MOTOROLA SOLUTIONS

SAMM 826

CERTIFICATE 2518.05

DECLARATION OF COMPLIANCE: MPE ASSESSMENT

Motorola Solutions Inc.
EME Test Laboratory
Motorola Solutions Malaysia Sdn Bhd
Plot 2A, Medan Bayan Lepas,
Mukim 12 SWD 11900 Bayan Lepas Penang,
Malaysia.

Date of Report: 12/21/2022
Report Revision: B

Responsible Engineer:	Hoe Kean Loon (EME Engineer)
Report author:	Hoe Kean Loon (EME Engineer)
Date(s) Tested:	05/19/2022 - 05/26/2022, 06/16/2022, 06/22/2022 – 06/23/2022
Manufacturer:	Motorola Solutions Inc.
Date submitted for test:	05/11/2022
DUT Description:	Bali Refresh Mobile 450-527MHz 40W GOB BT/GNSS/WiFi CD
Test TX mode(s):	CW
Max. Power output:	Refer to Table 6
TX Frequency Bands:	Refer to Table 6
Signaling type:	FM, TDMA, FHSS (Bluetooth / Bluetooth LE), 802.11b/g/n (WLAN 2.4 GHz)
Model(s) Tested:	AAM28TRN9RA1AN (PMUE4140C) (IC Model: PMUE4140CBMNAA)
Model(s) Certified:	AAM28TRN9RA1AN (PMUE4140C) (IC Model: PMUE4140CBMNAA), AAM28TRC9RA1AN (PMUE4140C) (IC Model: PMUE4140CBLNAA), AAM28TRN9WA1AN (PMUE4140C) (IC Model: PMUE4140CBMNKA)
Serial Number(s):	511TYH6800
Firmware Version:	R02.21.01.1002
Applicant Name:	Motorola Solutions Inc.
Applicant Address:	8000 West Sunrise Boulevard, Fort Lauderdale, Florida 33322
Classification:	Occupational/Controlled Environment
FCC ID:	AZ489FT7165 This report contains results that are immaterial for FCC equipment approval, which are clearly identified.
IC:	109U-89FT7165 This report contains results that are immaterial for ISED Canada equipment approval, which are clearly identified.
ISED Test Site registration:	24843
FCC Test Firm Registration Number:	823256

The MPE results clearly demonstrate compliance with FCC Occupational/Controlled RF Exposure limits. FCC rules require compliance for Passengers and Bystanders to the FCC General Population/Uncontrolled limits. The test results clearly demonstrate compliance with ICNIRP Guidelines for limiting exposure in time-varying electric, magnetic, and electromagnetic fields (up to 300 GHz).

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.

Saw Sun Hock (Approved Signatory)
Approval Date: 12/21/2022

Document Revision History

Date	Revision	Comments
10/20/2022	A	Initial release
12/21/2022	B	Update the BT/WLAN antenna gain and MPE result

Table of Contents

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 (PMUE4140C) (IC Model: PMUE4140CBMNAA).

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^2)	Percentage of Limit (%)	Power Density (mW/cm^2)	Percentage of Limit (%)	Power Density (mW/cm^2)	Percentage of Limit (%)	Power Density (mW/cm^2)	Percentage of Limit (%)
TNB	450-512 (LMR UHF2)	0.263	87.8	0.129	43.0	0.04	13.4	0.08	27.2
DTS	2412-2462 (WLAN 2.4 GHz)	0.015	1.49	0.015	1.49	0.015	1.49	0.015	1.49
DSS	2402-2480 (Bluetooth)	0.002	0.20	0.002	0.20	0.002	0.20	0.002	0.20
Simultaneous (Highest Combined Percentage of Limit)			89.29		44.49		14.89		28.69

3.0 Abbreviations / Definitions

BT: Bluetooth
CNR: Calibration Not Required
CW: Continuous Wave
DUT: Device Under Test
EME: Electromagnetic Energy
FHSS: Frequency Hopping Spread Spectrum
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
WLAN: Wireless Local Area Network
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 mW/cm^2	ICNIRP W/m^2	IEEE C95.1 1992/1999 mW/cm^2	IEEE C95.1 2005 W/m^2	RSS-102 Issue 5 2015 W/m^2
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 mW/cm^2	ICNIRP W/m^2	IEEE C95.1 1992/1999 mW/cm^2	IEEE C95.1 2005 W/m^2	RSS-102 Issue 5 2015 W/m^2
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					$3.33\times10^{-4}\,f$

Table 3 – General Population / Uncontrolled Exposure Limits

Frequency Range (MHz)	FCC OET Bulletin 65 mW/cm^2	ICNIRP W/m^2	IEEE C95.1 1992/1999 mW/cm^2	IEEE C95.1 2005 W/m^2	RSS-102 Issue 5 2015 W/m^2
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					$6.67\times10^{-5}\,f$

6.0 N_c 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

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

where N_c is the number of test channels, f_{high} and f_{low} are the highest and lowest frequencies within the transmission band, f_c 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 Probe – E-Field	ETS Model HI-2200 ETS Model H200	00206805 00237361	01/27/2022	01/27/2023

E-field measurements are in mW/cm^2.

8.0 Measurement System Uncertainty Levels

Table 5 – Uncertainty Budget for Near Field Probe Measurements

	Tol. (± %)	Prob. Dist.	Divisor	u_i (±%)		v_i
Measurement System						
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	∞
Test sample Related					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	∞
Combined Standard Uncertainty		RSS		15.6	15.6	∞
Expanded Uncertainty (95% CONFIDENCE LEVEL)		*k*=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. Time Division Multiple Access (TDMA) is used to allocate portions of the RF signal by dividing time into two slots. Time allocation enables independent units to transmit voice information without interference from each other. Transmission from a unit or base station is accommodated in time-slot lengths of 30 milliseconds and frame lengths of 60 milliseconds. The 4FSK TDMA modulation technique requires sophisticated algorithms and a digital signal processor (DSP) to perform voice compressions/decompressions and RF modulation/demodulation.

This device also incorporates a Class 1 Bluetooth device which is a Frequency Hopping Spread Spectrum (FHSS) technology. The Bluetooth radio modem is used to wireless link audio accessories. The maximum actual transmission duty cycle is imposed by the Bluetooth standard. The maximum duty cycle for BT is 100%. Bluetooth Low Energy (BT LE) intended to reduce power consumption.

This device also contains WLAN technology for data capabilities over 802.11b/g/n 2.4 GHz wireless networks.

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 (%)	Declared Max Power
LMR	450-527 (UHF2)	50 (PTT)	48 W
*BT	2402-2480	77	3.16 mW
*BT LE	2402-2480	77	3.98 mW, Other region 3.16 mW
*WLAN	2412 – 2484 (802.11b/g/n)	99.8	22.4 mW (802.11b), Other region 29.5 mW
		99.2	16.6 mW (802.11g), Other region 29.5 mW
		99.1	10.5 mW (802.11n), Other region 30.2 mW

Note: * Conducted (Average Detector) Power

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	RAE4152A	450–470 MHz, 5/8 Wave, 7.15dBi (BNC)	Yes	No	By similarity to HAE4003A
2	HAE6029A	403–527 MHz, 1/2 Wave, 4.15dBi	Yes	No	By similarity to HAE6022A
3	HAE6019A	403–527 MHz, 1/2 Wave, 4.15dBi	Yes	No	By similarity to HAE6022A
4	HAE6017B	403–527 MHz, 1/2 Wave, 4.15dBi (BNC)	Yes	No	By similarity to HAE6022A
5	HAE6021A	403–527 MHz, 1/2 Wave, 4.15dBi (BNC)	Yes	No	By similarity to HAE6022A
6	PMAE4031A	Combo GPS/UHF, 450–470 MHz, 1/4 Wave, 2.15dBi	Yes	No	By similarity to PMAE4041A
7	PMAE4037B	Combo GNSS/UHF, 450–470 MHz, 1/4 Wave, 2.15dBi (BNC)	Yes	No	By similarity to PMAE4041A
8	PMAE4042A	450–470 MHz, 5/8 Wave, 5.65dBi	Yes	No	By similarity to PMAE4033A
9	PMAE4034A	Combo GNSS/UHF, 450–470 MHz, 5/8 Wave, 7.15dBi	Yes	No	By similarity to PMAE4043A
10	RAE4154A	450–470 MHz, 5/8 Wave, 7.15dBi (BNC)	Yes	No	By similarity to PMAE4043A
11	PMAE4038B	450–470 MHz, 5/8 Wave, 7.15dBi (BNC)	Yes	No	By similarity to PMAE4043A
12	HAE6030A	470–527 MHz, 1/4 Wave, 2.15dBi	Yes	No	By similarity to HAE6020A
13	HAE6018A	470–527 MHz, 1/4 Wave, 2.15dBi (BNC)	Yes	No	By similarity to HAE6020A
14	HAE6028A	470–494 MHz, 5/8 Wave, 5.15dBi	Yes	No	By similarity to HAE6024A
15	HAE6025A	470–494 MHz, 5/8 Wave, 5.15dBi	Yes	No	By similarity to HAE6024A
16	HAE6027A	494–512 MHz, 5/8 Wave, 5.15dBi	Yes	No	By similarity to HAE6026A
17	HAE6023B	494–512 MHz, 5/8 Wave, 5.15dBi (BNC)	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 UHF2 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 45º radial at the corner of the trunk, and 90º radial at the side of the trunk.

Tests for the 90º radial direction where 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 UHF2 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.)*

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

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^2) 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^2) using the equation 3. H-field measurements are only applicable to frequencies below 300MHz.

Equation 3 – Converting A/m to mW/cm^2

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

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_c) and actual number of tested channels (Actual N_c). 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_c	Actual N_c
1	HAE4003A	450-470	16	2.15	¼ wave, wire	R	450-470	3	3
2	HAE4004A	470-527	15	2.15	¼ wave, wire	R	470-527	4	5
3	HAE4011A	450-470	73.2	5.65	5/8 wave, trap-loaded	R/T	450-470	3	3
4	HAE4012A	450-494	68.5	5.65	5/8 wave, trap-loaded	R/T	450-494	3	3
5	HAE4013A	494-512	64.2	5.65	5/8 wave, trap-loaded	R/T	450-512	3	3
6	HAE6020A	470-527	12.8	2.15	¼ wave, wire	R	470-512	4	5
7	HAE6022A	403-527	27.8	4.15	½ wave, wire	R/T	450-512	5	6
8	HAE6024A	470-494	28.4	5.15	5/8 wave, trap-loaded	R/T	470-494	3	3
9	HAE6026A	494-512	27.7	5.15	5/8 wave, trap-loaded	R/T	494-512	3	3
10	PMAE4041A	450-470	12.5	2.15	¼ wave, wire	R	450-470	3	3
11	PMAE4033A	450-470	31.2	5.65	5/8 wave, trap-loaded	R/T	450-470	3	3
12	PMAE4043A	450-470	76.8	7.15	5/8 wave, trap-loaded	R/T	450-470	3	3
13	*RAE4014ARB	445-470	92.7 (450.0125 MHz) 90.5 (460 MHz) 89.0 (469.9875 MHz)	7.15	5/8 wave, trap-loaded	R/T	445-470	3	3
BT/WLAN									
14	Internal	2400-2500	2.57	5.24	¼ wave, wire	-	2412-2462	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:
Blue fonts: Frequencies not regulated by FCC.
Results highlighted in yellow are configurations with highest percentage of limits

Trunk/ Roof	Test Positio	E/H Field	Angle (Degre	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 Lin	ICNIRP Limit	% To ICNIRP Spec Lin	ISED Limit	% To ISED Spec Lin
Trunk	BS	E	0	10	PMAE4033A (450 - 470 MHz)	48.0	47.2	450.0125	0.10	0.30	33.0	0.23	44.0	0.17	58.2
							47.1	460.0000	0.09	0.31	29.1	0.23	38.8	0.17	51.6
							47.5	469.9875	0.10	0.31	31.2	0.23	41.6	0.18	55.7
				12	PMAE4043A (450- 470 MHz)	48.0	47.2	450.0125	0.10	0.30	32.8	0.23	43.7	0.17	57.8
							47.1	460.0000	0.08	0.31	26.9	0.23	35.9	0.17	47.8
							47.5	469.9875	0.10	0.31	32.4	0.23	43.3	0.18	57.9
				13	RAE4004ARB (445-470 MHz)	48.0	47.2	450.0125	0.07	0.30	24.1	0.23	32.1	0.17	42.4
							47.1	460.0000	0.07	0.31	24.2	0.23	32.3	0.17	43.0
							47.5	469.9875	0.08	0.31	25.1	0.23	33.4	0.18	44.7
				3	HAE4011A (450 - 470 MHz)	48.0	47.2	450.0125	0.07	0.30	21.8	0.23	29.0	0.17	38.4
							47.1	460.0000	0.06	0.31	20.8	0.23	27.7	0.17	36.9
							47.5	469.9875	0.07	0.31	23.6	0.23	31.5	0.18	42.2
				4	HAE4012A (470 - 494 MHz)	48.0	47.5	470.0125	0.09	0.31	27.5	0.24	36.6	0.18	NA
							47.4	482.5000	0.07	0.32	21.9	0.24	29.3	0.18	NA
							47.3	494.9875	0.06	0.33	18.6	0.25	24.9	0.18	NA
				5	HAE4013A (494 - 512 MHz)	48.0	47.3	494.9875	0.08	0.33	23.2	0.25	30.9	0.18	NA
							47.6	503.0000	0.06	0.34	17.7	0.25	23.6	0.18	NA
							47.3	511.9875	0.04	0.34	12.6	0.26	16.8	0.19	NA
				7	HAE6022A (403-527 MHz)	48.0	47.2	450.0125	0.11	0.30	37.3	0.23	49.7	0.17	65.7
							47.5	469.9875	0.10	0.31	32.6	0.23	43.5	0.18	58.2
							47.4	482.5000	0.10	0.32	31.6	0.24	42.1	0.18	NA
							47.5	496.5000	0.08	0.33	23.3	0.25	31.0	0.18	NA
							47.3	511.9875	0.07	0.34	19.9	0.26	26.5	0.19	NA
							47.2	526.9875	0.09	0.35	27.0	0.26	36.0	0.19	NA
							47.2	450.0125	0.11	0.30	37.3	0.23	49.7	0.17	65.7
							47.2	450.0125	0.11	0.30	37.3	0.23	49.7	0.17	65.7

Table 8 (Continued)

MPE assessment for LMR UHF2 - trunk mounted antenna – Bystander

Notes:
Results highlighted in yellow are configurations with highest percentage of limits

Trunk/ Roof	Test Positio	E/H Field	Angle (Degre	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 Lin	ICNIRP Limit	% To ICNIRP Spec Lin	ISED Limit	% To ISED Spec Lin
Trunk	BS	E	0	8	HAE6024A (470 - 494 MHz)	48.0	47.5	470.0125	0.09	0.31	28.0	0.24	37.3	0.18	NA
							47.4	482.5000	0.08	0.32	25.5	0.24	34.0	0.18	NA
							47.2	493.9875	0.07	0.33	22.1	0.25	29.5	0.18	NA
				9	HAE6026A (494 - 512 MHz)	48.0	47.3	494.9875	0.07	0.33	20.5	0.25	27.3	0.18	NA
							47.6	503.0000	0.06	0.34	19.1	0.25	25.5	0.18	NA
							47.3	511.9875	0.06	0.34	17.8	0.26	23.8	0.19	NA
			45	7	HAE6022A (403-527 MHz)	48.0	47.2	450.0125	0.13	0.30	**43.0**	0.23	**57.4**	0.17	**75.8**
			90	7	HAE6022A (403-527 MHz)	48.0	47.2	450.0125	0.09	0.30	29.1	0.23	38.8	0.17	51.3

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 Positio	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 Lin	ICNIRP Limit	% To ICNIRP Spec Lin	ISED Limit	% To ISED Spec Lin
Roof	BS	E	1	HAE4003A (450 - 470 MHz)	48.0	47.2	450.0125	0.07	0.30	23.9	0.23	31.9	0.17	42.2
						47.1	460.0000	0.06	0.31	20.5	0.23	27.3	0.17	36.3
						47.5	469.9875	0.06	0.31	20.6	0.23	27.5	0.18	36.9
			10	PMAE4033A (450 - 470 MHz)	48.0	47.2	450.0125	0.08	0.30	26.5	0.23	35.4	0.17	46.7
						47.1	460.0000	0.07	0.31	21.9	0.23	29.1	0.17	38.8
						47.5	469.9875	0.07	0.31	21.4	0.23	28.5	0.18	38.2
			11	PMAE4041A (450 - 470 MHz)	48.0	47.2	450.0125	0.01	0.30	2.4	0.23	3.2	0.17	4.2
						47.1	460.0000	0.01	0.31	3.9	0.23	5.3	0.17	7.0
						47.5	469.9875	0.02	0.31	4.9	0.23	6.5	0.18	8.8
			12	PMAE4043A (450- 470 MHz)	48.0	47.2	450.0125	0.08	0.30	25.4	0.23	33.9	0.17	44.8
						47.1	460.0000	0.07	0.31	22.8	0.23	30.4	0.17	40.5
						47.5	469.9875	0.06	0.31	19.3	0.23	25.7	0.18	34.5
			13	RAE4004ARB (445-470 MHz)	48.0	47.2	450.0125	0.05	0.30	16.9	0.23	22.6	0.17	29.8
						47.1	460.0000	0.05	0.31	17.0	0.23	22.6	0.17	30.1
						47.5	469.9875	0.05	0.31	16.2	0.23	21.6	0.18	29.0
			2	HAE4004A (470 - 512 MHz)	48.0	47.5	470.0125	0.07	0.31	21.9	0.24	29.2	0.18	NA
						47.5	484.0000	0.06	0.32	19.7	0.24	26.3	0.18	NA
						47.7	498.0000	0.07	0.33	19.9	0.25	26.5	0.18	NA
						47.3	511.9875	0.06	0.34	16.4	0.26	21.9	0.19	NA
			3	HAE4011A (450 - 470 MHz)	48.0	47.2	450.0125	0.04	0.30	14.3	0.23	19.1	0.17	25.2
						47.1	460.0000	0.04	0.31	14.3	0.23	19.0	0.17	25.3
						47.5	469.9875	0.04	0.31	13.1	0.23	17.5	0.18	23.4
			4	HAE4012A (470 - 494 MHz)	48.0	47.5	470.0125	0.05	0.31	17.5	0.24	23.3	0.18	NA
						47.4	482.5000	0.05	0.32	14.9	0.24	19.9	0.18	NA
						47.3	494.9875	0.05	0.33	13.7	0.25	18.3	0.18	NA

Table 9 (Continued)

MPE assessment for LMR UHF2 - roof mounted antenna – Bystander

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^2)	FCC Limit	% To FCC Spec Limit	ICNIRP Limit	% To ICNIRP Spec Limit	ISED Limit	% To ISED Spec Limit
Roof	BS	E	5	HAE4013A (494 - 512 MHz)	48.0	47.3	494.9875	0.06	0.33	19.2	0.25	25.6	0.18	NA
						47.6	503.0000	0.05	0.34	15.6	0.25	20.8	0.18	NA
						47.3	511.9875	0.04	0.34	11.4	0.26	15.2	0.19	NA
			6	HAE6020A (470 - 527 MHz)	48.0	47.5	470.0125	0.02	0.31	7.0	0.24	9.3	0.18	NA
						47.4	482.5000	0.04	0.32	12.5	0.24	16.6	0.18	NA
						47.5	496.5000	0.05	0.33	16.4	0.25	21.8	0.18	NA
						47.3	511.9875	0.06	0.34	17.0	0.26	22.6	0.19	NA
						47.2	526.9875	0.04	0.35	11.0	0.26	14.6	0.19	NA
			7	HAE6022A (403-527 MHz)	48.0	47.2	450.0125	0.08	0.30	**27.2**	0.23	**36.3**	0.17	**47.9**
						47.5	469.9875	0.07	0.31	21.2	0.23	28.2	0.18	37.8
						47.4	482.5000	0.06	0.32	17.6	0.24	23.5	0.18	NA
						47.5	496.5000	0.06	0.33	19.2	0.25	25.6	0.18	NA
						47.3	511.9875	0.06	0.34	18.0	0.26	24.0	0.19	NA
						47.2	526.9875	0.07	0.35	19.5	0.26	26.0	0.19	NA
			8	HAE6024A (470 - 494 MHz)	48.0	47.5	470.0125	0.05	0.31	17.2	0.24	22.9	0.18	NA
						47.4	482.5000	0.05	0.32	16.0	0.24	21.4	0.18	NA
						47.2	493.9875	0.07	0.33	20.2	0.25	26.9	0.18	NA
			9	HAE6026A (494 - 512 MHz)	48.0	47.3	494.9875	0.06	0.33	17.9	0.25	23.9	0.18	NA
						47.6	503.0000	0.05	0.34	15.7	0.25	20.9	0.18	NA
						47.3	511.9875	0.06	0.34	16.8	0.26	22.5	0.19	NA

Table 10

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

Notes:
Blue fonts: Frequencies not regulated by FCC.
Results highlight in yellow are configurations with highest percentage of limits
*Result required SAR simulation to demonstrate compliance to the basic requirements

Trunk/ Roof	Test Positio	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 Lin	ICNIRP Limit	% To ICNIRP Spec Lin	ISED Limit	% To ISED Spec Lin
Trunk	PB	E	10	PMAE4033A (450 - 470 MHz)	48.0	47.2	450.0125	0.26	0.30	**87.8**	0.23	***117.1**	0.17	***154.6**
						47.1	460.0000	0.18	0.31	60.2	0.23	80.3	0.17	*106.7
						47.5	469.9875	0.24	0.31	77.1	0.23	102.8	0.18	*137.7
			12	PMAE4043A (450- 470 MHz)	48.0	47.2	450.0125	0.18	0.30	59.8	0.23	79.7	0.17	*105.3
						47.1	460.0000	0.16	0.31	52.2	0.23	69.5	0.17	92.5
						47.5	469.9875	0.19	0.31	61.6	0.23	82.1	0.18	*109.9
			13	RAE4004ARB (445-470 MHz)	48.0	47.2	450.0125	0.05	0.30	17.8	0.23	23.7	0.17	31.3
						47.1	460.0000	0.10	0.31	31.9	0.23	42.5	0.17	56.5
						47.5	469.9875	0.13	0.31	40.7	0.23	54.2	0.18	72.6
			3	HAE4011A (450 - 470 MHz)	48.0	47.2	450.0125	0.10	0.30	32.0	0.23	42.7	0.17	56.3
						47.1	460.0000	0.09	0.31	29.3	0.23	39.0	0.17	51.9
						47.5	469.9875	0.11	0.31	34.7	0.23	46.3	0.18	62.0
			4	HAE4012A (470 - 494 MHz)	48.0	47.5	470.0125	0.15	0.31	49.1	0.24	65.5	0.18	NA
						47.4	482.5000	0.12	0.32	37.6	0.24	50.2	0.18	NA
						47.3	494.9875	0.09	0.33	26.3	0.25	35.1	0.18	NA
			5	HAE4013A (494 - 512 MHz)	48.0	47.3	494.9875	0.15	0.33	45.8	0.25	61.1	0.18	NA
						47.6	503.0000	0.14	0.34	40.5	0.25	54.0	0.18	NA
						47.3	511.9875	0.15	0.34	43.3	0.26	57.7	0.19	NA
			7	HAE6022A (403-527 MHz)	48.0	47.2	450.0125	0.25	0.30	82.2	0.23	*109.5	0.17	*144.7
						47.5	469.9875	0.22	0.31	69.2	0.23	92.3	0.18	*123.6
						47.4	482.5000	0.20	0.32	63.2	0.24	84.2	0.18	NA
						47.5	496.5000	0.21	0.33	64.9	0.25	86.5	0.18	NA
						47.3	511.9875	0.26	0.34	75.7	0.26	100.9	0.19	NA
						47.2	526.9875	0.21	0.35	60.7	0.26	81.0	0.19	NA
			8	HAE6024A (470 - 494 MHz)	48.0	47.5	470.0125	0.19	0.31	60.1	0.24	80.2	0.18	NA
						47.4	482.5000	0.19	0.32	59.0	0.24	78.7	0.18	NA
						47.2	493.9875	0.20	0.33	62.0	0.25	82.7	0.18	NA

Table 11

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 Positio	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 Lin	ICNIRP Limit	% To ICNIRP Spec Lin	ISED Limit	% To ISED Spec Lin
Roof	PB	E	1	HAE4003A (450 - 470 MHz)	48.0	47.2	450.0125	0.03	0.30	9.9	0.23	13.2	0.17	17.4
						47.1	460.0000	0.04	0.31	**13.4**	0.23	**17.8**	0.17	**23.7**
						47.5	469.9875	0.04	0.31	11.2	0.23	14.9	0.18	20.0
			10	PMAE4033A (450 - 470 MHz)	48.0	47.2	450.0125	0.03	0.30	9.8	0.23	13.1	0.17	17.3
						47.1	460.0000	0.04	0.31	12.7	0.23	16.9	0.17	22.5
						47.5	469.9875	0.04	0.31	11.8	0.23	15.8	0.18	21.1
			11	PMAE4041A (450 - 470 MHz)	48.0	47.2	450.0125	0.00	0.30	0.7	0.23	1.0	0.17	1.3
						47.1	460.0000	0.01	0.31	1.7	0.23	2.2	0.17	3.0
						47.5	469.9875	0.01	0.31	2.5	0.23	3.3	0.18	4.4
			12	PMAE4043A (450- 470 MHz)	48.0	47.2	450.0125	0.01	0.30	3.8	0.23	5.1	0.17	6.7
						47.1	460.0000	0.02	0.31	5.0	0.23	6.7	0.17	8.9
						47.5	469.9875	0.02	0.31	5.2	0.23	6.9	0.18	9.2
			13	RAE4004ARB (445-470 MHz)	48.0	47.2	450.0125	0.00	0.30	1.1	0.23	1.4	0.17	1.9
						47.1	460.0000	0.01	0.31	2.8	0.23	3.8	0.17	5.0
						47.5	469.9875	0.01	0.31	3.0	0.23	4.0	0.18	5.4
			2	HAE4004A (470 - 512 MHz)	48.0	47.5	470.0125	0.04	0.31	13.3	0.24	17.7	0.18	NA
						47.5	484.0000	0.03	0.32	9.8	0.24	13.1	0.18	NA
						47.7	498.0000	0.02	0.33	4.9	0.25	6.5	0.18	NA
						47.3	511.9875	0.01	0.34	3.8	0.26	5.0	0.19	NA
			3	HAE4011A (450 - 470 MHz)	48.0	47.2	450.0125	0.00	0.30	1.0	0.23	1.3	0.17	1.8
						47.1	460.0000	0.00	0.31	1.4	0.23	1.8	0.17	2.4
						47.5	469.9875	0.01	0.31	2.2	0.23	3.0	0.18	4.0
			4	HAE4012A (470 - 494 MHz)	48.0	47.5	470.0125	0.01	0.31	4.0	0.24	5.4	0.18	NA
						47.4	482.5000	0.01	0.32	2.4	0.24	3.2	0.18	NA
						47.3	494.9875	0.01	0.33	2.6	0.25	3.4	0.18	NA

Table 11(continued)

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

Notes:
Blue fonts: Frequencies not regulated by FCC

Trunk/ Roof	Test Positio	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 Lin	ICNIRP Limit	% To ICNIRP Spec Lin	ISED Limit	% To ISED Spec Lin
Roof	PB	E	5	HAE4013A (494 - 512 MHz)	48.0	47.3	494.9875	0.01	0.33	3.6	0.25	4.7	0.18	NA
						47.6	503.0000	0.01	0.34	2.2	0.25	3.0	0.18	NA
						47.3	511.9875	0.01	0.34	2.0	0.26	2.7	0.19	NA
			6	HAE6020A (470 - 527 MHz)	48.0	47.5	470.0125	0.01	0.31	3.0	0.24	4.0	0.18	NA
						47.4	482.5000	0.02	0.32	5.4	0.24	7.2	0.18	NA
						47.5	496.5000	0.01	0.33	4.3	0.25	5.7	0.18	NA
						47.3	511.9875	0.01	0.34	3.1	0.26	4.2	0.19	NA
						47.2	526.9875	0.01	0.35	3.3	0.26	4.4	0.19	NA
			7	HAE6022A (403-527 MHz)	48.0	47.2	450.0125	0.03	0.30	9.7	0.23	13.0	0.17	17.1
						47.5	469.9875	0.03	0.31	11.0	0.23	14.7	0.18	19.6
						47.4	482.5000	0.03	0.32	8.9	0.24	11.8	0.18	NA
						47.5	496.5000	0.02	0.33	6.6	0.25	8.8	0.18	NA
						47.3	511.9875	0.01	0.34	3.6	0.26	4.8	0.19	NA
						47.2	526.9875	0.03	0.35	9.8	0.26	13.1	0.19	NA
			8	HAE6024A (470 - 494 MHz)	48.0	47.5	470.0125	0.03	0.31	9.4	0.24	12.6	0.18	NA
						47.4	482.5000	0.03	0.32	8.4	0.24	11.1	0.18	NA
						47.2	493.9875	0.02	0.33	7.4	0.25	9.9	0.18	NA
			9	HAE6026A (494 - 512 MHz)	48.0	47.3	494.9875	0.02	0.33	5.7	0.25	7.6	0.18	NA
						47.6	503.0000	0.01	0.34	3.0	0.25	4.0	0.18	NA
						47.3	511.9875	0.01	0.34	4.1	0.26	5.5	0.19	NA

Table 12

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

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^2)	FCC Limit	% To FCC Spec Limit	ICNIRP Limit	% To ICNIRP Spec Limit	ISED Limit	% To ISED Spec Limit
Trunk	PF	E	10	PMAE4033A (450 - 470 MHz)	48.0	47.2	450.0125	0.10	0.30	34.5	0.23	46.0	0.17	60.8
						47.1	460.0000	0.08	0.31	27.4	0.23	36.5	0.17	48.6
						47.5	469.9875	0.08	0.31	24.8	0.23	33.1	0.18	44.3
			12	PMAE4043A (450- 470 MHz)	48.0	47.2	450.0125	0.10	0.30	33.1	0.23	44.1	0.17	58.3
						47.1	460.0000	0.09	0.31	29.0	0.23	38.6	0.17	51.4
						47.5	469.9875	0.09	0.31	29.3	0.23	39.0	0.18	52.2
			13	RAE4004ARB (445-470 MHz)	48.0	47.2	450.0125	0.04	0.30	13.0	0.23	17.4	0.17	23.0
						47.1	460.0000	0.05	0.31	15.3	0.23	20.4	0.17	27.1
						47.5	469.9875	0.05	0.31	17.2	0.23	22.9	0.18	30.7
			3	HAE4011A (450 - 470 MHz)	48.0	47.2	450.0125	0.05	0.30	15.7	0.23	20.9	0.17	27.6
						47.1	460.0000	0.07	0.31	23.9	0.23	31.9	0.17	42.4
						47.5	469.9875	0.07	0.31	21.2	0.23	28.2	0.18	37.8
			4	HAE4012A (470 - 494 MHz)	48.0	47.5	470.0125	0.09	0.31	28.0	0.24	37.4	0.18	NA
						47.4	482.5000	0.04	0.32	11.6	0.24	15.5	0.18	NA
						47.3	494.9875	0.04	0.33	11.8	0.25	15.7	0.18	NA
			5	HAE4013A (494 - 512 MHz)	48.0	47.3	494.9875	0.06	0.33	17.2	0.25	23.0	0.18	NA
						47.6	503.0000	0.06	0.34	17.1	0.25	22.7	0.18	NA
						47.3	511.9875	0.06	0.34	18.1	0.26	24.1	0.19	NA
			7	HAE6022A (403-527 MHz)	48.0	47.2	450.0125	0.11	0.30	**36.2**	0.23	**48.2**	0.17	**63.7**
						47.5	469.9875	0.08	0.31	25.0	0.23	33.3	0.18	44.6
						47.4	482.5000	0.03	0.32	9.7	0.24	12.9	0.18	NA
						47.5	496.5000	0.05	0.33	15.7	0.25	20.9	0.18	NA
						47.3	511.9875	0.08	0.34	22.8	0.26	30.4	0.19	NA
						47.2	526.9875	0.08	0.35	22.2	0.26	29.6	0.19	NA

Table 12(continued)

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

Trunk/ Roof	Test Positio	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 Lin	ICNIRP Limit	% To ICNIRP Spec Lin	ISED Limit	% To ISED Spec Lin
Trunk	PF	E	8	HAE6024A (470 - 494 MHz)	48.0	47.5	470.0125	0.07	0.31	21.6	0.24	28.8	0.18	NA
						47.4	482.5000	0.06	0.32	18.5	0.24	24.7	0.18	NA
						47.2	493.9875	0.06	0.33	17.0	0.25	22.6	0.18	NA
			9	HAE6026A (494 - 512 MHz)	48.0	47.3	494.9875	0.04	0.33	12.5	0.25	16.6	0.18	NA
						47.6	503.0000	0.05	0.34	14.0	0.25	18.7	0.18	NA
						47.3	511.9875	0.08	0.34	22.8	0.26	30.4	0.19	NA

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 Positio	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 Lin	ICNIRP Limit	% To ICNIRP Spec Lin	ISED Limit	% To ISED Spec Lin
Roof	PF	E	1	HAE4003A (450 - 470 MHz)	48.0	47.2	450.0125	0.02	0.30	7.8	0.23	10.4	0.17	13.7
						47.1	460.0000	0.02	0.31	6.9	0.23	9.3	0.17	12.3
						47.5	469.9875	0.03	0.31	**9.7**	0.23	**12.9**	0.18	**17.3**
			10	PMAE4033A (450 - 470 MHz)	48.0	47.2	450.0125	0.02	0.30	8.3	0.23	11.0	0.17	14.6
						47.1	460.0000	0.03	0.31	9.3	0.23	12.4	0.17	16.6
						47.5	469.9875	0.03	0.31	9.5	0.23	12.7	0.18	16.9
			11	PMAE4041A (450 - 470 MHz)	48.0	47.2	450.0125	0.00	0.30	0.4	0.23	0.5	0.17	0.7
						47.1	460.0000	0.00	0.31	0.7	0.23	0.9	0.17	1.3
						47.5	469.9875	0.00	0.31	1.0	0.23	1.4	0.18	1.9
			12	PMAE4043A (450- 470 MHz)	48.0	47.2	450.0125	0.01	0.30	2.5	0.23	3.3	0.17	4.3
						47.1	460.0000	0.01	0.31	2.8	0.23	3.7	0.17	4.9
						47.5	469.9875	0.01	0.31	3.5	0.23	4.7	0.18	6.2
			13	RAE4004ARB (445-470 MHz)	48.0	47.2	450.0125	0.00	0.30	0.9	0.23	1.2	0.17	1.6
						47.1	460.0000	0.00	0.31	1.6	0.23	2.2	0.17	2.9
						47.5	469.9875	0.01	0.31	1.8	0.23	2.4	0.18	3.3
			2	HAE4004A (470 - 512 MHz)	48.0	47.5	470.0125	0.02	0.31	7.0	0.24	9.4	0.18	NA
						47.5	484.0000	0.02	0.32	6.1	0.24	8.2	0.18	NA
						47.7	498.0000	0.02	0.33	6.6	0.25	8.9	0.18	NA
						47.3	511.9875	0.02	0.34	5.2	0.26	6.9	0.19	NA
			3	HAE4011A (450 - 470 MHz)	48.0	47.2	450.0125	0.00	0.30	0.5	0.23	0.7	0.17	0.9
						47.1	460.0000	0.00	0.31	0.7	0.23	0.9	0.17	1.2
						47.5	469.9875	0.00	0.31	0.7	0.23	1.0	0.18	1.3
			4	HAE4012A (470 - 494 MHz)	48.0	47.5	470.0125	0.01	0.31	2.7	0.24	3.6	0.18	NA
						47.4	482.5000	0.00	0.32	1.2	0.24	1.5	0.18	NA
						47.3	494.9875	0.01	0.33	2.8	0.25	3.7	0.18	NA

Table 13(continued)

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

Notes:
Blue fonts: Frequencies not regulated by FCC.

Trunk/ Roof	Test Positio	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 Lin	ICNIRP Limit	% To ICNIRP Spec Lin	ISED Limit	% To ISED Spec Lin
Roof	PF	E	5	HAE4013A (494 - 512 MHz)	48.0	47.3	494.9875	0.02	0.33	4.9	0.25	6.6	0.18	NA
						47.6	503.0000	0.01	0.34	3.8	0.25	5.0	0.18	NA
						47.3	511.9875	0.01	0.34	1.7	0.26	2.3	0.19	NA
			6	HAE6020A (470 - 527 MHz)	48.0	47.5	470.0125	0.01	0.31	2.2	0.24	2.9	0.18	NA
						47.4	482.5000	0.01	0.32	2.6	0.24	3.5	0.18	NA
						47.5	496.5000	0.01	0.33	2.3	0.25	3.1	0.18	NA
						47.3	511.9875	0.01	0.34	2.5	0.26	3.3	0.19	NA
						47.2	526.9875	0.01	0.35	2.9	0.26	3.9	0.19	NA
			7	HAE6022A (403-527 MHz)	48.0	47.2	450.0125	0.02	0.30	7.7	0.23	10.3	0.17	13.6
						47.5	469.9875	0.03	0.31	9.6	0.23	12.8	0.18	17.1
						47.4	482.5000	0.02	0.32	5.4	0.24	7.3	0.18	NA
						47.5	496.5000	0.01	0.33	4.4	0.25	5.9	0.18	NA
						47.3	511.9875	0.02	0.34	5.0	0.26	6.7	0.19	NA
						47.2	526.9875	0.03	0.35	7.2	0.26	9.6	0.19	NA
			8	HAE6024A (470 - 494 MHz)	48.0	47.5	470.0125	0.02	0.31	5.8	0.24	7.7	0.18	NA
						47.4	482.5000	0.01	0.32	4.5	0.24	6.0	0.18	NA
						47.2	493.9875	0.02	0.33	5.8	0.25	7.8	0.18	NA
			9	HAE6026A (494 - 512 MHz)	48.0	47.3	494.9875	0.02	0.33	5.1	0.25	6.8	0.18	NA
						47.6	503.0000	0.02	0.34	5.7	0.25	7.6	0.18	NA
						47.3	511.9875	0.01	0.34	4.2	0.26	5.7	0.19	NA

17.2 Assessment of Bluetooth / WLAN Radio and Simultaneous Transmission

MPE calculation was use to determine power density for these transmitters due to lower power. According to FCC's OET Bulletin 65 Edition 97-01 Section 2, calculations can be made to predict RF field strength and power density levels around typical RF sources. Equation (5) is generally accurate in far-field of an antenna.

Equation 5 – Power Density Calculation

$$S = \frac{P_t G}{4\Pi d^2} F$$

Equation (5) accounts for the maximum duty cycle of the signal, and the factor, F, to provide a worst-case prediction of power density per FCC OET Bulletin 65, Edition 97-01 1997.

Where: S = power density
P_t = maximum output power scaled by the maximum duty cycle of the signal
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
d = distance from antenna
F = Enhancement factor [1 or 2.56 for predicting ground-level field strength]

Table 14 summarized the MPE calculation for each standalone transmitter bands, Bluetooth and WLAN.

Table 14 (FCC/ISED)

Antenna #	Max Power (W)	Duty Cycle (%)	Tx Frequency (MHz)	Antenna Gain (dBi)	Cable Loss, L (dB)	Dist., d (cm)	(4)Enhance Factor, F	Max Calc. MPE (mW/cm^2)	MPE Spec Limit (mW/cm^2)			
									FCC	% of FCC Spec Limit	ISED limit	% of ISED Spec Limit
NA Region												
WLAN2.4GHz												
Internal Antenna	0.0224	99.80%	2412.0	5.24	0.00	20	1.00	0.015	1.00	1.49	0.54	2.77
Internal Antenna	0.0224	99.80%	2437.0	5.24	0.00	20	1.00	0.015	1.00	1.49	0.54	2.75
Internal Antenna	0.0224	99.80%	2462.0	5.24	0.00	20	1.00	0.015	1.00	1.49	0.54	2.73
BLUETOOTH												
Internal Antenna	0.004	77.00%	2402.0	5.24	0.00	20	1.00	0.002	1.00	0.20	0.54	0.38
Internal Antenna	0.004	77.00%	2441.0	5.24	0.00	20	1.00	0.002	1.00	0.20	0.54	0.38
Internal Antenna	0.004	77.00%	2480.0	5.24	0.00	20	1.00	0.002	1.00	0.20	0.55	0.37

(ICNIRP)

Antenna #	Max Power (W)	Duty Cycle (%)	Tx Frequency (MHz)	Antenna Gain (dBi)	Cable Loss, L (dB)	Dist., d (cm)	(4)Enhance Factor, F	Max Calc. MPE (mW/cm^2)	MPE Spec Limit (mW/cm^2)	
									ICNIRP	% of ICNIRP Spec Limit
Other Region										
WLAN2.4GHz										
Internal Antenna	0.0302	99.20%	2412.0	5.24	0.00	20	1.00	0.020	1.00	1.99
Internal Antenna	0.0302	99.20%	2437.0	5.24	0.00	20	1.00	0.020	1.00	1.99
Internal Antenna	0.0302	99.20%	2462.0	5.24	0.00	20	1.00	0.020	1.00	1.99
BLUETOOTH										
Internal Antenna	0.003	77.00%	2402.0	5.24	0.00	20	1.00	0.002	1.00	0.16
Internal Antenna	0.003	77.00%	2441.0	5.24	0.00	20	1.00	0.002	1.00	0.16
Internal Antenna	0.003	77.00%	2480.0	5.24	0.00	20	1.00	0.002	1.00	0.16

Notes:
1) Distance from antenna (d), 20cm for more conservative estimation.
2) Cable loss (L), all cable loss include in antenna gain, so should be 0 dB.
3) Enhancement Factor (F), 1 (Ground reflection already factor in during antenna characterization)

17.3 Simultaneous Transmission

LMR bands can transmit simultaneously with Bluetooth or WLAN 2.4 GHz. Bluetooth and WLAN 2.4 GHz transmitters cannot transmit at the same time.

The highest percentage of limit for each standalone transmitters indicated in Table 15.

Table 15

Transmitters	Frequency Band (MHz)	Highest Percentage of Limit (%)		
		Passenger, Front Seat (PF)	Passenger, Back Seat (PB)	Bystander (BS)
FCC US				
LMR UHF2	450-512	36.2%	87.8%	43.0%
Bluetooth	2402 - 2480	0.20 %	0.20 %	0.20 %
WLAN 2.4 GHz	2412 - 2462	1.49 %	1.49 %	1.49 %
ISED Canada				
LMR UHF2	450-470	63.7%	154.6%	75.8%
Bluetooth	2402 - 2480	0.38 %	0.38 %	0.38 %
WLAN 2.4 GHz	2412 - 2462	2.77 %	2.77 %	2.77 %
ICNIRP				
LMR UHF2	450-527	48.2%	117.1%	57.4%
Bluetooth	2402 - 2480	0.16 %	0.16 %	0.16 %
WLAN 2.4 GHz	2412 - 2484	1.99 %	1.99 %	1.99 %

Per KDB 447498 D01, simultaneous transmission MPE test exclusion applies when the sum of MPE ratios for all simultaneous transmitting antennas incorporated in a host device is ≤ 1.0, according to calculated/estimated, numerically modeled, or measured field strengths or power density.

Calculated Maximum Power density for WLAN 2.4 GHz is greater than Bluetooth. WLAN 2.4 GHz and Bluetooth transmitters cannot transmit at the same time. Thus, WLAN 2.4 GHz will be use to evaluate simultaneous transmission test exclusion. The highest combined power density percentage for simultaneous transmission indicated in Table 16.

Table 16

Designator	Simultaneous Transmission Scenario	Highest Combined Percentage of Limit (%)		
		Passenger, Front Seat (PF)	Passenger, Back Seat (PB)	Bystander (BS)
FCC	LMR UHF2 and WLAN	37.69%	89.29%	44.49%
ISED Canada	LMR UHF2 and WLAN	66.47%	157.37%	78.57%
ICNIRP	LMR UHF2 and WLAN	50.19%	119.09%	59.39%

18.0 Conclusion

The assessments for this device were performed with an output power range as indicated in section 17.1 (for LMR) and 17.2 (for BT/WLAN). 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 and BT/WLAN transmitters scaled to maximum allowable power output are indicated in Table 17 and 18 for internal/passenger to the vehicle, and external/bystander to the vehicle.

Table 17: Maximum MPE RF Exposure Summary (LMR)

Designator	Transmitters	Frequency Band (MHz)	Passenger (mW/cm^2)	Bystander (mW/cm^2)
FCC	LMR UHF2	450-512	0.26	0.13
ISED Canada	LMR UHF2	450-470	0.26	0.13
ICNIRP	LMR UHF2	450-527	0.26	0.13

Table 18: Maximum MPE RF Exposure Summary (BT/WLAN)

Designator	Transmitters	Frequency Band (MHz)	Passenger (mW/cm^2)	Bystander (mW/cm^2)
FCC / ISED Canada	Bluetooth	2402-2480	0.002	0.002
	WLAN	2412-2462	0.015	0.015
ICNIRP	Bluetooth	2402-2480	0.002	0.002
	WLAN	2412-2484	0.020	0.020

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

Although MPE is a convenience method of demonstrating RF Exposure requirements, SAR is recognized as the “basic restriction”. For those configurations in the Table8-13 with ‘*’, compliance to the General Population / Uncontrolled SAR 1g limit of 1.6W/kg is demonstrated through SAR computational analysis.

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

Table 19

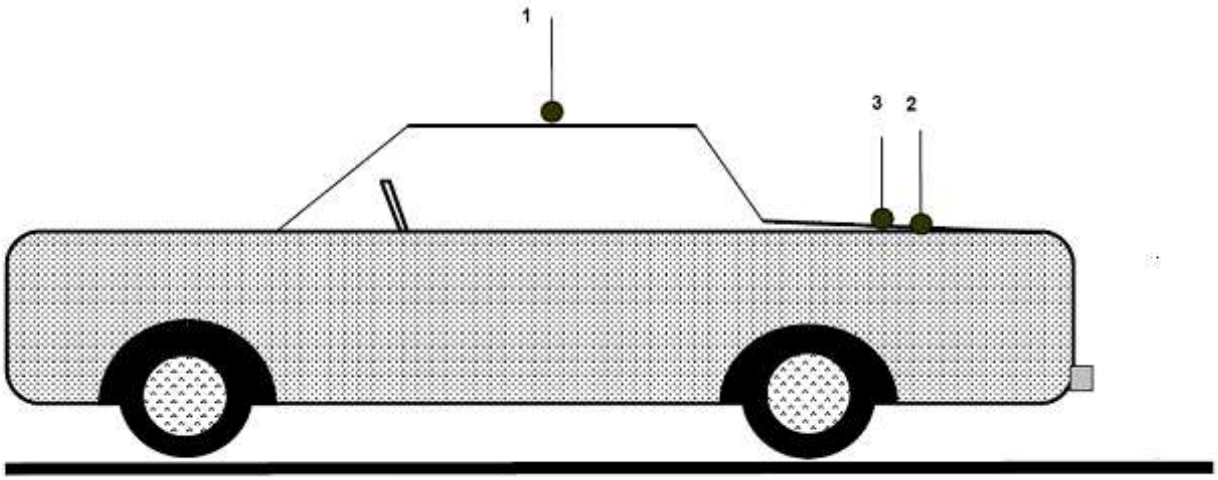
Designator	Exposure Conditions	Maximum peak average SAR(1g)
ISED Canada	Passenger	0.66 W/kg
ICNIRP	Passenger	0.45 W/kg

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.

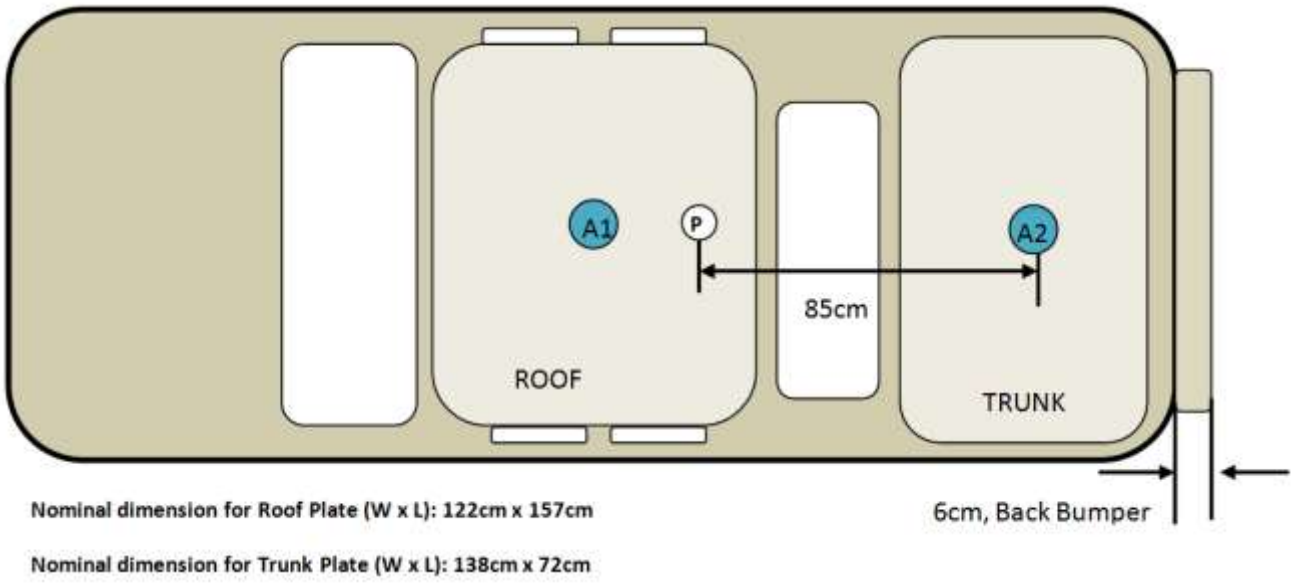
Appendix A - Antenna Locations, Test Distances, and Cable Losses

Antenna locations



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

Passenger Antenna mounting
(UHF2)



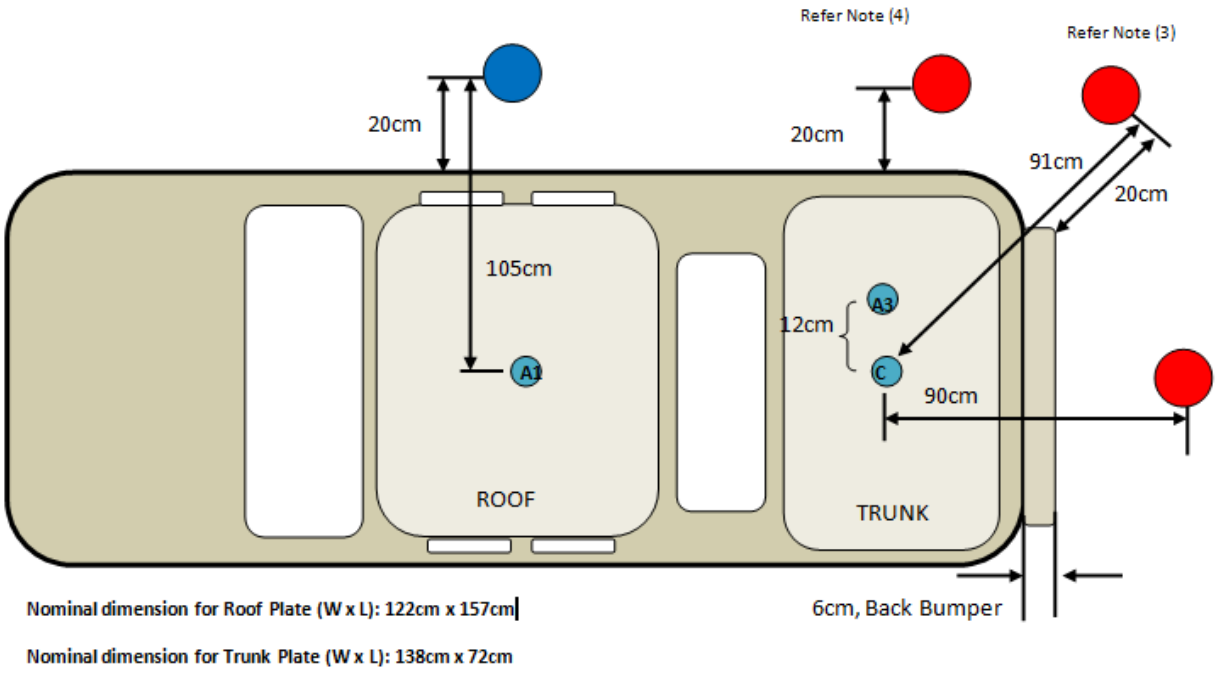
Notes:

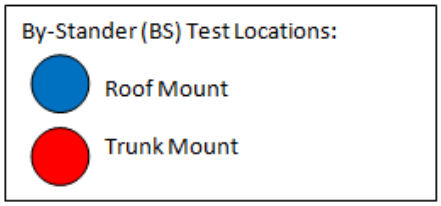
1.) Antenna location A1: Mobile radio roof antenna mounting locations for passenger back and front testing (UHF2)

2.) Antenna location A2: 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)

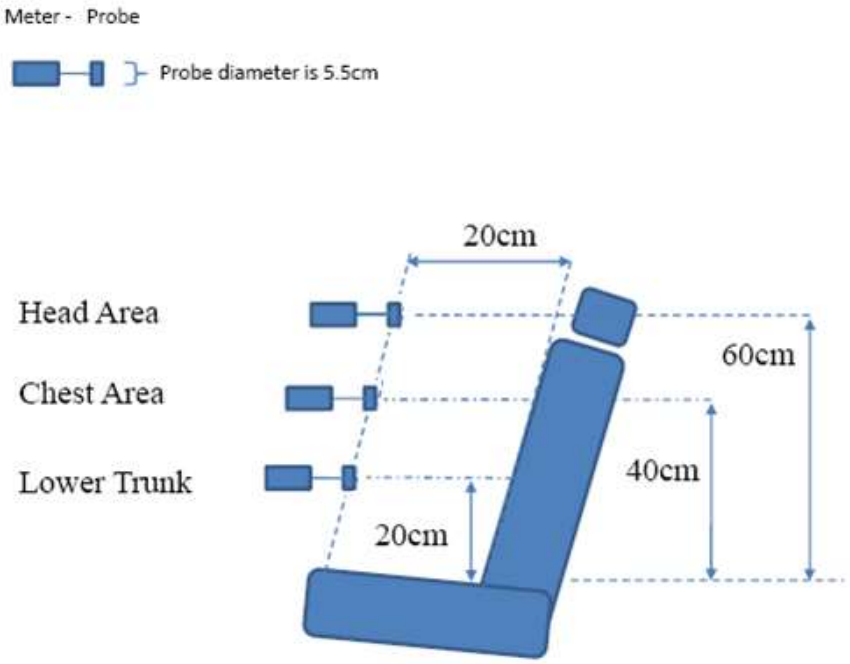




Notes:

1) Antenna location A1: Mobile radio roof antenna mounting location.
2) Antenna location A3: Mobile radio trunk antenna mounting location for bystander testing. (12cm away from the center)
3) 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.
4) 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)



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

ilac-MRA ACCREDITED Calibration Laboratory Certificate 1307.01

Cert I.D.: 143584

ETS·LINDGREN
An ESCO Technologies Company
1301 Arrow Point Drive
Cedar Park, Texas 78613
(512) 531-6400

ETS·LINDGREN
Track# S000053304 Ltd Cal ☐
By SB Date 27-Jan-22
Next Cal Due
www.ets-lindgren.com

Certificate of Calibration Conformance

Page 1 of 3

The instrument identified below has been individually calibrated in compliance with the following standard(s):
IEEE 1309 - 2013, Institute of Electrical and Electronics Engineers, Standard for Calibration of Electromagnetic Field Sensors and Probes, Excluding Antennas from 9 kHz to 40 GHz

Environment: Laboratory MTE is maintained in a temperature controlled environment with ambient conditions from 18 to 28 C, relative humidity less than 90%. The instrument under test has been calibrated in a suitable environment using an EMCO TEM Cell 5101C, GTEM 5305/5402 and an RF Shielded EMC Chamber which is conducive to maintaining accurate and reliable measurement quality.

Manufacturer:	ETS-Lindgren	**Operating Range:**	100kHz - 5GHz
Model Number:	E100	**Instrument Type:**	Isotropic Probe > 1 GHz
Serial Number/ ID:	*00237361*	**Date Code:**	
Tracking Number:	**S 000053304**	**Alternate ID:**	
Date Completed:	27-Jan-22	**Customer:**	Motorola Solutions Malaysia Sdn Bhd - Plot 2A, Medan Bayan Lepas, Mukim 12 S.W.D. - Bayan Lepas - Penang 11900 - Malaysia
Test Type:	Standard Field, Field Strength		

Calibration Uncertainty: Std Field Method 100kHz - 6 GHz, +/-0.64 dB, Linearity +/- 0.95 dB, Isotropicity +/- 0.86
k=2, (95% Confidence Level)

Test Remarks: Probe received in tolerance thus before and after data are the same. Additional frequency data provided per customer. Functional test performed with customer's HI-2200 S/N: 00206805.

Calibration Traceability: This document provides traceability of measurements to recognized national standards to using controlled processes. Any uncertainties listed are derived from the methods described in NIST Tech Note 1297 and other guides to the uncertainty of measurement. This certificate and any reported data may not be reproduced, except in ful, without the written approval of ETS-Lindgren Calibration Laboratory in accordance with ISO/IEC 17025-2017 and ANSI/NCSL Z540-1-1994. The results in this document relate only to the item(s) listed and should not be considered representative of a populations unless otherwise noted.

Standards and Equipment Used:
Make / Model / Name / S/N / Calibration Date

HP	8648C	Signal Generator	3836U02236	07-May-22
Keysight	E9304A	Power Sensor	MY56100039	15-Apr-22
Rohde & Schwarz	SMB 100A	Signal Generator	101558	16-Nov-22
Agilent	N5181B	MXG Signal Generator	MY51350051	07-Apr-22
Agilent	E9304A	Power Sensor	MY41499013	15-Apr-22
Agilent	E9304A	Power Sensor	MY41499012	15-Apr-22
Rohde & Schwarz	NRP-Z91	Power Sensor	100734	21-Oct-22
Rohde & Schwarz	NRP-Z91	Power Sensor	100246	06-Aug-22
Rohde & Schwarz	NRP-Z91	Power Sensor	100732	06-Aug-22
Agilent	E4419B	Power Meter	MY40510693	04-Aug-22
Agilent	E4419B	Power Meter	GB40202754	08-Apr-22
ETS-Lindgren	Probe Chamber	Probe Chamber	CL504	05-Nov-22
Rohde & Schwarz	NRVD	Power Meter	828110/019	09-Apr-22
Keysight	E9304A	Power Sensor	MY56100005	15-Apr-22
Rohde & Schwarz	NRV-Z55	Thermal Power Sensor	100352	21-Oct-22
Rohde & Schwarz	NRV-Z55	Thermal Power Sensor	100362	06-Aug-22
Agilent	N5181A	Signal Generator	MY50140851	06-Aug-22
Keysight	N5183B	MXG Analog Signal Gener	MY53270789	16-Apr-22

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

On Release:
In Tolerance to Internal Quality Standards

Calibration Completed By
Shane Bennett, Calibration Technician

Attested and Issued on 27-Jan-22
George Cismaros, Calibration Supervisor

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CALIBRATION REPORT

Electric Field Sensor

Model	*S/N*
E100	00237361
HI-2200	00206805

Date: 27 Jan 2022

_ New Instrument
_ Other
_ Out of Tolerance
X Within Tolerance

Frequency Response

Frequency Response		*Nominal Field*	*Cal Factor**	*Deviation*
	MHz	*V/m*	(Eapplied/Eindicated)	*dB*
1	1	20	1.04	-0.33
2	15	20	1.02	-0.16
3	30	20	1.02	-0.13
4	75	20	1.02	-0.21
5	100	20	1.03	-0.26
6	150	20	1.03	-0.27
7	200	20	1.02	-0.18
8	250	20	1.02	-0.19
9	300	20	1.01	-0.07
10	400	20	1.04	-0.38
11	500	20	0.94	0.50
12	600	20	0.94	0.55
13	700	20	0.99	0.07
14	800	20	1.00	0.02
15	900	20	1.03	-0.28
16	1000	20	1.02	-0.14
17	2000	20	0.97	0.28
18	2450	20	0.97	0.29
19	3000	20	1.01	-0.11
20	3500	20	0.96	0.38
21	4000	20	0.96	0.33
22	5000	20	1.08	-0.66
23	5500	20	1.25	-1.91
24	6000	20	1.36	-2.69

* Corrected electric field values (V/m) can be obtained by multiplying the Cal Factor with the indicated E field readings.

Linearity

maximum linearity deviation is 0.23 dB

(measurements taken from 0.3 V/m to 800 V/m at 27.12 MHz)

Test Conditions

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

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PROBE ROTATIONAL RESPONSE

Model	E100
S/N	00237361
Report	S000053304
Date	Date of Calibration 27 January 2022
Isotropy *	+ 0.1 dB/ -0.1 dB

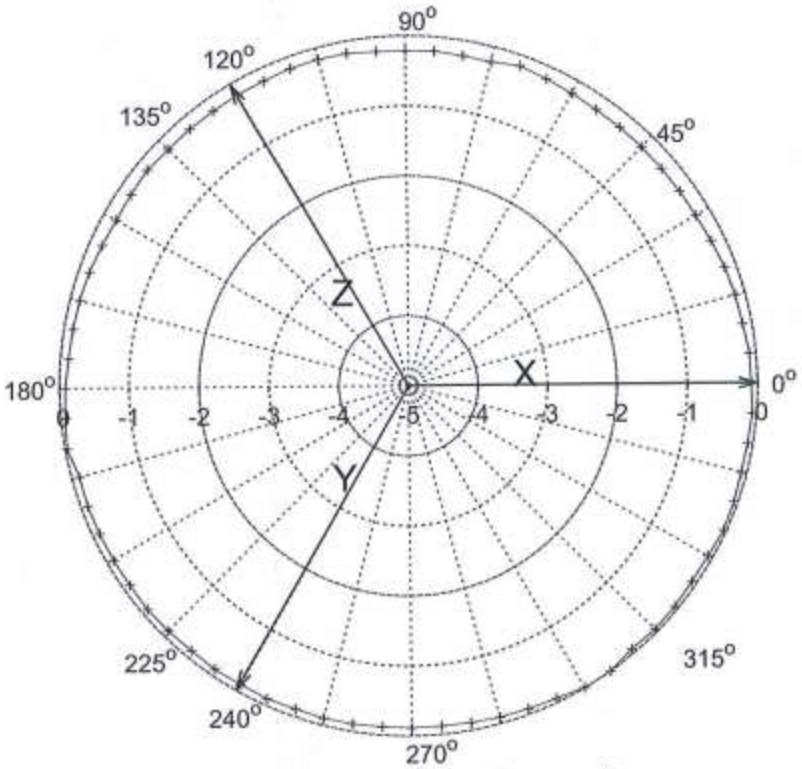

Figure 1: Probe Isotropic Response Chart.

Isotropic response is measured in a 20 V/m field at 400 MHz
*Isotropy is the maximum deviation from the geometric mean as defined by IEEE 1309-2013.

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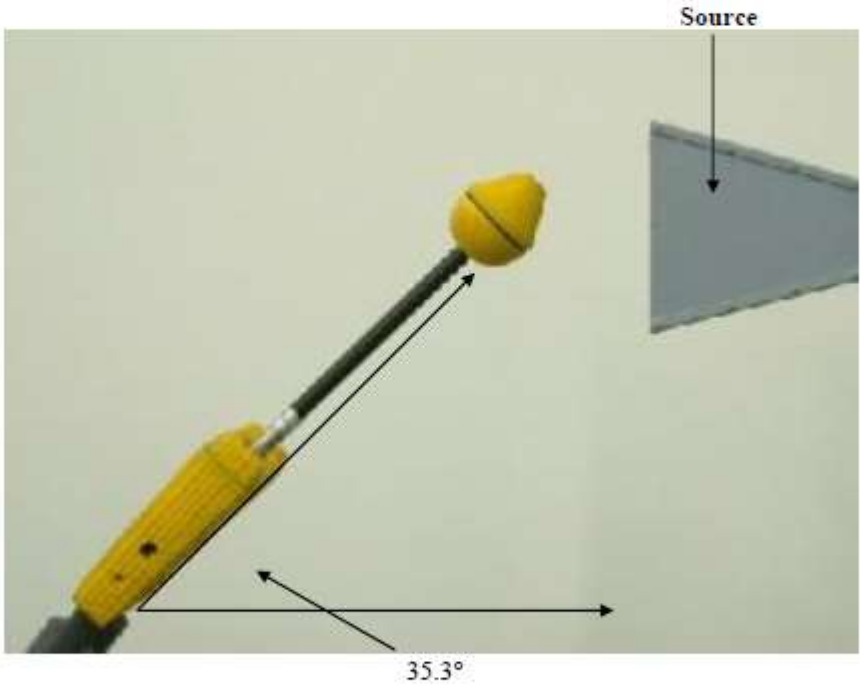
W&G_critical_angle.doc

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° 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

MPE calculations are defined in section 15.0.

D.U.T. Info.								Probe Info.			MPE Measurements														
												Bystander (BS) Positions													
(2)Ant Loc.	Ant. Model/ Desc.	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	(5) Test Pos.	(6) Meas. Unit	20 cm	40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm	200 cm	DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Roof	HAE4003A (450 - 470 MHz)	2.15	90	450.0125	48.0	47.2	CW	E	0.990	BS	2	0.008	0.010	0.014	0.031	0.063	0.091	0.229	0.273	0.349	0.359	0.5	0.141	0.071	0.070
Roof	HAE4003A (450 - 470 MHz)	2.15	90	460.0000	48.0	47.1	CW	E	0.980	BS	2	0.004	0.006	0.015	0.039	0.061	0.111	0.181	0.287	0.298	0.255	0.5	0.123	0.062	0.060
Roof	HAE4003A (450 - 470 MHz)	2.15	90	469.9875	48.0	47.5	CW	E	0.970	BS	2	0.008	0.014	0.025	0.058	0.072	0.098	0.151	0.258	0.315	0.321	0.5	0.128	0.064	0.060
Roof	HAE4004A (470 - 512 MHz)	2.15	90	470.0125	48.0	47.5	CW	E	0.970	BS	2	0.007	0.011	0.019	0.054	0.070	0.105	0.181	0.292	0.334	0.326	0.5	0.136	0.068	0.070
Roof	HAE4004A (470 - 512 MHz)	2.15	90	484.0000	48.0	47.5	CW	E	0.960	BS	2	0.004	0.011	0.015	0.030	0.044	0.084	0.156	0.244	0.347	0.378	0.5	0.126	0.063	0.060
Roof	HAE4004A (470 - 512 MHz)	2.15	90	498.0000	48.0	47.7	CW	E	0.940	BS	2	0.005	0.011	0.013	0.038	0.077	0.100	0.155	0.240	0.364	0.393	0.5	0.131	0.066	0.070
Roof	HAE4004A (470 - 512 MHz)	2.15	90	511.9875	48.0	47.3	CW	E	0.940	BS	2	0.005	0.008	0.015	0.050	0.078	0.081	0.133	0.196	0.285	0.322	0.5	0.110	0.055	0.060
Roof	HAE4011A (450 - 470 MHz)	5.65	90	450.0125	48.0	47.2	CW	E	0.990	BS	2	0.001	0.001	0.001	0.003	0.009	0.034	0.108	0.170	0.288	0.238	0.5	0.084	0.042	0.040
Roof	HAE4011A (450 - 470 MHz)	5.65	90	460.0000	48.0	47.1	CW	E	0.980	BS	2	0.001	0.001	0.001	0.003	0.005	0.017	0.072	0.197	0.319	0.261	0.5	0.086	0.043	0.040
Roof	HAE4011A (450 - 470 MHz)	5.65	90	469.9875	48.0	47.5	CW	E	0.970	BS	2	0.001	0.001	0.002	0.005	0.008	0.016	0.067	0.173	0.299	0.266	0.5	0.081	0.041	0.040
Roof	HAE4012A (470 - 494 MHz)	5.65	90	470.0125	48.0	47.5	CW	E	0.970	BS	2	0.002	0.004	0.011	0.029	0.047	0.063	0.152	0.272	0.317	0.222	0.5	0.109	0.054	0.050
Roof	HAE4012A (470 - 494 MHz)	5.65	90	482.5000	48.0	47.4	CW	E	0.960	BS	2	0.001	0.003	0.005	0.006	0.018	0.046	0.131	0.266	0.302	0.211	0.5	0.095	0.047	0.050
Roof	HAE4012A (470 - 494 MHz)	5.65	90	494.9875	48.0	47.3	CW	E	0.950	BS	2	0.001	0.004	0.004	0.009	0.022	0.041	0.106	0.228	0.296	0.228	0.5	0.089	0.045	0.050
Roof	HAE4013A (494 - 512 MHz)	5.65	90	494.9875	48.0	47.3	CW	E	0.950	BS	2	0.001	0.007	0.012	0.018	0.041	0.093	0.193	0.309	0.384	0.258	0.5	0.125	0.063	0.060
Roof	HAE4013A (494 - 512 MHz)	5.65	90	503.0000	48.0	47.6	CW	E	0.940	BS	2	0.003	0.006	0.007	0.022	0.050	0.064	0.176	0.251	0.304	0.222	0.5	0.104	0.052	0.050
Roof	HAE4013A (494 - 512 MHz)	5.65	90	511.9875	48.0	47.3	CW	E	0.940	BS	2	0.002	0.003	0.005	0.019	0.037	0.045	0.105	0.135	0.256	0.210	0.5	0.077	0.038	0.040

Table D.1 (Continued)

MPE measurement data for Bystander

MPE calculations are defined in section 15.0.

D.U.T. Info.								Probe Info.			MPE Measurements														
												Bystander (BS) Positions													
(2)Ant Loc.	Ant. Model/ Desc.	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	(5) Test Pos.	(6) Meas. Unit	20 cm	40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm	200 cm	DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Roof	HAE6020A (470 - 527 MHz)	2.15	90	470.0125	48.0	47.5	CW	E	0.970	BS	2	0.006	0.002	0.004	0.013	0.017	0.037	0.070	0.095	0.101	0.100	0.5	0.043	0.022	0.020
Roof	HAE6020A (470 - 527 MHz)	2.15	90	482.5000	48.0	47.4	CW	E	0.960	BS	2	0.001	0.005	0.006	0.019	0.037	0.054	0.094	0.164	0.212	0.232	0.5	0.079	0.040	0.040
Roof	HAE6020A (470 - 527 MHz)	2.15	90	496.5000	48.0	47.5	CW	E	0.940	BS	2	0.004	0.008	0.009	0.028	0.062	0.080	0.119	0.222	0.293	0.315	0.5	0.107	0.054	0.050
Roof	HAE6020A (470 - 527 MHz)	2.15	90	511.9875	48.0	47.3	CW	E	0.940	BS	2	0.005	0.010	0.016	0.059	0.085	0.094	0.138	0.204	0.285	0.319	0.5	0.114	0.057	0.060
Roof	HAE6020A (470 - 527 MHz)	2.15	90	526.9875	48.0	47.2	CW	E	0.940	BS	2	0.002	0.005	0.009	0.024	0.035	0.059	0.105	0.175	0.202	0.191	0.5	0.076	0.038	0.040
Roof	HAE6022A (403-527 MHz)	4.15	90	450.0125	48.0	47.2	CW	E	0.990	BS	2	0.008	0.015	0.016	0.041	0.073	0.121	0.236	0.393	0.422	0.297	0.5	0.161	0.080	0.080
Roof	HAE6022A (403-527 MHz)	4.15	90	469.9875	48.0	47.5	CW	E	0.970	BS	2	0.008	0.010	0.016	0.049	0.059	0.142	0.204	0.301	0.297	0.268	0.5	0.131	0.066	0.070
Roof	HAE6022A (403-527 MHz)	4.15	90	482.5000	48.0	47.4	CW	E	0.960	BS	2	0.003	0.008	0.011	0.032	0.052	0.079	0.149	0.252	0.302	0.279	0.5	0.112	0.056	0.060
Roof	HAE6022A (403-527 MHz)	4.15	90	496.5000	48.0	47.5	CW	E	0.940	BS	2	0.006	0.011	0.010	0.035	0.079	0.096	0.169	0.291	0.325	0.314	0.5	0.126	0.063	0.060
Roof	HAE6022A (403-527 MHz)	4.15	90	511.9875	48.0	47.3	CW	E	0.940	BS	2	0.006	0.013	0.016	0.064	0.098	0.105	0.139	0.233	0.306	0.307	0.5	0.121	0.060	0.060
Roof	HAE6022A (403-527 MHz)	4.15	90	526.9875	48.0	47.2	CW	E	0.940	BS	2	0.006	0.012	0.018	0.048	0.052	0.099	0.220	0.319	0.351	0.311	0.5	0.135	0.067	0.070
Roof	HAE6024A (470 - 494 MHz)	5.15	90	470.0125	48.0	47.5	CW	E	0.970	BS	2	0.006	0.009	0.013	0.040	0.057	0.109	0.175	0.245	0.234	0.210	0.5	0.107	0.053	0.050
Roof	HAE6024A (470 - 494 MHz)	5.15	90	482.5000	48.0	47.4	CW	E	0.960	BS	2	0.003	0.008	0.011	0.024	0.049	0.083	0.148	0.218	0.248	0.269	0.5	0.102	0.051	0.050
Roof	HAE6024A (470 - 494 MHz)	5.15	90	493.9875	48.0	47.2	CW	E	0.950	BS	2	0.003	0.008	0.014	0.035	0.073	0.104	0.196	0.300	0.345	0.297	0.5	0.131	0.065	0.070
Roof	HAE6026A (494 - 512 MHz)	5.15	90	494.9875	48.0	47.3	CW	E	0.950	BS	2	0.002	0.011	0.012	0.031	0.071	0.094	0.154	0.262	0.314	0.276	0.5	0.117	0.058	0.060
Roof	HAE6026A (494 - 512 MHz)	5.15	90	503.0000	48.0	47.6	CW	E	0.940	BS	2	0.005	0.008	0.013	0.048	0.084	0.087	0.145	0.208	0.271	0.242	0.5	0.104	0.052	0.050
Roof	HAE6026A (494 - 512 MHz)	5.15	90	511.9875	48.0	47.3	CW	E	0.940	BS	2	0.005	0.014	0.016	0.059	0.097	0.092	0.148	0.219	0.278	0.277	0.5	0.113	0.057	0.060

Table D.1 (Continued)

MPE measurement data for Bystander

MPE calculations are defined in section 15.0.

D.U.T. Info.								Probe Info.			MPE Measurements														
												Bystander (BS) Positions													
[2]Ant Loc.	Ant. Model/ Desc.	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	[5] Test Pos.	[6] Meas. Unit	20 cm	40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm	200 cm	DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Roof	PMAE4033A (450 - 470 MHz)	5.65	90	450.0125	48.0	47.2	CW	E	0.990	BS	2	0.008	0.015	0.020	0.049	0.069	0.113	0.272	0.370	0.387	0.279	0.5	0.157	0.078	0.080
Roof	PMAE4033A (450 - 470 MHz)	5.65	90	460.0000	48.0	47.1	CW	E	0.980	BS	2	0.004	0.013	0.011	0.038	0.051	0.105	0.209	0.338	0.330	0.243	0.5	0.132	0.066	0.070
Roof	PMAE4033A (450 - 470 MHz)	5.65	90	469.9875	48.0	47.5	CW	E	0.970	BS	2	0.008	0.012	0.020	0.048	0.063	0.128	0.222	0.316	0.286	0.264	0.5	0.133	0.066	0.070
Roof	PMAE4041A (450 - 470 MHz)	2.15	90	450.0125	48.0	47.2	CW	E	0.990	BS	2	0.001	0.001	0.002	0.003	0.006	0.010	0.019	0.031	0.037	0.033	0.5	0.014	0.007	0.010
Roof	PMAE4041A (450 - 470 MHz)	2.15	90	460.0000	48.0	47.1	CW	E	0.980	BS	2	0.001	0.001	0.002	0.007	0.009	0.017	0.035	0.058	0.059	0.053	0.5	0.024	0.012	0.010
Roof	PMAE4041A (450 - 470 MHz)	2.15	90	469.9875	48.0	47.5	CW	E	0.970	BS	2	0.001	0.002	0.004	0.010	0.011	0.026	0.046	0.069	0.074	0.071	0.5	0.030	0.015	0.020
Roof	PMAE4043A (450- 470 MHz)	7.15	90	450.0125	48.0	47.2	CW	E	0.990	BS	2	0.003	0.005	0.005	0.012	0.031	0.063	0.183	0.380	0.461	0.373	0.5	0.150	0.075	0.080
Roof	PMAE4043A (450- 470 MHz)	7.15	90	460.0000	48.0	47.1	CW	E	0.980	BS	2	0.004	0.003	0.003	0.013	0.015	0.039	0.144	0.337	0.459	0.385	0.5	0.137	0.069	0.070
Roof	PMAE4043A (450- 470 MHz)	7.15	90	469.9875	48.0	47.5	CW	E	0.970	BS	2	0.002	0.004	0.006	0.015	0.022	0.054	0.128	0.283	0.379	0.341	0.5	0.120	0.060	0.060
Roof	RAE4004ARB (445-470 MHz)	7.15	90	450.0125	48.0	47.2	CW	E	0.990	BS	2	0.003	0.002	0.003	0.009	0.011	0.009	0.039	0.164	0.362	0.406	0.5	0.100	0.050	0.050
Roof	RAE4004ARB (445-470 MHz)	7.15	90	460.0000	48.0	47.1	CW	E	0.980	BS	2	0.001	0.002	0.002	0.006	0.004	0.012	0.071	0.217	0.387	0.340	0.5	0.102	0.051	0.050
Roof	RAE4004ARB (445-470 MHz)	7.15	90	469.9875	48.0	47.5	CW	E	0.970	BS	2	0.003	0.003	0.006	0.011	0.021	0.024	0.079	0.198	0.344	0.349	0.5	0.101	0.050	0.050
Trunk	HAE4011A (450 - 470 MHz)	5.65	90	450.0125	48.0	47.2	CW	E	0.990	BS	2	0.003	0.001	0.007	0.026	0.134	0.352	0.392	0.229	0.073	0.081	0.5	0.129	0.064	0.070
Trunk	HAE4011A (450 - 470 MHz)	5.65	90	460.0000	48.0	47.1	CW	E	0.980	BS	2	0.005	0.003	0.008	0.022	0.105	0.301	0.417	0.264	0.079	0.074	0.5	0.125	0.063	0.060
Trunk	HAE4011A (450 - 470 MHz)	5.65	90	469.9875	48.0	47.5	CW	E	0.970	BS	2	0.009	0.007	0.009	0.023	0.135	0.383	0.456	0.290	0.105	0.094	0.5	0.147	0.073	0.070

Table D.1 (Continued)

MPE measurement data for Bystander

MPE calculations are defined in section 15.0.

D.U.T. Info.								Probe Info.			MPE Measurements														
												Bystander (BS) Positions													
[2]Ant Loc.	Ant. Model/ Desc.	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	[5] Test Pos.	[6] Meas. Unit	20 cm	40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm	200 cm	DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Trunk	HAE4012A (470 - 494 MHz)	5.65	90	470.0125	48.0	47.5	CW	E	0.970	BS	2	0.005	0.007	0.017	0.054	0.230	0.499	0.505	0.304	0.076	0.059	0.5	0.170	0.085	0.090
Trunk	HAE4012A (470 - 494 MHz)	5.65	90	482.5000	48.0	47.4	CW	E	0.960	BS	2	0.012	0.017	0.025	0.041	0.176	0.388	0.426	0.226	0.078	0.063	0.5	0.139	0.070	0.070
Trunk	HAE4012A (470 - 494 MHz)	5.65	90	494.9875	48.0	47.3	CW	E	0.950	BS	2	0.013	0.011	0.021	0.049	0.168	0.344	0.368	0.206	0.060	0.036	0.5	0.121	0.061	0.060
Trunk	HAE4013A (494 - 512 MHz)	5.65	90	494.9875	48.0	47.3	CW	E	0.950	BS	2	0.007	0.008	0.018	0.080	0.245	0.452	0.455	0.244	0.043	0.036	0.5	0.151	0.075	0.080
Trunk	HAE4013A (494 - 512 MHz)	5.65	90	503.0000	48.0	47.6	CW	E	0.940	BS	2	0.004	0.005	0.021	0.053	0.157	0.361	0.378	0.212	0.037	0.025	0.5	0.118	0.059	0.060
Trunk	HAE4013A (494 - 512 MHz)	5.65	90	511.9875	48.0	47.3	CW	E	0.940	BS	2	0.005	0.012	0.027	0.040	0.104	0.259	0.261	0.135	0.036	0.022	0.5	0.085	0.042	0.040
Trunk	HAE6022A (403-527 MHz)	4.15	90	450.0125	48.0	47.2	CW	E	0.990	BS	2	0.085	0.056	0.104	0.126	0.328	0.414	0.442	0.351	0.216	0.101	0.5	0.220	0.110	0.110
Trunk	HAE6022A (403-527 MHz)	4.15	90	469.9875	48.0	47.5	CW	E	0.970	BS	2	0.060	0.053	0.097	0.146	0.298	0.431	0.443	0.294	0.169	0.093	0.5	0.202	0.101	0.100
Trunk	HAE6022A (403-527 MHz)	4.15	90	482.5000	48.0	47.4	CW	E	0.960	BS	2	0.064	0.057	0.091	0.130	0.300	0.467	0.441	0.305	0.163	0.073	0.5	0.201	0.100	0.100
Trunk	HAE6022A (403-527 MHz)	4.15	90	496.5000	48.0	47.5	CW	E	0.940	BS	2	0.041	0.052	0.071	0.155	0.304	0.403	0.311	0.154	0.085	0.045	0.5	0.152	0.076	0.080
Trunk	HAE6022A (403-527 MHz)	4.15	90	511.9875	48.0	47.3	CW	E	0.940	BS	2	0.033	0.051	0.071	0.128	0.234	0.351	0.260	0.144	0.090	0.062	0.5	0.134	0.067	0.070
Trunk	HAE6022A (403-527 MHz)	4.15	90	526.9875	48.0	47.2	CW	E	0.940	BS	2	0.058	0.038	0.086	0.132	0.278	0.421	0.410	0.312	0.171	0.077	0.5	0.186	0.093	0.090
Trunk	HAE6024A (470 - 494 MHz)	5.15	90	470.0125	48.0	47.5	CW	E	0.970	BS	2	0.044	0.039	0.082	0.126	0.277	0.412	0.371	0.249	0.122	0.066	0.5	0.173	0.087	0.090
Trunk	HAE6024A (470 - 494 MHz)	5.15	90	482.5000	48.0	47.4	CW	E	0.960	BS	2	0.047	0.046	0.079	0.106	0.238	0.385	0.361	0.240	0.130	0.057	0.5	0.162	0.081	0.080
Trunk	HAE6024A (470 - 494 MHz)	5.15	90	493.9875	48.0	47.2	CW	E	0.950	BS	2	0.046	0.040	0.061	0.140	0.263	0.358	0.309	0.174	0.079	0.039	0.5	0.143	0.072	0.070

Table D.1 (Continued)

MPE measurement data for Bystander

MPE calculations are defined in section 15.0.

D.U.T. Info.								Probe Info.			MPE Measurements															
												Bystander (BS) Positions														
(2)Ant Loc.	Ant. Model/ Desc.	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	(5) Test Pos.	(6) Meas. Unit	20 cm	40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm	200 cm	DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Trunk	HAE6026A (494 - 512 MHz)	5.15	90	494.9875	48.0	47.3	CW	E	0.950	BS	2	0.039	0.041	0.060	0.117	0.261	0.327	0.270	0.168	0.079	0.038	0.5	0.133	0.067	0.070
Trunk	HAE6026A (494 - 512 MHz)	5.15	90	503.0000	48.0	47.6	CW	E	0.940	BS	2	0.032	0.042	0.062	0.114	0.210	0.314	0.289	0.171	0.078	0.040	0.5	0.127	0.064	0.060
Trunk	HAE6026A (494 - 512 MHz)	5.15	90	511.9875	48.0	47.3	CW	E	0.940	BS	2	0.029	0.049	0.061	0.114	0.221	0.302	0.236	0.140	0.090	0.035	0.5	0.120	0.060	0.060
Trunk	PMAE4033A (450 - 470 MHz)	5.65	90	450.0125	48.0	47.2	CW	E	0.990	BS	2	0.078	0.057	0.095	0.111	0.275	0.395	0.398	0.309	0.158	0.092	0.5	0.195	0.097	0.100
Trunk	PMAE4033A (450 - 470 MHz)	5.65	90	460.0000	48.0	47.1	CW	E	0.980	BS	2	0.060	0.034	0.077	0.122	0.297	0.379	0.384	0.250	0.134	0.051	0.5	0.175	0.088	0.090
Trunk	PMAE4033A (450 - 470 MHz)	5.65	90	469.9875	48.0	47.5	CW	E	0.970	BS	2	0.054	0.041	0.086	0.139	0.328	0.459	0.389	0.285	0.134	0.079	0.5	0.193	0.097	0.100
Trunk	PMAE4043A (450- 470 MHz)	7.15	90	450.0125	48.0	47.2	CW	E	0.990	BS	2	0.025	0.013	0.026	0.057	0.179	0.487	0.580	0.405	0.125	0.058	0.5	0.194	0.097	0.100
Trunk	PMAE4043A (450- 470 MHz)	7.15	90	460.0000	48.0	47.1	CW	E	0.980	BS	2	0.019	0.011	0.018	0.039	0.117	0.440	0.549	0.324	0.099	0.038	0.5	0.162	0.081	0.080
Trunk	PMAE4043A (450- 470 MHz)	7.15	90	469.9875	48.0	47.5	CW	E	0.970	BS	2	0.018	0.016	0.028	0.065	0.256	0.557	0.635	0.383	0.087	0.029	0.5	0.201	0.101	0.100
Trunk	RAE4004ARB (445-470 MHz)	7.15	90	450.0125	48.0	47.2	CW	E	0.990	BS	2	0.028	0.027	0.031	0.014	0.042	0.227	0.386	0.378	0.197	0.106	0.5	0.142	0.071	0.070
Trunk	RAE4004ARB (445-470 MHz)	7.15	90	460.0000	48.0	47.1	CW	E	0.980	BS	2	0.029	0.022	0.018	0.011	0.085	0.333	0.466	0.338	0.127	0.060	0.5	0.146	0.073	0.070
Trunk	RAE4004ARB (445-470 MHz)	7.15	90	469.9875	48.0	47.5	CW	E	0.970	BS	2	0.032	0.015	0.024	0.046	0.170	0.386	0.498	0.323	0.084	0.024	0.5	0.155	0.078	0.080
Trunk	HAE6022A (403-527 MHz)	4.15	90	450.0125	48.0	47.2	CW	E	0.990	BS	2	0.085	0.056	0.104	0.126	0.328	0.414	0.442	0.351	0.216	0.101	0.5	0.220	0.110	0.110
Trunk	HAE6022A (403-527 MHz)	4.15	90	450.0125	48.0	47.2	CW	E	0.990	BS	2	0.034	0.050	0.104	0.219	0.417	0.529	0.528	0.355	0.205	0.123	0.5	0.254	0.127	0.130
Trunk	HAE6022A (403-527 MHz)	4.15	90	450.0125	48.0	47.2	CW	E	0.990	BS	2	0.085	0.056	0.104	0.126	0.328	0.414	0.442	0.351	0.216	0.101	0.5	0.220	0.110	0.110
Trunk	HAE6022A (403-527 MHz)	4.15	90	450.0125	48.0	47.2	CW	E	0.990	BS	2	0.035	0.044	0.079	0.088	0.229	0.377	0.382	0.235	0.219	0.047	0.5	0.172	0.086	0.090

Table D.2

MPE measurement data for Passenger Back

MPE calculations are defined in section 15.0.

D.U.T. Info.								Probe Info.			[6] Meas. Unit							
[2]Ant Loc.	Ant. Model/ Desc.	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	[5] Test Pos.	MPE Measurements	Head/ Top 1/3	Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3	DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Roof	HAE4003A (450 - 470 MHz)	2.15	NA	450.0125	48.0	47.2	CW	E	0.990	PB	2	0.053	0.069	0.055	0.5	0.058	0.029	0.030
Roof	HAE4003A (450 - 470 MHz)	2.15	NA	460.0000	48.0	47.1	CW	E	0.980	PB	2	0.057	0.105	0.084	0.5	0.080	0.040	0.040
Roof	HAE4003A (450 - 470 MHz)	2.15	NA	469.9875	48.0	47.5	CW	E	0.970	PB	2	0.060	0.075	0.080	0.5	0.070	0.035	0.040
Roof	HAE4004A (470 - 512 MHz)	2.15	NA	470.0125	48.0	47.5	CW	E	0.970	PB	2	0.067	0.073	0.115	0.5	0.082	0.041	0.040
Roof	HAE4004A (470 - 512 MHz)	2.15	NA	484.0000	48.0	47.5	CW	E	0.960	PB	2	0.079	0.050	0.067	0.5	0.063	0.031	0.030
Roof	HAE4004A (470 - 512 MHz)	2.15	NA	498.0000	48.0	47.7	CW	E	0.940	PB	2	0.038	0.042	0.023	0.5	0.032	0.016	0.020
Roof	HAE4004A (470 - 512 MHz)	2.15	NA	511.9875	48.0	47.3	CW	E	0.940	PB	2	0.023	0.021	0.037	0.5	0.025	0.013	0.010
Roof	HAE4011A (450 - 470 MHz)	5.65	NA	450.0125	48.0	47.2	CW	E	0.990	PB	2	0.008	0.005	0.005	0.5	0.006	0.003	0.000
Roof	HAE4011A (450 - 470 MHz)	5.65	NA	460.0000	48.0	47.1	CW	E	0.980	PB	2	0.005	0.012	0.008	0.5	0.008	0.004	0.000
Roof	HAE4011A (450 - 470 MHz)	5.65	NA	469.9875	48.0	47.5	CW	E	0.970	PB	2	0.016	0.014	0.013	0.5	0.014	0.007	0.010
Roof	HAE4012A (470 - 494 MHz)	5.65	NA	470.0125	48.0	47.5	CW	E	0.970	PB	2	0.024	0.026	0.027	0.5	0.025	0.012	0.010
Roof	HAE4012A (470 - 494 MHz)	5.65	NA	482.5000	48.0	47.4	CW	E	0.960	PB	2	0.016	0.016	0.016	0.5	0.015	0.008	0.010
Roof	HAE4012A (470 - 494 MHz)	5.65	NA	494.9875	48.0	47.3	CW	E	0.950	PB	2	0.019	0.015	0.019	0.5	0.017	0.008	0.010
Roof	HAE4013A (494 - 512 MHz)	5.65	NA	494.9875	48.0	47.3	CW	E	0.950	PB	2	0.026	0.020	0.027	0.5	0.023	0.012	0.010
Roof	HAE4013A (494 - 512 MHz)	5.65	NA	503.0000	48.0	47.6	CW	E	0.940	PB	2	0.014	0.013	0.020	0.5	0.015	0.007	0.010
Roof	HAE4013A (494 - 512 MHz)	5.65	NA	511.9875	48.0	47.3	CW	E	0.940	PB	2	0.012	0.018	0.013	0.5	0.013	0.007	0.010

Table D.2 (Continued)

MPE measurement data for Passenger Back

MPE calculations are defined in section 15.0.

D.U.T. Info.								Probe Info.			[6] Meas. Unit							
[2]Ant Loc.	Ant. Model/ Desc.	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	[5] Test Pos.	MPE Measurements	Head/ Top 1/3	Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3	DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Roof	HAE6020A (470 - 527 MHz)	2.15	NA	470.0125	48.0	47.5	CW	E	0.970	PB	2	0.017	0.019	0.022	0.5	0.019	0.009	0.010
Roof	HAE6020A (470 - 527 MHz)	2.15	NA	482.5000	48.0	47.4	CW	E	0.960	PB	2	0.036	0.029	0.042	0.5	0.034	0.017	0.020
Roof	HAE6020A (470 - 527 MHz)	2.15	NA	496.5000	48.0	47.5	CW	E	0.940	PB	2	0.035	0.028	0.027	0.5	0.028	0.014	0.010
Roof	HAE6020A (470 - 527 MHz)	2.15	NA	511.9875	48.0	47.3	CW	E	0.940	PB	2	0.022	0.014	0.031	0.5	0.021	0.010	0.010
Roof	HAE6020A (470 - 527 MHz)	2.15	NA	526.9875	48.0	47.2	CW	E	0.940	PB	2	0.018	0.029	0.026	0.5	0.023	0.011	0.010
Roof	HAE6022A (403-527 MHz)	4.15	NA	450.0125	48.0	47.2	CW	E	0.990	PB	2	0.051	0.064	0.059	0.5	0.057	0.029	0.030
Roof	HAE6022A (403-527 MHz)	4.15	NA	469.9875	48.0	47.5	CW	E	0.970	PB	2	0.044	0.079	0.088	0.5	0.068	0.034	0.030
Roof	HAE6022A (403-527 MHz)	4.15	NA	482.5000	48.0	47.4	CW	E	0.960	PB	2	0.060	0.047	0.069	0.5	0.056	0.028	0.030
Roof	HAE6022A (403-527 MHz)	4.15	NA	496.5000	48.0	47.5	CW	E	0.940	PB	2	0.054	0.040	0.044	0.5	0.043	0.022	0.020
Roof	HAE6022A (403-527 MHz)	4.15	NA	511.9875	48.0	47.3	CW	E	0.940	PB	2	0.031	0.020	0.026	0.5	0.024	0.012	0.010
Roof	HAE6022A (403-527 MHz)	4.15	NA	526.9875	48.0	47.2	CW	E	0.940	PB	2	0.051	0.080	0.085	0.5	0.068	0.034	0.030
Roof	HAE6024A (470 - 494 MHz)	5.15	NA	470.0125	48.0	47.5	CW	E	0.970	PB	2	0.054	0.064	0.063	0.5	0.059	0.029	0.030
Roof	HAE6024A (470 - 494 MHz)	5.15	NA	482.5000	48.0	47.4	CW	E	0.960	PB	2	0.050	0.045	0.071	0.5	0.053	0.027	0.030
Roof	HAE6024A (470 - 494 MHz)	5.15	NA	493.9875	48.0	47.2	CW	E	0.950	PB	2	0.061	0.049	0.042	0.5	0.048	0.024	0.020
Roof	HAE6026A (494 - 512 MHz)	5.15	NA	494.9875	48.0	47.3	CW	E	0.950	PB	2	0.044	0.036	0.037	0.5	0.037	0.019	0.020
Roof	HAE6026A (494 - 512 MHz)	5.15	NA	503.0000	48.0	47.6	CW	E	0.940	PB	2	0.020	0.014	0.030	0.5	0.020	0.010	0.010
Roof	HAE6026A (494 - 512 MHz)	5.15	NA	511.9875	48.0	47.3	CW	E	0.940	PB	2	0.033	0.024	0.031	0.5	0.028	0.014	0.010

Table D.2 (Continued)

MPE measurement data for Passenger Back

MPE calculations are defined in section 15.0.

D.U.T. Info.								Probe Info.			[6] Meas. Unit							
[2]Ant Loc.	Ant. Model/ Desc.	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	[5] Test Pos.	MPE Measurements	Head/ Top 1/3	Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3	DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Roof	PMAE4033A (450 - 470 MHz)	5.65	NA	450.0125	48.0	47.2	CW	E	0.990	PB	2	0.040	0.070	0.066	0.5	0.058	0.029	0.030
Roof	PMAE4033A (450 - 470 MHz)	5.65	NA	460.0000	48.0	47.1	CW	E	0.980	PB	2	0.054	0.097	0.083	0.5	0.076	0.038	0.040
Roof	PMAE4033A (450 - 470 MHz)	5.65	NA	469.9875	48.0	47.5	CW	E	0.970	PB	2	0.071	0.075	0.081	0.5	0.073	0.037	0.040
Roof	PMAE4041A (450 - 470 MHz)	2.15	NA	450.0125	48.0	47.2	CW	E	0.990	PB	2	0.004	0.004	0.005	0.5	0.004	0.002	0.000
Roof	PMAE4041A (450 - 470 MHz)	2.15	NA	460.0000	48.0	47.1	CW	E	0.980	PB	2	0.005	0.014	0.012	0.5	0.010	0.005	0.010
Roof	PMAE4041A (450 - 470 MHz)	2.15	NA	469.9875	48.0	47.5	CW	E	0.970	PB	2	0.011	0.018	0.018	0.5	0.015	0.008	0.010
Roof	PMAE4043A (450- 470 MHz)	7.15	NA	450.0125	48.0	47.2	CW	E	0.990	PB	2	0.026	0.018	0.024	0.5	0.022	0.011	0.010
Roof	PMAE4043A (450- 470 MHz)	7.15	NA	460.0000	48.0	47.1	CW	E	0.980	PB	2	0.024	0.038	0.030	0.5	0.030	0.015	0.020
Roof	PMAE4043A (450- 470 MHz)	7.15	NA	469.9875	48.0	47.5	CW	E	0.970	PB	2	0.030	0.036	0.033	0.5	0.032	0.016	0.020
Roof	RAE4004ARB (445-470 MHz)	7.15	NA	450.0125	48.0	47.2	CW	E	0.990	PB	2	0.004	0.005	0.010	0.5	0.006	0.003	0.000
Roof	RAE4004ARB (445-470 MHz)	7.15	NA	460.0000	48.0	47.1	CW	E	0.980	PB	2	0.009	0.024	0.019	0.5	0.017	0.008	0.010
Roof	RAE4004ARB (445-470 MHz)	7.15	NA	469.9875	48.0	47.5	CW	E	0.970	PB	2	0.019	0.019	0.020	0.5	0.019	0.009	0.010
Trunk	HAE4011A (450 - 470 MHz)	5.65	NA	450.0125	48.0	47.2	CW	E	0.990	PB	2	0.205	0.169	0.198	0.5	0.189	0.094	0.100
Trunk	HAE4011A (450 - 470 MHz)	5.65	NA	460.0000	48.0	47.1	CW	E	0.980	PB	2	0.229	0.181	0.129	0.5	0.176	0.088	0.090
Trunk	HAE4011A (450 - 470 MHz)	5.65	NA	469.9875	48.0	47.5	CW	E	0.970	PB	2	0.359	0.143	0.164	0.5	0.215	0.108	0.110

Table D.2 (Continued)

MPE measurement data for Passenger Back

MPE calculations are defined in section 15.0.

D.U.T. Info.								Probe Info.			[6] Meas. Unit							
[2] Ant Loc.	Ant. Model/ Desc.	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	[5] Test Pos.	MPE Measurements	Head/ Top 1/3	Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3	DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Trunk	HAE4012A (470 - 494 MHz)	5.65	NA	470.0125	48.0	47.5	CW	E	0.970	PB	2	0.576	0.206	0.160	0.5	0.305	0.152	0.150
Trunk	HAE4012A (470 - 494 MHz)	5.65	NA	482.5000	48.0	47.4	CW	E	0.960	PB	2	0.305	0.363	0.079	0.5	0.239	0.120	0.120
Trunk	HAE4012A (470 - 494 MHz)	5.65	NA	494.9875	48.0	47.3	CW	E	0.950	PB	2	0.310	0.108	0.122	0.5	0.171	0.086	0.090
Trunk	HAE4013A (494 - 512 MHz)	5.65	NA	494.9875	48.0	47.3	CW	E	0.950	PB	2	0.525	0.211	0.205	0.5	0.298	0.149	0.150
Trunk	HAE4013A (494 - 512 MHz)	5.65	NA	503.0000	48.0	47.6	CW	E	0.940	PB	2	0.511	0.199	0.149	0.5	0.269	0.135	0.140
Trunk	HAE4013A (494 - 512 MHz)	5.65	NA	511.9875	48.0	47.3	CW	E	0.940	PB	2	0.371	0.316	0.242	0.5	0.291	0.146	0.150
Trunk	HAE6022A (403-527 MHz)	4.15	NA	450.0125	48.0	47.2	CW	E	0.990	PB	2	0.747	0.292	0.430	0.5	0.485	0.242	0.250
Trunk	HAE6022A (403-527 MHz)	4.15	NA	469.9875	48.0	47.5	CW	E	0.970	PB	2	0.629	0.279	0.420	0.5	0.429	0.215	0.220
Trunk	HAE6022A (403-527 MHz)	4.15	NA	482.5000	48.0	47.4	CW	E	0.960	PB	2	0.595	0.204	0.455	0.5	0.401	0.201	0.200
Trunk	HAE6022A (403-527 MHz)	4.15	NA	496.5000	48.0	47.5	CW	E	0.940	PB	2	0.631	0.374	0.351	0.5	0.425	0.212	0.210
Trunk	HAE6022A (403-527 MHz)	4.15	NA	511.9875	48.0	47.3	CW	E	0.940	PB	2	0.553	0.652	0.420	0.5	0.509	0.255	0.260
Trunk	HAE6022A (403-527 MHz)	4.15	NA	526.9875	48.0	47.2	CW	E	0.940	PB	2	0.540	0.442	0.357	0.5	0.420	0.210	0.210
Trunk	HAE6024A (470 - 494 MHz)	5.15	NA	470.0125	48.0	47.5	CW	E	0.970	PB	2	0.486	0.279	0.388	0.5	0.373	0.186	0.190
Trunk	HAE6024A (470 - 494 MHz)	5.15	NA	482.5000	48.0	47.4	CW	E	0.960	PB	2	0.697	0.146	0.329	0.5	0.375	0.188	0.190
Trunk	HAE6024A (470 - 494 MHz)	5.15	NA	493.9875	48.0	47.2	CW	E	0.950	PB	2	0.615	0.278	0.375	0.5	0.402	0.201	0.200

Table D.2 (Continued)

MPE measurement data for Passenger Back

MPE calculations are defined in section 15.0.

D.U.T. Info.								Probe Info.			[6] Meas. Unit							
[2]Ant Loc.	Ant. Model/ Desc.	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	[5] Test Pos.	MPE Measurements	Head/ Top 1/3	Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3	DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Trunk	PMAE4033A (450 - 470 MHz)	5.65	NA	450.0125	48.0	47.2	CW	E	0.990	PB	2	0.648	0.467	0.455	0.5	0.518	0.259	0.260
Trunk	PMAE4033A (450 - 470 MHz)	5.65	NA	460.0000	48.0	47.1	CW	E	0.980	PB	2	0.377	0.434	0.298	0.5	0.362	0.181	0.180
Trunk	PMAE4033A (450 - 470 MHz)	5.65	NA	469.9875	48.0	47.5	CW	E	0.970	PB	2	0.746	0.271	0.462	0.5	0.478	0.239	0.240
Trunk	PMAE4043A (450- 470 MHz)	7.15	NA	450.0125	48.0	47.2	CW	E	0.990	PB	2	0.469	0.302	0.298	0.5	0.353	0.176	0.180
Trunk	PMAE4043A (450- 470 MHz)	7.15	NA	460.0000	48.0	47.1	CW	E	0.980	PB	2	0.375	0.326	0.260	0.5	0.314	0.157	0.160
Trunk	PMAE4043A (450- 470 MHz)	7.15	NA	469.9875	48.0	47.5	CW	E	0.970	PB	2	0.607	0.262	0.312	0.5	0.382	0.191	0.190
Trunk	RAE4004ARB (445-470 MHz)	7.15	NA	450.0125	48.0	47.2	CW	E	0.990	PB	2	0.185	0.067	0.066	0.5	0.105	0.052	0.050
Trunk	RAE4004ARB (445-470 MHz)	7.15	NA	460.0000	48.0	47.1	CW	E	0.980	PB	2	0.305	0.156	0.126	0.5	0.192	0.096	0.100
Trunk	RAE4004ARB (445-470 MHz)	7.15	NA	469.9875	48.0	47.5	CW	E	0.970	PB	2	0.392	0.159	0.229	0.5	0.252	0.126	0.130

Table D.3

MPE measurement data for Passenger Front

MPE calculations are defined in section 15.0.

D.U.T. Info.								Probe Info.			[6] Meas. Unit							
[2]Ant Loc.	Ant. Model/ Desc.	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	[5] Test Pos.	MPE Measurements	Head/ Top 1/3	Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3	DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Roof	HAE4003A (450 - 470 MHz)	2.15	NA	450.0125	48.0	47.2	CW	E	0.990	PF	2	0.039	0.078	0.022	0.5	0.046	0.023	0.020
Roof	HAE4003A (450 - 470 MHz)	2.15	NA	460.0000	48.0	47.1	CW	E	0.980	PF	2	0.051	0.051	0.026	0.5	0.042	0.021	0.020
Roof	HAE4003A (450 - 470 MHz)	2.15	NA	469.9875	48.0	47.5	CW	E	0.970	PF	2	0.040	0.094	0.052	0.5	0.060	0.030	0.030
Roof	HAE4004A (470 - 512 MHz)	2.15	NA	470.0125	48.0	47.5	CW	E	0.970	PF	2	0.044	0.043	0.048	0.5	0.044	0.022	0.020
Roof	HAE4004A (470 - 512 MHz)	2.15	NA	484.0000	48.0	47.5	CW	E	0.960	PF	2	0.048	0.051	0.023	0.5	0.039	0.020	0.020
Roof	HAE4004A (470 - 512 MHz)	2.15	NA	498.0000	48.0	47.7	CW	E	0.940	PF	2	0.023	0.041	0.076	0.5	0.044	0.022	0.020
Roof	HAE4004A (470 - 512 MHz)	2.15	NA	511.9875	48.0	47.3	CW	E	0.940	PF	2	0.035	0.040	0.036	0.5	0.035	0.017	0.020
Roof	HAE4011A (450 - 470 MHz)	5.65	NA	450.0125	48.0	47.2	CW	E	0.990	PF	2	0.005	0.002	0.002	0.5	0.003	0.001	0.000
Roof	HAE4011A (450 - 470 MHz)	5.65	NA	460.0000	48.0	47.1	CW	E	0.980	PF	2	0.004	0.006	0.002	0.5	0.004	0.002	0.000
Roof	HAE4011A (450 - 470 MHz)	5.65	NA	469.9875	48.0	47.5	CW	E	0.970	PF	2	0.004	0.004	0.006	0.5	0.005	0.002	0.000
Roof	HAE4012A (470 - 494 MHz)	5.65	NA	470.0125	48.0	47.5	CW	E	0.970	PF	2	0.010	0.017	0.025	0.5	0.017	0.008	0.010
Roof	HAE4012A (470 - 494 MHz)	5.65	NA	482.5000	48.0	47.4	CW	E	0.960	PF	2	0.007	0.008	0.008	0.5	0.007	0.004	0.000
Roof	HAE4012A (470 - 494 MHz)	5.65	NA	494.9875	48.0	47.3	CW	E	0.950	PF	2	0.009	0.020	0.028	0.5	0.018	0.009	0.010
Roof	HAE4013A (494 - 512 MHz)	5.65	NA	494.9875	48.0	47.3	CW	E	0.950	PF	2	0.025	0.022	0.054	0.5	0.032	0.016	0.020
Roof	HAE4013A (494 - 512 MHz)	5.65	NA	503.0000	48.0	47.6	CW	E	0.940	PF	2	0.019	0.019	0.042	0.5	0.025	0.013	0.010
Roof	HAE4013A (494 - 512 MHz)	5.65	NA	511.9875	48.0	47.3	CW	E	0.940	PF	2	0.013	0.012	0.012	0.5	0.012	0.006	0.010

Table D.3 (Continued)

MPE measurement data for Passenger Front

MPE calculations are defined in section 15.0.

D.U.T. Info.								Probe Info.			[6] Meas. Unit							
[2]Ant Loc.	Ant. Model/ Desc.	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	[5] Test Pos.	MPE Measurements	Head/ Top 1/3	Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3	DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Roof	HAE6020A (470 - 527 MHz)	2.15	NA	470.0125	48.0	47.5	CW	E	0.970	PF	2	0.007	0.025	0.010	0.5	0.014	0.007	0.010
Roof	HAE6020A (470 - 527 MHz)	2.15	NA	482.5000	48.0	47.4	CW	E	0.960	PF	2	0.016	0.020	0.016	0.5	0.017	0.008	0.010
Roof	HAE6020A (470 - 527 MHz)	2.15	NA	496.5000	48.0	47.5	CW	E	0.940	PF	2	0.011	0.013	0.025	0.5	0.015	0.008	0.010
Roof	HAE6020A (470 - 527 MHz)	2.15	NA	511.9875	48.0	47.3	CW	E	0.940	PF	2	0.009	0.009	0.035	0.5	0.017	0.008	0.010
Roof	HAE6020A (470 - 527 MHz)	2.15	NA	526.9875	48.0	47.2	CW	E	0.940	PF	2	0.023	0.029	0.013	0.5	0.020	0.010	0.010
Roof	HAE6022A (403-527 MHz)	4.15	NA	450.0125	48.0	47.2	CW	E	0.990	PF	2	0.061	0.038	0.039	0.5	0.046	0.023	0.020
Roof	HAE6022A (403-527 MHz)	4.15	NA	469.9875	48.0	47.5	CW	E	0.970	PF	2	0.043	0.085	0.056	0.5	0.059	0.030	0.030
Roof	HAE6022A (403-527 MHz)	4.15	NA	482.5000	48.0	47.4	CW	E	0.960	PF	2	0.021	0.052	0.035	0.5	0.035	0.017	0.020
Roof	HAE6022A (403-527 MHz)	4.15	NA	496.5000	48.0	47.5	CW	E	0.940	PF	2	0.018	0.036	0.038	0.5	0.029	0.014	0.010
Roof	HAE6022A (403-527 MHz)	4.15	NA	511.9875	48.0	47.3	CW	E	0.940	PF	2	0.026	0.049	0.033	0.5	0.034	0.017	0.020
Roof	HAE6022A (403-527 MHz)	4.15	NA	526.9875	48.0	47.2	CW	E	0.940	PF	2	0.053	0.071	0.034	0.5	0.050	0.025	0.030
Roof	HAE6024A (470 - 494 MHz)	5.15	NA	470.0125	48.0	47.5	CW	E	0.970	PF	2	0.040	0.022	0.049	0.5	0.036	0.018	0.020
Roof	HAE6024A (470 - 494 MHz)	5.15	NA	482.5000	48.0	47.4	CW	E	0.960	PF	2	0.019	0.038	0.032	0.5	0.028	0.014	0.010
Roof	HAE6024A (470 - 494 MHz)	5.15	NA	493.9875	48.0	47.2	CW	E	0.950	PF	2	0.028	0.033	0.058	0.5	0.038	0.019	0.020
Roof	HAE6026A (494 - 512 MHz)	5.15	NA	494.9875	48.0	47.3	CW	E	0.950	PF	2	0.025	0.024	0.056	0.5	0.033	0.017	0.020
Roof	HAE6026A (494 - 512 MHz)	5.15	NA	503.0000	48.0	47.6	CW	E	0.940	PF	2	0.020	0.048	0.053	0.5	0.038	0.019	0.020
Roof	HAE6026A (494 - 512 MHz)	5.15	NA	511.9875	48.0	47.3	CW	E	0.940	PF	2	0.023	0.038	0.030	0.5	0.029	0.014	0.010

Table D.3 (Continued)

MPE measurement data for Passenger Front

MPE calculations are defined in section 15.0.

D.U.T. Info.								Probe Info.			[6] Meas. Unit							
[2]Ant Loc.	Ant. Model/ Desc.	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	[5] Test Pos.	MPE Measurements	Head/ Top 1/3	Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3	DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Roof	PMAE4033A (450 - 470 MHz)	5.65	NA	450.0125	48.0	47.2	CW	E	0.990	PF	2	0.045	0.057	0.046	0.5	0.049	0.024	0.020
Roof	PMAE4033A (450 - 470 MHz)	5.65	NA	460.0000	48.0	47.1	CW	E	0.980	PF	2	0.068	0.071	0.033	0.5	0.056	0.028	0.030
Roof	PMAE4033A (450 - 470 MHz)	5.65	NA	469.9875	48.0	47.5	CW	E	0.970	PF	2	0.062	0.068	0.052	0.5	0.059	0.029	0.030
Roof	PMAE4041A (450 - 470 MHz)	2.15	NA	450.0125	48.0	47.2	CW	E	0.990	PF	2	0.003	0.003	0.001	0.5	0.002	0.001	0.000
Roof	PMAE4041A (450 - 470 MHz)	2.15	NA	460.0000	48.0	47.1	CW	E	0.980	PF	2	0.005	0.005	0.003	0.5	0.004	0.002	0.000
Roof	PMAE4041A (450 - 470 MHz)	2.15	NA	469.9875	48.0	47.5	CW	E	0.970	PF	2	0.007	0.005	0.008	0.5	0.006	0.003	0.000
Roof	PMAE4043A (450- 470 MHz)	7.15	NA	450.0125	48.0	47.2	CW	E	0.990	PF	2	0.019	0.018	0.007	0.5	0.015	0.007	0.010
Roof	PMAE4043A (450- 470 MHz)	7.15	NA	460.0000	48.0	47.1	CW	E	0.980	PF	2	0.017	0.024	0.010	0.5	0.017	0.008	0.010
Roof	PMAE4043A (450- 470 MHz)	7.15	NA	469.9875	48.0	47.5	CW	E	0.970	PF	2	0.018	0.030	0.019	0.5	0.022	0.011	0.010
Roof	RAE4004ARB (445-470 MHz)	7.15	NA	450.0125	48.0	47.2	CW	E	0.990	PF	2	0.006	0.009	0.001	0.5	0.005	0.003	0.000
Roof	RAE4004ARB (445-470 MHz)	7.15	NA	460.0000	48.0	47.1	CW	E	0.980	PF	2	0.015	0.006	0.009	0.5	0.010	0.005	0.000
Roof	RAE4004ARB (445-470 MHz)	7.15	NA	469.9875	48.0	47.5	CW	E	0.970	PF	2	0.017	0.007	0.011	0.5	0.011	0.006	0.010
Trunk	HAE4011A (450 - 470 MHz)	5.65	NA	450.0125	48.0	47.2	CW	E	0.990	PF	2	0.109	0.105	0.066	0.5	0.092	0.046	0.050
Trunk	HAE4011A (450 - 470 MHz)	5.65	NA	460.0000	48.0	47.1	CW	E	0.980	PF	2	0.146	0.206	0.089	0.5	0.144	0.072	0.070
Trunk	HAE4011A (450 - 470 MHz)	5.65	NA	469.9875	48.0	47.5	CW	E	0.970	PF	2	0.145	0.149	0.112	0.5	0.131	0.066	0.070

Table D.3 (Continued)

MPE measurement data for Passenger Front

MPE calculations are defined in section 15.0.

D.U.T. Info.								Probe Info.			[6] Meas. Unit							
[2]Ant Loc.	Ant. Model/ Desc.	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	[5] Test Pos.	MPE Measurements	Head/ Top 1/3	Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3	DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Trunk	HAE4012A (470 - 494 MHz)	5.65	NA	470.0125	48.0	47.5	CW	E	0.970	PF	2	0.184	0.215	0.139	0.5	0.174	0.087	0.090
Trunk	HAE4012A (470 - 494 MHz)	5.65	NA	482.5000	48.0	47.4	CW	E	0.960	PF	2	0.054	0.099	0.078	0.5	0.074	0.037	0.040
Trunk	HAE4012A (470 - 494 MHz)	5.65	NA	494.9875	48.0	47.3	CW	E	0.950	PF	2	0.084	0.067	0.091	0.5	0.077	0.038	0.040
Trunk	HAE4013A (494 - 512 MHz)	5.65	NA	494.9875	48.0	47.3	CW	E	0.950	PF	2	0.157	0.064	0.133	0.5	0.112	0.056	0.060
Trunk	HAE4013A (494 - 512 MHz)	5.65	NA	503.0000	48.0	47.6	CW	E	0.940	PF	2	0.206	0.109	0.047	0.5	0.113	0.057	0.060
Trunk	HAE4013A (494 - 512 MHz)	5.65	NA	511.9875	48.0	47.3	CW	E	0.940	PF	2	0.221	0.110	0.057	0.5	0.122	0.061	0.060
Trunk	HAE6022A (403-527 MHz)	4.15	NA	450.0125	48.0	47.2	CW	E	0.990	PF	2	0.292	0.145	0.210	0.5	0.214	0.107	0.110
Trunk	HAE6022A (403-527 MHz)	4.15	NA	469.9875	48.0	47.5	CW	E	0.970	PF	2	0.174	0.189	0.116	0.5	0.155	0.077	0.080
Trunk	HAE6022A (403-527 MHz)	4.15	NA	482.5000	48.0	47.4	CW	E	0.960	PF	2	0.033	0.129	0.030	0.5	0.061	0.031	0.030
Trunk	HAE6022A (403-527 MHz)	4.15	NA	496.5000	48.0	47.5	CW	E	0.940	PF	2	0.139	0.107	0.082	0.5	0.103	0.051	0.050
Trunk	HAE6022A (403-527 MHz)	4.15	NA	511.9875	48.0	47.3	CW	E	0.940	PF	2	0.288	0.129	0.073	0.5	0.154	0.077	0.080
Trunk	HAE6022A (403-527 MHz)	4.15	NA	526.9875	48.0	47.2	CW	E	0.940	PF	2	0.191	0.211	0.088	0.5	0.154	0.077	0.080
Trunk	HAE6024A (470 - 494 MHz)	5.15	NA	470.0125	48.0	47.5	CW	E	0.970	PF	2	0.174	0.146	0.094	0.5	0.134	0.067	0.070
Trunk	HAE6024A (470 - 494 MHz)	5.15	NA	482.5000	48.0	47.4	CW	E	0.960	PF	2	0.135	0.149	0.084	0.5	0.118	0.059	0.060
Trunk	HAE6024A (470 - 494 MHz)	5.15	NA	493.9875	48.0	47.2	CW	E	0.950	PF	2	0.131	0.095	0.121	0.5	0.110	0.055	0.060

Table D.3 (Continued)

MPE measurement data for Passenger Front

MPE calculations are defined in section 15.0.

D.U.T. Info.								Probe Info.			[6] Meas. Unit							
[2]Ant Loc.	Ant. Model/ Desc.	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	[5] Test Pos.	MPE Measurements	Head/ Top 1/3	Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3	DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Trunk	HAE6026A (494 - 512 MHz)	5.15	NA	494.9875	48.0	47.3	CW	E	0.950	PF	2	0.103	0.085	0.068	0.5	0.081	0.041	0.040
Trunk	HAE6026A (494 - 512 MHz)	5.15	NA	503.0000	48.0	47.6	CW	E	0.940	PF	2	0.194	0.070	0.033	0.5	0.093	0.047	0.050
Trunk	HAE6026A (494 - 512 MHz)	5.15	NA	511.9875	48.0	47.3	CW	E	0.940	PF	2	0.284	0.153	0.053	0.5	0.154	0.077	0.080
Trunk	PMAE4033A (450 - 470 MHz)	5.65	NA	450.0125	48.0	47.2	CW	E	0.990	PF	2	0.266	0.163	0.188	0.5	0.204	0.102	0.100
Trunk	PMAE4033A (450 - 470 MHz)	5.65	NA	460.0000	48.0	47.1	CW	E	0.980	PF	2	0.202	0.215	0.088	0.5	0.165	0.082	0.080
Trunk	PMAE4033A (450 - 470 MHz)	5.65	NA	469.9875	48.0	47.5	CW	E	0.970	PF	2	0.200	0.188	0.088	0.5	0.154	0.077	0.080
Trunk	PMAE4043A (450- 470 MHz)	7.15	NA	450.0125	48.0	47.2	CW	E	0.990	PF	2	0.258	0.177	0.157	0.5	0.195	0.098	0.100
Trunk	PMAE4043A (450- 470 MHz)	7.15	NA	460.0000	48.0	47.1	CW	E	0.980	PF	2	0.190	0.256	0.088	0.5	0.174	0.087	0.090
Trunk	PMAE4043A (450- 470 MHz)	7.15	NA	469.9875	48.0	47.5	CW	E	0.970	PF	2	0.211	0.224	0.126	0.5	0.181	0.091	0.090
Trunk	RAE4004ARB (445-470 MHz)	7.15	NA	450.0125	48.0	47.2	CW	E	0.990	PF	2	0.104	0.064	0.065	0.5	0.077	0.038	0.040
Trunk	RAE4004ARB (445-470 MHz)	7.15	NA	460.0000	48.0	47.1	CW	E	0.980	PF	2	0.115	0.112	0.055	0.5	0.092	0.046	0.050
Trunk	RAE4004ARB (445-470 MHz)	7.15	NA	469.9875	48.0	47.5	CW	E	0.970	PF	2	0.141	0.109	0.080	0.5	0.107	0.053	0.050

Table D.3

LMR UHF2 MPE Results for FCC

Note:

Blue fonts: Frequencies not regulated by FCC.

Pmax (W)	48	P initial (W)	47.2	47.1	47.5	47.5	47.4	47.5	47.2	47.3	47.5	47.7	47.6	47.3	47.2
		FCC Limit (mW/cm^2)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4

Test Pos	Angle	Trunk/ Roof	E/H Field	Antenna no	f1	f2	f3	f4	f5	f6	f7	f8	f9	f10	f11	f12	f13
					450.0125	460.0000	469.9875	470.0125	482.5000	484.0000	493.9875	494.9875	496.5000	498.0000	503.0000	511.9875	526.9875
BS	0	Roof	E	1	0.07	0.06	0.06										
BS	0	Roof	E	2				0.07		0.06				0.07		0.06	
BS	0	Roof	E	3	0.04	0.04	0.04										
BS	0	Roof	E	4				0.05	0.05			0.05					
BS	0	Roof	E	5								0.06			0.05	0.04	
BS	0	Roof	E	6				0.02	0.04				0.05			0.06	0.04
BS	0	Roof	E	7	0.08		0.07		0.06				0.06			0.06	0.07
BS	0	Roof	E	8				0.05	0.05		0.07						
BS	0	Roof	E	9								0.06			0.05	0.06	
BS	0	Roof	E	10	0.08	0.07	0.07										
BS	0	Roof	E	11	0.01	0.01	0.02										
BS	0	Roof	E	12	0.08	0.07	0.06										
BS	0	Roof	E	13	0.05	0.05	0.05										
BS	0	Trunk	E	3	0.07	0.06	0.07										
BS	0	Trunk	E	4				0.09	0.07			0.06					
BS	0	Trunk	E	5								0.08			0.06	0.04	
BS	0	Trunk	E	7	0.11		0.1		0.1				0.08			0.07	0.09
BS	45	Trunk	E	7	0.13												
BS	90	Trunk	E	7	0.09												
BS	0	Trunk	E	8				0.09	0.08		0.07						
BS	0	Trunk	E	9								0.07			0.06	0.06	
BS	0	Trunk	E	10	0.1	0.09	0.1										
BS	0	Trunk	E	12	0.1	0.08	0.1										
BS	0	Trunk	E	13	0.07	0.07	0.08										
PB	0	Roof	E	1	0.03	0.04	0.04										
PB	0	Roof	E	2				0.04		0.03				0.02		0.01	
PB	0	Roof	E	3	0	0	0.01										
PB	0	Roof	E	4				0.01	0.01			0.01					
PB	0	Roof	E	5								0.01			0.01	0.01	
PB	0	Roof	E	6				0.01	0.02				0.01			0.01	0.01
PB	0	Roof	E	7	0.03		0.03		0.03				0.02			0.01	0.03
PB	0	Roof	E	8				0.03	0.03		0.02						
PB	0	Roof	E	9								0.02			0.01	0.01	
PB	0	Roof	E	10	0.03	0.04	0.04										
PB	0	Roof	E	11	0	0.01	0.01										
PB	0	Roof	E	12	0.01	0.02	0.02										
PB	0	Roof	E	13	0	0.01	0.01										

Table D.3 (Continue)

LMR UHF2 MPE Results for FCC

Note:

Blue fonts: Frequencies not regulated by FCC.

Pmax (W)	48	P initial (W)	47.2	47.1	47.5	47.5	47.4	47.5	47.2	47.3	47.5	47.7	47.6	47.3	47.2
		FCC Limit (mW/cm^2)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4

Test Pos	Angle	Trunk/ Roof	E/H Field	Antenna no	f1	f2	f3	f4	f5	f6	f7	f8	f9	f10	f11	f12	f13
					450.0125	460.0000	469.9875	470.0125	482.5000	484.0000	493.9875	494.9875	496.5000	498.0000	503.0000	511.9875	526.9875
PB	0	Trunk	E	3	0.1	0.09	0.11										
PB	0	Trunk	E	4				0.15	0.12			0.09					
PB	0	Trunk	E	5								0.15			0.14	0.15	
PB	0	Trunk	E	7	0.25		0.22		0.2				0.21			0.26	0.21
PB	0	Trunk	E	8				0.19	0.19		0.2						
PB	0	Trunk	E	10	0.26	0.18	0.24										
PB	0	Trunk	E	12	0.18	0.16	0.19										
PB	0	Trunk	E	13	0.05	0.1	0.13										
PF	0	Roof	E	1	0.02	0.02	0.03										
PF	0	Roof	E	2				0.02		0.02				0.02		0.02	
PF	0	Roof	E	3	0	0	0										
PF	0	Roof	E	4				0.01	0			0.01					
PF	0	Roof	E	5								0.02			0.01	0.01	
PF	0	Roof	E	6				0.01	0.01				0.01			0.01	0.01
PF	0	Roof	E	7	0.02		0.03		0.02				0.01			0.02	0.03
PF	0	Roof	E	8				0.02	0.01		0.02						
PF	0	Roof	E	9								0.02			0.02	0.01	
PF	0	Roof	E	10	0.02	0.03	0.03										
PF	0	Roof	E	11	0	0	0										
PF	0	Roof	E	12	0.01	0.01	0.01										
PF	0	Roof	E	13	0	0	0.01										
PF	0	Trunk	E	3	0.05	0.07	0.07										
PF	0	Trunk	E	4				0.09	0.04			0.04					
PF	0	Trunk	E	5								0.06			0.06	0.06	
PF	0	Trunk	E	7	0.11		0.08		0.03				0.05			0.08	0.08
PF	0	Trunk	E	8				0.07	0.06		0.06						
PF	0	Trunk	E	9								0.04			0.05	0.08	
PF	0	Trunk	E	10	0.1	0.08	0.08										
PF	0	Trunk	E	12	0.1	0.09	0.09										
PF	0	Trunk	E	13	0.04	0.05	0.05										