

# TEST REPORT

of

## FCC PART 15 SUBPART E AND CANADA RSS-210

New Application;  Class I PC;  Class II PC

**Product :** Thin Client  
**Brand:** acer  
**Model:** Veriton N2010G  
**Model Difference:** N/A  
**FCC ID:** HLZFX1  
**IC:** 1754F-FX1  
**FCC Rule Part:** §15.407, NII  
**IC Rule Part:** RSS-210 issue 8:2010, Annex 9  
**Applicant:** Acer Incorporated  
**Address:** 8F, 88, Sec 1, Hsin Tai Wu Rd, Hsichih, Taipei  
Hsien, Taiwan

### Test Performed by:

#### International Standards Laboratory

<Lung-Tan LAB>

\*Site Registration No.

BSMI: SL2-IN-E-0013; MRA TW1036; TAF: 0997; IC: IC4067B-3;

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Report No.: **ISL-13LR036FE**

Issue Date : **2013/03/21**

Test results given in this report apply only to the specific sample(s) tested and are traceable to national or international standard through calibration of the equipment and evaluating measurement uncertainty herein.

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## VERIFICATION OF COMPLIANCE

**Applicant:** Acer Incorporated  
**Product Description:** Thin Client  
**Brand Name:** acer  
**Model No.:** Veriton N2010G  
**Model Difference:** N/A  
**FCC ID:** HLZFX1  
**IC:** 1754F-FX1  
**FCC Rule Part:** §15.407  
**IC Rule Part:** RSS-210 issue 8:2010, Annex 9  
**Date of test:** 2013/03/04 ~ 2013/03/21  
**Date of EUT Received:** 2013/03/04

### We hereby certify that:

All the tests in this report have been performed and recorded in accordance with the standards described above and performed by an independent electromagnetic compatibility consultant, International Standards Laboratory.

The test results contained in this report accurately represent the measurements of the characteristics and the energy generated by sample equipment under test at the time of the test. The sample equipment tested as described in this report is in compliance with the limits of above standards.

<b>Test By:</b>	 _____	<b>Date:</b>	2013/03/21 _____
	<i>Dion Chang / Engineer</i>		
<b>Prepared By:</b>	 _____	<b>Date:</b>	2013/03/21 _____
	<i>Eva Kao / Technical Supervisor</i>		
<b>Approved By:</b>	 _____	<b>Date:</b>	2013/03/21 _____
	<i>Vincent Su / Technical Manager</i>		

## Version

Version No.	Date	Description
00	2013/03/21	Initial creation of document

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## 1. GENERAL INFORMATION

### 1.1. Product Description

General:

Product Name	Thin Client
Brand Name	acer
Model Name	Veriton N2010G
Model Difference	N/A
Power Supply	12Vdc from AC/DC adapter
	1. Adapter model: PA-1051-0, Supple: LITEON
	2. Adapter model: Au-799In, Supple: Elementech International Co., Ltd.
Hardware Version:	N/A
Software Version:	N/A
Adhoc Mode	No
DFS Mode	Client(without radar detection)
TPC	No
Operation Environment	Indoor

WLAN: 1TX/1RX

Wi-Fi	Frequency Range (MHz)	Channels	Peak Rated Power	Modulation Technology
802.11b	2412 – 2462(DTS)	11	20.4dBm	DSSS
802.11g	2412 – 2462(DTS)	11	23.61dBm	DSSS/OFDM
802.11n	HT20 2412 – 2462(DTS)	11	23.02dBm	OFDM
802.11a	5180 – 5320(NII)	8	12.53dBm	OFDM
	5500 – 5700(NII)	8	12.16dBm	
	5745 – 5825(DTS)	5	17.46dBm	
802.11n	HT20 5180 – 5320(NII)	8	12.43dBm	OFDM
	HT20 5500 – 5700(NII)	8	12.05dBm	
	HT20 5745 – 5825(DTS)	5	17.53dBm	
Modulation type		CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM		
Transition Rate:		Upto 65Mbps		
Antenna Designation:		PIFA Antenna 2412 – 2462MHz: -2.07dBi 5180 – 5320MHz: -0.03dBi 5500 – 5700MHz: 0.25dBi 5745 – 5825MHz: 0.7dBi		

The EUT is compliance with IEEE 802.11 a/b/g/n Standard.

This report applies for frequency bands 5180 MHz – 5320 MHz and 5500MHz – 5700MHz.

## **1.2. Related Submittal(s) / Grant (s)**

This submittal(s) (test report) is intended for **FCC ID: HLZFX1** filing to comply with Section 15.407 of the FCC Part 15, Subpart E Rules and **IC: 1754F-FX1** filing to comply with Industry Canada RSS-210 issue 8: 2010 Annex 9. The composite system (digital device) is compliance with Subpart B is authorized under a DoC procedure.

## **1.3. Test Methodology**

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003). and RSS-Gen: 2010. Radiated testing was performed at an antenna to EUT distance 3 meters. Radiated testing was performed at an antenna to EUT distance 3 meters.

KDB Document: KDB789033 D01 General UNII Test Procedures v01r02

## **1.4. Test Facility**

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of International Standards Laboratory <Lung-Tan LAB> No. 120, Lane 180, San Ho Tsuen, Hsin Ho Rd., Lung-Tan Hsiang, Tao Yuan County 325, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003. FCC Registration Number is: TW1036, Canada Registration Number: 4067B-3.

## **1.5. Special Accessories**

Not available for this EUT intended for grant.

## **1.6. Equipment Modifications**

Not available for this EUT intended for grant.



## **2. SYSTEM TEST CONFIGURATION**

### **2.1. EUT Configuration**

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

### **2.2. EUT Exercise**

The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements.

### **2.3. Test Procedure**

#### **2.3.1 Conducted Emissions**

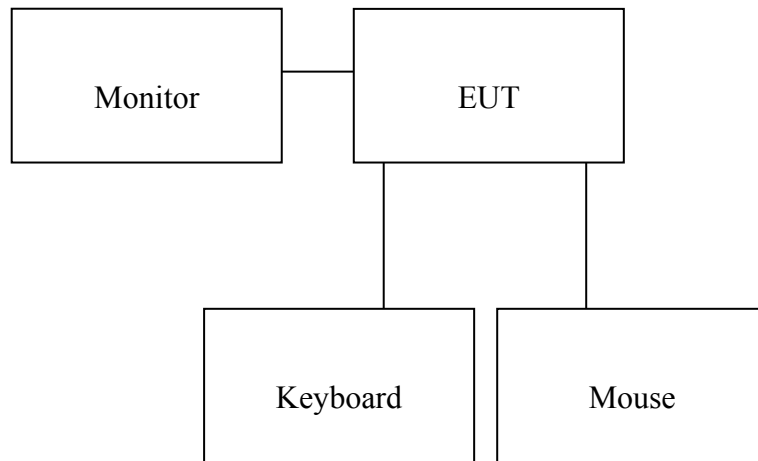
The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 7 and 13 of ANSI C63.4-2003. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and Average detector mode.

#### **2.3.2 Radiated Emissions**

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made “while keeping the antenna in the ‘cone of radiation’ from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.” Is still within the 3dB illumination BW of the measurement antenna. According to the requirements in Section 8 and 13 and Subclause 8.3.1.2 of ANSI C63.4-2003.

## 2.4. Configuration of Tested System

**Fig. 2-1 Configuration of Tested System**



**Table 1-1 Equipment Used in Tested System**

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1	Monitor	DELL	2408	N/A	Shielding	No- Shielding
2	Keyboard	DELL	SK-8115	N/A	Shielding	N/A
3	Mouse	DELL	MO56UC	N/A	Shielding	N/A

### 3. SUMMARY OF TEST RESULT

<b>FCC Rules</b>	<b>Description Of Test</b>	<b>Result</b>
§15.207 RSS-Gen §7.2.4	AC Power Line Conducted Emission	Compliant
§15.407(a) RSS 210 A9.2 RSS-Gen §4.6.3	26 dB Emission Bandwidth	Compliant
§15.407(a) RSS 210 A9.2(1)(2)(3)	Peak Output Power Measurement	Compliant
§15.407(a) RSS 210 A9.2(1)(2)(3)	Peak Power Spectral Density Measurement	Compliant
15.407(a)(6)	Peak Excursion Measurement	Compliant
§15.407(b) RSS 210 A9.2(1)(2)(3)	Undesirable Emission – Con- ducted Measurement	Compliant
§15.407(b) RSS 210 A9.2(1)(2)(3)	Undesirable Emission – Radiated Measurement	Compliant
§15.407© RSS 210 A9.4(4)	Transmission in case of Absence of Information	Compliant
§15.407(g) RSS 210 A9.5(5)	Frequency Stability	Compliant
§15.407(a) RSS-GEN 7.1.2, RSS-210 issue 8, §A8.4	Antenna Requirement	Compliant
§15.407(d) RSS 210 A9.3	TPC and DFS Measurement	Compliant
MPE	Maximum Permissible Exposure	Compliant

#### 4. DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

Test program used to control the EUT for staying in continuous transmitting mode is programmed.

5180MHz-5320MHz:

802.11 a mode: Channel lowest (5180MHz) 、Mid (5260MHz) and Highest (5320MHz) with 6Mbps data rate are chosen for full testing.

802.11 n HT 20 mode: Channel lowest (5180MHz) 、Mid (5260MHz) and Highest (5320MHz) with 6.5Mbps data rate are chosen for full testing

5500MHz-5700MHz:

802.11 a mode: Channel lowest (5500MHz) 、Mid (5580MHz) and Highest (5700MHz) with 6Mbps data rate are chosen for full testing.

802.11 n HT 20 mode: Channel lowest (5500MHz) 、Mid (5580MHz) and Highest (5700MHz) with 6.5Mbps data rate are chosen for full testing.

The worst case 802.11a 5180MHz-5320MHz was reported for Radiated Spurious Emission.

## 5. AC POWER LINE CONDUCTED EMISSION TEST

### 5.1. Standard Applicable

According to §15.207 and RSS-Gen §7.2.4, frequency range within 150 KHz to 30 MHz shall not exceed the Limit table as below.

Frequency range MHz	Limits dB(uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Note

- 1.The lower limit shall apply at the transition frequencies
- 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

### 5.2. Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
<b>Conduction 03</b>					
EMI Receiver 11	ROHDE & SCHWARZ	ESCI	100568	07/16/2012	07/16/2013
ISNT2-02	FCC	FCC-TLISN-T2-02	20413	07/22/2012	07/22/2013
ISNT4-02	FCC	FCC-TLISN-T4-02	20575	07/22/2012	07/22/2013
ISNT8-04	FCC	FCC-TLISN-T8-09	101192	09/29/2012	09/29/2013
LISN 07	FCC Inc.	FCC-LISN-50-100- 4-02	07040	07/23/2012	07/23/2013
LISN 08	FCC	FCC-LISN50-25-2- 01	07039	07/23/2012	07/23/2013
Conduction 03 -1 Cable	WOKEN	CFD 300-NL	Conduction 03 -1	06/28/2012	06/28/2013

### **5.3. EUT Setup:**

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.4-2003.
2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
3. The LISN was connected with 120Vac/60Hz power source.

### **5.4. Measurement Procedure:**

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

### **5.5. Measurement Result:**

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Note: Refer to next page for measurement data and plots.

## AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Operation Mode	Test Date:	2013/03/21
Adapter model:	Au-799In	Test By:	Dino

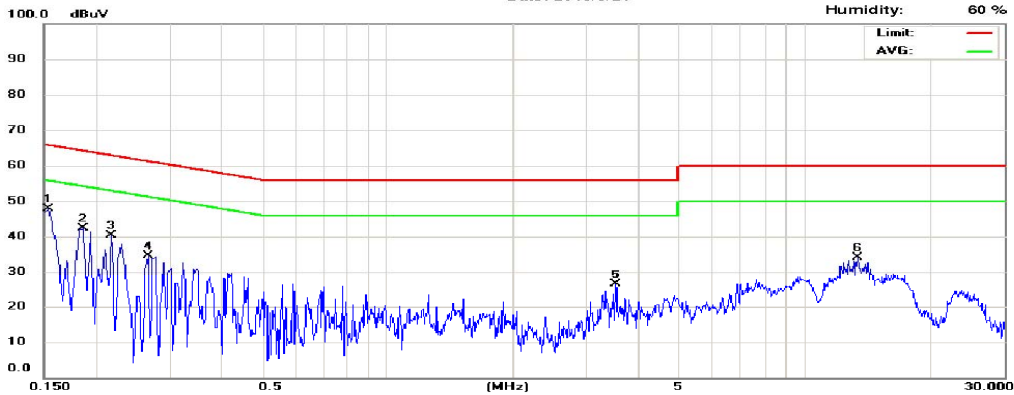


Address: No. 120, Lane 180, San Ho Tsuen, Hsin Ho Road, Lung-Tan Hsiang,  
Tao Yuan Conty, Taiwan R.O.C.  
Tel: 03-4071718

### Conducted Emission Measurement

operator: Jeff Chou  
Temperature: 26 °C  
Humidity: 60 %

Date: 2013/3/21



Site: Conduction 03

Phase: L1

Limit: CISPR22 Class B Conduction

No.	Frequency (MHz)	Correct Factor (dB)	QP Emission (dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVG Emission (dBuV)	AVG Limit (dBuV)	AVG Margin (dB)	Note
1	0.1540	0.15	46.36	65.78	-19.42	31.98	55.78	-23.80	
2	0.1860	0.14	40.81	64.21	-23.40	26.76	54.21	-27.45	
3	0.2180	0.14	31.02	62.89	-31.87	11.30	52.89	-41.59	
4	0.2660	0.14	32.60	61.24	-28.64	19.91	51.24	-31.33	
5	3.5140	0.22	16.80	56.00	-39.20	6.62	46.00	-39.38	
6	13.3740	0.37	29.45	60.00	-30.55	22.35	50.00	-27.65	



Address: No.120, Lane 180, San Ho Tsuen, Hsin Ho Road, Lung-Tan Hsiang,  
Tao Yuan County, Taiwan R.O.C.  
Tel: 03-4071718

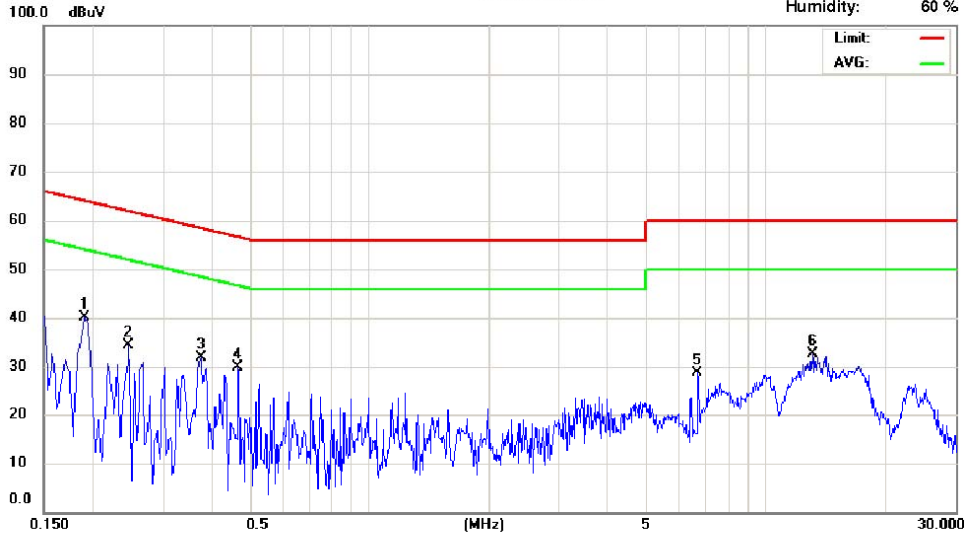
Conducted Emission Measurement

Date: 2013/3/21

operator: Jeff Chou

Temperature: 26 °C

Humidity: 60 %



Site: Conduction 03

Phase: N

Limit: CISPR22 Class B Conduction

No.	Frequency (MHz)	Correct Factor (dB)	QP Emission (dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVG Emission (dBuV)	AVG Limit (dBuV)	AVG Margin (dB)	Note
1	0.1900	0.07	38.89	64.04	-25.15	26.69	54.04	-27.35	
2	0.2460	0.07	24.64	61.89	-37.25	4.17	51.89	-47.72	
3	0.3740	0.06	25.76	58.41	-32.65	20.40	48.41	-28.01	
4	0.4660	0.07	19.35	56.58	-37.23	4.68	46.58	-41.90	
5	6.7140	0.17	16.66	60.00	-43.34	8.52	50.00	-41.48	
6	13.0580	0.25	29.45	60.00	-30.55	22.34	50.00	-27.66	



### AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Operation Mode	Test Date:	2013/03/11
Adapter model:	PA-1051-0	Test By:	Dino

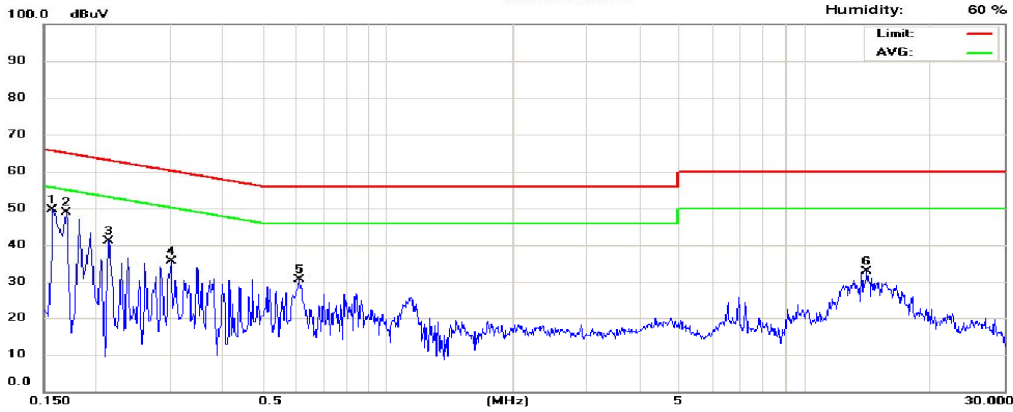


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Tel: 03-4071718

#### Conducted Emission Measurement

Date: 2013/3/21

operator: Jeff Chou  
Temperature: 26 °C  
Humidity: 60 %



Site: Conduction 03

Phase: L1

Limit: CISPR22 Class B Conduction

No.	Frequency (MHz)	Correct Factor (dB)	QP Emission (dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVG Emission (dBuV)	AVG Limit (dBuV)	AVG Margin (dB)	Note
1	0.1580	0.15	48.40	65.57	-17.17	28.99	55.57	-26.58	
2	0.1700	0.15	46.92	64.96	-18.04	28.06	54.96	-26.90	
3	0.2140	0.14	40.43	63.05	-22.62	21.87	53.05	-31.18	
4	0.3020	0.13	29.88	60.19	-30.31	12.44	50.19	-37.75	
5	0.6140	0.15	27.76	56.00	-28.24	20.91	46.00	-25.09	
6	14.1340	0.39	29.63	60.00	-30.37	24.82	50.00	-25.18	



Address: No. 120, Lane 180, San Ho Tsuen, Hsin Ho Road, Lung-Tan Hsiang,  
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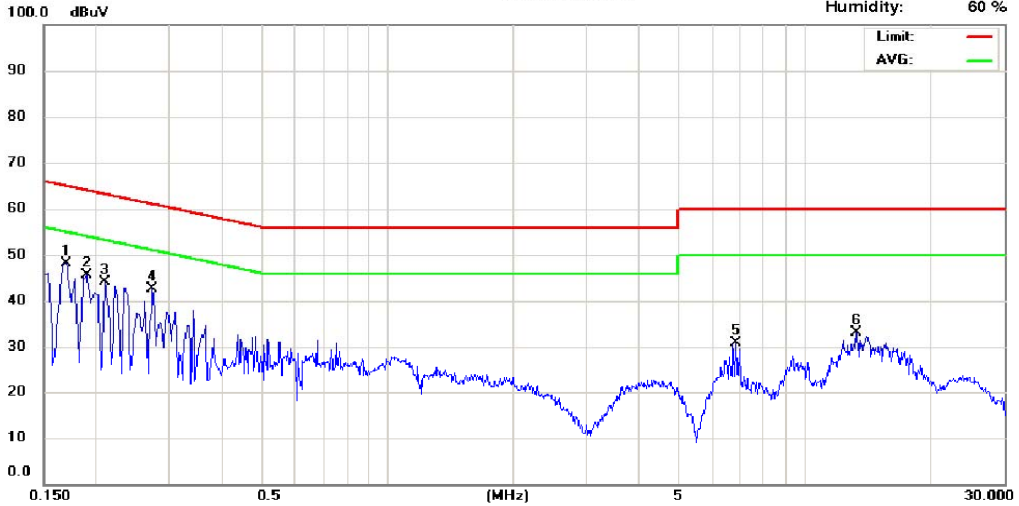
**Conducted Emission Measurement**

Date: 2013/3/21

operator: Jeff Chou

Temperature: 26 °C

Humidity: 60 %



Site: Conduction 03

Phase: N

Limit: CISPR22 Class B Conduction

No.	Frequency (MHz)	Correct Factor (dB)	QP Emission (dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVG Emission (dBuV)	AVG Limit (dBuV)	AVG Margin (dB)	Note
1	0.1700	0.08	46.27	64.96	-18.69	27.53	54.96	-27.43	
2	0.1900	0.07	41.53	64.04	-22.51	23.85	54.04	-30.19	
3	0.2100	0.07	40.00	63.21	-23.21	23.12	53.21	-30.09	
4	0.2740	0.07	33.80	61.00	-27.20	21.66	51.00	-29.34	
5	6.8700	0.17	21.36	60.00	-38.64	15.50	50.00	-34.50	
6	13.2820	0.25	31.26	60.00	-28.74	25.76	50.00	-24.24	

## 6. PEAK OUTPUT POWER MEASUREMENT

### 6.1 Standard Applicable

According to §15.407(a)

1. For the band 5.15-5.25 GHz, the maximum conducted power over the frequency of operation shall not exceed the lesser of 50 mW (17dBm) or  $4 \text{ dBm} + 10\log B$ .
2. For the band 5.25-5.35 GHz and 5.47-5.725GHz, the maximum conducted power over the frequency of operation shall not exceed the lesser of 250 mW (24dBm) or  $11 \text{ dBm} + 10\log B$ .
3. For the band 5.725-5.825 GHz, the maximum conducted power over the frequency of operation shall not exceed the lesser of 1W (30dBm) or  $17 \text{ dBm} + 10\log B$ .

According to RSS-210 A9.2

1. For the band 5150-5250 MHz, the maximum equivalent isotropically radiated power (e.i.r.p.) shall not exceed 200mW or  $10 + 10 \log_{10} B$ , dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10dBm in any 1.0 MHz band.
2. For the bands 5250-5350 MHz and 5470-5725 MHz, the maximum conducted output power shall not exceed 250mW or  $11 + 10 \log_{10} B$ , dBm, whichever power is less. The power spectral density shall not exceed 11dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or  $17 + 10 \log_{10} B$ , dBm, whichever power is less. B is the 99% emission bandwidth in MHz. In addition, devices with maximum e.i.r.p. greater than 500mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W. In addition to the above requirements, devices operating in the band 5250-5350 MHz with maximum e.i.r.p. greater than 200mW shall comply with the following e.i.r.p. elevation mask where  $\theta$  is the angle above the local horizontal plane (of the earth) as shown below:
  - (i) -13 dB(W/MHz) for  $0^\circ \leq \theta < 8^\circ$
  - (ii)  $-13 - 0.716 (\theta - 8)$  dB(W/MHz) for  $8^\circ \leq \theta < 40^\circ$
  - (iii)  $-35.9 - 1.22 (\theta - 40)$  dB(W/MHz) for  $40^\circ \leq \theta \leq 45^\circ$
  - (iv) -42 dB(W/MHz) for  $\theta > 45^\circ$
3. For the band 5725-5825 MHz, the maximum conducted output power shall not exceed 1.0 W or  $17 + 10 \log_{10} B$ , dBm, whichever power is less. The power spectral density shall not exceed 17dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 4.0 W or  $23 + 10 \log_{10} B$ , dBm, whichever power is less. B is the 99% emission bandwidth in MHz. Fixed point-to-point systems for this band are permitted to have an e.i.r.p. greater than 4 W, provided that the higher e.i.r.p. is achieved by employing higher gain antennas, but not higher transmitter output powers. Point-to-multipoint systems, omni-directional applications and multiple co-located transmitters transmitting the same information are prohibited from exceeding 4W e.i.r.p. However, remote stations of point-to-multipoint systems shall be permitted to operate at greater than 4W e.i.r.p., under the same conditions as for point-to-point systems where B is the 26dB emission bandwidth in MHz.

## 6.2 Measurement Procedure

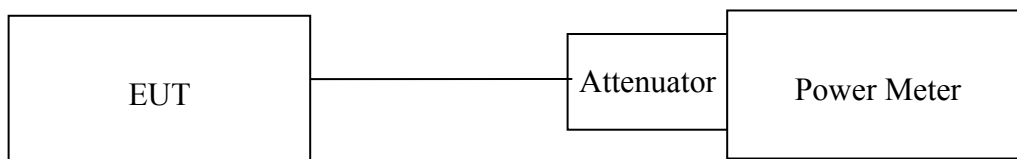
1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter
3. Record the max. reading.
4. Repeat above procedures until all frequency measured were complete.

Refer to section C4 of KDB Document: KDB789033 D01 General UNII Test Procedures v01r02

## 6.3 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Power Meter 05	Anritsu	ML2495A	1116010	04/17/2012	04/16/2013
Power Sensor 05	Anritsu	MA2411B	34NKF50	04/16/2012	04/15/2013
Temperature Chamber	KSON	THS-B4H100	2287	03/15/2013	03/14/2014
DC Power supply	ABM	51850	N/A	06/17/2012	06/16/2013
AC Power supply	EXTECH	CFC105W	NA	12/19/2012	12/18/2013
Splitter	MCLI	PS4-199	12465	07/18/2012	07/17/2013
Spectrum analyzer	Agilent	N9030A	MY51360021	03/11/2013	03/10/2014

## 6.4 Measurement Equipment Used:



## 6.5 Measurement Result

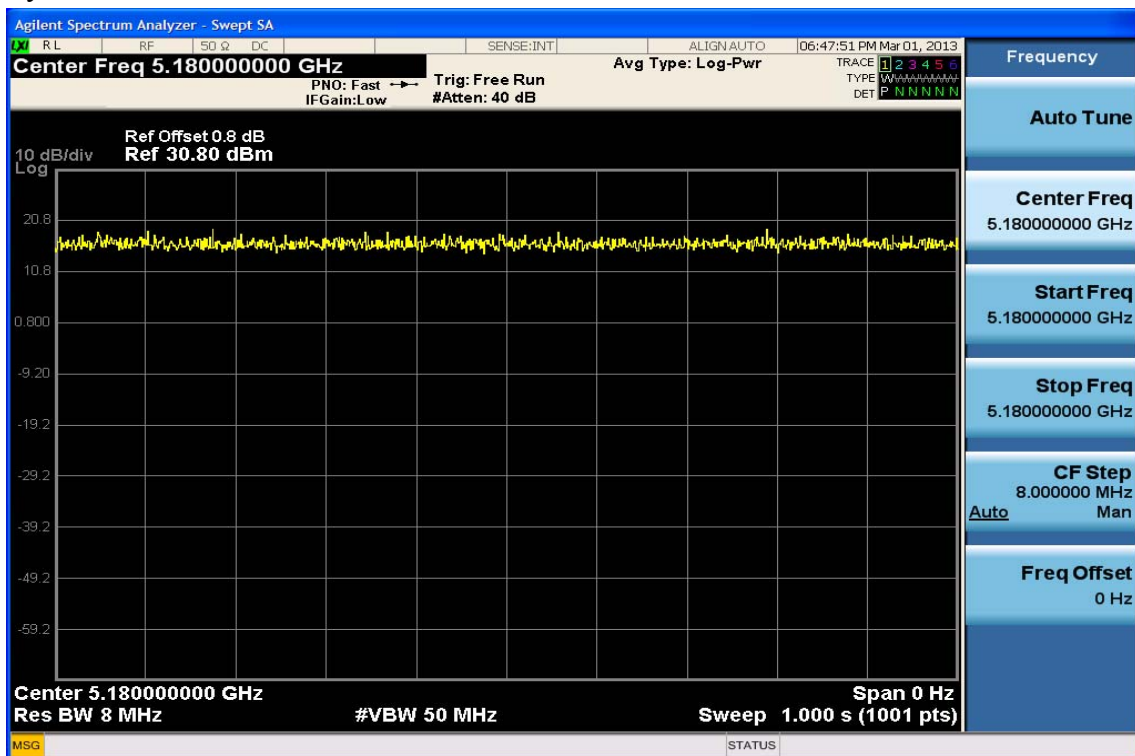
802.11a

Mode	Freq(MHz)	channel	Peak power (dBm)	limit(dBm)	result
802.11a	5180	36	12.53	16.98	pass
	5260	52	12.49	23.97	pass
	5320	64	12.25	23.97	pass
	5500	100	12.07	23.97	pass
	5580	116	11.90	23.97	pass
	5700	140	12.16	23.97	pass

802.11n HT20

Mode	Freq(MHz)	channel	Peak power (dBm)	limit(dBm)	result
802.11n HT20	5180	36	12.43	16.98	pass
	5260	52	12.22	23.97	pass
	5320	64	12.09	23.97	pass
	5500	100	11.98	23.97	pass
	5580	116	11.81	23.97	pass
	5700	140	12.05	23.97	pass

Duty Cycle: 100%



## **7. 26dB and 99% EMISSION BANDWIDTH MEASUREMENT**

### **7.1 Standard Applicable**

According to §15.407(a). No Limit required.

According to RSS 210 A9.2(1), No Limit required

RSS-Gen §4.4.1, the transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual.

The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded.

### **7.2 Measurement Procedure**

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=300KHz, VBW =1MHz, Span= 50MHz, Sweep=auto
4. Mark the peak frequency and -26dB (upper and lower) frequency.
5. Repeat above procedures until all frequency measured were complete.

**Refer to section D of KDB Document: KDB789033 D01 General UNII Test Procedures v01r02**

### **7.3 Measurement Equipment Used:**

Refer to section 6.3 for details.

### **7.4 Test Set-up:**

Refer to section 6.4 for details.

## 7.5 Measurement Result

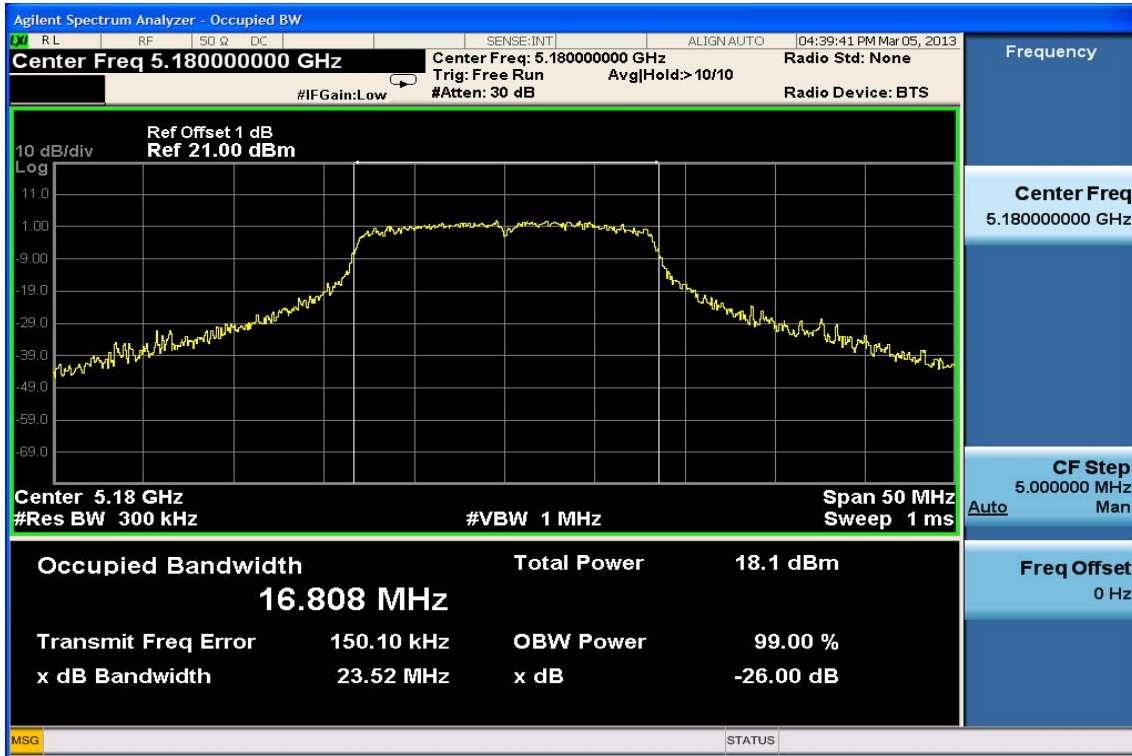
### 802.11a Mode

Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	10 Log (B) with 26dB Bandwidth (dB)	10 Log (B) with 99% Bandwidth (dB)
5180	23.520	16.808	13.71	12.26
5260	23.030	16.736	13.62	12.24
5320	23.230	16.790	13.66	12.25
5500	28.090	16.890	14.49	12.28
5580	23.250	16.832	13.66	12.26
5700	24.980	16.957	13.98	12.29

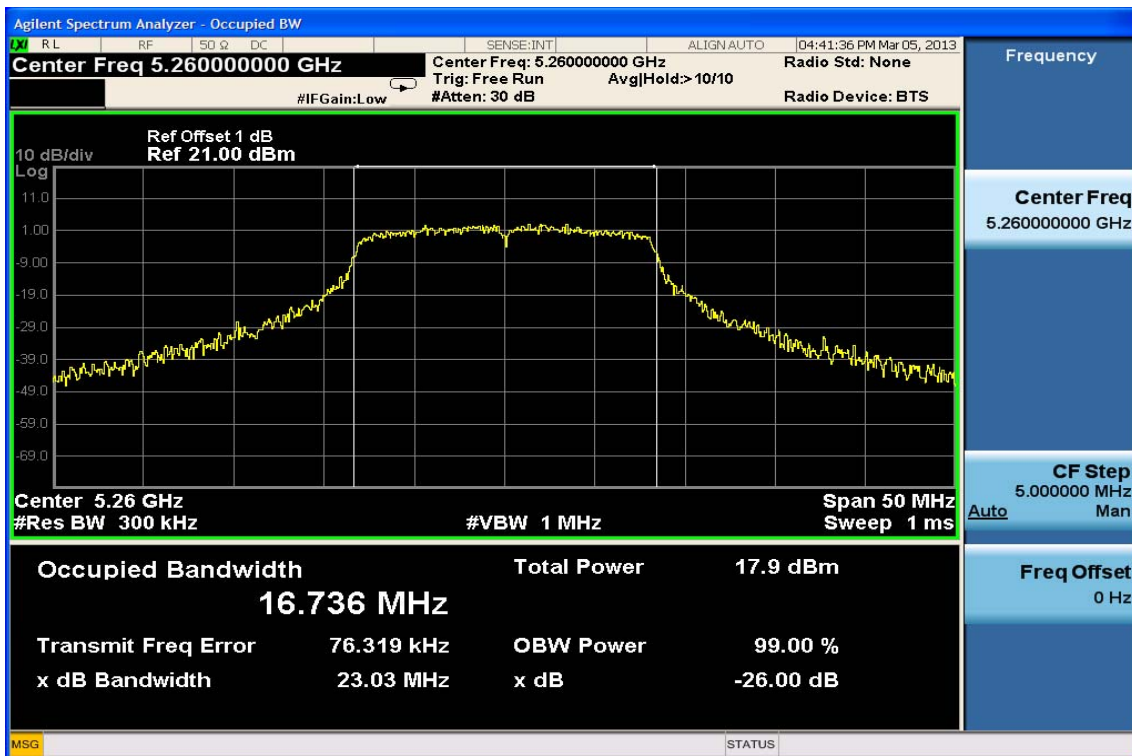
### 802.11n HT20 Mode

Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	10 Log (B) with 26dB Bandwidth (dB)	10 Log (B) with 26dB Bandwidth (dB)
5180	24.200	17.855	13.84	12.52
5260	23.640	17.810	13.74	12.51
5320	24.300	17.808	13.86	12.51
5500	28.500	18.100	14.55	12.58
5580	24.340	17.997	13.86	12.55
5700	29.700	18.152	14.73	12.59

## 26dB and 99% Band Width Test Data 802.11a, 5180MHz

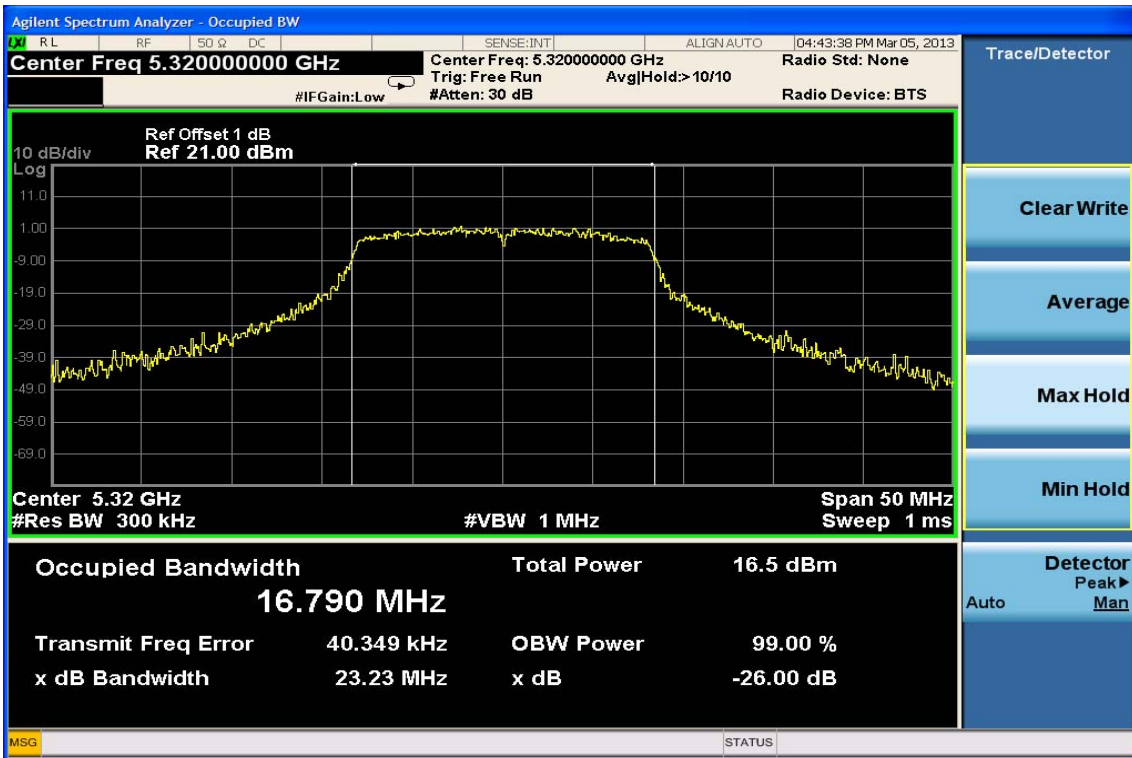


## 802.11a, 5260MHz

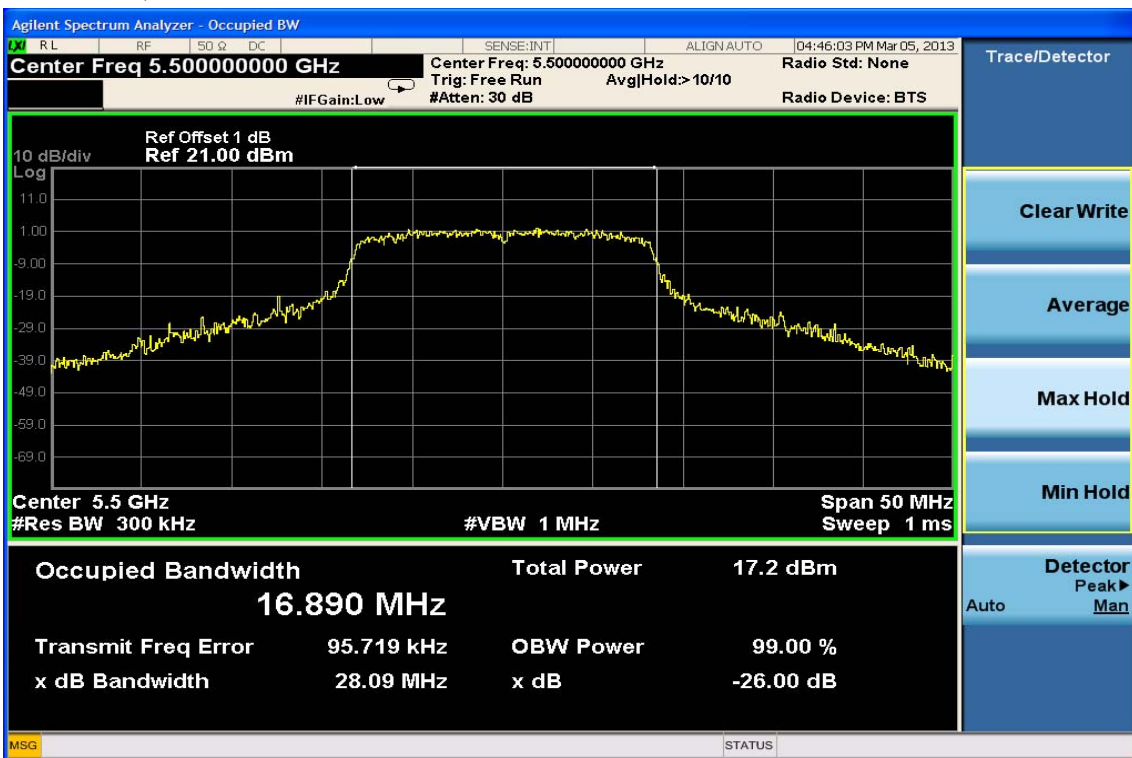




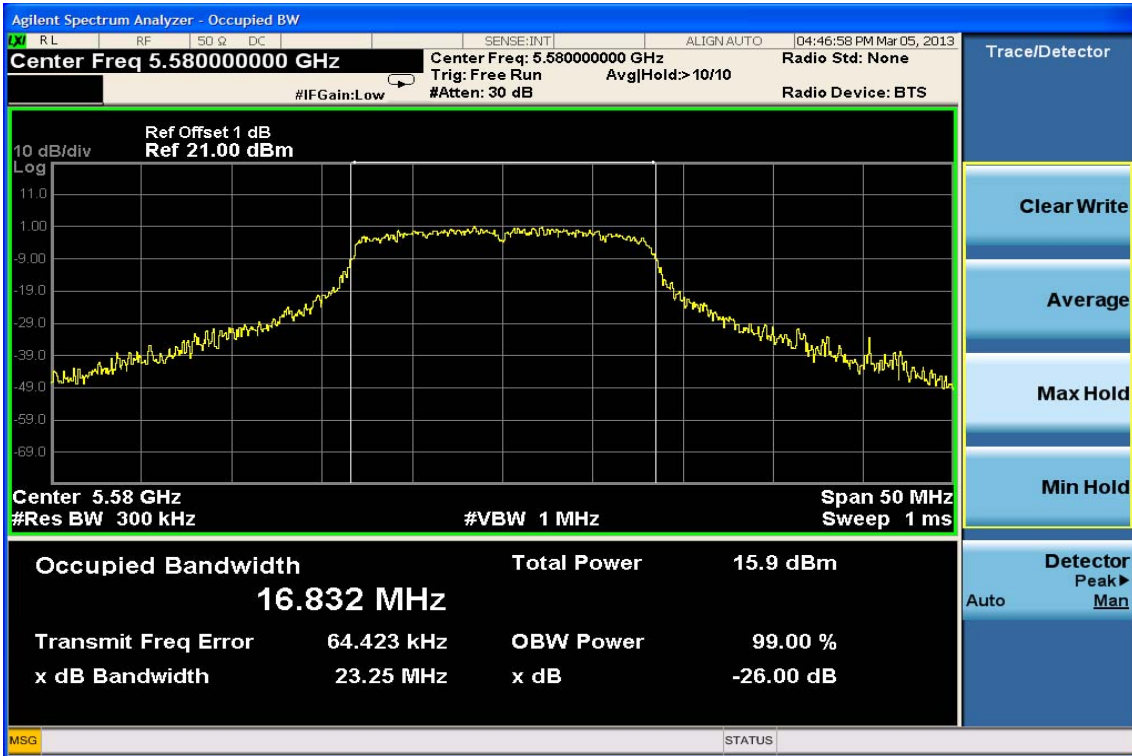
802.11a, 5320MHz



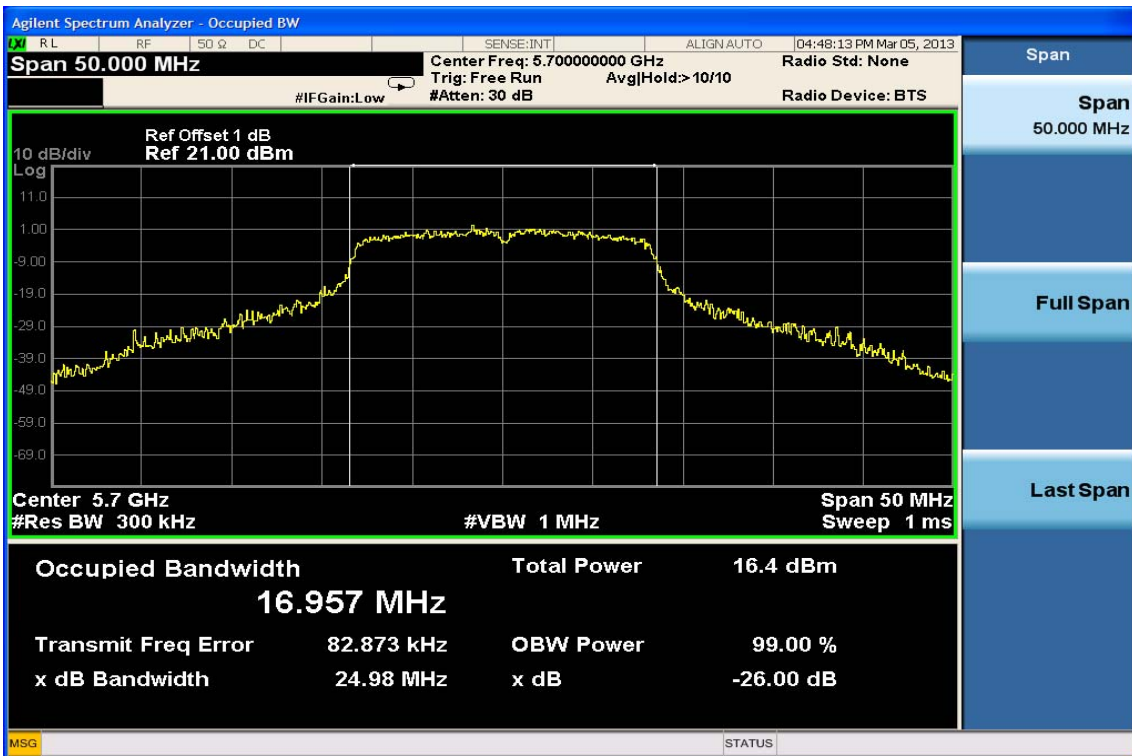
802.11a, 5500MHz



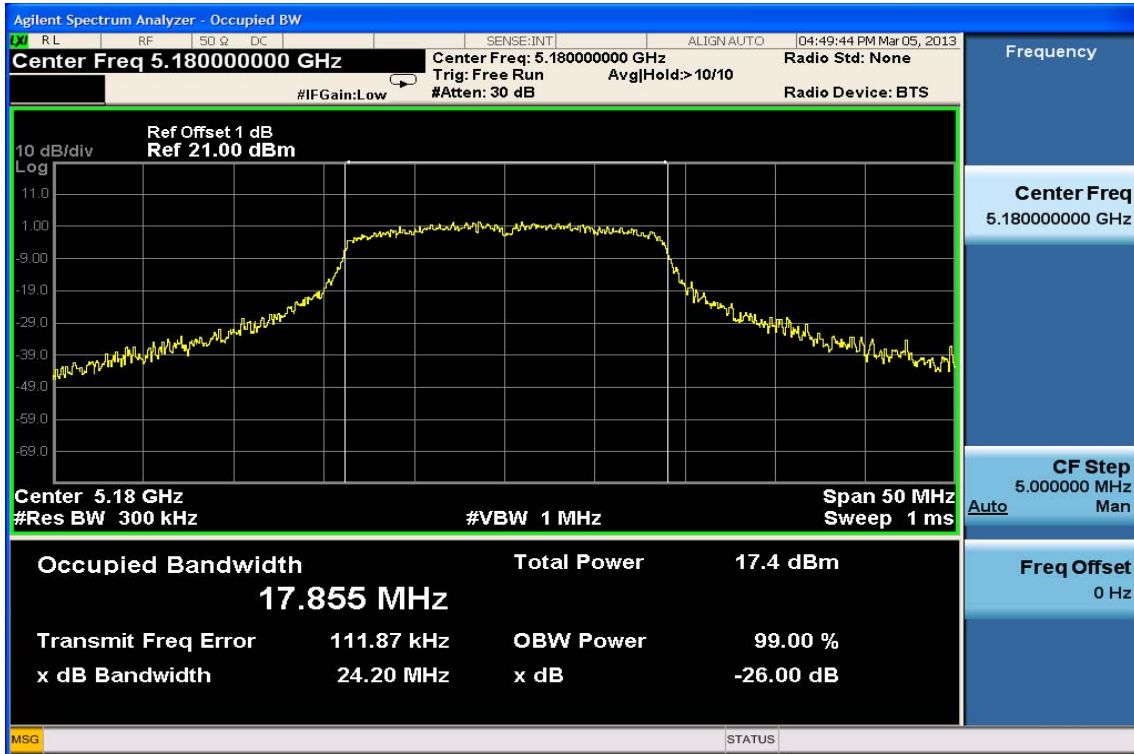
### 802.11a, 5580MHz



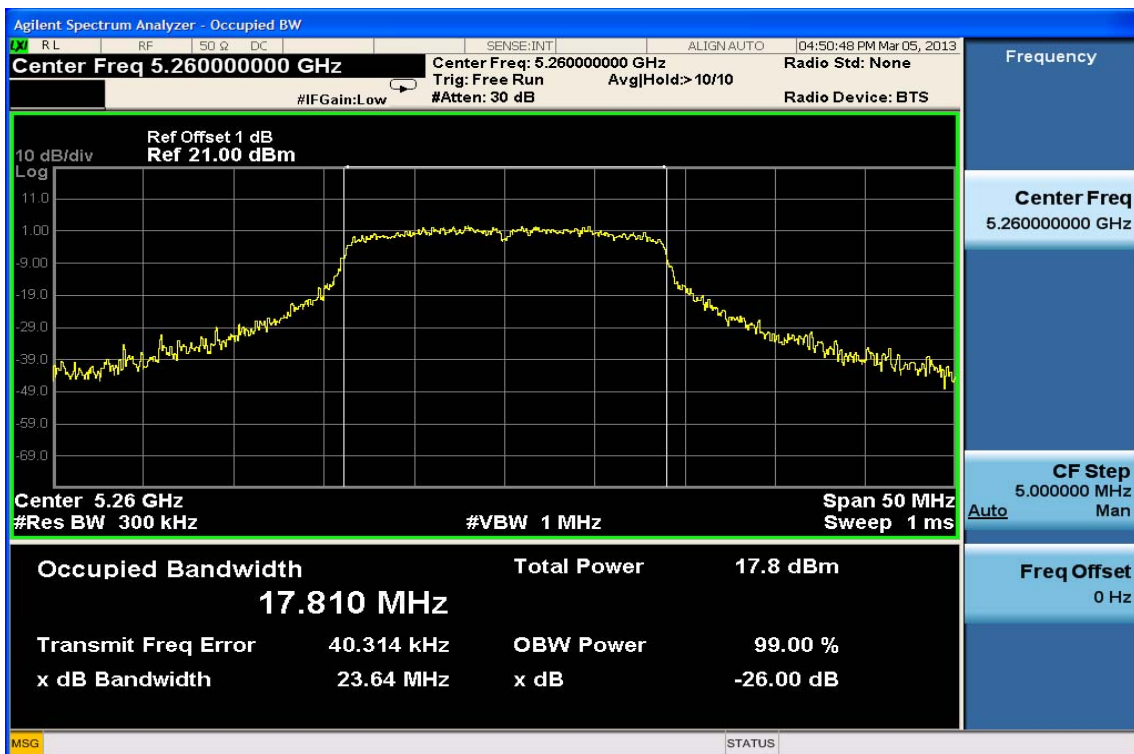
### 802.11a, 5700MHz



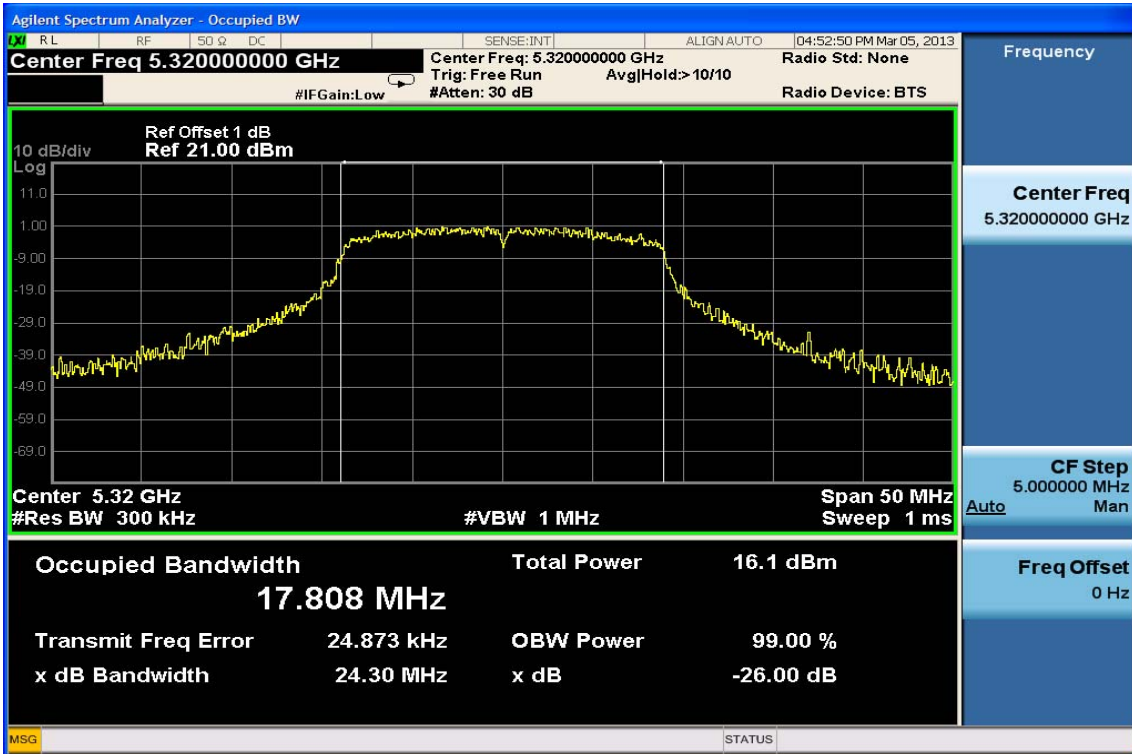
### 26dB and 99% Band Width Test Data 802.11n HT20, 5180MHz



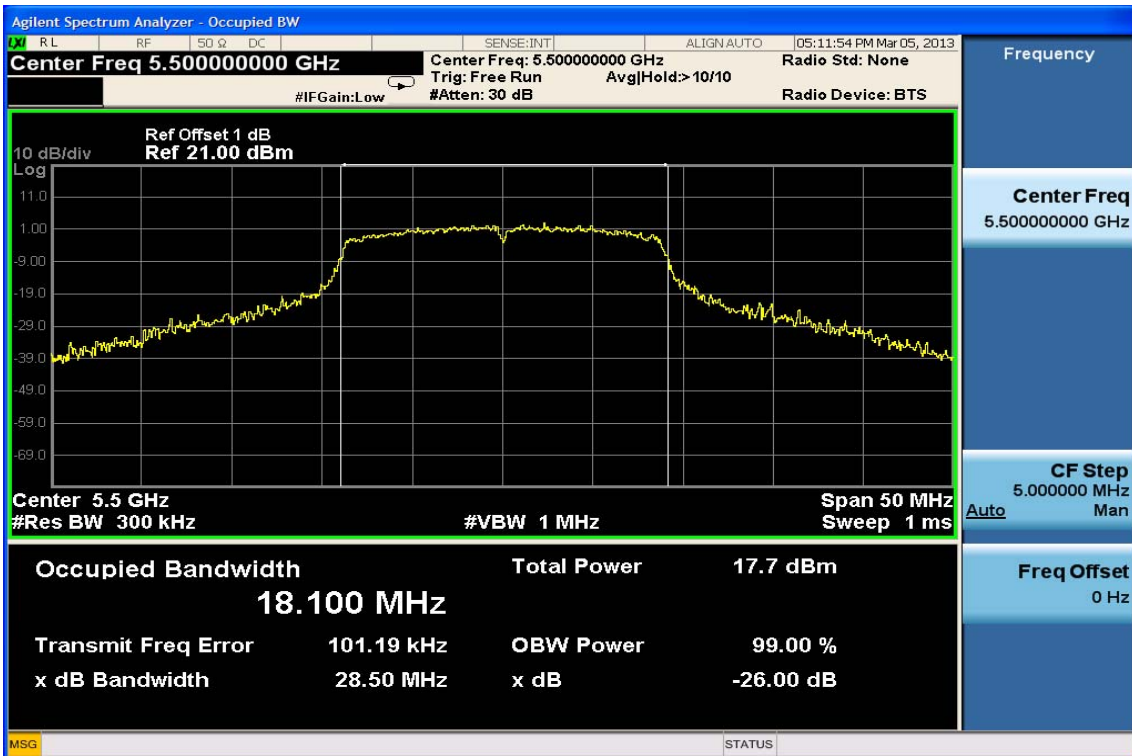
### 802.11n HT20, 5260MHz



### 802.11n HT20, 5320MHz

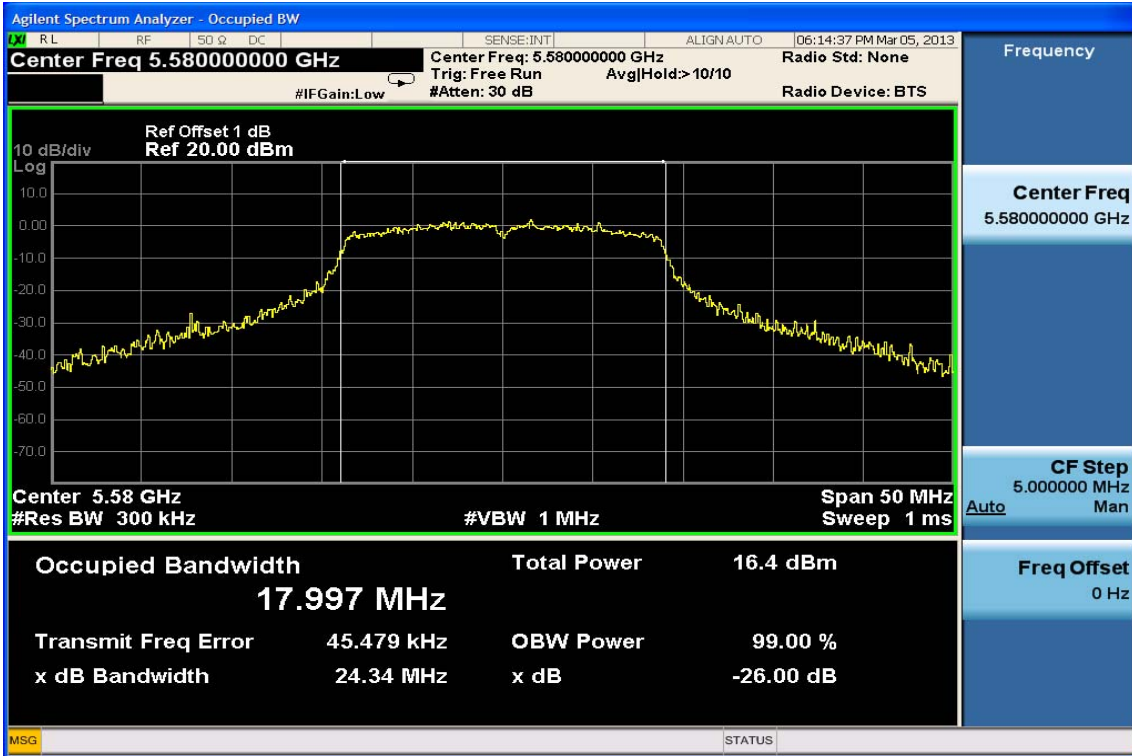


### 802.11n HT20, 5500MHz





### 802.11n HT20, 5580MHz



### 802.11n HT20, 5700MHz



## 8. PEAK POWER SPECTRAL DENSITY

### 8.1 Standard Applicable

According to §15.407(a)

1. For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 4 dBm in any 1-MHz band.
2. For the band 5.25-5.35 GHz and 5.47-5.725GHz, the peak power spectral density shall not exceed 11 dBm in any 1-MHz band.
3. For the band 5.725-5.825 GHz, the peak power spectral density shall not exceed 17 dBm in any 1-MHz band.

According to RSS-210 A9.2

1. For the band 5150-5250 MHz, the maximum equivalent isotropically radiated power (e.i.r.p.) shall not exceed 200 mW or  $10 + 10 \log_{10} B$ , dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.
2. For the bands 5250-5350 MHz and 5470-5725 MHz, the maximum conducted output power shall not exceed 250 mW or  $11 + 10 \log_{10} B$ , dBm, whichever power is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or  $17 + 10 \log_{10} B$ , dBm, whichever power is less. B is the 99% emission bandwidth in MHz. In addition, devices with maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W. In addition to the above requirements, devices operating in the band 5250-5350 MHz with maximum e.i.r.p. greater than 200 mW shall comply with the following e.i.r.p. elevation mask where  $\theta$  is the angle above the local horizontal plane (of the earth) as shown below:
  - (i)  $-13 \text{ dB(W/MHz)}$  for  $0^\circ \leq \theta < 8^\circ$
  - (ii)  $-13 - 0.716 (\theta - 8) \text{ dB(W/MHz)}$  for  $8^\circ \leq \theta < 40^\circ$
  - (iii)  $-35.9 - 1.22 (\theta - 40) \text{ dB(W/MHz)}$  for  $40^\circ \leq \theta \leq 45^\circ$
  - (iv)  $-42 \text{ dB (W/MHz)}$  for  $\theta > 45^\circ$
3. For the band 5725-5825 MHz, the maximum conducted output power shall not exceed 1.0 W or  $17 + 10 \log_{10} B$ , dBm, whichever power is less. The power spectral density shall not exceed 17 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 4.0 W or  $23 + 10 \log_{10} B$ , dBm, whichever power is less. B is the 99% emission bandwidth in MHz. Fixed point-to-point systems for this band are permitted to have an e.i.r.p. greater than 4 W, provided that the higher e.i.r.p. is achieved by employing higher gain antennas, but not higher transmitter output powers. Point-to-multipoint systems, omni-directional applications and multiple co-located transmitters transmitting the same information are prohibited from exceeding 4 W e.i.r.p. However, remote stations of point-to-multipoint systems shall be permitted to operate at greater than 4 W e.i.r.p, under the same conditions as for point-to-point systems. B is the 99% emission bandwidth in MHz.

## **8.2 Measurement Procedure**

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to Spectrum.
3. Set RBW=1MHz,VBW=3MHz, Span=50MHz (Base Mode), Sweep time = Auto, traces 100 sweeps of video averaging.
4. Record the max. reading.
5. Repeat above procedures until all frequency measured were complete.

**Refer to section E of KDB Document: KDB789033 D01 General UNII Test Procedures v01r02**

## **8.3 Measurement Equipment Used:**

Refer to section 6.3 for details.

## **8.4 Test Set-up:**

Refer to section 6.4 for details.

## 8.5 Measurement Result

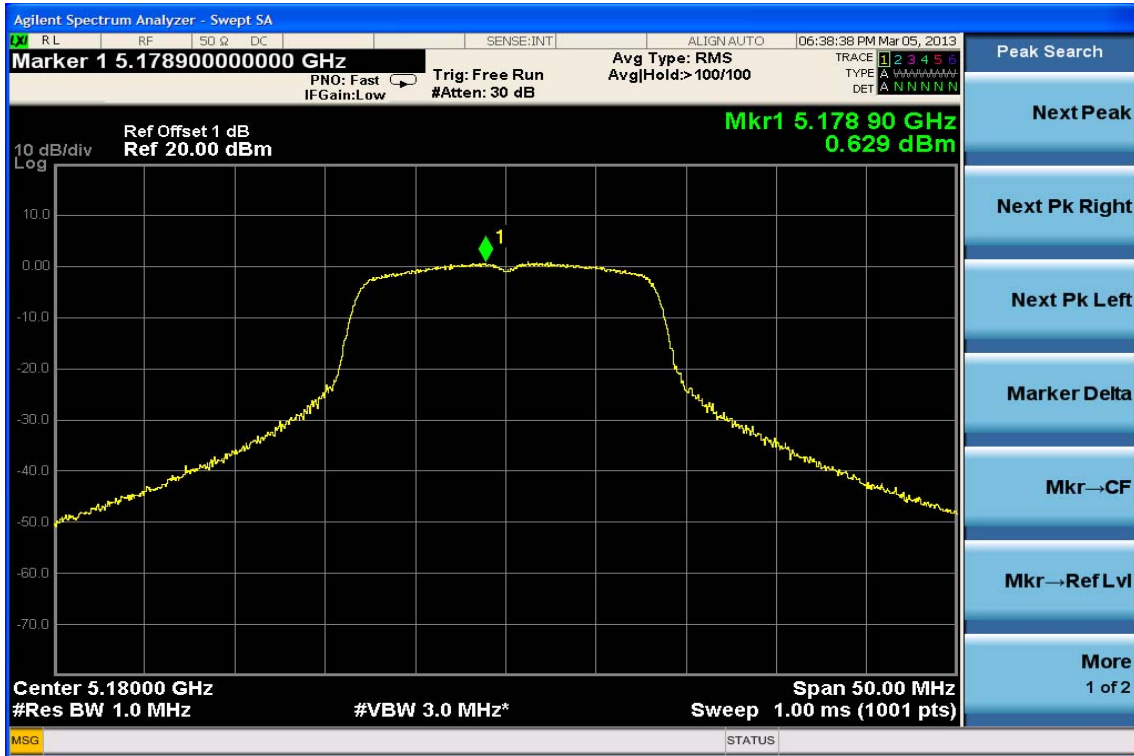
### 802.11a Mode

Frequency MHz	RF Power Density Reading (dBm)	Cable loss (dB)	Maximum Limit (dBm)
5180	0.629	0.00	4
5260	0.891	0.00	11
5320	-0.496	0.00	11
5500	0.305	0.00	11
5580	-1.085	0.00	11
5700	-0.642	0.00	11
802.11n HT20			
Frequency MHz	RF Power Density Reading (dBm)	Cable loss (dB)	Maximum Limit (dBm)
5180	0.372	0.00	4
5260	0.548	0.00	11
5320	-0.656	0.00	11
5500	0.043	0.00	11
5580	-1.305	0.00	11
5700	-0.886	0.00	11

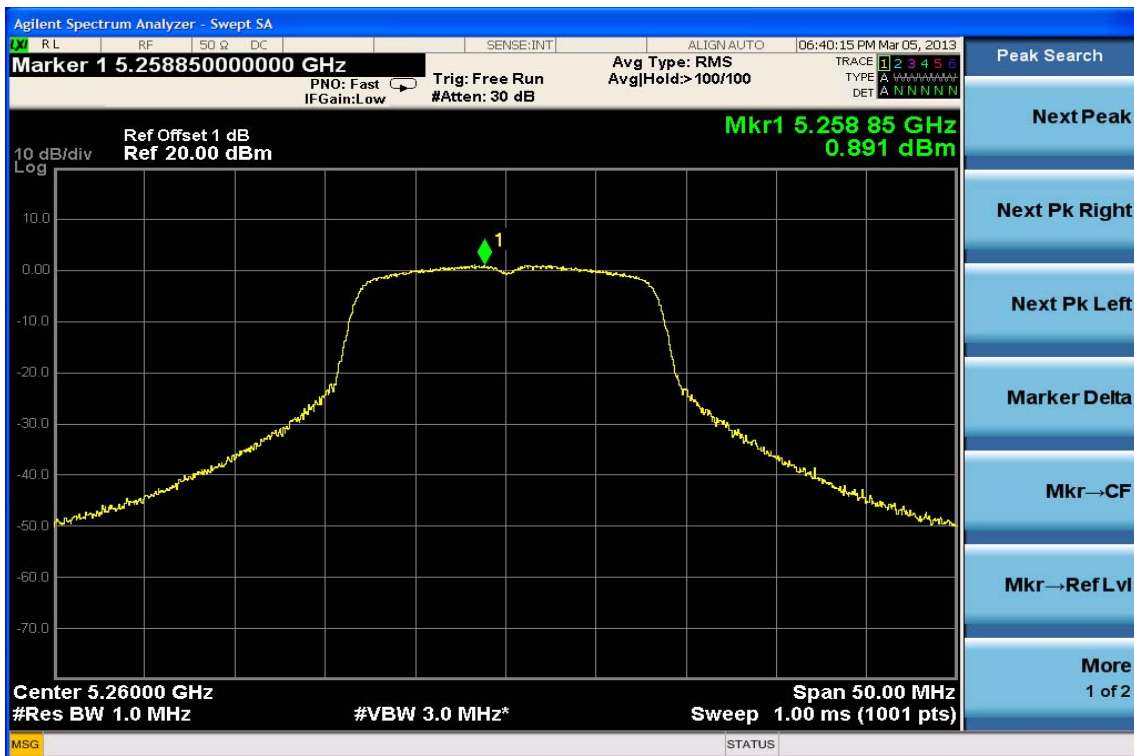
Remark: offset 1dB for cable loss.



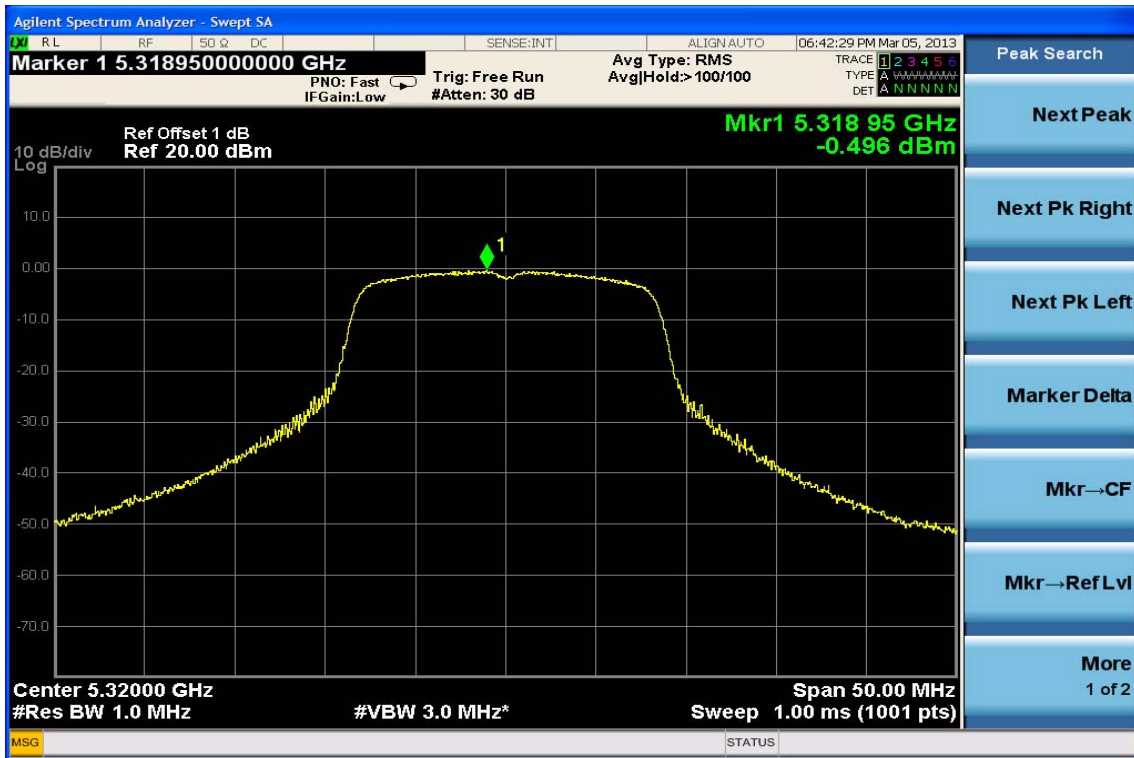
## Peak Power Spectral Density Data Plot 802.11a, 5180MHz



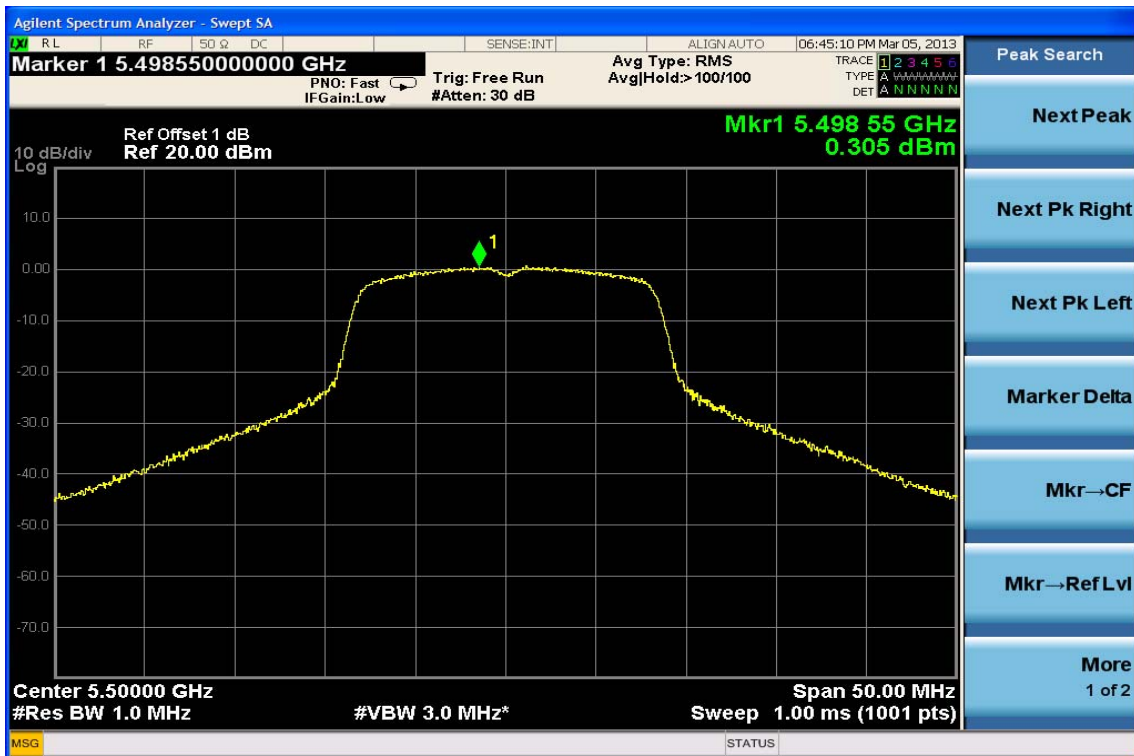
## 802.11a, 5260MHz



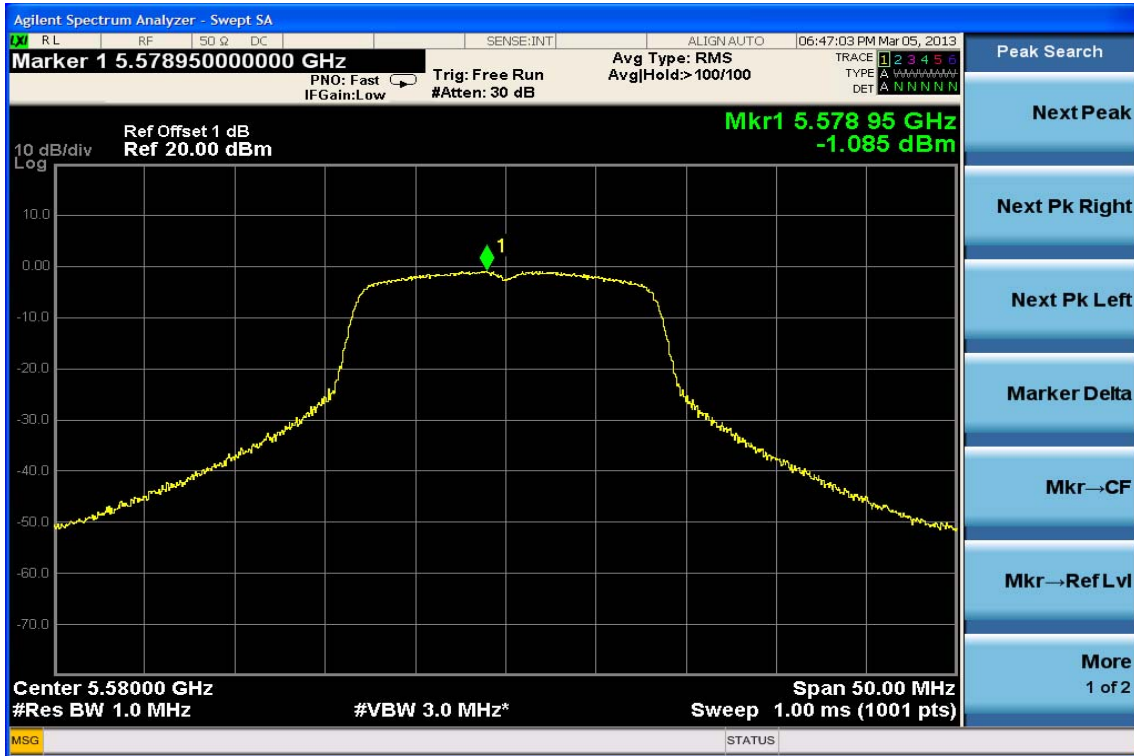
### 802.11a, 5320MHz



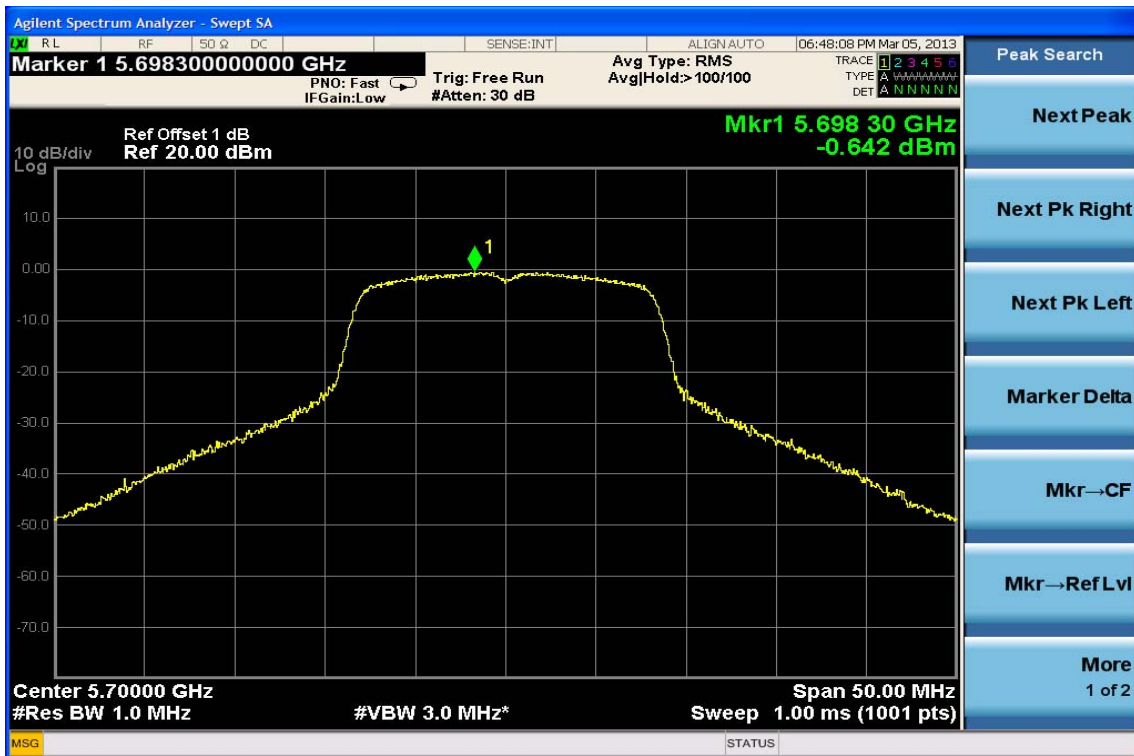
### 802.11a, 5500MHz



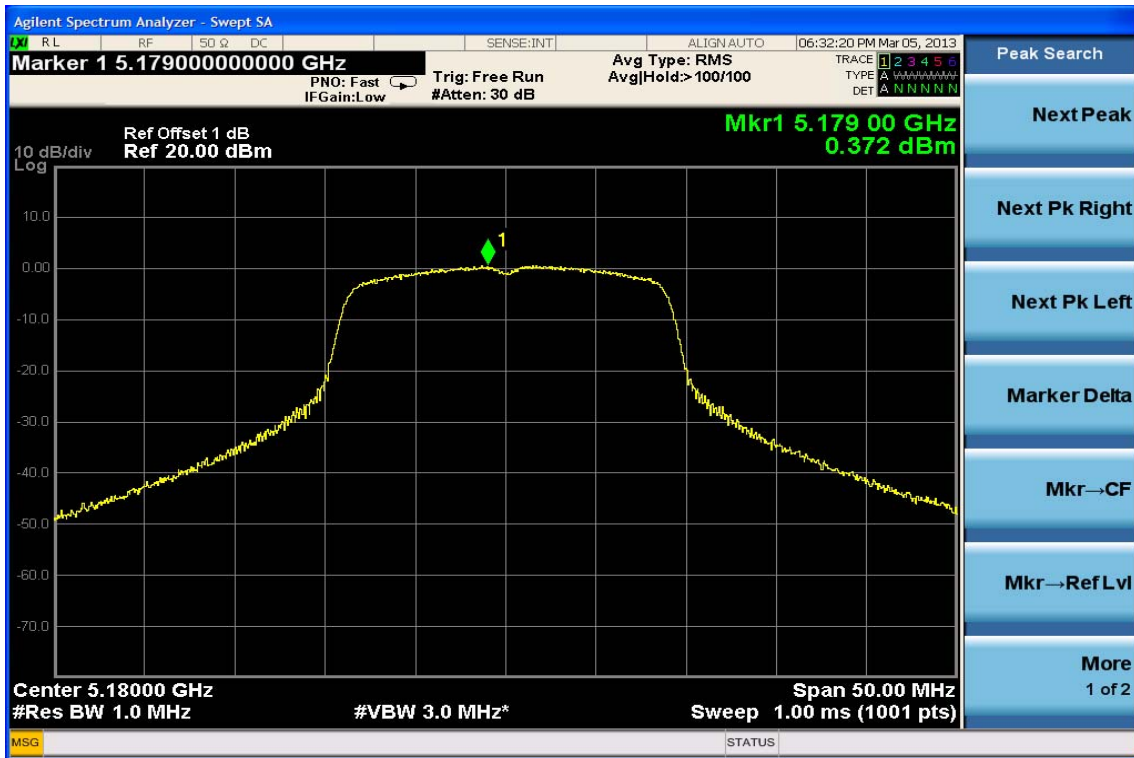
### 802.11a, 5580MHz



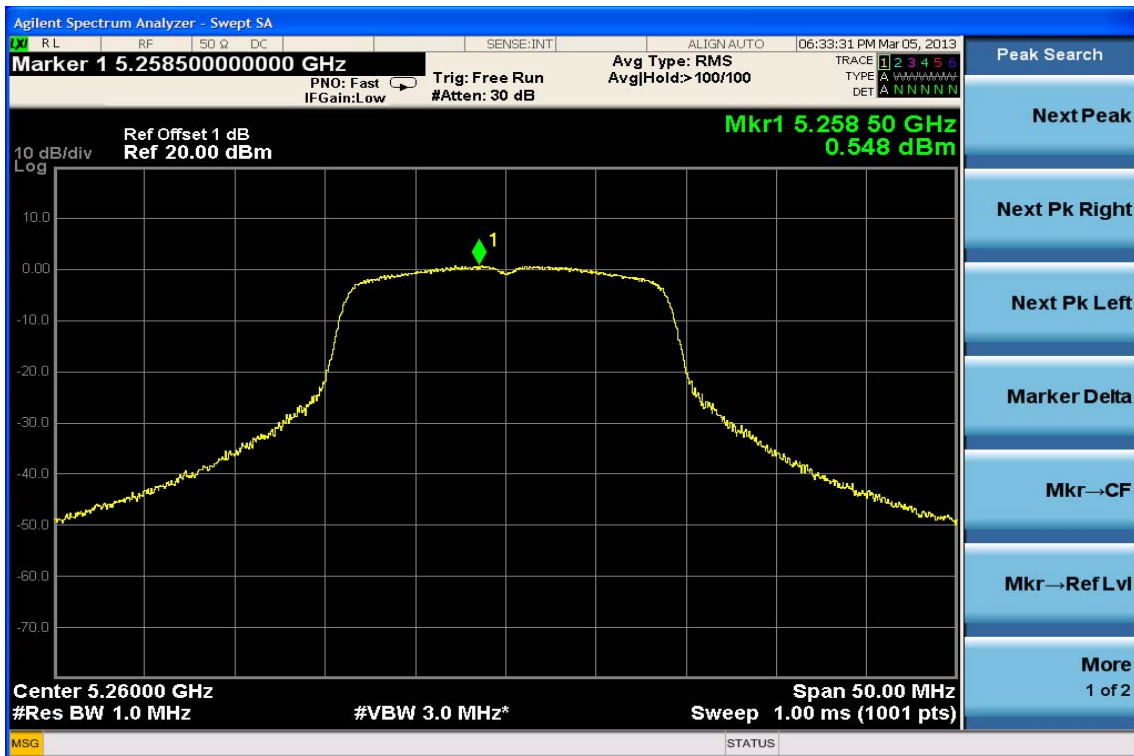
### 802.11a, 5700MHz



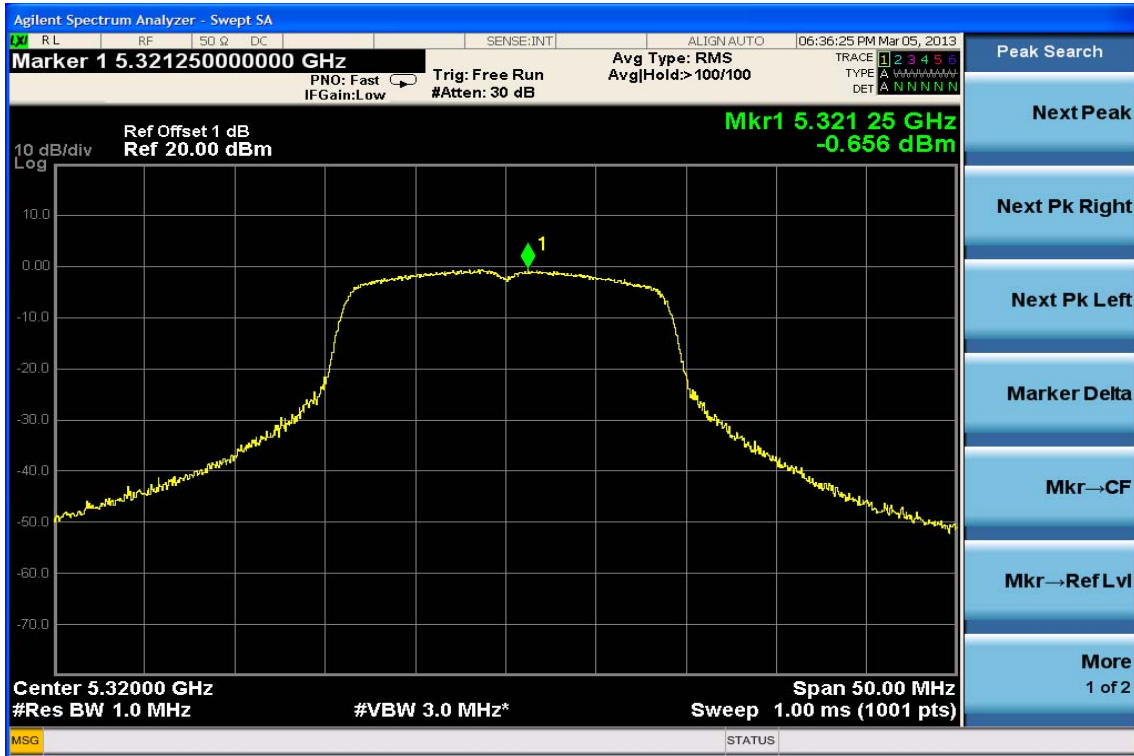
### Peak Power Spectral Density Data Plot 802.11n HT20, 5180MHz



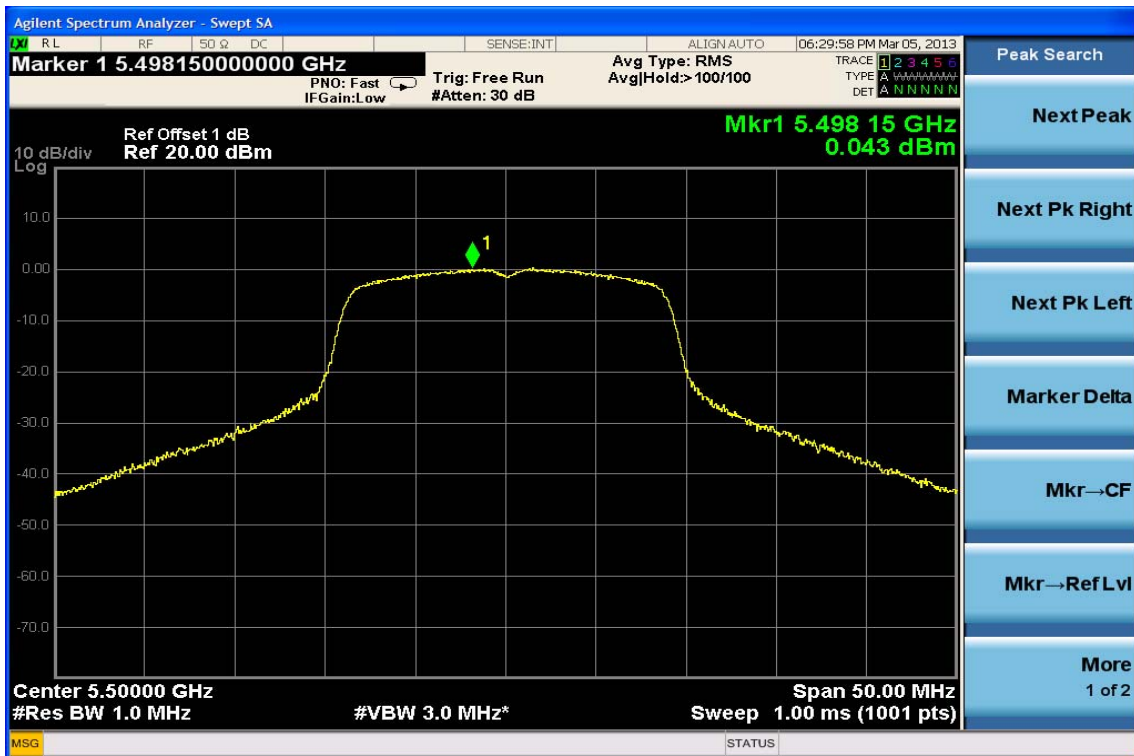
### 802.11n HT20, 5260MHz



### 802.11n HT20, 5320MHz

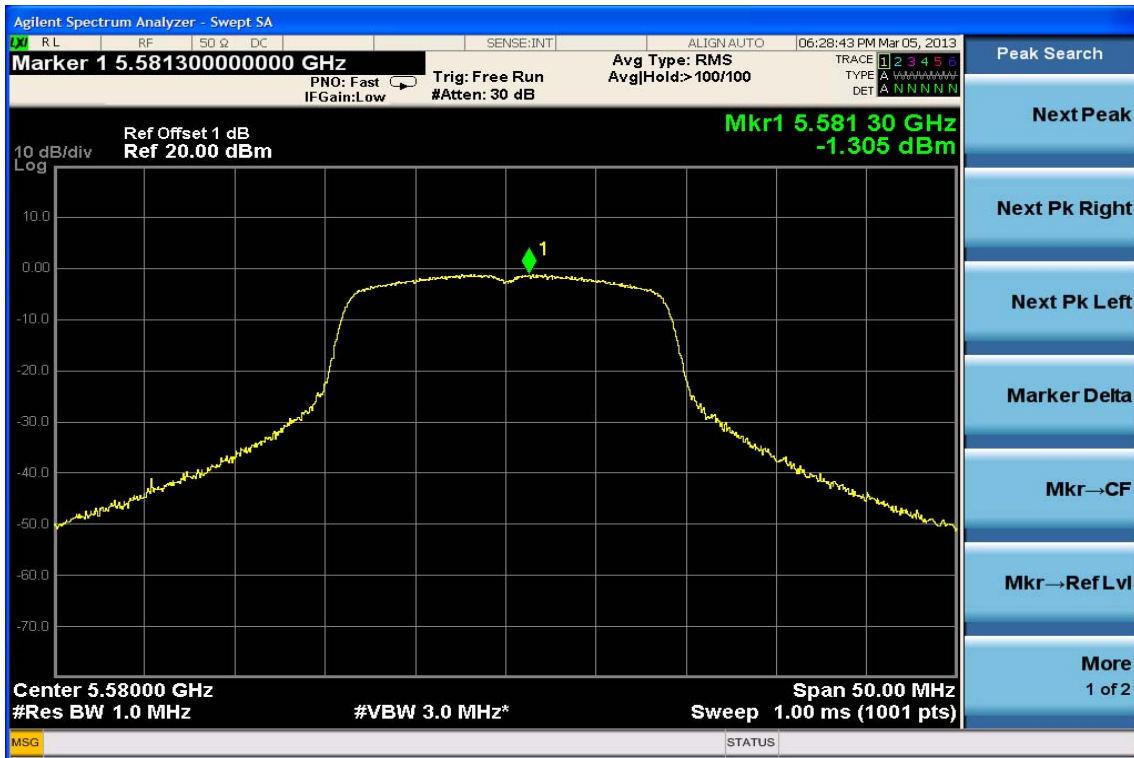


### 802.11n HT20, 5500MHz

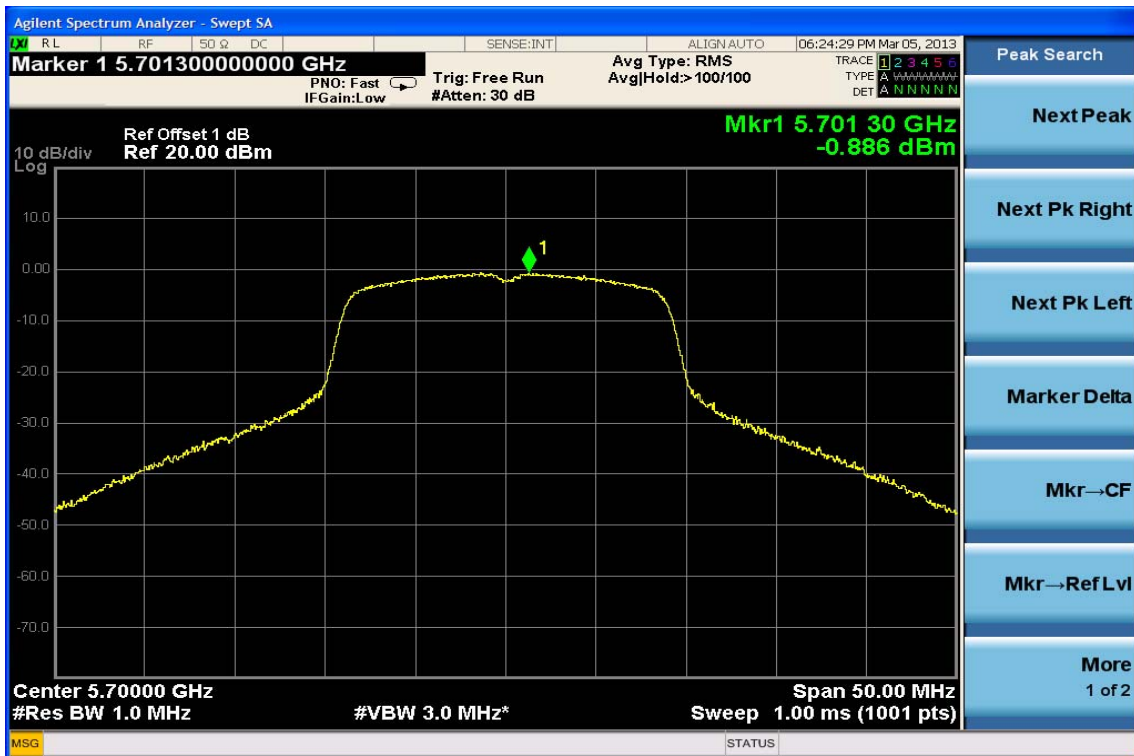




### 802.11n HT20, 5580MHz



### 802.11n HT20, 5700MHz



## 9. PEAK EXCURSION MEASUREMENT

### 9.1 Standard Applicable

15.407(a)(6) The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

### 9.2 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to spectrum.
3. Trace A, Set RBW=1MHz, VBW = 3MHz, Span = 26dBc, Max. hold.
4. Trace B, Set RBW=1MHz, VBW = 3MHz, Span = 26dBc, traces 100 sweeps of RMS averaging. Max. hold..
5. Delta Mark trace A center frequency and trace B center frequency.
6. Repeat above procedures until all frequency measured were complete.

**Refer to section F of KDB Document: KDB789033 D01 General UNII Test Procedures v01r02**

### 9.3 Measurement Equipment Used:

Refer to section 6.3 for details.

### 9.4 Test Set-up:

Refer to section 6.4 for details.

## 9.5 Test Results:

### 802.11a Mode

Frequency (MHz)	peak excursion (dB)	Limit (dB)	Margin (dB)
5180	7.789	13.00	-5.211
5260	7.456	13.00	-5.544
5320	7.271	13.00	-5.729
5500	7.588	13.00	-5.412
5580	6.719	13.00	-6.281
5700	6.639	13.00	-6.361

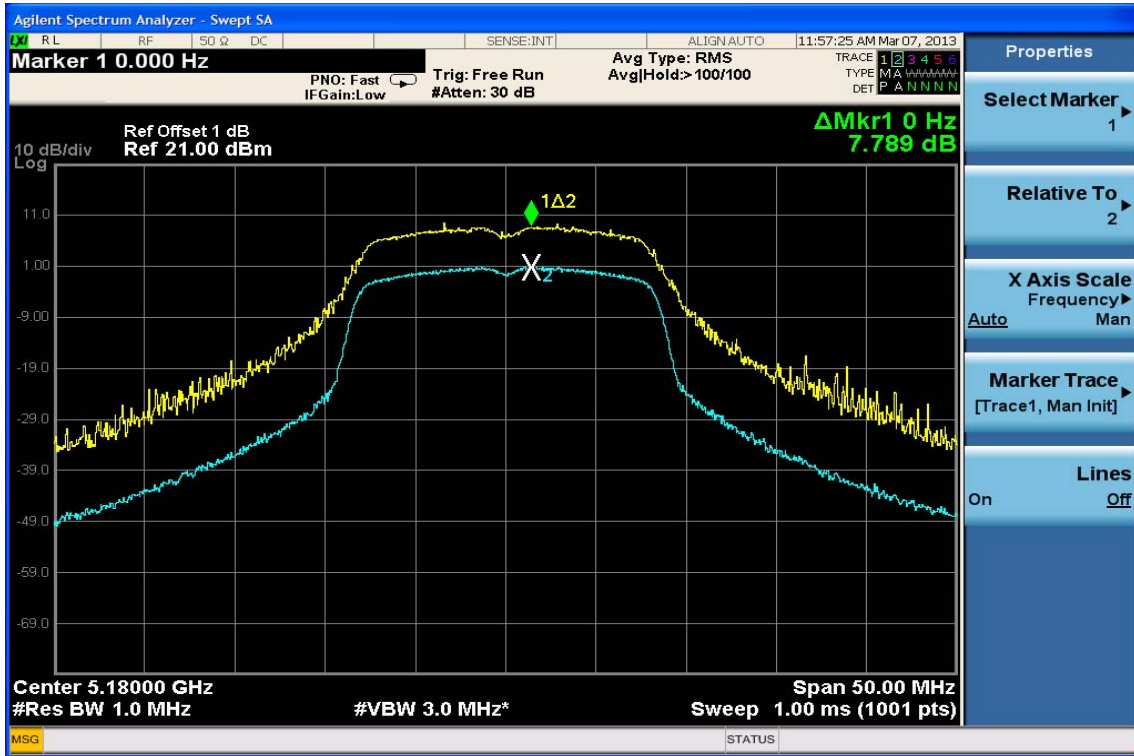
### 802.11n HT20 Mode

Frequency (MHz)	peak excursion (dB)	Limit (dB)	Margin (dB)
5180	7.744	13.00	-5.256
5260	7.453	13.00	-5.547
5320	7.613	13.00	-5.387
5500	7.381	13.00	-5.619
5580	7.087	13.00	-5.913
5700	7.649	13.00	-5.351

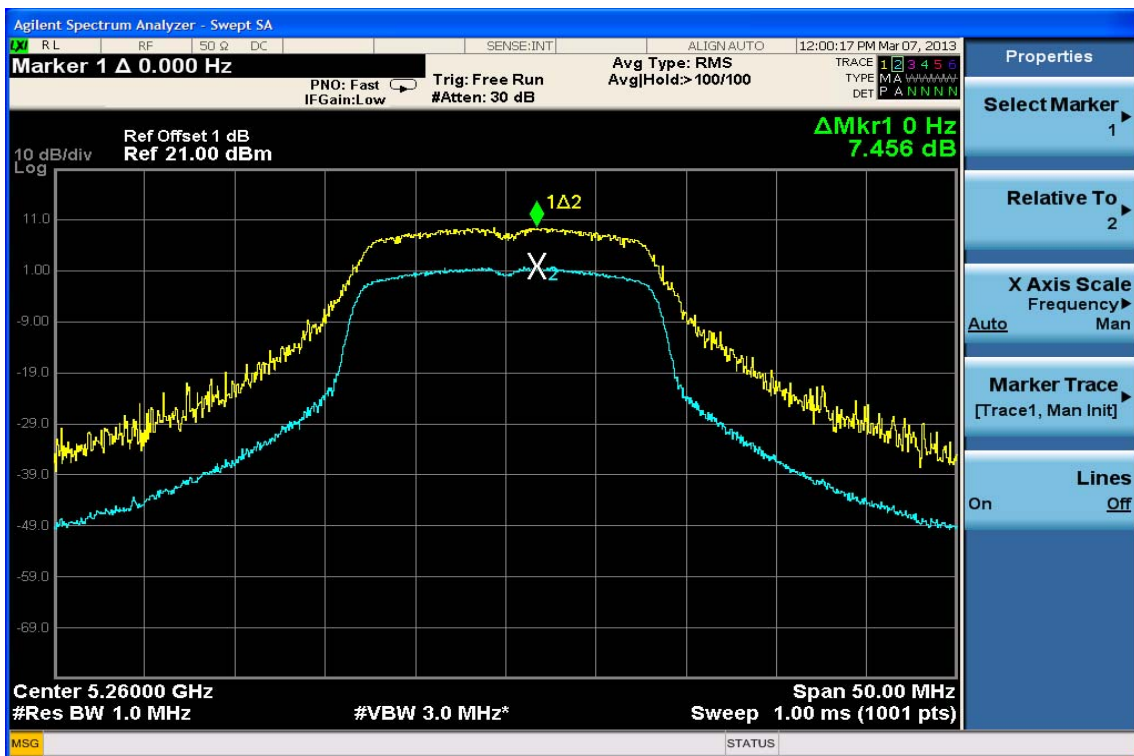
Remark: offset 1dB for cable loss.



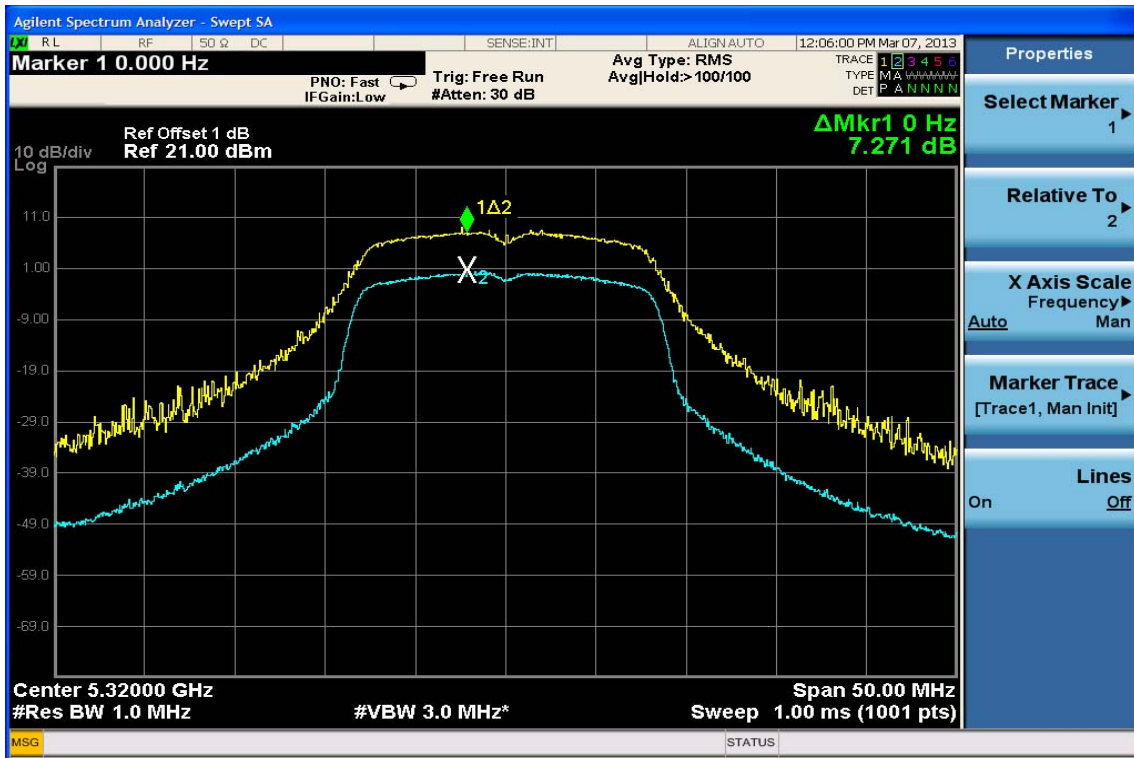
### Peak Excursion Data Plot 802.11a mode, 5180MHz



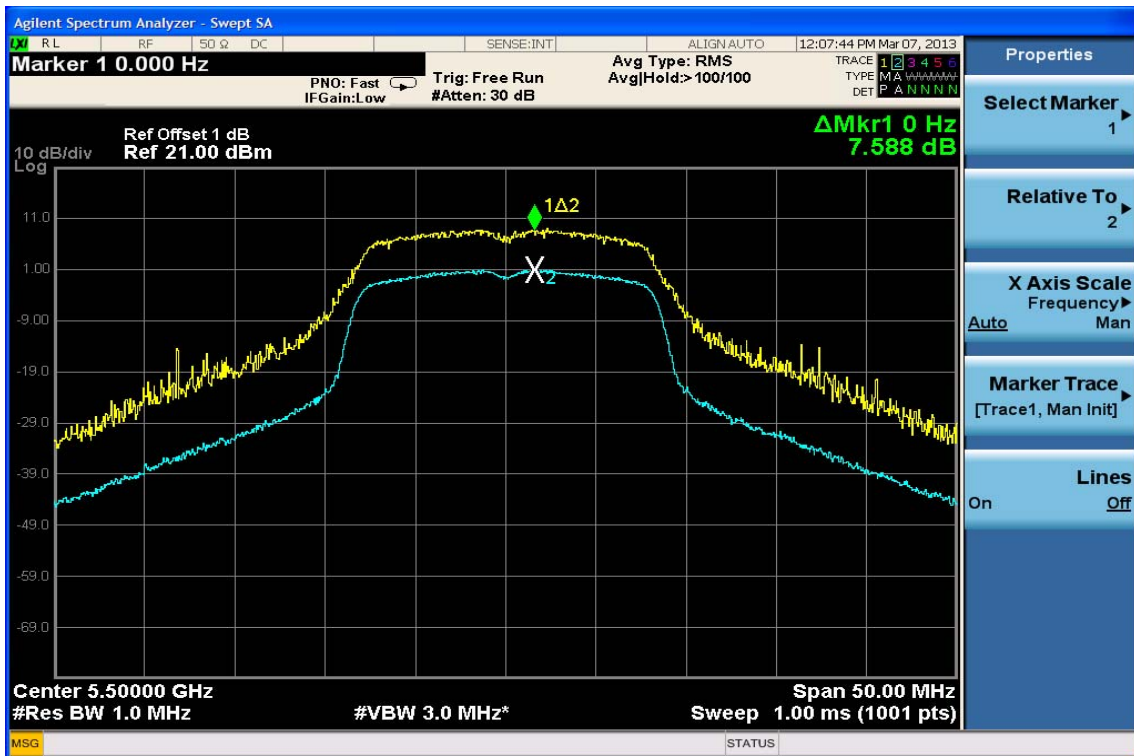
### 802.11a mode, 5260MHz



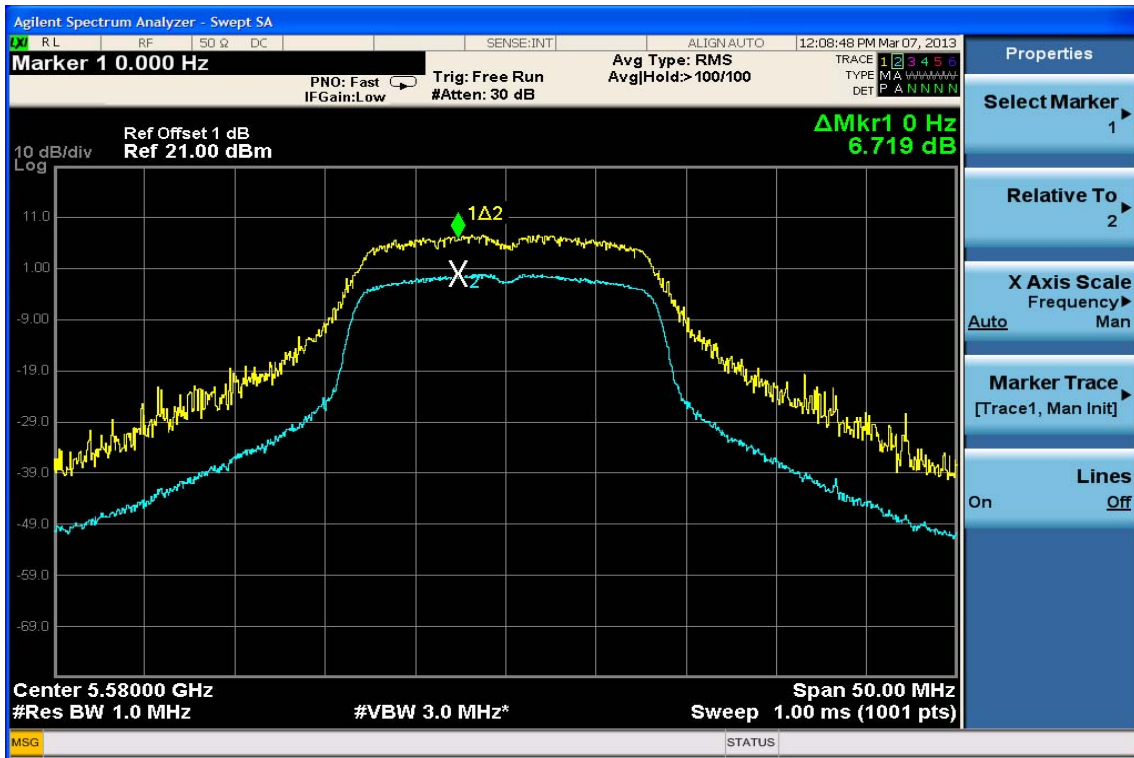
802.11a mode, 5320MHz



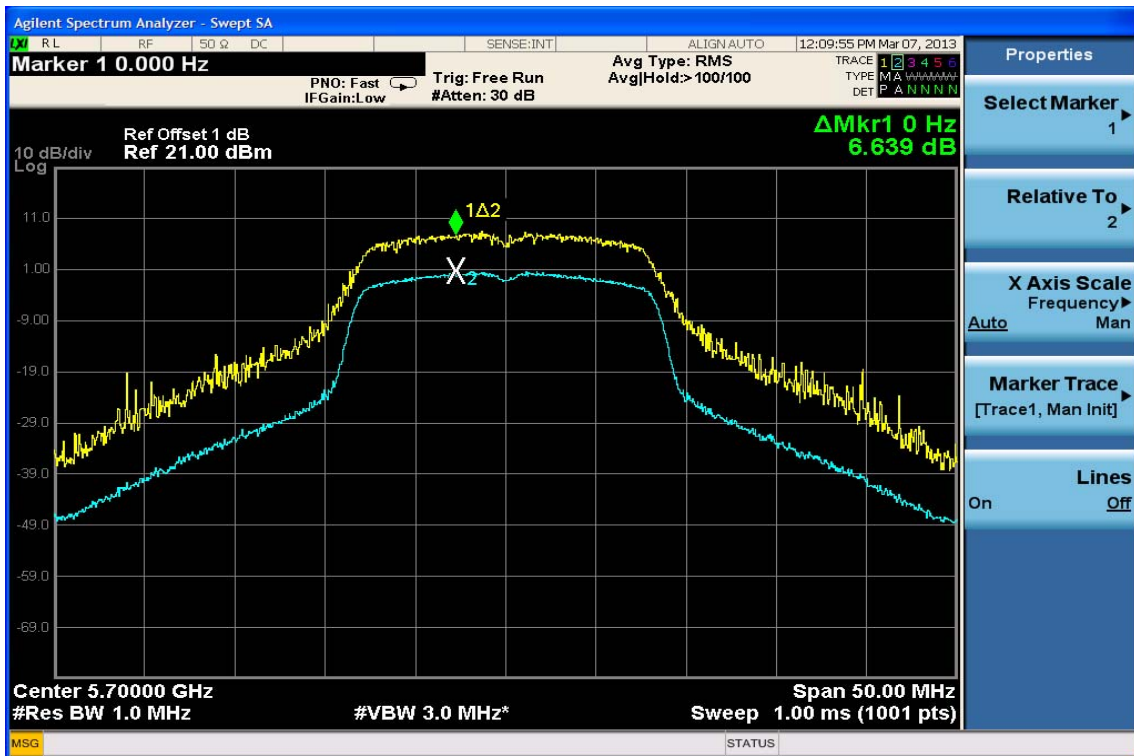
802.11a mode, 5500MHz



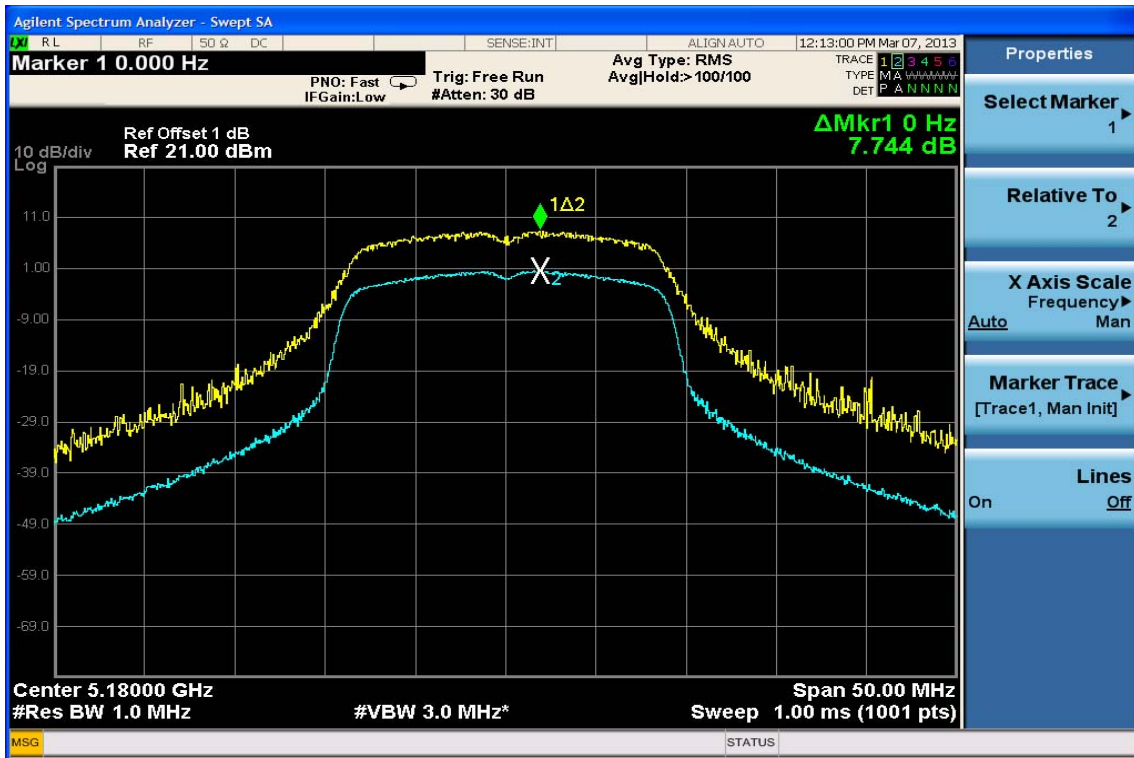
802.11a mode, 5580MHz



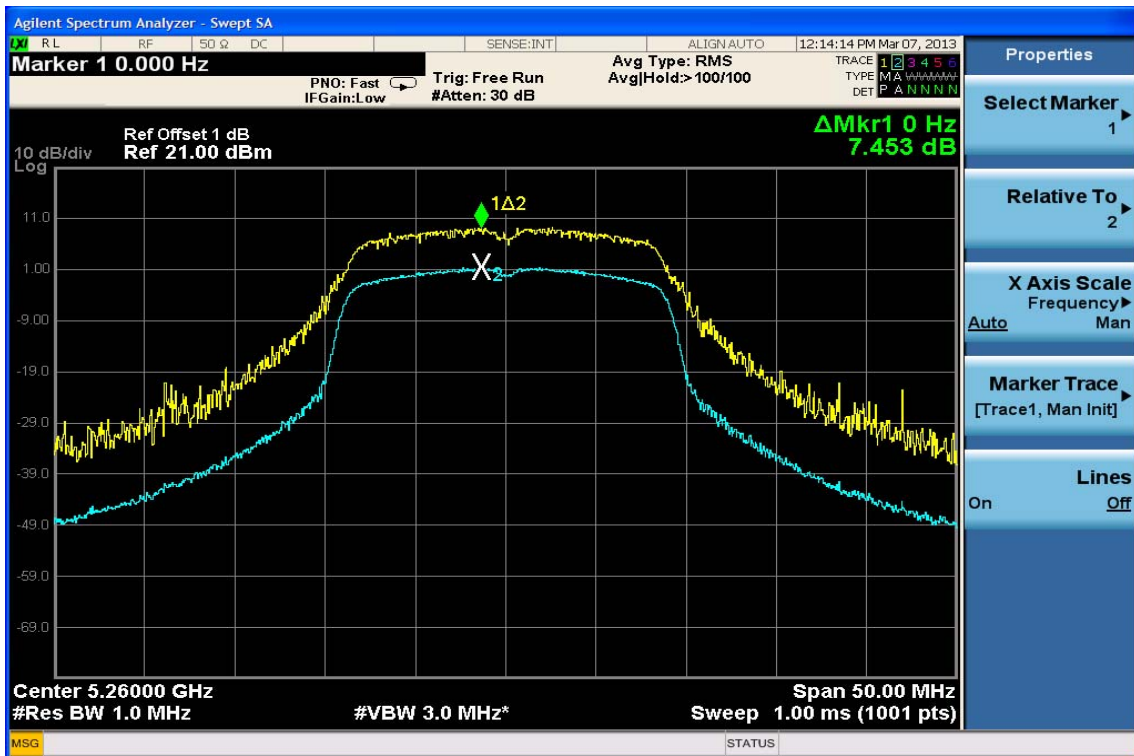
802.11a mode, 5700MHz



### Peak Excursion Data Plot 802.11n HT20 mode, 5180MHz

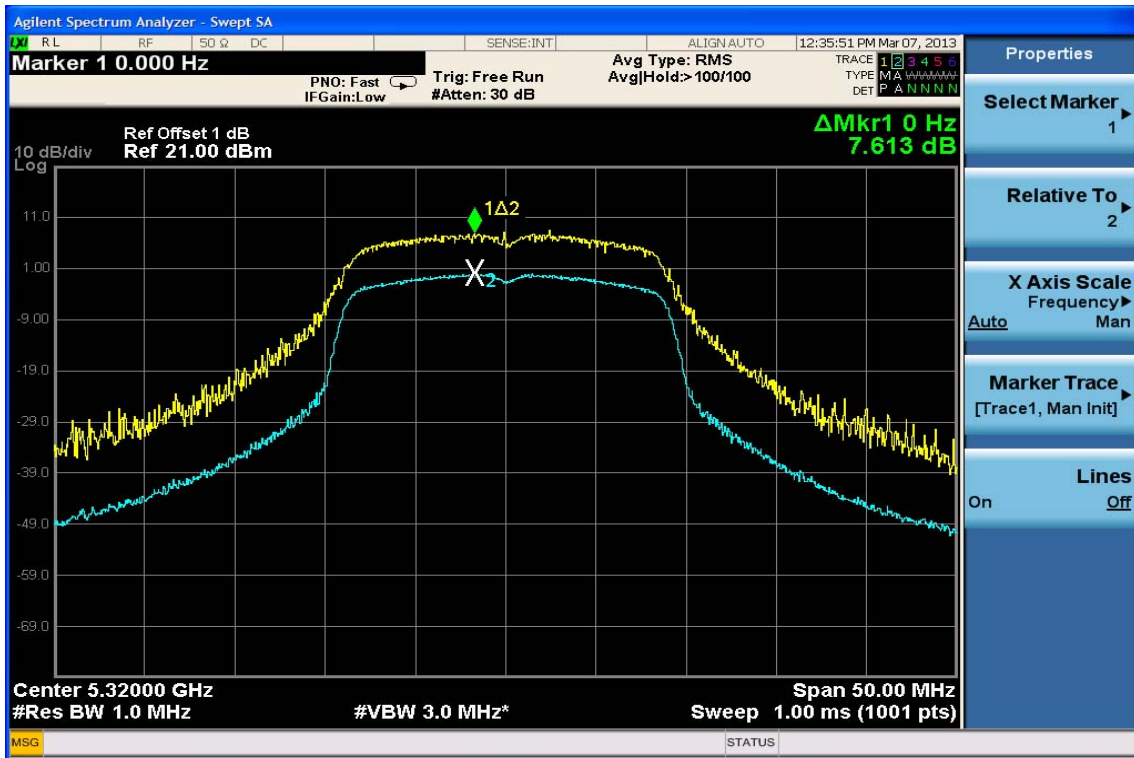


### 802.11n HT20 mode, 5180MHz

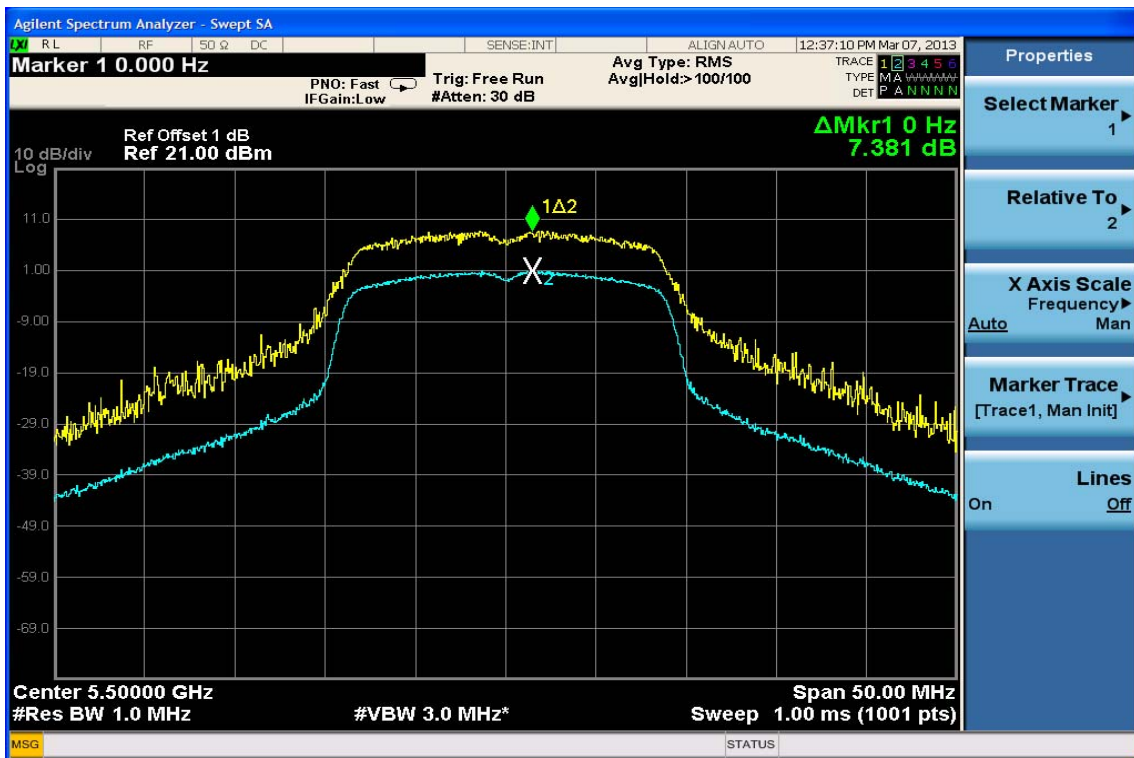




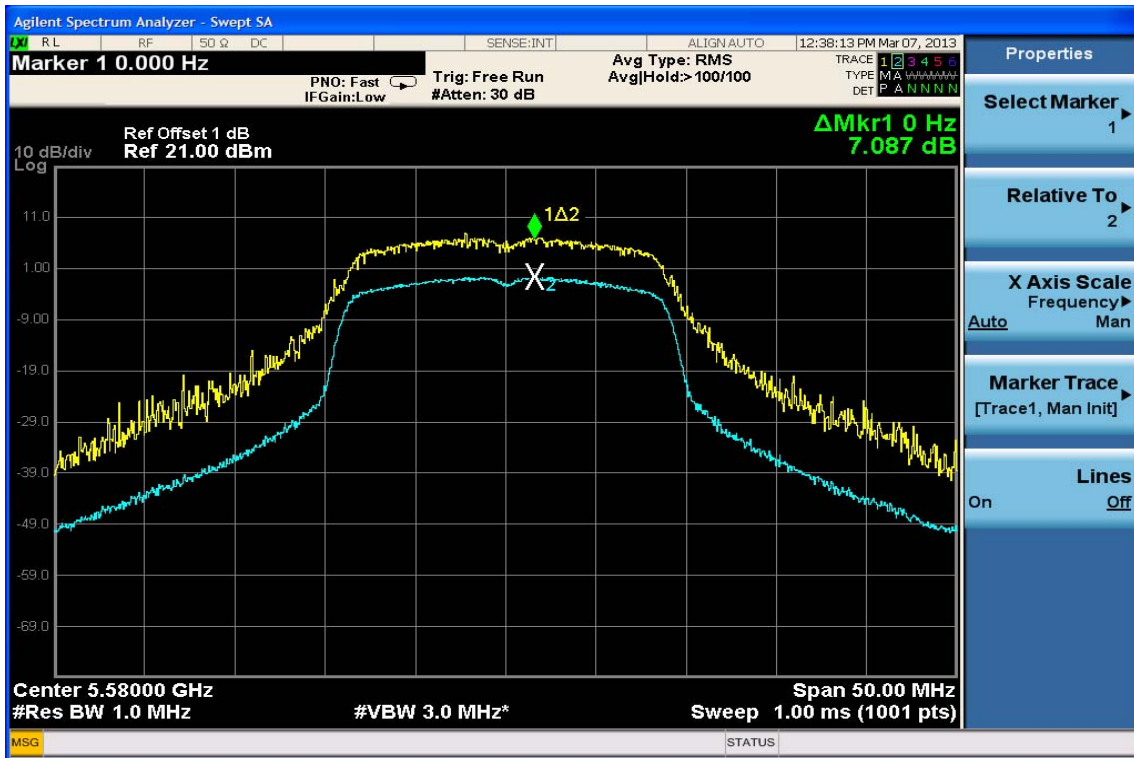
### 802.11n HT20 mode, 5180MHz



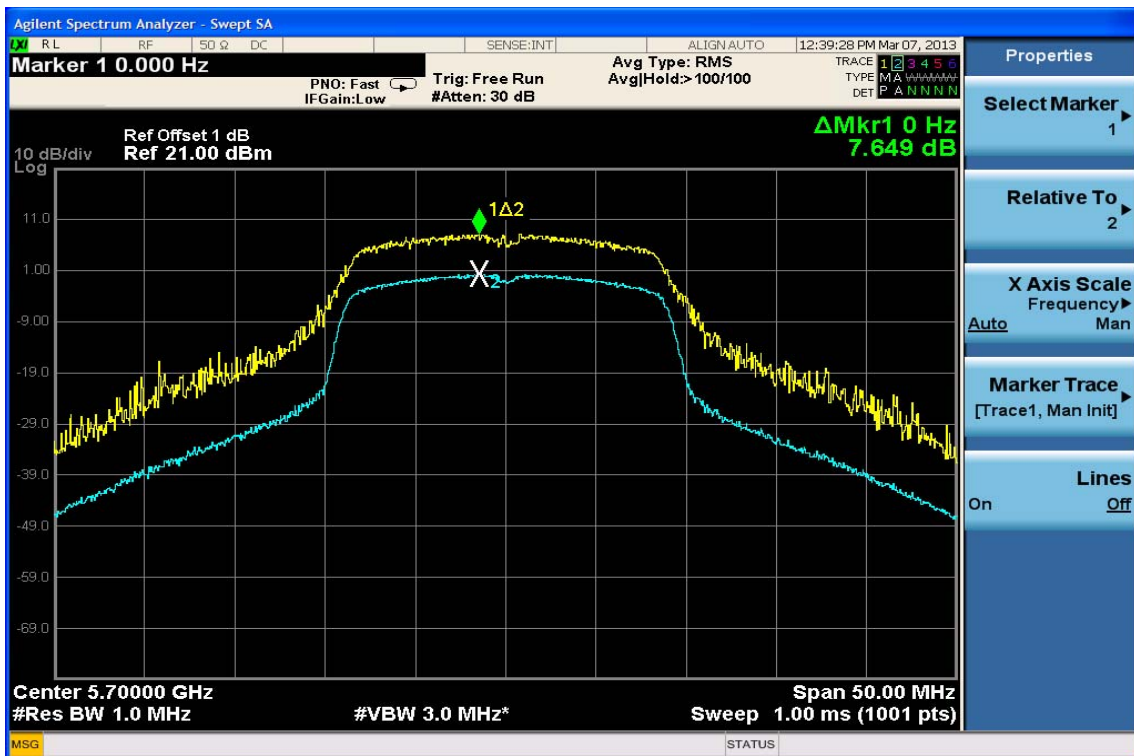
### 802.11n HT20 mode, 5180MHz



802.11n HT20 mode, 5180MHz



802.11n HT20 mode, 5180MHz



## 10. UNDESIRABLE EMISSION - CONDUCTED MEASUREMENT

### 10.1 Standard Applicable

According to §15.407(b),

(b) Undesirable Emission Limits: Except as shown in Paragraph (b)(6) of this section, the peak emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) 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.
- (2) For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.
- (3) For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725-5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz.
- (5) The above emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.
- (6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in Section 15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in Section 15.207.
- (7) The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.
- (8) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency block edges as the design of the equipment permits.

According to RSS-210 A9.2

- (1) For transmitters operating in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27dBm/MHz e.i.r.p.
- (2) For transmitters operating in the band 5250-5350 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27dBm/MHz e.i.r.p. Devices operating in the band 5250-5350 MHz that generate emissions in the band 5150-5250 MHz shall not exceed an out-of-band emission limit of -27dBm/MHz e.i.r.p. in the band 5150-5250 MHz in order to operate indoor/outdoor, or alternatively shall comply with the spectral power density for operation within the band 5150-5250 MHz and shall be labeled “for indoor use only”.
- (3) For transmitters operating in the band 5470-5725 MHz, all emissions outside that band shall not exceed -27dBm/MHz e.i.r.p.
- (4) For transmitters operating in the band 5725-5825 MHz, all emissions within the frequency range from the band edges to 10 MHz above or below the band edges shall not exceed -17dBm/MHz e.i.r.p. For frequencies more than 10 MHz above or below the band edges, emissions shall not exceed -27dBm/MHz.

## 10.2 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to spectrum.
3. Set Spectrum RBW=1MHz, VBW = 1MHz for peak measurement and 10Hz for average measurement.
4. Set Spectrum at lower/upper band edge and the restricted band adjacent to the lower/upper edge of the authorized band, with the transmitter set to the lowest/highest channel.
5. Set Spectrum over the 30MHz to 40GHz range with the transmitter set to the lowest, middle, and highest channels.

**Refer to section E of KDB Document: KDB789033 D01 General UNII Test Procedures v01r02**

Conducted RF measurements of the transmitter output were made at the band edges and the adjacent restricted bands.

Also, conducted RF measurements of the transmitter output over the 30 MHz to 40 GHz band were made in order to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

## 10.3 Measurement Equipment Used:

Refer to section 6.3 for details.