



MOTOROLA



CGISS EME Test Laboratory

8000 West Sunrise Blvd
Fort Lauderdale, FL. 33322

EME Compliance Test Report

Date of Report: May 5, 2003
Report Revision(s): Rev. O
Device Manufacturer: Motorola
Device Description: 3.5-35W Mobile Transceiver 764-870MHz
Classification: Occupational/Controlled Exposure
FCC ID: AZ492FT5823
Device Model: M20URS9PW1AN

Test Period: 4/29/03

Test Engineer: Jim Fortier (Principle Staff Engineer)

Author: Michael Sailsman (Global EME Regulatory Affairs Liaison)

Note: 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 all applicable national and international reference standards and guidelines.

Signature on File

Ken Enger
Senior Resource Manager, Laboratory Director, CGISS EME Lab
Phone: 954-723-6299 Fax: 954-723-3803

5/5/03

Date Approved

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TABLE OF CONTENTS

1.0	Product Description
2.0	Offered Options and Accessories
3.0	Measurement Standards
4.0	Data Collection Consideration
5.0	Measurement System Uncertainty Levels
6.0	Method of Measurement
6.1	EME measurements made on trunk mounted antennas
6.1.1	External vehicle EME measurement
6.1.2	Internal vehicle EME measurement
6.2	EME Measurements made on center roof mounted antennas
6.2.1	External vehicle EME measurements
6.2.2	Internal vehicle EME measurement
7.0	Test Site
8.0	Measurement System/Equipment
9.0	Test Unit Description
10.0	Test Set-Up Description
11.0	Test Results
	Table 1 – 764.0875 MHz external assessment at the trunk w/ antenna model HAF4016A
	Table 2 – 794.0875 MHz external assessment at the trunk w/ antenna model HAF4016A
	Table 3 – 823.9875 MHz external assessment at the trunk w/ antenna model HAF4016A
	Table 4 – 868.9875 MHz external assessment at the trunk w/ antenna model HAF4016A
	Table 5 – 764.0875 MHz external assessment at the trunk w/ antenna model HAF4014A
	Table 6 – 794.0875 MHz external assessment at the trunk w/ antenna model HAF4014A
	Table 7 – 823.9875 MHz external assessment at the trunk w/ antenna model HAF4014A
	Table 8 – 868.9875 MHz external assessment at the trunk w/ antenna model HAF4014A
	Table 9 – 764.0875 MHz external assessment at the trunk w/ antenna model HAF4013A
	Table 10 – 794.0875 MHz external assessment at the trunk w/ antenna model HAF4013A
	Table 11 – 823.9875 MHz external assessment at the trunk w/ antenna model HAF4013A
	Table 12 – 868.9875 MHz external assessment at the trunk w/ antenna model HAF4013A
	Table 13 – 764.0875 MHz external assessment at the trunk w/ antenna model HAF4017A
	Table 14 – 794.0875 MHz external assessment at the trunk w/ antenna model HAF4017A
	Table 15 – 823.9875 MHz external assessment at the trunk w/ antenna model HAF4017A
	Table 16 – 868.9875 MHz external assessment at the trunk w/ antenna model HAF4017A
	Table 17 – 809.0125 MHz external assessment at the trunk w/ antenna model HAF4002A
	Table 18 – 859.0125 MHz external assessment at the trunk w/ antenna model HAF4002A

Table 19 – 868.9875 MHz external assessment at the trunk w/ antenna model HAF4002A
Table 20 – 809.0125MHz external assessment at the trunk w/ antenna model RRA4914B
Table 21 – 859.0125MHz external assessment at the trunk w/ antenna model RRA4914B
Table 22 – 823.9875 MHz external assessment at the roof w/ antenna model HAF4016A
Table 23 – 764.0875 MHz internal assessment at the trunk w/ antenna model HAF4016A
Table 24 – 794.0875 MHz internal assessment at the trunk w/ antenna model HAF4016A
Table 25 – 823.9875 MHz internal assessment at the trunk w/ antenna model HAF4016A
Table 26 – 868.9875 MHz internal assessment at the trunk w/ antenna model HAF4016A
Table 27 – 764.0875 MHz internal assessment at the trunk w/ antenna model HAF4014A
Table 28 – 794.0875 MHz internal assessment at the trunk w/ antenna model HAF4014A
Table 29 – 823.9875 MHz internal assessment at the trunk w/ antenna model HAF4014A
Table 30 – 868.9875 MHz internal assessment at the trunk w/ antenna model HAF4014A
Table 31 – 764.0875 MHz internal assessment at the trunk w/ antenna model HAF4013A
Table 32 – 794.0875 MHz internal assessment at the trunk w/ antenna model HAF4013A
Table 33 – 823.9875 MHz internal assessment at the trunk w/ antenna model HAF4013A
Table 34 – 868.9875 MHz internal assessment at the trunk w/ antenna model HAF4013A
Table 35 – 764.0875 MHz internal assessment at the trunk w/ antenna model HAF4017A
Table 36 – 794.0875 MHz internal assessment at the trunk w/ antenna model HAF4017A
Table 37 – 823.9875 MHz internal assessment at the trunk w/ antenna model HAF4017A
Table 38 – 868.9875 MHz internal assessment at the trunk w/ antenna model HAF4017A
Table 39 – 809.0125 MHz internal assessment at the trunk w/ antenna model HAF4002A
Table 40 – 859.0125 MHz internal assessment at the trunk w/ antenna model HAF4002A
Table 41 – 868.9875 MHz internal assessment at the trunk w/ antenna model HAF4002A
Table 42 – 809.0125MHz internal assessment at the trunk w/ antenna model RRA4914B
Table 43 – 859.0125MHz internal assessment at the trunk w/ antenna model RRA4914B
Table 44 – 823.9875 MHz internal assessment at the roof w/ antenna model HAF4016A

12.0 Conclusion

Appendix A. Antenna Location Drawing

REVISION HISTORY

Date	Revision	Comments
5/5/03	O	Initial release Prototype results

1.0 Product Description



FCC ID: AZ492FT5823, model M20URS9PW1AN is a mobile transceiver that utilizes continuous carrier frequency modulation (FM). The modulation could be conventional analog voice, trunked analog voice, tone PL or C4FM digital. The control channel data rates are 3600 and 9600 baud on the C4FM envelope carrier. This does not represent packet or duty cycle modulation configuration. The intended use of the radio is Push-To-Talk (PTT) while the device is properly installed in a vehicle (either dash or remote mounted) 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, who 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. Motorola also makes available to its customers training classes on the proper use of two-way radios and wireless data devices. This device 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. The transmit frequency band is 764-870 MHz. The rated power of the device is 3.5 to 35 watts with a maximum conducted power output of 42 watts.

2.0 Applicable Options and Accessories

Antenna

HAF4016A	764-870 MHz ¼ wave 0dBi antenna; 3.3in
HAF4014A	764-870 MHz ¼ wave 3.0dBi gain antenna; 13in
HAF4013A	764-870 MHz ¼ wave 3.0dBi gain antenna; 2.4in
HAF4017A	764-870 MHz ¼ wave 3.0dBi gain antenna; 23in
RRA4914B	800-900 MHz ¼ wave 3.0dBi gain antenna; 13.5in
HAF4002A	800-870 MHz ¼ wave 0dBi antenna; 3.2in

3.0 Measurement Standards

Measurements were performed according to FCC Limits Per 47 CFR 2.1091 (b) for General Population/Uncontrolled RF Exposure.

For frequencies ranging from 764-870 MHz the MPE (Maximum Permissible Exposure) limit to electromagnetic energy in equivalent plane wave free-space power density is 0.51-0.58 mW/cm².

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 14.0 volts.

5.0 Measurement System Uncertainty Levels

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

<u>Description</u>	<u>Error</u>
NARDA Survey Meter	± 3%
Repeatability Accuracy	± 7%

6.0 Method of Measurement

6.1 EME measurements made on trunk mounted antennas (for reference, see Antenna Location Layout drawings in Appendix A)

6.1.1 External vehicle EME measurement (Antenna mounted at trunk center)

With the survey meter and probe, take ten (10) measurements, at the standard test distance of 60 cm to the antenna, from the back of the vehicle in a vertical line and then average the results. These measurements are taken and recorded at every twenty (20) centimeters over a range starting at twenty (20) centimeters above ground and ending at 2.0 meters; this would be representative of a person standing behind a vehicle during a mobile radio transmission.

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.

6.1.2 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, scan the inside of the vehicle, both front and back seating areas, for the highest level in each location. After the highest level is found, scan vertically making two (2) additional measurements within an area approximately 40 cm wide

(representing the width of a person) so as to have a total of three (3) measured points as indicated below that will be averaged.

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

6.2 EME measurements made on center roof mounted antennas (for reference, see Antenna Location Layout drawings in Appendix A)

6.2.1 External vehicle EME measurement

With the survey meter and probe, take ten (10) measurements, at the standard test distance of 60 cm from the vehicle-mounted antenna, in a vertical line and then average the results. These measurements are taken and recorded at every twenty (20) centimeters over a range starting at twenty (20) centimeters above ground and ending at 2.0 meters; this would be representative of a person standing next to a vehicle during a mobile radio transmission.

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.

6.2.2 Internal vehicle EME measurement

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

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

7.0 Test Site

The test site is the Motorola Commercial Government Industrial Solution Sector (CGISS) world wide electromagnetic exposure (EME) open area test site located at 8000 W. Sunrise Blvd., Plantation, FL. 33322.

8.0 Measurement System/Equipment

The minimum equipment required will mainly consist of a test vehicle, radio frequency radiation test set consisting of an Electromagnetic Radiation Survey Meter, E-Field Test Probe, and typical antenna configurations.

Below are the test equipment used to assess compliance:

- a) Automobile: 1991 Ford Taurus, 4-Door
- b) E-Field Survey Meter - NARDA Model 8718 (S/N 01108); Calibration date: 4/14/03
- c) E-Field (Electric Field) Probe - NARDA Model 8722B (S/N 12023) (300 kHz - 40 Ghz); Calibration date: 11/6/02
- d) Antennas - (1/4 wave 0dBi and a 3.0dBi gain)

9.0 Test Unit Description

Power density measurements were performed on a 3.5-35 watt mobile radio; model number M20URS9PW1AN serial number CAM0305RXK. The frequency band of the mobile is 764-870 MHz with functional operation within the 764-776, 794-806, 806-825, 851-870 MHz sub bands. The test frequencies evaluated were 764.0875, 794.0875, 809.0125, 823.9875, 859.0125, 868.9875 MHz. The 1/4 wave 0dBi and 1/4 wave 3.0dBi mobile antennas listed in section 2.0 were used to assess MPE compliance.

10.0 Test Set-Up Description

Following are the standard mobile antenna test configurations used for this product. (for reference, see Antenna Location Layout drawings in Appendix A)

- a) 1/4 wave 0dBi antenna model HAF4016A, HAF4002A, as well as 1/4 wave 3.0dBi gain antenna models HAF4014A, HAF4013A, HAF4017A, RRA4914B mounted on the center of the trunk.
- b) 1/4 wave 0dbi antenna, model HAF4016A mounted on the center of the roof. This antenna was selected because it exhibited the highest MPE results during the 60 cm trunk testing.

11.0 Test Results

Measurements were taken with the antenna located in two areas: the roof center, and trunk center. Below is the raw MPE data for all measured grid points. Results are based on a 50% duty cycle with the radio operating in accordance with the User Manual instructions. The bolded power density results represents the highest MPE results observed.

Raw MPE Data; Test Frequencies and measured Po:

764.0875 MHz (Po=36.8), 794.0875 MHz (Po=37.1), 809.0125 MHz (Po=43.1W), 823.9875 MHz (Po=43.1), 859.0125 MHz (Po=43.0W), 868.9875MHz (Po=43.0W)

Meter reads in % of controlled limit; controlled limit = 2.55-2.9 mW/cm² for 300-1500 MHz (Cal factors presented herein are automatically accounted for in the meter used for assessments)

General Population MPE limits = 0.51-0.58 mW/cm² (Test Frequency/1500)

External Vehicle Power Density (Pwr. Den. (cal.)) = average over body/2

Internal Vehicle Power Density (Pwr. Den. (cal.)) = average over (head/chest/leg)/2

Note: The average over the body test methodology is consistent with IEEE/ANSI C95.1-1999 guidelines

Table 1

External Vehicle MPE Assessment @ 764.0875 MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4016A/0dB	60	E	0.97	0.441	0.22
Measurement grid						
Test position	Height (cm)	% of control limit	Test position	Height (cm)	% of control limit	
1	20	0	6	120	42	
2	40	1	7	140	32	
3	60	4.0	8	160	18	
4	80	23	9	180	7.5	
5	100	42	10	200	3.5	

Table 2.

External Vehicle MPE Assessment @ 794.0875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4016A/0dB	60	E	0.97	0.483	0.24
Measurement grid						
Test position	Height (cm)	% of control limit	Test position	Height (cm)	% of control limit	
1	20	0	6	120	44	
2	40	3	7	140	38	
3	60	6	8	160	24	
4	80	21	9	180	8.5	
5	100	36	10	200	2.0	

Table 3

External Vehicle MPE Assessment @ 823.9875 MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4016A/0dB	60	E	0.95	0.596	0.30
Measurement grid						
Test position	Height (cm)	% of control limit	Test position	Height (cm)	% of control limit	
1	20	0.8	6	120	54.0	
2	40	4.0	7	140	37.0	
3	60	5.5	8	160	22.0	
4	80	24.0	9	180	15.0	
5	100	48.0	10	200	7.0	

Table 4.

External Vehicle MPE Assessment @ 868.9875 MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4016A/0dB	60	E	0.93	0.526	0.26
Measurement grid						
Test position	Height (cm)	% of control limit	Test position	Height (cm)	% of control limit	
1	20	2.0	6	120	49.0	
2	40	3.0	7	140	44.0	
3	60	5.5	8	160	17.0	
4	80	17.0	9	180	6.5	
5	100	32.0	10	200	5.5	

Table 5

External Vehicle MPE Assessment @ 764.0875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4014A/3dB	60	E	0.97	0.407	0.20
Measurement grid						
Test position	Height (cm)	% of control limit	Test position	Height (cm)	% of control limit	
1	20	1.2	6	120	55.0	
2	40	1.5	7	140	20.0	
3	60	5.0	8	160	2.0	
4	80	18.0	9	180	1.2	
5	100	55.0	10	200	1.0	

Table 6

External Vehicle MPE Assessment @ 794.0875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4014A/3dB	60	E	0.97	0.403	0.20
Measurement grid						
Test position	Height (cm)	% of control limit	Test position	Height (cm)	% of control limit	
1	20	1.0	6	120	56.0	
2	40	3.0	7	140	16.0	
3	60	6.5	8	160	3.0	
4	80	23.0	9	180	2.5	
5	100	42.0	10	200	2.0	

Table 7

External Vehicle MPE Assessment @ 823.9875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4014A/3dB	60	E	0.95	0.514	0.26
Measurement grid						
Test position	Height (cm)	% of control limit	Test position	Height (cm)	% of control limit	
1	20	1.5	6	120	67.0	
2	40	4.0	7	140	22.0	
3	60	7.0	8	160	5.0	
4	80	17.0	9	180	7.5	
5	100	52.0	10	200	4.5	

Table 8

External Vehicle MPE Assessment @ 868.9875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4014A/3dB	60	E	0.93	0.473	0.24
Measurement grid						
Test position	Height (cm)	% of control limit	Test position	Height (cm)	% of control limit	
1	20	2.5	6	120	57.0	
2	40	3.5	7	140	25.0	
3	60	5.0	8	160	5.5	
4	80	15.5	9	180	4.5	
5	100	43.0	10	200	5.5	

Table 9

External Vehicle MPE Assessment @ 764.0875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4013A/3dB	60	E	0.97	0.408	0.20
Measurement grid						
Test position	Height (cm)	% of control limit	Test position	Height (cm)	% of control limit	
1	20	1.0	6	120	40.0	
2	40	3.0	7	140	29.0	
3	60	6.0	8	160	14.0	
4	80	18.0	9	180	10.0	
5	100	35.0	10	200	7.0	

Table 10

External Vehicle MPE Assessment @ 794.0875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm^2)	Pwr. Density (mW/cm^2)
Trunk	HAF4013A/3dB	60	E	0.97	0.472	0.24
Measurement grid						
Test position	Height (cm)	% of control limit	Test position	Height (cm)	% of control limit	
1	20	1.0	6	120	42.0	
2	40	4.0	7	140	37.0	
3	60	7.0	8	160	24.0	
4	80	17.0	9	180	11.0	
5	100	35.0	10	200	4.0	

Table 11

External Vehicle MPE Assessment @ 823.9875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm^2)	Pwr. Density (mW/cm^2)
Trunk	HAF4013A/3dB	60	E	0.95	0.521	0.26
Measurement grid						
Test position	Height (cm)	% of control limit	Test position	Height (cm)	% of control limit	
1	20	1.0	6	120	43.0	
2	40	2.0	7	140	34.0	
3	60	5.0	8	160	22.0	
4	80	26.0	9	180	14.0	
5	100	35.0	10	200	8.0	

Table 12

External Vehicle MPE Assessment @ 868.9875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm^2)	Pwr. Density (mW/cm^2)
Trunk	HAF4013A/3dB	60	E	0.93	0.475	0.24
Measurement grid						
Test position	Height (cm)	% of control limit	Test position	Height (cm)	% of control limit	
1	20	1.5	6	120	43.0	
2	40	2.5	7	140	36.0	
3	60	4.5	8	160	17.0	
4	80	19.0	9	180	7.0	
5	100	29.0	10	200	4.5	

Table 13

External Vehicle MPE Assessment @ 764.0875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4017A/3dB	60	E	0.97	0.339	0.17
Measurement grid						
Test position	Height (cm)	% of control limit	Test position	Height (cm)	% of control limit	
1	20	0.1	6	120	36.0	
2	40	0.7	7	140	48.0	
3	60	1.2	8	160	13.0	
4	80	4.0	9	180	10.0	
5	100	10.0	10	200	10.0	

Table 14

External Vehicle MPE Assessment @ 794.0875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4017A/3dB	60	E	0.97	0.378	0.19
Measurement grid						
Test position	Height (cm)	% of control limit	Test position	Height (cm)	% of control limit	
1	20	1.0	6	120	50.0	
2	40	1.0	7	140	51.0	
3	60	1.2	8	160	11.0	
4	80	1.5	9	180	6.5	
5	100	12.5	10	200	7.0	

Table 15

External Vehicle MPE Assessment @ 823.9875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4017A/3dB	60	E	0.95	0.521	0.26
Measurement grid						
Test position	Height (cm)	% of control limit	Test position	Height (cm)	% of control limit	
1	20	1.5	6	120	62.0	
2	40	2.0	7	140	67.0	
3	60	2.5	8	160	16.0	
4	80	5.5	9	180	7.5	
5	100	17.0	10	200	9.0	

Table 16

External Vehicle MPE Assessment @ 869.9875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4017A/3dB	60	E	0.93	0.503	0.25
Measurement grid						
Test position	Height (cm)	% of control limit	Test position	Height (cm)	% of control limit	
1	20	3.0	6	120	40.0	
2	40	4.5	7	140	37.0	
3	60	7.5	8	160	19.0	
4	80	16.0	9	180	11.0	
5	100	25.0	10	200	10.5	

Table 17

External Vehicle MPE Assessment @ 809.0125 MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4002A/0dB	60	E	0.93	0.570	0.29
Measurement grid						
Test position	Height (cm)	% of control limit	Test position	Height (cm)	% of control limit	
1	20	2.0	6	120	50.0	
2	40	4.8	7	140	39.0	
3	60	6.7	8	160	24.0	
4	80	20.0	9	180	17.0	
5	100	40.0	10	200	8.0	

Table 18

External Vehicle MPE Assessment @ 859.0125 MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4002A/0dB	60	E	0.93	0.493	0.25
Measurement grid						
Test position	Height (cm)	% of control limit	Test position	Height (cm)	% of control limit	
1	20	3.0	6	120	38.0	
2	40	4.5	7	140	42.0	
3	60	7.0	8	160	18.5	
4	80	18.0	9	180	11.0	
5	100	21.0	10	200	7.5	

Table 19

External Vehicle MPE Assessment @ 868.9875 MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4002A/0dB	60	E	0.93	0.483	0.24
Measurement grid						
Test position	Height (cm)	% of control limit	Test position	Height (cm)	% of control limit	
1	20	2.7	6	120	70.0	
2	40	4.7	7	140	19.0	
3	60	5.0	8	160	8.0	
4	80	17.0	9	180	10.0	
5	100	26.0	10	200	6.0	

Table 20

External Vehicle MPE Assessment @ 809.0125 MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	RRA4914B/3dB	60	E	0.95	0.581	0.29
Measurement grid						
Test position	Height (cm)	% of control limit	Test position	Height (cm)	% of control limit	
1	20	3.0	6	120	70.0	
2	40	5.5	7	140	19.0	
3	60	9.0	8	160	8.0	
4	80	24.0	9	180	10.0	
5	100	61.0	10	200	6.0	

Table 21

External Vehicle MPE Assessment @ 859.0125 MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	RRA4914B/3dB	60	E	0.93	0.476	0.24
Measurement grid						
Test position	Height (cm)	% of control limit	Test position	Height (cm)	% of control limit	
1	20	2.6	6	120	55.0	
2	40	4.2	7	140	21.0	
3	60	7.0	8	160	8.0	
4	80	21.0	9	180	8.0	
5	100	32.0	10	200	7.5	

Table 22

External Vehicle MPE Assessment @ 859.0125 MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Body (mW/cm ²)	Pwr. Density (mW/cm ²)
Roof	HAF4016A/0dB	60	E	0.95	0.230	0.12
Measurement grid						
Test position	Height (cm)	% of control limit	Test position	Height (cm)	% of control limit	
1	20	1.6	6	120	9.0	
2	40	1.7	7	140	11.8	
3	60	1.4	8	160	17.0	
4	80	2.2	9	180	20.0	
5	100	4.0	10	200	15.0	

Table 23

Internal Vehicle MPE Assessment @ 764.0875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Leg Back/Front seats (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4016A/0dB	Highest reading	E	0.97	0.475/0.238	0.24
Measurement grid						
Test position	% of control limit Head	% of control limit Chest	% of control limit Leg			
Back seat	30	8	18			
Front seat	20	5.5	4			

Table 24

Internal Vehicle MPE Assessment @ 794.0875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Leg Back/Front seats (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4016A/0dB	Highest reading	E	0.97	0.520/0.309	0.26
Measurement grid						
Test position	% of control limit Head	% of control limit Chest	% of control limit Leg			
Back seat	37	13	9			
Front seat	25	7	3			

Table 25

Internal Vehicle MPE Assessment @ 823.9875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Leg Back/Front seats (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4016A/0dB	Highest reading	E	0.95	0.604/0.32	0.30
Measurement grid						
Test position	% of control limit Head		% of control limit Chest		% of control limit Leg	
Back seat	41		12		13	
Front seat	15		13		7	

Table 26

Internal Vehicle MPE Assessment @ 868.9875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Leg Back/Front seats (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4016A/0dB	Highest reading	E	0.93	0.599/0.183	0.30
Measurement grid						
Test position	% of control limit Head		% of control limit Chest		% of control limit Leg	
Back seat	33		20		9	
Front seat	9		8		6	

Table 27

Internal Vehicle MPE Assessment @ 764.0875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Leg Back/Front seats (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4014A/0dB	Highest reading	E	0.97	0.654/0.348	0.33
Measurement grid						
Test position	% of control limit Head		% of control limit Chest		% of control limit Leg	
Back seat	32		20		25	
Front seat	21		7		13	

Table 28

Internal Vehicle MPE Assessment @ 794.0875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Leg Back/Front seats (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4014A/3dB	Highest reading	E	0.97	0.556/0.428	0.28
Measurement grid						
Test position	% of control limit Head		% of control limit Chest		% of control limit Leg	
Back seat	35		15		13	
Front seat	30		12		6.5	

Table 29

Internal Vehicle MPE Assessment @ 823.9875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Leg Back/Front seats (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4014A/3dB	Highest reading	E	0.95	0.969/0.420	0.49
Measurement grid						
Test position	% of control limit Head		% of control limit Chest		% of control limit Leg	
Back seat	54		35		17	
Front seat	15		20		11	

Table 30

Internal Vehicle MPE Assessment @ 868.9875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Leg Back/Front seats (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4014A/3dB	Highest reading	E	0.93	0.647/0.309	0.32
Measurement grid						
Test position	% of control limit Head		% of control limit Chest		% of control limit Leg	
Back seat	31		20		16	
Front seat	10		16		6	

Table 31

Internal Vehicle MPE Assessment @ 764.0875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Leg Back/Front seats (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4013A/3dB	Highest reading	E	0.97	0.441/0.153	0.22
Measurement grid						
Test position	% of control limit Head		% of control limit Chest		% of control limit Leg	
Back seat	22		12		18	
Front seat	6		5		7	

Table 32

Internal Vehicle MPE Assessment @ 794.0875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Leg Back/Front seats (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4013A/3dB	Highest reading	E	0.97	0.406/0.362	0.20
Measurement grid						
Test position	% of control limit Head		% of control limit Chest		% of control limit Leg	
Back seat	27		11		8	
Front seat	25		12		4	

Table 33

Internal Vehicle MPE Assessment @ 823.9875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Leg Back/Front seats (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4013A/3dB	Highest reading	E	0.95	0.558/0.347	0.28
Measurement grid						
Test position	% of control limit Head		% of control limit Chest		% of control limit Leg	
Back seat	32		16		13	
Front seat	15		15		8	

Table 34

Internal Vehicle MPE Assessment @ 868.9875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Leg Back/Front seats (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4013A/3dB	Highest reading	E	0.93	0.521/0.241	0.26
Measurement grid						
Test position	% of control limit Head		% of control limit Chest		% of control limit Leg	
Back seat	24		20		10	
Front seat	11		10		4	

Table 35

Internal Vehicle MPE Assessment @ 764.0875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Leg Back/Front seats (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4017A/3dB	Highest reading	E	0.97	0.119/0.132	0.07
Measurement grid						
Test position	% of control limit Head		% of control limit Chest		% of control limit Leg	
Back seat	9		3		2	
Front seat	10		3.5		2	

Table 36

Internal Vehicle MPE Assessment @ 794.0875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Leg Back/Front seats (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4017A/3dB	Highest reading	E	0.97	0.256/0.185	0.13
Measurement grid						
Test position	% of control limit Head		% of control limit Chest		% of control limit Leg	
Back seat	15		7		7	
Front seat	13		5		3	

Table 37

Internal Vehicle MPE Assessment @ 823.9875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Leg Back/Front seats (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4017A/3dB	Highest reading	E	0.95	0.521/0.21	0.26
Measurement grid						
Test position	% of control limit Head	% of control limit Chest		% of control limit Leg		
Back seat	35	13		9		
Front seat	9	8		6		

Table 38

Internal Vehicle MPE Assessment @ 868.9875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Leg Back/Front seats (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4017A/3dB	Highest reading	E	0.93	0.435/0.237	0.22
Measurement grid						
Test position	% of control limit Head	% of control limit Chest		% of control limit Leg		
Back seat	18	13		14		
Front seat	10	9		5.5		

Table 39

Internal Vehicle MPE Assessment @ 809.0125MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Leg Back/Front seats (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4002A/0dB	Highest reading	E	0.95	0.485/0.333	0.24
Measurement grid						
Test position	% of control limit Head	% of control limit Chest		% of control limit Leg		
Back seat	30	13		11		
Front seat	20	12		5		

Table 40

Internal Vehicle MPE Assessment @ 859.0125MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Leg Back/Front seats (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4002A/0dB	Highest reading	E	0.93	0.868/0.200	0.43
Measurement grid						
Test position	% of control limit Head		% of control limit Chest		% of control limit Leg	
Back seat	55		25		11	
Front seat	7		6		8	

Table 41

Internal Vehicle MPE Assessment @ 868.9875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Leg Back/Front seats (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	HAF4002A/0dB	Highest reading	E	0.93	0.773/0.213	0.39
Measurement grid						
Test position	% of control limit Head		% of control limit Chest		% of control limit Leg	
Back seat	50		20		10	
Front seat	10		7		5	

Table 42

Internal Vehicle MPE Assessment @ 809.0125MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Leg Back/Front seats (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	RRA4914B/3dB	Highest reading	E	0.95	0.656/0.458	0.33
Measurement grid						
Test position	% of control limit Head		% of control limit Chest		% of control limit Leg	
Back seat	46		11		16	
Front seat	27		11		13	

Table 43

Internal Vehicle MPE Assessment @ 859.0125MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Leg Back/Front seats (mW/cm ²)	Pwr. Density (mW/cm ²)
Trunk	RRA4914B/3dB	Highest reading	E	0.93	0.877/0.353	0.44
Measurement grid						
Test position	% of control limit Head		% of control limit Chest		% of control limit Leg	
Back seat	55		25		12	
Front seat	18		10		9	

Table 44

Internal Vehicle MPE Assessment @ 823.9875MHz						
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Leg Back/Front seats (mW/cm ²)	Pwr. Density (mW/cm ²)
Roof	HAF4016A/0dB	Highest reading	E	0.95	0.105/0.101	0.05
Measurement grid						
Test position	% of control limit Head		% of control limit Chest		% of control limit Leg	
Back seat	5		4		2.5	
Front seat	3.5		4		3.5	

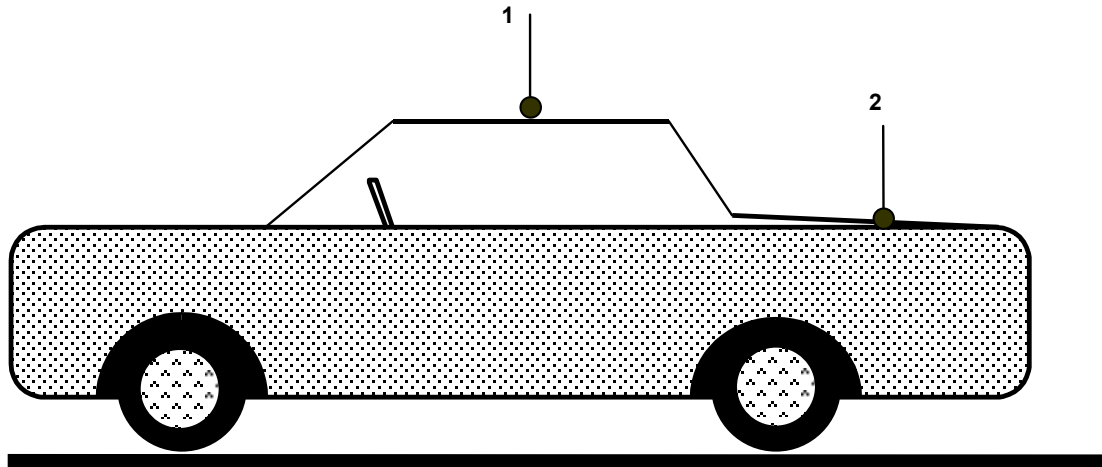
12.0 Conclusion

Depending on the test frequency, compliance assessments were performed with an output power range of 36.6W to 43.1W. The maximum RF power allowable will be equal to the upper limit of the final test factory transmit power specification of 42.0W. The highest power density result scaled to the maximum allowable power output is 0.30 mW/cm² external to the vehicle and 0.49 mW/cm² internal to the vehicle.

The measurement results clearly demonstrate compliance with the FCC Limits (test frequency / 1500 = 0.51-0.58 mW/cm² for the frequency band of 764-870 MHz) Per 47 CFR 2.1091 (d) for General Population/Uncontrolled RF Exposure.

APPENDIX A

ANTENNA LOCATION DRAWING



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

