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DATE: 9 December 2013

I.T.L. (PRODUCT TESTING) LTD.

FCC Radio Test Report

for

Corning Optical Communication Wireless

Equipment under test:

Mobile AccessHX High-Power DAS Remote Unit

HX-C85P19L70A17-AC-A
(C85=CELL; P19=PCS; L70=LTE;A17=AWS)

(AWS Section)

Written by: _____
R. Pinchuck, Documentation

Approved by: _____
A. Sharabi, Test Engineer

Approved by: _____
I. Raz, EMC Laboratory Manager

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Measurement/Technical Report for

Corning Optical Communication Wireless

Mobile AccessHX High-Power DAS Remote Unit

HX-C85P19L70A17-AC-A

(C85=CELL; P19=PCS; L70=LTE;A17=AWS)

(AWS Section)

FCC ID: OJFHXC85P19L70A17

This report concerns:	Original Grant: Class II change: X Class I change:
Equipment type:	PCS Licensed Transmitter
Limits used:	47CFR Parts 2; 27

Measurement procedure used is ANSI C63.4-2003.
Substitution Method used as in ANSI/TIA-603-C: 2004

Application for Certification
prepared by:
R. Pinchuck
ITL (Product Testing) Ltd.
1 Bat Sheva St.
Lod 7120101
Israel
e-mail rpinchuck@itl.co.il

Applicant for this device:
(different from "prepared by")
Habib Riazi
Corning Optical Communication Wireless
13221 Woodland Park Rd., Suite #400
Herndon, VA. 20171
U.S.A.
Tel: +1-541-758-2880
Fax: +1-703-848-0260
e-mail: Riazi@corning.com

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1. General Information

1.1 Administrative Information

Manufacturer:	Corning Optical Communication Wireless
Manufacturer's Address:	13221 Woodland Park Rd., Suite #400 Herndon, VA. 20171 Vienna, VA 22182 U.S.A. Tel: +1-541-758-2880 Fax: +1-703-848-0260
Manufacturer's Representative:	Habib Riazi
Equipment Under Test (E.U.T):	Mobile AccessHX High-Power DAS Remote Unit
Equipment Model No.:	HX-C85P19L70A17-AC-A (C85=CELL; P19=PCS; L70=LTE;A17=AWS)
Equipment Serial No.:	Not Designated
Date of Receipt of E.U.T:	06.11.13
Start of Test:	06.11.13
End of Test:	14.11.13
Test Laboratory Location:	I.T.L (Product Testing) Ltd. Kfar Bin Nun, ISRAEL 99780
Test Specifications:	FCC Parts 2; 27

1.2 List of Accreditations

The EMC laboratory of I.T.L. is accredited by the following bodies:

1. The American Association for Laboratory Accreditation (A2LA) (U.S.A.), Certificate No. 1152.01.
2. The Federal Communications Commission (FCC) (U.S.A.), Registration No. 90715.
3. The Israel Ministry of the Environment (Israel), Registration No. 1104/01.
4. The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) (Japan), Registration Numbers: C-1350, R-1285.
5. Industry Canada (Canada), IC File No.: 46405-4025; Site No. IC 4025B-1.

I.T.L. Product Testing Ltd. is accredited by the American Association for Laboratory Accreditation (A2LA) and the results shown in this test report have been determined in accordance with I.T.L.'s terms of accreditation unless stated otherwise in the report.

1.3 Product Description

The MobileAccess**HX** is a high power, Distributed Antenna System (DAS) solution for indoors or outdoors (model dependent). It is a fiber-fed, compact and scalable multi-service platform designed to provide complete RF open space coverage for large scale public venues, such as campuses, stadiums, convention centers, hotels, airports, and train stations.

HX supports multiple wireless technologies and operator services over a single broadband infrastructure. Using low loss fiber optic cabling remote units can cover distances of up to 2Km from the BTS signal sources at the head-end.

The solution can be deployed in new sites or alongside existing MobileAccess**1000** (MA1000) and/or MobileAccess**2000** (MA2000) systems, sharing a common head-end and element management system (EMS).

Alongside MA1000/MA2000 deployments, MobileAccess**HX** provides a comprehensive indoor and outdoor coverage solution for varying site requirements, supporting everything from high-rise buildings and campus topologies to stadiums and airports.

Features & Benefits:

Multi-Service Platform: Accommodates virtually any mix of wireless voice and data services, eliminating the need for separate overlay networks. Supported services and technologies include: GSM, UMTS, HSPA, LTE, EDGE, EV-DO, AWS, and more.

Cost-Effective High Power: Optimizes and reduces the number of antennas required to cover open areas by offering 33dBm (2W) composite power per frequency band.

Available in both Indoor and outdoor models – outdoor models are ingress protected whereas indoor models are field-upgradable. The combination of both provides maximum flexibility to match any deployment.

Pay-As-You-Grow Design: Can initially be deployed in dual-band, where tri-band or quad-band configurations can be enabled as needed.

Carrier-Grade Operation: Advanced signal handling and management ensures carrier-grade performance in multi-operator deployments.

Design and Deployment Flexibility:

Remote unit supports both SM and MM fiber connections.
Supports two to four wireless frequencies.

Compatible with Existing MA1000/MA2000 Deployment: Shares a common head-end and EMS in a single deployment.

System Architecture

MobileAccess**HX** provides a complete solution consisting of HX remote units at the remote locations and head-end elements that are shared with any existing MA1000/MA2000 system that is either installed or being installed at the site. In the downlink, at the head-end, the BTS or BDA signal is conditioned by the **RIU**, ensuring a constant RF level. The conditioned signal is then converted by the Base Unit to an optical signal for transport over single or multi-mode fiber to the HX remote units, which are located at the remote locations. In the uplink, the process is reversed. The **SC-450 Controller** enables local and remote management, as well as controls all MA1000, MA2000, and HX elements from a single, centralized location.

The **MobileAccessHX Remote Unit** (indoor and outdoor models) consists of a compact enclosure that houses the RF module, power elements, and the required interfaces. The RF module supports up to four services, where two services can be enabled initially and additional services can be enabled as needed. All mobile services are combined and distributed through a single antenna port over antennas installed at the remote locations.

1.4 Test Methodology

Radiated testing were performed according to the procedures in ANSI C63.4: 2003. Radiated testing was performed at an antenna to EUT distance of 3 meters.

1.5 Test Facility

The radiated emissions tests were performed at I.T.L.'s testing facility at Kfar Bin-Nun, Israel. This site is a FCC listed test laboratory (FCC Registration No. 90715, date of listing September 3, 2009).

I.T.L.'s EMC Laboratory is also accredited by A2LA, certificate No. 1152.01.

1.6 Measurement Uncertainty

Radiated Emission

Radiated Emission (CISPR 11, EN 55011, CISPR 22, EN 55022, ANSI C63.4) for open site 30-1000MHz:

Expanded Uncertainty (95% Confidence, K=2):

± 4.96 dB

2. System Test Configuration

2.1 Justification

A FCC Grant was issued for the E.U.T. on 9/13/2013. The LTE modulation has been added to the CELL, PCS and AWS band requiring a C2PC. The following tests were performed:

RF power output

Occupied bandwidth

Spurious emissions at antenna terminals

Band edge spectrum

Spurious radiated emissions

2.2 EUT Exercise Software

The Element Management System EngGUI ver. 1.00 build 10 used for commands delivery.
These commands are used to enable / disable of EUT transmission.
EUT Embedded SW version 01.00 build 14

2.3 Special Accessories

No special accessories were needed in order to achieve compliance.

2.4 Equipment Modifications

No modifications were necessary in order to achieve compliance.

2.5 Configuration of Tested System

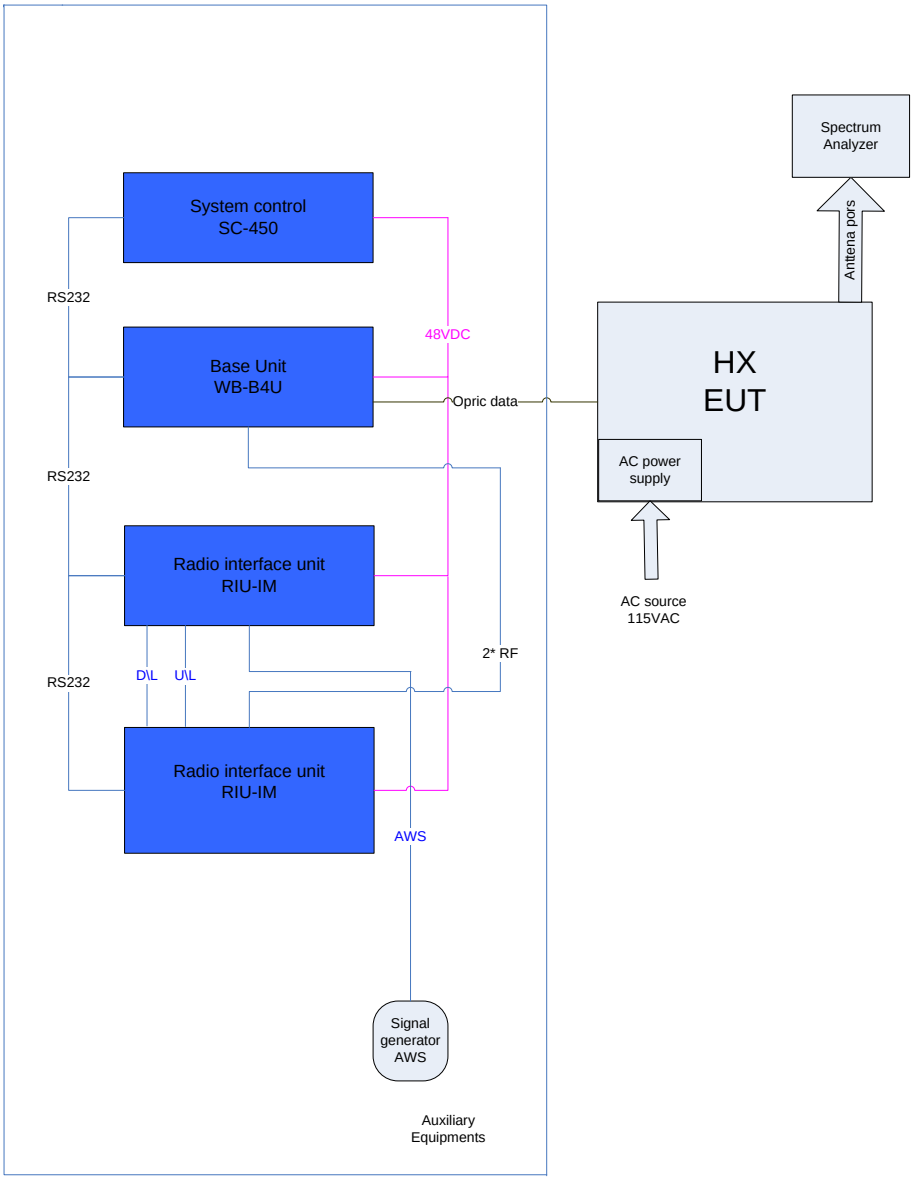

Figure 1. Test Set-up

Unit	Model	S.N
HX	HX-C8SP19LA17	5D10040
BTSE	RV-BDAC-AWS	0AS120A
BU	WB—B8U	0B09SC0
SC-450	SC-450	0A429SE
RIU	RIU-IM	0B10A8S

3. Test Set-up Photos

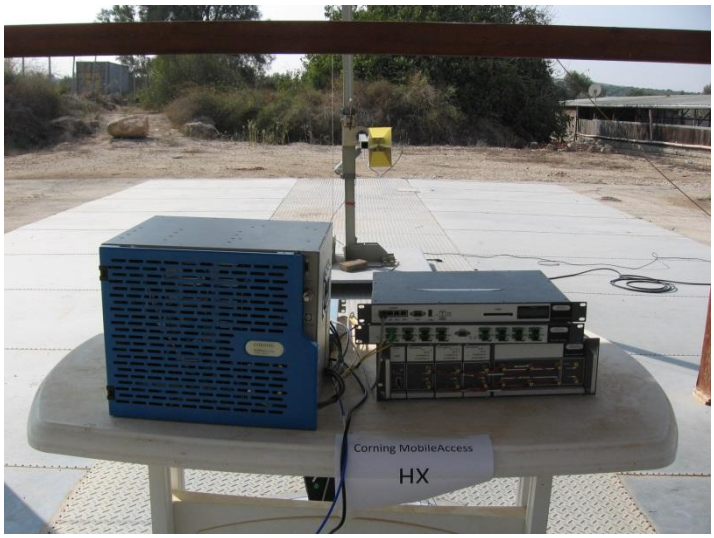

Figure 2. Radiated Emission Test

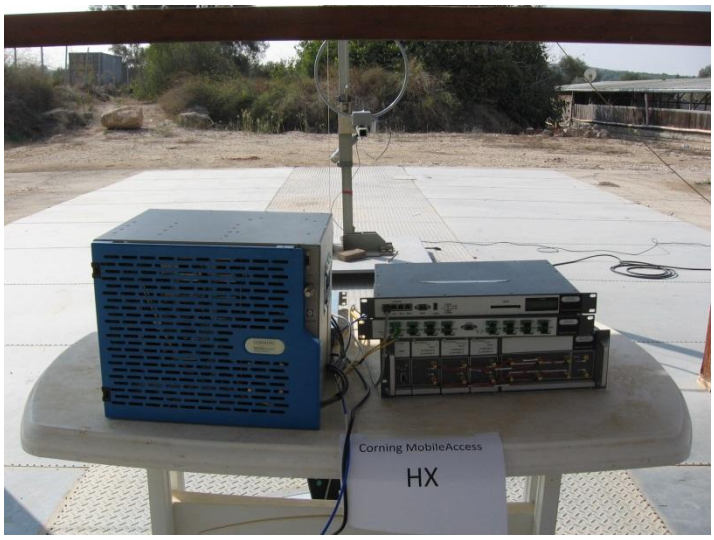

Figure 3. Radiated Emission Test

Figure 4. Radiated Emission Test

Figure 5. Radiated Emission Test

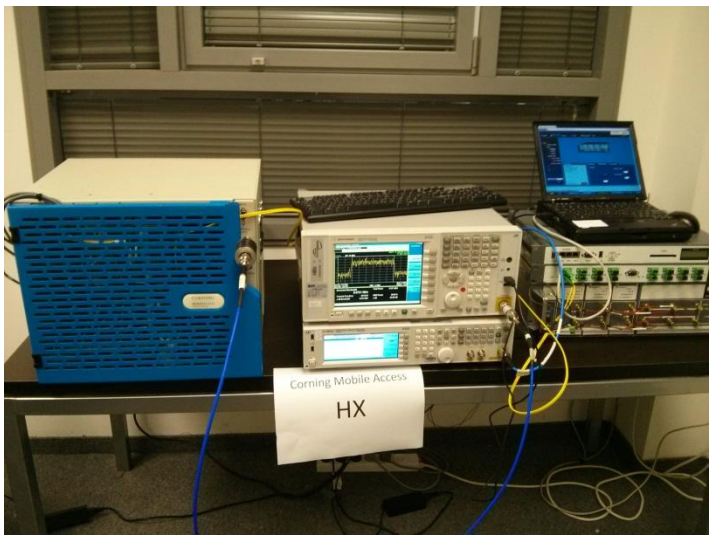

Figure 6. Conducted Emission Test

4. RF Power Output AWS

4.1 Test Specification

FCC Part 27, Subpart C (27.50(d))

4.2 Test procedure

The E.U.T. antenna terminal was connected to the Spectrum Analyzer through an external attenuator (40 dB) and an appropriate coaxial cable (1 dB). The E.U.T. RF output was modulated as follows:

LTE at 10 MHz BW channels (2115.0MHz, 2135.0 MHz and 2150.0 MHz)

16QAM;64 QAM;QPSK.

Special attention was taken to prevent Spectrum Analyzer RF input overload.

Signal generator input level 10dBm.

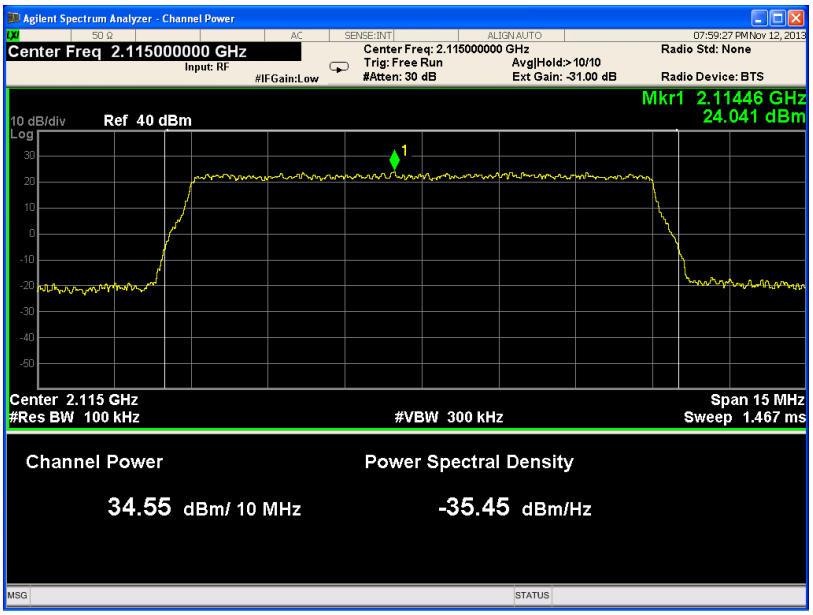

Figure 7.— 16QAM (low channel)

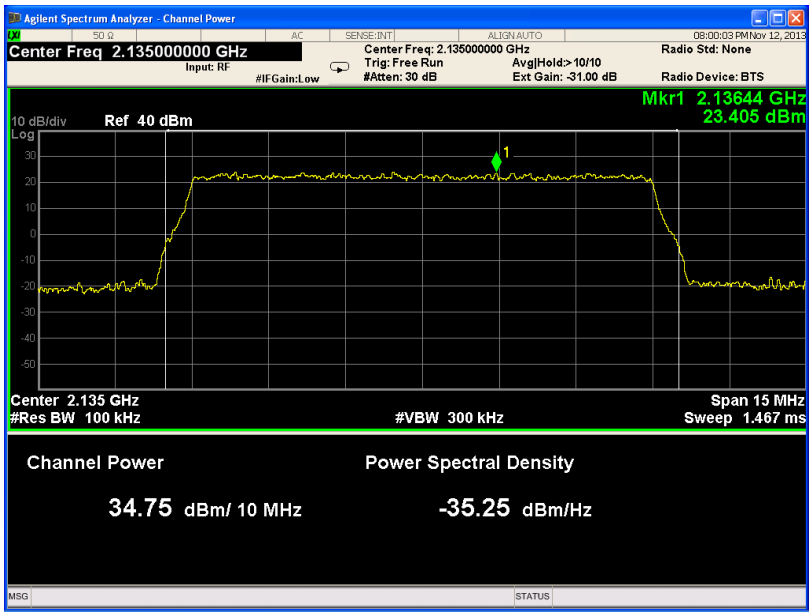

Figure 8.— 16QAM (mid channel)

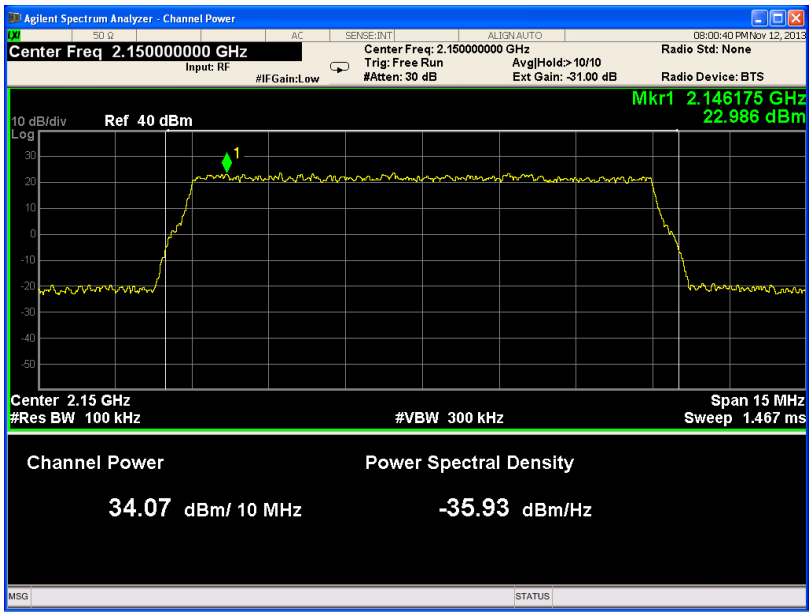

Figure 9.— 16QAM (high channel)

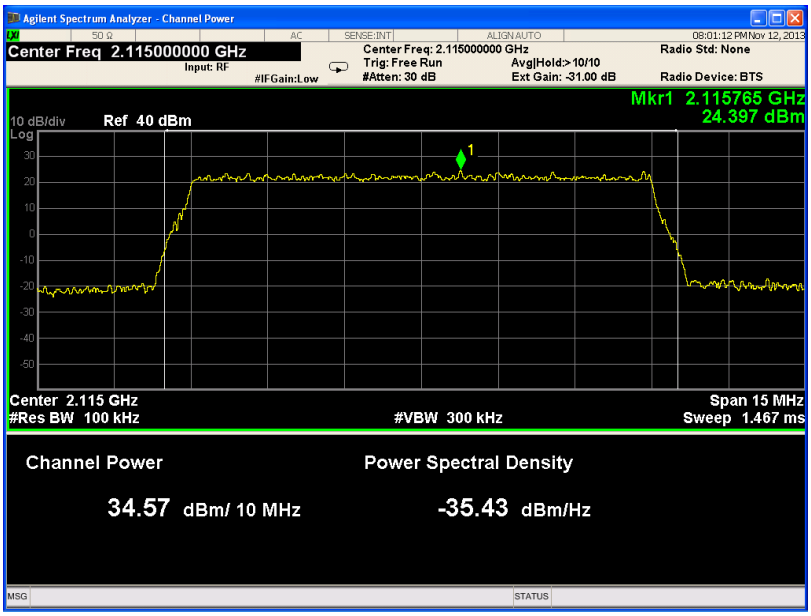

Figure 10.— 64QAM (low channel)

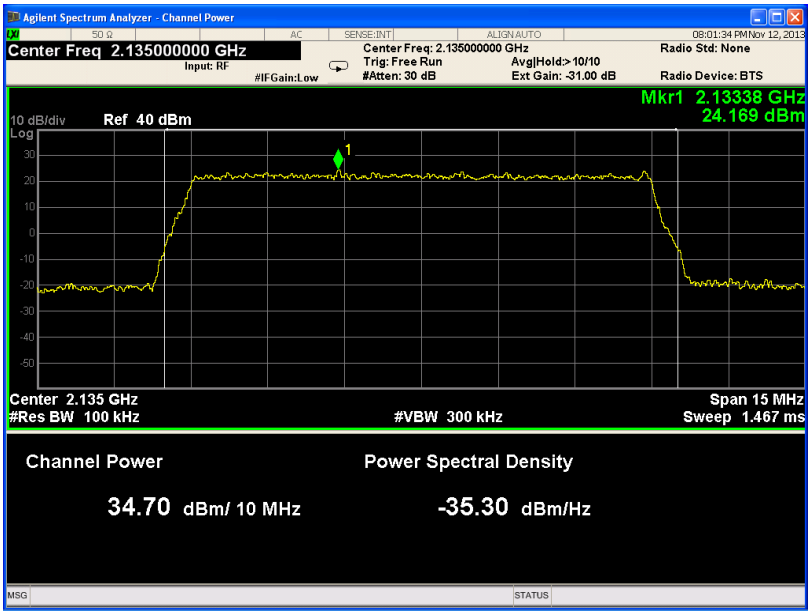

Figure 11.— 64QAM (mid channel)

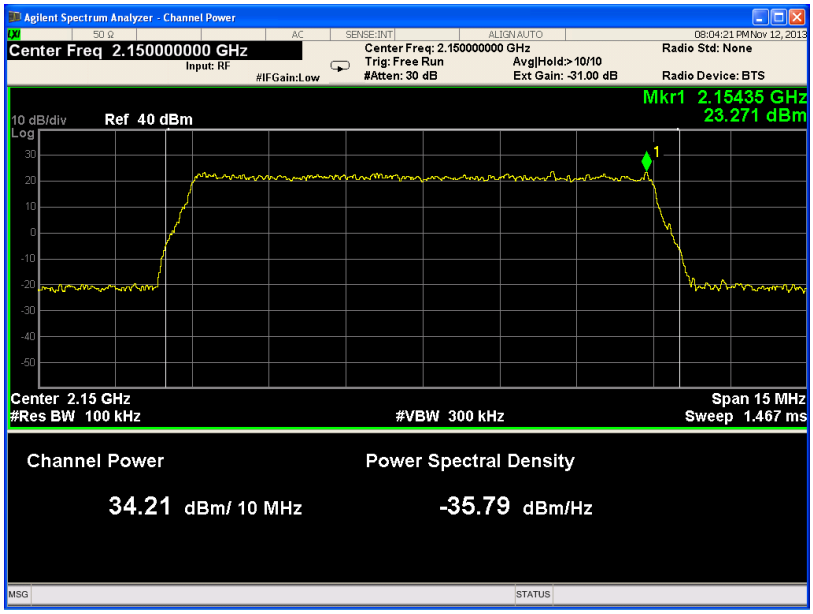

Figure 12.— 64QAM (high channel)

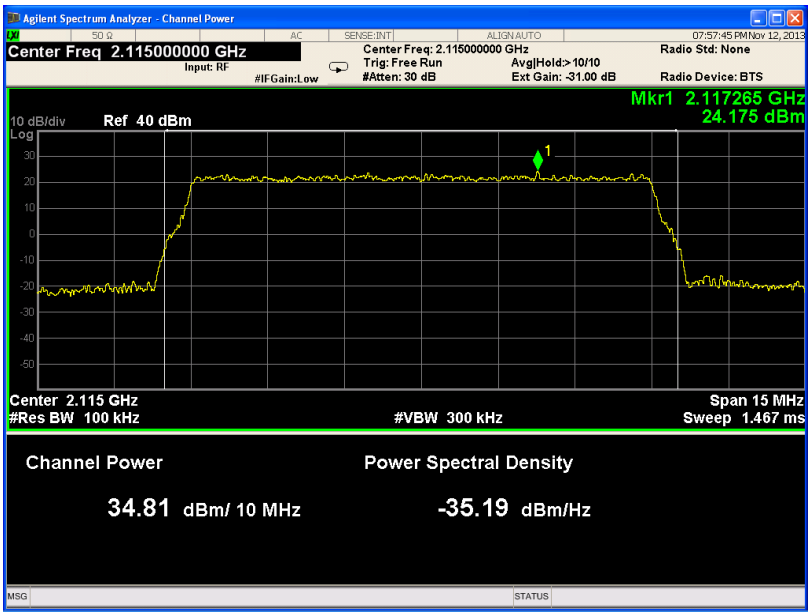

Figure 13.— QPSK (low channel)

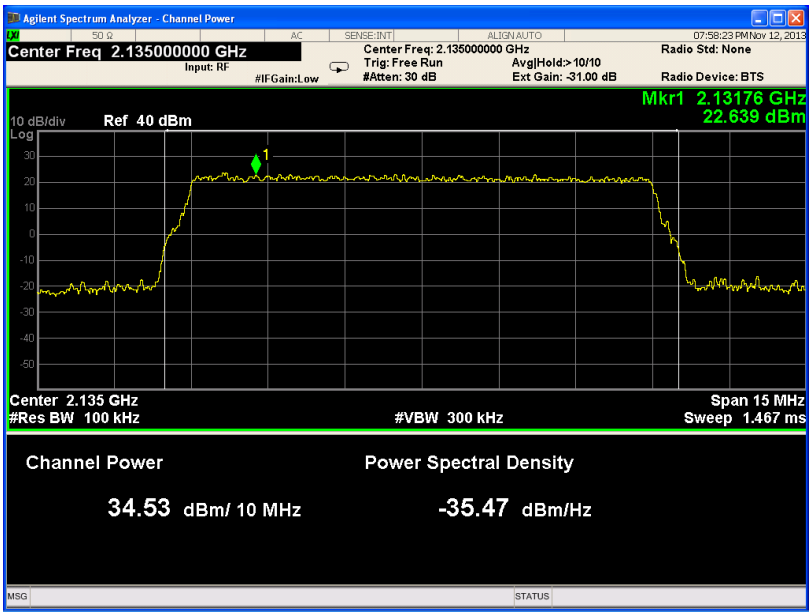

Figure 14.— QPSK (mid channel)

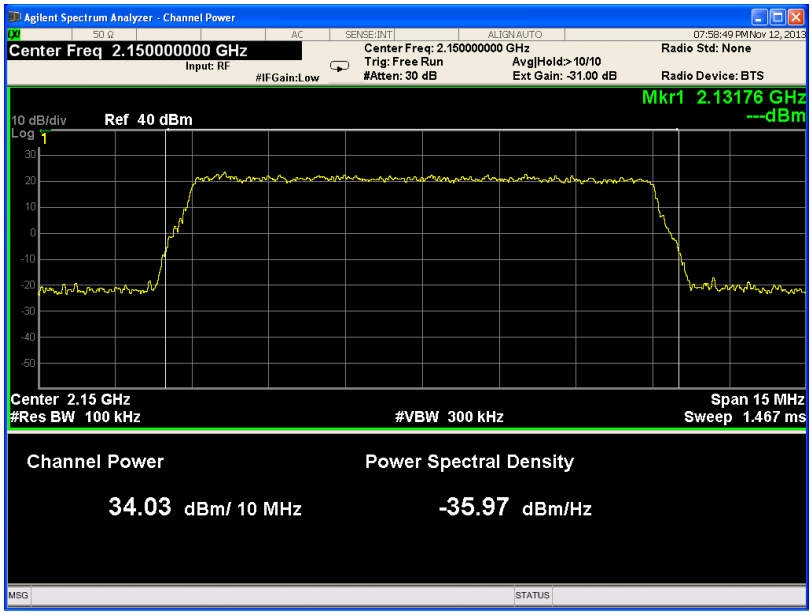

Figure 15.— QPSK (high channel)

4.3 Results

E.U.T. Description: Mobile AccessHX High-Power DAS Remote Unit
Model No.: HX-C85P19L70A17-AC-A (A17=AWS)
Serial Number: Not Designated
Specification: FCC Part 27, Subpart C, Section 27.50 (d)

Modulation	Operation Frequency (MHz)	Reading (dBm)
16 QAM	Low	34.55
16 QAM	Mid	34.75
16 QAM	High	34.07
64 QAM	Low	34.57
64 QAM	Mid	34.70
64 QAM	High	34.21
QPSK	Low	34.81
QPSK	Mid	34.57
QPSK	High	34.83

Figure 16 RF Power Output AWS

TEST PERSONNEL:

Tester Signature: _____ Date: 11.12.13

Typed/Printed Name: A. Sharabi

4.4 Test Equipment Used.

RF Power Output AWS

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibration	Period
Spectrum Analyzer	Agilent	N9010A EXA	MY49061070	July 28, 2013	1 year
Spectrum Analyzer	HP	8564E	3313U00346	February 28, 2013	1 year
Signal Generator	Agilent	N5172B EXG	MY51350549	December 28, 2012	1 year
Attenuator	MCE	46-30-34	BN4927	November 12, 2013	1 year
Cable	Mini-Circuits	30091		November 12, 2013	1 year

Figure 17 Test Equipment Used

5. Occupied Bandwidth AWS

5.1 Test Specification

FCC Part 2, Section 1049

5.2 Test Procedure

The E.U.T. was set to the applicable test frequency and modulation. The E.U.T. antenna terminal was connected to the spectrum analyzer through an external attenuator (at the output test) and an appropriate coaxial cable. The spectrum analyzer was set to proper resolution B.W.
The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limit, the mean powers radiated are each equal to 0.5% of the total mean power radiated by a given emission.
Occupied bandwidth measured was repeated in the input terminal of the E.U.T.

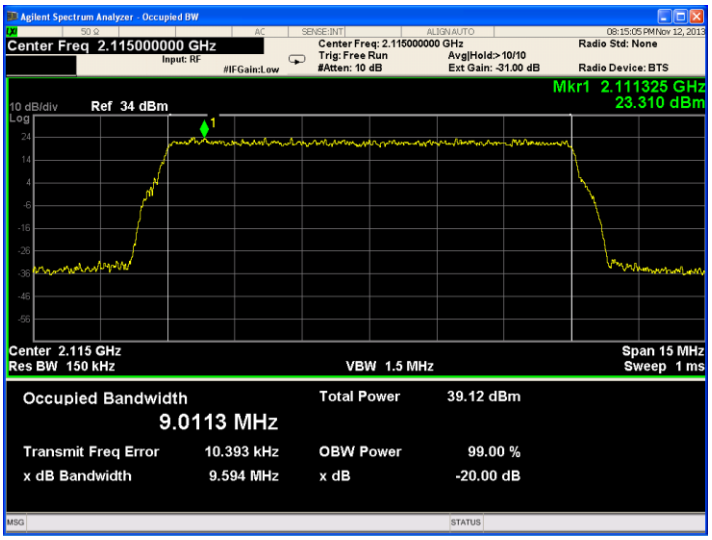

Figure 18.— 16QAM (low channel) IN

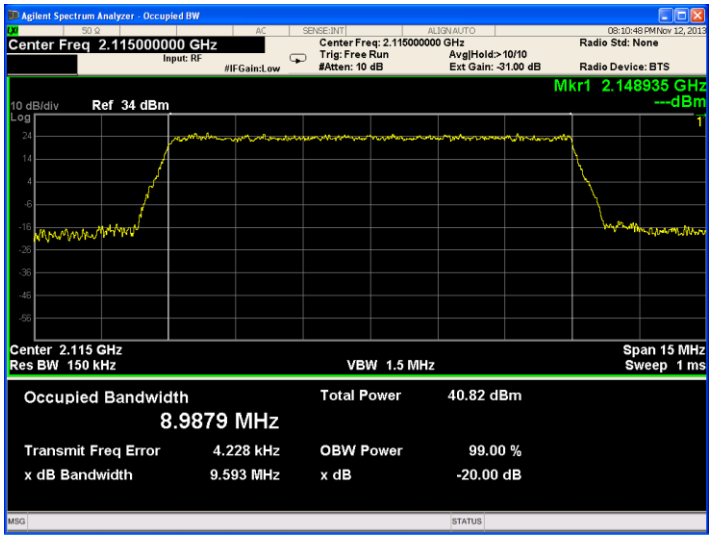

Figure 19.— 16QAM (low channel) OUT

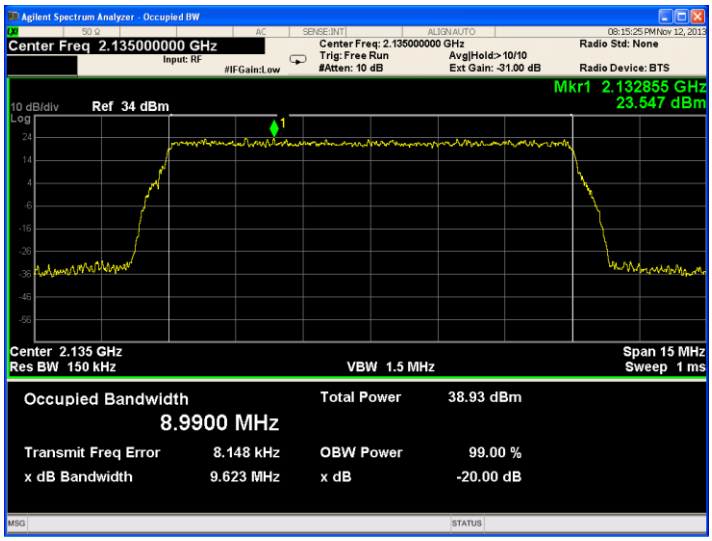

Figure 20.— 16QAM (mid channel) IN

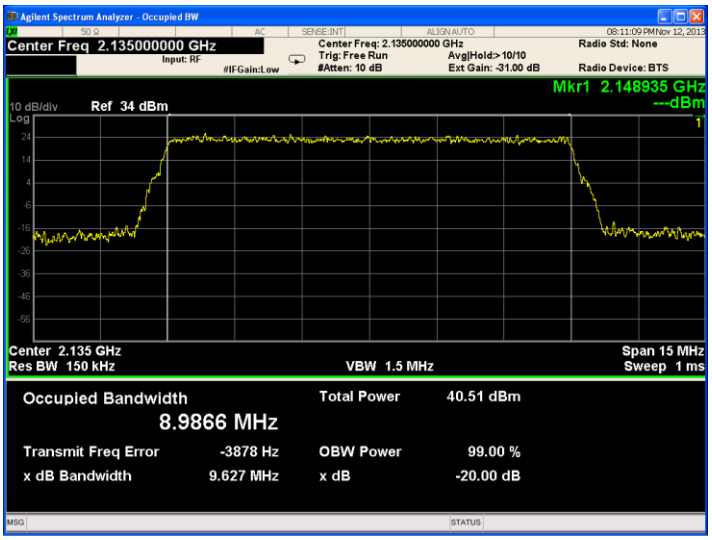

Figure 21.— 16QAM (mid channel) OUT

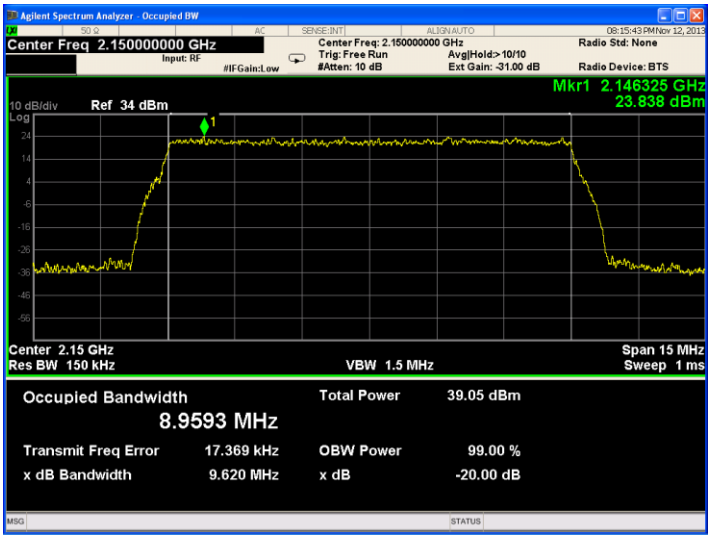

Figure 22.— 16 QAM (high channel) IN

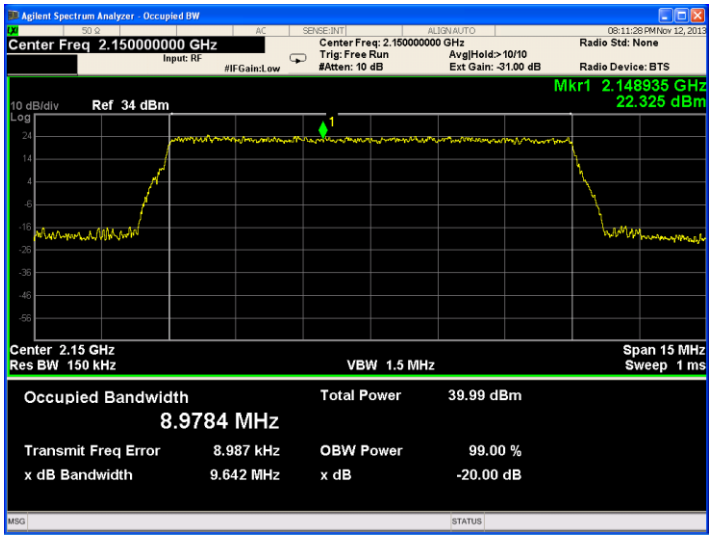

Figure 23.— 16QAM (high channel) OUT

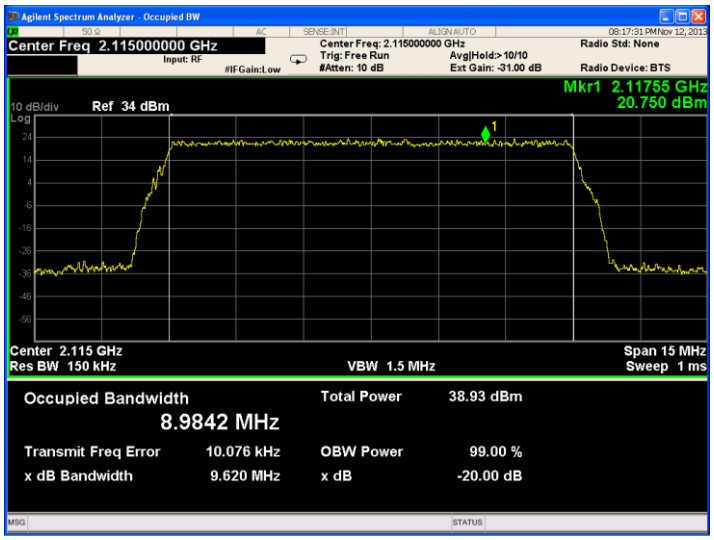

Figure 24.— 64QAM (low channel) IN

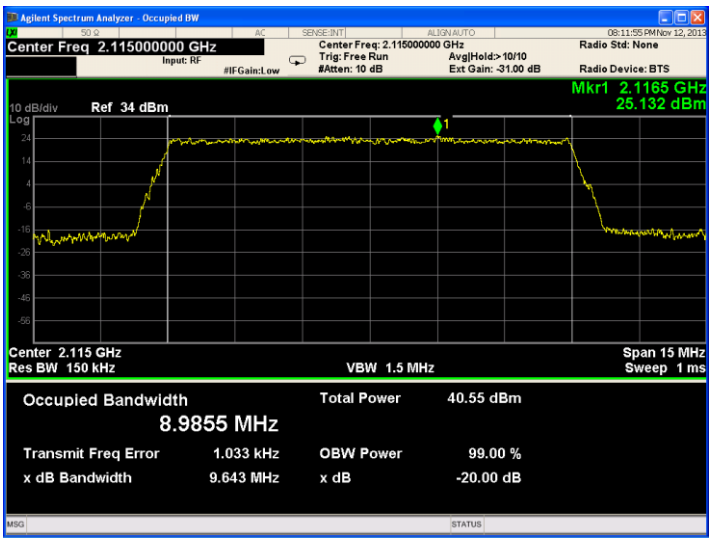

Figure 25.— 64QAM (low channel) OUT

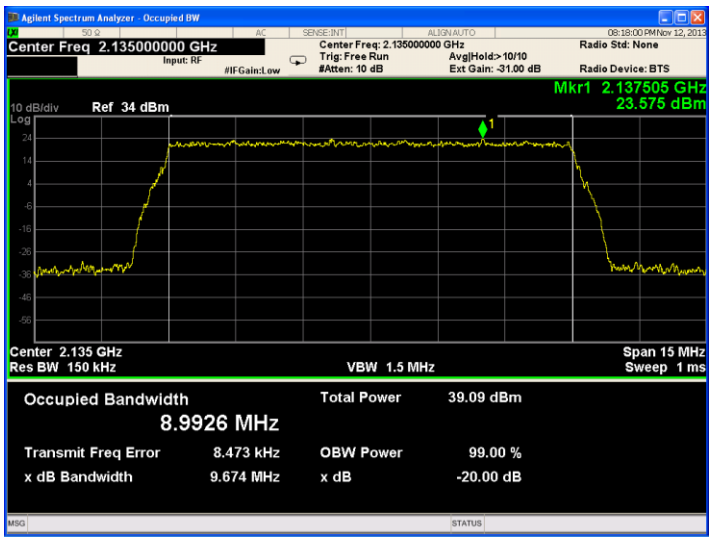

Figure 26.— 64QAM (mid channel) IN

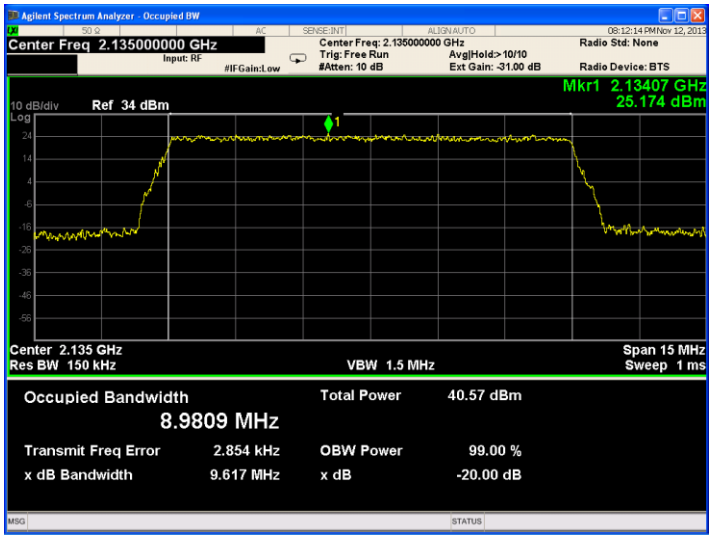

Figure 27.— 64QAM (mid channel) OUT

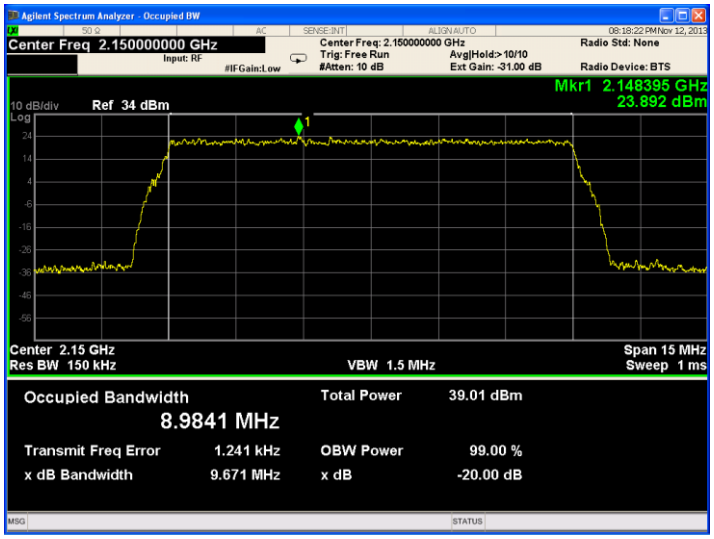

Figure 28.— 64QAM (high channel) IN

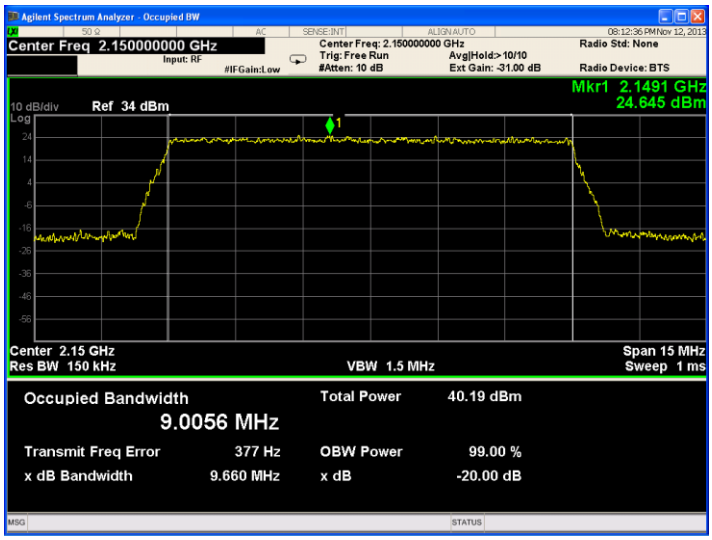

Figure 29.— 64QAM (high channel) OUT

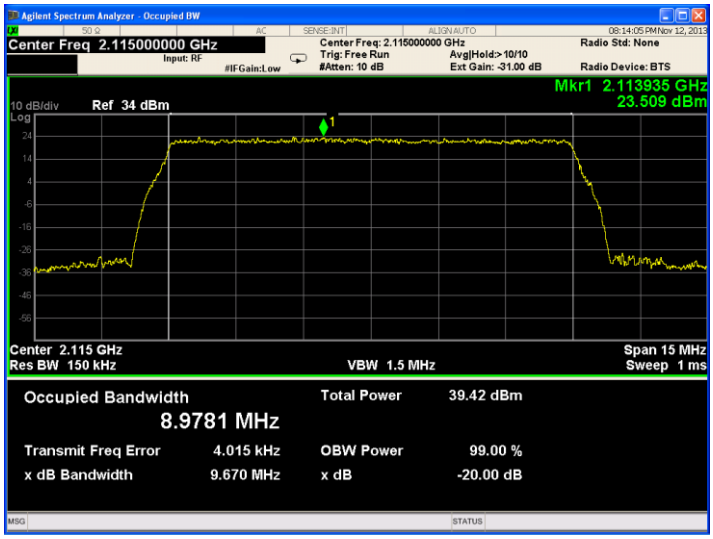

Figure 30.— QPSK (low channel) IN

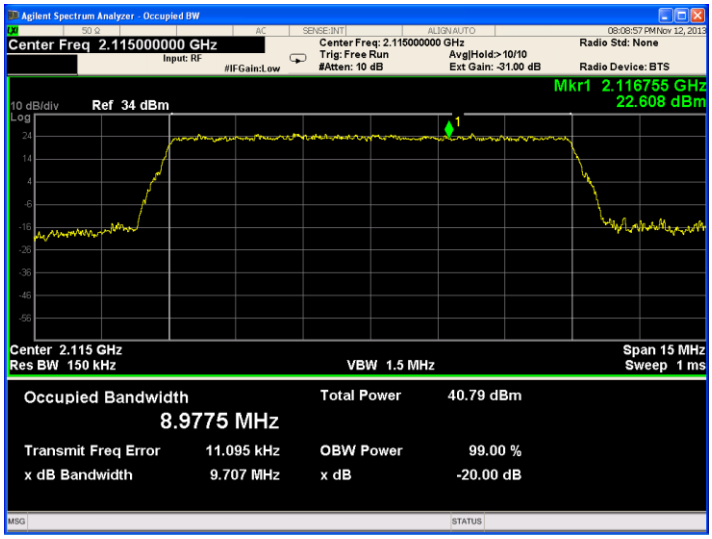

Figure 31.— QPSK (low channel) OUT

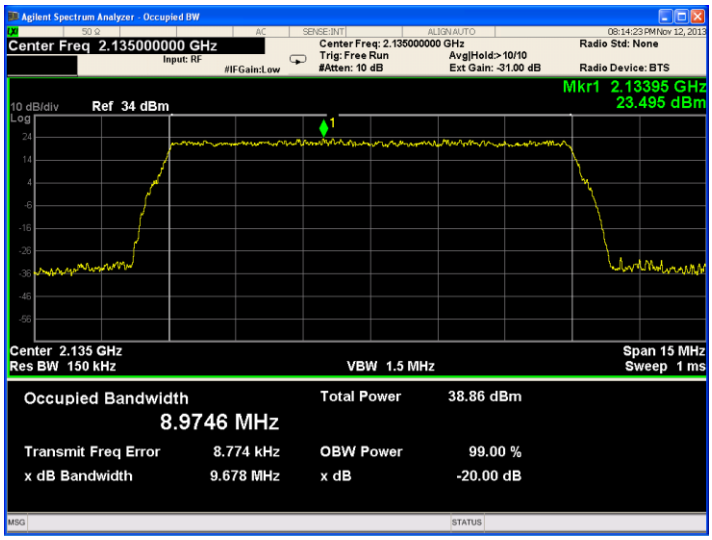

Figure 32.— QPSK (mid channel) IN

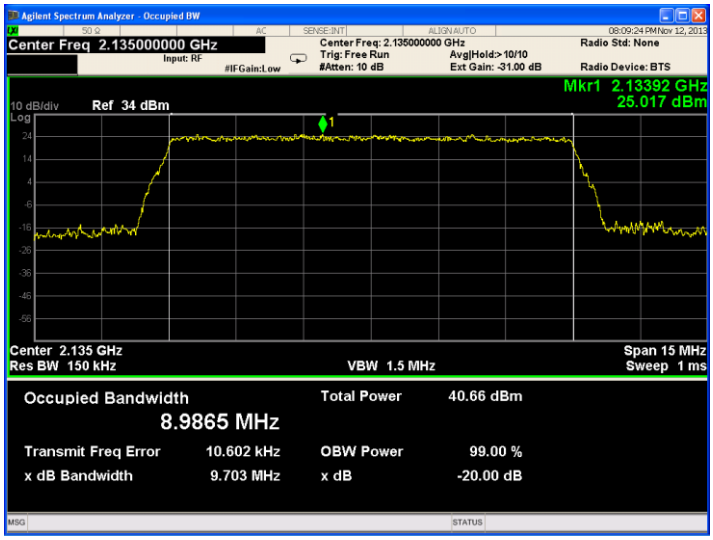

Figure 33.— QPSK (mid channel) OUT

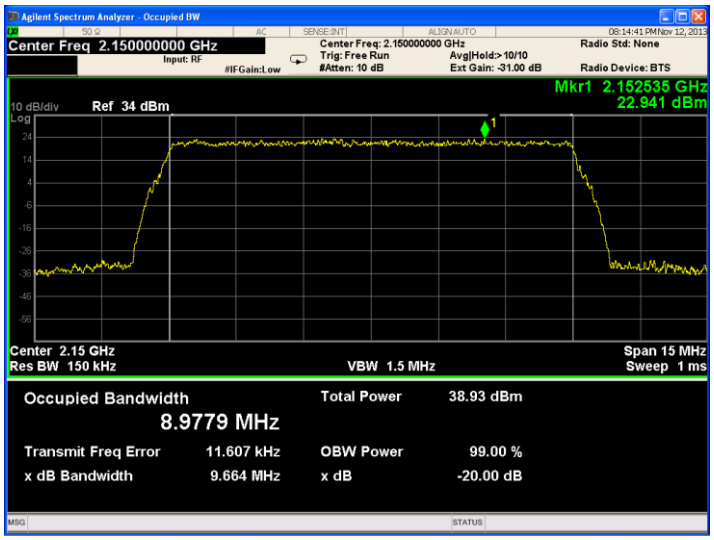

Figure 34.— QPSK (high channel) IN

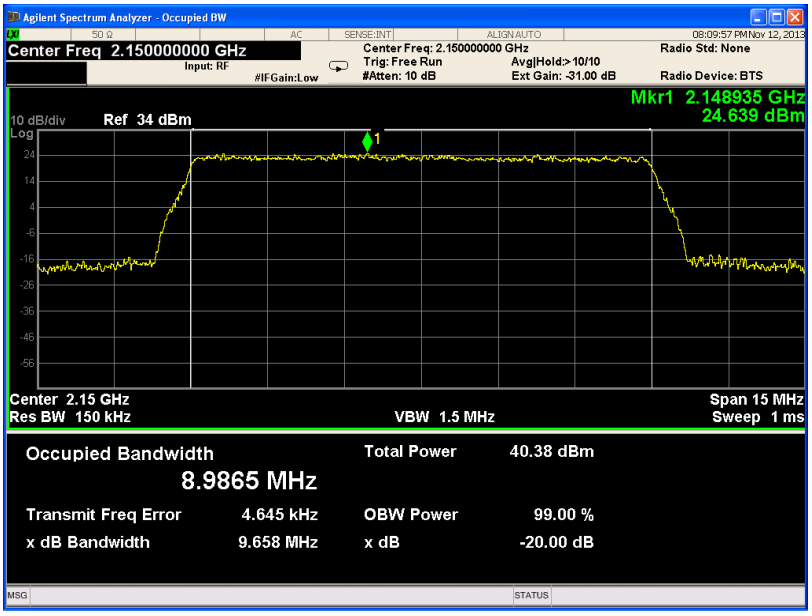

Figure 35.— QPSK (high channel) OUT

5.3 Results

E.U.T. Description: Mobile AccessHX High-Power DAS Remote Unit
Model No.: HX-C85P19L70A17-AC-A (A17=AWS)
Serial Number: Not Designated
Specification: FCC Part 2, Section 1049

Modulation	Input\Output	Operating Frequency	Reading
		(MHz)	(MHz)
16QAM	Input	Low	9.0113
	Output	Low	8.9879
	Input	Mid	8.9900
	Output	Mid	8.9866
	Input	High	8.9593
	Output	High	8.9784
64 QAM	Input	Low	8.9842
	Output	Low	8.9855
	Input	Mid	8.9926
	Output	Mid	8.9809
	Input	High	8.9841
	Output	High	9.0056
QPSK	Input	Low	8.9781
	Output	Low	8.9775
	Input	Mid	8.9746
	Output	Mid	8.9865
	Input	High	8.9779
	Output	High	8.9865

Figure 36 Occupied Bandwidth AWS

JUDGEMENT: Passed

TEST PERSONNEL:

Tester Signature: _____ Date: 11.12.13

Typed/Printed Name: A. Sharabi

5.4 Test Equipment Used.

Occupied Bandwidth

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibration	Period
Spectrum Analyzer	Agilent	N9010A EXA	MY49061070	July 28, 2013	1 year
Spectrum Analyzer	HP	8564E	3313U00346	February 28, 2013	1 year
Signal Generator	Agilent	N5172B EXG	MY51350549	December 28, 2012	1 year
Attenuator	MCE	46-30-34	BN4927	November 12, 2013	1 year
Cable	Mini-Circuits	30091	-	November 12, 2013	1 year

Figure 37 Test Equipment Used

6. Spurious Emissions at Antenna Terminals AWS

6.1 Test Specification

FCC Part 27, Subpart C, Section 27.53 (g)

6.2 Test procedure

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + log (P) dB, yielding –13dBm.
The E.U.T. antenna terminal was connected to the spectrum analyzer through an external attenuator and an appropriate coaxial cable (41.0 dB).

6.3 Result

JUDGEMENT: Passed

TEST PERSONNEL:

Tester Signature: _____ Date: 11.12.13

Typed/Printed Name: A. Sharabi

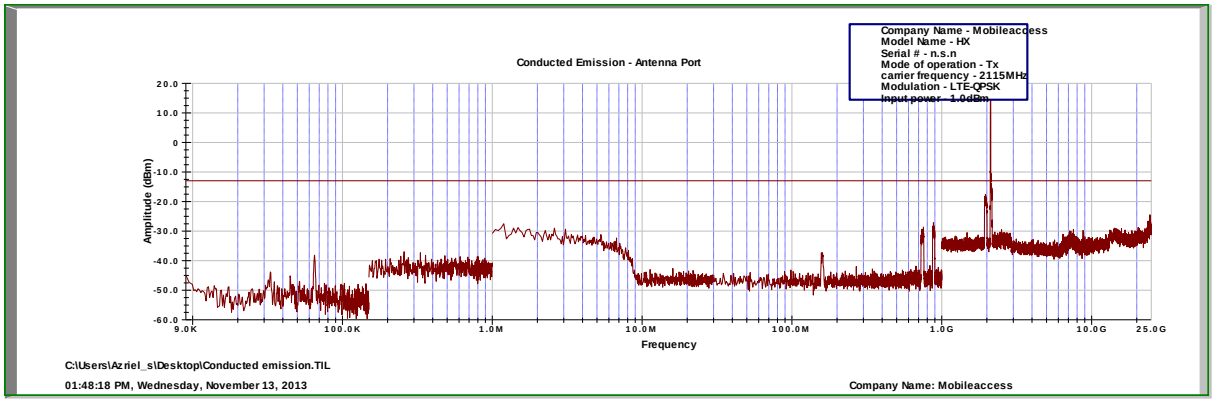

Figure 38.— 2115.00 MHz LTE 10MHz- QPSK

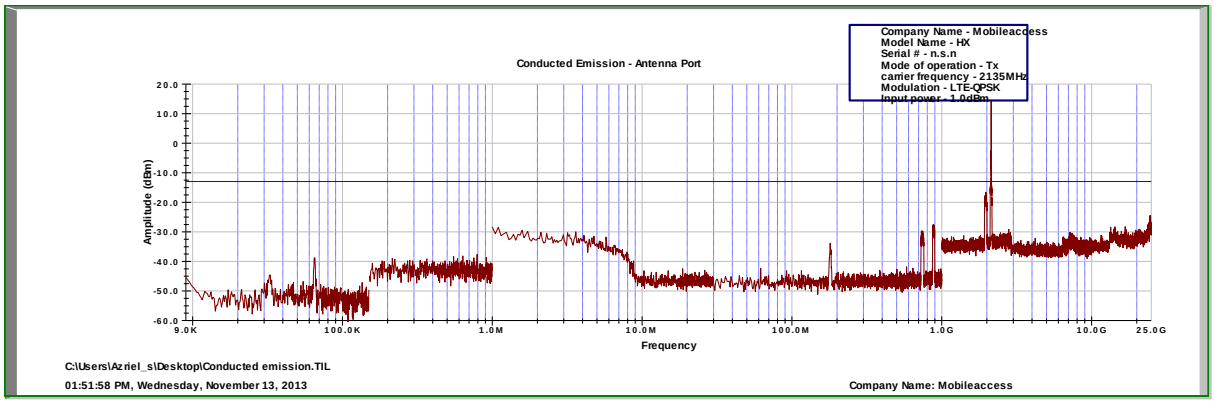

Figure 39.— 2135.00 MHz LTE 10MHz- QPSK

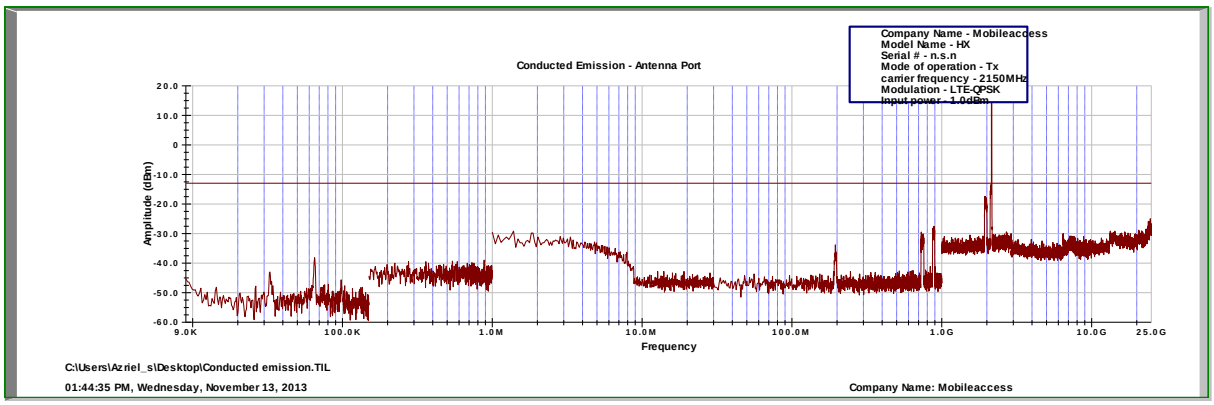

Figure 40.— 2150.00 MHz LTE 10MHz- QPSK

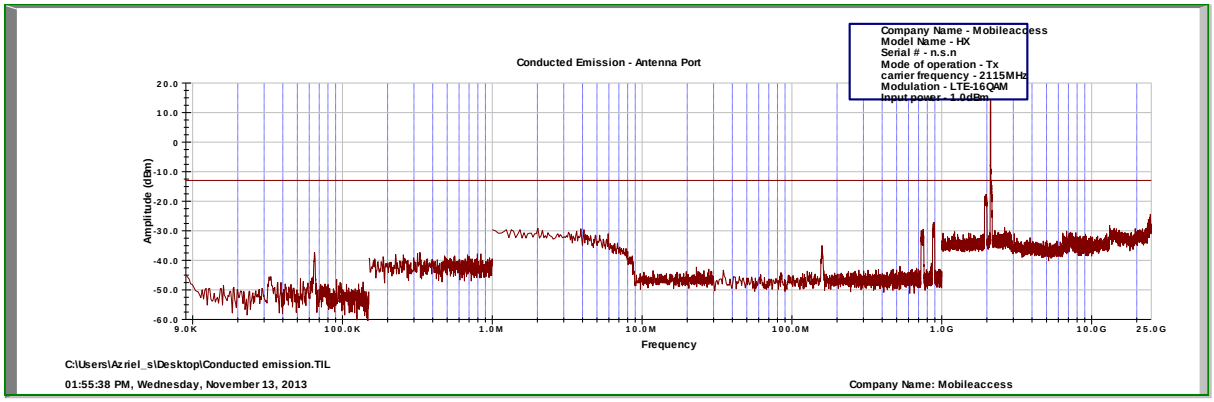

Figure 41.— 2115.00 MHz LTE 10MHz- 16QAM

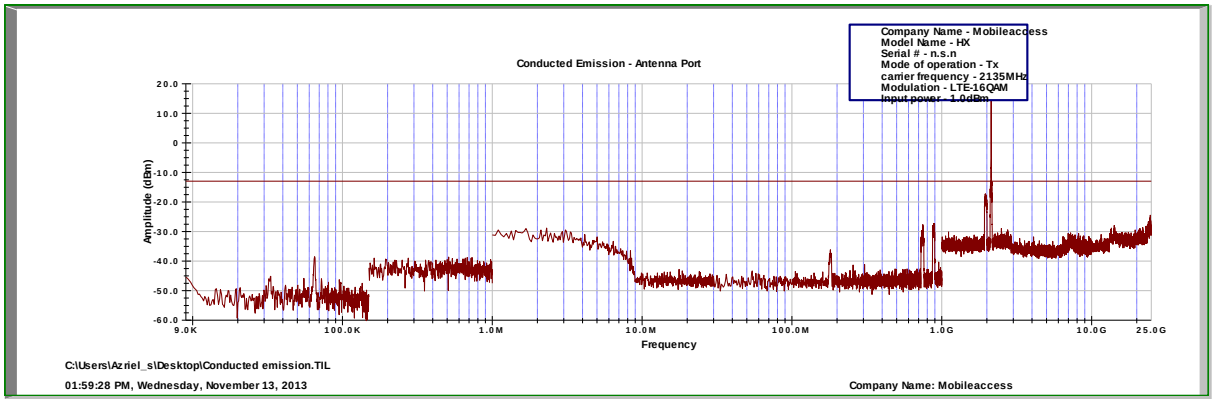

Figure 42.— 2135.00 MHz LTE 10MHz- 16QAM

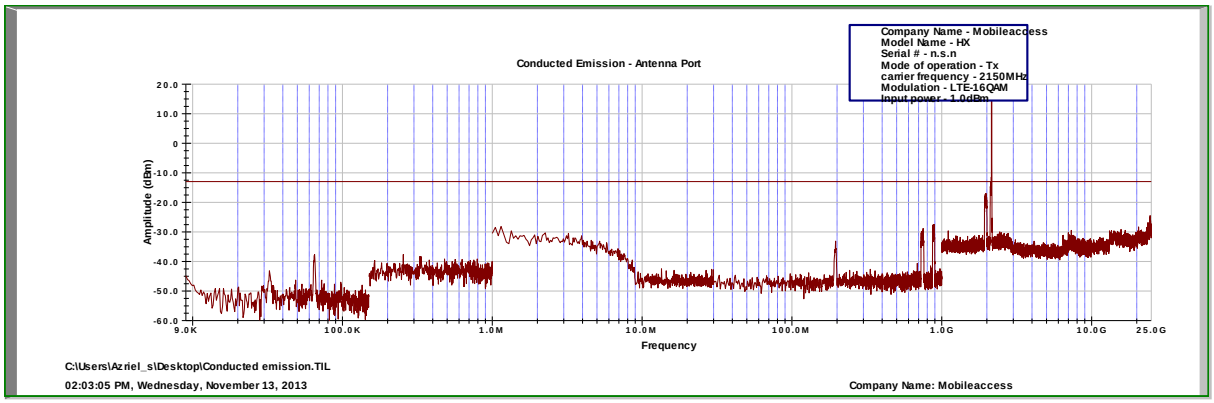

Figure 43.— 2150.00 MHz LTE 10MHz- 16QAM

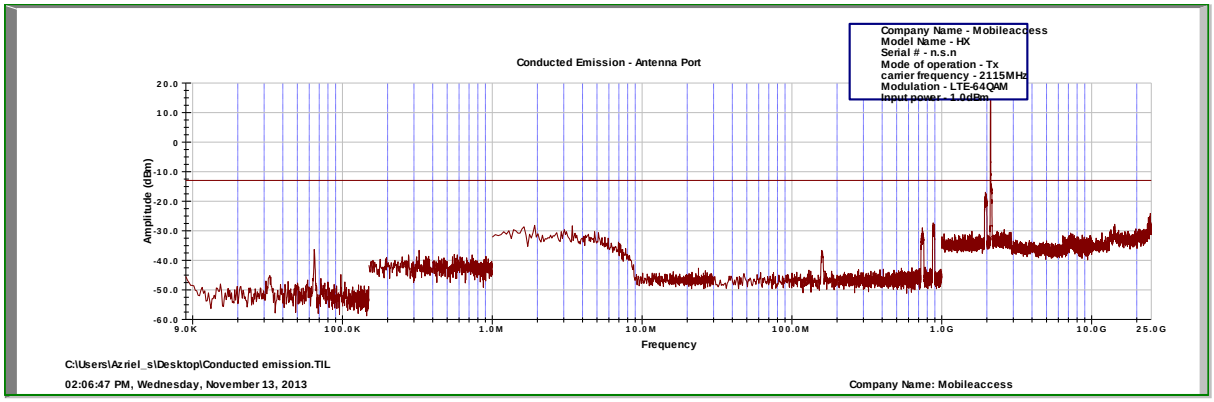

Figure 44.— 2115.00 MHz LTE 10MHz- 64QAM

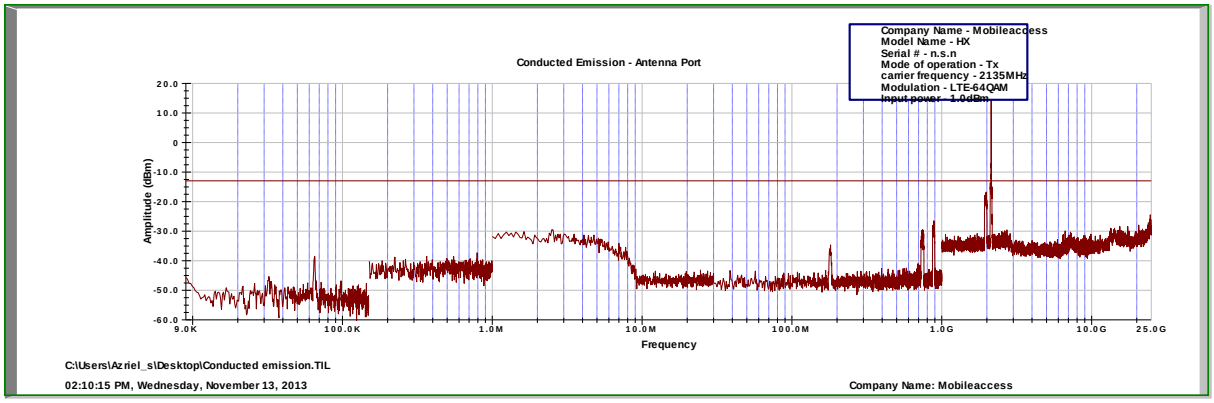

Figure 45.— 2135.00 MHz LTE 10MHz- 64QAM

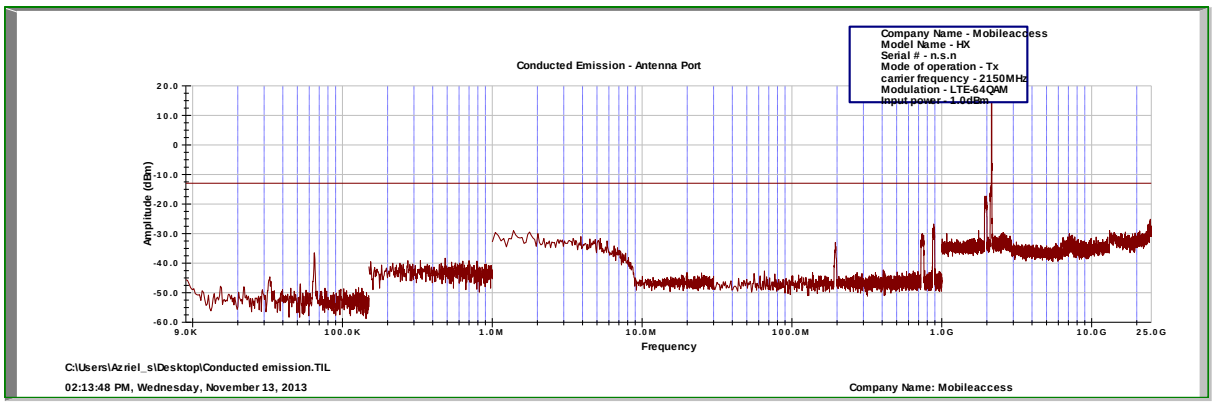

Figure 46.— 2150.00 MHz LTE 10MHz- 64QAM

6.4 Test Equipment Used.

Spurious Emissions at Antenna Terminals AWS

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibration	Period
Spectrum Analyzer	Agilent	N9010A EXA	MY49061070	July 28, 2013	1 year
Spectrum Analyzer	HP	8564E	3313U00346	February 28, 2013	1 year
Signal Generator	Agilent	N5172B EXG	MY51350549	December 28, 2012	1 year
Attenuator	MCE	46-30-34	BN4927	November 12, 2013	1 year
Cable	Mini-Circuits	30091	-	November 12, 2013	1 year

Figure 47 Test Equipment Used

7. Band Edge Spectrum AWS

7.1 Test Specification

FCC Part 27, Subpart C, Section 27.53 (m 4-6)

7.2 Test procedure

Enclosed are spectrum analyzer plots for the lowest operation frequency and the highest operation frequency in which the E.U.T. is planned to be used.

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + log (P) dB, yielding –13dBm.

The E.U.T. antenna terminal was connected to the spectrum analyzer through an external attenuator and an appropriate coaxial cable (41.0 dB).

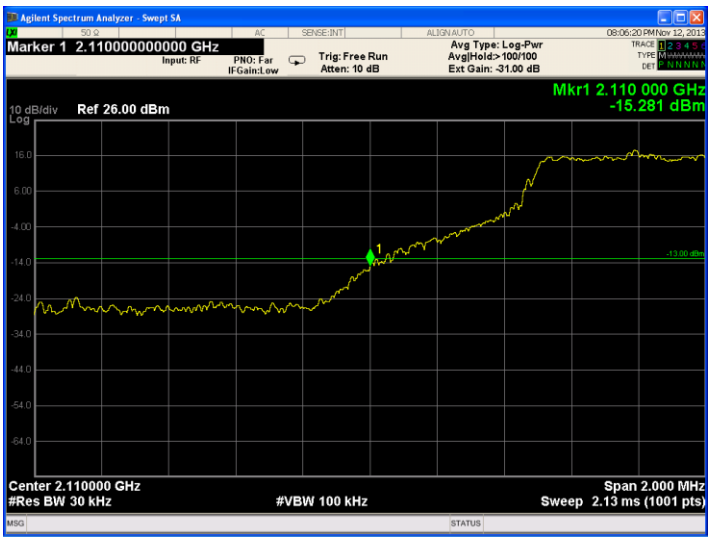

Figure 48.— 16QAM - LOW

Figure 49.— 16QAM HIGH

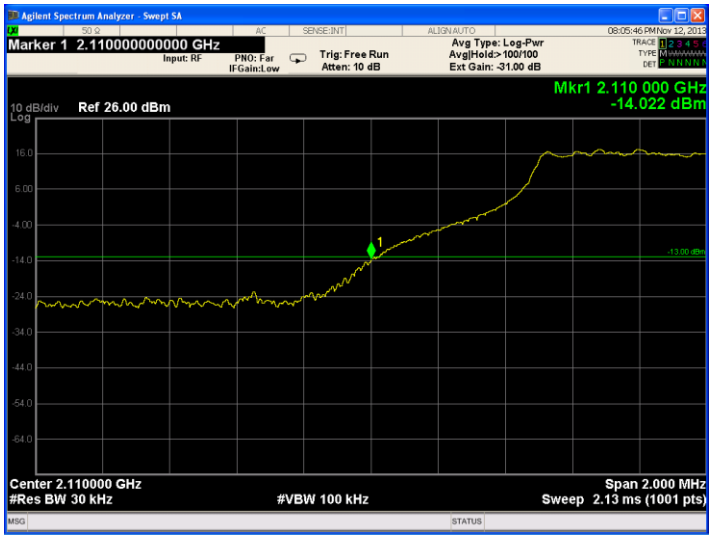

Figure 50.— 64QAM LOW

Figure 51.— 64QAM HIGH

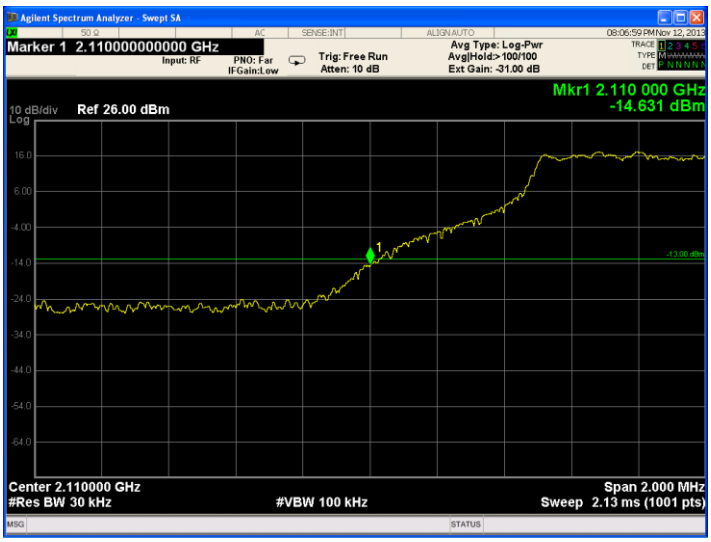

Figure 52.— QPSK LOW

Figure 53.— QPSK HIGH

7.3 Results

E.U.T. Description: Mobile AccessHX High-Power DAS Remote Unit
Model No.: HX-C85P19L70A17-AC-A (A17=AWS)
Serial Number: Not Designated
Specification: FCC Part 27, Subpart C, Section 27.53 (m 4-6)

Modulation	Operation Frequency (MHz)	Band Edge Frequency (MHz)	Reading (dBm)	Specification (dBm)
16QAM	2110.00	2110.00	-15.281	-13.0
16QAM	2155.00	2155.00	-17.685	-13.0
64QAM	2110.00	2110.00	-14.022	-13.0
64QAM	2155.00	2155.00	-16.044	-13.0
QPSK	2110.00	2110.00	-14.631	-13.0
QPSK	2155.00	2155.00	-15.369	-13.0

Figure 54 Band Edge Spectrum Results AWS

JUDGEMENT: Passed

TEST PERSONNEL:
Tester Signature: _____ Date: 11.12.13
Typed/Printed Name: A. Sharabi

7.4 Test Equipment Used.

Band Edge Spectrum AWS

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibration	Period
Spectrum Analyzer	Agilent	N9010A EXA	MY49061070	July 28, 2013	1 year
Spectrum Analyzer	HP	8564E	3313U00346	February 28, 2013	1 year
Signal Generator	Agilent	N5172B EXG	MY51350549	December 28, 2012	1 year
Attenuator	MCE	46-30-34	BN4927	November 12, 2013	1 year
Cable	Mini-Circuits	30091	-	November 12, 2013	1 year

Figure 55 Test Equipment Used

8. Spurious Radiated Emission AWS

8.1 Test Specification

FCC, Part 27, Subpart C Section 27.53 (g)

8.2 Test Procedure

The test method was based on ANSI/TIA-603-C: 2004, Section 2.2.12 Unwanted Emissions: Radiated Spurious.
The power of any emission outside of the authorized operating frequency ranges (2110-2155 MHz) must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB, yielding –13dBm.

(a) The E.U.T. operation mode and test set-up are as described in Section 2. A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The configuration tested is shown in Figure 1.
The frequency range 9 kHz-20 GHz was scanned, and the list of the highest emissions was verified and updated accordingly.
The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.
The emissions were measured at a distance of 3 meters.

(b) The E.U.T. was replaced by a substitution antenna (dipole 30MHz-1GHz, Horn Antenna above 1GHz) driven by a signal generator. The height was readjusted for maximum reading. The signal generator level was adjusted to obtain the same reading on the EMI receiver as in step (a).
The signals observed in step (a) were converted to radiated power using:
$P_d(dBm) = P_g(dBm) – Cable\ Loss\ (dB) + Substitution\ Antenna\ Gain\ (dB)$
P_d = Dipole equivalent power (result).
P_g = Signal generator output level.

8.3 Test Results

JUDGEMENT: Passed by 37.68 dB

The E.U.T met the requirements of the FCC, Part 27, Subpart C, Section 27.53 (g) specifications.

TEST PERSONNEL:

Tester Signature: _____ Date: 11.12.13

Typed/Printed Name: A. Sharabi

Carrier Channel (MHz)	Freq. (MHz)	Antenna Pol.	Maximum Peak Level (dBµV/m)	Signal Generator RF Output (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	Effective Radiated Power Level (dBm)	Spec. (dBm)	Margin (dB)
2115.0	4230.0	V	47.5	-55.89	4.45	9.12	-51.22	-13.0	-38.22
2115.0	4230.0	H	47.8	-55.35	4.45	9.12	-50.68	-13.0	-37.68
2135.0	4270.0	V	46.9	-57.17	4.45	9.38	-55.24	-13.0	-42.24
2135.0	4270.0	H	46.7	-56.91	4.45	9.38	-51.98	-13.0	-38.98
2150.0	4300.0	V	47.8	-56.27	4.45	9.38	-51.34	-13.0	-38.34
2150.0	4300.0	H	47.8	-55.81	4.45	9.38	-50.88	-13.0	-37.88

8.4 Test Instrumentation Used, Radiated Measurements AWS

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Period
EMI Receiver	HP	85422E	3906A00276	February 26, 2013	1Year
RF Filter Section	HP	85420E	3705A00248	February 26, 2013	1Year
Antenna Biconical	EMCO	3104	2606	August 30, 2013	1Year
Antenna Log Periodic	ARA	LPD-2010/A	1038	April 2, 2013	1 Year
Double Ridged Waveguide Horn Antenna	EMCO	3115	29845	March 14, 2012	2 Years
Horn Antenna	ARA	SWH-28	1007	January 26, 2011	3 Years
Horn Antenna	ETS	3115	29845	March 14, 2012	2 Years
Low Noise Amplifier	DBS MICROWAVE	LNA-DBS-0411N313	013	August 21, 2013	1 Year
Low Noise Amplifier	Sophia Wireless	LNA 28-B	232	August 28, 2013	1 Year
Spectrum Analyzer	HP	8592L	3826A01204	February 28, 2013	1 Year
Spectrum Analyzer	HP	8564E	3442A00275	February 28, 2013	1 Year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKGC19982	N/A	N/A

9. APPENDIX A - CORRECTION FACTORS

9.1 Correction factors for CABLE

from EMI receiver to test antenna at 3 meter range.

FREQUENCY (MHz)	CORRECTION FACTOR (dB)
10.0	0.3
20.0	0.6
30.0	0.8
40.0	0.9
50.0	1.1
60.0	1.2
70.0	1.3
80.0	1.4
90.0	1.6
100.0	1.7
150.0	2.0
200.0	2.3
250.0	2.7
300.0	3.1
350.0	3.4
400.0	3.7
450.0	4.0
500.0	4.3
600.0	4.7
700.0	5.3
800.0	5.9
900.0	6.3
1000.0	6.7

FREQUENCY (MHz)	CORRECTION FACTOR (dB)
1200.0	7.3
1400.0	7.8
1600.0	8.4
1800.0	9.1
2000.0	9.9
2300.0	11.2
2600.0	12.2
2900.0	13.0

NOTES:

1. The cable type is RG-214.

2. The overall length of the cable is 27 meters.

3. The above data is located in file 27MO3MO.CBL on the disk marked "Radiated Emission Tests EMI Receiver".

9.2 Correction factors for CABLE

from EMI receiver to test antenna at 3 meter range.

FREQUENCY (GHz)	CORRECTION FACTOR (dB)
1.0	1.2
2.0	1.6
3.0	2.0
4.0	2.4
5.0	3.0
6.0	3.4
7.0	3.8
8.0	4.2
9.0	4.6
10.0	5.0
12.0	5.8

NOTES:

1. The cable type is RG-8.

2. The overall length of the cable is 10 meters.

9.3 Correction factors for CABLE

from spectrum analyzer to test antenna above 2.9 GHz

FREQUENCY (GHz)	CORRECTION FACTOR (dB)	FREQUENCY (GHz)	CORRECTION FACTOR (dB)
1.0	1.9	14.0	9.1
2.0	2.7	15.0	9.5
3.0	3.5	16.0	9.9
4.0	4.2	17.0	10.2
5.0	4.9	18.0	10.4
6.0	5.5	19.0	10.7
7.0	6.0	20.0	10.9
8.0	6.5	21.0	11.2
9.0	7.0	22.0	11.6
10.0	7.5	23.0	11.9
11.0	7.9	24.0	12.3
12.0	8.3	25.0	12.6
13.0	8.7	26.0	13.0

NOTES:

1. The cable type is SUCOFLEX 104 E manufactured by SUHNER.

2. The cable is used for measurements above 2.9 GHz.

3. The overall length of the cable is 10 meters.

9.4 Correction factors for LOG PERIODIC ANTENNA

Type SAS-200/511
at 3 meter range.

FREQUENCY (GHz)	ANTENNA FACTOR (dB)
1.0	24.9
1.5	27.8
2.0	29.9
2.5	31.2
3.0	32.8
3.5	33.6
4.0	34.3
4.5	35.2
5.0	36.2
5.5	36.7
6.0	37.2
6.5	38.1

FREQUENCY (GHz)	ANTENNA FACTOR (dB)
7.0	38.6
7.5	39.2
8.0	39.9
8.5	40.4
9.0	40.8
9.5	41.1
10.0	41.7
10.5	42.4
11.0	42.5
11.5	43.1
12.0	43.4
12.5	44.4
13.0	44.6

NOTES:

1. *Antenna serial number is 253.*
2. *The above lists are located in file number SAS3M0.ANT for a 3 meter range.*
3. *The files mentioned above are located on the disk marked "Antenna Factors".*

9.5 Correction factors forDouble-Ridged Waveguide Horn

Model: 3115, S/N 29845
at 3 meter range.

FREQUENCY (GHz)	ANTENNA FACTOR (dB 1/m)	ANTENNA Gain (dBi)	FREQUENCY (GHz)	ANTENNA FACTOR (dB 1/m)	ANTENNA Gain (dBi)
1.0	24.8	5.4	10.0	38.8	11.4
1.5	26.1	7.6	10.5	38.9	11.8
2.0	28.6	7.7	11.0	39.0	12.1
2.5	29.8	8.4	11.5	39.6	11.8
3.0	31.4	8.4	12.0	39.8	12.0
3.5	32.4	8.7	12.5	39.6	12.5
4.0	33.7	8.6	13.0	40.0	12.5
4.5	33.4	9.9	13.5	39.8	13.0
5.0	34.5	9.7	14.0	40.2	13.0
5.5	35.1	9.9	14.5	40.6	12.9
6.0	35.4	10.4	15.0	41.3	12.4
6.5	35.6	10.8	15.5	39.5	14.6
7.0	36.2	10.9	16.0	38.8	15.5
7.5	37.3	10.4	16.5	40.0	14.6
8.0	37.7	10.6	17.0	41.4	13.4
8.5	38.3	10.5	17.5	44.8	10.3
9.0	38.5	10.8	18.0	47.2	8.1
9.5	38.7	11.1			