

 <b>MOTOROLA</b>	 <p>TESTING CERT #2518.01</p>
<p><b>FCC ID: AZ492FT5847</b>  <b>DECLARATION OF COMPLIANCE MPE ASSESSMENT</b></p>	
<p><b>Networks &amp; Enterprise</b>  <b>EME Test Laboratory</b>                  8000 West Sunrise Blvd                  Fort Lauderdale, FL. 33322</p>	<p><b>Date of Report:</b> 5/18/07  <b>Report Revision:</b> Rev. A  <b>Report ID:</b> MPE rpt_XTL1500 900MHz _                  Rev A_070518_SR4801</p>
<p><b>Responsible Engineer:</b> Kim Uong (EME Eng.)  <b>Date/s Tested:</b> 3/8/07  <b>Manufacturer/Location:</b> Motorola Penang  <b>Date submitted for test:</b> 2/14/07  <b>DUT Description:</b> XTL1500 MOBILE 3-30 WATT, 896-941 MHZ  <b>Test TX mode(s):</b> CW  <b>Max. Power output:</b> 38W, 50% Duty Cycle (PTT)  <b>TX Frequency Bands:</b> 896 - 902 MHz &amp; 935 -941 MHz  <b>Signaling type:</b> FM  <b>Model(s) Tested:</b> M28WRS9PW1AN  <b>Model(s) Certified:</b> M28WRS9PW1AN  <b>Serial Number(s):</b> 775T000001  <b>Classification:</b> Occupational Controlled (Operator); General Population/Uncontrolled (Passengers/Bystanders)  <b>Rule Part(s):</b> 2.1091 (d)</p> <p><b>Approved Accessories:</b>  <b>Antenna(s):</b>                  RAF4003ARM (890 - 960MHz 1/4 Wave 3dBi)                  RRA4935A (890-960MHz 1/4 Wave 3dBi)</p> <div style="text-align: right;">  </div> <p style="text-align: center;"><b>Final RF Exposure Results:</b>  <b>Mobile max calculated power density = 0.33 mW/cm<sup>2</sup></b></p>	
<p>Based on the information and the testing results provided herein, the undersigned certifies that when used as stated in the operating instructions supplied, said product complies with the national and international reference standards and guidelines listed in section 3.0 of this report. This report shall not be reproduced without written approval from an officially designated representative of the Motorola EME Laboratory.</p>	
<p style="text-align: center;"><i>Signature on file – Deanna Zakharia</i>                  Deanna Zakharia – N&amp;E EME Lab Senior Resource Manager,                  Laboratory Director,</p> <p style="text-align: center;"><b>Approval Date: 5/18/07</b></p>	<p><b>Certification Date:</b> 5/23/07  <b>Certification No.:</b> L1070511P</p>

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**REVISION HISTORY**

Date	Revision	Comments
5/18/07	A	Change the rated power from 10-30W to 3-30W
3/19/07	O	Initial release

## 1.0 Product and System Description

FCC ID: AZ492FT5847, model M28WRS9PW1AN, is a mobile transceiver that utilizes both analog and digital two-way radio communications. The modulation could be conventional analog voice, trunked analog voice, tone PL or C4FM digital modulation. Control channel data rates are 3600 and 9600 baud on the C4FM constant envelope carrier.

The intended use of the radio is Push-To-Talk (PTT) while the device is properly installed in a vehicle with an external antenna mounted at the center of the roof or trunk.

This device will be marketed to and used by employees solely for work-related operations, such as public safety agencies, e.g. police, fire and emergency medical. User training is the responsibility of these agencies which can be expected to employ the usage instructions, safety information and operational cautions set forth in the user's manual, instructional sessions or other means.

Accordingly this product is classified as Occupational/Controlled Exposure. However, In accordance with FCC requirements, the passengers inside the vehicle and the bystanders external to the vehicle are evaluated to the General Population/Uncontrolled Exposure Limits.

(Note that "By-standers" as used herein mean people other than operator)

## 2.0 Additional Options and Accessories:

Noted: The antenna RRA4935A was not tested due to this antenna is the same as the RAF4003ARM except for the cable length.

## 3.0 Measurement and Limit Standards

Measurements were performed according to the recommended guidelines in IEEE/ANSI C95.3-2002 and compared to FCC Limits Per 47 CFR 2.1091 (d) for General Population/Uncontrolled RF Exposure.

For test frequencies ranging from 896 - 902 MHz & 935 -941 MHz the MPE (Maximum Permissible Exposure) limit to electromagnetic energy in equivalent plane wave free-space power density is 0.60-0.63 mW/cm<sup>2</sup> and calculated using the formula  $f/1500$ .

## 4.0 Data Collection Consideration

Power density testing was performed with DUT installed in a 1991 Ford Taurus (4-door). Measurement data was taken with the vehicle running at idle and the vehicle battery measuring 13.8 volts.

## 5.0 Measurement System Uncertainty Levels

The information below presents an estimate of the possible errors that are associated with the measurement system.

Uncertainty Budget for Near Field Probe Measurements

	Tol. (± %)	Prob Dist.	Divisor	$u_i$ (±%)
<b>Measurement System</b>				
Survey Meter Calibration	3.0	N	1.00	3.0
Repeatability Accuracy	7.0	N	1.00	7.0
<b>Combined Standard Uncertainty</b>		RSS		7.6
<b>Expanded Uncertainty</b>		$k=2$		15

## 6.0 Method of Measurement

### 6.1 EME measurements made with roof mounted antenna(s)

(For reference, see Illustration of antenna location and test distances in appendix A).

#### 6.1.1 External vehicle EME measurement

(Antenna mounted at roof center)

MPE measurements for by-stander conditions are determined by taking the average of (10) measurements in a 2m vertical line for the test location indicated in appendix A with 20cm increments at the test distance of 60cm from the antenna under test. The measurement probe sensor is rotated 180° at each of the ten incremental measurements to ensure the highest result is captured. These measurements are representative of persons other than the operator standing next to the vehicle.

**Note:** Actual test distance was 110cm (60cm from antenna to roof edge; 30cm from roof edge to edge of car door; 20cm vertical test line to car door); this is the closest distance that can be achieved to an antenna mounted to the center of the vehicle used for MPE compliance assessment.

#### 6.1.2 Internal vehicle EME measurement

(Antenna mounted at roof center)

While rotating survey meter probe through 180 degrees to ensure that the highest level is found, scans were performed inside of the vehicle, both at the front and back seating areas, across the TX band to ascertain the highest level in each location. After the highest level is found, two (2) additional measurements were performed vertically within an area approximately 40cm wide (representing the width of a person) so as to have a total of three (3) measured points as indicated below that are averaged.

a) Head area

- b) Chest area
- c) Lower Trunk area

## 6.2 EME measurements made with trunk mounted antenna(s)

(For reference, see Illustration of antenna location and test distances in appendix A)

### 6.2.1 External vehicle EME measurement

(Antenna mounted at trunk center)

MPE measurements for by-stander conditions are determined by taking the average of (10) measurements in a 2m vertical line for each of the (3) test locations indicated in appendix A with 20cm increments at the test distance of 60cm from the antenna under test. The measurement probe sensor is rotated 180° at each of the ten incremental measurements to ensure the highest result is captured. These measurements are representative of persons other than the operator standing next to the vehicle.

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

For the current test vehicle, the antenna to probe sensor separation distance is 60cm (directly behind vehicle), 99.5 cm (45 degree radial) and 104 cm (90 degree radial).

**Note: the distance from the trunk-mounted antenna to the edge of the vehicle is 26cm and the distance from the edge of the vehicle's trunk to the MPE vertical line assessment is 34cm (trunk to edge of bumper is 10cm). The radial distance measured at 45° from corner of trunk to vertical test line is 99.5cm. The radial distance measured at 90° from the side of the trunk is 104cm.**

### 6.2.2 Internal vehicle EME measurement

(Antenna mounted at trunk center)

While rotating survey meter probe through 180 degrees to ensure that the highest level is found, scans were performed inside of the vehicle, at both front and back seating areas, across the TX band to ascertain the highest level at the head. After the highest level is found, scans were performed vertically making two (2) additional measurements within an area approximately 40cm wide (representing the width of a person) so as to have a total of three (3) measured points, indicated below, that are averaged.

- a) Head area
- b) Chest area
- c) Lower Trunk area

## 7.0 Test Site

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

## 8.0 Measurement System/Equipment

Equipment Type	Model #	SN	Calibration Due Date
Automobile	1991 Ford Taurus, 4-Door		
Survey Meter	NARDA Model 8718	01108	7/11/07
Probe - E-Field (Electric Field)	NARDA Model 8722B	13001	7/11/07

## 9.0 Test Unit Description

Power density measurements were performed on M28WRS9PW1AN with serial numbers 775T000001. The tested frequencies and associated power outputs are presented below.

Frequency (MHz)	Po (W)
896.0625	37.0
899.0625	37.2
901.9875	37.2
935.0625	36.9
938.0625	36.9
940.9875	36.9

## 10.0 Test Set-Up Description

The following is the mobile antenna test configuration used for this product.  
(for reference, see Illustration of antenna location and test distances in the appendix A)

The RAF4003ARM, 3.0dBi gain, antenna was assessed while mounted at the center of the roof, and at the center of the trunk of the test vehicle.

Assessments were made internal and external to the test vehicle at the specified distances and test locations indicated in sections 6.0, 11.0, and appendix A.

## 11.0 Test Results Summary

Appendix D presents detailed MPE measurement information for each test configuration; person external or internal to the vehicle, TX frequency, antenna (location, model and gain), distance from antenna to probe sensor, E field measurements, calibration factor, MPE average over body, initial power, power density calc, power density max calc, IEEE/FCC controlled and uncontrolled limits, and maximum output power.

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

The MPE test measurements were done at 100% duty cycle test mode, then the final calculated results are based on a 50% actual duty cycle which is in accordance with the User Manual instructions.

External to vehicle - 10 measurements are averaged over the body (*Body\_Avg*).

Internal to vehicle - 3 measurements are averaged over the body (*Body\_Avg*).

Narda Survey Meter measures in percent of the controlled limit. Therefore the averages over the body used in the calculations below reflect percentages.

MPE results are based on a Push-To-Talk (PTT) 50% duty cycle in CW mode.

Therefore;

$$\text{Average\_over\_Body} = \text{Body\_Avg} * \text{Controlled\_Limit}$$

$$\text{Pwr\_Density\_Calc} = \text{Average\_over\_Body} * \text{Duty\_Cycle}$$

$$\text{Pwr\_Density\_Max\_Calc} = \text{Pwr\_Density\_Calc} * \frac{\text{Max\_Output\_Power}}{\text{Initial\_Output\_Power}}$$

Note; For  $\text{Initial Output Power} > \text{Max\_Output\_Power}$ ,  $\text{Max\_Output\_Power} / \text{Initial Output Power} = 1$

**The table below summarizes the MPE results of the E field test configurations for the M28WRS9PW1AN mobile radio. See appendices A and D respectively for test positions and detailed MPE measurement data.**

TABLE 1

Tables	Antenna Model	Antenna Location	Test Frequency (MHz)	E/H Field	Passenger / By-stander	Max Calc Pwr Density (mW/cm <sup>2</sup> )	% of Uncontrolled Limit
<b>Roof Mount</b>							
1	RAF4003ARM	Roof	896.0625	E	By-stander	0.14	23%
2	RAF4003ARM	Roof	896.0625	E	Passenger	0.05	8%
3	RAF4003ARM	Roof	899.0625	E	By-stander	0.13	22%
4	RAF4003ARM	Roof	899.0625	E	Passenger	0.05	8%
5	RAF4003ARM	Roof	901.9875	E	By-stander	0.12	20%
6	RAF4003ARM	Roof	901.9875	E	Passenger	0.04	7%
7	RAF4003ARM	Roof	935.0625	E	By-stander	0.09	15%
8	RAF4003ARM	Roof	935.0625	E	Passenger	0.03	5%
9	RAF4003ARM	Roof	938.0625	E	By-stander	0.08	13%
10	RAF4003ARM	Roof	938.0625	E	Passenger	0.03	5%
11	RAF4003ARM	Roof	940.9875	E	By-stander	0.07	11%
12	RAF4003ARM	Roof	940.9875	E	Passenger	0.03	5%
<b>Trunk mount</b>							
13	RAF4003ARM	Trunk	896.0625	E	By-stander	0.27	45%
14	RAF4003ARM	Trunk	896.0625	E	Passenger	0.33	55%
15	RAF4003ARM	Trunk	899.0625	E	By-stander	0.25	42%
16	RAF4003ARM	Trunk	899.0625	E	Passenger	0.29	48%
17	RAF4003ARM	Trunk	901.9875	E	By-stander	0.22	37%
18	RAF4003ARM	Trunk	901.9875	E	Passenger	0.24	40%
19	RAF4003ARM	Trunk	935.0625	E	By-stander	0.17	27%
20	RAF4003ARM	Trunk	935.0625	E	Passenger	0.26	42%
21	RAF4003ARM	Trunk	938.0625	E	By-stander	0.17	27%
22	RAF4003ARM	Trunk	938.0625	E	Passenger	0.23	37%
23	RAF4003ARM	Trunk	940.9875	E	By-stander	0.15	24%
24	RAF4003ARM	Trunk	940.9875	E	Passenger	0.23	37%
<b>45 Degree From Trunk</b>							

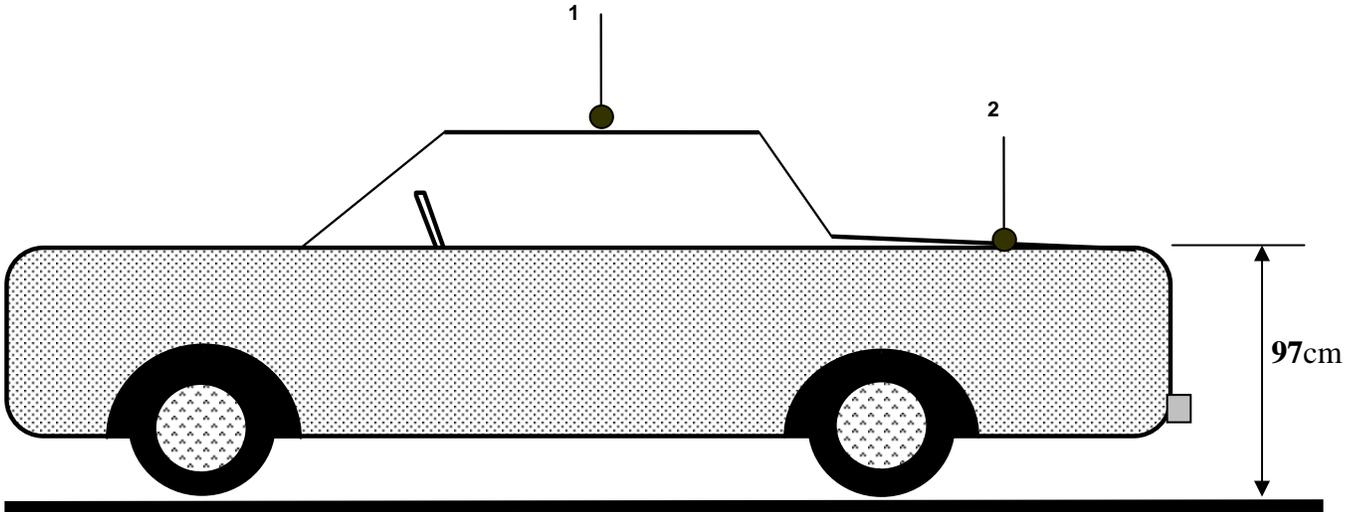
25	RAF4003ARM	Trunk	896.0625	E	By-stander	0.10	17%
<b>90 Degree From Trunk</b>							
26	RAF4003ARM	Trunk	896.0625	E	By-stander	0.11	18%

## 12.0 Conclusion

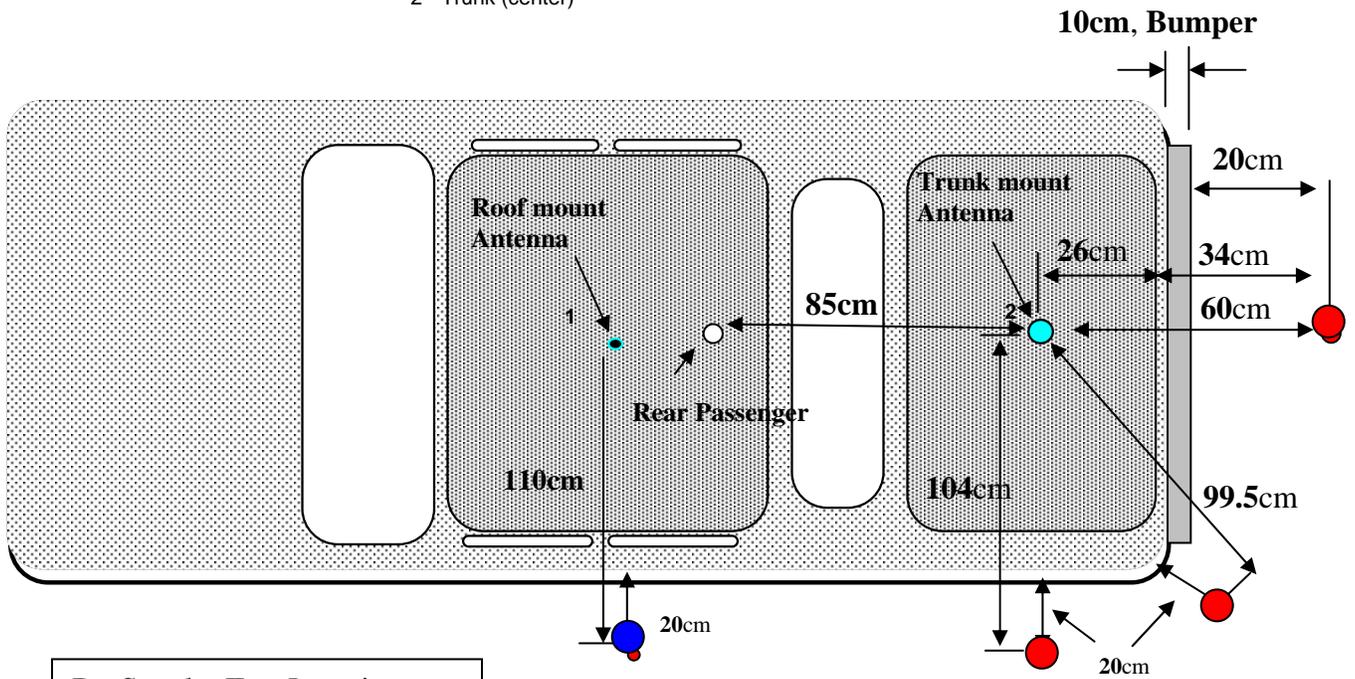
Depending on the test frequency, the M28WRS9PW1AN mobile assessments were performed with an output power range of 36.9-37.2W for 896 - 902 MHz & 935 -941 MHz band. The highest power density results for the M28WRS9PW1AN mobile device scaled to the maximum allowable power output is 0.33 mW/cm<sup>2</sup> internal to the vehicle, and 0.27 mW/cm<sup>2</sup> external to the vehicle. These MPE results demonstrate compliance to the FCC/IEEE General Population/Uncontrolled Exposure limit.

**APPENDIX A**

**Illustration of Antenna Locations and Test Distances**



- 1 - Roof (center)
- 2 - Trunk (center)



By-Stander Test Locations

- Roof Mount
- Trunk Mount

**APPENDIX B**

**Meter/Probe Calibration Certificates**

**CERTIFICATION OF CALIBRATION CONFORMANCE**

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

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

**ACCREDITATION NOTES:**

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

Instrumentation Environment: TEMP: 23°C RH: 41%  
Calibration Environment: TEMP: 23°C RH: 41%

Barometric Pressure (inches): 29.82

CERTIFICATE NO.: 2006061922

CLIENT: Motorola, Inc., 8000 W. Sunrise Blvd., Plantation, FL, 33322-9947, USA

MANUFACTURER: Narda

MODEL NUMBER: 8722B & 8718

SERIAL NUMBER: 13001 & 01108

ASSET NUMBER:

DATE OF CALIBRATION: Tuesday, July 11, 2006

NAME OF CALIBRATING ORGANIZATION Liberty Labs, Inc.

CALIBRATED BY: DSG *DSG*

RE-CERTIFICATION DATE: Re-Certification interval is at customer discretion.

**RECEIVED STATUS**

Received in tolerance:

**RETURNED STATUS**

Returned in tolerance:

Returned limited cal.:

**NOTES:** We have deviated from IEEE 1309 with the use of a tri-plate line as a transfer standard for frequencies at and/or below 1GHz. Client declined isotropic response testing. In/Out of tolerance based on alignment/mounting position and not on manufacturer's specifications. A probe position document is included with this certificate.

**LL, Inc.**

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*Michael W. Howard*

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

ispb-position



Certificate Number: 2123.01  
Rev. D: Issue Date 12/12/03

Probe01.txt

Date of Calibration: 11-July-2006  
 Date Printed: Tuesday, July 11, 2006  
 Customer Name: Motorola, Inc.  
 Probe Manufacturer: Narda  
 Probe Model: 8722B & 8718  
 Probe Serial No.: 13001 & 01108  
 Temperature (Deg C): 23  
 Humidity (%): 41  
 Notes: Calibrated with 8718 Monitor, s/n 01108.  
 CAL CERT #: 2006061922

Frequency in MHz	Correction Factors	
	Mutiplier	dB
1	1.91	5.62
15	1.23	1.82
30	0.89	-1.04
75	0.82	-1.74
100	0.71	-3.02
150	1.04	0.36
200	0.90	-0.88
300	0.73	-2.79
400	0.92	-0.75
500	1.08	0.70
600	1.35	2.62
700	0.86	-1.29
800	1.06	0.47
900	1.58	3.97
1000	0.68	-3.38
2000	1.10	0.80
2450	0.95	-0.49
3000	0.90	-0.91
4000	1.29	2.22
5000	0.90	-0.92
6000	0.84	-1.52
7000	0.98	-0.15

**APPENDIX C**

**Photos of Assessed Antenna**



**Antenna kit number: RAF4003ARM**

**APPENDIX D**

**Detailed MPE Measurement Data**

Table 1

External Vehicle MPE Assessment @ 896.0625 MHz									
Antenna Location	Antenna Model	Gain (dBi)	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm <sup>2</sup> )	Initial Power (W)	Pwr. Density Calc. (mW/cm <sup>2</sup> )	Pwr. Density Max Calc. (mW/cm <sup>2</sup> )
Roof (cnt)	RAF4003A RM	3	60(Actual 110)	E	1.56	0.276	37.0	0.138	0.14
Measurement Grid									
Test Position	Height (cm)	% of Control Limit		Test Position	Height (cm)	% of Control Limit		IEEE Controlled Limit	IEEE Uncontrolled Limit
1	20	0.5%		6	120	9.8%		2.99	0.60
2	40	2.0%		7	140	16.9%		RF Po (*Max)	38.0
3	60	2.8%		8	160	22.5%			
4	80	3.6%		9	180	21.3%			
5	100	4.8%		10	200	8.1%			

Table 2

Internal Vehicle MPE Assessment @ 896.0625 MHz										
Antenna Location	Antenna	Gain (dBi)	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front seats (mW/cm <sup>2</sup> )		Initial Power (W)	Pwr. Density Calc. (mW/cm <sup>2</sup> )	Pwr. Density Max Calc. (mW/cm <sup>2</sup> )
						Back	Front			
Roof (cnt)	RAF4003A RM	3	Highest Reading	E	1.56	0.096	0.050	37.0	0.048	0.05
Measurement Grid										
Test Position		% of Control Limit Head		% of Control Limit Chest		% of Control Limit Lower Trunk		IEEE Controlled Limit:		2.99
Back Seat		3.2%		3.0%		3.4%		IEEE Uncontrolled Limit:		0.60
Front Seat		1.3%		0.6%		3.1%		RF Po (*Max):		38.0

Table 3

External Vehicle MPE Assessment @ 899.0625 MHz									
Antenna Location	Antenna Model	Gain (dBi)	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm <sup>2</sup> )	Initial Power (W)	Pwr. Density Calc. (mW/cm <sup>2</sup> )	Pwr. Density Max Calc. (mW/cm <sup>2</sup> )
Roof (cnt)	RAF4003A RM	3	60(Actual 110)	E	1.57	0.254	37.2	0.127	0.13
Measurement Grid									
Test Position	Height (cm)	% of Control Limit		Test Position	Height (cm)	% of Control Limit		IEEE Controlled Limit	IEEE Uncontrolled Limit
1	20	0.5%		6	120	9.7%		3.00	0.60
2	40	1.7%		7	140	12.0%		RF Po (*Max)	38.0
3	60	2.5%		8	160	22.9%			
4	80	3.3%		9	180	18.8%			
5	100	6.0%		10	200	7.3%			

Table 4

Internal Vehicle MPE Assessment @ 899.0625 MHz										
Antenna Location	Antenna	Gain (dBi)	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front seats (mW/cm <sup>2</sup> )		Initial Power (W)	Pwr. Density Calc. (mW/cm <sup>2</sup> )	Pwr. Density Max Calc. (mW/cm <sup>2</sup> )
						Back	Front			
Roof (cnt)	RAF4003A RM	3	Highest Reading	E	1.57	0.100	0.041	37.2	0.050	0.05
Measurement Grid										
Test Position		% of Control Limit Head	% of Control Limit Chest	% of Control Limit Lower Trunk		IEEE Controlled Limit:			3.00	
Back Seat		3.3%	4.0%	2.7%		IEEE Uncontrolled Limit:			0.60	
Front Seat		1.1%	0.5%	2.5%		RF Po (*Max):			38.0	

Table 5

External Vehicle MPE Assessment @ 901.9875 MHz										
Antenna Location	Antenna Model	Gain (dBi)	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm <sup>2</sup> )	Initial Power (W)	Pwr. Density Calc. (mW/cm <sup>2</sup> )	Pwr. Density Max Calc. (mW/cm <sup>2</sup> )	
Roof (cnt)	RAF4003A RM	3	60(Actual 110)	E	1.56	0.238	37.2	0.119	0.12	
Measurement Grid										
Test Position	Height (cm)	% of Control Limit		Test Position	Height (cm)	% of Control Limit		IEEE Controlled Limit	IEEE Uncontrolled Limit	
1	20	1.0%		6	120	8.4%		3.01	0.60	
2	40	1.6%		7	140	12.3%				
3	60	2.2%		8	160	21.3%				
4	80	3.8%		9	180	16.3%				
5	100	5.4%		10	200	6.8%				
								RF Po (*Max)		38.0

Table 6

Internal Vehicle MPE Assessment @ 901.9875 MHz										
Antenna Location	Antenna	Gain (dBi)	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front seats (mW/cm <sup>2</sup> )		Initial Power (W)	Pwr. Density Calc. (mW/cm <sup>2</sup> )	Pwr. Density Max Calc. (mW/cm <sup>2</sup> )
						Back	Front			
Roof (cnt)	RAF4003A RM	3	Highest Reading	E	1.56	0.073	0.035	37.2	0.037	0.04
Measurement Grid										
Test Position		% of Control Limit Head	% of Control Limit Chest	% of Control Limit Lower Trunk		IEEE Controlled Limit:			3.01	
Back Seat		3.4%	1.7%	2.2%		IEEE Uncontrolled Limit:			0.60	
Front Seat		1.0%	0.5%	2.0%		RF Po (*Max):			38.0	

Table 7

External Vehicle MPE Assessment @ 935.0625 MHz									
Antenna Location	Antenna Model	Gain (dBi)	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm <sup>2</sup> )	Initial Power (W)	Pwr. Density Calc. (mW/cm <sup>2</sup> )	Pwr. Density Max Calc. (mW/cm <sup>2</sup> )
Roof (cnt)	RAF4003A RM	3	60(Actual 110)	E	1.27	0.167	36.9	0.084	0.09
Measurement Grid									
Test Position	Height (cm)	% of Control Limit		Test Position	Height (cm)	% of Control Limit		IEEE Controlled Limit	IEEE Uncontrolled Limit
1	20	0.5%		6	120	6.2%		3.12	0.62
2	40	1.4%		7	140	10.2%			
3	60	2.1%		8	160	14.0%			
4	80	2.5%		9	180	8.3%			
5	100	3.9%		10	200	4.5%			
								RF Po (*Max)	38.0

Table 8

Internal Vehicle MPE Assessment @ 935.0625 MHz										
Antenna Location	Antenna Model	Gain (dBi)	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front seats (mW/cm <sup>2</sup> )		Initial Power (W)	Pwr. Density Calc. (mW/cm <sup>2</sup> )	Pwr. Density Max Calc. (mW/cm <sup>2</sup> )
						Back	Front			
Roof (cnt)	RAF4003A RM	3	Highest Reading	E	1.27	0.064	0.060	36.9	0.032	0.03
Measurement Grid										
Test Position		% of Control Limit Head		% of Control Limit Chest		% of Control Limit Lower Trunk		IEEE Controlled Limit:		3.12
Back Seat		2.4%		1.6%		2.2%		IEEE Uncontrolled Limit:		0.62
Front Seat		3.2%		1.7%		0.9%		RF Po (*Max):		38.0

Table 9

External Vehicle MPE Assessment @ 938.0625 MHz									
Antenna Location	Antenna Model	Gain (dBi)	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm <sup>2</sup> )	Initial Power (W)	Pwr. Density Calc. (mW/cm <sup>2</sup> )	Pwr. Density Max Calc. (mW/cm <sup>2</sup> )
Roof (cnt)	RAF4003A RM	3	60(Actual 110)	E	1.24	0.152	36.9	0.076	0.08
Measurement Grid									
Test Position	Height (cm)	% of Control Limit		Test Position	Height (cm)	% of Control Limit		IEEE Controlled Limit	IEEE Uncontrolled Limit
1	20	0.7%		6	120	5.0%		3.13	0.63
2	40	1.0%		7	140	9.7%			
3	60	1.6%		8	160	13.1%			
4	80	2.0%		9	180	8.4%			
5	100	3.0%		10	200	4.1%			
								RF Po (*Max)	38.0

Table 10

Internal Vehicle MPE Assessment @ 938.0625 MHz										
Antenna Location	Antenna	Gain (dBi)	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front seats (mW/cm <sup>2</sup> )		Initial Power (W)	Pwr. Density Calc. (mW/cm <sup>2</sup> )	Pwr. Density Max Calc. (mW/cm <sup>2</sup> )
						Back	Front			
Roof (cnt)	RAF4003A RM	3	Highest Reading	E	1.24	0.065	0.055	36.9	0.032	0.03
Measurement Grid										
Test Position		% of Control Limit Head		% of Control Limit Chest		% of Control Limit Lower Trunk		IEEE Controlled Limit:		3.13
Back Seat		2.4%		2.0%		1.8%		IEEE Uncontrolled Limit:		0.63
Front Seat		2.8%		1.4%		1.1%		RF Po (*Max):		38.0

Table 11

External Vehicle MPE Assessment @ 940.9875 MHz										
Antenna Location	Antenna Model	Gain (dBi)	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm <sup>2</sup> )	Initial Power (W)	Pwr. Density Calc. (mW/cm <sup>2</sup> )	Pwr. Density Max Calc. (mW/cm <sup>2</sup> )	
										Roof (cnt)
Measurement Grid										
Test Position	Height (cm)	% of Control Limit		Test Position	Height (cm)	% of Control Limit		IEEE Controlled Limit	IEEE Uncontrolled Limit	
1	20	0.6%		6	120	4.4%		3.14	0.63	
2	40	0.9%		7	140	9.6%				
3	60	1.4%		8	160	11.6%				
4	80	2.0%		9	180	8.2%				
5	100	3.1%		10	200	4.5%				
								RF Po (*Max)		38.0

Table 12

Internal Vehicle MPE Assessment @ 940.9875 MHz										
Antenna Location	Antenna	Gain (dBi)	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front seats (mW/cm <sup>2</sup> )		Initial Power (W)	Pwr. Density Calc. (mW/cm <sup>2</sup> )	Pwr. Density Max Calc. (mW/cm <sup>2</sup> )
						Back	Front			
Roof (cnt)	RAF4003A RM	3	Highest Reading	E	1.21	0.055	0.050	36.9	0.028	0.03
Measurement Grid										
Test Position		% of Control Limit Head		% of Control Limit Chest		% of Control Limit Lower Trunk		IEEE Controlled Limit:		3.14
Back Seat		2.1%		1.8%		1.4%		IEEE Uncontrolled Limit:		0.63
Front Seat		2.5%		1.1%		1.2%		RF Po (*Max):		38.0

Table 13

External Vehicle MPE Assessment @ 896.0625 MHz									
Antenna Location	Antenna Model	Gain (dBi)	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm <sup>2</sup> )	Initial Power (W)	Pwr. Density Calc. (mW/cm <sup>2</sup> )	Pwr. Density Max Calc. (mW/cm <sup>2</sup> )
Trunk (cnt)	RAF4003A RM	3	60	E	1.56	0.535	37.0	0.267	0.27
Measurement Grid									
Test Position	Height (cm)	% of Control Limit		Test Position	Height (cm)	% of Control Limit		IEEE Controlled Limit	IEEE Uncontrolled Limit
1	20	5.0%		6	120	53.1%		2.99	0.60
2	40	4.8%		7	140	17.8%			
3	60	5.0%		8	160	11.6%			
4	80	19.8%		9	180	6.6%			
5	100	51.7%		10	200	3.6%			
								RF Po (*Max)	38.0

Table 14

Internal Vehicle MPE Assessment @ 896.0625 MHz										
Antenna Location	Antenna Model	Gain (dBi)	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front seats (mW/cm <sup>2</sup> )		Initial Power (W)	Pwr. Density Calc. (mW/cm <sup>2</sup> )	Pwr. Density Max Calc. (mW/cm <sup>2</sup> )
						Back	Front			
Trunk (cnt)	RAF4003A RM	3	Highest Reading	E	1.56	0.644	0.172	37.0	0.322	0.33
Measurement Grid										
Test Position		% of Control Limit Head		% of Control Limit Chest		% of Control Limit Lower Trunk		IEEE Controlled Limit:		2.99
Back Seat		28.6%		18.1%		18.0%		IEEE Uncontrolled Limit:		0.60
Front Seat		8.4%		5.7%		3.2%		RF Po (*Max):		38.0

Table 15

External Vehicle MPE Assessment @ 899.0625 MHz									
Antenna Location	Antenna Model	Gain (dBi)	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm <sup>2</sup> )	Initial Power (W)	Pwr. Density Calc. (mW/cm <sup>2</sup> )	Pwr. Density Max Calc. (mW/cm <sup>2</sup> )
Trunk (cnt)	RAF4003A RM	3	60	E	1.57	0.490	37.2	0.245	0.25
Measurement Grid									
Test Position	Height (cm)	% of Control Limit		Test Position	Height (cm)	% of Control Limit		IEEE Controlled Limit	IEEE Uncontrolled Limit
1	20	4.6%		6	120	48.0%		3.00	0.60
2	40	4.2%		7	140	16.5%			
3	60	5.9%		8	160	10.7%			
4	80	22.1%		9	180	6.1%			
5	100	43.0%		10	200	2.4%			
								RF Po (*Max)	38.0

Table 16

Internal Vehicle MPE Assessment @ 899.0625 MHz										
Antenna Location	Antenna	Gain (dBi)	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front seats (mW/cm <sup>2</sup> )		Initial Power (W)	Pwr. Density Calc. (mW/cm <sup>2</sup> )	Pwr. Density Max Calc. (mW/cm <sup>2</sup> )
						Back	Front			
Trunk (cnt)	RAF4003A RM	3	Highest Reading	E	1.57	0.566	0.151	37.2	0.283	0.29
Measurement Grid										
Test Position		% of Control Limit Head		% of Control Limit Chest		% of Control Limit Lower Trunk		IEEE Controlled Limit:		3.00
Back Seat		28.2%		15.7%		12.8%		IEEE Uncontrolled Limit:		0.60
Front Seat		6.8%		6.5%		1.8%		RF Po (*Max):		38.0

Table 17

External Vehicle MPE Assessment @ 901.9875 MHz										
Antenna Location	Antenna Model	Gain (dBi)	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm <sup>2</sup> )	Initial Power (W)	Pwr. Density Calc. (mW/cm <sup>2</sup> )	Pwr. Density Max Calc. (mW/cm <sup>2</sup> )	
										Trunk (cnt)
Measurement Grid										
Test Position	Height (cm)	% of Control Limit		Test Position	Height (cm)	% of Control Limit		IEEE Controlled Limit	IEEE Uncontrolled Limit	
1	20	3.2%		6	120	41.8%		3.01	0.60	
2	40	3.3%		7	140	14.5%				
3	60	5.2%		8	160	9.2%				
4	80	16.0%		9	180	6.1%				
5	100	39.7%		10	200	2.4%				
								RF Po (*Max)		38.0

Table 18

Internal Vehicle MPE Assessment @ 901.9875 MHz										
Antenna Location	Antenna	Gain (dBi)	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front seats (mW/cm <sup>2</sup> )		Initial Power (W)	Pwr. Density Calc. (mW/cm <sup>2</sup> )	Pwr. Density Max Calc. (mW/cm <sup>2</sup> )
						Back	Front			
Trunk (cnt)	RAF4003A RM	3	Highest Reading	E	1.56	0.473	0.184	37.2	0.237	0.24
Measurement Grid										
Test Position		% of Control Limit Head		% of Control Limit Chest		% of Control Limit Lower Trunk		IEEE Controlled Limit:		3.01
Back Seat		26.1%		11.1%		10.0%		IEEE Uncontrolled Limit:		0.60
Front Seat		7.3%		7.4%		3.7%		RF Po (*Max):		38.0

Table 19

External Vehicle MPE Assessment @ 935.0625 MHz									
Antenna Location	Antenna Model	Gain (dBi)	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm <sup>2</sup> )	Initial Power (W)	Pwr. Density Calc. (mW/cm <sup>2</sup> )	Pwr. Density Max Calc. (mW/cm <sup>2</sup> )
Trunk (cnt)	RAF4003A RM	3	60	E	1.27	0.333	36.9	0.167	0.17
Measurement Grid									
Test Position	Height (cm)	% of Control Limit		Test Position	Height (cm)	% of Control Limit		IEEE Controlled Limit	IEEE Uncontrolled Limit
1	20	3.0%		6	120	32.8%		3.12	0.62
2	40	2.9%		7	140	8.5%		RF Po (*Max)	38.0
3	60	2.8%		8	160	6.8%			
4	80	12.3%		9	180	5.6%			
5	100	28.5%		10	200	3.7%			

Table 20

Internal Vehicle MPE Assessment @ 935.0625 MHz										
Antenna Location	Antenna Model	Gain (dBi)	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front seats (mW/cm <sup>2</sup> )		Initial Power (W)	Pwr. Density Calc. (mW/cm <sup>2</sup> )	Pwr. Density Max Calc. (mW/cm <sup>2</sup> )
						Back	Front			
Trunk (cnt)	RAF4003A RM	3	Highest Reading	E	1.27	0.512	0.108	36.9	0.256	0.26
Measurement Grid										
Test Position		% of Control Limit Head		% of Control Limit Chest		% of Control Limit Lower Trunk		IEEE Controlled Limit:		3.12
Back Seat		30.3%		11.5%		7.5%		IEEE Uncontrolled Limit:		0.62
Front Seat		2.5%		4.7%		3.2%		RF Po (*Max):		38.0

Table 21

External Vehicle MPE Assessment @ 938.0625 MHz									
Antenna Location	Antenna Model	Gain (dBi)	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm <sup>2</sup> )	Initial Power (W)	Pwr. Density Calc. (mW/cm <sup>2</sup> )	Pwr. Density Max Calc. (mW/cm <sup>2</sup> )
Trunk (cnt)	RAF4003A RM	3	60	E	1.24	0.326	36.9	0.163	0.17
Measurement Grid									
Test Position	Height (cm)	% of Control Limit		Test Position	Height (cm)	% of Control Limit		IEEE Controlled Limit	IEEE Uncontrolled Limit
1	20	2.7%		6	120	31.7%		3.13	0.63
2	40	2.8%		7	140	9.5%		RF Po (*Max)	38.0
3	60	2.9%		8	160	6.9%			
4	80	12.6%		9	180	5.6%			
5	100	25.7%		10	200	4.0%			

Table 22

Internal Vehicle MPE Assessment @ 938.0625 MHz										
Antenna Location	Antenna	Gain (dBi)	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front seats (mW/cm <sup>2</sup> )		Initial Power (W)	Pwr. Density Calc. (mW/cm <sup>2</sup> )	Pwr. Density Max Calc. (mW/cm <sup>2</sup> )
						Back	Front			
Trunk (cnt)	RAF4003A RM	3	Highest Reading	E	1.24	0.450	0.129	36.9	0.225	0.23
Measurement Grid										
Test Position	% of Control Limit Head		% of Control Limit Chest		% of Control Limit Lower Trunk		IEEE Controlled Limit:		3.13	
Back Seat	24.7%		12.2%		6.3%		IEEE Uncontrolled Limit:		0.63	
Front Seat	3.6%		5.4%		3.4%		RF Po (*Max):		38.0	

Table 23

External Vehicle MPE Assessment @ 940.9875 MHz										
Antenna Location	Antenna Model	Gain (dBi)	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm <sup>2</sup> )	Initial Power (W)	Pwr. Density Calc. (mW/cm <sup>2</sup> )	Pwr. Density Max Calc. (mW/cm <sup>2</sup> )	
									IEEE Uncontrolled Limit:	
Trunk (cnt)	RAF4003A RM	3	60	E	1.21	0.293	36.9	0.146	0.15	
Measurement Grid										
Test Position	Height (cm)	% of Control Limit		Test Position	Height (cm)	% of Control Limit		IEEE Controlled Limit	IEEE Uncontrolled Limit	
1	20	1.9%		6	120	26.8%		3.14	0.63	
2	40	2.4%		7	140	7.5%		RF Po (*Max)	38.0	
3	60	2.5%		8	160	6.9%				
4	80	10.9%		9	180	6.7%				
5	100	23.2%		10	200	4.6%				

Table 24

Internal Vehicle MPE Assessment @ 940.9875 MHz										
Antenna Location	Antenna	Gain (dBi)	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front seats (mW/cm <sup>2</sup> )		Initial Power (W)	Pwr. Density Calc. (mW/cm <sup>2</sup> )	Pwr. Density Max Calc. (mW/cm <sup>2</sup> )
						Back	Front			
Trunk (cnt)	RAF4003A RM	3	Highest Reading	E	1.21	0.454	0.125	36.9	0.227	0.23
Measurement Grid										
Test Position	% of Control Limit Head		% of Control Limit Chest		% of Control Limit Lower Trunk		IEEE Controlled Limit:		3.14	
Back Seat	20.7%		14.0%		8.7%		IEEE Uncontrolled Limit:		0.63	
Front Seat	3.2%		5.8%		3.0%		RF Po (*Max):		38.0	

Table 25 - 45 Degree

External Vehicle MPE Assessment @ 896.0625 MHz									
Antenna Location	Antenna Model	Gain (dBi)	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm <sup>2</sup> )	Initial Power (W)	Pwr. Density Calc. (mW/cm <sup>2</sup> )	Pwr. Density Max Calc. (mW/cm <sup>2</sup> )
Trunk (cnt)	RAF4003A RM	3	60(Actual 99.5)	E	1.56	0.193	37.0	0.096	0.10
Measurement Grid									
Test Position	Height (cm)	% of Control Limit		Test Position	Height (cm)	% of Control Limit		IEEE Controlled Limit	IEEE Uncontrolled Limit
1	20	1.3%		6	120	20.9%		2.99	0.60
2	40	1.6%		7	140	8.1%			
3	60	2.1%		8	160	2.5%			
4	80	7.9%		9	180	2.1%			
5	100	15.7%		10	200	2.4%			
								RF Po (*Max)	38.0

Table 26 - 90 Degree

External Vehicle MPE Assessment @ 896.0625 MHz									
Antenna Location	Antenna Model	Gain (dBi)	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm <sup>2</sup> )	Initial Power (W)	Pwr. Density Calc. (mW/cm <sup>2</sup> )	Pwr. Density Max Calc. (mW/cm <sup>2</sup> )
Trunk (cnt)	RAF4003A RM	3	60(Actual 104)	E	1.56	0.220	37.0	0.110	0.11
Measurement Grid									
Test Position	Height (cm)	% of Control Limit		Test Position	Height (cm)	% of Control Limit		IEEE Controlled Limit	IEEE Uncontrolled Limit
1	20	1.8%		6	120	24.5%		2.99	0.60
2	40	1.1%		7	140	13.4%			
3	60	1.8%		8	160	6.2%			
4	80	5.4%		9	180	3.5%			
5	100	12.7%		10	200	3.1%			
								RF Po (*Max)	38.0