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MEASUREMENT REPORT FCC Part 27 / RSS-199 WIMAX

Applicant Name:
Samsung Electronics, Co. Ltd.
18600 Broadwick St.
Rancho Dominguez, CA 90220
United States

Date of Testing:
July 11-14, 2011
Test Site/Location:
PCTEST Lab., Columbia, MD, USA
Test Report Serial No.:
0Y1107131190.A3L

FCC ID:	A3LSPHD710
APPLICANT:	SAMSUNG ELECTRONICS, CO. LTD.

FCC Classification: Licensed portable transmitter held to ear (PCE)
FCC Rule Part(s): §2; §27 Subpart M
EUT Type: Cellular/PCS CDMA/EvDO Phone with BT, WLAN and WiMAX
Model(s): SPH-D710
Tx Frequency Range: 2498.5 - 2687.5MHz (WiMAX using 5MHz BW)
2501 - 2685MHz (WiMAX using 10MHz BW)
Max. RF Output Power: (10MHz) 0.138 W EIRP 16QAM (21.39 dBm)
(10MHz) 0.100 W EIRP QPSK (19.99 dBm)
(5MHz) 0.142 W EIRP QPSK (21.53 dBm)
(5 MHz) 0.162 W EIRP 16QAM (22.09 dBm)
Emission Designators: 9M12G7D (QPSK) / 9M13W7D (16QAM) (WiMAX - 10MHz BW)
4M57G7D (QPSK) / 4M52W7D (16QAM) (WiMAX - 5MHz BW)
Test Device Serial No.: *identical prototype* [S/N: N/A]

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them. Test results reported herein relate only to the item(s) tested.

Grant Conditions: Power output listed is EIRP for Part 27.

PCTEST certifies that no party to this application has been subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 862.



Randy Ortanez
President

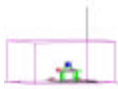


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MEASUREMENT REPORT

FCC Part 27



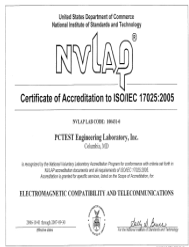
§2.1033 General Information



APPLICANT: Samsung Electronics, Co. Ltd.
APPLICANT ADDRESS: 18600 Broadwick St.
 Rancho Dominguez, CA 90220
TEST SITE: PCTEST ENGINEERING LABORATORY, INC.
TEST SITE ADDRESS: 6660-B Dobbin Road, Columbia, MD 21045 USA
FCC RULE PART(S): §2; §27(M)
BASE MODEL: SPH-D710
FCC ID: A3LSPHD710
FCC CLASSIFICATION: Licensed portable transmitter held to ear (PCE)
EMISSION DESIGNATOR(S): 9M12G7D (QPSK) / 9M13W7D (16QAM) (WiMAX - 10MHz BW)
 4M57G7D (QPSK) / 4M52W7D (16QAM) (WiMAX - 5MHz BW)
MODE: WiMAX
FREQUENCY TOLERANCE: Emission must remain in band
Test Device Serial No.: N/A Production Pre-Production Engineering
DATE(S) OF TEST: July 11-14, 2011
TEST REPORT S/N: 0Y1107131190.A3L

Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab. located in Columbia, MD 21045, U.S.A.

- PCTEST facility is an FCC registered (PCTEST Reg. No. 90864) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (2451A-1).
- PCTEST Lab is accredited to ISO 17025 by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP Lab code: 100431-0) in EMC, FCC and Telecommunications.
- PCTEST Lab is accredited to ISO 17025-2005 by the American Association for Laboratory Accreditation (A2LA) in Specific Absorption Rate (SAR) testing, Hearing Aid Compatibility (HAC) testing, CTIA Test Plans, and wireless testing for FCC and Industry Canada Rules.
- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC Guide 65 by the American National Standards Institute (ANSI) in all scopes of FCC Rules and Industry Canada Standards (RSS).
- PCTEST facility is an IC registered (2451A-1) test laboratory with the site description on file at Industry Canada.
- PCTEST is a CTIA Authorized Test Laboratory (CATL) for AMPS, CDMA, and EvDO wireless devices and for Over-the-Air (OTA) Antenna Performance testing for AMPS, CDMA, GSM, GPRS, EGPRS, UMTS (W-CDMA), CDMA 1xEVDO, and CDMA 1xRTT.

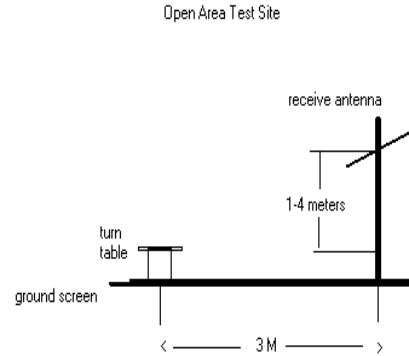


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1.0 INTRODUCTION

1.1 Measurement Procedure

The radiated spurious measurements were made outdoors at a 3-meter test range (see Figure 1-1). The equipment under test is placed on a wooden turntable 3-meters from the receive antenna. The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic antenna are taken into consideration.



Deviation from Measurement Procedure.....None

Figure 1-1. Diagram of 3-meter outdoor test range

1.2 Scope

Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission.

1.3 Testing Facility

These measurements were conducted at the PCTEST Engineering Laboratory, Inc. facility in New Concept Business Park, Guilford Industrial Park, Columbia, Maryland. The site address is 6660-B Dobbin Road, Columbia, MD 21045. The test site is one of the highest points in the Columbia area with an elevation of 390 feet above mean sea level. The site coordinates are 39° 11'15" N latitude and 76° 49'38" W longitude. The facility is 1.5 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. There are no FM or TV transmitters within 15 miles of the site. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2003 on January 28, 2009 and Industry Canada.

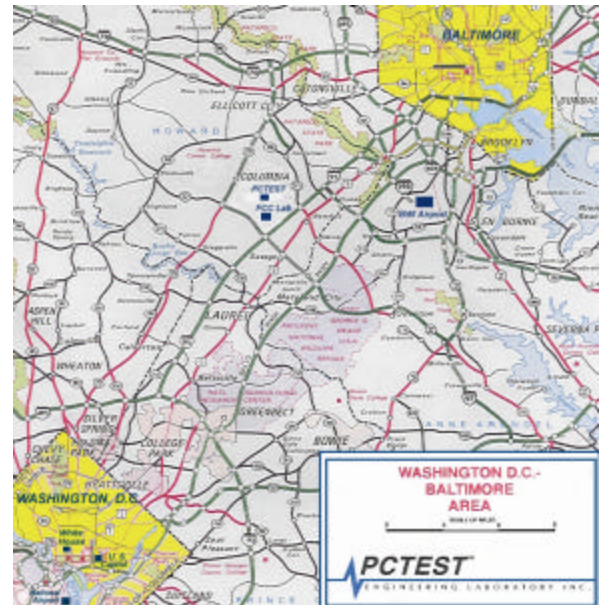


Figure 1-2. Map of the Greater Baltimore and Metropolitan Washington, D.C. area.

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Cellular/PCS CDMA/EvDO Phone with BT, WLAN and WiMAX FCC ID: A3LSPHD710**. The test data contained in this report pertains only to the emissions due to the EUT's WiMAX function. The EUT consisted of the following component(s):

Trade Name / Base Model	FCC ID	Description
Samsung / Model: SPH-D710	A3LSPHD710	Cellular/PCS CDMA/EvDO Phone with BT, WLAN and WiMAX

Table 2-1. EUT Equipment Description

The EUT was set to transmit at full power through test software installed in a laptop computer. Each of the available types of modulations was tested to determine the configuration producing the worst case emissions. The gated triggering functionality of the spectrum analyzer was used so that all measurements were made during the transmitter's "on" period.

2.2 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and no modifications were made during testing.

2.3 Labeling Requirements

Per 2.925

The FCC identifier shall be permanently affixed to the equipment and shall be readily visible to the purchaser at the time of purchase.



Per 15.19; Docket 95-19

In addition to this requirement, a device subject to certification shall be labeled as follows:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the trade name and FCC ID must be displayed on the device per Section 15.19(b)(2).

Please see attachment for FCC ID label and label location.

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3.0 DESCRIPTION OF TESTS

3.1 Occupied Bandwidth Emission Limits

§2.1049, §27.53(l)(6)

- a. On any frequency outside but within 5.5MHz from the band edge of a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log(P)$ dB. At frequencies greater than 5.5MHz from any in-band channel edge, the transmitter power (P) shall be attenuated by at least $55 + 10 \log(P)$ dB.
- b. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

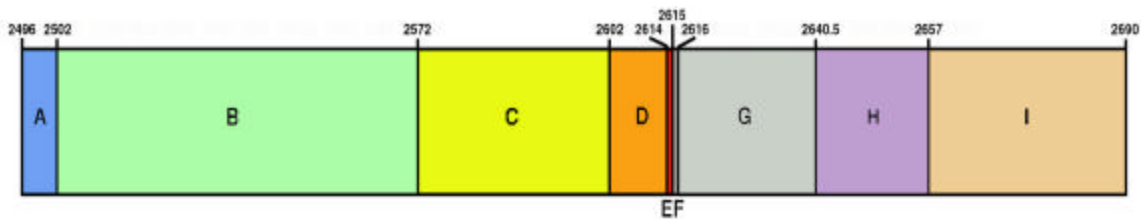
3.2 Channel Edge

§2.1051, §27.53(l)(4)(6)

When measuring conducted channel edge, the ACP (Adjacent Channel Power) feature of the signal analyzer was used. For each segment of the channel edge, the allowed integration bandwidth was configured to calculate the channel power that is highest within that channel edge segment.

3.3 EBS/BRS - Frequency Blocks

§27.5(i)



BLOCK A: 2496MHz – 2502MHz (BRS)

BLOCK B: 2502MHz – 2572MHz (EBS)

BLOCK C: 2572MHz – 2602MHz (EBS)

BLOCK D: 2602MHz – 2614MHz (BRS)



BLOCK E: 2614MHz – 2615MHz (BRS)

BLOCK F: 2615MHz – 2616MHz (EBS)

BLOCK G: 2616MHz – 2640.5MHz (BRS)

BLOCK H: 2640.5MHz – 2657MHz (EBS)

BLOCK A: 2657MHz – 2690MHz (BRS)

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3.4 Spurious and Harmonic Emissions at Antenna Terminal

§2.1051, §27.53(l)(4)(6)

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic.

3.5 Radiated Spurious and Harmonic Emissions

§2.1053, §27.53(l)(4)(6)

Spurious and harmonic radiated emissions are measured outdoors at our 3-meter test range. The equipment under test is placed on a wooden turntable 3-meters from the receive antenna. The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer reading. This level is recorded. For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration. This device was tested under all configurations and the worst case is reported with PUSC QPSK modulation when operating with 5MHz and 10MHz bandwidth. The device was tested in all setup positions and the worst case was reported in the horizontally flat configuration.

3.6 Frequency Stability / Temperature Variation

§2.1055, §27.54



The frequency stability of the transmitter is measured by:

- a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

Specification – The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Time Period and Procedure:

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a “standby” condition for one minute before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.



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4.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST).

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	263-10dB	(DC-18GHz) 10 dB Attenuator	N/A		N/A	N/A
-	No.166	(1000-26500MHz) Microwave RF Cable	N/A		N/A	N/A
-	No.167	(100kHz - 100MHz) RG58 Coax Cable	N/A		N/A	N/A
Agilent	8449B	(1-26.5GHz) Pre-Amplifier	2/8/2011	Annual	2/8/2012	3008A00985
Agilent	85650A	Quasi-Peak Adapter	4/7/2011	Annual	4/7/2012	3303A01872
Agilent	85650A	Quasi-Peak Adapter	4/7/2011	Annual	4/7/2012	2043A00301
Agilent	8566B	(100Hz-22GHz) Spectrum Analyzer	4/7/2011	Annual	4/7/2012	3638A08713
Agilent	E4407B	ESA Spectrum Analyzer	4/5/2011	Annual	4/5/2012	US39210313
Agilent	E4448A	PSA (3Hz-50GHz) Spectrum Analyzer	11/30/2010	Annual	11/30/2011	US42510244
Agilent	E8257D	(250kHz-20GHz) Signal Generator	4/8/2011	Annual	4/8/2012	MY45470194
Agilent	E8267C	Vector Signal Generator	10/11/2010	Annual	10/11/2011	US42340152
Agilent	N9020A	MXA Signal Analyzer	9/8/2010	Annual	9/8/2011	US46470561
Agilent	E5515C	Wireless Communications Test Set	2/8/2011	Annual	2/8/2012	GB45360985
Anritsu	ML2495A	Power Meter	10/13/2010	Annual	10/13/2011	941001
Anritsu	MA2411B	Pulse Sensor	N/A		N/A	1027293
Compliance Design	Roberts	Dipole Set	4/7/2010	Biennial	4/7/2012	146
Compliance Design	Roberts	Dipole Set	4/7/2010	Biennial	4/7/2012	147
Emco	3115	Horn Antenna (1-18GHz)	10/14/2009	Biennial	10/14/2011	9704-5182
Emco	3115	Horn Antenna (1-18GHz)	4/8/2010	Biennial	4/8/2012	9205-3874
Espec	ESX-2CA	Environmental Chamber	4/21/2011	Annual	4/21/2012	17620
Gigatronics	80701A	(0.05-18GHz) Power Sensor	10/11/2010	Annual	10/11/2011	1833460
Gigatronics	8651A	Universal Power Meter	10/11/2010	Annual	10/11/2011	8650319
K & L	11SH10	Band Pass Filter	N/A		N/A	1300/4000
K & L	11SH10	Band Pass Filter	N/A		N/A	4000/12000
MiniCircuits	VHF-1300+	High Pass Filter	N/A		N/A	30716
MiniCircuits	VHF-3100+	High Pass Filter	N/A		N/A	30721
Pasternack	PE2208-6	Bidirectional Coupler	N/A		N/A	N/A
Schwarzbeck	UHA9105	Dipole Antenna (400 - 1GHz) Rx	7/17/2009	Biennial	7/17/2011	9105-2404
Schwarzbeck	UHA9105	Dipole Antenna (400 - 1GHz) Tx	7/17/2009	Biennial	7/17/2011	9105-2403
Sunol	DRH-118	Horn Antenna (1 - 18GHz)	7/5/2011	Biennial	7/5/2013	A050307
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	7/17/2009	Biennial	7/17/2011	A051107
Sunol	DRH-118	Horn Antenna (1-18 GHz)	6/17/2011	Biennial	6/17/2013	A042511

Table 4-1. Test Equipment

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5.0 SAMPLE CALCULATIONS

Emission Designator

QPSK Modulation

Emission Designator = 9M62G7D

WiMAX BW = 9.62 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Amplitude/Angle Modulated

16QAM Modulation

Emission Designator = 9M45W7D

WiMAX BW = 9.45 MHz

W = Amplitude/Angle Modulated



7 = Quantized/Digital Info

D = Combination (Audio/Data)

Spurious Radiated Emission – WiMAX Band

Example: Middle Channel WiMAX Mode 2nd Harmonic (5200 MHz)

The receive analyzer reading at 3 meters with the EUT on the turntable was -81.0 dBm. The gain of the substituted antenna is 8.1 dBi. The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of -81.0 dBm on the receive analyzer. The loss of the cable between the signal generator and the terminals of the substituted antenna is 3.2 dB at 5200 MHz. So 4.9 dB is added to the signal generator reading of -30.00 dBm yielding -25.1 dBm. The fundamental EIRP was 25.501 dBm so this harmonic was 25.501 dBm $- (-25.1) = 50.6$ dBc.

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6.0 TEST RESULTS

6.1 Summary

Company Name: Samsung Electronics, Co. Ltd.
 FCC ID: A3LSPHD710
 FCC Classification: Licensed portable transmitter held to ear (PCE)
 Mode(s): WiMAX

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
TRANSMITTER MODE (Tx)					
2.1049, 27.53(m)(6)	Occupied Bandwidth	N/A	CONDUCTED	PASS	Section 7.0, 8.0
2.1051, 27.53(m)(4)(6)	Band Edge	< 43 + 10log ₁₀ (P[Watts]) within 5.5MHz from the band edge		PASS	Section 7.0, 8.0
2.1051, 27.53(m)(4)(6)	Conducted Spurious Emissions	< 55 + 10log ₁₀ (P[Watts]) for all emissions greater than 5.5MHz from the band edge		PASS	Section 7.0, 8.0
2.1046	Transmitter Conducted Output Power Measurements	N/A		PASS	Section 6.2
27.50(h)(2)	Equivalent Isotropic Radiated Power	< 2 Watts max. EIRP	RADIATED	PASS	Section 6.3
2.1053, 27.53(m)(4)	Undesirable Emissions	< 55 + 10log ₁₀ (P[Watts]) for all out-of-band emissions		PASS	Section 6.4, 6.5
2.1055, 27.54	Frequency Stability	Fundamental emissions must stay within the allotted band		PASS	Section 6.6, 6.7

Table 6-1. Summary of Test Results

FCC ID: A3LSPHD710		FCC Pt. 27 / WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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6.2 Transmitter Conducted Output Power

§2.1046

The MXA Signal Analyzer was used to measure the power of the Wimax device. The Wimax channel power measurement feature of the MXA was utilized in conjunction with the MXA's gating function to measure conducted powers. The WiMAX conducted powers are reported below as well as a test setup diagram.

Channel	Modulation	Coding Rate	PUSC			
			5 MHz BW	Max. Power (dBm)	10 MHz BW	Max. Power (dBm)
			Avg		Avg	
Low	QPSK	1/2	23.14	23.14	23.08	23.18
		3/4	23.04		23.12	
	16QAM	1/2	23.12		23.06	
		3/4	23.02		23.18	
Mid	QPSK	1/2	23.38	23.51	23.39	23.40
		3/4	23.26		23.38	
	16QAM	1/2	23.32		23.40	
		3/4	23.51		23.39	
High	QPSK	1/2	23.53	23.54	23.58	23.66
		3/4	23.48		23.54	
	16QAM	1/2	23.54		23.66	
		3/4	23.48		23.62	

Table 6-2. WiMAX Conducted Output Power

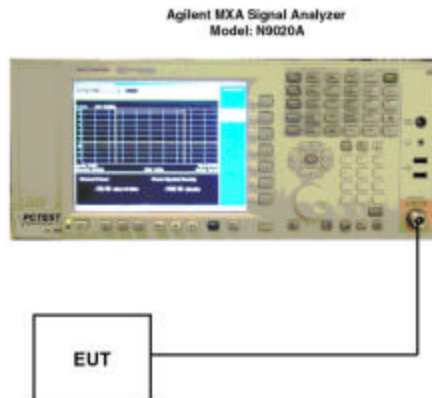




Figure 6-1. WiMAX Conducted Power Test Setup Diagram

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6.3 Equivalent Isotropic Radiated Power Output Data §27.50(h)(2)

POWER: Maximum (WiMAX Mode)

Frequency [MHz]	Mod.	Channel Bandwidth [MHz]	Measured Level [dBm]	Substitute Level [dBm]	Antenna Gain [dBi]	Pol [H/V]	EIRP [dBm]	EIRP [Watts]	Battery Type
2501.00	QPSK	10.0	-22.100	10.92	8.90	H	19.82	0.096	Standard
2501.00	16QAM	10.0	-22.300	10.72	8.90	H	19.62	0.092	Standard
2600.00	QPSK	10.0	-22.100	10.92	9.07	H	19.99	0.100	Standard
2600.00	16QAM	10.0	-20.700	12.32	9.07	H	21.39	0.138	Standard
2685.00	QPSK	10.0	-22.900	10.12	9.21	H	19.33	0.086	Standard
2685.00	16QAM	10.0	-22.300	10.64	9.21	H	19.85	0.097	Standard

Table 6-3. Equivalent Isotropic Radiated Power Output Data for 10MHz Wimax

Frequency [MHz]	Mod.	Channel Bandwidth [MHz]	Measured Level [dBm]	Substitute Level [dBm]	Antenna Gain [dBi]	Pol [H/V]	EIRP [dBm]	EIRP [Watts]	Battery Type
2498.50	QPSK	5.0	-20.900	12.12	8.90	H	21.02	0.127	Standard
2498.50	16QAM	5.0	-22.400	10.62	8.90	H	19.52	0.090	Standard
2600.00	QPSK	5.0	-21.900	11.12	9.07	H	20.19	0.104	Standard
2600.00	16QAM	5.0	-20.000	13.02	9.07	H	22.09	0.162	Standard
2687.50	QPSK	5.0	-20.700	12.32	9.21	H	21.53	0.142	Standard
2687.50	16QAM	5.0	-20.900	12.12	9.21	H	21.33	0.136	Standard



Table 6-4. Equivalent Isotropic Radiated Power Output Data for 5MHz Wimax

NOTES:

Equivalent Isotropic Radiated Power Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 80cm above the ground plane and 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For WiMAX signals, a broadband power meter was used to measure EIRP. A Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the Horn antenna is measured. The difference between the gain of the horn and an isotropic antenna is taken into consideration and the EIRP is recorded.

The device was tested in all setup positions and the worst case was reported in the horizontally flat configuration. This unit was tested with its standard battery.

FCC ID: A3LSPHD710		FCC Pt. 27 / WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1107131190.A3L	Test Date: July 11-14, 2011	EUT Type: Cellular/PCS CDMA/EvDO Phone with BT, WLAN and WiMAX		Page 12 of 39

6.4 10MHz WiMAX Radiated Measurements

§2.1053, §27.53(l)(4)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 2501.00 MHz
 CHANNEL: LBS
 MEASURED OUTPUT POWER: 21.39 dBm = 0.138 W
 MODULATION SIGNAL: 10MHz QPSK WiMAX
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10}(W) =$ 46.39 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
5002.00	-49.19	10.97	-38.22	H	59.6
7503.00	-57.75	10.80	-46.95	H	68.3
10004.00	-54.30	12.30	-42.00	H	63.4
12505.00	-77.13	12.88	-64.25	H	85.6
15006.00	-70.16	12.10	-58.06	H	79.4



Table 6-4. Radiated Spurious Data (WiMAX Mode)

NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 80cm above the ground plane and 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For WiMAX signals, an average detector is used, with RBW = 1 MHz. A Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the Horn antenna is measured. The difference between the gain of the horn and an isotropic antenna is taken into consideration and the EIRP is recorded.

This device was tested under all configurations and the worst case is reported with PUSC QPSK modulation when operating with 5MHz and 10MHz bandwidth. The device was tested in all setup positions and the worst case was reported in the horizontally flat configuration. This unit was tested with its standard battery.

FCC ID: A3LSPHD710		FCC Pt. 27 / WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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10MHz WiMAX Radiated Measurements (Cont'd)
§2.1053, §27.53(l)(4)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 2600.00 MHz
 CHANNEL: MBS
 MEASURED OUTPUT POWER: 21.39 dBm = 0.138 W
 MODULATION SIGNAL: 10MHz QPSK WiMAX
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10}(W) =$ 46.39 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
5200.00	-37.67	10.86	-26.81	H	48.2
7800.00	-51.87	11.25	-40.62	H	62.0
10400.00	-54.06	12.53	-41.54	H	62.9
13000.00	-75.71	12.65	-63.06	H	84.4
15600.00	-74.34	15.17	-59.17	H	80.6



Table 6-5. Radiated Spurious Data (WiMAX Mode)

NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 80cm above the ground plane and 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For WiMAX signals, an average detector is used, with RBW = 1 MHz. A Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the Horn antenna is measured. The difference between the gain of the horn and an isotropic antenna is taken into consideration and the EIRP is recorded.

This device was tested under all configurations and the worst case is reported with PUSC QPSK modulation when operating with 5MHz and 10MHz bandwidth. The device was tested in all setup positions and the worst case was reported in the horizontally flat configuration. This unit was tested with its standard battery.

FCC ID: A3LSPHD710		FCC Pt. 27 / WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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10MHz WiMAX Radiated Measurements (Cont'd)
§2.1053, §27.53(I)(4)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 2685.00 MHz
 CHANNEL: UBS
 MEASURED OUTPUT POWER: 21.39 dBm = 0.138 W
 MODULATION SIGNAL: 10MHz QPSK WiMAX
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10}(W) =$ 46.39 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
5370.00	-41.73	10.42	-31.31	H	52.7
8055.00	-54.05	10.98	-43.06	H	64.5
10740.00	-53.57	12.80	-40.77	H	62.2
13425.00	-75.96	12.90	-63.06	H	84.5
16110.00	-75.95	16.70	-59.25	H	80.6



Table 6-6. Radiated Spurious Data (WiMAX Mode)

NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 80cm above the ground plane and 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For WiMAX signals, an average detector is used, with RBW = 1 MHz. A Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the Horn antenna is measured. The difference between the gain of the horn and an isotropic antenna is taken into consideration and the EIRP is recorded.

This device was tested under all configurations and the worst case is reported with PUSC QPSK modulation when operating with 5MHz and 10MHz bandwidth. The device was tested in all setup positions and the worst case was reported in the horizontally flat configuration. This unit was tested with its standard battery.

FCC ID: A3LSPHD710		FCC Pt. 27 / WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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6.5 5MHz WiMAX Radiated Measurements

§2.1053, §27.53(l)(4)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 2498.50 MHz
 CHANNEL: LBS
 MEASURED OUTPUT POWER: 22.09 dBm = 0.162 W
 MODULATION SIGNAL: 5MHz QPSK WiMAX
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10}(W) =$ 47.09 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
4997.00	-50.59	10.97	-39.62	H	61.7
7495.50	-57.05	10.80	-46.25	H	68.3
9994.00	-53.40	12.30	-41.10	H	63.2
12492.50	-77.13	12.88	-64.25	H	86.3
14991.00	-70.16	12.10	-58.06	H	80.1



Table 6-7. Radiated Spurious Data (WiMAX Mode)

NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 80cm above the ground plane and 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For WiMAX signals, an average detector is used, with RBW = 1 MHz. A Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the Horn antenna is measured. The difference between the gain of the horn and an isotropic antenna is taken into consideration and the EIRP is recorded.

This device was tested under all configurations and the worst case is reported with PUSC QPSK modulation when operating with 5MHz and 10MHz bandwidth. The device was tested in all setup positions and the worst case was reported in the horizontally flat configuration. This unit was tested with its standard battery.

FCC ID: A3LSPHD710		FCC Pt. 27 / WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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5MHz WiMAX Radiated Measurements (Cont'd)
§2.1053, §27.53(I)(4)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 2600.00 MHz
 CHANNEL: MBS
 MEASURED OUTPUT POWER: 22.09 dBm = 0.162 W
 MODULATION SIGNAL: 5MHz QPSK WiMAX
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10}(W) =$ 47.09 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
5200.00	-38.47	10.86	-27.61	H	49.7
7800.00	-49.97	11.25	-38.72	H	60.8
10400.00	-52.66	12.53	-40.14	H	62.2
13000.00	-75.71	12.65	-63.06	H	85.1
15600.00	-74.34	15.17	-59.17	H	81.3



Table 6-8. Radiated Spurious Data (WiMAX Mode)

NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 80cm above the ground plane and 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For WiMAX signals, an average detector is used, with RBW = 1 MHz. A Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the Horn antenna is measured. The difference between the gain of the horn and an isotropic antenna is taken into consideration and the EIRP is recorded.

This device was tested under all configurations and the worst case is reported with PUSC QPSK modulation when operating with 5MHz and 10MHz bandwidth. The device was tested in all setup positions and the worst case was reported in the horizontally flat configuration. This unit was tested with its standard battery.

FCC ID: A3LSPHD710		FCC Pt. 27 / WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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5MHz WiMAX Radiated Measurements (Cont'd)

§2.1053, §27.53(l)(4)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 2687.50 MHz
 CHANNEL: UBS
 MEASURED OUTPUT POWER: 22.09 dBm = 0.162 W
 MODULATION SIGNAL: 5MHz QPSK WiMAX
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10}(W) =$ 47.09 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
5375.00	-41.23	10.42	-30.81	H	52.9
8062.50	-53.25	10.98	-42.26	H	64.4
10750.00	-52.87	12.80	-40.07	H	62.2
13437.50	-75.96	12.90	-63.06	H	85.2
16125.00	-75.95	16.70	-59.25	H	81.3



Table 6-9. Radiated Spurious Data (WiMAX Mode)

NOTES:

Radiated Spurious Emission Measurements by Substitution Method
 according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 80cm above the ground plane and 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For WiMAX signals, an average detector is used, with RBW = 1 MHz. A Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the Horn antenna is measured. The difference between the gain of the horn and an isotropic antenna is taken into consideration and the EIRP is recorded.

This device was tested under all configurations and the worst case is reported with PUSC QPSK modulation when operating with 5MHz and 10MHz bandwidth. The device was tested in all setup positions and the worst case was reported in the horizontally flat configuration. This unit was tested with its standard battery.

FCC ID: A3LSPHD710		FCC Pt. 27 / WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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6.6 10MHz WiMAX Frequency Stability Measurements

§2.1055, §27.54

OPERATING FREQUENCY: 2,600,000,000 Hz

CHANNEL: MBS



REFERENCE VOLTAGE: 3.7 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQ. (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	2,599,999,996	-4	0.000000
100 %		- 30	2,600,000,011	11	0.000000
100 %		- 20	2,599,999,985	-15	-0.000001
100 %		- 10	2,600,000,020	20	0.000001
100 %		0	2,600,000,011	11	0.000000
100 %		+ 10	2,599,999,985	-15	-0.000001
100 %		+ 20	2,599,999,993	-7	0.000000
100 %		+ 30	2,600,000,014	14	0.000001
100 %		+ 40	2,599,999,997	-3	0.000000
100 %		+ 50	2,599,999,994	-6	0.000000
115 %		4.26	+ 20	2,599,999,995	-5
BATT. ENDPOINT	3.40	+ 20	2,599,999,996	-4	0.000000

Table 6-7. Frequency Stability Data (10MHz WiMAX Mode)

Note:

The frequency deviation was measured to ensure that the channels emissions remained within the authorized band with varying temperature and voltage.

FCC ID: A3LSPHD710		FCC Pt. 27 / WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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10MHz WiMAX Frequency Stability Measurements (Cont'd)
§2.1055, §27.54

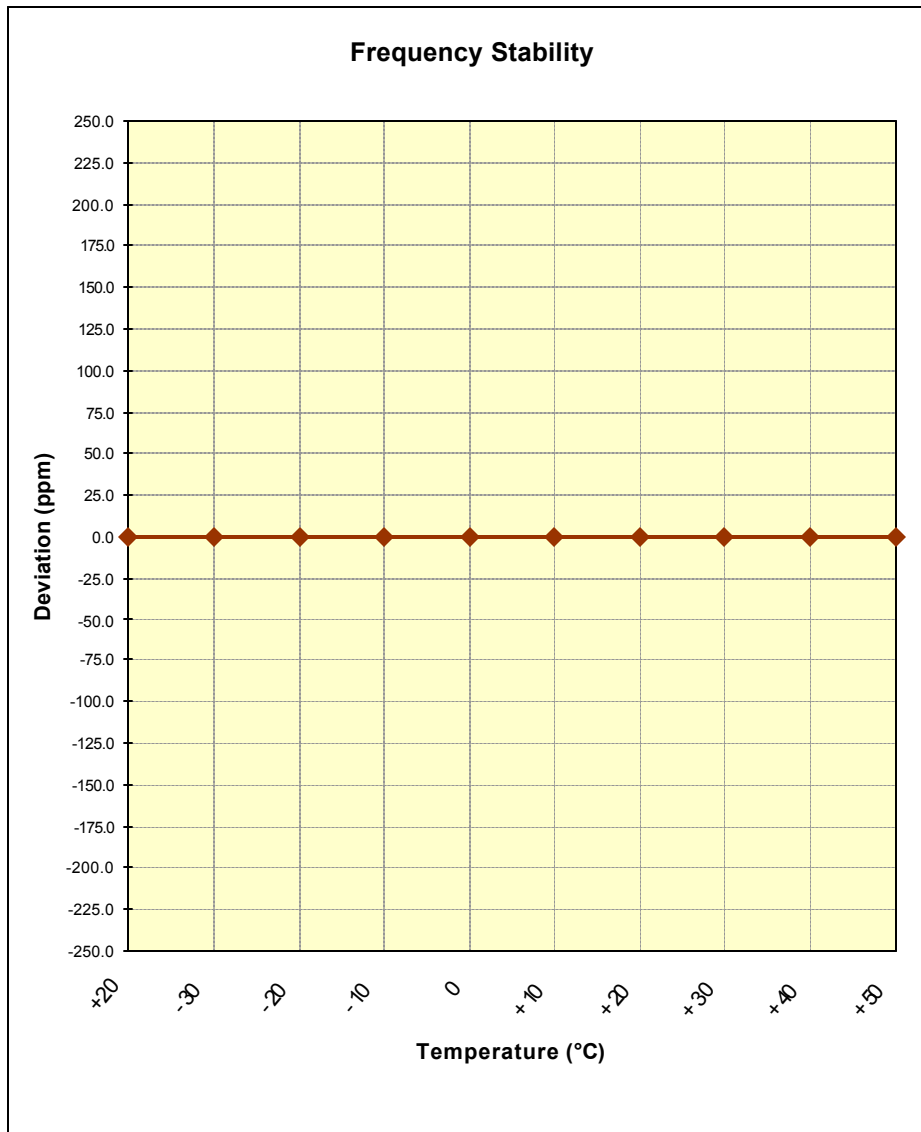




Figure 6-2. Frequency Stability Graph (10MHz WiMAX Mode)

Note:

The frequency deviation was measured to ensure that the channels emissions remained within the authorized band with varying temperature and voltage.

FCC ID: A3LSPHD710		FCC Pt. 27 / WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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6.7 5MHz WiMAX Frequency Stability Measurements

§2.1055, §27.54

OPERATING FREQUENCY: 2,600,000,000 Hz

CHANNEL: MBS



REFERENCE VOLTAGE: 3.7 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQ. (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	2,599,999,993	-7	0.000000
100 %		- 30	2,600,000,011	11	0.000000
100 %		- 20	2,599,999,984	-16	-0.000001
100 %		- 10	2,599,999,985	-15	-0.000001
100 %		0	2,599,999,990	-10	0.000000
100 %		+ 10	2,599,999,985	-15	-0.000001
100 %		+ 20	2,600,000,019	19	0.000001
100 %		+ 30	2,600,000,013	13	0.000001
100 %		+ 40	2,599,999,989	-11	0.000000
100 %		+ 50	2,600,000,009	9	0.000000
115 %	4.26	+ 20	2,599,999,995	-5	0.000000
BATT. ENDPOINT	3.40	+ 20	2,600,000,016	16	0.000001

Table 6-8. Frequency Stability Data (5MHz WiMAX Mode)

Note:

The frequency deviation was measured to ensure that the channels emissions remained within the authorized band with varying temperature and voltage.

FCC ID: A3LSPHD710		FCC Pt. 27 / WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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5MHz WiMAX Frequency Stability Measurements (Cont'd)

§2.1055, §27.54

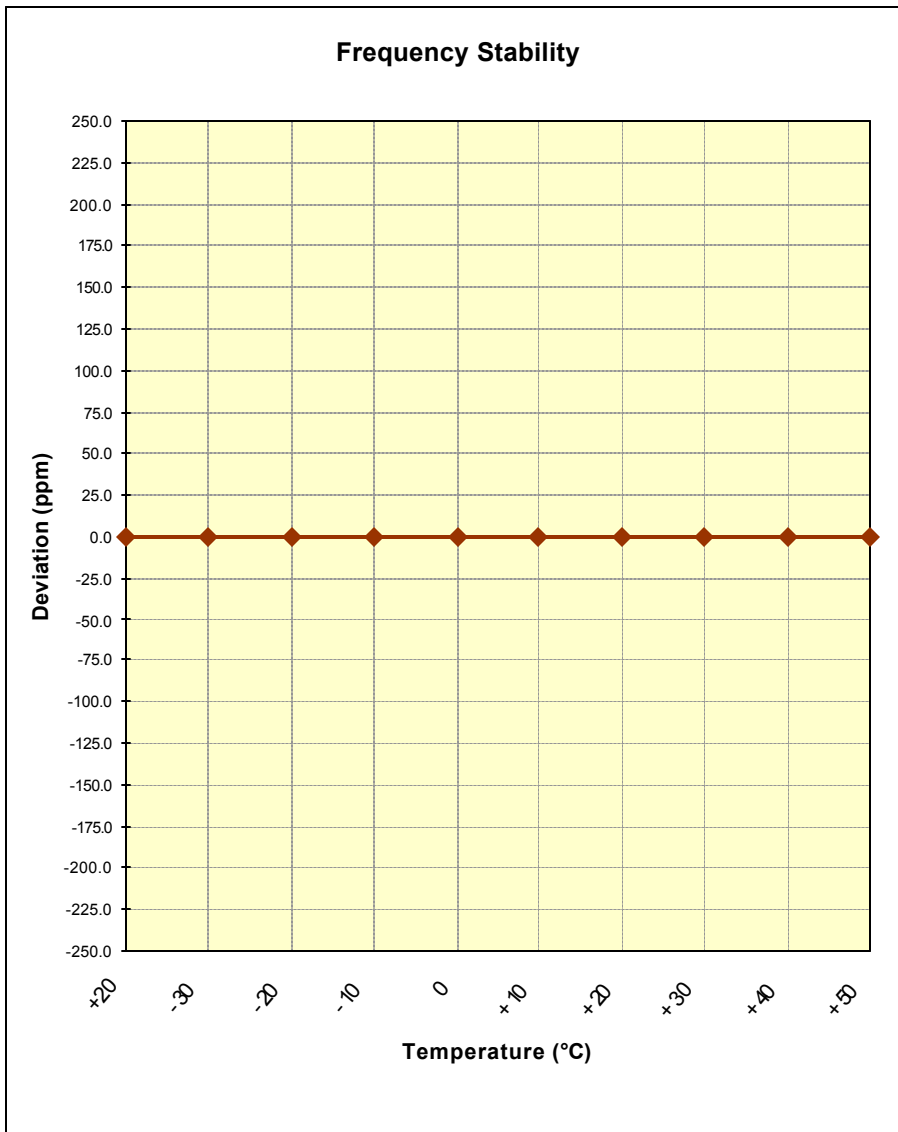




Figure 6-3. Frequency Stability Graph (5MHz WiMAX Mode)

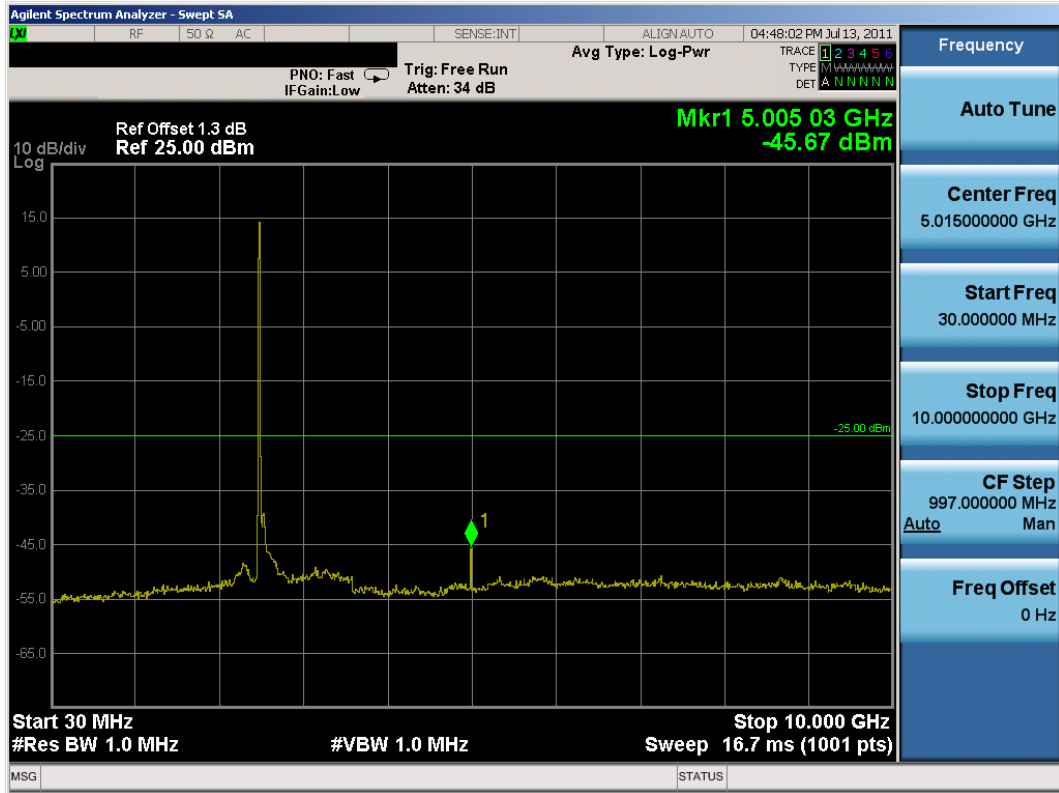
Note:

The frequency deviation was measured to ensure that the channels emissions remained within the authorized band with varying temperature and voltage.

FCC ID: A3LSPHD710		FCC Pt. 27 / WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1107131190.A3L	Test Date: July 11-14, 2011	EUT Type: Cellular/PCS CDMA/EvDO Phone with BT, WLAN and WiMAX		Page 22 of 39

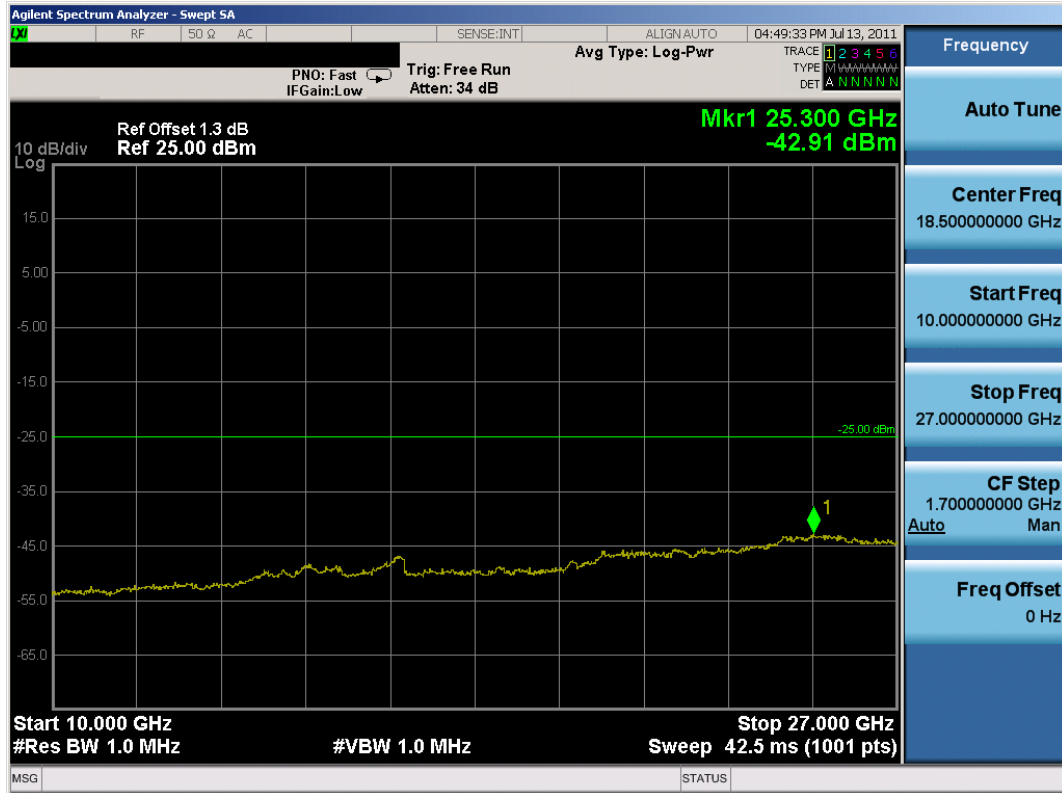
7.0 PLOT(S) OF EMISSIONS – 10MHZ WIMAX

Note: Device was investigated in all configurations and the worse case emissions are reported below, operating in PUSC QPSK mode.

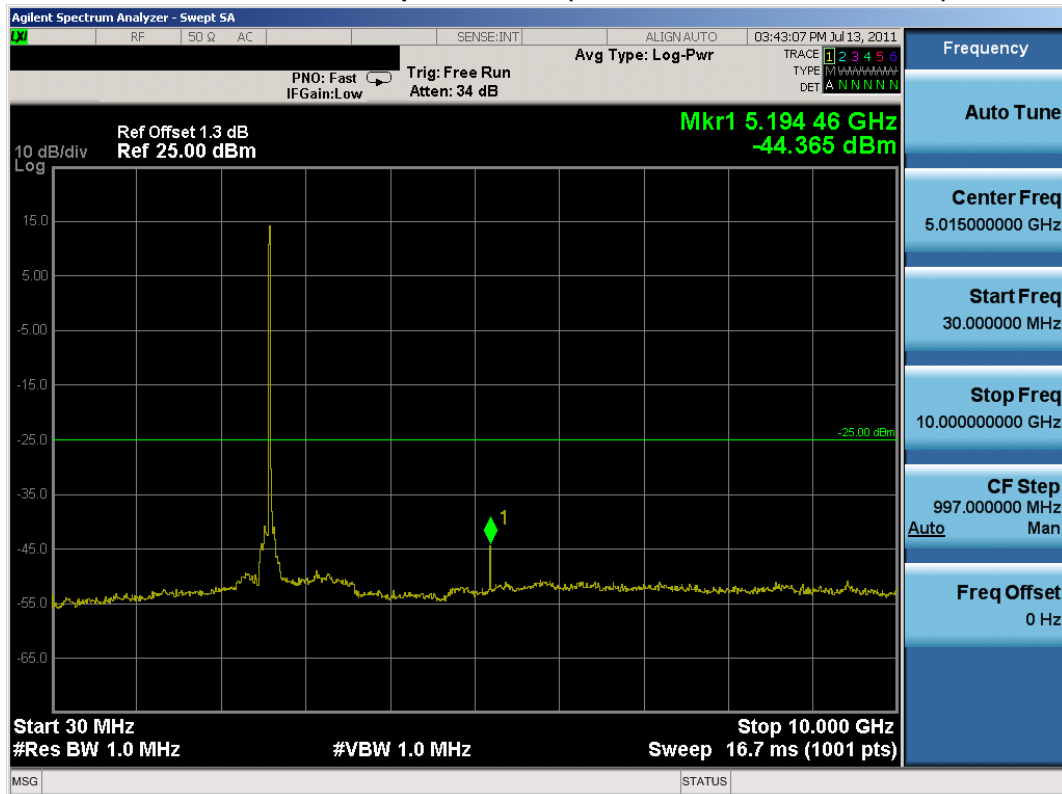


Plot 7-1. Conducted Spurious Plot (WiMAX Mode – Low Channel)

FCC ID: A3LSPHD710		FCC Pt. 27 / WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1107131190.A3L	Test Date: July 11-14, 2011	EUT Type: Cellular/PCS CDMA/EvDO Phone with BT, WLAN and WiMAX		Page 23 of 39

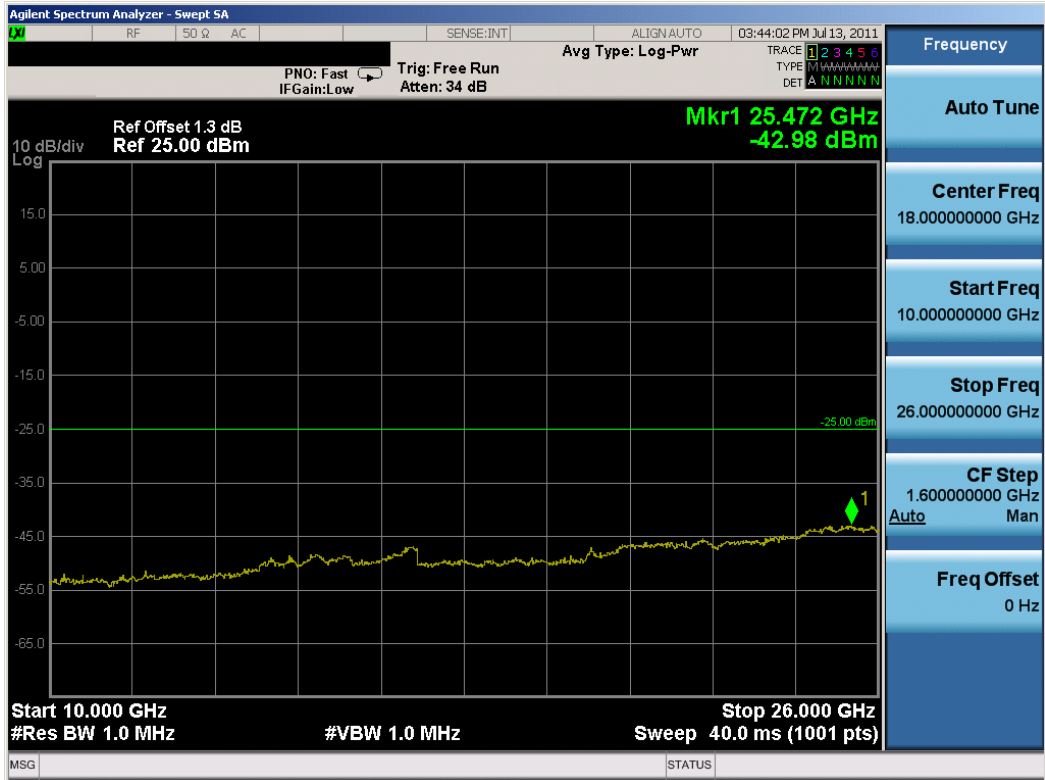


Plot 7-2. Conducted Spurious Plot (WiMAX Mode – Low Channel)

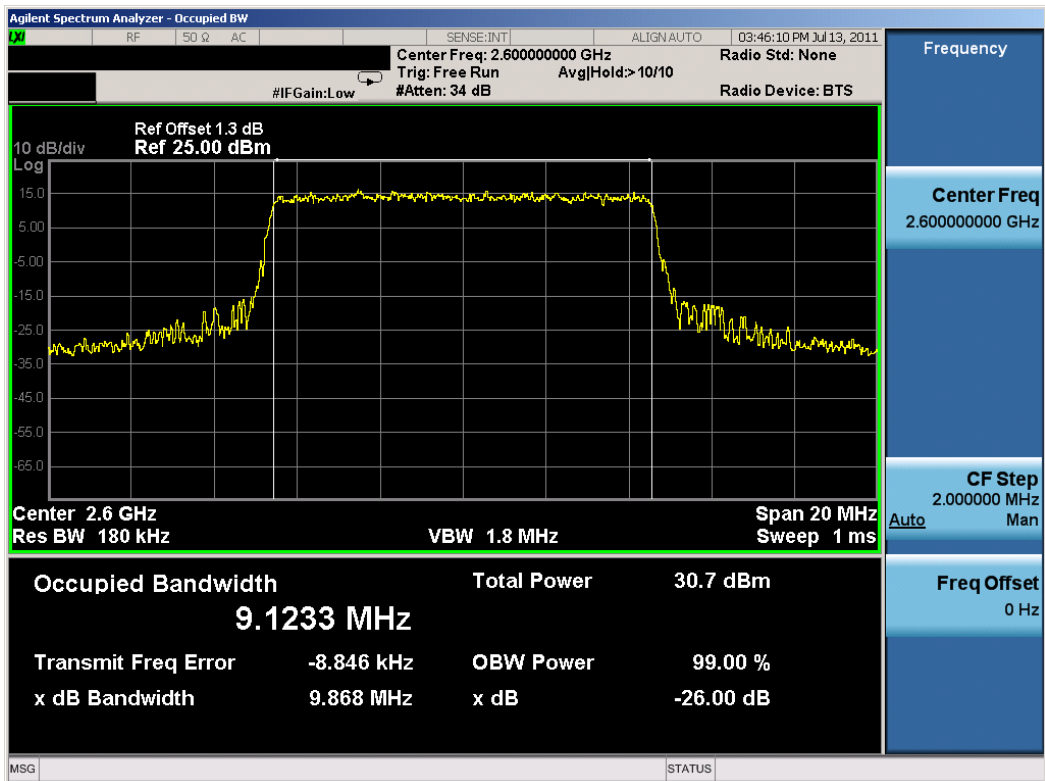


Plot 7-3. Conducted Spurious Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSPHD710		FCC Pt. 27 / WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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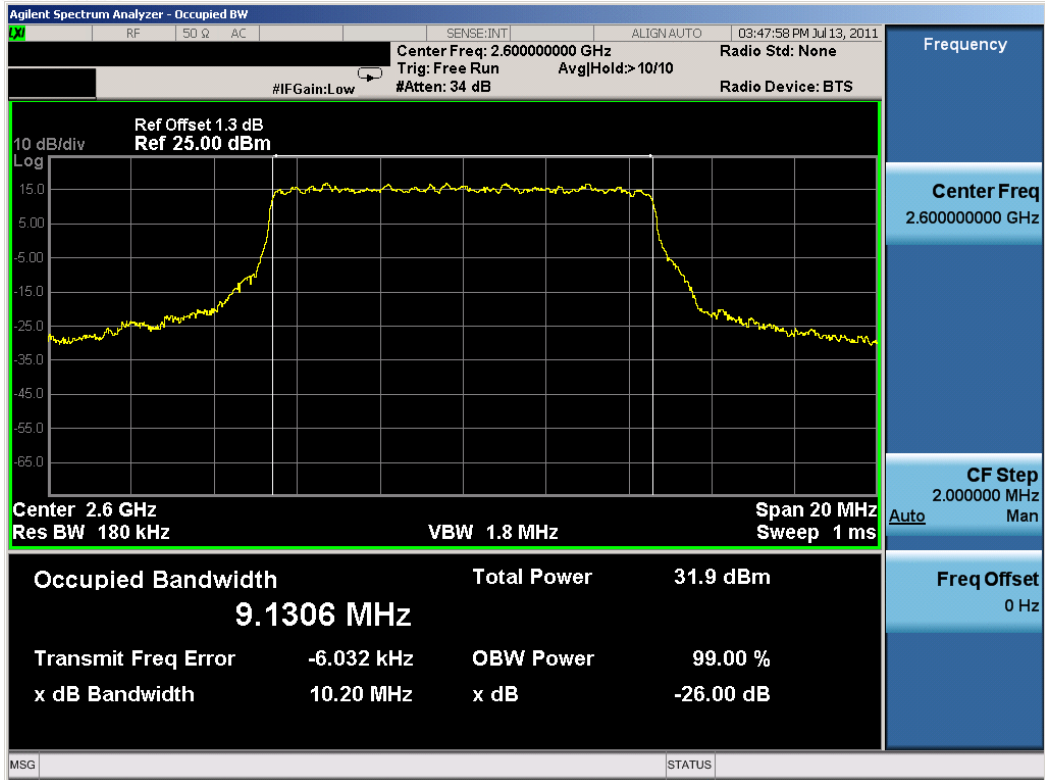


Plot 7-4. Conducted Spurious Plot (WiMAX Mode – Mid Channel)

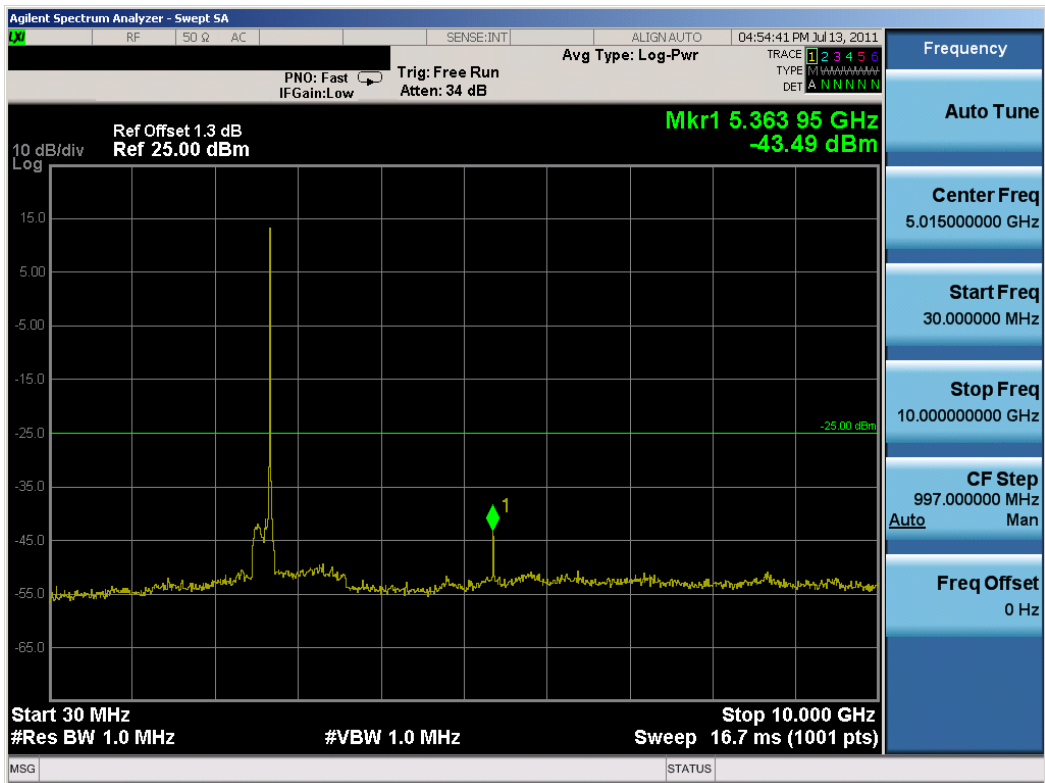


Plot 7-5. Occupied Bandwidth with PUSC QPSK Modulation Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSPHD710		FCC Pt. 27 / WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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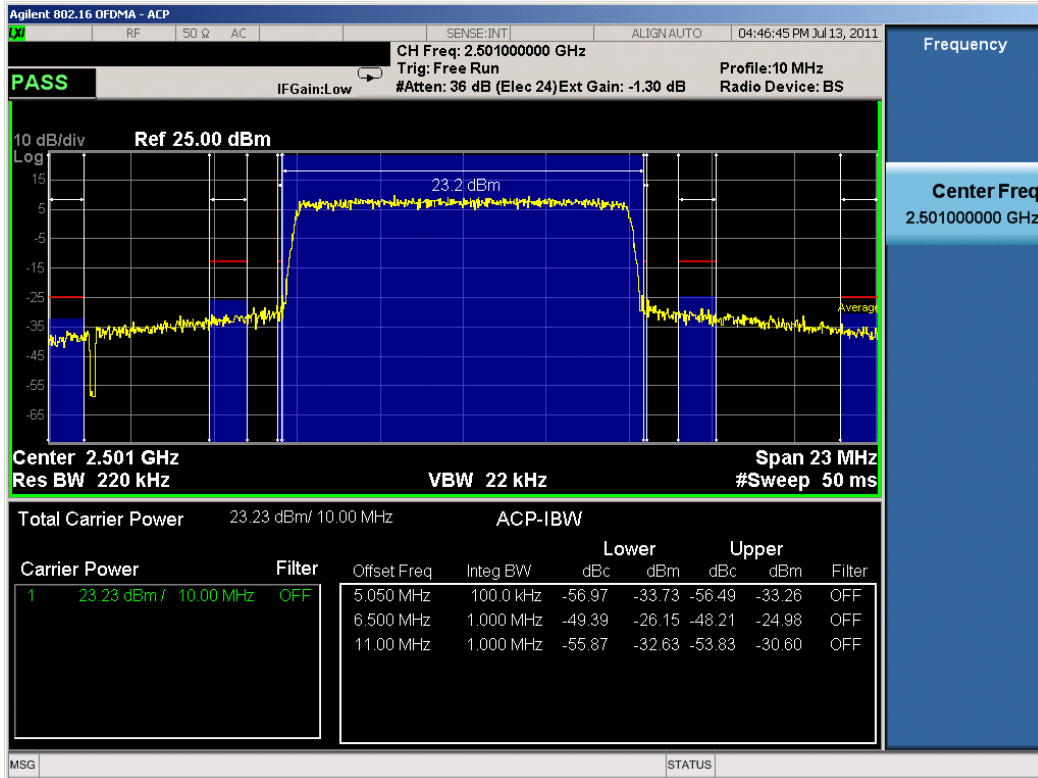


Plot 7-6. Occupied Bandwidth with PUSC 16QAM Modulation Plot (WiMAX Mode – Mid Channel)

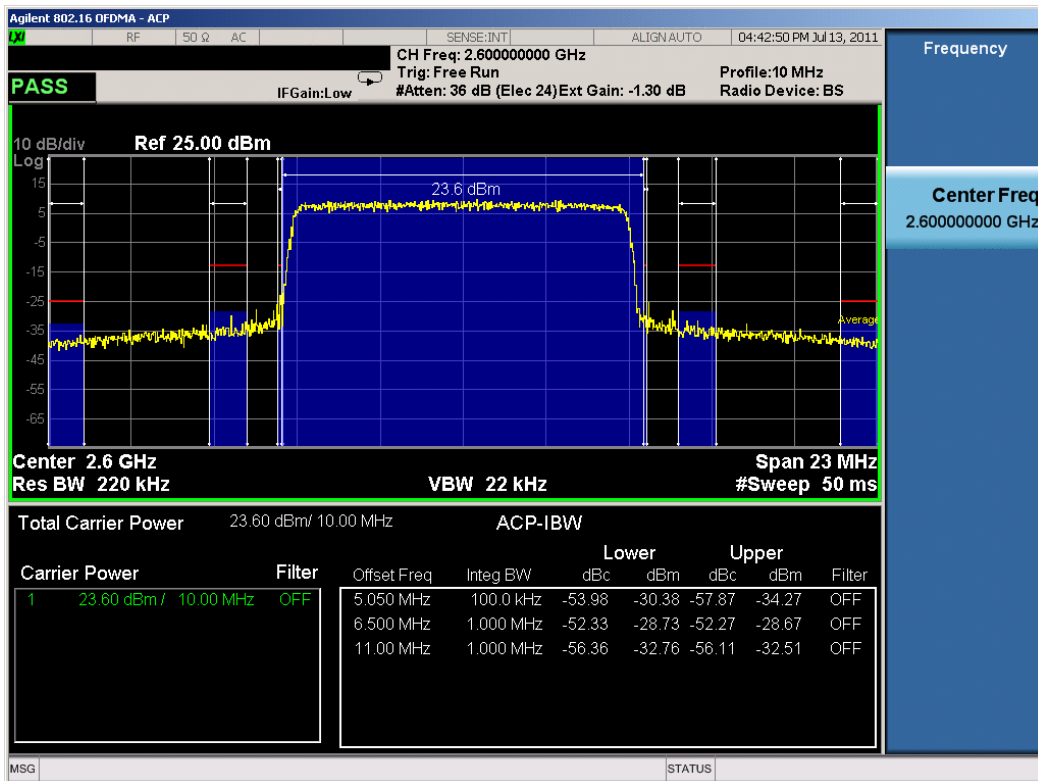


Plot 7-7. Conducted Spurious Plot (WiMAX Mode – High Channel)

FCC ID: A3LSPHD710		FCC Pt. 27 / WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1107131190.A3L	Test Date: July 11-14, 2011	EUT Type: Cellular/PCS CDMA/EvDO Phone with BT, WLAN and WiMAX		Page 26 of 39

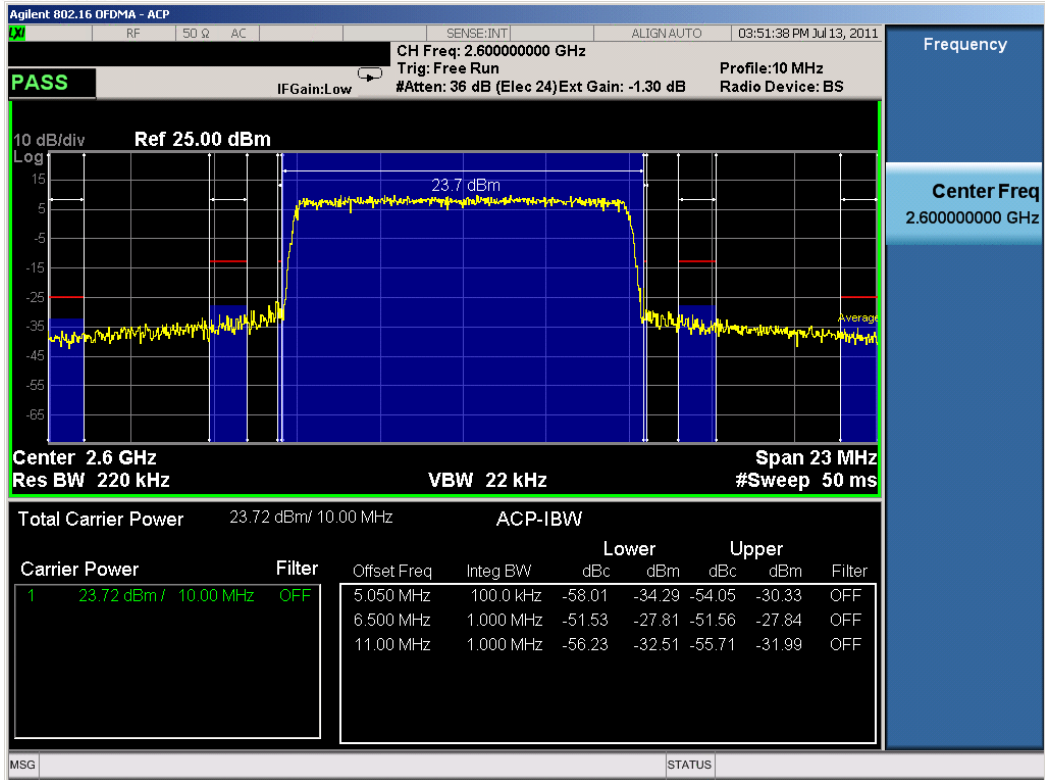


Plot 7-10. Adjacent Channel Power Plot (WiMAX Mode – Low Channel – 16QAM)

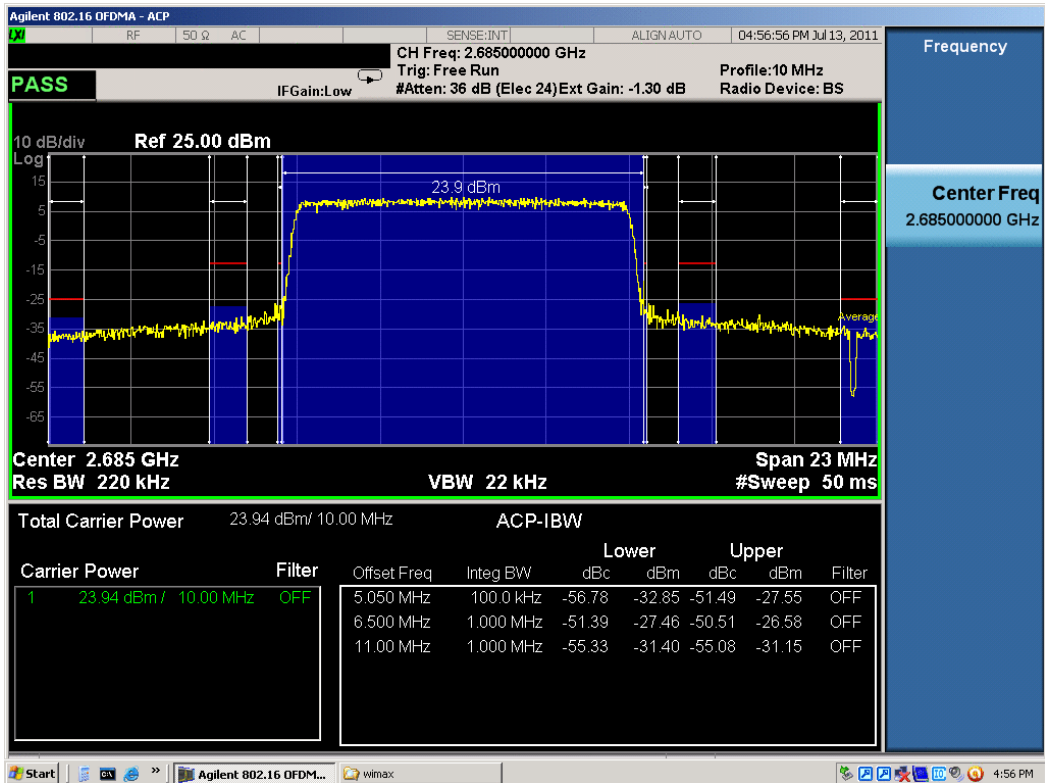


Plot 7-11. Adjacent Channel Power Plot (WiMAX Mode – Mid Channel - QPSK)

FCC ID: A3LSPHD710		FCC Pt. 27 / WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1107131190.A3L	Test Date: July 11-14, 2011	EUT Type: Cellular/PCS CDMA/EvDO Phone with BT, WLAN and WiMAX		Page 28 of 39

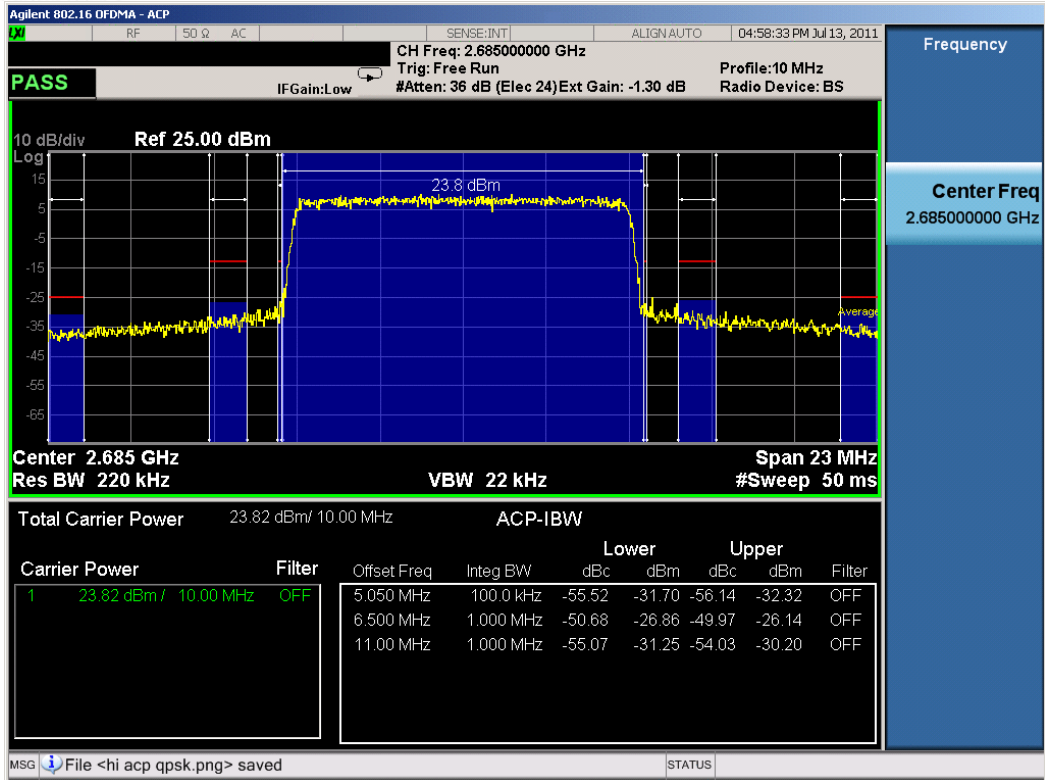


Plot 7-12. Adjacent Channel Power Plot (WiMAX Mode – Mid Channel – 16QAM)



Plot 7-13. Adjacent Channel Power Plot (WiMAX Mode – High Channel - QPSK)

FCC ID: A3LSPHD710		FCC Pt. 27 / WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1107131190.A3L	Test Date: July 11-14, 2011	EUT Type: Cellular/PCS CDMA/EvDO Phone with BT, WLAN and WiMAX		Page 29 of 39

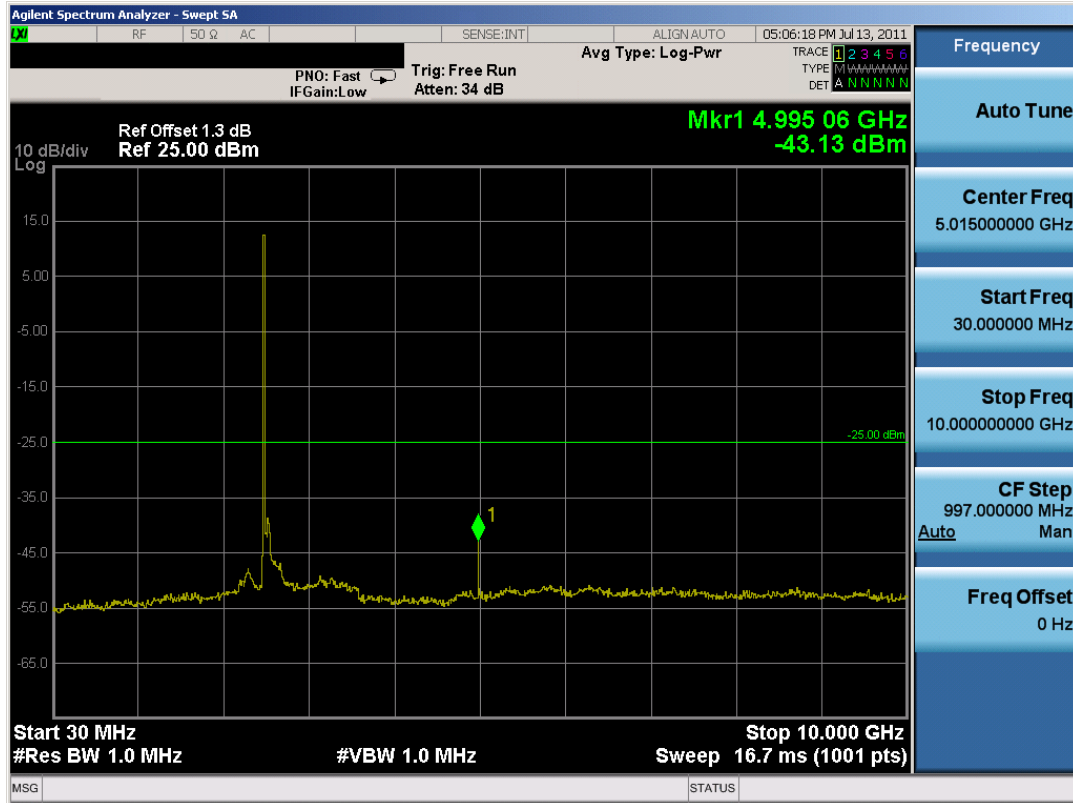


Plot 7-14. Adjacent Channel Power Plot (WiMAX Mode – High Channel – 16QAM)

FCC ID: A3LSPHD710	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 / WiMAX MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1107131190.A3L	Test Date: July 11-14, 2011	EUT Type: Cellular/PCS CDMA/EvDO Phone with BT, WLAN and WiMAX		Page 30 of 39

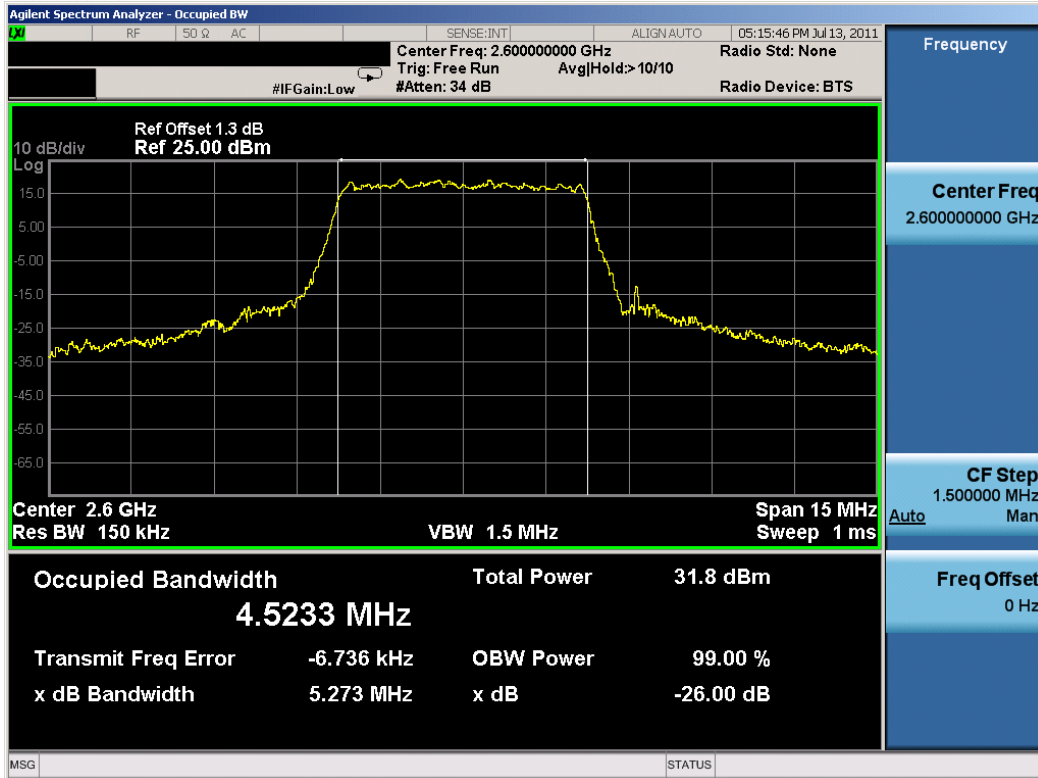
8.0 PLOT(S) OF EMISSIONS – 5MHZ WIMAX

Note: Device was investigated in all configurations and the worse case emissions are reported below, operating in PUSC QPSK mode.

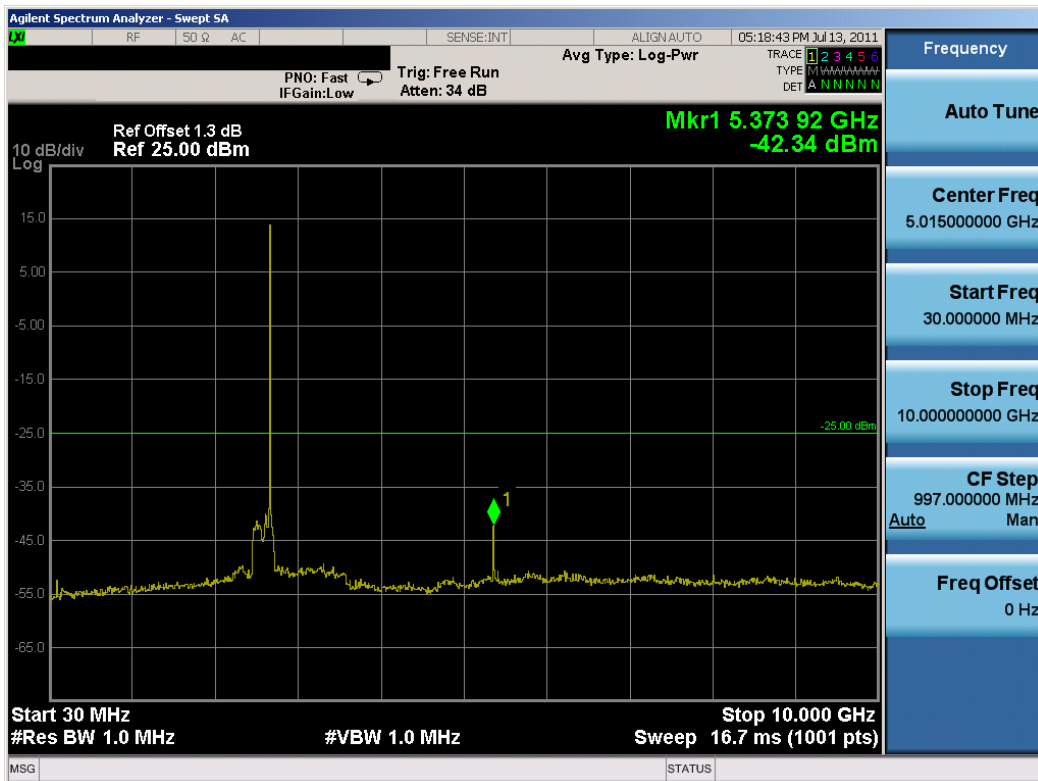


Plot 8-1. Conducted Spurious Plot (WiMAX Mode – Low Channel)

FCC ID: A3LSPHD710		FCC Pt. 27 / WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1107131190.A3L	Test Date: July 11-14, 2011	EUT Type: Cellular/PCS CDMA/EvDO Phone with BT, WLAN and WiMAX		Page 31 of 39

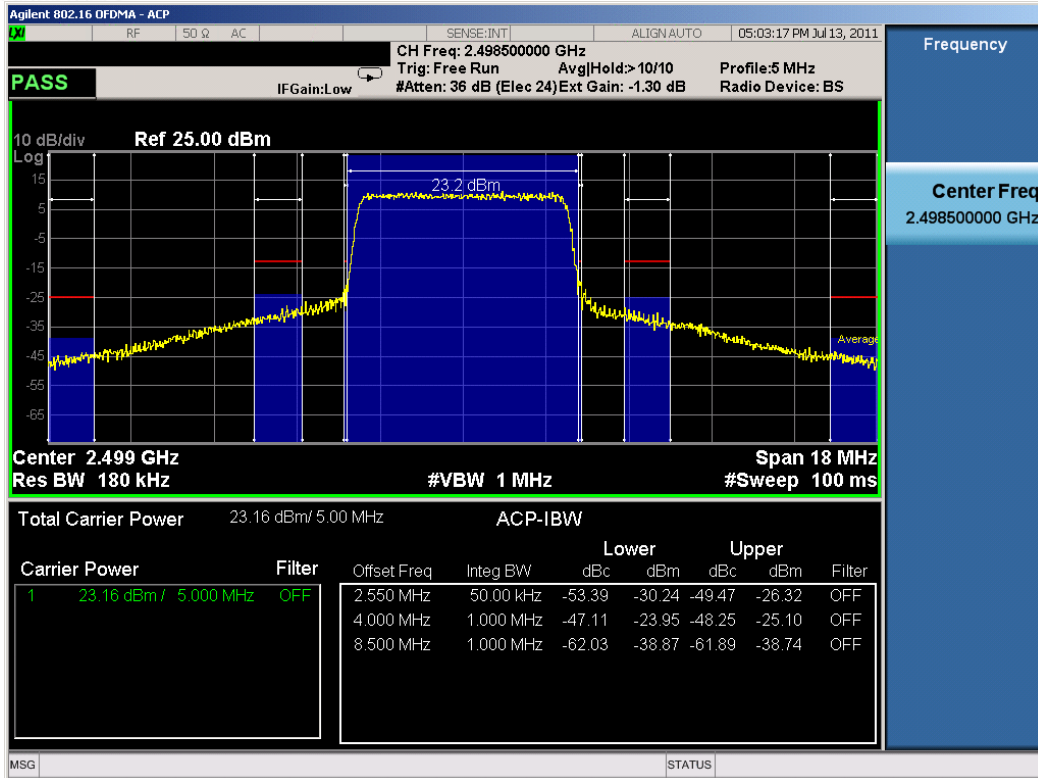


Plot 8-6. Occupied Bandwidth with PUSC 16QAM Modulation Plot (WiMAX Mode – Mid Channel)

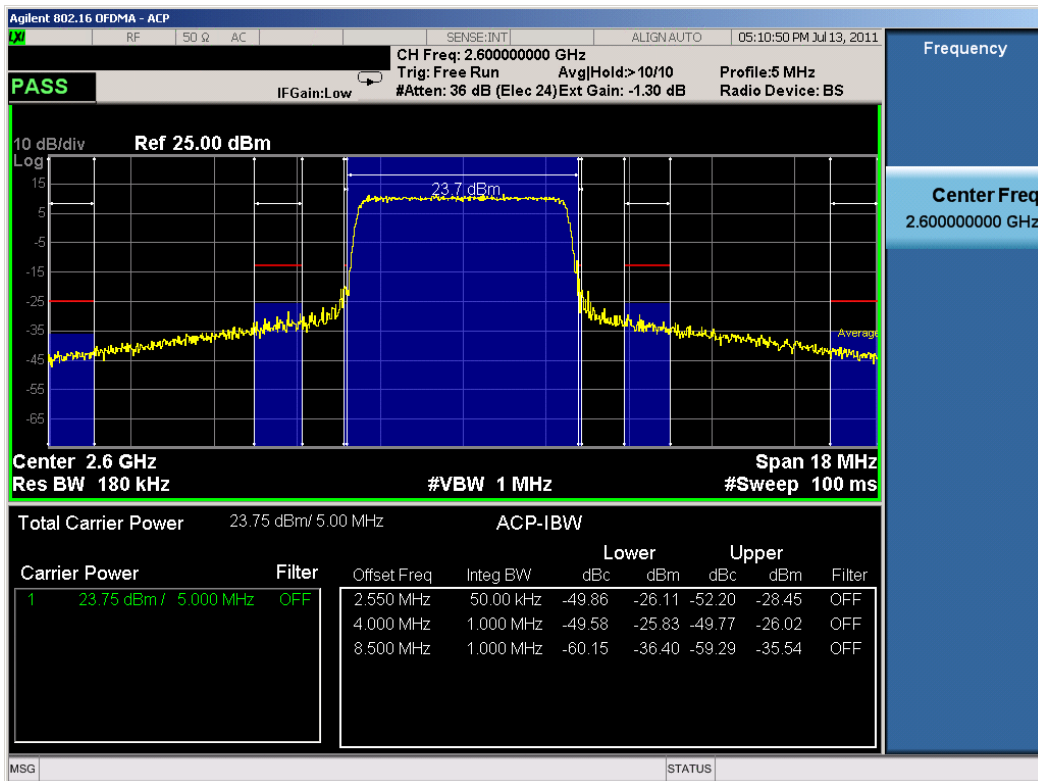


Plot 8-7. Conducted Spurious Plot (WiMAX Mode – High Channel)

FCC ID: A3LSPHD710		FCC Pt. 27 / WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1107131190.A3L	Test Date: July 11-14, 2011	EUT Type: Cellular/PCS CDMA/EvDO Phone with BT, WLAN and WiMAX		Page 34 of 39

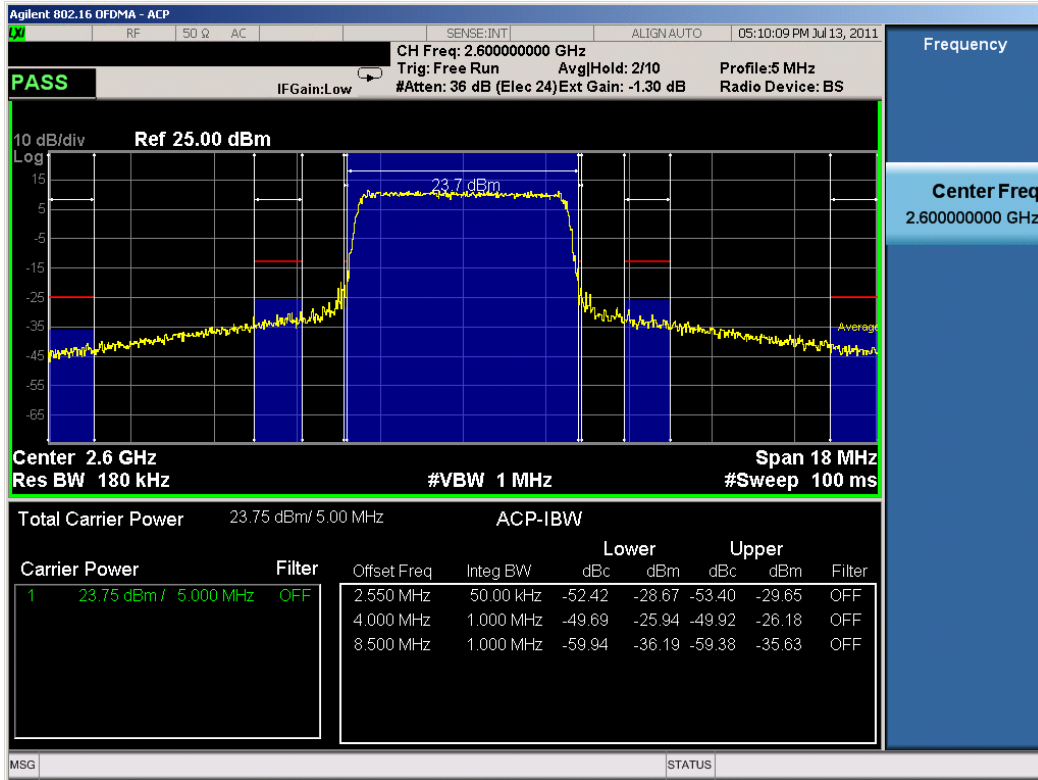


Plot 8-10. Adjacent Channel Power Plot (WiMAX Mode – Low Channel – 16QAM)

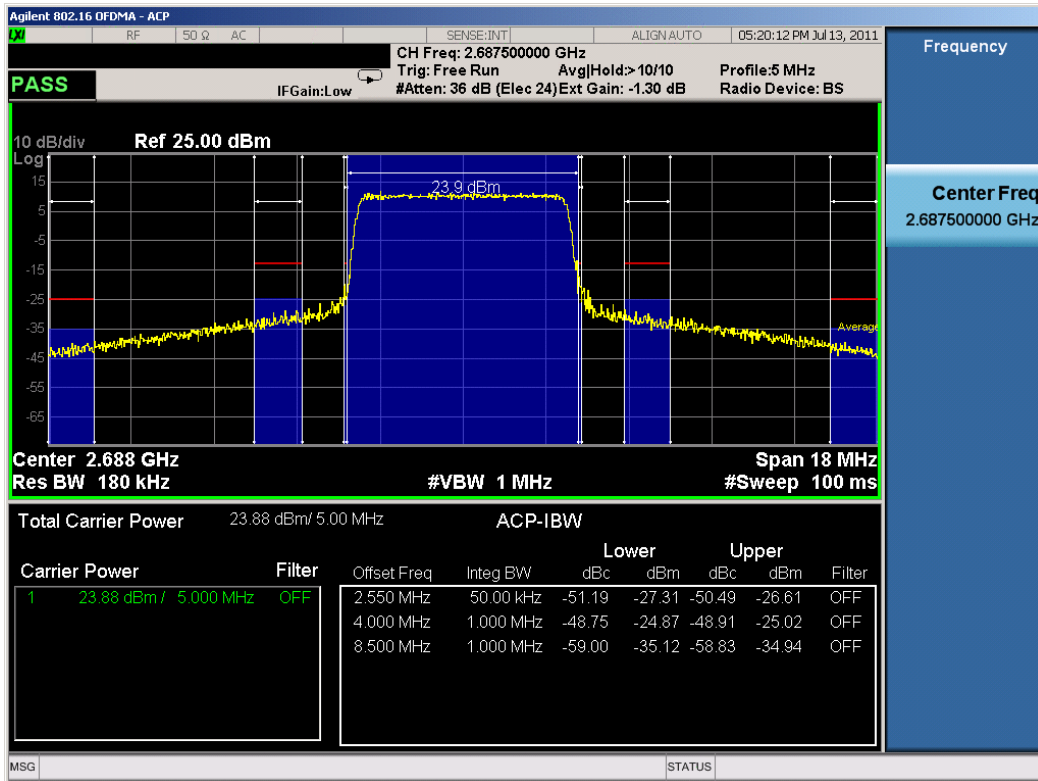


Plot 8-11. Adjacent Channel Power Plot (WiMAX Mode – Mid Channel - QPSK)

FCC ID: A3LSPHD710		FCC Pt. 27 / WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1107131190.A3L	Test Date: July 11-14, 2011	EUT Type: Cellular/PCS CDMA/EvDO Phone with BT, WLAN and WiMAX		Page 36 of 39

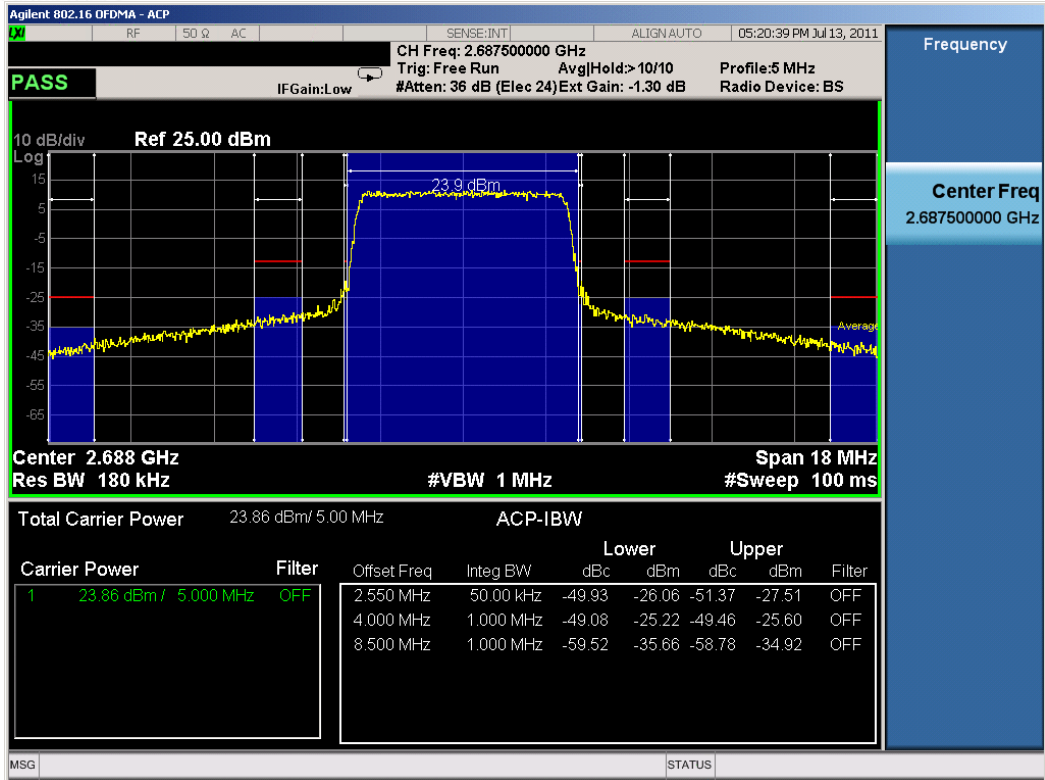


Plot 8-12. Adjacent Channel Power Plot (WiMAX Mode – Mid Channel – 16QAM)



Plot 8-13. Adjacent Channel Power Plot (WiMAX Mode – High Channel - QPSK)

FCC ID: A3LSPHD710		FCC Pt. 27 / WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1107131190.A3L	Test Date: July 11-14, 2011	EUT Type: Cellular/PCS CDMA/EvDO Phone with BT, WLAN and WiMAX		Page 37 of 39





Plot 8-14. Adjacent Channel Power Plot (WiMAX Mode – High Channel – 16QAM)

FCC ID: A3LSPHD710		FCC Pt. 27 / WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1107131190.A3L	Test Date: July 11-14, 2011	EUT Type: Cellular/PCS CDMA/EvDO Phone with BT, WLAN and WiMAX		Page 38 of 39

9.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Cellular/PCS CDMA/EvDO Phone with BT, WLAN and WiMAX FCC ID: A3LSPHD710** complies with all the requirements of Parts 2 and 27 of the FCC rules.

FCC ID: A3LSPHD710		FCC Pt. 27 / WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1107131190.A3L	Test Date: July 11-14, 2011	EUT Type: Cellular/PCS CDMA/EvDO Phone with BT, WLAN and WiMAX		Page 39 of 39