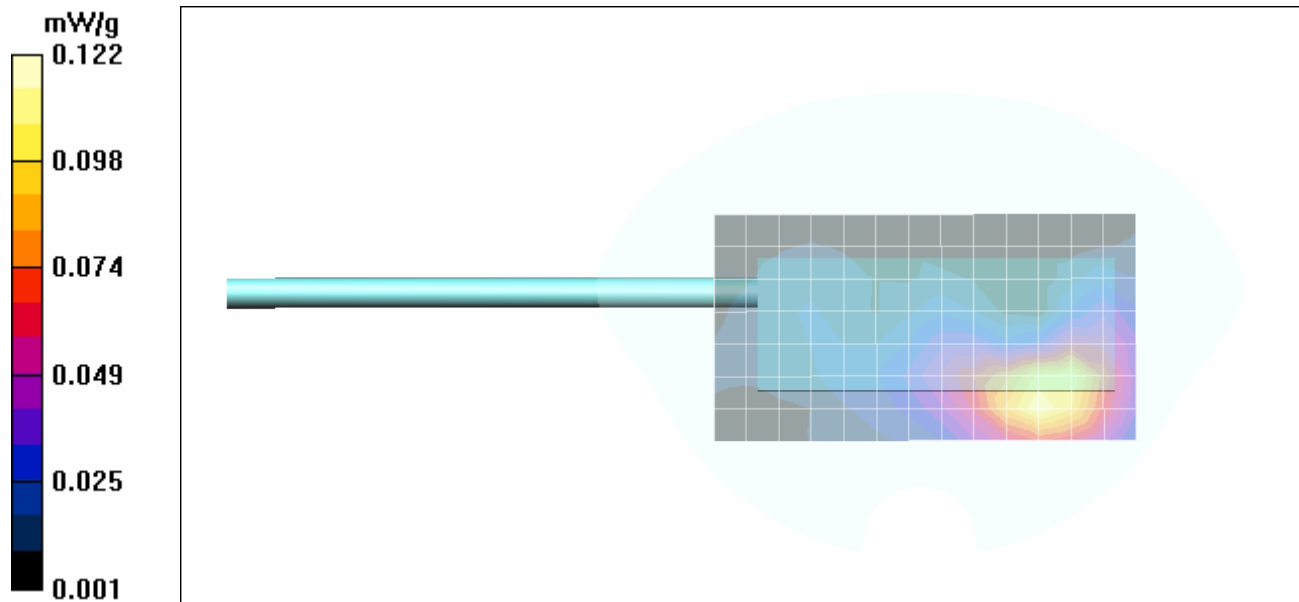
**Mid Channel/Zoom Scan (7x7x7)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$


Reference Value = 3.62 V/m; Power Drift = 0.064 dB



Peak SAR (extrapolated) = 0.180 W/kg

**SAR(1 g) = 0.100 mW/g; SAR(10 g) = 0.057 mW/g**

Maximum value of SAR (measured) = 0.122 mW/g



<b>Applicant:</b>	HARRIS CORPORATION	<b>FCC ID:</b>	AQZ-XG-100P00	<b>IC:</b>	122D-XG100P00	
<b>DUT Type:</b>	Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth	<b>Model:</b>	Unity XG-100P			
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	<u>Test Report Issue Date</u> December 23, 2009	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Date Tested: 12/08/2009

**Face-held SAR - Lithium-ion Battery Pack - Class 1 Bluetooth - DH5 (SDR) - 2402 MHz**

**DUT: HARRIS Unity XG-100P; Type: Multi-band PTT Radio Transceiver with Class 1 Bluetooth; Serial: EM067**

Ambient Temp: 24.1°C; Fluid Temp: 23.1°C; Barometric Pressure: 101.1 kPa; Humidity: 35%

Communication System: GFSK

Frequency: 2402 MHz; Duty Cycle: 1:1

Medium: HSL2450 Medium parameters used:  $f = 2402 \text{ MHz}$ ;  $\sigma = 1.89 \text{ mho/m}$ ;  $\epsilon_r = 38.3$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: EX3DV4 - SN3600; ConvF(6.3, 6.3, 6.3); Calibrated: 28/04/2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 28/04/2009
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASy4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

**Face-held SAR - 2.5 cm Spacing from Front Side of DUT to Planar Phantom Section**

**Area Scan (8x14x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (measured) = 0.037 mW/g

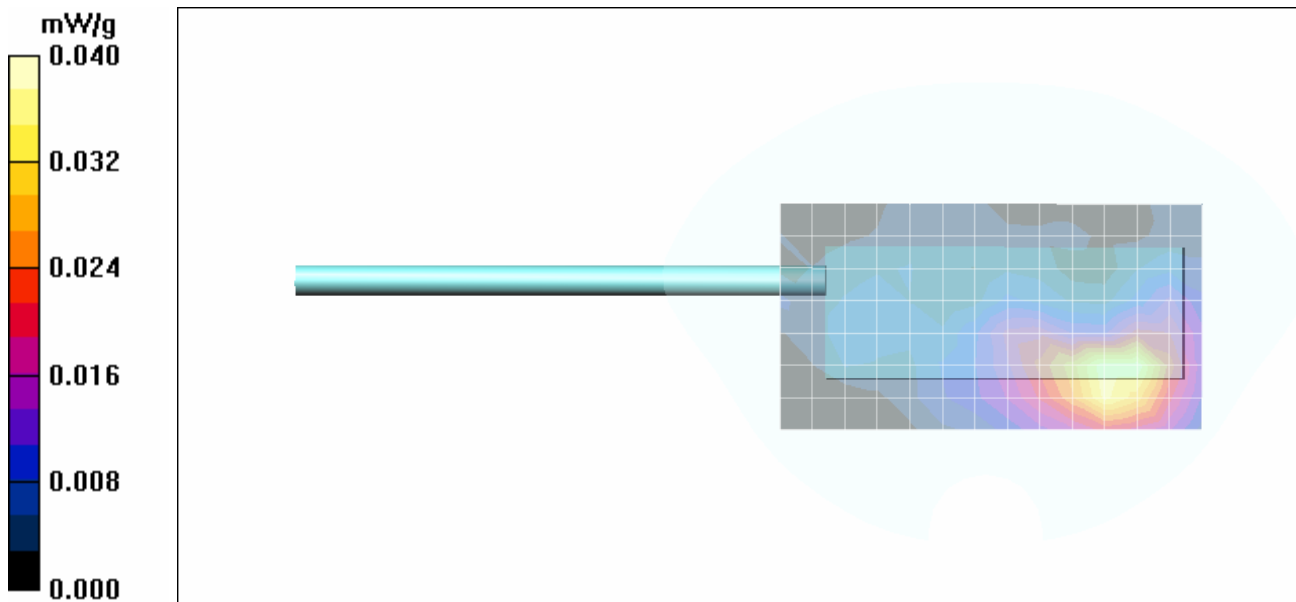
**Zoom Scan (7x7x7)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$


Reference Value = 2.16 V/m; Power Drift = -0.072 dB



Peak SAR (extrapolated) = 0.055 W/kg

**SAR(1 g) = 0.033 mW/g; SAR(10 g) = 0.019 mW/g**

Maximum value of SAR (measured) = 0.040 mW/g



Applicant:	HARRIS CORPORATION	FCC ID:	AQZ-XG-100P00	IC:	122D-XG100P00	
DUT Type:	Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth	Model:	Unity XG-100P			
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	<u>Test Report Issue Date</u> December 23, 2009	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Date Tested: 12/08/2009

## Face-held SAR - Lithium-ion Battery Pack - Class 1 Bluetooth - DH5 (SDR) - 2480 MHz

**DUT: HARRIS Unity XG-100P; Type: Multi-band PTT Radio Transceiver with Class 1 Bluetooth; Serial: EM067**

Ambient Temp: 24.1°C; Fluid Temp: 23.1°C; Barometric Pressure: 101.1 kPa; Humidity: 35%

Communication System: GFSK

Frequency: 2480 MHz; Duty Cycle: 1:1

Medium: HSL2450 Medium parameters used:  $f = 2480 \text{ MHz}$ ;  $\sigma = 1.89 \text{ mho/m}$ ;  $\epsilon_r = 38.3$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: EX3DV4 - SN3600; ConvF(6.3, 6.3, 6.3); Calibrated: 28/04/2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 28/04/2009
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASy4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

### Face-held SAR - 2.5 cm Spacing from Front Side of DUT to Planar Phantom Section

**Area Scan (8x14x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (measured) = 0.133 mW/g

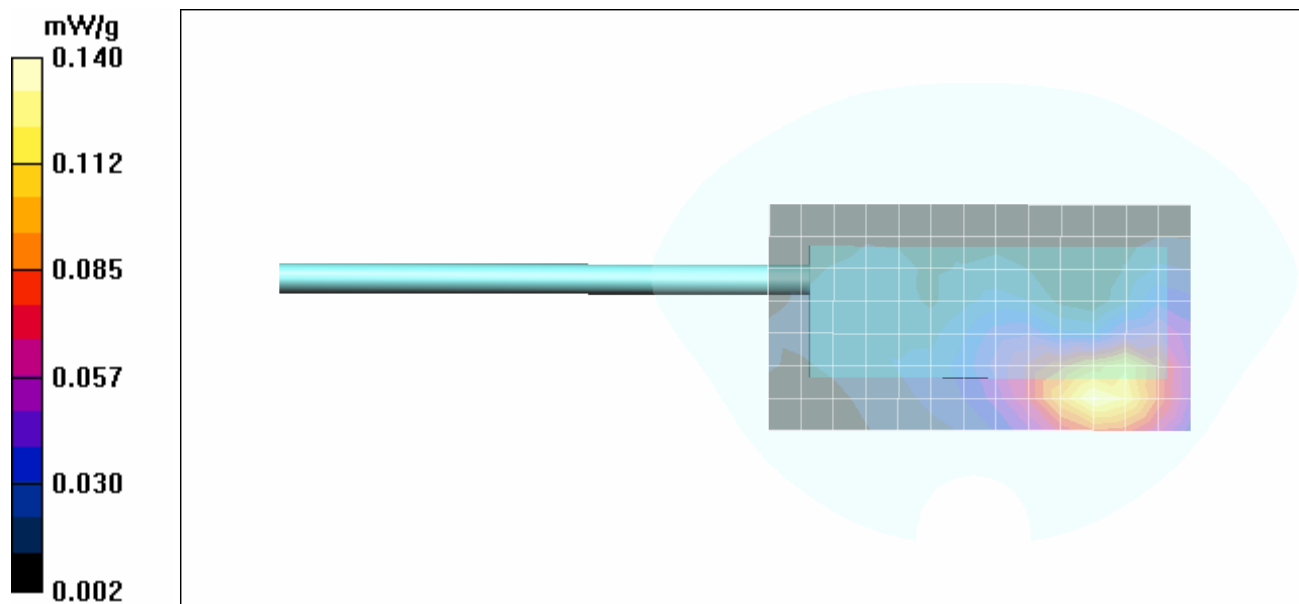
**Zoom Scan (7x7x7)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$


Reference Value = 3.61 V/m; Power Drift = 0.103 dB

Peak SAR (extrapolated) = 0.204 W/kg

**SAR(1 g) = 0.114 mW/g; SAR(10 g) = 0.065 mW/g**

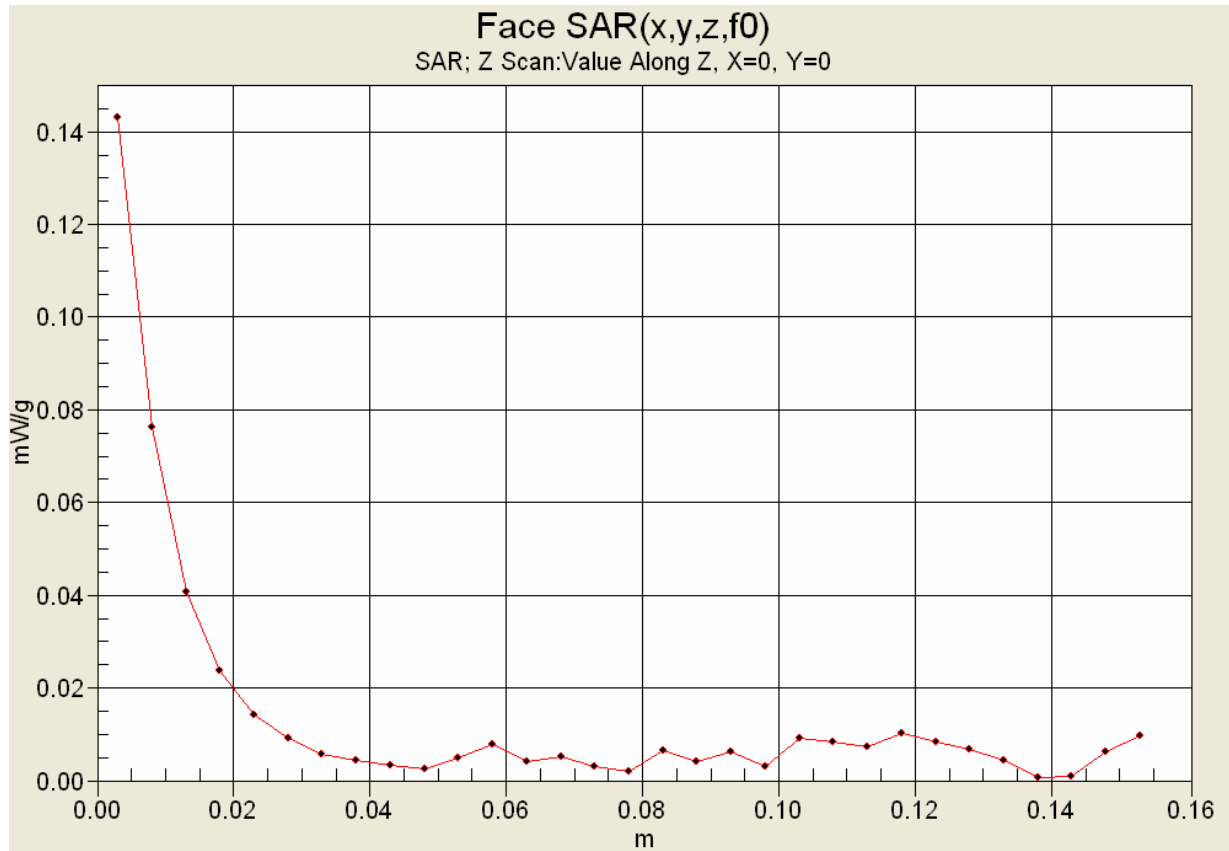
Maximum value of SAR (measured) = 0.140 mW/g





Applicant:	HARRIS CORPORATION	FCC ID:	AQZ-XG-100P00	IC:	122D-XG100P00	
DUT Type:	Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth	Model:	Unity XG-100P			
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### Z-Axis Scan



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	<u>Test Report Issue Date</u> December 23, 2009	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Date Tested: 12/08/2009

**Body-worn SAR - Alkaline Battery Case - Class 1 Bluetooth - DH5 (SDR) - 2441 MHz**

**DUT: HARRIS Unity XG-100P; Type: Multi-band PTT Radio Transceiver with Class 1 Bluetooth; Serial: EM067**

**Body-worn Accessory: Metal Belt-Clip; Audio Accessory: Speaker-Microphone**

Ambient Temp: 24.2°C; Fluid Temp: 23.3°C; Barometric Pressure: 101.1 kPa; Humidity: 35%

Communication System: GFSK

Frequency: 2441 MHz; Duty Cycle: 1:1

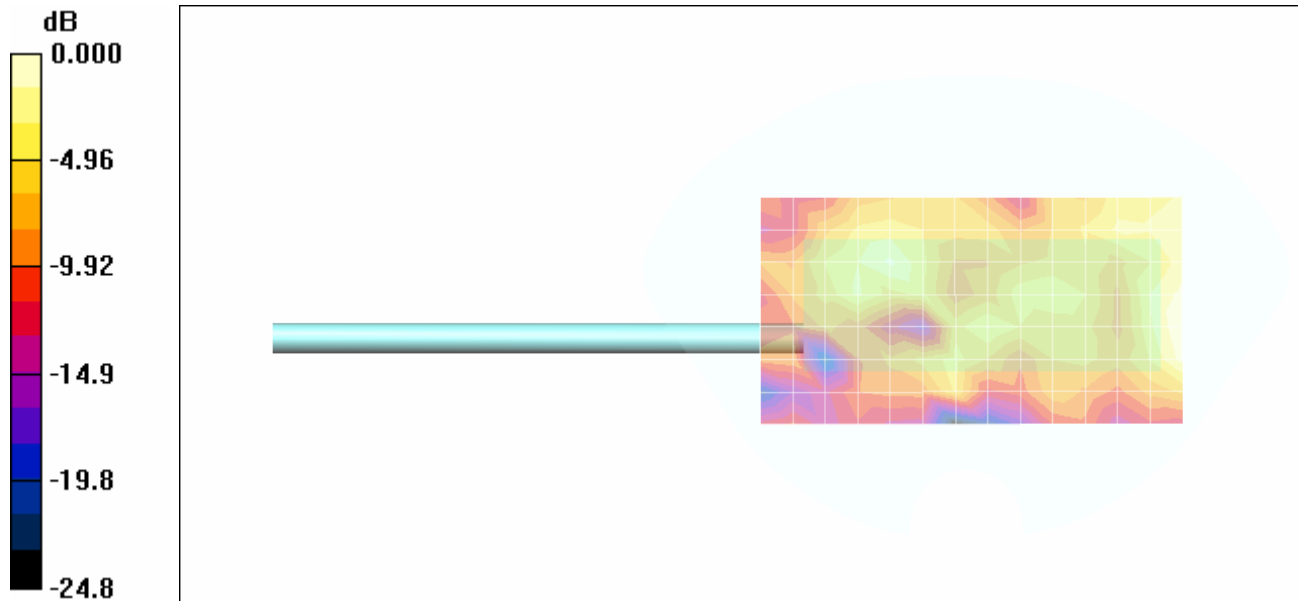
Medium: M2450 Medium parameters used:  $f = 2441 \text{ MHz}$ ;  $\sigma = 2.03 \text{ mho/m}$ ;  $\epsilon_r = 52.5$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: EX3DV4 - SN3600; ConvF(6.25, 6.25, 6.25); Calibrated: 28/04/2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 28/04/2009
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171


**Body-worn SAR - 1.2 cm Belt-Clip Spacing from Back Side of DUT to Planar Phantom Section**



**Area Scan (8x14x1):** Measurement grid: dx=15mm, dy=15mm

**Maximum value of SAR (measured) = 0.033 mW/g**



0 dB = 0.033 mW/g

<b>Applicant:</b>	HARRIS CORPORATION	<b>FCC ID:</b>	AQZ-XG-100P00	<b>IC:</b>	122D-XG100P00	
<b>DUT Type:</b>	Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth	<b>Model:</b>	Unity XG-100P			
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	<u>Test Report Issue Date</u> December 23, 2009	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Date Tested: 12/08/2009

**Body-worn SAR - Lithium-ion Battery Pack - Class 1 Bluetooth - DH5 (SDR) - 2441 MHz**

**DUT: HARRIS Unity XG-100P; Type: Multi-band PTT Radio Transceiver with Class 1 Bluetooth; Serial: EM067**

**Body-worn Accessory: Metal Belt-Clip; Audio Accessory: Speaker-Microphone**

Ambient Temp: 24.2°C; Fluid Temp: 23.3°C; Barometric Pressure: 101.1 kPa; Humidity: 35%

Communication System: GFSK

Frequency: 2441 MHz; Duty Cycle: 1:1

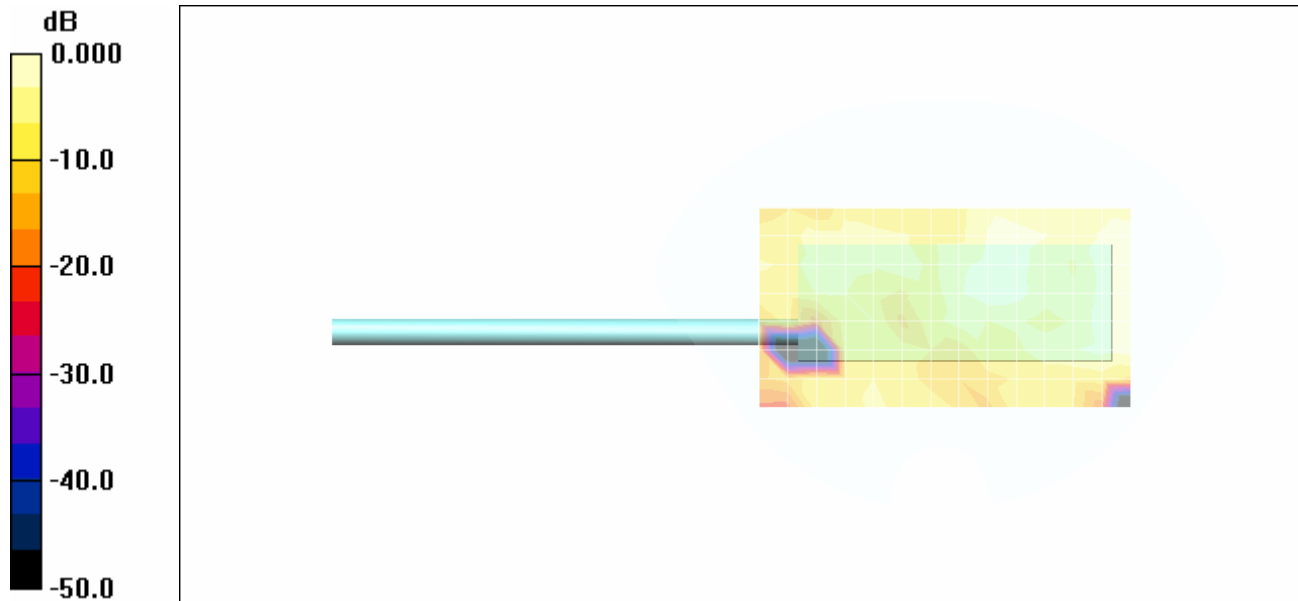
Medium: M2450 Medium parameters used:  $f = 2441 \text{ MHz}$ ;  $\sigma = 2.03 \text{ mho/m}$ ;  $\epsilon_r = 52.5$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: EX3DV4 - SN3600; ConvF(6.25, 6.25, 6.25); Calibrated: 28/04/2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 28/04/2009
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171


**Body-worn SAR - 1.2 cm Belt-Clip Spacing from Back Side of DUT to Planar Phantom Section**



**Area Scan (8x14x1):** Measurement grid: dx=15mm, dy=15mm

**Maximum value of SAR (measured) = 0.016 mW/g**



0 dB = 0.016 mW/g

<b>Applicant:</b>	HARRIS CORPORATION	<b>FCC ID:</b>	AQZ-XG-100P00	<b>IC:</b>	122D-XG100P00	
<b>DUT Type:</b>	Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth	<b>Model:</b>	Unity XG-100P			
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	<u>Test Report Issue Date</u> December 23, 2009	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Date Tested: 12/08/2009

**Body-worn SAR - Lithium-ion Battery Pack - Class 1 Bluetooth - DH5 (SDR) - 2402 MHz**

**DUT: HARRIS Unity XG-100P; Type: Multi-band PTT Radio Transceiver with Class 1 Bluetooth; Serial: EM067**

**Body-worn Accessory: Metal Belt-Clip; Audio Accessory: Speaker-Microphone**

Ambient Temp: 24.2°C; Fluid Temp: 23.3°C; Barometric Pressure: 101.1 kPa; Humidity: 35%

Communication System: GFSK

Frequency: 2402 MHz; Duty Cycle: 1:1

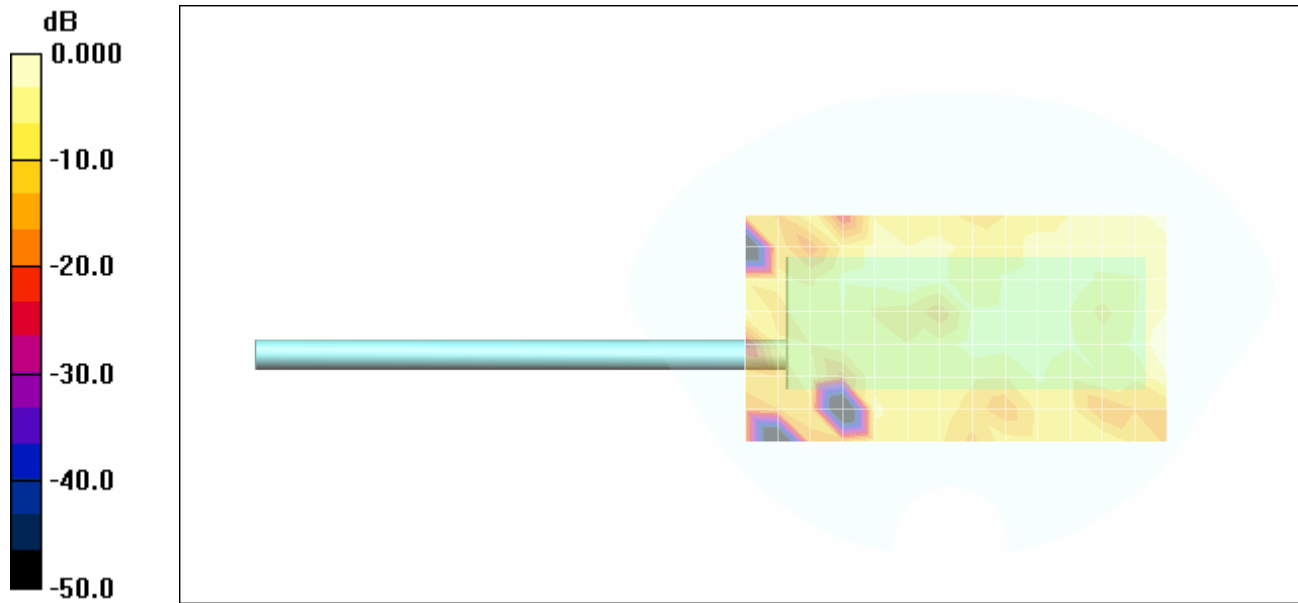
Medium: M2450 Medium parameters used:  $f = 2402 \text{ MHz}$ ;  $\sigma = 2.03 \text{ mho/m}$ ;  $\epsilon_r = 52.5$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: EX3DV4 - SN3600; ConvF(6.25, 6.25, 6.25); Calibrated: 28/04/2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 28/04/2009
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171


**Body-worn SAR - 1.2 cm Belt-Clip Spacing from Back Side of DUT to Planar Phantom Section**



**Area Scan (8x14x1):** Measurement grid: dx=15mm, dy=15mm

**Maximum value of SAR (measured) = 0.014 mW/g**



0 dB = 0.014 mW/g

<b>Applicant:</b>	HARRIS CORPORATION	<b>FCC ID:</b>	AQZ-XG-100P00	<b>IC:</b>	122D-XG100P00	
<b>DUT Type:</b>	Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth	<b>Model:</b>	Unity XG-100P			
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	<u>Test Report Issue Date</u> December 23, 2009	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Date Tested: 12/08/2009

**Body-worn SAR - Lithium-ion Battery Pack - Class 1 Bluetooth - DH5 (SDR) - 2480 MHz**

**DUT: HARRIS Unity XG-100P; Type: Multi-band PTT Radio Transceiver with Class 1 Bluetooth; Serial: EM067**

**Body-worn Accessory: Metal Belt-Clip; Audio Accessory: Speaker-Microphone**

Ambient Temp: 24.2°C; Fluid Temp: 23.3°C; Barometric Pressure: 101.1 kPa; Humidity: 35%

Communication System: GFSK

Frequency: 2480 MHz; Duty Cycle: 1:1

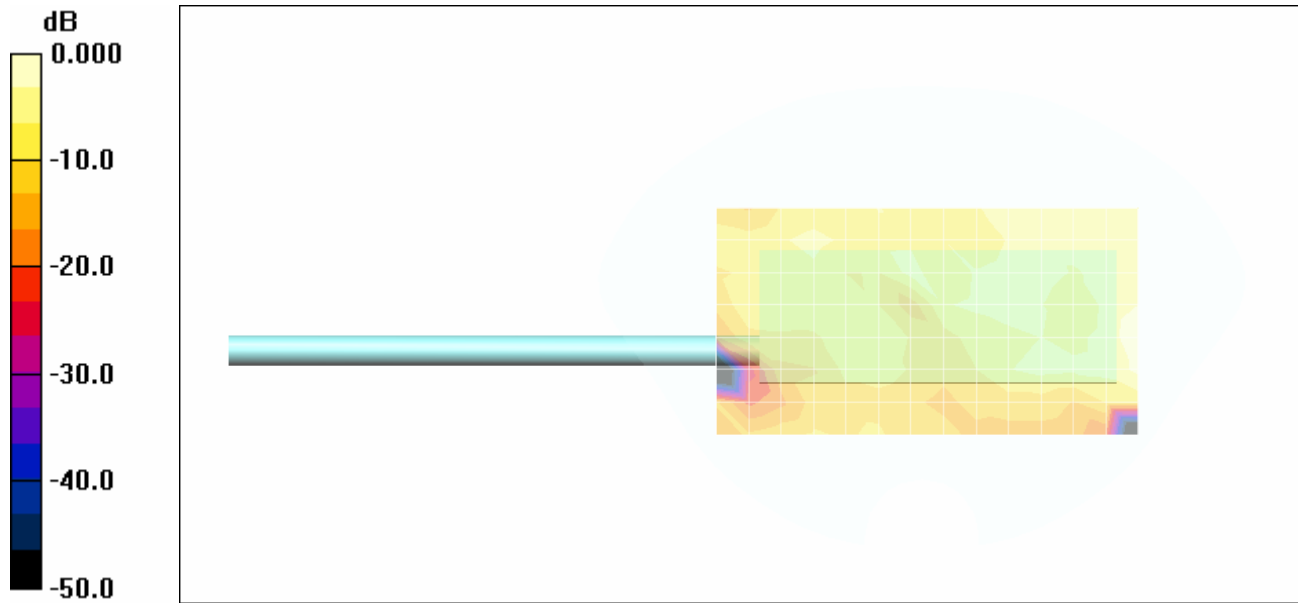
Medium: M2450 Medium parameters used:  $f = 2480 \text{ MHz}$ ;  $\sigma = 2.03 \text{ mho/m}$ ;  $\epsilon_r = 52.5$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: EX3DV4 - SN3600; ConvF(6.25, 6.25, 6.25); Calibrated: 28/04/2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 28/04/2009
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171


**Body-worn SAR - 1.2 cm Belt-Clip Spacing from Back Side of DUT to Planar Phantom Section**



**Area Scan (8x14x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

**Maximum value of SAR (measured) = 0.027 mW/g**




0 dB = 0.028mW/g



<b>Applicant:</b>	HARRIS CORPORATION	<b>FCC ID:</b>	AQZ-XG-100P00	<b>IC:</b>	122D-XG100P00	
<b>DUT Type:</b>	Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth	<b>Model:</b>	Unity XG-100P			
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	<u>Test Report Issue Date</u> December 23, 2009	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

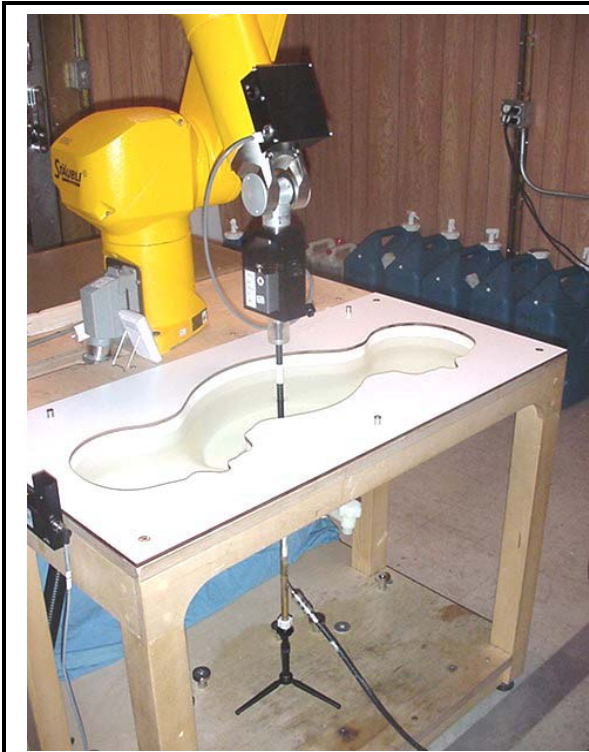
**APPENDIX B - SYSTEM PERFORMANCE CHECK**

<b>Applicant:</b>	<b>HARRIS CORPORATION</b>	<b>FCC ID:</b>	<b>AQZ-XG-100P00</b>	<b>IC:</b>	<b>122D-XG100P00</b>	
<b>DUT Type:</b>	<b>Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth</b>	<b>Model:</b>	<b>Unity XG-100P</b>			
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	Test Report Issue Date December 23, 2009	Description of Test(s) Specific Absorption Rate	RF Exposure Category Occupational (Controlled)	

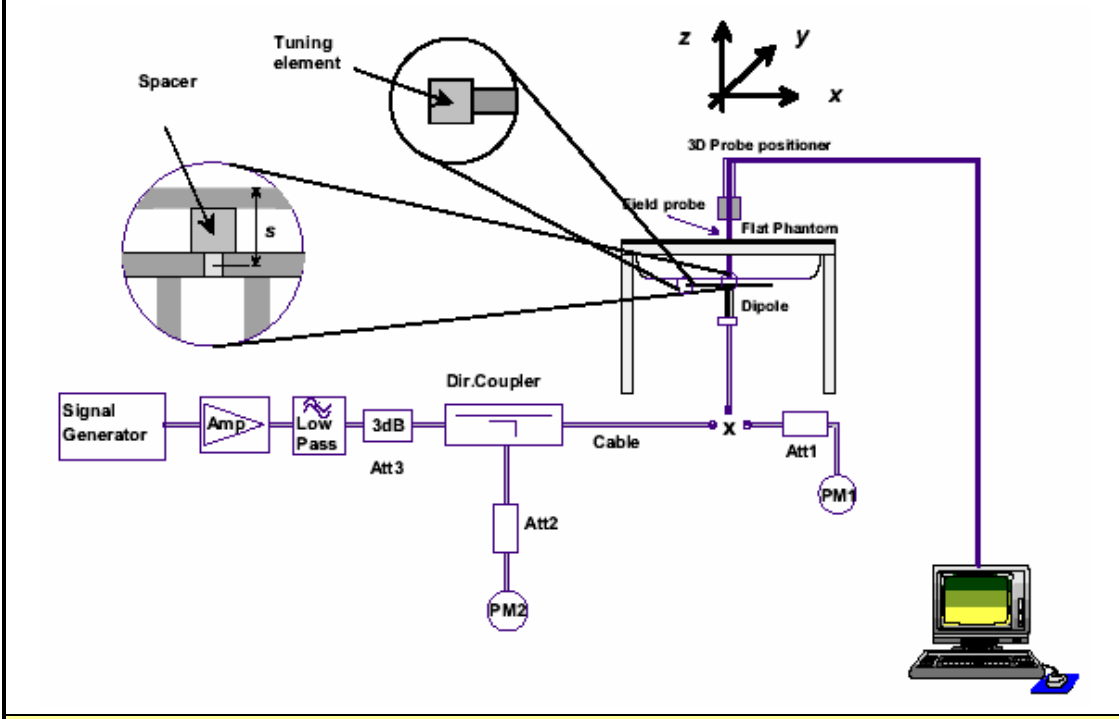
## SYSTEM PERFORMANCE CHECK MEASUREMENT SETUP




**DASY4 System with SAM Phantom V4.0C & 2450 Fluid**





**2450 MHz Validation Dipole Setup**



**System Performance Check Measurement Setup Diagram (IEEE Standard 1528-2003)**

<b>Applicant:</b>	HARRIS CORPORATION	<b>FCC ID:</b>	AQZ-XG-100P00	<b>IC:</b>	122D-XG100P00	
<b>DUT Type:</b>	Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth	<b>Model:</b>	Unity XG-100P			
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	<u>Test Report Issue Date</u> December 23, 2009	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Date Tested: 12/08/2009

## System Performance Check - 2450 MHz Dipole - HSL

**DUT: Dipole D2450V2; Asset: 00219; Serial: 825; Calibration: 04/17/2009**

Ambient Temp: 24.1°C; Fluid Temp: 23.1°C; Barometric Pressure: 101.1 kPa; Humidity: 35%

Communication System: CW

Forward Conducted Power: 250 mW

Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: HSL2450 Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.89$  mho/m;  $\epsilon_r = 38.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

- Probe: EX3DV4 - SN3600; ConvF(6.3, 6.3, 6.3); Calibrated: 28/04/2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 28/04/2009
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

### System Performance Check - 2450 MHz Dipole

**Area Scan (6x10x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 15.5 mW/g

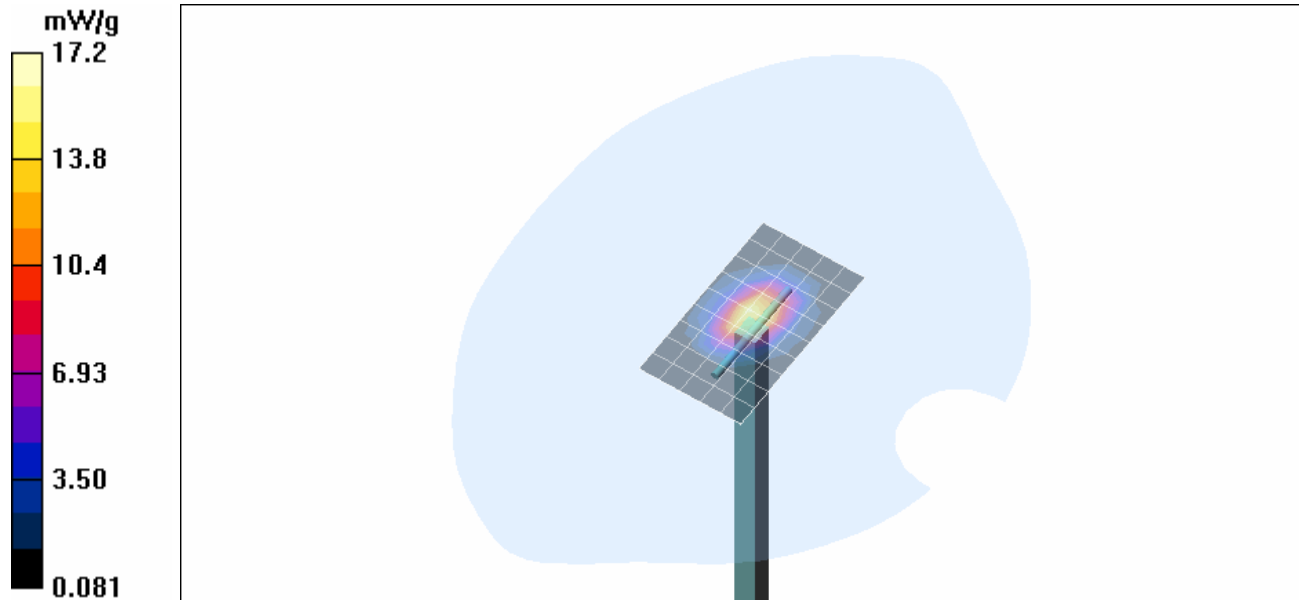
**Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm


Reference Value = 93.6 V/m; Power Drift = -0.013 dB

Peak SAR (extrapolated) = 27.8 W/kg

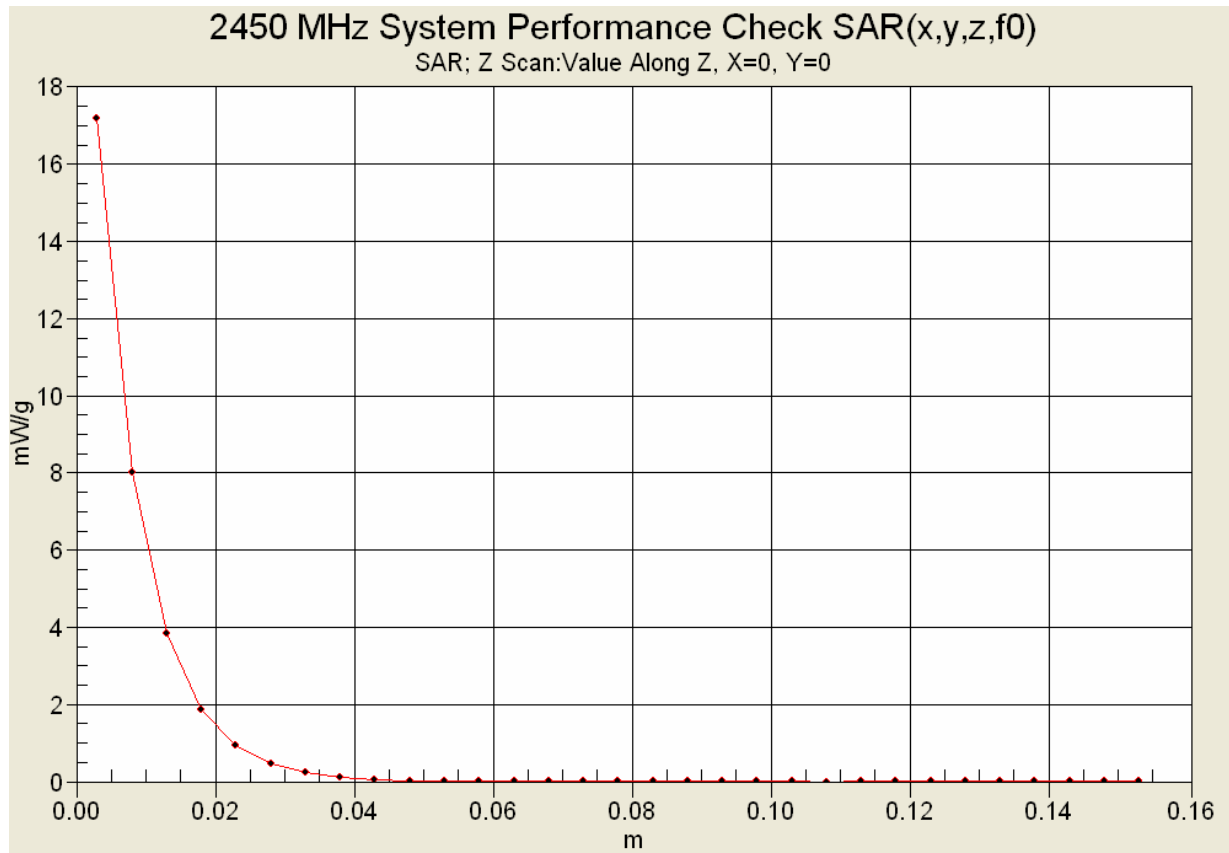
**SAR(1 g) = 12.8 mW/g; SAR(10 g) = 5.8 mW/g**



Maximum value of SAR (measured) = 17.2 mW/g



Applicant:	HARRIS CORPORATION	FCC ID:	AQZ-XG-100P00	IC:	122D-XG100P00	
DUT Type:	Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth	Model:	Unity XG-100P			
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**Z-Axis Scan**



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	<u>Test Report Issue Date</u> December 23, 2009	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Date Tested: 12/08/2009

## System Performance Check - 2450 MHz Dipole - MSL

**DUT: Dipole D2450V2; Asset: 00219; Serial: 825; Calibration: 04/17/2009**

Ambient Temp: 24.2°C; Fluid Temp: 23.3°C; Barometric Pressure: 101.1 kPa; Humidity: 35%

Communication System: CW

Forward Conducted Power: 250 mW

Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: M2450 Medium parameters used:  $f = 2450$  MHz;  $\sigma = 2.03$  mho/m;  $\epsilon_r = 52.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

- Probe: EX3DV4 - SN3600; ConvF(6.25, 6.25, 6.25); Calibrated: 28/04/2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 28/04/2009
- Phantom: SAM 4.0; Type: Fiberglass; Serial: 1033
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

### System Performance Check - 2450 MHz Dipole

**Area Scan (6x10x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 14.0 mW/g

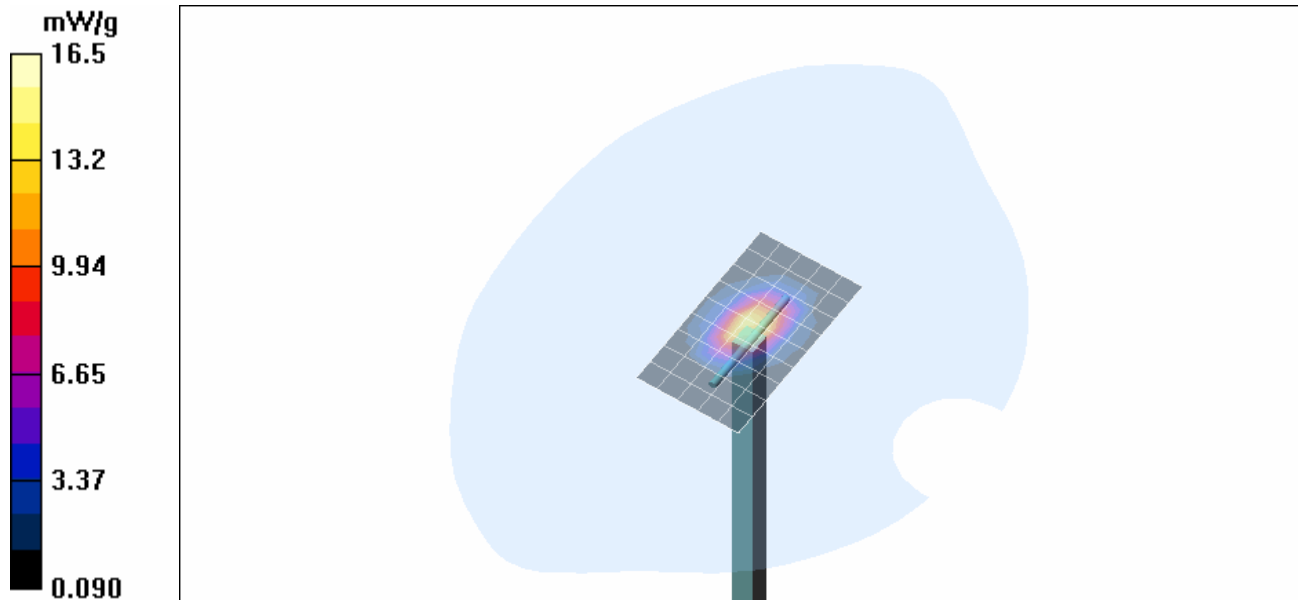
**Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm


Reference Value = 88.9 V/m; Power Drift = -0.005 dB

Peak SAR (extrapolated) = 26.2 W/kg

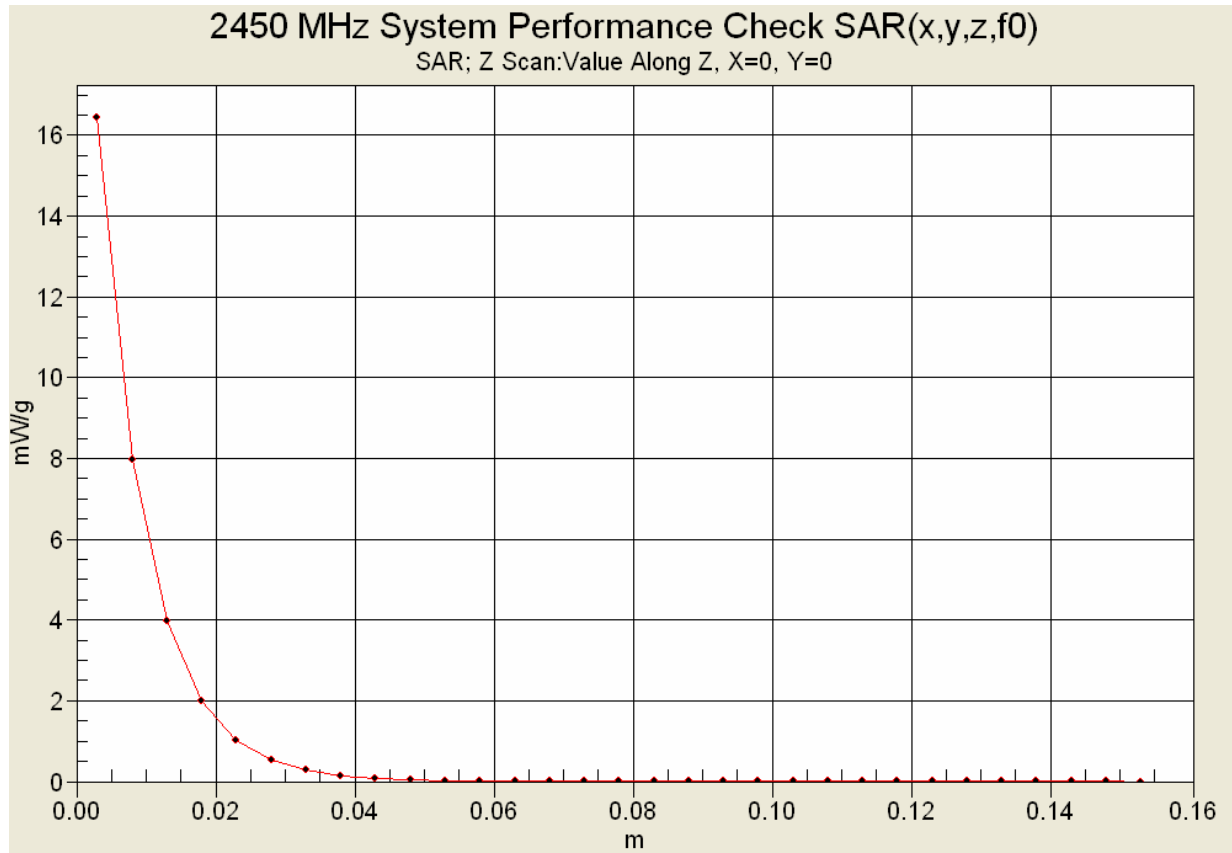
**SAR(1 g) = 12.4 mW/g; SAR(10 g) = 5.62 mW/g**



Maximum value of SAR (measured) = 16.5 mW/g




Applicant:	HARRIS CORPORATION	FCC ID:	AQZ-XG-100P00	IC:	122D-XG100P00	
DUT Type:	Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth	Model:	Unity XG-100P			
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### Z-Axis Scan





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	<u>Test Report Issue Date</u> December 23, 2009	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

**APPENDIX C - MEASURED FLUID DIELECTRIC PARAMETERS**

<b>Applicant:</b>	<b>HARRIS CORPORATION</b>	<b>FCC ID:</b>	<b>AQZ-XG-100P00</b>	<b>IC:</b>	<b>122D-XG100P00</b>	
<b>DUT Type:</b>	<b>Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth</b>	<b>Model:</b>	<b>Unity XG-100P</b>			
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	<u>Date(s) of Evaluation</u>	<u>Test Report Serial No.</u>	<u>Test Report Revision No.</u>	
	December 08, 2009	102809AQZ-T991-S15B	Rev. 1.1 (2nd Release)	
	<u>Test Report Issue Date</u>	<u>Description of Test(s)</u>	<u>RF Exposure Category</u>	
	December 23, 2009	Specific Absorption Rate	Occupational (Controlled)	Test Lab Certificate No. 2470.01


## 2450 MHz System Performance Check & DUT Evaluation (Head)



\*\*\*\*\*

Celltech Labs Inc.  
 Test Result for UIM Dielectric Parameter  
 08/Dec/2009  
 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

\*\*\*\*\*

Freq	FCC_eHFCC_sH	Test_e	Test_s
2.3500	39.38	1.71	38.14
2.3600	39.36	1.72	38.05
2.3700	39.34	1.73	38.03
2.3800	39.32	1.74	37.74
2.3900	39.31	1.75	37.77
2.4000	39.29	1.76	37.87
2.4100	39.27	1.76	38.24
2.4200	39.25	1.77	38.23
2.4300	39.24	1.78	38.11
2.4400	39.22	1.79	38.39
2.4500	39.20	1.80	38.33
2.4600	39.19	1.81	38.17
2.4700	39.17	1.82	38.32
2.4800	39.16	1.83	38.50
2.4900	39.15	1.84	38.50
2.5000	39.14	1.85	38.36
2.5100	39.12	1.87	38.29
2.5200	39.11	1.88	38.31
2.5300	39.10	1.89	38.30
2.5400	39.09	1.90	38.44
2.5500	39.07	1.91	38.44

<b>Applicant:</b>	<b>HARRIS CORPORATION</b>	<b>FCC ID:</b>	<b>AQZ-XG-100P00</b>	<b>IC:</b>	<b>122D-XG100P00</b>	
<b>DUT Type:</b>	<b>Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth</b>	<b>Model:</b>	<b>Unity XG-100P</b>			
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	<u>Date(s) of Evaluation</u>	<u>Test Report Serial No.</u>	<u>Test Report Revision No.</u>	
	December 08, 2009	102809AQZ-T991-S15B	Rev. 1.1 (2nd Release)	
	<u>Test Report Issue Date</u>	<u>Description of Test(s)</u>	<u>RF Exposure Category</u>	Test Lab Certificate No. 2470.01
	December 23, 2009	Specific Absorption Rate	Occupational (Controlled)	


## 2450 MHz System Performance Check & DUT Evaluation (Body)



\*\*\*\*\*

Celltech Labs Inc.  
 Test Result for UIM Dielectric Parameter  
 08/Dec/2009  
 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


\*\*\*\*\*



Freq	FCC_eB	FCC_sB	Test_e	Test_s
2.3500	52.83	1.85	52.51	1.88
2.3600	52.82	1.86	52.53	1.90
2.3700	52.81	1.87	52.59	1.89
2.3800	52.79	1.88	52.59	1.91
2.3900	52.78	1.89	52.52	1.97
2.4000	52.77	1.90	52.51	1.96
2.4100	52.75	1.91	52.50	1.97
2.4200	52.74	1.92	52.59	1.97
2.4300	52.73	1.93	52.39	1.97
2.4400	52.71	1.94	52.60	2.02
2.4500	52.70	1.95	52.50	2.03
2.4600	52.69	1.96	52.39	2.05
2.4700	52.67	1.98	52.21	2.02
2.4800	52.66	1.99	52.39	2.06
2.4900	52.65	2.01	52.31	2.08
2.5000	52.64	2.02	52.19	2.07
2.5100	52.62	2.04	52.37	2.10
2.5200	52.61	2.05	52.20	2.10
2.5300	52.60	2.06	52.13	2.13
2.5400	52.59	2.08	52.08	2.12
2.5500	52.57	2.09	52.13	2.18

<b>Applicant:</b>	<b>HARRIS CORPORATION</b>	<b>FCC ID:</b>	<b>AQZ-XG-100P00</b>	<b>IC:</b>	<b>122D-XG100P00</b>	
<b>DUT Type:</b>	<b>Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth</b>	<b>Model:</b>	<b>Unity XG-100P</b>			
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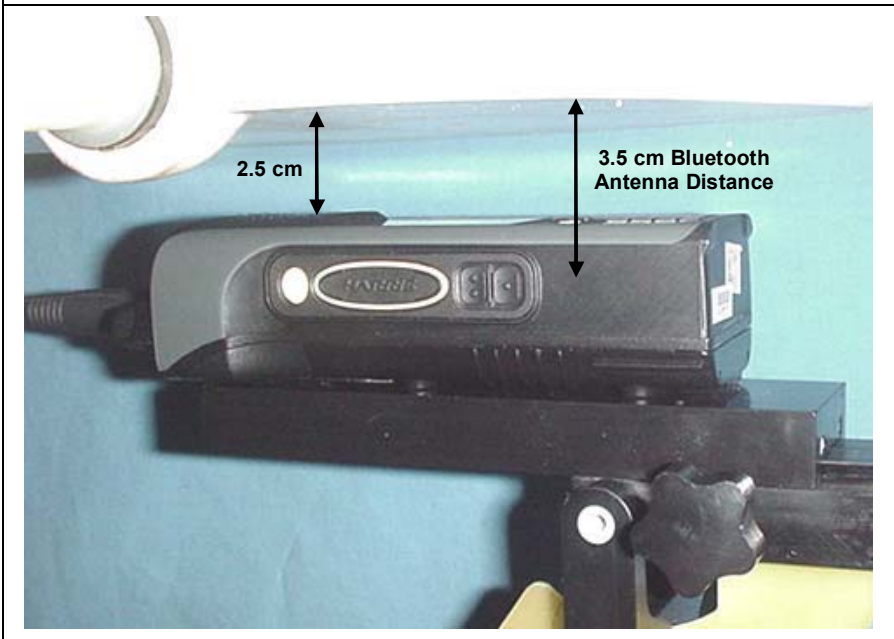
	<u>Date(s) of Evaluation</u> December 08, 2009	<u>Test Report Serial No.</u> 102809AQZ-T991-S15B	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> December 23, 2009	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	


**APPENDIX D - SAR TEST SETUP & DUT PHOTOGRAPHS**



<b>Applicant:</b>	<b>HARRIS CORPORATION</b>	<b>FCC ID:</b>	<b>AQZ-XG-100P00</b>	<b>IC:</b>	<b>122D-XG100P00</b>	
<b>DUT Type:</b>	<b>Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth</b>	<b>Model:</b>	<b>Unity XG-100P</b>			
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	<u>Test Report Issue Date</u> December 23, 2009	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

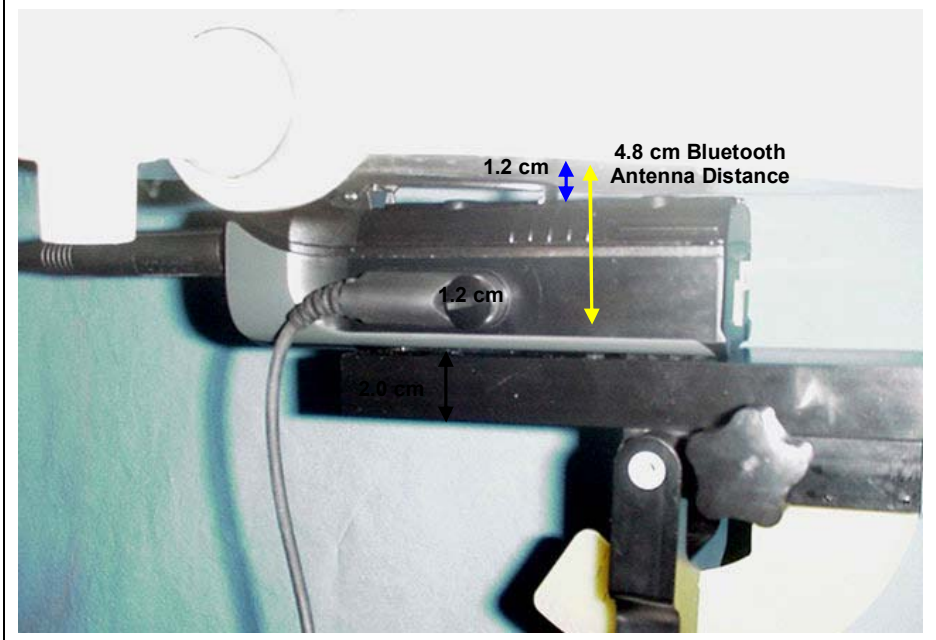
**FACE-HELD SAR TEST SETUP PHOTOGRAPHS**  
**2.5 cm Spacing from Front of DUT to Planar Section of SAM Phantom**




<b>Applicant:</b>	<b>HARRIS CORPORATION</b>	<b>FCC ID:</b>	<b>AQZ-XG-100P00</b>	<b>IC:</b>	<b>122D-XG100P00</b>	
<b>DUT Type:</b>	<b>Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth</b>	<b>Model:</b>	<b>Unity XG-100P</b>			
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	<u>Date(s) of Evaluation</u> December 08, 2009	<u>Test Report Serial No.</u> 102809AQZ-T991-S15B	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> December 23, 2009	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

**BODY-WORN SAR TEST SETUP PHOTOGRAPHS**  
**1.2 cm Belt-Clip Spacing from Back of DUT to Planar Section of SAM Phantom**




<b>Applicant:</b>	<b>HARRIS CORPORATION</b>	<b>FCC ID:</b>	<b>AQZ-XG-100P00</b>	<b>IC:</b>	<b>122D-XG100P00</b>	
<b>DUT Type:</b>	<b>Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth</b>	<b>Model:</b>	<b>Unity XG-100P</b>			
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	<u>Date(s) of Evaluation</u> December 08, 2009	<u>Test Report Serial No.</u> 102809AQZ-T991-S15B	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> December 23, 2009	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

## DUT PHOTOGRAPHS

		
Front of DUT with Multi-band Antenna	Back of DUT with Multi-band Antenna	Multi-band Antenna P/N: 12082-0250-01

<b>Applicant:</b>	HARRIS CORPORATION	<b>FCC ID:</b>	AQZ-XG-100P00	<b>IC:</b>	122D-XG100P00	
<b>DUT Type:</b>	Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth	<b>Model:</b>	Unity XG-100P			
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	Date(s) of Evaluation December 08, 2009	Test Report Serial No. 102809AQZ-T991-S15B	Test Report Revision No. Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	Test Report Issue Date December 23, 2009	Description of Test(s) Specific Absorption Rate	RF Exposure Category Occupational (Controlled)	


## DUT PHOTOGRAPHS





Front of DUT
Back of DUT w/ battery removed
Lithium-ion Battery P/N: 12082-0308-01
Lithium-ion Battery P/N: 12082-0308-01



Alkaline Battery Case P/N: 12082-0309-01
Alkaline Batteries AA x6
Alkaline Battery Case P/N: 12082-0309-01 (Batts removed)

Applicant:	HARRIS CORPORATION	FCC ID:	AQZ-XG-100P00	IC:	122D-XG100P00	
DUT Type:	Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth	Model:	Unity XG-100P			
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	<u>Date(s) of Evaluation</u> December 08, 2009	<u>Test Report Serial No.</u> 102809AQZ-T991-S15B	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> December 23, 2009	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	


**DUT PHOTOGRAPHS**





Front of DUT with Metal Belt-Clip accessory P/N: 12082-1291-01 and Speaker-Microphone audio accessory P/N: 12082-0600-01




Back of DUT with Metal Belt-Clip accessory P/N: 12082-1291-01 and Speaker-Microphone audio accessory P/N: 12082-0600-01

<b>Applicant:</b>	<b>HARRIS CORPORATION</b>	<b>FCC ID:</b>	<b>AQZ-XG-100P00</b>	<b>IC:</b>	<b>122D-XG100P00</b>	
<b>DUT Type:</b>	<b>Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth</b>	<b>Model:</b>	<b>Unity XG-100P</b>			
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	<u>Date(s) of Evaluation</u> December 08, 2009	<u>Test Report Serial No.</u> 102809AQZ-T991-S15B	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	
	<u>Test Report Issue Date</u> December 23, 2009	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

## DUT PHOTOGRAPHS

			
<b>DUT with Belt-Clip accessory and Li-ion Battery Pack</b>	<b>DUT with Belt-Clip accessory and Alkaline Battery Case</b>	<b>Metal Belt-Clip Accessory P/N: 12082-1291-01</b>	
			

<b>Applicant:</b>	<b>HARRIS CORPORATION</b>	<b>FCC ID:</b>	<b>AQZ-XG-100P00</b>	<b>IC:</b>	<b>122D-XG100P00</b>	
<b>DUT Type:</b>	<b>Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth</b>	<b>Model:</b>	<b>Unity XG-100P</b>			
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	<u>Date(s) of Evaluation</u> December 08, 2009	<u>Test Report Serial No.</u> 102809AQZ-T991-S15B	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> December 23, 2009	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

**DUT PHOTOGRAPHS**



DUT with Metal Belt-Clip accessory P/N: 12082-1291-01 and Lithium-ion Battery Pack P/N: 12082-0308-01


<b>Applicant:</b>	HARRIS CORPORATION	<b>FCC ID:</b>	AQZ-XG-100P00	<b>IC:</b>	122D-XG100P00	
<b>DUT Type:</b>	Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth	<b>Model:</b>	Unity XG-100P			
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	<u>Date(s) of Evaluation</u> December 08, 2009	<u>Test Report Serial No.</u> 102809AQZ-T991-S15B	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> December 23, 2009	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	



**DUT PHOTOGRAPHS**



DUT with Metal Belt-Clip accessory P/N: 12082-1291-01 and Alkaline Battery Case P/N: 12082-0309-01

<b>Applicant:</b>	HARRIS CORPORATION	<b>FCC ID:</b>	AQZ-XG-100P00	<b>IC:</b>	122D-XG100P00	
<b>DUT Type:</b>	Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth	<b>Model:</b>	Unity XG-100P			
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	<u>Date(s) of Evaluation</u> December 08, 2009	<u>Test Report Serial No.</u> 102809AQZ-T991-S15B	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> December 23, 2009	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

**DUT PHOTOGRAPHS**




**DUT with RF Connector for Bluetooth Conducted Output Power Measurements (modified after Bluetooth SAR evaluations completed)**

<b>Applicant:</b>	<b>HARRIS CORPORATION</b>	<b>FCC ID:</b>	<b>AQZ-XG-100P00</b>	<b>IC:</b>	<b>122D-XG100P00</b>	
<b>DUT Type:</b>	<b>Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth</b>	<b>Model:</b>	<b>Unity XG-100P</b>			
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	<u>Date(s) of Evaluation</u> December 08, 2009	<u>Test Report Serial No.</u> 102809AQZ-T991-S15B	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> December 23, 2009	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

**APPENDIX E - DIPOLE CALIBRATION**

<b>Applicant:</b>	<b>HARRIS CORPORATION</b>	<b>FCC ID:</b>	<b>AQZ-XG-100P00</b>	<b>IC:</b>	<b>122D-XG100P00</b>	
<b>DUT Type:</b>	<b>Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth</b>	<b>Model:</b>	<b>Unity XG-100P</b>			
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Accredited by the Swiss Accreditation Service (SAS)  
The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Celltech**

Certificate No.: **D2450V2-825\_Apr09**

## CALIBRATION CERTIFICATE

Object **D2450V2 - SN: 825**

Calibration procedure(s) **QA CAL-05.v7  
Calibration procedure for dipole validation kits**

Calibration date: **April 17, 2009**

Condition of the calibrated item **In Tolerance**

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

All calibrations have been conducted in the closed laboratory facility: environment temperature ( $22 \pm 3$ )°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	08-Oct-08 (No. 217-00898)	Oct-09
Power sensor HP 8481A	US37292783	08-Oct-08 (No. 217-00898)	Oct-09
Reference 20 dB Attenuator	SN: 5086 (20g)	31-Mar-09 (No. 217-01025)	Mar-10
Type-N mismatch combination	SN: 5047.2 / 06327	31-Mar-09 (No. 217-01029)	Mar-10
Reference Probe ES3DV2	SN: 3025	28-Apr-08 (No. ES3-3025_Apr08)	Apr-09
DAE4	SN: 601	07-Mar-09 (No. DAE4-601_Mar09)	Mar-10

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-07)	In house check: Oct-09
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-08)	In house check: Oct-09

Calibrated by: **Claudio Leubler**      Function: **Laboratory Technician**      Signature:

Approved by: **Katja Pokovic**      Technical Manager     

Issued: April 22, 2009

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





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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

**Glossary:**

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

**Calibration is Performed According to the Following Standards:**

- a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

**Additional Documentation:**

- d) DAS4/5 System Handbook

**Methods Applied and Interpretation of Parameters:**

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

## Measurement Conditions

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

<b>DASY Version</b>	DASY5	V5.0
<b>Extrapolation</b>	Advanced Extrapolation	
<b>Phantom</b>	Modular Flat Phantom V5.0	
<b>Distance Dipole Center - TSL</b>	10 mm	with Spacer
<b>Zoom Scan Resolution</b>	dx, dy, dz = 5 mm	
<b>Frequency</b>	2450 MHz ± 1 MHz	

## Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
<b>Nominal Head TSL parameters</b>	22.0 °C	39.2	1.80 mho/m
<b>Measured Head TSL parameters</b>	(22.0 ± 0.2) °C	38.0 ± 6 %	1.82 mho/m ± 6 %
<b>Head TSL temperature during test</b>	(22.0 ± 0.2) °C	---	---

## SAR result with Head TSL

<b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b>	Condition	
SAR measured	250 mW input power	13.6 mW / g
SAR normalized	normalized to 1W	54.4 mW / g
SAR for nominal Head TSL parameters <sup>1</sup>	normalized to 1W	<b>53.7 mW / g ± 17.0 % (k=2)</b>

<b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b>	condition	
SAR measured	250 mW input power	6.29 mW / g
SAR normalized	normalized to 1W	25.2 mW / g
SAR for nominal Head TSL parameters <sup>1</sup>	normalized to 1W	<b>25.0 mW / g ± 16.5 % (k=2)</b>

<sup>1</sup> Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

## Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.4 ± 6 %	1.98 mho/m ± 6 %
Body TSL temperature during test	(22.0 ± 0.2) °C	—	—

## SAR result with Body TSL

SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	12.9 mW / g
SAR normalized	normalized to 1W	51.6 mW / g
SAR for nominal Body TSL parameters <sup>2</sup>	normalized to 1W	51.6 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.05 mW / g
SAR normalized	normalized to 1W	24.2 mW / g
SAR for nominal Body TSL parameters <sup>2</sup>	normalized to 1W	24.2 mW / g ± 16.5 % (k=2)

<sup>2</sup> Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

## Appendix

### Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.5 $\Omega$ + 4.7 j $\Omega$
Return Loss	- 24.1 dB

### Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.2 $\Omega$ + 5.6 j $\Omega$
Return Loss	- 24.8 dB

### General Antenna Parameters and Design

Electrical Delay (one direction)	1.160 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

### Additional EUT Data

Manufactured by	SPEAG
Manufactured on	December 11, 2008

## DASY5 Validation Report for Head TSL

Date/Time: 17.04.2009 12:17:23

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN825**

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: HSL U10 BB

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.82$  mho/m;  $\epsilon_r = 38$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.4, 4.4, 4.4); Calibrated: 28.04.2008
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.03.2009
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

**Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:**

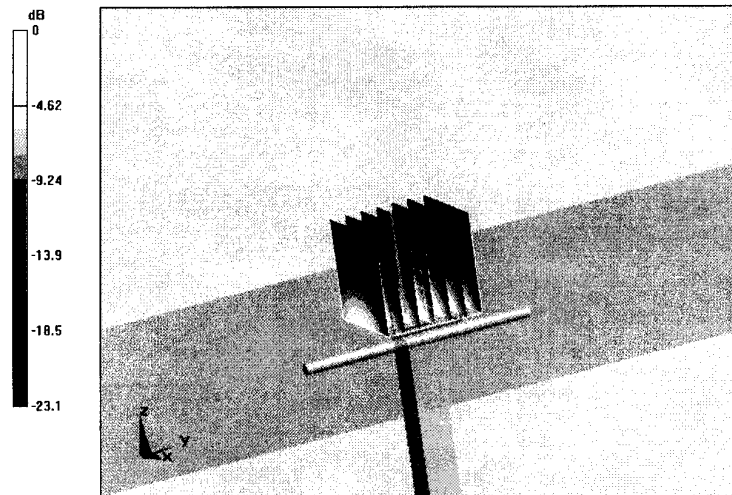
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 97.1 V/m; Power Drift = 0.026 dB

Peak SAR (extrapolated) = 28.4 W/kg

**SAR(1 g) = 13.6 mW/g; SAR(10 g) = 6.29 mW/g**

Maximum value of SAR (measured) = 17.7 mW/g



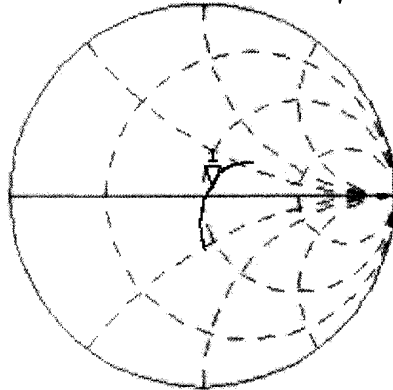
0 dB = 17.7mW/g

# Impedance Measurement Plot for Head TSL

17 Apr 2009 09:36:50

CH1 S11 1 U FS 1: 54.469  $\Omega$  4.7090  $\Omega$  305.90 pH 2 450.000 000 MHz

\*  
De1  
Cor



Avg  
16

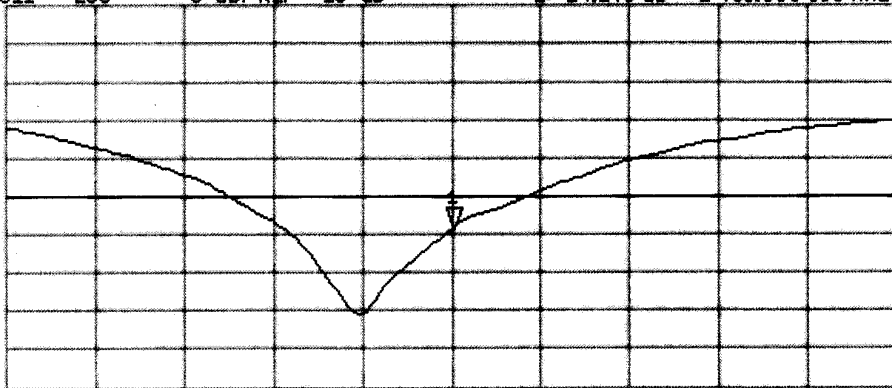
↑

CH2 S11 L06 5 dB/REF -20 dB 1: -24.145 dB 2 450.000 000 MHz

Cor

Avg  
16

↑



START 2 250.000 000 MHz

STOP 2 650.000 000 MHz

## DASY5 Validation Report for Body TSL

Date/Time: 17.04.2009 14:54:34

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:825**

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: MSL U10 BB

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.98$  mho/m;  $\epsilon_r = 54.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.07, 4.07, 4.07); Calibrated: 28.04.2008
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.03.2009
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

**Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:**

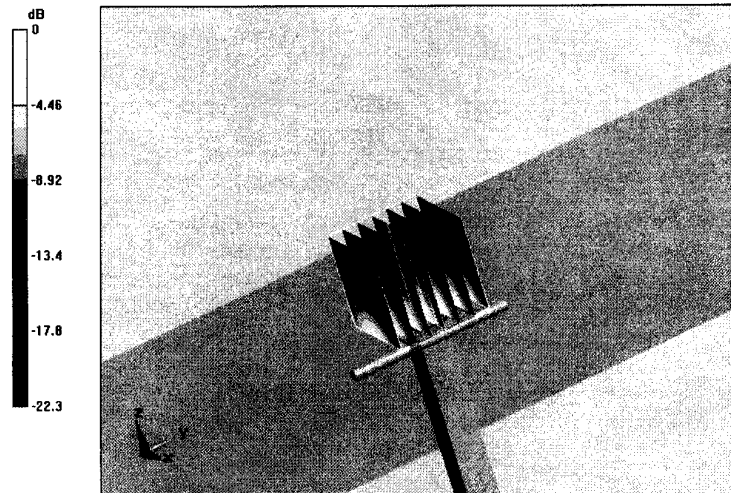
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 91.6 V/m; Power Drift = 0.046 dB

Peak SAR (extrapolated) = 26.1 W/kg

**SAR(1 g) = 12.9 mW/g; SAR(10 g) = 6.05 mW/g**

Maximum value of SAR (measured) = 16.6 mW/g



0 dB = 16.6mW/g

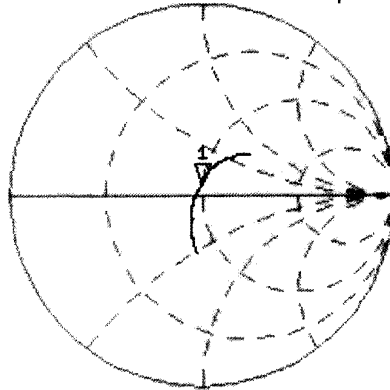


# Impedance Measurement Plot for Body TSL

17 Apr 2009 09:37:35

CH1 S11 1 U FS 1: 49.158  $\Omega$  5.6484  $\Omega$  365.93 pF 2 450.000 000 MHz

\*  
De1  
Cor



Avg  
16

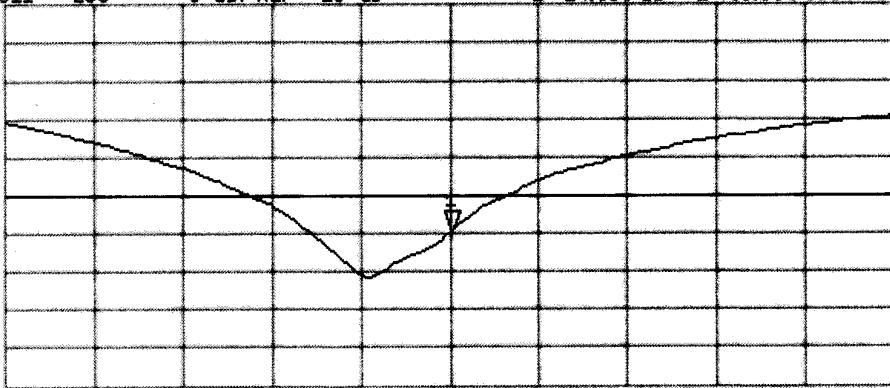
↑

CH2 S11 L06 5 dB/REF -20 dB 1: -24.800 dB 2 450.000 000 MHz

Cor



Avg  
16

↑




START 2 250.000 000 MHz

STOP 2 650.000 000 MHz

	<u>Date(s) of Evaluation</u> December 08, 2009	<u>Test Report Serial No.</u> 102809AQZ-T991-S15B	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> December 23, 2009	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

**APPENDIX F - PROBE CALIBRATION**

<b>Applicant:</b>	<b>HARRIS CORPORATION</b>	<b>FCC ID:</b>	<b>AQZ-XG-100P00</b>	<b>IC:</b>	<b>122D-XG100P00</b>	
<b>DUT Type:</b>	<b>Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth</b>	<b>Model:</b>	<b>Unity XG-100P</b>			
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Accredited by the Swiss Accreditation Service (SAS)  
The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Celltech**

Certificate No: **EX3-3600\_Apr09**

## CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3600**

Calibration procedure(s) **QA CAL-01.v6, QA CAL-14.v3 and QA CAL-23.v3  
Calibration procedure for dosimetric E-field probes**

Calibration date: **April 28, 2009**

Condition of the calibrated item **In Tolerance**

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

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-09 (No. 217-01030)	Apr-10
Power sensor E4412A	MY41495277	1-Apr-09 (No. 217-01030)	Apr-10
Power sensor E4412A	MY41498087	1-Apr-09 (No. 217-01030)	Apr-10
Reference 3 dB Attenuator	SN: S5054 (3c)	31-Mar-09 (No. 217-01026)	Mar-10
Reference 20 dB Attenuator	SN: S5086 (20b)	31-Mar-09 (No. 217-01028)	Mar-10
Reference 30 dB Attenuator	SN: S5129 (30b)	31-Mar-09 (No. 217-01027)	Mar-10
Reference Probe ES3DV2	SN: 3013	2-Jan-09 (No. ES3-3013_Jan09)	Jan-10
DAE4	SN: 660	9-Sep-08 (No. DAE4-660_Sep08)	Sep-09

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-08)	In house check: Oct-09

	Name	Function	Signature
Calibrated by:	<b>Katja Pokovic</b>	<b>Technical Manager</b>	
Approved by:	<b>Niels Kuster</b>	<b>Quality Manager</b>	

Issued: April 28, 2009

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



Accredited by the Swiss Accreditation Service (SAS)

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

Accreditation No.: **SCS 108**

### Glossary:

TSL	tissue simulating liquid
NORM <sub>x,y,z</sub>	sensitivity in free space
ConvF	sensitivity in TSL / NORM <sub>x,y,z</sub>
DCP	diode compression point
Polarization $\varphi$	$\varphi$ rotation around probe axis
Polarization $\vartheta$	$\vartheta$ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis

### Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

### Methods Applied and Interpretation of Parameters:

- NORM<sub>x,y,z</sub>**: Assessed for E-field polarization  $\vartheta = 0$  ( $f \leq 900$  MHz in TEM-cell;  $f > 1800$  MHz: R22 waveguide). NORM<sub>x,y,z</sub> are only intermediate values, i.e., the uncertainties of NORM<sub>x,y,z</sub> does not effect the E<sup>2</sup>-field uncertainty inside TSL (see below *ConvF*).
- NORM(f)<sub>x,y,z</sub>** = NORM<sub>x,y,z</sub> \* *frequency\_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- DCP<sub>x,y,z</sub>**: DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for  $f \leq 800$  MHz) and inside waveguide using analytical field distributions based on power measurements for  $f > 800$  MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM<sub>x,y,z</sub> \* *ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from  $\pm 50$  MHz to  $\pm 100$  MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

# Probe EX3DV4

## SN:3600

Manufactured:	January 10, 2007
Last calibrated:	April 19, 2008
Recalibrated:	April 28, 2009

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

## DASY - Parameters of Probe: EX3DV4 SN:3600

### Sensitivity in Free Space<sup>A</sup>

NormX	<b>0.51</b> ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$
NormY	<b>0.51</b> ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$
NormZ	<b>0.40</b> ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$

### Diode Compression<sup>B</sup>

DCP X	<b>90</b> mV
DCP Y	<b>89</b> mV
DCP Z	<b>90</b> mV

### Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

### Boundary Effect

**TSL**                      **1810 MHz**      **Typical SAR gradient: 10 % per mm**

Sensor Center to Phantom Surface Distance		<b>2.0 mm</b>	<b>3.0 mm</b>
SAR <sub>be</sub> [%]	Without Correction Algorithm	7.6	3.9
SAR <sub>be</sub> [%]	With Correction Algorithm	0.6	0.3

**TSL**                      **5200 MHz**      **Typical SAR gradient: 25 % per mm**

Sensor Center to Phantom Surface Distance		<b>2.0 mm</b>	<b>3.0 mm</b>
SAR <sub>be</sub> [%]	Without Correction Algorithm	19.9	10.2
SAR <sub>be</sub> [%]	With Correction Algorithm	0.5	0.3

### Sensor Offset

Probe Tip to Sensor Center    **1.0 mm**

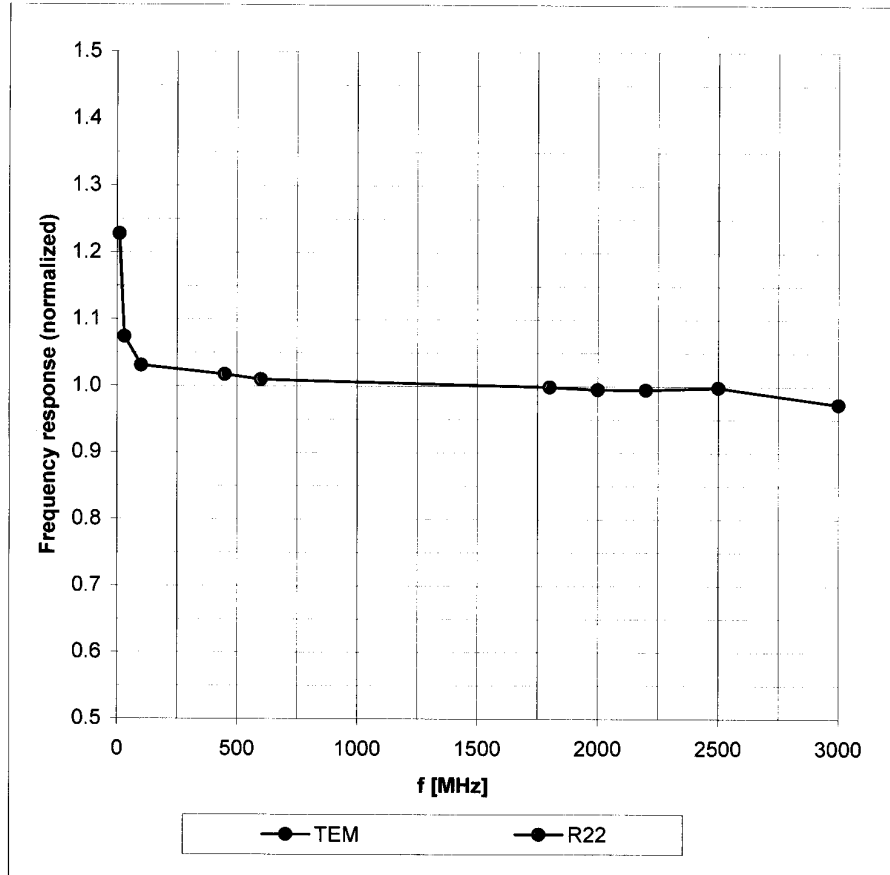
**The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.**

<sup>A</sup> The uncertainties of NormX,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Page 8).

<sup>B</sup> Numerical linearization parameter: uncertainty not required.

# Frequency Response of E-Field

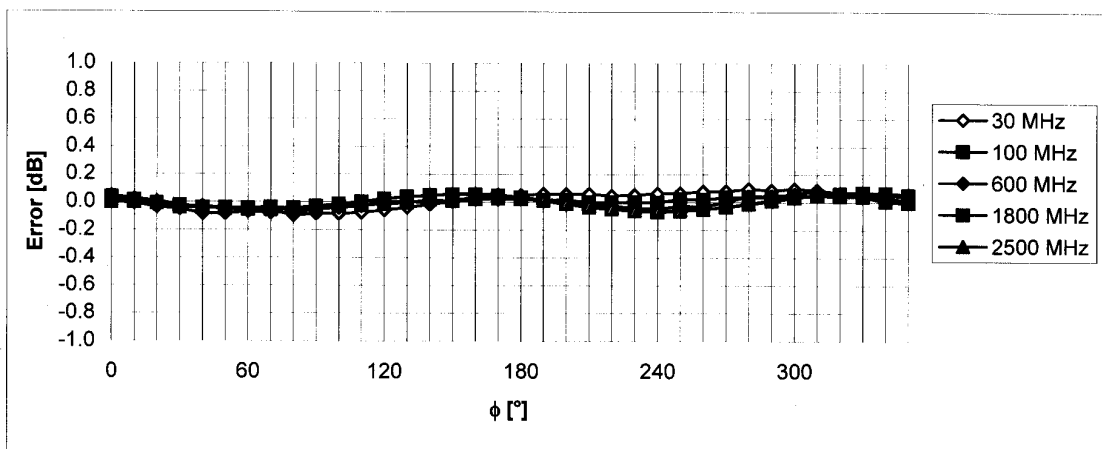
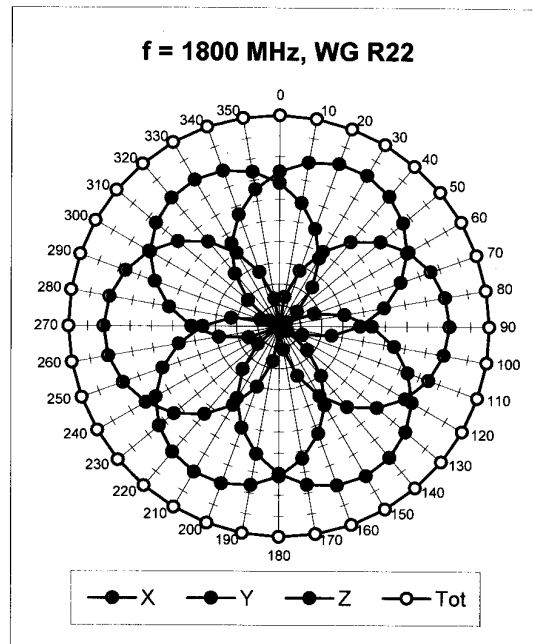
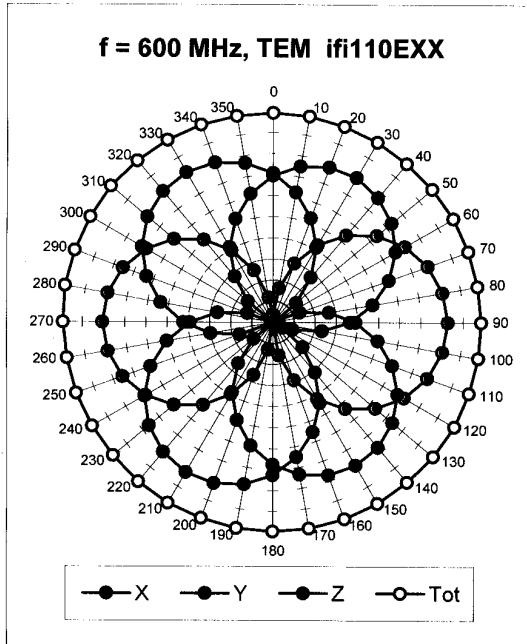
(TEM-Cell:ifi110 EXX, Waveguide: R22)



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

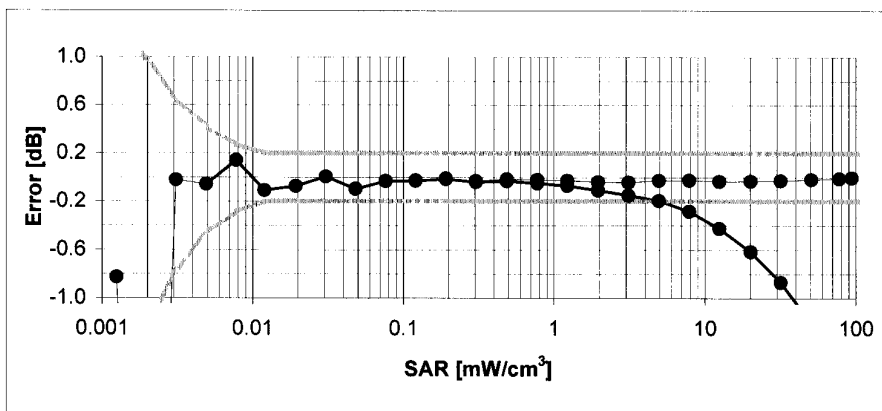
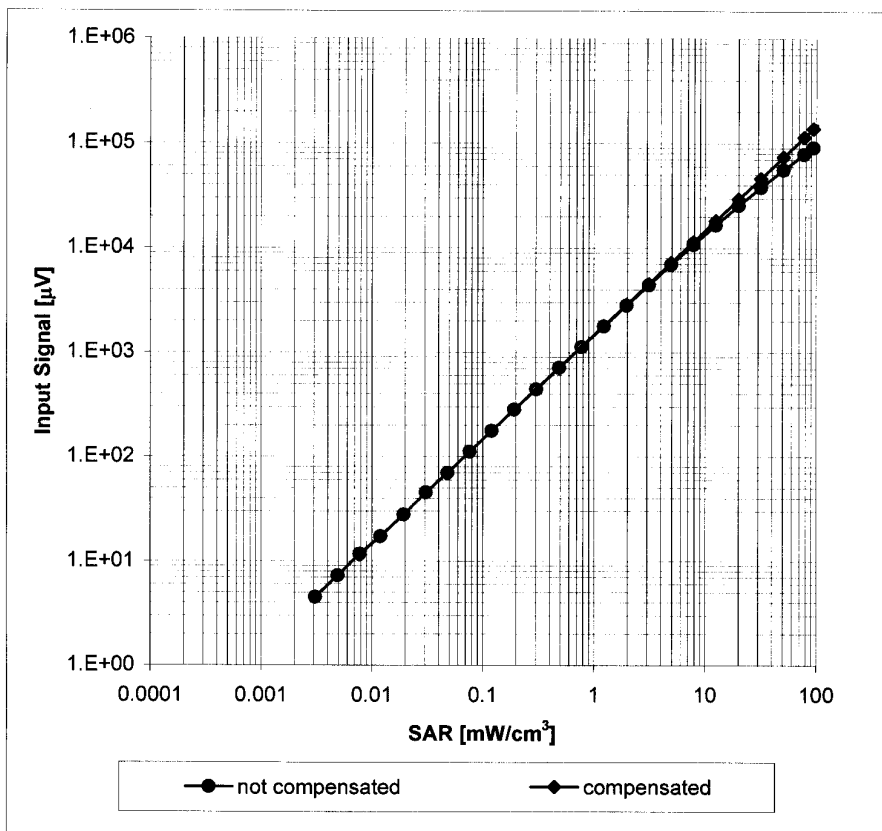


### Receiving Pattern ( $\phi$ ), $\vartheta = 0^\circ$



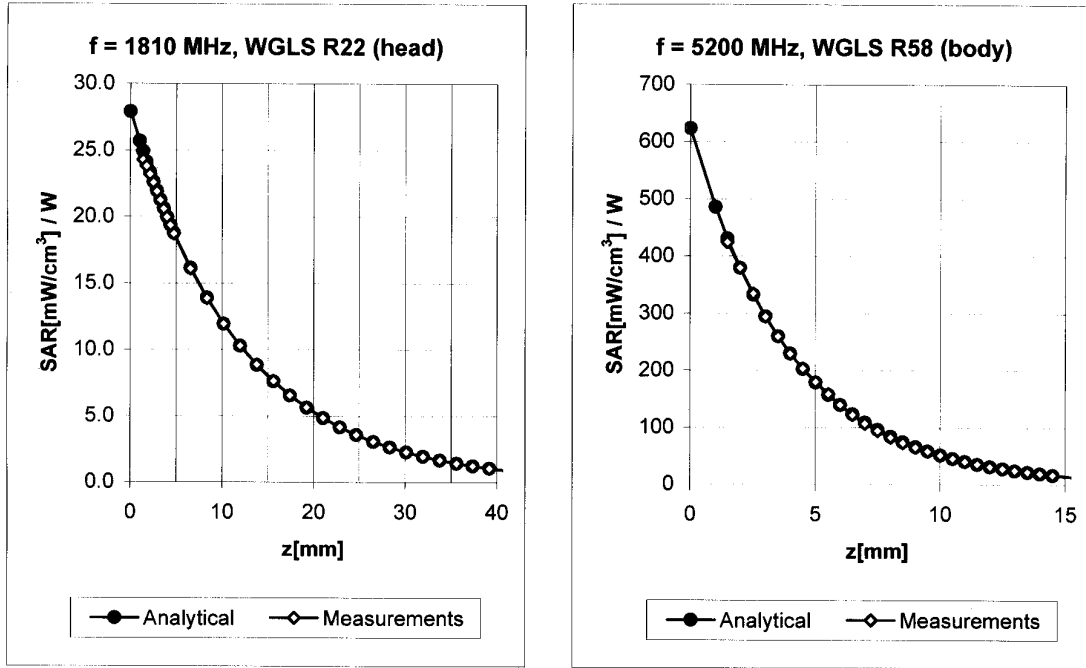
Uncertainty of Axial Isotropy Assessment:  $\pm 0.5\%$  ( $k=2$ )

## Dynamic Range $f(\text{SAR}_{\text{head}})$ (Waveguide R22, $f = 1800 \text{ MHz}$ )



**Uncertainty of Linearity Assessment:  $\pm 0.6\%$  ( $k=2$ )**

## Conversion Factor Assessment

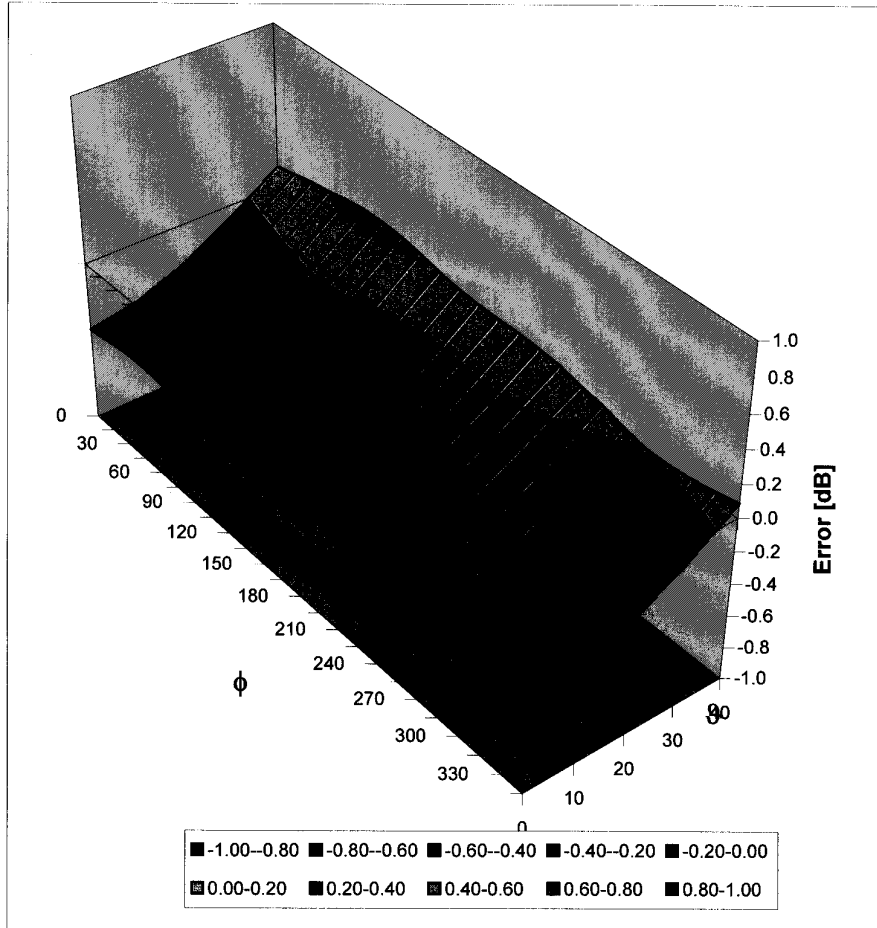


f [MHz]	Validity [MHz] <sup>c</sup>	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.70	0.61	6.77 ± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.66	0.62	6.62 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.50	0.90	6.30 ± 11.0% (k=2)
1810	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.66	0.71	6.68 ± 11.0% (k=2)
1950	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.39	0.92	6.64 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.30	1.06	6.25 ± 11.0% (k=2)
5200	± 50 / ± 100	Body	49.0 ± 5%	5.30 ± 5%	0.50	1.80	3.93 ± 13.1% (k=2)
5500	± 50 / ± 100	Body	48.6 ± 5%	5.65 ± 5%	0.55	1.80	3.70 ± 13.1% (k=2)
5800	± 50 / ± 100	Body	48.2 ± 5%	6.00 ± 5%	0.60	1.80	3.65 ± 13.1% (k=2)



<sup>c</sup> The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

### Deviation from Isotropy in HSL


Error ( $\phi$ ,  $\theta$ ),  $f = 900$  MHz



Uncertainty of Spherical Isotropy Assessment:  $\pm 2.6\%$  ( $k=2$ )

	<u>Date(s) of Evaluation</u> December 08, 2009	<u>Test Report Serial No.</u> 102809AQZ-T991-S15B	<u>Test Report Revision No.</u> Rev. 1.1 (2nd Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> December 23, 2009	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

**APPENDIX G - SAM PHANTOM CERTIFICATE OF CONFORMITY**

<b>Applicant:</b>	<b>HARRIS CORPORATION</b>	<b>FCC ID:</b>	<b>AQZ-XG-100P00</b>	<b>IC:</b>	<b>122D-XG100P00</b>	
<b>DUT Type:</b>	<b>Portable PTT Multi-band Radio Transceiver with Class 1 Bluetooth</b>	<b>Model:</b>	<b>Unity XG-100P</b>			
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# Schmid & Partner Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

## Certificate of conformity / First Article Inspection

Item	SAM Twin Phantom V4.0
Type No	QD 000 P40 BA
Series No	TP-1002 and higher
Manufacturer / Origin	Untersee Composites Hauptstr. 69 CH-8559 Fruthwilen Switzerland

### Tests

The series production process used allows the limitation to test of first articles. Complete tests were made on the pre-series Type No. QD 000 P40 AA, Serial No. TP-1001 and on the series first article Type No. QD 000 P40 BA, Serial No. TP-1006. Certain parameters have been retested using further series units (called samples).

Test	Requirement	Details	Units tested
Shape	Compliance with the geometry according to the CAD model.	IT'IS CAD File (*)	First article, Samples
Material thickness	Compliant with the requirements according to the standards	2mm +/- 0.2mm in specific areas	First article, Samples
Material parameters	Dielectric parameters for required frequencies	200 MHz – 3 GHz Relative permittivity < 5 Loss tangent < 0.05.	Material sample TP 104-5
Material resistivity	The material has been tested to be compatible with the liquids defined in the standards	Liquid type HSL 1800 and others according to the standard.	Pre-series, First article

### Standards

- [1] CENELEC EN 50361
- [2] IEEE P1528-200x draft 6.5
- [3] IEC PT 62209 draft 0.9

(\*) The IT'IS CAD file is derived from [2] and is also within the tolerance requirements of the shapes of [1] and [3].

### Conformity

Based on the sample tests above, we certify that this item is in compliance with the uncertainty requirements of SAR measurements specified in standard [1] and draft standards [2] and [3].

Date 18.11.2001

Signature / Stamp

**Schmid & Partner  
Engineering AG**

Zeughausstrasse 43, CH-8004 Zurich  
Tel. +41 1 245 97 00, Fax +41 1 245 97 79