


**MOTOROLA SOLUTIONS**


TESTING CERT # 2518.01

**DECLARATION OF COMPLIANCE: MPE/SAR ASSESSMENT Part 2 of 2**
**EME Test Laboratory**

 8000 West Sunrise Blvd  
 Fort Lauderdale, FL. 33322

**Date of Report:** Sept 29, 2011

**Report Revision:** 0

**Report ID:** SR9341 MPE Auto rpt APX7500 UHF R1 (HP) &  
 7/800 Rev O 110929

**Responsible Engineer:** Stephen C. Whalen (Principal Staff EME Test Engineer)  
**Report author:** Stephen C. Whalen (Principal Staff EME Test Engineer)  
**Date(s) Tested:** 7/800 test dates - 4/4/2008 – 4/11/2008, 4/21/2008  
**Manufacturer/Location:** Motorola, Schaumburg, IL  
**Date submitted for test:** 07/29/2011  
**DUT Description:** APX7500 Dual Band UHF R1 100W & 700 band (30W)/800 band (35W)  
**Test TX mode(s):** CW  
**Max. Power output:** 120W (380-470MHz) and 36W (700MHz band), 42W (800MHz band)  
**TX Frequency Bands:** 380-470MHz & 7/800MHz (Talkaround: 764-776MHz & 851-870MHz, Trunked: 794-824MHz)  
**Signaling type:** Analog, APCO 25, and TDMA 1:2 (F2)  
**Model(s) Tested:** M30URS9PW1AN  
**Model(s) Certified:** M30TXS9PW1AN (MHUS1009A)  
**Serial Number(s):** 174  
**Classification:** Occupational/Controlled Environment  
**FCC ID:** AZ492FT7048  
 Part 22 & 90 UHF (406.1-470MHz) & 7/800MHz (764-775MHz, 794-824MHz & 851-869MHz) Results outside of FCC bands are not applicable for FCC compliance demonstration.

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 Solutions Inc. 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.

Deanna Zakharia  
 EME Lab Senior Resource Manager and  
 Laboratory Director

Approval Date: 09/29/2011

Certification Date: 9/29/2011

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**Document Revision History**

<b>Date</b>	<b>Revision</b>	<b>Comments</b>
09/29/2011	0	Initial release

**Part 1 of 2: MPE Assessment for 380-470MHz**  
**Part 2 of 2: MPE Assessment for 7/800MHz**

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## 1.0 Introduction

This report details the test setup, test equipment and test results of Maximum Permissible Exposure (MPE) performed at Motorola Solutions' test site for product model M30TXS9PW1AN (MHUS1009A).

## 2.0 Abbreviations / Definitions

APCO: Association of Public-Safety Communications Officials

BS: Bystander

C4FM: Compatible 4-Level Frequency Modulation

CNR: Calibration Not Required

CQPSK: Compatible Quadrature Phase Shift Keying

CW: Continuous Wave

DUT: Device Under Test

EME: Electromagnetic Energy

F2: 2 slot Time Division Multiple Access

FM: Frequency Modulation

MPE: Maximum Permissible Exposure

NA: Not Applicable

PB: Passenger Backseat

PF: Passenger Front seat

PTT: Push to Talk

TDMA: Time Division Multiple Access

## 3.0 Referenced Standards and Guidelines

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

- United States Federal Communications Commission, Code of Federal Regulations; Rule Part 47CFR § 1.1310, § 2.1091 (d) and § 2.1093 for RF Exposure, where applicable.
- Federal Communications Commission, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields", OET Bulletin 65, Supplement C (Edition 01-01), FCC, Washington, D.C.: June 2001.
- American National Standards Institute (ANSI) / Institute of Electrical and Electronics Engineers (IEEE) C95. 1-1999
- American National Standards Institute (ANSI) / Institute of Electrical and Electronics Engineers (IEEE) C95. 1-1992. Specific to FCC rules and regulations.
- Institute of Electrical and Electronics Engineers (IEEE) C95.3-2002
- Ministry of Health (Canada) Safety Code 6 (2009), Limits of Human Exposure to Radio frequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz

#### 4.0 Power Density Limits

**Table 1 – Occupational / Controlled Exposure Limits**

Frequency Range (MHz)	FCC OET Bulletin 65 Supplement C	IEEE C95.1 1992/1999	IEEE C95.1 2005	RSS 102 issue 4 - 2010
	mW/cm <sup>2</sup>	mW/cm <sup>2</sup>	W/m <sup>2</sup>	W/m <sup>2</sup>
30 - 300	1.0			*10.0
10 - 400				
100 - 300		1.0	10.0	
300 - 1,500	f/300			f/30
300 - 3,000		f/300	f/30	
400 - 2,000				
1,500 - 15,000				50.0
1,500 - 100,000	5.0			
2,000 - 300,000				
3,000 - 300,000		10.0	100.0	

\*Power density limit is applicable at frequencies greater than 100MHz

**Table 2 – General Population / Uncontrolled Exposure Limits**

Frequency Range (MHz)	FCC OET Bulletin 65 Supplement C	IEEE C95.1 1992/1999	IEEE C95.1 2005	RSS 102 issue 4 - 2010
	mW/cm <sup>2</sup>	mW/cm <sup>2</sup>	W/m <sup>2</sup>	W/m <sup>2</sup>
30 - 300	0.2			*2.0
10 - 400				
100 - 300		0.2		
100 - 400			2.0	
300 - 1,500	f/1,500			f/150
400 - 2,000			f/200	
300 - 15,000		f/1,500		
1,500 - 15,000				10.0
1,500 - 100,000	1.0			
2,000 - 100,000			10.0	
2,000 - 300,000				

\*Power density limit is applicable at frequencies greater than 100MHz

## 5.0 $N_c$ Test Channels

The number of test channels are determined by using Equation 1 below. This equation is available in FCC's KDB 447498. The test channels are appropriately spaced across the antenna's frequency range.

Equation 1 – Number of test channels

$$N_c = \text{Round} \{ [100(f_{\text{high}} - f_{\text{low}})/f_c]^{0.5} \times (f_c / 100)^{0.2} \}$$

where  $N_c$  is the number of test channels,  $f_{\text{high}}$  and  $f_{\text{low}}$  are the highest and lowest frequencies within the transmission band,  $f_c$  is the mid-band frequency, and frequencies are in MHz.

## 6.0 Measurement Equipment

**Table 3 - Equipment**

Equipment Type	Model #	SN	Calibration Date	Calibration Due Date
Automobile	2003 Ford Crown Victoria, 4-Door	NA	NA	NA
Survey Meter Probe – E-Field	ETS Model HI-2200 ETS Model E100	00086316 00084254	2/20/2008	2/20/2009

E-field measurements are in mW/cm<sup>2</sup>.

## 7.0 Measurement System Uncertainty Levels

**Table 4 - Uncertainty Budget for Near Field Probe Measurements**

	Tol. (± %)	Prob. Dist.	Divisor	$u_i$ (±%)	$v_i$
<b>Measurement System</b>					
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	∞
<b>Test sample Related</b>					
Antenna Positioning	3.0	N	1.00	3.0	∞
Power drift	5.0	R	1.73	2.9	∞
<b>Combined Standard Uncertainty</b>		RSS		12.2	∞
<b>Expanded Uncertainty (95% CONFIDENCE LEVEL)</b>		$k=2$		24	

## 8.0 Product and System Description

Model M30TXS9PW1AN (MHUS1009A) 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 or 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 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 are people other than operator)

## 9.0 Additional Options and Accessories

Refer to Table 5 for complete list of tested antennas.

## 10.0 Test Set-Up Description

Assessments were performed with mobile radio installed in the test vehicle while engine was at idle, at the specified distances and test locations indicated in sections 11.0, 12.0 and Appendix A.

All antennas described in Table 5 were considered in order to develop the test plan for this product. Antennas were installed and tested per their appropriate mount locations (Roof / Trunk) and defined test channels.

## 11.0 Method of Measurement with trunk mounted antenna(s)

### 11.1 External/Bystander vehicle MPE measurements

Antenna is located at the center of the trunk. Refer to Appendix A for antenna location and distance.

MPE measurements for bystander (BS) conditions are determined by taking the average of (10) measurements in a 2 m vertical line for each of the (3) bystander test locations indicated in Appendix A with 20 cm height increments, with antenna to probe sensor separation distances of 62 cm directly behind vehicle, 104 cm (45 degree radial) and 110.5 cm (90 degree radial). The separation distance used for testing is defined from the antenna where as the RF safety booklet defines the same distance from the vehicle body to ensure that the assessment is applicable to other vehicles. 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 minimum of 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.

**Note: The distance from the centered trunk-mounted antenna to the rear edge of the vehicle is 42cm and the distance from the rear edge of the vehicle to the survey probe sensor is 20cm.**

### 11.2 Internal/Passenger vehicle MPE measurements

Antenna is located toward the center of the trunk at a minimum 85cm from backseat passenger. Users are instructed, per installation manual, to mount antennas on the roof only if a minimum 85cm cannot be achieved. Refer to Appendix A for antenna location and distance.

MPE measurements for passenger front seat (PF) and backseat (PB) 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 backseat is a bench seat and therefore each position (Head, Chest & Lower Trunk) were scanned across (horizontally) the seat starting from the middle of the seat to the edge of the seat stopping 20 cm from the vehicle door. Similar process was used in the front bucket seat.

The probe handle is oriented parallel (horizontal) to the ground and pointed towards the back of the vehicle. The probe handle is not oriented normal to the seat surface. The probe head (incorporating the field sensors) is scanned continuously (using the max-hold function available in the meter) along three test axes which are parallel to the seat angle (intended as the line determined by the intersection of the plane of the seat and the plane of the backrest) and are 20 cm from the seat surface. One test axis is at the Head height, another is at the Chest height, and another is at the Lower Trunk height. The maximum field level value recorded for each test axis is logged. The MPE is determined by averaging these three maximum values regardless of the geometrical location where they were observed. For instance, the locations of the three maxima may lie on different vertical (relative to

ground) lines.

This approach leads to results that are representative of the exposure of vehicle occupants since it is based on an average across the body portions closest to the antenna for both trunk and roof mount positions, and is conservatively biased because the highest results for each test axis are combined, e.g. the highest head exposure could be in the middle of the seat while the highest lower trunk exposure could be closer to the door.

## **12.0 Method of Measurement with roof mounted antenna(s)**

### **12.1 External/Bystander vehicle MPE measurements**

Antenna is located at the center of the roof. Refer to Appendix A for antenna location and distance.

MPE measurements for bystander (BS) 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 117cm 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 centered roof-mounted antenna to the probe element (97cm from antenna to edge of car door and 20cm from the edge of the car door to the survey probe sensor); this is the closest distance that can be achieved to a centered roof-mounted antenna used for MPE compliance assessment herein.**

### **12.2 Internal/Passenger vehicle MPE measurements**

Antenna is located at the center of the roof. Refer to Appendix A for antenna location and distance.

MPE measurements for passenger front seat (PF) and backseat (PB) 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 backseat is a bench seat and therefore each position (Head, Chest & Lower Trunk) were scanned across (horizontally) the seat starting from the middle of the seat to the edge of the seat stopping 20 cm from the vehicle door. Similar process was used in the front bucket seat.

The probe handle is oriented parallel (horizontal) to the ground and pointed towards the back of the vehicle. The probe handle is not oriented normal to the seat surface. The probe head (incorporating the field sensors) is scanned continuously (using the max-hold function available in the meter) along three test axes which are parallel to the seat angle (intended as the line determined by the intersection of the plane of the seat and the plane of the backrest) and are 20 cm from the seat surface. One test axis is at the Head height, another is at the Chest height, and another is at the Lower Trunk height. The maximum field level value recorded for each test axis is logged. The MPE is determined by averaging these three maximum values regardless of the geometrical location where they were observed. For instance, the locations of the three maxima may lie on different vertical (relative to ground) lines.

This approach leads to results that are representative of the exposure of vehicle occupants since it is based on an average across the body portions closest to the antenna for both trunk and roof mount positions, and is conservatively biased because the highest results for each test axis are combined, e.g. the highest head exposure could be in the middle of the seat while the highest lower trunk exposure could be closer to the door.

### 13.0 MPE Calculations

The final MPE results for this mobile radio are presented in section 15.0 Tables 6 - 9. These results are based on 50% duty cycle for PTT.

Below is an explanation of how the MPE results are calculated. Refer to Appendix D for MPE measurement results and calculations.

External to vehicle (Bystander) - 10 measurements are averaged over the body (*Avg\_over\_body*).  
Internal to vehicle (Passengers) - 3 measurements are averaged over the body (*Avg\_over\_body*).

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

Therefore;

Equation 2 – Power Density Calculation (*Calc.\_P.D.*)

$$\text{Calc.}_P.D. = (\text{Avg\_over\_body}) * (\text{probe\_frequency\_cal\_factor}) * (\text{duty\_cycle})$$

*Note 1: The highest “average” cal factors from the calibration certificates were selected for the applicable frequency range. Linear interpretation was used to determine “probe\_frequency\_cal\_factor” for the specific test frequencies.*

*Note 2: The E-field probe calibration certificate’s frequency cal factors were determined by measuring V/m. The survey meter’s results were measured in power density (mW/cm<sup>2</sup>) and therefore the “probe\_frequency\_cal\_factor” was squared in equation 2 to account for these results.*

*Note 3: The H-field probe calibration certificate’s frequency cal factors were determined by measuring A/m. The survey meter’s results were measured in A/m and therefore the “Avg\_over\_body” A/m results were converted to power density (mW/cm<sup>2</sup>) using the equation 3. H-field measurements are only applicable to frequencies below 300MHz.*

Equation 3 – Converting A/m to mW/cm<sup>2</sup>

$$mW/cm^2 = (A/m)^2 * 37.699$$

Equation 4 – Power Density Maximum Calculation

$$\text{Max\_Calc.}_P.D. = P.D._calc * \frac{\text{max\_output\_power}}{\text{initial\_output\_power}}$$

*Note 4: For initial output power > max\_output\_power; max\_output\_power / initial output power = 1*

## 14.0 Antenna Summary

Table 5 below summarizes the tested antennas and their descriptions, mount location (roof/trunk), overlap of FCC bands and the minimum number of test channels per FCC KDB 447498. This information was used to determine the test configurations presented in this report.

**Table 5**

#	Antenna Model	Frequency Range (MHz)	Physical Length (cm)	Gain (dBi)	Remarks	Mount Location (Roof/Trunk)	Overlap FCC Bands	N <sub>c</sub> Test Channels (KDB447498)
1	HAF4016A	764-870	9.3	2.15	1/4 wave, wire	R/T	764-869	9
2	HAF4014A	764-870	34.5	5.15	1/4 wave, trap-loaded	R/T	764-869	9
3	HAF4013A	764-870	6.0	5.15	1/4 wave, cylinder	R/T	764-869	9
4	HAF4017A	764-870	57.7	5.15	1/4 wave, trap-loaded	R/T	764-869	9
5	RRA4914B	806-900	34.5	5.15	1/4 wave, trap-loaded	R/T	764-869	6
6	HAF4002A	806-900	8.8	2.15	1/4 wave, wire	R/T	764-869	6

## 15.0 Test Results Summary

The following tables below summarize the MPE results for each test configuration: antenna location, test positions (BS-Bystander, PB-Passenger Backseat, PF-Passenger Front seat), E/H field measurements, angle, antenna model & freq. range, maximum output power, initial power, TX frequency, max calculated power density results, applicable FCC/IEEE specification limits and % of the applicable specification limits.

Table 6

## Bystander MPE assessment to General Pop. / Uncontrolled Exposure Limits for trunk mounted antennas

Trunk/ Roof	Test Position	E/H Field	Angle (Degree)	Antenna Model	Max Pwr (W)	Initial Pwr (W)	Tx Freq (MHz)	Max Calc. P.D. (mW/ cm <sup>2</sup> )	FCC Limit	% To Spec Limit				
Trunk	BS	E	0	HAF4016A (764-870MHz)	36	36.2	764.0875	0.20	0.51	40				
					36	36.6	770.0125	0.21	0.51	42				
					36	36.3	775.9125	0.21	0.52	41				
					36	36.9	794.0875	0.22	0.53	42				
					42	42.9	806.0125	0.21	0.54	38				
					42	42.7	823.9875	0.21	0.55	39				
					42	42.6	851.0125	0.18	0.57	31				
					42	42.4	862.0125	0.15	0.57	25				
					42	42.3	868.8875	0.15	0.58	26				
								HAF4002A (806-900MHz)	42	42.9	806.0125	0.21	0.54	39
									42	42.9	815.0125	0.24	0.54	44
									42	42.7	823.9875	0.22	0.55	41
									42	42.6	851.0125	0.20	0.57	34
									42	42.4	862.0125	0.16	0.57	28
									42	42.3	868.8875	0.16	0.58	28
								HAF4014A (764-870MHz)	36	36.2	764.0875	0.21	0.51	40
									36	36.6	770.0125	0.23	0.51	44
									36	36.3	775.9125	0.22	0.52	42
									36	36.9	794.0875	0.22	0.53	42
									42	42.9	806.0125	0.16	0.54	29
									42	42.7	823.9875	0.17	0.55	31
									42	42.6	851.0125	0.16	0.57	28
									42	42.4	862.0125	0.14	0.57	24
									42	42.3	868.8875	0.14	0.58	24

Note - Results outside FCC bands are not applicable for compliance demonstration.

Table 6 (continued)

Bystander MPE assessment to General Pop. / Uncontrolled Exposure Limits for trunk mounted antennas

Trunk/ Roof	Test Position	E/H Field	Angle (Degree)	Antenna Model	Max Pwr (W)	Initial Pwr (W)	Tx Freq (MHz)	Max Calc. P.D. (mW/cm <sup>2</sup> )	FCC Limit	% To Spec Limit				
Trunk	BS	E	0	HAF4013A (764-870MHz)	36	36.2	764.0875	0.24	0.51	46				
					36	36.6	770.0125	0.24	0.51	47				
					36	36.3	775.9125	0.23	0.52	45				
					36	36.9	794.0875	0.27	0.53	51				
					42	42.9	806.0125	0.22	0.54	40				
					42	42.7	823.9875	0.22	0.55	41				
					42	42.6	851.0125	0.20	0.57	35				
					42	42.4	862.0125	0.16	0.57	28				
					42	42.3	868.8875	0.17	0.58	30				
								HAF4017A (764-870MHz)	36	36.2	764.0875	0.14	0.51	28
									36	36.6	770.0125	0.13	0.51	26
									36	36.3	775.9125	0.14	0.52	27
									36	36.9	794.0875	0.16	0.53	30
									42	42.9	806.0125	0.13	0.54	24
									42	42.7	823.9875	0.18	0.55	33
									42	42.6	851.0125	0.23	0.57	40
									42	42.4	862.0125	0.23	0.57	41
									42	42.3	868.8875	0.22	0.58	38
								RRA4914B (806-900MHz)	42	42.9	806.0125	0.16	0.54	29
									42	42.9	815.0125	0.16	0.54	29
									42	42.7	823.9875	0.18	0.55	33
									42	42.6	851.0125	0.19	0.57	33
									42	42.4	862.0125	0.17	0.57	30
									42	42.3	868.8875	0.16	0.58	28
						45	HAF4013A (764-870MHz)	36	36.9	794.0875	0.13	0.53	24	
			90	HAF4013A (764-870MHz)	36	36.9	794.0875	0.09	0.53	16				

Note - Results outside FCC bands are not applicable for compliance demonstration.

Table 7

Passenger MPE assessment to General Pop. / Uncontrolled Exposure Limits for trunk mounted antennas

Trunk/ Roof	Test Position	E/H Field	Angle (Degree)	Antenna Model	Max Pwr (W)	Initial Pwr (W)	Tx Freq (MHz)	Max Calc. P.D. (mW/ cm^2)	FCC Limit	% To Spec Limit				
Trunk	PB	E	0	HAF4016A (764-870MHz)	36	36.2	764.0875	0.20	0.51	39				
					36	36.6	770.0125	0.18	0.51	35				
					36	36.3	775.9125	0.18	0.52	34				
					36	36.9	794.0875	0.24	0.53	46				
					42	42.9	806.0125	0.24	0.54	45				
					42	42.7	823.9875	0.32	0.55	58				
					42	42.6	851.0125	0.18	0.57	31				
					42	42.4	862.0125	0.15	0.57	27				
					42	42.3	868.8875	0.17	0.58	29				
								HAF4002A (806-900MHz)	42	42.9	806.0125	0.23	0.54	43
									42	42.9	815.0125	0.22	0.54	40
									42	42.7	823.9875	0.36	0.55	65
									42	42.6	851.0125	0.20	0.57	35
									42	42.4	862.0125	0.18	0.57	32
									42	42.3	868.8875	0.15	0.58	27
								HAF4014A (764-870MHz)	36	36.2	764.0875	0.24	0.51	47
									36	36.6	770.0125	0.29	0.51	56
									36	36.3	775.9125	0.32	0.52	61
									36	36.9	794.0875	0.36	0.53	67
									42	42.9	806.0125	0.46	0.54	86
									42	42.7	823.9875	0.53	0.55	97
									42	42.6	851.0125	0.21	0.57	38
									42	42.4	862.0125	0.20	0.57	35
									42	42.3	868.8875	0.15	0.58	27

Note - Results outside FCC bands are not applicable for compliance demonstration.

Table 7 (continued)

Passenger MPE assessment to General Pop. / Uncontrolled Exposure Limits for trunk mounted antennas

Trunk/ Roof	Test Position	E/H Field	Angle (Degree)	Antenna Model	Max Pwr (W)	Initial Pwr (W)	Tx Freq (MHz)	Max Calc. P.D. (mW/ cm <sup>2</sup> )	FCC Limit	% To Spec Limit				
Trunk	PB	E	0	HAF4013A (764-870MHz)	36	36.2	764.0875	0.19	0.51	36				
					36	36.6	770.0125	0.19	0.51	38				
					36	36.3	775.9125	0.18	0.52	34				
					36	36.9	794.0875	0.27	0.53	51				
					42	42.9	806.0125	0.27	0.54	50				
					42	42.7	823.9875	0.31	0.55	56				
					42	42.6	851.0125	0.15	0.57	27				
					42	42.4	862.0125	0.15	0.57	26				
					42	42.3	868.8875	0.14	0.58	23				
								HAF4017A (764-870MHz)	36	36.2	764.0875	0.07	0.51	13
									36	36.6	770.0125	0.08	0.51	16
									36	36.3	775.9125	0.09	0.52	18
									36	36.9	794.0875	0.17	0.53	32
									42	42.9	806.0125	0.24	0.54	44
									42	42.7	823.9875	0.39	0.55	71
									42	42.6	851.0125	0.17	0.57	30
									42	42.4	862.0125	0.18	0.57	31
									42	42.3	868.8875	0.16	0.58	28
								RRA4914B (806-900MHz)	42	42.9	806.0125	0.33	0.54	62
									42	42.9	815.0125	0.39	0.54	72
									42	42.7	823.9875	0.50	0.55	92
									42	42.6	851.0125	0.26	0.57	45
									42	42.4	862.0125	0.26	0.57	45
									42	42.3	868.8875	0.24	0.58	41

Note - Results outside FCC bands are not applicable for compliance demonstration.

Table 7 (continued)

## Passenger MPE assessment to General Pop. / Uncontrolled Exposure Limits for trunk mounted antennas

Trunk/ Roof	Test Position	E/H Field	Angle (Degree)	Antenna Model	Max Pwr (W)	Initial Pwr (W)	Tx Freq (MHz)	Max Calc. P.D. (mW/cm <sup>2</sup> )	FCC Limit	% To Spec Limit				
Trunk	PF	E	0	HAF4016A (764-870MHz)	36	36.2	764.0875	0.07	0.51	14				
					36	36.6	770.0125	0.07	0.51	14				
					36	36.3	775.9125	0.07	0.52	13				
					36	36.9	794.0875	0.08	0.53	16				
					42	42.9	806.0125	0.06	0.54	11				
					42	42.7	823.9875	0.07	0.55	13				
					42	42.6	851.0125	0.05	0.57	9				
					42	42.4	862.0125	0.05	0.57	9				
					42	42.3	868.8875	0.05	0.58	9				
								HAF4002A (806-900MHz)	42	42.9	806.0125	0.05	0.54	10
									42	42.9	815.0125	0.07	0.54	13
									42	42.7	823.9875	0.07	0.55	13
									42	42.6	851.0125	0.06	0.57	11
									42	42.4	862.0125	0.06	0.57	10
									42	42.3	868.8875	0.06	0.58	10
								HAF4014A (764-870MHz)	36	36.2	764.0875	0.09	0.51	18
									36	36.6	770.0125	0.11	0.51	22
									36	36.3	775.9125	0.12	0.52	22
									36	36.9	794.0875	0.12	0.53	23
									42	42.9	806.0125	0.09	0.54	17
									42	42.7	823.9875	0.12	0.55	22
									42	42.6	851.0125	0.09	0.57	16
									42	42.4	862.0125	0.06	0.57	11
									42	42.3	868.8875	0.06	0.58	10

Note - Results outside FCC bands are not applicable for compliance demonstration.

Table 7 (continued)

## Passenger MPE assessment to General Pop. / Uncontrolled Exposure Limits for trunk mounted antennas

Trunk/ Roof	Test Position	E/H Field	Angle (Degree)	Antenna Model	Max Pwr (W)	Initial Pwr (W)	Tx Freq (MHz)	Max Calc. P.D. (mW/ cm <sup>2</sup> )	FCC Limit	% To Spec Limit				
Trunk	PF	E	0	HAF4013A (764-870MHz)	36	36.2	764.0875	0.06	0.51	13				
					36	36.6	770.0125	0.07	0.51	14				
					36	36.3	775.9125	0.07	0.52	14				
					36	36.9	794.0875	0.08	0.53	15				
					42	42.9	806.0125	0.06	0.54	11				
					42	42.7	823.9875	0.07	0.55	13				
					42	42.6	851.0125	0.05	0.57	9				
					42	42.4	862.0125	0.04	0.57	7				
					42	42.3	868.8875	0.04	0.58	6				
								HAF4017A (764-870MHz)	36	36.2	764.0875	0.02	0.51	4
									36	36.6	770.0125	0.03	0.51	5
									36	36.3	775.9125	0.03	0.52	6
									36	36.9	794.0875	0.07	0.53	12
									42	42.9	806.0125	0.05	0.54	10
									42	42.7	823.9875	0.08	0.55	15
									42	42.6	851.0125	0.07	0.57	13
									42	42.4	862.0125	0.05	0.57	9
									42	42.3	868.8875	0.06	0.58	10
								RRA4914B (806-900MHz)	42	42.9	806.0125	0.11	0.54	20
									42	42.9	815.0125	0.09	0.54	17
									42	42.7	823.9875	0.12	0.55	21
									42	42.6	851.0125	0.13	0.57	24
									42	42.4	862.0125	0.12	0.57	21
									42	42.3	868.8875	0.08	0.58	14

Note - Results outside FCC bands are not applicable for compliance demonstration.

Table 8

## Bystander MPE assessment to General Pop. / Uncontrolled Exposure Limits for roof mounted antennas

Trunk/ Roof	Test Position	E/H Field	Angle (Degree)	Antenna Model	Max Pwr (W)	Initial Pwr (W)	Tx Freq (MHz)	Max Calc. P.D. (mW/ cm <sup>2</sup> )	FCC Limit	% To Spec Limit				
Roof	BS	E	NA	HAF4016A (764-870MHz)	36	36.2	764.0875	0.06	0.51	12				
					36	36.6	770.0125	0.06	0.51	11				
					36	36.3	775.9125	0.05	0.52	10				
					36	36.9	794.0875	0.06	0.53	12				
					42	42.9	806.0125	0.06	0.54	11				
					42	42.7	823.9875	0.07	0.55	12				
					42	42.6	851.0125	0.06	0.57	11				
					42	42.4	862.0125	0.05	0.57	8				
					42	42.3	868.8875	0.05	0.58	8				
								HAF4002A (806-900MHz)	42	42.9	806.0125	0.06	0.54	11
									42	42.9	815.0125	0.07	0.54	13
									42	42.7	823.9875	0.07	0.55	13
									42	42.6	851.0125	0.06	0.57	11
									42	42.4	862.0125	0.05	0.57	8
									42	42.3	868.8875	0.04	0.58	8
								HAF4014A (764-870MHz)	36	36.2	764.0875	0.07	0.51	14
									36	36.6	770.0125	0.07	0.51	14
									36	36.3	775.9125	0.07	0.52	13
									36	36.9	794.0875	0.08	0.53	15
									42	42.9	806.0125	0.07	0.54	14
									42	42.7	823.9875	0.09	0.55	16
									42	42.6	851.0125	0.07	0.57	12
									42	42.4	862.0125	0.05	0.57	9
									42	42.3	868.8875	0.05	0.58	9

Note - Results outside FCC bands are not applicable for compliance demonstration.



**Table 9**

**Passenger MPE assessment to General Pop. / Uncontrolled Exposure Limits for roof mounted antennas**

Trunk/ Roof	Test Position	E/H Field	Angle (Degree)	Antenna Model	Max Pwr (W)	Initial Pwr (W)	Tx Freq (MHz)	Max Calc. P.D. (mW/ cm <sup>2</sup> )	FCC Limit	% To Spec Limit				
Roof	PB	E	NA	HAF4016A (764-870MHz)	36	36.2	764.0875	0.04	0.51	7				
					36	36.6	770.0125	0.03	0.51	7				
					36	36.3	775.9125	0.02	0.52	5				
					36	36.9	794.0875	0.02	0.53	4				
					42	42.9	806.0125	0.02	0.54	5				
					42	42.7	823.9875	0.02	0.55	4				
					42	42.6	851.0125	0.02	0.57	4				
					42	42.4	862.0125	0.02	0.57	3				
					42	42.3	868.8875	0.03	0.58	5				
								HAF4002A (806-900MHz)	42	42.9	806.0125	0.02	0.54	5
									42	42.9	815.0125	0.03	0.54	6
									42	42.7	823.9875	0.03	0.55	5
									42	42.6	851.0125	0.02	0.57	4
									42	42.4	862.0125	0.02	0.57	4
									42	42.3	868.8875	0.02	0.58	4
								HAF4014A (764-870MHz)	36	36.2	764.0875	0.05	0.51	10
									36	36.6	770.0125	0.06	0.51	12
									36	36.3	775.9125	0.06	0.52	11
									36	36.9	794.0875	0.04	0.53	8
									42	42.9	806.0125	0.04	0.54	7
									42	42.7	823.9875	0.04	0.55	7
									42	42.6	851.0125	0.04	0.57	7
									42	42.4	862.0125	0.03	0.57	5
									42	42.3	868.8875	0.03	0.58	5

Note - Results outside FCC bands are not applicable for compliance demonstration.

Table 9 (continued)

## Passenger MPE assessment to General Pop. / Uncontrolled Exposure Limits for roof mounted antennas

Trunk/ Roof	Test Position	E/H Field	Angle (Degree)	Antenna Model	Max Pwr (W)	Initial Pwr (W)	Tx Freq (MHz)	Max Calc. P.D. (mW/ cm <sup>2</sup> )	FCC Limit	% To Spec Limit				
Roof	PB	E	NA	HAF4013A (764-870MHz)	36	36.2	764.0875	0.03	0.51	6				
					36	36.6	770.0125	0.03	0.51	6				
					36	36.3	775.9125	0.03	0.52	6				
					36	36.9	794.0875	0.02	0.53	4				
					42	42.9	806.0125	0.02	0.54	4				
					42	42.7	823.9875	0.03	0.55	5				
					42	42.6	851.0125	0.03	0.57	5				
					42	42.4	862.0125	0.03	0.57	5				
					42	42.3	868.8875	0.03	0.58	6				
								HAF4017A (764-870MHz)	36	36.2	764.0875	0.00	0.51	0
									36	36.6	770.0125	0.00	0.51	0
									36	36.3	775.9125	0.00	0.52	0
									36	36.9	794.0875	0.00	0.53	0
									42	42.9	806.0125	0.01	0.54	1
									42	42.7	823.9875	0.01	0.55	3
									42	42.6	851.0125	0.02	0.57	3
									42	42.4	862.0125	0.03	0.57	4
									42	42.3	868.8875	0.02	0.58	4
								RRA4914B (806-900MHz)	42	42.9	806.0125	0.03	0.54	5
									42	42.9	815.0125	0.04	0.54	7
									42	42.7	823.9875	0.04	0.55	7
									42	42.6	851.0125	0.04	0.57	8
									42	42.4	862.0125	0.04	0.57	7
									42	42.3	868.8875	0.04	0.58	7

Note - Results outside FCC bands are not applicable for compliance demonstration.

Table 9 (continued)

## Passenger MPE assessment to General Pop. / Uncontrolled Exposure Limits for roof mounted antennas

Trunk/ Roof	Test Position	E/H Field	Angle (Degree)	Antenna Model	Max Pwr (W)	Initial Pwr (W)	Tx Freq (MHz)	Max Calc. P.D. (mW/ cm <sup>2</sup> )	FCC Limit	% To Spec Limit				
Roof	PF	E	NA	HAF4016A (764-870MHz)	36	36.2	764.0875	0.01	0.51	2				
					36	36.6	770.0125	0.00	0.51	1				
					36	36.3	775.9125	0.01	0.52	1				
					36	36.9	794.0875	0.00	0.53	0				
					42	42.9	806.0125	0.02	0.54	3				
					42	42.7	823.9875	0.01	0.55	2				
					42	42.6	851.0125	0.00	0.57	0				
					42	42.4	862.0125	0.00	0.57	1				
					42	42.3	868.8875	0.01	0.58	1				
								HAF4002A (806-900MHz)	42	42.9	806.0125	0.02	0.54	3
									42	42.9	815.0125	0.02	0.54	4
									42	42.7	823.9875	0.01	0.55	2
									42	42.6	851.0125	0.00	0.57	0
									42	42.4	862.0125	0.00	0.57	1
									42	42.3	868.8875	0.01	0.58	1
								HAF4014A (764-870MHz)	36	36.2	764.0875	0.01	0.51	3
									36	36.6	770.0125	0.02	0.51	3
									36	36.3	775.9125	0.01	0.52	3
									36	36.9	794.0875	0.03	0.53	6
									42	42.9	806.0125	0.02	0.54	5
									42	42.7	823.9875	0.02	0.55	4
									42	42.6	851.0125	0.01	0.57	2
									42	42.4	862.0125	0.00	0.57	0
									42	42.3	868.8875	0.00	0.58	1

Note - Results outside FCC bands are not applicable for compliance demonstration.

Table 9 (continued)

## Passenger MPE assessment to General Pop. / Uncontrolled Exposure Limits for roof mounted antennas

Trunk/ Roof	Test Position	E/H Field	Angle (Degree)	Antenna Model	Max Pwr (W)	Initial Pwr (W)	Tx Freq (MHz)	Max Calc. P.D. (mW/ cm <sup>2</sup> )	FCC Limit	% To Spec Limit				
Roof	PF	E	NA	HAF4013A (764-870MHz)	36	36.2	764.0875	0.01	0.51	2				
					36	36.6	770.0125	0.01	0.51	1				
					36	36.3	775.9125	0.01	0.52	2				
					36	36.9	794.0875	0.02	0.53	4				
					42	42.9	806.0125	0.01	0.54	3				
					42	42.7	823.9875	0.01	0.55	2				
					42	42.6	851.0125	0.00	0.57	0				
					42	42.4	862.0125	0.00	0.57	1				
					42	42.3	868.8875	0.01	0.58	1				
								HAF4017A (764-870MHz)	36	36.2	764.0875	0.00	0.51	0
									36	36.6	770.0125	0.00	0.51	0
									36	36.3	775.9125	0.00	0.52	0
									36	36.9	794.0875	0.00	0.53	0
									42	42.9	806.0125	0.01	0.54	1
									42	42.7	823.9875	0.00	0.55	1
									42	42.6	851.0125	0.00	0.57	1
									42	42.4	862.0125	0.01	0.57	1
									42	42.3	868.8875	0.00	0.58	1
								RRA4914B (806-900MHz)	42	42.9	806.0125	0.03	0.54	5
									42	42.9	815.0125	0.04	0.54	7
									42	42.7	823.9875	0.02	0.55	3
									42	42.6	851.0125	0.01	0.57	3
									42	42.4	862.0125	0.01	0.57	1
									42	42.3	868.8875	0.00	0.58	1

Note - Results outside FCC bands are not applicable for compliance demonstration.

## 16.0 Conclusion

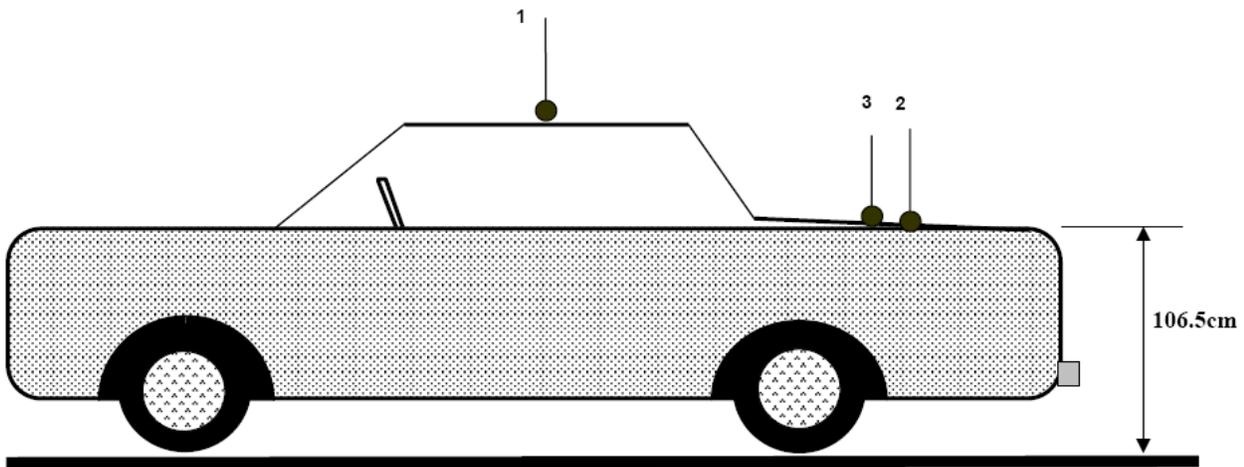
The assessments for this device were performed with an output power range as indicated in section 15.0 Tables 6 - 9. The maximum allowable output power is equal to the upper limit of the final test factory transmit power specification of 36W (700MHz band) and 42W (800MHz band). The highest power density results for the mobile device scaled to the maximum allowable power output are indicated in the Table10 for internal/passenger to the vehicle, and external/bystander to the vehicle.

**Table 10: RF Exposure Results for FCC Part 90 (764-869MHz)**

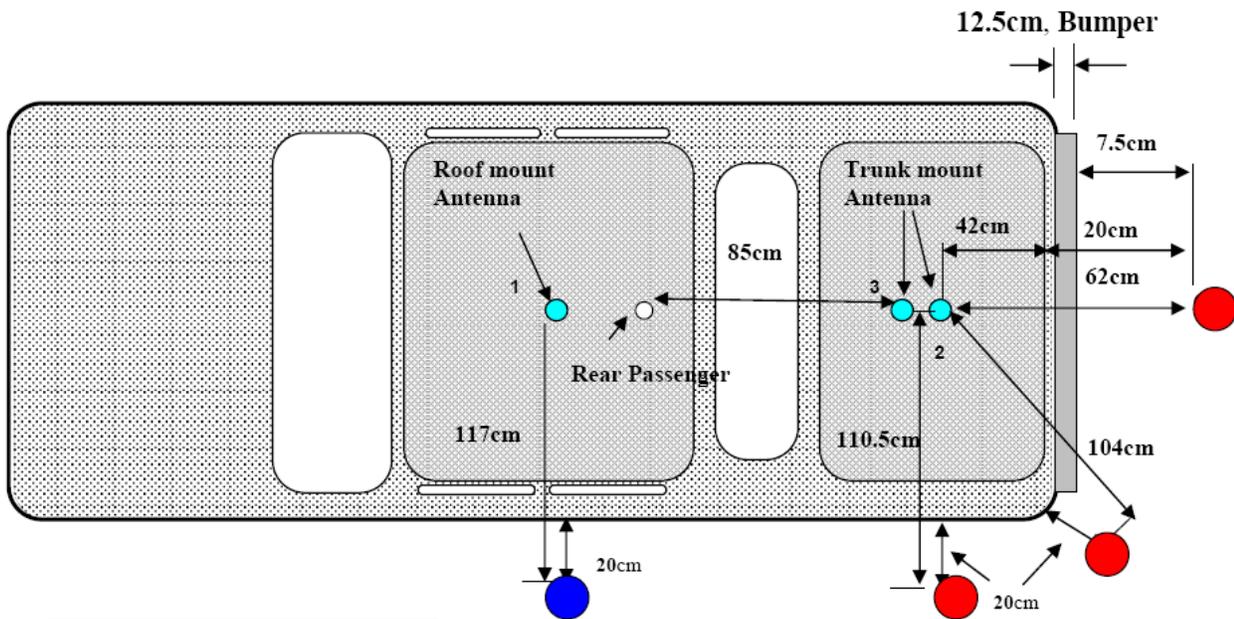
	<b>7/800 Band</b>
<b>Passenger - Max Calculated Power Density</b>	0.53mW/cm <sup>2</sup>
<b>Bystander - Max Calculated Power Density</b>	0.27mW/cm <sup>2</sup>

These MPE results herein demonstrate compliance to the FCC/IEEE Occupational/Controlled Exposure limit. FCC rules require compliance for Passengers and Bystanders to the FCC General Population/Uncontrolled limits.

**Appendix A - Illustration of Antenna Locations and Test Distances**



- 1 - Roof (center)
- 2 - Trunk (center)
- 3 - Trunk (85cm from back of the back seat)



By-Stander Test Locations

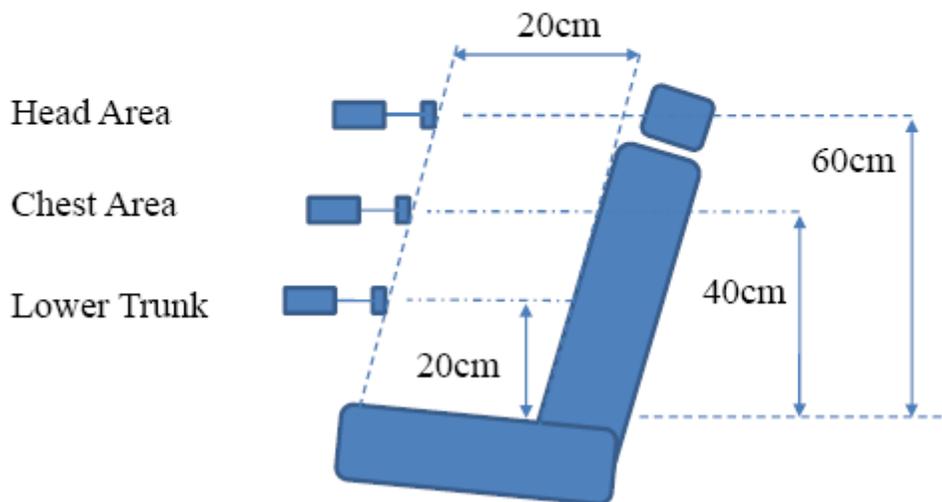
- Roof Mount
- Trunk Mount

**Note:** The distance from the centered trunk-mounted antenna to the edge of the vehicle is 42cm and the distance from the edge of the vehicle to the survey probe sensor is 20cm.

Seat scan areas  
(Applicable to both front and back seats)

Meter - Probe

 Probe diameter is 5.5cm



**Appendix B - Probe Calibration Certificates**

**LOCKHEED MARTIN**  
MISSION SERVICES



**Stennis Integrated Metrology Center  
Certificate of Calibration**



Certificate No: AGIL700384/2240985

Mfr: ETS-LINDGREN  
Model: E100  
Serial No: 00084254

Description: ELECTRICAL FIELD PROBE  
LMTO No: AGIL700384  
Asset No: 1-1215598145B  
Cycle: 12 Months

Customer: AGILENT TECHNOLOGIES INC.  
AGIL, MOTOROLA  
8000 WEST SUNRISE BLVD  
PLANTATION, FL 33322

PO No:

As Found: IN TOLERANCE  
As Shipped: IN TOLERANCE  
Date Calibrated: 20-FEB-2008  
Date Cal Due: 20-FEB-2009

Performed By: SP9597  
Temperature: 24C  
Humidity: 17%

Procedure: VEN PRO - VENDOR CALIBRATION PROCEDURE

Comments: REFER TO LIBERTY LABS INC CERT # 2008021504 DATED 2.20.08. CERT INCLUDES SNs  
00084254 & 00086316

**STANDARDS USED**

**TRACEABILITY**

All measurements were performed using standards traceable to the National Institute of Standards and Technology, an internationally recognized standard, an intrinsic standard or ratio method. Calibration was performed in compliance with our Laboratory Quality System that is based upon conformance to ISO/IEC 17025:1999. Unless otherwise noted, the accuracy ratios are equal or greater than 4:1 in accordance with ANSI/NCSL Z540-1-1994, paragraph 10.2.b.

This certificate may not be reproduced, except in full, without written permission from this laboratory.

**MAIL: Stennis Integrated Metrology Center**  
Building 5100  
Stennis Space Center, MS 39529  
PHONE: (228) 813-2069  
EMAIL: JOHN.A.BOYEA@LMCO.COM

**SHIP: Stennis Integrated Metrology Center**  
Building 5100  
Stennis Space Center, MS 39529  
FAX: (228) 813-2073

**CERTIFICATION OF CALIBRATION CONFORMANCE**

LIBERTY LABS, INC. 1346 Yellowwood Road Kimballton, IA 51543  
 EMAIL: mhoward@liberty-labs.com TEL: (712) 773-2199 FAX: (712)773-2299

This probe has been individually calibrated using IEEE Standard for Calibration of Electromagnetic Field Sensors and Probes, Excluding Antennas, from 9 kHz to 40 GHz; IEEE Std. 1309(1996 and/or 2005). All results of this calibration relate only to the items that were calibrated.

**ACCREDITATION NOTES:**

A complete copy of the scope of our A2LA accreditation is available upon request.

Instrumentation Environment:	TEMP: 24°C	RH: 17%
Calibration Environment:	TEMP: 24°C	RH: 17%

Barometric Pressure (inches): 30.58

CERTIFICATE NO.: 2008021504

CLIENT: Lockheed Martin IMC, Bldg. 5100, Stennis Space Center, MS, 39529, USA

MANUFACTURER: ETS

MODEL NUMBER: E100 & HI-2200

SERIAL NUMBER: 00084254 & 00086316

ASSET NUMBER: BBBBD051 & BBBBD050

DATE OF CALIBRATION: Wednesday, February 20, 2008

NAME OF CALIBRATING ORGANIZATION Liberty Labs, Inc.

CALIBRATED BY: DGB *DGB*

RE-CALIBRATION DATE: Re-calibration interval is at customer discretion.

**RECEIVED STATUS**

Received in tolerance:

**RETURNED STATUS**

Returned in tolerance:

Returned limited cal.:

**NOTES:** Below 1 GHz Liberty Labs uses a transfer standard calibrated to IEEE1309 Standards. Liberty Labs uses this transfer standard via the substitute method outlined in IEEE 1309 in a triplate test cell to calibrate probes. The uncertainty between the TEM and Triplate is minimal in this application. Client declined isotropic response testing. In/Out of tolerance based on alignment/mounting position and not on manufacturer's specifications. A probe position document is included with this certificate. Data above 5GHz is for reference only per manufacturer's specifications of 100kHz-5GHz.



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*Michael W. Howard*

ENGINEER IN CHARGE  
 MICHAEL W. HOWARD  
 NARTE CERTIFIED EMC ENGINEER, NO. EM C-000102-NE



Certificate Number: 2123.01

Rev. D: Issue Date 12/12/03

ispb-position

**CERTIFICATE NO: 2008021504**

**IN TOLERANCE/OUT OF TOLERANCE EXPLANATION:**

The In Tolerance/Out of Tolerance criteria are based on one of the following conditions, of judgement of this laboratory:

1. If the manufacturer has a specified tolerance for the antenna or item under test, then the calibration results, with our uncertainty value added, are compared to this tolerance, and the combined value must fall within the manufacturer's tolerance. The tolerance may be obtained from the manufacturer's web site, catalogs specification sheets, manuals, etc.
2. In the case where the manufacturer does not have any specified tolerances, the calibration results, with our uncertainty value added, are compared to typical curves provided by the manufacturer or historical in-house data with a  $\pm 3$  dB tolerance.
3. Where results are compared to published specifications from a standard, the calibration results, with our uncertainty value added, are compared to this tolerance, and the combined value must fall within the standard's tolerance.
4. In the situation that this laboratory's uncertainty of measurement is larger than the manufacturer's specified tolerance, the comparison criteria will be based on historical in-house data as defined above. This judgement will only be made using accredited calibration methods.

**INTERPRETATION TO THE GUIDANCE AND USE OF CALIBRATION DATA:**

The calibration values supplied with this certificate apply to measurements made under the physical (geometric) arrangements with respect to the distances to reference points on the probe. Use of these probes under other conditions will result in additional sources of error of which is the responsibility of the user.

**CALIBRATION TRACEABILITY:**

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to traceability is on file and is available for examination upon request. Measurement procedure per Military Handbook 52A as guidance for Military Standard (MIL-STD) 45662A, ANSI/NCSL Z540-1-1994, ISO/IEC 17025, and Liberty Labs, Inc. procedure CP-10.

**ALIGNMENT/MOUNTING POSITION:**

This calibration is valid only for the alignment/mounting position specified in this report. Any other alignment/mounting position of this probe will invalidate the correction factors given in this report. We have found the manufacturer's tolerances are only applicable to a very specific alignment/mounting position at the manufacturer's test frequencies. Alignment/mounting position of this probe is critical and deviation from alignment/mounting position indicated in this report can produce errors in excess of 6 dB.

CERTIFICATE NO: 2008021504

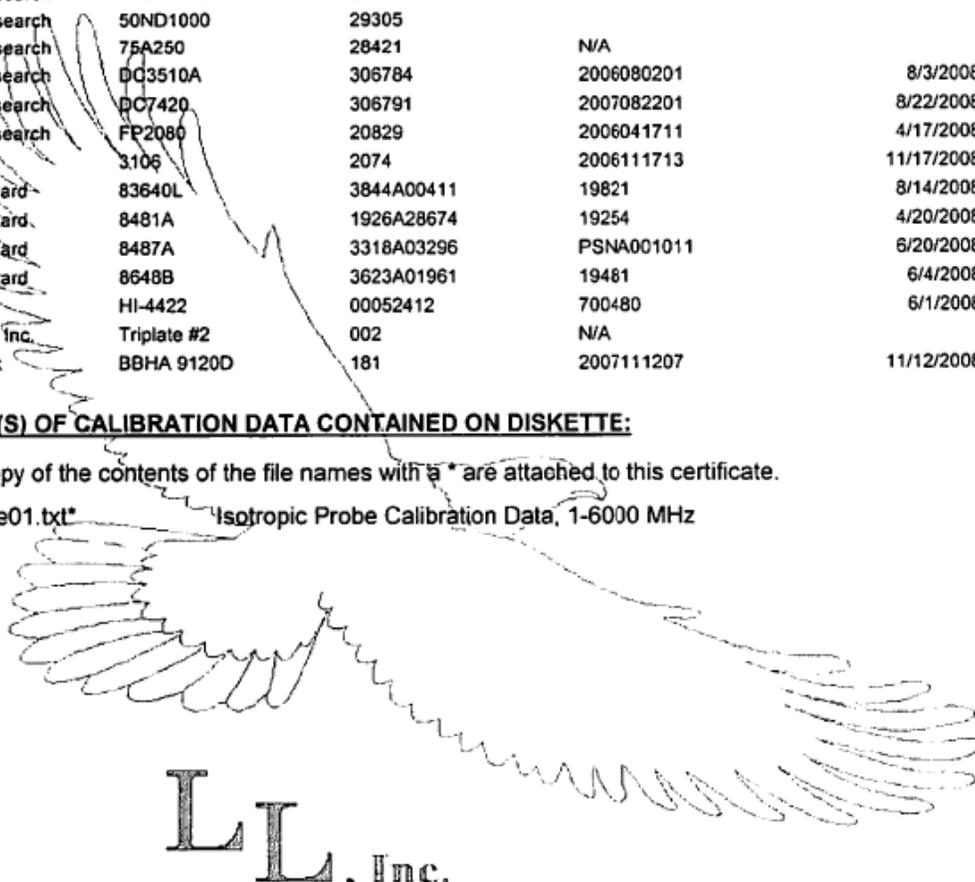
**CALIBRATION EQUIPMENT USED**

<u>Manufacturer</u>	<u>Model Number</u>	<u>Serial Number</u>	<u>Trace Number</u>	<u>Cal Due Date</u>
Agilent	E4419B	GB39511080	19256	4/17/2008
Agilent Technologies	E4419B	GB40202746	19802	8/2/2008
Agilent Technologies	E9304A	MY41495576	20015	8/27/2008
Agilent Technologies	E9304A	MY41495575	20016	8/27/2008
Amplifier Research	10ST1G18	306136	N/A	
Amplifier Research	50ND1000	29305		
Amplifier Research	75A250	28421	N/A	
Amplifier Research	DC3510A	306784	2006080201	8/3/2008
Amplifier Research	DC7420	306791	2007082201	8/22/2008
Amplifier Research	FP2080	20829	2006041711	4/17/2008
Emco	3106	2074	2006111713	11/17/2008
Hewlett Packard	83640L	3844A00411	19821	8/14/2008
Hewlett Packard	8481A	1926A28674	19254	4/20/2008
Hewlett Packard	8487A	3318A03296	PSNA001011	6/20/2008
Hewlett Packard	8648B	3623A01961	19481	6/4/2008
Holaday	HI-4422	00052412	700480	6/1/2008
Liberty Labs, Inc.	Triplate #2	002	N/A	
Schwarzbeck	BBHA 9120D	181	2007111207	11/12/2008

**FILENAME(S) OF CALIBRATION DATA CONTAINED ON DISKETTE:**

A printed copy of the contents of the file names with a \* are attached to this certificate.

Probe01.txt\* Isotropic Probe Calibration Data, 1-6000 MHz



**LL, Inc.**

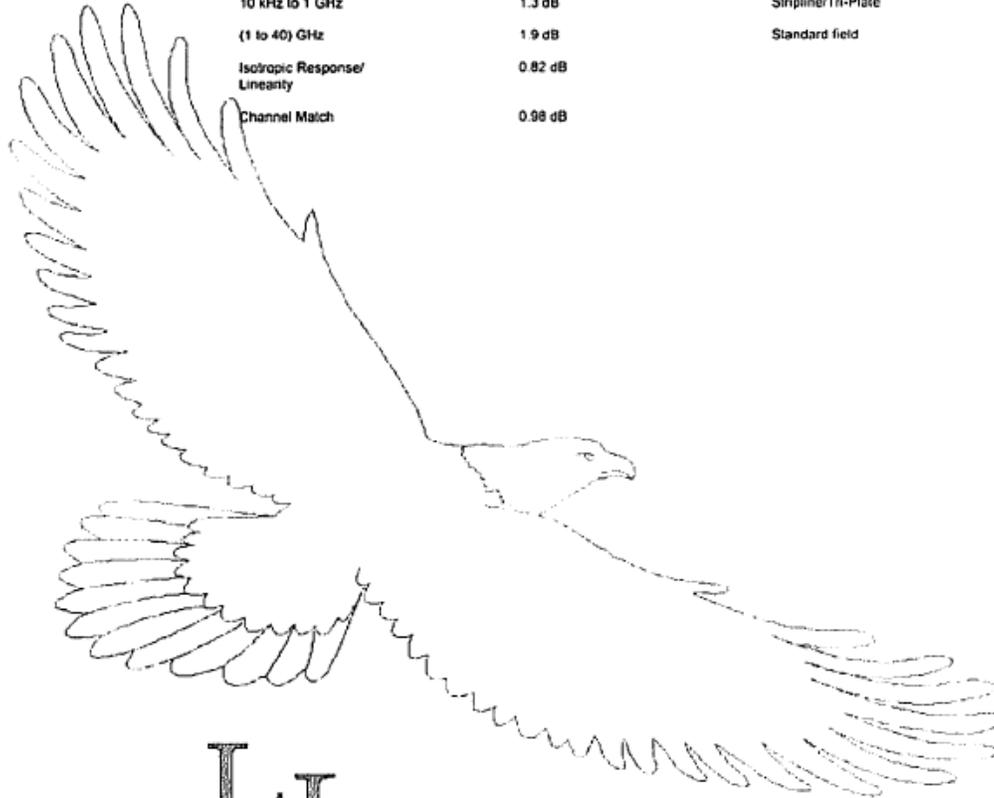
CERTIFICATE NO: 2008021504

**Calibration Uncertainty:**

Actual uncertainty (Expanded)

Typical uncertainties are shown below and checked for those that apply to this calibration. Best uncertainty equals our typical Muc in most cases. Best uncertainty is based on type A evaluations of at least 10 data sets or more.

<u>Parameter/Equipment:</u>	<u>Range:</u>	<u>Best Uncertainty*** (+/-):</u>	<u>Comments:</u>
RF Isotropic Probes*****	10 kHz to 1 GHz	0.71 dB	GTEM/TEM coil
	(0.1 to 18) GHz	0.76 dB	GTEM/Open Ended Wave Guide
	10 kHz to 1 GHz	1.3 dB	Sinpline/Tri-Plate
	(1 to 40) GHz	1.9 dB	Standard field
	Isotropic Response/Linearity	0.82 dB	
	Channel Match	0.98 dB	



**LL, Inc.**

\* This laboratory offers commercial calibration service.

\*\* Best Uncertainties represents an expanded uncertainty corresponding to a 95.45 % level of confidence using a coverage factor, k. Values of k other than 2 were approximated by a t-distribution with the effective degrees of freedom, v<sub>eff</sub>, obtained from the Welch-Satterthwaite formula.

\*\*\* "Best Uncertainty" is the smallest uncertainty of measurement that a laboratory can achieve within its scope of accreditation when performing more or less routine calibrations of nearly ideal measurement standards of nearly ideal measuring equipment. Best uncertainties represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of k = 2. The best uncertainty of a specific calibration performed by the laboratory may be greater than the best uncertainty due to the behavior of the customer's device, to the environment (if the calibration is performed in the field) and to influences from the circumstances of the specific calibration.

\*\*\*\* In the statement of best uncertainty, M is the Mismatch error due to connections of device to other devices in actual use.

\*\*\*\*\* On-site calibration service is available for this calibration. The uncertainties achievable on a customer's site can normally be expected to be larger than the Best Measurement Capabilities (BMC) that the accredited laboratory has been assigned as Best Uncertainty on the A2LA Scope. Allowance must be made for aspects such as the environment at the place of calibration and for other possible adverse effects such as those caused by transportation of the calibration equipment. The usual allowance for the uncertainty introduced by the item being calibrated, (e.g. resolution) must also be considered and this, on its own, could result in the calibration uncertainty being larger than the BMC.

Probe01.txt

Date of Calibration: 20-February-2008  
Date Printed: Wednesday, February 20, 2008  
Customer Name: Lockheed Martin IMC  
Probe Manufacturer: ETS  
Probe Model: E100 & HI-2200  
Probe Serial No.: 00084254 & 00086316  
Temperature (Deg C): 24  
Humidity (%): 17  
Notes:  
CAL CERT #: 2008021504

## Correction Factors

Frequency in MHz	15V/m Applied Field		125V/m Applied Field	
	Multiplier	dB	Multiplier	dB
1	1.15	1.22	1.17	1.36
15	1.06	0.52	1.09	0.79
30	1.08	0.69	1.10	0.81
75	1.09	0.77	1.13	1.07
100	1.12	0.98	1.13	1.03
150	1.12	1.00	1.17	1.33
200	1.11	0.89	1.15	1.18
250	1.13	1.03	1.19	1.48
300	1.05	0.42	1.14	1.15
400	1.07	0.59	1.10	0.79
500	1.05	0.44	1.09	0.74
600	1.07	0.63	1.14	1.18
700	1.14	1.16	1.17	1.36
800	1.15	1.24	1.21	1.66
900	1.13	1.06	1.17	1.37
1000	1.01	0.05	1.00	0.04

Frequency in MHz	15V/m Applied Field		50V/m Applied Field	
	Multiplier	dB	Multiplier	dB
2000	0.82	-1.72	0.86	-1.33
2450	0.93	-0.64	0.95	-0.44
3000	0.93	-0.60	0.95	-0.40
3500	1.02	0.16	1.02	0.13
4000	1.20	1.57	1.22	1.73
5000	0.86	-1.32	0.88	-1.14
5500	1.31	2.34	1.34	2.53
6000	5.83	15.31	5.62	15.00

**Appendix C - Photos of Assessed Antennas**

(Refer to Exhibit 7B)

**Appendix D – MPE Measurement Results**

MPE measurement data for Bystander

D.U.T. Info.							Probe Info.			By Stander (BS) Positions										DUT Max. TX Factor	Avg. over Body (mW/cm2)	Calc. P.D. (mW/cm2)	Max Calc. P.D. (mW/cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor	Test Pos.	20 cm	40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm	200 cm				
Trunk	HAF4016A (764-870MHz)	2.15	764.09	36	36.2	CW	E	1.43	BS	0.01	0.02	0.06	0.14	0.55	1.05	0.64	0.22	0.09	0.05	0.5	0.283	0.202	0.20
Trunk	HAF4016A (764-870MHz)	2.15	770.01	36	36.6	CW	E	1.44	BS	0.01	0.02	0.06	0.15	0.58	1.10	0.71	0.23	0.07	0.03	0.5	0.296	0.213	0.21
Trunk	HAF4016A (764-870MHz)	2.15	775.91	36	36.3	CW	E	1.44	BS	0.01	0.02	0.06	0.14	0.56	1.09	0.73	0.24	0.06	0.02	0.5	0.293	0.211	0.21
Trunk	HAF4016A (764-870MHz)	2.15	794.09	36	36.9	CW	E	1.46	BS	0.01	0.02	0.05	0.10	0.55	1.02	0.80	0.38	0.11	0.02	0.5	0.306	0.223	0.22
Trunk	HAF4016A (764-870MHz)	2.15	806.01	42	42.9	CW	E	1.46	BS	0.00	0.02	0.04	0.08	0.45	0.78	0.72	0.49	0.19	0.04	0.5	0.281	0.205	0.21
Trunk	HAF4016A (764-870MHz)	2.15	823.99	42	42.7	CW	E	1.44	BS	0.01	0.02	0.03	0.10	0.50	0.83	0.69	0.47	0.23	0.08	0.5	0.296	0.213	0.21
Trunk	HAF4016A (764-870MHz)	2.15	851.01	42	42.6	CW	E	1.42	BS	0.00	0.01	0.03	0.07	0.47	0.66	0.56	0.37	0.22	0.11	0.5	0.250	0.178	0.18
Trunk	HAF4016A (764-870MHz)	2.15	862.01	42	42.4	CW	E	1.41	BS	0.00	0.00	0.03	0.06	0.41	0.55	0.43	0.29	0.19	0.10	0.5	0.206	0.145	0.15
Trunk	HAF4016A (764-870MHz)	2.15	868.89	42	42.3	CW	E	1.40	BS	0.00	0.00	0.02	0.06	0.43	0.61	0.53	0.27	0.16	0.09	0.5	0.217	0.152	0.15
Trunk	HAF4002A (806-900MHz)	2.15	806.01	42	42.9	CW	E	1.46	BS	0.00	0.02	0.04	0.08	0.46	0.79	0.76	0.51	0.20	0.04	0.5	0.290	0.212	0.21
Trunk	HAF4002A (806-900MHz)	2.15	815.01	42	42.9	CW	E	1.45	BS	0.01	0.02	0.05	0.11	0.61	0.95	0.80	0.47	0.20	0.05	0.5	0.327	0.237	0.24
Trunk	HAF4002A (806-900MHz)	2.15	823.99	42	42.7	CW	E	1.44	BS	0.01	0.02	0.04	0.11	0.50	0.87	0.74	0.50	0.24	0.08	0.5	0.311	0.224	0.22
Trunk	HAF4002A (806-900MHz)	2.15	851.01	42	42.6	CW	E	1.42	BS	0.00	0.01	0.03	0.07	0.48	0.71	0.60	0.39	0.34	0.12	0.5	0.275	0.195	0.20
Trunk	HAF4002A (806-900MHz)	2.15	862.01	42	42.4	CW	E	1.41	BS	0.00	0.01	0.03	0.06	0.42	0.57	0.48	0.30	0.30	0.11	0.5	0.228	0.161	0.16
Trunk	HAF4002A (806-900MHz)	2.15	868.89	42	42.3	CW	E	1.40	BS	0.00	0.00	0.03	0.07	0.44	0.65	0.58	0.28	0.16	0.10	0.5	0.231	0.162	0.16

MPE calculations are defined in section 13.0.

MPE measurement data for Bystander

D.U.T. Info.							Probe Info.		Test Pos.	By Stander (BS) Positions										DUT Max. TX Factor	Avg. over Body (mW/cm2)	Calc. P.D. (mW/cm2)	Max Calc. P.D. (mW/cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor		20 cm	40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm	200 cm				
Trunk	HAF4014A (764-870MHz)	5.15	764.09	36	36.2	CW	E	1.43		BS	0.01	0.04	0.08	0.20	0.84	1.24	0.36	0.03	0.04				
Trunk	HAF4014A (764-870MHz)	5.15	770.01	36	36.6	CW	E	1.44	BS	0.01	0.04	0.09	0.20	0.93	1.40	0.41	0.02	0.02	0.02	0.5	0.314	0.226	0.23
Trunk	HAF4014A (764-870MHz)	5.15	775.91	36	36.3	CW	E	1.44	BS	0.01	0.04	0.09	0.20	0.90	1.33	0.39	0.02	0.01	0.01	0.5	0.300	0.216	0.22
Trunk	HAF4014A (764-870MHz)	5.15	794.09	36	36.9	CW	E	1.46	BS	0.02	0.04	0.09	0.18	0.93	1.30	0.41	0.06	0.00	0.01	0.5	0.304	0.222	0.22
Trunk	HAF4014A (764-870MHz)	5.15	806.01	42	42.9	CW	E	1.46	BS	0.01	0.03	0.06	0.13	0.65	0.87	0.25	0.08	0.04	0.01	0.5	0.213	0.155	0.16
Trunk	HAF4014A (764-870MHz)	5.15	823.99	42	42.7	CW	E	1.44	BS	0.01	0.02	0.05	0.15	0.68	1.00	0.28	0.07	0.09	0.04	0.5	0.239	0.172	0.17
Trunk	HAF4014A (764-870MHz)	5.15	851.01	42	42.6	CW	E	1.42	BS	0.00	0.01	0.04	0.08	0.61	0.90	0.32	0.06	0.13	0.10	0.5	0.225	0.160	0.16
Trunk	HAF4014A (764-870MHz)	5.15	862.01	42	42.4	CW	E	1.41	BS	0.00	0.00	0.03	0.07	0.52	0.76	0.30	0.05	0.11	0.09	0.5	0.193	0.136	0.14
Trunk	HAF4014A (764-870MHz)	5.15	868.89	42	42.3	CW	E	1.40	BS	0.00	0.00	0.03	0.06	0.51	0.81	0.39	0.04	0.09	0.09	0.5	0.202	0.141	0.14
Trunk	HAF4013A (764-870MHz)	5.15	764.09	36	36.2	CW	E	1.43	BS	0.01	0.03	0.06	0.15	0.63	1.18	0.78	0.29	0.11	0.05	0.5	0.329	0.235	0.24
Trunk	HAF4013A (764-870MHz)	5.15	770.01	36	36.6	CW	E	1.44	BS	0.01	0.03	0.06	0.15	0.65	1.24	0.81	0.28	0.09	0.03	0.5	0.335	0.241	0.24
Trunk	HAF4013A (764-870MHz)	5.15	775.91	36	36.3	CW	E	1.44	BS	0.01	0.02	0.02	0.14	0.64	1.23	0.81	0.28	0.08	0.02	0.5	0.325	0.234	0.23
Trunk	HAF4013A (764-870MHz)	5.15	794.09	36	36.9	CW	E	1.46	BS	0.01	0.02	0.06	0.11	0.62	1.19	1.02	0.48	0.13	0.03	0.5	0.367	0.268	0.27
Trunk	HAF4013A (764-870MHz)	5.15	806.01	42	42.9	CW	E	1.46	BS	0.00	0.02	0.04	0.08	0.46	0.80	0.79	0.54	0.21	0.04	0.5	0.298	0.218	0.22
Trunk	HAF4013A (764-870MHz)	5.15	823.99	42	42.7	CW	E	1.44	BS	0.01	0.02	0.03	0.10	0.51	0.87	0.76	0.55	0.26	0.01	0.5	0.312	0.225	0.22
Trunk	HAF4013A (764-870MHz)	5.15	851.01	42	42.6	CW	E	1.42	BS	0.00	0.01	0.03	0.07	0.49	0.72	0.63	0.43	0.26	0.13	0.5	0.277	0.197	0.20
Trunk	HAF4013A (764-870MHz)	5.15	862.01	42	42.4	CW	E	1.41	BS	0.00	0.01	0.03	0.06	0.41	0.59	0.51	0.35	0.23	0.12	0.5	0.231	0.163	0.16
Trunk	HAF4013A (764-870MHz)	5.15	868.89	42	42.3	CW	E	1.40	BS	0.00	0.00	0.02	0.07	0.45	0.67	0.62	0.33	0.20	0.12	0.5	0.248	0.174	0.17

MPE calculations are defined in section 13.0.

MPE measurement data for Bystander

D.U.T. Info.							Probe Info.		Test Pos.	By Stander (BS) Positions										DUT Max. TX Factor	Avg. over Body (mW/cm2)	Calc. P.D. (mW/cm2)	Max Calc. P.D. (mW/cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor		20 cm	40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm	200 cm				
Trunk	HAF4017A (764-870MHz)	5.15	764.09	36	36.2	CW	E	1.43		BS	0.00	0.01	0.01	0.02	0.08	0.50	0.92	0.27	0.08				
Trunk	HAF4017A (764-870MHz)	5.15	770.01	36	36.6	CW	E	1.44	BS	0.00	0.00	0.00	0.01	0.08	0.53	0.88	0.24	0.05	0.07	0.5	0.186	0.134	0.13
Trunk	HAF4017A (764-870MHz)	5.15	775.91	36	36.3	CW	E	1.44	BS	0.00	0.00	0.00	0.01	0.08	0.57	0.95	0.25	0.04	0.07	0.5	0.197	0.142	0.14
Trunk	HAF4017A (764-870MHz)	5.15	794.09	36	36.9	CW	E	1.46	BS	0.00	0.00	0.00	0.01	0.13	0.62	0.96	0.30	0.06	0.07	0.5	0.215	0.157	0.16
Trunk	HAF4017A (764-870MHz)	5.15	806.01	42	42.9	CW	E	1.46	BS	0.00	0.00	0.00	0.01	0.13	0.48	0.73	0.23	0.06	0.09	0.5	0.173	0.126	0.13
Trunk	HAF4017A (764-870MHz)	5.15	823.99	42	42.7	CW	E	1.44	BS	0.00	0.01	0.01	0.04	0.25	0.61	0.99	0.42	0.07	0.14	0.5	0.254	0.183	0.18
Trunk	HAF4017A (764-870MHz)	5.15	851.01	42	42.6	CW	E	1.42	BS	0.00	0.00	0.02	0.06	0.32	0.61	1.20	0.72	0.15	0.09	0.5	0.317	0.225	0.23
Trunk	HAF4017A (764-870MHz)	5.15	862.01	42	42.4	CW	E	1.41	BS	0.00	0.00	0.02	0.06	0.35	0.62	1.22	0.75	0.18	0.11	0.5	0.331	0.233	0.23
Trunk	HAF4017A (764-870MHz)	5.15	868.89	42	42.3	CW	E	1.40	BS	0.00	0.00	0.03	0.07	0.37	0.56	1.03	0.69	0.23	0.14	0.5	0.312	0.218	0.22
Trunk	RRA4914B (806-900MHz)	5.15	806.01	42	42.9	CW	E	1.46	BS	0.01	0.02	0.05	0.11	0.61	0.90	0.31	0.09	0.04	0.01	0.5	0.215	0.157	0.16
Trunk	RRA4914B (806-900MHz)	5.15	815.01	42	42.9	CW	E	1.45	BS	0.01	0.02	0.04	0.11	0.60	0.91	0.31	0.11	0.07	0.03	0.5	0.221	0.160	0.16
Trunk	RRA4914B (806-900MHz)	5.15	823.99	42	42.7	CW	E	1.44	BS	0.00	0.02	0.05	0.11	0.68	0.98	0.33	0.14	0.13	0.05	0.5	0.249	0.179	0.18
Trunk	RRA4914B (806-900MHz)	5.15	851.01	42	42.6	CW	E	1.42	BS	0.00	0.01	0.05	0.11	0.76	0.89	0.28	0.15	0.21	0.16	0.5	0.262	0.186	0.19
Trunk	RRA4914B (806-900MHz)	5.15	862.01	42	42.4	CW	E	1.41	BS	0.00	0.01	0.05	0.10	0.68	0.83	0.27	0.14	0.20	0.13	0.5	0.241	0.170	0.17
Trunk	RRA4914B (806-900MHz)	5.15	868.89	42	42.3	CW	E	1.40	BS	0.00	0.01	0.05	0.10	0.67	0.67	0.35	0.13	0.17	0.13	0.5	0.228	0.160	0.16
45 Degree																							
Trunk	HAF4013A (764-870MHz)	5.15	794.09	36	36.9	CW	E	1.46	BS	0.00	0.00	0.04	0.10	0.22	0.39	0.43	0.28	0.16	0.11	0.5	0.173	0.126	0.13
90 Degree																							
Trunk	HAF4013A (764-870MHz)	5.15	794.09	36	36.9	CW	E	1.46	BS	0.00	0.00	0.00	0.02	0.10	0.24	0.32	0.26	0.16	0.09	0.5	0.119	0.087	0.09

MPE calculations are defined in section 13.0.

## MPE measurement data for Passenger

D.U.T. Info.							Probe Info.		Test Pos.	Passenger Positions			DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor		Head	Chest	Lower Trunk				
Trunk	HAF4016A (764-870MHz)	2.15	764.0875	36	36.2	CW	E	1.43		PB	0.43	0.17				
Trunk	HAF4016A (764-870MHz)	2.15	770.0125	36	36.6	CW	E	1.44	PB	0.50	0.14	0.11	0.5	0.250	0.180	0.18
Trunk	HAF4016A (764-870MHz)	2.15	775.9125	36	36.3	CW	E	1.44	PB	0.41	0.14	0.19	0.5	0.247	0.178	0.18
Trunk	HAF4016A (764-870MHz)	2.15	794.0875	36	36.9	CW	E	1.46	PB	0.35	0.34	0.31	0.5	0.333	0.243	0.24
Trunk	HAF4016A (764-870MHz)	2.15	806.0125	42	42.9	CW	E	1.46	PB	0.34	0.31	0.35	0.5	0.333	0.243	0.24
Trunk	HAF4016A (764-870MHz)	2.15	823.9875	42	42.7	CW	E	1.44	PB	0.48	0.36	0.49	0.5	0.443	0.319	0.32
Trunk	HAF4016A (764-870MHz)	2.15	851.0125	42	42.6	CW	E	1.42	PB	0.33	0.24	0.18	0.5	0.250	0.178	0.18
Trunk	HAF4016A (764-870MHz)	2.15	862.0125	42	42.4	CW	E	1.41	PB	0.31	0.19	0.15	0.5	0.217	0.153	0.15
Trunk	HAF4016A (764-870MHz)	2.15	868.8875	42	42.3	CW	E	1.40	PB	0.33	0.15	0.25	0.5	0.243	0.170	0.17
Trunk	HAF4002A (806-900MHz)	2.15	806.0125	42	42.9	CW	E	1.46	PB	0.30	0.32	0.32	0.5	0.313	0.229	0.23
Trunk	HAF4002A (806-900MHz)	2.15	815.0125	42	42.9	CW	E	1.45	PB	0.39	0.33	0.19	0.5	0.303	0.220	0.22
Trunk	HAF4002A (806-900MHz)	2.15	823.9875	42	42.7	CW	E	1.44	PB	0.51	0.37	0.61	0.5	0.497	0.358	0.36
Trunk	HAF4002A (806-900MHz)	2.15	851.0125	42	42.6	CW	E	1.42	PB	0.36	0.26	0.22	0.5	0.280	0.199	0.20
Trunk	HAF4002A (806-900MHz)	2.15	862.0125	42	42.4	CW	E	1.41	PB	0.37	0.22	0.19	0.5	0.260	0.183	0.18
Trunk	HAF4002A (806-900MHz)	2.15	868.8875	42	42.3	CW	E	1.40	PB	0.37	0.16	0.13	0.5	0.220	0.154	0.15

MPE calculations are defined in section 13.0.

## MPE measurement data for Passenger

D.U.T. Info.							Probe Info.		Test Pos.	Passenger Positions			DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor		Head	Chest	Lower Trunk				
Trunk	HAF4014A (764-870MHz)	5.15	764.0875	36	36.2	CW	E	1.43		PB	0.54	0.21				
Trunk	HAF4014A (764-870MHz)	5.15	770.0125	36	36.6	CW	E	1.44	PB	0.71	0.31	0.18	0.5	0.400	0.288	0.29
Trunk	HAF4014A (764-870MHz)	5.15	775.9125	36	36.3	CW	E	1.44	PB	0.67	0.34	0.31	0.5	0.440	0.317	0.32
Trunk	HAF4014A (764-870MHz)	5.15	794.0875	36	36.9	CW	E	1.46	PB	0.67	0.43	0.36	0.5	0.487	0.355	0.36
Trunk	HAF4014A (764-870MHz)	5.15	806.0125	42	42.9	CW	E	1.46	PB	0.68	0.62	0.60	0.5	0.633	0.462	0.46
Trunk	HAF4014A (764-870MHz)	5.15	823.9875	42	42.7	CW	E	1.44	PB	0.88	0.62	0.71	0.5	0.737	0.530	0.53
Trunk	HAF4014A (764-870MHz)	5.15	851.0125	42	42.6	CW	E	1.42	PB	0.39	0.33	0.18	0.5	0.300	0.213	0.21
Trunk	HAF4014A (764-870MHz)	5.15	862.0125	42	42.4	CW	E	1.41	PB	0.46	0.21	0.19	0.5	0.287	0.202	0.20
Trunk	HAF4014A (764-870MHz)	5.15	868.8875	42	42.3	CW	E	1.40	PB	0.35	0.18	0.13	0.5	0.220	0.154	0.15
Trunk	HAF4013A (764-870MHz)	5.15	764.0875	36	36.2	CW	E	1.43	PB	0.42	0.16	0.20	0.5	0.260	0.186	0.19
Trunk	HAF4013A (764-870MHz)	5.15	770.0125	36	36.6	CW	E	1.44	PB	0.50	0.13	0.18	0.5	0.270	0.194	0.19
Trunk	HAF4013A (764-870MHz)	5.15	775.9125	36	36.3	CW	E	1.44	PB	0.49	0.11	0.14	0.5	0.247	0.178	0.18
Trunk	HAF4013A (764-870MHz)	5.15	794.0875	36	36.9	CW	E	1.46	PB	0.45	0.34	0.31	0.5	0.367	0.268	0.27
Trunk	HAF4013A (764-870MHz)	5.15	806.0125	42	42.9	CW	E	1.46	PB	0.38	0.27	0.45	0.5	0.367	0.268	0.27
Trunk	HAF4013A (764-870MHz)	5.15	823.9875	42	42.7	CW	E	1.44	PB	0.46	0.36	0.46	0.5	0.427	0.307	0.31

MPE calculations are defined in section 13.0.

## MPE measurement data for Passenger

D.U.T. Info.							Probe Info.			Test Pos.	Passenger Positions			DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor	Head		Chest	Lower Trunk					
Trunk	HAF4013A (764-870MHz)	5.15	851.0125	42	42.6	CW	E	1.42	PB		0.29	0.20	0.16				
Trunk	HAF4013A (764-870MHz)	5.15	862.0125	42	42.4	CW	E	1.41	PB	0.38	0.16	0.10	0.5	0.213	0.150	0.15	
Trunk	HAF4013A (764-870MHz)	5.15	868.8875	42	42.3	CW	E	1.40	PB	0.29	0.13	0.16	0.5	0.193	0.135	0.14	
Trunk	HAF4017A (764-870MHz)	5.15	764.0875	36	36.2	CW	E	1.43	PB	0.10	0.05	0.13	0.5	0.093	0.067	0.07	
Trunk	HAF4017A (764-870MHz)	5.15	770.0125	36	36.6	CW	E	1.44	PB	0.16	0.07	0.11	0.5	0.113	0.082	0.08	
Trunk	HAF4017A (764-870MHz)	5.15	775.9125	36	36.3	CW	E	1.44	PB	0.25	0.08	0.06	0.5	0.130	0.094	0.09	
Trunk	HAF4017A (764-870MHz)	5.15	794.0875	36	36.9	CW	E	1.46	PB	0.26	0.26	0.18	0.5	0.233	0.170	0.17	
Trunk	HAF4017A (764-870MHz)	5.15	806.0125	42	42.9	CW	E	1.46	PB	0.35	0.39	0.23	0.5	0.323	0.236	0.24	
Trunk	HAF4017A (764-870MHz)	5.15	823.9875	42	42.7	CW	E	1.44	PB	0.76	0.46	0.40	0.5	0.540	0.389	0.39	
Trunk	HAF4017A (764-870MHz)	5.15	851.0125	42	42.6	CW	E	1.42	PB	0.32	0.27	0.12	0.5	0.237	0.168	0.17	
Trunk	HAF4017A (764-870MHz)	5.15	862.0125	42	42.4	CW	E	1.41	PB	0.34	0.25	0.16	0.5	0.250	0.176	0.18	
Trunk	HAF4017A (764-870MHz)	5.15	868.8875	42	42.3	CW	E	1.40	PB	0.33	0.20	0.16	0.5	0.230	0.161	0.16	
Trunk	RRA4914B (806-900MHz)	5.15	806.0125	42	42.9	CW	E	1.46	PB	0.60	0.47	0.29	0.5	0.453	0.331	0.33	
Trunk	RRA4914B (806-900MHz)	5.15	815.0125	42	42.9	CW	E	1.45	PB	0.71	0.50	0.40	0.5	0.537	0.389	0.39	
Trunk	RRA4914B (806-900MHz)	5.15	823.9875	42	42.7	CW	E	1.44	PB	0.91	0.62	0.57	0.5	0.700	0.504	0.50	
Trunk	RRA4914B (806-900MHz)	5.15	851.0125	42	42.6	CW	E	1.42	PB	0.47	0.35	0.26	0.5	0.360	0.256	0.26	
Trunk	RRA4914B (806-900MHz)	5.15	862.0125	42	42.4	CW	E	1.41	PB	0.46	0.38	0.27	0.5	0.370	0.261	0.26	
Trunk	RRA4914B (806-900MHz)	5.15	868.8875	42	42.3	CW	E	1.40	PB	0.48	0.36	0.18	0.5	0.340	0.238	0.24	

MPE calculations are defined in section 13.0.

## MPE measurement data for Passenger

D.U.T. Info.							Probe Info.			Passenger Positions			DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor	Test Pos.	Head	Chest	Lower Trunk				
Trunk	HAF4016A (764-870MHz)	2.15	764.0875	36	36.2	CW	E	1.43	PF	0.18	0.06	0.06	0.5	0.100	0.072	0.07
Trunk	HAF4016A (764-870MHz)	2.15	770.0125	36	36.6	CW	E	1.44	PF	0.15	0.06	0.09	0.5	0.100	0.072	0.07
Trunk	HAF4016A (764-870MHz)	2.15	775.9125	36	36.3	CW	E	1.44	PF	0.15	0.09	0.05	0.5	0.097	0.070	0.07
Trunk	HAF4016A (764-870MHz)	2.15	794.0875	36	36.9	CW	E	1.46	PF	0.16	0.11	0.07	0.5	0.113	0.083	0.08
Trunk	HAF4016A (764-870MHz)	2.15	806.0125	42	42.9	CW	E	1.46	PF	0.11	0.06	0.07	0.5	0.080	0.058	0.06
Trunk	HAF4016A (764-870MHz)	2.15	823.9875	42	42.7	CW	E	1.44	PF	0.11	0.08	0.11	0.5	0.100	0.072	0.07
Trunk	HAF4016A (764-870MHz)	2.15	851.0125	42	42.6	CW	E	1.42	PF	0.14	0.04	0.04	0.5	0.073	0.052	0.05
Trunk	HAF4016A (764-870MHz)	2.15	862.0125	42	42.4	CW	E	1.41	PF	0.11	0.05	0.06	0.5	0.073	0.052	0.05
Trunk	HAF4016A (764-870MHz)	2.15	868.8875	42	42.3	CW	E	1.40	PF	0.12	0.04	0.06	0.5	0.073	0.051	0.05
Trunk	HAF4002A (806-900MHz)	2.15	806.0125	42	42.9	CW	E	1.46	PF	0.12	0.04	0.06	0.5	0.073	0.054	0.05
Trunk	HAF4002A (806-900MHz)	2.15	815.0125	42	42.9	CW	E	1.45	PF	0.18	0.07	0.05	0.5	0.100	0.073	0.07
Trunk	HAF4002A (806-900MHz)	2.15	823.9875	42	42.7	CW	E	1.44	PF	0.15	0.07	0.08	0.5	0.100	0.072	0.07
Trunk	HAF4002A (806-900MHz)	2.15	851.0125	42	42.6	CW	E	1.42	PF	0.14	0.09	0.04	0.5	0.090	0.064	0.06
Trunk	HAF4002A (806-900MHz)	2.15	862.0125	42	42.4	CW	E	1.41	PF	0.11	0.05	0.08	0.5	0.080	0.056	0.06
Trunk	HAF4002A (806-900MHz)	2.15	868.8875	42	42.3	CW	E	1.40	PF	0.14	0.04	0.06	0.5	0.080	0.056	0.06

MPE calculations are defined in section 13.0.

## MPE measurement data for Passenger

D.U.T. Info.							Probe Info.			Passenger Positions			DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor	Test Pos.	Head	Chest	Lower Trunk				
Trunk	HAF4014A (764-870MHz)	5.15	764.0875	36	36.2	CW	E	1.43	PF	0.20	0.11	0.07	0.5	0.127	0.091	0.09
Trunk	HAF4014A (764-870MHz)	5.15	770.0125	36	36.6	CW	E	1.44	PF	0.23	0.11	0.13	0.5	0.157	0.113	0.11
Trunk	HAF4014A (764-870MHz)	5.15	775.9125	36	36.3	CW	E	1.44	PF	0.27	0.11	0.10	0.5	0.160	0.115	0.12
Trunk	HAF4014A (764-870MHz)	5.15	794.0875	36	36.9	CW	E	1.46	PF	0.21	0.20	0.10	0.5	0.170	0.124	0.12
Trunk	HAF4014A (764-870MHz)	5.15	806.0125	42	42.9	CW	E	1.46	PF	0.22	0.08	0.08	0.5	0.127	0.092	0.09
Trunk	HAF4014A (764-870MHz)	5.15	823.9875	42	42.7	CW	E	1.44	PF	0.18	0.15	0.18	0.5	0.170	0.122	0.12
Trunk	HAF4014A (764-870MHz)	5.15	851.0125	42	42.6	CW	E	1.42	PF	0.17	0.15	0.06	0.5	0.127	0.090	0.09
Trunk	HAF4014A (764-870MHz)	5.15	862.0125	42	42.4	CW	E	1.41	PF	0.12	0.07	0.08	0.5	0.090	0.063	0.06
Trunk	HAF4014A (764-870MHz)	5.15	868.8875	42	42.3	CW	E	1.40	PF	0.12	0.06	0.07	0.5	0.083	0.058	0.06
Trunk	HAF4013A (764-870MHz)	5.15	764.0875	36	36.2	CW	E	1.43	PF	0.13	0.07	0.07	0.5	0.090	0.064	0.06
Trunk	HAF4013A (764-870MHz)	5.15	770.0125	36	36.6	CW	E	1.44	PF	0.15	0.07	0.08	0.5	0.100	0.072	0.07
Trunk	HAF4013A (764-870MHz)	5.15	775.9125	36	36.3	CW	E	1.44	PF	0.15	0.08	0.08	0.5	0.103	0.074	0.07
Trunk	HAF4013A (764-870MHz)	5.15	794.0875	36	36.9	CW	E	1.46	PF	0.18	0.09	0.05	0.5	0.107	0.078	0.08
Trunk	HAF4013A (764-870MHz)	5.15	806.0125	42	42.9	CW	E	1.46	PF	0.11	0.06	0.07	0.5	0.080	0.058	0.06
Trunk	HAF4013A (764-870MHz)	5.15	823.9875	42	42.7	CW	E	1.44	PF	0.11	0.08	0.11	0.5	0.100	0.072	0.07

MPE calculations are defined in section 13.0.

## MPE measurement data for Passenger

D.U.T. Info.							Probe Info.			Passenger Positions			DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor	Test Pos.	Head	Chest	Lower Trunk				
Trunk	HAF4013A (764-870MHz)	5.15	851.0125	42	42.6	CW	E	1.42	PF	0.13	0.06	0.03	0.5	0.073	0.052	0.05
Trunk	HAF4013A (764-870MHz)	5.15	862.0125	42	42.4	CW	E	1.41	PF	0.07	0.04	0.06	0.5	0.057	0.040	0.04
Trunk	HAF4013A (764-870MHz)	5.15	868.8875	42	42.3	CW	E	1.40	PF	0.10	0.04	0.02	0.5	0.053	0.037	0.04
Trunk	HAF4017A (764-870MHz)	5.15	764.0875	36	36.2	CW	E	1.43	PF	0.05	0.02	0.02	0.5	0.030	0.021	0.02
Trunk	HAF4017A (764-870MHz)	5.15	770.0125	36	36.6	CW	E	1.44	PF	0.05	0.02	0.04	0.5	0.037	0.026	0.03
Trunk	HAF4017A (764-870MHz)	5.15	775.9125	36	36.3	CW	E	1.44	PF	0.06	0.03	0.05	0.5	0.047	0.034	0.03
Trunk	HAF4017A (764-870MHz)	5.15	794.0875	36	36.9	CW	E	1.46	PF	0.14	0.08	0.05	0.5	0.090	0.066	0.07
Trunk	HAF4017A (764-870MHz)	5.15	806.0125	42	42.9	CW	E	1.46	PF	0.14	0.04	0.03	0.5	0.070	0.051	0.05
Trunk	HAF4017A (764-870MHz)	5.15	823.9875	42	42.7	CW	E	1.44	PF	0.13	0.10	0.12	0.5	0.117	0.084	0.08
Trunk	HAF4017A (764-870MHz)	5.15	851.0125	42	42.6	CW	E	1.42	PF	0.19	0.06	0.05	0.5	0.100	0.071	0.07
Trunk	HAF4017A (764-870MHz)	5.15	862.0125	42	42.4	CW	E	1.41	PF	0.11	0.09	0.03	0.5	0.077	0.054	0.05
Trunk	HAF4017A (764-870MHz)	5.15	868.8875	42	42.3	CW	E	1.40	PF	0.10	0.10	0.06	0.5	0.087	0.061	0.06
Trunk	RRA4914B (806-900MHz)	5.15	806.0125	42	42.9	CW	E	1.46	PF	0.21	0.11	0.13	0.5	0.150	0.110	0.11
Trunk	RRA4914B (806-900MHz)	5.15	815.0125	42	42.9	CW	E	1.45	PF	0.20	0.09	0.10	0.5	0.130	0.094	0.09
Trunk	RRA4914B (806-900MHz)	5.15	823.9875	42	42.7	CW	E	1.44	PF	0.19	0.17	0.13	0.5	0.163	0.118	0.12
Trunk	RRA4914B (806-900MHz)	5.15	851.0125	42	42.6	CW	E	1.42	PF	0.31	0.14	0.12	0.5	0.190	0.135	0.13
Trunk	RRA4914B (806-900MHz)	5.15	862.0125	42	42.4	CW	E	1.41	PF	0.22	0.10	0.19	0.5	0.170	0.120	0.12
Trunk	RRA4914B (806-900MHz)	5.15	868.8875	42	42.3	CW	E	1.40	PF	0.16	0.10	0.09	0.5	0.117	0.082	0.08

MPE calculations are defined in section 13.0.

MPE measurement data for Bystander

D.U.T. Info.							Probe Info.			Test Pos.	By Stander (BS) Positions									DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor	20 cm		40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm	200 cm				
Roof	HAF4016A (764-870MHz)	2.15	764.0875	36	36.2	CW	E	1.43	BS		0.00	0.00	0.01	0.02	0.03	0.05	0.10	0.18	0.23				
Roof	HAF4016A (764-870MHz)	2.15	770.0125	36	36.6	CW	E	1.44	BS	0.00	0.00	0.01	0.02	0.02	0.05	0.10	0.18	0.22	0.20	0.5	0.080	0.058	0.06
Roof	HAF4016A (764-870MHz)	2.15	775.9125	36	36.3	CW	E	1.44	BS	0.00	0.00	0.00	0.01	0.01	0.05	0.10	0.18	0.21	0.18	0.5	0.074	0.053	0.05
Roof	HAF4016A (764-870MHz)	2.15	794.0875	36	36.9	CW	E	1.46	BS	0.00	0.00	0.00	0.01	0.02	0.04	0.10	0.17	0.26	0.24	0.5	0.084	0.061	0.06
Roof	HAF4016A (764-870MHz)	2.15	806.0125	42	42.9	CW	E	1.46	BS	0.00	0.00	0.01	0.01	0.02	0.06	0.09	0.18	0.23	0.22	0.5	0.082	0.060	0.06
Roof	HAF4016A (764-870MHz)	2.15	823.9875	42	42.7	CW	E	1.44	BS	0.00	0.00	0.01	0.01	0.03	0.04	0.11	0.21	0.27	0.27	0.5	0.095	0.068	0.07
Roof	HAF4016A (764-870MHz)	2.15	851.0125	42	42.6	CW	E	1.42	BS	0.00	0.00	0.00	0.01	0.02	0.04	0.10	0.17	0.26	0.24	0.5	0.084	0.060	0.06
Roof	HAF4016A (764-870MHz)	2.15	862.0125	42	42.4	CW	E	1.41	BS	0.00	0.00	0.00	0.00	0.02	0.03	0.08	0.14	0.20	0.18	0.5	0.065	0.046	0.05
Roof	HAF4016A (764-870MHz)	2.15	868.8875	42	42.3	CW	E	1.40	BS	0.00	0.00	0.00	0.00	0.02	0.04	0.08	0.14	0.20	0.18	0.5	0.066	0.046	0.05
Roof	HAF4002A (806-900MHz)	2.15	806.0125	42	42.9	CW	E	1.46	BS	0.00	0.00	0.01	0.01	0.02	0.06	0.09	0.18	0.23	0.22	0.5	0.082	0.060	0.06
Roof	HAF4002A (806-900MHz)	2.15	815.0125	42	42.9	CW	E	1.45	BS	0.00	0.00	0.01	0.01	0.03	0.07	0.10	0.21	0.28	0.27	0.5	0.098	0.071	0.07
Roof	HAF4002A (806-900MHz)	2.15	823.9875	42	42.7	CW	E	1.44	BS	0.00	0.00	0.01	0.01	0.03	0.05	0.11	0.21	0.27	0.27	0.5	0.096	0.069	0.07
Roof	HAF4002A (806-900MHz)	2.15	851.0125	42	42.6	CW	E	1.42	BS	0.00	0.00	0.01	0.01	0.03	0.04	0.10	0.17	0.26	0.25	0.5	0.087	0.062	0.06
Roof	HAF4002A (806-900MHz)	2.15	862.0125	42	42.4	CW	E	1.41	BS	0.00	0.00	0.00	0.00	0.02	0.03	0.08	0.15	0.21	0.19	0.5	0.068	0.048	0.05
Roof	HAF4002A (806-900MHz)	2.15	868.8875	42	42.3	CW	E	1.40	BS	0.00	0.00	0.00	0.00	0.02	0.03	0.07	0.14	0.20	0.18	0.5	0.064	0.045	0.04

MPE calculations are defined in section 13.0.

MPE measurement data for Bystander

D.U.T. Info.							Probe Info.			Test Pos.	By Stander (BS) Positions									DUT Max. TX Factor	Avg. over Body (mW/cm <sup>2</sup> )	Calc. P.D. (mW/cm <sup>2</sup> )	Max Calc. P.D. (mW/cm <sup>2</sup> )
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor	20 cm		40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm	200 cm				
Roof	HAF4014A (764-870MHz)	5.15	764.0875	36	36.2	CW	E	1.43	BS		0.00	0.00	0.01	0.04	0.05	0.08	0.19	0.26	0.24				
Roof	HAF4014A (764-870MHz)	5.15	770.0125	36	36.6	CW	E	1.44	BS	0.00	0.00	0.01	0.04	0.03	0.09	0.20	0.29	0.26	0.10	0.5	0.102	0.073	0.07
Roof	HAF4014A (764-870MHz)	5.15	775.9125	36	36.3	CW	E	1.44	BS	0.00	0.00	0.01	0.03	0.01	0.10	0.19	0.28	0.23	0.10	0.5	0.095	0.068	0.07
Roof	HAF4014A (764-870MHz)	5.15	794.0875	36	36.9	CW	E	1.46	BS	0.00	0.00	0.02	0.02	0.04	0.11	0.20	0.30	0.28	0.15	0.5	0.112	0.082	0.08
Roof	HAF4014A (764-870MHz)	5.15	806.0125	42	42.9	CW	E	1.46	BS	0.00	0.00	0.01	0.01	0.03	0.10	0.17	0.28	0.26	0.14	0.5	0.100	0.073	0.07
Roof	HAF4014A (764-870MHz)	5.15	823.9875	42	42.7	CW	E	1.44	BS	0.00	0.00	0.02	0.01	0.05	0.10	0.19	0.34	0.34	0.18	0.5	0.123	0.089	0.09
Roof	HAF4014A (764-870MHz)	5.15	851.0125	42	42.6	CW	E	1.42	BS	0.00	0.00	0.01	0.01	0.04	0.06	0.16	0.28	0.29	0.14	0.5	0.099	0.070	0.07
Roof	HAF4014A (764-870MHz)	5.15	862.0125	42	42.4	CW	E	1.41	BS	0.00	0.00	0.00	0.00	0.03	0.05	0.12	0.22	0.23	0.12	0.5	0.077	0.054	0.05
Roof	HAF4014A (764-870MHz)	5.15	868.8875	42	42.3	CW	E	1.40	BS	0.00	0.00	0.00	0.00	0.03	0.04	0.11	0.20	0.22	0.11	0.5	0.071	0.050	0.05
Roof	HAF4013A (764-870MHz)	5.15	764.0875	36	36.2	CW	E	1.43	BS	0.00	0.00	0.00	0.01	0.02	0.05	0.10	0.18	0.23	0.21	0.5	0.080	0.057	0.06
Roof	HAF4013A (764-870MHz)	5.15	770.0125	36	36.6	CW	E	1.44	BS	0.00	0.00	0.01	0.01	0.02	0.04	0.10	0.18	0.23	0.20	0.5	0.079	0.057	0.06
Roof	HAF4013A (764-870MHz)	5.15	775.9125	36	36.3	CW	E	1.44	BS	0.00	0.00	0.00	0.01	0.01	0.04	0.10	0.17	0.21	0.19	0.5	0.073	0.053	0.05
Roof	HAF4013A (764-870MHz)	5.15	794.0875	36	36.9	CW	E	1.46	BS	0.00	0.00	0.00	0.00	0.02	0.06	0.10	0.17	0.23	0.22	0.5	0.080	0.058	0.06
Roof	HAF4013A (764-870MHz)	5.15	806.0125	42	42.9	CW	E	1.46	BS	0.00	0.00	0.00	0.00	0.01	0.06	0.08	0.17	0.22	0.22	0.5	0.076	0.055	0.06
Roof	HAF4013A (764-870MHz)	5.15	823.9875	42	42.7	CW	E	1.44	BS	0.00	0.00	0.00	0.01	0.03	0.05	0.11	0.20	0.26	0.27	0.5	0.093	0.067	0.07

MPE calculations are defined in section 13.0.

MPE measurement data for Bystander

D.U.T. Info.							Probe Info.			By Stander (BS) Positions										DUT Max. TX Factor	Avg. over Body (mW/cm <sup>2</sup> )	Calc. P.D. (mW/cm <sup>2</sup> )	Max Calc. P.D. (mW/cm <sup>2</sup> )
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor	Test Pos.	20 cm	40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm	200 cm				
Roof	HAF4013A (764-870MHz)	5.15	851.0125	42	42.6	CW	E	1.42	BS	0.00	0.00	0.00	0.01	0.03	0.04	0.09	0.17	0.26	0.26	0.5	0.086	0.061	0.06
Roof	HAF4013A (764-870MHz)	5.15	862.0125	42	42.4	CW	E	1.41	BS	0.00	0.00	0.00	0.00	0.02	0.03	0.07	0.14	0.22	0.20	0.5	0.068	0.048	0.05
Roof	HAF4013A (764-870MHz)	5.15	868.8875	42	42.3	CW	E	1.40	BS	0.00	0.00	0.00	0.00	0.02	0.03	0.07	0.14	0.21	0.20	0.5	0.067	0.047	0.05
Roof	HAF4017A (764-870MHz)	5.15	764.0875	36	36.2	CW	E	1.43	BS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.18	0.23	0.5	0.046	0.033	0.03
Roof	HAF4017A (764-870MHz)	5.15	770.0125	36	36.6	CW	E	1.44	BS	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.17	0.20	0.5	0.044	0.032	0.03
Roof	HAF4017A (764-870MHz)	5.15	775.9125	36	36.3	CW	E	1.44	BS	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.19	0.21	0.5	0.049	0.035	0.04
Roof	HAF4017A (764-870MHz)	5.15	794.0875	36	36.9	CW	E	1.46	BS	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.15	0.26	0.24	0.5	0.071	0.052	0.05
Roof	HAF4017A (764-870MHz)	5.15	806.0125	42	42.9	CW	E	1.46	BS	0.00	0.00	0.00	0.00	0.00	0.02	0.07	0.18	0.26	0.21	0.5	0.074	0.054	0.05
Roof	HAF4017A (764-870MHz)	5.15	823.9875	42	42.7	CW	E	1.44	BS	0.00	0.00	0.00	0.00	0.02	0.04	0.12	0.25	0.30	0.22	0.5	0.095	0.068	0.07
Roof	HAF4017A (764-870MHz)	5.15	851.0125	42	42.6	CW	E	1.42	BS	0.00	0.00	0.00	0.00	0.02	0.05	0.13	0.24	0.23	0.16	0.5	0.083	0.059	0.06
Roof	HAF4017A (764-870MHz)	5.15	862.0125	42	42.4	CW	E	1.41	BS	0.00	0.00	0.00	0.00	0.03	0.05	0.13	0.24	0.22	0.15	0.5	0.082	0.058	0.06
Roof	HAF4017A (764-870MHz)	5.15	868.8875	42	42.3	CW	E	1.40	BS	0.00	0.00	0.00	0.00	0.03	0.05	0.11	0.23	0.18	0.12	0.5	0.072	0.050	0.05
Roof	RRA4914B (806-900MHz)	5.15	806.0125	42	42.9	CW	E	1.46	BS	0.00	0.00	0.01	0.02	0.03	0.17	0.17	0.31	0.30	0.18	0.5	0.119	0.087	0.09
Roof	RRA4914B (806-900MHz)	5.15	815.0125	42	42.9	CW	E	1.45	BS	0.00	0.00	0.01	0.01	0.04	0.09	0.17	0.31	0.33	0.19	0.5	0.115	0.083	0.08
Roof	RRA4914B (806-900MHz)	5.15	823.9875	42	42.7	CW	E	1.44	BS	0.00	0.00	0.02	0.02	0.06	0.08	0.19	0.36	0.36	0.22	0.5	0.131	0.094	0.09
Roof	RRA4914B (806-900MHz)	5.15	851.0125	42	42.6	CW	E	1.42	BS	0.00	0.01	0.02	0.03	0.05	0.08	0.23	0.35	0.35	0.17	0.5	0.129	0.092	0.09
Roof	RRA4914B (806-900MHz)	5.15	862.0125	42	42.4	CW	E	1.41	BS	0.00	0.01	0.02	0.02	0.03	0.07	0.18	0.27	0.29	0.14	0.5	0.103	0.073	0.07
Roof	RRA4914B (806-900MHz)	5.15	868.8875	42	42.3	CW	E	1.40	BS	0.00	0.00	0.01	0.01	0.03	0.08	0.16	0.27	0.27	0.12	0.5	0.095	0.067	0.07

MPE calculations are defined in section 13.0.

## MPE measurement data for Passenger

D.U.T. Info.							Probe Info.		Test Pos.	Passenger Positions			DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor		Head	Chest	Lower Trunk				
Roof	HAF4016A (764-870MHz)	2.15	764.0875	36	36.2	CW	E	1.43		PB	0.04	0.04				
Roof	HAF4016A (764-870MHz)	2.15	770.0125	36	36.6	CW	E	1.44	PB	0.04	0.04	0.06	0.5	0.047	0.034	0.03
Roof	HAF4016A (764-870MHz)	2.15	775.9125	36	36.3	CW	E	1.44	PB	0.03	0.03	0.04	0.5	0.033	0.024	0.02
Roof	HAF4016A (764-870MHz)	2.15	794.0875	36	36.9	CW	E	1.46	PB	0.03	0.03	0.03	0.5	0.030	0.022	0.02
Roof	HAF4016A (764-870MHz)	2.15	806.0125	42	42.9	CW	E	1.46	PB	0.04	0.03	0.03	0.5	0.033	0.024	0.02
Roof	HAF4016A (764-870MHz)	2.15	823.9875	42	42.7	CW	E	1.44	PB	0.02	0.05	0.03	0.5	0.033	0.024	0.02
Roof	HAF4016A (764-870MHz)	2.15	851.0125	42	42.6	CW	E	1.42	PB	0.03	0.03	0.03	0.5	0.030	0.021	0.02
Roof	HAF4016A (764-870MHz)	2.15	862.0125	42	42.4	CW	E	1.41	PB	0.03	0.03	0.02	0.5	0.027	0.019	0.02
Roof	HAF4016A (764-870MHz)	2.15	868.8875	42	42.3	CW	E	1.40	PB	0.05	0.03	0.05	0.5	0.043	0.030	0.03
Roof	HAF4002A (806-900MHz)	2.15	806.0125	42	42.9	CW	E	1.46	PB	0.04	0.03	0.03	0.5	0.033	0.024	0.02
Roof	HAF4002A (806-900MHz)	2.15	815.0125	42	42.9	CW	E	1.45	PB	0.04	0.03	0.07	0.5	0.047	0.034	0.03
Roof	HAF4002A (806-900MHz)	2.15	823.9875	42	42.7	CW	E	1.44	PB	0.02	0.06	0.03	0.5	0.037	0.026	0.03
Roof	HAF4002A (806-900MHz)	2.15	851.0125	42	42.6	CW	E	1.42	PB	0.03	0.03	0.03	0.5	0.030	0.021	0.02
Roof	HAF4002A (806-900MHz)	2.15	862.0125	42	42.4	CW	E	1.41	PB	0.03	0.03	0.03	0.5	0.030	0.021	0.02
Roof	HAF4002A (806-900MHz)	2.15	868.8875	42	42.3	CW	E	1.40	PB	0.04	0.04	0.02	0.5	0.033	0.023	0.02

MPE calculations are defined in section 13.0.

## MPE measurement data for Passenger

D.U.T. Info.							Probe Info.		Test Pos.	Passenger Positions			DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor		Head	Chest	Lower Trunk				
Roof	HAF4014A (764-870MHz)	5.15	764.0875	36	36.2	CW	E	1.43		PB	0.06	0.07				
Roof	HAF4014A (764-870MHz)	5.15	770.0125	36	36.6	CW	E	1.44	PB	0.08	0.10	0.07	0.5	0.083	0.060	0.06
Roof	HAF4014A (764-870MHz)	5.15	775.9125	36	36.3	CW	E	1.44	PB	0.07	0.08	0.08	0.5	0.077	0.055	0.06
Roof	HAF4014A (764-870MHz)	5.15	794.0875	36	36.9	CW	E	1.46	PB	0.05	0.04	0.09	0.5	0.060	0.044	0.04
Roof	HAF4014A (764-870MHz)	5.15	806.0125	42	42.9	CW	E	1.46	PB	0.07	0.03	0.06	0.5	0.053	0.039	0.04
Roof	HAF4014A (764-870MHz)	5.15	823.9875	42	42.7	CW	E	1.44	PB	0.03	0.07	0.06	0.5	0.053	0.038	0.04
Roof	HAF4014A (764-870MHz)	5.15	851.0125	42	42.6	CW	E	1.42	PB	0.05	0.05	0.06	0.5	0.053	0.038	0.04
Roof	HAF4014A (764-870MHz)	5.15	862.0125	42	42.4	CW	E	1.41	PB	0.04	0.03	0.05	0.5	0.040	0.028	0.03
Roof	HAF4014A (764-870MHz)	5.15	868.8875	42	42.3	CW	E	1.40	PB	0.04	0.04	0.04	0.5	0.040	0.028	0.03
Roof	HAF4013A (764-870MHz)	5.15	764.0875	36	36.2	CW	E	1.43	PB	0.03	0.05	0.05	0.5	0.043	0.031	0.03
Roof	HAF4013A (764-870MHz)	5.15	770.0125	36	36.6	CW	E	1.44	PB	0.04	0.04	0.05	0.5	0.043	0.031	0.03
Roof	HAF4013A (764-870MHz)	5.15	775.9125	36	36.3	CW	E	1.44	PB	0.04	0.04	0.04	0.5	0.040	0.029	0.03
Roof	HAF4013A (764-870MHz)	5.15	794.0875	36	36.9	CW	E	1.46	PB	0.02	0.02	0.05	0.5	0.030	0.022	0.02
Roof	HAF4013A (764-870MHz)	5.15	806.0125	42	42.9	CW	E	1.46	PB	0.04	0.02	0.03	0.5	0.030	0.022	0.02
Roof	HAF4013A (764-870MHz)	5.15	823.9875	42	42.7	CW	E	1.44	PB	0.02	0.05	0.04	0.5	0.037	0.026	0.03

MPE calculations are defined in section 13.0.

## MPE measurement data for Passenger

D.U.T. Info.							Probe Info.			Passenger Positions			DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor	Test Pos.	Head	Chest	Lower Trunk				
Roof	HAF4013A (764-870MHz)	5.15	851.0125	42	42.6	CW	E	1.42	PB	0.03	0.03	0.05	0.5	0.037	0.026	0.03
Roof	HAF4013A (764-870MHz)	5.15	862.0125	42	42.4	CW	E	1.41	PB	0.03	0.03	0.06	0.5	0.040	0.028	0.03
Roof	HAF4013A (764-870MHz)	5.15	868.8875	42	42.3	CW	E	1.40	PB	0.04	0.04	0.06	0.5	0.047	0.033	0.03
Roof	HAF4017A (764-870MHz)	5.15	764.0875	36	36.2	CW	E	1.43	PB	0.00	0.00	0.00	0.5	0.000	0.000	0.00
Roof	HAF4017A (764-870MHz)	5.15	770.0125	36	36.6	CW	E	1.44	PB	0.00	0.00	0.00	0.5	0.000	0.000	0.00
Roof	HAF4017A (764-870MHz)	5.15	775.9125	36	36.3	CW	E	1.44	PB	0.00	0.00	0.00	0.5	0.000	0.000	0.00
Roof	HAF4017A (764-870MHz)	5.15	794.0875	36	36.9	CW	E	1.46	PB	0.00	0.00	0.00	0.5	0.000	0.000	0.00
Roof	HAF4017A (764-870MHz)	5.15	806.0125	42	42.9	CW	E	1.46	PB	0.01	0.01	0.01	0.5	0.010	0.007	0.01
Roof	HAF4017A (764-870MHz)	5.15	823.9875	42	42.7	CW	E	1.44	PB	0.01	0.03	0.02	0.5	0.020	0.014	0.01
Roof	HAF4017A (764-870MHz)	5.15	851.0125	42	42.6	CW	E	1.42	PB	0.03	0.03	0.02	0.5	0.027	0.019	0.02
Roof	HAF4017A (764-870MHz)	5.15	862.0125	42	42.4	CW	E	1.41	PB	0.03	0.03	0.05	0.5	0.037	0.026	0.03
Roof	HAF4017A (764-870MHz)	5.15	868.8875	42	42.3	CW	E	1.40	PB	0.02	0.03	0.04	0.5	0.030	0.021	0.02
Roof	RRA4914B (806-900MHz)	5.15	806.0125	42	42.9	CW	E	1.46	PB	0.06	0.03	0.03	0.5	0.040	0.029	0.03
Roof	RRA4914B (806-900MHz)	5.15	815.0125	42	42.9	CW	E	1.45	PB	0.05	0.05	0.05	0.5	0.050	0.036	0.04
Roof	RRA4914B (806-900MHz)	5.15	823.9875	42	42.7	CW	E	1.44	PB	0.04	0.06	0.05	0.5	0.050	0.036	0.04
Roof	RRA4914B (806-900MHz)	5.15	851.0125	42	42.6	CW	E	1.42	PB	0.06	0.07	0.06	0.5	0.063	0.045	0.04
Roof	RRA4914B (806-900MHz)	5.15	862.0125	42	42.4	CW	E	1.41	PB	0.05	0.05	0.07	0.5	0.057	0.040	0.04
Roof	RRA4914B (806-900MHz)	5.15	868.8875	42	42.3	CW	E	1.40	PB	0.05	0.06	0.06	0.5	0.057	0.040	0.04

MPE calculations are defined in section 13.0.

## MPE measurement data for Passenger

D.U.T. Info.							Probe Info.			Passenger Positions			DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor	Test Pos.	Head	Chest	Lower Trunk				
Roof	HAF4016A (764-870MHz)	2.15	764.0875	36	36.2	CW	E	1.43	PF	0.02	0.02	0.01	0.5	0.017	0.012	0.01
Roof	HAF4016A (764-870MHz)	2.15	770.0125	36	36.6	CW	E	1.44	PF	0.01	0.01	0.00	0.5	0.007	0.005	0.00
Roof	HAF4016A (764-870MHz)	2.15	775.9125	36	36.3	CW	E	1.44	PF	0.01	0.02	0.00	0.5	0.010	0.007	0.01
Roof	HAF4016A (764-870MHz)	2.15	794.0875	36	36.9	CW	E	1.46	PF	0.00	0.01	0.00	0.5	0.003	0.002	0.00
Roof	HAF4016A (764-870MHz)	2.15	806.0125	42	42.9	CW	E	1.46	PF	0.02	0.03	0.02	0.5	0.023	0.017	0.02
Roof	HAF4016A (764-870MHz)	2.15	823.9875	42	42.7	CW	E	1.44	PF	0.01	0.02	0.01	0.5	0.013	0.010	0.01
Roof	HAF4016A (764-870MHz)	2.15	851.0125	42	42.6	CW	E	1.42	PF	0.00	0.01	0.00	0.5	0.003	0.002	0.00
Roof	HAF4016A (764-870MHz)	2.15	862.0125	42	42.4	CW	E	1.41	PF	0.00	0.01	0.01	0.5	0.007	0.005	0.00
Roof	HAF4016A (764-870MHz)	2.15	868.8875	42	42.3	CW	E	1.40	PF	0.01	0.01	0.01	0.5	0.010	0.007	0.01
Roof	HAF4002A (806-900MHz)	2.15	806.0125	42	42.9	CW	E	1.46	PF	0.02	0.03	0.02	0.5	0.023	0.017	0.02
Roof	HAF4002A (806-900MHz)	2.15	815.0125	42	42.9	CW	E	1.45	PF	0.01	0.04	0.05	0.5	0.033	0.024	0.02
Roof	HAF4002A (806-900MHz)	2.15	823.9875	42	42.7	CW	E	1.44	PF	0.01	0.03	0.01	0.5	0.017	0.012	0.01
Roof	HAF4002A (806-900MHz)	2.15	851.0125	42	42.6	CW	E	1.42	PF	0.00	0.01	0.00	0.5	0.003	0.002	0.00
Roof	HAF4002A (806-900MHz)	2.15	862.0125	42	42.4	CW	E	1.41	PF	0.00	0.01	0.01	0.5	0.007	0.005	0.00
Roof	HAF4002A (806-900MHz)	2.15	868.8875	42	42.3	CW	E	1.40	PF	0.01	0.01	0.01	0.5	0.010	0.007	0.01

MPE calculations are defined in section 13.0.

## MPE measurement data for Passenger

D.U.T. Info.									Probe Info.		Passenger Positions			DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor	Test Pos.	Head	Chest	Lower Trunk					
Roof	HAF4014A (764-870MHz)	5.15	764.0875	36	36.2	CW	E	1.43	PF	0.02	0.02	0.02	0.5	0.020	0.014	0.01	
Roof	HAF4014A (764-870MHz)	5.15	770.0125	36	36.6	CW	E	1.44	PF	0.03	0.02	0.02	0.5	0.023	0.017	0.02	
Roof	HAF4014A (764-870MHz)	5.15	775.9125	36	36.3	CW	E	1.44	PF	0.01	0.03	0.02	0.5	0.020	0.014	0.01	
Roof	HAF4014A (764-870MHz)	5.15	794.0875	36	36.9	CW	E	1.46	PF	0.06	0.05	0.03	0.5	0.047	0.034	0.03	
Roof	HAF4014A (764-870MHz)	5.15	806.0125	42	42.9	CW	E	1.46	PF	0.02	0.03	0.05	0.5	0.033	0.024	0.02	
Roof	HAF4014A (764-870MHz)	5.15	823.9875	42	42.7	CW	E	1.44	PF	0.02	0.05	0.03	0.5	0.033	0.024	0.02	
Roof	HAF4014A (764-870MHz)	5.15	851.0125	42	42.6	CW	E	1.42	PF	0.01	0.01	0.03	0.5	0.017	0.012	0.01	
Roof	HAF4014A (764-870MHz)	5.15	862.0125	42	42.4	CW	E	1.41	PF	0.00	0.01	0.00	0.5	0.003	0.002	0.00	
Roof	HAF4014A (764-870MHz)	5.15	868.8875	42	42.3	CW	E	1.40	PF	0.01	0.00	0.01	0.5	0.007	0.005	0.00	
Roof	HAF4013A (764-870MHz)	5.15	764.0875	36	36.2	CW	E	1.43	PF	0.02	0.01	0.01	0.5	0.013	0.010	0.01	
Roof	HAF4013A (764-870MHz)	5.15	770.0125	36	36.6	CW	E	1.44	PF	0.01	0.01	0.01	0.5	0.010	0.007	0.01	
Roof	HAF4013A (764-870MHz)	5.15	775.9125	36	36.3	CW	E	1.44	PF	0.01	0.02	0.01	0.5	0.013	0.010	0.01	
Roof	HAF4013A (764-870MHz)	5.15	794.0875	36	36.9	CW	E	1.46	PF	0.04	0.02	0.03	0.5	0.030	0.022	0.02	
Roof	HAF4013A (764-870MHz)	5.15	806.0125	42	42.9	CW	E	1.46	PF	0.01	0.02	0.03	0.5	0.020	0.015	0.01	
Roof	HAF4013A (764-870MHz)	5.15	823.9875	42	42.7	CW	E	1.44	PF	0.01	0.03	0.01	0.5	0.017	0.012	0.01	

MPE calculations are defined in section 13.0.

## MPE measurement data for Passenger

D.U.T. Info.							Probe Info.			Passenger Positions			DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor	Test Pos.	Head	Chest	Lower Trunk				
Roof	HAF4013A (764-870MHz)	5.15	851.0125	42	42.6	CW	E	1.42	PF	0.00	0.00	0.01	0.5	0.003	0.002	0.00
Roof	HAF4013A (764-870MHz)	5.15	862.0125	42	42.4	CW	E	1.41	PF	0.01	0.00	0.01	0.5	0.007	0.005	0.00
Roof	HAF4013A (764-870MHz)	5.15	868.8875	42	42.3	CW	E	1.40	PF	0.01	0.01	0.01	0.5	0.010	0.007	0.01
Roof	HAF4017A (764-870MHz)	5.15	764.0875	36	36.2	CW	E	1.43	PF	0.00	0.00	0.00	0.5	0.000	0.000	0.00
Roof	HAF4017A (764-870MHz)	5.15	770.0125	36	36.6	CW	E	1.44	PF	0.00	0.00	0.00	0.5	0.000	0.000	0.00
Roof	HAF4017A (764-870MHz)	5.15	775.9125	36	36.3	CW	E	1.44	PF	0.00	0.00	0.00	0.5	0.000	0.000	0.00
Roof	HAF4017A (764-870MHz)	5.15	794.0875	36	36.9	CW	E	1.46	PF	0.00	0.00	0.00	0.5	0.000	0.000	0.00
Roof	HAF4017A (764-870MHz)	5.15	806.0125	42	42.9	CW	E	1.46	PF	0.01	0.01	0.01	0.5	0.010	0.007	0.01
Roof	HAF4017A (764-870MHz)	5.15	823.9875	42	42.7	CW	E	1.44	PF	0.00	0.01	0.01	0.5	0.007	0.005	0.00
Roof	HAF4017A (764-870MHz)	5.15	851.0125	42	42.6	CW	E	1.42	PF	0.00	0.00	0.02	0.5	0.007	0.005	0.00
Roof	HAF4017A (764-870MHz)	5.15	862.0125	42	42.4	CW	E	1.41	PF	0.01	0.01	0.01	0.5	0.010	0.007	0.01
Roof	HAF4017A (764-870MHz)	5.15	868.8875	42	42.3	CW	E	1.40	PF	0.01	0.00	0.01	0.5	0.007	0.005	0.00
Roof	RRA4914B (806-900MHz)	5.15	806.0125	42	42.9	CW	E	1.46	PF	0.04	0.04	0.03	0.5	0.037	0.027	0.03
Roof	RRA4914B (806-900MHz)	5.15	815.0125	42	42.9	CW	E	1.45	PF	0.05	0.05	0.06	0.5	0.053	0.039	0.04
Roof	RRA4914B (806-900MHz)	5.15	823.9875	42	42.7	CW	E	1.44	PF	0.00	0.04	0.03	0.5	0.023	0.017	0.02
Roof	RRA4914B (806-900MHz)	5.15	851.0125	42	42.6	CW	E	1.42	PF	0.02	0.02	0.02	0.5	0.020	0.014	0.01
Roof	RRA4914B (806-900MHz)	5.15	862.0125	42	42.4	CW	E	1.41	PF	0.01	0.01	0.01	0.5	0.010	0.007	0.01
Roof	RRA4914B (806-900MHz)	5.15	868.8875	42	42.3	CW	E	1.40	PF	0.01	0.00	0.01	0.5	0.007	0.005	0.00

MPE calculations are defined in section 13.0.