MOTOROLA

ACCREDITED

CGISS EME Test Laboratory
8000 West Sunrise Blvd
Fort Lauderdale, FL. 33322

MPE Compliance Test Report

Date of Report:	August 13, 2003
Report Revision(s):	Rev. O
Manufacturer:	Motorola
Product Description:	5-50W Mobile Transceiver 136-174MHz
Classification:	Occupational/Controlled Exposure
FCC ID:	AZ492FT3806
Device Model:	M20KSS9PW1AN

Test Period:	07/02/03 – 8/12/03
EME Engineer:	Stephen C. Whalen (Sr. EME Engineer)
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Reviewer:	Michael Sailsman (Global EME Regulatory Affairs Liaison) Jim Fortier (Sr. Staff Engineer)

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 — 8/14/03

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Date Approved

TABLE OF CONTENTS

11.0 Test Results Continued

11.0 Test Results Continued

REVISION HISTORY

Date	Revision	Comments
08/13/03	O	Initial release Prototype results

1.0 Product Description

FCC ID AZ492FT3806, model M20KSS9PW1AN 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 modulation. Control channel data rates are 3600 and 9600 baud on the C4FM constant envelope carrier. This is not 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 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 136-174MHz. The rated power of the device is 5-50 watts with a maximum conducted power output of 57 watts.

2.0 Offered Options and Accessories (see Appendix B for photos of antennas)

Antenna	Description
HAD4006A	136-144MHz, ¼ Wave, 51cm, 0 dBi
HAD4007A	144-150.8MHz, ¼ Wave, 48.1cm, 0 dBi
HAD4008A	150.8-162MHz, ¼ Wave, 44.6cm, 0 dBi
HAD4009A	162-174 MHz, ¼ Wave, 41.8cm, 0 dBi
HAD4014AR	140-174MHz, ½ Wave, 1.17m, 5 dBi
RAD4000A	136-174MHz, ½ Wave, 1.32m, 5 dBi
RAD4010ARB	140-174MHz, ½ Wave, 1.32m, 5 dBi

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 136-174 MHz the MPE (Maximum Permissible Exposure) limit to electromagnetic energy in equivalent plane wave free-space power density is 0.20 mW/cm^2.

4.0 Data Collection Consideration

Power density testing was performed with DUT (Device Under Test) 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.

Description	Error
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 90 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 64cm.

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
(Antenna mounted at roof center)

With the survey meter and probe, take ten (10) measurements, at the standard test distance of 90 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
(Antenna mounted at roof 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

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, H-Field Test Probe and typical antenna configurations.
Below are the test equipment used to assess compliance:

a) Automobile: 1991 Ford Taurus, 4-Door

b) Survey Meter – NARDA Model 8718 (S/N 01108); Calibration date: 04/14/03

c) E-Field (Electric Field) Probe – NARDA Model 8722B (SN13001) (300 kHz – 40 Ghz); Calibration date: 05/06/03

d) H-field (Magnetic Field) Probe – NARDA Model 8731 (S/N03006) 10MHz – 300MHz), Calibration date 03/21/03

9.0 Test Unit Description

Power density measurements were performed on a 5-50 watt mobile radio; model number M20KSS9PW1AN serial number 112. The frequency band of the mobile was 136-174 MHz; the test frequencies were 136.0125, 147.0125, 155.0125 and 173.9875MHz. The HAD4006A, HAD4007A, HAD4008A, HAD4009A, HAD4014AR, RAD4000A, RAD4010ARB 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) ½ wave antenna models HAD4014AR, RAD4000A and RAD4010ARB were mounted on the center of the trunk and roof.
b) ¼ wave antenna models HAD4006A, HAD4007A, HAD4008A and HAD4009A were mounted on the roof only.

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 result represents the highest MPE results observed.

Raw MPE Data; Test Frequencies and measured Po:
136.0125 MHz (Po=55.2W), 147.0125 MHz (Po= 55.6W), 155.0125 MHz (Po= 55.7W), 173.9875 MHz (Po = 55.5 W)
Meter reads in % of controlled limit; controlled limit = 1.0mW/cm^2 for 136-174 MHz
(Cal factors presented herein are automatically accounted for in the meter used for assessments)
General Population MPE limits = 0.20mW/cm^2
External Vehicle Power Density (Pwr. Den. (cal.)) = average over body/2
Max cal External Vehicle Power Density (Pwr. Den. (cal.)) = (Pmax/Pintial)*average over body/2
Internal Vehicle Power Density (Pwr. Den. (cal.)) = average over (head/chest/lower trunk)/2
Max cal Internal Vehicle Power Density (Pwr. Den. (cal.)) = (Pmax/Pintial)*average over (head/chest/lower trunk)/2
Note: The average over the body test methodology is consistent with IEEE/ANSI C95.1-1999 guidelines

Table 1

External Vehicle MPE Assessment @ 155.0125MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Trunk (cnt)	HAD4014AR / 5dBi	90	E	0.83	0.295	0.15	0.15

Measurement grid					
Test position	**Height (cm)**	**% of control limit**	**Test position**	**Height (cm)**	**% of control limit**
1	20	2.3%	6	120	35.1%
2	40	4.5%	7	140	53.5%
3	60	9.1%	8	160	58.7%
4	80	13.4%	9	180	55.3%
5	100	21.0%	10	200	42.1%

Table 2

External Vehicle MPE Assessment @ 173.9875MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Trunk (cnt)	HAD4014AR / 5dBi	90	E	0.86	0.082	0.04	0.04

Measurement grid					
Test position	**Height (cm)**	**% of control limit**	**Test position**	**Height (cm)**	**% of control limit**
1	20	2.1%	6	120	7.1%
2	40	2.7%	7	140	11.7%
3	60	4.3%	8	160	14.2%
4	80	3.7%	9	180	15.3%
5	100	4.2%	10	200	16.3%

Table 3

External Vehicle MPE Assessment @ 136.0125MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Trunk (cnt)	RAD4000A / 5dBi	90	E	0.81	0.182	0.09	0.09

Measurement grid					
Test position	**Height (cm)**	**% of control limit**	**Test position**	**Height (cm)**	**% of control limit**
1	20	1.3%	6	120	20.3%
2	40	2.2%	7	140	36.1%
3	60	3.6%	8	160	37.8%
4	80	5.9%	9	180	35.7%
5	100	10.4%	10	200	28.9%

Table 4

External Vehicle MPE Assessment @ 147.0125MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Trunk (cnt)	RAD4000A / 5dBi	90	E	0.82	0.239	0.12	0.12
Measurement grid							
Test position	**Height (cm)**	**% of control limit**	**Test position**	**Height (cm)**	**% of control limit**		
1	20	4.3%	6	120	24.0%		
2	40	6.1%	7	140	41.3%		
3	60	8.5%	8	160	48.5%		
4	80	9.4%	9	180	44.7%		
5	100	14.5%	10	200	38.0%		

Table 5

External Vehicle MPE Assessment @ 155.0125MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Trunk (cnt)	RAD4000A / 5dBi	90	E	0.83	0.316	0.16	0.16
Measurement grid							
Test position	**Height (cm)**	**% of control limit**	**Test position**	**Height (cm)**	**% of control limit**		
1	20	3.0%	6	120	38.7%		
2	40	4.0%	7	140	57.5%		
3	60	9.1%	8	160	63.2%		
4	80	14.3%	9	180	57.1%		
5	100	22.4%	10	200	46.4%		

Table 6

External Vehicle MPE Assessment @ 173.9875MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Trunk (cnt)	RAD4000A / 5dBi	90	E	0.86	0.274	0.14	0.14
Measurement grid							
Test position	**Height (cm)**	**% of control limit**	**Test position**	**Height (cm)**	**% of control limit**		
1	20	3.2%	6	120	30.0%		
2	40	5.4%	7	140	46.0%		
3	60	9.1%	8	160	52.5%		
4	80	11.3%	9	180	55.8%		
5	100	16.3%	10	200	44.4%		

Table 7

External Vehicle MPE Assessment @ 155.0125MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Trunk (cnt)	RAD4010ARB / 5dBi	90	E	0.83	0.377	0.19	0.19

Measurement grid					
Test position	**Height (cm)**	**% of control limit**	**Test position**	**Height (cm)**	**% of control limit**
1	20	4.3%	6	120	42.3%
2	40	6.5%	7	140	65.8%
3	60	11.2%	8	160	73.0%
4	80	16.4%	9	180	75.4%
5	100	25.5%	10	200	56.1%

Table 8

External Vehicle MPE Assessment @ 173.9875MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Trunk (cnt)	RAD4010ARB / 5dBi	90	E	0.86	0.030	0.01	0.02

Measurement grid					
Test position	**Height (cm)**	**% of control limit**	**Test position**	**Height (cm)**	**% of control limit**
1	20	0.7%	6	120	2.8%
2	40	1.3%	7	140	4.0%
3	60	1.4%	8	160	4.6%
4	80	1.2%	9	180	5.7%
5	100	1.7%	10	200	6.4%

Table 9

External Vehicle MPE Assessment @ 155.0125MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Trunk (cnt)	HAD4014AR / 5dBi	90	H	0.98	0.33	0.17	0.17

Measurement grid					
Test position	**Height (cm)**	**Pwr. Density (mW/cm^2)**	**Test position**	**Height (cm)**	**Pwr. Density (mW/cm^2)**
1	20	0.11	6	120	0.24
2	40	0.10	7	140	0.31
3	60	0.14	8	160	0.57
4	80	0.13	9	180	0.84
5	100	0.16	10	200	0.74

Table 10

External Vehicle MPE Assessment @ 173.9875MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Trunk (cnt)	HAD4014AR / 5dBi	90	H	0.97	0.20	0.10	0.10

Measurement grid					
Test position	**Height (cm)**	**Pwr. Density (mW/cm^2)**	**Test position**	**Height (cm)**	**Pwr. Density (mW/cm^2)**
1	20	0.10	6	120	0.15
2	40	0.10	7	140	0.18
3	60	0.14	8	160	0.28
4	80	0.13	9	180	0.37
5	100	0.17	10	200	0.37

Table 11

External Vehicle MPE Assessment @ 136.0125MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Trunk (cnt)	RAD4000A / 5dBi	90	H	0.99	0.26	0.13	0.13

Measurement grid					
Test position	**Height (cm)**	**Pwr. Density (mW/cm^2)**	**Test position**	**Height (cm)**	**Pwr. Density (mW/cm^2)**
1	20	0.20	6	120	0.14
2	40	0.18	7	140	0.23
3	60	0.18	8	160	0.32
4	80	0.17	9	180	0.47
5	100	0.13	10	200	0.53

Table 12

External Vehicle MPE Assessment @ 147.0125MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Trunk (cnt)	RAD4000A / 5dBi	90	H	0.98	0.32	0.16	0.16

Measurement grid					
Test position	**Height (cm)**	**Pwr. Density (mW/cm^2)**	**Test position**	**Height (cm)**	**Pwr. Density (mW/cm^2)**
1	20	0.14	6	120	0.13
2	40	0.17	7	140	0.19
3	60	0.13	8	160	0.40
4	80	0.20	9	180	0.75
5	100	0.18	10	200	0.87

Table 13

External Vehicle MPE Assessment @ 155.0125MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Trunk (cnt)	RAD4000A / 5dBi	90	H	0.98	0.29	0.14	0.15
Measurement grid							
Test position	**Height (cm)**	**Pwr. Density (mW/cm^2)**	**Test position**	**Height (cm)**	**Pwr. Density (mW/cm^2)**		
1	20	0.11	6	120	0.18		
2	40	0.17	7	140	0.30		
3	60	0.18	8	160	0.44		
4	80	0.20	9	180	0.57		
5	100	0.19	10	200	0.54		

Table 14

External Vehicle MPE Assessment @ 173.9875MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Trunk (cnt)	RAD4000A / 5dBi	90	H	0.97	0.26	0.13	0.14
Measurement grid							
Test position	**Height (cm)**	**Pwr. Density (mW/cm^2)**	**Test position**	**Height (cm)**	**Pwr. Density (mW/cm^2)**		
1	20	0.05	6	120	0.22		
2	40	0.09	7	140	0.42		
3	60	0.08	8	160	0.54		
4	80	0.10	9	180	0.54		
5	100	0.12	10	200	0.47		

Table 15

External Vehicle MPE Assessment @ 155.0125MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Trunk (cnt)	RAD4010ARB / 5dBi	90	H	0.98	0.35	0.17	0.18
Measurement grid							
Test position	**Height (cm)**	**Pwr. Density (mW/cm^2)**	**Test position**	**Height (cm)**	**Pwr. Density (mW/cm^2)**		
1	20	0.12	6	120	0.18		
2	40	0.11	7	140	0.32		
3	60	0.14	8	160	0.60		
4	80	0.19	9	180	0.83		
5	100	0.12	10	200	0.84		

Table 16

External Vehicle MPE Assessment @ 173.9875MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Trunk (cnt)	RAD4010ARB / 5dBi	90	H	0.97	0.14	0.07	0.07

Measurement grid					
Test position	**Height (cm)**	**Pwr. Density (mW/cm^2)**	**Test position**	**Height (cm)**	**Pwr. Density (mW/cm^2)**
1	20	0.00	6	120	0.13
2	40	0.00	7	140	0.14
3	60	0.00	8	160	0.28
4	80	0.07	9	180	0.31
5	100	0.10	10	200	0.33

Table 17

External Vehicle MPE Assessment @ 136.0125MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Roof (cnt)	HAD4006A / 0dBi	110	E	0.81	0.145	0.07	0.07

Measurement grid					
Test position	**Height (cm)**	**% of control limit**	**Test position**	**Height (cm)**	**% of control limit**
1	20	4.2%	6	120	16.2%
2	40	6.3%	7	140	26.0%
3	60	9.5%	8	160	27.6%
4	80	5.5%	9	180	24.3%
5	100	9.1%	10	200	16.5%

Table 18

External Vehicle MPE Assessment @ 147.0125MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Roof (cnt)	HAD4007A / 0dBi	110	E	0.82	0.162	0.08	0.08

Measurement grid					
Test position	**Height (cm)**	**% of control limit**	**Test position**	**Height (cm)**	**% of control limit**
1	20	4.3%	6	120	19.1%
2	40	5.1%	7	140	27.5%
3	60	7.4%	8	160	31.0%
4	80	5.3%	9	180	30.5%
5	100	9.5%	10	200	22.7%

Table 19

External Vehicle MPE Assessment @ 155.0125MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Roof (cnt)	HAD4008A / 0dBi	110	E	0.83	0.188	0.09	0.10
Measurement grid							
Test position	**Height (cm)**	**% of control limit**	**Test position**	**Height (cm)**	**% of control limit**		
1	20	3.0%	6	120	26.2%		
2	40	4.3%	7	140	34.5%		
3	60	8.1%	8	160	34.2%		
4	80	8.5%	9	180	32.3%		
5	100	14.7%	10	200	22.0%		

Table 20

External Vehicle MPE Assessment @ 173.9875MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Roof (cnt)	HAD4009A / 0dBi	110	E	0.86	0.163	0.08	0.08
Measurement grid							
Test position	**Height (cm)**	**% of control limit**	**Test position**	**Height (cm)**	**% of control limit**		
1	20	2.0%	6	120	20.4%		
2	40	2.2%	7	140	30.8%		
3	60	3.1%	8	160	29.5%		
4	80	4.5%	9	180	30.7%		
5	100	13.3%	10	200	26.0%		

Table 21

External Vehicle MPE Assessment @ 155.0125MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Roof (cnt)	HAD4014AR / 5dBi	110	E	0.83	0.090	0.04	0.05
Measurement grid							
Test position	**Height (cm)**	**% of control limit**	**Test position**	**Height (cm)**	**% of control limit**		
1	20	2.1%	6	120	6.5%		
2	40	1.9%	7	140	10.2%		
3	60	2.8%	8	160	14.9%		
4	80	2.3%	9	180	21.3%		
5	100	3.1%	10	200	24.8%		

Table 22

External Vehicle MPE Assessment @ 173.9875MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Roof (cnt)	HAD4014AR / 5dBi	110	E	0.86	0.030	0.01	0.02
Measurement grid							
Test position	**Height (cm)**	**% of control limit**	**Test position**	**Height (cm)**	**% of control limit**		
1	20	1.1%	6	120	3.1%		
2	40	0.9%	7	140	4.2%		
3	60	1.2%	8	160	4.0%		
4	80	1.1%	9	180	5.3%		
5	100	1.9%	10	200	7.0%		

Table 23

External Vehicle MPE Assessment @ 136.0125MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Roof (cnt)	RAD4000A / 5dBi	110	E	0.81	0.071	0.04	0.04
Measurement grid							
Test position	**Height (cm)**	**% of control limit**	**Test position**	**Height (cm)**	**% of control limit**		
1	20	2.1%	6	120	3.2%		
2	40	2.0%	7	140	7.1%		
3	60	2.8%	8	160	12.4%		
4	80	2.3%	9	180	18.3%		
5	100	2.1%	10	200	19.0%		

Table 24

External Vehicle MPE Assessment @ 147.0125MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Roof (cnt)	RAD4000A / 5dBi	110	E	0.82	0.066	0.03	0.03
Measurement grid							
Test position	**Height (cm)**	**% of control limit**	**Test position**	**Height (cm)**	**% of control limit**		
1	20	1.9%	6	120	4.1%		
2	40	2.1%	7	140	6.0%		
3	60	3.2%	8	160	9.3%		
4	80	2.3%	9	180	15.4%		
5	100	2.4%	10	200	19.3%		

Table 25

External Vehicle MPE Assessment @ 155.0125MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Roof (cnt)	RAD4000A / 5dBi	110	E	0.83	0.090	0.04	0.05

Measurement grid					
Test position	**Height (cm)**	**% of control limit**	**Test position**	**Height (cm)**	**% of control limit**
1	20	1.1%	6	120	4.9%
2	40	1.9%	7	140	10.3%
3	60	2.1%	8	160	15.4%
4	80	3.1%	9	180	22.0%
5	100	2.9%	10	200	26.2%

Table 26

External Vehicle MPE Assessment @ 173.9875MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Roof (cnt)	RAD4000A / 5dBi	110	E	0.86	0.097	0.05	0.05

Measurement grid					
Test position	**Height (cm)**	**% of control limit**	**Test position**	**Height (cm)**	**% of control limit**
1	20	2.9%	6	120	7.4%
2	40	3.2%	7	140	10.2%
3	60	2.3%	8	160	14.9%
4	80	1.9%	9	180	22.1%
5	100	4.3%	10	200	27.5%

Table 27

External Vehicle MPE Assessment @ 155.0125MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Roof (cnt)	RAD4010ARB / 5dBi	110	E	0.83	0.103	0.05	0.05

Measurement grid					
Test position	**Height (cm)**	**% of control limit**	**Test position**	**Height (cm)**	**% of control limit**
1	20	1.8%	6	120	6.4%
2	40	2.1%	7	140	11.2%
3	60	2.8%	8	160	15.5%
4	80	3.2%	9	180	24.9%
5	100	4.1%	10	200	31.2%

Table 28

External Vehicle MPE Assessment @ 173.9875MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Roof (cnt)	RAD4010ARB / 5dBi	110	E	0.86	0.019	0.01	0.01
Measurement grid							
Test position	**Height (cm)**	**% of control limit**	**Test position**	**Height (cm)**	**% of control limit**		
1	20	1.2%	6	120	2.3%		
2	40	1.3%	7	140	3.1%		
3	60	1.1%	8	160	2.5%		
4	80	1.4%	9	180	2.2%		
5	100	1.9%	10	200	2.1%		

Table 29

External Vehicle MPE Assessment @ 136.0125MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Roof (cnt)	HAD4006A / 0dBi	110	H	0.99	0.16	0.08	0.08
Measurement grid							
Test position	**Height (cm)**	**Pwr. Density (mW/cm^2)**	**Test position**	**Height (cm)**	**Pwr. Density (mW/cm^2)**		
1	20	0.12	6	120	0.14		
2	40	0.11	7	140	0.10		
3	60	0.13	8	160	0.27		
4	80	0.14	9	180	0.18		
5	100	0.13	10	200	0.31		

Table 30

External Vehicle MPE Assessment @ 147.0125MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Roof (cnt)	HAD4007A / 0dBi	110	H	0.98	0.21	0.11	0.11
Measurement grid							
Test position	**Height (cm)**	**Pwr. Density (mW/cm^2)**	**Test position**	**Height (cm)**	**Pwr. Density (mW/cm^2)**		
1	20	0.08	6	120	0.20		
2	40	0.09	7	140	0.25		
3	60	0.13	8	160	0.30		
4	80	0.15	9	180	0.39		
5	100	0.19	10	200	0.34		

Table 31

External Vehicle MPE Assessment @ 155.0125MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Roof (cnt)	HAD4008A / 0dBi	110	H	0.98	0.18	0.09	0.09

Measurement grid					
Test position	**Height (cm)**	**Pwr. Density (mW/cm^2)**	**Test position**	**Height (cm)**	**Pwr. Density (mW/cm^2)**
1	20	0.08	6	120	0.19
2	40	0.09	7	140	0.20
3	60	0.12	8	160	0.28
4	80	0.12	9	180	0.29
5	100	0.18	10	200	0.24

Table 32

External Vehicle MPE Assessment @ 173.9875MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Roof (cnt)	HAD4009A / 0dBi	110	H	0.97	0.22	0.11	0.11

Measurement grid					
Test position	**Height (cm)**	**Pwr. Density (mW/cm^2)**	**Test position**	**Height (cm)**	**Pwr. Density (mW/cm^2)**
1	20	0.09	6	120	0.26
2	40	0.10	7	140	0.24
3	60	0.12	8	160	0.35
4	80	0.14	9	180	0.34
5	100	0.24	10	200	0.31

Table 33

External Vehicle MPE Assessment @ 155.0125MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Roof (cnt)	HAD4014AR / 5dBi	110	H	0.98	0.17	0.08	0.08

Measurement grid					
Test position	**Height (cm)**	**Pwr. Density (mW/cm^2)**	**Test position**	**Height (cm)**	**Pwr. Density (mW/cm^2)**
1	20	0.12	6	120	0.13
2	40	0.13	7	140	0.16
3	60	0.12	8	160	0.21
4	80	0.13	9	180	0.23
5	100	0.10	10	200	0.32

Table 34

External Vehicle MPE Assessment @ 173.9875MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Roof (cnt)	HAD4014AR / 5dBi	110	H	0.97	0.11	0.05	0.06
Measurement grid							
Test position	**Height (cm)**	**Pwr. Density (mW/cm^2)**	**Test position**	**Height (cm)**	**Pwr. Density (mW/cm^2)**		
1	20	0.05	6	120	0.12		
2	40	0.07	7	140	0.11		
3	60	0.08	8	160	0.12		
4	80	0.10	9	180	0.15		
5	100	0.11	10	200	0.17		

Table 35

External Vehicle MPE Assessment @ 136.0125MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Roof (cnt)	RAD4000A / 5dBi	110	H	0.99	0.16	0.08	0.08
Measurement grid							
Test position	**Height (cm)**	**Pwr. Density (mW/cm^2)**	**Test position**	**Height (cm)**	**Pwr. Density (mW/cm^2)**		
1	20	0.11	6	120	0.14		
2	40	0.10	7	140	0.18		
3	60	0.12	8	160	0.17		
4	80	0.11	9	180	0.23		
5	100	0.12	10	200	0.29		

Table 36

External Vehicle MPE Assessment @ 147.0125MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Roof (cnt)	RAD4000A / 5dBi	110	H	0.99	0.19	0.10	0.10
Measurement grid							
Test position	**Height (cm)**	**Pwr. Density (mW/cm^2)**	**Test position**	**Height (cm)**	**Pwr. Density (mW/cm^2)**		
1	20	0.10	6	120	0.14		
2	40	0.14	7	140	0.16		
3	60	0.21	8	160	0.24		
4	80	0.23	9	180	0.25		
5	100	0.20	10	200	0.24		

Table 37

External Vehicle MPE Assessment @ 155.0125MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Roof (cnt)	RAD4000A / 5dBi	110	H	0.98	0.15	0.07	0.08

Measurement grid					
Test position	**Height (cm)**	**Pwr. Density (mW/cm^2)**	**Test position**	**Height (cm)**	**Pwr. Density (mW/cm^2)**
1	20	0.13	6	120	0.12
2	40	0.10	7	140	0.15
3	60	0.14	8	160	0.15
4	80	0.09	9	180	0.18
5	100	0.13	10	200	0.28

Table 38

External Vehicle MPE Assessment @ 173.9875MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Roof (cnt)	RAD4000A / 5dBi	110	H	0.97	0.16	0.08	0.08

Measurement grid					
Test position	**Height (cm)**	**Pwr. Density (mW/cm^2)**	**Test position**	**Height (cm)**	**Pwr. Density (mW/cm^2)**
1	20	0.05	6	120	0.10
2	40	0.07	7	140	0.14
3	60	0.11	8	160	0.27
4	80	0.10	9	180	0.27
5	100	0.10	10	200	0.34

Table 39

External Vehicle MPE Assessment @ 155.0125MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Roof (cnt)	RAD4010ARB / 5dBi	110	H	0.98	0.18	0.09	0.09

Measurement grid					
Test position	**Height (cm)**	**Pwr. Density (mW/cm^2)**	**Test position**	**Height (cm)**	**Pwr. Density (mW/cm^2)**
1	20	0.11	6	120	0.19
2	40	0.15	7	140	0.20
3	60	0.12	8	160	0.22
4	80	0.14	9	180	0.24
5	100	0.14	10	200	0.33

Table 40

External Vehicle MPE Assessment @ 173.9875MHz							
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Body (mW/cm^2)**	**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
Roof (cnt)	RAD4010ARB / 5dBi	110	H	0.97	0.12	0.06	0.06

Measurement grid					
Test position	**Height (cm)**	**Pwr. Density (mW/cm^2)**	**Test position**	**Height (cm)**	**Pwr. Density (mW/cm^2)**
1	20	0.07	6	120	0.14
2	40	0.08	7	140	0.12
3	60	0.10	8	160	0.11
4	80	0.10	9	180	0.20
5	100	0.11	10	200	0.18

Table 41

Internal Vehicle MPE Assessment @ 155.0125MHz								
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)**		**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
					Back	**Front**		
Trunk	HAD4014AR / 5dBi	Highest reading	E	0.83	0.193	0.023	0.10	0.10

Measurement grid			
Test position	**% of control limit Head**	**% of control limit Chest**	**% of control limit Lower Trunk**
Back seat	35.2%	16.3%	6.3%
Front seat	3.4%	1.9%	1.6%

Table 42

Internal Vehicle MPE Assessment @ 173.9875MHz								
Antenna Location	**Antenna /gain**	**Meas. Distance (cm)**	**E/H Field**	**Calibration Factor**	**Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)**		**Pwr. Density (mW/cm^2)**	**Pwr. Density max cal (mW/cm^2)**
					Back	**Front**		
Trunk	HAD4014AR / 5dBi	Highest reading	E	0.86	0.063	0.018	0.03	0.03

Measurement grid			
Test position	**% of control limit Head**	**% of control limit Chest**	**% of control limit Lower Trunk**
Back seat	5.1%	7.2%	6.6%
Front seat	1.0%	2.0%	2.4%

Table 43

Internal Vehicle MPE Assessment @ 136.0125MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Trunk	RAD4000A / 5dBi	Highest reading	E	0.81	0.167	0.032	0.08	0.09

Measurement grid			
Test position	% of control limit Head	% of control limit Chest	% of control limit Lower Trunk
Back seat	35.4%	9.4%	5.3%
Front seat	3.1%	2.3%	4.3%

Table 44

Internal Vehicle MPE Assessment @ 147.0125MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Trunk	RAD4000A / 5dBi	Highest reading	E	0.82	0.039	0.010	0.02	0.02

Measurement grid			
Test position	% of control limit Head	% of control limit Chest	% of control limit Lower Trunk
Back seat	6.3%	3.2%	2.3%
Front seat	1.1%	0.9%	1.1%

Table 45

Internal Vehicle MPE Assessment @ 155.0125MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Trunk	RAD4000A / 5dBi	Highest reading	E	0.83	0.169	0.023	0.08	0.09

Measurement grid			
Test position	% of control limit Head	% of control limit Chest	% of control limit Lower Trunk
Back seat	30.2%	12.3%	8.1%
Front seat	3.5%	2.3%	1.1%

Table 46

Internal Vehicle MPE Assessment @ 173.9875MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Trunk	RAD4000A / 5dBi	Highest reading	E	0.86	0.194	0.047	0.10	0.10

Measurement grid			
Test position	% of control limit Head	% of control limit Chest	% of control limit Lower Trunk
Back seat	24.5%	20.4%	13.3%
Front seat	3.7%	5.6%	4.9%

Table 47

Internal Vehicle MPE Assessment @ 155.0125MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Trunk	RAD4010ARB / 5dBi	Highest reading	E	0.83	0.155	0.033	0.08	0.08

Measurement grid			
Test position	% of control limit Head	% of control limit Chest	% of control limit Lower Trunk
Back seat	24.6%	13.4%	8.4%
Front seat	4.7%	2.0%	3.2%

Table 48

Internal Vehicle MPE Assessment @ 173.9875MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Trunk	RAD4010ARB / 5dBi	Highest reading	E	0.86	0.041	0.014	0.02	0.02

Measurement grid			
Test position	% of control limit Head	% of control limit Chest	% of control limit Lower Trunk
Back seat	4.5%	3.2%	4.5%
Front seat	0.9%	1.1%	2.3%

Table 49

Internal Vehicle MPE Assessment @ 155.0125MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Trunk	HAD4014AR / 5dBi	Highest reading	H	0.98	0.14	0.11	0.07	0.07

Measurement grid			
Test position	Pwr. Density (mW/cm^2) Head	Pwr. Density (mW/cm^2) Chest	Pwr. Density (mW/cm^2) Lower Trunk
Back seat	0.17	0.14	0.12
Front seat	0.13	0.10	0.11

Table 50

Internal Vehicle MPE Assessment @ 173.9875MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Trunk	HAD4014AR / 5dBi	Highest reading	H	0.97	0.13	0.12	0.07	0.07

Measurement grid			
Test position	Pwr. Density (mW/cm^2) Head	Pwr. Density (mW/cm^2) Chest	Pwr. Density (mW/cm^2) Lower Trunk
Back seat	0.14	0.13	0.12
Front seat	0.13	0.12	0.12

Table 51

Internal Vehicle MPE Assessment @ 136.0125MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Trunk	RAD4000A / 5dBi	Highest reading	H	0.99	0.18	0.14	0.09	0.09

Measurement grid			
Test position	Pwr. Density (mW/cm^2) Head	Pwr. Density (mW/cm^2) Chest	Pwr. Density (mW/cm^2) Lower Trunk
Back seat	0.24	0.17	0.13
Front seat	0.17	0.13	0.12

Table 52

Internal Vehicle MPE Assessment @ 147.0125MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Trunk	RAD4000A / 5dBi	Highest reading	H	0.98	0.09	0.09	0.05	0.05

Measurement grid			
Test position	Pwr. Density (mW/cm^2) Head	Pwr. Density (mW/cm^2) Chest	Pwr. Density (mW/cm^2) Lower Trunk
Back seat	0.10	0.09	0.09
Front seat	0.10	0.08	0.09

Table 53

Internal Vehicle MPE Assessment @ 155.0125MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Trunk	RAD4000A / 5dBi	Highest reading	H	0.98	0.15	0.13	0.08	0.08

Measurement grid			
Test position	Pwr. Density (mW/cm^2) Head	Pwr. Density (mW/cm^2) Chest	Pwr. Density (mW/cm^2) Lower Trunk
Back seat	0.18	0.15	0.13
Front seat	0.14	0.12	0.13

Table 54

Internal Vehicle MPE Assessment @ 173.9875MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Trunk	RAD4000A / 5dBi	Highest reading	H	0.97	0.13	0.10	0.06	0.07

Measurement grid			
Test position	Pwr. Density (mW/cm^2) Head	Pwr. Density (mW/cm^2) Chest	Pwr. Density (mW/cm^2) Lower Trunk
Back seat	0.15	0.12	0.11
Front seat	0.12	0.08	0.09

Table 55

Internal Vehicle MPE Assessment @ 155.0125MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Trunk	RAD4010ARB / 5dBi	Highest reading	H	0.98	0.15	0.14	0.08	0.08

Measurement grid			
Test position	Pwr. Density (mW/cm^2) Head	Pwr. Density (mW/cm^2) Chest	Pwr. Density (mW/cm^2) Lower Trunk
Back seat	0.18	0.15	0.13
Front seat	0.17	0.13	0.13

Table 56

Internal Vehicle MPE Assessment @ 173.9875MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Trunk	RAD4010ARB / 5dBi	Highest reading	H	0.97	0.12	0.13	0.07	0.07

Measurement grid			
Test position	Pwr. Density (mW/cm^2) Head	Pwr. Density (mW/cm^2) Chest	Pwr. Density (mW/cm^2) Lower Trunk
Back seat	0.12	0.13	0.12
Front seat	0.13	0.13	0.13

Table 57

Internal Vehicle MPE Assessment @ 136.0125MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Roof	HAD4006A / 0dBi	Highest reading	E	0.81	0.274	0.147	0.14	0.14

Measurement grid			
Test position	% of control limit Head	% of control limit Chest	% of control limit Lower Trunk
Back seat	42.3%	19.8%	20.1%
Front seat	25.4%	9.5%	9.3%

Table 58

Internal Vehicle MPE Assessment @ 147.0125MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Roof	HAD4007A / 0dBi	Highest reading	E	0.82	0.376	0.158	0.19	0.19

Measurement grid			
Test position	% of control limit Head	% of control limit Chest	% of control limit Lower Trunk
Back seat	80.2%	23.3%	9.3%
Front seat	10.4%	19.3%	17.8%

Table 59

Internal Vehicle MPE Assessment @ 155.0125MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Roof	HAD4008A / 0dBi	Highest reading	E	0.83	0.299	0.108	0.15	0.15

Measurement grid			
Test position	% of control limit Head	% of control limit Chest	% of control limit Lower Trunk
Back seat	49.7%	23.7%	16.3%
Front seat	14.5%	8.7%	9.3%

Table 60

Internal Vehicle MPE Assessment @ 173.9875MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Roof	HAD4009A / 0dBi	Highest reading	E	0.86	0.242	0.148	0.12	0.12

Measurement grid			
Test position	% of control limit Head	% of control limit Chest	% of control limit Lower Trunk
Back seat	32.3%	23.8%	16.4%
Front seat	17.8%	15.3%	11.3%

Table 61

Internal Vehicle MPE Assessment @ 155.0125MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Roof	HAD4014AR / 5dBi	Highest reading	E	0.83	0.054	0.027	0.03	0.03

Measurement grid			
Test position	% of control limit Head	% of control limit Chest	% of control limit Lower Trunk
Back seat	7.8%	4.2%	4.3%
Front seat	2.3%	2.3%	3.4%

Table 62

Internal Vehicle MPE Assessment @ 173.9875MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Roof	HAD4014AR / 5dBi	Highest reading	E	0.86	0.047	0.032	0.02	0.02

Measurement grid			
Test position	% of control limit Head	% of control limit Chest	% of control limit Lower Trunk
Back seat	4.6%	3.2%	6.3%
Front seat	2.1%	3.1%	4.5%

Table 63

Internal Vehicle MPE Assessment @ 136.0125MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Roof	RAD4000A / 5dBi	Highest reading	E	0.81	0.041	0.023	0.02	0.02

Measurement grid			
Test position	% of control limit Head	% of control limit Chest	% of control limit Lower Trunk
Back seat	6.1%	2.9%	3.3%
Front seat	3.0%	1.8%	2.1%

Table 64

Internal Vehicle MPE Assessment @ 147.0125MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Roof	RAD4000A / 5dBi	Highest reading	E	0.82	0.044	0.021	0.02	0.02

Measurement grid			
Test position	% of control limit Head	% of control limit Chest	% of control limit Lower Trunk
Back seat	6.3%	4.5%	2.3%
Front seat	0.9%	2.3%	3.1%

Table 65

Internal Vehicle MPE Assessment @ 155.0125MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Roof	RAD4000A / 5dBi	Highest reading	E	0.83	0.042	0.031	0.02	0.02

Measurement grid			
Test position	% of control limit Head	% of control limit Chest	% of control limit Lower Trunk
Back seat	5.5%	3.5%	3.5%
Front seat	3.4%	2.6%	3.3%

Table 66

Internal Vehicle MPE Assessment @ 173.9875MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Roof	RAD4000A / 5dBi	Highest reading	E	0.86	0.066	0.038	0.03	0.03

Measurement grid			
Test position	% of control limit Head	% of control limit Chest	% of control limit Lower Trunk
Back seat	7.2%	5.3%	7.2%
Front seat	3.2%	3.6%	4.5%

Table 67

Internal Vehicle MPE Assessment @ 155.0125MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Roof	RAD4010ARB / 5dBi	Highest reading	E	0.83	0.053	0.042	0.03	0.03

Measurement grid			
Test position	% of control limit Head	% of control limit Chest	% of control limit Lower Trunk
Back seat	6.3%	4.8%	4.8%
Front seat	4.5%	2.7%	5.4%

Table 68

Internal Vehicle MPE Assessment @ 173.9875MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Roof	RAD4010ARB / 5dBi	Highest reading	E	0.86	0.024	0.018	0.01	0.01

Measurement grid			
Test position	% of control limit Head	% of control limit Chest	% of control limit Lower Trunk
Back seat	2.1%	1.9%	3.2%
Front seat	1.0%	2.1%	2.3%

Table 69

Internal Vehicle MPE Assessment @ 136.0125MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Roof	HAD4006A / 0dBi	Highest reading	H	0.97	0.26	0.15	0.13	0.14

Measurement grid			
Test position	Pwr. Density (mW/cm^2) Head	Pwr. Density (mW/cm^2) Chest	Pwr. Density (mW/cm^2) Lower Trunk
Back seat	0.41	0.22	0.16
Front seat	0.25	0.12	0.09

Table 70

Internal Vehicle MPE Assessment @ 147.0125MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Roof	HAD4007A / 0dBi	Highest reading	H	0.98	0.09	0.11	0.06	0.06

Measurement grid			
Test position	Pwr. Density (mW/cm^2) Head	Pwr. Density (mW/cm^2) Chest	Pwr. Density (mW/cm^2) Lower Trunk
Back seat	0.24	0.04	0.00
Front seat	0.20	0.12	0.01

Table 71

Internal Vehicle MPE Assessment @ 155.0125MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Roof	HAD4008A / 0dBi	Highest reading	H	0.98	0.16	0.13	0.08	0.08

Measurement grid			
Test position	Pwr. Density (mW/cm^2) Head	Pwr. Density (mW/cm^2) Chest	Pwr. Density (mW/cm^2) Lower Trunk
Back seat	0.29	0.11	0.09
Front seat	0.18	0.10	0.10

Table 72

Internal Vehicle MPE Assessment @ 173.9875MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Roof	HAD4009A / 0dBi	Highest reading	H	0.97	0.11	0.15	0.07	0.08

Measurement grid			
Test position	Pwr. Density (mW/cm^2) Head	Pwr. Density (mW/cm^2) Chest	Pwr. Density (mW/cm^2) Lower Trunk
Back seat	0.12	0.09	0.11
Front seat	0.14	0.13	0.17

Table 73

Internal Vehicle MPE Assessment @ 155.0125MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Roof	HAD4014AR / 5dBi	Highest reading	H	0.98	0.08	0.09	0.04	0.04

Measurement grid			
Test position	Pwr. Density (mW/cm^2) Head	Pwr. Density (mW/cm^2) Chest	Pwr. Density (mW/cm^2) Lower Trunk
Back seat	0.10	0.08	0.07
Front seat	0.10	0.08	0.08

Table 74

Internal Vehicle MPE Assessment @ 173.9875MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Roof	HAD4014AR / 5dBi	Highest reading	H	0.97	0.06	0.06	0.03	0.03

Measurement grid			
Test position	Pwr. Density (mW/cm^2) Head	Pwr. Density (mW/cm^2) Chest	Pwr. Density (mW/cm^2) Lower Trunk
Back seat	0.06	0.06	0.06
Front seat	0.06	0.06	0.07

Table 75

Internal Vehicle MPE Assessment @ 136.0125MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Roof	RAD4000A / 5dBi	Highest reading	H	0.99	0.05	0.05	0.02	0.02

Measurement grid			
Test position	Pwr. Density (mW/cm^2) Head	Pwr. Density (mW/cm^2) Chest	Pwr. Density (mW/cm^2) Lower Trunk
Back seat	0.05	0.04	0.05
Front seat	0.05	0.05	0.04

Table 76

Internal Vehicle MPE Assessment @ 147.0125MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Roof	RAD4000A / 5dBi	Highest reading	H	0.98	0.05	0.06	0.03	0.03

Measurement grid			
Test position	Pwr. Density (mW/cm^2) Head	Pwr. Density (mW/cm^2) Chest	Pwr. Density (mW/cm^2) Lower Trunk
Back seat	0.06	0.05	0.04
Front seat	0.07	0.06	0.06

Table 77

Internal Vehicle MPE Assessment @ 155.0125MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Roof	RAD4000A / 5dBi	Highest reading	H	0.98	0.09	0.10	0.05	0.05

Measurement grid			
Test position	Pwr. Density (mW/cm^2) Head	Pwr. Density (mW/cm^2) Chest	Pwr. Density (mW/cm^2) Lower Trunk
Back seat	0.11	0.09	0.08
Front seat	0.11	0.09	0.10

Table 78

Internal Vehicle MPE Assessment @ 173.9875MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Roof	RAD4000A / 5dBi	Highest reading	H	0.97	0.06	0.07	0.03	0.03

Measurement grid			
Test position	Pwr. Density (mW/cm^2) Head	Pwr. Density (mW/cm^2) Chest	Pwr. Density (mW/cm^2) Lower Trunk
Back seat	0.07	0.06	0.06
Front seat	0.07	0.06	0.07

Table 79

Internal Vehicle MPE Assessment @ 155.0125MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Roof	RAD4010ARB / 5dBi	Highest reading	H	0.98	0.08	0.09	0.05	0.05

Measurement grid			
Test position	Pwr. Density (mW/cm^2) Head	Pwr. Density (mW/cm^2) Chest	Pwr. Density (mW/cm^2) Lower Trunk
Back seat	0.10	0.08	0.07
Front seat	0.10	0.08	0.09

Table 80

Internal Vehicle MPE Assessment @ 173.9875MHz								
Antenna Location	Antenna /gain	Meas. Distance (cm)	E/H Field	Calibration Factor	Average over Head, Chest, Lower Trunk Back/Front Seats (mW/cm^2)		Pwr. Density (mW/cm^2)	Pwr. Density max cal (mW/cm^2)
					Back	Front		
Roof	RAD4010ARB / 5dBi	Highest reading	H	0.97	0.05	0.05	0.03	0.03

Measurement grid			
Test position	Pwr. Density (mW/cm^2) Head	Pwr. Density (mW/cm^2) Chest	Pwr. Density (mW/cm^2) Lower Trunk
Back seat	0.05	0.04	0.05
Front seat	0.05	0.05	0.05

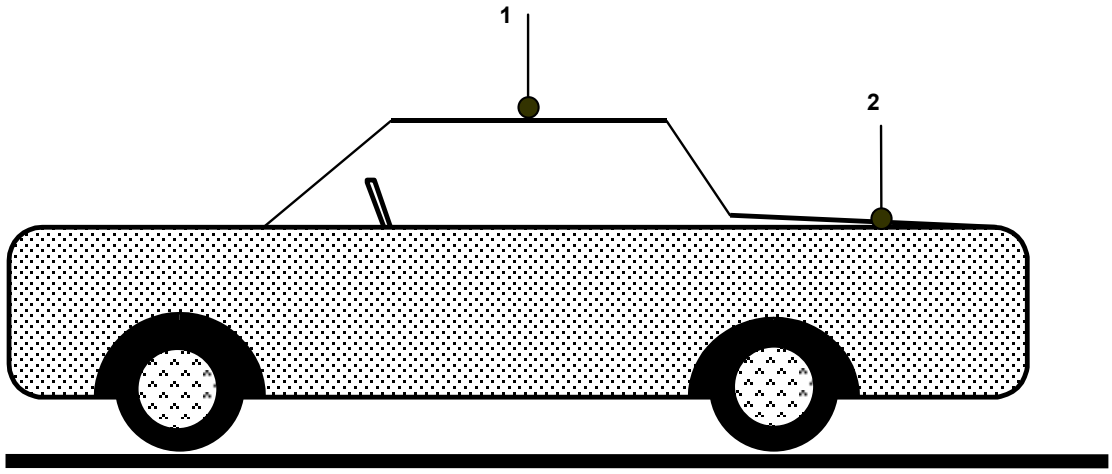
12.0Conclusion

Depending on the test frequency, compliance assessments were performed with an output power range of 5-50W. The maximum RF power allowable will be equal to the upper limit of the final test factory transmit power specification of 57W. The highest power density result scaled to the maximum allowable power output is 0.19mW/cm^2.

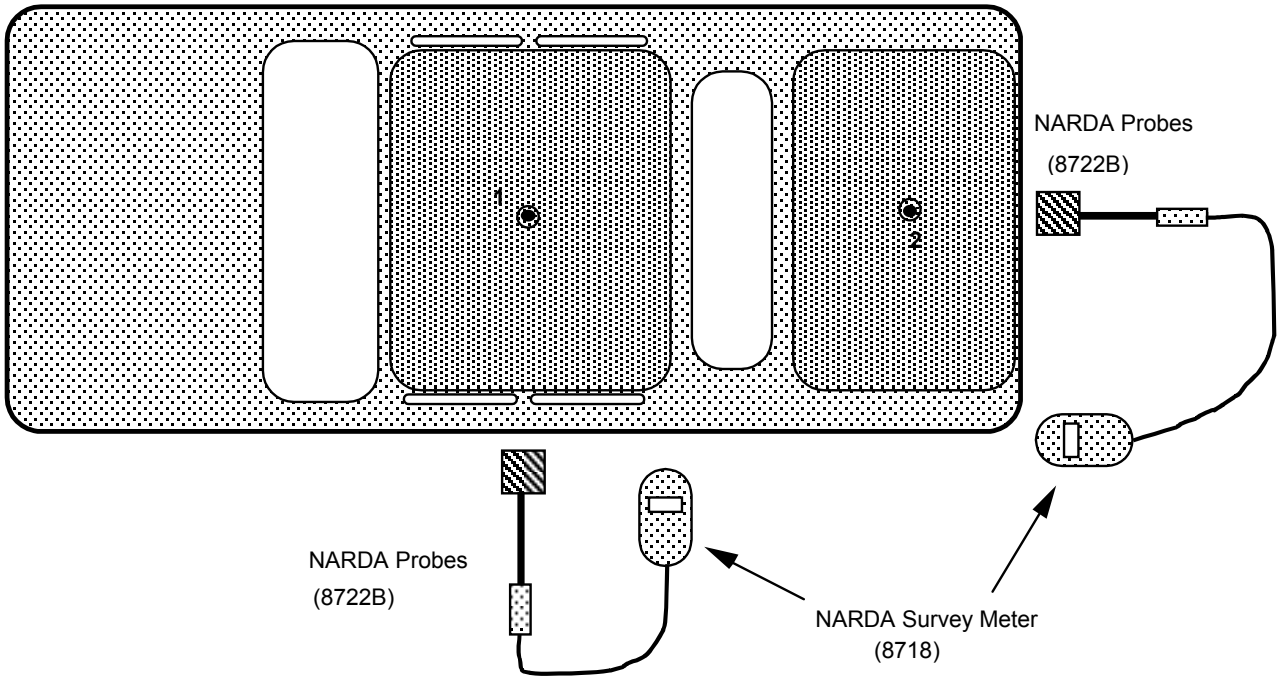
The measurement results clearly demonstrate compliance with the FCC Limits for the frequency band of 136-174MHz Per 47 CFR 2.1091 (d) for General Population/Uncontrolled RF Exposure.

APPENDIX A

ANTENNA LOCATION DRAWING

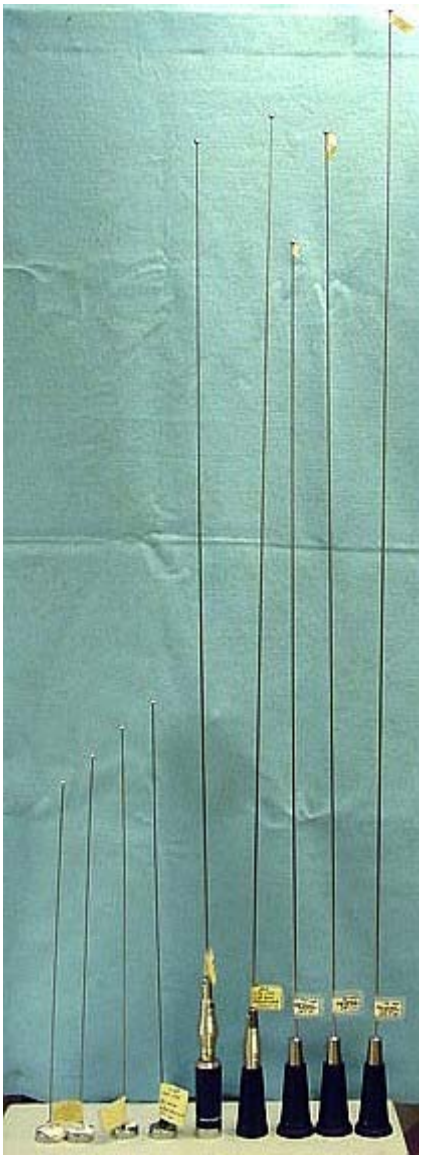


1 - Roof (center)
2 - Trunk (center)



APPENDIX B

Antenna photos



Antenna kit numbers, from left to right; HAD4009A (41.8cm), HAD4008A (44.6cm), HAD4007A (48.1cm), HAD4006A (51.0cm), HAD4014AR (1.17m), RAD4010ARB (1.32m), RAD4000A (10.5m), RAD4000A (1.18m) and RAD4000A (1.32m)