

**MOTOROLA SOLUTIONS**

CERTIFICATE 2518.05

DECLARATION OF COMPLIANCE: MPE ASSESSMENT**Motorola Solutions Inc.
EME Test Laboratory**

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Date of Report: 11/21/2020
Report Revision: A

Responsible Engineer: Saw Sun Hock (EME Engineer)
Report author: Saw Sun Hock (EME Engineer)
Date(s) Tested: 8/21/2020-9/14/2020
Manufacturer: Motorola Solutions Inc.
Date submitted for test: 8/7/2020
DUT Description: XPR 5550e 136-174M 45W GOB BT/GNSS/WiFi CD
Test TX mode(s): CW
Max. Power output: 54W (136-174 MHz); 3.2mW (Bluetooth); 4.0mW (Bluetooth LE);
 17.8 mW (WLAN 2.4GHz 802.11b), 13.2mW (WLAN 2.4GHz 802.11g), 8.3mW (WLAN 2.4GHz 802.11n)
TX Frequency Bands: 136-174 MHz; WLAN 2412-2462 MHz; BT 2402-2480 MHz
Signaling type: FM, TDMA, FHSS (Bluetooth), 802.11b/g/n (WLAN 2.4 GHz)
Model(s) Tested: AAM28JQN9RA1AN (PMUD2567C)(IC MODEL: PMUD2567CBMNAA)
Model(s) Certified: AAM28JQN9RA1AN (PMUD2567C)(IC MODEL: PMUD2567CBMNAA),
 AAM28JQC9RA1AN (PMUD2567C)(IC MODEL: PMUD2567CBLNAA) and
 AAM28JQN9WA1AN (PMUD2567C)(IC MODEL: PMUD2567CBMNKA).
Serial Number(s): 511TWP7146
Classification: Occupational/Controlled Environment
Applicant Name: Motorola Solutions Inc.
Applicant Address: 8000 West Sunrise Boulevard, Fort Lauderdale, Florida 33322
FCC ID: AZ492FT7138
 150.8-173.4 MHz, 2402-2480 MHz, 2412-2462 MHz
 This report contains results that are immaterial for FCC equipment approval, which are clearly identified.
IC: 109U-92FT7138
 This report contains results that are immaterial for ICSED Canada equipment approval, which are clearly identified.

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.

Tey Pei Loo**Deputy Technical Manager (Approved Signatory)****Approval Date:** 11/21/2020

Document Revision History

Date	Revision	Comments
11/21/2020	A	Initial release

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1.0 Introduction

This report details the test setup, test equipment and test results of Maximum Permissible Exposure (MPE) performed at Motorola Solutions' outside test site for product model AAM28JQN9RA1AN (PMUD2567C)(IC MODEL: PMUD2567CBMNAA).

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	150.8-173.4 (LMR VHF)	0.656	327.8	0.207	103.4	0.176	88.0	0.126	63.0
DTS	2412 – 2462 (WLAN 2.4 GHz)	0.012	1.24	0.012	1.24	0.012	1.24	0.012	1.24
DSS	2402-2480 (Bluetooth)	0.002	0.21	0.002	0.21	0.002	0.21	0.002	0.21
Simultaneous (Highest Combined Percentage of Limit)		NA	329.04	NA	104.64	NA	89.24	NA	64.24

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.
- Institute of Electrical and Electronics Engineers (IEEE) C95. 1-2019
- 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/ 47CFR § 1.1310	ICNIRP	IEEE C95.1 2019	RSS-102 Issue 5 2015
	mW/cm ²		W/m ²	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 – 400			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/ 47CFR § 1.1310	ICNIRP	IEEE C95.1 2019	RSS-102 Issue 5 2015
	mW/cm ²			
400 – 2,000		f/40	f/40	
1,500 – 100,000	5.0			
2,000 – 300,000		50.0	50.0	
6,000 – 15,000				50.0
15000 – 150,000				50.0
150000 – 300,000				$3.33 \times 10^{-4} f$

Table 3 – General Population / Uncontrolled Exposure Limits

Frequency Range (MHz)	FCC OET Bulletin 65/ 47CFR § 1.1310	ICNIRP	IEEE C95.1 2019	RSS-102 Issue 5 2015
	mW/cm 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				
100 – 400			2.0	
300 – 1,500	f/1,500			
300 – 6000				$0.02619 f^{0.6834}$
400 – 2,000		f/200	f/200	
1,500 – 100,000	1.0			
2,000 – 300,000		10.0	10.0	
6,000 – 15,000				10.0
15,000 – 150,000				10.0
150,000 – 300,000				$6.67 \times 10^{-5} f$

6.0 N_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

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

where N_c is the number of test channels, f_{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	ETS Model HI-2200	00206805	04/01/2019	04/01/2020
Probe – E-Field	ETS Model E100	00126277		

E-field measurements are in mW/cm².

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.

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 77%. 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 (%)	Max Power (W)
LMR	136-174 (VHF)	50 (PTT)	54
BT	2402-2480	77	0.0032
BT LE	2402-2480	77	0.0040
WLAN	2412 – 2482 (802.11b/g/n)	99.8	0.0178 (802.11b)
		99.2	0.0132 (802.11g)
		99.1	0.0083 (802.11n)

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

Below are additional antenna kits which include the tested antennas and GPS base.

RAD4214A - Identical to tested antenna RAD4226A with GPS base
RAD4215A - Identical to tested antenna RAD4225A with GPS base.
RAD4216A - Identical to tested antenna RAD4224A with GPS base.
RAD4217A - Identical to tested antenna RAD4223A with GPS base.
RAD4218A - Identical to tested antenna RAD4227A with GPS base.

Below are additional antenna kits that are electrically identical to the tested antennas but have a BNC connector instead of the mini-U connector (tested) and / or a GPS base:

RAD4219A – Identical to tested antenna RAD4226A with GPS base and BNC connector
RAD4220A - Identical to tested antenna RAD4225A with GPS base and BNC connector
RAD4221A - Identical to tested antenna RAD4224A with GPS base and BNC connector
RAD4222A - Identical to tested antenna RAD4223A with GPS base and BNC connector
RAD4198A – Identical to tested antenna RAD4226A with BNC connector
RAD4199A – Identical to tested antenna RAD4225A with BNC connector
RAD4200A – Identical to tested antenna RAD4224A with BNC connector
RAD4201A - Identical to tested antenna RAD4223A with BNC connector

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 VHF band). The measurement probe is positioned orthogonal to antenna (typically parallel to ground with a vertically mounted antenna) and aimed directly at the antenna's axis. These measurements are representative of persons other than the operator standing next to the vehicle.

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

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

12.2 Internal/Passenger vehicle MPE measurements

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

MPE measurements for passenger front seat (PF) and backseat (PB) conditions are determined by taking the average of the (3) measurements (Head, Chest, and Lower Trunk) inside the vehicle for both the front and back seats.

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

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

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

13.0 Method of Measurement with roof mounted antenna(s)

13.1 External/Bystander vehicle MPE measurements

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

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

13.2 Internal/Passenger vehicle MPE measurements

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

MPE measurements for passenger front seat (PF) and backseat (PB) conditions are determined by taking the average of the (3) measurements (Head, Chest, and Lower Trunk) inside the vehicle for both the front and back seats.

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

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

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

14.0 MPE Variability Requirement for External/Bystander vehicle MPE measurement

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

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

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

15.0 MPE Calculations

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

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

External to vehicle (Bystander) - 10 measurements are averaged over the body (*Avg_over_body*).
Internal to vehicle (Passengers) - 3 measurements are averaged over the body (*Avg_over_body*).

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

Therefore;

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

$$\text{Calc._P.D.} = (\text{Avg_over_body}) * (\text{probe_frequency_cal_factor}) * (\text{duty_cycle})$$

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

Note 2: The E-field probe calibration certificate’s frequency cal factors were determined by measuring V/m. The survey meter’s results were measured in power density (mW/cm²) 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/cm²) using the equation 3. H-field measurements are only applicable to frequencies below 300MHz.

Equation 3 – Converting A/m to mW/cm²

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

Equation 4 – Power Density Maximum Calculation

$$Max_Calc_P.D. = P.D._calc * \frac{max_output_power}{initial_output_power}$$

Note 4: For initial output power > max_output_power; max_output_power / initial output power = 1

16.0 Antenna Summary

Table below summarizes the tested or evaluated antennas and their descriptions, mount location (roof/trunk), overlap of FCC bands, number of test channels per FCC KDB 447498 (FCC N_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	HAD4006A	136-144	52.0	2.15	1/4 wave	R	NA	0	2
2	HAD4007A	144-150.8	49.0	2.15	1/4 wave	R	150.8	1	2
3	HAD4008A	150.8-162	45.5	2.15	1/4 wave	R	150.8-162	3	3
4	HAD4009A	162-174	43.0	2.15	1/4 wave	R	162-173.4	3	3
5	RAD4223A	162-174	40.8	2.15	1/4 wave	R	162-173.4	3	3
6	RAD4224A	150.8-162	44.3	2.15	1/4 wave	R	150.8-162	3	3
7	RAD4225A	146-150.8	47.3	2.15	1/4 wave	R	150.8	1	2
8	RAD4226A	136-144	50.3	2.15	1/4 wave	R	NA	0	2
9	RAD4227A	146-172	87.1	5.15	5/8 wave	R	150.8-172	4	5
10	*HAD4022A	132-174	130.0 (138 MHz) 118.5 (144 MHz) 114.0 (150.8 MHz) 102.7 (158.0125MHz) 96.5 (165.0125MHz) 89.9 (173.0125MHz)	5.15	5/8 wave	R/T	150.8-173.4	4	6

Note:* Antenna length trimmed to frequency.

All quarter-wave antennas, RAD4227 (and equivalent to antenna RAD4218A) are restricted to install on the roof only.

17.0 Test Results Summary

17.1 MPE Test Results Summary for LMR

Table 8

MPE assessment for LMR VHF - trunk mounted antenna – Bystander

Blue fonts: Frequencies not regulated by FCC.

Results highlight in yellow are configurations with highest percentage of limits

* Results required SAR simulation to demonstrate compliance to the basic requirements

Trunk/ Roof	Test Position	E/H Field	Angle (Degree)	Antenna Model	Max Pwr (W)	Initial Pwr (W)	Tx Freq (MHz)	Max Calc. P.D. (mW/ cm ²)	FCC Limit	% To FCC Spec Limit	ICNIRP Limit	% To ICNIRP Spec Limit	ISED Limit	% To ISED Spec Limit
Trunk	BS	E	0	HAD4022A, 5/8 Wave, (132-174MHz)	54	53.3	138.0000	0.101	0.20	50.6	0.20	50.6	0.13	78.3
						52.8	144.0000	0.128	0.20	64.1	0.20	64.1	0.13	99.2
						52.8	150.8000	0.098	0.20	48.8	0.20	48.8	0.13	75.7
						52.7	158.0125	0.090	0.20	45.2	0.20	45.2	0.13	70.0
						52.1	165.0125	0.094	0.20	47.1	0.20	47.1	0.13	72.9
						52.1	173.0125	0.079	0.20	39.4	0.20	39.4	0.13	61.0
			45	HAD4022A, 5/8 Wave, (132-174MHz)	54	52.8	144.0000	0.096	0.20	47.9	0.20	47.9	0.13	74.3
						52.8	150.8000	0.078	0.20	39.2	0.20	39.2	0.13	60.7
			90	HAD4022A, 5/8 Wave, (132-174MHz)	54	52.8	144.0000	0.093	0.20	46.4	0.20	46.4	0.13	71.9
						52.8	150.8000	0.107	0.20	53.5	0.20	53.5	0.13	82.9
Trunk	BS	H	0	HAD4022A, 5/8 Wave, (132-174MHz)	54	53.3	138.0000	0.126	0.20	62.9	0.20	62.9	0.13	97.5
						52.8	144.0000	0.178	0.20	89.1	0.20	89.1	0.13	*138.1
						52.8	150.8000	0.145	0.20	72.7	0.20	72.7	0.13	*112.7
						52.7	158.0125	0.167	0.20	83.4	0.20	83.4	0.13	*129.1
						52.1	165.0125	0.185	0.20	92.4	0.20	92.4	0.13	*143.2
						52.1	173.0125	0.162	0.20	80.8	0.20	80.8	0.13	*125.2
			45	HAD4022A, 5/8 Wave, (132-174MHz)	54	52.1	165.0125	0.207	0.20	*103.4	0.20	*103.4	0.13	*160.2
			90	HAD4022A, 5/8 Wave, (132-174MHz)	54	52.1	165.0125	0.202	0.20	*100.8	0.20	*100.8	0.13	*156.2

Table 9**MPE assessment for LMR VHF - roof mounted antenna – Bystander**

Blue fonts: Frequencies not regulated by FCC.

Trunk/ Roof	Test Position	E/H Field	Angle (Degree)	Antenna Model	Max Pwr (W)	Initial Pwr (W)	Tx Freq (MHz)	Max Calc. P.D. (mW/ cm^2)	FCC Limit	% To FCC Spec Limit	ICNIRP Limit	% To ICNIRP Spec Limit	ISED Limit	% To ISED Spec Limit
Roof	BS	E	0	HAD4006A, 1/4 Wave, (136-144MHz)	54	53.3	138.0000	0.078	0.20	38.9	0.20	38.9	0.13	60.2
						52.8	144.0000	0.095	0.20	47.4	0.20	47.4	0.13	73.5
				HAD4007A, 1/4 Wave, (144-150.8 MHz)	54	52.0	146.0000	0.075	0.20	37.4	0.20	37.4	0.13	58.0
						52.8	150.8000	0.065	0.20	32.4	0.20	32.4	0.13	50.3
				HAD4008A, 1/4 Wave, (150.8-162 MHz)	54	52.8	150.8000	0.067	0.20	33.6	0.20	33.6	0.13	52.0
						52.4	156.4000	0.088	0.20	44.0	0.20	44.0	0.13	68.1
						52.2	162.0000	0.086	0.20	42.8	0.20	42.8	0.13	66.4
				HAD4009A, 1/4 Wave, (162-174MHz)	54	52.2	162.0000	0.075	0.20	37.4	0.20	37.4	0.13	57.9
						52.1	165.0125	0.071	0.20	35.5	0.20	35.5	0.13	55.1
						52.1	173.0125	0.082	0.20	41.0	0.20	41.0	0.13	63.6
				RAD4223A, 1/4 wave (162-174MHz)	54	52.2	162.0000	0.036	0.20	17.8	0.20	17.8	0.13	27.6
						52.1	165.0125	0.052	0.20	26.0	0.20	26.0	0.13	40.2
						52.1	173.0125	0.069	0.20	34.5	0.20	34.5	0.13	53.5
				RAD4224A, 1/4 wave (150.8-162MHz)	54	52.8	150.8000	0.023	0.20	11.7	0.20	11.7	0.13	18.1
						52.4	156.4000	0.079	0.20	39.5	0.20	39.5	0.13	61.2
						52.2	162.0000	0.075	0.20	37.5	0.20	37.5	0.13	58.1
				RAD4225A, 1/4 wave (146-150.8MHz)	54	52.0	146.0000	0.074	0.20	36.9	0.20	36.9	0.13	57.1
						52.8	150.8000	0.074	0.20	37.1	0.20	37.1	0.13	57.4
				RAD4226A, 1/4 wave (136-144MHz)	54	53.3	138.0000	0.065	0.20	32.4	0.20	32.4	0.13	50.3
						52.8	144.0000	0.087	0.20	43.3	0.20	43.3	0.13	67.1
				RAD4227A, 5/8 wave (146-172MHz)	54	52.0	146.0000	0.077	0.20	38.6	0.20	38.6	0.13	59.7
						52.8	150.8000	0.061	0.20	30.6	0.20	30.6	0.13	47.4
						52.7	158.0125	0.077	0.20	38.7	0.20	38.7	0.13	59.9
						52.1	165.0125	0.056	0.20	28.2	0.20	28.2	0.13	43.6
						52.4	172.0000	0.029	0.20	14.4	0.20	14.4	0.13	22.4
				HAD4022A, 5/8 Wave, (132-174MHz)	54	53.3	138.0000	0.037	0.20	18.7	0.20	18.7	0.13	28.9
						52.8	144.0000	0.062	0.20	30.8	0.20	30.8	0.13	47.7
						52.8	150.8000	0.046	0.20	22.9	0.20	22.9	0.13	35.5
						52.7	158.0125	0.072	0.20	36.2	0.20	36.2	0.13	56.1
						52.1	165.0125	0.071	0.20	35.7	0.20	35.7	0.13	55.3
						52.1	173.0125	0.074	0.20	36.9	0.20	36.9	0.13	57.2

Table 9 (Continued)**MPE assessment for LMR VHF - roof mounted antenna – Bystander**

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	Angle (Degree)	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	H	0	HAD4006A, 1/4 Wave, (136-144MHz)	54	53.3	138.0000	0.057	0.20	28.4	0.20	28.4	0.13	44.0
						52.8	144.0000	0.068	0.20	33.8	0.20	33.8	0.13	52.3
				HAD4007A, 1/4 Wave, (144-150.8 MHz)	54	52.0	146.0000	0.081	0.20	40.3	0.20	40.3	0.13	62.4
						52.8	150.8000	0.113	0.20	56.7	0.20	56.7	0.13	87.8
				HAD4008A, 1/4 Wave, (150.8-162 MHz)	54	52.8	150.8000	0.100	0.20	50.2	0.20	50.2	0.13	77.8
						52.4	156.4000	0.112	0.20	55.8	0.20	55.8	0.13	86.5
						52.2	162.0000	0.126	0.20	63.0	0.20	63.0	0.13	97.6
				HAD4009A, 1/4 Wave, (162-174MHz)	54	52.2	162.0000	0.108	0.20	54.1	0.20	54.1	0.13	83.8
						52.1	165.0125	0.114	0.20	56.8	0.20	56.8	0.13	88.1
						52.1	173.0125	0.097	0.20	48.5	0.20	48.5	0.13	75.1
				RAD4223A, 1/4 wave (162-174MHz)	54	52.2	162.0000	0.064	0.20	31.9	0.20	31.9	0.13	49.5
						52.1	165.0125	0.087	43.3	45.5	0.20	43.3	0.13	67.1
						52.1	173.0125	0.105	0.20	52.4	0.20	52.4	0.13	81.1
				RAD4224A, 1/4 wave (150.8-162MHz)	54	52.8	150.8000	0.060	0.20	30.2	0.20	30.2	0.13	46.8
						52.4	156.4000	0.124	0.20	62.1	0.20	62.1	0.13	96.2
						52.2	162.0000	0.119	0.20	59.7	0.20	59.7	0.13	92.5
				RAD4225A, 1/4 wave (146-150.8MHz)	54	52.0	146.0000	0.115	0.20	57.4	0.20	57.4	0.13	89.0
						52.8	150.8000	0.123	0.20	61.5	0.20	61.5	0.13	95.3
				RAD4226A, 1/4 wave (136-144MHz)	54	53.3	138.0000	0.091	0.20	45.6	0.20	45.6	0.13	70.7
						52.8	144.0000	0.107	0.20	53.6	0.20	53.6	0.13	83.0
				RAD4227A, wave (146-172MHz)	54	52.0	146.0000	0.104	0.20	52.0	0.20	52.0	0.13	80.5
						52.8	150.8000	0.088	0.20	43.9	0.20	43.9	0.13	68.0
						52.7	158.0125	0.086	0.20	43.1	0.20	43.1	0.13	66.8
						52.1	165.0125	0.060	0.20	30.2	0.20	30.2	0.13	46.8
						52.4	172.0000	0.039	0.20	19.3	0.20	19.3	0.13	29.8
				HAD4022A, 5/8 Wave, (132-174MHz)	54	53.3	138.0000	0.074	0.20	36.8	0.20	36.8	0.13	57.0
						52.8	144.0000	0.073	0.20	36.3	0.20	36.3	0.13	56.2
						52.8	150.8000	0.076	0.20	38.2	0.20	38.2	0.13	59.2
						52.7	158.0125	0.092	0.20	46.0	0.20	46.0	0.13	71.2
						52.1	165.0125	0.116	0.20	58.1	0.20	58.1	0.13	90.0
						52.1	173.0125	0.107	0.20	53.5	0.20	53.5	0.13	82.9

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

Blue fonts: Frequencies not regulated by FCC.

Results highlight in yellow are configurations with highest percentage of limits

*Results required SAR simulation to demonstrate compliance to the basic requirements

Trunk/ Roof	Test Position	E/H Field	Angle (Degree)	Antenna Model	Max Pwr (W)	Initial Pwr (W)	Tx Freq (MHz)	Max Calc. P.D. (mW/ cm^2)	FCC Limit	% To FCC Spec Limit	ICNIRP Limit	% To ICNIRP Spec Limit	ISED Limit	% To ISED Spec Limit
Trunk	PB	E	0	HAD4022A, 5/8 Wave, (132-174MHz)	54	53.3	138.0000	0.079	0.20	39.3	0.20	39.3	0.13	60.8
						52.8	144.0000	0.167	0.20	83.5	0.20	83.5	0.13	*129.3
						52.8	150.8000	0.163	0.20	81.5	0.20	81.5	0.13	*126.2
						52.7	158.0125	0.246	0.20	*123.1	0.20	*123.1	0.13	*190.7
						52.1	165.0125	0.544	0.20	*271.9	0.20	*271.9	0.13	*421.2
						52.1	173.0125	0.656	0.20	*327.8	0.20	*327.8	0.13	*507.9
Trunk	PB	H	0	HAD4022A, 5/8 Wave, (132-174MHz)	54	53.3	138.0000	0.102	0.20	51.0	0.20	51.0	0.13	79.0
						52.8	144.0000	0.163	0.20	81.3	0.20	81.3	0.13	*125.9
						52.8	150.8000	0.141	0.20	70.4	0.20	70.4	0.13	*109.1
						52.7	158.0125	0.183	0.20	91.5	0.20	91.5	0.13	*141.8
						52.1	165.0125	0.388	0.20	*193.8	0.20	*193.8	0.13	*300.2
						52.1	173.0125	0.471	0.20	*235.3	0.20	*235.3	0.13	*364.5

Table 11**MPE assessment for LMR VHF - roof mounted antenna – Passenger Back**

Blue fonts: Frequencies not regulated by FCC.

* Results required SAR simulation to demonstrate compliance to the basic requirements

Trunk/ Roof	Test Position	E/H Field	Angle (Degree)	Antenna Model	Max Pwr (W)	Initial Pwr (W)	Tx Freq (MHz)	Max Calc. P.D. (mW/ cm^2)	FCC Limit	% To FCC Spec Limit	ICNIRP Limit	% To ICNIRP Spec Limit	ISED Limit	% To ISED Spec Limit
Roof	PB	E	0	HAD4006A, 1/4 Wave, (136-144MHz)	54	53.3	138.0000	0.143	0.20	71.6	0.20	71.6	0.13	*110.9
						52.8	144.0000	0.125	0.20	62.4	0.20	62.4	0.13	96.7
				HAD4007A, 1/4 Wave, (144-150.8 MHz)	54	52.0	146.0000	0.118	0.20	58.8	0.20	58.8	0.13	91.1
						52.8	150.8000	0.128	0.20	64.2	0.20	64.2	0.13	99.4
				HAD4008A, 1/4 Wave, (150.8-162 MHz)	54	52.8	150.8000	0.127	0.20	63.6	0.20	63.6	0.13	98.6
						52.4	156.4000	0.150	0.20	75.1	0.20	75.1	0.13	*116.3
						52.2	162.0000	0.170	0.20	85.2	0.20	85.2	0.13	*132.0
				HAD4009A, 1/4 Wave, (162-174MHz)	54	52.2	162.0000	0.143	0.20	71.6	0.20	71.6	0.13	*110.9
						52.1	165.0125	0.164	0.20	81.9	0.20	81.9	0.13	*126.9
						52.1	173.0125	0.134	0.20	67.2	0.20	67.2	0.13	*104.1
				RAD4223A, 1/4 wave (162-174MHz)	54	52.2	162.0000	0.091	0.20	45.3	0.20	45.3	0.13	70.2
						52.1	165.0125	0.124	0.20	61.8	0.20	61.8	0.13	95.7
						52.1	173.0125	0.120	0.20	59.8	0.20	59.8	0.13	92.6
				RAD4224A, 1/4 wave (150.8-162MHz)	54	52.8	150.8000	0.049	0.20	24.6	0.20	24.6	0.13	38.1
						52.4	156.4000	0.126	0.20	63.1	0.20	63.1	0.13	97.7
						52.2	162.0000	0.158	0.20	78.9	0.20	78.9	0.13	*122.2
				RAD4225A, 1/4 wave (146-150.8MHz)	54	52.0	146.0000	0.128	0.20	64.1	0.20	64.1	0.13	99.3
						52.8	150.8000	0.146	0.20	73.1	0.20	73.1	0.13	*113.3
				RAD4226A, 1/4 wave (136-144MHz)	54	53.3	138.0000	0.139	0.20	69.5	0.20	69.5	0.13	*107.7
						52.8	144.0000	0.127	0.20	63.6	0.20	63.6	0.13	98.6
				RAD4227A, 5/8 wave (146-172MHz)	54	52.0	146.0000	0.084	0.20	42.2	0.20	42.2	0.13	65.4
						52.8	150.8000	0.087	0.20	43.6	0.20	43.6	0.13	67.5
						52.7	158.0125	0.083	0.20	41.4	0.20	41.4	0.13	64.1
						52.1	165.0125	0.099	0.20	49.6	0.20	49.6	0.13	76.8
						52.4	172.0000	0.053	0.20	26.3	0.20	26.3	0.13	40.7
				HAD4022A, 5/8 Wave, (132-174MHz)	54	53.3	138.0000	0.037	0.20	18.3	0.20	18.3	0.13	28.3
						52.8	144.0000	0.030	0.20	15.1	0.20	15.1	0.13	23.4
						52.8	150.8000	0.022	0.20	11.2	0.20	11.2	0.13	17.4
						52.7	158.0125	0.034	0.20	17.1	0.20	17.1	0.13	26.4
						52.1	165.0125	0.095	0.20	47.5	0.20	47.5	0.13	73.5
						52.1	173.0125	0.057	0.20	28.4	0.20	28.4	0.13	44.1

Table 11 (Continued)**MPE assessment for LMR VHF - roof mounted antenna – Passenger Back**

Blue fonts: Frequencies not regulated by FCC.

Results highlight in yellow are configurations with highest percentage of limits

* Results required SAR simulation to demonstrate compliance to the basic requirements

Trunk/ Roof	Test Position	E/H Field	Angle (Degree)	Antenna Model	Max Pwr (W)	Initial Pwr (W)	Tx Freq (MHz)	Max Calc. P.D. (mW/ cm ²)	FCC Limit	% To FCC Spec Limit	ICNIRP Limit	% To ICNIRP Spec Limit	ISED Limit	% To ISED Spec Limit
Roof	PB	H	0	HAD4006A, 1/4 Wave, (136-144MHz)	54	53.3	138.0000	0.126	0.20	62.9	0.20	62.9	0.13	97.4
						52.8	144.0000	0.092	0.20	45.8	0.20	45.8	0.13	70.9
				HAD4007A, 1/4 Wave, (144-150.8 MHz)	54	52.0	146.0000	0.082	0.20	40.9	0.20	40.9	0.13	63.3
						52.8	150.8000	0.120	0.20	59.8	0.20	59.8	0.13	92.6
				HAD4008A, 1/4 Wave, (150.8-162 MHz)	54	52.8	150.8000	0.085	0.20	42.6	0.20	42.6	0.13	66.1
						52.4	156.4000	0.145	0.20	72.3	0.20	72.3	0.13	*112.0
						52.2	162.0000	0.176	0.20	88.0	0.20	88.0	0.13	*136.4
				HAD4009A, 1/4 Wave, (162-174MHz)	54	52.2	162.0000	0.152	0.20	75.9	0.20	75.9	0.13	*117.5
						52.1	165.0125	0.162	0.20	80.9	0.20	80.9	0.13	*125.3
						52.1	173.0125	0.113	0.20	56.3	0.20	56.3	0.13	87.2
				RAD4223A, 1/4 wave (162-174MHz)	54	52.2	162.0000	0.087	0.20	43.5	0.20	43.5	0.13	67.3
						52.1	165.0125	0.115	0.20	57.5	0.20	57.5	0.13	89.0
						52.1	173.0125	0.099	0.20	49.5	0.20	49.5	0.13	76.7
				RAD4224A, 1/4 wave (150.8-162MHz)	54	52.8	150.8000	0.053	0.20	26.5	0.20	26.5	0.13	41.0
						52.4	156.4000	0.103	0.20	51.4	0.20	51.4	0.13	79.7
						52.2	162.0000	0.140	0.20	70.1	0.20	70.1	0.13	*108.5
				RAD4225A, 1/4 wave (146-150.8MHz)	54	52.0	146.0000	0.103	0.20	51.7	0.20	51.7	0.13	80.1
						52.8	150.8000	0.119	0.20	59.7	0.20	59.7	0.13	92.4
				RAD4226A, 1/4 wave (136-144MHz)	54	53.3	138.0000	0.124	0.20	62.0	0.20	62.0	0.13	96.0
						52.8	144.0000	0.121	0.20	60.6	0.20	60.6	0.13	93.9
				RAD4227A, 5/8 wave (146-172MHz)	54	52.0	146.0000	0.059	0.20	29.7	0.20	29.7	0.13	46.0
						52.8	150.8000	0.079	0.20	39.6	0.20	39.6	0.13	61.4
						52.7	158.0125	0.091	0.20	45.5	0.20	45.5	0.13	70.5
						52.1	165.0125	0.102	0.20	50.9	0.20	50.9	0.13	78.8
						52.4	172.0000	0.055	0.20	27.6	0.20	27.6	0.13	42.8
				HAD4022A, 5/8 Wave, (132-174MHz)	54	53.3	138.0000	0.042	0.20	20.9	0.20	20.9	0.13	32.4
						52.8	144.0000	0.038	0.20	19.1	0.20	19.1	0.13	29.7
						52.8	150.8000	0.047	0.20	23.7	0.20	23.7	0.13	36.8
						52.7	158.0125	0.067	0.20	33.3	0.20	33.3	0.13	51.5
						52.1	165.0125	0.079	0.20	39.4	0.20	39.4	0.13	61.0
						52.1	173.0125	0.062	0.20	31.1	0.20	31.1	0.13	48.1

Table 12
MPE assessment for LMR VHF - trunk mounted antenna – Passenger Front

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	Angle (Degree)	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	0	HAD4022A, 5/8 Wave, (132-174MHz)	54	53.3	138.0000	0.012	0.20	5.8	0.20	5.8	0.13	8.9
						52.8	144.0000	0.017	0.20	8.3	0.20	8.3	0.13	12.9
						52.8	150.8000	0.040	0.20	19.9	0.20	19.9	0.13	30.8
						52.7	158.0125	0.044	0.20	21.8	0.20	21.8	0.13	33.7
						52.1	165.0125	0.049	0.20	24.4	0.20	24.4	0.13	37.8
						52.1	173.0125	0.043	0.20	21.3	0.20	21.3	0.13	33.0
Trunk	PF	H	0	HAD4022A, 5/8 Wave, (132-174MHz)	54	53.3	138.0000	0.035	0.20	17.3	0.20	17.3	0.13	26.8
						52.8	144.0000	0.043	0.20	21.6	0.20	21.6	0.13	33.5
						52.8	150.8000	0.044	0.20	22.1	0.20	22.1	0.13	34.3
						52.7	158.0125	0.040	0.20	20.2	0.20	20.2	0.13	31.2
						52.1	165.0125	0.054	0.20	27.2	0.20	27.2	0.13	42.1
						52.1	173.0125	0.032	0.20	16.1	0.20	16.1	0.13	25.0

Table 13**MPE assessment for LMR VHF - roof mounted antenna – Passenger Front**

Blue fonts: Frequencies not regulated by FCC.

Trunk/ Roof	Test Position	E/H Field	Angle (Degree)	Antenna Model	Max Pwr (W)	Initial Pwr (W)	Tx Freq (MHz)	Max Calc. P.D. (mW/ cm ²)	FCC Limit	% To FCC Spec Limit	ICNIRP Limit	% To ICNIRP Spec Limit	ISED Limit	% To ISED Spec Limit
Roof	PF	E	0	HAD4006A, 1/4 Wave, (136-144MHz)	54	53.3	138.0000	0.034	0.20	17.1	0.20	17.1	0.13	26.5
						52.8	144.0000	0.036	0.20	17.9	0.20	17.9	0.13	27.7
				HAD4007A, 1/4 Wave, (144-150.8 MHz)	54	52.0	146.0000	0.041	0.20	20.3	0.20	20.3	0.13	31.5
						52.8	150.8000	0.040	0.20	20.2	0.20	20.2	0.13	31.2
				HAD4008A, 1/4 Wave, (150.8-162 MHz)	54	52.8	150.8000	0.038	0.20	19.0	0.20	19.0	0.13	29.5
						52.4	156.4000	0.039	0.20	19.4	0.20	19.4	0.13	30.1
						52.2	162.0000	0.053	0.20	26.7	0.20	26.7	0.13	41.4
				HAD4009A, 1/4 Wave, (162-174MHz)	54	52.2	162.0000	0.044	0.20	22.1	0.20	22.1	0.13	34.2
						52.1	165.0125	0.041	0.20	20.6	0.20	20.6	0.13	31.9
						52.1	173.0125	0.049	0.20	24.3	0.20	24.3	0.13	37.7
				RAD4223A, 1/4 wave (162-174MHz)	54	52.2	162.0000	0.021	0.20	10.3	0.20	10.3	0.13	15.9
						52.1	165.0125	0.033	0.20	16.7	0.20	16.7	0.13	25.8
						52.1	173.0125	0.044	0.20	21.9	0.20	21.9	0.13	33.9
				RAD4224A, 1/4 wave (150.8-162MHz)	54	52.8	150.8000	0.014	0.20	7.1	0.20	7.1	0.13	11.0
						52.4	156.4000	0.032	0.20	15.9	0.20	15.9	0.13	24.7
						52.2	162.0000	0.063	0.20	31.4	0.20	31.4	0.13	48.6
				RAD4225A, 1/4 wave (146-150.8MHz)	54	52.0	146.0000	0.037	0.20	18.6	0.20	18.6	0.13	28.9
						52.8	150.8000	0.038	0.20	19.0	0.20	19.0	0.13	29.5
				RAD4226A, 1/4 wave (136-144MHz)	54	53.3	138.0000	0.029	0.20	14.6	0.20	14.6	0.13	22.5
						52.8	144.0000	0.038	0.20	19.2	0.20	19.2	0.13	29.8
				RAD4227A, 5/8 wave (146-172MHz)	54	52.0	146.0000	0.032	0.20	16.1	0.20	16.1	0.13	24.9
						52.8	150.8000	0.021	0.20	10.5	0.20	10.5	0.13	16.3
						52.7	158.0125	0.020	0.20	9.8	0.20	9.8	0.13	15.2
						52.1	165.0125	0.017	0.20	8.4	0.20	8.4	0.13	13.0
						52.4	172.0000	0.007	0.20	3.6	0.20	3.6	0.13	5.6
				HAD4022A, 5/8 Wave, (132-174MHz)	54	53.3	138.0000	0.008	0.20	3.9	0.20	3.9	0.13	6.0
						52.8	144.0000	0.013	0.20	6.7	0.20	6.7	0.13	10.4
						52.8	150.8000	0.010	0.20	4.8	0.20	4.8	0.13	7.4
						52.7	158.0125	0.010	0.20	5.2	0.20	5.2	0.13	8.1
						52.1	165.0125	0.019	0.20	9.4	0.20	9.4	0.13	14.6
						52.1	173.0125	0.015	0.20	7.3	0.20	7.3	0.13	11.4

Table 13 (Continued)**MPE assessment for LMR VHF - roof mounted antenna – Passenger Front**

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	Angle (Degree)	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	PF	H	0	HAD4006A, 1/4 Wave, (136-144MHz)	54	53.3	138.0000	0.067	0.20	33.3	0.20	33.3	0.13	51.6
						52.8	144.0000	0.069	0.20	34.7	0.20	34.7	0.13	53.8
				HAD4007A, 1/4 Wave, (144-150.8 MHz)	54	52.0	146.0000	0.078	0.20	38.9	0.20	38.9	0.13	60.2
						52.8	150.8000	0.070	0.20	35.1	0.20	35.1	0.13	54.4
				HAD4008A, 1/4 Wave, (150.8-162 MHz)	54	52.8	150.8000	0.076	0.20	37.9	0.20	37.9	0.13	58.7
						52.4	156.4000	0.062	0.20	31.2	0.20	31.2	0.13	48.3
						52.2	162.0000	0.072	0.20	35.9	0.20	35.9	0.13	55.6
				HAD4009A, 1/4 Wave, (162-174MHz)	54	52.2	162.0000	0.063	0.20	31.5	0.20	31.5	0.13	48.9
						52.1	165.0125	0.069	0.20	34.4	0.20	34.4	0.13	53.3
						52.1	173.0125	0.038	0.20	19.2	0.20	19.2	0.13	29.8
				RAD4223A, 1/4 wave (162-174MHz)	54	52.2	162.0000	0.041	0.20	20.7	0.20	21.7	0.13	32.1
						52.1	165.0125	0.045	0.20	22.7	0.20	22.7	0.13	35.2
						52.1	173.0125	0.045	0.20	22.7	0.20	22.7	0.13	35.2
				RAD4224A, 1/4 wave (150.8-162MHz)	54	52.8	150.8000	0.037	0.20	18.6	0.20	18.6	0.13	28.9
						52.4	156.4000	0.070	0.20	34.9	0.20	34.9	0.13	54.1
						52.2	162.0000	0.084	0.20	42.0	0.20	42.0	0.13	65.1
				RAD4225A, 1/4 wave (146-150.8MHz)	54	52.0	146.0000	0.077	0.20	38.6	0.20	38.6	0.13	59.8
						52.8	150.8000	0.079	0.20	39.6	0.20	39.6	0.13	61.3
				RAD4226A, 1/4 wave (136-144MHz)	54	53.3	138.0000	0.063	0.20	31.7	0.20	31.7	0.13	49.2
						52.8	144.0000	0.066	0.20	33.0	0.20	33.0	0.13	51.1
				RAD4227A, 5/8 wave (146-172MHz)	54	52.0	146.0000	0.063	0.20	31.6	0.20	31.6	0.13	48.9
						52.8	150.8000	0.051	0.20	25.5	0.20	25.5	0.13	39.5
						52.7	158.0125	0.048	0.20	23.8	0.20	23.8	0.13	36.8
						52.1	165.0125	0.042	0.20	20.9	0.20	20.9	0.13	32.3
						52.4	172.0000	0.019	0.20	9.6	0.20	9.6	0.13	14.9
				HAD4022A, 5/8 Wave, (132-174MHz)	54	53.3	138.0000	0.027	0.20	13.7	0.20	13.7	0.13	21.2
						52.8	144.0000	0.028	0.20	14.0	0.20	14.0	0.13	21.6
						52.8	150.8000	0.029	0.20	14.3	0.20	14.3	0.13	22.2
						52.7	158.0125	0.035	0.20	17.3	0.20	17.3	0.13	26.9
						52.1	165.0125	0.041	0.20	20.6	0.20	20.6	0.13	31.8
						52.1	173.0125	0.021	0.20	10.6	0.20	10.6	0.13	16.5

17.2 Assessment of Bluetooth / WLAN Radio and Simultaneous Transmission

MPE calculation was used 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 limit	% To FCC Spec Limit	ISED limit	% To ISED Spec Limit
WLAN 2.4 GHz												
NA Regions												
Internal Antenna	0.018	99.80%	2412.0	5.45	0.00	20	1.00	0.012	1.00	1.24	0.54	2.31
Internal Antenna	0.018	99.80%	2437.0	5.45	0.00	20	1.00	0.012	1.00	1.24	0.54	2.29
Internal Antenna	0.018	99.80%	2462.0	5.45	0.00	20	1.00	0.012	1.00	1.24	0.54	2.28
Bluetooth												
NA Regions												
Internal Antenna	0.004	77.00%	2402.0	5.45	0.00	20	1.00	0.002	1.00	0.21	0.54	0.40
Internal Antenna	0.004	77.00%	2441.0	5.45	0.00	20	1.00	0.002	1.00	0.21	0.54	0.40
Internal Antenna	0.004	77.00%	2480.0	5.45	0.00	20	1.00	0.002	1.00	0.21	0.55	0.39

(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 limit	% To ICNIRP Spec Limit
WLAN 2.4 GHz										
Other Regions										
Internal Antenna	0.030	99.80%	2412.0	5.45	0.00	20	1.00	0.021	1.00	2.10
Internal Antenna	0.030	99.80%	2437.0	5.45	0.00	20	1.00	0.021	1.00	2.10
Internal Antenna	0.030	99.80%	2462.0	5.45	0.00	20	1.00	0.021	1.00	2.10
Bluetooth										
Other Regions										
Internal Antenna	0.003	77.00%	2402.0	5.45	0.00	20	1.00	0.002	1.00	0.17
Internal Antenna	0.003	77.00%	2441.0	5.45	0.00	20	1.00	0.002	1.00	0.17
Internal Antenna	0.003	77.00%	2480.0	5.45	0.00	20	1.00	0.002	1.00	0.17

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.

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 UHF1	150.8-173.4	42.0 %	327.8 %	103.4 %
Bluetooth	2402 - 2480	0.21 %	0.21 %	0.21 %
WLAN 2.4 GHz	2412 - 2462	1.24 %	1.24 %	1.24 %
ISED Canada				
LMR UHF1	138-174	65.1 %	507.9 %	160.2 %
Bluetooth	2402 - 2480	0.40 %	0.40 %	0.40 %
WLAN 2.4 GHz	2412 - 2462	2.31 %	2.31 %	2.31 %
ICNIRP				
LMR UHF1	136-174	42.0 %	327.8 %	103.4 %
Bluetooth	2402 - 2480	0.17 %	0.17 %	0.17 %
WLAN 2.4 GHz	2412 - 2462	2.10 %	2.10 %	2.10 %

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 and Bluetooth. WLAN 2.4 GHz and Bluetooth transmitters cannot transmit at the same time. Thus, WLAN 2.4 GHz will be used 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 and WLAN	43.24 %	329.04 %	104.64 %
ISED Canada	LMR and WLAN	67.41 %	510.21 %	162.51 %
ICNIRP	LMR and WLAN	44.10 %	329.90 %	105.50 %

18.0 Conclusion

The assessments for this device were performed with an output power range as indicated in section 17.1. The maximum allowable output power is equal to the upper limit of the final test factory transmit power specification listed in Table 6. The highest power density results for LMR transmitters scaled to maximum allowable power output are indicated in Table 14 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 VHF	150.8-173.4	0.656	0.207
ISED Canada	LMR VHF	138-174	0.656	0.207
ICNIRP	LMR VHF	136-174	0.656	0.207

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
ICNIRP	Bluetooth	2402 – 2480	0.002	0.002
FCC / ISED Canada	2.4 GHz WLAN	2412-2462	0.012	0.012
ICNIRP	2.4 GHz WLAN	2412-2462	0.021	0.021

These MPE results herein demonstrate compliance to the FCC US, 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 convenient method of demonstrating RF Exposure requirements, SAR is recognized as the “basic restriction”. For those configurations in Table 8-13 with ‘*’, compliance to the General Population / Uncontrolled SAR 1g limit of 1.6 W/kg is demonstrated through SAR computational analysis.

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

Table 19

Designator	Exposure Conditions	Maximum peak average SAR (1g)
FCC	Passenger	0.82 W/kg
	Bystander	0.43 W/kg
ISED Canada	Passenger	0.82 W/kg
	Bystander	0.50 W/kg

Table 19 (Continued)

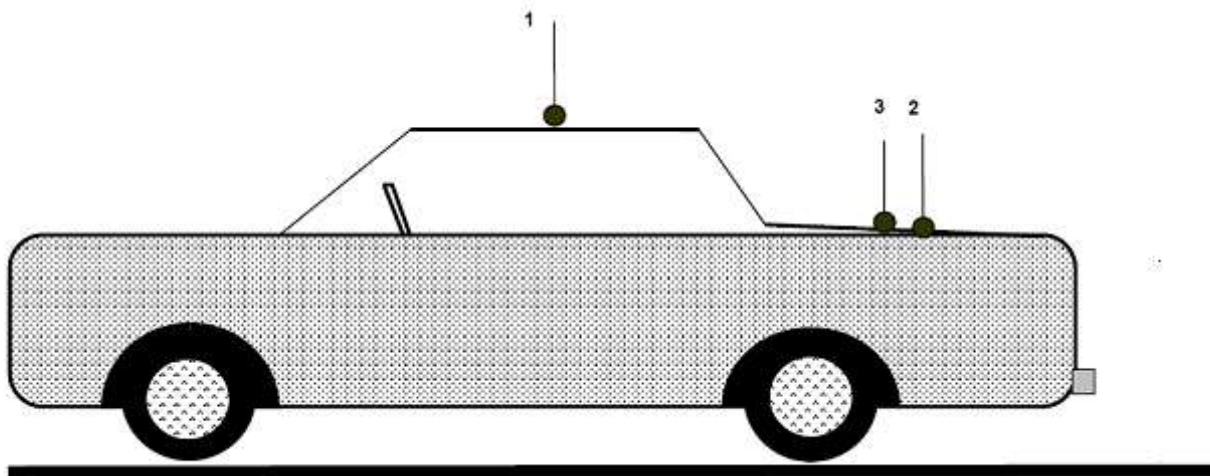
Designator	Exposure Conditions	Maximum peak average SAR (1g)
ICNIRP	Passenger	0.75 W/kg
	Bystander	0.28 W/kg

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.

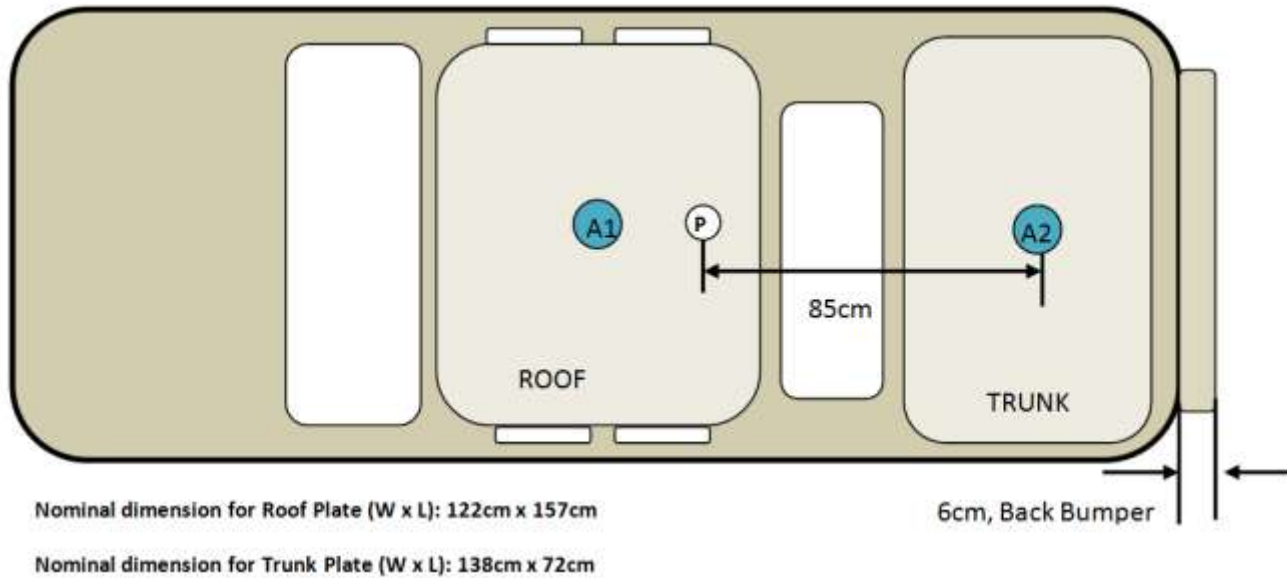
Appendix A - Antenna Locations, Test Distances, and Cable Losses

Antenna locations



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

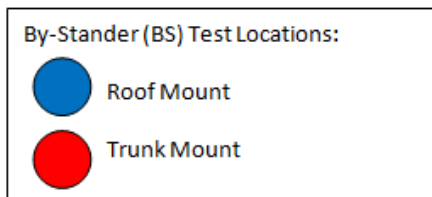
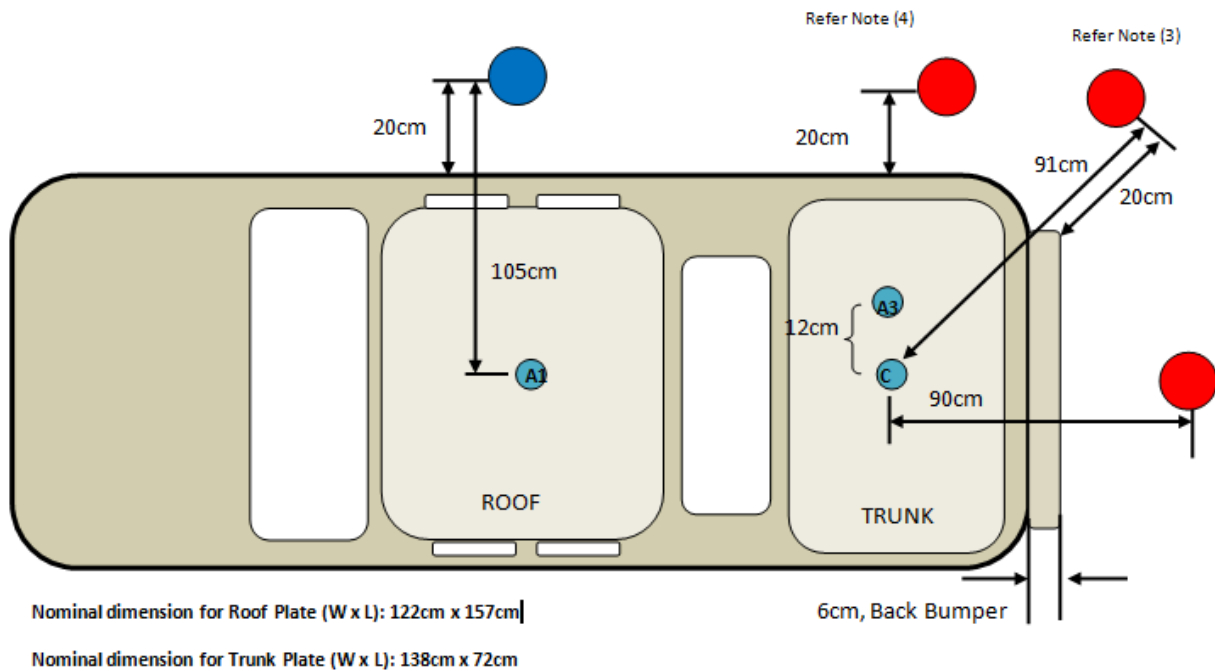
Passenger Antenna mounting



Notes:

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

Bystander Antenna mounting



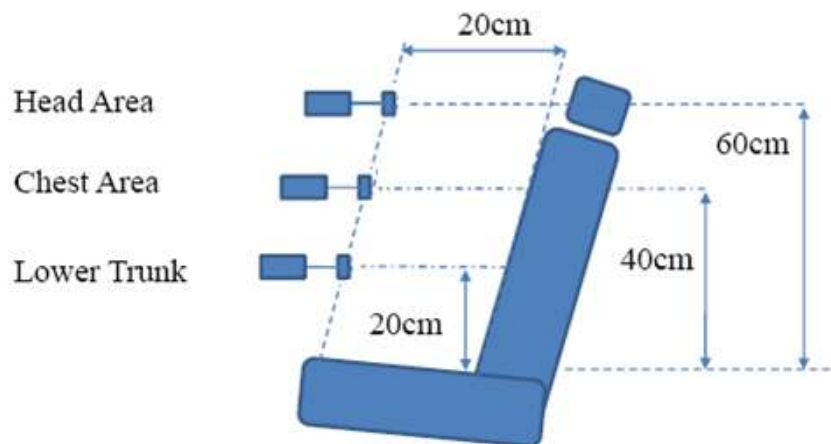
Notes:

- 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 12 cm from center of the trunk)

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

Meter - Probe

Probe diameter is 5.5cm



Cable Losses

Test Cable

Teflon RG58A/U Loss Per 100 Feet

160 MHz - 5 dB

450 MHz - 9 dB

1 GHz - 13.8 dB

Customer Cable

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

136 MHz – 5.5 dB

450 MHz – 9.6 dB

900 MHz – 13.9 dB

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

2500 MHz - 12.9 dB

5800 MHz -20.4 dB

Appendix B - Probe Calibration Certificates

Service Test Report
QAF 1126, 03/11
Report ID: 134653



Certificate of Test Conformance
Page 1 of 1

Reference: S 000048638

Customer: Motorola Solutions Malaysia Sdn Bhd - Plot 2A, Medan Bayan Lepas, Mukim 12
S.W.D. - Bayan Lepas - Penang 11900 - Malaysia

The instrument listed below has been tested and verified to Internal Quality Standards. Test data is Attached. Equipment used during instrument testing is controlled by laboratory compliance with ISO/IEC 17025-2017 and ANSI/NCSL Z540-1-1994 using ETS-Lindgren Quality Management System internal procedures.

<u>Manufacturer</u>	ETS-Lindgren	<u>Status In</u>
<u>Instrument Type</u>	RF Survey Meter	In Tolerance
<u>Model</u>	HI-2200	<u>Date Completed</u>
<u>Serial Number/ID</u>	00086887	06-May-20
		<u>Status Out</u>
		Compliant with Internal Quality Standards

Remarks

Performed functional test with E100 sn 00224511 and H200 sn 00224521. Unit had Firmware #2.32 Upgrade. Alt ID: MS10201.

I would like to take this opportunity to express our appreciation for using ETS-Lindgren for your EMI test equipment services and I am looking forward to continued business with your organization. Please feel free to contact our offices at (512) 531-6400, if you have any questions regarding this report.

Sincerely,

George Cisneros
Calibration Supervisor

Date Attested: 06-May-20



Cert I.D.: 134551

**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:	00224511	Date Code:	
Tracking Number:	S 000048638	Alternate ID:	MS10428
Date Completed:	06-May-20	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 dB
 $k=2$, (95% Confidence Level)

Test Remarks: Probe received in tolerance thus before and after data are the same. Calibration performed with customer's HI-2200 sn 00066887.

Calibration Traceability: All Measuring and Test Equipment (MTE) identified below are traceable to the SI units through the National Institute for Standards and Technology (NIST) or other recognized National Metrology Institute. Calibration Laboratory and Quality System controls are compliant with ISO/IEC 17025:2017 and ANSI/NCCL Z540-1-1994.

Standards and Equipment Used:

Make / Model / Name / S/N / Calibration Date	Condition of Instrument Upon Receipt:
HP 8648C Signal Generator 3836U02236 04-May-21	In Tolerance to Internal Quality Standards
Keysight E9304A Power Sensor MY56100039 16-Apr-21	
Hewlett Packard E4422B Signal Generator US40050591 09-Aug-20	On Release:
Agilent E9304A Power Sensor MY41499013 16-Apr-21	In Tolerance to Internal Quality Standards
Agilent E9304A Power Sensor MY41499012 16-Apr-21	
Rohde & Schwarz NRP-Z91 Power Sensor 100733 06-Mar-21	
Agilent E4419B Power Meter MY40510693 08-Aug-20	
Agilent N1913A Power Meter MY50000415 16-Mar-21	
Marconi 2024 Signal Generator 112343/043 04-May-21	
Rohde & Schwarz NRVD Power Meter 828110/019 09-Jan-21	
Hewlett Packard E4419B Power Meter US39250717 14-Aug-20	
Keysight E9304A Power Sensor MY56100005 16-Apr-21	
Rohde & Schwarz NRV-Z55 Thermal Power Sensor 100352 20-Sep-20	
Rohde & Schwarz NRV-Z55 Thermal Power Sensor 100037 22-Oct-20	
Rohde & Schwarz NRP-Z91 Power Sensor 100734 01-Aug-20	
Keysight N5183B MXG Analog Signal Gener MY53270789 08-Feb-21	

Calibration Completed By
 Julio A. Aquino, Calibration Technician

Attested and Issued on 06-May-20
 George Chimeras, Calibration Supervisor

This document provides traceability of measurements to recognized national standards using controlled processes at the ETS-Lindgren Calibration Laboratory. Uncertainties listed are derived from the methods described by NIST Tech Note 1297. This certificate and report may not be reproduced, except in full, without the written approval of ETS-Lindgren Calibration Laboratory in accordance with ISO/IEC 17025:2017 and ANSI/NCCL Z540-1-1994. The results in this document relate only to the item(s) listed and should not be considered representative of a population unless otherwise noted. QAF 1127 (02/11)

CALIBRATION REPORT

Electric Field Sensor

Model	S/N
E100	00224511
HI-2200	00086887

Date: 06 May 2020

New Instrument

_ Other

_ Out of Tolerance

☒ Within Tolerance

Frequency Response

Frequency Response	Nominal Field	Cal Factor*	Deviation
MHz	V/m	(Applied/Indicated)	dB
1	0.1	20	1.45
2	0.5	20	1.12
3	1	20	1.05
4	3	20	1.00
5	15	20	1.00
6	27.12	20	1.01
7	30	20	1.00
8	75	20	1.01
9	100	20	1.01
10	150	20	1.01
11	200	20	1.00
12	250	20	1.00
13	300	20	0.99
14	400	20	1.01
15	500	20	1.05
16	600	20	1.05
17	700	20	1.08
18	800	20	1.10
19	900	20	1.05
20	1000	20	1.00
21	2000	20	1.04
22	2450	20	1.04
23	3000	20	0.98
24	3500	20	0.90
25	4000	20	0.99
26	5000	20	1.01
27	5500	20	1.25
28	6000	20	1.33

* 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 0.42 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



PROBE ROTATIONAL RESPONSE

Model E100
S/N 00224511
Report S00048638
Date Date of Calibration 06 May 2020
Time 08:45:13 AM
Isotropy * + 0.308 dB/ -0.308 dB

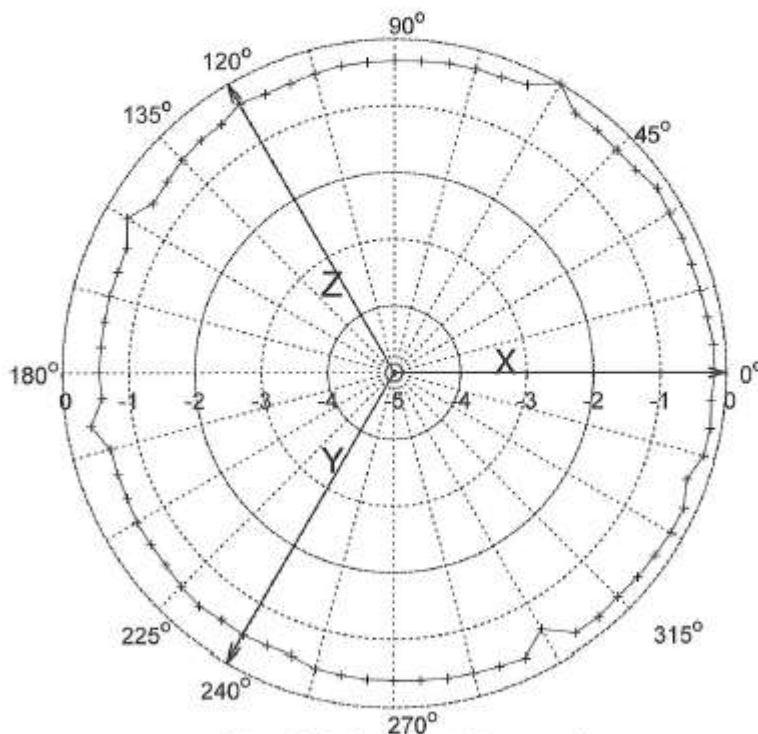


Figure 1: Probe Isotropic Response Chart.

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.



Cert I.D.: 134652

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

**Certificate of Calibration Conformance**

Page 1 of 2

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:	5-300MHz / 30mA/m-10A/m
Model Number:	H200	Instrument Type:	Isotropic Magnetic Field Probe (2)
Serial Number/ ID:	00224521	Date Code:	
Tracking Number:	S 000048638	Alternate ID:	MS10429
Date Completed:	06-May-20	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: Direct Field Method 1.15dB

k=2, (95% Confidence Level)

Test Remarks: Probe received in tolerance thus before and after data are the same. Probe was tested with customer's HI-2200 sn 00086887.

Calibration Traceability: All Measuring and Test Equipment (MTE) identified below are traceable to the SI units through the National Institute for Standards and Technology (NIST) or other recognized National Metrology Institute. Calibration Laboratory and Quality System controls are compliant with ISO/IEC 17025:2017 and ANSI/NCSL Z540-1-1994.

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

HP	8648C	Signal Generator	3836U02236	04-May-21
Keysight	E9304A	Power Sensor	MY56100039	16-Apr-21
Hewlett Packard	E4422B	Signal Generator	US40050591	09-Aug-20
Agilent	E9304A	Power Sensor	MY41489013	16-Apr-21
Agilent	E9304A	Power Sensor	MY41489012	16-Apr-21
Rohde & Schwarz	NRP-Z91	Power Sensor	100733	06-Mar-21
Agilent	E4419B	Power Meter	MY40510893	08-Aug-20
Agilent	N1913A	Power Meter	MY50000415	16-Mar-21

Condition of Instrument**Upon Receipt:**

In Tolerance to Internal Quality Standards

On Release:

In Tolerance to Internal Quality Standards

Calibration Completed By
Julie A. Aquino, Calibration Technician

Attested and Issued on 06-May-20
George Cameros, Calibration Supervisor

This document provides traceability of measurements to recognized national standards using controlled processes at the ETS-Lindgren Calibration Laboratory. Uncertainties listed are derived from the methods described by NIST Tech Note 1597. This certificate and report may not be reproduced, except in full, without the written approval of ETS-Lindgren Calibration Laboratory in accordance with ISO/IEC 17025:2017 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 population unless otherwise noted. QAF 1127 (03/11)

CALIBRATION REPORT

Magnetic Field Sensor

Model	S/N
H200	00224521
HI-2200	00086887

Date: 06 May 2020

☐ New Instrument
☐ Other
☐ Out of Tolerance
☒ Within Tolerance

Frequency Response

Frequency Response		Nominal Field	Cal Factor*	Deviation
	MHz	A/m	(Applied/Indicated)	dB
1	5	30	1.20	-1.57
2	6	30	1.14	-1.12
3	7	30	1.10	-0.83
4	8	30	1.08	-0.63
5	9	30	1.06	-0.48
6	10	30	1.04	-0.38
7	13.6	30	1.02	-0.17
8	15	30	1.02	-0.13
9	20	30	1.00	-0.04
10	27.1	30	1.00	0.04
11	30	30	0.99	0.06
12	40	30	0.98	0.14
13	50	30	0.98	0.16
14	60	30	0.97	0.27
15	70	30	0.97	0.27
16	75	30	0.97	0.28
17	80	30	0.96	0.32
18	90	30	0.96	0.31
19	100	30	0.94	0.53
20	150	30	0.84	1.53
21	175	30	0.79	2.00
22	200	30	0.73	2.73
23	250	30	0.54	5.41
24	300	30	0.34	9.44

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

Linearity

maximum linearity deviation is 0.32 dB
 (measurements taken from 30 mA/m to 9 A/m at 27.12 MHz)

Test Conditions

Calibration performed at ambient room temperature: 23 ±3°C
 The above sensor was calibrated to factory specifications. This calibration is performed per IEEE 1309 standard. All equipment used are traceable to US National Institute of Standards and Technology (NIST).

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

Appendix D - MPE Measurement Results

Table D.1
MPE Measurement Data for Bystander

D.U.T. Info.							Probe Info.		Test Pos.	MPE Measurements										DUT Max. TX Factor	Avg. over Body (mW/cm2)	Calc. P.D. (mW/cm2)	Max Calc. P.D. (mW/cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor		Bystander (BS) Positions													
										20 cm	40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm	200 cm				
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	138.0000	54.0	53.3	CW	E	1.02	BS	0.045	0.05	0.038	0.091	0.165	0.263	0.319	0.386	0.306	0.294	0.5	0.200	0.100	0.101
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	144.0000	54.0	52.8	CW	E	1.02	BS	0.063	0.09	0.096	0.162	0.235	0.315	0.345	0.39	0.377	0.383	0.5	0.251	0.125	0.128
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	150.8000	54.0	52.8	CW	E	1.02	BS	0.045	0.05	0.073	0.093	0.174	0.252	0.288	0.284	0.316	0.298	0.5	0.191	0.096	0.098
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	158.0125	54.0	52.7	CW	E	1.02	BS	0.062	0.067	0.066	0.084	0.152	0.239	0.245	0.237	0.303	0.274	0.5	0.176	0.088	0.090
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	165.0125	54.0	52.1	CW	E	1.01	BS	0.056	0.058	0.075	0.121	0.191	0.266	0.271	0.252	0.266	0.243	0.5	0.182	0.091	0.094
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	173.0125	54.0	52.1	CW	E	1.01	BS	0.03	0.029	0.048	0.104	0.184	0.248	0.239	0.213	0.213	0.197	0.5	0.152	0.076	0.079
45 Degree (FCC)																							
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	150.8000	54.0	52.8	CW	E	1.02	BS	0.04	0.087	0.101	0.086	0.113	0.16	0.204	0.228	0.24	0.243	0.5	0.153	0.077	0.078
45 Degree (ISED/Whole range)																							
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	144.0000	54.0	52.8	CW	E	1.02	BS	0.03	0.092	0.11	0.11	0.151	0.252	0.269	0.274	0.272	0.278	0.5	0.187	0.094	0.096
90 Degree (FCC)																							
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	150.8000	54.0	52.8	CW	E	1.02	BS	0.049	0.086	0.087	0.087	0.147	0.238	0.307	0.335	0.357	0.36	0.5	0.209	0.105	0.107
90 Degree (ISED/Whole range)																							
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	144.0000	54.0	52.8	CW	E	1.02	BS	0.046	0.094	0.092	0.075	0.125	0.216	0.256	0.279	0.291	0.305	0.5	0.181	0.091	0.093

MPE calculations are defined in section 15.0

Table D.1 (Continued)
MPE Measurement Data for Bystander

D.U.T. Info.							Probe Info.		Test Pos.	MPE Measurements										DUT Max. TX Factor	Avg. over Body (mW/cm2)	Calc. P.D. (mW/cm2)	Max Calc. P.D. (mW/cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor		Bystander (BS) Positions													
										20 cm	40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm	200 cm				
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	138.0000	54.0	53.3	CW	H	0.86	BS	0.055	0.052	0.057	0.059	0.087	0.086	0.105	0.118	0.135	0.136	0.5	0.248	0.124	0.126
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	144.0000	54.0	52.8	CW	H	0.85	BS	0.068	0.065	0.078	0.09	0.1	0.117	0.128	0.147	0.152	0.142	0.5	0.349	0.174	0.178
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	150.8000	54.0	52.8	CW	H	0.84	BS	0.056	0.054	0.065	0.078	0.089	0.107	0.122	0.135	0.14	0.136	0.5	0.284	0.142	0.145
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	158.0125	54.0	52.7	CW	H	0.82	BS	0.062	0.061	0.077	0.091	0.105	0.124	0.135	0.145	0.148	0.138	0.5	0.325	0.163	0.167
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	165.0125	54.0	52.1	CW	H	0.81	BS	0.082	0.060	0.096	0.109	0.128	0.138	0.145	0.151	0.14	0.118	0.5	0.357	0.178	0.185
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	173.0125	54.0	52.1	CW	H	0.79	BS	0.084	0.071	0.087	0.105	0.121	0.127	0.133	0.133	0.139	0.128	0.5	0.312	0.156	0.162
45 Degree (FCC/ISED/Whole range)																							
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	165.0125	54.0	52.1	CW	H	0.81	BS	0.088	0.109	0.113	0.126	0.135	0.136	0.143	0.145	0.136	0.128	0.5	0.399	0.200	0.207
90 Degree (FCC/ISED/Whole range)																							
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	165.0125	54.0	52.1	CW	H	0.81	BS	0.064	0.078	0.094	0.108	0.126	0.139	0.159	0.154	0.151	0.140	0.5	0.389	0.195	0.202

MPE calculations are defined in section 15.0.

Table D.1 (Continued)
MPE measurement data for Bystander

D.U.T. Info.							Probe Info.		Test Pos.	MPE Measurements										DUT Max. TX Factor	Avg. over Body (mW/cm2)	Calc. P.D. (mW/cm2)	Max Calc. P.D. (mW/cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor		Bystander (BS) Positions													
										20 cm	40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm	200 cm				
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	138.0000	54.0	53.3	CW	E	1.02	BS	0.01	0.023	0.029	0.021	0.018	0.028	0.066	0.125	0.185	0.218	0.5	0.074	0.037	0.037
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	144.0000	54.0	52.8	CW	E	1.02	BS	0.028	0.053	0.05	0.031	0.032	0.063	0.144	0.217	0.265	0.298	0.5	0.120	0.060	0.062
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	150.8000	54.0	52.8	CW	E	1.02	BS	0.031	0.051	0.04	0.015	0.021	0.062	0.107	0.153	0.190	0.209	0.5	0.090	0.045	0.046
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	158.0125	54.0	52.7	CW	E	1.02	BS	0.030	0.065	0.048	0.037	0.056	0.102	0.173	0.238	0.296	0.34	0.5	0.141	0.071	0.072
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	165.0125	54.0	52.1	CW	E	1.01	BS	0.041	0.064	0.067	0.043	0.044	0.090	0.192	0.243	0.264	0.316	0.5	0.138	0.069	0.071
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	173.0125	54.0	52.1	CW	E	1.01	BS	0.029	0.035	0.019	0.027	0.071	0.121	0.193	0.266	0.313	0.337	0.5	0.143	0.071	0.074
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	146.0000	54.0	52.0	CW	E	1.02	BS	0.081	0.124	0.127	0.093	0.076	0.109	0.168	0.209	0.229	0.24	0.5	0.149	0.074	0.077
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	150.8000	54.0	52.8	CW	E	1.02	BS	0.053	0.088	0.071	0.036	0.044	0.100	0.159	0.195	0.209	0.217	0.5	0.120	0.060	0.061
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	158.0125	54.0	52.7	CW	E	1.02	BS	0.057	0.082	0.066	0.052	0.079	0.133	0.196	0.243	0.261	0.311	0.5	0.151	0.075	0.077
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	165.0125	54.0	52.1	CW	E	1.01	BS	0.043	0.065	0.049	0.025	0.035	0.078	0.141	0.187	0.218	0.235	0.5	0.109	0.054	0.056
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	172.0000	54.0	52.4	CW	E	1.01	BS	0.011	0.016	0.009	0.011	0.027	0.052	0.078	0.101	0.12	0.13	0.5	0.056	0.028	0.029

MPE calculations are defined in section 15.0.

Table D.1 (Continued)
MPE measurement data for Bystander

D.U.T. Info.							Probe Info.			MPE Measurements										DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)	
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor		Test Pos.	Bystander (BS) Positions													
											20 cm	40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm					200 cm
Roof	HAD4006A, 1/4 wave (136-144MHz)	2.15	138.0000	54.0	53.3	CW	E	1.02	BS	0.07	0.121	0.139	0.136	0.089	0.127	0.201	0.229	0.208	0.185	0.5	0.154	0.077	0.078	
Roof	HAD4006A, 1/4 wave (136-144MHz)	2.15	144.0000	54.0	52.8	CW	E	1.02	BS	0.085	0.181	0.192	0.141	0.107	0.118	0.213	0.256	0.281	0.245	0.5	0.186	0.093	0.095	
Roof	HAD4007A, 1/4 wave (146-150.8MHz)	2.15	146.0000	54.0	52.0	CW	E	1.02	BS	0.101	0.131	0.082	0.084	0.084	0.138	0.181	0.197	0.207	0.208	0.5	0.144	0.072	0.075	
Roof	HAD4007A, 1/4 wave (146-150.8MHz)	2.15	150.8000	54.0	52.8	CW	E	1.02	BS	0.092	0.092	0.074	0.048	0.076	0.131	0.188	0.176	0.188	0.179	0.5	0.127	0.063	0.065	
Roof	HAD4008A, 1/4 wave (150.8-162MHz)	2.15	150.8000	54.0	52.8	CW	E	1.02	BS	0.075	0.104	0.088	0.064	0.067	0.123	0.184	0.202	0.194	0.186	0.5	0.131	0.066	0.067	
Roof	HAD4008A, 1/4 wave (150.8-162MHz)	2.15	156.4000	54.0	52.4	CW	E	1.02	BS	0.076	0.117	0.094	0.065	0.104	0.176	0.241	0.26	0.266	0.274	0.5	0.171	0.085	0.088	
Roof	HAD4008A, 1/4 wave (150.8-162MHz)	2.15	162.0000	54.0	52.2	CW	E	1.02	BS	0.077	0.132	0.107	0.078	0.097	0.147	0.207	0.232	0.261	0.286	0.5	0.166	0.083	0.086	
Roof	HAD4009A, 1/4 wave (162-174MHz)	2.15	162.0000	54.0	52.2	CW	E	1.02	BS	0.068	0.115	0.094	0.069	0.083	0.133	0.19	0.194	0.221	0.251	0.5	0.145	0.072	0.075	
Roof	HAD4009A, 1/4 wave (162-174MHz)	2.15	165.0125	54.0	52.1	CW	E	1.01	BS	0.056	0.085	0.062	0.036	0.062	0.125	0.186	0.241	0.234	0.271	0.5	0.137	0.069	0.071	
Roof	HAD4009A, 1/4 wave (162-174MHz)	2.15	173.0125	54.0	52.1	CW	E	1.01	BS	0.046	0.063	0.047	0.064	0.112	0.163	0.226	0.261	0.287	0.299	0.5	0.158	0.079	0.082	

MPE calculations are defined in section 15.0.

Table D.1 (Continued)
MPE measurement data for Bystander

D.U.T. Info.							Probe Info.			MPE Measurements										DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)	
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor		Test Pos.	Bystander (BS) Positions													
											20 cm	40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm					200 cm
Roof	RAD4226A, 1/4 wave (136-144MHz)	2.15	138.0000	54.0	53.3	CW	E	1.02	BS	0.04	0.103	0.117	0.09	0.081	0.114	0.168	0.19	0.183	0.17	0.5	0.128	0.064	0.065	
Roof	RAD4226A, 1/4 wave (136-144MHz)	2.15	144.0000	54.0	52.8	CW	E	1.02	BS	0.096	0.16	0.113	0.114	0.105	0.163	0.217	0.238	0.232	0.223	0.5	0.169	0.085	0.087	
Roof	RAD4225A, 1/4 wave (146-150.8MHz)	2.15	146.0000	54.0	52.0	CW	E	1.02	BS	0.1	0.131	0.085	0.086	0.089	0.144	0.182	0.191	0.193	0.191	0.5	0.142	0.071	0.074	
Roof	RAD4225A, 1/4 wave (146-150.8MHz)	2.15	150.8000	54.0	52.8	CW	E	1.02	BS	0.106	0.111	0.093	0.059	0.088	0.151	0.219	0.192	0.205	0.197	0.5	0.145	0.072	0.074	
Roof	RAD4224A, 1/4 wave (150.8-162MHz)	2.15	150.8000	54.0	52.8	CW	E	1.02	BS	0.033	0.034	0.028	0.017	0.027	0.05	0.071	0.061	0.067	0.061	0.5	0.046	0.023	0.023	
Roof	RAD4224A, 1/4 wave (150.8-162MHz)	2.15	156.4000	54.0	52.4	CW	E	1.02	BS	0.083	0.092	0.073	0.066	0.112	0.178	0.218	0.216	0.24	0.225	0.5	0.153	0.077	0.079	
Roof	RAD4224A, 1/4 wave (150.8-162MHz)	2.15	162.0000	54.0	52.2	CW	E	1.02	BS	0.097	0.127	0.093	0.085	0.105	0.152	0.167	0.17	0.202	0.224	0.5	0.145	0.073	0.075	
Roof	RAD4223A, 1/4 wave (162-174MHz)	2.15	162.0000	54.0	52.2	CW	E	1.02	BS	0.051	0.064	0.046	0.04	0.049	0.07	0.076	0.077	0.096	0.106	0.5	0.069	0.034	0.036	
Roof	RAD4223A, 1/4 wave (162-174MHz)	2.15	165.0125	54.0	52.1	CW	E	1.01	BS	0.076	0.089	0.056	0.044	0.062	0.101	0.125	0.128	0.146	0.165	0.5	0.100	0.050	0.052	
Roof	RAD4223A, 1/4 wave (162-174MHz)	2.15	173.0125	54.0	52.1	CW	E	1.01	BS	0.051	0.057	0.039	0.051	0.088	0.136	0.187	0.211	0.244	0.255	0.5	0.133	0.067	0.069	

MPE calculations are defined in section 15.0.

Table D.1 (Continued)
MPE measurement data for Bystander

D.U.T. Info.							Probe Info.		Test Pos.	MPE Measurements										DUT Max. TX Factor	Avg. over Body (mW/cm2)	Calc. P.D. (mW/cm2)	Max Calc. P.D. (mW/cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor		Bystander (BS) Positions													
										20 cm	40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm	200 cm				
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	138.0000	54.0	53.3	CW	H	0.86	BS	0.038	0.039	0.046	0.054	0.064	0.061	0.076	0.094	0.098	0.11	0.5	0.145	0.073	0.074
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	144.0000	54.0	52.8	CW	H	0.85	BS	0.038	0.039	0.046	0.054	0.064	0.061	0.076	0.094	0.098	0.11	0.5	0.142	0.071	0.073
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	150.8000	54.0	52.8	CW	H	0.84	BS	0.037	0.038	0.049	0.054	0.061	0.058	0.071	0.105	0.106	0.117	0.5	0.150	0.075	0.076
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	158.0125	54.0	52.7	CW	H	0.82	BS	0.038	0.042	0.061	0.069	0.071	0.071	0.084	0.109	0.118	0.127	0.5	0.179	0.090	0.092
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	165.0125	54.0	52.1	CW	H	0.81	BS	0.049	0.057	0.07	0.075	0.079	0.080	0.1	0.124	0.134	0.136	0.5	0.224	0.112	0.116
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	173.0125	54.0	52.1	CW	H	0.79	BS	0.042	0.053	0.066	0.07	0.08	0.087	0.1	0.133	0.125	0.129	0.5	0.206	0.103	0.107
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	146.0000	54.0	52.0	CW	H	0.85	BS	0.045	0.052	0.064	0.077	0.087	0.086	0.088	0.1	0.11	0.118	0.5	0.200	0.100	0.104
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	150.8000	54.0	52.8	CW	H	0.84	BS	0.043	0.046	0.063	0.07	0.081	0.080	0.08	0.095	0.104	0.112	0.5	0.172	0.086	0.088
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	158.0125	54.0	52.7	CW	H	0.82	BS	0.044	0.051	0.067	0.077	0.081	0.077	0.084	0.104	0.098	0.107	0.5	0.168	0.084	0.086
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	165.0125	54.0	52.1	CW	H	0.81	BS	0.041	0.045	0.053	0.057	0.065	0.059	0.071	0.081	0.096	0.094	0.5	0.117	0.058	0.060
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	172.0000	54.0	52.4	CW	H	0.80	BS	0.035	0.038	0.041	0.044	0.05	0.052	0.058	0.073	0.072	0.075	0.5	0.075	0.037	0.039

MPE calculations are defined in section 15.0.

Table D.1 (Continued)
MPE measurement data for Bystander

D.U.T. Info.							Probe Info.		Test Pos.	MPE Measurements										DUT Max. TX Factor	Avg. over Body (mW/cm2)	Calc. P.D. (mW/cm2)	Max Calc. P.D. (mW/cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor		Bystander (BS) Positions													
										20 cm	40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm	200 cm				
Roof	HAD4006A, 1/4 wave (136-144MHz)	2.15	138.0000	54.0	53.3	CW	H	0.86	BS	0.037	0.043	0.048	0.06	0.066	0.067	0.071	0.078	0.076	0.073	0.5	0.112	0.056	0.057
Roof	HAD4006A, 1/4 wave (136-144MHz)	2.15	144.0000	54.0	52.8	CW	H	0.85	BS	0.04	0.044	0.059	0.066	0.072	0.074	0.077	0.082	0.082	0.084	0.5	0.132	0.066	0.068
Roof	HAD4007A, 1/4 wave (146-150.8MHz)	2.15	146.0000	54.0	52.0	CW	H	0.85	BS	0.046	0.049	0.063	0.072	0.079	0.083	0.08	0.089	0.089	0.089	0.5	0.155	0.078	0.081
Roof	HAD4007A, 1/4 wave (146-150.8MHz)	2.15	150.8000	54.0	52.8	CW	H	0.84	BS	0.047	0.055	0.07	0.083	0.096	0.103	0.102	0.106	0.111	0.112	0.5	0.222	0.111	0.113
Roof	HAD4008A, 1/4 wave (150.8-162MHz)	2.15	150.8000	54.0	52.8	CW	H	0.84	BS	0.044	0.05	0.064	0.077	0.092	0.096	0.098	0.098	0.105	0.107	0.5	0.196	0.098	0.100
Roof	HAD4008A, 1/4 wave (150.8-162MHz)	2.15	156.4000	54.0	52.4	CW	H	0.83	BS	0.049	0.058	0.072	0.085	0.096	0.098	0.097	0.105	0.112	0.116	0.5	0.217	0.108	0.112
Roof	HAD4008A, 1/4 wave (150.8-162MHz)	2.15	162.0000	54.0	52.2	CW	H	0.82	BS	0.057	0.069	0.085	0.092	0.094	0.093	0.101	0.117	0.12	0.129	0.5	0.244	0.122	0.126
Roof	HAD4009A, 1/4 wave (162-174MHz)	2.15	162.0000	54.0	52.2	CW	H	0.82	BS	0.051	0.067	0.077	0.085	0.086	0.085	0.094	0.109	0.113	0.119	0.5	0.209	0.105	0.108
Roof	HAD4009A, 1/4 wave (162-174MHz)	2.15	165.0125	54.0	52.1	CW	H	0.81	BS	0.052	0.061	0.073	0.081	0.086	0.09	0.102	0.117	0.12	0.128	0.5	0.219	0.110	0.114
Roof	HAD4009A, 1/4 wave (162-174MHz)	2.15	173.0125	54.0	52.1	CW	H	0.79	BS	0.047	0.052	0.063	0.08	0.089	0.093	0.094	0.105	0.117	0.119	0.5	0.187	0.094	0.097

MPE calculations are defined in section 15.0.

Table D.1 (Continued)
MPE measurement data for Bystander

D.U.T. Info.							Probe Info.		Test Pos.	MPE Measurements										DUT Max. TX Factor	Avg. over Body (mW/cm2)	Calc. P.D. (mW/cm2)	Max Calc. P.D. (mW/cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor		Bystander (BS) Positions													
										20 cm	40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm	200 cm				
Roof	RAD4226A, 1/4 wave (136-144MHz)	2.15	138.0000	54.0	53.3	CW	H	0.86	BS	0.047	0.051	0.057	0.072	0.082	0.089	0.095	0.097	0.098	0.093	0.5	0.180	0.090	0.091
Roof	RAD4226A, 1/4 wave (136-144MHz)	2.15	144.0000	54.0	52.8	CW	H	0.85	BS	0.05	0.038	0.043	0.044	0.095	0.102	0.108	0.117	0.113	0.108	0.5	0.210	0.105	0.107
Roof	RAD4225A, 1/4 wave (146-150.8MHz)	2.15	146.0000	54.0	52.0	CW	H	0.85	BS	0.043	0.059	0.071	0.085	0.094	0.097	0.103	0.108	0.107	0.108	0.5	0.221	0.111	0.115
Roof	RAD4225A, 1/4 wave (146-150.8MHz)	2.15	150.8000	54.0	52.8	CW	H	0.84	BS	0.055	0.058	0.08	0.081	0.097	0.102	0.103	0.121	0.112	0.116	0.5	0.241	0.120	0.123
Roof	RAD4224A, 1/4 wave (150.8-162MHz)	2.15	150.8000	54.0	52.8	CW	H	0.84	BS	0.041	0.051	0.053	0.056	0.069	0.064	0.068	0.088	0.085	0.076	0.5	0.118	0.059	0.060
Roof	RAD4224A, 1/4 wave (150.8-162MHz)	2.15	156.4000	54.0	52.4	CW	H	0.83	BS	0.047	0.043	0.081	0.092	0.103	0.103	0.106	0.117	0.116	0.119	0.5	0.241	0.121	0.124
Roof	RAD4224A, 1/4 wave (150.8-162MHz)	2.15	162.0000	54.0	52.2	CW	H	0.82	BS	0.055	0.062	0.074	0.081	0.095	0.099	0.097	0.12	0.12	0.123	0.5	0.231	0.115	0.119
Roof	RAD4223A, 1/4 wave (162-174MHz)	2.15	162.0000	54.0	52.2	CW	H	0.82	BS	0.049	0.056	0.057	0.059	0.066	0.07	0.068	0.09	0.087	0.083	0.5	0.123	0.062	0.064
Roof	RAD4223A, 1/4 wave (162-174MHz)	2.15	165.0125	54.0	52.1	CW	H	0.81	BS	0.047	0.043	0.066	0.068	0.08	0.082	0.084	0.106	0.106	0.109	0.5	0.167	0.084	0.087
Roof	RAD4223A, 1/4 wave (162-174MHz)	2.15	173.0125	54.0	52.1	CW	H	0.79	BS	0.047	0.058	0.071	0.078	0.092	0.091	0.1	0.113	0.131	0.112	0.5	0.202	0.101	0.105

MPE calculations are defined in section 15.0.

Table D.2**MPE measurement data for Passenger**

D.U.T. Info.							Probe Info.		Test Pos.	MPE Measurements			DUT Max. TX Factor	Avg. over Body (mW/cm2)	Calc. P.D. (mW/cm2)	Max Calc. P.D. (mW/cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor		Passenger/Operator (MC) Positions						
										Head/ Top 1/3	Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3				
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	138.0000	54.0	53.3	CW	E	1.02	PB	0.22	0.157	0.079	0.5	0.155	0.078	0.079
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	144.0000	54.0	52.8	CW	E	1.02	PB	0.428	0.32	0.212	0.5	0.326	0.163	0.167
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	150.8000	54.0	52.8	CW	E	1.02	PB	0.435	0.328	0.174	0.5	0.319	0.159	0.163
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	158.0125	54.0	52.7	CW	E	1.02	PB	0.594	0.48	0.339	0.5	0.480	0.240	0.246
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	165.0125	54.0	52.1	CW	E	1.01	PB	1.044	1.176	0.897	0.5	1.049	0.525	0.544
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	173.0125	54.0	52.1	CW	E	1.01	PB	0.925	1.521	1.312	0.5	1.265	0.633	0.656
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	138.0000	54.0	53.3	CW	H	0.86	PB	0.104	0.083	0.063	0.5	0.201	0.101	0.102
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	144.0000	54.0	52.8	CW	H	0.85	PB	0.128	0.106	0.086	0.5	0.318	0.159	0.163
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	150.8000	54.0	52.8	CW	H	0.84	PB	0.115	0.103	0.085	0.5	0.275	0.138	0.141
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	158.0125	54.0	52.7	CW	H	0.82	PB	0.124	0.126	0.105	0.5	0.357	0.179	0.183
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	165.0125	54.0	52.1	CW	H	0.81	PB	0.174	0.184	0.163	0.5	0.748	0.374	0.388
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	173.0125	54.0	52.1	CW	H	0.79	PB	0.187	0.199	0.203	0.5	0.908	0.454	0.471

MPE calculations are defined in section 15.0.

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

D.U.T. Info.							Probe Info.			MPE Measurements			DUT Max. TX Factor	Avg. over Body (mW/cm2)	Calc. P.D. (mW/cm2)	Max Calc. P.D. (mW/cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor		Passenger/Operator (MC) Positions						
										Head/ Top 1/3	Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3				
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	138.0000	54.0	53.3	CW	E	1.02	PB	0.106	0.069	0.037	0.5	0.072	0.036	0.037
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	144.0000	54.0	52.8	CW	E	1.02	PB	0.069	0.059	0.046	0.5	0.059	0.030	0.030
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	150.8000	54.0	52.8	CW	E	1.02	PB	0.047	0.049	0.033	0.5	0.044	0.022	0.022
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	158.0125	54.0	52.7	CW	E	1.02	PB	0.072	0.071	0.053	0.5	0.067	0.033	0.034
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	165.0125	54.0	52.1	CW	E	1.01	PB	0.182	0.205	0.157	0.5	0.183	0.092	0.095
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	173.0125	54.0	52.1	CW	E	1.01	PB	0.058	0.105	0.163	0.5	0.110	0.055	0.057
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	146.0000	54.0	52.0	CW	E	1.02	PB	0.205	0.165	0.108	0.5	0.163	0.081	0.084
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	150.8000	54.0	52.8	CW	E	1.02	PB	0.194	0.169	0.138	0.5	0.170	0.085	0.087
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	158.0125	54.0	52.7	CW	E	1.02	PB	0.166	0.179	0.13	0.5	0.162	0.081	0.083
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	165.0125	54.0	52.1	CW	E	1.01	PB	0.175	0.238	0.155	0.5	0.191	0.096	0.099
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	172.0000	54.0	52.4	CW	E	1.01	PB	0.049	0.12	0.134	0.5	0.102	0.051	0.053

MPE calculations are defined in section 15.0.

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

D.U.T. Info.							Probe Info.			MPE Measurements			DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor		Passenger/Operator (MC) Positions						
										Head/ Top 1/3	Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3				
Roof	HAD4006A, 1/4 wave (136-144MHz)	2.15	138.0000	54.0	53.3	CW	E	1.02	PB	0.419	0.258	0.154	0.5	0.283	0.141	0.143
Roof	HAD4006A, 1/4 wave (136-144MHz)	2.15	144.0000	54.0	52.8	CW	E	1.02	PB	0.310	0.246	0.162	0.5	0.244	0.122	0.125
Roof	HAD4007A, 1/4 wave (146-150.8MHz)	2.15	146.0000	54.0	52.0	CW	E	1.02	PB	0.244	0.231	0.191	0.5	0.226	0.113	0.118
Roof	HAD4007A, 1/4 wave (146- 150.8MHz)	2.15	150.8000	54.0	52.8	CW	E	1.02	PB	0.294	0.262	0.182	0.5	0.251	0.125	0.128
Roof	HAD4008A, 1/4 wave (150.8-162MHz)	2.15	150.8000	54.0	52.8	CW	E	1.02	PB	0.294	0.253	0.185	0.5	0.249	0.124	0.127
Roof	HAD4008A, 1/4 wave (150.8-162MHz)	2.15	156.4000	54.0	52.4	CW	E	1.02	PB	0.328	0.297	0.232	0.5	0.291	0.146	0.150
Roof	HAD4008A, 1/4 wave (150.8-162MHz)	2.15	162.0000	54.0	52.2	CW	E	1.02	PB	0.331	0.388	0.25	0.5	0.329	0.165	0.170
Roof	HAD4009A, 1/4 wave (162-174MHz)	2.15	162.0000	54.0	52.2	CW	E	1.02	PB	0.297	0.314	0.203	0.5	0.277	0.138	0.143
Roof	HAD4009A, 1/4 wave (162-174MHz)	2.15	165.0125	54.0	52.1	CW	E	1.01	PB	0.271	0.399	0.269	0.5	0.316	0.158	0.164
Roof	HAD4009A, 1/4 wave (162-174MHz)	2.15	173.0125	54.0	52.1	CW	E	1.01	PB	0.17	0.324	0.276	0.5	0.259	0.130	0.134

MPE calculations are defined in section 15.0.

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

D.U.T. Info.							Probe Info.			MPE Measurements						
										Passenger/Operator (MC) Positions						
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor	Test Pos.	Head/ 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	RAD4226A, 1/4 wave (136-144MHz)	2.15	138.0000	54.0	53.3	CW	E	1.02	PB	0.376	0.275	0.156	0.5	0.274	0.137	0.139
Roof	RAD4226A, 1/4 wave (136-144MHz)	2.15	144.0000	54.0	52.8	CW	E	1.02	PB	0.285	0.254	0.193	0.5	0.249	0.124	0.127
Roof	RAD4225A, 1/4 wave (146-150.8MHz)	2.15	146.0000	54.0	52.0	CW	E	1.02	PB	0.306	0.247	0.173	0.5	0.247	0.123	0.128
Roof	RAD4225A, 1/4 wave (146-150.8MHz)	2.15	150.8000	54.0	52.8	CW	E	1.02	PB	0.332	0.303	0.206	0.5	0.286	0.143	0.146
Roof	RAD4224A, 1/4 wave (150.8-162MHz)	2.15	150.8000	54.0	52.8	CW	E	1.02	PB	0.108	0.100	0.075	0.5	0.096	0.048	0.049
Roof	RAD4224A, 1/4 wave (150.8-162MHz)	2.15	156.4000	54.0	52.4	CW	E	1.02	PB	0.266	0.278	0.176	0.5	0.245	0.122	0.126
Roof	RAD4224A, 1/4 wave (150.8-162MHz)	2.15	162.0000	54.0	52.2	CW	E	1.02	PB	0.326	0.342	0.229	0.5	0.305	0.152	0.158
Roof	RAD4223A, 1/4 wave (162-174MHz)	2.15	162.0000	54.0	52.2	CW	E	1.02	PB	0.172	0.201	0.142	0.5	0.175	0.088	0.091
Roof	RAD4223A, 1/4 wave (162-174MHz)	2.15	165.0125	54.0	52.1	CW	E	1.01	PB	0.222	0.263	0.223	0.5	0.238	0.119	0.124
Roof	RAD4223A, 1/4 wave (162-174MHz)	2.15	173.0125	54.0	52.1	CW	E	1.01	PB	0.149	0.276	0.26	0.5	0.231	0.115	0.120

MPE calculations are defined in section 15.0.

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

D.U.T. Info.							Probe Info.		Test Pos.	MPE Measurements			DUT Max. TX Factor	Avg. over Body (mW/cm2)	Calc. P.D. (mW/cm2)	Max Calc. P.D. (mW/cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor		Passenger/Operator (MC) Positions						
										Head/ Top 1/3	Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3				
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	138.0000	54.0	53.3	CW	H	0.86	PB	0.063	0.052	0.047	0.5	0.083	0.041	0.042
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	144.0000	54.0	52.8	CW	H	0.85	PB	0.066	0.041	0.047	0.5	0.075	0.037	0.038
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	150.8000	54.0	52.8	CW	H	0.84	PB	0.067	0.059	0.05	0.5	0.093	0.046	0.047
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	158.0125	54.0	52.7	CW	H	0.82	PB	0.083	0.069	0.061	0.5	0.130	0.065	0.067
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	165.0125	54.0	52.1	CW	H	0.81	PB	0.08	0.081	0.074	0.5	0.152	0.076	0.079
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	173.0125	54.0	52.1	CW	H	0.79	PB	0.069	0.075	0.070	0.5	0.120	0.060	0.062
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	146.0000	54.0	52.0	CW	H	0.85	PB	0.069	0.066	0.059	0.5	0.114	0.057	0.059
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	150.8000	54.0	52.8	CW	H	0.84	PB	0.085	0.075	0.068	0.5	0.155	0.077	0.079
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	158.0125	54.0	52.7	CW	H	0.82	PB	0.085	0.087	0.079	0.5	0.178	0.089	0.091
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	165.0125	54.0	52.1	CW	H	0.81	PB	0.090	0.093	0.084	0.5	0.196	0.098	0.102
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	172.0000	54.0	52.4	CW	H	0.80	PB	0.065	0.068	0.067	0.5	0.107	0.054	0.055

MPE calculations are defined in section 15.0.

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

D.U.T. Info.							Probe Info.			MPE Measurements			DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor		Passenger/Operator (MC) Positions						
										Head/ Top 1/3	Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3				
Roof	HAD4006A, 1/4 wave (136-144MHz)	2.15	138.0000	54.0	53.3	CW	H	0.86	PB	0.112	0.097	0.069	0.5	0.248	0.124	0.126
Roof	HAD4006A, 1/4 wave (136-144MHz)	2.15	144.0000	54.0	52.8	CW	H	0.85	PB	0.099	0.081	0.058	0.5	0.179	0.090	0.092
Roof	HAD4007A, 1/4 wave (146-150.8MHz)	2.15	146.0000	54.0	52.0	CW	H	0.85	PB	0.075	0.085	0.067	0.5	0.157	0.079	0.082
Roof	HAD4007A, 1/4 wave (146- 150.8MHz)	2.15	150.8000	54.0	52.8	CW	H	0.84	PB	0.103	0.095	0.082	0.5	0.234	0.117	0.120
Roof	HAD4008A, 1/4 wave (150.8-162MHz)	2.15	150.8000	54.0	52.8	CW	H	0.84	PB	0.068	0.090	0.078	0.5	0.167	0.083	0.085
Roof	HAD4008A, 1/4 wave (150.8-162MHz)	2.15	156.4000	54.0	52.4	CW	H	0.83	PB	0.114	0.102	0.095	0.5	0.281	0.140	0.145
Roof	HAD4008A, 1/4 wave (150.8-162MHz)	2.15	162.0000	54.0	52.2	CW	H	0.82	PB	0.118	0.123	0.106	0.5	0.340	0.170	0.176
Roof	HAD4009A, 1/4 wave (162-174MHz)	2.15	162.0000	54.0	52.2	CW	H	0.82	PB	0.115	0.109	0.098	0.5	0.293	0.147	0.152
Roof	HAD4009A, 1/4 wave (162-174MHz)	2.15	165.0125	54.0	52.1	CW	H	0.81	PB	0.112	0.115	0.11	0.5	0.312	0.156	0.162
Roof	HAD4009A, 1/4 wave (162-174MHz)	2.15	173.0125	54.0	52.1	CW	H	0.79	PB	0.092	0.102	0.094	0.5	0.217	0.109	0.113

MPE calculations are defined in section 15.0.

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

D.U.T. Info.							Probe Info.			MPE Measurements			DUT Max. TX Factor	Avg. over Body (mW/cm2)	Calc. P.D. (mW/cm2)	Max Calc. P.D. (mW/cm2)	
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor		Test Pos.	Passenger/Operator (MC) Positions						
											Head/ Top 1/3	Chest/ Middle 1/3					Lower Trunk/ Bottom 1/3
Roof	RAD4226A, 1/4 wave (136-144MHz)	2.15	138.0000	54.0	53.3	CW	H	0.86	PB	0.112	0.095	0.069	0.5	0.245	0.122	0.124	
Roof	RAD4226A, 1/4 wave (136-144MHz)	2.15	144.0000	54.0	52.8	CW	H	0.85	PB	0.111	0.092	0.073	0.5	0.237	0.119	0.121	
Roof	RAD4225A, 1/4 wave (146-150.8MHz)	2.15	146.0000	54.0	52.0	CW	H	0.85	PB	0.106	0.082	0.063	0.5	0.199	0.100	0.103	
Roof	RAD4225A, 1/4 wave (146-150.8MHz)	2.15	150.8000	54.0	52.8	CW	H	0.84	PB	0.106	0.094	0.079	0.5	0.233	0.117	0.119	
Roof	RAD4224A, 1/4 wave (150.8-162MHz)	2.15	150.8000	54.0	52.8	CW	H	0.84	PB	0.075	0.062	0.047	0.5	0.104	0.052	0.053	
Roof	RAD4224A, 1/4 wave (150.8-162MHz)	2.15	156.4000	54.0	52.4	CW	H	0.83	PB	0.096	0.089	0.077	0.5	0.200	0.100	0.103	
Roof	RAD4224A, 1/4 wave (150.8-162MHz)	2.15	162.0000	54.0	52.2	CW	H	0.82	PB	0.105	0.106	0.099	0.5	0.271	0.135	0.140	
Roof	RAD4223A, 1/4 wave (162-174MHz)	2.15	162.0000	54.0	52.2	CW	H	0.82	PB	0.084	0.084	0.076	0.5	0.168	0.084	0.087	
Roof	RAD4223A, 1/4 wave (162-174MHz)	2.15	165.0125	54.0	52.1	CW	H	0.81	PB	0.093	0.105	0.085	0.5	0.222	0.111	0.115	
Roof	RAD4223A, 1/4 wave (162-174MHz)	2.15	173.0125	54.0	52.1	CW	H	0.79	PB	0.085	0.096	0.089	0.5	0.191	0.096	0.099	

MPE calculations are defined in section 15.0.

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

D.U.T. Info.							Probe Info.			MPE Measurements			DUT Max. TX Factor	Avg. over Body (mW/cm2)	Calc. P.D. (mW/cm2)	Max Calc. P.D. (mW/cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor		Passenger/Operator (MC) Positions						
										Head/ Top 1/3	Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3				
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	138.0000	54.0	53.3	CW	E	1.02	PF	0.011	0.01	0.046	0.5	0.023	0.011	0.012
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	144.0000	54.0	52.8	CW	E	1.02	PF	0.037	0.03	0.029	0.5	0.033	0.016	0.017
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	150.8000	54.0	52.8	CW	E	1.02	PF	0.067	0.086	0.076	0.5	0.078	0.039	0.040
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	158.0125	54.0	52.7	CW	E	1.02	PF	0.082	0.089	0.079	0.5	0.085	0.043	0.044
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	165.0125	54.0	52.1	CW	E	1.01	PF	0.089	0.089	0.102	0.5	0.094	0.047	0.049
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	173.0125	54.0	52.1	CW	E	1.01	PF	0.06	0.089	0.095	0.5	0.082	0.041	0.043
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	138.0000	54.0	53.3	CW	H	0.86	PF	0.055	0.048	0.045	0.5	0.068	0.034	0.035
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	144.0000	54.0	52.8	CW	H	0.85	PF	0.053	0.054	0.06	0.5	0.085	0.042	0.043
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	150.8000	54.0	52.8	CW	H	0.84	PF	0.054	0.057	0.06	0.5	0.087	0.043	0.044
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	158.0125	54.0	52.7	CW	H	0.82	PF	0.063	0.056	0.047	0.5	0.079	0.039	0.040
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	165.0125	54.0	52.1	CW	H	0.81	PF	0.068	0.072	0.054	0.5	0.105	0.052	0.054
Trunk	HAD4022A, 5/8 wave (136-174MHz)	5.15	173.0125	54.0	52.1	CW	H	0.79	PF	0.047	0.052	0.055	0.5	0.062	0.031	0.032

MPE calculations are defined in section 15.0.

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

D.U.T. Info.							Probe Info.		Test Pos.	MPE Measurements			DUT Max. TX Factor	Avg. over Body (mW/cm2)	Calc. P.D. (mW/cm2)	Max Calc. P.D. (mW/cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor		Passenger/Operator (MC) Positions						
										Head/ Top 1/3	Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3				
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	138.0000	54.0	53.3	CW	E	1.02	PF	0.017	0.015	0.013	0.5	0.015	0.008	0.008
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	144.0000	54.0	52.8	CW	E	1.02	PF	0.022	0.031	0.024	0.5	0.026	0.013	0.013
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	150.8000	54.0	52.8	CW	E	1.02	PF	0.017	0.019	0.019	0.5	0.019	0.009	0.010
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	158.0125	54.0	52.7	CW	E	1.02	PF	0.014	0.024	0.022	0.5	0.020	0.010	0.010
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	165.0125	54.0	52.1	CW	E	1.01	PF	0.02	0.04	0.048	0.5	0.036	0.018	0.019
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	173.0125	54.0	52.1	CW	E	1.01	PF	0.018	0.022	0.044	0.5	0.028	0.014	0.015
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	146.0000	54.0	52.0	CW	E	1.02	PF	0.057	0.072	0.053	0.5	0.062	0.031	0.032
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	150.8000	54.0	52.8	CW	E	1.02	PF	0.036	0.045	0.04	0.5	0.041	0.021	0.021
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	158.0125	54.0	52.7	CW	E	1.02	PF	0.03	0.039	0.044	0.5	0.038	0.019	0.020
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	165.0125	54.0	52.1	CW	E	1.01	PF	0.021	0.027	0.048	0.5	0.032	0.016	0.017
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	172.0000	54.0	52.4	CW	E	1.01	PF	0.01	0.013	0.019	0.5	0.014	0.007	0.007

MPE calculations are defined in section 15.0.

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

D.U.T. Info.							Probe Info.			MPE Measurements						
										Passenger/Operator (MC) Positions						
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor	Test Pos.	Head/ 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	HAD4006A, 1/4 wave (136-144MHz)	2.15	138.0000	54.0	53.3	CW	E	1.02	PF	0.065	0.065	0.069	0.5	0.068	0.034	0.034
Roof	HAD4006A, 1/4 wave (136-144MHz)	2.15	144.0000	54.0	52.8	CW	E	1.02	PF	0.05	0.084	0.072	0.5	0.070	0.035	0.036
Roof	HAD4007A, 1/4 wave (146-150.8MHz)	2.15	146.0000	54.0	52.0	CW	E	1.02	PF	0.076	0.085	0.069	0.5	0.078	0.039	0.041
Roof	HAD4007A, 1/4 wave (146-150.8MHz)	2.15	150.8000	54.0	52.8	CW	E	1.02	PF	0.068	0.080	0.084	0.5	0.079	0.039	0.040
Roof	HAD4008A, 1/4 wave (150.8-162MHz)	2.15	150.8000	54.0	52.8	CW	E	1.02	PF	0.062	0.080	0.077	0.5	0.074	0.037	0.038
Roof	HAD4008A, 1/4 wave (150.8-162MHz)	2.15	156.4000	54.0	52.4	CW	E	1.02	PF	0.065	0.085	0.072	0.5	0.075	0.038	0.039
Roof	HAD4008A, 1/4 wave (150.8-162MHz)	2.15	162.0000	54.0	52.2	CW	E	1.02	PF	0.055	0.101	0.148	0.5	0.103	0.052	0.053
Roof	HAD4009A, 1/4 wave (162-174MHz)	2.15	162.0000	54.0	52.2	CW	E	1.02	PF	0.046	0.078	0.127	0.5	0.085	0.043	0.044
Roof	HAD4009A, 1/4 wave (162-174MHz)	2.15	165.0125	54.0	52.1	CW	E	1.01	PF	0.032	0.063	0.141	0.5	0.079	0.040	0.041
Roof	HAD4009A, 1/4 wave (162-174MHz)	2.15	173.0125	54.0	52.1	CW	E	1.01	PF	0.051	0.098	0.13	0.5	0.094	0.047	0.049

MPE calculations are defined in section 15.0.

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

D.U.T. Info.							Probe Info.			MPE Measurements			DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor		Passenger/Operator (MC) Positions						
										Head/ Top 1/3	Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3				
Roof	RAD4226A, 1/4 wave (136-144MHz)	2.15	138.0000	54.0	53.3	CW	E	1.02	PF	0.056	0.064	0.049	0.5	0.057	0.029	0.029
Roof	RAD4226A, 1/4 wave (136-144MHz)	2.15	144.0000	54.0	52.8	CW	E	1.02	PF	0.065	0.083	0.073	0.5	0.075	0.038	0.038
Roof	RAD4225A, 1/4 wave (146-150.8MHz)	2.15	146.0000	54.0	52.0	CW	E	1.02	PF	0.072	0.076	0.063	0.5	0.072	0.036	0.037
Roof	RAD4225A, 1/4 wave (146-150.8MHz)	2.15	150.8000	54.0	52.8	CW	E	1.02	PF	0.065	0.073	0.081	0.5	0.074	0.037	0.038
Roof	RAD4224A, 1/4 wave (150.8-162MHz)	2.15	150.8000	54.0	52.8	CW	E	1.02	PF	0.024	0.028	0.030	0.5	0.028	0.014	0.014
Roof	RAD4224A, 1/4 wave (150.8-162MHz)	2.15	156.4000	54.0	52.4	CW	E	1.02	PF	0.045	0.061	0.076	0.5	0.062	0.031	0.032
Roof	RAD4224A, 1/4 wave (150.8-162MHz)	2.15	162.0000	54.0	52.2	CW	E	1.02	PF	0.052	0.134	0.171	0.5	0.121	0.061	0.063
Roof	RAD4223A, 1/4 wave (162-174MHz)	2.15	162.0000	54.0	52.2	CW	E	1.02	PF	0.024	0.033	0.06	0.5	0.040	0.020	0.021
Roof	RAD4223A, 1/4 wave (162-174MHz)	2.15	165.0125	54.0	52.1	CW	E	1.01	PF	0.028	0.049	0.114	0.5	0.064	0.032	0.033
Roof	RAD4223A, 1/4 wave (162-174MHz)	2.15	173.0125	54.0	52.1	CW	E	1.01	PF	0.051	0.066	0.134	0.5	0.085	0.042	0.044

MPE calculations are defined in section 15.0.

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

D.U.T. Info.							Probe Info.		Test Pos.	MPE Measurements			DUT Max. TX Factor	Avg. over Body (mW/cm2)	Calc. P.D. (mW/cm2)	Max Calc. P.D. (mW/cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor		Passenger/Operator (MC) Positions						
										Head/ Top 1/3	Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3				
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	138.0000	54.0	53.3	CW	H	0.86	PF	0.044	0.043	0.045	0.5	0.054	0.027	0.027
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	144.0000	54.0	52.8	CW	H	0.85	PF	0.049	0.044	0.041	0.5	0.055	0.027	0.028
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	150.8000	54.0	52.8	CW	H	0.84	PF	0.046	0.051	0.04	0.5	0.056	0.028	0.029
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	158.0125	54.0	52.7	CW	H	0.82	PF	0.05	0.053	0.052	0.5	0.068	0.034	0.035
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	165.0125	54.0	52.1	CW	H	0.81	PF	0.055	0.064	0.05	0.5	0.079	0.040	0.041
Roof	HAD4022A, 5/8 wave (136-174MHz)	5.15	173.0125	54.0	52.1	CW	H	0.79	PF	0.040	0.039	0.046	0.5	0.041	0.021	0.021
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	146.0000	54.0	52.0	CW	H	0.85	PF	0.069	0.077	0.052	0.5	0.122	0.061	0.063
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	150.8000	54.0	52.8	CW	H	0.84	PF	0.063	0.066	0.054	0.5	0.100	0.050	0.051
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	158.0125	54.0	52.7	CW	H	0.82	PF	0.053	0.071	0.056	0.5	0.093	0.046	0.048
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	165.0125	54.0	52.1	CW	H	0.81	PF	0.053	0.060	0.058	0.5	0.081	0.040	0.042
Roof	RAD4227A, 5/8 wave (146-172MHz)	5.15	172.0000	54.0	52.4	CW	H	0.80	PF	0.037	0.041	0.04	0.5	0.037	0.019	0.019

MPE calculations are defined in section 15.0.

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

D.U.T. Info.							Probe Info.			MPE Measurements			DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor		Passenger/Operator (MC) Positions						
										Head/ Top 1/3	Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3				
Roof	HAD4006A, 1/4 wave (136-144MHz)	2.15	138.0000	54.0	53.3	CW	H	0.86	PF	0.074	0.072	0.059	0.5	0.131	0.066	0.067
Roof	HAD4006A, 1/4 wave (136-144MHz)	2.15	144.0000	54.0	52.8	CW	H	0.85	PF	0.078	0.075	0.057	0.5	0.136	0.068	0.069
Roof	HAD4007A, 1/4 wave (146-150.8MHz)	2.15	146.0000	54.0	52.0	CW	H	0.85	PF	0.065	0.085	0.071	0.5	0.150	0.075	0.078
Roof	HAD4007A, 1/4 wave (146-150.8MHz)	2.15	150.8000	54.0	52.8	CW	H	0.84	PF	0.065	0.078	0.072	0.5	0.137	0.069	0.070
Roof	HAD4008A, 1/4 wave (150.8-162MHz)	2.15	150.8000	54.0	52.8	CW	H	0.84	PF	0.073	0.083	0.067	0.5	0.148	0.074	0.076
Roof	HAD4008A, 1/4 wave (150.8-162MHz)	2.15	156.4000	54.0	52.4	CW	H	0.83	PF	0.058	0.080	0.065	0.5	0.121	0.061	0.062
Roof	HAD4008A, 1/4 wave (150.8-162MHz)	2.15	162.0000	54.0	52.2	CW	H	0.82	PF	0.076	0.084	0.06	0.5	0.139	0.069	0.072
Roof	HAD4009A, 1/4 wave (162-174MHz)	2.15	162.0000	54.0	52.2	CW	H	0.82	PF	0.071	0.083	0.05	0.5	0.122	0.061	0.063
Roof	HAD4009A, 1/4 wave (162-174MHz)	2.15	165.0125	54.0	52.1	CW	H	0.81	PF	0.056	0.080	0.081	0.5	0.133	0.066	0.069
Roof	HAD4009A, 1/4 wave (162-174MHz)	2.15	173.0125	54.0	52.1	CW	H	0.79	PF	0.051	0.050	0.066	0.5	0.074	0.037	0.038

MPE calculations are defined in section 15.0.

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

D.U.T. Info.							Probe Info.			MPE Measurements			DUT Max. TX Factor	Avg. over Body (mW/ cm2)	Calc. P.D. (mW/ cm2)	Max Calc. P.D. (mW/ cm2)
Ant Loc.	Ant. Model/ Desc.	Ant. Gain (dBi)	Tx Freq (MHz)	Max Pwr (W)	Initial Pwr (W)	Test Mode	E/H Field	Probe Cal. Factor		Passenger/Operator (MC) Positions						
										Head/ Top 1/3	Chest/ Middle 1/3	Lower Trunk/ Bottom 1/3				
Roof	RAD4226A, 1/4 wave (136-144MHz)	2.15	138.0000	54.0	53.3	CW	H	0.86	PF	0.069	0.074	0.057	0.5	0.125	0.063	0.063
Roof	RAD4226A, 1/4 wave (136-144MHz)	2.15	144.0000	54.0	52.8	CW	H	0.85	PF	0.065	0.075	0.066	0.5	0.129	0.064	0.066
Roof	RAD4225A, 1/4 wave (146-150.8MHz)	2.15	146.0000	54.0	52.0	CW	H	0.85	PF	0.079	0.083	0.057	0.5	0.149	0.074	0.077
Roof	RAD4225A, 1/4 wave (146-150.8MHz)	2.15	150.8000	54.0	52.8	CW	H	0.84	PF	0.071	0.085	0.072	0.5	0.155	0.077	0.079
Roof	RAD4224A, 1/4 wave (150.8-162MHz)	2.15	150.8000	54.0	52.8	CW	H	0.84	PF	0.051	0.052	0.054	0.5	0.073	0.036	0.037
Roof	RAD4224A, 1/4 wave (150.8-162MHz)	2.15	156.4000	54.0	52.4	CW	H	0.83	PF	0.069	0.080	0.067	0.5	0.135	0.068	0.070
Roof	RAD4224A, 1/4 wave (150.8-162MHz)	2.15	162.0000	54.0	52.2	CW	H	0.82	PF	0.077	0.084	0.079	0.5	0.162	0.081	0.084
Roof	RAD4223A, 1/4 wave (162-174MHz)	2.15	162.0000	54.0	52.2	CW	H	0.82	PF	0.056	0.062	0.05	0.5	0.080	0.040	0.041
Roof	RAD4223A, 1/4 wave (162-174MHz)	2.15	165.0125	54.0	52.1	CW	H	0.81	PF	0.054	0.065	0.059	0.5	0.088	0.044	0.045
Roof	RAD4223A, 1/4 wave (162-174MHz)	2.15	173.0125	54.0	52.1	CW	H	0.79	PF	0.06	0.058	0.065	0.5	0.088	0.044	0.045

MPE calculations are defined in section 15.0.

Table D.3
LMR VHF MPE Results for FCC

Note:
Blue fonts: Frequencies not regulated by FCC.

P_{max} (W) 54

P_{initial} (W)

53.3	52.8	52.0	52.8	52.4	52.7	52.2	52.1	52.4	52.1
0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20

Table	Test Post	Angle	Trunk / Roof	E/H Field	Antenna No.	f1	f2	f3	f4	f5	f6	f7	f8	f9	f10
						138.0000	144.0000	146.0000	150.8000	156.4000	158.0125	162.0000	165.0125	172.0000	173.0125
D.1	BS	0	Trunk	E	10	0.101	0.128		0.098		0.090		0.094		0.079
D.1	BS	45	Trunk	E	10				0.078						
D.1	BS	90	Trunk	E	10				0.107						
D.1	BS	0	Roof	E	10	0.037	0.062		0.046		0.072		0.071		0.074
D.1	BS	0	Roof	E	9			0.077	0.061		0.077		0.056	0.029	
D.1	BS	0	Roof	E	1	0.078	0.095								
D.1	BS	0	Roof	E	2			0.075	0.065						
D.1	BS	0	Roof	E	3				0.067	0.088		0.086			
D.1	BS	0	Roof	E	4							0.075	0.071		0.082
D.1	BS	0	Roof	E	8	0.065	0.087								
D.1	BS	0	Roof	E	7			0.074	0.074						
D.1	BS	0	Roof	E	6				0.023	0.079		0.075			
D.1	BS	0	Roof	E	5							0.036	0.052		0.069
D.2	PB	0	Trunk	E	10	0.079	0.167		0.163		0.246		0.544		0.656
D.2	PB	0	Roof	E	10	0.037	0.030		0.022		0.034		0.095		0.057
D.2	PB	0	Roof	E	9			0.084	0.087		0.083		0.099	0.053	
D.2	PB	0	Roof	E	1	0.143	0.125								
D.2	PB	0	Roof	E	2			0.118	0.128						
D.2	PB	0	Roof	E	3				0.127	0.150		0.170			
D.2	PB	0	Roof	E	4							0.143	0.164		0.134
D.2	PB	0	Roof	E	8	0.139	0.127								
D.2	PB	0	Roof	E	7			0.128	0.146						
D.2	PB	0	Roof	E	6				0.049	0.126		0.158			
D.2	PB	0	Roof	E	5							0.091	0.124		0.120
D.2	PF	0	Trunk	E	10	0.012	0.017		0.040		0.044		0.049		0.043
D.2	PF	0	Roof	E	10	0.008	0.013		0.010		0.010		0.019		0.015
D.2	PF	0	Roof	E	9			0.032	0.021		0.020		0.017	0.007	
D.2	PF	0	Roof	E	1	0.034	0.036								
D.2	PF	0	Roof	E	2			0.041	0.040						
D.2	PF	0	Roof	E	3				0.038	0.039		0.053			
D.2	PF	0	Roof	E	4							0.044	0.041		0.049
D.2	PF	0	Roof	E	8	0.029	0.038								
D.2	PF	0	Roof	E	7			0.037	0.038						
D.2	PF	0	Roof	E	6				0.014	0.032		0.063			
D.2	PF	0	Roof	E	5							0.021	0.033		0.044

Table D.3 (Continued)

LMR VHF MPE Results for FCC

Note:

Blue fonts: Frequencies not regulated by FCC.

Pmax (W) 54

Pinitial (W)

53.3	52.8	52.0	52.8	52.4	52.7	52.2	52.1	52.4	52.1
0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20

Table	Test Post	Angle	Trunk / Roof	E/H Field	Antenna No.	f1	f2	f3	f4	f5	f6	f7	f8	f9	f10
						138.0000	144.0000	146.0000	150.8000	156.4000	158.0125	162.0000	165.0125	172.0000	173.0125
D.1	BS	0	Trunk	H	10	0.126	0.178		0.145		0.167		0.185		0.162
D.1	BS	45	Trunk	H	10								0.207		
D.1	BS	90	Trunk	H	10								0.202		
D.1	BS	0	Roof	E	10	0.074	0.073		0.076		0.092		0.116		0.107
D.1	BS	0	Roof	E	9			0.104	0.088		0.086		0.060	0.039	
D.1	BS	0	Roof	E	1	0.057	0.068								
D.1	BS	0	Roof	E	2			0.081	0.113						
D.1	BS	0	Roof	E	3				0.100	0.112		0.126			
D.1	BS	0	Roof	E	4							0.108	0.114		0.097
D.1	BS	0	Roof	E	8	0.091	0.107								
D.1	BS	0	Roof	E	7			0.115	0.123						
D.1	BS	0	Roof	H	6				0.060	0.124		0.119			
D.1	BS	0	Roof	H	5							0.064	0.087		0.105
D.2	PB	0	Trunk	H	10	0.102	0.163		0.141		0.183		0.388		0.471
D.2	PB	0	Roof	H	10	0.042	0.038		0.047		0.067		0.079		0.062
D.2	PB	0	Roof	H	9			0.059	0.079		0.091		0.102	0.055	
D.2	PB	0	Roof	H	1	0.126	0.092								
D.2	PB	0	Roof	H	2			0.082	0.120						
D.2	PB	0	Roof	H	3				0.085	0.145		0.176			
D.2	PB	0	Roof	H	4							0.152	0.162		0.113
D.2	PB	0	Roof	H	8	0.124	0.121								
D.2	PB	0	Roof	H	7			0.103	0.119						
D.2	PB	0	Roof	H	6				0.053	0.103		0.140			
D.2	PB	0	Roof	H	5							0.087	0.115		0.099
D.2	PF	0	Trunk	H	10	0.035	0.043		0.044		0.040		0.054		0.032
D.2	PF	0	Roof	H	10	0.027	0.028		0.029		0.035		0.041		0.021
D.2	PF	0	Roof	H	9			0.063	0.051		0.048		0.042	0.019	
D.2	PF	0	Roof	H	1	0.067	0.069								
D.2	PF	0	Roof	H	2			0.078	0.070						
D.2	PF	0	Roof	H	3				0.076	0.062		0.072			
D.2	PF	0	Roof	H	4							0.063	0.069		0.038
D.2	PF	0	Roof	H	8	0.063	0.066								
D.2	PF	0	Roof	H	7			0.077	0.079						
D.2	PF	0	Roof	H	6				0.037	0.070		0.084			
D.2	PF	0	Roof	H	5							0.041	0.045		0.045

Table D.4
LMR VHF MPE Variability Test (FCC)

Note:

Bystander measurement at initial mounting location
Bystander measurement at 10cm antenna offset from initial mounting location

Trunk / Roof	Test Post.	E/H Field	Antenna Model	Angle	Max Pwr (W)	Initial Pwr (W)	Tx Freq (MHz)	Max Calc. P.D. (mW/cm ²)	FCC Limit	% To FCC Spec Limit	MPE Variability (%)
Trunk	BS	E	HAD4022A, 5/8 Wave (132 -174 MHz)	0	54.0	52.8	150.8000	0.107	0.20	53.5	
						52.8	150.8000	0.097	0.20	48.5	-9.40
Trunk	BS	H	HAD4022A, 5/8 Wave (132 -174 MHz)	0	54.0	52.8	150.8000	0.145	0.20	72.7	
						52.8	150.8000	0.128	0.20	64.1	-1.83
Trunk	BS	H	HAD4022A, 5/8 Wave (132 -174 MHz)	0	54.0	52.7	158.0125	0.167	0.20	83.4	
						52.7	158.0125	0.160	0.20	80.1	-3.88
Trunk	BS	H	HAD4022A, 5/8 Wave (132 -174 MHz)	0	54.0	52.1	165.0125	0.185	0.20	92.4	
						52.1	165.0125	0.160	0.20	80.0	-13.44
Trunk	BS	H	HAD4022A, 5/8 Wave (132 -174 MHz)	0	54.0	52.1	173.0125	0.162	0.20	80.8	
						52.1	173.0125	0.139	0.20	69.3	-14.30
Roof	BS	H	HAD4022A, 5/8 Wave (132 -174 MHz)	0	54.0	52.1	165.0125	0.116	0.20	58.1	
						52.1	165.0125	0.102	0.20	50.8	-12.53
Roof	BS	H	HAD4022A, 5/8 Wave (132 -174 MHz)	0	54.0	52.1	173.0125	0.107	0.20	53.5	
						52.1	173.0125	0.100	0.20	50.1	-6.36
Roof	BS	H	HAD4007A, 1/4 wave (146-150.8MHz)	0	54.0	52.8	150.8000	0.113	0.20	56.7	
						52.8	150.8000	0.123	0.20	61.7	8.90
Roof	BS	H	HAD4008A, 1/4 wave (150.8-162MHz)	0	54.0	52.2	162.0000	0.126	0.20	63.0	
						52.2	162.0000	0.121	0.20	60.5	-3.96
Roof	BS	H	HAD4009A, 1/4 wave (162-174MHz)	0	54.0	52.1	165.0125	0.114	0.20	56.8	
						52.1	165.0125	0.098	0.20	48.9	-13.86

Table D.4 (Continued)
LMR VHF MPE Variability Test (FCC)

Note:

Bystander measurement at initial mounting location
Bystander measurement at 10cm antenna offset from initial mounting location

Trunk / Roof	Test Post.	E/H Field	Antenna Model	Angle	Max Pwr (W)	Initial Pwr (W)	Tx Freq (MHz)	Max Calc. P.D. (mW/cm ²)	FCC Limit	% To FCC Spec Limit	MPE Variability (%)
Roof	BS	H	RAD4225A, 1/4 wave (146-150.8MHz)	0	54.0	52.8	150.8000	0.123	0.20	61.5	
						52.8	150.8000	0.117	0.20	58.3	-5.16
Roof	BS	H	RAD4224A, 1/4 wave (150.8-162MHz)	0	54.0	52.4	156.4000	0.124	0.20	62.1	
						52.4	156.4000	0.118	0.20	59.2	-4.71
Roof	BS	H	RAD4223A, 1/4 wave (162-174MHz)	0	54.0	52.1	173.0125	0.105	0.20	52.4	
						52.1	173.0125	0.114	0.20	57.1	9.05