


**MOTOROLA**


TESTING CERT # 2518.01

**FCC ID: AZ492FT7037**  
**DECLARATION OF COMPLIANCE MPE ASSESSMENT Part 2 of 2**

Enterprise Mobility Solution  
 EME Test Laboratory  
 8000 West Sunrise Blvd  
 Fort Lauderdale, FL. 33322

Date of Report: 10/2/09  
 Report Revision: O  
 Report ID: SR7445\_MPE rpt\_APX7500\_7/800 and VHF  
 bands\_Mid power\_Mobile\_Rev O \_091002

**Responsible Engineer:** Kim Uong (Principle Staff EME Eng.)  
**Date/s Tested:** 4/4/08 - 4/21/08; 8/20/09 - 8/21/09  
**Manufacturer/Location:** Motorola Schaumburg, IL  
**Date submitted for test:** 7/15/09  
**DUT Description:** APX7500 mobile 700/800MHz 35W VHF 50W  
**Test TX mode(s):** CW  
**Max. Power output:** 36W (764-806MHz); 42W (806-870MHz); 60W (136-174MHz)  
**TX Frequency Bands:** 700MHz bands: 764-776MHz (talk around); 794-806MHz (Trunked);  
 800MHz bands: 806-824MHz (Trunked); 851-870MHz (talk around);  
 VHF Band: 136 - 174MHz (Trunked/ Talk Around);  
**Signaling type:** Analog, APCO 25, and TDMA (F2)  
**Model(s) Tested:** M30URS9PW1AN, M30KSS9PW1AN  
**Model(s) Certified:** M30TSS9PW1AN  
**Serial Number(s):** 174 (M30URS9PW1AN), QM0KW063 (M30KSS9PW1AN)  
**Classification:** Occupational/Controlled Environment  
**Rule Part(s):** 22 and 90

**DUT Photo**  
*(Refer to Exhibit 7B)*

**Approved Accessories:**  
**Antenna(s):**

Antennas for VHF band	Antennas for 700/800MHz bands
HAD4006A (Roof Mount 136 - 144 MHz, 1/4 Wave, 2.15dBi) HAD4007A (Roof Mount 144-150.8 MHz, 1/4 Wave, 2.15dBi) HAD4008A (Roof Mount 150.8-162 MHz, 1/4 Wave, 2.15dBi) HAD4009A (Roof Mount 162 - 174 MHz, 1/4 Wave, 2.15dBi) RAD4010ARB (Thru-hole Mount 136 - 174 MHz, 1/2 Wave, 5.15dBi) HAD4016A (Roof Mount 136 - 162 MHz, 1/4 Wave, 2.15dBi) HAD4017A (Roof Mount 146 - 174 MHz, 1/4 Wave, 2.15dBi) HAD4021A (Roof Mount 136 - 174 MHz, 1/4 Wave, 2.15dBi)	HAF4016A (Thru-hole Mount 764-870MHz, 1/4 wave, 2.15dBi) HAF4014A (Thru-hole Mount 764-870 MHz, 1/4 wave, 5.15dBi) HAF4013A (Thru-hole Mount 764-870 MHz, 1/4 wave, 5.15dBi) HAF4017A (Thru-hole Mount 764-870 MHz, 1/4 wave, 5.15dBi) RRA4914B (Thru-hole Mount 806 - 900 MHz, 1/4 wave, 5.15dBi) HAF4002A (Thru-hole Mount 806 - 900 MHz, 1/4 wave, 2.15dBi)

**Final RF Exposure Results:**

	<b>700/800MHz Bands</b>	<b>VHF Band</b>
<b>Passenger - Max Calculated Power Density</b>	0.53 mW/cm <sup>2</sup>	0.15 mW/cm <sup>2</sup>
<b>Bystander - Max Calculated Power Density</b>	0.27 mW/cm <sup>2</sup>	0.15 mW/cm <sup>2</sup>

Based on the information and the testing results provided herein, the undersigned certifies that when used as stated in the operating instructions supplied, said product complies with the national and international reference standards and guidelines listed in section 3.0 of this report. This report shall not be reproduced without written approval from an officially designated representative of the Motorola EME Laboratory.

I attest to the accuracy of the data and assume full responsibility for the completeness of these measurements.

This reporting format is consistent with the suggested guidelines of the TIA TSB-159 April 2006

The results and statements contained in this report pertain only to the device(s) evaluated herein.

*Signature on file – Deanna Zakharia*  
**Deanna Zakharia, EMS EME Lab Senior Resource Manager,  
 Laboratory Director,**  
**Approval Date: 10/2/2009**

Certification Date: NA  
 Certification No.: NA

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#### **REVISION HISTORY**

Date	Revision	Comments
10/2/09	O	Initial release

## 1.0 Product and System Description

FCC ID: AZ492FT7037, model M30TSS9PW1AN is a mobile transceiver that utilizes analog, APCO 25 & F2 digital two-way radio communications. The analog modulation scheme uses Frequency Modulation (FM). APCO 25 & F2 digital modes use C4FM of CQPSK family of modulation (Compatible 4-Level Frequency Modulation of Compatible Quadrature Phase Shift Keying). F2 is a TDMA 1:2 protocol that allocates portions of the RF signal by dividing time into two slots (2 slots TDMA). Transmission from a unit or base station is accommodated in time-slot lengths of 30 milliseconds and frame lengths of 60 milliseconds. This product supports voice in analog mode, and both voice and data modes in digital mode.

The maximum duty cycle for TDMA is 1:2 (50%) and is controlled by software. The FM signal is continuous. However because of hand shaking or Push-To-Talk (PTT) between users and/or base stations a conservative 50% duty cycle is applied. The TDMA mode was not tested because its duty cycle is inherently 50% and would include an additional 50% duty cycle for PTT.

The intended use of the radio is PTT while the device is properly installed in a vehicle with an external antenna mounted at the center of the roof or trunk.

This device will be marketed to and used by employees solely for work-related 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.

Accordingly this product is classified as Occupational/Controlled Exposure. However, in accordance with FCC requirements, the passengers inside the vehicle and the bystanders external to the vehicle are evaluated to the General Population/Uncontrolled Exposure Limits.

(Note that "Bystanders" as used herein mean people other than operator)

## 2.0 Additional Options and Accessories

NA

## 3.0 Measurement and Limit Standards

Measurements were performed according to the recommended guidelines in IEEE/ANSI C95.3-2002 and compared to FCC Limits Per 47 CFR 2.1091 (d) for General Population/ Uncontrolled RF Exposure.

For test frequencies ranging from 136 - 174MHz the MPE (Maximum Permissible Exposure) limit to electromagnetic energy in equivalent plane wave free-space power density is 0.2mW/cm<sup>2</sup>.

## 4.0 Measurement System Uncertainty Levels

### Uncertainty Budget for Near Field Probe Measurements

	Tol. ( $\pm$ %)	Prob. Dist.	Divisor	$u_i$ ( $\pm$ %)	$v_i$
<b>Measurement System</b>					
Probe Calibration	6.0	N	1.00	6.0	$\infty$
Survey Meter Calibration	3.0	N	1.00	3.0	$\infty$
Hemispherical Isotropy	8.0	R	1.73	4.6	$\infty$
Linearity	5.0	R	1.73	2.9	$\infty$
Pulse Response	1.0	R	1.73	0.6	$\infty$
RF Ambient Noise	3.0	R	1.73	1.7	$\infty$
RF Reflections	8.0	R	1.73	4.6	$\infty$
Probe Positioning	10.0	R	1.73	5.8	$\infty$
<b>Test sample Related</b>					
Antenna Positioning	3.0	N	1.00	3.0	$\infty$
Power drift	5.0	R	1.73	2.9	$\infty$
<b>Combined Standard</b>		RSS		12.2	$\infty$
<b>Expanded Uncertainty (95% CONFIDENCE LEVEL)</b>			$k=2$		24

FCD-1770, Rev. 1

## 5.0 Method of Measurement

### 5.1 EME measurements made with trunk mounted antenna(s) (Refer to APPENDIX A for antenna location and test distances)

#### 5.1.1 External/Bystander vehicle EME measurement (Antenna mounted at trunk center)

MPE measurements for bystander conditions are determined by taking the average of (10) measurements in a 2m vertical line for each of the (3) test locations indicated in appendix A with 20cm increments at the test distance of 90cm from the antenna under test. The measurement probe is positioned orthogonal to antenna (typically parallel to ground with a vertically mounted antenna) and aimed directly at the antenna's axis. These measurements are representative of persons other than the operator standing next to the vehicle.

Each of the offered antennas mounted at the center of the trunk were assessed at the rear of the vehicle while maintaining a twenty (20) centimeter separation distance between the probe sensor and vehicle body. The worst case antenna was then tested at a 45° radial at the corner of the trunk, and 90° radial at the side of the trunk.

For the current test vehicle, the antenna to probe sensor separation distance is 90cm (directly behind vehicle), 104 cm (45 degree radial) and 110.5 cm (90 degree radial).

**Note: The distance from the trunk-mounted antenna to the edge of the vehicle is 42cm and the distance from the edge of the vehicle's trunk to the Survey Probe Sensor is 48cm.**

### **5.1.2 Internal/Passenger vehicle EME measurement (Antenna mounted at trunk center)**

MPE measurements for passenger conditions are determined by taking the average of the (3) measurements (Head, Chest, and Lower Trunk) inside the vehicle for both the front and back seats. The measurement probe is positioned orthogonal to antenna (typically parallel to ground with a vertically mounted antenna), and aimed directly at the antenna's axis while the antenna is at 85cm from the back of the backseat passenger's head. These measurements are representative of operator and passengers sitting in the front and back seat of the vehicle.

## **5.2 EME measurements made with roof mounted antenna(s) (Refer to APPENDIX A for antenna location and test distances)**

### **5.2.1 External/Bystander vehicle EME measurement (Antenna mounted at roof center)**

MPE measurements for bystander conditions are determined by taking the average of (10) measurements in a 2m vertical line for the test location indicated in APPENDIX A with 20cm increments at the test distance of 90cm from the antenna under test. The measurement probe is positioned orthogonal to antenna (typically parallel to ground with a vertically mounted antenna) and aimed directly at the antenna's axis. These measurements are representative of persons other than the operator standing next to the vehicle.

**Note: Actual test distance was approximately 117cm from antenna to probe element (97cm from antenna to edge of car door; 20cm vertical test line to car door); this is the closest distance that can be achieved to an antenna mounted to the center of the vehicle used for MPE compliance assessment.**

### **5.2.2 Internal/Passenger vehicle EME measurement (Antenna mounted at roof center)**

MPE measurements for passenger conditions are determined by taking the average of the (3) measurements (Head, Chest, and Lower Trunk) inside the vehicle for both the front and back seats. The measurement probe is positioned orthogonal to antenna (typically parallel to ground with a vertically mounted antenna) and aimed directly at the antenna's axis. These measurements are representative of operator and passengers sitting in the front and back seat of the vehicle.

## 6.0 Test Site

The test site is the Motorola open area test site located at 8000 W. Sunrise Blvd., Plantation, FL. 33322.

## 7.0 Measurement System/Equipment

Equipment Type	Model #	SN	Calibration Date
Automobile	2003 Ford Crown Victoria, 4-Door	NA	NA
Survey Meter	ETS Model HI-2200	00086887	1/13/2009; 12/4/2008
Probe: E-Field (Electric Field)	ETS Model E100	00083370	12/4/2008
Probe: H-Field (Magnetic Field)	ETS Model H200	00084225	1/13/2009

## 8.0 DUT Output Power

Power density measurements were performed with the test frequencies and associated power levels presented in the table below.

Test Frequencies (MHz)	Measured Initial Power (W)
136.0000	57.6
146.0000	58.0
147.4000	58.1
149.0000	58.0
155.0000	58.3
156.4000	58.2
160.0000	57.9
162.0000	58.0
173.9875	58.2

## 9.0 Test Set-Up Description

All antennas listed on the cover page of this report were considered in order to develop the test plan for this product with the following restrictions.

- a) The  $\frac{1}{4}$  wave 2.15dBi gain antennas (HAD4006A, HAD4007A, HAD4008A, HAD4009A, HAD4016A, HAD4017A, HAD4021A), and the  $\frac{1}{2}$  wave 5.15dBi gain antenna (RAD4010ARB) were assessed while mounted at the center of the roof of the test vehicle.
- b) The  $\frac{1}{2}$  wave 5.15dBi gain antenna (RAD4010ARB) was assessed while mounted at the center of the trunk of the test vehicle.

Assessments were performed with DUT (Device Under Test) installed on a test vehicle, while engine was at idle, at the specified distances and test locations indicated in section 5.0 and APPENDIX A.

## 10.0 Test Results Summary

The tables below summarized the MPE measurement results for each test configuration: antenna (model and description), antenna gain, TX frequency, maximum output power, initial power, E/H field measurements, probe frequency cal factor, test positions (BS-Bystander, PB-Passenger Back, PF-Passenger Front), average over body results, calculated power density results, max calculated power density results, % of the applicable specification limit, and applicable FCC specification limits.

MPE results for this mobile radio are based on 50% duty cycle which is in accordance with the User Manual instructions.

Below is an explanation of how the MPE results are calculated.

External to vehicle (Bystander) -10 measurements are averaged over the body (*body\_avg*).

Internal to vehicle (Passengers) - 3 measurements are averaged over the body (*body\_avg*).

The Average over Body test methodology is consistent with IEEE/ANSI C95.3-2002 guidelines.

Therefore;

$$\text{Pwr\_density\_calc} = \text{body\_avg} * (\text{probe\_frequency\_cal\_factor})^2 * \text{duty\_cycle}$$

$$\text{Pwr\_density\_max\_calc} = \text{pwr\_density\_calc} * \frac{\text{max\_output\_power}}{\text{initial\_output\_power}}$$

Note1: For initial output power > max\_output\_power; max\_output\_power / initial output power = 1

Note2: The probe frequency cal factors used for MPE evaluation of this product are based on the worse case.

Note 3: The calibration certificate's frequency cal factors were determined by measuring V/m for E-field probe and A/m for H-field probe. The results presented herein are power density (mW/cm<sup>2</sup>) and therefore the cal factors were squared as indicated in the formula above.

Note 4: The H-field measurements were done in A/m. Therefore the calculated power density results were converted to mW/cm<sup>2</sup> using the formula: mW/cm<sup>2</sup> = (A/m)<sup>2</sup>\*37.699.

**Table 1: E-field - MPE assessment data with antennas mounted on the roof**

<b>Ant. Model/ Desc.</b>	<b>Ant. Gain (dBi)</b>	<b>Tx Freq (MHz)</b>	<b>Max Pwr (W)</b>	<b>Initial Pwr (W)</b>	<b>Test Mode</b>	<b>E/H Field</b>	<b>Probe Freq. Cal Factor</b>	<b>Test Pos.</b>	<b>Avg. over Body (mW/cm<sup>2</sup>)</b>	<b>Calc. (mW/cm<sup>2</sup>)</b>	<b>Max Calc. (mW/cm<sup>2</sup>)</b>	<b>% of Spec Limit</b>	<b>FCC Spec Limit (mW/cm<sup>2</sup>)</b>
<b>HAD4016A</b>													
HAD4016A (136 - 162 MHz, 1/4W)	2.15	136.0000	60	57.6	CW	E	0.99	BS	0.11	0.05	0.05	27	0.2
HAD4016A (136 - 162 MHz, 1/4W)	2.15	136.0000	60	57.6	CW	E	0.99	PB	0.13	0.06	0.07	34	0.2
HAD4016A (136 - 162 MHz, 1/4W)	2.15	136.0000	60	57.6	CW	E	0.99	PF	0.04	0.02	0.02	9	0.2
HAD4016A (136 - 162 MHz, 1/4W)	2.15	149.0000	60	58	CW	E	0.98	BS	0.12	0.06	0.06	29	0.2
HAD4016A (136 - 162 MHz, 1/4W)	2.15	149.0000	60	58	CW	E	0.98	PB	0.09	0.05	0.05	24	0.2
HAD4016A (136 - 162 MHz, 1/4W)	2.15	149.0000	60	58	CW	E	0.98	PF	0.10	0.05	0.05	25	0.2
HAD4016A (136 - 162 MHz, 1/4W)	2.15	162.0000	60	58	CW	E	0.96	BS	0.10	0.05	0.05	25	0.2
HAD4016A (136 - 162 MHz, 1/4W)	2.15	162.0000	60	58	CW	E	0.96	PB	0.09	0.04	0.04	22	0.2
HAD4016A (136 - 162 MHz, 1/4W)	2.15	162.0000	60	58	CW	E	0.96	PF	0.03	0.01	0.01	7	0.2
<b>HAD4017A</b>													
HAD4017A (146 - 174 MHz, 1/4W)	2.15	146.0000	60	58	CW	E	0.98	BS	0.07	0.03	0.04	18	0.2
HAD4017A (146 - 174 MHz, 1/4W)	2.15	146.0000	60	58	CW	E	0.98	PB	0.10	0.05	0.05	25	0.2
HAD4017A (146 - 174 MHz, 1/4W)	2.15	146.0000	60	58	CW	E	0.98	PF	0.06	0.03	0.03	15	0.2
HAD4017A (146 - 174 MHz, 1/4W)	2.15	160.0000	60	57.9	CW	E	0.96	BS	0.13	0.06	0.06	31	0.2
HAD4017A (146 - 174 MHz, 1/4W)	2.15	160.0000	60	57.9	CW	E	0.96	PB	0.07	0.03	0.03	17	0.2
HAD4017A (146 - 174 MHz, 1/4W)	2.15	160.0000	60	57.9	CW	E	0.96	PF	0.03	0.01	0.01	7	0.2
HAD4017A (146 - 174 MHz, 1/4W)	2.15	173.9875	60	58.2	CW	E	0.94	BS	0.16	0.07	0.08	38	0.2
HAD4017A (146 - 174 MHz, 1/4W)	2.15	173.9875	60	58.2	CW	E	0.94	PB	0.08	0.04	0.04	19	0.2
HAD4017A (146 - 174 MHz, 1/4W)	2.15	173.9875	60	58.2	CW	E	0.94	PF	0.03	0.01	0.01	6	0.2

**Table 1 (cont): E field - MPE assessment data with antenna mounted on the roof**

Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Freq. Cal Factor	Test Pos.	Avg. over Body (mW/cm <sup>2</sup> )	Calc. (mW/cm <sup>2</sup> )	Max Calc. (mW/cm <sup>2</sup> )	% of Spec Limit	FCC Spec Limit (mW/cm <sup>2</sup> )
<b>RAD4010ARB</b>													
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	136.0000	60	57.6	CW	E	0.99	BS	0.06	0.03	0.03	16	0.2
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	136.0000	60	57.6	CW	E	0.99	PB	0.02	0.01	0.01	6	0.2
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	136.0000	60	57.6	CW	E	0.99	PF	0.00	0.00	0.00	0	0.2
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	155.0000	60	58.3	CW	E	0.97	BS	0.09	0.05	0.05	23	0.2
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	155.0000	60	58.3	CW	E	0.97	PB	0.06	0.03	0.03	15	0.2
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	155.0000	60	58.3	CW	E	0.97	PF	0.01	0.00	0.00	2	0.2
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	173.9875	60	58.2	CW	E	0.94	BS	0.12	0.05	0.06	28	0.2
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	173.9875	60	58.2	CW	E	0.94	PB	0.06	0.03	0.03	14	0.2
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	173.9875	60	58.2	CW	E	0.94	PF	0.02	0.01	0.01	4	0.2
<b>HAD4006A</b>													
HAD4006A (136-144 MHz, 1/4W)	2.15	136.0000	60	57.6	CW	E	0.99	BS	0.13	0.06	0.07	34	0.2
HAD4006A (136-144 MHz, 1/4W)	2.15	136.0000	60	57.6	CW	E	0.99	PB	0.16	0.08	0.08	41	0.2
HAD4006A (136-144 MHz, 1/4W)	2.15	136.0000	60	57.6	CW	E	0.99	PF	0.05	0.02	0.02	12	0.2
<b>HAD4007A</b>													
HAD4007A (144- 150.8 MHz, 1/4W)	2.15	147.4000	60	58.1	CW	E	0.98	BS	0.13	0.06	0.06	32	0.2
HAD4007A (144- 150.8 MHz, 1/4W)	2.15	147.4000	60	58.1	CW	E	0.98	PB	0.12	0.06	0.06	30	0.2
HAD4007A (144- 150.8 MHz, 1/4W)	2.15	147.4000	60	58.1	CW	E	0.98	PF	0.10	0.05	0.05	25	0.2
<b>HAD4008A</b>													
HAD4008A (150.8- 162 MHz, 1/4W)	2.15	156.4000	60	58.2	CW	E	0.97	BS	0.15	0.07	0.07	37	0.2
HAD4008A (150.8- 162 MHz, 1/4W)	2.15	156.4000	60	58.2	CW	E	0.97	PB	0.17	0.08	0.09	43	0.2
HAD4008A (150.8- 162 MHz, 1/4W)	2.15	156.4000	60	58.2	CW	E	0.97	PF	0.09	0.05	0.05	23	0.2

**Table 1 (cont): E field - MPE assessment data with antenna mounted on the roof**

<b>Ant. Model/ Desc.</b>	<b>Ant. Gain (dBi)</b>	<b>Tx Freq (MHz)</b>	<b>Max Pwr (W)</b>	<b>Initial Pwr (W)</b>	<b>Test Mode</b>	<b>E/H Field</b>	<b>Probe Freq. Cal Factor</b>	<b>Test Pos.</b>	<b>Avg. over Body (mW/cm<sup>2</sup>)</b>	<b>Calc. (mW/cm<sup>2</sup>)</b>	<b>Max Calc. (mW/cm<sup>2</sup>)</b>	<b>% of Spec Limit</b>	<b>FCC Spec Limit (mW/cm<sup>2</sup>)</b>
<b>HAD4009A</b>													
HAD4009A (162 - 174 MHz, 1/4W)	2.15	173.9875	60	58.2	CW	E	0.94	BS	0.16	0.08	0.08	39	0.2
HAD4009A (162 - 174 MHz, 1/4W)	2.15	173.9875	60	58.2	CW	E	0.94	PB	0.07	0.03	0.04	18	0.2
HAD4009A (162 - 174 MHz, 1/4W)	2.15	173.9875	60	58.2	CW	E	0.94	PF	0.02	0.01	0.01	4	0.2
<b>HAD4021A</b>													
HAD4021A (136 - 174 MHz, 1/4W)	2.15	136.0000	60	57.6	CW	E	0.99	BS	0.10	0.05	0.05	27	0.2
HAD4021A (136 - 174 MHz, 1/4W)	2.15	136.0000	60	57.6	CW	E	0.99	PB	0.14	0.07	0.07	35	0.2
HAD4021A (136 - 174 MHz, 1/4W)	2.15	136.0000	60	57.6	CW	E	0.99	PF	0.03	0.01	0.02	8	0.2
HAD4021A (136 - 174 MHz, 1/4W)	2.15	155.0000	60	58.3	CW	E	0.97	BS	0.12	0.06	0.06	29	0.2
HAD4021A (136 - 174 MHz, 1/4W)	2.15	155.0000	60	58.3	CW	E	0.97	PB	0.16	0.08	0.08	40	0.2
HAD4021A (136 - 174 MHz, 1/4W)	2.15	155.0000	60	58.3	CW	E	0.97	PF	0.07	0.04	0.04	18	0.2
HAD4021A (136 - 174 MHz, 1/4W)	2.15	173.9875	60	58.2	CW	E	0.94	BS	0.11	0.05	0.05	27	0.2
HAD4021A (136 - 174 MHz, 1/4W)	2.15	173.9875	60	58.2	CW	E	0.94	PB	0.05	0.02	0.02	12	0.2
HAD4021A (136 - 174 MHz, 1/4W)	2.15	173.9875	60	58.2	CW	E	0.94	PF	0.01	0.00	0.00	2	0.2

**Table 2: H field - MPE assessment data with antenna mounted on the roof**

<b>Ant. Model/ Desc.</b>	<b>Ant. Gain (dBi)</b>	<b>Tx Freq (MHz)</b>	<b>Max Pwr (W)</b>	<b>Initial Pwr (W)</b>	<b>Test Mode</b>	<b>E/H Field</b>	<b>Probe Freq. Cal Factor</b>	<b>Test Pos.</b>	<b>Avg. over Body (mW/cm<sup>2</sup>)</b>	<b>Calc. (mW/cm<sup>2</sup>)</b>	<b>Max Calc. (mW/cm<sup>2</sup>)</b>	<b>% of Spec Limit</b>	<b>FCC Spec Limit (mW/cm<sup>2</sup>)</b>
<b>HAD4016A</b>													
HAD4016A (136 - 162 MHz, 1/4W)	2.15	136.0000	60	57.6	CW	H	0.79	BS	0.14	0.06	0.06	29	0.2
HAD4016A (136 - 162 MHz, 1/4W)	2.15	136.0000	60	57.6	CW	H	0.79	PB	0.08	0.03	0.03	17	0.2
HAD4016A (136 - 162 MHz, 1/4W)	2.15	136.0000	60	57.6	CW	H	0.79	PF	0.04	0.02	0.02	9	0.2
HAD4016A (136 - 162 MHz, 1/4W)	2.15	149.0000	60	58	CW	H	0.74	BS	0.17	0.06	0.06	32	0.2
HAD4016A (136 - 162 MHz, 1/4W)	2.15	149.0000	60	58	CW	H	0.74	PB	0.09	0.03	0.04	18	0.2
HAD4016A (136 - 162 MHz, 1/4W)	2.15	149.0000	60	58	CW	H	0.74	PF	0.07	0.03	0.03	14	0.2
HAD4016A (136 - 162 MHz, 1/4W)	2.15	162.0000	60	58	CW	H	0.71	BS	0.12	0.04	0.04	22	0.2
HAD4016A (136 - 162 MHz, 1/4W)	2.15	162.0000	60	58	CW	H	0.71	PB	0.05	0.02	0.02	9	0.2
HAD4016A (136 - 162 MHz, 1/4W)	2.15	162.0000	60	58	CW	H	0.71	PF	0.02	0.01	0.01	4	0.2
<b>HAD4017A</b>													
HAD4017A (146 - 174 MHz, 1/4W)	2.15	146.0000	60	58	CW	H	0.75	BS	0.09	0.03	0.03	17	0.2
HAD4017A (146 - 174 MHz, 1/4W)	2.15	146.0000	60	58	CW	H	0.75	PB	0.07	0.03	0.03	14	0.2
HAD4017A (146 - 174 MHz, 1/4W)	2.15	146.0000	60	58	CW	H	0.75	PF	0.04	0.02	0.02	8	0.2
HAD4017A (146 - 174 MHz, 1/4W)	2.15	160.0000	60	57.9	CW	H	0.71	BS	0.15	0.05	0.06	28	0.2
HAD4017A (146 - 174 MHz, 1/4W)	2.15	160.0000	60	57.9	CW	H	0.71	PB	0.08	0.03	0.03	15	0.2
HAD4017A (146 - 174 MHz, 1/4W)	2.15	160.0000	60	57.9	CW	H	0.71	PF	0.03	0.01	0.01	5	0.2
HAD4017A (146 - 174 MHz, 1/4W)	2.15	173.9875	60	58.2	CW	H	0.68	BS	0.18	0.06	0.06	31	0.2
HAD4017A (146 - 174 MHz, 1/4W)	2.15	173.9875	60	58.2	CW	H	0.68	PB	0.08	0.03	0.03	14	0.2
HAD4017A (146 - 174 MHz, 1/4W)	2.15	173.9875	60	58.2	CW	H	0.68	PF	0.03	0.01	0.01	5	0.2

**Table 2 (cont): H field - MPE assessment data with antenna mounted on the roof**

<b>Ant. Model/ Desc.</b>	<b>Ant. Gain (dBi)</b>	<b>Tx Freq (MHz)</b>	<b>Max Pwr (W)</b>	<b>Initial Pwr (W)</b>	<b>Test Mode</b>	<b>E/H Field</b>	<b>Probe Freq. Cal Factor</b>	<b>Test Pos.</b>	<b>Avg. over Body (mW/cm<sup>2</sup>)</b>	<b>Calc. (mW/cm<sup>2</sup>)</b>	<b>Max Calc. (mW/cm<sup>2</sup>)</b>	<b>% of Spec Limit</b>	<b>FCC Spec Limit (mW/cm<sup>2</sup>)</b>
<b>RAD4010ARB</b>													
RAD4010ARB (136 - 174 MHz, 5.15	5.15	136.0000	60	57.6	CW	H	0.79	BS	0.05	0.02	0.02	10	0.2
RAD4010ARB (136 - 174 MHz, 5.15	5.15	136.0000	60	57.6	CW	H	0.79	PB	0.02	0.01	0.01	4	0.2
RAD4010ARB (136 - 174 MHz, 5.15	5.15	136.0000	60	57.6	CW	H	0.79	PF	0.01	0.00	0.00	1	0.2
RAD4010ARB (136 - 174 MHz, 5.15	5.15	155.0000	60	58.3	CW	H	0.73	BS	0.09	0.03	0.03	16	0.2
RAD4010ARB (136 - 174 MHz, 5.15	5.15	155.0000	60	58.3	CW	H	0.73	PB	0.04	0.02	0.02	8	0.2
RAD4010ARB (136 - 174 MHz, 5.15	5.15	155.0000	60	58.3	CW	H	0.73	PF	0.01	0.00	0.00	2	0.2
RAD4010ARB (136 - 174 MHz, 5.15	5.15	173.9875	60	58.2	CW	H	0.68	BS	0.14	0.05	0.05	25	0.2
RAD4010ARB (136 - 174 MHz, 5.15	5.15	173.9875	60	58.2	CW	H	0.68	PB	0.03	0.01	0.01	6	0.2
RAD4010ARB (136 - 174 MHz, 5.15	5.15	173.9875	60	58.2	CW	H	0.68	PF	0.02	0.01	0.01	3	0.2
<b>HAD4006A</b>													
HAD4006A (136-144 MHz, 1/4W) 2.15	2.15	136.0000	60	57.6	CW	H	0.79	BS	0.16	0.06	0.07	33	0.2
HAD4006A (136-144 MHz, 1/4W) 2.15	2.15	136.0000	60	57.6	CW	H	0.79	PB	0.09	0.04	0.04	19	0.2
HAD4006A (136-144 MHz, 1/4W) 2.15	2.15	136.0000	60	57.6	CW	H	0.79	PF	0.05	0.02	0.02	10	0.2
<b>HAD4007A</b>													
HAD4007A (144-150.8 MHz, 1/4W) 2.15	2.15	147.4000	60	58.1	CW	H	0.75	BS	0.14	0.05	0.06	28	0.2
HAD4007A (144-150.8 MHz, 1/4W) 2.15	2.15	147.4000	60	58.1	CW	H	0.75	PB	0.11	0.04	0.04	21	0.2
HAD4007A (144-150.8 MHz, 1/4W) 2.15	2.15	147.4000	60	58.1	CW	H	0.75	PF	0.05	0.02	0.02	10	0.2
<b>HAD4008A</b>													
HAD4008A (150.8-162 MHz, 1/4W) 2.15	2.15	156.4000	60	58.2	CW	H	0.72	BS	0.16	0.06	0.06	30	0.2
HAD4008A (150.8-162 MHz, 1/4W) 2.15	2.15	156.4000	60	58.2	CW	H	0.72	PB	0.09	0.03	0.03	17	0.2
HAD4008A (150.8-162 MHz, 1/4W) 2.15	2.15	156.4000	60	58.2	CW	H	0.72	PF	0.03	0.01	0.01	6	0.2

**Table 2 (cont): H field - MPE assessment data with antenna mounted on the roof**

<b>Ant. Model/ Desc.</b>	<b>Ant. Gain (dBi)</b>	<b>Tx Freq (MHz)</b>	<b>Max Pwr (W)</b>	<b>Initial Pwr (W)</b>	<b>Test Mode</b>	<b>E/H Field</b>	<b>Probe Freq. Cal Factor</b>	<b>Test Pos.</b>	<b>Avg. over Body (mW/cm<sup>2</sup>)</b>	<b>Calc. (mW/cm<sup>2</sup>)</b>	<b>Max Calc. (mW/cm<sup>2</sup>)</b>	<b>% of Spec Limit</b>	<b>FCC Spec Limit (mW/cm<sup>2</sup>)</b>
<b>HAD4009A</b>													
HAD4009A (162 - 174 MHz, 1/4W)	2.15	173.9875	60	58.2	CW	H	0.68	BS	0.17	0.06	0.06	31	0.2
HAD4009A (162 - 174 MHz, 1/4W)	2.15	173.9875	60	58.2	CW	H	0.68	PB	0.07	0.02	0.02	12	0.2
HAD4009A (162 - 174 MHz, 1/4W)	2.15	173.9875	60	58.2	CW	H	0.68	PF	0.03	0.01	0.01	5	0.2
<b>HAD4021A</b>													
HAD4021A (136 - 174 MHz, 1/4W)	2.15	136.0000	60	57.6	CW	H	0.79	BS	0.13	0.05	0.05	27	0.2
HAD4021A (136 - 174 MHz, 1/4W)	2.15	136.0000	60	57.6	CW	H	0.79	PB	0.07	0.03	0.03	15	0.2
HAD4021A (136 - 174 MHz, 1/4W)	2.15	136.0000	60	57.6	CW	H	0.79	PF	0.03	0.01	0.01	7	0.2
HAD4021A (136 - 174 MHz, 1/4W)	2.15	155.0000	60	58.3	CW	H	0.73	BS	0.13	0.05	0.05	25	0.2
HAD4021A (136 - 174 MHz, 1/4W)	2.15	155.0000	60	58.3	CW	H	0.73	PB	0.09	0.03	0.04	18	0.2
HAD4021A (136 - 174 MHz, 1/4W)	2.15	155.0000	60	58.3	CW	H	0.73	PF	0.03	0.01	0.01	5	0.2
HAD4021A (136 - 174 MHz, 1/4W)	2.15	173.9875	60	58.2	CW	H	0.68	BS	0.14	0.05	0.05	24	0.2
HAD4021A (136 - 174 MHz, 1/4W)	2.15	173.9875	60	58.2	CW	H	0.68	PB	0.06	0.02	0.02	11	0.2
HAD4021A (136 - 174 MHz, 1/4W)	2.15	173.9875	60	58.2	CW	H	0.68	PF	0.03	0.01	0.01	6	0.2

**Table 3: E field - MPE assessment data with antenna mounted on the trunk**

<b>Ant. Model/ Desc.</b>	<b>Ant. Gain (dBi)</b>	<b>Tx Freq (MHz)</b>	<b>Max Pwr (W)</b>	<b>Initial Pwr (W)</b>	<b>Test Mode</b>	<b>E/H Field</b>	<b>Probe Freq. Cal Factor</b>	<b>Test Pos.</b>	<b>Avg. over Body (mW/cm<sup>2</sup>)</b>	<b>Calc. (mW/cm<sup>2</sup>)</b>	<b>Max Calc. (mW/cm<sup>2</sup>)</b>	<b>% of Spec Limit</b>	<b>FCC Spec Limit (mW/cm<sup>2</sup>)</b>
<b>RAD4010ARB</b>													
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	136.0000	60	57.6	CW	E	0.99	BS	0.19	0.09	0.10	48	0.2
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	136.0000	60	57.6	CW	E	0.99	PB	0.03	0.02	0.02	9	0.2
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	136.0000	60	57.6	CW	E	0.99	PF	0.00	0.00	0.00	1	0.2
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	155.0000	60	58.3	CW	E	0.97	BS	0.25	0.12	0.13	63	0.2
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	155.0000	60	58.3	CW	E	0.97	PB	0.09	0.04	0.04	22	0.2
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	155.0000	60	58.3	CW	E	0.97	PF	0.01	0.00	0.00	2	0.2
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	173.9875	60	58.2	CW	E	0.94	BS	0.31	0.14	0.15	75	0.2
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	173.9875	60	58.2	CW	E	0.94	PB	0.31	0.15	0.15	76	0.2
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	173.9875	60	58.2	CW	E	0.94	PF	0.03	0.01	0.01	7	0.2
<b>----- 45 Degree -----</b>													
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	173.9875	60	58.2	CW	E	0.94	BS	0.23	0.11	0.11	56	0.2
<b>----- 90 Degree -----</b>													
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	173.9875	60	58.2	CW	E	0.94	BS	0.21	0.10	0.10	51	0.2

**Table 4: H field - MPE assessment data with antenna mounted on the trunk**

<b>Ant. Model/ Desc.</b>	<b>Ant. Gain (dBi)</b>	<b>Tx Freq (MHz)</b>	<b>Max Pwr (W)</b>	<b>Initial Pwr (W)</b>	<b>Test Mode</b>	<b>E/H Field</b>	<b>Probe Freq. Cal Factor</b>	<b>Test Pos.</b>	<b>Avg. over Body (mW/cm<sup>2</sup>)</b>	<b>Calc. (mW/cm<sup>2</sup>)</b>	<b>Max Calc. (mW/cm<sup>2</sup>)</b>	<b>% of Spec Limit</b>	<b>FCC Spec Limit (mW/cm<sup>2</sup>)</b>
<b>RAD4010ARB</b>													
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	136.0000	60	57.6	CW	H	0.79	BS	0.17	0.07	0.07	35	0.2
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	136.0000	60	57.6	CW	H	0.79	PB	0.03	0.01	0.01	6	0.2
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	136.0000	60	57.6	CW	H	0.79	PF	0.01	0.00	0.00	2	0.2
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	155.0000	60	58.3	CW	H	0.73	BS	0.30	0.11	0.11	56	0.2
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	155.0000	60	58.3	CW	H	0.73	PB	0.03	0.01	0.01	6	0.2
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	155.0000	60	58.3	CW	H	0.73	PF	0.02	0.01	0.01	3	0.2
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	173.9875	60	58.2	CW	H	0.68	BS	0.41	0.14	0.14	71	0.2
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	173.9875	60	58.2	CW	H	0.68	PB	0.33	0.11	0.12	58	0.2
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	173.9875	60	58.2	CW	H	0.68	PF	0.04	0.01	0.01	7	0.2
<b>----- 45 Degree -----</b>													
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	173.9875	60	58.2	CW	H	0.68	BS	0.33	0.11	0.12	58	0.2
<b>----- 90 Degree -----</b>													
RAD4010ARB (136 - 174 MHz, 1/2 Wave )	5.15	173.9875	60	58.2	CW	H	0.68	BS	0.31	0.11	0.11	55	0.2

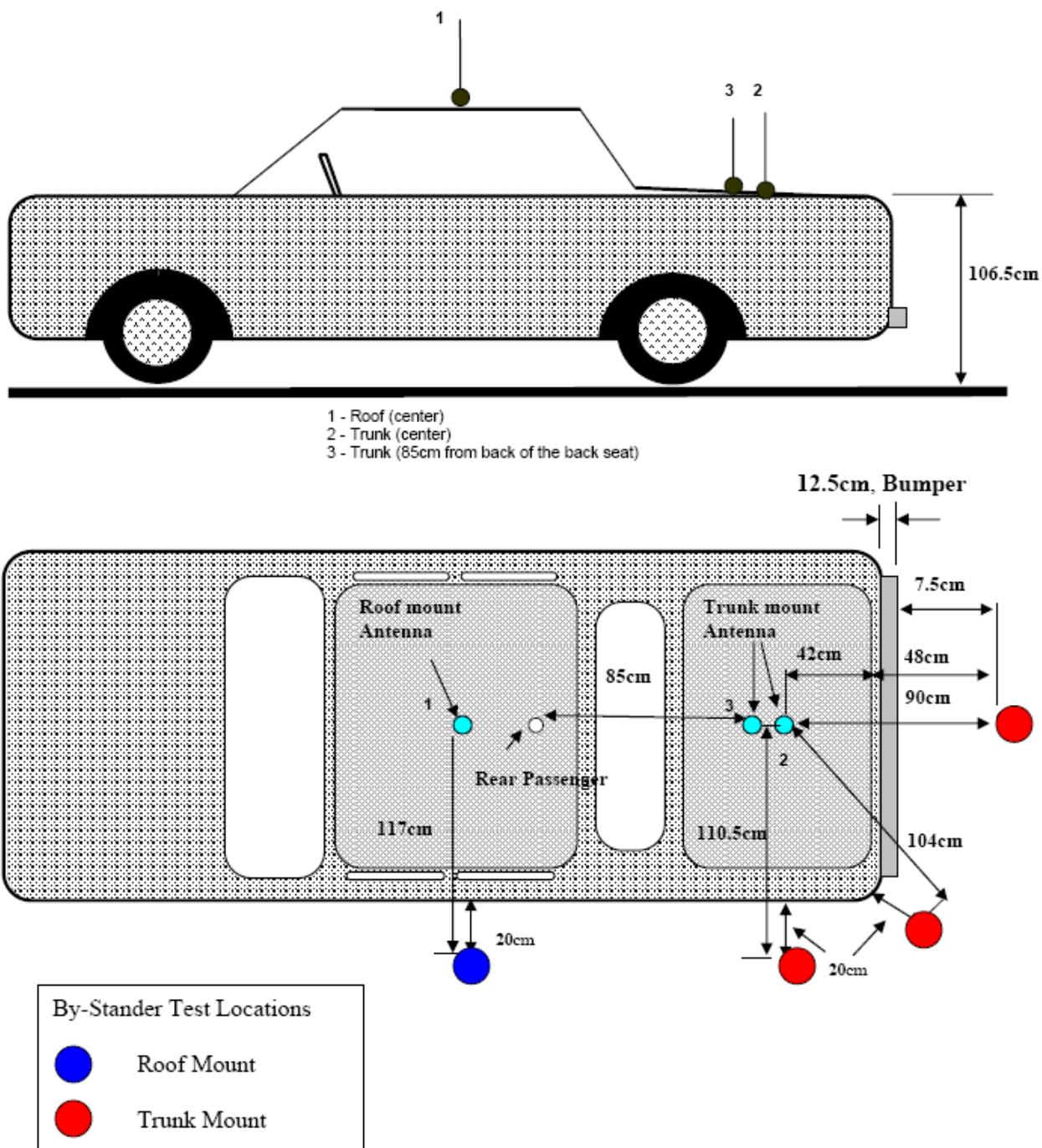
## 11.0 Conclusion

The assessments for this device were performed with an output power range as indicated in section 8.0. The maximum allowable output power is equal to the upper limit of the final test factory transmit power specification of 60W for frequency range of 136 - 174MHz. The highest power density results for the mobile device scaled to the maximum allowable power output is  $0.15\text{mW/cm}^2$  for internal/passenger to the vehicle, and  $0.15\text{mW/cm}^2$  for external/bystander to the vehicle.

These MPE results demonstrate compliance to the FCC Occupational/Controlled Exposure limit. These MPE results also demonstrate compliance to the FCC General Population/Uncontrolled limits as required by FCC rules for passengers and bystanders.

**APPENDIX A**  
**Illustration of Antenna Locations and Test Distances**

**Antenna Location Drawing with Test Locations Identified**



**Figure 1**

**APPENDIX B**  
**Meter/Probe Calibration Certificates**



Cert I.D.: 70578  
Lab Code 115844/1207.01

1301 Arrow Point Drive  
Cedar Park, Texas 78613  
(512) 531-6498

**ETS-LINDGREN™**  
A ESCO Technologies Company  
Track# S000015131 Ltd Cal   
By AS Date 04-Dec-08  
Next Cal Due  
[www.ets-lindgren.com](http://www.ets-lindgren.com)

### Certificate of Calibration Conformance

Page 1 of 4

The instrument identified below has been individually calibrated in compliance with the following standard(s):

IEEE 1309 - 2005, Institute of Electrical and Electronics Engineers, Standard for Calibration of Electromagnetic Field Sensors and Probes, Excluding Antennas from 9 kHz to 40 GHz

Environment: Laboratory MTE is maintained in a temperature controlled environment with ambient conditions from 18 to 28 C, relative humidity less than 90%. The instrument under test has been calibrated in a suitable environment using an EMCO TEM Cell 5101C, GTEM! 5305 and an RF Shielded EMC Chamber which is conducive to maintaining accurate and reliable measurement quality.

Manufacturer:	ETS-Lindgren	Operating Range:	100kHz - 5GHz
Model Number:	E100	Instrument Type:	Isotropic Probe > 1 GHz
Serial Number/ ID:	00083370	Date Code:	
Tracking Number:	S000015131	Alternate ID:	
Date Completed:	04-Dec-08	Customer:	MOTOROLA INC. (FL)
Test Type:	Standard Field, Field Strength		
Calibration Uncertainty:	Std Field Method k=2, (95% Confidence Level)	10kHz - 18000 MHz, +/-0.7 dB, 26.5GHz - 40GHz, +/- 0.95 dB	

Test Remarks: Provided special data points per customer request.

Calibration Traceability: All Measuring and Test Equipment (M/TE) identified below are traceable to the National Institute for Standards and Technology (NIST). Calibration Laboratory and Quality System controls are compliant with ISO/IEC 17025-2005.

**Standards and Equipment Used:**

**Make / Model / Name / S/N / Recall Date**

					<b>Condition of Instrument Upon Receipt:</b>
Boonton	9200B	RF Voltmeter	280601AE	29-Sep-09	In Tolerance to Internal Quality Standards
Hewlett Packard	437B	HP Power Meter	3125U12370	21-May-09	
Fluke	6060B	RF Signal Generator	5690204	20-May-09	On Release:
Marconi	2022	Signal Generator	119019/077	02-Oct-09	In Tolerance to Internal Quality Standards
Rohde & Schwarz	657.8008.0	Power Meter NRV	828110/019	27-Dec-08	
Hewlett Packard	83620B	Signal Generator	3722A00541	19-Sep-09	

Calibration Completed By  
Alan Schifferdecker, Calibration Technician

Attested and Issued on 04-Dec-08  
Justin Tary, Calibration Supervisor

This document provides traceability of measurements to recognized national standards using controlled processes at the ETS-Lindgren Calibration Laboratory. Uncertainties listed are derived from the methods described by NIST Tech Note 1297. This certificate and report may not be reproduced, except in full, without the written approval of ETS-Lindgren Calibration Laboratory in accordance with ISO/IEC 17025-2005. QAF 1127 (06/07)



**Frequency Response Calibration Factors**  
**Model E100 Serial Number 00083370**  
**Date of Calibration 4 Dec 2008**

Frequency (MHz)	Applied V/m	Probe Reading			Correction Factor			Avg
		X	Y	Z	X	Y	Z	
1.00	7.97	6.74	6.71	6.60	1.18	1.19	1.21	1.19
1.00	20.01	17.05	16.99	16.75	1.17	1.18	1.19	1.18
1.00	69.93	59.37	59.09	58.36	1.18	1.18	1.20	1.19
1.00	124.30	105.11	104.67	103.34	1.18	1.19	1.20	1.19
15.00	8.02	7.86	7.79	7.76	1.02	1.03	1.03	1.03
15.00	19.96	19.62	19.45	19.42	1.02	1.03	1.03	1.02
15.00	70.28	68.97	68.30	68.14	1.02	1.03	1.03	1.03
15.00	125.20	122.31	121.06	120.78	1.02	1.03	1.04	1.03
30.00	8.02	8.00	7.92	7.89	1.00	1.01	1.02	1.01
30.00	20.11	20.09	19.88	19.85	1.00	1.01	1.01	1.01
30.00	69.83	69.30	68.56	68.31	1.01	1.02	1.02	1.02
30.00	124.31	122.47	121.21	120.74	1.01	1.03	1.03	1.02
75.00	8.03	8.24	8.23	8.12	0.97	0.98	0.99	0.98
75.00	20.11	20.71	20.64	20.46	0.97	0.97	0.98	0.98
75.00	70.04	72.11	71.83	71.03	0.97	0.98	0.99	0.98
75.00	124.66	128.20	127.66	126.29	0.97	0.98	0.99	0.98
100.00	8.02	8.17	8.13	8.04	0.98	0.99	1.00	0.99
100.00	20.04	20.45	20.33	20.21	0.98	0.99	0.99	0.99
100.00	70.33	71.31	70.79	70.25	0.99	0.99	1.00	0.99
100.00	124.43	125.68	124.79	123.57	0.99	1.00	1.01	1.00
150.00	8.03	8.14	8.14	8.02	0.99	0.99	1.00	0.99
150.00	19.96	20.33	20.31	20.09	0.98	0.98	0.99	0.99
150.00	70.14	71.64	71.55	70.58	0.98	0.98	0.99	0.98
150.00	125.58	128.56	128.42	126.52	0.98	0.98	0.99	0.98
200.00	8.00	8.43	8.53	8.28	0.95	0.94	0.97	0.95
200.00	19.97	21.08	21.37	20.85	0.95	0.93	0.96	0.95
200.00	69.86	74.08	74.82	72.92	0.94	0.93	0.96	0.94
200.00	124.95	132.17	134.06	130.32	0.95	0.93	0.96	0.95
250.00	7.97	8.11	7.88	7.96	0.98	1.01	1.00	1.00
250.00	19.99	20.55	19.75	20.20	0.97	1.01	0.99	0.99
250.00	70.06	72.32	70.37	70.59	0.97	1.00	0.99	0.99
250.00	125.12	128.64	124.26	125.28	0.97	1.01	1.00	0.99
300.00	8.00	8.08	7.94	7.97	0.99	1.01	1.00	1.00
300.00	20.03	20.57	20.25	20.34	0.97	0.99	0.98	0.98
300.00	69.79	72.57	71.30	71.56	0.96	0.98	0.98	0.97
300.00	125.28	130.82	128.42	128.85	0.96	0.98	0.97	0.97
400.00	8.00	8.10	7.97	7.97	0.99	1.00	1.00	1.00
400.00	19.89	20.15	19.87	19.89	0.99	1.00	1.00	1.00
400.00	69.67	70.49	69.32	69.33	0.99	1.01	1.00	1.00
400.00	125.09	126.27	124.24	124.10	0.99	1.01	1.01	1.00
500.00	8.01	7.89	7.95	7.68	1.02	1.01	1.03	1.02
500.00	19.94	19.59	19.74	19.37	1.02	1.01	1.03	1.02
500.00	70.28	69.65	70.06	68.64	1.01	1.00	1.02	1.01
500.00	124.58	123.19	123.63	121.24	1.01	1.01	1.03	1.02
600.00	8.01	7.65	7.63	7.61	1.04	1.05	1.06	1.05
600.00	20.01	19.34	19.09	19.06	1.04	1.05	1.05	1.04
600.00	69.90	67.55	67.54	66.46	1.03	1.04	1.05	1.04
600.00	125.28	120.21	120.01	119.47	1.03	1.05	1.05	1.04



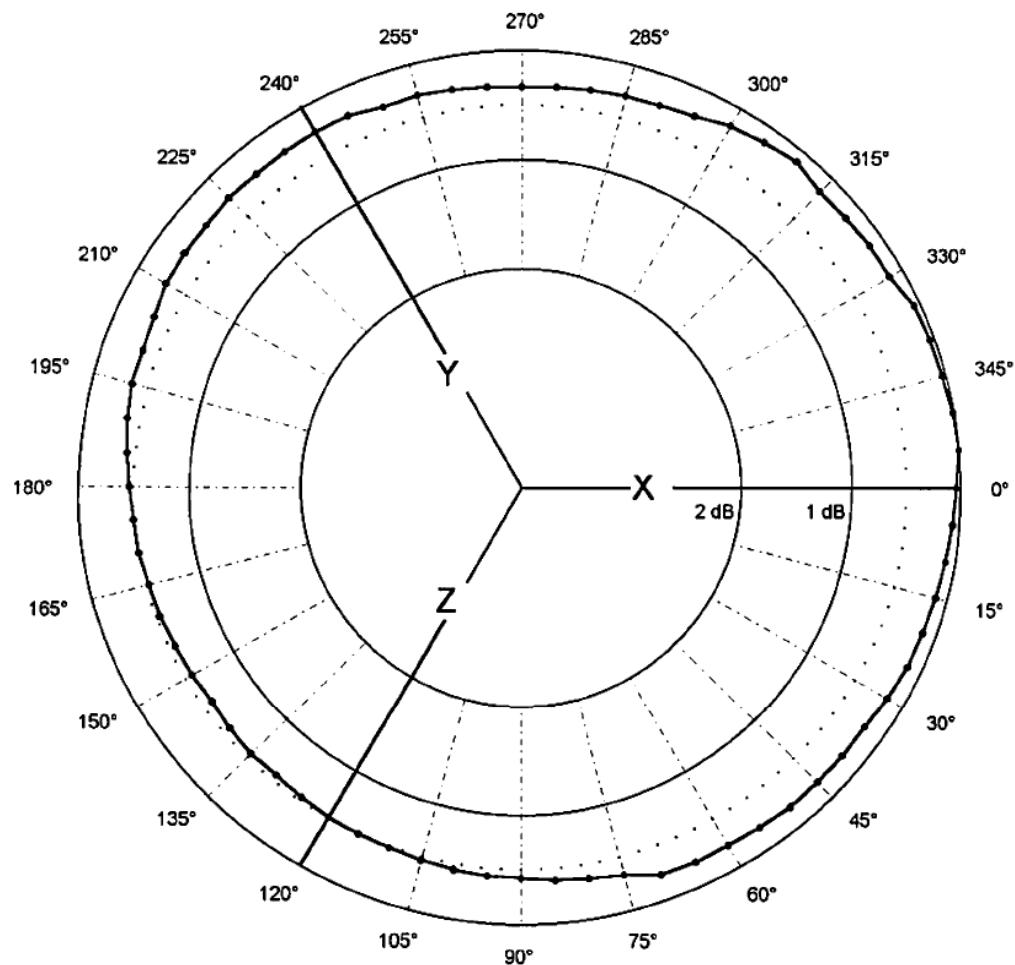
**Frequency Response Calibration Factors**  
**Model E100 Serial Number 00083370**  
**Date of Calibration 4 Dec 2008**

Frequency (MHz)	Applied V/m	Probe Reading			Correction Factor			
		X	Y	Z	X	Y	Z	Avg
700.00	7.96	7.56	7.35	7.42	1.05	1.08	1.07	1.07
700.00	20.10	19.21	18.63	18.87	1.05	1.08	1.06	1.06
700.00	70.26	67.25	65.16	65.96	1.05	1.08	1.07	1.06
700.00	125.09	119.09	115.24	116.69	1.05	1.09	1.07	1.07
800.00	8.04	7.34	7.28	7.22	1.10	1.10	1.11	1.10
800.00	20.02	18.38	18.27	18.07	1.09	1.09	1.11	1.10
800.00	69.85	64.15	63.68	63.03	1.09	1.10	1.11	1.10
800.00	124.82	113.69	112.90	111.64	1.10	1.10	1.12	1.11
900.00	7.97	7.70	7.78	7.56	1.03	1.02	1.05	1.04
900.00	20.03	19.42	19.58	19.07	1.03	1.02	1.05	1.03
900.00	70.21	67.77	68.79	66.47	1.04	1.02	1.06	1.04
900.00	124.81	119.63	120.40	117.19	1.04	1.04	1.06	1.05
1000.00	7.99	8.09	7.90	7.89	0.99	1.01	1.01	1.00
1000.00	19.92	20.17	19.63	19.74	0.99	1.01	1.01	1.00
1000.00	69.78	70.08	68.11	68.35	1.00	1.02	1.02	1.01
1000.00	124.80	124.87	120.11	120.41	1.01	1.04	1.03	1.02
2000.00	19.92	19.09	18.99	20.04	1.04	1.05	0.99	1.03
2450.00	20.38	19.27	18.50	17.75	1.06	1.10	1.15	1.10
3000.00	20.36	19.27	18.66	19.77	1.06	1.09	1.03	1.06
3500.00	20.02	21.99	21.67	19.57	0.91	0.92	1.02	0.95
4000.00	19.99	19.75	18.25	19.57	1.01	1.10	1.02	1.04
5000.00	19.97	14.40	13.92	15.38	1.39	1.43	1.30	1.37



## PROBE ROTATIONAL RESPONSE

Model E100  
S/N 00083370  
Date 04-Dec-2008  
Time 20:40:05  
Variation 0.59 dB



- Isotropic response measured in a 20 V/m field at 400 MHz



## CALIBRATION REPORT

**Magnetic Field Sensor**

Model	S/N
H200	00084225
HI-2200	00086887

As received, the instrument was found:  Within Tolerance  
 Out of Tolerance  
 (New Instrument)

**Frequency Response**

Frequency Response	Nominal			
	MHz	Field	Cal Factor*	Deviation
		A/m	(Applied/Indicated)	dB
1	13.56	0.08	1.06	-0.51
2	27.12	0.08	1.02	-0.14
3	100	0.08	0.96	0.39
4	150	0.08	0.86	1.31
5	175	0.08	0.82	1.69

\* Corrected magnetic field values (A/m) can be obtained by multiplying the Cal Factor with the indicated H field readings.

**Linearity**

Maximum linearity deviation is 0.03 dB  
(measurements taken from 30 mA/m to 9 A/m at 27.12 MHz)

**Test Conditions**

Calibration performed at ambient room temperature: 23 ±3°C

The above sensor was calibrated to factory specifications. This calibration is performed per IEEE 1309 standard. All equipment used are traceable to US National Institute of Standards and Technology (NIST).

By:	
Calibration Date:	13-Jan-2009

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Recommended calibration interval: 1 year  
This calibration was performed by ETS-Lindgren, Cedar Park, TX.  
This report shall not be reproduced, except in full, without written approval from ETS-Lindgren.

**APPENDIX C  
DUT Photos  
(Refer to Exhibit 7B)**