


MOTOROLA SOLUTIONS

TESTING CERT # 2518.01
DECLARATION OF COMPLIANCE SAR ASSESSMENT Part 1 of 2

EME Test Laboratory
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Fort Lauderdale, FL. 33322.

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(MNUE1005A/MNUE1006A) _Rev.O_110121_
SR8653/8903/8425

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Report Author: Kim Uong (Principal Staff Eng.)
Date/s Tested: 7/27/10 - 9/20/10, 10/5/10 – 10/7/10, 10/8/10 – 1/13/11
Manufacturer/Location: Motorola, Reynosa/Schaumburg
Sector/Group/Div.: G&PS
Date submitted for test: 7/23/10, 8/6/2010

DUT Description: APX6000 UHF R1 380 – 470 MHz, 3-5.7W, 6.25kHz/12.5kHz/25kHz, Basic Top Display Model. Capable of digital and analog FM transmission. Also capable of TDMA transmission and Bluetooth equipped.

Test TX mode(s): CW (PTT) for UHF; CW (76.1% duty cycle for Bluetooth)
Max. Power output: 5.7 W for UHF; 10 mW for Bluetooth
Nominal Power: 5.0 W for UHF; 10 mW for Bluetooth
Tx Frequency Bands: 380 - 470 MHz; 2402 – 2480 MHz
Signaling type: FM and TDMA (UHF); FHSS (Bluetooth)
Model(s) Tested: H98QDD9PW5AN (MNUE1005A/MNUE1006A)
Model(s) Certified: H98QDD9PW5AN (MNUE1006A)
Serial Number(s): NUE1006A0052, NUE1006A0043, CAI1006KW2
Classification: Occupational/Controlled
FCC ID: AZ489FT4892
FCC Rule Part(s): 90 (406.1 - 470 MHz)
IC: 109U-89FT4892
IC standard(s): RSS 102 issue 4; Safety Code 6

** 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 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.

Signature on file – Deanna Zakharia
Deanna Zakharia
EME Lab Senior Resource Manager,
Laboratory Director

Approval Date: 1/21/2011

Certification Date:

Certification No.:

Part 1 of 2

1.0	Introduction.....	4
2.0	Abbreviations / Definitions.....	4
3.0	Referenced Standards and Guidelines	4
4.0	SAR Limits	5
5.0	SAR Result Scaling Methodology	6
6.0	Description of Device Under Test (DUT)	6
7.0	Optional Accessories and Test Criteria	7
7.1	Antennas	7
7.2	Batteries	7
7.3	Body worn Accessories	8
7.4	Audio Accessories	8
8.0	Description of Test System.....	8
8.1	Description of Robotics/Probes/Readout Electronics.....	9
8.2	Description of Phantom(s)	9
8.2.1	Dual Flat Phantom	9
8.2.2	SAM Phantom.....	9
8.2.3	Elliptical Flat Phantom	9
8.3	Description of Simulated Tissue.....	10
9.0	Additional Test Equipment.....	11
10.0	SAR Measurement System Verification.....	12
10.1	Equivalent Tissue Test Results	12
10.2	System Check Test Results.....	16
11.0	Environmental Test Conditions	17
12.0	DUT Test Methodology	17
12.1	Measurements	17
12.2	DUT Configuration(s).....	17
12.3	DUT Positioning Procedures	17
12.3.1	Body.....	17
12.3.2	Head	18
12.3.3	Face.....	18
12.4	DUT Test Channels.....	18
12.5	DUT Test Plan	18
12.5.1	General Test Flowchart.....	19
13.0	DUT Test Data	23
13.1	Assessments at the Face with antenna PMAE4065A (CW mode).....	23
13.2	Assessments at the Face with antenna FAF5259A (CW mode).....	25
13.3	Assessment at the Face with PSM PMMN4059A and antenna PMAE4065A (CW mode)	27
13.4	Assessment at the Face with PSM PMMN4059A and antenna FAF5259A (CW mode)	28
13.5	Assessment at the Face with PSM PMMN4061A and antenna PMAE4065A (CW mode)	29
13.6	Assessment at the Face with PSM PMMN4061A and antenna FAF5259A (CW mode)	30

13.7	Assessments at the Body with antenna PMAE4065A (CW mode)	31
13.8	Assessments at the Body with antenna FAF5259A (CW mode)	34
13.9	Assessments at the Body with PSM PMMN4059A and antenna PMAE4065A (CW mode)	37
13.10	Assessments at the Body with PSM PMMN4059A and antenna FAF5259A (CW mode)	38
13.11	Assessments at the Body with PSM PMMN4061A and antenna PMAE4065A (CW mode)	39
13.12	Assessments at the Body with PSM PMMN4061A and antenna FAF5259A (CW mode)	40
13.13	Shorten Scan Assessment	41
14.0	Simultaneous Transmission Exclusion	41
15.0	Conclusion	41

APPENDICES

A	Measurement Uncertainty	42
B	Probe Calibration Certificates.....	45
C	Dipole Calibration Certificates	72

Part 2 of 2

APPENDICES

D	Test System Verification Scans	2
E	FCC Part 90 (406.1 – 470 MHz) DUT Scans (Shortened Scan and Highest SAR configurations)	46
F	DUT Scans - FCC Part 90 (406.1-470 MHz)	51
G	DUT Scans (380-470 MHz)	75
H	DUT Supplementary Data (Power Slump)	99
I	DUT Test Position Photos	100
J	DUT and Body worn Accessory Photos	101

Report Revision History

Date	Revision	Comments
1/21/2011	O	Initial release

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 EME Test Laboratory for model number H98QDD9PW5AN (MNUE1005A/MNUE1006A).

2.0 Abbreviations / Definitions

CNR: Calibration Not Required
 CQPSK: Compatible Quadrature Phase-Shift Keying
 CW: Continues Wave
 DUT: Device Under Test
 FHSS: Frequency Hopping Spread Spectrum
 FM: Frequency Modulation
 NA: Not Applicable
 PTT: Push to Talk
 PSM: Public Safety Microphone
 RSM: Remote Speaker Microphone
 TDMA: Time Division Multiple Access
 SAR: Specific Absorption Rate

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 (1999), 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:

$$Max_Calc = SAR_meas \cdot 10^{\frac{-Drift}{10}} \cdot \frac{P_max}{P_int} \cdot DC$$

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 digital and analog frequency modulation (FM) as well as TDMA 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 and includes 12.5kHz 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 2:1 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. The TDMA mode was not tested because its duty cycle is inherently 50% and would include an additional 50% duty cycle for PTT. 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. Bluetooth v1.1, 1.2, 2.0, and 2.1 packet types of varying duty cycles: 1-slot, 3-slot and 5-slot packets. The maximum duty cycle for Bluetooth is 76.1%.

The model represented under this filing utilizes removable antennas for the 380-470 MHz (UHF) band and fixed internal antenna for the 2402 – 2480MHz (Bluetooth) band. The nominal output power and maximum output powers for each of the applicable bands are indicated in table 2 below. The max power is defined by upper limit of the production line final test station. The intended operating positions are “at the face” with the DUT or PSM at least 1 inch from the mouth, and “at the body” by means of the offered body worn accessories. Body worn audio and PTT operation is accomplished by means of optional remote accessories that are connected to the radio.

TABLE 2

Frequency Band	Nominal Output Power	Maximum Output Power
380 – 470 MHz	5 W	5.7 W
2402 – 2480 MHz	10 mW	10 mW

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. The following sections identify the test criteria and details for each accessory category.

7.1 Antennas:

All offered antennas were tested. The table below lists the antennas and their descriptions.

TABLE 3

Antenna Models	Description	*Tested
PMAE4065A	UHF/GPS whip; 380-520, 1575 MHz; ¼ wave; 1.5dBi gain	Yes
FAF5259A	UHF/PSM/GPS Stubby; 380-470, 1575 MHz; ¼ wave; 1.5dBi gain	Yes

*Refer to Exhibit 7B for antenna separation distances.

7.2 Batteries:

All offered batteries were tested. The table below lists the batteries, and there descriptions.

TABLE 4

Battery Models	Description	*Tested	Comments
PMNN4403A	Impres Li Ion slim 2150mAh	Yes	Height = 85mm
NNTN7038A	Hi Cap Impres Li Ion 2900mAh	Yes	Height = 85mm
NNTN7034A	Impres Li Ion 4200mAh	Yes	Height = 130mm

*Refer to Exhibit 7B for antenna separation distances.

7.3 Body worn Accessories:

All offered body worn accessories were tested. The table below lists the body worn accessories, and their descriptions.

TABLE 5

Body worn Models	Description	*Tested	Comments
HLN6875A	3" Belt Clip	Yes	NA
NTN9179A	Swivel D clip & belt loop	Yes	NA

*Refer to Exhibit 7B for antenna separation distances.

7.4 Audio Accessories:

All audio accessories were tested. The table below lists the audio accessories and their descriptions.

TABLE 6

Audio Acc. Models	Description	Comments
PMMN4059A	Public Safety Microphone (PSM) 18" IP55, 3.5mm jack TX/RX	
PMMN4061A	Public Safety Microphone (PSM) 30" IP55, 3.5mm jack TX/RX	
RMN5058A	Core L/W Headset	

8.0 Description of Test System:



8.1 Descriptions of Robotics/Probes/Readout Electronics:

The laboratory utilizes a Dosimetric Assessment System (DASY4™) SAR measurement system Version 4.7 build 80 manufactured by Schmid & Partner Engineering AG (SPEAG™), of Zurich Switzerland. The test system consists of a Stäubli RX90L robot, DAE3 and DAE4, and ES3DV3 E-field probe. The DASY4™ system is operated per the instructions in the DASY4™ 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 Flat Phantom

TABLE 7

Phantom ID (s)	Material Parameters	Phantom Dimensions LxWxD (mm)	Material Thickness (mm)	Support Structure Material	Loss Tangent (wood)
OVAL1011 OVAL1016 OVAL1018 OVAL1019 OVAL1020 OVAL1090	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.

Simulated Tissue Composition (by mass)

TABLE 8

% of listed ingredients	450MHz		2450MHz	
	Head	Body	Head	Body
Sugar	56.0	46.5	0	0
Diacetin	0	0	51	34.5
De ionized -Water	39.1	50.53	48.75	65.2
Salt	3.8	1.87	0.15	0.2
HEC	1.0	1.0	0	0
Bact.	0.1	0.1	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 9

Equipment Type	Model Number	Serial Number	Calibration Date	Calibration Due Date
Power Meter (Agilent)	E4419B	MY45103725	4/19/2010	4/19/2011
Power Meter (Agilent)	E4418B	US39251152	3/2/2010	3/2/2011
Power Meter (Agilent)	E4418B	GB40206480	12/7/2009	12/7/2010*
Power Meter (Agilent)	E4418B	GB40206480	11/29/2010	11/29/2011
Power Sensor (Agilent)	8482B	3318A06773	5/7/2010	5/7/2011
Power Sensor (Agilent)	8481B	3318A10894	3/5/2010	3/5/2011
E-Series Avg. Power Sensor (Agilent)	E9301B	MY41495730	4/13/2010	4/13/2011
E-Series Avg. Power Sensor (Agilent)	E9301B	MY41495733	4/13/2010	4/13/2011
Signal Generator (Agilent)	E4428C	MY47381119	1/14/2010	1/14/2012
Signal Generator (Agilent)	E4438C	MY42082269	2/18/2010	2/18/2012
Bi-Directional Coupler (NARDA)	3020A	40295	6/3/2010	6/3/2012
Bi-Directional Coupler (NARDA)	3022	77115	3/3/2010	3/3/2012
AMP (Amplifier Research)	10WD1000	28782	CNR	CNR
Temperature Recording Equipment				
Dickson Temperature Recorder	TM125	1195889	2/16/2010	2/16/2011
Omega Digital Thermometer with J Type TC Probe	HH200A	20857	9/20/2010	9/20/2011
Omega Digital Thermometer with J Type TC Probe	HH202A	18800	11/10/2009	11/10/2010
Omega Digital Thermometer with J Type TC Probe	HH202A	18800	11/17/2010	11/17/2011
Omega Digital Thermometer with J Type TC Probe	HH202A	18801	4/19/2010	4/19/2011
Omega Digital Thermometer with J Type TC Probe	HH202A	18812	3/24/2010	3/24/2011
Tissue Station				
Agilent PNA-L Network Analyzer	N5230A	MY45001092	6/10/2010	6/10/2011
Dielectric Probe Kit (HP)	85070C	US99360076	CNR	CNR
Dipole				
Speag Dipole	D450V2	1001	4/26/2010	4/26/2012
Speag Dipole	D450V2	1002	9/26/2008	9/26/2010*

*Equipment used for test dates prior to equipment cal due date.

10.0 SAR Measurement System Verification:

The SAR measurements were conducted with probe model/serial numbers ES3DV3/SN3147 and ES3DV3/SN3185. 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 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 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 10 summarizes the measured tissue parameters used for the SAR assessment.

TABLE 10

Frequency (MHz)	Tissue Type	Conductivity Target & Range (S/m)	Dielectric Constant Target & Range	Conductivity Meas. (S/m)	Dielectric Constant Meas.	Tested Date
395	IEEE/IEC Head	0.87 (0.83-0.91)	44.2 (42.0-46.4)	0.84	44.2	7/27/2010
				0.83	43.8	7/28/2010
				0.84	44.1	7/29/2010
				0.84	44.2	7/30/2010
				0.86	44.6	7/31/2010
				0.87	43.7	9/02/2010
				0.86	45.0	10/7/2010
				0.84	45.1	10/19/2010
				0.84	44.8	12/13/2010
				0.83	44.3	12/17/2010
				0.84	44.4	12/18/2010
				0.84	44.4	12/19/2010
				0.85	44.1	12/20/2010
				0.87	46.3	1/5/2011
				0.84	45.1	1/7/2011
				0.88	46.3	1/12/2011
				0.84	45.0	1/13/2011
422	IEEE/ IEC Head	0.87 (0.83-0.91)	43.8 (41.6-46.0)	0.85	43.2	7/27/2010
				0.84	42.9	7/28/2010
				0.84	43.2	7/29/2010
				0.85	43.3	7/30/2010
				0.87	43.7	7/31/2010
				0.89	45.9	8/06/2010
				0.88	42.7	9/02/2010
				0.88	44.4	10/7/2010
				0.86	44.5	10/19/2010
				0.85	43.8	12/13/2010
				0.83	43.4	12/17/2010
				0.84	43.6	12/18/2010
				0.83	43.4	12/19/2010
				0.86	43.3	12/20/2010
				0.88	45.4	1/5/2011
438	IEEE/ IEC Head	0.87 (0.83-0.91)	43.6 (41.4-45.8)	0.85	42.4	7/28/2010
				0.88	43.2	7/31/2010
				0.89	42.2	9/02/2010
				0.85	43.1	12/18/2010
				0.85	43.0	12/19/2010
450	IEEE/ IEC Head	0.87 (0.83-0.91)	43.5 (41.3-45.7)	0.87	42.4	7/27/2010
				0.86	42.1	7/28/2010
				0.86	42.2	7/29/2010
				0.88	42.6	7/30/2010
				0.89	42.9	7/31/2010
				0.90	41.9	9/02/2010
				0.86	42.7	12/17/2010
				0.87	42.9	12/18/2010
				0.86	42.8	12/19/2010
				0.88	42.7	12/20/2010
				0.90	44.8	1/5/2011
				0.87	43.6	1/7/2011
				0.88	43.6	1/13/2011

TABLE 10 (continued)

Frequency (MHz)	Tissue Type	Conductivity Target & Range (S/m)	Dielectric Constant Target & Range	Conductivity Meas. (S/m)	Dielectric Constant Meas.	Tested Date
454	IEEE/ IEC Head	0.87 (0.83-0.91)	43.5 (41.3-45.7)	0.88	42.3	7/27/2010
				0.87	42.0	7/28/2010
				0.87	42.3	7/29/2010
				0.88	42.4	7/30/2010
				0.90	42.8	7/31/2010
				0.91	41.8	9/02/2010
				0.91	43.6	10/7/2010
				0.88	43.2	12/13/2010
				0.86	42.6	12/17/2010
				0.87	42.8	12/18/2010
				0.86	42.7	12/19/2010
				0.89	42.7	12/20/2010
				0.86	42.7	1/5/2011
395	FCC Body	0.93 (0.88 -0.98)	57.3 (54.4 – 60.2)	0.90	57.5	8/01/2010
				0.91	57.6	8/02/2010
				0.89	57.4	8/03/2010
				0.89	57.5	8/04/2010
				0.89	57.1	8/05/2010
				0.89	57.1	10/5/2010
				0.89	56.9	10/6/2010
				0.89	56.7	10/14/2010
				0.89	56.7	10/15/2010
				0.91	57.2	11/24/2010
				0.93	57.1	11/27/2010
				0.91	55.3	12/7/2010
				0.90	56.5	12/10/2010
				0.90	56.2	12/11/2010
				0.90	56.0	12/12/2010
				0.90	56.8	12/16/2010
				0.89	56.3	1/12/2011
422	FCC Body	0.94 (0.89-0.98)	57.0 (54.1-59.8)	0.91	56.7	8/01/2010
				0.92	56.9	8/02/2010
				0.90	56.7	8/03/2010
				0.90	56.8	8/04/2010
				0.90	56.4	8/05/2010
				0.90	56.0	8/06/2010
				0.90	55.6	9/02/2010
				0.93	55.1	9/20/2010
				0.92	56.6	10/5/2010
				0.91	56.4	10/6/2010
				0.91	56.2	10/7/2010
				0.91	56.2	10/14/2010
				0.92	56.3	10/15/2010
				0.89	56.1	11/23/2010
				0.93	56.8	11/24/2010
				0.92	54.6	12/7/2010
				0.94	55.4	12/8/2010
				0.90	55.6	12/10/2010
				0.90	55.3	12/11/2010
				0.90	55.1	12/12/2010
				0.90	55.1	12/16/2010
				0.90	55.7	1/12/2011
				0.89	55.3	1/13/2011

TABLE 10 (continued)

Frequency (MHz)	Tissue Type	Conductivity Target & Range (S/m)	Dielectric Constant Target & Range	Conductivity Meas. (S/m)	Dielectric Constant Meas.	Tested Date
438	FCC Body	0.94 (0.89-0.98)	56.8 (53.9-59.6)	0.92	56.3	8/01/2010
				0.92	56.4	8/03/2010
				0.91	56.0	8/05/2010
				0.91	55.7	8/06/2010
				0.93	54.2	9/16/2010
				0.92	56.1	10/6/2010
				0.92	55.9	10/7/2010
				0.93	55.9	10/14/2010
				0.90	55.8	11/23/2010
				0.95	56.4	11/27/2010
				0.90	54.9	12/11/2010
				0.91	54.8	12/12/2010
				0.91	55.4	1/12/2011
450	FCC Body	0.94 (0.89-0.99)	56.7 (53.9-59.5)	0.93	56.1	8/01/2010
				0.95	56.3	8/02/2010
				0.93	56.1	8/03/2010
				0.93	56.1	8/04/2010
				0.93	55.8	8/05/2010
				0.92	55.4	8/06/2010
				0.94	54.0	9/16/2010
				0.96	54.6	9/20/2010
				0.94	56.2	10/5/2010
				0.93	55.9	10/6/2010
				0.93	55.6	10/7/2010
				0.94	55.7	10/14/2010
				0.95	55.9	10/15/2010
				0.95	56.2	10/19/2010
				0.91	55.5	11/23/2010
				0.95	56.4	11/24/2010
				0.97	56.2	11/27/2010
				0.94	53.9	12/7/2010
				0.97	55.0	12/8/2010
				0.92	54.7	12/9/2010
				0.92	55.1	12/10/2010
				0.92	54.8	12/11/2010
				0.92	54.7	12/12/2010
				0.91	54.7	12/13/2010
				0.93	55.3	12/16/2010
				0.93	55.3	1/12/2011
454	FCC Body	0.94 (0.89-0.99)	56.7 (53.9-59.5)	0.94	56.0	8/01/2010
				0.95	56.2	8/02/2010
				0.93	56.1	8/03/2010
				0.93	56.0	8/04/2010
				0.93	55.7	8/05/2010
				0.94	55.8	10/6/2010
				0.93	55.6	10/7/2010
				0.94	55.7	10/14/2010
				0.92	55.5	11/23/2010
				0.97	56.1	11/27/2010
				0.95	53.9	12/7/2010
				0.97	54.9	12/8/2010
				0.92	54.7	12/9/2010
				0.93	55.0	12/10/2010
				0.93	54.7	12/11/2010
				0.93	54.7	12/12/2010
				0.93	55.2	1/12/2011

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 11

Probe Serial #	Tissue Type	Probe Cal Date	Dipole Kit / Serial #	Reference SAR @ 1W (W/kg)	System Check Test Results when normalized to 1W (W/kg)	Tested Date
3147	IEEE/ IEC Head	2/18/2010	SPEAG D450V2 /1002	4.58 +/- 10%	4.44	7/27/2010
					4.48	7/28/2010
					4.56	7/29/2010
					4.60	7/30/2010
					4.60	7/31/2010
	FCC Body			4.40 +/- 10%	4.12	8/1/2010
					4.12	8/2/2010
					4.24	8/3/2010
					4.16	8/4/2010
					4.12	8/5/2010
					4.12	8/6/2010
	IEEE/ IEC Head	2/18/2010	SPEAG D450V2 /1001	4.72 +/- 10%	4.80	9/2/2010
					4.52	12/17/2010
					4.44	12/18/2010
					4.44	12/19/2010
					4.56	12/20/2010
	FCC Body	2/18/2010	SPEAG D450V2 /1001	4.32 +/- 10%	4.24	9/16/2010
					4.36	9/20/2010
					4.24	10/5/2010
					4.28	10/6/2010
					4.20	10/7/2010
					4.16	10/14/2010
					4.20	10/15/2010
					4.28	10/19/2010
					4.24	11/23/2010
					4.24	11/24/2010
					4.32	11/27/2010
					4.20	12/07/2010
					4.32	12/08/2010
					4.16	12/09/2010
					4.04	12/10/2010
					4.04	12/11/2010
					4.04	12/12/2010
					4.16	12/13/2010
					4.12	12/16/2010
3185	FCC Body	2/18/2010	SPEAG D450V2 /1001	4.32 +/- 10%	4.40	1/12/2011
	IEEE/ IEC Head	2/18/2010	SPEAG D450V2 /1001	4.72 +/- 10%	4.84	1/5/2011
					4.60	1/7/2011
					4.68	1/13/2011

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 $\pm 2^{\circ}\text{C}$ 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 12

	Target	Measured
Ambient Temperature	18 - 25 $^{\circ}\text{C}$	Range: 20.7 – 23.8 $^{\circ}\text{C}$ Avg. 21.6 $^{\circ}\text{C}$
Relative Humidity	30 - 70 %	Range: 22.4 – 71.8% Avg. 50.7%
Tissue Temperature	NA	Range: 19.7 – 22.3 $^{\circ}\text{C}$ Avg. 21.0 $^{\circ}\text{C}$

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 and face testing.

12.2 DUT Configuration(s)

The DUT is a portable device operational at the body 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 used to test all possible accessory combinations.

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:

The DUT and PSM were positioned in the intended use configuration against the phantom with the offered body worn and audio accessories where applicable.

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. Note that this product has two microphones, one on the front and one on the back of the DUT and therefore both sides were assessed. The offered PSMs were also tested with its' front separated 2.5cm from the phantom.

12.4 DUT Test Channels:

The number of test channels was determined by the following equation.

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

Where

N_c = Number of channels

F_{high} = Upper channel

F_{low} = Lower channel

F_c = Center channel

12.5 DUT Test Plan:

All modes of operation identified in section 6.0 were considered during the development of the test plan. The mode which presented the highest duty cycle FM mode (CW) utilizing 25 kHz and 12.5kHz channel spacing, was chosen for SAR assessment.

All accessories listed in section 7.0 of this report were evaluated and only those identified for testing were used to develop the SAR test plan for this product.

Tests were performed in each band at the even channels of the UHF (380-470MHz) Band. Depending on the SAR result for each of the test configurations at these channels, the other frequency channels are assessed only for the configuration that indicated highest SAR result or for each of the configurations that indicated SAR results within 70% of the specification limit as recommended by the FCC (Correspondence Reference Number: 341759). If the 70% threshold is not required then the highest SAR configurations from the even channel assessments were tested at all other applicable frequencies. 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.

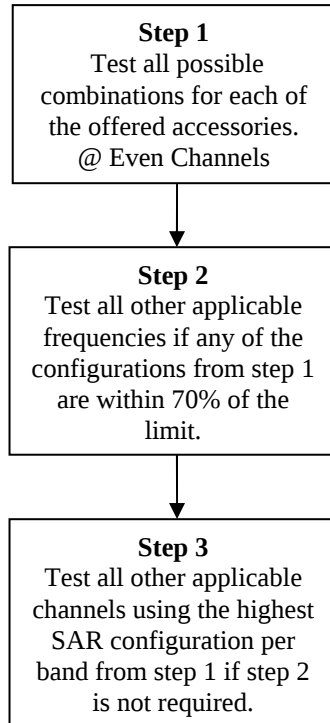
Per FCC KDB648474 Bluetooth testing is not required due to Bluetooth max power is 10mW which is less than 12mW (Pref @ 2.45GHz).

Note that test results that are outside the relevant FCC frequency allocations are presented herein in blue font.

12.5.1 General Test Flowchart

The following flowcharts identify the general approach to the test sequences for face and body positions.

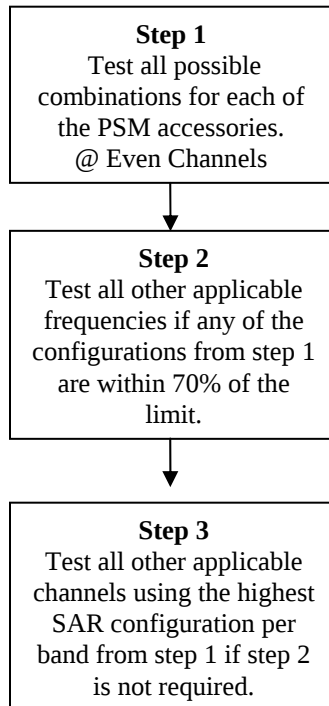
Flowchart Objectives Face



Step 1 - The objective is to determine the highest SAR configuration at the even channels for all combinations of offered accessories at the body.

Step 2 – The objective is to determine the highest SAR configurations for all possible combinations of offered accessories. Refer to section 12.5 for more information regarding additional test channels.

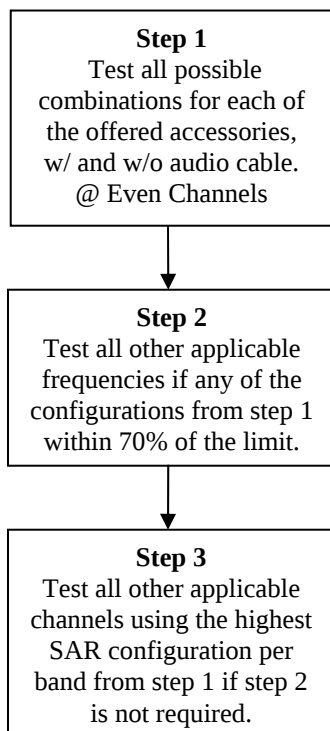
Step 3 - Determine the highest SAR performance across all applicable channels if the SAR results from Step 2 is below the recommended 70% threshold. Refer to section 12.5 for more information regarding additional test channels.

**DUT PSM Face Test Methodology
(General flowchart)****Flowchart
Objectives PSM Face**

Step 1 - The objective is to determine the highest SAR configuration at the even channels for all combinations of offered accessories at the body.

Step 2 – The objective is to determine the highest SAR configurations for all possible combinations of offered accessories. Refer to section 12.5 for more information regarding additional test channels.

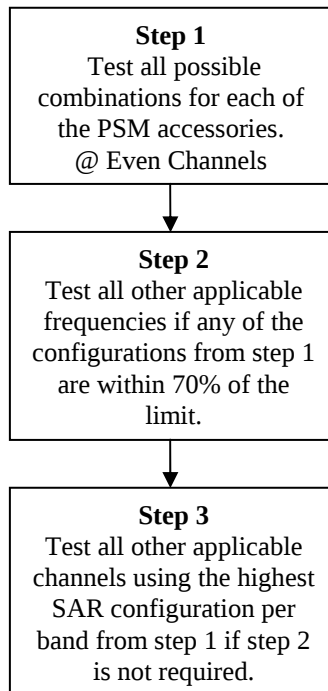
Step 3 - Determine the highest SAR performance across all applicable channels if the SAR results from Step 1 is below the recommended 70% threshold. Refer to section 12.5 for more information regarding additional test channels.

**DUT Body Test Methodology
(General flowchart)****Flowchart
Objectives Body**

Step 1 - The objective is to determine the highest SAR configuration at the even channels for all combinations of offered accessories at the body.

Step 2 – The objective is to determine the highest SAR configurations for all possible combinations of offered accessories. Refer to section 12.5 for more information regarding additional test channels.

Step 3 - Determine the highest SAR performance across all applicable channels if the SAR results from Step 1 is below the recommended 70% threshold. Refer to section 12.5 for more information regarding additional test channels.

**DUT PSM Body Test Methodology
(General flowchart)****Flowchart
Objectives PSM Body**

Step 1 - The objective is to determine the highest SAR configuration at the even channels for all combinations of offered accessories at the body.

Step 2 – The objective is to determine the highest SAR configurations for all possible combinations of offered accessories. Refer to section 12.5 for more information regarding additional test channels.

Step 3 - Determine the highest SAR performance across all applicable channels if the SAR results from Step 1 is below the recommended 70% threshold. Refer to section 12.5 for more information regarding additional test channels.

13.0 DUT Test Data:

13.1 Assessments at the Face with antenna PMAE4065A (CW mode)

Assessments at the Face with antenna PMAE4065A using batteries

NNTN7038A, PMNN4403A and NNTN7034A: The DUT was tested at the applicable even frequency channels (2, 4, and 6). The DUT front and back sides separated 2.5cm from the phantom. Refer to section 12.5 for additional frequency channels test consideration details.

The highest SAR result from the table below (bolded) is included in APPENDIX F and G Section 1.0.

TABLE 13

Assessments at the Face with antenna PMAE4065A												
Antenna	Battery	Carry Accessory	Test Position	Additional attachments	Test Freq. (MHz)	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc.1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)	Run#
PMAE4065A (380 - 520 / 1575MHz)	NNTN7038A	None	Front DUT at 2.5cm	None	380.0125							
					395.0000	5.67	-0.499	6.89	5.11	3.88	2.88	MeC-Face-100729-02
					406.1250							
					422.1250	5.62	-0.305	5.62	4.16	3.06	2.26	MeC-Face-100729-03
					438.1250							
					453.9875	5.64	-0.124	3.55	2.63	1.85	1.37	MeC-Face-100729-04
PMAE4065A (380 - 520 / 1575MHz)	NNTN7038A	None	Back DUT at 2.5cm	None	380.0125							
					395.0000	5.69	-0.509	7.36	5.46	4.14	3.07	MeC-Face-100729-05
					406.1250							
					422.1250	5.66	-0.279	6.4	4.72	3.44	2.53	MeC-Face-100729-06
					438.1250							
					453.9875	5.67	-0.153	3.9	2.89	2.03	1.50	MeC-Face-100729-07
PMAE4065A (380 - 520 / 1575MHz)	PMNN4403A	None	Front DUT at 2.5cm	None	380.0125							
					395.0000	5.76	-0.714	8.20	6.07	4.83	3.58	JsT-Face-101019-09
					406.1250							
					422.1250	5.62	-0.257	7.19	5.31	3.87	2.86	MeC-Face-100729-09
					438.1250							
					453.9875	5.66	-0.158	4.39	3.24	2.29	1.69	MeC-Face-100729-10
PMAE4065A (380 - 520 / 1575MHz)	PMNN4403A	None	Back DUT at 2.5cm	None	380.0125							
					395.0000	5.67	-0.701	6.75	5	3.99	2.95	MeC-Face-100730-02
					406.1250							
					422.1250	5.69	-0.262	6.71	4.97	3.57	2.64	MeC-Face-100730-03
					438.1250							
					453.9875	5.62	-0.0932	4.22	3.13	2.19	1.62	MeC-Face-100730-04
PMAE4065A (380 - 520 / 1575MHz)	NNTN7034A	None	Front DUT at 2.5cm	None	380.0125							
					395.0000	5.72	-0.108	4.67	3.48	2.39	1.78	HvH-Face-101213-09
					406.1250							
					422.1250	5.71	-0.405	5.22	3.88	2.87	2.13	HvH-Face-101213-10
					438.1250							
					453.9875	5.69	-0.093	3.09	2.32	1.58	1.19	HvH-Face-101213-12
PMAE4065A (380 - 520 / 1575MHz)	NNTN7034A	None	Back DUT at 2.5cm	None	380.0125							
					395.0000	5.69	-0.172	3.37	2.48	1.76	1.29	CM-Face-101217-05
					406.1250							
					422.1250	5.69	-0.307	5.11	3.77	2.75	2.03	CM-Face-101217-06
					438.1250							
					453.9875	5.67	0.094	3.69	2.74	1.85	1.38	CM-Face-101217-07

Assessment at the Face with antenna PMAE4065A – Other Frequency

channels: The DUT was tested at all other applicable frequencies using the highest SAR configuration from table 13. Refer to section 12.5 for additional frequency channels test consideration details.

The highest SAR result from the table below (bolded) is included in APPENDIX F and G Section 2.0

TABLE 14

Assessments at the Face with antenna PMAE4065A – Other Frequency channels												
Antenna	Battery	Carry Accessory	Test Position	Additional attachments	Test Freq. (MHz)	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)	Run#
PMAE4065A (380 - 520 / 1575MHz)	PMNN4403 A	None	Front DUT at 2.5cm	None	380.0125	5.65	-0.289	6.78	5.01	3.66	2.70	MeC-Face-100902-02
					406.1250	5.75	-0.704	8.96	6.64	5.27	3.90	JsT-Face-101019-08
					438.1250	5.53	-0.123	5.18	3.8	2.75	2.01	MeC-Face-100902-04
					469.9875	5.59	-0.19	3.67	2.69	1.95	1.43	MeC-Face-100902-05

13.2 Assessments at the Face with antenna FAF5259A (CW mode)

Assessment at the Face with antenna FAF5259A using batteries NNTN7038A, PMNN4403A and NNTN7034A: The DUT was tested at the applicable even frequency channels (2, 4, and 6). The DUT front and back sides separated 2.5cm from the phantom. Refer to section 12.5 for additional frequency channels test consideration details.

The highest SAR result from the table below (bolded) is included in APPENDIX F and G Section 3.0.

TABLE 15

Assessments at the Face with antenna FAF5259A												
Antenna	Battery	Carry Accessory	Test Position	Additional attachments	Test Freq. (MHz)	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)	Run#
FAF5259A (380 – 470 / 1575 MHz)	NNTN7038A	None	Front DUT at 2.5cm	None	380.0125							
					395.0000	5.64	-0.674	6.96	5.18	4.11	3.06	MeC-Face-100727-03
					406.1250							
					422.1250	5.6	-0.278	5.93	4.42	3.22	2.40	MeC-Face-100727-04
					438.1250							
					453.9875	5.53	-0.026	2.82	2.1	1.46	1.09	MeC-Face-100727-05
FAF5259A (380 – 470 / 1575 MHz)	NNTN7038A	None	Back DUT at 2.5cm	None	469.9875							
					380.0125							
					395.0000	5.62	-0.681	7.04	5.22	4.18	3.10	MeC-Face-100727-06
					406.1250							
					422.1250	5.58	-0.226	7.06	5.23	3.80	2.81	MeC-Face-100727-07
					438.1250							
FAF5259A (380 – 470 / 1575 MHz)	PMNN4403A	None	Front DUT at 2.5cm	None	453.9875	5.55	-0.0686	3.18	2.37	1.66	1.24	MeC-Face-100727-08
					469.9875							
					380.0125							
					395.0000	5.68	-0.768	7.84	5.76	4.69	3.45	MeC-Face-100728-02
					406.1250							
					422.1250	5.62	-0.336	7.49	5.51	4.10	3.02	MeC-Face-100728-03
FAF5259A (380 – 470 / 1575 MHz)	PMNN4403A	None	Back DUT at 2.5cm	None	438.1250							
					453.9875	5.51	-0.0736	3.29	2.43	1.73	1.28	MeC-Face-100728-04
					469.9875							
					380.0125							
					395.0000	5.66	-0.749	6.54	4.85	3.91	2.90	MeC-Face-100728-05
					406.1250							
FAF5259A (380 – 470 / 1575MHz)	PMNN4403A	None	Back DUT at 2.5cm	None	422.1250	5.59	-0.298	7.34	5.44	4.01	2.97	MeC-Face-100728-06
					438.1250							
					453.9875	5.61	-0.127	3.23	2.4	1.69	1.26	MeC-Face-100728-07
					469.9875							
					380.0125							
					395.0000	5.72	0.065	2.99	2.21	1.50	1.11	MeC-Face-101218-04
FAF5259A (380 – 470 / 1575MHz)	NNTN7034A	None	Front DUT at 2.5cm	None	406.1250							
					422.1250	5.64	-0.473	6.13	4.54	3.45	2.56	MeC-Face-101218-05
					438.1250							
					453.9875	5.68	-0.133	2.95	2.21	1.53	1.14	MeC-Face-101218-06
					469.9875							
					380.0125							
FAF5259A (380 – 470 / 1575MHz)	NNTN7034A	None	Back DUT at 2.5cm	None	395.0000	5.7	-0.105	3.2	2.36	1.64	1.21	MeC-Face-101218-07
					406.1250							
					422.1250	5.65	-0.402	7.12	5.25	3.94	2.91	MeC-Face-101218-08
					438.125							
					453.9875	5.67	-0.196	4.03	3.01	2.12	1.58	MeC-Face-101218-09
					469.9875							

Assessment at the Face with antenna FAF5259A – Other Frequency channels:

The DUT was tested at all other applicable frequencies using the highest SAR configuration from table 15. Refer to section 12.5 for additional frequency channels test consideration details.

The highest SAR result from the table below (bolded) is included in APPENDIX F and G Section 4.0

TABLE 16

Assessments at the Face with antenna FAF5259A – Other Frequency channels												
Antenna	Battery	Carry Accessory	Test Position	Additional attachments	Test Freq. (MHz)	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)	Run#
FAF5259A (380 - 470 / 1575MHz)	PMNN4403A	None	Front DUT at 2.5cm	None	380.0125	5.67	-0.23	6.11	4.53	3.24	2.40	MeC-Face-100728-08
				None	406.125	5.66	-0.801	10.18	7.59	6.16	4.60	MeC-Face-100806-11
				None	438.1250	5.68	-0.154	4.9	3.62	2.55	1.88	MeC-Face-100728-10
				None	469.9875	5.63	-0.131	2.49	1.84	1.30	0.96	MeC-Face-100728-11

13.3 Assessment at the Face with PSM PMMN4059A and antenna PMAE4065A (CW mode)

Assessment at the Face with PSM PMMN4059A and antenna PMAE4065A using batteries NNTN7038A, PMNN4403A and NNTN7034A: The DUT was tested with the PSM at the applicable even frequency channels (2, 4, and 6). The PSM front side separated 2.5cm from the phantom. Refer to section 12.5 for additional frequency channels test consideration details.

The highest SAR result from the table below (bolded) is included in APPENDIX F and G Section 5.0.

TABLE 17

Assessments at the Face with PSM PMMN4059A and antenna PMAE4065A												
Antenna	Battery	Carry Accessory	Test Position	Additional attachments	Test Freq. (MHz)	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)	Run#
PMAE4065A (380 - 520 / 1575MHz)	NNTN7038A	None	Front PSM at 2.5cm	PMMN4059 A	380.0125							
					395.0000	5.58	-0.67	1.93	1.41	1.15	0.84	JsT-Face-101007-09
					406.1250							
					422.1250	5.53	-0.199	2.96	2.17	1.60	1.17	JsT-Face-101007-10
					438.1250							
					453.9875	5.51	-0.216	4.68	3.41	2.54	1.85	JsT-Face-101007-11
PMAE4065A (380 - 520 / 1575MHz)	PMNN4403A	None	Front PSM at 2.5cm	PMMN4059 A	469.9875							
					380.0125							
					395.0000	5.58	-0.843	1.85	1.35	1.15	0.84	JsT-Face-101007-12
					406.1250							
					422.1250	5.5	-0.231	2.99	2.19	1.63	1.20	CM-Face-101007-13
					438.1250							
PMAE4065A (380 - 520 / 1575MHz)	NNTN7034A	None	Front PSM at 2.5cm	PMMN4059 A	453.9875	5.52	-0.156	5.13	3.74	2.75	2.00	CM-Face-101007-14
					469.9875							
					380.0125							
					395.0000	5.81	-0.641	2.0	1.47	1.16	0.85	CM-Face-110112-13
					406.1250							
					422.1250	5.72	-0.198	2.84	2.06	1.49	1.08	CM-Face-101218-18
PMAE4065A (380 - 520 / 1575MHz)	NNTN7034A	None	Front PSM at 2.5cm	PMMN4059 A	438.1250							
					453.9875	5.72	-0.125	4.56	3.33	2.35	1.71	CM-Face-101218-19
					469.9875							

Assessment at the Face with PSM PMMN4059A and antenna PMAE4065A – Other Frequency channels: The DUT was tested with the PSM at all other applicable frequencies using the highest SAR configuration from table 17. Refer to section 12.5 for additional frequency channels test consideration details.

The highest SAR result from the table below (bolded) is included in APPENDIX F and G Section 6.0

TABLE 18

Assessments at the Face with PSM PMMN4059A and antenna PMAE4065A – Other Frequency channels												
Antenna	Battery	Carry Accessory	Test Position	Additional attachments	Test Freq. (MHz)	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)	Run#
PMAE4065A (380 - 520 / 1575MHz)	PMNN4403A	None	Front PSM at 2.5cm	PMMN4059 A	380.0125	5.58	-0.776	1.68	1.23	1.03	0.75	CM-Face-101007-15
					406.1250	5.56	-1.06	2.41	1.78	1.58	1.16	CM-Face-101007-16
					438.1250	5.51	-0.0812	3.31	2.43	1.74	1.28	CM-Face-101007-17
					469.9875	5.5	-0.331	5.67	4.12	3.17	2.30	CM-Face-101007-18

13.4 Assessment at the Face with PSM PMMN4059A and antenna FAF5259A (CW mode)

Assessment at the Face with PSM PMMN4059A and antenna FAF5259A using batteries NNTN7038A, PMNN4403A and NNTN7034A: the DUT was tested with the PSM at the applicable even frequency channels (2, 4, and 6). The PSM front side separated 2.5cm from the phantom. Refer to section 12.5 for additional frequency channels test consideration details.

The highest SAR result from the table below (bolded) is included in APPENDIX F and G Section 7.0

TABLE 19

Assessments at the Face with PSM PMMN4059A and antenna FAF5259A												
Antenna	Battery	Carry Accessory	Test Position	Additional attachments	Test Freq. (MHz)	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc.1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)	Run#
FAF5259A (380 - 470 / 1575MHz)	NNTN7038A	None	Front PSM at 2.5cm	PMMN4059A	380.0125							
					395.0000	5.68	-0.589	1.52	1.1	0.87	0.63	MeC-Face-100730-09
					406.1250							
					422.1250	5.63	-0.176	2.92	2.1	1.54	1.11	MeC-Face-100730-10
					438.1250							
					453.9875	5.66	-0.29	6.58	4.75	3.54	2.56	MeC-Face-100730-11
					469.9875							
FAF5259A (380 - 470 / 1575MHz)	PMNN4403A	None	Front PSM at 2.5cm	PMMN4059A	380.0125							
					395.0000	5.67	-0.696	1.42	1.03	0.84	0.61	MeC-Face-100731-02
					406.1250							
					422.1250	5.68	-0.167	2.61	1.89	1.36	0.99	MeC-Face-100731-03
					438.1250							
					453.9875	5.62	-0.35	6.55	4.74	3.60	2.61	MeC-Face-100731-04
					469.9875							
FAF5259A (380 - 470 / 1575MHz)	NNTN7034A	None	Front PSM at 2.5cm	PMMN4059A	380.0125							
					395.0000	5.73	-0.389	1.5	1.09	0.82	0.60	CM-Face-101218-24
					406.1250							
					422.1250	5.72	-0.208	2.96	2.12	1.55	1.11	CM-Face-101218-25
					438.1250							
					453.9875	5.74	-0.213	6.96	5.03	3.65	2.64	CM-Face-101218-26
					469.9875							

Assessment at the Face with PSM PMMN4059A and antenna FAF5259A –

Other Frequency channels: The DUT was tested with the PSM at all other applicable frequencies using the highest SAR configuration from table 19. Refer to section 12.5 for additional frequency channels test consideration details.

The highest SAR result from the table below (bolded) is included in APPENDIX F and G Section 8.0

TABLE 20

Assessments at the Face with PSM PMMN4059A and antenna FAF5259A												
Antenna	Battery	Carry Accessory	Test Position	Additional attachments	Test Freq. (MHz)	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc.1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)	Run#
FAF5259A (380 - 470 / 1575MHz)	NNTN7034A	None	Front PSM at 2.5cm	PMMN4059A	380.0125	5.76	-0.349	1.36	0.98	0.74	0.53	CM-Face-101218-27
					406.1250	5.71	-0.696	2.29	1.64	1.34	0.96	MeC-Face-101219-02
					438.1250	5.66	-0.04	3.19	2.30	1.62	1.17	MeC-Face-101219-03
					469.9875	5.7	-0.256	5.60	4.03	2.97	2.14	MeC-Face-101219-04

13.5 Assessment at the Face with PSM PMMN4061A and antenna PMAE4065A (CW mode)

Assessment at the Face with PSM PMMN4061A and antenna PMAE4065A using batteries NNTN7038A, PMNN4403A and NNTN7034A: The DUT was tested with the PSM at the applicable even frequency channels (2, 4, and 6). The PSM front side separated 2.5cm from the phantom. Refer to section 12.5 for additional frequency channels test consideration details.

The highest SAR result from the table below (bolded) is included in APPENDIX F and G Section 9.0

TABLE 21

Assessments at the Face with PSM PMMN4061A and antenna PMAE4065A												
Antenna	Battery	Carry Accessory	Test Position	Additional attachments	Test Freq. (MHz)	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc.1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)	Run#
PMAE4065A (380 - 520 / 1575MHz)	NNTN7038A	None	Front PSM at 2.5cm	PMMN4061 A	380.0125							
					395.0000	5.72	-0.579	1.13	0.82	0.65	0.47	MeC-Face-101219-08
					406.1250							
					422.1250	5.7	-0.067	1.21	0.88	0.61	0.45	MeC-Face-101219-09
					438.1250							
					453.9875	5.69	-0.168	3.90	2.84	2.03	1.48	MeC-Face-101219-10
PMAE4065A (380 - 520 / 1575MHz)	PMNN4403A	None	Front PSM at 2.5cm	PMMN4061 A	469.9875							
					380.0125							
					395.0000	5.73	-0.799	1.15	0.83	0.69	0.50	MeC-Face-101219-11
					406.1250							
					422.1250	5.68	-0.014	1.08	0.78	0.54	0.39	MeC-Face-101219-12
					438.1250							
PMAE4065A (380 - 520 / 1575MHz)	NNTN7034A	None	Front PSM at 2.5cm	PMMN4061 A	453.9875	5.7	-0.218	3.91	2.85	2.06	1.50	MeC-Face-101219-13
					469.9875							
					380.0125							
					395.0000	5.87	-0.758	1.20	0.90	0.714	0.536	JsT-Face-110113-03
					406.1250							
					422.1250	5.69	-0.096	1.32	0.96	0.68	0.49	MeC-Face-101219-06
PMAE4065A (380 - 520 / 1575MHz)	NNTN7034A	None	Front PSM at 2.5cm	PMMN4061 A	438.1250							
					453.9875	5.65	-0.215	4.45	3.24	2.36	1.72	MeC-Face-101219-07
					469.9875							

Assessment at the Face with PSM PMMN4061A and antenna PMAE4065A – Other Frequency channels: The DUT was tested with the PSM at all other applicable frequencies using the highest SAR configuration from table 21. Refer to section 12.5 for additional frequency channels test consideration details.

The highest SAR result from the table below (bolded) is included in APPENDIX F and G Section 10.0

TABLE 22

Assessments at the Face with PSM PMMN4061A and antenna PMAE4065A – Other Frequency channels												
Antenna	Battery	Carry Accessory	Test Position	Additional attachments	Test Freq. (MHz)	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc.1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)	Run#
PMAE4065A (380 - 520 / 1575MHz)	NNTN7034A	None	Front PSM at 2.5cm	PMMN4061 A	380.0125	5.73	-0.328	1.72	1.27	0.93	0.68	MeC-Face-110107-04
					406.1250	5.72	-0.163	1.10	0.799	0.57	0.41	CM-Face-101219-15
					438.1250	5.7	-0.054	2.12	1.54	1.07	0.78	CM-Face-101219-16
					469.9875	5.71	-0.23	4.10	2.98	2.16	1.57	CM-Face-101219-17

13.6 Assessment at the Face with PSM PMMN4061A and antenna FAF5259A (CW mode)

Assessment at the Face with PSM PMMN4061A and antenna FAF5259A using batteries NNTN7038A, PMNN4403A and NNTN7034A: The DUT was tested with the PSM at the applicable even frequency channels (2, 4, and 6). The PSM front side separated 2.5cm from the phantom. Refer to section 12.5 for additional frequency channels test consideration details.

The highest SAR result from the table below (bolded) is included in APPENDIX F and G Section 11.0

TABLE 23

Assessments at the Face with PSM PMMN4061A and antenna FAF5259A												
Antenna	Battery	Carry Accessory	Test Position	Additional attachments	Test Freq. (MHz)	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)	Run#
FAF5259A (380 - 470 / 1575MHz)	NNTN7038A	None	Front PSM at 2.5cm	PMMN4061A	380.0125							
					395.0000	5.74	-0.535	1.32	0.955	0.75	0.54	CM-Face-101219-24
					406.1250							
					422.1250	5.72	-0.081	1.23	0.884	0.63	0.45	CM-Face-101219-25
					438.1250							
					453.9875	5.74	-0.23	4.59	3.32	2.42	1.75	CM-Face-101219-26
FAF5259A (380 - 470 / 1575MHz)	PMNN4403A	None	Front PSM at 2.5cm	PMMN4061A	469.9875							
					380.0125							
					395.0000	5.71	-0.792	1.08	0.779	0.65	0.47	CM-Face-101219-27
					406.1250							
					422.1250	5.79	-0.103	1.29	0.924	0.66	0.47	ErC-Face-101220-02
					438.1250							
FAF5259A (380 - 470 / 1575MHz)	NNTN7034A	None	Front PSM at 2.5cm	PMMN4061A	453.9875	5.8	-0.195	5.71	4.1	2.99	2.14	ErC-Face-101220-03
					469.9875							
					380.0125							
					395.0000	5.75	-0.641	1.40	1.01	0.81	0.59	MeC-Face-110105-02
					406.1250							
					422.1250	5.71	-0.092	1.32	0.953	0.67	0.49	MeC-Face-110105-03
FAF5259A (380 - 470 / 1575MHz)	NNTN7034A	None	Front PSM at 2.5cm	PMMN4061A	438.1250							
					453.9875	5.76	-0.191	5.24	3.79	2.74	1.98	CM-Face-101219-23
					469.9875							

Assessment at the Face with PSM PMMN4061A and antenna FAF5259A –

Other Frequency channels: The DUT was tested with the PSM at all other applicable frequencies using the highest SAR configuration from table 23. Refer to section 12.5 for additional frequency channels test consideration details.

The highest SAR result from the table below (bolded) is included in APPENDIX F and G Section 12.0

TABLE 24

Assessments at the Face with PSM PMMN4061A and antenna FAF5259A – Other Frequency channels												
Antenna	Battery	Carry Accessory	Test Position	Additional attachments	Test Freq. (MHz)	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)	Run#
FAF5259A (380 - 470 / 1575MHz)	PMNN4403A	None	Front PSM at 2.5cm	PMMN4061A	380.0125	5.81	-0.258	1.35	0.986	0.72	0.52	ErC-Face-101220-04
					406.1250	5.8	-0.239	1.07	0.777	0.57	0.41	ErC-Face-101220-07
					438.1250	5.79	-0.056	2.33	1.69	1.18	0.86	ErC-Face-101220-08
					469.9875	5.77	-0.13	3.59	2.6	1.85	1.34	ErC-Face-101220-09

13.7 Assessment at the Body with antenna PMAE4065A (CW mode)

Assessment at the Body with antenna PMAE4065A and Audio cable RMN5058A using batteries NNTN7038A, PMNN4403A and NNTN7034A, body worn accessories HLN6875A and NTN9179A: the DUT was tested at the applicable even frequency channels (2, 4, and 6). Refer to section 12.5 for additional frequency channels test consideration details.

The highest SAR result from the table below (bolded) is included in APPENDIX F and G Section 13.0

TABLE 25

Assessments at the Body with antenna PMAE4065A and Audio cable RMN5058A												
Antenna	Battery	Carry Accessory	Test Position	Additional attachments	Test Freq. (MHz)	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc.1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)	Run#
PMAE4065A (380 - 520 / 1575MHz)	NNTN7038A	HLN6875A Belt clip	Against phantom	RMN5058A (headset)	380.0125							
					395.0000	5.69	-0.199	7.07	3.43	3.71	1.80	MeC-Ab-100804-05
					406.1250							
					422.1250	5.65	-0.188	4.08	2.18	2.15	1.15	MeC-Ab-100804-06
					438.1250							
					453.9875	5.61	-0.0744	3.47	2.57	1.79	1.33	MeC-Ab-100804-07
					469.9875							
PMAE4065A (380 - 520 / 1575MHz)	NNTN7038A	NTN9179A D-clip and Belt Loop	Against phantom	RMN5058A (headset)	380.0125							
					395.0000	5.66	-0.113	7.78	3.25	4.02	1.68	MeC-Ab-100804-11
					406.1250							
					422.1250	5.68	-0.152	5.95	2.36	3.09	1.23	MeC-Ab-100804-12
					438.1250							
					453.9875	5.63	-0.179	3.61	1.62	1.90	0.85	MeC-Ab-100804-13
					469.9875							
PMAE4065A (380 - 520 / 1575MHz)	PMNN4403A	HLN6875A Belt clip	Against phantom	RMN5058A (headset)	380.0125							
					395.0000	5.67	-0.26	6.12	4.56	3.27	2.43	MeC-Ab-100804-08
					406.1250							
					422.1250	5.64	-0.244	5.12	3.81	2.74	2.04	MeC-Ab-100804-09
					438.1250							
					453.9875	5.66	-0.146	3.49	2.58	1.82	1.34	MeC-Ab-100804-10
					469.9875							
PMAE4065A (380 - 520 / 1575MHz)	PMNN4403A	NTN9179A D-clip and Belt Loop	Against phantom	RMN5058A (headset)	380.0125							
					395.0000	5.71	-0.322	5.99	2.49	3.23	1.34	JsT-Ab-100805-02
					406.1250							
					422.1250	5.67	-0.213	5.58	2.35	2.95	1.24	JsT-Ab-100805-03
					438.1250							
					453.9875	5.67	-0.121	3.31	1.46	1.71	0.75	JsT-Ab-100805-04
					469.9875							
PMAE4065A (380 - 520 / 1575MHz)	NNTN7034A	HLN6875A Belt clip	Against phantom	RMN5058A (headset)	380.0125							
					395.0000	5.72	-0.166	3.78	2.76	1.96	1.43	HvH-Ab-101207-05
					406.1250							
					422.1250	5.71	-0.467	4.59	3.43	2.56	1.91	HvH-Ab-101207-04
					438.1250							
					453.9875	5.67	-0.192	4.50	3.36	2.36	1.77	HvH-Ab-101207-03
					469.9875							
PMAE4065A (380 - 520 / 1575MHz)	NNTN7034A	NTN9179A D-clip and Belt Loop	Against phantom	RMN5058A (headset)	380.0125							
					395.0000	5.73	-0.239	2.87	2.17	1.52	1.15	HvH-Ab-101207-09
					406.1250							
					422.1250	5.66	0.321	3.62	2.77	1.82	1.39	MeC-Ab-101208-04
					438.1250							
					453.9875	5.62	-0.104	4.16	1.64	2.16	0.85	MeC-Ab-101208-05
					469.9875							

Assessment at the Body with antenna PMAE4065A and Audio cable RMN5058A – Other Frequency channels: The DUT was tested at all other applicable frequencies using the highest SAR configuration from table 25. Refer to section 12.5 for additional frequency channels test consideration details.

The highest SAR result from the table below (bolded) is included in APPENDIX F and G Section 14.0

TABLE 26

Assessments at the Body with antenna PMAE4065A and Audio cable RMN5058A – Other Frequency channels												
Antenna	Battery	Carry Accessory	Test Position	Additional attachments	Test Freq. (MHz)	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)	Run#
PMAE4065A (380 – 520 / 1575MHz)	NNTN7038A	NTN9179A D-clip and Belt Loop	Against phantom	RMN5058A (headset)	380.0125	5.76	-0.276	7.50	2.97	4.00	1.58	JsT-Ab-100805-09
					406.1250	5.74	-0.282	7.92	3.18	4.23	1.70	MeC-Ab-100805-10
					438.1250	5.71	-0.166	4.58	1.88	2.38	0.98	MeC-Ab-100805-11
					469.9875	5.71	-0.241	2.61	1.22	1.38	0.64	MeC-Ab-100805-12

Assessment at the Body with antenna PMAE4065A w/o audio cable attached using batteries NNTN7038A, PMNN4403A and NNTN7034A, body worn accessories HLN6875A and NTN9179A: the DUT was tested at the applicable even frequency channels (2, 4, and 6). Refer to section 12.5 for additional frequency channels test consideration details.

The highest SAR result from the table below (bolded) is included in APPENDIX F and G Section 15.0

TABLE 27

Assessments at the Body with antenna PMAE4065A w/o Audio cable attached												
Antenna	Battery	Carry Accessory	Test Position	Additional Attachments	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 (380 - 520 / 1575MHz)	NNTN7038A	HLN6875A Belt clip	Against phantom	None	380.0125	5.78	-0.314	10.92	4.42	5.87	2.38	JsT-Ab-101014-07
					395.0000	5.76	-0.357	10.92	4.44	5.93	2.41	JsT-Ab-101014-03
					406.1250	5.73	-0.295	9.16	3.82	4.90	2.04	JsT-Ab-101014-08
					422.1250	5.7	-0.20	6.94	2.94	3.63	1.54	JsT-Ab-101014-04
					438.1250	5.68	-0.196	5.76	2.53	3.02	1.33	JsT-Ab-101014-09
					453.9875	5.62	-0.107	5.61	2.60	2.92	1.35	MeC-Ab-101207-11
					469.9875	5.65	-0.231	4.49	2.01	2.39	1.07	JsT-Ab-101014-10
PMAE4065A (380 - 520 / 1575MHz)	NNTN7038A	NTN9179A D-clip and Belt Loop	Against phantom	None	380.0125							
					395.0000	5.79	-0.201	9.87	3.86	5.17	2.02	JsT-Ab-101015-02
					406.1250							
					422.1250	5.76	-0.414	6.75	2.62	3.71	1.44	JsT-Ab-101015-03
					438.1250							
					453.9875	5.64	-0.23	4.70	2.06	2.50	1.10	MeC-Ab-101207-13
					469.9875							
PMAE4065A (380 - 520 / 1575MHz)	PMNN4403A	HLN6875A Belt clip	Against phantom	None	380.0125							
					395.0000	5.85	-0.315	9.98	4.24	5.37	2.28	JsT-Ab-101014-11
					406.1250							
					422.1250	5.81	-0.332	7.61	3.21	4.11	1.73	JsT-Ab-101014-12
					438.1250							
					453.9875	5.66	-0.096	4.60	2.45	2.37	1.26	MeC-Ab-101207-12
					469.9875							
PMAE4065A (380 - 520 / 1575MHz)	PMNN4403A	NTN9179A D-clip and Belt Loop	Against phantom	None	380.0125							
					395.0000	5.81	-0.386	8.91	3.60	4.87	1.97	JsT-Ab-101015-05
					406.1250							
					422.1250	5.79	-0.403	6.56	2.67	3.60	1.46	JsT-Ab-101015-09
					438.1250							
					453.9875	5.66	-0.104	4.71	2.15	2.43	1.11	MeC-Ab-101208-02
					469.9875							
PMAE4065A (380 - 520 / 1575MHz)	NNTN7034A	HLN6875A Belt clip	Against phantom	None	380.0125							
					395.0000	5.69	-0.157	5.12	3.81	2.66	1.98	MeC-ab-101208-03
					406.1250							
					422.1250	5.69	-0.524	5.61	4.21	3.17	2.38	MeC-Ab-101206-08
					438.1250							
					453.9875	5.67	-0.215	4.74	3.55	2.50	1.87	HvH-Ab-101207-02
					469.9875							
PMAE4065A (380 - 520 / 1575MHz)	NNTN7034A	NTN9179A D-clip and Belt Loop	Against phantom	None	380.0125							
					395.0000	5.73	-0.201	3.72	2.84	1.95	1.49	HvH-Ab-101207-06
					406.1250							
					422.1250	5.71	-0.143	3.58	2.73	1.85	1.41	HvH-Ab-101207-07
					438.1250							
					453.9875	5.68	-0.125	4.83	1.90	2.49	0.98	HvH-Ab-101207-08
					469.9875							

13.8 Assessment at the Body with antenna FAF5259A (CW mode)

Assessment at the Body with antenna FAF5259A and Audio cable RMN5058A using batteries NNTN7038A, PMNN4403A and NNTN7034A, body worn accessories HLN6875A and NTN9179A: the DUT was tested at the applicable even frequency channels (2, 4, and 6). Refer to section 12.5 for additional frequency channels test consideration details.

The highest SAR result from the table below (bolded) is included in APPENDIX F and G Section 16.0

TABLE 28

Assessments at the Body with antenna FAF5259A and Audio cable RMN5058A												
Antenna	Battery	Carry Accessory	Test Position	Additional attachments	Test Freq. (MHz)	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)	Run#
FAF5259A (380 - 470 / 1575MHz)	NNTN7038A	HLN6875A Belt clip	Against phantom	RMN5058A (headset)	380.0125							
					395.0000	5.67	-0.736	8.49	4.04	5.06	2.41	MeC-Ab-100802-10
					406.1250							
					422.1250	5.64	-0.247	4.78	2.55	2.56	1.36	MeC-Ab-100802-11
					438.1250							
					453.9875	5.65	-0.145	2.74	2.04	1.43	1.06	MeC-Ab-100802-12
					469.9875							
FAF5259A (380 - 470 / 1575MHz)	NNTN7038A	NTN9179A D-clip and Belt Loop	Against phantom	RMN5058A (headset)	380.0125							
					395.0000	5.68	-0.631	7.66	3.57	4.44	2.07	MeC-Ab-100802-16
					406.1250							
					422.1250	5.66	-0.236	5.46	2.53	2.90	1.35	MeC-Ab-100802-17
					438.1250							
					453.9875	5.65	-0.0867	2.52	1.23	1.30	0.63	MeC-Ab-100802-18
					469.9875							
FAF5259A (380 - 470 / 1575MHz)	PMNN4403A	HLN6875A Belt clip	Against phantom	RMN5058A (headset)	380.0125							
					395.0000	5.65	-0.996	4.74	2.7	3.01	1.71	MeC-Ab-100802-13
					406.1250							
					422.1250	5.67	-0.345	3.90	2.29	2.12	1.25	MeC-Ab-100802-14
					438.1250							
					453.9875	5.66	-0.133	2.68	1.99	1.39	1.03	MeC-Ab-100802-15
					469.9875							
FAF5259A (380 - 470 / 1575MHz)	PMNN4403A	NTN9179A D-clip and Belt Loop	Against phantom	RMN5058A (headset)	380.0125							
					395.0000	5.66	-0.803	3.66	2.76	2.22	1.67	MeC-Ab-100803-02
					406.1250							
					422.1250	5.62	-0.414	4.54	2.21	2.53	1.23	MeC-Ab-100803-03
					438.1250							
					453.9875	5.65	-0.0824	2.24	1.16	1.15	0.60	MeC-Ab-100803-04
					469.9875							
FAF5259A (380 - 470 / 1575MHz)	NNTN7034A	HLN6875A Belt clip	Against phantom	RMN5058A (headset)	380.0125							
					395.0000	5.77	-0.436	4.64	3.39	2.57	1.87	HvH-Ab-101210-05
					406.1250							
					422.1250	5.72	-0.471	4.50	3.34	2.51	1.86	HvH-Ab-101210-06
					438.1250							
					453.9875	5.68	-0.113	2.50	1.87	1.29	0.96	HvH-Ab-101210-07
					469.9875							
FAF5259A (380 - 470 / 1575MHz)	NNTN7034A	NTN9179A D-clip and Belt Loop	Against phantom	RMN5058A (headset)	380.0125							
					395.0000	5.76	-0.488	3.12	2.34	1.75	1.31	HvH-Ab-101210-11
					406.1250							
					422.1250	5.74	-0.393	3.91	2.94	2.14	1.61	HvH-Ab-101210-12
					438.1250							
					453.9875	5.70	-0.088	2.06	1.54	1.05	0.79	HvH-Ab-101210-13
					469.9875							

Assessment at the Body with antenna FAF5259A and Audio cable RMN5058A – Other Frequency channels: The DUT was tested at all other applicable frequencies using the highest SAR configuration from table 28. Refer to section 12.5 for additional frequency channels test consideration details.

The highest SAR result from the table below (bolded) is included in APPENDIX F and G Section 17.0

TABLE 29

Assessments at the Body with Antenna FAF5259A and Audio cable RMN5058A – Other Frequency channels												
Antenna	Battery	Carry Accessory	Test Position	Additional attachments	Test Freq. (MHz)	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)	Run#
FAF5259A (380 - 470 / 1575MHz)	NNTN7038A	HLN6875A Belt clip	Against phantom	RMN5058A (headset)	380.0125	5.69	-0.429	7.89	3.41	4.36	1.89	MeC-Ab-100803-05
					406.1250	5.69	-0.40	6.30	3.44	3.46	1.89	MeC-Ab-100803-06
					438.1250	5.65	-0.183	3.75	2.78	1.97	1.46	MeC-Ab-100803-07
					469.9875	5.66	-0.127	2.07	1.52	1.07	0.79	MeC-Ab-100803-08
FAF5259A (380 - 470 / 1575MHz)	NNTN7038A	NTN9179A D-clip and Belt Loop	Against phantom	RMN5058A (headset)	380.0125	5.72	-0.246	8.47	3.37	4.48	1.78	JsT-Ab-100805-05
					406.1250	5.47	-0.619	10.13	3.97	6.09	2.39	JsT-Ab-100920-02
					438.1250	5.67	-0.212	4.28	1.76	2.26	0.93	JsT-Ab-100805-07
					469.9875	5.67	-0.13	1.79	0.799	0.93	0.41	JsT-Ab-100805-08

Assessment at the Body with antenna FAF5259A w/o Audio cable attached, using batteries NNTN7038A, PMNN4403A and NNTN7034A, body worn accessories HLN6875A and NTN9179A: the DUT was tested at the applicable even frequency channels (2, 4, and 6). Refer to section 12.5 for additional frequency channels test consideration details.

The highest SAR result from the table below (bolded) is included in APPENDIX F and G Section 18.0

TABLE 30

Assessments at the Body with antenna FAF5259A w/o Audio cable attached												
Antenna	Battery	Carry Accessory	Test Position	Additional Attachments	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 (380 - 470 / 1575MHz)	NNTN7038A	HLN6875A Belt clip	Against phantom	None	380.0125							
					395.0000	5.40	-0.521	7.67	5.71	4.56	3.40	CM-Ab-101124-02
					406.1250							
					422.1250	5.40	-0.241	8.07	4.02	4.50	2.24	CM-Ab-101123-08
					438.1250							
					453.9875	5.66	-0.105	4.13	1.89	2.13	0.97	MeC-Ab-101209-02
FAF5259A (380 - 470 / 1575MHz)	NNTN7038A	NTN9179A D-clip and Belt Loop	Against phantom	None	469.9875							
					380.0125	5.51	0.066	6.75	3.04	3.49	1.57	HvH-Ab-101127-06
					395.0000	5.68	-0.433	11.60	4.77	6.43	2.64	CM-Ab-101216-14
					406.1250	5.45	-0.059	8.95	4.21	4.74	2.23	CM-Ab-101124-06
					422.1250	5.37	-0.074	7.37	3.44	3.98	1.86	CM-Ab-101123-16
					438.1250	5.53	-0.157	6.51	2.91	3.48	1.55	HvH-Ab-101127-03
FAF5259A (380 - 470 / 1575MHz)	PMNN4403A	HLN6875A Belt clip	Against phantom	None	453.9875	5.67	0.004	4.22	1.81	2.12	0.91	MeC-Ab-101209-04
					469.9875	5.56	-0.122	4.79	2.18	2.53	1.15	HvH-Ab-101127-04
					380.0125							
					395.0000	5.41	-0.576	8.21	6.16	4.94	3.71	CM-Ab-101124-03
					406.1250							
					422.1250	5.45	-0.266	6.64	3.8	3.69	2.11	CM-Ab-101123-14
FAF5259A (380 - 470 / 1575MHz)	PMNN4403A	NTN9179A D-clip and Belt Loop	Against phantom	None	438.1250							
					453.9875	5.69	-0.079	3.83	2.84	1.95	1.45	MeC-Ab-101209-03
					469.9875							
					380.0125	5.79	-0.048	9.58	3.97	4.84	2.01	HvH-Ab-101210-14
					395.0000	5.44	-0.278	10.70	4.66	5.98	2.60	CM-Ab-101124-05
					406.1250	5.85	-0.771	11.67	4.76	6.97	2.84	JsT-Ab-110113-08
FAF5259A (380 - 470 / 1575MHz)	NNTN7034A	HLN6875A Belt clip	Against phantom	None	422.1250	5.39	-0.187	7.40	3.49	4.08	1.93	CM-Ab-101123-18
					438.1250	5.54	-0.313	7.28	3.31	4.03	1.83	HvH-Ab-101127-09
					453.9875	5.68	-0.098	3.94	1.79	2.02	0.92	MeC-Ab-101209-05
					469.9875	5.55	-0.083	4.29	1.97	2.25	1.03	HvH-Ab-101127-10
					380.0125							
					395.0000	5.73	-0.152	4.62	3.41	2.39	1.77	HvH-Ab-101210-02
FAF5259A (380 - 470 / 1575MHz)	NNTN7034A	NTN9179A D-clip and Belt Loop	Against phantom	None	406.1250							
					422.1250	5.71	-0.464	5.89	4.43	3.28	2.46	HvH-Ab-101210-03
					438.1250							
					453.9875	5.7	-0.181	3.64	2.72	1.90	1.42	HvH-Ab-101210-04
					469.9875							
					380.0125							
FAF5259A (380 - 470 / 1575MHz)	NNTN7034A	NTN9179A D-clip and Belt Loop	Against phantom	None	395.0000	5.75	-0.342	3.46	2.62	1.87	1.42	HvH-Ab-101210-08
					406.1250							
					422.1250	5.74	-0.378	4.02	3.05	2.19	1.66	HvH-Ab-101210-09
					438.1250							
					453.9875	5.72	0.074	3.83	1.48	1.92	0.74	HvH-Ab-101210-10
					469.9875							

13.9 Assessment at the Body with PSM PMMN4059A and antenna PMAE4065A (CW mode)

The DUT was tested at the Body with PSM PMMN4059A and antenna PMAE4065A, using batteries NNTN7038A, PMNN4403A and NNTN7034A, and PSM belt clip 4205823V01, at the applicable even frequency channels (2, 4, and 6). Refer to section 12.5 for additional frequency channels test consideration details.

The highest SAR result from the table below (bolded) is included in APPENDIX F and G Section 19.0

TABLE 31

Assessments at the Body with PSM PMMN4059A and antenna PMAE4065A												
Antenna	Battery	Carry Accessory	Test Position	Additional attachments	Test Freq. (MHz)	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)	Run#
PMAE4065A (380 - 520 / 1575MHz)	NNTN7038A	4205823V01 PSM Belt clip	Against phantom	PMMN4059 A	380.0125	5.58	-0.62	10.51	5.71	6.19	3.36	JsT-Ab-101006-03
					395.0000	5.52	-0.29	7.44	3.83	4.11	2.11	CM-Ab-101005-09
					406.1250	5.56	-0.258	10.34	6.03	5.62	3.28	JsT-Ab-101006-04
					422.1250	5.54	-0.216	9.20	5.64	4.97	3.05	CM-Ab-101005-10
					438.1250	5.54	-0.157	10.90	6.86	5.81	3.66	JsT-Ab-101006-05
					453.9875	5.53	-0.317	10.40	6.86	5.77	3.80	JsT-Ab-101006-02
					469.9875	5.54	-0.182	10.30	6.90	5.53	3.70	JsT-Ab-101006-07
PMAE4065A (380 - 520 / 1575MHz)	PMNN4403A	4205823V01 PSM Belt clip	Against phantom	PMMN4059 A	380.0125	5.58	-0.839	10.08	5.50	6.25	3.41	CM-Ab-101006-12
					395.0000	5.57	-0.736	9.99	5.58	6.06	3.38	JsT-Ab-101006-08
					406.1250	5.54	-0.267	10.44	6.01	5.71	3.29	JsT-Ab-101007-02
					422.1250	5.53	-0.18	9.60	5.74	5.16	3.08	CM-Ab-101006-09
					438.1250	5.5	-0.151	10.80	6.87	5.79	3.69	JsT-Ab-101007-06
					453.9875	5.51	-0.353	10.9	7.23	6.12	4.06	CM-Ab-101006-10
					469.9875	5.49	-0.33	9.82	6.67	5.50	3.74	JsT-Ab-101007-07
PMAE4065A (380 - 520 / 1575MHz)	NNTN7034A	4205823V01 PSM Belt clip	Against phantom	PMMN4059 A	380.0125	5.79	-0.395	10.46	5.55	5.73	3.04	HvH-Ab-101211-07
					395.0000	5.76	-0.527	10.56	5.89	5.96	3.32	HvH-Ab-101211-04
					406.1250	5.74	-0.223	10.59	6.09	5.57	3.21	HvH-Ab-101211-08
					422.1250	5.73	-0.155	9.64	5.77	5.00	2.99	HvH-Ab-101211-05
					438.1250	5.67	-0.118	11.02	6.92	5.69	3.57	HvH-Ab-101211-09
					453.9875	5.71	-0.297	11.66	7.67	6.24	4.11	HvH-Ab-101211-06
					469.9875	5.66	-0.205	10.46	6.89	5.52	3.64	HvH-Ab-101211-10

13.10 Assessment at the Body with PSM PMMN4059A and antenna FAF5259A (CW mode)

The DUT was tested with PSM PMMN4059A and antenna FAF5259A, using antenna FAF5259A, batteries NNTN7038A, PMNN4403A, NNTN7034A, and PSM belt clip 4205823V01, at the applicable even frequency channels (2, 4, and 6). Refer to section 12.5 for additional frequency channels test consideration details.

The highest SAR result from the table below (bolded) is included in APPENDIX F and G Section 20.0

TABLE 32

Assessment at the Body with PSM PMMN4059A and antenna FAF5259A												
Antenna	Battery	Carry Accessory	Test Position	Additional attachments	Test Freq. (MHz)	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)	Run#
FAF5259A (380 - 470 / 1575MHz)	NNTN7038A	4205823V01 PSM Belt clip	Against phantom	PMMN4059A	380.0125	5.65	-0.741	9.73	5.41	5.82	3.24	MeC-Ab-100801-02
					395.0000	5.68	-0.58	10.17	6.11	5.83	3.50	MeC-Ab-100731-09
					406.1250	5.66	-0.164	10.94	6.39	5.72	3.34	MeC-Ab-100801-03
					422.1250	5.64	-0.109	9.72	6.14	5.04	3.18	MeC-Ab-100731-10
					438.1250	5.64	-0.411	12.92	8.25	7.18	4.58	MeC-Ab-100801-04
					453.9875	5.67	-0.439	12.00	8.56	6.67	4.76	MeC-Ab-100731-11
					469.9875	5.64	-0.134	6.55	4.68	3.41	2.44	MeC-Ab-100801-05
FAF5259A (380 - 470 / 1575MHz)	PMNN4403A	4205823V01 PSM Belt clip	Against phantom	PMMN4059A	380.0125	5.66	-0.633	8.66	4.82	5.04	2.81	MeC-Ab-100801-09
					395.0000	5.68	-0.68	10.49	6.08	6.16	3.57	MeC-Ab-100801-06
					406.1250	5.64	-0.168	10.94	6.47	5.75	3.40	MeC-Ab-100801-10
					422.1250	5.66	-0.0982	10.54	6.46	5.43	3.33	MeC-Ab-100801-07
					438.1250	5.50	-0.481	13.46	8.38	7.79	4.85	MeC-Ab-100916-09
					453.9875	5.6	-0.428	11.70	8.39	6.57	4.71	MeC-Ab-100801-08
					469.9875	5.64	-0.192	6.54	4.68	3.45	2.47	MeC-Ab-100801-12
FAF5259A (380 - 470 / 1575MHz)	NNTN7034A	4205823V01 PSM Belt clip	Against phantom	PMMN4059A	380.0125	5.84	-0.55	10.36	5.46	5.88	3.10	HvH-Ab-101211-16
					395	5.78	-0.539	11.38	6.27	6.44	3.55	HvH-Ab-101211-11
					406.125	5.71	-0.204	11.71	6.64	6.14	3.48	HvH-Ab-101211-17
					422.125	5.75	-0.104	11.10	6.54	5.68	3.35	HvH-Ab-101211-12
					438.125	5.69	-0.229	14.28	8.80	7.54	4.65	HvH-Ab-101211-20
					453.9875	5.74	-0.385	12.87	8.39	7.03	4.58	HvH-Ab-101211-15
					469.9875	5.70	-0.148	6.91	4.54	3.57	2.35	HvH-Ab-101211-21

13.11 Assessment at the Body with PSM PMMN4061A and antenna PMAE4065A (CW mode)

Assessment at the Body with PSM PMMN4061A and antenna PMAE4065A, using batteries NNTN7038A, PMNN4403A and NNTN7034A, and PSM belt clip 4205823V01: the DUT was tested at the applicable even frequency channels (2, 4, and 6). Refer to section 12.5 for additional frequency channels test consideration details.

The highest SAR result from the table below (bolded) is included in APPENDIX F and G Section 21.0

TABLE 33

Assessment at the Body with PSM PMMN4061A and antenna PMAE4065A												
Antenna	Battery	Carry Accessory	Test Position	Additional attachments	Test Freq. (MHz)	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)	Run#
PMAE4065 A (380 - 520 / 1575MHz)	NNTN7038A	4205823V01 PSM Belt clip	Against phantom	PMMN4061A	380.0125							
					395.0000	5.71	-0.264	8.42	4.43	4.47	2.35	HvH-Ab-101212-04
					406.1250							
					422.1250	5.69	-0.065	8.36	4.99	4.25	2.54	HvH-Ab-101212-05
					438.1250							
					453.9875	5.68	-0.107	10.66	6.87	5.48	3.53	HvH-Ab-101212-06
PMAE4065 A (380 - 520 / 1575MHz)	PMNN4403A	4205823V01 PSM Belt clip	Against phantom	PMMN4061A	380.0125							
					395.0000	5.73	-0.338	8.1	4.74	4.38	2.56	HvH-Ab-101212-07
					406.1250							
					422.1250	5.71	-0.087	7.93	4.79	4.05	2.44	HvH-Ab-101212-08
					438.1250							
					453.9875	5.72	-0.186	9.28	5.85	4.84	3.05	HvH-Ab-101212-09
PMAE4065 A (380 - 520 / 1575MHz)	NNTN7034A	4205823V01 PSM Belt clip	Against phantom	PMMN4061A	380.0125							
					395.0000	5.73	-0.274	8.18	4.32	4.36	2.30	HvH-Ab-101211-22
					406.1250							
					422.1250	5.70	-0.053	7.99	4.64	4.04	2.35	HvH-Ab-101212-02
					438.1250							
					453.9875	5.70	-0.135	9.61	6.11	4.96	3.15	HvH-Ab-101212-03

Assessment at the Body with PMMN4061A and antenna PMAE4065A – Other Frequency channels: the DUT was tested at all other applicable frequencies using the highest SAR configuration from table 33. Refer to section 12.5 for additional frequency channels test consideration details.

The highest SAR result from the table below (bolded) is included in APPENDIX F and G Section 22.0

TABLE 34

Assessment at the Body with PSM PMMN4059A and antenna PMAE4065A - Other Frequency channels												
Antenna	Battery	Carry Accessory	Test Position	Additional attachments	Test Freq. (MHz)	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)	Run#
PMAE4065 A (380 - 520 / 1575MHz)	NNTN7038A	4205823V01 PSM Belt clip	Against phantom	PMMN4061A	380.0125	5.78	-0.356	8.95	4.55	4.86	2.47	HvH-Ab-101212-10
					406.125	5.74	-0.132	7.66	4.2	3.95	2.16	HvH-Ab-101212-11
					438.125	5.69	-0.158	10.66	6.77	5.54	3.52	HvH-Ab-101212-12
					469.9875	5.69	-0.152	7.24	4.69	3.76	2.43	HvH-Ab-101212-13

13.12 Assessment at the Body with PSM PMMN4061A and antenna FAF5259A (CW mode)

The DUT was tested with PSM PMMN4061A and antenna FAF5259A using batteries NNTN7038A, PMNN4403A and NNTN7034A, and PSM belt clip 4205823V01, at the applicable even frequency channels (2, 4, and 6). Refer to section 12.5 for additional frequency channels test consideration details.

The highest SAR result from the table below (bolded) is included in APPENDIX F and G Section 23.0

TABLE 35

Assessment at the Body with PSM PMMN4061A and antenna FAF5259A												
Antenna	Battery	Carry Accessory	Test Position	Additional attachments	Test Freq. (MHz)	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)	Run#
FAF5259A (380 - 470 / 1575MHz)	NNTN7038A	4205823V01 PSM Belt clip	Against phantom	PMMN4061A	380.0125	5.77	-0.488	9.43	4.93	5.28	2.76	HvH-Ab-101212-23
					395.0000	5.73	-0.286	9.25	4.77	4.94	2.55	HvH-Ab-101212-18
					406.1250	5.72	-0.098	8.41	4.76	4.30	2.43	HvH-Ab-101212-24
					422.1250	5.72	-0.041	11.51	7.01	5.81	3.54	HvH-Ab-101212-21
					438.1250	5.68	-0.236	14.38	8.83	7.62	4.68	HvH-Ab-101213-02
					453.9875	5.71	-0.136	7.00	4.53	3.61	2.34	HvH-Ab-101212-22
					469.9875	5.71	-0.082	4.34	2.84	2.21	1.45	HvH-Ab-101213-04
FAF5259A (380 - 470 / 1575MHz)	PMNN4403A	4205823V01 PSM Belt clip	Against phantom	PMMN4061A	380.0125	5.85	-0.627	8.33	4.34	4.81	2.51	JsT-Ab-110112-03
					395.0000	5.71	-0.273	9.00	4.54	4.79	2.42	HvH-Ab-101213-05
					406.1250	5.82	-0.152	7.76	3.84	4.02	1.99	JsT-Ab-110112-04
					422.1250	5.7	-0.026	11.16	6.46	5.61	3.25	HvH-Ab-101213-06
					438.1250	5.80	-0.145	13.90	8.21	7.19	4.24	JsT-Ab-110112-05
					453.9875	5.71	-0.165	7.71	4.91	4.00	2.55	HvH-Ab-101213-08
					469.9875	5.81	-0.125	7.33	4.83	3.77	2.49	JsT-Ab-110112-07
FAF5259A (380 - 470 / 1575MHz)	NNTN7034A	4205823V01 PSM Belt clip	Against phantom	PMMN4061A	380.0125							
					395.0000	5.73	-0.240	9.35	4.86	4.94	2.57	HvH-Ab-101212-14
					406.1250							
					422.1250	5.71	-0.059	11.00	6.49	5.57	3.29	HvH-Ab-101212-15
					438.1250							
					453.9875	5.71	-0.124	7.32	4.67	3.77	2.40	HvH-Ab-101212-17
					469.9875							

13.13 Shorten Scan Assessment

Short scan assessment: A “shortened” scan was performed to validate the SAR drift of the full DASY4™ 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 both SAR results from the table below are provided in APPENDIX E.

TABLE 36

Short scan assessment - Face												
Antenna	Battery	Carry Accessory	Test Position	Additional attachments	Test Freq. (MHz)	Initial Power (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Meas. 10g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Max Calc. 10g-SAR (W/kg)	Run#
Full scan												
FAF5259A (380 - 470 / 1575MHz)	PMNN4403A	None	Front DUT at 2.5cm	None	406.125	5.66	-0.801	10.18	7.59	6.16	4.60	MeC-Face-100806-11
Shortened scan												
FAF5259A (380 - 470 / 1575MHz)	PMNN4403A	None	Front DUT at 2.5cm	None	406.125	5.64	-0.417	10.90	8.04	6.06	4.47	MeC-Face-100902-06

14.0 Simultaneous Transmission Exclusion:

Not required per FCC KDB648474 due to Bluetooth power is 10mW.

15.0 Conclusion:

The highest Operational Maximum Calculated 1-gram and 10-gram average SAR values found for this filing: model H98QDD9PW5AN (MNUE1005A/MNUE1006A):

TABLE 37: RF Exposure Results for FCC Part 90

Frequency Range (MHz)	Max Calc at Body (W/kg)		Max Calc at Face (W/kg)	
	1g-SAR	10g-SAR	1g-SAR	10g-SAR
406.1-470	7.79	4.85	6.16	4.60

TABLE 38: RF Exposure Results for entire frequency range

Frequency Range (MHz)	Max Calc at Body (W/kg)		Max Calc at Face (W/kg)	
	1g-SAR	10g-SAR	1g-SAR	10g-SAR
380-470	7.79	4.85	6.16	4.60

The test results clearly demonstrate compliance with FCC Occupational/Controlled RF Exposure limits of **8W/kg** per the requirements of 47 CFR 2.1093(d).

APPENDIX A

Measurement Uncertainty

The Measurement Uncertainty tables indicated in this APPENDIX are applicable to the DUT ranging from 100MHz to 800MHz and for Dipole test frequency ranging from 300MHz to 800MHz. Therefore, the highest tolerance for the probe calibration uncertainty is indicated.

Table A1:
Uncertainty Budget for Device Under Test, for 100 MHz to 800 MHz

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e = f(d,k)</i>	<i>f</i>	<i>g</i>	<i>h = c x f / e</i>	<i>i = c x g / e</i>
	IEEE 1528 section	Tol. (± %)	Prob Dist		<i>c_i</i> (1 g)	<i>c_i</i> (10 g)	1 g <i>u_i</i> (±%)	10 g <i>u_i</i> (±%)
Uncertainty Component				Div.				
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)			<i>k</i> = 2				27	27

FCD-0558 Uncertainty Budget Rev.8

Table A2:**Uncertainty Budget for System Validation (dipole & flat phantom) for 300 MHz to 800 MHz**

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e = f(d,k)</i>	<i>f</i>	<i>g</i>	<i>h = c x f / e</i>	<i>i = c x g / e</i>
Uncertainty Component	IEEE 1528 section	Tol. (± %)	Prob. Dist.	Div.	<i>c_i</i> (1 g)	<i>c_i</i> (10 g)	1 g <i>u_i</i> (±%)	10 g <i>u_i</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)			<i>k</i> =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) *c_i* - sensitivity coefficient that should be applied to convert the variability of the uncertainty component into a variability of SAR.g) *u_i* – SAR uncertaintyh) *u_i* - 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
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S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

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

Client **Motorola EME**

Certificate No: **ES3-3147_Feb10**

CALIBRATION CERTIFICATE

Object **ES3DV3 - SN:3147**

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: **February 18, 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 $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-09 (No. 217-01030)	Apr-10
Power sensor E4412A	MY41495277	1-Apr-09 (No. 217-01030)	Apr-10
Power sensor E4412A	MY41498087	1-Apr-09 (No. 217-01030)	Apr-10
Reference 3 dB Attenuator	SN: S5054 (3c)	31-Mar-09 (No. 217-01026)	Mar-10
Reference 20 dB Attenuator	SN: S5085 (20b)	31-Mar-09 (No. 217-01026)	Mar-10
Reference 30 dB Attenuator	SN: S5129 (30b)	31-Mar-09 (No. 217-01027)	Mar-10
Reference Probe ES3DV2	SN: 3013	30-Dec-09 (No. ES3-3013_Dec09)	Dec-10
DAE4	SN: 660	29-Sep-09 (No. DAE4-660_Sep09)	Sep-10

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: Oct-10

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

Issued: February 19, 2010

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

Certificate No: ES3-3147_Feb10

Page 1 of 11

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



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S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

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

Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,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., $\vartheta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}**: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not effect the E²-field uncertainty inside TSL (see below ConvF).
- NORM(f)_{x,y,z}** = NORM_{x,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.
- DCP_{x,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.
- A_{x,y,z}; B_{x,y,z}; C_{x,y,z}; VR_{x,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 $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{x,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.

ES3DV3 SN:3147

February 18, 2010

Probe ES3DV3

SN:3147

Manufactured:	July 12, 2007
Last calibrated:	February 13, 2009
Recalibrated:	February 18, 2010

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

ES3DV3 SN:3147

February 18, 2010

DASY - 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	90.7	94.9	92.9	

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 E²-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.

ES3DV3 SN:3147

February 18, 2010

DASY - 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%	6.79	6.79	6.79	0.23	0.86 ± 13.3%
450	± 50 / ± 100	43.5 ± 5%	0.87 ± 5%	6.43	6.43	6.43	0.23	1.45 ± 13.3%
750	± 50 / ± 100	41.5 ± 5%	0.90 ± 5%	6.24	6.24	6.24	0.64	1.19 ± 11.0%
900	± 50 / ± 100	41.5 ± 5%	0.97 ± 5%	5.85	5.85	5.85	0.70	1.14 ± 11.0%
1810	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	5.06	5.06	5.06	0.42	1.80 ± 11.0%
1950	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	4.81	4.81	4.81	0.44	1.69 ± 11.0%
2300	± 50 / ± 100	39.5 ± 5%	1.67 ± 5%	4.68	4.68	4.68	0.40	1.85 ± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	4.42	4.42	4.42	0.40	2.06 ± 11.0%
2600	± 50 / ± 100	39.0 ± 5%	1.96 ± 5%	4.29	4.29	4.29	0.48	1.71 ± 11.0%
3500	± 50 / ± 100	37.9 ± 5%	2.91 ± 5%	4.09	4.09	4.09	1.00	1.23 ± 13.1%
3700	± 50 / ± 100	37.7 ± 5%	3.12 ± 5%	3.68	3.68	3.68	1.00	1.30 ± 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.

ES3DV3 SN:3147

February 18, 2010

DASY - Parameters of Probe: ES3DV3 SN:3147

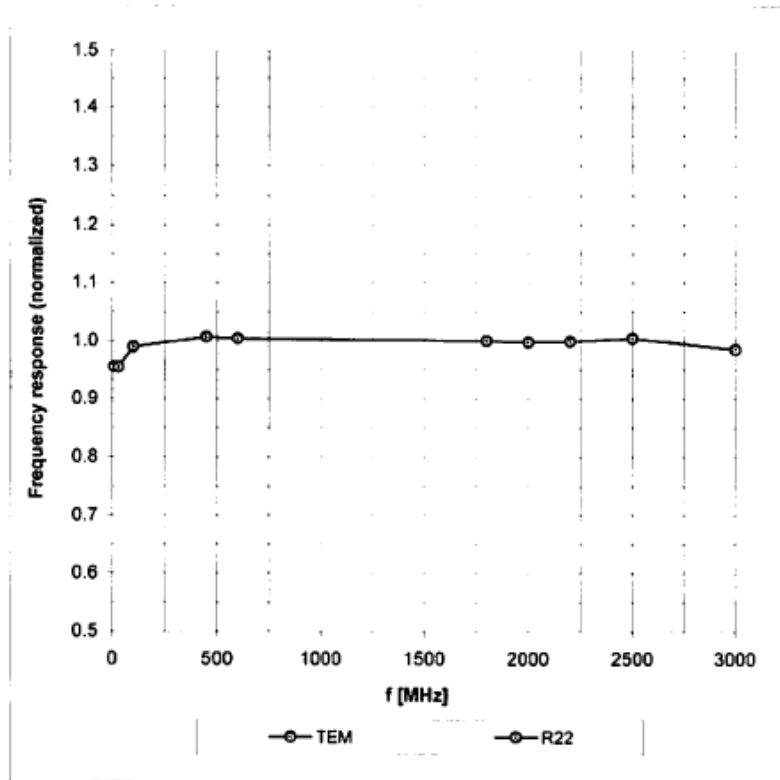
Calibration Parameter Determined in Body Tissue Simulating Media

f [MHz]	Validity [MHz] ^c	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth Unc (k=2)
450	± 50 / ± 100	56.7 ± 5%	0.94 ± 5%	6.82	6.82	6.82	0.10	2.74 ± 13.3%
750	± 50 / ± 100	55.5 ± 5%	0.96 ± 5%	5.95	5.95	5.95	0.78	1.14 ± 11.0%
900	± 50 / ± 100	55.0 ± 5%	1.05 ± 5%	5.81	5.81	5.81	0.88	1.13 ± 11.0%
1810	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.90	4.90	4.90	0.28	2.75 ± 11.0%
1950	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.75	4.75	4.75	0.42	1.98 ± 11.0%
2300	± 50 / ± 100	52.8 ± 5%	1.85 ± 5%	4.33	4.33	4.33	0.45	1.82 ± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	4.18	4.18	4.18	0.70	1.29 ± 11.0%
2600	± 50 / ± 100	52.5 ± 5%	2.16 ± 5%	4.07	4.07	4.07	0.87	1.15 ± 11.0%
3500	± 50 / ± 100	51.3 ± 5%	3.31 ± 5%	3.50	3.50	3.50	1.00	1.38 ± 13.1%
3700	± 50 / ± 100	51.0 ± 5%	3.55 ± 5%	3.38	3.38	3.38	0.64	1.93 ± 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:ifi1110 EXX, Waveguide: R22)

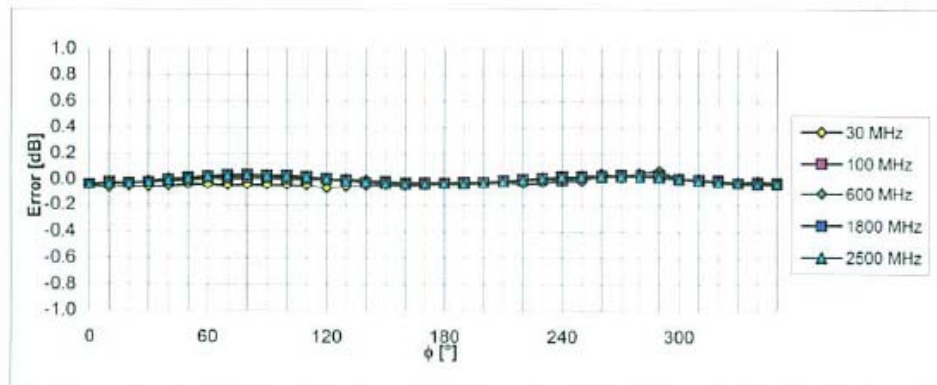
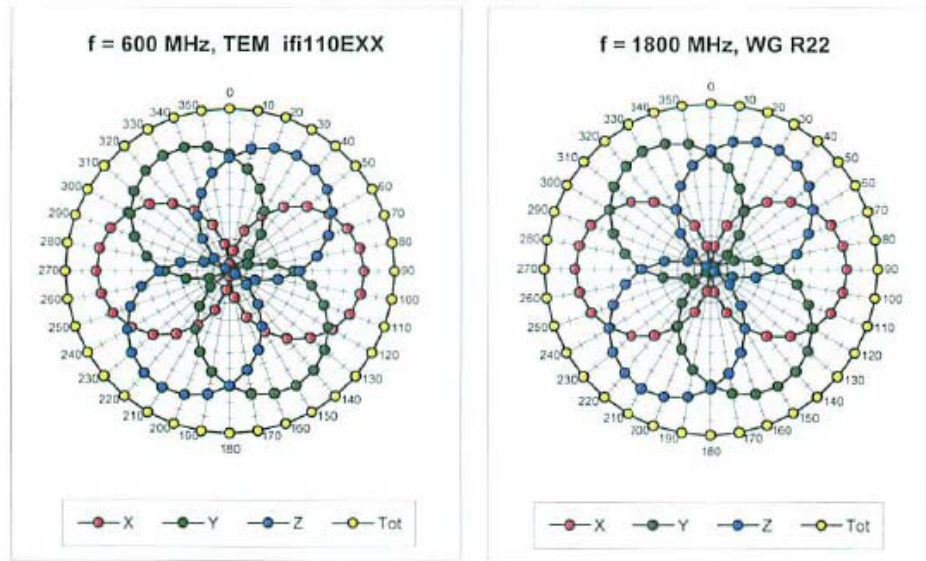


Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

ES3DV3 SN:3147

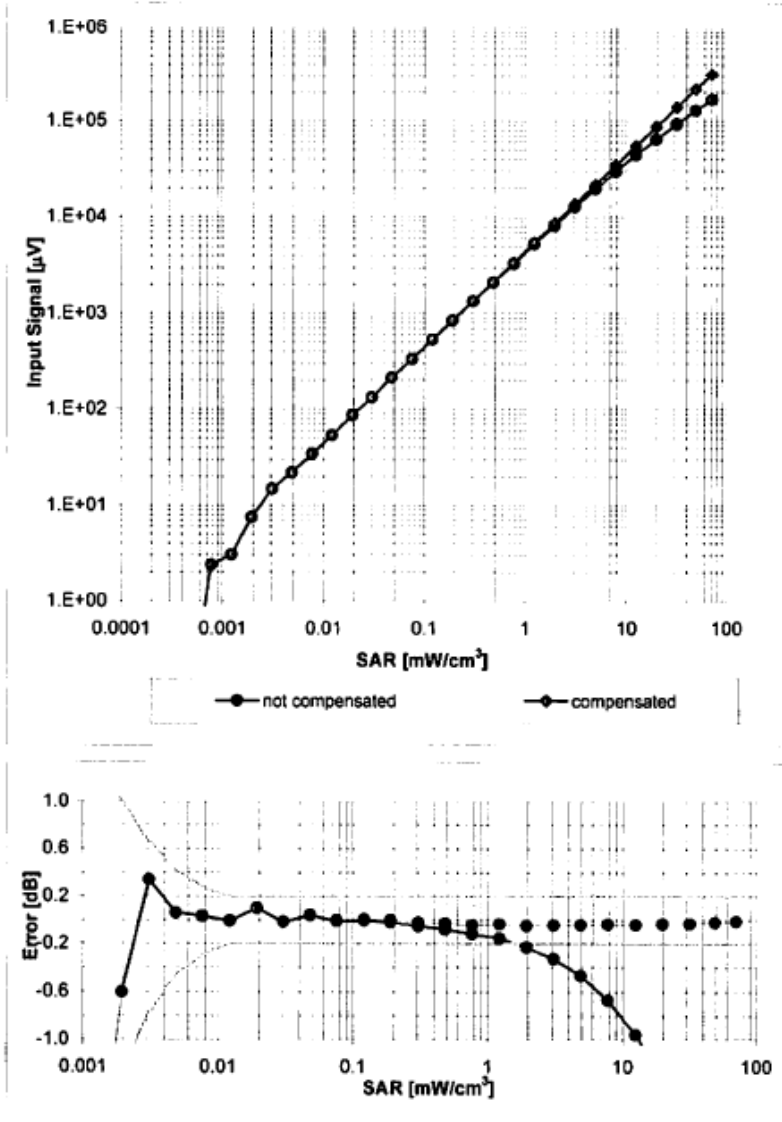
February 18, 2010

Receiving Pattern (ϕ), $\theta = 0^\circ$



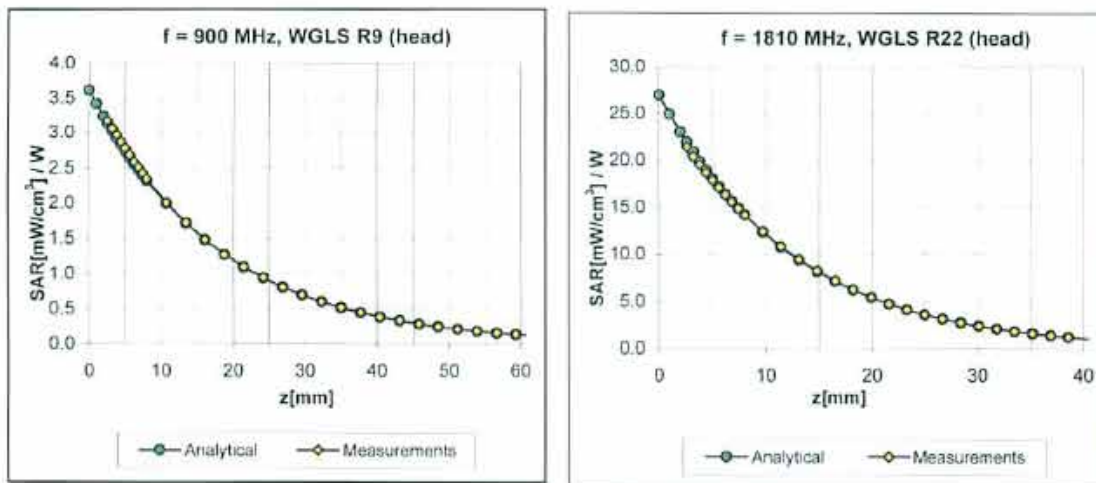
Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

Dynamic Range f(SAR_{head})
(Waveguide R22, f = 1800 MHz)



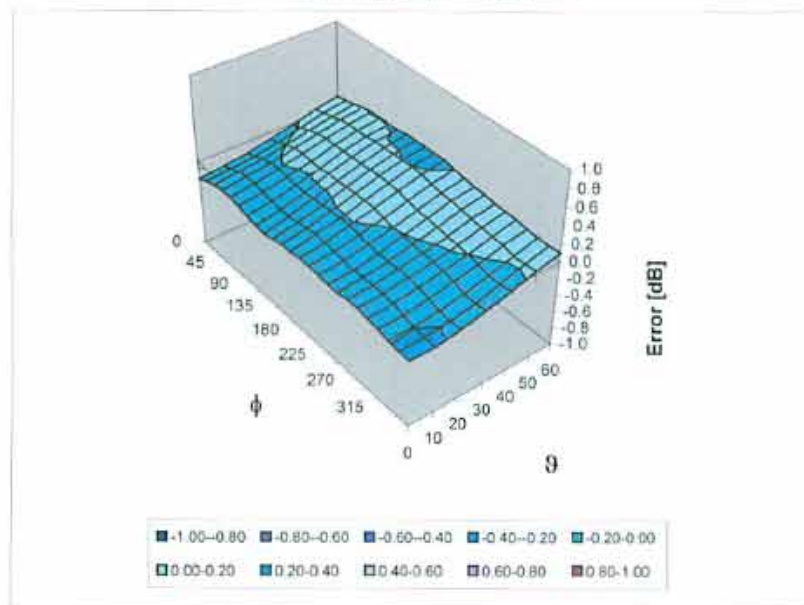
Uncertainty of Linearity Assessment: $\pm 0.6\%$ (k=2)

Conversion Factor Assessment



Deviation from Isotropy in HSL

Error (ϕ , θ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: $\pm 2.6\%$ (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

Additional Conversion Factors

for Dosimetric E-Field Probe

Type:

ES3DV3

Serial Number:

3147

Place of Assessment:

Zurich

Date of Assessment:

February 22, 2010

Probe Calibration Date:

February 18, 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:



Dosimetric E-Field Probe ES3DV3 SN:3147

Conversion factor ($\pm$ standard deviation)

150 MHz	<i>ConvF</i>	$8.0 \pm 10\%$	$\epsilon_r = 52.3$ $\sigma = 0.76 \text{ mho/m}$ (head tissue)
250 MHz	<i>ConvF</i>	$7.2 \pm 10\%$	$\epsilon_r = 47.6$ $\sigma = 0.83 \text{ mho/m}$ (head tissue)
150 MHz	<i>ConvF</i>	$7.7 \pm 10\%$	$\epsilon_r = 61.9$ $\sigma = 0.80 \text{ mho/m}$ (body tissue)
250 MHz	<i>ConvF</i>	$7.3 \pm 10\%$	$\epsilon_r = 59.4$ $\sigma = 0.88 \text{ mho/m}$ (body tissue)
300 MHz	<i>ConvF</i>	$7.1 \pm 9\%$	$\epsilon_r = 58.2$ $\sigma = 0.92 \text{ mho/m}$ (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 Section 4.7 of the DASY4 Manual.

**Calibration Laboratory of
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Zeughausstrasse 43, 8004 Zurich, Switzerland



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Accreditation No.: **SCS 108**

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

Client **Motorola EME**

Certificate No: **ES3-3185_Nov10**

CALIBRATION CERTIFICATE

Object **ES3DV3 - SN:3185**

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: **November 25, 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 $(22 \pm 3)^\circ\text{C}$ 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-10)	In house check: Oct-11

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

Issued: November 25, 2010

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

Certificate No: **ES3-3185_Nov10**

Page 1 of 11

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Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,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., $\vartheta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}**: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not effect the E²-field uncertainty inside TSL (see below ConvF).
- NORM(f)_{x,y,z}** = NORM_{x,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.
- DCP_{x,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.
- A_{x,y,z}; B_{x,y,z}; C_{x,y,z}; VR_{x,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 $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{x,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.

ES3DV3 SN:3185

November 25, 2010

Probe ES3DV3

SN:3185

Manufactured:	March 25, 2008
Last calibrated:	November 23, 2009
Recalibrated:	November 25, 2010

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

ES3DV3 SN:3185

November 25, 2010

DASY/EASY - Parameters of Probe: ES3DV3 SN:3185**Basic Calibration Parameters**

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu\text{V}/(\text{V}/\text{m})^2$) ^A	1.34	1.23	1.15	± 10.1%
DCP (mV) ^B	100.6	99.9	102.1	

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	117.6	± 2.9 %
			Y	0.00	0.00	1.00	145.9	
			Z	0.00	0.00	1.00	143.8	

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 E²-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 rectangular distribution and is expressed for the square of the field value.

ES3DV3 SN:3185

November 25, 2010

DASY/EASY - Parameters of Probe: ES3DV3 SN:3185**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%	6.85	6.85	6.85	0.23	0.81 ± 13.3%
450	± 50 / ± 100	43.5 ± 5%	0.87 ± 5%	6.13	6.13	6.13	0.18	1.72 ± 13.3%
750	± 50 / ± 100	41.9 ± 5%	0.89 ± 5%	6.10	6.10	6.10	0.99	1.04 ± 11.0%
900	± 50 / ± 100	41.5 ± 5%	0.97 ± 5%	5.73	5.73	5.73	0.88	1.08 ± 11.0%
1810	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	4.86	4.86	4.86	0.60	1.95 ± 11.0%
1950	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	4.65	4.65	4.65	0.43	1.64 ± 11.0%
2300	± 50 / ± 100	39.5 ± 5%	1.67 ± 5%	4.48	4.48	4.48	0.37	1.84 ± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	4.24	4.24	4.24	0.41	1.85 ± 11.0%
2600	± 50 / ± 100	39.0 ± 5%	1.96 ± 5%	4.12	4.12	4.12	0.45	1.78 ± 11.0%
3500	± 50 / ± 100	37.9 ± 5%	2.91 ± 5%	3.96	3.96	3.96	0.70	1.40 ± 13.1%
3700	± 50 / ± 100	37.7 ± 5%	3.12 ± 5%	3.49	3.49	3.49	0.80	1.40 ± 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.

ES3DV3 SN:3185

November 25, 2010

DASY/EASY - Parameters of Probe: ES3DV3 SN:3185**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%	6.74	6.74	6.74	0.21	1.59 ± 13.3%
450	± 50 / ± 100	56.7 ± 5%	0.94 ± 5%	6.51	6.51	6.51	0.07	1.00 ± 13.3%
750	± 50 / ± 100	55.5 ± 5%	0.96 ± 5%	5.83	5.83	5.83	0.93	1.10 ± 11.0%
900	± 50 / ± 100	55.0 ± 5%	1.05 ± 5%	5.62	5.62	5.62	0.75	1.20 ± 11.0%
1810	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.59	4.59	4.59	0.36	1.85 ± 11.0%
1950	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.57	4.57	4.57	0.26	2.86 ± 11.0%
2300	± 50 / ± 100	52.8 ± 5%	1.85 ± 5%	4.29	4.29	4.29	0.45	1.87 ± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	4.14	4.14	4.14	0.53	1.50 ± 11.0%
2600	± 50 / ± 100	52.5 ± 5%	2.16 ± 5%	4.03	4.03	4.03	0.93	1.09 ± 11.0%
3500	± 50 / ± 100	51.3 ± 5%	3.31 ± 5%	3.41	3.41	3.41	0.90	1.30 ± 13.1%
3700	± 50 / ± 100	51.0 ± 5%	3.55 ± 5%	3.26	3.26	3.26	0.90	1.50 ± 13.1%

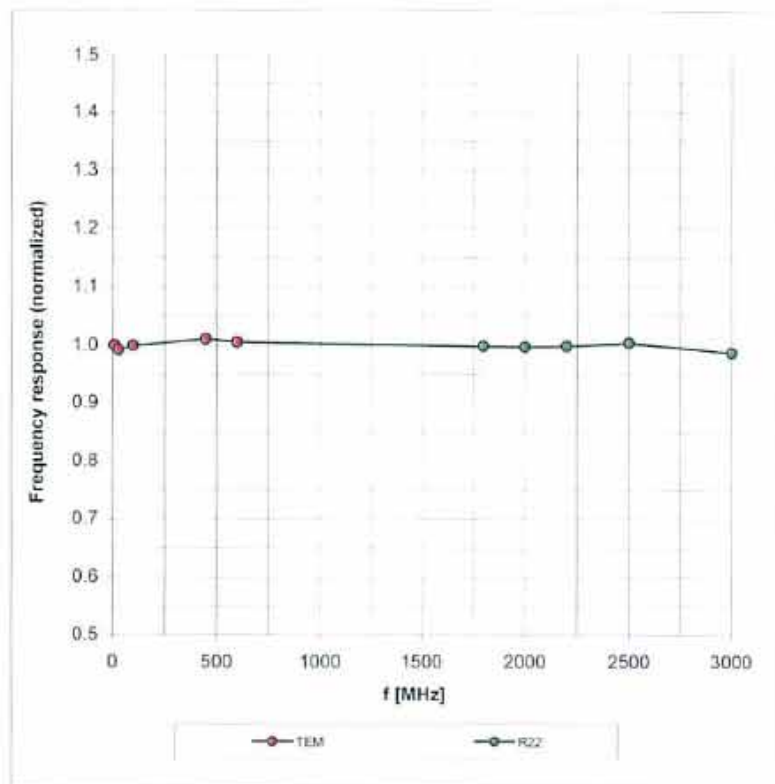
^c The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

ES3DV3 SN:3185

November 25, 2010

Frequency Response of E-Field

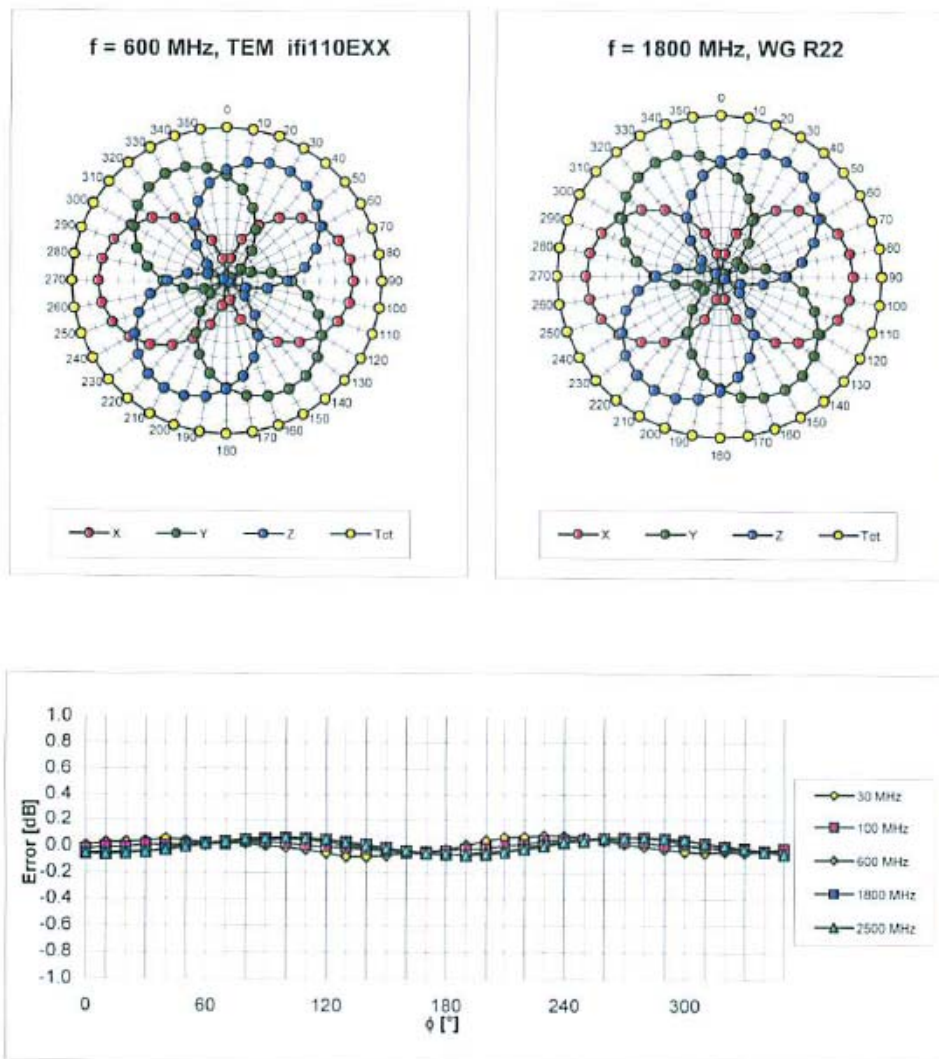
(TEM-Cell:ifi110 EXX, Waveguide: R22)

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

ES3DV3 SN:3185

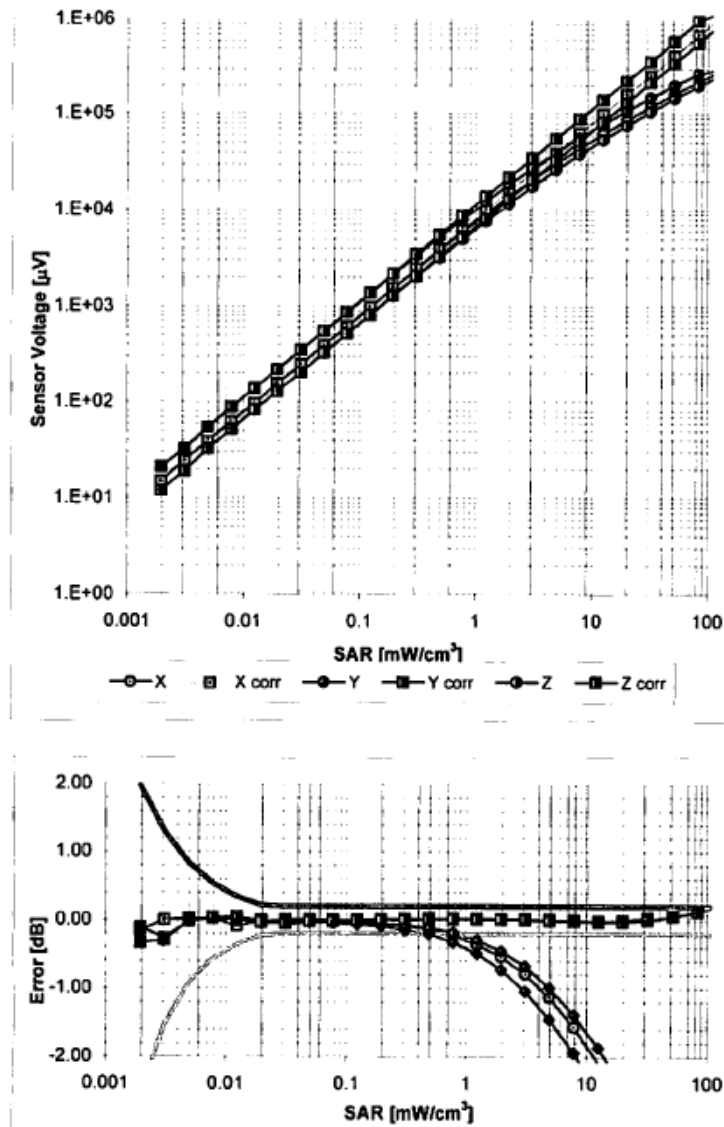
November 25, 2010

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



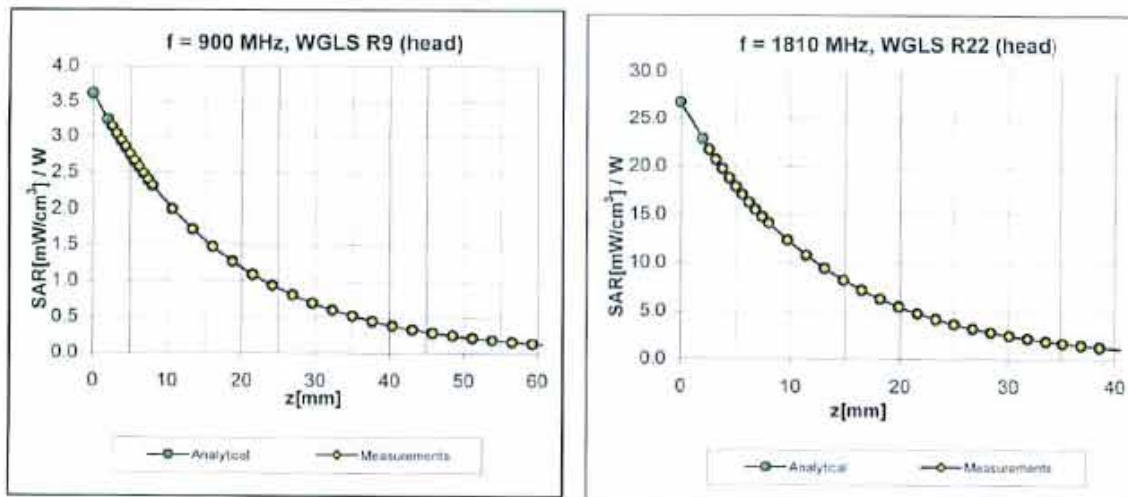
Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

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



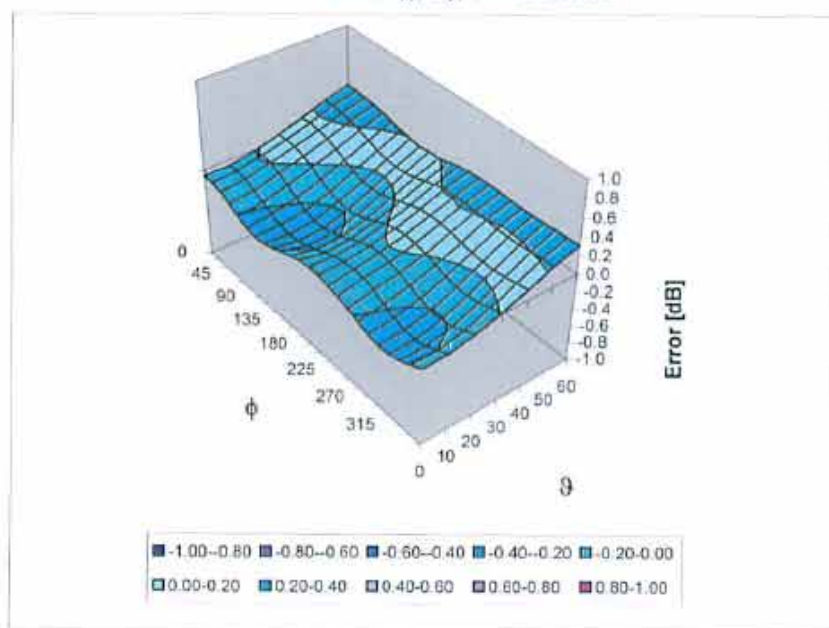
Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

Conversion Factor Assessment



Deviation from Isotropy in HSL

Error (ϕ , θ), f = 900 MHz



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

ES3DV3 SN:3185

November 25, 2010

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

Additional Conversion Factors

for Dosimetric E-Field Probe

Type:

ES3DV3

Serial Number:

3185

Place of Assessment:

Zurich

Date of Assessment:

November 26, 2010

Probe Calibration Date:

November 25, 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:



Dosimetric E-Field Probe ES3DV3 SN:3185

Conversion factor ($\pm$ standard deviation)

150 MHz	$ConvF$	$7.8 \pm 10\%$	$\epsilon_r = 52.3$ $\sigma = 0.76 \text{ mho/m}$ (head tissue)
250 MHz	$ConvF$	$6.9 \pm 10\%$	$\epsilon_r = 47.6$ $\sigma = 0.83 \text{ mho/m}$ (head tissue)
150 MHz	$ConvF$	$7.5 \pm 10\%$	$\epsilon_r = 61.9$ $\sigma = 0.80 \text{ mho/m}$ (body tissue)
250 MHz	$ConvF$	$7.1 \pm 10\%$	$\epsilon_r = 59.4$ $\sigma = 0.88 \text{ mho/m}$ (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 Section 4.7 of the DASY4 Manual.

APPENDIX C
Dipole Calibration Certificates

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



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 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Motorola CGISS**

Certificate No: **D450V2-1002_Sep08**

CALIBRATION CERTIFICATE

Object **D450V2 - SN: 1002**

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

Calibration date: **September 26, 2008**

Condition of the calibrated item **In Tolerance**

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

All calibrations have been conducted in the closed laboratory facility: environment temperature $(22 \pm 3)^{\circ}\text{C}$ 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	01-Apr-08 (No. 217-00788)	Apr-09
Power sensor E4412A	MY41495277	01-Apr-08 (No. 217-00788)	Apr-09
Power sensor E4412A	MY41498087	01-Apr-08 (No. 217-00788)	Apr-09
Reference 3 dB Attenuator	SN: S5054 (3c)	01-Jul-08 (No. 217-00865)	Jul-09
Reference 20 dB Attenuator	SN: S5086 (20b)	31-Mar-08 (No. 217-00787)	Mar-09
Type-N mismatch combination	SN: 5047.2 / 06327	01-Jul-08 (No. 217-00867)	Jul-09
Reference Probe ET3DV6 (LF)	SN: 1507	27-Jun-08 (No. ET3-1507_Jun08)	Jun-09
DAE4	SN: 601	14-Mar-08 (No. DAE4-601_Mar08)	Mar-09
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8548C	US3642U01700	04-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585	19-Oct-01 (in house check Oct-07)	In house check: Oct-08

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

Issued: September 29, 2008

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

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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:

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

- 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	V5.0
Extrapolation	Advanced Extrapolation	
Phantom	Flat Phantom V4.4	Shell thickness: 6 ± 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 $\pm$ 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	$43.1 \pm 6 \%$	$0.83 \text{ mho/m} \pm 6 \%$
Head TSL temperature during test	(21.8 ± 0.2) °C	---	---

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	condition	
SAR measured	398 mW input power	1.97 mW / g
SAR normalized	normalized to 1W	4.95 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	5.03 mW / g $\pm$ 18.1 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	398 mW input power	1.33 mW / g
SAR normalized	normalized to 1W	3.34 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	3.37 mW / g $\pm$ 17.6 % (k=2)

¹ Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	56.3 Ω - 6.1 j Ω
Return Loss	- 21.7 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.348 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	March 22, 2002

DASY5 Validation Report for Head TSL

Date/Time: 26.09.2008 13:21:17

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 450 MHz; Type: D450V2; Serial: D450V2 - SN:1002

Communication System: CW; Frequency: 450 MHz; Duty Cycle: 1:1

Medium: HSL450

Medium parameters used: $f = 450$ MHz; $\sigma = 0.83$ mho/m; $\epsilon_r = 43.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ET3DV6 - SN1507 (LF); ConvF(6.66, 6.66, 6.66); Calibrated: 27.06.2008
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 4.4; Type: Flat Phantom 4.4
- Measurement SW: DASY5, V5.0 Build 119; SEMCAD X Version 13.2 Build 87

d=15mm, Pin=398mW/Area Scan (41x111x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 2.09 mW/g

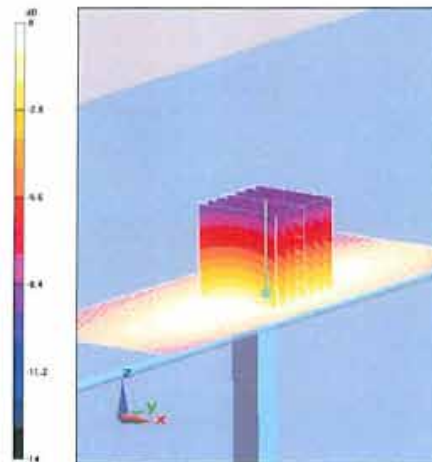
d=15mm, Pin=398mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 51.7 V/m; Power Drift = -0.034 dB

Peak SAR (extrapolated) = 2.92 W/kg

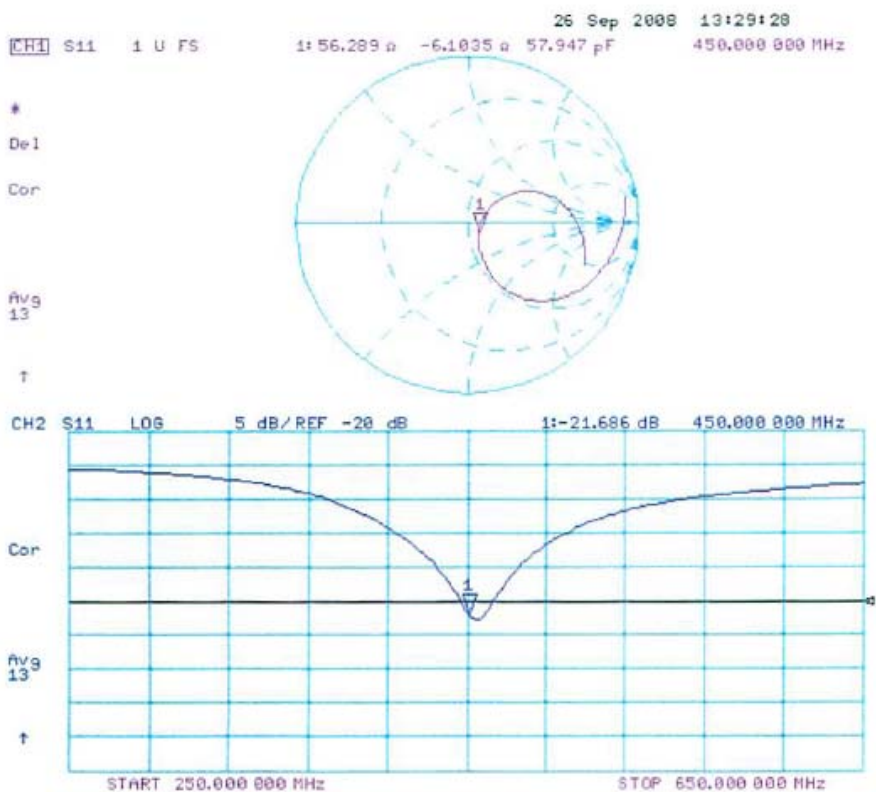
SAR(1 g) = 1.97 mW/g; SAR(10 g) = 1.33 mW/g

Maximum value of SAR (measured) = 2.12 mW/g



0 dB = 2.12mW/g

Impedance Measurement Plot for Head TSL



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



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 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Motorola EME**

Certificate No: **D450V2-1001_Apr10**

CALIBRATION CERTIFICATE

Object **D450V2 - SN: 1001**

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

Calibration date: **April 26, 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 (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 (LF)	SN: 1507	03-Jul-09 (No. ET3-1507_Jul09)	Jul-10
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-09)	In house check: Oct-10

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

Issued: April 26, 2010

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

Certificate No: D450V2-1001_Apr10

Page 1 of 6

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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:

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

- DASY4 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	V5.2
Extrapolation	Advanced Extrapolation	
Phantom	Flat Phantom V4.4	Shell thickness: 6 ± 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 $\pm$ 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 $\pm$ 0.2) °C	44.2 $\pm$ 6 %	0.83 mho/m $\pm$ 6 %
Head TSL temperature during test	(22.0 $\pm$ 0.2) °C	---	---

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	condition	
SAR measured	398 mW input power	1.93 mW / g
SAR normalized	normalized to 1W	4.85 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	5.05 mW / g $\pm$ 18.1 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	398 mW input power	1.28 mW / g
SAR normalized	normalized to 1W	3.22 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	3.33 mW / g $\pm$ 17.6 % (k=2)

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	49.3 Ω - 9.3 j Ω
Return Loss	- 20.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.343 ns
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After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

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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	March 22, 2002

DASY5 Validation Report for Head TSL

Date/Time: 26.04.2010 11:59:05

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 450 MHz; Type: D450V2; Serial: D450V2 - SN:1001

Communication System: CW; Frequency: 450 MHz; Duty Cycle: 1:1

Medium: HSL450

Medium parameters used: $f = 450$ MHz; $\sigma = 0.83$ mho/m; $\epsilon_r = 44.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ET3DV6 - SN1507 (LF); ConvF(6.66, 6.66, 6.66); Calibrated: 03.07.2009
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn654; Calibrated: 23.04.2010
- Phantom: Flat Phantom 4,4 ; Type: Flat Phantom 4,4; Serial: 1002
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 57

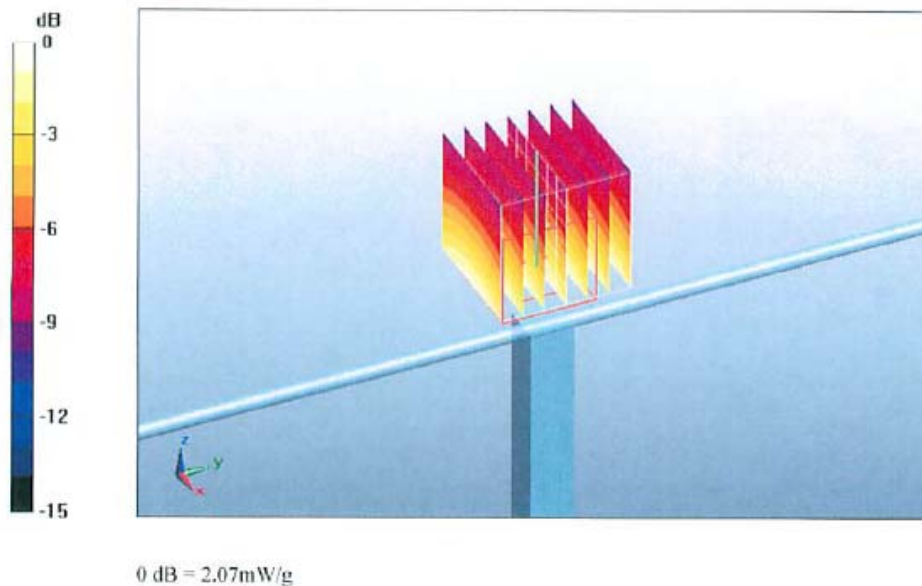
Pin=398mW/d=15mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 50.7 V/m; Power Drift = 0.0013 dB

Peak SAR (extrapolated) = 2.89 W/kg

SAR(1 g) = 1.93 mW/g; SAR(10 g) = 1.28 mW/g

Maximum value of SAR (measured) = 2.07 mW/g



Impedance Measurement Plot for Head TSL

