MOTOROLA

ACCREDITED
Certificate Number: 1449-01

FCC ID: AZ489FT3807
DECLARATION OF COMPLIANCE SAR ASSESSMENT Part 1 of 3

Government & Enterprise Mobility Solutions
EME Test Laboratory
8000 West Sunrise Blvd
Fort Lauderdale, FL. 33322

Date of Report: March 15, 2006
Report Revision: Rev. 0
Report ID: PCII rpt_XTS2500 VHF Submersible_Rev 0_060315 SR3669_3742

Responsible Engineer: Deanna Zakharia (Elect. Principle Staff Eng.)
Date/s Tested: 3/1/2006-3/6/2006
Manufacturer/Location: Motorola, Penang
Sector/Group/Div.: GEMS
Date submitted for test: 2/17/2006
DUT Description: Portable Transceiver; 1-5W, Digital, 512 channels, 3x6 keypad, 6-line display, submersible and secure option & no display or keypad, submersible Non secured
Test TX mode(s): CW
Max. Power output: 5.7 Watts
Nominal Power: 5.0 Watts
Tx Frequency Bands: 136-174 MHz
Signaling type: FM
Model(s) Tested: PMUD2154A/H46KDH9PW7BN & PMUD2145A/H46KDC9PW5BN
Model(s) Certified: PMUD2154A/H46KDH9PW7BN & PMUD2145A/H46KDC9PW5BN
Serial Number(s): 407T000035 & 407T000004
Classification: Occupational/Controlled
Rule Part(s): 90

Approved Accessories:
Antenna(s):
NAD6563A (Whip 136-174MHz ¼ wave; -10.0dBi); NAD6566A (136-150.8MHz ¼ wave; -9dBi); NAD6567A (150.8-162MHz ¼ wave; -8dBi); NAD6568A (162-174MHz ¼ wave; -7dBi)
Battery(ies):
NNTN6263A (JedRay NiMH Impress FM Submersible.), NTN9857C (Nickel Metal Hydride Ultra-Hi Capacity Factory Mutual Intrinsically Safe 1800 mAh), NTN9816A (NiCAD Hi Capacity Factory Mutual Intrinsically Safe 1525 mAh), NTN9815B (NiCAD Hi Capacity 1525 mAh), NTN9858B (Nickel Metal Hydride Ultra-Hi Capacity 1800 mAh)
Body worn accessory:
NNTN4115A (Bonded case 3 inch loop with swivel), NNTN4116A (Bonded case 2.5 inch loop with swivel), NNTN4117A (Bonded case belt loop 3 inch), HLN9844A (2 inch belt clip), HLN6853A (2.25 inch belt clip), TDN9675B (Wrist strap for carrying radio), NLN6349A (Shoulder strap for carrying radio), NTN5243A (Shoulder strap for carrying radio)
Audio Accessories
See section 3.0 for list of approved audio acc.

Max. Calc. 1-g/10-g Avg. SAR: 2.37/1.47 mW/g (Body-worn)
Max. Calc. 1-g/10-g Avg. SAR: 1.89/1.40 mW/g (Face)

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.

This reporting format is consistent with the test report 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 – Ken Enger

Ken Enger GEMS EME Lab Senior Resource Manager, Laboratory Director,

Approval Date: 3/16/2006

Certification Date: 3/16/2006

Certification No.: L1060362 & L1060323

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REVISION HISTORY

Date	Revision	Comments
3/15/06	O	Addendum to report on file dated 2/26/04

1.0 Introduction and Overview

This report details the utilization, test setup, test equipment, and test results of the Specific Absorption Rate (S.A.R.) measurements performed at the GEMS EME Test Lab for model numbers PMUD2154A/H46KDH9PW7BN (Full keypad and display) and PMUD2145A/H46KDC9PW5BN (No keypad or display) , FCC ID: AZ489FT3807.

The test results presented herein clearly demonstrate compliance with FCC Occupational/Controlled RF Exposure limits of **8.0 mW/g** per the requirements of 47 CFR 2.1093(d).

2.0 Reference Standards and Guidelines

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

- 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) C95.1-1999 Edition
- International Commission on Non-Ionizing Radiation Protection (ICNIRP) 1998
- Ministry of Health (Canada) Safety Code 6. Limits of Human Exposure to Terminal 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”
- Health Canada, “Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz”, Safety Code 6.
- Industry Canada, “Evaluation Procedure for Mobile and Portable Radio Transmitters with respect to Health Canada’s Safety Code 6 for Exposure of Humans to Radio Frequency Fields”, Radio Standards Specification RSS-102 Issue 1 (Provisional): September 1999.

2.1 SAR Limits

EXPOSURE LIMITS	SAR (W/kg)	
	(General Population / Uncontrolled Exposure Environment)	(Occupational / Controlled Exposure Environment)
Spatial Average (averaged over the whole body)	0.08	**0.4**
Spatial Peak (averaged over any 1-g of tissue)	1.60	**8.0**
Spatial Peak (hands/wrists/feet/ankles averaged over 10-g)	4.0	**20.0**
Localized SAR (Head and Trunk 10-g)	2.0	**10.0**

3.0 Description of Device Under Test (DUT)

FCC ID: AZ489FT3807 is a VHF portable two-way radio that operates using APCO 25(C4FM) digital voice frequency modulation (FM) incorporating traditional simplex transmission protocol. There are two models represented under this filing – PMUD2145A/H46KDC9PW5BN (no keypad, no display) and PMUD2154A/H46KDH9PW7BN (Keypad and Display). Both models utilize removable antennas and are capable of transmitting in the 136-174MHz band. The nominal output power is 5 Watts with maximum output powers of 5.7 Watts as defined by the upper limit of the production line final test station. The intended operating positions are “at the face” with the DUT 1 to 2 inches 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 connect to the radio. This device will be marketed to and used by employees solely for occupational operations, such as public safety agencies, e.g. police, fire and emergency medical. User training is the responsibility of these agencies, which can be expected to employ the usage instructions, safety information and operational cautions set forth in the user's manual, instructional sessions or other means. Motorola also makes available to its customers training classes on the proper use of two-way radios and wireless data devices.

FCC ID: AZ489FT3807 is offered with the options and accessories listed on the coversheet of this report as well as the audio accessories listed below:

Audio Acc.:
BDN6664A Earpiece with std. Earphone
BDN6665A Earpiece with extra loud earphone
BDN6666A Earpiece with volume control
BDN6667A Earpiece, Mic and PTT combined
BDN6668A Earpiece, Mic and PTT separate
BDN6669A Earpiece, Mic and PTT with extra loud earphone
BDN6670A Earpiece, Mid and PTT separate with extra loud earphone
BDN6719A Earpad, w/3.5 MM threaded plug
BDN6781A Earbud, single, receive only, black
NMN6191C Jedi Noise Canceling remote speaker mic

NMN6193C Jedi remote speaker mic
BDN6677A Standard ear mic – 95DB (black)
BDN6678A Standard ear mic – 95 DB (beige)
BDN6641A High noise level ear mic – up to 105 DB (black)
BDN6708B Push to talk interface module
BDN6671B Voice-activated interface module
BDN6645A Noise canceling boom mic headset with PTT on ear cup (use with BDN6673B)
BDN6673B Headset adapter cable
BDN6780A Earpiece, single with mic and PTT combined (black)
NTN8613A Surveilance adapter – has the 6 pin Hirose connector
NNTN4285A RSM adapter
BDN6726A Earpiece with standard ear phone, black
BDN6727A Earpiece with extra loud ear phone, black
BDN6728A Earpiece with volume control, black
RMN5038A RSM
BDN6729A Earpiece, mic and PTT combined, black
BDN6730A Earpiece, mic and PTT separate, black
BDN6731A Earpiece, mic and PTT combined, with extra loud earphone, black
BDN6732A Earpiece, mic and PTT separate, with extra loud earphone, black
BDN6635C Earpiece, mic and PTT separate, with extra loud earphone, black
BDN6636C Heavy-duty VOX headset with throat mic
BDN6676D Jedi adapter 3.5mm w/PTT switch
NMN1020A Safety helmet headset
NMN6245A Light weight headset
NMN6246B Ultralite headset with boom mic
NMN6258A Ultralite headset with boom mic
NMN6259A Medium weight, dual headset with NC mic
RMN4049A Temple Transducer
NTN8819B CommPort II (Integrated Microphone/Receiver System)
NTN1625A CommPort Integrated Microphone/Receiver with PTT on Radio Adapter
NTN1624A CommPort Integrated Microphone/Receiver with Palm PTT
NTN1663A CommPort Integrated Microphone/Receiver with Ring PTT
NTN1736A CommPort Integrated Microphone/Receiver with Snap on side PTT
NNTN4186A CommPort Integrated Microphone/Receiver with Body PTT
0180300E83 Body switch Push-to-talk accy
ZMN6031A Speaker mic 3 piece
ZMN6032A Speaker mic 2 piece
ZMN6038A Speaker mic, 2-piece, extra loud
ZMN6039A Speaker mic, 3-piece, extra loud
NTN7660C Man-down side connector
NMN6193BSP03 Microphone ruggedized submersible

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™) S.A.R. measurement system Version 4.6 B23 manufactured by Schmid & Partner Engineering AG (SPEAG™), of Zurich Switzerland. The test system consists of a Stäubli RX90L robot with ET3DV6 and EX3DV3 E-Field probes. Please reference the SPEAG user manual and application notes for detailed probe, robot, and S.A.R. 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 S.A.R. 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 Flat Phantom

Phantom Type	Phantom Material	Phantom Dimensions (cm)	Support structure opening dimensions (cm)	Support structure material	Loss Tangent (wood)
Flat	High Density Polyethylene (HDPE)	80x60x20x0.2	68.58x25.40	Wood	< 0.05

4.2.2 SAM Phantom

Phantom Type	Material Parameters	Material Thickness (mm)	Support structure material	Loss Tangent (wood)
NA	200MHz -3GHz; Er = <5, Loss Tangent = <0.05	2mm +/- 0.2mm	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 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. The solution is mixed thoroughly, covered, and allowed to sit overnight prior to use.

4.3.2 Simulated Tissue Composition

% of listed ingredients	835MHz		900MHz	
	Head	Body	Head	Body
Sugar	57	44.9	56.5	44.9
Diacetin	NA	NA	NA	NA
De ionized - Water	40.45	53.06	40.95	53.06
Salt	1.45	0.94	1.45	0.94
HEC	1	1	1	1
Bact.	0.1	0.1	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 (HP)	E4419B	MY40330364	1/31/2007
Power Sensor (HP)	8482B	3318A05259	3/28/2006
Power Sensor (HP)	8482B	3318A06774	3/22/2006
Directional Coupler (NARDA)	3020A	40295	7/18/2006
Signal Generator (Agilent)	E4421B	US40051446	12/23/2006
Signal Generator (HP)	E4421B	US39270649	2/28/2007
AMP (ComTech PST)	10WD1000	28782	CNR
AMP (Amplifier Research)	1W1000	16625	CNR
Network Analyzer (HP)	E5071B	MY42403133	11/26/2006
Dielectric Probe Kit (HP)	85070C	US99360076	CNR
SPEAG Dipole	D300V2	1002	5/29/2006

6.0 SAR Measurement System Verification

The S.A.R. measurements were conducted with probe model/serial number ET3DV6/SN1384. The system performance check was conducted daily and within 24 hours prior to testing. DASY output files of the system performance test results and the probe/dipole calibration certificates are included in appendices B and C 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 GEMS 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 GEMS EME system performance validation are provided herein.

6.1 Equivalent Tissue Test Results

Simulated tissue prepared for S.A.R. measurements is measured daily and within 24 hours prior to actual S.A.R. 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 Agilent (HP) probe kit model 85070C and a E5071B Network Analyzer.

Actual versus Target tissue parameters (3/1/2006-3/8/2006)

FCC Body				
Frequency (MHz)	**Di-electric Constant Target**	**Di-electric Constant Meas. (Range)**	**Conductivity Target S/m**	**Conductivity Meas. (Range) S/m**
155	61.8	62.9-63.7	0.80	0.77-0.81
300	58.2	58.2-59.2	0.92	0.89-0.93

IEEE Head				
Frequency (MHz)	**Di-electric Constant Target**	**Di-electric Constant Meas. (Range)**	**Conductivity Target S/m**	**Conductivity Meas. (Range) S/m**
155	52.1	53.8-54.3	0.76	0.74-0.76
300	45.3	46.7-47.2	0.87	0.87-0.90

6.2 System Check Test Results

Probe Serial #	Tissue Type	Probe Cal Date	Dipole Kit / Serial #	System Perf. Result when normalized to 1W (mW/g)	Reference S.A.R @ 1W (mW/g)	Test Date(s)
1384	FCC Body	5/26/2005	D300V2/1002	2.715 +/- 0.075	2.79 +/- 10%	3/1/06-3/3/06 & 3/7/06-3/8/06 5 test days
1384	IEEE Head	5/26/2005	D300V2/1002	2.795 +/- 0.055	2.85 +/- 10%	3/4/06 & 3/6/06 2 test days

Note: See Appendix D for an explanation of the reference S.A.R. targets stated above.
(System performance results reflects the median performance +/- ½ of the test date(s) performance ranges)

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 S.A.R. compliance was calibrated according to 17025 A2LA guidelines.

7.0 DUT Test Strategy and Methodology

DUT Configuration

PTT operation using Frequency Modulation (FM) in CW transmission mode
The DUT's PTT switch is engaged and the radio is placed in the reported test positions presented in Appendix G.

7.1 Test Plan

All options and accessories listed on the cover page and sec 3.0 of this report were considered in order to develop the S.A.R. test plan for this product. S.A.R. measurements were performed using a flat phantom with the applicable simulated tissue to assess performance at the body and face using CW transmission mode.
Note that a coarse-to-cube approximation methodology was utilized to determine the worst-case S.A.R. performance configuration for each applicable body location. The test configurations that produced the highest S.A.R. results for each body position using the coarse-to-cube approximation methodology were assessed using the full DASY4™ coarse and 7x7x7 cube scans.

Assessments at the Body **[Page 12-13 of 29; Table 1]**

- Assessment of each offered antenna at the center frequency of the 136-174MHz band.
- Assessment of worst case antenna from above with the offered batteries.
- Assessment of offered body worn accessories with the worst case configuration from above.
- Assessment of offered audio accessories with the worst case configuration from above.
- Assessment across the band of each offered antenna using the worst case configuration from above.

Assessments at the body (@ 2.5cm) [Page 13 of 29; Table 1]

- Assessment with the DUT's back and front separated 2.5cm from the phantom without a body worn accessory using the worst case test configuration from the body assessment above.

Assessments at the face [Page 14-15 of 29; Table 2]

- Assessment of each offered antenna at the center frequency of the 136-174MHz band.
- Assessment of worst case antenna from above with the offered batteries.
- Assessment of offered audio accessories with the worst case configuration from above.
- Assessment across the band of each offered antenna using the worst case configuration from above.

Shortened scan assessment at the body [Appendix E Part 3 of 3]
A "shortened" scan was performed using the test configuration that produced the highest S.A.R. results overall at the body. 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, perform a cube scan only. 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 such that the applicable body worn accessories were centered against the body phantom as close as possible according to a normal use position. The DUT back housing and front housing were positioned with 2.5cm separation distance from the flat phantom. Attached accessories are allowed to hang straight down from the radio.

7.2.2 Head

NA

7.2.3 Face

The DUT was positioned at the center of the flat phantom with a 2.5cm separation distance from the front housing with and without the offered applicable audio accessories.

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 +/ - 2°C of the temperature at which the dielectric properties were determined. The liquid depth within the phantom used for measurements was 15cm +/- 0.5cm. 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 S.A.R. tests reported herein:

	Target	Measured
Ambient Temperature	20 - 25 ˚C	Range: 21.3-22.5.0˚C Avg. 22.1˚C
Relative Humidity	30 - 70 %	Range: 38.0-53.7% Avg. 47.2%
Tissue Temperature	NA	Range: 19.6-21.5˚C Avg. 20.55 ˚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 S.A.R scans are repeated.

9.0 Test Results Summary

All S.A.R. 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. The worst case test configurations observed for each body location were then assessed using the full DASY4™ coarse and 7x7x7 cube methodology, and they are presented as bolded results. The associated S.A.R. plots are provided in Appendix E. Appendix E also presents a shortened S.A.R. cube scan to assess the validity of the calculated results presented herein. Note: The results of the shortened cube scan presented in Appendix E demonstrates that the scaling methodology used to determine the calculated S.A.R. results presented herein are valid.

Table 1

DUT assessment at the body; CW mode												
Run Number/ SN	**Antenna**	**Freq. (MHz)**	**Battery**	**Test position**	**Carry Case**	**Additional attachments**	**Initial Power (W)**	**S.A.R. Drift (dB)**	**Meas. 1g-S.A.R. (mW/g)**	**Meas. 10g-S.A.R. (mW/g)**	**Max Calc. 1g-S.A.R. (mW/g)**	**Max Calc. 10g-S.A.R. (mW/g)**
Assessment of offered antennas												
ErC-Ab-060302-06/407T000035	NAD6563A	155.0125	NNTN6263A	Against Phantom	HLN6853A	NMN6193BSP03	5.67	-0.965	0.626	0.458	0.39	0.29
ErC-Ab-060302-07/407T000035	NAD6566A	143.4	NNTN6263A	Against Phantom	HLN6853A	NMN6193BSP03	5.62	-0.0808	0.612	0.446	0.32	0.23
ErC-Ab-060302-08/407T000035	NAD6567A	156.4	NNTN6263A	Against Phantom	HLN6853A	NMN6193BSP03	5.68	-0.423	0.785	0.574	0.43	0.32
ErC-Ab-060302-09/407T000035	NAD6568A	168.0125	NNTN6263A	Against Phantom	HLN6853A	NMN6193BSP03	5.71	-1.92	0.589	0.441	0.46	0.34
Assessment of offered batteries												
ErC-Ab-060302-11/407T000035	NAD6568A	168.0125	NTN9857C	Against Phantom	HLN6853A	NMN6193BSP03	5.72	-1.94	0.59	0.442	0.46	0.35
ErC-Ab-060302-12/407T000035	NAD6568A	168.0125	NTN9816A	Against Phantom	HLN6853A	NMN6193BSP03	5.73	-2.09	0.549	0.411	0.44	0.33
CM-Ab-060302-13/407T000035	NAD6568A	168.0125	NTN9815B	Against Phantom	HLN6853A	NMN6193BSP03	5.74	-2.4	0.507	0.385	0.44	0.33
Assessment of offered body worn accessories												
CM-Ab-060302-14/407T000035	NAD6568A	168.0125	NTN9857C	Against Phantom	NNTN4115A	NMN6193BSP03	5.74	-1.65	0.193	0.147	0.14	0.11
CM-Ab-060302-15/407T000035	NAD6568A	168.0125	NTN9857C	Against Phantom	NNTN4116A	NMN6193BSP03	5.75	-1.49	0.134	0.130	0.09	0.07
CM-Ab-060302-16/407T000035	NAD6568A	168.0125	NTN9857C	Against Phantom	NNTN4117A	NMN6193BSP03	5.76	-2.18	0.271	0.204	0.22	0.17
CM-Ab-060302-17/407T000035	NAD6568A	168.0125	NTN9857C	Against Phantom	HLN9844A	NMN6193BSP03	5.74	-2.08	0.571	0.425	0.46	0.34
Assessment of audio accessories												
CM-Ab-060302-18/407T000035	NAD6568A	168.0125	NTN9857C	Against Phantom	HLN6853A	NMN6191C	5.76	-1.24	0.914	0.663	0.61	0.44
CM-Ab-060302-19/407T000035	NAD6568A	168.0125	NTN9857C	Against Phantom	HLN6853A	BDN6671B w/BDN6641A &0180300E83	5.74	-2.10	1.32	0.946	1.07	0.77
CM-Ab-060302-20/407T000035	NAD6568A	168.0125	NTN9857C	Against Phantom	HLN6853A	BDN6645A w/BDN6673B	5.75	-2.20	1.52	1.10	1.26	0.91
CM-Ab-060302-21/407T000035	NAD6568A	168.0125	NTN9857C	Against Phantom	HLN6853A	BDN6729A w/BDN6676D	5.74	-2.43	1.24	0.898	1.08	0.79
CM-Ab-060302-22/407T000035	NAD6568A	168.0125	NTN9857C	Against Phantom	HLN6853A	BDN6730A w/BDN6676D	5.74	-2.57	0.918	0.684	0.83	0.62
CM-Ab-060302-23/407T000035	NAD6568A	168.0125	NTN9857C	Against Phantom	HLN6853A	NMN1020A w/BDN6676D	5.76	-2.07	1.90	1.35	1.53	1.09
JsT-Ab-060303-01/407T000035	NAD6568A	168.0125	NTN9857C	Against Phantom	HLN6853A	NMN6245A w/BDN6676D	5.75	-1.75	2.10	1.53	1.57	1.14
JsT-Ab-060303-02/407T000035	NAD6568A	168.0125	NTN9857C	Against Phantom	HLN6853A	NMN6246B w/BDN6676D	5.77	-2.02	1.75	1.28	1.39	1.02
JsT-Ab-060303-03/407T000035	NAD6568A	168.0125	NTN9857C	Against Phantom	HLN6853A	NMN6258A w/BDN6676D	5.76	-2.23	1.13	0.835	0.94	0.70
JsT-Ab-060303-04/407T000035	NAD6568A	168.0125	NTN9857C	Against Phantom	HLN6853A	RMN4049A	5.78	-2.5	1.06	0.791	0.94	0.70
JsT-Ab-060303-05/407T000035	NAD6568A	168.0125	NTN9857C	Against Phantom	HLN6853A	ZMN6031A w/NTN8613A	5.78	-2.51	0.90	0.674	0.80	0.60
JsT-Ab-060303-06/407T000035	NAD6568A	168.0125	NTN9857C	Against Phantom	HLN6853A	ZMN6032A w/NTN8613A	5.77	-2.29	1.03	0.766	0.87	0.65
JsT-Ab-060303-07/407T000035	NAD6568A	168.0125	NTN9857C	Against Phantom	HLN6853A	NTN1625A w/NTN8819B	5.78	-1.95	2.09	1.53	1.64	1.20

Table 1 (continued)

DUT assessment at the body; CW mode												
Run Number/ SN	**Antenna model**	**Freq. (MHz)**	**Battery**	**Test position**	**Carry Case**	**Additional attachments**	**Initial Power (W)**	**S.A.R. Drift (dB)**	**Meas. 1g-S.A.R. (mW/g)**	**Meas. 10g-S.A.R. (mW/g)**	**Max Calc. 1g-S.A.R. (mW/g)**	**Max Calc. 10g-S.A.R. (mW/g)**
Assessment of audio accessories (Cont.)												
JsT-Ab-060303-08/407T000035	NAD6568A	168.0125	NTN9857C	Against Phantom	HLN6853A	RMN5038A w/NNTN4285A	5.77	-2.34	0.789	0.590	0.68	0.51
Assessment across the band of antenna model NAD6563A												
JsT-Ab-060303-09/407T000035	NAD6563A	136.0125	NTN9857C	Against Phantom	HLN6853A	NTN1625A w/NTN8819B	5.56	-0.0902	1.18	0.825	0.62	0.43
JsT-Ab-060303-10/407T000035	NAD6563A	155.0125	NTN9857C	Against Phantom	HLN6853A	NTN1625A w/NTN8819B	5.82	-1.42	0.607	0.446	0.42	0.31
JsT-Ab-060303-11/407T000035	NAD6563A	173.975	NTN9857C	Against Phantom	HLN6853A	NTN1625A w/NTN8819B	5.68	-0.652	0.889	0.652	0.52	0.38
Assessment across the band of antenna model NAD6566A												
***JsT-Ab-060303-12/407T000035**	NAD6566A	136.0125	NTN9857C	Against Phantom	HLN6853A	NTN1625A w/NTN8819B	5.56	-0.0437	3.62	2.64	1.87	1.37
CM-Ab-060303-25/407T000035 (full scan)	NAD6566A	136.0125	NTN9857C	Against Phantom	HLN6853A	NTN1625A w/NTN8819B	5.53	-0.0349	4.08	2.53	2.12	1.31
CM-Ab-060303-26/407T000035 (Shorten Scan)	NAD6566A	136.0125	NTN9857C	Against Phantom	HLN6853A	NTN1625A w/NTN8819B	5.53	-0.0592	4.39	2.70	2.29	1.41
JsT-Ab-060303-13/407T000035	NAD6566A	143.40	NTN9857C	Against Phantom	HLN6853A	NTN1625A w/NTN8819B	5.72	-0.0158	1.30	0.953	0.65	0.48
ErC-Ab-060303-15/407T000035	NAD6566A	150.80	NTN9857C	Against Phantom	HLN6853A	NTN1625A w/NTN8819B	5.85	-0.333	0.473	0.359	0.26	0.19
Assessment across the band of antenna model NAD6567A												
ErC-Ab-060303-16/407T000035	NAD6567A	150.80	NTN9857C	Against Phantom	HLN6853A	NTN1625A w/NTN8819B	5.86	-0.127	2.39	1.78	1.23	0.92
ErC-Ab-060303-17/407T000035	NAD6567A	156.40	NTN9857C	Against Phantom	HLN6853A	NTN1625A w/NTN8819B	5.74	-0.575	1.18	0.892	0.67	0.51
ErC-Ab-060303-18/407T000035	NAD6567A	162.00	NTN9857C	Against Phantom	HLN6853A	NTN1625A w/NTN8819B	5.71	-1.54	0.93	0.684	0.66	0.49
Assessment across the band of antenna model NAD6568A												
ErC-Ab-060303-19/407T000035	NAD6568A	162.00	NTN9857C	Against Phantom	HLN6853A	NTN1625A w/NTN8819B	5.72	-0.557	1.910	1.39	1.09	0.79
ErC-Ab-060303-20/407T000035	NAD6568A	173.975	NTN9857C	Against Phantom	HLN6853A	NTN1625A w/NTN8819B	5.67	-0.14	0.842	0.634	0.44	0.33
Assessment at 2.5cm separation												
ErC-Ab-060303-21/407T000035	NAD6566A	136.0125	NTN9857C	Against Phantom	Unit back to phantom; ant. at 2.5cm	NTN1625A w/NTN8819B	5.57	-0.131	2.94	2.23	1.55	1.18
ErC-Ab-060303-22/407T000035	NAD6566A	136.0125	NTN9857C	Against Phantom	Unit front at 2.5cm	NTN1625A w/NTN8819B	5.58	-0.458	1.76	1.35	1.00	0.77

***Assessment with the worst case test configuration at the body using the full DASY coarse and 7x7x7 cube scan measurements.**												
JsT-Ab-060307-11/407T000004	**NAD6566A**	**136.0125**	**NTN9857C**	**Against Phantom**	**HLN6853A**	**NTN1625A w/NTN8819B**	**5.75**	**-0.437**	**4.28**	**2.65**	**2.37**	**1.47**

Table 2

DUT assessment at the face; CW mode												
Run Number/ SN	**Antenna Position**	**Freq. (MHz)**	**Battery**	**Test position**	**Carry Case**	**Additional attachments**	**Initial Power (W)**	**S.A.R. Drift (dB)**	**Meas. 1g-S.A.R. (mW/g)**	**Meas. 10g-S.A.R. (mW/g)**	**Max Calc. 1g-S.A.R. (mW/g)**	**Max Calc. 10g-S.A.R. (mW/g)**
Assessment of offered antennas												
CM-Face-060303-27/407T000035	NAD6563A	155.0125	NNTN6263A	DUT front 2.5cm	None	None	5.82	-1.910	0.706	0.531	0.55	0.41
CM-Face-060303-28/407T000035	NAD6566A	143.4	NNTN6263A	DUT front 2.5cm	None	None	5.79	-0.201	2.38	1.82	1.25	0.95
CM-Face-060303-29/407T000035	NAD6567A	156.4	NNTN6263A	DUT front 2.5cm	None	None	5.78	-0.681	2.33	1.78	1.36	1.04
***CM-Face-060303-30/407T000035**	NAD6568A	168.0125	NNTN6263A	DUT front 2.5cm	None	None	5.78	-0.752	2.91	2.22	1.73	1.32
ErC-Face-060306-02/407T000035 (full scan)	NAD6568A	168.0125	NNTN6263A	DUT front 2.5cm	None	None	5.7	-0.878	2.83	2.12	1.73	1.30
Assessment of offered batteries												
CM-Face-060303-32/407T000035	NAD6568A	168.0125	NTN9857C	DUT front 2.5cm	None	None	5.76	-0.705	2.91	2.22	1.71	1.31
JsT-Face-060304-01/407T000035	NAD6568A	168.0125	NTN9816A	DUT front 2.5cm	None	None	5.79	-0.497	2.95	2.25	1.65	1.26
JsT-Face-060304-02/407T000035	NAD6568A	168.0125	NTN9815B	DUT front 2.5cm	None	None	5.78	-0.404	2.78	2.12	1.53	1.16
Assessment of offered audios												
JsT-Face-060304-05/407T000035	NAD6568A	168.0125	NNTN6263A	DUT front 2.5cm	None	BDN6665A w/BDN6676D	5.79	0.232	0.855	0.651	0.43	0.33
JsT-Face-060304-04/407T000035	NAD6568A	168.0125	NNTN6263A	DUT front 2.5cm	None	BDN6666A w/BDN6676D	5.78	0.139	1.5	1.15	0.75	0.58
JsT-Face-060304-06/407T000035	NAD6568A	168.0125	NNTN6263A	DUT front 2.5cm	None	BDN6781A w/BDN6676D	5.8	-2.47	1.15	0.875	1.02	0.77
Assessment across the band of antenna model NAD6563A												
JsT-Face-060304-07/407T000035	NAD6563A	136.0125	NNTN6263A	DUT front 2.5cm	None	None	5.57	-1.27	0.828	0.629	0.57	0.43
JsT-Face-060304-08/407T000035	NAD6563A	155.0125	NNTN6263A	DUT front 2.5cm	None	None	5.84	-1.5	0.723	0.545	0.51	0.38
JsT-Face-060304-09/407T000035	NAD6563A	173.975	NNTN6263A	DUT front 2.5cm	None	None	5.69	-0.441	0.694	0.529	0.38	0.29
Assessment across the band of antenna model NAD6566A												
JsT-Face-060304-11/407T000035	NAD6566A	136.0125	NNTN6263A	DUT front 2.5cm	None	None	5.57	-0.339	1.74	1.33	0.96	0.74
JsT-Face-060304-12/407T000035	NAD6566A	143.40	NNTN6263A	DUT front 2.5cm	None	None	5.73	0.0442	2.54	1.94	1.27	0.97

Table 2 (continued)

DUT assessment at the face; CW mode												
Run Number/ SN	**Antenna Position**	**Freq. (MHz)**	**Battery**	**Test position**	**Carry Case**	**Additional attachments**	**Initial Power (W)**	**S.A.R. Drift (dB)**	**Meas. 1g-S.A.R. (mW/g)**	**Meas. 10g-S.A.R. (mW/g)**	**Max Calc. 1g-S.A.R. (mW/g)**	**Max Calc. 10g-S.A.R. (mW/g)**
Assessment across the band of antenna model NAD6566A (cont.)												
JsT-Face-060304-13/407T000035	NAD6566A	150.80	NNTN6263A	DUT front 2.5cm	None	None	5.87	-0.285	0.935	0.715	0.50	0.38
Assessment across the band of antenna model NAD6567A												
JsT-Face-060304-14/407T000035	NAD6567A	150.80	NNTN6263A	DUT front 2.5cm	None	None	5.88	0.0525	2.48	1.89	1.24	0.95
JsT-Face-060304-15/407T000035	NAD6567A	156.40	NNTN6263A	DUT front 2.5cm	None	None	5.76	-0.427	2.12	1.62	1.17	0.89
JsT-Face-060304-16/407T000035	NAD6567A	162.00	NNTN6263A	DUT front 2.5cm	None	None	5.72	-1.49	1.11	0.843	0.78	0.59
Assessment across the band of antenna model NAD6568A												
JsT-Face-060304-17/407T000035	NAD6568A	162.00	NNTN6263A	DUT front 2.5cm	None	None	5.74	-1.89	1.08	0.82	0.83	0.63
JsT-Face-060304-18/407T000035	NAD6568A	168.0125	NNTN6263A	DUT front 2.5cm	None	None	5.82	-2.79	0.355	0.269	0.34	0.26
JsT-Face-060304-20/407T000035	NAD6568A	173.975	NNTN6263A	DUT front 2.5cm	None	None	5.69	-0.0752	0.224	0.170	0.11	0.09

*Assessment with the worst case test configuration at the face using the full DASY coarse and 7x7x7 cube scan measurements.												
JsT-Face-060308-02/407T000004	**NAD6568A**	**168.0125**	**NNTN6263A**	**DUT front 2.5cm**	**None**	**None**	**5.67**	**-0.729**	**3.18**	**2.36**	**1.89**	**1.40**

9.1 Highest S.A.R. results calculation methodology

The calculated maximum 1-gram and 10-gram averaged S.A.R. results reported herein for the full DASY 4™ coarse and 7x7x7 cube measurements are determined by scaling the measured S.A.R. to account for power leveling variations and power slump. For this device the Maximum Calculated 1-gram and 10-gram averaged peak S.A.R. is calculated using the following formula:

Max. Calc. 1-g/10-g Avg. SAR = ((S.A.R. meas. / (10^(Pdrift/10)))*(Pmax/Pint))* DC%
P_{max} = Maximum Power (W)
P_{int} = Initial Power (W)
Pdrift = DASY drift results (dB) - (for conservative results positive drifts are not accounted for)
$SAR_{meas.}$ = Measured 1 gram averaged peak S.A.R. (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 S.A.R. values found for FCC ID: AZ489FT3807 models PMUD2154A/H46KDH9PW7BN & PMUD2145A/H46KDC9PW5BN.

At the Body: **1-g Avg. = 2.37mW/g; 10-g Avg. = 1.47mW/g**
At the Face: **1-g Avg. = 1.89mW/g; 10-g Avg. = 1.40mW/g**

These test results clearly demonstrate compliance with FCC Occupational/Controlled RF Exposure limits of **8.0 mW/g** per the requirements of 47 CFR 2.1093(d).

APPENDIX A
Measurement Uncertainty

Table 1: Uncertainty Budget for Device Under Test for 30 MHz to 3 GHz

a	*b*	*c*	*d*	*e = f(d,k)*	*f*	*g*	*h = c x f / e*	*i = c x g / e*	*k*
Uncertainty Component	IEEE 1528 section	**Tol. (± %)**	**Prob Dist**	**Div.**	c_i **(1 g)**	c_i **(10 g)**	**1 g** u_i **(±%)**	**10 g** u_i **(±%)**	v_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)			*k* =2				22	22	

Table 2: Uncertainty Budget for System Performance Check (dipole & flat phantom) for 30 MHz to 3 GHz

a	*b*	*c*	*d*	*e = f(d,k)*	*f*	*g*	*h = c x f / e*	*i = c x g / e*	*k*
Uncertainty Component	**IEEE 1528 section**	**Tol. (± %)**	**Prob. Dist.**	**Div.**	**c_i (1 g)**	**c_i (10 g)**	**1 g u_i (±%)**	**10 g u_i (±%)**	**v_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)			*k*=2				18	17	

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

Appendix B
Probe Calibration Certification

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

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

Accredited by the Swiss Federal Office of Metrology and Accreditation
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_May05

CALIBRATION CERTIFICATE

Object	ET3DV6 - SN:1384
Calibration procedure(s)	QA CAL-01.v5 and QA CAL-12.v4 Calibration procedure for dosimetric E-field probes
Calibration date:	May 26, 2005
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 (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	3-May-05 (METAS, No. 251-00466)	May-06
Power sensor E4412A	MY41495277	3-May-05 (METAS, No. 251-00466)	May-06
Power sensor E4412A	MY41498087	3-May-05 (METAS, No. 251-00466)	May-06
Reference 3 dB Attenuator	SN: S5054 (3c)	10-Aug-04 (METAS, No. 251-00403)	Aug-05
Reference 20 dB Attenuator	SN: S5086 (20b)	3-May-05 (METAS, No. 251-00467)	May-06
Reference 30 dB Attenuator	SN: S5129 (30b)	10-Aug-04 (METAS, No. 251-00404)	Aug-05
Reference Probe ES3DV2	SN: 3013	7-Jan-05 (SPEAG, No. ES3-3013_Jan05)	Jan-06
DAE4	SN: 617	19-Jan-05 (SPEAG, No. DAE4-617_Jan05)	Jan-06
Secondary Standards	**ID #**	**Check Date (in house)**	**Scheduled Check**
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check Dec-03)	In house check: Dec-05
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Nov-04)	In house check: Nov 05

	Name	Function	Signature
Calibrated by:	Nico Vetterli	Laboratory Technician	N. Vetterli
Approved by:	Katja Pokovic	Technical Manager	Katja

Issued: May 26, 2005

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

ET3DV6 SN:1384 May 26, 2005

DASY - Parameters of Probe: ET3DV6 SN:1384

Sensitivity in Free Space[A]

NormX	**1.78** ± 10.1%	$\mu V/(V/m)^2$	DCP X	**92** mV
NormY	**1.76** ± 10.1%	$\mu V/(V/m)^2$	DCP Y	**92** mV
NormZ	**1.94** ± 10.1%	$\mu V/(V/m)^2$	DCP Z	**92** mV

Diode Compression[B]

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	10.1	5.1
SAR_{be} [%]	With Correction Algorithm	0.1	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	14.5	9.5
SAR_{be} [%]	With Correction Algorithm	1.0	0.1

Sensor Offset

Probe Tip to Sensor Center **2.7** mm

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

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Page 8).

[B] Numerical linearization parameter: uncertainty not required.

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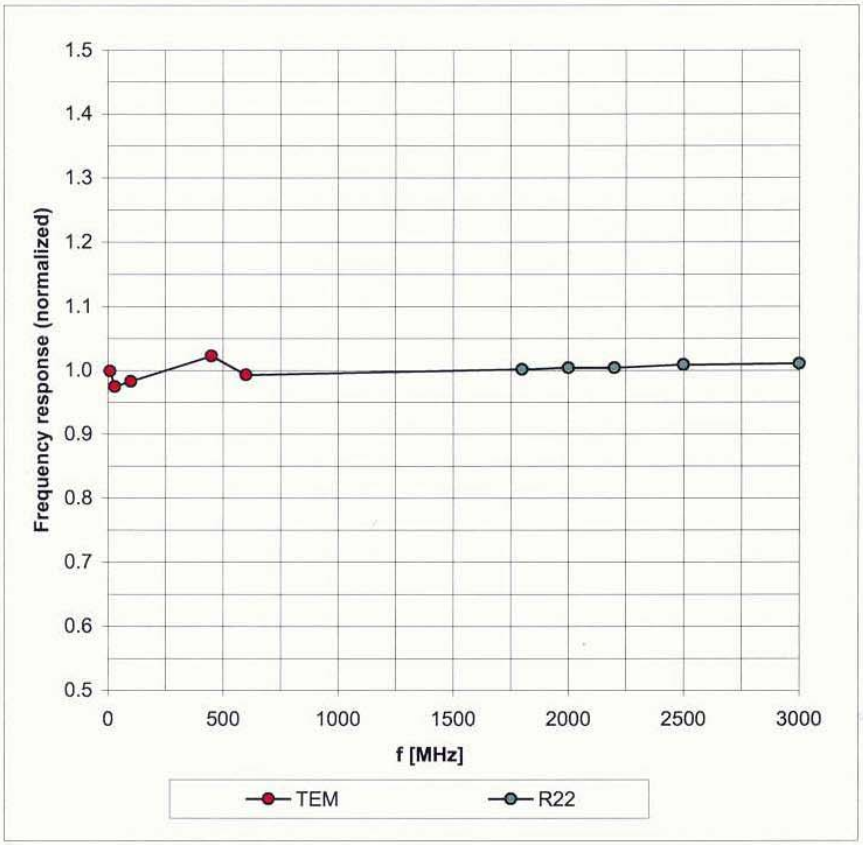
Frequency Response of E-Field

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



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

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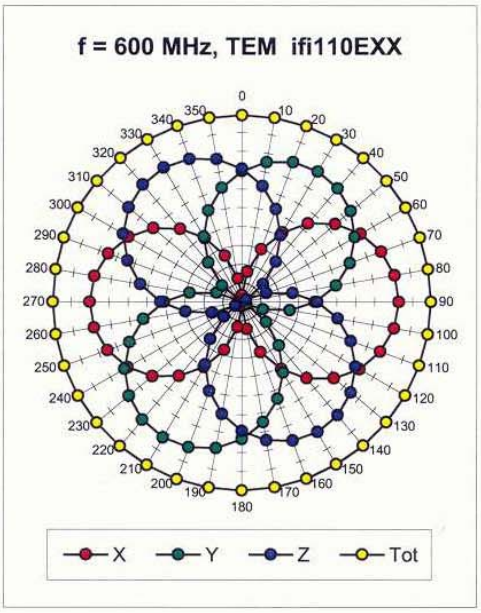
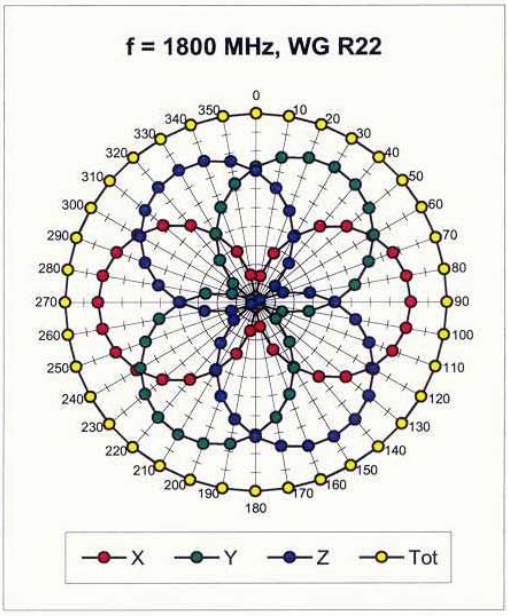
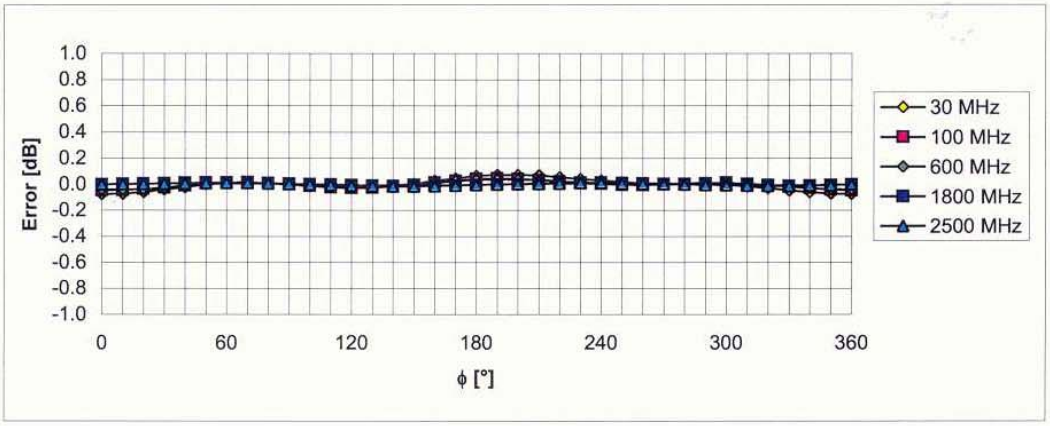
Receiving Pattern (ϕ), ϑ = 0°







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

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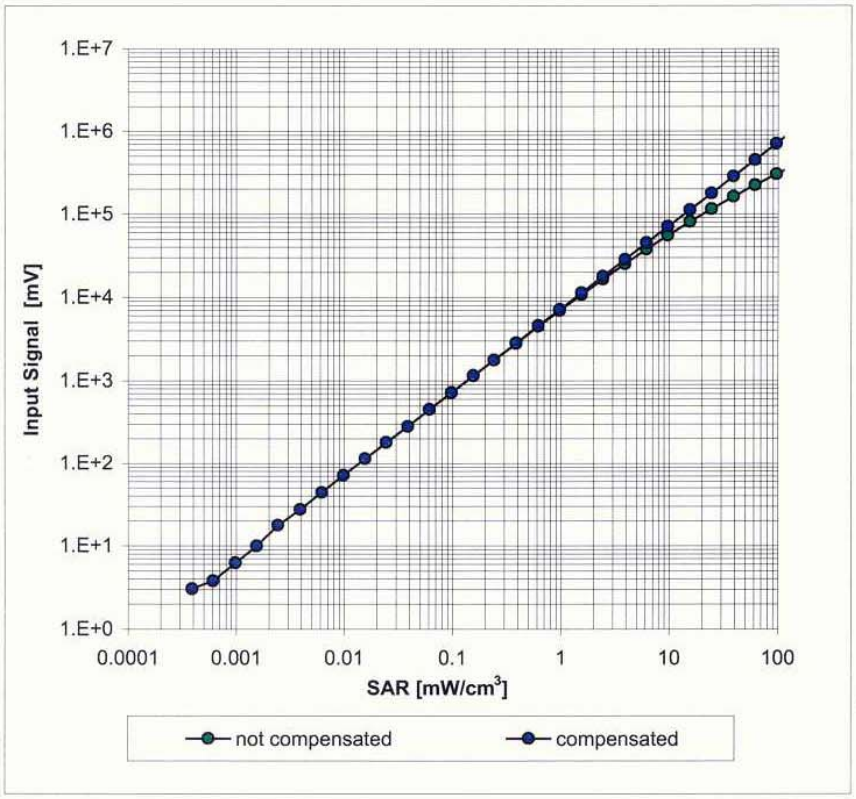
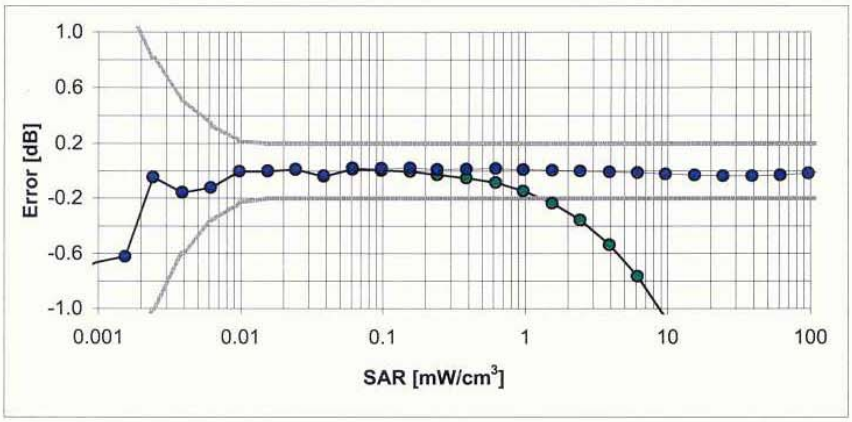
Dynamic Range f(SAR_{head})

(Waveguide R22, f = 1800 MHz)





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

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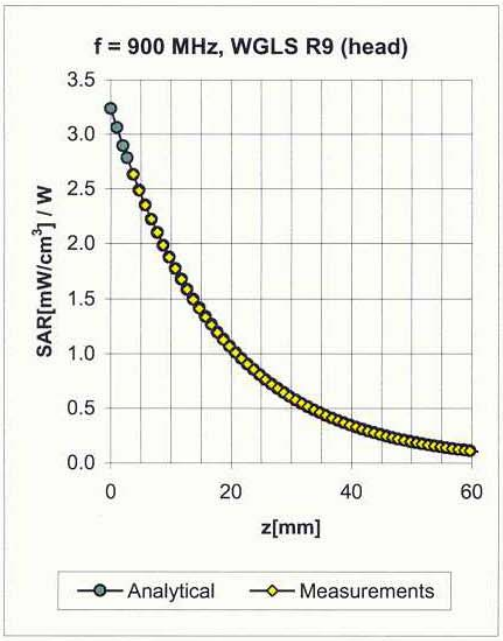
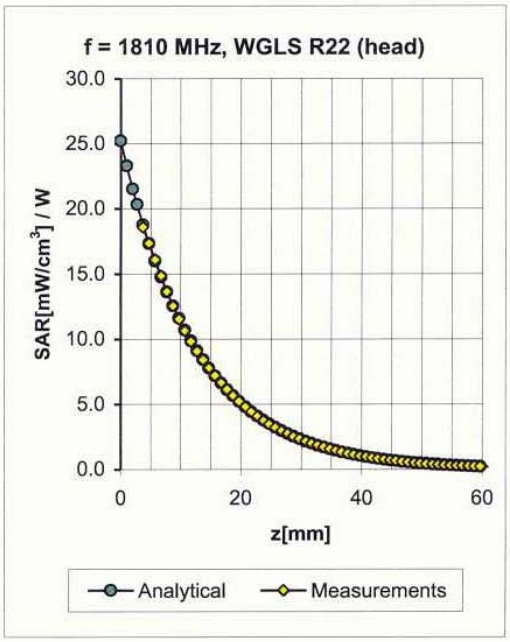
Conversion Factor Assessment





f [MHz]	Validity [MHz][C]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
450	± 50 / ± 100	Head	43.5 ± 5%	0.87 ± 5%	0.08	1.62	7.51 ± 13.3% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.84	1.67	6.53 ± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.73	2.19	5.31 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.81	2.05	4.71 ± 11.8% (k=2)
450	± 50 / ± 100	Body	56.7 ± 5%	0.94 ± 5%	0.10	1.75	7.10 ± 13.3% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.66	1.95	6.19 ± 11.0% (k=2)
1810	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.67	2.58	4.80 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.93	1.80	4.46 ± 11.8% (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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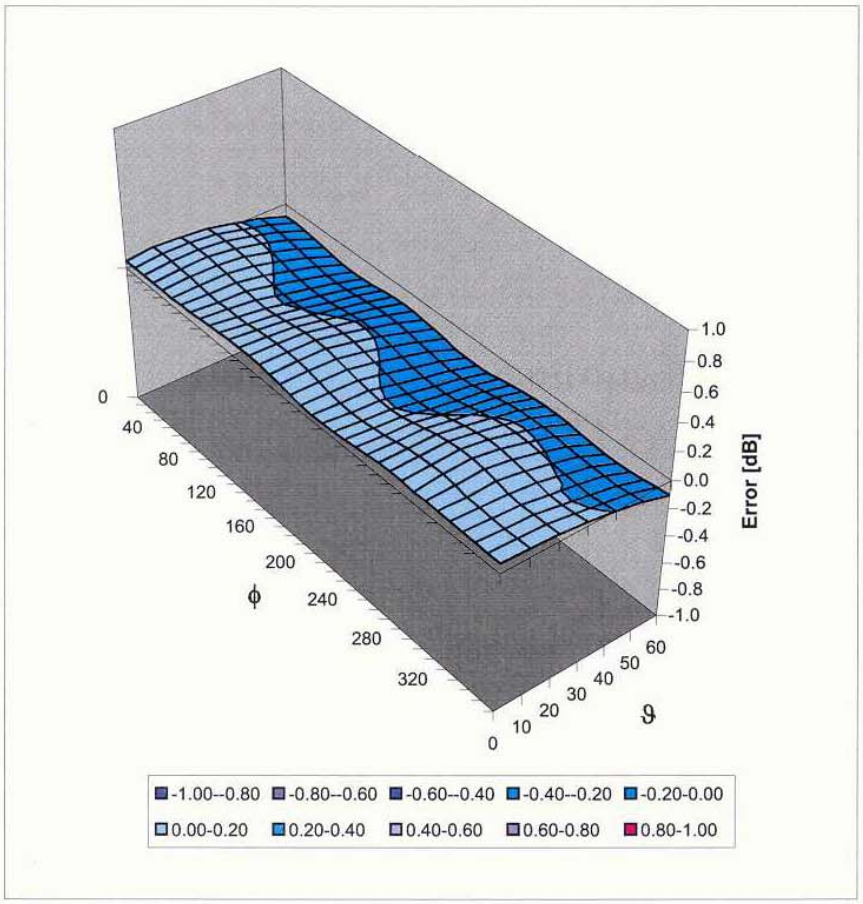
Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 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 30, 2005**
Probe Calibration Date:	**May 26, 2005**

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 1800 MHz.

Assessed by:

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Dosimetric E-Field Probe ET3DV6 SN:1384

Conversion factor (± standard deviation)

150 MHz	*ConvF*	**8.9 ± 10%**	ε_r **= 52.3** σ **= 0.76 mho/m** (head tissue)
250 MHz	*ConvF*	**8.1 ± 10%**	ε_r **= 47.6** σ **= 0.83 mho/m** (head tissue)
300 MHz	*ConvF*	**8.0 ± 9%**	ε_r **= 45.3** σ **= 0.87 mho/m** (head tissue)
750 MHz	*ConvF*	**6.8 ± 7%**	ε_r **= 41.9** σ **= 0.89 mho/m** (head tissue)
150 MHz	*ConvF*	**8.6 ± 10%**	ε_r **= 61.9** σ **= 0.80 mho/m** (body tissue)
250 MHz	*ConvF*	**8.1 ± 10%**	ε_r **= 59.4** σ **= 0.88 mho/m** (body tissue)
300 MHz	*ConvF*	**8.0 ± 9%**	ε_r **= 58.2** σ **= 0.92 mho/m** (body tissue)
750 MHz	*ConvF*	**6.6 ± 7%**	ε_r **= 55.5** σ **= 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.