Engineering and Testing for EMC and Safety Compliance

Accredited under A2LA Testing Certificate # 2653.01

Class II Permissive Change Report

Harris Corporation
221 Jefferson Ridge Parkway
Lynchburg, VA 24501
Daryl Popowitch
Phone: (434) 455-9527

Model: OpenSky® 700 MHz Cell Site

FCC ID: BV8CS700
IC: 3670A-CS700

September 22, 2009

Standards Referenced for this Report	
Part 2: 2008	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
Part 90: 2008	Private Land Mobile Radio Services
ANSI TIA-603-C-2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
RSS-119 Issue 9 2007	Land Mobile and Fixed Radio Transmitters and Receivers Operating in the Frequency Range 27.41- 960 MHz
SP 768 Issue 1 June 2009	Narrowband and Wideband Public Safety Radiocommunication Systems in the Bands 768-776 MHz and 798-806 MHz

Frequency Range	Rated Transmit Power (W) (Conducted)*	Measured Frequency Tolerance (ppm)	Emission Designator
764-776 MHz	31.5	0.01	12K1F9W (4-Level TDMA voice/data)
764-776 MHz	31.5	0.01	8K40F9W (NBOTP)

**Rated power, actual measured power in test report*

Report Prepared by Test Engineer: Daniel W. Baltzell

Document Number: 2009255

Table of Contents

Table of Tables

Table of Plots

Table of Figures

Table of Appendixes

Table of Photographs

1 General Information

The following Certification Report is prepared on behalf of **Harris Corporation** in accordance with the Federal Communications Commission and Industry Canada. The Equipment Under Test (EUT) was the **OpenSky Cell Site, FCC ID: BV8CS700**, **IC: 3670A-CS700**. The test results reported in this document relate only to the item that was tested.

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

1.1 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.

1.2 Related Submittal(s)/Grant(s)

This is a Class II Permissive Change which adds an emission designator, 8K40F9W, for the Narrow Band OpenSky Trunking Protocol (NBOTP), and also requests that the full range of 764–776 MHz be listed on both the FCC and IC grants to reflect the full band allowed at this time. The original certification was granted on May 4, 2006.

2 Tested System Details

The test sample was received on September 3, 2009. Listed below are the identifiers and descriptions of all equipment, cables, and internal devices used with the EUT for this test, as applicable. The cell site station is offered in duplex and non-duplex versions, allowing one or two antennas to be used. The duplex version has conducted power of 5 to 25 W. The non-duplex version has conducted power of 5 to 31.5 W.

Table 2-1: Test System Details

Model Tested	OpenSky Cell Site
Frequency Band	764-776 MHz
Modulation Type	4-level Frequency Shift Keying (FSK)
Channel Step Size	6.25 kHz
Channel Bandwidth	12.5 kHz
Primary Power	27 VDC
Rated Transmitter Output Power	Continually variable 5-25 W in duplex configuration, 5-31.5 W non-duplex configuration
Duty Cycle	100% maximum

Table 2-2: Equipment Under Test (EUT)

Part	Manufacturer	Model	PN/SN	FCC ID	RTL Bar Code
Cell Site	Harris Corporation	OpenSky	MACS-MC700	BV8CS700	19194

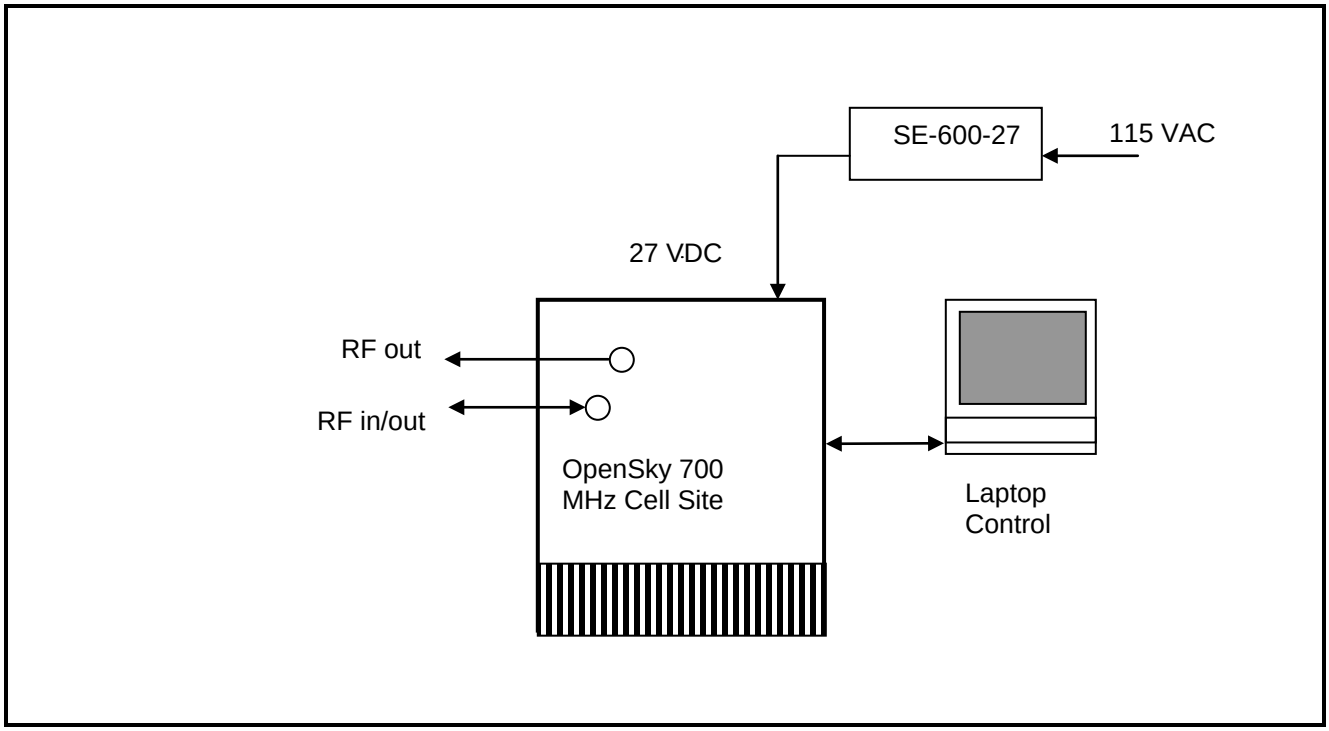
Table 2-3: Ports and Cabling (EUT)

Port	Cable Type	Quantity	Length (feet)	Shield
RF In/Out	N type	1	N/A	Yes
RF Out	N type	1	N/A	Yes
Terminal	DB-9	1	N/A	No

Table 2-4: Support Equipment

Part	Manufacturer	Model	PN/SN	FCC ID	RTL Bar Code
Notebook Computer	Dell	Latitude	N/A	N/A	18262
AC Adapter	Dell	N/A	N/A	N/A	16952
Serial Interface Cable	N/A	DB-9	N/A	N/A	N/A
Power Supply	Mean Well	SE-600-27	CA 50051062	N/A	19195

Figure 2-1: Configuration of Tested System



3 FCC Rules and Regulations Part 2 §2.1033(c)(8) Voltages and Currents Through The Final Amplifying Stage

Nominal DC Voltage: 27 VDC
Current: 6 A

4 FCC Rules and Regulations Part 90 §90.1215(a) and Part 2 §2.1046(a): Peak Output Power

4.1 Test Procedure

ANSI TIA-603-2004, section 2.2.1.

The EUT was connected to a coaxial attenuator having a 50 Ω load impedance.

4.2 Test Data

Table 4-1: RF Power Output: Carrier Output Power – NBOTP

Frequency (MHz)	Full Duplex Version RF Power Measured (Watt)*	Non-Duplex Version RF Power Measured (Watt)*
764.0125	25.2	32.5
766.9875	25.8	32.2
773.0125	25.1	31.4
775.9875	25.6	32.7
764.0125	3.3	3.2
766.9875	3.3	3.1
773.0125	3.2	3.2
775.9875	3.1	3.1

* Measurement accuracy: +/-.02 dB (logarithmic mode)

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

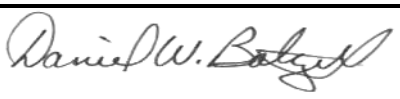
Rated Power - Duplex Mode
25.0 W

Rated Power - Non-Duplex Mode
31.5 W

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

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901356	Agilent Technologies	E9323A	Power Sensor	31764-264	11/5/09
901184	Agilent Technologies	E4416A	EPM-P Power Meter, single channel	GB41050573	11/5/09
901138	Weinschel Corp.	48-40-34 DC-18GHz	Attenuator, 100W 40dB	BK5883	12/3/09

Test Personnel:

Daniel W. Baltzell		September 4, 2009
Test Engineer	Signature	Date Of Tests

5 FCC Rules and Regulations Part 2 §2.1051: Spurious Emissions at Antenna Terminals; Part 90 §90.210: Emissions Masks; RSS-119 §4.2: Transmitter Unwanted Emissions

5.1 Test Procedure

ANSI TIA-603-C-2004, Section 2.2.13.

The transmitter is terminated with a 50 Ω load and interfaced with a spectrum analyzer. The device uses digital modulation modulated to its maximum extent using a pseudo random data sequence of 9600 bps for NBOTP (Narrow Band OpenSky Trunking Protocol) mode.

5.2 Test Data

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

Limit: P(dBm) – (43 + 10xLOG P(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.

Table 5-1: Conducted Spurious Emissions – 764.0125 MHz; Non-Duplex Mode

Limit = 43 + 10 log (32.5) = 58.1 dBc

Frequency (MHz)	Spectrum Analyzer Level (dBm)	Insertion Losses (dB)	Level (dBc)	Margin (dB)
1528.0250	-31.0	11.6	64.5	-6.4
2292.0375	-34.1	7.4	71.8	-13.7
3056.0500	-66.0	0.4	110.8	-52.6
3820.0625	-46.8	1.8	90.1	-32.0
4584.0750	-80.9	4.0	122.0	-63.9
5348.0875	-71.1	4.9	111.3	-53.2
6876.1130	-75.6	7.4	113.3	-55.2

Table 5-2: Conducted Spurious Emissions – 764.0125 MHz; Full Duplex Mode

Limit = 43 + 10 log (25.2) = 57.0 dBc

Frequency (MHz)	Spectrum Analyzer Level (dBm)	Insertion Losses (dB)	Level (dBc)	Margin (dB)
1528.0250	-35.6	11.6	68.0	-11.0
2292.0375	-40.0	7.4	76.6	-19.6
3056.0500	-78.1	0.4	121.8	-64.7
3820.0625	-47.7	1.8	89.9	-32.9
5348.0875	-67.0	4.9	106.1	-49.1
6876.1130	-73.2	7.4	109.8	-52.8

Table 5-3: Conducted Spurious Emissions – 766.9875 MHz; Non-Duplex Mode

Limit = 43 + 10 log (32.2) = 58.1 dBc

Frequency (MHz)	Spectrum Analyzer Level (dBm)	Insertion Losses (dB)	Level (dBc)	Margin (dB)
1533.9750	-31.8	1.3	75.6	-17.5
2300.9625	-34.8	8.5	71.4	-13.3
3067.9500	-65.8	1.1	109.8	-51.7
3834.9375	-45.8	1.9	89.0	-31.0
4601.9250	-81.3	8.8	117.6	-59.5
5368.9125	72.7	11.2	-38.9	96.9
6902.8875	-72.1	8.2	109.0	-50.9

Table 5-4: Conducted Spurious Emissions – 766.9875MHz; Full Duplex Mode

Limit = 43 + 10 log (25.8) = 57.1 dBc

Frequency (MHz)	Spectrum Analyzer Level (dBm)	Insertion Losses (dB)	Level (dBc)	Margin (dB)
1533.9750	-32.3	1.3	75.1	-18.0
2300.9625	-37.0	8.5	72.6	-15.5
3067.9500	-72.5	1.1	115.5	-58.4
3834.9375	-46.9	1.9	89.2	-32.1
4601.9250	-81.1	8.8	116.4	-59.3
5368.9125	-73.4	11.2	106.3	-49.2
6902.8875	-71.8	8.2	107.7	-50.6

Table 5-5: Conducted Spurious Emissions – 773.0125 MHz; Non-Duplex Mode

Limit = 43 + 10 log (31.4) = 58.0 dBc

Frequency (MHz)	Spectrum Analyzer Level (dBm)	Insertion Losses (dB)	Level (dBc)	Margin (dB)
1546.0250	-32.3	1.4	75.9	-18.0
2319.0375	-34.3	9.4	69.9	-11.9
3092.0500	-68.2	1.2	112.0	-54.0
3865.0625	-45.5	0.8	89.7	-31.7
4638.0750	-82.4	8.8	118.6	-60.6
5411.0875	-68.5	7.2	106.3	-48.3
6957.1125	-69.8	5.7	109.1	-51.1

Table 5-6: Conducted Spurious Emissions – 773.0125 MHz; Full Duplex Mode

Limit = 43 + 10 log (25.1) = 57.0 dBc

Frequency (MHz)	Spectrum Analyzer Level (dBm)	Insertion Losses (dB)	Level (dBc)	Margin (dB)
1546.0250	-33.2	1.4	75.9	-18.9
2319.0375	-33.2	9.4	67.8	-10.8
3092.0500	-76.3	1.2	119.1	-62.1
3865.0625	-46.5	0.8	89.7	-32.7
5411.0875	-75.8	7.2	112.6	-55.6
6957.1125	-71.6	5.7	109.9	-52.9

Table 5-7: Conducted Spurious Emissions – 775.9875 MHz; Non-Duplex Mode

Limit = 43 + 10 log (32.7) = 58.1 dBc

Frequency (MHz)	Spectrum Analyzer Level (dBm)	Insertion Losses (dB)	Level (dBc)	Margin (dB)
1551.9750	-33.1	1.4	76.9	-18.8
2327.9625	-39.1	9.4	74.8	-16.7
3103.9500	-67.3	1.3	111.2	-53.0
3879.9375	-45.7	0.8	90.1	-31.9
4655.9250	-82.6	8.8	119.0	-60.8
5431.9125	-64.9	11.7	98.3	-40.2
6983.8875	-70.2	5.9	109.4	-51.3

Table 5-8: Conducted Spurious Emissions – 775.9875 MHz; Full Duplex Mode

Limit = 43 + 10 log (25.6) = 57.1 dBc

Frequency (MHz)	Spectrum Analyzer Level (dBm)	Insertion Losses (dB)	Level (dBc)	Margin (dB)
1551.9750	-35.1	1.4	77.8	-20.8
2327.9625	-41.1	9.4	75.8	-18.7
3103.9500	-69.9	1.3	112.7	-55.6
3879.9375	-47.3	0.8	90.6	-33.5
5431.9125	-70.5	11.7	102.9	-45.8
6983.8875	-74.1	5.9	112.2	-55.2

Table 5-9: Test Equipment for Testing Conducted Spurious Emissions

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901215	Hewlett Packard	8596EM	EMC Analyzer (9 kHz – 12.8 GHz)	3826A00144	10/23/09
901138	Weinschel Corp.	48-40-34 DC-18GHz	Attenuator, 100W 40dB	BK5883	12/3/09
901517	Insulated Wire Inc.	KPS-1503-360-KPS-09302008	RF cable 36"	NA	10/17/09
900948	Weinschel Corporation	47-10-43	Attenuator DC-18 GHz 10 dB 50W	BH1487	12/3/09
901132	Par Electronics	806-902 (25W)	UHF Notch Filter	N/A	3/10/12

Test Personnel:

Daniel W. Baltzell		September 4, 2009
Test Engineer	Signature	Date Of Tests

6 FCC Rules and Regulations Part 90 §90.543(a) and Part 2 §2.1049(c)(1): Occupied Bandwidth; RSS-119 §4.2: Transmitter Unwanted Emissions

Occupied Bandwidth - provided that the ACCP requirements are met, the applicants may request any authorized bandwidth that does not exceed the channel size.

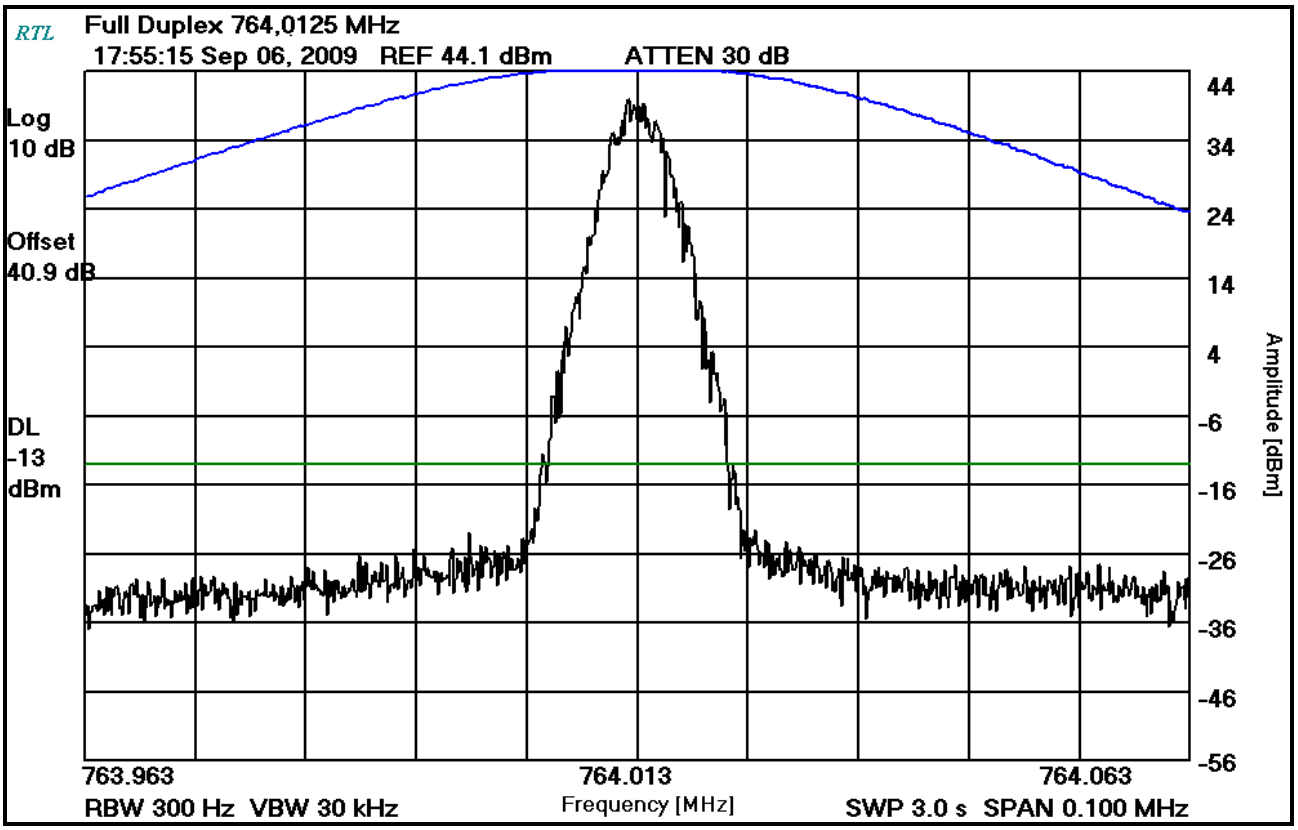
6.1 Test Procedure

Device with digital modulation: modulated to its maximum extent using a pseudo-random data sequence – 9600 bps.

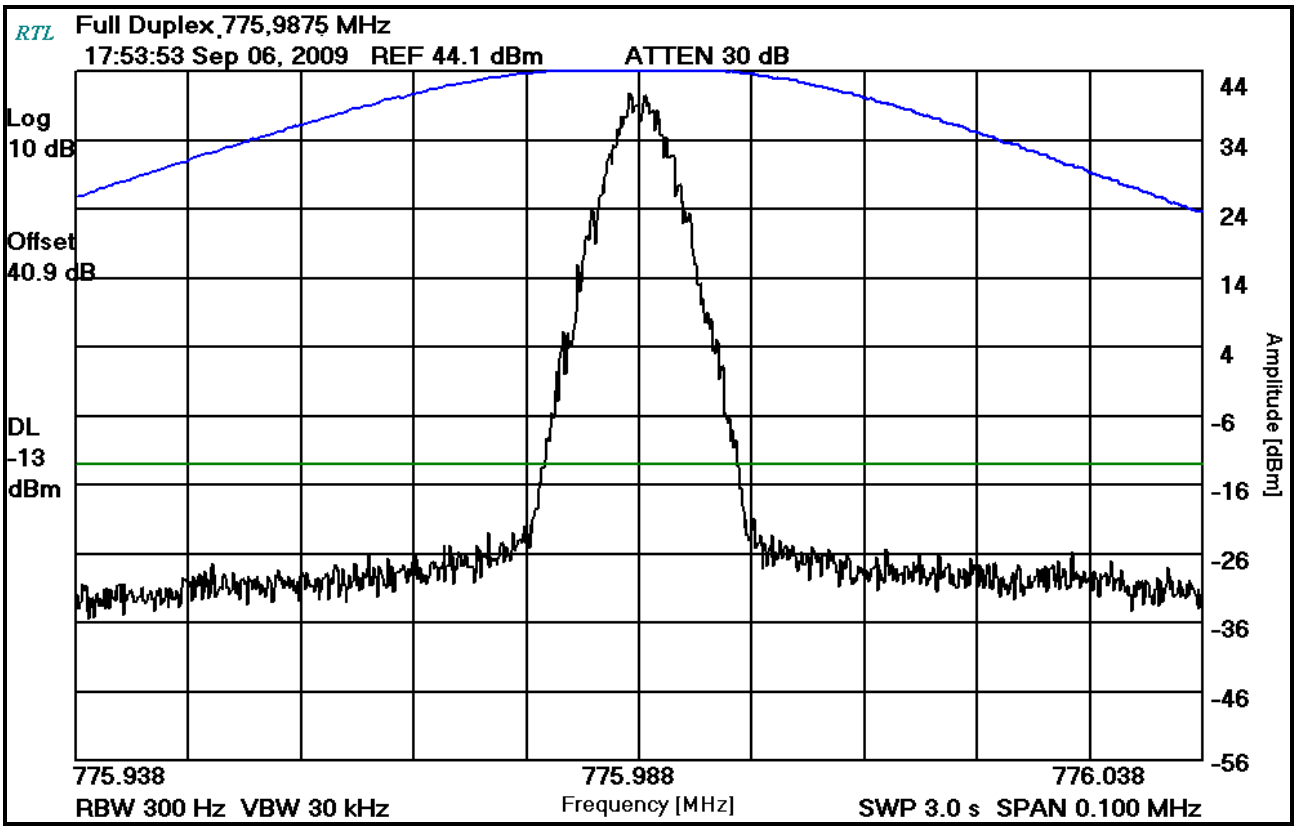
ANSI/TIA-603-B-2002, section 2.2.11

6.2 Test Data

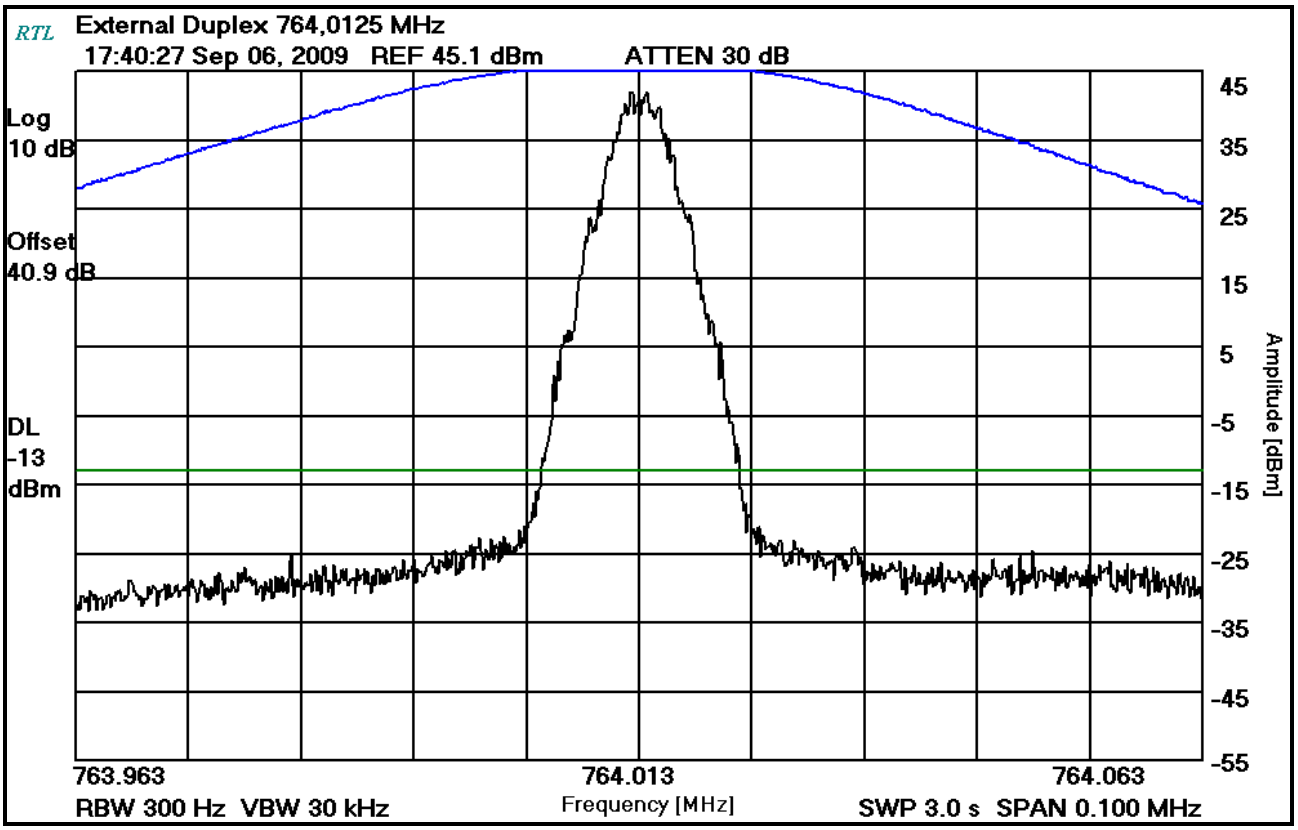
Plot 6-1: Occupied Bandwidth; Full Duplex Mode; 764.0125 MHz



Plot 6-2: Occupied Bandwidth; Full Duplex Mode; 775.9875 MHz



Plot 6-3: Occupied Bandwidth; Non-Duplex Mode; 764.0125 MHz



Plot 6-4: Occupied Bandwidth; Non-Duplex Mode; 775.9875 MHz

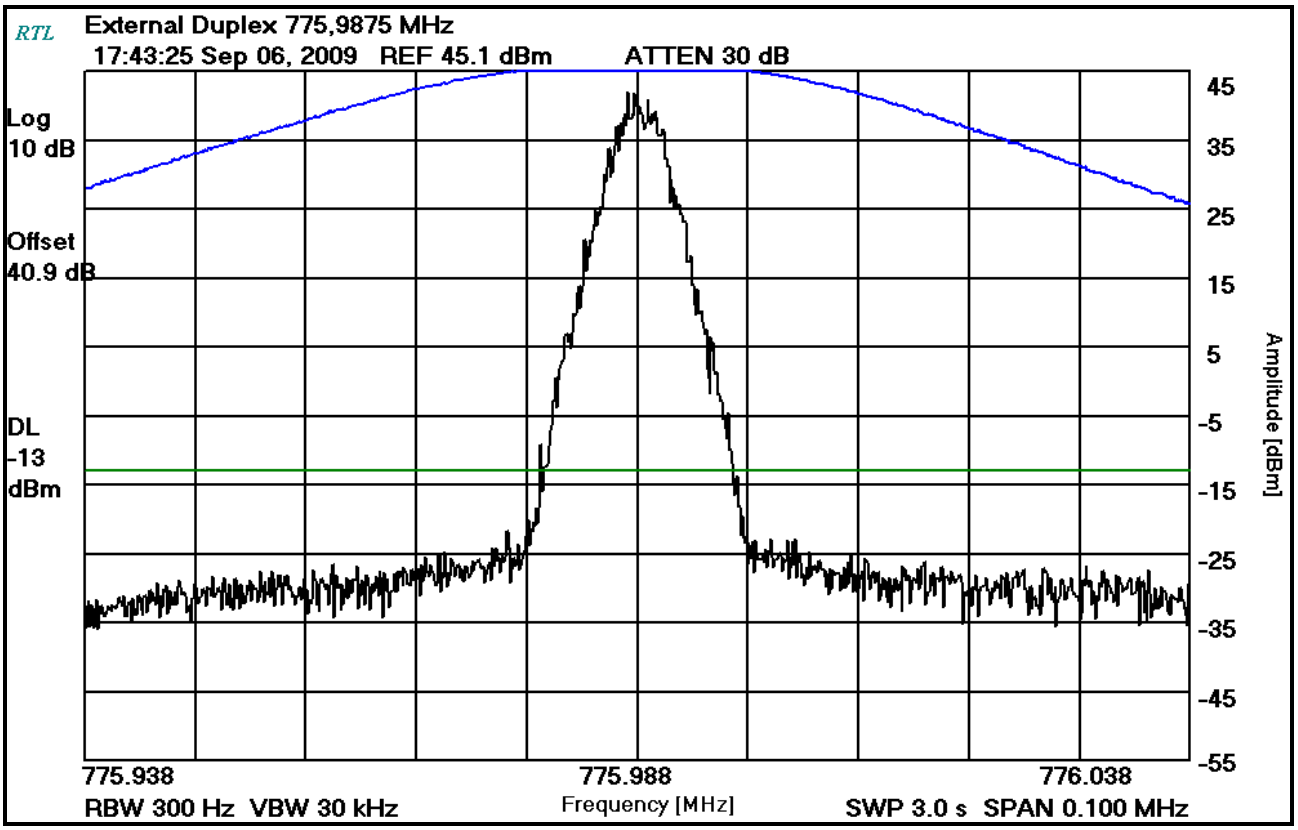
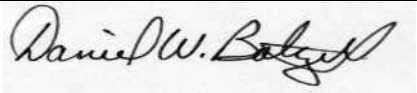


Table 6-1: Test Equipment for Testing Occupied Bandwidth

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900930	Hewlett Packard	85662A	Spectrum Analyzer Display Section	3144A20839	8/26/10
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz - 22 GHz)	3138A07771	8/26/10
901396	MCE Weinschel	48-40-34	Attenuator, 40 dB, DC-18 GHz, 100 W	93453	12/3/09
901517	Insulated Wire Inc.	KPS-1503-360-KPS-09302008	RF cable 36"	NA	10/17/09

Test Personnel:

Dan Baltzell		September 6, 2009
Test Engineer	Signature	Date Of Tests

7 FCC Rules and Regulations Part 90 §90.543(a): Emission Limitations: ACCP Requirements

Transmitters designed to operate in the 764-776 MHz and 794-806 MHz frequency bands must meet the emission limitations of this section.

7.1 Test Procedure

Device with digital modulation: modulated to its maximum extent using a pseudo-random data sequence – 9600 bps.

For a base transmitter designed to operate with a 12.5 kHz channel bandwidth, the ACCP shall be in accordance with the following table:

Offset from Center Frequency (kHz)	Measurement Bandwidth (kHz)	Maximum ACCP (dBc)
9.375	6.25	-40
15.625	6.25	-60
21.875	6.25	-60
37.5	25	-60
62.5	25	-65
87.5	25	-65
150	100	-65
250	100	-65
>400 to receive band	30(s)	(1)
In the receive band	30(s)	-100

[1] -80 (continues @-6dB/oct)

FCC Rules and Regulations Part 90 §90.543(b)

Setting Reference Level - Part 90 §90.543(b)(1): using a spectrum analyzer capable of ACCP measurements, set the measurement bandwidth to the channel size 12.5 kHz. Set the frequency offset of the measurement to zero and adjust the center frequency of the spectrum analyzer to give the power level in the measurement bandwidth. Record this power as the reference power level.

Measuring the power level at the frequency offset <600 kHz - Part 90 §90.543(b)(2): using a spectrum analyzer capable of ACCP measurements, set the measurement bandwidth as shown in the table. Measure ACCP in dBm. These measurements were made at maximum power. Calculate the coupled power by subtracting the measurements made in this step from the reference power level. The absolute ACCP values must be less than the values given in the table for each condition.

Measuring the power level at the frequency offset >600 kHz - Part 90 §90.543(b)(3): set the spectrum analyzer to 30 kHz resolution bandwidth, 1 MHz video bandwidth, and sample detection mode. Sweep +/-6 MHz from the carrier frequency. Set the reference level to the RMS value of the transmitter power and note the power. The response at frequencies >600 kHz must be less than the values listed in the table.

7.2 Test Data

Table 7-1: ACCP – Full Duplex Mode

			764.0125 MHz		775.9875 MHz	
Offset from Center Frequency (kHz)	Measurement BW (kHz)	Max ACP (dBc)	Max ACP Low Offset (dBc)	Max ACP High Offset (dBc)	Max ACP Low Offset (dBc)	Max ACP High Offset (dBc)
(+/-)9.375	6.25	-40	-41.0	-41.2	-42.0	-41.3
(+/-)15.625	6.25	-60	-63.8	-63.7	-63.6	-65.0
(+/-)21.875	6.25	-60	-68.2	-66.8	-69.5	-67.9
(+/-)37.5	25	-60	-69.3	-67.7	-69.1	-63.8
(+/-)62.5	25	-65	-71.1	-71.0	-71.5	-67.9
(+/-)87.5	25	-65	-72.8	-73.5	-73.7	-72.7
(+/-)150	100	-65	-68.3	-67.7	-68.1	-68.2
(+/-)250	100	-65	-71.1	-70.8	-70.6	-70.8

Table 7-2: ACCP - Full Duplex Mode

			764.0125 MHz	775.9875 MHz
Offset from Center Frequency (kHz)	Measurement BW (kHz)	Max ACP (dBc)	Max ACP (dBc)	Max ACP (dBc)
>600 to receive band	30(s)	-80	-103.0	-102.4
In receive band	30(s)	-100	-104.6	-103.6

Table 7-3: ACCP – Non-Duplex Mode

			764.0125 MHz		775.9875 MHz	
Offset from Center Frequency (kHz)	Measurement BW (kHz)	Max ACP (dBc)	Max ACP Low Offset (dBc)	Max ACP High Offset (dBc)	Max ACP Low Offset (dBc)	Max ACP High Offset (dBc)
(+/-)9.375	6.25	-40	-45.8	-42.4	-44.4	-42.3
(+/-)15.625	6.25	-60	-64.7	-64.2	-61.0	-60.9
(+/-)21.875	6.25	-60	-66.2	-66.3	-66.9	-65.9
(+/-)37.5	25	-60	-64.7	-64.7	-66.5	-65.2
(+/-)62.5	25	-65	-71.8	-72.7	-73.3	-71.3
(+/-)87.5	25	-65	-71.5	-71.3	-76.7	-76.0
(+/-)150	100	-65	-68.5	-68.8	-69.5	-69.5
(+/-)250	100	-65	-67.0	-68.8	-68.1	-68.0

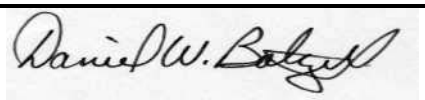
Table 7-4: ACCP - Non-Duplex Mode

			764.0125 MHz	775.9875 MHz
Offset from Center Frequency (kHz)	**Measurement BW (kHz)**	**Max ACP (dBc)**	**Max ACP (dBc)**	**Max ACP (dBc)**
>600 to receive band	30(s)	-80	-102.4	-102.8
In receive band	30(s)	-100	-103.5	-103.7

Table 7-5: Test Equipment for Testing ACCP Requirements

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900824	Hewlett Packard	8591E	Spectrum Analyzer	N/A	2/8/10
900913	Hewlett Packard	85462A	EMI Receiver RF Section (9 KHz – 6.5 GHz)	3325A00159	6/8/10
900914	Hewlett Packard	85460A	RF Filter Section, (100 KHz - 6.5 GHz)	3330A00107	6/8/10
900928	Hewlett Packard	83752A	Synthesized Sweeper, (0.01 - 20 GHz)	3610A00866	2/9/10
N/A	Kiwa Filter	8.3 FM	Mixer Filter	N/A	N/A
N/A	Mini-Circuits	ZFM-2000	455 kHz Mixer	15542	N/A
900948	Weinschel Corporation	47-10-43	Attenuator DC-18 GHz 10 dB 50W	BH1487	12/3/09
901396	MCE Weinschel	48-40-34	Attenuator, 40 dB, DC-18 GHz, 100 W	93453	12/3/09
901424	Insulated Wire Inc.	KPS-1503-360-KPS	RF cable 36"	NA	3/13/10

Test Personnel:

Dan Baltzell		September 6, 2009
Test Engineer	Signature	Date Of Tests

8 FCC Rules and Regulations Part 90 §90.210(g) and Part 2 §2.1053(a): Field Strength of Spurious Radiation; RSS-119 §4.2: Unwanted Emissions

8.1 Test Procedure

ANSI TIA-603-C-2004, section 2.2.12.

The EUT was tested in both duplex and non-duplex configurations.

The device uses digital modulation modulated to its maximum extent using a pseudo-random data sequence of 9600 bps for NBOTP (Narrow Band OpenSky Trunking Protocol) mode.

The spurious emissions levels were measured and the device under test was replaced by a substitution antenna connected to a signal generator. This maximized 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 was further corrected to a half wave dipole.

8.2 Test Data

8.2.1 CFR 47 Part 90.210 Requirements

The worst-case emissions test data are shown. The magnitude of emissions attenuated more than 20 dB below the FCC limit need not be recorded.

Limit: P(dBm) – (43 + 10xLOG P(W))

Table 8-1: Field Strength of Spurious Radiation: 764.0125 MHz – Non-Duplex Mode - Horizontal Polarity - 8K40F9W (NBOTP)

Limit = 43 + 10 log (32.5) = 58.1 dBc

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to transmit Antenna (dB)	Antenna Gain (dBd)	EIRP (dBc)	Margin (dB)
1528.0250	69.2	-47.8	1.1	6.5	87.5	-29.4
2292.0375	79.7	-36.5	1.8	7.4	76.0	-17.9
3056.0500	64.1	-49.0	2.0	7.2	88.9	-30.8
3820.0625	39.7	-71.8	2.3	7.0	112.2	-54.1
4584.0750	39.7	-68.1	2.3	9.1	106.4	-48.3
5348.0875	35.4	-67.9	4.4	8.5	108.9	-50.8
6112.1000	36.1	-68.7	3.4	9.0	108.2	-50.1
6876.1125	37.6	-63.4	4.3	9.5	103.3	-45.2
7640.1250	37.6	-64.7	5.9	9.3	106.4	-48.3

Table 8-2: Field Strength of Spurious Radiation: 764.0125 MHz – Non-Duplex Mode - Vertical Polarity - 8K40F9W (NBOTP)

Limit = 43 + 10 log (32.5) = 58.1 dBc

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to transmit Antenna (dB)	Antenna Gain (dBd)	EIRP (dBc)	Margin (dB)
1528.0250	64.5	-52.4	1.1	6.5	92.1	-34.0
2292.0375	82.0	-34.5	1.8	7.4	74.0	-15.9
3056.0500	65.8	-48.2	2.0	7.2	88.1	-30.0
3820.0625	39.3	-72.9	2.3	7.0	113.3	-55.2
4584.0750	39.3	-69.5	2.3	9.1	107.8	-49.7
5348.0875	34.9	-68.8	4.4	8.5	109.8	-51.7
6112.1000	37.4	-67.6	3.4	9.0	107.1	-49.0
6876.1125	36.6	-65.2	4.3	9.5	105.1	-47.0
7640.1250	36.4	-66.1	5.9	9.3	107.8	-49.7

Table 8-3: Field Strength of Spurious Radiation: 764.0125 MHz – Full Duplex Mode - Horizontal Polarity - 8K40F9W (NBOTP)

Limit = 43 + 10 log (25.2) = 57.0 dBc

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to transmit Antenna (dB)	Antenna Gain (dBd)	EIRP (dBc)	Margin (dB)
1528.0250	72.7	-44.3	1.1	6.5	82.9	-25.9
2292.0375	81.0	-35.2	1.8	7.4	73.6	-16.6
3056.0500	64.5	-48.6	2.0	7.2	87.4	-30.4
3820.0625	40.4	-71.1	2.3	7.0	110.4	-53.4
4584.0750	39.0	-68.8	2.3	9.1	106.0	-49.0
5348.0875	35.0	-68.3	4.4	8.5	108.2	-51.2
6112.1000	35.5	-69.3	3.4	9.0	107.7	-50.7
6876.1125	37.5	-63.5	4.3	9.5	102.3	-45.3
7640.1250	37.5	-64.8	5.9	9.3	105.4	-48.4

Table 8-4: Field Strength of Spurious Radiation: 764.0125 MHz – Full Duplex Mode - Vertical Polarity - 8K40F9W (NBOTP)

Limit = 43 + 10 log (25.2) = 57.0 dBc

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to transmit Antenna (dB)	Antenna Gain (dBd)	EIRP (dBc)	Margin (dB)
1528.0250	66.2	-50.7	1.1	6.5	89.3	-32.3
2292.0375	78.5	-38.0	1.8	7.4	76.4	-19.4
3056.0500	67.1	-46.9	2.0	7.2	85.7	-28.7
3820.0625	41.0	-71.2	2.3	7.0	110.5	-53.5
4584.0750	38.5	-70.3	2.3	9.1	107.5	-50.5
5348.0875	35.3	-68.4	4.4	8.5	108.3	-51.3
6112.1000	36.4	-68.6	3.4	9.0	107.0	-50.0
6876.1125	37.5	-64.3	4.3	9.5	103.1	-46.1
7640.1250	37.7	-64.8	5.9	9.3	105.4	-48.4

Table 8-5: Field Strength of Spurious Radiation: 775.9875 MHz – Non-Duplex Mode - Horizontal Polarity - 8K40F9W (NBOTP)

Limit = 43 + 10 log (32.4) = 58.1 dBc

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to transmit Antenna (dB)	Antenna Gain (dBd)	EIRP (dBc)	Margin (dB)
1551.9750	69.1	-47.2	1.1	6.5	86.3	-28.8
2327.9625	70.7	-46.1	1.2	7.4	84.4	-26.9
3103.9500	71.9	-41.5	2.1	7.2	80.9	-23.4
3879.9375	38.9	-71.8	3.7	7.0	113.0	-55.5
4655.9250	39.2	-65.3	4.2	9.1	104.9	-47.4
5431.9125	35.0	-67.2	3.6	8.5	106.8	-49.3
6207.9000	38.4	-66.2	4.1	9.0	105.8	-48.3
6983.8875	37.4	-63.8	5.2	9.5	104.0	-46.5
7759.8750	36.9	-63.8	4.8	9.3	103.8	-46.3

Table 8-6: Field Strength of Spurious Radiation: 775.9875 MHz – Non-Duplex Mode - Vertical Polarity - 8K40F9W (NBOTP)

Limit = 43 + 10 log (32.4) = 58.1 dBc

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to transmit Antenna (dB)	Antenna Gain (dBd)	EIRP (dBc)	Margin (dB)
1551.9750	63.5	-52.2	1.1	6.5	91.9	-33.8
2327.9625	71.3	-44.8	1.2	7.4	83.7	-25.6
3103.9500	73.7	-39.5	2.1	7.2	79.5	-21.4
3879.9375	38.2	-72.7	3.7	7.0	114.5	-56.4
4655.9250	38.2	-66.6	4.2	9.1	106.8	-48.7
5431.9125	35.1	-66.9	3.6	8.5	107.1	-49.0
6207.9000	36.4	-68.6	4.1	9.0	108.8	-50.7
6983.8875	37.0	-64.3	5.2	9.5	105.1	-47.0
7759.8750	38.0	-63.4	4.8	9.3	104.0	-45.9

Table 8-7: Field Strength of Spurious Radiation: 775.9875 MHz – Full Duplex Mode - Horizontal Polarity - 8K40F9W (NBOTP)

Limit = 43 + 10 log (25.6) = 57.1dBc

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to transmit Antenna (dB)	Antenna Gain (dBd)	EIRP (dBc)	Margin (dB)
1551.9750	71.7	-45.3	1.1	6.5	84.0	-26.9
2327.9625	74.8	-41.4	1.2	7.4	79.3	-22.2
3103.9500	74.7	-38.4	2.1	7.2	77.4	-20.3
3879.9375	37.5	-74.0	3.7	7.0	114.8	-57.7
4655.9250	38.5	-69.3	4.2	9.1	108.5	-51.4
5431.9125	34.6	-68.7	3.6	8.5	107.9	-50.8
6207.9000	37.8	-67.0	4.1	9.0	106.2	-49.1
6983.8875	37.3	-63.7	5.2	9.5	103.5	-46.4
7759.8750	36.8	-65.5	4.8	9.3	105.1	-48.0

Table 8-8: Field Strength of Spurious Radiation: 775.9875 MHz – Full Duplex Mode - Vertical Polarity - 8K40F9W (NBOTP)

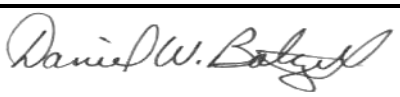
Limit = 43 + 10 log (25.6) = 57.1 dBc

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss to transmit Antenna (dB)	Antenna Gain (dBd)	EIRP (dBc)	Margin (dB)
1551.9750	67.8	-47.9	1.1	6.5	86.6	-29.5
2327.9625	74.5	-41.6	1.2	7.4	79.5	-22.4
3103.9500	76.0	-37.2	2.1	7.2	76.2	-19.1
3879.9375	39.5	-71.4	3.7	7.0	112.2	-55.1
4655.9250	37.6	-67.2	4.2	9.1	106.4	-49.3
5431.9125	37.8	-64.2	3.6	8.5	103.4	-46.3
6207.9000	35.4	-69.6	4.1	9.0	108.8	-51.7
6983.8875	35.9	-65.4	5.2	9.5	105.2	-48.1
7759.8750	36.2	-65.2	4.8	9.3	104.8	-47.7

Table 8-9: Test Equipment for Testing Field Strength of Spurious Radiation

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901215	Hewlett Packard	8596EM	Spectrum Analyzer (9 kHz - 12.8 GHz)	3826A00144	10/23/09
900928	Hewlett Packard	83752A	Synthesized Sweeper, (0.01 - 20 GHz)	3610A00866	2/9/10
900791	Chase	CBL6111B	Bilog Antenna (30 MHz – 2000 MHz)	N/A	12/12/10
900772	EMCO	3161-02	Horn Antenna (2 - 4 GHz)	9804-1044	6/14/10
900321	EMCO	3161-03	Horn Antenna (4.0 - 8.2 GHz)	9508-1020	6/14/10
900323	EMCO	3160-07	Horn Antenna (8.2 - 12.4 GHz)	9605-1054	6/14/10
901262	ETS	3160-9	Double ridged Guide Antenna (1 - 18 GHz)	6748	5/1/11
901426	Insulated Wire Inc.	KPS-1503-3600-KPS	RF cable, 30'	NA	10/17/09
901516	Insulated Wire, Inc.	KPS-1503-2400-KPS-09302008	RF cable, 20'	NA	10/17/09
901517	Insulated Wire Inc.	KPS-1503-360-KPS-09302008	RF cable 36"	NA	10/17/09
901365	MITEQ	JS4-00102600-41-5P	Amplifier, 0.1-26 GHz, 30dB gain	N/A	3/4/10

Test Personnel:

Daniel W. Baltzell		September 12, 2009
Test Engineer	Signature	Date Of Test

9 FCC Rules and Regulations Part 2 §2.202: Necessary Bandwidth and Emission Bandwidth

Type of Emission: F9W
Digital Voice and Data: 9600 BPS

Calculations:

$B(n) = (R/Log_2(S) + 2DK)$

8K40F9W:
where
R = 9.6 kilobits per second [raw data rate]
S = 4 [4-level FSK]
D = 2.77 [Peak FM Deviation]
K = 0.65
B(n) = 8.4 kHz
FCC Emission Designator: 8K40F9W

10 Conclusion

The data in this measurement report shows that the **Harris Corporation** Model **OpenSky 700 MHz Cell Site, FCC ID: BV8CS700, IC: 3670A-CS700,** complies with all the applicable requirements of FCC Parts 90, 15 and 2 and Industry Canada RSS-119.