



Engineering Solutions & Electromagnetic Compatibility Services

FCC & IC Class 2 Permissive Change Report

Harris Corporation
RF Communications Division
1680 University Avenue
Rochester, NY 14610

Model: M7300,378-430MHz,50W

FCC ID: OWDTR-0061-E
IC: 3636B-0061

February 2, 2013

Standards Referenced for this Report	
Part 2: 2012	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
Part 90: 2012	Private Land Mobile Radio Services
TIA-102.CCAA August 2011	Two-Slot Time Division Multiple Access Transceiver Measurement Methods
TIA-102.CCAB October 2011	Two - Slot Time Division Multiple Access Transceiver Performance Recommendations
SRSP-500	Technical Requirements for Land Mobile and Fixed Radio Services Operating in the Bands 138-144 MHz and 148-174 MHz
RSS-119, Issue 11; June 2011	Radio Transmitters and Receivers Operating in the Land Mobile and Fixed Services in the Frequency Range 27.41-960 MHz

Frequency Range (MHz)	Rated Transmit Power (W) (Conducted)	Frequency Tolerance (ppm)	Emission Designator (Transmit Mode)
378 – 406.1 (Federal)* 406.1 – 430 (FCC/IC)	50.0	0.5	8K10DXW

*The 378-406 MHz data is for reference only

Report Prepared By: Daniel Baltzell

Document Number: 2013009

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These tests are accredited and meet the requirements of ISO/IEC 17025 as verified by ANSI-ASQ National Accreditation Board/ACLASS. Refer to certificate and scope of accreditation AT-1445.

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1 Test Result Summary

Test	FCC Reference	IC Reference	Result
RF Power Output	2.1046(a), 90.541(b), 90.542(a)(6)	RSS-119 5.4	Complies
Spurious Emissions at Antenna Terminals	2.1046(a), 90.541(b), 90.542(a)(6)	RSS-119 5.4	Complies
Occupied Bandwidth/Emission Masks	2.1049(c)(1), 90.543(d)	RSS-119 5.5, 5.8	Complies

2 General Information

The following Class 2 Permissive Change Report is prepared on behalf of Harris Corporation in accordance with the Federal Communications Commission and Industry Canada rules and regulations. The Equipment Under Test (EUT) was M7300 UHF-L Radio; FCC ID: OWDTR-0061-E, IC: 3636B-0061.

The purpose of this Class 2 Permissive Change is to add emission designator 8K10DXW (H-CPM TDMA) and a motorcycle count enclosure.

All measurements contained in this application were conducted in accordance with the applicable sections of FCC Rules and Regulations CFR 47 Parts 2 and 90. Calibration checks are performed regularly on the instruments, and all accessories including high pass filter, coaxial attenuator, preamplifier and cables.

2.1 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the parking lot of Rhein Tech Laboratories, Inc. 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report submitted to, and approved by, the Federal Communications Commission to perform AC line conducted and radiated emissions testing.

2.2 Related Submittal(s)/Grant(s)

The original FCC and IC certifications were granted November 29, 2010. The model name as registered with IC is M7300,378-430MHz,50W.

2.3 Grant Notes

Power is continuously variable from 10 - 50 W. The grant listed power is rated power.

3 Tested System Details

The test sample was received on January 14, 2013. Listed below are the identifiers and descriptions of all equipment, cables, and internal devices used with the EUT for this test, as applicable.

The device was programmed for multiple test patterns using the H-CPM TDMA mode. All test patterns were investigated and found to be nearly identical from an emissions perspective.

Table 3-1: Equipment Under Test (EUT)

Part	Manufacturer	Model	PN/SN	FCC ID	RTL Bar Code
M7300 UHF-L Radio	Harris Corporation	M7300	RU144750-021	OWDTR-0061-E	20964

Figure 3-1: Configuration of Tested System

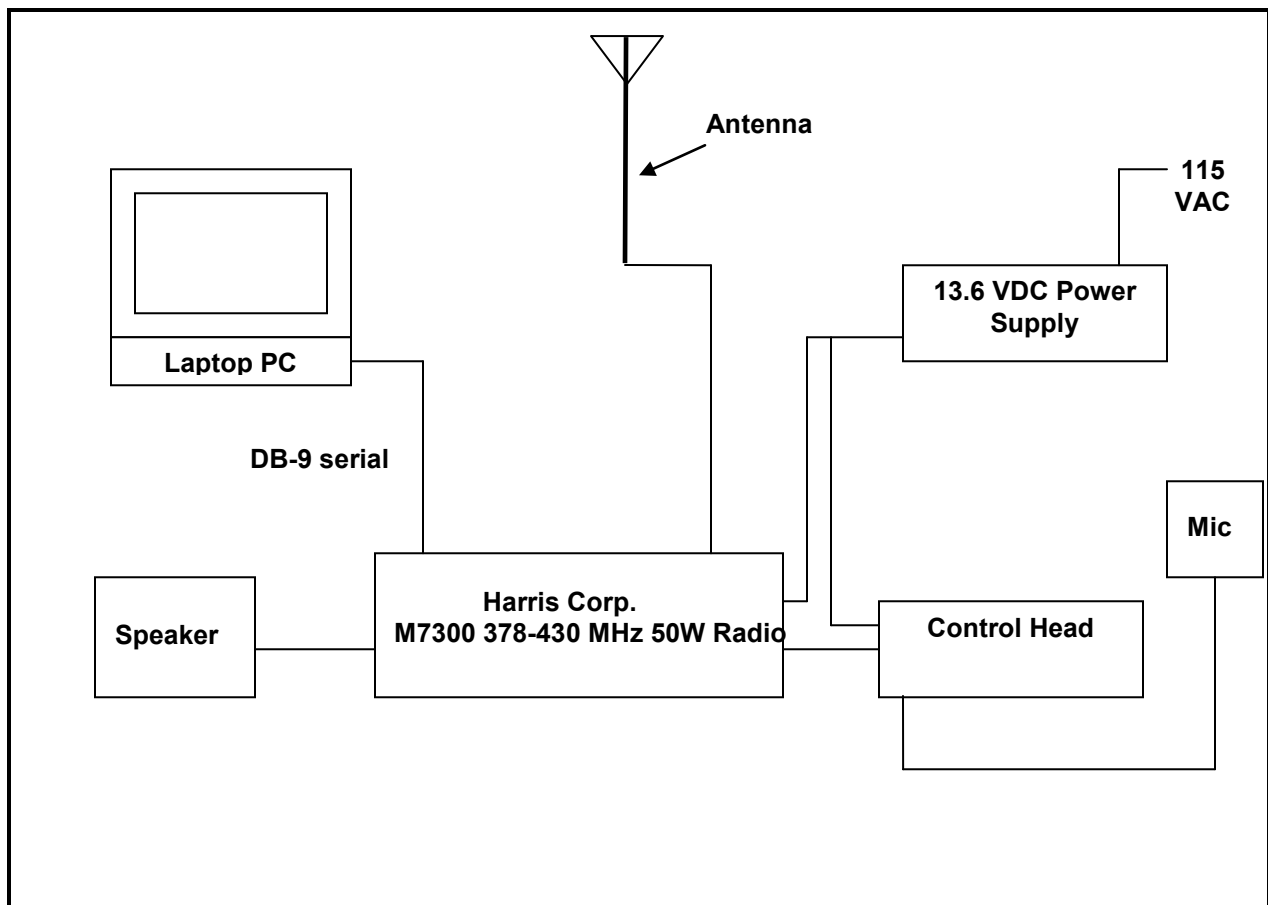
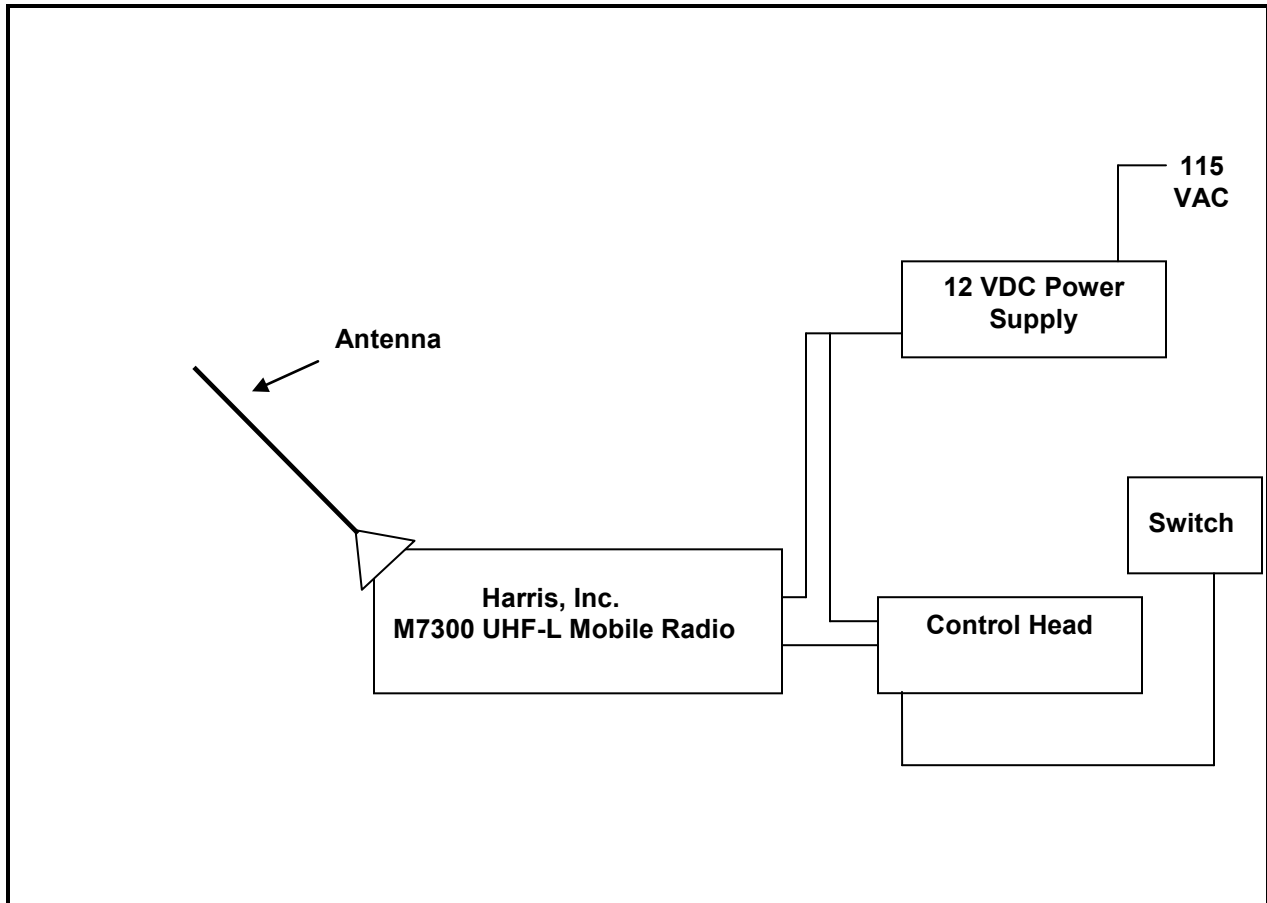


Figure 3-2: Configuration of Tested System (Motorcycle Mount)



4 FCC Rules and Regulations §90.1215(a) and §2.1046(a), IC RSS-119 5.4: Peak Output Power

4.1 Test Procedure

TIA-102.CCAA August 2011, section 2.2.1, TIA-102.CCAB October 2011, section 3.2.1

The EUT was connected via an appropriate 50 ohm attenuator to a signal analyzer. Attenuator loss was accounted for.

4.2 Test Data

Table 4-1: RF Power Output: Modulated Carrier Output Power

Frequency (MHz)	High Power (dBm)	High Power (W)
378.0125	47.2	52.5
406.1125	47.2	52.5
417.0125	47.2	52.5
429.9875	47.3	53.2

Table 4-2: RF Power Output (Rated Power)

Frequency (MHz)	High Power Rated (W)
378-430	50

Table 4-3: Test Equipment Used for Testing RF Power Output – Conducted

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	1166.1660.50	Spectrum Analyzer	2001006	6/3/13
901537	Weinschel Corp	48-40-34	Attenuator, 40 dB, 100W	CB66628	12/14/13

Test Personnel:

Daniel Baltzell
 EMC Test Engineer



Signature

January 23, 2013
 Date of Test

5 FCC Rules and Regulations §2.1051: Spurious Emissions at Antenna Terminals; §90.210: Emissions Masks; RSS-119 §4.2: Transmitter Unwanted Emissions

5.1 Test Procedure

TIA-102.CCAA August 2011, section 2.2.7, TIA-102.CCAB October 2011, section 3.2.7

The transmitter is terminated with a 50 Ω load and interfaced with a signal analyzer.

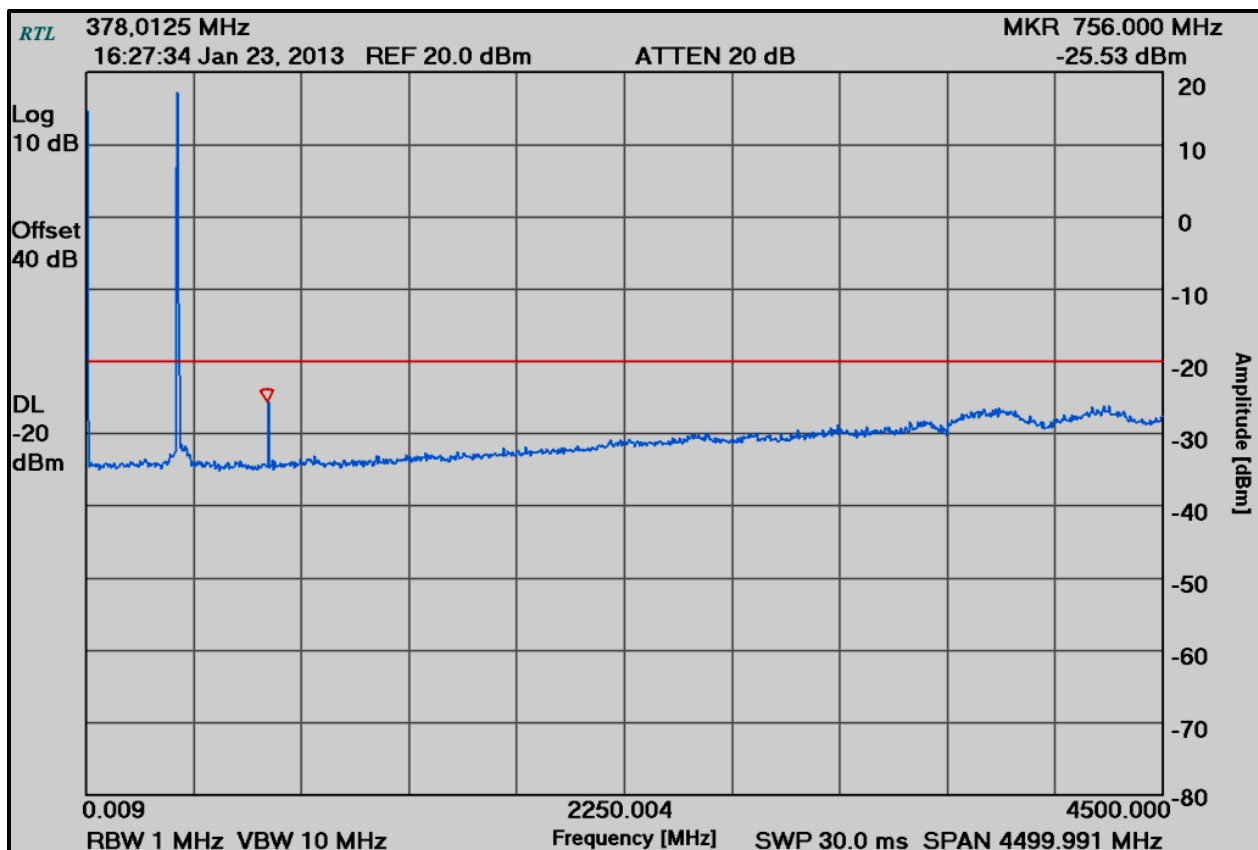
5.2 Test Data

Frequency range of measurement per Part 2.1057: 9 kHz to 10xFc.

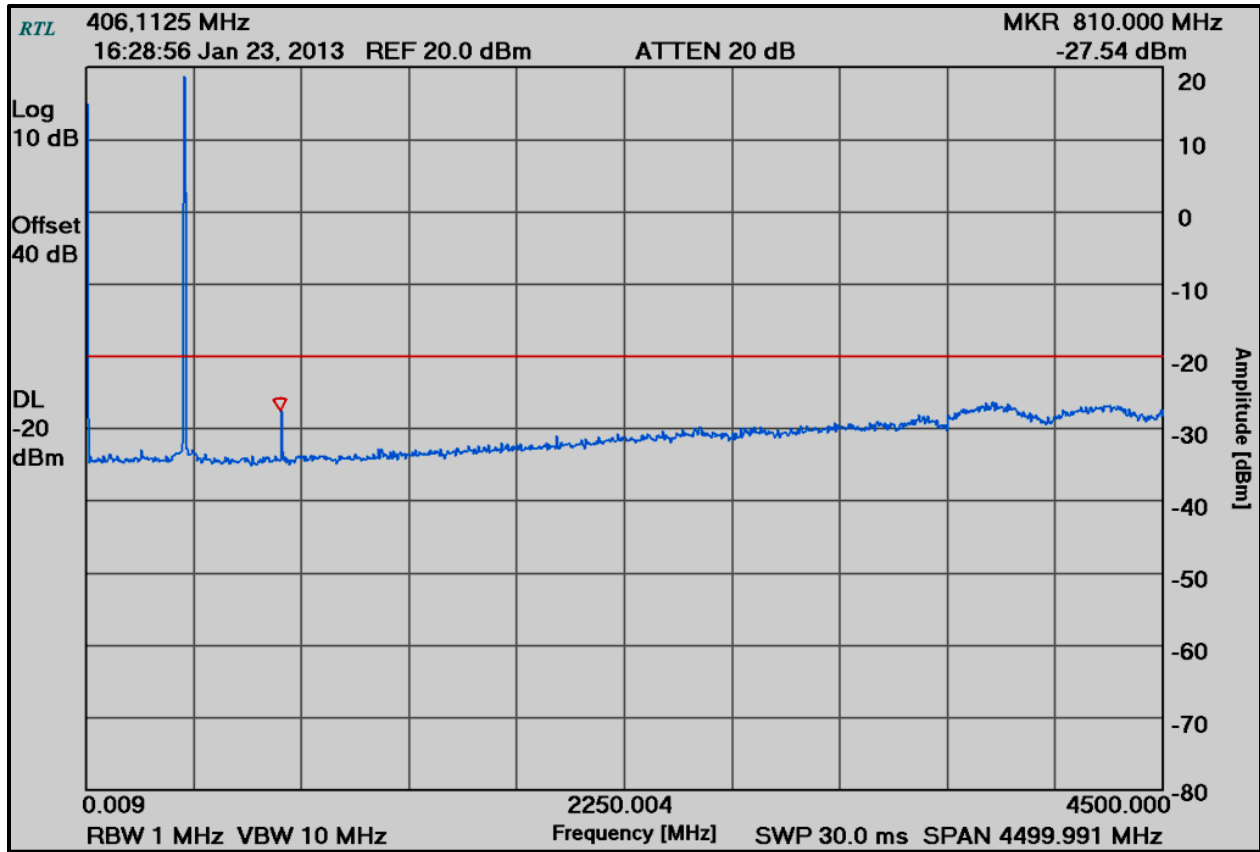
Limit: $P(\text{dBm}) - (50 + 10 \times \text{LOG } P(\text{W}))$

The worst case (unwanted emissions) channels are shown. The magnitude of emissions attenuated more than 20 dB below the FCC limit need not be recorded.

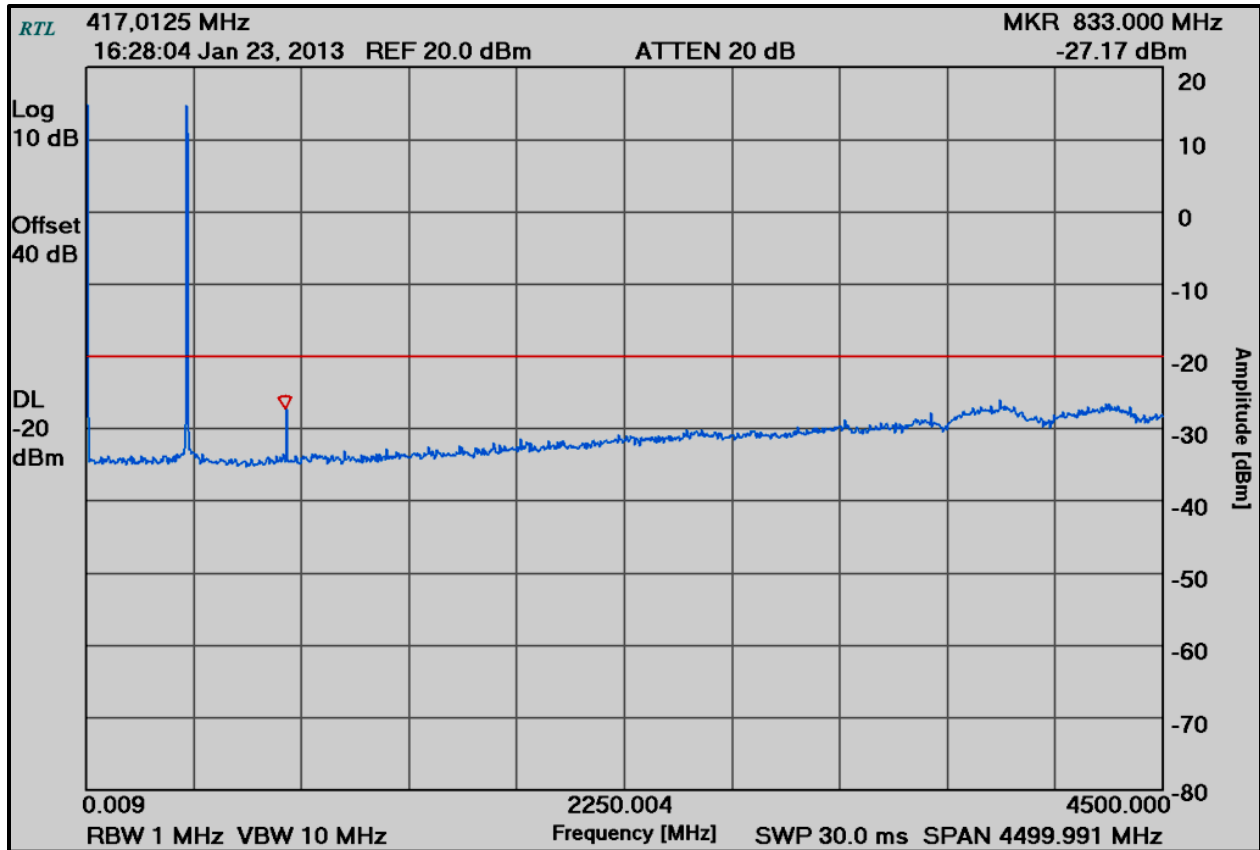
Plot 5-1: Conducted Spurious Emissions – H-CPM TDMA; 378.0125 MHz



Plot 5-2: Conducted Spurious Emissions – H-CPM TDMA; 406.1125 MHz



Plot 5-3: Conducted Spurious Emissions – H-CPM TDMA; 417.0125 MHz



Plot 5-4: Conducted Spurious Emissions – H-CPM TDMA; 429.9875 MHz

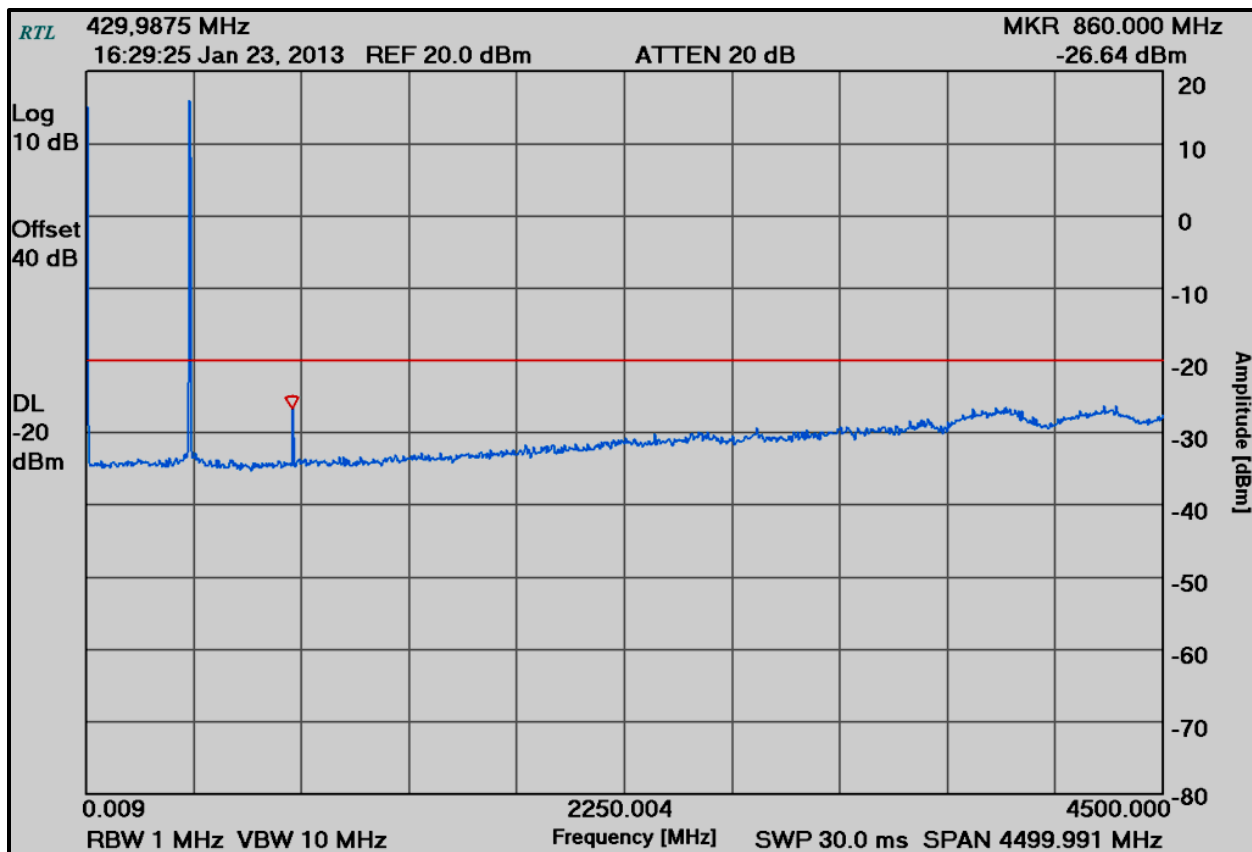


Table 5-1: Test Equipment Used for Testing Spurious Emissions

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	1166.1660.50	Spectrum Analyzer	2001006	6/3/13
901537	Weinschel Corp	48-40-34	Attenuator, 40 dB, 100W	CB66628	12/14/13

Test Personnel:

Daniel Baltzell
 EMC Test Engineer

Signature

January 23, 2013
 Date of Test

6 FCC Rules and Regulations §2.1049(c)(1); §90.210; RSS-119 §5.8: Occupied Bandwidth

6.1 Test Procedure

TIA-102.CCAA August 2011, section 2.2.5, TIA-102.CCAB October 2011, section 3.2.5

Notes: FCC 90.210 specifies masks G and H for the 800 MHz band operation of this equipment, RSS-119 and TIA-102.CCAB October 2011 section 3.2.5.1 specify mask D; all data is presented on the following pages

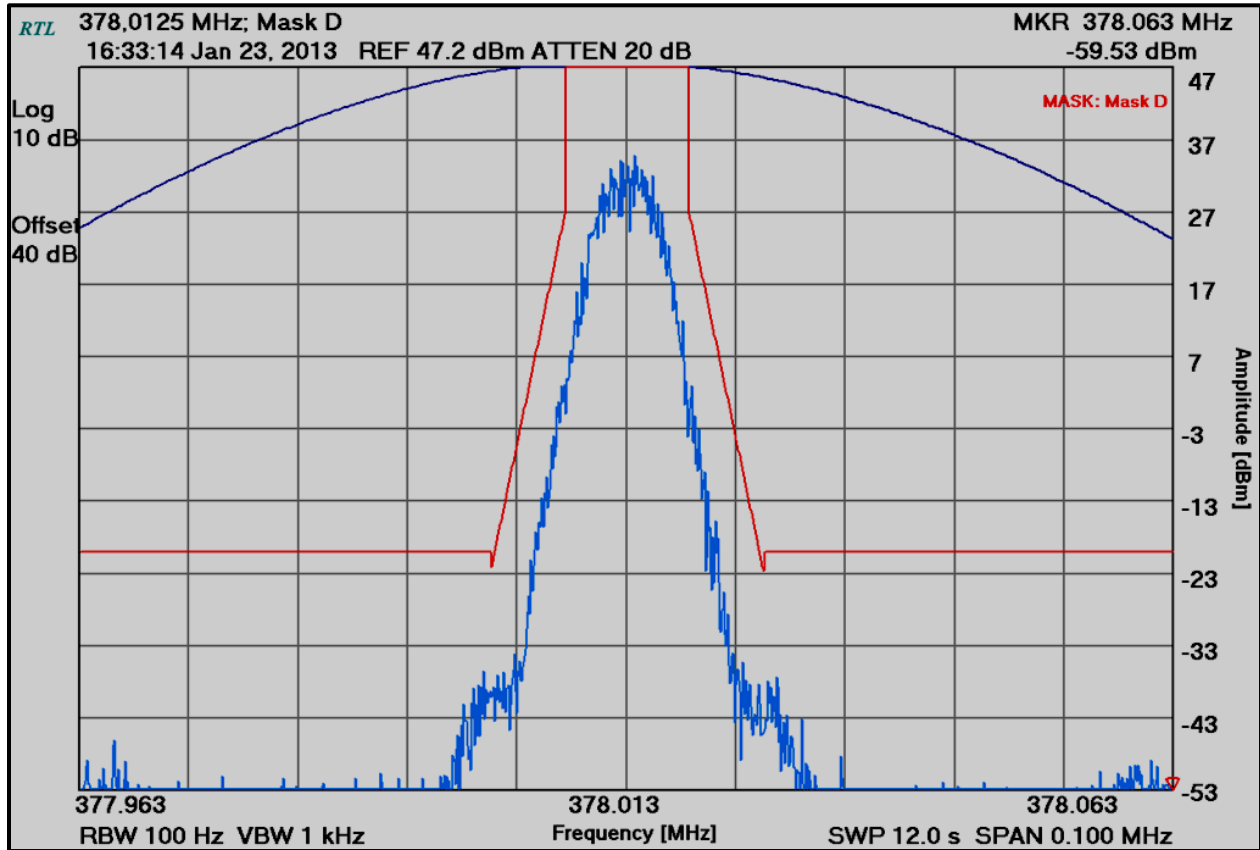
FCC §90.210

Applicable Emission Masks		
Frequency Band (MHz)	Mask for Equipment with Audio Low Pass Filter	Mask for Equipment without Audio Low Pass Filter
Below 25 ¹	A or B	A or C
25–50.....	B	C
72–76.....	B	C
150–174 ²	B, D, or E	C, D, or E
150 Paging-only	B	C
220–222	F	F
421–512 ²	B, D, or E	C, D, or E
450 Paging-only	B	G
806–809/851–854	B	H
809–824/854–869 ³	B	G
896–901/935–940	I	J
902–928	K	K
929–930	B	G
4940–4990 MHz	L or M	L or M
5850–5925 ⁴		
All other bands	B	C

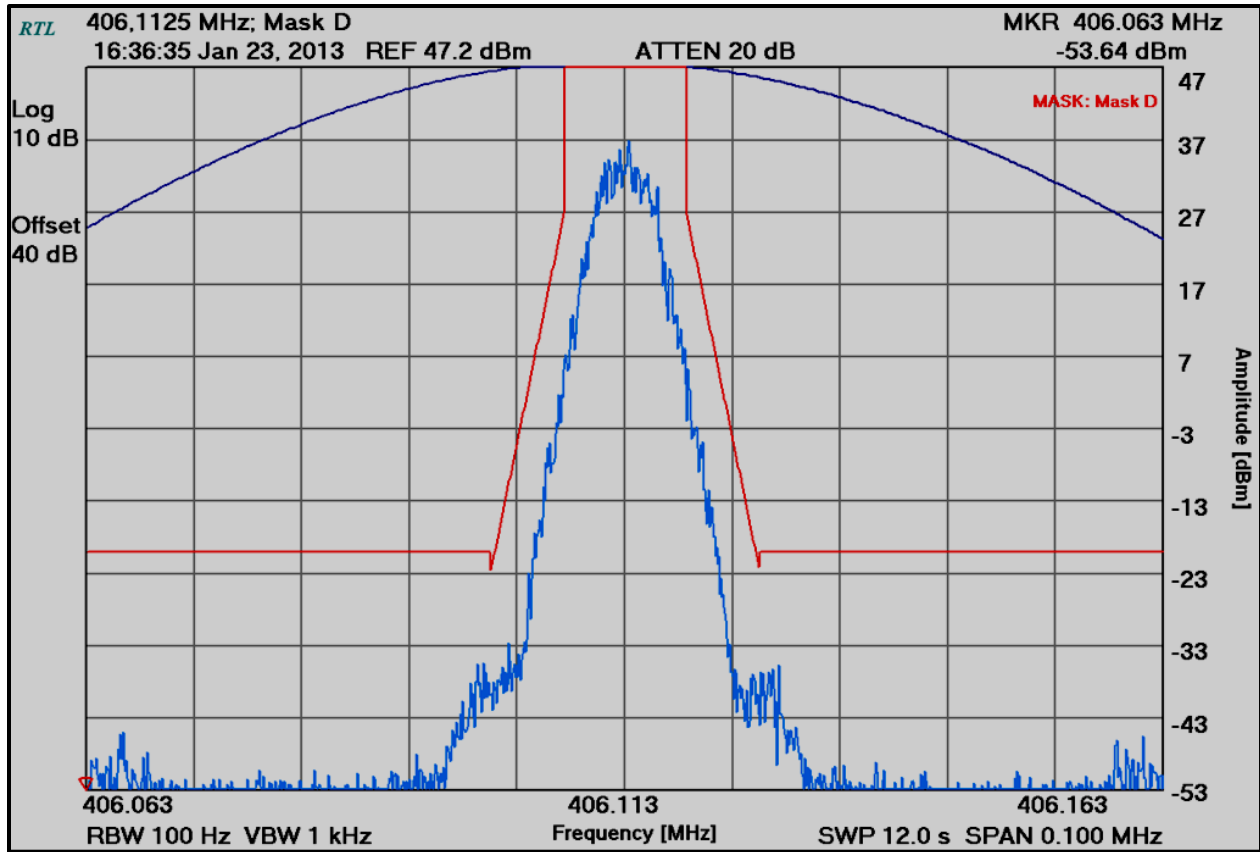
¹ Equipment using single sideband J3E emission must meet the requirements of Emission Mask A. Equipment using other emissions must meet the requirements of Emission Mask B or C, as applicable.
² Equipment designed to operate with a 25 kHz channel bandwidth must meet the requirements of Emission Mask B or C, as applicable. Equipment designed to operate with a 12.5 kHz channel bandwidth must meet the requirements of Emission Mask D, and equipment designed to operate with a 6.25 kHz channel bandwidth must meet the requirements of Emission Mask E.
³ Equipment used in this licensed to EA or non-EA systems shall comply with the emission mask provisions of §90.691.
⁴ DSRCS Roadside Unit equipment in the 5850–5925 MHz band is governed under subpart M of this part.

6.2 Test Data

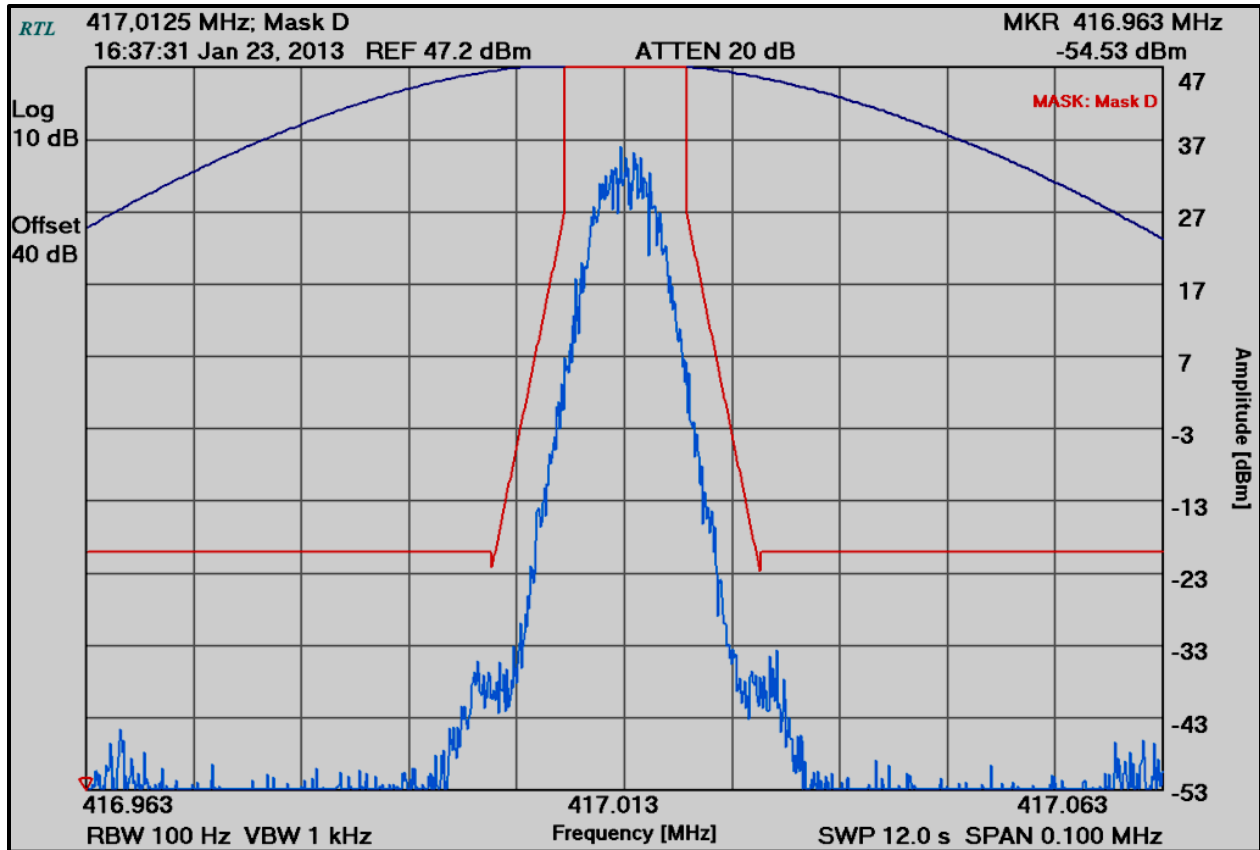
Plot 6-1: Occupied Bandwidth – H-CPM TDMA; 378.0125 MHz; Mask D



Plot 6-2: Occupied Bandwidth – H-CPM TDMA; 406.1125 MHz; Mask D



Plot 6-3: Occupied Bandwidth – H-CPM TDMA; 417.0125 MHz; Mask D



Plot 6-4: Occupied Bandwidth – H-CPM TDMA; 429.9875 MHz; Mask D

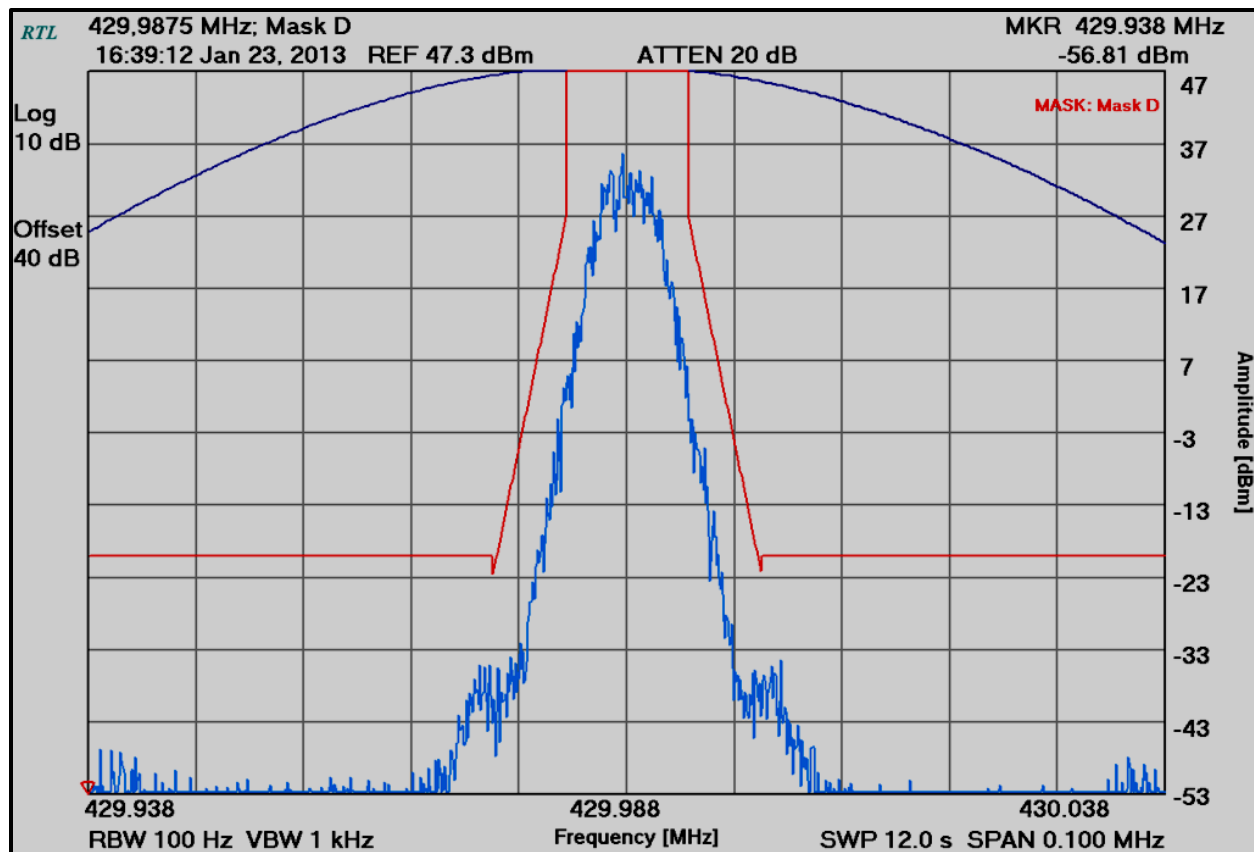


Table 6-1: Test Equipment Used for Testing Occupied Bandwidth

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	1166.1660.50	Spectrum Analyzer	2001006	6/3/13
901537	Weinschel Corp	48-40-34	Attenuator, 40 dB, 100W	CB66628	12/14/13
901337	Narda Microline	766-10	Attenuator (DC-4GHz, 10 dB, 20W)	6242	8/17/13

Test Personnel:

Daniel Baltzell
 Test Engineer

Signature

January 23, 2013
 Date of Test

7 FCC Rules and Regulations Part 90.210(g) and Part 2.1053(a): Field Strength of Spurious Radiation; IC RSS-119 5.8.9.2 Out-of-band Emission Limit

7.1 Test Procedure

ANSI/TIA-603-2004, section 2.2.12

The device uses digital modulation modulated to its maximum extent using a pseudo-random data sequence.

The spurious emissions levels were measured, and the device under test was replaced by a substitution antenna connected to a signal generator. This signal generator level was then corrected by subtracting the cable loss from the substitution antenna to the signal generator, and the gain of the antenna (dBd) was added to achieve the ERP level, then converted from the corrected signal generator level (dBm) to dBc and compared to the limit.

7.2 Test Data for Motorcycle Mount Configuration

Table 7-1: Field Strength of Spurious Radiation – 378.0125 MHz

Conducted Power 47.2 dBm; 52.5 W; Limit=50+10LogP=67.2 dBc

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Gain (dBd)	Corrected Signal Generator Level (dBc)	Margin (dB)
756.0250	62.2	-37.3	0.5	0.9	84.1	-31.6
1134.0375	57.0	-45.7	0.6	4.2	89.3	-36.8
1512.0500	42.7	-56.0	0.7	6.2	97.7	-45.2
1890.0625	48.1	-48.0	0.8	5.7	90.3	-37.8
2268.0750	50.0	-51.2	0.9	6.9	92.4	-39.9
2646.0875	41.1	-59.4	1.0	7.2	100.4	-47.9
3024.1000	40.3	-58.3	1.1	6.9	99.7	-47.2
3402.1125	39.7	-57.1	1.2	7.1	98.4	-45.9
3780.1250	33.8	-61.2	1.2	6.4	103.2	-50.7

Table 7-2: Field Strength of Spurious Radiation – 406.1125 MHz

Conducted Power 47.2 dBm; 52.5 W; Limit=50+10LogP=67.2 dBc

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Gain (dBd)	Corrected Signal Generator Level (dBc)	Margin (dB)
812.2250	52.8	-45.3	0.5	0.6	92.4	-39.9
1218.3375	54.6	-46.9	0.6	4.4	90.3	-37.8
1624.4500	41.4	-57.3	0.7	6.5	98.7	-46.2
2030.5625	66.2	-34.7	0.8	6.2	76.6	-24.1
2436.6750	36.0	-67.1	0.9	6.9	108.3	-55.8
2842.7875	50.0	-49.5	1.0	7.5	90.2	-37.7
3248.9000	33.1	-64.4	1.1	6.8	106.0	-53.5
3655.0125	36.8	-58.8	1.2	6.9	100.3	-47.8
4061.1250	28.5	-65.1	1.3	7.5	106.1	-53.6

Table 7-3: Field Strength of Spurious Radiation – 417.0125 MHz

Conducted Power 47.2 dBm; 52.5 W; Limit=50+10LogP=67.2 dBc

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Gain (dBd)	Corrected Signal Generator Level (dBc)	Margin (dB)
834.0250	57.5	-40.1	0.5	0.7	87.1	-34.6
1251.0375	48.0	-53.0	0.6	4.7	96.2	-43.7
1668.0500	43.7	-54.8	0.7	6.4	96.3	-43.8
2085.0625	58.8	-41.9	0.9	6.4	83.6	-31.1
2502.0750	32.9	-68.3	1.0	7.0	109.5	-57.0
2919.0875	47.4	-51.7	1.1	7.3	92.7	-40.2
3336.1000	32.2	-64.9	1.1	6.9	106.3	-53.8
3753.1125	36.8	-58.3	1.2	6.5	100.2	-47.7
4170.1250	28.4	-64.7	1.3	8.0	105.2	-52.7

Table 7-4: Field Strength of Spurious Radiation – 429.9875 MHz

Conducted Power 47.3 dBm; 53.2 W; Limit=50+10LogP=67.3 dBc

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to Transmit Antenna (dB)	Substitution Antenna Gain (dBd)	Corrected Signal Generator Level (dBc)	Margin (dB)
859.9750	58.4	-41.1	0.5	0.7	88.2	-35.0
1289.9625	52.6	-47.0	0.6	4.9	90.0	-36.8
1719.9500	44.2	-53.5	0.8	6.3	95.3	-42.1
2149.9375	48.0	-52.3	0.9	6.6	93.8	-40.6
2579.9250	59.3	-41.5	1.0	6.9	82.8	-29.6
3009.9125	37.7	-61.0	1.1	7.0	102.4	-49.2
3439.9000	33.9	-62.7	1.2	7.1	104.1	-50.9
3869.8875	31.5	-63.0	1.3	6.6	105.0	-51.8
4299.8750	36.2	-56.2	1.4	8.4	96.5	-43.3

Table 7-5: Test Equipment Used For Testing Field Strength of Spurious Radiation

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900932	Hewlett Packard	8449B OPT H02	Preamplifier (1-26.5 GHz)	3008A00505	8/10/13
900878	Rhein Tech Laboratories	AM3-1197-0005	3 meter antenna mast, polarizing	OATS1	N/A
901592	Insulated Wire Inc.	KPS-1503-3600-KPR	SMK RF Cables 20'	NA	8/16/13
901593	Insulated Wire Inc.	KPS-1503-360-KPR	SMK RF Cables 36"	NA	8/16/13
901594	Insulated Wire Inc.	KPS-1503-360-KPR	SMK RF Cables 36"	NA	8/16/13
901242	Rhein Tech Laboratories	WRT-000-0003	Wood rotating table	N/A	N/A
900791	Chase	CBL6111B	Bilog Antenna (30 MHz–2000 MHz)	N/A	1/31/13
900321	EMCO	3161-03	Horn Antennas (4–8 GHz)	9508-1020	4/19/14
900772	EMCO	3161-02	Horn Antenna (2-4 GHz)	9804-1044	4/19/14
900928	Hewlett Packard	83752A	Synthesized Sweeper, (0.01-20 GHz)	3610A00866	2/18/13
901595	Mini-Circuits	ZHL-4240V	Amplifier	H090293-5	2/17/13
901581	Rohde & Schwarz	1166.1660.50	Spectrum Analyzer	2001006	6/3/13

Rhein Tech Laboratories, Inc.
360 Herndon Parkway
Suite 1400
Herndon, VA20170
<http://www.rheintech.com>

Client: Harris Corporation
Model: M7300 UHF-L Mobile Radio
ID's: OWDTR-0061-E/3636B-0061
Standards: FCC Part 90/IC RSS-119
Report #: 2013009

Test Personnel:

Daniel Baltzell
Test Engineer



Signature

January 30, 2013
Date of Test

8 Conclusion

The data in this Class 2 measurement report shows that the Harris Corporation Model M7300 UHF-L; FCC ID: OWDTR-0061-E, IC: 3636B-0061, complies with all the applicable requirements of FCC Parts 90 and 2, and Industry Canada RSS-119.