



## **Electromagnetic Compatibility Test Report**

**Test Report No: EXT 140507**

**Issued on: May 14, 2007**

### **Product Name**

**Access Point EXRP40**

**FCC ID: VDJ-EXRP-40, IC: 7180A-EXRP40**

**Access Point EXRP20**

**FCC ID: VDJ-EXRP-20, IC: 7180A-EXRP20**

### **Tested According to**

**FCC 47 CFR, Part 15, Subparts B, C & E**

### **Tests Performed for**

**Extricom Ltd.**

Haim Levanon Street, P.O. Box 39040, Tel-Aviv 61390, Israel  
Tel: +972-3-7451000, Fax: +972-3-7451001"

### ***QualiTech EMC Laboratory***

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Regis. No: 102724 1633.01



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**QualiTech EMC Laboratory**



1633.01

### **Test Report details:**

Test commencement date: 18.03.2007  
Test completion date: 30.04.2007  
Customer's Representative: A.Y. Erez  
Issued on: 14.05.2007

### **Assessment information:**

This report contained an assessment of the EUT against Electromagnetic Compatibility based upon tests carried out on the samples submitted. The results contained in this report relate only to the items tested. Manufactured products will not necessarily give identical results due to production and measurement tolerances. QualiTech, EMC Lab does not assume responsibility for any conclusion and generalization drawn from the test results with regards to other specimens or samples of type of the equipment represented by test item.

The EUT was set up and exercised using the configuration, modes of operation and arrangements defined in this report only.

### **Modifications:**

#### **Modifications made to the EUT**

None

#### **Modifications made to the Test Standard**

None

## Summary of Compliance Status

Test Spec. Clause	Test Case	Remarks
§15.247 (a) (2) & RSS-210 section A8.2 (1)	6 dB Bandwidth	Comply
§15.247 (b) (3) & RSS-210 section A8.4 (4)	Maximum Peak Output Power	Comply
§15.247 (e) & RSS-210 Section A8.2 (2)	Peak power spectral density	Comply
§15.247 (d) & RSS-210 Section A8.5	Conducted Spurious Emissions	Comply
§15.247 (d) & §15.205 & RSS-210 section A8.5	Radiated Emissions, Restricted Bands	Comply
§15.209 & RSS-210 section A8.5	Radiated Emissions	Comply
47 CFR §15.403 (i) & RSS-210A9.2(1)	Emission Bandwidth (26dB BW)	Comply
47 CFR §15.407 (a) (1) & RSS-210A9.2(1)	Peak Output Power, 5180-5250 MHz	Comply
47 CFR §15.407 (a) (1) & RSS-210A9.2(1)	Peak Power Spectral Density	Comply
47 CFR §15.407 (a) (6)	Peak Excursion	Comply
47 CFR §15.407 (b) (1) & §15.407 (b)(6) & RSS-210A3.3(1)	Conducted Spurious Emissions	Comply
47 CFR §15.407 (b) (1) & (b)(6) & RSS-210A3.3(1)	Spurious Radiated Emissions, Restricted Bands	Comply
§15.203 & RSS- Gen.Section 7.1.4	Antenna Connector requirement	Comply



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## 1. General Description

### Description of the EUT system/test Item:

**Product name:** IEEE 802.11a/b/g Wireless Access Point

**Model:** EXRP40 and EXRP20

**FCC ID:** VDJ-EXRP-40 and VDJ-EXRP-20

**IC:** 7180A-EXRP40 and 7180A-EXRP20

### Transmit Power:

802.11b: 38mW

802.11g: 35mW

802.11a: 40mW

### Frequency range:

802.11b/g: 2.412 – 2.462 GHz

802.11a: 5.15-5.250, 5.745-5.825 GHz

### Transmit Data rate:

Protocol	Rate [Mbps]							
802.11a	6	9	12	18	24	36	48	54
802.11b	1	2	5.5	11				
802.11g	6	9	12	18	24	36	48	54

### Type of Modulation:

Protocol	Modulation
802.11a	OFDM (64QAM, 16QAM, QPSK, BPSK)
802.11b	DSSS (CCQ, DQPSK, DBPSK)
802.11g	DSSS/OFDM (64QAM, 16QAM, QPSK, BPSK, CCK, DQPSK, DBPSK)

### Antenna Specification:

Type: Omni-Directional Chip Antenna

Gain:

802.11b/g: 4 dBi

802.11a: 4 dBi

### Description:

EXRP40 and EXRP20 are Access Point products with MiniPCI Transceiver cards installed into a small device. Each module is an identical 802.11a/b/g transceiver with small cabled internal Omni-Directional Chip Antennas of 4dBi gain. The transmitters can not transmit simultaneously on the same channel and different information is transmitted on different channels. Since the modules operate independently and collocation was addressed, each was treated independently and complies with the rules independently. EXRP40 and EXRP20 differ only by the fact that EXRP20 is assembled with only two Mini PCI Transceiver cards. All components, layout and schematics of the EXRP40/EXRP20 products are the same. The emission resulting from the simultaneous operation of the individual non-coordinated transmitters was investigated, complies with the rules, and no new emissions were seen.

RF exposure compliance is with respect to the aggregate exposure from all simultaneously transmitting transmitters/antennas.

## **2. Method of Measurements**

### **2.1. Conducted RF Measurements:**

The RF output of the transmitter under test was directly connected to the input of the Spectrum analyzer through a specialized antenna connector provided by the manufacturer, and an attenuator as specified. The external attenuator and cable loss were added to the reading. Worst-case results of the various modulation modes (where applicable) were reported.

For carrier frequency separation, number of hopping frequencies, time of occupancy, 20dB BW, peak output power, band edge emissions, and spurious emissions were measured according the guidelines in DA 00-705.

For PSD, emission peak was zoomed within the pass band with spectrum analyzer's settings as reported (Sweep time=Span/3kHz). Transmitter outputs transmitting simultaneously was aggregated through a combiner.

For Maximum Conducted Output Power per §15.247(b)(3), the spectrum analyzer was set for free ran, and 100 traces were averaged in power averaging mode. The power was integrated across a bandwidth of the 26dB EBW of the signal, using the spectrum analyzer's band power measurement function with band limits set equal to the EBW band edges.

For spurious emissions measurement, the spectrum from 9 KHz to 40GHz was investigated with the transmitter set to the lowest, middle and highest channel frequencies.

### **2.2. Radiated Emission measurements:**

Measurements were performed at a 3-meter measurement distance in the semi-anechoic chamber in order to evaluate the radiated electromagnetic interference characteristics of the EUT. The EUT was placed on a non-metallic table/support, 0.8m above the turntable, was configured, arranged and operated in a manner consistent with typical application and load conditions. The test program of exercising the equipment ensured that various parts of the EUT were exercised to permit detection of all EUT disturbances.

An appropriate antenna depending upon the frequency range, per ANSI C63.4-2003 clause 4.1.5 was used. While the turntable was being rotated, the height of the antenna was varied from 1 to 4m for the frequency range of 30MHz to 1GHz. The highest radiated emission was detected by manipulating the system cables to the worst-case position. This process was repeated for both antenna polarizations. The spectrum up to 40GHz was investigated for spurious emissions, using a band-reject filter where appropriate.

The amplitudes of worst-case emission were measured with the detector modes and resolution bandwidths over various frequency ranges according to the requirements of ANSI C63.4-2003 clause 4.2.

### **2.3. Worst Case Results:**

Worst case result is determined as the channel with the highest output power. Worst-case results of various modulation modes were determined as the modulation with the highest output power, and that was reported.

For multiple simultaneous beams, conducted and radiated emission on different channels was investigated, and worst case result was reported.

### 3. Test Facility & Uncertainty of Measurement

#### 3.1. Accreditation/ Registration reference:

- A2LA Certificate Number: 1633.01

#### 3.2. Test Facility description

The tests were performed at the EMC Laboratory, QualiTech Division, ECI Telecom Group

**Address:** 30, Hasivim St., Petah Tikva, Israel.  
 Tel: 972-3-926-8443

#### 3m Anechoic Chamber:

The 3m-screened chamber is used in two configurations: the semi-anechoic configuration for Radiated Emission measurements and the full-anechoic configuration for Radiated Immunity tests.

#### Semi Anechoic Configuration:

Measurement distance	3m
Chamber dimensions	9.5m x 6.5m x 5.2m
Antenna height	1 - 4m
Shielding Effectiveness	Magnetic field $\geq 80$ dB at 15 kHz $\geq 90$ dB at 100 kHz Electric field $> 120$ dB from 1MHz to 1GHz $> 110$ dB from 1GHz to 10GHz
Absorbing material	Ferrite tiles on the walls and ceiling Frankonia hybrid absorbing material in selected positions on the walls
Normalized Site Attenuation measured at 5 positions	$\pm 3.49$ dB, 30MHz to 1GHz
Transmission Loss measured at 5 positions, at 1.5m height	$\pm 3$ dB, 1GHz to 18GHz

#### Full-Anechoic Configuration:

Measurement distance	3m
Chamber dimensions	7m x 4m x 3m
Antenna height	1.55m at Horizontal & Vertical polarizations
Shielding Effectiveness	Magnetic field $\geq 80$ dB at 15 kHz $\geq 90$ dB at 100 kHz Electric field $> 120$ dB from 1MHz to 1GHz $> 110$ dB from 1GHz to 10GHz
Absorbing material	Ferrite tiles on the walls and ceiling Frankonia hybrid absorbing material in selected positions on the walls and floor
Field Uniformity to EN61000-4-3	$\pm 3$ dB 80MHz to 18GHz



### 3.3. Uncertainty of Measurement:

Test Name	Test Method & Range	Uncertainty	
		Combined std. Uc(y) [dB]	Expanded U [dB]
<b>Radiated Emission</b>	30MHz÷230MHz, Horiz. polar.	1.8	3.6
	30MHz÷230MHz, Ver. polar.	2.0	3.9
	230MHz÷1000MHz, Horiz. polar.	1.5	3.0
	230MHz÷1000MHz, Vert. polar.	1.5	3.0
<b>Conducted Emission</b>	9 kHz÷150 kHz	1.4	2.8
	150 kHz÷30MHz	1.1	2.2

## 4. Report of Measurements and Examinations

### 4.1. 6 dB Bandwidth

Reference document:	<b>47 CFR §15.247 (a) (2)</b>		
Test Requirements:	Systems using digital modulation techniques may operate in 2400-2483.5 MHz and 5725 MHz-5850 MHz bands. The minimum 6dB bandwidth shall be at least 500 kHz.		
Test setup:	See sec 2.1,	<b>Comply</b>	
Method of testing:	Conducted		
Operating conditions:	Under normal test conditions		
S.A. Settings:	RBW: 100kHz, VBW: 300kHz		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 3.1.1 to 3.1.9	

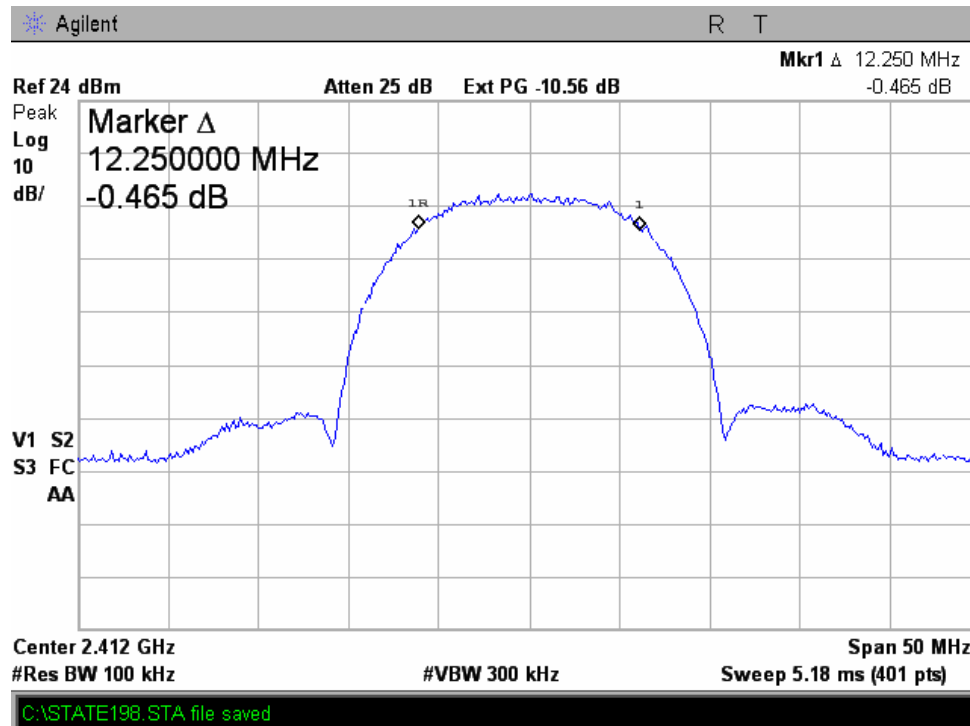
### Test results

Worst case output of the four individual transmitters.

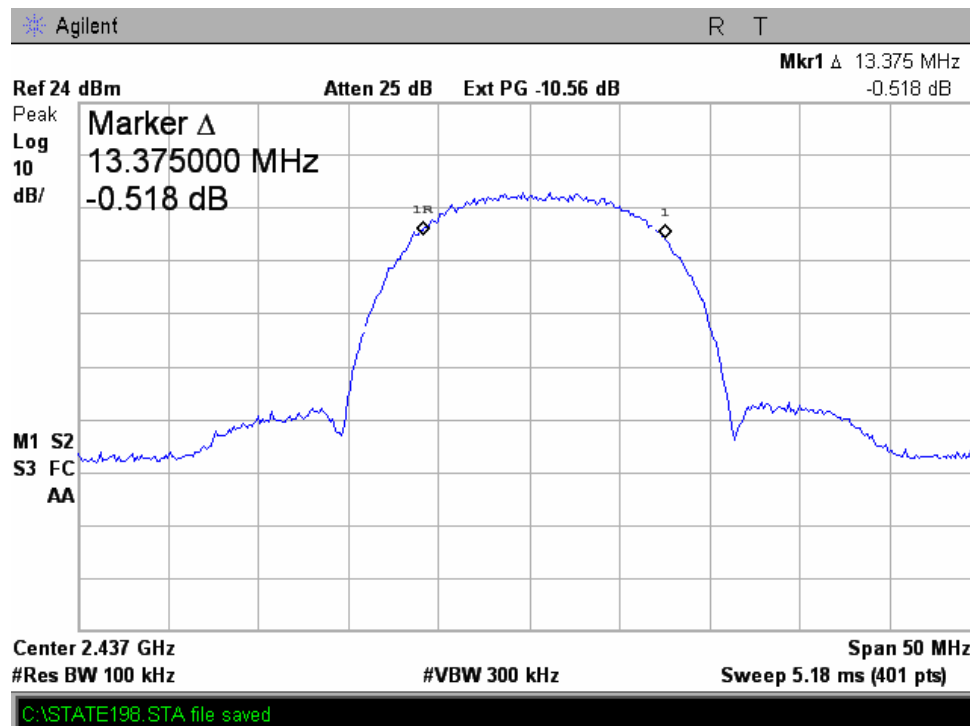
Frequency [MHz]	Data Rate [Mbps]	6 dB Bandwidth [kHz]	Limit [kHz]	Ref Plot
<b>802.11b Mode</b>				
2412	11	12250	>500	3.1.1
2437	11	13375	>500	3.1.2
2462	11	13250	>500	3.1.3
<b>802.11g Mode</b>				
2412	54	16375	>500	3.1.4
2437	54	16500	>500	3.1.5
2462	54	16500	>500	3.1.6
<b>802.11a Mode</b>				
5745	54	16500	>500	3.1.7
5785	54	16500	>500	3.1.8
5825	54	16375	>500	3.1.9

## 802.11b Mode

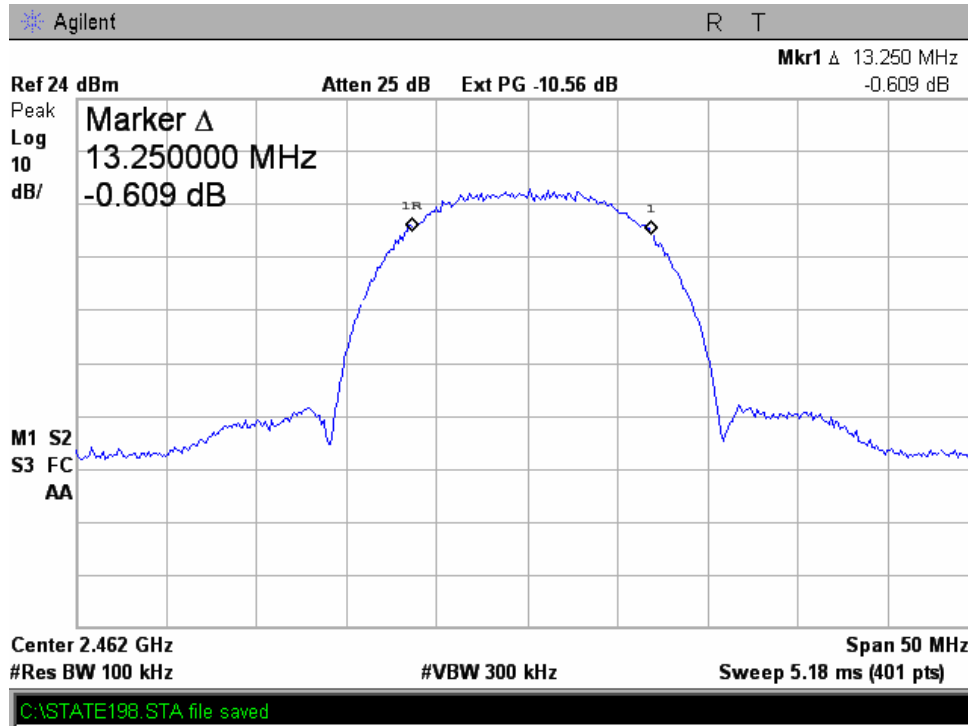
**Plot 3.1.1**



**Plot 3.1.2**

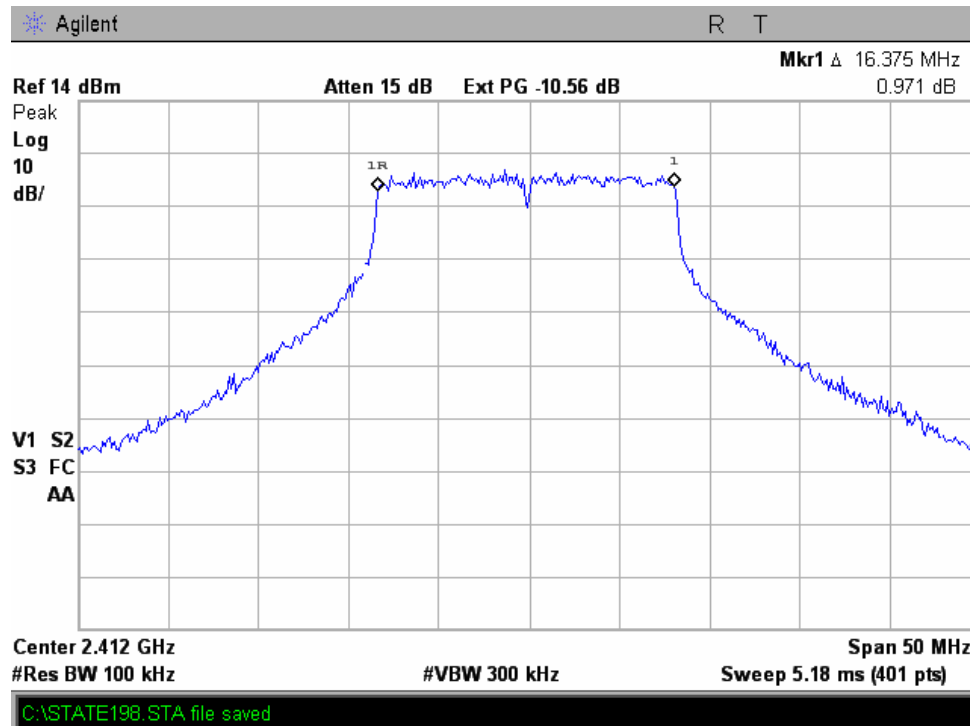


**Plot 3.1.3**

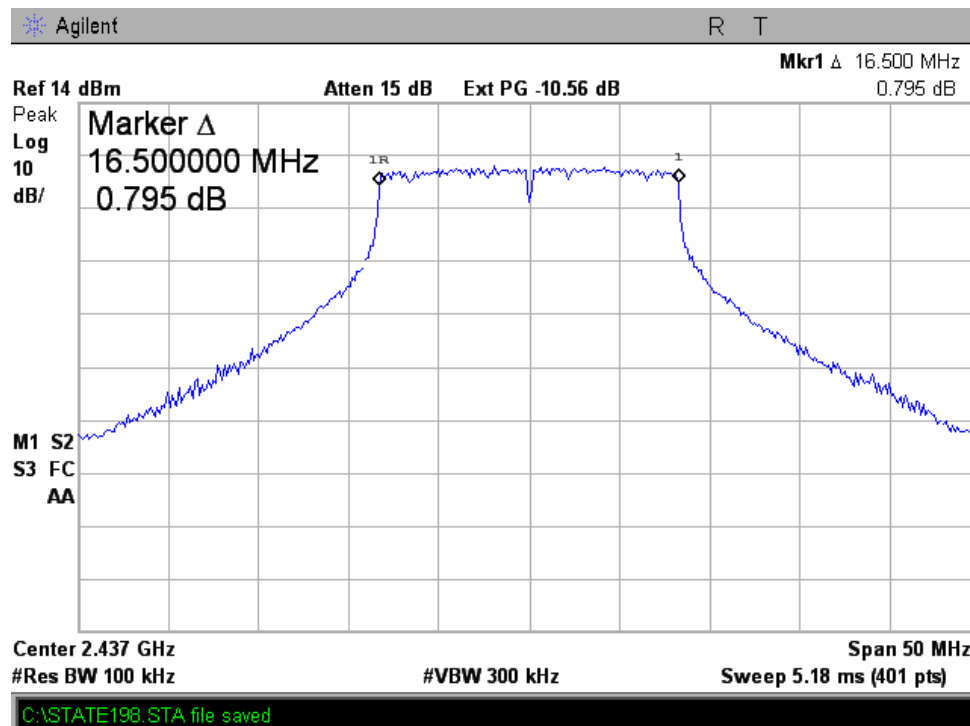


## 802.11g Mode

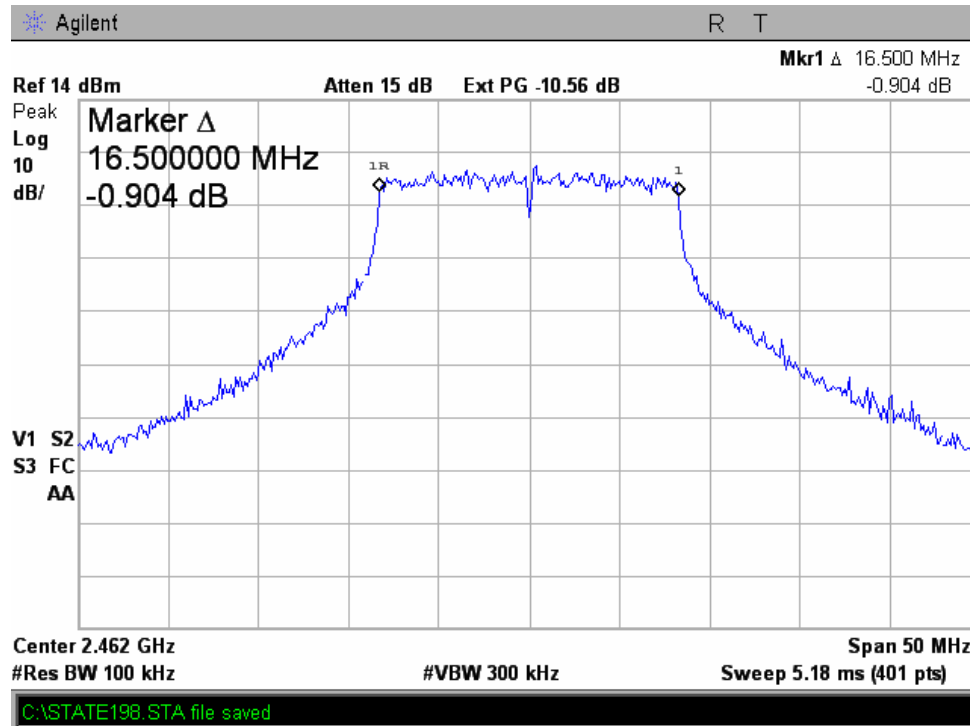
**Plot 3.1.4**



**Plot 3.1.5**

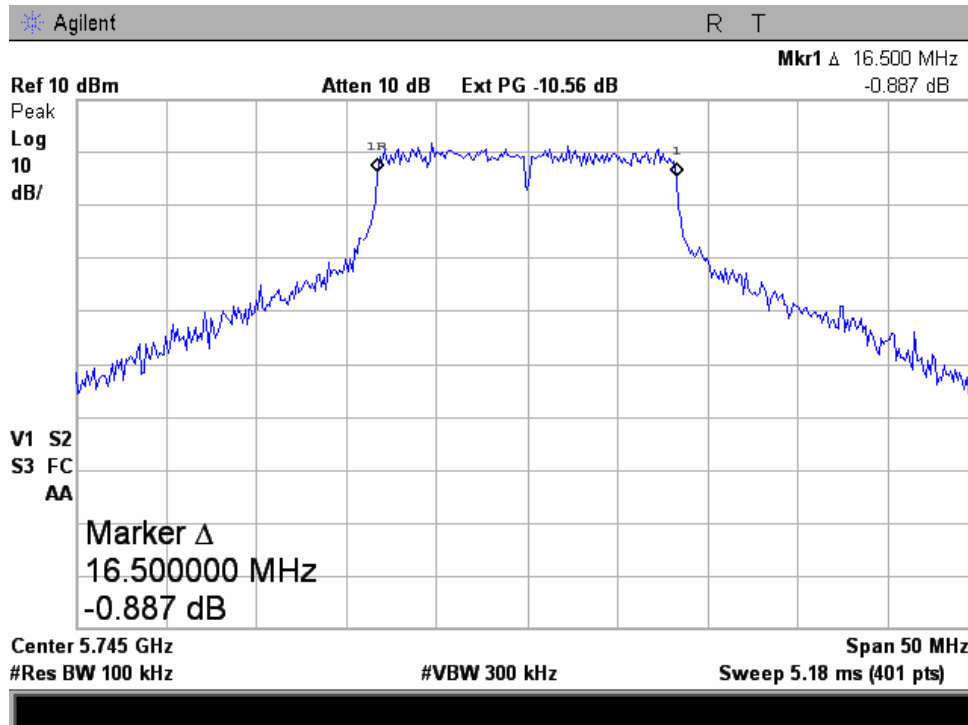


**Plot 3.1.6**

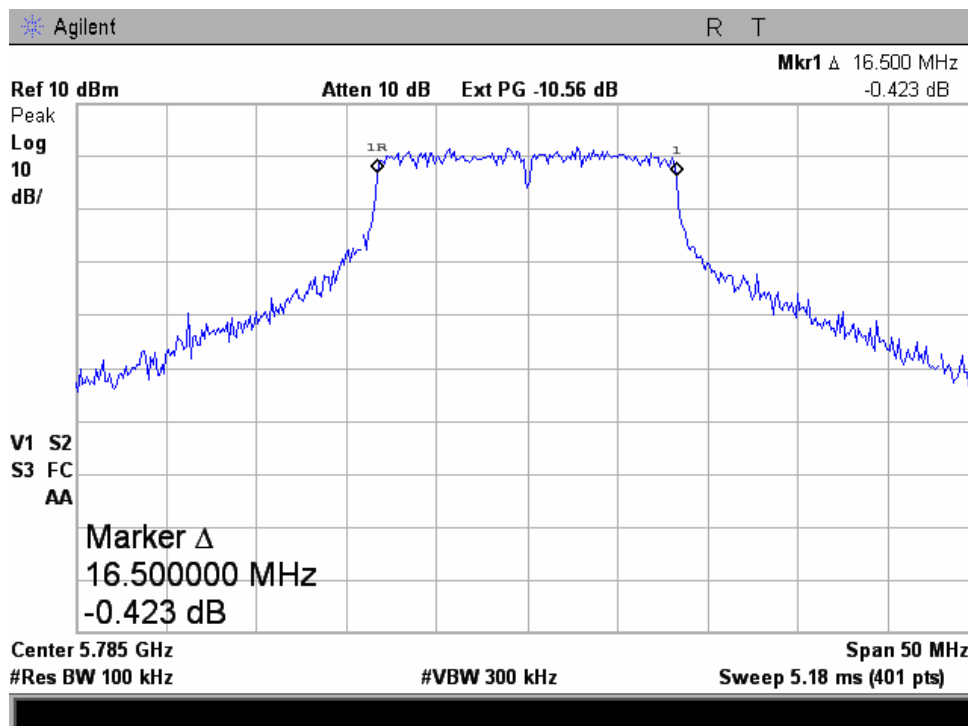


## 802.11a Mode

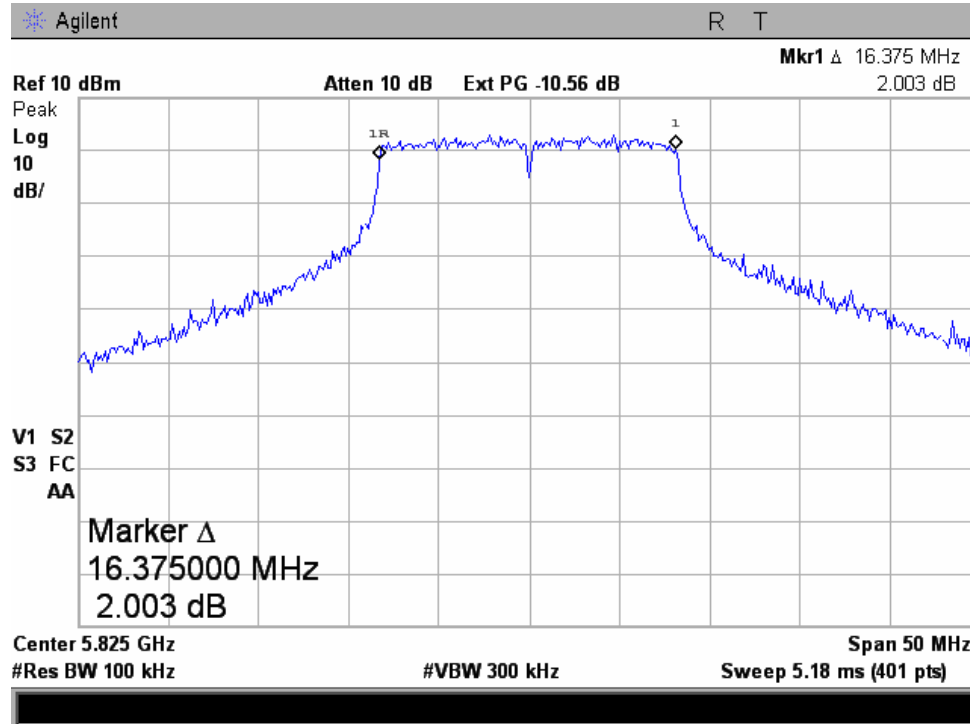
**Plot 3.1.7**



**Plot 3.1.8**



**Plot 3.1.9**





#### 4.2. Maximum Peak Output Power, 2400-2483.5 MHz

Reference document:	<b>47 CFR §15.247 (b) (3) &amp; §15.247 (c) (2)(ii) &amp; §15.247 (c) (2)(iii)</b>		
Test Requirements:	<p>The maximum peak output power of the intentional radiator for systems using digital modulation in the 2400-2483.5 MHz band shall not exceed 1 Watt.</p> <p>Transmitters operating in the 2400-2483.5 MHz bands that emits multiple directional beams but does not emit multiple directional beams simultaneously, the total output power conducted to the arrays, i.e. the sum of the power sullied to the antenna elements, shall not exceed the limit calculated below. The total conducted output power shall be reduced by 1dB below the specified limit for each 3 dB that the directional gain of the antenna array exceeds 6dBi.</p> <p>If a transmitter employs an antenna that operates simultaneously on multiple directional beams using the same or different frequency channels, and if the transmitted beams overlap, the power shall be reduced to ensure that their aggregate power transmitted simultaneously on all beams does not exceed the limit calculated above by more than 8dB.</p>		
Test setup:	See sec 2.1,	<b>Comply</b>	
Method of testing:	Conducted		
Operating conditions:	Under normal test conditions		
S.A. Settings:	RBW: 1MHz, VBW: 3MHz		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 3.2.1 to 3.2.6	

#### Peak Output Power, 5725-5850MHz

Reference document:	<b>47 CFR §15.247 (b) (3) &amp; §15.247 (c) (1)(ii).</b>		
Test Requirements:	<p>The maximum peak output power of the intentional radiator for systems using digital modulation in the 5725–5850 MHz band shall not exceed 1 Watt. Systems operating in the 5725–5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted output power.</p>		
Test setup:	See sec 2.1, 10.56 dB attenuator	<b>Comply</b>	
Method of testing:	Conducted		
Operating conditions:	Under normal test conditions		
S.A. Settings:	RBW: 1MHz, VBW: 3MHz		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 3.2.7 to 3.2.9	

**Test Results:**

Worst case output of the four individual transmitters.

**2400-2483.5 MHz Band:**

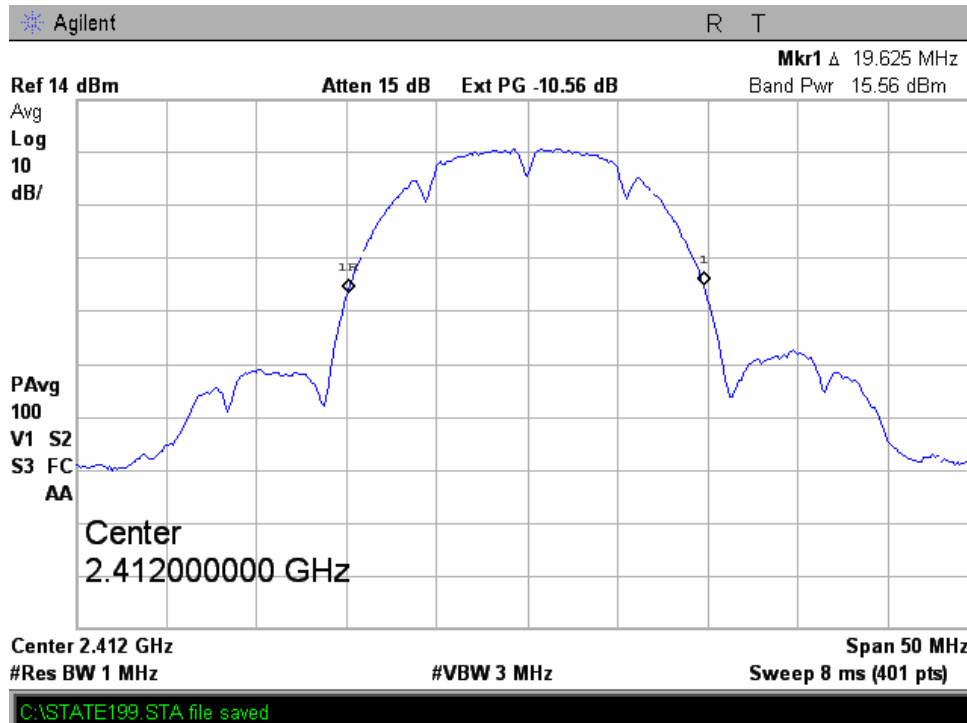
Frequency [MHz]	Data Rate [Mbps]	Peak Power [dBm]	Peak Power [mW]	Limit (P <sub>L</sub> ) [dBm]	Margin [dB]	Ref Plot
<b>802.11b Mode</b>						
2412	1	15.56	35.97	30.00	14.44	Plot 3.2.1
2437	1	15.4	34.67	30.00	14.60	Plot 3.2.2
2462	1	15.76	37.67	30.00	14.24	Plot 3.2.3
<b>802.11g Mode</b>						
2412	6	14.94	31.19	30.00	15.06	Plot 4.2.4
2437	6	15.15	32.73	30.00	14.85	Plot 4.2.5
2462	6	15.43	34.91	30.00	14.57	Plot 4.2.6

**5725-5850MHz Band:**

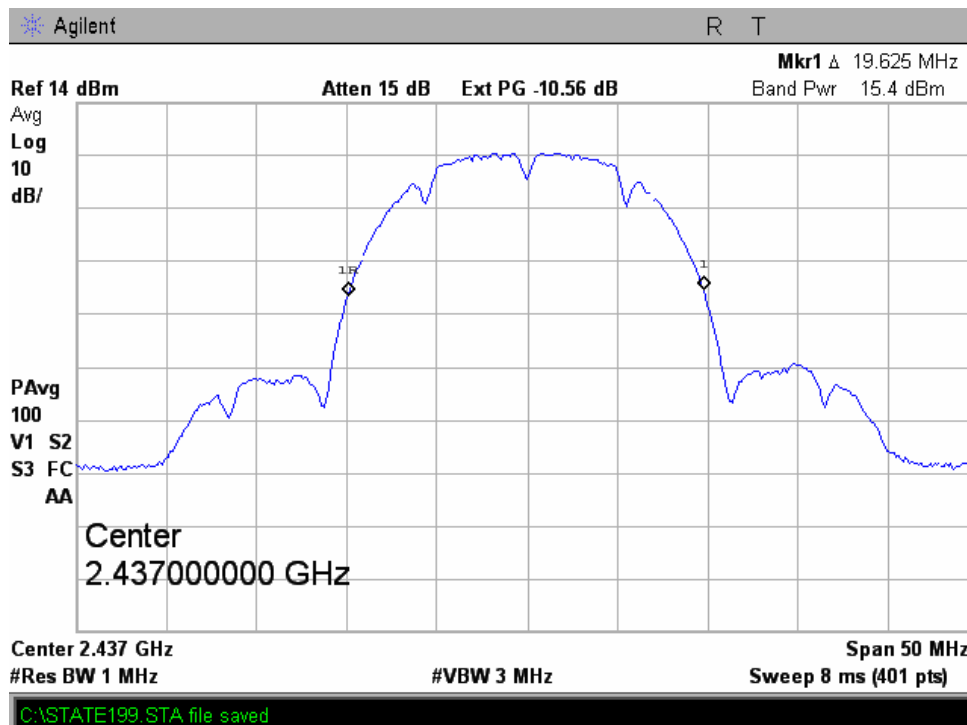
Frequency [MHz]	Data Rate [Mbps]	Peak Power [dBm]	Peak Power [mW]	Limit (P <sub>L</sub> ) [dBm]	Margin [dB]	Ref Plot
<b>802.11a Mode</b>						
5745	6	14.4	27.54	30.00	15.60	Plot 3.2.7
5785	6	15.02	31.77	30.00	14.98	Plot 3.2.8
5825	6	15.63	36.56	30.00	14.37	Plot 3.2.9

**2400-2483.5 MHz**

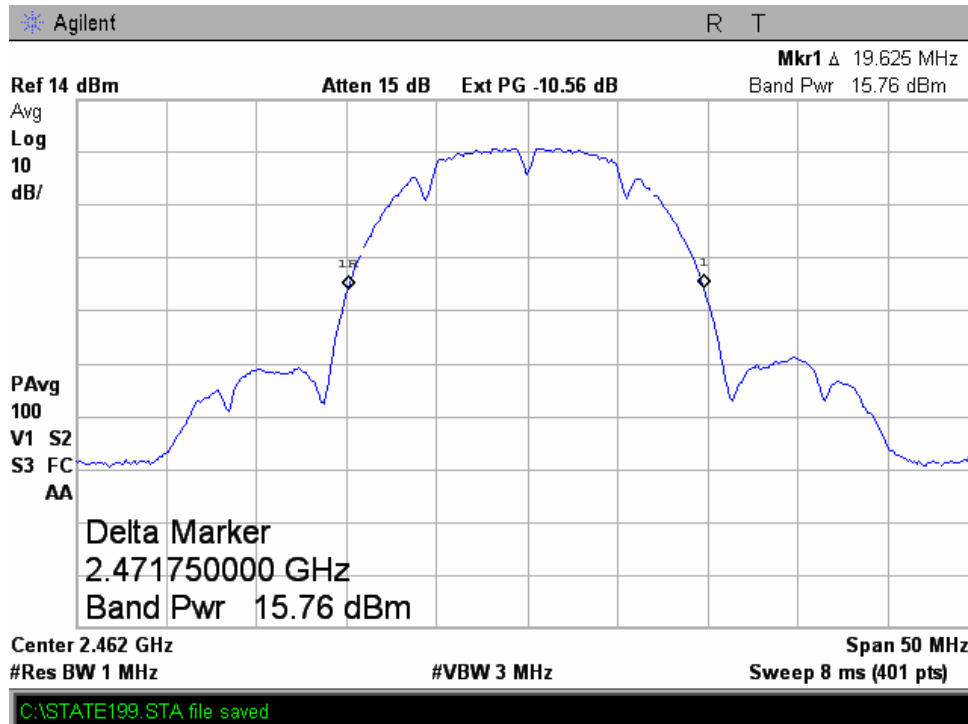
**Plot 3.2.1**



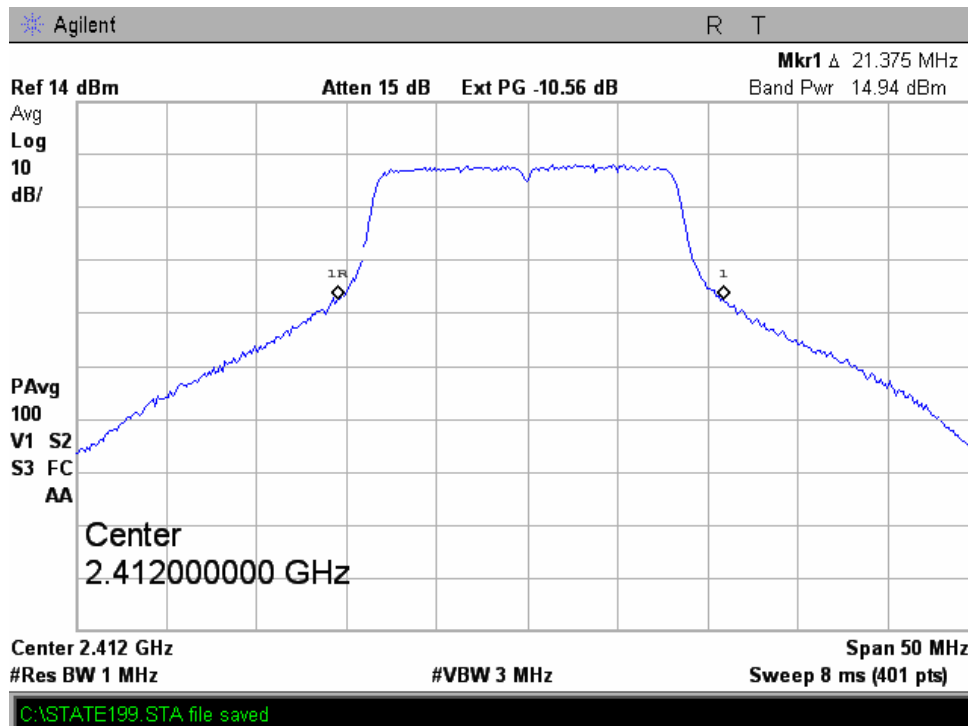
**Plot 3.2.2**



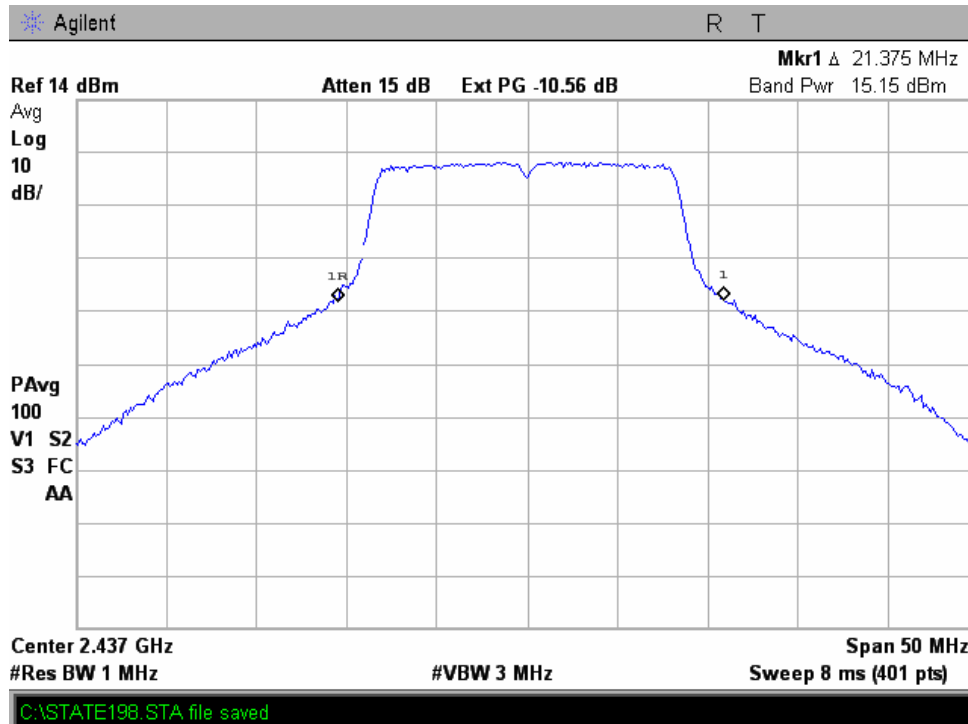
**Plot 3.2.3**



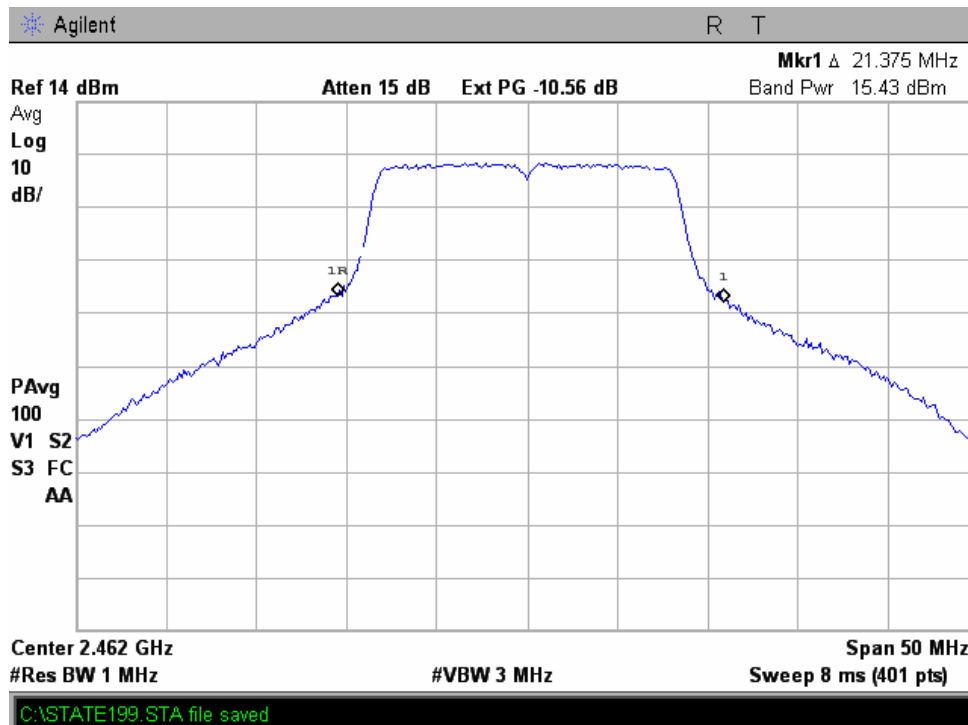
**Plot 3.2.4**



**Plot 3.2.5**

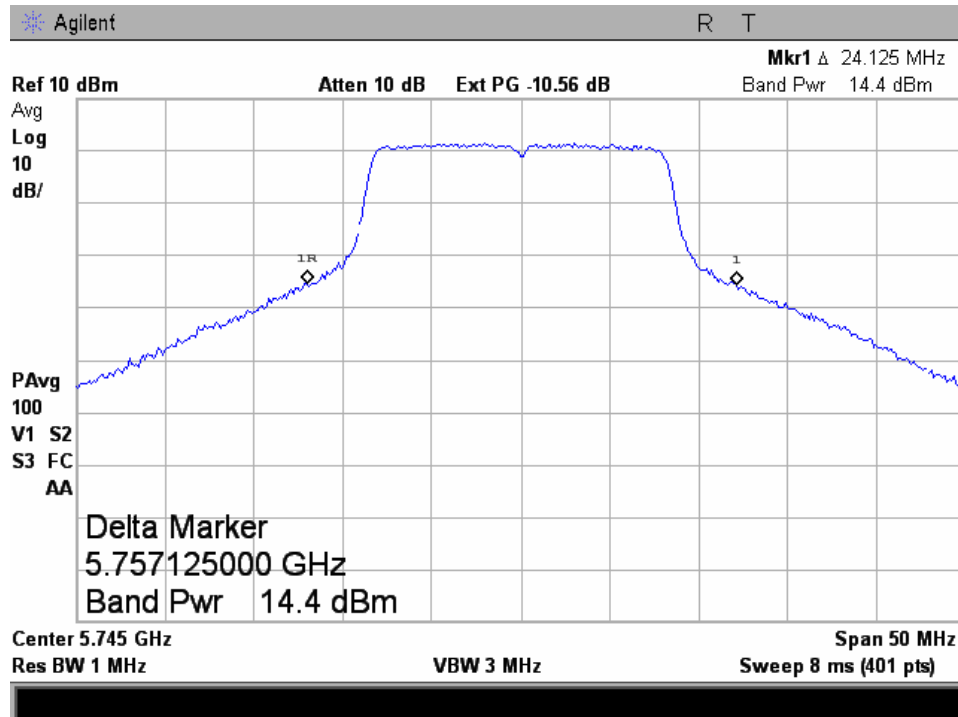


**Plot 3.2.6**

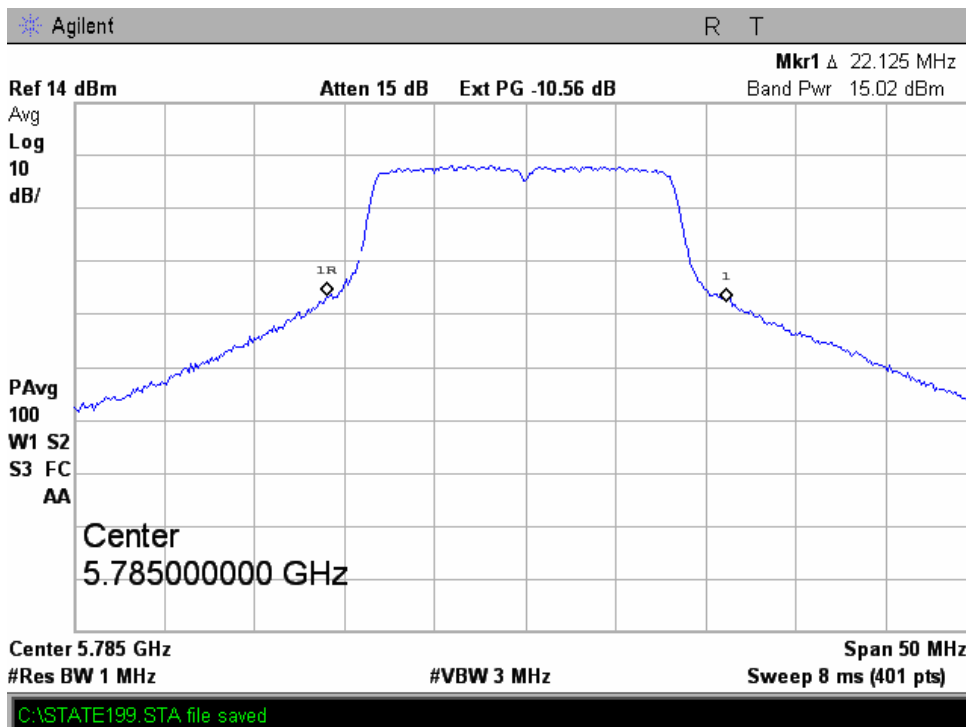


**5725-5850MHz**

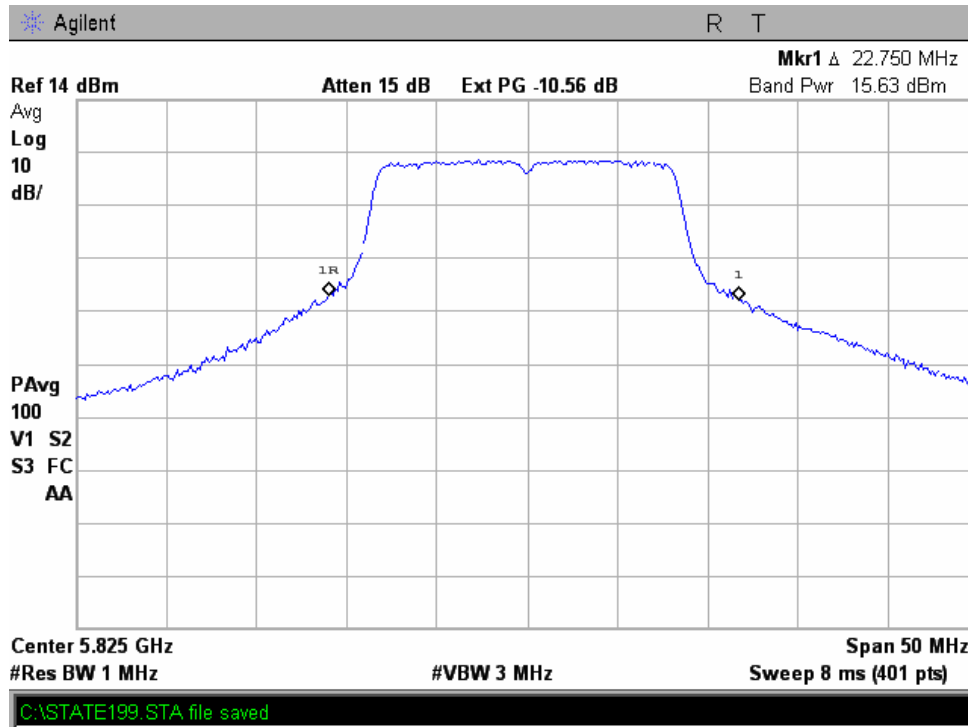
**Plot 3.2.7**



**Plot 3.2.8**



**Plot 3.2.9**



### 4.3. Peak power spectral density

Reference document:	<b>47 CFR §15.247 (e)</b>		
Test Requirements:	For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.		
Test setup:	See sec 2.1,	<b>Comply</b>	
Method of testing:	Conducted		
Operating conditions:	Under normal test conditions		
S.A. Settings:	RBW: 3 kHz, VBW: 10 kHz, Sweep Time: 100s		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 3.3.1 to 3.3.9	

### Test Results:

Worst case output of the four individual transmitters.

### 2400-2483.5 MHz Band:

Frequency [MHz]	Data Rate [Mbps]	PSD [dBm/3kHz]	Limit PSD [dBm/3kHz]	Margin [dB]	Ref Plot
<b>802.11b Mode</b>					
2412	1	+2.83	8	-5.17	3.3.1
2437	1	-1.36	8	-9.36	3.3.2
2462	1	-1.16	8	-8.12	3.3.3
<b>802.11g Mode</b>					
2412	6	-1.30	8	-9.30	3.3.4
2437	6	-1.91	8	-9.91	3.3.5
2462	6	-2.60	8	-10.60	3.3.6

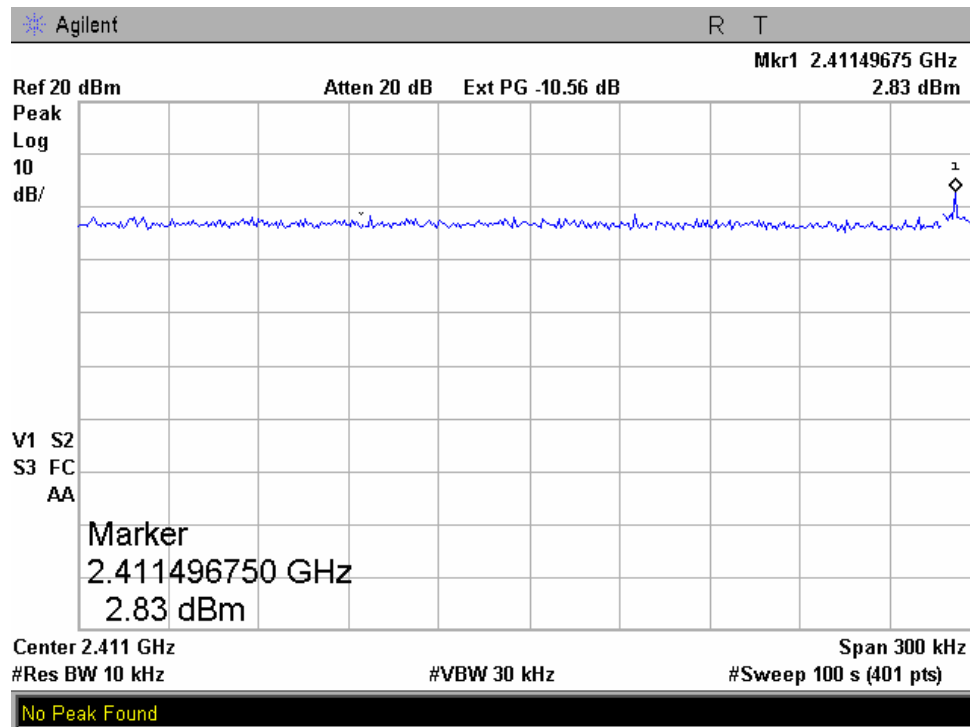
### 5725-5850MHz Band:

Frequency [MHz]	Data Rate [Mbps]	PSD [dBm/3kHz]	Limit PSD [dBm/3kHz]	Margin [dB]	Ref Plot
<b>802.11a Mode</b>					
5745	6	-9.01	8	-17.01	3.3.7
5785	6	-8.72	8	-16.72	3.3.8
5825	6	-8.01	8	-16.01	3.3.9

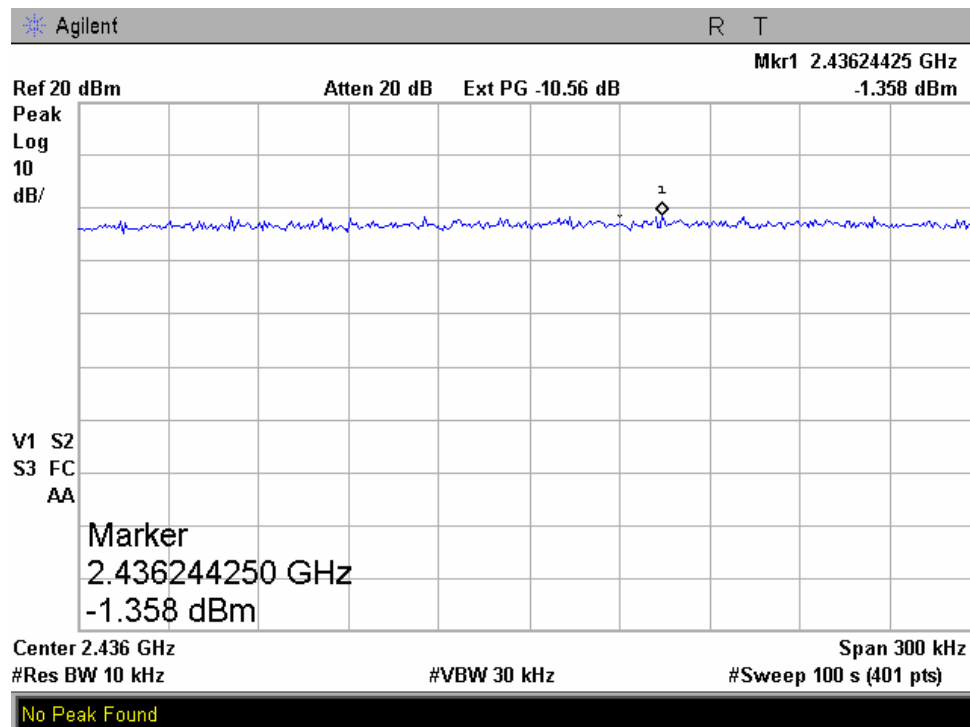


## 802.11b Mode

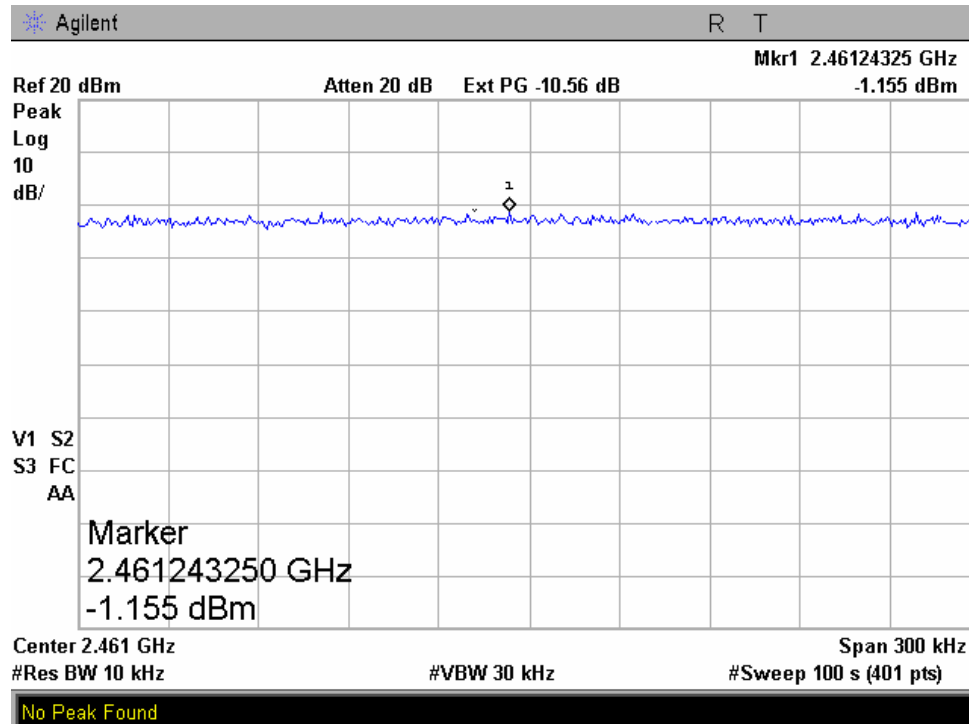
**Plot 3.3.1**



**Plot 3.3.2**

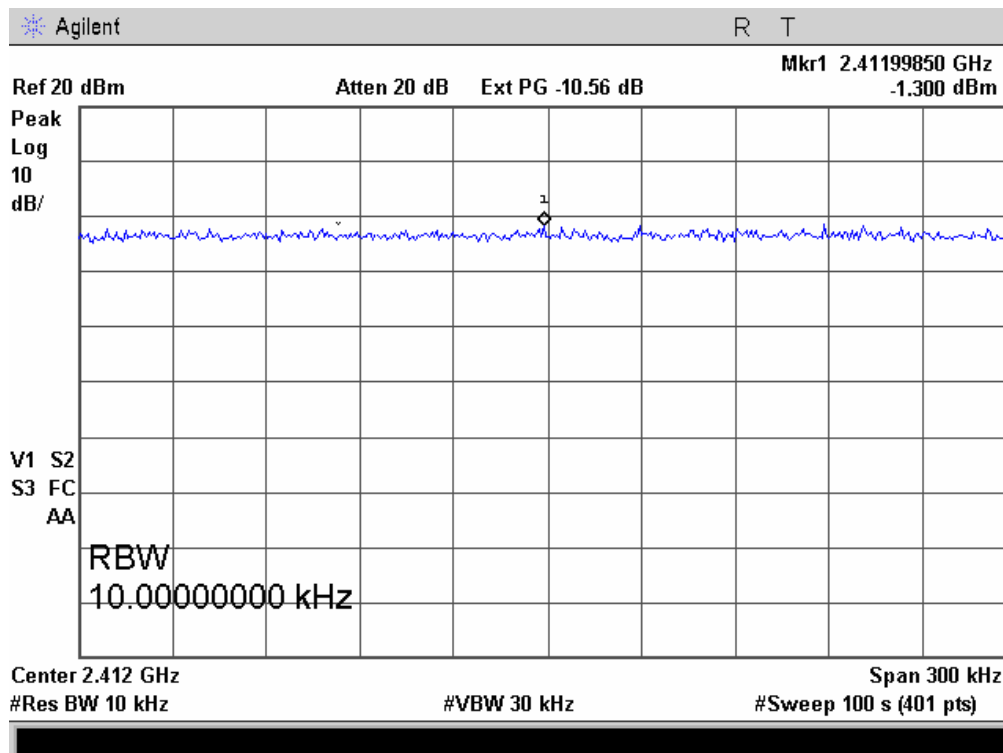


**Plot 3.3.3**

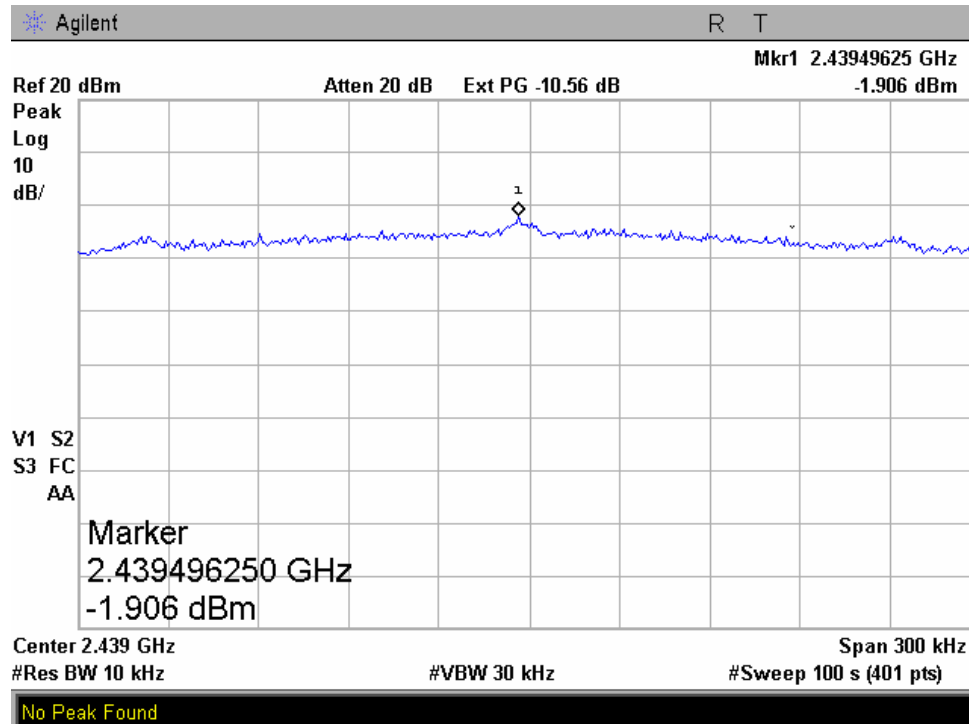


## 802.11g Mode

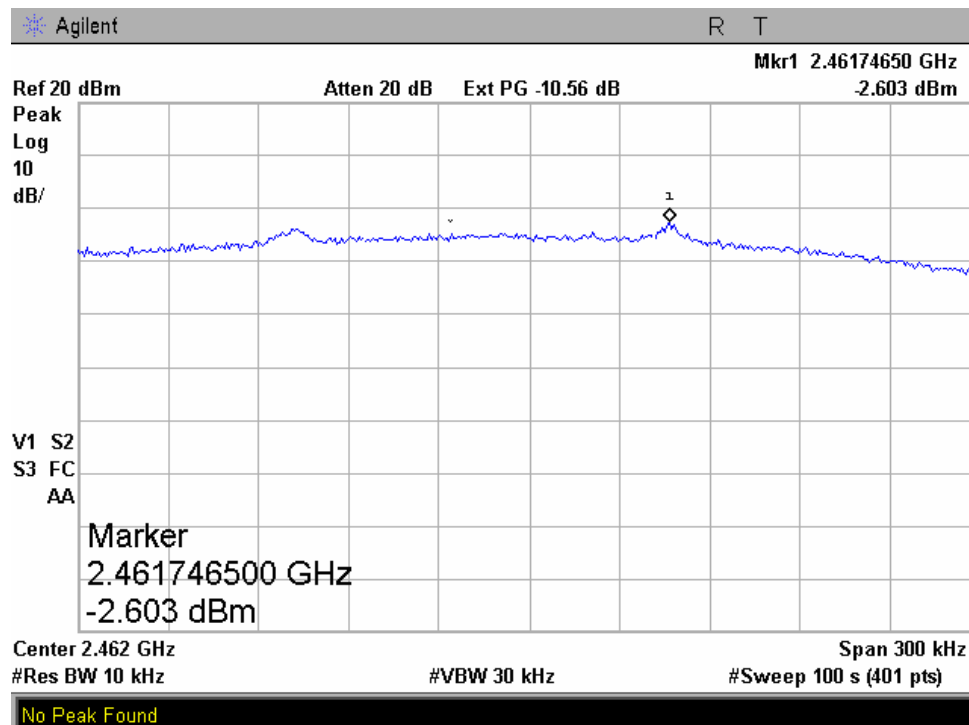
**Plot 3.3.4**



**Plot 3.3.5**

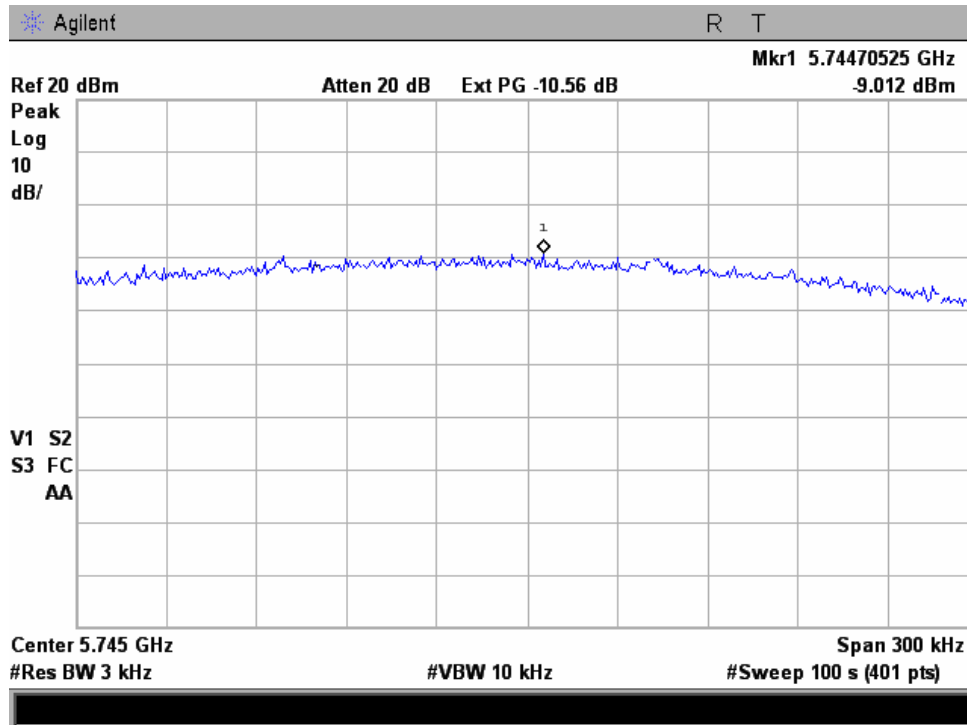


**Plot 3.3.6**

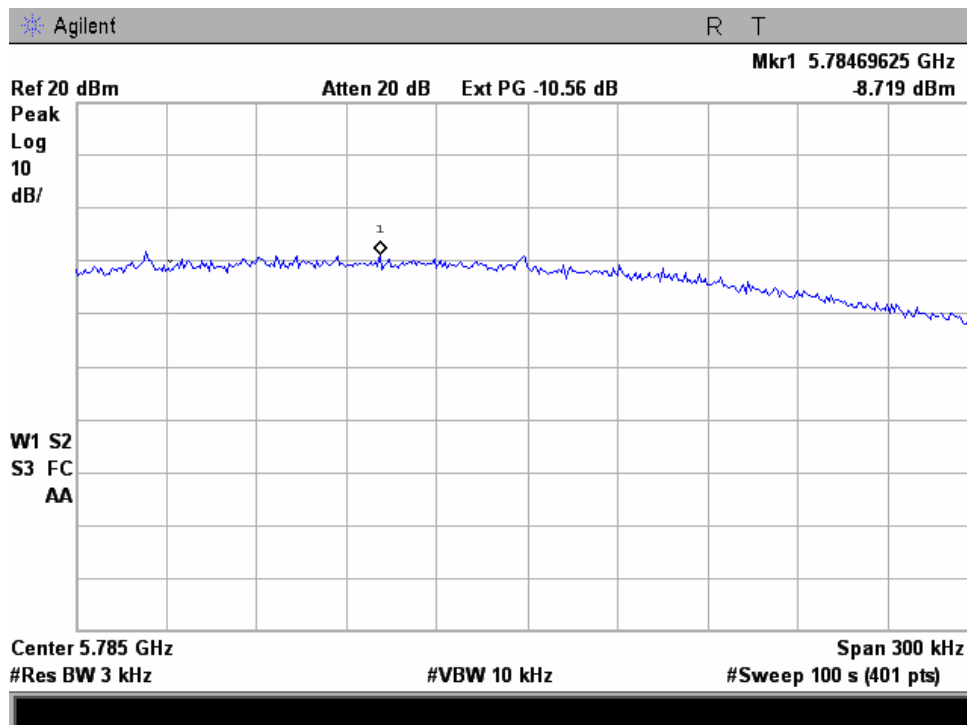


## 802.11a Mode

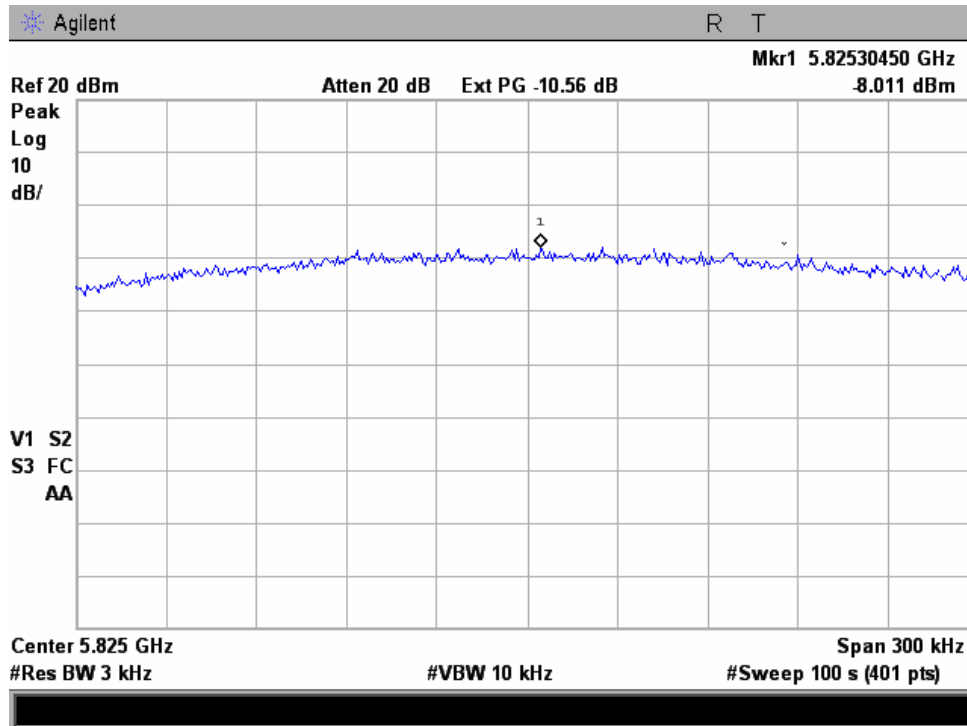
**Plot 3.3.7**



**Plot 3.3.8**



**Plot 3.3.9**



#### 4.4. Conducted Spurious Emissions

Reference document:	<b>47 CFR §15.247 (d)</b>		
Test Requirements:	In any 100 kHz bandwidth outside the frequency band in which the digitally modulated radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30dB instead of 20dB. Attenuation below the general limits specified in Section §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (See §15.205(c).		
Test setup:	See sec 2.1,	<b>Comply</b>	
Method of testing:	Conducted		
Operating conditions:	Under normal test conditions		
S.A. Settings:	RBW: 100kHz, VBW:300kHz		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 3.4.1 to 3.4.24	

**Test results:**

Worst case output of the four individual transmitters.

**2400-2483.5 MHz Band:**
**Spurious**

Frequency [MHz]	Data Rate [Mbps]	Delta value [dBc]	Delta value Limit [dBc]	Reference Plot*	Result
<b>802.11b Mode</b>					
2412	11	*	-20	3.4.1 - 3.4.2	Comply
2437	11	*	-20	3.4.3 - 3.4.4	Comply
2462	11	*	-20	3.4.5 - 3.4.6	Comply
<b>802.11g Mode</b>					
2412	54	*	-20	3.4.7 - 3.4.8	Comply
2437	54	*	-20	3.4.9 - 3.4.10	Comply
2462	54	*	-20	3.4.11 - 3.4.12	Comply

\*All emissions at least 25 dB below the limit (45dBc)

**Band edge**

Frequency [MHz]	Data Rate [Mbps]	Delta value [dBc]	Delta value Limit [dBc]	Reference	Result
<b>802.11b Mode</b>					
2412	11	-48.54	-20	3.4.13	Comply
2462	11	-48.64	-20	3.4.14	Comply
<b>802.11g Mode</b>					
2412	54	-25.70	-20	3.4.15	Comply
2462	54	-43.27	-20	3.4.16	Comply

**5725-5850MHz Band:**
**Spurious**

Frequency [MHz]	Data Rate [Mbps]	Delta value [dBc]	Delta value Limit [dBc]	Reference	Result
<b>802.11a Mode</b>					
5745	54	*	-20	3.4.17 - 3.4.18	Comply
5785	54	*	-20	3.4.19 - 3.4.20	Comply
5825	54	*	-20	3.4.21 - 3.4.22	Comply

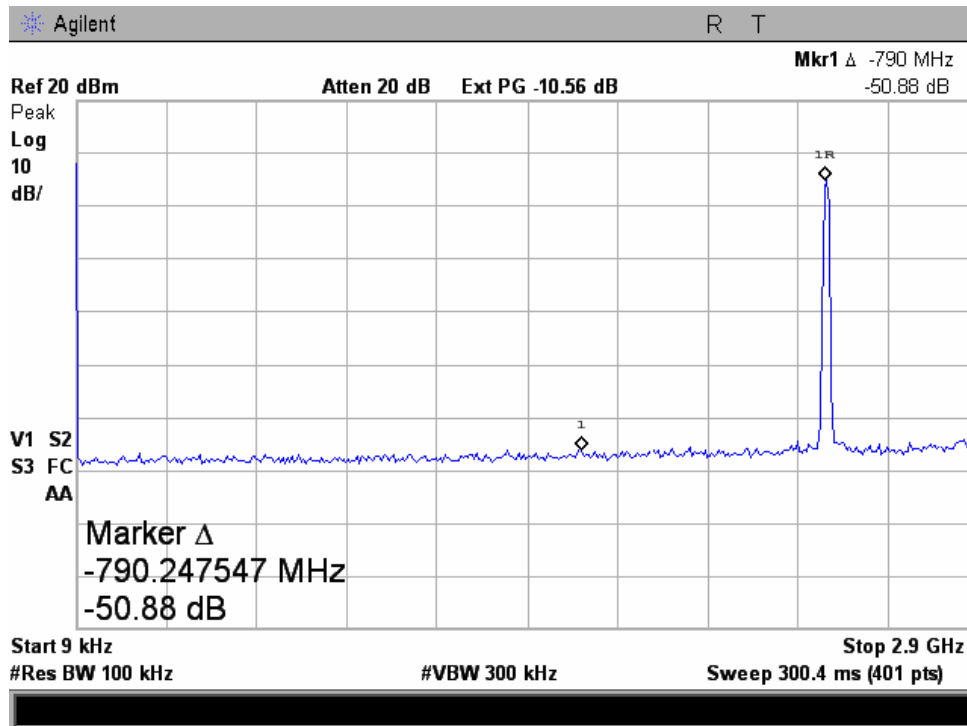
\*All emissions at least 25 dB below the limit (45dBc)

**Band edge**

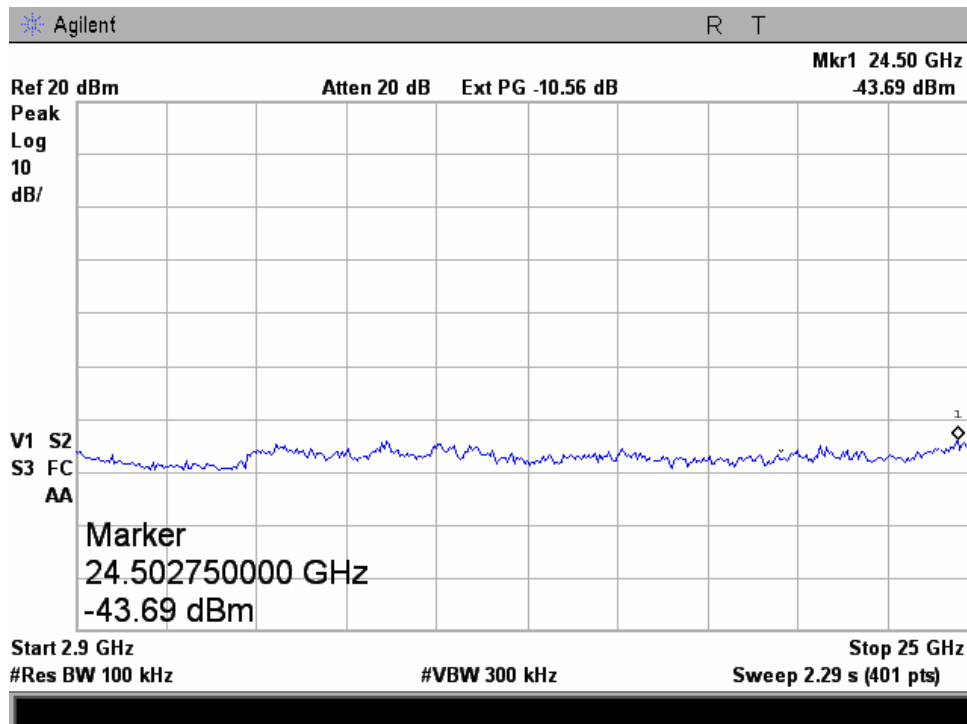
Frequency [MHz]	Data Rate [Mbps]	Delta value [dBc]	Delta value Limit [dBc]	Reference	Result
<b>802.11a Mode</b>					
5745	54	-48.16	-20	3.4.23	Comply
5825	54	-47.99	-20	3.4.24	Comply

## 802.11b Mode

**Plot 3.4.1**

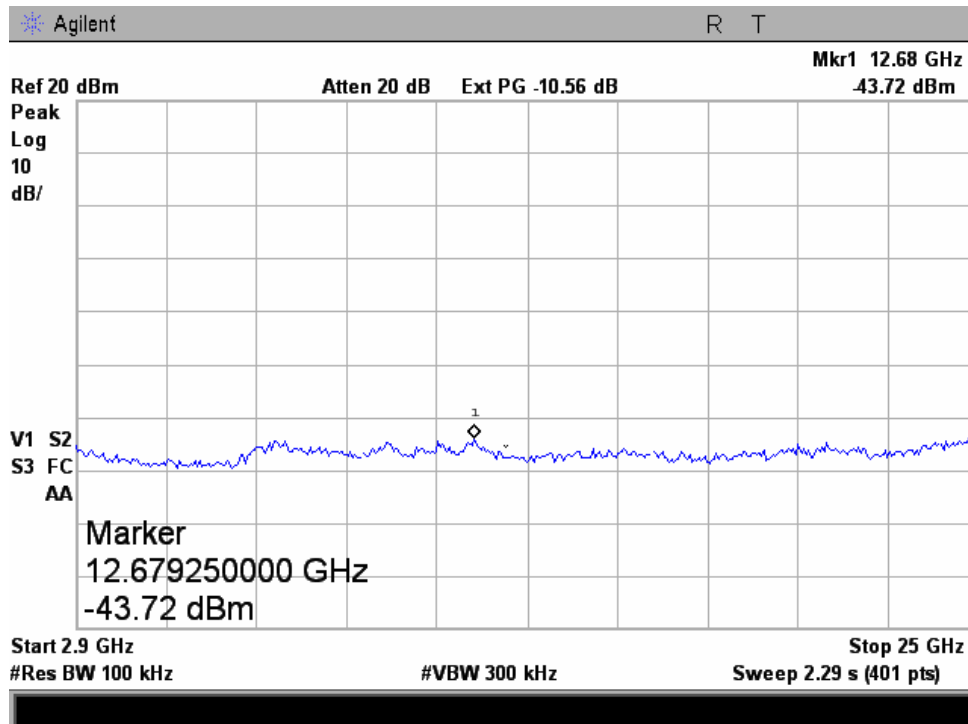


**Plot 3.4.2**

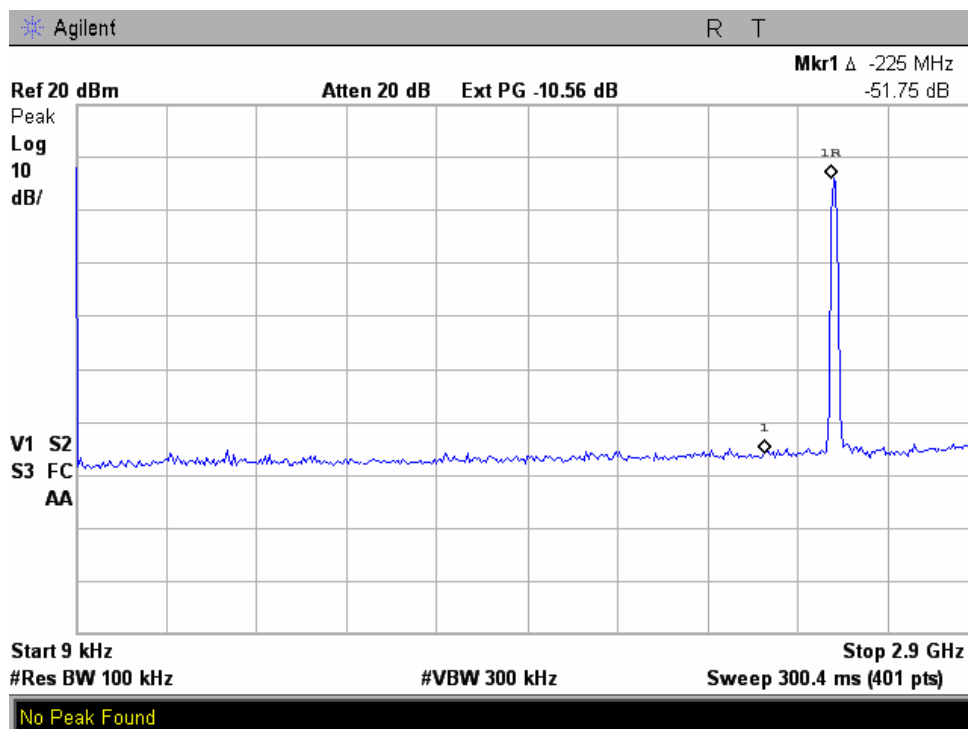




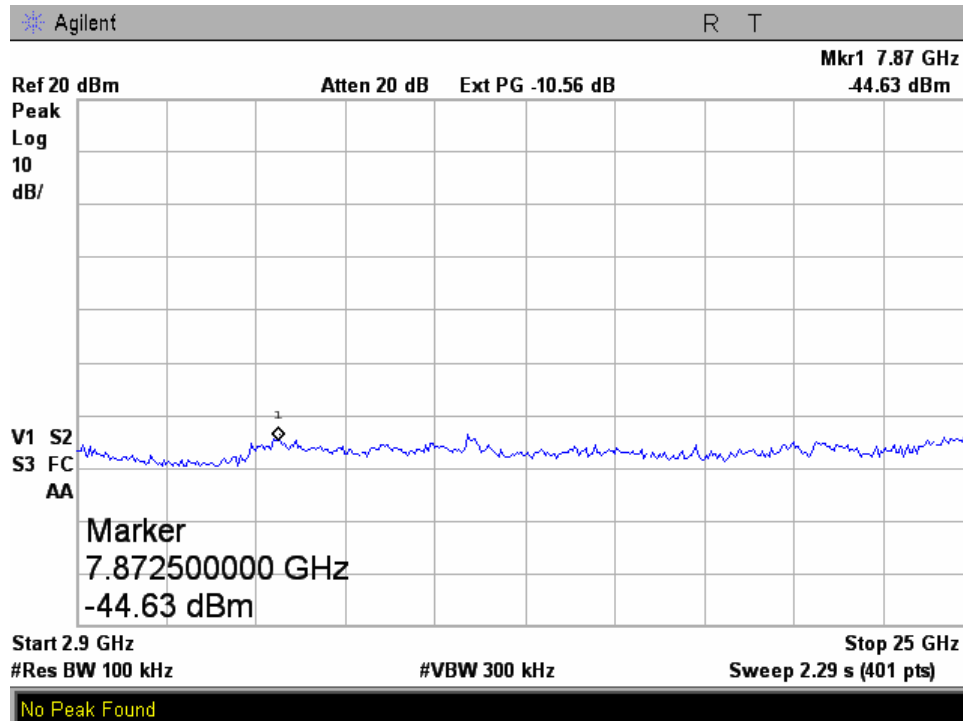
**Plot 3.4.3**



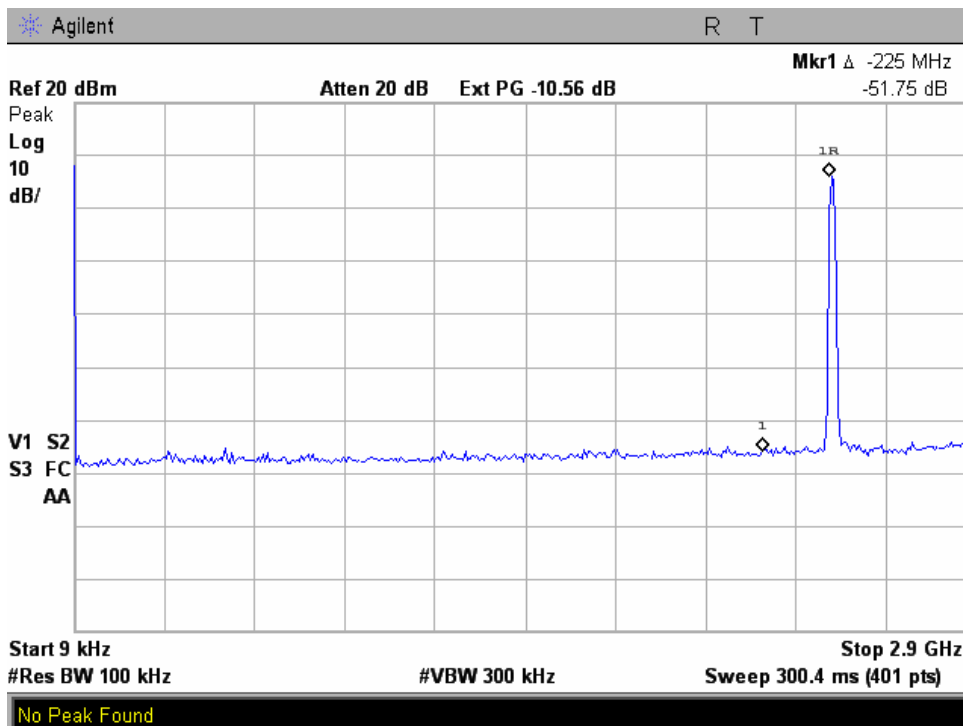
**Plot 3.4.4**



**Plot 3.4.5**

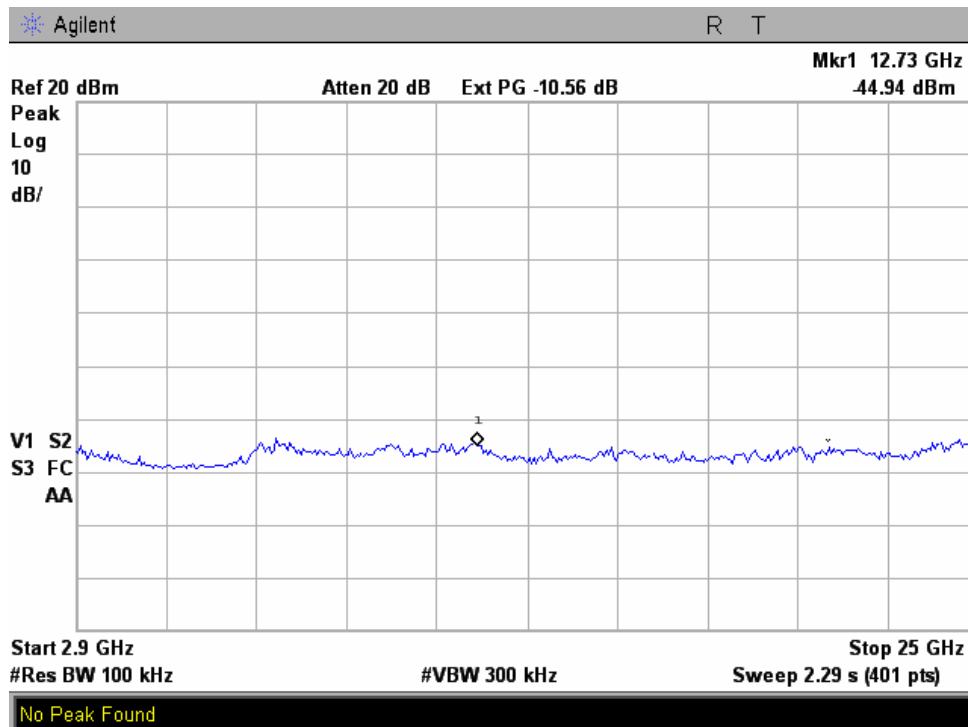


**Plot 3.4.6**

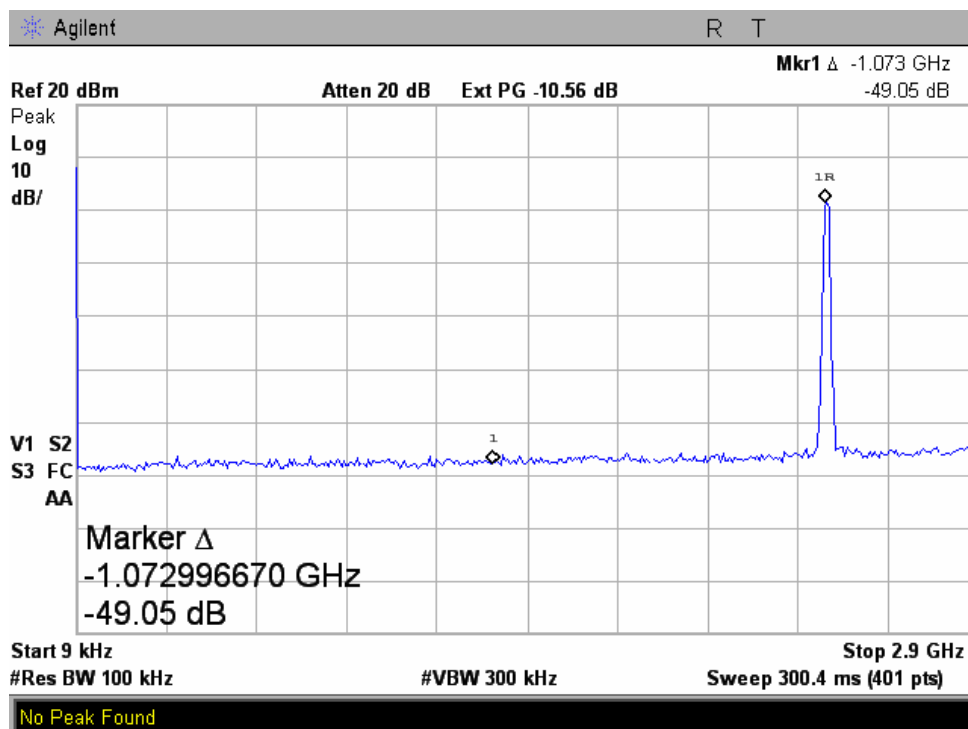


## 802.11g Mode

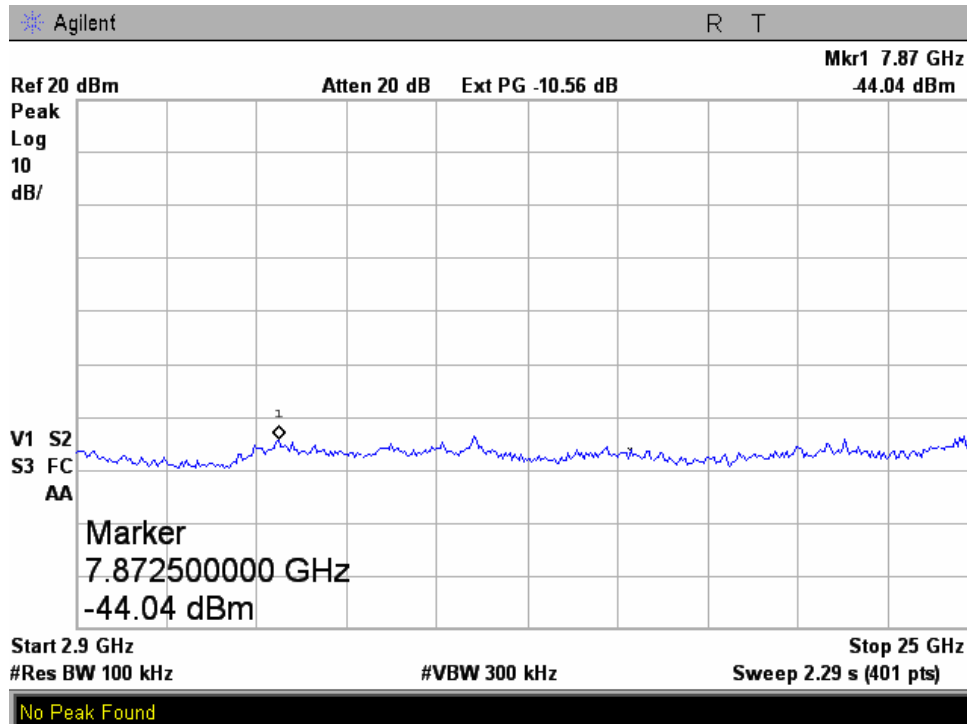
**Plot 3.4.7**



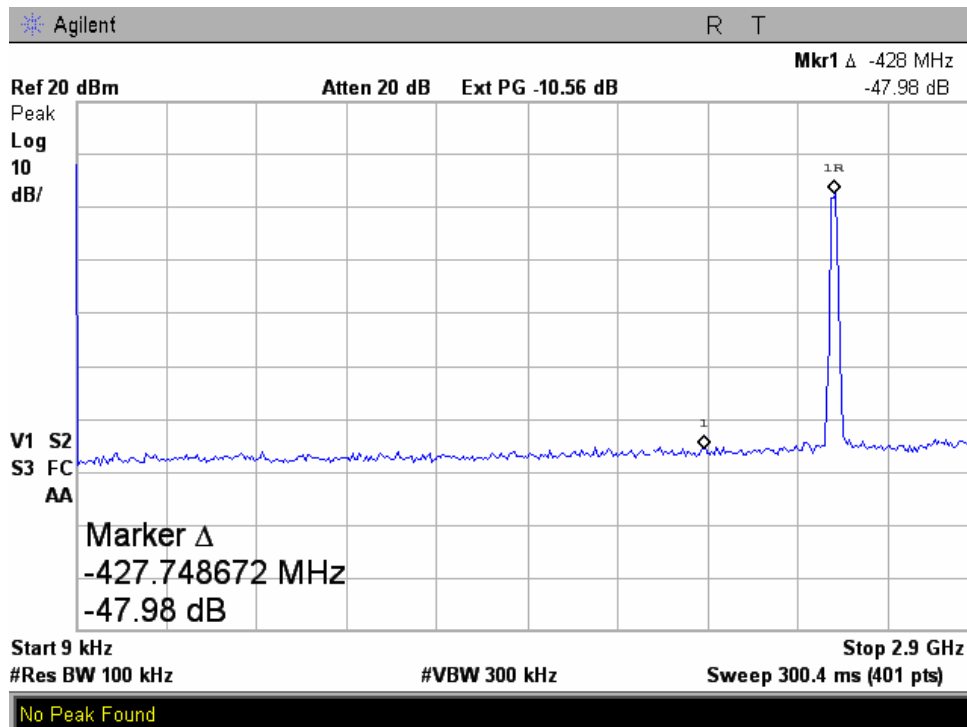
**Plot 3.4.8**



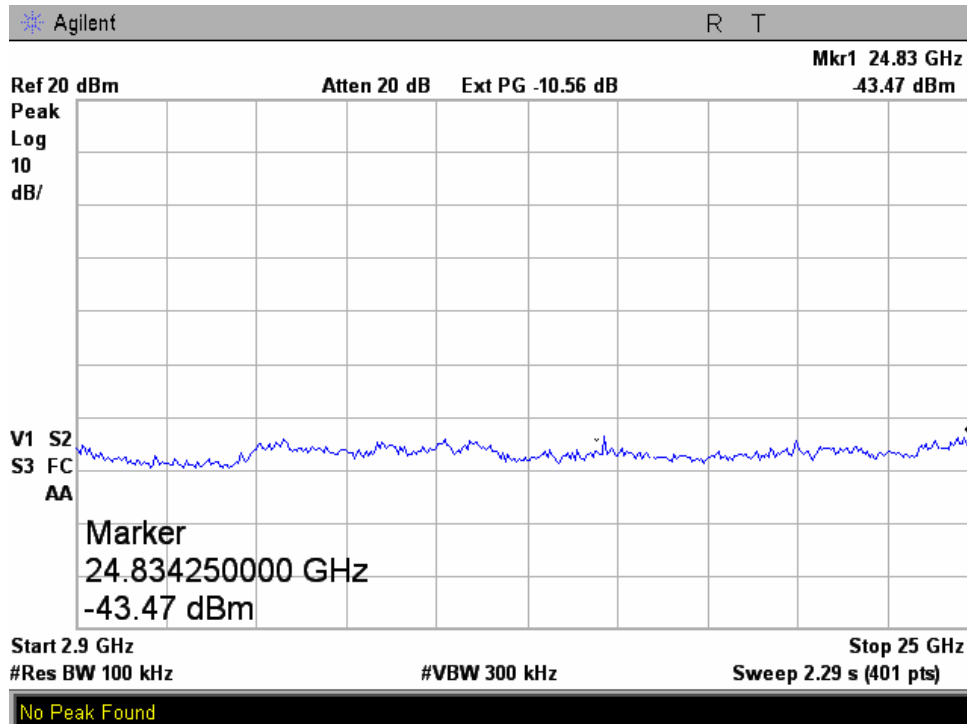
**Plot 3.4.9**



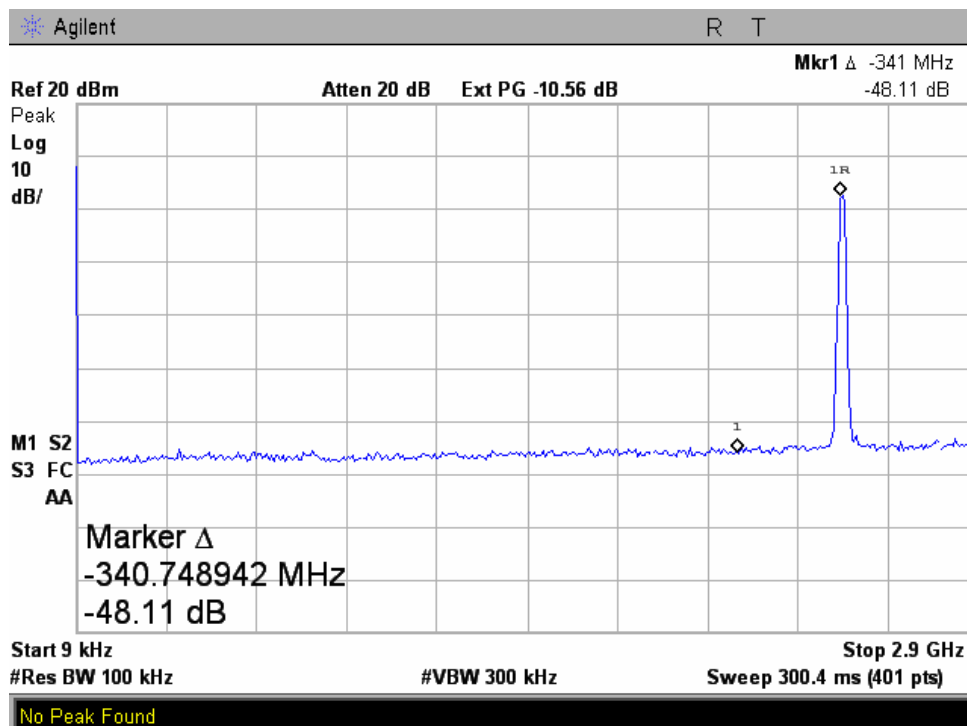
**Plot 3.4.10**



**Plot 3.4.11**

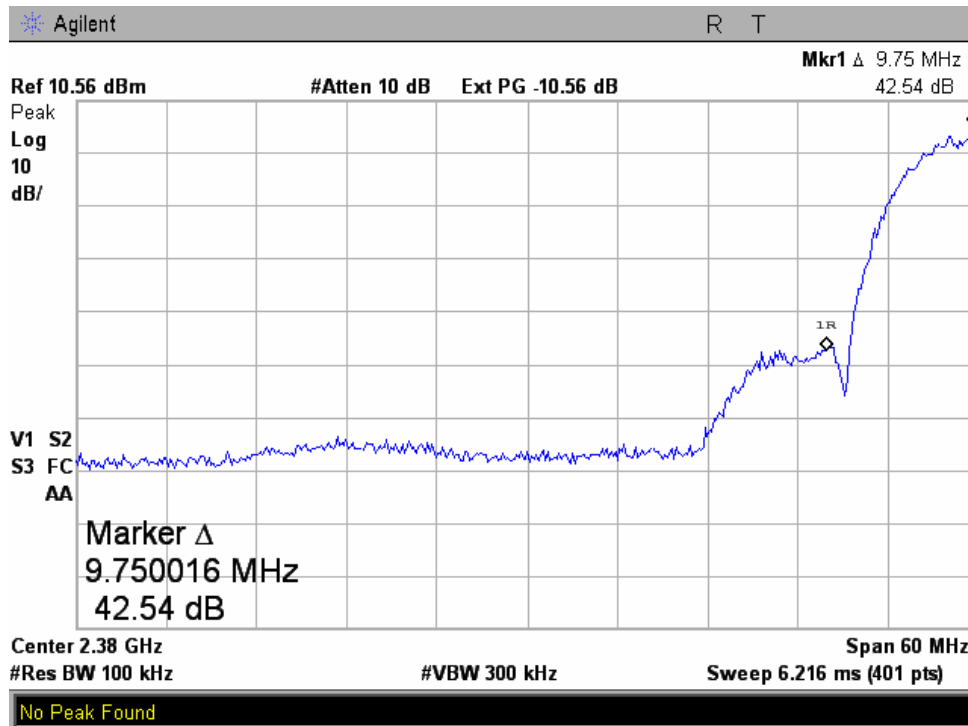


**Plot 3.4.12**

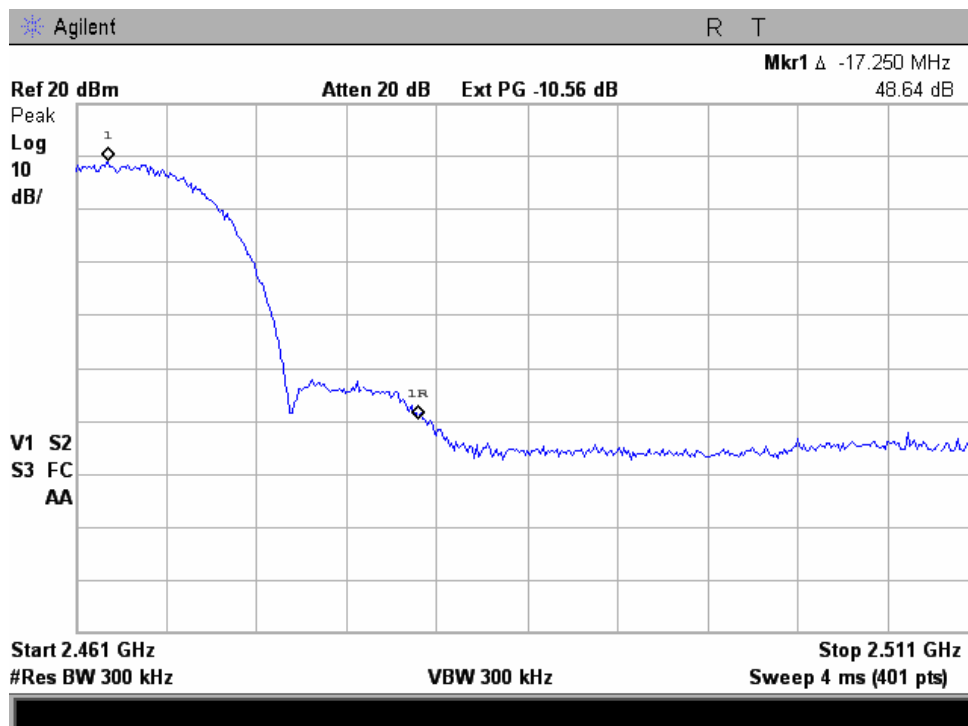


## 802.11b Mode

Plot 3.4.13

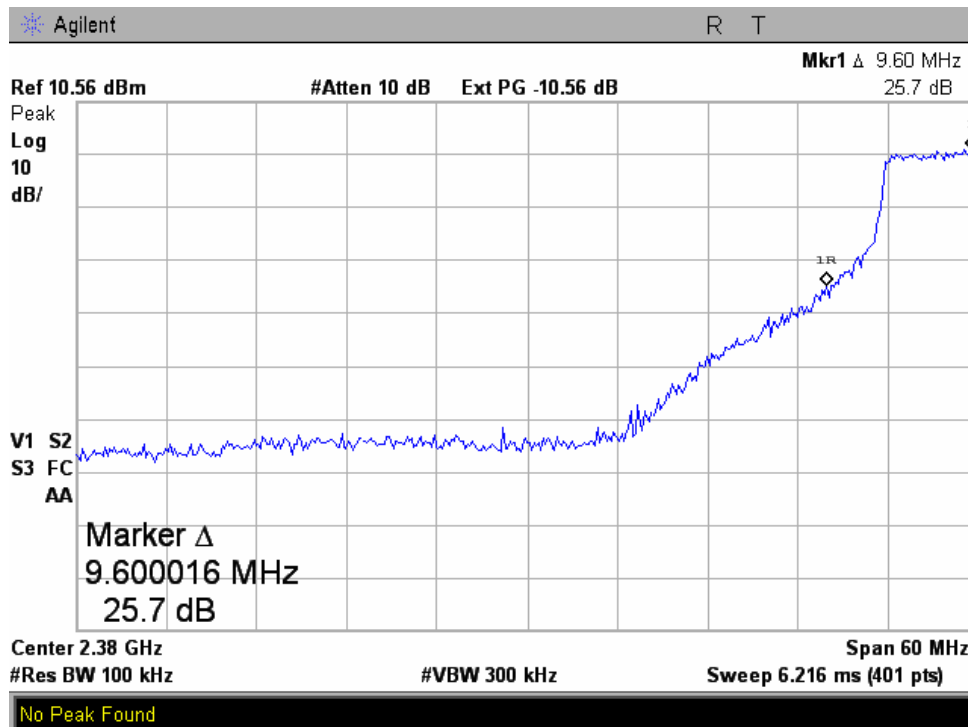


Plot 3.4.14

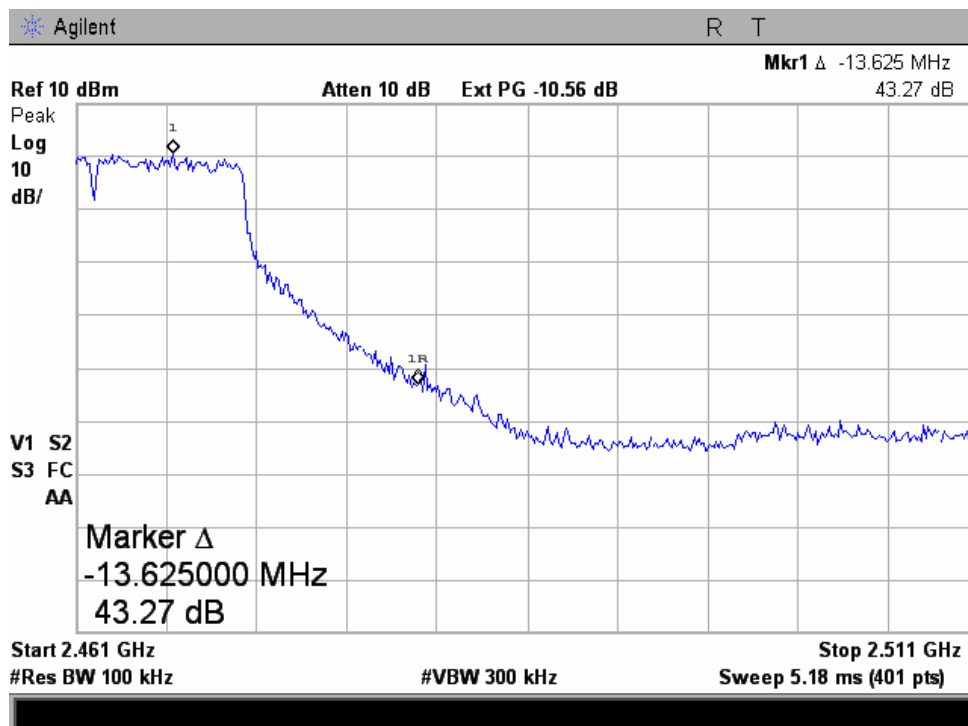


## 802.11g Mode

Plot 3.4.15

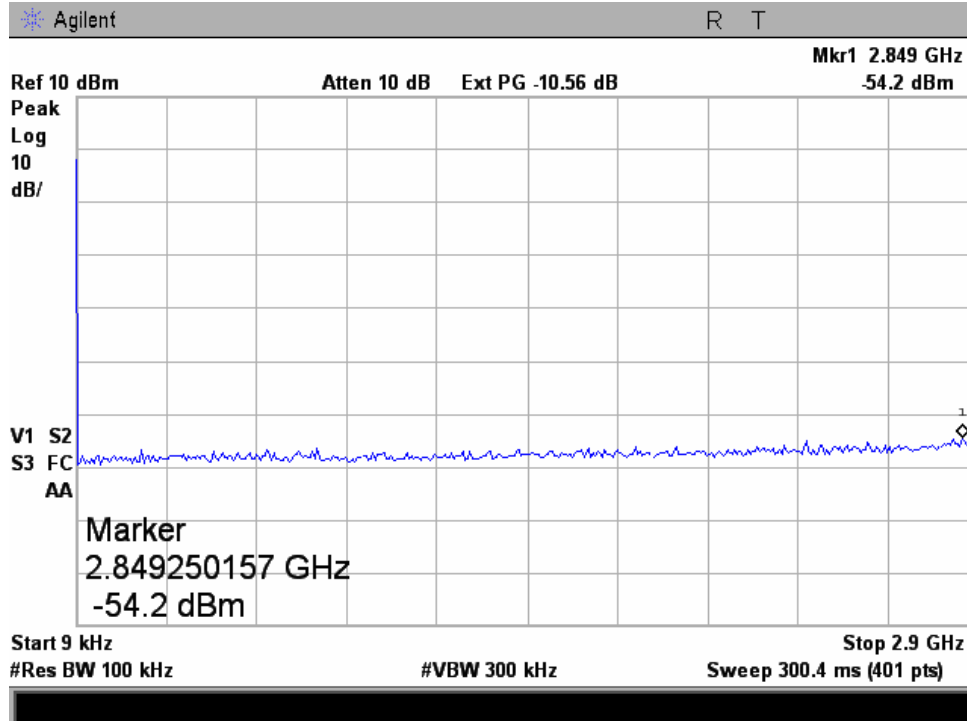


Plot 3.4.16

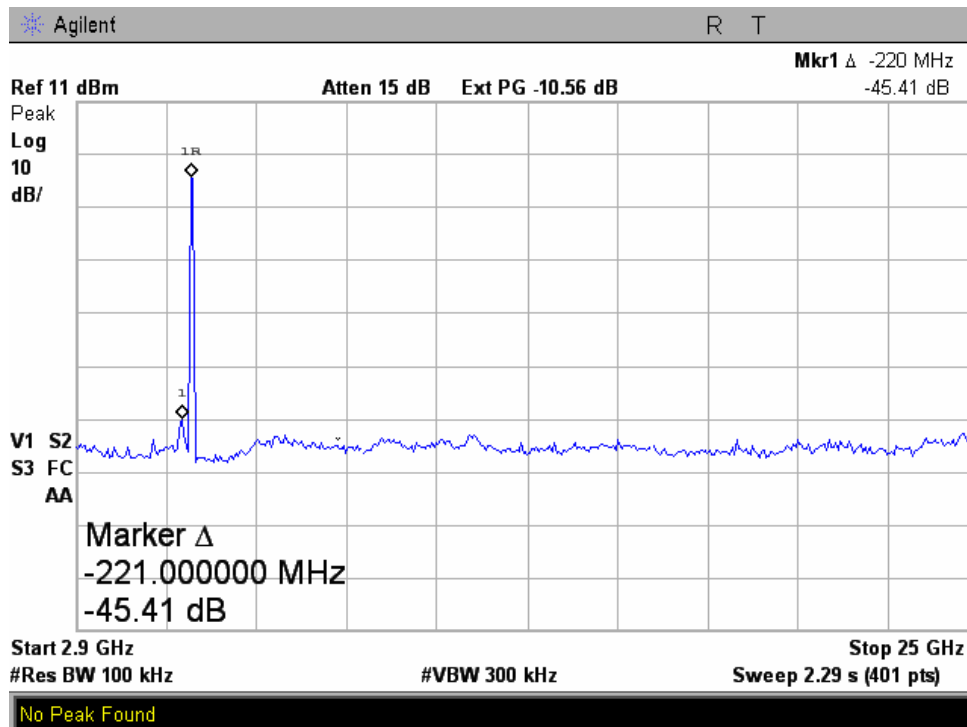


## 802.11a Mode

**Plot 3.4.17**

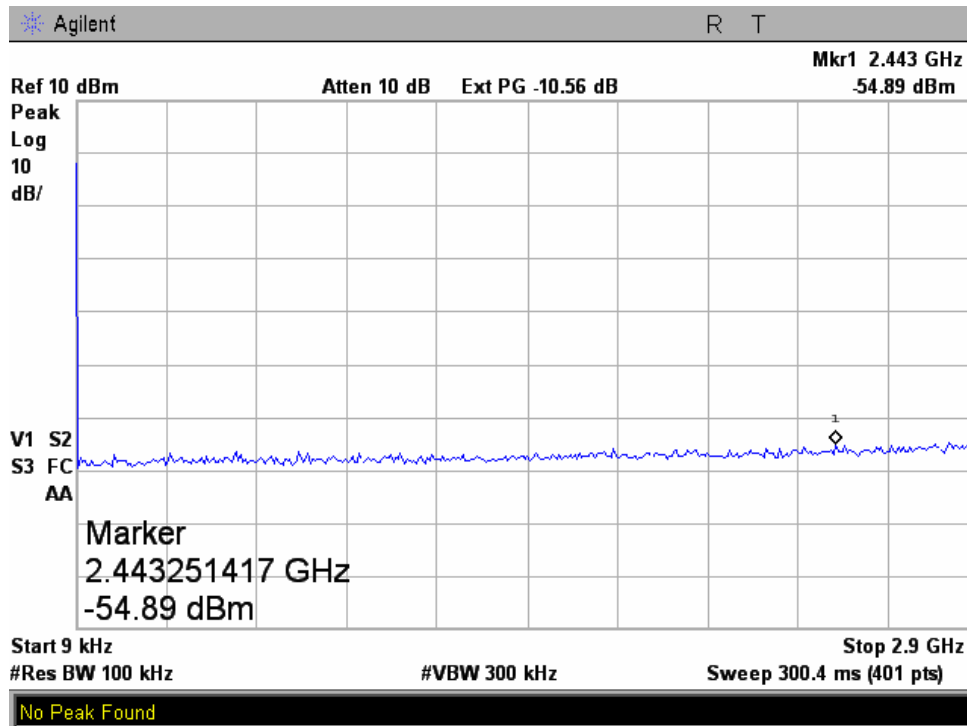


**Plot 3.4.18**

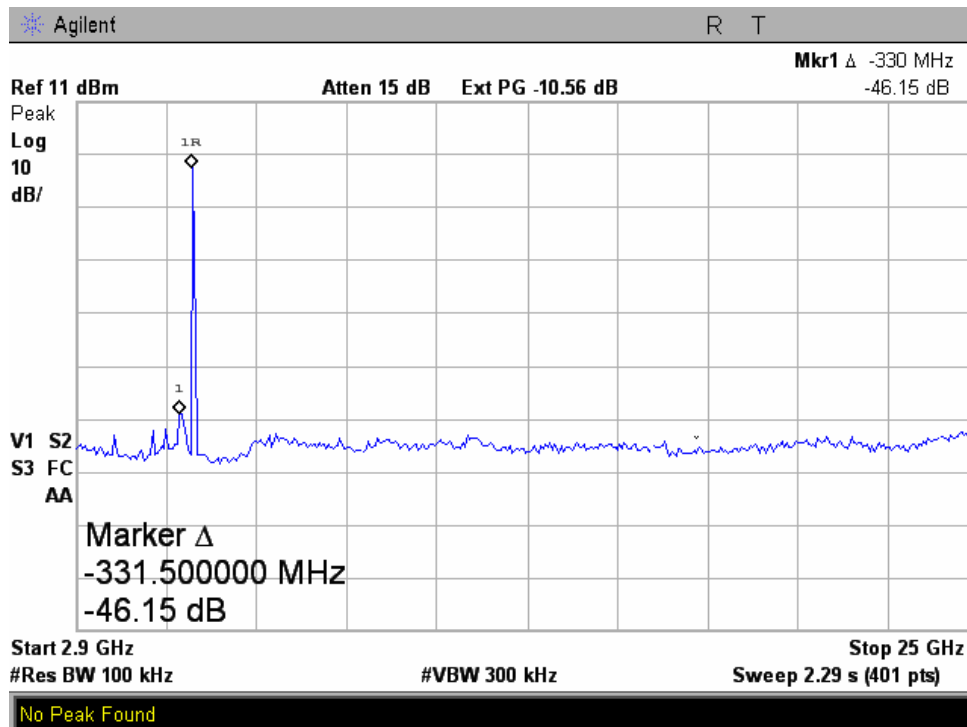




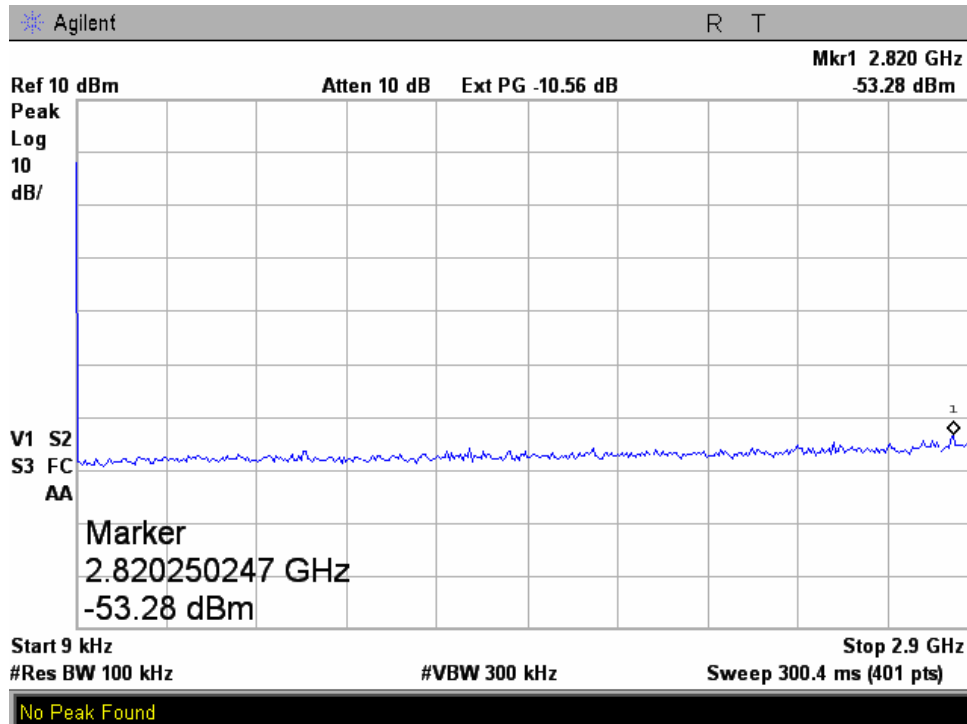
**Plot 3.4.19**



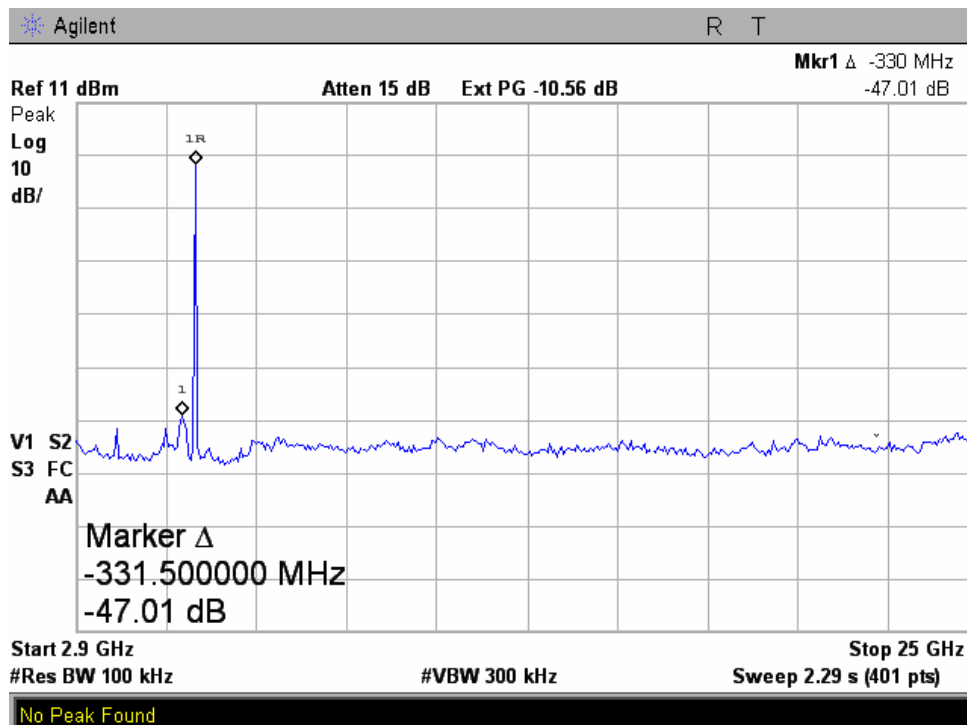
**Plot 3.4.20**



**Plot 3.4.21**

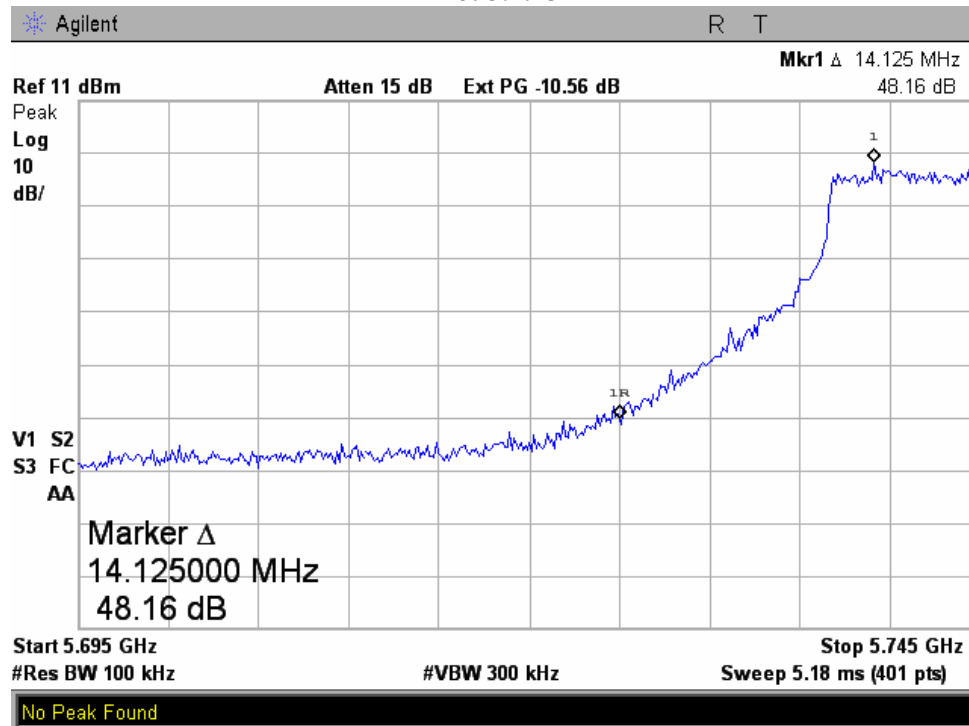


**Plot 3.4.22**

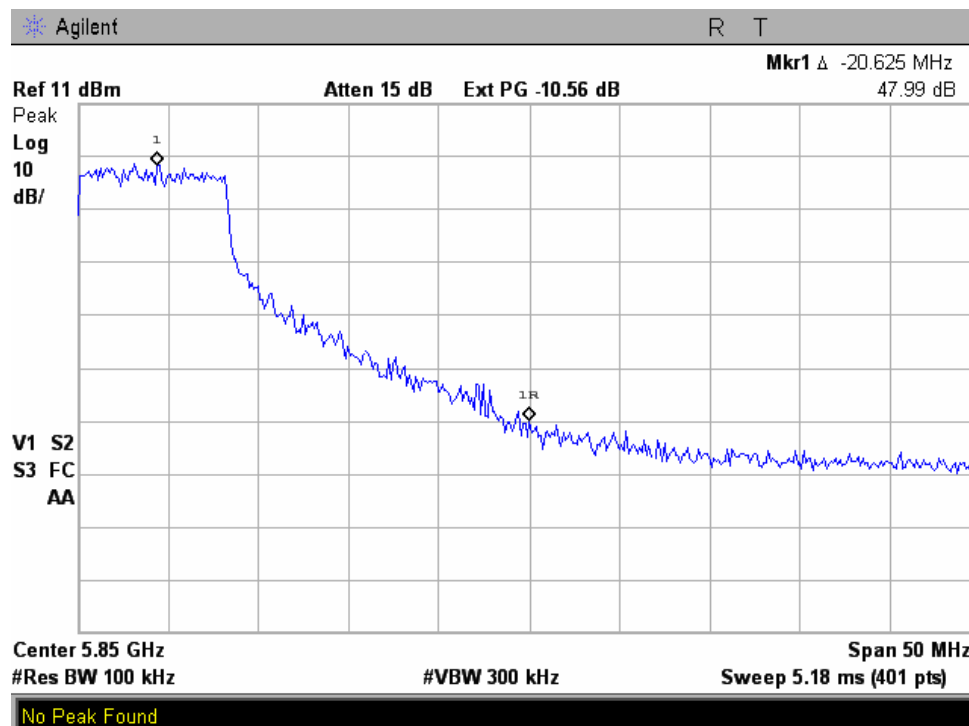


## 802.11a Mode

**Plot 3.4.23**



**Plot 3.4.24**



#### 4.5. Spurious Radiated Emissions, Restricted Bands 2310-2390MHz & 2483.5-2500MHz

Reference document:	<b>47 CFR §15.247 (d) &amp; §15.205</b>		
Test Requirements:	Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (See §15.205(c)).		
Test setup:	See sec 2.2,	<b>Comply</b>	
Method of testing:	Radiated		
Operating conditions:	Under normal test conditions		
S.A. Settings:	Peak: RBW= 1MHz, VBW= 1MHz, Average: VBW= 10 Hz		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 3.5.1 to 3.5.16	

#### Test results:

Worst case emission of the four transmitters operating simultaneously.

Frequency [MHz]	Data Rate [Mbps]	Antenna Gain [dBi]	Emission Frequency [MHz]	Detector Type	Polarization V/H	Emission Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]
<b>802.11b Mode</b>								
2412	11	4	2319.58	Avg	H	35.26	54	-18.74
2412	11	4	2369.53	Peak	H	49.45	74	-24.55
2462	11	4	2499.90	Avg	H	35.28	54	-18.72
2462	11	4	2499.30	Peak	H	49.44	74	-24.56
<b>802.11g Mode</b>								
2412	54	4	2390.00	Avg	H	42.95	54	-11.05
2412	54	4	2390.00	Peak	H	62.68	74	-11.32
2462	54	4	2483.50	Avg	H	42.72	54	-11.28
2462	54	4	2483.50	Peak	H	62.03	74	-11.97

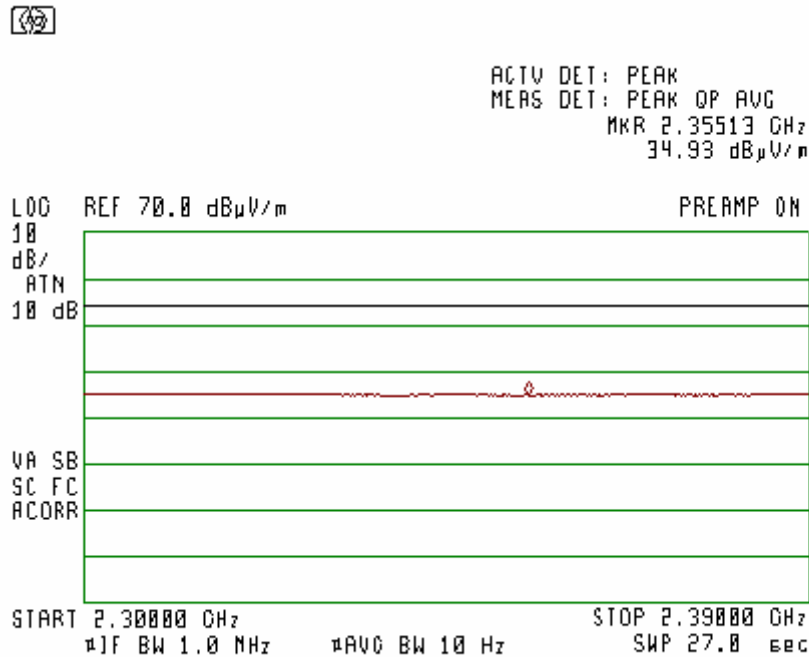
**Note:** Spurious Emission [dBμV/m] = measured [dBμV] + Correction-factor [dB (1/m)]

Correction Factor = Antenna factor + Cable Loss

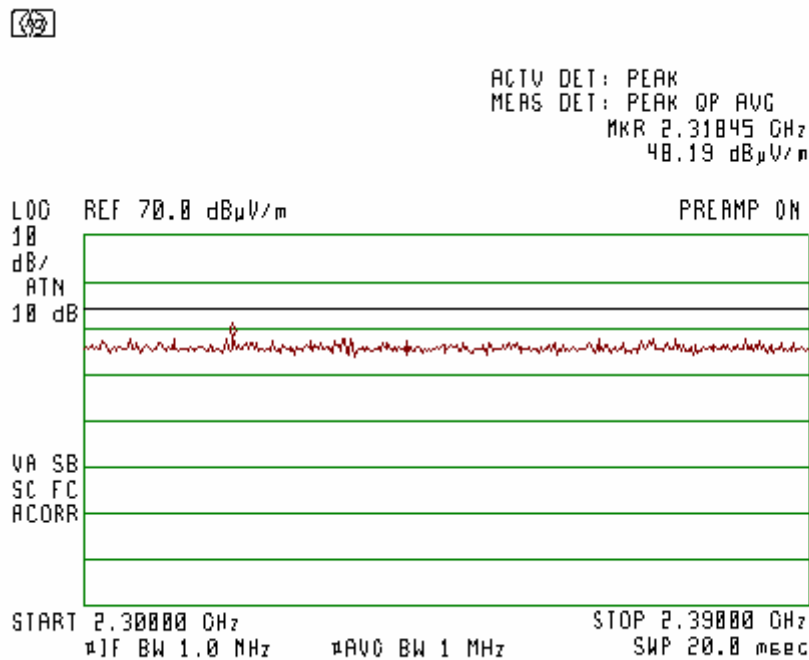
## 11 Mbit, Lowest Frequency

### Vertical Polarization

#### Average Plot 3.5.1

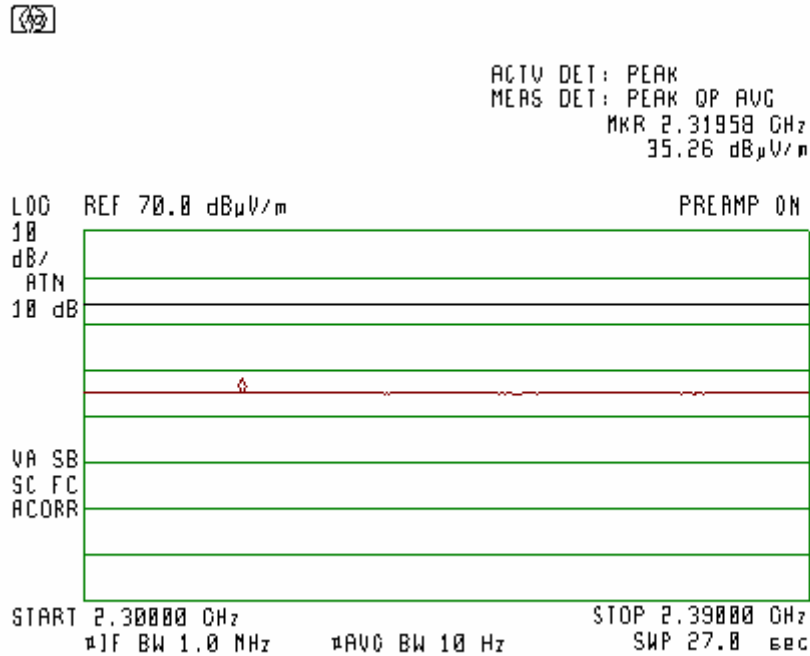


#### Peak Plot 3.5.2

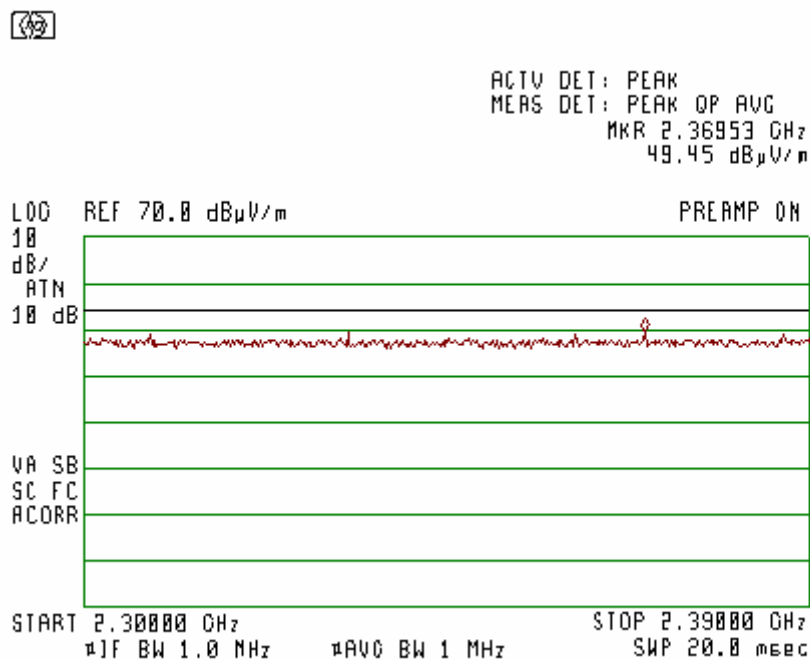


## Horizontal Polarization

### Average Plot 3.5.3



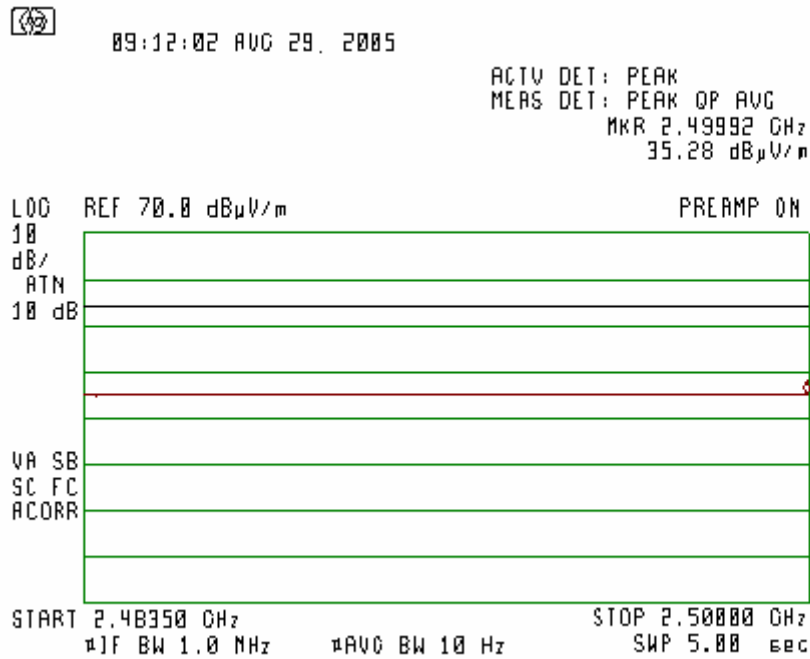
### Peak Plot 3.5.4



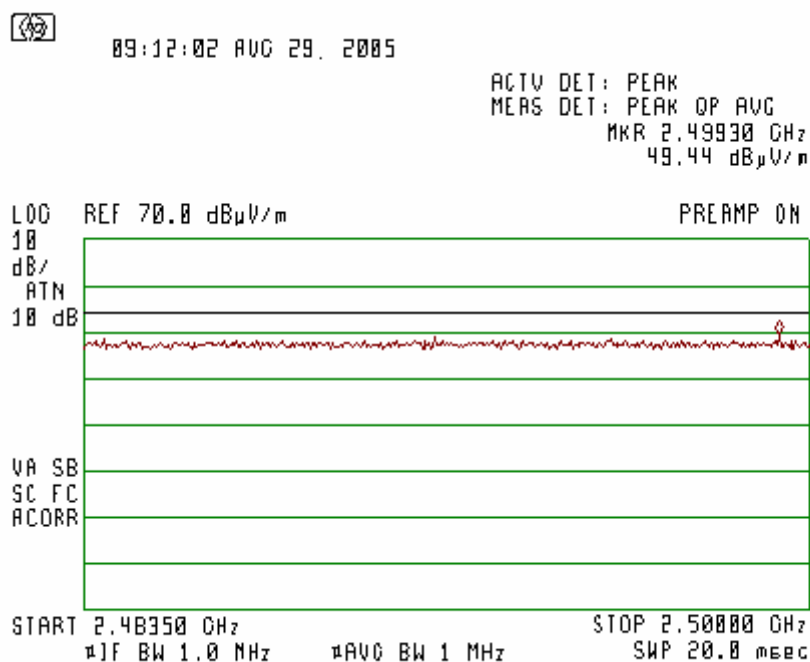
## 11 Mbit, Highest Frequency

### Horizontal Polarization

#### Average Plot 3.5.5

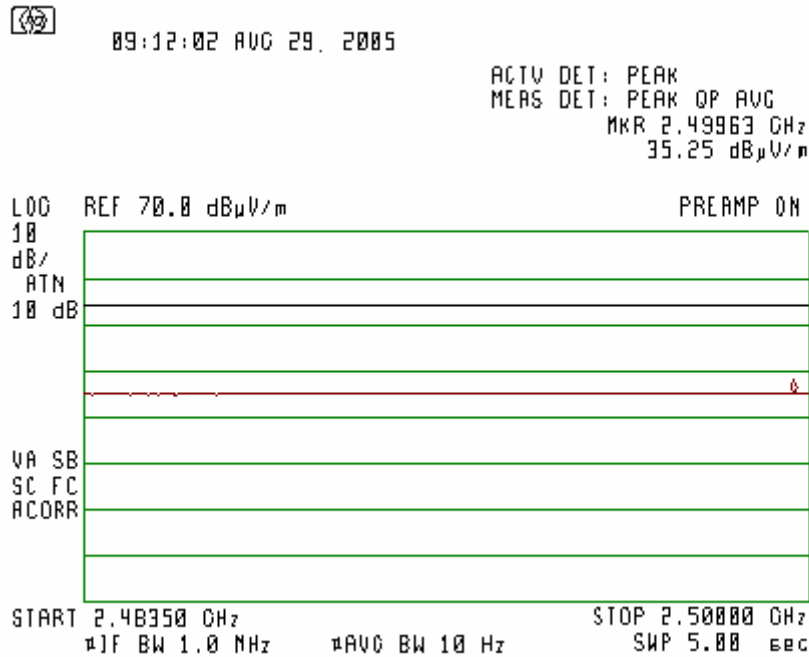


#### Peak Plot 3.5.6

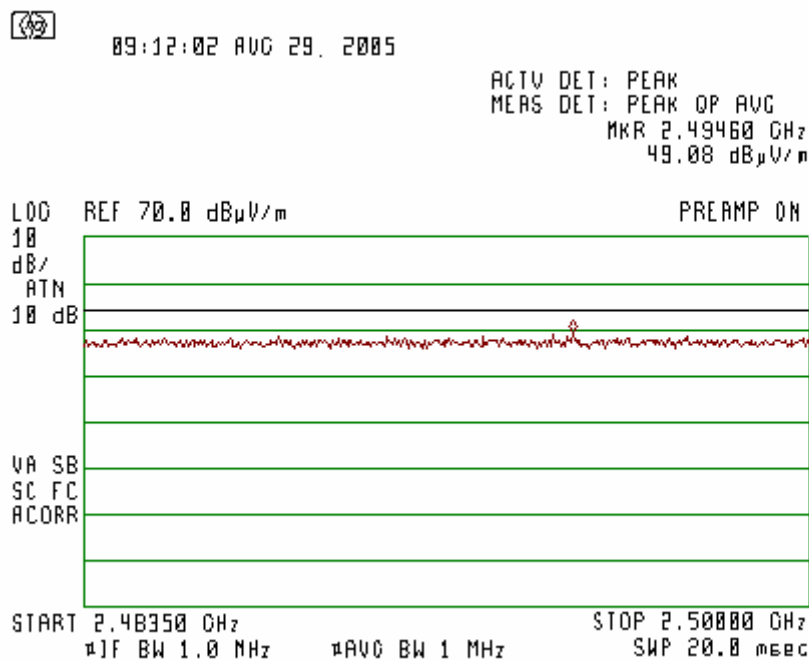


### Vertical Polarization

#### Average Plot 3.5.7

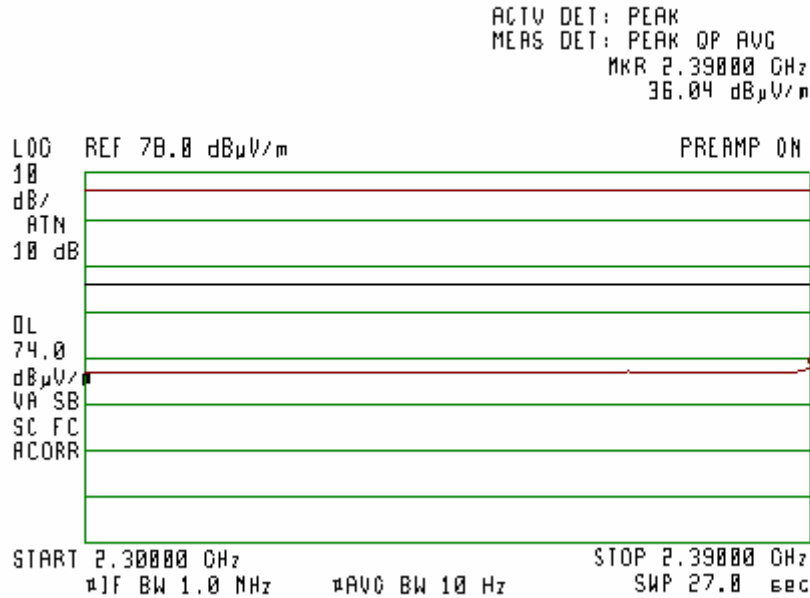


#### Peak Plot 3.5.8

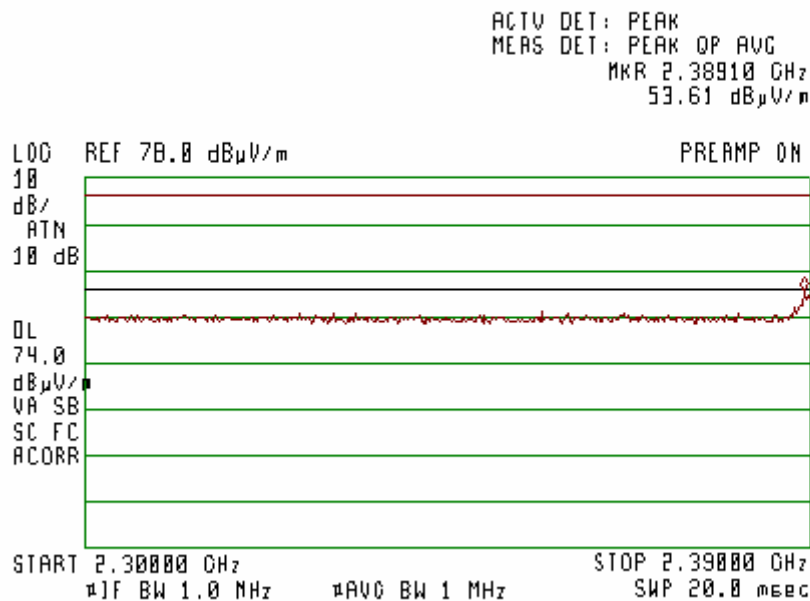




**54 Mbit, Lowest Frequency  
Vertical Polarization  
Average  
Plot 3.5.9**

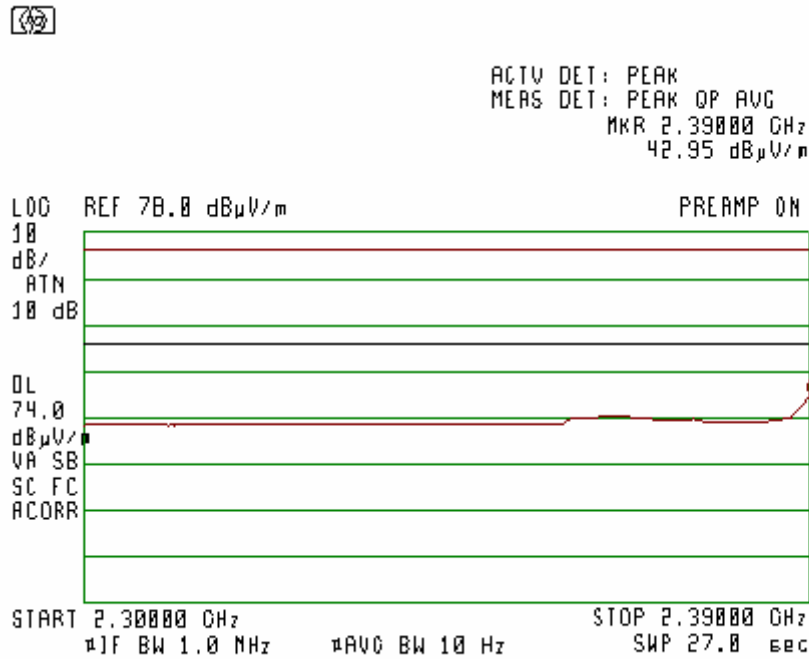


**Peak  
Plot 3.5.10**

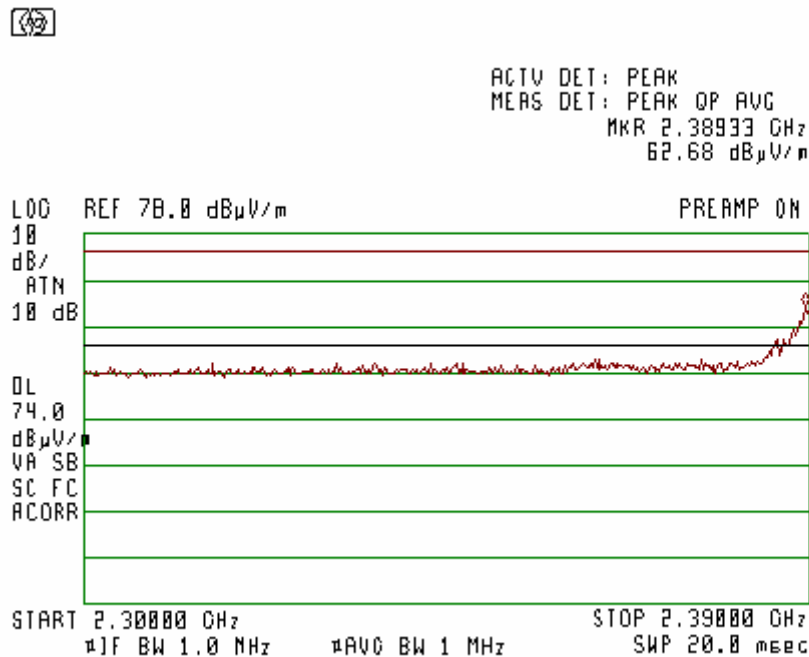


## Horizontal Polarization

### Average Plot 3.5.11



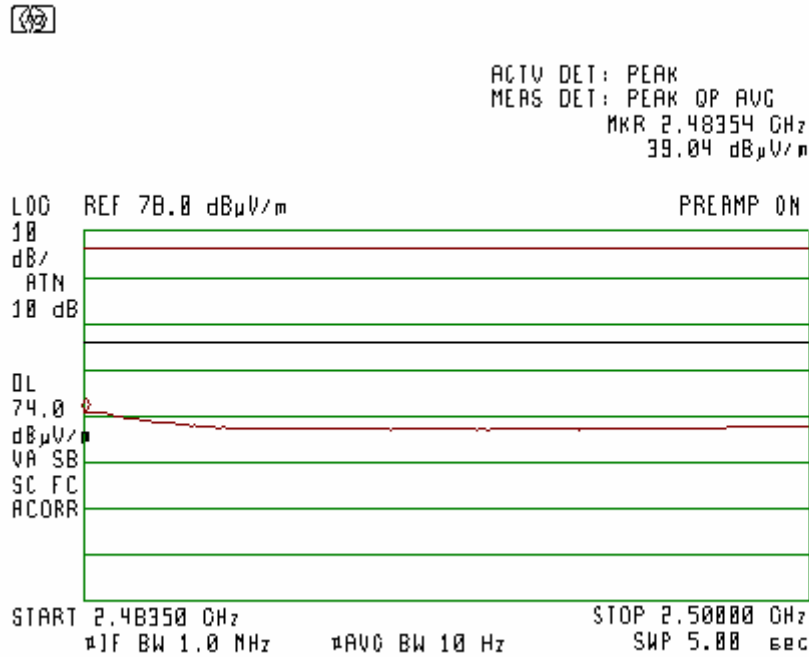
### Peak Plot 3.5.12



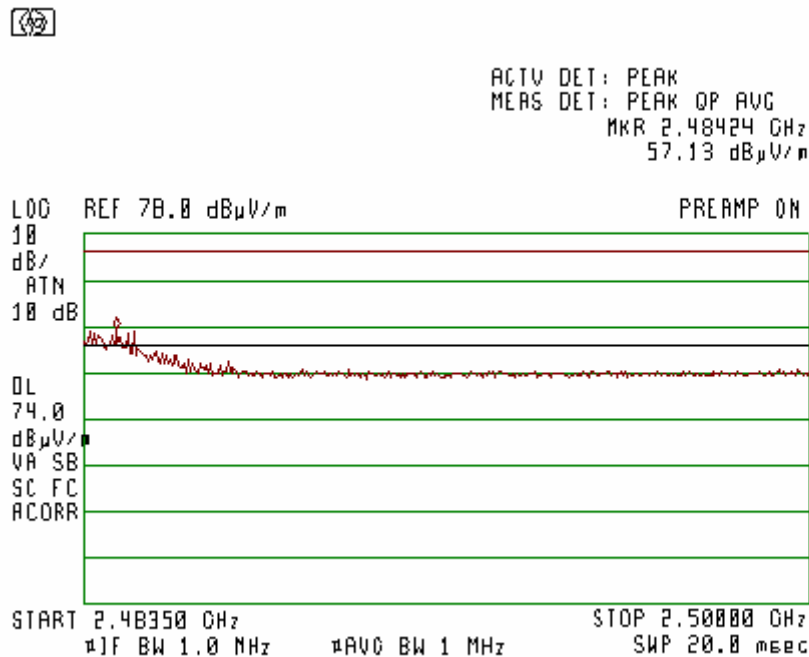
**54 Mbit, Highest Frequency**

**Vertical Polarization**

**Average  
Plot 3.5.13**

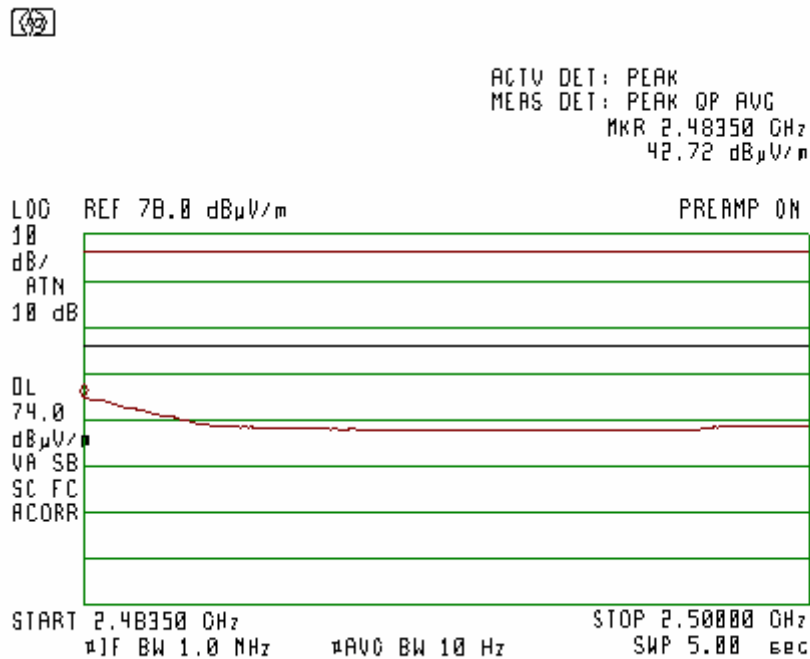


**Peak  
Plot 3.5.14**

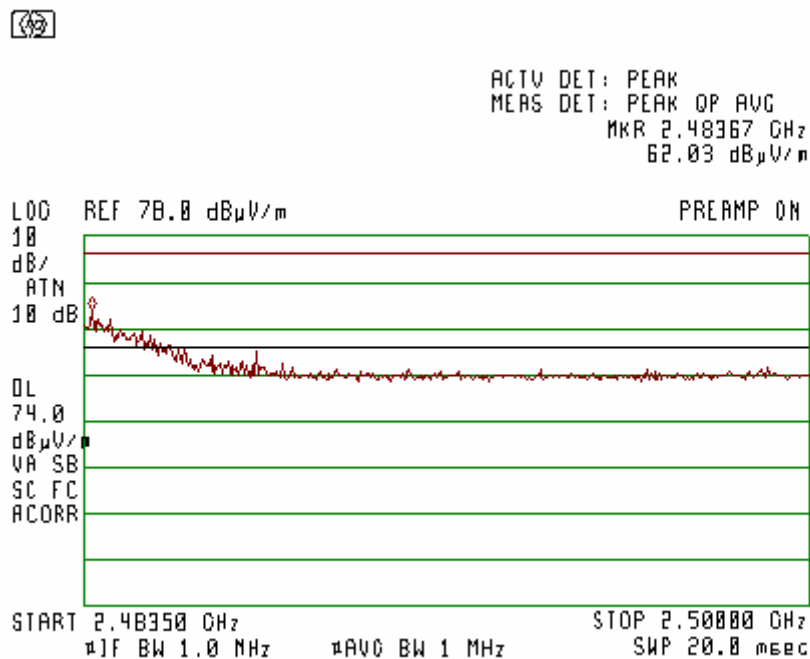


## Horizontal Polarization

### Average Plot 3.5.15



### Peak Plot 3.5.16



#### 4.6. Spurious Radiated Emissions, Restricted Bands

Reference document:	<b>47 CFR §15.247 (d), &amp; §15.205, &amp; §15.209(a)</b>		
Test Requirements:	The emissions from an intentional radiator shall not exceed the field strength levels specified in §15.209(a).		
Test setup:	See sec 2.2, with Band Reject filter	<b>Comply</b>	
Method of testing:	Radiated		
Operating conditions:	Under normal test conditions		
S.A. Settings:	RBW: 1MHz, VBW: 3MHz		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 3.6.1 to 3.6.16	

#### Test result:

Worst case emission while four transmitters operating simultaneously.

- Operating:
- 1) 802.11b Modes and 802.11a Modes transmitting simultaneously
  - 2) 802.11g Modes and 802.11a Modes transmitting simultaneously
  - 3) 802.11 a Modes transmitting simultaneously

All measurements were done in horizontal and vertical polarizations; the results show the worst case.

Channel Frequency [MHz]	Data Rate [Mbps]		Emission Frequency [MHz]	Detector Type	Polarization V/H	Emission Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]
<b>802.11b Mode</b>								
2412	11		4824	peak	H	52.21	74	-21.79
2412	11		4824	Avg	H	43.75	54	-10.25
2412	11		1167	peak	H	40.75	74	-33.25
2412	11		1167	Avg	H	37.95	54	-16.05
2412	11		1200	peak	H	39.56	74	-34.44
2412	11		1200	Avg	H	36.87	54	-17.13
2437	11		4874	peak	H	51.75	74	-22.25
2437	11		4874	Avg	H	42.87	54	-11.13
2437	11		1167	peak	H	40.75	74	-33.25
2437	11		1167	Avg	H	37.95	54	-16.05
2437	11		1200	peak	H	39.56	74	-34.44
2437	11		1200	Avg	H	36.87	54	-17.13
2462	11		4924	peak	H	53.89	74	-20.11
2462	11		4924	Avg	H	44.96	54	-9.04
2462	11		1167	peak	H	40.75	74	-33.25
2462	11		1167	Avg	H	37.95	54	-16.05
2462	11		1200	peak	H	39.56	74	-34.44
2462	11		1200	Avg	H	36.87	54	-17.13
All other emissions at least 30 dB below the limit								

802.11g Mode							
Channel Frequency [MHz]	Data Rate [Mbps]	Emission Frequency [MHz]	Detector Type	Polarization V/H	Emission Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]
2412	54	4824	peak	H	48.78	74	-25.22
2412	54	4824	Avg	H	39.56	54	-14.44
2412	54	1167	peak	H	42.36	74	-31.64
2412	54	1167	Avg	H	38.25	54	-15.75
2412	54	1200	peak	H	40.12	74	-33.88
2412	54	1200	Avg	H	36.76	54	-17.24
2437	54	4874	peak	H	47.21	74	-26.79
2437	54	4874	Avg	H	38.36	54	-15.64
2437	54	1167	peak	H	42.36	74	-31.64
2437	54	1167	Avg	H	38.25	54	-15.75
2437	54	1200	peak	H	40.12	74	-33.88
2437	54	1200	Avg	H	36.76	54	-17.24
2462	54	4924	peak	H	47.32	74	-26.68
2462	54	4924	Avg	H	38.45	54	-15.55
2462	54	1167	peak	H	42.36	74	-31.64
2462	54	1167	Avg	H	38.25	54	-15.75
2462	54	1200	peak	H	40.12	74	-33.88
2462	54	1200	Avg	H	36.76	54	-17.24
All other emissions at least 30 dB below the limit							

802.11a Mode							
Channel Frequency [MHz]	Data Rate [Mbps]	Emission Frequency [MHz]	Detector Type	Polarization V/H	Emission Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]
5745	54	11490	peak	H	50.69	74	-23.31
5745	54	11490	Avg	H	42.36	54	-11.64
5745	54	1167	peak	H	41.78	74	-32.22
5745	54	1167	Avg	H	37.58	54	-16.42
5745	54	1200	peak	H	40.21	74	-33.79
5745	54	1200	Avg	H	36.57	54	-17.43
5745	54	1822.25	peak	H	43.68	74	-30.32
5745	54	1822.25	Avg	H	39.61	54	-14.39
5785	54	11570	peak	H	52.45	74	-21.55
5785	54	11570	Avg	H	44.21	54	-9.79
5785	54	1167	peak	H	41.78	74	-32.22
5785	54	1167	Avg	H	37.58	54	-16.42
5785	54	1200	peak	H	40.21	74	-33.79
5785	54	1200	Avg	H	36.57	54	-17.43
5785	54	1822.25	peak	H	43.68	74	-30.32
5785	54	1822.25	Avg	H	39.61	54	-14.39
5825	54	11650	peak	H	53.21	74	-20.79
5825	54	11650	Avg	H	45.75	54	-8.25
5825	54	1167	peak	H	42.56	74	-31.44
5825	54	1167	Avg	H	37.58	54	-16.42
5825	54	1200	peak	H	40.21	74	-33.79
5825	54	1200	Avg	H	36.57	54	-17.43
5825	54	1822.25	peak	H	43.68	74	-30.32
5825	54	1822.25	Avg	H	39.61	54	-14.39
All other emissions at least 30 dB below the limit							

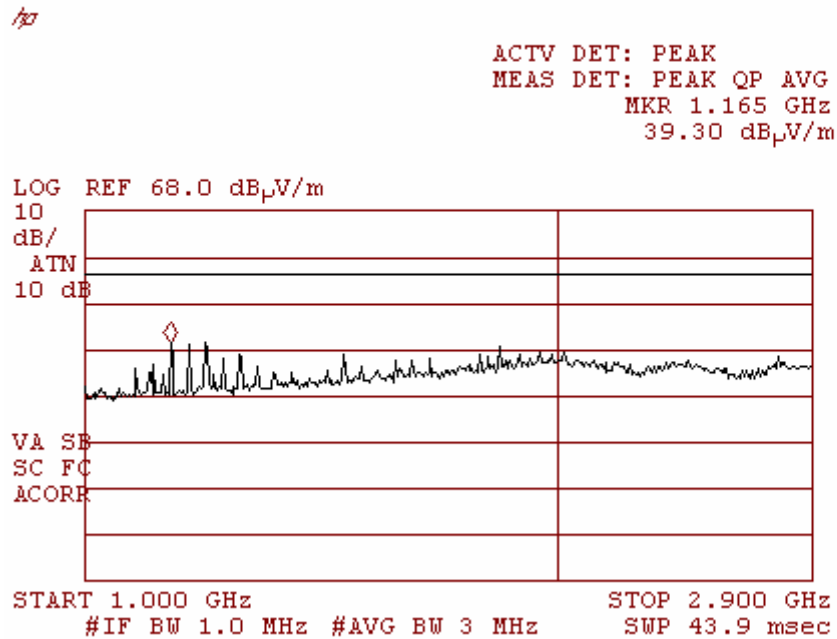
**Test results below 1GHz:**

All measurements were done in horizontal and vertical polarizations; the results show the worst case for all mode and channel.

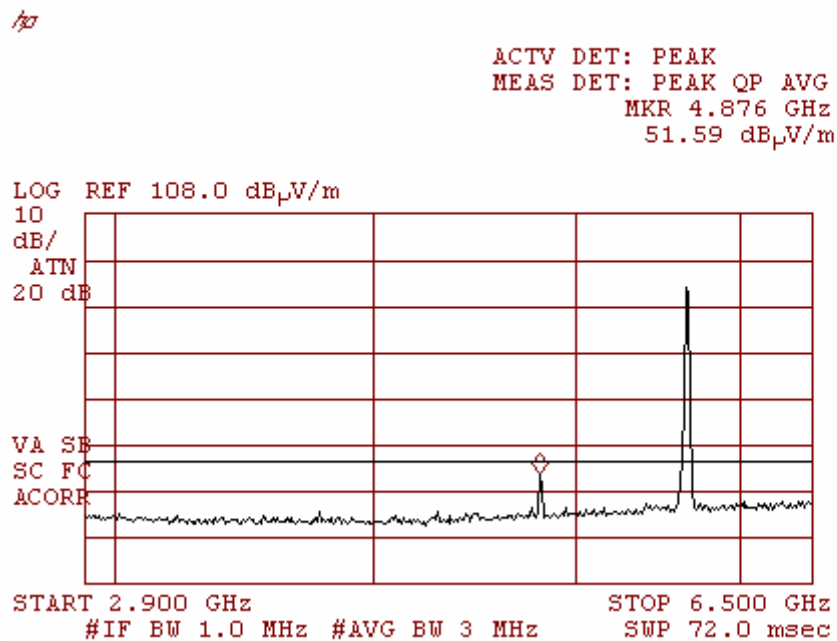
Frequency [MHz]	Emission Level [dBμV/m]	Detector Type	Pola V/H	Limit [dBμV/m]	Margin [dB]
300	45.3	QP	H	46.5	-1.2
500	34.8	QP	H	46.5	-11.7
900	42.2	QP	H	46.5	-4.3
933	36.9	QP	H	46.5	-9.6
68.7	31.56	QP	V	40	-8.44
200	28.47	QP	H	43.5	-15.03

**Note:** Spurious Emission [dBμV/m] = measured [dBμV] + Correction-factor [dB (1/m)]  
 Correction Factor = Antenna factor + Cable Loss + Filter I/L.

**Vertical & Horizontal Polarization**  
**Plot 3.6.1**

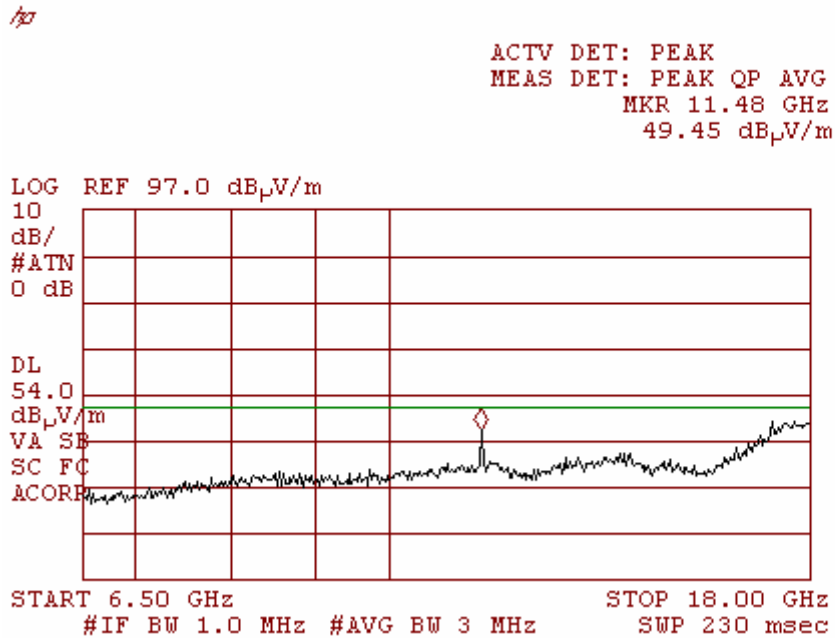


**Vertical & Horizontal Polarization**  
**Plot 3.6.2**

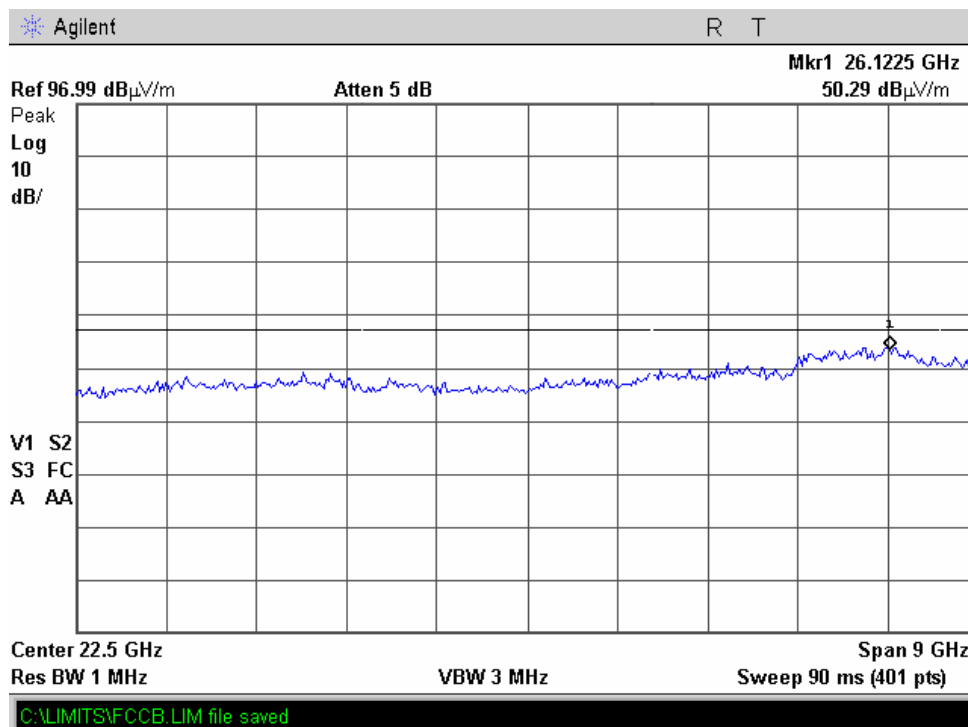




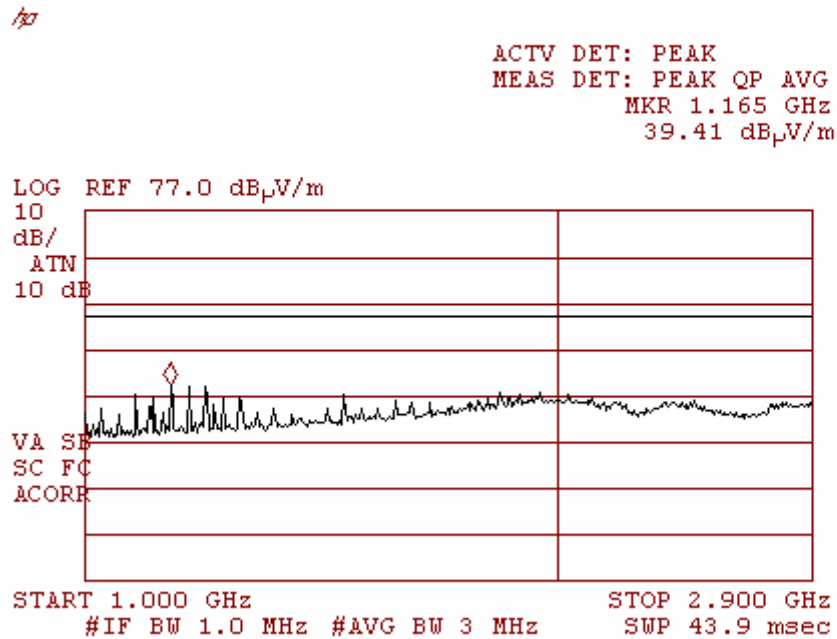
**Vertical & Horizontal Polarization**  
**Plot 3.6.3**



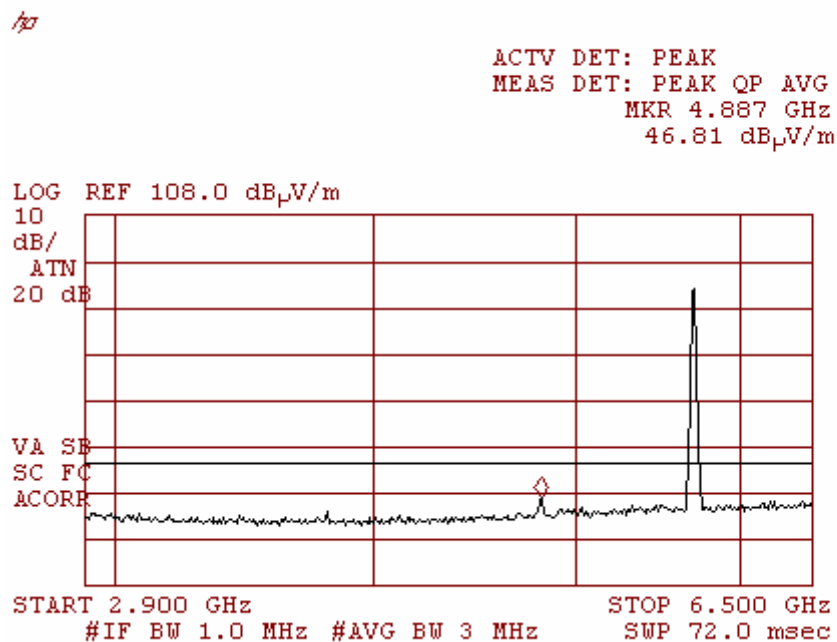
**Vertical & Horizontal Polarization**  
**Plot 3.6.4**



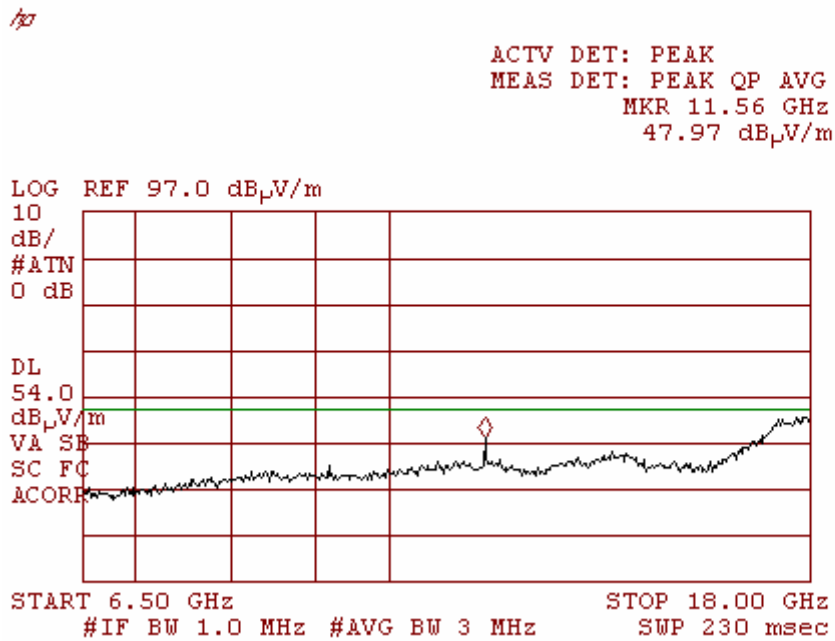
**Vertical & Horizontal Polarization**  
**Plot 3.6.5**



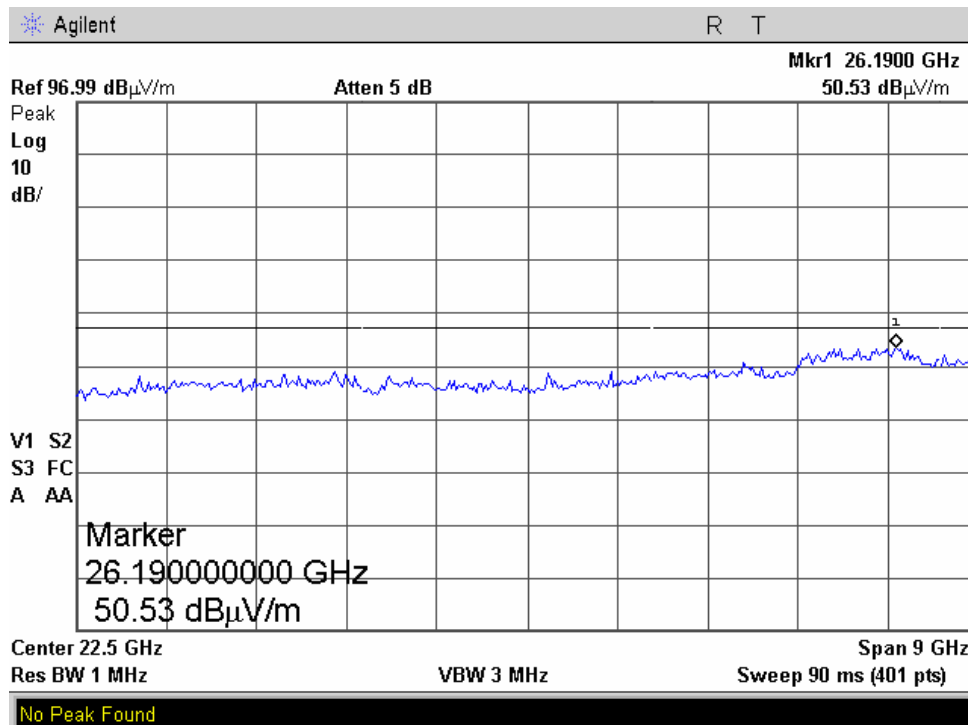
**Vertical & Horizontal Polarization**  
**Plot 3.6.6**



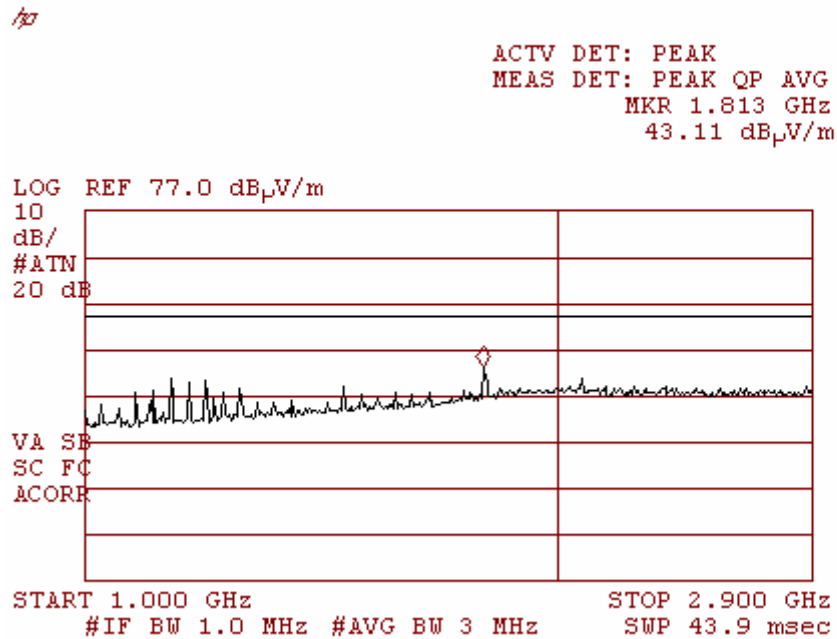
**Vertical & Horizontal Polarization**  
**Plot 3.6.7**



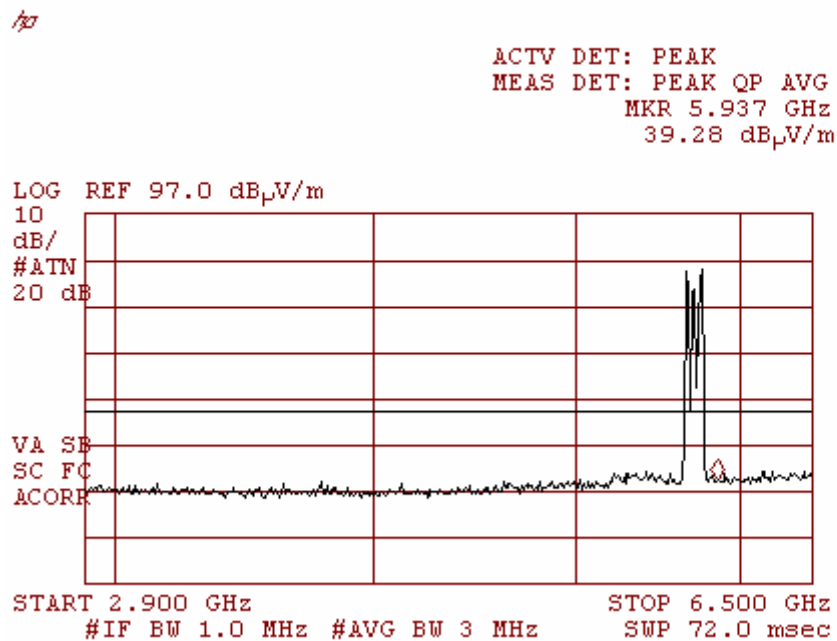
**Plot 3.6.8**  
**Vertical & Horizontal Polarization**



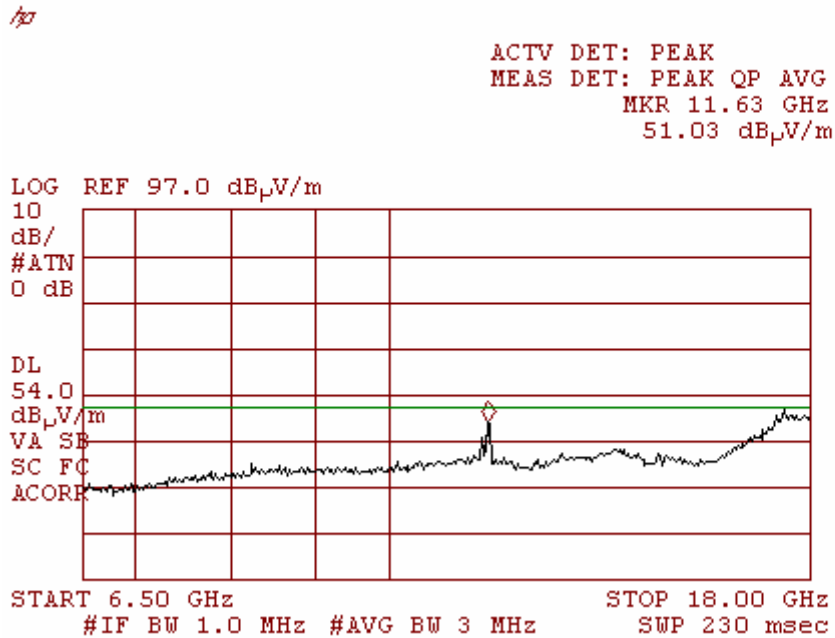
**Vertical & Horizontal Polarization**  
**Plot 3.6.9**



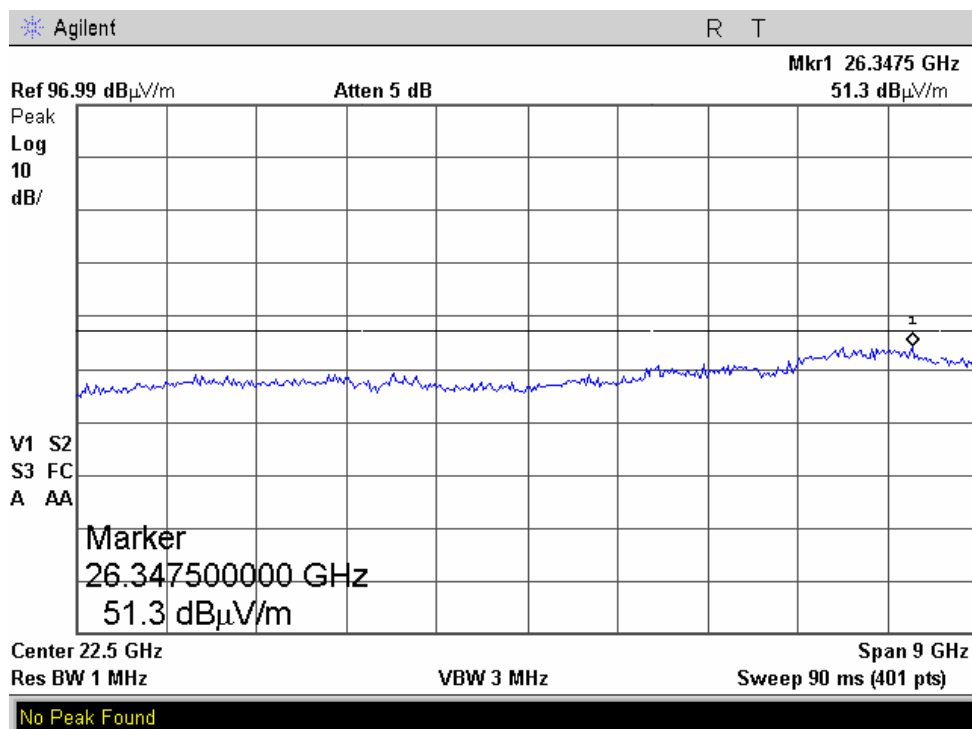
**Vertical & Horizontal Polarization**  
**Plot 3.6.10**



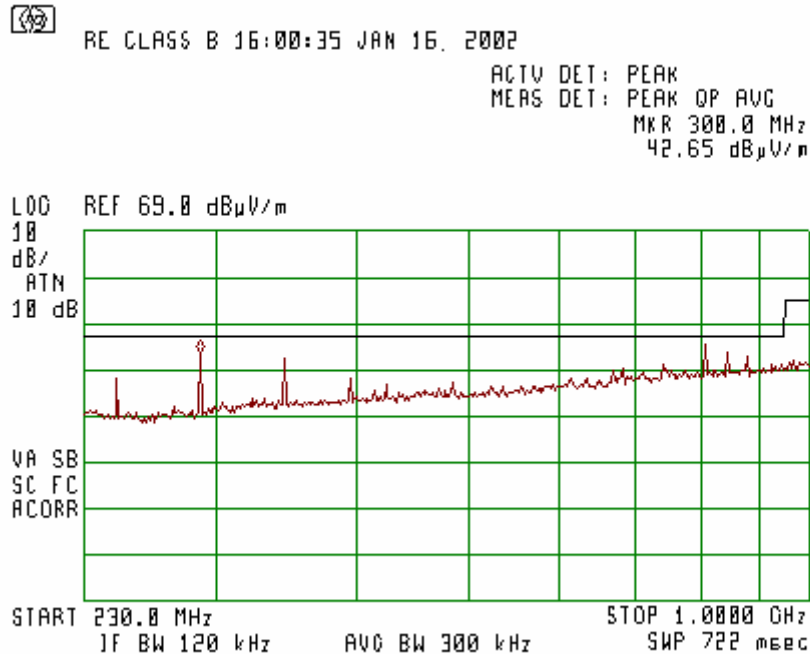
**Vertical & Horizontal Polarization**  
**Plot 3.6.11**



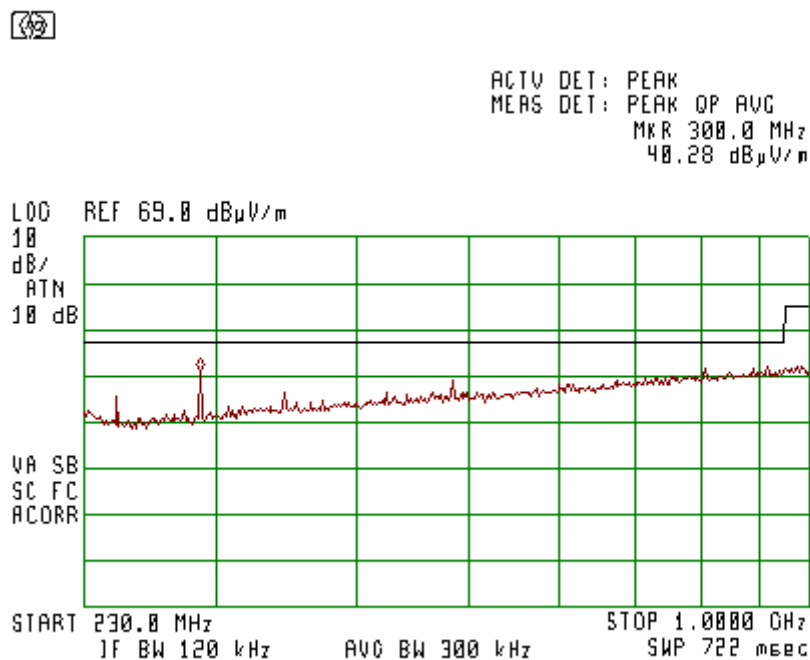
**Vertical & Horizontal Polarization**  
**Plot 3.6.12**



**Worst case for all Mode and all channel**  
**Horizontal Polarization**  
**Plot 3.6.13**



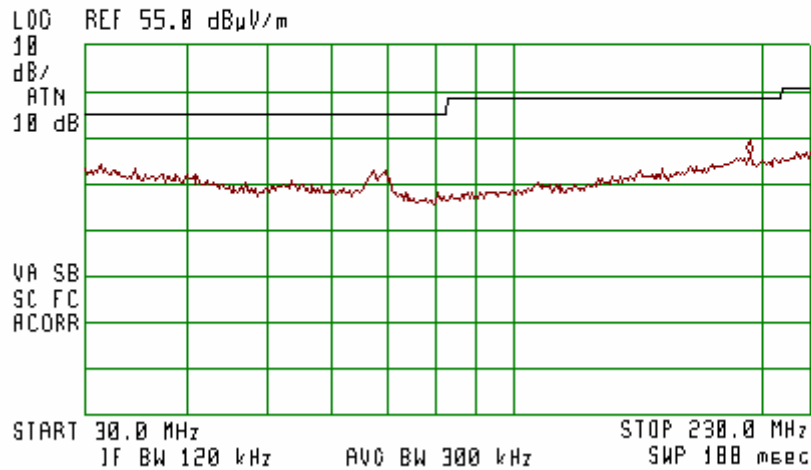
**Vertical Polarization**  
**Plot 3.6.14**



**Horizontal Polarization**  
**Plot 3.6.15**



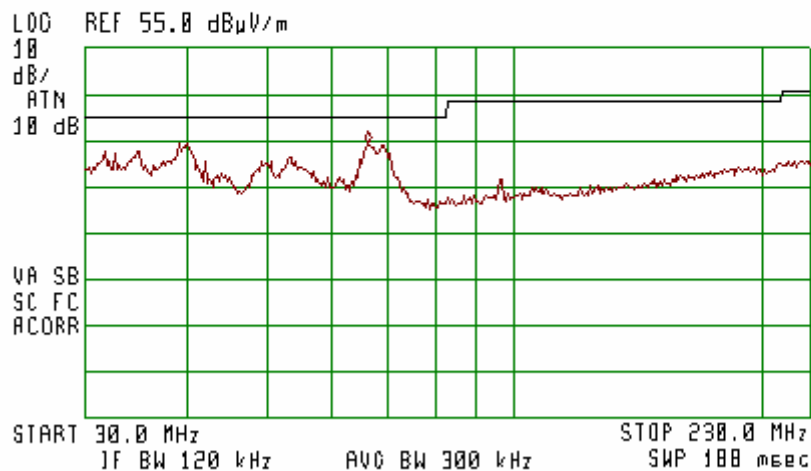
ACTV DET: PEAK  
MEAS DET: PEAK OP AVG  
Mkr 201.0 MHz  
31.28 dB $\mu$ V/m



**Vertical Polarization**  
**Plot 3.6.16**



ACTV DET: PEAK  
MEAS DET: PEAK OP AVG  
Mkr 68.7 MHz  
34.38 dB $\mu$ V/m



#### 4.7. Radiated Emission, Receive Mode

Reference document:	<b>47 CFR §15.109/209</b>		
Test Requirements:	Emission Level shall not exceed §15.109 & §15.209(a) limits		
Test setup:	See sec 2.2	<b>Comply</b>	
Method of testing:	Radiated		
Operating conditions:	Under normal test conditions		
S.A. Settings:	RBW: 120kHz, VBW: 300kHz		
Mode of operation:	Receive		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 3.7.1 to Plot 3.7.4	

#### Test results:

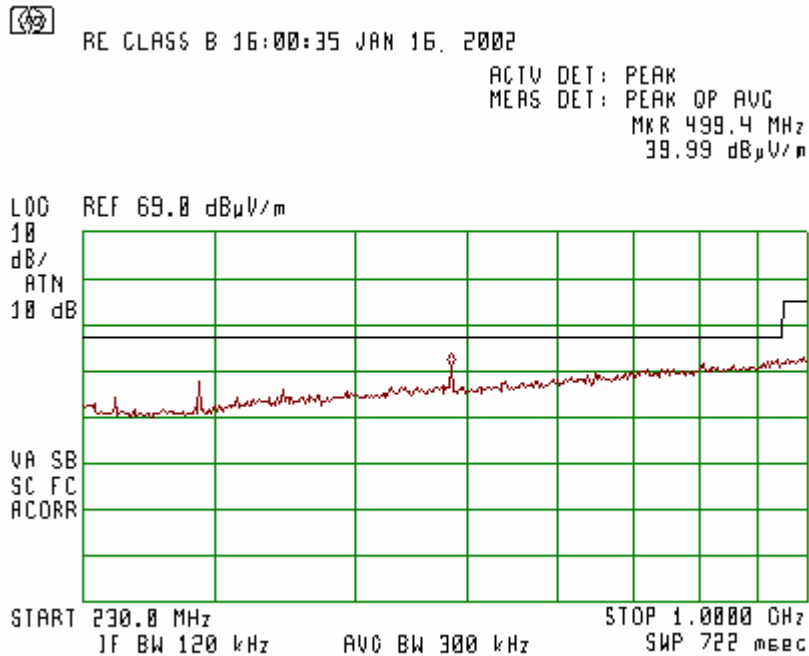
All measurements were done in horizontal and vertical polarizations; the results show the worst case.

Frequency [MHz]	Emission Level [dBμV/m]	Detector Type	Polarization V/H	Limit [dBμV/m]	Margin [dB]
300	44.9	QP	H	46.5	-1.6
500	37.5	QP	H	46.5	-9.0
900	43.9	QP	H	46.5	-2.6
933	43.9	QP	H	46.5	-2.6
33.34	31.7	QP	V	40.0	-8.3
200	30.4	QP	H	43.5	-13.1

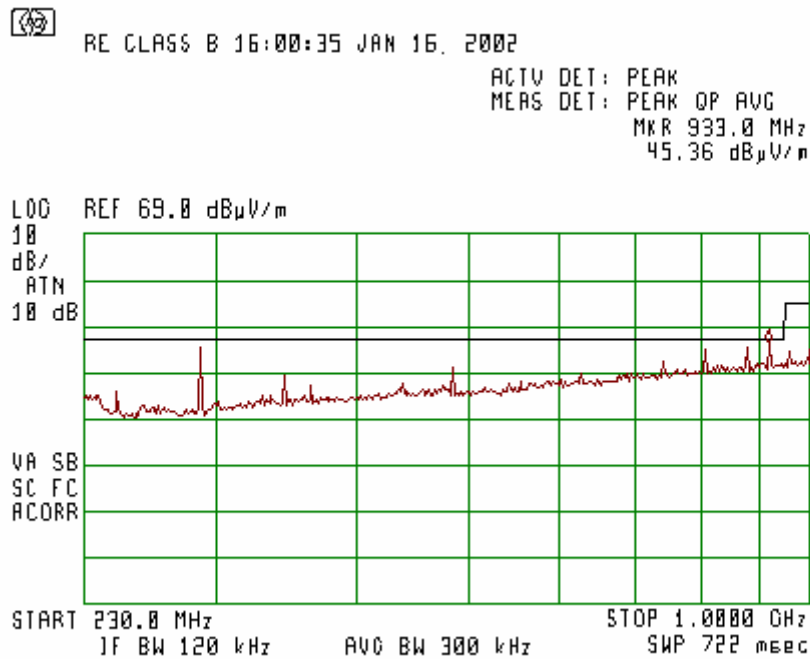
**Note:** Emission Level [dBμV/m] = measured [dBμV] + Correction-factor [dB (1/m)]  
 Correction Factor = Antenna factor + Cable Loss



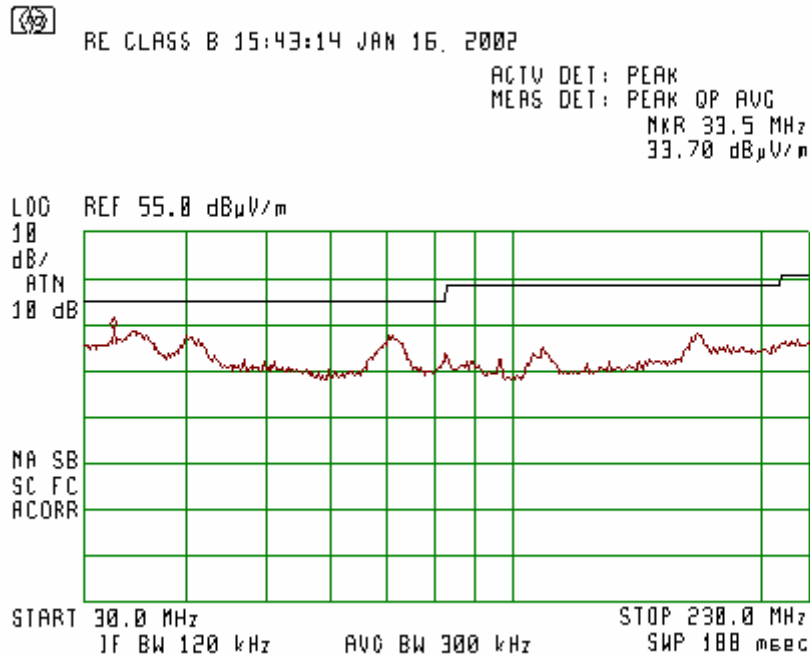
### Vertical Polarization Plot 3.7.1



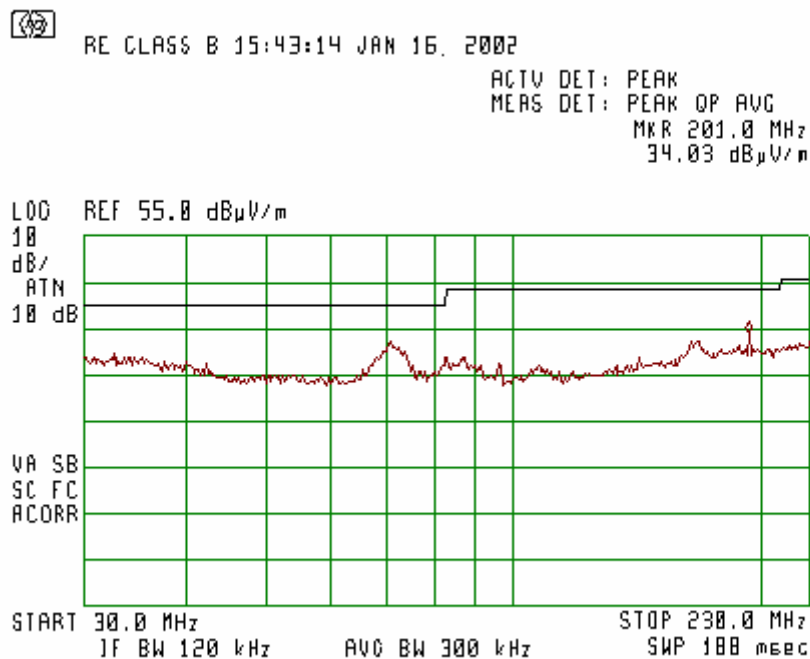
### Horizontal Polarization Plot 3.7.2



**Vertical polarization**  
**Plot 3.7.3**



**Horizontal polarization**  
**Plot 3.7.4**



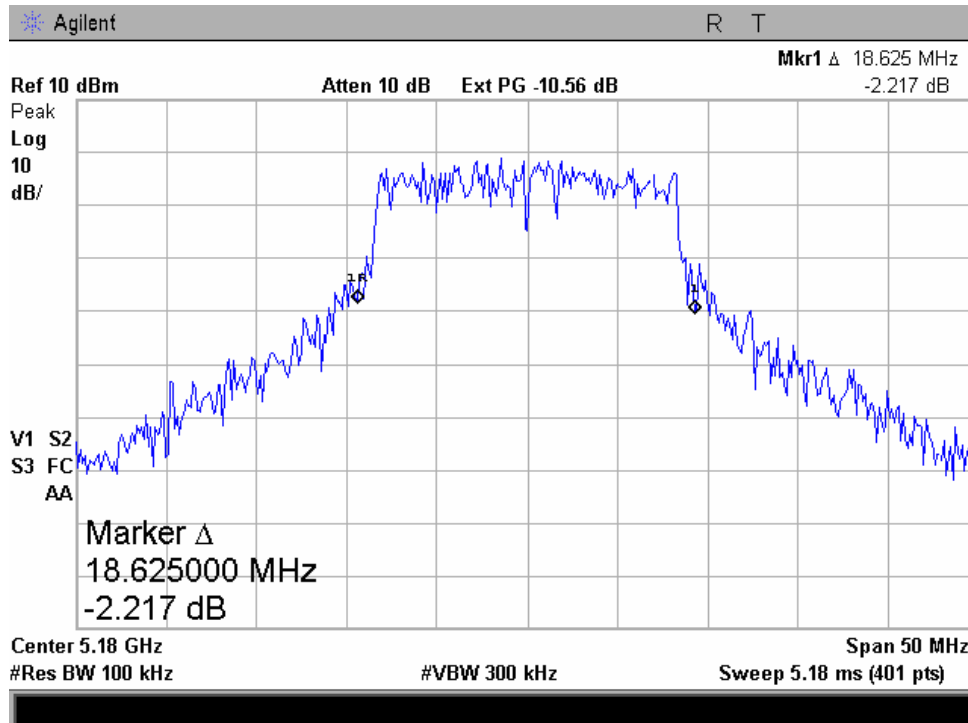
#### 4.8. Emission Bandwidth (26dB BW)

Reference document:	<b>47 CFR §15.403 (i)</b>		
Test Requirements:	For purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Determination of the emissions bandwidth is based on the use of measurement instrumentation employing a peak detector function with an instrument resolution bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.		
Test setup:	See sec 3.1,	<b>Comply</b>	
Method of testing:	Conducted		
Operating conditions:	Under normal test conditions		
S.A. Settings:	RBW: 100kHz, VBW: 300kHz		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 3.10.1 to 3.10.3	

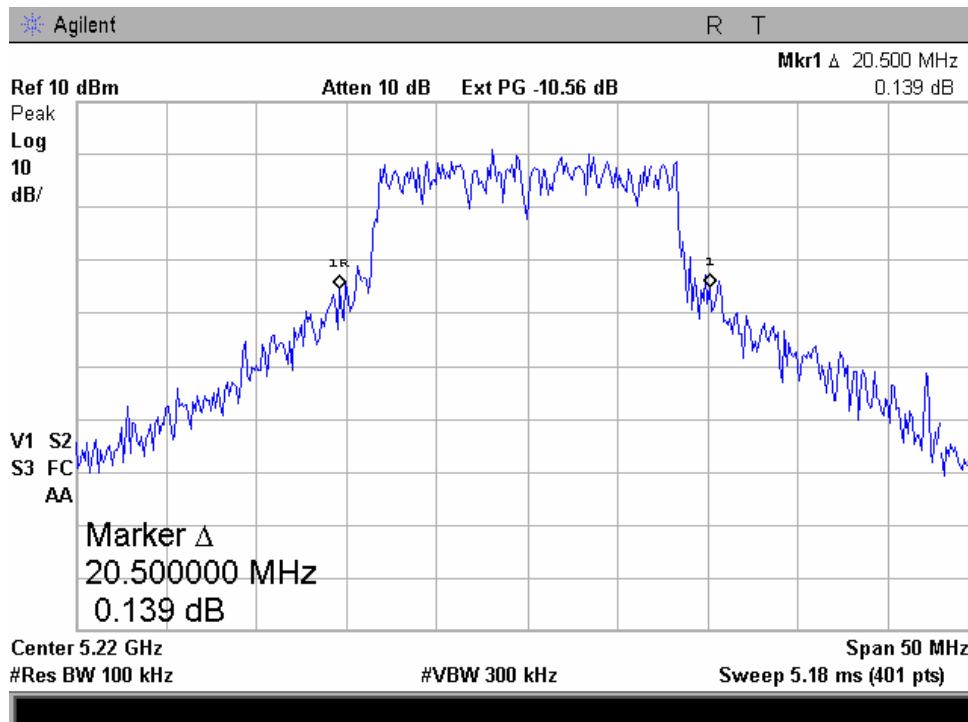
#### Test results

Frequency [MHz]	Data Rate [Mbps]	26 dB Bandwidth [kHz]	Ref Plot
<b>802.11a</b>			
5180	54	18625	3.10.1
5220	54	20500	3.10.2
5240	54	19000	3.10.3

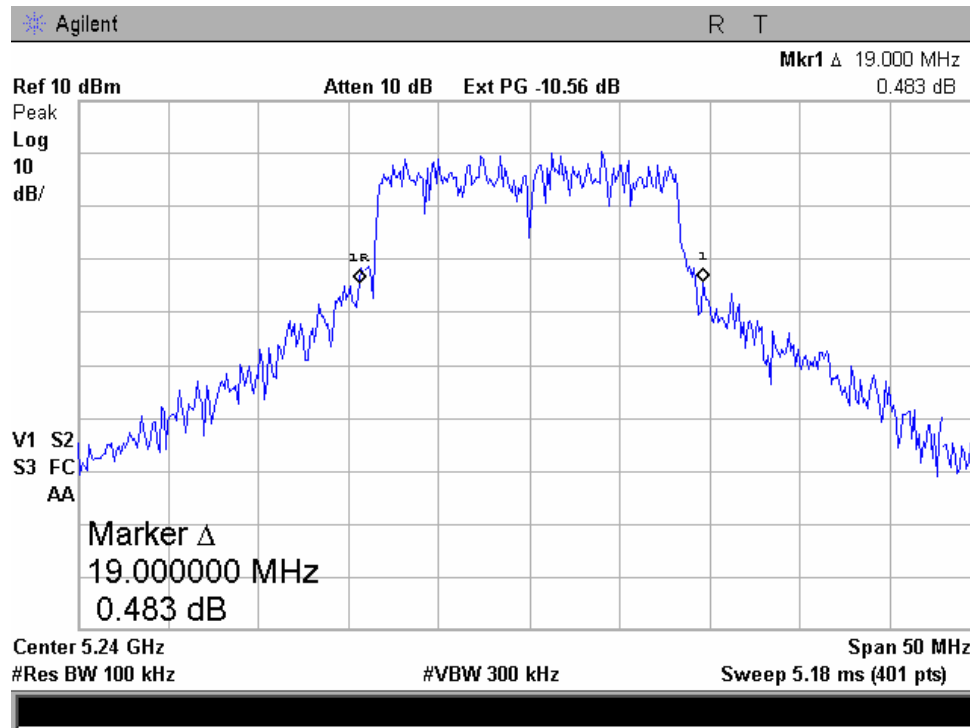
**5180-5250 MHz**  
**Plot 3.10.1**



**Plot 3.10.2**



**Plot 3.10.3**



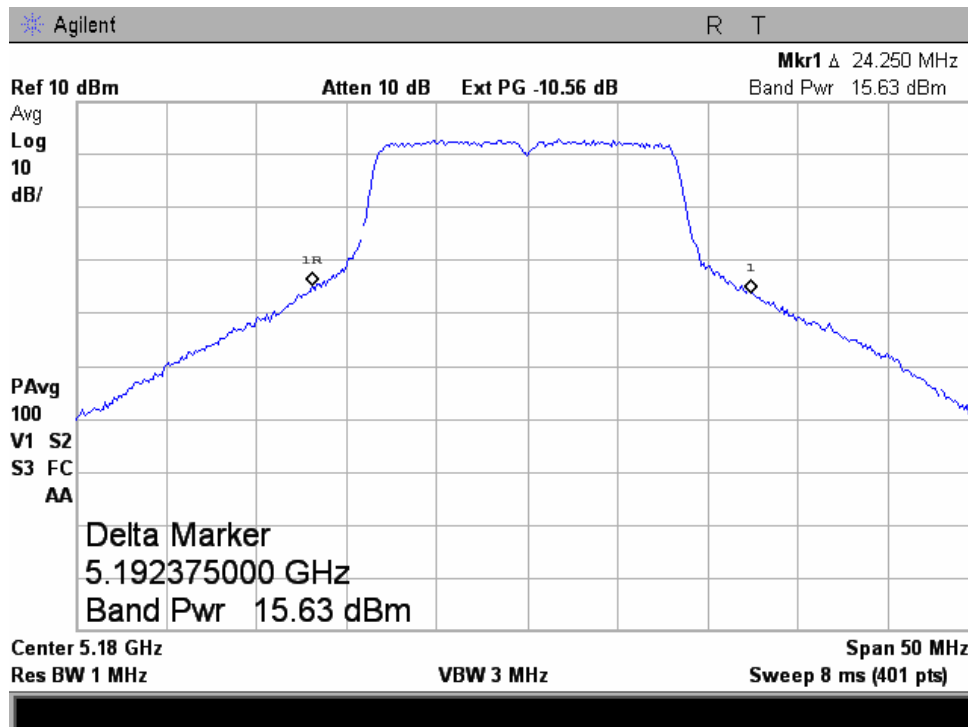
#### 4.9. Peak Output Power, 5180-5250 MHz

Reference document:	<b>47 CFR §15.407 (a) (1)</b>		
Test Requirements:	For the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1-MHz 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.		
Test setup:	See sec 3.1,	<b>Comply</b>	
Method of testing:	Conducted		
Operating conditions:	Under normal test conditions		
S.A. Settings:	RBW: 1MHz, VBW: 3MHz		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 3.11.1 to 3.11.3	

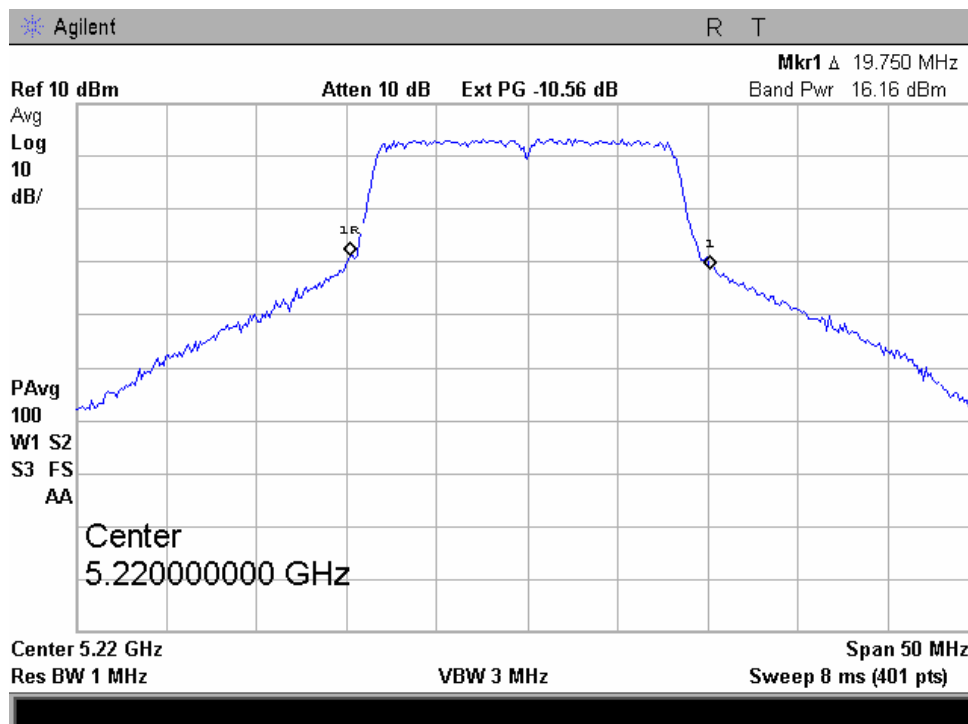
#### 5150-5250MHz Band:

Frequency [MHz]	26 dB Bandwidth (B) [MHz]	10Log B [dBm]	4 + 10Log B [dBm]	Measured Peak Power [dBm]	Power Limit [dBm]	Margin [dB]	Ref Plot
<b>802.11a Mode</b>							
5180	18.63	12.70	16.70	15.63	16.70	-1.07	3.11.1
5220	20.50	13.12	17.12	16.16	17.00	-0.84	3.11.2
5240	19.00	12.79	16.79	15.99	16.79	-0.80	3.11.3

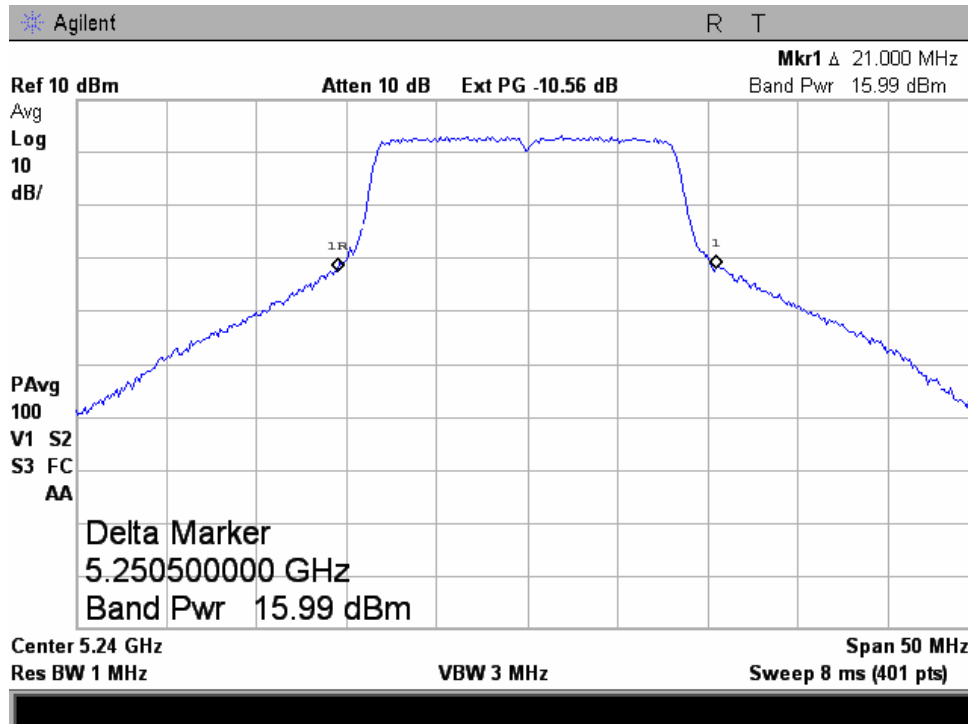
**5725-5850MHz per 15.407 (a)(1)**  
**Plot 3.11.1**



**Plot 3.11.2**



**Plot 3.11.3**





#### 4.10. Peak Power Spectral Density

Reference document:	<b>47 CFR §15.407 (a) (1)</b>		
Test Requirements:	For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 4 dBm in any 1MHz 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.		
Test setup:	See sec 3.1,	<b>Comply</b>	
Method of testing:	Conducted		
Operating conditions:	Under normal test conditions		
S.A. Settings:	RBW: 1MHz , VBW: 3MHz , Sweep Time: Auto		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 3.12.1 to 3.12.3	

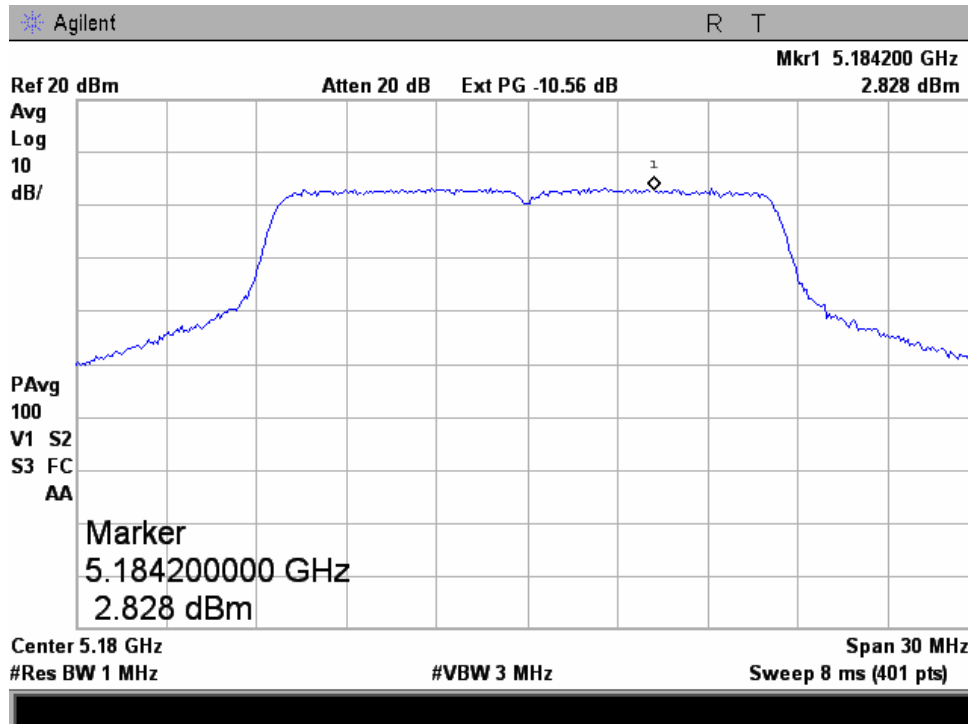
#### Test Results:

##### 5150-5250 MHz:

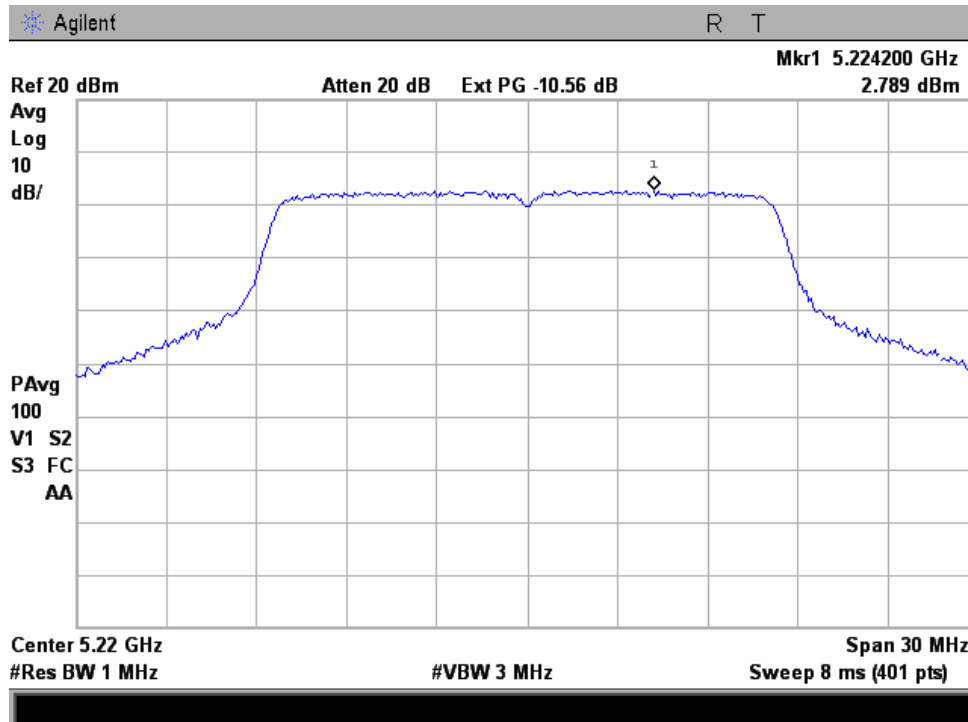
Frequency [MHz]	Data Rate [Mbps]	PPSD [dBm/1MHz]	PPSD Limit [dBm/1MHz]	Margin [dB]	Ref Plot
<b>802.11a Mode</b>					
5180	6	2.828	4	-1.172	3.12.1
5220	6	2.789	4	-1.211	3.12.2
5240	6	3.146	4	-0.854	3.12.3

## 802.11 a Mode

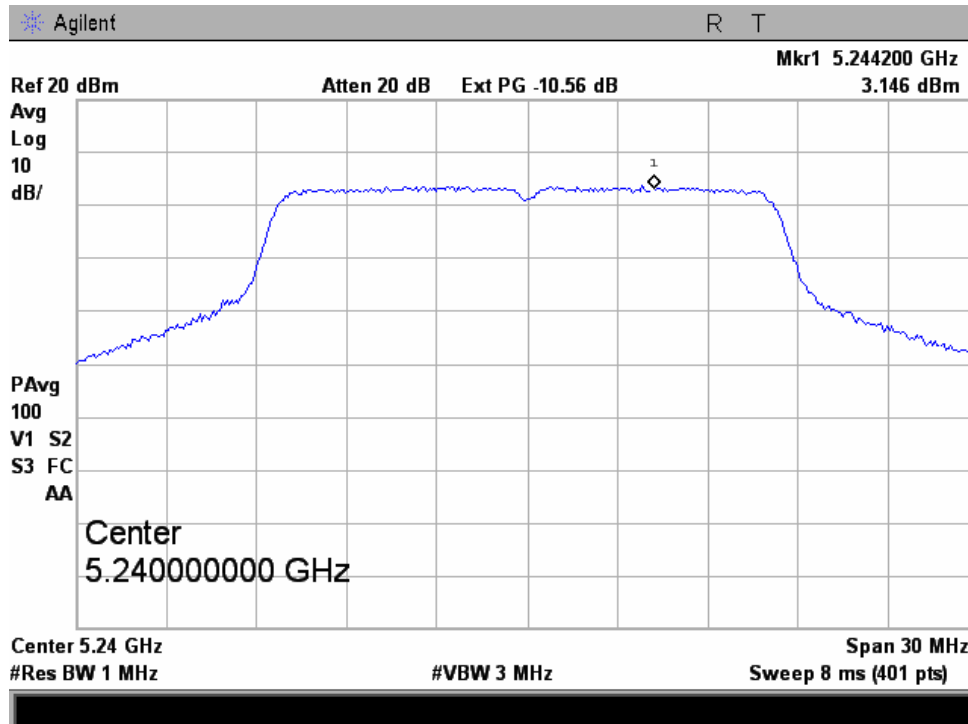
Plot 3.12.1



Plot 3.12.2



**Plot 3.12.3**



#### 4.11. Peak Excursion

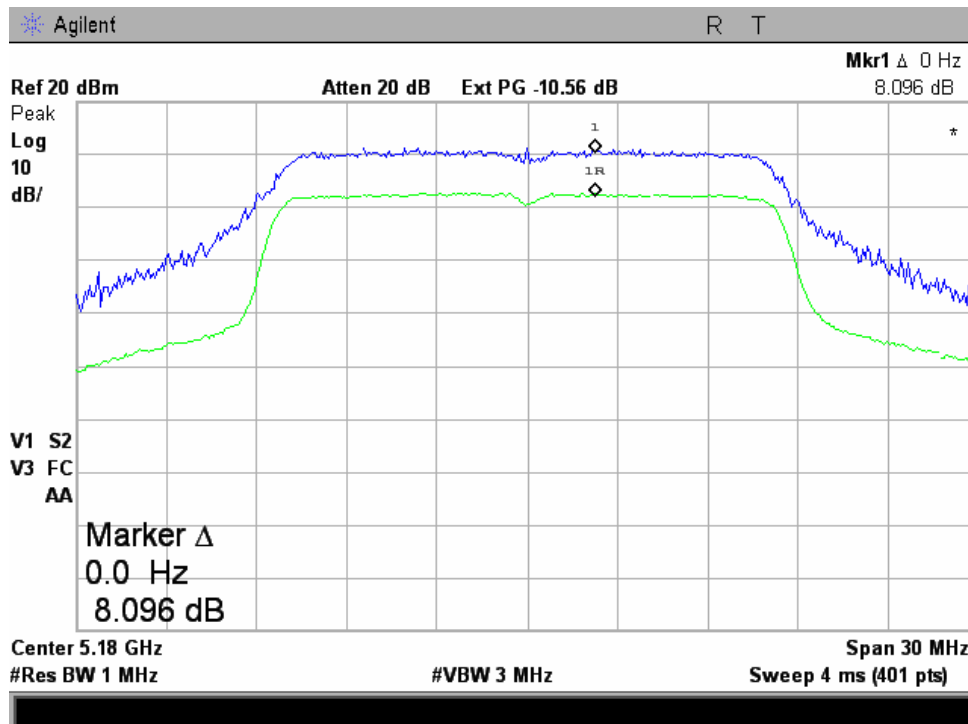
Reference document:	<b>47 CFR §15.407 (a) (6)</b>		
Test Requirements:	The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.		
Test setup:	See sec 3.1,	<b>Comply</b>	
Method of testing:	Conducted		
Operating conditions:	Under normal test conditions		
S.A. Settings:	Trace 1:RBW: 1MHz , VBW: 3MHz , Peak Max Hold, Sweep Time: Auto, Trace 2: RBW: 1MHz , VBW: 30kHz , Peak Max Hold, Sweep Time: Auto		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 3.13.1 to 3.13.3	

#### Test Results:

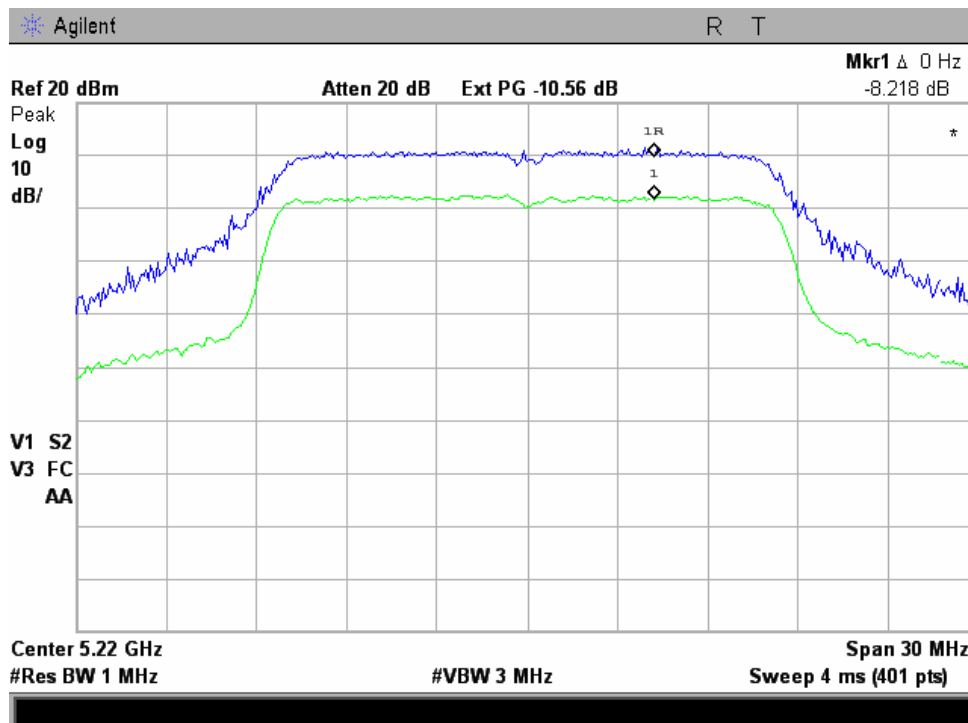
##### 5150-5250 MHz:

Frequency [MHz]	Peak Excursion [dB]	Limit [dB]	Margin [dB]	Ref Plot
<b>802.11a Mode</b>				
5180	8.09	13	-4.91	3.13.1
5220	8.21	13	-4.79	3.13.2
5240	10.19	13	-2.81	3.13.3

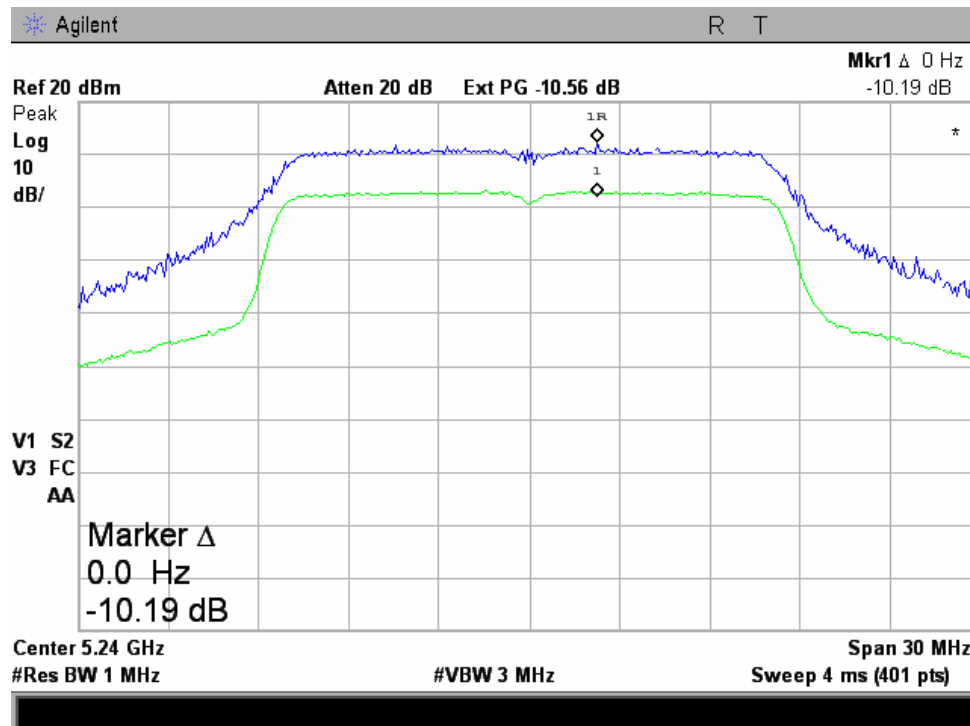
**Plot 3.13.1**



**Plot 3.13.2**



**Plot 3.13.3**



#### 4.12. Conducted Spurious Emissions

Reference document:	<b>47 CFR §15.407 (b) (1) &amp; §15.407 (b)(6)</b>		
Test Requirements:	For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz, unwanted emissions below 1 GHz must comply with the general field strength limits set forth in Sec. 15.209.		
Test setup:	See sec 3.1,	<b>Comply</b>	
Method of testing:	Conducted		
Operating conditions:	Under normal test conditions		
S.A. Settings:	RBW: 1 MHz, VBW:1 MHz		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 3.14.1 to 3.14.9	

#### Test results:

#### 5150-5250 MHz:

##### Spurious

Frequency [MHz]	Data Rate [Mbps]	Measured Value [dBm/MHz]	EIRP Value Limit [dBm/MHz]	Reference	Result
<b>802.11a Mode</b>					
5180	54	*	-27	3.14.1-3.14.2	Comply
5220	54	*	-27	3.14.3-3.14.4	Comply
5240	54	*	-27	3.14.5-3.14.6	Comply

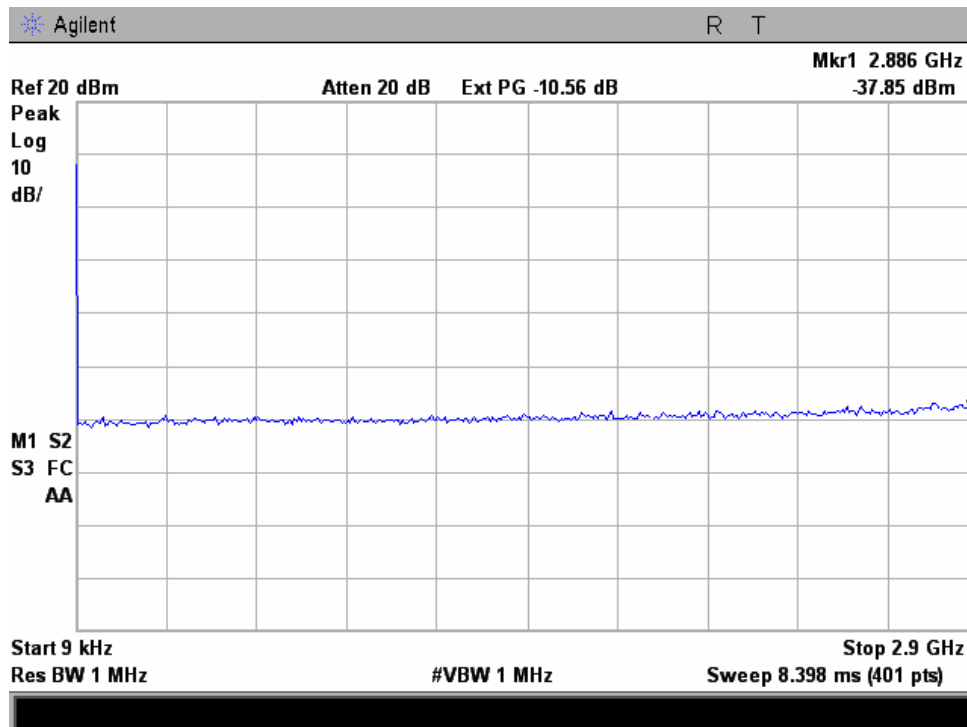
##### Band edge

Frequency [MHz]	Data Rate [Mbps]	Measured Value [dBm/MHz]	EIRP Value Limit [dBm/MHz]	Reference	Result
<b>802.11a Mode</b>					
5180	54	*	-27	3.14.7	Comply
5240	54	*	-27	3.14.8	Comply

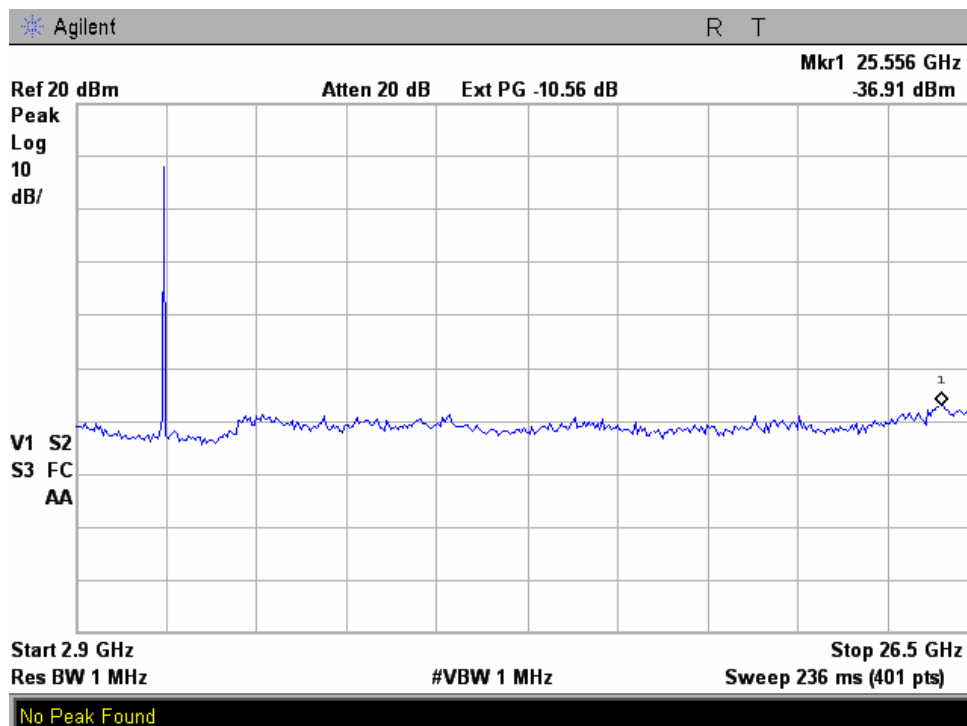
\*All emissions at least 10 dB below -27dBm. For EIRP calculation: the gain of the antenna is uncertain, however worst-case gain would be 4dBi.

## 802.11a Mode

**Plot 3.14.1**

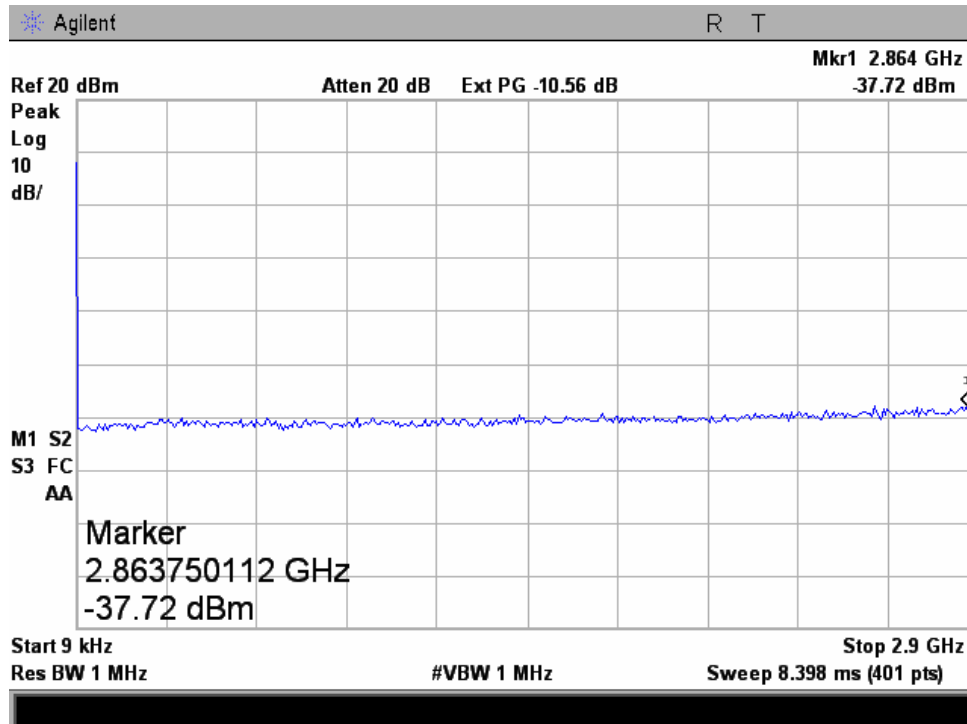


**Plot 3.14.2**

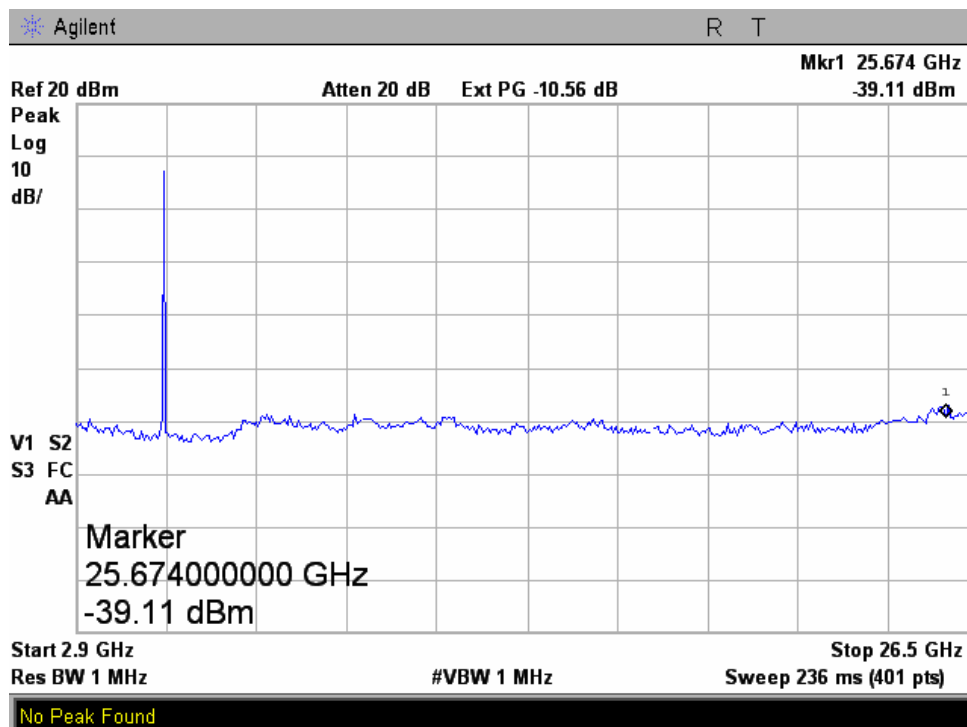




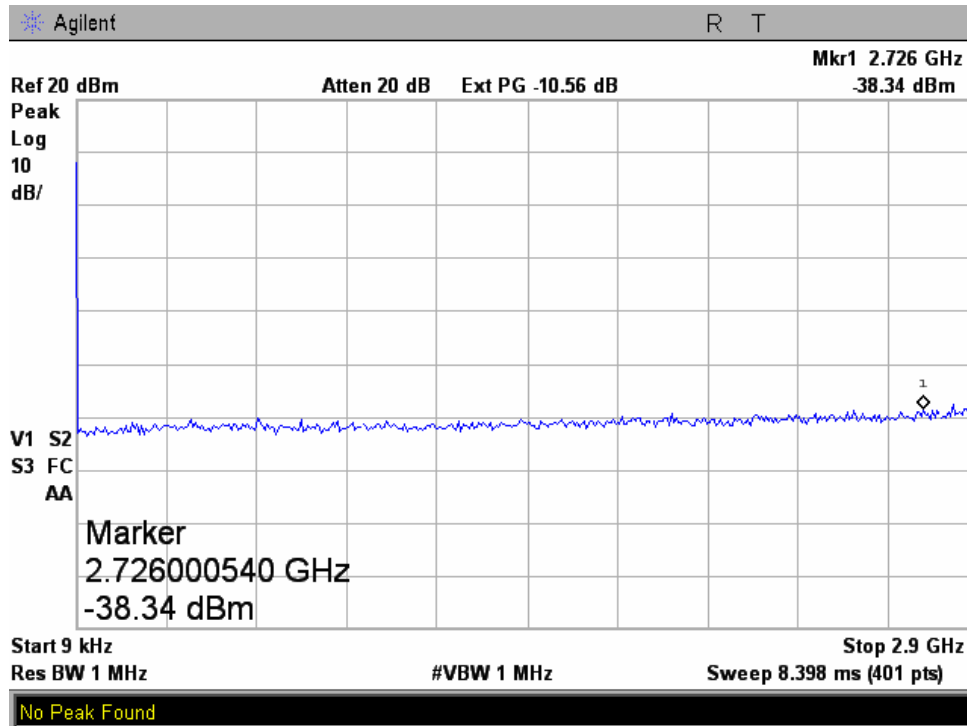
**Plot 3.14.3**



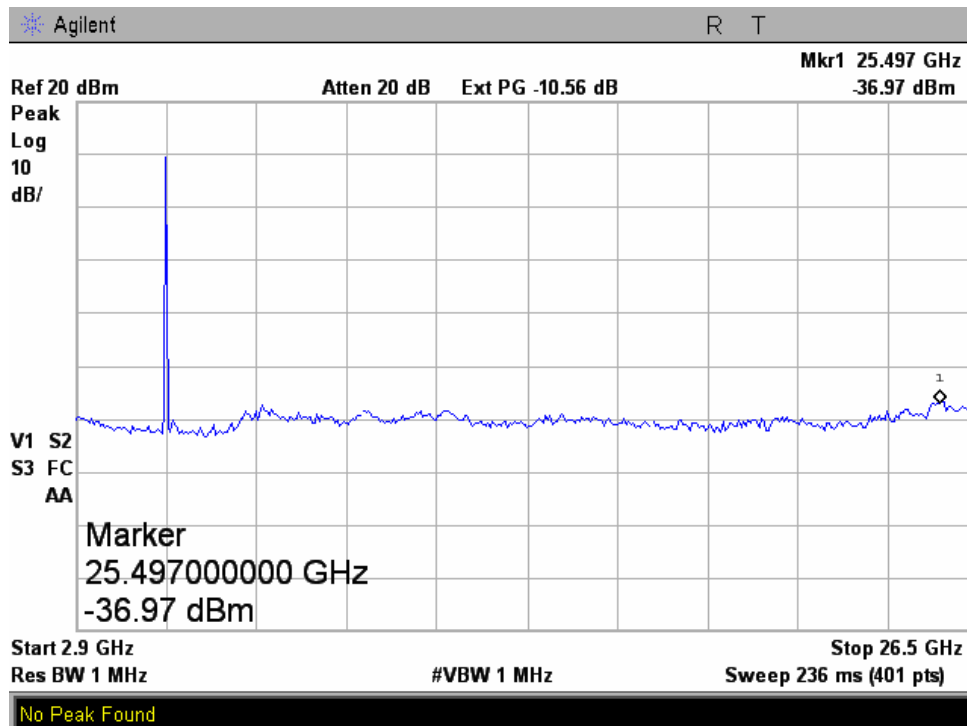
**Plot 3.14.4**



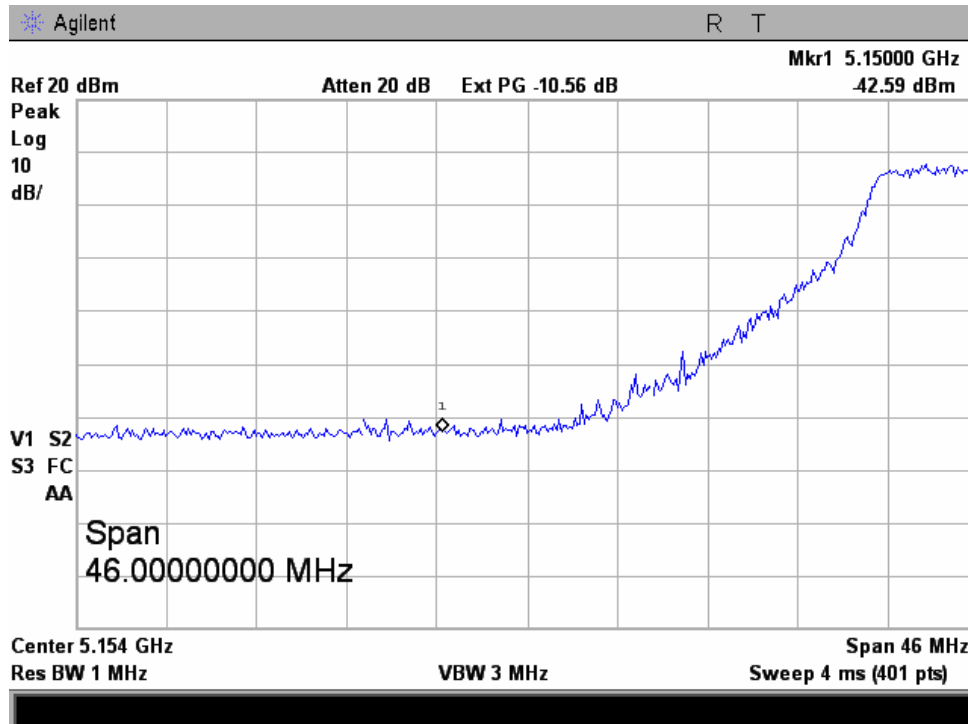
**Plot 3.14.5**



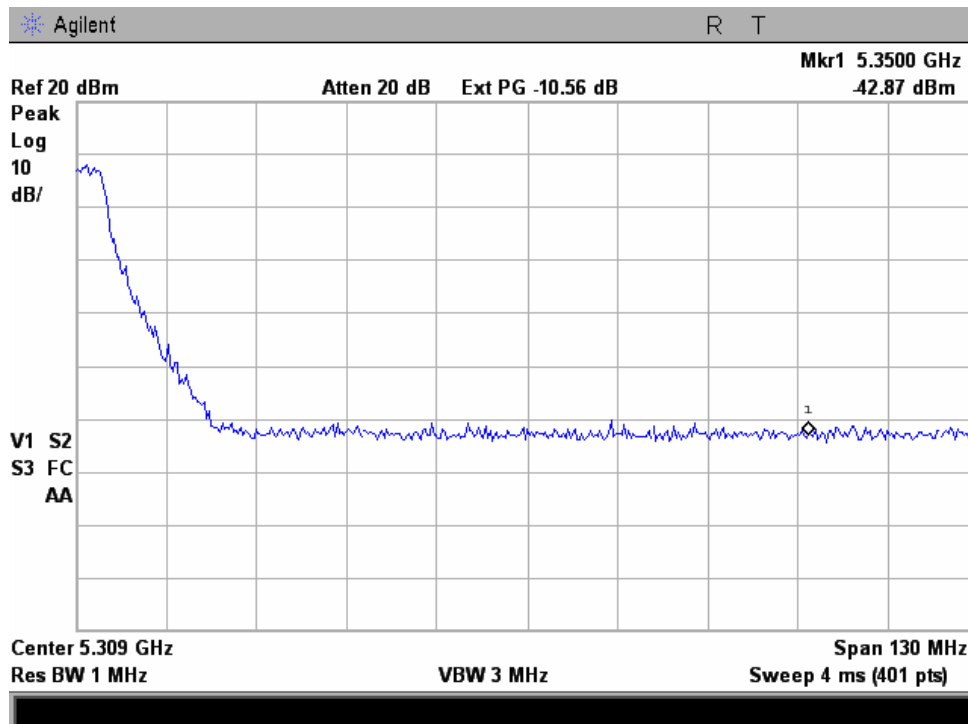
**Plot 3.14.6**



**802.11a Mode**  
**Plot 3.14.7**



**Plot 3.14.8**



#### 4.13. Spurious Radiated Emissions, Restricted Bands

Reference document:	<b>47 CFR §15.407 (b) (1) &amp; §15.407 (b)(6)</b>		
Test Requirements:	For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHZ, unwanted emissions below 1 GHz must comply with the general field strength limits set forth in Sec. 15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in Sec. 15.207. The provisions of Sec. 15.205 apply to intentional radiators operating under this section.		
Test setup:	See sec 3.1	<b>Comply</b>	
Method of testing:	Radiated		
Operating conditions:	Under normal test conditions		
S.A. Settings:	Peak: RBW= 1MHz, VBW= 3MHz, Average: VBW= 10 Hz		
Environment conditions:	Ambient Temperature: 22°C	Relative Humidity: 48%	Atmospheric Pressure: 1011.4 hPa
Test Result:	See below	See Plot 3.15.1 to 3.15.12	

#### Test results:

802.11a Mode							
Frequency [MHz]	Data Rate [Mbps]	Emission frequency [MHz]	Detector Type	Polar. V/H	Emission Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]
5180	54	10360	peak	H	46.83	74	-27.17
5180	54	10360	Avg	H	38.25	54	-15.75
5180	54	1167	peak	H	37.68	74	-36.32
5180	54	1167	Avg	H	29.63	54	-24.37
5180	54	1200	peak	H	38.74	74	-35.26
5180	54	1200	Avg	H	30.25	54	-23.75
5180	54	3483.52	peak	H	41.25	74	-32.75
5180	54	3483.52	Avg	H	33.56	54	-20.44
5220	54	10440	peak	H	47.36	74	-26.64
5220	54	10440	Avg	H	39.65	54	-14.35
5220	54	1167	peak	H	37.68	74	-36.32
5220	54	1167	Avg	H	29.63	54	-24.37
5220	54	1200	peak	H	38.74	74	-35.26
5220	54	1200	Avg	H	30.25	54	-23.75
5220	54	3483.52	peak	H	41.25	74	-32.75
5220	54	3483.52	Avg	H	33.56	54	-20.44
5240	54	10480	peak	H	45.87	74	-28.13
5240	54	10480	Avg	H	37.69	54	-16.31
5240	54	1167	peak	H	37.68	74	-36.32
5240	54	1167	Avg	H	29.63	54	-24.37
5240	54	1200	peak	H	38.74	74	-35.26
5240	54	1200	Avg	H	30.25	54	-23.75
5240	54	3483.52	peak	H	41.25	74	-32.75
5240	54	3483.52	Avg	H	33.56	54	-20.44

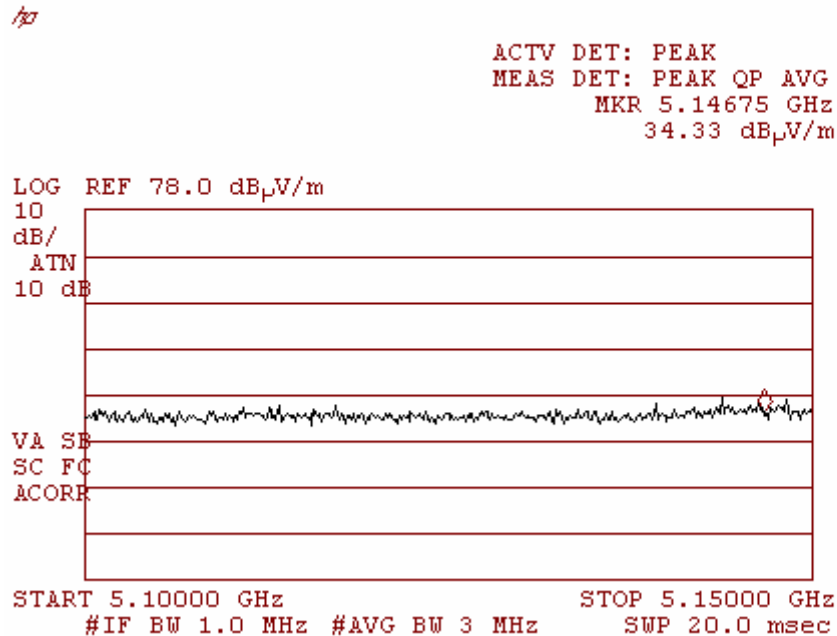
**Test results below 1GHz:**

All measurements were done in horizontal and vertical polarizations; the results show the worst case for all mode and channel.

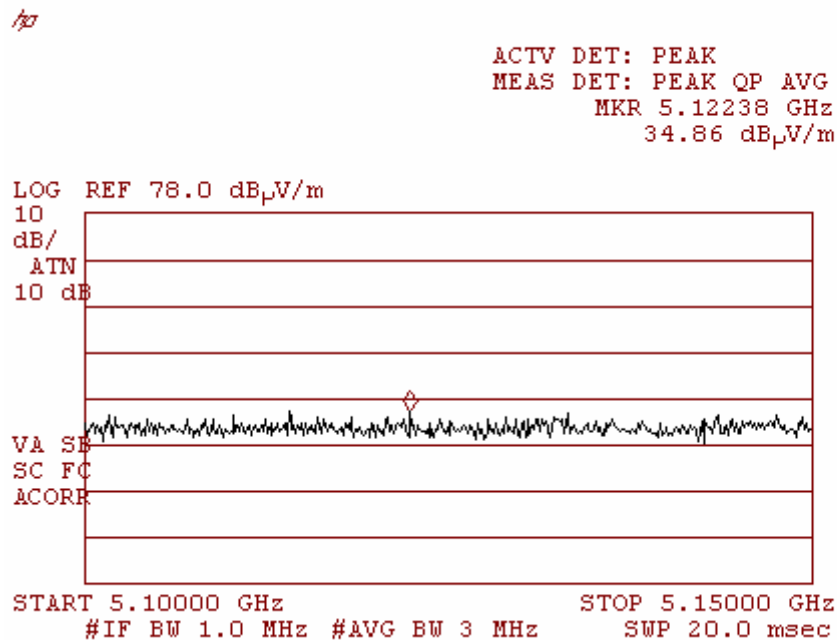
Frequency [MHz]	Emission Level [dB $\mu$ V/m]	Detector Type	Pol. V/H	Limit [dB $\mu$ V/m]	Margin [dB]
300	44.36	QP	H	46.5	-2.14
500	36.74	QP	H	46.5	-9.76
900	41.69	QP	H	46.5	-4.81
933	38.12	QP	H	46.5	-8.38
45.6	32.83	QP	V	40	-7.17
200	26.56	QP	H	43.5	-16.94

**Note:** Spurious Emission [dB $\mu$ V/m] = measured [dB $\mu$ V] + Correction-factor [dB (1/m)]  
 Correction Factor = Antenna factor + Cable Loss + Filter I/L.

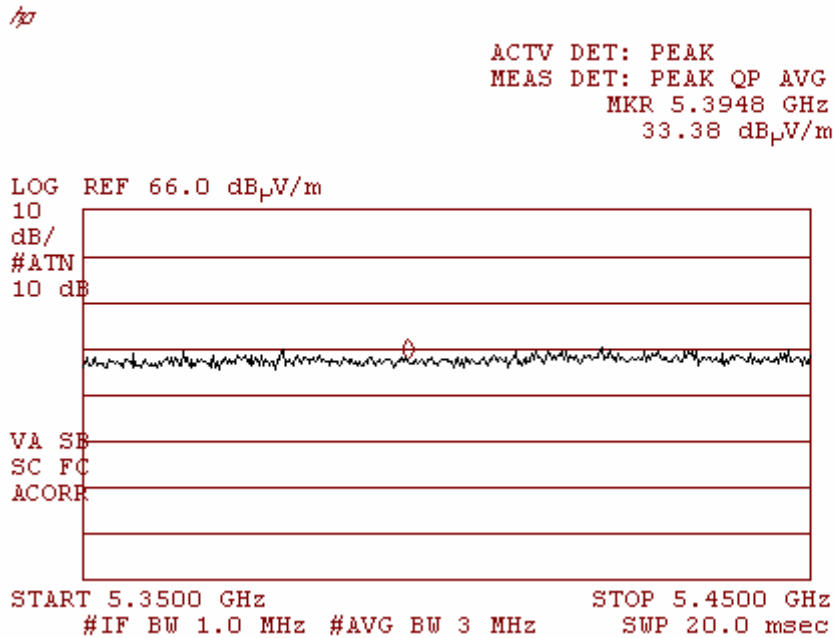
**54 Mbit, Lowest Frequency  
Vertical Polarization  
Plot 3.15.1**



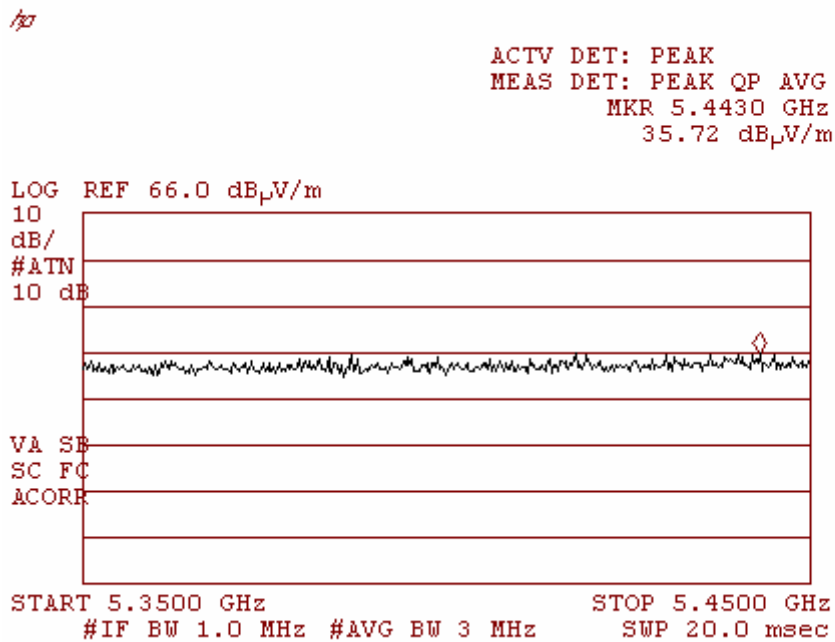
**Horizontal Polarization  
Plot 3.15.2**



**Highest Frequency  
Horizontal Polarization  
Plot 3.15.3**

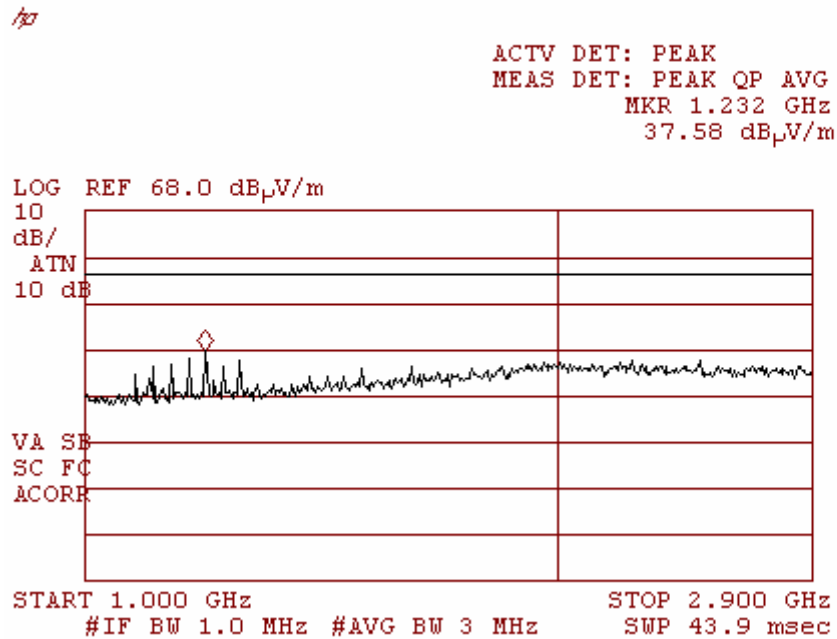


**Vertical Polarization  
Plot 3.15.4**

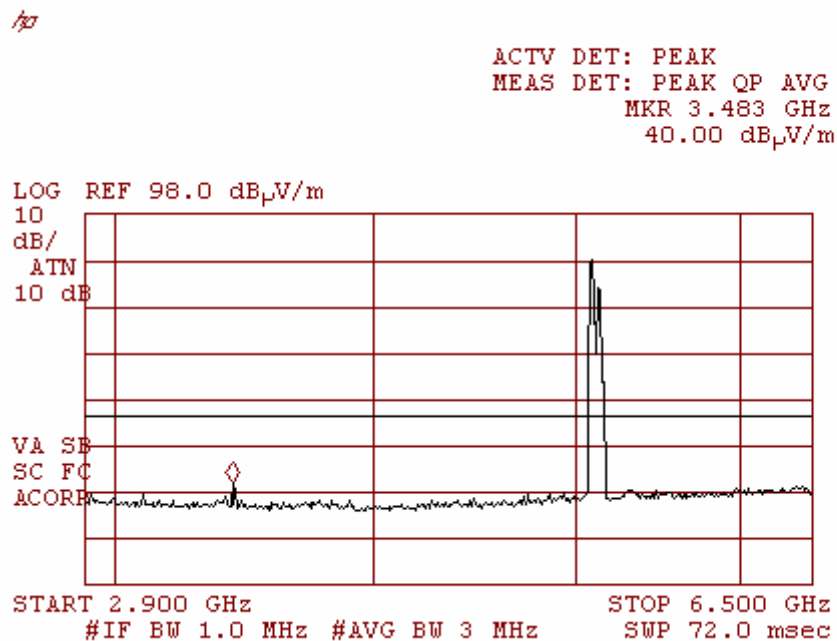


**802.11a Mode all channels transmitting simultaneously.  
Highest Frequency**

**Vertical & Horizontal Polarization  
Plot 3.15.5**

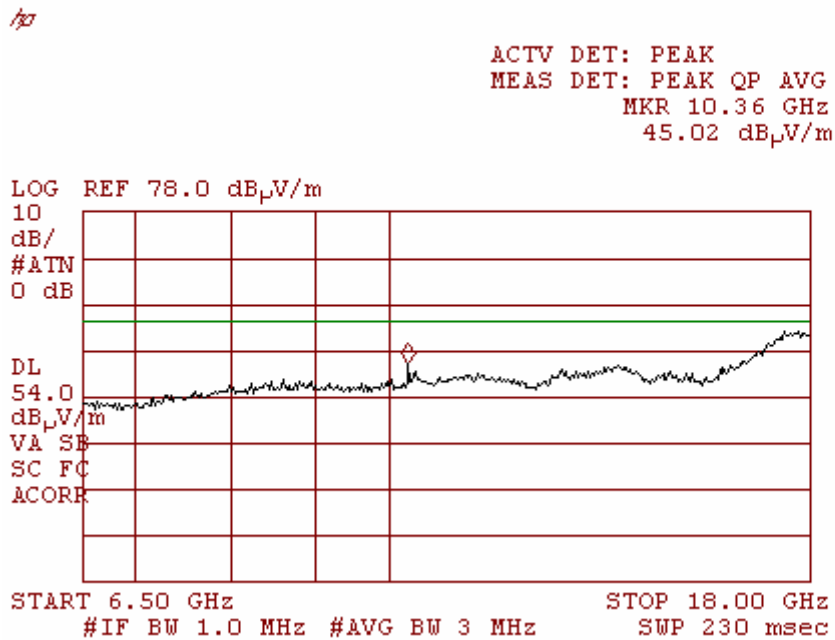


**Vertical & Horizontal Polarization  
Plot 3.15.6**

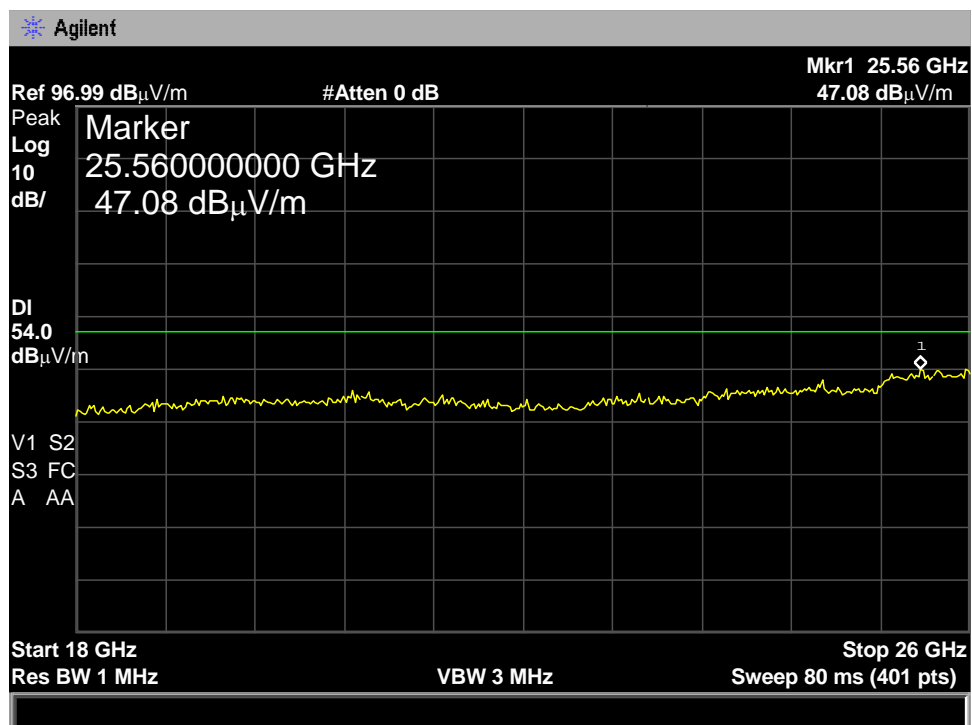




**Vertical & Horizontal Polarization**  
**Plot 3.15.7**



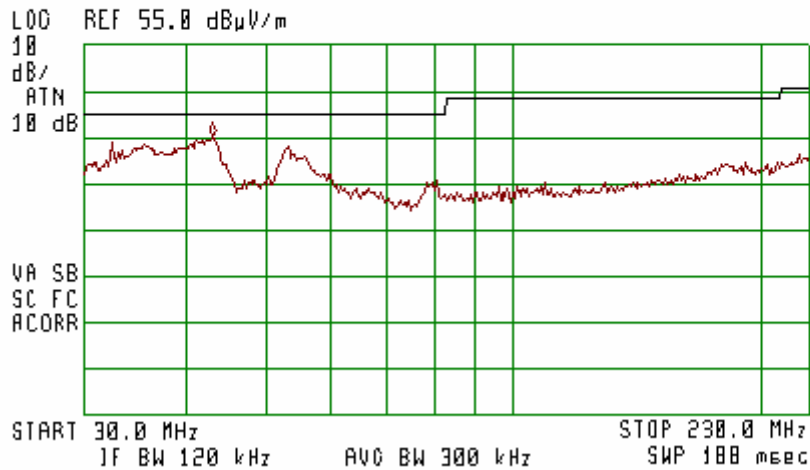
**Vertical & Horizontal Polarization**  
**Plot 3.15.8**



**Below 1 GHz Worst case for all Mode and all channel Radiated Emission**  
**Vertical Polarization**  
**Plot 3.15.9**



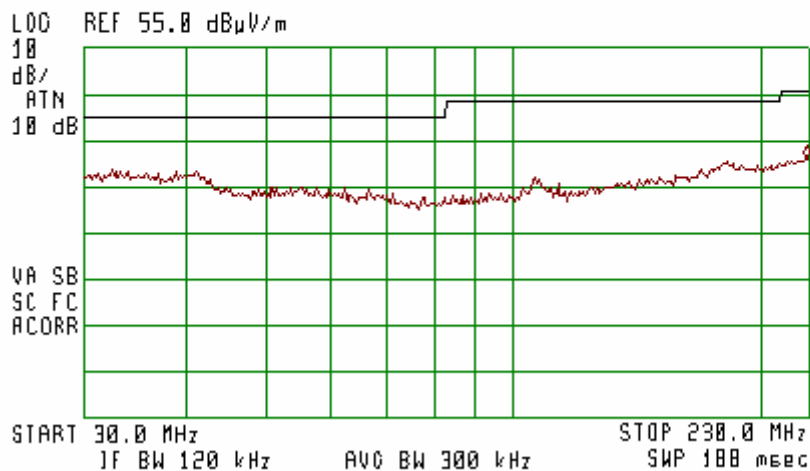
ACTV DET: PEAK  
MERS DET: PEAK QP AVG  
MKR 45.6 MHz  
35.19 dB $\mu$ V/m



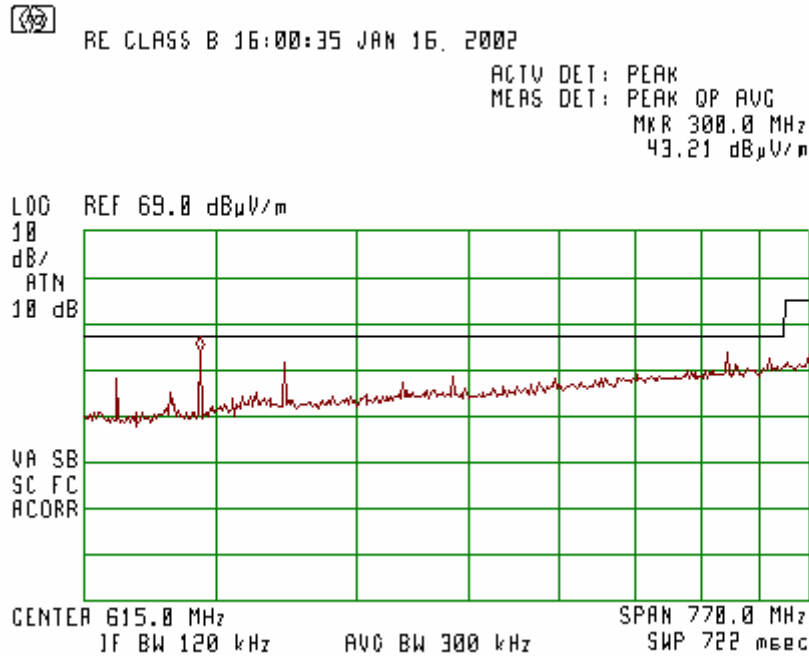
**Horizontal Polarization**  
**Plot 3.15.10**



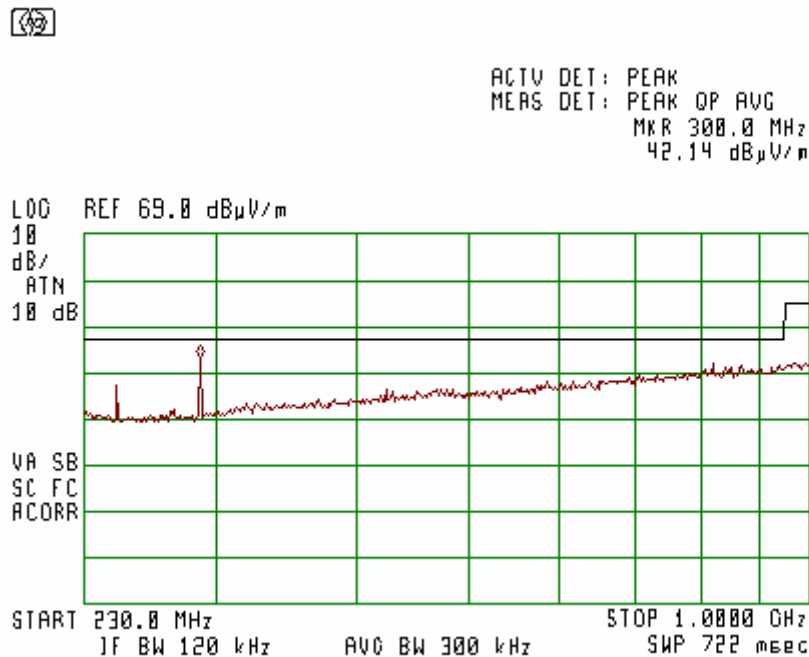
ACTV DET: PEAK  
MERS DET: PEAK QP AVG  
MKR 220.3 MHz  
30.98 dB $\mu$ V/m



**Horizontal Polarization**  
**Plot 3.15.11**



**Vertical Polarization**  
**Plot 3.15.12**



#### 4.14. Antenna Connector Requirements

Reference document:	<b>47 CFR §15.203</b>	
Test Requirements:	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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with provisions of this section.	
Result:	The Access Point – EXRP40 employs internal antennas with U.FL -Type connectors and U.FL coaxial cables.	<b>Comply</b>

## 5. Appendix

### Appendix A: List of Measuring Equipment used:

Equipment	Manufacturer/ Model	Serial Number	Due date
CISPR16 EMI Receiver	HP8546A	3710A00392	30-06-07
Spectrum Analyzer 9kHz ÷ 22 GHz	HP 8593EM	3536A00131	30-06-07
Spectrum Analyzer 100 Hz ÷ 26.5 GHz	Agilent E7405A	US41160436	30-06-07
LNA Amplifier 1 GHz ÷ 18 GHz	AMP – 5D-010180-30-10P-GW	618653	30-06-07
Power meter	Agilent N1911A	MY45100784	23-02-08
Dual Ridged Guide Ant. 1-18 GHz	EMCO 3115	9602-4677	30-06-07
Antenna 18 GHz ÷ 26.5 GHz	Alpha Industry 861A/599	505	30-06-07
Turn table	HD100	100/693	-
Antenna Mast	HD 100	100/693	-
Biconical 20 – 200 MHz	Schwarzbeck VHBB9124	9124/0255	16-05-07
Log-Periodic 200 – 1000 MHz	Schwarzbeck VUSLP9111	VUSLP9111184	16-05-07
Pre-Amplifier	MiTeq, AMF-5F-18002650-30-10P	945372	30-06-07
LISN	Fischer 50/250-25-2	-	30-06-07
Transient Limiter	HP11947A	-	30-06-07
Notch Filter	Micro-Tronics BRM50702-05	0001	30-06-07

***End of the Test Report***