# EXALT COMMUNICATIONS, INC.

## 5 GHz Radio Module
## Model: Radio Module 5 GHz

**22 August 2012**
**Report No.: SL12031601-EXA-009R1**
**(This report supersedes: SL09061508-EXT-005 rev 1)**

EMC Test Report
To: FCC Part 15.407 & RSS210 Issue8: 2010

SIEMIC, INC.
Accessing global markets

| Modifications made to the product : None |
|---|

| This Test Report is Issued Under the Authority of: | |
|---|---|
| | |
| Choon Sian Ooi<br>Test Engineer | David Zhang<br>Test Engineer |

# Laboratory Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.

In addition to testing and certification, SIEMIC provides initial design reviews and compliance management through out a project. Our extensive experience with China, Asia Pacific, North America, European, and international compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

## Accreditations for Conformity Assessment

| Country/Region | Accreditation Body | Scope |
|---|---|---|
| USA | FCC, A2LA | EMC , RF/Wireless , Telecom |
| Canada | IC, A2LA, NIST | EMC, RF/Wireless , Telecom |
| Taiwan | BSMI , NCC , NIST | EMC, RF, Telecom , Safety |
| Hong Kong | OFTA , NIST | RF/Wireless ,Telecom |
| Australia | NATA, NIST | EMC, RF, Telecom , Safety |
| Korea | KCC/RRA, NIST | EMI, EMS, RF , Telecom, Safety |
| Japan | VCCI, JATE, TELEC, RFT | EMI, RF/Wireless, Telecom |
| Mexico | NOM, COFETEL, Caniety | Safety, EMC , RF/Wireless, Telecom |
| Europe | A2LA, NIST | EMC, RF, Telecom , Safety |

## Accreditations for Product Certifications

| Country | Accreditation Body | Scope |
|---|---|---|
| USA | FCC TCB, NIST | EMC , RF , Telecom |
| Canada | IC FCB , NIST | EMC , RF , Telecom |
| Singapore | iDA, NIST | EMC , RF , Telecom |
| EU | NB | EMC & R&TTE Directive |
| Japan | MIC (RCB 208) | RF , Telecom |
| HongKong | OFTA (US002) | RF , Telecom |

This page has been left blank intentionally.

# CONTENTS

This page has been left blank intentionally.

# 1 Executive Summary & EUT information

The purpose of this test programme was to demonstrate compliance of the Exalt Communications, Inc., 5 GHz Radio Module, and Model: Radio Module 5 GHz against the current Stipulated Standards. The 5 GHz Radio Module have demonstrated compliance with the FCC 15.407 2011.

## EUT Information

| | | |
|---|---|---|
| **EUT Description** | : | The unlicensed products are fixed point-to-point radio operating in the (5250MHz to 5350MHz) & (5470MHz to 5725MHz) bands. Two units, combined with external antennas and transmission lines, make up a complete pointto-point link. Users connect Ethernet and/or time division multiplexed (TDM) signals (T1, E1 or DS3) to carry bi-directional traffic across the link in place of traditional copper wires or fiber. The system utilizes time division duplex (TDD) radio transmission, and provides the administrator selection between one of three modulation modes, and one of three occupied bandwidths. The administrator may also select the specific operating center frequency across a frequency range that is defined by the limits of the selected occupied bandwidth. The output power may be adjusted by the installer in accordance to the connected transmission system and the specific regulations or link design. The radio is connected to a flat panel or parabolic dish antenna with coaxial transmission line, or in some cases, elliptical waveguide. The transmission system is grounded, along with any lightning arrestors that may be placed at any cable egress points. The radio is typically mounted outside on a tower, a mast on the roof of a building, or a wall on the outside of a building. Alternatively the radio could be mounted in a grounded equipment rack, and is connected to DC power, via either direct DC source or AC/DC converter, with power grounding, as required. The user's services (T1, E1, DS3, Ethernet) are directly connected, along with any diagnostic equipment. The radio chassis has a separate grounding connector, if required for separate chassis grounding. |
| **Model No** | : | Radio Module 5 GHz |
| **Input Power** | : | 120 Vac |
| **Classification Per Stipulated Test Standard** | : | NII |

**Note:** Manufacturer declares the device employ TPC feature.

# 2 TECHNICAL DETAILS

| | |
|---|---|
| **Purpose** | Compliance testing of 5 GHz Radio Module with stipulated standard |
| **Applicant / Client** | Exalt Communications, Inc. |
| **Manufacturer** | Exalt Communications, Inc.<br>254 E Hacienda Avenue<br>Campbell, CA 95008-6617 USA |
| **Laboratory performing the tests** | SIEMIC Laboratories<br>775 Montague Expressway<br>Milpitas, California 95035, USA |
| **Test report reference number** | SL12031601-EXA-009R1 |
| **Date EUT received** | 01 Augst 2012 |
| **Standard applied** | 47 CFR §15.407 (2011) |
| **Dates of test (from – to)** | August 01-15, 2012 |
| **No of Units:** | 1 |
| **Equipment Category:** | NII |
| **Trade Name:** | Exalt Communications, Inc. |
| **Model :** | Radio Module 5 GHz |
| **RF Operating Frequency (ies)** | **(5250MHz to 5350MHz) & (5470MHz to 5725MHz)** |

| Frequency Band & channel Bandwidth | Low Channel | Mid Channel | High Channel |
|---|---|---|---|
| 5.2GHz band (8MHz Bandwidth) | 5257MHz | 5300MHz | 5343MHz |
| 5.2GHz band (16MHz Bandwidth) | 5261MHz | 5300MHz | 5340MHz |
| 5.2GHz band (32MHz Bandwidth) | 5269MHz | 5300MHz | 5331MHz |
| 5.4GHz band (8MHz Bandwidth) | 5477MHz | 5596MHz | 5718MHz |
| 5.4GHz band (16MHz Bandwidth) | 5479MHz | 5592MHz | 5715MHz |
| 5.4GHz band (32MHz Bandwidth) | 5489MHz | 5581MHz | 5706MHz |

| | |
|---|---|
| **Channel Bandwidth:** | 8MHz Channel Bandwidth, 16MHz Channel Bandwidth, 32MHz Channel Bandwidth |
| **Modulation :** | Mode 1:QPSK, Mode 2:16QAM, Mode 3:64QAM |
| **FCC ID :** | TTM-105P25T |
| **IC ID :** | 6254A-105P25T |

# 3 MODIFICATION

**NONE**

# 4 TEST SUMMARY

The product was tested in accordance with the following specifications. All Testing has been performed according to below product classification:

single carrier QAM modulated system

**Test Results Summary**

| Test Standard | | Description | Pass / Fail |
|---|---|---|---|
| CFR 47 Part 15.407: 2011 | RSS 210 Issue 8: 2010 | | |
| 15.203 | - | Antenna Requirement | Pass |
| 15.205 | RSS210(A8.5) | Restricted Band of Operation | Pass |
| 15.207(a) | RSSGen(7.2.2) | Conducted Emissions Voltage | Pass |
| 15.407(a) | RSS210(A9.2(2)) | 26dB and 99% Occupied Bandwidth | Pass |
| 15.407(b) | RSS210(A9.2(2)) | Output Power | Pass |
| 15.407(c) | RSS210(A8.4) | Antenna Gain > 6 dBi | Pass |
| 15.209; 15.407(b) | RSS210(A9.3(a)) | Radiated Spurious Emissions | Pass |
| 15.407(a) | RSS210(A9.2(2)) | Power Spectral Density | Pass |
| 15.407 (f) | RSSGen(5.5) | RF Exposure requirement | Pass |
| 15.207(a) (6) | - | Peak Excursion ratio | Pass |
| | RSSGen(4.8) | Receiver Spurious Emissions | Pass |
| ANSI C63.4: 2003/ RSS-Gen Issue 2: 2007<br>PS: All measurement uncertainties are not taken into consideration for all presented test result. | | | |

# 5 MEASUREMENTS, EXAMINATION AND DERIVED RESULTS

## 5.1 Antenna Requirement

**Requirement(s):** 47 CFR §15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Antenna requirement must meet at least one of the following:

a) Antenna must be permanently attached to the device.

b) Antenna must use a unique type of connector to attach to the device.

c) Device must be professionally installed. Installer shall be responsible for ensuring that the correct antenna is employed with the device.

The device must be professionally installed. Installer shall be responsible for ensuring that the correct antenna is employed with the device.

Tested Antenna Model: SPD6-5.2, Antenna gain 37.5dBi

Tested Antenna Model: FP2-5-28, Antenna gain 28dBi

*Table 7 Supported 5GHz antennas*

| Manufacturer | Model # | Description | Midband Gain (dBi) | 3dB (Azimuth/Elevation) Beamwidth (degrees) |
|---|---|---|---|---|
| Andrew | P2F-52-N | 2-foot Dish | 29.4 | 5.4 |
| Andrew | PX2F-52-N | 2-foot Xpol Dish | 29.4 | 5.4 |
| Andrew | P3F-52-N | 3-foot Dish | 33.4 | 3.8 |
| Andrew | PX3F-52-N | 3-foot Xpol Dish | 33.4 | 3.8 |
| Andrew | P4F-52-N | 4-foot Dish | 34.9 | 3.0 |
| Andrew | PX4F-52-N | 4-foot Xpol Dish | 34.9 | 3.0 |
| Andrew | HP2F-52-NPA | 2-foot HP Dish | 29.0 | 5.4 |
| Andrew | HPX2F-52-NPA | 2-foot Xpol HP | 29.0 | 5.4 |
| Andrew | HP3F-52-NPA | 3-foot HP Dish | 33.0 | 3.8 |
| Andrew | HPX3F-52-NPA | 3-foot Xpol HP | 33.0 | 3.8 |
| Andrew | HP4F-52-NPA | 4-foot HP Dish | 34.5 | 3.0 |
| Andrew | HPX4F-52-NPA | 4-foot Xpol HP | 34.5 | 3.0 |
| Andrew | HP6F-52-NPA | 6-foot HP Dish | 37.2 | 1.8 |
| Andrew | HPX6F-52-NPA | 6-foot Xpol HP | 37.2 | 1.8 |
| Gabriel | DFPD2-52 | 2-foot Panel | 28.0 | 4.6 |
| Gabriel | QF2-52-N | 2-foot Dish | 28.5 | 5.6 |
| Gabriel | QF2.5-52-N | 2.5-foot Dish | 31.2 | 4.4 |
| Gabriel | QF4-52-N | 4-foot Dish | 34.8 | 2.7 |
| Gabriel | QFD2-52 | 2-foot Xpol Dish | 28.4 | 5.6 |
| Gabriel | QFD2.5-52 | 2.5-foot Xpol Dish | 31.1 | 4.4 |
| Gabriel | QFD4-52 | 4-foot Xpol Dish | 34.7 | 2.7 |
| Gabriel | HQF2-52-N | 2-foot HP Dish | 28.2 | 5.7 |
| Gabriel | HQF4-52-N | 4-foot HP Dish | 34.4 | 2.8 |
| Gabriel | HQF6-52-N | 6-foot HP Dish | 37.4 | 1.9 |
| Gabriel | HQFD2-52 | 2-foot Xpol HP | 28.1 | 5.7 |
| Gabriel | HQFD2.5-52 | 2.5-foot Xpol HP | 30.7 | 4.5 |
| Gabriel | HQFD4-52 | 4-foot Xpol HP | 34.3 | 2.8 |
| Gabriel | HQFD6-52 | 6-foot Xpol HP | 37.3 | 1.9 |
| MTI | MT-486004 | 18-inch Panel | 26.0 | 6.0 |
| MTI | MT-486001 | 2-foot Panel | 28.0 | 4.5 |
| Radio Waves | FP2-5-28 | 2-foot Panel | 28.0 | 4.5 |
| Radio Waves | SP2-5.2 | 2-foot Dish | 29.0 | 6.1 |
| Radio Waves | HP2-5.2 | 2-foot HP Dish | 28.6 | 6.1 |
| Radio Waves | SP3-5.2 | 3-foot Dish | 32.0 | 4.0 |
| Radio Waves | SP4-5.2 | 4-foot Dish | 34.8 | 3.0 |
| Radio Waves | SPD2-5.2 | 2-foot Xpol Dish | 28.1 | 6.2 |

*Table 7 Supported 5GHz antennas (Continued)*

| Manufacturer | Model # | Description | Midband Gain (dBi) | 3dB (Azimuth/Elevation) Beamwidth (degrees) |
|---|---|---|---|---|
| Radio Waves | SPD3-5.2 | 3-foot Xpol Dish | 31.1 | 4.2 |
| Radio Waves | SPD4-5.2 | 4-foot Xpol Dish | 34.4 | 3.1 |
| Radio Waves | SPD6-5.2 | 6-foot Xpol Dish | 37.5 | 2.1 |
| RFS | SPF2-52A | 2-foot Dish | 27.9 | 6.2 |
| RFS | SPF3-52A | 3-foot Dish | 31.4 | 4.2 |
| RFS | SPF4-52A | 4-foot Dish | 33.9 | 3.1 |
| RFS | SPF6-52A | 6-foot Dish | 37.4 | 2.1 |
| RFS | SDF4-52A | 4-foot HP Dish | 33.9 | 3.1 |
| RFS | SDF6-52A | 6-foot HP Dish | 37.4 | 2.1 |
| RFS | MA0528-28AN | 2-foot Panel | 28.0 | 4.5 |

# 5.2 Conducted Emissions Voltage

Requirement :

| Frequency of emission (MHz) | Conducted limit (dBµV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15–0.5 | 66 to 56* | 56 to 46* |
| 0.5–5 | 56 | 46 |
| 5–30 | 60 | 50 |

*Decreases with the logarithm of the frequency.

**Procedures:**

1. All possible modes of operation were investigated. Only the 6 worst case emissions measured, using the correct CISPR and Average detectors, are reported. All other emissions were relatively insignificant.
2. A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
3. Conducted Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 9kHz – 30MHz (Average & Quasi-peak) is ±3.5dB.
4. Environmental Conditions

| | |
|---|---|
| Temperature | 23°C |
| Relative Humidity | 50% |
| Atmospheric Pressure | 1019mbar |

Test Date : August 01-15, 2012
Tested By : Choon Sian Ooi

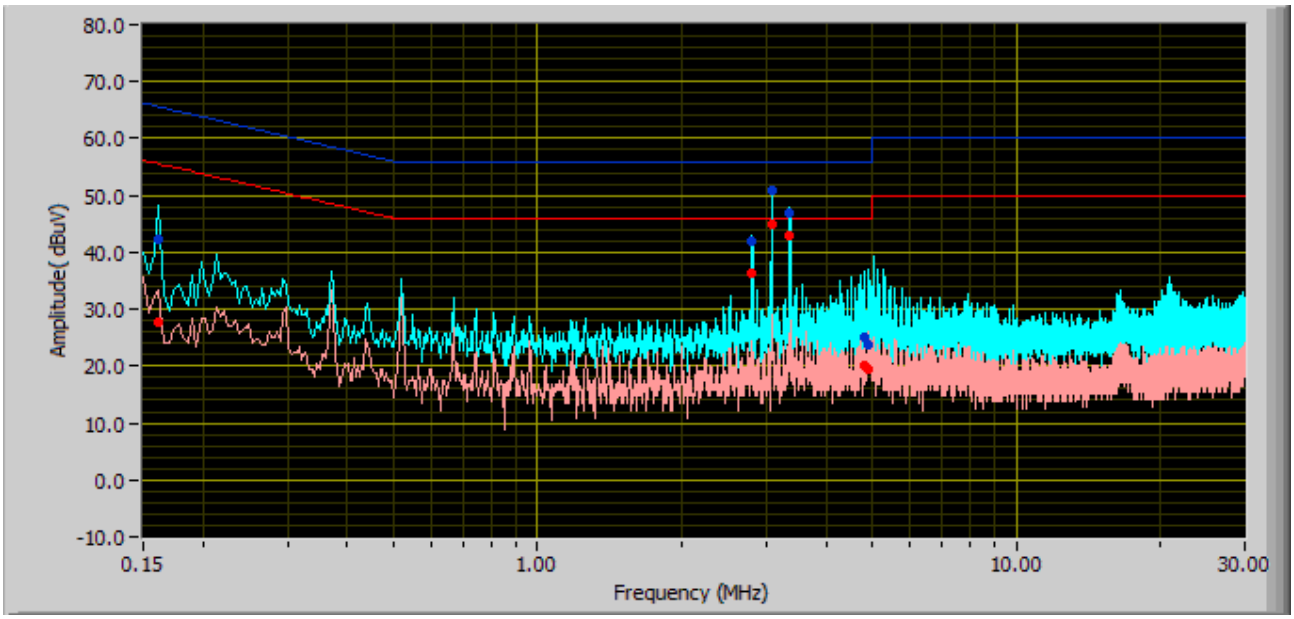
**Results:**

**Results:**

**Note: 2**

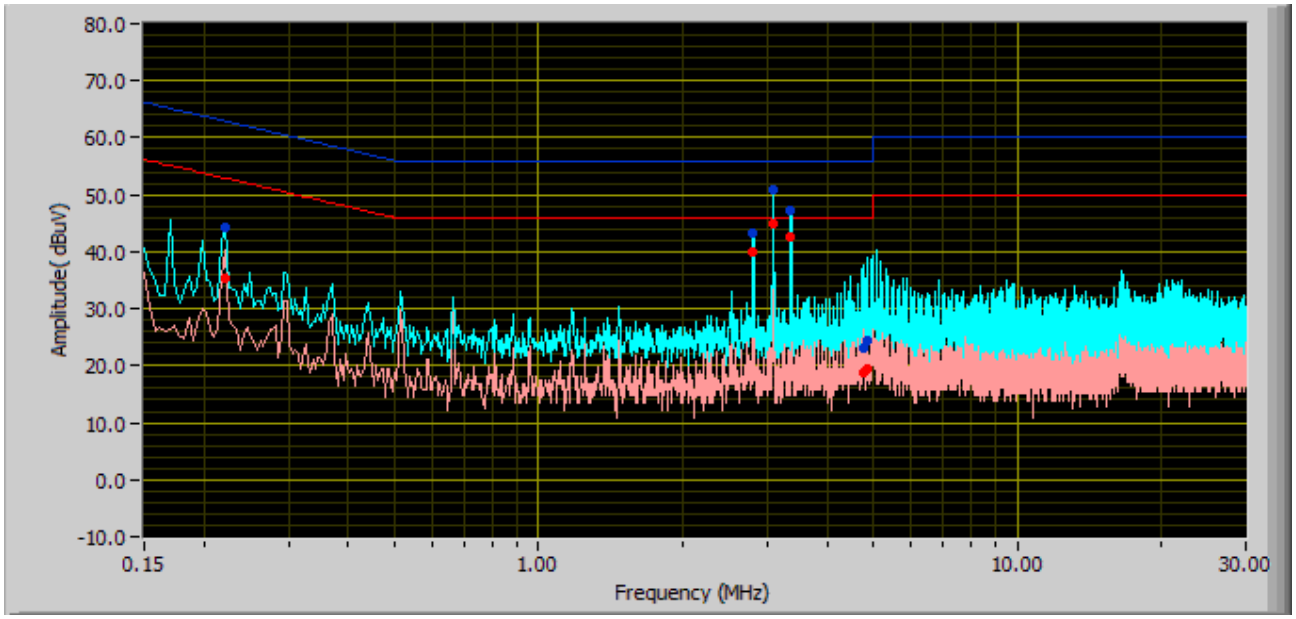
Average Limit

Quasi-Peak Limit




**Phase Line Plot at 120Vac, 60Hz**

| Line Under Test | Frequency (MHz) | Corrected Amplitude (dBuV) QP | Limit (dBuV) QP | Margin (dB) QP | Corrected Amplitude (dBuV) AVG | Limit (dBuV) AVG | Margin (dB) AVG |
|---|---|---|---|---|---|---|---|
| **Phase** | 3.09 | 50.80 | 56.00 | -5.20 | 45.88 | 46.00 | -0.12 |
| **Phase** | 3.37 | 47.03 | 56.00 | -8.97 | 43.09 | 46.00 | -2.91 |
| **Phase** | 2.80 | 42.09 | 56.00 | -13.91 | 36.44 | 46.00 | -9.56 |
| **Phase** | 0.16 | 42.22 | 65.54 | -23.32 | 27.83 | 55.54 | -27.71 |
| **Phase** | 4.89 | 23.89 | 56.00 | -32.11 | 19.58 | 46.00 | -26.42 |
| **Phase** | 4.81 | 24.96 | 56.00 | -31.04 | 20.18 | 46.00 | -25.82 |




**Neutral Line Plot at 120Vac, 60Hz**

| Line Under Test | Frequency (MHz) | Corrected Amplitude (dBuV) QP | Limit (dBuV) QP | Margin (dB) QP | Corrected Amplitude (dBuV) AVG | Limit (dBuV) AVG | Margin (dB) AVG |
|---|---|---|---|---|---|---|---|
| **Neutral** | 3.09 | 50.74 | 56.00 | -5.26 | 45.88 | 46.00 | -0.12 |
| **Neutral** | 3.37 | 47.39 | 56.00 | -8.61 | 42.70 | 46.00 | -3.30 |
| **Neutral** | 2.81 | 43.19 | 56.00 | -12.81 | 39.99 | 46.00 | -6.01 |
| **Neutral** | 4.86 | 24.26 | 56.00 | -31.74 | 19.58 | 46.00 | -26.42 |
| **Neutral** | 0.22 | 44.25 | 62.87 | -18.62 | 35.22 | 52.87 | -17.65 |
| **Neutral** | 4.79 | 23.10 | 56.00 | -32.90 | 18.94 | 46.00 | -27.06 |

# 5.3 26dB & 99% Occupied Bandwidth

1. Conducted Measurement
   EUT was set for low , mid, high channel with modulated mode and highest RF output power.
   The spectrum analyzer was connected to the antenna terminal.
2. Environmental Conditions

| | |
|---|---|
| Temperature | 23°C |
| Relative Humidity | 50% |
| Atmospheric Pressure | 1019mbar |

3. Conducted Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 40GHz is ±1.5dB.
4. Test Date : August 01-15, 2012
   Tested By : Choon Sian Ooi

**Requirement(s):** 47 CFR §15.407(a); RSS210(A9.2(2))

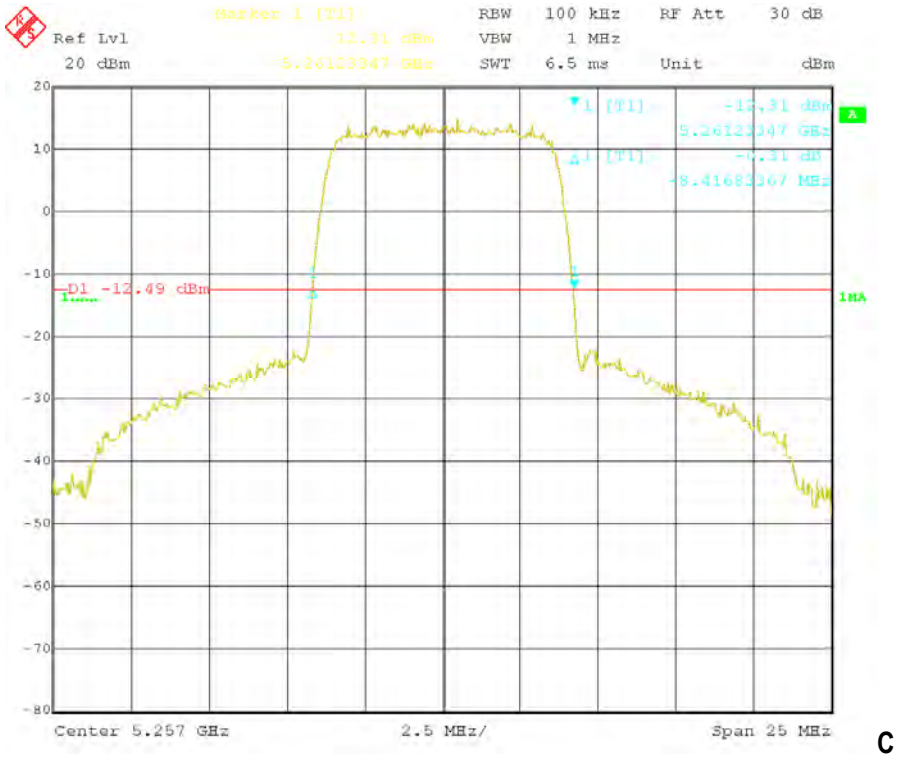
**Procedures:** The 26dB and 99% bandwidths were measured conducted using a spectrum analyzer at low, mid, and hi channels. (KDB 789033 D01, Section E & F)

**5.3GHz Bands**

**Mode: 1 = QPSK , 8MHz Channel Bandwidth**

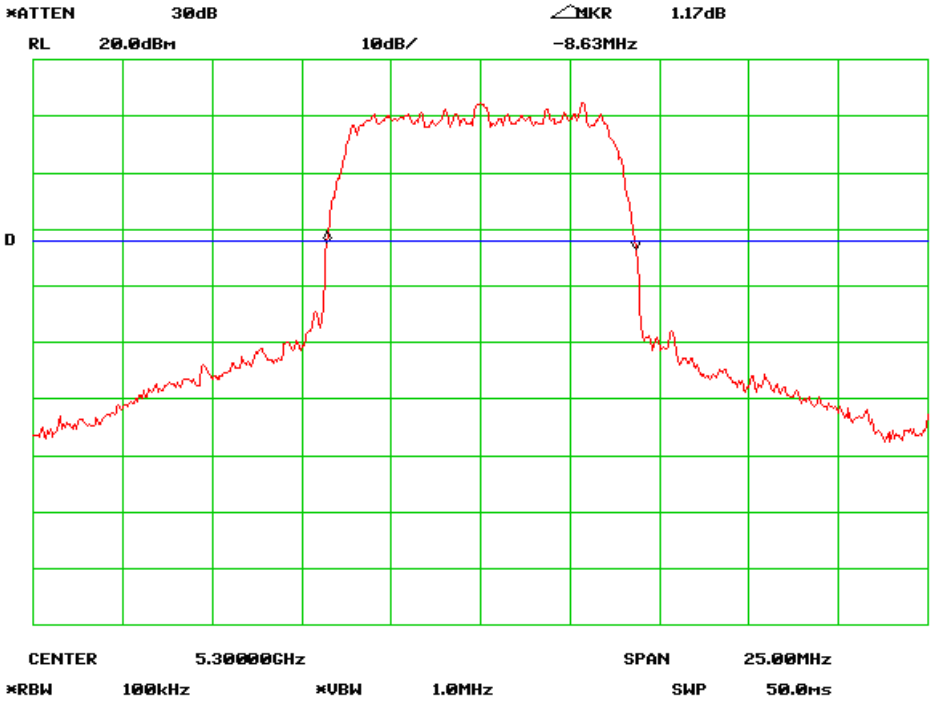
| Mode | Channel Bandwidth | Mode | 26 dB Channel Bandwidth (MHz) | 99% Channel Bandwidth (MHz) |
|---|---|---|---|---|
| Mode1 | 8MHz | Low Channel | 8.42 | 7.54 |
| | 8MHz | Mid Channel | 8.63 | 7.58 |
| | 8MHz | High Channel | 8.42 | 7.58 |

Refer to the attached plots.

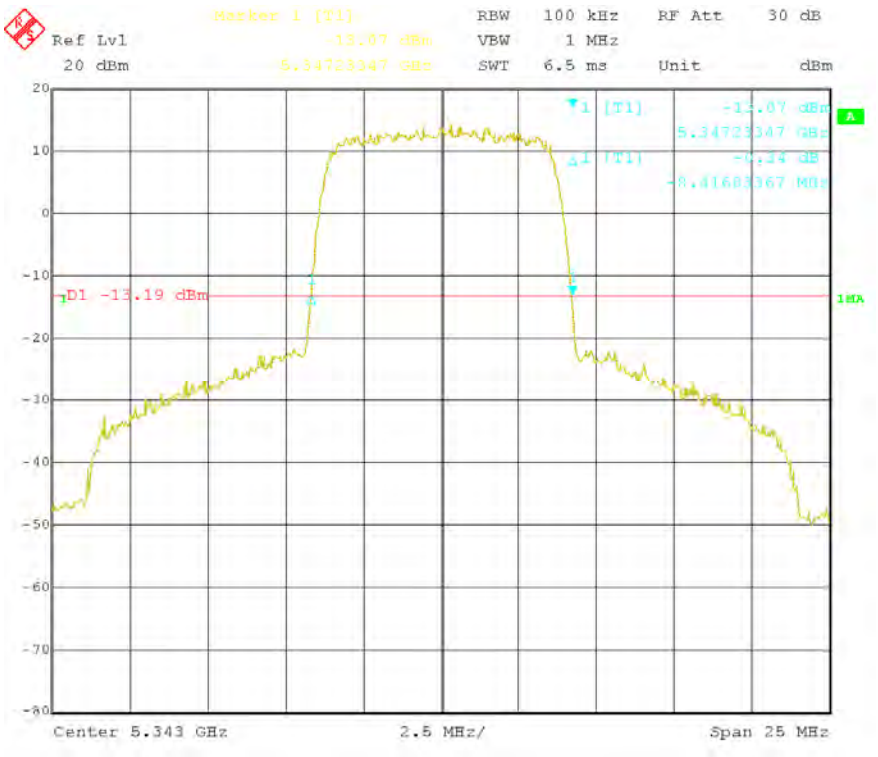



C

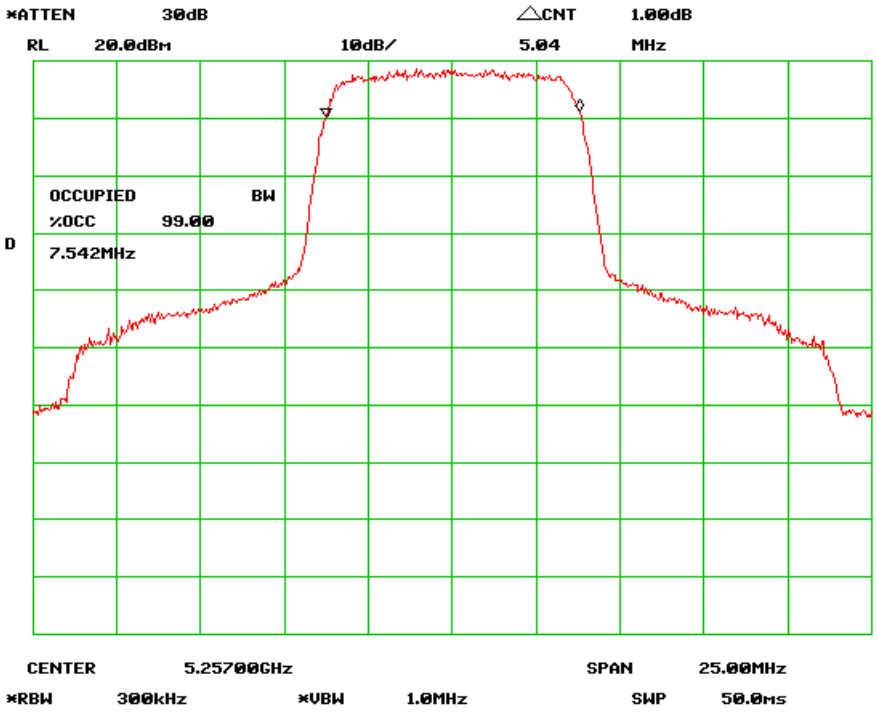
**26dB-Low Channel**



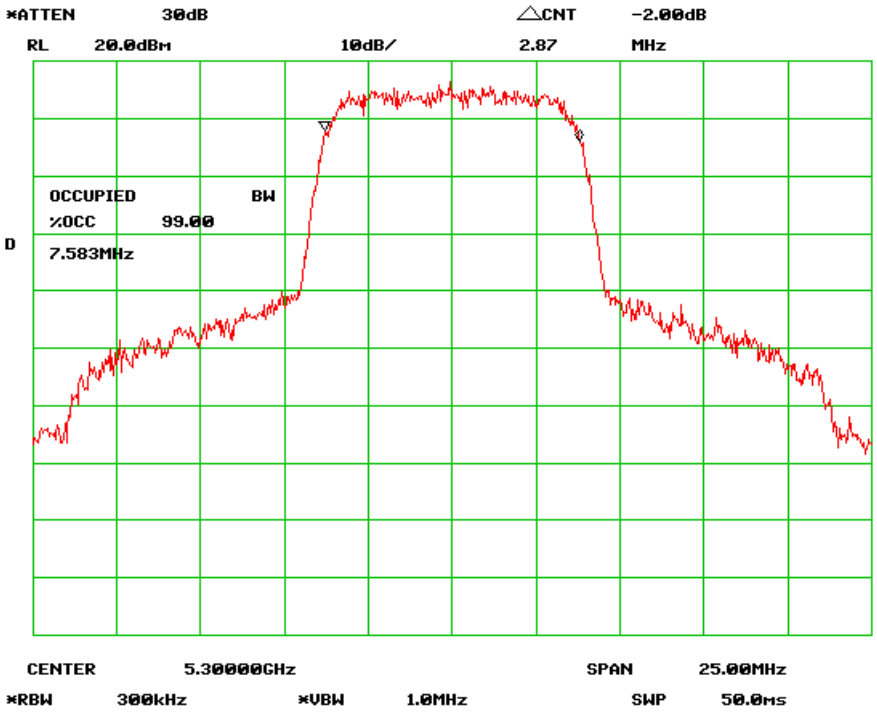

**26dB-Mid Channel**



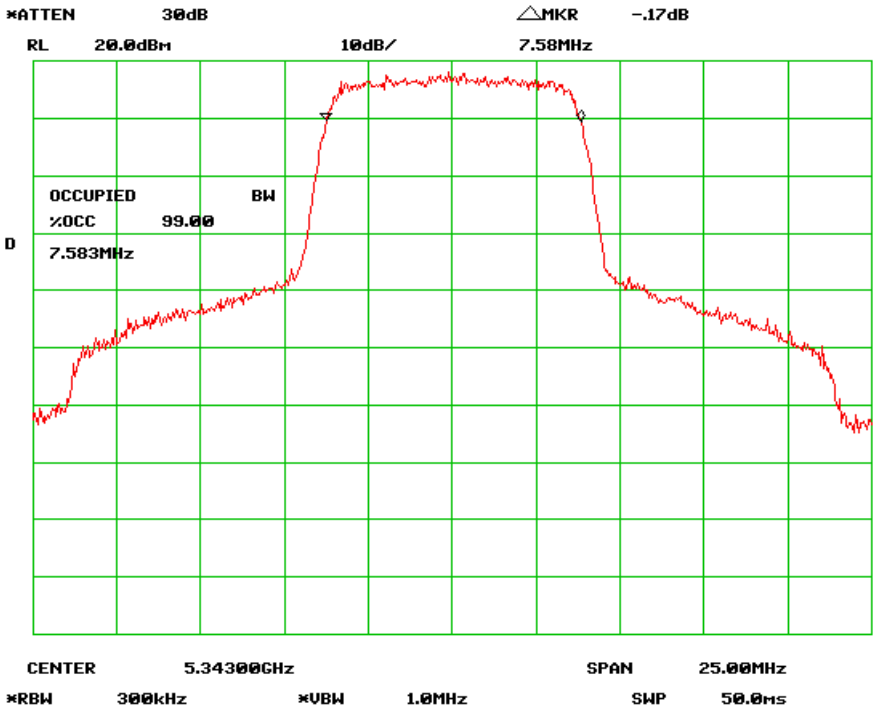

**26dB-High Channel**




**99% Bandwidth-Low Channel**



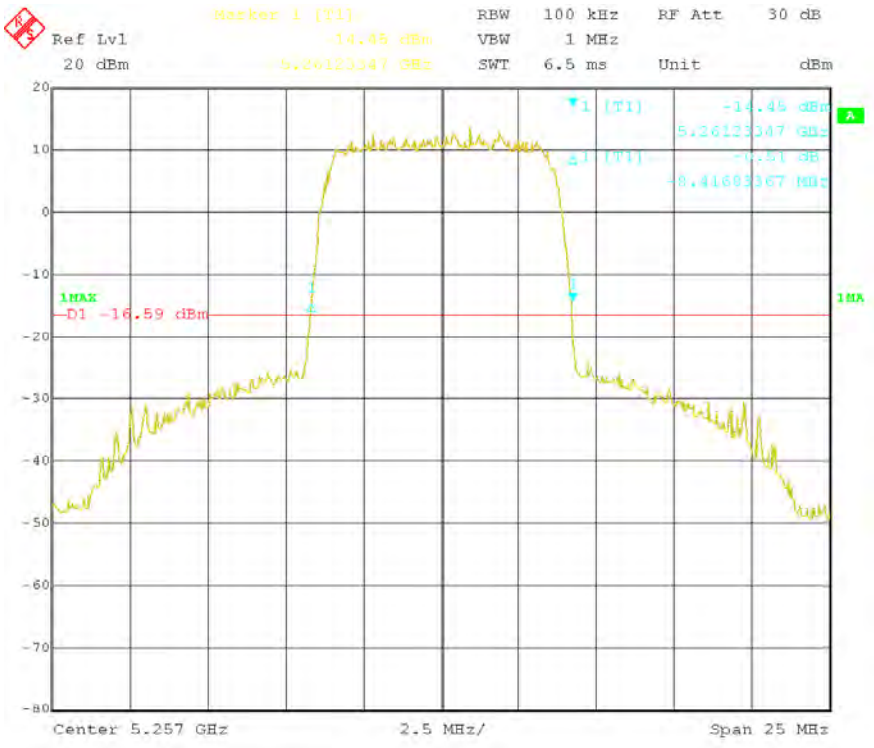

**99% Bandwidth-Mid Channel**



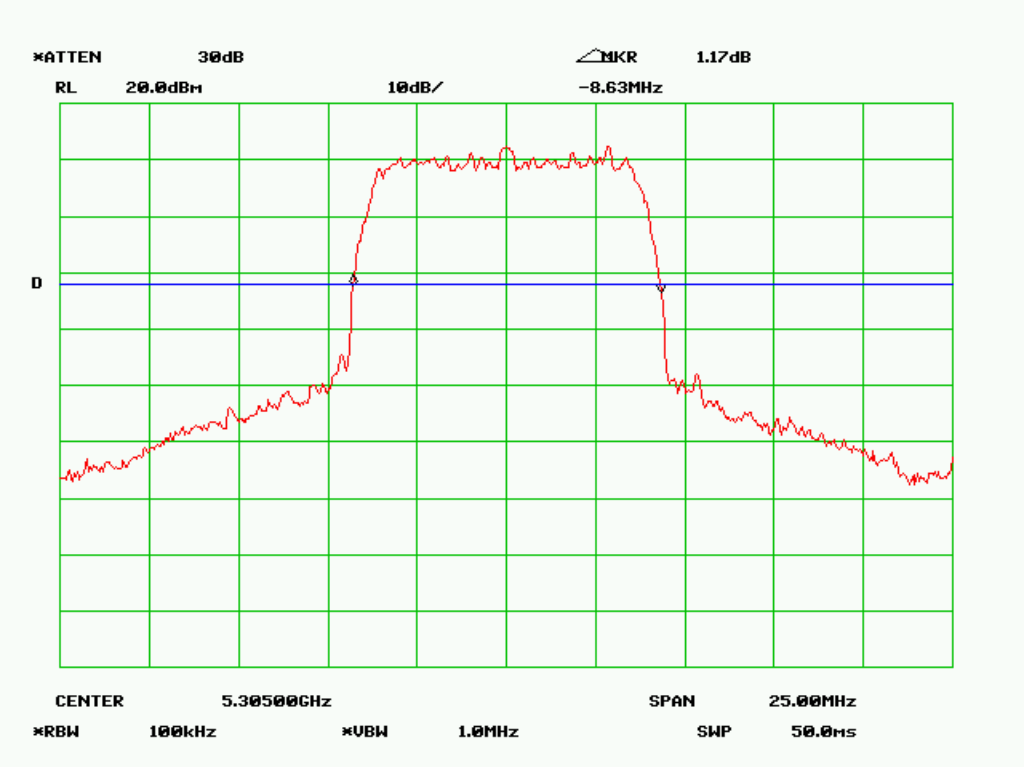

**99% Bandwidth-High Channel**

**Mode: 2 = 16QAM, 8MHz Channel Bandwidth**

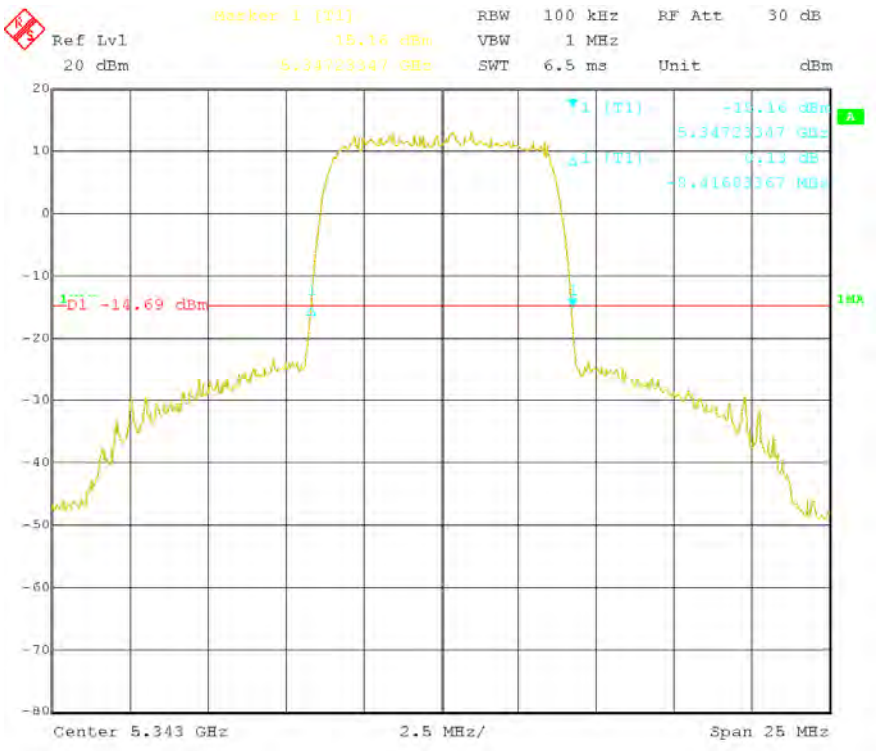
| Mode | Channel Bandwidth | Mode | 26 dB Channel Bandwidth (MHz) | 99% Channel Bandwidth (MHz) |
|---|---|---|---|---|
| Mode 2 | 8MHz | Low Channel | 8.42 | 7.54 |
| | 8MHz | Mid Channel | 8.63 | 7.54 |
| | 8MHz | High Channel | 8.42 | 7.50 |



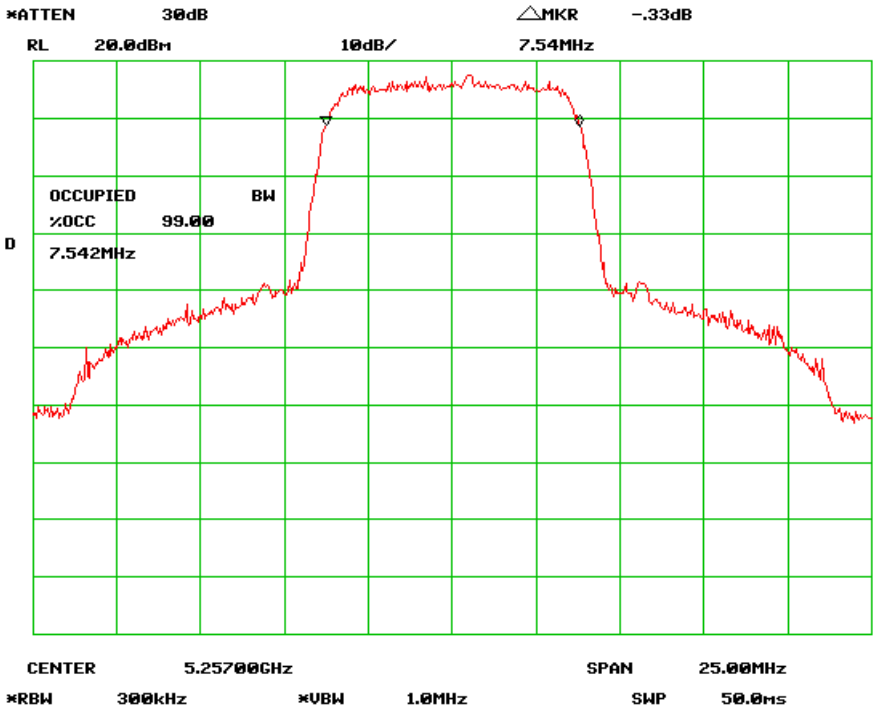

**26 dB Bandwidth-Low Channel**



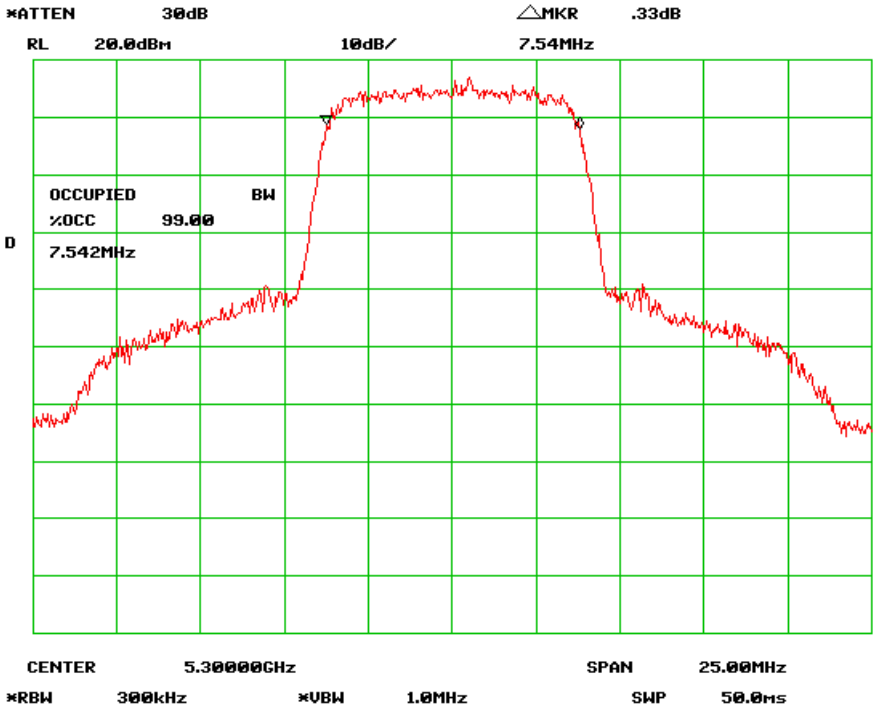

**26 dB Bandwidth-Mid Channel**



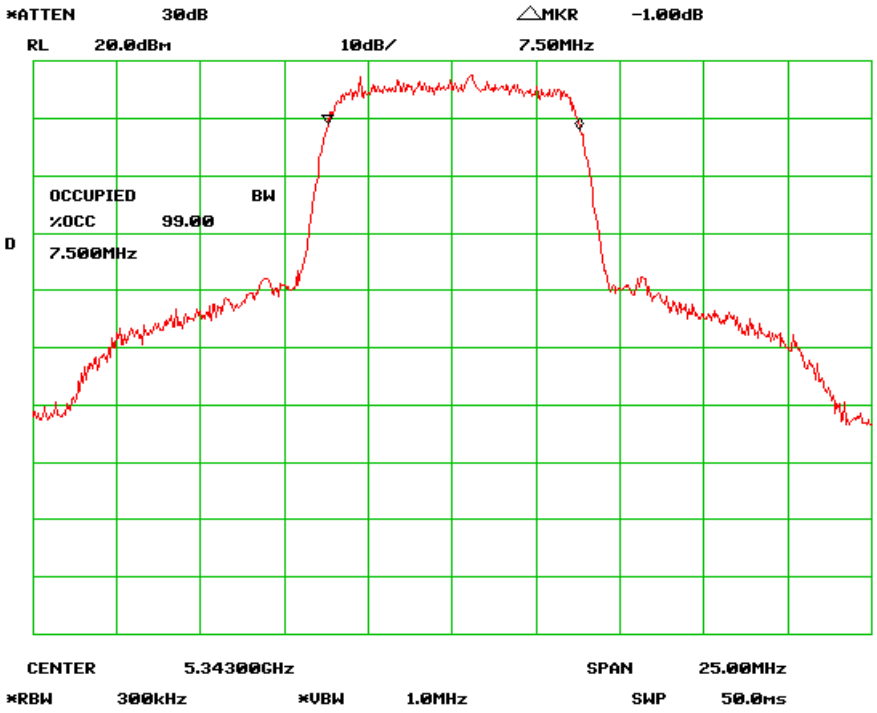

**26 dB Bandwidth-High Channel**




**99% Bandwidth-Low Channel**



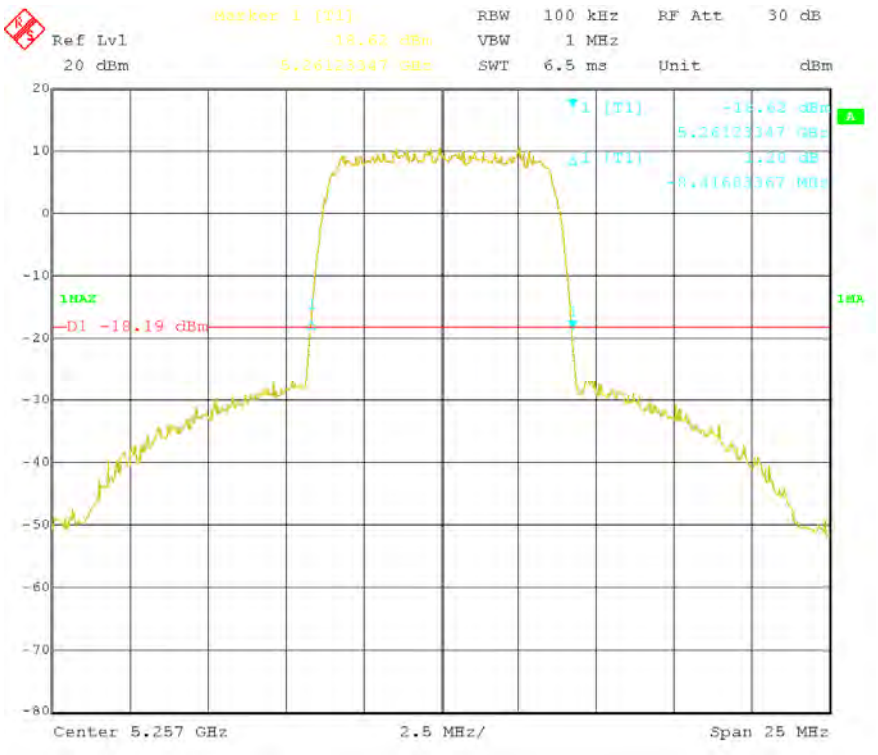

**99% Bandwidth-Mid Channel**



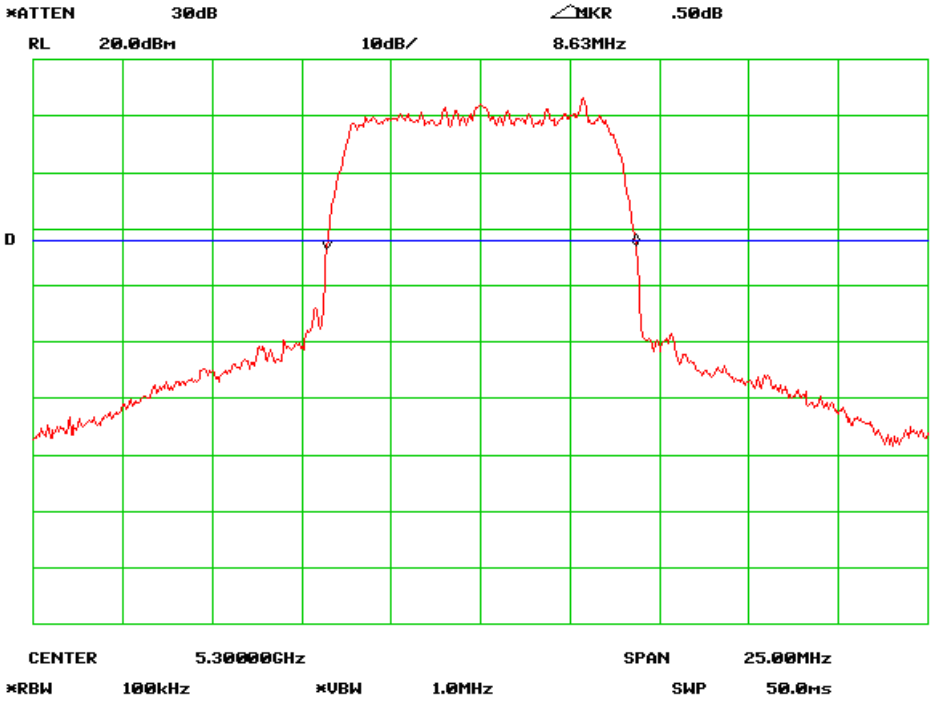

**99% Bandwidth-High Channel**

**Mode: 3 = 64QAM, 8MHz Channel Bandwidth**

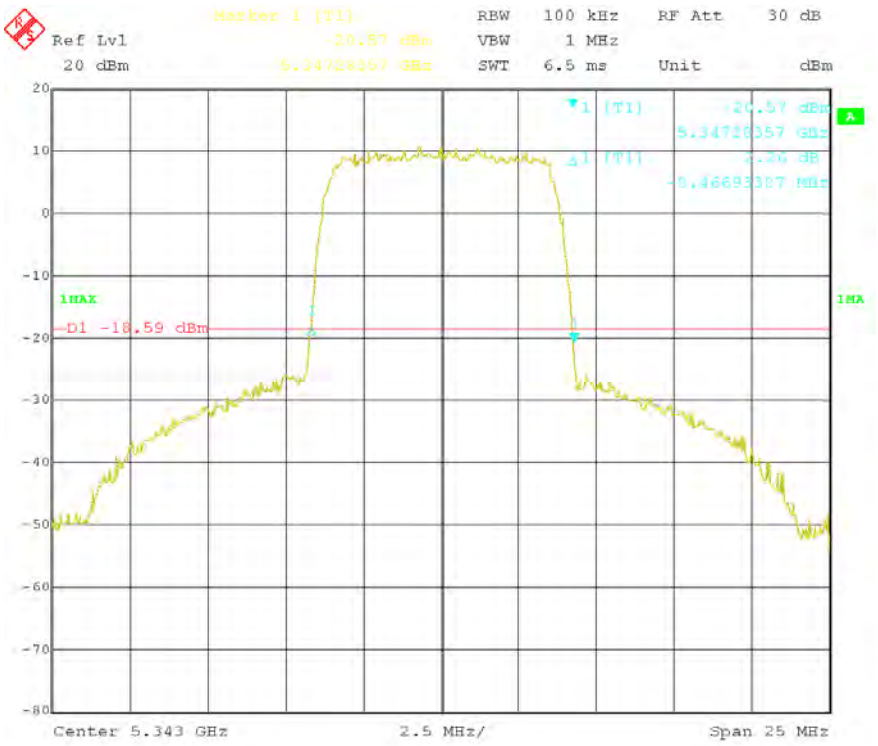
| Mode | Channel Bandwidth | Mode | 26 dB Channel Bandwidth (MHz) | 99% Channel Bandwidth (MHz) |
|---|---|---|---|---|
| Mode 3 | 8MHz | Low Channel | 8.42 | 7.54 |
| | 8MHz | Mid Channel | 8.63 | 7.54 |
| | 8MHz | High Channel | 8.47 | 7.58 |



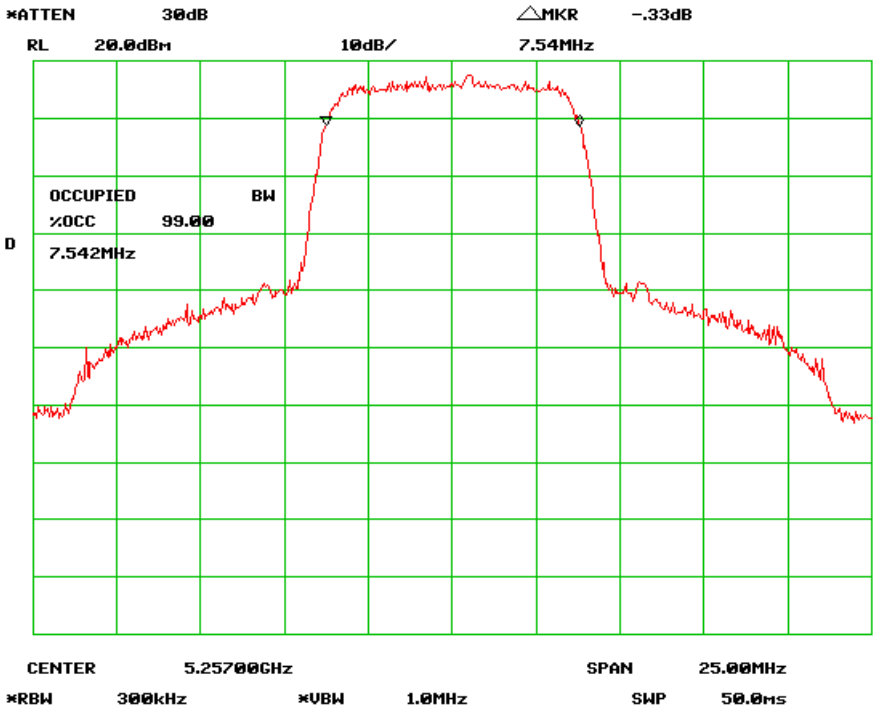

**26 dB Bandwidth-Low Channel**



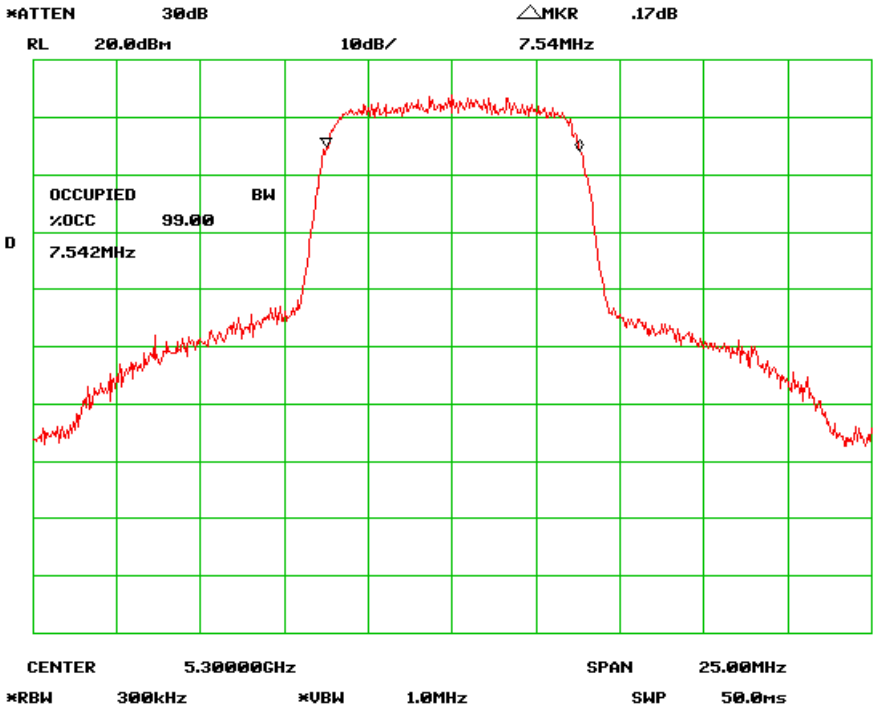

**26 dB Bandwidth-Mid Channel**



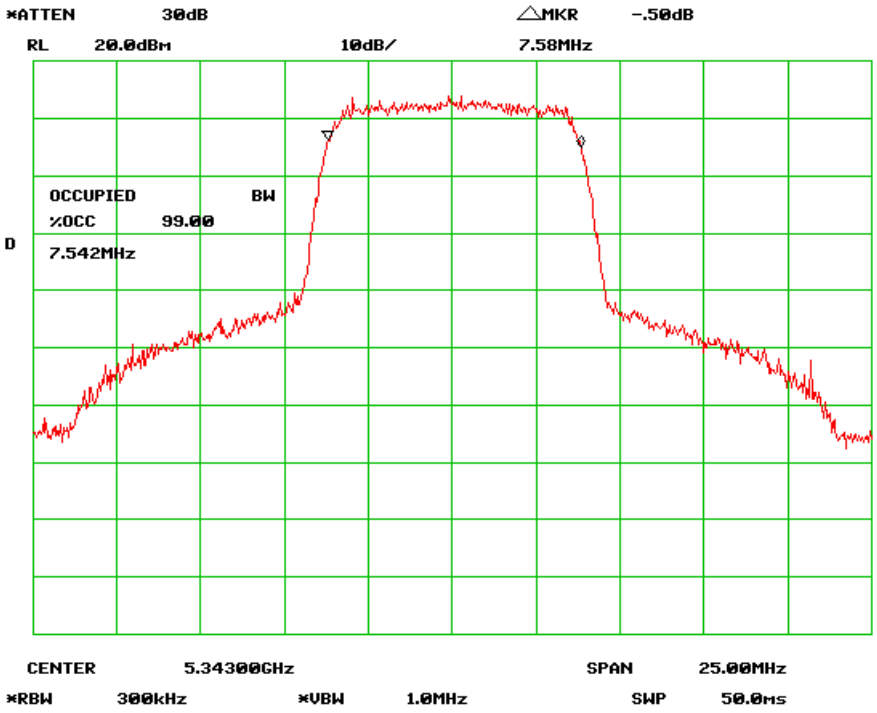

**26 dB Bandwidth-High Channel**




**99% Bandwidth-Low Channel**




**99% Bandwidth-Mid Channel**

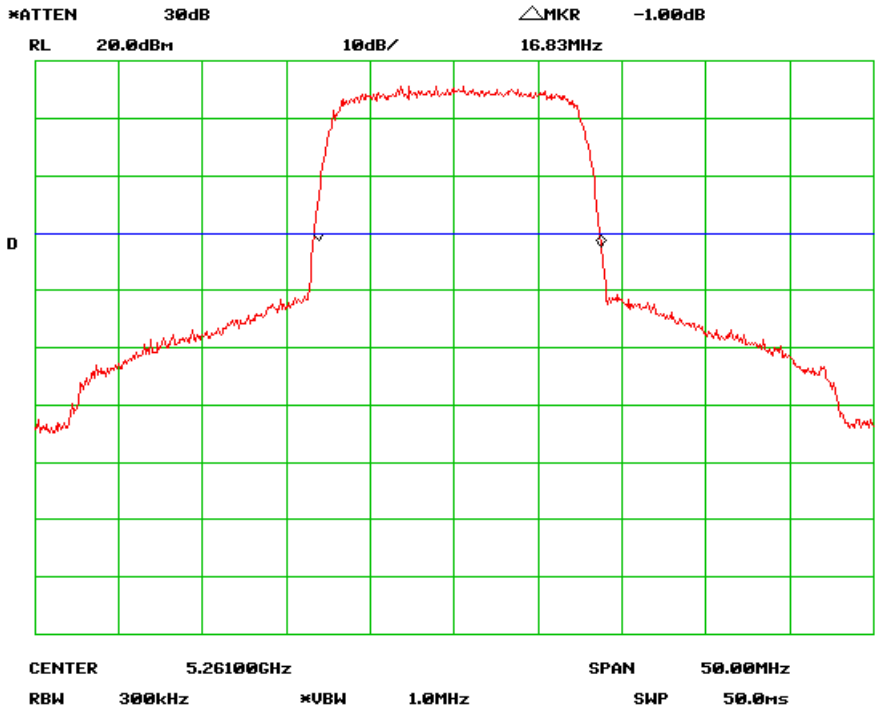



**99% Bandwidth-High Channel**

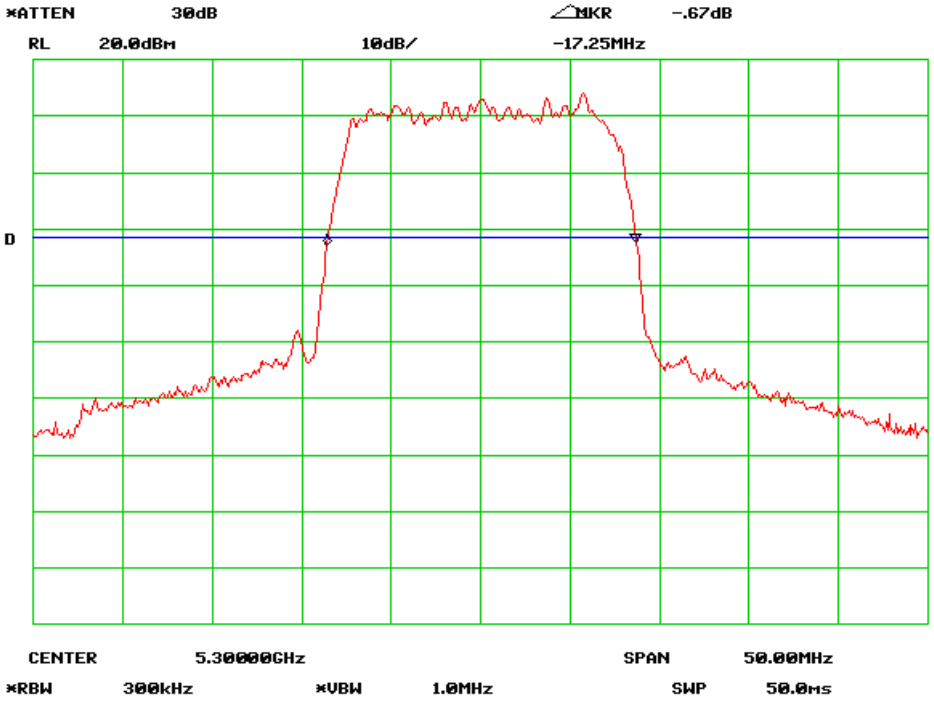
**Mode: 1 = QPSK , 16MHz Channel Bandwidth**

| Mode | Channel Bandwidth | Mode | 26 dB Channel Bandwidth (MHz) | 99% Channel Bandwidth (MHz) |
|---|---|---|---|---|
| Mode 1 | 16MHz | Low Channel | 16.83 | 14.90 |
| | 16MHz | Mid Channel | 17.25 | 14.85 |
| | 16MHz | High Channel | 16.83 | 14.90 |

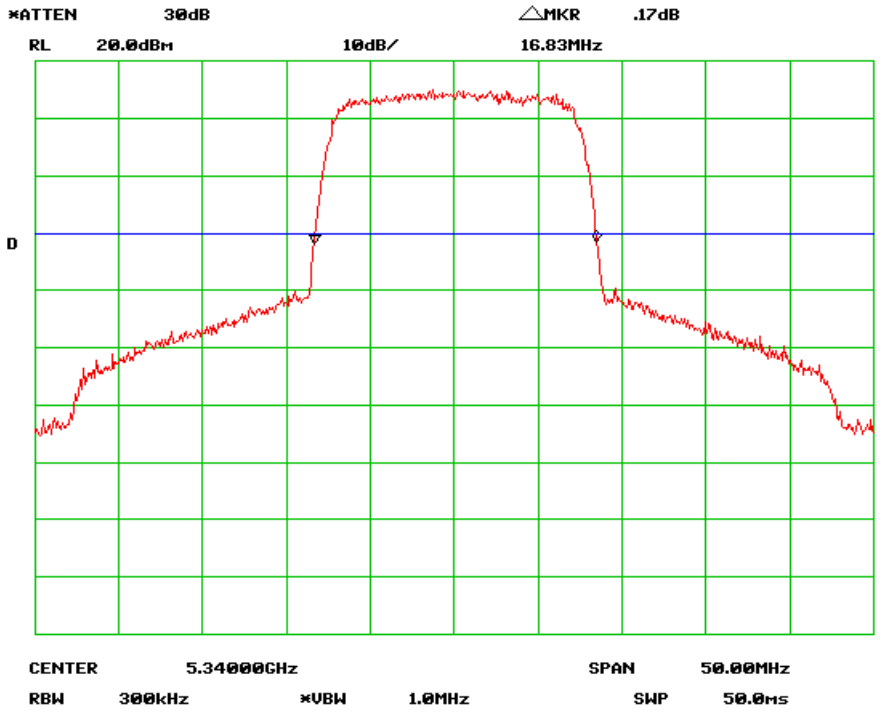
Refer to the attached plots.



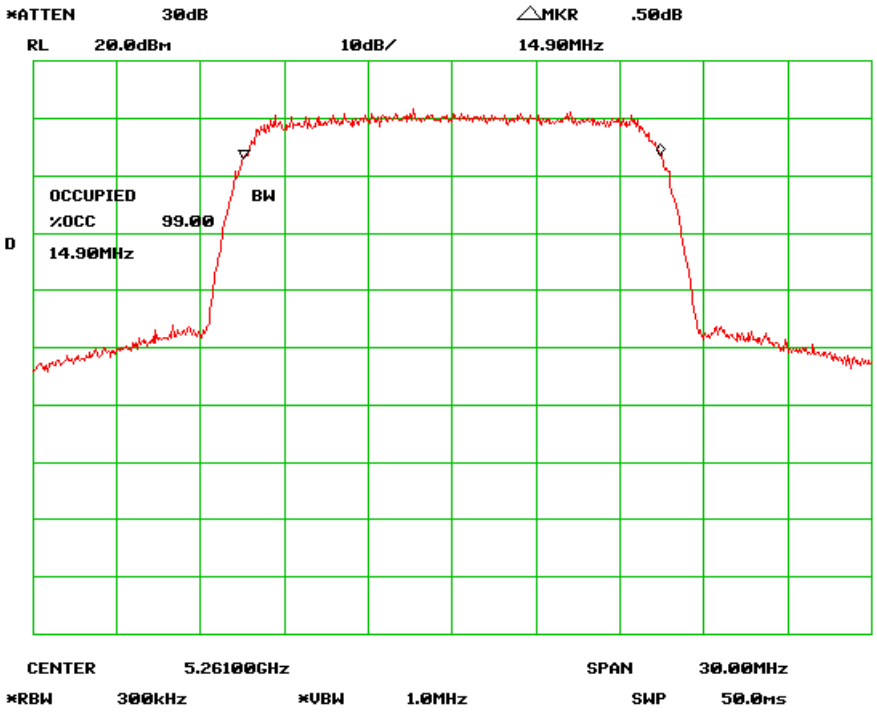

**26 dB Bandwidth-Low Channel**



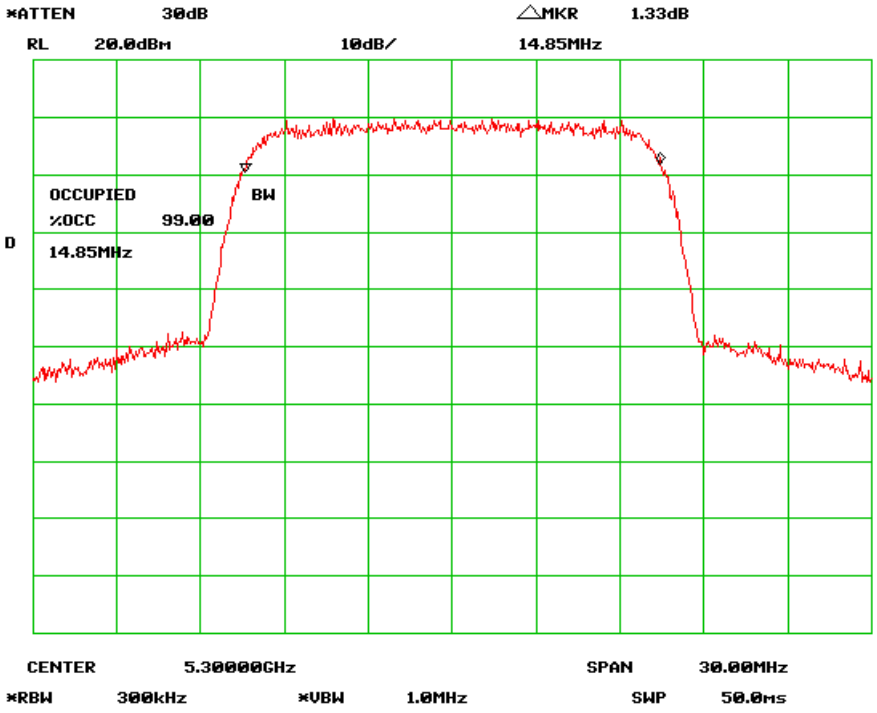

**26 dB Bandwidth-Mid Channel**



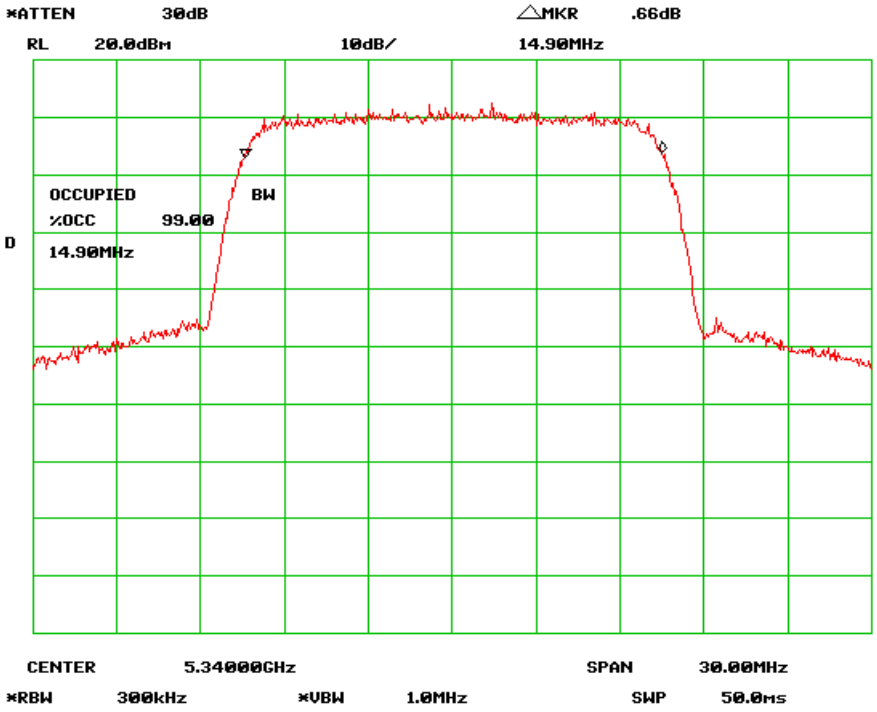

**26 dB Bandwidth-High Channel**




**99% Bandwidth- Low Channel**



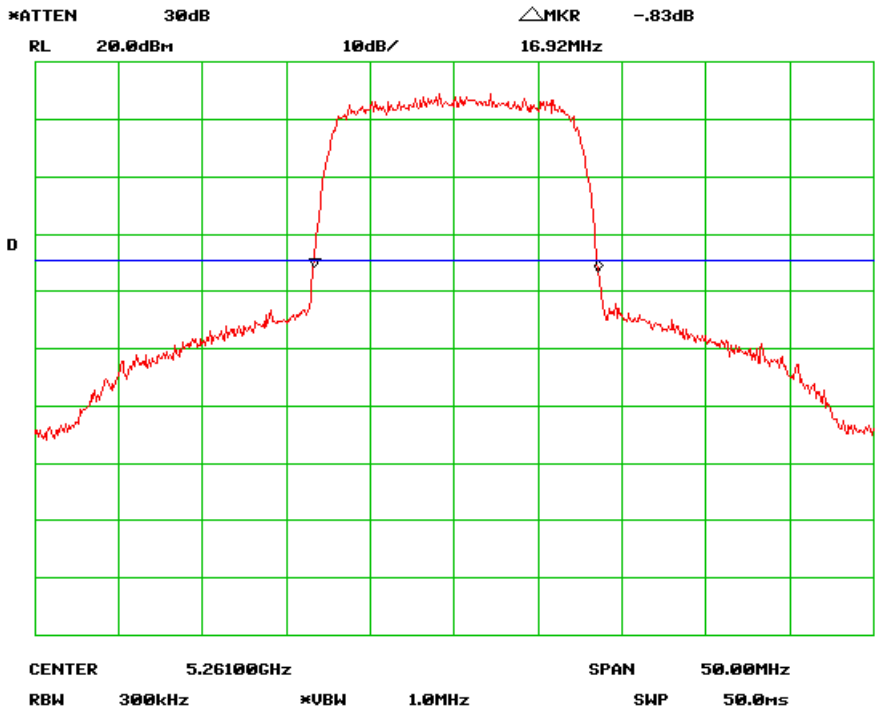

**99% Bandwidth- Mid Channel**



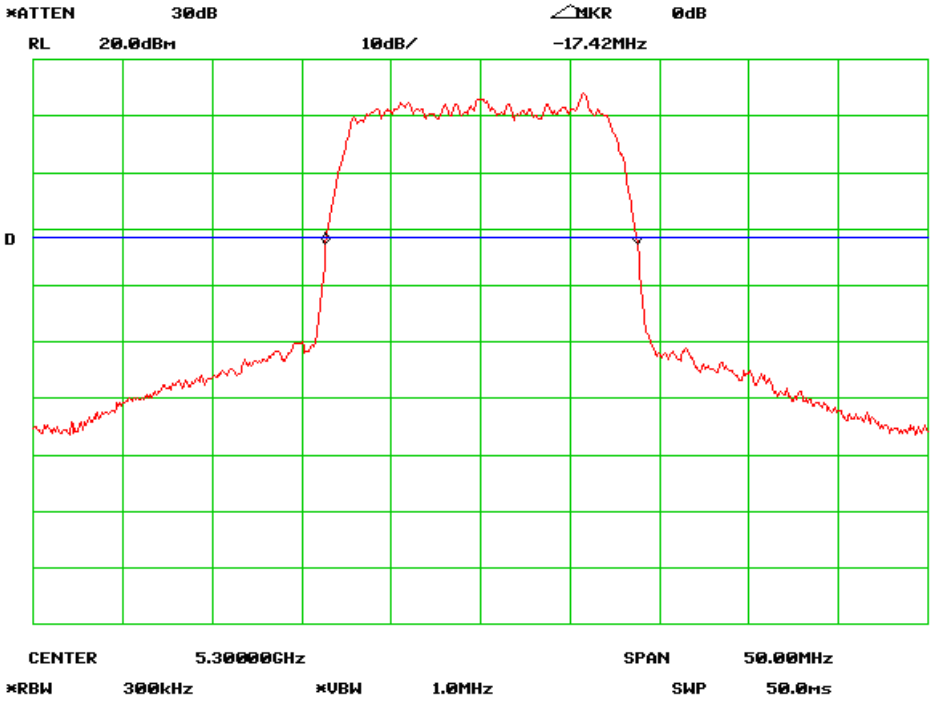

**99% Bandwidth- High Channel**

**Mode: 2 = 16QAM, 16MHz Channel Bandwidth**

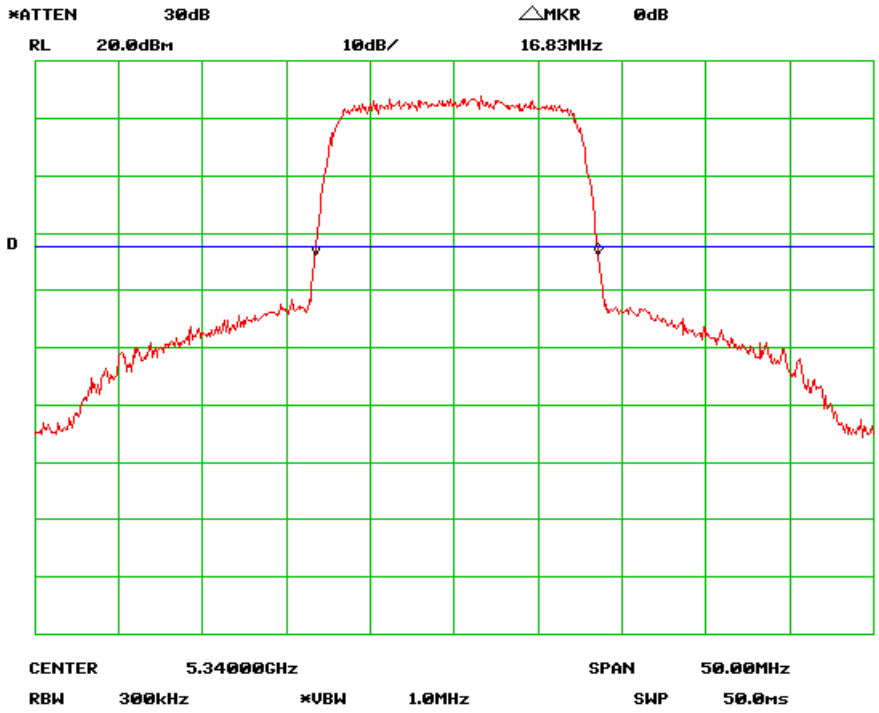
| Mode | Channel Bandwidth | Mode | 26 dB Channel Bandwidth (MHz) | 99% Channel Bandwidth (MHz) |
|---|---|---|---|---|
| Mode 2 | 16MHz | Low Channel | 16.92 | 14.85 |
| | 16MHz | Mid Channel | 17.42 | 14.85 |
| | 16MHz | High Channel | 16.83 | 14.90 |



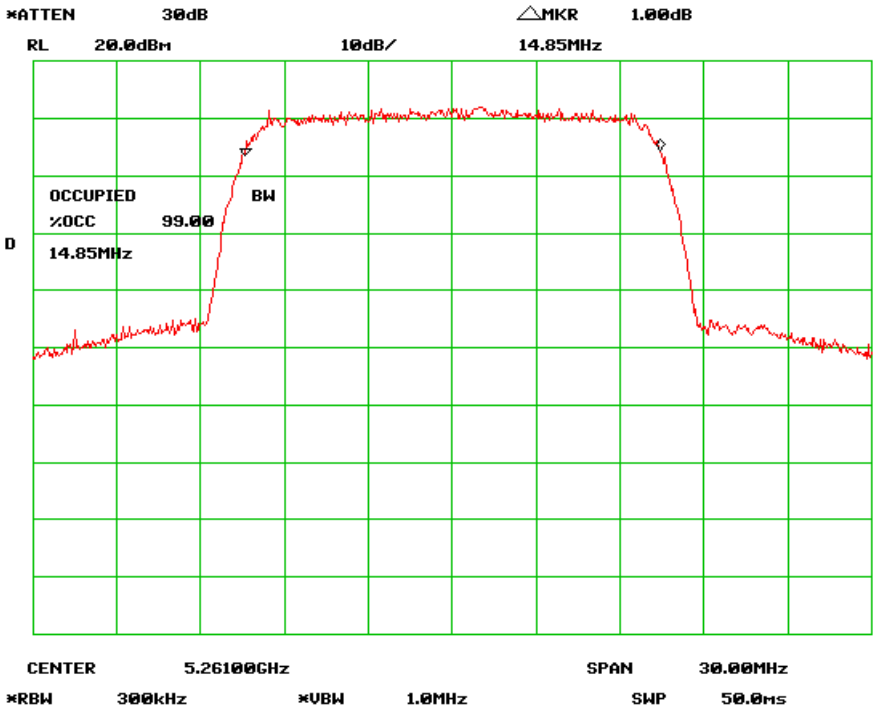

**26 dB Bandwidth- Low Channel**



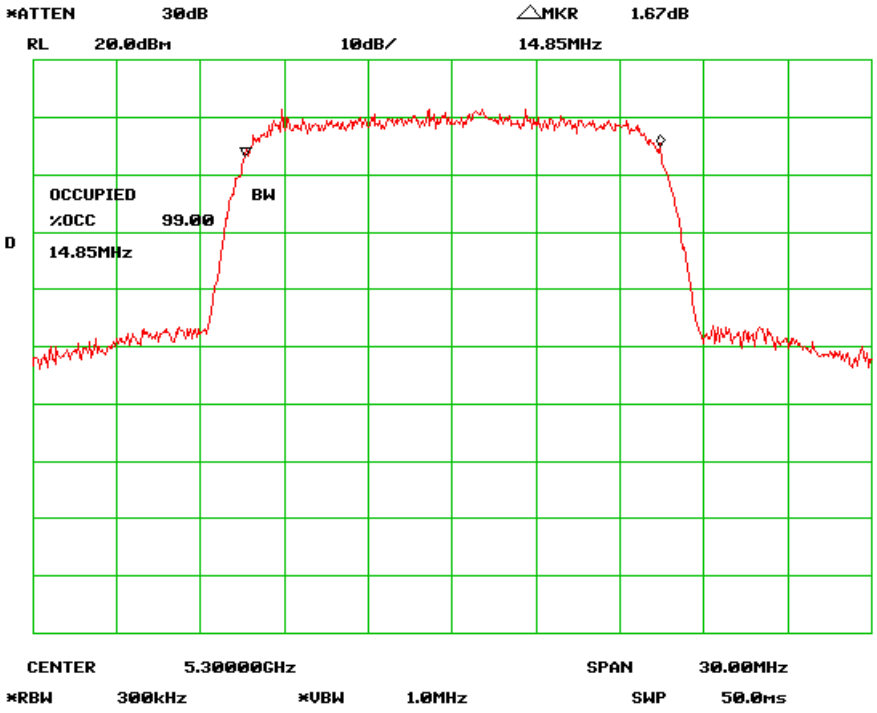

**26 dB Bandwidth- Mid Channel**



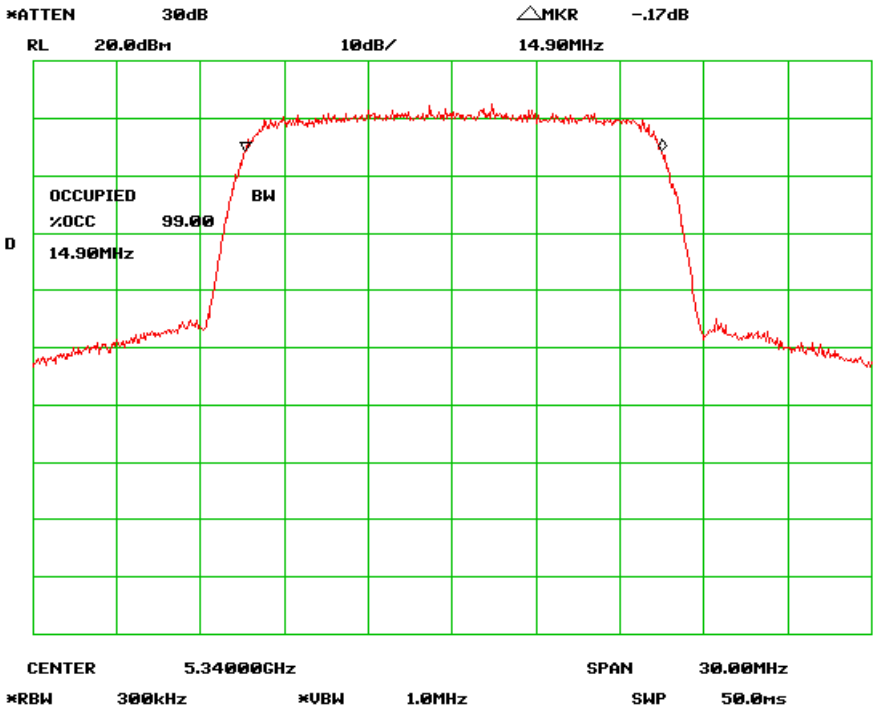

**26 dB Bandwidth- High Channel**




**99% Bandwidth-Low Channel**



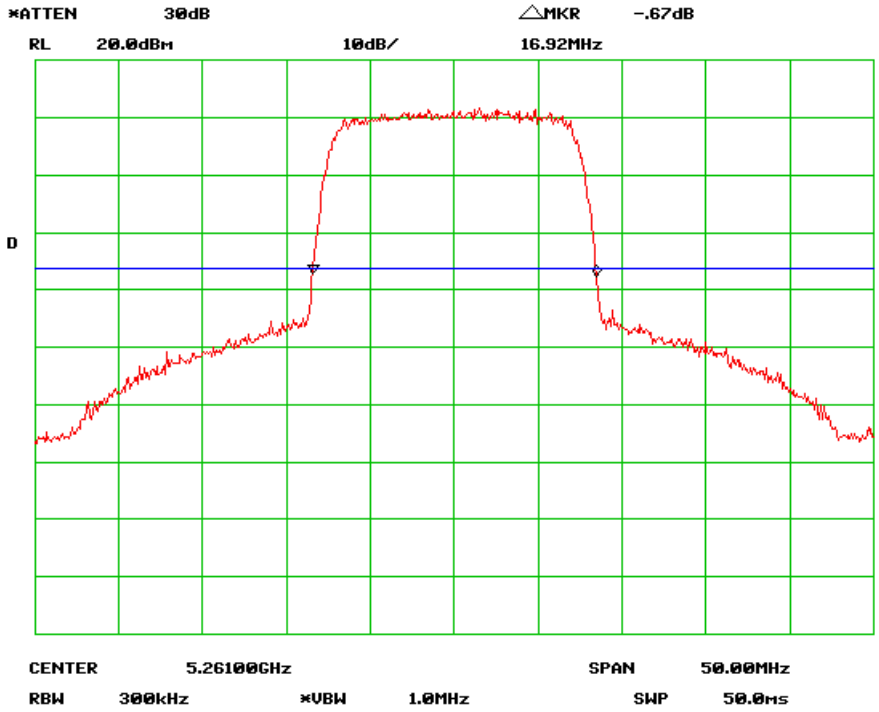

**99% Bandwidth-Mid Channel**



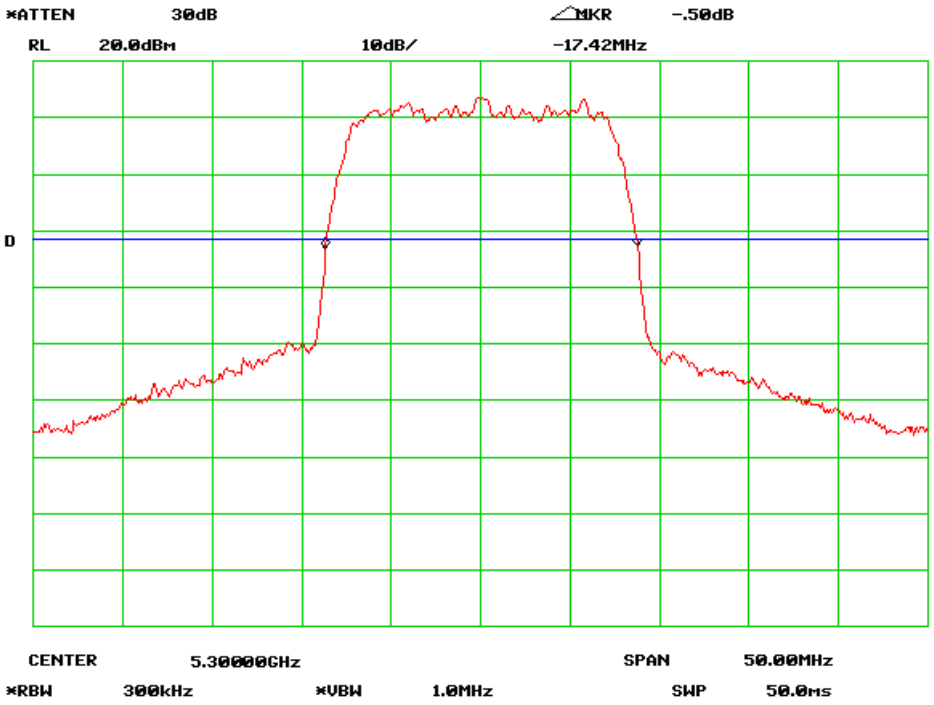

**99% Bandwidth-High Channel**

**Mode: 3 = 64QAM, 16MHz Channel Bandwidth**

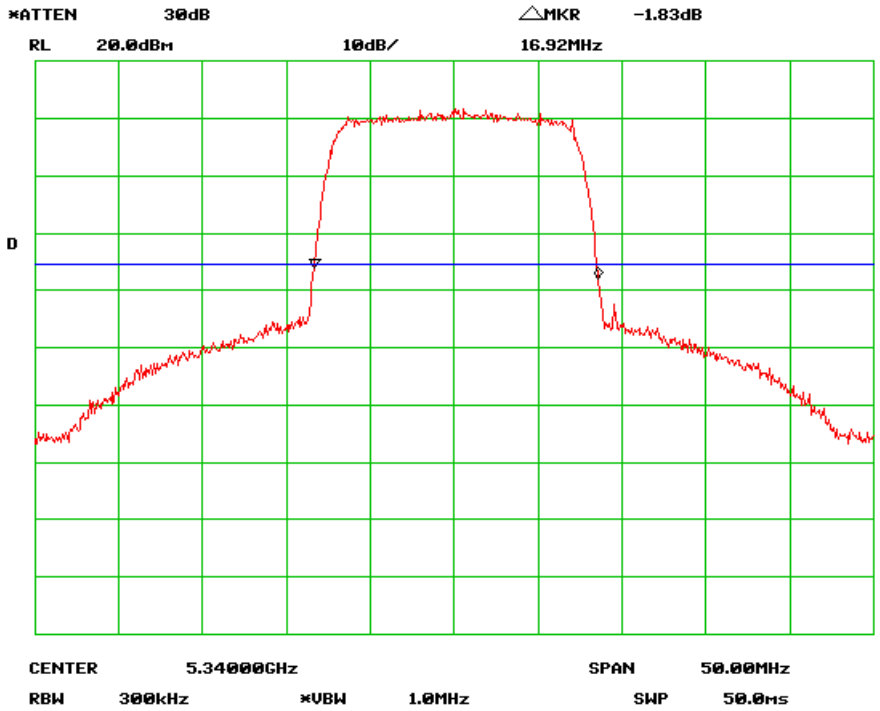
| Mode | Channel Bandwidth | Mode | 26 dB Channel Bandwidth (MHz) | 99% Channel Bandwidth (MHz) |
|---|---|---|---|---|
| Mode 3 | 16MHz | Low Channel | 16.92 | 14.85 |
| | 16MHz | Mid Channel | 17.42 | 14.90 |
| | 16MHz | High Channel | 16.92 | 14.85 |



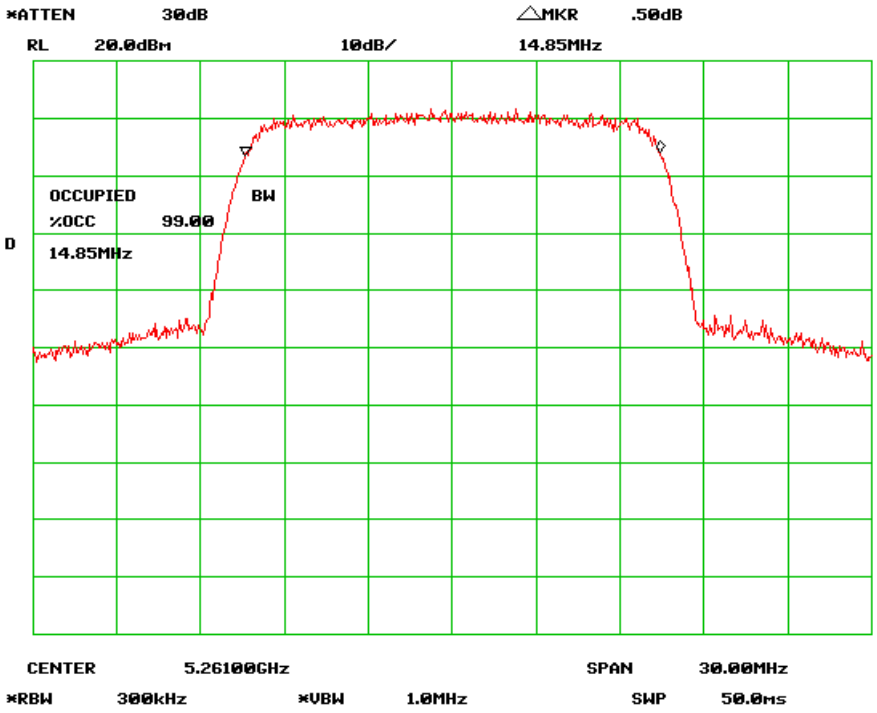

**26 dB Bandwidth-Low Channel**



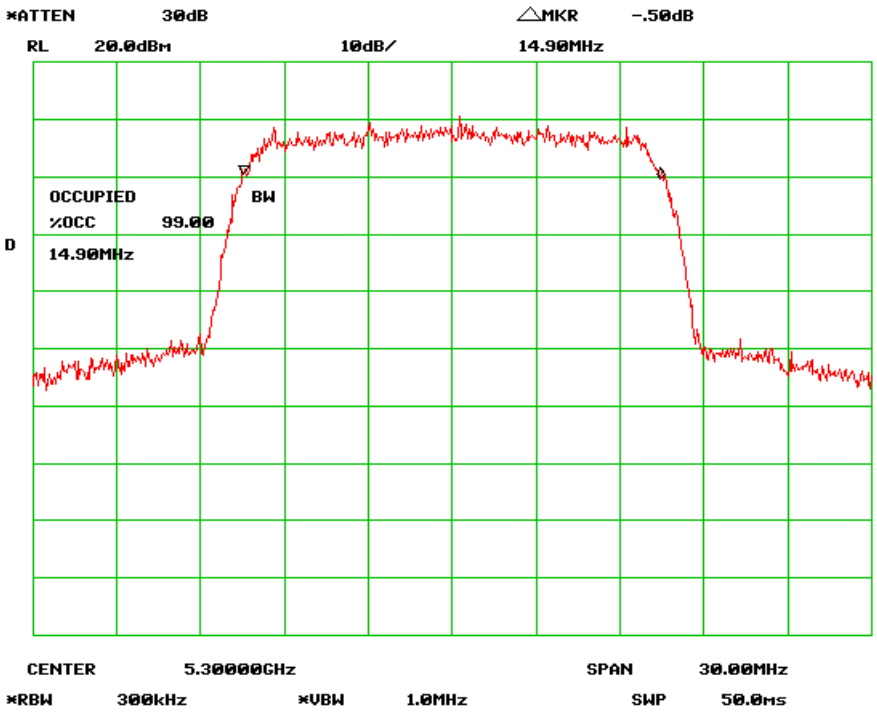

**26 dB Bandwidth-Mid Channel**



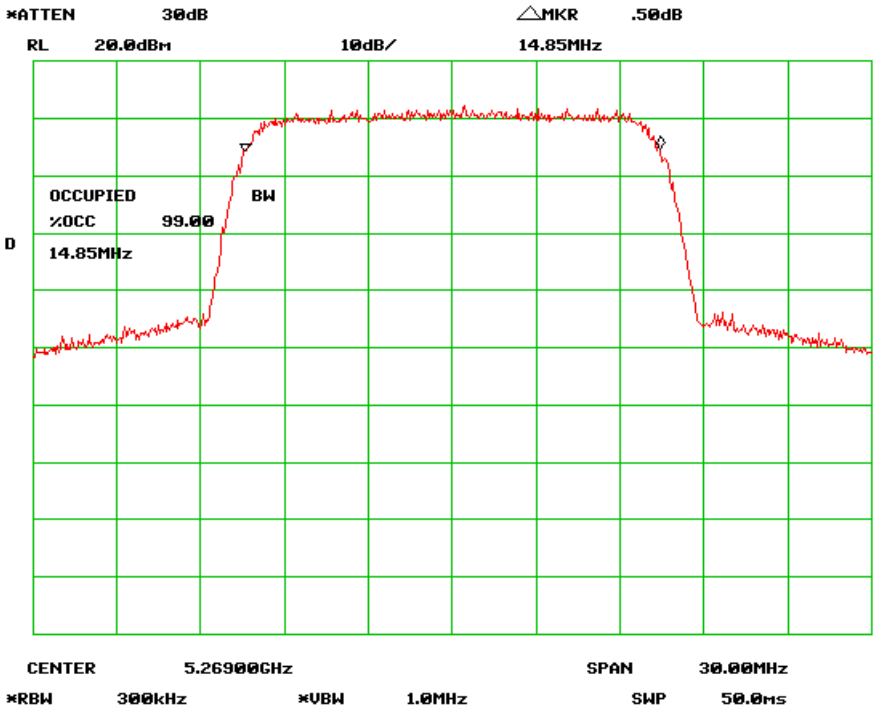

**26 dB Bandwidth-High Channel**




**99% Bandwidth - Low Channel**




**99% Bandwidth - Mid Channel**

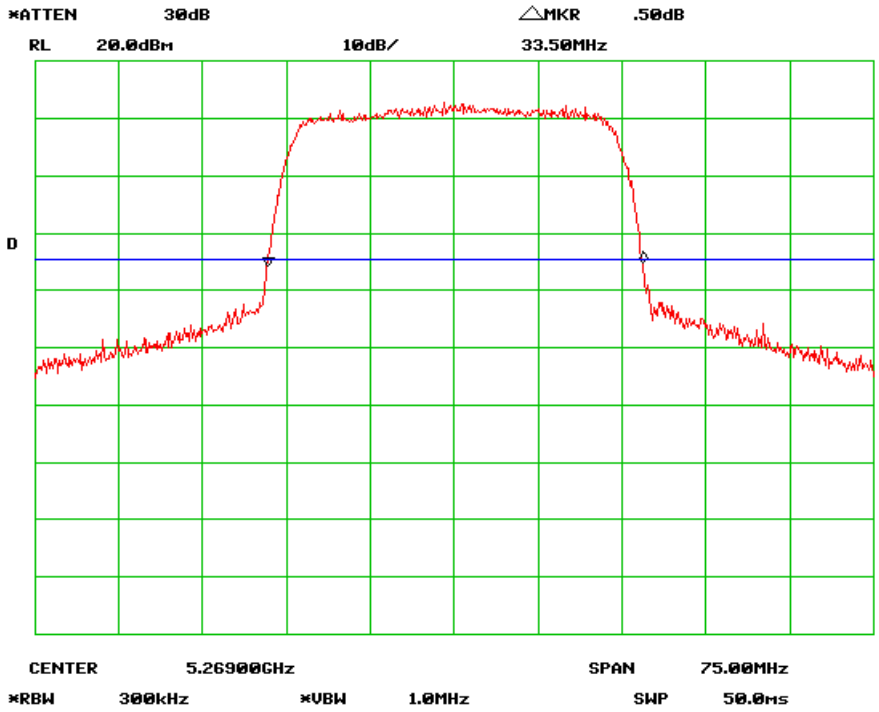



**99% Bandwidth - High Channel**

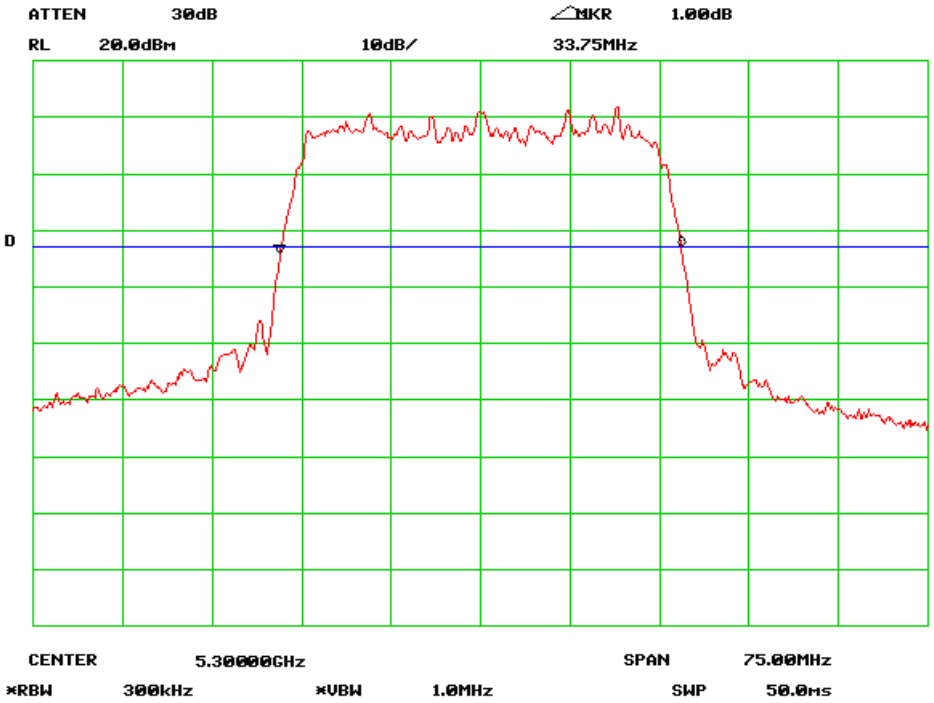
**Mode: 1 = QPSK , 32MHz Channel Bandwidth**

| Mode | Channel Bandwidth | Mode | 26 dB Channel Bandwidth (MHz) | 99% Channel Bandwidth (MHz) |
|---|---|---|---|---|
| Mode 1 | 32MHz | Low Channel | 33.50 | 29.92 |
| | 32MHz | Mid Channel | 33.75 | 29.83 |
| | 32MHz | High Channel | 33.75 | 29.92 |

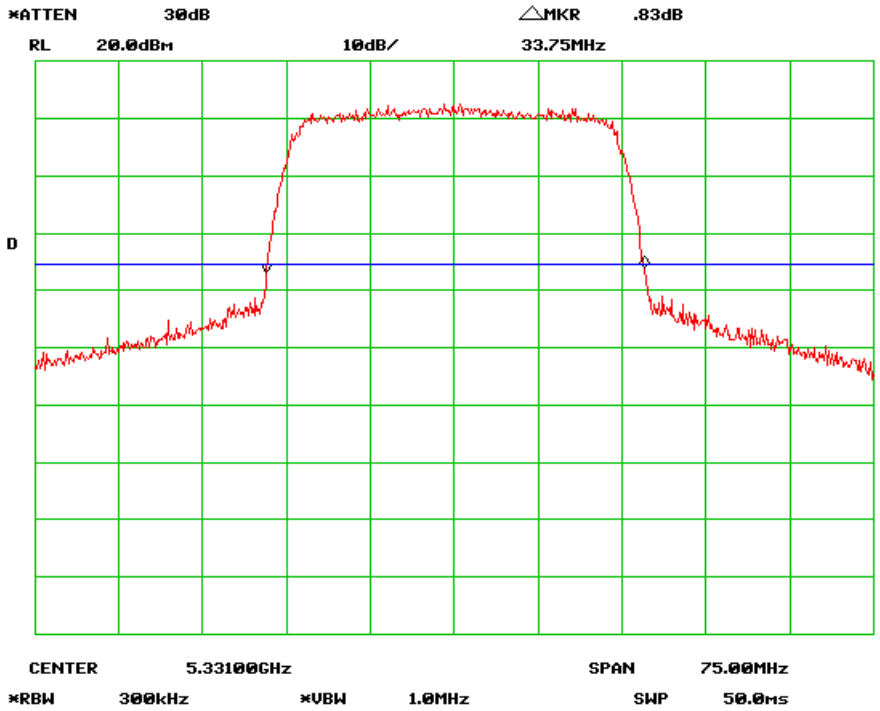
Refer to the attached plots.



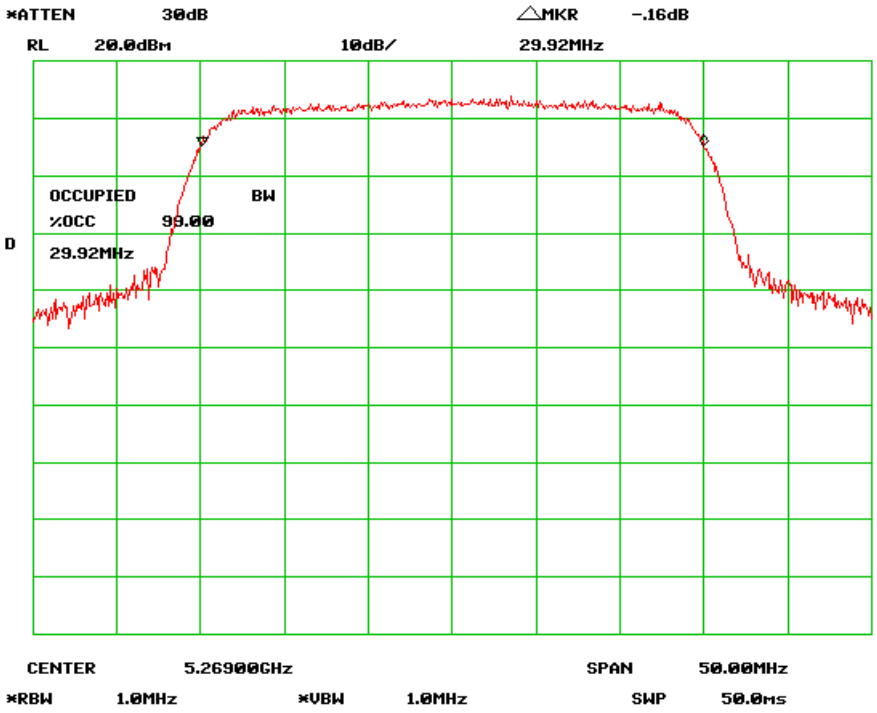

**26 dB Bandwidth- Low Channel**



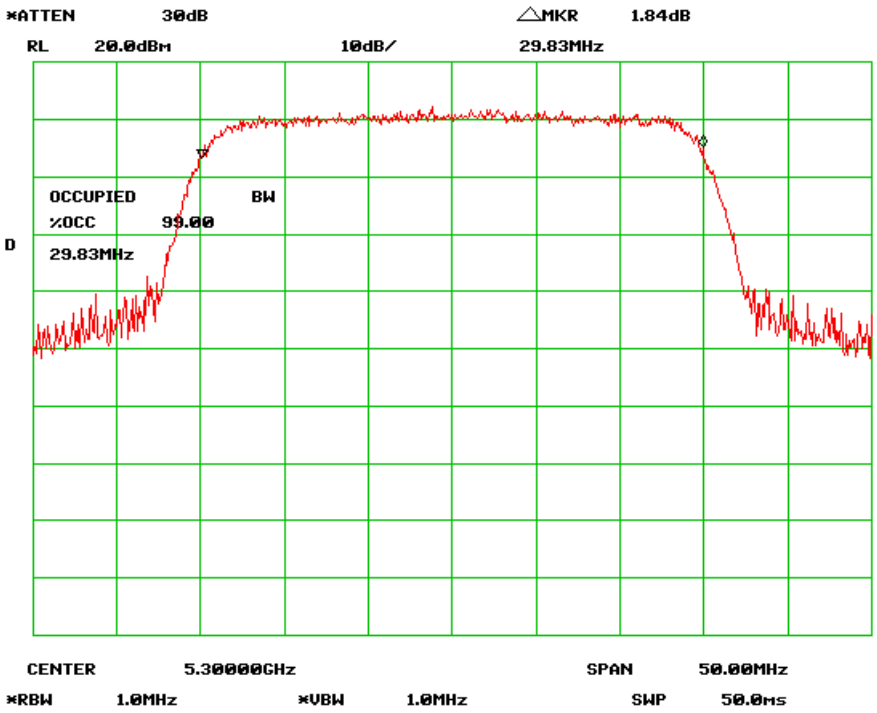

**26 dB Bandwidth- Mid Channel**



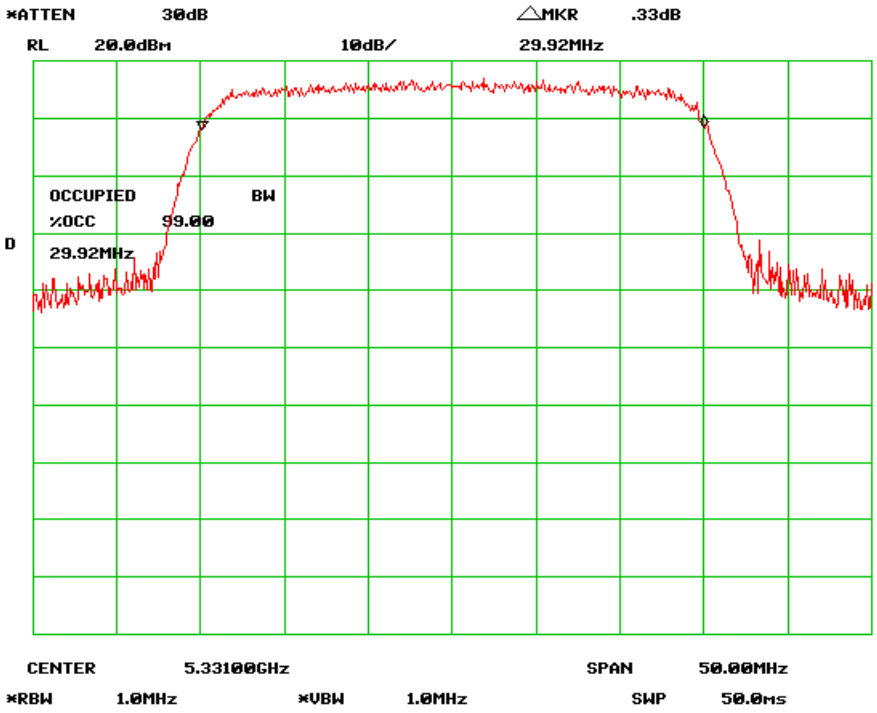

**26 dB Bandwidth- High Channel**




**99% Bandwidth –Low Channel**



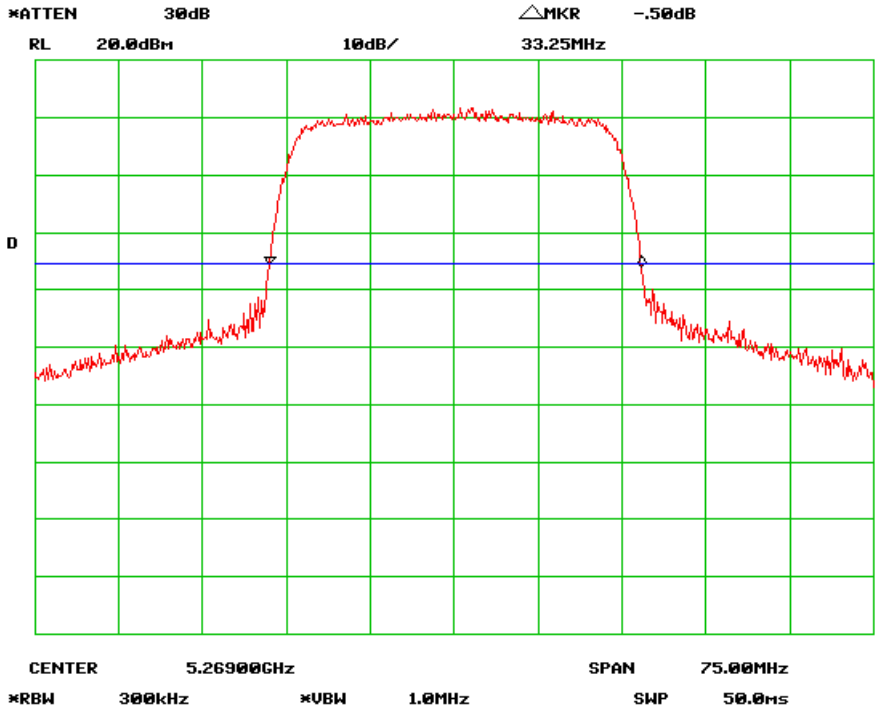

**99% Bandwidth –Mid Channel**



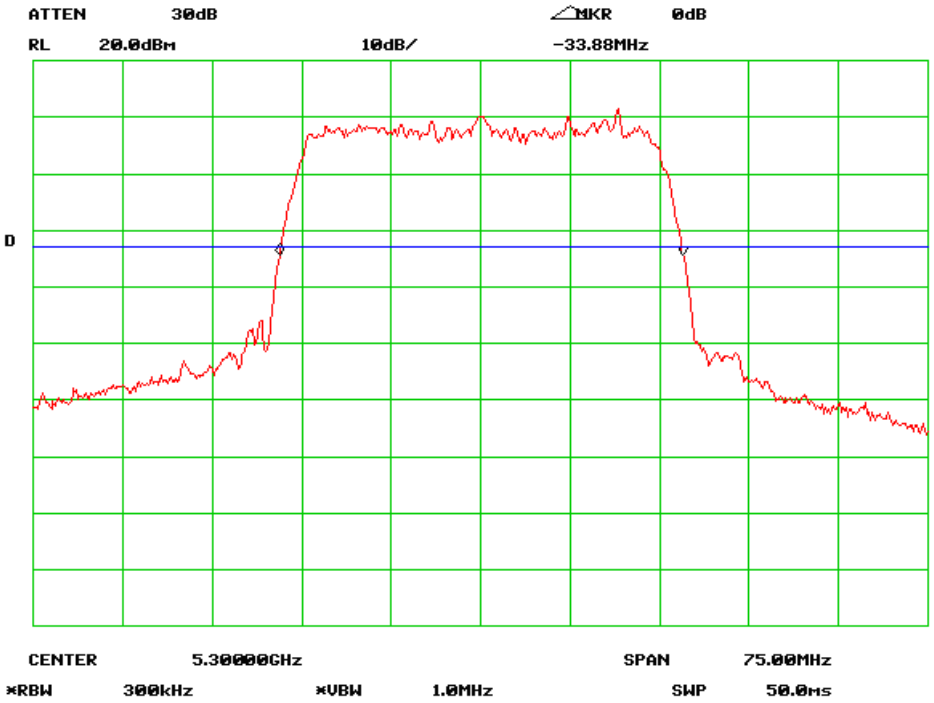

**99% Bandwidth –High Channel**

**Mode: 2 = 16QAM, 32MHz Channel Bandwidth**

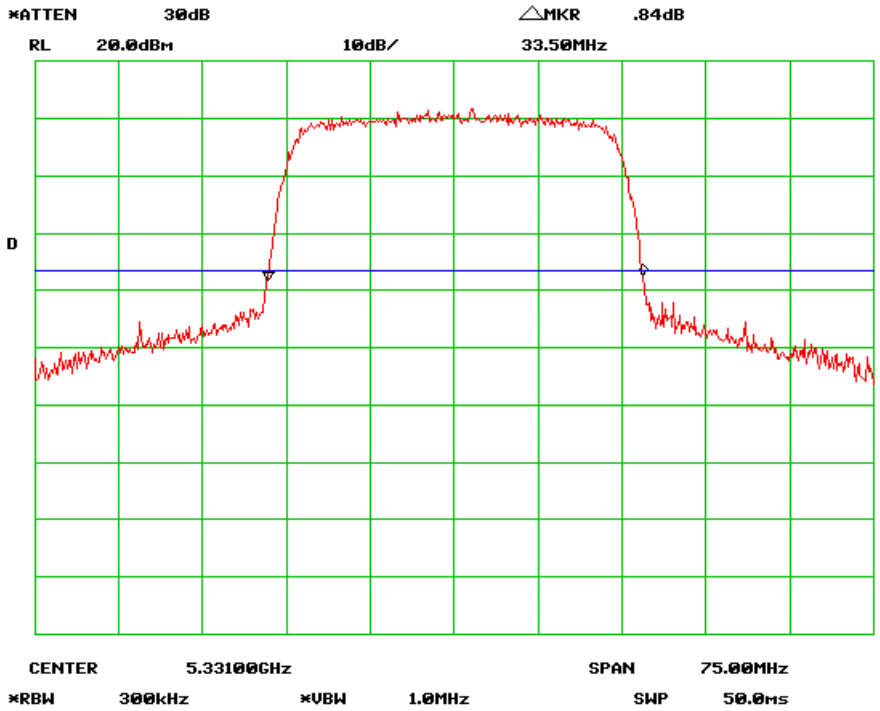
| Mode | Channel Bandwidth | Mode | 26 dB Channel Bandwidth (MHz) | 99% Channel Bandwidth (MHz) |
|---|---|---|---|---|
| Mode 2 | 8MHz | Low Channel | 33.85 | 30.85 |
| | 8MHz | Mid Channel | 33.88 | 30.88 |
| | 8MHz | High Channel | 33.84 | 30.84 |



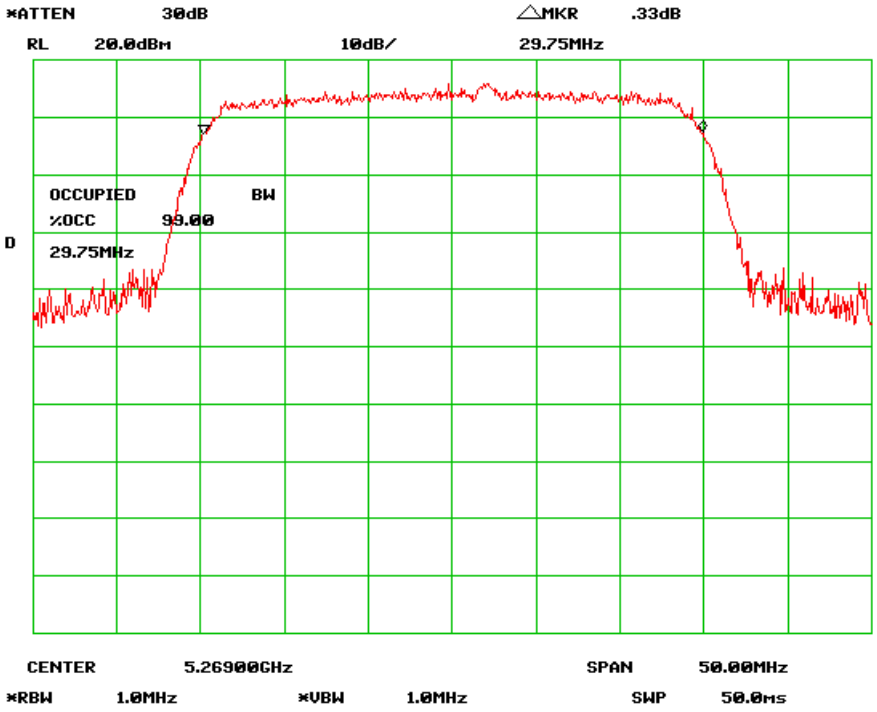

**26 dB Bandwidth-Low Channel**



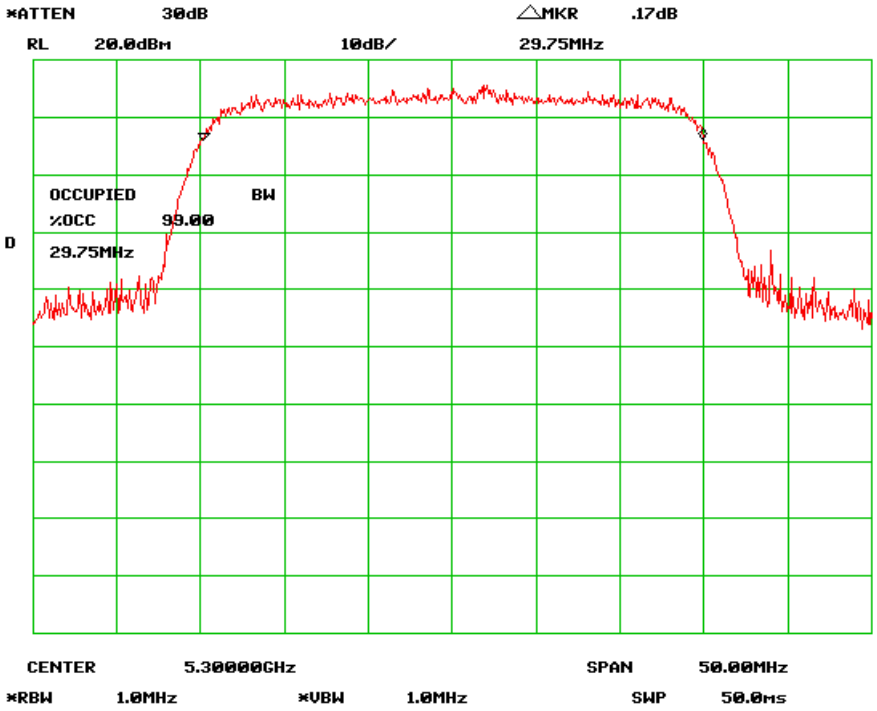

**26 dB Bandwidth-Mid Channel**



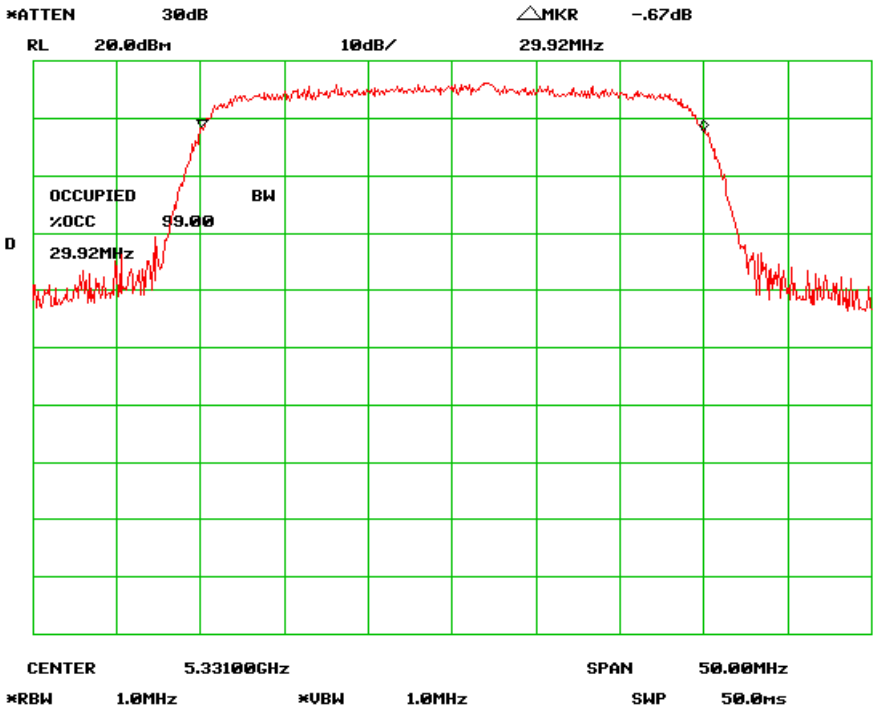

**26 dB Bandwidth-High Channel**




**99% Bandwidth – Low Channel**



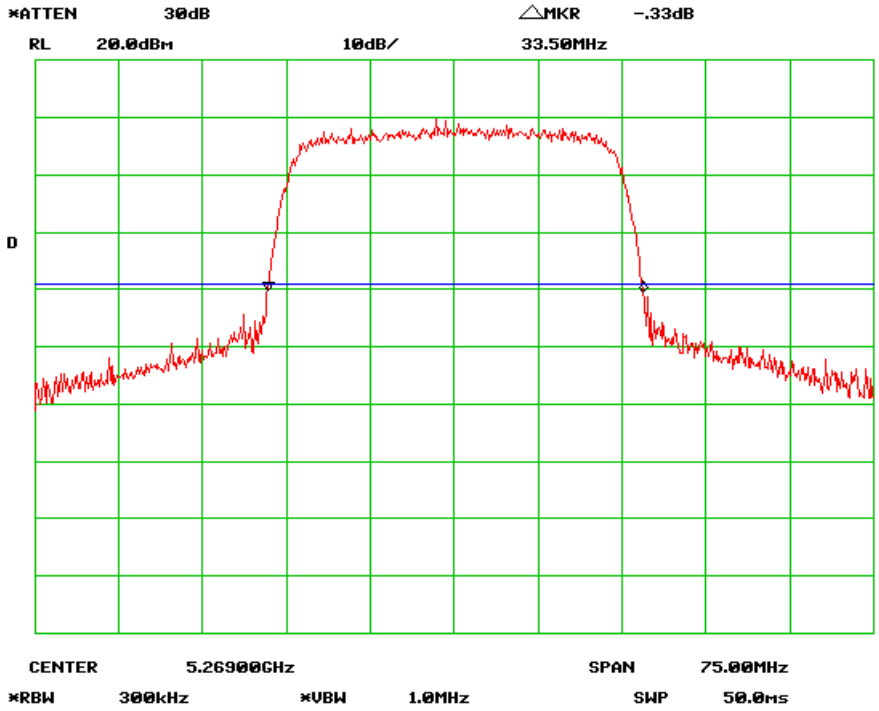

**99% Bandwidth – Mid Channel**



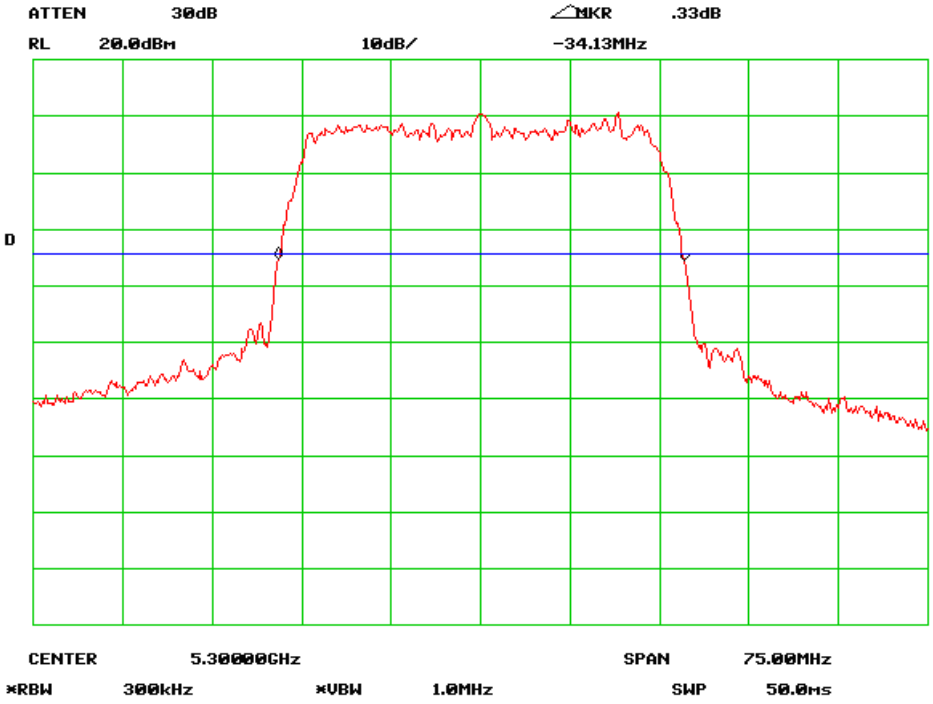

**99% Bandwidth – High Channel**

**Mode: 3 = 64QAM, 32MHz Channel Bandwidth**

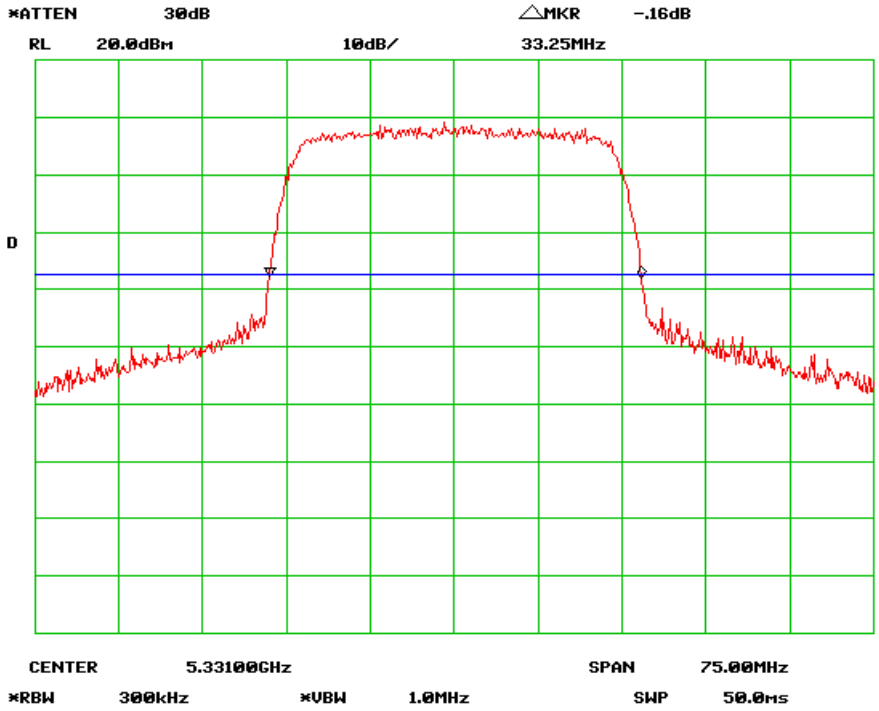
| Mode | Channel Bandwidth | Mode | 26 dB Channel Bandwidth (MHz) | 99% Channel Bandwidth (MHz) |
|---|---|---|---|---|
| Mode 3 | 32MHz | Low Channel | 33.50 | 29.83 |
| | 32MHz | Mid Channel | 34.13 | 29.75 |
| | 32MHz | High Channel | 33.25 | 29.83 |



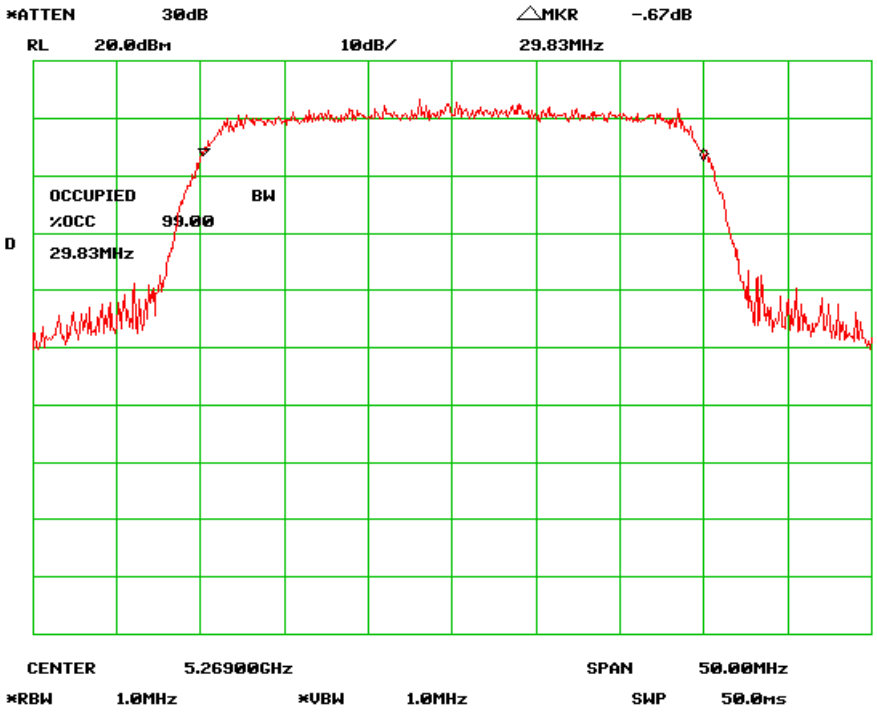

**26 dB Bandwidth-Low Channel**



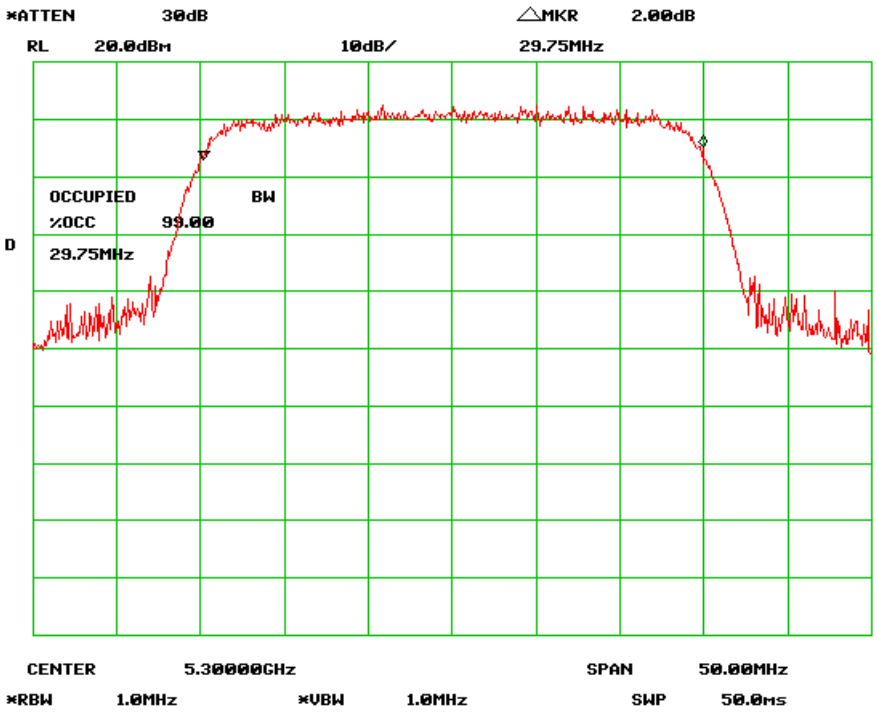

**26 dB Bandwidth-Mid Channel**



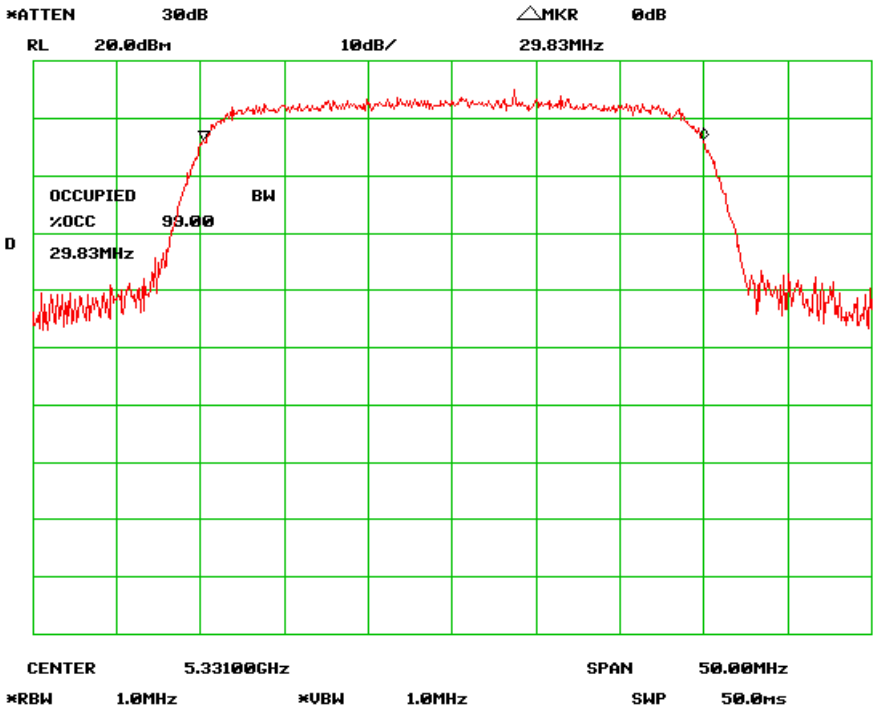

**26 dB Bandwidth-High Channel**




**99% Bandwidth -Low Channel**




**99% Bandwidth -Mid Channel**



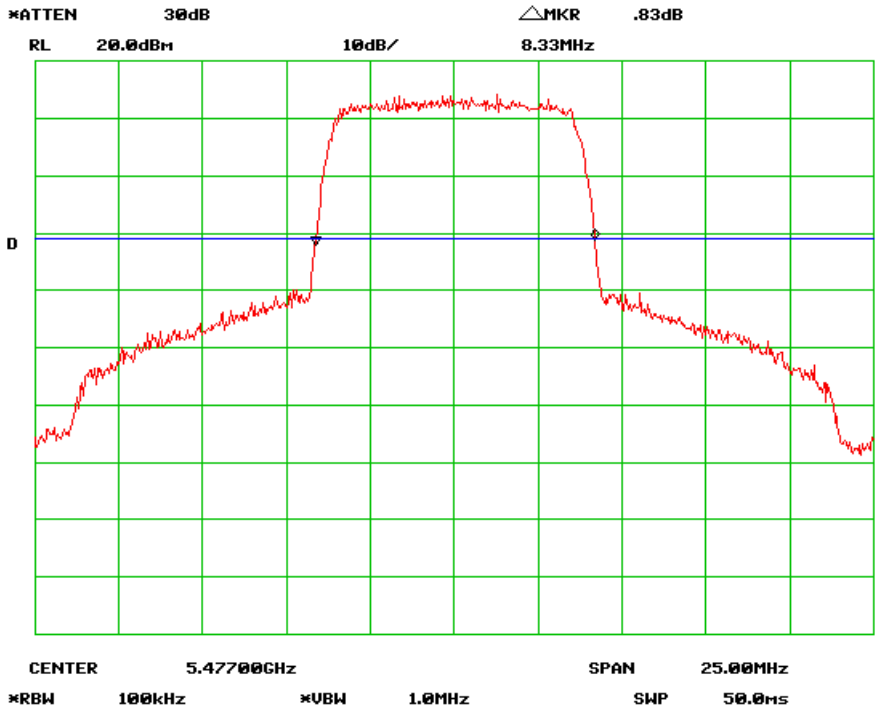

**99% Bandwidth -High Channel**

## 5.4GHz Band

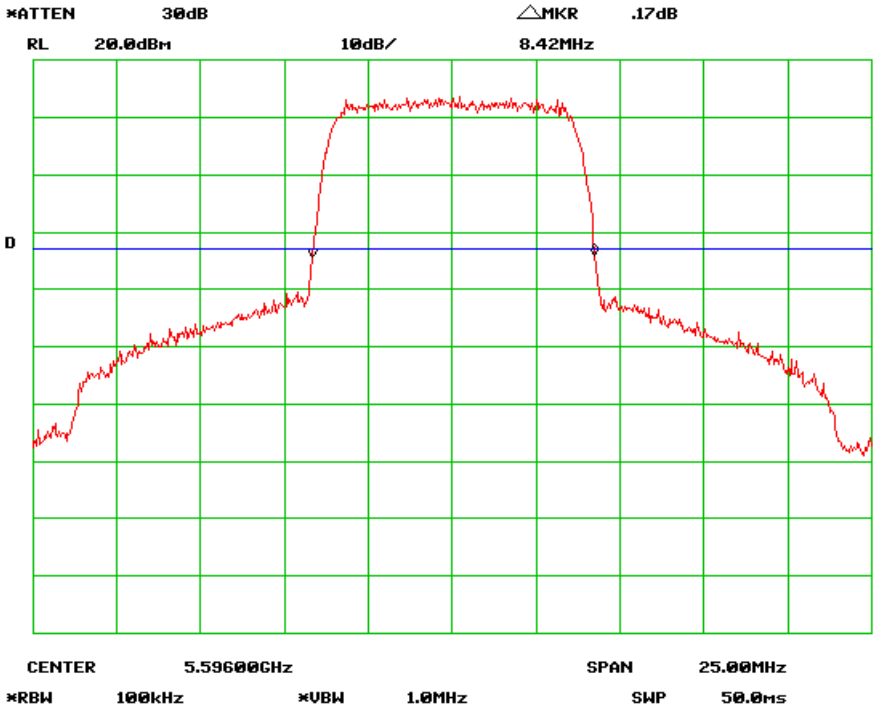
### Mode: 1 = QPSK , 8MHz Channel Bandwidth

| Mode | Channel Bandwidth | Mode | 26 dB Channel Bandwidth (MHz) | 99% Channel Bandwidth (MHz) |
|---|---|---|---|---|
| Mode 1 | 8MHz | Low Channel | 8.33 | 7.54 |
| | 8MHz | Mid Channel | 8.42 | 7.54 |
| | 8MHz | High Channel | 8.46 | 7.58 |

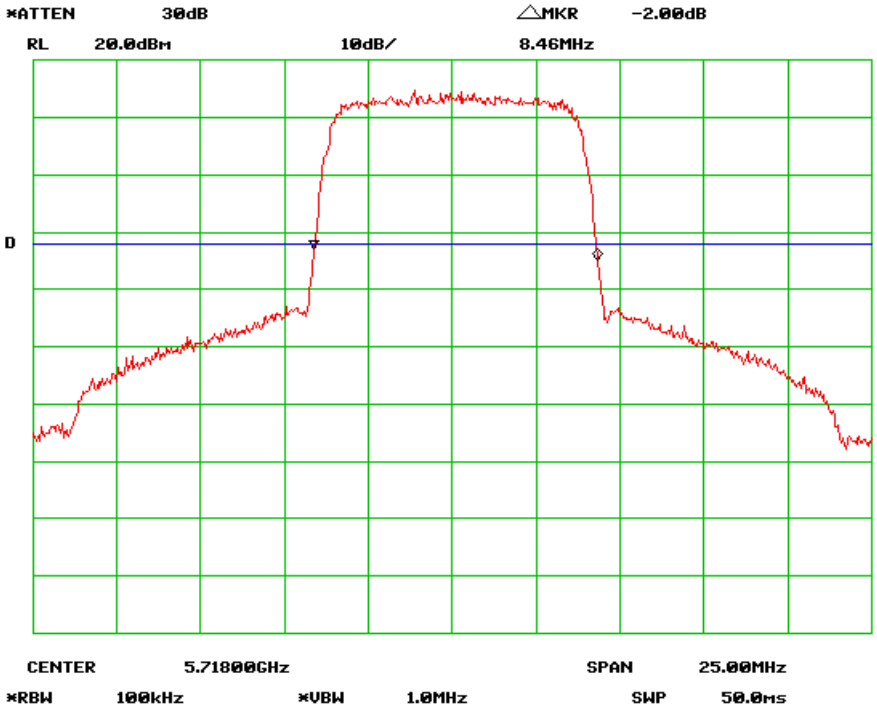
Refer to the attached plots.



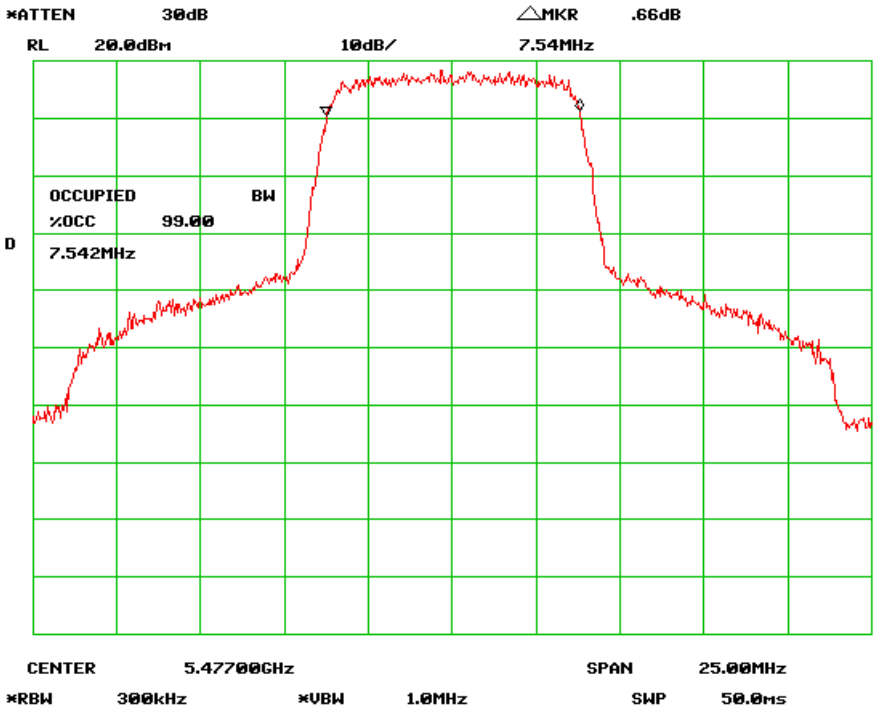

**26 dB Bandwidth-Low Channel**



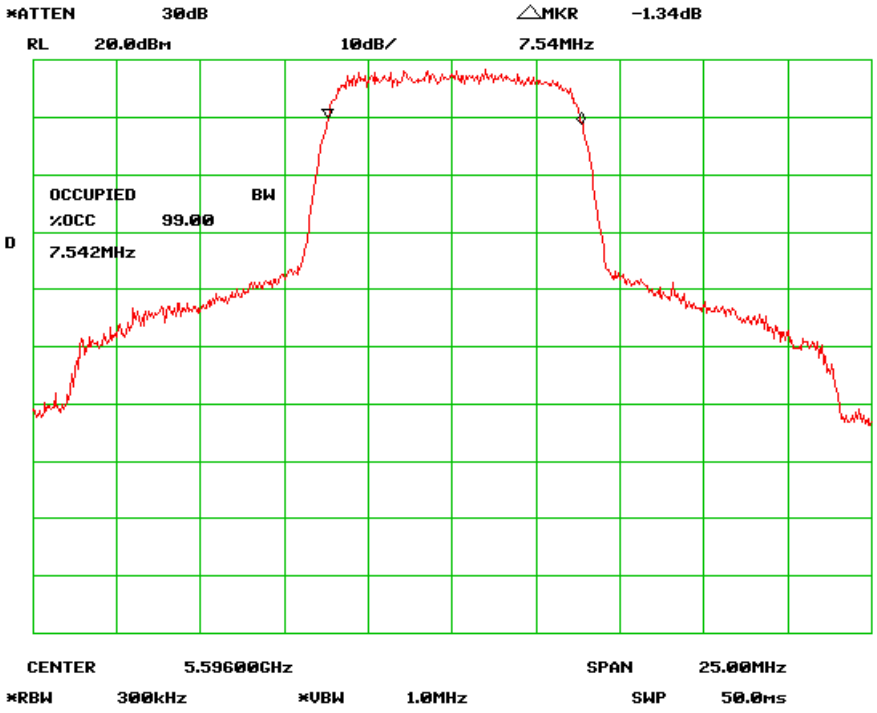

**26 dB Bandwidth-Mid Channel**



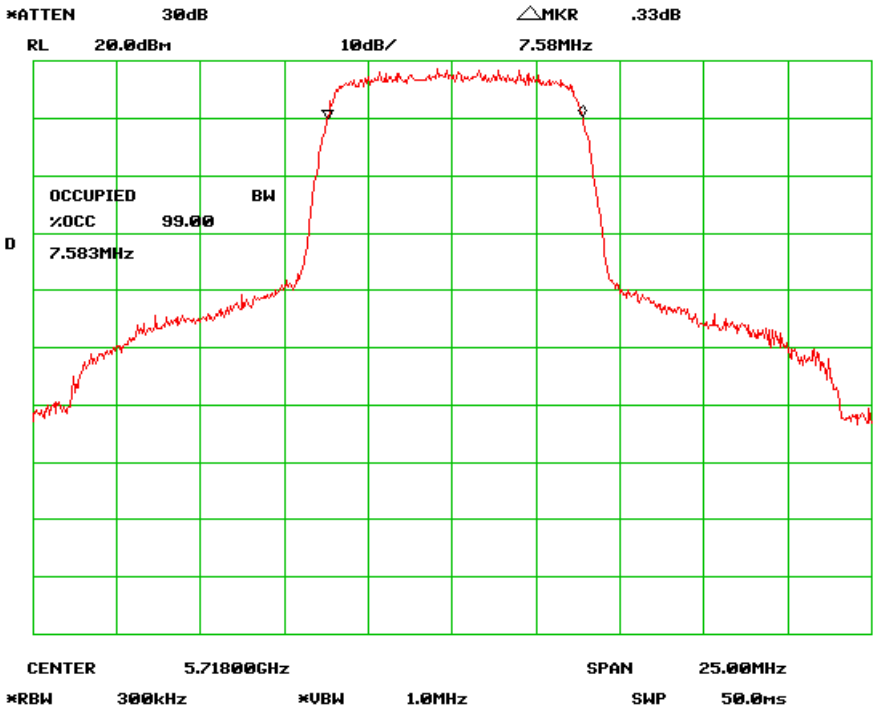

**26 dB Bandwidth-High Channel**




**99% Bandwidth-Low Channel**



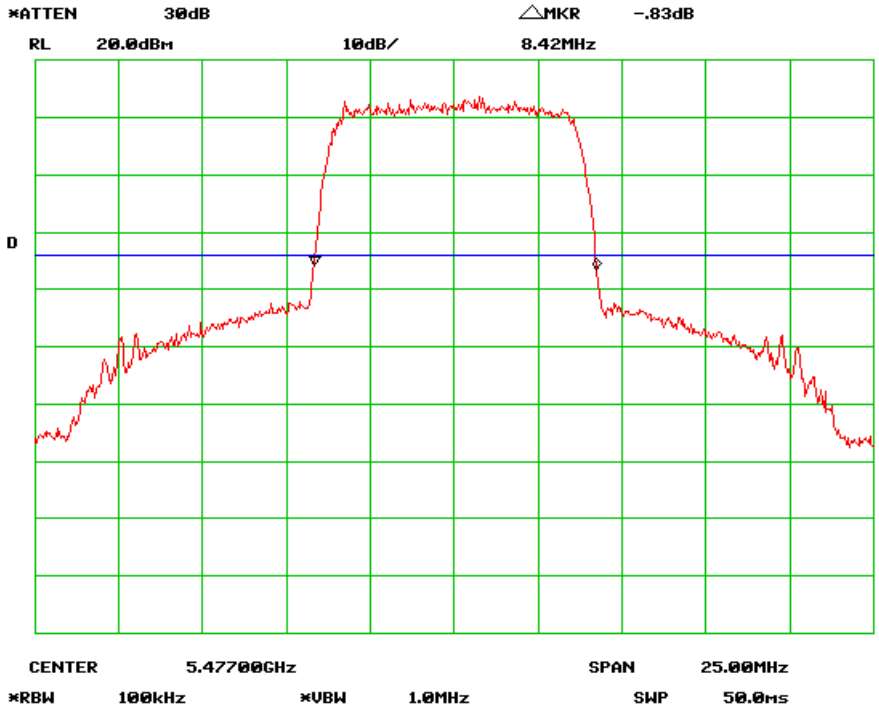

**99% Bandwidth-Mid Channel**



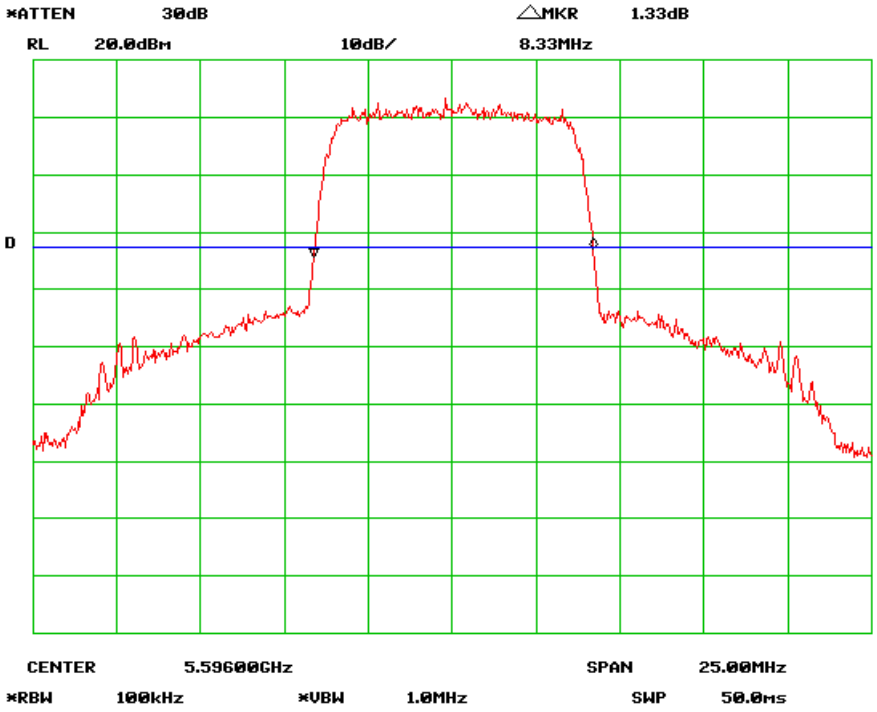

**99% Bandwidth-High Channel**

**Mode: 2 = 16QAM, 8MHz Channel Bandwidth**

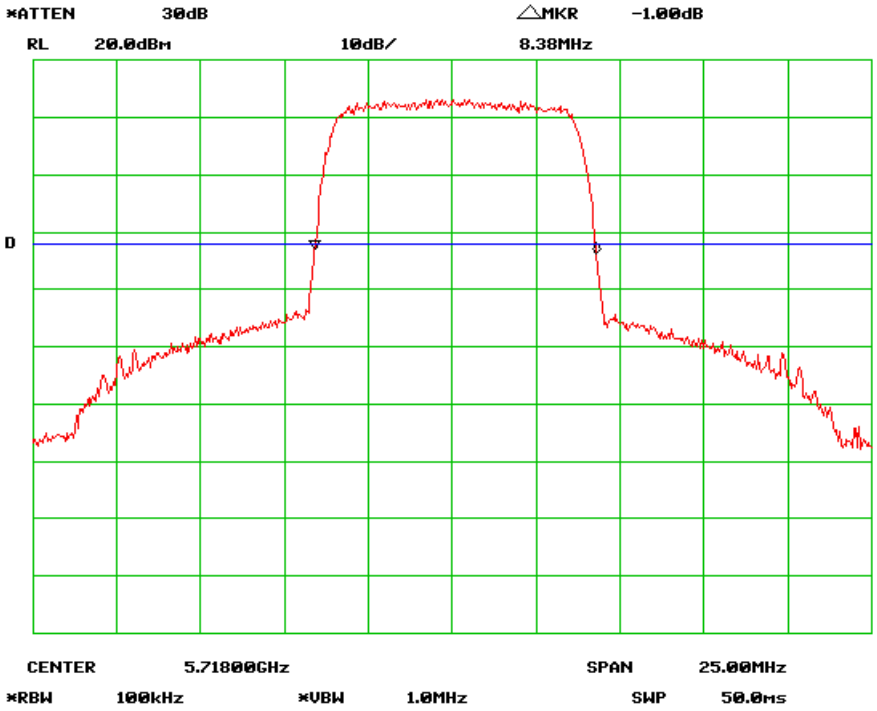
| Mode | Channel Bandwidth | Mode | 26 dB Channel Bandwidth (MHz) | 99% Channel Bandwidth (MHz) |
|---|---|---|---|---|
| Mode 2 | 8MHz | Low Channel | 8.42 | 7.54 |
| | 8MHz | Mid Channel | 8.33 | 7.50 |
| | 8MHz | High Channel | 8.38 | 7.58 |



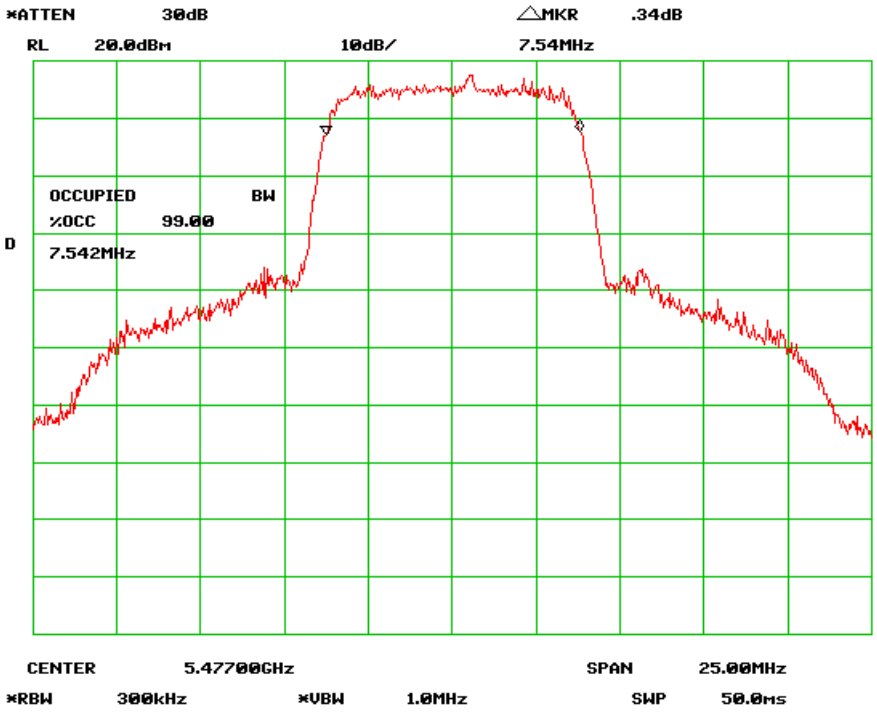

**26 dB Bandwidth-Low Channel**



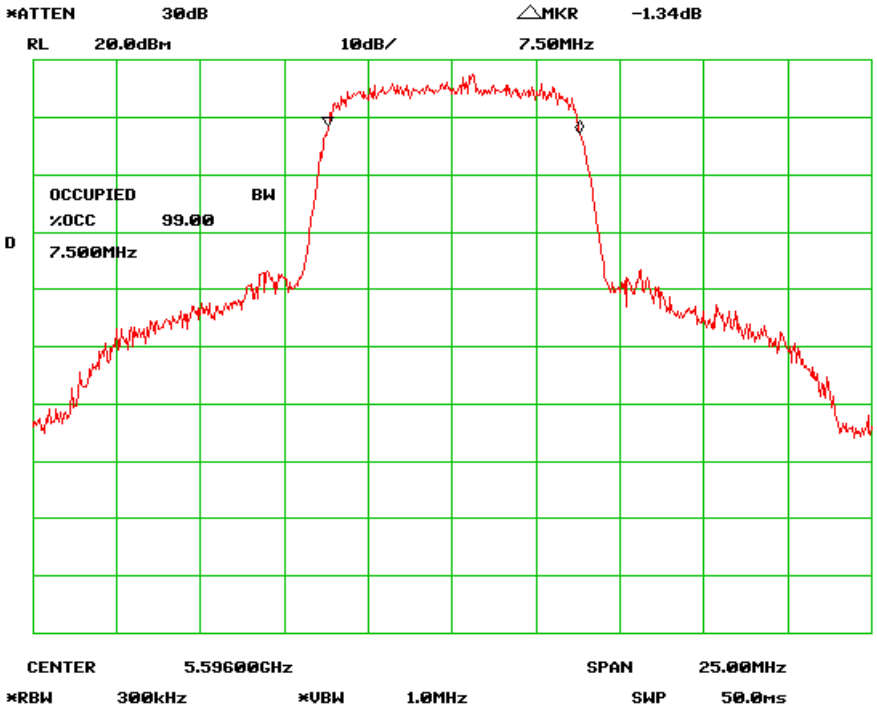

**26 dB Bandwidth-Mid Channel**



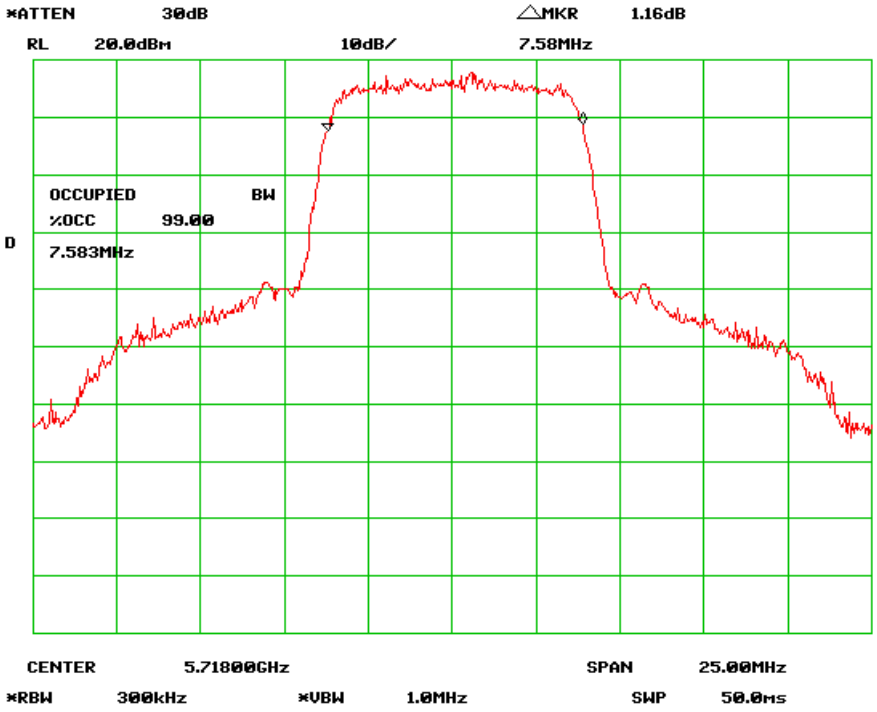

**26 dB Bandwidth-High Channel**




**99% Bandwidth-Low Channel**



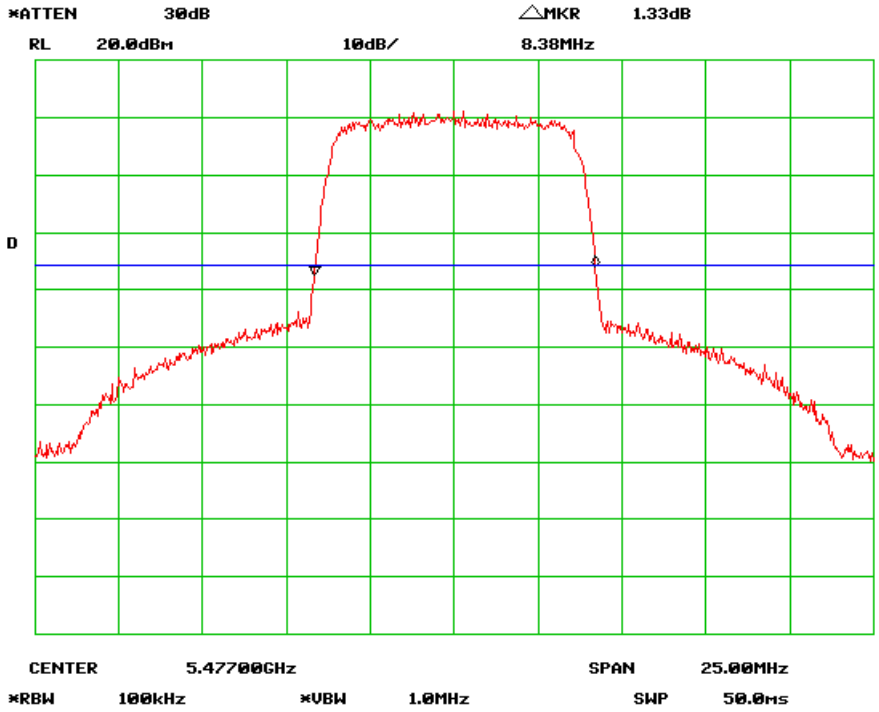

**99% Bandwidth-Mid Channel**



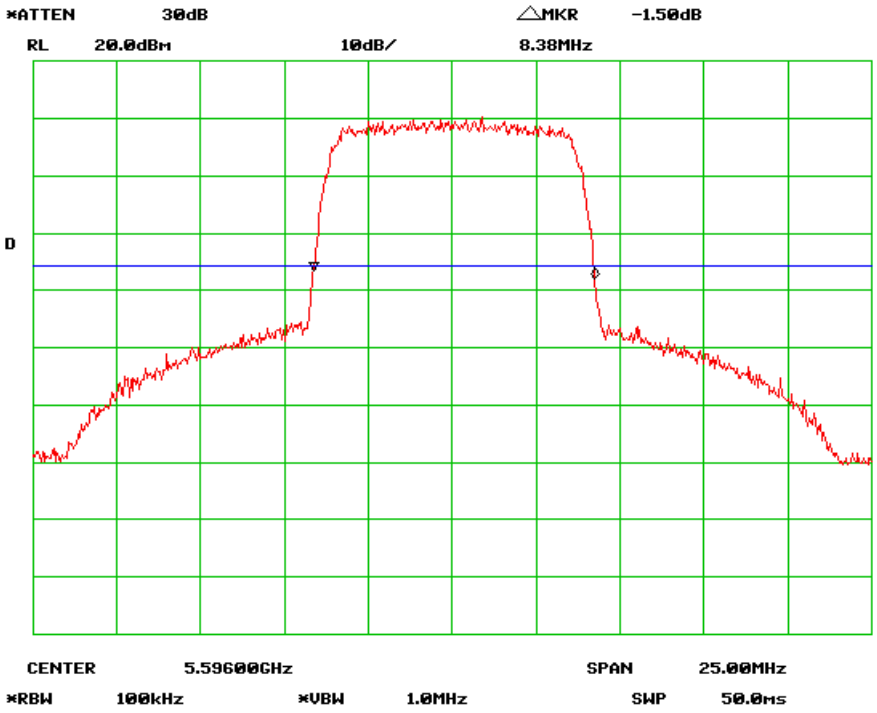

**99% Bandwidth-High Channel**

**Mode: 3 = 64QAM, 8MHz Channel Bandwidth**

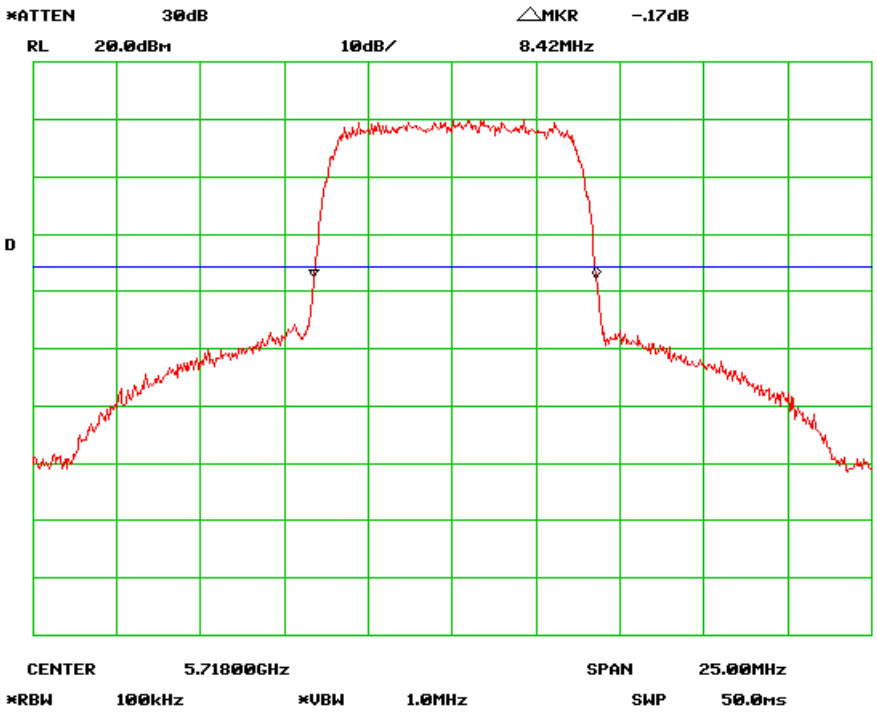
| Mode | Channel Bandwidth | Mode | 26 dB Channel Bandwidth (MHz) | 99% Channel Bandwidth (MHz) |
|---|---|---|---|---|
| Mode 3 | 8MHz | Low Channel | 8.38 | 7.54 |
| | 8MHz | Mid Channel | 8.38 | 7.54 |
| | 8MHz | High Channel | 8.42 | 7.58 |



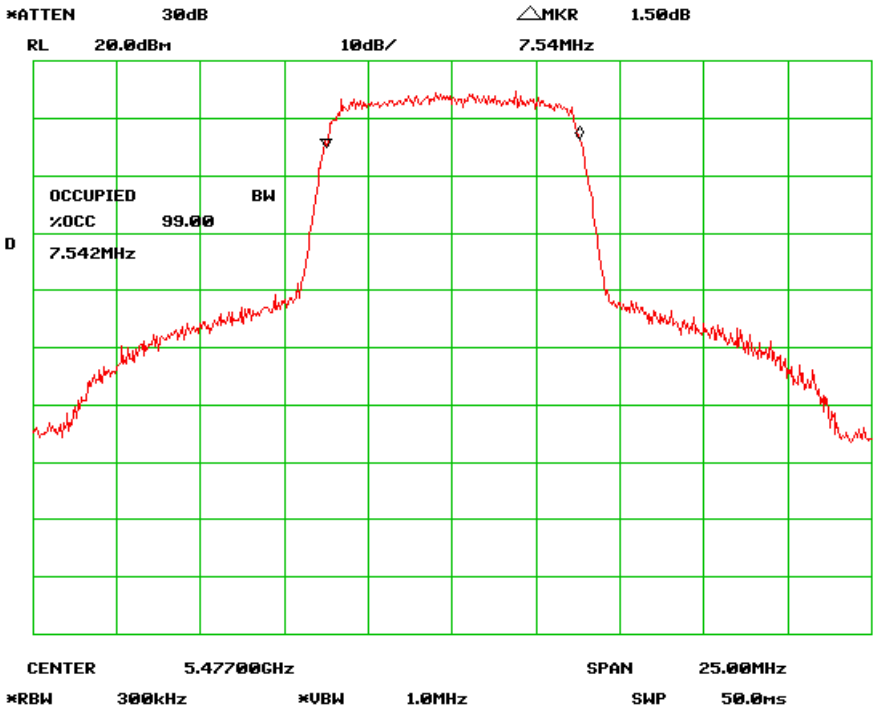

**26 dB Bandwidth-Low Channel**



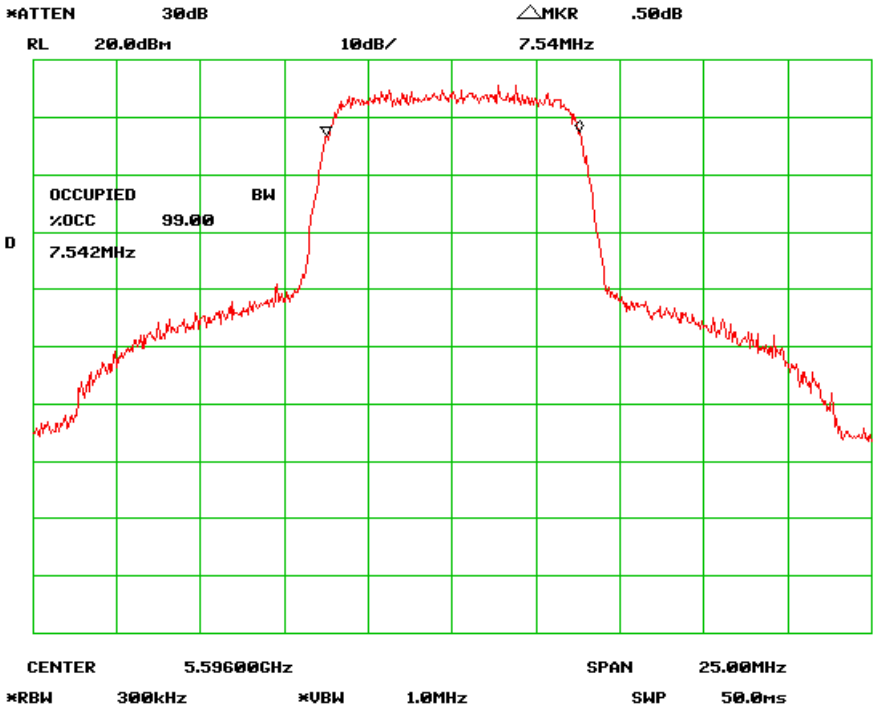

**26 dB Bandwidth-Mid Channel**



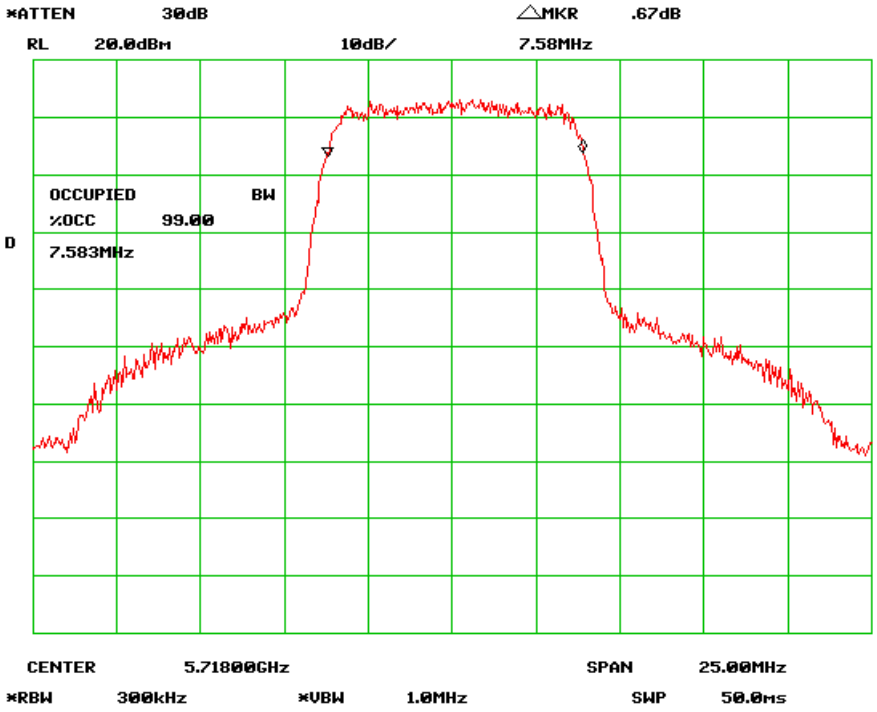

**26 dB Bandwidth-High Channel**




**99% Bandwidth- Low Channel**




**99% Bandwidth- mid Channel**

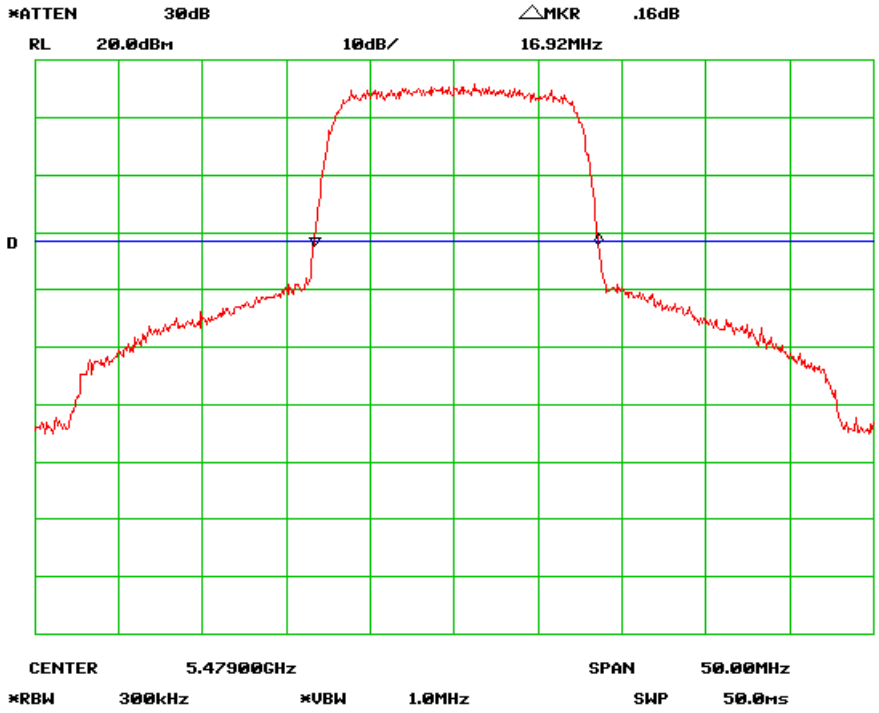



**99% Bandwidth- High Channel**

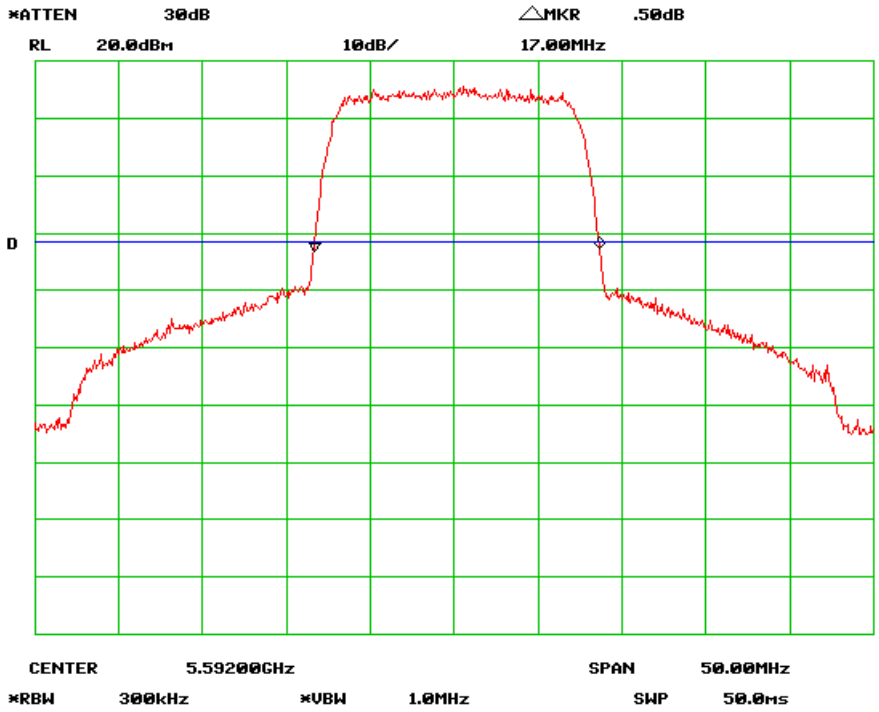
**Mode: 1 = QPSK , 16MHz Channel Bandwidth**

| Mode | Channel Bandwidth | Mode | 26 dB Channel Bandwidth (MHz) | 99% Channel Bandwidth (MHz) |
|---|---|---|---|---|
| Mode 1 | 16MHz | Low Channel | 16.92 | 14.92 |
| | 16MHz | Mid Channel | 17.00 | 14.92 |
| | 16MHz | High Channel | 17.08 | 14.92 |

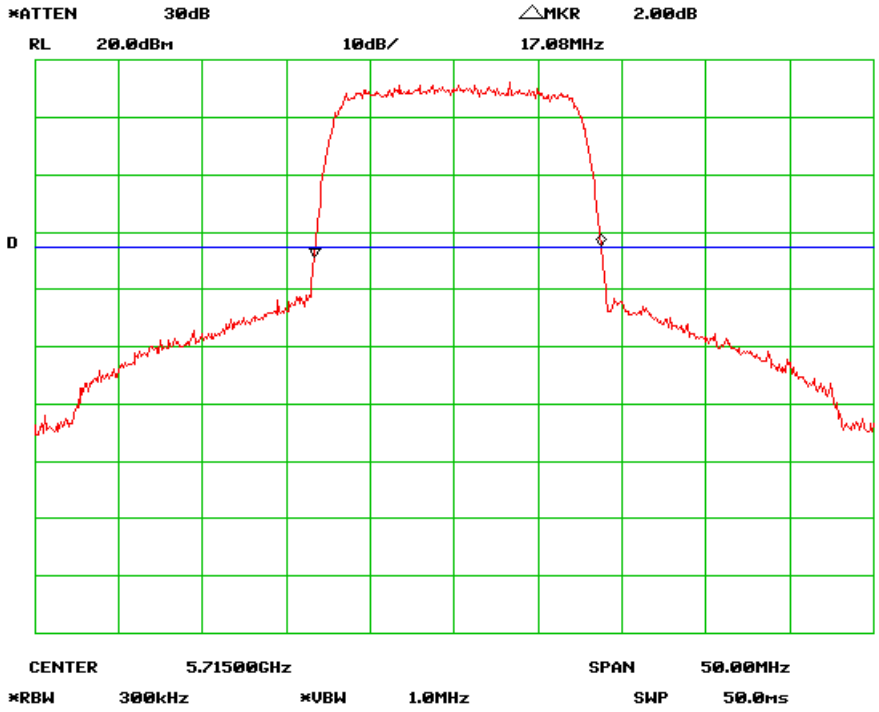
Refer to the attached plots.



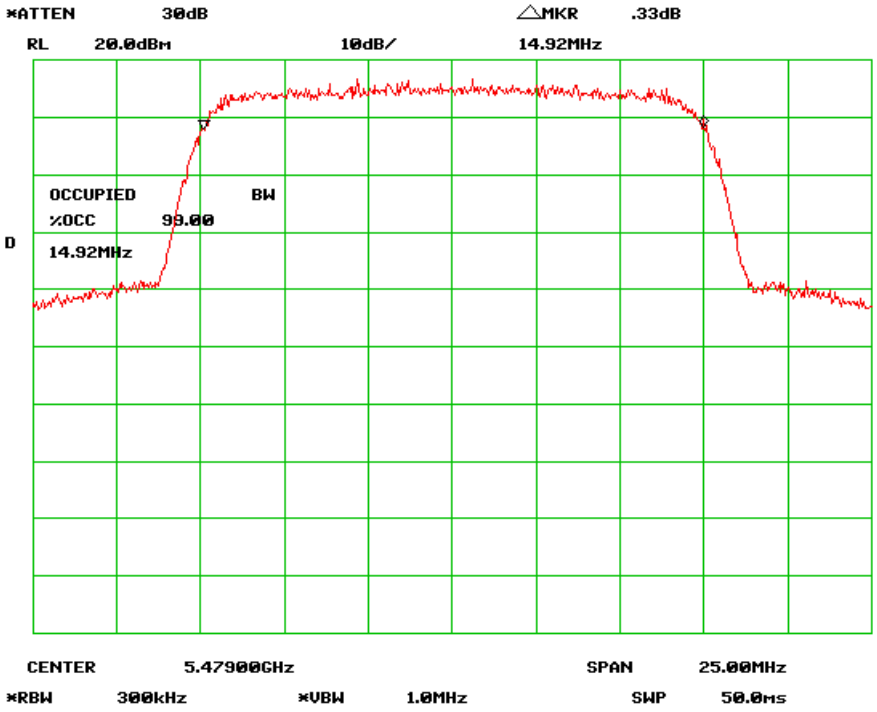

**26 dB Bandwidth-Low Channel**



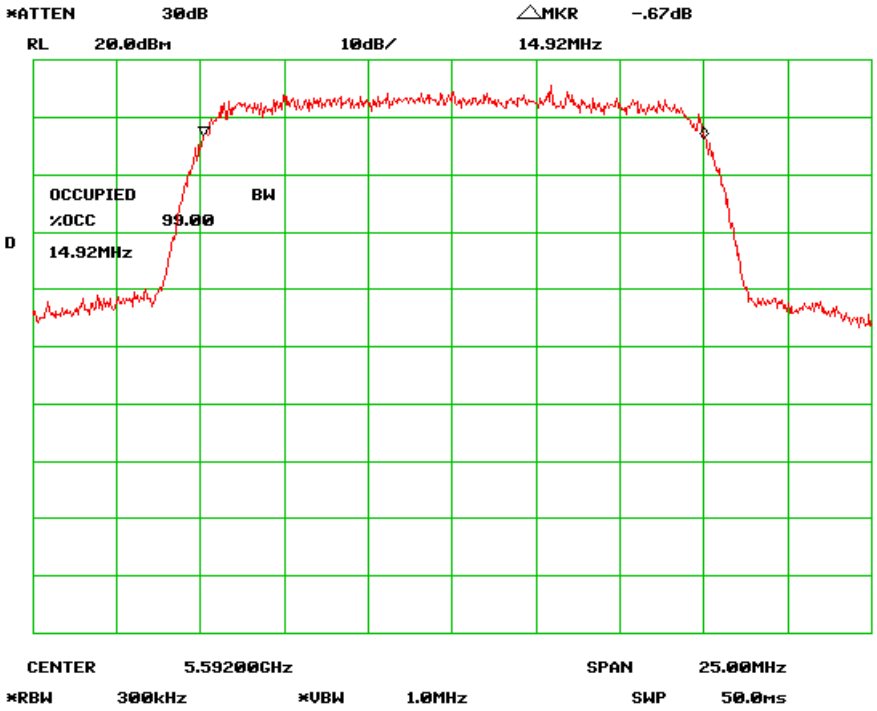

**26 dB Bandwidth-Mid Channel**



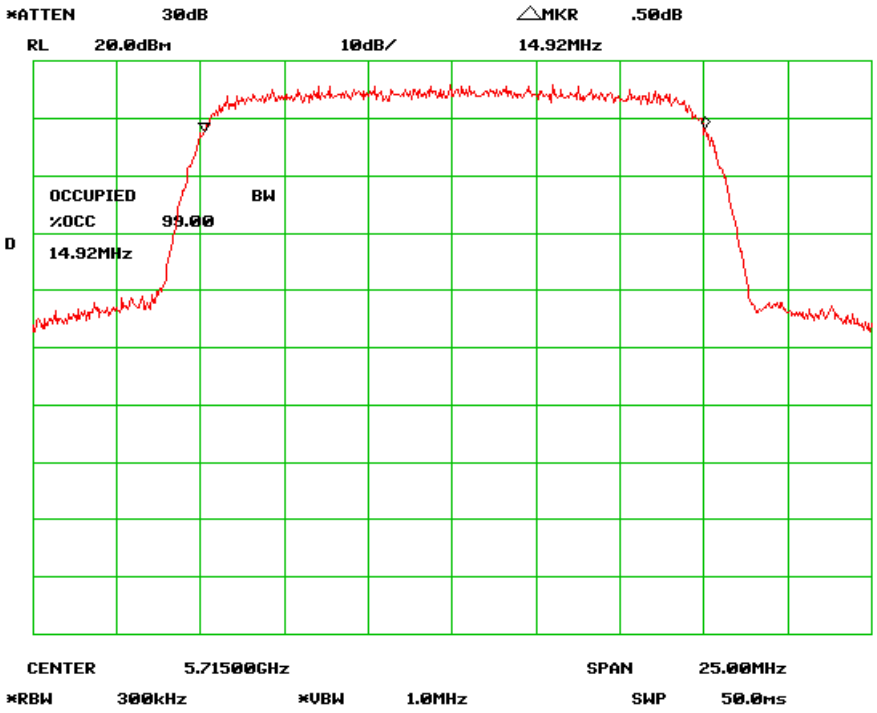

**26 dB Bandwidth-High Channel**




**99% Bandwidth –Low Channel**



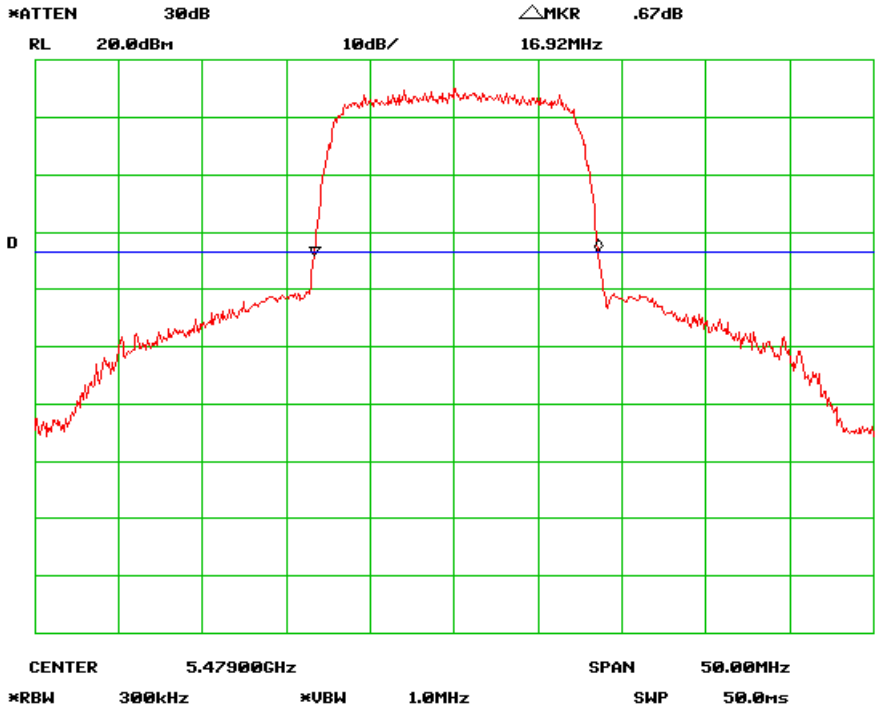

**99% Bandwidth –Mid Channel**



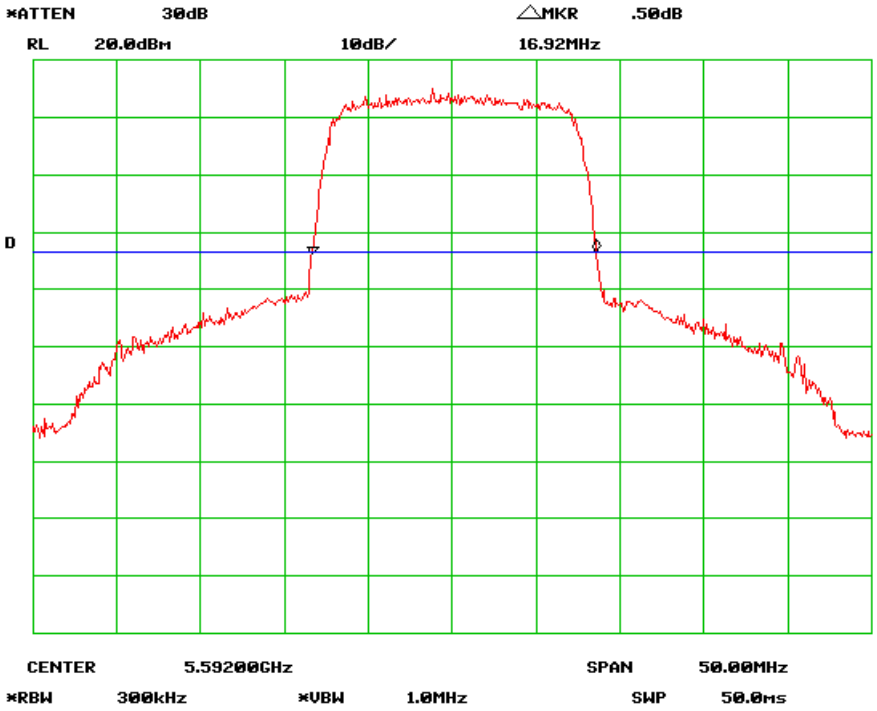

**99% Bandwidth –High Channel**

**Mode: 2 = 16QAM, 16MHz Channel Bandwidth**

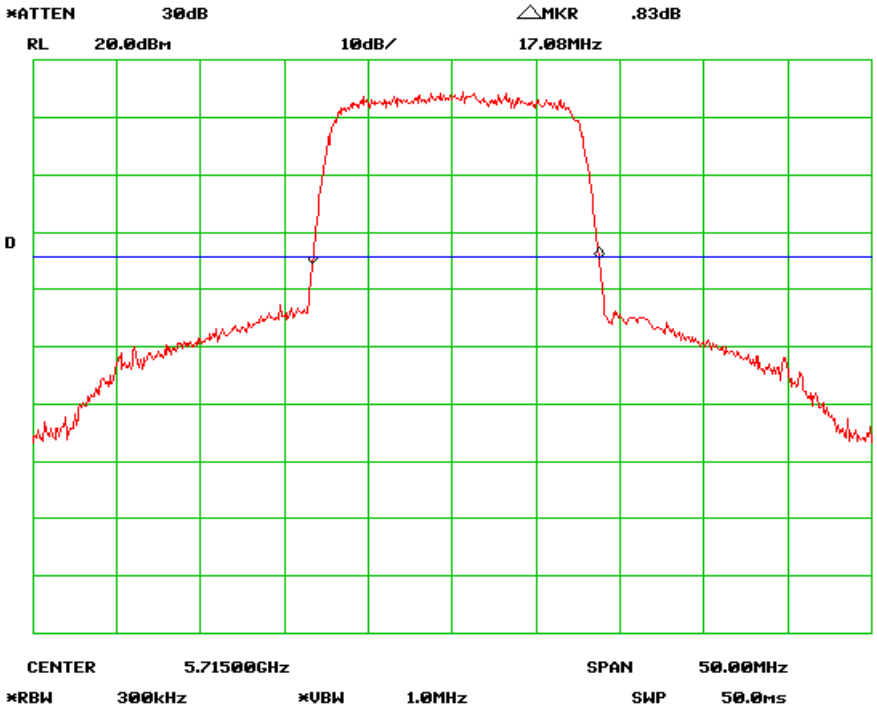
| Mode | Channel Bandwidth | Mode | 26 dB Channel Bandwidth (MHz) | 99% Channel Bandwidth (MHz) |
|---|---|---|---|---|
| Mode 2 | 16MHz | Low Channel | 16.92 | 14.88 |
| | 16MHz | Mid Channel | 16.92 | 14.88 |
| | 16MHz | High Channel | 17.08 | 14.88 |



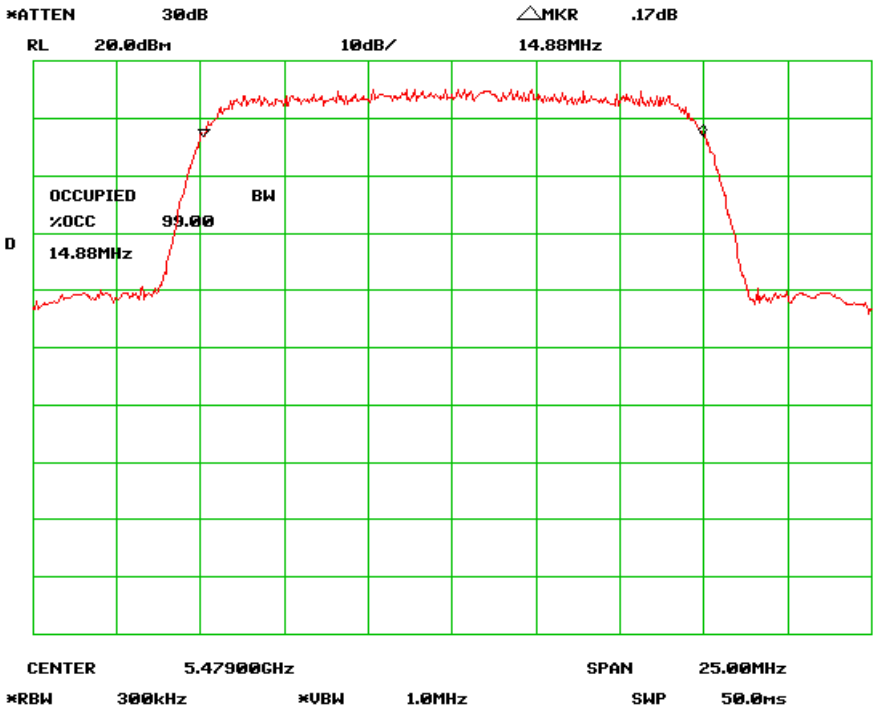

**26 dB Bandwidth-Low Channel**



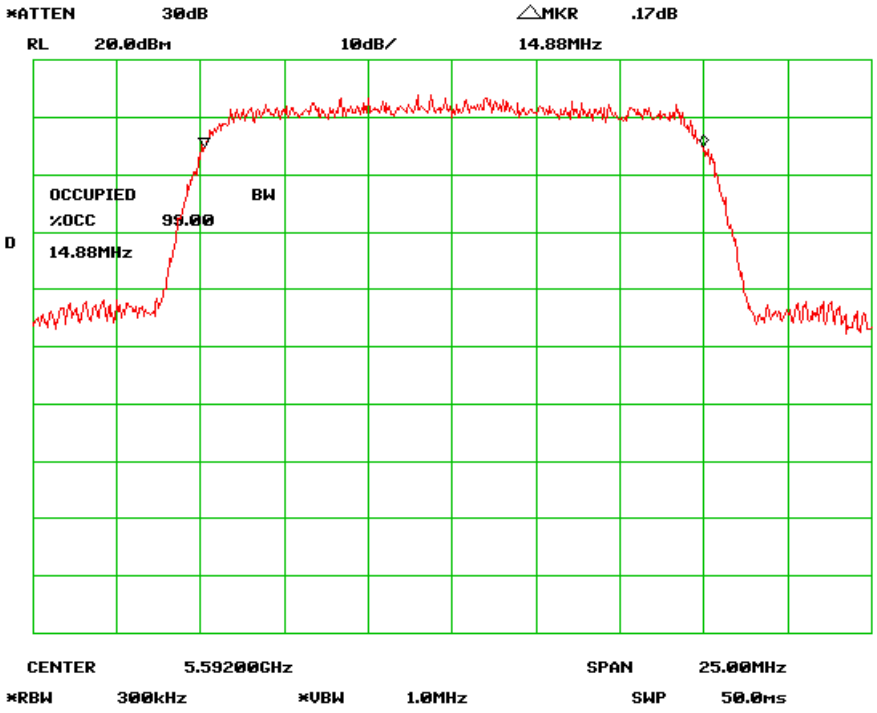

**26 dB Bandwidth-Mid Channel**



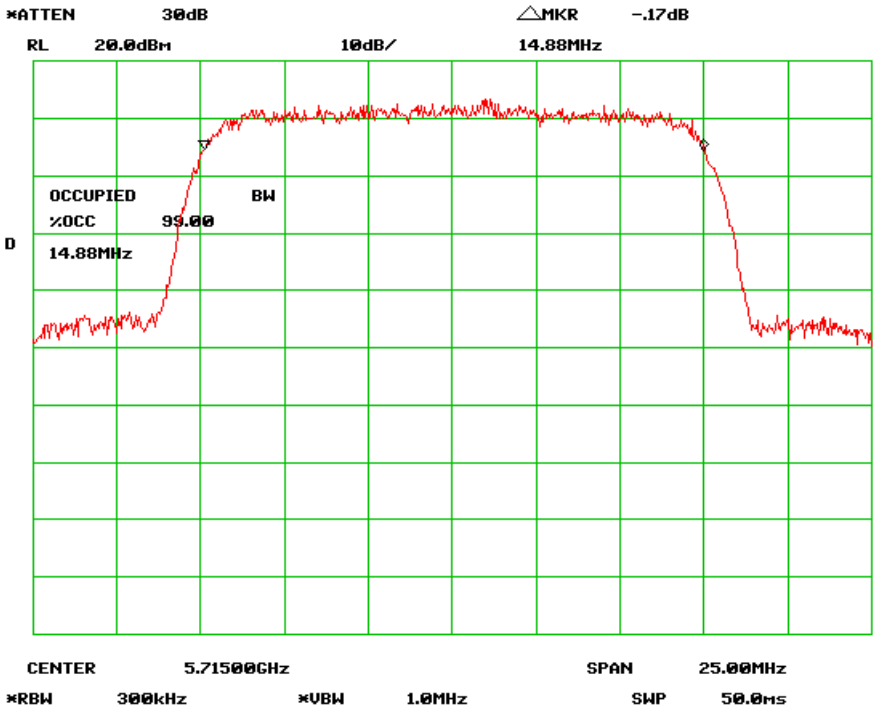

**26 dB Bandwidth-High Channel**




**99% Bandwidth-Low Channel**



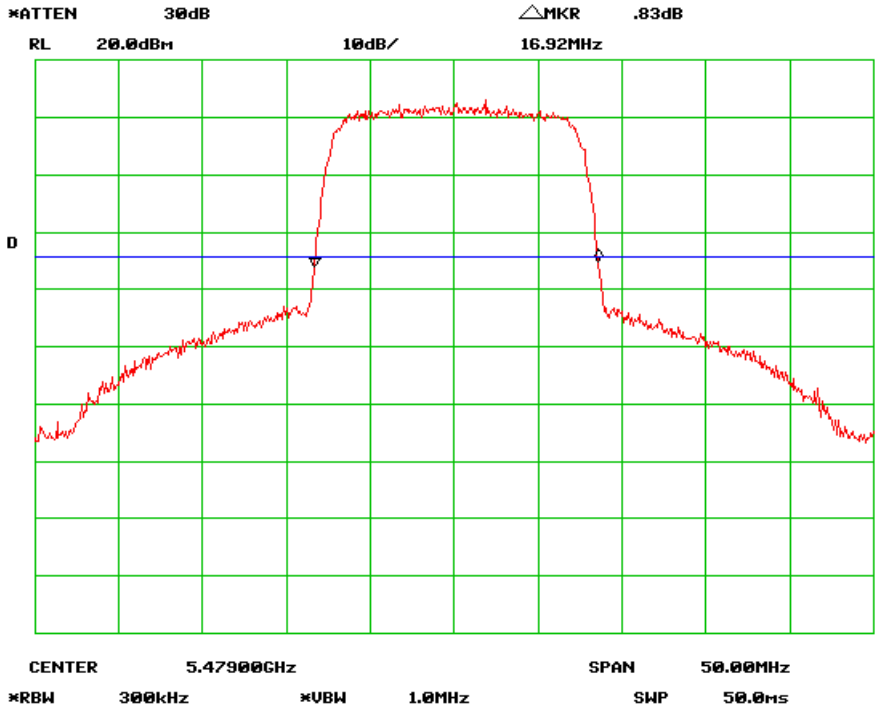

**99% Bandwidth-Mid Channel**



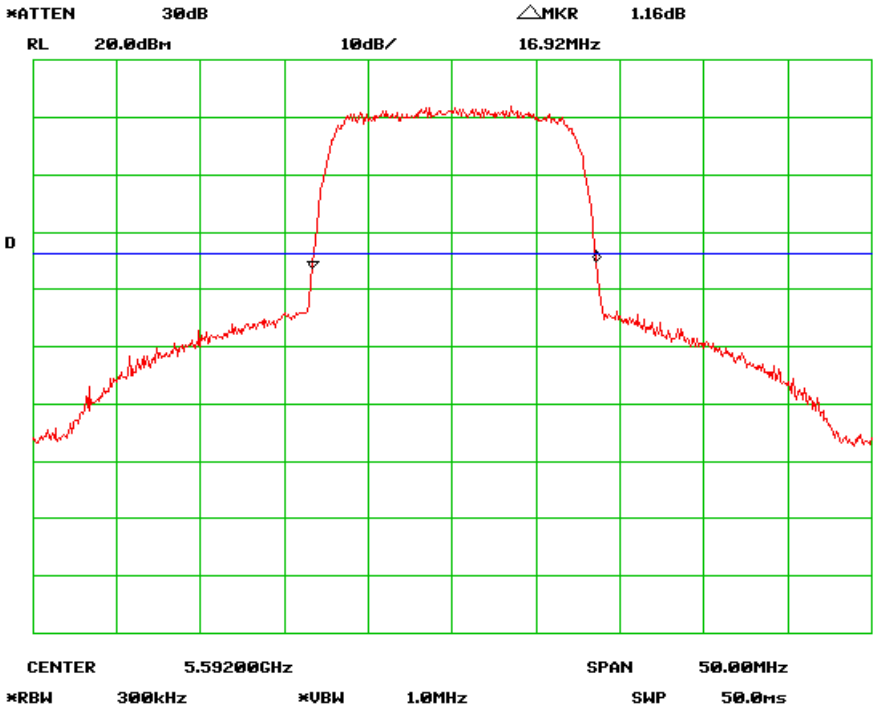

**99% Bandwidth-High Channel**

**Mode: 3 = 64QAM, 16MHz Channel Bandwidth**

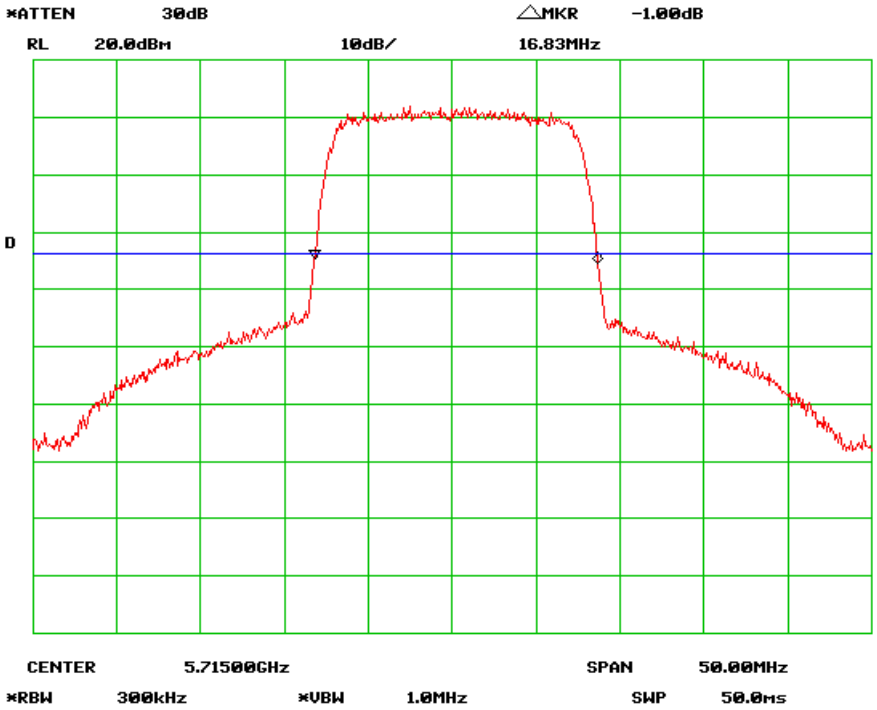
| Mode | Channel Bandwidth | Mode | 26 dB Channel Bandwidth (MHz) | 99% Channel Bandwidth (MHz) |
|---|---|---|---|---|
| Mode 3 | 16MHz | Low Channel | 16.92 | 14.88 |
| | 16MHz | Mid Channel | 16.92 | 14.88 |
| | 16MHz | High Channel | 16.83 | 14.92 |



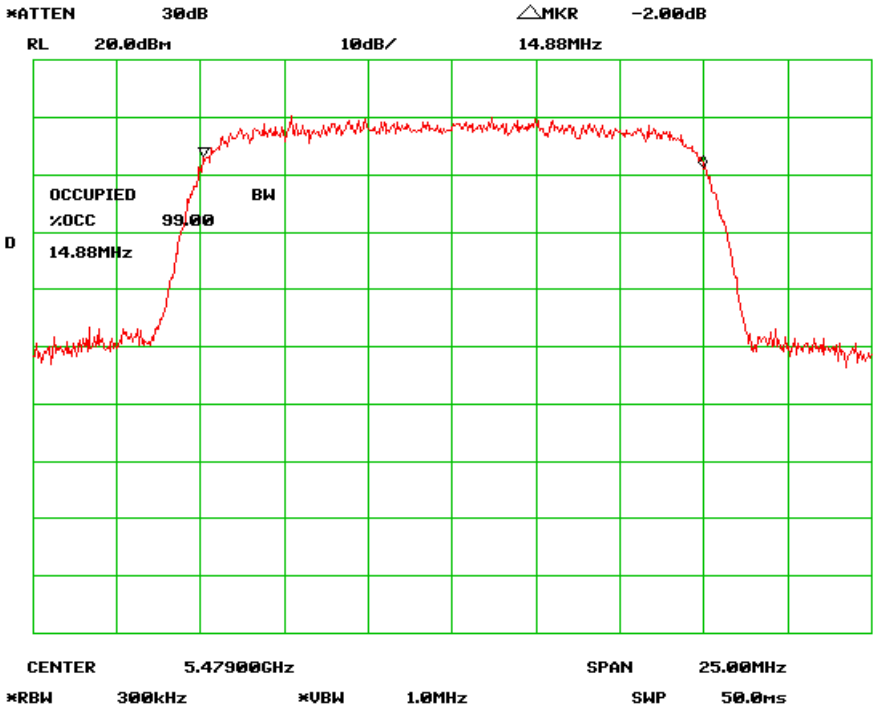

**26 dB Bandwidth-Low Channel**



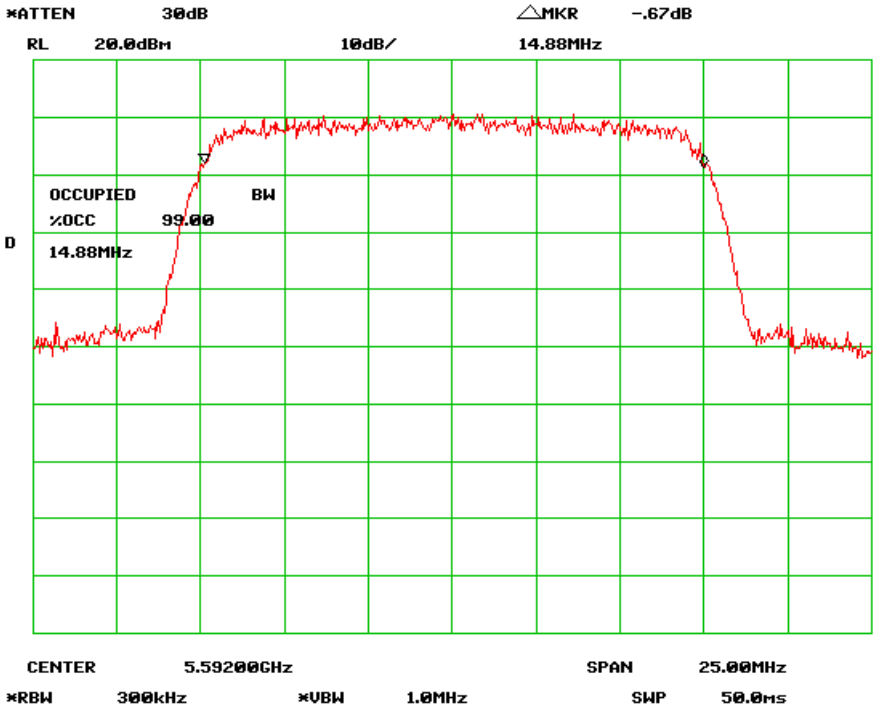

**26 dB Bandwidth-Mid Channel**



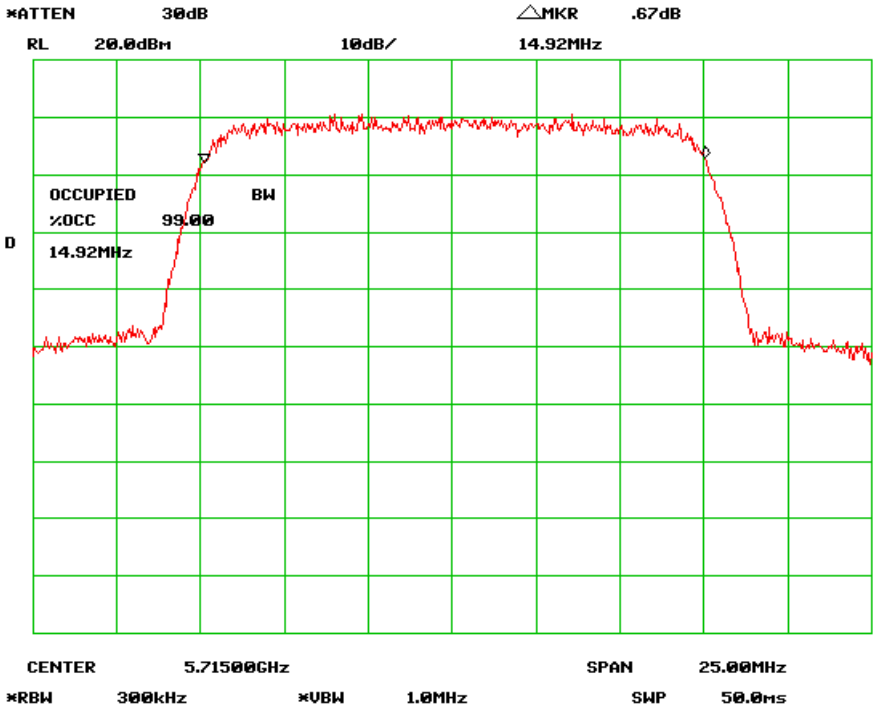

**26 dB Bandwidth-High Channel**




**99% Bandwidth -Low Channel**




**99% Bandwidth -Mid Channel**

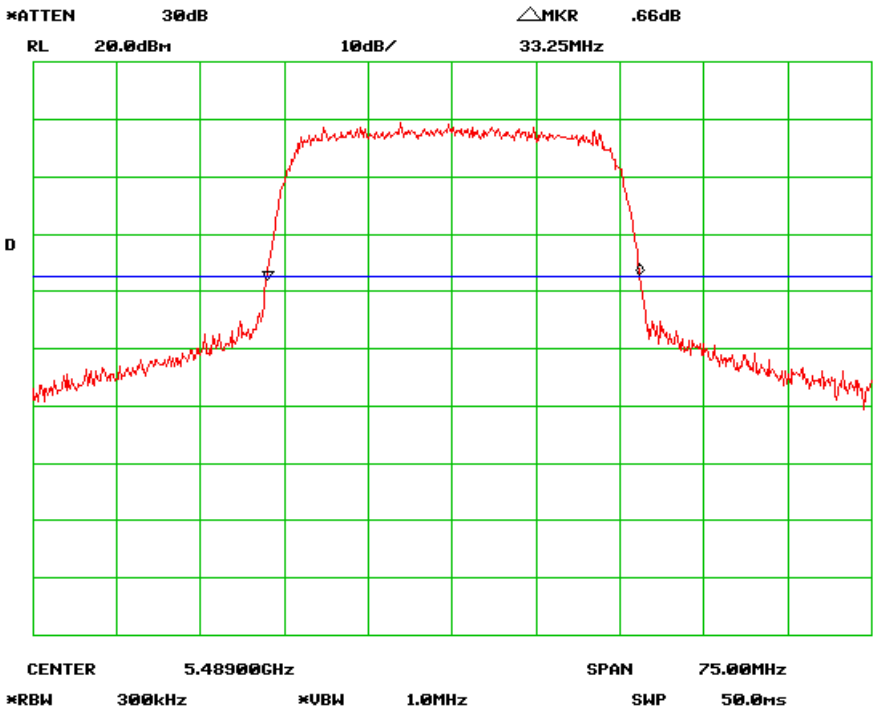



**99% Bandwidth -High Channel**

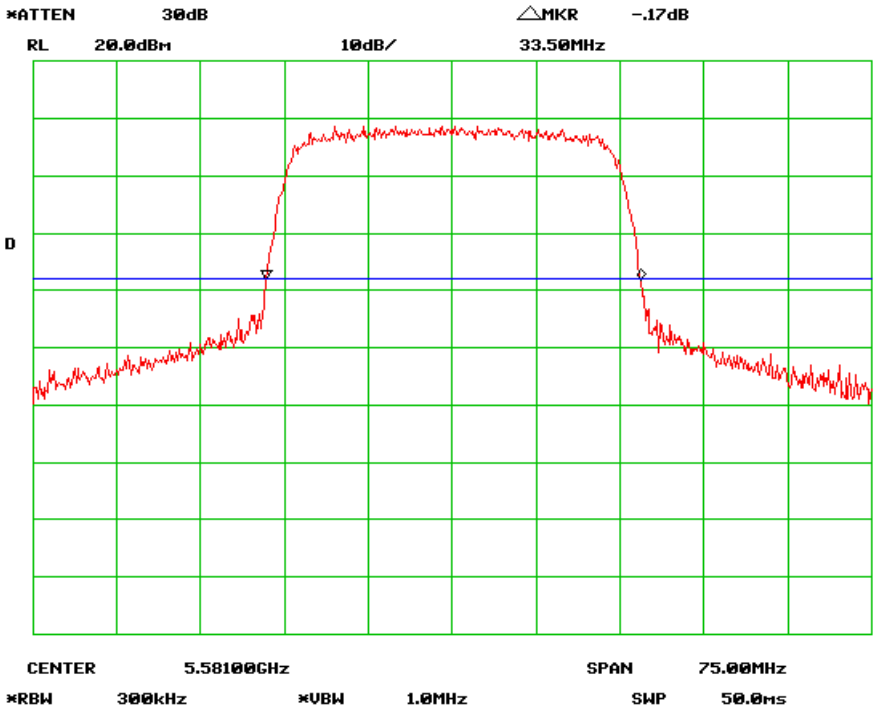
**Mode: 1 = QPSK , 32MHz Channel Bandwidth**

| Mode | Channel Bandwidth | Mode | 26 dB Channel Bandwidth (MHz) | 99% Channel Bandwidth (MHz) |
|---|---|---|---|---|
| Mode 1 | 32MHz | Low Channel | 33.25 | 29.92 |
| | 32MHz | Mid Channel | 33.50 | 30.00 |
| | 32MHz | High Channel | 33.75 | 30.08 |

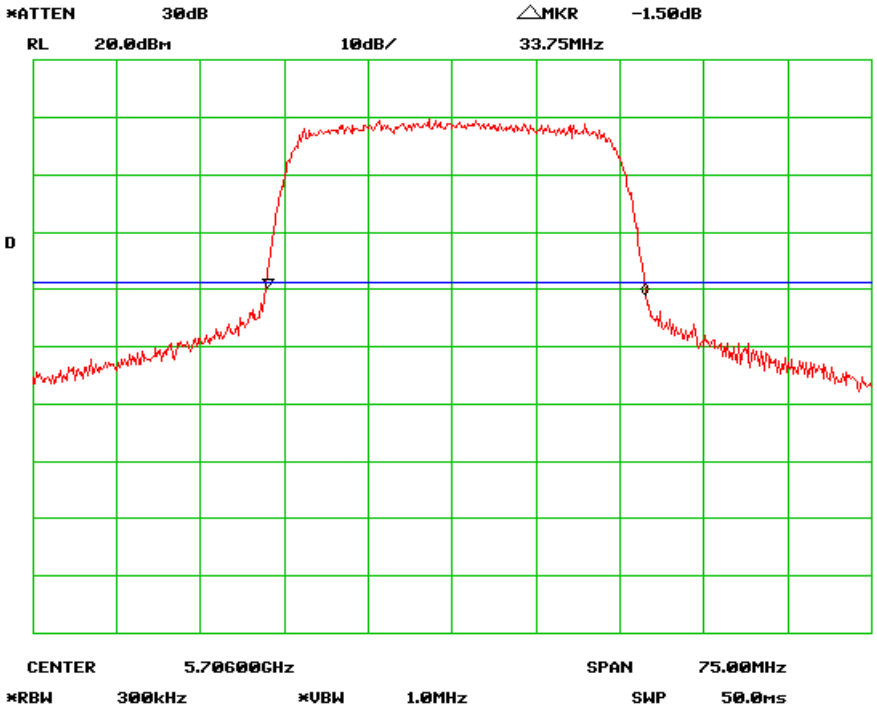
Refer to the attached plots.



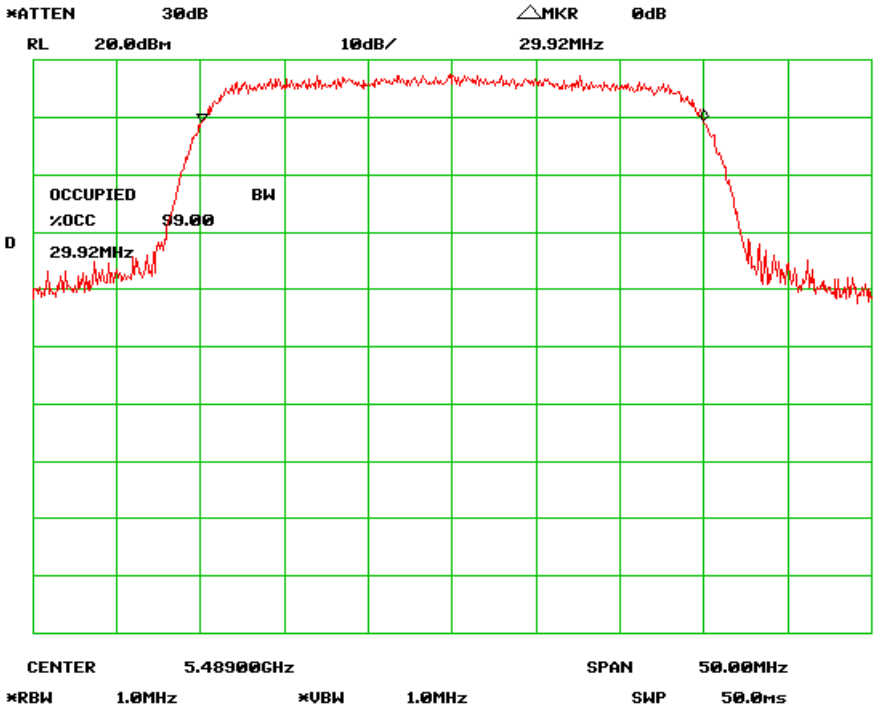

**26 dB Bandwidth-Low Channel**



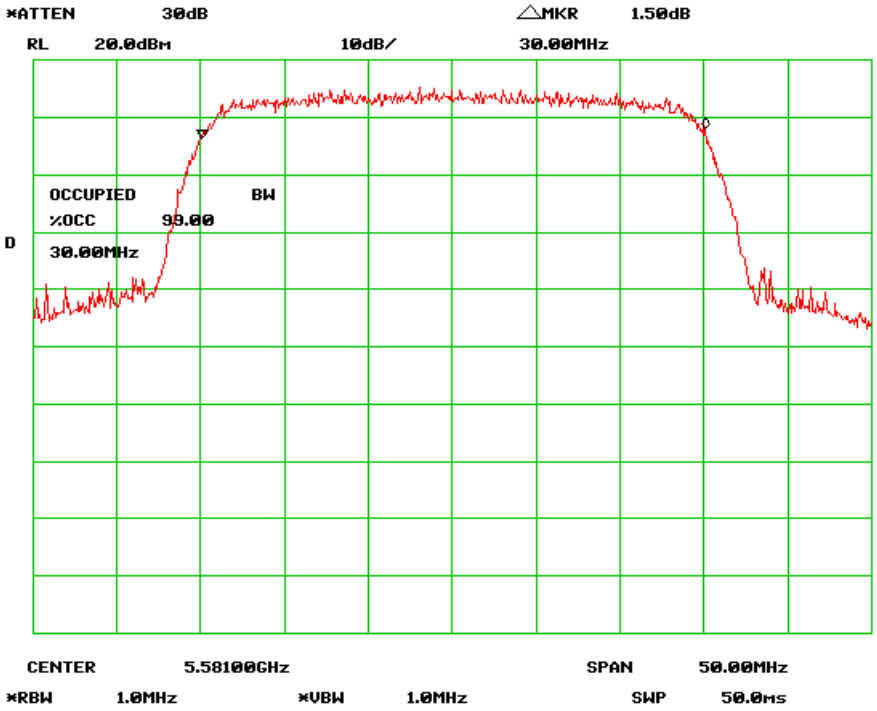

**26 dB Bandwidth-Mid Channel**



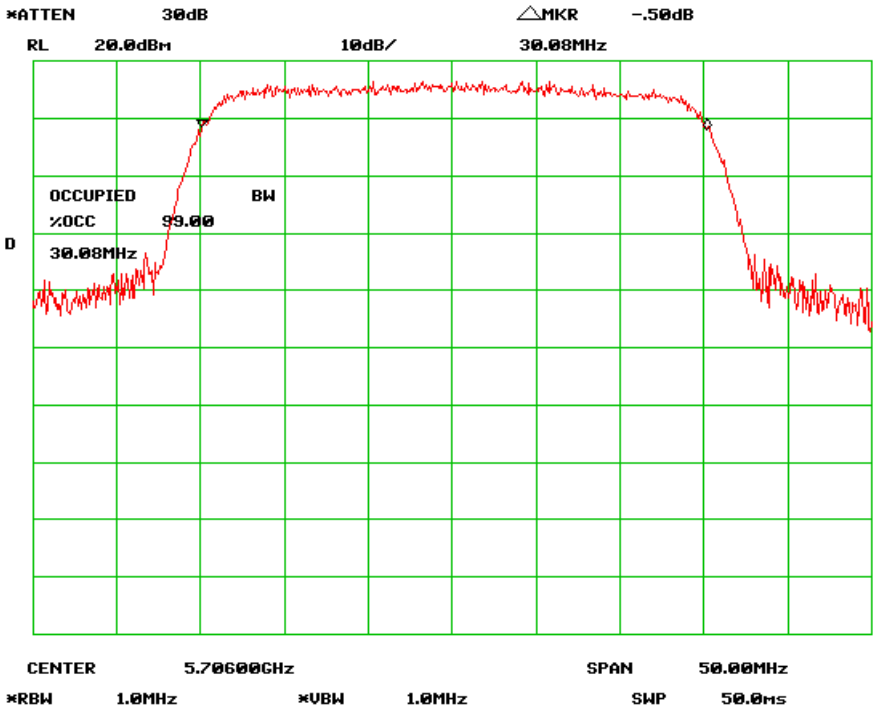

**26 dB Bandwidth-High Channel**




**99% Bandwidth-Low Channel**



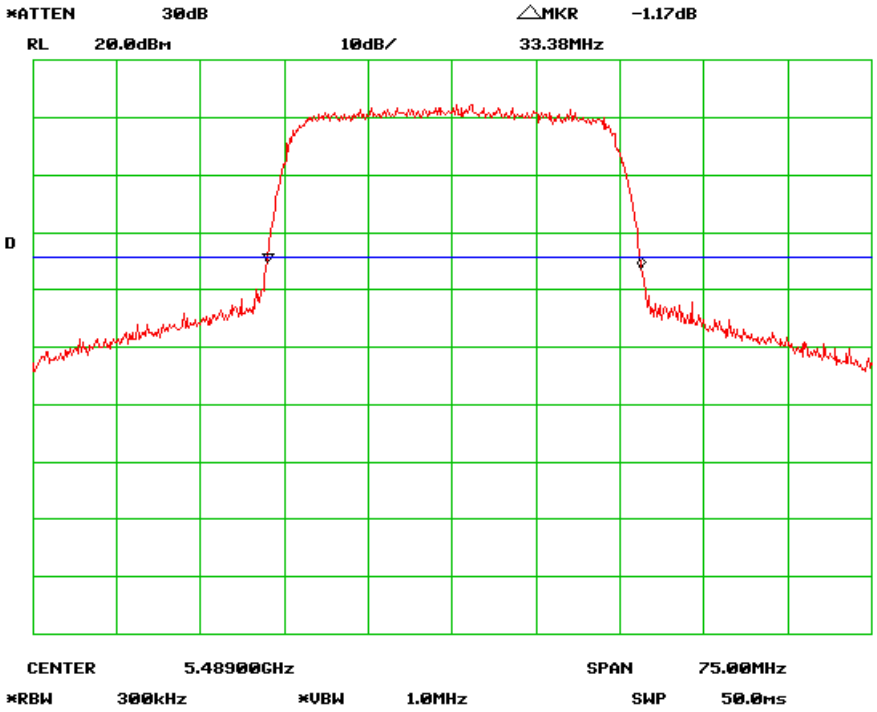

**99% Bandwidth-Mid Channel**



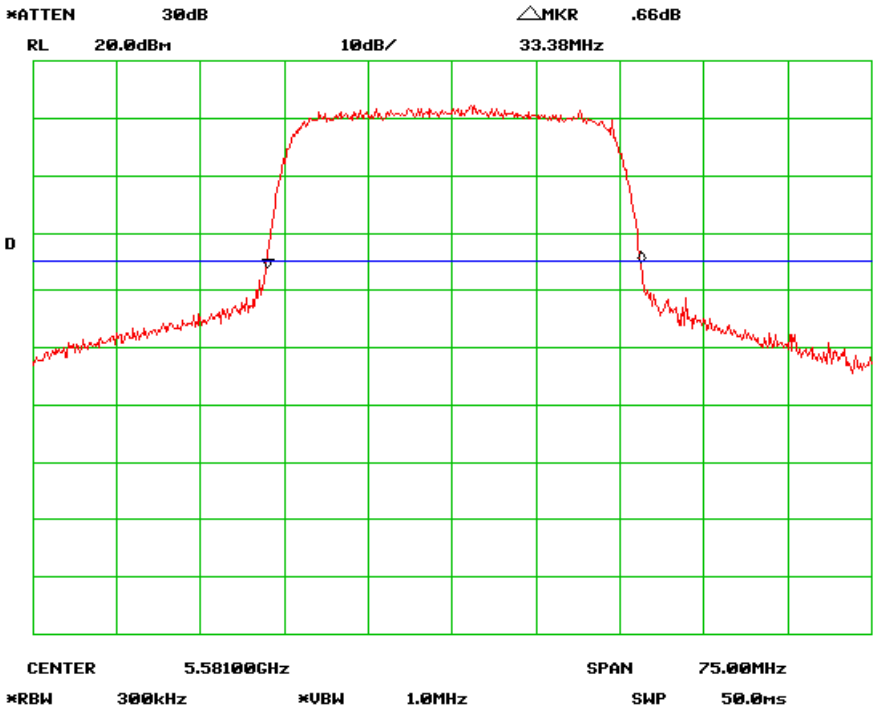

**99% Bandwidth-High Channel**

**Mode: 2 = 16QAM, 32MHz Channel Bandwidth**

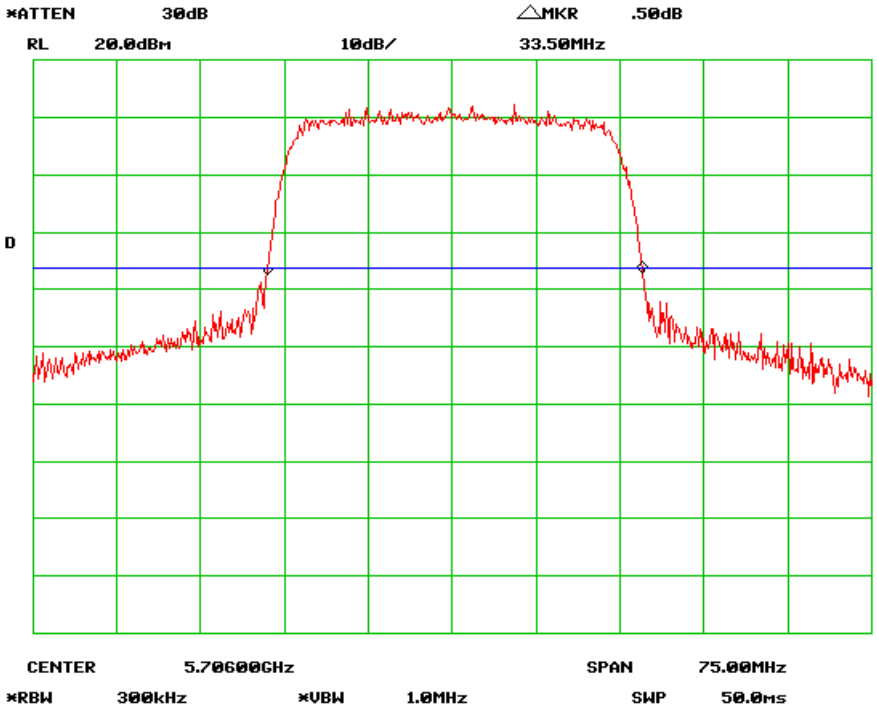
| Mode | Channel Bandwidth | Mode | 26 dB Channel Bandwidth (MHz) | 99% Channel Bandwidth (MHz) |
|---|---|---|---|---|
| Mode 2 | 32MHz | Low Channel | 33.38 | 29.92 |
| | 32MHz | Mid Channel | 33.38 | 30.00 |
| | 32MHz | High Channel | 33.50 | 30.00 |



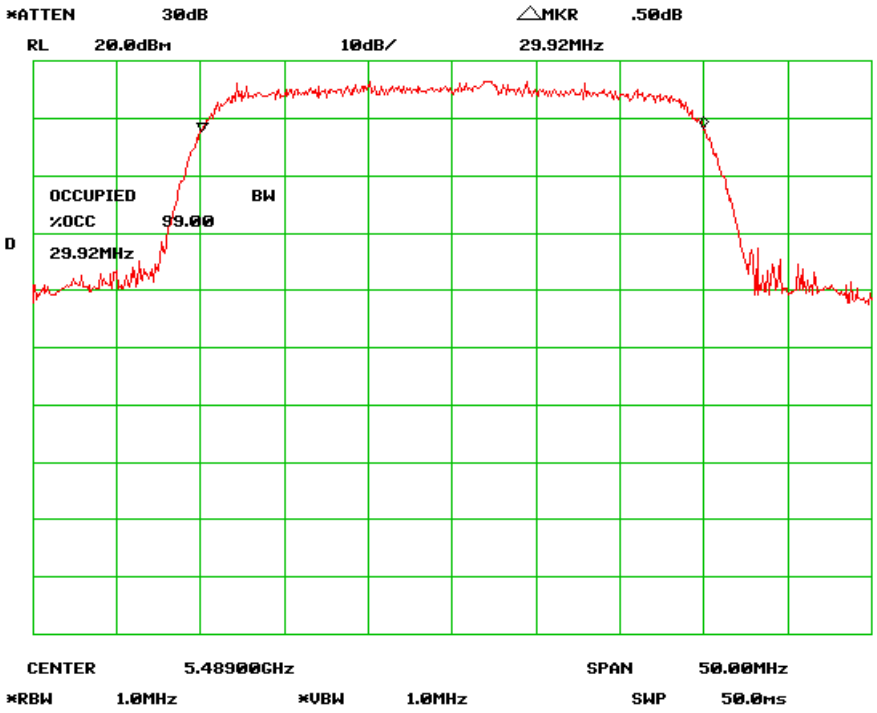

**26 dB Bandwidth-Low Channel**



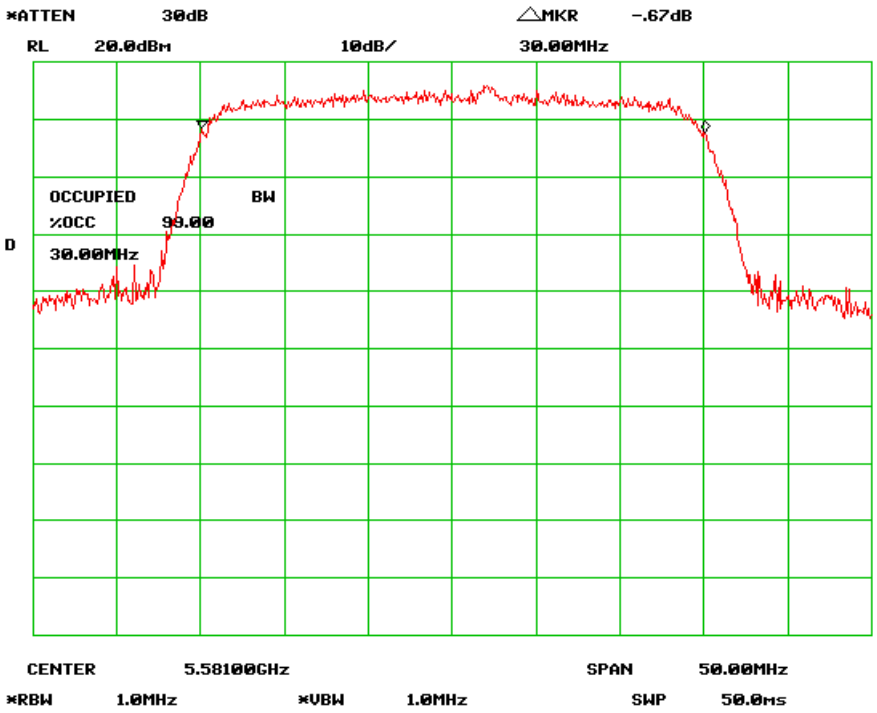

**26 dB Bandwidth-Mid Channel**



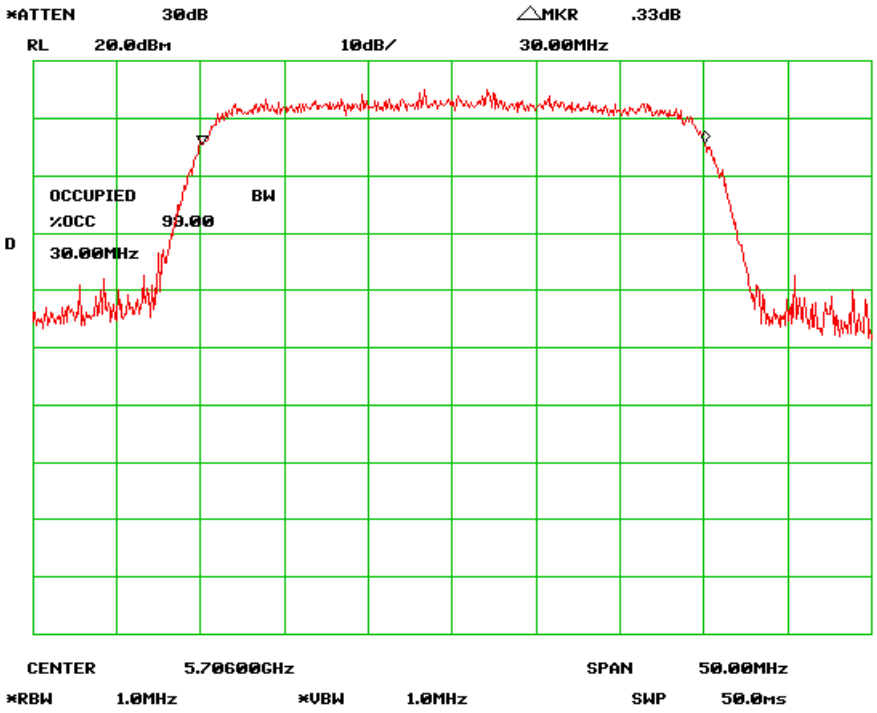

**26 dB Bandwidth-High Channel**




**99% Bandwidth – Low Channel**



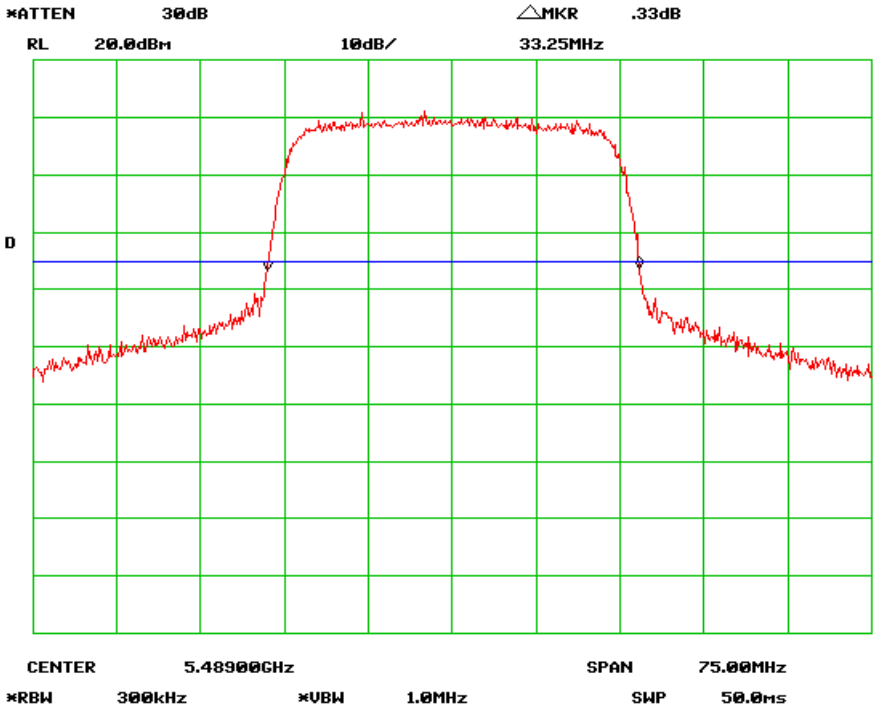

**99% Bandwidth – Mid Channel**



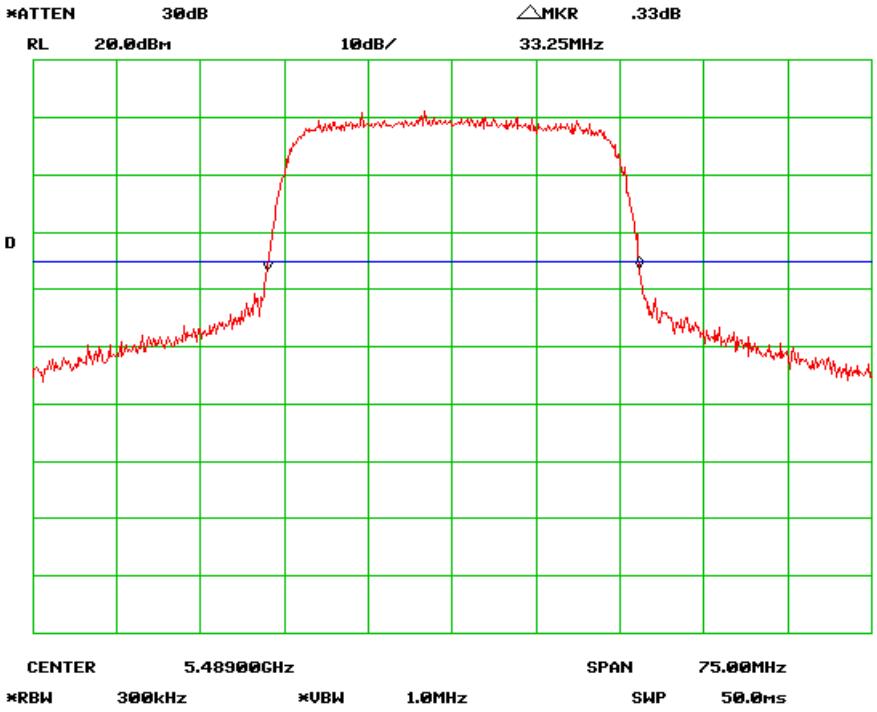

**99% Bandwidth – High Channel**

**Mode: 3 = 64QAM, 32MHz Channel Bandwidth**

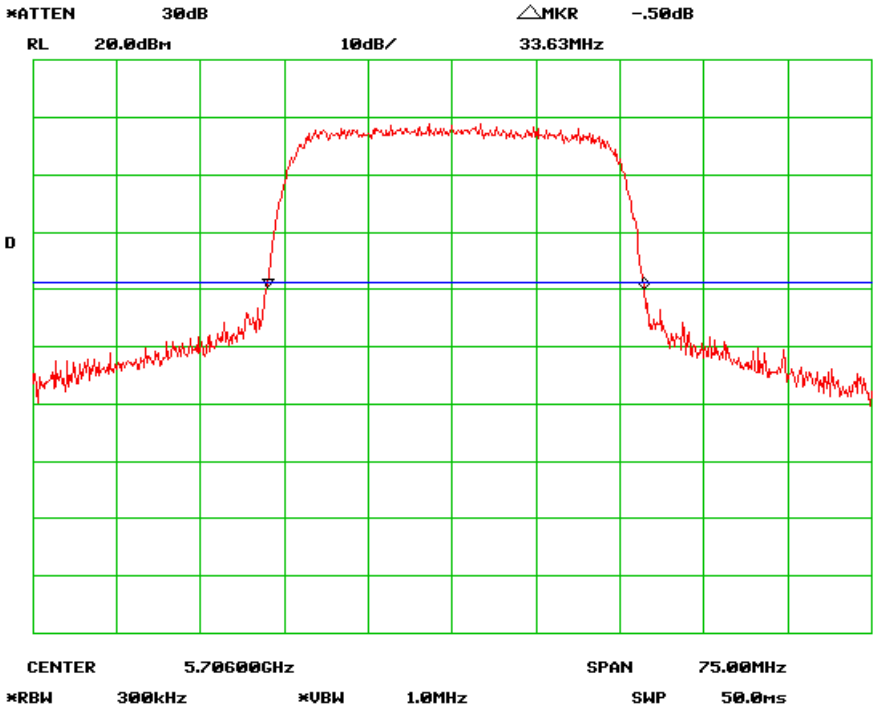
| Mode | Channel Bandwidth | Mode | 26 dB Channel Bandwidth (MHz) | 99% Channel Bandwidth (MHz) |
|---|---|---|---|---|
| Mode 3 | 32MHz | Low Channel | 33.25 | 29.83 |
| | 32MHz | Mid Channel | 33.25 | 29.92 |
| | 32MHz | High Channel | 33.63 | 30.00 |



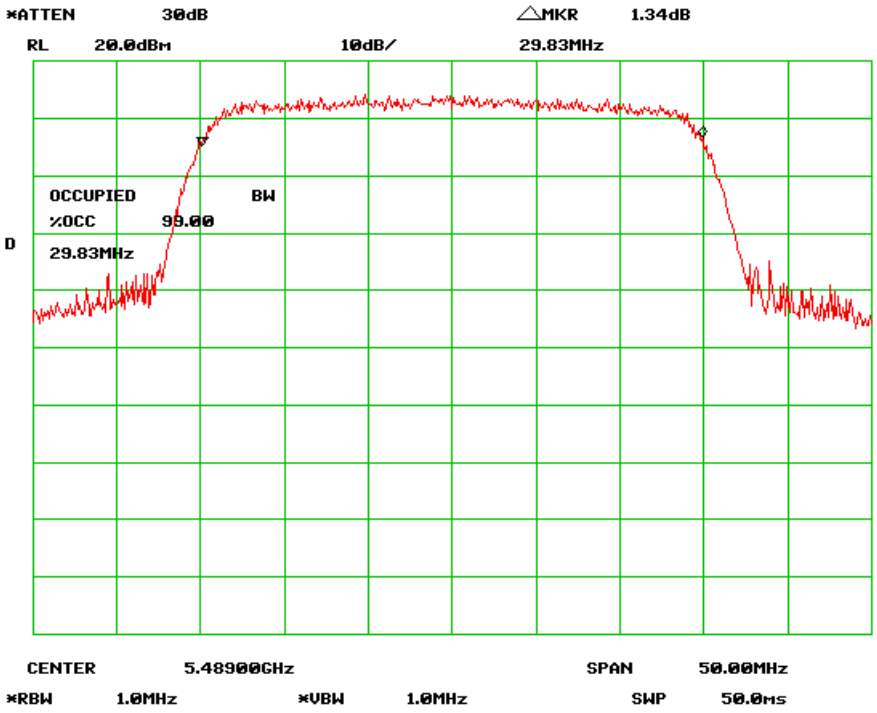

**26 dB Bandwidth – Low Channel**



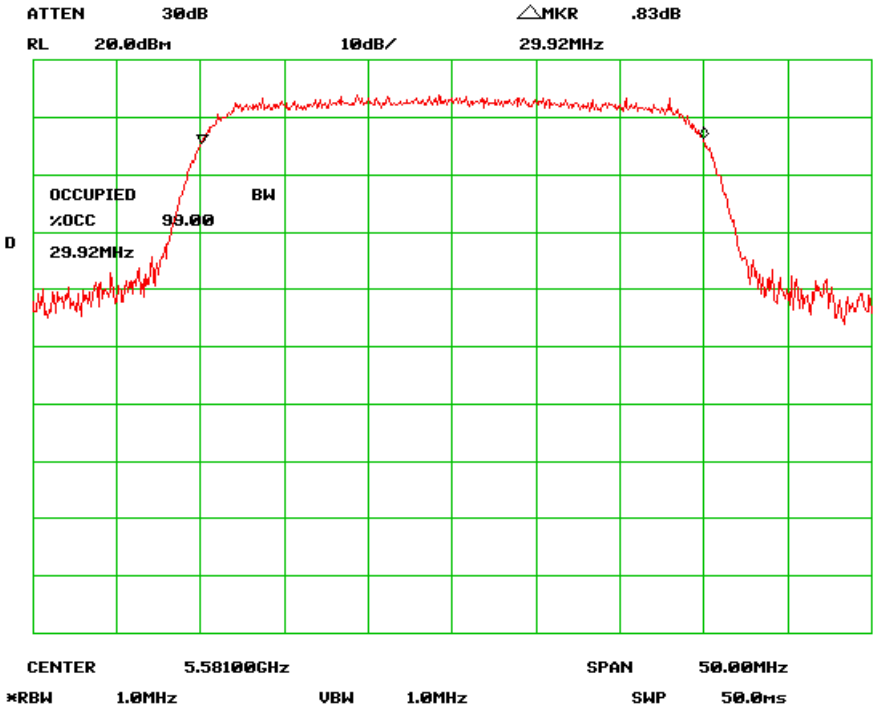

**26 dB Bandwidth – Mid Channel**



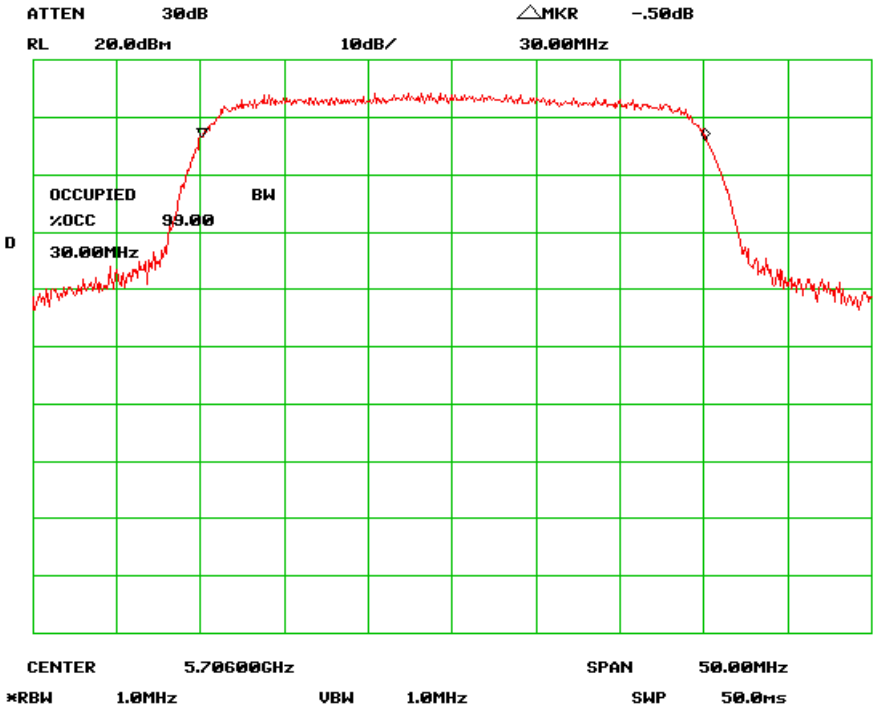

**26 dB Bandwidth – High Channel**




**99% Bandwidth –Low Channel**




**99% Bandwidth –Mid Channel**




**99% Bandwidth –High Channel**

# 5.4 Peak Spectral Density

1. Conducted Measurement
   EUT was set for low , mid, high channel with modulated mode and highest RF output power.
   The spectrum analyzer was connected to the antenna terminal.
2. Conducted Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 40GHz is ±1.5dB.
3. Environmental Conditions

| | |
|---|---|
| Temperature | 23°C |
| Relative Humidity | 50% |
| Atmospheric Pressure | 1019mbar |

4. Test Date : August 01-15, 2012
   Tested By : Choon Sian Ooi

**Standard Requirement :** 47 CFR §15.407(a); RSS210(A9.2(2))

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

**Procedures:** KDB 789033 D01, Section E & F

**Test Result :**

Refer to the attached plots.

| Mode | Gain (dBi) | Antenna Gain >6dBi | Max Allowable Peak Power Spectral Density (dBm) |
|---|---|---|---|
| Panel | 28.0 | 22 | -11 |
| Parabolic | 37.5 | 31.5 | -20.5 |

Note: Test plot is measured at Max conducted RF output power configuration when antenna gain is less than 6dBi. If higher gain antenna is used, power must be reduced to stated value on the table

## Mode: 1 = QPSK, 8MHz Channel Bandwidth

| 802.11a | Channel Frequency (MHz) | Channel | Peak-Max-hold Spectrum (dB) | Measured Peak Spectral Density (dBm/MHz) | Measured Peak Excursion ratio (dB) | Peak Excursion Ratio Limit (dB) |
|---|---|---|---|---|---|---|
| 5.25–5.35 GHz | 5257 | Low | 15.30 | 10.39 | 4.91 | 13 |
| | 5300 | Mid | 15.67 | 10.98 | 4.69 | 13 |
| | 5343 | High | 15.53 | 10.37 | 5.16 | 13 |
| 5.47–5.725 GHz | 5477 | Low | 16.41 | 10.92 | 5.49 | 13 |
| | 5596 | Mid | 15.38 | 10.78 | 4.60 | 13 |
| | 5718 | High | 15.14 | 10.50 | 4.64 | 13 |

## Mode: 2 = 16QAM, 8MHz Channel Bandwidth

| 802.11a | Channel Frequency (MHz) | Channel | Peak-Max-hold Spectrum (dB) | Measured Peak Spectral Density (dBm/MHz) | Measured Peak Excursion ratio (dB) | Peak Excursion Ratio Limit (dB) |
|---|---|---|---|---|---|---|
| 5.25–5.35 GHz | 5257 | Low | 19.05 | 10.15 | 8.90 | 13 |
| | 5300 | Mid | 18.23 | 10.58 | 7.65 | 13 |
| | 5343 | High | 19.14 | 10.33 | 8.81 | 13 |
| 5.47–5.725 GHz | 5477 | Low | 18.99 | 10.97 | 8.02 | 13 |
| | 5596 | Mid | 18.59 | 10.42 | 8.17 | 13 |
| | 5718 | High | 19.08 | 10.37 | 8.71 | 13 |

## Mode: 3 = 64QAM, 8MHz Channel Bandwidth

| 802.11a | Channel Frequency (MHz) | Channel | Peak-Max-hold Spectrum (dB) | Measured Peak Spectral Density (dBm/MHz) | Measured Peak Excursion ratio (dB) | Peak Excursion Ratio Limit (dB) |
|---|---|---|---|---|---|---|
| 5.25–5.35 GHz | 5257 | Low | 17.96 | 10.69 | 7.27 | 13 |
| | 5300 | Mid | 17.72 | 10.08 | 7.64 | 13 |
| | 5343 | High | 16.84 | 10.31 | 6.53 | 13 |
| 5.47–5.725 GHz | 5477 | Low | 17.93 | 10.94 | 6.99 | 13 |
| | 5596 | Mid | 17.34 | 10.77 | 6.57 | 13 |
| | 5718 | High | 17.13 | 10.90 | 6.23 | 13 |

### Mode: 1 = QPSK, 16MHz Channel Bandwidth

| 802.11a | Channel Frequency (MHz) | Channel | Peak-Max-hold Spectrum (dB) | Measured Peak Spectral Density (dBm/MHz) | Measured Peak Excursion ratio (dB) | Peak Excursion Ratio Limit (dB) |
|---|---|---|---|---|---|---|
| 5.25–5.35 GHz | 5261 | Low | 17.59 | 10.39 | 7.20 | 13 |
| | 5300 | Mid | 17.09 | 10.26 | 6.83 | 13 |
| | 5340 | High | 16.94 | 10.88 | 6.06 | 13 |
| 5.47–5.725 GHz | 5479 | Low | 16.70 | 10.86 | 5.84 | 13 |
| | 5592 | Mid | 18.44 | 10.40 | 8.04 | 13 |
| | 5715 | High | 18.36 | 10.82 | 7.54 | 13 |

### Mode: 2 = 16QAM, 16MHz Channel Bandwidth

| 802.11a | Channel Frequency (MHz) | Channel | Peak-Max-hold Spectrum (dB) | Measured Peak Spectral Density (dBm/MHz) | Measured Peak Excursion ratio (dB) | Peak Excursion Ratio Limit (dB) |
|---|---|---|---|---|---|---|
| 5.25–5.35 GHz | 5261 | Low | 18.81 | 10.73 | 8.08 | 13 |
| | 5300 | Mid | 17.27 | 10.92 | 6.35 | 13 |
| | 5340 | High | 18.28 | 10.65 | 7.63 | 13 |
| 5.47–5.725 GHz | 5479 | Low | 19.68 | 10.51 | 9.17 | 13 |
| | 5592 | Mid | 19.11 | 10.98 | 8.13 | 13 |
| | 5715 | High | 19.67 | 10.41 | 9.26 | 13 |

### Mode: 3 = 64QAM, 16MHz Channel Bandwidth

| 802.11a | Channel Frequency (MHz) | Channel | Peak-Max-hold Spectrum (dB) | Measured Peak Spectral Density (dBm/MHz) | Measured Peak Excursion ratio (dB) | Peak Excursion Ratio Limit (dB) |
|---|---|---|---|---|---|---|
| 5.25–5.35 GHz | 5261 | Low | 16.09 | 9.62 | 6.47 | 13 |
| | 5300 | Mid | 15.51 | 9.53 | 5.98 | 13 |
| | 5340 | High | 16.40 | 9.98 | 6.42 | 13 |
| 5.47–5.725 GHz | 5479 | Low | 17.49 | 9.95 | 7.54 | 13 |
| | 5592 | Mid | 17.25 | 9.73 | 7.52 | 13 |
| | 5715 | High | 17.34 | 10.06 | 7.28 | 13 |

## Mode: 1 = QPSK, 32MHz Channel Bandwidth

| 802.11a | Channel Frequency (MHz) | Channel | Peak-Max-hold Spectrum (dB) | Measured Peak Spectral Density (dBm/MHz) | Measured Peak Excursion ratio (dB) | Peak Excursion Ratio Limit (dB) |
|---|---|---|---|---|---|---|
| 5.25–5.35 GHz | 5269 | Low | 14.24 | 8.52 | 5.72 | 13 |
| | 5300 | Mid | 15.34 | 8.50 | 6.84 | 13 |
| | 5331 | High | 13.34 | 8.28 | 5.06 | 13 |
| 5.47–5.725 GHz | 5489 | Low | 15.90 | 7.42 | 8.48 | 13 |
| | 5581 | Mid | 16.10 | 7.83 | 8.27 | 13 |
| | 5706 | High | 16.50 | 8.13 | 8.37 | 13 |

## Mode: 2 = 16QAM, 32MHz Channel Bandwidth

| 802.11a | Channel Frequency (MHz) | Channel | Peak-Max-hold Spectrum (dB) | Measured Peak Spectral Density (dBm/MHz) | Measured Peak Excursion ratio (dB) | Peak Excursion Ratio Limit (dB) |
|---|---|---|---|---|---|---|
| 5.25–5.35 GHz | 5269 | Low | 16.29 | 9.46 | 6.83 | 13 |
| | 5300 | Mid | 15.99 | 9.22 | 6.77 | 13 |
| | 5331 | High | 16.22 | 9.11 | 7.11 | 13 |
| 5.47–5.725 GHz | 5489 | Low | 17.23 | 9.03 | 8.20 | 13 |
| | 5581 | Mid | 16.70 | 9.21 | 7.49 | 13 |
| | 5706 | High | 15.61 | 8.37 | 7.24 | 13 |

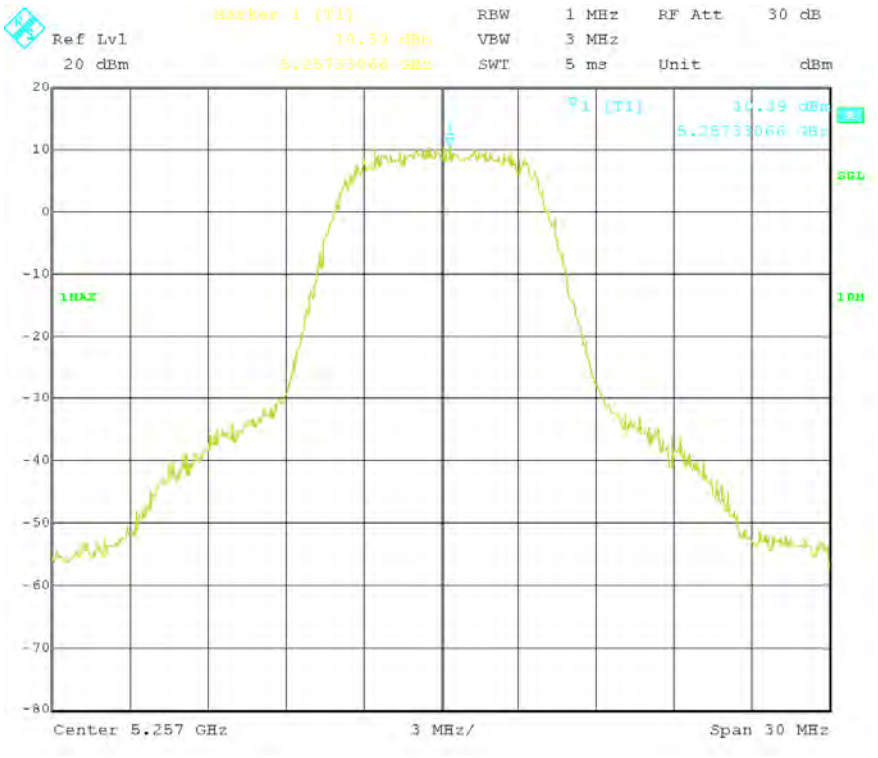
## Mode: 3 = 64QAM, 32MHz Channel Bandwidth

| 802.11a | Channel Frequency (MHz) | Channel | Peak-Max-hold Spectrum (dB) | Measured Peak Spectral Density (dBm/MHz) | Measured Peak Excursion ratio (dB) | Peak Excursion Ratio Limit (dB) |
|---|---|---|---|---|---|---|
| 5.25–5.35 GHz | 5269 | Low | 14.56 | 7.33 | 7.23 | 13 |
| | 5300 | Mid | 13.58 | 6.73 | 6.85 | 13 |
| | 5331 | High | 14.78 | 6.67 | 8.11 | 13 |
| 5.47–5.725 GHz | 5489 | Low | 15.10 | 7.42 | 7.68 | 13 |
| | 5581 | Mid | 14.80 | 7.83 | 6.97 | 13 |
| | 5706 | High | 14.68 | 7.83 | 6.85 | 13 |

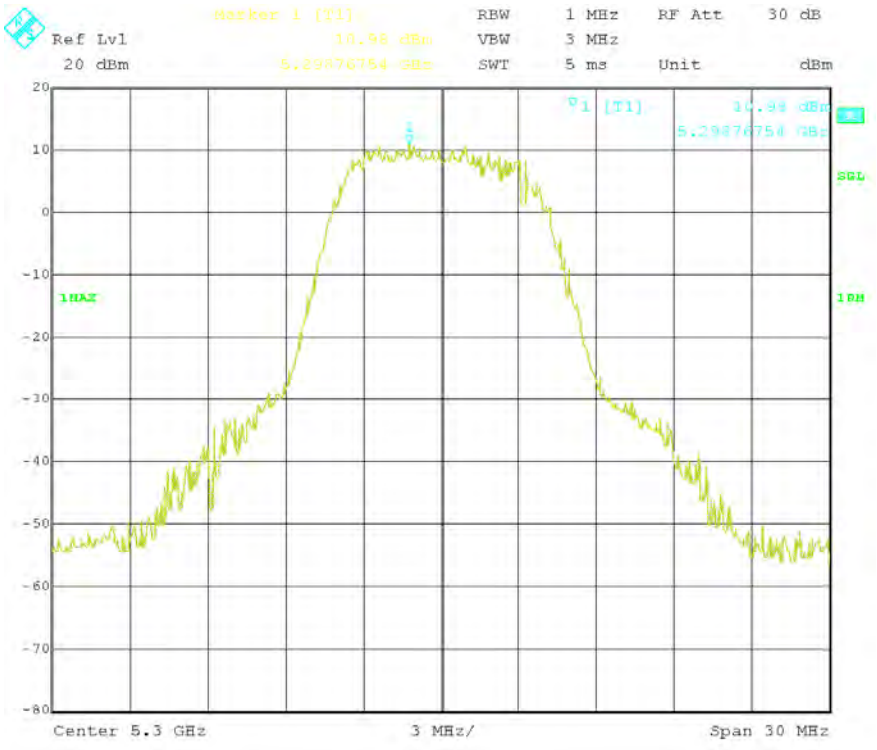
## 5.2GHz Band

### Mode: 1 = QPSK, 8MHz Channel Bandwidth

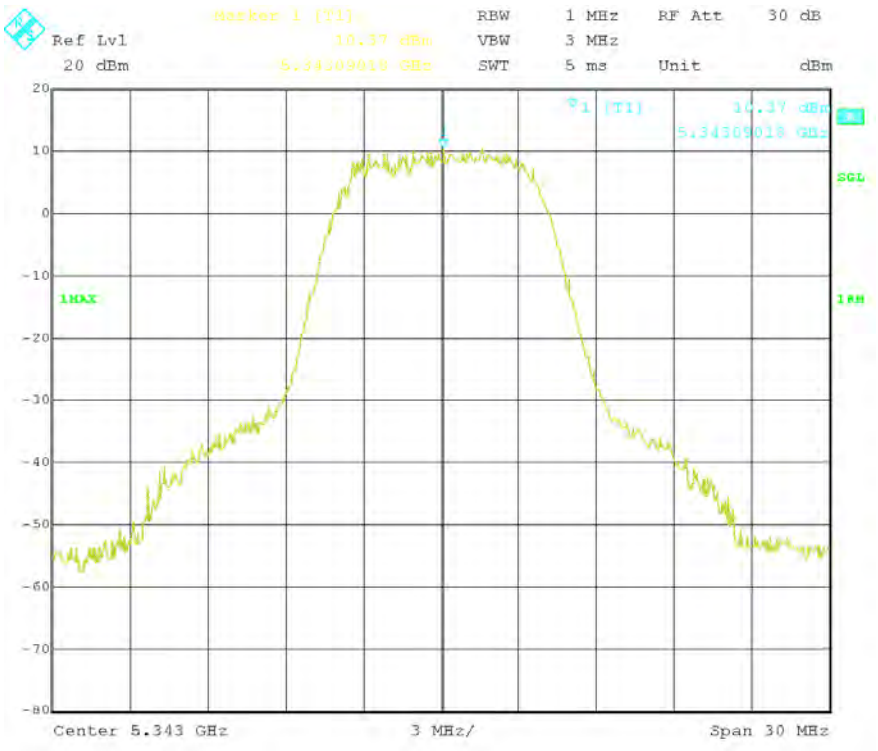
| Mode | Channel Bandwidth | Mode | PPSD (dBm) |
|---|---|---|---|
| Mode1 | 8MHz | Low Channel | 10.39 |
| | 8MHz | Mid Channel | 10.98 |
| | 8MHz | High Channel | 10.37 |




**Low Channel**



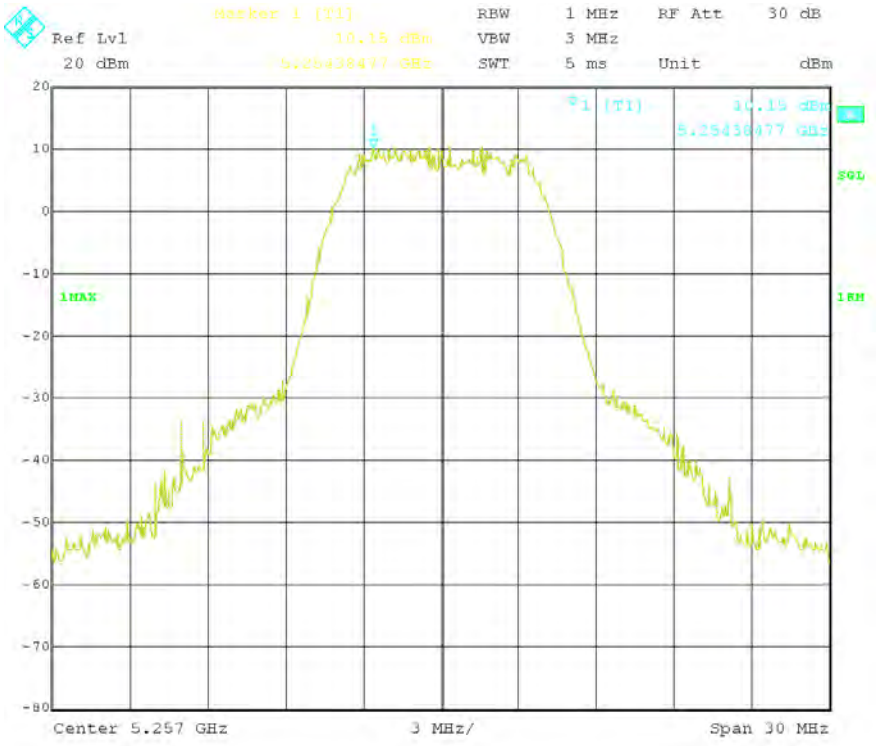

**Mid Channel**



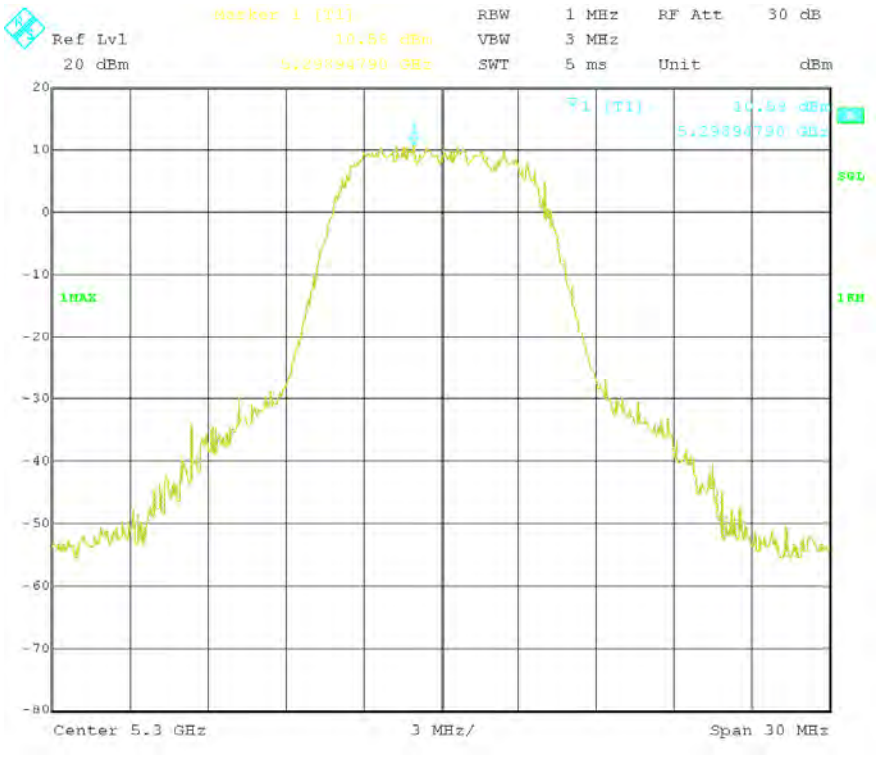

**High Channel**

**Mode: 2 = 16QAM, 8MHz Channel Bandwidth**

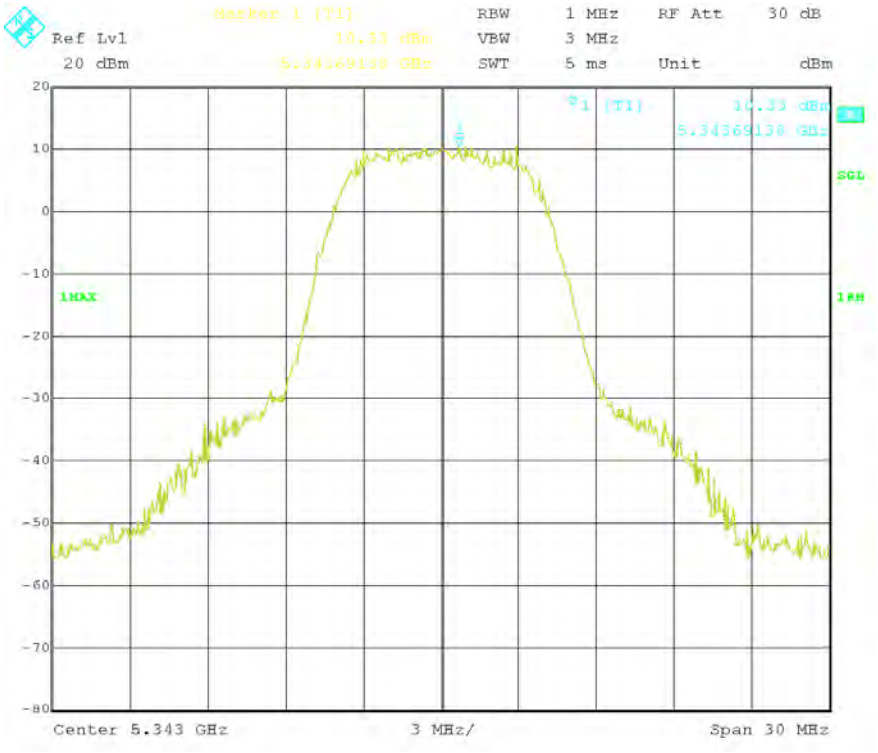
| Mode | Channel Bandwidth | Mode | PPSD (dBm) |
|---|---|---|---|
| Mode1 | 8MHz | Low Channel | 10.15 |
| | 8MHz | Mid Channel | 10.58 |
| | 8MHz | High Channel | 10.33 |




**Low Channel**



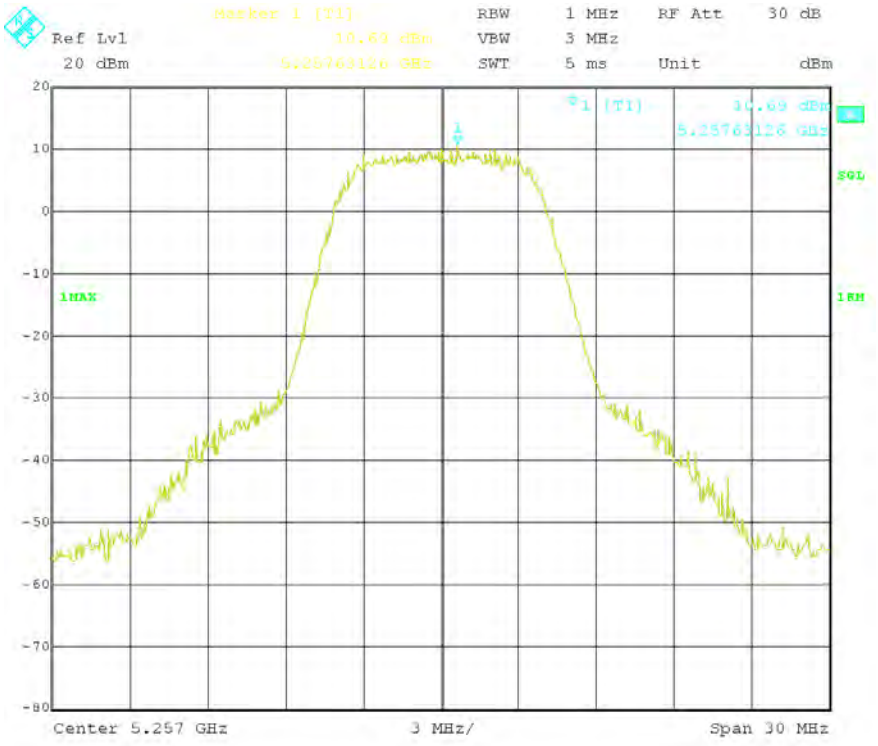

**Mid Channel**



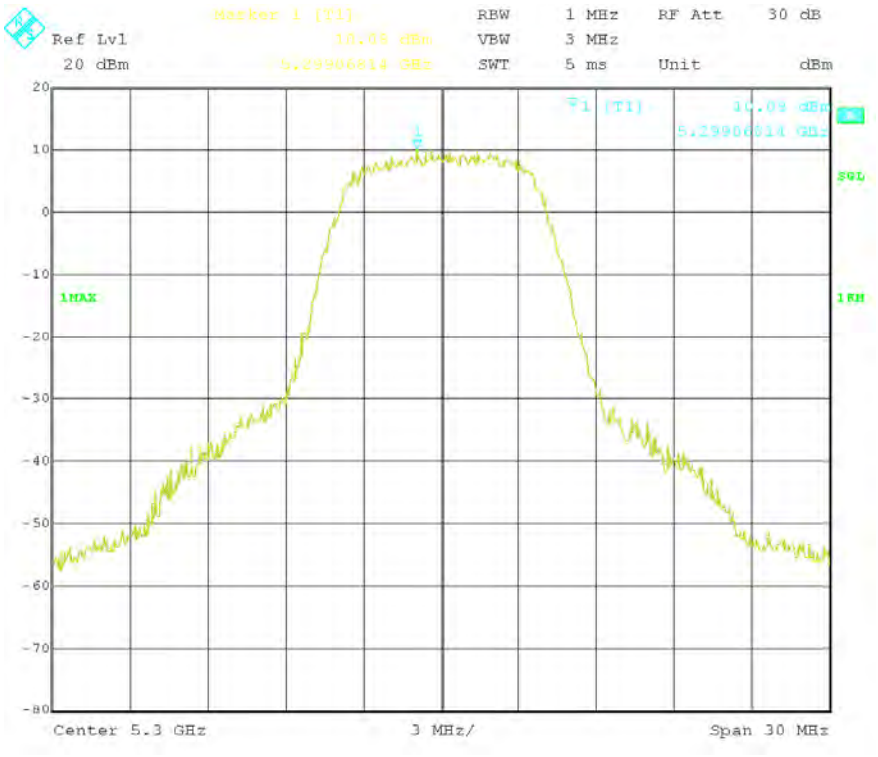

**High Channel**

**Mode: 3 = 64QAM, 8MHz Channel Bandwidth**

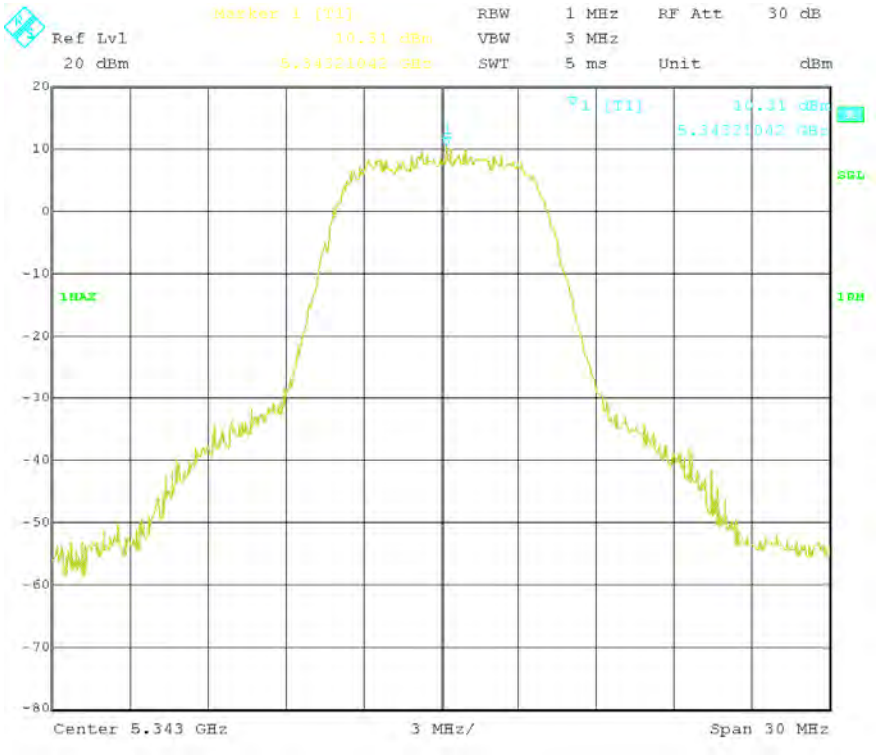
| Mode | Channel Bandwidth | Mode | PPSD (dBm) |
|---|---|---|---|
| Mode1 | 8MHz | Low Channel | 10.69 |
| | 8MHz | Mid Channel | 10.08 |
| | 8MHz | High Channel | 10.31 |




**Low Channel**



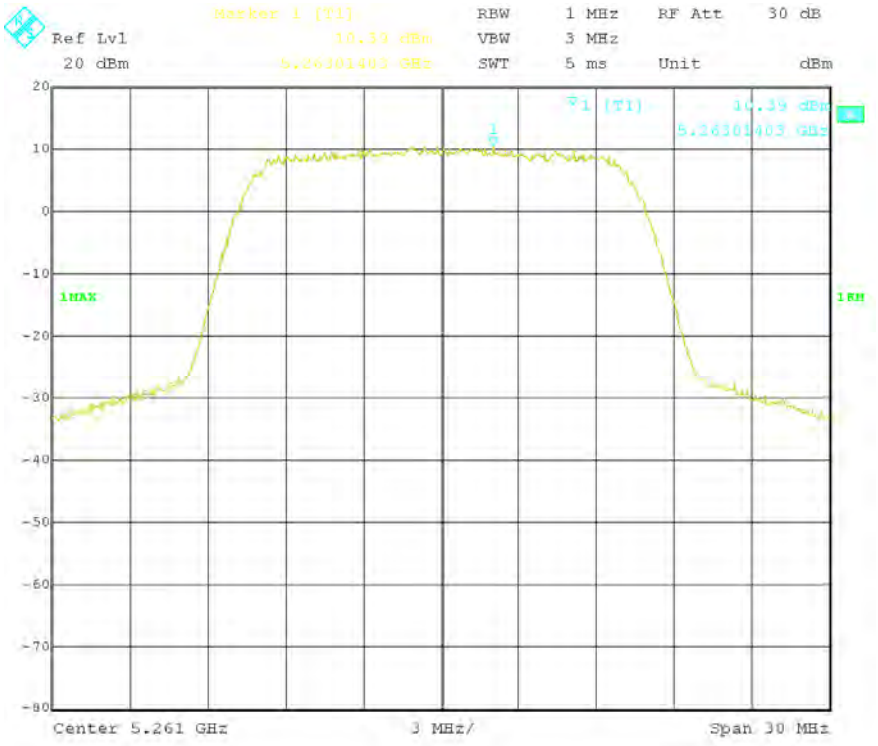

**Mid Channel**



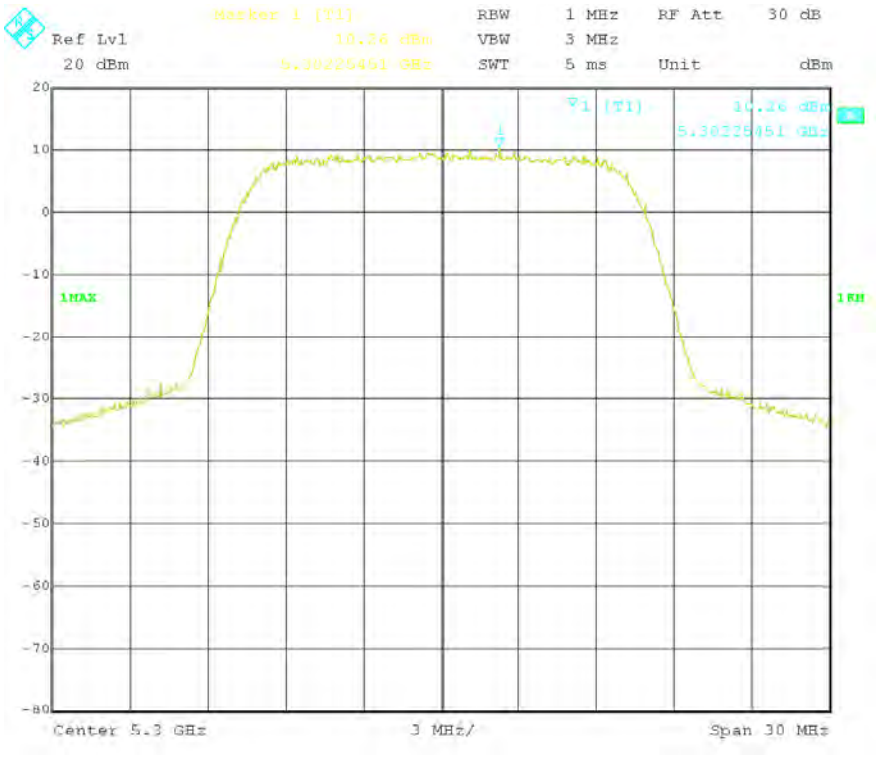

**High Channel**

**Mode: 1 = QPSK, 16MHz Channel Bandwidth**

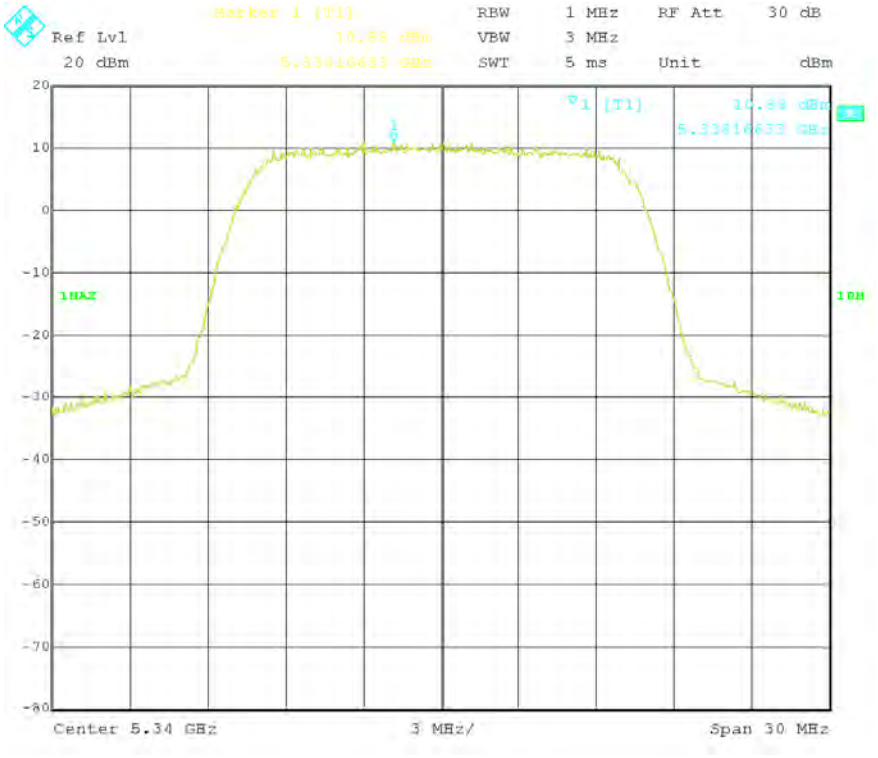
| Mode | Channel Bandwidth | Mode | PPSD (dBm) |
|---|---|---|---|
| Mode1 | 16MHz | Low Channel | 10.39 |
| | 16MHz | Mid Channel | 10.26 |
| | 16MHz | High Channel | 10.88 |




**Low Channel**



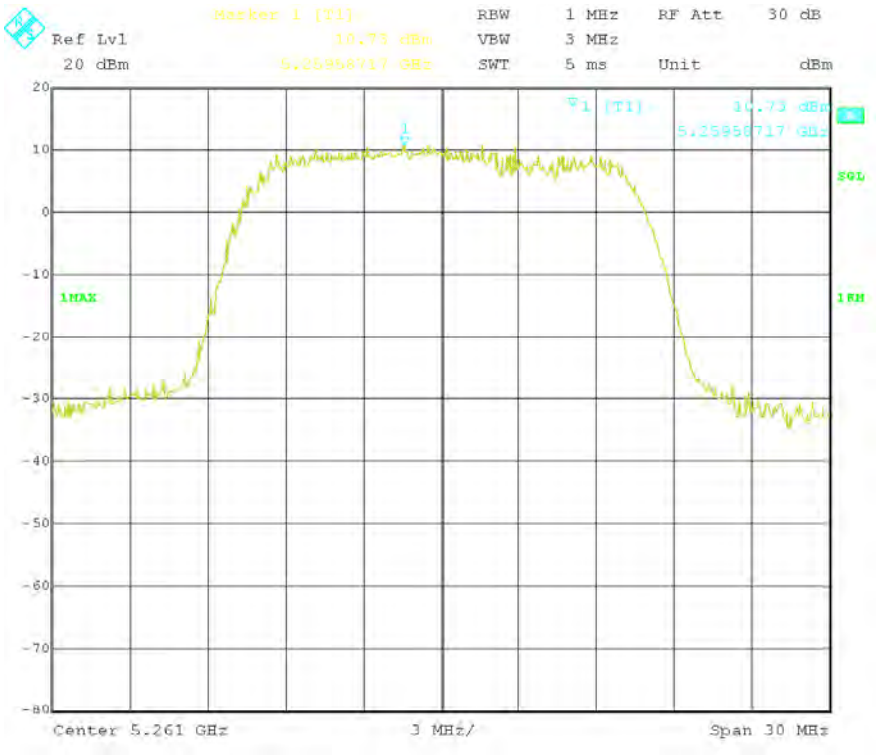

**Mid Channel**



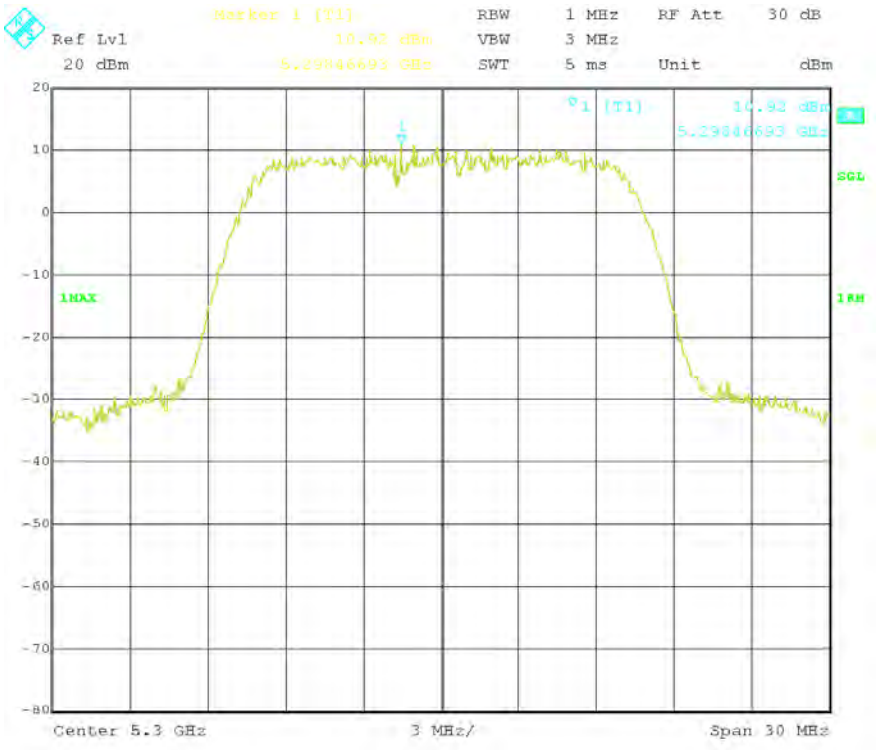

**High Channel**

**Mode: 2 = 16QAM, 16MHz Channel Bandwidth**

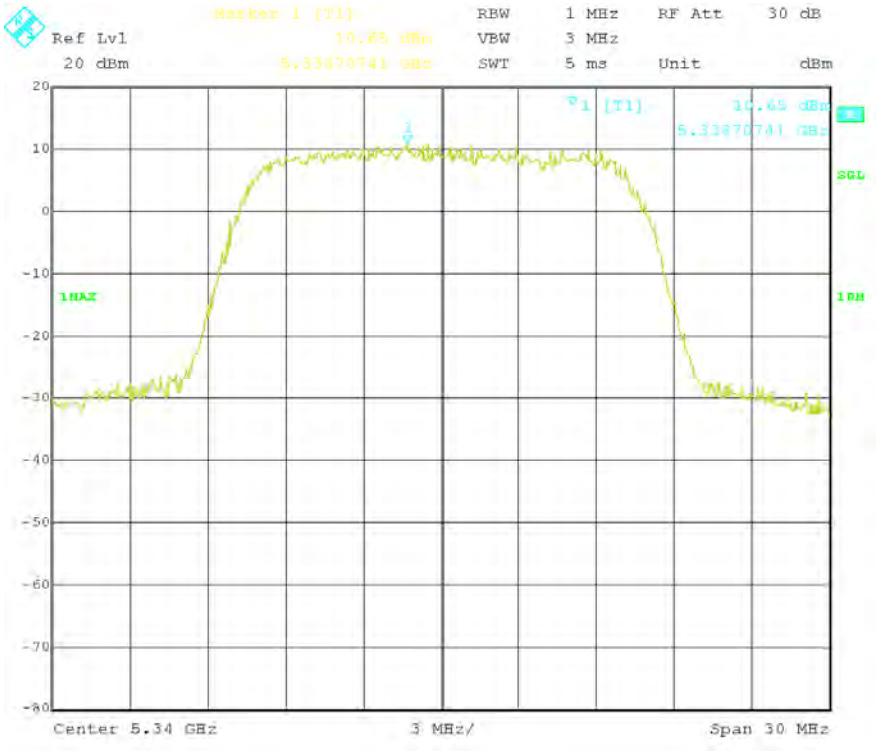
| Mode | Channel Bandwidth | Mode | PPSD (dBm) |
|---|---|---|---|
| Mode1 | 16MHz | Low Channel | 10.73 |
| | 16MHz | Mid Channel | 10.92 |
| | 16MHz | High Channel | 10.65 |




**Low Channel**



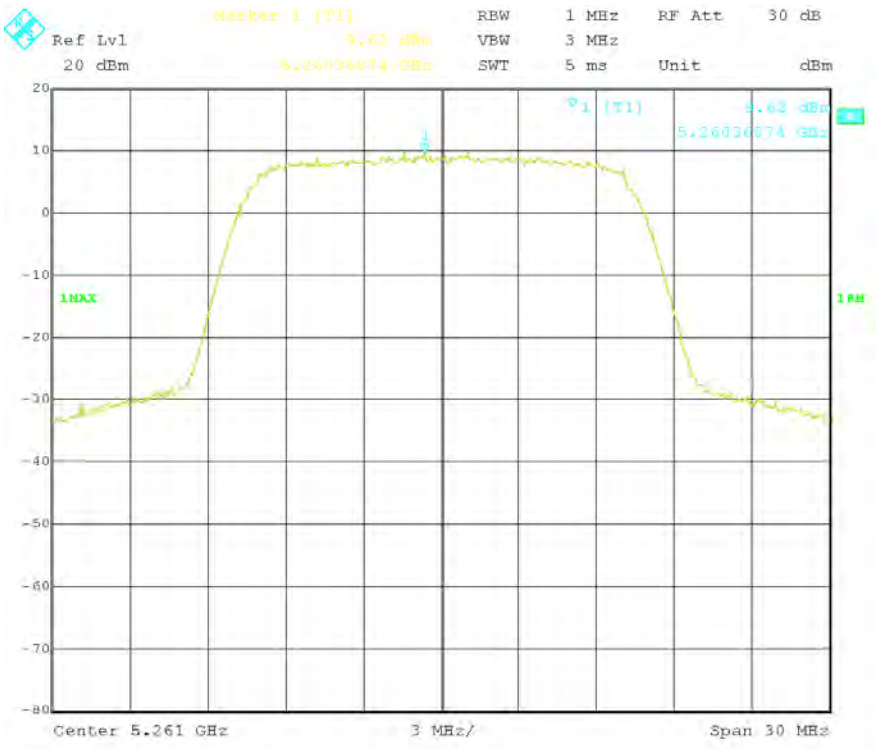

**Mid Channel**



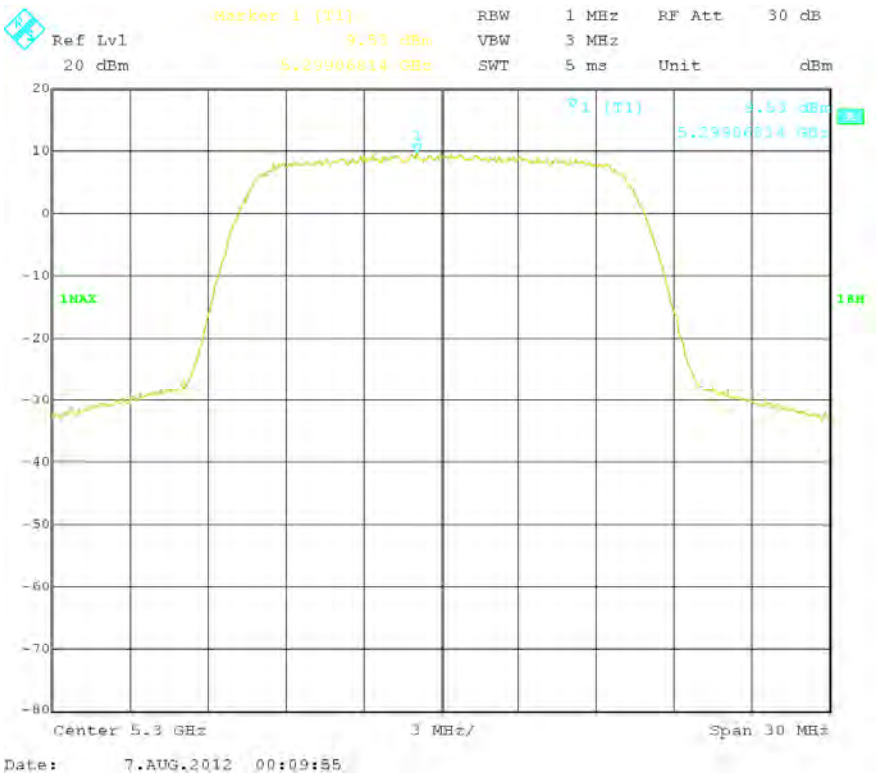

**High Channel**

**Mode: 3 = 64QAM, 16MHz Channel Bandwidth**

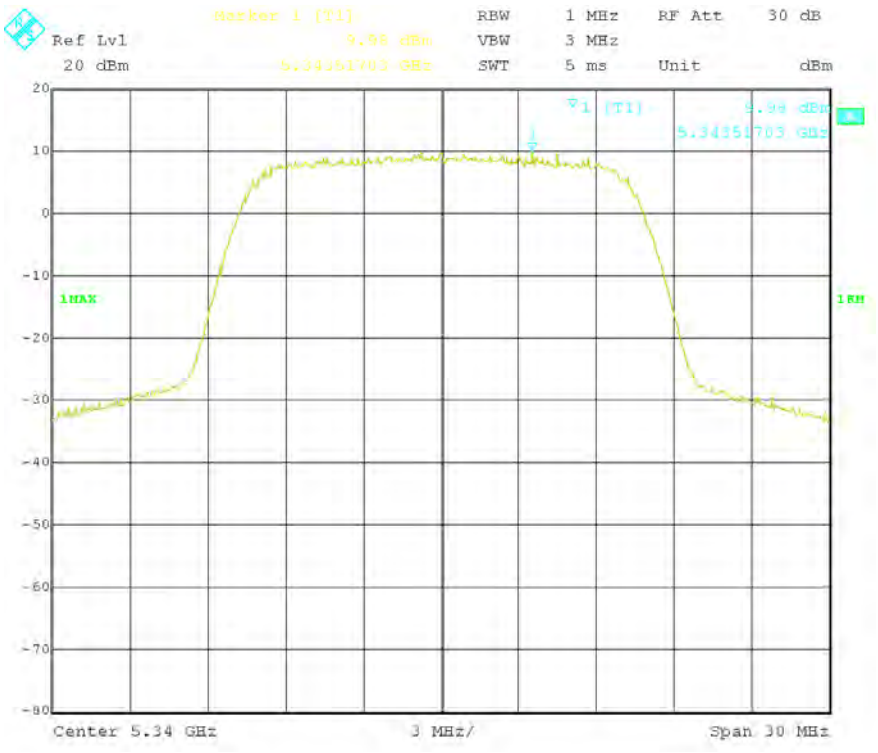
| Mode | Channel Bandwidth | Mode | PPSD (dBm) |
|---|---|---|---|
| Mode1 | 16MHz | Low Channel | 9.62 |
| | 16MHz | Mid Channel | 9.53 |
| | 16MHz | High Channel | 9.98 |




**Low Channel**



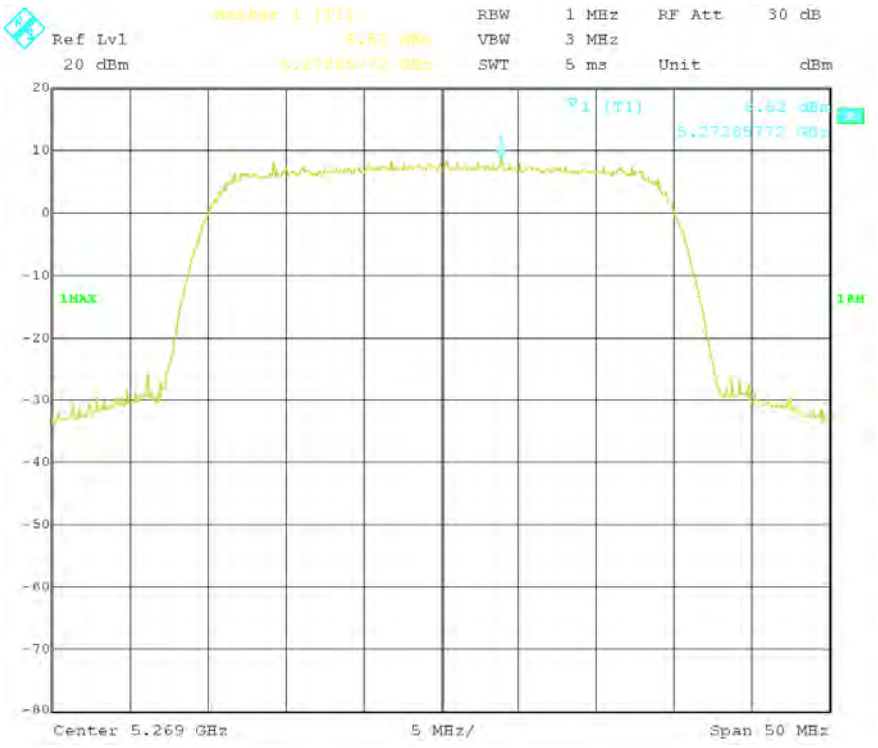

**Mid Channel**



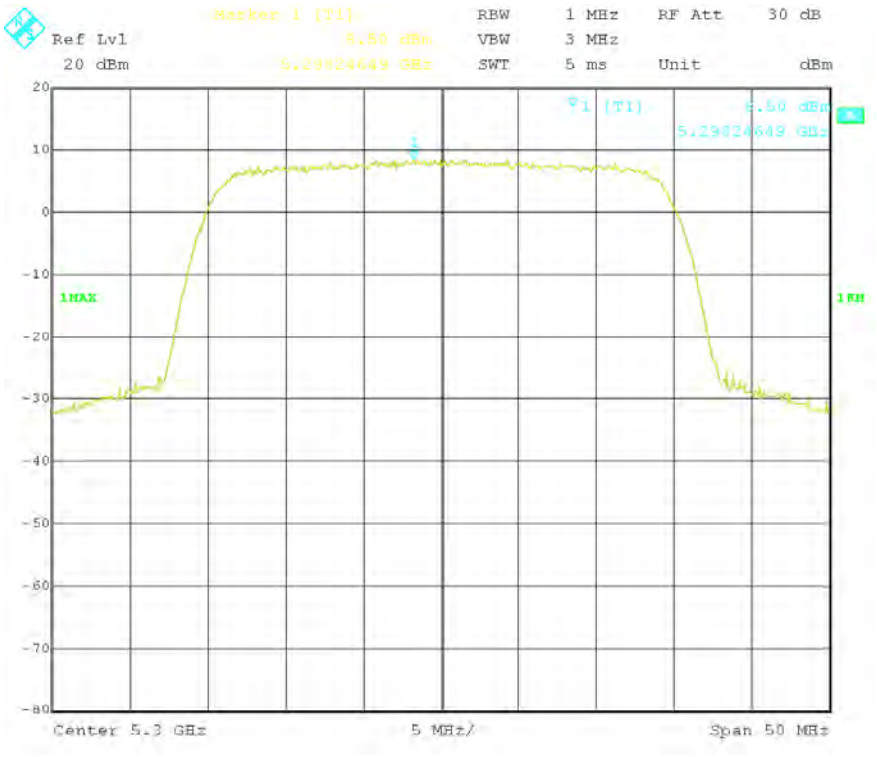

**High Channel**

**Mode: 1 = QPSK, 32MHz Channel Bandwidth**

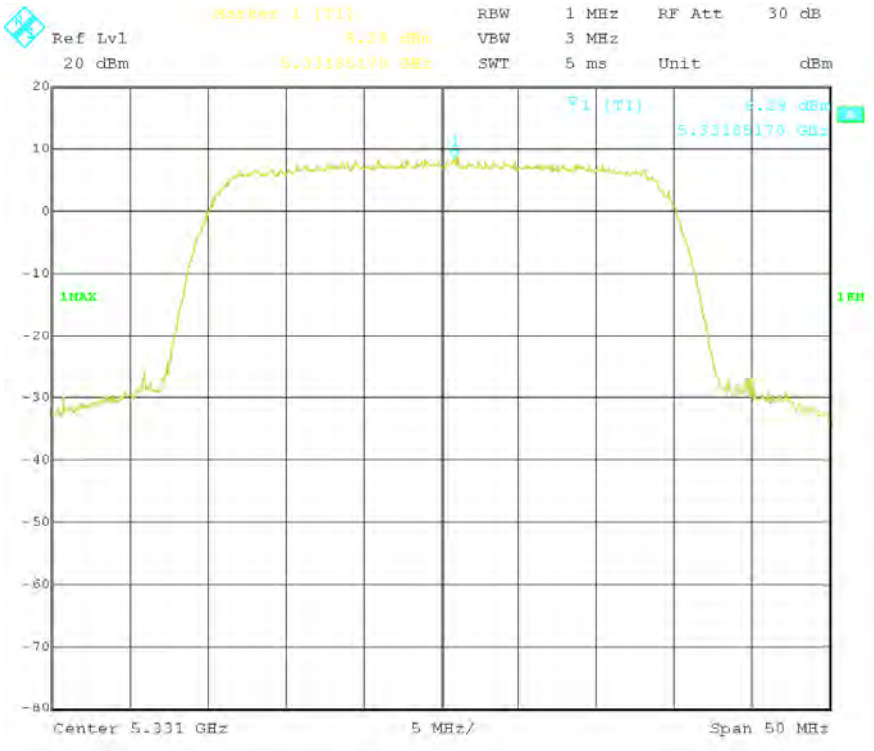
| Mode | Channel Bandwidth | Mode | PPSD (dBm) |
|---|---|---|---|
| Mode1 | 32MHz | Low Channel | 8.52 |
| | 32MHz | Mid Channel | 8.50 |
| | 32MHz | High Channel | 8.28 |




**Low Channel**



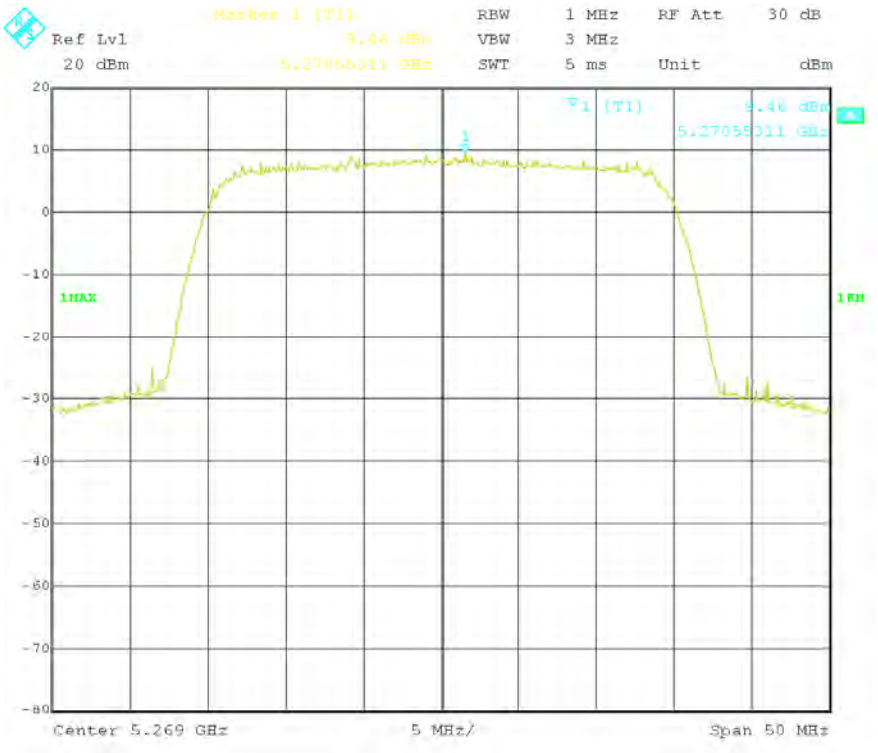

**Mid Channel**



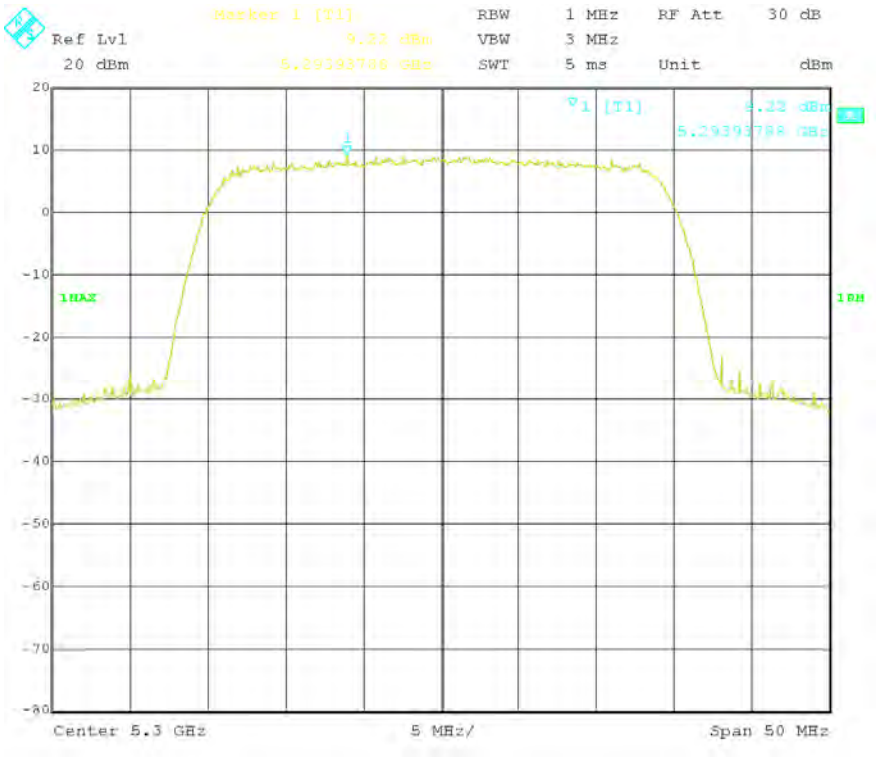

**High Channel**

**Mode: 2 = 16QAM, 32MHz Channel Bandwidth**

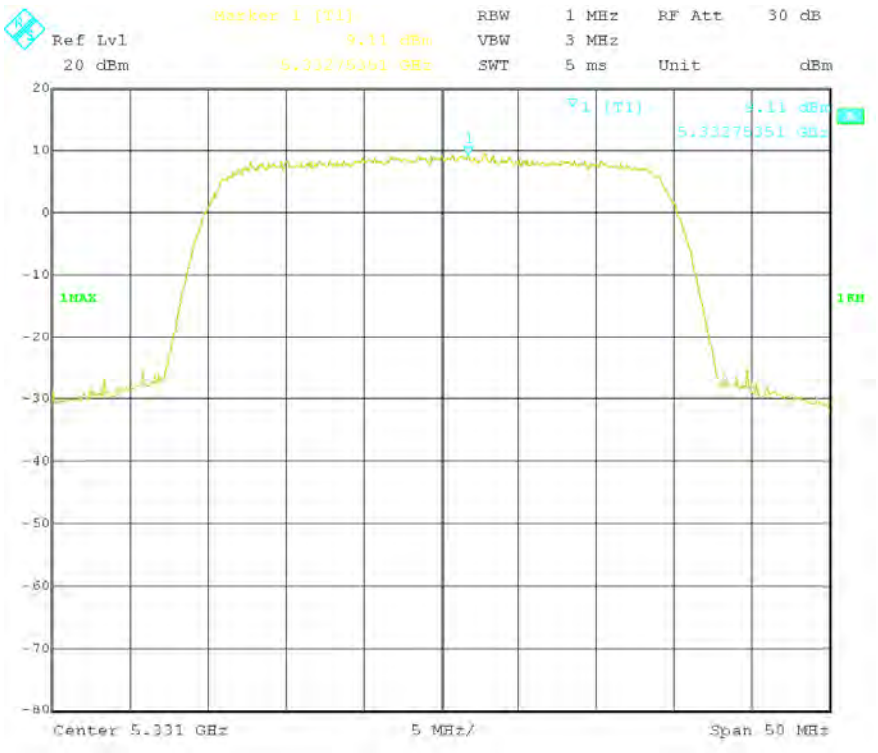
| Mode | Channel Bandwidth | Mode | PPSD (dBm) |
|---|---|---|---|
| Mode1 | 32MHz | Low Channel | 9.46 |
| | 32MHz | Mid Channel | 9.22 |
| | 32MHz | High Channel | 9.11 |




**Low Channel**



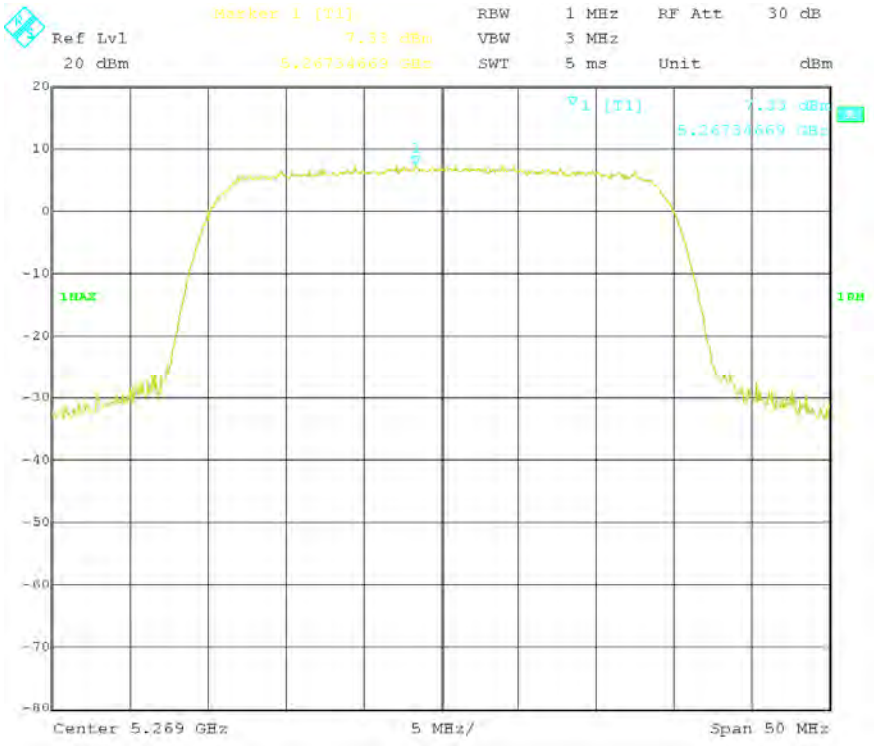

**Mid Channel**



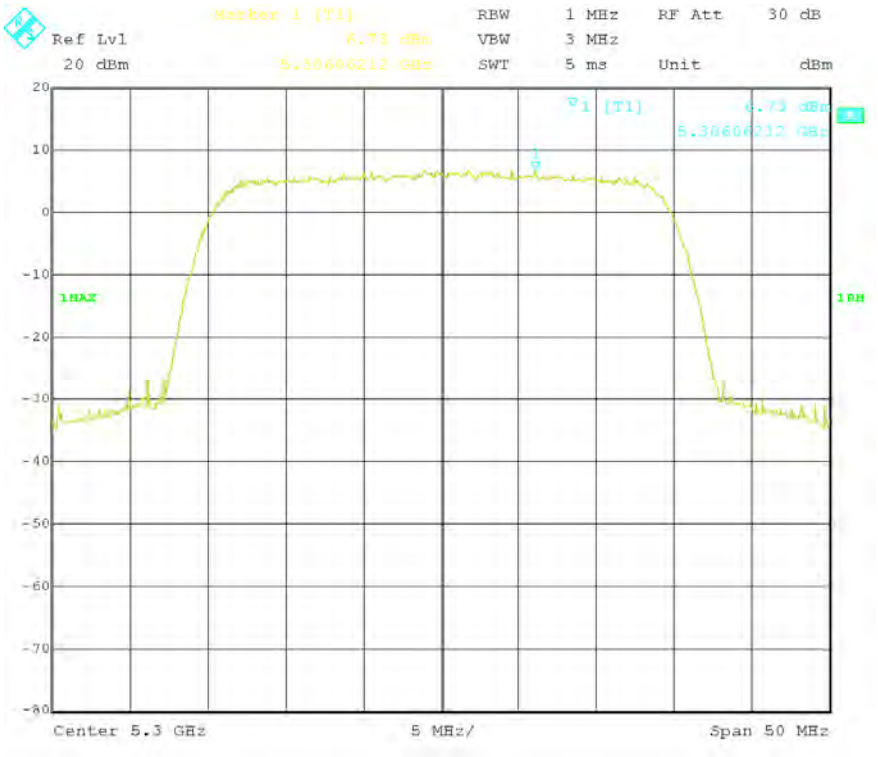

**High Channel**

**Mode: 3 = 64QAM, 32MHz Channel Bandwidth**

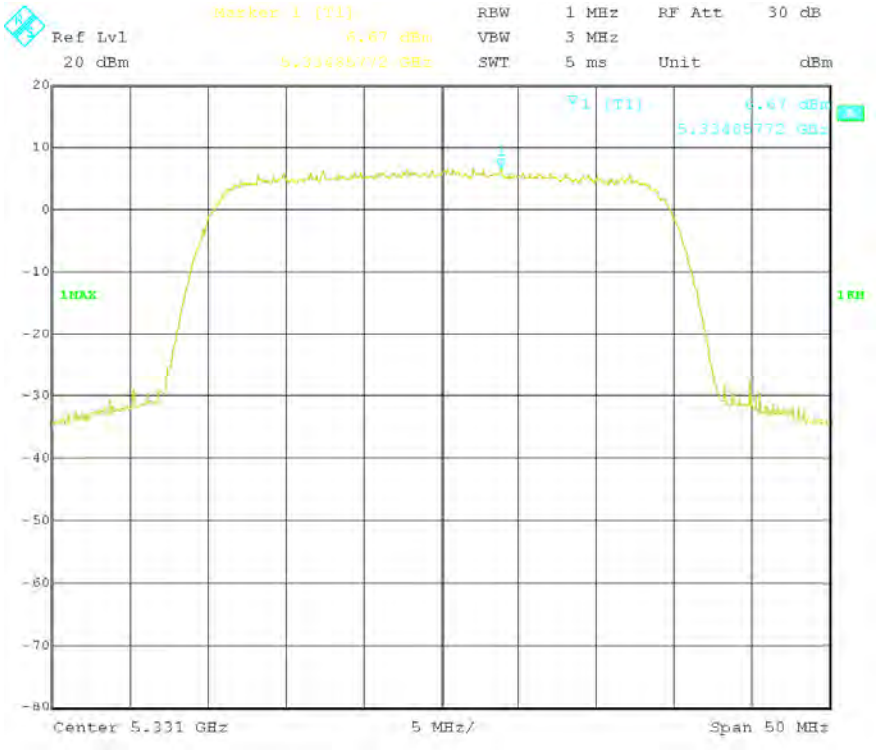
| Mode | Channel Bandwidth | Mode | PPSD (dBm) |
|---|---|---|---|
| Mode 3 | 32MHz | Low Channel | 7.33 |
| | 32MHz | Mid Channel | 6.73 |
| | 32MHz | High Channel | 6.67 |




**Low Channel**




**Mid Channel**

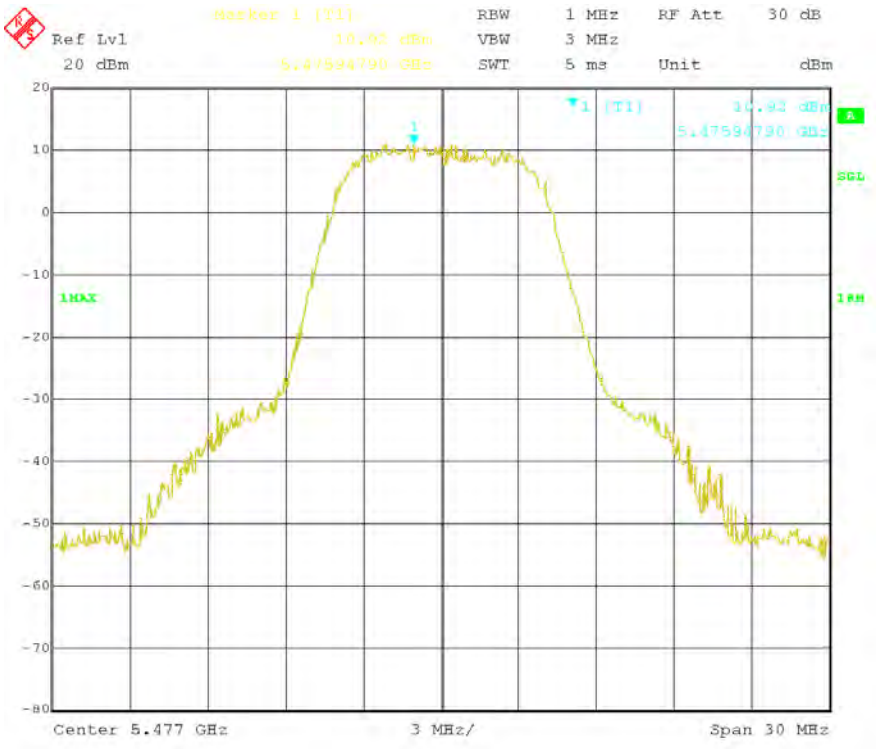



**High Channel**

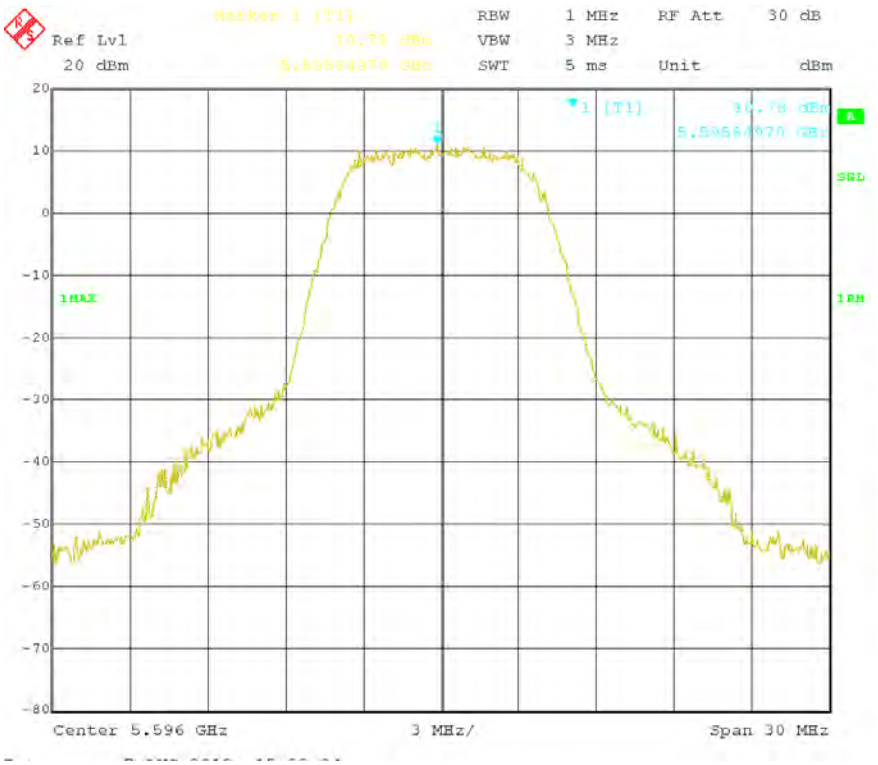
## 5.4GHz Band

### Mode: 1 = QPSK, 8MHz Channel Bandwidth

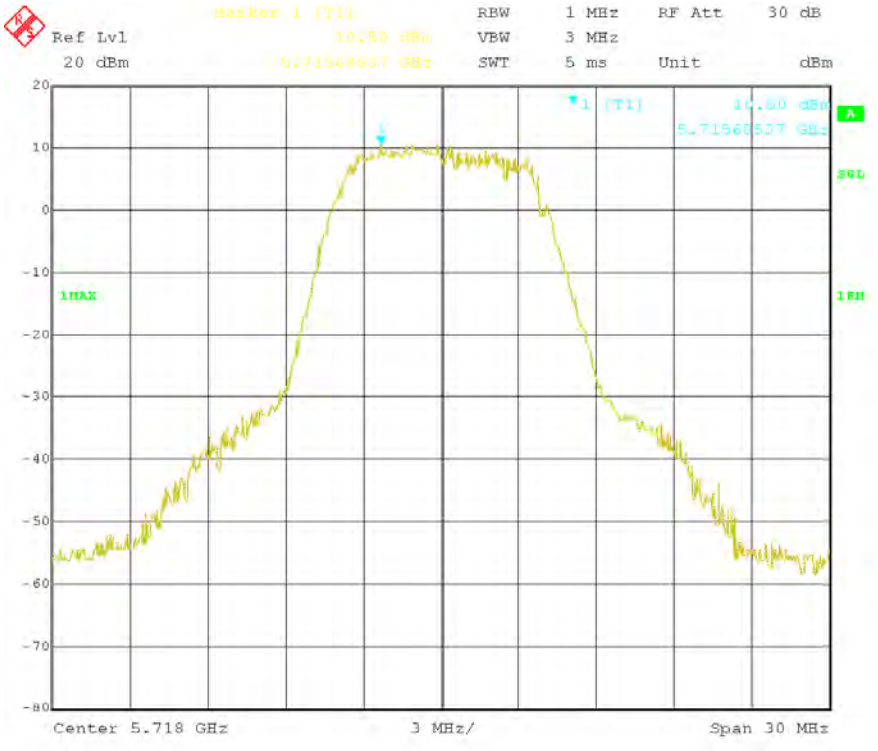
| Mode | Channel Bandwidth | Mode | PPSD (dBm) |
|---|---|---|---|
| Mode 1 | 8MHz | Low Channel | 10.92 |
| | 8MHz | Mid Channel | 10.78 |
| | 8MHz | High Channel | 10.50 |




**Low Channel**



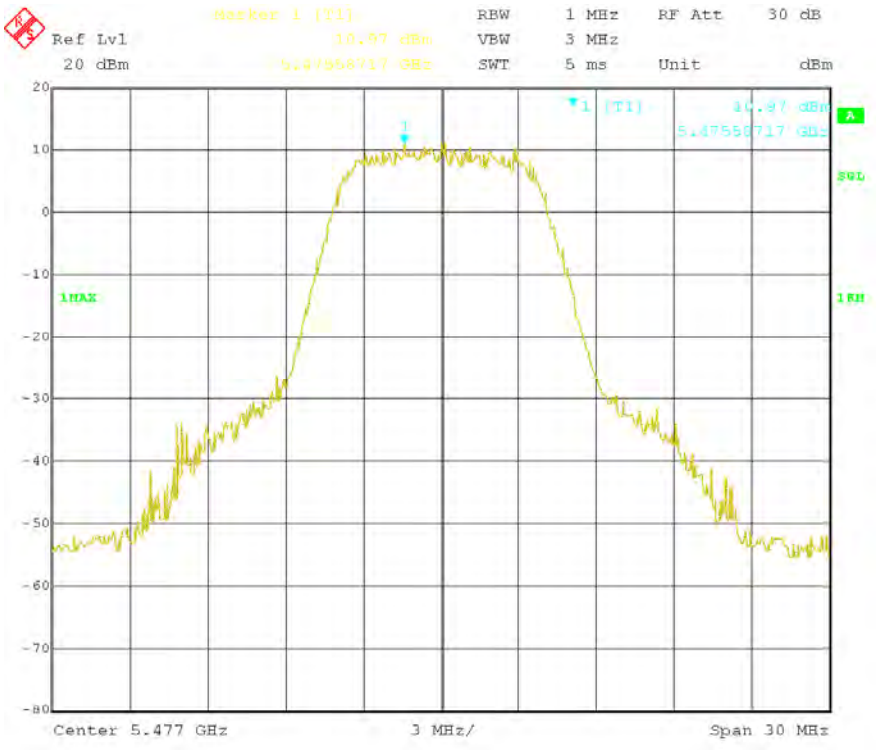

**Mid Channel**



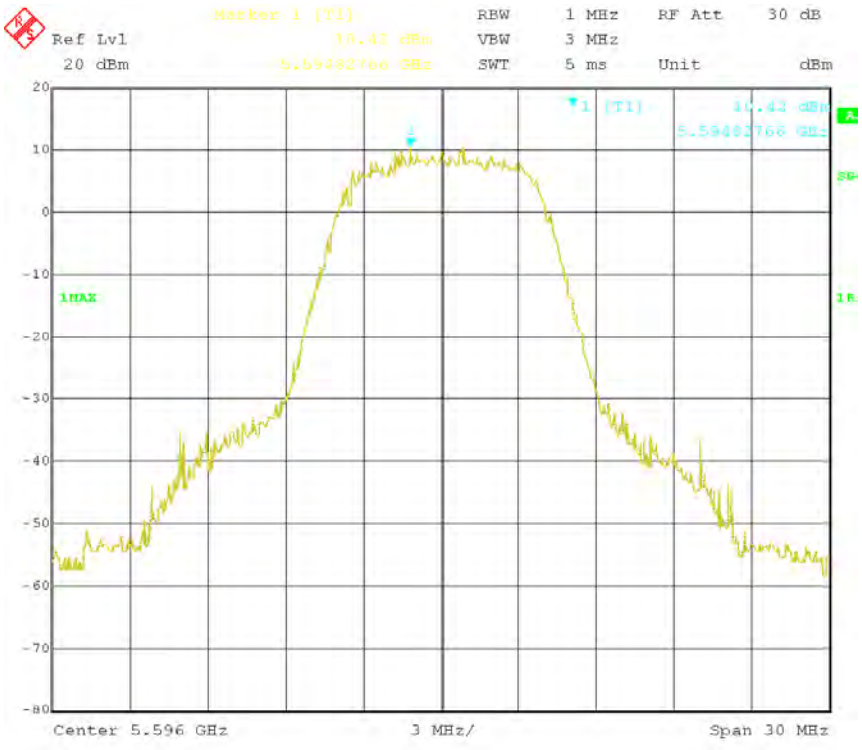

**High Channel**

**Mode: 2 = 16QAM, 8MHz Channel Bandwidth**

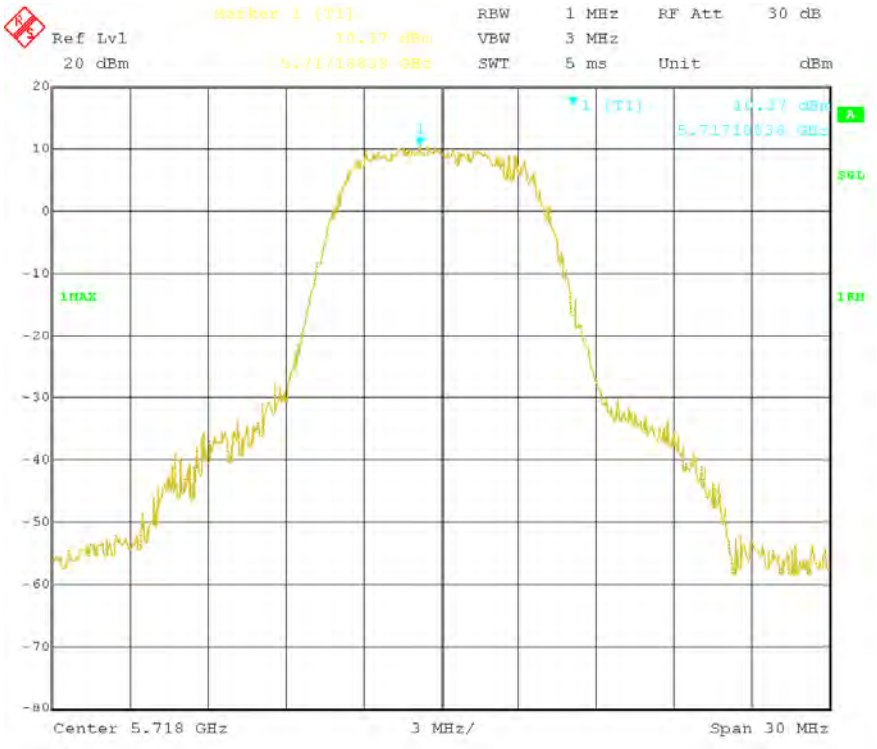
| Mode | Channel Bandwidth | Mode | PPSD (dBm) |
|---|---|---|---|
| Mode 1 | 8MHz | Low Channel | 10.97 |
| | 8MHz | Mid Channel | 10.42 |
| | 8MHz | High Channel | 10.37 |




**Low Channel**



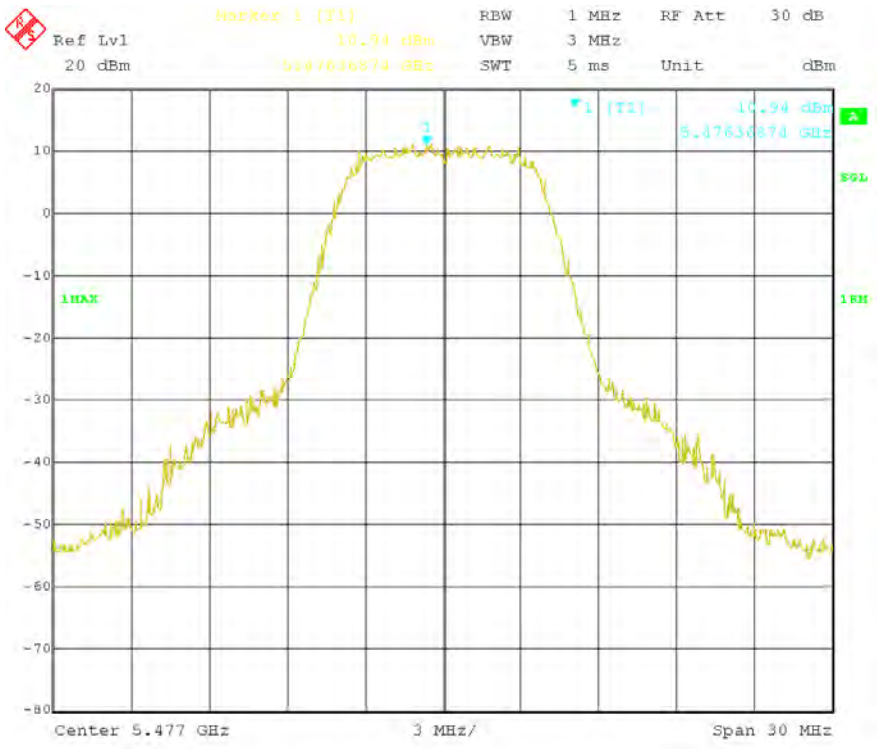

**Mid Channel**



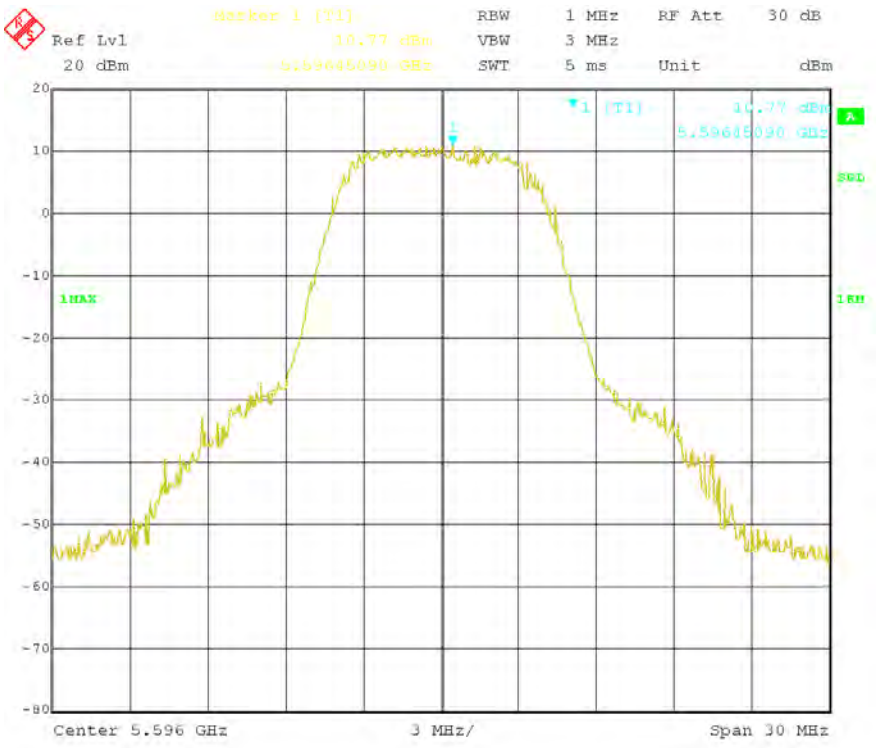

**High Channel**

**Mode: 3 = 64QAM, 8MHz Channel Bandwidth**

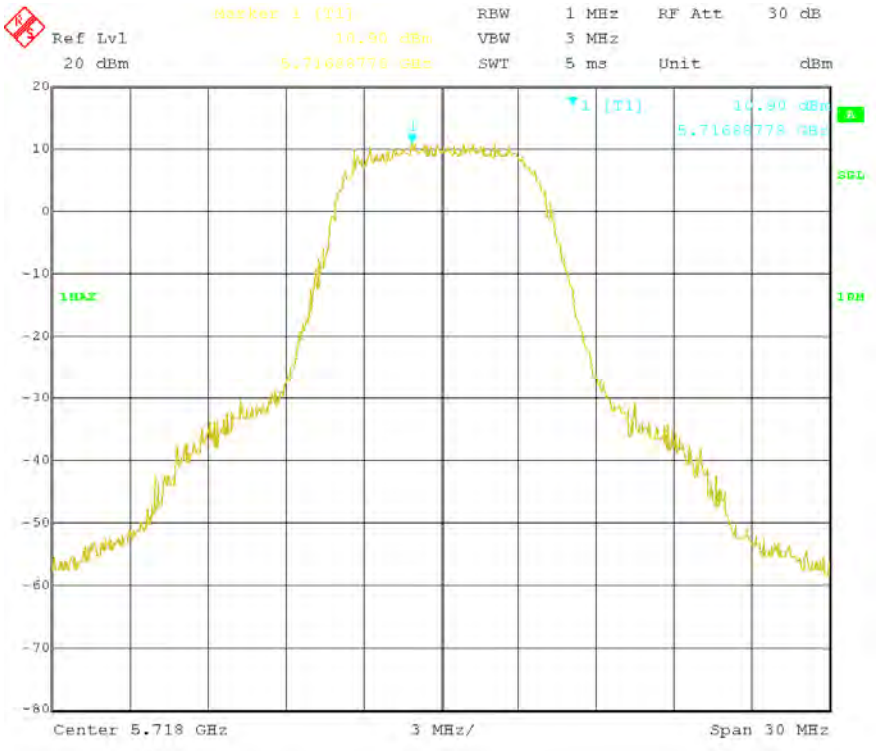
| Mode | Channel Bandwidth | Mode | PPSD (dBm) |
|---|---|---|---|
| Mode 1 | 8MHz | Low Channel | 10.94 |
| | 8MHz | Mid Channel | 10.77 |
| | 8MHz | High Channel | 10.90 |




**Low Channel**



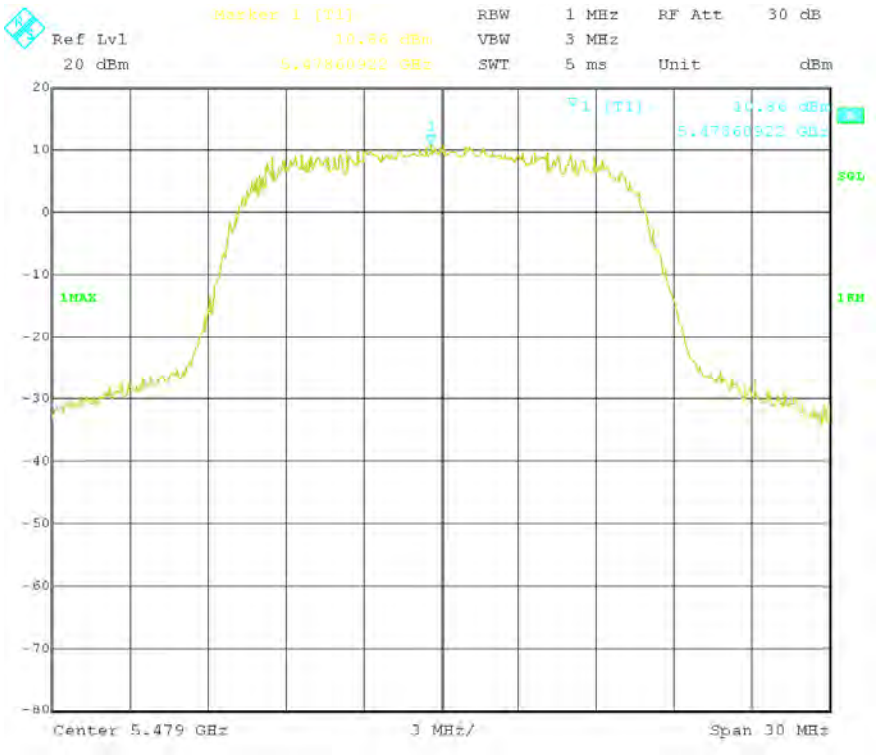

**Mid Channel**



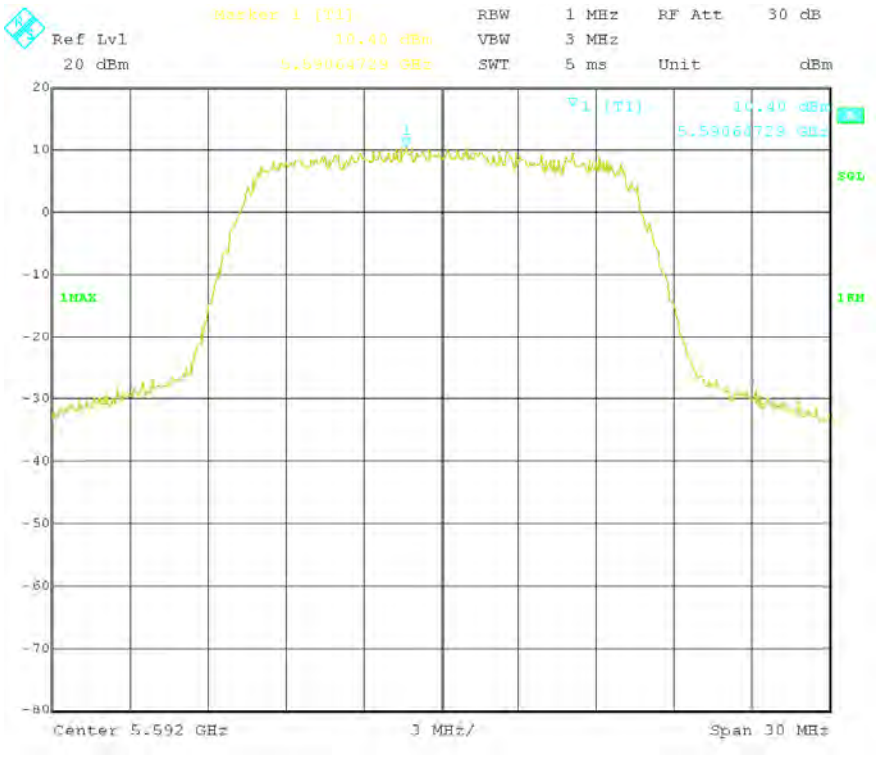

**High Channel**

**Mode: 1 = QPSK, 16MHz Channel Bandwidth**

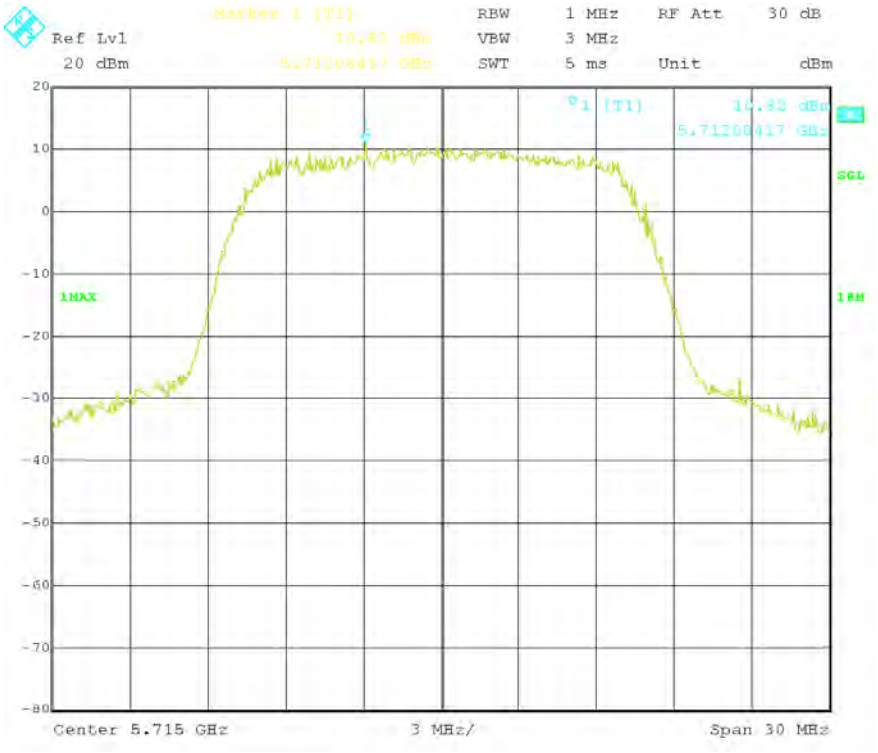
| Mode | Channel Bandwidth | Mode | PPSD (dBm) |
|---|---|---|---|
| Mode 1 | 16MHz | Low Channel | 10.86 |
| | 16MHz | Mid Channel | 10.40 |
| | 16MHz | High Channel | 10.82 |




**Low Channel**



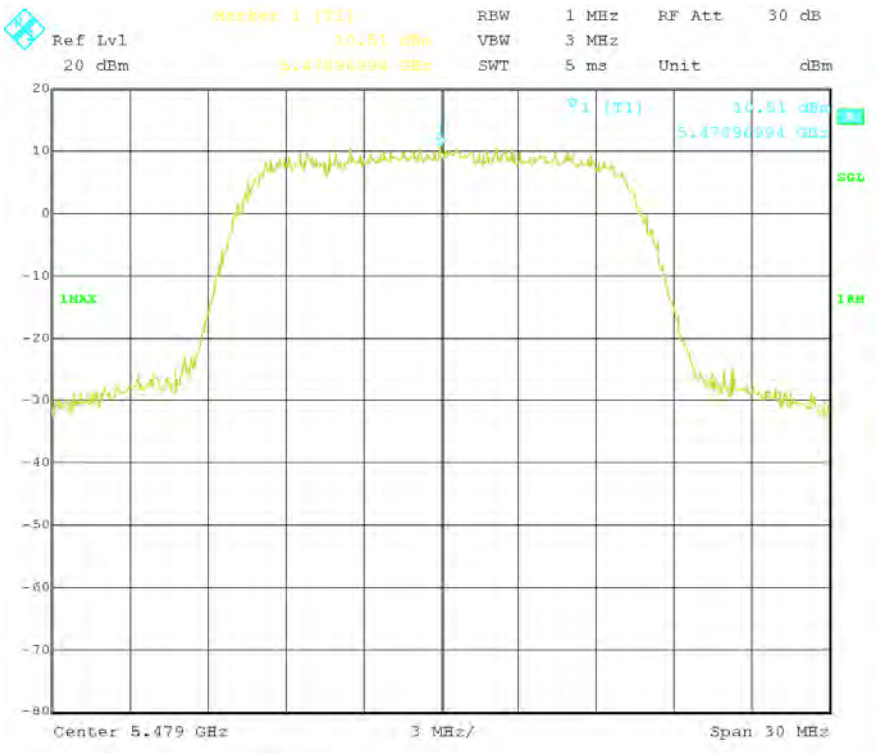

**Mid Channel**



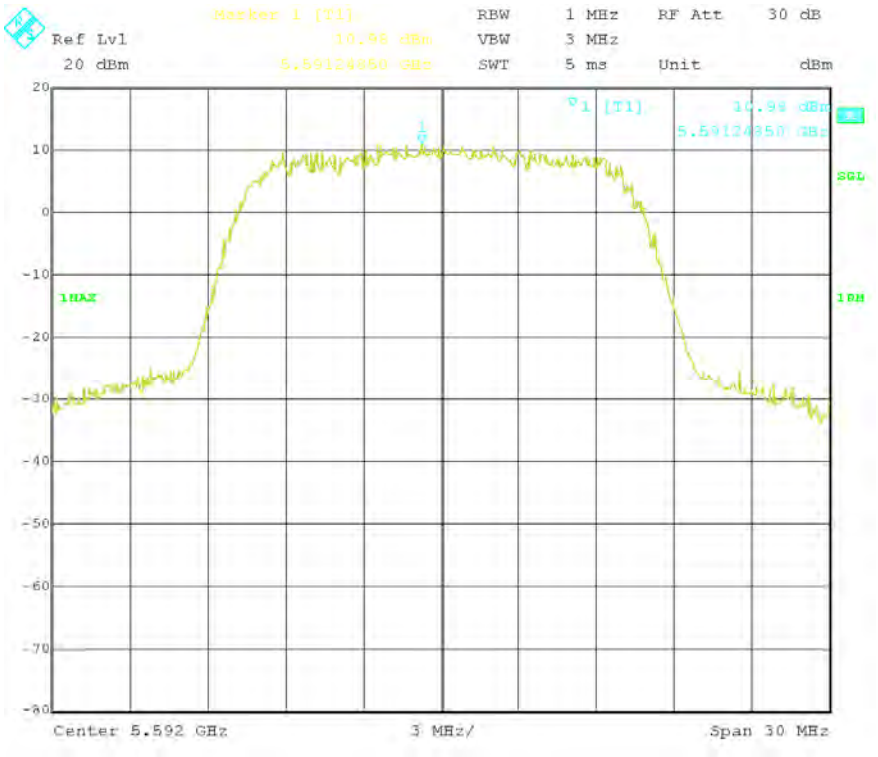

**High Channel**

**Mode: 2 = 16QAM, 16MHz Channel Bandwidth**

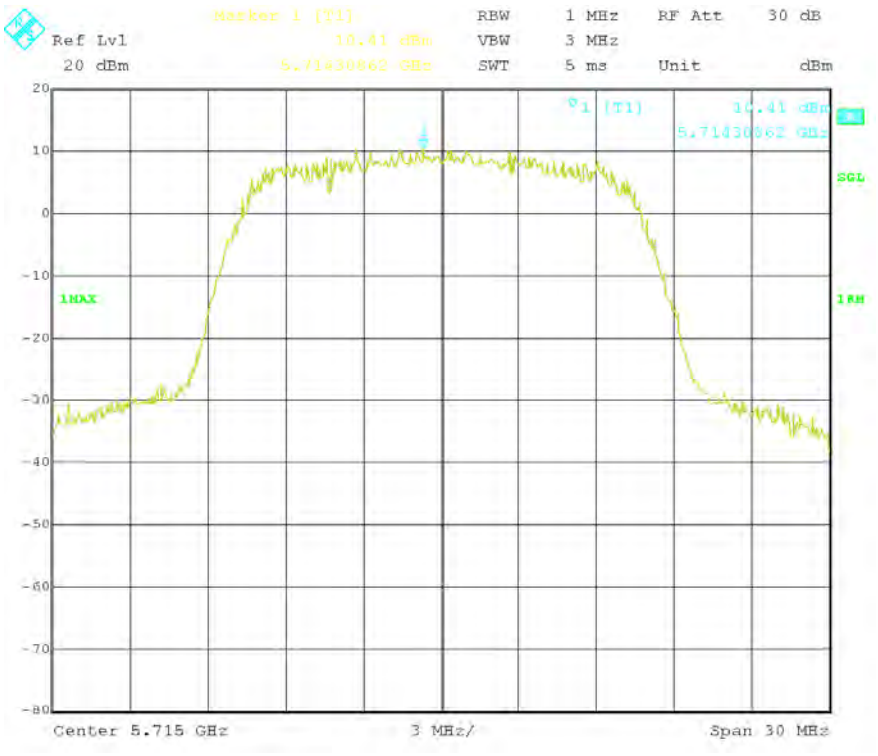
| Mode | Channel Bandwidth | Mode | PPSD (dBm) |
|---|---|---|---|
| Mode 2 | 16MHz | Low Channel | 10.51 |
| | 16MHz | Mid Channel | 10.98 |
| | 16MHz | High Channel | 10.41 |




**Low Channel**



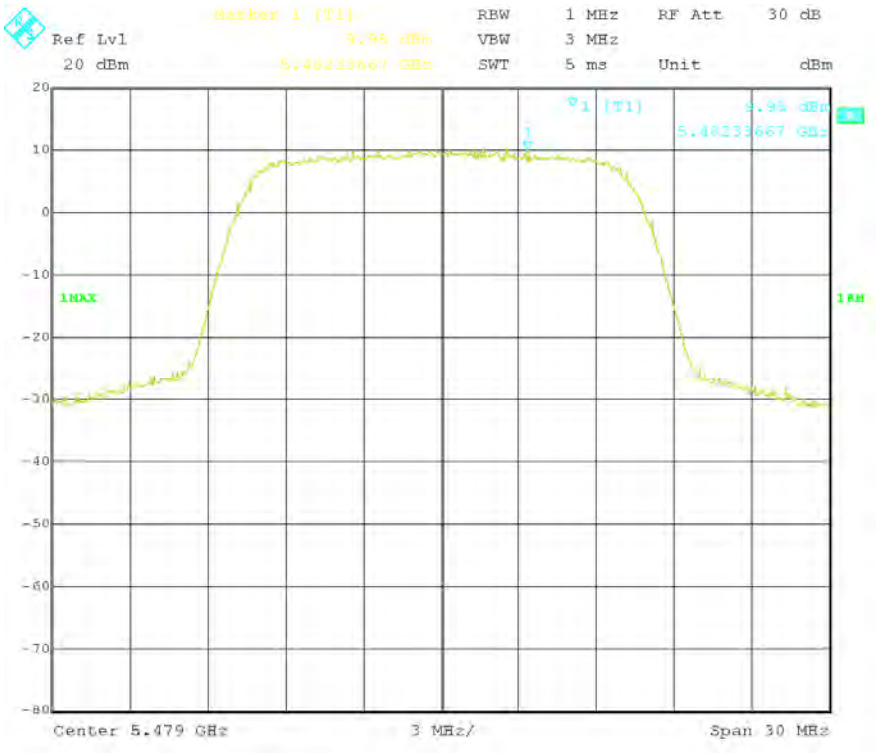

**Mid Channel**



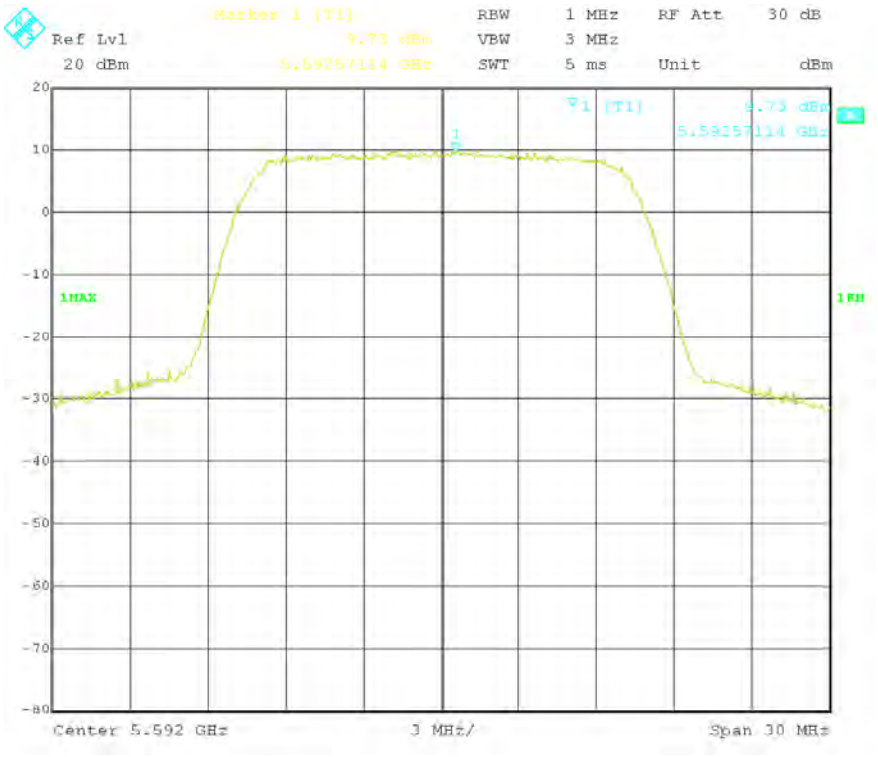

**High Channel**

**Mode: 3 = 64QAM, 16MHz Channel Bandwidth**

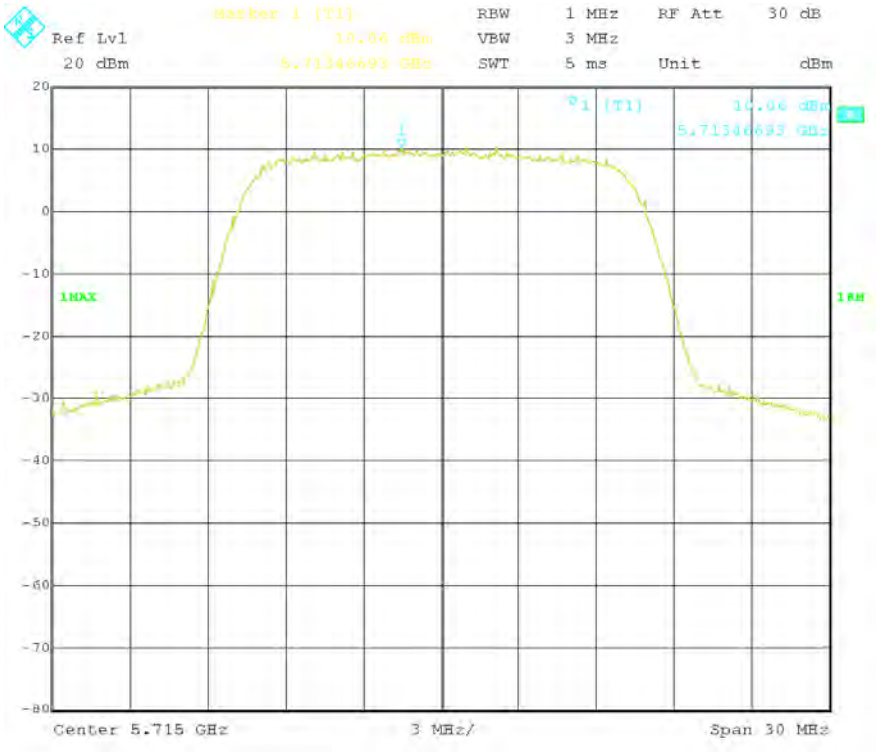
| Mode | Channel Bandwidth | Mode | PPSD (dBm) |
|---|---|---|---|
| Mode 3 | 16MHz | Low Channel | 9.95 |
| | 16MHz | Mid Channel | 9.73 |
| | 16MHz | High Channel | 10.06 |




**Low Channel**



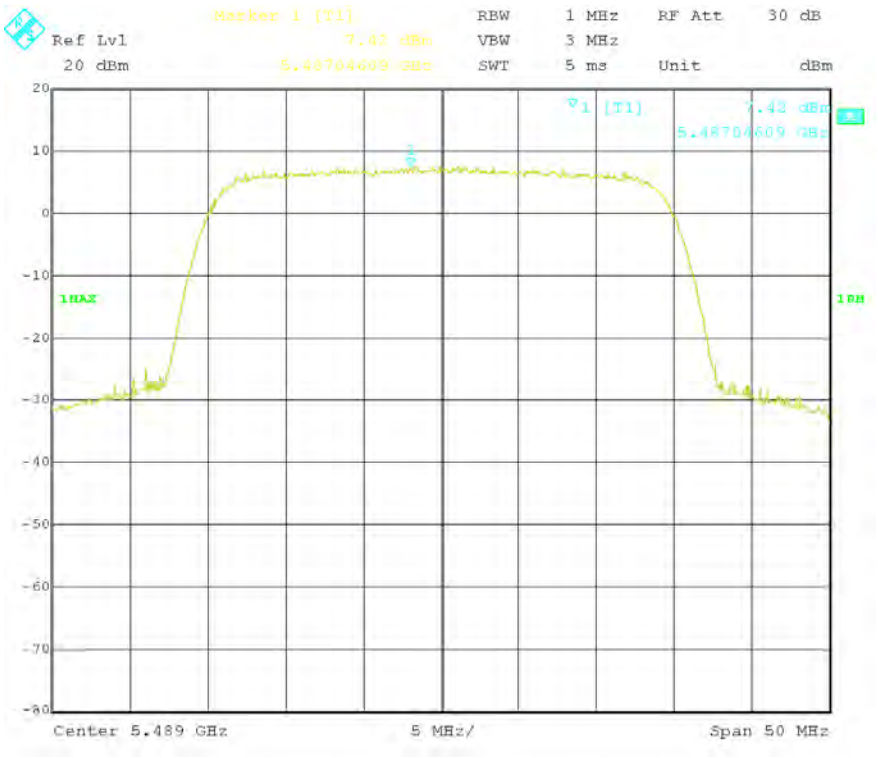

**Mid Channel**



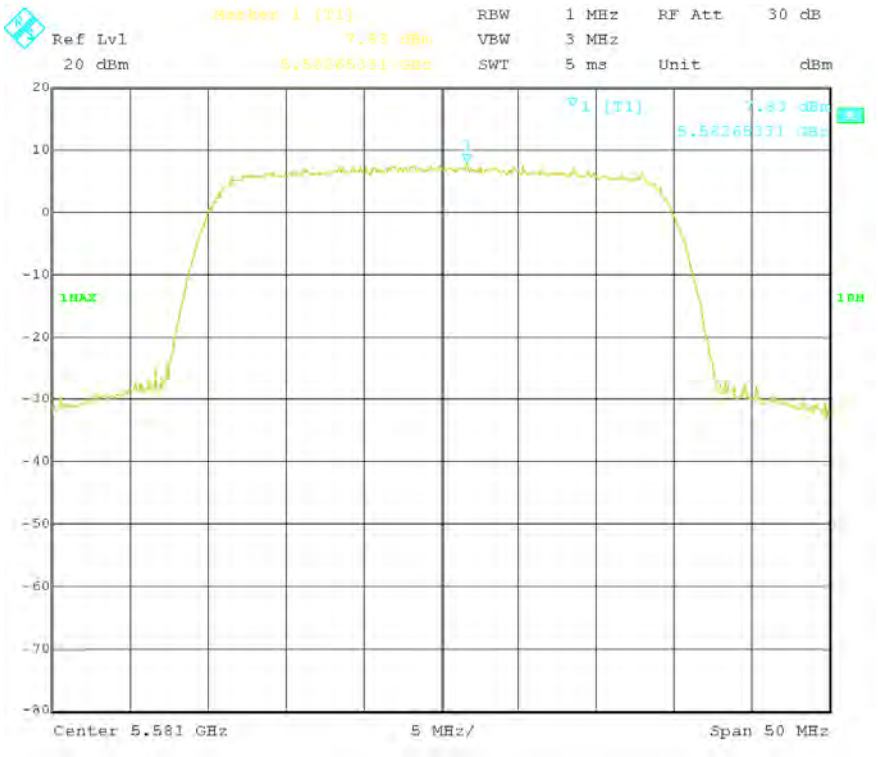

**High Channel**

**Mode: 1 = QPSK, 32MHz Channel Bandwidth**

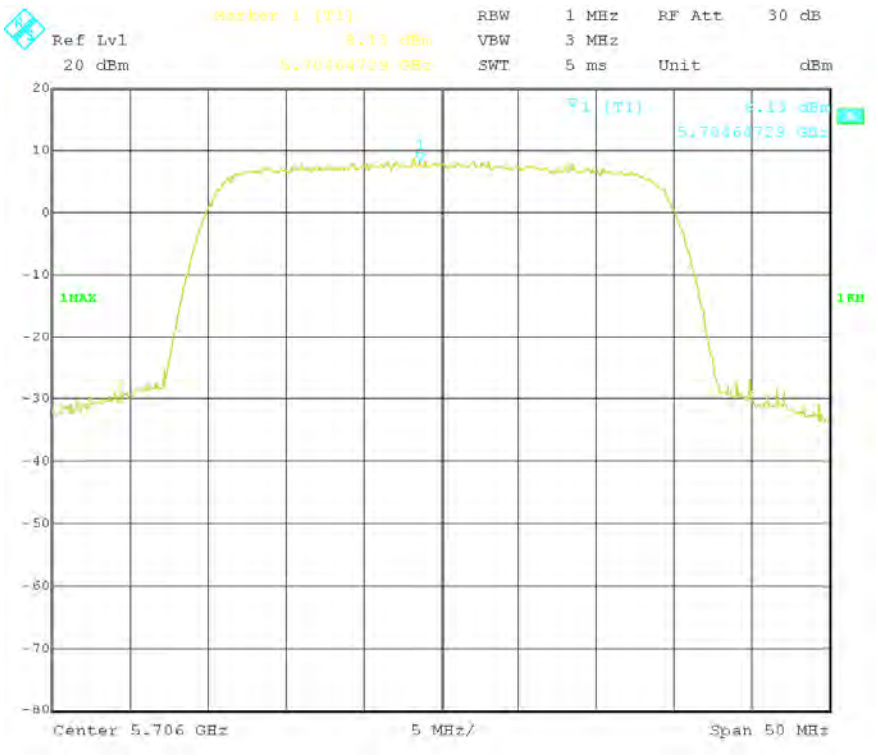
| Mode | Channel Bandwidth | Mode | PPSD (dBm) |
|---|---|---|---|
| Mode 3 | 16MHz | Low Channel | 7.42 |
| | 16MHz | Mid Channel | 7.83 |
| | 16MHz | High Channel | 8.13 |




**Low Channel**



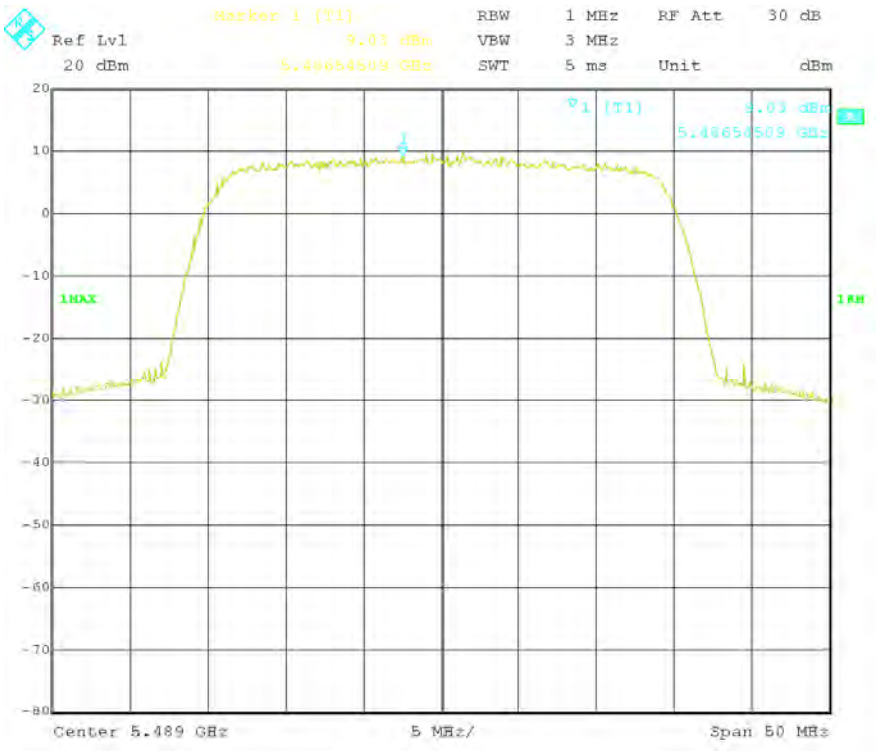

**Mid Channel**



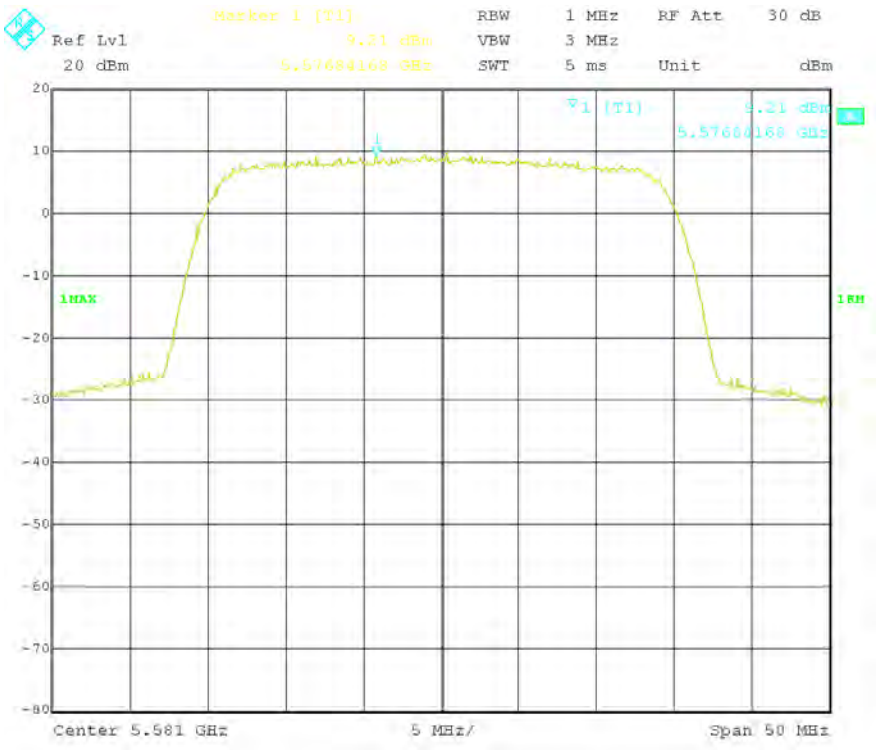

**High Channel**

**Mode: 2 = 16QAM, 32MHz Channel Bandwidth**

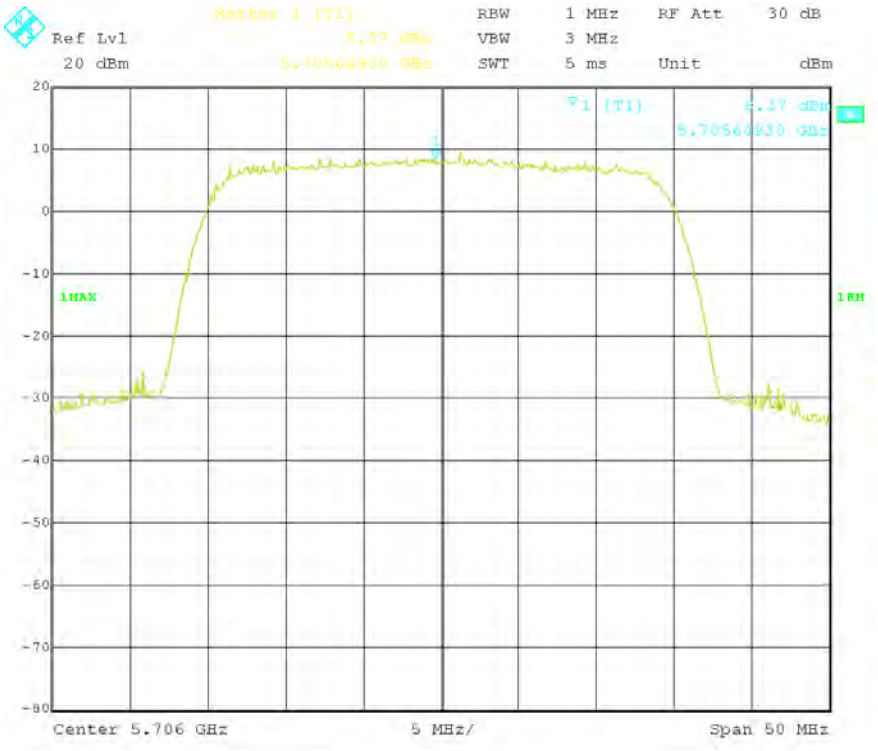
| Mode | Channel Bandwidth | Mode | PPSD (dBm) |
|---|---|---|---|
| Mode 2 | 32MHz | Low Channel | 9.03 |
| | 32MHz | Mid Channel | 9.21 |
| | 32MHz | High Channel | 8.37 |




**Low Channel**



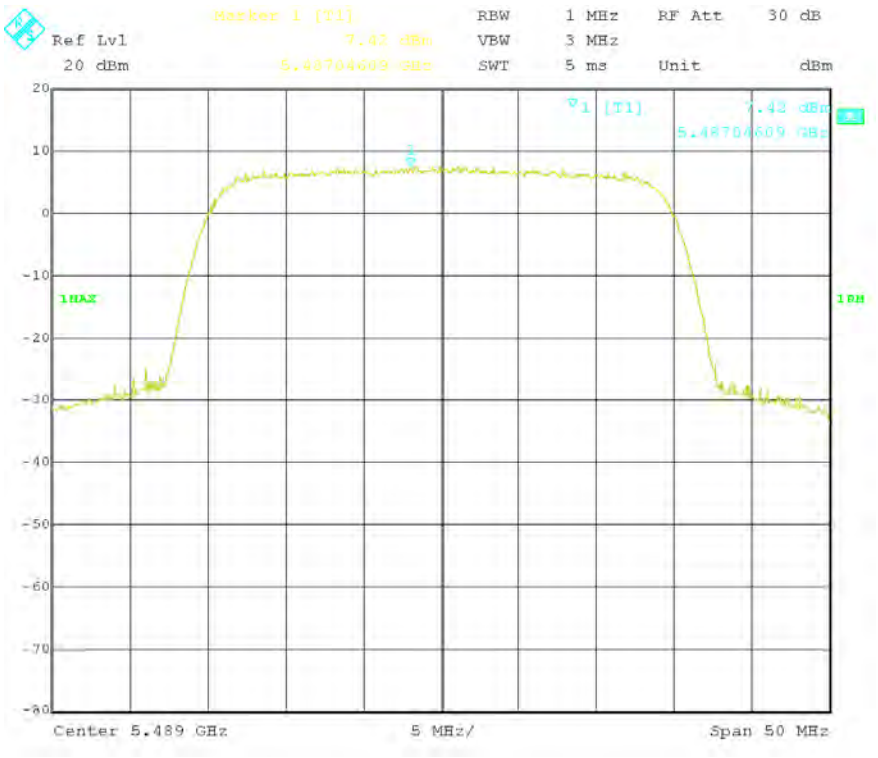

**Mid Channel**



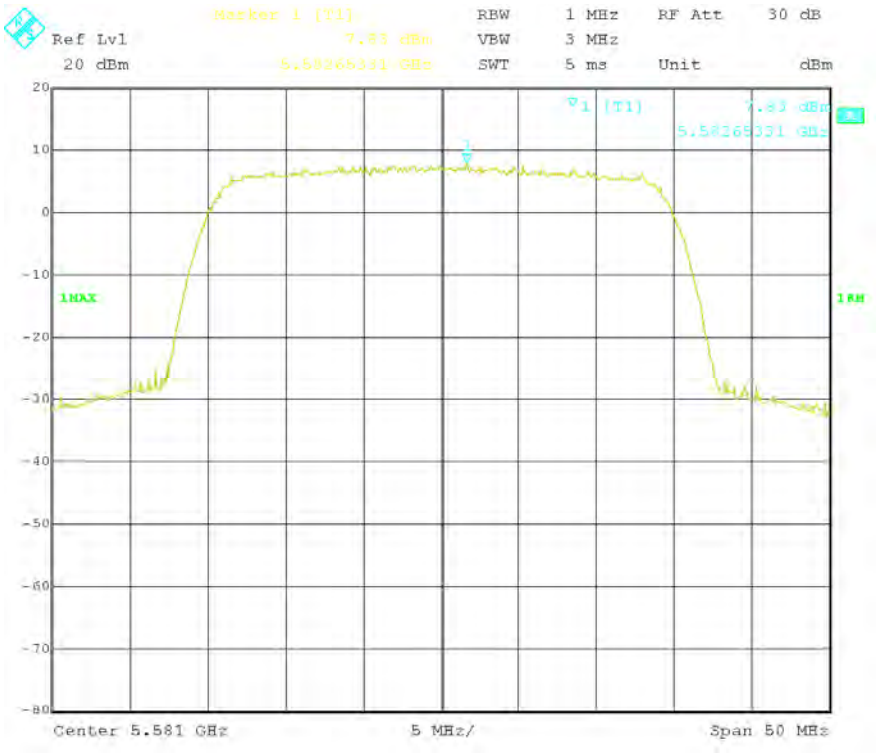

**High Channel**

**Mode: 3= 64QAM, 32MHz Channel Bandwidth**

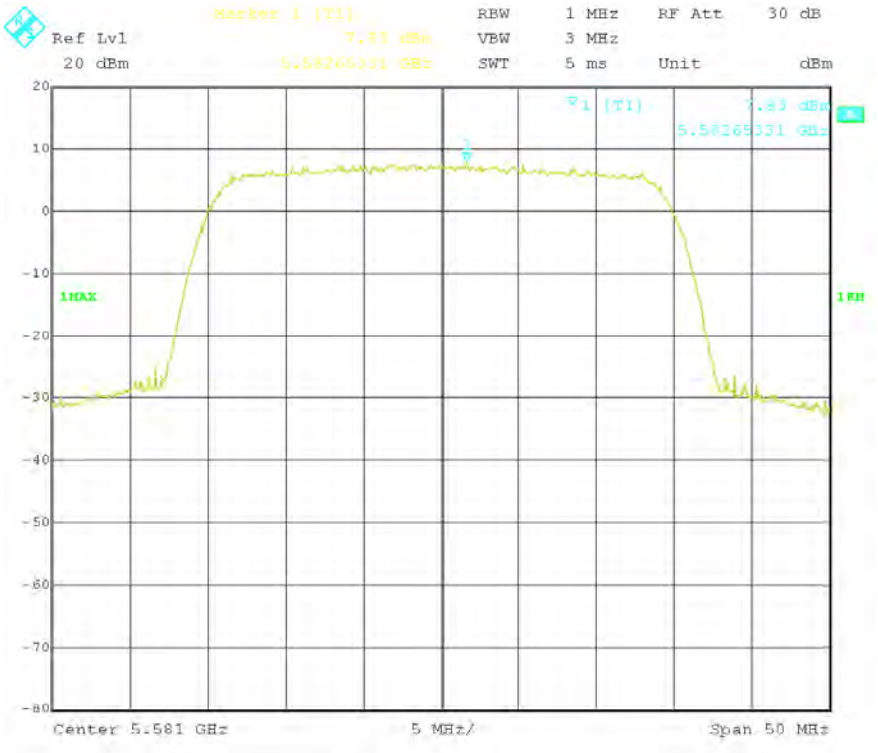
| Mode | Channel Bandwidth | Mode | PPSD (dBm) |
|---|---|---|---|
| Mode 3 | 32MHz | Low Channel | 7.42 |
| | 32MHz | Mid Channel | 7.83 |
| | 32MHz | High Channel | 7.83 |




**Low Channel**




**Mid Channel**



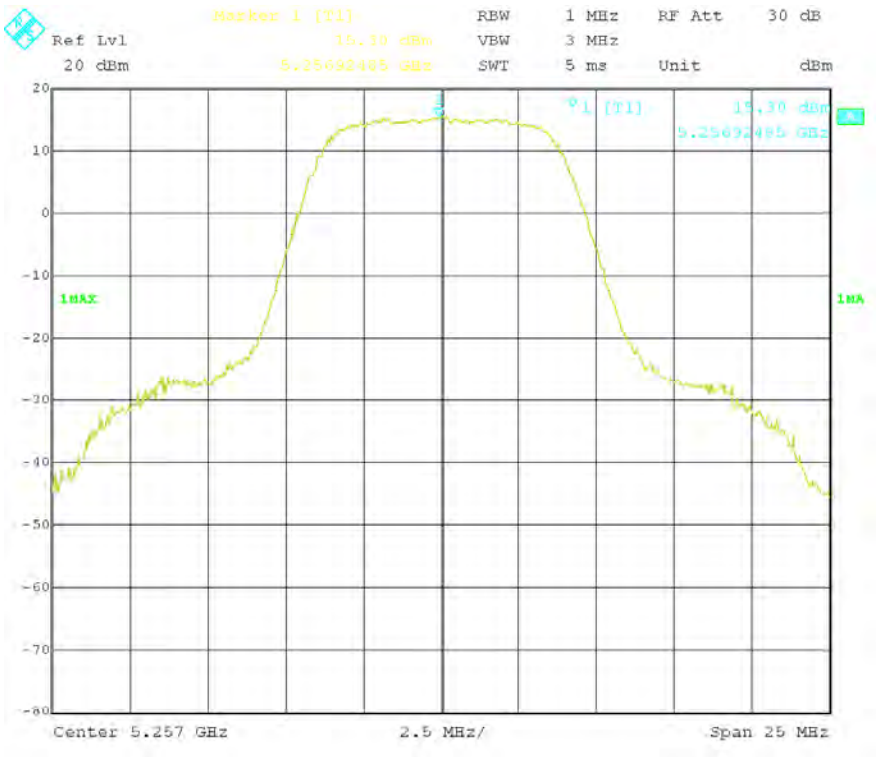

**High Channel**

**Peak Max hold Spectrum**

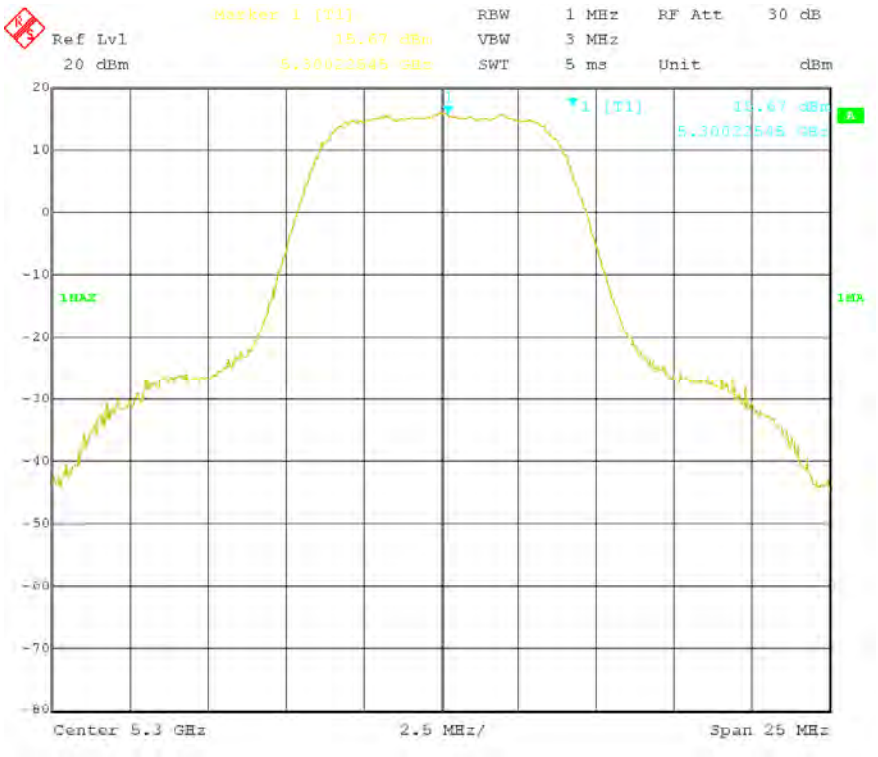
## 5.2GHz Band

## Mode: 1 = QPSK, 8MHz Channel Bandwidth

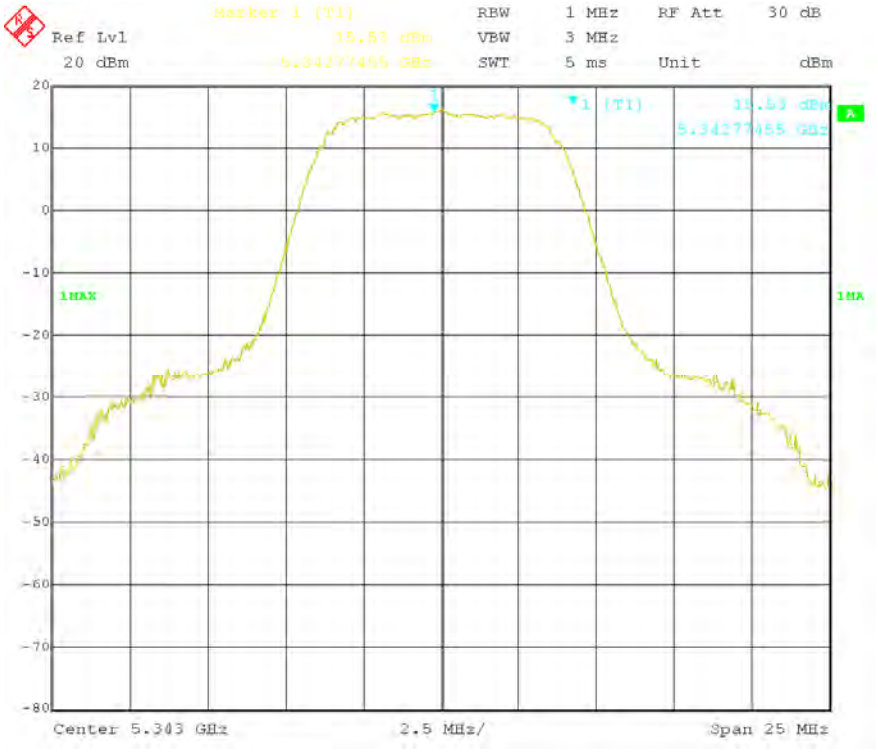
| Mode | Channel Bandwidth | Mode | Peak Max hold Spectrum (dBm) |
|---|---|---|---|
| Mode1 | 8MHz | Low Channel | 15.30 |
| | 8MHz | Mid Channel | 15.67 |
| | 8MHz | High Channel | 15.53 |




**Low Channel**



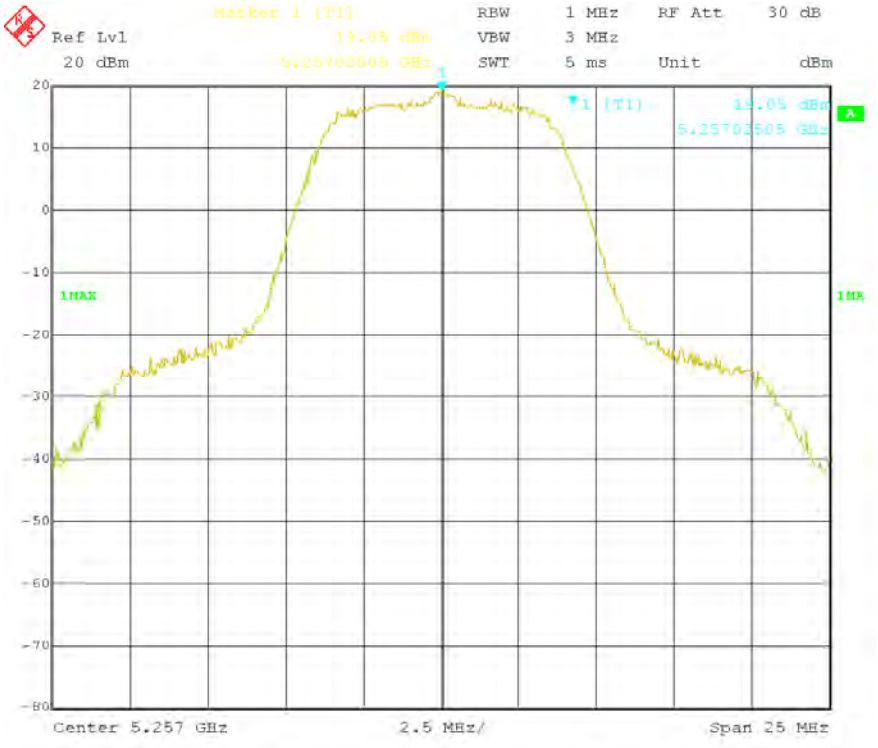

**Mid Channel**



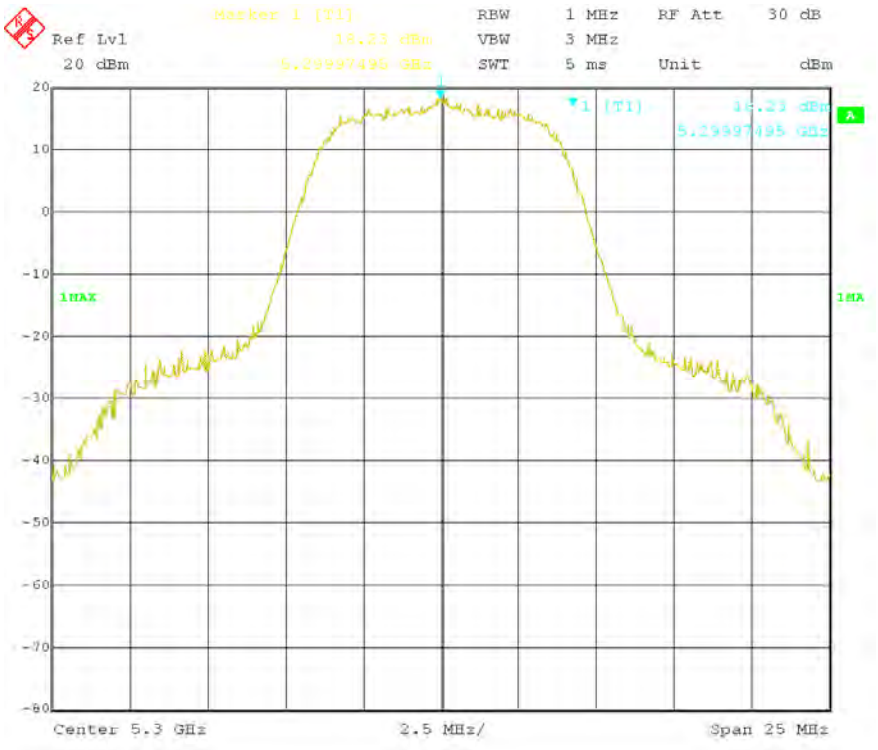

**High Channel**

**Mode: 2 = 16QAM, 8MHz Channel Bandwidth**

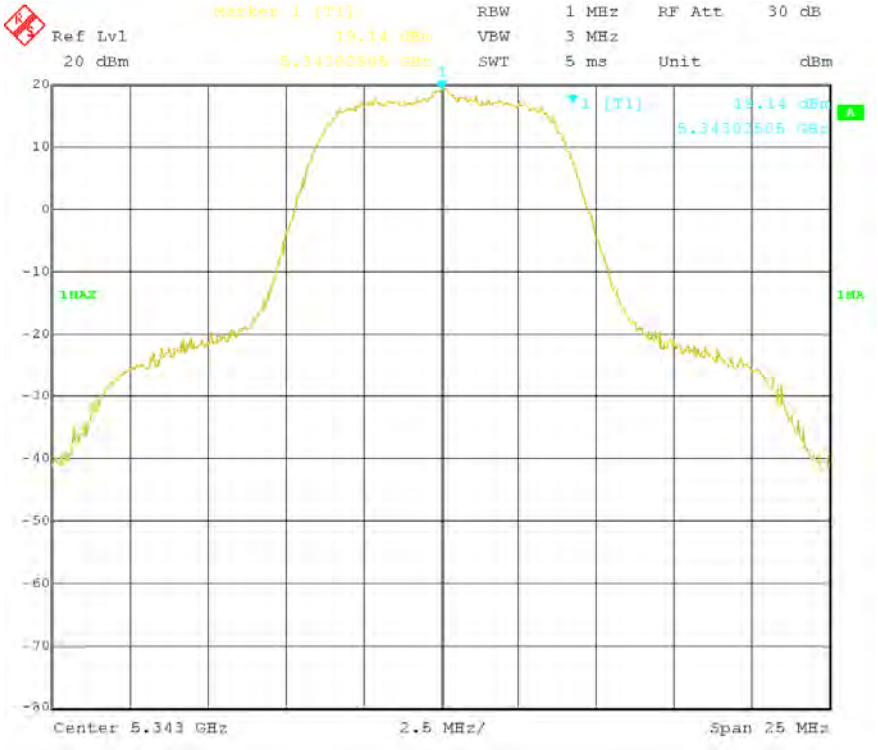
| Mode | Channel Bandwidth | Mode | Peak Max hold Spectrum (dBm) |
|---|---|---|---|
| Mode1 | 8MHz | Low Channel | 19.05 |
| | 8MHz | Mid Channel | 18.23 |
| | 8MHz | High Channel | 19.14 |




**Low Channel**



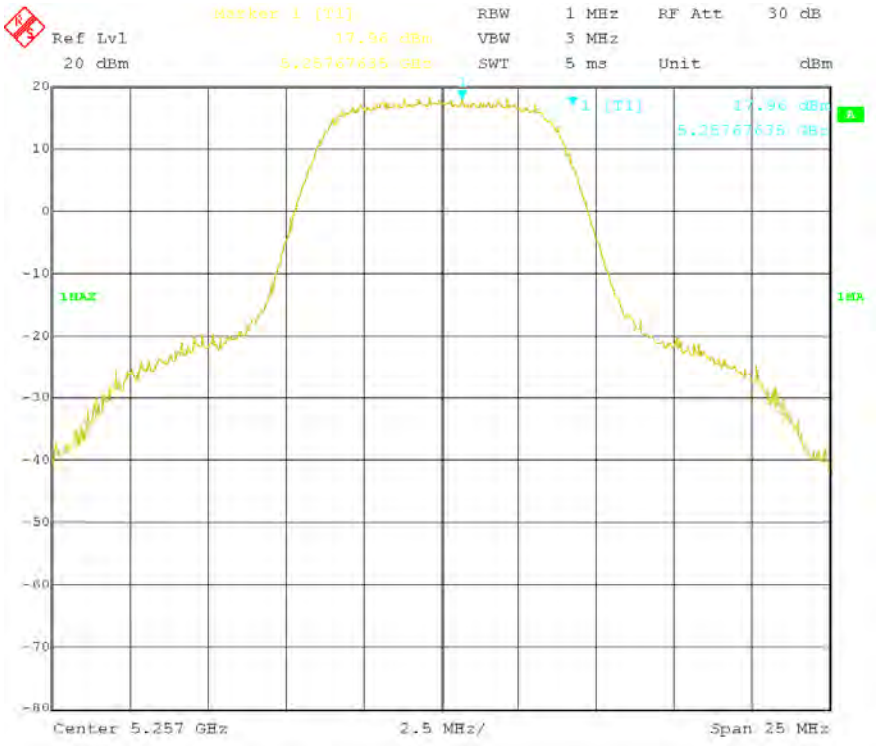

**Mid Channel**



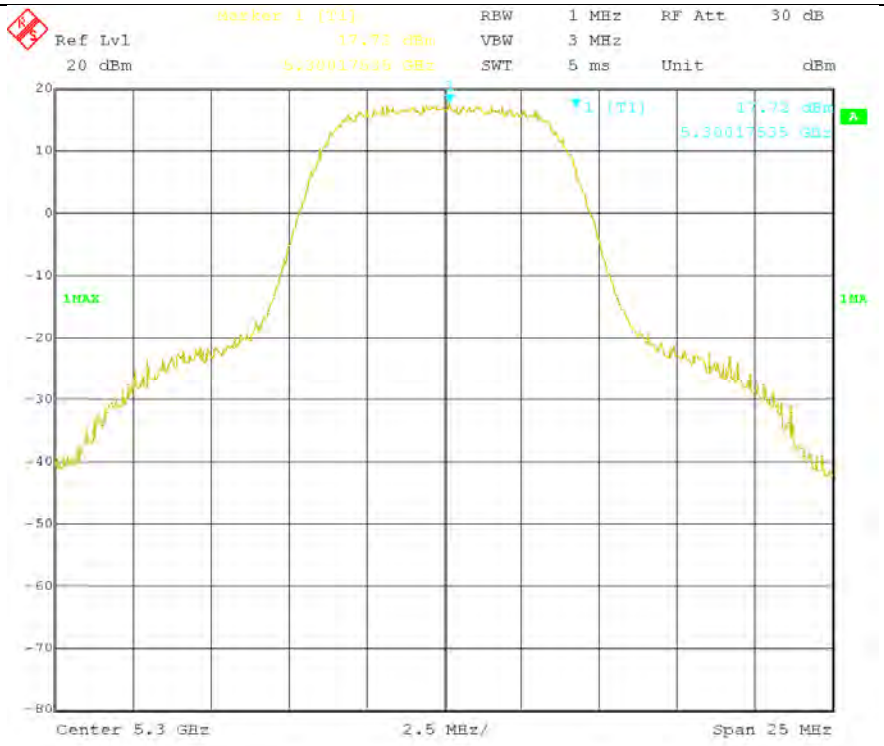

**High Channel**

**Mode: 3 = 64QAM, 8MHz Channel Bandwidth**

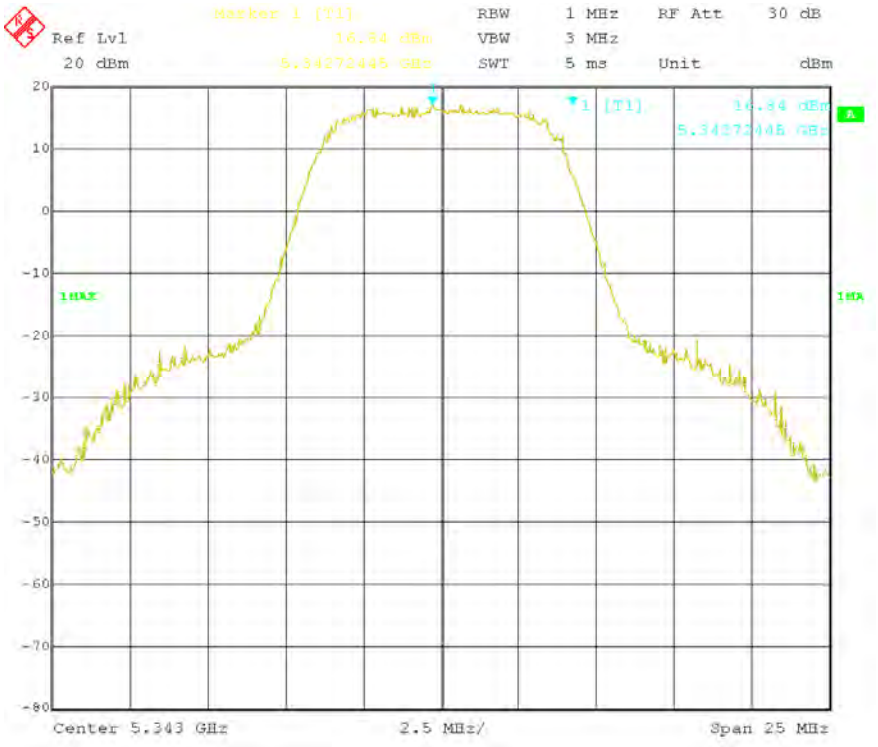
| Mode | Channel Bandwidth | Mode | Peak Max hold Spectrum (dBm) |
|---|---|---|---|
| Mode1 | 8MHz | Low Channel | 17.96 |
| | 8MHz | Mid Channel | 17.72 |
| | 8MHz | High Channel | 16.84 |




**Low Channel**



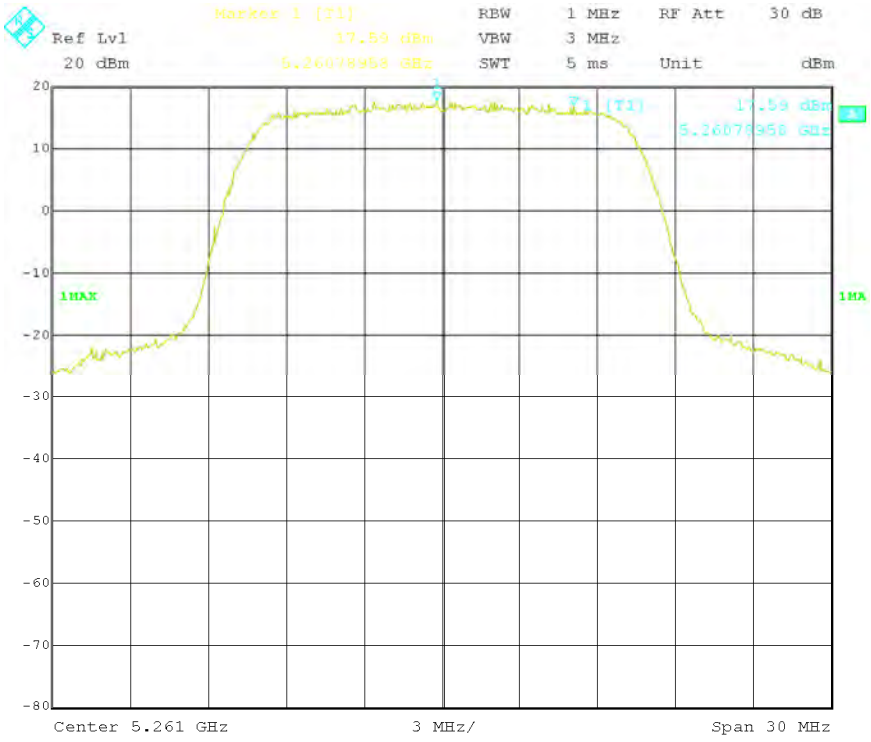

**Mid Channel**



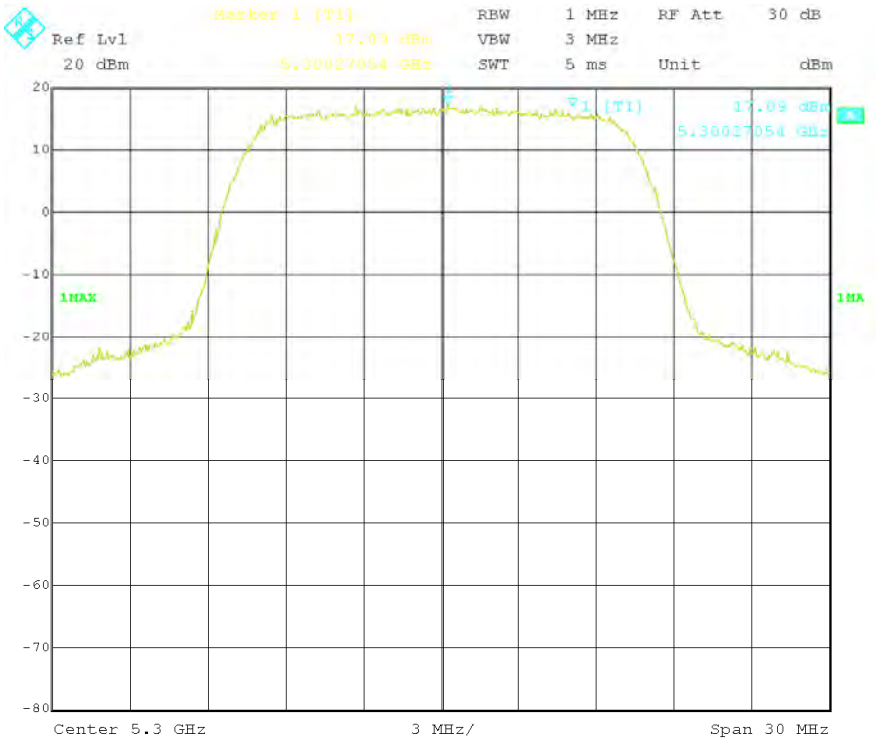

**High Channel**

**Mode: 1 = QPSK, 16MHz Channel Bandwidth**

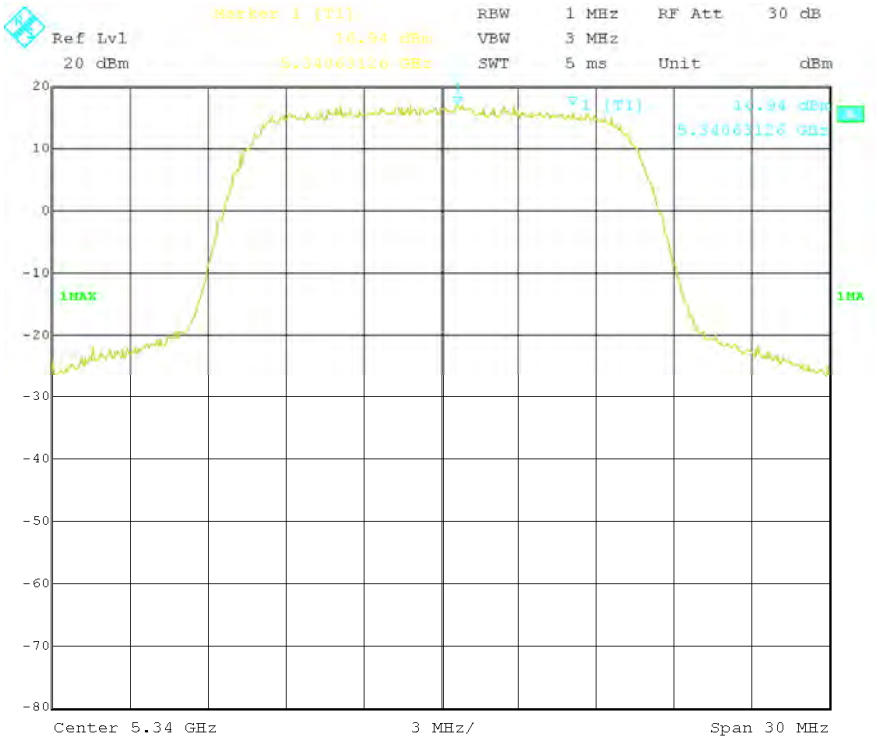
| Mode | Channel Bandwidth | Mode | Peak Max hold Spectrum (dBm) |
|---|---|---|---|
| Mode1 | 16MHz | Low Channel | 17.59 |
| | 16MHz | Mid Channel | 17.09 |
| | 16MHz | High Channel | 16.94 |




**Low Channel**



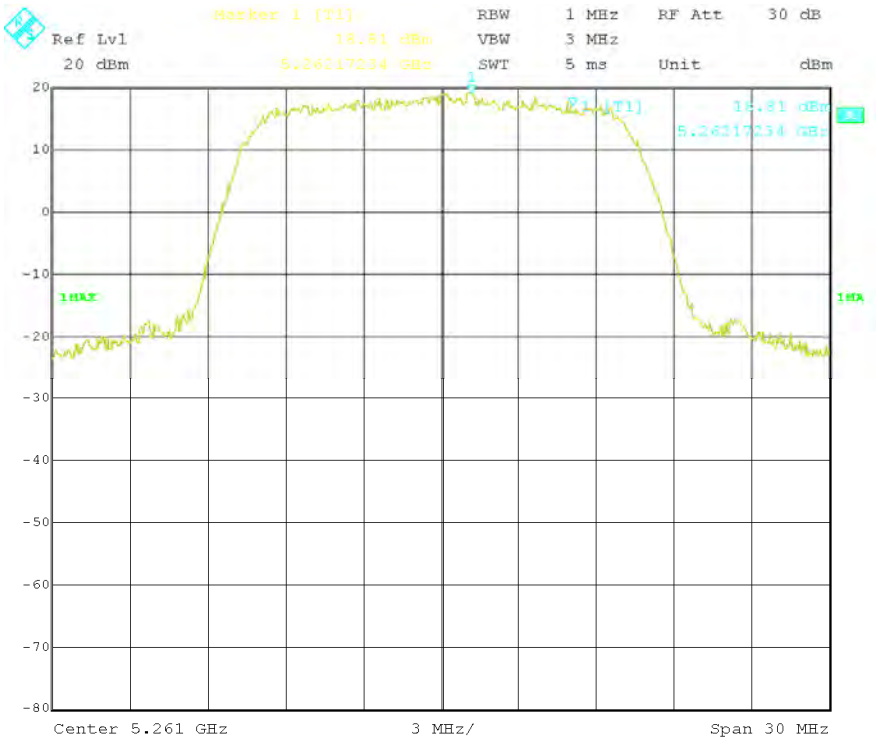

**Mid Channel**



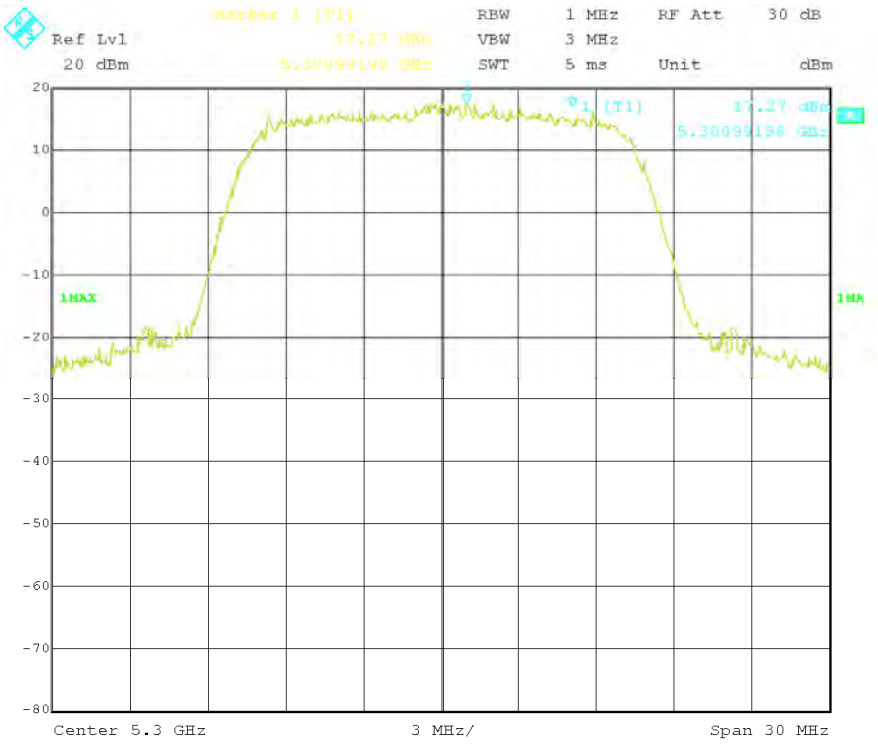

**High Channel**

**Mode: 2 = 16QAM, 16MHz Channel Bandwidth**

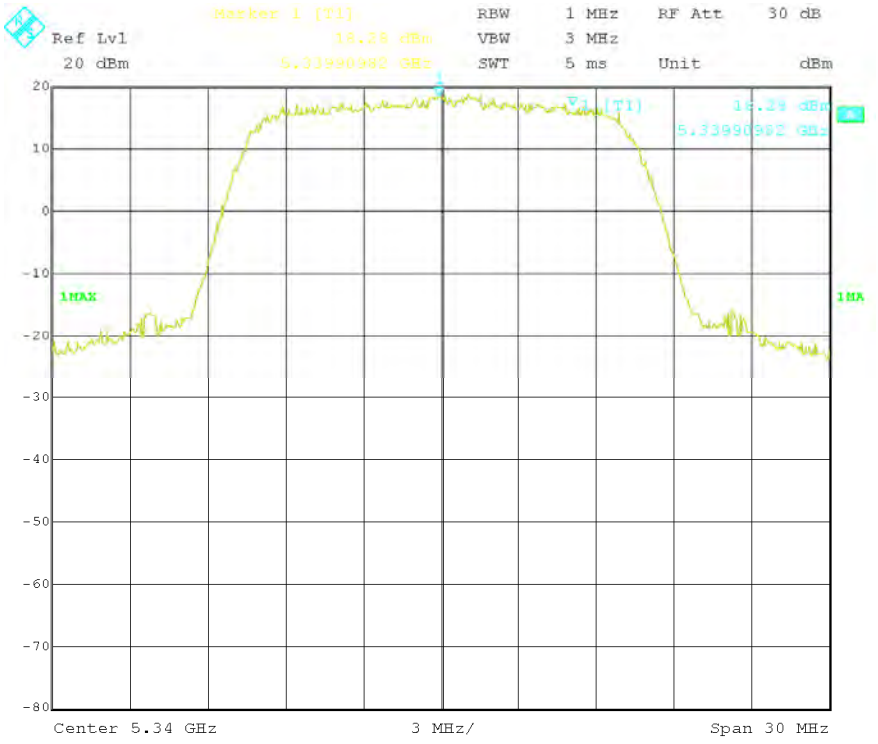
| Mode | Channel Bandwidth | Mode | Peak Max hold Spectrum (dBm) |
|---|---|---|---|
| Mode1 | 16MHz | Low Channel | 18.81 |
| | 16MHz | Mid Channel | 17.27 |
| | 16MHz | High Channel | 18.28 |




**Low Channel**



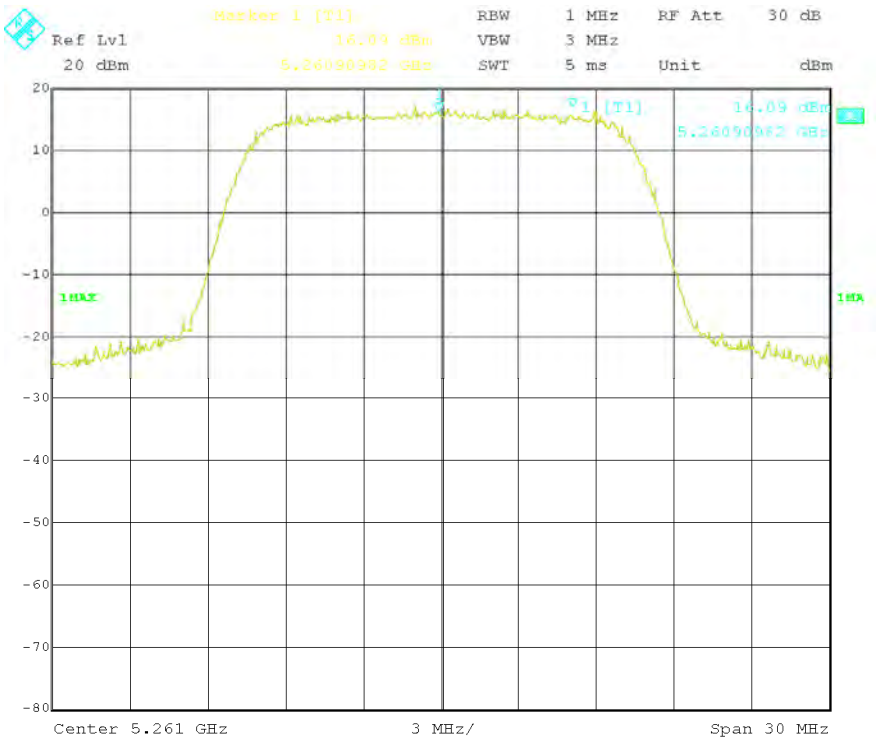

**Mid Channel**



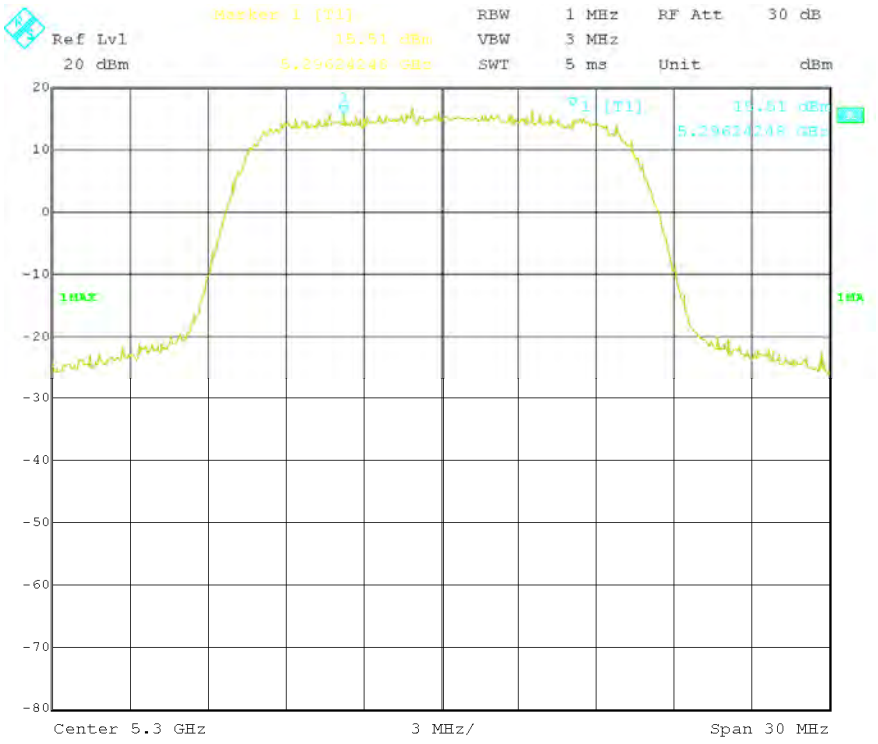

**High Channel**

**Mode: 3 = 64QAM, 16MHz Channel Bandwidth**

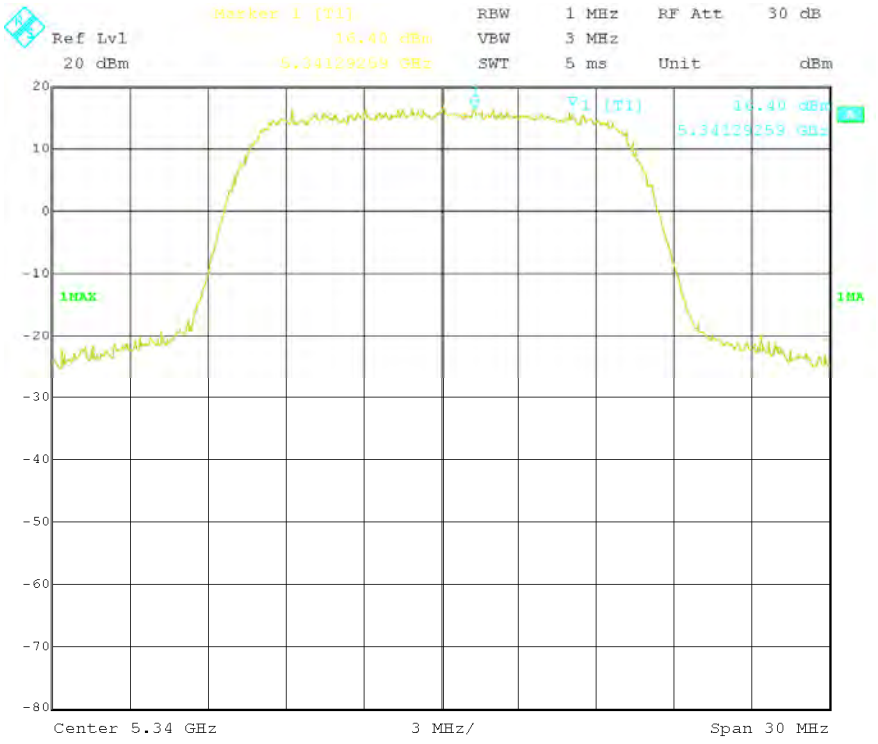
| Mode | Channel Bandwidth | Mode | Peak Max hold Spectrum (dBm) |
|---|---|---|---|
| Mode1 | 16MHz | Low Channel | 16.09 |
| | 16MHz | Mid Channel | 15.51 |
| | 16MHz | High Channel | 16.40 |




**Low Channel**



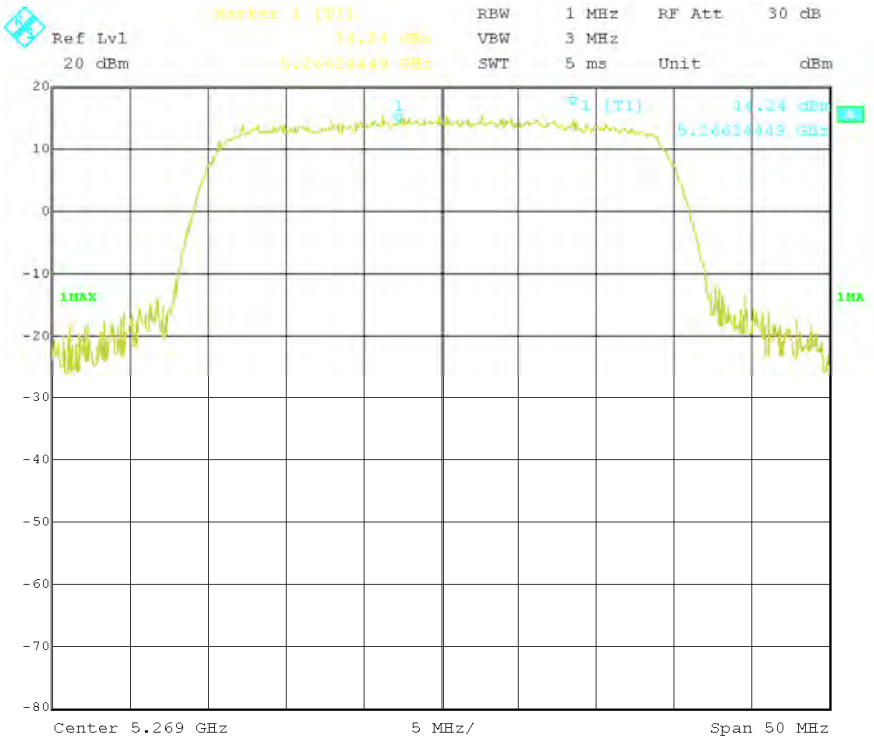

**Mid Channel**



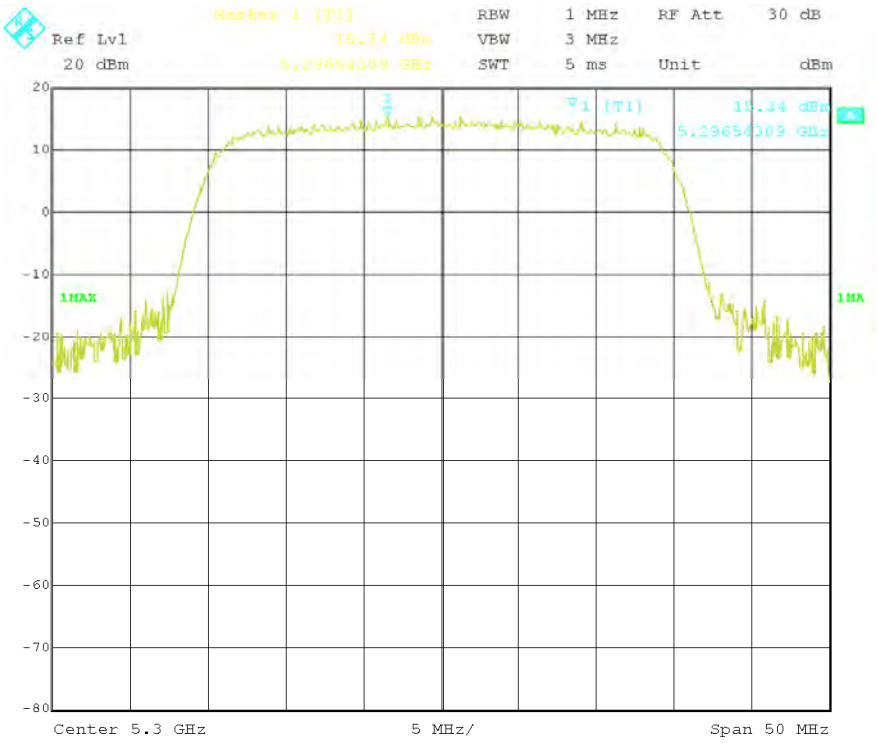

**High Channel**

**Mode: 1 = QPSK, 32MHz Channel Bandwidth**

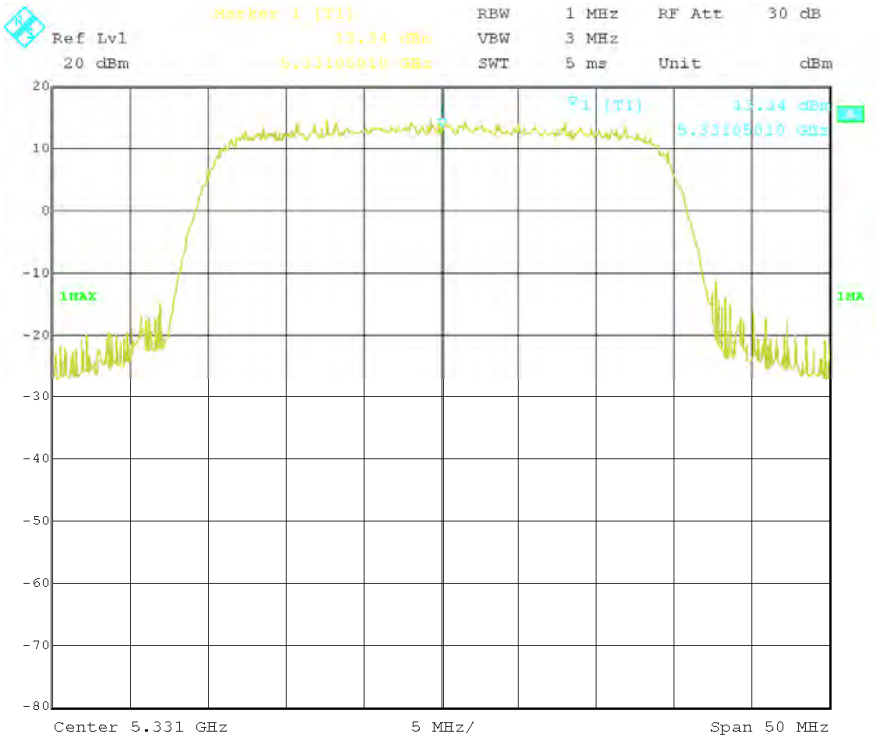
| Mode | Channel Bandwidth | Mode | Peak Max hold Spectrum (dBm) |
|---|---|---|---|
| Mode1 | 32MHz | Low Channel | 14.24 |
| | 32MHz | Mid Channel | 15.34 |
| | 32MHz | High Channel | 13.34 |




**Low Channel**



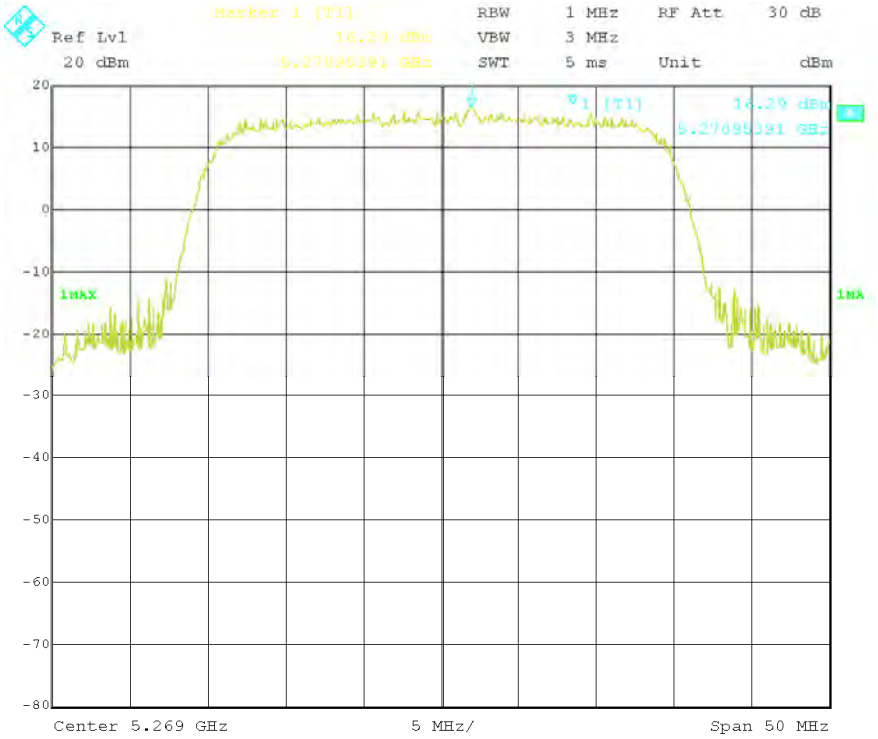

**Mid Channel**



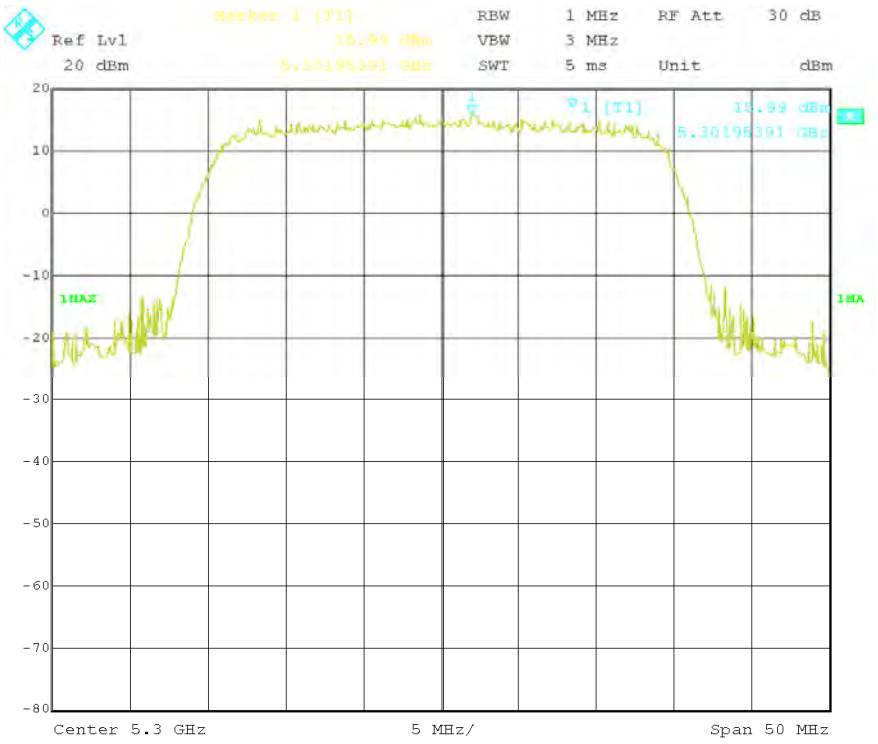

**High Channel**

**Mode: 2 = 16QAM, 32MHz Channel Bandwidth**

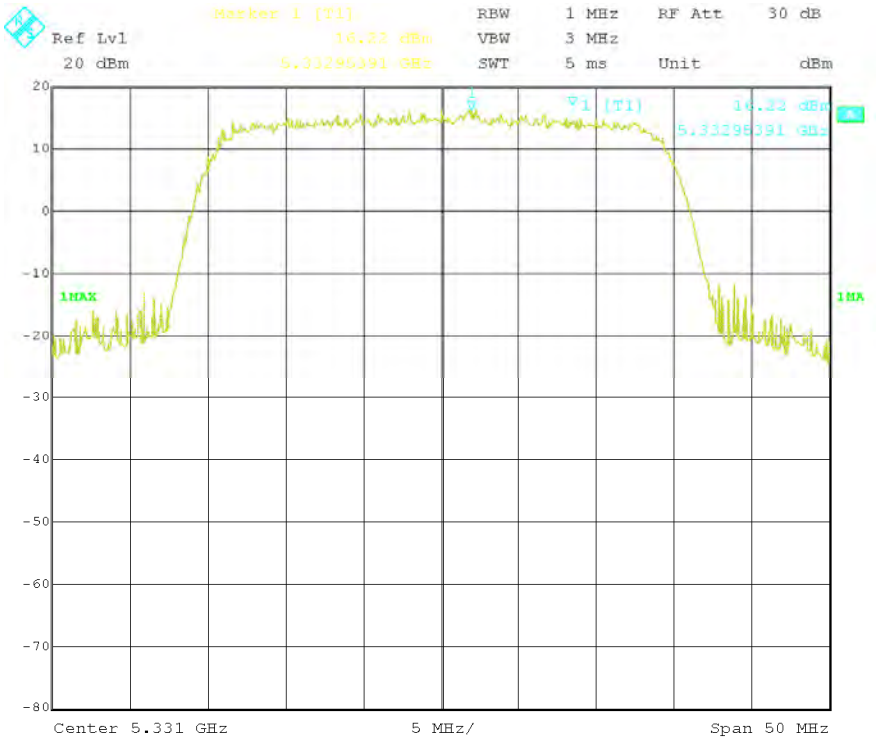
| Mode | Channel Bandwidth | Mode | Peak Max hold Spectrum (dBm) |
|---|---|---|---|
| Mode1 | 32MHz | Low Channel | 16.29 |
| | 32MHz | Mid Channel | 15.99 |
| | 32MHz | High Channel | 16.22 |




**Low Channel**



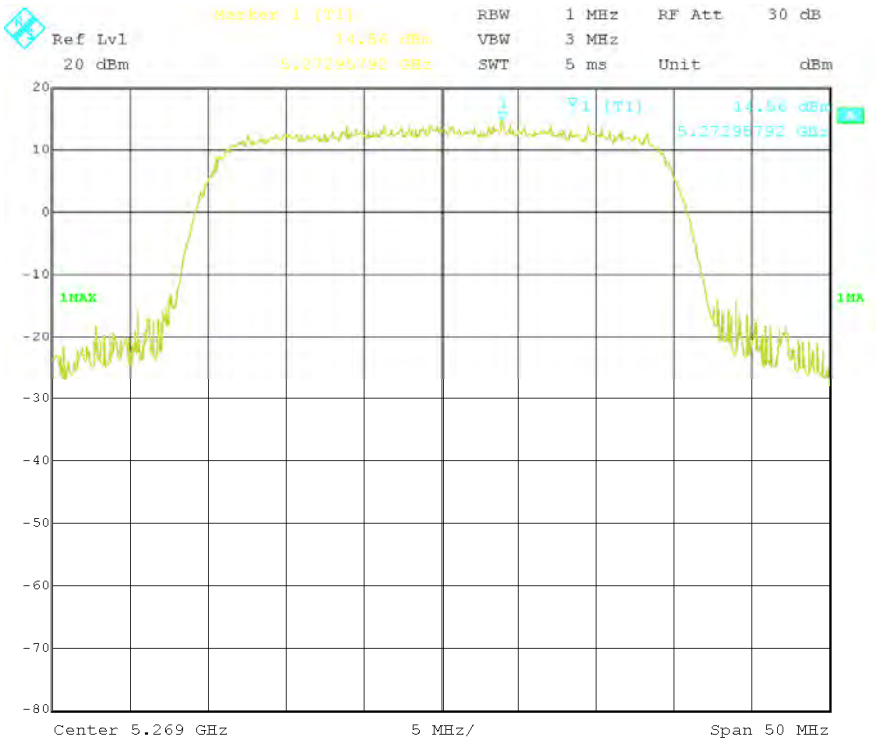

**Mid Channel**



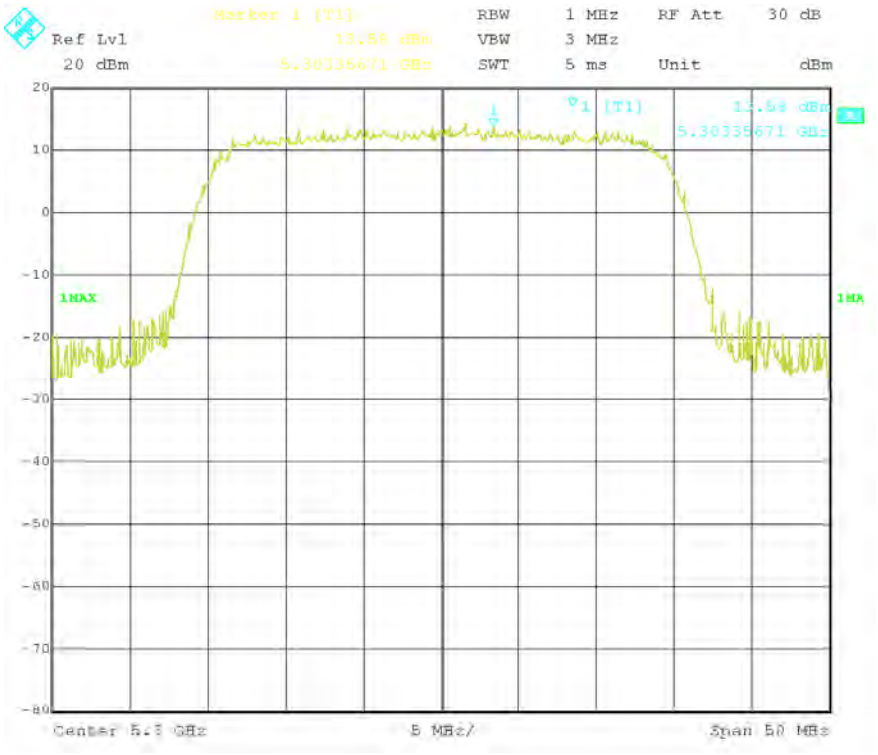

**High Channel**

**Mode: 3 = 64QAM, 32MHz Channel Bandwidth**

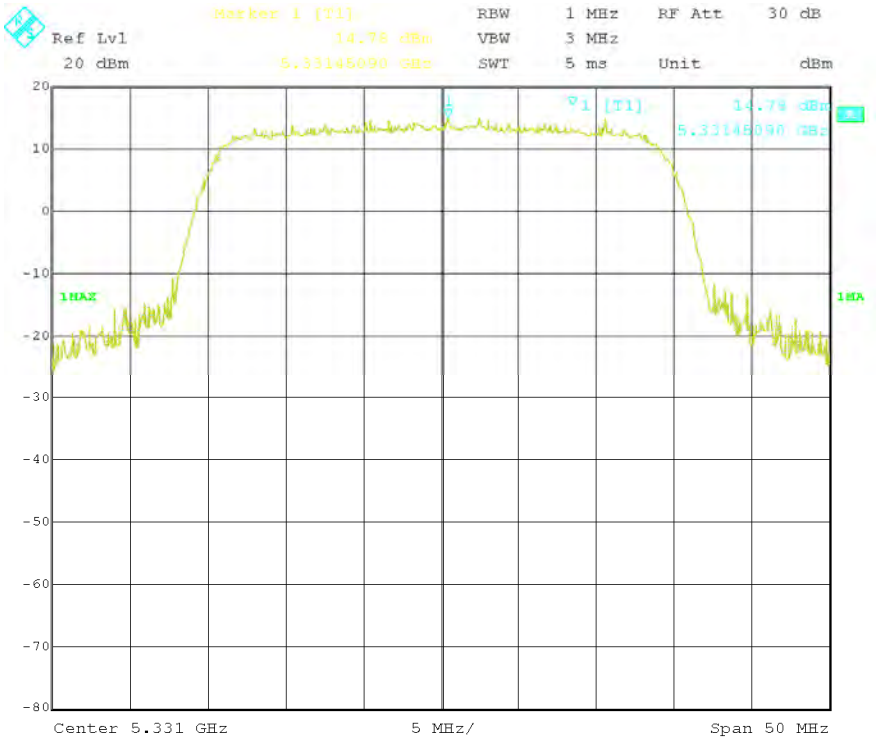
| Mode | Channel Bandwidth | Mode | Peak Max hold Spectrum (dBm) |
|---|---|---|---|
| Mode 3 | 32MHz | Low Channel | 14.56 |
| | 32MHz | Mid Channel | 13.58 |
| | 32MHz | High Channel | 14.78 |




**Low Channel**




**Mid Channel**

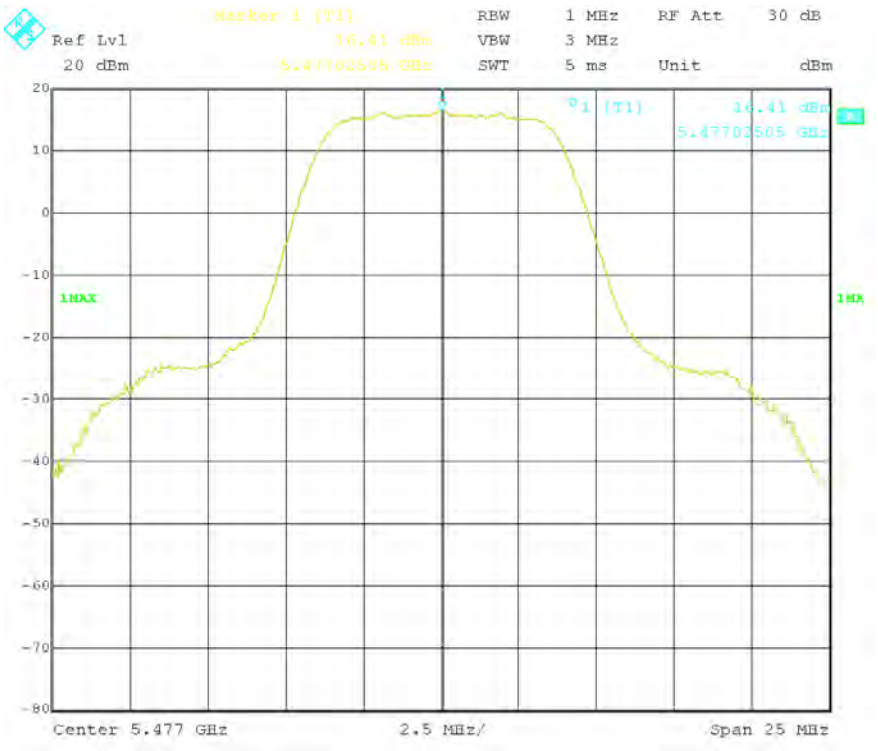



**High Channel**

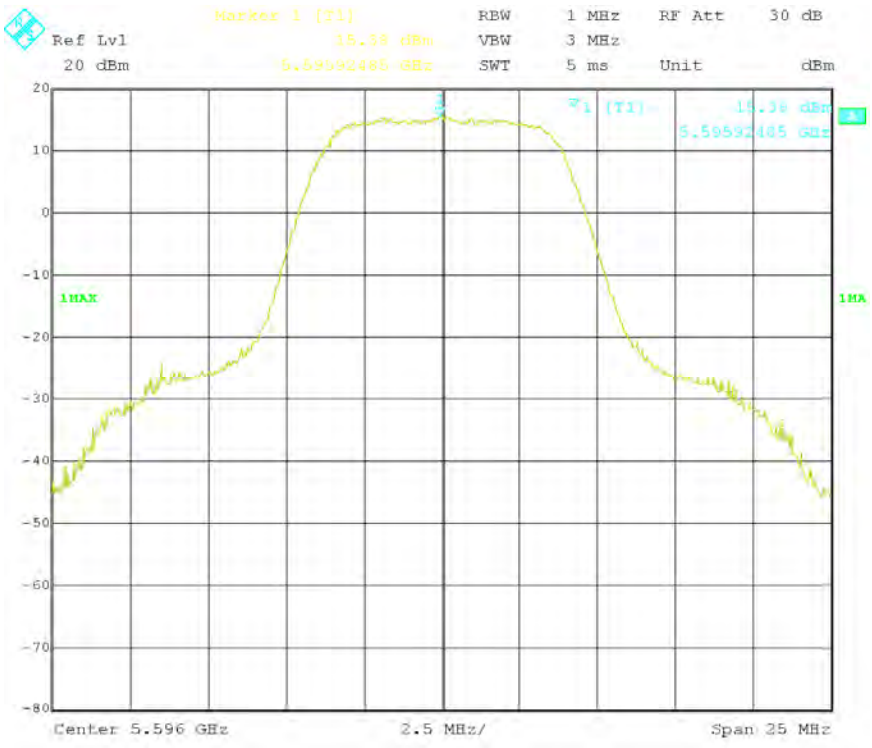
## 5.4GHz Band

## Mode: 1 = QPSK, 8MHz Channel Bandwidth

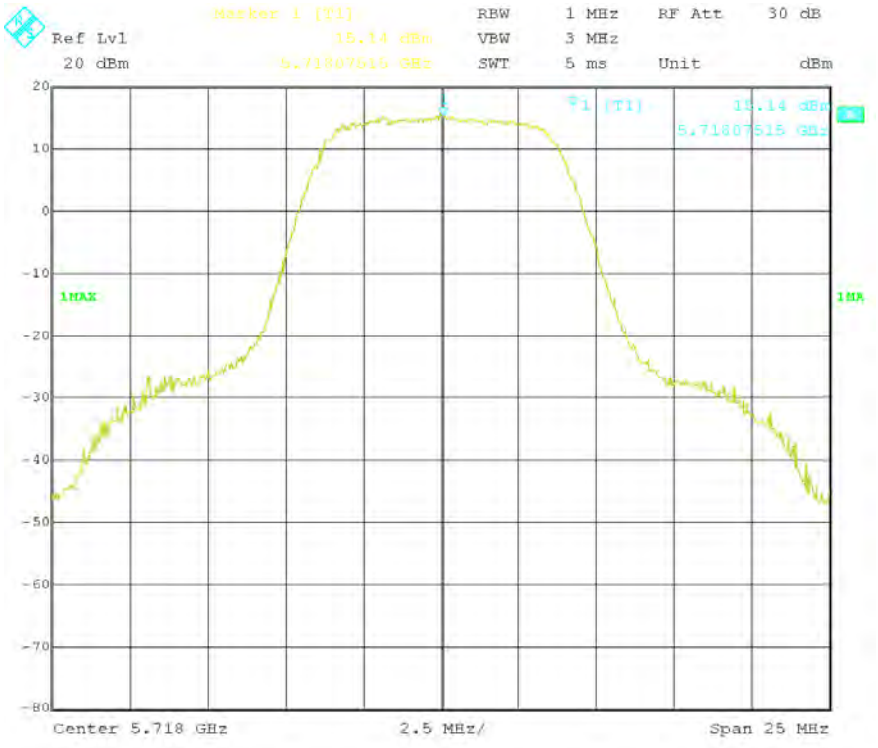
| Mode | Channel Bandwidth | Mode | Peak Max hold Spectrum (dBm) |
|---|---|---|---|
| Mode 1 | 8MHz | Low Channel | 16.41 |
| | 8MHz | Mid Channel | 15.38 |
| | 8MHz | High Channel | 15.14 |




**Low Channel**



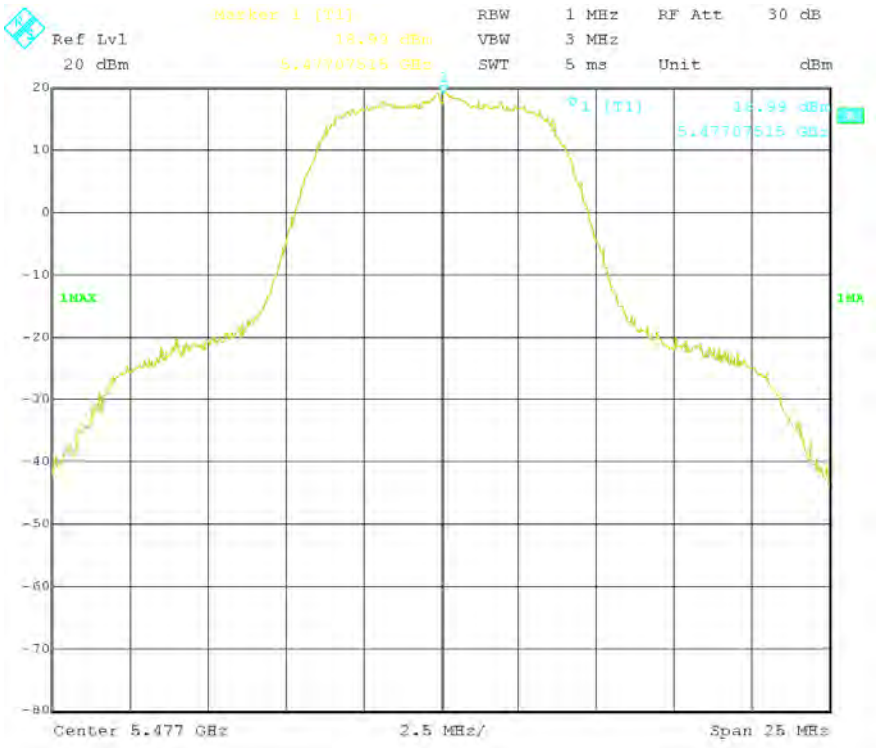

**Mid Channel**



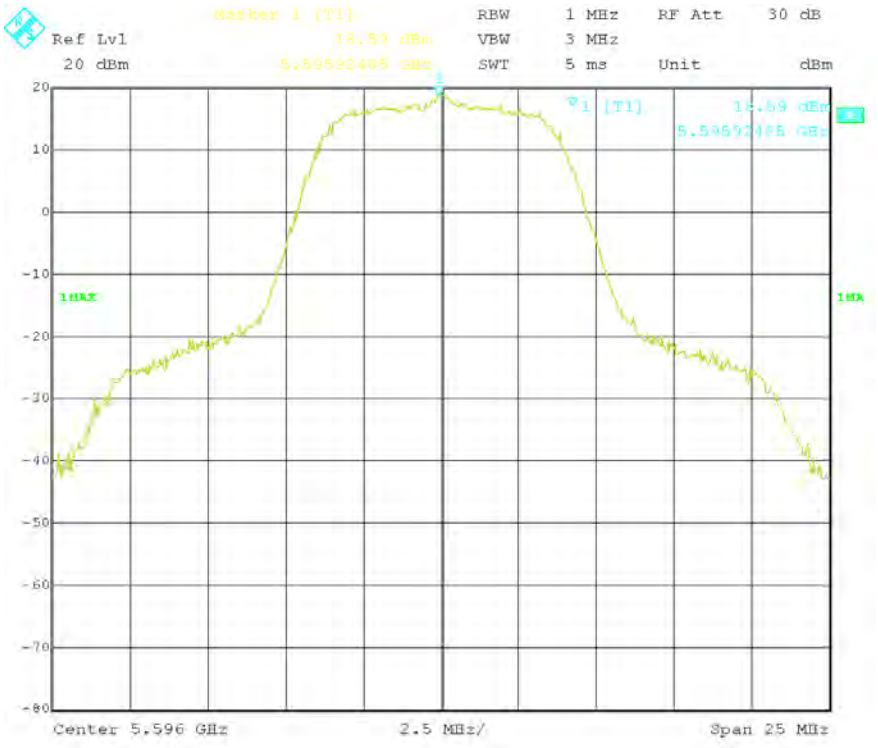

**High Channel**

**Mode: 2 = 16QAM, 8MHz Channel Bandwidth**

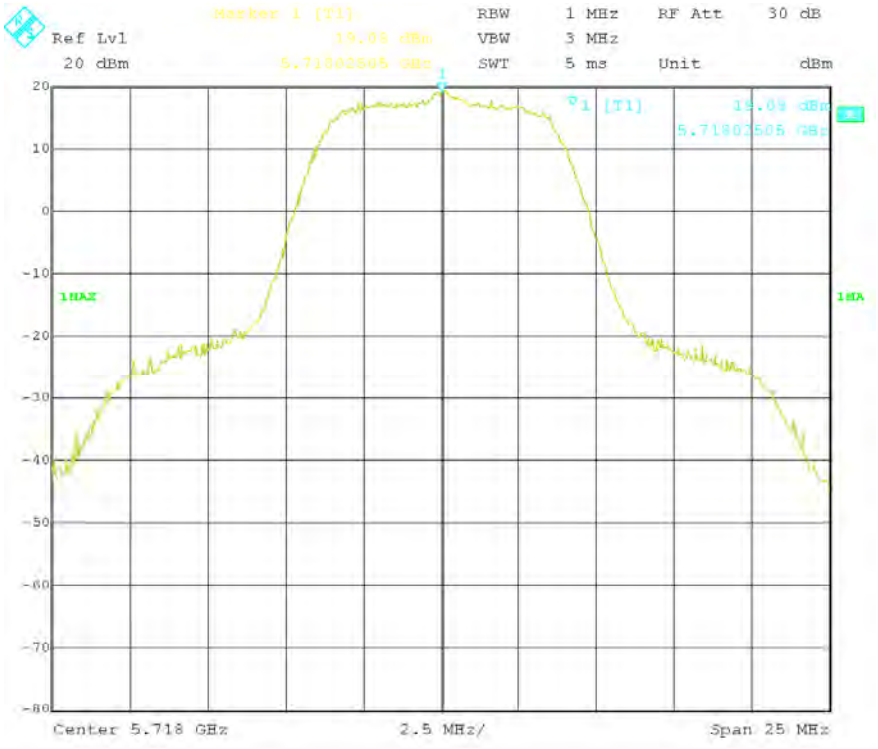
| Mode | Channel Bandwidth | Mode | Peak Max hold Spectrum (dBm) |
|---|---|---|---|
| Mode 1 | 8MHz | Low Channel | 18.99 |
| | 8MHz | Mid Channel | 18.59 |
| | 8MHz | High Channel | 19.08 |




**Low Channel**




**Mid Channel**




**High Channel**