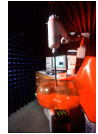




PCTEST ENGINEERING LABORATORY, INC.

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:
Panasonic Corporation of North America
One Panasonic Way, 4B-8
Secaucus, NJ 07094
United States

Date of Testing:
June 18, 2009
Test Site/Location:
PCTEST Lab., Columbia, MD, USA
Test Report Serial No.:
0903050400.ACJ

FCC ID:	ACJ9TGCF-524
APPLICANT:	PANASONIC CORPORATION OF NORTH AMERICA

Application Type: Certification

FCC Classification: PCS Licensed Transmitter (PCB)

FCC Rule Part(s): §2; §27 Subpart M

EUT Type: Toughbook Model: CF-52

Model(s): CF-52

Tx Frequency Range: 5MHz WiMAX: 2498.5 - 2687.5MHz
10MHz WiMAX: 2501 - 2685MHz

Max. RF Output Power: 5MHz WiMAX: 0.219 W EIRP (23.4 dBm) (QPSK)
10MHz WiMAX: 0.204 W EIRP (23.1 dBm) (QPSK)
5MHz WiMAX: 0.245 W EIRP (23.9 dBm) (16QAM)
10MHz WiMAX: 0.224 W EIRP (23.5 dBm) (16QAM)

Emission Designator(s): 5MHz WiMAX: 4M47G7D (QPSK) / 4M49D7W (16QAM)
10MHz WiMAX: 9M16G7D (QPSK) / 9M16D7W (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

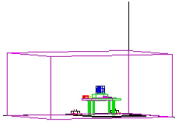


FCC ID: ACJ9TGCF-524	 FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0903050400.ACJ	Test Dates: June 18, 2009	EUT Type: Toughbook Model: CF-52	Page 1 of 31

T A B L E O F C O N T E N T S

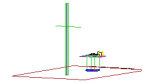
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MEASUREMENT REPORT

FCC Part 27



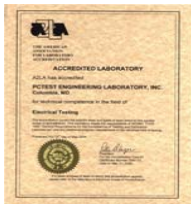
§2.1033 General Information


APPLICANT: Panasonic Corporation of North America
APPLICANT ADDRESS: One Panasonic Way, 4B-8
 Secaucus, NJ 07094
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: CF-52
FCC ID: ACJ9TGCF-524
FCC CLASSIFICATION: PCS Licensed Transmitter (PCB)
EMISSION DESIGNATOR(S): 10MHz WiMAX: 9M16G7D (QPSK) / 9M16D7W (16QAM)
 5MHz WiMAX: 4M47G7D (QPSK) / 4M49D7W (16QAM)
MODE: WiMAX
FREQUENCY TOLERANCE: Emission must remain in band
Test Device Serial No.: N/A Production Pre-Production Engineering
DATE(S) OF TEST: June 18, 2009
TEST REPORT S/N: 0903050400.ACJ

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.

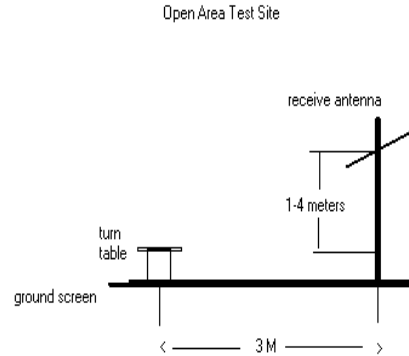


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1.0 INTRODUCTION

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 27, 2006 and Industry Canada.

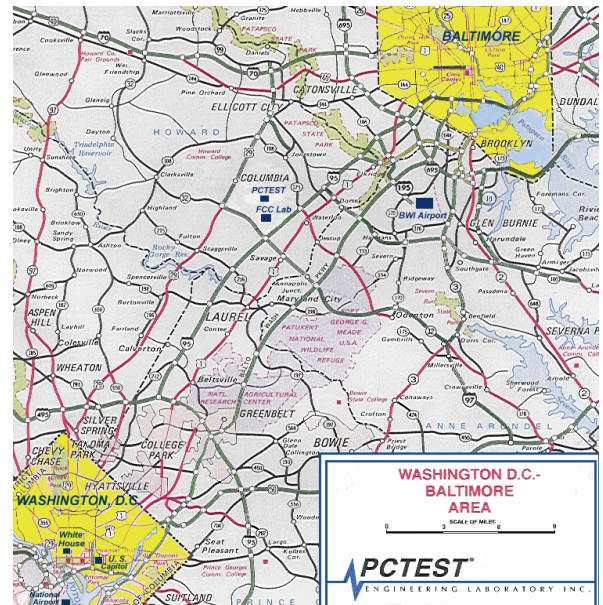


Figure 1-2. Map of the Greater Baltimore and Metropolitan Washington, D.C. area.

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Panasonic Toughbook Model: CF-52 FCC ID: ACJ9TGCF-524**. 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):

Manufacturer / Model	FCC ID	Description
Panasonic / Model: CF-52	ACJ9TGCF-524	Toughbook Model: CF-52
Alps / Model: UGNZA	N/A	Bluetooth Module
Qualcomm / Model: UNDP-1	J9CUNDP-1	WWAN Module
Intel / Model: 512ANX MM2	PD9512ANXM	WiMAX and Wireless LAN Module

Table 2-1. EUT Equipment Description

The EUT was set to transmit at full power through a connection to a WiMAX test set (Agilent E6651A). Each available type 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.
- c. 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.
- d. 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.

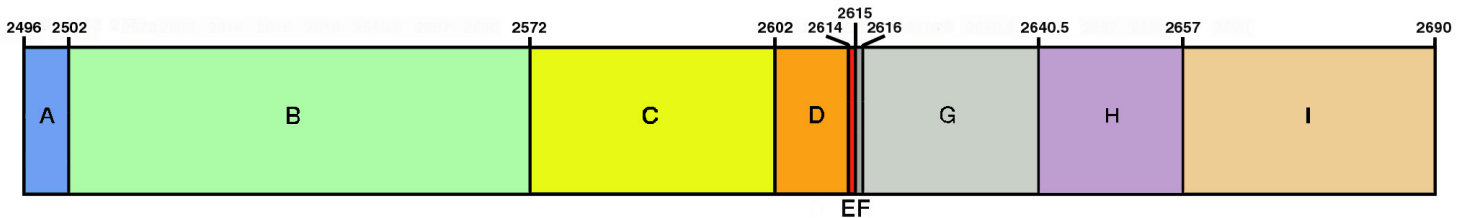
3.2 Band Edge

§2.1051, §27.53(l)(4)(6)

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

FCC ID: ACJ9TGCF-524	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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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 BAMC 16QAM modulation.

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
-	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
Agilent	11713A	Attenuation/Switch Driver	12/4/2008	Annual	12/4/2009	3439A02645
Agilent	8447D	Broadband Amplifier	N/A		N/A	1937A03348
Agilent	8447D	Broadband Amplifier	N/A		N/A	2443A01900
Agilent	8449B	(1-26.5GHz) Pre-Amplifier	12/4/2008	Annual	12/4/2009	3008A00985
Agilent	85650A	Quasi-Peak Adapter	12/4/2008	Annual	12/4/2009	3303A01872
Agilent	85650A	Quasi-Peak Adapter	3/24/2009	Annual	3/24/2010	2043A00301
Agilent	8566B	(100Hz-22GHz) Spectrum Analyzer	3/24/2009	Annual	3/24/2010	2618A02866
Agilent	8566B	(100Hz-22GHz) Spectrum Analyzer	3/24/2009	Annual	3/24/2010	2542A11898
Agilent	8566B	(100Hz-22GHz) Spectrum Analyzer	12/5/2008	Annual	12/5/2009	3638A08713
Agilent	8591A	(9kHz-1.8GHz) Spectrum Analyzer	8/19/2008	Annual	8/19/2009	3144A02458
Agilent	E4407B	ESA Spectrum Analyzer	3/24/2009	Annual	3/24/2010	US39210313
Agilent	E4448A	PSA (3Hz-50GHz) Spectrum Analyzer	12/5/2008	Annual	12/5/2009	US42510244
Agilent	E8257D	(250kHz-20GHz) Signal Generator	3/25/2009	Biennial	3/25/2011	MY45470194
Agilent	N9020A	MXA Signal Analyzer	9/17/2008	Annual	9/17/2009	US46470561
Emco	3115	Horn Antenna (1-18GHz)	9/24/2007	Biennial	9/24/2009	9704-5182
Emco	3115	Horn Antenna (1-18GHz)	10/4/2007	Biennial	10/4/2009	9205-3874
Emco	3116	Horn Antenna (18 - 40GHz)	9/9/2008	Triennial	9/9/2011	9203-2178
MiniCircuits	VHF-3100+	High Pass Filter	N/A		N/A	30721
Rohde & Schwarz	NRVD	Dual Channel Power Meter	8/20/2008	Biennial	8/20/2010	101695
Rohde & Schwarz	NRVS	Single Channel Power Meter	7/3/2007	Biennial	7/3/2009	835360/0079
Rohde & Schwarz	NRV-Z32	Peak Power Sensor (100uW-2W)	12/5/2008	Biennial	12/5/2010	100155
Rohde & Schwarz	NRV-Z33	Peak Power Sensor (1mW-20W)	12/5/2008	Biennial	12/5/2010	100004
Rohde & Schwarz	NRV-Z53	Power Sensor	7/3/2007	Biennial	7/3/2009	846076/0007
Solar Electronics	8012-50-R-24-BNC	LISN	11/8/2007	Biennial	11/8/2009	310233
Sunol	DRH-118	Horn Antenna (1 - 18GHz)	5/14/2009	Biennial	5/14/2011	A050307
Rohde & Schwarz	FSQ 26	Spectrum Analyzer	9/29/2008	Annual	9/29/2009	200452

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
 D = Amplitude/Angle Modulated
 7 = Quantized/Digital Info
 W = 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: Panasonic Corporation of North America
 FCC ID: ACJ9TGCF-524
 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(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
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 6.5
2.1055, 27.54	Frequency Stability	Fundamental emissions must stay within the allotted band		PASS	Section 6.6
RECEIVER MODE (Rx) / DIGITAL EMISSIONS					
15.107	AC Conducted Emissions 150kHz – 30MHz	< FCC 15.107 limits	LINE CONDUCTED	PASS	Pt. 15B Test Report
15.109	General Field Strength Limits (Restricted Bands and Radiated Emissions Limits)	< FCC 15.109 limits	RADIATED (30MHz-1GHz) (1-25 GHz)	PASS	Pt. 15B Test Report
RF EXPOSURE					
2.1091 / 2.1093	MPE Test	1 mW/cm ² (MPE Limit) @ 20cm	MPE	PASS	MPE Report

Table 6-1. Summary of Test Results

FCC ID: ACJ9TGCF-524	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 / 802.16e 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 as to measure the power of the wimax device. The wimax channel power measurement feature of the MXA, was utilized for conducted power measurements. The WiMAX conducted powers are reported below as well as a test setup diagram.

Frequency[MHz]	Modulation	10MHz	5MHz
		Average	Average
Low Channel 2501(for 10MHz) / 2498.5 (for 5MHz)	QPSK1/2	23.09	23.53
	16QAM1/2	22.88	23.14
	QPSK3/4	23.10	23.51
	16QAM3/4	23.12	23.73
Mid Channel 2600 (for 10 MHz and 5MHz)	QPSK1/2	23.10	23.22
	16QAM1/2	23.13	23.41
	QPSK3/4	23.26	23.55
	16QAM3/4	23.33	23.49
High Channel 2685 (for 10MHz)/ 2687.5 (for 5MHz)	QPSK1/2	23.75	23.44
	16QAM1/2	23.72	23.29
	QPSK3/4	23.70	23.50
	16QAM3/4	23.83	23.54

Table 6-2. WiMAX Conducted Output Power

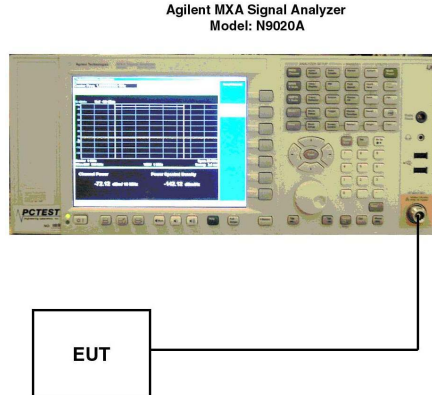




Figure 6-1. WiMAX Conducted Power Test Setup Diagram

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

POWER: Maximum (WiMAX Mode, QPSK)

Frequency [MHz]	Modulation	Measured Level [dBm]	Substitute Level [dBm]	Antenna Gain [dBi]	Pol [H/V]	EIRP [dBm]	EIRP [Watts]	Battery Type
2498.50	QPSK	-26.400	14.40	8.00	H	22.40	0.174	Standard
2600.00	QPSK	-25.400	15.40	8.00	H	23.40	0.219	Standard
2687.50	QPSK	-25.800	15.00	8.00	H	23.00	0.200	Standard

Table 6-3. Equivalent Isotropic Radiated Power Output Data for 5MHz Wimax QPSK

Frequency [MHz]	Modulation	Measured Level [dBm]	Substitute Level [dBm]	Antenna Gain [dBi]	Pol [H/V]	EIRP [dBm]	EIRP [Watts]	Battery Type
2501.00	QPSK	-25.700	15.10	8.00	H	23.10	0.204	Standard
2593.00	QPSK	-26.700	14.10	8.00	H	22.10	0.162	Standard
2685.00	QPSK	-26.300	14.50	8.00	H	22.50	0.178	Standard



Table 6-4. Equivalent Isotropic Radiated Power Output Data for 10MHz Wimax QPSK

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.

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

POWER: Maximum (WiMAX Mode, 16QAM)

Frequency [MHz]	Modulation	Measured Level [dBm]	Substitute Level [dBm]	Antenna Gain [dBi]	Pol [H/V]	EIRP [dBm]	EIRP [Watts]	Battery Type
2498.50	16QAM	-25.800	15.00	8.00	H	23.00	0.200	Standard
2600.00	16QAM	-24.900	15.90	8.00	H	23.90	0.245	Standard
2687.50	16QAM	-25.300	15.50	8.00	H	23.50	0.224	Standard

Table 6-5. Equivalent Isotropic Radiated Power Output Data for 5MHz Wimax 16QAM

Frequency [MHz]	Modulation	Measured Level [dBm]	Substitute Level [dBm]	Antenna Gain [dBi]	Pol [H/V]	EIRP [dBm]	EIRP [Watts]	Battery Type
2501.00	16QAM	-25.300	15.50	8.00	H	23.50	0.224	Standard
2593.00	16QAM	-25.900	14.90	8.00	H	22.90	0.195	Standard
2685.00	16QAM	-26.100	14.70	8.00	H	22.70	0.186	Standard



Table 6-6. Equivalent Isotropic Radiated Power Output Data for 10MHz Wimax 16QAM

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.

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6.5 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: 23.500 dBm = 0.224 W
 MODULATION SIGNAL: 10MHz WiMAX
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10} (W) =$ 48.50 dBc

FREQ. (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
5002.00	-50.53	10.70	-39.83	H	63.3
7503.00	-44.00	11.69	-32.31	H	55.8
10004.00	-85.42	12.00	-73.41	H	96.9
12505.00	-79.03	12.80	-66.23	H	89.7
15006.00	-72.38	12.44	-59.93	H	83.4



Table 6-3. 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.

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10MHz WiMAX Radiated Measurements (Cont'd)
§2.1053, §27.53(l)(4)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 2593.00 MHz
 CHANNEL: MBS
 MEASURED OUTPUT POWER: 23.500 dBm = 0.224 W
 MODULATION SIGNAL: 10MHz WiMAX
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10} (W) =$ 48.50 dBc

FREQ. (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
5186.00	-50.09	10.66	-39.43	H	62.9
7779.00	-41.43	11.15	-30.28	H	53.8
10372.00	-85.27	12.24	-73.03	H	96.5
12965.00	-77.89	12.90	-64.99	H	88.5
15558.00	-77.40	16.00	-61.40	H	84.9



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.

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10MHz 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: 23.500 dBm = 0.224 W
 MODULATION SIGNAL: 10MHz WiMAX
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10} (W) =$ 48.50 dBc

FREQ. (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
5370.00	-46.54	10.63	-35.92	H	59.4
8055.00	-39.39	10.85	-28.55	H	52.0
10740.00	-84.73	12.54	-72.19	H	95.7
13425.00	-76.42	13.50	-62.92	H	86.4
16110.00	-78.19	16.18	-62.02	H	85.5



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.

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6.6 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: 23.900 dBm = 0.245 W
 MODULATION SIGNAL: 5MHz WiMAX
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10} (W) =$ 48.90 dBc

FREQ. (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
4997.00	-49.73	10.70	-39.03	H	62.9
7495.50	-43.40	11.69	-31.71	H	55.6
9994.00	-85.42	12.00	-73.41	H	97.3
12492.50	-79.03	12.80	-66.23	H	90.1
14991.00	-72.38	12.44	-59.93	H	83.8



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 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.

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5MHz 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: 23.900 dBm = 0.245 W
 MODULATION SIGNAL: 5MHz WiMAX
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10} (W) =$ 48.90 dBc

FREQ. (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
5200.00	-48.89	10.66	-38.23	H	62.1
7800.00	-42.93	11.15	-31.78	H	55.7
10400.00	-85.27	12.24	-73.03	H	96.9
13000.00	-77.89	12.90	-64.99	H	88.9
15600.00	-77.40	16.00	-61.40	H	85.3



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 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.

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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: 23.900 dBm = 0.245 W
 MODULATION SIGNAL: 5MHz WiMAX
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10} (W) =$ 48.90 dBc

FREQ. (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
5375.00	-46.84	10.63	-36.22	H	60.1
8062.50	-42.39	10.85	-31.55	H	55.4
10750.00	-84.73	12.54	-72.19	H	96.1
13437.50	-76.42	13.50	-62.92	H	86.8
16125.00	-78.19	16.18	-62.02	H	85.9



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 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.

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6.7 10MHz WiMAX Frequency Stability Measurements

\$2.1055, \$27.54

OPERATING FREQUENCY: 2,593,000,000 Hz

CHANNEL: MBS



REFERENCE VOLTAGE: 11.1 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQ. (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	11.10	+ 20 (Ref)	2,593,000,007	7	0.000000
100 %		- 30	2,593,000,009	9	0.000000
100 %		- 20	2,592,999,986	-14	-0.000001
100 %		- 10	2,592,999,972	-28	-0.000001
100 %		0	2,592,999,988	-12	0.000000
100 %		+ 10	2,592,999,971	-29	-0.000001
100 %		+ 20	2,592,999,995	-5	0.000000
100 %		+ 30	2,592,999,998	-2	0.000000
100 %		+ 40	2,593,000,028	28	0.000001
100 %		+ 50	2,592,999,989	-11	0.000000
115 %	12.77	+ 20	2,592,999,968	-32	-0.000001
BATT. ENDPOINT	9.85	+ 20	2,592,999,978	-22	-0.000001

Table 6-6. 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.

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10MHz WiMAX Frequency Stability Measurements (Cont'd)
§2.1055, §27.54

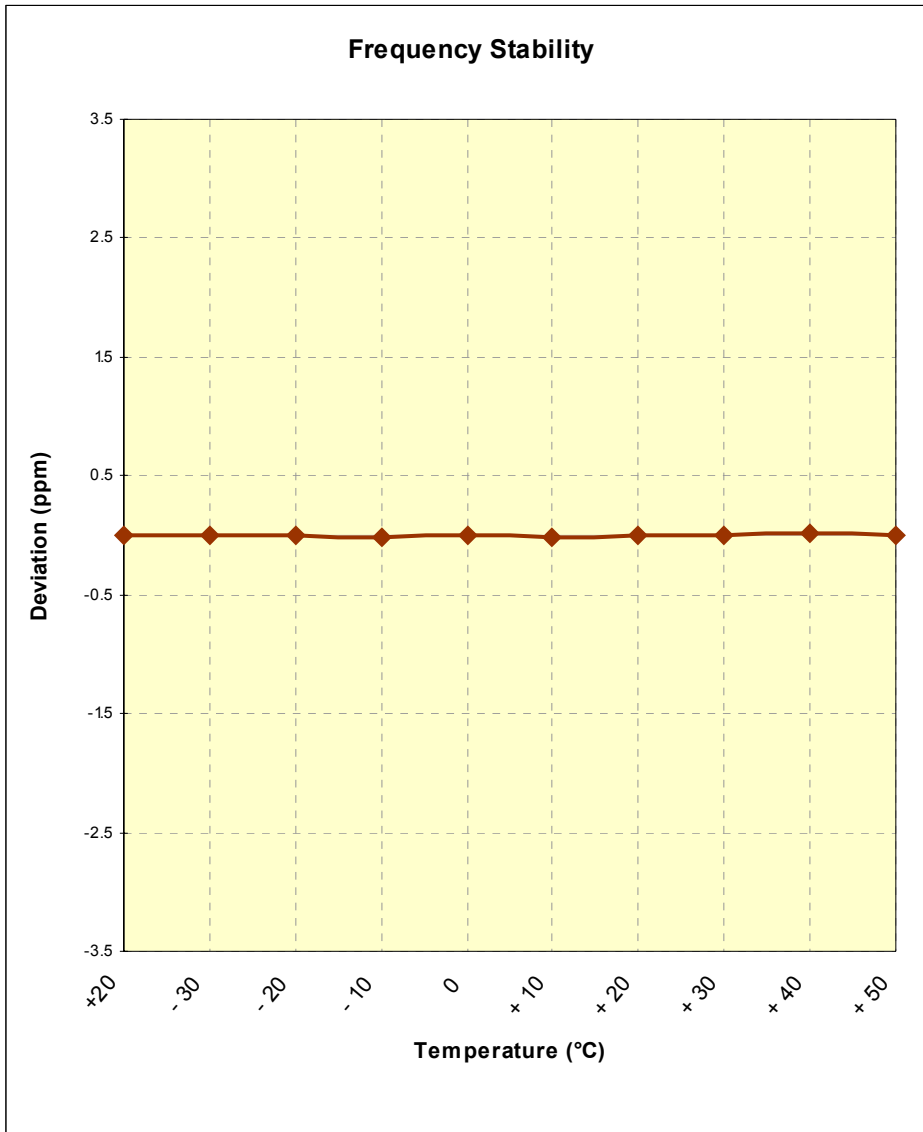


Figure 6-2. Frequency Stability Graph (10MHz WiMAX Mode)

Note:

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

FCC ID: ACJ9TGCF-524	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)	Panasonic	Reviewed by: Quality Manager
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6.8 5MHz WiMAX Frequency Stability Measurements

\$2.1055, \$27.54



OPERATING FREQUENCY: 2,593,000,000 Hz
 CHANNEL: MBS
 REFERENCE VOLTAGE: 11.1 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQ. (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	11.10	+ 20 (Ref)	2,592,999,997	-3	0.000000
100 %		- 30	2,593,000,013	13	0.000001
100 %		- 20	2,592,999,976	-24	-0.000001
100 %		- 10	2,593,000,026	26	0.000001
100 %		0	2,592,999,974	-26	-0.000001
100 %		+ 10	2,593,000,000	0	0.000000
100 %		+ 20	2,592,999,999	-1	0.000000
100 %		+ 30	2,593,000,023	23	0.000001
100 %		+ 40	2,593,000,007	7	0.000000
100 %		+ 50	2,592,999,986	-14	-0.000001
115 %	12.77	+ 20	2,592,999,988	-12	0.000000
BATT. ENDPOINT	9.85	+ 20	2,593,000,005	5	0.000000

Table 6-7. 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: ACJ9TGCF-524		FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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5MHz WiMAX Frequency Stability Measurements (Cont'd)
§2.1055, §27.54

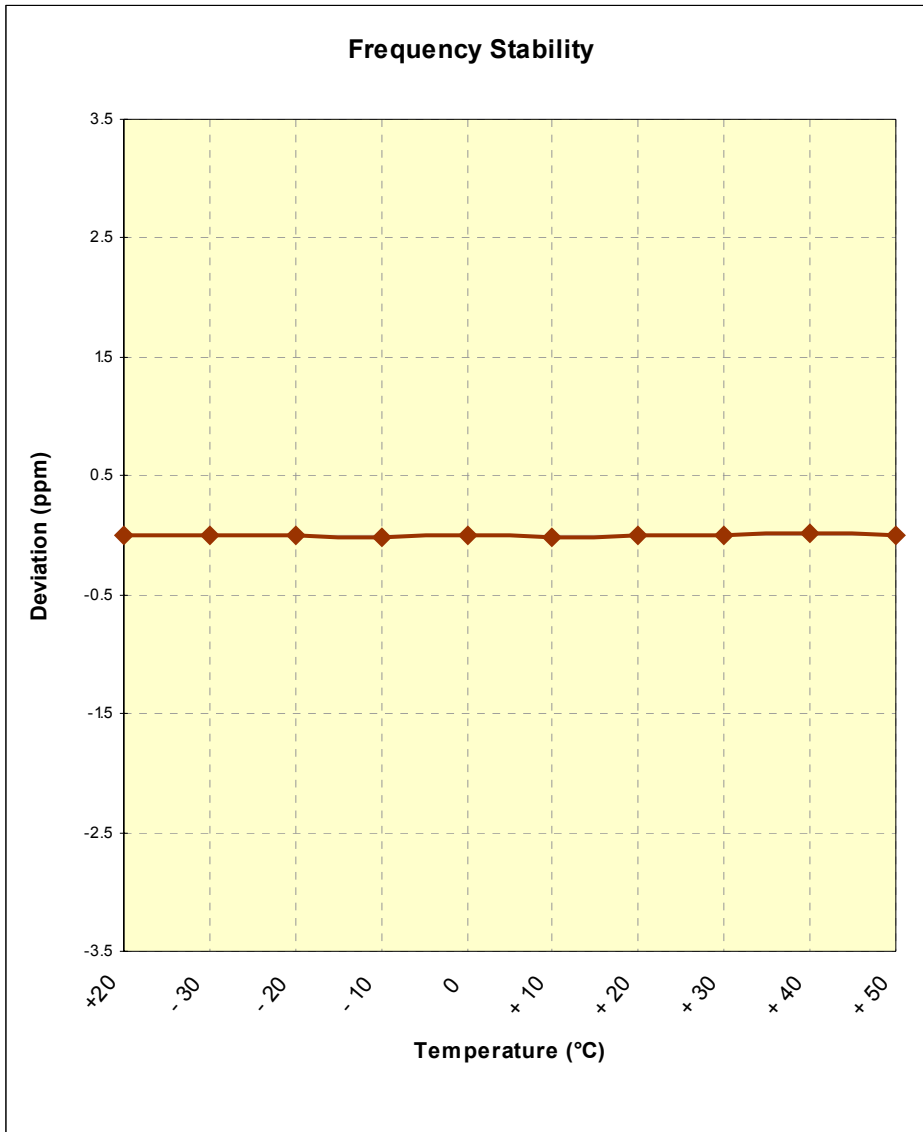




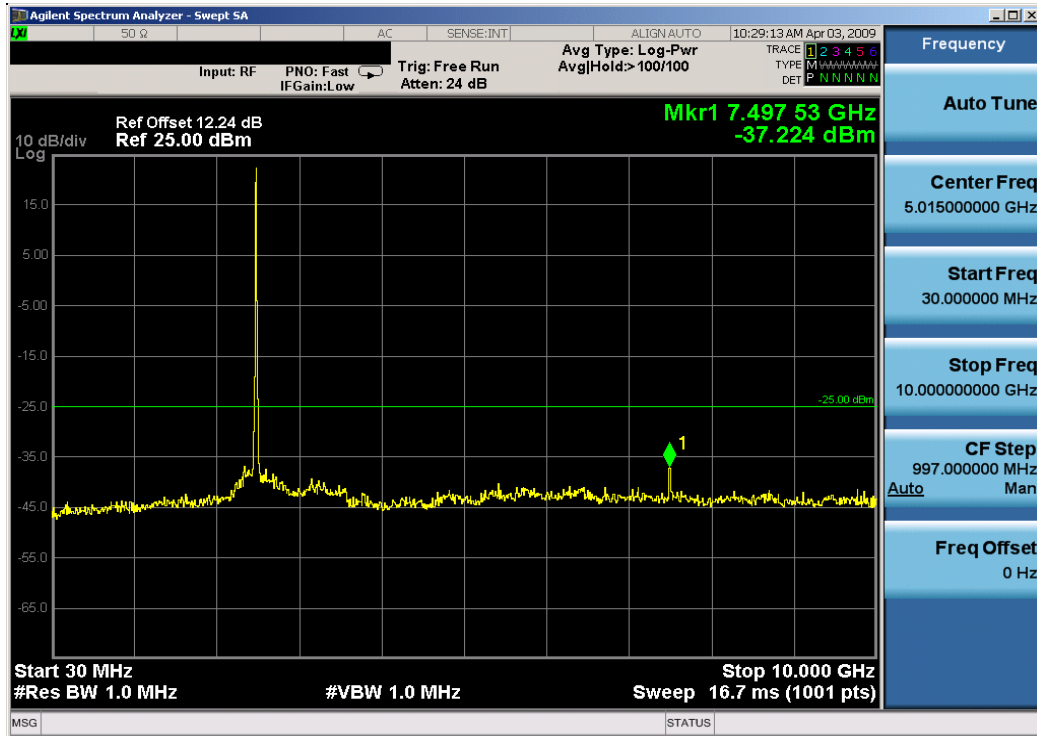
Figure 6-3. Frequency Stability Graph (5MHz WiMAX Mode)

Note:

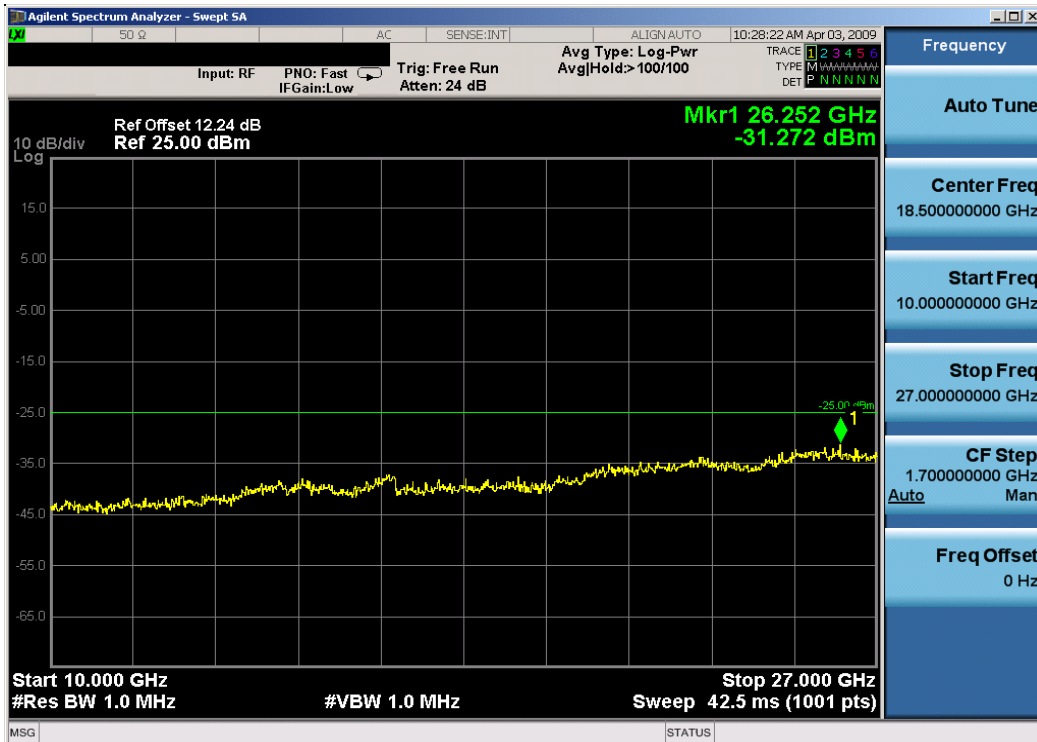
The frequency deviation was measured to ensure that the channels emissions remained within the authorized band with varying temperature and voltage.

FCC ID: ACJ9TGCF-524		FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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7.0 PLOT(S) OF EMISSIONS – 10MHz WiMAX

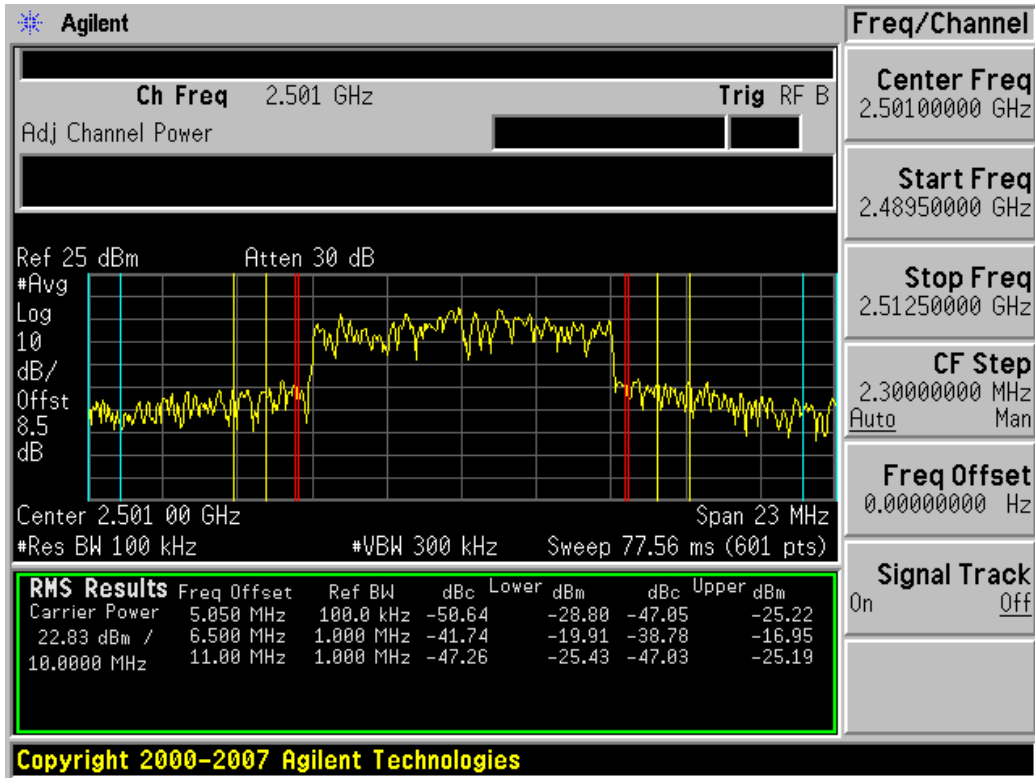


Plot 7-1. Conducted Spurious Plot (WiMAX Mode – Low Channel)

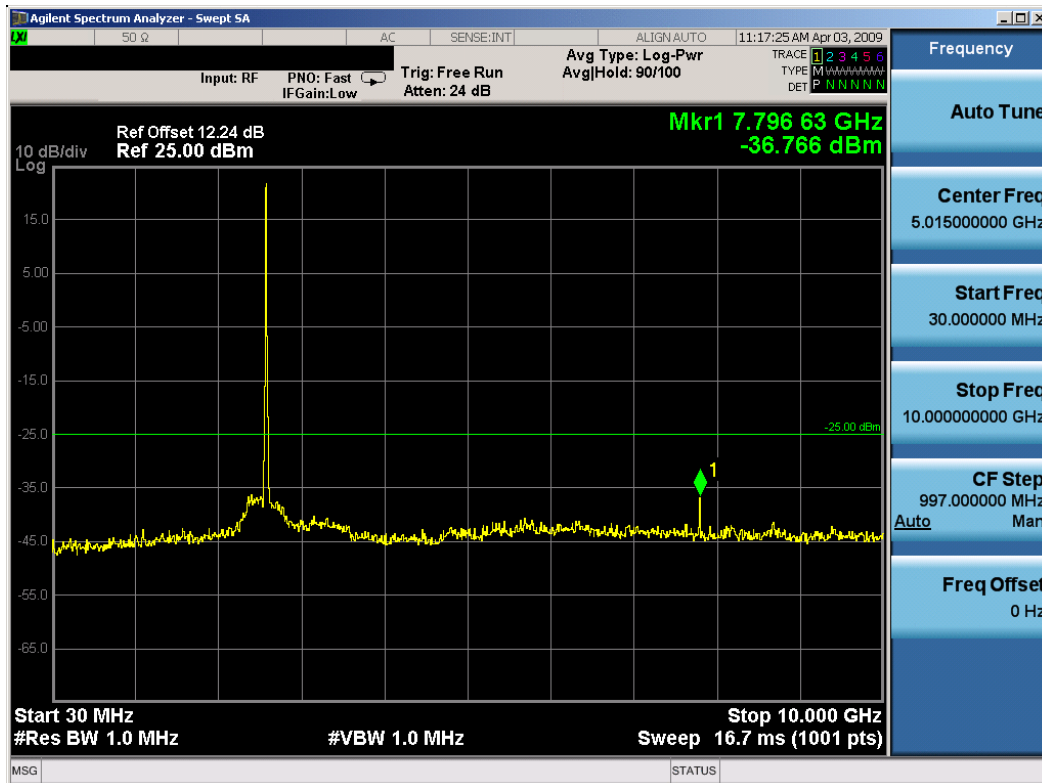


Plot 7-2. Conducted Spurious Plot (WiMAX Mode – Low Channel)

FCC ID: ACJ9TGCF-524	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)	Panasonic	Reviewed by: Quality Manager
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Plot 7-3. Band Edge Plot (WiMAX Mode – Low Channel)

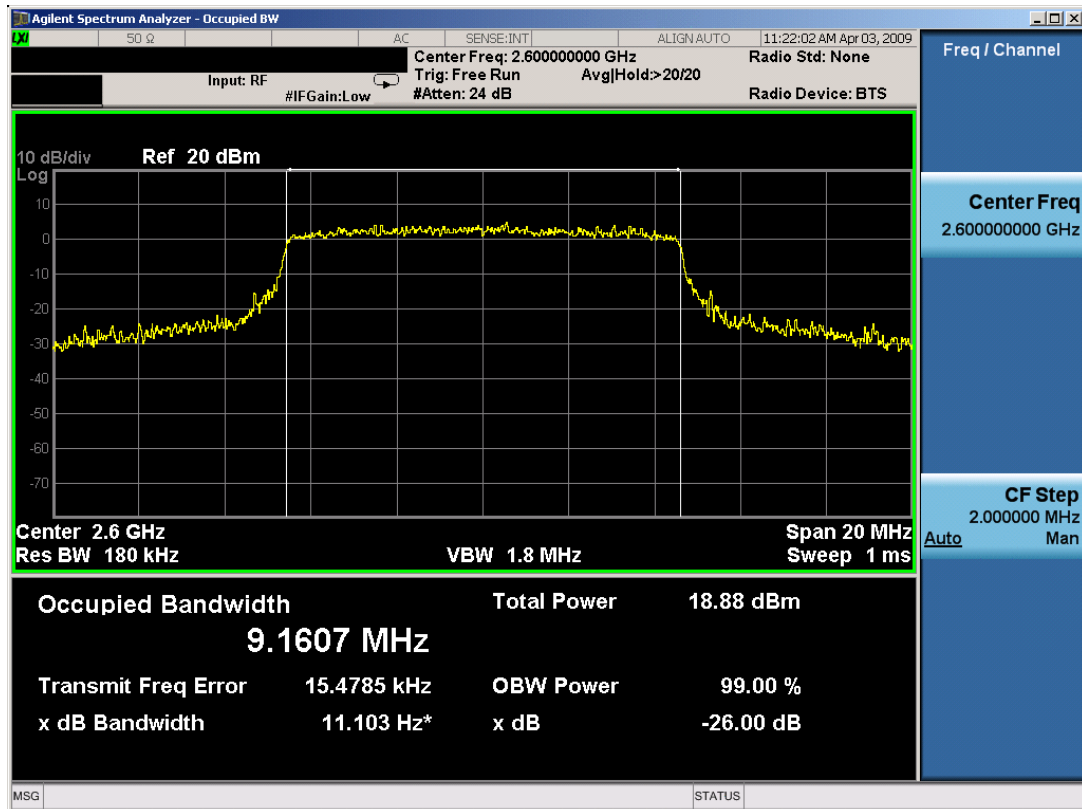


Plot 7-4. Conducted Spurious Plot (WiMAX Mode – Mid Channel)

FCC ID: ACJ9TGCF-524	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)	Panasonic	Reviewed by: Quality Manager
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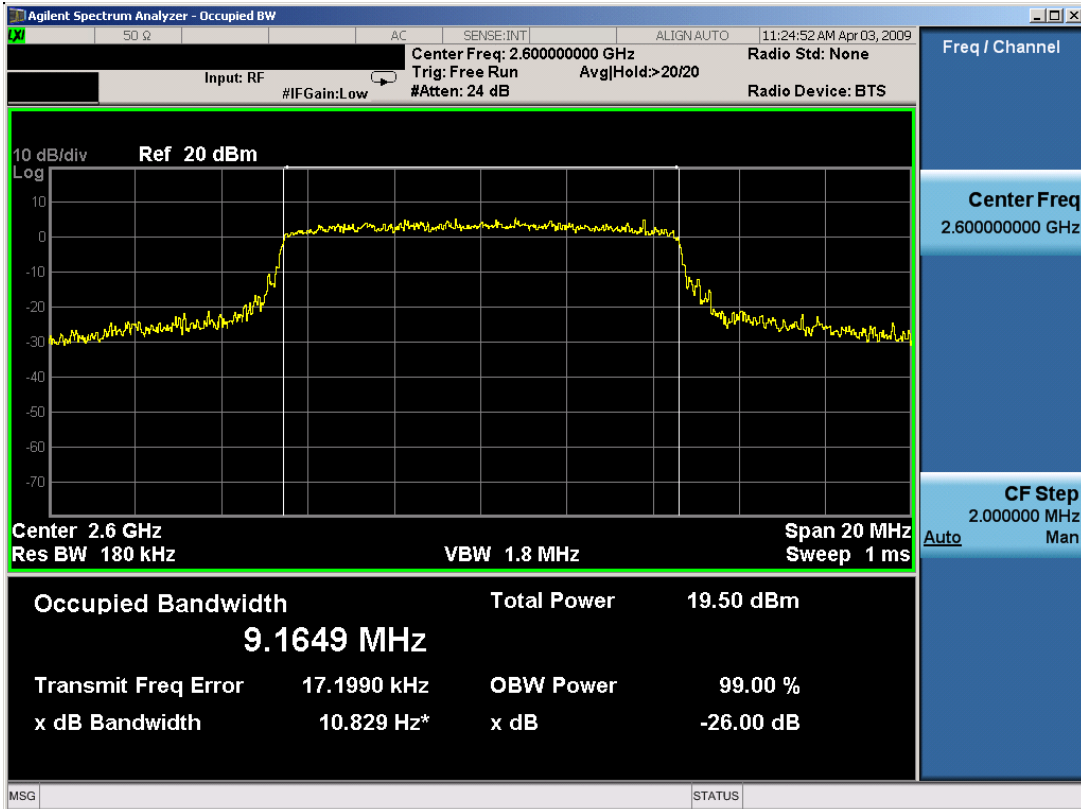


Plot 7-5. Conducted Spurious Plot (WiMAX Mode – Mid Channel)

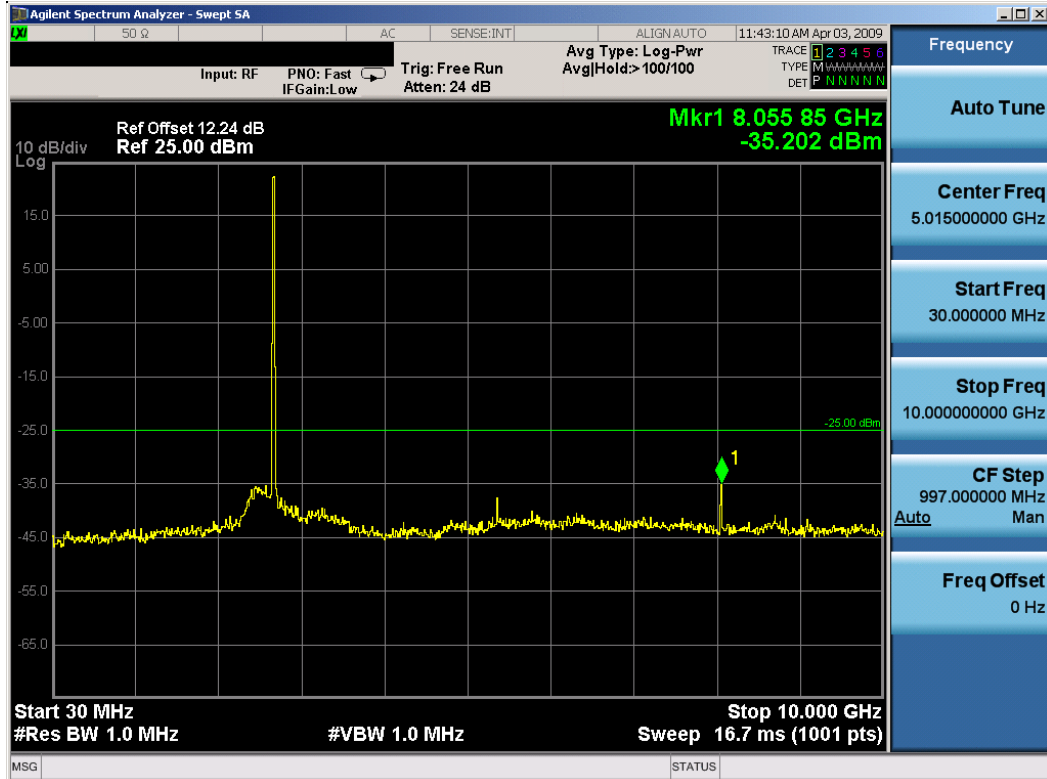


Plot 7-6. Occupied Bandwidth with QPSK Modulation Plot (WiMAX Mode – Mid Channel)

FCC ID: ACJ9TGCF-524	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)	Panasonic	Reviewed by: Quality Manager
Test Report S/N: 0903050400.ACJ	Test Dates: June 18, 2009	EUT Type: Toughbook Model: CF-52		Page 26 of 31



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

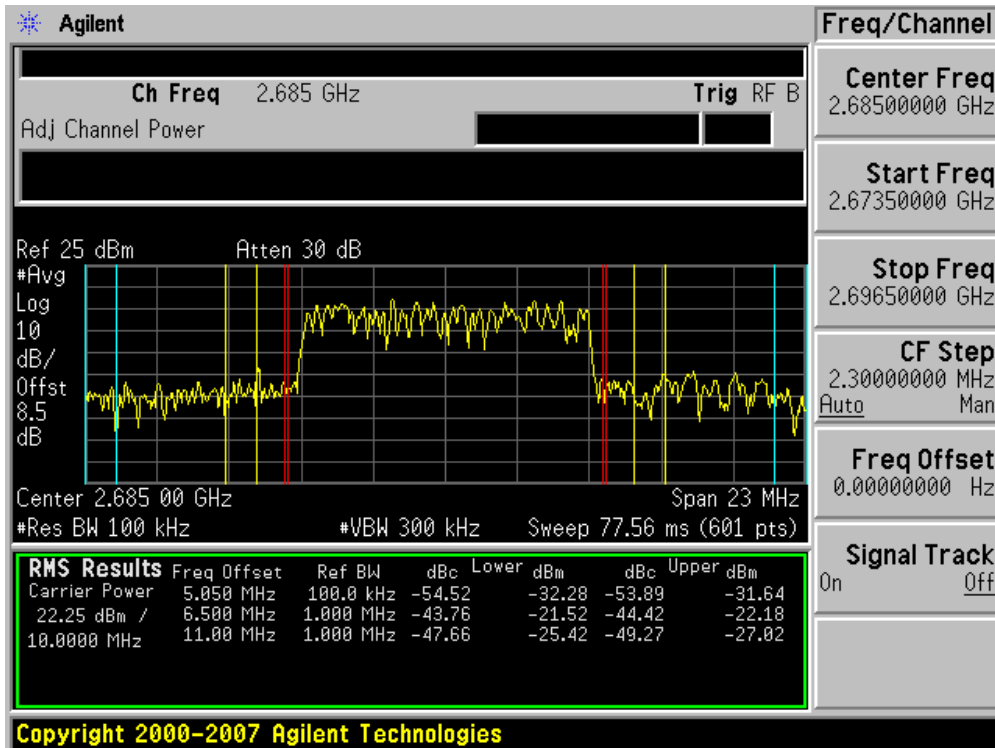


FCC ID: ACJ9TGCF-524	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)	Panasonic	Reviewed by: Quality Manager
Test Report S/N: 0903050400.ACJ	Test Dates: June 18, 2009	EUT Type: Toughbook Model: CF-52		Page 27 of 31

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



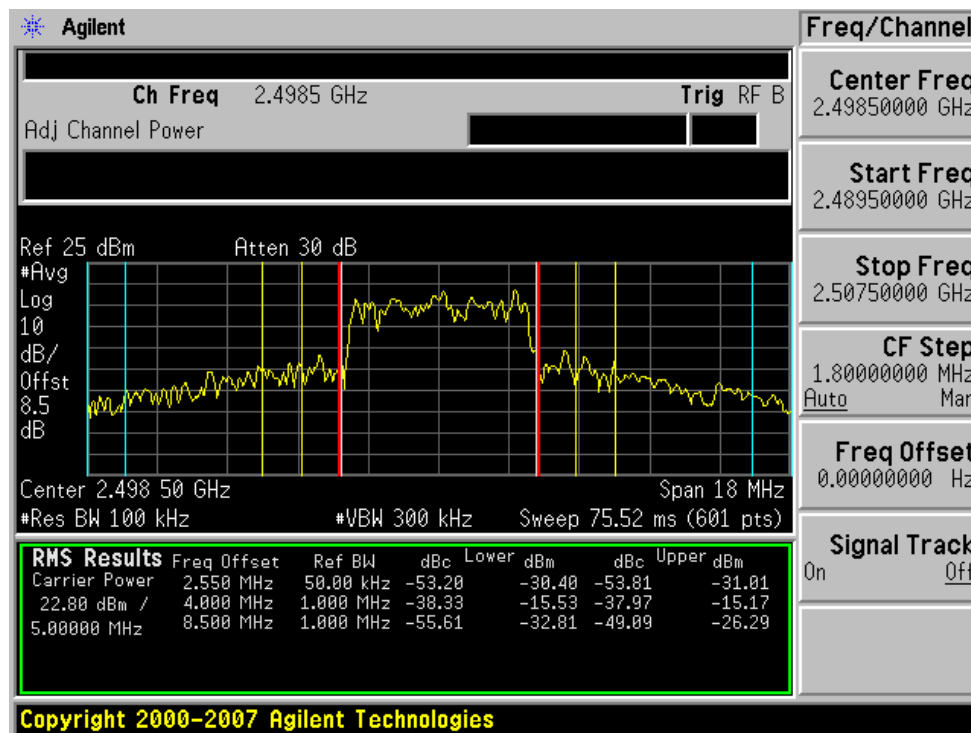
Plot 7-9. Conducted Spurious Plot (WiMAX Mode – High Channel)



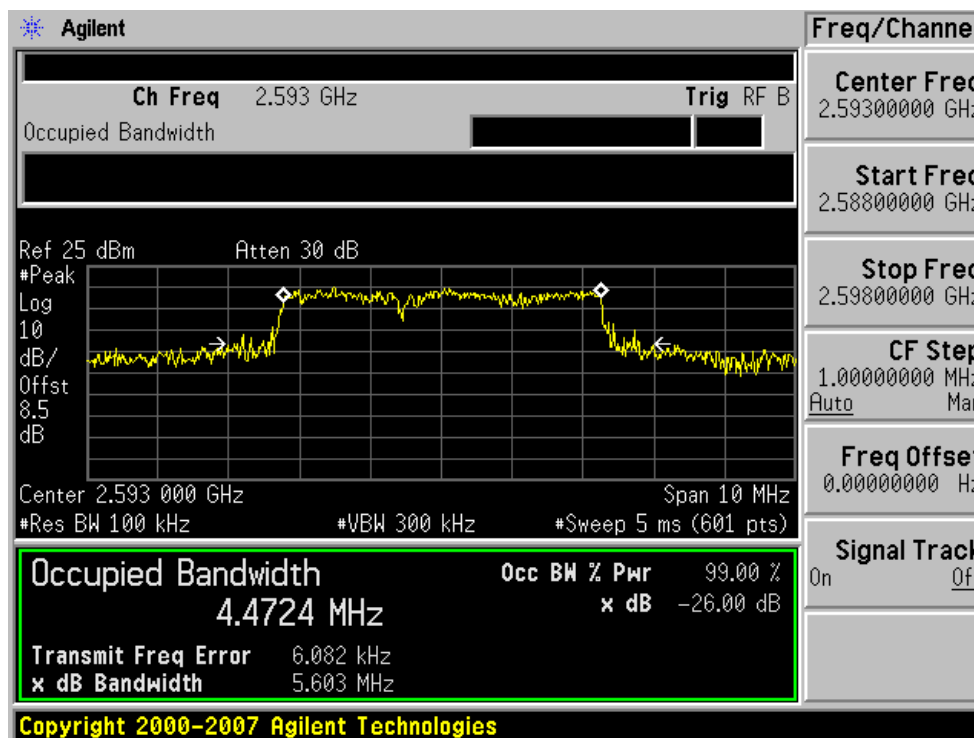
Plot 7-10. Band Edge Plot (WiMAX Mode – High Channel)

FCC ID: ACJ9TGCF-524		FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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8.0 PLOT(S) OF EMISSIONS – 5MHZ WIMAX

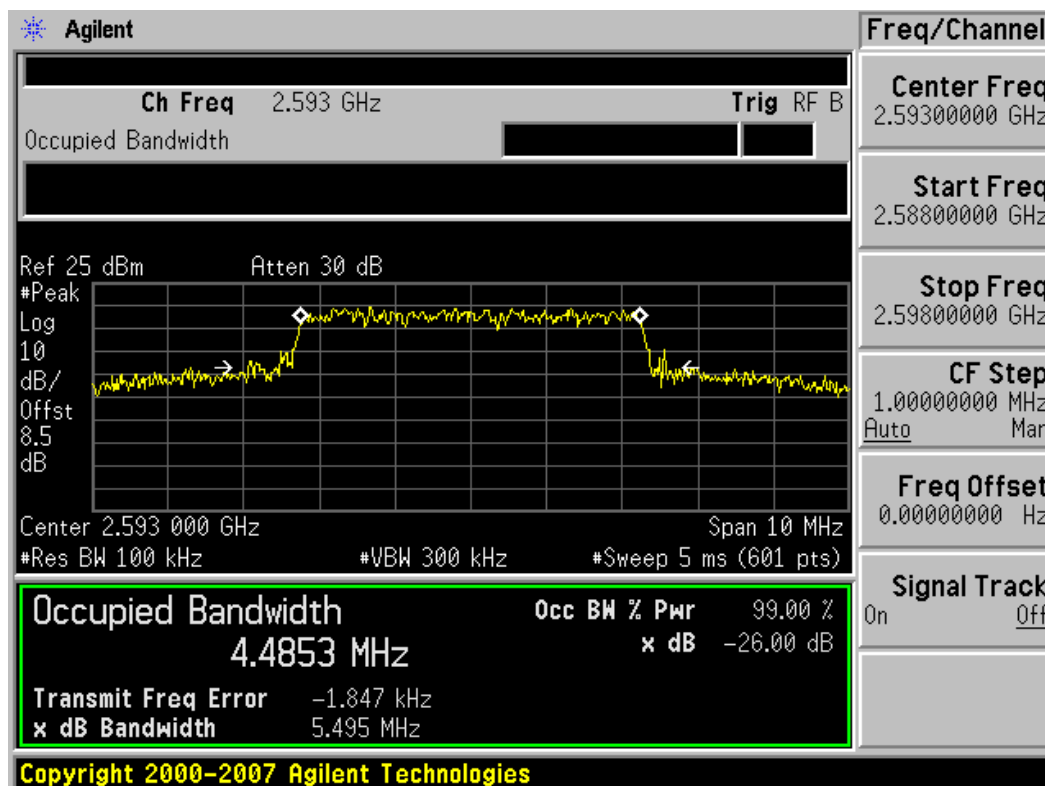


Plot 8-1. Band Edge Plot (WiMAX Mode – Low Channel)

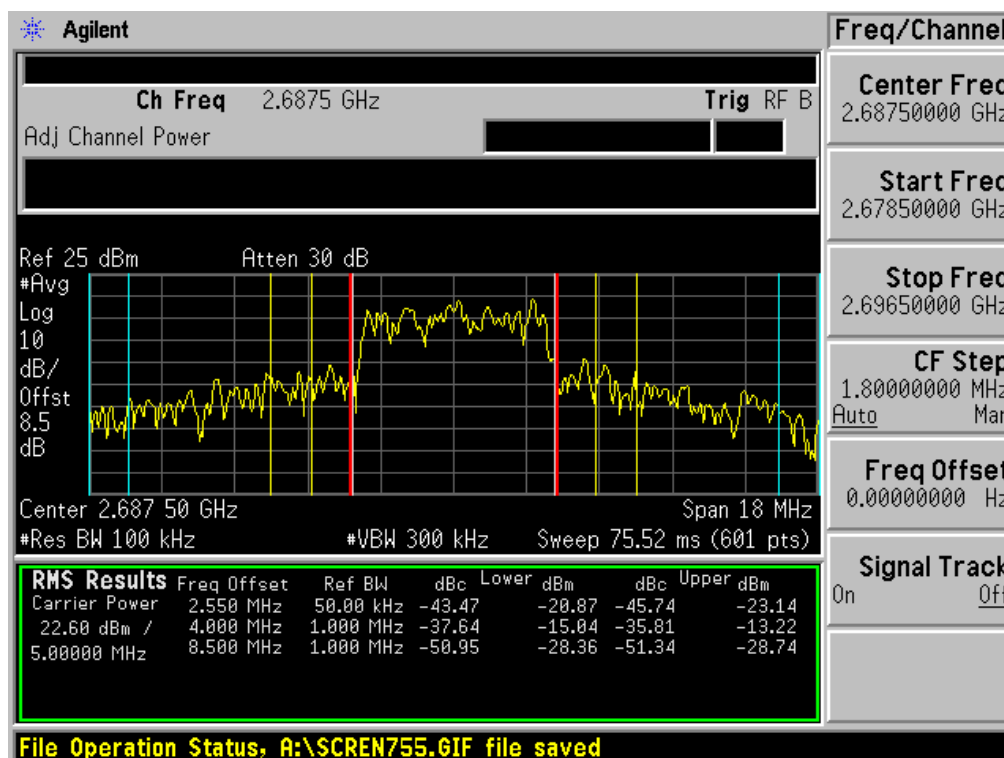


Plot 8-2. Occupied Bandwidth with QPSK Modulation Plot (WiMAX Mode – Mid Channel)

FCC ID: ACJ9TGCF-524		FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Plot 8-3. Occupied Bandwidth with 16QAM Modulation Plot (WiMAX Mode – Mid Channel)





Plot 8-4. Band Edge Plot (WiMAX Mode – High Channel)

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9.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Panasonic Toughbook Model: CF-52 FCC ID: ACJ9TGCF-524** complies with all the requirements of Parts 2 and 27 of the FCC rules.

FCC ID: ACJ9TGCF-524		FCC Pt. 27 / 802.16e WiMAX MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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