

## Vyyo Inc.

**FCC ID:** PBJV3000-A  
**FCC Rule Part:** 27

### General Overview

The equipment with the referenced FCC ID was granted certification on 30 January 2006. Changes to software and firmware allow the transmitter to operate at higher channel bandwidths than originally reported. No hardware changes are required to effect this change. Data is presented for output power, occupied bandwidth, and out of band emissions for channel bandwidths 311-317 kHz, depending on modulation type. Data shows that the referenced equipment meets emissions limits in Part 27 for the wider bandwidths .

### SPECIFICATIONS

#### Transmitter

TX operating frequency:	746-747 MHz
TX output power:	95.3 watts Peak
Digital Modulation:	QPSK, 16AQM, and 64QAM
	Modulation is internally generated and limited
Power requirements:	120 VAC or 48 VDC
Antenna connector:	N- type

### Test Summary Results

Test Description	Plot or Table No.	Test Results
RF Power Output	Plots 1-12	Pass
Occupied Bandwidth	Plots 13-15	Pass
Spurious and Harmonic Emissions at Antenna Terminals	Plots 16-24	Pass

## FCC CERTIFICATION INFORMATION

The following information is in accordance with FCC Rules, 47CFR Parts 1 and 2.

**1.1307(b)** RF exposure information is provided in a separate attachment in the form of maximum permissible exposure (MPE) data.

**2.1033(c)1** Applicant: Vyyo Inc.  
4015 Miranda Avenue  
Palo Alto, CA. 94304

**2.1033(c)2** FCC ID: PBJV3000-A

**2.1033(c)3** Installation instructions are found in document previously submitted.

**2.1033(c)4** Emission types and emission designators to be added:

Emission Type	Designator
QPSK	300KG1D
16QAM	295KW1D
64QAM	290KW1D

**2.1033(c)5 Frequency range:** 746-747 MHz

### **2.1033(c)6 Range of Operating Power**

95.3 watts Peak/ 16.1 watts Average Maximum, variable in 1 dB steps

### **2.1033(c)7 Maximum Power Rating**

95.3watts Peak/ 16.1 watts Average

Maximum allowed per Section 27.50(b)1: 1 kW ERP

### **2.1033(c)8 Applied voltages and currents into the final transistor elements**

Refer to schematics submitted with original application

### **2.1033(c)9 Tune-up procedure**

Refer to installation instructions submitted with original application .

### **2.1033(c)10 Circuit and Functional Block Diagram, Description of Circuitry**

Refer to documents submitted with original application

## 2.1033(c)11 FCC ID Label

Refer to documents submitted with original application

## 2.1033(c)12 Product Photographs

Refer to documents submitted with original application

## 2.1033(c)13 Description of Modulation System

QPSK, 16QAM, and 64QAM produced by internal DOCSIS cable modem

## Test Equipment List

TEST EQUIPMENT LIST				
Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
EMI Receiver, 9 kHz ~ 2.9 GHz	HP	8542E	3942A00286	3/29/06
RF Filter Section	HP	85420E	3705A00256	3/29/06
Antenna, Bilog 30MHz ~ 2Ghz	Sunol Sciences	JB1	A121003	3/3/07
Signal Generator 2 ~40 GHz	R & S	SMP04	DE 34210	6/8/06
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	2238	4/22/06
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6717	4/22/06
Antenna, Horn 1 ~ 18 GHz	ETS	3117	29310	4/22/06
Peak Power Meter	Agilent	E4416A	GB41291160	2/9/07
Peak / Average Power Sensor	Agilent	E9327A	US40440755	2/10/07
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent	E4446A	US42070220	1/12/07
Temperature / Humidity Chamber	Thermotron	SE 600-10-10	29800	6/10/06
High Power Attenuator	BIRD	8343-200	970	N/A
	ELECTRONIC CORP			

## 2.1033(C)14 TEST DATA PER 2.1046 – 2.1057

### 2.1046 RF Output Power Measurements

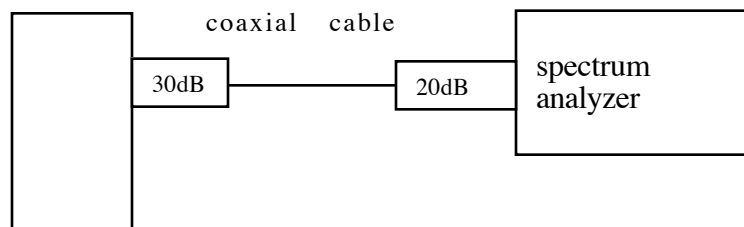
#### Requirement/Limit: 27.50(b)1

(b) The following power and antenna height limits apply to transmitters operating in the 746–764 MHz and 776–794 MHz bands:

(1) Fixed and base stations transmitting in the 746–764 MHz band and the 777–792 MHz band must not exceed an effective radiated power (ERP) of 1000 watts and an antenna height of 305 m height above average terrain (HAAT), except that antenna heights greater than 305 m HAAT are permitted if power levels are reduced below 1000 watts ERP in accordance with Table 1 of this section;

#### Test set-up:

Figure 1



**Total offset: 30dB directional coupler + 20 dB attenuator + 1.5 dB cable loss  
= 51.5 dB**

#### Test Procedures

The transmitter was set to produce the different modulations at the lowest and highest center frequencies at which all required Part 27 parameters are met:

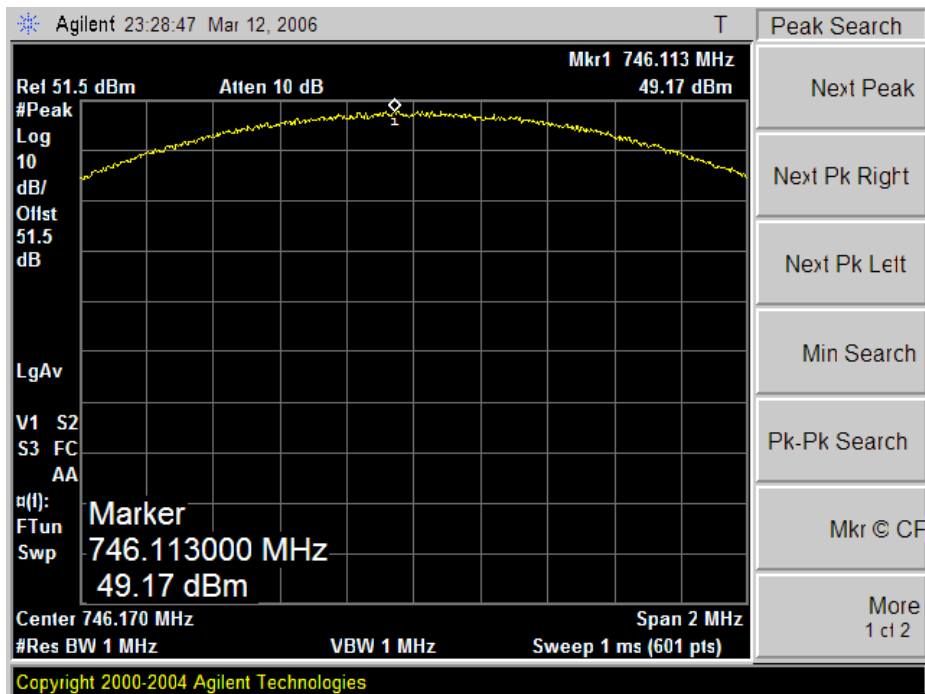
Modulation	Low Channel	High Channel
QPSK	746.17	746.83
16AQM	746.17	746.83
64QAM	746.17	746.83

The spectrum analyzer RBW=1 MHz, greater than emission occupied bandwidth (317kHz). Measurements were made for both PEAK and AVERAGE detector settings.

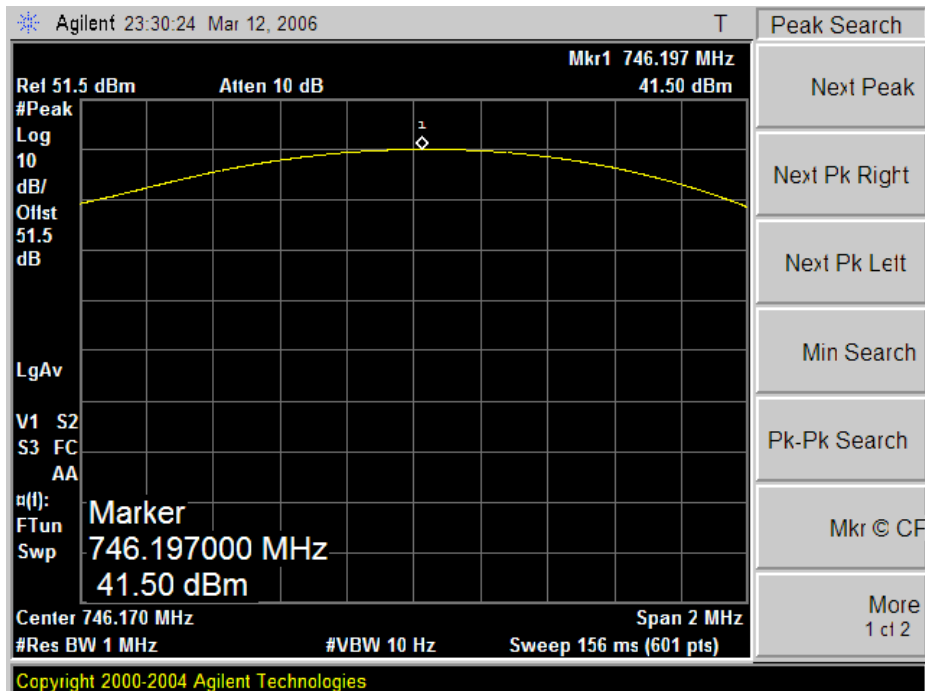
#### Test Results

Maximum results were 50.0 dBm/ 42.02 dBm (100watts Peak/ 16 watts Average). Refer to spectrum analyzer plots below.

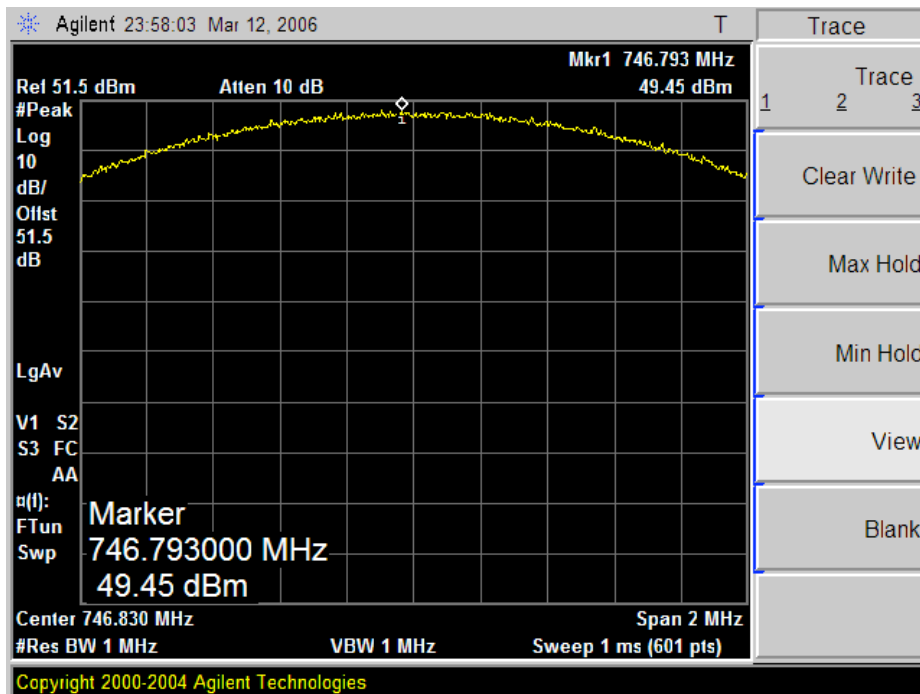
### Plot #1 - QPSK PEAK Power Low Channel



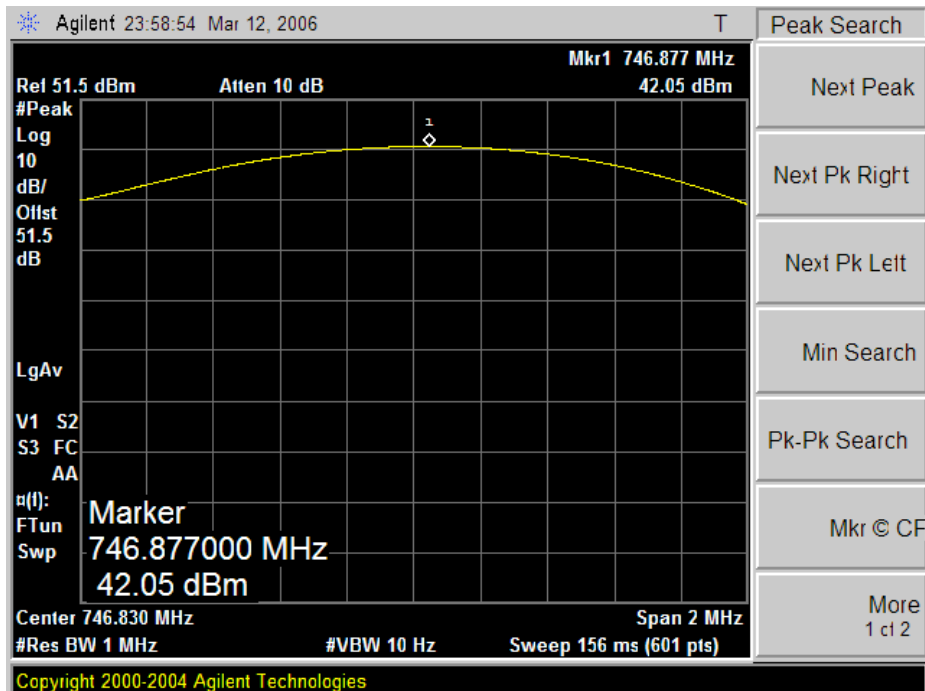
### Plot#2 - QPSK AVERAGE Power Low Channel



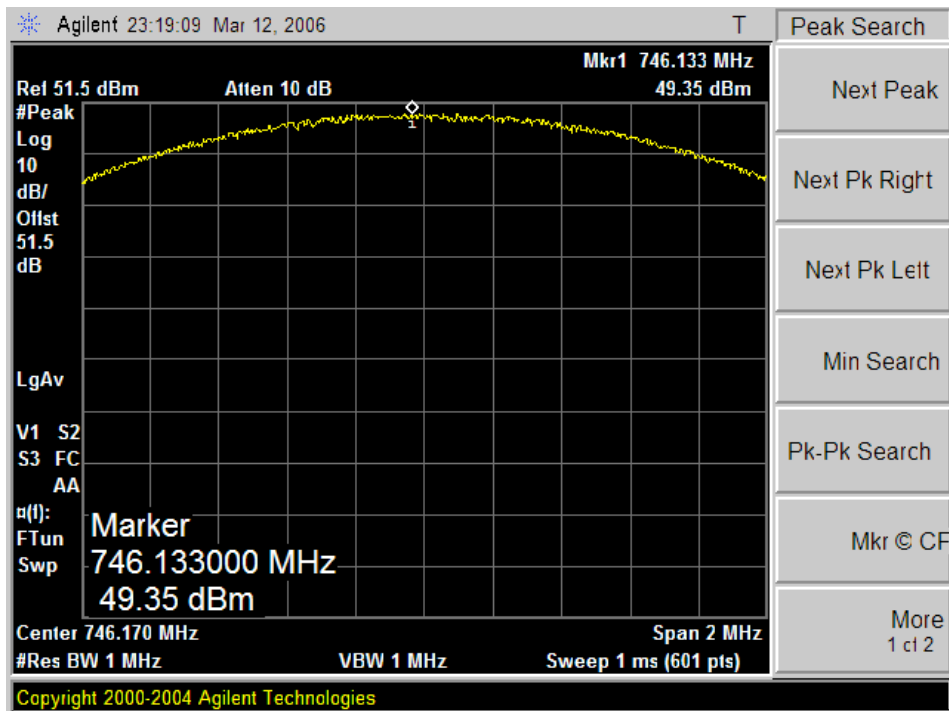
### Plot#3 - QPSK PEAK Power High Channel



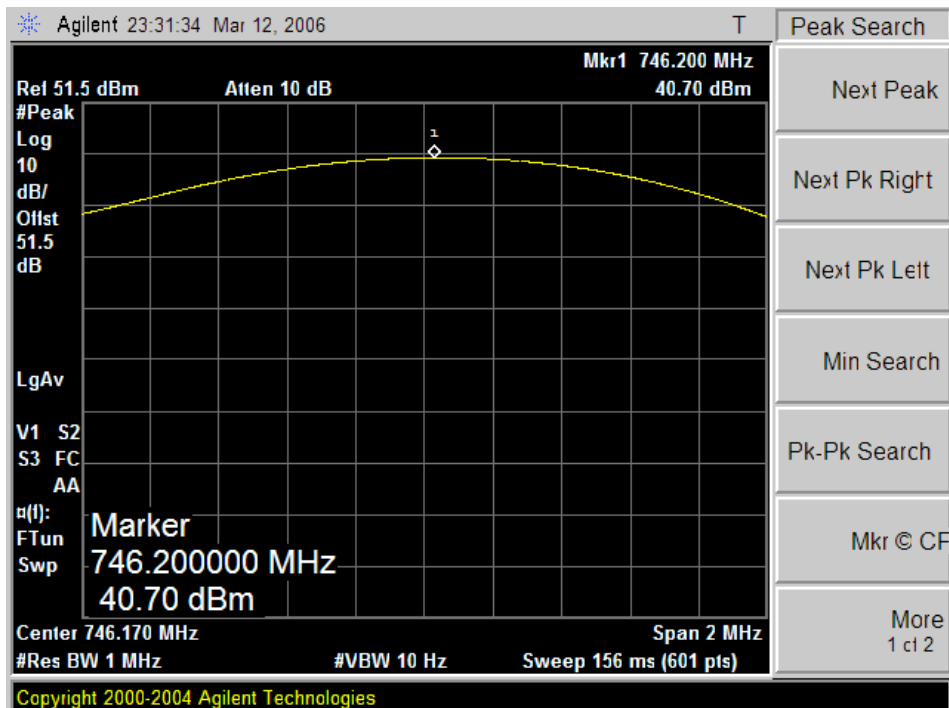
### Plot#4 - QPSK AVERAGE Power High Channel



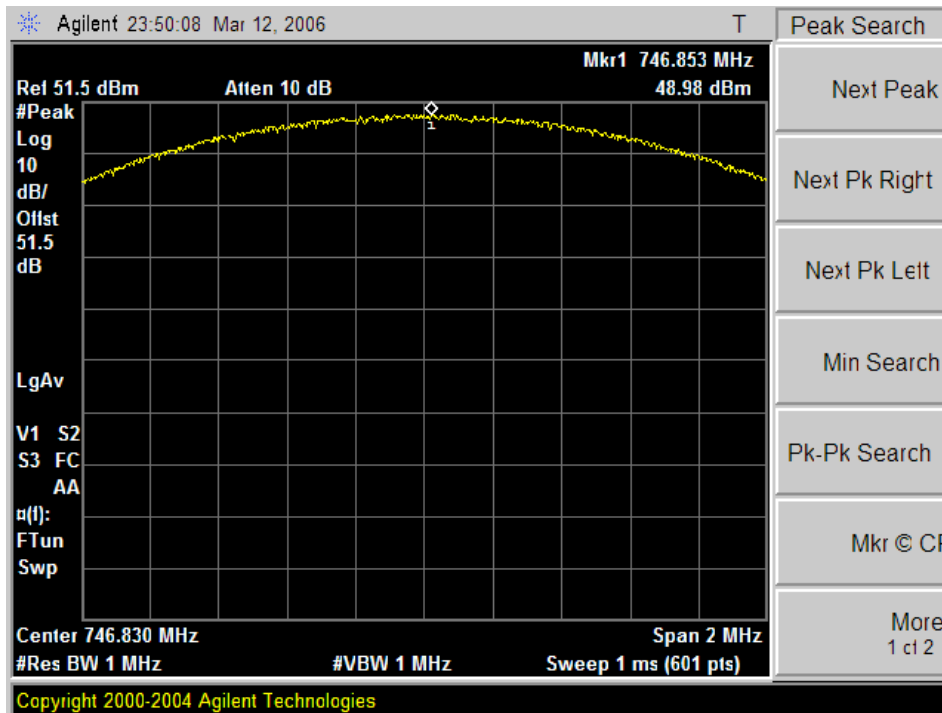
### Plot # 5 - 16QAM PEAK Power Low Channel



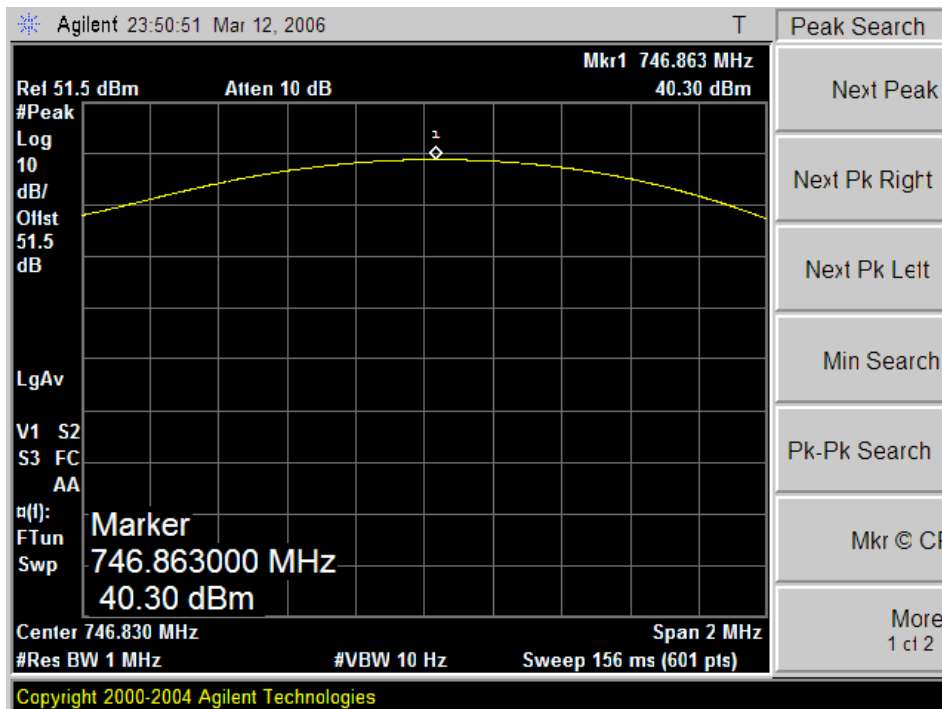
### Plot # 6 - 16QAM AVERAGE Power Low Channel



**Plot # 7 - 16QAM PEAK Power HIGH Channel**

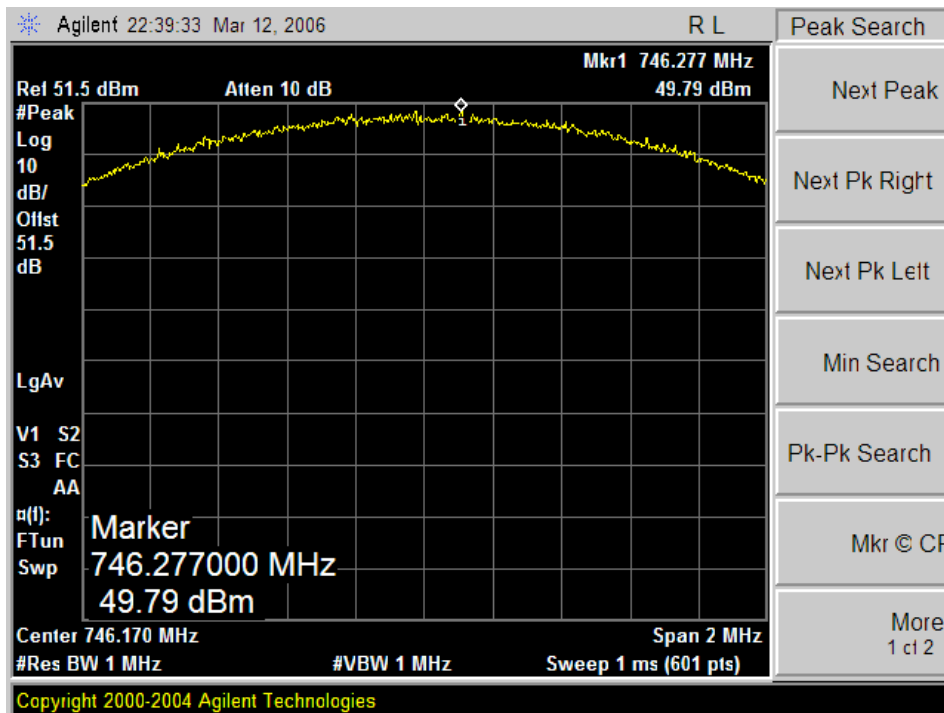


**Plot # 8 - 16QAM AVERAGE Power High Channel**

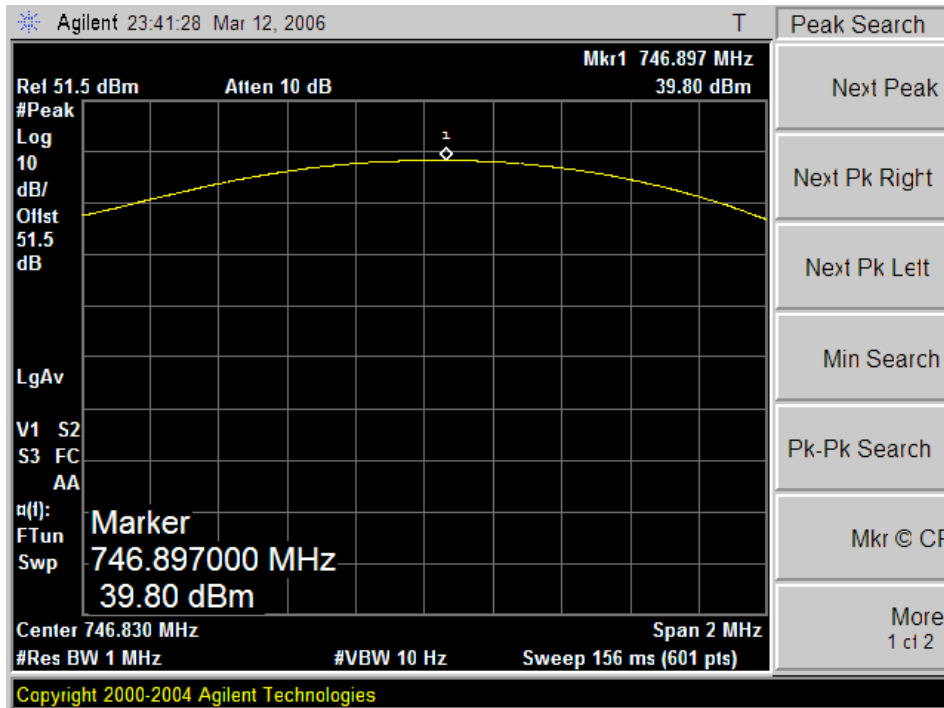




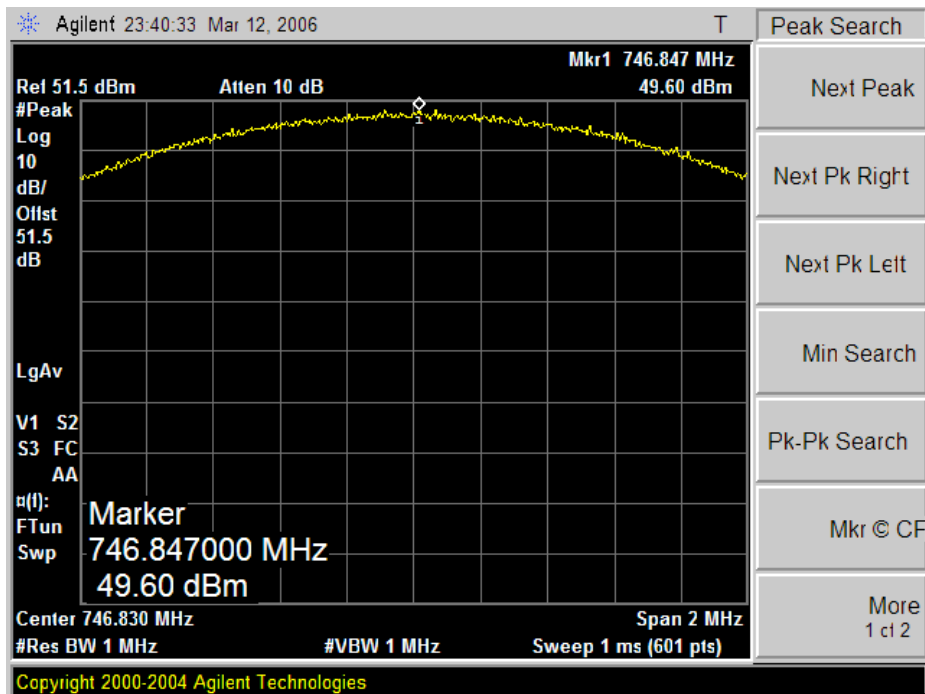
Plot # 9 - 64QAM PEAK Power Low Channel



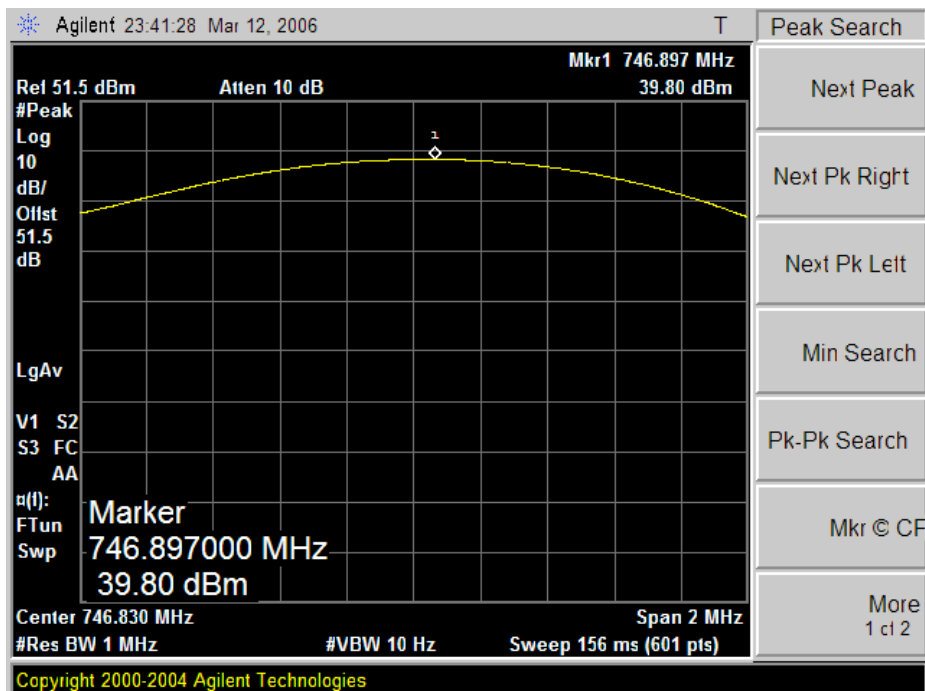
Plot # 10 - 64QAM AVERAGE Power Low Channel



### Plot # 11 - 64QAM PEAK Power High Channel



### Plot # 12 - 64QAM AVERAGE Power High Channel



**Section 2.1049 Occupied Bandwidth  
Requirement/Limit: 27.53(d)4**

(4) *Authorized bandwidth.* Provided that the ACP requirements of this section are met, applicants may request any authorized bandwidth that does not exceed the channel size.

**Test set-up:** Refer to Figure 1, above

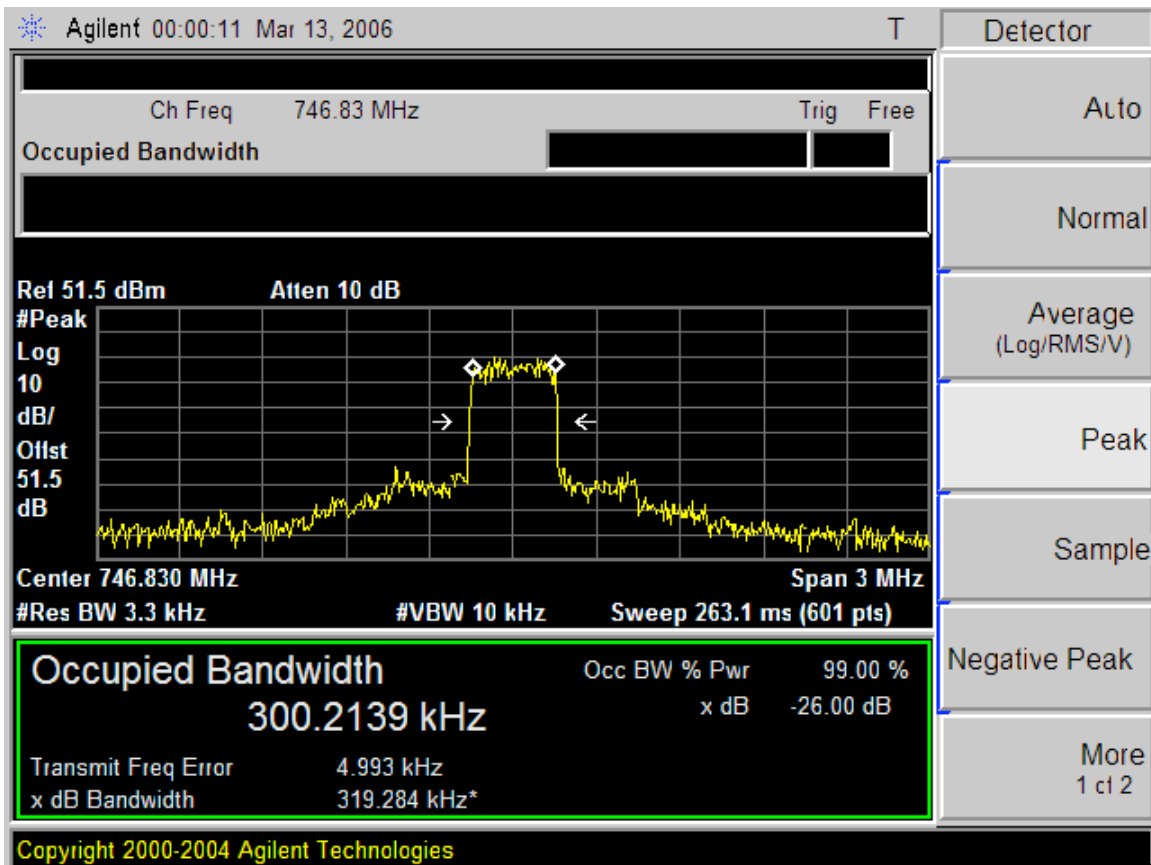
**Test Procedures:**

Using the spectrum analyzer Occupied Bandwidth measurement function, the 99% occupied bandwidth was measured for the EUT at LOW, MID, and HIGH channels with the EUT operating at full rated power.

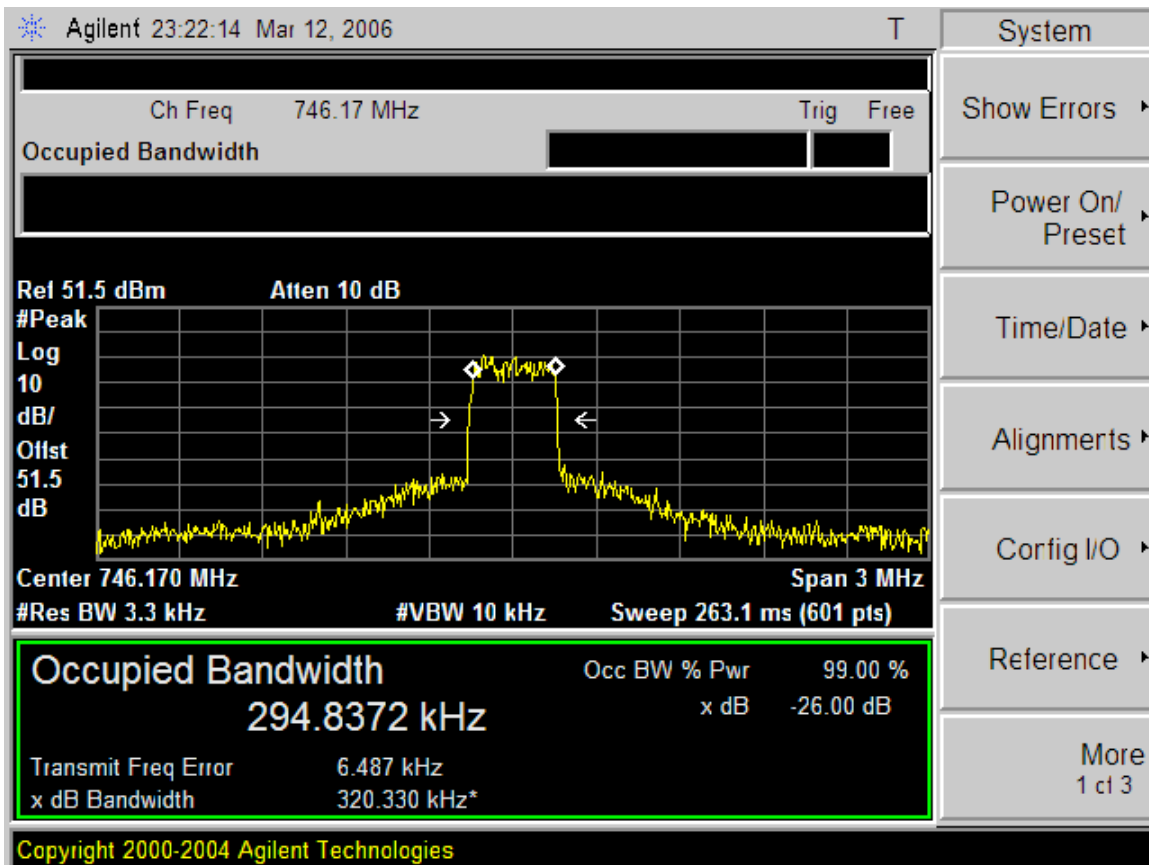
**Test Results:**

Refer to spectrum analyzer displays below.

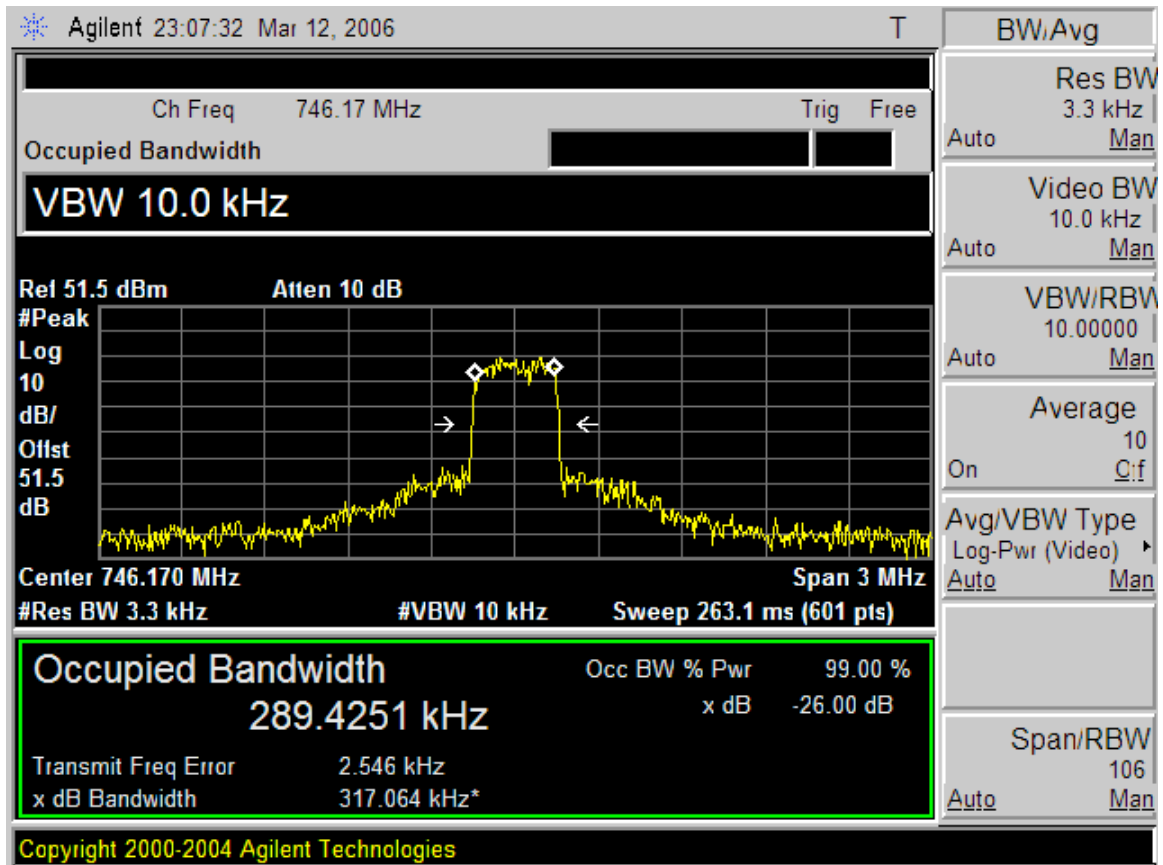
Plot # 13 - QPSK Occupied Bandwidth



### Plot#14 – 16QAM Occupied Bandwidth



Plot#15 – 64QAM Occupied Bandwidth



## Section 2.1051 ACP, Spurious and Harmonic Emissions at Antenna Terminals

### Requirement/Limit: 27.53(d)

(d) For operations in the 746–747 MHz, 762–764 MHz, 776–777 MHz, and 792–794 MHz bands, transmitters must meet the following emission limitations:

(3) *Out-of-band emission limit.* On any frequency outside of the frequency ranges covered by the ACP tables in this section, the power of any emission must be reduced below the unmodulated carrier power (P) by at least  $43 + 10 \log (P)$  dB ( $= -43\text{dBW} = -13\text{dBm}$ )

**Test set-up:** Refer to Figure 1, above

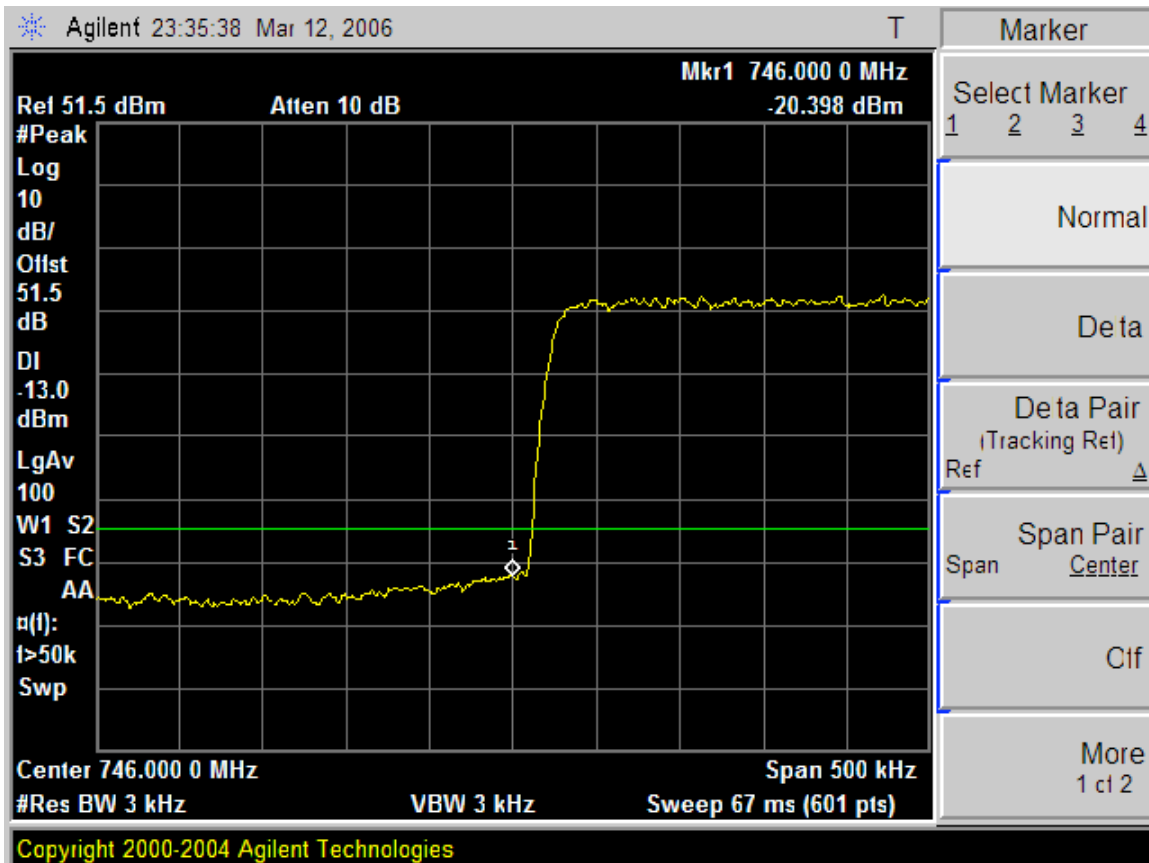
### Test Procedures

1. Testing was performed at the lower and upper bandedges for each modulation. Emissions were compared to the  $-13\text{dBm}$  limit
2. For worst-case modulation, antenna port conducted out of band emissions were measured up to  $10f_o$ .

### Test Results

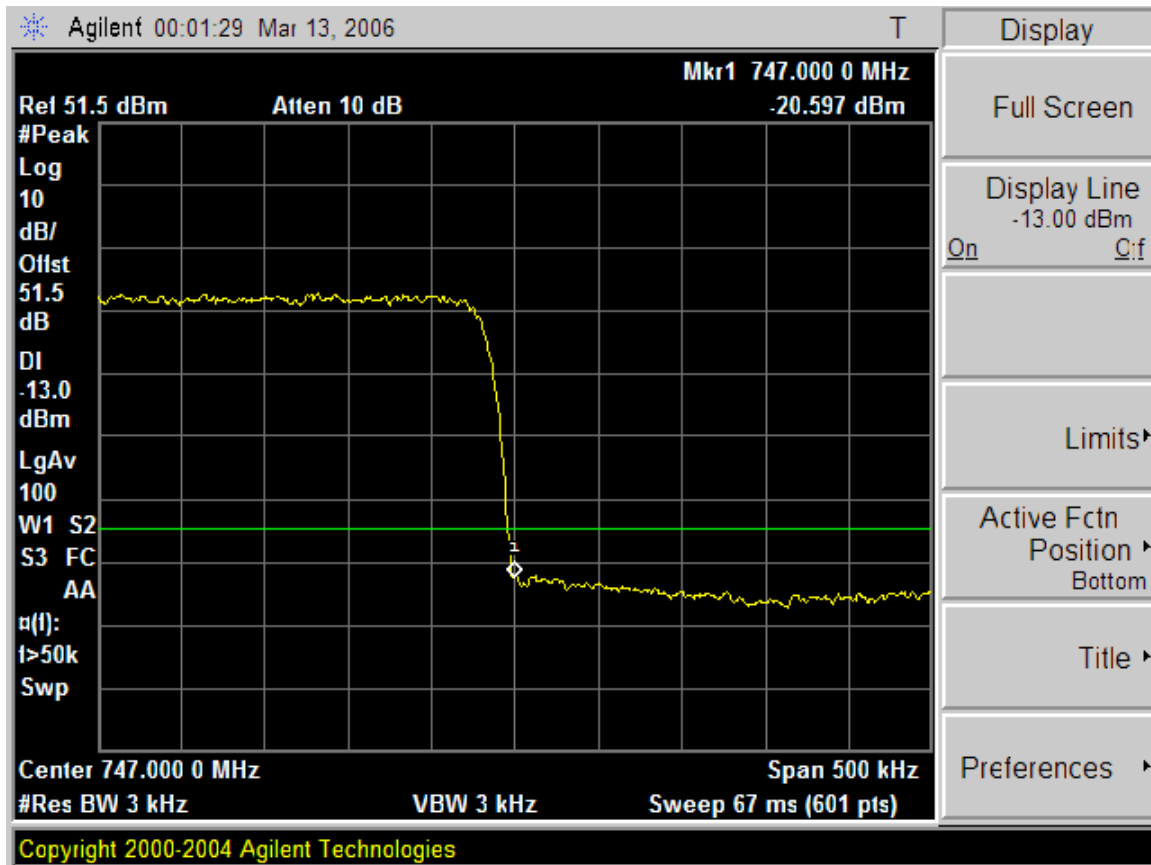
**PASS.** Out of band emissions meet the  $-13\text{dBm}$  limit. Refer to spectrum analyzer plots below. Worst-case modulation was 64 QAM

Plot #16 Low Channel QPSK Bandedge

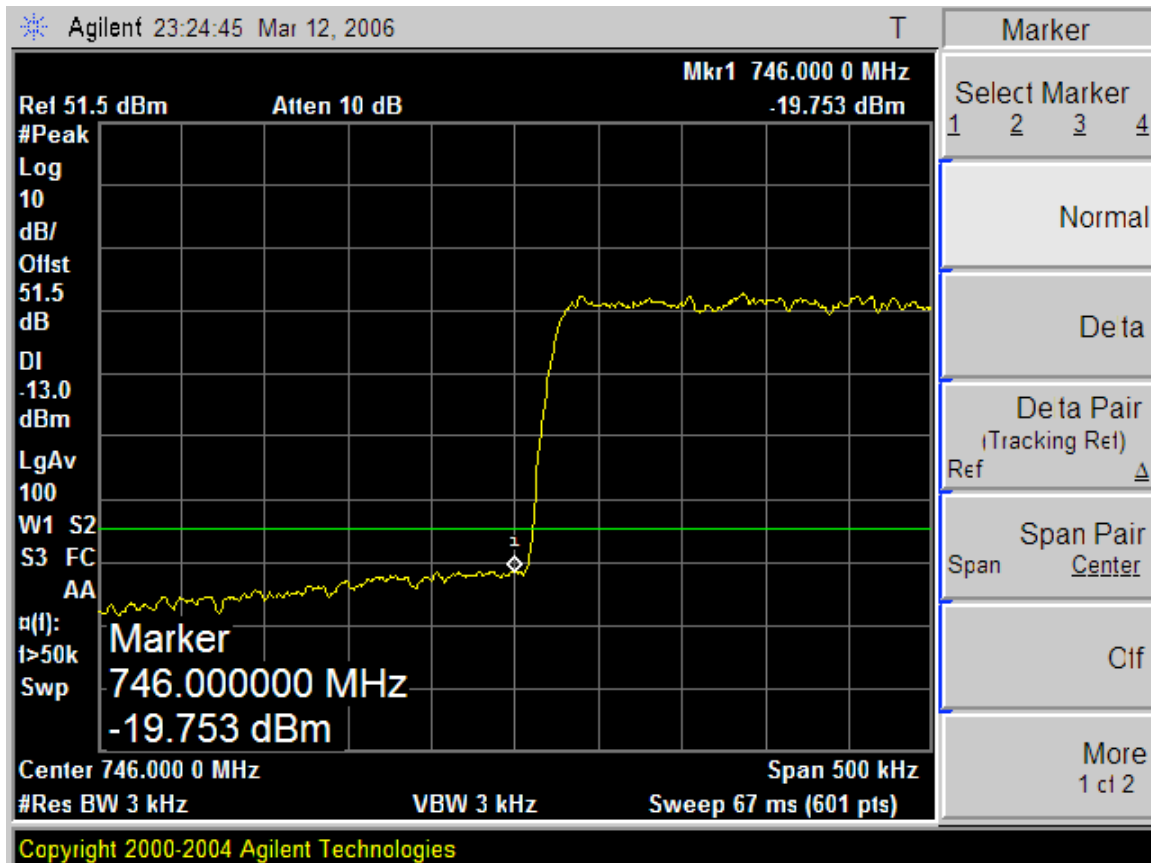




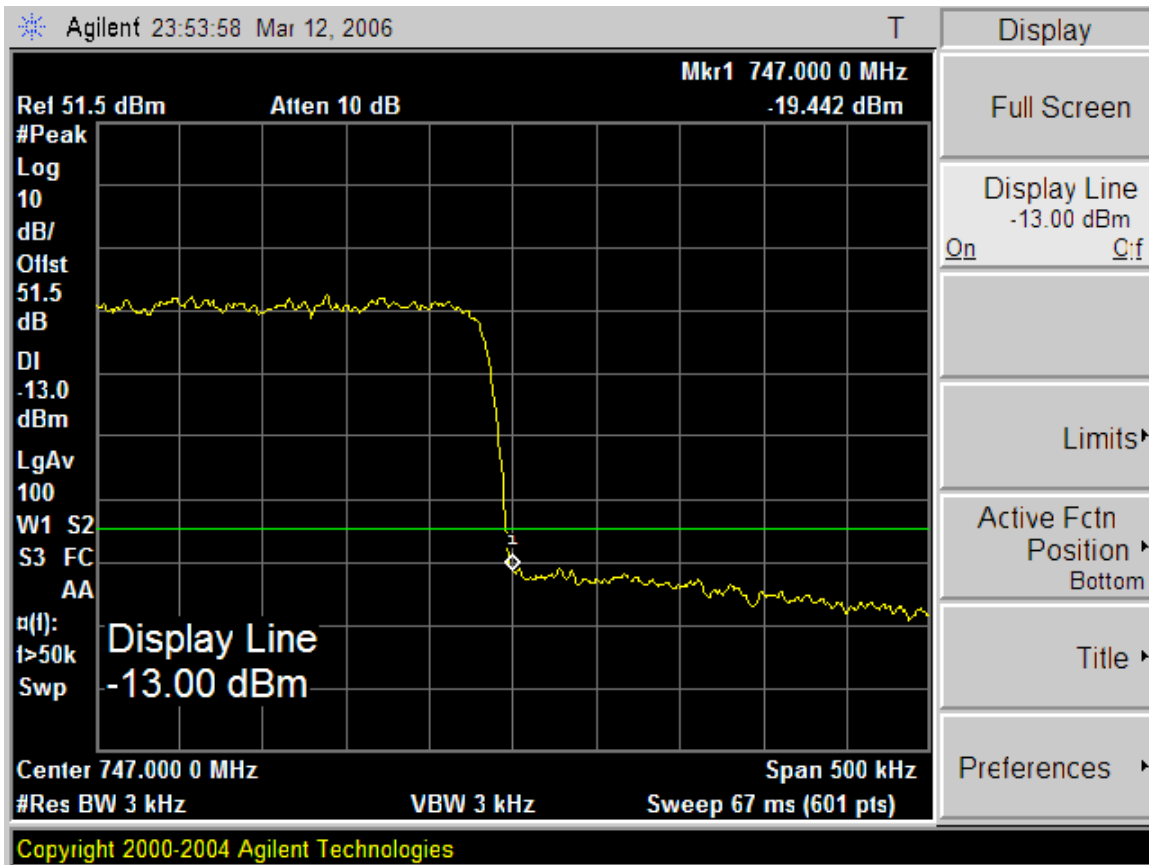
Plot#17 QPSK High Channel Bandedge



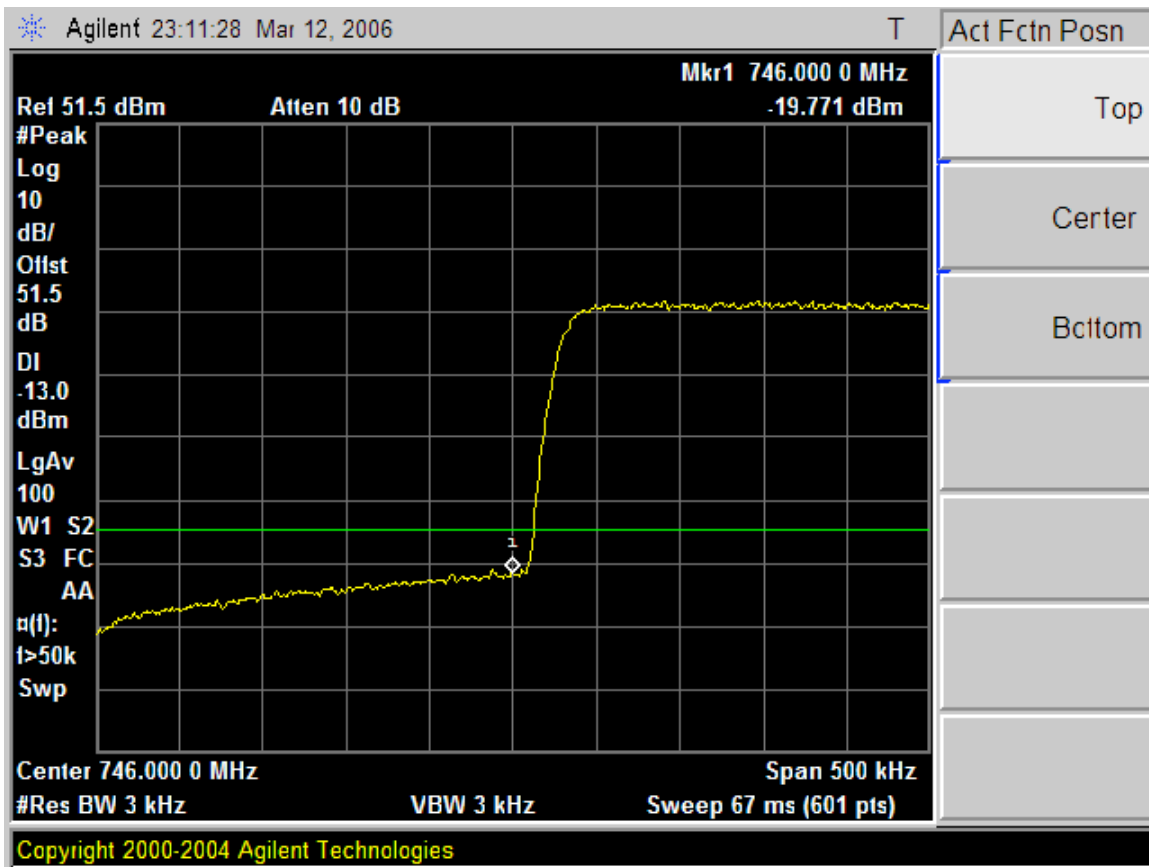
Plot#18 16QAM Low Channel Bandedge



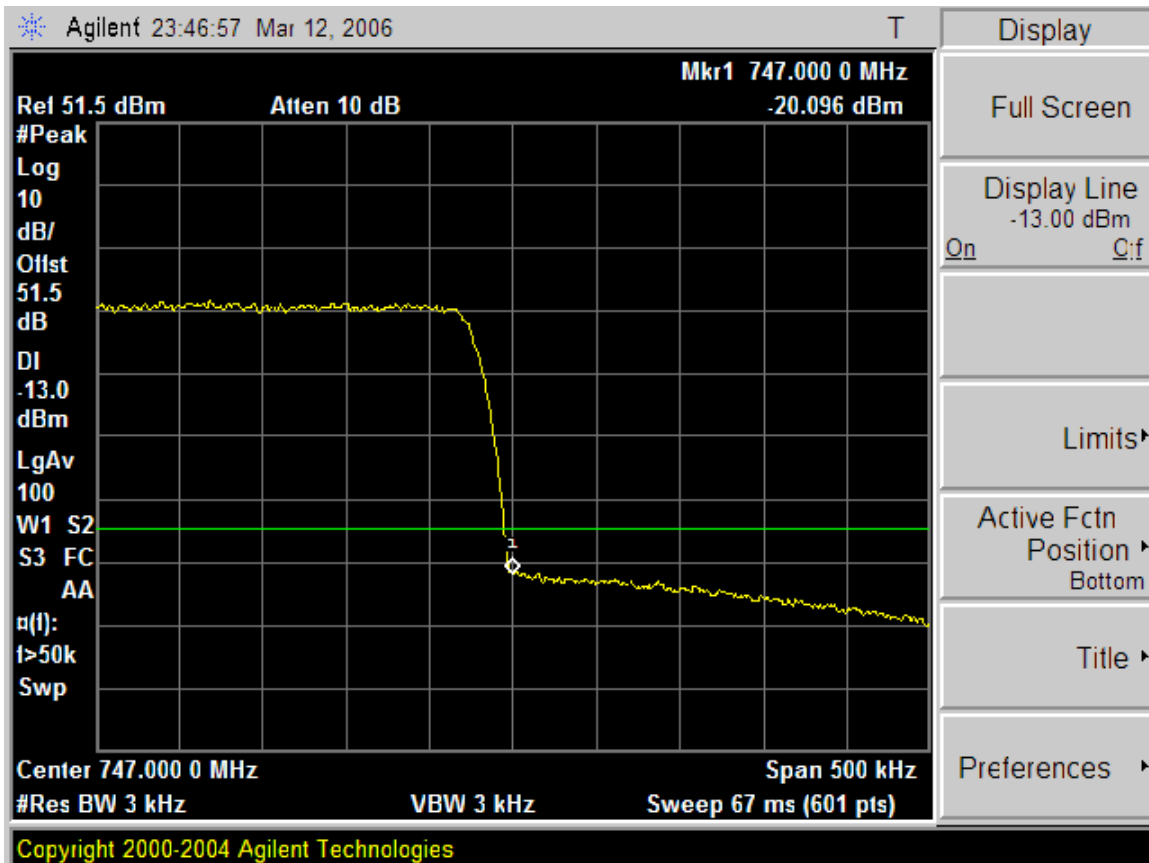
Plot#19 16QAM High Channel Bandedge



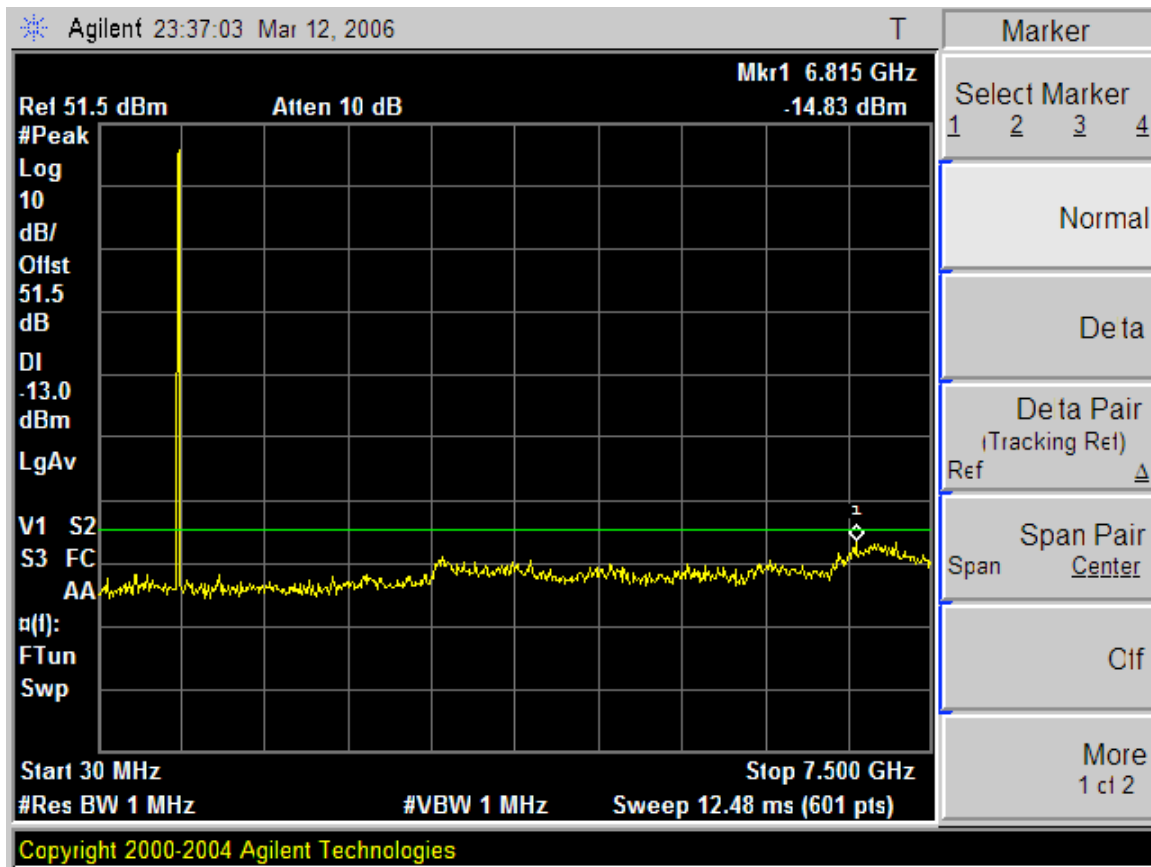
Plot# 20 64QAM Low Channel Bandedge



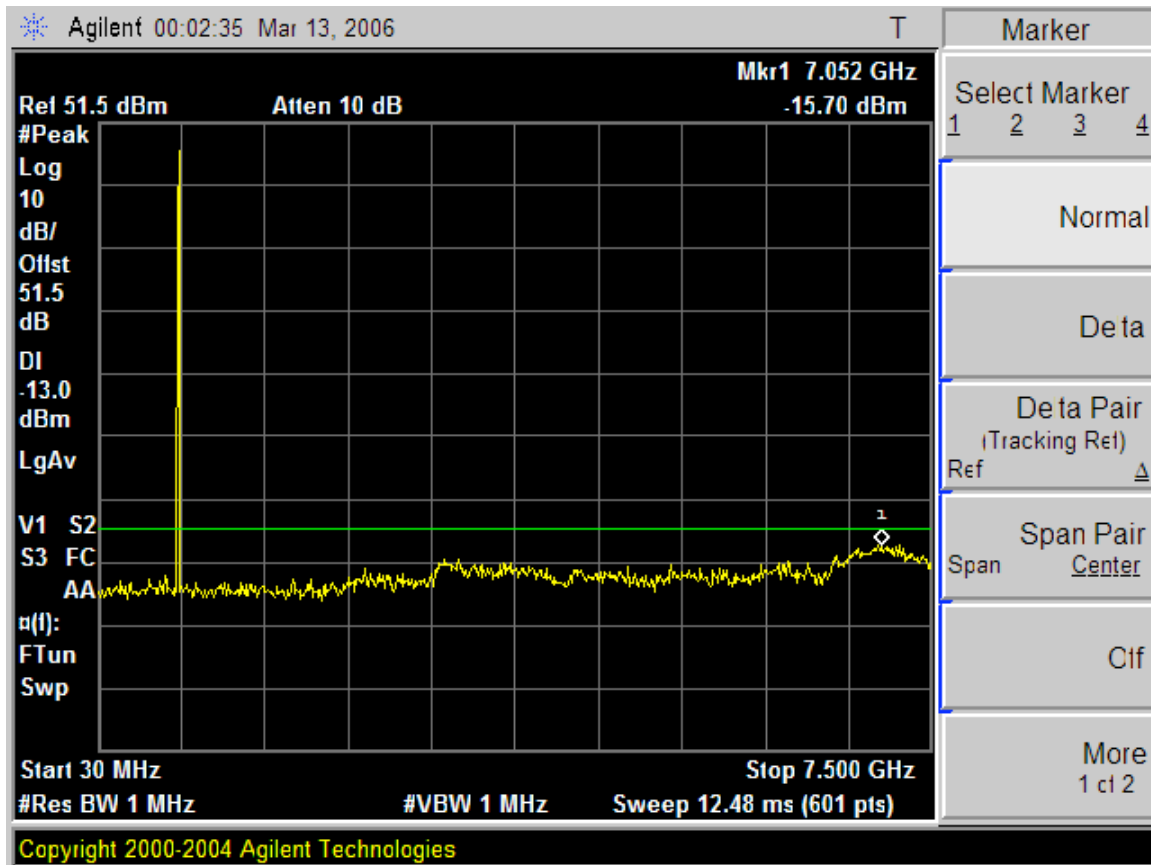
Plot# 21 64QAM HIGH Channel Bandedge



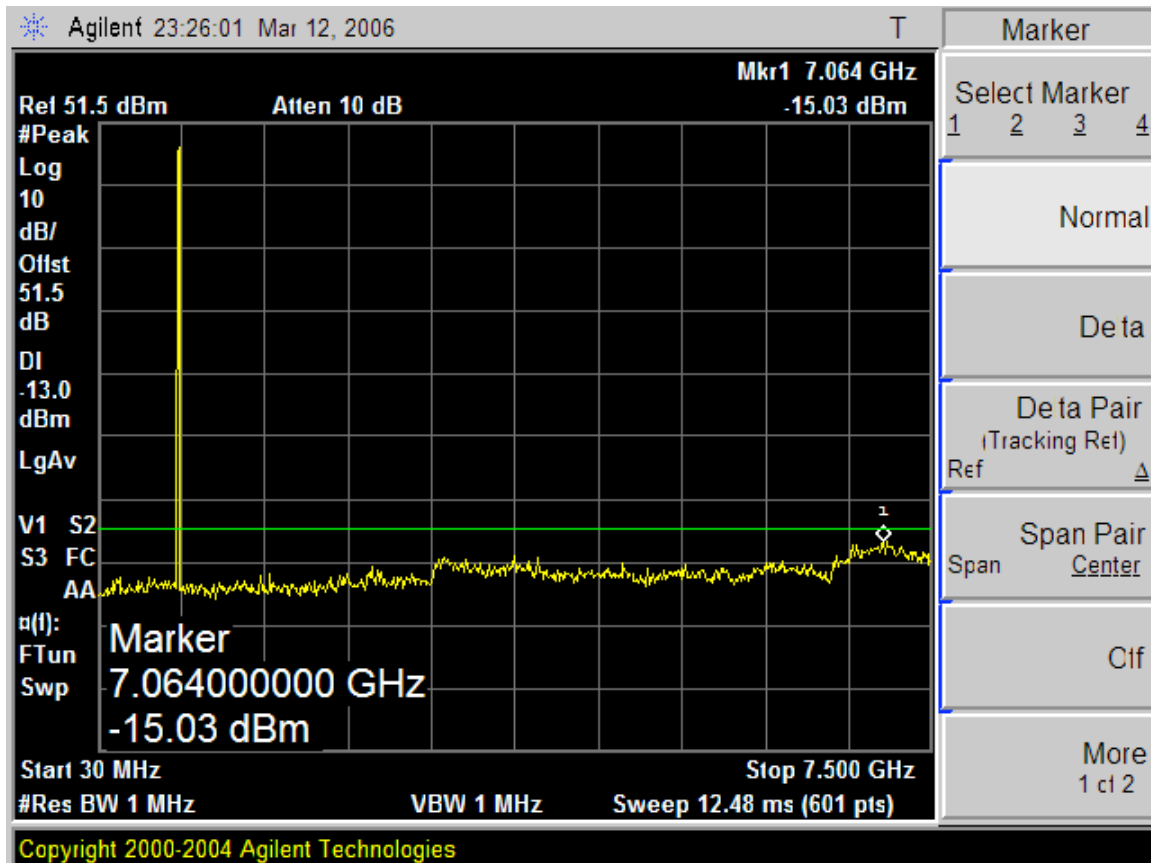
Plot#22 QPSK Conducted harmonic and spurious emissions – Low Channel



Plot#23 QPSK Conducted harmonic and spurious emissions – High Channel

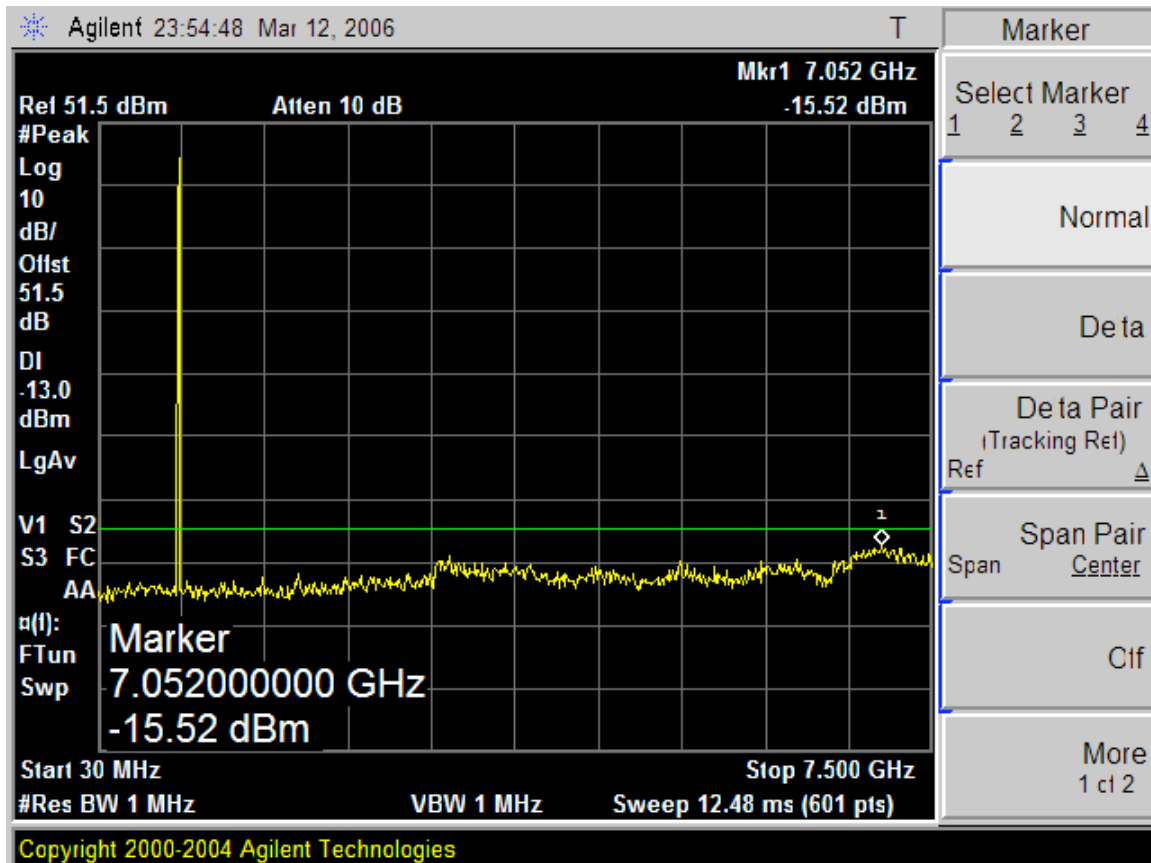


Plot#24 16QAM Conducted harmonic and spurious emissions – Low Channel

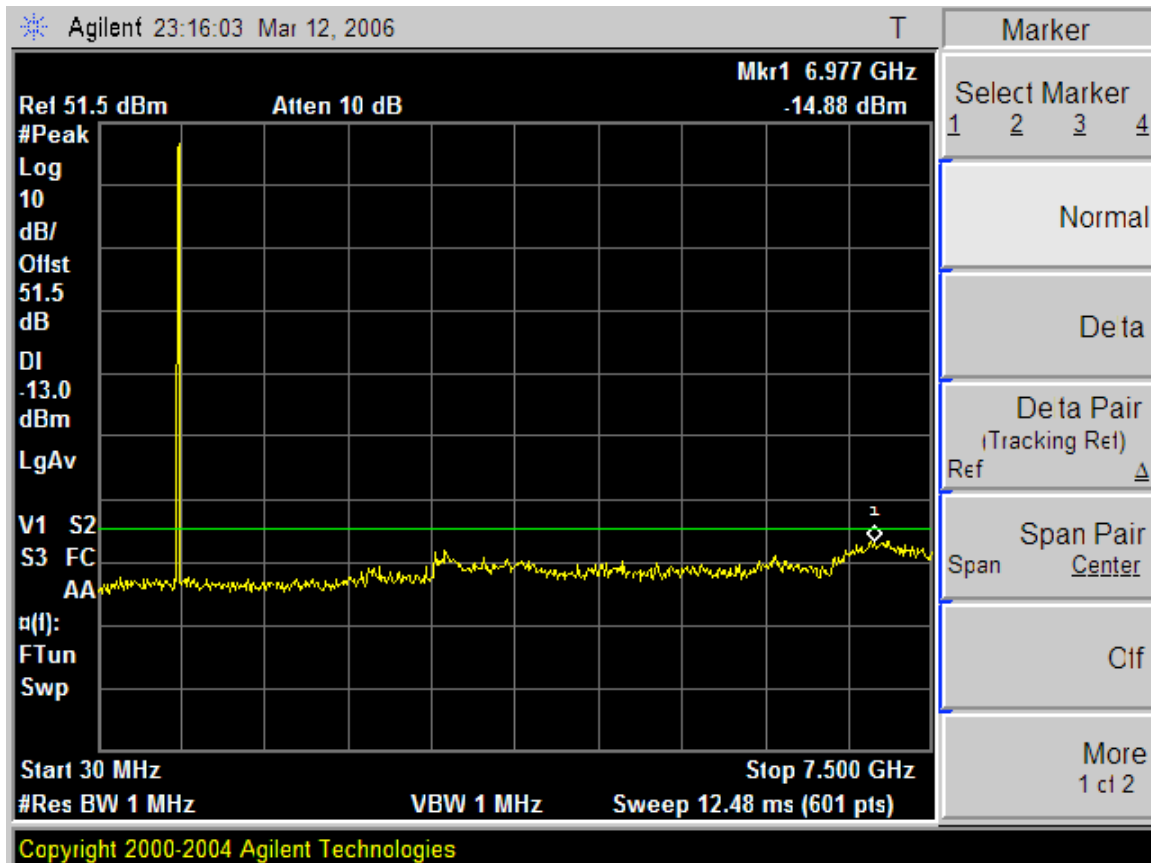




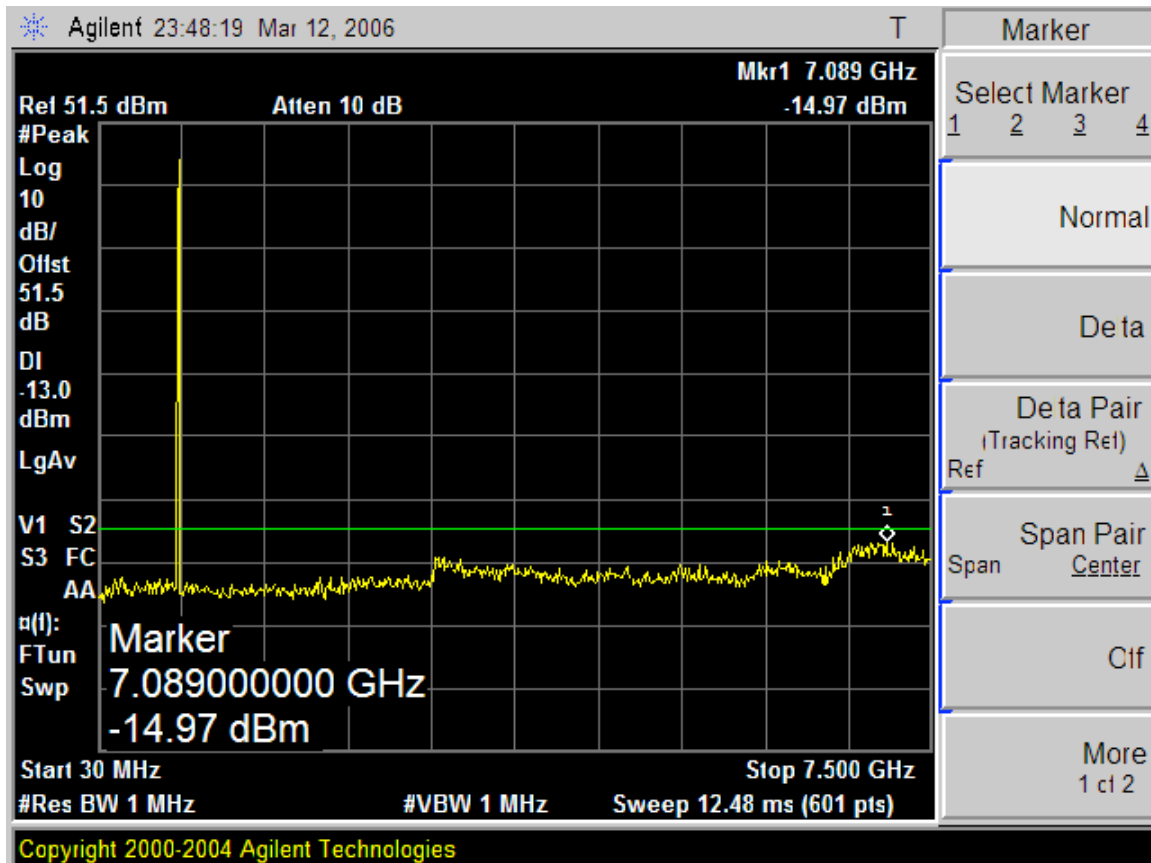
Plot#24 16QAM Conducted harmonic and spurious emissions – High Channel



Plot#24 64QAM Conducted harmonic and spurious emissions – Low Channel



Plot#24 16QAM Conducted harmonic and spurious emissions – High Channel



### Test Site And Test Dates

Test Location: Compliance Certification Services  
561 F Monterey Road  
Morgan Hill CA 95037

Test Date: 17 March 2006

All testing was performed at Compliance Certification Services either by me or under my supervision. Conducted and radiated emissions were performed using test equipment with calibration traceable to NIST, and following test procedures accepted by the industry.

A handwritten signature in blue ink, reading "T. N. Cokenias", with a long horizontal flourish extending to the right.

THOMAS N. COKENIAS  
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