MOTOROLA

ACCREDITED
Certificate Number: 1449-01

FCC ID: AZ489FT3810
DECLARATION OF COMPLIANCE SAR ASSESSMENT Part 2 of 2

CGISS EME Test Laboratory
8000 West Sunrise Blvd
Fort Lauderdale, FL. 33322

Date of Report: December 17, 2004
Report Revision: Rev. O
Report ID: FCC rpt_AlphaL VHF_Rev O_041217 SR1795

Responsible Engineer:	Jim Fortier (Elect. Principle Staff Eng.)
Date/s Tested:	12/8/04 -12/10/04
Manufacturer/Location:	Motorola
Sector/Group/Div.:	CGISS/GTDG
Date submitted for test:	11/19/04
DUT Description:	Portable, PTT, Alpha L VHF 5W 150-174Mhz, 16ch, Black
Test TX mode(s):	CW
Max. Power output:	5.5 Watts
Nominal Power:	5.0 Watts
Tx Frequency Bands:	150-174 MHz
Signaling type:	FM
Model(s) Tested:	PMUD2085A
Model(s) Certified:	PMUD2085A
Serial Number(s):	027YEU0007, 027YEU0006
Classification:	Occupational/Controlled
Rule Part(s):	90.210

Approved Accessories:

Antenna(s):
PMAD4051 (Alpha L antenna 150-174MHZ ¼ wave, 14cm, -3dBi)
Battery(ies):
PMNN4071A (NiMH battery)
Body worn accessory:
RLN5644A (Spring Belt clip); PMLN4691A (Standard Belt clip)
Audio Accessories:
PMMN4008A (RSM); PMLN4442A (Earbud w/ in-line mic & PTT/VOX switch); PMLN4443A (Ear receiver w/ in-line mic & PTT/VOX switch; PMLN4444A (Earphone Boom mic w/ in-line mic & PTT/VOX switch); PMLN4445A (Ultra lightweight headset w/ in-line PTT/VOX switch)

Max. Calc. 1-g/10-g Avg. SAR: 1.85/1.38 W/kg (Head/Face); 2.21/1.43 W/kg (Body)

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 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 CGISS EME Lab Senior Resource Manager, Laboratory Director,

Certification Date: 12/17/04

Certification No.: L1041246

APPENDIX A
Measurement Uncertainty

Table 1: Uncertainty Budget for Device Under Test: 75 – 3000 MHz

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	4.8	N	1.00	1	1	4.8	4.8	∞
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	1.0	N	1.00	1	1	1.0	1.0	∞
Response Time	E.2.7	0.8	R	1.73	1	1	0.5	0.5	∞
Integration Time	E.2.8	1.3	R	1.73	1	1	0.8	0.8	∞
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	1.0	R	1.73	1	1	0.6	0.6	∞
Probe Positioning w.r.t Phantom	E.6.3	4.0	R	1.73	1	1	2.3	2.3	∞
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	3.4	N	1.00	1	1	3.4	3.4	29
Device Holder Uncertainty	E.4.1	3.8	N	1.00	1	1	3.8	3.8	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	6.5	N	1.00	0.64	0.43	4.2	2.8	∞
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	4.0	N	1.00	0.6	0.49	2.4	2.0	∞
Combined Standard Uncertainty			RSS				12	11	601
Expanded Uncertainty (95% CONFIDENCE LEVEL)			*k*=2				23	22	

Table 2: Uncertainty Budget for System Check: 75 – 3000 MHz

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	4.8	N	1.00	1	1	4.8	4.8	∞
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	1.0	N	1.00	1	1	1.0	1.0	∞
Response Time	E.2.7	0.8	R	1.73	1	1	0.5	0.5	∞
Integration Time	E.2.8	1.3	R	1.73	1	1	0.8	0.8	∞
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	6.0	R	1.73	0.64	0.43	2.2	1.5	∞
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	6.0	R	1.73	0.6	0.49	2.1	1.7	∞
Combined Standard Uncertainty			RSS				9	8	99999
Expanded Uncertainty (95% CONFIDENCE LEVEL)			*k*=2				17	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

Client **Motorola CGISS**

CALIBRATION CERTIFICATE

Object(s)	ET3DV6 - SN:1383
Calibration procedure(s)	QA CAL-01.v2 Calibration procedure for dosimetric E-field probes
Calibration date:	February 25, 2004
Condition of the calibrated item	In Tolerance (according to the specific calibration document)

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 +/- 2 degrees Celsius and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

Model Type	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM E4419B	GB41293874	2-Apr-03 (METAS, No 252-0250)	Apr-04
Power sensor E4412A	MY41495277	2-Apr-03 (METAS, No 252-0250)	Apr-04
Reference 20 dB Attenuator	SN: 5086 (20b)	3-Apr-03 (METAS, No. 251-0340)	Apr-04
Fluke Process Calibrator Type 702	SN: 6295803	8-Sep-03 (Sintrel SCS No. E-030020)	Sep-04
Power sensor HP 8481A	MY41092180	18-Sep-02 (SPEAG, in house check Oct-03)	In house check: Oct 05
RF generator HP 8684C	US3642U01700	4-Aug-99 (SPEAG, in house check Aug-02)	In house check: Aug-05
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Oct-03)	In house check: Oct 05

	Name	Function	Signature
Calibrated by:	Nico Vetterli	Technician	D. Vetterli
Approved by:	Katja Pokovic	Laboratory Director	

Date issued: February 25, 2004

This calibration certificate is issued as an intermediate solution until the accreditation process (based on ISO/IEC 17025 International Standard) for Calibration Laboratory of Schmid & Partner Engineering AG is completed.

ET3DV6 SN:1383 February 25, 2004

DASY - Parameters of Probe: ET3DV6 SN:1383

Sensitivity in Free Space

NormX	**1.88** $\mu V/(V/m)^2$	DCP X	**92**	mV
NormY	**1.63** $\mu V/(V/m)^2$	DCP Y	**92**	mV
NormZ	**1.71** $\mu V/(V/m)^2$	DCP Z	**92**	mV

Diode Compression[A]

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Plese see Page 7.

Boundary Effect

Head **900 MHz** **Typical SAR gradient: 5 % per mm**

Sensor Cener to Phantom Surface Distance		**3.7 mm**	**4.7 mm**
SAR_{be} [%]	Without Correction Algorithm	9.9	5.0
SAR_{be} [%]	With Correction Algorithm	0.1	0.3

Head **1800 MHz** **Typical SAR gradient: 10 % per mm**

Sensor to Surface Distance		**3.7 mm**	**4.7 mm**
SAR_{be} [%]	Without Correction Algorithm	13.6	8.8
SAR_{be} [%]	With Correction Algorithm	0.1	0.2

Sensor Offset

Probe Tip to Sensor Center	**2.7** mm
Optical Surface Detection	**very low, but repeatable**

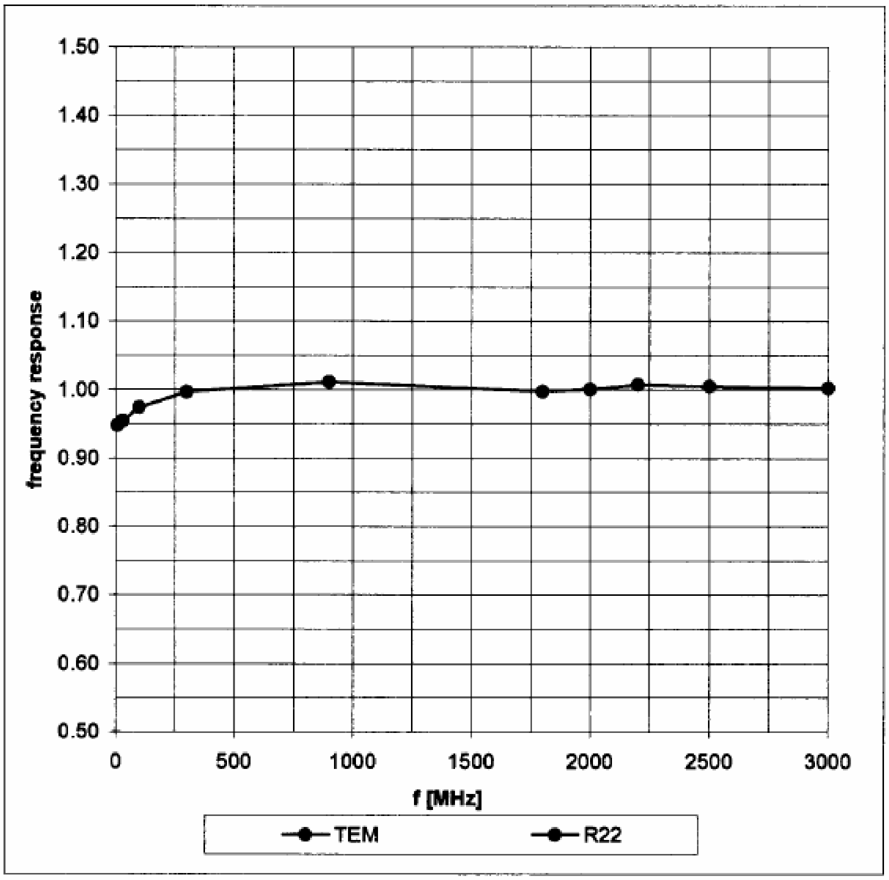
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] numerical linearization parameter: uncertainty not required

ET3DV6 SN:1383 February 25, 2004

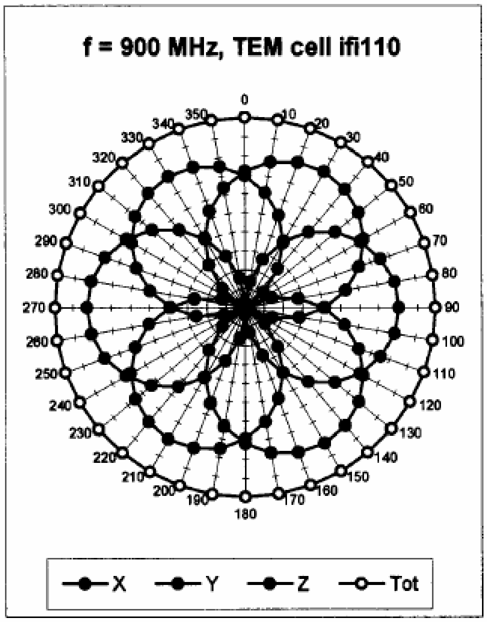
Frequency Response of E-Field

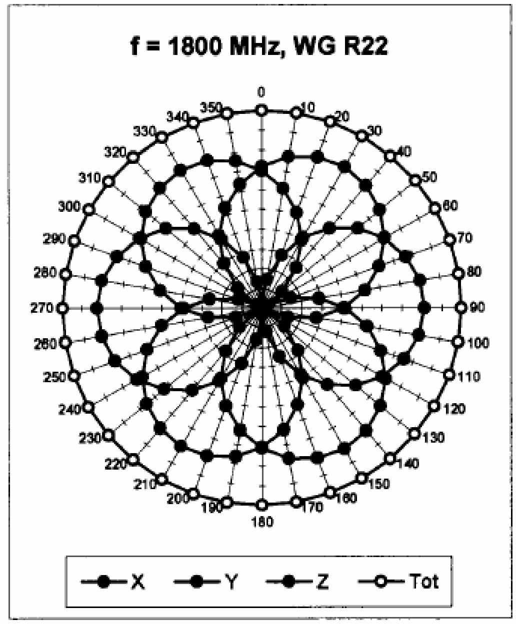
(TEM-Cell:ifi110, Waveguide R22)

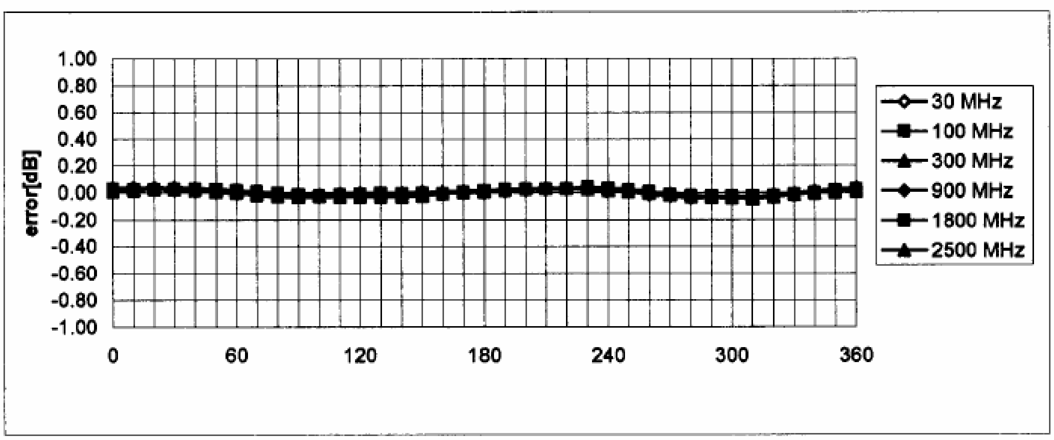


ET3DV6 SN:1383 **February 25, 2004**

Receiving Pattern (ϕ) , θ = 0°



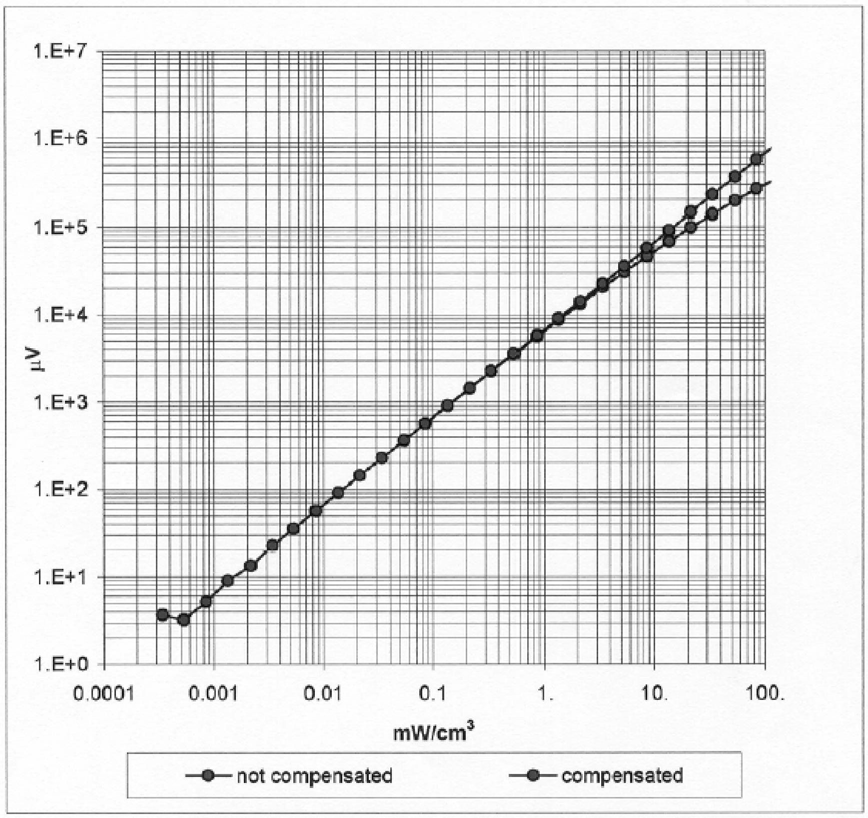


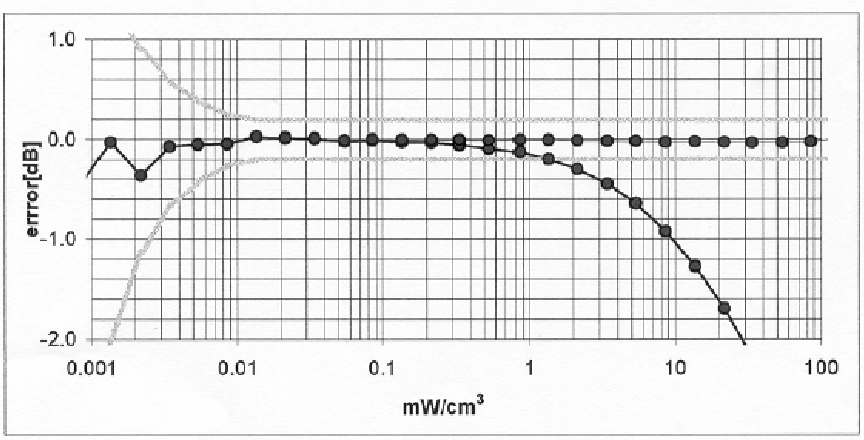


Axial Isotropy Error < ± 0.2 dB

Dynamic Range f(SAR_{head})

(Waveguide R22)

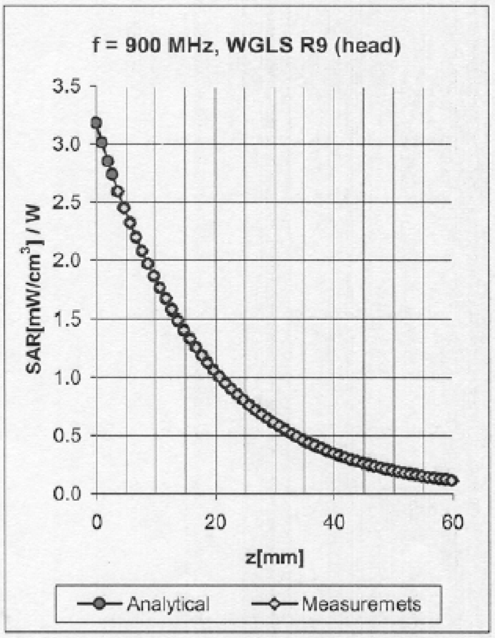


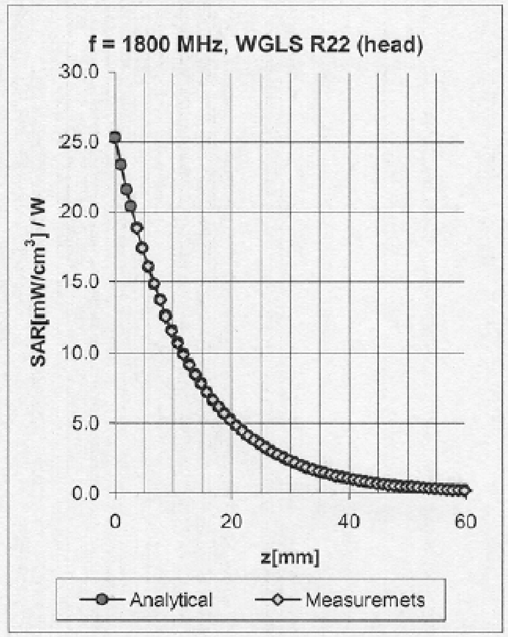


Probe Linearity < ± 0.2 dB

ET3DV6 SN:1383 February 25, 2004

Conversion Factor Assessment





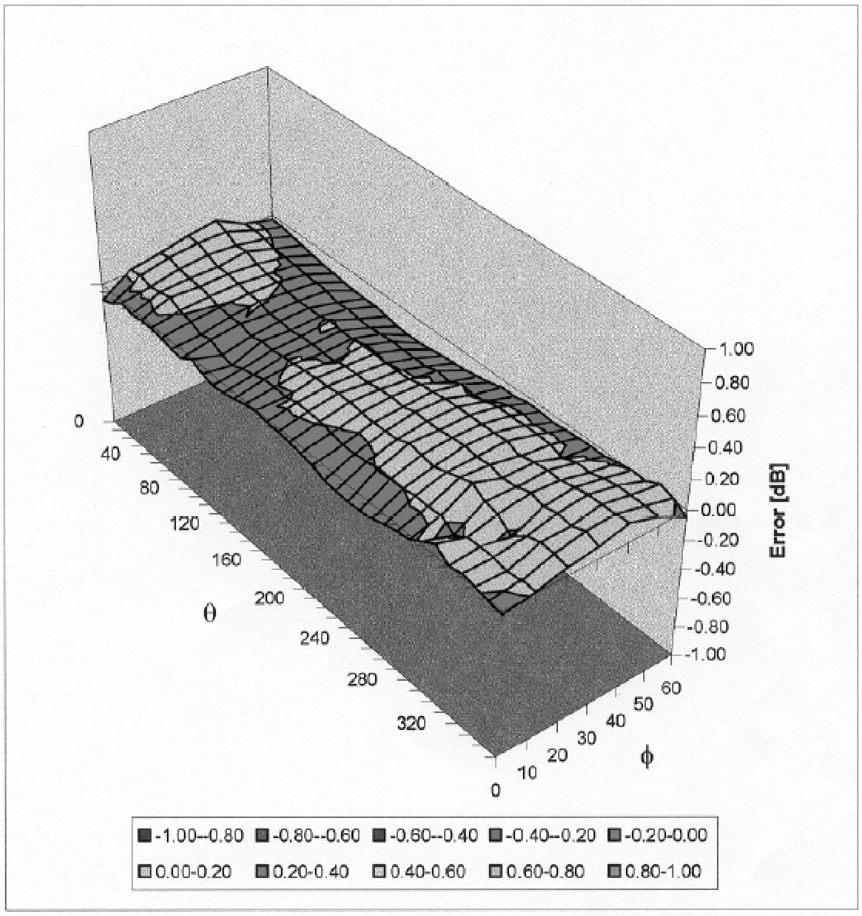
f [MHz]	Validity [MHz][B]	Tissue	Permittivity	Conductivity	Alpha	Depth	ConvF	Uncertainty
900	800-1000	Head	41.5 ± 5%	0.97 ± 5%	0.72	1.77	6.30	± 9.5% (k=2)
1450	1400-1500	Head	40.5 ± 5%	1.20 ± 5%	0.55	2.40	5.72	± 9.5% (k=2)
1800	1710-1910	Head	40.0 ± 5%	1.40 ± 5%	0.57	2.38	5.14	± 9.5% (k=2)
2450	2400-2500	Head	39.2 ± 5%	1.80 ± 5%	1.18	1.72	4.76	± 9.5% (k=2)
900	800-1000	Body	55.0 ± 5%	1.05 ± 5%	0.51	2.27	5.82	± 9.5% (k=2)
1450	1400-1500	Body	54.0 ± 5%	1.30 ± 5%	0.53	2.58	5.27	± 9.5% (k=2)
1800	1710-1910	Body	53.3 ± 5%	1.52 ± 5%	0.62	2.67	4.55	± 9.5% (k=2)
2450	2400-2500	Body	52.7 ± 5%	1.95 ± 5%	1.91	1.23	4.41	± 9.5% (k=2)

[B] The stated uncertainty of calibration was assessed according to P1528.

ET3DV6 SN:1383 February 25, 2004

Deviation from Isotropy in HSL

Error (θ,φ), f = 900 MHz



Spherical Isotropy Error < ± 0.4 dB

Schmid & Partner
Engineering AG

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

Additional Conversion Factors

for Dosimetric E-Field Probe

Type:	**ET3DV6**
Serial Number:	**1383**
Place of Assessment:	**Zurich**
Date of Assessment:	**February 27, 2004**
Probe Calibration Date:	**February 25, 2004**

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:

Dosimetric E-Field Probe ET3DV6 SN:1383

Conversion factor (± standard deviation)

150 MHz	ConvF	7.9 ± 8%	ε_r = 61.9 σ = 0.80 mho/m (body tissue)
236 MHz	ConvF	7.7 ± 8%	ε_r = 59.8 σ = 0.87 mho/m (body tissue)
300 MHz	ConvF	7.6 ± 8%	ε_r = 58.2 σ = 0.92 mho/m (body tissue)
350 MHz	ConvF	7.5 ± 8%	ε_r = 57.7 σ = 0.93 mho/m (body tissue)
450 MHz	ConvF	7.2 ± 8%	ε_r = 56.7 σ = 0.94 mho/m (body tissue)
784 MHz	ConvF	6.3 ± 8%	ε_r = 55.4 σ = 0.97 mho/m (body tissue)

Dosimetric E-Field Probe ET3DV6 SN:1383

Conversion factor (± standard deviation)

150 MHz	ConvF	8.7 ± 8%	ε_r = 52.3 σ = 0.76 mho/m (head tissue)
236 MHz	ConvF	7.9 ± 8%	ε_r = 48.3 σ = 0.82 mho/m (head tissue)
300 MHz	ConvF	7.5 ± 8%	ε_r = 45.3 σ = 0.87 mho/m (head tissue)
350 MHz	ConvF	7.4 ± 8%	ε_r = 44.7 σ = 0.87 mho/m (head tissue)
400 MHz	ConvF	7.3 ± 8%	ε_r = 44.4 σ = 0.87 mho/m (head tissue - CENELEC)
450 MHz	ConvF	7.2 ± 8%	ε_r = 43.5 σ = 0.87 mho/m (head tissue)
784 MHz	ConvF	6.5 ± 8%	ε_r = 41.8 σ = 0.90 mho/m (head tissue)

Appendix C
Dipole Calibration Certificates

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

Client **Motorola CGISS**

CALIBRATION CERTIFICATE

Object(s)	D300V2 - SN:1001
Calibration procedure(s)	QA CAL-15.v2 Calibration procedure for dipole validation kits below 800 MHz
Calibration date:	August 13, 2004
Condition of the calibrated item	In Tolerance (according to the specific calibration document)

This calibration statement documents traceability of M&TE used in the calibration procedures and conformity of the procedures with the ISO/IEC 17025 international standard.

All calibrations have been conducted in the closed laboratory facility: environment temperature 22 +/- 2 degrees Celsius and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

Model Type	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM E4419B	GB41293874	5-May-04 (METAS, No 251-00388)	May-05
Power sensor E4412A	MY41495277	5-May-04 (METAS, No 251-00388)	May-05
Reference 20 dB Attenuator	SN: 5086 (20b)	3-May-04 (METAS, No 251-00389)	May-05
Fluke Process Calibrator Type 702	SN: 6295803	8-Sep-03 (Sintrel SCS No. E-030020)	Sep-04
Power sensor HP 8481A	MY41092180	18-Sep-02 (SPEAG, in house check Oct-03)	In house check: Oct 05
RF generator HP 8684C	US3642U01700	4-Aug-99 (SPEAG, in house check Aug-02)	In house check: Aug-05
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Oct-03)	In house check: Oct 05

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

Date issued: August 13, 2004

This calibration certificate is issued as an intermediate solution until the accreditation process (based on ISO/IEC 17025 International Standard) for Calibration Laboratory of Schmid & Partner Engineering AG is completed.

1. Measurement Conditions

The measurements were performed in the 6mm thick flat phantom filled with **head** simulating liquid of the following electrical parameters at 300 MHz:

Relative Dielectricity	**45.8**	± 5%
Conductivity	**0.89 mho/m**	± 5%

The DASY4 System with a dosimetric E-field probe ET3DV6 (SN:1507, Conversion factor 8.75 at 300 MHz) was used for the measurements.

The dipole was mounted on the small tripod so that the dipole feedpoint was positioned below the center of the flat phantom and the dipole was oriented parallel to the longer side of the phantom. The standard measuring distance was 15mm from dipole center to the liquid surface including the 6mm thick phantom shell. The included distance spacer was used during measurements for accurate distance positioning.

The coarse grid with a grid spacing of 15mm was aligned with the dipole. The 7x7x7 fine cube was chosen for cube integration.

The dipole input power (forward power) was 398 mW ± 3 %. The results are normalized to 1W input power.

2. SAR Measurement with DASY System

Standard SAR-measurements were performed according to the measurement conditions described in section 1. The results (see figure supplied) have been normalized to a dipole input power of 1W (forward power). The resulting averaged SAR-values measured with the dosimetric probe ET3DV6 SN:1507 and applying the advanced extrapolation are:

averaged over 1 cm^3 (1 g) of tissue:	**2.79 mW/g** ± 20.7 % (k=2)[1]
averaged over 10 cm^3 (10 g) of tissue:	**1.87 mW/g** ± 20.2 % (k=2)[1]

[1] validation uncertainty

3. Dipole Impedance and Return Loss

The impedance was measured at the SMA-connector with a network analyzer and numerically transformed to the dipole feedpoint. The transformation parameters from the SMA-connector to the dipole feedpoint are:

Electrical delay:	**1.745 ns**	(one direction)
Transmission factor:	**0.993**	(voltage transmission, one direction)

The dipole was positioned at the flat phantom sections according to section 1 and the distance spacer was in place during impedance measurements.

Feedpoint impedance at 300 MHz:	Re{Z} = **55.1 Ω**
	Im {Z} = **-9.0 Ω**
Return Loss at 300 MHz	**-20.2 dB**

4. Handling

Do not apply excessive force to the dipole arms, because they might bend. Bending of the dipole arms stresses the soldered connections near the feedpoint leading to a damage of the dipole.

5. Design

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

6. Power Test

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

Date/Time: 08/13/04 15:41:44

Test Laboratory: SPEAG, Zurich, Switzerland
DUT: Dipole 300 MHz; Serial: D300V2 - SN:1001

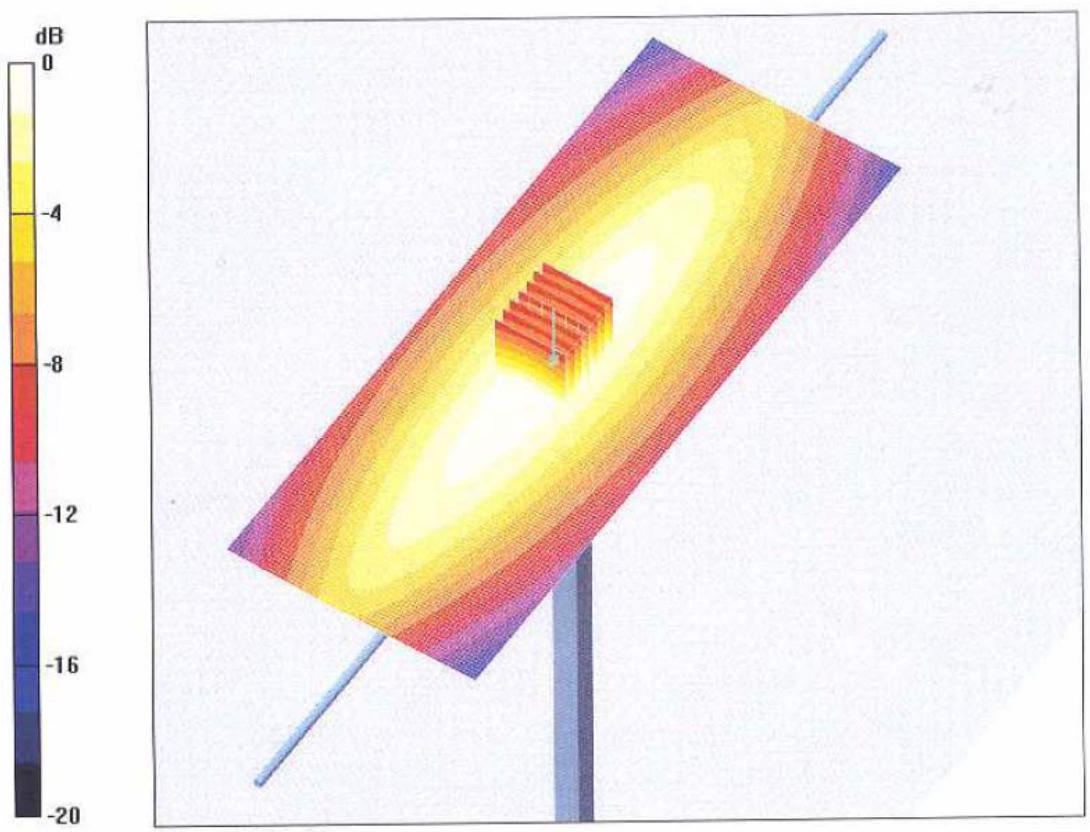
Communication System: CW;Duty Cycle: 1:1; Medium: HSL300
Medium parameters used: f = 300 MHz; σ = 0.89 mho/m; ε_r = 45.8; ρ = 1000 kg/m^3
Phantom: Flat Phantom 4.4; Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (low frequencies); ConvF(8.75, 8.75, 8.75);
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn901; Calibrated: 6/29/2004
- Measurement SW: DASY4, V4.3 Build 14;

d=15mm, Pin=398mW/Area Scan (71x181x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.17 mW/g

d=15mm, Pin=398mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 37 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 1.74 W/kg
SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.743 mW/g
Maximum value of SAR (measured) = 1.19 mW/g



0 dB = 1.19mW/g

Appendix D
Test System Verification Scans

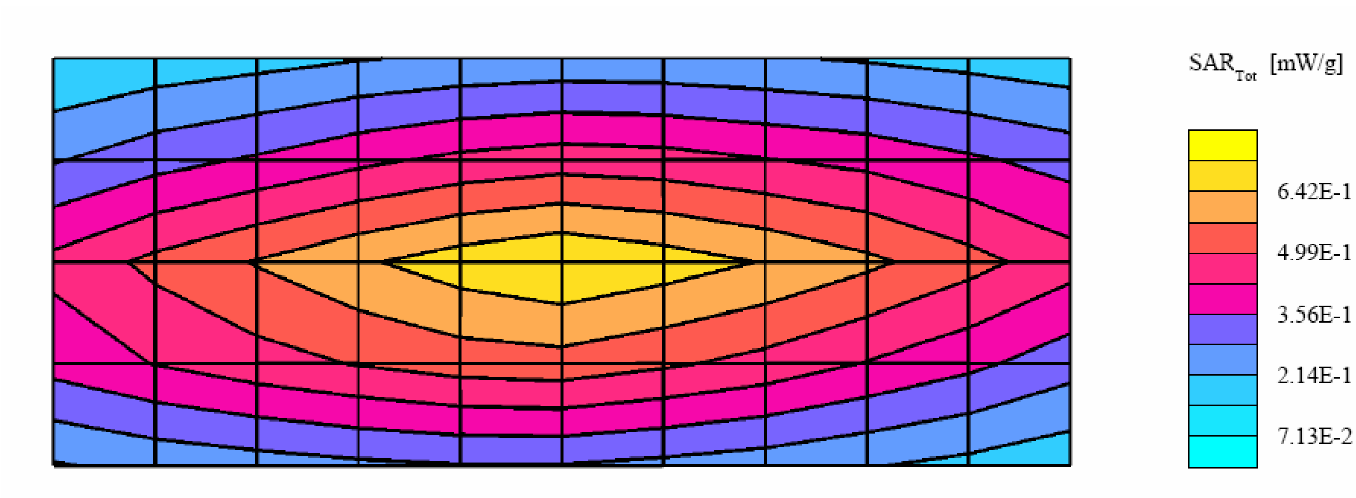
Note: Dipole validation scans at the head from SPEAG are provided in APPENDIX D. The CGISS EME lab validated the dipole to the applicable IEEE system performance targets. Within the same day system validation was performed using FCC body tissue parameters to generate the system performance target values for body at the applicable frequency. The results of the CGISS EME system performance validation are provided herein.

SPEAG 350 MHz Dipole; Model D350V2, SN 1001; Test Date: 12/08/04
Motorola CGISS EME Lab

Run #: Sys Perf-R3-041208-01
TX Freq: 300 MHz
Sim Tissue Temp: 20.9 (Celsius)
Start Power: 250mW

SAR target at 1W is 2.89 mW/g (1g avg, including drift)
SAR target at 1W is 1.93 mW/g (10g avg, including drift)
SAR calculated at 1W is 2.88 mW/g (1g avg). Percent from target (including drift) is -0.40 %
SAR calculated at 1W is 1.92 mW/g (10g avg). Percent from target (including drift) is -0.64 %

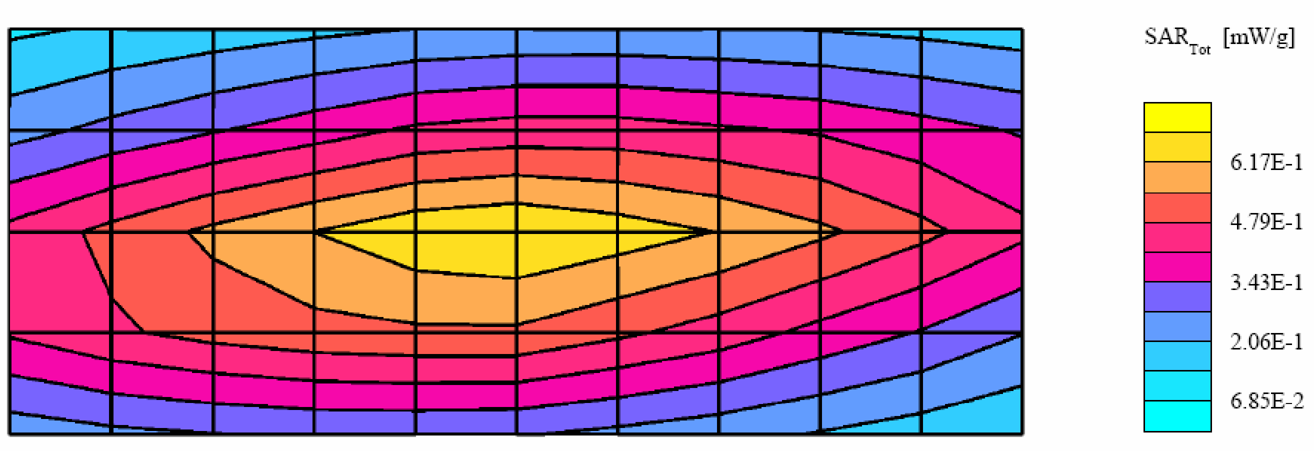
Flat; Probe: ET3DV6 - SN1383(Cal Date 25 Feb 2004);Probe Cal Date: 25/2/04ConvF(7.50,7.50,7.50); Crest factor: 1.0; IEEE Head: 300 MHz: σ = 0.86 mho/m ε_r = 46.2 ρ = 1.00 g/cm^3; DAE3: 401 DAE Cal Date: 8/25/2004
Cubes (2): Peak: 1.10 mW/g ± 0.03 dB, SAR (1g): 0.713 mW/g ± 0.02 dB, SAR (10g): 0.475 mW/g ± 0.02 dB, (Worst-case extrapolation) Penetration depth: 12.8 (11.3, 14.8) [mm]
Power drift: -0.04 dB



SPEAG 350 MHz Dipole; Model D350V2, SN 1001; Test Date: 12/09/04
Motorola CGISS EME Lab
Run #: Sys Perf-R3-041209-01
TX Freq: 300 MHz
Sim Tissue Temp: 20.3 (Celsius)
Start Power; 250mW

SAR target at 1W is 2.76 mW/g (1g avg, including drift)
SAR target at 1W is 1.87 mW/g (10g avg, including drift)
SAR calculated at 1W is 2.77 mW/g (1g avg). Percent from target (including drift) is 0.23 %
SAR calculated at 1W is 1.87 mW/g (10g avg). Percent from target (including drift) is -0.09 %

Flat; Probe: ET3DV6 - SN1383(Cal Date 25 Feb 2004);Probe Cal Date: 25/2/04ConvF(7.50,7.50,7.50); Crest factor: 1.0; FCC Body 300: σ = 0.88 mho/m ε_r = 56.7 ρ = 1.00 g/cm3; DAE3: 401 DAE Cal Date: 8/25/2004
Cubes (2): Peak: 1.06 mW/g ± 0.01 dB, SAR (1g): 0.690 mW/g ± 0.01 dB, SAR (10g): 0.466 mW/g ± 0.01 dB, (Worst-case extrapolation) Penetration depth: 13.4 (11.7, 15.5) [mm]
Power drift: -0.01 dB

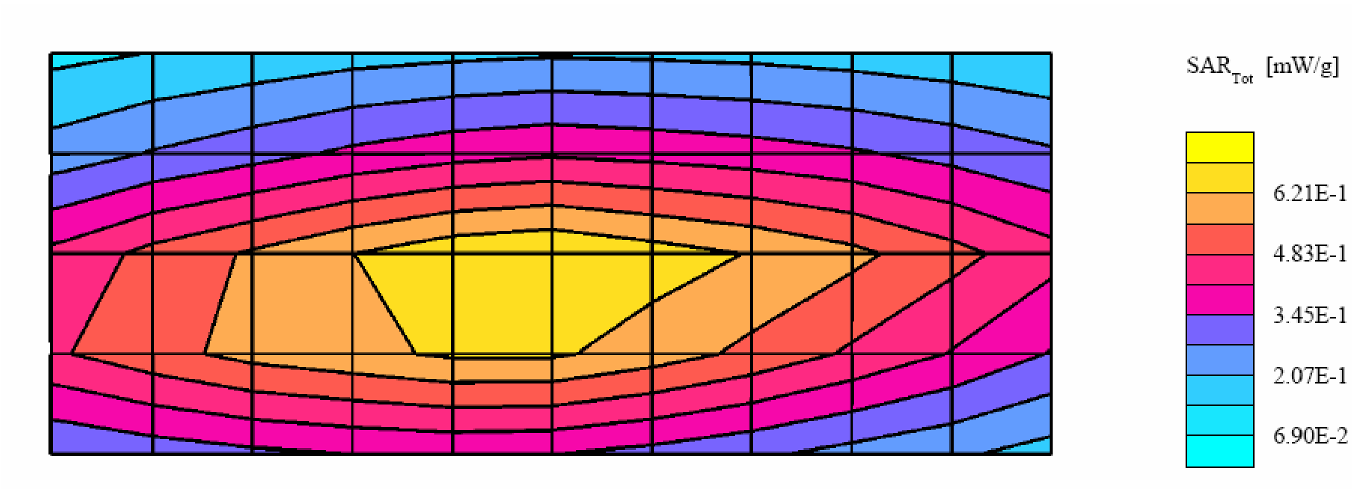


SPEAG 350 MHz Dipole; Model D350V2, SN 1001; Test Date: 12/10/04
Motorola CGISS EME Lab

Run #: Sys Perf-R3-041210-01
TX Freq: 300 MHz
Sim Tissue Temp: 20.2 (Celsius)
Start Power; 250mW

SAR target at 1W is 2.89 mW/g (1g avg, including drift)
SAR target at 1W is 1.93 mW/g (10g avg, including drift)
SAR calculated at 1W is mW/g (1g avg). Percent from target (including drift) is %
SAR calculated at 1W is mW/g (10g avg). Percent from target (including drift) is %

Flat; Probe: ET3DV6 - SN1383(Cal Date 25 Feb 2004);Probe Cal Date: 25/2/04ConvF(7.50,7.50,7.50); Crest factor: 1.0; IEEE Head: 300 MHz: σ = 0.88 mho/m ε_r = 46.9 ρ = 1.00 g/cm^3; DAE3: 401 DAE Cal Date: 8/25/2004
Cubes (2): Peak: 1.13 mW/g ± 0.00 dB, SAR (1g): 0.729 mW/g ± 0.00 dB, SAR (10g): 0.487 mW/g ± 0.01 dB, (Worst-case extrapolation)Penetration depth: 12.9 (11.3, 14.8) [mm]
Power drift: -0.04 dB



SYSTEM PERFORMANCE CHECK TARGET SAR

Date:	9/7/2004	Frequency (MHz):	300
Lab Location:	CGISS	Mixture Type:	FCC Body
Robot System:	CGISS-2	Ambient Temp.(°C):	21.7
Probe Serial #:	ET3DV6-1393	Tissue Temp.(°C):	20.3
DAE Serial #:	374		

Tissue Characteristics

Permitivity:	57.7	Phantom Type/SN:	80602002A-S1
Conductivity:	0.90	Distance (mm):	15 (tissue/dipole cnt)

Reference Source: Dipole (Dipole)
Reference SN: 1001

Power to Dipole: 250 mW

Measured SAR Value: 0.683 mW/g, 0.462 mW/g (10g avg.)
Power Drift: -0.04 dB

New Target/Measured
SAR Value: 2.76 mW/g, 1.87 mW/g (10g avg.)
(normalized to 1.0 W, including drift)

Test performed by: E. Church Initial: E.C.

10/07/04

Dipole D300V2 ; Test date:10/07/04

Run #: Sys Perf-R2-041007-01
Model #: D300V2
Robot: CGISS-2
DAE3: SN: 374
TX Freq: 300 MHz
Start Power: 250mW

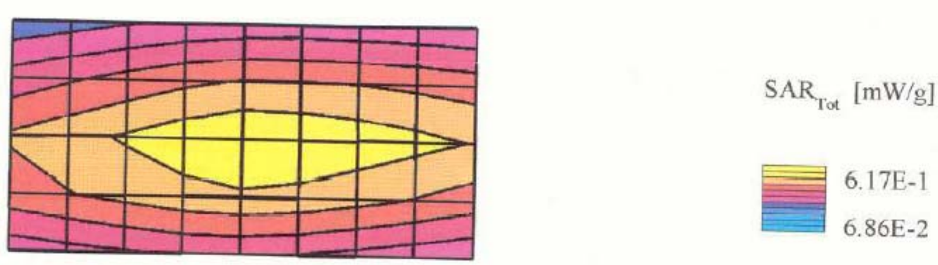
Phantom #: 80602002A-S1
SN: 1001
Tester: E. Church
Cal Date: (3/23/04)
Sim Tissue Temp: 20.3 C

Target:

2.76 mW/g for 1g SAR   1.87 mW/g for 10g SAR

SAR calculated 1g is 2.76 mW/g percent from target (including drift) is 0 %
SAR Calculated 10g is 1.87 mW/g Percent from target (including drift) is 0 %

Flat (2); Probe: ET3DV6 - SN1393 (Cal Date 28/04/04); ConvF(8.10,8.10,8.10); Crest factor: 1.0; FCC Body 300: σ = 0.90 mho/m ε_r = 57.7 ρ = 1.00 g/cm^3
Cubes (2): Peak: 1.03 mW/g ± 0.01 dB, SAR (1g): 0.683 mW/g ± 0.02 dB, SAR (10g): 0.462 mW/g ± 0.02 dB, (Worst-case extrapolation)
Penetration depth: 13.4 (11.9, 15.2) [mm]
Powerdrift: -0.04 dB



Motorola CGISS EME Lab

SYSTEM VALIDATION

Date:	9/7/2004	Frequency (MHz):	300
Lab Location:	CGISS	Mixture Type:	IEEE Head
Robot System:	CGISS-2	Ambient Temp.(°C):	21.7
Probe Serial #:	ET3DV6-1393	Tissue Temp.(°C):	21.1
DAE Serial #:	374		

Tissue Characteristics

Permitivity:	47.5	Phantom Type/SN:	80602002B-S2
Conductivity:	0.88	Distance (mm):	15 (tissue/dipole cnt)

Reference Source:	Dipole	(Dipole)
Reference SN:	300	

Power to Dipole:	250	mW
Power Output (radio	NA	mW

Target SAR Value: (normalized to 1.0 W)	3.00	mW/g,	2.00	mW/g (10g avg.)
Measured SAR Value:	0.720	mW/g,	0.482	mW/g (10g avg.)
Power Drift:	-0.01	dB		
Measured SAR Value: (normalized to 1.0 W, including drift)	2.89	mW/g,	1.93	mW/g (10g avg.)

Percent Difference From Target (MUST be within System Uncertainty): 3.78 % (1g ave)

3.38 % (10g ave)

Test performed by: Edward R. Church Initial: ERC

10/07/04

Dipole D300V2 ; Test date:10/07/04

Run #: Sys Perf-R2-041007-02
Model #: D300V2
Robot: CGISS-2
DAE3: SN: 374
TX Freq: 300 MHz
Start Power: 250mW

Phantom #: 80602002B-S2
SN: 1001
Tester: E. Church
Cal Date: (3/23/04)
Sim Tissue Temp: 21.1 C

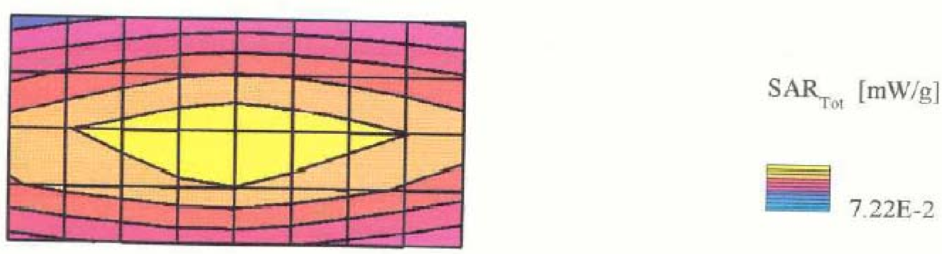
Target:

2.89 mW/g for 1g SAR

1.93 mW/g for 10g SAR

SAR calculated 1g is 2.89 mW/g percent from target (including drift) is 0 %
SAR Calculated 10g is 1.93 mW/g Percent from target (including drift) is 0 %

Flat (2); Probe: ET3DV6 - SN1393 (Cal Date 28/04/04); ConvF(8.10,8.10,8.10); Crest factor: 1.0; IEEE Head 300 MHz: $\sigma = 0.88$ mho/m $\varepsilon_r = 47.5$ $\rho = 1.00$ g/cm³
Cubes (2): Peak: 1.10 mW/g ± 0.01 dB, SAR (1g): 0.720 mW/g ± 0.02 dB, SAR (10g): 0.482 mW/g ± 0.03 dB, (Worst-case extrapolation)
Penetration depth: 12.9 (11.5, 14.6) [mm]
Powerdrift: -0.01 dB



Motorola CGISS EME Lab

Appendix E
DUT Scans (Shortened scans & Highest SAR configurations)

Shortened Scan Results

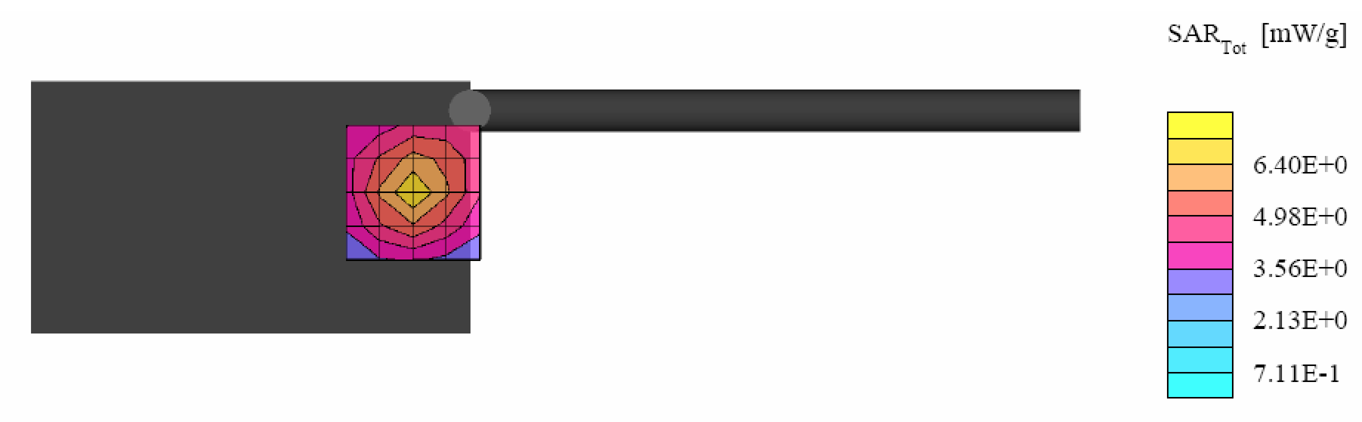
FCC ID: AZ489FT3810; Test Date: 12/8/04
Motorola CGISS EME Laboratory

Run #: CM-Ab-R3-041209-07
Model #: PMUD2085A SN: 027YEU0007
Tx Freq: 162.025 MHz
Sim tissue temp: 20.1 C
Start power: 5.71 W

Antenna: PMAD4051A
Battery Kit: PMNN4071A
Body worn Acc.: RLN5644A
Audio/Data Acc.: PMLN4444A

Shortened scan reflect highest S.A.R. producing configuration; Run time 7 minutes.
Representative "normal" scan run time was 23 minutes
"Shortened" scan max calculated S.A.R. using S.A.R. drift: 1-g Avg. = 2.18mW/g; 10-g Avg. = 1.41mW/g
"Normal" scan max calculated S.A.R. using S.A.R. drift: 1-g Avg. = 2.21mW/g; 10-g Avg. = 1.43mW/g
(see part 1 of 2 section 9.0 run # CM-Ab-R3-041209-06)

DUT w/ body worn accessory against the phantom
Flat Phantom; Position: (90°,90°);
Probe: ET3DV6 - SN1383(Cal Date 25 Feb 2004); ConvF(7.90,7.90,7.90); Probe cal date: 25/2/04; Crest factor: 1.0; FCC Body 162: σ = 0.78 mho/m εr = 60.2 ρ = 1.00 g/cm3; DAE: DAE3V1SN401 Cal Date: 8/25/04
Cube 5x5x7: SAR (1g): 4.18 mW/g, SAR (10g): 2.71 mW/g, (Worst-case extrapolation)
Power drift: -0.18 dB

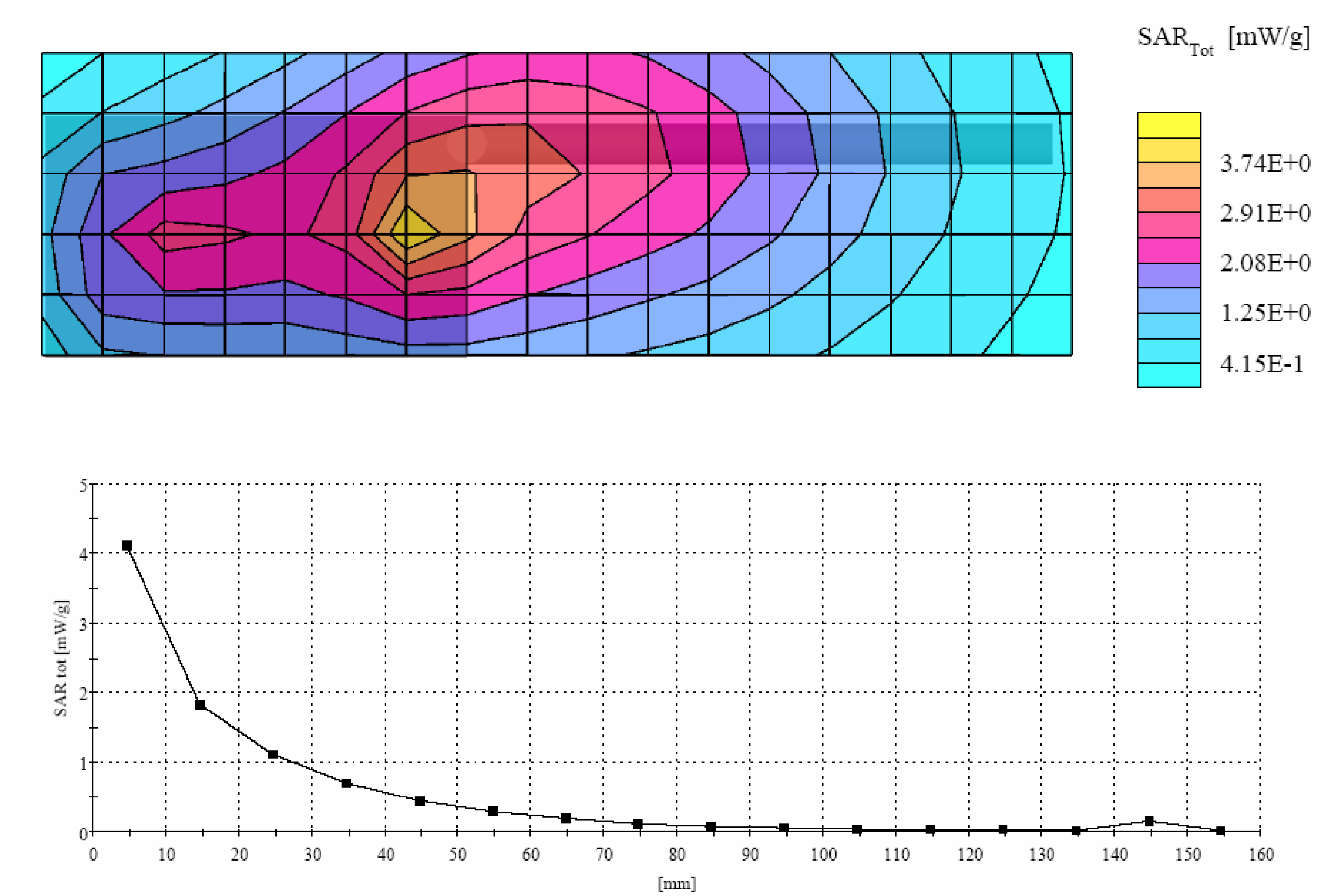


Highest SAR Configurations Results

FCC ID: AZ489FT3810; Test Date: 12/9/04
Motorola CGISS EME Laboratory
Run #: CM-Ab-R3-041209-06
Model #: PMUD2085A SN: 027YEU0007
Tx Freq: 162.025 MHz
Sim tissue temp: 20.2 C
Start power: 5.65 W

Antenna: PMAD4051A
Battery Kit: PMNN4071A
Body worn Acc.: RLN5644A
Audio/Data Acc.: PMLN4444A

DUT w/ body worn accessory against the phantom
Flat Phantom; Position: (90°,90°);
Probe: ET3DV6 - SN1383(Cal Date 25 Feb 2004); ConvF(7.90,7.90,7.90); Probe cal date: 25/2/04; Crest factor: 1.0; FCC Body 162: σ = 0.78 mho/m εr = 60.2 ρ = 1.00 g/cm3; DAE: DAE3V1SN401 Cal Date: 8/25/04
Cube 5x5x7: SAR (1g): 4.11 mW/g, SAR (10g): 2.66 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 43.5, 91.5, 4.7
Power drift: -0.31 dB

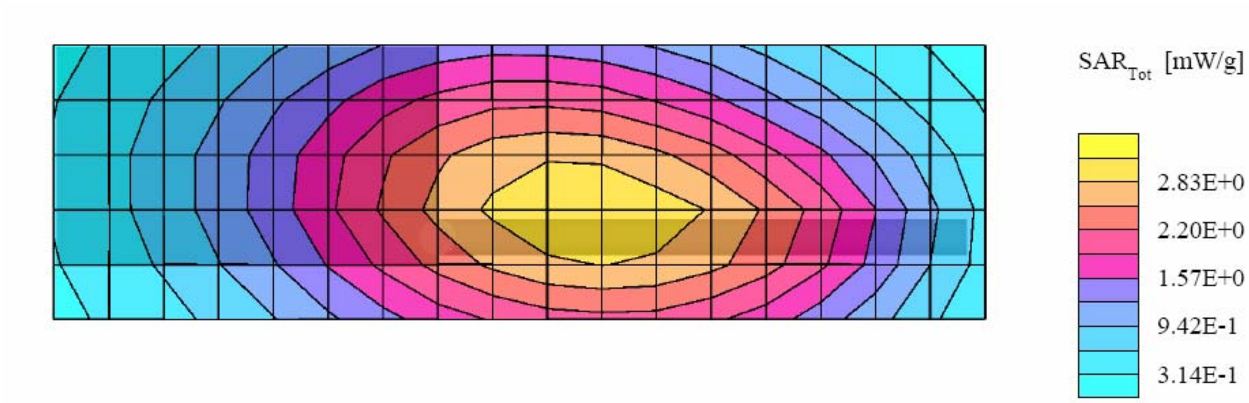


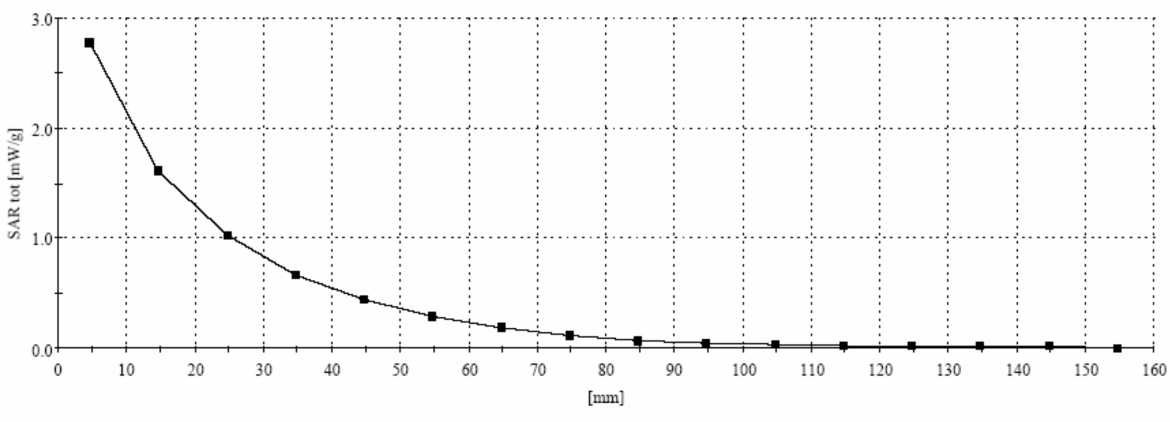
FCC ID: AZ489FT3810; Test Date: 12/10/04
Motorola CGISS EME Laboratory

Run #: CM- Face-R3-041210-06
Model #: PMUD2085A SN: 027YEU0006
Tx Freq: 162.025 MHz
Sim tissue temp: 20.1 C
Start power: 6.22 W

Antenna: PMAD4051A
Battery Kit: PMNN4071A
Body worn Acc.: None
Audio/Data Acc.: None

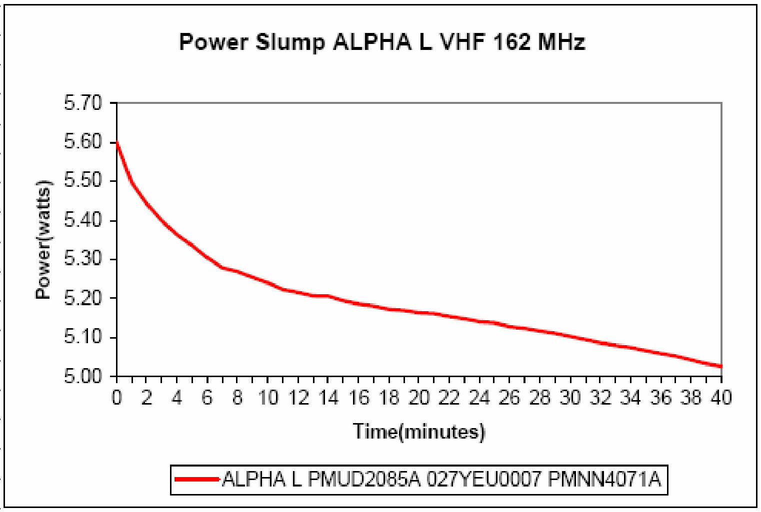
DUT w/ front separated 2.5cm from phantom (Face)
Flat Phantom; Position: (90°,90°);
Probe: ET3DV6 - SN1383(Cal Date 25 Feb 2004); ConvF(8.70,8.70,8.70); Probe cal date: 25/2/04; Crest factor: 1.0; IEEE Head: 162 MHz: σ = 0.77 mho/m εr = 52.1 ρ = 1.00 g/cm3; DAE: DAE3V1SN401 Cal Date: 8/25/04
Cube 5x5x7: SAR (1g): 2.95 mW/g, SAR (10g): 2.20 mW/g * Max outside, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0; Max at 45.0, 145.5, 4.7
Power drift: -0.99 dB
Note: “Max outside” has been identified by SPEAG as an unresolved intermittent occurrence with the DASY 3 application even when the entire peak area is captured.





APPENDIX F
DUT Supplementary Data (Power slump)

Product Name	ALPHA L
Model #	PMUD2085A
Radio s/n	027YEU0007
Battery	PMNN4071A
Frequency(MHz)	162
Time(minutes)	Power(watts)
0	5.60
1	5.50
2	5.44
3	5.40
4	5.36
5	5.34
6	5.31
7	5.28
8	5.27
9	5.25
10	5.24
11	5.22
12	5.22
13	5.21
14	5.21
15	5.19
16	5.19
17	5.18
18	5.17
19	5.17
20	5.16
21	5.16
22	5.15
23	5.15
24	5.14
25	5.14
26	5.13
27	5.12
28	5.12
29	5.11
30	5.10
31	5.10
32	5.09
33	5.08
34	5.08
35	5.07
36	5.06
37	5.05
38	5.04
39	5.03
40	5.03



Appendix G
DUT Test Position Photos

Figure 1: Highest S.A.R. Test Position (Body)
DUT with body worn accessory model RLN5644A against the phantom.
(Same position used for other offered audio accessories)

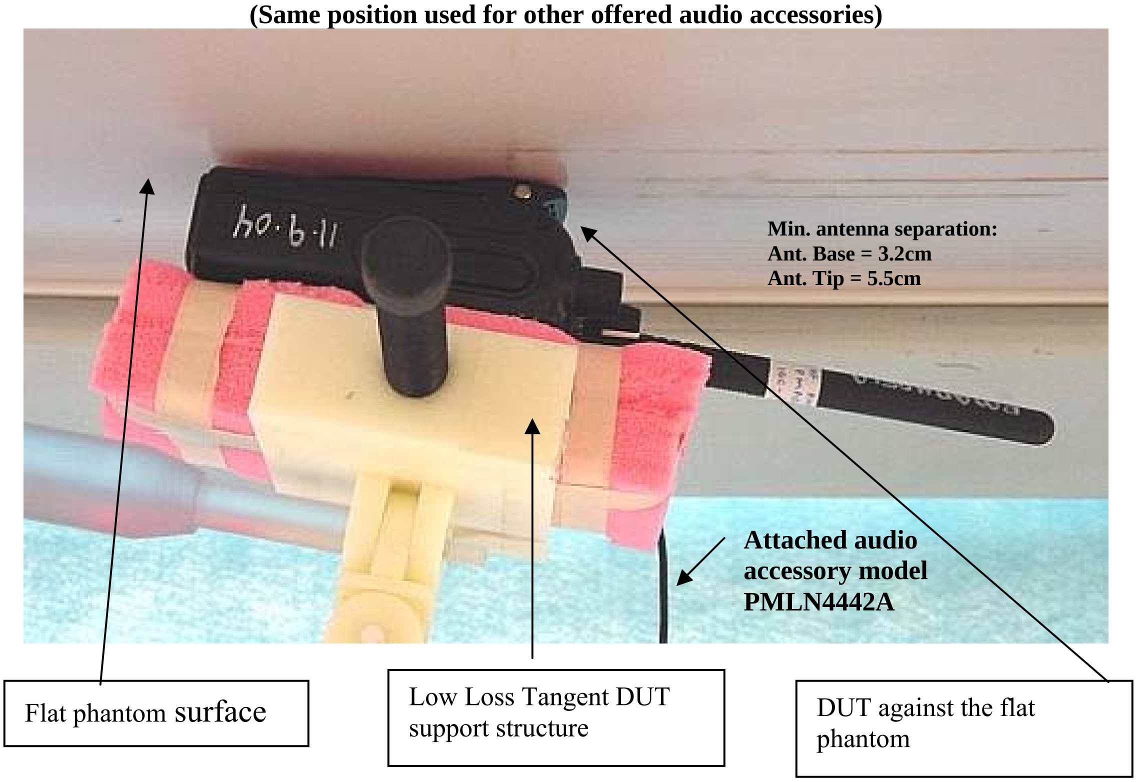


Figure 2: Body Assessment
DUT with body worn accessory model PMLN4691A against the phantom.

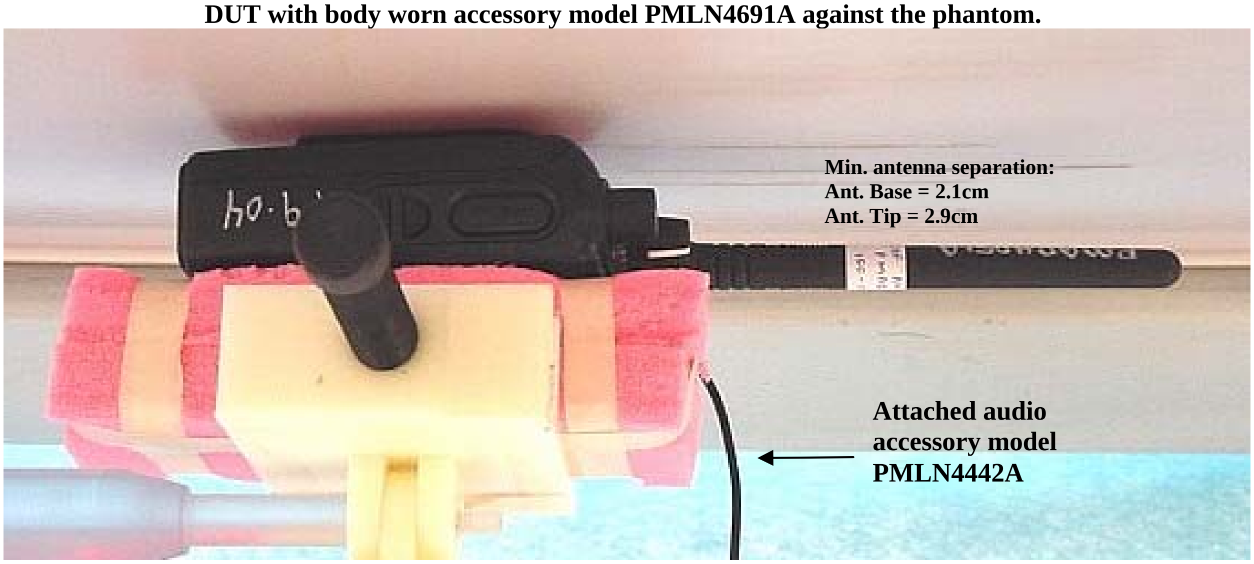


Figure 3: Body Assessment w/ front housing separated 2.5cm

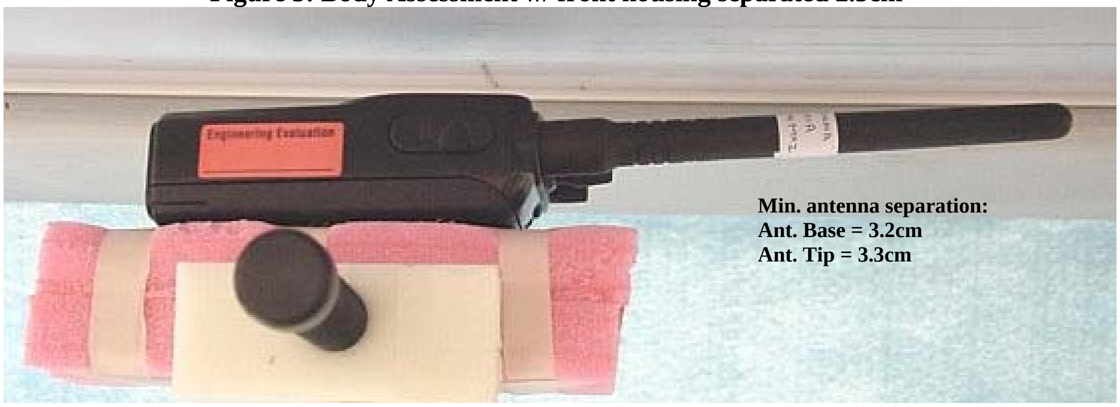
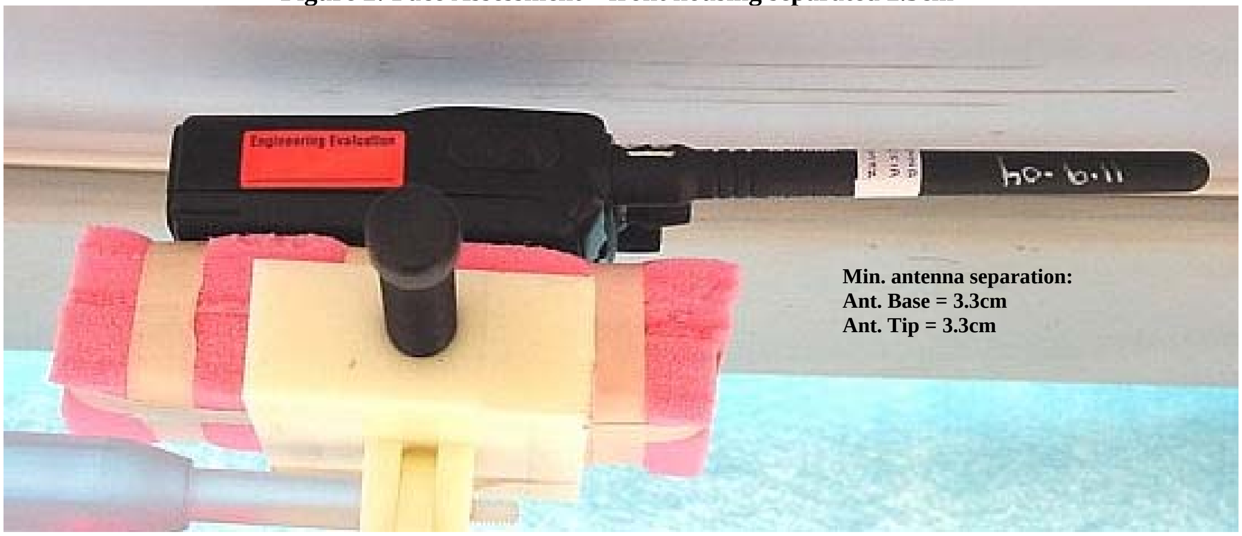


Figure 4: Body Assessment w/ back housing separated 2.5cm

Figure 5: Body Assessment w/ antenna (back towards phantom) separated 2.5cm

Figure 2: Face Assessment – front housing separated 2.5cm



Appendix H
DUT and Accessory Photos

The purpose of this appendix is to illustrate the body-worn carry accessories for FCC ID: AZ489FT3810. The sample that was used in the following photos represents the product used to obtain the results presented herein and was used in this section to demonstrate the different body-worn accessories.

Photo 1.
Model PMLN4691A
Back View

Photo 2.
Model PMLN4691A
Side View

Photo 3.
Model RLN5644A
Back View

Photo 4.
Model RLN5644A
Side View

Appendix I
DUT Body-worn Separation Distances

The following table summarizes the test status and separation distance provided by each of the applicable body-worn accessories:

Carry Case Models	Tested ?	Min. Separation distances between DUT antenna and phantom surface. (mm)	Comments
PMLN4691A	Yes	21	NA
RLN5644A	Yes	32	NA

Audio Acc. Models	Tested ?	Separation distances between DUT antenna and phantom surface. (mm)	Comments
PMMN4008A	Yes	NA	NA
PMLN4442A	Yes	NA	NA
PMLN4443A	Yes	NA	NA
PMLN4444A	Yes	NA	NA
PMLN4445A	Yes	NA	NA