



**DECLARATION OF COMPLIANCE: MPE ASSESSMENT**

<p><b>Motorola Solutions Inc. EME Test Laboratory</b> Motorola Solutions Malaysia Sdn Bhd Plot 2A, Medan Bayan Lepas, Mukim 12 SWD 11900 Bayan Lepas Penang, Malaysia.</p>	<p><b>Date of Report:</b> 10/28/2022 <b>Report Revision:</b> A</p>
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<p><b>Responsible Engineer:</b> <b>Report author:</b> <b>Date(s) Tested:</b> <b>Manufacturer:</b> <b>Date submitted for test:</b> <b>DUT Description:</b> <b>Test TX mode(s):</b> <b>Max. Power output:</b> <b>TX Frequency Bands:</b> <b>Signaling type:</b> <b>Model(s) Tested:</b> <b>Model(s) Certified:</b>  <b>Serial Number(s):</b> <b>Firmware Version:</b> <b>Applicant Name:</b> <b>Applicant Address:</b> <b>Classification:</b> <b>FCC ID:</b>  <b>IC:</b>  <b>ISED Test Site registration:</b> <b>FCC Test Firm Registration Number:</b></p>	<p>Hoe Kean Loon (EME Engineer) Puteri Alifah Ilyana Binti Nor Rahim (EME Engineer) 9/22/2022-9/28/2022, 10/27/2022 Motorola Solutions Inc. 09/19/2022 XPR 5550e 450-512M 40W GOB GNSS CD CW Refer to Table 6 450-512 MHz FM, TDMA AAM28TRN9RA1AN-1 (PMUE5873A) (IC Model: PMUE5873ABUNWA) AAM28TRN9RA1AN-1 (PMUE5873A) (IC Model: PMUE5873ABUNWA), AAM28TRC9RA1AN-1 (PMUE5873A) (IC Model: PMUE5873ABTNWA), AAM28TRN9WA1AN-1 (PMUE5873A) (IC Model: PMUE5873ABUNYA) 511TYT0370 D02.22.02.3002 Motorola Solutions Inc. 8000 West Sunrise Boulevard, Fort Lauderdale, Florida 33322 Occupational/Controlled Environment AZ492FT4976 This report contains results that are immaterial for FCC equipment approval, which are clearly identified.  109U-92FT4976 This report contains results that are immaterial for ISED Canada equipment approval, which are clearly identified.  24843 823256</p>
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The MPE results clearly demonstrate compliance with FCC/ISED Occupational/Controlled RF Exposure limits. FCC/ISED rules require compliance for Passengers and Bystanders to the FCC/ISED General Population/Uncontrolled limits.

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 4.0 of this report (no deviation from standard methods). 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.

 <p><b>Saw Sun Hock (Approved Signatory)</b> <b>Approval Date:</b> 11/4/2022</p>	
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**Document Revision History**

<b>Date</b>	<b>Revision</b>	<b>Comments</b>
10/28/2022	A	Initial release

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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’ outside test site for product model AAM28TRN9RA1AN-1 (PMUE5873A) (IC Model: PMUE5873ABUNWA).

### 2.0 FCC MPE Summary

**Table 1**

Equipment Class	Frequency band (MHz)	Trunk Mounted Antennas				Roof Mounted Antennas			
		Passenger		Bystander		Passenger		Bystander	
		Power Density (mW/cm <sup>2</sup> )	Percentage of Limit (%)	Power Density (mW/cm <sup>2</sup> )	Percentage of Limit (%)	Power Density (mW/cm <sup>2</sup> )	Percentage of Limit (%)	Power Density (mW/cm <sup>2</sup> )	Percentage of Limit (%)
TNB	450-512 (LMR UHF2)	0.237	78.90	0.122	38.8	0.035	11.5	0.082	27.3

### 3.0 Abbreviations / Definitions

- CNR: Calibration Not Required
- CW: Continuous Wave
- DUT: Device Under Test
- EME: Electromagnetic Energy
- FM: Frequency Modulation
- MPE: Maximum Permissible Exposure
- GPS: Global Positioning System
- LMR: Land Mobile Radio
- NA: Not Applicable
- BS: Bystander
- PB: Passenger Back seat
- PF: Passenger Front seat
- PTT: Push to Talk
- TDMA: Time Division Multiple Access

#### 4.0 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 (Edition 97-01), FCC, Washington, D.C.: August 1997.
- 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
- International Commission on Non-Ionizing Radiation Protection (ICNIRP) 1998
- Ministry of Health (Canada) Safety Code 6 (2015), Limits of Human Exposure to Radio frequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz
- RSS-102 (Issue 5) – Radio Frequency (RF) Exposure Compliance of Radio communication Apparatus (All Frequency Bands)
- FCC KDB – 447498 D01 General RF Exposure Guidance v06
- FCC KDB – 865664 D02 RF Exposure Reporting v01r02
- EN 62311:2008 Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz – 300 GHz).

#### 5.0 Power Density Limits

**Table 2 – Occupational / Controlled Exposure Limits**

Frequency Range (MHz)	FCC OET Bulletin 65	ICNIRP	IEEE C95.1 1992/1999	IEEE C95.1 2005	RSS-102 Issue 5 2015
	mW/cm <sup>2</sup>	W/m <sup>2</sup>	mW/cm <sup>2</sup>	W/m <sup>2</sup>	W/m <sup>2</sup>
10 – 20					10.0
20 – 48					44.72 / $f^{0.5}$
30 – 300	1.0				
48 – 100					6.455
10 – 400		10.0			
100 – 300			1.0	10.0	
100 – 6,000					0.6455 $f^{0.5}$
300 – 1,500	f/300				

**Table 2 – Occupational / Controlled Exposure Limits (Con’t.)**

Frequency Range (MHz)	FCC OET Bulletin 65	ICNIRP	IEEE C95.1 1992/1999	IEEE C95.1 2005	RSS-102 Issue 5 2015
	mW/cm <sup>2</sup>	W/m <sup>2</sup>	mW/cm <sup>2</sup>	W/m <sup>2</sup>	W/m <sup>2</sup>
300 – 3,000			f/300	f/30	
400 – 2,000		f/40			
1,500 – 15,000					
1,500 – 100,000	5.0				
2,000 – 300,000		50.0			
3,000 – 300,000			10.0	100.0	
6,000 – 15,000					50.0
15000 – 150,000					50.0
150000 – 300,000					$3.33 \times 10^{-4} f$

**Table 3 – General Population / Uncontrolled Exposure Limits**

Frequency Range (MHz)	FCC OET Bulletin 65	ICNIRP	IEEE C95.1 1992/1999	IEEE C95.1 2005	RSS-102 Issue 5 2015
	mW/cm <sup>2</sup>	W/m <sup>2</sup>	mW/cm <sup>2</sup>	W/m <sup>2</sup>	W/m <sup>2</sup>
10 – 20					2.0
20 – 48					$8.944 / f^{0.5}$
30 – 300	0.2				
48 – 300					1.291
10 – 400		2.0			
100 – 300			0.2		
100 – 400				2.0	
300 – 1,500	f/1,500				
300 – 6000					$0.02619 f^{0.6834}$
400 – 2,000		f/200		f/200	
300 – 15,000			f/1,500		
1,500 – 15,000					
1,500 – 100,000	1.0				
2,000 – 100,000				10.0	
2,000 – 300,000		10.0			
6,000 – 15,000					10.0
15,000 – 150,000					10.0
150,000 – 300,000					$6.67 \times 10^{-5} f$

### 6.0 N<sub>c</sub> Test Channels

The number of test channels is 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<sub>c</sub>* is the number of test channels, *f<sub>high</sub>* and *f<sub>low</sub>* are the highest and lowest frequencies within the transmission band, *f<sub>c</sub>* is the mid-band frequency, and frequencies are in MHz.

### 7.0 Measurement Equipment

**Table 4 – Equipment**

Equipment Type	Model #	SN	Calibration Date	Calibration Due Date
Automobile	Volvo 240-1988	NA	NA	NA
Survey Meter	ETS Model HI-2200	00086887	06/16/2022	06/16/2023
Probe – E-Field	ETS Model E100	00224511		
Survey Meter	ETS Model HI-2200	00206805	01/27/2022	01/27/2023
Probe – E-Field	ETS Model H200	00237361		

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

### 8.0 Measurement System Uncertainty Levels

**Table 5 – Uncertainty Budget for Near Field Probe Measurements**

	Tol. (± %)	Prob. Dist.	Divisor	<i>u<sub>i</sub></i> (±%)		<i>v<sub>i</sub></i>
<b>Measurement System</b>						
Probe Calibration	7.1	N	1.00	7.1	50.4	∞
Survey Meter Calibration	0.0	N	1.00	0.0	0.0	∞
Hemispherical Isotropy	8.0	R	1.73	4.6	21.33	∞
Linearity	5.0	R	1.73	2.9	8.33	∞
Pulse Response	1.0	R	1.73	0.6	0.33	∞
RF Ambient Noise	3.0	R	1.73	1.7	3.00	∞
RF Reflections	8.0	R	1.73	4.6	21.33	∞
Probe Positioning	10.0	R	1.73	5.8	33.333	∞
<b>Test sample Related</b>					0.00	
Antenna Positioning	3.0	N	1.00	3.0	9.0	∞
Power drift	5.0	R	1.73	2.9	8.33	∞
Bystander measurement uncertainty	4.8	N	1.00	4.8	23.04	∞
Passenger measurement uncertainty	8.1	N	1.00	8.1	65.61	∞
<b>Combined Standard Uncertainty</b>		RSS		15.6	15.6	∞
<b>Expanded Uncertainty</b> (95% CONFIDENCE LEVEL)		<i>k</i> =2		31	31	

## 9.0 Product and System Description

This mobile device operates in the LMR bands using either frequency modulation (FM) with 100% transmit duty cycle or TDMA signals with maximum of 50% transmit duty cycle. For conservative assessment, FM signal was tested. A duty factor of 50% applies for PTT operation mode.

Table 6 below summarizes the technologies, bands, maximum duty cycles and maximum output powers. Maximum output powers are defined as upper limit of the production line final test station.

**Table 6**

Technologies	Bands (MHz)	Duty Cycle (%)	Max Power (W)
LMR	450-512 (UHF2)	50 (PTT)	48

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)

## 10.0 Additional Options and Accessories

Refer to Table 7 for complete list of tested antennas.

Below are additional antenna kits that are electrically identical to the tested antennas but have a BNC connector or optional GPS Base:

No.	Antenna Models	Description	Selected for test	Tested	Comments
1	HAE6029A	403–527 MHz, 1/2 Wave, 4.15dBi	Yes	No	By similarity to HAE6022A
2	HAE6019A	403–527 MHz, 1/2 Wave, 4.15dBi	Yes	No	By similarity to HAE6022A
3	PMAE4031A	Combo GPS/UHF, 450–470 MHz, 1/4 Wave, 2.15dBi	Yes	No	By similarity to PMAE4041A
4	PMAE4042A	450–470 MHz, 5/8 Wave, 5.65dBi	Yes	No	By similarity to PMAE4033A
5	PMAE4034A	Combo GNSS/UHF, 450–470 MHz, 5/8 Wave, 7.15dBi	Yes	No	By similarity to PMAE4043A
6	HAE6030A	470–527 MHz, 1/4 Wave, 2.15dBi	Yes	No	By similarity to HAE6020A
7	HAE6028A	470–494 MHz, 5/8 Wave, 5.15dBi	Yes	No	By similarity to HAE6024A
8	HAE6027A	494–512 MHz, 5/8 Wave, 5.15dBi	Yes	No	By similarity to HAE6026A

## 11.0 Test Set-Up Description

Assessments were performed with mobile radio installed in the test vehicle, at the specified distances and test locations indicated in sections 12.0, 13.0 and Appendix A.

All antennas described in Table 7 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.

The system was tested using a low-loss 16' Teflon RG58A/U cable attaching the radio to the transmit antenna. This cable is shorter and lower attenuation than the 17' RG58A/U cables supplied in the customer kits for connecting the radio to the transmit antenna. The cable used in the test setup also has lower attenuation over the test frequency range than the cable provided in the customer kits. The use of a shorter cable with lower attenuation in the test setup ensures that the test data is more conservative with regards to the actual installation. Cable losses are reported in Appendix A.

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

### 12.1 External/Bystander vehicle MPE measurements

Initially the 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 the distance between the antenna and the geometric center of the probe sensor equal to 90 cm (for UHF band). 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.

Tests for the 90° radial direction were conducted with the antenna displaced towards the "bystander on the side of the trunk" test location in order to attain 90 cm (12 cm antenna displacement) distances from that test location. In this way, the antenna is closer to the test location, and the MPE is higher, than it would be if the antenna was left at the center of the trunk

## 12.2 Internal/Passenger vehicle MPE measurements

Antenna is located toward the center of the trunk at a minimum 85 cm 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.

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

### **13.1 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 20 cm height increments, with the distance between the antenna and the geometric center of the probe sensor equal to 90 cm (for UHF band). 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.

### **13.2 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.

## 14.0 MPE Variability Requirement for External/Bystander vehicle MPE measurement

If all the MPE bystander measurements for a particular antenna are below 50% of the FCC MPE limit, no variability testing for that antenna is required.

If one or more MPE bystander measurements for a particular is between 50-80% of the FCC MPE limit, with no results > 80%, variability testing shall be done on the single worst case for that antenna.

For any MPE bystander measurement above 80% of the MPE limit, variability testing shall be done for all of such configuration. When SAR simulation is performed for a particular antenna configuration to determine compliance, variability measurements are not required for that antenna configuration.

## 15.0 MPE Calculations

The final MPE results for this mobile radio are presented in section 16.0. These results are based on 50% duty cycle for PTT for LMR bands.

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

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>

$$\text{mW/cm}^2 = (\text{A/m})^2 * 37.699$$

**Equation 4 – Power Density Maximum Calculation**

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

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

**16.0 Antenna Summary**

Table below summarizes the tested or evaluated antennas and their descriptions, mount location (roof/trunk), overlap of FCC bands, number of test channels per FCC KDB 447498 (FCC N<sub>c</sub>) and actual number of tested channels (Actual N<sub>c</sub>). This information was used to determine the test configurations presented in this report.

**Table 7**

Antenna No.	Antenna Model	Frequency Range (MHz)	Physical Length (cm)	Gain (dBi)	Remarks	Mount Location (Roof/Trunk)	Overlap FCC Bands (MHz)	FCC N <sub>c</sub>	Actual N <sub>c</sub>
1	HAE4003A	450-470	13.1	2.15	1/4 wave	R	450-470	3	3
2	HAE4004A	470-512	12.6	2.15	1/4 wave	R	470-512	4	4
3	HAE4011A	450-470	30.9	5.65	1/2 wave	R/T	450-470	3	3
4	HAE4012A	470-494	29.4	5.15	5/8 wave	R/T	470-494	3	3
5	HAE4013A	494-512	64.2	5.65	5/8 wave	R/T	450-512	3	3
6	HAE6020A	470-527	11.9	2.15	1/4 wave	R	470-512	5	5
7	HAE6022A	403-527	27.5	4.15	1/2 wave	R/T	450-512	6	6
8	HAE6024A	470-494	29.4	5.15	5/8 wave	R/T	470-494	3	3
9	HAE6026A	494-512	29.4	5.15	5/8 wave	R/T	494-512	3	3
10	PMAE4033A	450-470	31	5.65	5/8 wave	R/T	450-470	3	3
11	PMAE4041A	450-470	13.1	2.15	1/4 wave	R	450-470	3	3
12	PMAE4043A	450-470	76.8	7.15	5/8 wave	R/T	450-470	3	3
13	*RAE4004ARB	445-470	92.7 (450.0125 MHz) 90.5 (460 MHz) 89.0 (469.9875 MHz)	7.15	5/8 wave	R/T	450-470	3	3

Note:\* Antenna length trimmed to frequency.

### 17.0 Test Results Summary

#### 17.1 MPE Test Results Summary for LMR

**Table 8**

MPE assessment for LMR UHF2 - trunk mounted antenna – Bystander

Notes:

Results highlighted in yellow are configurations with highest percentage of limits

Trunk/ Roof	Test Position	E/H Field	Angle (Degree)	Antenna No.	Antenna Model	Max Pwr (W)	Initial Pwr (W)	Tx Freq (MHz)	Max Calc. P.D. (mW/ cm <sup>2</sup> )	FCC Limit	% To FCC Spec Limit	ISED Limit	% To ISED Spec Limit
Trunk	BS	E	0	3	HAE4011A (450 - 470 MHz)	48	47.7	450.0125	0.069	0.30	22.8	0.17	40.2
							45.8	460.0000	0.082	0.31	26.7	0.17	47.4
							47.3	469.9875	0.081	0.31	25.9	0.18	46.2
				4	HAE4012A (470 - 494 MHz)	48	46.7	470.0125	0.098	0.31	31.1	0.18	55.6
							47.8	482.5000	0.083	0.32	25.7	0.18	46.2
							46.4	494.9875	0.063	0.33	19.0	0.18	34.6
				5	HAE4013A (494 - 512 MHz)	48	46.4	494.9875	0.085	0.33	25.7	0.18	46.6
							45.9	503.0000	0.091	0.34	27.3	0.18	49.8
							47.3	511.9875	0.064	0.34	18.7	0.19	34.4
				7	HAE6022A (403-527 MHz)	48	47.7	450.0125	0.109	0.30	36.4	0.17	64.1
							47.3	469.9875	0.120	0.31	38.3	0.18	68.4
							47.8	482.5000	0.106	0.32	33.0	0.18	59.5
							46.5	496.5000	0.107	0.33	32.2	0.18	58.5
							47.3	511.9875	0.097	0.34	28.4	0.19	52.0
				8	HAE6024A (470 - 494 MHz)	48	46.7	470.0125	0.097	0.31	31.0	0.18	55.3
							47.8	482.5000	0.091	0.32	28.4	0.18	51.1
							46.3	493.9875	0.085	0.33	25.9	0.18	47.1
				9	HAE6026A (494 - 512 MHz)	48	46.4	494.9875	0.088	0.33	26.6	0.18	48.2
							45.9	503.0000	0.094	0.34	28.0	0.18	51.1
							47.3	511.9875	0.099	0.34	29.0	0.19	53.2
				10	PMAE4033A (450 - 470 MHz)	48	47.7	450.0125	0.096	0.30	32.1	0.17	56.6
							45.8	460.0000	0.100	0.31	32.7	0.17	58.0
							47.3	469.9875	0.122	0.31	38.8	0.18	69.3
				12	PMAE4043A (450- 470 MHz)	48	47.7	450.0125	0.103	0.30	34.2	0.17	60.3
							45.8	460.0000	0.102	0.31	33.4	0.17	59.2
							47.3	469.9875	0.116	0.31	37.1	0.18	66.2
				13	RAE4004ARB (445-470 MHz)	48	47.7	450.0125	0.075	0.30	25.0	0.17	44.1
45.8	460.0000	0.084	0.31				27.3	0.17	48.4				
47.3	469.9875	0.080	0.31				25.4	0.18	45.4				
45	10	PMAE4033A (450 - 470 MHz)	48.0	47.3	469.9875	0.119	0.31	38.1	0.18	68.0			
90	10	PMAE4033A (450 - 470 MHz)	48.0	47.3	469.9875	0.070	0.31	22.4	0.18	40.0			

**Table 9**

**MPE assessment for LMR UHF2 - roof mounted antenna – Bystander**

Notes:

Results highlight in yellow are configurations with highest percentage of limits

Trunk/ Roof	Test Position	E/H Field	Antenna No.	Antenna Model	Max Pwr (W)	Initial Pwr (W)	Tx Freq (MHz)	Max Calc. P.D. (mW/ cm <sup>2</sup> )	FCC Limit	% To FCC Spec Limit	ISED Limit	% To ISED Spec Limit
Roof	BS	E	1	HAE4003A (450 - 470 MHz)	48	47.7	450.0125	0.076	0.30	25.4	0.17	44.8
						45.8	460.0000	0.065	0.31	21.2	0.17	37.7
						47.3	469.9875	0.064	0.31	20.5	0.18	36.6
			2	HAE4004A (470 - 512 MHz)	48	46.7	470.0125	0.070	0.31	22.2	0.18	39.6
						47.3	484.0000	0.065	0.32	20.2	0.18	36.3
						46.2	498.0000	0.072	0.33	21.8	0.18	39.6
						47.3	511.9875	0.060	0.34	17.6	0.19	32.3
			3	HAE4011A (450 - 470 MHz)	48	47.7	450.0125	0.040	0.30	13.3	0.17	23.5
						45.8	460.0000	0.045	0.31	14.7	0.17	26.1
						47.3	469.9875	0.043	0.31	13.6	0.18	24.3
			4	HAE4012A (470 - 494 MHz)	48	46.7	470.0125	0.054	0.31	17.4	0.18	31.0
						47.8	482.5000	0.041	0.32	12.7	0.18	22.8
						46.4	494.9875	0.041	0.33	12.6	0.18	22.8
			5	HAE4013A (494 - 512 MHz)	48	46.4	494.9875	0.065	0.33	19.7	0.18	35.7
						45.9	503.0000	0.063	0.34	18.7	0.18	34.2
						47.3	511.9875	0.041	0.34	12.0	0.19	22.1
			6	HAE6020A (470 - 527 MHz)	48	46.7	470.0125	0.021	0.31	6.7	0.18	12.0
						47.8	482.5000	0.035	0.32	10.8	0.18	19.5
						46.5	496.5000	0.062	0.33	18.6	0.18	33.8
						47.3	511.9875	0.050	0.34	14.5	0.19	26.7
			7	HAE6022A (403-527 MHz)	48	47.7	450.0125	0.078	0.30	26.0	0.17	45.8
						47.3	469.9875	0.064	0.31	20.5	0.18	36.5
						47.8	482.5000	0.067	0.32	20.8	0.18	37.4
						46.5	496.5000	0.076	0.33	23.1	0.18	41.9
						47.3	511.9875	0.072	0.34	21.1	0.19	38.8
			8	HAE6024A (470 - 494 MHz)	48	46.7	470.0125	0.055	0.31	17.6	0.18	31.4
						47.8	482.5000	0.059	0.32	18.5	0.18	33.3
						46.3	493.9875	0.063	0.33	19.3	0.18	35.0
			9	HAE6026A (494 - 512 MHz)	48	46.4	494.9875	0.059	0.33	17.9	0.18	32.6
						45.9	503.0000	0.079	0.34	23.5	0.18	42.8
						47.3	511.9875	0.061	0.34	17.7	0.19	32.5
			10	PMAE4033A (450 - 470 MHz)	48	47.7	450.0125	0.080	0.30	26.8	0.17	47.2
						45.8	460.0000	0.069	0.31	22.4	0.17	39.7
						47.3	469.9875	0.068	0.31	21.7	0.18	38.7

**Table 9 (Continued)**

MPE assessment for LMR UHF2 - roof mounted antenna – Bystander

Notes:

Results highlight in yellow are configurations with highest percentage of limits

Trunk/ Roof	Test Position	E/H Field	Antenna No.	Antenna Model	Max Pwr (W)	Initial Pwr (W)	Tx Freq (MHz)	Max Calc. P.D. (mW/ cm <sup>2</sup> )	FCC Limit	% To FCC Spec Limit	ISED Limit	% To ISED Spec Limit
Roof	BS	E	11	PMAE4041A (450 - 470 MHz)	48	47.7	450.0125	0.009	0.30	3.0	0.17	5.4
						45.8	460.0000	0.010	0.31	3.4	0.17	6.0
						47.3	469.9875	0.015	0.31	4.8	0.18	8.5
			12	PMAE4043A (450- 470 MHz)	48	47.7	450.0125	0.082	0.30	27.3	0.17	48.1
						45.8	460.0000	0.063	0.31	20.4	0.17	36.1
						47.3	469.9875	0.062	0.31	19.9	0.18	35.5
			13	RAE4004ARB (445-470 MHz)	48	47.7	450.0125	0.053	0.30	17.6	0.17	30.9
						45.8	460.0000	0.051	0.31	16.6	0.17	29.5
						47.3	469.9875	0.049	0.31	15.6	0.18	27.9

**Table 10**  
MPE assessment for LMR UHF2 - trunk mounted antenna – Passenger Back

Notes:  
Results highlight in yellow are configurations with highest percentage of limits  
\*Configuration required SAR simulation

Trunk/ Roof	Test Position	E/H Field	Antenna No.	Antenna Model	Max Pwr (W)	Initial Pwr (W)	Tx Freq (MHz)	Max Calc. P.D. (mW/ cm^2)	FCC Limit	% To FCC Spec Limit	ISED Limit	% To ISED Spec Limit
Trunk	PB	E	3	HAE4011A (450 - 470 MHz)	48	47.7	450.0125	0.093	0.30	31.1	0.17	54.7
						45.8	460.0000	0.099	0.31	32.3	0.17	57.4
						47.3	469.9875	0.094	0.31	30.0	0.18	53.5
			4	HAE4012A (470 - 494 MHz)	48	46.7	470.0125	0.115	0.31	36.7	0.18	65.6
						47.8	482.5000	0.094	0.32	29.2	0.18	52.6
						46.4	494.9875	0.092	0.33	27.8	0.18	50.5
			5	HAE4013A (494 - 512 MHz)	48	46.4	494.9875	0.163	0.33	49.3	0.18	89.4
						45.9	503.0000	0.144	0.34	42.8	0.18	78.1
						47.3	511.9875	0.136	0.34	40.0	0.19	73.3
			7	HAE6022A (403-527 MHz)	48	47.7	450.0125	0.167	0.30	55.7	0.17	98.1
						47.3	469.9875	0.191	0.31	61.1	0.18	109.0
						47.8	482.5000	0.216	0.32	67.3	0.18	121.1
						46.5	496.5000	0.203	0.33	61.5	0.18	111.7
						47.3	511.9875	0.230	0.34	67.3	0.19	123.5
			8	HAE6024A (470 - 494 MHz)	48	46.7	470.0125	0.166	0.31	53.1	0.18	94.8
						47.8	482.5000	0.147	0.32	45.8	0.18	82.4
						46.3	493.9875	0.157	0.33	47.5	0.18	86.2
			9	HAE6026A (494 - 512 MHz)	48	46.4	494.9875	0.134	0.33	40.6	0.18	73.6
						45.9	503.0000	0.153	0.34	45.5	0.18	83.0
						47.3	511.9875	0.170	0.34	49.8	0.19	91.4
			10	PMAE4033A (450 - 470 MHz)	48	47.7	450.0125	0.237	0.30	78.9	0.17	*139.0
						45.8	460.0000	0.223	0.31	72.9	0.17	*129.2
						47.3	469.9875	0.206	0.31	65.9	0.18	*117.6
			12	PMAE4043A (450- 470 MHz)	48	47.7	450.0125	0.213	0.30	70.9	0.17	*124.9
						45.8	460.0000	0.210	0.31	68.4	0.17	*121.3
						47.3	469.9875	0.198	0.31	63.3	0.18	*113.1
			13	RAE4004ARB (445-470 MHz)	48	47.7	450.0125	0.046	0.30	15.3	0.17	26.9
						45.8	460.0000	0.069	0.31	22.5	0.17	39.9
						47.3	469.9875	0.084	0.31	26.7	0.18	47.7

**Table 11**

**MPE assessment for LMR UHF2 - roof mounted antenna – Passenger Back**

Notes:

Blue fonts: Frequencies not regulated by FCC.

Results highlight in yellow are configurations with highest percentage of limits

Trunk/ Roof	Test Position	E/H Field	Antenna No.	Antenna Model	Max Pwr (W)	Initial Pwr (W)	Tx Freq (MHz)	Max Calc. P.D. (mW/ cm <sup>2</sup> )	FCC Limit	% To FCC Spec Limit	ISED Limit	% To ISED Spec Limit
Roof	PB	E	1	HAE4003A (450 - 470 MHz)	48	47.7	450.0125	0.031	0.30	10.3	0.17	18.1
						45.8	460.0000	0.034	0.31	11.1	0.17	19.7
						47.3	469.9875	0.035	0.31	11.0	0.18	19.7
			2	HAE4004A (470 - 512 MHz)	48	46.7	470.0125	0.033	0.31	10.4	0.18	18.5
						47.3	484.0000	0.036	0.32	11.1	0.18	20.1
						46.2	498.0000	0.024	0.33	7.4	0.18	13.4
						47.3	511.9875	0.019	0.34	5.5	0.19	10.1
			3	HAE4011A (450 - 470 MHz)	48	47.7	450.0125	0.005	0.30	1.7	0.17	2.9
						45.8	460.0000	0.007	0.31	2.3	0.17	4.0
						47.3	469.9875	0.006	0.31	1.8	0.18	3.2
			4	HAE4012A (470 - 494 MHz)	48	46.7	470.0125	0.012	0.31	3.7	0.18	6.6
						47.8	482.5000	0.012	0.32	3.9	0.18	6.9
						46.4	494.9875	0.009	0.33	2.7	0.18	4.9
			5	HAE4013A (494 - 512 MHz)	48	46.4	494.9875	0.010	0.33	2.9	0.18	5.3
						45.9	503.0000	0.007	0.34	2.2	0.18	4.1
						47.3	511.9875	0.006	0.34	1.8	0.19	3.4
			6	HAE6020A (470 - 527 MHz)	48	46.7	470.0125	0.010	0.31	3.1	0.18	5.6
						47.8	482.5000	0.016	0.32	4.9	0.18	8.9
						46.5	496.5000	0.018	0.33	5.4	0.18	9.7
						47.3	511.9875	0.012	0.34	3.5	0.19	6.5
			7	HAE6022A (403-527 MHz)	48	47.7	450.0125	0.035	0.30	11.5	0.17	20.3
						47.3	469.9875	0.034	0.31	10.8	0.18	19.2
						47.8	482.5000	0.025	0.32	7.8	0.18	14.0
						46.5	496.5000	0.021	0.33	6.2	0.18	11.3
						47.3	511.9875	0.014	0.34	4.1	0.19	7.6
			8	HAE6024A (470 - 494 MHz)	48	46.7	470.0125	0.028	0.31	9.0	0.18	16.1
						47.8	482.5000	0.034	0.32	10.7	0.18	19.2
						46.3	493.9875	0.021	0.33	6.5	0.18	11.7
			9	HAE6026A (494 - 512 MHz)	48	46.4	494.9875	0.018	0.33	5.4	0.18	9.8
						45.9	503.0000	0.023	0.34	6.8	0.18	12.4
						47.3	511.9875	0.014	0.34	4.0	0.19	7.3
			10	PMAE4033A (450 - 470 MHz)	48	47.7	450.0125	0.028	0.30	9.4	0.17	16.6
						45.8	460.0000	0.035	0.31	11.3	0.17	20.1
						47.3	469.9875	0.032	0.31	10.1	0.18	18.1

**Table 11 (Continued)**

MPE assessment for LMR UHF2 - roof mounted antenna – Passenger Back

Notes:

Results highlight in yellow are configurations with highest percentage of limits

Trunk/ Roof	Test Position	E/H Field	Antenna No.	Antenna Model	Max Pwr (W)	Initial Pwr (W)	Tx Freq (MHz)	Max Calc. P.D. (mW/ cm <sup>2</sup> )	FCC Limit	% To FCC Spec Limit	ISED Limit	% To ISED Spec Limit		
Roof	PB	E	11	PMAE4041A (450 - 470 MHz)	48	47.7	450.0125	0.007	0.30	2.2	0.17	3.8		
						45.8	460.0000	0.005	0.31	1.7	0.17	3.0		
						47.3	469.9875	0.007	0.31	2.3	0.18	4.1		
			12	PMAE4043A (450- 470 MHz)	48	47.7	450.0125	0.014	0.30	4.6	0.17	8.1		
						45.8	460.0000	0.014	0.31	4.4	0.17	7.9		
						47.3	469.9875	0.012	0.31	3.9	0.18	6.9		
			13	RAE4004ARB (445-470 MHz)	48	47.7	450.0125	0.007	0.30	2.2	0.17	3.8		
45.8	460.0000	0.008				0.31	2.6	0.17	4.6					
47.3	469.9875	0.011				0.31	3.5	0.18	6.2					

**Table 12**

**MPE assessment for LMR UHF2 - trunk mounted antenna – Passenger Front**

Notes:

Results highlight in yellow are configurations with highest percentage of limits

Trunk/ Roof	Test Position	E/H Field	Antenna No.	Antenna Model	Max Pwr (W)	Initial Pwr (W)	Tx Freq (MHz)	Max Calc. P.D. (mW/ cm <sup>2</sup> )	FCC Limit	% To FCC Spec Limit	ISED Limit	% To ISED Spec Limit
Trunk	PF	E	3	HAE4011A (450 - 470 MHz)	48	47.7	450.0125	0.041	0.30	13.5	0.17	23.8
						45.8	460.0000	0.055	0.31	17.9	0.17	31.8
						47.3	469.9875	0.063	0.31	20.0	0.18	35.8
			4	HAE4012A (470 - 494 MHz)	48	46.7	470.0125	0.081	0.31	25.8	0.18	46.1
						47.8	482.5000	0.046	0.32	14.3	0.18	25.7
						46.4	494.9875	0.035	0.33	10.6	0.18	19.2
			5	HAE4013A (494 - 512 MHz)	48	46.4	494.9875	0.062	0.33	18.9	0.18	34.3
						45.9	503.0000	0.072	0.34	21.6	0.18	39.3
						47.3	511.9875	0.057	0.34	16.6	0.19	30.5
			7	HAE6022A (403-527 MHz)	48	47.7	450.0125	0.073	0.30	24.5	0.17	43.1
						47.3	469.9875	0.094	0.31	30.1	0.18	53.7
						47.8	482.5000	0.048	0.32	14.9	0.18	26.8
						46.5	496.5000	0.066	0.33	20.0	0.18	36.3
						47.3	511.9875	0.074	0.34	21.8	0.19	40.0
			8	HAE6024A (470 - 494 MHz)	48	46.7	470.0125	0.078	0.31	24.9	0.18	44.5
						47.8	482.5000	0.043	0.32	13.4	0.18	24.2
						46.3	493.9875	0.051	0.33	15.5	0.18	28.1
			9	HAE6026A (494 - 512 MHz)	48	46.4	494.9875	0.048	0.33	14.5	0.18	26.3
						45.9	503.0000	0.073	0.34	21.8	0.18	39.8
						47.3	511.9875	0.070	0.34	20.6	0.19	37.8
			10	PMAE4033A (450 - 470 MHz)	48	47.7	450.0125	0.065	0.30	21.7	0.17	38.2
						45.8	460.0000	0.078	0.31	25.4	0.17	45.0
						47.3	469.9875	0.096	0.31	30.8	0.18	55.0
			12	PMAE4043A (450- 470 MHz)	48	47.7	450.0125	0.080	0.30	26.5	0.17	46.7
						45.8	460.0000	0.068	0.31	22.1	0.17	39.3
						47.3	469.9875	0.063	0.31	20.0	0.18	35.8
			13	RAE4004ARB (445-470 MHz)	48	47.7	450.0125	0.035	0.30	11.7	0.17	20.7
						45.8	460.0000	0.053	0.31	17.2	0.17	30.6
						47.3	469.9875	0.063	0.31	20.2	0.18	36.1

**Table 13**

**MPE assessment for LMR UHF2 - roof mounted antenna – Passenger Front**

Notes:

Results highlight in yellow are configurations with highest percentage of limits

Trunk/ Roof	Test Position	E/H Field	Antenna No.	Antenna Model	Max Pwr (W)	Initial Pwr (W)	Tx Freq (MHz)	Max Calc. P.D. (mW/ cm <sup>2</sup> )	FCC Limit	% To FCC Spec Limit	ISED Limit	% To ISED Spec Limit
Roof	PF	E	1	HAE4003A (450 - 470 MHz)	48	47.7	450.0125	0.012	0.30	3.9	0.17	6.9
						45.8	460.0000	0.013	0.31	4.3	0.17	7.7
						47.3	469.9875	0.012	0.31	3.7	0.18	6.6
			2	HAE4004A (470 - 512 MHz)	48	46.7	470.0125	0.012	0.31	3.9	0.18	6.9
						47.3	484.0000	0.008	0.32	2.4	0.18	4.3
						46.2	498.0000	0.010	0.33	2.9	0.18	5.3
						47.3	511.9875	0.009	0.34	2.6	0.19	4.7
			3	HAE4011A (450 - 470 MHz)	48	47.7	450.0125	0.002	0.30	0.7	0.17	1.2
						45.8	460.0000	0.002	0.31	0.8	0.17	1.4
						47.3	469.9875	0.002	0.31	0.5	0.18	0.9
			4	HAE4012A (470 - 494 MHz)	48	46.7	470.0125	0.005	0.31	1.6	0.18	2.9
						47.8	482.5000	0.003	0.32	0.9	0.18	1.5
						46.4	494.9875	0.004	0.33	1.1	0.18	2.0
			5	HAE4013A (494 - 512 MHz)	48	46.4	494.9875	0.008	0.33	2.4	0.18	4.4
						45.9	503.0000	0.006	0.34	1.9	0.18	3.4
						47.3	511.9875	0.004	0.34	1.3	0.19	2.4
			6	HAE6020A (470 - 527 MHz)	48	46.7	470.0125	0.005	0.31	1.6	0.18	2.8
						47.8	482.5000	0.005	0.32	1.6	0.18	3.0
						46.5	496.5000	0.010	0.33	3.1	0.18	5.6
						47.3	511.9875	0.009	0.34	2.6	0.19	4.8
			7	HAE6022A (403-527 MHz)	48	47.7	450.0125	0.016	0.30	5.4	0.17	9.5
						47.3	469.9875	0.014	0.31	4.5	0.18	8.0
						47.8	482.5000	0.008	0.32	2.5	0.18	4.5
						46.5	496.5000	0.011	0.33	3.4	0.18	6.1
						47.3	511.9875	0.009	0.34	2.7	0.19	5.0
			8	HAE6024A (470 - 494 MHz)	48	46.7	470.0125	0.012	0.31	3.7	0.18	6.6
						47.8	482.5000	0.007	0.32	2.3	0.18	4.1
						46.3	493.9875	0.011	0.33	3.2	0.18	5.9
			9	HAE6026A (494 - 512 MHz)	48	46.4	494.9875	0.009	0.33	2.8	0.18	5.1
						45.9	503.0000	0.009	0.34	2.8	0.18	5.0
47.3	511.9875	0.010				0.34	2.8	0.19	5.1			
10	PMAE4033A (450 - 470 MHz)	48	47.7	450.0125	0.015	0.30	5.0	0.17	8.8			
			45.8	460.0000	0.016	0.31	5.3	0.17	9.5			
			47.3	469.9875	0.017	0.31	5.6	0.18	9.9			

**Table 13 (Continued)**

MPE assessment for LMR UHF2 - roof mounted antenna – Passenger Front

Notes:

Results highlight in yellow are configurations with highest percentage of limits

Trunk/ Roof	Test Position	E/H Field	Antenna No.	Antenna Model	Max Pwr (W)	Initial Pwr (W)	Tx Freq (MHz)	Max Calc. P.D. (mW/ cm <sup>2</sup> )	FCC Limit	% To FCC Spec Limit	ISED Limit	% To ISED Spec Limit
Roof	PF	E	11	PMAE4041A (450 - 470 MHz)	48	47.7	450.0125	0.002	0.30	0.8	0.17	1.4
						45.8	460.0000	0.002	0.31	0.7	0.17	1.3
						47.3	469.9875	0.004	0.31	1.2	0.18	2.1
			12	PMAE4043A (450- 470 MHz)	48	47.7	450.0125	0.007	0.30	2.2	0.17	3.9
						45.8	460.0000	0.007	0.31	2.1	0.17	3.8
						47.3	469.9875	0.006	0.31	1.9	0.18	3.4
			13	RAE4004ARB (445-470 MHz)	48	47.7	450.0125	0.002	0.30	0.6	0.17	1.0
						45.8	460.0000	0.003	0.31	0.9	0.17	1.7
						47.3	469.9875	0.003	0.31	1.0	0.18	1.8

## 18.0 Conclusion

The assessments for this device were performed with an output power range as indicated in section 17.1. The maximum allowable output power is equal to the upper limit of the final test factory transmit power specification listed in Table 6. The highest power density results for LMR transmitters scaled to maximum allowable power output are indicated in Table 17.

**Table 17: Maximum MPE RF Exposure Summary (LMR)**

Designator	Transmitters	Frequency Band (MHz)	Passenger (mW/cm <sup>2</sup> )	Bystander (mW/cm <sup>2</sup> )
FCC	LMR UHF2	450-512	0.237	0.122
ISED Canada	LMR UHF2	450-470	0.237	0.122

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

Although MPE is a convenient method of demonstrating RF Exposure requirements, SAR is recognized as the “basic restriction”. For those configurations in Table 10 with ‘\*’, compliance to the General Population / Uncontrolled SAR 1g limit of 1.6 W/kg is demonstrated through SAR computational analysis.

The computational results show that this device, when used with the offered antennas in accordance with the user manual instructions, exhibits the maximum peak average SAR values indicated in the Table below for the configurations requiring SAR analysis.

**Table 18**

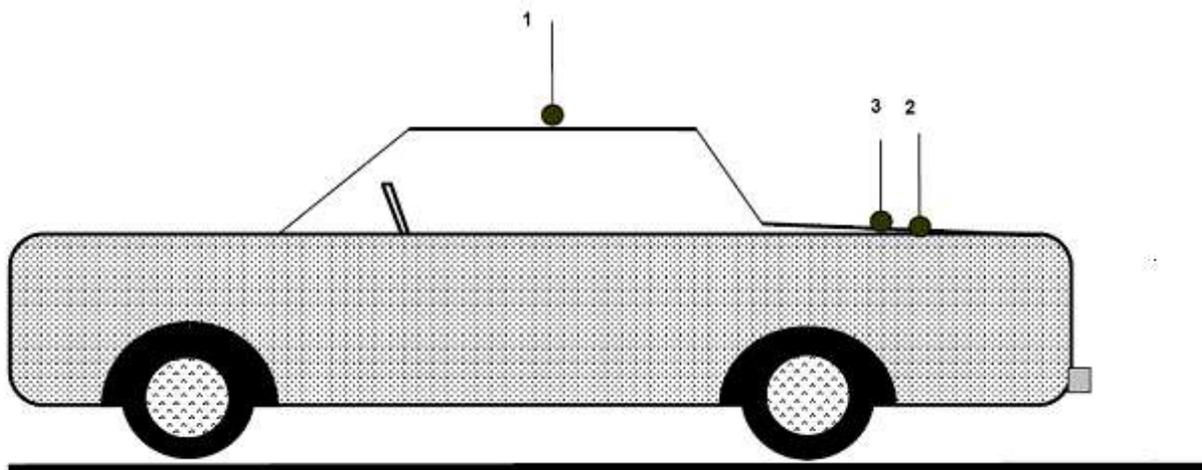
Designator	Exposure Conditions	Maximum peak average SAR(1g)
ISED Canada	Passenger	0.64 W/kg

## 19.0 User Instructions Considerations

In order to facilitate the task of professional users, the Safety Manual for this radio requires that bystanders be kept at least 3 ft (90 cm) from the vehicle Body.

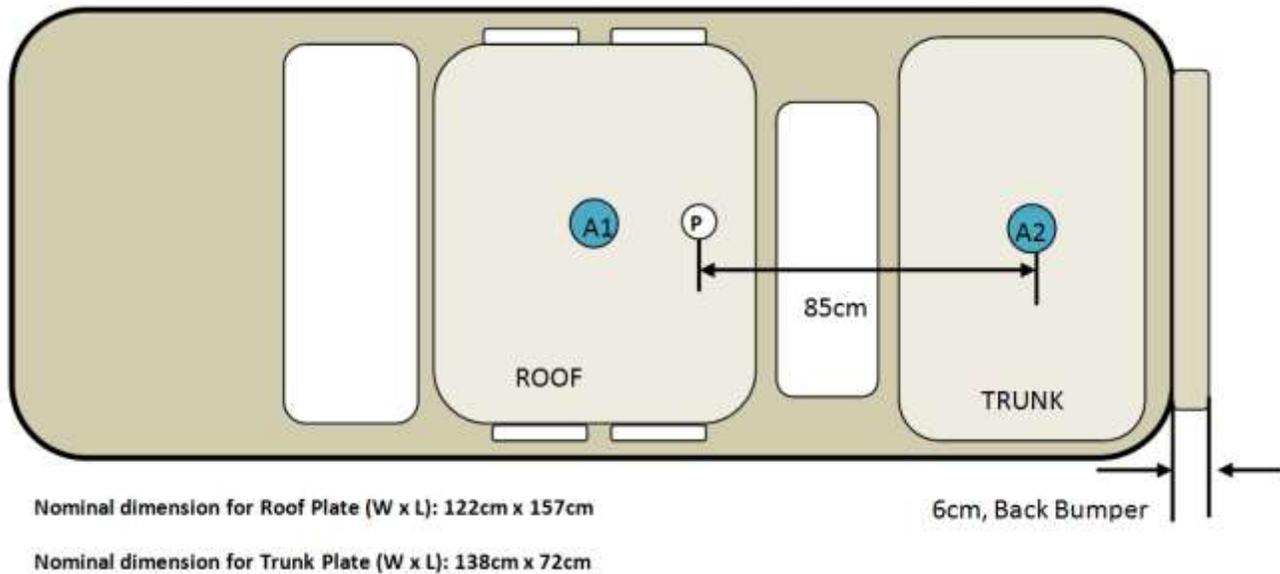
## Appendix A - Antenna Locations, Test Distances, and Cable Losses

### Antenna locations



1. Roof (20cm from center)
2. Trunk (85cm from back of the back seat)
3. Trunk (center)

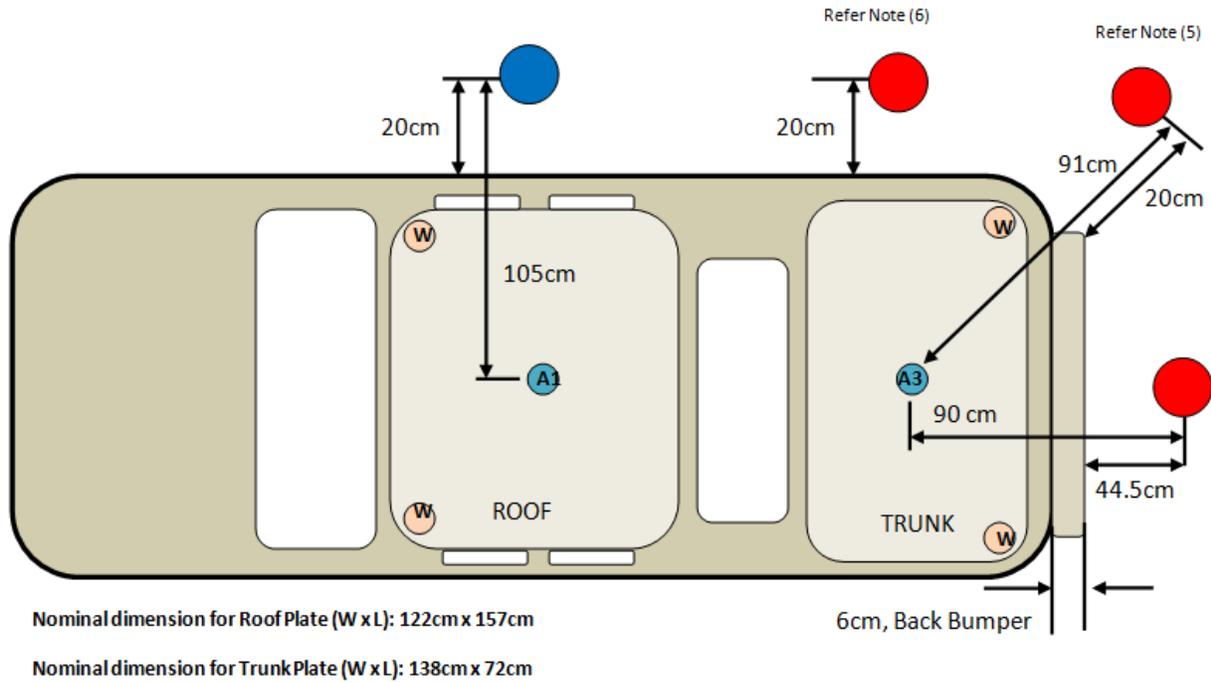
## Passenger Antenna mounting (UHF2)



### Notes:

- 1.) Antenna location A1: APX mobile radio roof antenna mounting locations for passenger back and front testing (UHF2)
- 2.) Antenna location A2: APX mobile trunk antenna mounting locations for passenger back and front testing (UHF2)
- 3.) Total distance between trunk mount antenna and rear passenger is 85cm

### Bystander Antenna mounting (UHF2)



By-Stander (BS) Test Locations:

- Roof Mount
- Trunk Mount

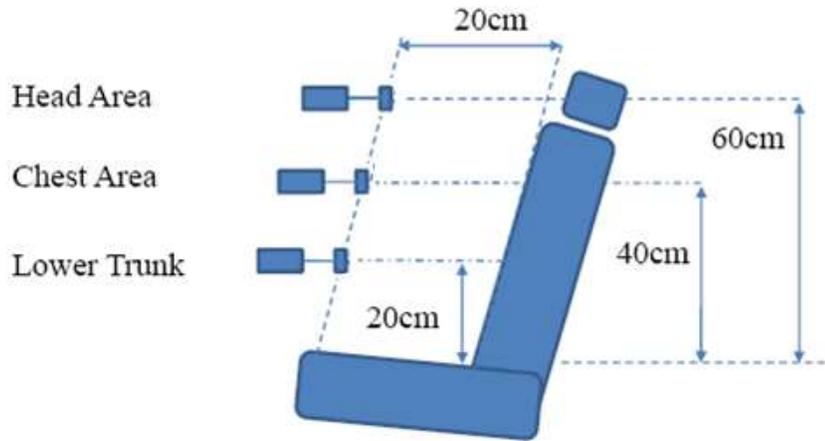
Notes:

- 1) Antenna location A1: LMR antennas roof mount
- 2) Antenna location A3: LMR antennas trunk mount for bystander testing.
- 3) Antenna location W: Total 4 locations identified for BT/WLAN antenna mounting. (If LMR antennas installed at trunk, BT/WLAN should install at roof and vice versa).
- 4) Total distance between Bystander 45 degree angles from the centered-trunk mount antenna is 91cm to maintain a minimum 20cm separation between probe sensor and vehicle body.
- 5) Total distance between Bystander 90 degree angle from the centered-trunk mount antenna is 90cm (by moving antenna location A3 12cm from center of the trunk).

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

Meter - Probe

 Probe diameter is 5.5cm



## Cable Losses

### **Test Cable**

#### Teflon RG58A/U Loss Per 100 Feet

160 MHz - 5 dB

450 MHz - 9 dB

1 GHz - 13.8 dB

### **Customer Cable**

#### RG-58A/U Loss Per 100 Feet (For LMR)

136 MHz – 5.5 dB

450 MHz – 9.6 dB

900 MHz – 13.9 dB

#### PFP 240 Loss Per 100 Feet (For BT/WLAN)

2500 MHz - 12.9 dB

5800 MHz -20.4 dB

## Appendix B - Probe Calibration Certificates

# Certificate of Calibration

ISO/IEC 17025:2017 and ANSI/NCSL Z540.1-1994

Certificate Number 220613-142138-6fc978







<b>Model Number</b>	E100; HI-2200	<b>Customer</b>
<b>Manufacturer</b>	ETS - Lindgren	Motorola Solutions Malaysia Sdn Bhd
<b>Description</b>	Field Probe	Plot 2A Medan Bayan Lepas Technoplex
<b>Serial Number</b>	00224511; 00086887	Industrial Park Mukim 12 SWD
<b>Customer Asset No.</b>	MSI0428; MSI0201	Bayan Lepas, Penang 11900
		MALAYSIA
<b>Date of Calibration</b>	06/16/2022	<b>Location of Calibration</b>
<b>Temperature</b>	22°C	Keysight Technologies Inc.
<b>Humidity</b>	45% RH	1346 Yellowwood Road
		Kimballton, IA 51543
		United States

This certifies that the equipment has been calibrated using applicable Keysight Technologies procedures and in compliance with ISO/IEC 17025:2017 and ANSI/NCSL Z540.1-1994 (R2002). The quality management system is registered to ISO 9001:2015.

Calibration Standard(s)	Calibration Method(s)	Calibration Procedure(s)
IEEE Std 1309-2013 Section 4.1 IEEE Std 1309-2013 Section 5 IEEE Std 1309-2013 Section 8.2 IEEE Std 1309-2013 Section Annex A IEEE Std 1309-2013 Section A.3	Calculated, Substitution	287330

**Calibration Software**  
Probe Calculated Method 3.14  
Probe Comparison 1.4.1

**As Received Conditions**  
The measured values of the equipment were observed in specification at the points tested.

**Action Taken**  
No action was taken.

**As Completed Conditions**  
The measured values of the equipment were observed in specification at the points tested.

**Calibration Due**  
Based on the customer's request, the next calibration is due on 16 Jun 2023

**Remarks or Special Requirements**  
A probe position document is included with this certificate. This calibration is valid only for the alignment/mounting position specified in this report.

This calibration report shall not be reproduced, except in full. The documented results relate to the equipment calibrated only.

The test limits stated in the report correspond to the published specifications of the equipment, at the points tested.

Keysight Technologies, Inc.  
1346 Yellowwood Road  
Kimballton, IA 51543  
United States

  
 Brandt Langer Iowa Service Center Manager

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Issue Date 16 Jun 2022

Page 1 of 7



# Certificate of Calibration

ISO/IEC 17025:2017 and ANSI/NCSL Z540.1-1994

Certificate Number 220613-142138-6fc978



### Traceability Information

**Technician Name**      Dennis Bissen

Measurements are traceable to the International System of Units (SI) via national metrology institutes ([www.keysight.com/find/NMI](http://www.keysight.com/find/NMI)) that are signatories to the CIPM Mutual Recognition Arrangement.

### Calibration Equipment Used

Manufacturer	Model Number	Model Description	Equipment ID	Cal Due Date	Certificate Number
AR	00W1000B	Amp	11546	NA	
AR	15T4G18	Amp	10888	NA	NA
EMCO	5302	G/TEM	10223	NA	2003121915
AR	600A400	Amplifier, 10KHz-400 MHz, 600W	624658	NA	
AR	75A250	Amp	10560	NA	N/A
AR	80S1G4	Amp	11728	NA	
Agilent Technologies, Inc.	83650B	Synthesized Swept Signal Generator	1354	09/30/2022	210830-153923-e08fad
Hewlett-Packard	8481A	Power Sensor	10449	06/30/2023	220601-144708-684eba
Hewlett-Packard	8487A	Power Sensor	10577	12/31/2022	211209-090756-c27f06
Hewlett-Packard	8648B	Signal Generator	10272	11/30/2022	211109-082104-7669a9
Schwarzbeck Mess-Elektronik	BBHA 9120D	Horn	10194	11/17/2022	201111-115541-0b3b6c
IFI	CC 104	TEM	011521	NA	
Agilent Technologies, Inc.	E4419B	EPM Series Power Meter	10458	10/31/2022	211001-112510-54fea3
AR	FI7000	Interface	11015	NA	700516
AR	FL7006	Isotropic Probe	10946	12/08/2022	2021050080-1
Holaday	HI-4422	Isotropic Probe	10022	10/06/2022	2020070063-1
dbwave	PADD200050180 0B	Dual Directional Coupler	20522	03/25/2023	220323-090439-3aec96

### Compliance with Specification

Unless otherwise noted, the calibration results are reported without factoring in the effect of uncertainty on the assessment of compliance/specification.

### In Specification/Out of Specification Explanation

The standard criteria to determine the "In Specification/Out of Specification" status is based on one or more of the following conditions, as requested by the client:

1. If the manufacturer has a specified specification for the item being calibrated, then the calibration values are compared to this specification, and the values must fall within the manufacturer's specification. The specification may be obtained from the manufacturer's web site, data sheets, equipment manuals, etc.
2. Where specifications are called out in a published standard, the calibration results are compared to this specification, and the measured values must fall within the standard's specification.
3. In cases where the manufacturer, standard, or client does not identify any relevant specifications, applicable calibration results are compared to historical data with a +/- 3 dB specification.



# Certificate of Calibration

ISO/IEC 17025:2017 and ANSI/NCSL Z540.1-1994  
 Certificate Number 220613-142138-6fc978



**Uncertainty of Measurement**

The uncertainty evaluation has been performed in accordance with ISO/IEC Guide 98-3:2008(GUM). The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95%. This probability corresponds to a coverage factor of k=2 for a normal distribution.

Parameter	Range	MU (+/-)
RF Isotropic E-Field Probes - GTEM Cell - Isotropic	10 kHz to 1000 MHz	0.97 dB
RF Isotropic E-Field Probes - Anechoic Chamber - Frequency Response	(450 to 18,000) MHz	1.1 dB
RF Isotropic E-Field Probes - GTEM Cell - Frequency Response	10 kHz to 1000 MHz	0.97 dB
RF Isotropic E-Field Probes - TEM Cell - Linearity	5 kHz to 800 MHz	0.91 dB

Customer Name: Motorola Solutions Malaysia Sdn Bhd

Probe Manufacturer: ETS - Lindgren

Probe Model: E100; HI-2200

Probe Serial No.: 00224511; 00086887

Notes:

CAL CERT #: 220613-142138-6fc978

Frequency in MHz	Correction Factors	
	Multiplier	20V/m dB
0.1	1.39	2.84
0.5	1.18	1.42
1	1.08	0.71
3	1.00	-0.03
15	0.98	-0.18
27.12	1.00	-0.04
30	0.99	-0.09
75	1.06	0.50
100	1.08	0.63
150	1.08	0.70
200	1.12	0.95
250	1.14	1.14
300	1.19	1.51
400	0.90	-0.87
500	1.13	1.03
600	1.15	1.20
700	1.23	1.79
800	0.87	-1.23
900	1.06	0.52
1000	0.93	-0.67
2000	0.97	-0.29
2450	0.89	-0.98
3000	0.86	-1.33
3500	0.90	-0.94
4000	0.83	-1.65
5000	1.03	0.22
5500	1.07	0.57
6000	1.09	0.75

Customer Name: Motorola Solutions Malaysia Sdn Bhd

Probe Manufacturer: ETS - Lindgren

Probe Model: E100; HI-2200

Probe Serial No.: 00224511; 00086887

Notes:

CAL CERT # 220613-142138-6fc978

Isotropic Response at 400 MHz at 20V/m

Deg	Response dB
0	0.00
45	-0.14
90	0.01
135	-0.03
180	0.00
225	0.03
270	-0.06
315	-0.11
360	-0.07

Max Dev. 0.18

Customer Name: Motorola Solutions Malaysia Sdn Bhd  
 Probe Manufacturer: ETS - Lindgren  
 Probe Model: E100; HI-2200  
 Probe Serial No.: 00224511; 00086887  
 Notes:  
 CAL CERT #: 220613-142138-6fc978

### Linearity

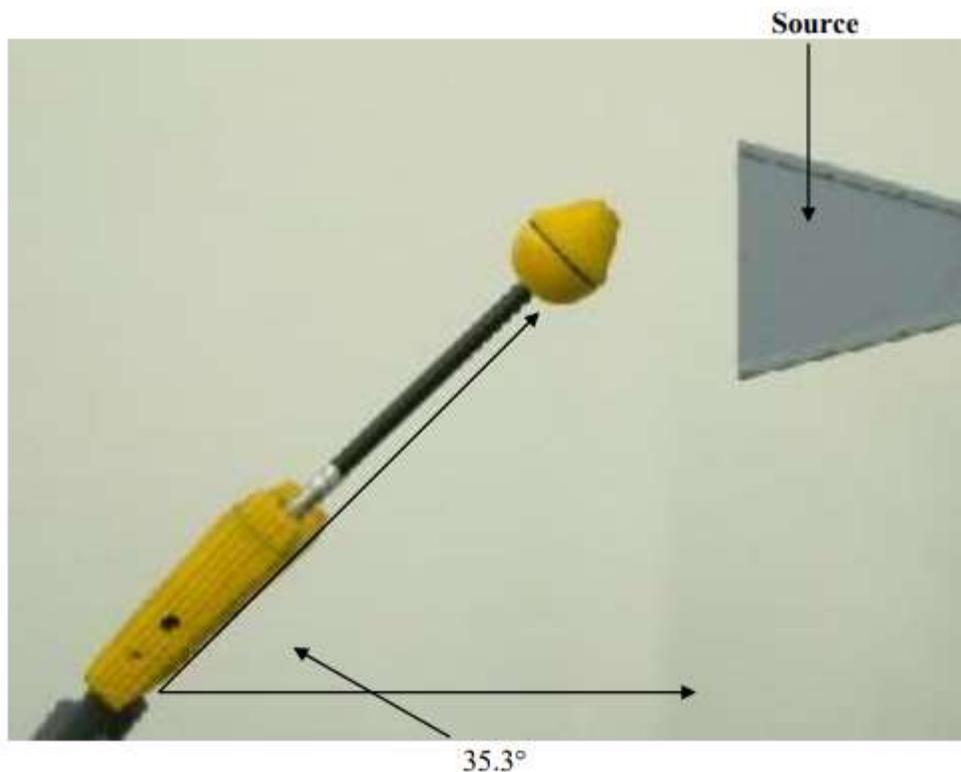
Freq MHz	Applied Field V/m	Indicated Field V/m	Max Dev dB
27.12	0.50	0.57	-1.14
27.12	1.00	1.12	-0.98
27.12	2.04	2.22	-0.73
27.12	4.04	4.42	-0.78
27.12	8.07	8.68	-0.63
27.12	15.02	16.04	-0.57
27.12	20.11	21.43	-0.55
27.12	30.06	32.03	-0.55
27.12	50.15	53.30	-0.53
27.12	65.23	69.84	-0.59
27.12	100.09	107.70	-0.64
27.12	125.90	135.80	-0.66
27.12	201.60	220.20	-0.77
27.12	250.50	274.60	-0.80
27.12	301.40	332.20	-0.85
27.12	350.19	374.40	-0.58
27.12	403.20	445.30	-0.86
27.12	452.20	497.50	-0.83
27.12	503.40	557.60	-0.89
27.12	551.90	617.60	-0.98
27.12	602.70	684.40	-1.10

## Probe Alignment/Mounting Position

The alignment/mounting position of the probe is critical. The correction factors given with calibration are valid only for the indicated alignment/mounting position. Deviation from indicated alignment/mounting position of calibration can produce errors in excess of 6 dB.

The probe was positioned with the probe wand at a  $35.3^\circ$  angle position with the probe head centered in front of the field source. The picture below is for probe positioning reference only. The equipment shown does not necessarily indicate the equipment used for calibration.

Side View





# Certificate of Calibration

ISO/IEC 17025:2017 and ANSI/NCSL Z540.1-1994  
Certificate Number 220613-141323-d3c00e



**Model Number** H200; HI-2200  
**Manufacturer** ETS - Lindgren  
**Description** Field Probe  
**Serial Number** 00224521; 00086887  
**Customer Asset No.** MSI0429; MSI0201

**Customer**  
 Motorola Solutions Malaysia Sdn Bhd  
 Plot 2A Medan Bayan Lepas Technoplex  
 Industrial Park Mukim 12 SWD  
 Bayan Lepas, Penang 11900  
 MALAYSIA

**Date of Calibration** 06/16/2022  
**Temperature** 22°C  
**Humidity** 45% RH

**Location of Calibration**  
 Keysight Technologies Inc.  
 1346 Yellowwood Road  
 Kimballton, IA 51543  
 United States

This certifies that the equipment has been calibrated using applicable Keysight Technologies procedures and in compliance with ISO/IEC 17025:2017 and ANSI/NCSL Z540.1-1994 (R2002). The quality management system is registered to ISO 9001:2015.

Calibration Standard(s)	Calibration Method(s)	Calibration Procedure(s)
IEEE Std 1309-2013 Section 4.1 IEEE Std 1309-2013 Section 5 IEEE Std 1309-2013 Section 8.2 IEEE Std 1309-2013 Section Annex A IEEE Std 1309-2013 Section A.3	Substitution	287330

**Calibration Software**  
 Probe Comparison 1.4.1

**As Received Conditions**  
 The measured values of the equipment were observed in specification at the points tested.

**Action Taken**  
 No action was taken.

**As Completed Conditions**  
 The measured values of the equipment were observed in specification at the points tested.

**Calibration Due**  
 Based on the customer's request, the next calibration is due on 16 Jun 2023

**Remarks or Special Requirements**  
 Client declined isotropic response testing. A probe position document is included with this certificate. This calibration is valid only for the alignment/mounting position specified in this report.

This calibration report shall not be reproduced, except in full. The documented results relate to the equipment calibrated only.

The test limits stated in the report correspond to the published specifications of the equipment, at the points tested.

Keysight Technologies, Inc.  
 1346 Yellowwood Road  
 Kimballton, IA 51543  
 United States

  
 Brandt Langer Iowa Service Center Manager

Issue Date 16 Jun 2022

Page 1 of 5



# Certificate of Calibration

ISO/IEC 17025:2017 and ANSI/NCSL Z540.1-1994  
Certificate Number 220613-141323-d3c00e



**Traceability Information**

**Technician Name** Dennis Bissen

Measurements are traceable to the International System of Units (SI) via national metrology institutes ([www.keysight.com/find/NMI](http://www.keysight.com/find/NMI)) that are signatories to the CIPM Mutual Recognition Arrangement.

**Calibration Equipment Used**

Manufacturer	Model Number	Model Description	Equipment ID	Cal Due Date	Certificate Number
AR	00W1000B	Amp	11546	NA	
EMCO	5302	G/TEM	10223	NA	2003121915
Hewlett-Packard	8648B	Signal Generator	10272	11/30/2022	211109-082104-7669a9
IFI	CC 104	TEM	011521	NA	
AR	FI7000	Interface	11015	NA	700516
AR	FL7006	Isotropic Probe	10946	12/08/2022	2021050080-1
Holaday	HI-4422	Isotropic Probe	10022	10/06/2022	2020070063-1

**Compliance with Specification**

Unless otherwise noted, the calibration results are reported without factoring in the effect of uncertainty on the assessment of compliance/specification.

**In Specification/Out of Specification Explanation**

The standard criteria to determine the "In Specification/Out of Specification" status is based on one or more of the following conditions, as requested by the client:

1. If the manufacturer has a specified specification for the item being calibrated, then the calibration values are compared to this specification, and the values must fall within the manufacturer's specification. The specification may be obtained from the manufacturer's web site, data sheets, equipment manuals, etc.
2. Where specifications are called out in a published standard, the calibration results are compared to this specification, and the measured values must fall within the standard's specification.
3. In cases where the manufacturer, standard, or client does not identify any relevant specifications, applicable calibration results are compared to historical data with a +/- 3 dB specification.

**Uncertainty of Measurement**

The uncertainty evaluation has been performed in accordance with ISO/IEC Guide 98-3:2008(GUM). The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95%. This probability corresponds to a coverage factor of k=2 for a normal distribution.

Parameter	Range	MU (+/-)
RF Isotropic E-Field Probes - GTEM Cell - Frequency Response	10 kHz to 1000 MHz	0.97 dB
RF Isotropic E-Field Probes - TEM Cell - Linearity	5 kHz to 800 MHz	0.91 dB

## 2022\_Frequency Response.txt

Customer Name: Motorola Solutions Malaysia Sdn Bhd

Probe Manufacturer: ETS - Lindgren

Probe Model: H200; HI-2200

Probe Serial No.: 00224521; 00086887

Notes:

CAL CERT #: 220613-141323-d3c00e

## Correction Factors

Freq in MHz	Mult	dB
5	1.92	5.65
6	1.85	5.36
7	1.82	5.21
8	1.81	5.15
9	1.81	5.14
10	1.82	5.19
13.6	1.81	5.13
15	1.81	5.15
20	1.79	5.05
27.1	1.71	4.68
30	1.68	4.52
40	1.55	3.81
50	1.41	2.98
60	1.28	2.14
70	1.17	1.36
75	1.11	0.91
80	1.06	0.49
90	0.94	-0.53
100	0.84	-1.49
150	0.72	-2.81
175	0.71	-2.94
200	0.72	-2.90
250	0.64	-3.87
300	0.61	-4.24

2022\_Linearity.txt

Customer Name: Motorola Solutions Malaysia Sdn Bhd  
 Probe Manufacturer: ETS - Lindgren  
 Probe Model: H200; HI-2200  
 Probe Serial No.: 00224521; 00086887  
 Notes:  
 CAL CERT #: 220613-141323-d3c00e

## Linearity

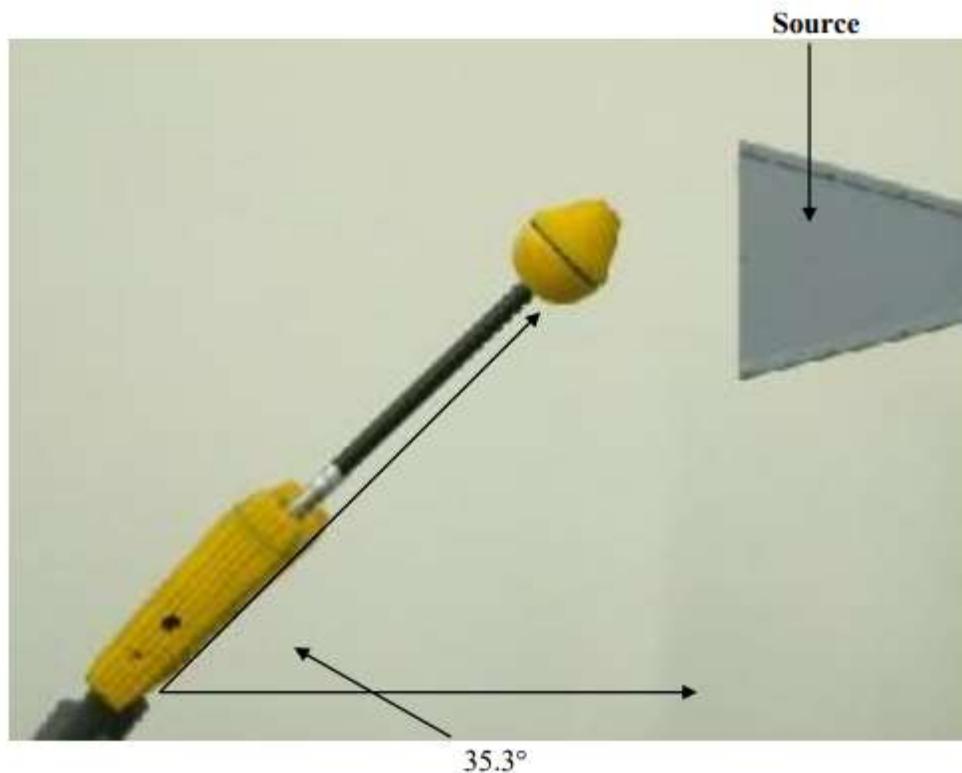
Freq MHz	Applied Field A/m	Indicated Field A/m	Max Dev dB
27.12	0.04	0.041	-0.23
27.12	0.05	0.061	-1.21
27.12	0.08	0.092	-1.15
27.12	0.13	0.152	-1.16
27.12	0.17	0.199	-1.22
27.12	0.27	0.309	-1.27
27.12	0.33	0.346	-0.33
27.12	0.54	0.558	-0.36
27.12	0.67	0.696	-0.37
27.12	0.80	0.831	-0.38
27.12	0.94	0.979	-0.38
27.12	1.06	1.108	-0.36
27.12	1.20	1.248	-0.37
27.12	1.34	1.403	-0.40
27.12	1.46	1.538	-0.43
27.12	1.60	1.687	-0.48

## Probe Alignment/Mounting Position

The alignment/mounting position of the probe is critical. The correction factors given with calibration are valid only for the indicated alignment/mounting position. Deviation from indicated alignment/mounting position of calibration can produce errors in excess of 6 dB.

The probe was positioned with the probe wand at a  $35.3^\circ$  angle position with the probe head centered in front of the field source. The picture below is for probe positioning reference only. The equipment shown does not necessarily indicate the equipment used for calibration.

Side View



**Appendix C - Photos of Assessed Antennas**  
(Refer to Exhibit 7B)

## **Appendix D - MPE Measurement Results**

**Table D.1**  
**MPE measurement data for Bystander**

<sup>(2)</sup> Ant Loc.	D.U.T. Info.								Probe Info.		<sup>(5)</sup> Test Pos.	<sup>(6)</sup> Meas. Unit	MPE Measurements										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. Model/ Desc.	Ant. Gain (dBi)	Ant. Meas. Dist. (cm)	Tx Freq (MHz)	<sup>(3)</sup> Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	<sup>(4)</sup> Probe Cal. Factor	Bystander (BS) Positions																
										20 cm			40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm	200 cm					
Roof	HAE4003A (450 - 470 MHz)	2.15	90	450.0125	48.0	47.7	CW	E	1.020	BS	2	0.005	0.008	0.018	0.028	0.056	0.086	0.175	0.327	0.414	0.370	0.5	0.152	0.076	0.076	
Roof	HAE4003A (450 - 470 MHz)	2.15	90	460.0000	48.0	45.8	CW	E	1.040	BS	2	0.004	0.005	0.011	0.024	0.031	0.061	0.163	0.272	0.334	0.290	0.5	0.124	0.062	0.065	
Roof	HAE4003A (450 - 470 MHz)	2.15	90	469.9875	48.0	47.3	CW	E	1.060	BS	2	0.005	0.008	0.012	0.026	0.031	0.075	0.160	0.258	0.321	0.298	0.5	0.127	0.063	0.064	
Roof	HAE4004A (470 - 512 MHz)	2.15	90	470.0125	48.0	46.7	CW	E	1.060	BS	2	0.005	0.008	0.012	0.024	0.031	0.081	0.182	0.272	0.352	0.310	0.5	0.135	0.068	0.070	
Roof	HAE4004A (470 - 512 MHz)	2.15	90	484.0000	48.0	47.3	CW	E	1.090	BS	2	0.003	0.006	0.010	0.017	0.032	0.073	0.141	0.226	0.304	0.364	0.5	0.128	0.064	0.065	
Roof	HAE4004A (470 - 512 MHz)	2.15	90	498.0000	48.0	46.2	CW	E	1.130	BS	2	0.004	0.006	0.014	0.017	0.033	0.083	0.142	0.241	0.326	0.367	0.5	0.139	0.070	0.072	
Roof	HAE4004A (470 - 512 MHz)	2.15	90	511.9875	48.0	47.3	CW	E	1.130	BS	2	0.004	0.005	0.009	0.035	0.056	0.064	0.106	0.199	0.277	0.293	0.5	0.118	0.059	0.060	
Roof	HAE4011A (450 - 470 MHz)	5.65	90	450.0125	48.0	47.7	CW	E	1.020	BS	2	0.002	0.003	0.003	0.005	0.007	0.014	0.055	0.161	0.275	0.254	0.5	0.079	0.040	0.040	
Roof	HAE4011A (450 - 470 MHz)	5.65	90	460.0000	48.0	45.8	CW	E	1.040	BS	2	0.002	0.002	0.004	0.005	0.005	0.015	0.049	0.168	0.302	0.277	0.5	0.086	0.043	0.045	
Roof	HAE4011A (450 - 470 MHz)	5.65	90	469.9875	48.0	47.3	CW	E	1.060	BS	2	0.001	0.003	0.006	0.006	0.007	0.010	0.049	0.156	0.286	0.270	0.5	0.084	0.042	0.043	
Roof	HAE4012A (470 - 494 MHz)	5.65	90	470.0125	48.0	46.7	CW	E	1.060	BS	2	0.004	0.005	0.005	0.010	0.016	0.044	0.126	0.239	0.308	0.243	0.5	0.106	0.053	0.054	
Roof	HAE4012A (470 - 494 MHz)	5.65	90	482.5000	48.0	47.8	CW	E	1.090	BS	2	0.005	0.005	0.007	0.006	0.010	0.034	0.090	0.211	0.302	0.260	0.5	0.081	0.041	0.041	
Roof	HAE4012A (470 - 494 MHz)	5.65	90	494.9875	48.0	46.4	CW	E	1.120	BS	2	0.002	0.006	0.005	0.005	0.011	0.028	0.065	0.154	0.230	0.209	0.5	0.080	0.040	0.041	
Roof	HAE4013A (494 - 512 MHz)	5.65	90	494.9875	48.0	46.4	CW	E	1.120	BS	2	0.002	0.002	0.004	0.007	0.020	0.054	0.121	0.250	0.356	0.304	0.5	0.125	0.063	0.065	
Roof	HAE4013A (494 - 512 MHz)	5.65	90	503.0000	48.0	45.9	CW	E	1.130	BS	2	0.003	0.007	0.009	0.011	0.026	0.045	0.109	0.240	0.336	0.278	0.5	0.120	0.060	0.063	
Roof	HAE4013A (494 - 512 MHz)	5.65	90	511.9875	48.0	47.3	CW	E	1.130	BS	2	0.002	0.005	0.008	0.008	0.017	0.037	0.059	0.149	0.226	0.206	0.5	0.081	0.041	0.041	

MPE calculations are defined in section 15.0.

**Table D.1 (Continued)**

**MPE measurement data for Bystander**

D.U.T. Info.										Probe Info.		MPE Measurements										DUT Max. TX Factor	Avg. over Body (mW/cm2)	Calc. P.D. (mW/cm2)	Max Calc. P.D. (mW/cm2)
<sup>(2)</sup> Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Ant. Meas. Dist. (cm)	Tx Freq (MHz)	<sup>(3)</sup> Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	<sup>(4)</sup> Probe Cal. Factor	<sup>(5)</sup> Test Pos.	<sup>(6)</sup> Meas. Unit	Bystander (BS) Positions													
												20 cm	40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm	200 cm				
Roof	HAE6020A (470 - 527 MHz)	2.15	90	470.0125	48.0	46.7	CW	E	1.060	BS	2	0.005	0.007	0.007	0.008	0.009	0.024	0.052	0.084	0.100	0.091	0.5	0.041	0.021	0.021
Roof	HAE6020A (470 - 527 MHz)	2.15	90	482.5000	48.0	47.8	CW	E	1.090	BS	2	0.003	0.005	0.007	0.010	0.016	0.037	0.073	0.122	0.170	0.192	0.5	0.069	0.035	0.035
Roof	HAE6020A (470 - 527 MHz)	2.15	90	496.5000	48.0	46.5	CW	E	1.120	BS	2	0.004	0.004	0.007	0.019	0.046	0.070	0.118	0.193	0.283	0.322	0.5	0.119	0.060	0.062
Roof	HAE6020A (470 - 527 MHz)	2.15	90	511.9875	48.0	47.3	CW	E	1.130	BS	2	0.003	0.005	0.005	0.025	0.047	0.053	0.085	0.154	0.228	0.260	0.5	0.098	0.049	0.050
Roof	HAE6022A (403-527 MHz)	4.15	90	450.0125	48.0	47.7	CW	E	1.020	BS	2	0.007	0.009	0.013	0.035	0.061	0.081	0.187	0.352	0.408	0.366	0.5	0.155	0.077	0.078
Roof	HAE6022A (403-527 MHz)	4.15	90	469.9875	48.0	47.3	CW	E	1.060	BS	2	0.005	0.009	0.012	0.028	0.035	0.085	0.193	0.291	0.281	0.253	0.5	0.126	0.063	0.064
Roof	HAE6022A (403-527 MHz)	4.15	90	482.5000	48.0	47.8	CW	E	1.090	BS	2	0.005	0.005	0.011	0.021	0.039	0.089	0.176	0.255	0.323	0.298	0.5	0.133	0.067	0.067
Roof	HAE6022A (403-527 MHz)	4.15	90	496.5000	48.0	46.5	CW	E	1.120	BS	2	0.007	0.005	0.013	0.023	0.061	0.093	0.163	0.281	0.357	0.317	0.5	0.148	0.074	0.076
Roof	HAE6022A (403-527 MHz)	4.15	90	511.9875	48.0	47.3	CW	E	1.130	BS	2	0.009	0.007	0.012	0.020	0.061	0.092	0.156	0.258	0.338	0.306	0.5	0.142	0.071	0.072
Roof	HAE6024A (470 - 494 MHz)	5.15	90	470.0125	48.0	46.7	CW	E	1.060	BS	2	0.007	0.005	0.010	0.028	0.033	0.072	0.146	0.237	0.248	0.227	0.5	0.107	0.054	0.055
Roof	HAE6024A (470 - 494 MHz)	5.15	90	482.5000	48.0	47.8	CW	E	1.090	BS	2	0.006	0.009	0.013	0.021	0.028	0.077	0.159	0.239	0.278	0.256	0.5	0.118	0.059	0.059
Roof	HAE6024A (470 - 494 MHz)	5.15	90	493.9875	48.0	46.3	CW	E	1.120	BS	2	0.005	0.007	0.012	0.020	0.040	0.085	0.125	0.226	0.299	0.274	0.5	0.122	0.061	0.063
Roof	HAE6026A (494 - 512 MHz)	5.15	90	494.9875	48.0	46.4	CW	E	1.120	BS	2	0.005	0.007	0.009	0.017	0.048	0.070	0.130	0.216	0.270	0.250	0.5	0.114	0.057	0.059
Roof	HAE6026A (494 - 512 MHz)	5.15	90	503.0000	48.0	45.9	CW	E	1.130	BS	2	0.008	0.005	0.015	0.028	0.066	0.099	0.179	0.260	0.339	0.334	0.5	0.151	0.075	0.079
Roof	HAE6026A (494 - 512 MHz)	5.15	90	511.9875	48.0	47.3	CW	E	1.130	BS	2	0.004	0.007	0.018	0.033	0.062	0.086	0.130	0.209	0.261	0.246	0.5	0.119	0.060	0.061

MPE calculations are defined in section 15.0.

Table D.1 (Continued)

MPE measurement data for Bystander

<sup>(2)</sup> Ant Loc.	D.U.T. Info.								Probe Info.		<sup>(5)</sup> Test Pos.	<sup>(6)</sup> Meas. Unit	MPE Measurements										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. Model/ Desc.	Ant. Gain (dBi)	Ant. Meas. Dist. (cm)	Tx Freq (MHz)	<sup>(3)</sup> Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	<sup>(4)</sup> Probe Cal. Factor	Bystander (BS) Positions																
										20 cm			40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm	200 cm					
Roof	PMAE4033A (450 - 470 MHz)	5.65	90	450.0125	48.0	47.7	CW	E	1.020	BS	2	0.003	0.005	0.009	0.031	0.052	0.116	0.254	0.399	0.407	0.291	0.5	0.160	0.080	0.080	
Roof	PMAE4033A (450 - 470 MHz)	5.65	90	460.0000	48.0	45.8	CW	E	1.040	BS	2	0.006	0.008	0.009	0.039	0.087	0.106	0.194	0.293	0.301	0.216	0.5	0.131	0.065	0.069	
Roof	PMAE4033A (450 - 470 MHz)	5.65	90	469.9875	48.0	47.3	CW	E	1.060	BS	2	0.008	0.014	0.020	0.047	0.067	0.116	0.193	0.280	0.293	0.226	0.5	0.134	0.067	0.068	
Roof	PMAE4041A (450 - 470 MHz)	2.15	90	450.0125	48.0	47.7	CW	E	1.020	BS	2	0.004	0.004	0.005	0.008	0.005	0.010	0.023	0.038	0.044	0.037	0.5	0.018	0.009	0.009	
Roof	PMAE4041A (450 - 470 MHz)	2.15	90	460.0000	48.0	45.8	CW	E	1.040	BS	2	0.003	0.003	0.005	0.007	0.007	0.012	0.025	0.041	0.047	0.039	0.5	0.020	0.010	0.010	
Roof	PMAE4041A (450 - 470 MHz)	2.15	90	469.9875	48.0	47.3	CW	E	1.060	BS	2	0.005	0.004	0.007	0.008	0.012	0.021	0.035	0.058	0.065	0.063	0.5	0.029	0.015	0.015	
Roof	PMAE4043A (450 - 470 MHz)	7.15	90	450.0125	48.0	47.7	CW	E	1.020	BS	2	0.003	0.004	0.005	0.007	0.020	0.060	0.186	0.368	0.525	0.420	0.5	0.163	0.081	0.082	
Roof	PMAE4043A (450 - 470 MHz)	7.15	90	460.0000	48.0	45.8	CW	E	1.040	BS	2	0.004	0.005	0.007	0.010	0.020	0.040	0.111	0.240	0.380	0.330	0.5	0.119	0.060	0.063	
Roof	PMAE4043A (450 - 470 MHz)	7.15	90	469.9875	48.0	47.3	CW	E	1.060	BS	2	0.006	0.005	0.009	0.017	0.022	0.036	0.096	0.247	0.379	0.342	0.5	0.123	0.061	0.062	
Roof	RAE4004ARB (445-470 MHz)	7.15	90	450.0125	48.0	47.7	CW	E	1.020	BS	2	0.004	0.005	0.005	0.007	0.012	0.045	0.110	0.166	0.363	0.310	0.5	0.105	0.052	0.053	
Roof	RAE4004ARB (445-470 MHz)	7.15	90	460.0000	48.0	45.8	CW	E	1.040	BS	2	0.004	0.003	0.006	0.008	0.015	0.039	0.081	0.171	0.314	0.295	0.5	0.097	0.049	0.051	
Roof	RAE4004ARB (445-470 MHz)	7.15	90	469.9875	48.0	47.3	CW	E	1.060	BS	2	0.005	0.005	0.006	0.010	0.019	0.041	0.073	0.148	0.299	0.305	0.5	0.097	0.048	0.049	
Trunk	HAE4011A (450 - 470 MHz)	5.65	90	450.0125	48.0	47.7	CW	E	1.020	BS	2	0.002	0.005	0.008	0.023	0.102	0.342	0.428	0.275	0.072	0.078	0.5	0.136	0.068	0.069	
Trunk	HAE4011A (450 - 470 MHz)	5.65	90	460.0000	48.0	45.8	CW	E	1.040	BS	2	0.006	0.007	0.009	0.024	0.118	0.361	0.491	0.314	0.088	0.085	0.5	0.156	0.078	0.082	
Trunk	HAE4011A (450 - 470 MHz)	5.65	90	469.9875	48.0	47.3	CW	E	1.060	BS	2	0.009	0.005	0.009	0.021	0.115	0.378	0.492	0.313	0.084	0.082	0.5	0.160	0.080	0.081	

MPE calculations are defined in section 15.0.

**Table D.1 (Continued)**

**MPE measurement data for Bystander**

(2) Ant Loc.	Ant. Model/ Desc.	D.U.T. Info.						Probe Info.			(5) Test Pos.	(6) Meas. Unit	MPE Measurements										DUT Max. TX Factor	Avg. over Body (mW/cm2)	Calc. P.D. (mW/cm2)	Max Calc. P.D. (mW/cm2)
		Ant. Gain (dBi)	Ant. Meas. Dist. (cm)	Tx Freq (MHz)	(3) Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	(4) Probe Cal. Factor	Bystander (BS) Positions																
										20 cm			40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm	200 cm					
Trunk	HAE4012A (470 - 494 MHz)	5.65	90	470.0125	48.0	46.7	CW	E	1.060	BS	2	0.008	0.006	0.029	0.078	0.275	0.519	0.520	0.245	0.056	0.054	0.5	0.190	0.095	0.098	
Trunk	HAE4012A (470 - 494 MHz)	5.65	90	482.5000	48.0	47.8	CW	E	1.090	BS	2	0.011	0.012	0.022	0.055	0.190	0.405	0.448	0.224	0.067	0.074	0.5	0.164	0.082	0.083	
Trunk	HAE4012A (470 - 494 MHz)	5.65	90	494.9875	48.0	46.4	CW	E	1.120	BS	2	0.007	0.007	0.014	0.032	0.142	0.307	0.313	0.148	0.050	0.065	0.5	0.122	0.061	0.063	
Trunk	HAE4013A (494 - 512 MHz)	5.65	90	494.9875	48.0	46.4	CW	E	1.120	BS	2	0.005	0.004	0.013	0.043	0.192	0.419	0.445	0.258	0.050	0.033	0.5	0.164	0.082	0.085	
Trunk	HAE4013A (494 - 512 MHz)	5.65	90	503.0000	48.0	45.9	CW	E	1.130	BS	2	0.007	0.006	0.017	0.043	0.169	0.414	0.498	0.287	0.069	0.038	0.5	0.175	0.087	0.091	
Trunk	HAE4013A (494 - 512 MHz)	5.65	90	511.9875	48.0	47.3	CW	E	1.130	BS	2	0.005	0.010	0.014	0.030	0.139	0.309	0.343	0.191	0.051	0.024	0.5	0.126	0.063	0.064	
Trunk	HAE6022A (403-527 MHz)	4.15	90	450.0125	48.0	47.7	CW	E	1.020	BS	2	0.089	0.068	0.088	0.105	0.258	0.428	0.456	0.345	0.201	0.091	0.5	0.217	0.109	0.109	
Trunk	HAE6022A (403-527 MHz)	4.15	90	469.9875	48.0	47.3	CW	E	1.060	BS	2	0.057	0.046	0.096	0.135	0.319	0.490	0.494	0.355	0.167	0.074	0.5	0.237	0.118	0.120	
Trunk	HAE6022A (403-527 MHz)	4.15	90	482.5000	48.0	47.8	CW	E	1.090	BS	2	0.057	0.048	0.076	0.099	0.250	0.426	0.442	0.298	0.175	0.071	0.5	0.212	0.106	0.106	
Trunk	HAE6022A (403-527 MHz)	4.15	90	496.5000	48.0	46.5	CW	E	1.120	BS	2	0.047	0.035	0.072	0.145	0.334	0.453	0.383	0.222	0.103	0.051	0.5	0.207	0.103	0.107	
Trunk	HAE6022A (403-527 MHz)	4.15	90	511.9875	48.0	47.3	CW	E	1.130	BS	2	0.035	0.051	0.071	0.129	0.254	0.399	0.326	0.209	0.123	0.092	0.5	0.191	0.095	0.097	
Trunk	HAE6024A (470 - 494 MHz)	5.15	90	470.0125	48.0	46.7	CW	E	1.060	BS	2	0.048	0.037	0.077	0.106	0.260	0.390	0.396	0.272	0.138	0.058	0.5	0.189	0.094	0.097	
Trunk	HAE6024A (470 - 494 MHz)	5.15	90	482.5000	48.0	47.8	CW	E	1.090	BS	2	0.050	0.041	0.069	0.082	0.230	0.369	0.385	0.247	0.138	0.058	0.5	0.182	0.091	0.091	
Trunk	HAE6024A (470 - 494 MHz)	5.15	90	493.9875	48.0	46.3	CW	E	1.120	BS	2	0.042	0.035	0.056	0.120	0.251	0.378	0.327	0.126	0.095	0.042	0.5	0.165	0.082	0.085	
Trunk	HAE6026A (494 - 512 MHz)	5.15	90	494.9875	48.0	46.4	CW	E	1.120	BS	2	0.043	0.039	0.078	0.117	0.238	0.319	0.312	0.208	0.106	0.054	0.5	0.170	0.085	0.088	
Trunk	HAE6026A (494 - 512 MHz)	5.15	90	503.0000	48.0	45.9	CW	E	1.130	BS	2	0.039	0.037	0.042	0.110	0.262	0.383	0.344	0.227	0.101	0.046	0.5	0.180	0.090	0.094	
Trunk	HAE6026A (494 - 512 MHz)	5.15	90	511.9875	48.0	47.3	CW	E	1.130	BS	2	0.040	0.051	0.079	0.112	0.264	0.403	0.343	0.220	0.135	0.079	0.5	0.195	0.097	0.099	

MPE calculations are defined in section 15.0.

Table D.1 (Continued)

MPE measurement data for Bystander

D.U.T. Info.										Probe Info.		MPE Measurements										DUT Max. TX Factor	Avg. over Body (mW/cm2)	Calc. P.D. (mW/cm2)	Max Calc. P.D. (mW/cm2)	
<sup>(2)</sup> Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Ant. Meas. Dist. (cm)	Tx Freq (MHz)	<sup>(3)</sup> Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	<sup>(4)</sup> Probe Cal. Factor	<sup>(5)</sup> Test Pos.	<sup>(6)</sup> Meas. Unit	Bystander (BS) Positions														
												20 cm	40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm	200 cm					
Trunk	PMAE4033A (450 - 470 MHz)	5.65	90	450.0125	48.0	47.7	CW	E	1.020	BS	2	0.078	0.056	0.074	0.100	0.273	0.393	0.410	0.296	0.143	0.056	0.5	0.192	0.096	0.096	
Trunk	PMAE4033A (450 - 470 MHz)	5.65	90	460.0000	48.0	45.8	CW	E	1.040	BS	2	0.055	0.038	0.075	0.116	0.283	0.412	0.397	0.264	0.142	0.059	0.5	0.191	0.096	0.100	
Trunk	PMAE4033A (450 - 470 MHz)	5.65	90	469.9875	48.0	47.3	CW	E	1.060	BS	2	0.047	0.038	0.091	0.151	0.363	0.523	0.505	0.321	0.152	0.070	0.5	0.240	0.120	0.122	
Trunk	PMAE4043A (450 - 470 MHz)	7.15	90	450.0125	48.0	47.7	CW	E	1.020	BS	2	0.031	0.021	0.035	0.043	0.176	0.487	0.621	0.396	0.136	0.054	0.5	0.204	0.102	0.103	
Trunk	PMAE4043A (450 - 470 MHz)	7.15	90	460.0000	48.0	45.8	CW	E	1.040	BS	2	0.017	0.018	0.027	0.040	0.186	0.472	0.590	0.374	0.107	0.049	0.5	0.196	0.098	0.102	
Trunk	PMAE4043A (450 - 470 MHz)	7.15	90	469.9875	48.0	47.3	CW	E	1.060	BS	2	0.019	0.024	0.031	0.062	0.246	0.556	0.666	0.411	0.110	0.034	0.5	0.229	0.114	0.116	
Trunk	RAE4004ARB (445-470 MHz)	7.15	90	450.0125	48.0	47.7	CW	E	1.020	BS	2	0.041	0.010	0.017	0.015	0.025	0.197	0.405	0.423	0.230	0.100	0.5	0.149	0.075	0.075	
Trunk	RAE4004ARB (445-470 MHz)	7.15	90	460.0000	48.0	45.8	CW	E	1.040	BS	2	0.027	0.010	0.018	0.017	0.080	0.304	0.465	0.387	0.171	0.058	0.5	0.160	0.080	0.084	
Trunk	RAE4004ARB (445-470 MHz)	7.15	90	469.9875	48.0	47.3	CW	E	1.060	BS	2	0.025	0.012	0.026	0.035	0.103	0.347	0.444	0.325	0.133	0.030	0.5	0.157	0.078	0.080	
Trunk	PMAE4033A (450 - 470 MHz)	5.65	90	469.9875	48.0	47.3	CW	E	1.060	BS	2	0.047	0.038	0.091	0.151	0.363	0.523	0.505	0.321	0.152	0.070	0.5	0.240	0.120	0.122	
Trunk	PMAE4033A (450 - 470 MHz)	5.65	90	469.9875	48.0	47.3	CW	E	1.060	BS	2	0.047	0.038	0.091	0.151	0.363	0.523	0.505	0.321	0.152	0.070	0.5	0.240	0.120	0.122	
	45 degrees																									
Trunk	PMAE4033A (450 - 470 MHz)	5.65	90	469.9875	48.0	47.3	CW	E	1.060	BS	2	0.048	0.056	0.118	0.230	0.341	0.459	0.423	0.293	0.153	0.097	0.5	0.235	0.118	0.119	

D.U.T. Info.										Probe Info.		MPE Measurements										DUT Max. TX Factor	Avg. over Body (mW/cm2)	Calc. P.D. (mW/cm2)	Max Calc. P.D. (mW/cm2)
<sup>(2)</sup> Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Ant. Meas. Dist. (cm)	Tx Freq (MHz)	<sup>(3)</sup> Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	<sup>(4)</sup> Probe Cal. Factor	<sup>(5)</sup> Test Pos.	<sup>(6)</sup> Meas. Unit	Bystander (BS) Positions													
												20 cm	40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm	200 cm				
Trunk	PMAE4033A (450 - 470 MHz)	5.65	90	469.9875	48.0	47.3	CW	E	1.060	BS	2	0.048	0.056	0.118	0.230	0.341	0.459	0.423	0.293	0.153	0.097	0.5	0.235	0.118	0.119

MPE calculations are defined in section 15.0.

**Table D.2**

**MPE measurement data for Passenger**

D.U.T. Info.										Probe Info.		<sup>(6)</sup> Meas. Unit			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> )
<sup>(2)</sup> Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Ant. Meas. Dist. (cm)	Tx Freq (MHz)	<sup>(3)</sup> Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	<sup>(4)</sup> Probe Cal. Factor	<sup>(5)</sup> Test Pos.	MPE Measurements							
												Head/ Top 1/3	Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3				
Roof	HAE4003A (450 - 470 MHz)	2.15	NA	450.0125	48.0	47.7	CW	E	1.020	PB	2	0.050	0.068	0.062	0.5	0.061	0.031	0.031
Roof	HAE4003A (450 - 470 MHz)	2.15	NA	460.0000	48.0	45.8	CW	E	1.040	PB	2	0.044	0.067	0.077	0.5	0.065	0.033	0.034
Roof	HAE4003A (450 - 470 MHz)	2.15	NA	469.9875	48.0	47.3	CW	E	1.060	PB	2	0.062	0.063	0.068	0.5	0.068	0.034	0.035
Roof	HAE4004A (470 - 512 MHz)	2.15	NA	470.0125	48.0	46.7	CW	E	1.060	PB	2	0.056	0.058	0.065	0.5	0.063	0.032	0.033
Roof	HAE4004A (470 - 512 MHz)	2.15	NA	484.0000	48.0	47.3	CW	E	1.090	PB	2	0.082	0.069	0.044	0.5	0.071	0.035	0.036
Roof	HAE4004A (470 - 512 MHz)	2.15	NA	498.0000	48.0	46.2	CW	E	1.130	PB	2	0.042	0.040	0.043	0.5	0.047	0.024	0.024
Roof	HAE4004A (470 - 512 MHz)	2.15	NA	511.9875	48.0	47.3	CW	E	1.130	PB	2	0.043	0.033	0.022	0.5	0.037	0.018	0.019
Roof	HAE4011A (450 - 470 MHz)	5.65	NA	450.0125	48.0	47.7	CW	E	1.020	PB	2	0.014	0.009	0.006	0.5	0.010	0.005	0.005
Roof	HAE4011A (450 - 470 MHz)	5.65	NA	460.0000	48.0	45.8	CW	E	1.040	PB	2	0.016	0.014	0.008	0.5	0.013	0.007	0.007
Roof	HAE4011A (450 - 470 MHz)	5.65	NA	469.9875	48.0	47.3	CW	E	1.060	PB	2	0.012	0.010	0.009	0.5	0.011	0.005	0.006
Roof	HAE4012A (470 - 494 MHz)	5.65	NA	470.0125	48.0	46.7	CW	E	1.060	PB	2	0.024	0.021	0.019	0.5	0.023	0.011	0.012
Roof	HAE4012A (470 - 494 MHz)	5.65	NA	482.5000	48.0	47.8	CW	E	1.090	PB	2	0.028	0.025	0.015	0.5	0.025	0.012	0.012
Roof	HAE4012A (470 - 494 MHz)	5.65	NA	494.9875	48.0	46.4	CW	E	1.120	PB	2	0.016	0.010	0.020	0.5	0.017	0.009	0.009
Roof	HAE4013A (494 - 512 MHz)	5.65	NA	494.9875	48.0	46.4	CW	E	1.120	PB	2	0.024	0.011	0.015	0.5	0.019	0.009	0.010
Roof	HAE4013A (494 - 512 MHz)	5.65	NA	503.0000	48.0	45.9	CW	E	1.130	PB	2	0.011	0.012	0.015	0.5	0.014	0.007	0.007
Roof	HAE4013A (494 - 512 MHz)	5.65	NA	511.9875	48.0	47.3	CW	E	1.130	PB	2	0.015	0.010	0.008	0.5	0.012	0.006	0.006

MPE calculations are defined in section 15.0.

**Table D.2 (Continued)**

**MPE measurement data for Passenger**

D.U.T. Info.								Probe Info.			<sup>(6)</sup> Meas. Unit			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> )	
<sup>(2)</sup> Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Ant. Meas. Dist. (cm)	Tx Freq (MHz)	<sup>(3)</sup> Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	<sup>(4)</sup> Probe Cal. Factor	<sup>(5)</sup> Test Pos.	MPE Measurements							
												Head/ Top 1/3	Chest/ Middle 1/3					Lower Trunk/ Bottom 1/3
Roof	HAE6020A (470 - 527 MHz)	2.15	NA	470.0125	48.0	46.7	CW	E	1.060	PB	2	0.019	0.016	0.019	0.5	0.019	0.010	0.010
Roof	HAE6020A (470 - 527 MHz)	2.15	NA	482.5000	48.0	47.8	CW	E	1.090	PB	2	0.034	0.031	0.022	0.5	0.032	0.016	0.016
Roof	HAE6020A (470 - 527 MHz)	2.15	NA	496.5000	48.0	46.5	CW	E	1.120	PB	2	0.032	0.026	0.034	0.5	0.034	0.017	0.018
Roof	HAE6020A (470 - 527 MHz)	2.15	NA	511.9875	48.0	47.3	CW	E	1.130	PB	2	0.022	0.020	0.021	0.5	0.024	0.012	0.012
Roof	HAE6022A (403-527 MHz)	4.15	NA	450.0125	48.0	47.7	CW	E	1.020	PB	2	0.059	0.071	0.072	0.5	0.069	0.034	0.035
Roof	HAE6022A (403-527 MHz)	4.15	NA	469.9875	48.0	47.3	CW	E	1.060	PB	2	0.060	0.061	0.067	0.5	0.066	0.033	0.034
Roof	HAE6022A (403-527 MHz)	4.15	NA	482.5000	48.0	47.8	CW	E	1.020	PB	2	0.055	0.040	0.052	0.5	0.050	0.025	0.025
Roof	HAE6022A (403-527 MHz)	4.15	NA	496.5000	48.0	46.5	CW	E	1.120	PB	2	0.036	0.033	0.038	0.5	0.040	0.020	0.021
Roof	HAE6022A (403-527 MHz)	4.15	NA	511.9875	48.0	47.3	CW	E	1.130	PB	2	0.028	0.024	0.022	0.5	0.028	0.014	0.014
Roof	HAE6024A (470 - 494 MHz)	5.15	NA	470.0125	48.0	46.7	CW	E	1.060	PB	2	0.053	0.055	0.048	0.5	0.055	0.028	0.028
Roof	HAE6024A (470 - 494 MHz)	5.15	NA	482.5000	48.0	47.8	CW	E	1.090	PB	2	0.068	0.073	0.047	0.5	0.068	0.034	0.034
Roof	HAE6024A (470 - 494 MHz)	5.15	NA	493.9875	48.0	46.3	CW	E	1.120	PB	2	0.048	0.034	0.028	0.5	0.041	0.021	0.021
Roof	HAE6026A (494 - 512 MHz)	5.15	NA	494.9875	48.0	46.4	CW	E	1.120	PB	2	0.035	0.030	0.027	0.5	0.034	0.017	0.018
Roof	HAE6026A (494 - 512 MHz)	5.15	NA	503.0000	48.0	45.9	CW	E	1.130	PB	2	0.050	0.031	0.035	0.5	0.044	0.022	0.023
Roof	HAE6026A (494 - 512 MHz)	5.15	NA	511.9875	48.0	47.3	CW	E	1.130	PB	2	0.027	0.024	0.020	0.5	0.027	0.013	0.014

MPE calculations are defined in section 15.0.

**Table D.2 (Continued)**

**MPE measurement data for Passenger**

D.U.T. Info.								Probe Info.			<sup>(6)</sup> Meas. Unit			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> )	
<sup>(2)</sup> Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Ant. Meas. Dist. (cm)	Tx Freq (MHz)	<sup>(3)</sup> Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	<sup>(4)</sup> Probe Cal. Factor	<sup>(5)</sup> Test Pos.	MPE Measurements							
												Head/ Top 1/3	Chest/ Middle 1/3					Lower Trunk/ Bottom 1/3
Roof	PMAE4033A (450 - 470 MHz)	5.65	NA	450.0125	48.0	47.7	CW	E	1.020	PB	2	0.049	0.061	0.055	0.5	0.056	0.028	0.028
Roof	PMAE4033A (450 - 470 MHz)	5.65	NA	460.0000	48.0	45.8	CW	E	1.040	PB	2	0.041	0.074	0.076	0.5	0.066	0.033	0.035
Roof	PMAE4033A (450 - 470 MHz)	5.65	NA	469.9875	48.0	47.3	CW	E	1.060	PB	2	0.042	0.062	0.073	0.5	0.063	0.031	0.032
Roof	PMAE4041A (450 - 470 MHz)	2.15	NA	450.0125	48.0	47.7	CW	E	1.020	PB	2	0.021	0.012	0.005	0.5	0.013	0.006	0.007
Roof	PMAE4041A (450 - 470 MHz)	2.15	NA	460.0000	48.0	45.8	CW	E	1.040	PB	2	0.007	0.010	0.012	0.5	0.010	0.005	0.005
Roof	PMAE4041A (450 - 470 MHz)	2.15	NA	469.9875	48.0	47.3	CW	E	1.060	PB	2	0.012	0.015	0.013	0.5	0.014	0.007	0.007
Roof	PMAE4043A (450 - 470 MHz)	7.15	NA	450.0125	48.0	47.7	CW	E	1.020	PB	2	0.027	0.031	0.023	0.5	0.028	0.014	0.014
Roof	PMAE4043A (450 - 470 MHz)	7.15	NA	460.0000	48.0	45.8	CW	E	1.040	PB	2	0.020	0.035	0.020	0.5	0.026	0.013	0.014
Roof	PMAE4043A (450 - 470 MHz)	7.15	NA	469.9875	48.0	47.3	CW	E	1.060	PB	2	0.027	0.019	0.022	0.5	0.024	0.012	0.012
Roof	RAE4004ARB (445-470 MHz)	7.15	NA	450.0125	48.0	47.7	CW	E	1.020	PB	2	0.009	0.011	0.018	0.5	0.013	0.006	0.007
Roof	RAE4004ARB (445-470 MHz)	7.15	NA	460.0000	48.0	45.8	CW	E	1.040	PB	2	0.009	0.015	0.020	0.5	0.015	0.008	0.008
Roof	RAE4004ARB (445-470 MHz)	7.15	NA	469.9875	48.0	47.3	CW	E	1.060	PB	2	0.023	0.018	0.020	0.5	0.022	0.011	0.011
Trunk	HAE4011A (450 - 470 MHz)	5.65	NA	450.0125	48.0	47.7	CW	E	1.020	PB	2	0.254	0.186	0.105	0.5	0.185	0.093	0.093
Trunk	HAE4011A (450 - 470 MHz)	5.65	NA	460.0000	48.0	45.8	CW	E	1.040	PB	2	0.304	0.139	0.103	0.5	0.189	0.095	0.099
Trunk	HAE4011A (450 - 470 MHz)	5.65	NA	469.9875	48.0	47.3	CW	E	1.060	PB	2	0.307	0.114	0.103	0.5	0.185	0.093	0.094

MPE calculations are defined in section 15.0.

**Table D.2 (Continued)**

**MPE measurement data for Passenger**

D.U.T. Info.										Probe Info.		<sup>(6)</sup> Meas. Unit			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> )
<sup>(2)</sup> Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Ant. Meas. Dist. (cm)	Tx Freq (MHz)	<sup>(3)</sup> Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	<sup>(4)</sup> Probe Cal. Factor	<sup>(5)</sup> Test Pos.	MPE Measurements							
												Head/ Top 1/3	Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3				
Trunk	HAE4012A (470 - 494 MHz)	5.65	NA	470.0125	48.0	46.7	CW	E	1.060	PB	2	0.361	0.147	0.126	0.5	0.224	0.112	0.115
Trunk	HAE4012A (470 - 494 MHz)	5.65	NA	482.5000	48.0	47.8	CW	E	1.090	PB	2	0.284	0.127	0.104	0.5	0.187	0.094	0.094
Trunk	HAE4012A (470 - 494 MHz)	5.65	NA	494.9875	48.0	46.4	CW	E	1.120	PB	2	0.264	0.118	0.093	0.5	0.177	0.089	0.092
Trunk	HAE4013A (494 - 512 MHz)	5.65	NA	494.9875	48.0	46.4	CW	E	1.120	PB	2	0.484	0.242	0.116	0.5	0.314	0.157	0.163
Trunk	HAE4013A (494 - 512 MHz)	5.65	NA	503.0000	48.0	45.9	CW	E	1.130	PB	2	0.340	0.261	0.128	0.5	0.275	0.137	0.144
Trunk	HAE4013A (494 - 512 MHz)	5.65	NA	511.9875	48.0	47.3	CW	E	1.130	PB	2	0.280	0.312	0.122	0.5	0.269	0.134	0.136
Trunk	HAE6022A (403-527 MHz)	4.15	NA	450.0125	48.0	47.7	CW	E	1.020	PB	2	0.450	0.281	0.246	0.5	0.332	0.166	0.167
Trunk	HAE6022A (403-527 MHz)	4.15	NA	469.9875	48.0	47.3	CW	E	1.060	PB	2	0.523	0.267	0.277	0.5	0.377	0.189	0.191
Trunk	HAE6022A (403-527 MHz)	4.15	NA	482.5000	48.0	47.8	CW	E	1.090	PB	2	0.603	0.320	0.263	0.5	0.431	0.215	0.216
Trunk	HAE6022A (403-527 MHz)	4.15	NA	496.5000	48.0	46.5	CW	E	1.120	PB	2	0.409	0.380	0.267	0.5	0.394	0.197	0.203
Trunk	HAE6022A (403-527 MHz)	4.15	NA	511.9875	48.0	47.3	CW	E	1.130	PB	2	0.587	0.358	0.257	0.5	0.453	0.226	0.230
Trunk	HAE6024A (470 - 494 MHz)	5.15	NA	470.0125	48.0	46.7	CW	E	1.060	PB	2	0.498	0.220	0.198	0.5	0.324	0.162	0.166
Trunk	HAE6024A (470 - 494 MHz)	5.15	NA	482.5000	48.0	47.8	CW	E	1.090	PB	2	0.411	0.266	0.130	0.5	0.293	0.147	0.147
Trunk	HAE6024A (470 - 494 MHz)	5.15	NA	493.9875	48.0	46.3	CW	E	1.120	PB	2	0.265	0.419	0.125	0.5	0.302	0.151	0.157
Trunk	HAE6026A (494 - 512 MHz)	5.15	90	494.9875	48.0	46.4	CW	E	1.120	PB	2	0.218	0.352	0.123	0.5	0.259	0.129	0.134
Trunk	HAE6026A (494 - 512 MHz)	5.15	90	503.0000	48.0	45.9	CW	E	1.130	PB	2	0.370	0.232	0.173	0.5	0.292	0.146	0.153
Trunk	HAE6026A (494 - 512 MHz)	5.15	90	511.9875	48.0	47.3	CW	E	1.130	PB	2	0.340	0.374	0.176	0.5	0.335	0.168	0.170

MPE calculations are defined in section 15.0.

**Table D.2 (Continued)**

**MPE measurement data for Passenger**

D.U.T. Info.								Probe Info.			<sup>(6)</sup> Meas. Unit			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> )		
<sup>(2)</sup> Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Ant. Meas. Dist. (cm)	Tx Freq (MHz)	<sup>(3)</sup> Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	<sup>(4)</sup> Probe Cal. Factor		<sup>(5)</sup> Test Pos.	MPE Measurements							
													Head/ Top 1/3					Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3
Trunk	PMAE4033A (450 - 470 MHz)	5.65	NA	450.0125	48.0	47.7	CW	E	1.020	PB	2	0.560	0.515	0.309	0.5	0.471	0.235	0.237	
Trunk	PMAE4033A (450 - 470 MHz)	5.65	NA	460.0000	48.0	45.8	CW	E	1.040	PB	2	0.558	0.444	0.228	0.5	0.426	0.213	0.223	
Trunk	PMAE4033A (450 - 470 MHz)	5.65	NA	469.9875	48.0	47.3	CW	E	1.060	PB	2	0.571	0.334	0.246	0.5	0.407	0.203	0.206	
Trunk	PMAE4043A (450- 470 MHz)	7.15	NA	450.0125	48.0	47.7	CW	E	1.020	PB	2	0.663	0.410	0.171	0.5	0.423	0.211	0.213	
Trunk	PMAE4043A (450- 470 MHz)	7.15	NA	460.0000	48.0	45.8	CW	E	1.040	PB	2	0.659	0.326	0.170	0.5	0.400	0.200	0.210	
Trunk	PMAE4043A (450- 470 MHz)	7.15	NA	469.9875	48.0	47.3	CW	E	1.060	PB	2	0.621	0.238	0.248	0.5	0.391	0.196	0.198	
Trunk	RAE4004ARB (445-470 MHz)	7.15	NA	450.0125	48.0	47.7	CW	E	1.020	PB	2	0.150	0.065	0.053	0.5	0.091	0.046	0.046	
Trunk	RAE4004ARB (445-470 MHz)	7.15	NA	460.0000	48.0	45.8	CW	E	1.040	PB	2	0.203	0.086	0.091	0.5	0.132	0.066	0.069	
Trunk	RAE4004ARB (445-470 MHz)	7.15	NA	469.9875	48.0	47.3	CW	E	1.060	PB	2	0.268	0.103	0.096	0.5	0.165	0.083	0.084	

MPE calculations are defined in section 15.0.

**Table D.2 (Continued)**

**MPE measurement data for Passenger**

D.U.T. Info.										Probe Info.		<sup>(6)</sup> Meas. Unit			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> )
<sup>(2)</sup> Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Ant. Meas. Dist. (cm)	Tx Freq (MHz)	<sup>(3)</sup> Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	<sup>(4)</sup> Probe Cal. Factor	<sup>(5)</sup> Test Pos.	MPE Measurements							
												Head/ Top 1/3	Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3				
Roof	HAE4003A (450 - 470 MHz)	2.15	NA	450.0125	48.0	47.7	CW	E	1.020	PF	2	0.034	0.019	0.016	0.5	0.023	0.012	0.012
Roof	HAE4003A (450 - 470 MHz)	2.15	NA	460.0000	48.0	45.8	CW	E	1.040	PF	2	0.041	0.017	0.015	0.5	0.025	0.013	0.013
Roof	HAE4003A (450 - 470 MHz)	2.15	NA	469.9875	48.0	47.3	CW	E	1.060	PF	2	0.036	0.013	0.016	0.5	0.023	0.011	0.012
Roof	HAE4004A (470 - 512 MHz)	2.15	NA	470.0125	48.0	46.7	CW	E	1.060	PF	2	0.039	0.014	0.014	0.5	0.024	0.012	0.012
Roof	HAE4004A (470 - 512 MHz)	2.15	NA	484.0000	48.0	47.3	CW	E	1.090	PF	2	0.021	0.008	0.013	0.5	0.015	0.008	0.008
Roof	HAE4004A (470 - 512 MHz)	2.15	NA	498.0000	48.0	46.2	CW	E	1.130	PF	2	0.024	0.009	0.016	0.5	0.018	0.009	0.010
Roof	HAE4004A (470 - 512 MHz)	2.15	NA	511.9875	48.0	47.3	CW	E	1.130	PF	2	0.019	0.016	0.011	0.5	0.017	0.009	0.009
Roof	HAE4011A (450 - 470 MHz)	5.65	NA	450.0125	48.0	47.7	CW	E	1.020	PF	2	0.004	0.005	0.003	0.5	0.004	0.002	0.002
Roof	HAE4011A (450 - 470 MHz)	5.65	NA	460.0000	48.0	45.8	CW	E	1.040	PF	2	0.005	0.004	0.004	0.5	0.005	0.002	0.002
Roof	HAE4011A (450 - 470 MHz)	5.65	NA	469.9875	48.0	47.3	CW	E	1.060	PF	2	0.003	0.004	0.002	0.5	0.003	0.002	0.002
Roof	HAE4012A (470 - 494 MHz)	5.65	NA	470.0125	48.0	46.7	CW	E	1.060	PF	2	0.014	0.008	0.006	0.5	0.010	0.005	0.005
Roof	HAE4012A (470 - 494 MHz)	5.65	NA	482.5000	48.0	47.8	CW	E	1.090	PF	2	0.006	0.004	0.005	0.5	0.005	0.003	0.003
Roof	HAE4012A (470 - 494 MHz)	5.65	NA	494.9875	48.0	46.4	CW	E	1.120	PF	2	0.006	0.007	0.006	0.5	0.007	0.004	0.004
Roof	HAE4013A (494 - 512 MHz)	5.65	NA	494.9875	48.0	46.4	CW	E	1.120	PF	2	0.017	0.011	0.013	0.5	0.015	0.008	0.008
Roof	HAE4013A (494 - 512 MHz)	5.65	NA	503.0000	48.0	45.9	CW	E	1.130	PF	2	0.011	0.014	0.007	0.5	0.012	0.006	0.006
Roof	HAE4013A (494 - 512 MHz)	5.65	NA	511.9875	48.0	47.3	CW	E	1.130	PF	2	0.008	0.009	0.006	0.5	0.009	0.004	0.004

MPE calculations are defined in section 15.0.

**Table D.2 (Continued)**  
**MPE measurement data for Passenger**

D.U.T. Info.										Probe Info.		<sup>(6)</sup> Meas. Unit			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> )
<sup>(2)</sup> Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Ant. Meas. Dist. (cm)	Tx Freq (MHz)	<sup>(3)</sup> Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	<sup>(4)</sup> Probe Cal. Factor	<sup>(5)</sup> Test Pos.	MPE Measurements							
												Head/ Top 1/3	Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3				
Roof	HAE6020A (470 - 527 MHz)	2.15	NA	470.0125	48.0	46.7	CW	E	1.060	PF	2	0.014	0.007	0.006	0.5	0.010	0.005	0.005
Roof	HAE6020A (470 - 527 MHz)	2.15	NA	482.5000	48.0	47.8	CW	E	1.090	PF	2	0.016	0.005	0.008	0.5	0.011	0.005	0.005
Roof	HAE6020A (470 - 527 MHz)	2.15	NA	496.5000	48.0	46.5	CW	E	1.120	PF	2	0.022	0.013	0.018	0.5	0.020	0.010	0.010
Roof	HAE6020A (470 - 527 MHz)	2.15	NA	511.9875	48.0	47.3	CW	E	1.130	PF	2	0.017	0.016	0.014	0.5	0.018	0.009	0.009
Roof	HAE6022A (403-527 MHz)	4.15	NA	450.0125	48.0	47.7	CW	E	1.020	PF	2	0.056	0.022	0.017	0.5	0.032	0.016	0.016
Roof	HAE6022A (403-527 MHz)	4.15	NA	469.9875	48.0	47.3	CW	E	1.060	PF	2	0.046	0.013	0.019	0.5	0.028	0.014	0.014
Roof	HAE6022A (403-527 MHz)	4.15	NA	482.5000	48.0	47.8	CW	E	1.090	PF	2	0.023	0.009	0.012	0.5	0.016	0.008	0.008
Roof	HAE6022A (403-527 MHz)	4.15	NA	496.5000	48.0	46.5	CW	E	1.120	PF	2	0.025	0.011	0.022	0.5	0.022	0.011	0.011
Roof	HAE6022A (403-527 MHz)	4.15	NA	511.9875	48.0	47.3	CW	E	1.130	PF	2	0.018	0.014	0.017	0.5	0.018	0.009	0.009
Roof	HAE6024A (470 - 494 MHz)	5.15	NA	470.0125	48.0	46.7	CW	E	1.060	PF	2	0.037	0.011	0.016	0.5	0.023	0.011	0.012
Roof	HAE6024A (470 - 494 MHz)	5.15	NA	482.5000	48.0	47.8	CW	E	1.090	PF	2	0.019	0.009	0.012	0.5	0.015	0.007	0.007
Roof	HAE6024A (470 - 494 MHz)	5.15	NA	493.9875	48.0	46.3	CW	E	1.120	PF	2	0.027	0.008	0.020	0.5	0.021	0.010	0.011
Roof	HAE6026A (494 - 512 MHz)	5.15	NA	494.9875	48.0	46.4	CW	E	1.120	PF	2	0.024	0.011	0.013	0.5	0.018	0.009	0.009
Roof	HAE6026A (494 - 512 MHz)	5.15	NA	503.0000	48.0	45.9	CW	E	1.130	PF	2	0.020	0.016	0.011	0.5	0.018	0.009	0.009
Roof	HAE6026A (494 - 512 MHz)	5.15	NA	511.9875	48.0	47.3	CW	E	1.130	PF	2	0.019	0.015	0.016	0.5	0.019	0.009	0.010

MPE calculations are defined in section 15.0.

**Table D.2 (Continued)**  
**MPE measurement data for Passenger**

D.U.T. Info.										Probe Info.		<sup>(6)</sup> Meas. Unit			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> )
<sup>(2)</sup> Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Ant. Meas. Dist. (cm)	Tx Freq (MHz)	<sup>(3)</sup> Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	<sup>(4)</sup> Probe Cal. Factor	<sup>(5)</sup> Test Pos.	MPE Measurements							
												Head/ Top 1/3	Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3				
Roof	PMAE4033A (450 - 470 MHz)	5.65	NA	450.0125	48.0	47.7	CW	E	1.020	PF	2	0.042	0.034	0.012	0.5	0.030	0.015	0.015
Roof	PMAE4033A (450 - 470 MHz)	5.65	NA	460.0000	48.0	45.8	CW	E	1.040	PF	2	0.050	0.025	0.015	0.5	0.031	0.016	0.016
Roof	PMAE4033A (450 - 470 MHz)	5.65	NA	469.9875	48.0	47.3	CW	E	1.060	PF	2	0.052	0.028	0.017	0.5	0.034	0.017	0.017
Roof	PMAE4041A (450 - 470 MHz)	2.15	NA	450.0125	48.0	47.7	CW	E	1.020	PF	2	0.006	0.003	0.005	0.5	0.005	0.002	0.002
Roof	PMAE4041A (450 - 470 MHz)	2.15	NA	460.0000	48.0	45.8	CW	E	1.040	PF	2	0.006	0.004	0.002	0.5	0.004	0.002	0.002
Roof	PMAE4041A (450 - 470 MHz)	2.15	NA	469.9875	48.0	47.3	CW	E	1.060	PF	2	0.010	0.006	0.005	0.5	0.007	0.004	0.004
Roof	PMAE4043A (450 - 470 MHz)	7.15	NA	450.0125	48.0	47.7	CW	E	1.020	PF	2	0.018	0.013	0.008	0.5	0.013	0.007	0.007
Roof	PMAE4043A (450 - 470 MHz)	7.15	NA	460.0000	48.0	45.8	CW	E	1.040	PF	2	0.021	0.009	0.006	0.5	0.012	0.006	0.007
Roof	PMAE4043A (450 - 470 MHz)	7.15	NA	469.9875	48.0	47.3	CW	E	1.060	PF	2	0.016	0.008	0.009	0.5	0.012	0.006	0.006
Roof	RAE4004ARB (445-470 MHz)	7.15	NA	450.0125	48.0	47.7	CW	E	1.020	PF	2	0.005	0.003	0.002	0.5	0.003	0.002	0.002
Roof	RAE4004ARB (445-470 MHz)	7.15	NA	460.0000	48.0	45.8	CW	E	1.040	PF	2	0.008	0.005	0.003	0.5	0.006	0.003	0.003
Roof	RAE4004ARB (445-470 MHz)	7.15	NA	469.9875	48.0	47.3	CW	E	1.060	PF	2	0.009	0.006	0.003	0.5	0.006	0.003	0.003
Trunk	HAE4011A (450 - 470 MHz)	5.65	NA	450.0125	48.0	47.7	CW	E	1.020	PF	2	0.082	0.091	0.064	0.5	0.081	0.040	0.041
Trunk	HAE4011A (450 - 470 MHz)	5.65	NA	460.0000	48.0	45.8	CW	E	1.040	PF	2	0.099	0.132	0.072	0.5	0.105	0.053	0.055
Trunk	HAE4011A (450 - 470 MHz)	5.65	NA	469.9875	48.0	47.3	CW	E	1.060	PF	2	0.155	0.117	0.078	0.5	0.124	0.062	0.063

MPE calculations are defined in section 15.0.

**Table D.2 (Continued)**  
**MPE measurement data for Passenger**

D.U.T. Info.										Probe Info.		<sup>(6)</sup> Meas. Unit			DUT Max. TX Factor	Avg. over Body (mW/cm2)	Calc. P.D. (mW/cm2)	Max Calc. P.D. (mW/cm2)
<sup>(2)</sup> Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Ant. Meas. Dist. (cm)	Tx Freq (MHz)	<sup>(3)</sup> Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	<sup>(4)</sup> Probe Cal. Factor	<sup>(5)</sup> Test Pos.	MPE Measurements							
												Head/ Top 1/3	Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3				
Trunk	HAE4012A (470 - 494 MHz)	5.65	NA	470.0125	48.0	46.7	CW	E	1.060	PF	2	0.183	0.173	0.090	0.5	0.158	0.079	0.081
Trunk	HAE4012A (470 - 494 MHz)	5.65	NA	482.5000	48.0	47.8	CW	E	1.090	PF	2	0.098	0.100	0.054	0.5	0.092	0.046	0.046
Trunk	HAE4012A (470 - 494 MHz)	5.65	NA	494.9875	48.0	46.4	CW	E	1.120	PF	2	0.066	0.073	0.042	0.5	0.068	0.034	0.035
Trunk	HAE4013A (494 - 512 MHz)	5.65	NA	494.9875	48.0	46.4	CW	E	1.120	PF	2	0.116	0.143	0.064	0.5	0.121	0.060	0.062
Trunk	HAE4013A (494 - 512 MHz)	5.65	NA	503.0000	48.0	45.9	CW	E	1.130	PF	2	0.148	0.130	0.089	0.5	0.138	0.069	0.072
Trunk	HAE4013A (494 - 512 MHz)	5.65	NA	511.9875	48.0	47.3	CW	E	1.130	PF	2	0.152	0.095	0.050	0.5	0.112	0.056	0.057
Trunk	HAE6022A (403-527 MHz)	4.15	NA	450.0125	48.0	47.7	CW	E	1.020	PF	2	0.196	0.122	0.111	0.5	0.146	0.073	0.073
Trunk	HAE6022A (403-527 MHz)	4.15	NA	469.9875	48.0	47.3	CW	E	1.060	PF	2	0.207	0.187	0.132	0.5	0.186	0.093	0.094
Trunk	HAE6022A (403-527 MHz)	4.15	NA	482.5000	48.0	47.8	CW	E	1.090	PF	2	0.071	0.132	0.059	0.5	0.095	0.048	0.048
Trunk	HAE6022A (403-527 MHz)	4.15	NA	496.5000	48.0	46.5	CW	E	1.120	PF	2	0.103	0.176	0.064	0.5	0.128	0.064	0.066
Trunk	HAE6022A (403-527 MHz)	4.15	NA	511.9875	48.0	47.3	CW	E	1.130	PF	2	0.200	0.111	0.078	0.5	0.147	0.073	0.074
Trunk	HAE6024A (470 - 494 MHz)	5.15	NA	470.0125	48.0	46.7	CW	E	1.060	PF	2	0.158	0.164	0.108	0.5	0.152	0.076	0.078
Trunk	HAE6024A (470 - 494 MHz)	5.15	NA	482.5000	48.0	47.8	CW	E	1.090	PF	2	0.069	0.120	0.048	0.5	0.086	0.043	0.043
Trunk	HAE6024A (470 - 494 MHz)	5.15	NA	493.9875	48.0	46.3	CW	E	1.120	PF	2	0.074	0.143	0.047	0.5	0.099	0.049	0.051
Trunk	HAE6026A (494 - 512 MHz)	5.15	NA	494.9875	48.0	46.4	CW	E	1.120	PF	2	0.075	0.124	0.049	0.5	0.093	0.046	0.048
Trunk	HAE6026A (494 - 512 MHz)	5.15	NA	503.0000	48.0	45.9	CW	E	1.130	PF	2	0.143	0.153	0.075	0.5	0.140	0.070	0.073
Trunk	HAE6026A (494 - 512 MHz)	5.15	NA	511.9875	48.0	47.3	CW	E	1.130	PF	2	0.196	0.118	0.054	0.5	0.139	0.069	0.070

MPE calculations are defined in section 15.0.

**Table D.2 (Continued)**

**MPE measurement data for Passenger**

D.U.T. Info.								Probe Info.			<sup>(6)</sup> Meas. Unit			DUT Max. TX Factor	Avg. over Body (mW/cm2)	Calc. P.D. (mW/cm2)	Max Calc. P.D. (mW/cm2)		
<sup>(2)</sup> Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Ant. Meas. Dist. (cm)	Tx Freq (MHz)	<sup>(3)</sup> Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	<sup>(4)</sup> Probe Cal. Factor		<sup>(5)</sup> Test Pos.	MPE Measurements							
													Head/ Top 1/3					Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3
Trunk	PMAE4033A (450 - 470 MHz)	5.65	NA	450.0125	48.0	47.7	CW	E	1.020	PF	2	0.165	0.123	0.092	0.5	0.129	0.065	0.065	
Trunk	PMAE4033A (450 - 470 MHz)	5.65	NA	460.0000	48.0	45.8	CW	E	1.040	PF	2	0.119	0.211	0.098	0.5	0.148	0.074	0.078	
Trunk	PMAE4033A (450 - 470 MHz)	5.65	NA	469.9875	48.0	47.3	CW	E	1.060	PF	2	0.205	0.215	0.118	0.5	0.190	0.095	0.096	
Trunk	PMAE4043A (450- 470 MHz)	7.15	NA	450.0125	48.0	47.7	CW	E	1.020	PF	2	0.183	0.145	0.137	0.5	0.158	0.079	0.080	
Trunk	PMAE4043A (450- 470 MHz)	7.15	NA	460.0000	48.0	45.8	CW	E	1.020	PF	2	0.161	0.112	0.108	0.5	0.130	0.065	0.068	
Trunk	PMAE4043A (450- 470 MHz)	7.15	NA	469.9875	48.0	47.3	CW	E	1.060	PF	2	0.141	0.122	0.087	0.5	0.124	0.062	0.063	
Trunk	RAE4004ARB (445-470 MHz)	7.15	NA	450.0125	48.0	47.7	CW	E	1.020	PF	2	0.096	0.050	0.060	0.5	0.070	0.035	0.035	
Trunk	RAE4004ARB (445-470 MHz)	7.15	NA	460.0000	48.0	45.8	CW	E	1.040	PF	2	0.114	0.094	0.083	0.5	0.101	0.050	0.053	
Trunk	RAE4004ARB (445-470 MHz)	7.15	NA	469.9875	48.0	47.3	CW	E	1.060	PF	2	0.134	0.125	0.094	0.5	0.125	0.062	0.063	

MPE calculations are defined in section 15.0.

**Table D.3**

**LMR UHF2 MPE Results for FCC**

Pmax (W)		P initial (W)		FCC Limit (mW/cm <sup>2</sup> )												
48		48		47.7	45.8	47.3	46.7	47.8	47.3	46.3	46.4	46.5	46.2	45.9	47.3	
				0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
Test Pos	Angle	Trunk/ Roof	E/H Field	Antenna no.	f1	f2	f3	f4	f5	f6	f7	f8	f9	f10	f11	f12
					450.0125	460.0000	469.9875	470.0125	482.5000	484.0000	493.9875	494.9875	496.5000	498.0000	503.0000	511.9875
BS	0	Roof	E	1	0.076	0.065	0.064									
BS	0	Roof	E	2				0.07		0.065				0.072		0.06
BS	0	Roof	E	3	0.04	0.045	0.043									
BS	0	Roof	E	4				0.054	0.041			0.041				
BS	0	Roof	E	5								0.065			0.063	0.041
BS	0	Roof	E	6				0.021	0.035				0.062			0.05
BS	0	Roof	E	7	0.078		0.064		0.067				0.076			0.072
BS	0	Roof	E	8				0.055	0.059		0.063					
BS	0	Roof	E	9								0.059			0.079	0.061
BS	0	Roof	E	10	0.08	0.069	0.068									
BS	0	Roof	E	11	0.009	0.01	0.015									
BS	0	Roof	E	12	0.082	0.063	0.062									
BS	0	Roof	E	13	0.053	0.051	0.049									
BS	0	Trunk	E	3	0.069	0.082	0.081									
BS	0	Trunk	E	4				0.098	0.083			0.063				
BS	0	Trunk	E	5								0.085			0.091	0.064
BS	0	Trunk	E	7	0.109		0.12		0.106				0.107			0.097
BS	0	Trunk	E	8				0.097	0.091		0.085					
BS	0	Trunk	E	9								0.088			0.094	0.099
BS	0	Trunk	E	10	0.096	0.1	0.122									
BS	45	Trunk	E	10			0.119									
BS	90	Trunk	E	10			0.07									
BS	0	Trunk	E	12	0.103	0.102	0.116									
BS	0	Trunk	E	13	0.075	0.084	0.08									
PB	0	Roof	E	1	0.031	0.034	0.035									
PB	0	Roof	E	2				0.033		0.036				0.024		0.019
PB	0	Roof	E	3	0.005	0.007	0.006									
PB	0	Roof	E	4				0.012	0.012			0.009				
PB	0	Roof	E	5								0.01			0.007	0.006
PB	0	Roof	E	6				0.01	0.016				0.018			0.012
PB	0	Roof	E	7	0.035		0.034		0.025				0.021			0.014
PB	0	Roof	E	8				0.028	0.034		0.021					
PB	0	Roof	E	9								0.018			0.023	0.014
PB	0	Roof	E	10	0.028	0.035	0.032									
PB	0	Roof	E	11	0.007	0.005	0.007									
PB	0	Roof	E	12	0.014	0.014	0.012									
PB	0	Roof	E	13	0.007	0.008	0.011									
PB	0	Trunk	E	3	0.093	0.099	0.094									
PB	0	Trunk	E	4				0.115	0.094			0.092				
PB	0	Trunk	E	5								0.163			0.144	0.136
PB	0	Trunk	E	7	0.167		0.191		0.216				0.203			0.23
PB	0	Trunk	E	8				0.166	0.147		0.157					
PB	0	Trunk	E	9								0.134			0.153	0.17
PB	0	Trunk	E	10	0.237	0.223	0.206									
PB	0	Trunk	E	12	0.213	0.21	0.198									
PB	0	Trunk	E	13	0.046	0.069	0.084									
PF	0	Roof	E	1	0.012	0.013	0.012									
PF	0	Roof	E	2				0.012		0.008				0.01		0.009
PF	0	Roof	E	3	0.002	0.002	0.002									
PF	0	Roof	E	4				0.005	0.003			0.004				
PF	0	Roof	E	5								0.008			0.006	0.004
PF	0	Roof	E	6				0.005	0.005				0.01			0.009
PF	0	Roof	E	7	0.016		0.014		0.008				0.011			0.009
PF	0	Roof	E	8				0.012	0.007		0.011					
PF	0	Roof	E	9								0.009			0.009	0.01
PF	0	Roof	E	10	0.015	0.016	0.017									
PF	0	Roof	E	11	0.002	0.002	0.004									
PF	0	Roof	E	12	0.007	0.007	0.006									
PF	0	Roof	E	13	0.002	0.003	0.003									
PF	0	Trunk	E	3	0.041	0.055	0.063									
PF	0	Trunk	E	4				0.081	0.046			0.035				
PF	0	Trunk	E	5								0.062			0.072	0.057
PF	0	Trunk	E	7	0.073		0.094		0.048				0.066			0.074
PF	0	Trunk	E	8				0.078	0.043		0.051					
PF	0	Trunk	E	9								0.048			0.073	0.07
PF	0	Trunk	E	10	0.065	0.078	0.096									
PF	0	Trunk	E	12	0.08	0.068	0.063									
PF	0	Trunk	E	13	0.035	0.053	0.063									