



MOTOROLA



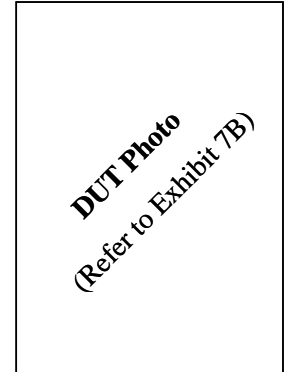
TESTING CERT # 2518.01

**FCC ID: IHDT56JQ1
DECLARATION OF COMPLIANCE SAR ASSESSMENT Part 1 of 2**

Government & Public Safety
EME Test Laboratory
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Date of Report: 10/8/08
Report Revision: A
Report ID: i9_SR6744_081008

Responsible Engineer: K. Uong (Principal Staff EME Eng.)
Report Author: K. Uong (Principal Staff EME Eng.)
Date/s Tested: 9/12/08 – 9/18/08
Manufacturer/Location: Motorola, China
Sector/Group/Div.: iDEN Subscriber
Date submitted for test: 9/8/08
DUT Description: TDMA: 81:120, 1:3, 1:12, and 1:6; 64 QAM, 16QAM, and QPSK Modulations; 0.60W Pulse Avg; MOTOTalk: 114:120 8FSK; 0.85 W nominal; (GPS and Bluetooth Capable).
Test TX mode(s): iDEN: 1:6, 1:3, 81:120; MOTOTalk: 114:120
Max. Power output: 0.640W pulsed average (iDEN); 0.891W (MOTOTalk); 2.5mW (Bluetooth)
Nominal Power: 0.6W Pulse Average Conducted Power (iDEN); 0.85W (MOTOTalk); 1mW (Bluetooth)
Tx Frequency Bands: 806-825, 896-902MHz (iDEN); 902-928MHz (MOTOTalk); 2.402-2.480GHz (Bluetooth)
Signaling type: iDEN: 1:6, 1:3, 81:120; MOTOTalk: 114:120; BT:FHSS
Model(s) Tested: H07XAN6JR7AN
Model(s) Certified: H07XAN6JR7AN
Serial Number(s): 364VJQ5Z3M, 364VJQ6T8D
Classification: General Population/Uncontrolled Environment
Rule Part(s): 15 and 90



Approved Accessories:

Antenna(s):

0105952U32 (IFA, 806-928MHz, 1/4 wave, -0.336 to 0.108 dBd gain)
 Bluetooth (Printed IFA, 2.4-2.48GHz, 1/4 wave, 3.972dBd gain)

Battery(ies):

SNN5807A (BX50 High performance battery); SNN5809A (BX80 Max cap performance battery); NTN2487XXXA (High performance battery door); NTN2508XXXA (Max cap performance battery door).

Body worn accessory(ies):

SYN2992A (Holster)

Audio/Data cable accessory(ies):

SYN1458A (Stereo Headset); SYN1472A (Mono Headset); SKN6238A (LONG WELL USB cable)

Max. Calc. : 1-g Avg. SAR: 1.07 W/kg (Body); 10-g Avg. SAR: 0.76 W/kg (Body)
Max. Calc. : 1-g Avg. SAR: 0.33 W/kg (Face); 10-g Avg. SAR: 0.24 W/kg (Face)
Max. Calc. : 1-g Avg. SAR: 0.61 W/kg (Head); 10-g Avg. SAR: 0.32 W/kg (Head)

The test results clearly demonstrate compliance with FCC General Population/Uncontrolled RF Exposure limits of 1.6W/kg per the requirements of 47 CFR 2.1093(d). The test results clearly demonstrate compliance with ICNIRP (1998) Guidelines for limiting exposure in time-varying electric, magnetic, and electromagnetic fields (up to 300GHz), Health Physics 74, 494-522 RF Exposure limits of 2W/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 2.0 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 – Stephen Whalen for Deanna Zakharia
**Deanna Zakharia G&PS EME Lab Senior Resource Manager,
 Laboratory Director**

Approval Date: 10/08/08

Certification Date: 10/08/08

Certification No.: L1081002P

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Report Revision History

Date	Revision	Comments
9/29/08	O	Initial release
10/8/08	A	To revise the model number for the device tested.

1.0 Introduction and Overview

This report details the utilization, test setup, test equipment, and test results of the Specific Absorption Rate (SAR) measurements performed at the G&PS EME Test Lab for the model number H07XAN6JR7AN FCC ID: IHDT56JQ1. The results herein reflect initial test results.

2.0 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 Electronic Engineers (IEEE) C95. 1-1992
- Institute of Electrical and Electronic Engineers (IEEE) C95.1-2005 Edition
- International Commission on Non-Ionizing Radiation Protection (ICNIRP) 1998
- Ministry of Health (Canada) Safety Code 6. Limits of Human Exposure to Radio frequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz, 1999
- Australian Communications Authority Radiocommunications (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 9KHz and 300 GHz." and "Attachment to resolution # 303 from July 2, 2002"

2.1 SAR Limits

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)	1.60	8.0
Spatial Peak - ICNIRP/ANSI - (hands/wrists/feet/ankles averaged over 10-g)	4.0	20.0
Localized SAR - ICNIRP - (Head and Trunk 10-g)	2.0	10.0

3.0 Description of Device Under Test (DUT)

FCC ID: IHDT56JQ1, a digital multi-service data capable device that employs time division multiplexing transmission technology with a duty cycle ranging from 16.67% to 33.33% using M16-QAM modulation for voice or circuit data transmission. There is a Split 1:3 mode that operates using a 16.67% transmission duty cycle, two pulses in each of the 90-msec frame format. This mode is available in both the 806-825MHz and 896-902MHz bands in the telephone interconnect mode only. Packet data transmission is supported up to a maximum duty cycle of 67.5% using quad QPSK modulation. This device also possesses MOTOTalk (Part 15 service), which employs Frequency Hopping Spread Spectrum technology in the 900 MHz ISM band. MOTOTalk emissions have a maximum duty cycle of 114:120 using 8 FSK modulation. MOTOTalk operates only in PTT mode in front of the face or at the abdomen with the applicable offered audio accessories. This device also incorporates a Class 2 Bluetooth device which is a Frequency Hopping Spread Spectrum (FHSS) technology. Bluetooth is a short range wireless protocol used for communication between users. Users link to each other through an Ad-Hock network of pico-nets. Packet Data operation is possible with and without connection to an external data device, via a data cable. This device is also GPS capable.

This device will be marketed to and used by the general population. This device may be used while held against the head in voice mode, in front of the face in PTT mode, and against the body in phone, dispatch, MOTOTalk, and data modes.

FCC ID: IHDT56JQ1 is capable of operating in the 806-825 MHz and 896-902MHz bands for iDEN mode, in the 902-928MHz for MOTOTalk mode, and in the 2.402-2.480 GHz for Bluetooth. The rated conducted power is 0.600W pulsed averaged in 806-825MHz and 896-902MHz bands, 0.85W in the MOTOTalk band, and 1mW in Bluetooth. The maximum conducted output power is 0.640W pulsed average, 0.891W, and 2.5mW respectively as defined by the upper limit of the production line final test station.

FCC ID: IHDT56JQ1 is offered with the options and accessories listed on the coversheet.

Test Output Power

A table of the characteristic power slump versus time is provided in Appendix F.

4.0 Description of Test System



4.1 Descriptions of Robotics/probes/Readout Electronics

The laboratory utilizes a Dosimetric Assessment System (DASY4™) SAR measurement system Version 4.7 build 71 manufactured by Schmid & Partner Engineering AG (SPEAG™), of Zurich Switzerland. The test system consists of a Stäubli RX90L robot, DAE3V1, and ET3DV6 E-Field probes. Please reference the SPEAG user manual and application notes for detailed probe, robot, and SAR computational procedures. Section 5.0 presents relevant 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.

4.2 Description of Phantom(s)

4.2.1 Rectangular Flat Phantom

Phantom ID	Phantom Material	Phantom Dimensions (cm)	Support structure opening dimensions (cm)	Support structure material	Loss Tangent (wood)
80302002D	High Density Polyethylene (HDPE)	80x30x20x0.2	68.58x20.32	Wood	< 0.05

4.2.2 SAM Phantom

Phantom ID	Material Parameters	Material Thickness (mm)	Support structure material	Loss Tangent (wood)
SAMTP1234	200MHz -3GHz; Er = <5, Loss Tangent = 0.05	2mm +/- 0.2mm	Wood	< 0.05

4.2.3 Elliptical Flat Phantom

Phantom ID	Material Parameters	Material Thickness (mm)	Support structure material	Loss Tangent (wood)
NA	300MHz -6GHz; Er = 4+/- 1, Loss Tangent = <0.05	NA	Wood	< 0.05

4.3 Description of Equivalent tissues

Type 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 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

% of listed ingredients	900MHz	
	Head	Body
Sugar	56.5	44.9
Diacetin	NA	NA
De ionized -Water	40.95	53.06
Salt	1.45	0.94
HEC	1.0	1
Bact.	0.1	0.1

Reference section 6.1 for target parameters

5.0 Additional Test Equipment

Equipment Type	Model Number	Serial Number	Calibration Due Date
Power Meter (Agilent)	E4419B	MY40330364	7/16/2009
Power Meter (HP)	E4418B	US39251152	3/24/2009
E-Series Avg. Power Sensor (Agilent)	E9301B	MY41495593	2/14/2009
E-Series Avg. Power Sensor (Agilent)	E9301B	MY41495594	2/14/2009
Power Sensor (Agilent)	8482B	3318A06774	2/26/2009
Bi-Directional Coupler (NARDA)	3020A	40295	6/9/2010
Bi-Directional Coupler (NARDA)	3022	77115	3/20/2010
Signal Generator (Agilent)	E4438C	MY42082269	7/8/2010
AMP (ComTech PST)	AR88258-10	N1R1A00-1015	CNR
Temperature Recording Equipment			
Dickson Temperature Recorder	TM125	1195889	6/18/2009
Omega Digital Thermometer with J Type TC Probe	HH202A	18801	3/26/2009
Omega Digital Thermometer with J Type TC Probe	HH202A	18812	4/25/2009
Tissue Station			
Agilent PNA-L Network Analyzer	N5230A	MY45001092	5/22/2010
Dielectric Probe Kit (HP)	85070C	US99360076	CNR
Dipole			
Speag Dipole	D900V2	84	3/17/2010

6.0 SAR Measurement System Verification

The SAR measurements were conducted with probe model/serial number ET3DV6/SN1384. The system performance check was conducted daily and within 24 hours prior to testing. DASYS output files of the probe/dipole calibration certificates and system performance test results are included in appendices B, C, D respectively. The table below summarizes the system performance check results normalized to 1W.

Dipole validation scans at the head from SPEAG are provided in APPENDIX D. The G&PS EME lab validated the dipole to the applicable IEEE 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 G&PS EME system performance validation are provided herein.

6.1 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 5.0.

Tissue Target Tolerances

FCC Body		
Frequency (MHz)	Di-electric Constant	Conductivity S/m
815.5	55.3 +/- 5%	0.97 +/- 5%
900/899	55.0 +/- 5%	1.05 +/- 5%
915	55.0 +/- 5%	1.06 +/- 5%

IEC Head		
Frequency (MHz)	Di-electric Constant Target	Conductivity Target S/m
815.5	41.6 +/- 5%	0.90 +/- 5%
900/899	41.5 +/- 5%	0.97 +/- 5%
915	41.5 +/- 5%	0.98 +/- 5%

6.2 System Check Test Results

Probe Serial #	Tissue Type	Probe Cal Date	Dipole Kit / Serial #	Reference SAR Target Tolerances @ 1W (mW/g)
1384	FCC Body	5/19/2008	SPEAG D900V2 /084	11.75 +/- 10%
1384	IEEE Head	5/19/2008	SPEAG D900V2 /084	11.27 +/- 10%

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

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 17025 A2LA guidelines.

7.0 DUT Test Strategy and Methodology

7.1 DUT Configuration(s)

The DUT is a portable device with iDEN, and MOTOTalk (FHSS 8FSK) transmission signaling operational at the body, head, and face using the offered accessories. The device is placed in the test positions presented in Appendix G.

Test Plan

All options and accessories listed on the cover page of this report were considered in order to develop the SAR test plan for this product. SAR measurements were performed using a rectangular flat phantom and a SAM phantom with the applicable simulated tissue to assess performance at the body, head, and face respectively using the relevant transmission modes.

Note that a coarse-to-cube approximation methodology was utilized to determine the worst-case SAR performance configuration for each applicable body location. The test configurations that produced the highest SAR results for each body position using the coarse-to-cube approximation methodology were assessed using the full DASY4™ coarse and 5x5x7 zoom scans.

Per FCC TCB workshop (February 2008) and FCC OET draft 648474 (April 2008) “SAR Evaluation Considerations for handsets with multiple Transmitters and Antennas”, SAR measurements were not performed for the Bluetooth band due to the maximum output power for Bluetooth is 2.5mW and the separation distance between the Bluetooth antenna and the other antenna is 30mm.

Assessments at the Head: 806-825MHz Band (iDEN phone 1:3 mode)

(Page 13 of 33; Table 1)

- Assessment at the center of the 806-825MHz band, using the offered batteries and applicable test configurations at the left ear.
- Assessment of other frequencies, using the worst case from above.
- Assessment at the center of the 806-825MHz band, using the offered batteries and applicable test configurations at the right ear.
- Assessment of other frequencies, using the worst case from above.

Assessments at the Face: 806-825MHz Band (iDEN dispatch 1:6 mode)

(Page 13 of 33; Table 1)

- Assessment at the center of the 806-825MHz band using one offered battery with flip opened and closed. The other offered battery was assessed using the worst case flip configuration from above.

Assessments at the Body: 806-825MHz band (iDEN 81:120 and 1:3 mode)

(Page 14 of 33; Table 2)

- Assessment at the center of the 806-825MHz band, in the 81:120 data transmission mode, using the offered batteries and applicable body-worn accessory.
- Assessment of the offered data cable option using the worst case configuration from above.
- Assessment of the offered audio cable options, in the 1:3 (iDEN phone) transmission mode, using the worse case configuration from above.
- Assessment of other frequencies, using the worst case from above.
- Assessment using the overall worst case test configuration from above with the back

and front housing of the DUT separated 2.5cm from the phantom.

Assessments at the Head: 896-902MHz Band (iDEN phone 1:3 mode)

(Page 15 of 33; Table 3)

- Assessment at the center of the 896-902MHz band, using the offered batteries and applicable test configurations at the left ear.
- Assessment of other frequencies, using the worst case from above.
- Assessment at the center of the 896-902MHz band, using the offered batteries and applicable test configurations at the right ear.
- Assessment of other frequencies, using the worst case from above.

Assessments at the Face: 896-902MHz Band (iDEN dispatch 1:6 mode)

(Page 15 of 33; Table 3)

- Assessment at the center of the 896-902MHz band using one offered battery with flip opened and closed. The other offered battery was assessed using the worst case flip configuration from above.

Assessments at the Body: 896-902MHz band (iDEN 81:120 and 1:3 mode)

(Page 16 of 33; Table 4)

- Assessment at the center of the 896-902MHz band, in the 81:120 data transmission mode, using the offered batteries and applicable body-worn accessory.
- Assessment of the offered data cable option using the worst case configuration from above.
- Assessment of the offered audio cable options, in the 1:3 (iDEN phone) transmission mode, using the worst case configuration from above.
- Assessment of other frequencies, using the worst case from above.
- Assessment using the overall worst case test configuration from above with the back and front housing of the DUT separated 2.5cm from the phantom.

Assessments at the Face: 902-928MHz band (MOTOTalk 114:120 mode)

(Page 16 of 33; Table 5)

- Assessment at the center of the 902-928MHz band using one offered battery with flip opened and closed. The other offered battery was assessed using the worst case flip configuration from above.
- Assessment of other frequencies, using the worst case from above.

Assessments at the Body: 902-928MHz band (MOTOTalk 114:120 mode)

(Page 17 of 33; Table 6)

- Assessment at the center of the 902-928MHz band using one offered audio cable, batteries, and the offered body-worn accessory.
- Assessment of other offered audio cable option using the worst case configuration from above.
- Assessment of other frequencies, using the worst case from above.
- Assessment using the overall worst case test configuration from above with the back

and front housing of the DUT separated 2.5cm from the phantom.

Shortened scan assessment (Page 17 of 33; Table 7)

- A “shortened” scan was performed using the offered battery and test configuration that produced the highest SAR results overall. Note that the shortened scan is obtained by first running a coarse scan to find the peak area and then, using a newly charged battery, a cube scan only was performed. The shortened scan represents the cube scan performance results.

7.2 Device Positioning Procedures

Reference Appendix G for photos of the DUT tested positions.

7.2.1 Body

The DUT was positioned in normal use configuration against the phantom with the offered body worn accessory.

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

7.2.2 Head

The DUT was placed against the right and left heads of the SAM phantom in the cheek touch and tilt positions.

7.2.3 Face

The DUT was positioned with its’ front side separated 2.5cm from the phantom with the flip opened and closed.

8.0 Environmental Test Conditions

The EME Laboratory 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:

	Target	Measured
Ambient Temperature	20 - 25 °C	Range: 20.4-22.1°C Avg. 21.3°C
Relative Humidity	30 - 70 %	Range: 50.3-61.2% Avg. 54.4%
Tissue Temperature	NA	Range: 18.1-19.7°C Avg. 18.8 °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.

9.0 Test Results Summary

All SAR results obtained by the tests described in Section 7.1 are listed below. As noted in section 7.1, a coarse-to-cube approximation methodology, was utilized to ascertain the worst case test configuration for each body location per band (in bold with *). The worst case test configurations observed for each body location were assessed using the full DASY4™ coarse and 5x5x7 zoom methodology and they are summarized in the worst case table below. The associated SAR plots are provided in APPENDIX E. Appendix E also presents shortened SAR cube scans to assess the validity of the calculated results presented herein. Note: The results of the shortened cube scans presented in Appendix E demonstrate that the scaling methodology used to determine the calculated SAR results presented herein are valid.

Table 1

Assessments at the Head/Face: 806-825MHz band												
Run Number/ SN	Antenna	Freq. (MHz)	Battery	Test position	Carry Case	Additional attachments	Initial Power (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)
Assessments at the Left Ear (Phone mode 1:3)												
MeC-Lear-080912-05/ 364VJQ6T8D	Internal	815.5125	SNN5807A w/ batt cover NTN2487XXXXA	Touch	None	None	0.669	-0.042	0.317	0.212	0.32	0.21
MeC-Lear-080912-07/ 364VJQ6T8D	Internal	815.5125	SNN5809A w/ batt cover NTN2508XXXXA	Touch	None	None	0.667	-0.033	0.300	0.199	0.30	0.20
MeC-Lear-080912-08/ 364VJQ6T8D	Internal	815.5125	SNN5807A w/ batt cover NTN2487XXXXA	Tilt	None	None	0.665	-0.102	0.067	0.048	0.07	0.05
MeC-Lear-080912-09/ 364VJQ6T8D	Internal	806.0125	SNN5807A w/ batt cover NTN2487XXXXA	Touch	None	None	0.690	-0.058	0.237	0.161	0.24	0.16
MeC-Lear-080912-10/ 364VJQ6T8D	Internal	824.9875	SNN5807A w/ batt cover NTN2487XXXXA	Touch	None	None	0.670	-0.073	0.332	0.220	0.34	0.22
Assessments at the Right Ear (Phone mode 1:3)												
JsT-Rear-080915-12/ 364VJQ6T8D	Internal	815.5125	SNN5807A w/ batt cover NTN2487XXXXA	Touch	None	None	0.669	-0.127	0.466	0.274	0.48	0.28
CM-Rear-080915-13/ 364VJQ6T8D	Internal	815.5125	SNN5809A w/ batt cover NTN2508XXXXA	Touch	None	None	0.670	-0.122	0.464	0.272	0.48	0.28
CM-Rear-080915-14/ 364VJQ6T8D	Internal	815.5125	SNN5807A w/ batt cover NTN2487XXXXA	Tilt	None	None	0.671	0.162	0.070	0.048	0.07	0.05
CM-Rear-080915-15/ 364VJQ6T8D	Internal	806.0125	SNN5807A w/ batt cover NTN2487XXXXA	Touch	None	None	0.653	0.034	0.400	0.227	0.40	0.23
*CM-Rear-080915-16/ 364VJQ6T8D	Internal	824.9875	SNN5807A w/ batt cover NTN2487XXXXA	Touch	None	None	0.639	-0.042	0.514	0.289	0.52	0.29
Assessments at the Face (Dispatch mode 1:6)												
CM-Face-080915-21/ 364VJQ6T8D	Internal	815.5125	SNN5807A w/ batt cover NTN2487XXXXA	Radio's front @ 2.5cm	None / flip open	None	0.667	-0.032	0.086	0.061	0.04	0.03
CM-Face-080915-22/ 364VJQ6T8D	Internal	815.5125	SNN5807A w/ batt cover NTN2487XXXXA	Radio's front @ 2.5cm	None / flip closed	None	0.668	-0.067	0.109	0.078	0.06	0.04
CM-Face-080915-23/ 364VJQ6T8D	Internal	815.5125	SNN5809A w/ batt cover NTN2508XXXXA	Radio's front @ 2.5cm	None / flip closed	None	0.670	0.076	0.115	0.081	0.06	0.04

Table 2

Assessments at the Body: 806-825MHz band												
Run Number/ SN	Antenna	Freq. (MHz)	Battery	Test position	Carry Case	Additional attachments	Initial Power (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)
Assessments at the Body (Data mode 81:120)												
*JsT-Ab-080916-09/ 364VJQ6T8D	Internal	815.5125	SNN5807A w/ batt cover NTN2487XXXXA	Against phantom	SYN2992A Holster	None	0.661	-1.350	0.753	0.523	1.03	0.71
CM-Ab-080916-11/ 364VJQ6T8D	Internal	815.5125	SNN5809A w/ batt cover NTN2508XXXXA	Against phantom	SYN2992A Holster	None	0.660	-1.170	0.619	0.438	0.81	0.57
Data cable assessments at the Body (Data mode 81:120)												
CM-Ab-080916-12/ 364VJQ6T8D	Internal	815.5125	SNN5807A w/ batt cover NTN2487XXXXA	Against phantom	SYN2992A Holster	SKN6238A	0.659	-1.240	0.670	0.468	0.89	0.62
Audio Cables assessment at the Body (Phone mode 1:3)												
CM-Ab-080916-13/ 364VJQ6T8D	Internal	815.5125	SNN5807A w/ batt cover NTN2487XXXXA	Against phantom	SYN2992A Holster	SYN1458A	0.672	-0.090	0.360	0.252	0.37	0.26
CM-Ab-080916-14/ 364VJQ6T8D	Internal	815.5125	SNN5807A w/ batt cover NTN2487XXXXA	Against phantom	SYN2992A Holster	SYN1472A	0.672	-0.047	0.370	0.260	0.37	0.26
Assessment of other frequencies at the Body (Data mode 81:120)												
CM-Ab-080916-15/ 364VJQ6T8D	Internal	806.0125	SNN5807A w/ batt cover NTN2487XXXXA	Against phantom	SYN2992A Holster	None	0.654	-1.640	0.614	0.428	0.90	0.62
CM-Ab-080916-16/ 364VJQ6T8D	Internal	824.9875	SNN5807A w/ batt cover NTN2487XXXXA	Against phantom	SYN2992A Holster	None	0.640	-0.673	0.699	0.489	0.82	0.57
2.5cm assessment at the Body (Data mode 81:120)												
CM-Ab-080916-17/ 364VJQ6T8D	Internal	815.5125	SNN5807A w/ batt cover NTN2487XXXXA	Radio's back @ 2.5cm	None	None	0.668	-1.490	0.584	0.412	0.82	0.58
CM-Ab-080916-18/ 364VJQ6T8D	Internal	815.5125	SNN5807A w/ batt cover NTN2487XXXXA	Radio's front @ 2.5cm	None	None	0.668	-1.830	0.349	0.247	0.53	0.38

Table 3

Assessments at the Head/Face: 896-902MHz band												
Run Number/ SN	Antenna	Freq. (MHz)	Battery	Test position	Carry Case	Additional attachments	Initial Power (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)
Assessments at the Left Ear (Phone mode 1:3)												
JsT-Lear-080915-02/ 364VJQ6T8D	Internal	898.49375	SNN5807A w/ batt cover NTN2487XXXXA	Touch	None	None	0.641	-0.216	0.340	0.226	0.36	0.24
JsT-Lear-080915-03/ 364VJQ6T8D	Internal	898.49375	SNN5809A w/ batt cover NTN2508XXXXA	Touch	None	None	0.639	-0.0378	0.308	0.207	0.31	0.21
JsT-Lear-080915-04/ 364VJQ6T8D	Internal	898.49375	SNN5807A w/ batt cover NTN2487XXXXA	Tilt	None	None	0.639	-0.0974	0.107	0.0752	0.11	0.08
JsT-Lear-080915-05/ 364VJQ6T8D	Internal	896.01875	SNN5807A w/ batt cover NTN2487XXXXA	Touch	None	None	0.634	0.0487	0.333	0.226	0.34	0.23
JsT-Lear-080915-06/ 364VJQ6T8D	Internal	901.98125	SNN5807A w/ batt cover NTN2487XXXXA	Touch	None	None	0.633	-0.11	0.298	0.203	0.31	0.21
Assessments at the Right Ear (Phone mode 1:3)												
JsT-Rear-080915-07/ 364VJQ6T8D	Internal	898.49375	SNN5807A w/ batt cover NTN2487XXXXA	Touch	None	None	0.638	0.0083	0.471	0.288	0.47	0.29
JsT-Rear-080915-08/ 364VJQ6T8D	Internal	898.49375	SNN5809A w/ batt cover NTN2508XXXXA	Touch	None	None	0.638	-0.026	0.503	0.302	0.51	0.30
JsT-Rear-080915-09/ 364VJQ6T8D	Internal	898.49375	SNN5809A w/ batt cover NTN2508XXXXA	Tilt	None	None	0.638	-0.0415	0.112	0.0788	0.11	0.08
JsT-Rear-080915-10/ 364VJQ6T8D	Internal	896.01875	SNN5809A w/ batt cover NTN2508XXXXA	Touch	None	None	0.633	-0.0497	0.517	0.314	0.53	0.32
CM-Rear-080915-19/ 364VJQ6T8D	Internal	901.98125	SNN5809A w/ batt cover NTN2508XXXXA	Touch	None	None	0.624	0.374	0.554	0.313	0.57	0.32
*CM-Rear-080915- 18/ 364VJQ5Z3M	Internal	901.98125	SNN5809A w/ batt cover NTN2508XXXXA	Touch	None	None	0.633	-0.319	0.711	0.409	0.77	0.45
Assessments at the Face (Dispatch mode 1:6)												
CM-Face-080915-24/ 364VJQ6T8D	Internal	898.49375	SNN5807A w/ batt cover NTN2508XXXXA	Radio's front @ 2.5cm	None / flip opened	None	0.632	-0.0285	0.0739	0.0562	0.04	0.03
CM-Face-080915-25/ 364VJQ6T8D	Internal	898.49375	SNN5807A w/ batt cover NTN2487XXXXA	Radio's front @ 2.5cm	None / flip closed	None	0.624	-0.173	0.083	0.059	0.04	0.03
CM-Face-080915-26/ 364VJQ6T8D	Internal	898.49375	SNN5809A w/ batt cover NTN2508XXXXA	Radio's front @ 2.5cm	None / flip closed	None	0.630	0.0738	0.083	0.059	0.04	0.03

Table 4

Assessments at the Body: 896-902MHz band												
Run Number/ SN	Antenna	Freq. (MHz)	Battery	Test position	Carry Case	Additional attachments	Initial Power (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)
Assessments at the Body (Data mode 81:120)												
CM-Ab-080916-19/ 364VJQ6T8D	Internal	898.49375	SNN5807A w/ batt cover NTN2487XXXXA	Against phantom	SYN2992A Holster	None	0.631	-1.93	0.306	0.212	0.48	0.34
CM-Ab-080916-20/ 364VJQ6T8D	Internal	898.49375	SNN5809A w/ batt cover NTN2508XXXXA	Against phantom	SYN2992A Holster	None	0.629	-0.907	0.320	0.214	0.40	0.27
Data cable assessments at the Body (Data mode 81:120)												
CM-Ab-080916- 21/364VJQ6T8D	Internal	898.49375	SNN5807A w/ batt cover NTN2487XXXXA	Against phantom	SYN2992A Holster	SKN6238A	0.632	-1.32	0.245	0.169	0.34	0.23
Audio Cables assessment at the Body (Phone mode 1:3)												
CM-Ab-080916-22/ 364VJQ6T8D	Internal	898.49375	SNN5807A w/ batt cover NTN2487XXXXA	Against phantom	SYN2992A Holster	SYN1458A	0.633	0.014	0.167	0.117	0.17	0.12
CM-Ab-080916-23/ 364VJQ6T8D	Internal	898.49375	SNN5807A w/ batt cover NTN2487XXXXA	Against phantom	SYN2992A Holster	SYN1472A	0.631	0.0258	0.157	0.110	0.16	0.11
Assessment of other frequencies at the Body (Data mode 81:120)												
JsT-Ab-080917-02/ 364VJQ6T8D	Internal	896.01875	SNN5807A w/ batt cover NTN2487XXXXA	Against phantom	SYN2992A Holster	None	0.625	-1.69	0.282	0.198	0.43	0.30
JsT-Ab-080917-03/ 364VJQ6T8D	Internal	901.98125	SNN5807A w/ batt cover NTN2487XXXXA	Against phantom	SYN2992A Holster	None	0.627	-1.66	0.330	0.224	0.49	0.34
2.5cm assessment at the Body (Data mode 81:120)												
JsT-Ab-080917-04/ 364VJQ6T8D	Internal	901.98125	SNN5807A w/ batt cover NTN2487XXXXA	Radio's back @ 2.5cm	None	None	0.626	-1.5	0.357	0.246	0.52	0.36
JsT-Ab-080917-05/ 364VJQ6T8D	Internal	901.98125	SNN5807A w/ batt cover NTN2487XXXXA	Radio's front @ 2.5cm	None	None	0.625	-1.27	0.237	0.167	0.33	0.23

Table 5

Assessments at the Face (MOTOTalk mode 114:120): 902-928 MHz band												
Run Number/ SN	Antenna	Freq. (MHz)	Battery	Test position	Carry Case	Additional attachments	Initial Power (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)
Assessments at the Face												
CM-Face-080917-19/ 364VJQ6T8D	Internal	915.525	SNN5807A w/ batt cover NTN2487XXXXA	Radio's front @ 2.5cm	None / flip open	None	0.895	-0.0004	0.422	0.301	0.21	0.15
CM-Face-080917-20/ 364VJQ6T8D	Internal	915.525	SNN5807A w/ batt cover NTN2487XXXXA	Radio's front @ 2.5cm	None / flip closed	None	0.894	0.0366	0.499	0.354	0.25	0.18
CM-Face-080917-21/ 364VJQ6T8D	Internal	915.525	SNN5809A w/ batt cover NTN2508XXXXA	Radio's front @ 2.5cm	None / flip closed	None	0.895	0.32	0.492	0.349	0.25	0.17
CM-Face-080917-22/ 364VJQ6T8D	Internal	902.525	SNN5807A w/ batt cover NTN2487XXXXA	Radio's front @ 2.5cm	None / flip closed	None	0.899	-0.018	0.513	0.364	0.26	0.18
*JsT-Face-080918- 02/ 364VJQ5Z3M	Internal	902.525	SNN5807A w/ batt cover NTN2487XXXXA	Radio's front @ 2.5cm	None / flip closed	None	0.909	-0.0373	0.648	0.459	0.33	0.23
CM-Face-080917-23/ 364VJQ6T8D	Internal	927.475	SNN5807A w/ batt cover NTN2487XXXXA	Radio's front @ 2.5cm	None / flip closed	None	0.903	0.0637	0.408	0.288	0.20	0.14

Table 6

Assessments at the Body (MOTOTalk mode 114:120): 902-928 MHz band												
Run Number/ SN	Antenna	Freq. (MHz)	Battery	Test position	Carry Case	Additional attachments	Initial Power (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)
Assessments at the Body												
JsT-Ab-080918-04/ 364VJQ6T8D	Internal	915.525	SNN5807A w/ batt cover NTN2487XXXXA	Against phantom	SYN2992A Holster	SYN1458A	0.906	-0.0398	0.694	0.485	0.35	0.24
JsT-Ab-080918-05/ 364VJQ6T8D	Internal	915.525	SNN5809A w/ batt cover NTN2508XXXXA	Against phantom	SYN2992A Holster	SYN1458A	0.909	0.316	0.711	0.497	0.36	0.25
JsT-Ab-080918-06/ 364VJQ6T8D	Internal	915.525	SNN5809A w/ batt cover NTN2508XXXXA	Against phantom	SYN2992A Holster	SYN1472A	0.910	0.162	0.605	0.422	0.30	0.21
Assessment of other frequencies at the Body												
JsT-Ab-080918-07/ 364VJQ6T8D	Internal	902.525	SNN5809A w/ batt cover NTN2508XXXXA	Against phantom	SYN2992A Holster	SYN1458A	0.910	-0.0227	0.685	0.479	0.34	0.24
JsT-Ab-080918-08/ 364VJQ6T8D	Internal	927.475	SNN5809A w/ batt cover NTN2508XXXXA	Against phantom	SYN2992A Holster	SYN1458A	0.920	0.0901	0.687	0.480	0.34	0.24
2.5cm assessment at the Body												
JsT-Ab-080918-09/ 364VJQ6T8D	Internal	915.525	SNN5809A w/ batt cover NTN2508XXXXA	Radio's back @ 2.5cm	None	SYN1458A	0.908	0.0429	0.686	0.477	0.34	0.24
JsT-Ab-080918-10/ 364VJQ6T8D	Internal	915.525	SNN5809A w/ batt cover NTN2508XXXXA	Radio's front @ 2.5cm	None	SYN1458A	0.910	0.0187	0.443	0.311	0.22	0.16

Table 7

*Worst case configuration per body location from above (including shortened scan) –using the DASY 4 full coarse and 5x5x7 cube scan measurements.												
Run Number/ SN	Antenna	Freq. (MHz)	Battery	Test position	Carry Case	Additional attachments	Initial Power (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)
Full scan JsT-Face- 080918-03/ 364VJQ5Z3M	Internal	902.525	SNN5807A w/ batt cover NTN2487XXXXA	Radio's front @ 2.5cm	None / flip closed	None	0.905	-0.001	0.656	0.476	0.33	0.24
Full scan JsT-Rear- 080916-05/ 364VJQ6T8D	Internal	824.9875	SNN5807A w/ batt cover NTN2487XXXXA	Touch	None	None	0.624	-0.689	0.510	0.268	0.61	0.32
Full scan JsT-Rear- 080916-07/ 364VJQ5Z3M	Internal	901.98125	SNN5809A w/ batt cover NTN2508XXXXA	Touch	None	None	0.642	-0.353	0.494	0.296	0.54	0.32
Full scan JsT-Ab- 080917-07/ 364VJQ6T8D	Internal	815.5125	SNN5807A w/ batt cover NTN2487XXXXA	Against phantom	SYN2992A Holster	None	0.662	-2.640	0.4270	0.3240	0.78	0.60
Shorten scan JsT-Ab- 080918-13/ 364VJQ6T8D	Internal	815.5125	SNN5807A w/ batt cover NTN2487XXXXA	Against phantom	SYN2992A Holster	None	0.668	-1.090	0.829	0.594	1.07	0.76

9.1 Highest SAR results calculation methodology

The calculated maximum 1-gram and 10-gram averaged SAR results reported herein for the full DASYS™ coarse and 5x5x7 cube measurements are determined by scaling the measured SAR to account for power leveling variations and power slump. For this device the Maximum Calculated 1-gram and 10-gram averaged peak SAR is calculated using the following formula:

$$\text{Max. Calc. 1-g/10-g Avg. SAR} = ((\text{SAR meas.} / (10^{(\text{Pdrift}/10)})) * (\text{Pmax}/\text{Pint})) * \text{DC}\%$$

P_{max} = Maximum Power (W)

P_{int} = Initial Power (W)

Pdrift = DASYS drift results (dB) - (for conservative results positive drifts are not accounted for)

SAR_{meas.} = Measured 1-g/10-g Avg. SAR (mW/g)

DC % = Transmission mode duty cycle in % where applicable

50% duty cycle is applied for PTT operation.

10.0 Conclusion

The highest Operational Maximum Calculated 1-gram and 10-gram average SAR values found for FCC ID: IHDT56JQ1 models H07XAN6JR7AN.

Max. Calc. : 1-g Avg. SAR: 1.07 W/kg (Body); 10-g Avg. SAR: 0.76 W/kg (Body)

Max. Calc. : 1-g Avg. SAR: 0.33 W/kg (Face); 10-g Avg. SAR: 0.24 W/kg (Face)

Max. Calc. : 1-g Avg. SAR: 0.61 W/kg (Head); 10-g Avg. SAR: 0.32 W/kg (Head)

The test results clearly demonstrate compliance with FCC General Population/Uncontrolled RF Exposure limits of **1.6 W/kg** per the requirements of 47 CFR 2.1093(d).

Appendix A

Measurement Uncertainty

Uncertainty Budget for Device Under Test, for 30 MHz to 3 GHz

<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>	<i>k</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> (±%)	<i>v_i</i>
Measurement System									
Probe Calibration	E.2.1	5.9	N	1.00	1	1	5.9	5.9	∞
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	29
Device Holder Uncertainty	E.4.1	4.0	N	1.00	1	1	4.0	4.0	8
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				11	11	411
Expanded Uncertainty (95% CONFIDENCE LEVEL)			<i>k</i> =2				22	22	

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- 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 uncertainty
- h) *v_i* - degrees of freedom for standard uncertainty and effective degrees of freedom for the expanded uncertainty.

Uncertainty Budget for System Validation (dipole & flat phantom) for 30 MHz to 3 GHz

<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>	<i>k</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> (±%)	<i>v_i</i>
Measurement System									
Probe Calibration	E.2.1	5.9	N	1.00	1	1	5.9	5.9	∞
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				9	9	99999
Expanded Uncertainty (95% CONFIDENCE LEVEL)			<i>k</i> =2				18	17	

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Appendix B
Probe Calibration Certificates

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



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

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

Accreditation No.: **SCS 108**

Client **Motorola CGISS**

Certificate No: **ET3-1384_May08**

CALIBRATION CERTIFICATE

Object **ET3DV6 - SN:1384**

Calibration procedure(s) **QA CAL-01.v6, QA CAL-12.v5 and QA CAL-23.v3
Calibration procedure for dosimetric E-field probes**

Calibration date: **May 19, 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 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-08 (No. 217-00788)	Apr-09
Power sensor E4412A	MY41495277	1-Apr-08 (No. 217-00788)	Apr-09
Power sensor E4412A	MY41498087	1-Apr-08 (No. 217-00788)	Apr-09
Reference 3 dB Attenuator	SN: S5054 (3c)	8-Aug-07 (No. 217-00719)	Aug-08
Reference 20 dB Attenuator	SN: S5086 (20b)	31-Mar-08 (No. 217-00787)	Apr-09
Reference 30 dB Attenuator	SN: S5129 (30b)	8-Aug-07 (No. 217-00720)	Aug-08
Reference Probe ES3DV2	SN: 3013	2-Jan-08 (No. ES3-3013_Jan08)	Jan-09
DAE4	SN: 660	3-Sep-07 (No. DAE4-660_Sep07)	Sep-08
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-07)	In house check: Oct-08

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

Issued: May 20, 2008

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

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



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

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

Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
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 (no uncertainty required). DCP does not depend on frequency nor media.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{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.

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Probe ET3DV6

SN:1384

Manufactured:	August 16, 1999
Last calibrated:	May 29, 2007
Recalibrated:	May 19, 2008

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

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DASY - Parameters of Probe: ET3DV6 SN:1384

Sensitivity in Free Space ^A			Diode Compression ^B	
NormX	1.79 ± 10.1%	$\mu V/(V/m)^2$	DCP X	90 mV
NormY	1.84 ± 10.1%	$\mu V/(V/m)^2$	DCP Y	90 mV
NormZ	2.02 ± 10.1%	$\mu V/(V/m)^2$	DCP Z	90 mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

TSL	900 MHz	Typical SAR gradient: 5 % per mm		
	Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
	SAR _{be} [%]	Without Correction Algorithm	12.3	7.4
	SAR _{be} [%]	With Correction Algorithm	0.6	0.2

TSL	1810 MHz	Typical SAR gradient: 10 % per mm		
	Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
	SAR _{be} [%]	Without Correction Algorithm	11.7	7.0
	SAR _{be} [%]	With Correction Algorithm	0.7	0.4

Sensor Offset

Probe Tip to Sensor Center	2.7 mm
Optical Surface Detection	non-functional

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 Page 8).

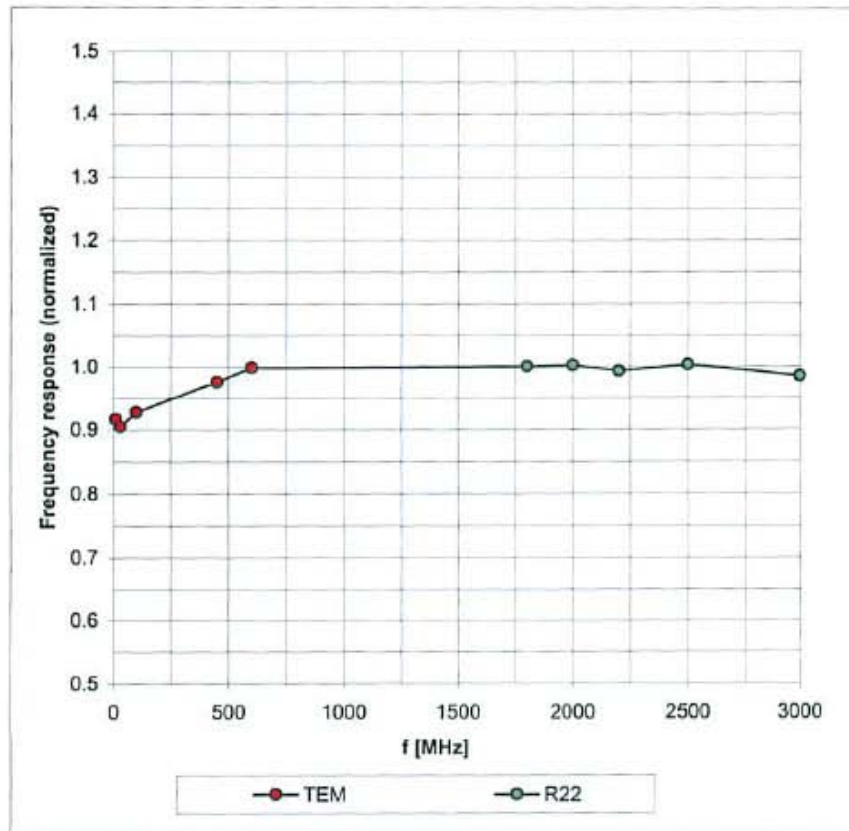
^B Numerical linearization parameter: uncertainty not required.

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Frequency Response of E-Field

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

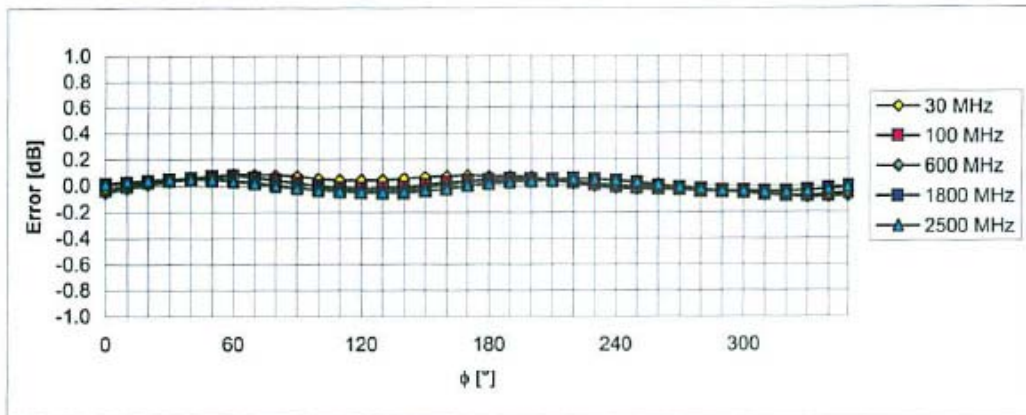
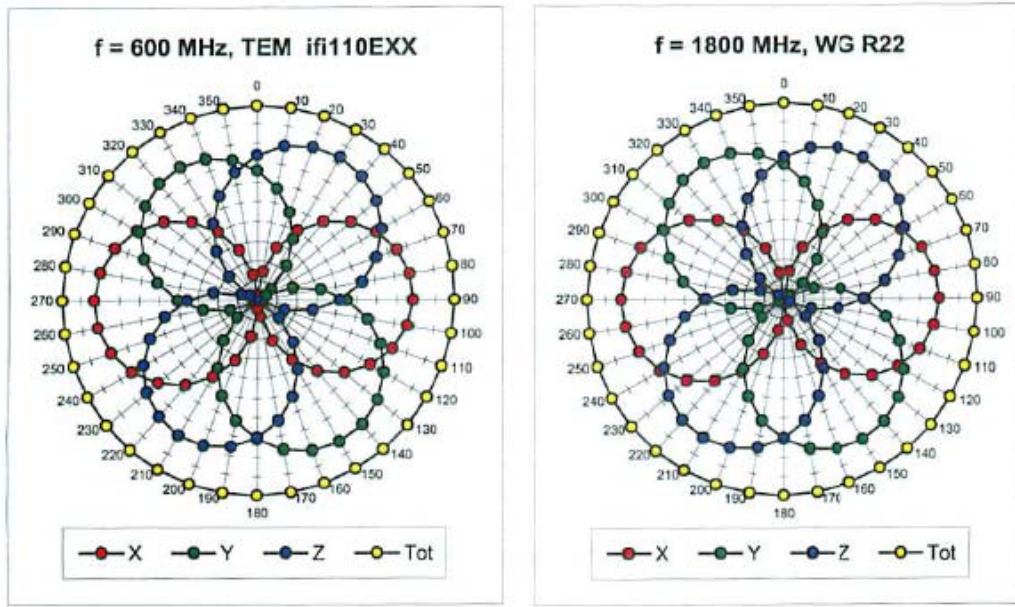


Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ (k=2)

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

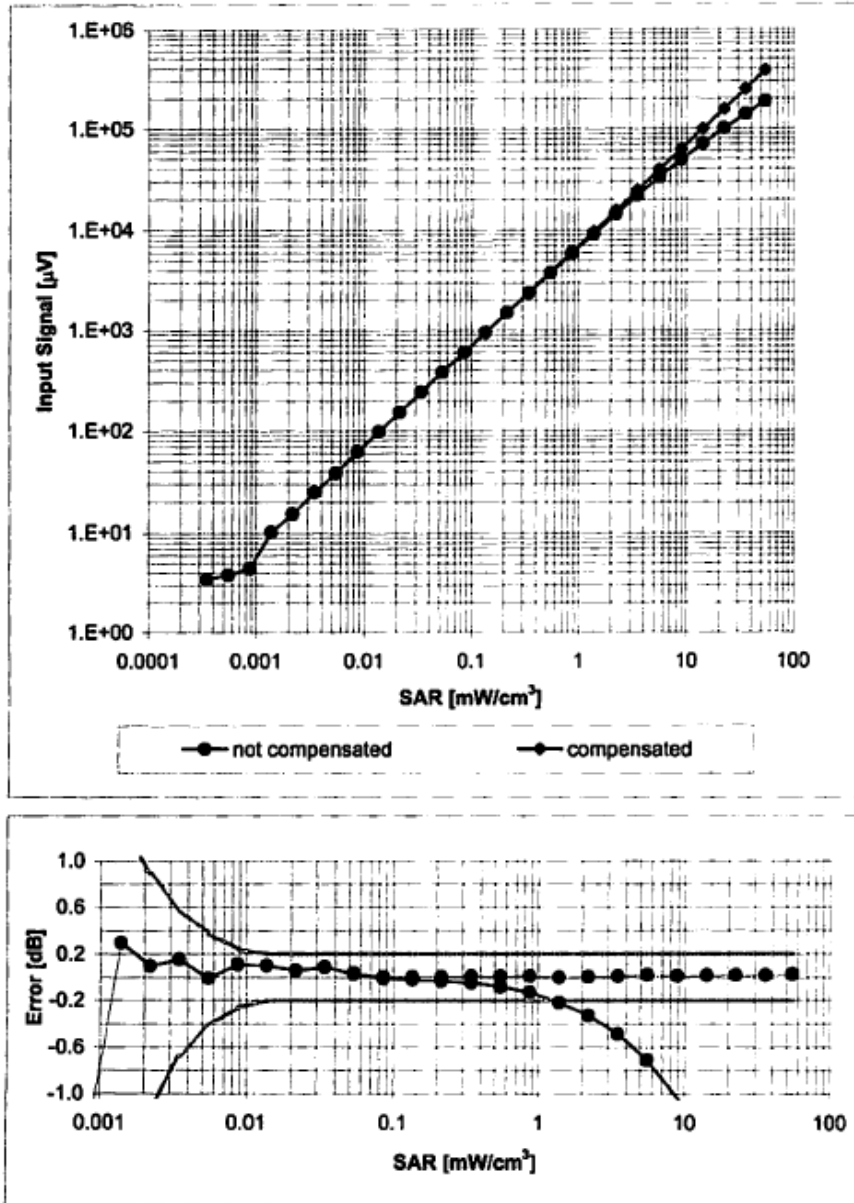


Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ (k=2)

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

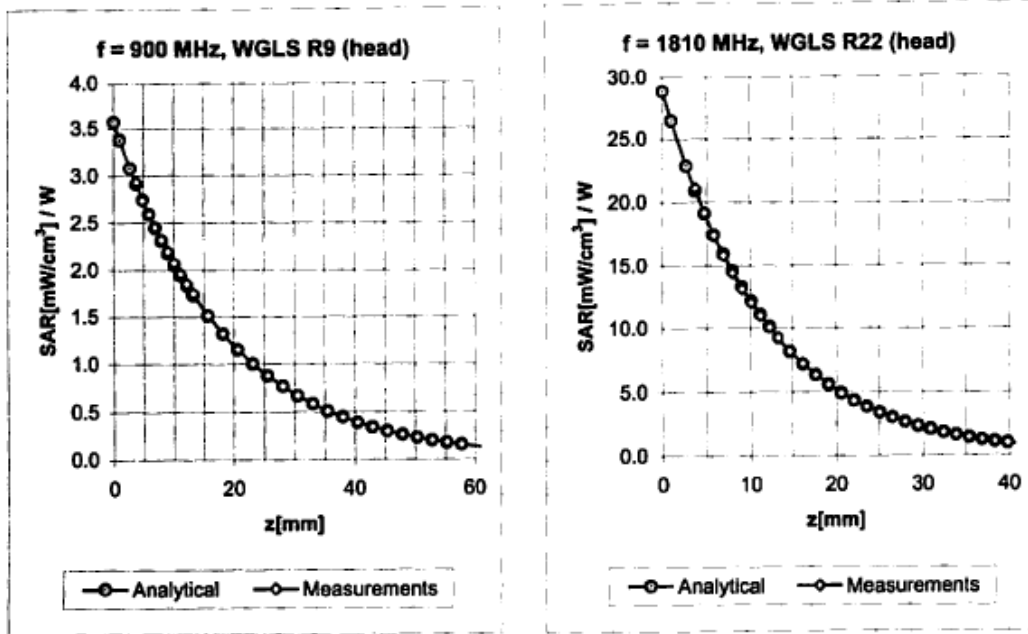


Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

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Conversion Factor Assessment



f [MHz]	Validity [MHz] ^c	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
450	± 50 / ± 100	Head	43.5 ± 5%	0.87 ± 5%	0.39	1.95	7.08 ± 13.3% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.35	3.01	6.00 ± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.55	2.50	5.15 ± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.60	2.40	4.95 ± 11.0% (k=2)
2300	± 50 / ± 100	Head	39.4 ± 5%	1.71 ± 5%	0.53	2.30	4.79 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.47	2.30	4.55 ± 11.0% (k=2)
450	± 50 / ± 100	Body	56.7 ± 5%	0.94 ± 5%	0.32	2.00	7.46 ± 13.3% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.31	3.17	5.86 ± 11.0% (k=2)
1810	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.55	2.50	4.70 ± 11.0% (k=2)
1950	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.60	2.40	4.63 ± 11.0% (k=2)
2300	± 50 / ± 100	Body	52.8 ± 5%	1.85 ± 5%	0.60	2.30	4.21 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.50	2.30	4.04 ± 11.0% (k=2)

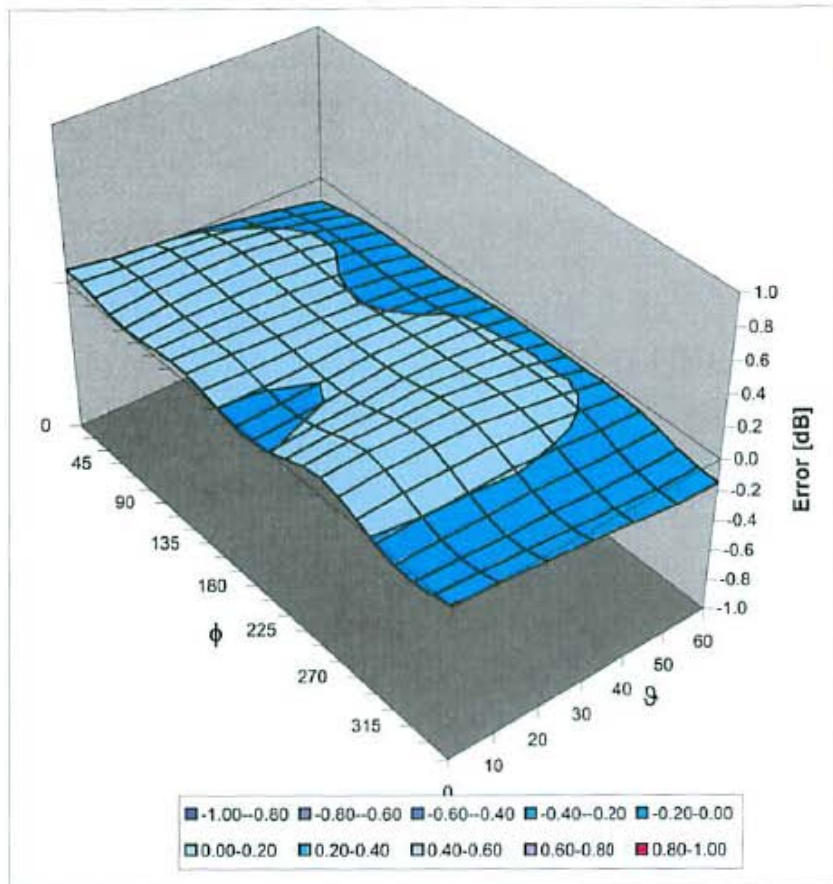
^c The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

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Deviation from Isotropy in HSL

Error (ϕ, θ), $f = 900$ MHz



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

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Additional Conversion Factors
 for Dosimetric E-Field Probe

Type:	ET3DV6
Serial Number:	1384
Place of Assessment:	Zurich
Date of Assessment:	May 23, 2008
Probe Calibration Date:	May 19, 2008

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

Assessed by: 

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Dosimetric E-Field Probe ET3DV6 SN:1384

Conversion factor (\pm standard deviation)

150 MHz	<i>C_{conv}</i>	8.2 \pm 10%	$\epsilon_r = 52.3$ $\sigma = 0.76$ mho/m (head tissue)
250 MHz	<i>C_{conv}</i>	7.4 \pm 10%	$\epsilon_r = 47.6$ $\sigma = 0.83$ mho/m (head tissue)
300 MHz	<i>C_{conv}</i>	7.3 \pm 9%	$\epsilon_r = 45.3$ $\sigma = 0.87$ mho/m (head tissue)
750 MHz	<i>C_{conv}</i>	6.3 \pm 7%	$\epsilon_r = 41.9$ $\sigma = 0.89$ mho/m (head tissue)
150 MHz	<i>C_{conv}</i>	7.9 \pm 10%	$\epsilon_r = 61.9$ $\sigma = 0.80$ mho/m (body tissue)
250 MHz	<i>C_{conv}</i>	7.5 \pm 10%	$\epsilon_r = 59.4$ $\sigma = 0.88$ mho/m (body tissue)
300 MHz	<i>C_{conv}</i>	7.3 \pm 9%	$\epsilon_r = 58.2$ $\sigma = 0.92$ mho/m (body tissue)
750 MHz	<i>C_{conv}</i>	6.1 \pm 7%	$\epsilon_r = 55.5$ $\sigma = 0.96$ 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.