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DECLARATION OF COMPLIANCE SAR ASSESSMENT Part 1 of 3

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Date of Report: 3/22/2012
Report Revision: B
Report ID: SR9408 APX7000 U1/U2 BT Rev B 120322

Responsible Engineer:	Deanna Zakharia (Lab Senior Resource Manager /Laboratory Director) Kim Uong (Principal Staff Engineer)
Report Author:	Kim Uong (Principal Staff Engineer)
Date/s Tested:	5/28/2011-6/17/2011, 10/19/2011 – 12/15/2011
Manufacturer/Location:	Motorola, Penang
Sector/Group/Div.:	G&PS
Date submitted for test:	04/18/2011
DUT Description:	380-470MHz 1-5W, 470-520MHz 1-5W, 6.25kHz/12.5kHz/25kHz, Basic Top Display Model-1, W/GPS & with Bluetooth. Capable of digital and analog FM transmission. Also capable of TDMA transmission.
Test TX mode(s):	CW (PTT); CW (BlueTooth)
Max. Power output:	5.7W (UHF R1) & 5.6W (UHF R2), 12mW (Bluetooth)
Nominal Power:	5.0W (UHF R1) & 5.0W (UHF R2), 12mW (Bluetooth)
Tx Frequency Bands:	380-406 MHz (UHF R1) & 406.1-470 MHz (UHF R1) & 470-520 MHz (UHF R2), 2.402-2.480 GHz (Bluetooth)
Signaling type:	FM, TDMA, FHSS (Bluetooth)
Model(s) Tested:	H97TGD9PW1AN (NUE3622)
Model(s) Certified:	H97TGD9PW1AN (NUE3622)
Serial Number(s):	Q0SOM063 and Q0SOM064
Classification:	Occupational/Controlled
FCC ID:	AZ489FT4906; Rule part 90 (406.1 – 512 MHz); Rule part 15 (2402 – 2480 MHz) Results outside FCC bands are not applicable for FCC compliance demonstration.

* Refer to section 15 of part 1 for highest SAR summary results.

The test results clearly demonstrate compliance with FCC Occupational/Controlled RF Exposure limits of 8 W/kg averaged over 1 gram per the requirements of 47 CFR 2.1093(d). The 10 grams result is not applicable to FCC filing.
The test results clearly demonstrate compliance with ICNIRP (1998) Guidelines for limiting exposure in time-varying electric, magnetic, and electromagnetic fields (up to 300 GHz), Health Physics 74, 494-522 RF Exposure limits of 10 W/kg averaged over 10grams of contiguous tissue.

Based on the information and the testing results provided herein, the undersigned certifies that when used as stated in the operating instructions supplied, said product complies with the national and international reference standards and guidelines listed in section 3.0 of this report. This report shall not be reproduced without written approval from an officially designated representative of the Motorola Solutions Inc EME Laboratory.
I attest to the accuracy of the data and assume full responsibility for the completeness of these measurements. This reporting format is consistent with the suggested guidelines of the TIA TSB-150 December 2004. The results and statements contained in this report pertain only to the device(s) evaluated.

Deanna M Zakharia

Deanna Zakharia
EMS EME Lab Senior Resource Manager,
Laboratory Director

Approval Date: 3/22/2012

Certification Date:

Certification No.:

Part 1 of 3

APPENDICES

Part 2 of 3

APPENDICES (continued)

Part 3 of 3

APPENDICES (continued)

Report Revision History

Date	Revision	Comments
1/27/2012	O	Initial release
3/9/2012	A	Revised to accommodate the FCC correspondent reference # 721461
3/21/2012	B	Revised to accommodate FCC inquiry dated 3/14/2012. Revised Ex 7b to include the FCC ID.

1.0 Introduction

This report details the utilization, test setup, test equipment, and test results of the Specific Absorption Rate (SAR) measurements performed at the Motorola Solutions Inc. EME Test Laboratory for model number H97TGD9PW1AN (NUE3622).

2.0 Abbreviations / Definitions

CNR: Calibration Not Required
EME: Electromagnetic Energy
CQPSK**:** Compatible Quadrature Phase-Shift Keying
FHSS: Frequency Hopping Spread Spectrum
BT: Bluetooth
GPS: Global Positioning System
CW: Continuous Wave
DUT: Device Under Test
DC: Duty Cycle
FM: Frequency Modulation/Factory Mutual
NA: Not Applicable
PTT: Push to Talk
RSM: Remote Speaker Microphone
SAR: Specific Absorption Rate
TDMA: Time Division Multiple Access
RF: Radio Frequency
C4FM: Compatible 4-level Frequency Modulation
DSP: Digital Signal Processor

Audio accessories: These accessories allow communication while the DUT is worn on the body.
Body worn accessories: These accessories allow the DUT to be worn on the body of the user.
Maximum Power: Defined as the upper limit of the production line final test station.

3.0 Referenced Standards and Guidelines

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

- IEC62209-1*(2005) Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)
- United States Federal Communications Commission, Code of Federal Regulations; Rule Part 47CFR § 2.1093 sub-part J:1999
- 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.

- IEEE 1528*(2003), Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques

- American National Standards Institute (ANSI) / Institute of Electrical and Electronics Engineers (IEEE) C95. 1-1992

- Institute of Electrical and Electronics Engineers (IEEE) C95.1-2005

- International Commission on Non-Ionizing Radiation Protection (ICNIRP) 1998
- Ministry of Health (Canada) Safety Code 6 (2009), Limits of Human Exposure to Radio frequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz

- Australian Communications Authority Radio communications (Electromagnetic Radiation - Human Exposure) Standard (2003)

- ANATEL, Brazil Regulatory Authority, Resolution No. 303 of July 2, 2002 "Regulation of the limitation of exposure to electrical, magnetic, and electromagnetic fields in the radio frequency range between 9 kHz and 300 GHz." and “Attachment to resolution # 303 from July 2, 2002”

- IEC62209-2 Edition 1.0 2010-03, Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures – Part 2: Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz).

  (*) The IEC62209-1 and IEEE 1528 are applicable for hand-held devices used in close proximity to the ear only.

4.0 SAR Limits

TABLE 1

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

5.0 SAR Result Scaling Methodology

The calculated 1-gram and 10-gram averaged SAR results indicated as “Max Calc. 1g-SAR” and “Max Calc.10g-SAR” in the data tables is determined by scaling the measured SAR to account for power leveling variations and power slump. A table and graph of output power versus time is provided in APPENDIX H. For this device the “Max Calc. 1g-SAR” and “Max Calc.10g-SAR” are scaled using the following formula:

$$Max\_Calc = SAR\_meas \cdot 10^{\frac{-Drift}{10}} \cdot \frac{P\_\max}{P\_\text{int}} \cdot DC$$

P_max = Maximum Power (W)
P_int = Initial Power (W)
Drift = DASY drift results (dB)
SAR_meas = Measured 1-g or 10-g Avg. SAR (W/kg)
DC = Transmission mode duty cycle in % where applicable
50% duty cycle is applied for PTT operation

Note: for conservative results, the following are applied:
If P_int > P_max, then P_max/P_int = 1.
Drift = 1 for positive drift

Additional SAR scaling was applied using the methodologies outlined in FCC KDB450824 using tissue sensitivity values. SAR was scaled for conditions where the tissue permittivity was measured above the nominal target and for tissue conductivity that was measured below the nominal target.

6.0 Description of Device Under Test (DUT)

This device operates using TDMA and analog frequency modulation (FM) signaling incorporating traditional simplex two-way radio transmission protocol.

Time Division Multiple Access (TDMA) is used to allocate portions of the RF signal by dividing time into two slots. Time allocation enables each unit to transmit its voice information without interference from other transmitting units. Transmission from a unit or base station is accommodated during two time-slot lengths of 30 milliseconds with frame length of 60 milliseconds. C4FM CQPSK modulation is used at 12.5 kHz channel spacing. The TDMA technique requires sophisticated algorithms and a digital signal processor (DSP) to perform voice compressions/decompressions and RF modulation/demodulation. The maximum duty cycle for TDMA is 50% for F2 (2 slot TDMA) protocol and is controlled by software. The FM signal is continuous. However, because of hand shaking or Push-To-Talk (PTT) between users and/or base stations a conservative 50% duty cycle is applied. This device also incorporates a Class 1 Bluetooth device which is a Frequency Hopping Spread Spectrum (FHSS) technology. The Bluetooth radio modem is used to wireless link audio accessories. The maximum actual transmission duty cycle is imposed by the Bluetooth standard. The maximum duty cycle for BT is 76.1%.

The model represented under this filing utilizes removable antennas (UHF bands) and an internal fixed antenna (BT) capable of transmitting in the 380-406 MHz (UHF R1) & 406.1-470 MHz (UHF R1) & 470-520 MHz (UHF R2), and 2.402-2.480 GHz (Bluetooth) bands respectively. The nominal output powers are 5.0W (380-470 MHz) and 5.0 W (470 – 520

MHz), with maximum output powers of 5.7 W, and 5.6 W respectively. The nominal BT output power is 0.012 W and the maximum output power is 0.012 W as defined by upper limit of the production line final test station. The intended operating positions are “at the face” with the DUT at least 1 inch from the mouth, and “at the body” by means of the offered body worn accessories, and “at the shoulder” by means of the offered Public Safety Microphone. Body worn audio and PTT operation is accomplished by means of optional remote accessories that are connected to the radio. Operation at the body without an audio accessory attached is possible by means of wireless BT accessories.

7.0 Optional Accessories and Test Criteria

This device is offered with optional accessories. All accessories were individually evaluated during the test plan creation to determine if testing was required per the guidelines outlined in “SAR Test Reduction Considerations for Occupational PTT Radios” FCC KDB 643646 D01 dated 4/4/11 to assess compliance of this device. The following sections identify the test criteria and details for each accessory category.

7.1 Antennas

There are three (3) UHF antennas and one BT internal antenna offered for this product. The table below lists their descriptions.

TABLE 2

Antenna Models	Description	*Tested
PMAE4065A	Whip UHF/GPS (radio and PSM) (380-520 MHz/ 1575 MHz), 1/4 wave, -2 dBd	Yes
FAF5259A	Helix Stubby UHF R1/GPS (380-470 MHz / 1575 MHz), 1/4 wave, -2 dBd	Yes
FAF5260A	Helix Stubby UHF R2/GPS (450-520 MHz / 1575 MHz), 1/4 wave, -2 dBd	Yes
85009282001	Internal BT (2402-2481 MHz) ¼ wave, 0dBd	No

*Refer to Exhibit 7B for antenna separation distances**.**

7.2 Batteries

There are two batteries offered for this product. The table below lists the batteries, and battery description.

TABLE 3

Battery Models	Description	*Tested	Comments
NNTN7033A	FM Impres Li Ion 4100 mAh	Yes	
NNTN7034A	Impres Li Ion 4200 mAh	Yes	
NNTN7036A	FM Impres NiMH 2000mAh	Yes	
NNTN7035A	FM Impres NiMH 2000mAh Ruggedized	No	Similar to NNTN7036A except for ruggedize test.
NNTN7037A	Impres NiMH 2100mAh	Yes	
NNTN7573A	Impres NiMH 2100 mAh Ruggedized	No	Similar to NNTN7037A except for ruggedize test.
NNTN7038A	Hi Cap Impres Li Ion 2900mAh	Yes	
NNTN8092A	FM Impress Li Ion 2300mAh Ruggedized	Yes	
PMNN4403A	Impres LiIon Slim 2150mAh	Yes	

*Refer to Exhibit 7B for antenna separation distances**.**

7.3 Body worn Accessories

All body worn accessories were considered. The table below lists the body worn accessories, and body worn accessory descriptions.

TABLE 4

Body worn Models	Description	*Tested	Comments
4205823V08	PSM's Shoulder Clip	Yes	Tested with PSM PMMN4059B, PMMN4060B, and PMMN4061B
HLN6875A	3 inches Belt Clip	Yes	
NTN5243A	Carry Strap	Yes	Tested with PMLN5322B, PMLN5323B, PMLN5324B, PMLN5560B, PMLN5325B, PMLN5326B, PMLN5327B, PMLN5328B, PMLN5329B, PMLN5330B.
NTN9179A	Swivel D-clip and Belt Loop	Yes	
PMLN5322B	Nylon Carry Case with 3 inches Fixed Belt Loop	Yes	Fit batteries PMNN4403A, NNTN8092A and NNTN7038A.
PMLN5323B	Hard Leather Carry Case with 3 inches Fixed Belt Loop	Yes	Fit batteries PMNN4403A, NNTN8092A and NNTN7038A.
PMLN5324B	Hard Leather Carry Case with 2.75 inches Swivel Belt Loop	Yes	Fit batteries PMNN4403A, NNTN8092A and NNTN7038A.
PMLN5325B	Nylon case 3.0 inches Fixed Belt Loop	Yes	Fit batteries NNTN7033A and NNTN7034A.
PMLN5326B	Leather case 3.0 inches Fixed Belt Loop	Yes	Fit batteries NNTN7033A and NNTN7034A.
PMLN5327B	Leather case 2.75 inches swivel Belt Loop	Yes	Fit batteries NNTN7033A and NNTN7034A.
PMLN5328B	Nylon Carry Case with 3 inches Fixed Belt Loop	Yes	Fit batteries NNTN7035A, NNTN7036A, NNTN7037A and NNTN7573A..
PMLN5329B	Hard Leather Carry Case with 3 inches Fixed Belt Loop	Yes	Fit batteries NNTN7035A, NNTN7036A, NNTN7037A and NNTN7573A..
PMLN5330B	Hard Leather Carry Case with 2.75 inches Swivel Belt Loop	Yes	Fit batteries NNTN7035A, NNTN7036A, NNTN7037A and NNTN7573A..
PMLN5560B	Carry Holder-FLIP	Yes	Fit batteries PMNN4403A, NNTN8092A and NNTN7038A.
RLN6458A	Clip plus Carry Case	Yes	Fit batteries PMNN4403A, NNTN8092A and NNTN7038A.
RLN6459A	Belt Clip for Swivel Leather Carrying Case	Yes	Fit batteries NNTN7033A and NNTN7034A.

*Refer to Exhibit 7B for antenna separation distances**.**

7.4 Audio Accessories

All audio accessories were considered. The table below lists the offered audio accessories and their descriptions. Exhibit 7B illustrates photos of the tested audio accessories.

TABLE 5

Audio Acc. Models	Description	Tested	Comments
Public Safety Microphones			
PMMN4059B	Public Safety Mic 18 inch IP55 (w/ 4205823V08 shoulder clip)	Yes	Tested w/ antenna PMAE4065A
PMMN4060B	Public Safety Mic 24 inch IP55 (w/ 4205823V08 shoulder clip)		
PMMN4061B	Public Safety Mic 30 inch IP55 (w/ 4205823V08 shoulder clip)		
Receiver only Audio accessories			
BDN6664A	Earpiece with standard earpiece beige Tilt / Man Down Switch	No	Testing is not required per KDB 643646
BDN6665A	Earpiece w/ XL Earphone		
BDN6666A	Earpiece w/ Volume Control		
BDN6719A	Earpad, w/3.5 MM threaded plug		
BDN6726A	Earpiece with standard earpiece Black		
BDN6727A	Earpiece with extra loud earphone Black		
BDN6728A	Earpiece with volume control Black		
BDN6781A	Earbud, single, receive only, Black		
RLN5878A	Core 1 wire - Black		
RLN5879A	Core 1 wire - Beige		
Secondary Audio accessories			
RMN5116A	Temple Transducer Headset	Yes	Tested w/ DRSM kit # HMN4104B
RLN6424A	RX only Secondary Audio accessory for DRSM	No	
AARLN4885B	3.5mm RX only earbud for RSM short coiled cable	No	
RLN4941A	3.5mm RX only earpiece w/ translucent tube - Short coiled cable	No	
WADN4190B	3.5mm ear receiver w/ coil cable	No	
PMLN4620A	RX only earpiece	No	

TABLE 5 (Continued)

Audio Acc. Models	Description	Select for Test	Tested	Comments
BDN6783A	Headset/Earpiece Audio accessory Adapter	Yes	Yes	Tested w/ adaptor BDN6731A, BDN6732A and BDN6780A
BDN6731A	Earpiece, Mic and PTT combined with extra loud earpiece black	Yes	Yes	Tested w/ adaptor BDN6783A
BDN6732A	Earpiece, Mic and PTT separate with extra loud earpiece black			
BDN6780A	Earbud Single w/ Mic & PTT			
BDN6667A	Earpiece, Mic & PTT Combo	No	No	Similar to BDN6731A Same cable connector, length and thickness.
BDN6669A	Earpiece, Mic and PTT combined with extra loud earpiece beige			
BDN6729A	Earpiece, Mic and PTT combined black			
BDN6668A	Earpiece, Mic & PTT Separate	No	No	Similar to BDN6732A Same cable connector, length and thickness.
BDN6670A	Earpiece, Mic and PTT separate with extra loud earpiece beige			
BDN6730A	Earpiece, Mic and PTT separate Black			
HMN4104B	IMPRES Display Submersible RSM w/jack & Ch. Selector	Yes	Yes	
HMN4101B	Display RSM w/o Display and w/o Channel Knob	No	No	Similar to HMN4104B Same cable connector, length and thickness.
HMN4103B	Display RSM w/o Channel Knob			
NNTN7869A	Surveillance/Keyloader accessory Adapter	Yes	Yes	Tested w/ ZMN6031A, ZMN6032A
ZMN6031A	Speaker Mic 3 piece	Yes	Yes	Tested w/ NNTN7869A
ZMN6039A	Speaker Mic 3 piece XL	No	No	Similar to ZMN6031A Same cable connector, length and thickness.
ZMN6032A	Speaker Mic 2 piece	Yes	Yes	Tested w/ NNTN7869A
ZMN6038A	SPKR MIC 2 PIECE XL	No	No	Similar to ZMN6032A Same cable connector, length and thickness.
PMLN5101A	Impress Temple Transducer	Yes	Yes	
PMLN5111A	Plus 3 wire - Black- one programmable button	Yes	Yes	
PMLN5112A	Plus 3 wire - Beige-one programmable button	No	No	Similar to PMLN5111A, differ color
PMLN5275C	Core H/D Headset	Yes	Yes	
PMMN4024A	Core RSM	Yes	Yes	
PMMN4065A	Standard Large IP57 RSM	Yes	Yes	
PMMN4062A	Large Plus Noise cancelling RSM IP55 3.5MM jack RX only	Yes	Yes	
PMMN4025A	Small plus RSM	No	No	Similar to PMMN4062A Same cable connector, length and thickness.
PMMN4069A	APX Basic Smart RSM, IP55			
RLN5882A	Plus 2 wire w/ translucent tube - Black One programmable button	Yes	Yes	
RLN5880A	Plus 2 wire - Black-one programmable button	No	No	Similar to RLN5882A Same cable connector, length and thickness.
RLN5881A	Plus 2 wire - Beige-one programmable button			
RLN5883A	Plus 2 wire w/ translucent tube - Beige one programmable button			
RMN5058A	Core L/W Headset	Yes	Yes	

8.0 Description of Test System

8.1 Descriptions of Robotics/Probes/Readout Electronics

The laboratory utilizes a Dosimetric Assessment System (DASY5™) SAR measurement system Version 52.6.2.424 manufactured by Schmid & Partner Engineering AG (SPEAG™), of Zurich Switzerland. The test system consists of a Stäubli RX90L robot, DAE3&4 and ES3DV3 E-field probe. The DASY5™ system is operated per the instructions in the DASY5™ Users Manual. The complete manual is available directly from SPEAG™. All measurement equipment used to assess EME SAR compliance was calibrated according to ISO/IEC 17025 A2LA guidelines. Section 9.0 presents additional test equipment information. Appendices B and C present the applicable calibration certificates. The E-field probe first scans a coarse grid over a large area inside the phantom in order to locate the interpolated maximum SAR distribution. After the coarse scan measurement, the probe is automatically moved to a position at the interpolated maximum. The subsequent scan can directly use this position as reference for the cube evaluations.

8.2 Description of Phantom(s)

8.2.1 Dual Flat Phantom

Not Applicable

8.2.2 SAM Phantom

Not Applicable

8.2.3 Elliptical Phantom

TABLE 6

Phantom ID (s)	Material Parameters	Phantom Dimensions LxWxD (mm)	Material Thickness (mm)	Support Structure Material	Loss Tangent (wood)
OVAL1016 OVAL1021 OVAL1022 OVAL1090 OVAL1108	300MHz -6GHz; Er = 4+/- 1, Loss Tangent = ≤0.05	600x400x190	2mm +/- 0.2mm	Wood	< 0.05

8.3 Description of Simulated Tissue

The simulated tissue used is compliant to that specified in FCC Supplement C (Edition 01-01) to OET Bulletin 65 (Edition 97-01) and IEEE Std 1528 - 2003 "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques". The simulated tissue used is also compliant to that specified in IEC62209-1 (2005) and adopted by CENELEC as EN62209-1 (2006).

The sugar based simulate tissue is produced by placing the correct measured amount of De-ionized water into a large container. Each of the dried ingredients are weighed and added to the water carefully to avoid clumping. If the solution has a high sugar concentration the water is pre-heated to aid in dissolving the ingredients. For Diacetin and similar type simulates, sugar and HEC ingredients are not needed. The solution is mixed thoroughly, covered, and allowed to sit overnight prior to use.

The simulated tissue mixture was mixed based on the Simulated Tissue Composition indicated in table 7 below for 450 MHz. During the daily testing of this product, the applicable mixture was used to measure the Di-electric parameters at each of the tested frequencies to verify that the Di-electric parameters were within the tolerance of the tissue specifications.

TABLE 7: Simulated Tissue Composition (by mass)

% of listed ingredients	450MHz	
	Head	Body
Sugar	56.0	46.5
Diacetin	0	0
De ionized -Water	39.1	50.53
Salt	3.8	1.87
HEC	1.0	1.0
Bact.	0.1	0.1

Reference section 10.1 for target parameters

9.0 Additional Test Equipment

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

TABLE 8

Equipment Type	Model Number	Serial Number	Calibration Date	Calibration Due Date
Power Meter (Agilent)	E4418B	GB40206480	11/29/2010	11/29/2011
Power Sensor (HP)	8481B	3318A10984	4/2/2011	4/2/2012
Power Meter (Agilent)	E4418B	GB40206553	4/6/2011	4/6/2012
E-Series Avg. Power Sensor(Agilent)	E9301B	MY50280001	8/8/2011	8/8/2012
Power Meter (Agilent)	E4419B	MY50000505	9/2/2010	9/2/2011 (1)
E-Series Avg. Power Sensor (Agilent)	E9301B	MY50280001	8/3/2010	8/3/2011 (1)
E-Series Avg. Power Sensor (Agilent)	E9301B	MY50290001	8/3/2010	8/3/2011 (1)
Power Meter (Agilent)	E4419B	MY50000505	9/6/2011	9/6/2012
E-Series Avg. Power Sensor (Agilent)	E9301B	MY41495730	4/22/2011	4/22/2012
E-Series Avg. Power Sensor (Agilent)	E9301B	MY41495733	4/28/2011	4/28/2012
Power Meter (Agilent)	E4419B	MY45103725	4/6/2011	4/6/2012
Power Meter (Agilent)	E4418B	US39251150	4/6/2011	4/6/2012
E-Series Avg. Power Sensor (Agilent)	E9301B	MY41495593	2/19/2011	2/19/2012
E-Series Avg. Power Sensor (Agilent)	E9301B	MY41495594	2/4/2011	2/4/2012
HP Power Sensor	8481B	3318A10982	4/2/2011	4/2/212
Bi-Directional Coupler (NARDA)	3020A	40296	2/5/2010	2/5/2012
Bi-Directional Coupler (NARDA)	3022	77115	3/3/2010	3/3/2012
Bi-Directional Coupler (NARDA)	3022	70181	11/14/2011	11/14/2013
Bi-Directional Coupler (NARDA)	3020A	40295	6/3/2010	6/3/2012
AMP (Amplifier Research)	10WD1000	28782	CNR	CNR
Signal Generator (Agilent)	E4428C	MY47381119	6/24/2011	6/24/2013
Signal Generator (Agilent)	E4438C	MY42082269	2/18/2010	2/18/2012
Signal Generator (Agilent)	E4421B	US40051446	8/12/2010	8/12/2012
AMP (Amplifier Research)	1W1000	16625	CNR	CNR
AMP (Comtech)	AR88258-10	M3Y6A00-1007	CNR	CNR
Dickson Temperature Recorder	TM125	1195889	3/9/2011	3/9/2012
Omega Digital Thermometer with J Type TC Probe	HH200A	20857	9/20/2010	9/20/2011 (1)
		20857	10/28/2011	10/28/2012
	HH202A	18800	11/17/2010	11/17/2011 (3)
		18801	5/18/2011	5/18/2012
		18812	5/3/2011	5/3/2012
Agilent PNA-L Network Analyzer	N5230A	MY45001092	6/10/2010	6/10/2011 (2)
			6/9/2011	6/9/2012
HP Network Analyzer	8753D	3410A09135	2/23/2011	2/23/2012
Dielectric Probe Kit (HP)	85070C	US99360076	CNR	CNR
SPEAG Dipole	D450V3	1075	8/22/2011	8/22/2013
		1077	1/11/2011	1/11/2013

(1) Test dates: 5/28/11- 6/17/11.
(2) Test dates: 5/28/11 – 6/1/11
(3) Test dates: 5/28/11 – 10/31/11

10.0 SAR Measurement System Verification

The SAR measurements were conducted with probe model/serial number ES3DV3/3291, 3163, 3147, and 3185. The system performance check was conducted daily and within 24 hours prior to testing. DASY output files of the probe/dipole calibration certificates and system performance test results are included in appendices B, C, D respectively.

Dipole validation scans using head tissue equivalent medium are provided in APPENDIX D. The EMS EME lab validated the dipole to the applicable IEEE 1528-2003 system performance targets. Within the same day system validation was performed using FCC body tissue parameters to generate the system performance target values for body at the applicable frequency. The results of the EMS EME system performance validation are provided herein.

10.1 Equivalent Tissue Test Results

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

TABLE 9

Frequency (MHz)	Tissue Type	Conductivity Target (S/m)	Dielectric Constant Target	Conductivity Meas. (S/m)	Dielectric Constant Meas.	Tested Date
Simulated Tissue Measurements for UHF R1 testing						
380	IEEE /IEC Head	0.87 (0.83 – 0.91)	44.3 (42.1 – 46.6)	0.85	46.0	11/16/11
393	IEEE /IEC Head	0.97 (0.83 – 0.91)	44.2 (42.0 – 46.4)	0.86	45.6	11/16/11
450	IEEE /IEC Head	0.87 (0.83 – 0.91)	43.5 (41.3 – 45.7)	0.86	43.1	6/1/11
				0.87	43.4	10/20/11
				0.91	44.7	10/21/11
				0.84	43.4	11/9/11
				0.90	44.1	11/16/11
470	IEEE / IEC Head	0.87 (0.83 – 0.92)	43.4 (41.2 – 45.6)	0.91	43.8	10/19/11
				0.89	43.0	10/20/11
				0.91	43.7	10/21/11
				0.91	43.5	11/16/11
380	FCC Body	0.93 (0.88 – 0.98)	57.4 (54.5 – 60.3)	0.89	57.4	11/15/11
				0.89	57.5	11/16/11
393	FCC Body	0.93 (0.89 – 0.98)	57.3 (54.4 – 60.1)	0.90	57.1	11/15/11
				0.89	57.3	11/16/11

(a) Same Tissue measurements for UHF R1 and R2 applicable testing dates

TABLE 9 (Continued)

Frequency (MHz)	Tissue Type	Conductivity Target (S/m)	Dielectric Constant Target	Conductivity Meas. (S/m)	Dielectric Constant Meas.	Tested Date
Simulated Tissue Measurements for UHF R1 testing (continued)						
406	FCC Body	0.93 (0.89 – 0.98)	57.1 (54.3 – 60.0)	0.90	58.2	06/16/11
				0.90	56.8	10/21/11
				0.90	56.7	11/11/11
422	FCC Body	0.94 (0.89 – 0.98)	57.0 (54.1 – 59.8)	0.91	57.9	06/16/11
				0.91	56.3	11/11/11
438	FCC Body	0.94 (0.89 – 0.99)	56.8 (54.0 – 59.7)	0.93	57.5	06/16/11
				0.93	57.2	06/17/11
				0.92	56.0	11/11/11
450	FCC Body	0.94 (0.89 – 0.99)	56.7 (53.9 – 59.5)	0.91	56.6	05/28/11 (a)
				0.92	57.1	06/01/11
				0.94	57.0	6/17/11
				0.95	56.1	10/19/11
				0.94	56.1	10/21/11
				0.93	55.7	10/24/11
				0.95	56.5	10/25/11
				0.95	56.3	10/26/11
				0.94	56.1	10/27/11
				0.94	55.7	10/31/11
				0.96	56.3	11/01/11
				0.94	56.6	11/02/11
				0.95	56.5	11/05/11
				0.96	56.5	11/07/11
				0.95	56.2	11/08/11
				0.96	57.0	11/09/11
				0.94	55.9	11/10/11
				0.93	55.8	11/11/11
				0.94	55.9	11/14/11
				0.94	55.9	11/15/11
				0.93	56.0	11/16/11
454	FCC Body	0.94 (0.89 – 0.99)	56.7 (53.9 – 59.5)	0.94	57.3	06/16/11
				0.94	55.7	11/11/11
				0.94	55.8	11/14/11
460	FCC Body	0.94 (0.89 – 0.99)	56.7 (53.8 – 59.5)	0.96	56.1	10/26/11
				0.95	55.6	10/31/11
				0.95	56.5	11/01/11
				0.96	56.3	11/05/11
				0.97	56.8	11/09/11
				0.95	55.8	11/10/11
				0.95	55.8	11/15/11

(a) Same Tissue measurements for UHF R1 and R2 applicable testing dates

TABLE 9 (Continued)

Frequency (MHz)	Tissue Type	Conductivity Target (S/m)	Dielectric Constant Target	Conductivity Meas. (S/m)	Dielectric Constant Meas.	Tested Date
Simulated Tissue Measurements for UHF R1 testing (continued)						
470	FCC Body	0.94 (0.89 – 0.99)	56.6 (53.8 – 59.5)	0.95	56.4	05/28/11 [(a)]
				0.96	57.0	06/16/11
				0.95	55.7	10/21/11
				0.95	55.4	10/24/11
				0.97	56.1	10/25/11
				0.97	55.9	10/26/11
				0.96	55.8	10/27/11
				0.96	55.6	10/28/11
				0.96	55.4	10/31/11
				0.97	56.1	11/01/11
				0.96	56.3	11/02/11
				0.97	56.2	11/05/11
				0.98	56.2	11/07/11
				0.97	55.9	11/08/11
				0.98	56.7	11/09/11
				0.96	55.7	11/10/11
				0.96	55.5	11/11/11
Simulated Tissue Measurements for UHF R2 testing						
450	IEEE /IEC Head	0.87 (0.83 – 0.91)	43.5 (41.3 – 45.7)	0.89	44.2	10/19/11
				0.84	43.1	10/20/11
				0.83	42.9	10/21/11
				0.84	43.7	12/15/11
470	IEEE / IEC Head	0.87 (0.83 – 0.92)	43.4 (41.2 – 45.6)	0.85	42.8	10/19/11
				0.85	42.7	10/20/11
				0.84	42.4	10/21/11
516	IEEE /IEC Head	0.88 (0.83 – 0.92)	43.2 (41.0 – 45.3)	0.90	42.1	11/09/11
				0.91	42.0	12/13/11
520	IEEE /IEC Head	0.88 (0.83 – 0.92)	43.1 (41.0 – 45.3)	0.90	42.0	11/09/11
				0.91	41.9	12/13/11
450	FCC Body	0.94 (0.89 – 0.99)	56.7 (53.9 – 59.5)	0.93	56.2	10/25/11
				0.90	55.3	10/26/11
				0.90	55.3	10/27/11
				0.90	55.0	10/28/11
				0.91	55.6	10/31/11
				0.90	55.3	11/01/11
				0.90	55.7	11/02/11
				0.93	57.0	11/03/11
				0.90	55.8	11/04/11
				0.90	56.1	11/05/11
				0.91	55.8	11/07/11
				0.90	55.6	11/08/11
				0.90	55.9	11/09/11
				0.93	55.3	12/13/11

(a) Same Tissue measurements for UHF R1 and R2 applicable testing dates

TABLE 9 (Continued)

Frequency (MHz)	Tissue Type	Conductivity Target (S/m)	Dielectric Constant Target	Conductivity Meas. (S/m)	Dielectric Constant Meas.	Tested Date
Simulated Tissue Measurements for UHF R2 testing (continued)						
470	FCC Body	0.94 (0.89 – 0.99)	56.6 (53.8 – 59.5)	0.95	56.4	05/28/11 [(a)]
				0.96	56.3	06/09/11
				0.96	56.3	06/10/11
				0.93	55.6	06/14/11
				0.95	55.7	10/21/11
				0.95	55.9	10/25/11
				0.92	55.0	10/26/11
				0.92	54.9	10/27/11
				0.92	54.7	10/28/11
				0.91	54.4	10/31/11
				0.92	55.0	11/01/11
				0.92	55.3	11/02/11
				0.95	56.7	11/03/11
				0.92	55.5	11/04/11
				0.92	55.8	11/05/11
				0.93	55.5	11/07/11
				0.92	55.4	11/08/11
				0.94	55.0	12/13/11
484	FCC Body	0.94 (0.90 – 0.99)	56.6 (53.7 – 59.4)	0.93	55.0	10/21/11
				0.96	55.6	10/25/11
				0.93	54.7	10/26/11
				0.93	56.6	10/27/11
				0.93	54.4	10/28/11
				0.93	54.7	11/01/11
				0.96	56.5	11/03/11
				0.93	55.4	11/04/11
				0.93	55.6	11/05/11
				0.94	55.3	11/07/11
				0.93	55.2	11/08/11
498	FCC Body	0.94 (0.90 – 0.99)	56.5 (53.7 – 59.3)	0.98	55.4	10/25/11
				0.95	54.5	10/27/11
				0.94	54.2	10/28/11
				0.95	54.5	11/01/11
				0.95	54.9	11/02/11
				0.98	56.4	11/03/11
				0.94	55.2	11/04/11
				0.94	55.4	11/05/11
				0.95	55.1	11/07/11
				0.95	55.0	11/08/11

(a) Same Tissue measurements for UHF R1 and R2 applicable testing dates

TABLE 9 (continued)

Frequency (MHz)	Tissue Type	Conductivity Target (S/m)	Dielectric Constant Target	Conductivity Meas. (S/m)	Dielectric Constant Meas.	Tested Date
Simulated Tissue Measurements for UHF R2 testing (continued)						
512	FCC Body	0.94 (0.90 – 0.99)	56.5 (53.6 – 59.3)	0.98	55.8	05/31/11
				0.97	55.0	06/14/11
				0.95	54.2	10/27/11
				0.95	54.0	10/28/11
				0.96	54.3	11/01/11
				0.96	54.7	11/02/11
				0.99	56.2	11/03/11
				0.95	55.0	11/04/11
				0.95	55.0	11/04/11
				0.95	55.2	11/05/11
				0.96	54.9	11/07/11
				0.96	54.8	11/08/11
516	FCC Body	0.95 (0.90 – 0.99)	56.4 (53.6 – 59.3)	0.97	54.8	10/21/11
				0.96	54.8	11/8/11
				0.98	54.2	12/13/11
520	FCC Body	0.95 (0.90 – 0.99)	56.4 (53.6 – 59.2)	0.96	54.5	10/21/11
				0.96	54.7	11/8/11
				0.95	54.1	12/15/11

10.2 System Check Test Results

System performance checks were conducted each day during the SAR assessment. The results are normalized to 1W. APPENDIX D explains how the targets were set and includes DASY plots for each day during the SAR assessment. The table below summarizes the daily system check results used for the SAR assessment.

TABLE 10

Probe Serial #	Tissue Type	Dipole Kit / Serial #	Reference SAR @ 1W (W/kg)	System Check Test Results when normalized to 1W (W/kg)	Tested Date
System Check result for UHF R1 and R2 testing					
3291	450 FCC Body	D450V3 / 1077	4.68 +/- 10%	4.48	5/28/11
System Check results for UHF R1 testing					
3291	450 IEEE / IEC Head	D450V3 / 1077	5.04 +/- 10%	4.76	6/1/11
3291	450 FCC Body	D450V3 / 1077	4.68 +/- 10%	4.52	6/16/11
				4.56	6/17/11
3163	450 FCC Body	D450V3 / 1075	4.65 +/- 10%	4.60	10/19/11
				4.52	10/24/11
				4.56	10/25/11
				4.56	10/26/11
				4.44	10/27/11
				4.52	10/28/11
				4.48	10/31/11
				4.60	11/1/11
				4.48	11/2/11
				4.52	11/5/11
				4.56	11/7/11
				4.56	11/8/11
				4.48	11/10/11
				4.48	11/11/11
				4.48	11/14/11
				4.52	11/15/11
3163	450 IEEE / IEC Head	D450V3 / 1075	4.81 +/- 10%	4.64	10/20/11
				4.92	10/21/11
				4.76	11/9/11
				4.80	11/16/11

TABLE 10 (continued)

Probe Serial #	Tissue Type	Dipole Kit / Serial #	Reference SAR @ 1W (W/kg)	System Check Test Results when normalized to 1W (W/kg)	Tested Date
System Checks results for UHF R2 testing					
3291	450 FCC Body	D450V3 / 1077	4.68 +/- 10%	4.40	5/31/11
				4.52	6/9/11
				4.56	6/10/11
				4.56	6/14/11
3147	450 IEEE / IEC Head	D450V3 / 1075	4.81 +/- 10%	4.84	10/19/11
				4.72	10/20/11
				4.64	10/21/11
3147	450 FCC Body	D450V3 / 1075	4.65 +/- 10%	4.68	10/25/11
				4.56	10/26/11
				4.64	10/27/11
				4.60	10/28/11
				4.60	10/31/11
				4.64	11/1/11
				4.60	11/2/11
				4.68	11/3/11
				4.60	11/4/11
				4.60	11/5/11
				4.64	11/7/11
				4.56	11/8/11
				4.56	11/9/11
3185	450 FCC Body	D450V3 / 1075	4.65 +/- 10%	4.68	12/13/11
3185	450 IEEE / IEC Head	D450V3 / 1075	4.81 +/- 10%	4.56	12/15/11

Note: See APPENDIX D for an explanation of the reference SAR targets stated above.

11.0 Environmental Test Conditions

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

TABLE 11

	Target	Measured
Ambient Temperature	18 - 25 ˚C	Range: 21.1 – 23.0˚C Avg. 21.9 ˚C
Relative Humidity	30 - 70 %	Range: 47.6 – 66.8 % Avg. 53.4%
Tissue Temperature	NA	Range: 19.9 – 22.8˚C Avg. 21.1˚C

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

12.0 DUT Test Methodology

12.1 Measurements

SAR measurements were performed using the DASY system described in section 8.0 using coarse and 5x5x7 zoom scan. Elliptical flat phantoms filled with applicable simulated tissue were used for body/shoulder and face testing.

12.2 DUT Configuration(s)

The DUT is a portable device operational at the body/shoulder and face as described in section 6.0 while using the applicable accessories listed in section 7.0. All accessories listed in section 7.0 of this report were considered when implementing the guidelines specified in KDB 643646 D01.

12.3 DUT Positioning Procedures

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

12.3.1 Body/Shoulder

Body: the DUT was positioned in normal use configuration against the phantom with the offered body worn accessory as well as with and without the offered audio accessories as applicable.
Shoulder: the PSM was positioned in the intended use configuration against the phantom with the offered shoulder clip.

12.3.2 Head

Not applicable.

12.3.3 Face

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

12.4 DUT Test Channels

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

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

Where
N_c = Number of channels
F_{high} = Upper channel
F_{low} = Lower channel
F_c = Center channel

12.5 DUT Test Plan

The guidelines and requirements outlined in "SAR Test Reduction Considerations for Occupational PTT Radios" FCC KDB 643646 D01 dated 4/4/11 for head (face) and body/shoulder were used to assess compliance of this device. All modes of operation identified in section 6.0 were considered during the development of the test plan.
Tests at the body without the offered audio accessory are to satisfy intended use operation with offered wireless BT accessories. In some cases the initial power listed herein may exceed the reported maximum power due to software step size tuning limitations. However, the initial powers measured are not greater than the allowed 5% of the reported maximum power.

13.0 DUT Test Data

13.1 Assessments at the Body for 380 – 470 MHz band

The battery PMNN4403A was selected as the default battery for assessments at the Body since it is the thinnest battery (refers to Exhibit 7B for the dimension of the battery). The conducted power measurement for all test channels within part 90 frequency range using the default battery PMNN4403A is indicated in table 12. The channel with the highest conducted power will be identified as the default channel per KDB 643646 D01 SAR Test for PTT Radios v01r01. SAR plots of the highest results per table (bolded) are presented in appendices E-G.

TABLE 12

Test Freq (MHz)	Power (W)
406.125	5.46
422.1	5.46
438.1	5.47
450	5.47
454	5.45
460	5.47
470	5.55

13.1.1 Assessments at the Body with Body worn HLN6875A

Assessment of offered antennas with the default battery, body worn HLN6875A, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 12 for highest output power channel.

TABLE 13

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
FAF5260A	PMNN4403A	HLN6875A	PMLN5275C	450.000	5.54	-0.081	6.77	4.96	3.55	2.60	HvH-Ab-110528-05
				460.000							
				470.000	5.66	-0.13	6.82	5.02	3.54	2.60	HvH-Ab-110528-04
FAF5259A	PMNN4403A	HLN6875A	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.66	-0.2	4.06	2.98	2.14	1.57	HvH-Ab-110528-12
PMAE4065A	PMNN4403A	HLN6875A	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.66	-0.59	4.31	3.17	2.49	1.83	HvH-Ab-110528-19
Assessment of the additional offered batteries											
FAF5260A	NNTN8092A	HLN6875A	PMLN5275C	450.000	5.57	-0.14	7.93	5.82	4.19	3.08	HvH-Ab-110601-03
	NNTN7038A				5.60	-0.056	6.61	3.19	3.41	1.64	HvH-Ab-111021-10
	NNTN7033A				5.55	-0.2	5.99	4.44	3.22	2.39	HvH-Ab-111024-02
	NNTN7034A				5.57	-0.22	6.46	4.78	3.48	2.57	HvH-Ab-111024-03
	NNTN7037A				5.60	-0.59	7.36	5.42	**4.29**	3.16	HvH-Ab-111024-04
	NNTN7036A				5.60	-0.64	7.18	5.29	4.23	3.12	HvH-Ab-111024-05

13.1.2 Assessments at the Body with Body worn RLN6458A

Assessment of offered antennas with the default battery, body worn RLN6458A, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 12 for highest output power channel.

TABLE 14

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	PMNN4403A	RLN6458A	PMLN5275C	450.000							
				460.000							
				470.000	5.68	-0.18	2.06	1.55	1.08	0.81	HvH-Ab-111024-06
FAF5259A	PMNN4403A	RLN6458A	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.70	-0.13	1.23	0.929	0.63	0.48	HvH-Ab-111024-07
PMAE4065A	PMNN4403A	RLN6458A	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.69	-0.18	1.5	1.14	0.78	0.60	HvH-Ab-111024-08
Assessment of the additional offered batteries											
FAF5260A	NNTN8092A	RLN6458A	PMLN5275C	470.000	5.69	-0.14	2.28	1.72	**1.18**	0.89	HvH-Ab-111024-09
	NNTN7038A				5.70	-0.021	2.33	1.76	1.17	0.88	HvH-Ab-111024-10

13.1.3 Assessments at the Body with Body worn NTN9179A

Assessment of offered antennas with the default battery, body worn NTN9179A, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 12 for highest output power channel.

TABLE 15

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	PMNN4403A	NTN9179A	PMLN5275C	450.000							
				460.000							
				470.000	5.69	-0.22	4.9	3.66	2.58	1.93	HvH-Ab-111025-02
FAF5259A	PMNN4403A	NTN9179A	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.70	-0.14	2.69	2.01	1.39	1.04	HvH-Ab-111025-03
PMAE4065A	PMNN4403A	NTN9179A	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.70	-0.59	3.06	2.29	1.75	1.31	HvH-Ab-111025-04
Assessment of the additional offered batteries											
FAF5260A	NNTN8092A	NTN9179A	PMLN5275C	470.000	5.70	-0.18	4.85	3.63	2.53	1.89	HvH-Ab-111025-05
	NNTN7038A				5.70	-0.076	4.84	3.62	2.46	1.84	HvH-Ab-111025-06
	NNTN7033A				5.70	-0.3	5.69	4.26	3.05	2.28	HvH-Ab-111025-07
	NNTN7034A				5.70	-0.36	6.07	4.54	3.30	2.47	HvH-Ab-111025-08
	NNTN7037A				5.71	-0.49	6.09	4.51	**3.41**	2.52	HvH-Ab-111025-09
	NNTN7036A				5.71	-0.55	5.84	4.33	3.31	2.46	HvH-Ab-111025-10

13.1.4 Assessments at the Body with Body worn PMLN5322B

Assessment of offered antennas with the default battery and body worn PMLN5322B per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 12 for highest output power channel.

TABLE 16

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 10g-SAR (mW/g)	Meas. 1g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	PMNN4403A	PMLN5322B	PMLN5275C	450.000	5.61	-0.26	9.00	6.66	4.85	3.59	HvH-Ab-111026-04
				460.000	5.59	-0.15	8.61	6.37	4.54	3.36	HvH-Ab-111026-03
				470.000	5.70	-0.13	8.21	6.05	4.23	3.12	HvH-Ab-111026-02
FAF5259A	PMNN4403A	PMLN5322B	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.69	-0.021	4.78	3.53	2.41	1.78	HvH-Ab-111027-02
PMAE4065A	PMNN4403A	PMLN5322B	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.70	-0.14	5.47	4.04	2.82	2.09	HvH-Ab-111027-03
Assessment of the additional offered batteries											
FAF5260A	NNTN8092A	PMLN5322B	PMLN5275C	450.000	5.60	-0.18	9.54	7.08	**5.06**	3.76	HvH-Ab-111027-04
	NNTN7038A				5.61	-0.21	9.25	6.86	4.93	3.66	HvH-Ab-111027-05

13.1.5 Assessments at the Body with Body worn PMLN5323B

Assessment of offered antennas with the default battery, body worn PMLN5323B, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 12 for highest output power channel.

TABLE 17

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	PMNN4403A	PMLN5323B	PMLN5275C	450.000							
				460.000							
				470.000	5.71	-0.052	5.68	4.21	2.87	2.13	HvH-Ab-111027-06
FAF5259A	PMNN4403A	PMLN5323B	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.72	-0.23	3.38	2.51	1.78	1.32	HvH-Ab-111027-07
PMAE4065A	PMNN4403A	PMLN5323B	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.72	-0.18	3.65	2.71	1.90	1.41	HvH-Ab-111027-08
Assessment of the additional offered batteries											
FAF5260A	NNTN8092A	PMLN5323B	PMLN5275C	470.000	5.70	-0.19	6.08	4.5	**3.18**	2.35	HvH-Ab-111027-09
	NNTN7038A				5.72	-0.13	5.92	4.39	3.05	2.26	HvH-Ab-111027-10

13.1.6 Assessments at the Body with Body worn PMLN5324B

Assessment of offered antennas with the default battery, body worn PMLN5324B, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 12 for highest output power channel.

TABLE 18

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	PMNN4403A	PMLN5324B	PMLN5275C	450.000							
				460.000							
				470.000	5.71	-0.13	3.01	2.28	**1.55**	1.17	HvH-Ab-111028-02
FAF5259A	PMNN4403A	PMLN5324B	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.72	-0.16	1.81	1.37	0.94	0.71	HvH-Ab-111028-03
PMAE4065A	PMNN4403A	PMLN5324B	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.73	-0.19	1.92	1.45	1.00	0.76	HvH-Ab-111028-04
Assessment of the additional offered batteries											
FAF5260A	NNTN8092A	PMLN5324B	PMLN5275C	470.000	5.72	-0.14	2.92	2.21	1.51	1.14	HvH-Ab-111028-05
	NNTN7038A				5.73	-0.12	2.98	2.26	1.53	1.16	HvH-Ab-111028-06

13.1.7 Assessments at the Body with Body worn PMLN5560B

Assessment of offered antennas with the default battery, body worn PMLN5560B, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 12 for highest output power channel.

TABLE 19

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	PMNN4403A	PMLN5560B	PMLN5275C	450.000							
				460.000							
				470.000	5.73	-0.2	2	1.53	1.05	0.80	HvH-Ab-111028-07
FAF5259A	PMNN4403A	PMLN5560B	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.72	-0.099	1.22	0.932	0.62	0.48	HvH-Ab-111028-08
PMAE4065A	PMNN4403A	PMLN5560B	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.73	-0.16	1.23	0.941	0.64	0.49	HvH-Ab-111028-09
Assessment of the additional offered batteries											
FAF5260A	NNTN8092A	PMLN5560B	PMLN5275C	470.000	5.73	-0.21	2.07	1.58	**1.09**	0.83	HvH-Ab-111028-10
	NNTN7038A				5.70	-0.1	1.95	1.48	1.00	0.76	HvH-Ab-111031-02

13.1.8 Assessments at the Body with Body worn PMLN5325B

Assessment of offered antennas with the default battery, body worn PMLN5325B, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 12 for highest output power channel.

TABLE 20

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7034A	PMLN5325B	PMLN5275C	450.000	5.63	-0.21	10.1	7.44	**5.37**	3.95	HvH-Ab-111031-05
				460.000	5.65	-0.24	9.51	7.01	5.07	3.74	HvH-Ab-111031-04
				470.000	5.71	-0.31	9.26	6.81	4.97	3.66	HvH-Ab-111031-03
FAF5259A	NNTN7034A	PMLN5325B	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.73	-0.11	6.05	4.46	3.10	2.29	HvH-Ab-111031-06
PMAE4065A	NNTN7034A	PMLN5325B	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.73	-0.21	6.5	4.8	3.41	2.52	HvH-Ab-111031-07
Assessment of the additional offered batteries											
FAF5260A	NNTN7033A	PMLN5325B	PMLN5275C	450.000	5.61	-0.19	9.55	7.06	5.07	3.75	HvH-Ab-111031-08

13.1.9 Assessments at the Body with Body worn PMLN5326B

Assessment of offered antennas with the default battery and body worn PMLN5326B, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 12 for highest output power channel.

TABLE 21

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7034A	PMLN5326B	PMLN5275C	450.000							
				460.000							
				470.000	5.74	-0.38	5.39	4	**2.94**	2.18	HvH-Ab-111031-09
FAF5259A	NNTN7034A	PMLN5326B	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.74	-0.26	3.81	2.83	2.02	1.50	HvH-Ab-111031-10
PMAE4065A	NNTN7034A	PMLN5326B	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.71	-0.18	3.79	2.81	1.98	1.46	HvH-Ab-111101-02
Assessment of the additional offered batteries											
FAF5260A	NNTN7033A	PMLN5326B	PMLN5275C	470.000	5.72	0.18	4.87	3.6	2.44	1.80	HvH-Ab-111101-03

13.1.10 Assessments at the Body with Body worn PMLN5327B

Assessment of offered antennas with the default battery, body worn PMLN5327B, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 12 for highest output power channel.

TABLE 22

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7034A	PMLN5327B	PMLN5275C	450.000							
				460.000							
				470.000	5.74	-0.3	3.4	2.53	**1.82**	1.36	HvH-Ab-111101-04
FAF5259A	NNTN7034A	PMLN5327B	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.74	-0.21	2.75	2.05	1.44	1.08	HvH-Ab-111101-05
PMAE4065A	NNTN7034A	PMLN5327B	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.74	-0.21	2.45	1.83	1.29	0.96	HvH-Ab-111101-06
Assessment of the additional offered batteries											
FAF5260A	NNTN7033A	PMLN5327B	PMLN5275C	470.000	5.73	-0.46	2.94	1.55	1.63	0.86	HvH-Ab-111101-07

13.1.11 Assessments at the Body with Body worn PMLN5328B

Assessment of offered antennas with the default battery, body worn PMLN5328B, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 12 for highest output power channel.

TABLE 23

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7037A	PMLN5328B	PMLN5275C	450.000	5.67	-0.51	8.58	6.35	4.85	3.59	HvH-Ab-111101-10
				460.000	5.67	-0.49	7.97	5.89	4.48	3.31	HvH-Ab-111101-09
				470.000	5.74	-0.43	7.34	5.4	4.05	2.98	HvH-Ab-111101-08
FAF5259A	NNTN7037A	PMLN5328B	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.74	-0.2	5.54	4.08	2.90	2.14	HvH-Ab-111101-11
PMAE4065A	NNTN7037A	PMLN5328B	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.72	-0.26	5.81	4.27	3.08	2.27	HvH-Ab-111102-02
Assessment of the additional offered batteries											
FAF5260A	NNTN7036A	PMLN5328B	PMLN5275C	450.000	5.62	-0.6	8.37	6.17	**4.87**	3.59	HvH-Ab-111102-03

13.1.12 Assessments at the Body with Body worn PMLN5329B

Assessment of offered antennas with the default battery, body worn PMLN5329B, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 12 for highest output power channel.

TABLE 24

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7037A	PMLN5329B	PMLN5275C	450.000							
				460.000							
				470.000	5.74	-0.34	5.46	4.02	2.95	2.17	HvH-Ab-111102-04
FAF5259A	NNTN7037A	PMLN5329B	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.73	-0.45	4.35	3.21	2.41	1.78	HvH-Ab-111102-05
PMAE4065A	NNTN7037A	PMLN5329B	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.74	-0.11	4.2	3.09	2.15	1.58	HvH-Ab-111102-06
Assessment of the additional offered batteries											
FAF5260A	NNTN7036A	PMLN5329B	PMLN5275C	470.000	5.73	-0.46	5.53	4.06	**3.07**	2.26	HvH-Ab-111102-07

13.1.13 Assessments at the Body with Body worn PMLN5330B

Assessment of offered antennas with the default battery, body worn PMLN5330B, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 12 for highest output power channel.

TABLE 25

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7037A	PMLN5330B	PMLN5275C	450.000							
				460.000							
				470.000	5.71	-0.42	3.51	2.59	1.93	1.43	HvH-Ab-111105-02
FAF5259A	NNTN7037A	PMLN5330B	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.73	-0.46	3.17	2.35	1.76	1.31	HvH-Ab-111105-03
PMAE4065A	NNTN7037A	PMLN5330B	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.74	-0.43	2.83	2.1	1.56	1.16	HvH-Ab-111105-04
Assessment of the additional offered batteries											
FAF5260A	NNTN7036A	PMLN5330B	PMLN5275C	470.000	5.71	-0.43	3.75	2.78	**2.07**	1.53	HvH-Ab-111105-05

13.1.14 Assessments at the Body with Body worn RLN6459A

Assessment of offered antennas with the default battery, body worn RLN6459A, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 12 for highest output power channel.

TABLE 26

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7034A	RLN6459A	PMLN5275C	450.000							
				460.000							
				470.000	5.74	-0.35	2.25	1.7	1.22	0.92	HvH-Ab-111105-06
FAF5259A	NNTN7034A	RLN6459A	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.74	-0.096	1.57	1.18	0.80	0.60	HvH-Ab-111105-07
PMAE4065A	NNTN7034A	RLN6459A	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.74	-0.24	1.43	1.08	0.76	0.57	HvH-Ab-111105-08
Assessment of the additional offered batteries											
FAF5260A	NNTN7033A	RLN6459A	PMLN5275C	470.000	5.73	-0.35	2.36	1.78	**1.28**	0.96	HvH-Ab-111105-09

13.1.15 Assessments at the Body with Body worn PMLN5322B/NTN5243A

Assessment of offered antennas with the default battery body worn PMLN5322B/NTN5243A, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 12 for highest output power channel.

TABLE 27

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	PMNN4403A	PMLN5322B NTN5243A	PMLN5275C	450.000	5.65	-0.16	9.8	7.22	5.13	3.78	HvH-Ab-111105-12
				460.000	5.65	-0.12	9.03	6.66	4.68	3.45	HvH-Ab-111105-11
				470.000	5.73	-0.33	8.71	6.4	4.70	3.45	HvH-Ab-111105-10
FAF5259A	PMNN4403A	PMLN5322B NTN5243A	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.73	-0.11	5.17	3.8	2.65	1.95	HvH-Ab-111105-13
PMAE4065A	PMNN4403A	PMLN5322B NTN5243A	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.71	-0.18	6.18	4.55	3.22	2.37	HvH-Ab-111107-02
Assessment of the additional offered batteries											
FAF5260A	NNTN8092A	PMLN5322B NTN5243A	PMLN5275C	450.000	5.61	-0.18	10.8	7.95	**5.72**	4.21	HvH-Ab-111107-03
	NNTN7038A				5.62	-0.11	10.5	7.78	5.46	4.05	HvH-Ab-111107-04

13.1.16 Assessments at the Body with Body worn PMLN5323B/NTN5243A

Assessment of offered antennas with the default battery, body worn PMLN5323B/NTN5243A, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 12 for highest output power channel.

TABLE 28

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	PMNN4403A	PMLN5323B NTN5243A	PMLN5275C	450.000							
				460.000							
				470.000	5.70	-0.18	5.95	4.4	3.10	2.29	HvH-Ab-111107-05
FAF5259A	PMNN4403A	PMLN5323B NTN5243A	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.74	-0.068	3.46	2.57	1.76	1.31	HvH-Ab-111107-06
PMAE4065A	PMNN4403A	PMLN5323B NTN5243A	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.74	-0.21	3.94	2.92	2.07	1.53	HvH-Ab-111107-07
Assessment of the additional offered batteries											
FAF5260A	NNTN8092A	PMLN5323B NTN5243A	PMLN5275C	470.000	5.72	-0.29	6.13	4.53	**3.28**	2.42	HvH-Ab-111107-08
	NNTN7038A			470.000	5.72	-0.16	5.86	4.32	3.04	2.24	HvH-Ab-111107-09

13.1.17 Assessments at the Body with Body worn PMLN5324B/NTN5243A

Assessment of offered antennas with the default battery, body worn PMLN5324B/NTN5243A, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 12 for highest output power channel.

TABLE 29

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	PMNN4403A	PMLN5324B NTN5243A	PMLN5275C	450.000	5.64	0.084	7.78	5.24	3.93	2.65	HvH-Ab-111107-11
				460.000							
				470.000	5.72	-0.13	6.97	4.79	3.59	2.47	HvH-Ab-111107-10
FAF5259A	PMNN4403A	PMLN5324B NTN5243A	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.71	0.056	4.18	2.85	2.09	1.43	HvH-Ab-111108-02
PMAE4065A	PMNN4403A	PMLN5324B NTN5243A	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.70	-0.28	5.05	3.53	2.69	1.88	HvH-Ab-111108-03
Assessment of the additional offered batteries											
FAF5260A	NNTN8092A	PMLN5324B NTN5243A	PMLN5275C	450.000	5.63	-0.16	7.86	5.58	4.13	2.93	HvH-Ab-111108-04
	NNTN7038A				5.64	-0.12	7.97	5.54	**4.14**	2.88	HvH-Ab-111108-05

13.1.18 Assessments at the Body with Body worn PMLN5560B/ NTN5243A

Assessment of offered antennas with the default battery, body worn PMLN5560B/ NTN5243A, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 12 for highest output power channel.

TABLE 30

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	PMNN4403A	PMLN5560B NTN5243A	PMLN5275C	450.000							
				460.000							
				470.000	5.73	-0.097	4.42	3.32	2.26	1.70	HvH-Ab-111108-06
FAF5259A	PMNN4403A	PMLN5560B NTN5243A	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.73	-0.044	2.71	1.97	1.37	1.00	HvH-Ab-111108-07
PMAE4065A	PMNN4403A	PMLN5560B NTN5243A	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.74	-0.065	1.33	0.961	0.68	0.49	HvH-Ab-111108-08
Assessment of the additional offered batteries											
FAF5260A	NNTN8092A	PMLN5560B NTN5243A	PMLN5275C	470.000	5.73	-0.21	4.36	3.27	2.29	1.72	HvH-Ab-111108-09
	NNTN7038A				5.73	-0.1	4.56	3.42	**2.33**	1.75	HvH-Ab-111108-10

13.1.19 Assessments at the Body with Body worn PMLN5325B/ NTN5243A

Assessment of offered antennas with the default battery, body worn PMLN5325B/ NTN5243A, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 12 for highest output power channel.

TABLE 31

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7034A	PMLN5325B NTN5243A	PMLN5275C	450.000	5.66	-0.24	8.72	6.44	**4.64**	3.43	HvH-Ab-111109-03
				460.000	5.65	-0.26	8.11	5.99	4.34	3.21	HvH-Ab-111109-02
				470.000	5.75	-0.38	8.25	6.1	4.50	3.33	HvH-Ab-111108-11
FAF5259A	NNTN7034A	PMLN5325B NTN5243A	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.75	-0.18	5.32	3.93	2.77	2.05	HvH-Ab-111109-04
PMAE4065A	NNTN7034A	PMLN5325B NTN5243A	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.75	-0.21	5.98	4.39	3.14	2.30	HvH-Ab-111109-05
Assessment of the additional offered batteries											
FAF5260A	NNTN7033A	PMLN5325B NTN5243A	PMLN5275C	450.000	5.62	-0.23	8.59	6.36	4.59	3.40	HvH-Ab-111109-06

13.1.20 Assessments at the Body with Body worn PMLN5326B/ NTN5243A

Assessment of offered antennas with the default battery, body worn PMLN5326B/ NTN5243A, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 12 for highest output power channel.

TABLE 32

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7034A	PMLN5326B NTN5243A	PMLN5275C	450.000							
				460.000							
				470.000	5.74	-0.36	5.44	4.03	**2.96**	2.19	CM-Ab-111109-07
FAF5259A	NNTN7034A	PMLN5326B NTN5243A	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.75	-0.35	4.32	3.19	2.34	1.73	CM-Ab-111109-08
PMAE4065A	NNTN7034A	PMLN5326B NTN5243A	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.74	-0.25	4.31	3.19	2.28	1.69	CM-Ab-111109-10
Assessment of the additional offered batteries											
FAF5260A	NNTN7033A	PMLN5326B NTN5243A	PMLN5275C	470.000	5.73	0.2	5.11	3.78	2.56	1.89	CM-Ab-111109-11

13.1.21 Assessments at the Body with Body worn PMLN5327B/ NTN5243A

Assessment of offered antennas with the default battery, body worn PMLN5327B/ NTN5243A, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 12 for highest output power channel.

TABLE 33

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7034A	PMLN5327B NTN5243A	PMLN5275C	450.000	5.65	-0.17	8.58	5.84	4.50	3.06	ErC-Ab-111110-03
				460.000	5.67	-0.32	8.33	5.58	**4.51**	3.02	ErC-Ab-111110-02
				470.000	5.73	-0.41	8.16	5.2	4.48	2.86	CM-Ab-111109-13
FAF5259A	NNTN7034A	PMLN5327B NTN5243A	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.77	-0.32	5.26	3.38	2.83	1.82	ErC-Ab-111110-04
PMAE4065A	NNTN7034A	PMLN5327B NTN5243A	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.76	-0.32	5.68	3.5	3.06	1.88	HvH-Ab-111110-05
Assessment of the additional offered batteries											
FAF5260A	NNTN7033A	PMLN5327B NTN5243A	PMLN5275C	460.000	5.66	-0.032	7.1	4.65	3.60	2.36	HvH-Ab-111110-06

13.1.22 Assessments at the Body with Body worn PMLN5328B/ NTN5243A

Assessment of offered antennas with the default battery, body worn PMLN5328B/ NTN5243A, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 12 for highest output power channel.

TABLE 34

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7037A	PMLN5328B NTN5243A	PMLN5275C	450.000	5.67	-0.69	7.75	5.73	**4.57**	3.38	ErC-Ab-111110-08
				460.000							
				470.000	5.75	-0.57	6.97	5.12	3.97	2.92	ErC-Ab-111110-07
FAF5259A	NNTN7037A	PMLN5328B NTN5243A	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.77	-0.51	5.36	3.94	3.01	2.22	ErC-Ab-111110-09
PMAE4065A	NNTN7037A	PMLN5328B NTN5243A	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.76	-0.2	6.05	4.45	3.17	2.33	ErC-Ab-111110-10
Assessment of the additional offered batteries											
FAF5260A	NNTN7036A	PMLN5328B NTN5243A	PMLN5275C	450.000	5.67	-0.61	7.54	5.57	4.36	3.22	ErC-Ab-111110-11

13.1.23 Assessments at the Body with Body worn PMLN5329B/ NTN5243A

Assessment of offered antennas with the default battery, body worn PMLN5329B/ NTN5243A, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 12 for highest output power channel.

TABLE 35

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7037A	PMLN5329B NTN5243A	PMLN5275C	450.000							
				460.000							
				470.000	5.76	-0.48	5.22	3.85	2.92	2.15	CM-Ab-111110-12
FAF5259A	NNTN7037A	PMLN5329B NTN5243A	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.75	-0.43	4.63	3.41	2.56	1.88	CM-Ab-111110-13
PMAE4065A	NNTN7037A	PMLN5329B NTN5243A	PMLN5275C	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.75	-0.35	4.16	3.08	2.25	1.67	CM-Ab-111110-14
Assessment of the additional offered batteries											
FAF5260A	NNTN7036A	PMLN5329B NTN5243A	PMLN5275C	470.000	5.74	-0.48	5.44	4.01	**3.04**	2.24	CM-Ab-111110-15

13.1.24 Assessments at the Body with Body worn PMLN5330B/ NTN5243A

Assessment of offered antennas with the default battery, body worn PMLN5330B/ NTN5243A, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 12 for highest output power channel.

.

TABLE 36

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7037A	PMLN5330B NTN5243A	PMLN5275C	450.000	5.65	-0.65	9.24	5.13	**5.41**	3.01	CM-Ab-111110-18
				460.000	5.68	-0.49	9.59	5.02	5.39	2.82	CM-Ab-111110-17
				470.000	5.75	-0.42	9.34	4.92	5.14	2.71	CM-Ab-111110-16
FAF5259A	NNTN7037A	PMLN5330B NTN5243A	PMLN5275C	406.125	5.65	-0.1	7.34	4.79	3.79	2.47	ErC-Ab-111111-04
				422.100	5.65	-0.09	7.94	4.83	4.09	2.49	ErC-Ab-111111-03
				438.100	5.65	-0.21	7.65	4.64	4.05	2.46	ErC-Ab-111111-02
				454.000	5.62	-0.22	7.94	4.31	4.24	2.30	CM-Ab-111110-20
				470.000	5.76	-0.38	7.5	3.86	4.09	2.11	CM-Ab-111110-19
PMAE4065A	NNTN7037A	PMLN5330B NTN5243A	PMLN5275C	406.125	5.63	-0.11	6.68	4.36	3.47	2.26	ErC-Ab-111111-09
				422.100	5.65	-0.04	6.98	4.46	3.55	2.27	ErC-Ab-111111-08
				438.100	5.65	-0.09	7.9	4.71	4.07	2.43	ErC-Ab-111111-07
				454.000	5.64	-0.09	8.65	4.91	4.46	2.53	ErC-Ab-111111-06
				470.000	5.75	-0.34	7.86	4.29	4.25	2.32	ErC-Ab-111111-05
Assessment of the additional offered batteries											
FAF5260A	NNTN7036A	PMLN5330B NTN5243A	PMLN5275C	450.000	5.64	-0.64	9.15	5.06	5.36	2.96	ErC-Ab-111111-10
FAF5259A	NNTN7036A	PMLN5330B NTN5243A	PMLN5275C	454.000	5.62	-0.15	8.34	4.5	4.38	2.36	HvH-Ab-111114-05
PMAE4065A	NNTN7036A	PMLN5330B NTN5243A	PMLN5275C	454.000	5.61	-0.27	8.61	4.55	4.65	2.46	HvH-Ab-111114-06

13.1.25 Assessments at the Body with additional audio accessories

Testing additional audio accessories per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for audio accessories without Integral antenna.

TABLE 37

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
FAF5260A	NNTN8092A	PMLN5322B NTN5243A	BDN6731A BDN6783A	450.000	5.62	-0.23	10.3	7.59	5.51	4.06	HvH-Ab-111114-07
			BDN6732A BDN6783A		5.60	-0.21	9.79	7.24	5.23	3.87	HvH-Ab-111114-08
			BDN6780A BDN6783A		5.62	-0.23	9.86	7.28	5.27	3.89	HvH-Ab-111114-09
			HMN4104B		5.63	-0.19	9.6	7.08	5.08	3.74	HvH-Ab-111114-10
			HMN4104B RMN5116A		5.63	-0.069	9.08	6.69	4.67	3.44	HvH-Ab-111114-11
			NNTN7869A ZMN6031A		5.62	-0.14	9.16	6.76	4.80	3.54	HvH-Ab-111114-12
			NNTN7869A ZMN6032A		5.62	0.065	8.34	6.14	4.23	3.11	HvH-Ab-111114-13
			PMLN5101A		5.57	-0.2	9.31	6.88	4.99	3.69	CM-Ab-111114-19
			PMLN5111A		5.59	-0.25	9.9	7.32	5.35	3.95	CM-Ab-111114-20
			PMMN4024A		5.60	-0.22	10.1	7.47	5.41	4.00	ErC-Ab-111115-02
			PMMN4062A		5.63	-0.26	10.6	7.84	5.70	4.21	ErC-Ab-111115-03
			PMMN4065A		5.64	-0.25	10.1	7.44	5.41	3.98	ErC-Ab-111115-04
			RLN5882A		5.61	-0.17	9.76	7.2	5.16	3.80	ErC-Ab-111115-05
			RMN5058A		5.64	-0.27	9.82	7.28	5.28	3.91	ErC-Ab-111115-06
			None		5.65	-0.28	12.37	9.18	**6.66**	4.94	CM-Ab-111116-12
			None	460.000	5.65	-0.27	11.1	8.23	5.96	4.42	ErC-Ab-111115-08

13.1.26 Assessments at the Body for frequencies outside FCC part 90

Assessment at the Body for frequencies outside FCC part 90, using highest SAR test configuration from tables 13 thru 37 above for each of the applicable offered antennas.

TABLE 38

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
FAF5259A	NNTN8092A	PMLN5322B NTN5243A	None	380.000	5.60	-0.87	6.63	4.92	4.12	3.06	ErC-Ab-111116-08
				393.100	5.62	-0.9	7.17	5.31	4.47	3.31	CM-Ab-111116-09
PMAE4065A	NNTN8092A	PMLN5322B NTN5243A	None	380.000	5.58	-0.41	8.02	5.94	**4.50**	3.33	CM-Ab-111116-10
				393.100	5.65	-0.39	8.05	5.97	4.44	3.29	CM-Ab-111116-11

13.1.27 Assessments at the Shoulder with Public Safety Microphones (PSM)

The battery NNTN7034A was selected as the default battery for assessments of the PSM since it is the highest capacity battery (refers to Exhibit 7B for the dimension of the battery). The conducted power measurement for all test channels within part 90 frequency range using the default battery NNTN7034A is indicated in table 39. The channel with the highest conducted power will be identified as the default channel per KDB 643646 D01 SAR Test for PTT Radios v01r01. SAR plots of the highest results per table (bolded) are presented in appendices E-G.

TABLE 39

Test Freq (MHz)	Power (W)
406.125	5.46
422.100	5.46
438.100	5.47
454.000	5.45
470.000	5.55

Assessment of offered Public Safety Microphones PMMN4059B, PMMN4060B, and PMMN4061B with the applicable antenna and default battery per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for audio accessories with Integral antenna. Refer to table 39 for highest output power channel.

TABLE 40

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
PMAE4065A	NNTN7034A	4205823V08	PMMN4059B	406.100	5.65	-0.097	6.29	4.22	3.24	2.18	HvH-Ab-110616-15
				422.100	5.66	0.021	6.6	4.7	3.32	2.37	HvH-Ab-110616-14
				438.100	5.68	-0.024	9.03	6.46	**4.56**	3.26	HvH-Ab-110616-13
				454.000							
				470.000	5.70	-0.14	7.24	5.17	3.74	2.67	HvH-Ab-110616-12
PMAE4065A	NNTN7034A	4205823V08	PMMN4060B	406.125	5.57	0.0069	6.27	4.13	3.21	2.11	HvH-Ab-111021-08
				422.100							
				438.100	5.66	-0.084	6.91	4.39	3.55	2.25	ErC-Ab-110617-02
				454.000	5.70	-0.12	7.44	4.56	3.82	2.34	HvH-Ab-110616-17
				470.000	5.69	-0.37	7.7	5.23	4.20	2.85	HvH-Ab-110616-16
PMAE4065A	NNTN7034A	4205823V08	PMMN4061B	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.69	-0.37	6	4.24	3.27	2.31	HvH-Ab-111021-09

Assessment at the Shoulder with PSM for frequencies outside FCC part 90, using highest SAR test configuration from table 40 above.

TABLE 41

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
PMAE4065A	NNTN7034A	4205823V08	PMMN4059B	380.000	5.57	-0.72	6.81	4.03	**4.11**	2.43	CM-Ab-111115-15
				393.100	5.59	-0.21	6.92	4.27	3.70	2.28	CM-Ab-111115-16

13.2 Assessments at the Face for 380 – 470 MHz band

The highest capacity battery NNTN7034A was selected as the default battery. The conducted power measurement for all test channels within Part 90 frequency range using battery NNTN7034A is listed in the Table 42. The channel with the highest conducted power was used as the default channel per KDB 643646 D01 SAR Test for PTT Radios v01r01. SAR plots of the highest results per table (bolded) are presented in appendices E-G.

TABLE 42

Test Freq (MHz)	Power (W)
406.125	5.44
422.100	5.44
438.100	5.45
450.000	5.44
454.000	5.45
460.000	5.47
470.000	5.54

13.2.1 Assessments at the Face (DUT Front)

Assessment of each of the offered antennas with the default battery NNTN7034A, front of DUT facing phantom, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Head SAR Test Considerations. Refer to table 42 for highest output power channel.

TABLE 43

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7034A	None, Front @ 2.5cm	None	450.000							
				460.000							
				470.000	5.61	-0.45	4.02	3.05	2.27	1.72	HvH-Face-111019-05
FAF5259A	NNTN7034A	None, Front @ 2.5cm	None	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.6	-0.33	2.51	1.91	1.38	1.05	HvH-Face-111019-07
PMAE4065A	NNTN7034A	None, Front @ 2.5cm	None	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.65	-0.2	2.72	2.07	1.44	1.09	HvH-Face-111019-08
Assessment of the additional offered batteries											
FAF5260A	NNTN8092A	None, Front @ 2.5cm	None	470.000	5.61	-0.17	4.71	3.55	2.49	1.88	HvH-Face-111019-09
	NNTN7038A				5.63	-0.34	4.85	3.66	2.66	2.00	HvH-Face-111019-10
	NNTN7033A				5.62	-0.11	3.76	2.86	1.96	1.49	HvH-Face-111020-02
	PMNN4403A				5.65	-0.14	5.54	4.17	**2.89**	2.17	HvH-Face-111020-03
	NNTN7037A				5.66	-0.29	4.18	3.15	2.25	1.70	HvH-Face-111020-04
	NNTN7036A				5.65	-0.31	4.24	3.19	2.30	1.73	HvH-Face-111020-05

13.2.2 Assessments at the Face (DUT Back)

Assessment of each of the offered antennas with the default battery NNTN7034A, back of DUT facing phantom, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Head SAR Test Considerations. Refer to table 42 for highest output power channel.

TABLE 44

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7034A	None, Back @ 2.5cm	None	450.000							
				460.000							
				470.000	5.8	-0.25	6.13	4.52	**3.25**	2.39	ErC-Face-111116-07
FAF5259A	NNTN7034A	None, Back @ 2.5cm	None	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.67	-0.32	3.41	2.56	1.85	1.39	HvH-Face-111020-08
PMAE4065A	NNTN7034A	None, Back @ 2.5cm	None	406.125							
				422.100							
				438.100							
				454.000							
				470.000	5.68	-0.24	3.64	2.73	1.93	1.45	HvH-Face-111020-09
Assessment of the additional offered batteries											
FAF5260A	NNTN8092A	None, Back @ 2.5cm	None	470.000	5.66	-0.17	5.82	4.36	3.05	2.28	HvH-Face-111021-02
	NNTN7038A				5.68	-0.19	5.73	4.29	3.00	2.25	HvH-Face-111021-03
	NNTN7033A				5.67	-0.02	5.4	4.03	2.73	2.04	HvH-Face-111021-04
	PMNN4403A				5.68	-0.23	5.77	4.32	3.05	2.29	HvH-Face-111021-05
	NNTN7037A				5.67	-0.34	4.68	3.48	2.54	1.89	HvH-Face-111021-06
	NNTN7036A				5.64	-0.36	4.6	3.43	2.53	1.88	HvH-Face-111021-07

13.2.3 Assessments at the Face for frequencies outside FCC part 90

Assessment at the Face for frequencies outside FCC part 90, using highest SAR test configuration from tables 43 – 44 above for each of the applicable offered antennas.

TABLE 45

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
FAF5259A	NNTN7034A	None, Back @ 2.5cm	None	380.0000	5.56	1.11	4.09	2.99	2.10	1.53	ErC-Face-111116-03
				393.1000	5.6	-0.19	3.76	2.77	2.00	1.47	ErC-Face-111116-04
PMAE4065A	NNTN7034A	None, Back @ 2.5cm	None	380.0000	5.58	0.64	4.08	3.02	2.08	1.54	ErC-Face-111116-05
				393.1000	5.63	-0.39	4.34	3.23	**2.40**	1.79	ErC-Face-111116-06

13.3 Assessments at the Body for 470 – 520 MHz band

The battery PMNN4403A was selected as the default battery for assessments at the Body since it is the thinnest battery (refers to Exhibit 7B for the dimension of the battery). The conducted power measurement for all test channels within part 90 frequency range using the default battery PMNN4403A is indicated in table 46. The channel with the highest conducted power will be identified as the default channel per KDB 643646 D01 SAR Test for PTT Radios v01r01. SAR plots of the highest results per table (bolded) are presented in appendices E-G.

TABLE 46

Test Freq (MHz)	Power (W)
470.000	5.53
484.000	5.37
498.000	5.36
512.000	5.37

13.3.1 Assessments at the Body with Body worn HLN6875A

Assessment of offered antennas with the default battery, body worn HLN6875A, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 46 for highest output power channel.

TABLE 47

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	PMNN4403A	HLN6875A	PMLN5275C	470.000	5.66	-0.13	6.82	5.02	3.54	2.60	HvH-Ab-110528-04
				484.000							
				498.000							
				512.000	5.57	-0.16	6.1	4.47	3.24	2.37	HvH-Ab-110531-04
PMAE4065A	PMNN4403A	HLN6875A	PMLN5275C	470.000	5.66	-0.59	4.31	3.17	2.49	1.83	HvH-Ab-110528-19
				484.000							
				498.000							
				512.000							
Assessment of the additional offered batteries											
FAF5260A	NNTN8092A	HLN6875A	PMLN5275C	470.000	5.97	-0.16	7.58	5.61	**3.93**	2.91	CM-Ab-111213-02
	NNTN7038A				5.7	-0.17	6.85	5.05	3.56	2.63	HvH-Ab-110609-16
	NNTN7033A				5.67	0.58	6.36	3.14	3.20	1.58	HvH-Ab-110610-02
	NNTN7034A				5.68	-0.32	6.78	4.99	3.66	2.70	HvH-Ab-110610-03
	NNTN7037A				5.64	-0.44	5.45	3.16	3.05	1.77	HvH-Ab-110610-04
	NNTN7036A				5.64	-0.39	5.79	3.31	3.20	1.83	HvH-Ab-110610-05

13.3.2 Assessments at the Body with Body worn RLN6458A

Assessment of offered antennas with the default battery, body worn RLN6458A, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 46 for highest output power channel.

TABLE 48

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	PMNN4403A	RLN6458A	PMLN5275C	470.000	5.86	-0.023	2.67	2.01	1.34	1.01	ErC-Ab-111021-06
				484.000							
				498.000							
				512.000							
PMAE4065A	PMNN4403A	RLN6458A	PMLN5275C	470.000	5.88	-0.1	1.69	1.28	0.86	0.65	ErC-Ab-111021-07
				484.000							
				498.000							
				512.000							
Assessment of the additional offered batteries											
FAF5260A	NNTN8092A	RLN6458A	PMLN5275C	470.000	5.9	-0.074	2.68	2.03	**1.36**	1.03	ErC-Ab-111021-09
	NNTN7038A				5.9	-0.056	2.57	1.95	1.30	0.99	ErC-Ab-111021-10

13.3.3 Assessments at the Body with Body worn NTN9179A

Assessment of offered antennas with the default battery, body worn NTN9179A, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 46 for highest output power channel.

TABLE 49

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	PMNN4403A	NTN9179A	PMLN5275C	470.000	5.85	-0.0092	4.87	3.66	2.44	1.83	ErC-Ab-111025-02
				484.000							
				498.000							
				512.000							
PMAE4065A	PMNN4403A	NTN9179A	PMLN5275C	470.000	5.84	-0.02	3.13	2.36	1.57	1.19	ErC-Ab-111025-03
				484.000							
				498.000							
				512.000							
Assessment of the additional offered batteries											
FAF5260A	NNTN8092A	NTN9179A	PMLN5275C	470.000	5.84	-0.097	5.07	3.82	2.59	1.95	ErC-Ab-111025-04
	NNTN7038A				5.86	0.063	5.42	4.08	2.71	2.04	ErC-Ab-111025-05
	NNTN7033A				5.83	0.49	5.85	4.4	2.93	2.20	ErC-Ab-111025-06
	NNTN7034A				5.85	-0.15	6.69	5.07	3.46	2.62	ErC-Ab-111025-07
	NNTN7037A				5.85	-0.56	6.28	4.71	**3.57**	2.68	ErC-Ab-111025-08
	NNTN7036A				5.84	-0.56	6.06	4.54	3.45	2.58	ErC-Ab-111025-09

13.3.4 Assessments at the Body with Body worn PMLN5322B

Assessment of offered antennas with the default battery, body worn PMLN5322B, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 46 for highest output power channel.

TABLE 50

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	PMNN4403A	PMLN5322B	PMLN5275C	470.000	5.88	-0.07	8.41	6.25	**4.27**	3.18	ErC-Ab-111025-10
				484.000	5.73	-0.14	8.13	6.03	4.20	3.11	CM-Ab-111025-11
				498.000							
				512.000	5.85	-0.11	6.28	4.65	3.22	2.38	CM-Ab-111104-14
PMAE4065A	PMNN4403A	PMLN5322B	PMLN5275C	470.000	5.93	-0.11	5.72	4.26	2.93	2.18	CM-Ab-111025-14
				484.000							
				498.000							
				512.000							
Assessment of the additional offered batteries											
FAF5260A	NNTN8092A	PMLN5322B	PMLN5275C	470.000	5.98	-0.15	7.5	5.56	3.88	2.88	CM-Ab-111104-15
	NNTN7038A				5.99	-0.13	7.62	5.65	3.93	2.91	CM-Ab-111104-16

13.3.5 Assessments at the Body with Body worn PMLN5323B

Assessment of offered antennas with the default battery, body worn PMLN5323B, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 46 for highest output power channel.

TABLE 51

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	PMNN4403A	PMLN5323B	PMLN5275C	470.000	5.91	0.056	4.83	3.62	2.42	1.81	CM-Ab-111025-17
				484.000							
				498.000							
				512.000							
PMAE4065A	PMNN4403A	PMLN5323B	PMLN5275C	470.000	5.9	-0.11	3.9	2.91	2.00	1.49	CM-Ab-111025-19
				484.000							
				498.000							
				512.000							
Assessment of the additional offered batteries											
FAF5260A	NNTN8092A	PMLN5323B	PMLN5275C	470.000	5.85	-0.0016	5.4	4.01	**2.70**	2.01	ErC-Ab-111026-02
	NNTN7038A				5.88	0.058	5.1	3.8	2.55	1.90	ErC-Ab-111026-03

13.3.6 Assessments at the Body with Body worn PMLN5324B

Assessment of offered antennas with the default battery, body worn PMLN5324B, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 46 for highest output power channel.

TABLE 52

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	PMNN4403A	PMLN5324B	PMLN5275C	470.000	5.89	-0.077	2.36	1.79	1.20	0.91	ErC-Ab-111026-04
				484.000							
				498.000							
				512.000							
PMAE4065A	PMNN4403A	PMLN5324B	PMLN5275C	470.000	5.92	0.04	1.71	1.29	0.86	0.65	ErC-Ab-111026-05
				484.000							
				498.000							
				512.000							
Assessment of the additional offered batteries											
FAF5260A	NNTN8092A	PMLN5324B	PMLN5275C	470.000	5.89	-0.0049	2.4	1.82	1.20	0.91	ErC-Ab-111026-06
	NNTN7038A				5.89	0.02	2.43	1.84	**1.22**	0.92	ErC-Ab-111026-07

13.3.7 Assessments at the Body with Body worn PMLN5560B

Assessment of offered antennas with the default battery, body worn PMLN5560B, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 46 for highest output power channel.

TABLE 53

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	PMNN4403A	PMLN5560B	PMLN5275C	470.000	5.94	-0.05	1.93	1.48	**0.98**	0.75	ErC-Ab-111026-08
				484.000							
				498.000							
				512.000							
PMAE4065A	PMNN4403A	PMLN5560B	PMLN5275C	470.000	5.93	-0.24	1.27	0.964	0.67	0.51	CM-Ab-111026-09
				484.000							
				498.000							
				512.000							
Assessment of the additional offered batteries											
FAF5260A	NNTN8092A	PMLN5560B	PMLN5275C	470.000	5.9	-0.089	1.88	1.43	0.96	0.73	CM-Ab-111026-10
	NNTN7038A				5.95	-0.034	1.88	1.43	0.95	0.72	CM-Ab-111026-11

13.3.8 Assessments at the Body with Body worn PMLN5325B

Assessment of offered antennas with the default battery, body worn PMLN5325B, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 46 for highest output power channel.

TABLE 54

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7034A	PMLN5325B	PMLN5275C	470.000	5.97	-0.18	9.13	6.75	4.76	3.52	CM-Ab-111026-12
				484.000	5.82	-0.22	9.22	6.82	**4.85**	3.59	CM-Ab-111026-13
				498.000	5.74	-0.25	8.66	6.43	4.59	3.41	ErC-Ab-111027-03
				512.000	5.74	-0.11	8.53	6.28	4.37	3.22	ErC-Ab-111027-02
PMAE4065A	NNTN7034A	PMLN5325B	PMLN5275C	470.000	5.9	-0.11	6.51	4.81	3.34	2.47	ErC-Ab-111027-05
				484.000							
				498.000							
				512.000							
Assessment of the additional offered batteries											
FAF5260A	NNTN7033A	PMLN5325B	PMLN5275C	484.000	5.76	-0.24	7.94	5.87	4.20	3.10	ErC-Ab-111027-06

13.3.9 Assessments at the Body with Body worn PMLN5326B

Assessment of offered antennas with the default battery, body worn PMLN5326B, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 46 for highest output power channel.

TABLE 55

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7034A	PMLN5326B	PMLN5275C	470.000	5.83	-0.2	5.44	4.06	**2.85**	2.13	ErC-Ab-111027-07
				484.000							
				498.000							
				512.000							
PMAE4065A	NNTN7034A	PMLN5326B	PMLN5275C	470.000	5.92	-0.24	4.03	3	2.13	1.59	ErC-Ab-111027-09
				484.000							
				498.000							
				512.000							
Assessment of the additional offered batteries											
FAF5260A	NNTN7033A	PMLN5326B	PMLN5275C	470.000	5.9	0.31	5.19	3.87	2.60	1.94	ErC-Ab-111027-10

13.3.10 Assessments at the Body with Body worn PMLN5327B

Assessment of offered antennas with the default battery, body worn PMLN5327B, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 46 for highest output power channel.

TABLE 56

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7034A	PMLN5327B	PMLN5275C	470.000	5.91	-0.14	3.33	2.53	**1.72**	1.31	ErC-Ab-111027-11
				484.000							
				498.000							
				512.000							
PMAE4065A	NNTN7034A	PMLN5327B	PMLN5275C	470.000	5.95	-0.43	2.52	1.89	1.39	1.04	CM-Ab-111027-13
				484.000							
				498.000							
				512.000							
Assessment of the additional offered batteries											
FAF5260A	NNTN7033A	PMLN5327B	PMLN5275C	470.000	5.96	0.59	3.05	2.29	1.53	1.15	CM-Ab-111027-14

13.3.11 Assessments at the Body with Body worn PMLN5328B

Assessment of offered antennas with the default battery, body worn PMLN5328B, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 46 for highest output power channel.

TABLE 57

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7037A	PMLN5328B	PMLN5275C	470.000	5.95	-0.63	7.53	5.57	4.35	3.22	CM-Ab-111027-15
				484.000	5.84	-0.51	7.37	5.42	4.14	3.05	CM-Ab-111027-16
				498.000	5.83	-0.42	7.71	5.7	4.25	3.14	CM-Ab-111027-18
				512.000	5.82	-0.13	7.96	5.86	4.10	3.02	CM-Ab-111027-17
PMAE4065A	NNTN7037A	PMLN5328B	PMLN5275C	470.000	5.95	-0.56	6.13	4.53	3.49	2.58	CM-Ab-111027-19
				484.000							
				498.000							
				512.000							
Assessment of the additional offered batteries											
FAF5260A	NNTN7036A	PMLN5328B	PMLN5275C	470.000	5.96	-0.98	7.14	5.28	**4.47**	3.31	CM-Ab-111027-20

13.3.12 Assessments at the Body with Body worn PMLN5329B

Assessment of offered antennas with the default battery, body worn PMLN5329B, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 46 for highest output power channel.

TABLE 58

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7037A	PMLN5329B	PMLN5275C	470.000	5.96	-0.54	4.69	3.51	**2.66**	1.99	ErC-Ab-111028-02
				484.000							
				498.000							
				512.000							
PMAE4065A	NNTN7037A	PMLN5329B	PMLN5275C	470.000	5.97	-0.4	4.15	3.08	2.28	1.69	ErC-Ab-111028-04
				484.000							
				498.000							
				512.000							
Assessment of the additional offered batteries											
FAF5260A	NNTN7036A	PMLN5329B	PMLN5275C	470.000	5.98	-0.54	3.72	2.78	2.11	1.57	ErC-Ab-111028-05

13.3.13 Assessments at the Body with Body worn PMLN5330B

Assessment of offered antennas with the default battery, body worn PMLN5330B, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 46 for highest output power channel.

TABLE 59

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7037A	PMLN5330B	PMLN5275C	470.000	5.97	-0.55	3.86	2.88	**2.19**	1.63	ErC-Ab-111028-06
				484.000							
				498.000							
				512.000							
PMAE4065A	NNTN7037A	PMLN5330B	PMLN5275C	470.000	5.97	-0.4	2.99	2.23	1.64	1.22	ErC-Ab-111028-07
				484.000							
				498.000							
				512.000							
Assessment of the additional offered batteries											
FAF5260A	NNTN7036A	PMLN5330B	PMLN5275C	470.000	5.98	-0.71	3.53	2.64	2.08	1.55	ErC-Ab-111028-08

13.3.14 Assessments at the Body with Body worn RLN6459A

Assessment of offered antennas with the default battery, body worn RLN6459A, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 46 for highest output power channel.

TABLE 60

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7034A	RLN6459A	PMLN5275C	470.000	5.98	-0.14	2.8	2.11	**1.45**	1.09	ErC-Ab-111028-09
				484.000							
				498.000							
				512.000							
PMAE4065A	NNTN7034A	RLN6459A	PMLN5275C	470.000	5.98	-0.24	1.93	1.47	1.02	0.78	ErC-Ab-111028-11
				484.000							
				498.000							
				512.000							
Assessment of the additional offered batteries											
FAF5260A	NNTN7033A	RLN6459A	PMLN5275C	470.000	5.98	-0.15	2.63	2	1.36	1.04	ErC-Ab-111028-12

13.3.15 Assessments at the Body with Body worn PMLN5322B/NTN5243A

Assessment of offered antennas with the default battery, body worn PMLN5322B/NTN5243A, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 46 for highest output power channel.

TABLE 61

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	PMNN4403A	PMLN5322B NTN5243A	PMLN5275C	470.000	5.95	-0.15	8.45	6.29	4.37	3.26	ErC-Ab-111028-13
				484.000	5.84	-0.17	8.97	6.67	4.66	3.47	CM-Ab-111028-14
				498.000	5.84	-0.41	8.8	6.53	4.84	3.59	CM-Ab-111028-16
				512.000	5.82	-0.14	8.2	6.07	4.23	3.13	CM-Ab-111028-15
PMAE4065A	PMNN4403A	PMLN5322B NTN5243A	PMLN5275C	470.000	5.97	-0.085	5.51	4.12	2.81	2.10	CM-Ab-111028-18
				484.000							
				498.000							
				512.000							
Assessment of the additional offered batteries											
FAF5260A	NNTN8092A	PMLN5322B NTN5243A	PMLN5275C	498.000	5.81	-0.42	9	6.68	4.96	3.68	CM-Ab-111028-19
	NNTN7038A				5.83	-0.3	9.3	6.93	**4.98**	3.71	CM-Ab-111028-20

13.3.16 Assessments at the Body with Body worn PMLN5323B/NTN5243A

Assessment of offered antennas with the default battery, body worn PMLN5323B/NTN5243A, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 46 for highest output power channel.

TABLE 62

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	PMNN4403A	PMLN5323B NTN5243A	PMLN5275C	470.000	5.98	-0.12	6.2	4.64	3.19	2.38	CM-Ab-111028-21
				484.000							
				498.000							
				512.000							
PMAE4065A	PMNN4403A	PMLN5323B NTN5243A	PMLN5275C	470.000	5.93	-0.29	3.9	2.93	2.08	1.57	CM-Ab-111028-23
				484.000							
				498.000							
				512.000							
Assessment of the additional offered batteries											
FAF5260A	NNTN8092A	PMLN5323B NTN5243A	PMLN5275C	470.000	5.91	-0.2	6.15	4.57	**3.22**	2.39	CM-Ab-111031-02
	NNTN7038A				5.94	-0.078	5.7	4.25	2.90	2.16	CM-Ab-111031-03

13.3.17 Assessments at the Body with Body worn PMLN5324B/NTN5243A

Assessment of offered antennas with the default battery, body worn PMLN5324B/NTN5243A, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 46 for highest output power channel.

TABLE 63

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	PMNN4403A	PMLN5324B NTN5243A	PMLN5275C	470.000	5.91	-0.11	6.81	4.71	3.49	2.42	CM-Ab-111031-04
				484.000							
				498.000							
				512.000							
PMAE4065A	PMNN4403A	PMLN5324B NTN5243A	PMLN5275C	470.000	5.92	-0.32	5.04	3.48	2.71	1.87	CM-Ab-111031-05
				484.000							
				498.000							
				512.000							
Assessment of the additional offered batteries											
FAF5260A	NNTN8092A	PMLN5324B NTN5243A	PMLN5275C	470.000	5.9	-0.15	7.13	5.33	**3.69**	2.76	CM-Ab-111031-06
	NNTN7038A				5.94	-0.12	6.27	4.68	3.22	2.41	CM-Ab-111031-07

13.3.18 Assessments at the Body with Body worn PMLN5560B/NTN5243A

Assessment of offered antennas with the default battery, body worn PMLN5560B/NTN5243A, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 46 for highest output power channel.

TABLE 64

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	PMNN4403A	PMLN5560B NTN5243A	PMLN5275C	470.000	5.91	-0.043	4	3.02	2.02	1.53	CM-Ab-111031-08
				484.000							
				498.000							
				512.000							
PMAE4065A	PMNN4403A	PMLN5560B NTN5243A	PMLN5275C	470.000	5.96	-0.12	3.43	2.51	1.76	1.29	ErC-Ab-111101-02
				484.000							
				498.000							
				512.000							
Assessment of the additional offered batteries											
FAF5260A	NNTN8092A	PMLN5560B NTN5243A	PMLN5275C	470.000	5.95	-0.1	5.35	3.97	**2.74**	2.03	ErC-Ab-111101-03
	NNTN7038A				5.98	-0.28	4.19	3.12	2.23	1.66	ErC-Ab-111101-04

13.3.19 Assessments at the Body with Body worn PMLN5325B/NTN5243A

Assessment of offered antennas with the default battery, body worn PMLN5325B/NTN5243A, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 46 for highest output power channel.

TABLE 65

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7034A	PMLN5325B NTN5243A	PMLN5275C	470.000	5.98	-0.21	9.49	7.06	**4.98**	3.70	ErC-Ab-111101-05
				484.000	5.89	-0.28	8.72	6.48	4.65	3.46	ErC-Ab-111101-06
				498.000	5.86	-0.3	8.18	6.06	4.38	3.25	ErC-Ab-111101-08
				512.000	5.9	-0.23	8.61	6.35	4.54	3.35	ErC-Ab-111101-07
PMAE4065A	NNTN7034A	PMLN5325B NTN5243A	PMLN5275C	470.000	5.98	-0.28	6.41	4.78	3.42	2.55	ErC-Ab-111101-10
				484.000							
				498.000							
				512.000							
Assessment of the additional offered batteries											
FAF5260A	NNTN7033A	PMLN5325B NTN5243A	PMLN5275C	470.000	5.98	0.29	7.98	5.94	3.99	2.97	ErC-Ab-111101-11

13.3.20 Assessments at the Body with Body worn PMLN5326B/NTN5243A

Assessment of offered antennas with the default battery, body worn PMLN5326B/NTN5243A, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 46 for highest output power channel.

TABLE 66

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7034A	PMLN5326B NTN5243A	PMLN5275C	470.000	5.96	0.081	6.57	4.89	**3.29**	2.45	CM-Ab-111101-12
				484.000							
				498.000							
				512.000							
PMAE4065A	NNTN7034A	PMLN5326B NTN5243A	PMLN5275C	470.000	5.96	-0.28	4.5	3.35	2.40	1.79	CM-Ab-111101-14
				484.000							
				498.000							
				512.000							
Assessment of the additional offered batteries											
FAF5260A	NNTN7033A	PMLN5326B NTN5243A	PMLN5275C	470.000	5.98	-0.55	4.71	3.52	2.67	2.00	CM-Ab-111101-15

13.3.21 Assessments at the Body with Body worn PMLN5327B/NTN5243A

Assessment of offered antennas with the default battery, body worn PMLN5327B/NTN5243A, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 46 for highest output power channel.

TABLE 67

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7034A	PMLN5327B NTN5243A	PMLN5275C	470.000	5.95	-0.17	8.76	5.44	4.55	2.83	CM-Ab-111101-17
				484.000	5.82	-0.21	8.84	5.17	4.64	2.71	CM-Ab-111101-18
				498.000	5.81	-0.41	10	5.74	**5.50**	3.15	ErC-Ab-111102-02
				512.000	5.83	-0.18	9.37	5.11	4.88	2.66	CM-Ab-111101-19
PMAE4065A	NNTN7034A	PMLN5327B NTN5243A	PMLN5275C	470.000	5.98	-0.32	6.52	4.28	3.51	2.30	ErC-Ab-111102-04
				484.000							
				498.000	5.84	-0.3	7.82	4.45	4.19	2.38	ErC-Ab-111102-06
				512.000	5.84	-0.11	8.67	4.91	4.45	2.52	ErC-Ab-111102-05
Assessment of the additional offered batteries											
FAF5260A	NNTN7033A	PMLN5327B NTN5243A	PMLN5275C	498.000	5.84	0.05	8.26	5.03	4.13	2.52	ErC-Ab-111102-07
PMAE4065A	NNTN7033A	PMLN5327B NTN5243A	PMLN5275C	512.000	5.88	-0.0099	6.88	3.99	3.45	2.00	ErC-Ab-111102-08

13.3.22 Assessments at the Body with Body worn PMLN5328B/NTN5243A

Assessment of offered antennas with the default battery, body worn PMLN5328B/NTN5243A, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 46 for highest output power channel.

TABLE 68

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7037A	PMLN5328B NTN5243A	PMLN5275C	470.000	5.98	-0.27	6.9	5.09	3.67	2.71	ErC-Ab-111102-11
				484.000							
				498.000	5.86	-0.35	7.78	5.78	4.22	3.13	CM-Ab-111102-13
				512.000	5.82	-0.26	7.67	5.69	4.07	3.02	CM-Ab-111102-12
PMAE4065A	NNTN7037A	PMLN5328B NTN5243A	PMLN5275C	470.000	5.98	-0.5	5.69	4.22	3.19	2.37	CM-Ab-111102-14
				484.000							
				498.000							
				512.000							
Assessment of the additional offered batteries											
FAF5260A	NNTN7036A	PMLN5328B NTN5243A	PMLN5275C	498.000	5.89	-0.78	7.12	5.31	**4.26**	3.18	CM-Ab-111102-15

13.3.23 Assessments at the Body with Body worn PMLN5329B/NTN5243A

Assessment of offered antennas with the default battery, body worn PMLN5329B/NTN5243A, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 46 for highest output power channel.

TABLE 69

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7037A	PMLN5329B NTN5243A	PMLN5275C	470.000	5.96	-0.57	5.1	3.79	2.91	2.16	CM-Ab-111102-16
				484.000							
				498.000							
				512.000							
PMAE4065A	NNTN7037A	PMLN5329B NTN5243A	PMLN5275C	470.000	5.95	-0.5	4.34	3.21	2.43	1.80	CM-Ab-111102-17
				484.000							
				498.000							
				512.000							
Assessment of the additional offered batteries											
FAF5260A	NNTN7036A	PMLN5329B NTN5243A	PMLN5275C	470.000	5.99	-0.73	5.08	3.77	**3.00**	2.23	CM-Ab-111102-18

13.3.24 Assessments at the Body with Body worn PMLN5330B/NTN5243A

Assessment of offered antennas with the default battery, body worn PMLN5330B/NTN5243A, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for Body worn Accessories. Refer to table 46 for highest output power channel.

TABLE 70

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7037A	PMLN5330B NTN5243A	PMLN5275C	470.000	5.97	-0.68	9.3	4.86	5.44	2.84	ErC-Ab-111103-02
				484.000	5.87	-0.28	10.7	5.42	5.71	2.89	ErC-Ab-111103-03
				498.000	5.9	-0.26	11.1	5.49	5.89	2.91	ErC-Ab-111103-05
				512.000	5.88	-0.26	11	5.66	5.84	3.00	ErC-Ab-111103-04
PMAE4065A	NNTN7037A	PMLN5330B NTN5243A	PMLN5275C	470.000	5.98	-0.11	9.16	4.76	4.70	2.44	ErC-Ab-111103-06
				484.000	5.86	-0.3	9.03	4.8	4.84	2.57	ErC-Ab-111103-07
				498.000	5.91	-0.15	9.81	4.81	5.08	2.49	ErC-Ab-111103-09
				512.000	5.88	-0.07	9.46	4.79	4.81	2.43	ErC-Ab-111103-08
Assessment of the additional offered batteries											
FAF5260A	NNTN7036A	PMLN5330B NTN5243A	PMLN5275C	484.000	5.83	-0.72	8.76	4.61	5.17	2.72	CM-Ab-111103-11
				498.000	5.86	-0.45	11.2	5.55	**6.21**	3.08	ErC-Ab-111103-10
				512.000	5.87	-0.26	10.6	5.1	5.63	2.71	CM-Ab-111103-12
PMAE4065A	NNTN7036A	PMLN5330B NTN5243A	PMLN5275C	498.000	5.85	-0.32	6.65	3.63	3.58	1.95	CM-Ab-111103-13

13.3.25 Assessments at the Body with additional audio accessories

Testing additional audio accessories per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for audio accessories without Integral antenna.

TABLE 71

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
FAF5260A	NNTN7036A	PMLN5330B NTN5243A	BDN6731A BDN6783A	470.000	5.98	-0.22	6.71	3.62	3.53	1.90	CM-Ab-111103-14
				484.000	5.83	-0.35	9.2	4.58	4.99	2.48	CM-Ab-111103-16
				498.000	5.84	-0.41	7.73	4.23	4.25	2.32	CM-Ab-111103-17
				512.000	5.85	-0.3	8.11	4.27	4.35	2.29	CM-Ab-111103-18
			BDN6732A BDN6783A	470.000	5.98	-1	6.04	3.63	3.80	2.28	ErC-Ab-111104-02
				484.000	5.87	-0.66	6.26	3.54	3.64	2.06	ErC-Ab-111104-03
				498.000	5.85	-0.3	7.05	3.78	3.78	2.03	ErC-Ab-111104-04
				512.000	5.94	-0.25	6.33	3.36	3.35	1.78	ErC-Ab-111104-05
			BDN6780A BDN6783A	470.000	5.98	-0.84	6.27	3.58	3.80	2.17	ErC-Ab-111104-06
				484.000	5.9	-0.49	6.09	3.16	3.41	1.77	ErC-Ab-111104-07
				498.000	5.86	-0.36	7.69	4.06	4.18	2.21	ErC-Ab-111104-08
				512.000	5.93	-0.14	8.47	4.41	4.37	2.28	ErC-Ab-111104-09
			HMN4104B	470.000	5.98	-0.89	9.77	5.17	6.00	3.17	ErC-Ab-111104-10
				484.000	5.85	-0.41	8.46	4.35	4.65	2.39	ErC-Ab-111104-11
				498.000	5.85	-0.19	8.96	4.58	4.68	2.39	ErC-Ab-111104-12
				512.000	5.86	-0.21	9.66	5.08	5.07	2.67	CM-Ab-111104-17
			RMN5116A HMN4104B	470.000	5.99	-0.96	8.69	4.6	5.42	2.87	CM-Ab-111104-18
				484.000	5.84	-0.32	6.42	3.38	3.46	1.82	CM-Ab-111104-19
				498.000	5.87	-0.41	8.99	4.74	4.94	2.60	CM-Ab-111104-20
				512.000	5.87	-0.31	10.3	5.48	5.53	2.94	ErC-Ab-111105-02
			NNTN7869A ZMN6031A	470.000	5.98	-0.26	6.75	3.86	3.58	2.05	ErC-Ab-111105-03
				484.000	5.87	-0.68	6.04	3.22	3.53	1.88	ErC-Ab-111105-04
				498.000	5.85	-0.28	6.52	3.37	3.48	1.80	ErC-Ab-111105-05
				512.000	5.9	-0.14	8.49	4.19	4.38	2.16	ErC-Ab-111105-06
			NNTN7869A ZMN6032A	470.000	5.98	-0.19	7.75	3.86	4.05	2.02	ErC-Ab-111105-07
				484.000	5.9	-0.64	7.29	3.81	4.22	2.21	ErC-Ab-111105-08
				498.000	5.88	-0.4	6.62	3.45	3.63	1.89	ErC-Ab-111105-09
				512.000	5.88	-0.33	10.5	5.02	5.66	2.71	ErC-Ab-111105-10

TABLE 71(Continued)

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
FAF5260A	NNTN7036A	PMLN5330B NTN5243A	PMLN5101A	470.000	5.98	-0.73	10.52	5.39	6.22	3.19	ErC-Ab-111105-11
				484.000	5.89	-0.43	11.38	5.56	6.28	3.07	ErC-Ab-111105-12
				498.000	5.87	-0.28	9.24	4.67	4.93	2.49	ErC-Ab-111105-13
				512.000	5.89	-0.19	9.45	4.68	4.94	2.44	CM-Ab-111105-14
			PMLN5111A	470.000	5.97	-0.84	10.52	5.3	6.38	3.22	CM-Ab-111105-16
				484.000	5.86	-0.48	9.85	4.93	5.50	2.75	CM-Ab-111105-17
				498.000	5.86	-0.23	9.06	4.63	4.78	2.44	CM-Ab-111105-18
				512.000	5.89	-0.22	9.27	4.59	4.88	2.41	CM-Ab-111105-19
			PMMN4024A	470.000	5.98	-0.72	10.82	5.52	6.39	3.26	CM-Ab-111105-21
				484.000	5.87	-0.52	9.98	5.09	5.62	2.87	CM-Ab-111105-22
				498.000	5.85	-0.29	9.68	4.86	5.17	2.60	CM-Ab-111105-23
				512.000	5.9	-0.27	8.83	4.58	4.70	2.44	CM-Ab-111105-24
			PMMN4062A	470.000	5.97	-0.9	9.89	4.98	6.08	3.06	CM-Ab-111107-02
				484.000	5.86	-0.57	10.01	5.17	5.71	2.95	CM-Ab-111107-03
				498.000	5.85	-0.19	9.16	4.68	4.78	2.44	CM-Ab-111107-04
				512.000	5.87	-0.34	8.88	4.48	4.80	2.42	CM-Ab-111107-05
			PMMN4065A	470.000	5.96	-0.8	9.96	5.02	5.99	3.02	CM-Ab-111107-06
				484.000	5.85	-0.47	10.41	5.22	5.80	2.91	CM-Ab-111107-07
				498.000	5.85	-0.34	9.65	4.94	5.22	2.67	CM-Ab-111107-08
				512.000	5.86	-0.38	10.4	5.01	5.68	2.73	CM-Ab-111107-09
			RLN5882A	470.000	5.92	-0.3	6.14	3.31	3.29	1.77	ErC-Ab-111108-02
				484.000	5.85	-0.34	6.04	3.34	3.27	1.81	ErC-Ab-111108-03
				498.000	5.87	-0.2	9.62	4.96	5.04	2.60	ErC-Ab-111108-04
				512.000	5.9	-0.24	8.98	4.58	4.75	2.42	ErC-Ab-111108-05
			RMN5058A	470.000	5.98	-1.2	7.36	4.1	4.85	2.70	ErC-Ab-111108-06
				484.000	5.9	-0.39	8.57	4.56	4.69	2.49	ErC-Ab-111108-07
				498.000	5.94	-0.42	9.32	4.93	5.13	2.72	ErC-Ab-111108-08
				512.000	5.92	-0.23	10.1	5.05	5.32	2.66	ErC-Ab-111108-09
			None	470.000	5.98	-0.95	9.62	5.05	5.99	3.14	ErC-Ab-111108-10
				484.000	5.93	-0.59	10.37	5.64	5.94	3.23	ErC-Ab-111108-11
				498.000	5.92	-0.48	11.8	6.19	**6.59**	3.46	ErC-Ab-111108-12
				512.000	5.86	-0.22	11.3	5.91	5.94	3.11	ErC-Ab-111108-13

13.3.26 Assessments at the Body for frequencies outside FCC part 90

Assessment at the Body for frequencies outside FCC part 90 using highest SAR test configuration from tables 47- 71 above for each of the applicable offered antennas.

TABLE 72

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
FAF5260A	NNTN7036A	PMLN5330B NTN5243A	None	516.000	5.84	-0.57	10.4	5.66	5.93	3.23	CM-Ab-111108-14
				520.000	5.85	-0.37	11.3	5.86	6.15	3.19	CM-Ab-111108-15
PMAE4065A	NNTN7036A	PMLN5330B NTN5243A	None	516.000	5.77	-0.68	12.1	5.86	**7.08**	3.43	CM-Ab-111213-03
				520.000	5.77	-0.66	11.9	5.72	6.93	3.33	HvH-Ab-111215-03

13.3.27 Assessments at the Shoulder with Public Safety Microphones (PSM)

The battery NNTN7034A was selected as the default battery for assessments of the PSM since it is the highest capacity battery (refers to Exhibit 7B for the dimension of the battery). The conducted power measurement for all test channels within part 90 frequency range using the default battery NNTN7034A is indicated in table 73. The channel with the highest conducted power will be identified as the default channel per KDB 643646 D01 SAR Test for PTT Radios v01r01. SAR plots of the highest results per table (bolded) are presented in appendices E-G.

TABLE 73

Test Freq (MHz)	Power (W)
470.000	5.55
484.000	5.39
498.000	5.39
512.000	5.38

Assessment of offered Public Safety Microphones PMMN4059B, PMMN4060B, and PMMN4061B with the applicable antenna and default battery per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Body SAR Test Considerations for audio accessories with Integral antenna. Refer to table 73 for highest output power channel.

TABLE 74

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
PMAE4065A	NNTN7034A	4205823V08	PMMN4059B	470.000	5.7	-0.18	7.18	5.14	3.74	2.68	HvH-Ab-110614-13
				484.000							
				498.000							
				512.000	5.57	-0.12	3.57	2.54	1.88	1.34	HvH-Ab-110614-14
PMAE4065A	NNTN7034A	4205823V08	PMMN4060B	470.000	5.7	-0.34	7.73	5.28	4.18	2.85	HvH-Ab-110614-15
				484.000	5.68	-0.086	9.41	6.7	**4.82**	3.43	ErC-Ab-111021-03
				498.000							
				512.000	5.57	-0.14	5.83	4.13	3.08	2.18	HvH-Ab-110614-17
PMAE4065A	NNTN7034A	4205823V08	PMMN4061B	470.000	5.7	-0.38	6.39	4.41	3.49	2.41	HvH-Ab-110614-18
				484.000							
				498.000							
				512.000							

Assessment at the Shoulder with PSM for frequencies outside FCC part 90, using highest SAR test configuration from table 74 above.

TABLE 75

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
PMAE4065A	NNTN7034A	4205823V08	PMMN4060B	516.000	5.71	-0.07	5.29	3.77	**2.69**	1.92	ErC-Ab-111021-04
				520.000	5.73	-0.082	4.49	3.21	2.29	1.64	ErC-Ab-111021-05

13.4 Assessments at the Face for 470 – 520 MHz band

The highest capacity battery NNTN7034A was selected as the default battery. The conducted power measurement for all test channels within Part 90 frequency range using battery NNTN7034A is listed in the Table 76. The channel with the highest conducted power was used as the default channel per KDB 643646 D01 SAR Test for PTT Radios v01r01. SAR plots of the highest results per table (bolded) are presented in appendices E-G.

TABLE 76

Test Freq (MHz)	Power (W)
470.000	5.58
484.000	5.39
498.000	5.38
512.000	5.39

13.4.1 Assessments at the Face (DUT Front)

Assessment of each of the offered antennas with the default battery NNTN7034A, front of DUT facing phantom, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Head SAR Test Considerations. Refer to table 76 for highest output power channel.

TABLE 77

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7034A	None, Front @ 2.5cm	None	470.000	5.64	-0.3	4.28	3.24	2.32	1.75	ErC-Face-111019-02
				484.000							
				498.000							
				512.000							
PMAE4065A	NNTN7034A	None, Front @ 2.5cm	None	470.000	5.84	-0.17	2.62	1.99	1.36	1.03	ErC-Face-111019-04
				484.000							
				498.000							
				512.000							
Assessment of the additional offered batteries											
FAF5260A	NNTN8092A	None, Front @ 2.5cm	None	470.000	5.85	-0.25	4.77	3.61	2.53	1.91	ErC-Face-111019-05
	NNTN7038A				5.8	-0.12	4.84	3.65	2.49	1.88	ErC-Face-111020-02
	NNTN7033A				5.78	-0.39	4.16	3.16	2.28	1.73	ErC-Face-111020-03
	PMNN4403A				5.8	-0.11	5.74	4.31	**2.94**	2.21	ErC-Face-111020-04
	NNTN7037A				5.8	-0.36	4.52	3.41	2.46	1.85	ErC-Face-111020-05
	NNTN7036A				5.81	-0.42	4.7	3.55	2.59	1.96	ErC-Face-111020-06

13.4.2 Assessments at the Face (DUT Back)

Assessment of each of the offered antennas with the default battery NNTN7034A, back of DUT facing phantom, and additional offered batteries per KDB 643646 D01 SAR Test for PTT Radios v01r01 – Head SAR Test Considerations. Refer to table 76 for highest output power channel.

TABLE 78

TABLEAntenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
Assessment of the offered antennas with the default battery											
FAF5260A	NNTN7034A	None	None	470.000	5.85	0.077	5.96	4.46	2.98	2.23	ErC-Face-111020-07
				484.000							
				498.000							
				512.000							
PMAE4065A	NNTN7034A	None	None	470.000	5.82	-0.31	3.84	2.89	2.06	1.55	ErC-Face-111020-08
				484.000							
				498.000							
				512.000							
Assessment of the additional offered batteries											
FAF5260A	NNTN8092A	None	None	470.000	5.77	-0.11	6.1	4.57	**3.13**	2.34	ErC-Face-111020-09
	NNTN7038A				5.84	-0.076	5.96	4.48	3.03	2.28	ErC-Face-111020-10
	NNTN7033A				5.85	0.083	5.91	4.42	2.96	2.21	ErC-Face-111020-11
	PMNN4403A				5.89	-0.16	5.9	4.42	3.06	2.29	ErC-Face-111020-12
	NNTN7037A				5.89	-0.36	5.02	3.77	2.73	2.05	ErC-Face-111020-13
	NNTN7036A				5.8	-0.45	4.6	3.45	2.55	1.91	ErC-Face-111021-02

Assessment at the Face for frequencies outside FCC part 90, using highest SAR test configuration from tables 77-78 above for each of the applicable offered antennas.

TABLE 79

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
FAF5260A	NNTN8092A	None @Back	None	516.000	5.84	-0.1	5.06	3.78	2.59	1.93	ErC-Face-111109-07
FAF5260A	NNTN8092A	None @Back	None	520.000	5.85	0.07	5.35	4.01	**2.68**	2.01	ErC-Face-111109-08
PMAE4065A	NNTN8092A	None @Back	None	516.000	5.8	0.052	4.54	3.38	2.27	1.69	CM-Face-111213-06
PMAE4065A	NNTN8092A	None @Back	None	520.000	5.79	0.13	5.53	4.1	2.77	2.05	CM-Face-111213-07

13.5 Shorten Scan Assessment

A "shortened" scan was performed to validate the SAR drift of the full DASY5™ coarse and 5x5x7 zoom scans. Note that the shortened scan represents the zoom scan performance result; this is obtained by first running a coarse scan to find the peak area and then, using a newly charged battery, a 5x5x7 zoom scan only was performed. The results of the shortened cube scan presented in APPENDIX E demonstrate that the scaling methodology used to determine the calculated SAR results presented herein are valid. The SAR result from the table below is provided in APPENDIX E.

TABLE 80

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (mW/g)	Meas. 10g-SAR (mW/g)	Max Calc. 1g-SAR (mW/g)	Max Calc. 10g-SAR (mW/g)	Run#
FAF5260A	NNTN8092A	PMLN5322B NTN5243A	None	450.000	5.66	-0.071	13.17	9.77	**6.74**	5.00	CM-Ab-111116-13

14.0 Simultaneous Transmission Exclusion

Per FCC KDB 447498 and KDB 648474, Bluetooth testing is not required due to the followings:

a) Bluetooth max power is 12mW.
b) The separation distance between the Bluetooth antenna and the primary antenna is >5cm, refer to exhibit 7B for photo.

15.0 Conclusion

The highest Operational Maximum Calculated 1-gram and 10-gram average SAR values found for this filing: Model H97TGD9PW1AN (NUE3622).

TABLE 81

Designator	Frequency (MHz)	Max Calc at Body (mW/g)		Max Calc at Face (mW/g)	
		1g-SAR	10g-SAR	1g-SAR	10g-SAR
Overall	380-470	6.74	5.00	3.25	2.39
	470-520	7.08	3.43	3.13	2.34
FCC	406.1-470	6.74	5.00	3.25	2.39
	470-512	6.59	3.46	3.13	2.34

The test results clearly demonstrate compliance with FCC Occupational/Controlled RF Exposure limits of 8 W/kg averaged over 1 gram per the requirements of 47 CFR 2.1093(d). The 10 grams result is not applicable to FCC filing.

APPENDIX A
Measurement Uncertainty

The Measurement Uncertainty tables indicated in this APPENDIX are applicable to the DUT test frequencies ranging from 100MHz to 800MHz, 800MHz to 3GHz and for Dipole test frequencies ranging from 800MHz to 3GHz. Therefore, the highest tolerance for the probe calibration uncertainty is indicated.

Uncertainty Budget for Device Under Test, for 100 MHz to 800 MHz

a	*b*	*c*	*d*	*e = f(d,k)*	*f*	*g*	*h = c x f / e*	*i = c x g / e*
Uncertainty Component	**IEEE 1528 section**	**Tol. (± %)**	**Prob Dist**	**Div.**	**c_i (1 g)**	**c_i (10 g)**	**1 g u_i (±%)**	**10 g u_i (±%)**
Measurement System								
Probe Calibration	E.2.1	10.0	N	1.00	1	1	10.0	10.0
Axial Isotropy	E.2.2	4.7	R	1.73	0.707	0.707	1.9	1.9
Hemispherical Isotropy	E.2.2	9.6	R	1.73	0.707	0.707	3.9	3.9
Boundary Effect	E.2.3	1.0	R	1.73	1	1	0.6	0.6
Linearity	E.2.4	4.7	R	1.73	1	1	2.7	2.7
System Detection Limits	E.2.5	1.0	R	1.73	1	1	0.6	0.6
Readout Electronics	E.2.6	0.3	N	1.00	1	1	0.3	0.3
Response Time	E.2.7	1.1	R	1.73	1	1	0.6	0.6
Integration Time	E.2.8	1.1	R	1.73	1	1	0.6	0.6
RF Ambient Conditions - Noise	E.6.1	3.0	R	1.73	1	1	1.7	1.7
RF Ambient Conditions - Reflections	E.6.1	0.0	R	1.73	1	1	0.0	0.0
Probe Positioner Mech. Tolerance	E.6.2	0.4	R	1.73	1	1	0.2	0.2
Probe Positioning w.r.t Phantom	E.6.3	1.4	R	1.73	1	1	0.8	0.8
Max. SAR Evaluation (ext., int., avg.)	E.5	3.4	R	1.73	1	1	2.0	2.0
Test sample Related								
Test Sample Positioning	E.4.2	3.2	N	1.00	1	1	3.2	3.2
Device Holder Uncertainty	E.4.1	4.0	N	1.00	1	1	4.0	4.0
SAR drift	6.6.2	5.0	R	1.73	1	1	2.9	2.9
Phantom and Tissue Parameters								
Phantom Uncertainty	E.3.1	4.0	R	1.73	1	1	2.3	2.3
Liquid Conductivity (target)	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2
Liquid Conductivity (measurement)	E.3.3	3.3	N	1.00	0.64	0.43	2.1	1.4
Liquid Permittivity (target)	E.3.2	5.0	R	1.73	0.6	0.49	1.7	1.4
Liquid Permittivity (measurement)	E.3.3	1.9	N	1.00	0.6	0.49	1.1	0.9
Combined Standard Uncertainty			RSS				14	13
Expanded Uncertainty (95% CONFIDENCE LEVEL)			k=2				27	27

FCD-0558 Uncertainty Budget Rev.8

Uncertainty Budget for System Validation (dipole & flat phantom) for 300 MHz to 800 MHz

a	*b*	*c*	*d*	*e = f(d,k)*	*f*	*g*	*h = c x f / e*	*i = c x g / e*
Uncertainty Component	**IEEE 1528 section**	**Tol. (± %)**	**Prob. Dist.**	**Div.**	**c_i (1 g)**	**c_i (10 g)**	**1 g u_i (±%)**	**10 g u_i (±%)**
Measurement System								
Probe Calibration	E.2.1	9.0	N	1.00	1	1	9.0	9.0
Axial Isotropy	E.2.2	4.7	R	1.73	1	1	2.7	2.7
Spherical Isotropy	E.2.2	9.6	R	1.73	0	0	0.0	0.0
Boundary Effect	E.2.3	1.0	R	1.73	1	1	0.6	0.6
Linearity	E.2.4	4.7	R	1.73	1	1	2.7	2.7
System Detection Limits	E.2.5	1.0	R	1.73	1	1	0.6	0.6
Readout Electronics	E.2.6	0.3	N	1.00	1	1	0.3	0.3
Response Time	E.2.7	1.1	R	1.73	1	1	0.6	0.6
Integration Time	E.2.8	0.0	R	1.73	1	1	0.0	0.0
RF Ambient Conditions - Noise	E.6.1	3.0	R	1.73	1	1	1.7	1.7
RF Ambient Conditions - Reflections	E.6.1	0.0	R	1.73	1	1	0.0	0.0
Probe Positioner Mechanical Tolerance	E.6.2	0.4	R	1.73	1	1	0.2	0.2
Probe Positioning w.r.t. Phantom	E.6.3	1.4	R	1.73	1	1	0.8	0.8
Max. SAR Evaluation (ext., int., avg.)	E.5	3.4	R	1.73	1	1	2.0	2.0
Dipole								
Dipole Axis to Liquid Distance	8, E.4.2	2.0	R	1.73	1	1	1.2	1.2
Input Power and SAR Drift Measurement	8, 6.6.2	5.0	R	1.73	1	1	2.9	2.9
Phantom and Tissue Parameters								
Phantom Uncertainty	E.3.1	4.0	R	1.73	1	1	2.3	2.3
Liquid Conductivity (target)	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2
Liquid Conductivity (measurement)	E.3.3	3.3	R	1.73	0.64	0.43	1.2	0.8
Liquid Permittivity (target)	E.3.2	5.0	R	1.73	0.6	0.49	1.7	1.4
Liquid Permittivity (measurement)	E.3.3	1.9	R	1.73	0.6	0.49	0.6	0.5
Combined Standard Uncertainty			RSS				11	11
Expanded Uncertainty (95% CONFIDENCE LEVEL)			*k* =2				22	22

FCD-0558 Uncertainty Budget Rev.8

Notes for Tables 1, 2, 3 and 4
a) Column headings *a-k* are given for reference.
b) Tol. - tolerance in influence quantity.
c) Prob. Dist. – Probability distribution
d) N, R - normal, rectangular probability distributions
e) Div. - divisor used to translate tolerance into normally distributed standard uncertainty
f) *ci* - sensitivity coefficient that should be applied to convert the variability of the uncertainty component into a variability of SAR.
g) *ui* – SAR uncertainty
h) *vi* - degrees of freedom for standard uncertainty and effective degrees of freedom for the expanded uncertainty

APPENDIX B
Probe Calibration Certificates

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

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

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client **Motorola EME**

Certificate No: ES3-3291_Sep10

CALIBRATION CERTIFICATE

Object	ES3DV3 - SN:3291
Calibration procedure(s)	QA CAL-01.v6, QA CAL-12.v6, QA CAL-14.v3, QA CAL-23.v3 and QA CAL-25.v2 Calibration procedure for dosimetric E-field probes
Calibration date:	September 3, 2010

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-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41495277	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41498087	1-Apr-10 (No. 217-01136)	Apr-11
Reference 3 dB Attenuator	SN: S5054 (3c)	30-Mar-10 (No. 217-01159)	Mar-11
Reference 20 dB Attenuator	SN: S5086 (20b)	30-Mar-10 (No. 217-01161)	Mar-11
Reference 30 dB Attenuator	SN: S5129 (30b)	30-Mar-10 (No. 217-01160)	Mar-11
Reference Probe ES3DV2	SN: 3013	30-Dec-09 (No. ES3-3013_Dec09)	Dec-10
DAE4	SN: 660	20-Apr-10 (No. DAE4-660_Apr10)	Apr-11

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-09)	In house check: Oct10

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Niels Kuster	Quality Manager	

Issued: September 4, 2010

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

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

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis

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

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *Ax,y,z; Bx,y,z; Cx,y,z, VRx,y,z: A, B, C* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 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 *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe ES3DV3

SN:3291

Manufactured: July 6, 2010
Calibrated: September 3, 2010

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: ES3DV3 SN:3291

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.88	1.39	0.84	± 10.1%
DCP (mV)[B]	96.5	98.0	94.3	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dBuV	C	VR mV	Unc[E] (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	300.0	± 1.5%
			Y	0.00	0.00	1.00	300.0	
			Z	0.00	0.00	1.00	300.0	

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

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).

[B] Numerical linearization parameter: uncertainty not required.

[E] Uncertainty is determined using the maximum deviation from linear response applying recatangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: ES3DV3 SN:3291

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz]	Validity [MHz][C]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth Unc (k=2)
450	± 50 / ± 100	43.5 ± 5%	0.87 ± 5%	6.70	6.70	6.70	0.16	1.88 ± 13.3%
750	± 50 / ± 100	41.9 ± 5%	0.89 ± 5%	6.58	6.58	6.58	0.95	1.06 ± 11.0%
900	± 50 / ± 100	41.5 ± 5%	0.97 ± 5%	6.24	6.24	6.24	0.99	1.05 ± 11.0%
1810	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	5.20	5.20	5.20	0.51	1.44 ± 11.0%
1950	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	4.96	4.96	4.96	0.44	1.59 ± 11.0%
2300	± 50 / ± 100	39.5 ± 5%	1.67 ± 5%	4.85	4.85	4.85	0.43	1.78 ± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	4.51	4.51	4.51	0.41	1.88 ± 11.0%
2600	± 50 / ± 100	39.0 ± 5%	1.96 ± 5%	4.44	4.44	4.44	0.51	1.72 ± 11.0%
3500	± 50 / ± 100	37.9 ± 5%	2.91 ± 5%	4.17	4.17	4.17	0.93	1.27 ± 13.1%
3700	± 50 / ± 100	37.7 ± 5%	3.12 ± 5%	3.78	3.78	3.78	0.95	1.27 ± 13.1%

[C] 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.

DASY/EASY - Parameters of Probe: ES3DV3 SN:3291

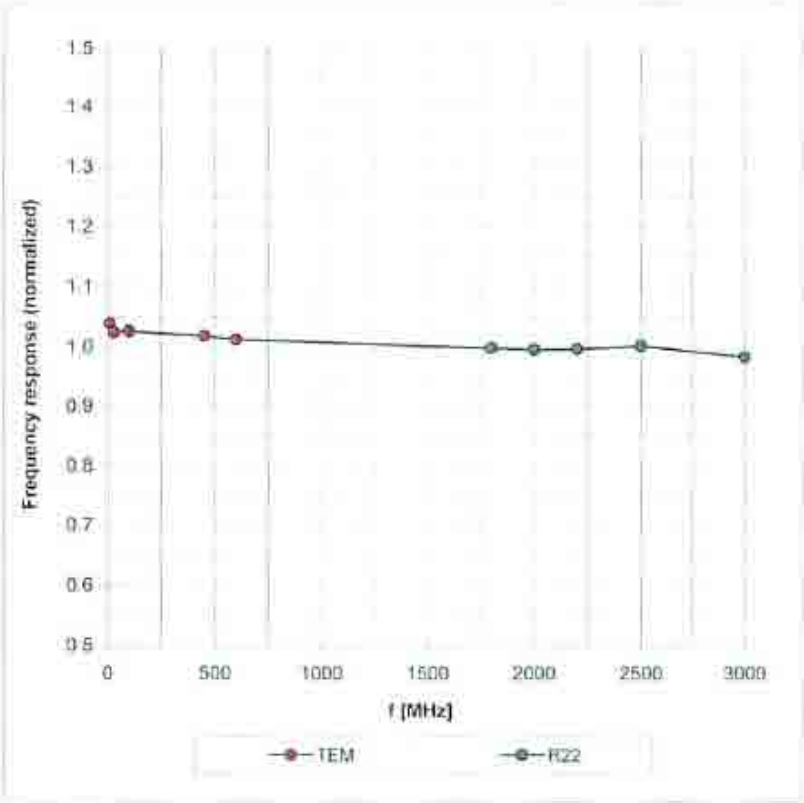
Calibration Parameter Determined in Body Tissue Simulating Media

f [MHz]	Validity [MHz][C]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth	Unc (k=2)
450	± 50 / ± 100	56.7 ± 5%	0.94 ± 5%	7.28	7.28	7.28	0.09	1.00	± 13.3%
750	± 50 / ± 100	55.5 ± 5%	0.96 ± 5%	6.38	6.38	6.38	0.75	1.20	± 11.0%
900	± 50 / ± 100	55.0 ± 5%	1.05 ± 5%	6.19	6.19	6.19	0.80	1.19	± 11.0%
1810	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	5.01	5.01	5.01	0.36	2.03	± 11.0%
1950	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	5.05	5.05	5.05	0.41	1.87	± 11.0%
2300	± 50 / ± 100	52.8 ± 5%	1.85 ± 5%	4.71	4.71	4.71	0.48	1.75	± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	4.54	4.54	4.54	0.80	1.22	± 11.0%
2600	± 50 / ± 100	52.5 ± 5%	2.16 ± 5%	4.46	4.46	4.46	0.99	1.07	± 11.0%
3500	± 50 / ± 100	51.3 ± 5%	3.31 ± 5%	3.54	3.54	3.54	0.95	1.35	± 13.1%
3700	± 50 / ± 100	51.0 ± 5%	3.55 ± 5%	3.39	3.39	3.39	0.58	2.06	± 13.1%

[C] 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.

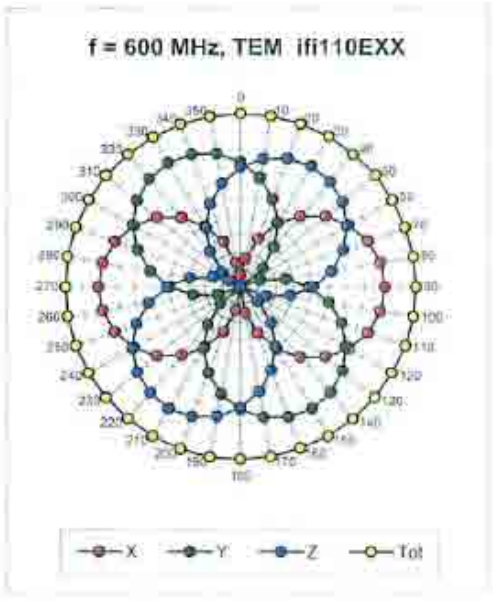
Frequency Response of E-Field

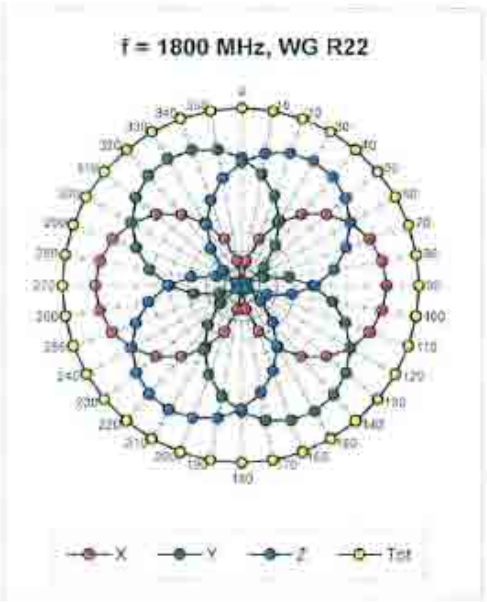
(TEM-Cell:ifi110 EXX, Waveguide: R22)

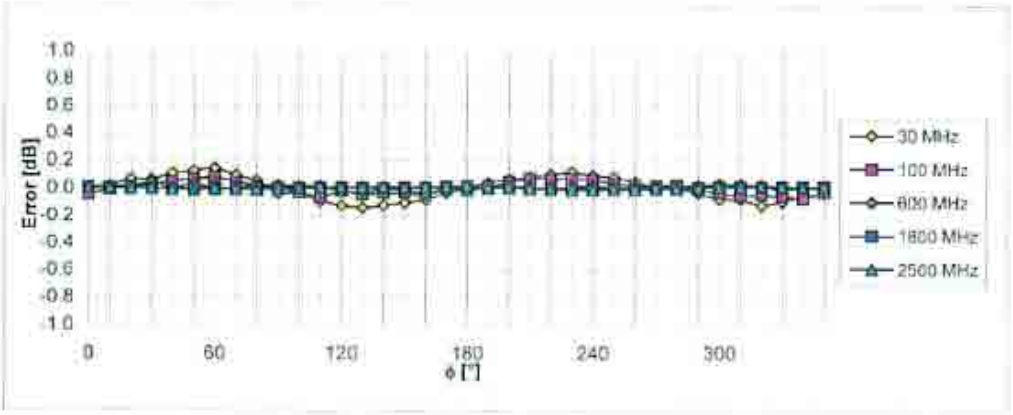


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Receiving Pattern (ϕ), ϑ = 0°



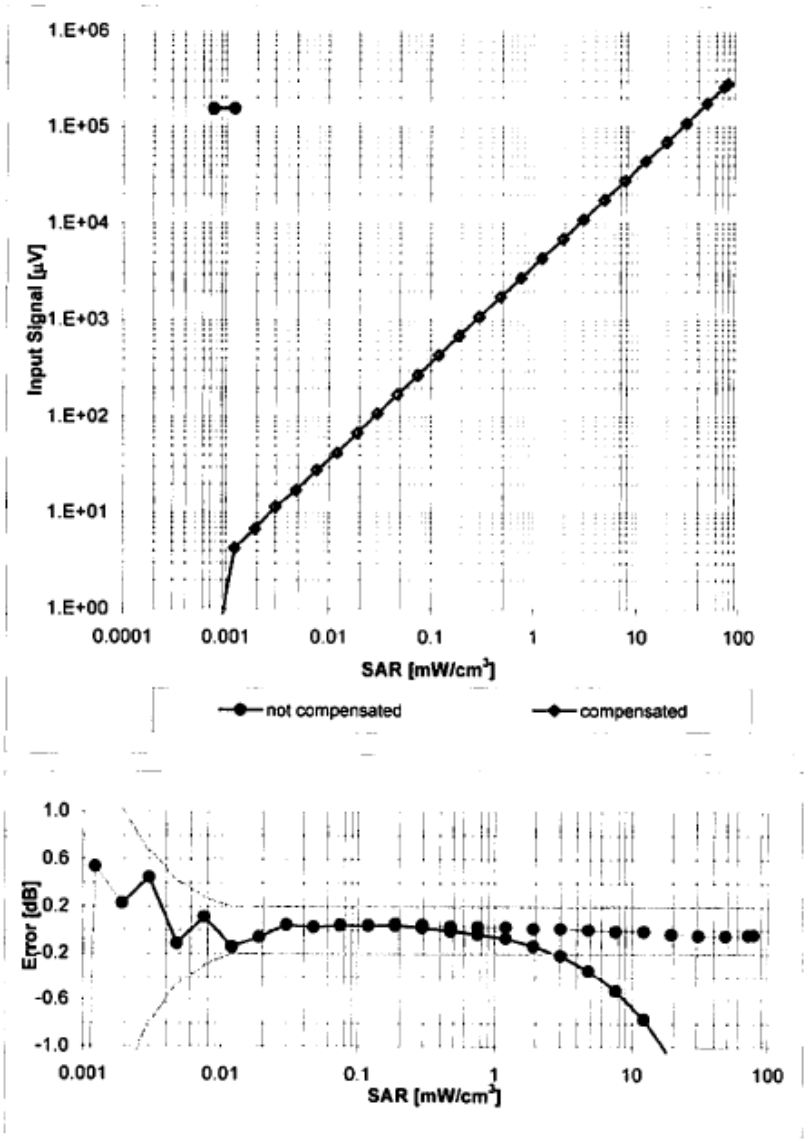




Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

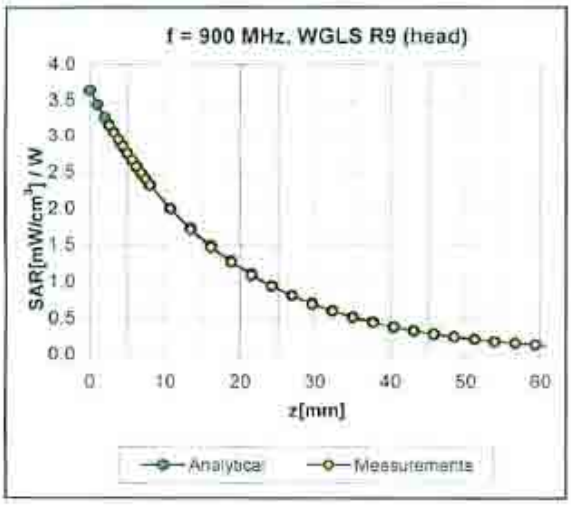
Dynamic Range f(SAR_{head})

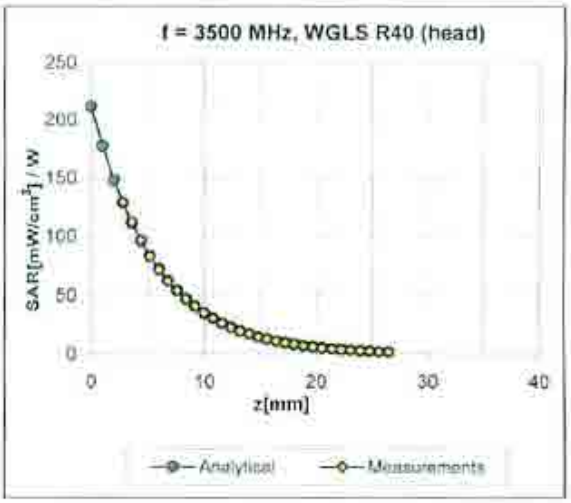
(Waveguide R22, f = 1800 MHz)



Uncertainty of Linearity Assessment: ± 0.6% (k=2)

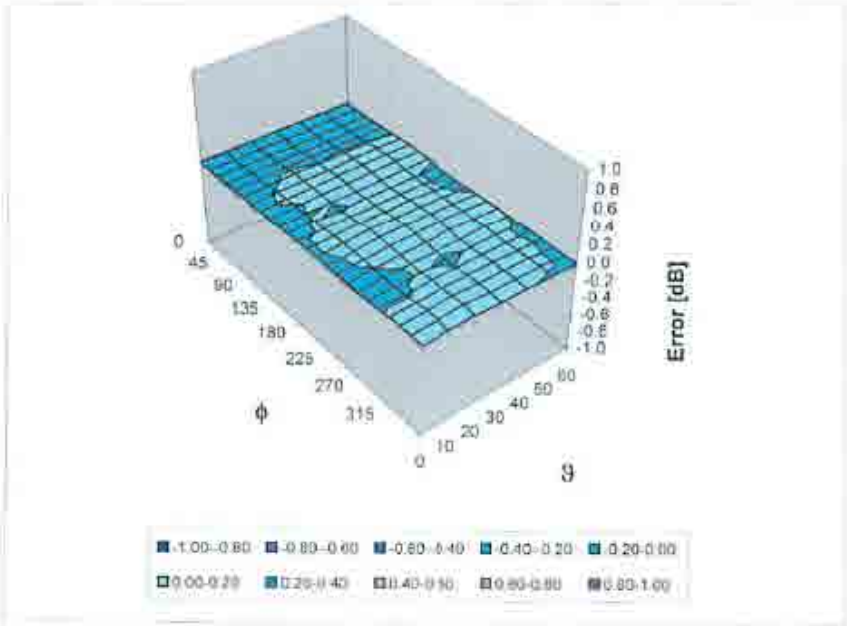
Conversion Factor Assessment





Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4.0 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

Schmid & Partner Engineering AG

s p e a g

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Phone +41 44 245 9700, Fax +41 44 245 9779
info@speag.com, http://www.speag.com

Additional Conversion Factors

for Dosimetric E-Field Probe

Type:	**ES3DV3**
Serial Number:	**3291**
Place of Assessment:	**Zurich**
Date of Assessment:	**September 8, 2010**
Probe Calibration Date:	**September 3, 2010**

Schmid & Partner Engineering AG hereby certifies that conversion factor(s) of this probe have been evaluated on the date indicated above. The assessment was performed using the FDTD numerical code SEMCAD of Schmid & Partner Engineering AG. Since the evaluation is coupled with measured conversion factors, it has to be recalculated yearly, i.e., following the re-calibration schedule of the probe. The uncertainty of the numerical assessment is based on the extrapolation from measured value at 900 MHz or at 1810 MHz.

Assessed by:

Schmid & Partner Engineering AG
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Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 44 245 9700, Fax +41 44 245 9779
info@speag.com, http://www.speag.com

Dosimetric E-Field Probe ES3DV3 SN:3291

Conversion factor (± standard deviation)

150 ± 50 MHz	*ConvF*	8.5 ± 10%	ε_r = 52.3 σ = 0.76 mho/m (head tissue)
250 ± 50 MHz	*ConvF*	7.9 ± 10%	ε_r = 47.6 σ = 0.83 mho/m (head tissue)
300 ± 50 MHz	*ConvF*	7.6 ± 10%	ε_r = 45.3 σ = 0.87 mho/m (head tissue)
150 ± 50 MHz	*ConvF*	8.2 ± 10%	ε_r = 61.9 σ = 0.80 mho/m (body tissue)
250 ± 50 MHz	*ConvF*	7.8 ± 10%	ε_r = 59.4 σ = 0.88 mho/m (body tissue)
300 ± 50 MHz	*ConvF*	7.6 ± 9%	ε_r = 58.2 σ = 0.92 mho/m (body tissue)

Important Note:

For numerically assessed probe conversion factors, parameters Alpha and Delta in the DASY software must have the following entries: Alpha = 0 and Delta = 1.

Please see also DASY Manual.

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Accredited by the Swiss Accreditation Service (SAS)
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Accreditation No.: SCS 108

Client **Motorola EME**

Certificate No: **ES3-3163_Apr11**

CALIBRATION CERTIFICATE

Object ES3DV3 - SN:3163

Calibration procedure(s) QA CAL-01.v7, QA CAL-12.v6, QA CAL-14.v3, QA CAL-23.v4, QA CAL-25.v3
Calibration procedure for dosimetric E-field probes

Calibration date: April 13, 2011

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	31-Mar-11 (No. 217-01372)	Apr-12
Power sensor E4412A	MY41495277	31-Mar-11 (No. 217-01372)	Apr-12
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Reference 3 dB Attenuator	SN: S5054 (3c)	29-Mar-11 (No. 217-01369)	Apr-12
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Reference 30 dB Attenuator	SN: S5129 (30b)	29-Mar-11 (No. 217-01370)	Apr-12
Reference Probe ES3DV2	SN: 3013	29-Dec-10 (No. ES3-3013_Dec10)	Dec-11
DAE4	SN: 654	23-Apr-10 (No. DAE4-654_Apr10)	Apr-11
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Niels Kuster	Quality Manager	

Issued: April 13, 2011

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

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Accredited by the Swiss Accreditation Service (SAS) **Accreditation No.: SCS 108**
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Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis

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

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *PAR:* PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- *Ax,y,z; Bx,y,z; Cx,y,z* are numerical linearization parameters in dB assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media.
- *VR:* VR is the validity range of the calibration related to the average diode voltage or DAE voltage in mV.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 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 *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe ES3DV3

SN:3163

Manufactured: October 8, 2007
Calibrated: April 13, 2011

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3163

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	1.34	1.14	1.06	± 10.1 %
DCP (mV)[B]	100.6	102.9	102.3	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc[E] (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	112.6	±2.7 %
			Y	0.00	0.00	1.00	105.3	
			Z	0.00	0.00	1.00	98.4	

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

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3163

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
300	45.3	0.87	6.88	6.88	6.88	0.25	1.08	± 13.4 %
450	43.5	0.87	6.53	6.53	6.53	0.17	1.84	± 13.4 %
750	41.9	0.89	6.39	6.39	6.39	0.99	1.10	± 12.0 %
900	41.5	0.97	6.04	6.04	6.04	0.99	1.08	± 12.0 %
1810	40.0	1.40	5.05	5.05	5.05	0.89	1.16	± 12.0 %
1950	40.0	1.40	4.88	4.88	4.88	0.87	1.17	± 12.0 %
2300	39.5	1.67	4.70	4.70	4.70	0.77	1.25	± 12.0 %
2450	39.2	1.80	4.44	4.44	4.44	0.77	1.25	± 12.0 %
2600	39.0	1.96	4.29	4.29	4.29	0.75	1.29	± 12.0 %
3500	37.9	2.91	4.06	4.06	4.06	0.99	1.26	± 13.1 %
3700	37.7	3.12	3.63	3.63	3.63	0.99	1.29	± 13.1 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

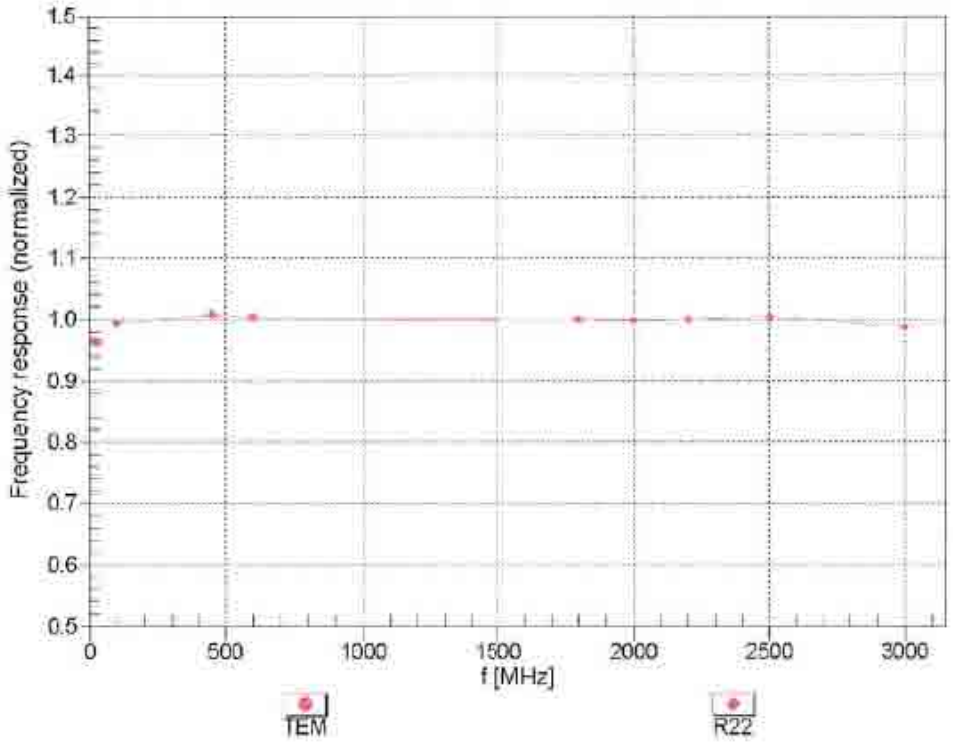
DASY/EASY - Parameters of Probe: ES3DV3- SN:3163

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
300	58.2	0.92	6.83	6.83	6.83	0.22	1.69	± 13.4 %
450	56.7	0.94	7.01	7.01	7.01	0.09	1.00	± 13.4 %
750	55.5	0.96	6.13	6.13	6.13	0.99	1.14	± 12.0 %
900	55.0	1.05	5.99	5.99	5.99	0.99	1.14	± 12.0 %
1810	53.3	1.52	4.87	4.87	4.87	0.87	1.30	± 12.0 %
1950	53.3	1.52	4.81	4.81	4.81	0.77	1.37	± 12.0 %
2300	52.9	1.81	4.38	4.38	4.38	0.90	1.15	± 12.0 %
2450	52.7	1.95	4.20	4.20	4.20	0.99	1.05	± 12.0 %
2600	52.5	2.16	4.07	4.07	4.07	0.99	1.06	± 12.0 %
3500	51.3	3.31	3.47	3.47	3.47	0.99	1.37	± 13.1 %
3700	51.0	3.55	3.42	3.42	3.42	0.99	1.41	± 13.1 %

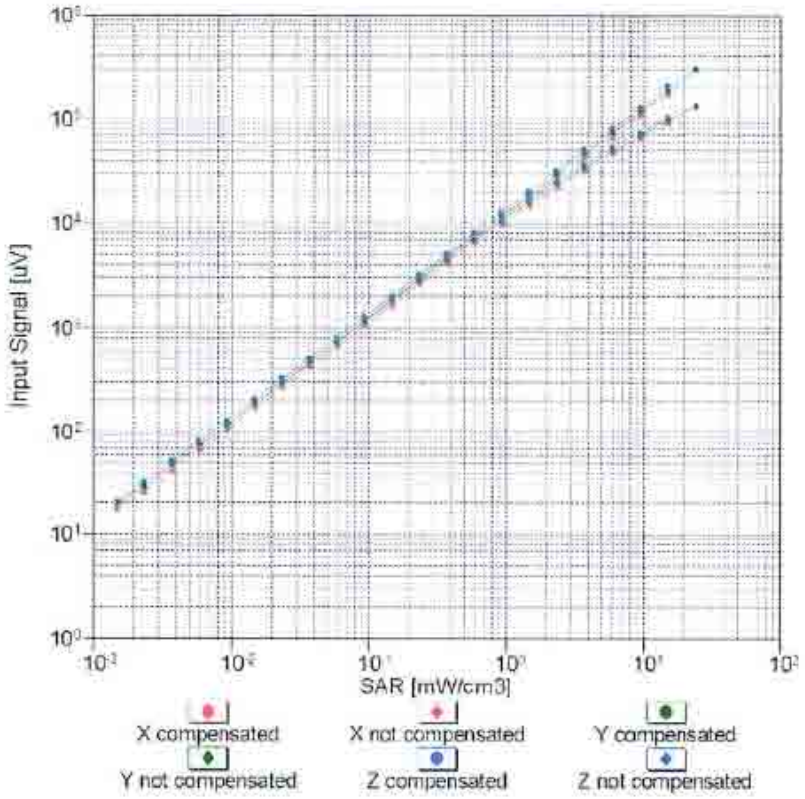
[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

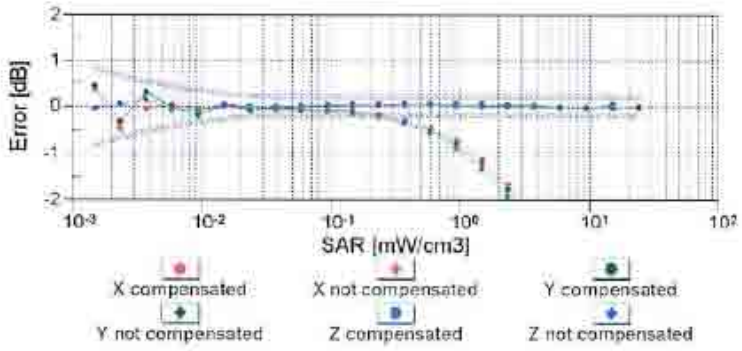
Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Dynamic Range f(SAR_{head})
(TEM cell , f = 900 MHz)

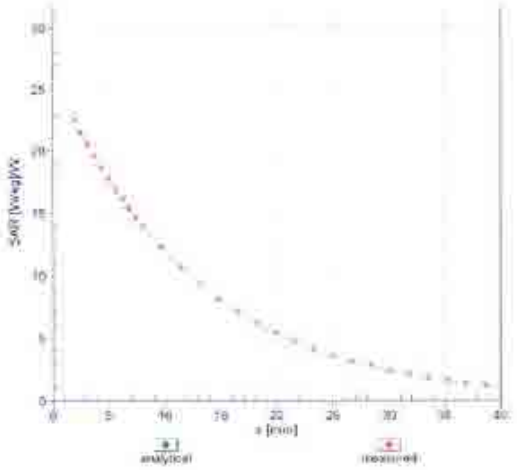




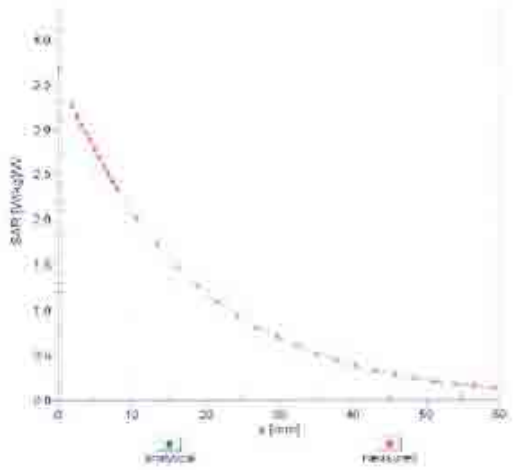
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment

f = 1810 MHz,WGLS R22 (H_convF)

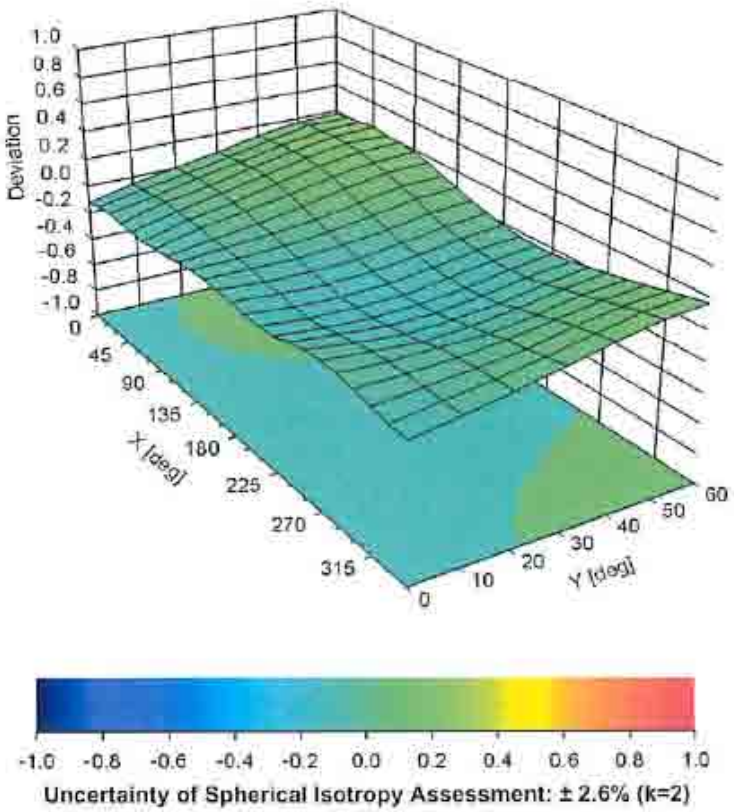


f = 900 MHz,WGLS R9 (H_convF)



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3163

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

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Additional Conversion Factors

for Dosimetric E-Field Probe

Type:	**ES3DV3**
Serial Number:	**3163**
Place of Assessment:	**Zurich**
Date of Assessment:	**April 15, 2011**
Probe Calibration Date:	**April 13, 2011**

Schmid & Partner Engineering AG hereby certifies that conversion factor(s) of this probe have been evaluated on the date indicated above. The assessment was performed using the FDTD numerical code SEMCAD of Schmid & Partner Engineering AG. Since the evaluation is coupled with measured conversion factors, it has to be recalculated yearly, i.e., following the re-calibration schedule of the probe. The uncertainty of the numerical assessment is based on the extrapolation from measured value at 900 MHz or at 1810 MHz.

Assessed by:

Schmid & Partner Engineering AG

s p e a g

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info@speag.com, http://www.speag.com

Dosimetric E-Field Probe ES3DV3 SN:3163

Conversion factor (± standard deviation)

150 MHz	*ConvF*	**8.2 ± 10%**	ε_r = 52.3 σ = 0.76 mho/m (head tissue)
250 MHz	*ConvF*	**7.7 ± 10%**	ε_r = 47.6 σ = 0.83 mho/m (head tissue)
150 MHz	*ConvF*	**7.9 ± 10%**	ε_r = 61.9 σ = 0.80 mho/m (body tissue)
250 MHz	*ConvF*	**7.5 ± 10%**	ε_r = 59.4 σ = 0.88 mho/m (body tissue)

Important Note:

For numerically assessed probe conversion factors, parameters Alpha and Delta in the DASY software must have the following entries: Alpha = 0 and Delta = 1.

Please see also DASY Manual.

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

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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: Motorola EME

Certificate No: ES3-3147_Jan11

CALIBRATION CERTIFICATE

Object	ES3DV3 - SN:3147
Calibration procedure(s)	QA CAL-01.v7, QA CAL-12.v6, QA CAL-14.v3, QA CAL-23.v4 and QA CAL-25.v3 Calibration procedure for dosimetric E-field probes
Calibration date:	January 26, 2011

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-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41495277	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41498087	1-Apr-10 (No. 217-01136)	Apr-11
Reference 3 dB Attenuator	SN: S5054 (3c)	30-Mar-10 (No. 217-01159)	Mar-11
Reference 20 dB Attenuator	SN: S5086 (20b)	30-Mar-10 (No. 217-01161)	Mar-11
Reference 30 dB Attenuator	SN: S5129 (30b)	30-Mar-10 (No. 217-01160)	Mar-11
Reference Probe ES3DV2	SN: 3013	29-Dec-10 (No. ES3-3013_Dec10)	Dec-11
DAE4	SN: 660	20-Apr-10 (No. DAE4-660_Apr10)	Apr-11

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: January 26, 2011

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

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S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis

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

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *Ax,y,z; Bx,y,z; Cx,y,z, VRx,y,z: A, B, C* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 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 *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe ES3DV3

SN:3147

Manufactured:	July 12, 2007
Last calibrated:	February 18, 2010
Recalibrated:	January 26, 2011

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: ES3DV3 SN:3147

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	1.25	1.22	1.20	± 10.1%
DCP (mV)[B]	100.7	101.9	101.1	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dBuV	C	VR mV	Unc[E] (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	112.5	± 3.4 %
			Y	0.00	0.00	1.00	108.1	
			Z	0.00	0.00	1.00	107.7	

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

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).

[B] Numerical linearization parameter: uncertainty not required.

[E] Uncertainty is determined using the maximum deviation from linear response applying recatangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: ES3DV3 SN:3147

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz]	Validity [MHz][C]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth	Unc (k=2)
300	± 50 / ± 100	45.3 ± 5%	0.87 ± 5%	6.91	6.91	6.91	0.25	1.08	± 13.3%
450	± 50 / ± 100	43.5 ± 5%	0.87 ± 5%	6.49	6.49	6.49	0.15	1.67	± 13.3%
750	± 50 / ± 100	41.9 ± 5%	0.89 ± 5%	6.25	6.25	6.25	0.72	1.16	± 11.0%
900	± 50 / ± 100	41.5 ± 5%	0.97 ± 5%	5.88	5.88	5.88	0.58	1.25	± 11.0%
1810	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	5.13	5.13	5.13	0.43	1.63	± 11.0%
1950	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	4.88	4.88	4.88	0.43	1.65	± 11.0%
2300	± 50 / ± 100	39.5 ± 5%	1.67 ± 5%	4.73	4.73	4.73	0.45	1.64	± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	4.45	4.45	4.45	0.53	1.59	± 11.0%
2600	± 50 / ± 100	39.0 ± 5%	1.96 ± 5%	4.34	4.34	4.34	0.51	1.62	± 11.0%
3500	± 50 / ± 100	37.9 ± 5%	2.91 ± 5%	4.13	4.13	4.13	0.85	1.25	± 13.1%
3700	± 50 / ± 100	37.7 ± 5%	3.12 ± 5%	3.78	3.78	3.78	0.90	1.18	± 13.1%

[C] 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.

DASY/EASY - Parameters of Probe: ES3DV3 SN:3147

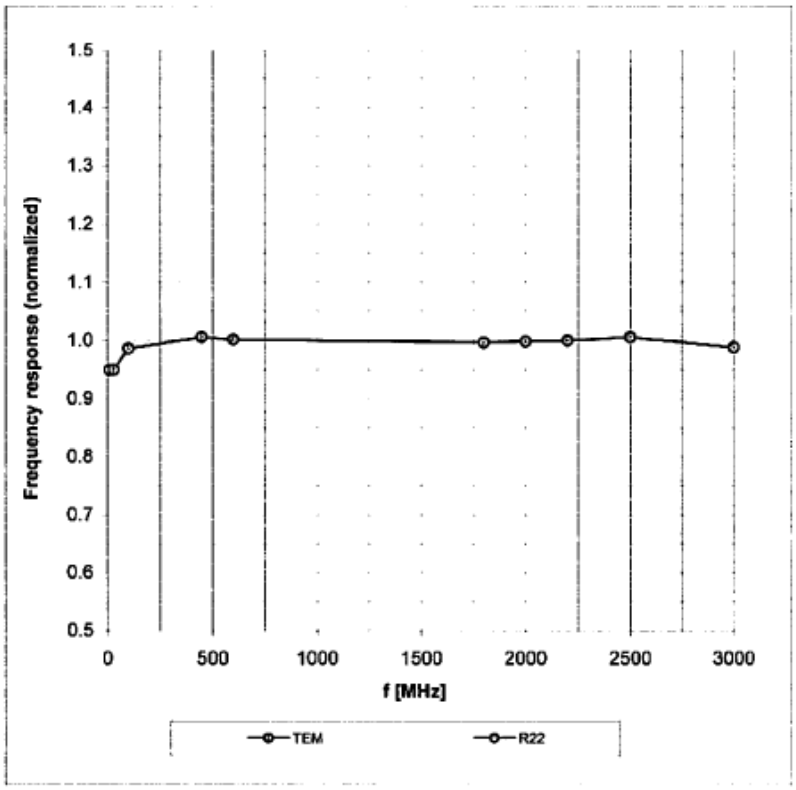
Calibration Parameter Determined in Body Tissue Simulating Media

f [MHz]	Validity [MHz][C]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth	Unc (k=2)
300	± 50 / ± 100	58.2 ± 5%	0.92 ± 5%	6.95	6.95	6.95	0.22	1.78	± 13.3%
450	± 50 / ± 100	56.7 ± 5%	0.94 ± 5%	6.83	6.83	6.83	0.07	1.00	± 13.3%
750	± 50 / ± 100	55.5 ± 5%	0.96 ± 5%	6.05	6.05	6.05	0.78	1.16	± 11.0%
900	± 50 / ± 100	55.0 ± 5%	1.05 ± 5%	5.93	5.93	5.93	0.85	1.14	± 11.0%
1810	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.65	4.65	4.65	0.26	2.61	± 11.0%
1950	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.66	4.66	4.66	0.26	2.92	± 11.0%
2300	± 50 / ± 100	52.9 ± 5%	1.81 ± 5%	4.31	4.31	4.31	0.46	1.68	± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	4.18	4.18	4.18	0.66	1.31	± 11.0%
2600	± 50 / ± 100	52.5 ± 5%	2.16 ± 5%	4.11	4.11	4.11	0.88	1.10	± 11.0%
3500	± 50 / ± 100	51.3 ± 5%	3.31 ± 5%	3.57	3.57	3.57	0.80	1.31	± 13.1%
3700	± 50 / ± 100	51.0 ± 5%	3.55 ± 5%	3.53	3.53	3.53	0.80	1.29	± 13.1%

[C] 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.

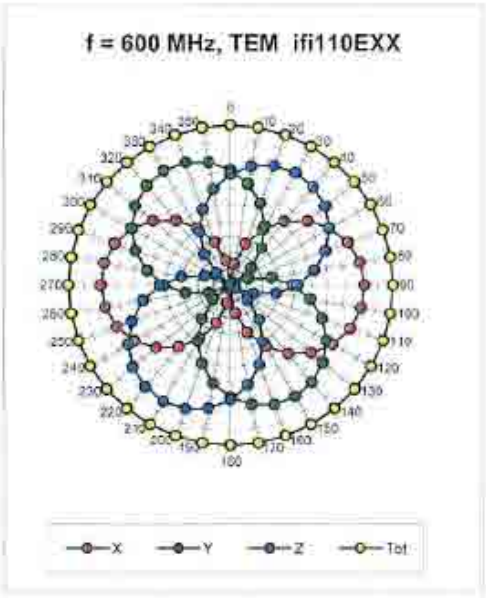
Frequency Response of E-Field

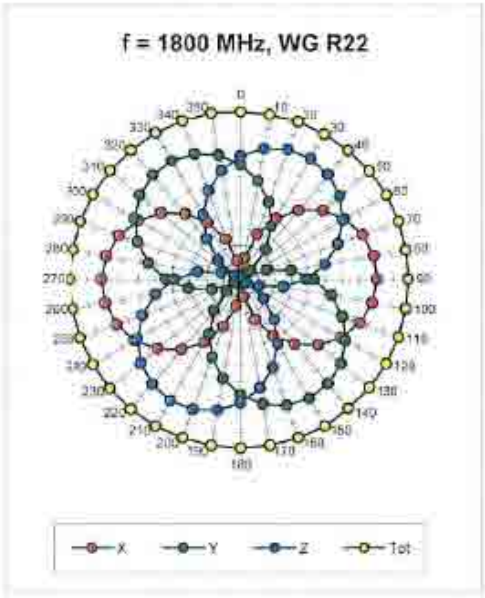
(TEM-Cell:ifi110 EXX, Waveguide: R22)

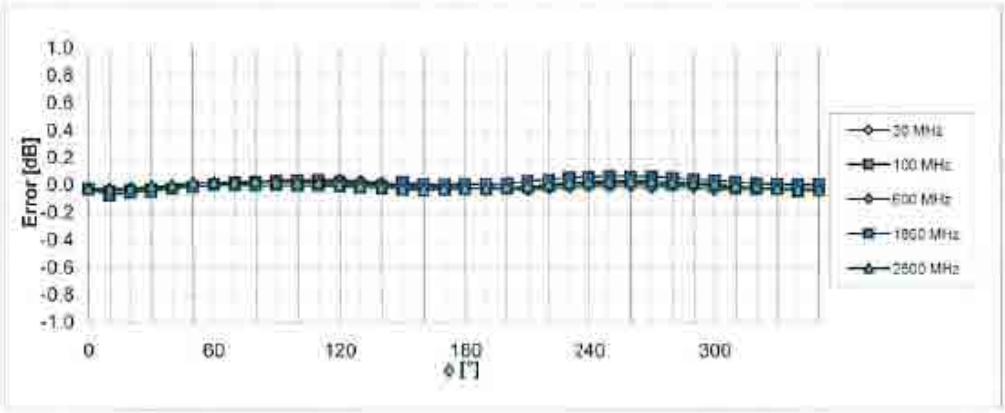


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Receiving Pattern (ϕ), ϑ = 0°



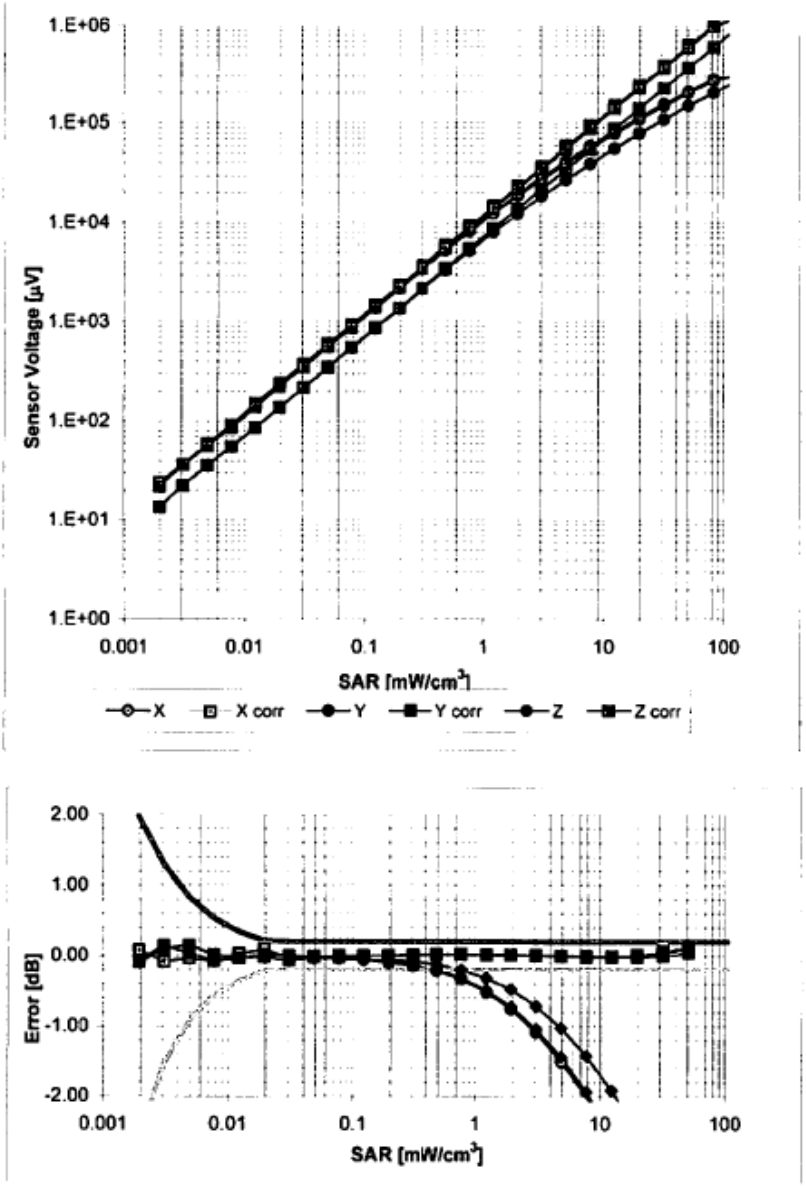




Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

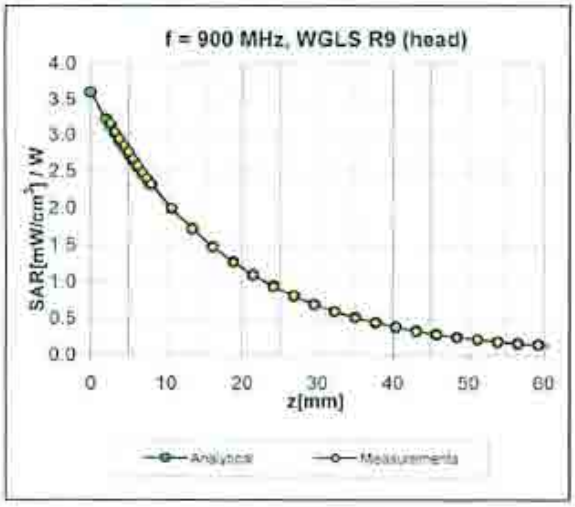
Dynamic Range f(SAR_{head})

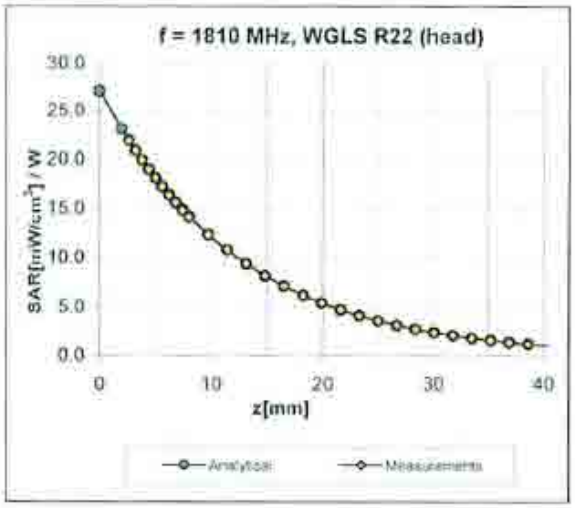
(TEM cell, f = 900 MHz)



Uncertainty of Linearity Assessment: ± 0.6% (k=2)

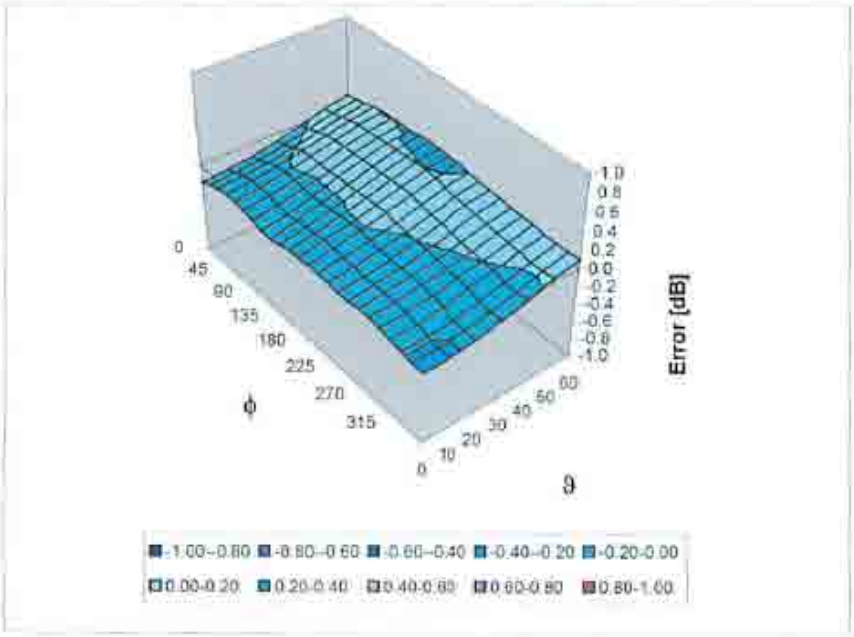
Conversion Factor Assessment





Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

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Additional Conversion Factors

for Dosimetric E-Field Probe

Type:	**ES3DV3**
Serial Number:	**3147**
Place of Assessment:	**Zurich**
Date of Assessment:	**January 28, 2011**
Probe Calibration Date:	**January 26, 2011**

Schmid & Partner Engineering AG hereby certifies that conversion factor(s) of this probe have been evaluated on the date indicated above. The assessment was performed using the FDTD numerical code SEMCAD of Schmid & Partner Engineering AG. Since the evaluation is coupled with measured conversion factors, it has to be recalculated yearly, i.e., following the re-calibration schedule of the probe. The uncertainty of the numerical assessment is based on the extrapolation from measured values at 450, 900 MHz and 1810 MHz.

Assessed by:

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Dosimetric E-Field Probe ES3DV3 SN:3147

Conversion factor (± standard deviation)

150 MHz	*ConvF*	**8.0 ± 10%**	ε_r = 52.3 σ = 0.76 mho/m (head tissue)
250 MHz	*ConvF*	**7.3 ± 10%**	ε_r = 47.6 σ = 0.83 mho/m (head tissue)
150 MHz	*ConvF*	**7.7± 10%**	ε_r = 61.9 σ = 0.80 mho/m (body tissue)
250 MHz	*ConvF*	**7.3 ± 10%**	ε_r = 59.4 σ = 0.88 mho/m (body tissue)

Important Note:

For numerically assessed probe conversion factors, parameters Alpha and Delta in the DASY software must have the following entries: Alpha = 0 and Delta = 1.

Please see also DASY Manual.

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Accreditation No.: SCS 108

Client: Motorola EME

Certificate No: ES3-3185_Nov11

CALIBRATION CERTIFICATE

Object: ES3DV3 - SN:3185

Calibration procedure(s): QA CAL-01.v8, QA CAL-12.v7, QA CAL-14.v3, QA CAL-23.v4, QA CAL-25.v4
Calibration procedure for dosimetric E-field probes

Calibration date: November 17, 2011

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	31-Mar-11 (No. 217-01372)	Apr-12
Power sensor E4412A	MY41498087	31-Mar-11 (No. 217-01372)	Apr-12
Reference 3 dB Attenuator	SN: S5054 (3c)	29-Mar-11 (No. 217-01369)	Apr-12
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Reference 30 dB Attenuator	SN: S5129 (30b)	29-Mar-11 (No. 217-01370)	Apr-12
Reference Probe ES3DV2	SN: 3013	29-Dec-10 (No. ES3-3013_Dec10)	Dec-11
DAE4	SN: 654	3-May-11 (No. DAE4-654_May11)	May-12
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-11)	In house check: Apr-13
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: November 17, 2011

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

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Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis

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

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *PAR:* PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- *Ax,y,z; Bx,y,z; Cx,y,z, VRx,y,z*: *A, B, C* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 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 *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe ES3DV3

SN:3185

Manufactured: March 25, 2008
Calibrated: November 17, 2011

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3185

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	1.41	1.23	1.07	± 10.1 %
DCP (mV)[B]	100.2	99.3	101.9	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc[E] (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	121.6	±2.5 %
			Y	0.00	0.00	1.00	114.3	
			Z	0.00	0.00	1.00	107.5	

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

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3185

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
300	45.3	0.87	6.75	6.75	6.75	0.25	1.06	± 13.4 %
450	43.5	0.87	6.22	6.22	6.22	0.14	1.68	± 13.4 %
750	41.9	0.89	5.95	5.95	5.95	0.80	1.00	± 12.0 %
900	41.5	0.97	5.64	5.64	5.64	0.80	1.00	± 12.0 %
1810	40.0	1.40	5.07	5.07	5.07	0.80	1.36	± 12.0 %
1950	40.0	1.40	4.79	4.79	4.79	0.80	1.29	± 12.0 %
2300	39.5	1.67	4.56	4.56	4.56	0.80	1.29	± 12.0 %
2450	39.2	1.80	4.24	4.24	4.24	0.80	1.28	± 12.0 %
2600	39.0	1.96	4.08	4.08	4.08	0.80	1.32	± 12.0 %
3500	37.9	2.91	4.03	4.03	4.03	0.95	1.20	± 13.1 %
3700	37.7	3.12	3.71	3.71	3.71	0.95	1.20	± 13.1 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

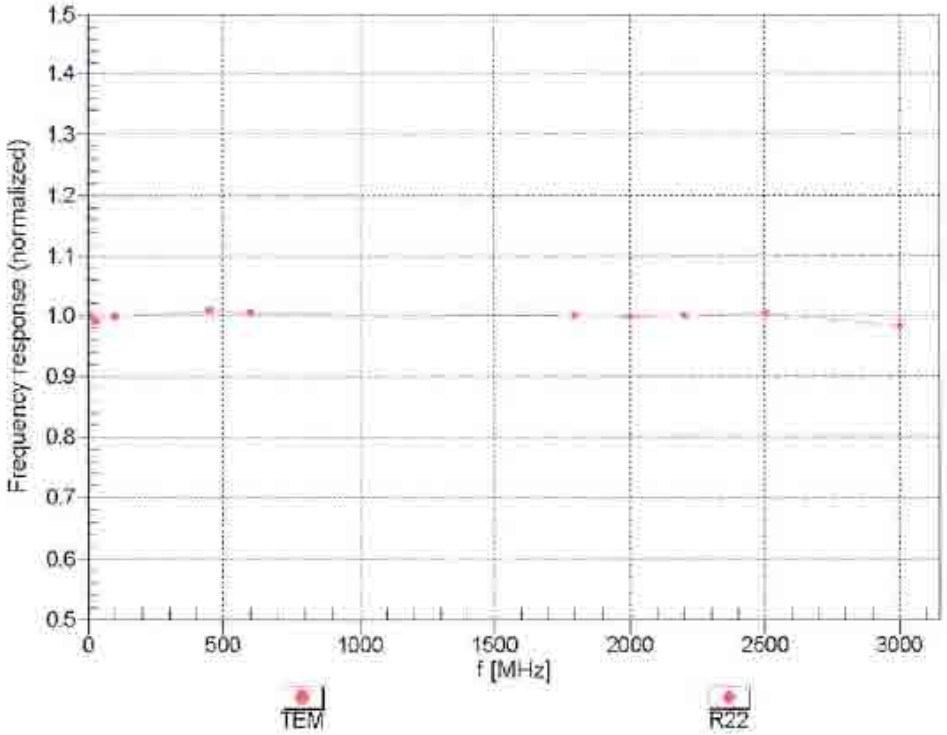
DASY/EASY - Parameters of Probe: ES3DV3 - SN:3185

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
300	58.2	0.92	6.73	6.73	6.73	0.23	1.79	± 13.4 %
450	56.7	0.94	6.67	6.67	6.67	0.09	1.00	± 13.4 %
750	55.5	0.96	5.89	5.89	5.89	0.80	1.00	± 12.0 %
900	55.0	1.05	5.75	5.75	5.75	0.80	1.00	± 12.0 %
1810	53.3	1.52	4.61	4.61	4.61	0.80	1.33	± 12.0 %
1950	53.3	1.52	4.63	4.63	4.63	0.77	1.35	± 12.0 %
2300	52.9	1.81	4.26	4.26	4.26	0.80	1.24	± 12.0 %
2450	52.7	1.95	4.11	4.11	4.11	0.80	1.00	± 12.0 %
2600	52.5	2.16	3.96	3.96	3.96	0.80	1.00	± 12.0 %
3500	51.3	3.31	3.38	3.38	3.38	0.90	1.22	± 13.1 %
3700	51.0	3.55	3.31	3.31	3.31	0.99	1.35	± 13.1 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)

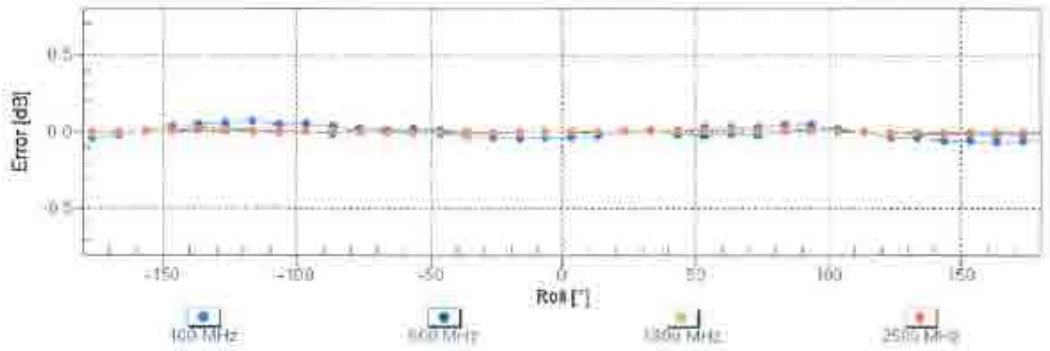


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Receiving Pattern (ϕ), ϑ = 0°

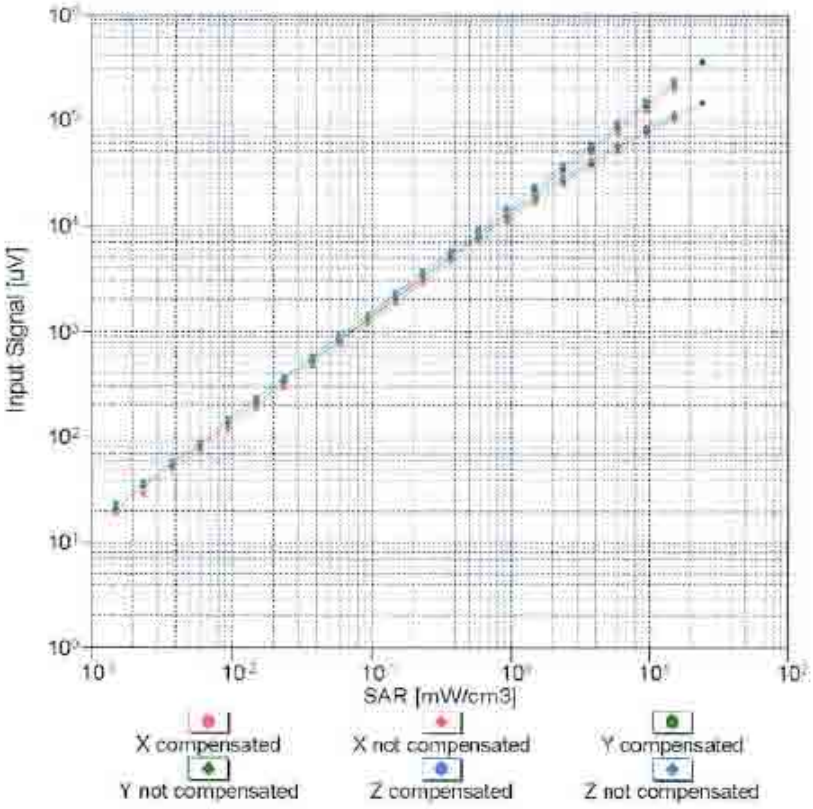
f=600 MHz,TEM

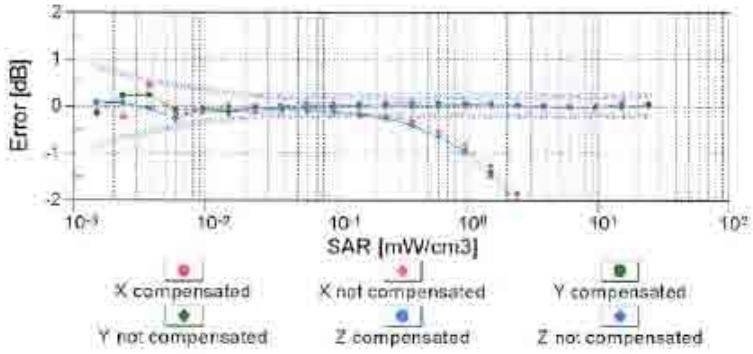
f=1800 MHz,R22



Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})
(TEM cell , f = 900 MHz)

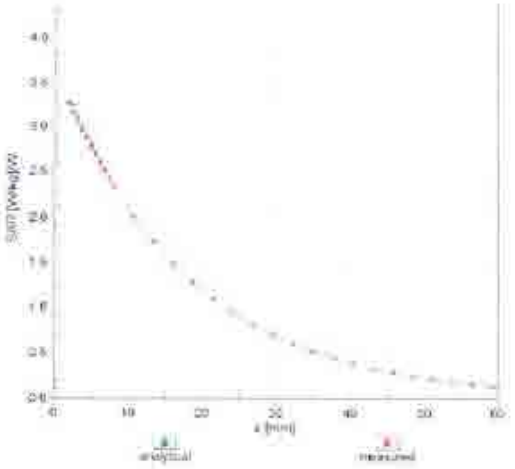




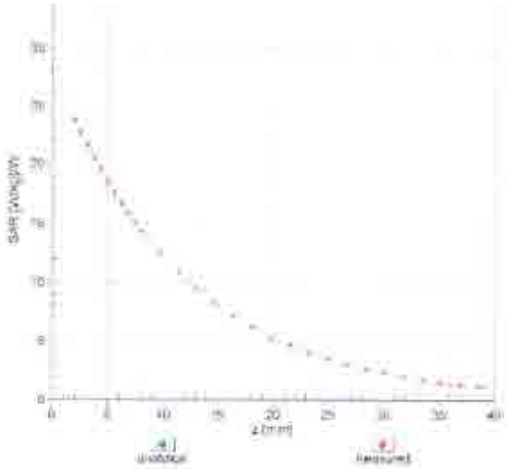
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment

f = 900 MHz,WGLS R9 (H_convF)

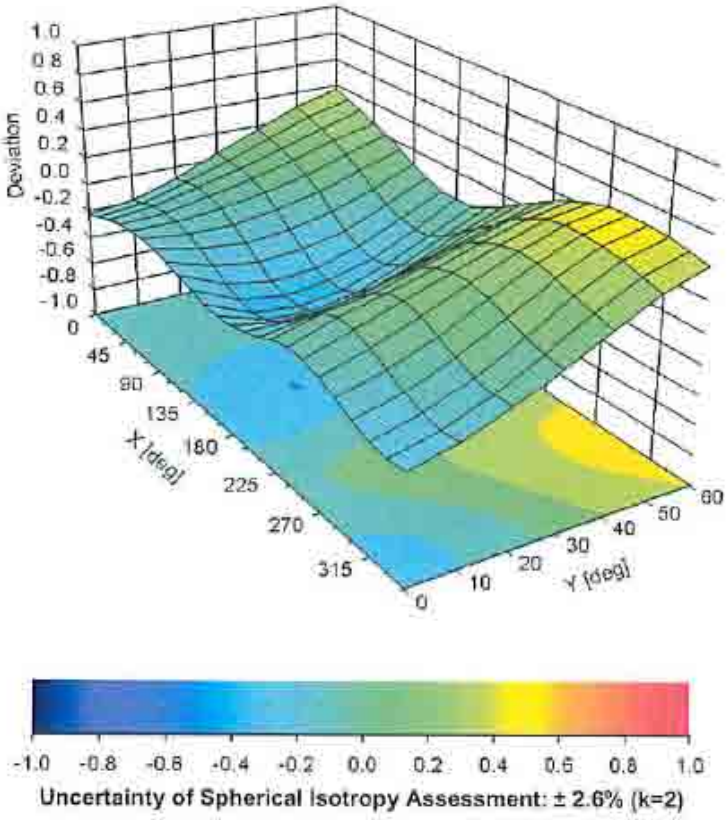


f = 1950 MHz,WGLS R22 (H_convF)



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3185

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

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Additional Conversion Factors

for Dosimetric E-Field Probe

Type:	**ES3DV3**
Serial Number:	**3185**
Place of Assessment:	**Zurich**
Date of Assessment:	**November 21, 2011**
Probe Calibration Date:	**November 17, 2011**

Schmid & Partner Engineering AG hereby certifies that conversion factor(s) of this probe have been evaluated on the date indicated above. The assessment was performed using the FDTD numerical code SEMCAD of Schmid & Partner Engineering AG. Since the evaluation is coupled with measured conversion factors, it has to be recalculated yearly, i.e., following the re-calibration schedule of the probe. The uncertainty of the numerical assessment is based on the extrapolation from measured value at 900 MHz or at 1810 MHz.

Assessed by: 

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Dosimetric E-Field Probe ES3DV3 SN:3185

Conversion factor (± standard deviation)

150 ± 50 MHz	*ConvF*	**7.7 ± 10%**	**ε_r = 52.3** **σ = 0.76 mho/m** (head tissue)
250 ± 50 MHz	*ConvF*	**7.0 ± 10%**	**ε_r = 47.6** **σ = 0.83 mho/m** (head tissue)
150 ± 50 MHz	*ConvF*	**7.4 ± 10%**	**ε_r = 61.9** **σ = 0.80 mho/m** (body tissue)
250 ± 50 MHz	*ConvF*	**7.0 ± 10%**	**ε_r = 59.4** **σ = 0.88 mho/m** (body tissue)

Important Note:

For numerically assessed probe conversion factors, parameters Alpha and Delta in the DASY software must have the following entries: Alpha = 0 and Delta = 1.

Please see also DASY Manual.

APPENDIX C
Dipole Calibration Certificates

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Accreditation No.: **SCS 108**

Client **Motorola EME**

Certificate No: **D450V3-1077_Jan11**

CALIBRATION CERTIFICATE

Object: D450V3 - SN: 1077

Calibration procedure(s): QA CAL-15.v5
Calibration Procedure for dipole validation kits below 800 MHz

Calibration date: January 11, 2011

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 (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41495277	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41498087	1-Apr-10 (No. 217-01136)	Apr-11
Reference 3 dB Attenuator	SN: S5054 (3c)	30-Mar-10 (No. 217-01159)	Mar-11
Reference 20 dB Attenuator	SN: S5086 (20b)	30-Mar-10 (No. 217-01161)	Mar-11
Type-N mismatch combination	SN: 5047.3 / 06327	30-Mar-10 (No. 217-01162)	Mar-11
Reference Probe ET3DV6	SN: 1507	30-Apr-10 (No. ET3-1507_Apr10)	Apr-11
DAE4	SN: 654	23-Apr-10 (No. DAE4-654_Apr10)	Apr-11

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	04-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: January 12, 2011

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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

Glossary:

TSL	tissue simulating liquid
ConF	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) DASY4/5 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.

DASY Version	DASY5	V52.6
Extrapolation	Advanced Extrapolation	
Phantom	ELI4 Flat Phantom	Shell thickness: 2 ± 0.2 mm
Distance Dipole Center - TSL	15 mm	with Spacer
Area Scan Resolution	dx, dy = 15 mm	
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	43.5	0.87 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	43.6 ± 6 %	0.83 mho/m ± 6 %
Head TSL temperature during test	(22.5 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	condition	
SAR measured	398 mW input power	1.82 mW / g
SAR normalized	normalized to 1W	4.57 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**4.73 mW / g ± 18.1 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	398 mW input power	1.21 mW / g
SAR normalized	normalized to 1W	3.04 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**3.13 mW / g ± 17.6 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	56.7	0.94 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	53.9 ± 6 %	0.90 mho/m ± 6 %
Body TSL temperature during test	(22.0 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	condition	
SAR measured	398 mW input power	1.74 mW / g
SAR normalized	normalized to 1W	4.37 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**4.47 mW / g ± 18.1 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	398 mW input power	1.16 mW / g
SAR normalized	normalized to 1W	2.91 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**2.98 mW / g ± 17.6 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	57.6 Ω - 6.0 jΩ
Return Loss	- 20.9 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	55.6 Ω - 8.6 jΩ
Return Loss	- 20.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.350 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	June 24, 2010

DASY5 Validation Report for Head TSL

Date/Time: 11.01.2011 10:41:12

Test Laboratory: SPEAG, Zurich, Switzerland

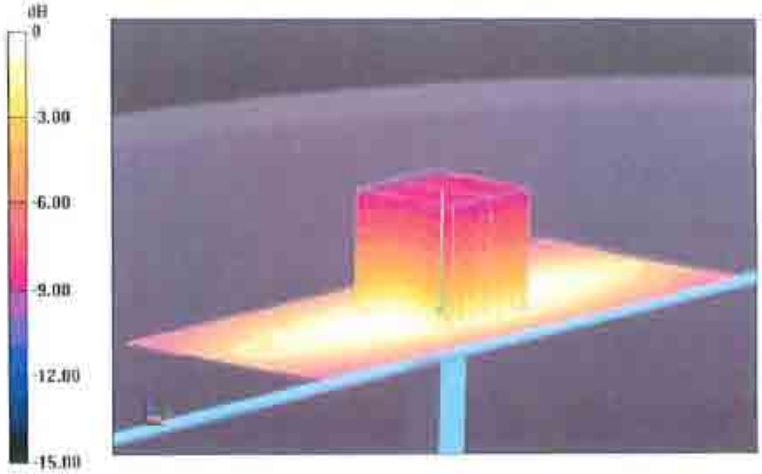
DUT: Dipole 450 MHz; Type: D450V3; Serial: D450V3 - SN:1077

Communication System: CW; Frequency: 450 MHz; Duty Cycle: 1:1
Medium: HSL450
Medium parameters used: f = 450 MHz; σ = 0.83 mho/m; ε_r = 43.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

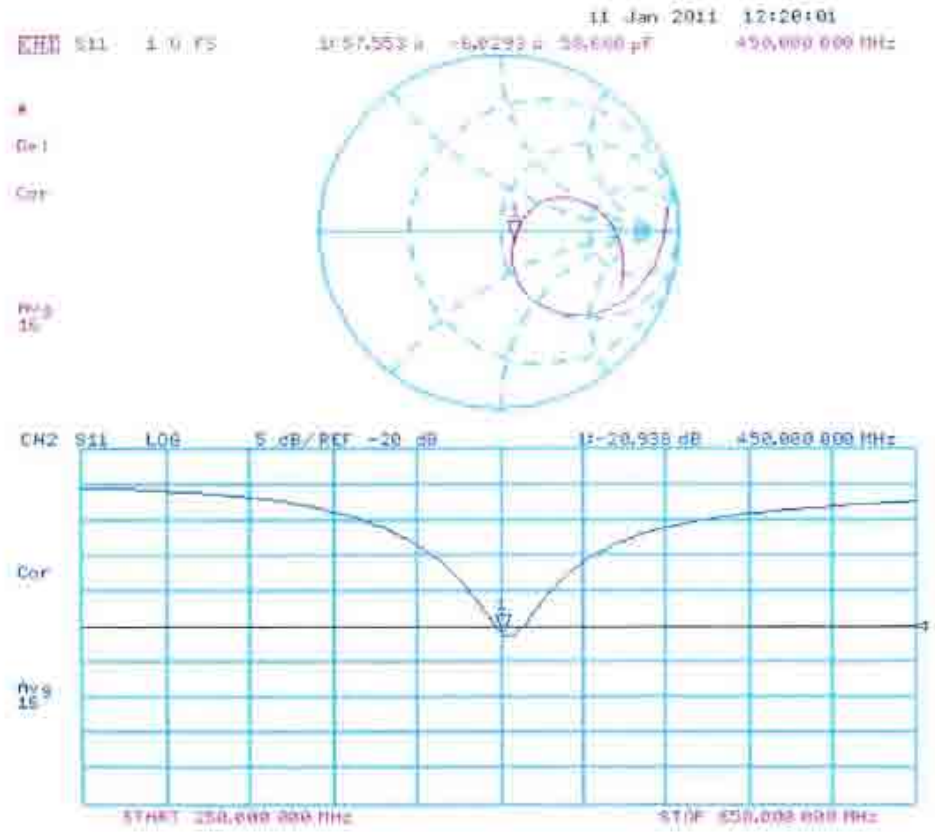
- Probe: ET3DV6 - SN1507; ConvF(6.62, 6.62, 6.62); Calibrated: 30.04.2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn654; Calibrated: 23.04.2010
- Phantom: ELI4.0; Type: QDOVA001BA; Serial: 1002
- Measurement SW: DASY52, V52.6.1 Build (408)
- Postprocessing SW: SEMCAD X, V14.4.2 Build (2595)

Pin=398mW /d=15mm, /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 50.139 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 2.774 W/kg
SAR(1 g) = 1.82 mW/g; SAR(10 g) = 1.21 mW/g
Maximum value of SAR (measured) = 1.939 mW/g



0 dB = 1.940mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date/Time: 11.01.2011 13:17:57

Test Laboratory: SPEAG, Zurich, Switzerland

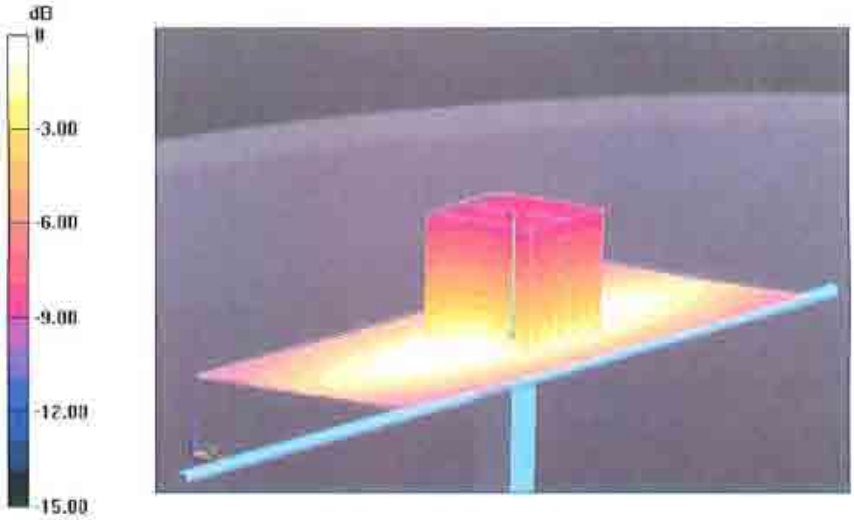
DUT: Dipole 450 MHz; Type: D450V3; Serial: D450V3 - SN:1077

Communication System: CW; Frequency: 450 MHz; Duty Cycle: 1:1
Medium: MSL450
Medium parameters used: f = 450 MHz; σ = 0.9 mho/m; ε_r = 53.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

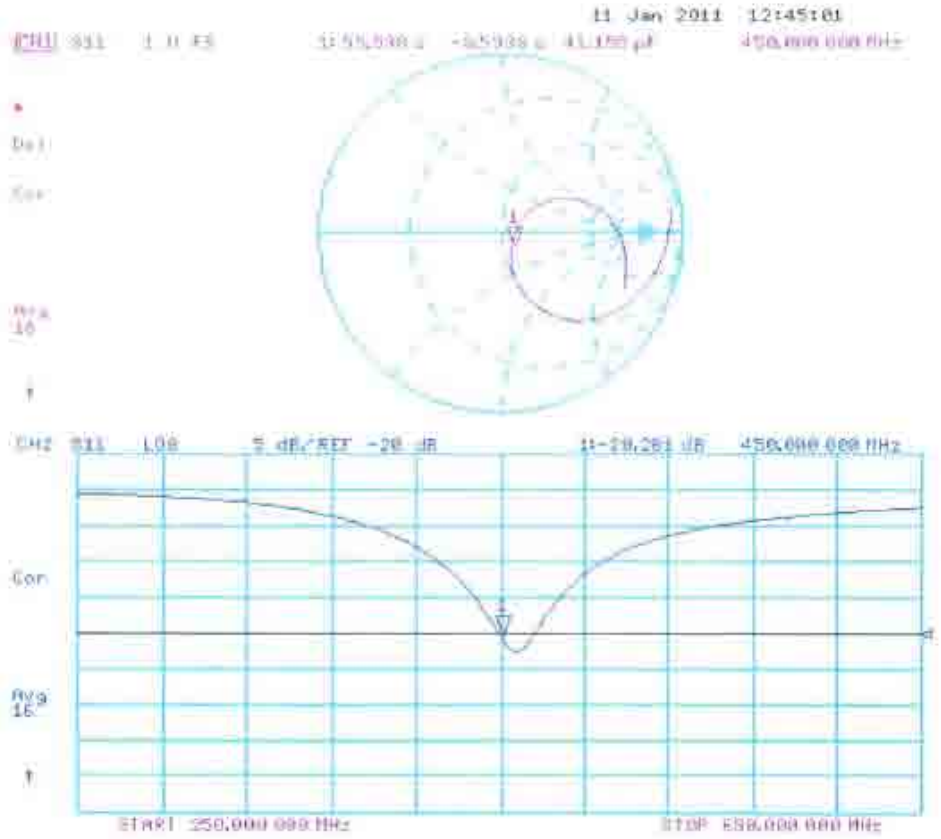
- Probe: ET3DV6 - SN1507; ConvF(7.2, 7.2, 7.2); Calibrated: 30.04.2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn654; Calibrated: 23.04.2010
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1002
- Measurement SW: DASY52, V52.6.1 Build (408)
- Postprocessing SW: SEMCAD X, V14.4.2 Build (2595)

Pin=398mW /d=15mm /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 46.781 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 2.716 W/kg
SAR(1 g) = 1.74 mW/g; SAR(10 g) = 1.16 mW/g
Maximum value of SAR (measured) = 1.858 mW/g



0 dB = 1.860mW/g

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 108

Client: Motorola EME

Certificate No: D450V3-1075_Aug11

CALIBRATION CERTIFICATE

Object: D450V3 - SN: 1075

Calibration procedure(s): QA CAL-15.v6
Calibration procedure for dipole validation kits below 700 MHz

Calibration date: August 22, 2011

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	31-Mar-11 (No. 217-01372)	Apr-12
Power sensor E4412A	MY41498087	31-Mar-11 (No. 217-01372)	Apr-12
Reference 3 dB Attenuator	SN: S5054 (3c)	29-Mar-11 (No. 217-01369)	Apr-12
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Type-N mismatch combination	SN: 5047.3 / 06327	29-Mar-11 (No. 217-01168)	Apr-12
Reference Probe ET3DV6	SN: 1507	29-Apr-11 (No. ET3-1507_Apr11)	Apr-12
DAE4	SN: 654	3-May-11 (No. DAE4-654_May11)	May-12

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: August 24, 2011

Calibration Laboratory of
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Zeughausstrasse 43, 8004 Zurich, Switzerland

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S Swiss Calibration Service

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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
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) DASY4/5 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.

DASY Version	DASY5	V52.6.2
Extrapolation	Advanced Extrapolation	
Phantom	ELI4 Flat Phantom	Shell thickness: 2 ± 0.2 mm
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	43.5	0.87 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	44.5 ± 6 %	0.86 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	398 mW input power	1.84 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**4.69 mW /g ± 18.1 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	398 mW input power	1.23 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**3.12 mW /g ± 17.6 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	56.7	0.94 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.5 ± 6 %	0.94 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	398 mW input power	1.80 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**4.50 mW / g ± 18.1 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	398 mW input power	1.20 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**3.01 mW / g ± 17.6 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	59.4 Ω - 2.2 jΩ
Return Loss	- 21.1 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	56.6 Ω - 5.8 jΩ
Return Loss	- 21.7 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.355 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	June 24, 2010

DASY5 Validation Report for Head TSL

Date: 22.08.2011

Test Laboratory: SPEAG

DUT: Dipole 450 MHz; Type: D450V3; Serial: D450V3 - SN: 1075

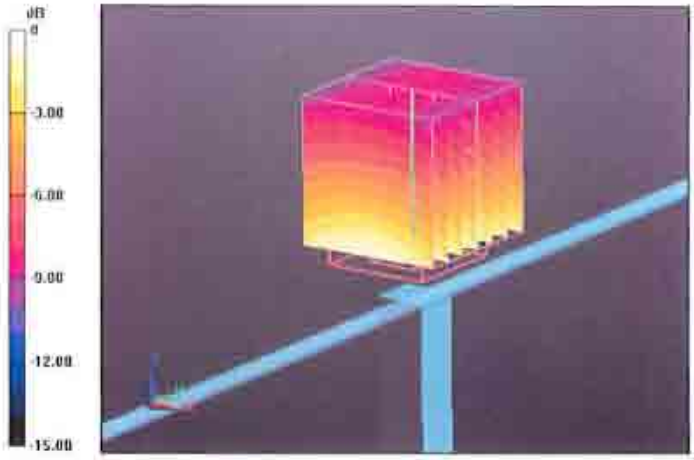
Communication System: CW; Frequency: 450 MHz
Medium parameters used: f = 450 MHz; σ = 0.86 mho/m; ε_r = 44.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(6.59, 6.59, 6.59); Calibrated: 29.04.2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn654; Calibrated: 03.05.2011
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1003
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

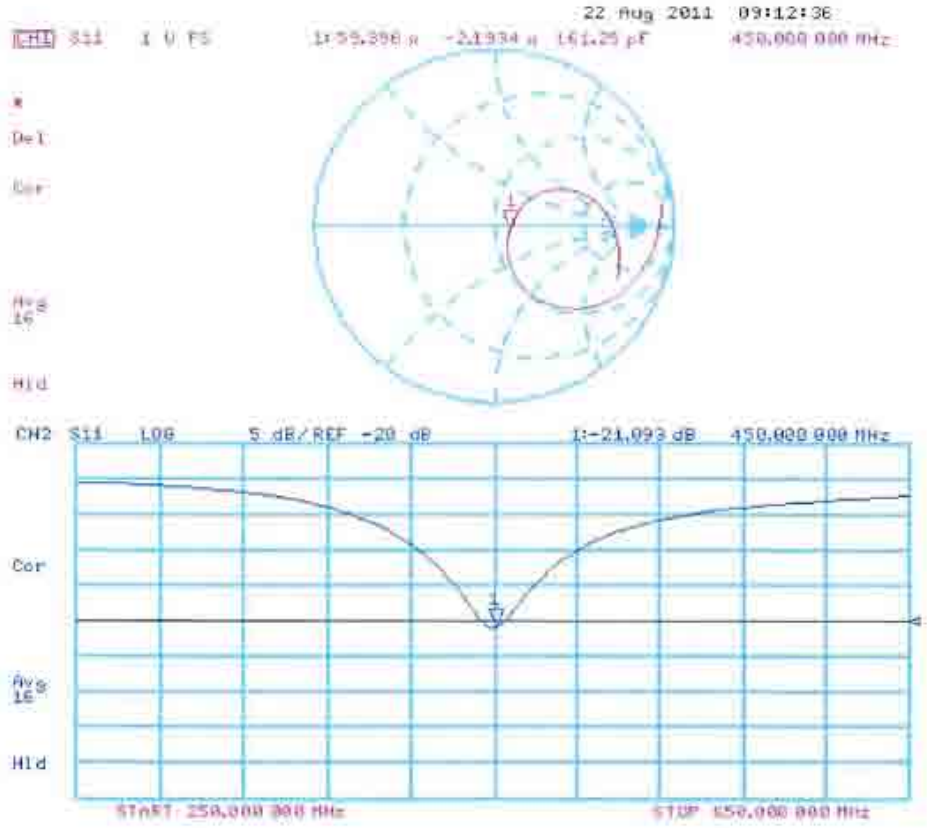
Dipole Calibration for Head Tissue/d=15mm, Pin=398mW/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 49.673 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 2.798 W/kg
SAR(1 g) = 1.84 mW/g; SAR(10 g) = 1.23 mW/g
Maximum value of SAR (measured) = 1.967 mW/g



0 dB = 1.970mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 22.08.2011

Test Laboratory: SPEAG

DUT: Dipole 450 MHz; Type: D450V3; Serial: D450V3 - SN: 1075

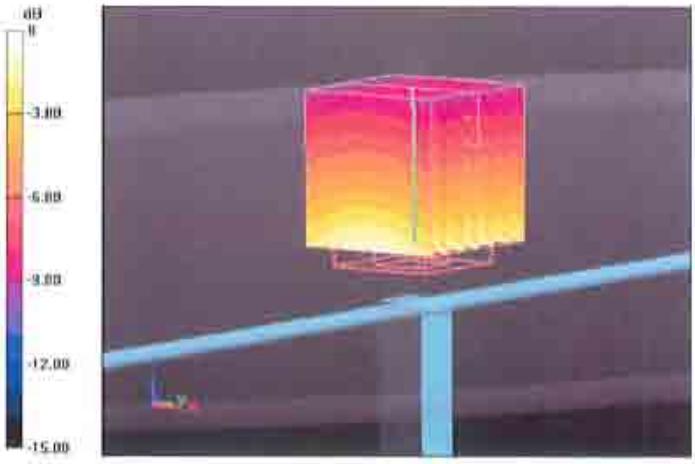
Communication System: CW; Frequency: 450 MHz
Medium parameters used: f = 450 MHz; σ = 0.94 mho/m; ε_r = 55.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(7.05, 7.05, 7.05); Calibrated: 29.04.2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn654; Calibrated: 03.05.2011
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1003
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Body Tissue/d=15mm, Pin=398mW/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 46.440 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 2.825 W/kg
SAR(1 g) = 1.8 mW/g; SAR(10 g) = 1.2 mW/g
Maximum value of SAR (measured) = 1.924 mW/g



0 dB = 1.920mW/g

Impedance Measurement Plot for Body TSL