



PCTEST ENGINEERING LABORATORY, INC.

6660-B Dobbin Road, Columbia, MD 21045 USA

Tel. 410.290.6652 / Fax 410.290.6554

<http://www.pctestlab.com>



CERTIFICATE OF COMPLIANCE FCC Part 27 Certification

Applicant Name:

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

Date of Testing:

September 18 - 21, 2007

Test Site/Location:

PCTEST Lab., Columbia, MD, USA

Test Report Serial No.:

0709101001.A3L

FCC ID: A3LSWCE100

APPLICANT: SAMSUNG ELECTRONICS, CO. LTD.

Application Type: Certification

FCC Classification: Licensed Non-Broadcast Transmitter (TNB)

FCC Rule Part(s): §2; §27 Subpart M

EUT Type: WiMAX Data Card

Model(s): SWC-E100

Tx Frequency Range: 2501 - 2685MHz (WiMAX)

Max. RF Output Power: 0.241 W EIRP WiMAX (23.82) dBm (16QAM)

0.207 W EIRP WiMAX (23.16) dBm (QPSK)

Emission Designator(s): 9M36G7D (QPSK) / 9M34W7D (16QAM)

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.

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.

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

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


Randy Ortanez
President

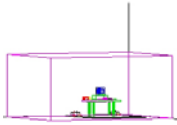


FCC ID: A3LSWCE100		FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0709101001.A3L	Test Dates: September 18 - 21, 2007	EUT Type: WiMAX Data Card		Page 1 of 25

TABLE OF CONTENTS

FCC PART 27 MEASUREMENT REPORT	3
1.0 INTRODUCTION	4
1.1 MEASUREMENT PROCEDURE	4
1.2 SCOPE	4
1.3 TESTING FACILITY	4
2.0 PRODUCT INFORMATION.....	5
2.1 EQUIPMENT DESCRIPTION	5
2.2 EMI SUPPRESSION DEVICE(S)/MODIFICATIONS	5
2.3 LABELING REQUIREMENTS.....	5
3.0 DESCRIPTION OF TESTS	6
3.1 OCCUPIED BANDWIDTH EMISSION LIMITS	6
3.2 EBS/BRS - FREQUENCY BLOCKS	6
3.3 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL.....	7
3.4 RADIATED SPURIOUS AND HARMONIC EMISSIONS	7
3.5 FREQUENCY STABILITY / TEMPERATURE VARIATION	7
4.0 TEST EQUIPMENT CALIBRATION DATA	8
5.0 SAMPLE CALCULATIONS	9
6.0 TEST RESULTS.....	10
6.1 SUMMARY.....	10
6.2 TRANSMITTER CONDUCTED OUTPUT POWER	11
6.3 EQUIVALENT ISOTROPIC RADIATED POWER OUTPUT DATA.....	12
6.4 WIMAX RADIATED MEASUREMENTS.....	13
6.5 WIMAX FREQUENCY STABILITY MEASUREMENTS	16
7.0 PLOT(S) OF EMISSIONS	18
8.0 CONCLUSION.....	25

FCC ID: A3LSWCE100		FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0709101001.A3L	Test Dates: September 18 - 21, 2007	EUT Type: WiMAX Data Card		Page 2 of 25



MEASUREMENT REPORT

FCC Part 27

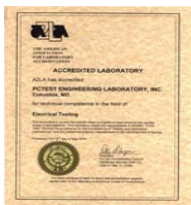


§2.1033 General Information

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
BASE MODEL: SWC-E100
FCC ID: A3LSWCE100
FCC CLASSIFICATION: Licensed Non-Broadcast Transmitter (TNB)
EMISSION DESIGNATOR(S): 9M36G7D (QPSK) / 9M34W7D (16QAM)
MODE: WiMAX
FREQUENCY TOLERANCE: Emissions must remain in band
Test Device Serial No.: N/A ☐ Production ☒ Pre-Production ☐ Engineering
DATE(S) OF TEST: September 18 - 21, 2007
TEST REPORT S/N: 0709101001.A3L

Test Facility / Accreditations

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



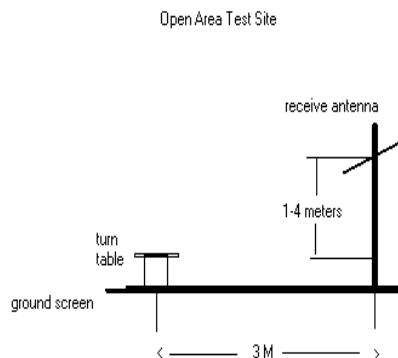
- PCTEST facility is an FCC registered (PCTEST Reg. No. 90864) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (IC-2451).
- PCTEST Lab is accredited to ISO 17025 by U.S. National Institute of Standards 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 (IC-2451) 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.

FCC ID: A3LSWCE100		FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0709101001.A3L	Test Dates: September 18 - 21, 2007	EUT Type: WiMAX Data Card		Page 3 of 25

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 27, 2006 and Industry Canada.

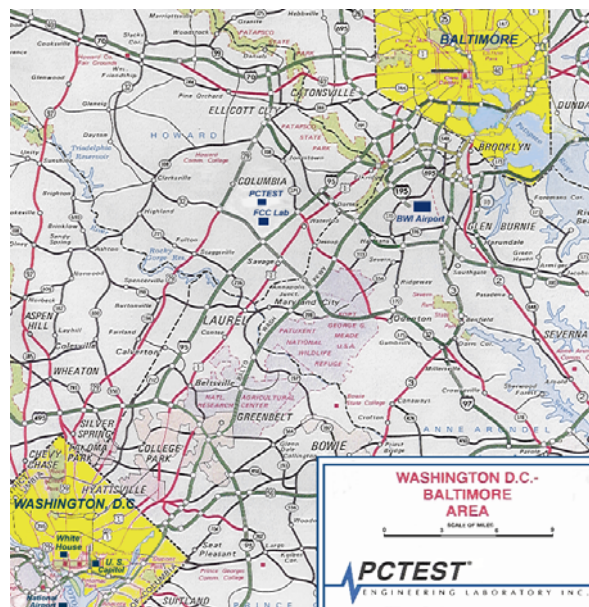


Figure 1-2. Map of the Greater Baltimore and Metropolitan Washington, D.C. area.

FCC ID: A3LSWCE100		FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0709101001.A3L	Test Dates: September 18 - 21, 2007	EUT Type: WiMAX Data Card		Page 4 of 25

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung WiMAX Data Card FCC ID: A3LSWCE100**. 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: SWC-E100	A3LSWCE100	WiMAX Data Card

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 four available types of modulations was tested to determine the configuration producing the worst case emissions. An external trigger was used so that all measurements were made during the transmitters "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.

FCC ID: A3LSWCE100		FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0709101001.A3L	Test Dates: September 18 - 21, 2007	EUT Type: WiMAX Data Card		Page 5 of 25

3.0 DESCRIPTION OF TESTS

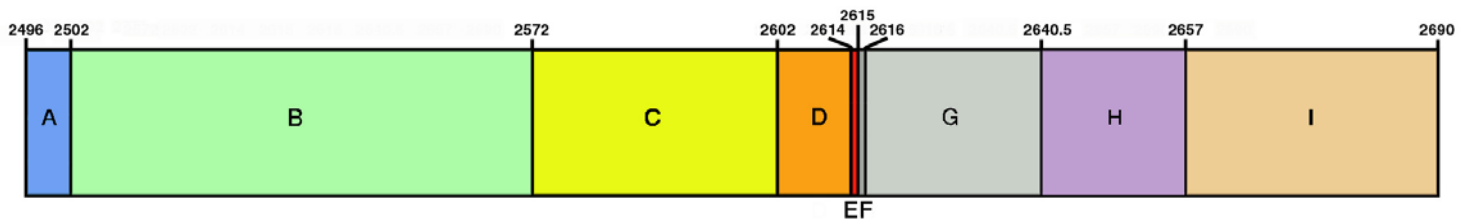
3.1 Occupied Bandwidth Emission Limits

§2.1049, §27.53(l)(6)

- 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.
- 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.
- When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.
- The measurement of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

3.2 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)

FCC ID: A3LSWCE100		FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0709101001.A3L	Test Dates: September 18 - 21, 2007	EUT Type: WiMAX Data Card		Page 6 of 25

3.3 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.

3.4 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 BAMC 16QAM modulation.

3.5 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.

FCC ID: A3LSWCE100		FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0709101001.A3L	Test Dates: September 18 - 21, 2007	EUT Type: WiMAX Data Card		Page 7 of 25

4.0 TEST EQUIPMENT CALIBRATION DATA

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

Manufacturer	Model / Equipment	Calibration Date	Cal Interval	Calibration Due	Serial No.
Agilent	E4407B ESA Spectrum Analyzer	04/29/07	Annual	04/28/08	US39210313
Agilent	E5515C Wireless Communications Test Set	07/27/06	Biennial	07/26/08	GB41450275
Agilent	E5515C Wireless Communications Test Set	10/06/06	Biennial	10/05/08	GB43193972
Agilent	E5515C Wireless Communications Test Set	10/26/06	Biennial	10/25/08	GB46310798
EMCO	Model 3115 (1-18GHz) Horn Antenna	09/24/06	Biennial	09/23/08	9203-2178
EMCO	Model 3115 (1-18GHz) Horn Antenna	09/25/06	Biennial	09/24/08	9704-5182
Rohde & Schwarz	NRVS Power Meter	07/03/07	Biennial	07/02/09	835360/079
Rohde & Schwarz	NRV-Z53 Power Sensor	07/03/07	Biennial	07/02/09	846076/007
Rohde & Schwarz	CMU200 Base Station Simulator	11/08/06	Annual	11/08/07	107826
Rohde & Schwarz	CMU200 Base Station Simulator	09/07/07	Annual	09/06/08	833855/010
Rohde & Schwarz	CMU200 Base Station Simulator	05/24/07	Annual	05/23/08	836371/079
Agilent	HP 8566B (100Hz-22GHz) Spectrum Analyzer	12/21/06	Annual	12/21/07	3638A08713
Agilent	E8257D (250kHz-20GHz) Signal Generator	03/08/07	Annual	03/07/08	MY45470194
Agilent	HP 85650A Quasi-Peak Adapter	12/21/06	Annual	12/21/07	2043A00301
Agilent	HP 8449B (1-26.5GHz) Pre-Amplifier	12/12/06	Annual	12/12/07	3008A00985
Agilent	HP 85650A Quasi-Peak Adapter	12/21/06	Annual	12/21/07	2043A00301
Agilent	HP 8449B (1-26.5GHz) Pre-Amplifier	12/12/06	Annual	12/12/07	3008A00985
Agilent	HP 11713A Attenuation/Switch Driver	12/12/06	Annual	12/12/07	N/A
Agilent	HP 85685A (20Hz-2GHz) Preselector	12/12/06	Annual	12/12/07	N/A
Agilent	HP 8566B Opt. 462 Impulse Bandwidth	12/12/06	Annual	12/12/07	3701A22204
EMCO	Dipole Pair	09/21/06	Biennial	09/20/08	23951
SOLAR	8012-50 LISN (2)	11/18/05	Biennial	11/18/07	0313233, 0310234
K & L	11SH10 Band Pass Filter	N/A	Annual	N/A	1300/4000
K & L	11SH10 Band Pass Filter	N/A	Annual	N/A	4000/12000
Agilent	HP 8495A (0-70dB) DC-4GHz Attenuator	N/A		N/A	N/A
-	263-10dB (DC-18GHz) 10 dB Attenuator	N/A		N/A	N/A
Pasternack	PE2208-6 Bidirectional Coupler	N/A		N/A	N/A
-	No.165 (30MHz - 1000MHz) RG58 Coax Cable	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
Rohde & Schwarz	NRVD Dual Channel Power Meter	12/11/06	Biennial	12/10/08	101695
Rohde & Schwarz	NRV-Z33 Peak Power Sensor (1mW-20W)	11/28/06	Biennial	11/27/08	100155

Table 4-1. Test Equipment

FCC ID: A3LSWCE100		FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0709101001.A3L	Test Dates: September 18 - 21, 2007	EUT Type: WiMAX Data Card		Page 8 of 25

5.0 SAMPLE CALCULATIONS

Emission Designator

QPSK Modulation

Emission Designator = 9M62G7D

WiMAX BW = 9.62 MHz
 G = Phase Modulation
 7 = Quantized/Digital Info
 D = Data Transmission

16QAM Modulation

Emission Designator = 9M45W7D

WiMAX BW = 9.45 MHz
 W = Composite – Quadrature Amplitude Modulation
 7 = Quantized/Digital Info
 D = Data Transmission

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.

FCC ID: A3LSWCE100		FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0709101001.A3L	Test Dates: September 18 - 21, 2007	EUT Type: WiMAX Data Card		Page 9 of 25

6.0 TEST RESULTS

6.1 Summary

Company Name: Samsung Electronics, Co. Ltd.
 FCC ID: A3LSWCE100
 FCC Classification: Licensed Non-Broadcast Transmitter (TNB)
 Mode(s): WiMAX

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
TRANSMITTER MODE (Tx)					
2.1049, 27.53(l)(6)	Occupied Bandwidth	N/A	CONDUCTED	PASS	Section 7.0
2.1051, 27.53(l)(4)(6)	Band Edge	< 43 + 10log ₁₀ (P[Watts]) within 5.5MHz from the band edge		PASS	Section 7.0
2.1051, 27.53(l)(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
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(l)(4)	Undesirable Emissions	< 55 + 10log ₁₀ (P[Watts]) for all out-of-band emissions		PASS	Section 6.4
2.1055, 27.54	Frequency Stability	Fundamental emissions must stay within the allotted band		PASS	Section 6.5
RECEIVER MODE (Rx) / DIGITAL EMISSIONS					
15.107	AC Conducted Emissions 150kHz – 30MHz	< FCC 15.107 limits or < RSS-Gen table 2 limits	LINE CONDUCTED	PASS	Pt. 15B Test Report
15.109	General Field Strength Limits (Restricted Bands and Radiated Emissions Limits)	< FCC 15.109 limits or < RSS-Gen limits [Section 6; Table 1]	RADIATED (30MHz-1GHz) (1-25 GHz)	PASS	Pt. 15B Test Report
RF EXPOSURE					
2.1091 / 2.1093	SAR Test	1.6 W/kg (SAR Limit)	SAR	PASS	SAR Report

Table 6-1. Summary of Test Results

FCC ID: A3LSWCE100		FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0709101001.A3L	Test Dates: September 18 - 21, 2007	EUT Type: WiMAX Data Card	Page 10 of 25	

6.2 Transmitter Conducted Output Power

§2.1046

A WiMAX test set was used as an external trigger source to a spectrum analyzer. The trigger was set in such a way that the analyzer recorded power measurements only during the times in which the EUT's was transmitting. The WiMAX conducted powers are reported below as well as a test setup diagram.

Band	Band Segment	Frequency [MHz]	QPSK		16QAM	
			PUSC	BAMC	PUSC	BAMC
			[dBm]	[dBm]	[dBm]	[dBm]
EBS/BR5	LBS	2501.00	23.13	23.52	22.87	23.87
	MBS	2600.00	22.92	23.19	23.11	23.71
	UBS	2685.00	22.68	23.21	22.69	23.58

Table 6-2. WiMAX Conducted Output Power

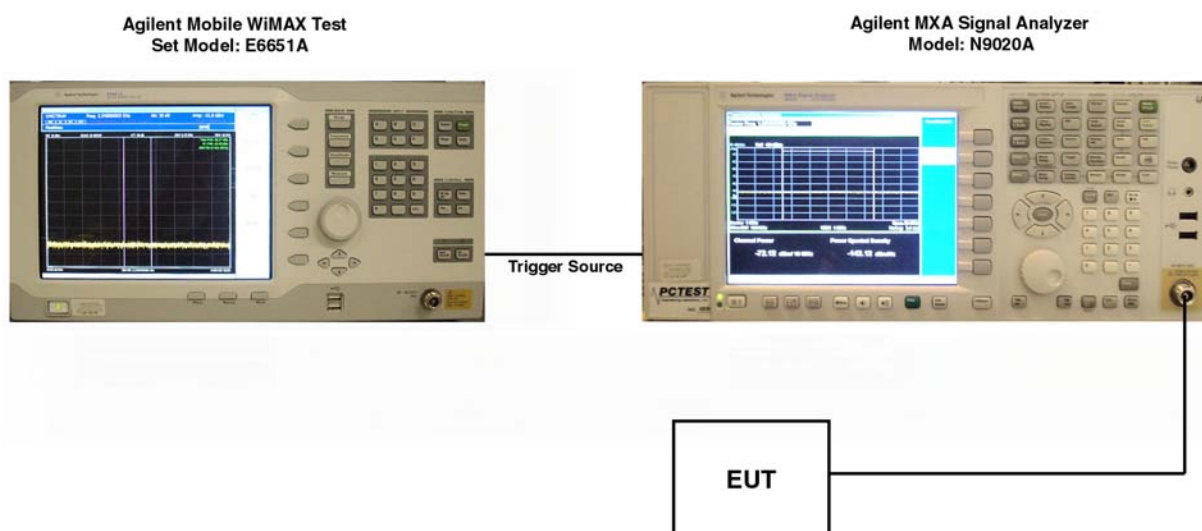


Figure 6-1. WiMAX Conducted Power Test Setup Diagram

6.3 Equivalent Isotropic Radiated Power Output Data

§27.50(h)(2)

POWER: Maximum (WiMAX Mode)

Frequency [MHz]	Modulation	Measured Level [dBm]	Substitute Level [dBm]	Antenna Gain [dBi]	Pol [H/V]	EIRP [dBm]	EIRP [Watts]	Battery Type
2501.00	16QAM	-21.130	15.12	8.70	V	23.82	0.241	Standard
2600.00	16QAM	-21.940	14.31	8.74	V	23.05	0.202	Standard
2685.00	16QAM	-22.850	13.40	8.78	V	22.18	0.165	Standard
2501.00	QPSK	-21.790	14.46	8.70	V	23.16	0.207	Standard

Table 6-3. Equivalent Isotropic Radiated Power Output Data

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 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 peak detector is used, with RBW = VBW = 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 BAMC 16QAM modulation. This unit was tested with its standard battery.

FCC ID: A3LSWCE100		FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0709101001.A3L	Test Dates: September 18 - 21, 2007	EUT Type: WiMAX Data Card		Page 12 of 25



6.4 WiMAX Radiated Measurements

§2.1053, §27.53(l)(4)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 2501.00 MHz
CHANNEL: LBS
MEASURED OUTPUT POWER: 23.820 dBm = 0.241 W
MODULATION SIGNAL: WiMAX (Internal)
DISTANCE: 3 meters
LIMIT: $55 + 10 \log_{10} (W) =$ 48.82 dBc

FREQ. (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
5002.00	-53.35	8.70	-44.65	V	68.5
7503.00	-60.52	10.50	-50.02	V	73.8
10004.00	-87.58	10.60	-76.97	V	100.8
12505.00	-86.94	12.00	-74.94	V	98.8
15006.00	-84.19	12.50	-71.69	V	95.5

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 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 peak detector is used, with RBW = VBW = 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 BAMC 16QAM modulation. This unit was tested with its standard battery.

FCC ID: A3LSWCE100		FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0709101001.A3L	Test Dates: September 18 - 21, 2007	EUT Type: WiMAX Data Card		Page 13 of 25



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: 23.820 dBm = 0.241 W
MODULATION SIGNAL: WiMAX (Internal)
DISTANCE: 3 meters
LIMIT: $55 + 10 \log_{10} (W) =$ 48.82 dBc

FREQ. (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
5200.00	-56.68	8.74	-47.94	V	71.8
7800.00	-58.89	10.46	-48.43	V	72.3
10400.00	-87.62	10.84	-76.77	V	100.6
13000.00	-87.00	12.16	-74.84	V	98.7
15600.00	-83.18	12.30	-70.88	V	94.7

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 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 peak detector is used, with RBW = VBW = 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 BAMC 16QAM modulation. This unit was tested with its standard battery.

FCC ID: A3LSWCE100		FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0709101001.A3L	Test Dates: September 18 - 21, 2007	EUT Type: WiMAX Data Card		Page 14 of 25



WiMAX Radiated Measurements (Cont'd)

§2.1053, §27.53(l)(4)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 2685.00 MHz
CHANNEL: UBS
MEASURED OUTPUT POWER: 23.820 dBm = 0.241 W
MODULATION SIGNAL: WiMAX (Internal)
DISTANCE: 3 meters
LIMIT: $55 + 10 \log_{10} (W) =$ 48.82 dBc

FREQ. (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
5370.00	-54.77	8.78	-45.99	V	69.8
8055.00	-54.02	10.43	-43.59	V	67.4
10740.00	-87.64	11.03	-76.61	V	100.4
13425.00	-87.06	12.49	-74.57	V	98.4
16110.00	-82.77	12.30	-70.47	V	94.3

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 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 peak detector is used, with RBW = VBW = 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 BAMC 16QAM modulation. This unit was tested with its standard battery.

FCC ID: A3LSWCE100		FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0709101001.A3L	Test Dates: September 18 - 21, 2007	EUT Type: WiMAX Data Card		Page 15 of 25



6.5 WiMAX Frequency Stability Measurements

S2.1055, S27.54

OPERATING FREQUENCY: 2,600,000,000 Hz

CHANNEL: MBS

REFERENCE VOLTAGE: 10.65 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQ. (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	10.65	+ 20 (Ref)	2,600,000,000	0.00	0.000000
100 %		- 30	2,600,016,390	16,390	0.000630
100 %		- 20	2,600,026,820	26,820	0.001032
100 %		- 10	2,600,008,000	8,000	0.000308
100 %		0	2,599,993,500	-6,500	-0.000250
100 %		+ 10	2,599,971,000	-29,000	-0.001115
100 %		+ 20	2,600,019,500	19,500	0.000750
100 %		+ 30	2,600,028,000	28,000	0.001077
100 %		+ 40	2,599,985,000	-15,000	-0.000577
100 %		+ 50	2,599,987,000	-13,000	-0.000500
115 %	12.25	+ 20	2,600,011,500	11,500.00	0.000442
BATT. ENDPOINT	9.43	+ 20	2,600,004,620	4,620.00	0.000178

Table 6-7. Frequency Stability Data (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: A3LSWCE100		FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0709101001.A3L	Test Dates: September 18 - 21, 2007	EUT Type: WiMAX Data Card		Page 16 of 25

WiMAX Frequency Stability Measurements (Cont'd)

§2.1055, §27.54

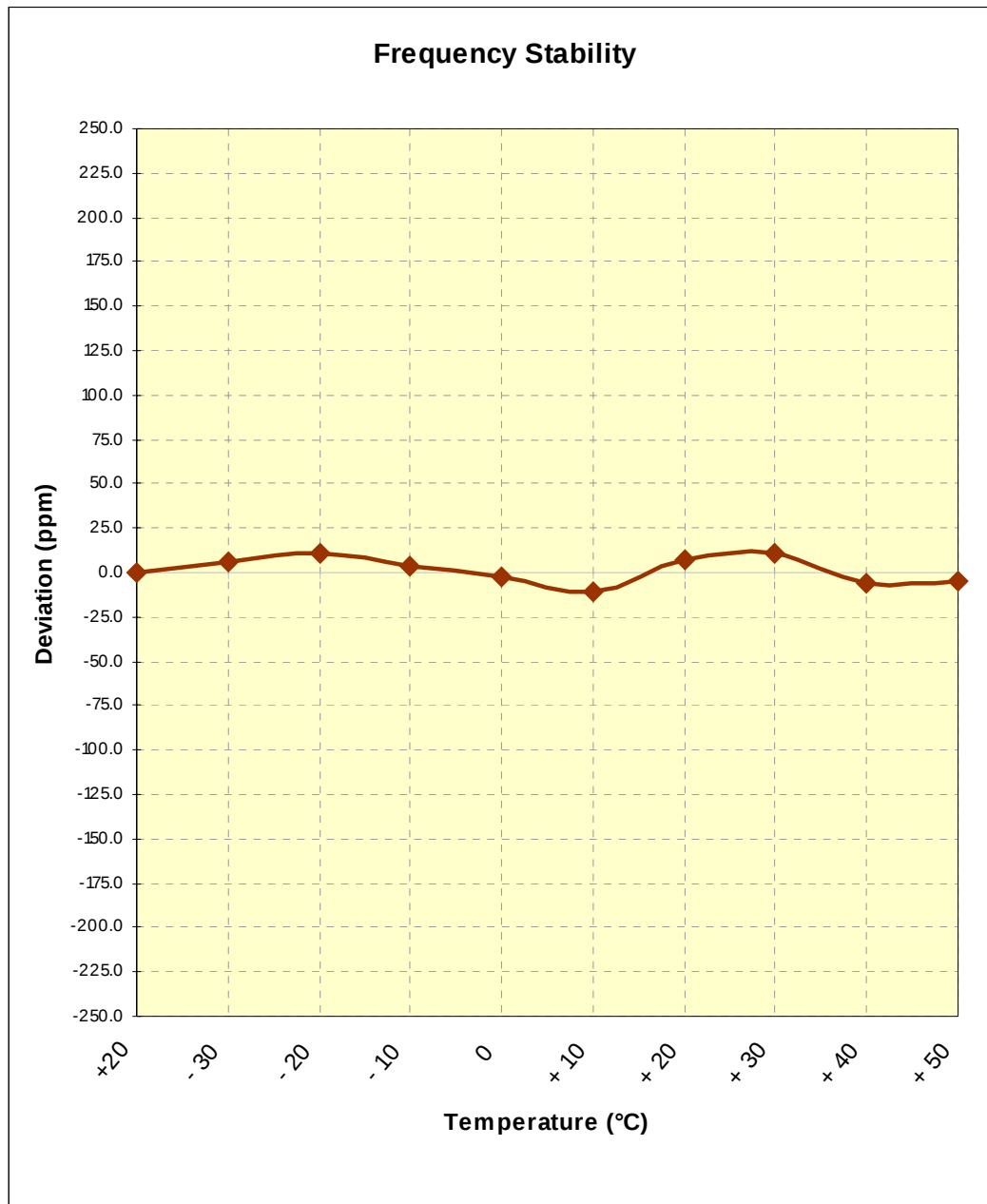


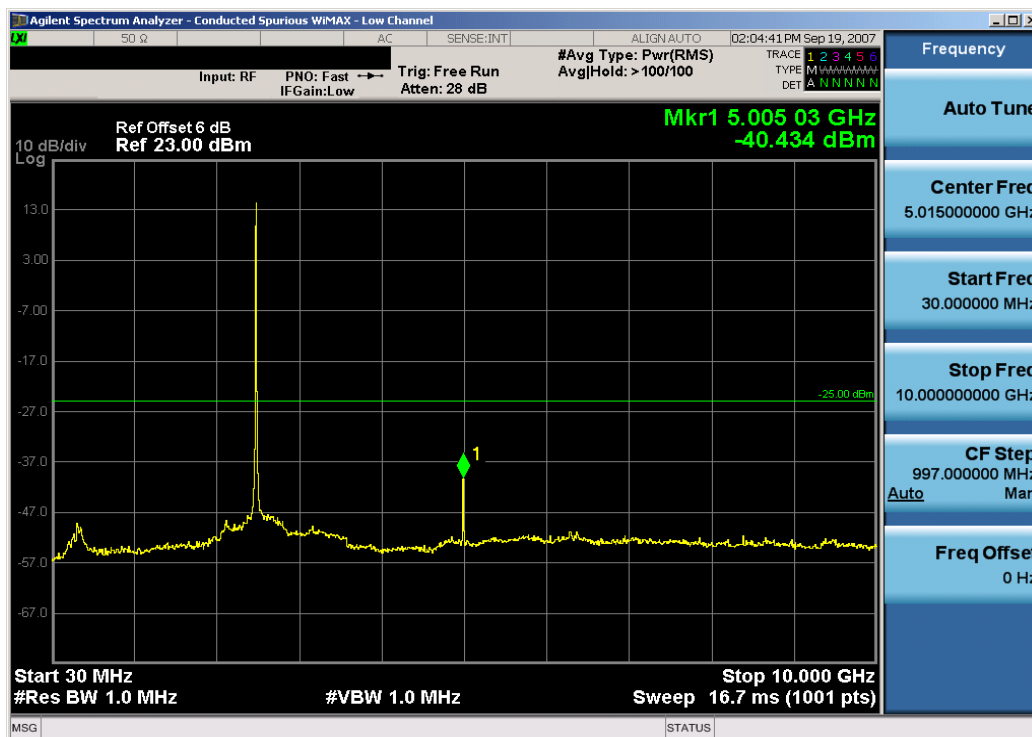
Figure 6-2. Frequency Stability Graph (WiMAX Mode)

Note:

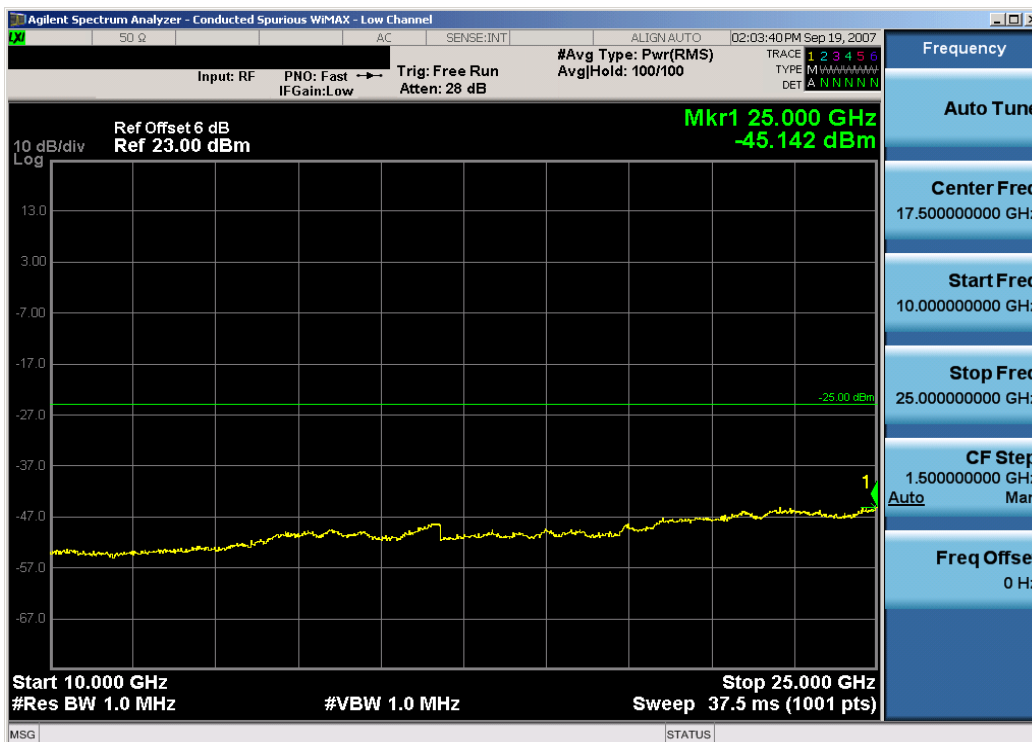
The frequency deviation was measured to ensure that the channels emissions remained within the authorized band with varying temperature and voltage.

FCC ID: A3LSWCE100		FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0709101001.A3L	Test Dates: September 18 - 21, 2007	EUT Type: WiMAX Data Card		Page 17 of 25

7.0 PLOT(S) OF EMISSIONS



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

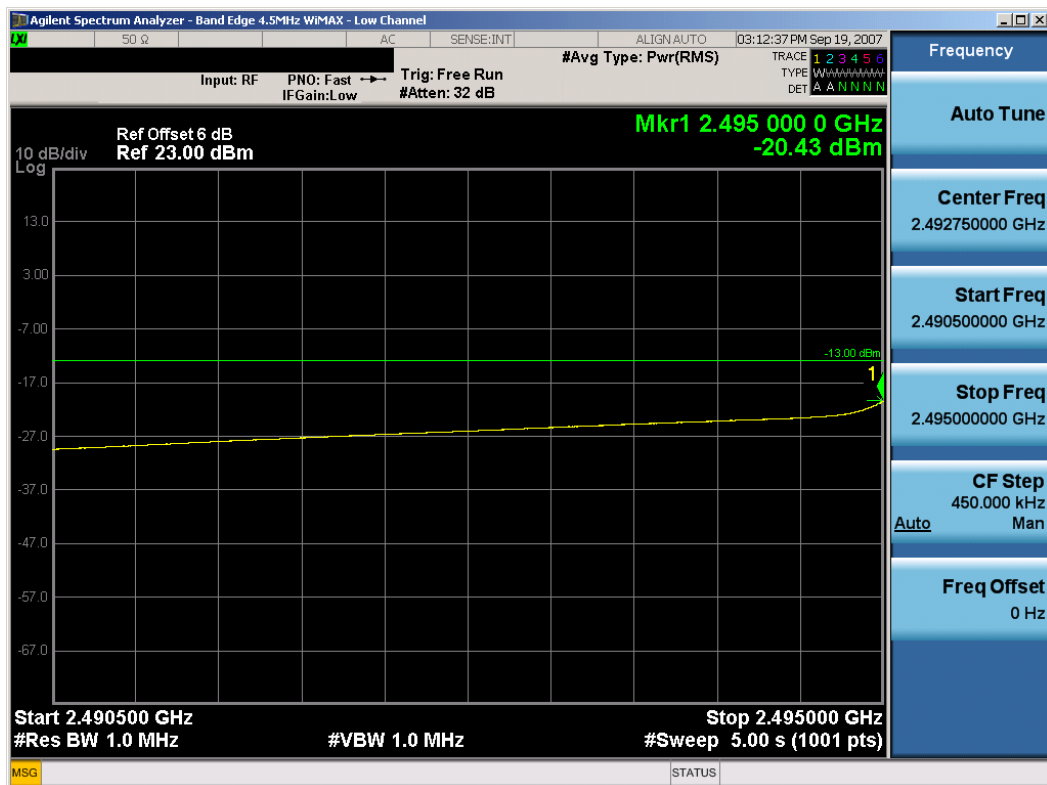


Plot 7-2. Conducted Spurious Plot (WiMAX Mode – Low Channel)

FCC ID: A3LSWCE100		FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0709101001.A3L	Test Dates: September 18 - 21, 2007	EUT Type: WiMAX Data Card		Page 18 of 25

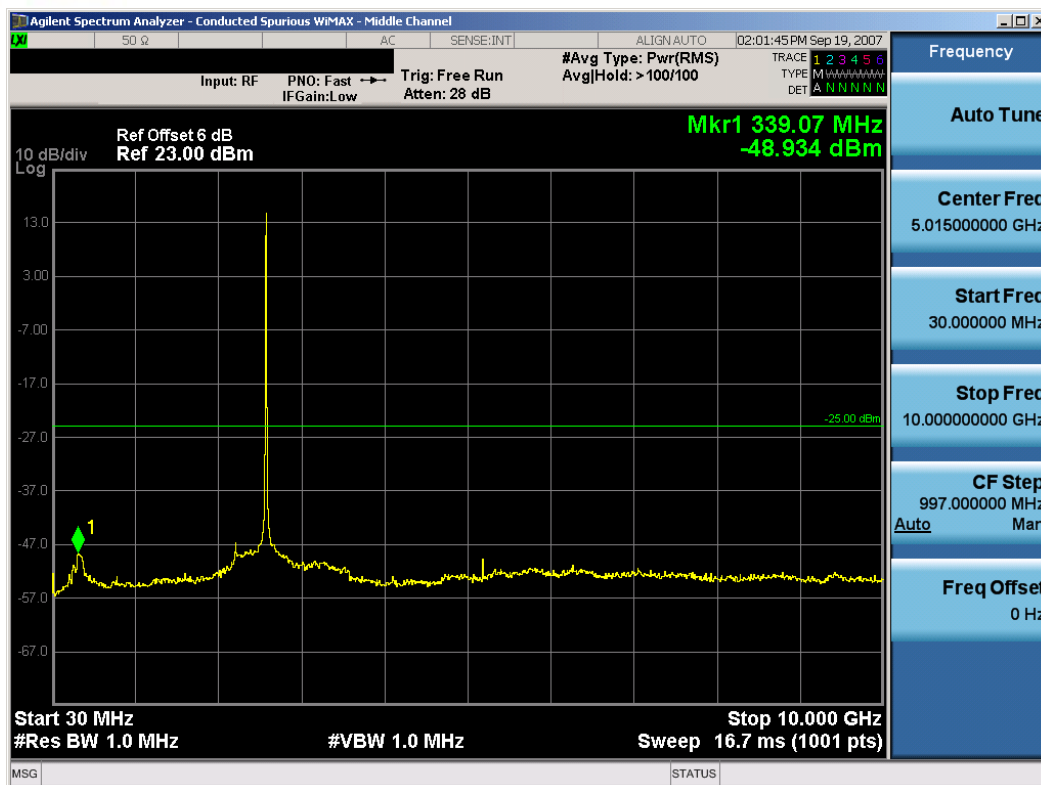


Plot 7-3. Band Edge Plot (WiMAX Mode – Low Channel)

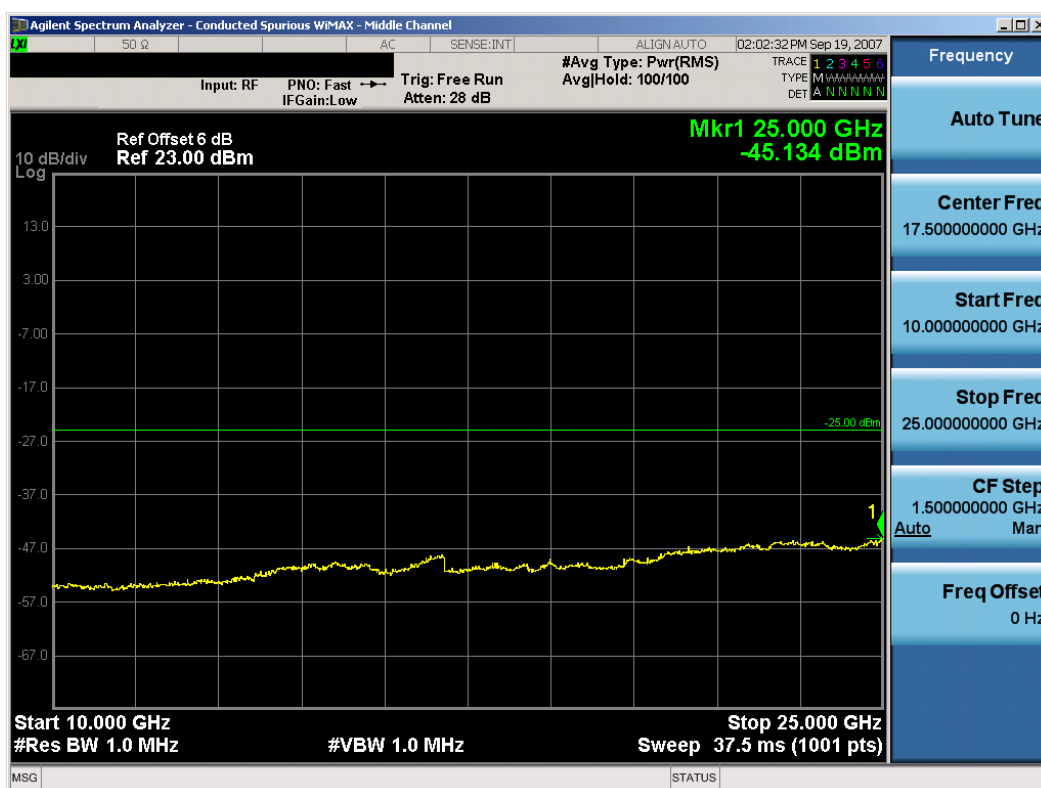


Plot 7-4. 5.5MHz Band Edge Plot (WiMAX Mode – Low Channel)

FCC ID: A3LSWCE100	PCTEST wireless	FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0709101001.A3L	Test Dates: September 18 - 21, 2007	EUT Type: WiMAX Data Card		Page 19 of 25

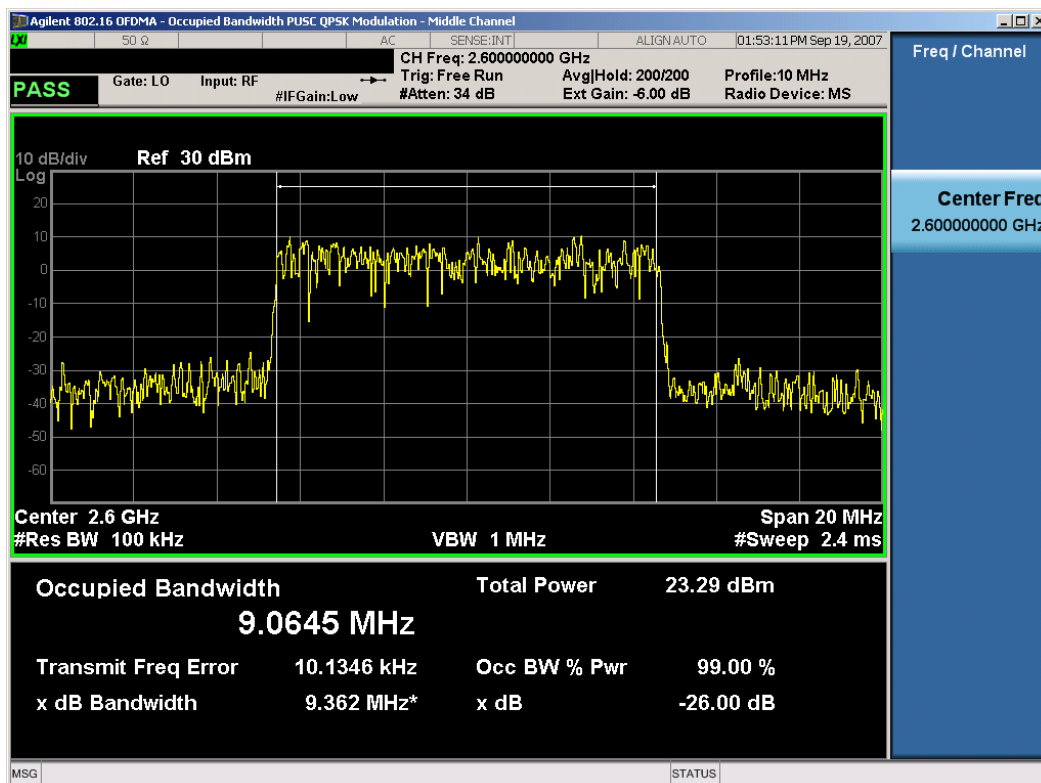


Plot 7-5. Conducted Spurious Plot (WiMAX Mode – Mid Channel)

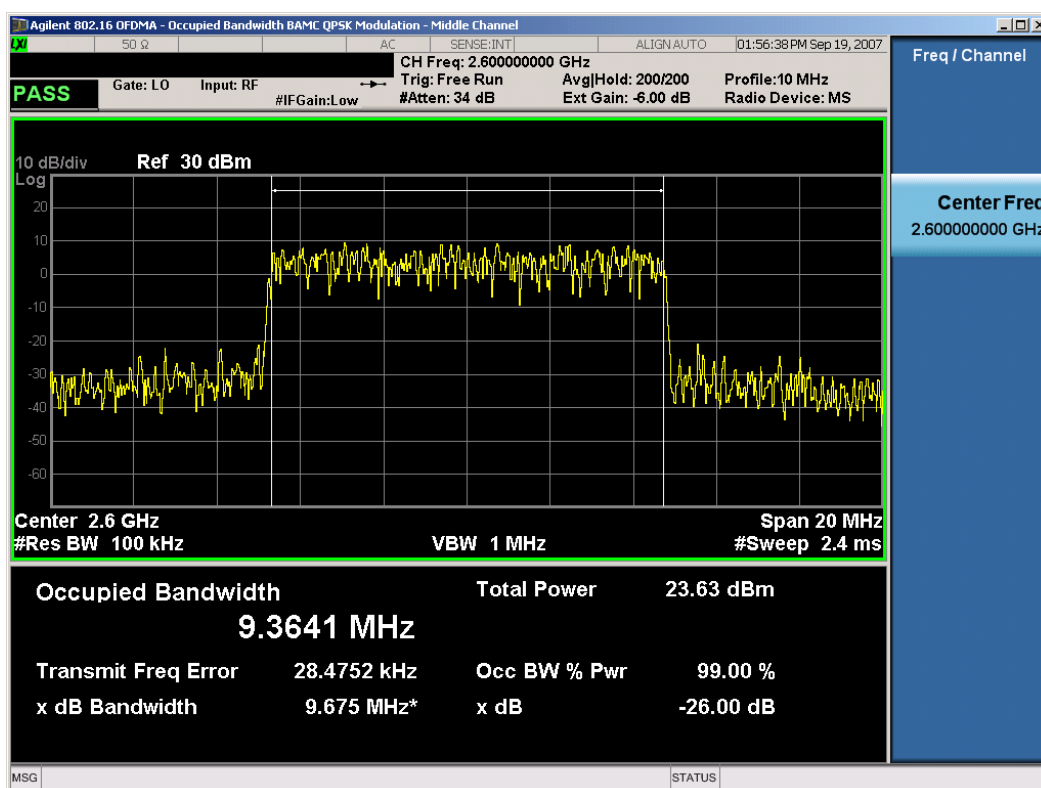


Plot 7-6. Conducted Spurious Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSWCE100	PCTEST wireless	FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0709101001.A3L	Test Dates: September 18 - 21, 2007	EUT Type: WiMAX Data Card		Page 20 of 25

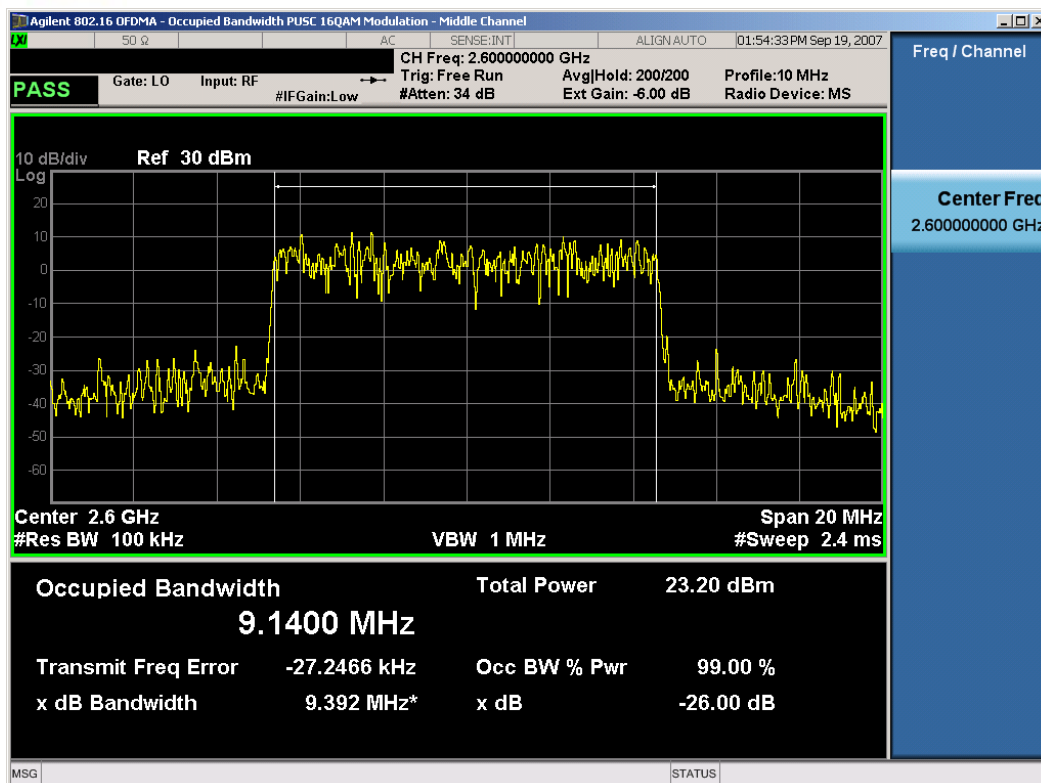


Plot 7-7. Occupied Bandwidth with PUSC QPSK Modulation Plot (WiMAX Mode – Mid Channel)

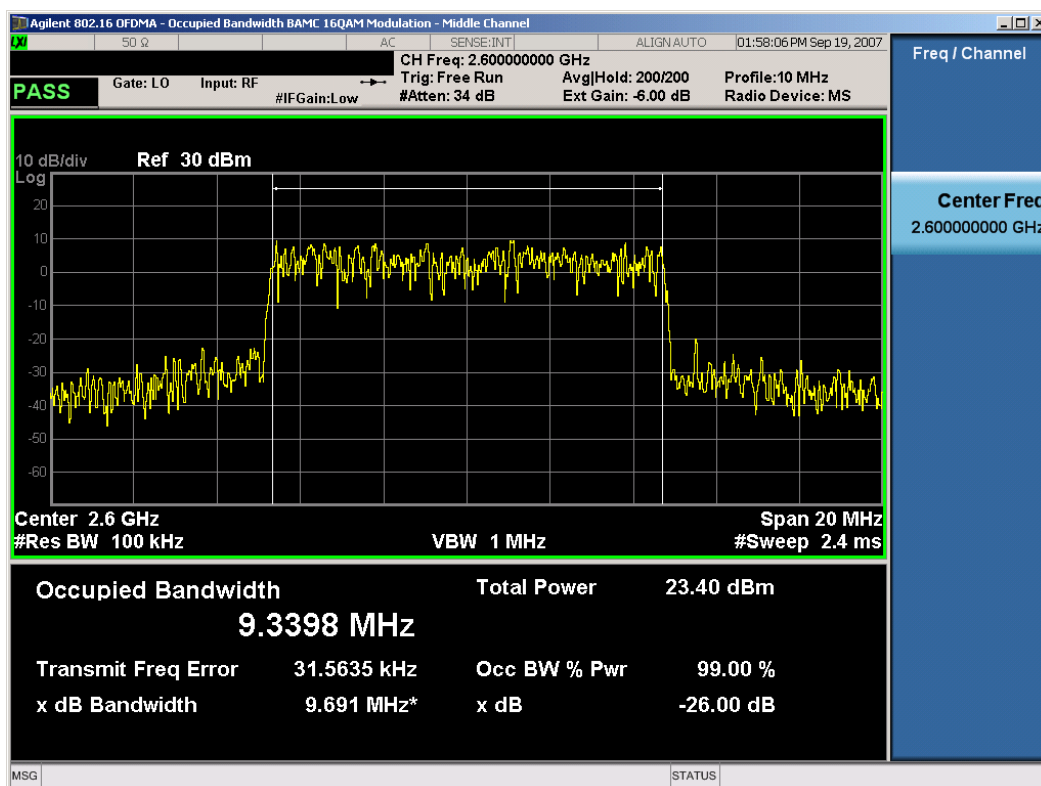


Plot 7-8. Occupied Bandwidth with BAMC QPSK Modulation Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSWCE100	PCTEST wireless	FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0709101001.A3L	Test Dates: September 18 - 21, 2007	EUT Type: WiMAX Data Card		Page 21 of 25

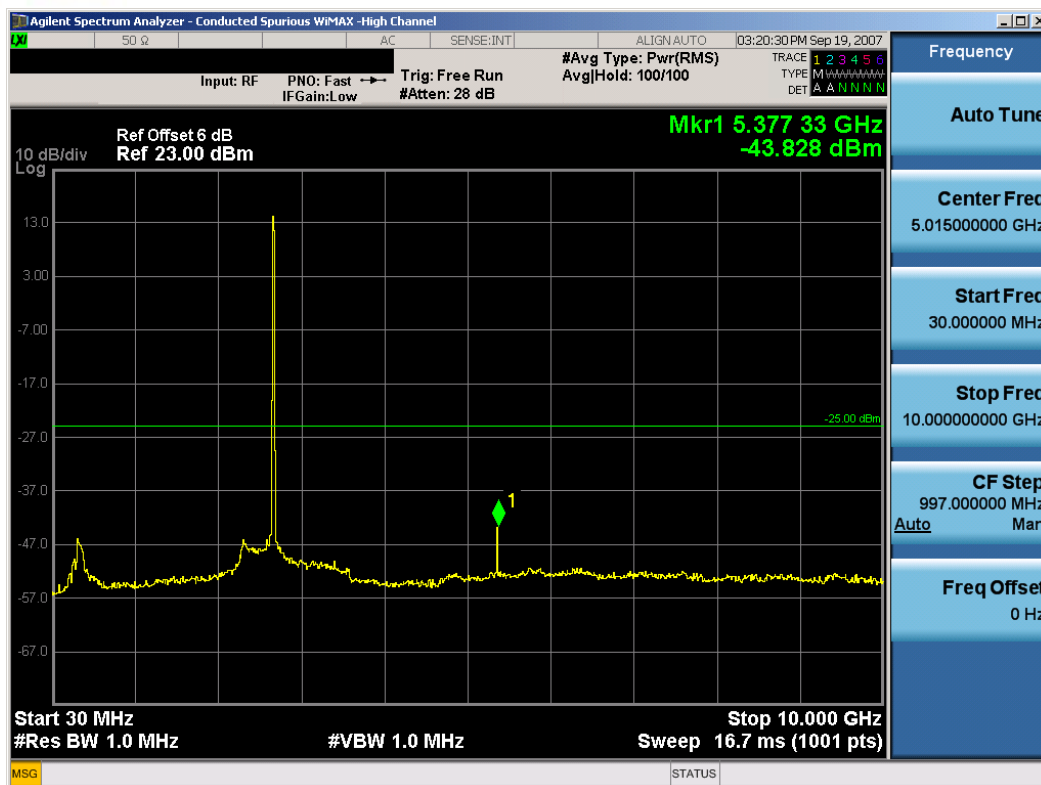


Plot 7-9. Occupied Bandwidth with PUSC 16QAM Modulation Plot (WiMAX Mode – Mid Channel)

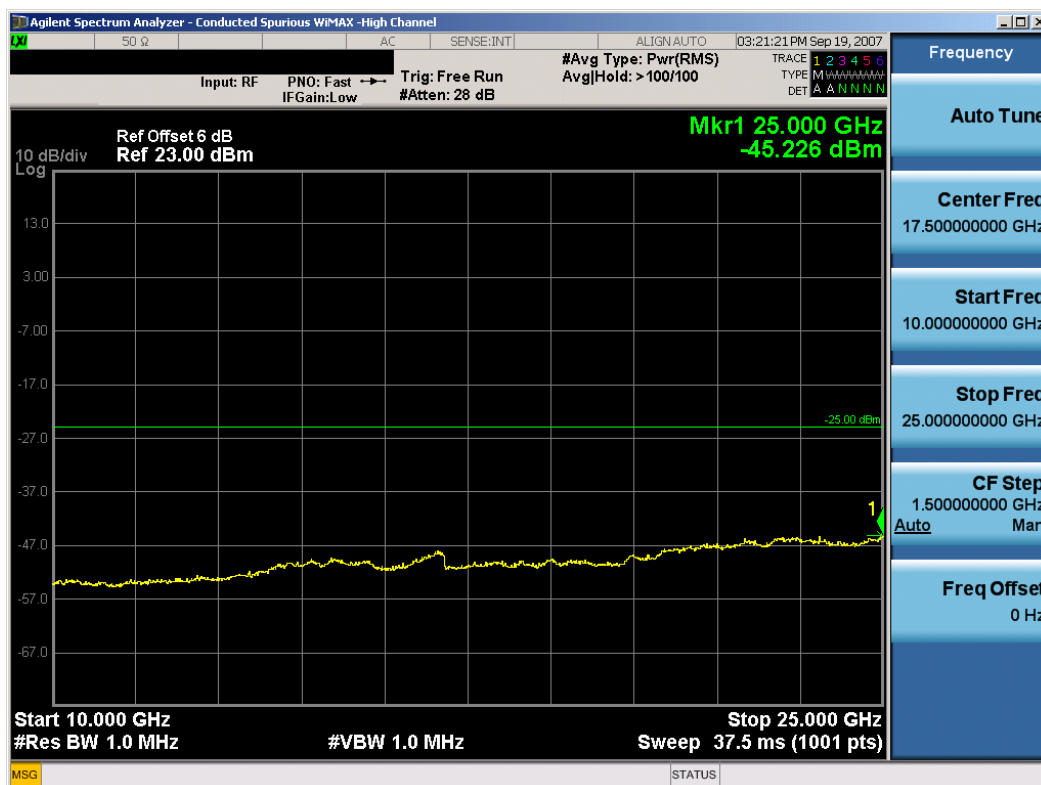


Plot 7-10. Occupied Bandwidth with BAMC 16QAM Modulation Plot (WiMAX Mode – Mid Channel)

FCC ID: A3LSWCE100	PCTEST wireless	FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0709101001.A3L	Test Dates: September 18 - 21, 2007	EUT Type: WiMAX Data Card		Page 22 of 25

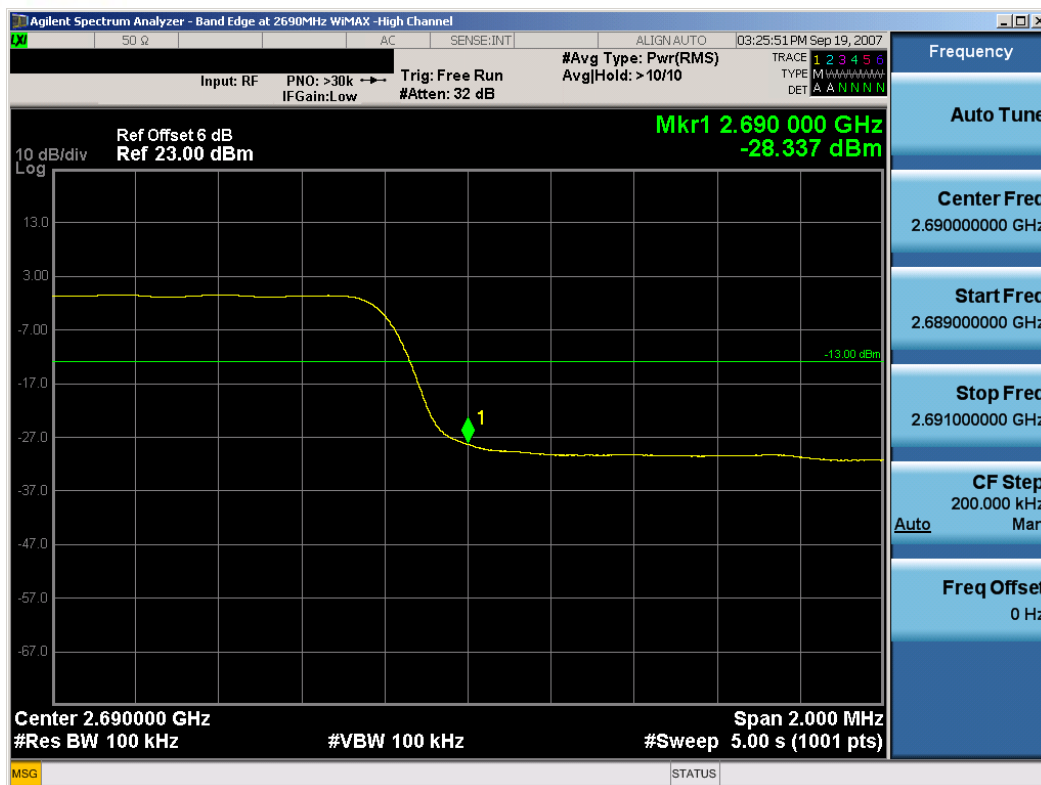


Plot 7-11. Conducted Spurious Plot (WiMAX Mode – High Channel)

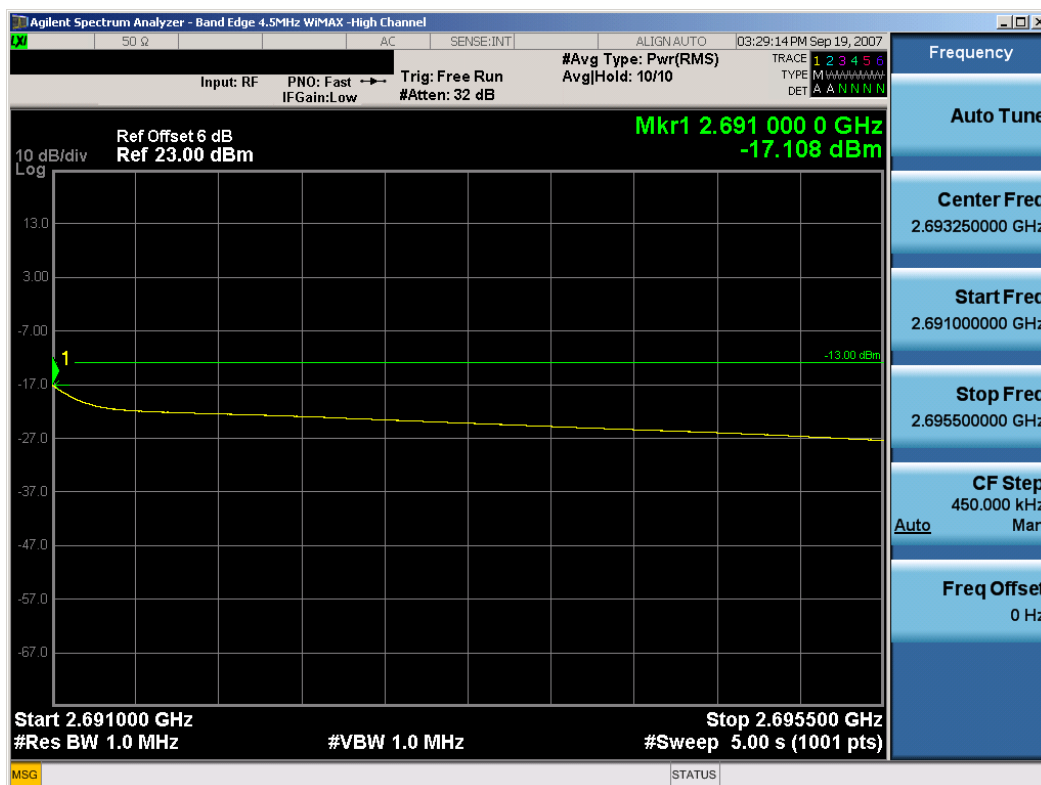


Plot 7-12. Conducted Spurious Plot (WiMAX Mode – High Channel)

FCC ID: A3LSWCE100	PCTEST w i r e l e s s	FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0709101001.A3L	Test Dates: September 18 - 21, 2007	EUT Type: WiMAX Data Card		Page 23 of 25



Plot 7-13. Band Edge Plot (WiMAX Mode – High Channel)



Plot 7-14. 5.5MHz Band Edge Plot (WiMAX Mode – High Channel)

FCC ID: A3LSWCE100		FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0709101001.A3L	Test Dates: September 18 - 21, 2007	EUT Type: WiMAX Data Card		Page 24 of 25

8.0 CONCLUSION

The data collected show that the **Samsung WiMAX Data Card FCC ID: A3LSWCE100** complies with all the requirements of Parts 2 and 27 of the FCC rules.

FCC ID: A3LSWCE100		FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0709101001.A3L	Test Dates: September 18 - 21, 2007	EUT Type: WiMAX Data Card		Page 25 of 25