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# MEASUREMENT REPORT
## FCC Part 27 / IC RSS-199

**Applicant Name:**
Motorola Mobility, Inc.
8000 West Sunrise Blvd.
Plantation, FL 33322
United States

**Date of Testing:**
April 18 - May 5, 2011
**Test Site/Location:**
PCTEST Lab., Columbia, MD, USA
**Test Report Serial No.:**
0Y1104110685-R1.IHD

| | |
|---|---|
| **FCC ID:** | **IHDP56MD1** |
| **APPLICANT:** | **MOTOROLA MOBILITY, INC.** |

| | |
|---|---|
| **Application Type:** | Certification |
| **FCC Classification:** | PCS Licensed Transmitter Held to Ear (PCE) |
| **FCC Rule Part(s):** | §2; §27 Subpart M |
| **IC Specification(s):** | RSS-199 Issue 1 |
| **EUT Type:** | Cellular/PCS CDMA/EvDO and WiMAX Phone with BT and WLAN |
| **Tx Frequency Range:** | 2498.5 - 2687.5MHz (5MHz BW - WiMAX), 2501 - 2685MHz (10MHz BW - WiMAX) |
| **Max. RF Output Power:** | 0.286 W EIRP (5MHz BW WiMAX, QPSK) (24.56 dBm) |
| | 0.272 W EIRP (5MHz BW WiMAX, 16-QAM) (24.35 dBm) |
| | 0.222 W EIRP (10MHz BW WiMAX, QPSK) (23.47 dBm) |
| | 0.215 W EIRP (10MHz BW WiMAX, 16-QAM) (23.33 dBm) |
| **Emission Designator(s):** | 4M45G7D (5MHz BW, QPSK), 4M45W7D (5MHz BW, 16-QAM), 9M10G7D (10MHz BW, QPSK), 9M10W7D (10MHz BW, 16-QAM) |
| **Test Device IMEI:** | *identical prototype* [S/N: 356465040002540] |

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.

***This revised Test Report (S/ N: 0Y1104110685-R1.IHD) supersedes and replaces the previously issued test report on the same subject EUT for the same type of testing as indicated. Please discard and destroy the previously issued test report (S/N: 0Y114110685.IHD) and dispose of it accordingly.**

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 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

ilac-MRA
ACCREDITED
TESTING LABORATORY
CERTIFICATE #2041.01


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# TABLE OF CONTENTS


FCC PART 27 MEASUREMENT REPORT……3

1.0 INTRODUCTION ....4

1.1 SCOPE ....4

1.2 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 MEASUREMENT PROCEDURE ....6

3.2 OCCUPIED BANDWIDTH ....6

3.3 EBS/BRS - FREQUENCY BLOCKS ....6

3.4 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL....7

3.5 RADIATED SPURIOUS AND HARMONIC EMISSIONS ....7

3.6 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 – ANTENNA 1....13

6.5 WIMAX RADIATED MEASUREMENTS – ANTENNA 2....16

6.6 WIMAX FREQUENCY STABILITY MEASUREMENTS – ANTENNA 1 ....19

6.7 WIMAX FREQUENCY STABILITY MEASUREMENTS – ANTENNA 2 ....20

7.0 PLOT(S) OF EMISSIONS – 5MHZ BANDWIDTH....21

8.0 PLOT(S) OF EMISSIONS – 10MHZ BANDWIDTH....41

9.0 CONCLUSION....61




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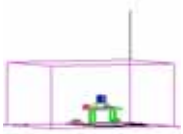

# MEASUREMENT REPORT
## FCC Part 27

## §2.1033 General Information

| | |
|---|---|
| **APPLICANT:** | Motorola Mobility, Inc. |
| **APPLICANT ADDRESS:** | 8000 West Sunrise Blvd.<br>Plantation, FL 33322 |
| **TEST SITE:** | PCTEST ENGINEERING LABORATORY, INC. |
| **TEST SITE ADDRESS:** | 6660-B Dobbin Road, Columbia, MD 21045 USA |
| **FCC RULE PART(S):** | §2; §27(M) |
| **IC SPECIFICATION(S):** | RSS-199 Issue 1 |
| **FCC ID:** | IHDP56MD1 |
| **FCC CLASSIFICATION:** | PCS Licensed Transmitter Held to Ear (PCE) |
| **MODE:** | 5MHz and 10MHz Bandwidth WiMAX |
| **FREQUENCY TOLERANCE:** | Emission must remain in band |
| **Test Device IMEI:** | 356465040002540 ☐ Production ☒ Pre-Production ☐ Engineering |
| **DATE(S) OF TEST:** | April 18 - May 5, 2011 |
| **TEST REPORT S/N:** | 0Y1104110685-R1.IHD |

## 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 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 and the Industry Canada Certification and Engineering Bureau.

## 1.2 Testing Facility

The map below shows the location of the PCTEST LABORATORY, its proximity to the FCC Laboratory, the Columbia vicinity are, the Baltimore-Washington Internt'l (BWI) airport, the city of Baltimore and the Washington, DC area. (*See Figure 1-1*).

These measurement tests 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$^{o}$ 11'15" N latitude and 76$^{o}$ 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.

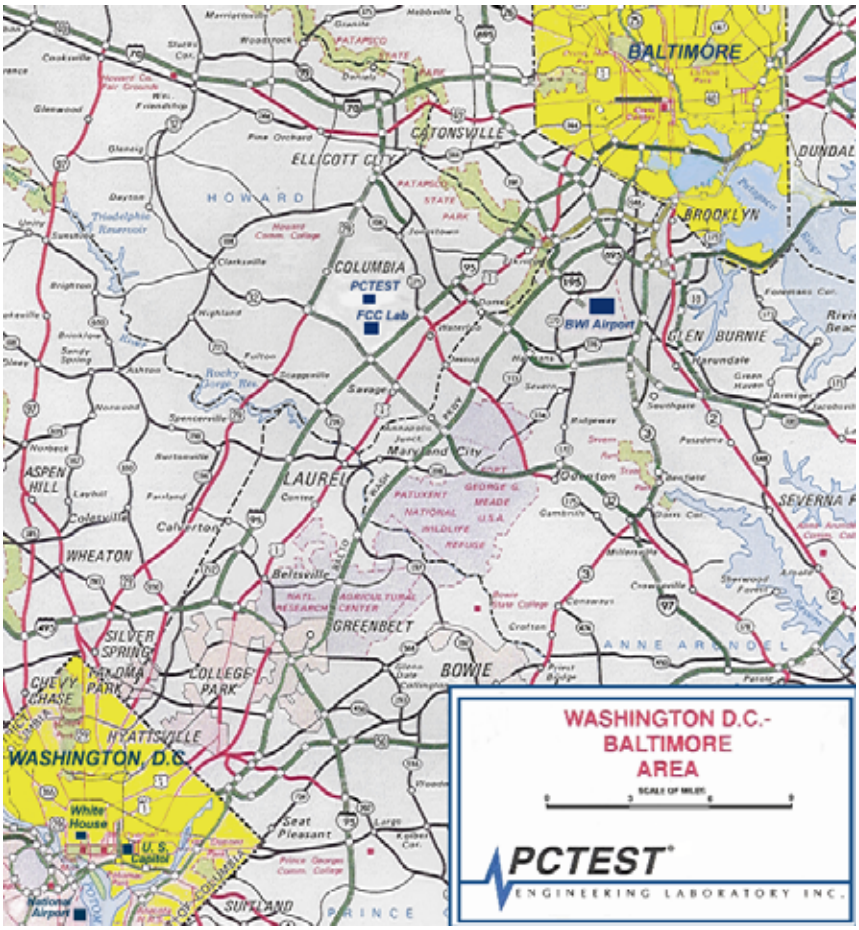


**Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area**


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# 2.0 PRODUCT INFORMATION

## 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Motorola Cellular/PCS CDMA/EvDO and WiMAX Phone with BT and WLAN FCC ID: IHDP56MD1**. 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 | FCC ID | Description |
|---|---|---|
| Motorola | IHDP56MD1 | Cellular/PCS CDMA/EvDO and WiMAX Phone with BT and WLAN |

**Table 2-1. EUT Equipment Description**

The EUT was set up to operate through test software installed in a laptop computer and a vector signal generator (VSG). The VSG provided downlink waveforms to the EUT in order to establish a particular configuration of modulation, channel bandwidth, coding rate, zone type, and antenna diversity. The output power was controlled by software on the laptop. Each configuration was tested to determine the maximum radiated power and the worst case radiated spurious emissions.

## 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 Measurement Procedure

The radiated spurious measurements were made outdoors at a 3-meter test range (See Figure 3-1). The equipment under test is placed on a wooden turntable 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. This power level was recorded using a broadband average power meter. 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 with the power meter. 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.

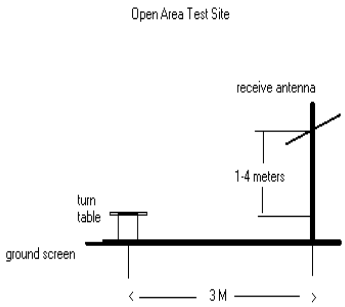



**Figure 3-1. Diagram of 3-meter outdoor test range**

**Deviation from Measurement Procedure……..None**

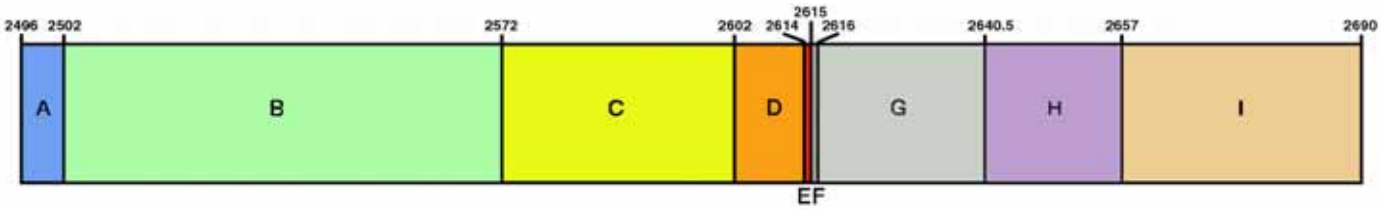
## 3.2 Occupied Bandwidth

**§2.1049, RSS-Gen (4.6.1)**

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1 percent of the selected span as is possible without being below 1 percent. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual. The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 percent of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded. The span between the two recorded frequencies is the occupied bandwidth.

## 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 I: 2657MHz – 2690MHz (BRS)**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## 3.4 Spurious and Harmonic Emissions at Antenna Terminal

**§2.1051, §27.53(m)(4)(6); RSS-199 (4.5)**

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. On any frequency outside 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. 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.

## 3.5 Radiated Spurious and Harmonic Emissions

**§2.1053, §27.50(h)(2), §27.53(m)(4)(6); RSS-199 (4.4) RSS-199 (4.5)**

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 radiated spurious emissions were found with the unit was transmitting from Antenna 1 using a 5MHz channel with 1/2 PUSC QPSK modulation while connected via USB to a laptop PC.

## 3.6 Frequency Stability / Temperature Variation

**§2.1055, §27.54; RSS-199 (4.3)**

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 | 8648D | (9kHz-4GHz) Signal Generator | 10/13/2010 | Annual | 10/13/2011 | 3613A00315 |
| Agilent | E4407B | ESA Spectrum Analyzer | 4/5/2011 | Annual | 4/5/2012 | US39210313 |
| Agilent | E5515C | Wireless Communications Test Set | 10/11/2010 | Annual | 10/11/2011 | GB46110872 |
| 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 |
| Anritsu | ML2495A | Power Meter | 10/13/2010 | Annual | 10/13/2011 | 941001 |
| Anritsu | MA2411B | Pulse Sensor | N/A | Annual | | 1027293 |
| Emco | 3115 | Horn Antenna (1-18GHz) | 4/8/2010 | Biennial | 4/8/2012 | 9205-3874 |
| Espec | ESX-2CA | Environmental Chamber | 2/8/2011 | Annual | 2/8/2012 | 17620 |
| 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 |
| Rohde & Schwarz | CMU200 | Base Station Simulator | 6/17/2010 | Annual | 6/17/2011 | 836536/0005 |
| 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) | 5/14/2009 | Biennial | 5/14/2011 | A050307 |
| Sunol | JB5 | Bi-Log Antenna (30M - 5GHz) | 7/17/2009 | Biennial | 7/17/2011 | A051107 |

**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 = Data transmission, telemetry, telecommand

### 16QAM Modulation

**Emission Designator = 9M45W7D**

WiMAX BW = 9.45 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data transmission, telemetry, telecommand

## 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: Motorola Mobility, Inc.

FCC ID: IHDP56MD1

FCC Classification: PCS Licensed 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 | Sections 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 | Sections 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 | Sections 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 |
| 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 |

**Table 6-1. Summary of Test Results**


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## 6.2 Transmitter Conducted Output Power

**§2.1046**

The **Motorola Cellular/PCS CDMA/EvDO and WiMAX Phone with BT and WLAN FCC ID: IHDP56MD1** was connected via USB to a laptop PC with software used to control the output of the device. Through use of downlink waveforms generated by a VSG and software installed on the PC, the EUT was set to transmit at maximum power. All RF measurements were performed with a signal analyzer employing a gating function in order to capture emissions only during the transmitters' active transmit period. All available modulation, channel bandwidth, coding rates, zone types, and antenna configurations were investigated. The WiMAX conducted powers are reported below.

| | Bandwidth | Frequency [MHz] | QPSK (CTC) 1/2 | | QPSK (CTC) 3/4 | | 16QAM (CTC) 1/2 | | 16QAM (CTC) 3/4 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Ant 1 | Ant 2 | Ant 1 | Ant 2 | Ant 1 | Ant 2 | Ant 1 | Ant 2 |
| | | | [dBm] | [dBm] | [dBm] | [dBm] | [dBm] | [dBm] | [dBm] | [dBm] |
| PUSC | 5MHz | 2498.50 | 23.87 | 23.82 | 23.60 | 23.58 | 23.62 | 23.33 | 23.47 | 23.41 |
| | | 2600.00 | 23.94 | 23.86 | 23.45 | 23.61 | 23.45 | 23.56 | 23.34 | 23.45 |
| | | 2687.50 | 24.00 | 23.66 | 23.46 | 23.43 | 23.56 | 23.35 | 23.57 | 23.54 |
| | 10MHz | 2501.00 | 23.27 | 22.99 | 23.02 | 22.98 | 23.01 | 22.98 | 22.95 | 22.93 |
| | | 2600.00 | 23.22 | 22.96 | 22.99 | 22.95 | 23.01 | 22.94 | 22.99 | 22.88 |
| | | 2685.00 | 23.10 | 23.02 | 22.91 | 22.85 | 23.04 | 22.86 | 23.02 | 22.99 |
| BAMC | 5MHz | 2498.50 | 23.46 | 23.45 | 23.39 | 23.38 | 23.43 | 23.58 | 23.42 | 23.55 |
| | | 2600.00 | 23.57 | 23.51 | 23.49 | 23.61 | 23.45 | 23.46 | 23.47 | 23.40 |
| | | 2687.50 | 23.37 | 23.31 | 23.51 | 23.48 | 23.56 | 23.49 | 23.51 | 23.48 |
| | 10MHz | 2501.00 | 22.95 | 22.91 | 22.96 | 22.91 | 22.87 | 22.84 | 22.85 | 22.81 |
| | | 2600.00 | 22.93 | 22.61 | 22.91 | 22.63 | 22.85 | 22.57 | 23.02 | 22.51 |
| | | 2685.00 | 22.81 | 22.82 | 22.83 | 22.78 | 22.80 | 22.77 | 22.92 | 22.92 |

**Table 6-2. WiMAX Conducted Output Power**


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## 6.3 Equivalent Isotropic Radiated Power Output Data

**§27.50(h)(2); RSS-199 (4.4)**

| Frequency [MHz] | Antenna | Bandwidth [MHz] | Modulation | Measured Level [dBm] | Substitute Level [dBm] | Antenna Gain [dBi] | Pol [H/V] | EIRP [dBm] | EIRP [Watts] | Power Source |
|---|---|---|---|---|---|---|---|---|---|---|
| 2498.50 | 1 | 5 | QPSK | -22.480 | 11.73 | 8.90 | H | 20.63 | 0.116 | Battery |
| 2600.00 | 1 | 5 | QPSK | -22.680 | 11.53 | 9.06 | H | 20.59 | 0.115 | Battery |
| 2687.50 | 1 | 5 | QPSK | -22.720 | 11.49 | 9.21 | H | 20.70 | 0.118 | Battery |
| 2498.50 | 1 | 5 | 16-QAM | -22.650 | 11.56 | 8.90 | H | 20.46 | 0.111 | Battery |
| 2600.00 | 1 | 5 | 16-QAM | -22.710 | 11.50 | 9.06 | H | 20.56 | 0.114 | Battery |
| 2687.50 | 1 | 5 | 16-QAM | -22.830 | 11.38 | 9.21 | H | 20.59 | 0.115 | Battery |
| 2498.50 | 2 | 5 | QPSK | -18.550 | 15.66 | 8.90 | H | **24.56** | **0.286** | Battery |
| 2600.00 | 2 | 5 | QPSK | -20.140 | 14.07 | 9.06 | H | 23.13 | 0.206 | Battery |
| 2687.50 | 2 | 5 | QPSK | -21.640 | 12.57 | 9.21 | H | 21.78 | 0.151 | Battery |
| 2498.50 | 2 | 5 | 16-QAM | -18.760 | 15.45 | 8.90 | H | **24.35** | **0.272** | Battery |
| 2600.00 | 2 | 5 | 16-QAM | -20.400 | 13.81 | 9.06 | H | 22.87 | 0.194 | Battery |
| 2687.50 | 2 | 5 | 16-QAM | -21.950 | 12.26 | 9.21 | H | 21.47 | 0.140 | Battery |
| 2501.00 | 1 | 10 | QPSK | -22.210 | 12.00 | 8.90 | H | 20.90 | 0.123 | Battery |
| 2600.00 | 1 | 10 | QPSK | -23.480 | 10.73 | 9.06 | H | 19.79 | 0.095 | Battery |
| 2685.00 | 1 | 10 | QPSK | -23.030 | 11.18 | 9.21 | H | 20.39 | 0.109 | Battery |
| 2501.00 | 1 | 10 | 16-QAM | -22.610 | 11.60 | 8.90 | H | 20.50 | 0.112 | Battery |
| 2600.00 | 1 | 10 | 16-QAM | -24.040 | 10.17 | 9.06 | H | 19.23 | 0.084 | Battery |
| 2685.00 | 1 | 10 | 16-QAM | -23.670 | 10.54 | 9.21 | H | 19.75 | 0.094 | Battery |
| 2501.00 | 2 | 10 | QPSK | -19.640 | 14.57 | 8.90 | H | **23.47** | **0.222** | Battery |
| 2600.00 | 2 | 10 | QPSK | -20.510 | 13.70 | 9.06 | H | 22.76 | 0.189 | Battery |
| 2685.00 | 2 | 10 | QPSK | -21.260 | 12.95 | 9.21 | H | 22.16 | 0.164 | Battery |
| 2501.00 | 2 | 10 | 16-QAM | -19.780 | 14.43 | 8.90 | H | **23.33** | **0.215** | Battery |
| 2600.00 | 2 | 10 | 16-QAM | -20.680 | 13.53 | 9.06 | H | 22.59 | 0.182 | Battery |
| 2685.00 | 2 | 10 | 16-QAM | -20.630 | 13.58 | 9.21 | H | 22.79 | 0.190 | Battery |

**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 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. Final power measurements are made with a broadband average power meter. 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 spectrum analyzer reading. This level is recorded using the power meter. 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 unit was tested with its standard battery (SNN5890A). The EUT was tested in three orthogonal planes and in all possible test configurations and positioning.


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## 6.4 WiMAX Radiated Measurements – Antenna 1

**§2.1053, §27.53(m)(4); RSS-199 (4.5)**

### Field Strength of SPURIOUS Radiation

| | | | | |
|---|---|---|---|---|
| OPERATING FREQUENCY: | 2498.50 | MHz | | |
| MEASURED OUTPUT POWER: | 20.703 | dBm | = | 0.118 W |
| MODULATION SIGNAL: | QPSK | | | |
| DISTANCE: | 3 | meters | | |
| LIMIT: | 55 + 10 $\log_{10}$ (W) = | 45.70 | dBc | |

| FREQUENCY (MHz) | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBi) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | (dBc) |
|---|---|---|---|---|---|
| 4997.00 | -47.96 | 11.20 | -36.76 | H | 57.5 |
| 7495.50 | -39.13 | 11.10 | -28.03 | H | 48.7 |
| 9994.00 | -83.73 | 12.55 | -71.17 | H | 91.9 |
| 12492.50 | -76.14 | 12.70 | -63.43 | H | 84.1 |
| 14991.00 | -66.11 | 11.64 | -54.47 | H | 75.2 |

**Table 6-4. Radiated Spurious Data (5MHz Bandwidth WiMAX, QPSK, Antenna 1)**

**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. Final power measurements are made with a broadband average power meter. 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 spectrum analyzer reading. This spurious level is recorded using the power meter. For readings above 1GHz, 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 unit was tested with its standard battery (SNN5890A). The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. This device was tested under all configurations and the worst case radiated spurious emissions were found with the unit was transmitting from Antenna 1 using a 5MHz channel with 1/2 PUSC QPSK modulation while connected via USB to a laptop PC.


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## WiMAX Radiated Measurements – Antenna 1 (Cont'd)

**§2.1053, §27.53(m)(4); RSS-199 (4.5)**

### Field Strength of SPURIOUS Radiation

| | | | | |
|---|---|---|---|---|
| OPERATING FREQUENCY: | 2600.00 | MHz | | |
| MEASURED OUTPUT POWER: | 20.703 | dBm | = | 0.118 W |
| MODULATION SIGNAL: | QPSK | | | |
| DISTANCE: | 3 | meters | | |
| LIMIT: | 55 + 10 $\log_{10}$ (W) = | 45.70 | dBc | |

| FREQUENCY (MHz) | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBi) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | (dBc) |
|---|---|---|---|---|---|
| 5200.00 | -47.74 | 10.91 | -36.82 | H | 57.5 |
| 7800.00 | -38.45 | 11.34 | -27.11 | H | 47.8 |
| 10400.00 | -83.57 | 12.83 | -70.74 | H | 91.4 |
| 13000.00 | -75.34 | 13.10 | -62.24 | H | 82.9 |
| 15600.00 | -70.64 | 14.98 | -55.66 | H | 76.4 |

**Table 6-5. Radiated Spurious Data (5MHz Bandwidth WiMAX, QPSK, Antenna 1)**

**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. Final power measurements are made with a broadband average power meter. 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 spectrum analyzer reading. This spurious level is recorded using the power meter. For readings above 1GHz, 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 unit was tested with its standard battery (SNN5890A). The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. This device was tested under all configurations and the worst case radiated spurious emissions were found with the unit was transmitting from Antenna 1 using a 5MHz channel with 1/2 PUSC QPSK modulation while connected via USB to a laptop PC.


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## WiMAX Radiated Measurements – Antenna 1 (Cont'd)

**§2.1053, §27.53(m)(4); RSS-199 (4.5)**

### Field Strength of SPURIOUS Radiation

| | | | | |
|---|---|---|---|---|
| OPERATING FREQUENCY: | 2687.50 | MHz | | |
| MEASURED OUTPUT POWER: | 20.703 | dBm | = | 0.118 W |
| MODULATION SIGNAL: | QPSK | | | |
| DISTANCE: | 3 | meters | | |
| LIMIT: | 55 + 10 $\log_{10}$ (W) = | 45.70 | dBc | |

| FREQUENCY (MHz) | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBi) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | (dBc) |
|---|---|---|---|---|---|
| 5375.00 | -45.50 | 10.68 | -34.83 | H | 55.5 |
| 8062.50 | -37.15 | 11.51 | -25.64 | H | 46.3 |
| 10750.00 | -82.92 | 13.05 | -69.87 | H | 90.6 |
| 13437.50 | -73.77 | 13.13 | -60.64 | H | 81.3 |
| 16125.00 | -71.36 | 16.17 | -55.19 | H | 75.9 |

**Table 6-6. Radiated Spurious Data (5MHz Bandwidth WiMAX, QPSK, Antenna 1)**

**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. Final power measurements are made with a broadband average power meter. 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 spectrum analyzer reading. This spurious level is recorded using the power meter. For readings above 1GHz, 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 unit was tested with its standard battery (SNN5890A). The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. This device was tested under all configurations and the worst case radiated spurious emissions were found with the unit was transmitting from Antenna 1 using a 5MHz channel with 1/2 PUSC QPSK modulation while connected via USB to a laptop PC.


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## 6.5 WiMAX Radiated Measurements – Antenna 2

**§2.1053, §27.53(m)(4); RSS-199 (4.5)**

### Field Strength of SPURIOUS Radiation

| | | | | |
|---|---|---|---|---|
| OPERATING FREQUENCY: | 2498.50 | MHz | | |
| MEASURED OUTPUT POWER: | 24.560 | dBm | = | 0.286 W |
| MODULATION SIGNAL: | QPSK | | | |
| DISTANCE: | 3 | meters | | |
| LIMIT: | 55 + 10 $\log_{10}$ (W) = | 49.56 | dBc | |

| FREQUENCY (MHz) | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBi) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | (dBc) |
|---|---|---|---|---|---|
| 4997.00 | -45.75 | 11.20 | -34.55 | H | 59.1 |
| 7495.50 | -39.83 | 11.10 | -28.73 | H | 53.3 |
| 9994.00 | -83.73 | 12.55 | -71.17 | H | 95.7 |
| 12492.50 | -76.14 | 12.70 | -63.43 | H | 88.0 |
| 14991.00 | -66.11 | 11.64 | -54.47 | H | 79.0 |

**Table 6-7. Radiated Spurious Data (5MHz Bandwidth WiMAX, QPSK, Antenna 2)**

**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. Final power measurements are made with a broadband average power meter. 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 spectrum analyzer reading. This spurious level is recorded using the power meter. For readings above 1GHz, 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 unit was tested with its standard battery (SNN5890A). The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. This device was tested under all configurations and the worst case radiated spurious emissions were found with the unit was transmitting from Antenna 1 using a 5MHz channel with 1/2 PUSC QPSK modulation while connected via USB to a laptop PC.


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## WiMAX Radiated Measurements – Antenna 2 (Cont'd)

**§2.1053, §27.53(m)(4); RSS-199 (4.5)**

### Field Strength of SPURIOUS Radiation

| | | | | |
|---|---|---|---|---|
| OPERATING FREQUENCY: | 2600.00 | MHz | | |
| MEASURED OUTPUT POWER: | 24.560 | dBm | = | 0.286 W |
| MODULATION SIGNAL: | QPSK | | | |
| DISTANCE: | 3 | meters | | |
| LIMIT: | 55 + 10 $\log_{10}$ (W) = | 49.56 | dBc | |

| FREQUENCY (MHz) | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBi) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | (dBc) |
|---|---|---|---|---|---|
| 5200.00 | -48.68 | 10.91 | -37.76 | H | 62.3 |
| 7800.00 | -42.72 | 11.34 | -31.38 | H | 55.9 |
| 10400.00 | -83.57 | 12.83 | -70.74 | H | 95.3 |
| 13000.00 | -75.34 | 13.10 | -62.24 | H | 86.8 |
| 15600.00 | -70.64 | 14.98 | -55.66 | H | 80.2 |

**Table 6-8. Radiated Spurious Data (5MHz Bandwidth WiMAX, QPSK, Antenna 2)**

**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. Final power measurements are made with a broadband average power meter. 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 spectrum analyzer reading. This spurious level is recorded using the power meter. For readings above 1GHz, 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 unit was tested with its standard battery (SNN5890A). The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. This device was tested under all configurations and the worst case radiated spurious emissions were found with the unit was transmitting from Antenna 1 using a 5MHz channel with 1/2 PUSC QPSK modulation while connected via USB to a laptop PC.


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## WiMAX Radiated Measurements – Antenna 2 (Cont'd)

**§2.1053, §27.53(m)(4); RSS-199 (4.5)**

### Field Strength of SPURIOUS Radiation

| | | | | |
|---|---|---|---|---|
| OPERATING FREQUENCY: | 2687.50 | MHz | | |
| MEASURED OUTPUT POWER: | 24.560 | dBm | = | 0.286 W |
| MODULATION SIGNAL: | QPSK | | | |
| DISTANCE: | 3 | meters | | |
| LIMIT: | 55 + 10 $\log_{10}$ (W) = | 49.56 | dBc | |

| FREQUENCY (MHz) | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBi) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | (dBc) |
|---|---|---|---|---|---|
| 5375.00 | -51.53 | 10.68 | -40.86 | H | 65.4 |
| 8062.50 | -46.44 | 11.51 | -34.93 | H | 59.5 |
| 10750.00 | -82.92 | 13.05 | -69.87 | H | 94.4 |
| 13437.50 | -73.77 | 13.13 | -60.64 | H | 85.2 |
| 16125.00 | -71.36 | 16.17 | -55.19 | H | 79.8 |

**Table 6-9. Radiated Spurious Data (5MHz Bandwidth WiMAX, QPSK, Antenna 2)**

**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. Final power measurements are made with a broadband average power meter. 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 spectrum analyzer reading. This spurious level is recorded using the power meter. For readings above 1GHz, 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 unit was tested with its standard battery (SNN5890A). The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. This device was tested under all configurations and the worst case radiated spurious emissions were found with the unit was transmitting from Antenna 1 using a 5MHz channel with 1/2 PUSC QPSK modulation while connected via USB to a laptop PC.


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## 6.6 WiMAX Frequency Stability Measurements – Antenna 1

**§2.1055, §27.54; RSS-199 (4.3)**

OPERATING FREQUENCY: 2,600,000,000 Hz

REFERENCE VOLTAGE: 3.7 VDC

| VOLTAGE (%) | POWER (VDC) | TEMP (°C) | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|---|---|---|---|---|---|
| 100 % | 3.70 | + 20 (Ref) | 2,600,000,017 | 17 | 0.000001 |
| 100 % | | - 30 | 2,600,000,012 | 12 | 0.000000 |
| 100 % | | - 20 | 2,600,000,020 | 20 | 0.000001 |
| 100 % | | - 10 | 2,599,999,992 | -8 | 0.000000 |
| 100 % | | 0 | 2,599,999,983 | -17 | -0.000001 |
| 100 % | | + 10 | 2,600,000,020 | 20 | 0.000001 |
| 100 % | | + 20 | 2,600,000,011 | 11 | 0.000000 |
| 100 % | | + 30 | 2,599,999,992 | -8 | 0.000000 |
| 100 % | | + 40 | 2,599,999,982 | -18 | -0.000001 |
| 100 % | | + 50 | 2,600,000,010 | 10 | 0.000000 |
| 115 % | 4.26 | + 20 | 2,600,000,012 | 12 | 0.000000 |
| BATT. ENDPOINT | 3.39 | + 20 | 2,599,999,983 | -17 | -0.000001 |

**Table 6-10. Frequency Stability Data (5MHz BW WiMAX Mode – Antenna 1)**


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## 6.7 WiMAX Frequency Stability Measurements – Antenna 2

**§2.1055, §27.54; RSS-199 (4.3)**

OPERATING FREQUENCY: 2,600,000,000 Hz

REFERENCE VOLTAGE: 3.7 VDC

| VOLTAGE (%) | POWER (VDC) | TEMP (ºC) | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|---|---|---|---|---|---|
| 100 % | 3.70 | + 20 (Ref) | 2,600,000,013 | 13 | 0.000001 |
| 100 % | | - 30 | 2,600,000,005 | 5 | 0.000000 |
| 100 % | | - 20 | 2,599,999,994 | -6 | 0.000000 |
| 100 % | | - 10 | 2,600,000,019 | 19 | 0.000001 |
| 100 % | | 0 | 2,599,999,993 | -7 | 0.000000 |
| 100 % | | + 10 | 2,599,999,988 | -12 | 0.000000 |
| 100 % | | + 20 | 2,600,000,010 | 10 | 0.000000 |
| 100 % | | + 30 | 2,600,000,013 | 13 | 0.000001 |
| 100 % | | + 40 | 2,600,000,002 | 2 | 0.000000 |
| 100 % | | + 50 | 2,600,000,017 | 17 | 0.000001 |
| 115 % | 4.26 | + 20 | 2,600,000,009 | 9 | 0.000000 |
| BATT. ENDPOINT | 3.39 | + 20 | 2,600,000,010 | 10 | 0.000000 |

**Table 6-11. Frequency Stability Data (5MHz BW WiMAX Mode – Antenna 2)**


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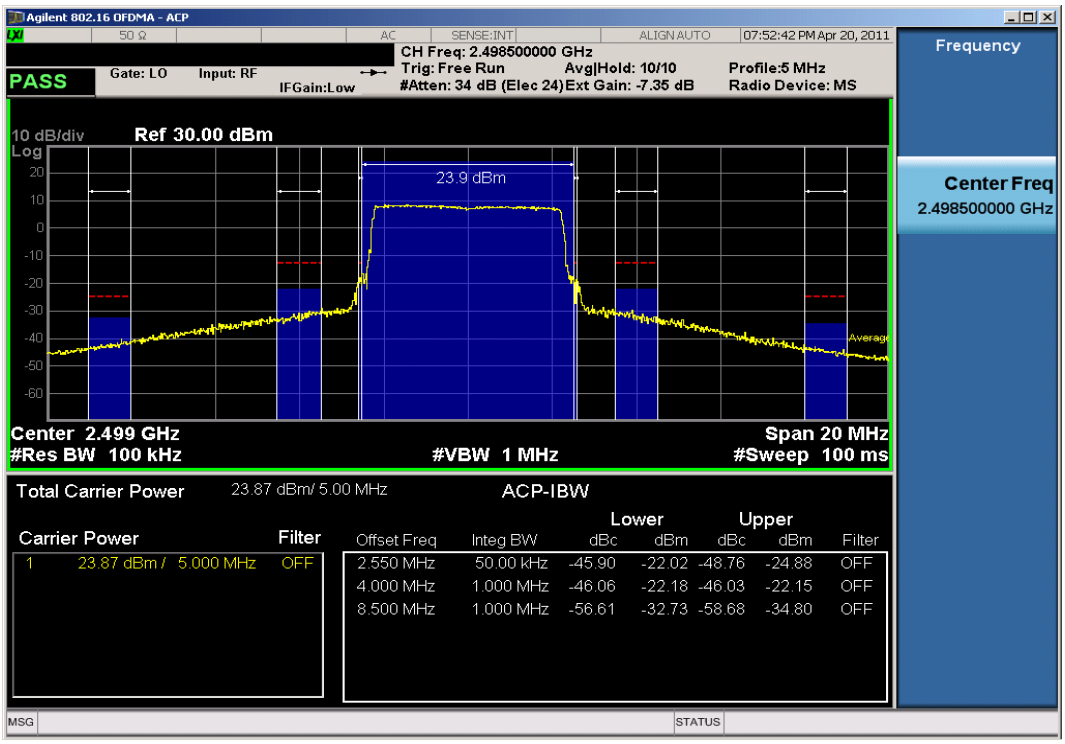
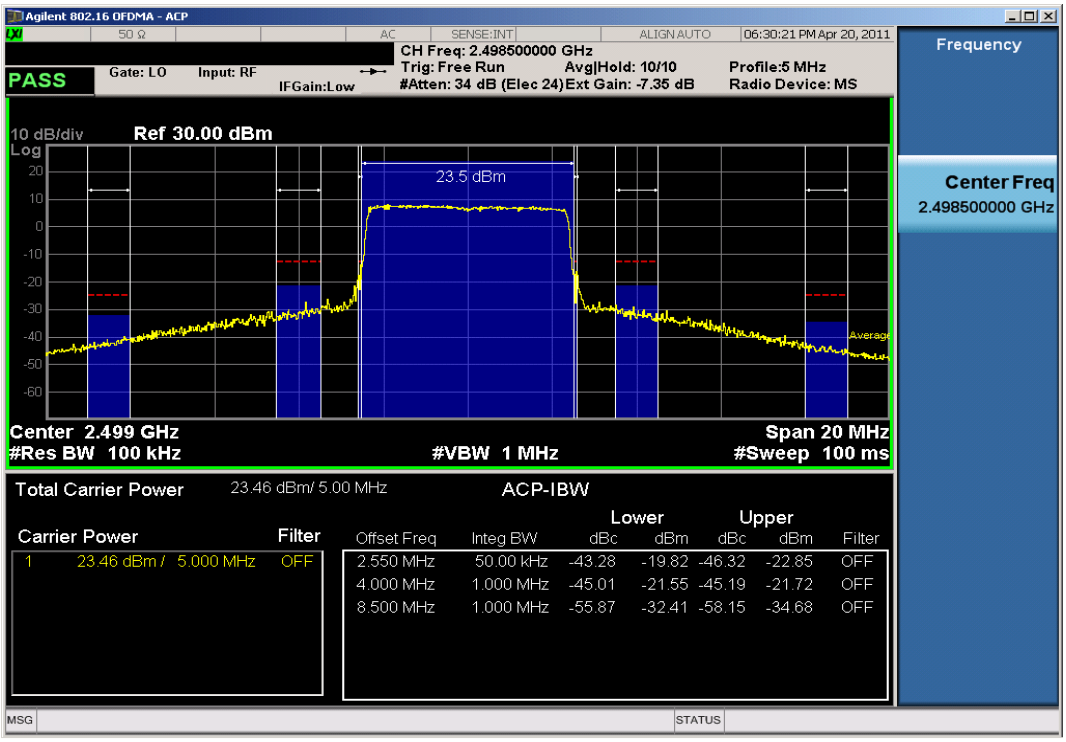
# 7.0 PLOT(S) OF EMISSIONS – 5MHZ BANDWIDTH




**Plot 7-1. Channel Edge Plot (Low Ch., 5MHz BW, PUSC QPSK, Antenna 1)**




**Plot 7-2. Channel Edge Plot (Low Ch., 5MHz BW, BAMC QPSK, Antenna 1)**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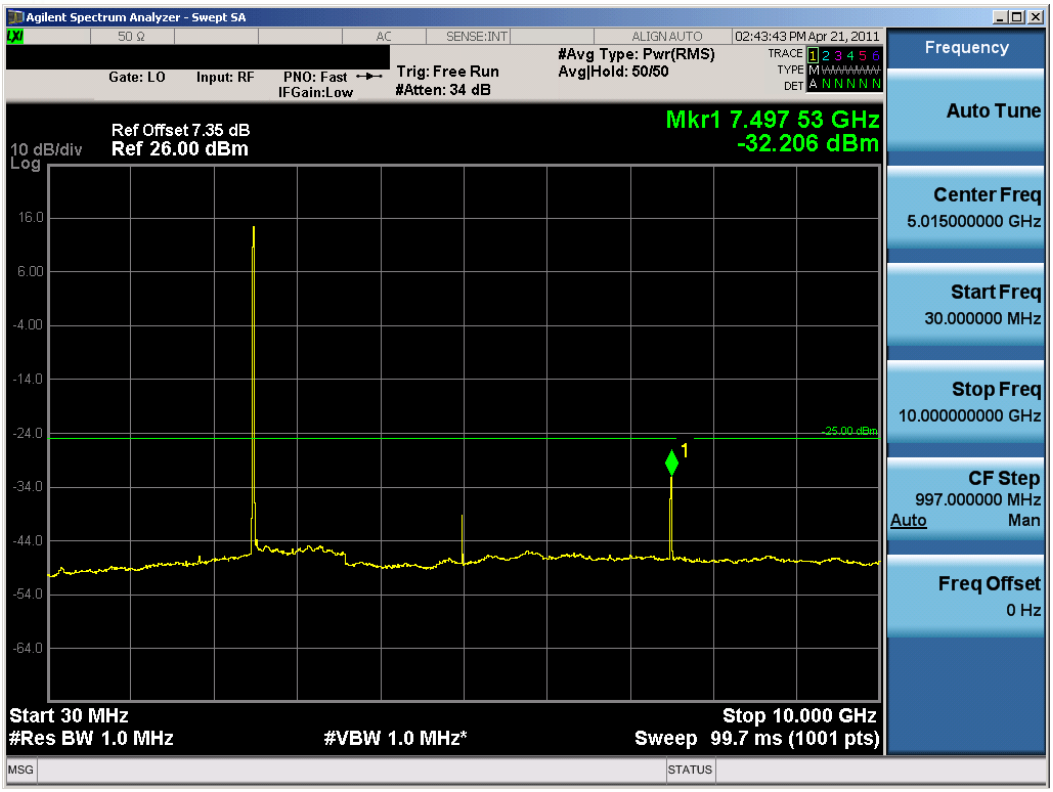


**Plot 7-3. Conducted Spurious Plot (Low Ch., 5MHz BW, QPSK, Antenna 1)**

**Plot 7-4. Conducted Spurious Plot (Low Ch., 5MHz BW, QPSK, Antenna 1)**


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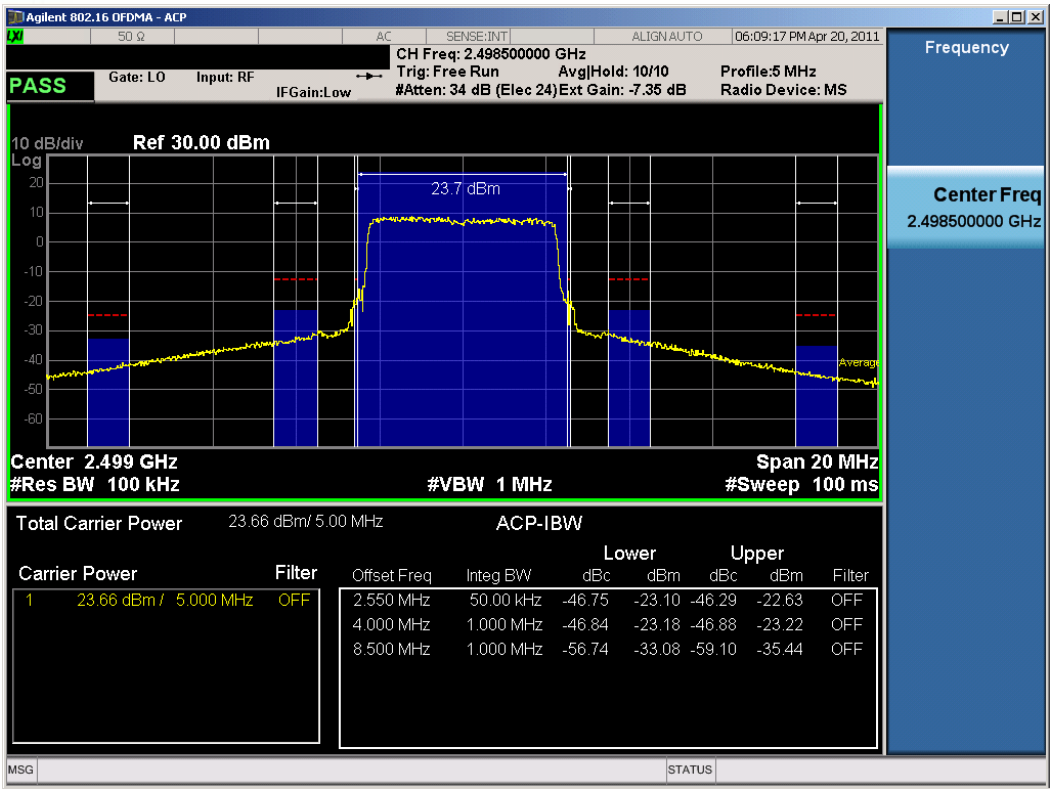
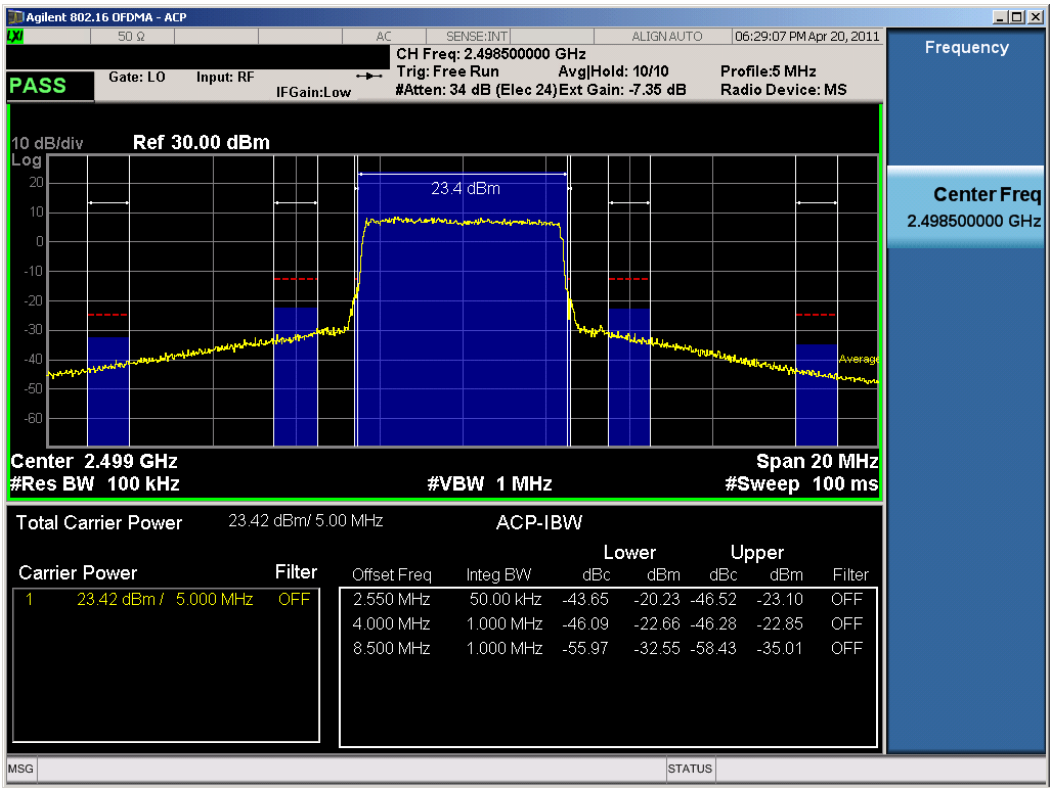



**Plot 7-5. Channel Edge Plot (Low Ch., 5MHz BW, PUSC 16-QAM, Antenna 1)**




**Plot 7-6. Channel Edge Plot (Low Ch., 5MHz BW, BAMC 16-QAM, Antenna 1)**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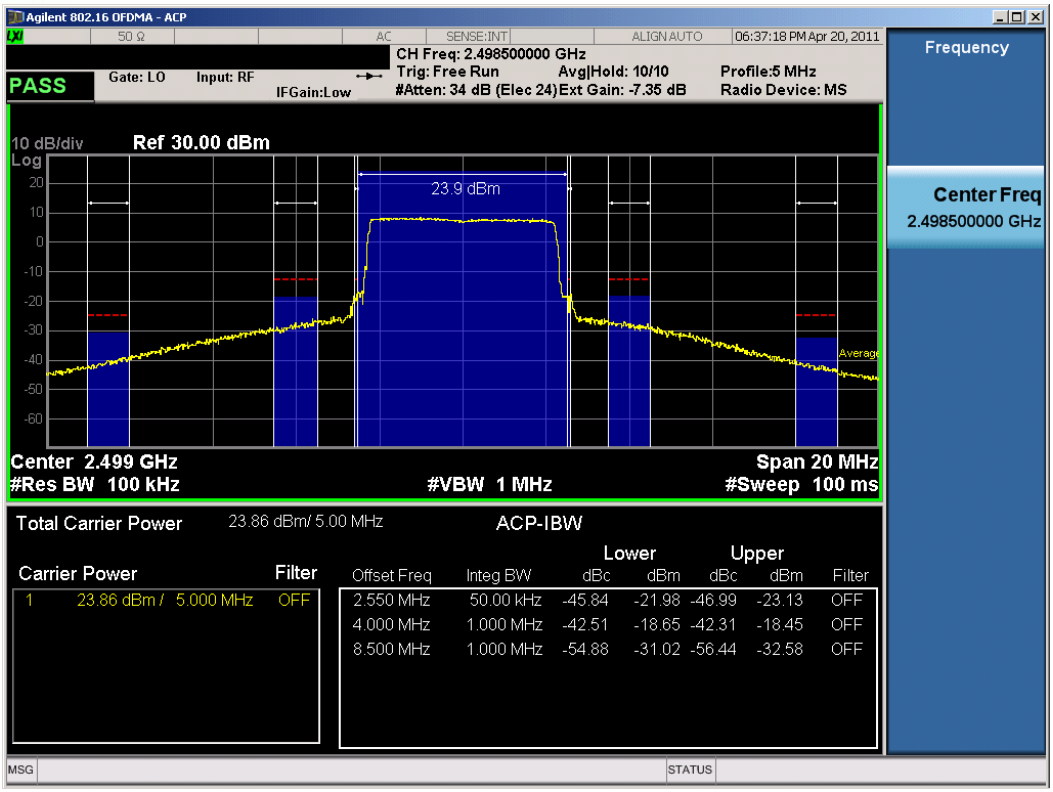
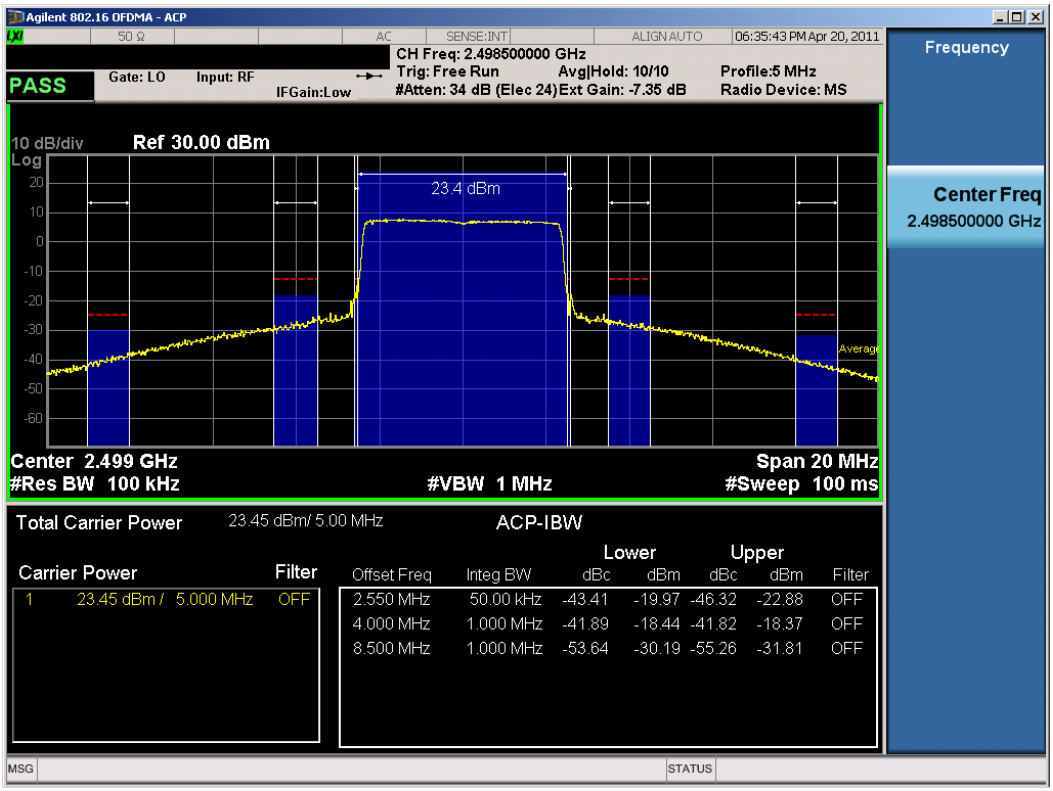



**Plot 7-7. Channel Edge Plot (Low Ch., 5MHz BW, PUSC QPSK, Antenna 2)**




**Plot 7-8. Channel Edge Plot (Low Ch., 5MHz BW, BAMC QPSK, Antenna 2)**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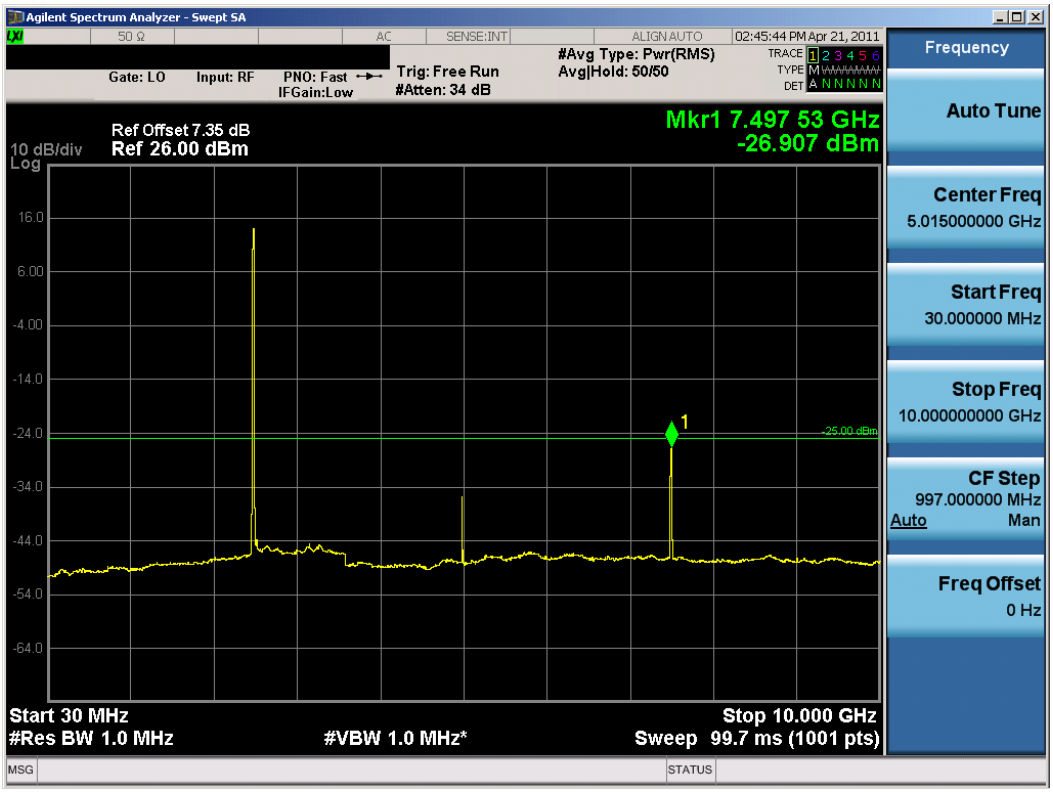


**Plot 7-9. Conducted Spurious Plot (Low Ch., 5MHz BW, QPSK, Antenna 2)**

**Plot 7-10. Conducted Spurious Plot (Low Ch., 5MHz BW, QPSK, Antenna 2)**


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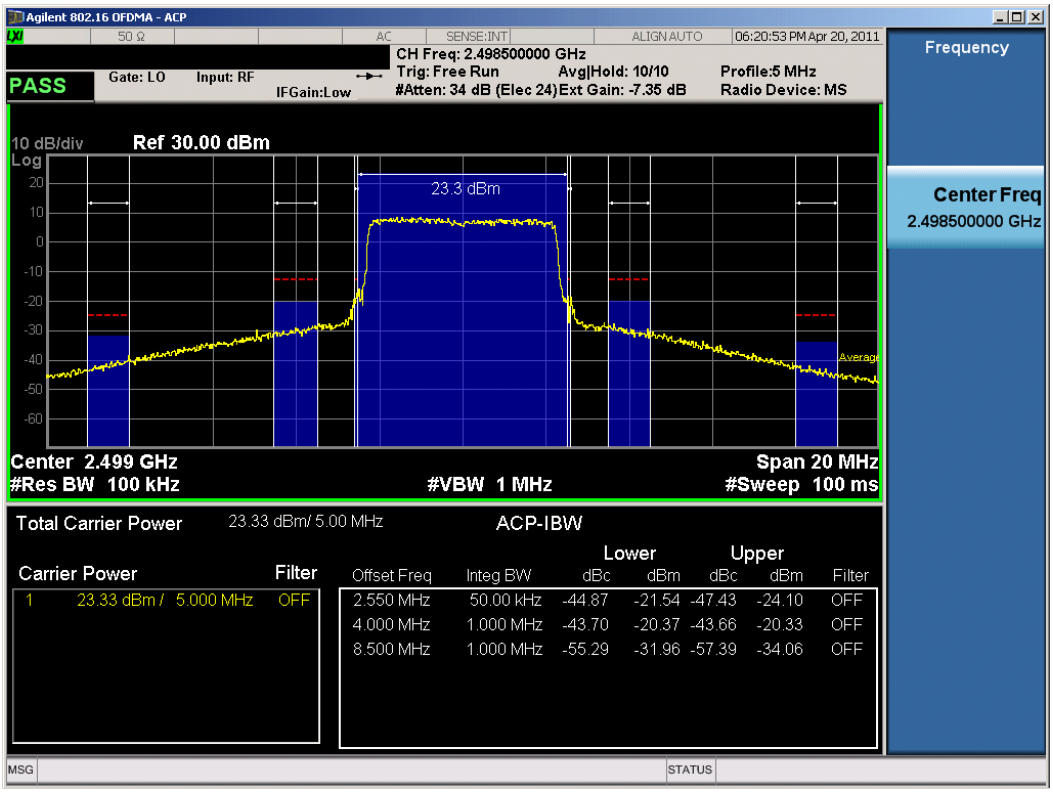
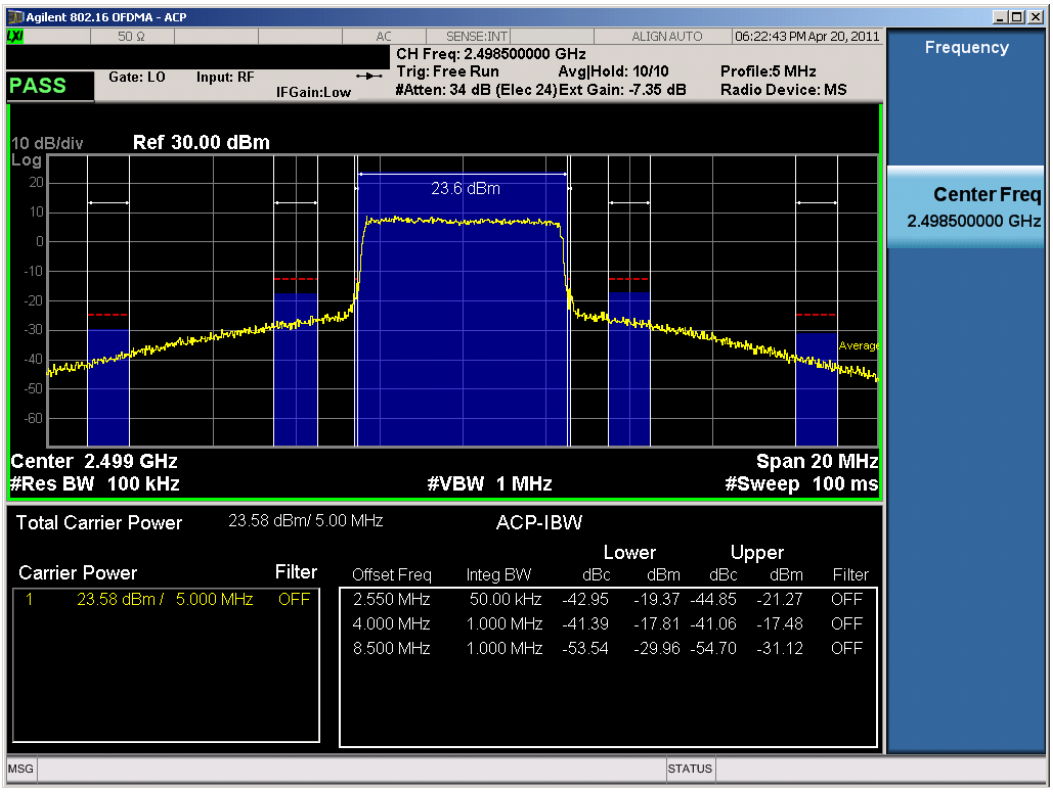



**Plot 7-11. Channel Edge Plot (Low Ch., 5MHz BW, PUSC 16-QAM, Antenna 2)**




**Plot 7-12. Channel Edge Plot (Low Ch., 5MHz BW, BAMC 16-QAM, Antenna 2)**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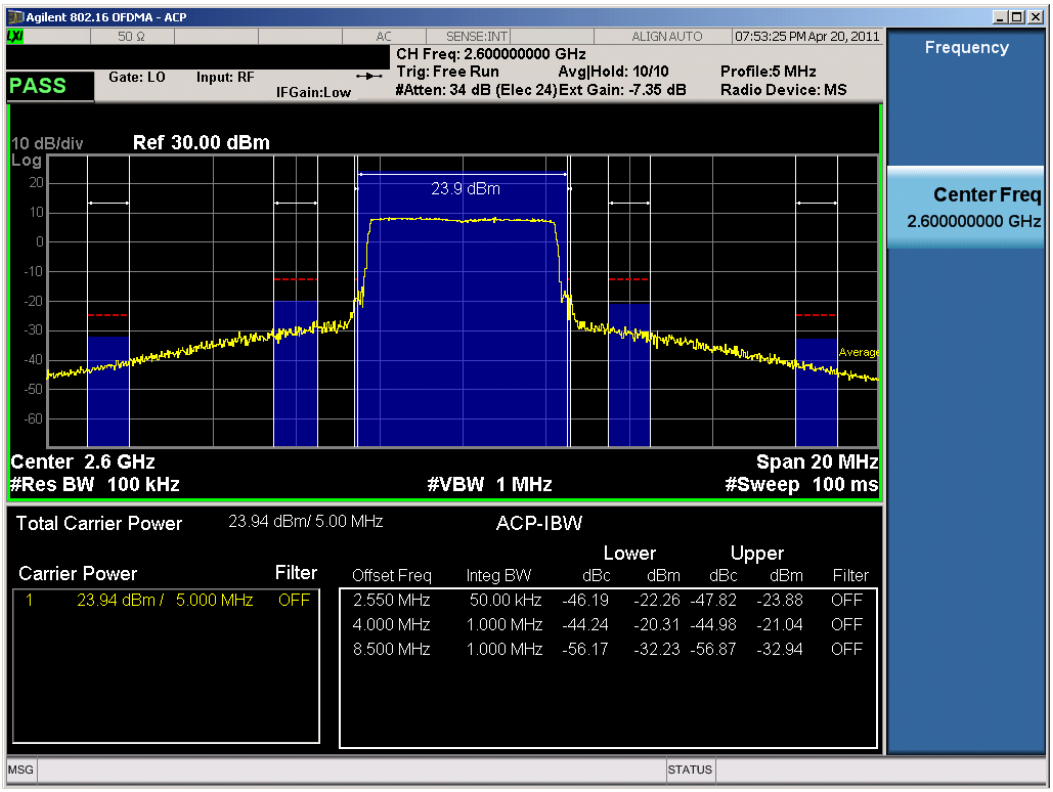
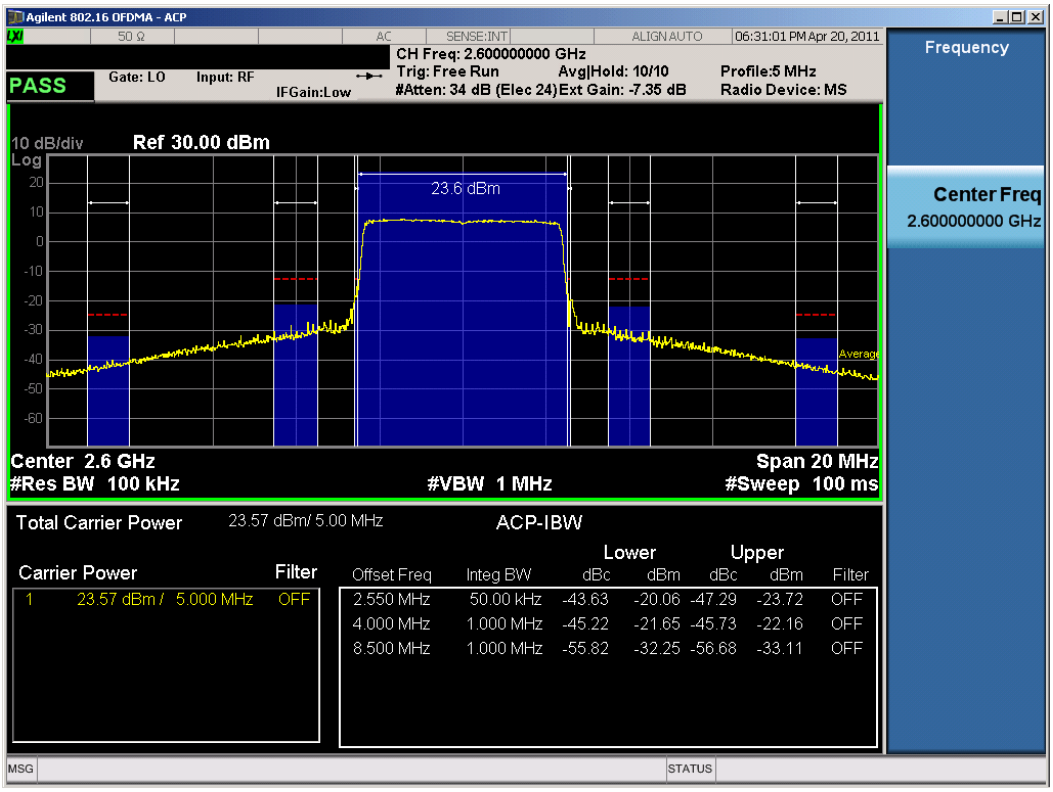



**Plot 7-13. Channel Edge Plot (Mid Ch., 5MHz BW, PUSC QPSK, Antenna 1)**




**Plot 7-14. Channel Edge Plot (Mid Ch., 5MHz BW, BAMC QPSK, Antenna 1)**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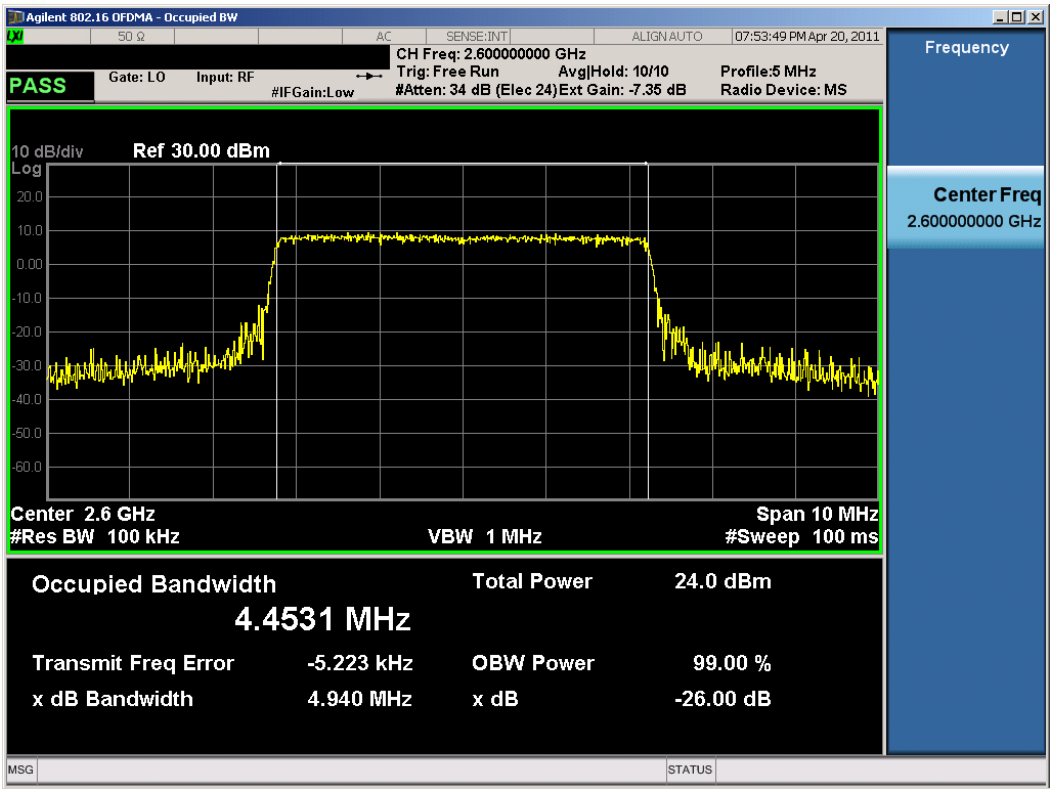
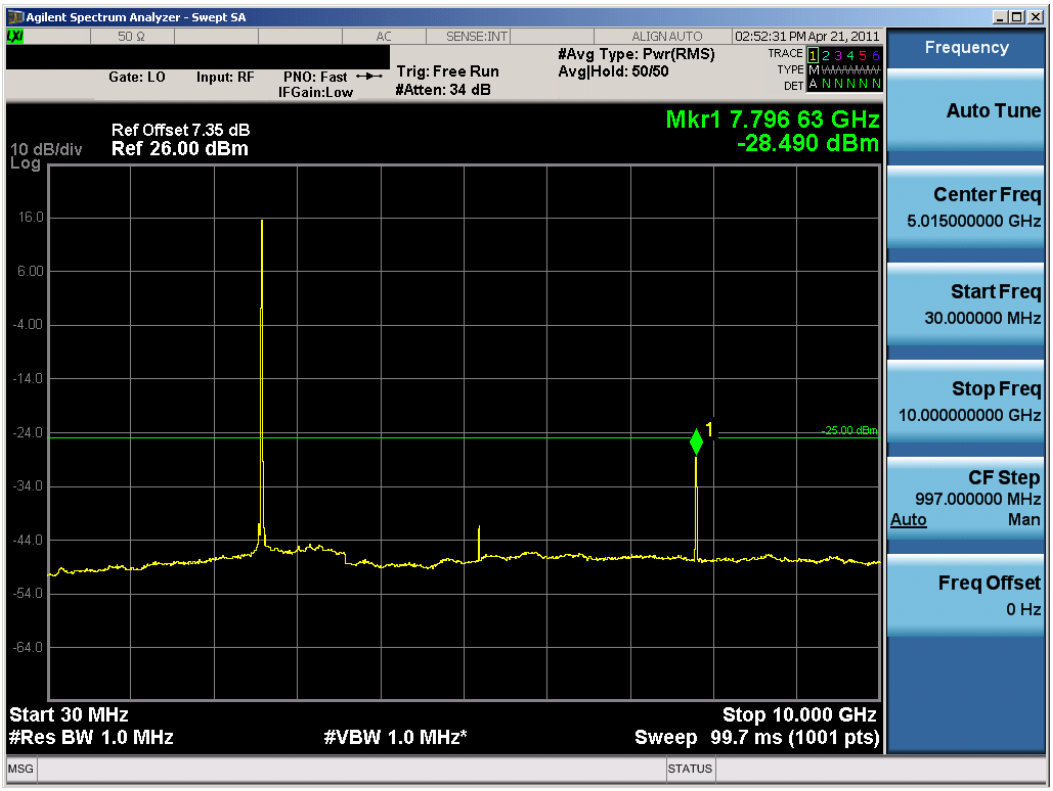



**Plot 7-15. Occupied Bandwidth Plot (Mid Ch., 5MHz BW, QPSK, Antenna 1)**




**Plot 7-16. Conducted Spurious Plot (Mid Ch., 5MHz BW, QPSK Antenna 1)**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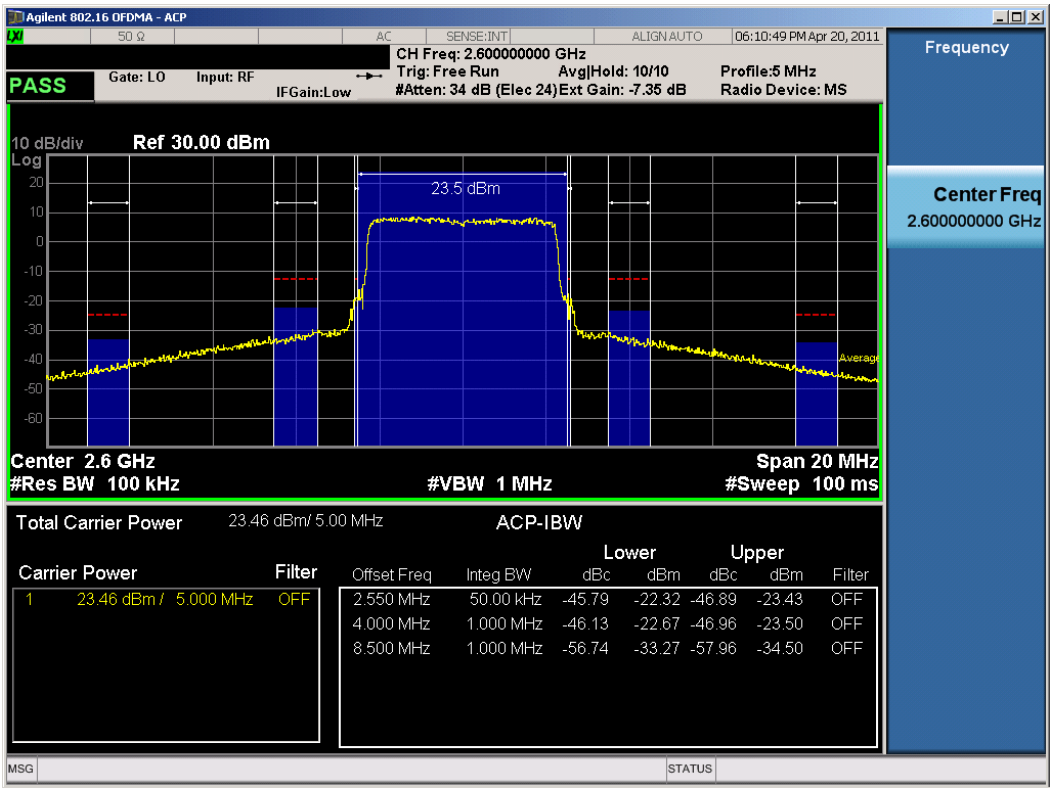
**Plot 7-17. Conducted Spurious Plot (Mid Ch., 5MHz BW, QPSK Antenna 1)**




**Plot 7-18. Channel Edge Plot (Mid Ch., 5MHz BW, PUSC 16-QAM, Antenna 1)**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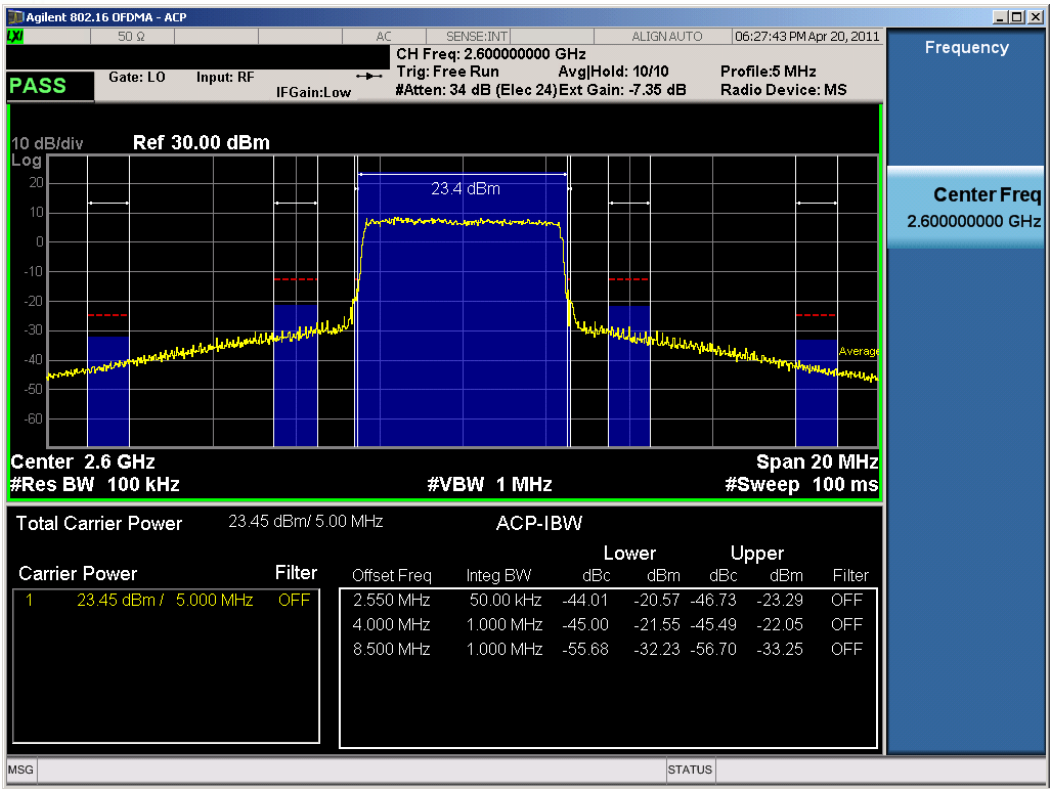
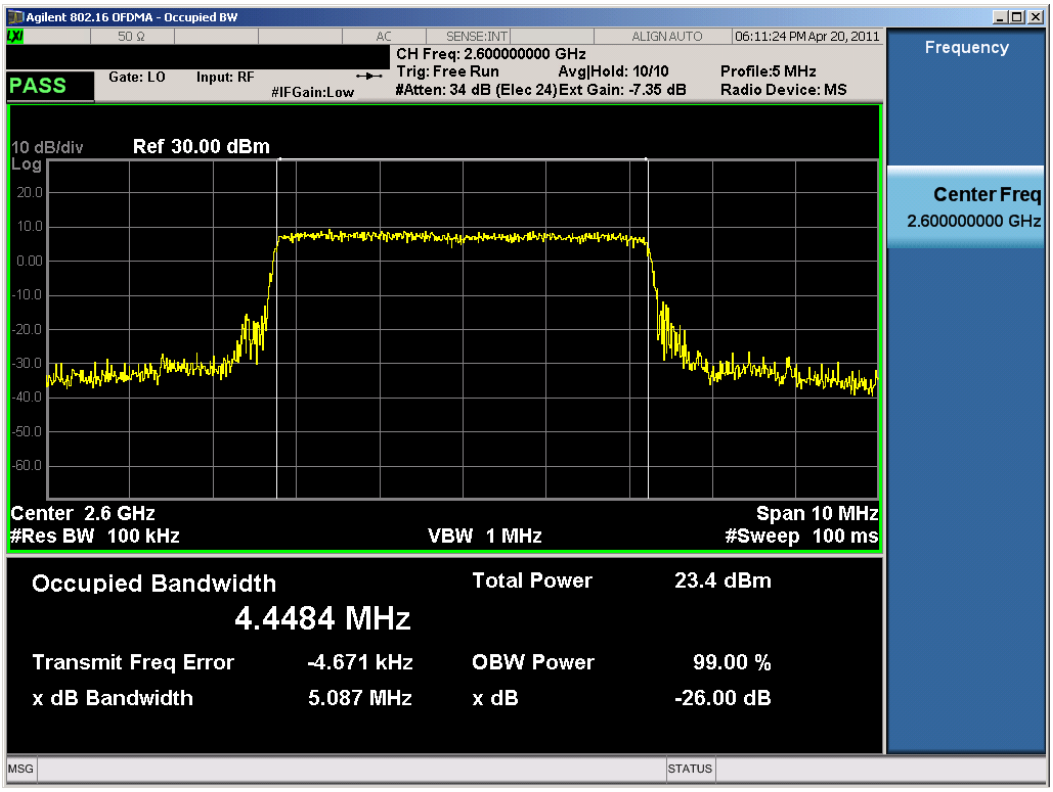



**Plot 7-19. Channel Edge Plot (Mid Ch., 5MHz BW, BAMC 16-QAM, Antenna 1)**




**Plot 7-20. Occupied Bandwidth Plot (Mid Ch., 5MHz BW, 16-QAM, Antenna 1)**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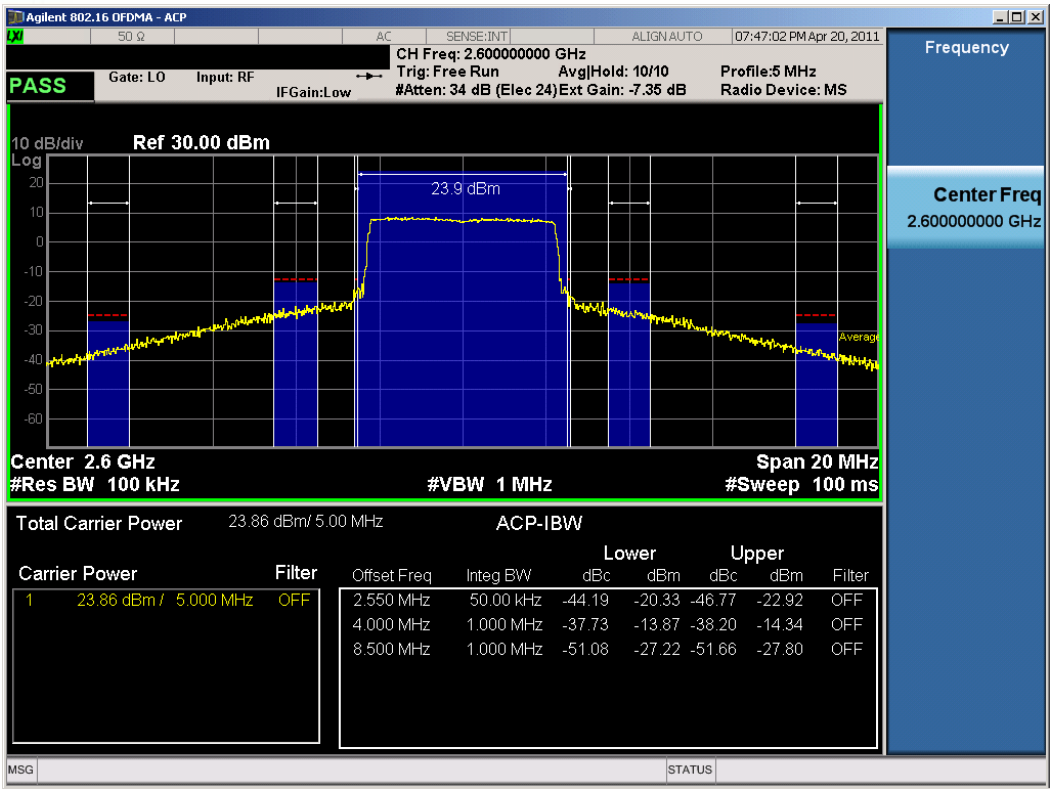
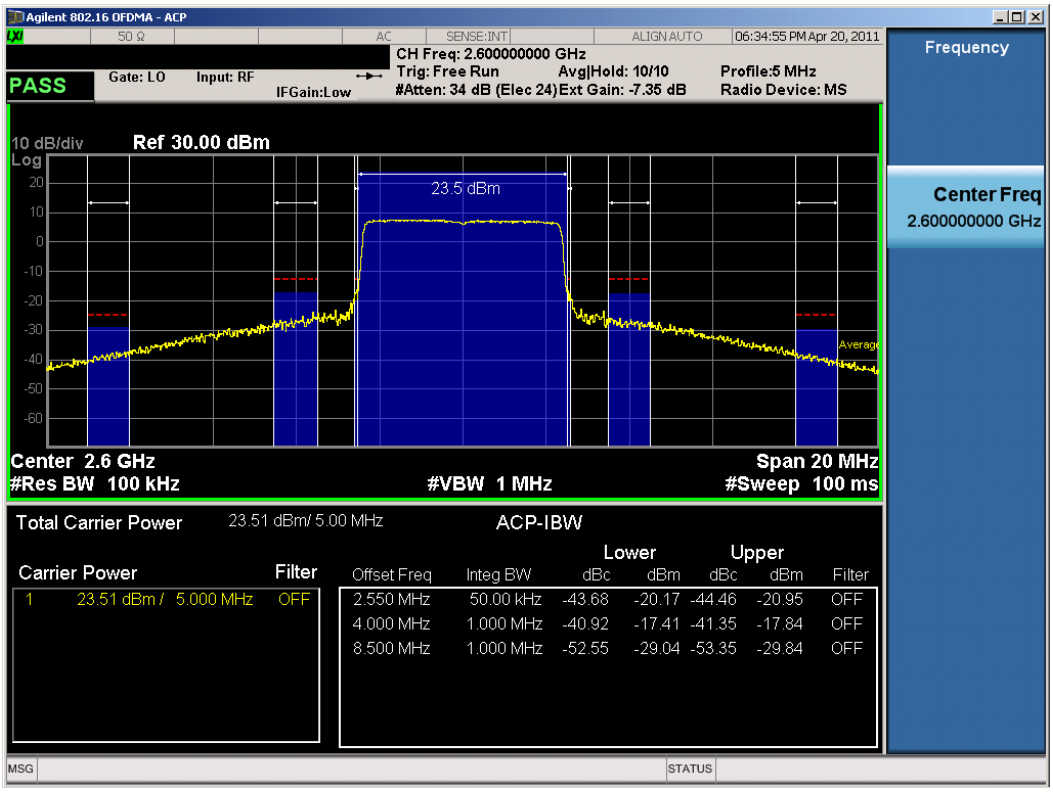



**Plot 7-21. Channel Edge Plot (Mid Ch., 5MHz BW, PUSC QPSK, Antenna 2)**




**Plot 7-22. Channel Edge Plot (Mid Ch., 5MHz BW, BAMC QPSK, Antenna 2)**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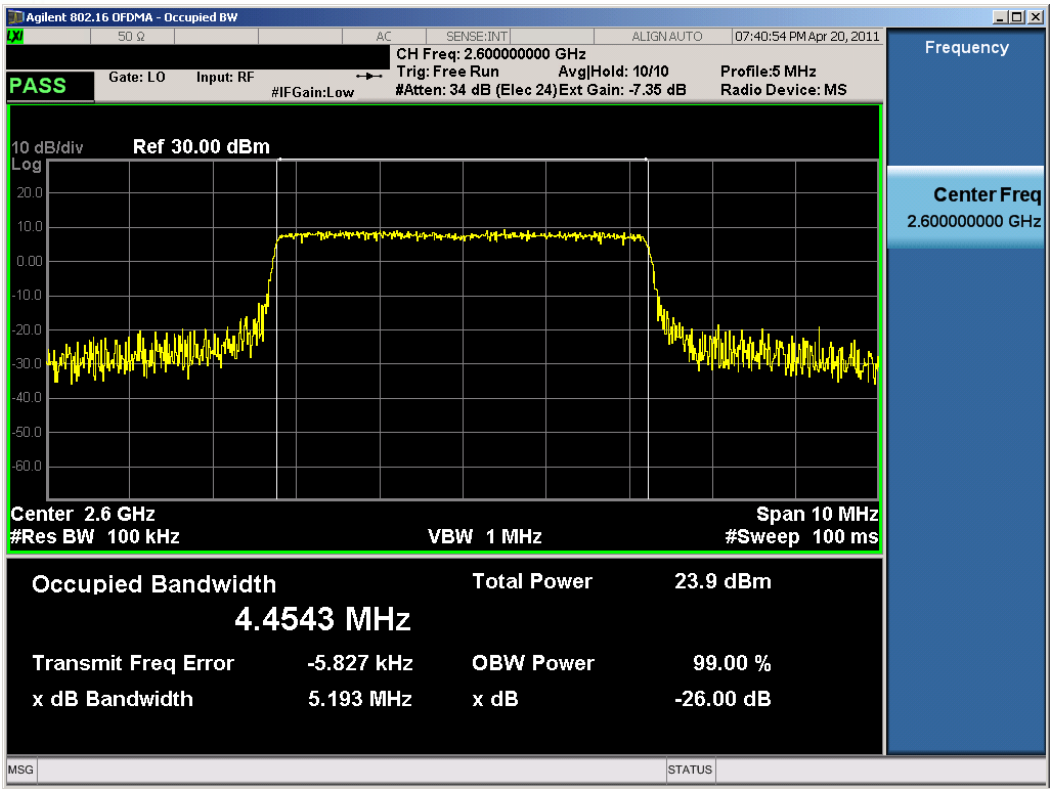
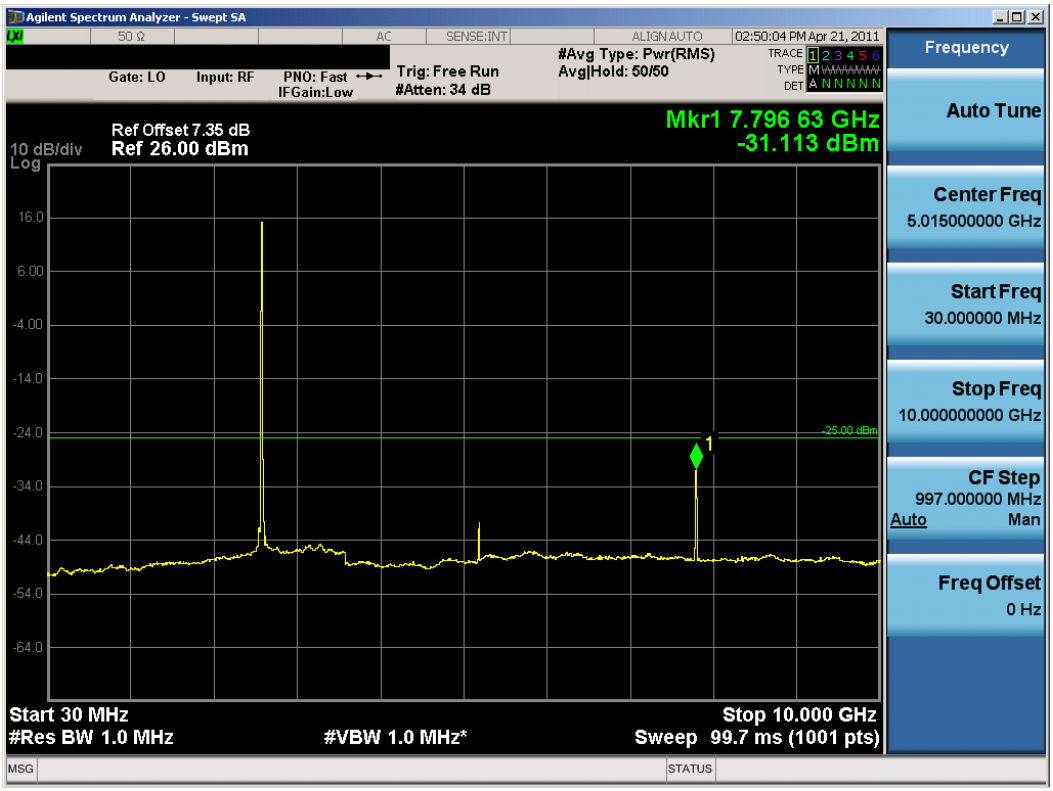



**Plot 7-23. Occupied Bandwidth Plot (Mid Ch., 5MHz BW, QPSK, Antenna 2)**




**Plot 7-24. Conducted Spurious Plot (Mid Ch., 5MHz BW, QPSK Antenna 2)**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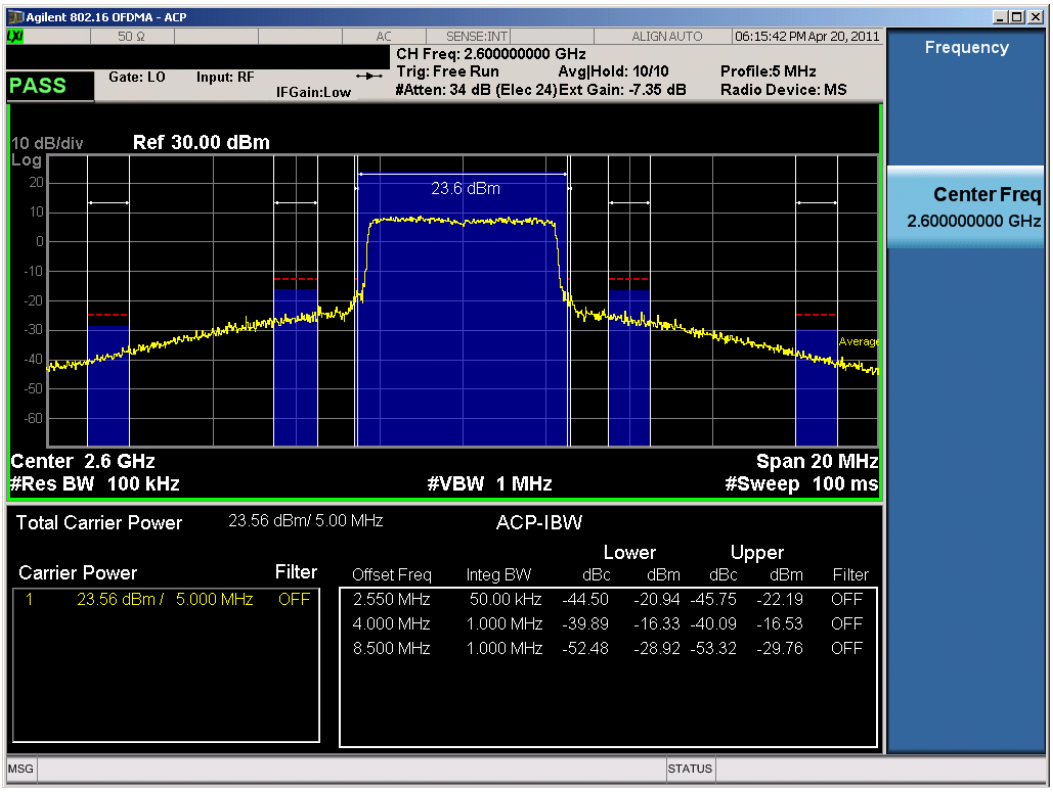
**Plot 7-25. Conducted Spurious Plot (Mid Ch., 5MHz BW, QPSK Antenna 2)**




**Plot 7-26. Channel Edge Plot (Mid Ch., 5MHz BW, PUSC 16-QAM, Antenna 2)**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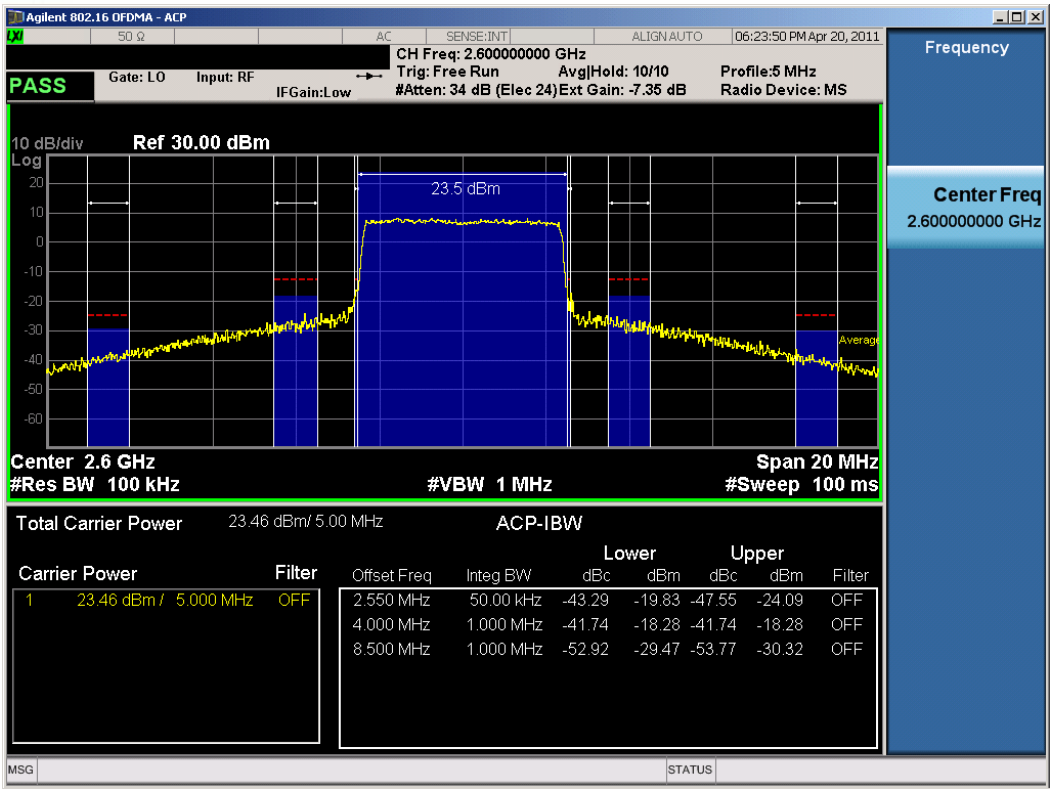
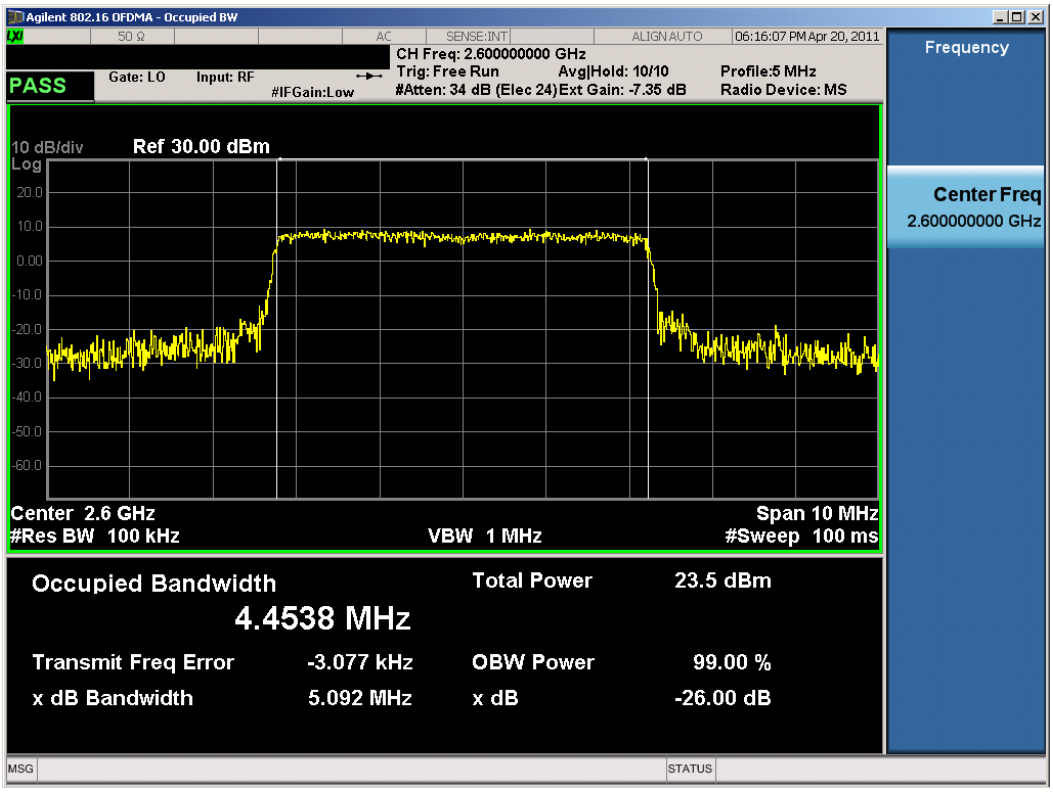



**Plot 7-27. Channel Edge Plot (Mid Ch., 5MHz BW, BAMC 16-QAM, Antenna 2)**




**Plot 7-28. Occupied Bandwidth Plot (Mid Ch., 5MHz BW, 16-QAM, Antenna 2)**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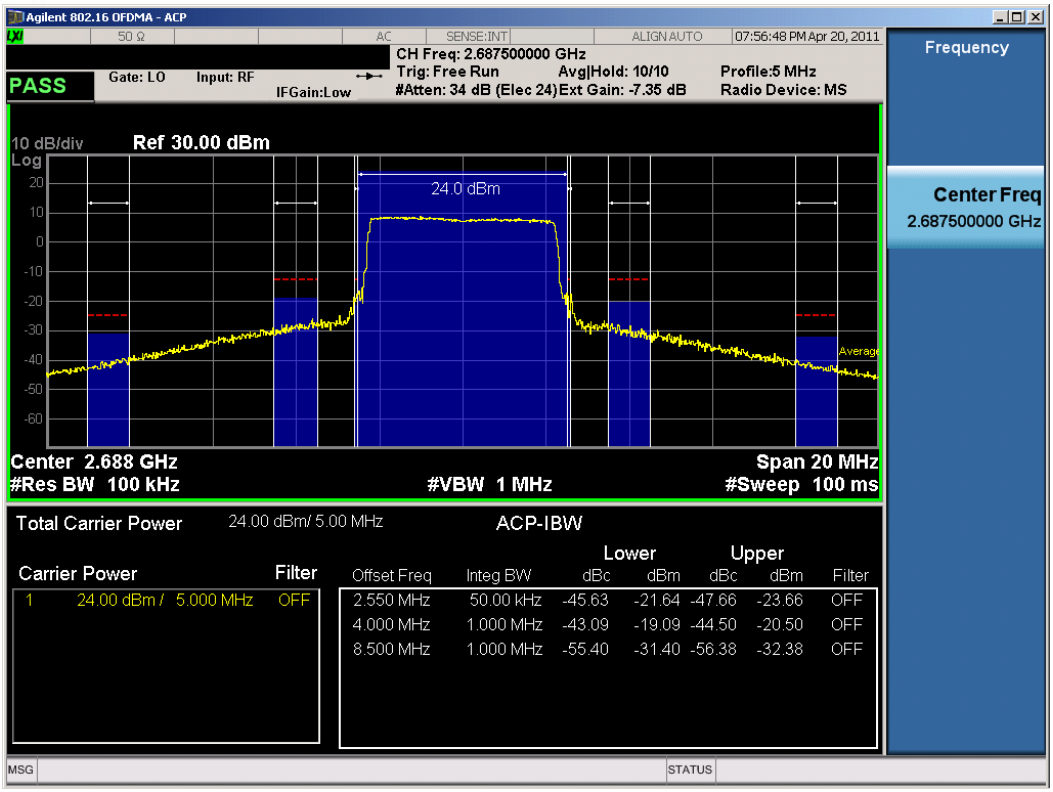
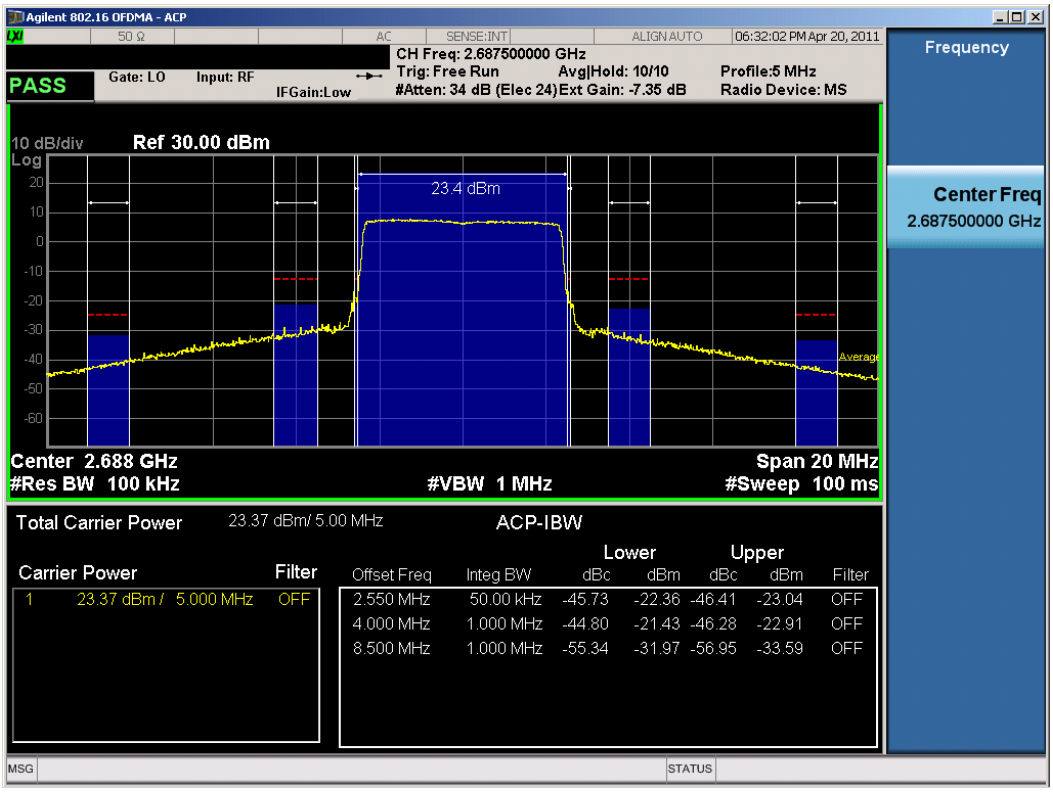



**Plot 7-29. Channel Edge Plot (High Ch., 5MHz BW, PUSC QPSK, Antenna 1)**




**Plot 7-30. Channel Edge Plot (High Ch., 5MHz BW, BAMC QPSK, Antenna 1)**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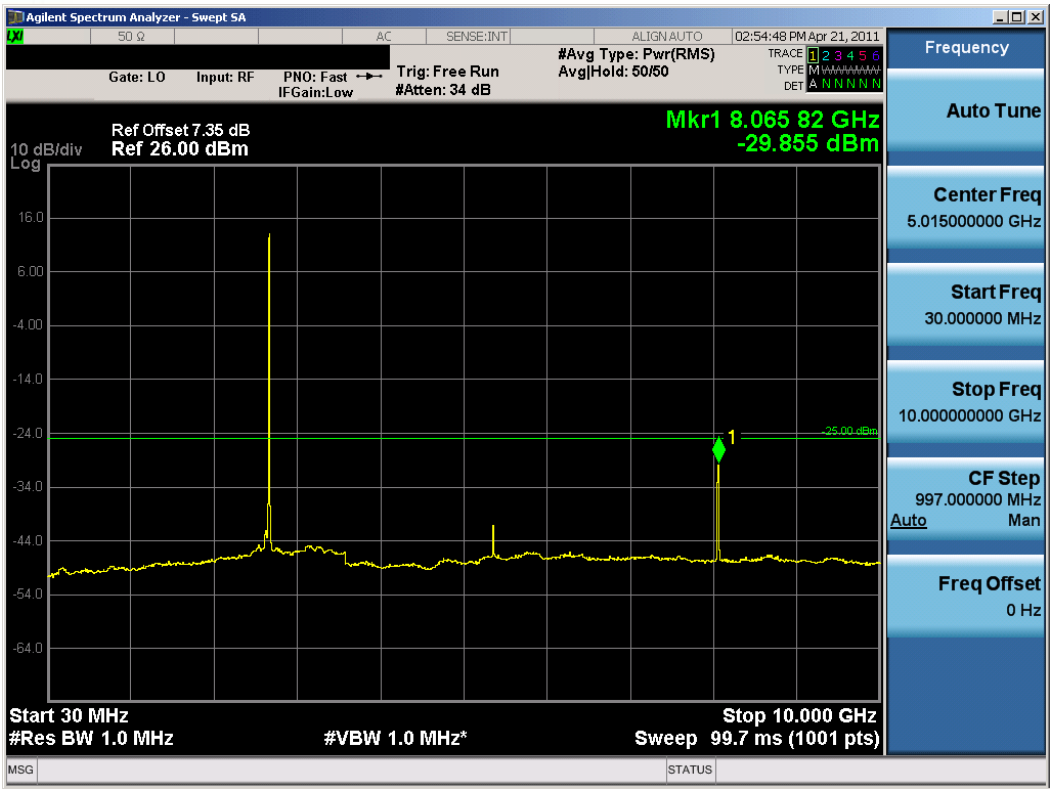


**Plot 7-31. Conducted Spurious Plot (High Ch., 5MHz BW, QPSK, Antenna 1)**

**Plot 7-32. Conducted Spurious Plot (High Ch., 5MHz BW, QPSK, Antenna 1)**


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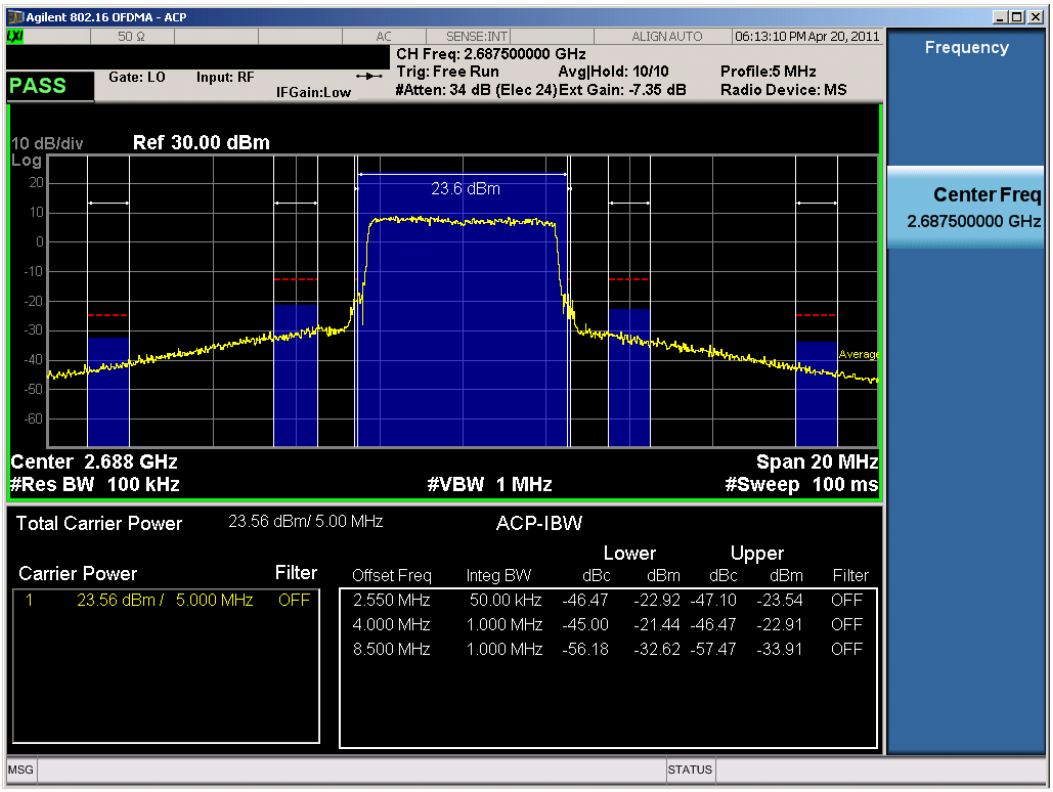
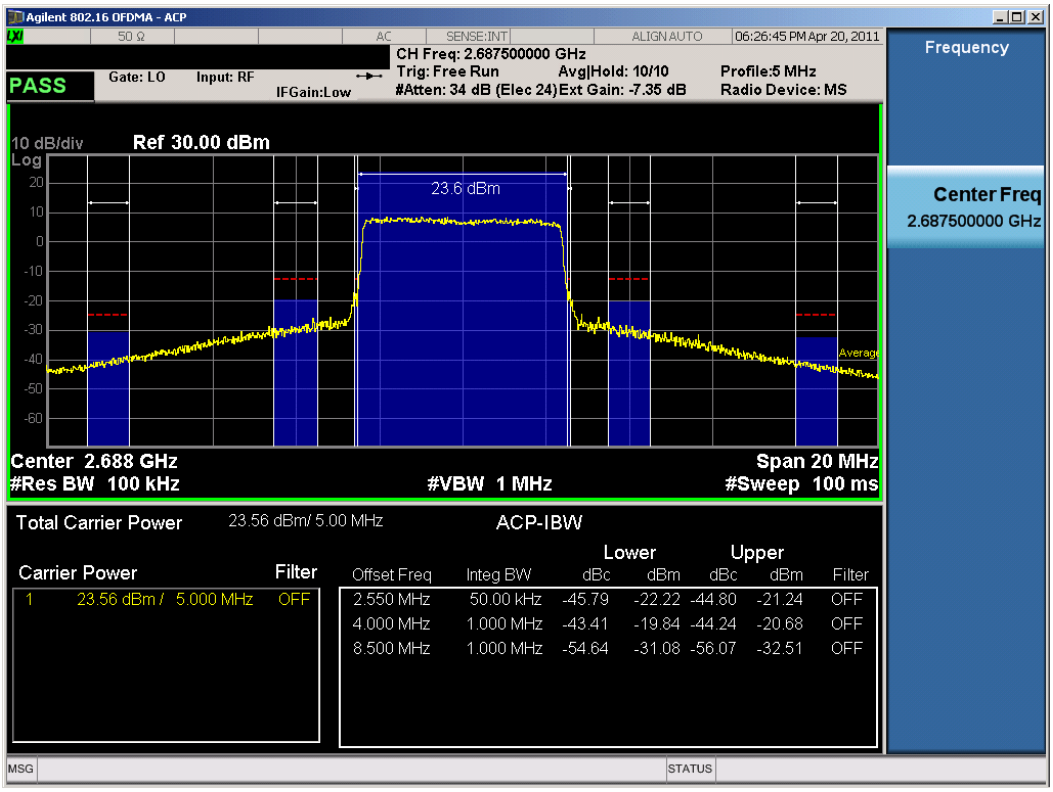



**Plot 7-33. Channel Edge Plot (High Ch., 5MHz BW, PUSC 16-QAM, Antenna 1)**




**Plot 7-34. Channel Edge Plot (High Ch., 5MHz BW, BAMC 16-QAM, Antenna 1)**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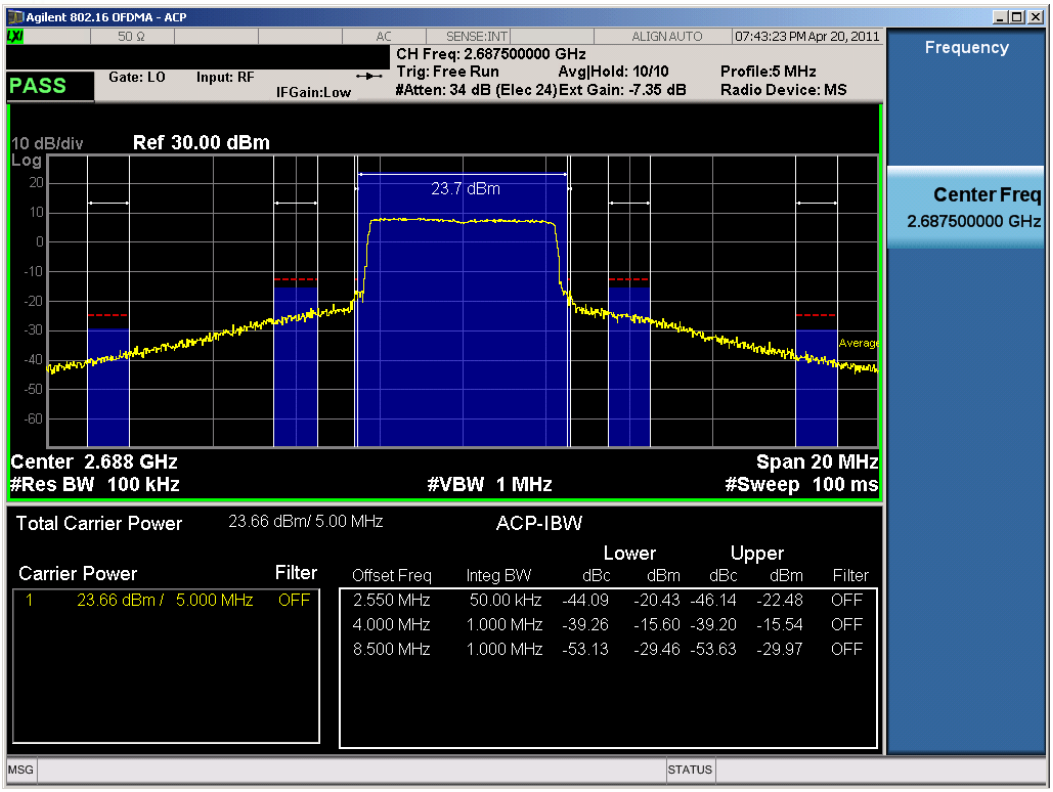
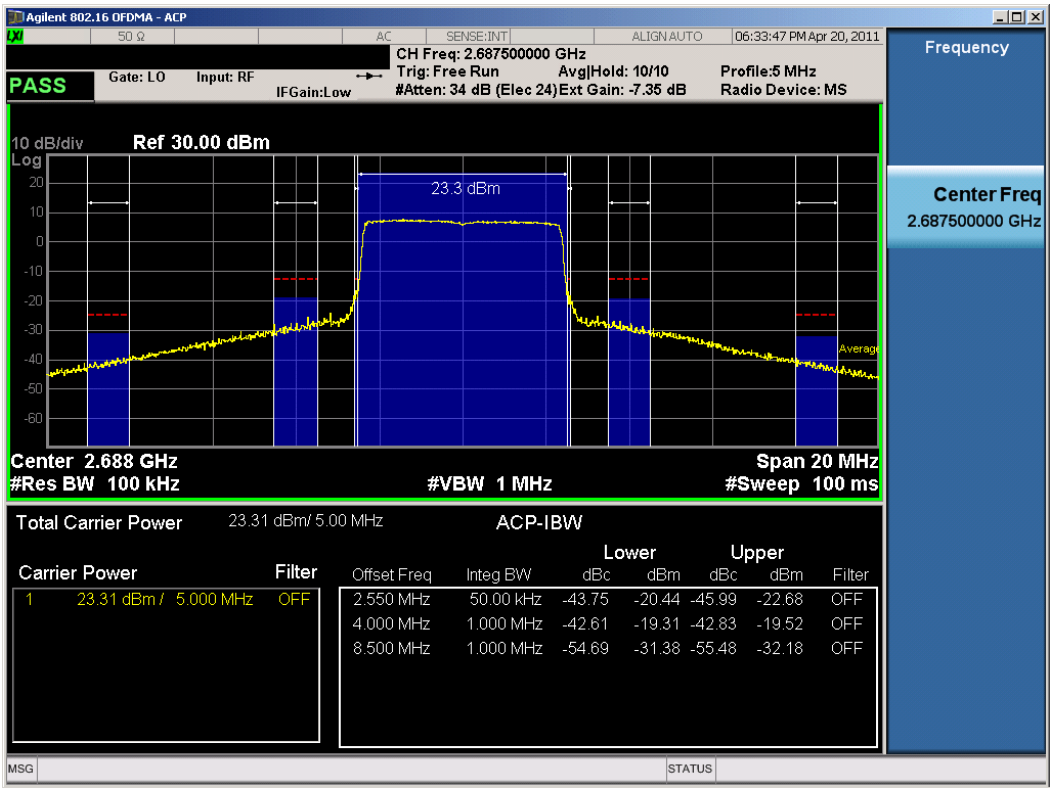



**Plot 7-35. Channel Edge Plot (High Ch., 5MHz BW, PUSC QPSK, Antenna 2)**




**Plot 7-36. Channel Edge Plot (High Ch., 5MHz BW, BAMC QPSK, Antenna 2)**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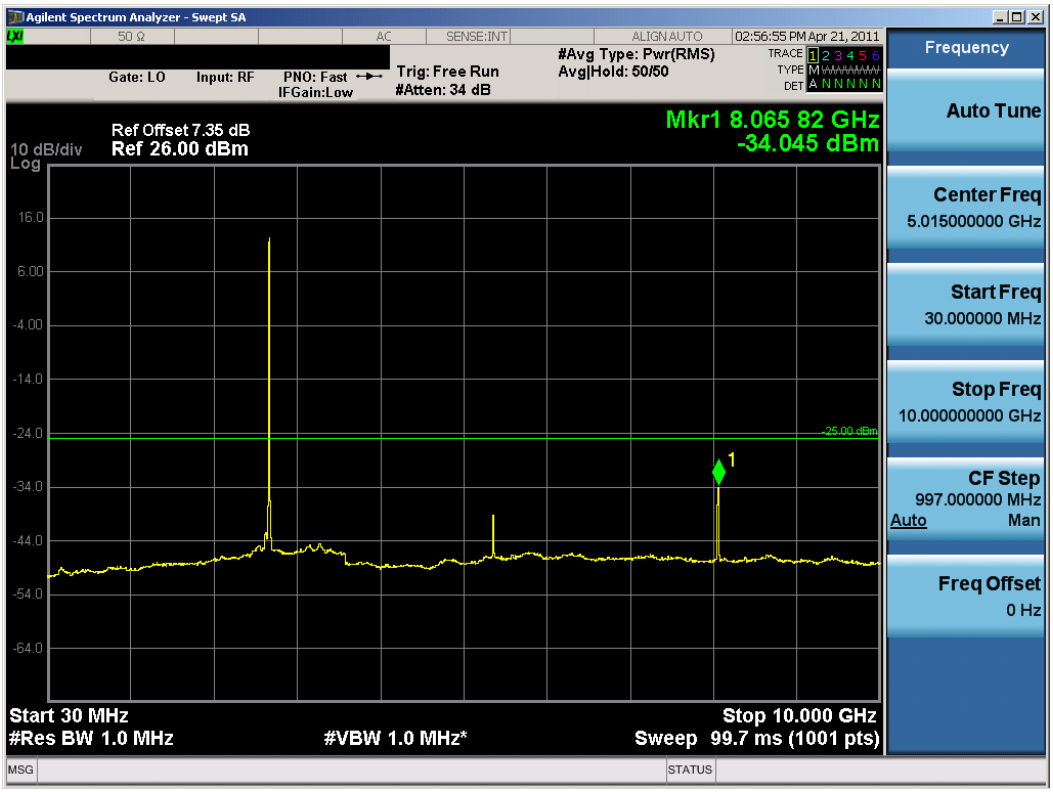
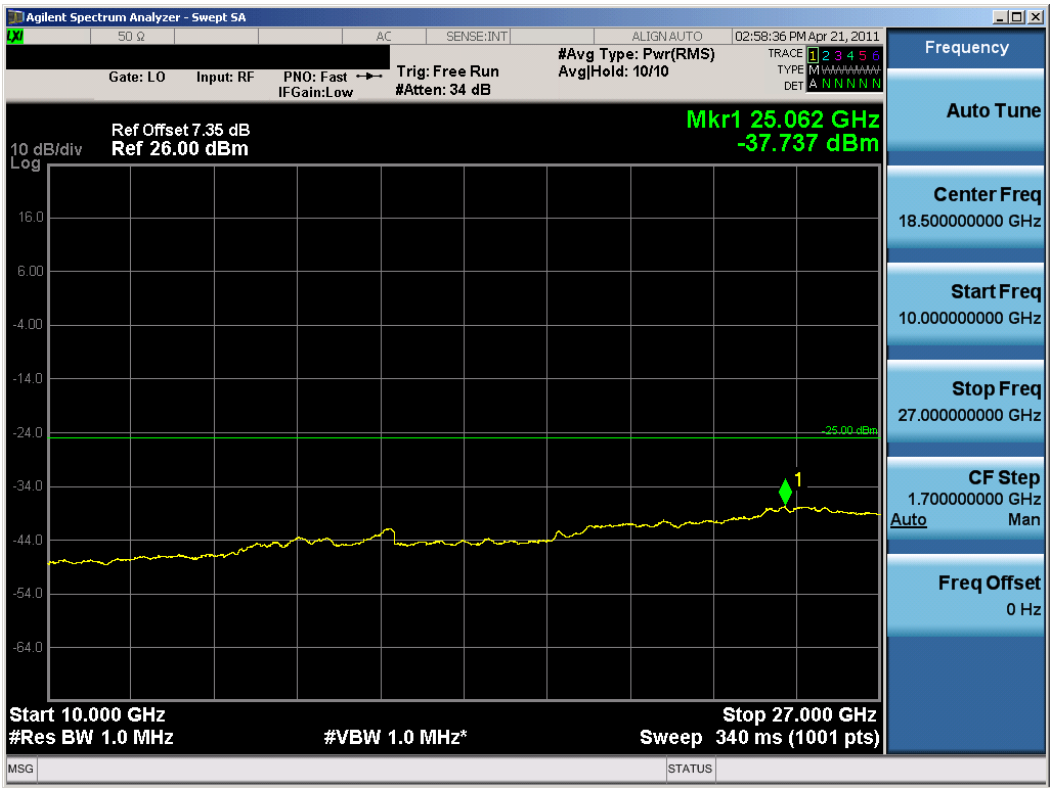



**Plot 7-37. Conducted Spurious Plot (High Ch., 5MHz BW, QPSK, Antenna 2)**




**Plot 7-38. Conducted Spurious Plot (High Ch., 5MHz BW, QPSK, Antenna 2)**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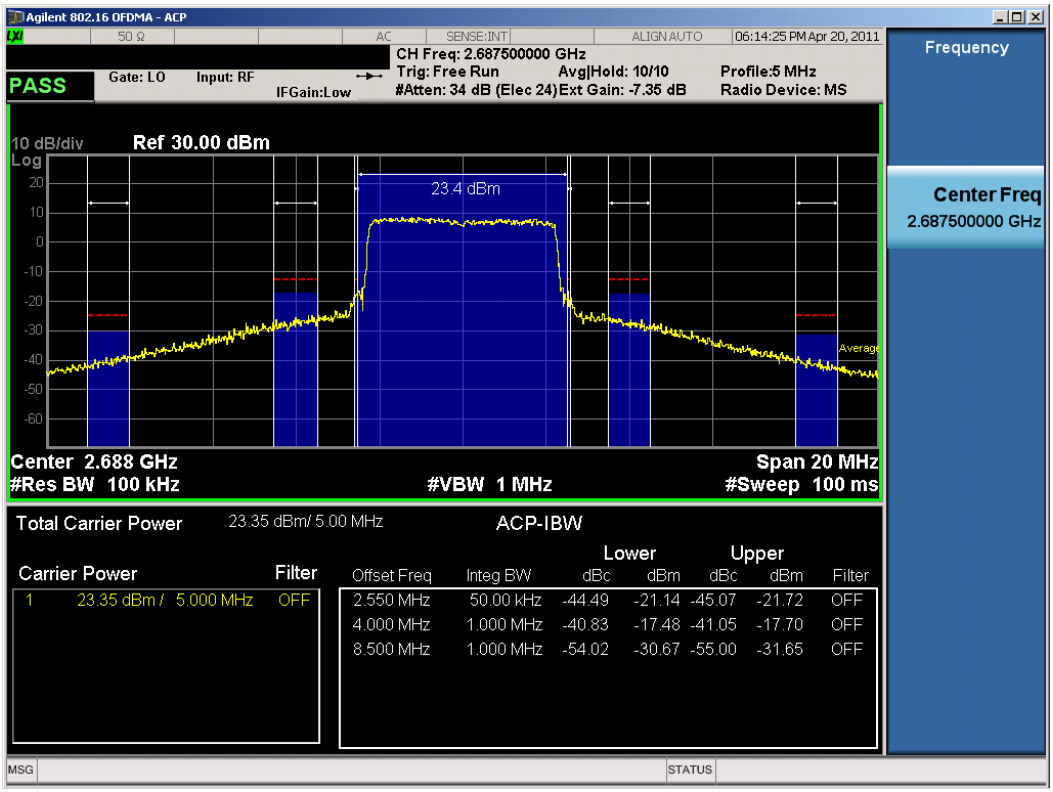
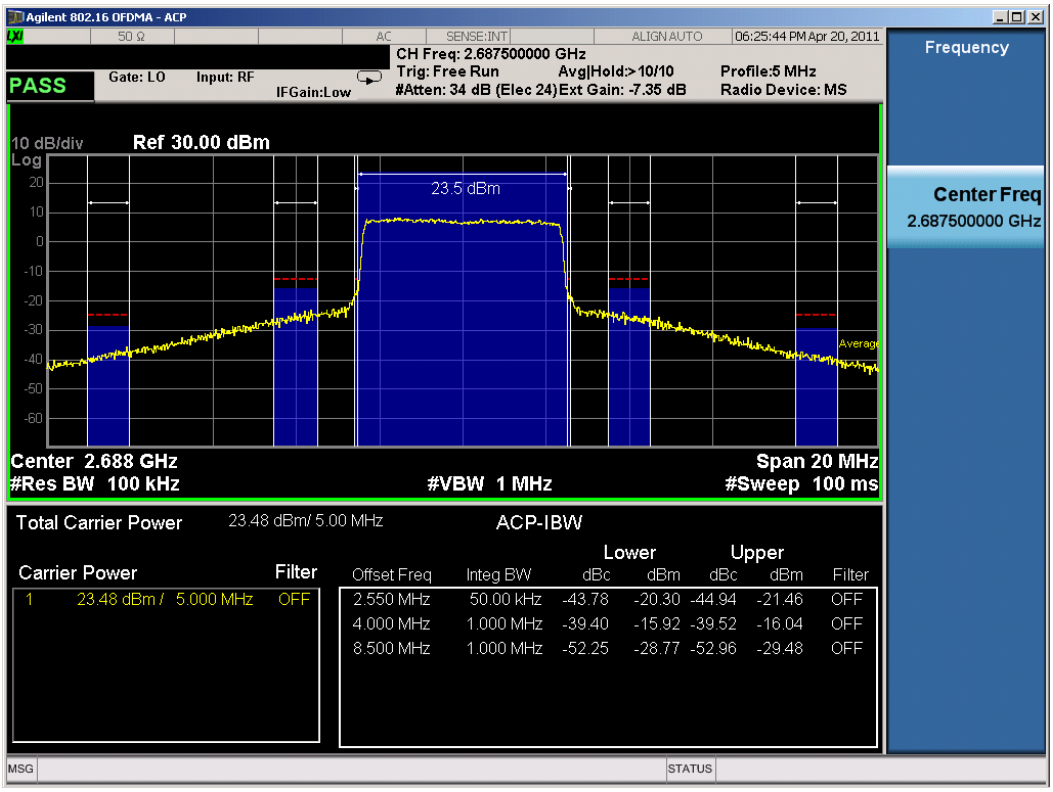



**Plot 7-39. Channel Edge Plot (High Ch., 5MHz BW, PUSC 16-QAM, Antenna 2)**




**Plot 7-40. Channel Edge Plot (High Ch., 5MHz BW, BAMC 16-QAM, Antenna 2)**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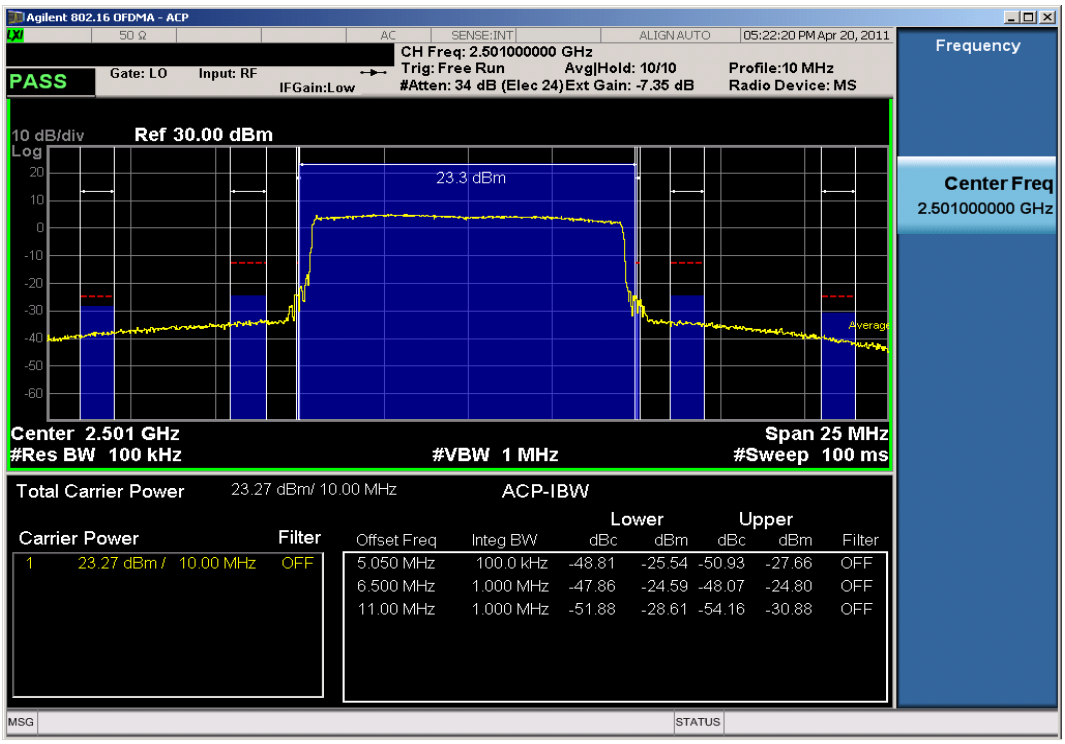
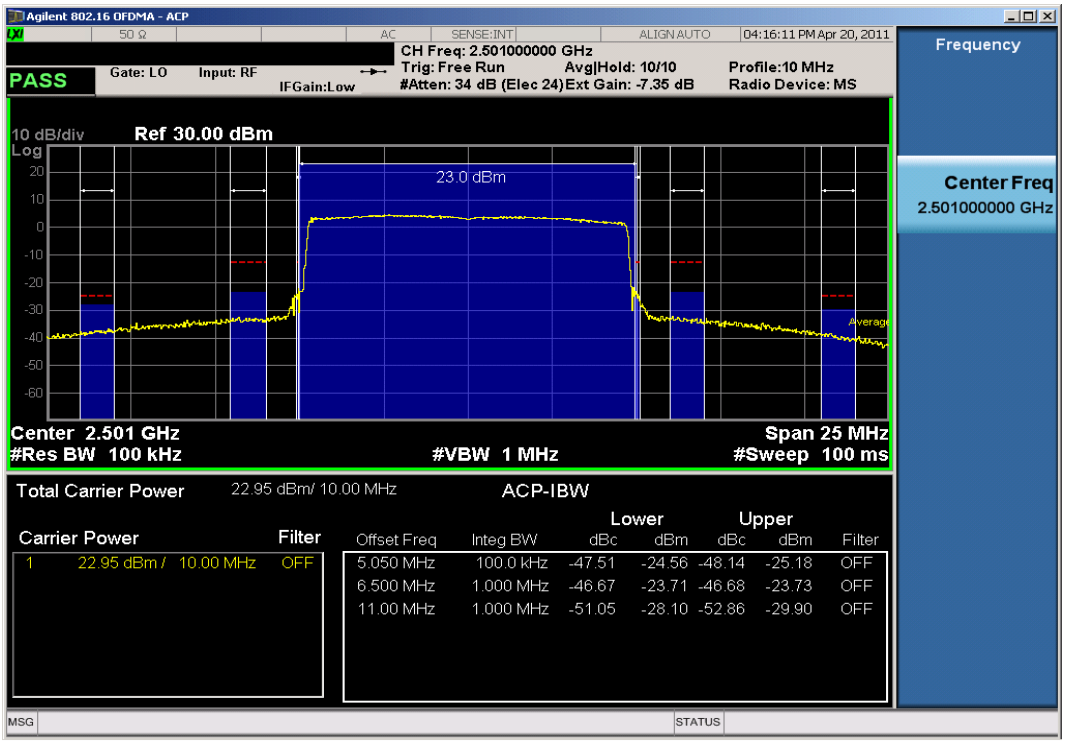
# 8.0 PLOT(S) OF EMISSIONS – 10MHZ BANDWIDTH




**Plot 8-1. Channel Edge Plot (Low Ch., 10MHz BW, PUSC QPSK, Antenna 1)**




**Plot 8-2. Channel Edge Plot (Low Ch., 10MHz BW, BAMC QPSK, Antenna 1)**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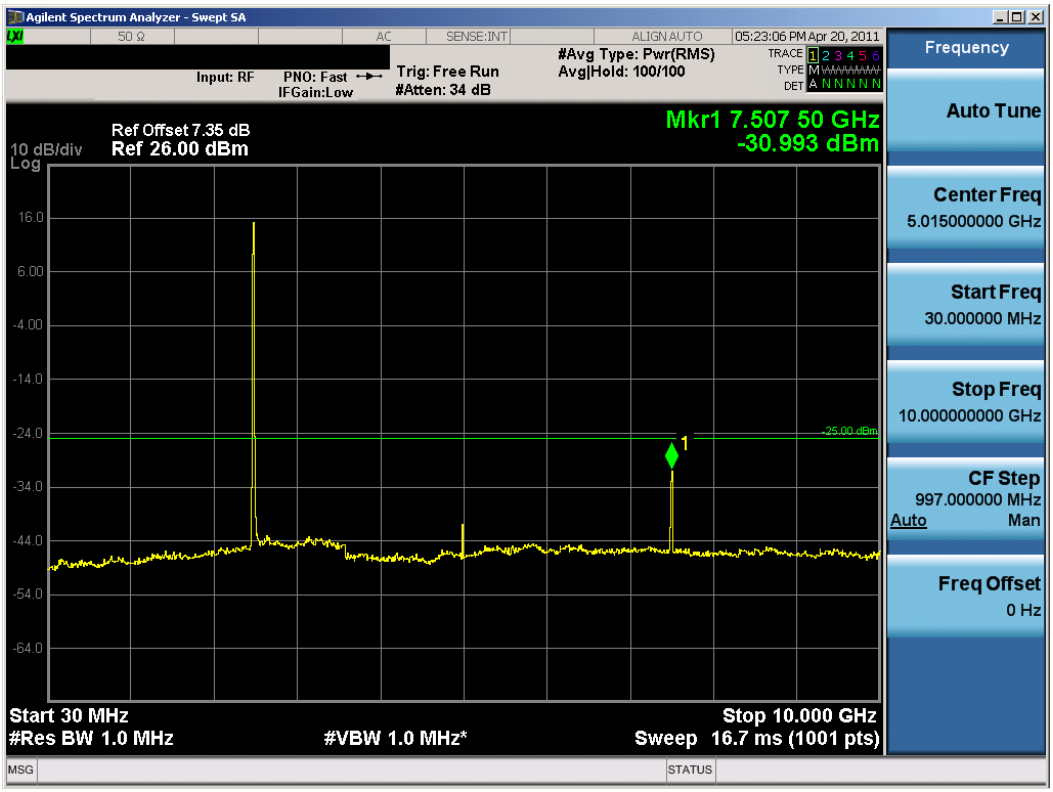
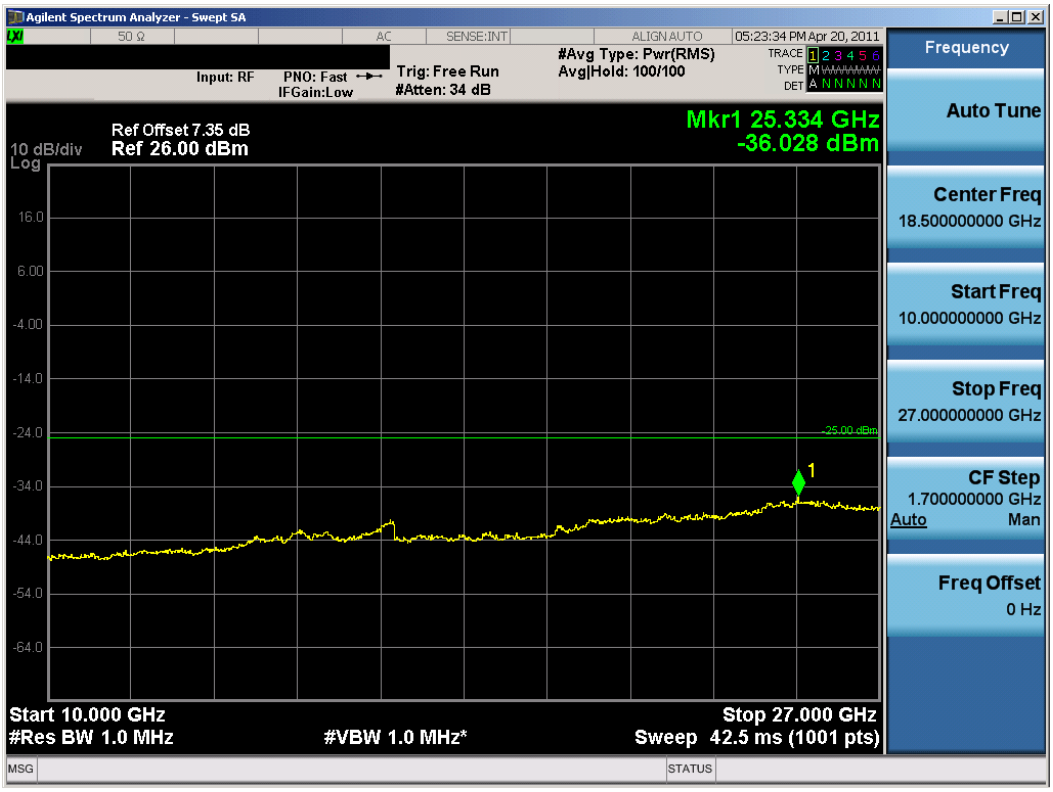



**Plot 8-3. Conducted Spurious Plot (Low Ch., 10MHz BW, QPSK, Antenna 1)**




**Plot 8-4. Conducted Spurious Plot (Low Ch., 10MHz BW, QPSK, Antenna 1)**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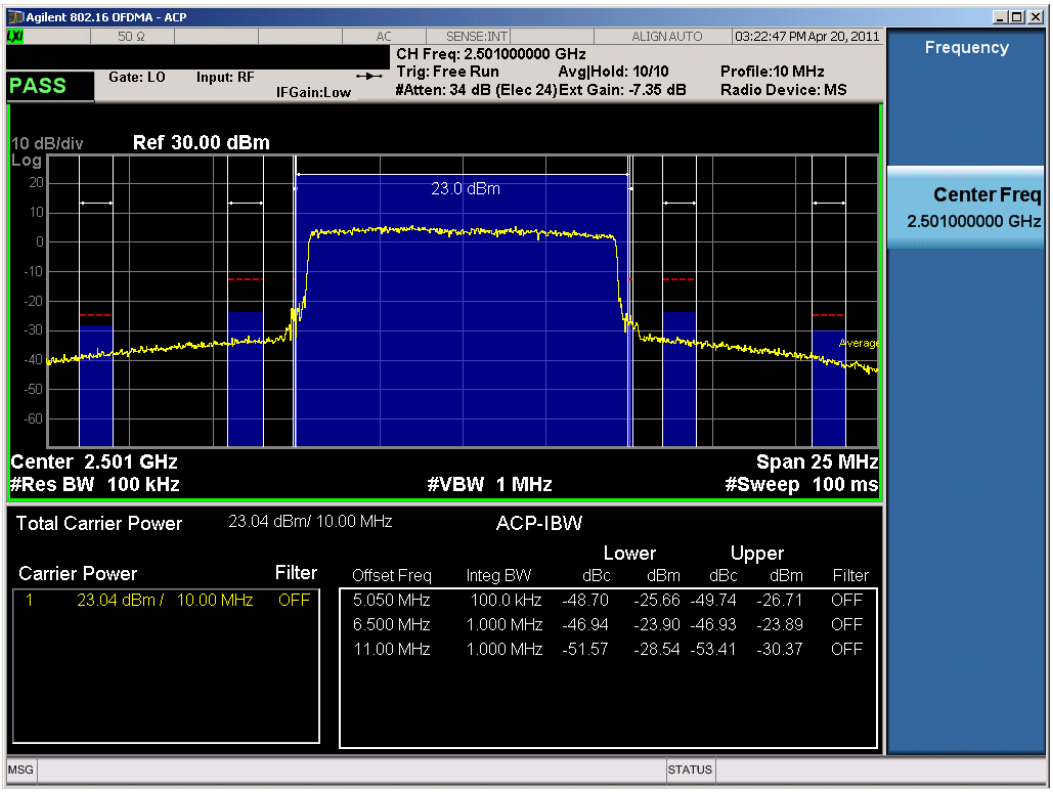
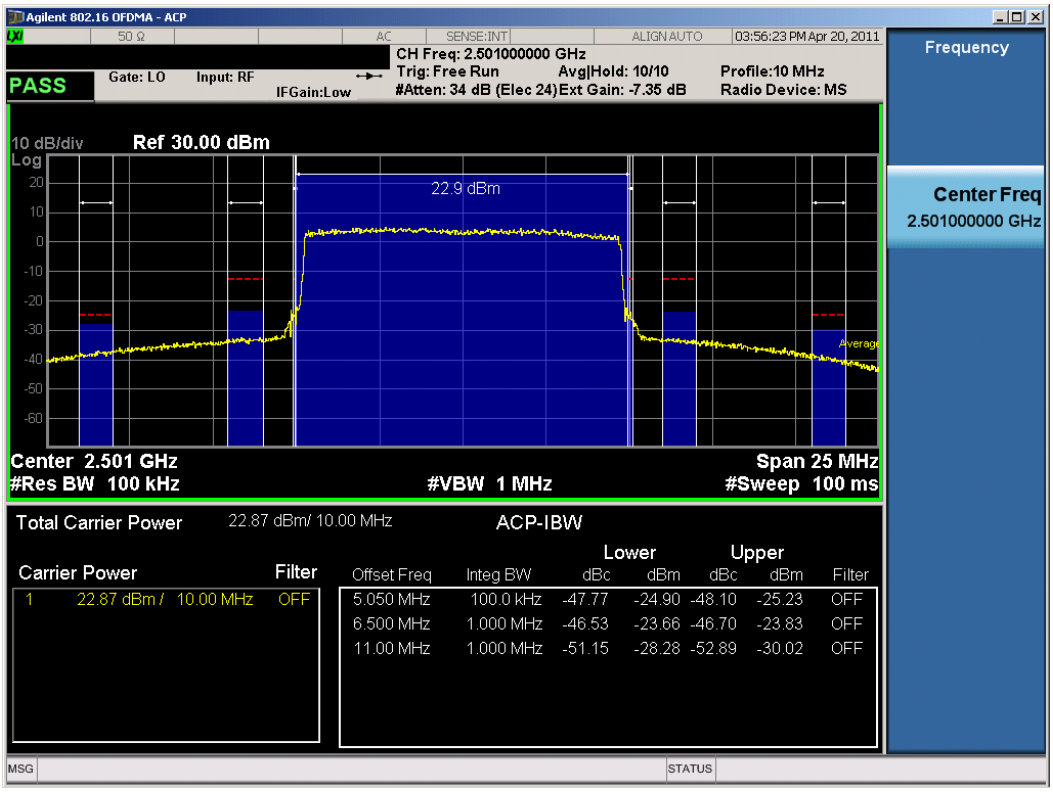



**Plot 8-5. Channel Edge Plot (Low Ch., 10MHz BW, PUSC 16-QAM, Antenna 1)**




**Plot 8-6. Channel Edge Plot (Low Ch., 10MHz BW, BAMC 16-QAM, Antenna 1)**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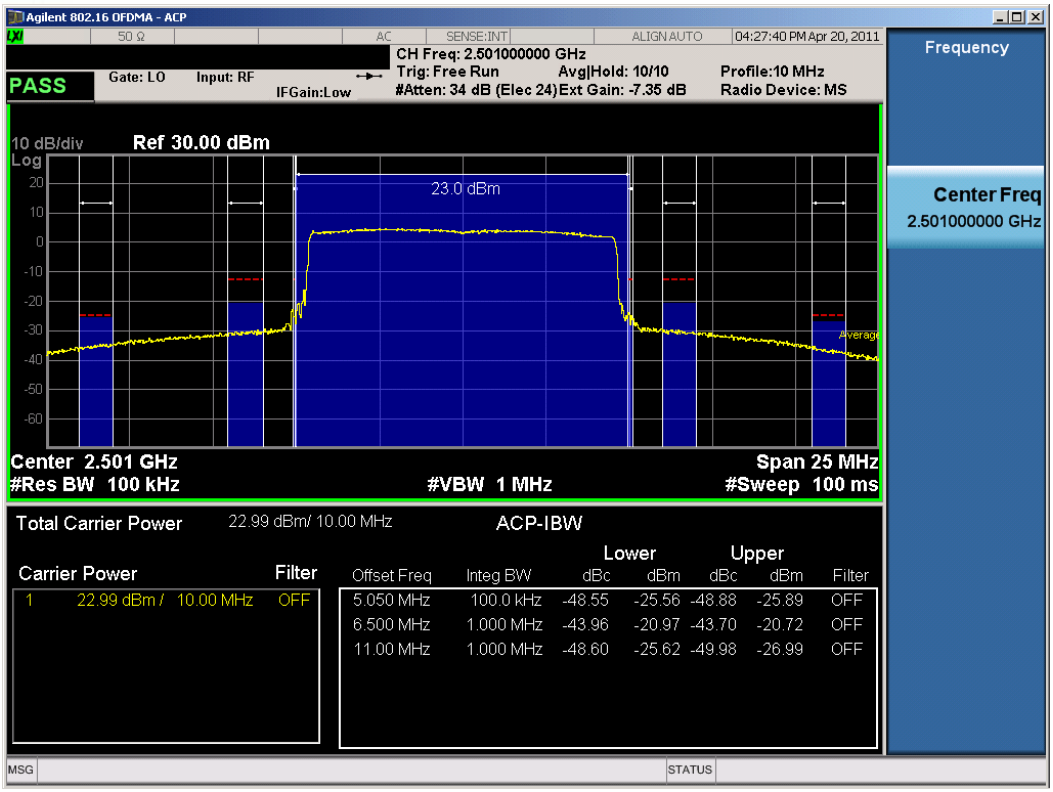
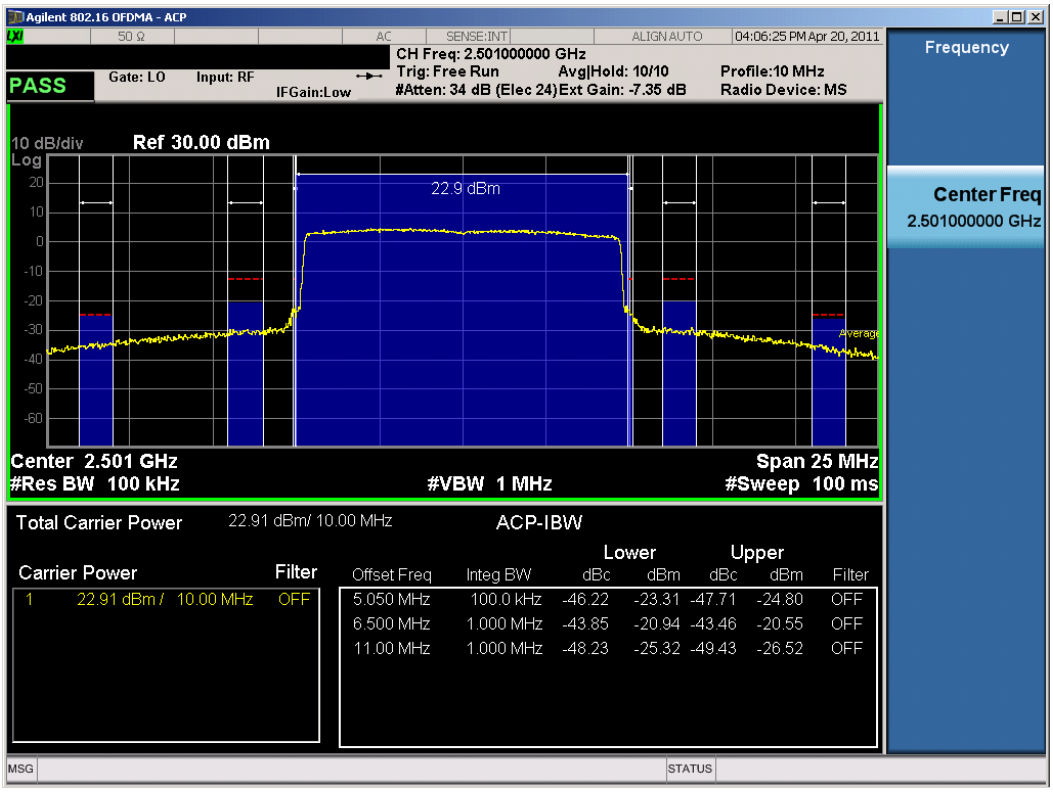



**Plot 8-7. Channel Edge Plot (Low Ch., 10MHz BW, PUSC QPSK, Antenna 2)**




**Plot 8-8. Channel Edge Plot (Low Ch., 10MHz BW, BAMC QPSK, Antenna 2)**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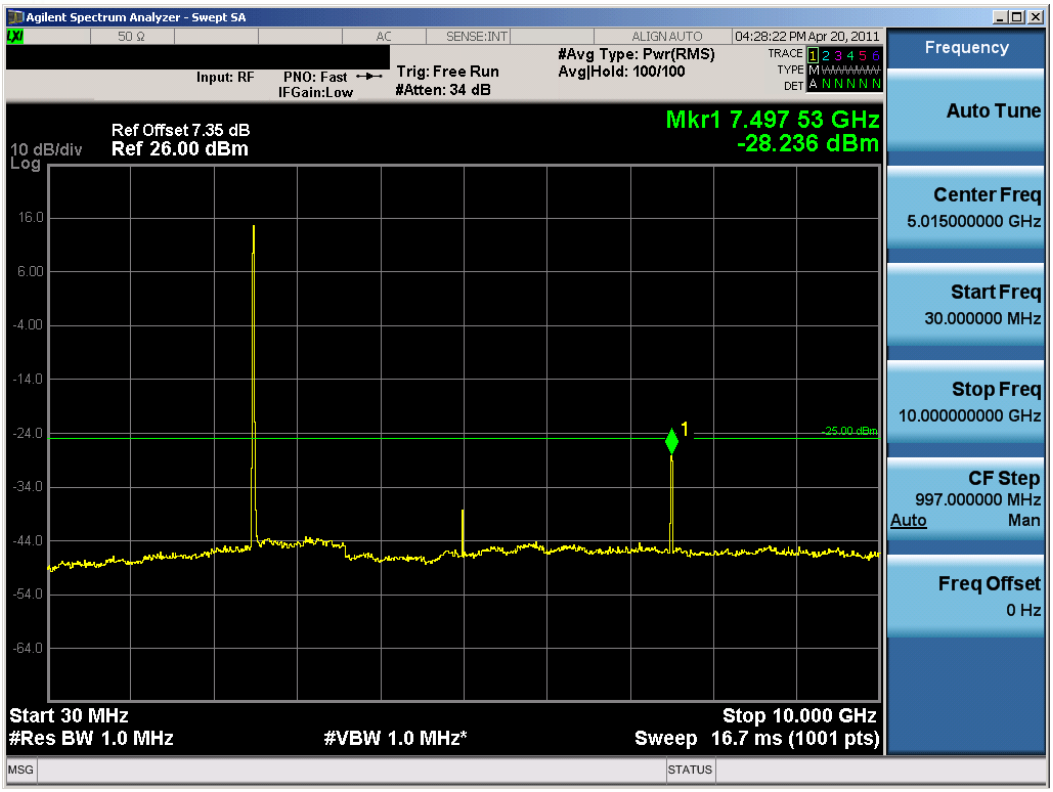


**Plot 8-9. Conducted Spurious Plot (Low Ch., 10MHz BW, QPSK, Antenna 2)**

**Plot 8-10. Conducted Spurious Plot (Low Ch., 10MHz BW, QPSK, Antenna 2)**


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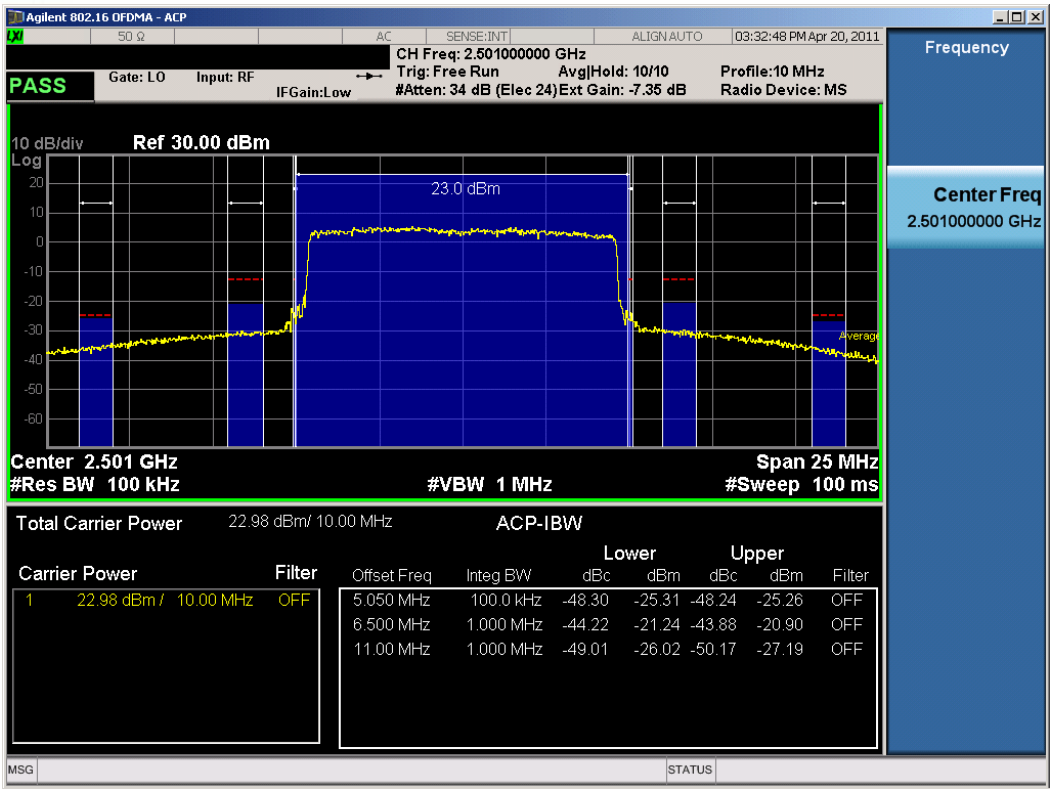
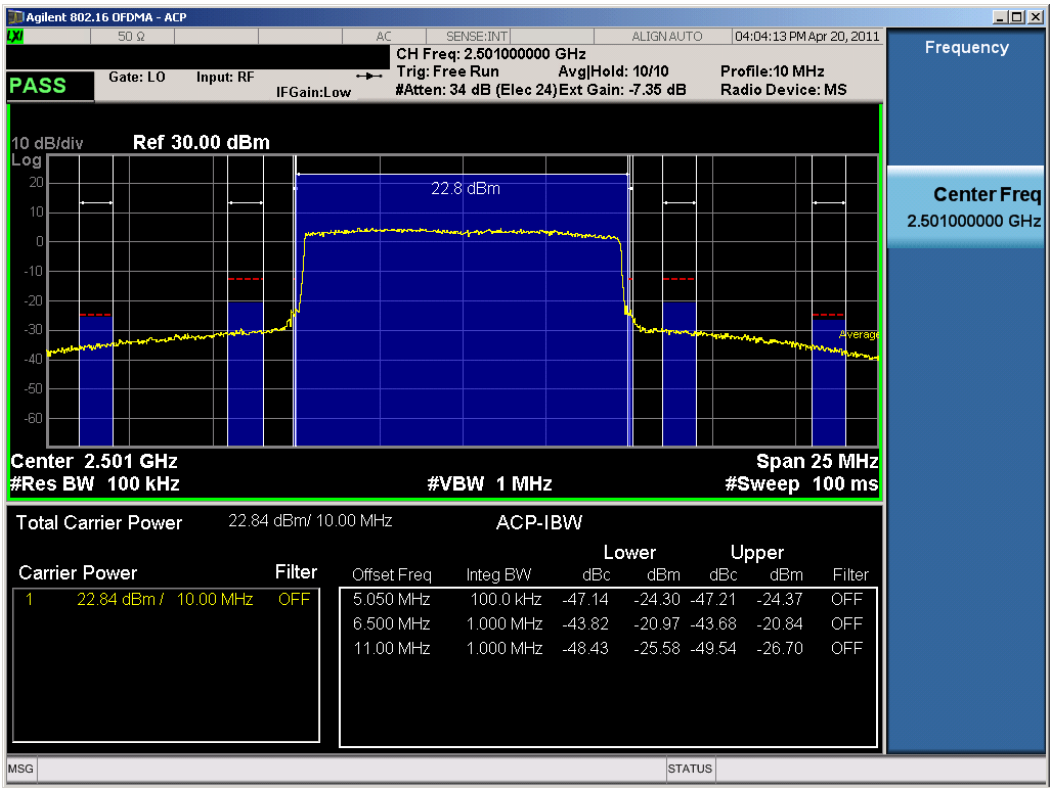



**Plot 8-11. Channel Edge Plot (Low Ch., 10MHz BW, PUSC 16-QAM, Antenna 2)**




**Plot 8-12. Channel Edge Plot (Low Ch., 10MHz BW, BAMC 16-QAM, Antenna 2)**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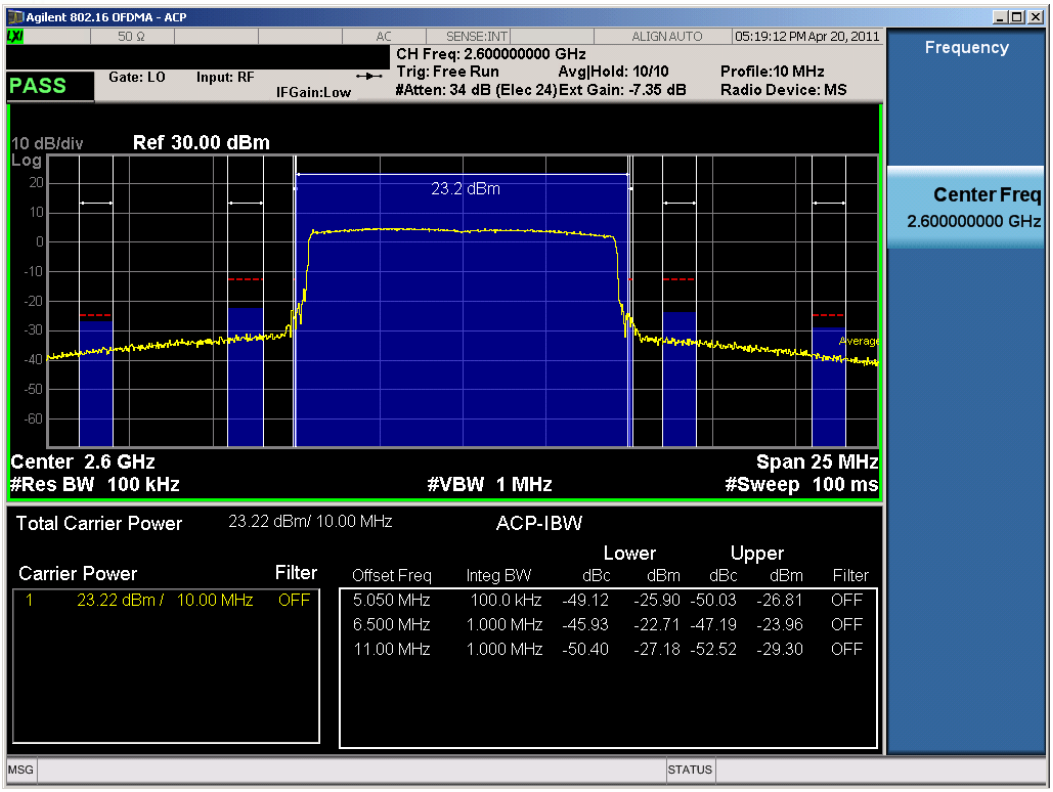
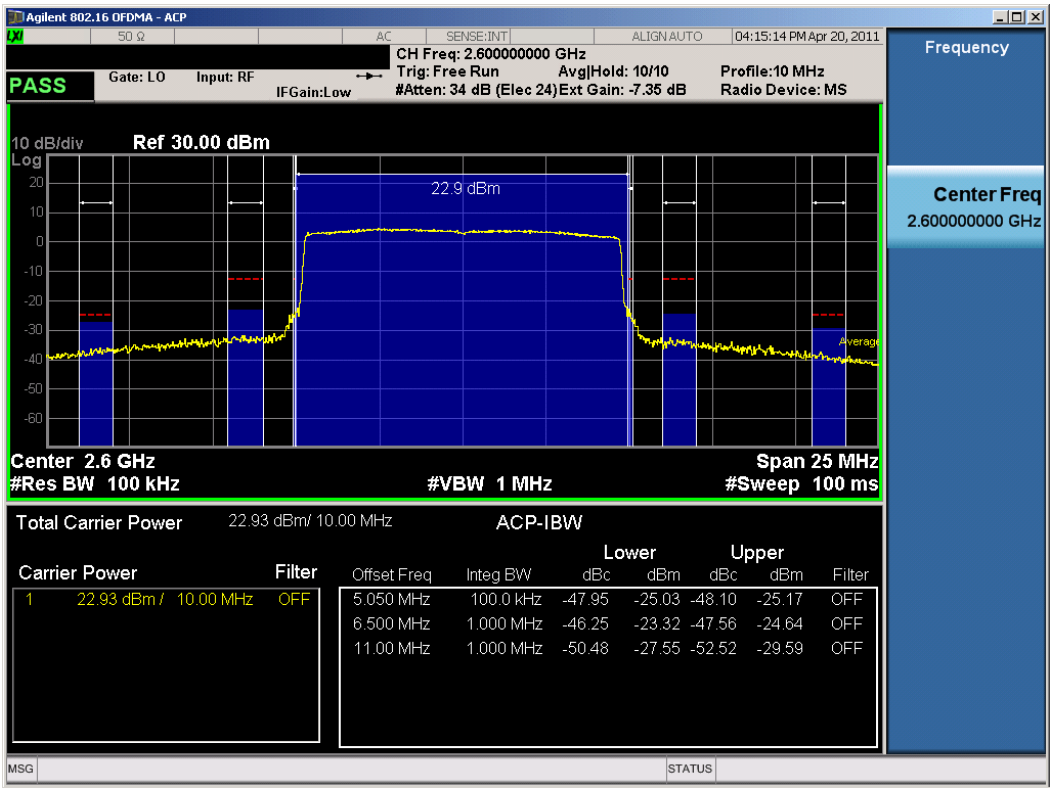



**Plot 8-13. Channel Edge Plot (Mid Ch., 10MHz BW, PUSC QPSK, Antenna 1)**




**Plot 8-14. Channel Edge Plot (Mid Ch., 10MHz BW, BAMC QPSK, Antenna 1)**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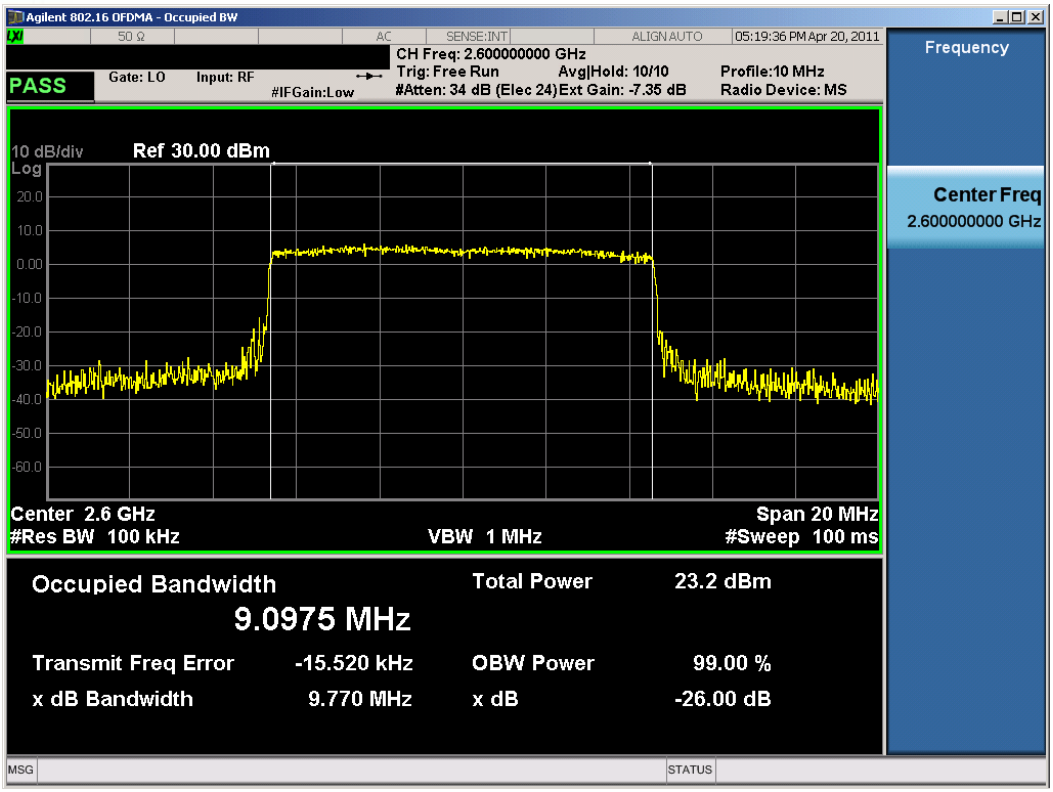
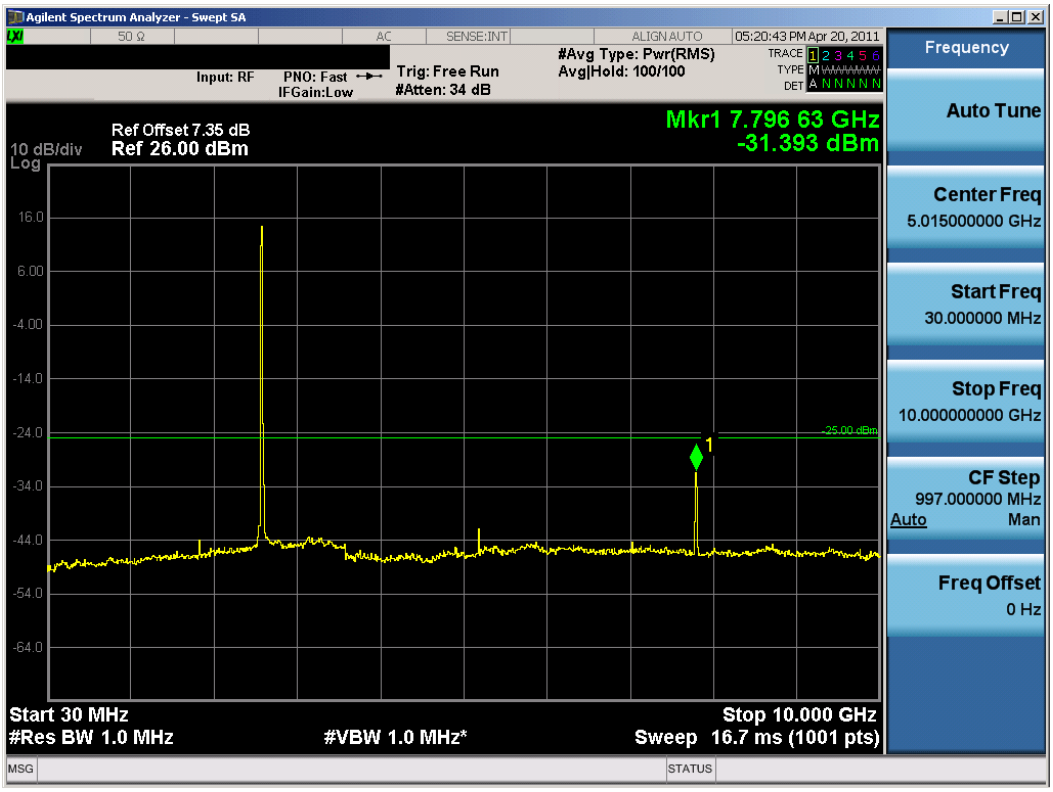



**Plot 8-15. Occupied Bandwidth Plot (Mid Ch., 10MHz BW, QPSK, Antenna 1)**




**Plot 8-16. Conducted Spurious Plot (Mid Ch., 10MHz BW, QPSK Antenna 1)**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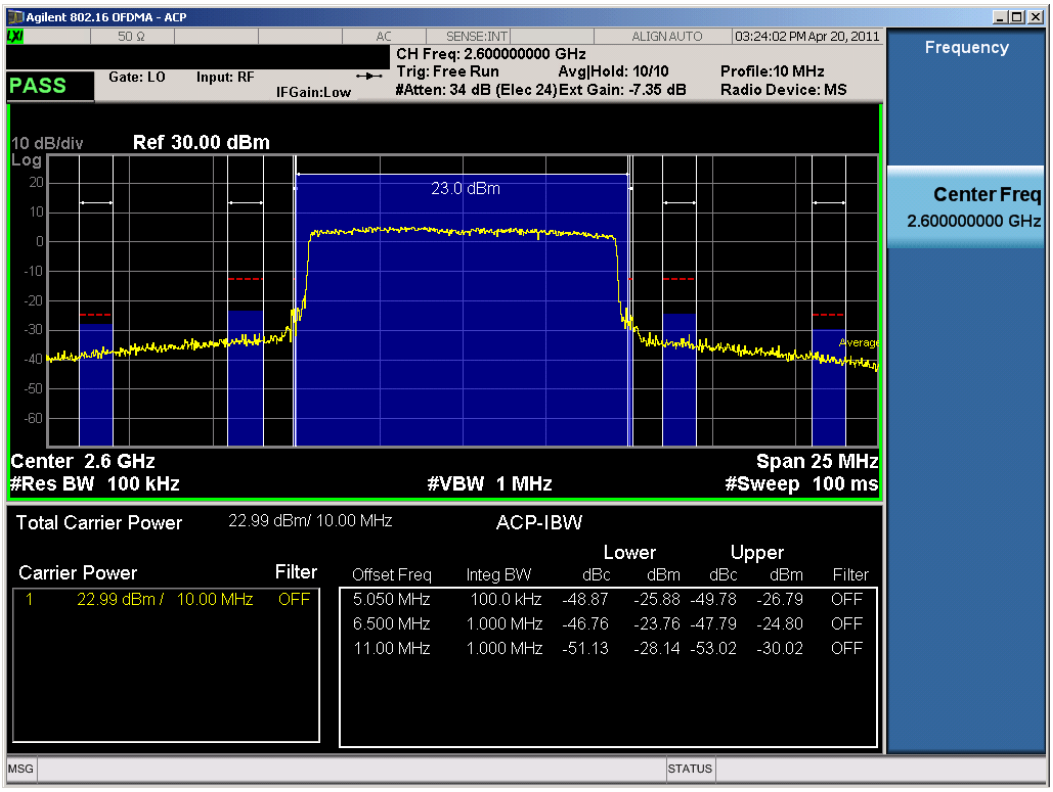
**Plot 8-17. Conducted Spurious Plot (Mid Ch., 10MHz BW, QPSK Antenna 1)**




**Plot 8-18. Channel Edge Plot (Mid Ch., 10MHz BW, PUSC 16-QAM, Antenna 1)**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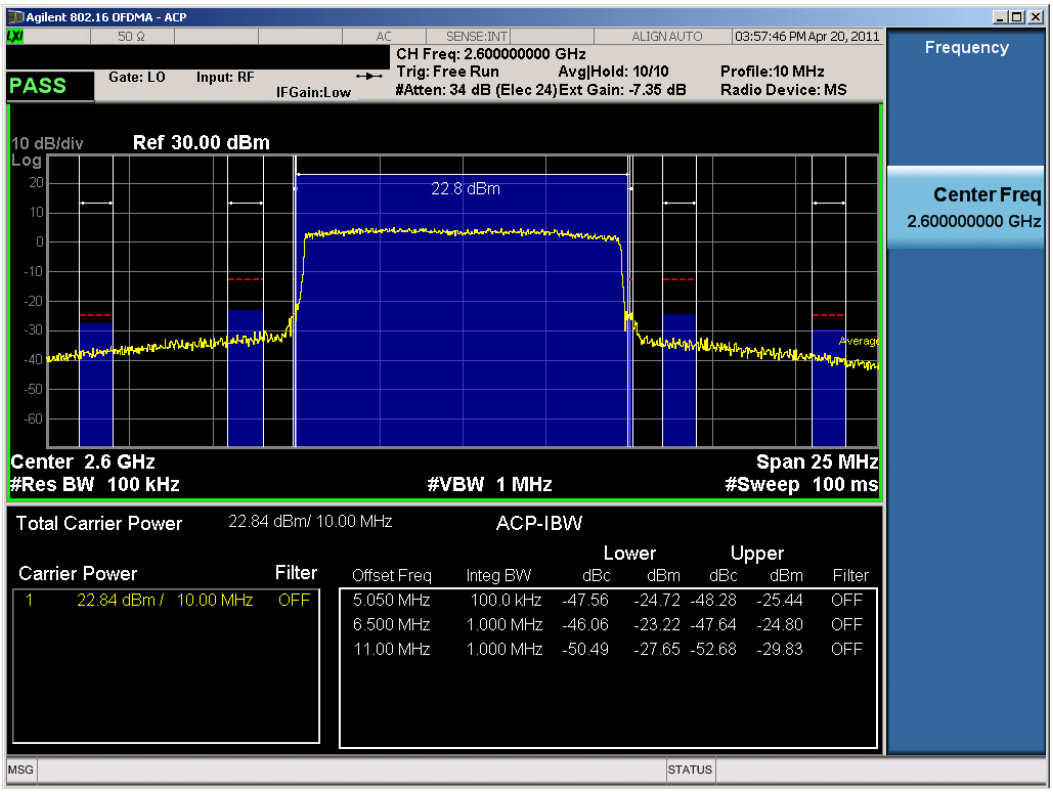
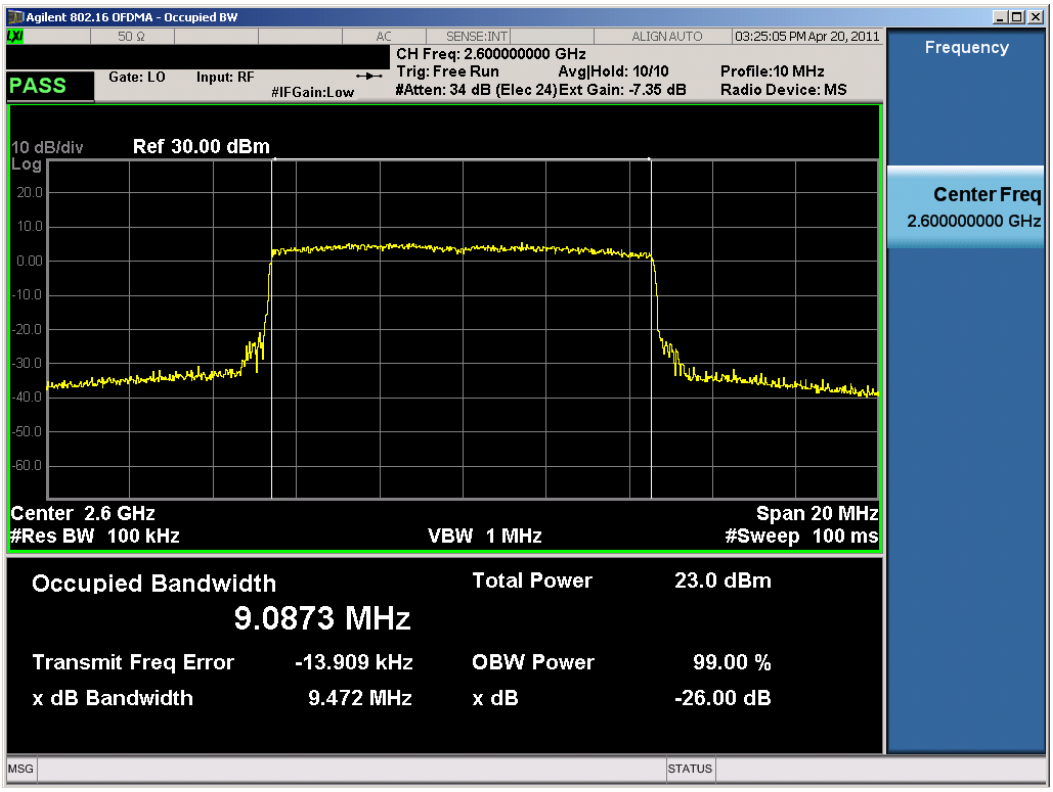



**Plot 8-19. Channel Edge Plot (Mid Ch., 10MHz BW, BAMC 16-QAM, Antenna 1)**




**Plot 8-20. Occupied Bandwidth Plot (Mid Ch., 10MHz BW, 16-QAM, Antenna 1)**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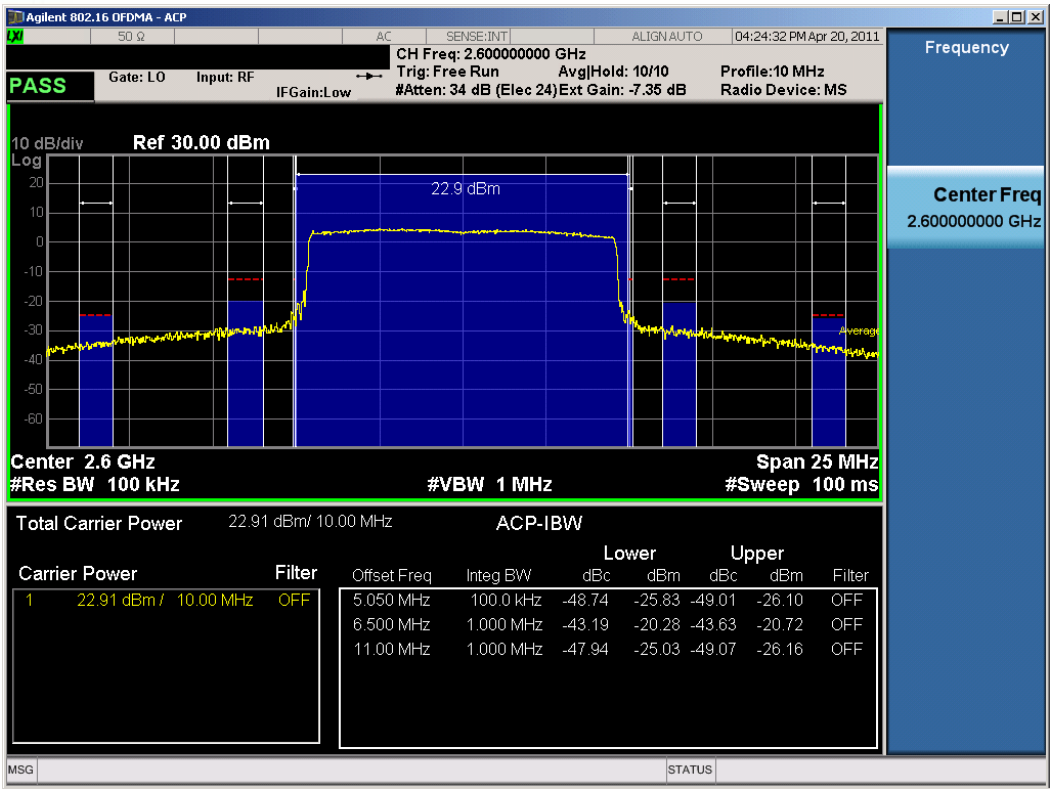
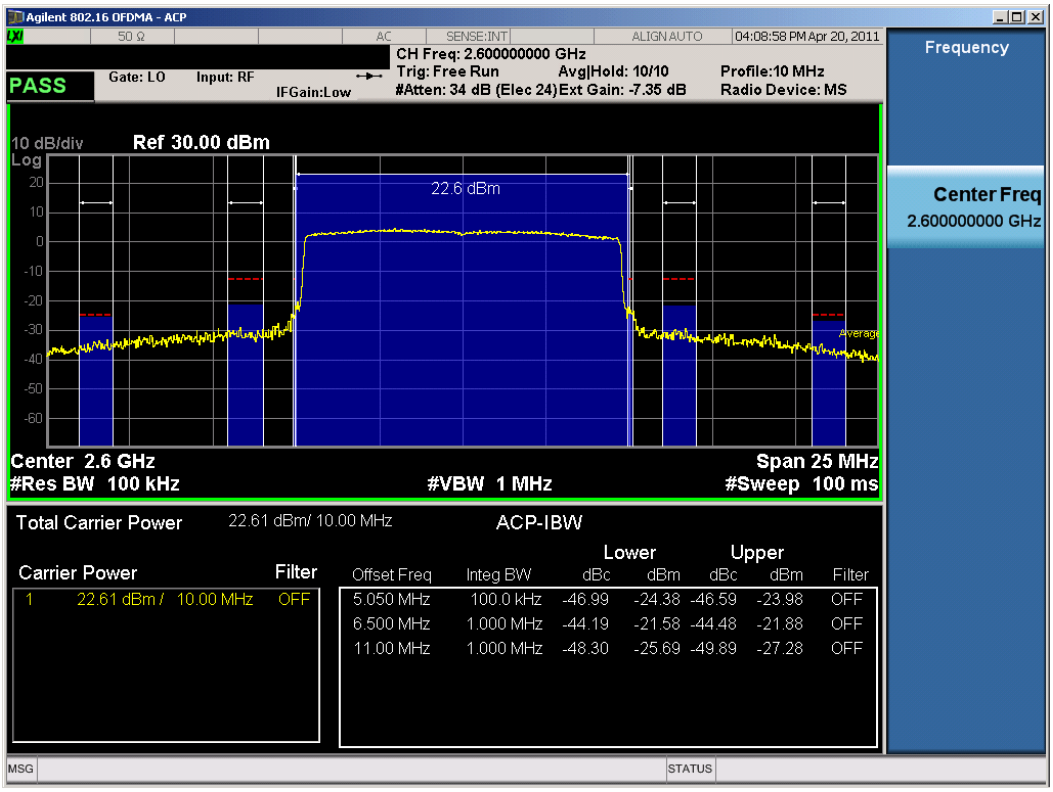



**Plot 8-21. Channel Edge Plot (Mid Ch., 10MHz BW, PUSC QPSK, Antenna 2)**




**Plot 8-22. Channel Edge Plot (Mid Ch., 10MHz BW, BAMC QPSK, Antenna 2)**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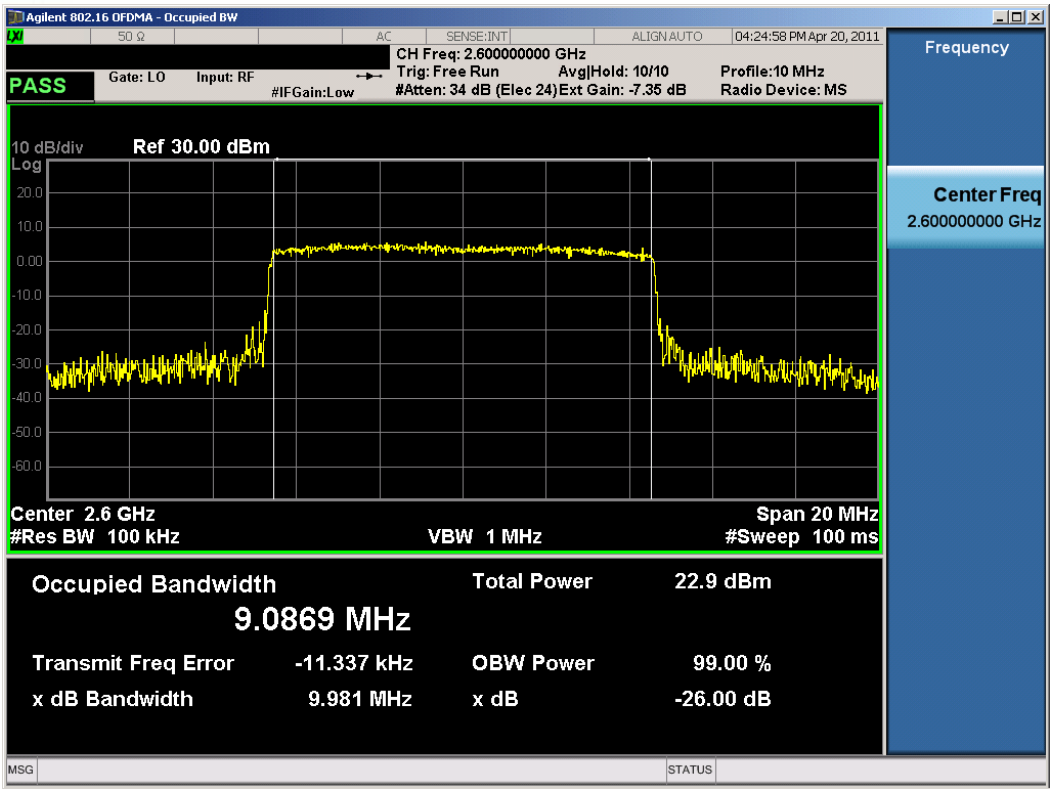
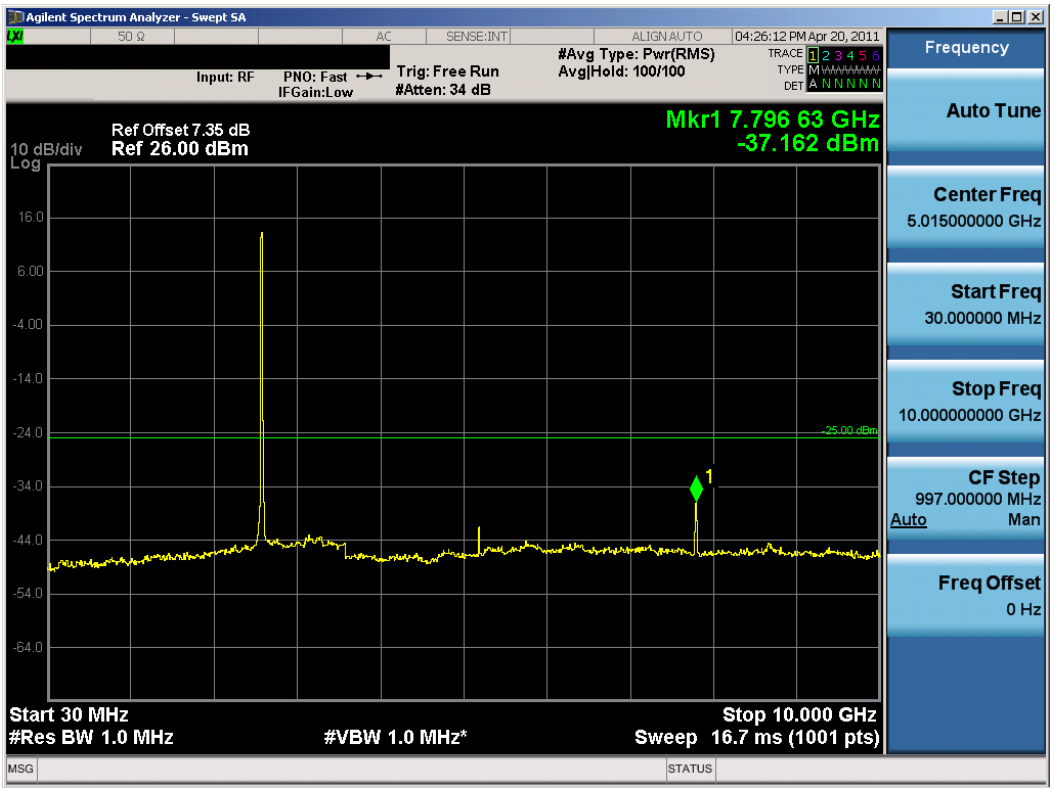



**Plot 8-23. Occupied Bandwidth Plot (Mid Ch., 10MHz BW, QPSK, Antenna 2)**




**Plot 8-24. Conducted Spurious Plot (Mid Ch., 10MHz BW, QPSK Antenna 2)**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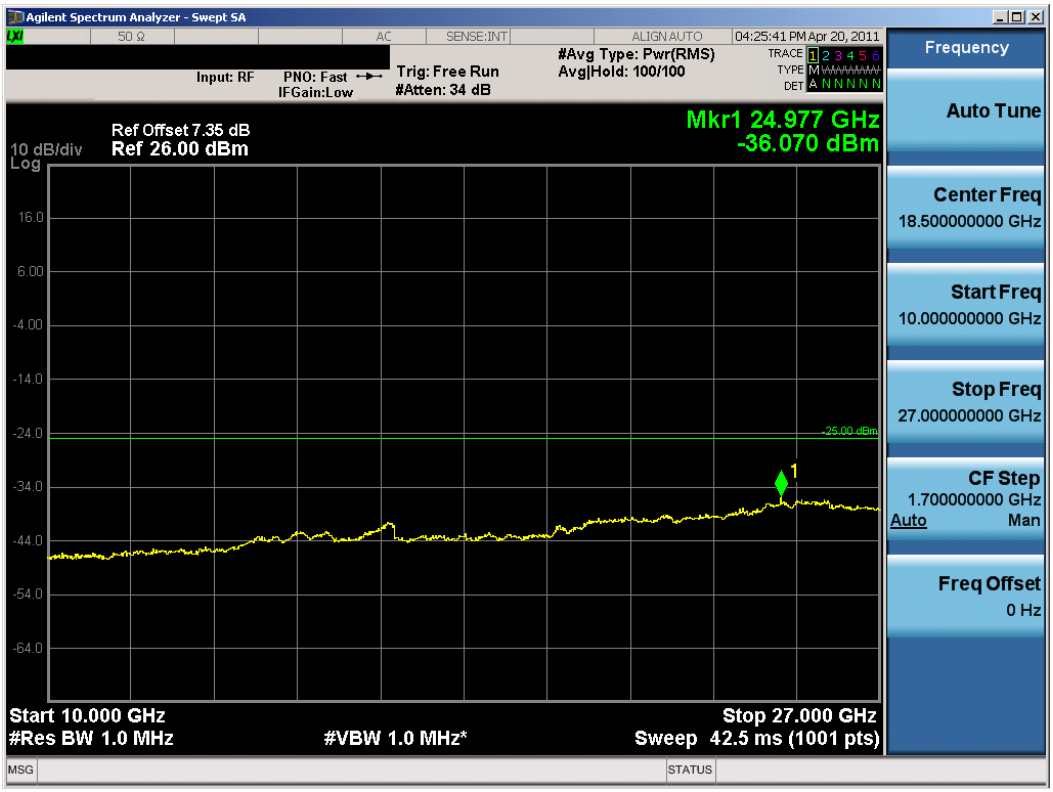
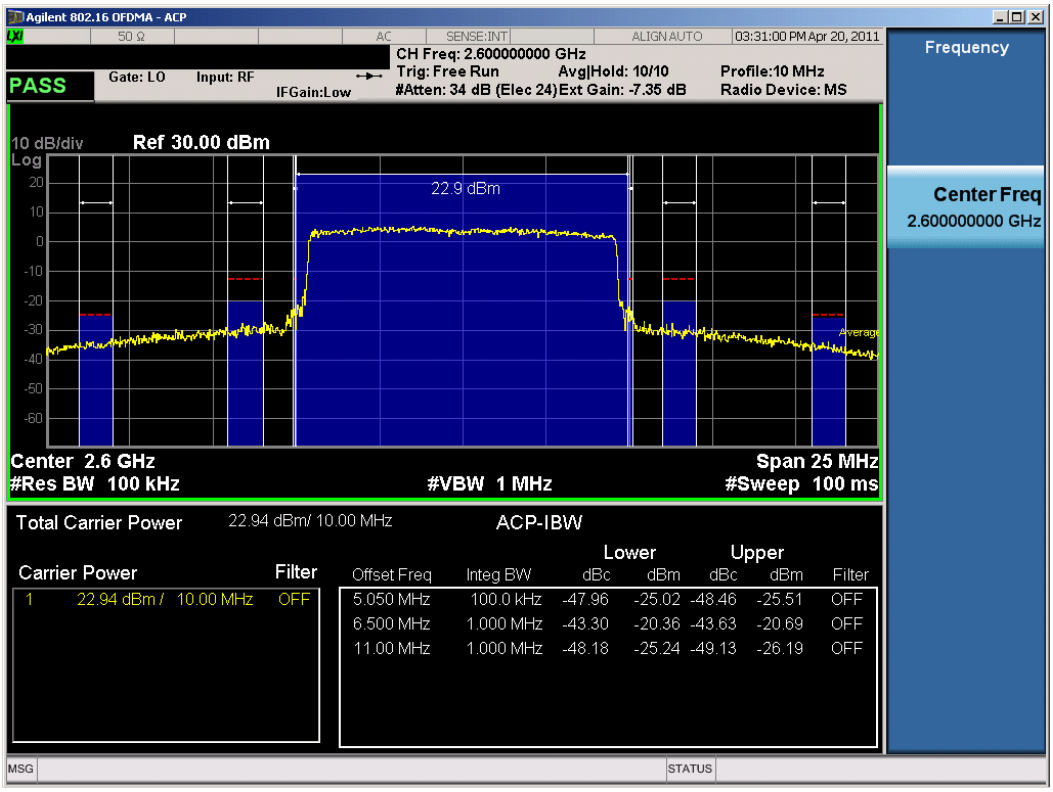



**Plot 8-25. Conducted Spurious Plot (Mid Ch., 10MHz BW, QPSK Antenna 2)**




**Plot 8-26. Channel Edge Plot (Mid Ch., 10MHz BW, PUSC 16-QAM, Antenna 2)**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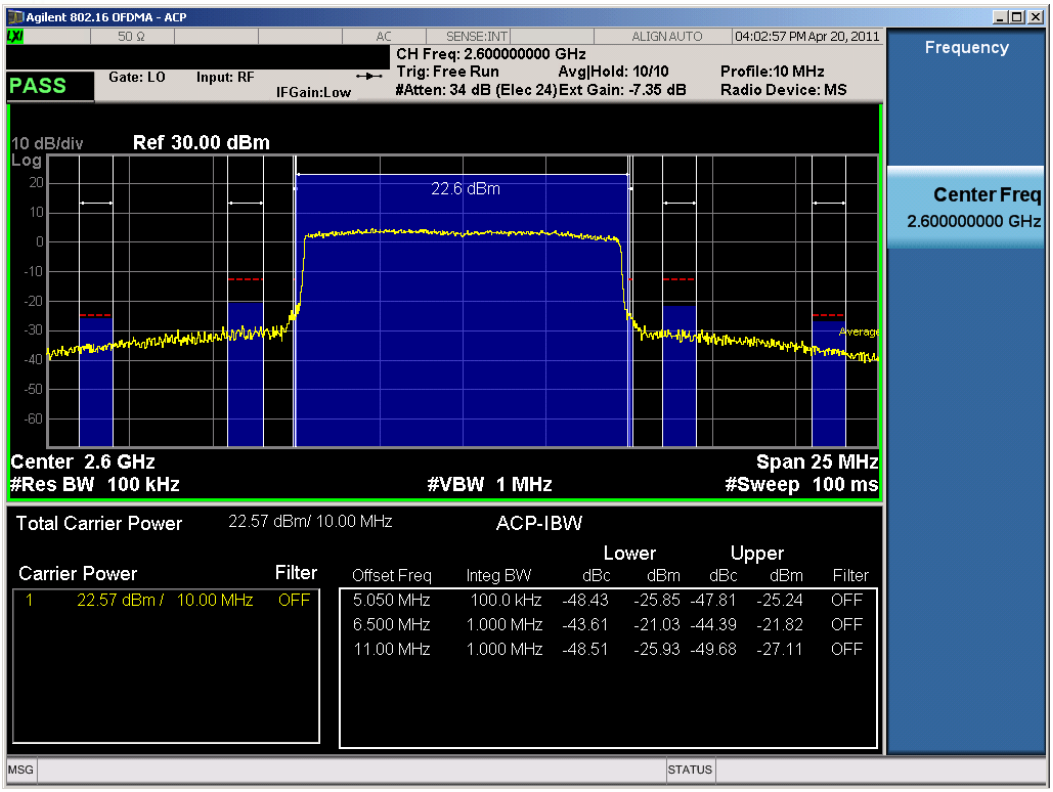
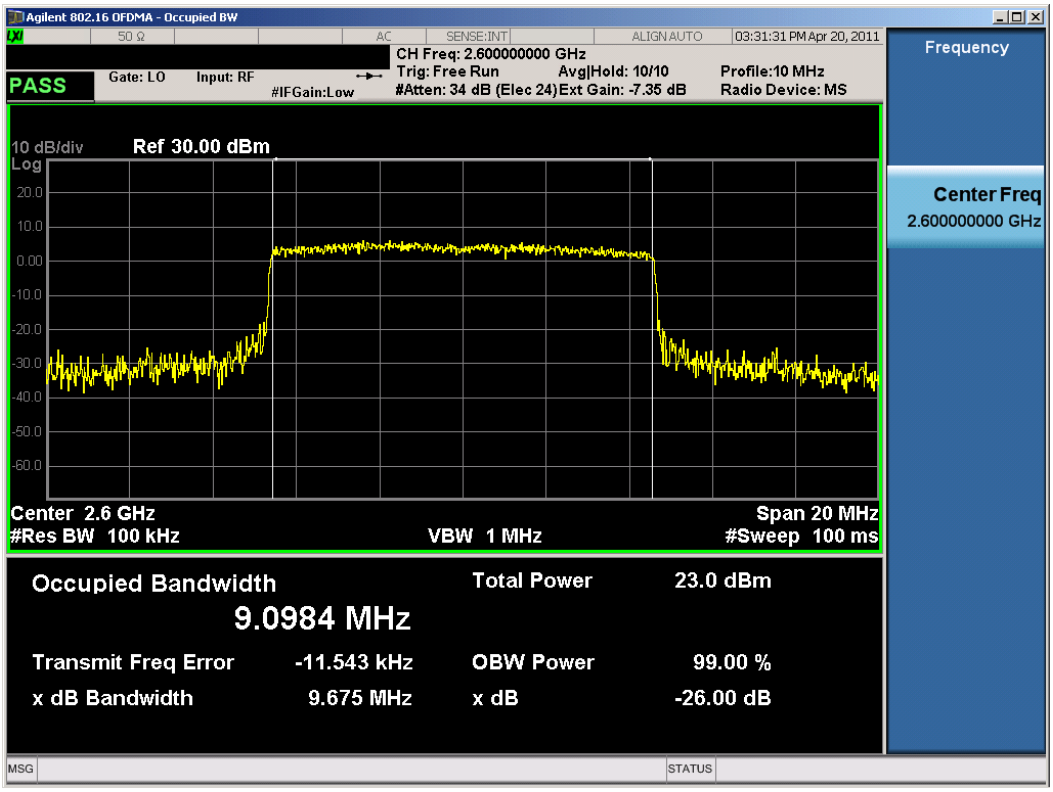



**Plot 8-27. Channel Edge Plot (Mid Ch., 10MHz BW, BAMC 16-QAM, Antenna 2)**




**Plot 8-28. Occupied Bandwidth Plot (Mid Ch., 10MHz BW, 16-QAM, Antenna 2)**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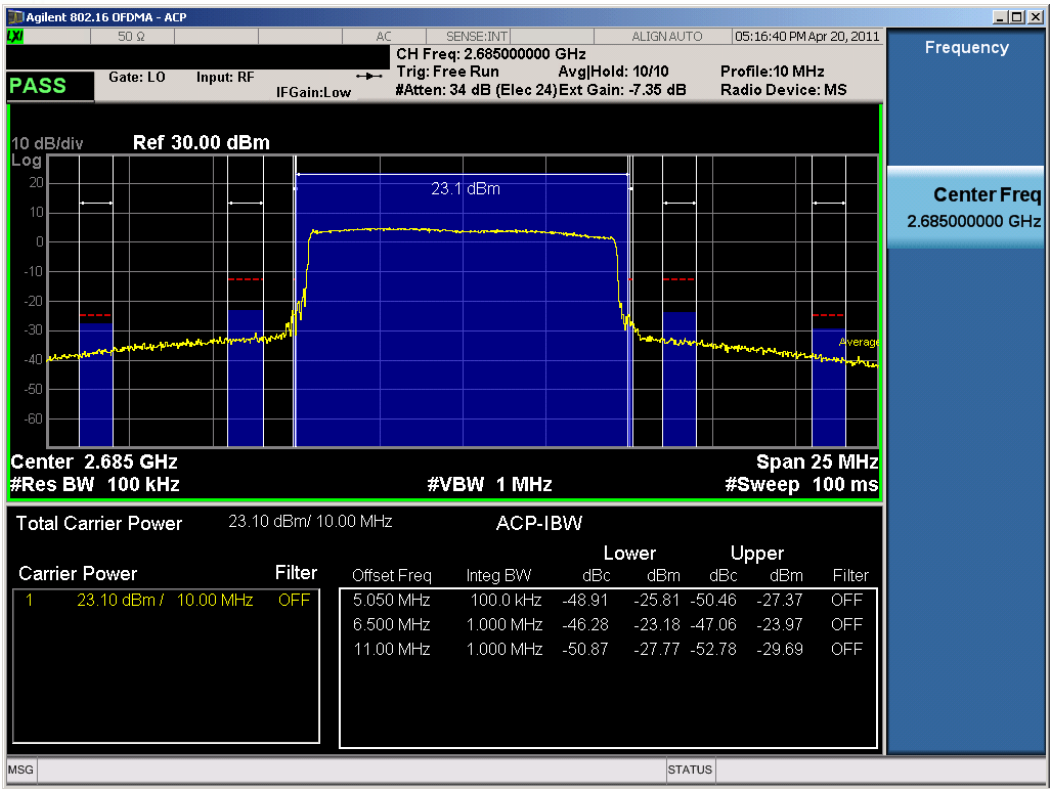
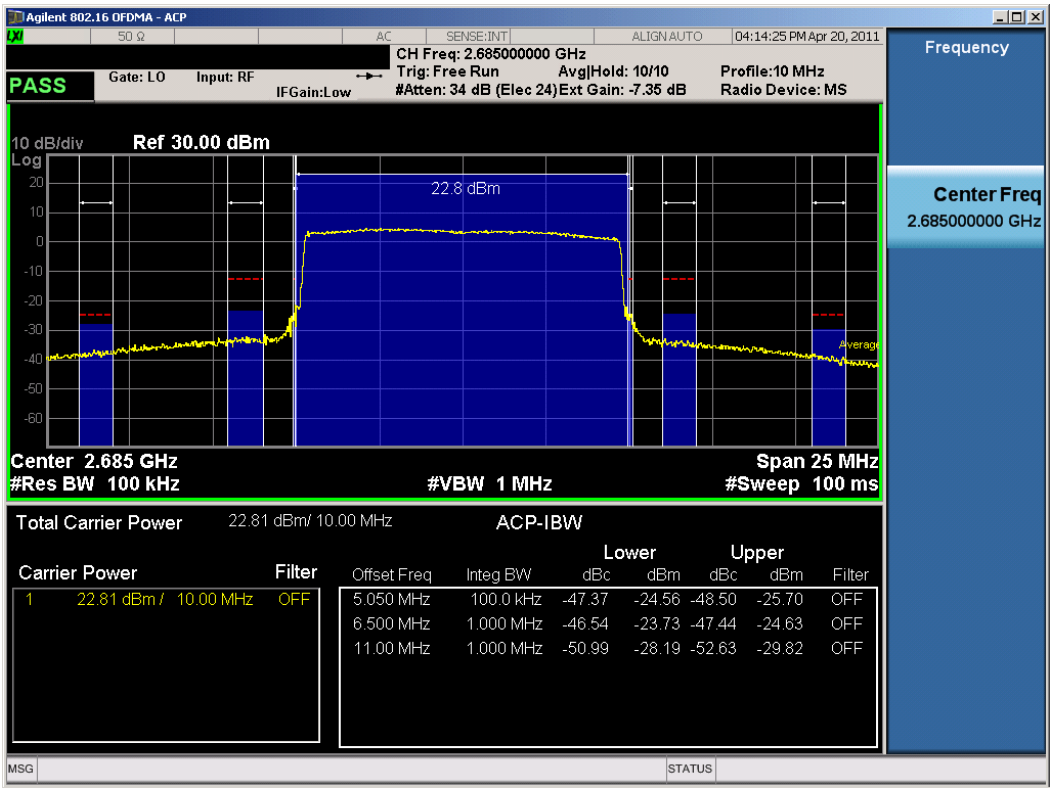



**Plot 8-29. Channel Edge Plot (High Ch., 10MHz BW, PUSC QPSK, Antenna 1)**




**Plot 8-30. Channel Edge Plot (High Ch., 10MHz BW, BAMC QPSK, Antenna 1)**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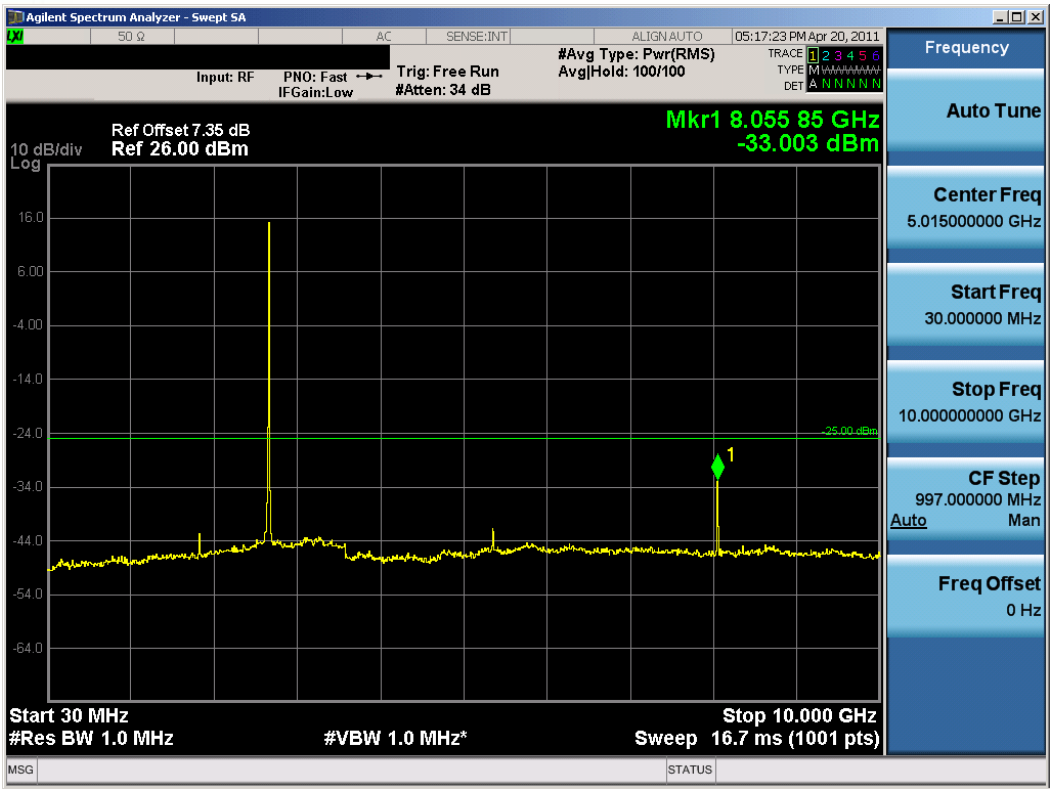
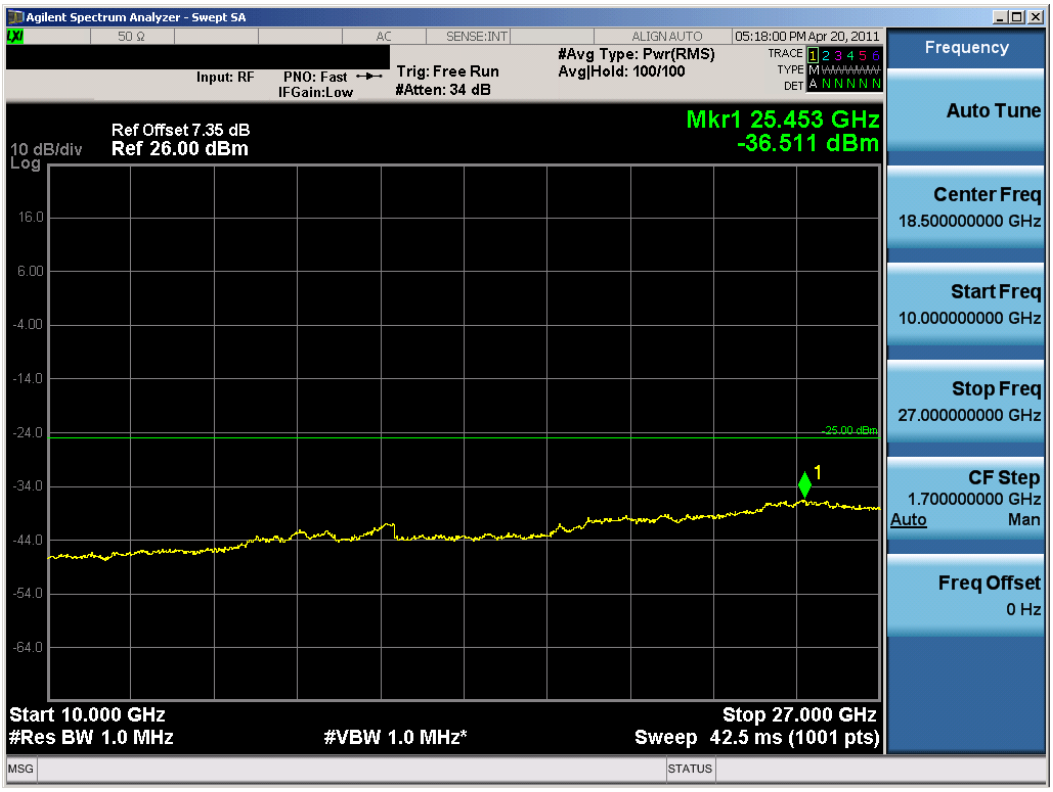



**Plot 8-31. Conducted Spurious Plot (High Ch., 10MHz BW, QPSK, Antenna 1)**




**Plot 8-32. Conducted Spurious Plot (High Ch., 10MHz BW, QPSK, Antenna 1)**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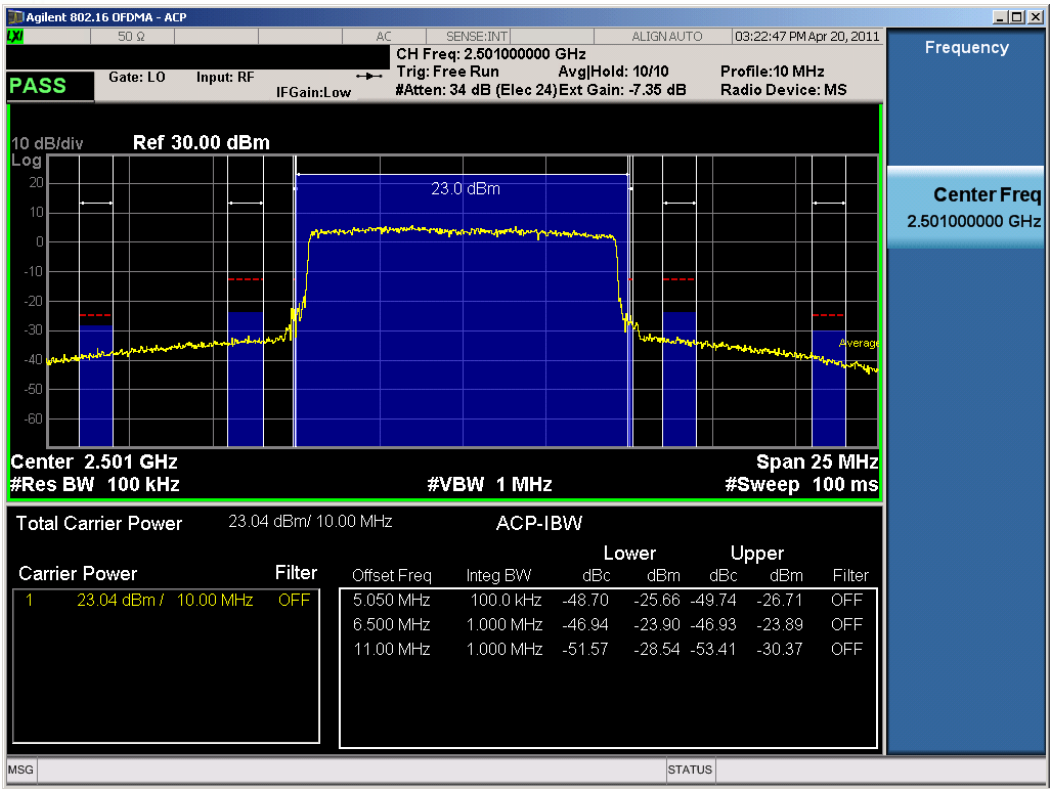
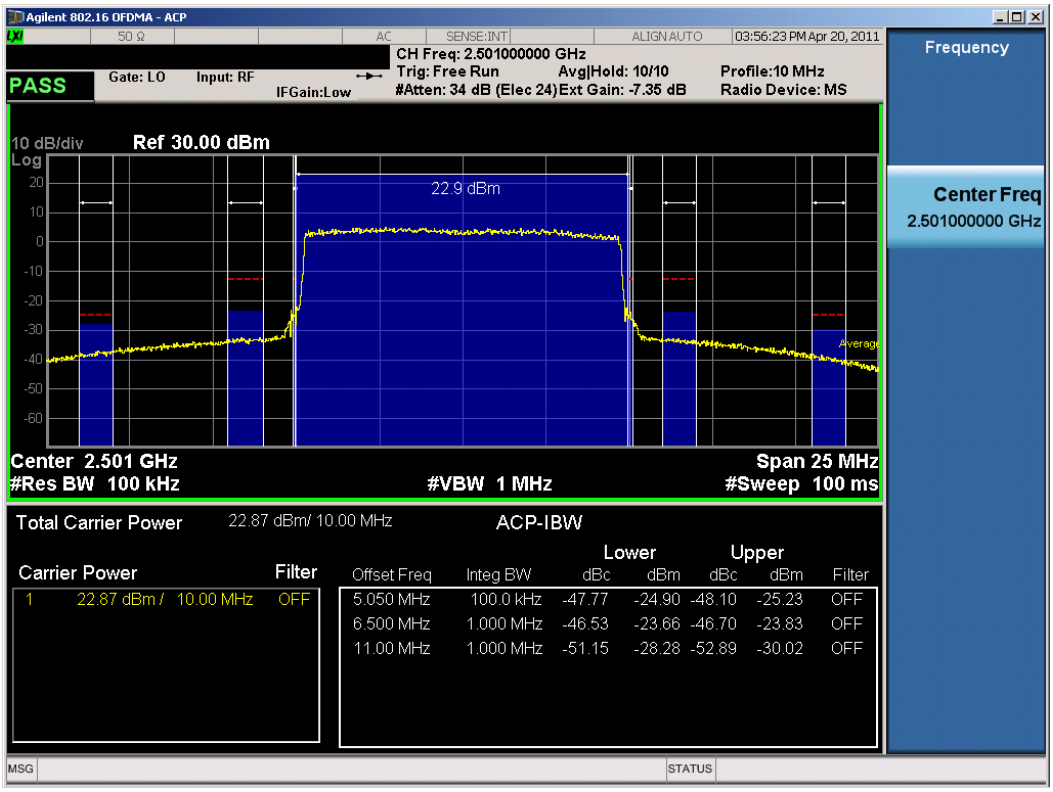



**Plot 8-33. Channel Edge Plot (High Ch., 10MHz BW, PUSC 16-QAM, Antenna 1)**




**Plot 8-34. Channel Edge Plot (High Ch., 10MHz BW, BAMC 16-QAM, Antenna 1)**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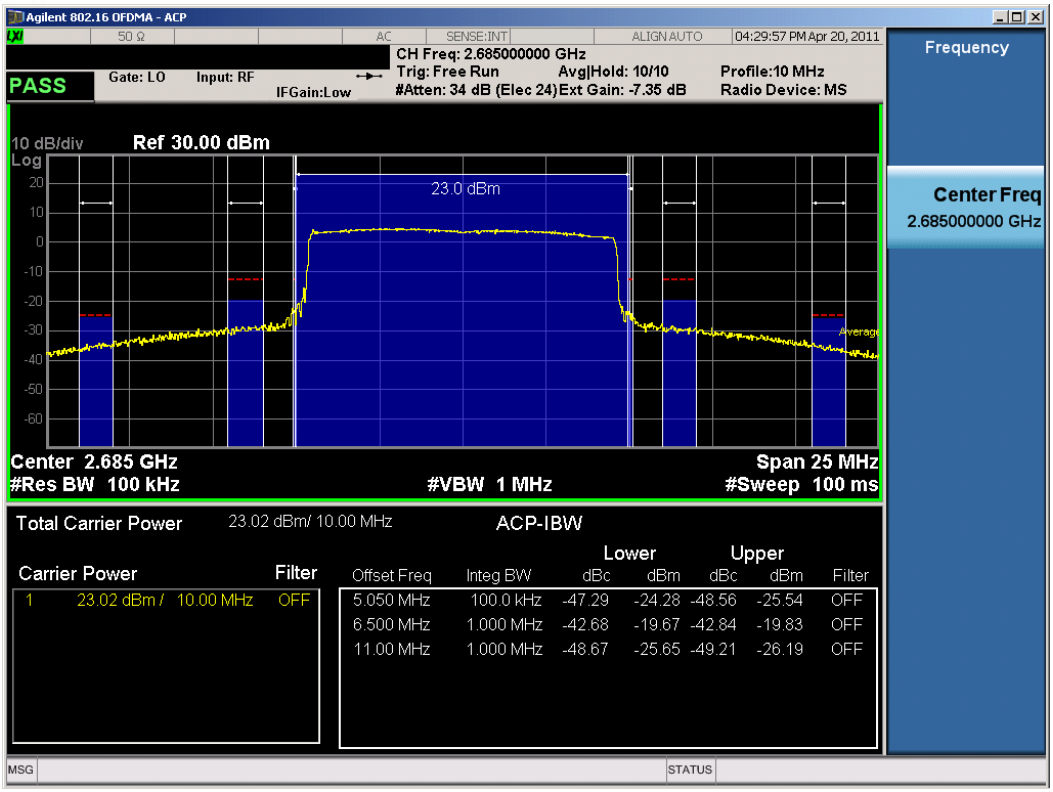
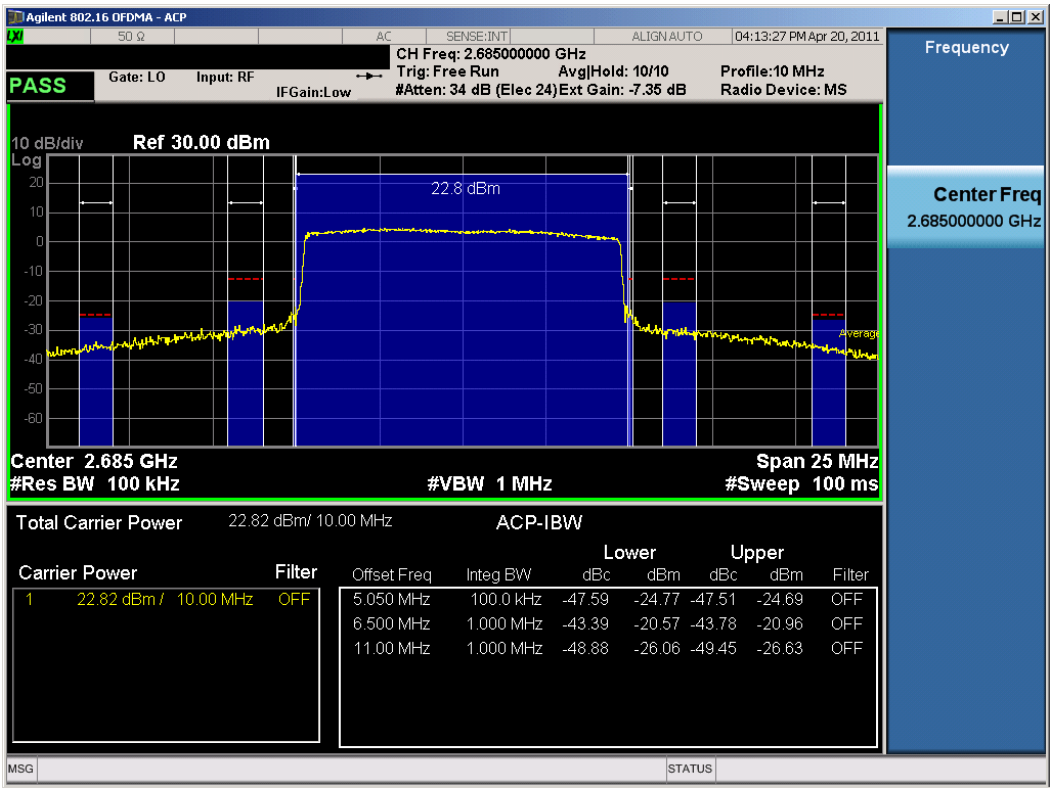



**Plot 8-35. Channel Edge Plot (High Ch., 10MHz BW, PUSC QPSK, Antenna 2)**




**Plot 8-36. Channel Edge Plot (High Ch., 10MHz BW, BAMC QPSK, Antenna 2)**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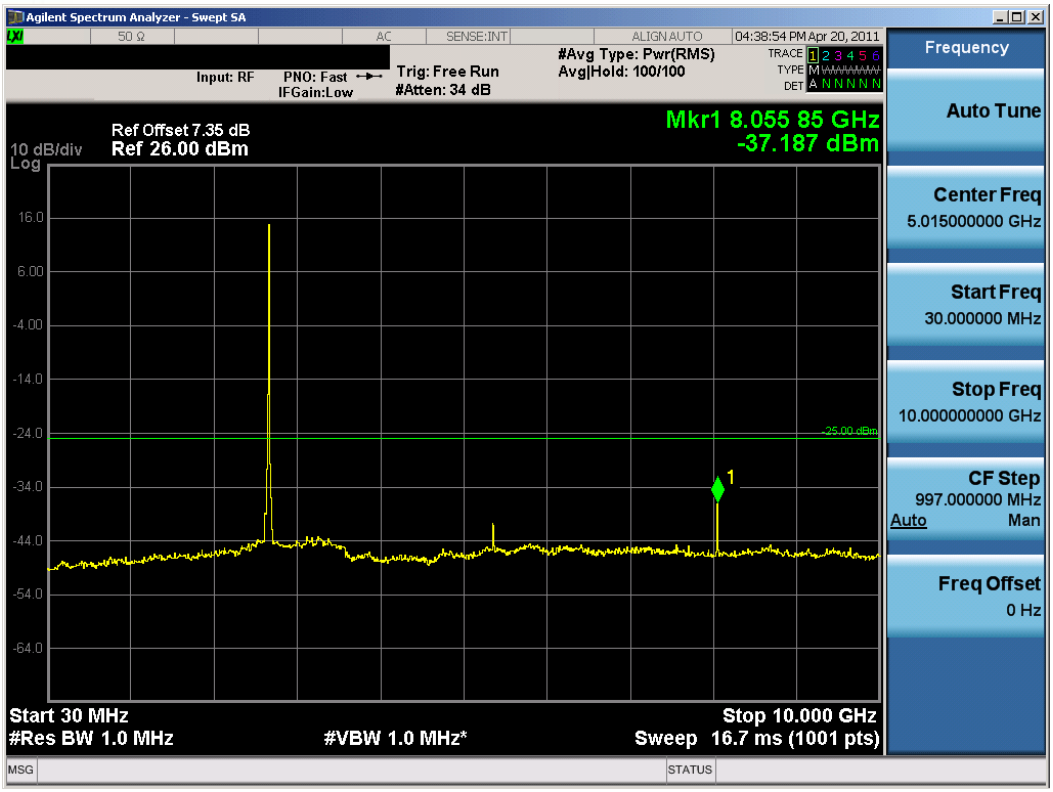
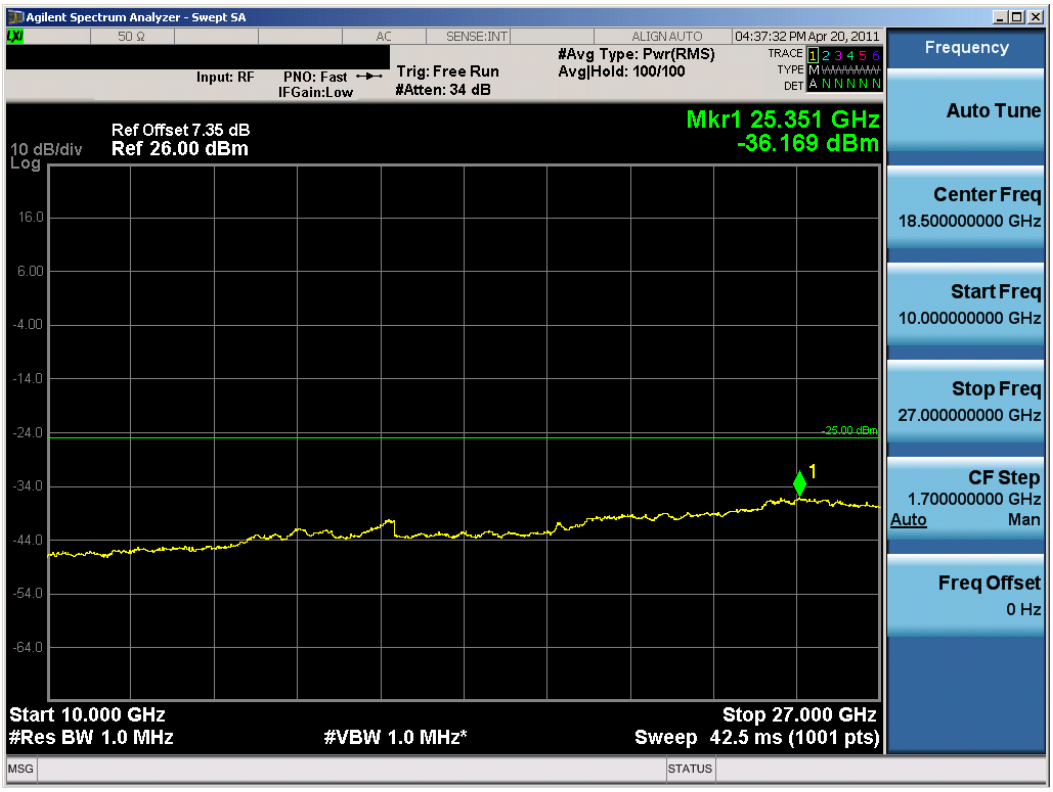



**Plot 8-37. Conducted Spurious Plot (High Ch., 10MHz BW, QPSK, Antenna 2)**




**Plot 8-38. Conducted Spurious Plot (High Ch., 10MHz BW, QPSK, Antenna 2)**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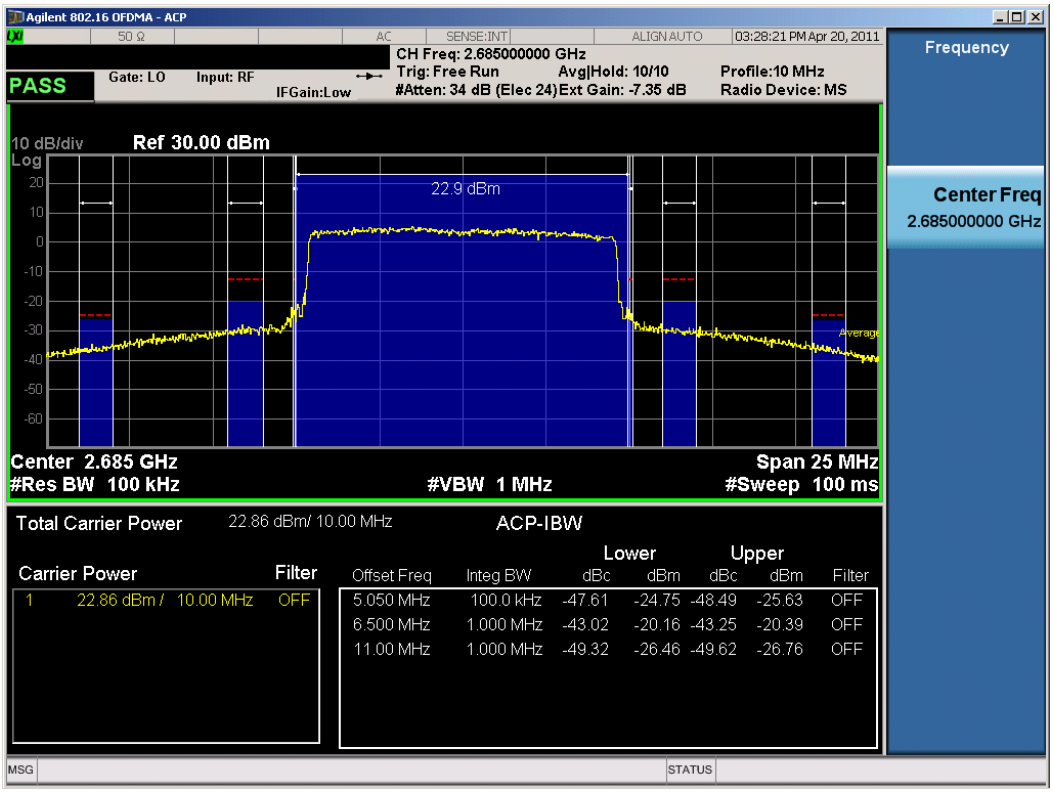
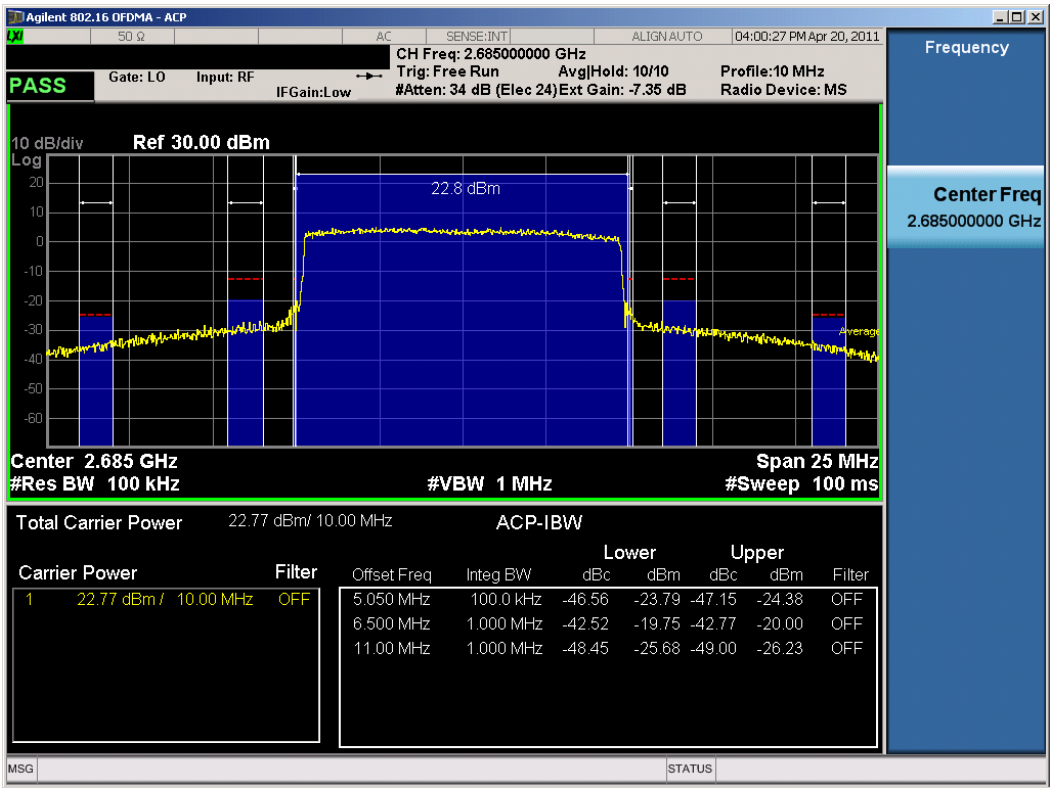



**Plot 8-39. Channel Edge Plot (High Ch., 10MHz BW, PUSC 16-QAM, Antenna 2)**




**Plot 8-40. Channel Edge Plot (High Ch., 10MHz BW, BAMC 16-QAM, Antenna 2)**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# 9.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Motorola Cellular/PCS CDMA/EvDO and WiMAX Phone with BT and WLAN FCC ID: IHDP56MD1** complies with all the requirements of Parts 2 and 27 of the FCC rules.


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