MOTOROLA

ACCREDITED

TESTING CERT # 2518.01

FCC ID: AZ492FT3824
DECLARATION OF COMPLIANCE MPE ASSESSMENT

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

Date of Report: October 20, 2009
Report Revision: Rev. O
Report ID: SR7485_ MPE rpt_APX7500_VHF _Motorcycle_Rev O _091020

Responsible Engineer: Kim Uong (Principle Staff EME Eng.)
Date/s Tested: 9/25/09-10/15/09
Manufacturer/Location: Motorola, Penang
Date submitted for test: 8/13/09
DUT Description: Mackinaw mobile VHF mid-power (15 Watt) - Motorcycle Mount option
Test TX mode(s): CW
Max. Power output: 18W
TX Frequency Bands: 136 - 174 MHz
Signaling type: Analog, APCO 25, and F2 (TDMA)
Model(s) Tested: M30KSS9PW1AN with G67 motorcycle option
Model(s) Certified: M30KSS9PW1AN with G67 motorcycle option
Serial Number(s): CAI09018Z9
Classification: Occupational/Controlled Environment
Rule Part(s): 22 and *90 (150.8-173.4MHz)
* MPE results outside of Part 90 are not applicable for FCC compliance demonstration.

DUT Photo
(Refer to Exhibit 7B)

Approved Accessories:

Antenna(s):
RAD4002ARB (Motorcycle Mount, 136 - 144 MHz, 1/4 Wave, 2.15 dBi)
RAD4003ARB (Motorcycle Mount, 144 - 150.8 MHz, 1/4 Wave, 2.15 dBi)
RAD4004ARB (Motorcycle Mount, 150.8-162 MHz, 1/4 Wave, 2.15 dBi)
RAD4005ARB (Motorcycle Mount, 162-174 MHz, 1/4 Wave, 2.15 dBi)

Final RF Exposure Results:

	VHF Band
Operator - Max Calculated Power Density	0.82 mW/cm²
Bystander - Max Calculated Power Density	0.09 mW/cm²

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: 10/20/09

Certification Date:

Certification No.:

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REVISION HISTORY

Date	Revision	Comments
10/20/09	O	Initial release

1.0 Product and System Description

FCC ID: AZ492FT3824, model M30KSS9PW1AN with G67 motorcycle option 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 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 Push-To-Talk (PTT) while the device is properly installed on a motorcycle.

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 bystanders are evaluated to the General Population/ Uncontrolled Exposure Limits, and the operator is evaluated to the Occupational/Controlled Exposure Limits.

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

2.0 Abbreviations / Definitions

APCO: Association of Public-Safety Communications Officials
C4FM: Compatible 4-Level Frequency Modulation
CNR: Calibration Not Required
CQPSK: Compatible Quadrature Phase Shift Keying
CW: Continues Wave
DUT: Device Under Test
F2: 2 slot Time Division Multiple Access
FM: Frequency Modulation
NA: Not Applicable
PTT: Push to Talk
TDMA: Time Division Multiple Access
MPE: Maximum Permissible Exposure
EME: Electromagnetic Energy

3.0 Additional Options and Accessories

NA

4.0 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 and Occupational/Controlled RF Exposure limits.

For test frequencies ranging from 136 - 174 MHz the MPE (Maximum Permissible Exposure) limit to electromagnetic energy in equivalent plane wave free-space power density is 0.20mW/cm^2 for General Population, and 1.0mW/cm^2 for Occupational.

5.0 Measurement System Uncertainty Levels

Uncertainty Budget for Near Field Probe Measurements

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

6.0 Method of Measurement

6.1 MPE assessments for motorcycle-mounted antennas

(Refer to APPENDIX A for antenna location and test positions)

6.1.1 Bystander MPE assessment

MPE measurements for bystander conditions are determined by taking the average of (10) measurements in a 2m vertical line directly behind the vehicle with 20cm increments at the standard test distance of 60cm from the

antenna. 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 maintaining a twenty (20) centimeter separation distance between the probe sensor and reradiating structures. These measurements are representative of persons other than the operator standing next to the vehicle.

6.1.2 Operator MPE assessment

MPE measurements for operator conditions are performed by taking the following (3) measurements at the standard test distance of 30cm from the operators' seat area: scan the lower third of the antenna for a peak reading, scan the middle third of the antenna for a peak reading, and scan the top third (up to 2 meters from ground). 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 maintaining a twenty (20) centimeter separation distance between the probe sensor and reradiating structures. The (3) results are then averaged.

7.0 Test Site

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

8.0 Measurement System/Equipment

Equipment Type	Model #	SN	Calibration Date
Motorcycle	2005 Kawasaki KZ1000		
Survey Meter / Probe – E-Field (Electric Field)	ETS Model HI-2200 / ETS Model E100	86887 / 83370	12/04/08
Survey Meter / Probe – H-Field (Magnetic Field)	ETS Model HI-2200 / ETS Model H200	86887 / 84225	01/13/09

ETS equipments measured for E-field is in mW/cm2 for E-field.
ETS equipments measured for H-field is in A/m, the final results for H-field is converted to mW/cm2.

9.0 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)
136.0125	17.6
147.4	17.7
155	17.6
173.4	18.0
173.9875	17.6

10.0 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.

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 sections 6.0, 11.0, and the APPENDIX A.

11.0 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, OP-Operator), average over body results, calculated power density results, max calculated power density results, % of the applicable FCC specification limits.

MPE results for this motorcycle 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.

Bystander - 10 measurements are averaged over the body (*body_avg*).
Operator - 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;

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

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

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^2) 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/cm2 using the formula: $mW/cm^2 = (A/m)^2 * 37.699$.

Table 1: E-Field MPE data summary

Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	E/H Field	Probe Cal. Factor	Test Pos.	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)	% of Spec Limit	FCC Spec Limit (mW/ cm2)
RAD4002ARB (136 -144 MHz)	2.15	136.0125	18	17.6	E	0.99	OP	1.00	0.50	0.51	51	1.0
RAD4002ARB (136 -144 MHz)	2.15	136.0125	18	17.6	E	0.99	BS	0.17	0.09	0.09	44	0.2
RAD4003ARB (144 -150.8 MHz)	2.15	147.4	18	17.7	E	0.98	OP	0.91	0.45	0.46	46	1.0
RAD4003ARB (144 -150.8 MHz)	2.15	147.4	18	17.7	E	0.98	BS	0.17	0.08	0.09	43	0.2
RAD4004ARB (150.8-162 MHz)	2.15	155	18	17.6	E	0.97	OP	0.88	0.43	0.44	44	1.0
RAD4004ARB (150.8-162 MHz)	2.15	155	18	17.6	E	0.97	BS	0.14	0.07	0.07	35	0.2
RAD4005ARB (162-174 MHz)	2.15	173.4	18	18	E	0.94	OP	1.55	0.73	0.73	73	1.0
RAD4005ARB (162-174 MHz)	2.15	173.4	18	18	E	0.94	BS	0.11	0.05	0.05	27	0.2
RAD4005ARB (162-174 MHz)	2.15	173.9875	18	17.6	E	0.94	OP	1.70	0.80	0.82	82	1.0
RAD4005ARB (162-174 MHz)	2.15	173.9875	18	17.6	E	0.94	BS	0.14	0.06	0.06	32	0.2

Table 2: H-Field MPE data summary

Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	E/H Field	Probe Cal. Factor	Test Pos.	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)	% of Spec Limit	FCC Spec Limit (mW/ cm2)
RAD4002ARB (136 - 144 MHz)	2.15	136.0125	18	17.6	H	0.79	OP	0.77	0.31	0.31	31	1.0
RAD4002ARB (136 - 144 MHz)	2.15	136.0125	18	17.6	H	0.79	BS	0.21	0.08	0.09	43	0.2
RAD4003ARB (144 -150.8 MHz)	2.15	147.4	18	17.7	H	0.75	OP	0.77	0.29	0.30	30	1.0
RAD4003ARB (144 -150.8 MHz)	2.15	147.4	18	17.7	H	0.75	BS	0.21	0.08	0.08	41	0.2
RAD4004ARB (150.8-162 MHz)	2.15	155	18	17.6	H	0.73	OP	0.70	0.26	0.26	26	1.0
RAD4004ARB (150.8-162 MHz)	2.15	155	18	17.6	H	0.73	BS	0.16	0.06	0.06	31	0.2
RAD4005ARB (162-174 MHz)	2.15	173.4	18	18.0	H	0.68	OP	0.70	0.24	0.24	24	1.0
RAD4005ARB (162-174 MHz)	2.15	173.4	18	18.0	H	0.68	BS	0.10	0.03	0.03	17	0.2
RAD4005ARB (162-174 MHz)	2.15	173.9875	18	17.6	H	0.68	OP	0.77	0.26	0.27	27	1.0
RAD4005ARB (162-174 MHz)	2.15	173.9875	18	17.6	H	0.68	BS	0.14	0.05	0.05	24	0.2

12.0 Conclusion

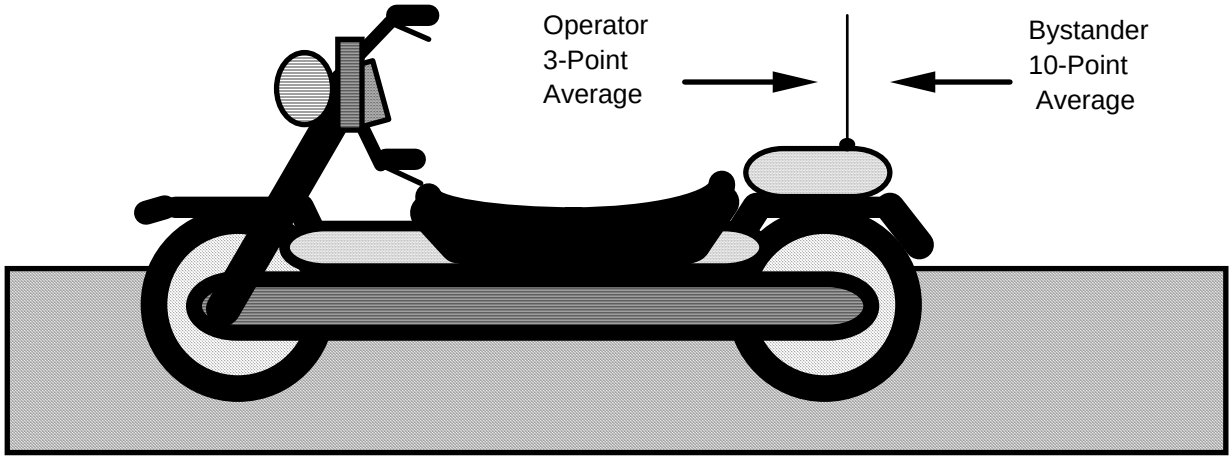
The assessments for this device were performed with an output power range as indicated in section 9. The maximum allowable output power is equal to the upper limit of the final test factory transmit power specification of 18W. The highest power density results scale to the maximum allowable power output is 0.09mW/cm^2 for bystander test position and 0.82mW/cm^2 for operator test position.

The MPE results for bystander presented herein demonstrate compliance to the applicable FCC General Population/ Uncontrolled RF Exposure limit.

The MPE results for operator presented herein demonstrate compliance to the applicable FCC Occupational Population/Controlled Exposure limit.

APPENDIX A
Illustration of Antenna Locations and Test Positions

ANTENNA LOCATION DRAWING



APPENDIX B
Meter/Probe Calibration Certificates

ACCREDITED

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

ETS·LINDGREN™
An ESCO Technologies Company
1301 Arrow Point Drive
Cedar Park, Texas 78613
(512) 531-6498

ETS·LINDGREN
An ESCO Technologies Company
Track# S000015131 Ltd Cal ☐
By AS Date 04-Dec-08
Next Cal Due
www.ets-lindgren.com

Certificate of Calibration Conformance

The instrument identifed 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 10kHz - 18000 MHz, +/-0.7 dB, 26.5GHz - 40GHz, +/- 0.95 dB
k=2, (95% Confidence Level)

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

Boonton	9200B	RF Voltmeter	280601AE	29-Sep-09
Hewlett Packard	437B	HP Power Meter	3125U12370	21-May-09
Fluke	6060B	RF Signal Generator	5690204	20-May-09
Marconi	2022	Signal Generator	119019/077	02-Oct-09
Rohde & Schwarz	857.8008.0	Power Meter NRVD	828110/019	27-Dec-08
Hewlett Packard	83620B	Signal Generator	3722A00541	19-Sep-09

Condition of Instrument Upon Receipt:
In Tolerance to Internal Quality Standards

On Release:
In Tolerance to Internal Quality Standards

Calibration Completed By
Alan Schifferdecker, Calibration Technician

Attested and Issued on 04-Dec-08
Justin Tarr, 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)

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

Frequency	Applied	Probe Reading			Correction Factor			
(MHz)	V/m	X	Y	Z	X	Y	Z	Avg
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

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

Frequency	Applied	Probe Reading			Correction Factor			
(MHz)	V/m	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

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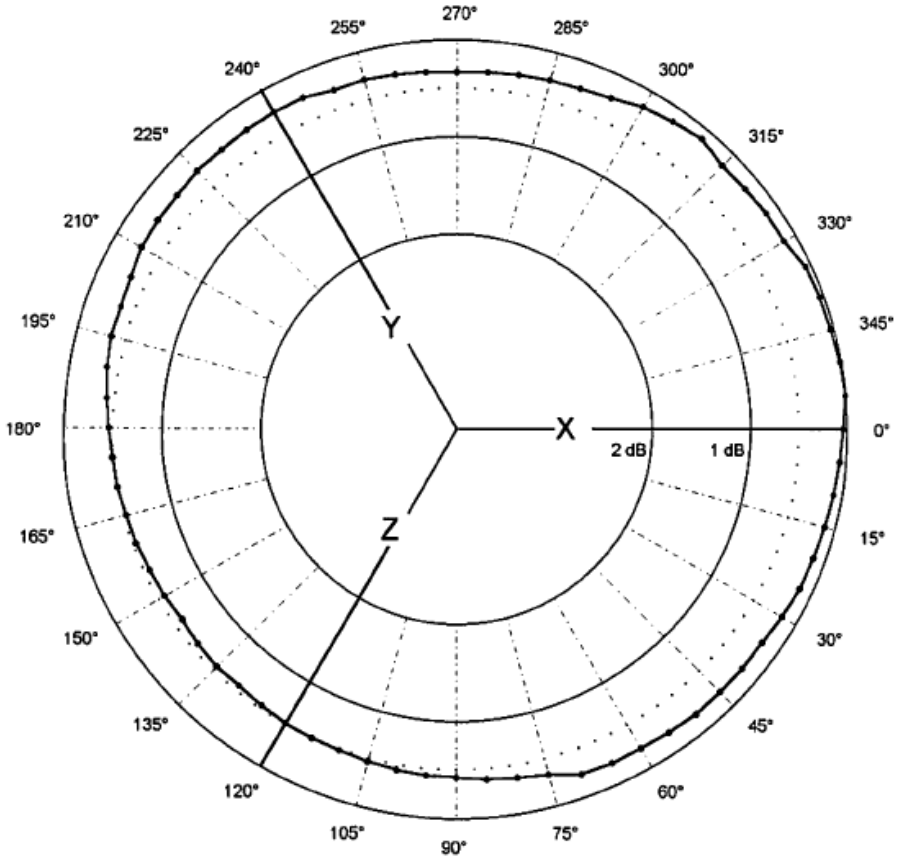
ETS·LINDGREN™
An ESCO Technologies Company

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

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ETS-LINDGREN
An ESCO Technologies Company

CALIBRATION REPORT

Magnetic Field Sensor

Model	*S/N*
H200	00084225
HI-2200	00086887

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

Frequency Response

Frequency Response		*Nominal Field*	*Cal Factor**	*Deviation*
	MHz	*A/m*	(Happlied/Hindicated)	*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: Richard C. Bradbury

Calibration Date: 13-Jan-2009

Recommended calibration interval: 1 year
This calibration was performed by ETS-Lindgren, Cedar Park, TX.
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APPENDIX C
DUT Photos
(Refer to Exhibit 7B)