

# **Wi-Fi 2.4GHz Conducted Measurements Test Report**

**FCC ID: 2ADDK360FLY4K**

**IC: 12404A-360FLY4K**

**FCC Rule Part: FCC Part 15 Subpart C**

**IC Radio Standards Specification: RSS-247**

**Manufacturer: 360fly Inc.**

**Model: 360FLY4K**

**Test Facility: 12 Ang Mo Kio St 64 #03-01  
UE BizHub Central (Blk A), 569088 Singapore.**

**Test Begin Date: Mar 11, 2016**

**Test End Date: April 19, 2016**

**Report Issue Date: April 19, 2014**

**Test By:**

**Name: PS Yeo**

**Signature: *PSYeo***

**Reviewed By:**

**Name: CC Pang**

**Signature: *CCPang***

## 1 List of Test Equipment

Manufacturer	Model	Equipment Type	Serial No.	Last Calibration Date	Calibration Due Date
Agilent	E4404B	Spectrum Analyzer	MY44220422	10 Feb 15	10 Feb 17
Advantest	R3273	Spectrum Analyzer	95090358	06 Oct 15	06 Oct 16
Agilent	N1911A	Power Meter	MY53150005	12 Jun 15	12 Jun 17
Agilent	N1921A	Power Sensor	MY53160021	23 Jun 15	23 Jun 16

## 2 Applicable Standard References

The following standards were used:

FCC Rules	IC Rules	Description of Test	Result
§ 15.247 (a) (2)	RSS 247 5.2.1	6dB Bandwidth	Pass
§ 15.247 (b) (3)	RSS 247 5.4.4	Peak Output Power	Pass
§ 15.247 (d)	RSS 247 5.5	100kHz Bandwidth of Frequency Band Edges	Pass
§ 15.247 (e)	RSS 247 5.2.2	Power Spectral Density	Pass
§ 15.209	RSS 247 5.5	Spurious Emission	Pass

## 3 Summary of Tests

### 3.1 6 dB Bandwidth – FCC Section 15.247 (a) (2), *RSS 247 5.2.1/ 99% Bandwidth - RSS GEN 6.6*

#### 3.1.1 Measurement Procedure

The 6dB bandwidth was measured in accordance with the **RSS 247 5.2.1** and the FCC KDB Publication No.558074 v03r02 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (47 CFR 15.247)” DTS 6-dB Signal Bandwidth Option 1. The RBW of the spectrum analyzer was set to 100 kHz and VBW 300 kHz. Span was set large enough to capture the entire emissions and >> RBW.

The 99% occupied bandwidth was measured with the spectrum analyzer

span set to fully display the emission, including the emissions skirts. The RBW of the spectrum analyzer was set to greater than or equal to the 1% to 5% of the 99% bandwidth. The occupied 99% bandwidth was measured using the occupied bandwidth function of the analyzer.

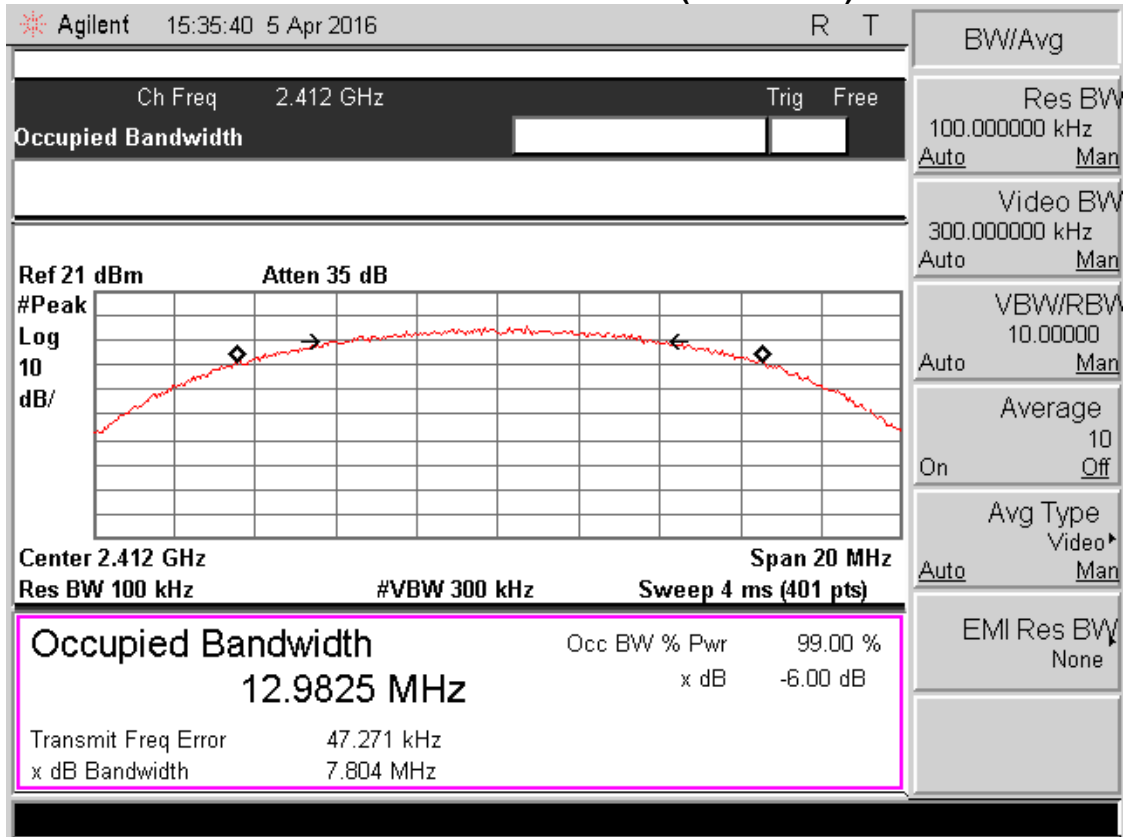
### 3.1.2 Measurement Result

Frequency (MHz)	For 802.11b: 6dB Bandwidth (MHz)	For 802.11g: 6dB Bandwidth (MHz)	For 802.11n_20MHz: 6dB Bandwidth (MHz)
2412	7.804	16.481	17.672
2437	8.666	16.623	17.706
2462	8.837	16.734	17.794

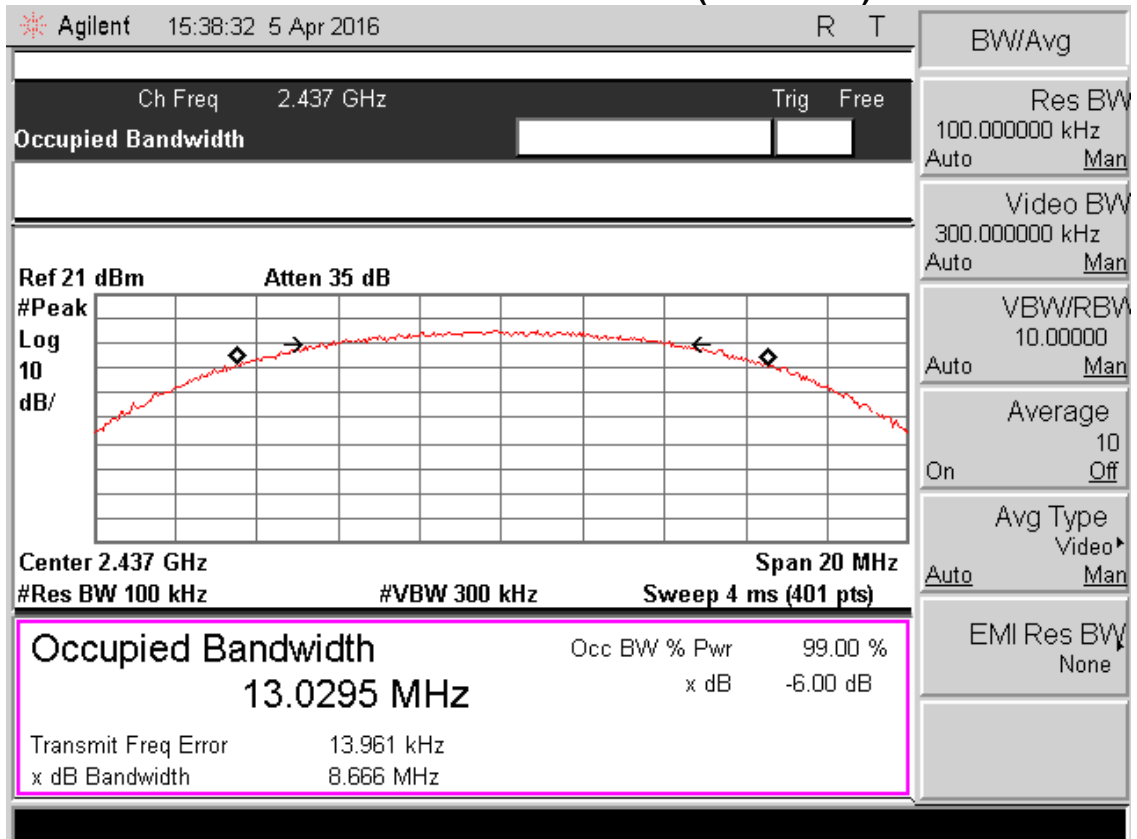
Frequency (MHz)	For 802.11b: 99% Bandwidth (MHz)	For 802.11g: 99% Bandwidth (MHz)	For 802.11n_20MHz: 99% Bandwidth (MHz)
2412	13.095	16.999	18.180
2437	13.207	17.168	18.497
2462	13.153	18.497	18.240

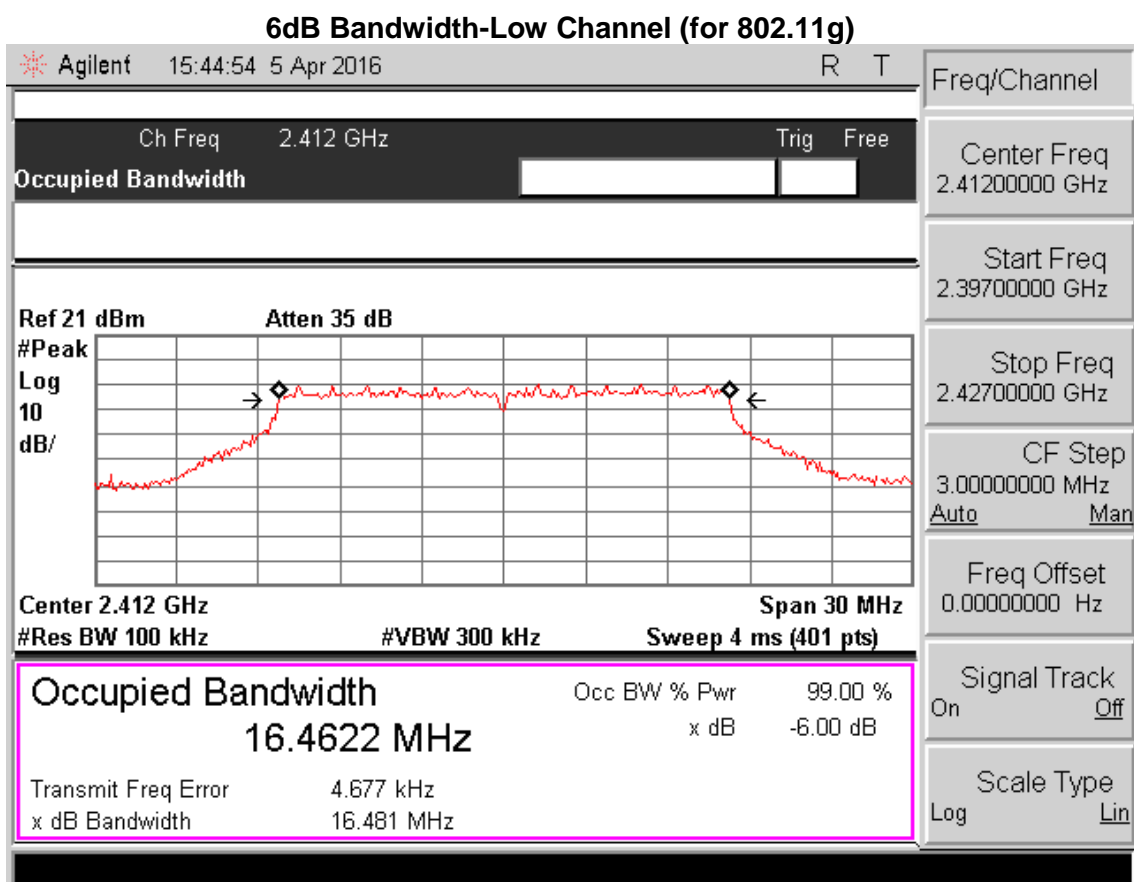
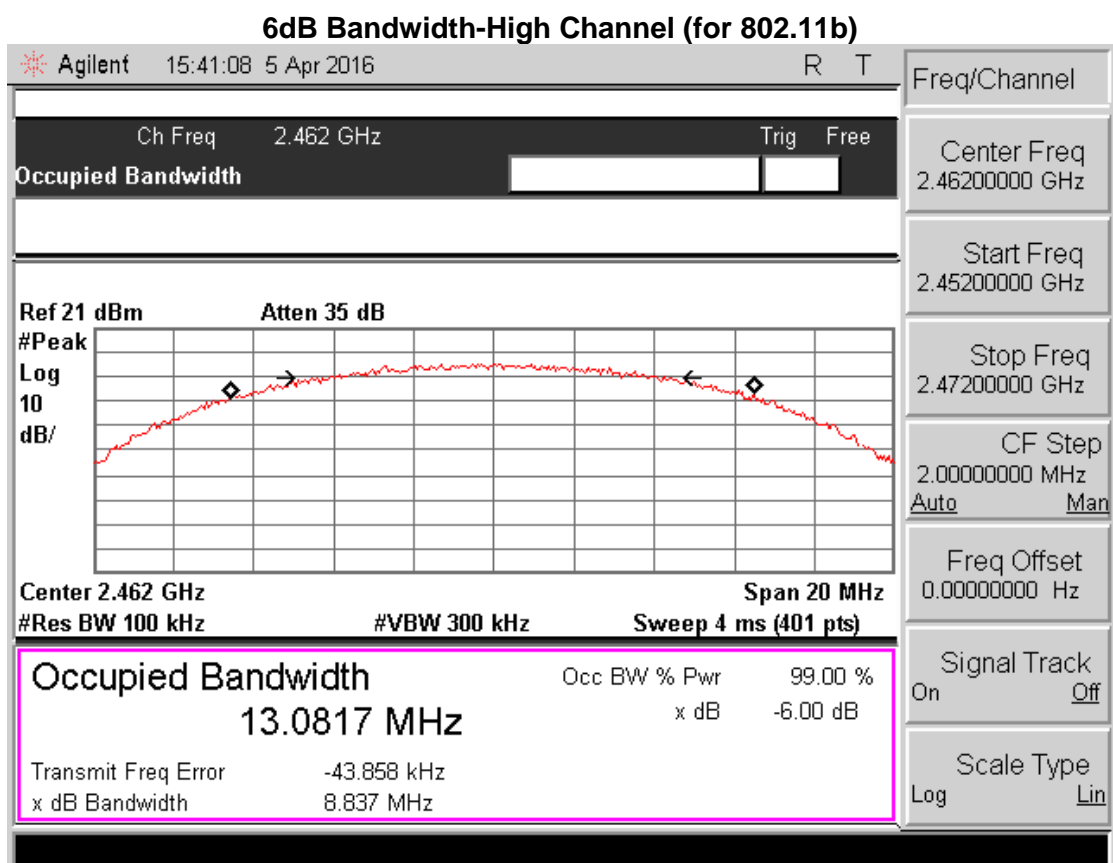
Frequency (MHz)	For 802.11n_40MHz: 6dB Bandwidth (MHz)	For 802.11n_40MHz: 99% Bandwidth (MHz)
2422	36.145	37.926
2437	35.779	40.219
2452	36.368	40.020

### 6dB Bandwidth-Low Channel (for 802.11b)

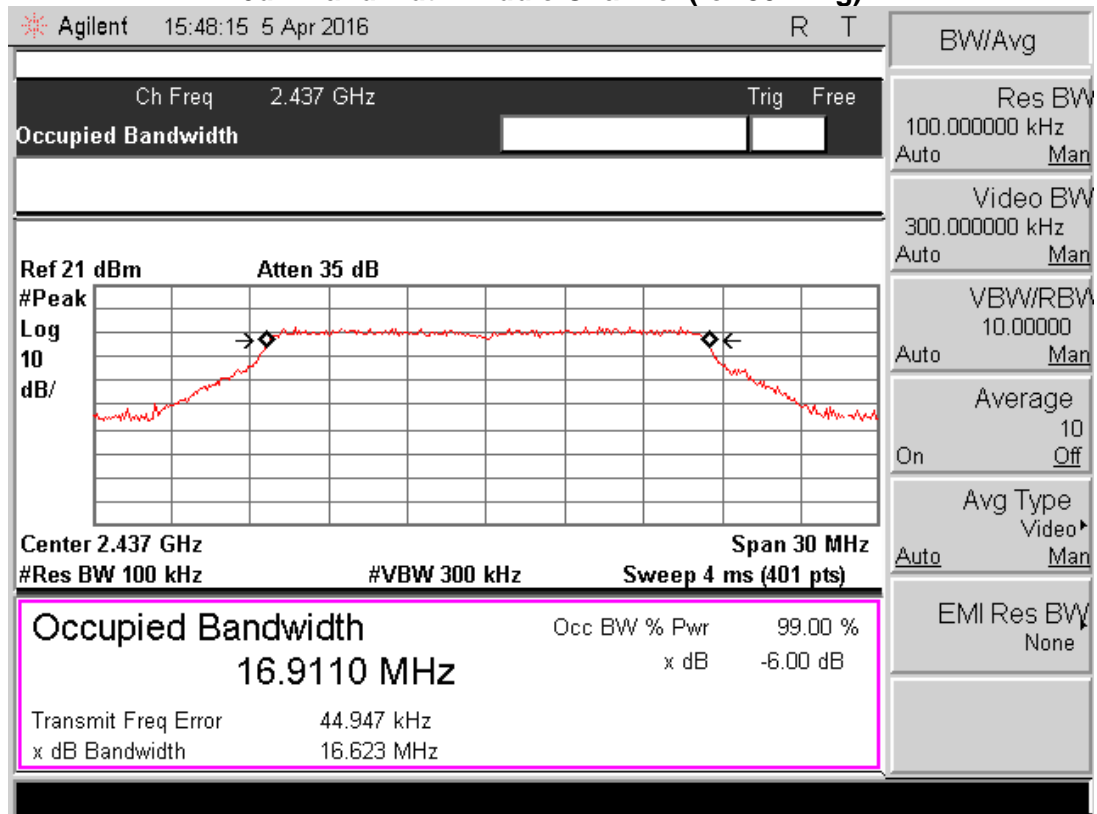


### 6dB Bandwidth-Middle Channel (for 802.11b)

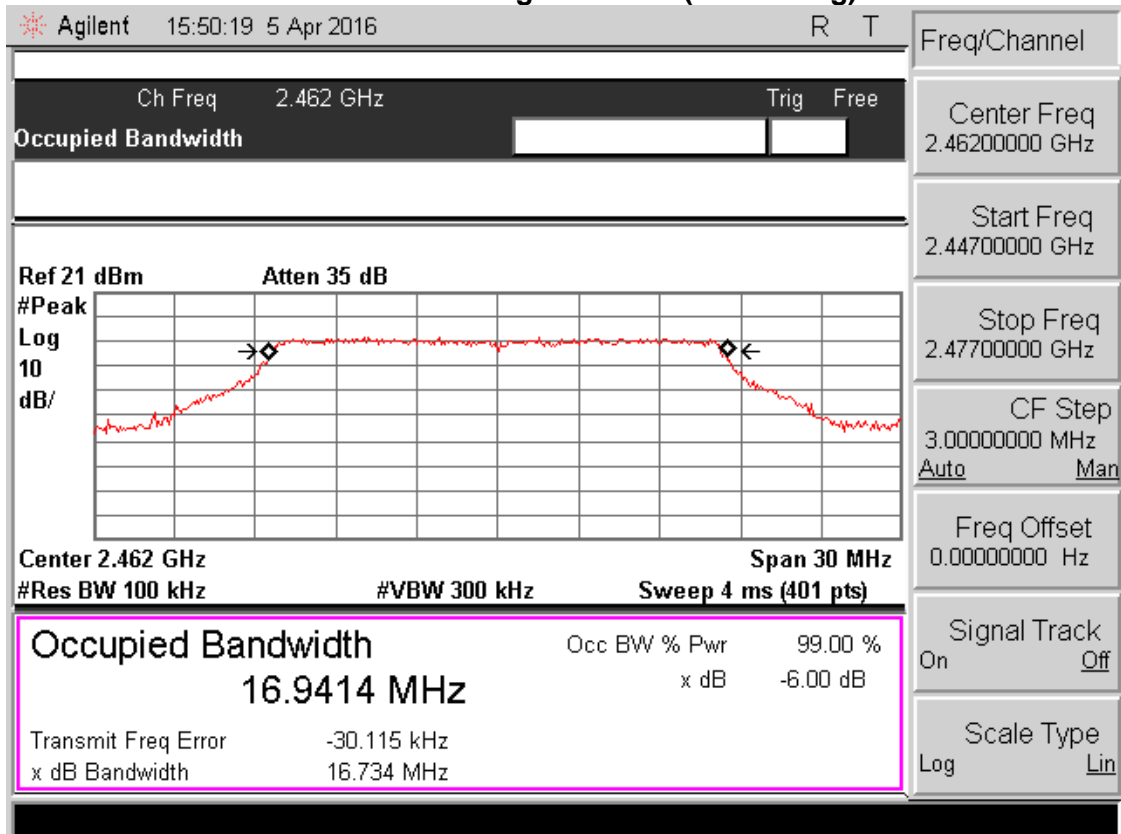




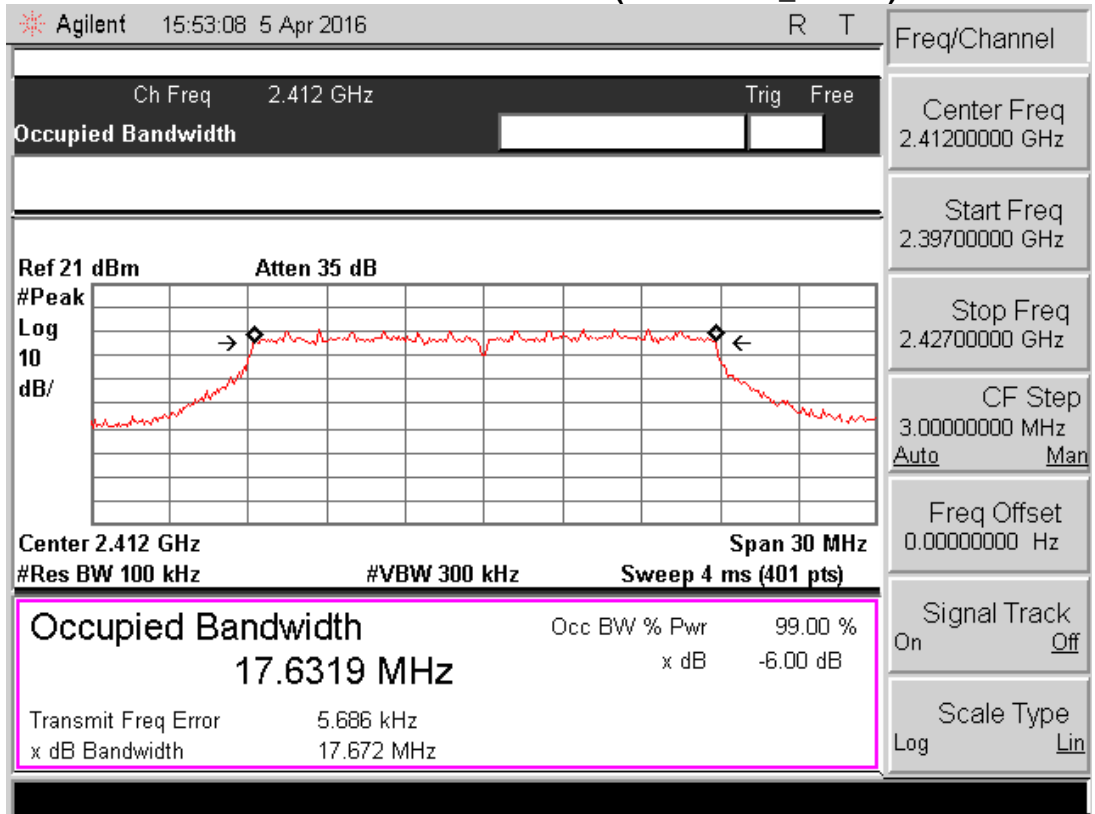
### 6dB Bandwidth-Middle Channel (for 802.11g)



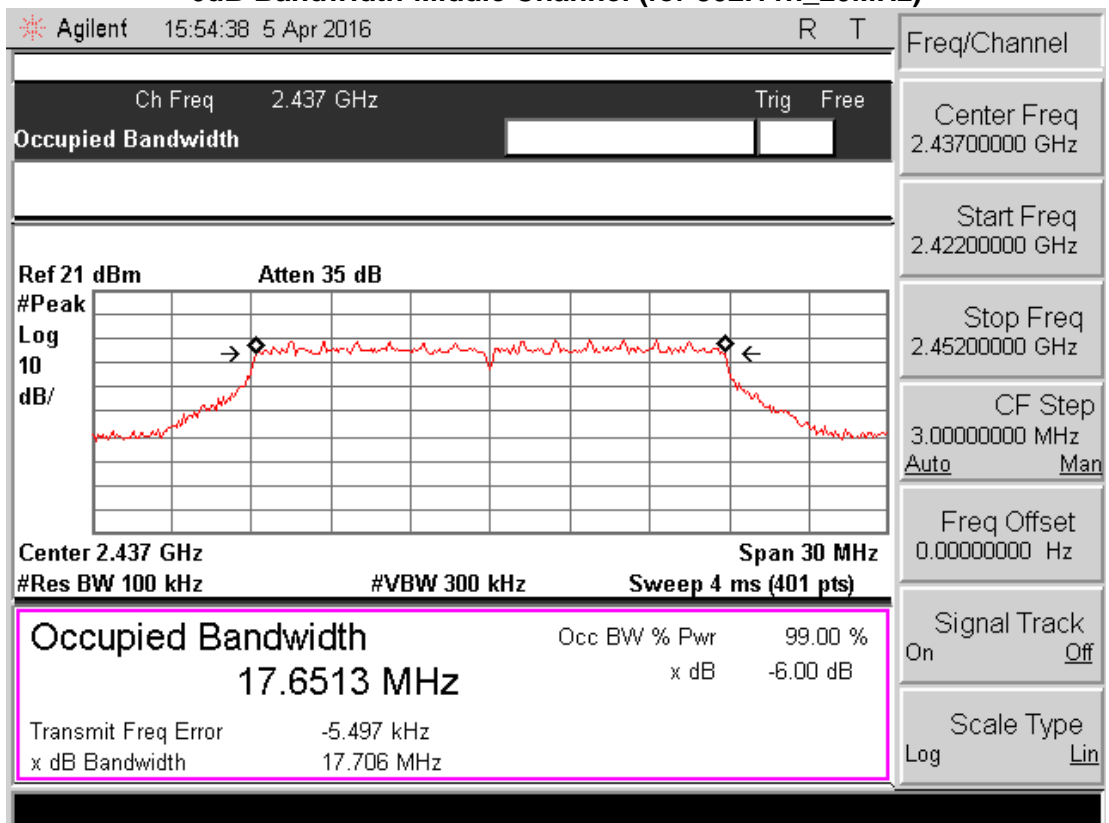
### 6dB Bandwidth-High Channel (for 802.11g)



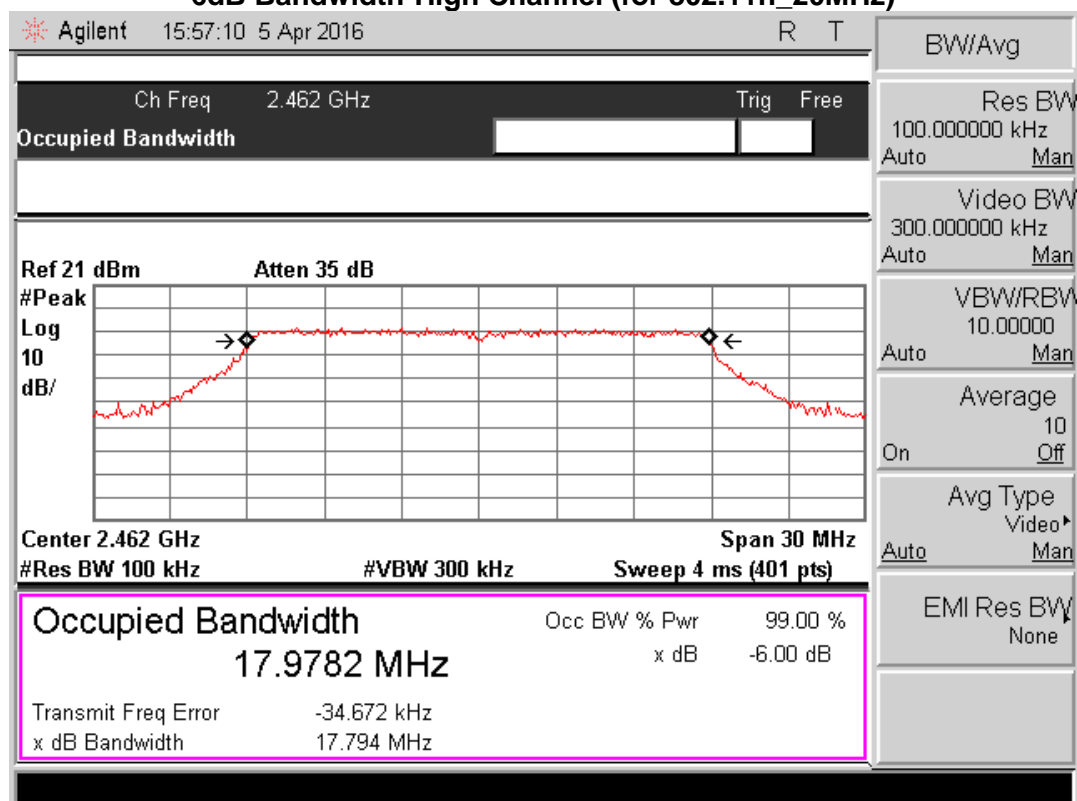
### 6dB Bandwidth-Low Channel (for 802.11n\_20MHz)



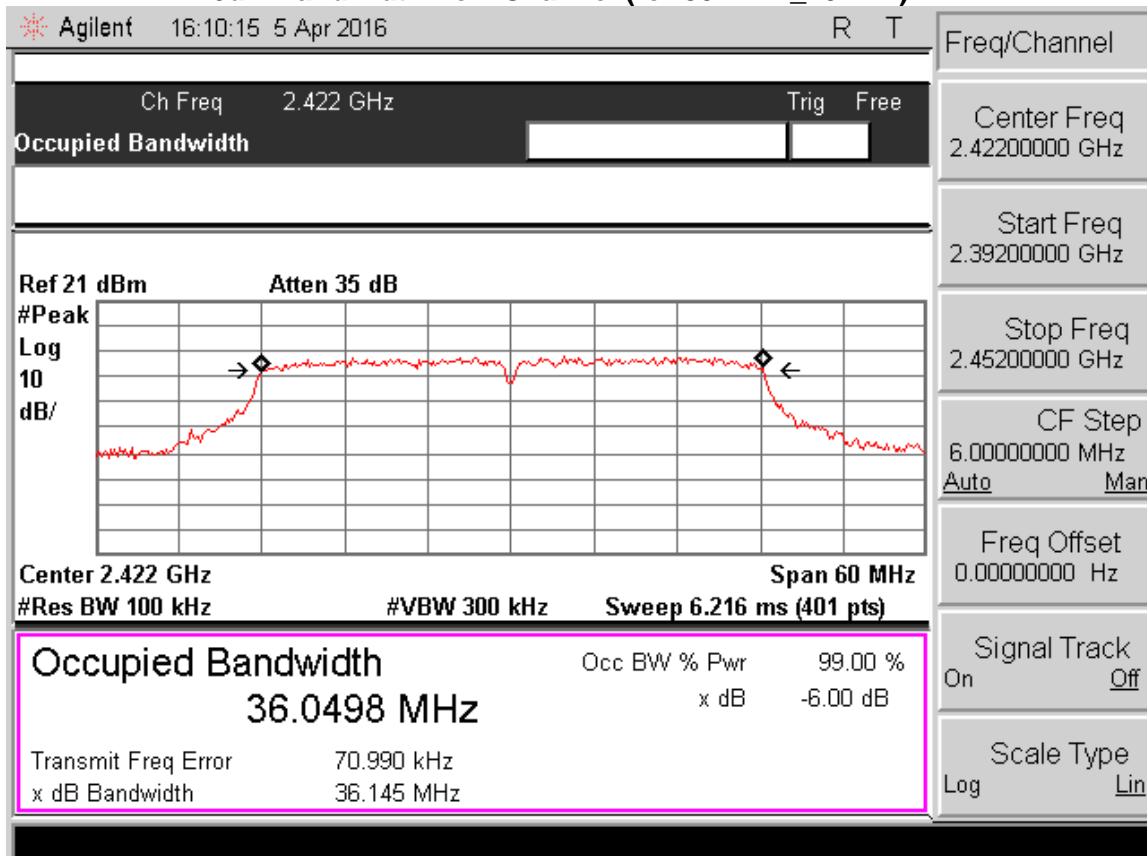
### 6dB Bandwidth-Middle Channel (for 802.11n\_20MHz)



### 6dB Bandwidth-High Channel (for 802.11n\_20MHz)

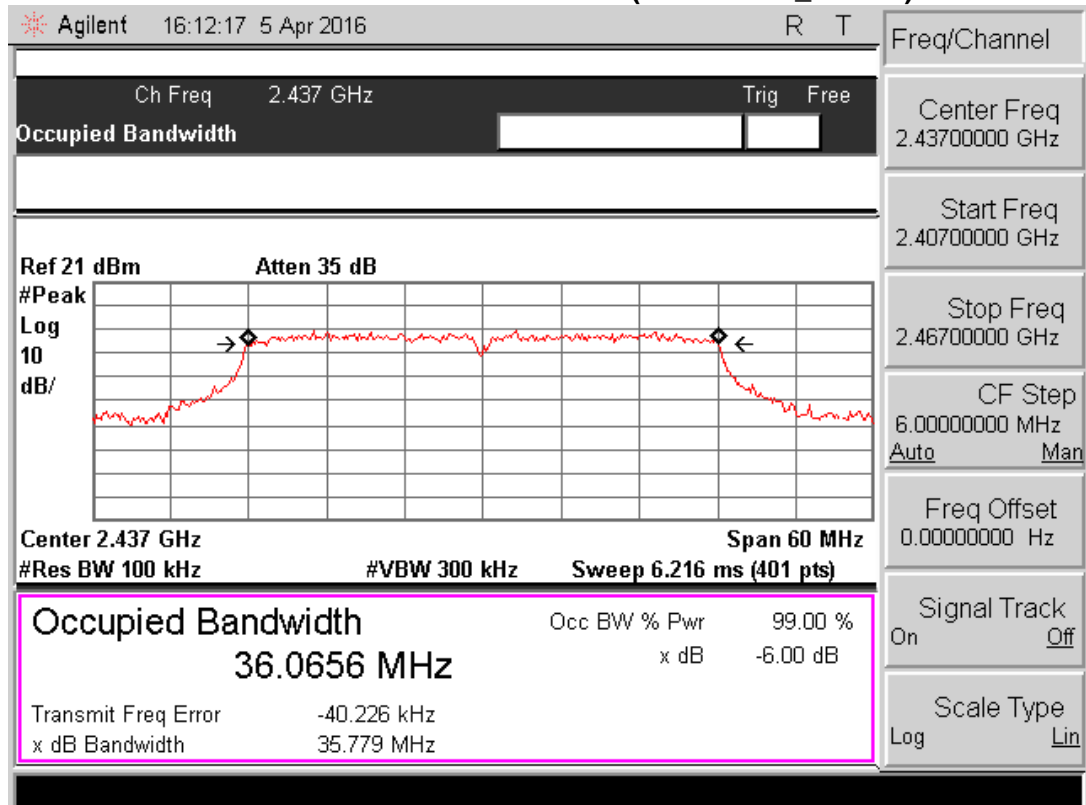


### 6dB Bandwidth-Low Channel (for 802.11n\_40MHz)

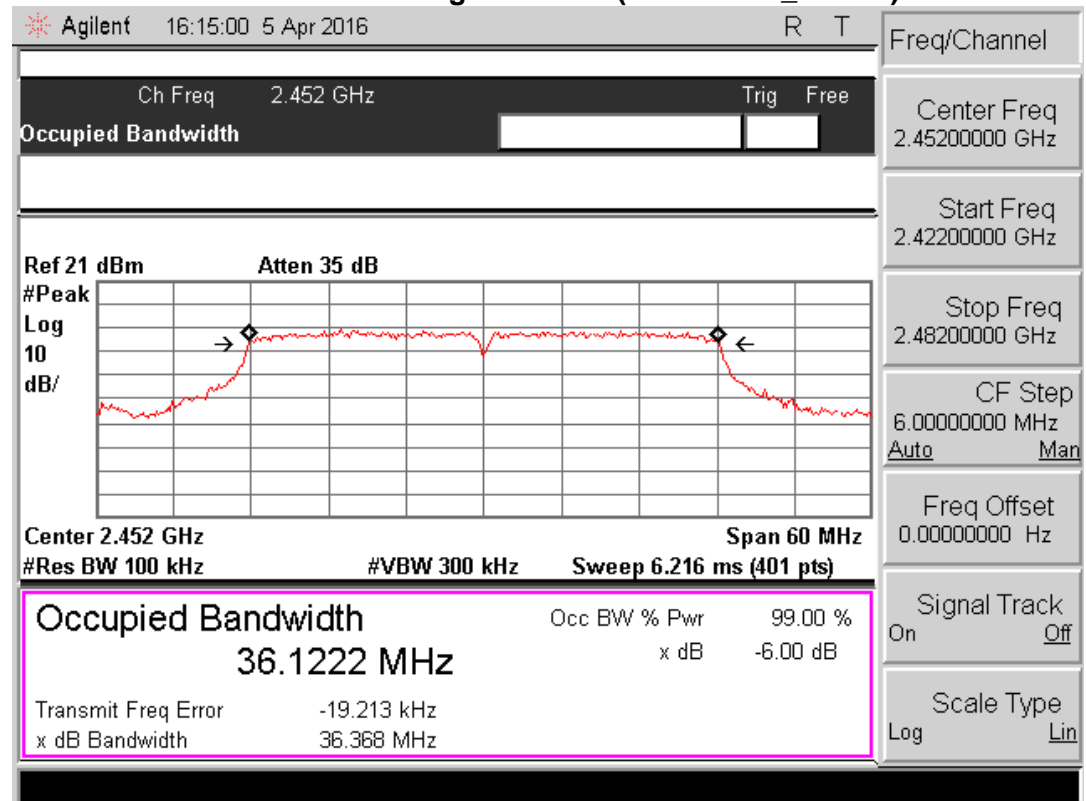




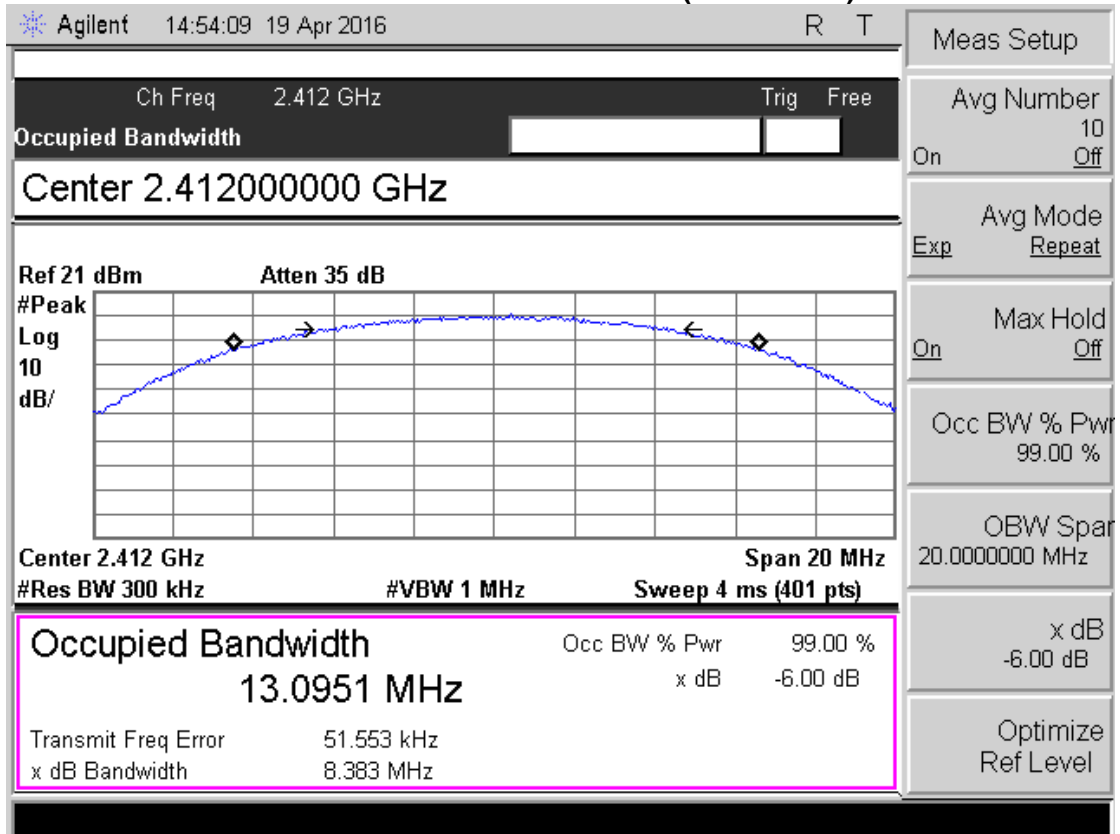
### 6dB Bandwidth-Middle Channel (for 802.11n\_40MHz)



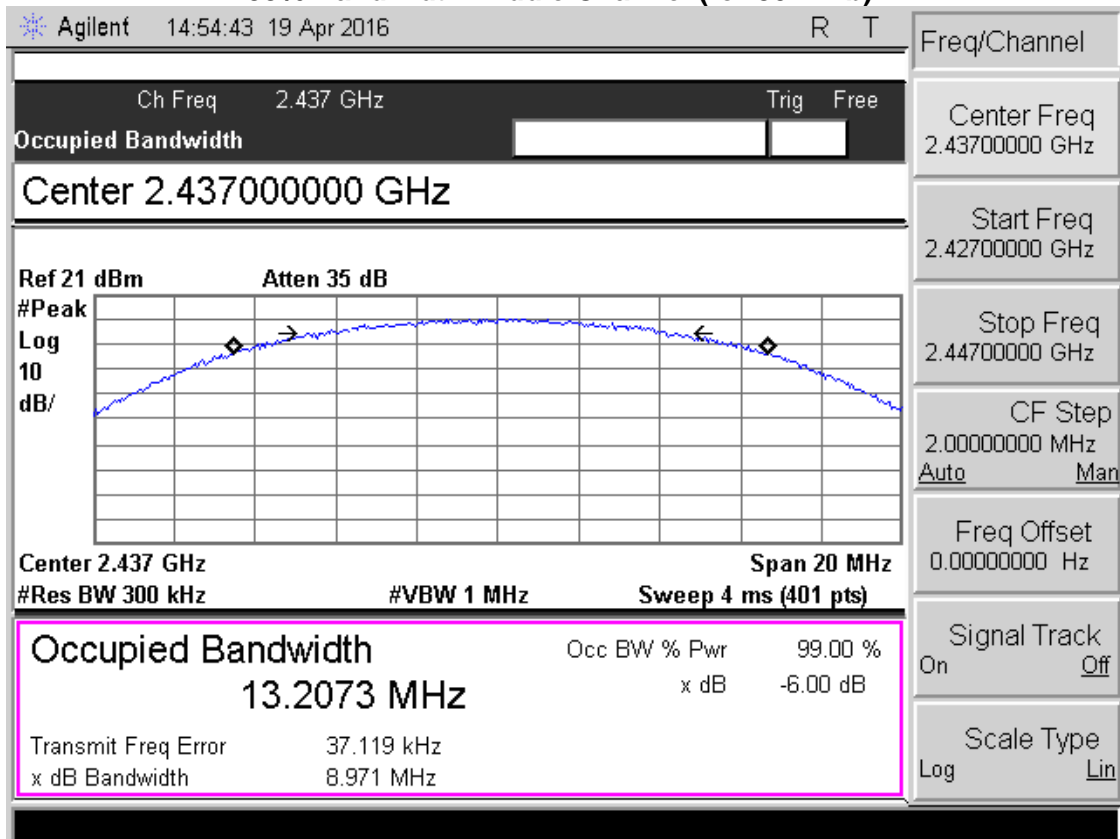
### 6dB Bandwidth-High Channel (for 802.11n\_40MHz)



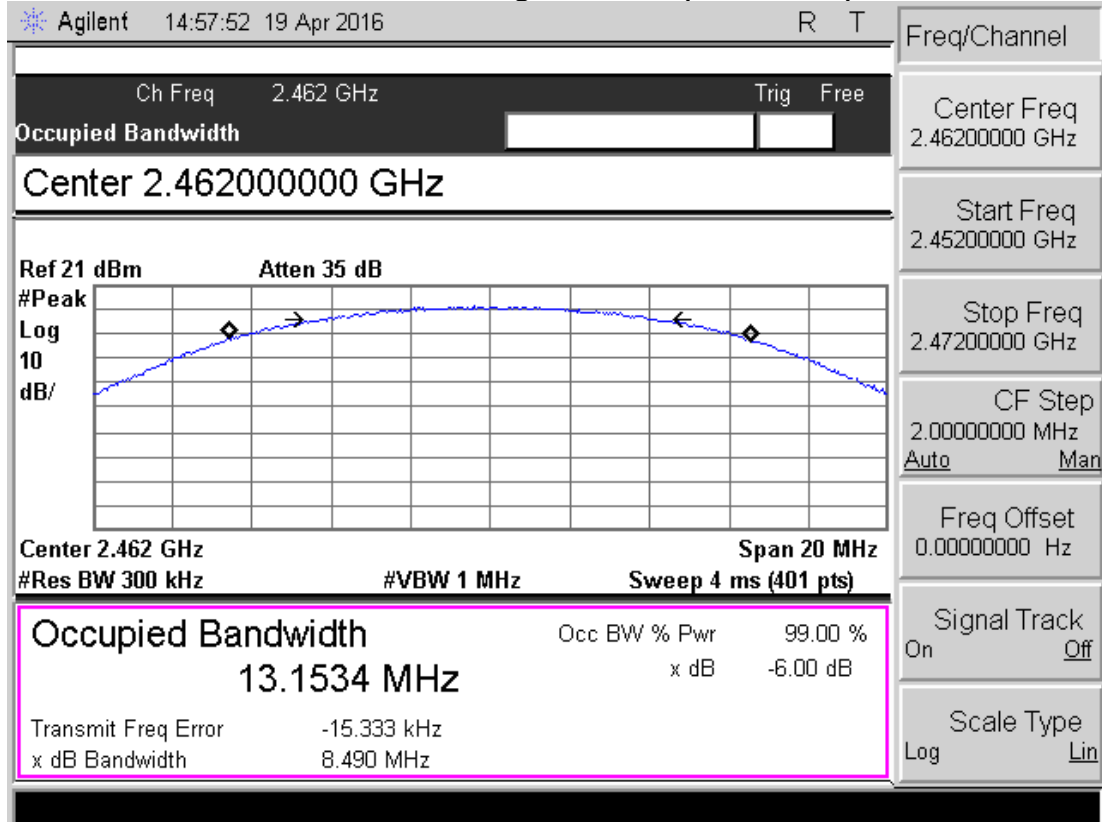
### 99% Bandwidth-Low Channel (for 802.11b)



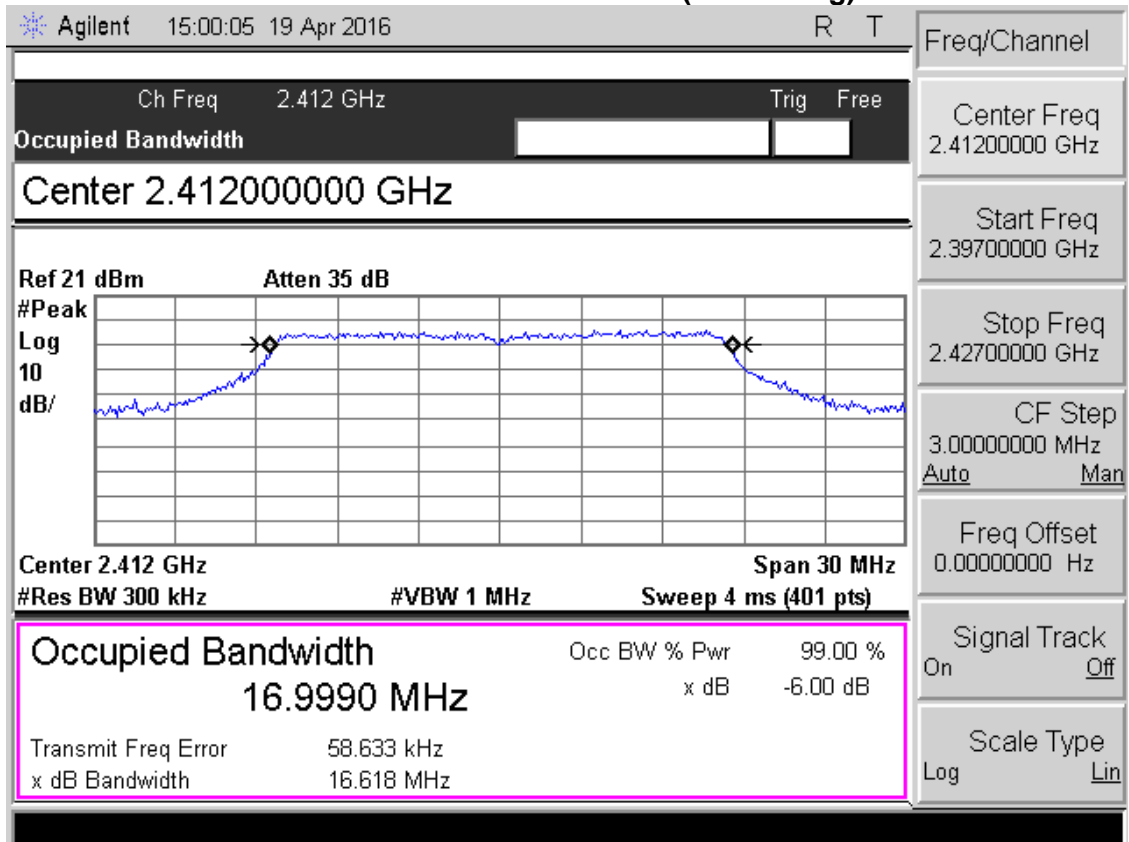
### 99% Bandwidth-Middle Channel (for 802.11b)



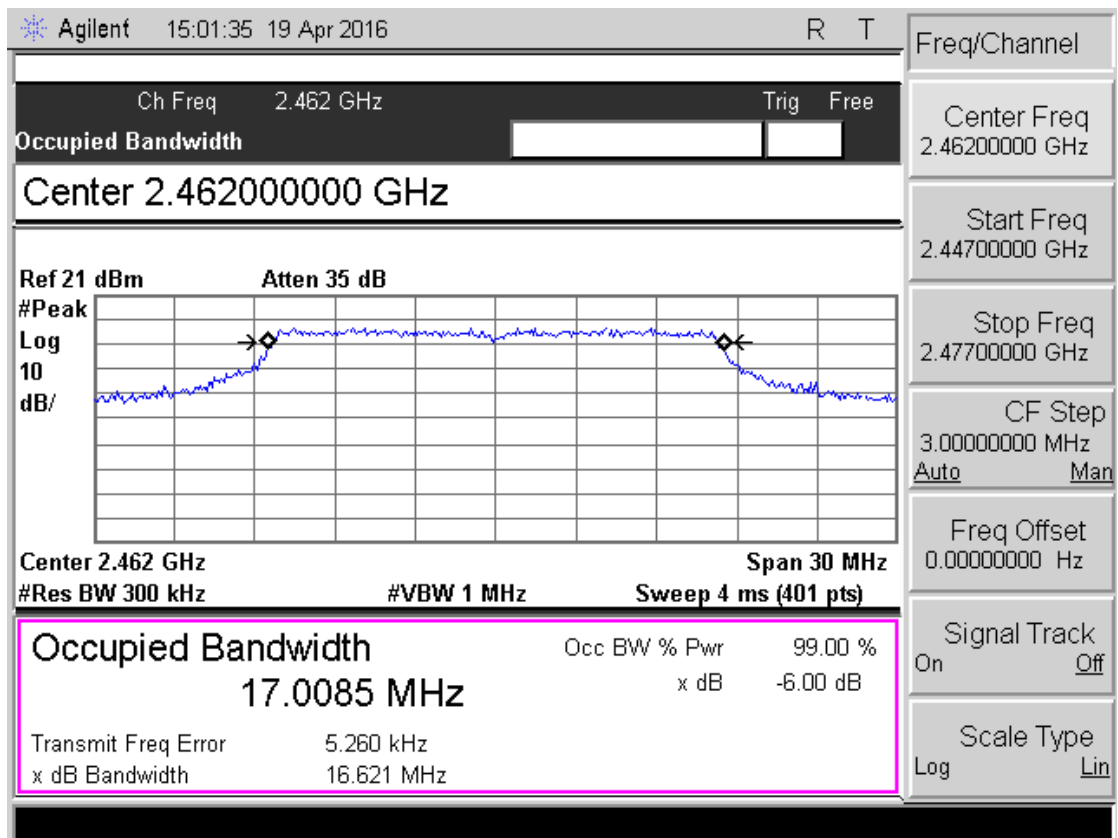
### 99% Bandwidth-High Channel (for 802.11b)



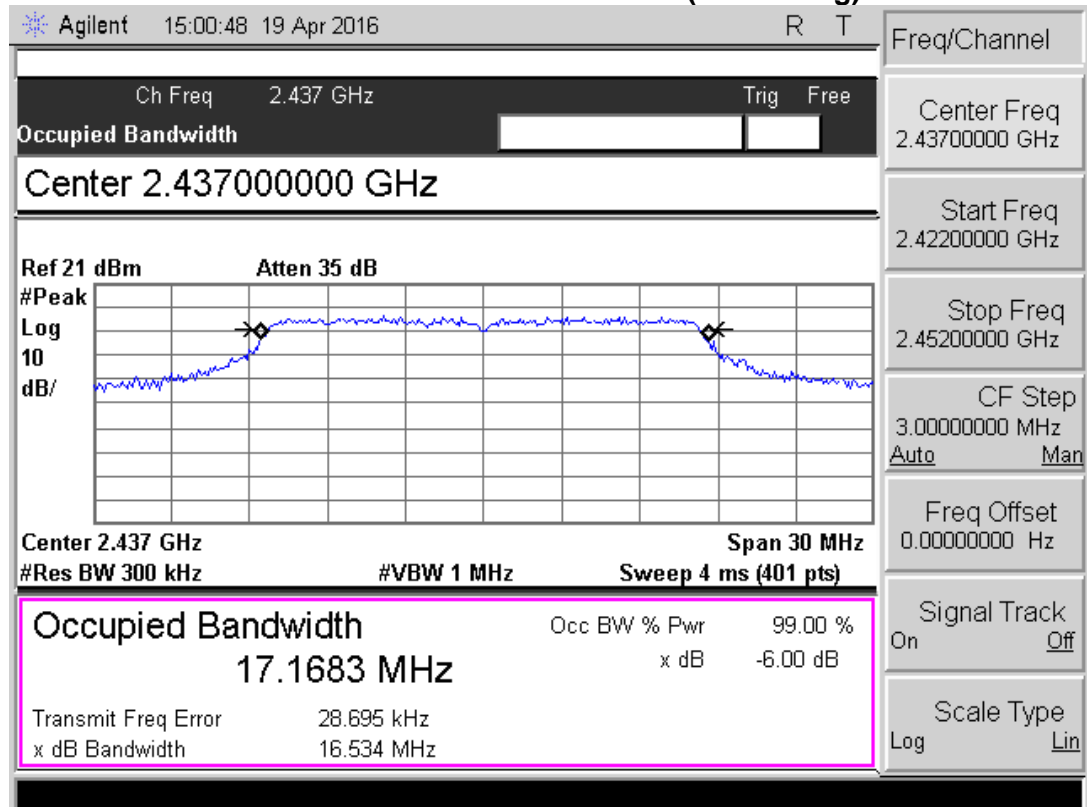
### 99% Bandwidth-Low Channel (for 802.11g)



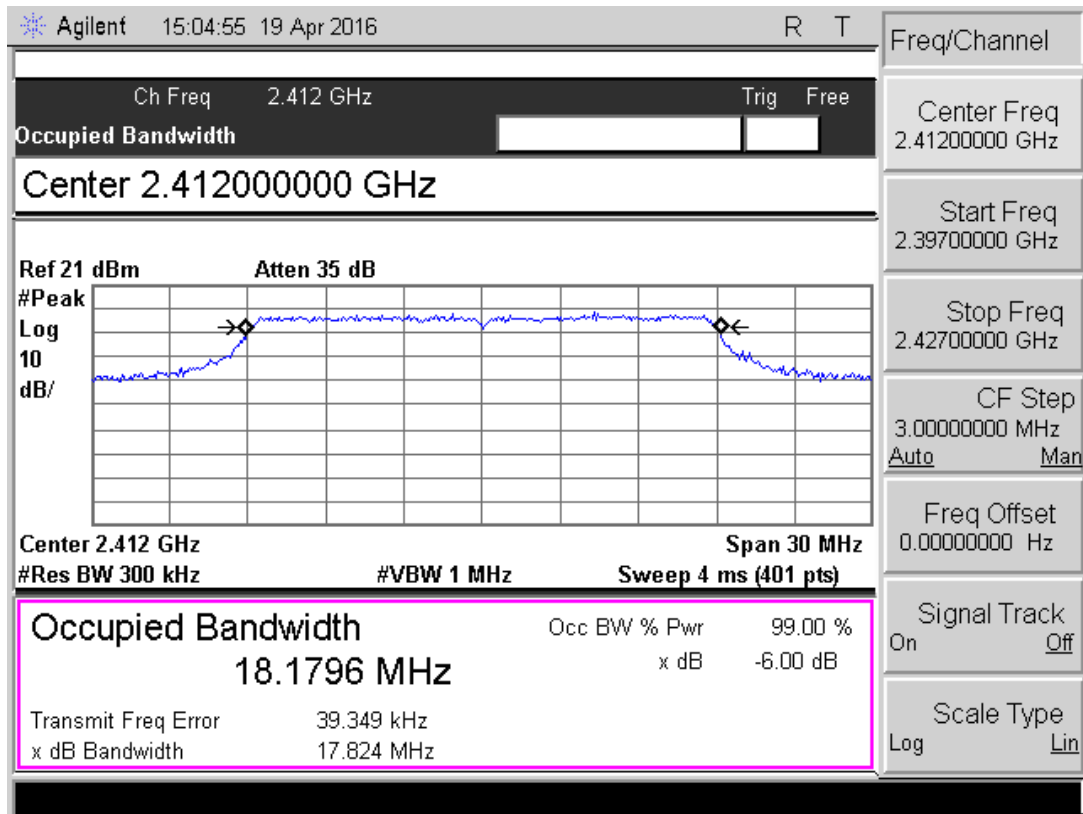
### 99% Bandwidth-High Channel (for 802.11g)



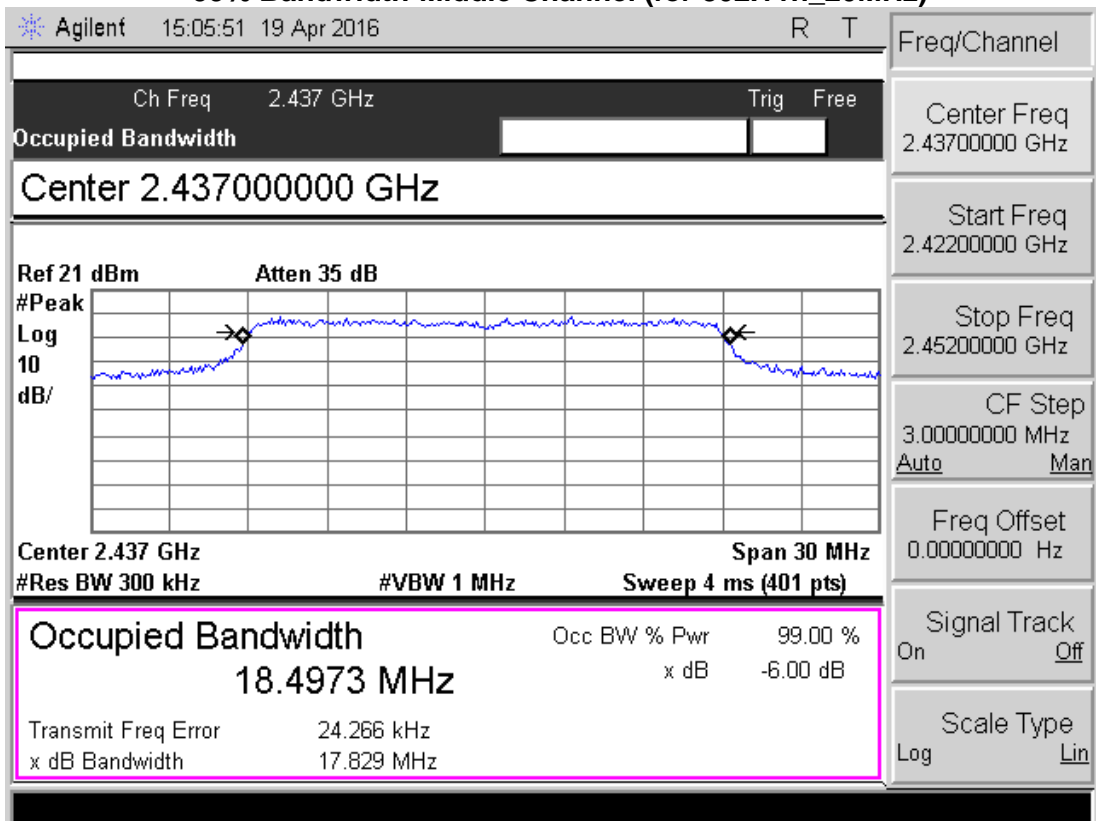
### 99% Bandwidth-Middle Channel (for 802.11g)



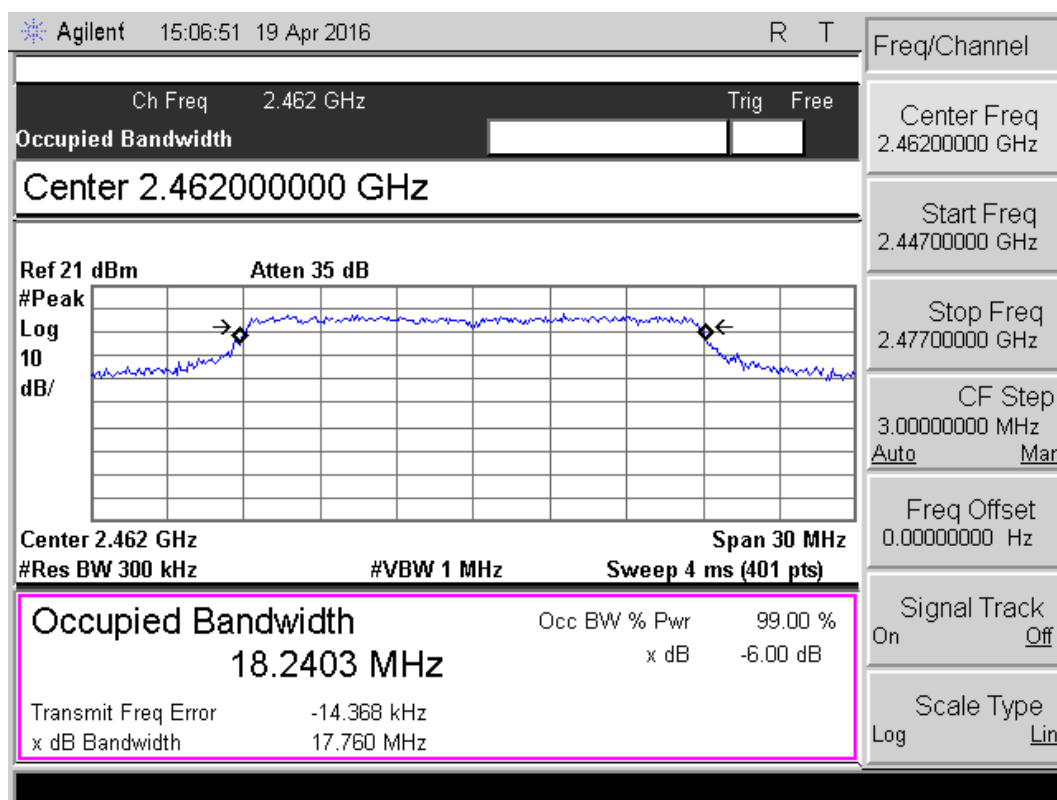
### 99% Bandwidth-Low Channel (for 802.11n\_20MHz)



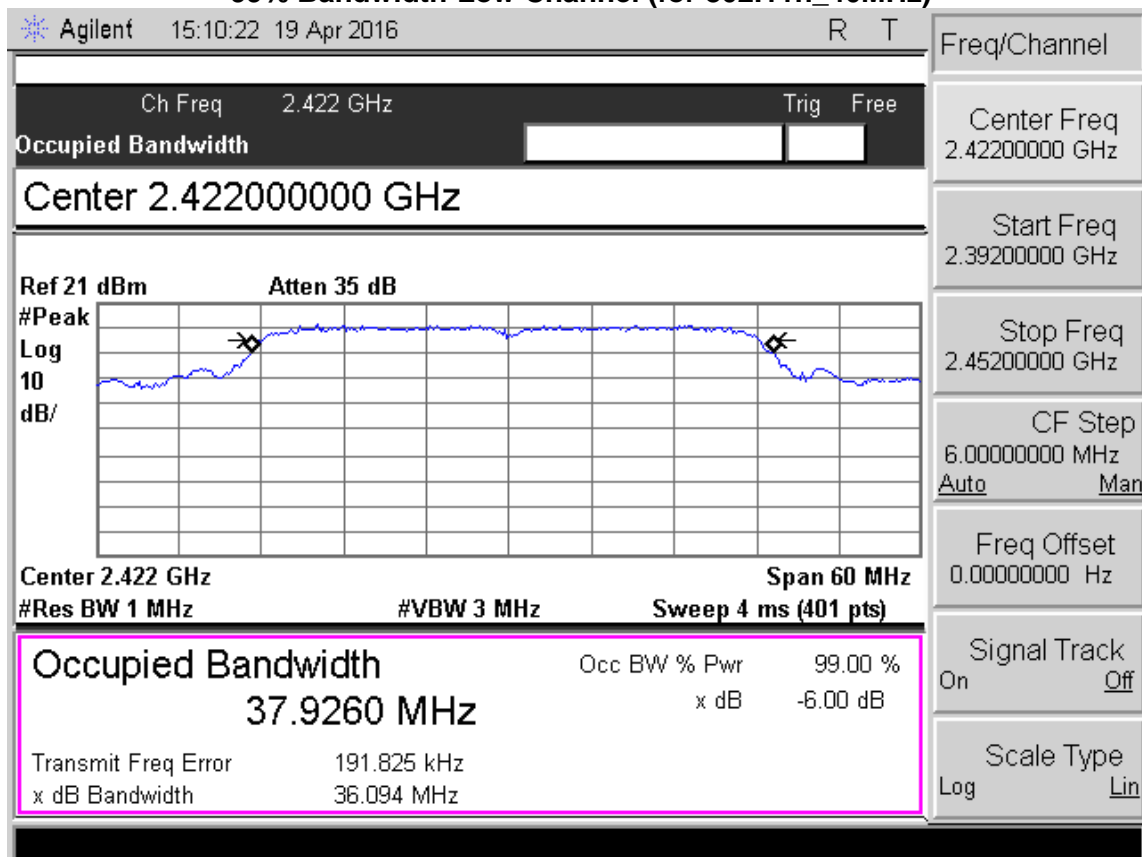
### 99% Bandwidth-Middle Channel (for 802.11n\_20MHz)



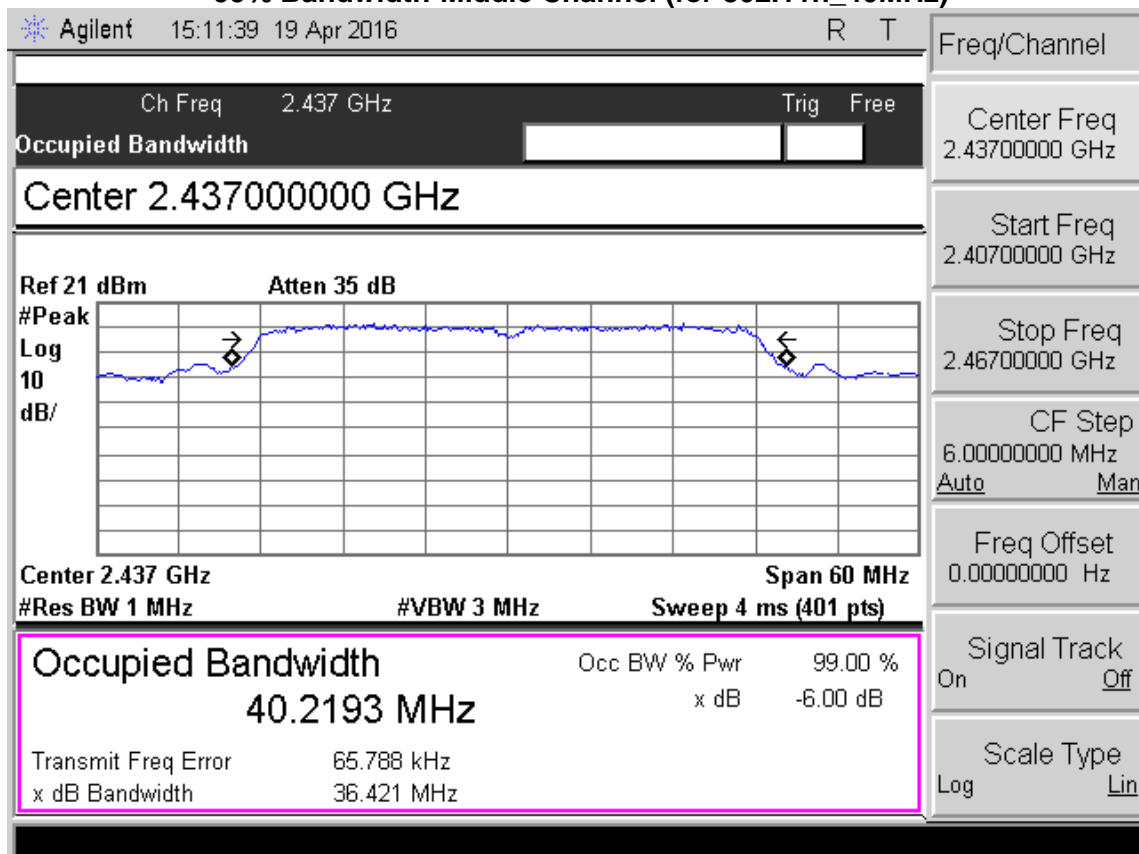
### 99% Bandwidth-High Channel (for 802.11n\_20MHz)



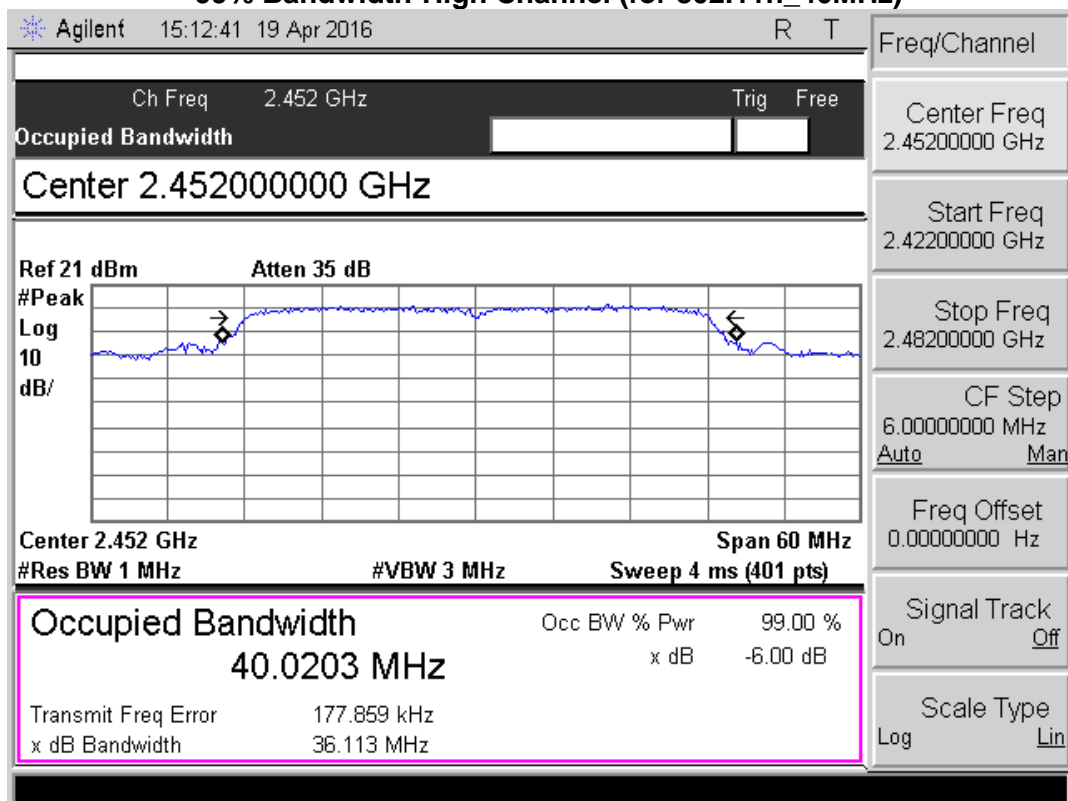
### 99% Bandwidth-Low Channel (for 802.11n\_40MHz)



### 99% Bandwidth-Middle Channel (for 802.11n\_40MHz)



### 99% Bandwidth-High Channel (for 802.11n\_40MHz)



## 3.2 Peak Output Power – FCC Section 15.247 (b)(1), RSS 247 5.4.4

### 3.2.1 Measurement Procedure

The peak output power was measured in accordance with the **RSS 247 5.4.4** and the FCC KDB Publication No.558074 v03r02 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (47 CFR 15.247)” Section 9.1.2 Peak Power Meter Method.

Manufacturer	Model	Equipment Type	Serial No.	Last Calibration Date	Calibration Due Date
Agilent	N1911A	Power Meter	MY53150005	12 Jun 15	12 Jun 17
Agilent	N1921A	Power Sensor	MY53160021	23 Jun 15	23 Jun 16

### 3.2.2 Measurement Result

Frequency (MHz)	For 802.11b: RF Output Power (dBm)	For 802.11g: RF Output Power (dBm)	For 802.11n_20MHz: RF Output Power (dBm)
2412	14.28	10.22	10.71
2437	14.87	9.31	9.04
2462	14.93	9.61	9.34

Frequency (MHz)	For 802.11n_40MHz: RF Output Power (dBm)
2422	8.61
2437	8.84
2452	9.01

## 3.3 Band-Edge Compliance of RF Conducted Emissions – FCC Section 15.247(d), RSS 247 5.5

### 3.3.1 Measurement Procedure

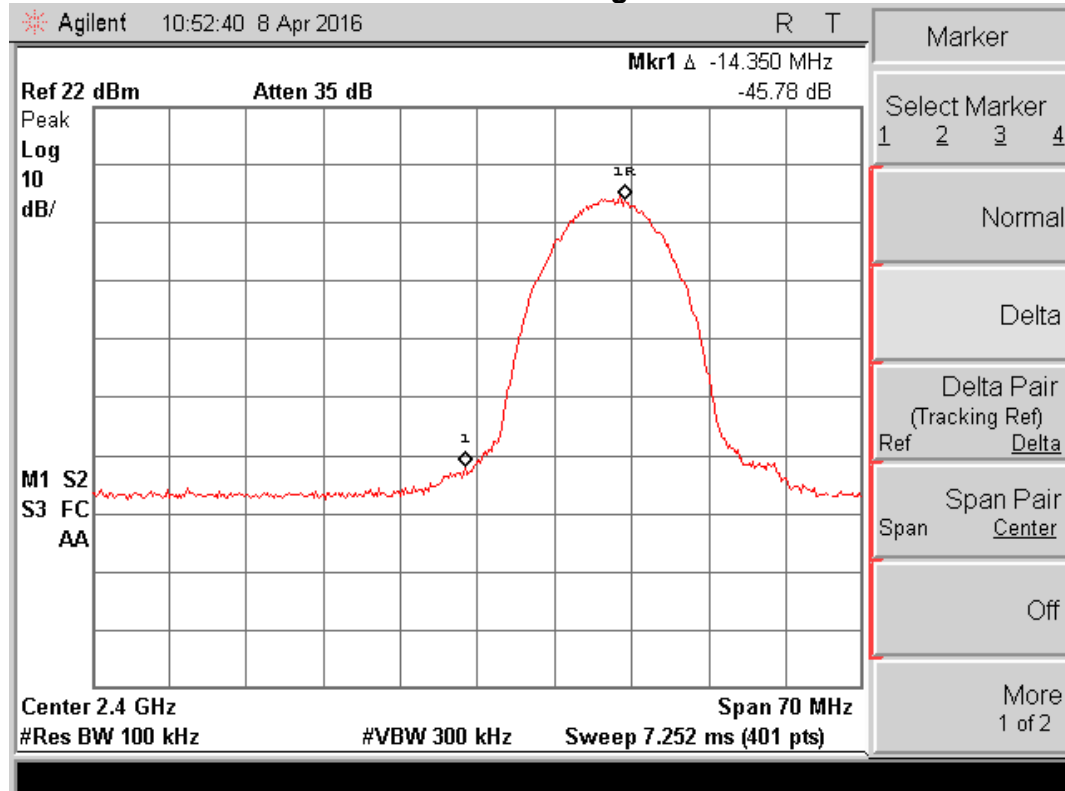
The band-edge measurement was measured in accordance with the **RSS 247 5.5** and the FCC KDB Publication No.558074 v03r02 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (47 CFR 15.247)” Section 13.2 Marker-delta Method. The RF output of the equipment under test was directly connected to the input of the spectrum analyzer through suitable attenuation. The EUT was investigated at the lowest and highest channel available to determine band-edge compliance. The RBW of the spectrum analyzer was set to 100 kHz and VBW 300 kHz. The reference level was



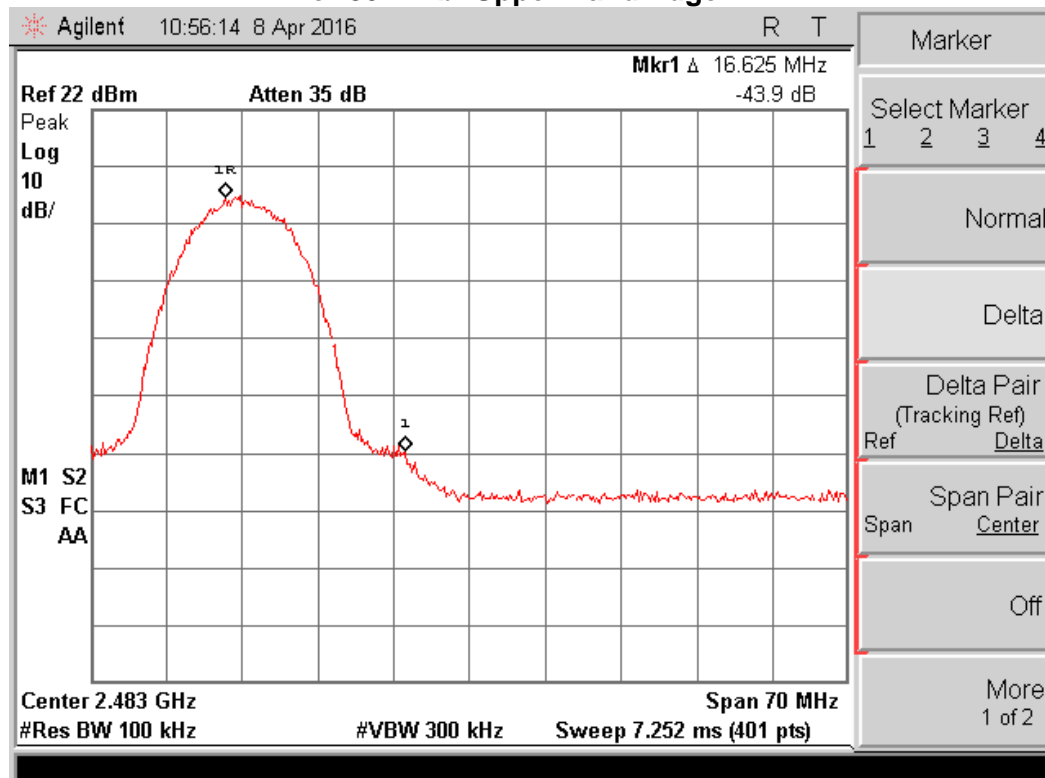
determined by measuring the Peak PSD level in any 100 kHz bandwidth within the DTS channel bandwidth.

### 3.3.2 Measurement Result

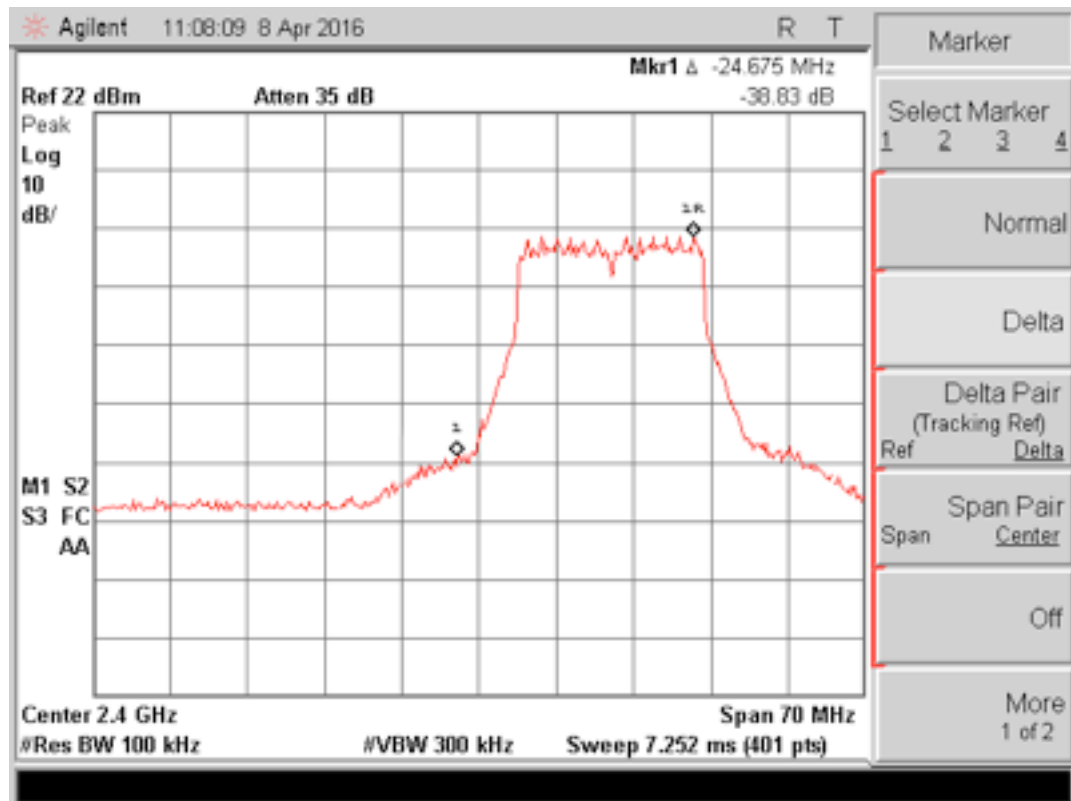
**For 802.11b: Lower Band Edge**



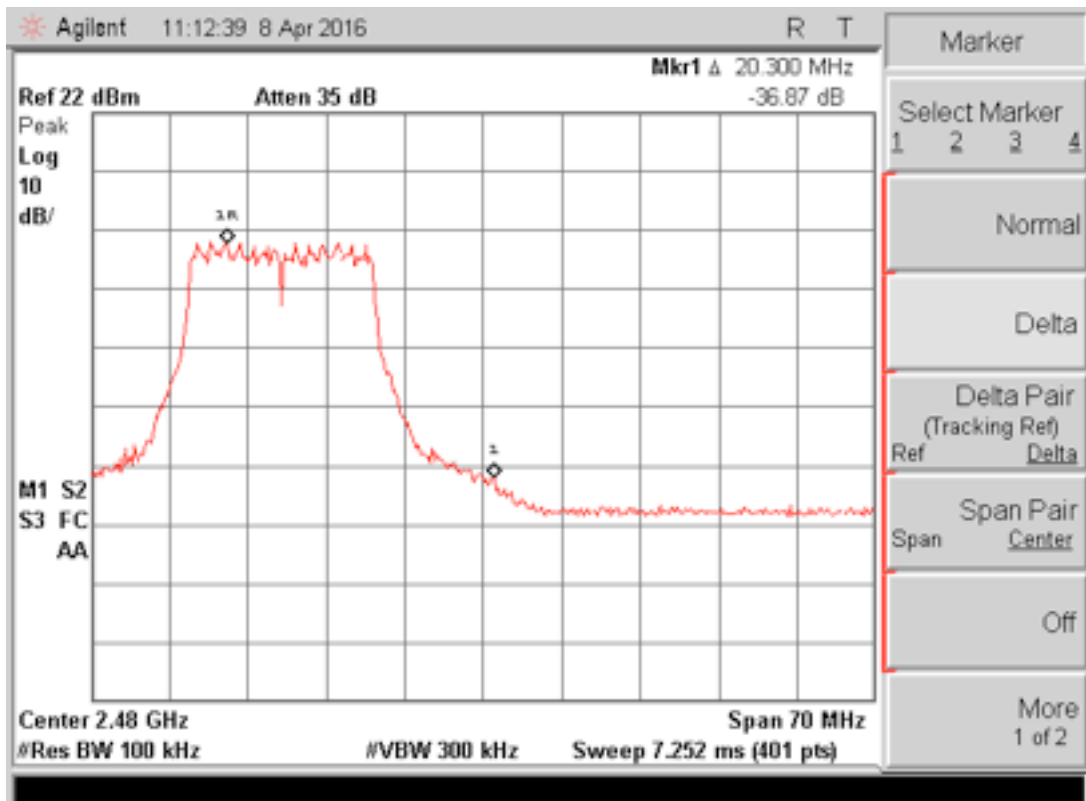
**For 802.11b: Upper Band Edge**



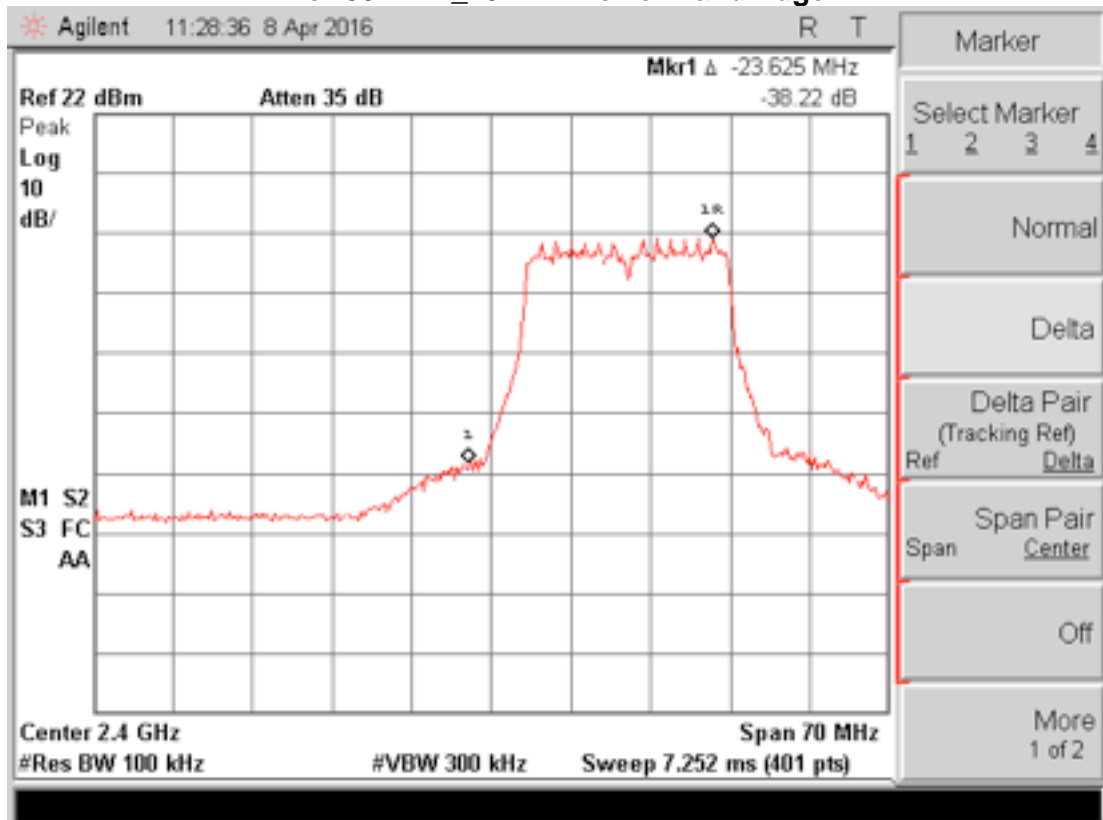
### For 802.11g: Lower Band Edge



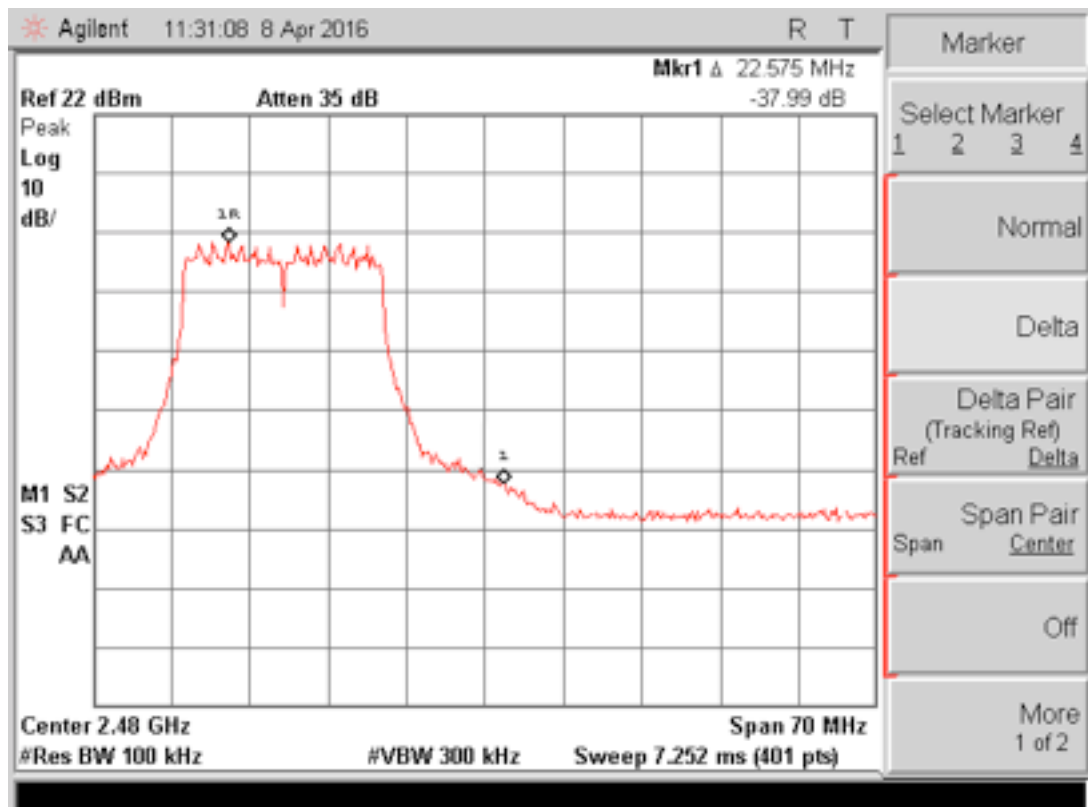
### For 802.11g: Upper Band Edge



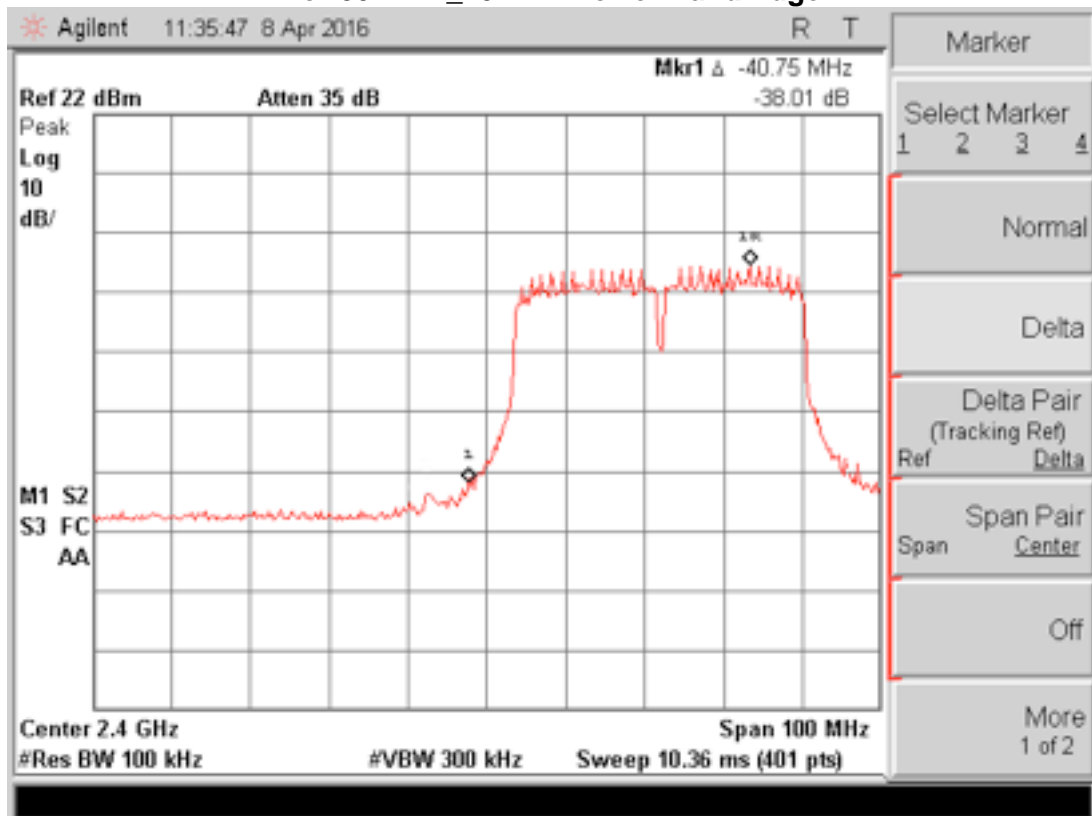
### For 802.11n\_20MHz: Lower Band Edge



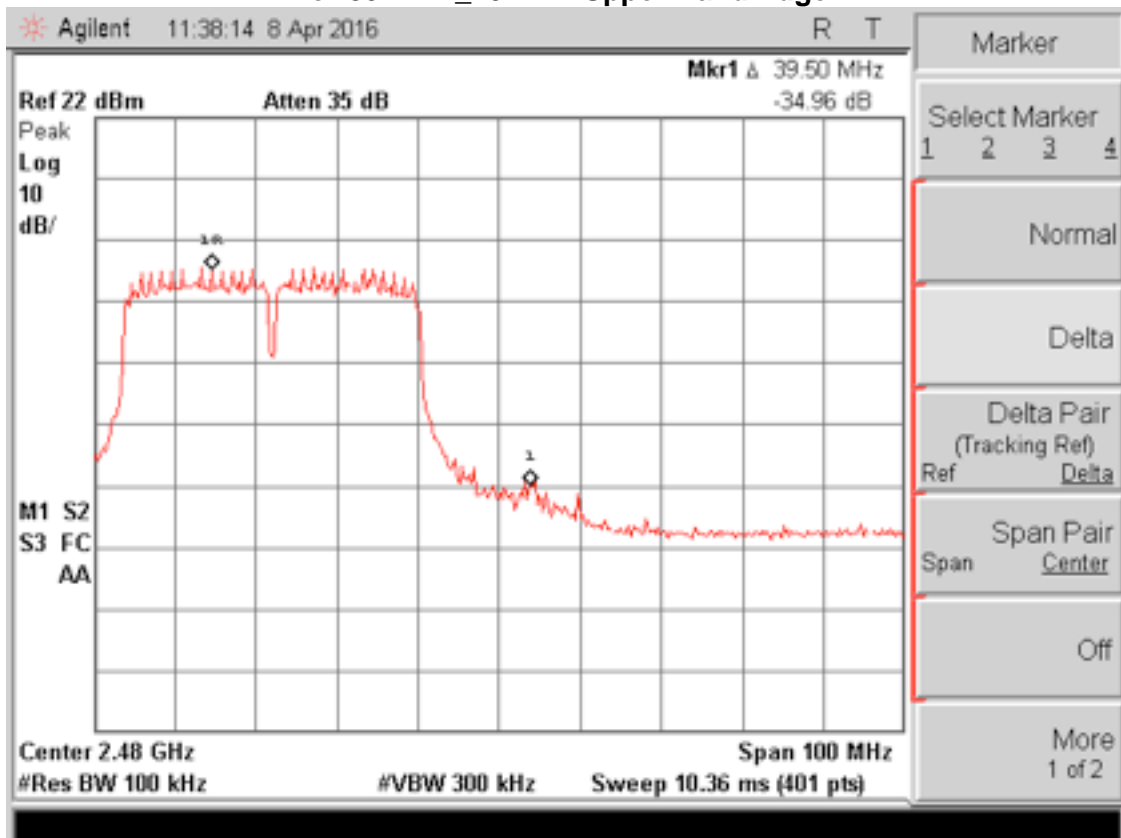
### For 802.11n\_20MHz: Upper Band Edge



### For 802.11n\_40MHz: Lower Band Edge



### For 802.11n\_40MHz: Upper Band Edge



### 3.4 Power Spectral Density – FCC Section 15.247(e), RSS 247 5.2.2

#### 3.4.1 Measurement Procedure

The power spectral density was measured in accordance with the **RSS 247 5.2.2** and the FCC KDB Publication No.558074 v03r02 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (47 CFR 15.247)” Section 10.2 Peak PSD Method. The RBW of the spectrum analyzer was set to 100 kHz and VBW 300 kHz. The peak marker function was used to determine the maximum amplitude level within the RBW.

Span = 1.5 times 6 dB Bandwidth

Spec = 8 dBm/3 KHz

#### 3.4.2 Measurement Result PSD 3KHz

Frequency (MHz)	For 802.11b: PSD(dBm)	For 802.11g: PSD (dBm)	For 802.11n_20MHz: PSD(dBm)
2412	-9.05	-14.13	-14.97
2437	-8.02	-15.49	-16.49
2462	-8.10	-16.14	-15.31

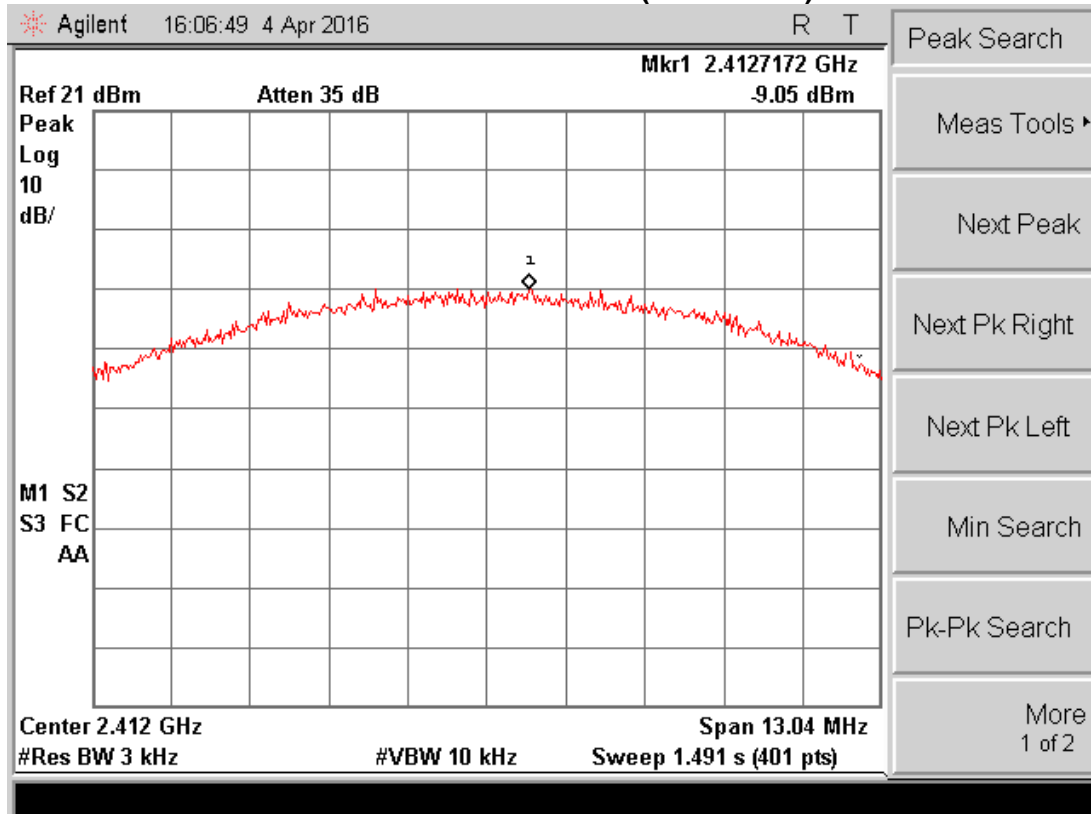
Frequency (MHz)	For 802.11n_40MHz: PSD (dBm)
2422	-19.70
2437	-19.79
2452	-19.43

1.5 x 6 dB Bandwidth Span settings for Spectrum Analyzer on the PSD 3 KHz measurement :

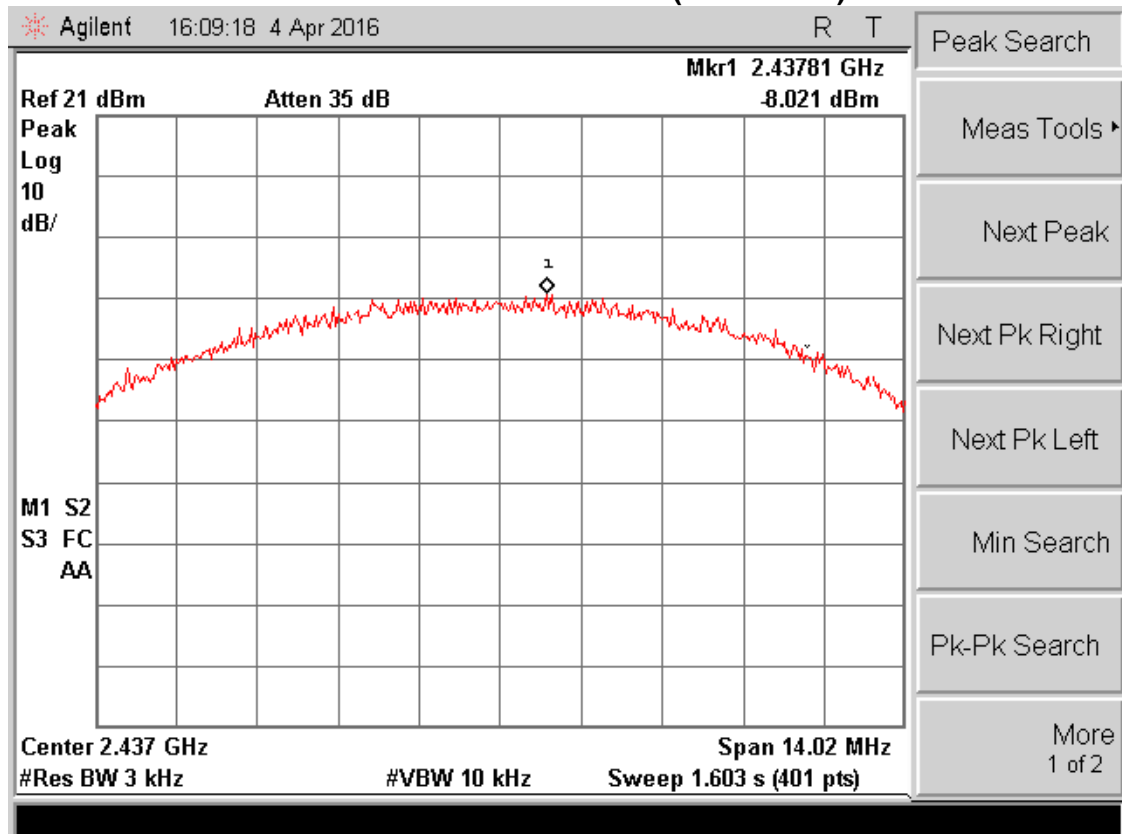
Frequency (MHz)	For 802.11b: 1.5 x 6dB Bandwidth (MHz)	For 802.11g: 1.5 x 6dB Bandwidth (MHz)	For 802.11n_20MHz: 1.5 x 6dB Bandwidth (MHz)
2412	13.040	24.915	26.804
2437	14.019	24.986	26.541
2462	13.542	24.986	26.792

Frequency (MHz)	For 802.11n_40MHz: 1.5 x 6dB Bandwidth (MHz)
2422	54.420
2437	54.168
2452	54.467

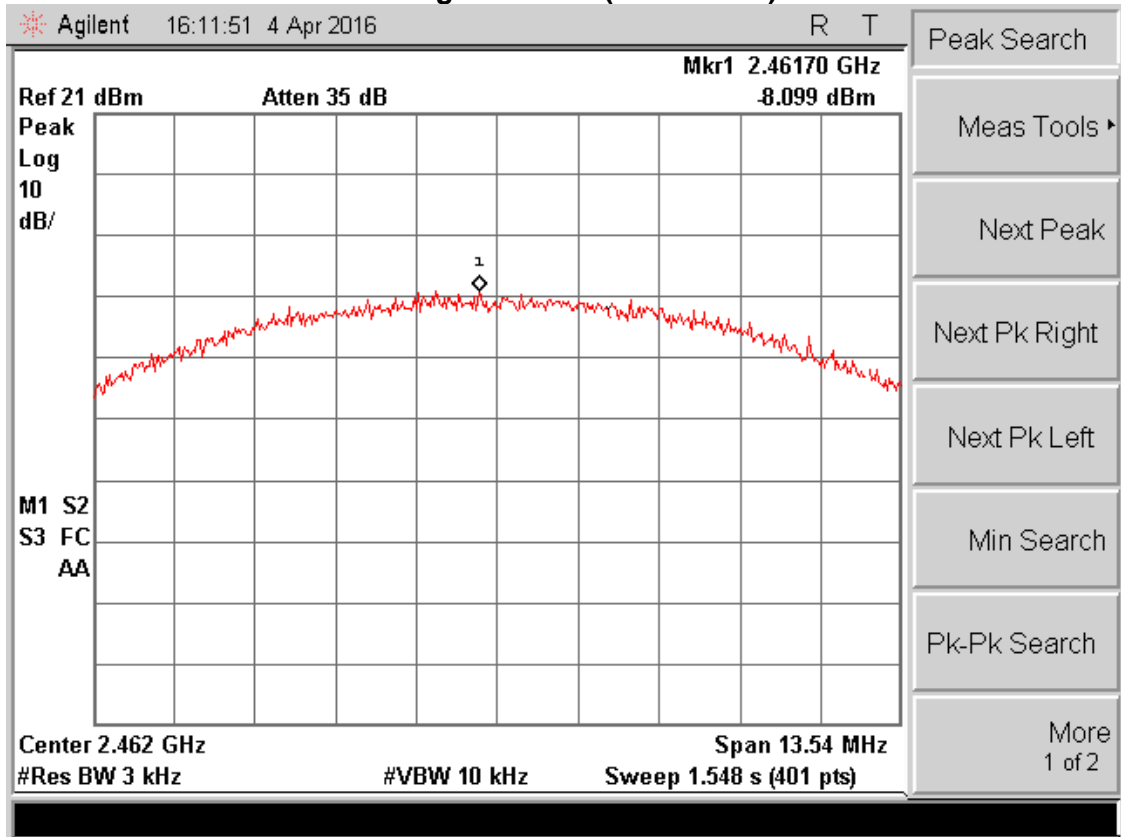
### PSD 3KHz -Low Channel (for 802.11b)



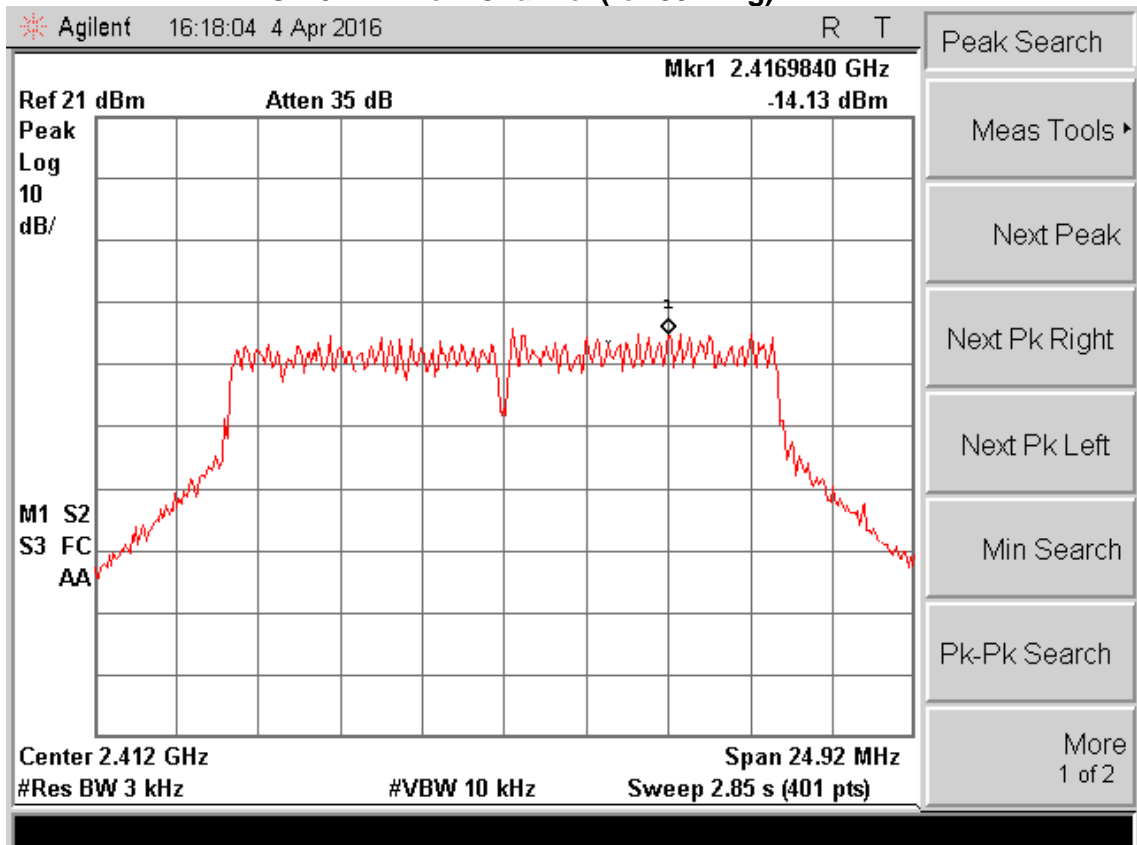
### PSD 3KHz -Middle Channel (for 802.11b)



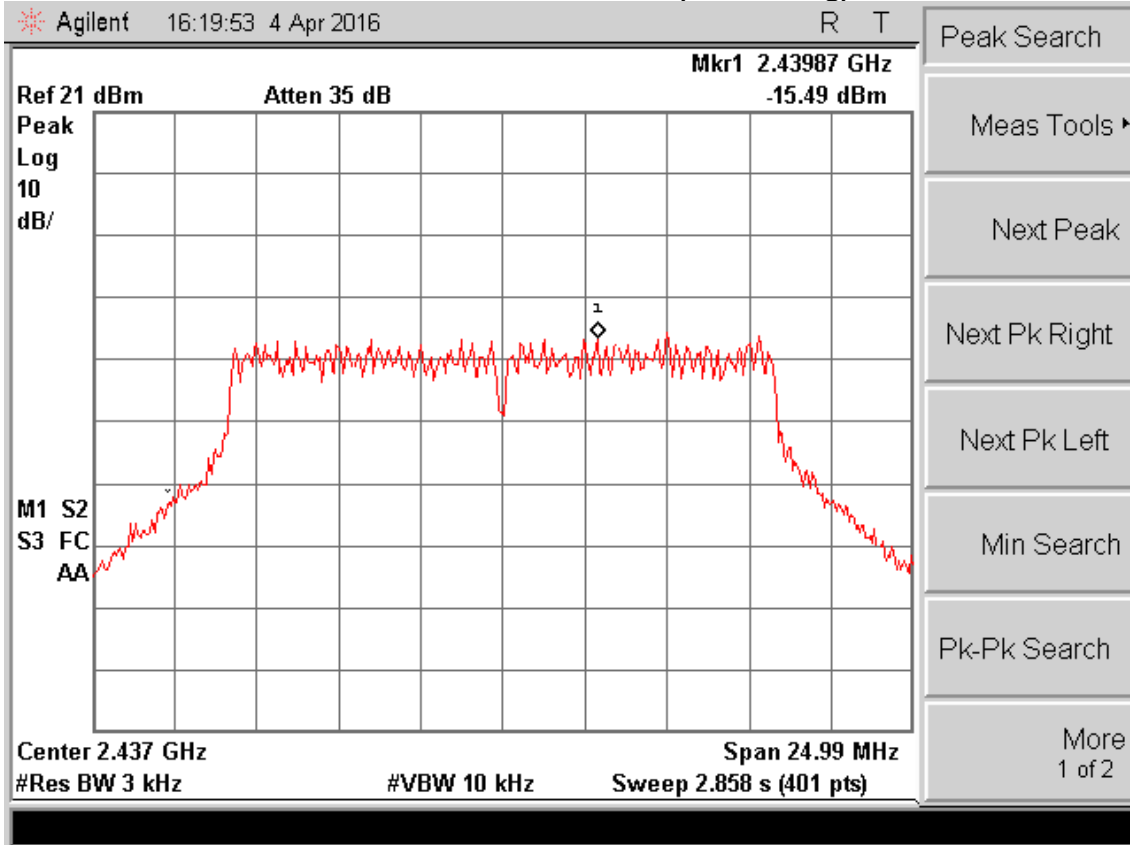
### PSD 3KHz -High Channel (for 802.11b)



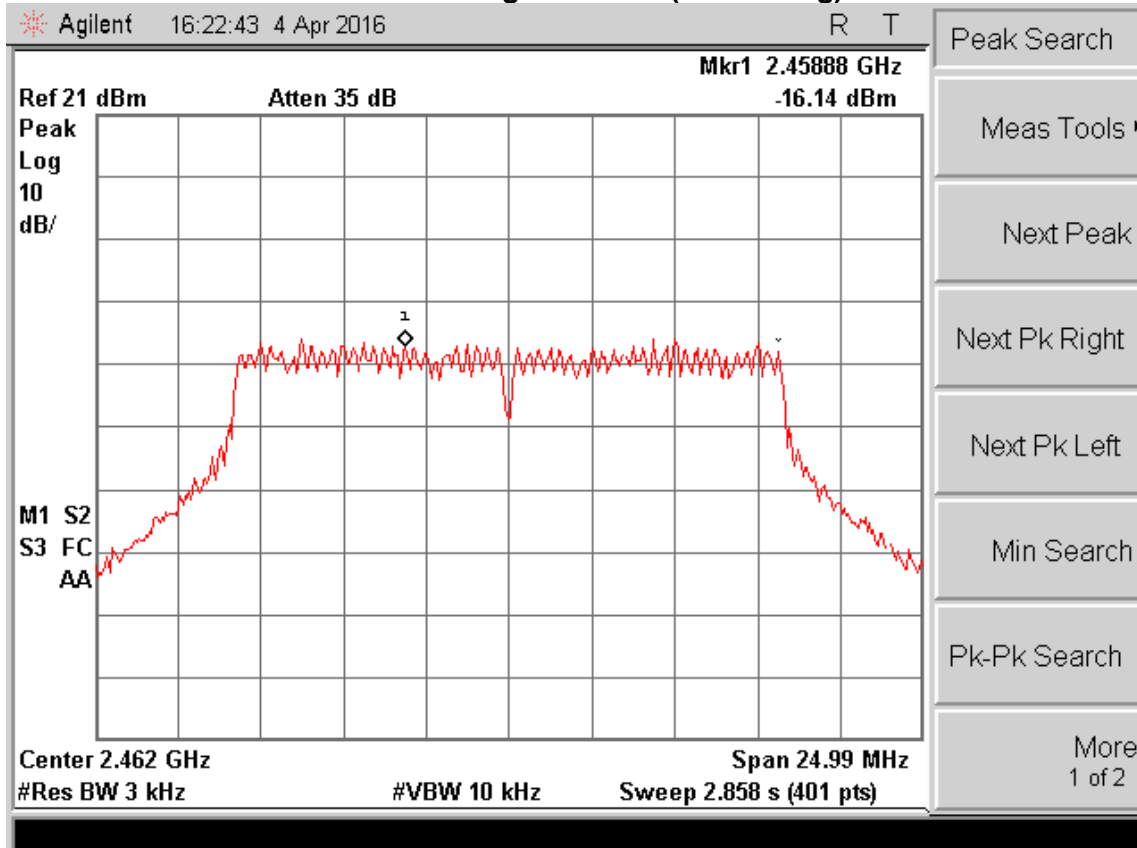
### PSD 3KHz -Low Channel (for 802.11g)



### PSD 3KHz -Middle Channel (for 802.11g)

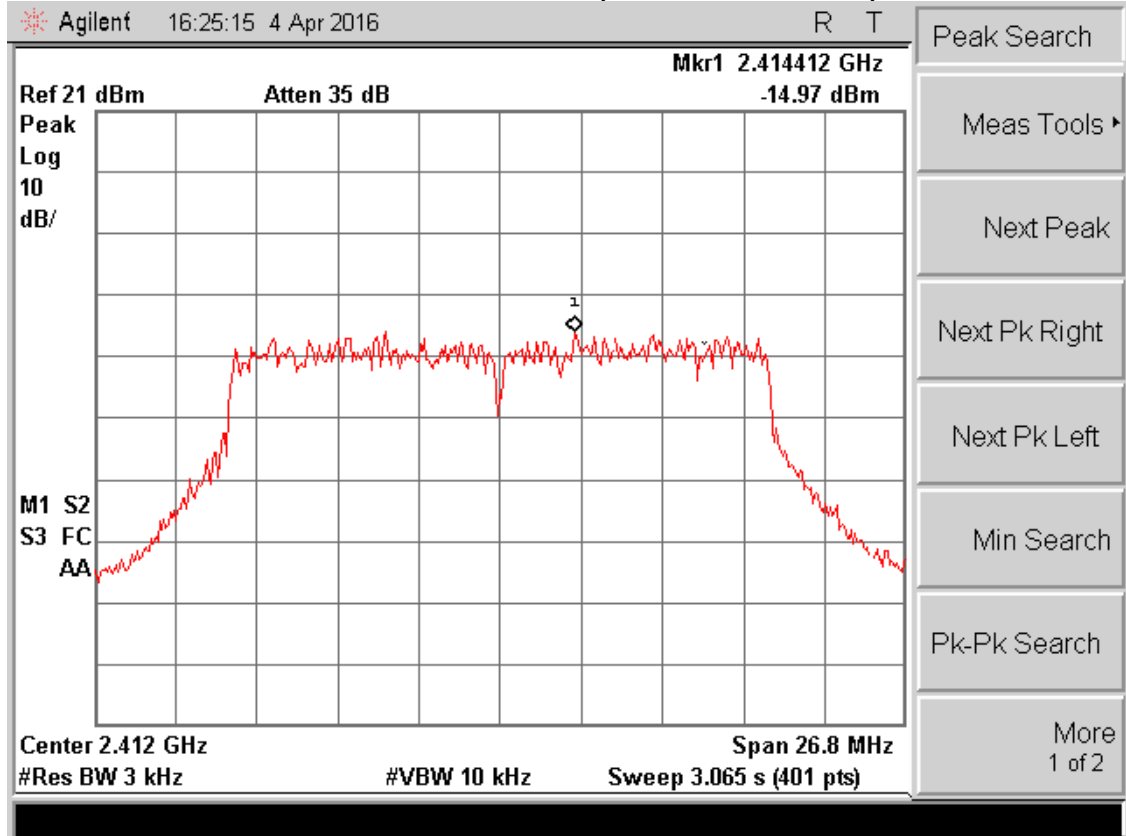


### PSD 3KHz -High Channel (for 802.11g)

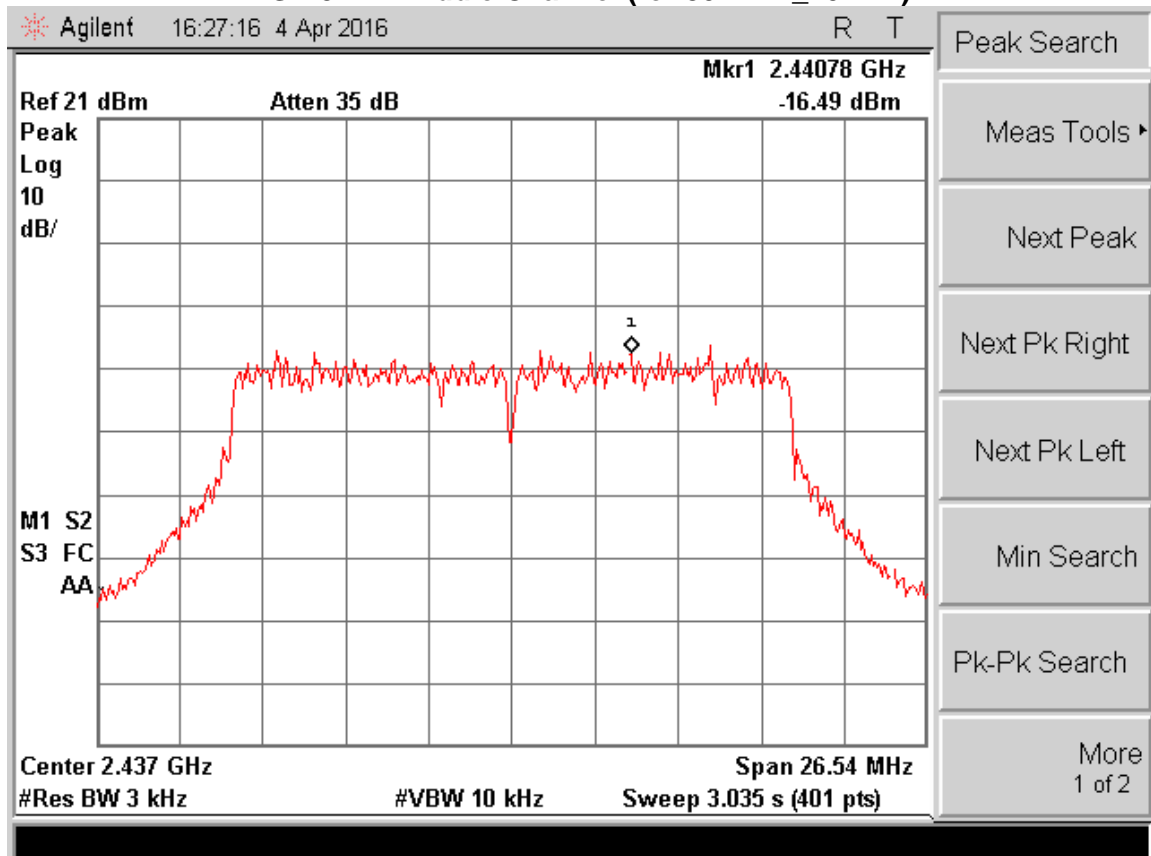




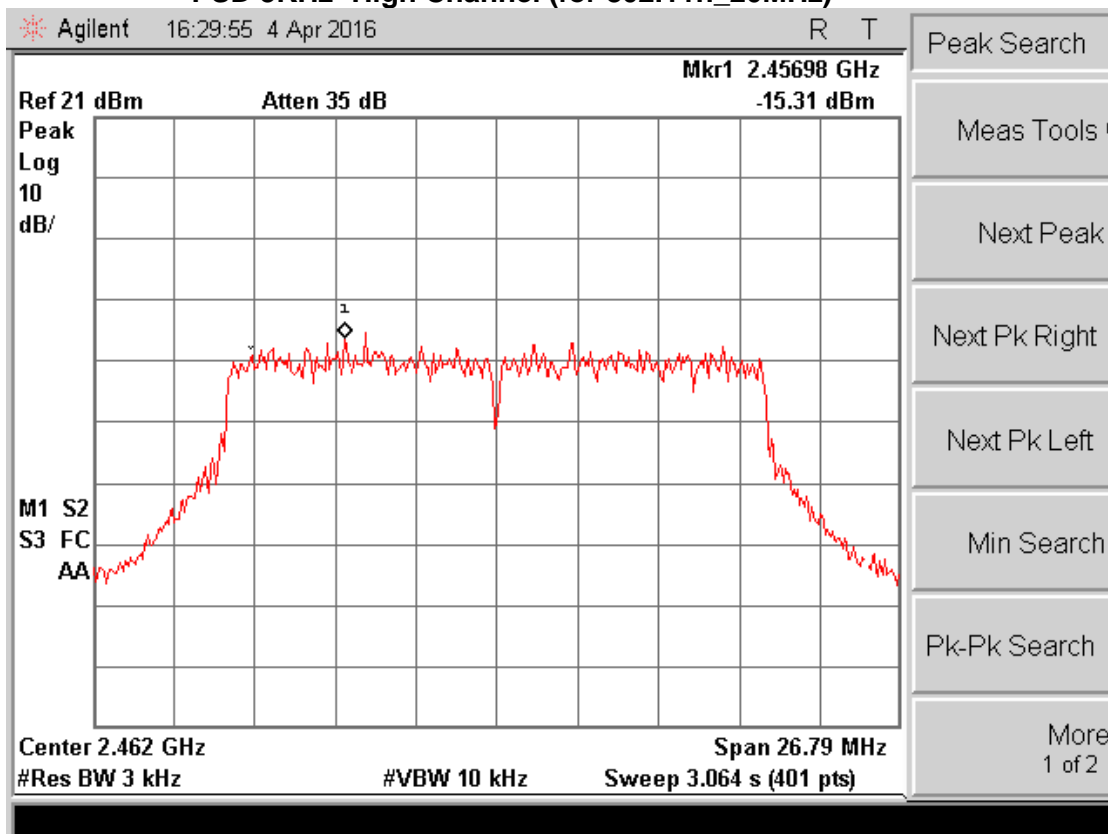
### PSD 3KHz-Low Channel (for 802.11n\_20MHz)



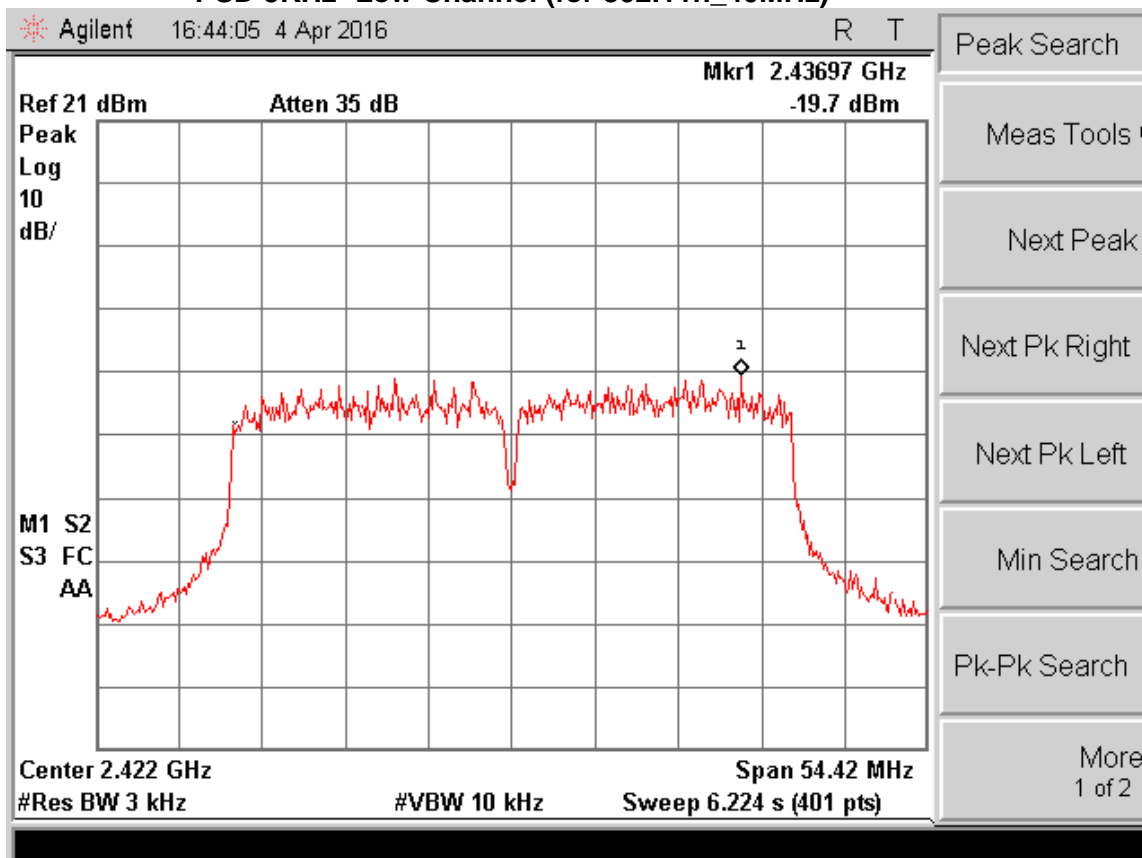
### PSD 3KHz-Middle Channel (for 802.11n\_20MHz)



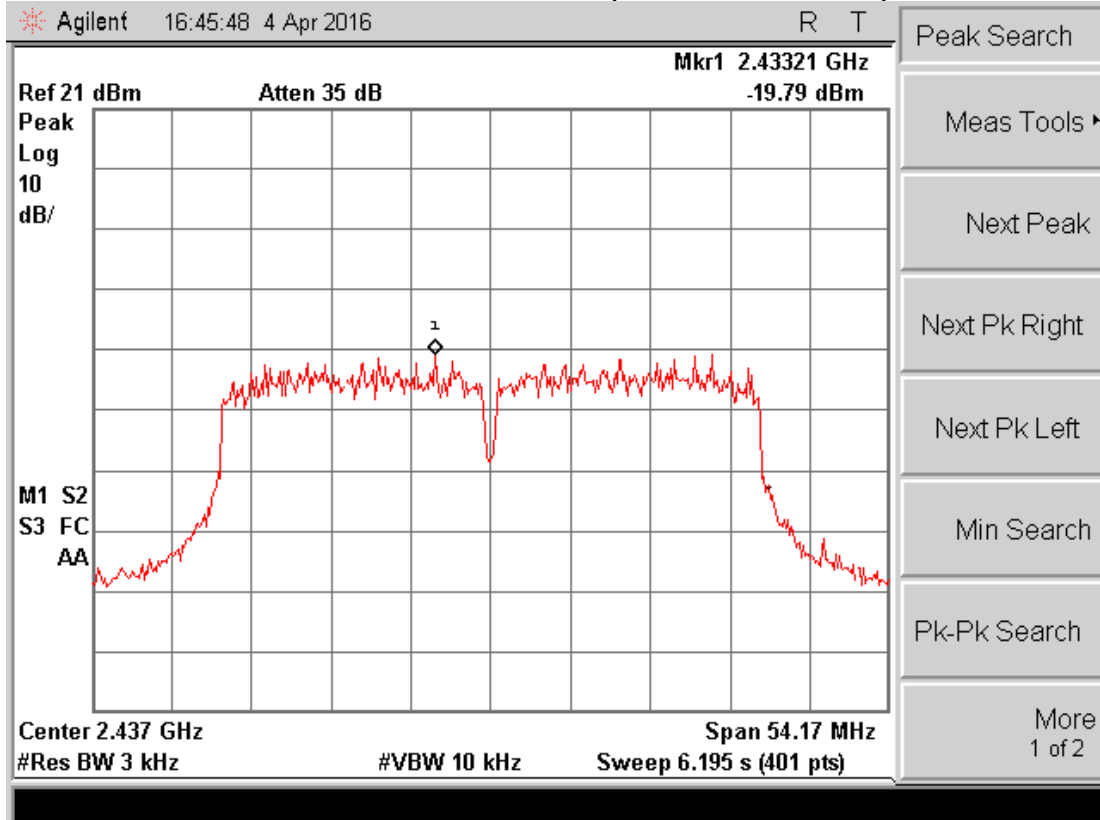
# PSD 3KHz -High Channel (for 802.11n\_20MHz)



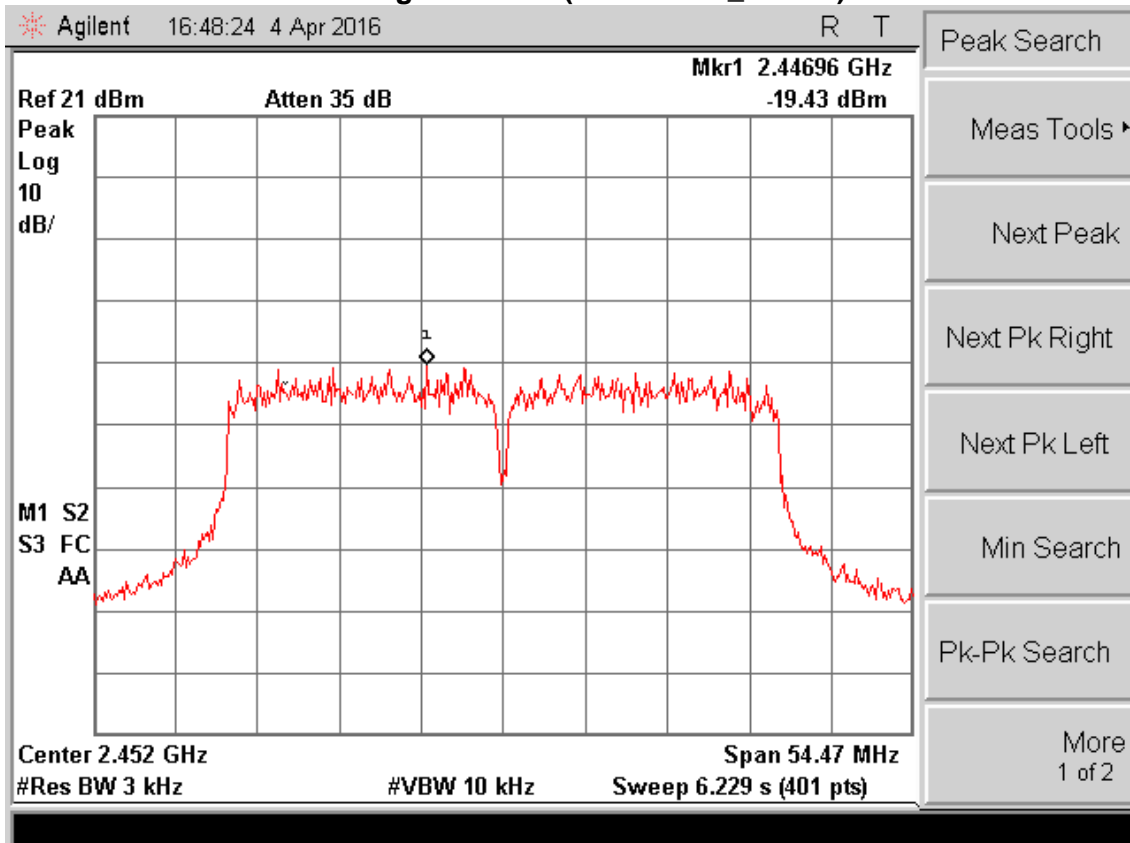
# PSD 3KHz -Low Channel (for 802.11n\_40MHz)



### PSD 3KHz -Middle Channel (for 802.11n\_40MHz)



### PSD-High Channel (for 802.11n\_40MHz)



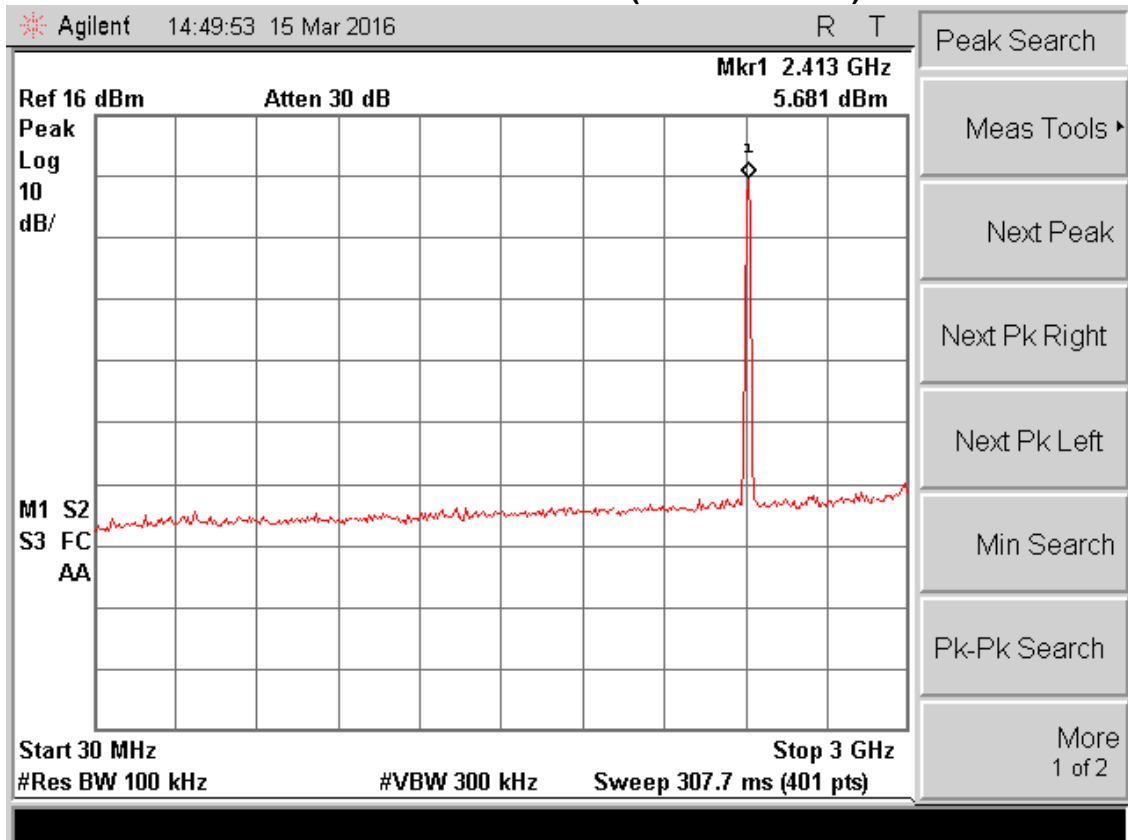
### **3.5 Conducted Spurious Emissions – FCC Section 15.209), RSS 247 5.5**

#### **3.5.1 Measurement Procedure**

The RF conducted spurious emissions were measured in accordance with the **RSS 247 5.5** and the FCC KDB Publication No.558074 v03r02 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (47 CFR 15.247)”. The RF output of the equipment under test was directly connected to the input of the spectrum analyzer. The EUT was investigated for conducted spurious emissions from 30MHz to 26GHz, 10 times the highest fundamental frequency. Measurements were made at the low, middle and high channels of the EUT. For each measurement, the RBW of the spectrum analyzer was set to 100 kHz and VBW 300 kHz. The reference level was determined by measuring the peak PSD level in any of the 100 kHz bandwidth within the DTS channel bandwidth.

#### **4 Measurement Result**

### For 802.11b: Low Channel (30MHz to 3GHz)



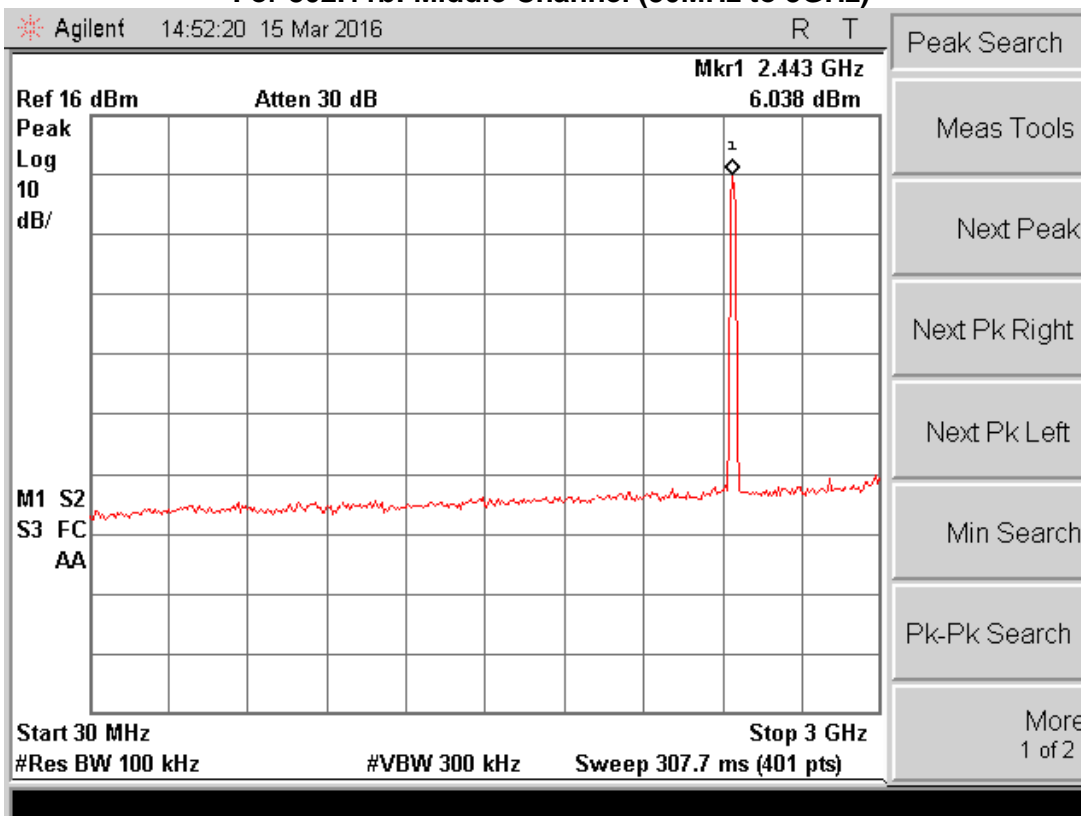
### For 802.11b: Low Channel (2GHz to 13GHz)



### For 802.11b: Low Channel (13GHz to 26GHz)



### For 802.11b: Middle Channel (30MHz to 3GHz)



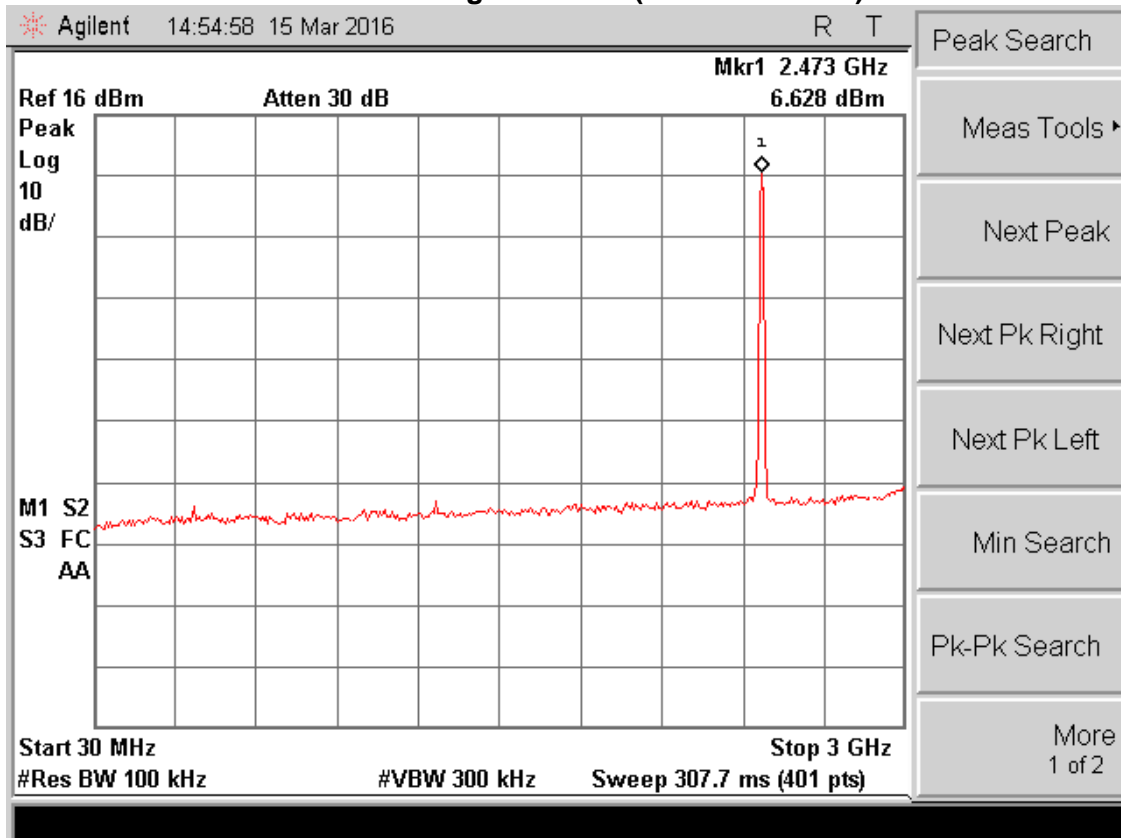
### For 802.11b: Middle Channel (2GHz to 13GHz)



### For 802.11b: Middle Channel (13GHz to 26GHz)



### For 802.11b: High Channel (30MHz to 3GHz)

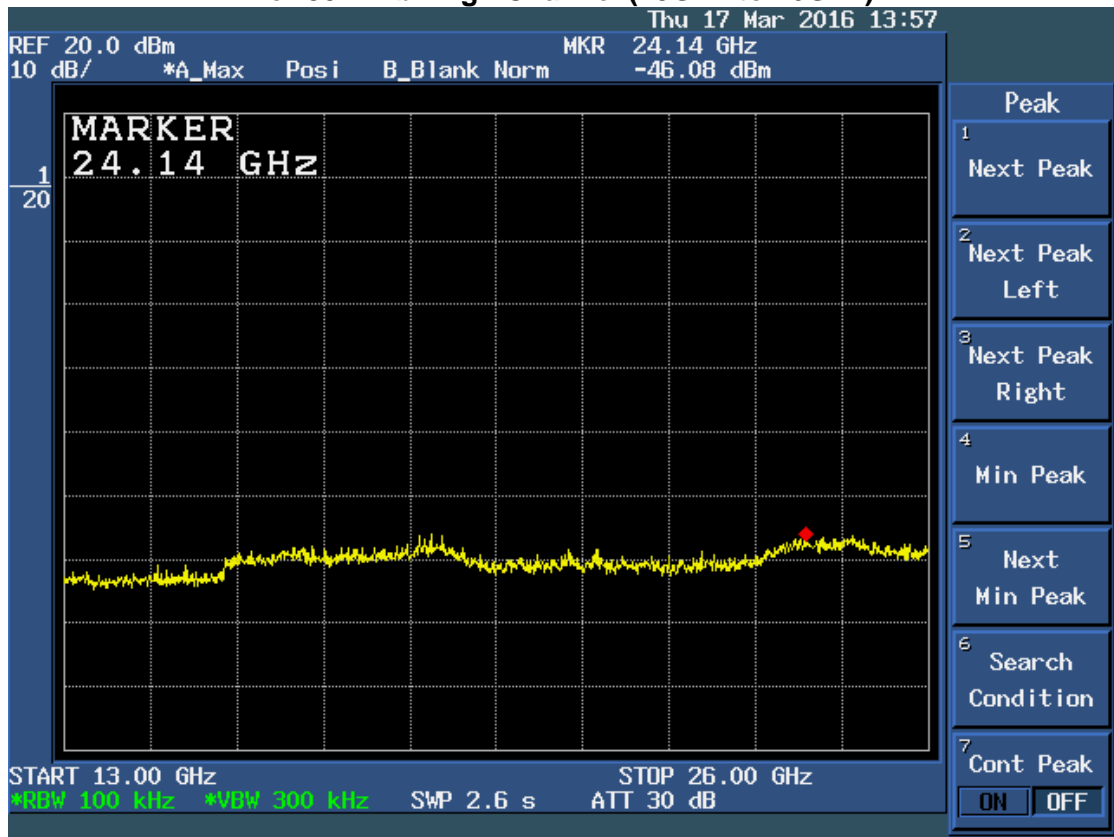


### For 802.11b: High Channel (2GHz to 13GHz)

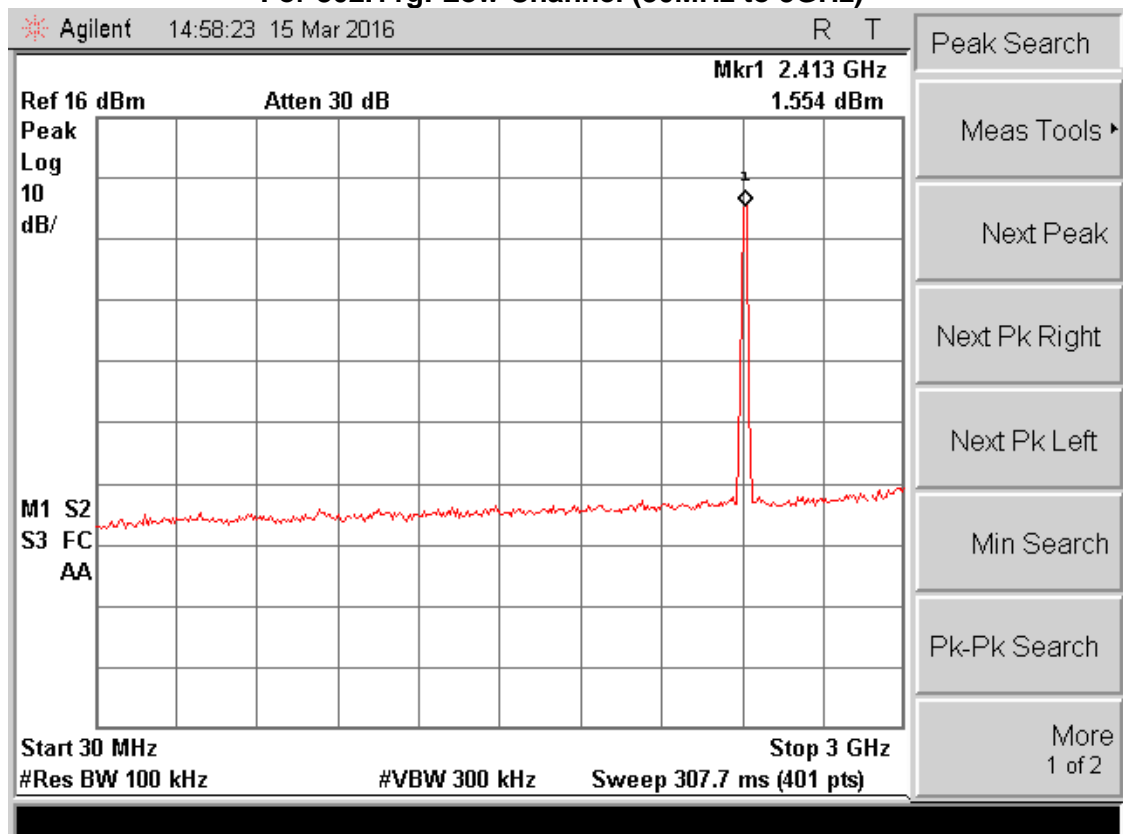




### For 802.11b: High Channel (13GHz to 26GHz)



### For 802.11g: Low Channel (30MHz to 3GHz)



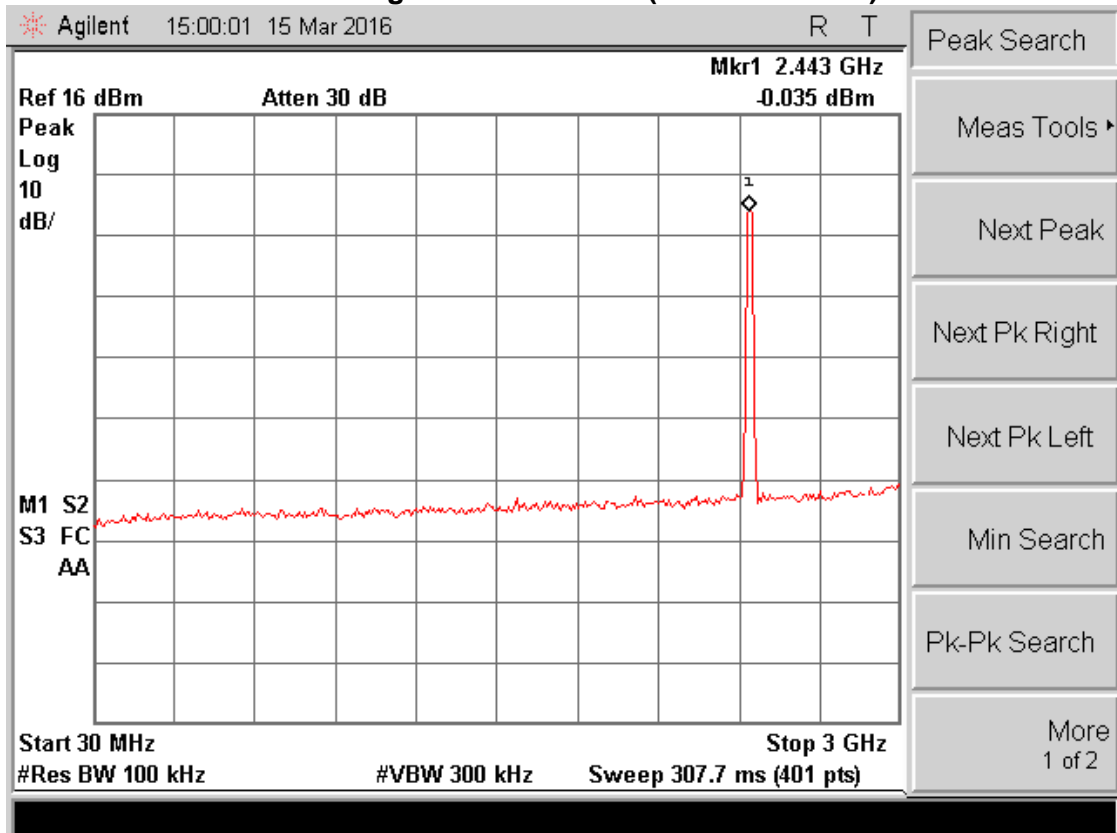
### For 802.11g: Low Channel (2GHz to 13GHz)



### For 802.11g: Low Channel (13GHz to 26GHz)



### For 802.11g: Middle Channel (30MHz to 3GHz)



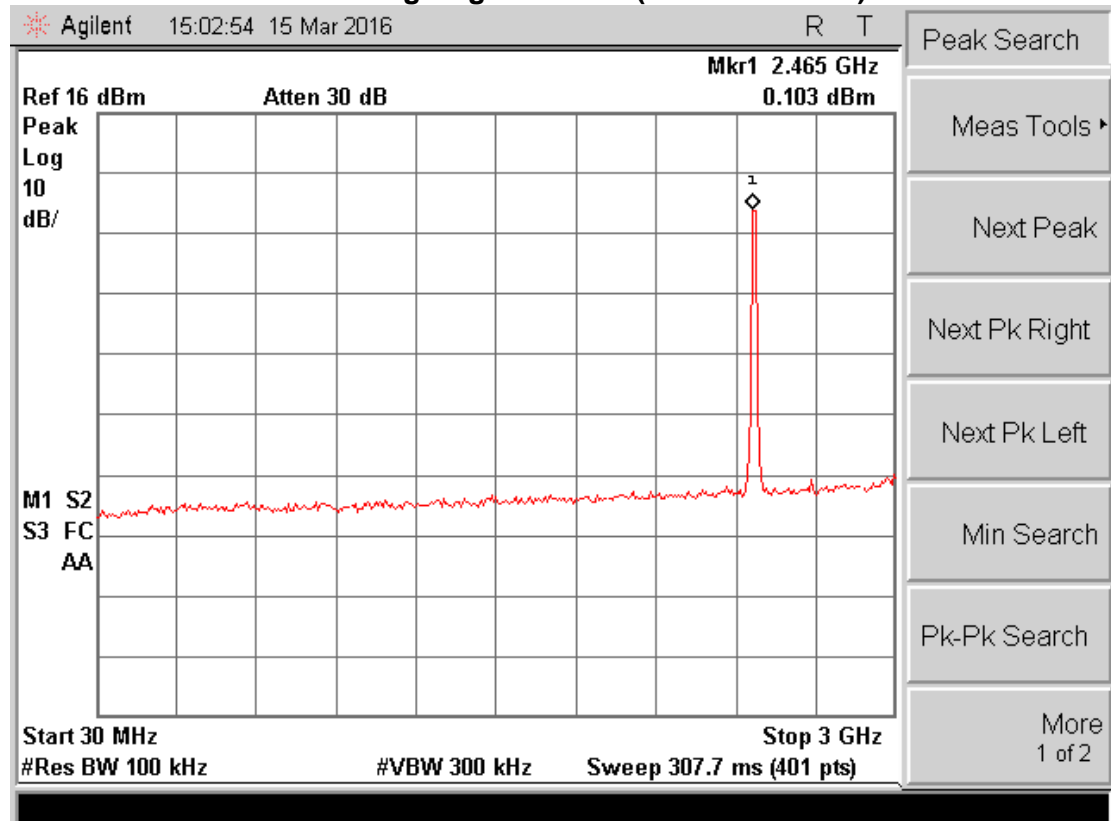
### For 802.11g: Middle Channel (2GHz to 13GHz)



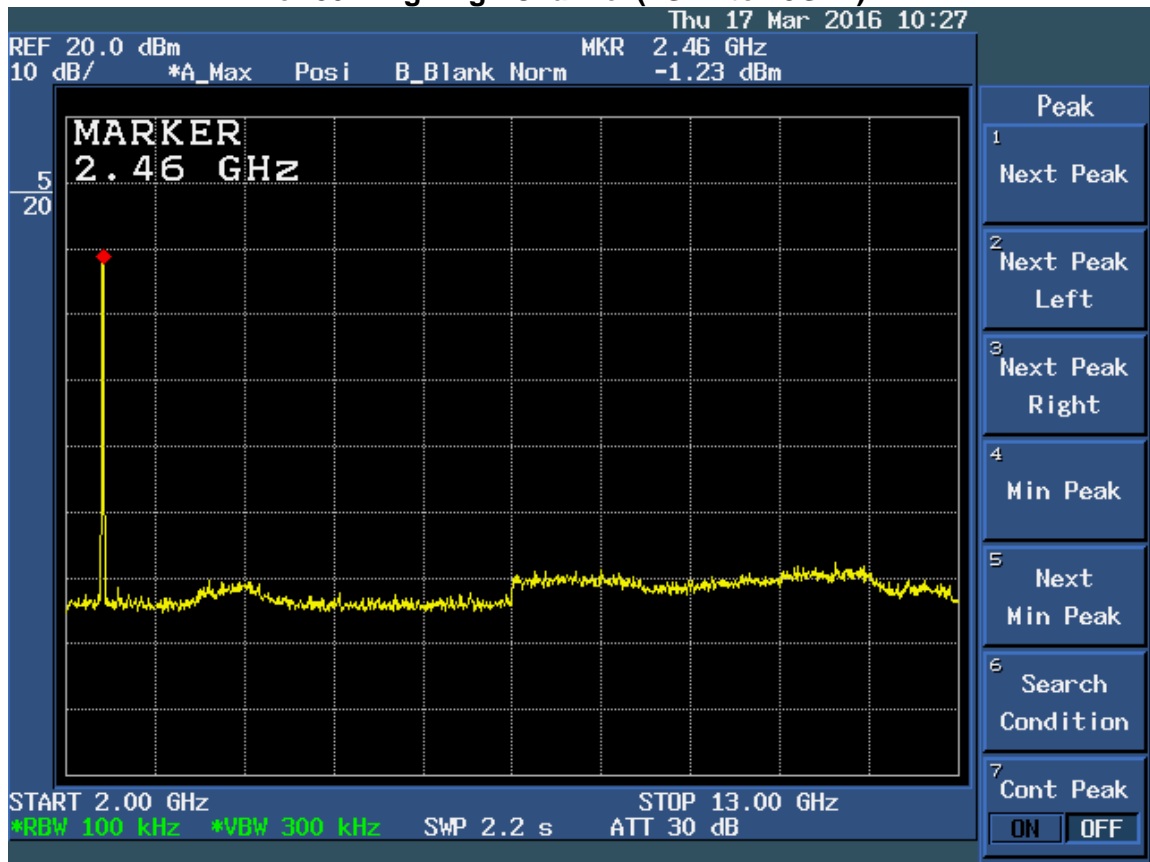
### For 802.11g: Middle Channel (13GHz to 26GHz)



### For 802.11g: High Channel (30MHz to 3GHz)



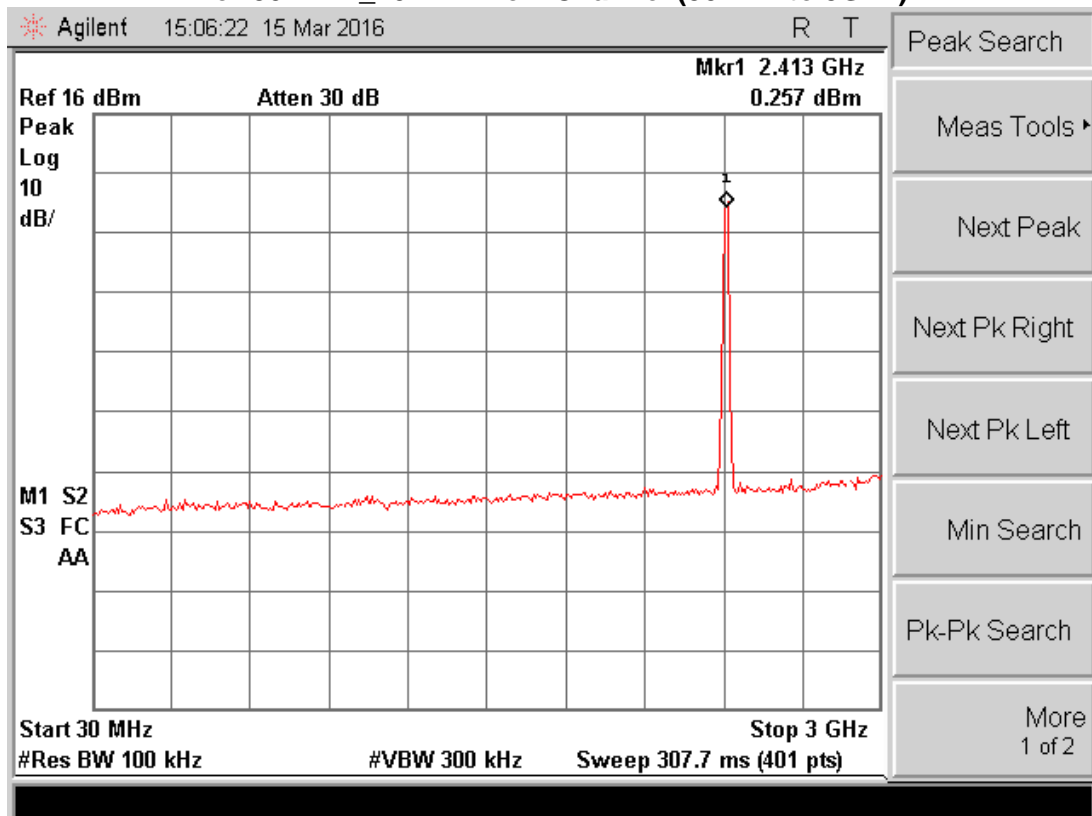
### For 802.11g: High Channel (2GHz to 13GHz)



### For 802.11g: High Channel (13GHz to 26GHz)



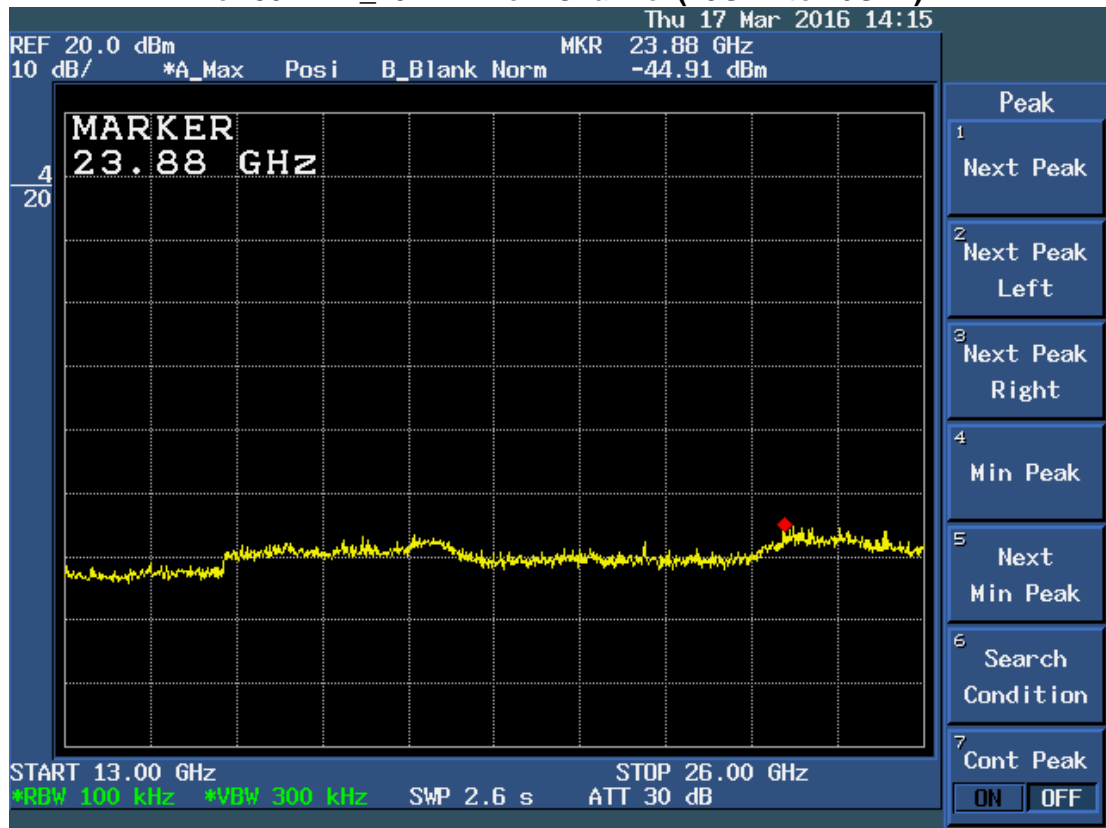
### For 802.11n\_20MHz: Low Channel (30MHz to 3GHz)



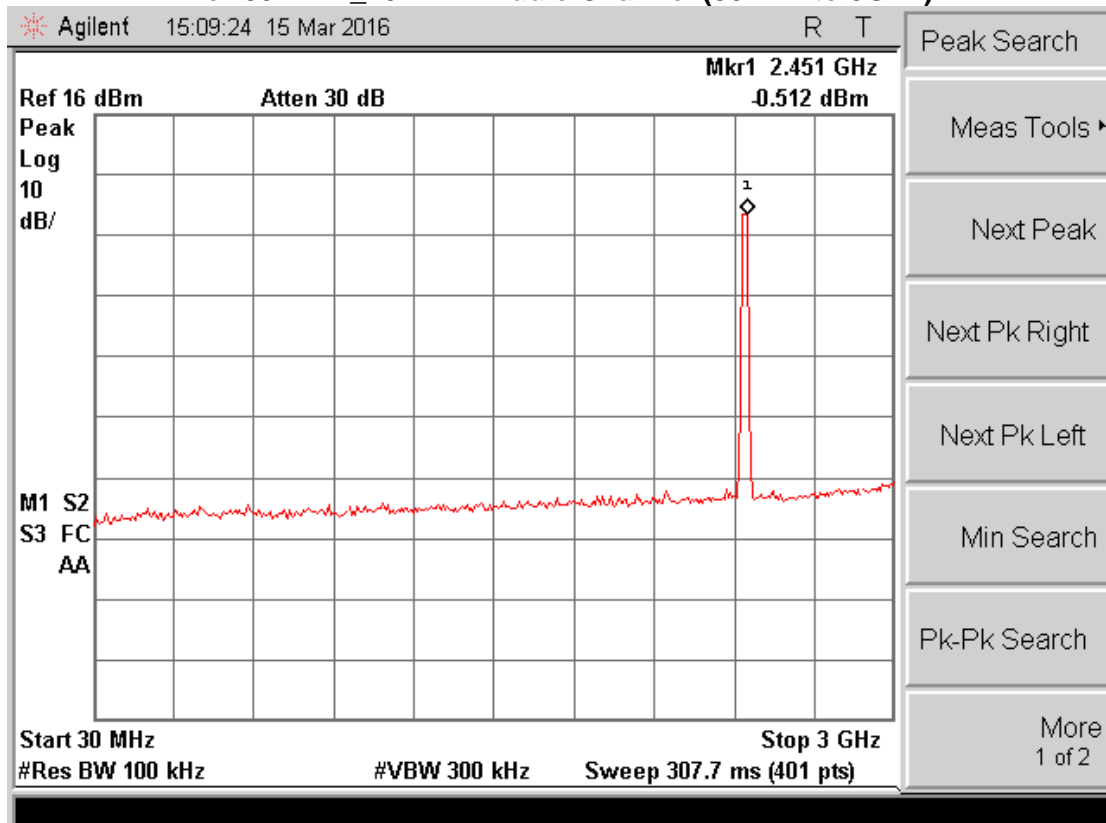
### For 802.11n\_20MHz: Low Channel (2GHz to 13GHz)



### For 802.11n\_20MHz: Low Channel (13GHz to 26GHz)



### For 802.11n\_20MHz: Middle Channel (30MHz to 3GHz)



### For 802.11n\_20MHz: Middle Channel (2GHz to 13GHz)

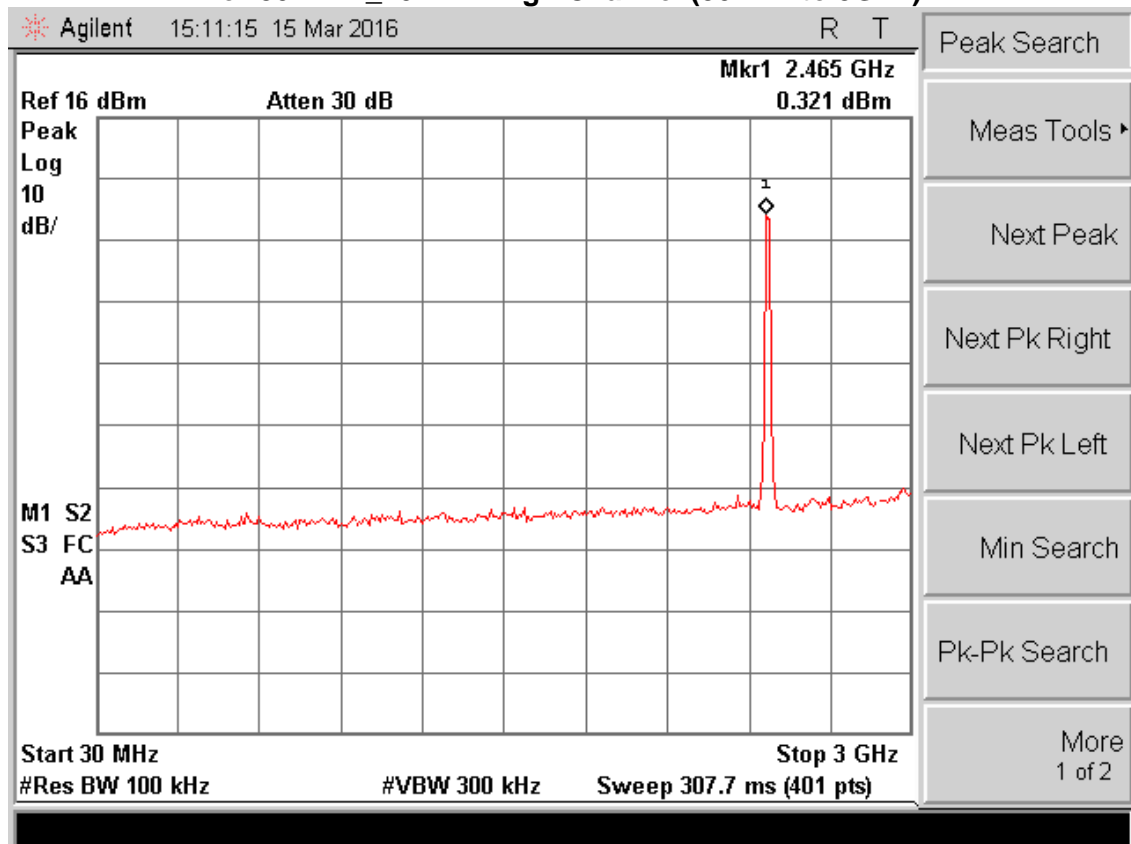


### For 802.11n\_20MHz: Middle Channel (13GHz to 26GHz)





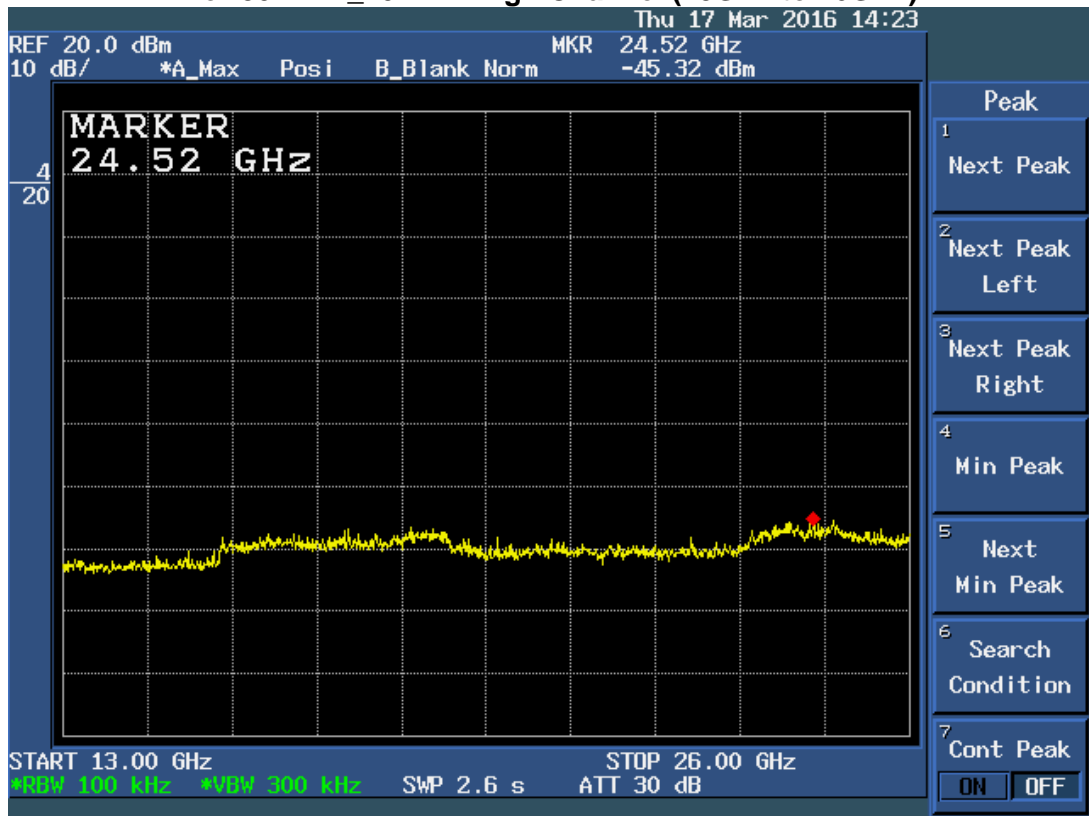
### For 802.11n\_20MHz: High Channel (30MHz to 3GHz)



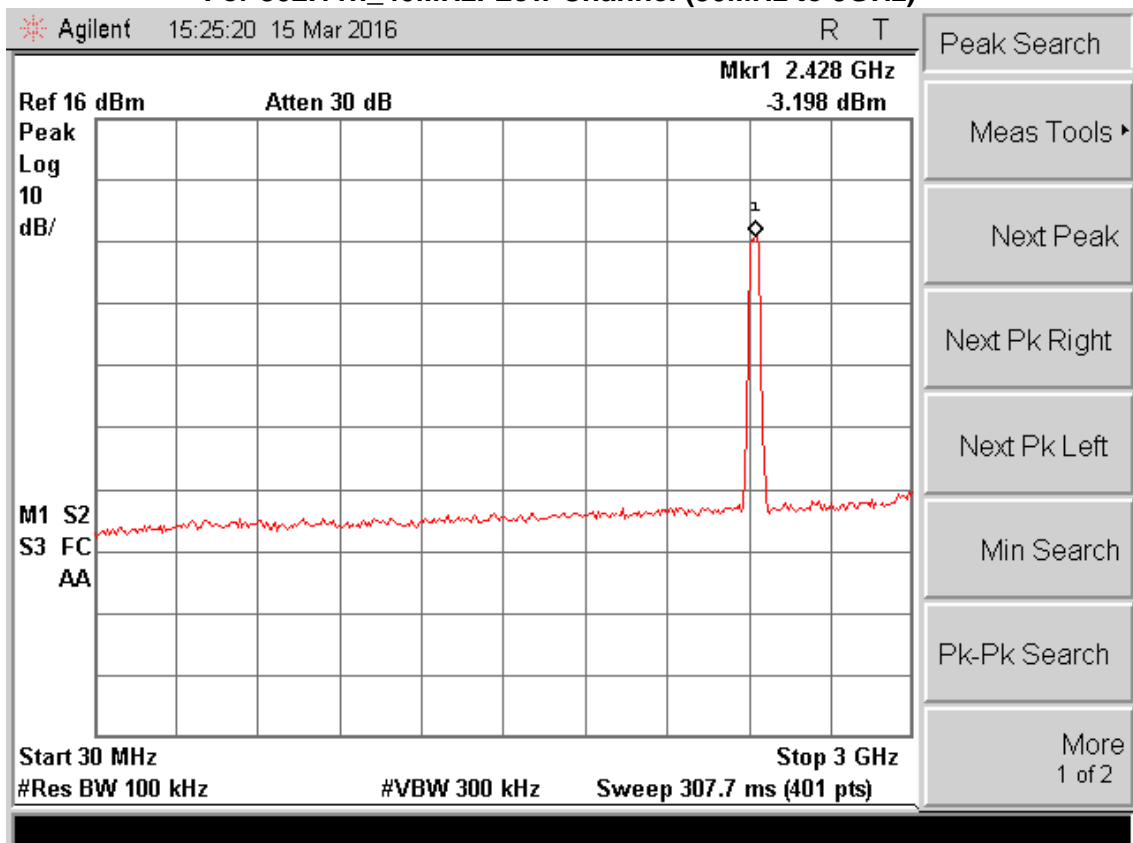
### For 802.11n\_20MHz: High Channel (2GHz to 13GHz)



### For 802.11n\_20MHz: High Channel (13GHz to 26GHz)



### For 802.11n\_40MHz: Low Channel (30MHz to 3GHz)



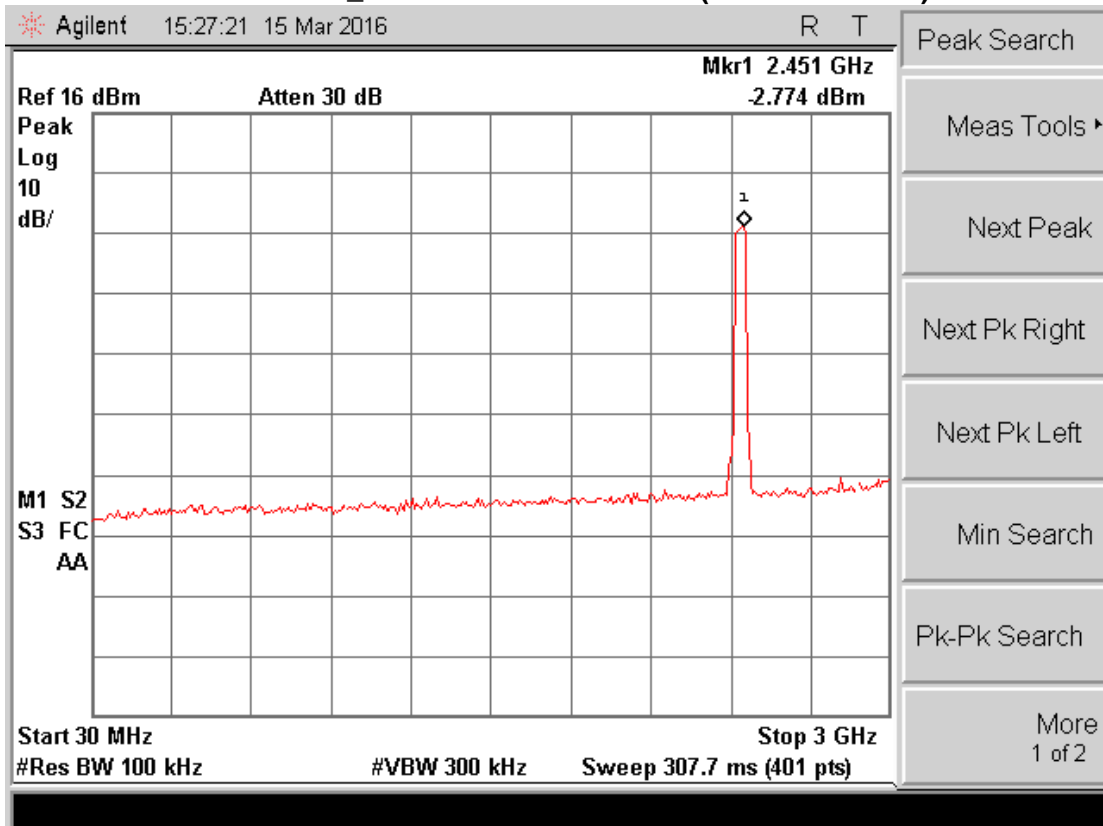
### For 802.11n\_40MHz: Low Channel (2GHz to 13GHz)



### For 802.11n\_40MHz: Low Channel (13GHz to 26GHz)



### For 802.11n\_40MHz: Middle Channel (30MHz to 3GHz)



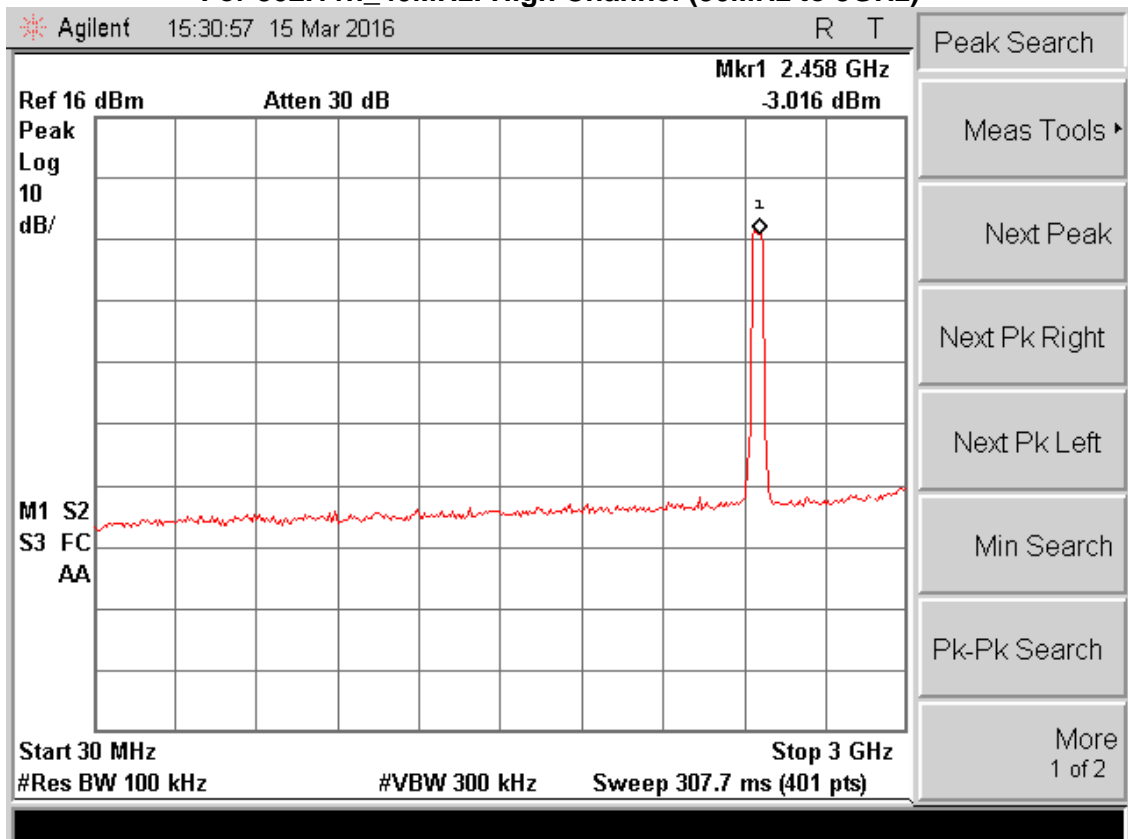
### For 802.11n\_40MHz: Middle Channel (2GHz to 13GHz)



### For 802.11n\_40MHz: Middle Channel (13GHz to 26GHz)



### For 802.11n\_40MHz: High Channel (30MHz to 3GHz)



### For 802.11n\_40MHz: High Channel (2GHz to 13GHz)



### For 802.11n\_40MHz: High Channel (13GHz to 26GHz)

