



**FCC 47 CFR PART 15 SUBPART C &  
INDUSTRY CANADA RSS-210**

**TEST REPORT**

**For**

**Wireless LAN ,Bluetooth Combo Module**

**Model: DWM-W091**

**Trade Name: MITSUMI**

*Issued to*

**MITSUMI ELECTRIC CO.,LTD.  
1601,SAKAI,ATSUGI-SHI,KANAGAWA, 243-8533 JAPAN**

*Issued by*

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Issued Date: August 6, 2012**



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**Revision History**

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	August 6, 2012	Initial Issue	ALL	Eunice Shen



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# 1. TEST RESULT CERTIFICATION

**Applicant:** MITSUMI ELECTRIC CO.,LTD.  
1601,SAKAI,ATSUGI-SHI,KANAGAWA,243-8533 JAPAN

**Manufacturer:** MITSUMI ELECTRIC CO.,LTD.  
1601,SAKAI,ATSUGI-SHI,KANAGAWA,243-8533 JAPAN

**Equipment Under Test:** Wireless LAN, Bluetooth Combo Module

**Trade Name:** MITSUMI

**Model:** DWM-W091

**Date of Test:** July 7 ~ August 3, 2012

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 15 Subpart C Industry Canada RSS-210 Issue 8 Annex 8 Industry Canada RSS-GEN Issue 3	No non-compliance noted

### We hereby certify that:

Compliance Certification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The test results of this report relate only to the tested sample identified in this report.

*Approved by*

*Reviewed by*

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Miller Lee  
Section Manager  
Compliance Certification Services Inc.

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Gina Lo  
Section Manager  
Compliance Certification Services Inc.



## 2. EUT DESCRIPTION

<b>Product</b>	Wireless LAN ,Bluetooth Combo Module
<b>Trade Name</b>	MITSUMI
<b>Model Number</b>	DWM-W091
<b>Model Discrepancy</b>	N/A
<b>Power Supply</b>	Powered by host device
<b>Received Date</b>	July 2, 2012
<b>Frequency Range</b>	IEEE 802.11a/ IEEE 802.11n HT 20 MHz: 5.725~5.850 GHz IEEE 802.11b/g/ IEEE 802.11n HT 20 MHz: 2.412~2.462 GHz
<b>Transmit Power</b>	IEEE 802.11a mode: 19.45 dBm IEEE 802.11n HT 20 MHz mode: 19.06 dBm IEEE 802.11b mode: 19.87 dBm IEEE 802.11g mode: 23.93 dBm IEEE 802.11n HT 20 MHz mode: 24.06 dBm
<b>Modulation Technique &amp; Transmit Data Rate</b>	IEEE 802.11a: OFDM (54, 48, 36, 24, 18, 12, 9, 6 Mbps) IEEE 802.11n HT 20 MHz mode: OFDM (6.5, 7.2, 13, 14.4, 14.44, 19.5, 21.7, 26, 28.89, 28.9, 39, 43.3, 43.33 52, 57.78, 57.8, 58.5, 65.0, 72.2, 78, 86.67, 104, 115.56, 117, 130, 144.44 Mbps) IEEE 802.11b mode: DSSS (1, 2, 5.5 and 11 Mbps) IEEE 802.11g mode: OFDM (6, 9, 12, 18, 24, 36, 48 and 54 Mbps) IEEE 802.11n HT 20 MHz mode: OFDM (6.5, 7.2, 13, 14.4, 14.44, 19.5, 21.7, 26, 28.89, 28.9, 39, 43.3, 43.33 52, 57.78, 57.8, 58.5, 65.0Mbps)
<b>Number of Channels</b>	IEEE 802.11a mode: 5 Channels IEEE 802.11n HT 20 MHz mode: 5 Channels IEEE 802.11b/g mode: 11 Channels IEEE 802.11n HT 20 MHz mode: 11 Channels
<b>Antenna Specification</b>	<b>For 2.4G</b> 1. Wieson Technologies Co., LTD. / PIFA Antenna P/N: GY196HT0321-024-H(WLAN Main) / Gain: 0.71 dBi GY196HT0321-023-H (WLAN Aux) / Gain: 1.98 dBi 2. Jieng Tai International Electric Corporation / PIFA Antenna P/N: JT1201507Y0311 (WLAN Main) / Gain: -0.47 dBi JT1201507Y1511 (WLAN Aux) / Gain: -1.62 dBi <b>For 5G</b> 1. Wieson Technologies Co., LTD. / PIFA Antenna P/N: GY196HT0321-024-H(WLAN Main) / Gain: 2.89 dBi GY196HT0321-023-H (WLAN Aux) / Gain: 1.02 dBi 2. Jieng Tai International Electric Corporation / PIFA Antenna P/N: JT1201507Y0311 (WLAN Main) / Gain: 2.31 dBi JT1201507Y1511 (WLAN Aux) / Gain: -0.98 dBi

### Remark:

1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for FCC&IC ID: **EW4DWMW091** & **4250A-DWMW091** filing to comply with FCC Part 15C, Section 15.207, 15.209 and IC RSS-210 & RSS-GEN.



### **3. TEST METHODOLOGY**

The tests documented in this report were performed in accordance with ANSI C63.4 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, 15.207, 15.209 and 15.247.

The tests documented in this report were performed in accordance with IC RSS-210, IC RSS-Gen, IC RSS-102, and ANSI C63.4.

This submittal(s) (test report) is intended for IC Certification with Industry Canada RSS-210.

#### **3.1 EUT CONFIGURATION**

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

#### **3.2 EUT EXERCISE**

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

The tests documented in this report were performed in accordance with IC RSS-210, IC RSS-Gen, IC RSS-102, and ANSI C63.4.

#### **3.3 GENERAL TEST PROCEDURES**

##### **Conducted Emissions**

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

##### **Radiated Emissions**

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable 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 maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4.



### 3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	( <sup>2</sup> )
13.36 - 13.41	322 - 335.4		

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup> Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.



### 3.5 DESCRIPTION OF TEST MODES

The EUT (model: DWM-W091) is a 1x1 802.11abgn+ BT combo card module. WLAN and Bluetooth cannot transmit simultaneously.

Two PIFA antennas are supplied: Wieson and Jieng Tai, Wieson with the higher gain was selected for final test.

Software used to control the EUT for staying in continuous transmitting and receiving mode was programmed.

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz and power line conducted emissions below 30MHz, which worst case was in normal link mode only.

**IEEE 802.11b mode:**

Channel Low (2412MHz), Channel Mid (2442MHz) and Channel High (2462MHz) with 1Mbps data rate were chosen for full testing.

**IEEE 802.11g mode:**

Channel Low (2412MHz), Channel Mid (2442MHz) and Channel High (2462MHz) with 6Mbps data rate were chosen for full testing.

**IEEE 802.11n HT 20 MHz mode:**

Channel Low (2412MHz), Channel Mid (2442MHz) and Channel High (2462MHz) with 6.5Mbps data rate were chosen for full testing.

**IEEE 802.11a mode:**

Channel Low (5745MHz), Channel Mid (5785MHz) and Channel High (5825MHz) with 6Mbps data rate were chosen for full testing.

**IEEE 802.11n HT 20 MHz mode:**

Channel Low(5745MHz), Channel Mid(5785MHz) and Channel High(5825MHz) with 6.5Mbps data rate were chosen for full testing.





## 4. INSTRUMENT CALIBRATION

### 4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

### 4.2 MEASUREMENT EQUIPMENT USED

#### Equipment Used for Emissions Measurement

*Remark: Each piece of equipment is scheduled for calibration once a year and Loop Antenna is scheduled for calibration once three years.*

Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360131	03/16/2013
Power Meter	Anritsu	ML2495A	1012009	04/26/2013
Power Sensor	Anritsu	MA2411B	0917072	04/26/2013

Wugu 966 Chamber A				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US42510252	11/02/2012
EMI Test Receiver	R&S	ESCI	100064	02/16/2013
Pre-Amplifier	Mini-Circuits	ZFL-1000LN	SF350700823	01/12/2013
Pre-Amplifier	MITEQ	AFS44-00102650-42-10P-44	1415367	11/19/2012
Bilog Antenna	Sunol Sciences	JB3	A030105	10/03/2012
Horn Antenna	EMCO	3117	00055165	01/11/2013
Horn Antenna	EMCO	3116	00026370	10/12/2012
Loop Antenna	EMCO	6502	8905/2356	06/10/2013
Turn Table	CCS	CC-T-1F	N/A	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R
Site NSA	CCS	N/A	N/A	12/25/2012
Test S/W	EZ-EMC (CCS-3A1RE)			

Conducted Emission room # A				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESCI	101203	07/25/2013
LISN	R&S	ESH3-Z5	848773/014	12/07/2012
LISN	SCHWARZBECK	NSLK 8127	8127-541	12/14/2012
Coaxial Cable	Commate	CFD300-NL	NA	12/07/2012
Test S/W	CCS-3A1-CE			



### 4.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
Powerline Conducted Emission	+/- 1.2575
3M Semi Anechoic Chamber / 30M~200M	+/- 4.0138
3M Semi Anechoic Chamber / 200M~1000M	+/- 3.9483
3M Semi Anechoic Chamber / 1G~8G	+/- 2.5975
3M Semi Anechoic Chamber / 8G~18G	+/- 2.6112
3M Semi Anechoic Chamber / 18G~26G	+/- 2.7389
3M Semi Anechoic Chamber / 26G~40G	+/- 2.9683

**Remark:** This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .



## **5 FACILITIES AND ACCREDITATIONS**

### **5.1 FACILITIES**

All measurement facilities used to collect the measurement data are located at

No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.

Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029

No.11, Wu-Gong 6th Rd., Wugu Industrial Park, New Taipei City 248, Taiwan (R.O.C.)

Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045

No.81-1, Lane 210, Bade 2nd Rd., Lujhu Township, Taoyuan County 33841, TAIWAN, R.O.C.

Tel: 886-3-324-0332 / Fax: 886-3-324-5235

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.




All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

### **5.2 LABORATORY ACCREDITATIONS AND LISTING**

The test facilities used to perform radiated and conducted emissions tests are accredited by American Association for Laboratory Accreditation Program for the specific scope accreditation under Lab Code: 0824-01 to perform Electromagnetic Interference tests according to FCC Part 15 and CISPR 22 requirements. In addition, the test facilities are listed with Industry Canada, Certification and Engineering Bureau, IC 2324G-1 for 3M Semi Anechoic Chamber A, IC 2324G-2 for 3M Semi Anechoic Chamber B.



### 5.3 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements	 FCC MRA: TW1039
Taiwan	TAF	LP0002, RTTE01, FCC Method-47 CFR Part 15 Subpart C, D, E, RSS-210, RSS-310 IDA TS SRD, AS/NZS 4268, AS/NZS 4771, TS 12.1 & 12.2, ETSI EN 300 440-1, ETSI EN 300 440-2, ETSI EN 300 328, ETSI EN 300 220-1, ETSI EN 300 220-2, ETSI EN 301 893, ETSI EN 301 489-1/3/7/17 FCC OET Bulletin 65 + Supplement C, EN 50360, EN 50361, EN 50371, RSS 102, EN 50383, EN 50385, EN 50392, IEC 62209, CNS 14958-1, CNS 14959 FCC Method -47 CFR Part 15 Subpart B IEC / EN 61000-3-2, IEC / EN 61000-3-3, IEC / EN 61000-4-2/3/4/5/6/8/11	
Canada	Industry Canada	3M Semi Anechoic Chamber (IC 2324G-1 / IC 2324G-2) to perform	 IC 2324G-1 IC 2324G-2

\* No part of this report may be used to claim or imply product endorsement by A2LA or any agency of the US Government.



## 6 SETUP OF EQUIPMENT UNDER TEST

### 6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix II for the actual connections between EUT and support equipment.

### 6.2 SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1	Notebook PC	HP	dv6-1332TX	CNF9491GPS	PD9112BNHU	N/A	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
2	Notebook PC	HP	N/A	N/A	FCC DoC	N/A	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
3	Test Kit	N/A	N/A	N/A	N/A	N/A	N/A
4	Power Supply	ABM	8301HD	D011531	FCC DoC	N/A	Shielded, 1.5m
5	LCD Monitor	DELL	3008WFP	CN-0XK290-7161 8-846-169L	FCC DoC	Unshielded, 1.8m	Shielded, 1.8m
6	HDD	TeraSys	F12-UF(COMBO)	A0100215-42O014	FCC DoC	Shielded, 1.8m	N/A
7	USB Mouse	DELL	MO56UC	E1G01GBO	FCC DoC	Shielded, 1.8m	N/A

**Remark:**

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.



## 7 RSS 210 REQUIREMENTS

### 7.1 DUTY CYCLE

#### LIMIT

KDB 789033

#### TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer or radiated field strength. The RBW is set to 1 MHz and the VBW is set to 1 MHz. The sweep time is coupled and the span is set to 0 Hz.

#### TEST RESULTS

Mode	ON Time (msec)	Period (msec)	Duty Cycle (%)
802.11b	4.496	4.59	98
802.11g	4.508	4.602	98
802.11n	1.297	1.326	98



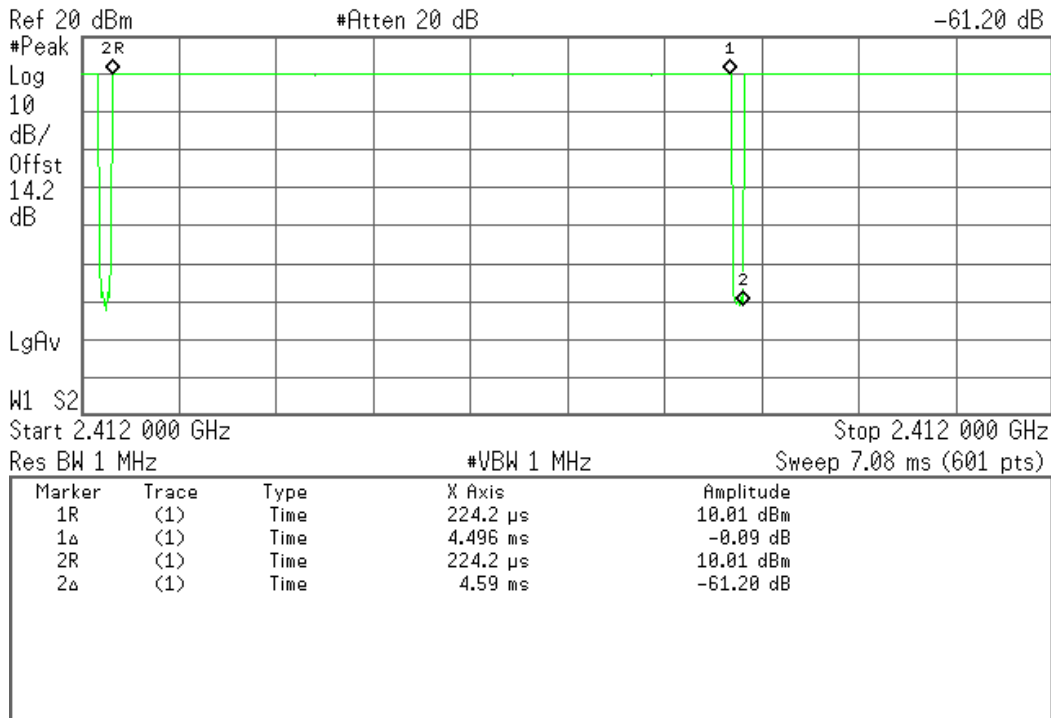
Test plots

b mode

Agilent 22:19:26 Jul 24, 2012

R T

Mkr2 4.59 ms  
-61.20 dB

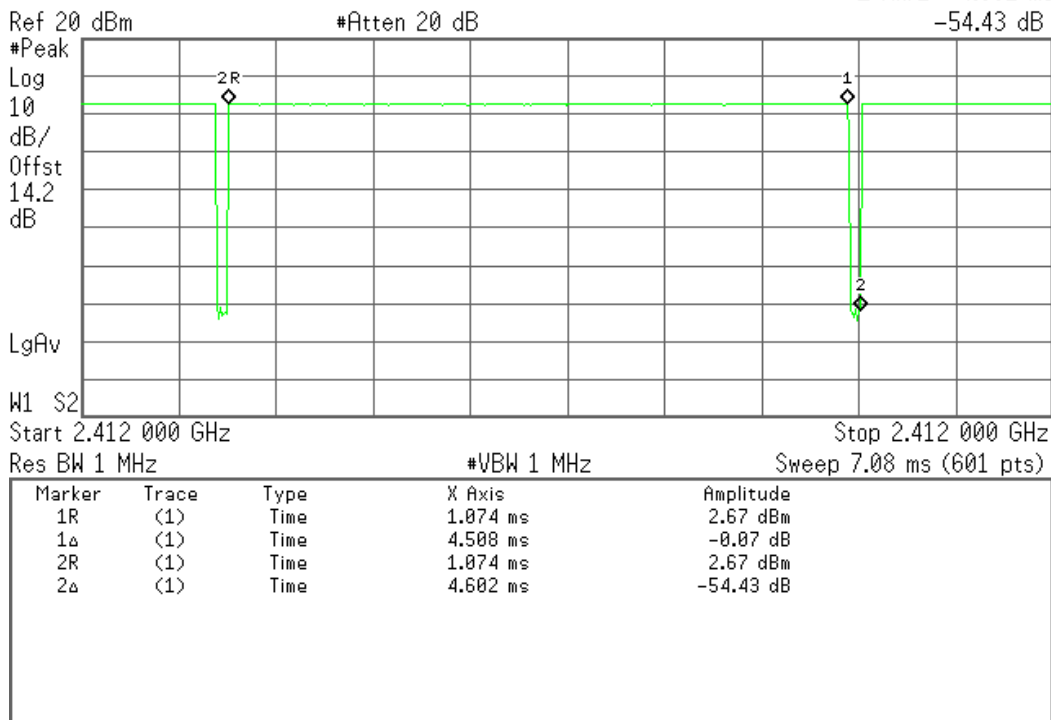


g mode

Agilent 22:21:01 Jul 24, 2012

R T

Mkr2 4.602 ms  
-54.43 dB



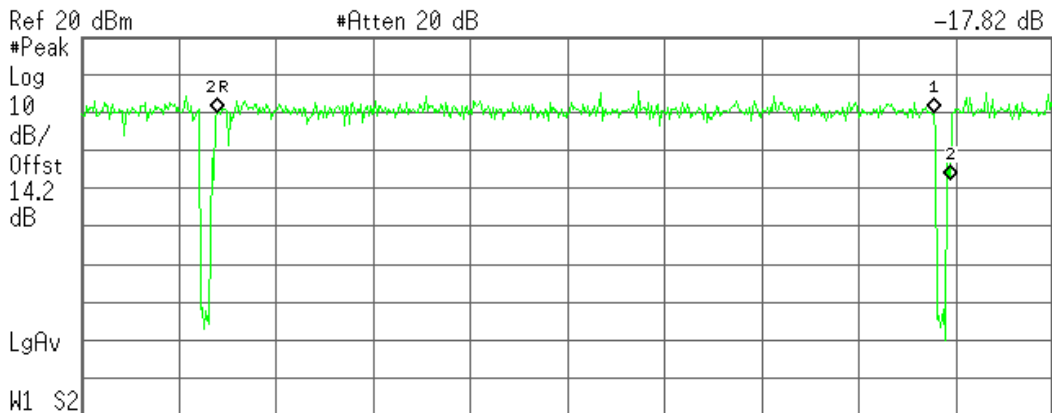


HT20 mode

Agilent 22:22:31 Jul 24, 2012

R T

Mkr2 1.326 ms  
-17.82 dB



Ref 20 dBm #Atten 20 dB  
Start 2.412 000 GHz Stop 2.412 000 GHz  
Res BW 1 MHz #VBW 1 MHz Sweep 1.76 ms (601 pts)

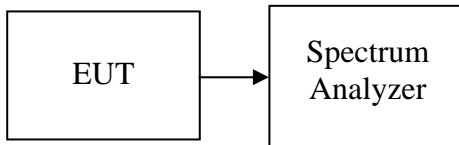
Marker	Trace	Type	X Axis	Amplitude
1R	(1)	Time	246.4 $\mu$ s	0.30 dBm
1 $\Delta$	(1)	Time	1.297 ms	-0.16 dB
2R	(1)	Time	246.4 $\mu$ s	0.30 dBm
2 $\Delta$	(1)	Time	1.326 ms	-17.82 dB





## **7.299%BANDWIDTH**

### **Test Configuration**



### **TEST PROCEDURE**

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.

### **TEST RESULTS**

*No non-compliance noted.*



**Test Data**

**Test mode: IEEE 802.11b mode**

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	13.6592
Mid	2442	13.6758
High	2462	13.6901

**Test mode: IEEE 802.11g mode**

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	16.3532
Mid	2442	16.3500
High	2462	16.3371

**Test mode: IEEE 802.11n HT 20 MHz mode**

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	17.4244
Mid	2442	17.4122
High	2462	17.3996

**Test mode: IEEE 802.11a mode**

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5745	16.4076
Mid	5785	16.4164
High	5825	16.5692

**Test mode: IEEE 802.11n HT 20 MHz mode**

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5745	17.4507
Mid	5785	17.4507
High	5825	17.5099



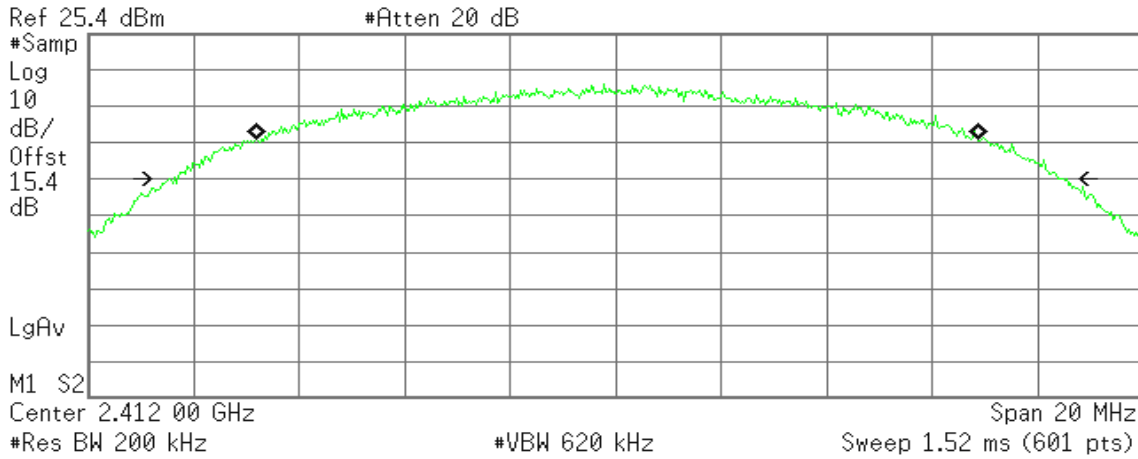
**Test Plot**

**IEEE 802.11b mode**

**99% Bandwidth (CH Low)**

Agilent 17:15:29 Jul 26, 2012

R T



**Occupied Bandwidth**  
13.6592 MHz

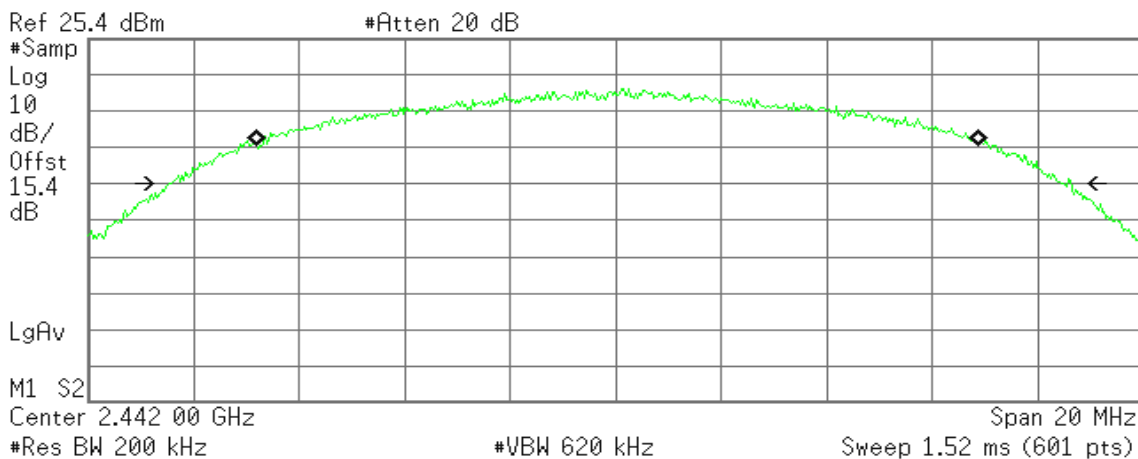
**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** 32.071 kHz  
**x dB Bandwidth** 16.921 MHz\*

**99% Bandwidth (CH Mid)**

Agilent 17:14:58 Jul 26, 2012

R T



**Occupied Bandwidth**  
13.6758 MHz

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

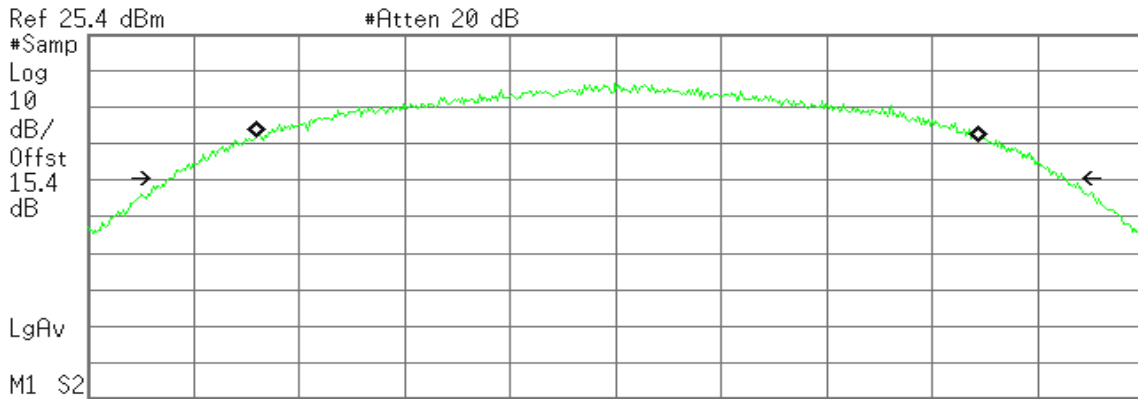
**Transmit Freq Error** 40.170 kHz  
**x dB Bandwidth** 17.075 MHz\*



### 99% Bandwidth (CH High)

Agilent 17:14:10 Jul 26, 2012

R T



Center 2.462 00 GHz Span 20 MHz  
 #Res BW 200 kHz #VBW 620 kHz Sweep 1.52 ms (601 pts)

**Occupied Bandwidth**  
**13.6901 MHz**

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

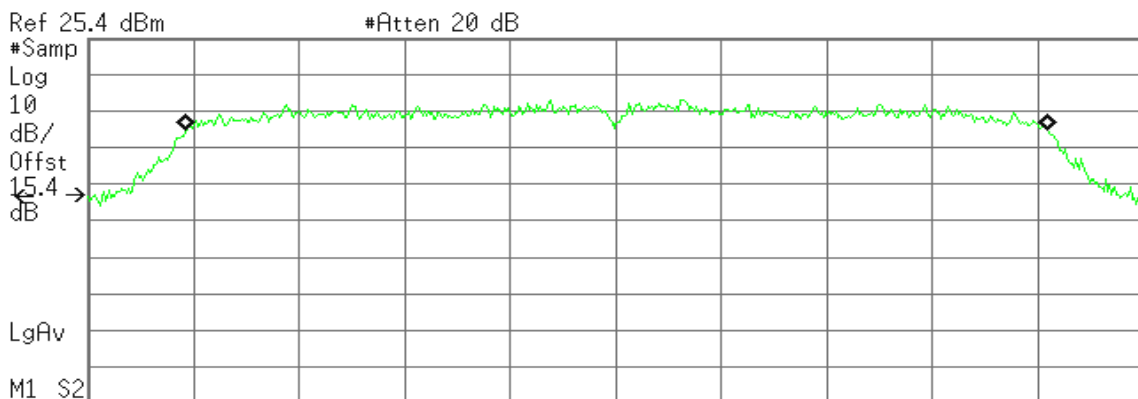
**Transmit Freq Error** 31.319 kHz  
**x dB Bandwidth** 17.032 MHz\*

### IEEE 802.11g mode

### 99% Bandwidth (CH Low)

Agilent 17:11:15 Jul 26, 2012

R T



Center 2.412 00 GHz Span 20 MHz  
 #Res BW 200 kHz #VBW 620 kHz Sweep 1.52 ms (601 pts)

**Occupied Bandwidth**  
**16.3532 MHz**

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

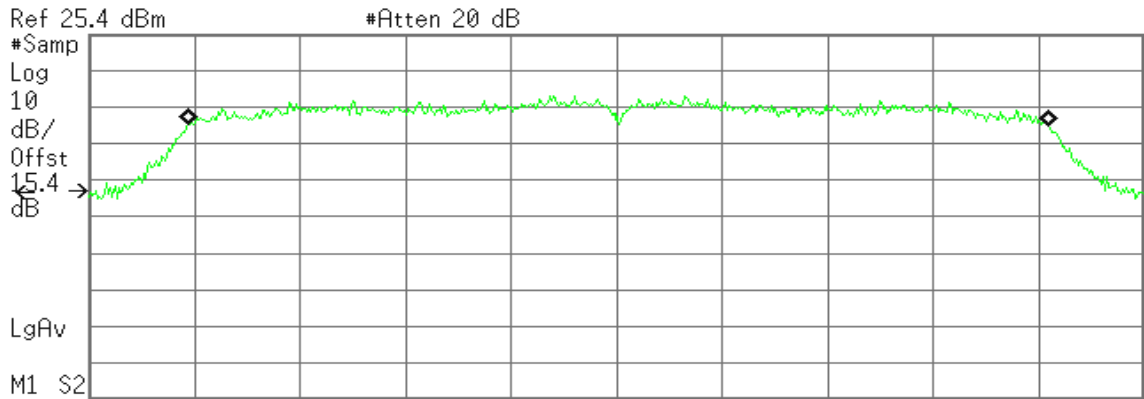
**Transmit Freq Error** 24.020 kHz  
**x dB Bandwidth** 19.509 MHz\*



### 99% Bandwidth (CH Mid)

Agilent 17:12:22 Jul 26, 2012

R T



Center 2.442 00 GHz Span 20 MHz  
 #Res BW 200 kHz #VBW 620 kHz Sweep 1.52 ms (601 pts)

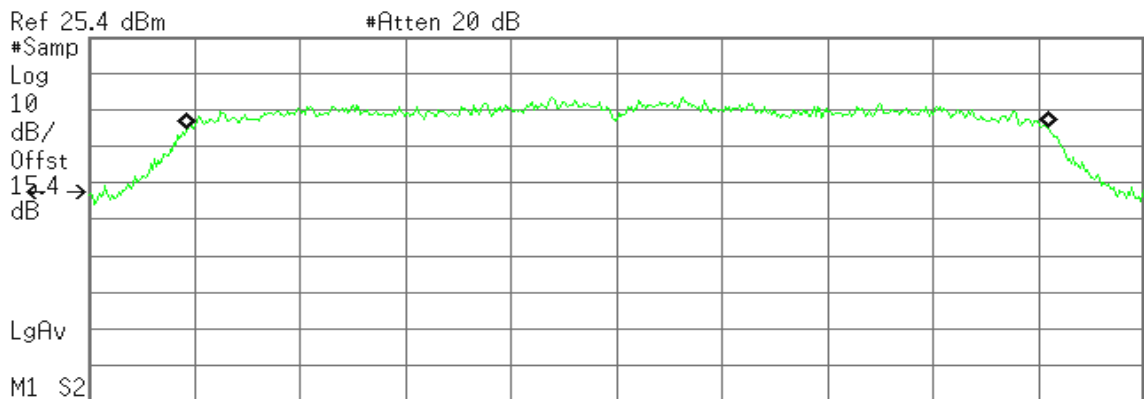
**Occupied Bandwidth** **Occ BW % Pwr** 99.00 %  
 16.3500 MHz **x dB** -26.00 dB

**Transmit Freq Error** 31.350 kHz  
**x dB Bandwidth** 19.494 MHz\*

### 99% Bandwidth (CH High)

Agilent 17:13:18 Jul 26, 2012

R T



Center 2.462 00 GHz Span 20 MHz  
 #Res BW 200 kHz #VBW 620 kHz Sweep 1.52 ms (601 pts)

**Occupied Bandwidth** **Occ BW % Pwr** 99.00 %  
 16.3371 MHz **x dB** -26.00 dB

**Transmit Freq Error** 17.916 kHz  
**x dB Bandwidth** 19.727 MHz\*

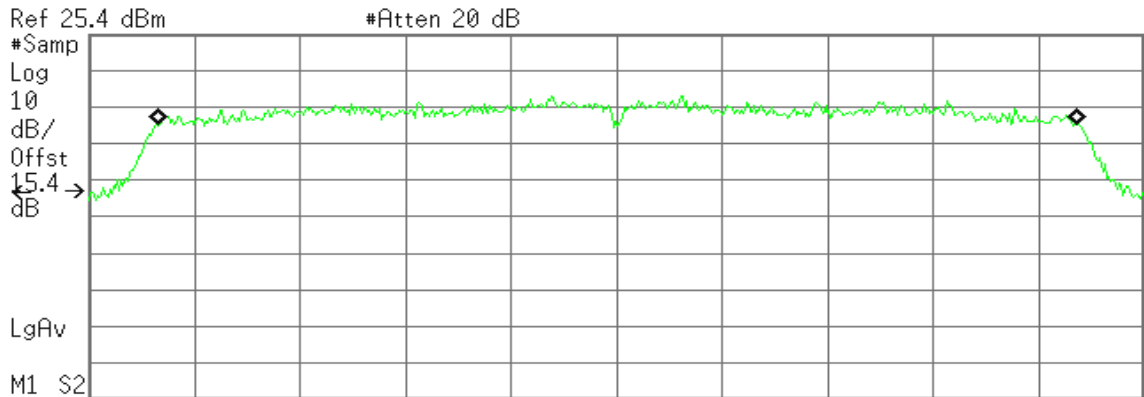


### IEEE 802.11n HT 20 MHz mode

#### 99% Bandwidth (CH Low)

Agilent 17:09:41 Jul 26, 2012

R T



Center 2.412 00 GHz Span 20 MHz

#Res BW 200 kHz #VBW 620 kHz Sweep 1.52 ms (601 pts)

**Occupied Bandwidth**  
17.4244 MHz

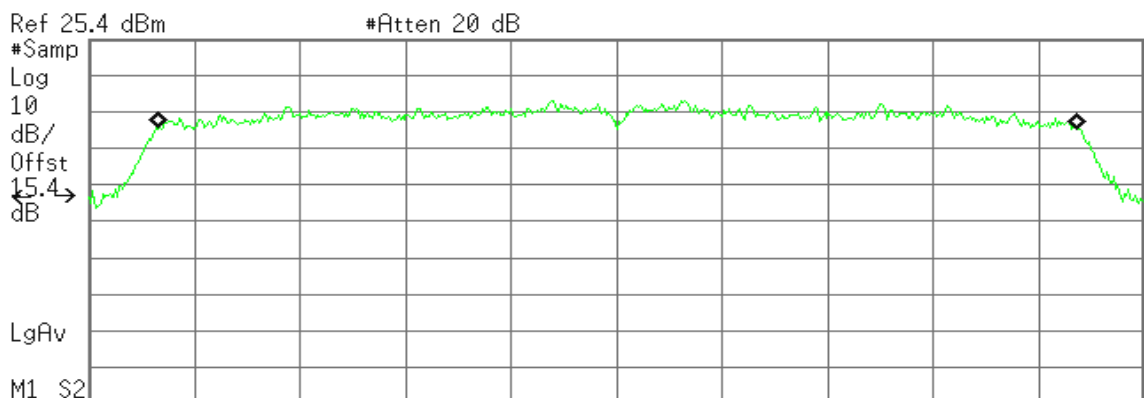
**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** 25.116 kHz  
**x dB Bandwidth** 19.479 MHz\*

#### 99% Bandwidth (CH Mid)

Agilent 17:09:14 Jul 26, 2012

R T



Center 2.442 00 GHz Span 20 MHz

#Res BW 200 kHz #VBW 620 kHz Sweep 1.52 ms (601 pts)

**Occupied Bandwidth**  
17.4122 MHz

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

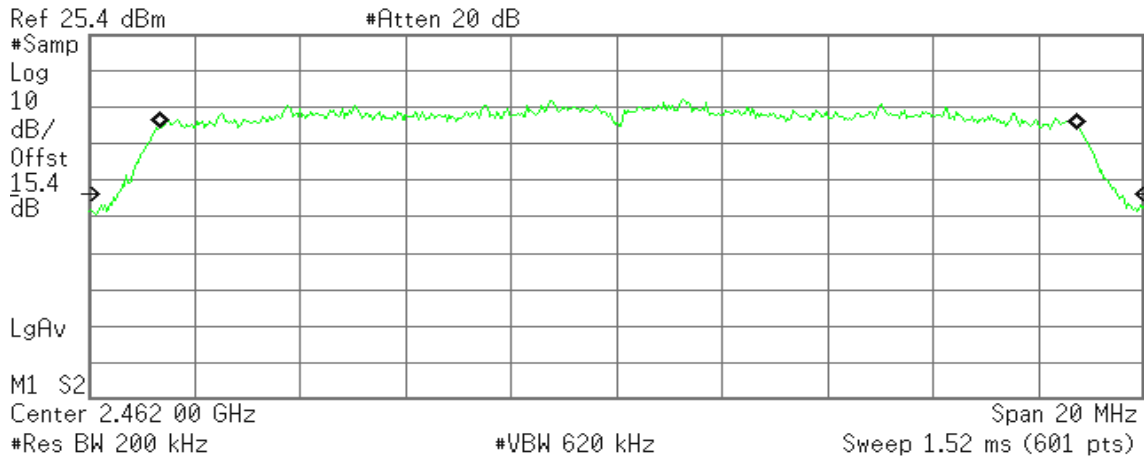
**Transmit Freq Error** 21.710 kHz  
**x dB Bandwidth** 19.672 MHz\*



### 99% Bandwidth (CH High)

Agilent 17:08:03 Jul 26, 2012

R T



**Occupied Bandwidth**  
17.3996 MHz

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

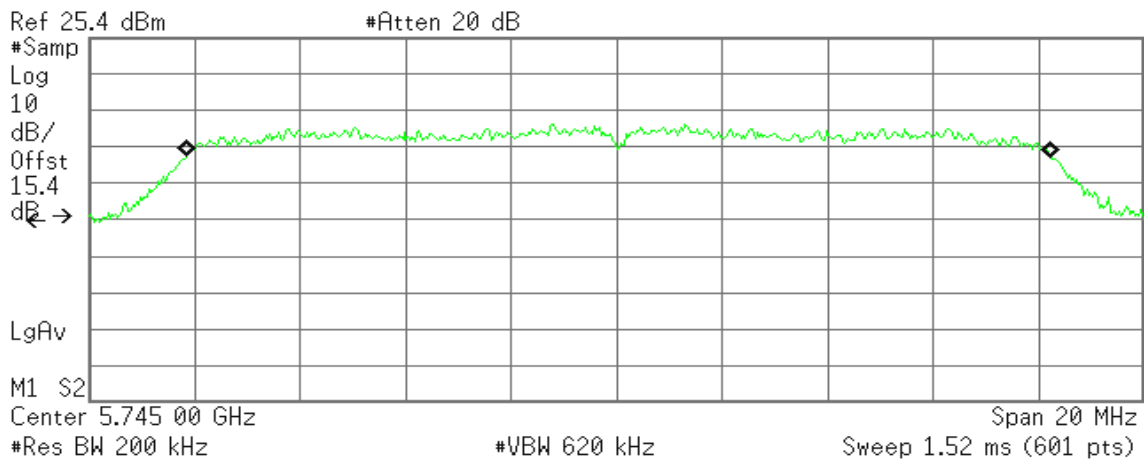
**Transmit Freq Error** 18.726 kHz  
**x dB Bandwidth** 18.959 MHz\*

### IEEE 802.11a mode

### 99% Bandwidth (CH Low)

Agilent 15:24:27 Jul 26, 2012

R T



**Occupied Bandwidth**  
16.4076 MHz

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

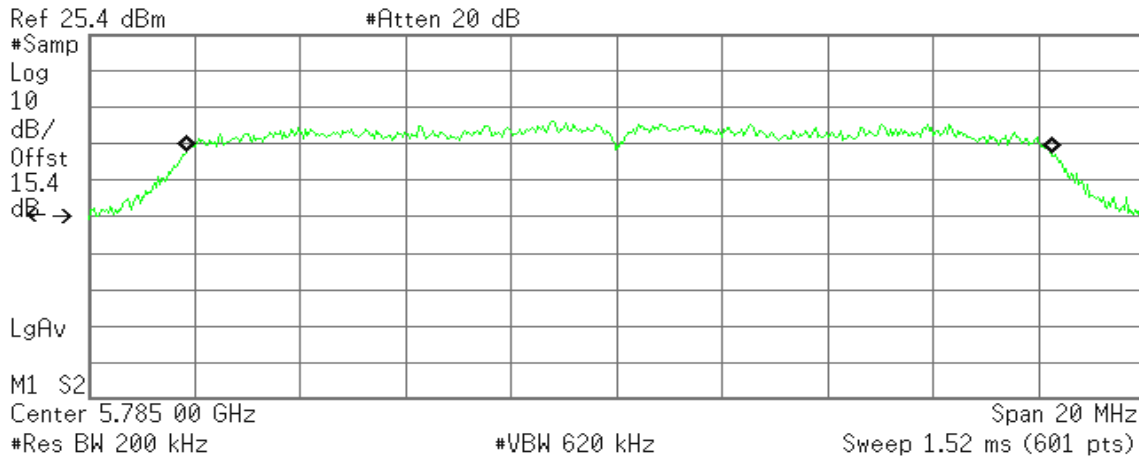
**Transmit Freq Error** 41.753 kHz  
**x dB Bandwidth** 20.000 MHz\*



### 99% Bandwidth (CH Mid)

Agilent 15:25:26 Jul 26, 2012

R T



Occupied Bandwidth  
16.4164 MHz

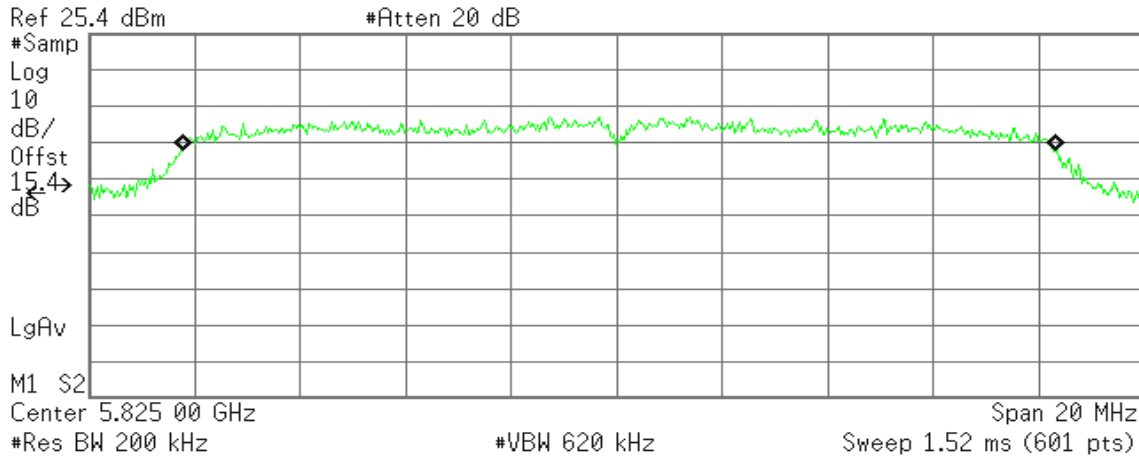
Occ BW % Pwr 99.00 %  
x dB -26.00 dB

Transmit Freq Error 42.835 kHz  
x dB Bandwidth 19.988 MHz\*

### 99% Bandwidth (CH High)

Agilent 15:26:11 Jul 26, 2012

R T



Occupied Bandwidth  
16.5692 MHz

Occ BW % Pwr 99.00 %  
x dB -26.00 dB

Transmit Freq Error 35.998 kHz  
x dB Bandwidth 20.000 MHz\*



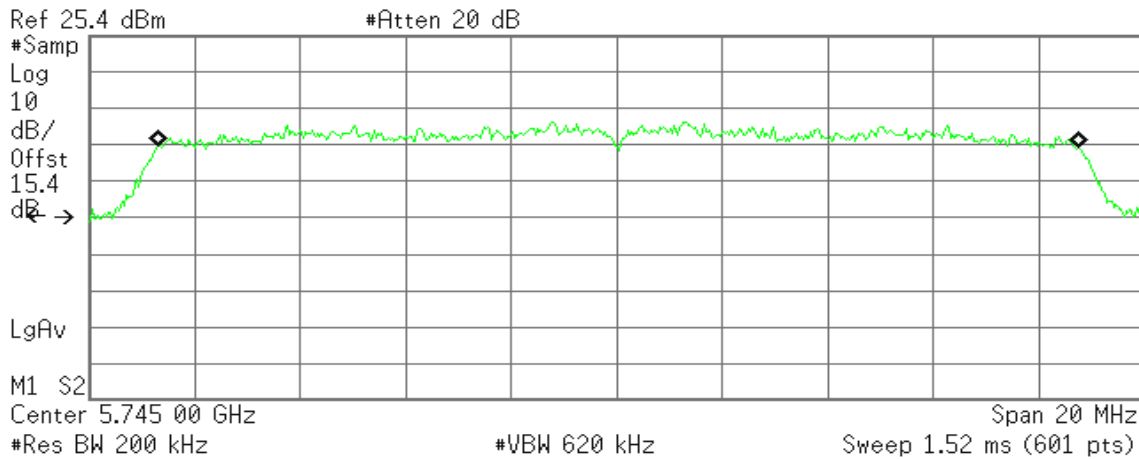


### IEEE 802.11n HT 20 MHz mode

#### 99% Bandwidth (CH Low)

Agilent 15:48:15 Jul 26, 2012

R T



**Occupied Bandwidth**  
**17.4507 MHz**

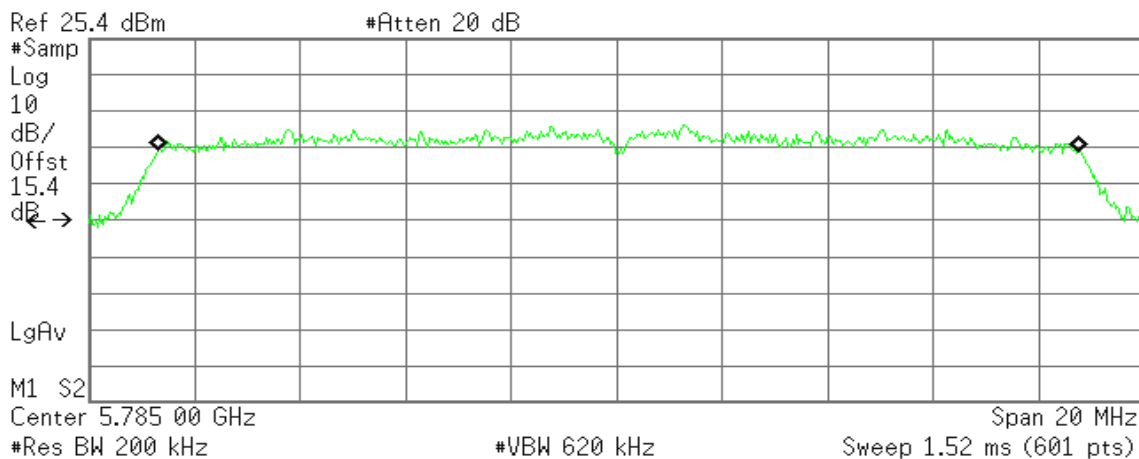
**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** 30.687 kHz  
**x dB Bandwidth** 19.962 MHz\*

#### 99% Bandwidth (CH Mid)

Agilent 15:49:10 Jul 26, 2012

R T



**Occupied Bandwidth**  
**17.4507 MHz**

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

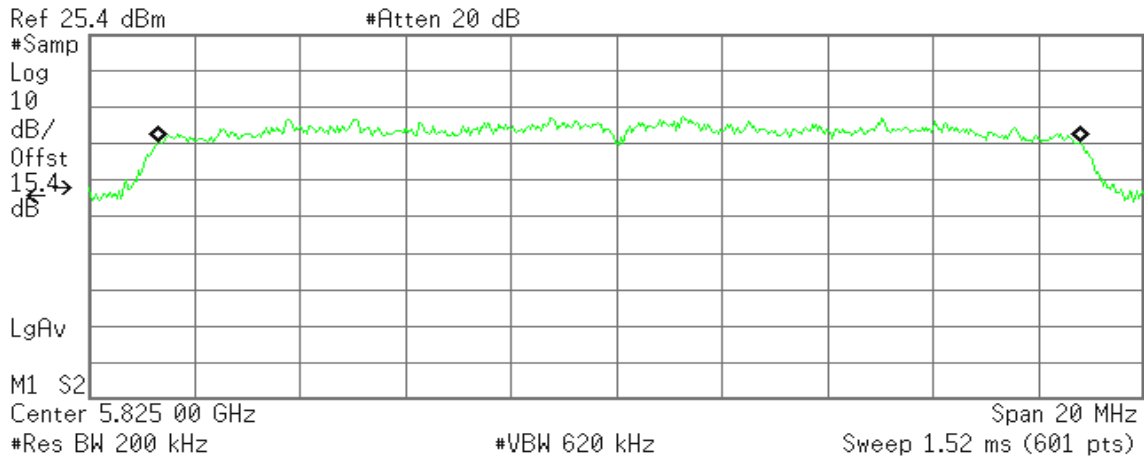
**Transmit Freq Error** 38.403 kHz  
**x dB Bandwidth** 19.989 MHz\*



### 99% Bandwidth (CH High)

Agilent 15:50:14 Jul 26, 2012

R T



**Occupied Bandwidth**  
**17.5099 MHz**

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** 38.619 kHz  
**x dB Bandwidth** 20.000 MHz\*

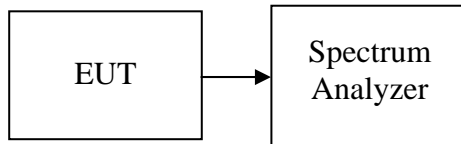


### 7.3 6DB BANDWIDTH

#### **LIMIT**

According to §15.247(a)(2) & RSS-210 §A8.2(a), systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6dB bandwidth shall be at least 500 kHz.

#### **Test Configuration**



#### **TEST PROCEDURE**

The transmitter output is connected to the spectrum analyzer. Set the RBW = 1%-5% of the emission bandwidth, VBW  $\geq 3 \times$  RBW, Detector = Peak, Trace mode = max hold, Sweep = auto couple. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6dB relative to the maximum level measured in the fundamental emission.

#### **TEST RESULTS**

*No non-compliance noted*



**Test Data**

**Test mode: IEEE 802.11b mode**

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	9.13	>500	PASS
Mid	2442	9.17		PASS
High	2462	9.17		PASS

**Test mode: IEEE 802.11g mode**

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	15.23	>500	PASS
Mid	2442	15.33		PASS
High	2462	15.97		PASS

**Test mode: IEEE 802.11n HT 20 MHz mode**

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.30	>500	PASS
Mid	2442	17.23		PASS
High	2462	17.30		PASS

**Test mode: IEEE 802.11a mode**

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
Low	5745	16.03	>500	PASS
Mid	5785	15.93		PASS
High	5825	15.60		PASS

**Test mode: IEEE 802.11n HT 20 MHz mode**

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
Low	5745	17.27	>500	PASS
Mid	5785	17.27		PASS
High	5825	16.70		PASS



### Test Plot

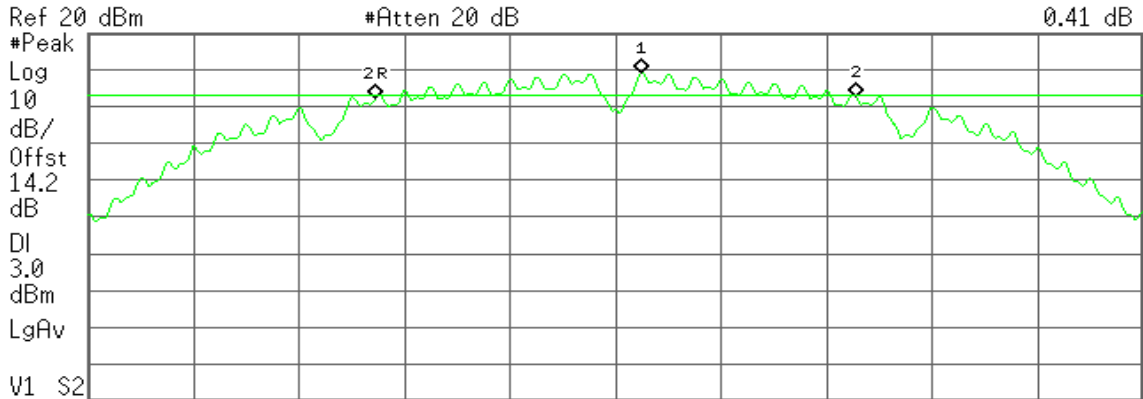
#### IEEE 802.11b mode

#### 6dB Bandwidth (CH Low)

Agilent 22:09:27 Jul 24, 2012

R T

Mkr2 9.13 MHz  
0.41 dB



Center 2.412 00 GHz Span 20 MHz  
#Res BW 160 kHz #VBW 480 kHz Sweep 1 ms (601 pts)

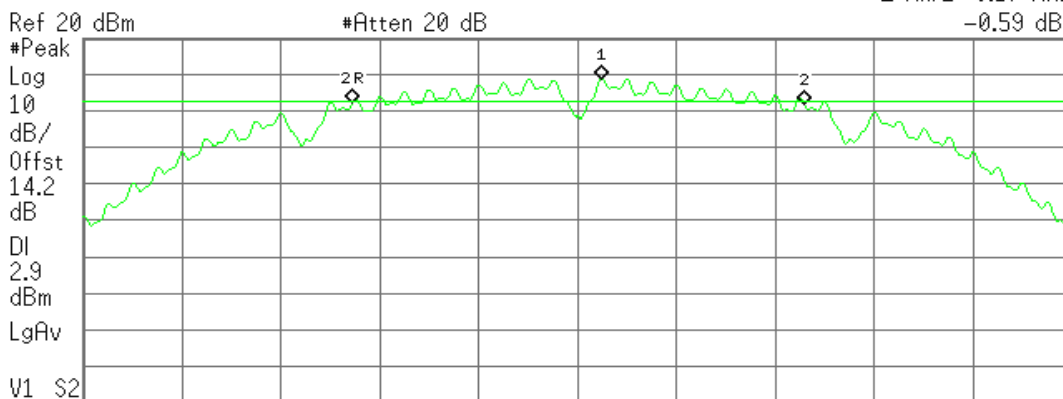
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.412 50 GHz	9.02 dBm
2R	(1)	Freq	2.407 43 GHz	2.45 dBm
2Δ	(1)	Freq	9.13 MHz	0.41 dB

#### 6dB Bandwidth (CH Mid)

Agilent 22:15:43 Jul 24, 2012

R T

Mkr2 9.17 MHz  
-0.59 dB



Center 2.442 00 GHz Span 20 MHz  
#Res BW 160 kHz #VBW 480 kHz Sweep 1 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.442 50 GHz	8.89 dBm
2R	(1)	Freq	2.437 43 GHz	2.27 dBm
2Δ	(1)	Freq	9.17 MHz	-0.59 dB

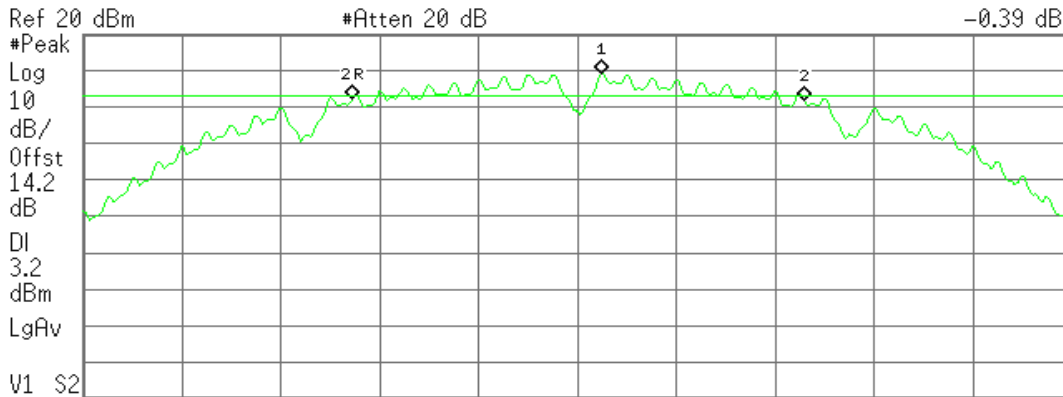


### 6dB Bandwidth (CH High)

Agilent 22:17:32 Jul 24, 2012

R T

Mkr2 9.17 MHz  
-0.39 dB



Ref 20 dBm #Atten 20 dB

#Peak Log 10 dB/Offst 14.2 dB DI 3.2 dBm LgAv

V1 S2

Center 2.462 00 GHz Span 20 MHz

#Res BW 160 kHz #VBW 480 kHz Sweep 1 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.462 50 GHz	9.18 dBm
2R	(1)	Freq	2.457 43 GHz	2.22 dBm
2Δ	(1)	Freq	9.17 MHz	-0.39 dB

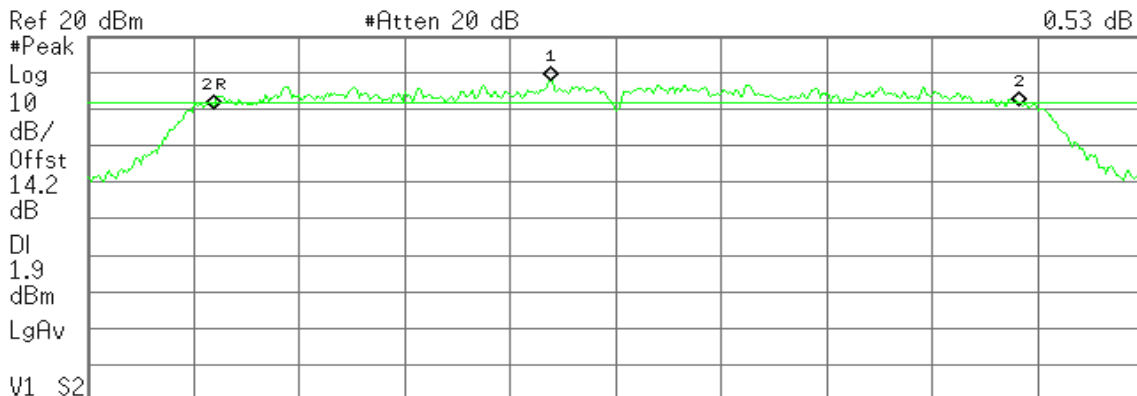
### IEEE 802.11g mode

### 6dB Bandwidth (CH Low)

Agilent 22:07:19 Jul 24, 2012

R T

Mkr2 15.23 MHz  
0.53 dB



Ref 20 dBm #Atten 20 dB

#Peak Log 10 dB/Offst 14.2 dB DI 1.9 dBm LgAv

V1 S2

Center 2.412 00 GHz Span 20 MHz

#Res BW 180 kHz #VBW 560 kHz Sweep 1 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.410 77 GHz	7.89 dBm
2R	(1)	Freq	2.404 40 GHz	0.23 dBm
2Δ	(1)	Freq	15.23 MHz	0.53 dB

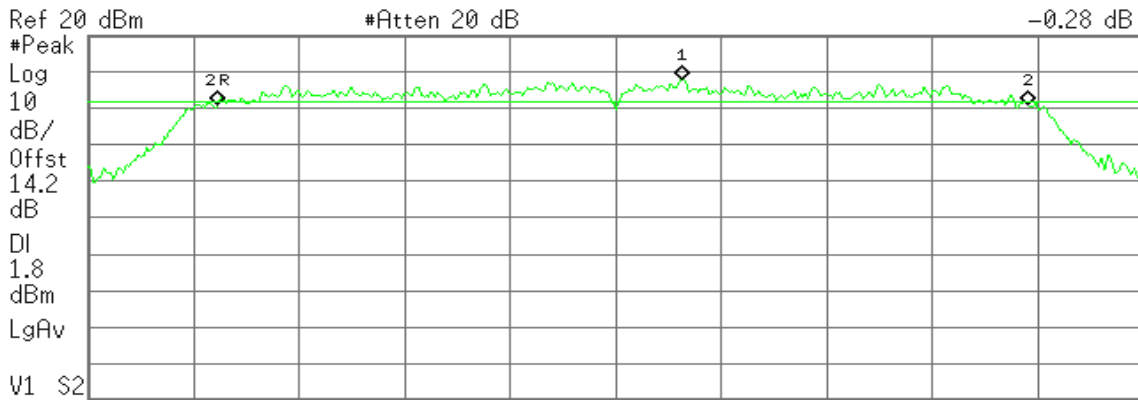


### 6dB Bandwidth (CH Mid)

Agilent 22:05:33 Jul 24, 2012

R T

Mkr2 15.33 MHz  
-0.28 dB



Center 2.442 00 GHz Span 20 MHz  
#Res BW 180 kHz #VBW 560 kHz Sweep 1 ms (601 pts)

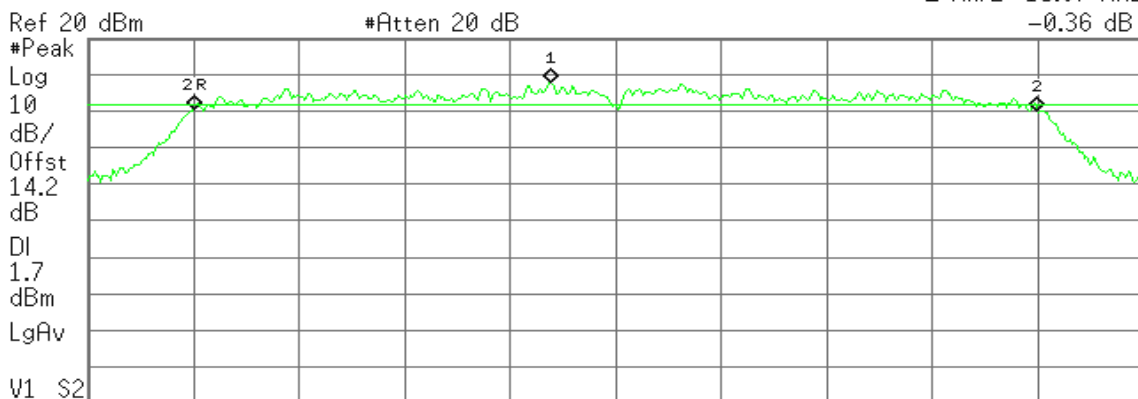
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.443 27 GHz	7.77 dBm
2R	(1)	Freq	2.434 47 GHz	1.07 dBm
2Δ	(1)	Freq	15.33 MHz	-0.28 dB

### 6dB Bandwidth (CH High)

Agilent 22:03:52 Jul 24, 2012

R T

Mkr2 15.97 MHz  
-0.36 dB



Center 2.462 00 GHz Span 20 MHz  
#Res BW 180 kHz #VBW 560 kHz Sweep 1 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.460 77 GHz	7.72 dBm
2R	(1)	Freq	2.454 83 GHz	0.59 dBm
2Δ	(1)	Freq	15.97 MHz	-0.36 dB



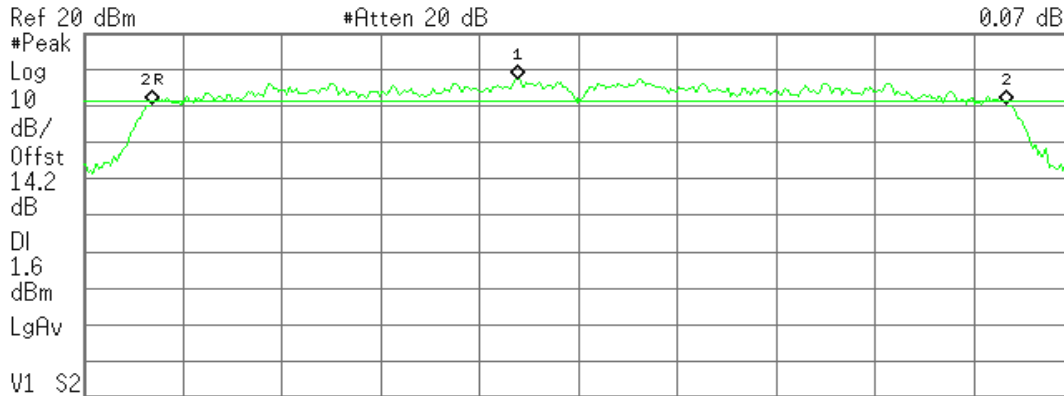
### IEEE 802.11n HT 20 MHz mode

#### 6dB Bandwidth (CH Low)

Agilent 21:57:04 Jul 24, 2012

R T

Mkr2 17.30 MHz  
0.07 dB



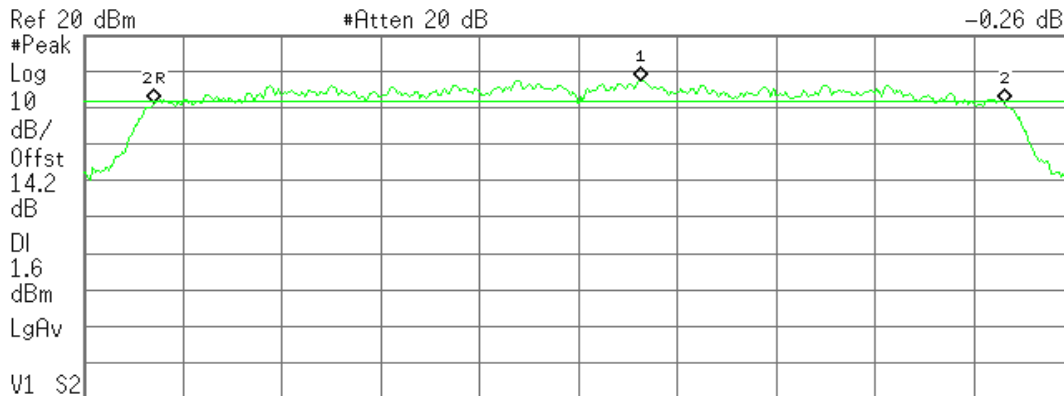
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.410 77 GHz	7.57 dBm
2R	(1)	Freq	2.403 37 GHz	0.45 dBm
2Δ	(1)	Freq	17.30 MHz	0.07 dB

#### 6dB Bandwidth (CH Mid)

Agilent 21:59:14 Jul 24, 2012

R T

Mkr2 17.23 MHz  
-0.26 dB



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.443 27 GHz	7.54 dBm
2R	(1)	Freq	2.433 40 GHz	1.43 dBm
2Δ	(1)	Freq	17.23 MHz	-0.26 dB



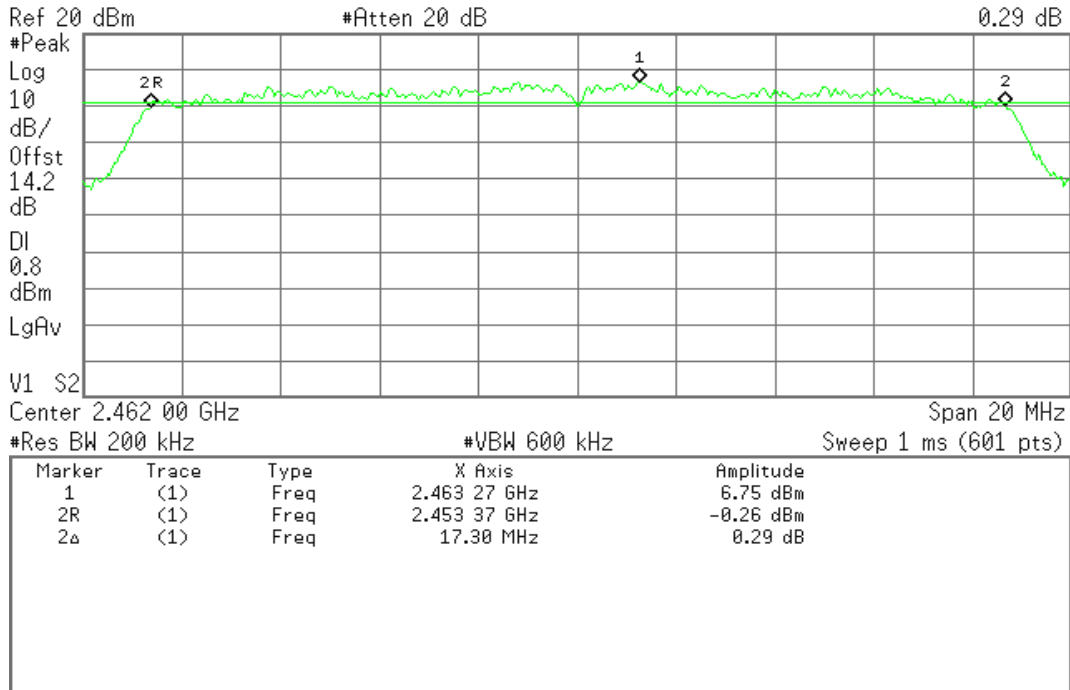


### 6dB Bandwidth (CH High)

Agilent 22:01:49 Jul 24, 2012

R T

Mkr2 17.30 MHz  
0.29 dB



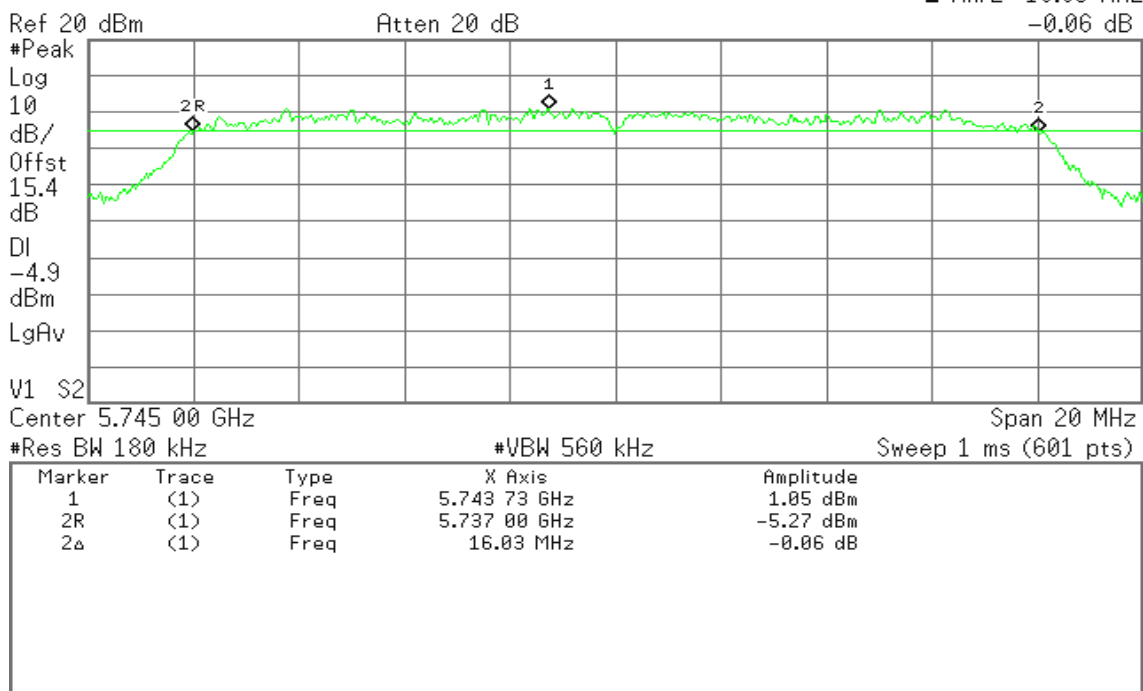
### IEEE 802.11a mode

### 6dB Bandwidth (CH Low)

Agilent 20:06:14 Jul 25, 2012

R T

Mkr2 16.03 MHz  
-0.06 dB



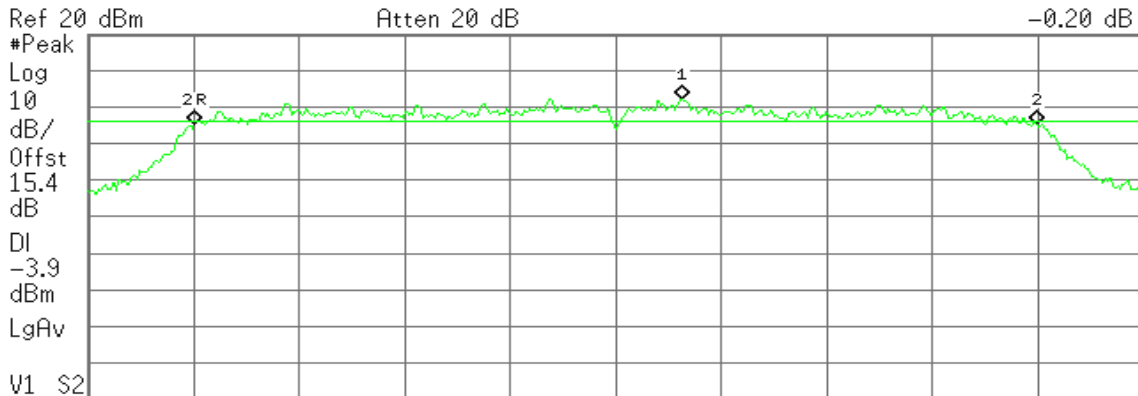


### 6dB Bandwidth (CH Mid)

Agilent 20:01:09 Jul 25, 2012

R T

Mkr2 15.93 MHz  
-0.20 dB



Center 5.785 00 GHz Span 20 MHz  
#Res BW 180 kHz #VBW 560 kHz Sweep 1 ms (601 pts)

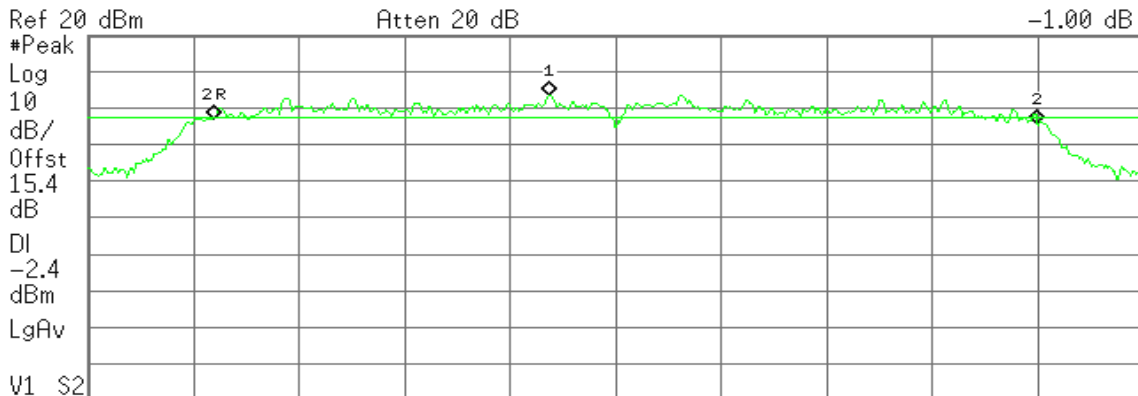
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	5.786 27 GHz	2.10 dBm
2R	(1)	Freq	5.777 83 GHz	-4.53 dBm
2Δ	(1)	Freq	15.93 MHz	-0.20 dB

### 6dB Bandwidth (CH High)

Agilent 20:04:10 Jul 25, 2012

R T

Mkr2 15.60 MHz  
-1.00 dB



Center 5.825 00 GHz Span 20 MHz  
#Res BW 180 kHz #VBW 560 kHz Sweep 1 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	5.823 73 GHz	3.59 dBm
2R	(1)	Freq	5.817 48 GHz	-3.12 dBm
2Δ	(1)	Freq	15.60 MHz	-1.00 dB



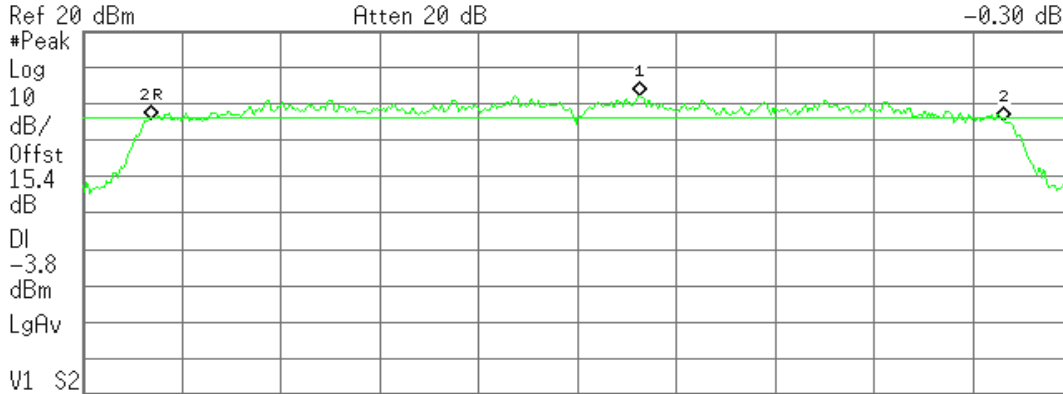
### IEEE 802.11n HT 20 MHz mode

#### 6dB Bandwidth (CH Low)

Agilent 19:34:28 Jul 25, 2012

R T

Mkr2 17.27 MHz  
-0.30 dB



Center 5.745 00 GHz Span 20 MHz  
#Res BW 200 kHz #VBW 600 kHz Sweep 1 ms (601 pts)

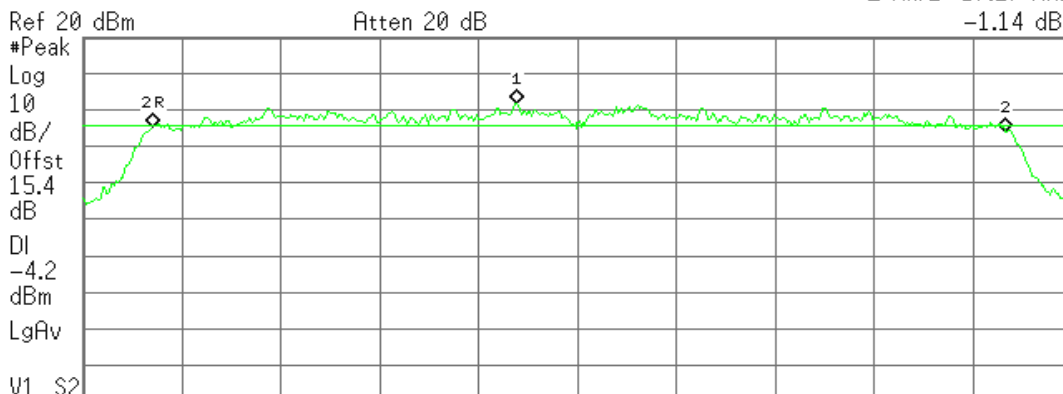
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	5.746 27 GHz	2.18 dBm
2R	(1)	Freq	5.736 37 GHz	-4.22 dBm
2Δ	(1)	Freq	17.27 MHz	-0.30 dB

#### 6dB Bandwidth (CH Mid)

Agilent 19:32:24 Jul 25, 2012

R T

Mkr2 17.27 MHz  
-1.14 dB



Center 5.785 00 GHz Span 20 MHz  
#Res BW 200 kHz #VBW 600 kHz Sweep 1 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	5.783 77 GHz	1.75 dBm
2R	(1)	Freq	5.776 40 GHz	-4.76 dBm
2Δ	(1)	Freq	17.27 MHz	-1.14 dB

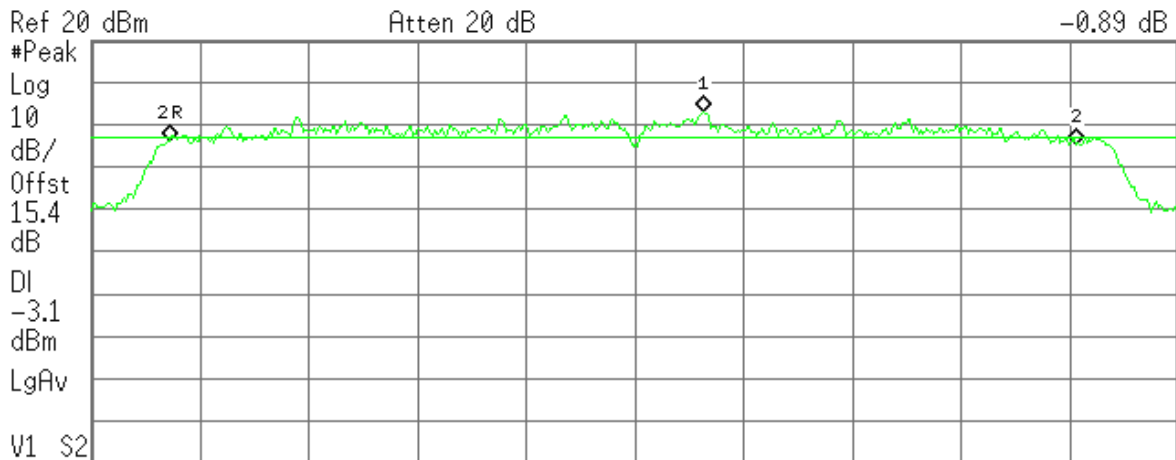


### 6dB Bandwidth (CH High)

Agilent 18:54:26 Jul 25, 2012

R T

▲ Mkr2 16.70 MHz  
-0.89 dB



Center 5.825 00 GHz      Span 20 MHz

#Res BW 200 kHz      #VBW 600 kHz      Sweep 1 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	5.826 27 GHz	2.92 dBm
2R	(1)	Freq	5.816 43 GHz	-3.89 dBm
2▲	(1)	Freq	16.70 MHz	-0.89 dB



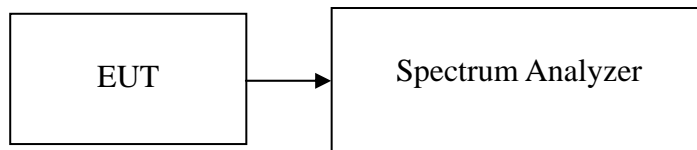
## 7.4 PEAK POWER

### LIMIT

The maximum peak output power of the intentional radiator shall not exceed the following:

1. According to §15.247(b)(3), for systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz: 1 Watt.
2. According to §15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
3. According to RSS-210 §A8.4(4), for systems employing digital modulation techniques operating in the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz, the maximum peak conducted output power shall not exceed 1 W.

### Test Configuration



### TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. Set the RBW = 1MHz , VBW = 3MHz, Detector = Peak, Trace mode = max hold, Sweep = auto couple. Record the max reading.

Repeat the above procedure until the measurements for all frequencies are completed.

### TEST RESULTS

*No non-compliance noted*



**Test Data**

**Test mode: IEEE 802.11b mode**

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	19.21	0.0833	1.00	PASS
Mid	2442	19.64	0.0920		PASS
High	2462	19.87	0.0970		PASS

**Test mode: IEEE 802.11g mode**

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	23.70	0.2344	1.00	PASS
Mid	2442	23.93	0.2471		PASS
High	2462	23.84	0.2421		PASS

**Test mode: IEEE 802.11n HT 20 MHz mode**

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	23.98	0.2500	1.00	PASS
Mid	2442	24.06	0.2546		PASS
High	2462	22.90	0.1949		PASS

**Test mode: IEEE 802.11a mode**

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	5745	18.38	0.0688	1.00	PASS
Mid	5785	18.19	0.0659		PASS
High	5825	19.45	0.0881		PASS

**Test mode: IEEE 802.11n HT 20 MHz mode**

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	5745	18.14	0.0651	1.00	PASS
Mid	5785	18.55	0.0716		PASS
High	5825	19.06	0.0805		PASS

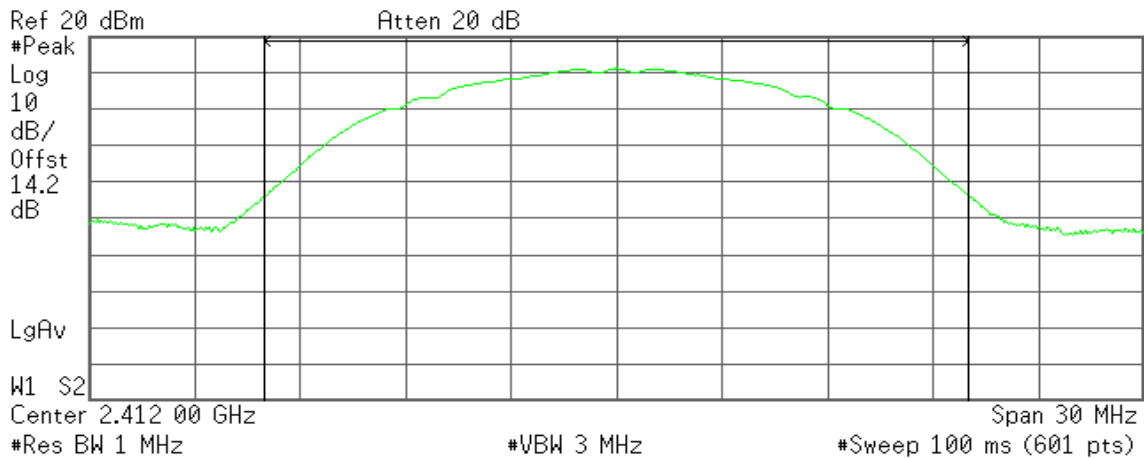


IEEE 802.11b mode

Peak power (CH Low)

Agilent 20:23:46 Jul 24, 2012

R T



Channel Power

19.21 dBm /20.0000 MHz

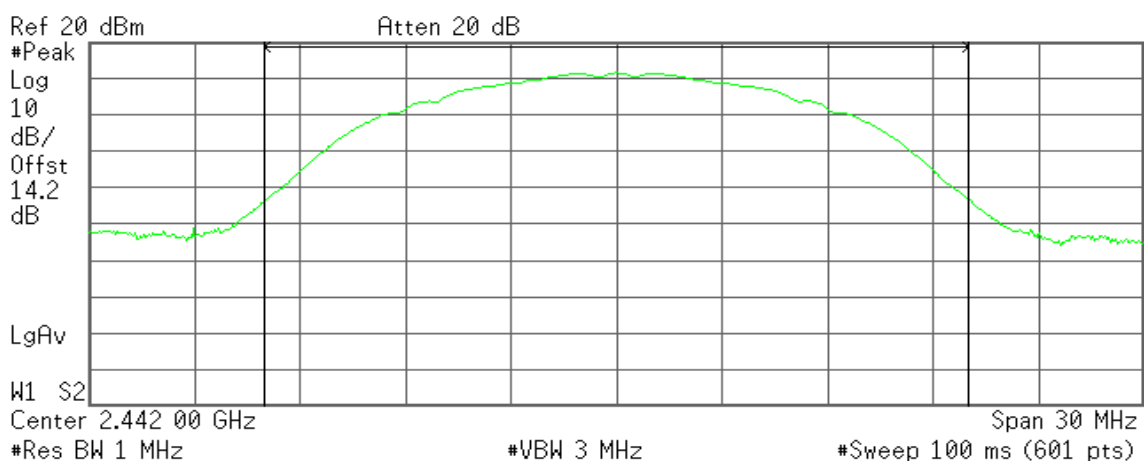
Power Spectral Density

-53.80 dBm/Hz

Peak power (CH Mid)

Agilent 20:03:23 Jul 24, 2012

R T



Channel Power

19.64 dBm /20.0000 MHz

Power Spectral Density

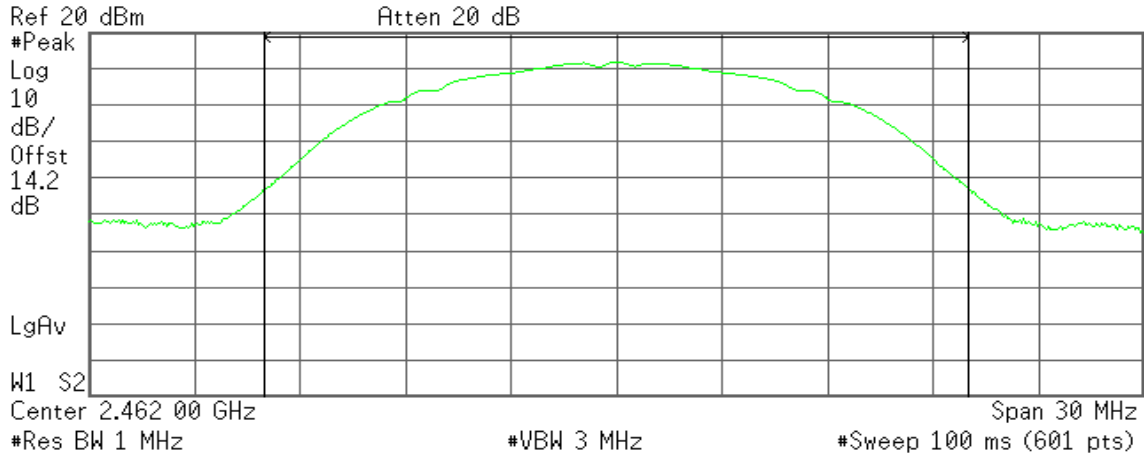
-53.37 dBm/Hz



### Peak power (CH High)

Agilent 19:59:20 Jul 24, 2012

R T



**Channel Power**

19.87 dBm /20.0000 MHz

**Power Spectral Density**

-53.14 dBm/Hz



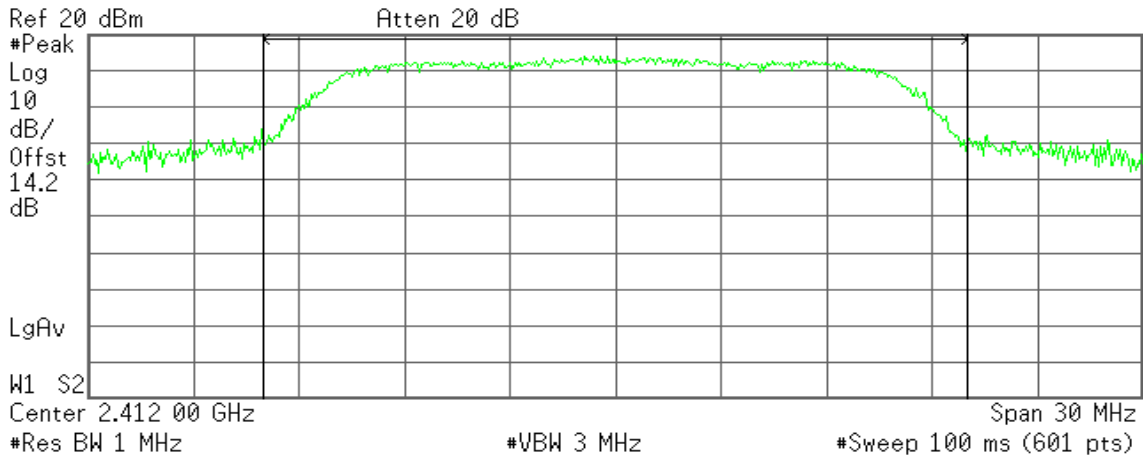


**IEEE 802.11g mode**

**Peak power (CH Low)**

Agilent 20:50:51 Jul 24, 2012

R T



**Channel Power**

23.70 dBm /20.0000 MHz

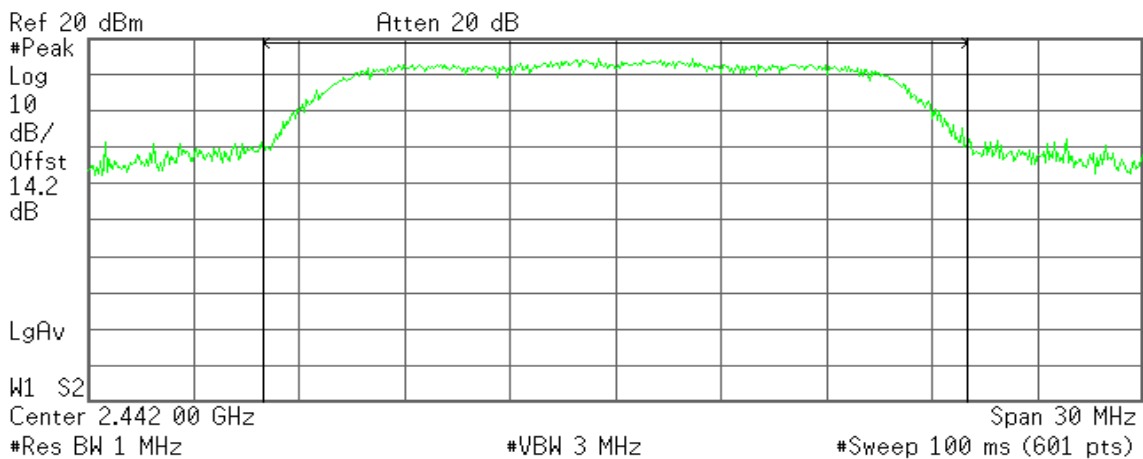
**Power Spectral Density**

-49.31 dBm/Hz

**Peak power (CH Mid)**

Agilent 20:44:53 Jul 24, 2012

R T



**Channel Power**

23.93 dBm /20.0000 MHz

**Power Spectral Density**

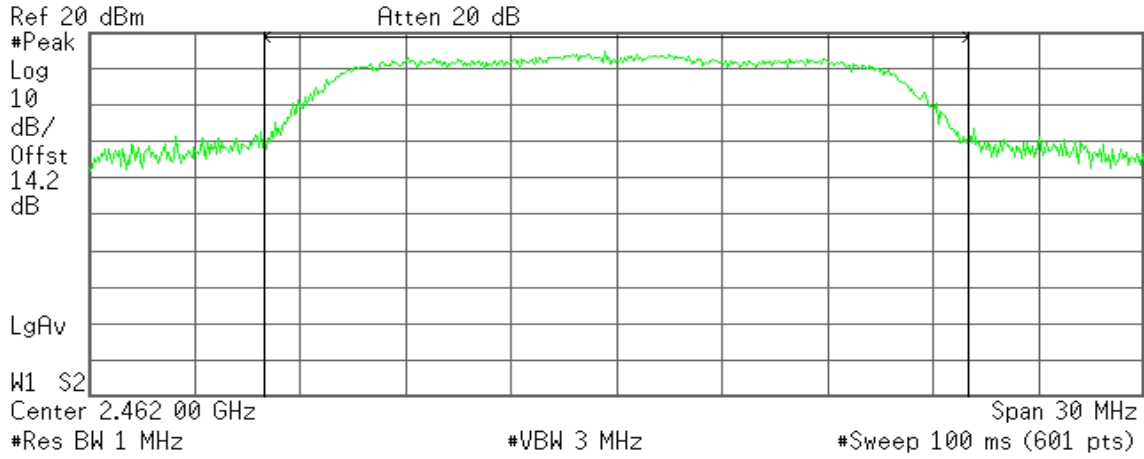
-49.08 dBm/Hz



### Peak power (CH High)

Agilent 20:40:18 Jul 24, 2012

R T



**Channel Power**

23.84 dBm /20.0000 MHz

**Power Spectral Density**

-49.17 dBm/Hz

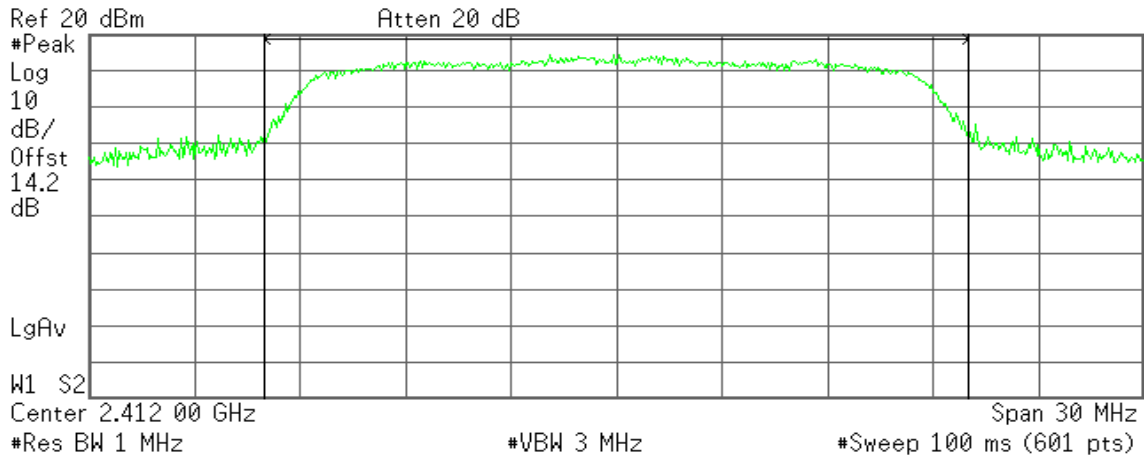


IEEE 802.11n HT20 MHz mode

Peak power (CH Low)

Agilent 21:21:26 Jul 24, 2012

R T



Channel Power

23.98 dBm /20.0000 MHz

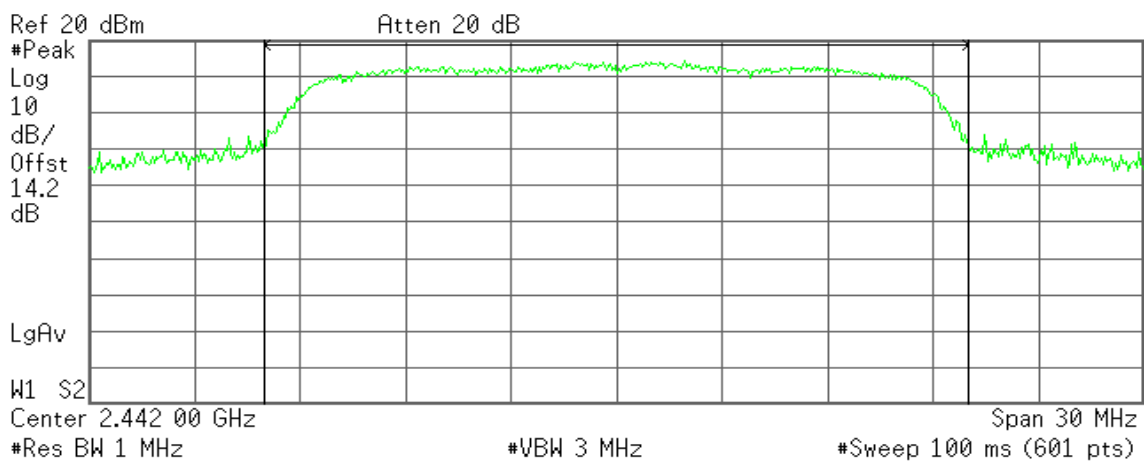
Power Spectral Density

-49.03 dBm/Hz

Peak power (CH Mid)

Agilent 21:36:57 Jul 24, 2012

R T



Channel Power

24.06 dBm /20.0000 MHz

Power Spectral Density

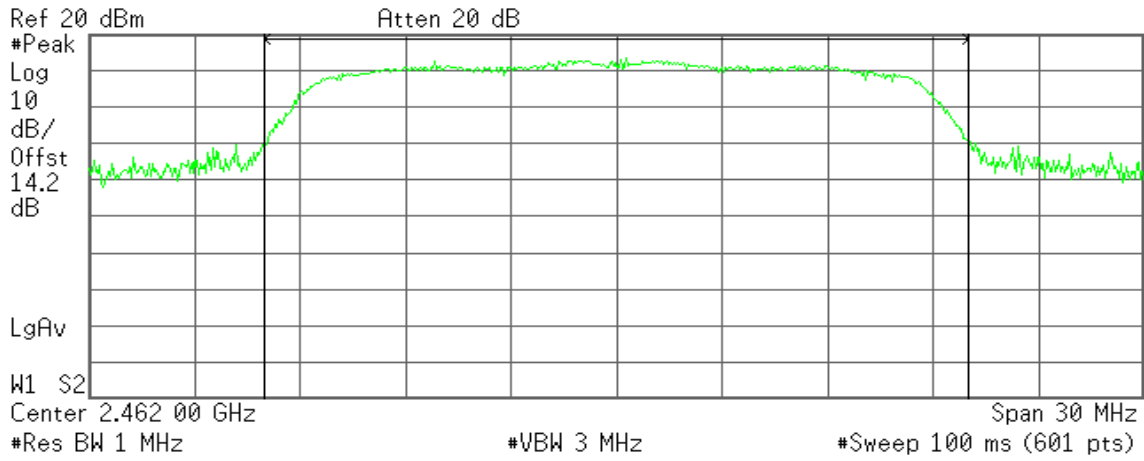
-48.95 dBm/Hz



### Peak power (CH High)

Agilent 21:33:10 Jul 24, 2012

R T



**Channel Power**

22.90 dBm /20.0000 MHz

**Power Spectral Density**

-50.11 dBm/Hz

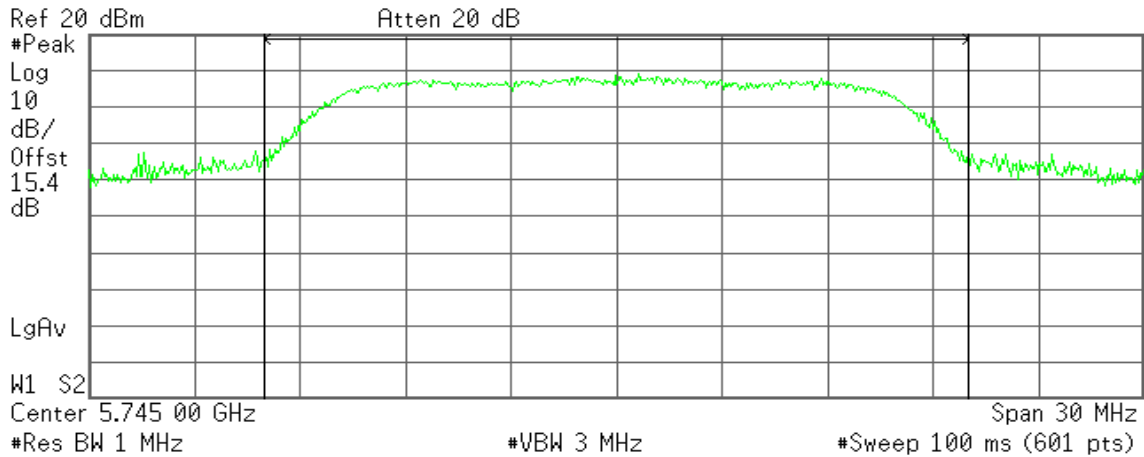


IEEE 802.11a mode

Peak power (CH Low)

Agilent 19:53:36 Jul 25, 2012

R T



Channel Power

18.38 dBm /20.0000 MHz

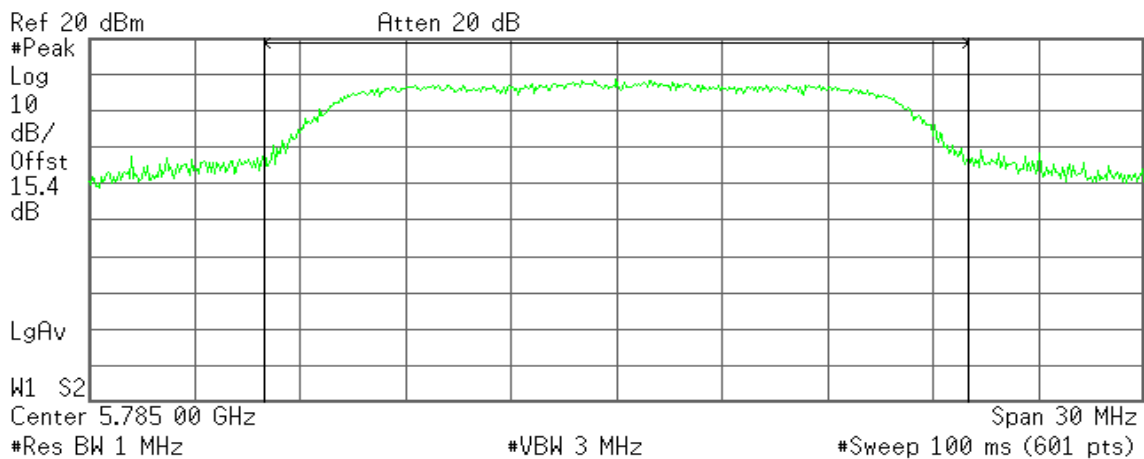
Power Spectral Density

-54.63 dBm/Hz

Peak power (CH Mid)

Agilent 19:49:02 Jul 25, 2012

R T



Channel Power

18.19 dBm /20.0000 MHz

Power Spectral Density

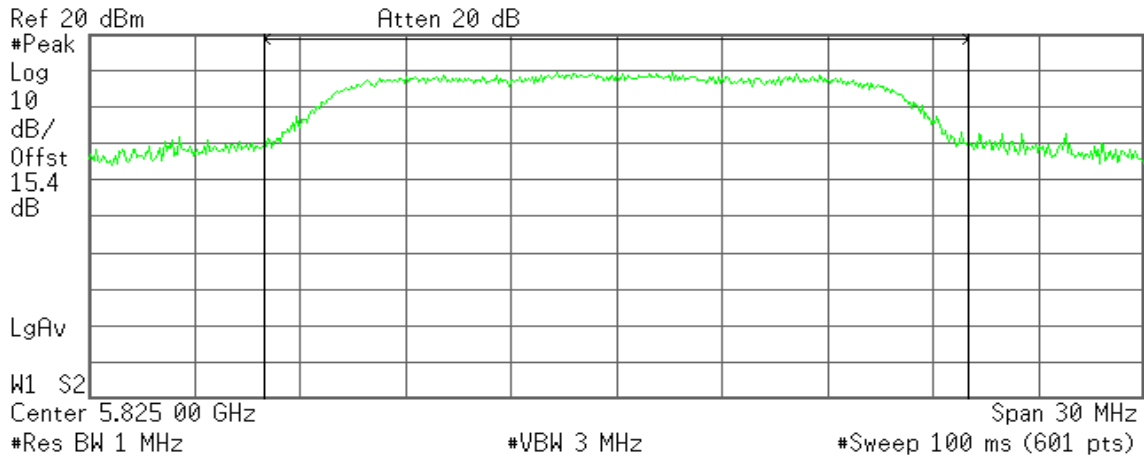
-54.82 dBm/Hz



### Peak power (CH High)

Agilent 19:45:14 Jul 25, 2012

R T



**Channel Power**

19.45 dBm /20.0000 MHz

**Power Spectral Density**

-53.56 dBm/Hz

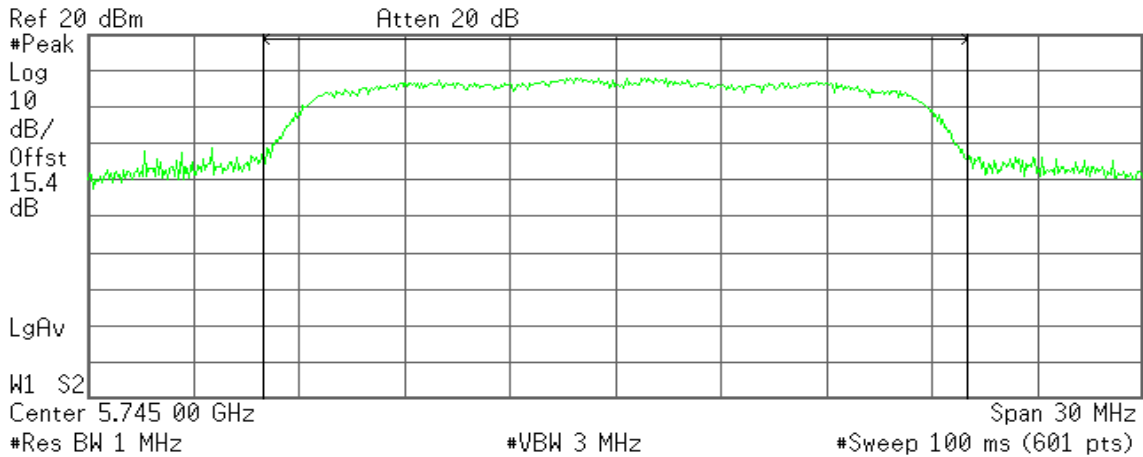


IEEE 802.11n HT20 MHz mode

Peak power (CH Low)

Agilent 18:01:16 Jul 25, 2012

R T



Channel Power

18.14 dBm /20.0000 MHz

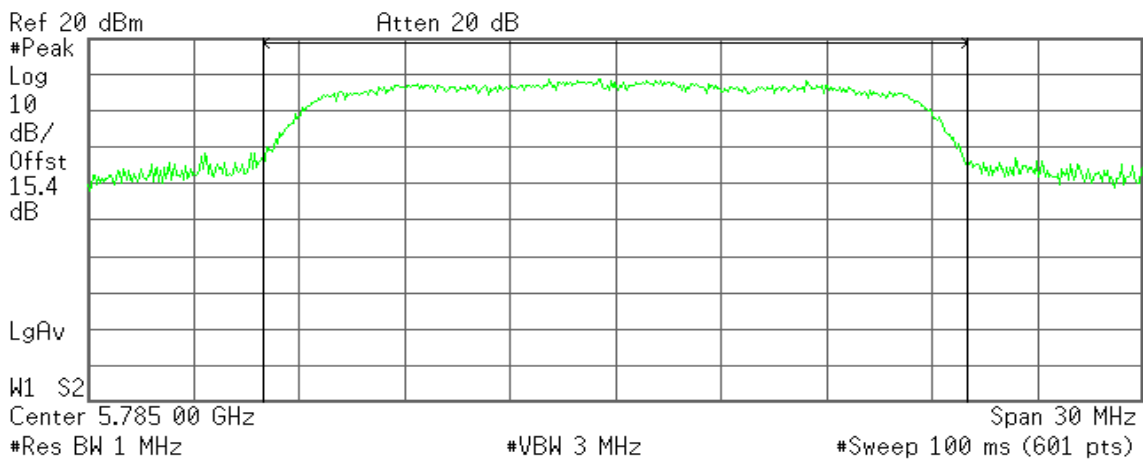
Power Spectral Density

-54.87 dBm/Hz

Peak power (CH Mid)

Agilent 17:37:18 Jul 25, 2012

R T



Channel Power

18.55 dBm /20.0000 MHz

Power Spectral Density

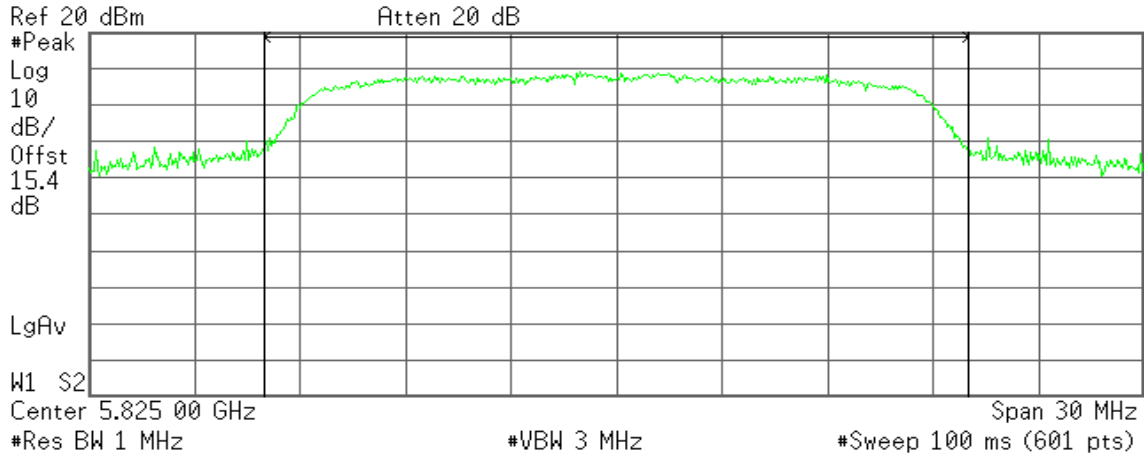
-54.46 dBm/Hz



### Peak power (CH High)

Agilent 17:21:52 Jul 25, 2012

R T



**Channel Power**

19.06 dBm /20.0000 MHz

**Power Spectral Density**

-53.95 dBm/Hz



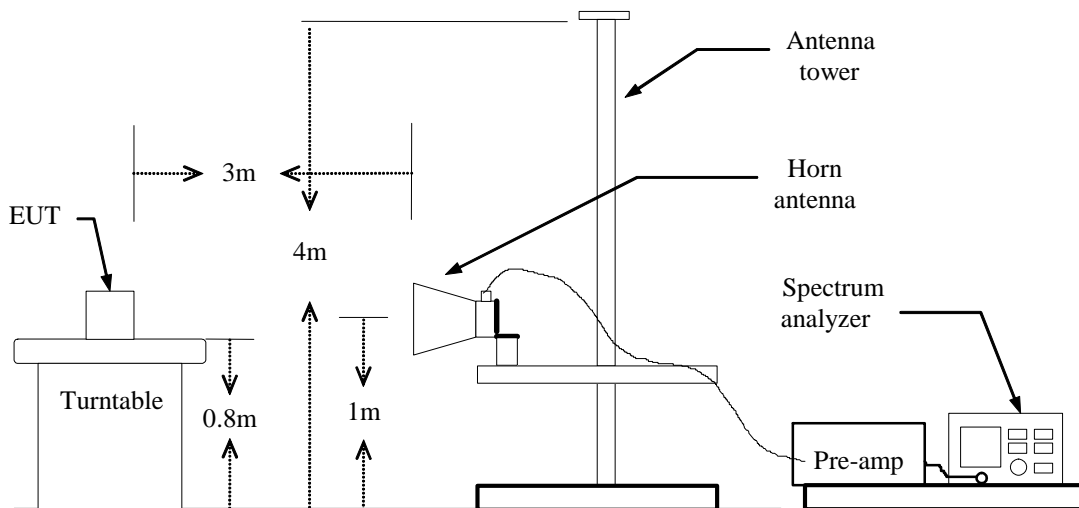


## 7.5 BAND EDGES MEASUREMENT

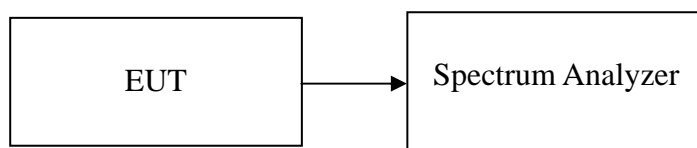
### LIMIT

According to §15.247(d) & RSS-210 §A8.5, in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional 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. 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 Section 15.205(c)).

### Test Configuration



### **For Conducted**





## **TEST PROCEDURE**

### **For Radiated**

1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
  - (a) PEAK: RBW=1MHz / VBW=3MHz / Sweep=AUTO
  - (b) AVERAGE: RBW=1MHz / VBW=10MHz / Sweep=AUTO
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

### **For Conducted**

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 100 kHz.

## **TEST RESULTS**

Refer to attach spectrum analyzer data chart.



**802.11a Mode**

1. Operating Frequency: 5725-5875MHz
2. CH Low: 5745MHz, CH High: 5825MHz
3. 6dB bandwidth: CH Low: 16.03MHz, CH High: 15.60MHz

Because the mentioned conditions, the test is not applicable.



### Band Edges (IEEE 802.11b mode / CH Low)

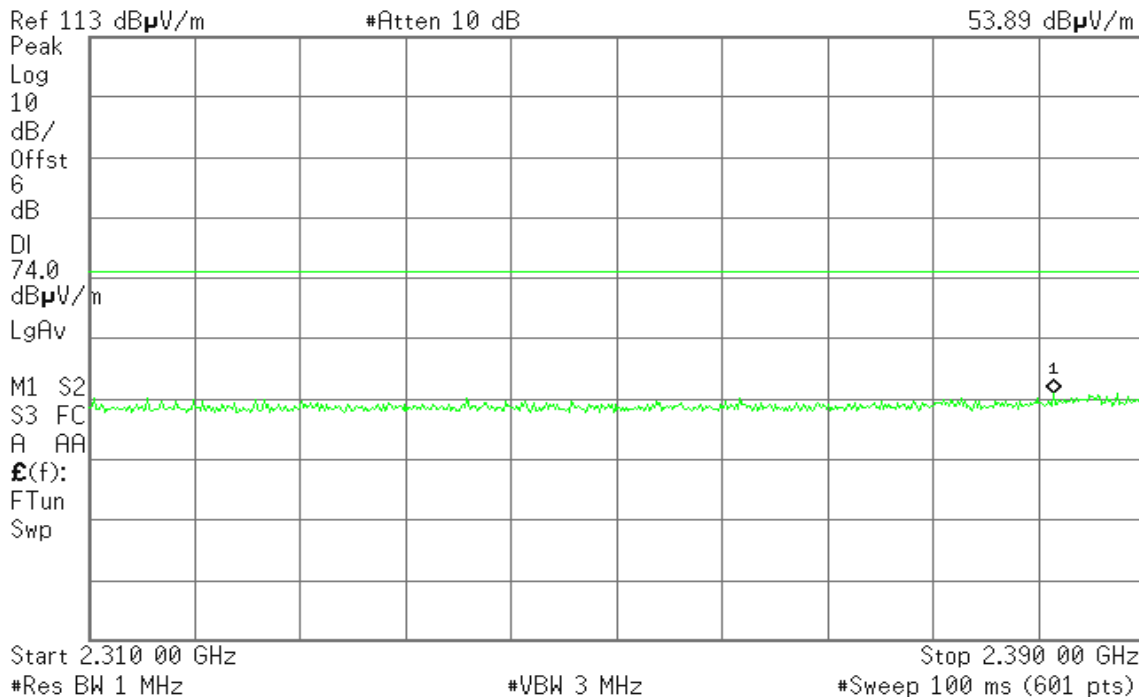
Detector mode: Peak

Polarity: Vertical

Agilent

R T

Mkr1 2.383 20 GHz  
53.89 dB $\mu$ V/m



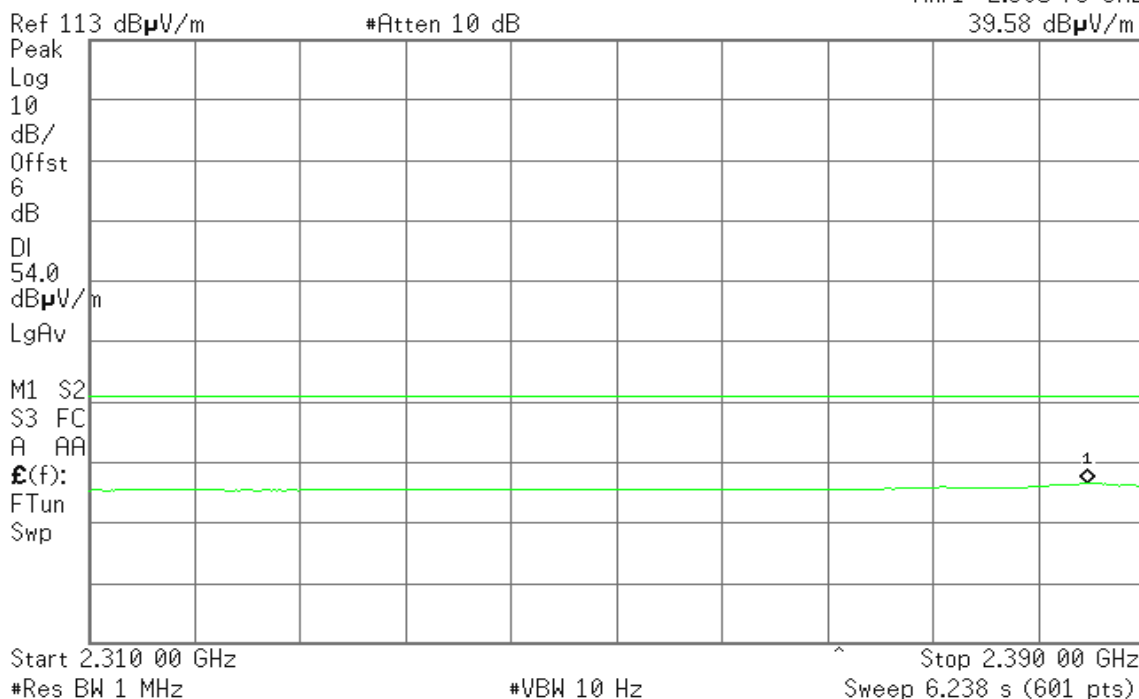
Detector mode: Average

Polarity: Vertical

Agilent

R T

Mkr1 2.385 73 GHz  
39.58 dB $\mu$ V/m





Detector mode: Peak

Polarity: Horizontal

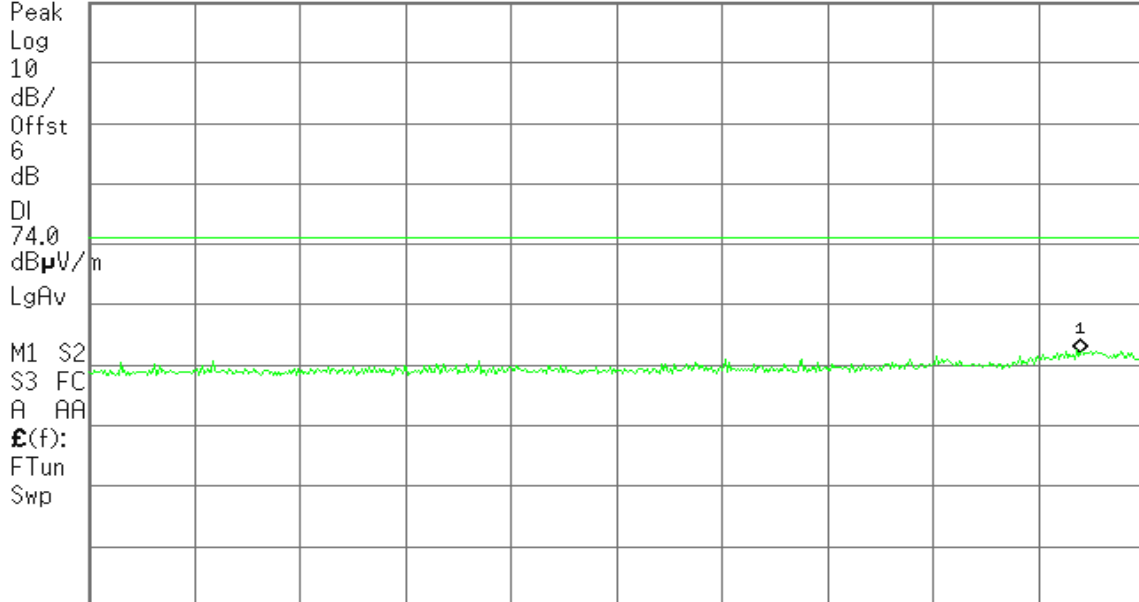
Agilent

R T

Mkr1 2.385 20 GHz  
55.15 dB $\mu$ V/m

Ref 113 dB $\mu$ V/m

#Atten 10 dB



Start 2.310 00 GHz

Stop 2.390 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

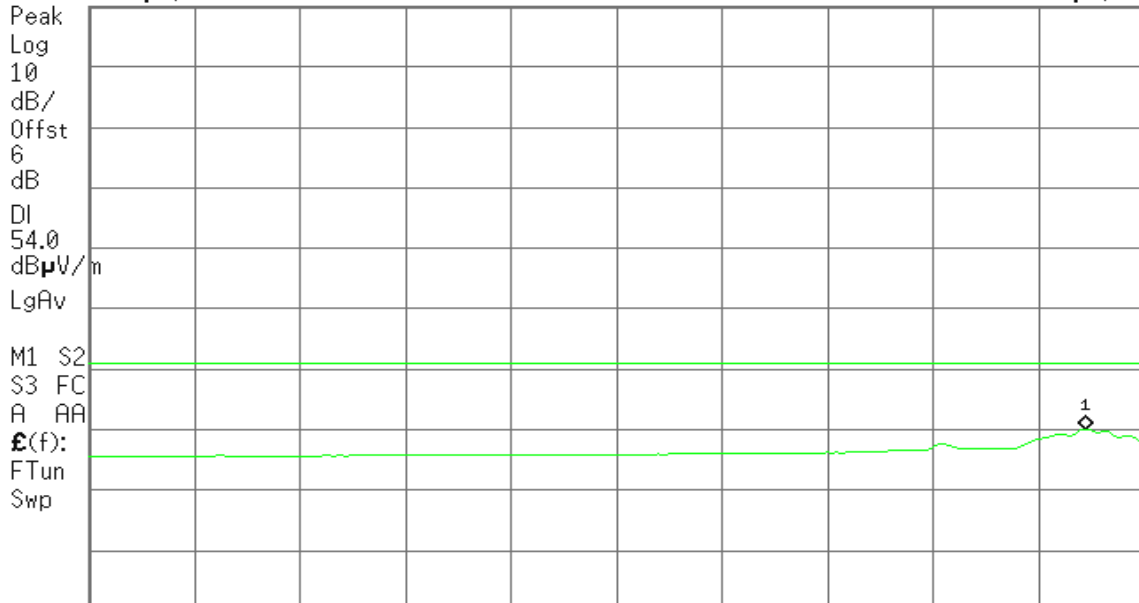
Agilent

R T

Mkr1 2.385 60 GHz  
43.10 dB $\mu$ V/m

Ref 113 dB $\mu$ V/m

#Atten 10 dB



Start 2.310 00 GHz

Stop 2.390 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Sweep 6.238 s (601 pts)



### Band Edges (IEEE 802.11b mode / CH High)

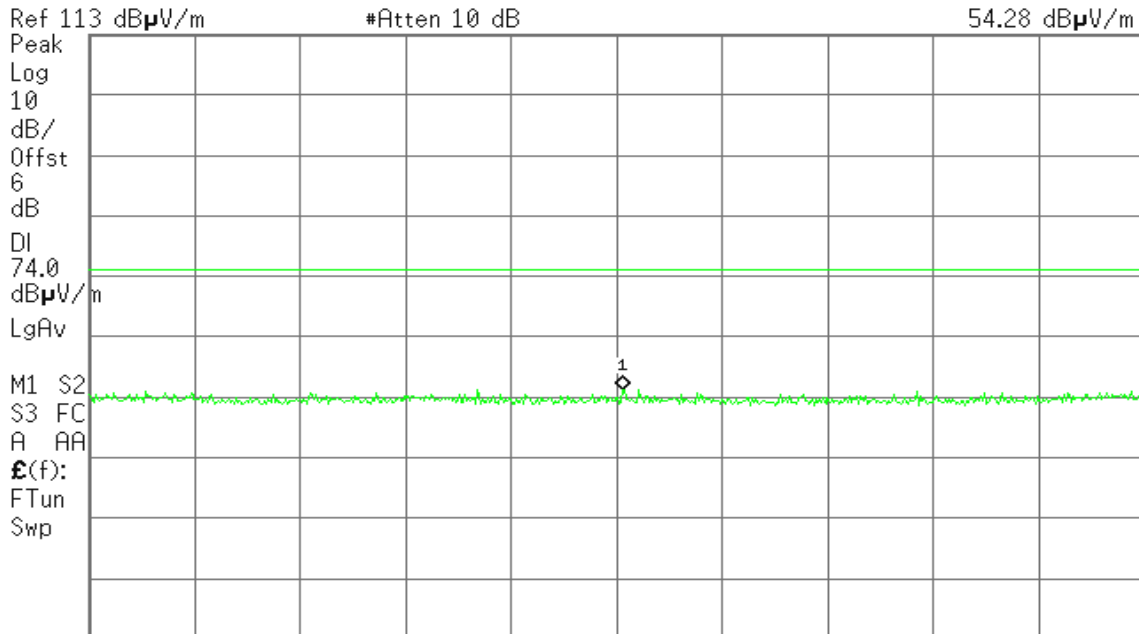
Detector mode: Peak

Polarity: Vertical

Agilent

T

Mkr1 2.491 86 GHz  
54.28 dB $\mu$ V/m



Start 2.483 50 GHz #Res BW 1 MHz #VBW 3 MHz Stop 2.500 00 GHz #Sweep 100 ms (601 pts)

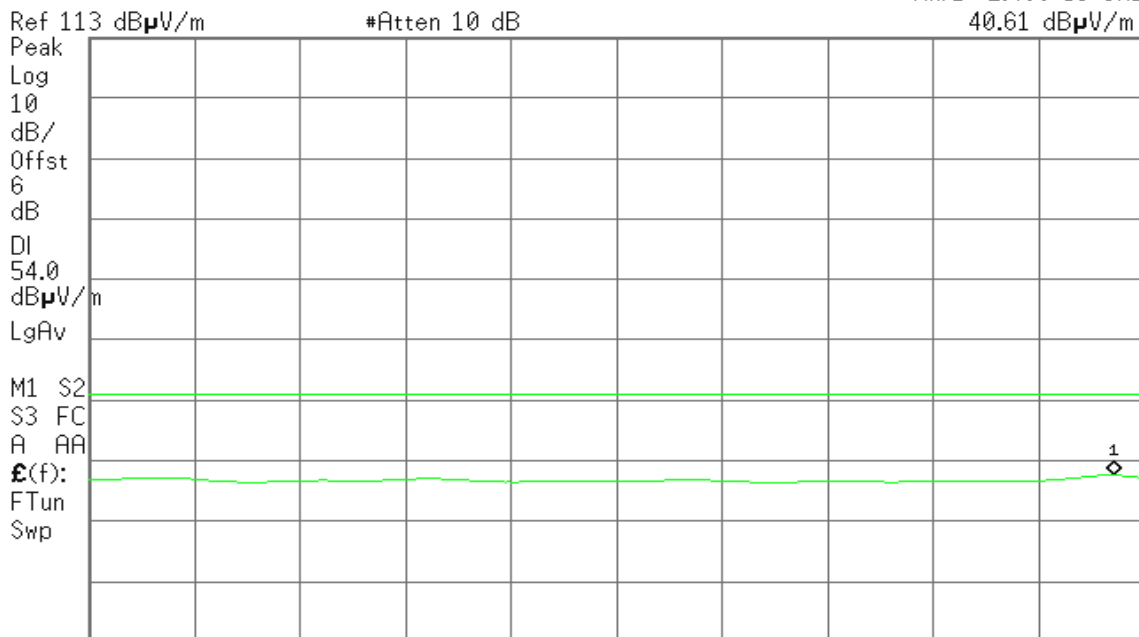
Detector mode: Average

Polarity: Vertical

Agilent

T

Mkr1 2.499 53 GHz  
40.61 dB $\mu$ V/m



Start 2.483 50 GHz #Res BW 1 MHz #VBW 10 Hz Stop 2.500 00 GHz Sweep 1.287 s (601 pts)



Detector mode: Peak

Polarity: Horizontal

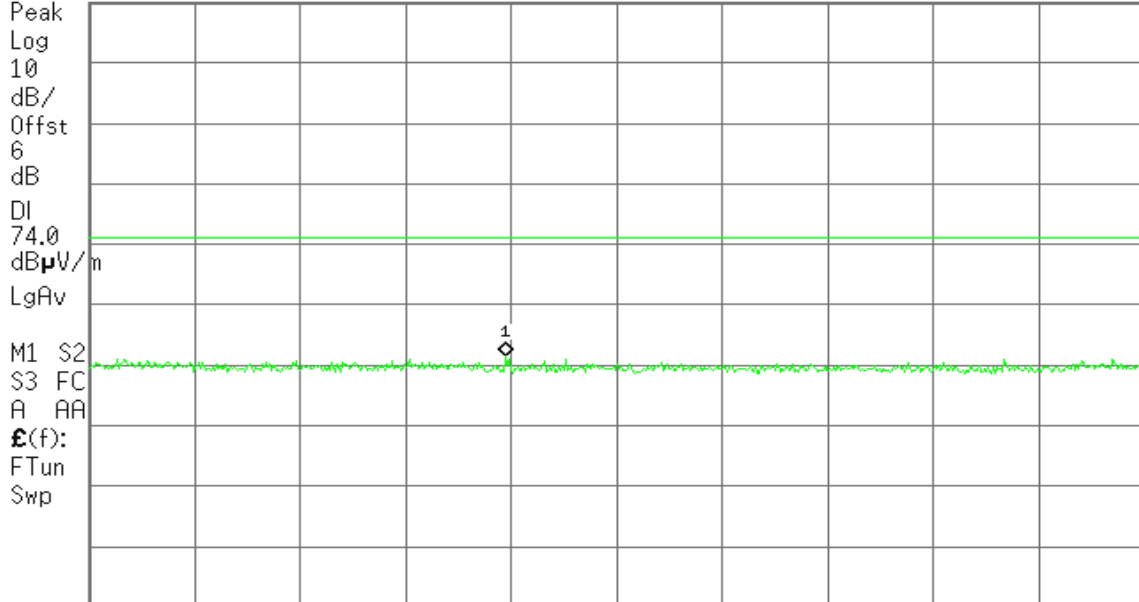
Agilent

T

Mkr1 2.490 02 GHz  
54.55 dB $\mu$ W/m

Ref 113 dB $\mu$ W/m

#Atten 10 dB



Start 2.483 50 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

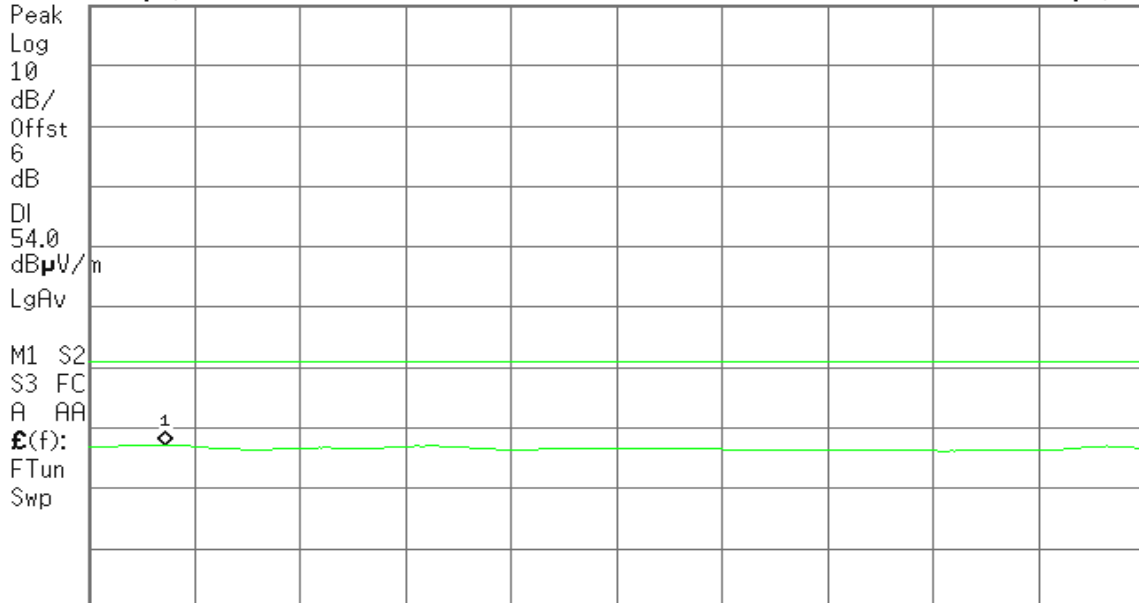
Agilent

T

Mkr1 2.484 68 GHz  
40.20 dB $\mu$ W/m

Ref 113 dB $\mu$ W/m

#Atten 10 dB



Start 2.483 50 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Sweep 1.287 s (601 pts)



### Band Edges (IEEE 802.11g mode / CH Low)

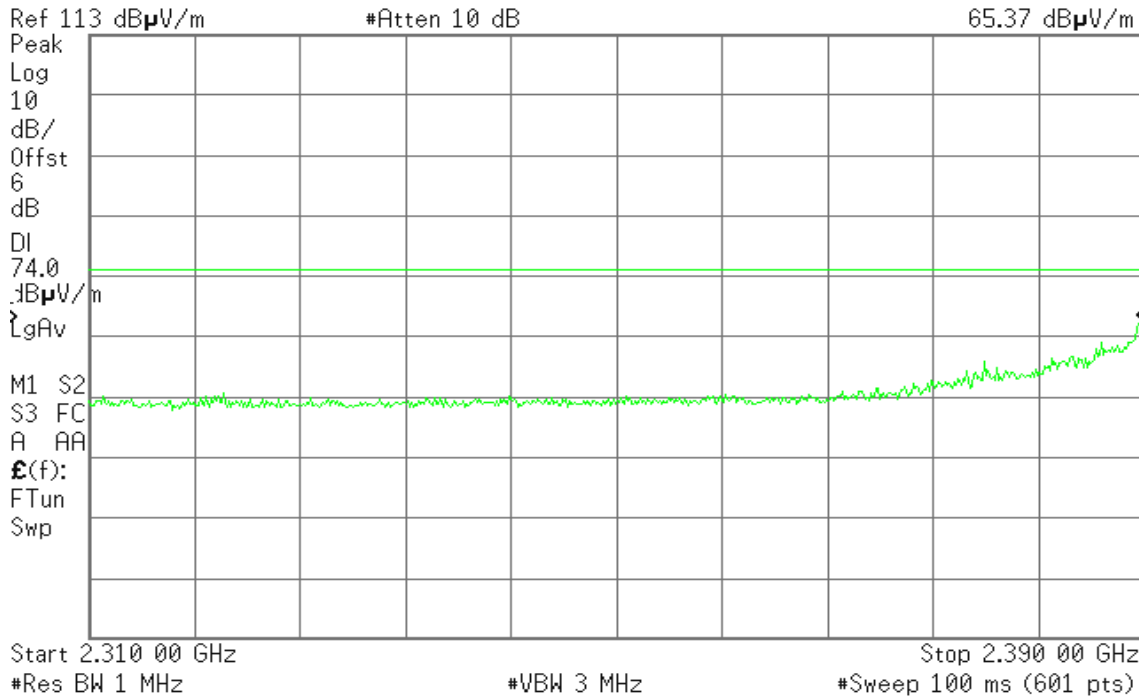
Detector mode: Peak

Polarity: Vertical

Agilent

T

Mkr1 2.390 00 GHz  
65.37 dB $\mu$ V/m



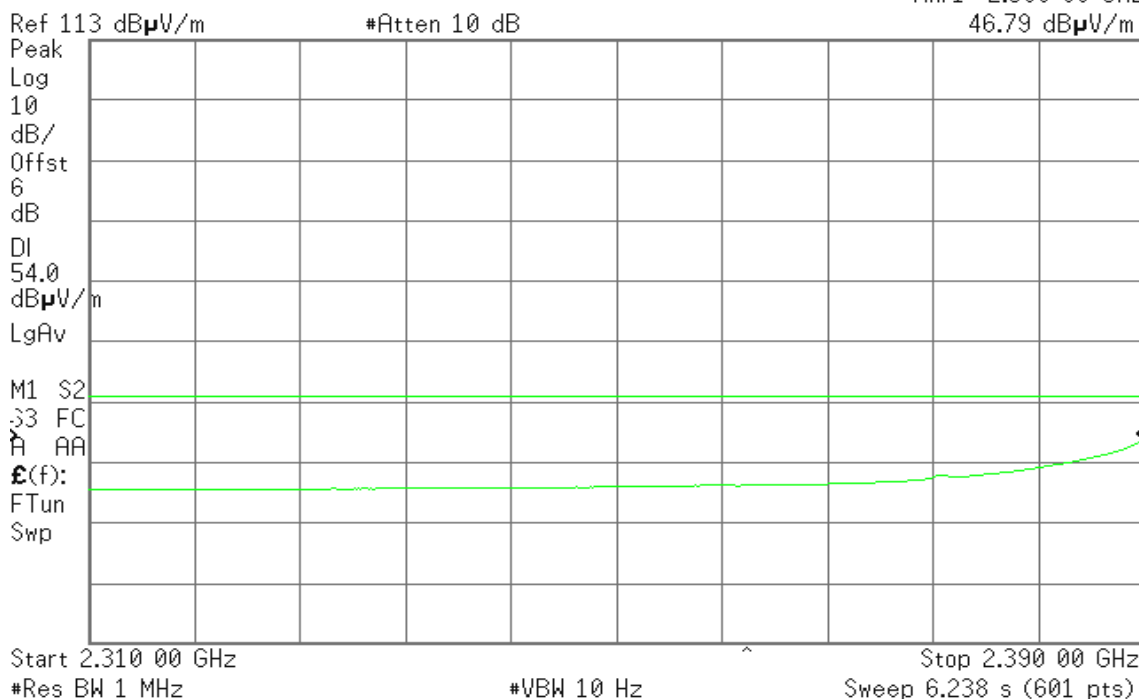
Detector mode: Average

Polarity: Vertical

Agilent

T

Mkr1 2.390 00 GHz  
46.79 dB $\mu$ V/m







Detector mode: Peak

Polarity: Horizontal

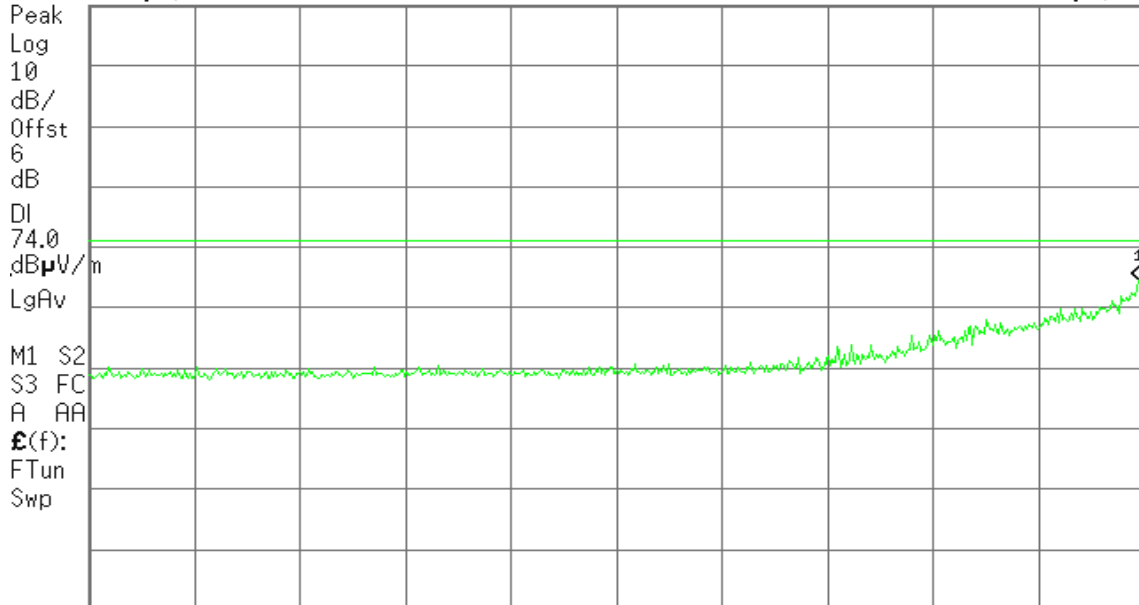
Agilent

T

Mkr1 2.389 60 GHz  
67.60 dBμV/m

Ref 113 dBμV/m

#Atten 10 dB



Start 2.310 00 GHz

Stop 2.390 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

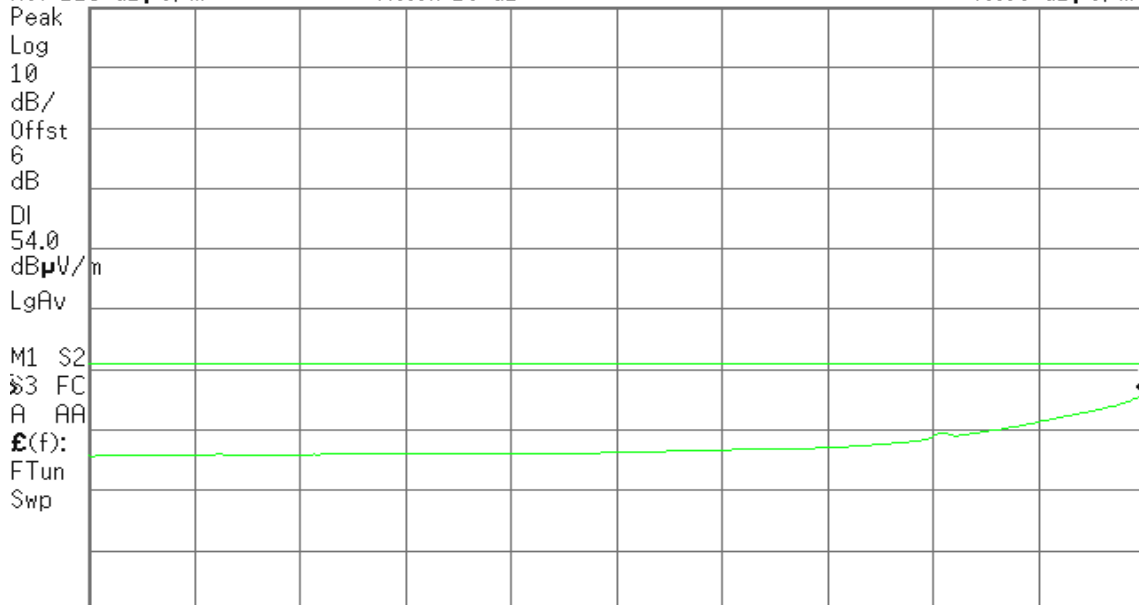
Agilent

T

Mkr1 2.390 00 GHz  
48.90 dBμV/m

Ref 113 dBμV/m

#Atten 10 dB



Start 2.310 00 GHz

Stop 2.390 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Sweep 6.238 s (601 pts)



### Band Edges (IEEE 802.11g mode / CH High)

Detector mode: Peak

Polarity: Vertical

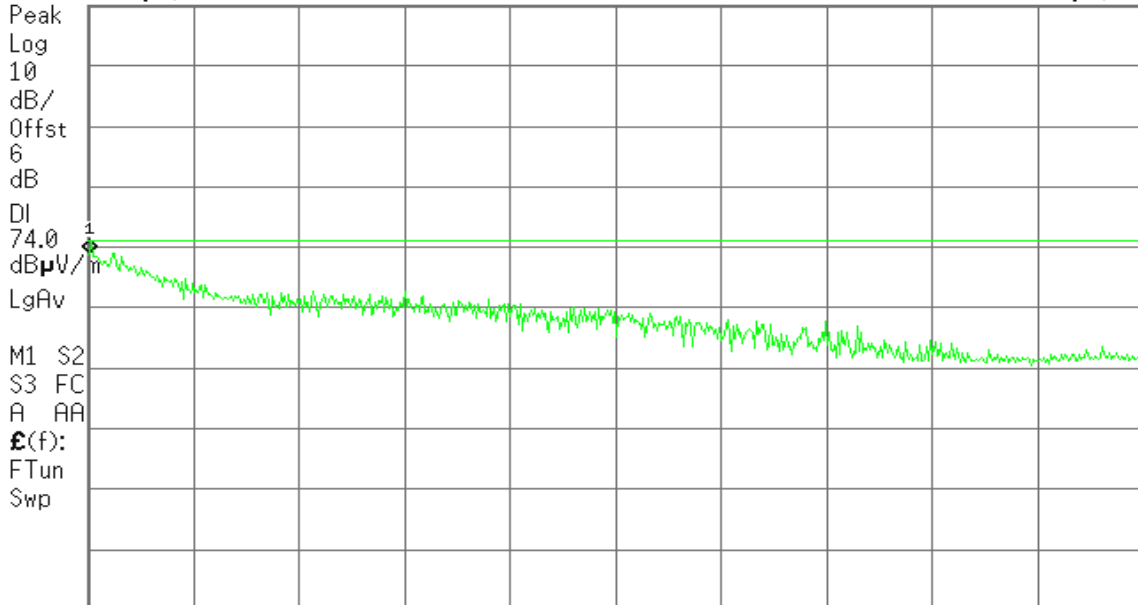
Agilent

T

Mkr1 2.483 53 GHz  
71.91 dB $\mu$ V/m

Ref 113 dB $\mu$ V/m

#Atten 10 dB



Start 2.483 50 GHz

#Res BW 1 MHz

#VBW 3 MHz

Stop 2.500 00 GHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Vertical

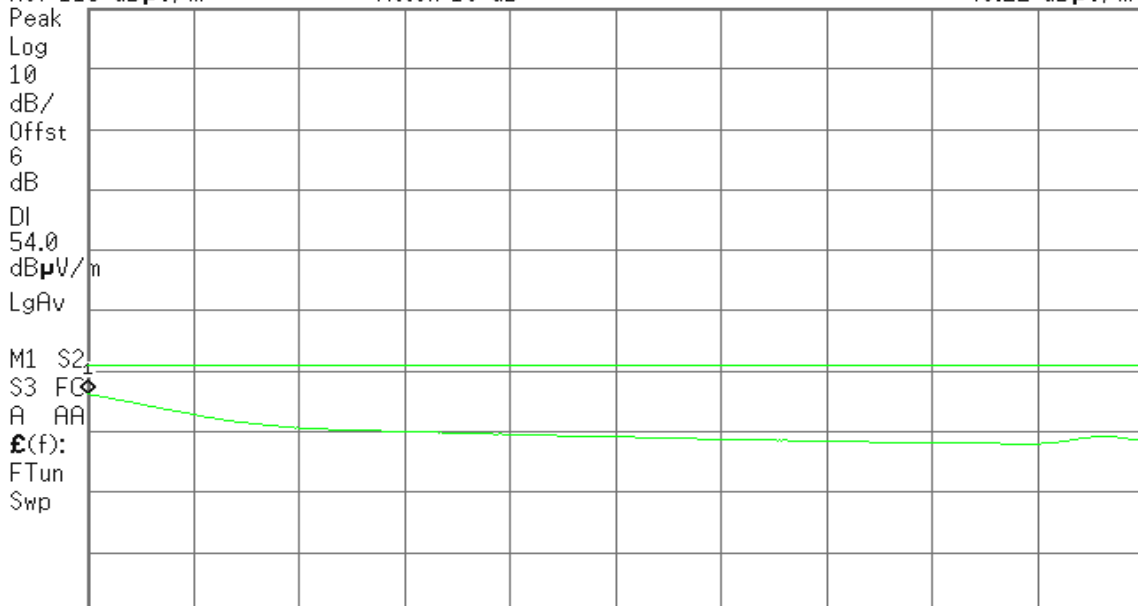
Agilent

T

Mkr1 2.483 50 GHz  
49.22 dB $\mu$ V/m

Ref 113 dB $\mu$ V/m

#Atten 10 dB



Start 2.483 50 GHz

#Res BW 1 MHz

#VBW 10 Hz

Stop 2.500 00 GHz

Sweep 1.287 s (601 pts)

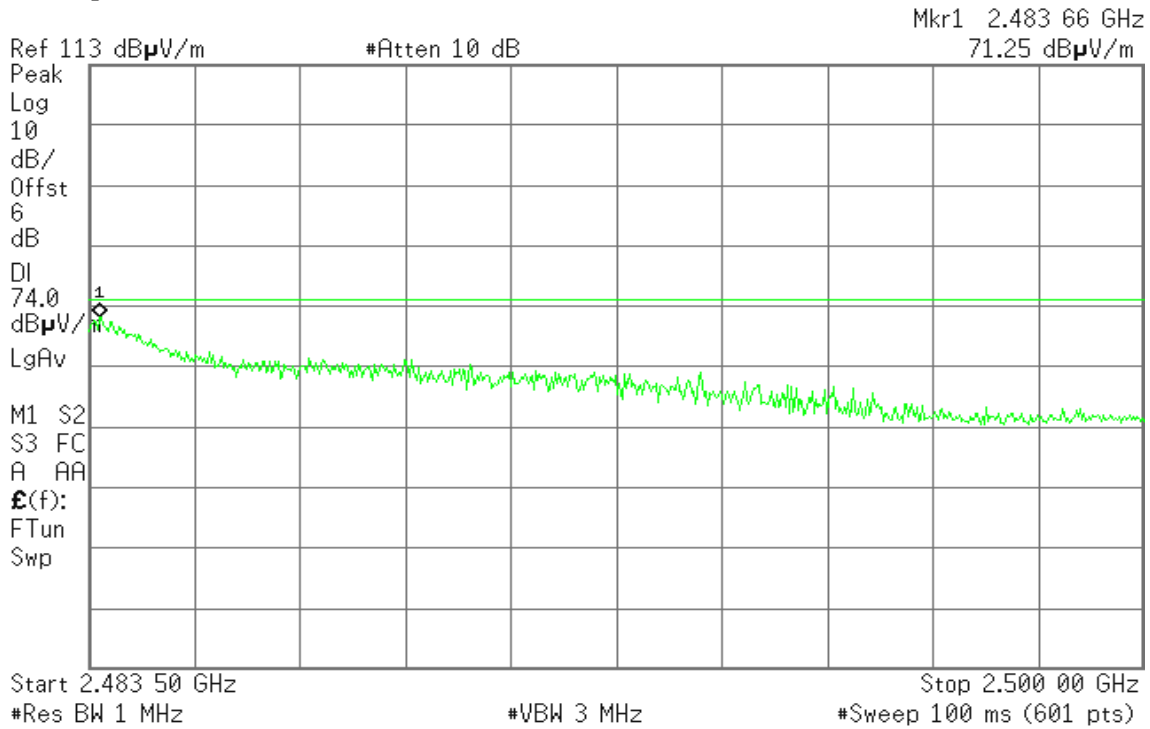


**Detector mode: Peak**

**Polarity: Horizontal**

Agilent

R T

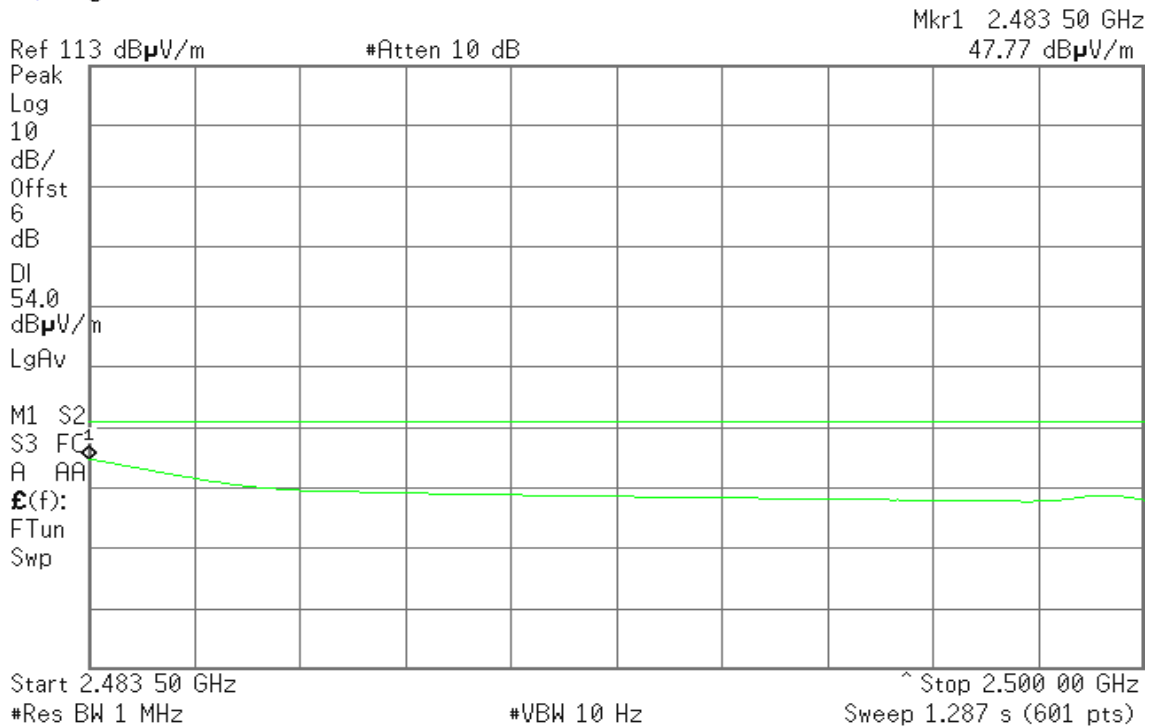


**Detector mode: Average**

**Polarity: Horizontal**

Agilent

R T





Band Edges (IEEE 802.11n HT 20 MHz mode / CH Low)

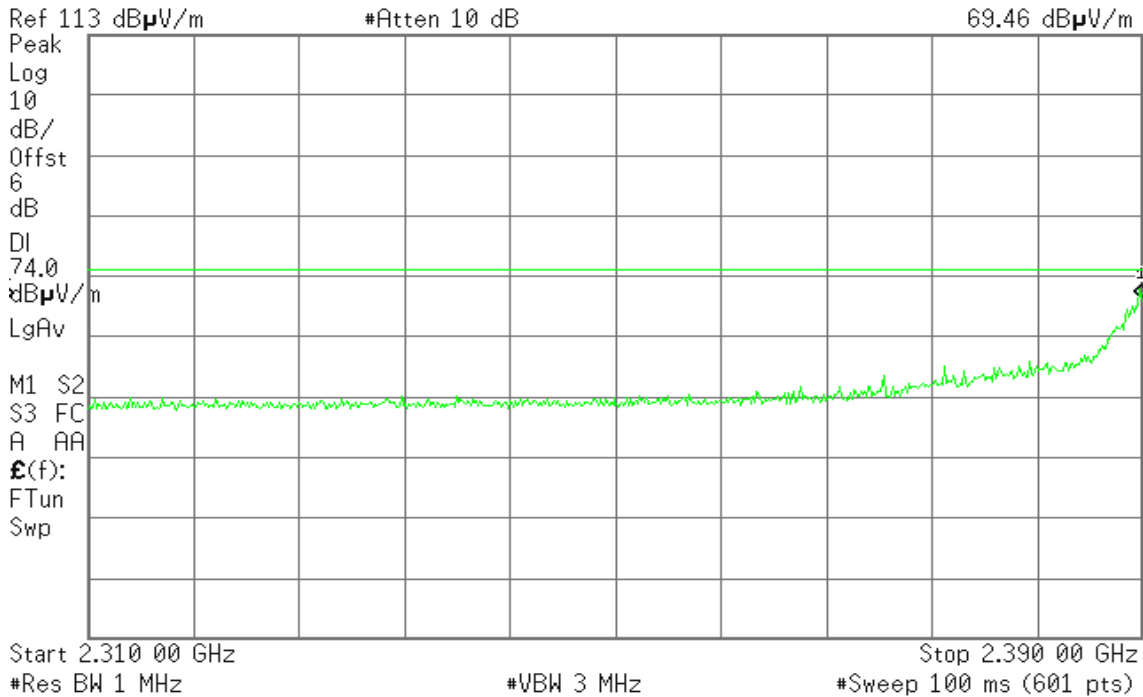
Detector mode: Peak

Polarity: Vertical

Agilent

T

Mkr1 2.389 87 GHz  
69.46 dBμV/m



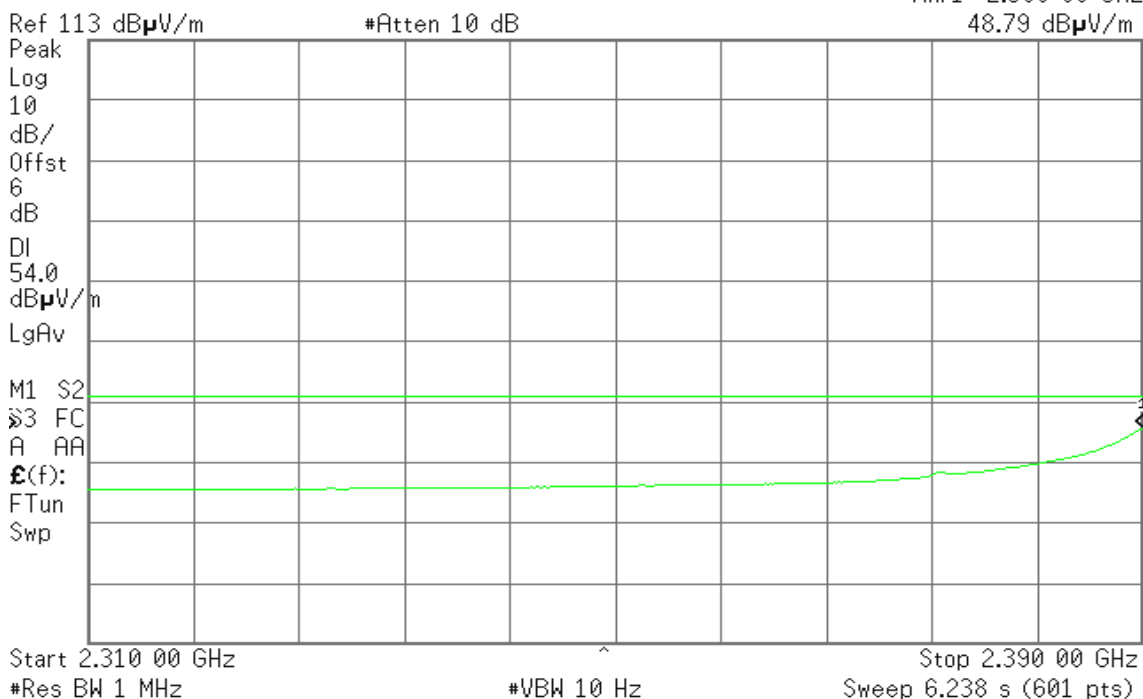
Detector mode: Average

Polarity: Vertical

Agilent

T

Mkr1 2.390 00 GHz  
48.79 dBμV/m





Detector mode: Peak

Polarity: Horizontal

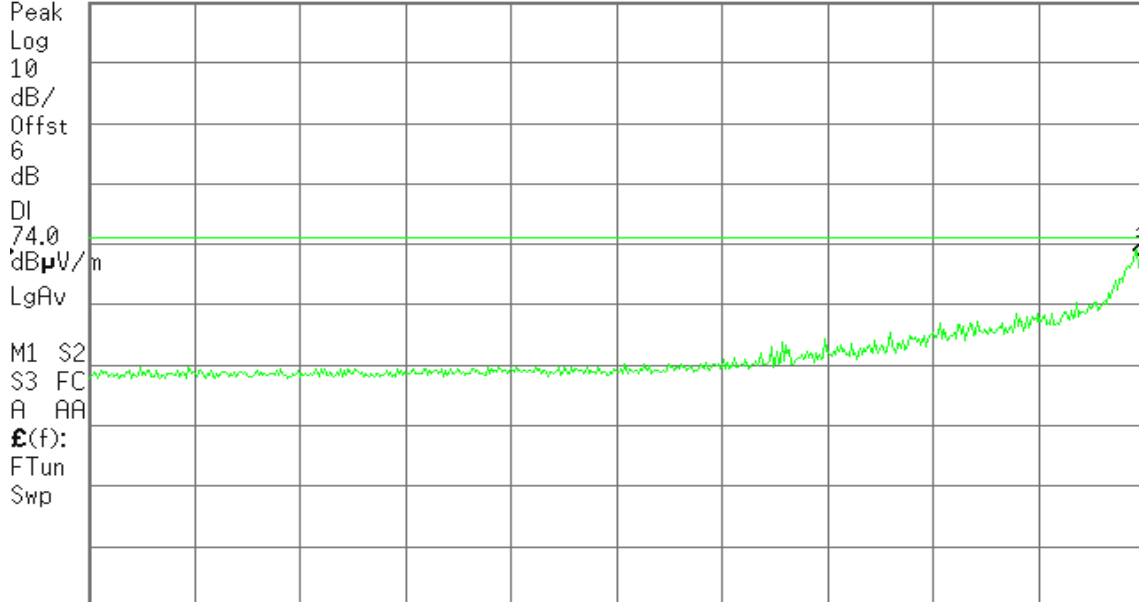
Agilent

T

Mkr1 2.389 73 GHz  
71.08 dB $\mu$ W/m

Ref 113 dB $\mu$ W/m

#Atten 10 dB



Start 2.310 00 GHz

Stop 2.390 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

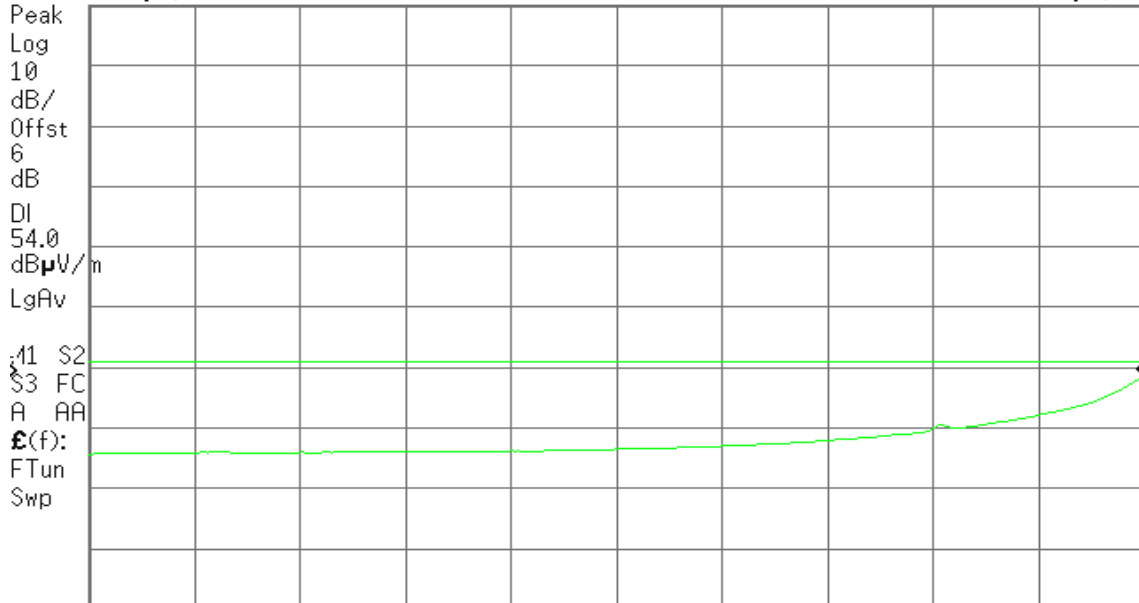
Agilent

T

Mkr1 2.390 00 GHz  
51.64 dB $\mu$ W/m

Ref 113 dB $\mu$ W/m

#Atten 10 dB



Start 2.310 00 GHz

Stop 2.390 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Sweep 6.238 s (601 pts)



### Band Edges (IEEE 802.11n HT 20 MHz mode / CH High)

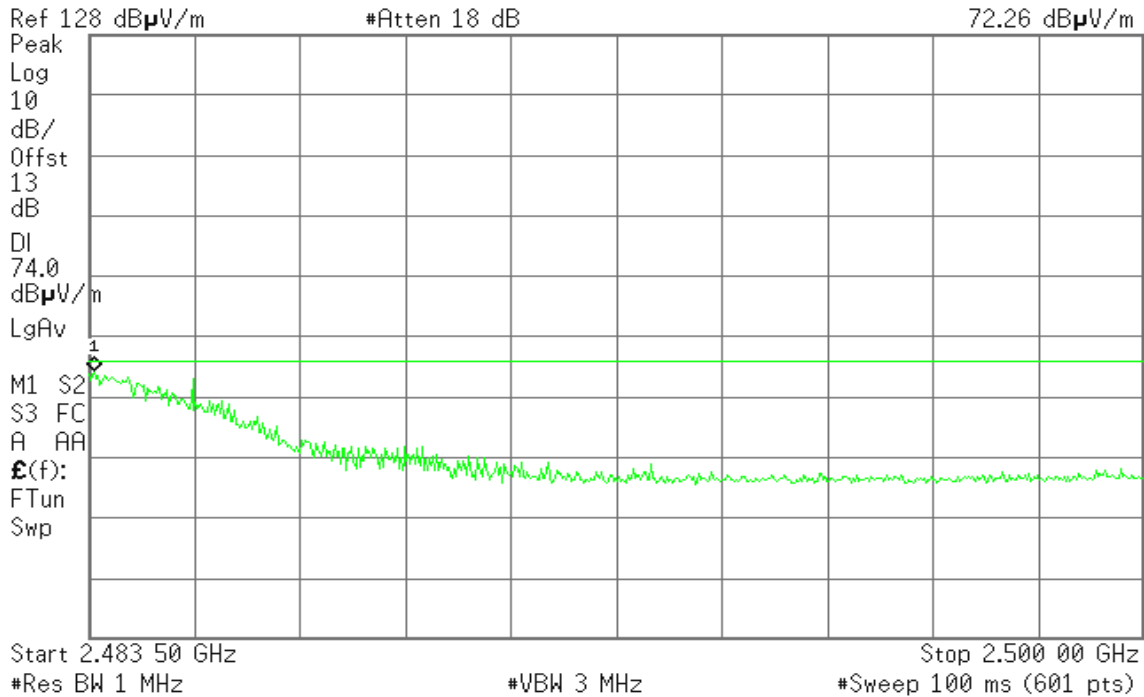
Detector mode: Peak

Polarity: Vertical

Agilent

R T

Mkr1 2.483 58 GHz  
72.26 dB $\mu$ V/m



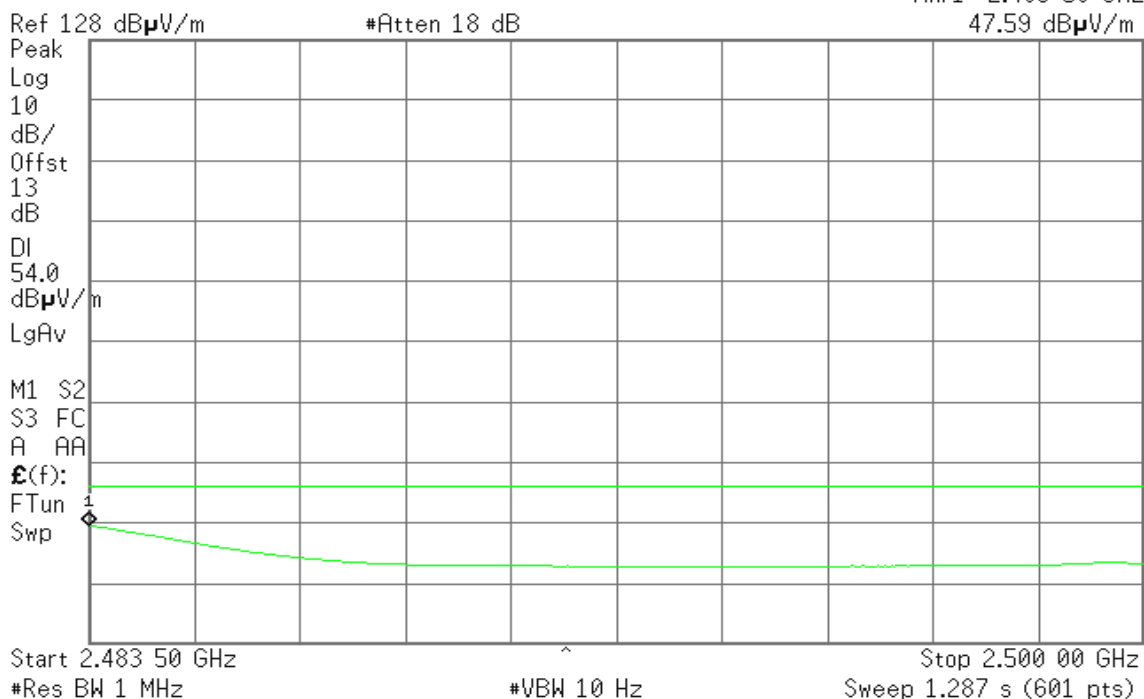
Detector mode: Average

Polarity: Vertical

Agilent

R T

Mkr1 2.483 50 GHz  
47.59 dB $\mu$ V/m





Detector mode: Peak

Polarity: Horizontal

Agilent

R T

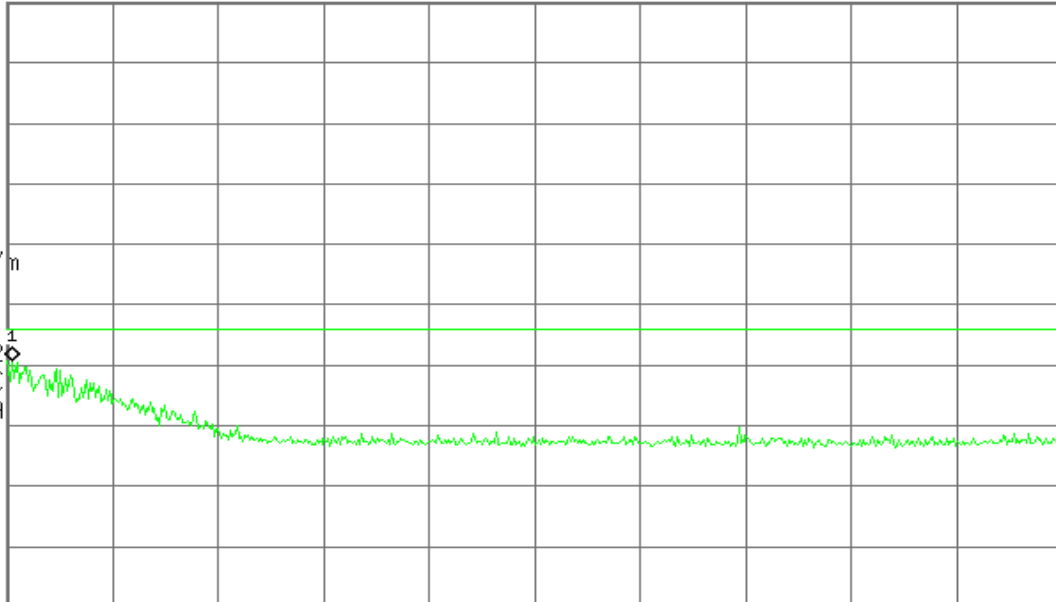
Mkr1 2.483 58 GHz  
68.71 dBµV/m

Ref 128 dBµV/m

#Atten 18 dB

Peak  
Log  
10  
dB/  
Offst  
13  
dB  
DI  
74.0  
dBµV/m  
LgAv

M1 S2  
S3 FC  
A AA  
£(f):  
FTun  
Swp



Start 2.483 50 GHz

#Res BW 1 MHz

#VBW 3 MHz

Stop 2.500 00 GHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

Agilent

R T

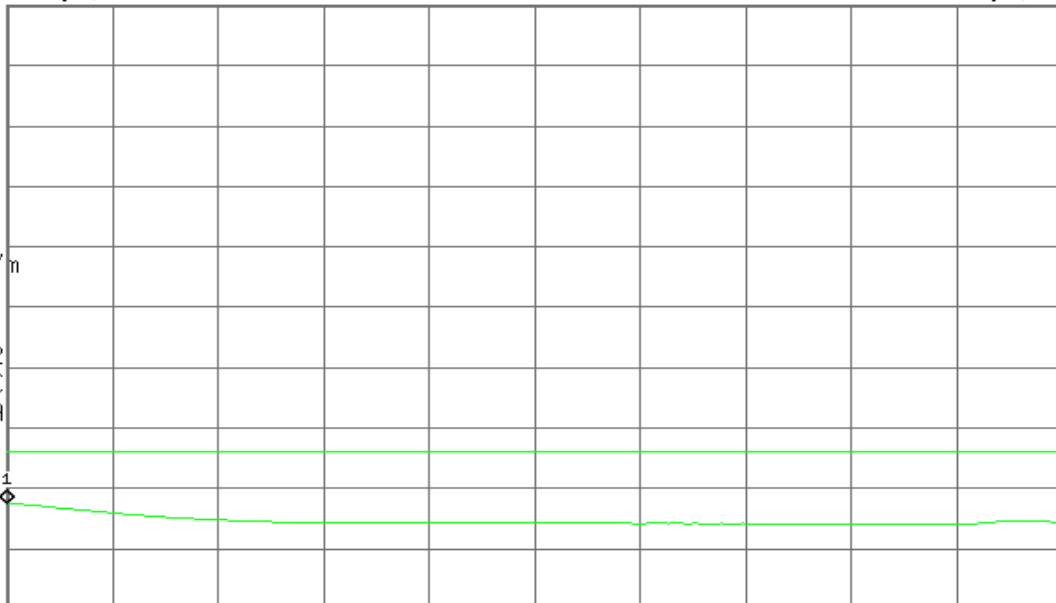
Mkr1 2.483 50 GHz  
45.57 dBµV/m

Ref 128 dBµV/m

#Atten 18 dB

Peak  
Log  
10  
dB/  
Offst  
13  
dB  
DI  
54.0  
dBµV/m  
LgAv

M1 S2  
S3 FC  
A AA  
£(f):  
FTun  
Swp



Start 2.483 50 GHz

#Res BW 1 MHz

#VBW 10 Hz

Stop 2.500 00 GHz

Sweep 1.287 s (601 pts)

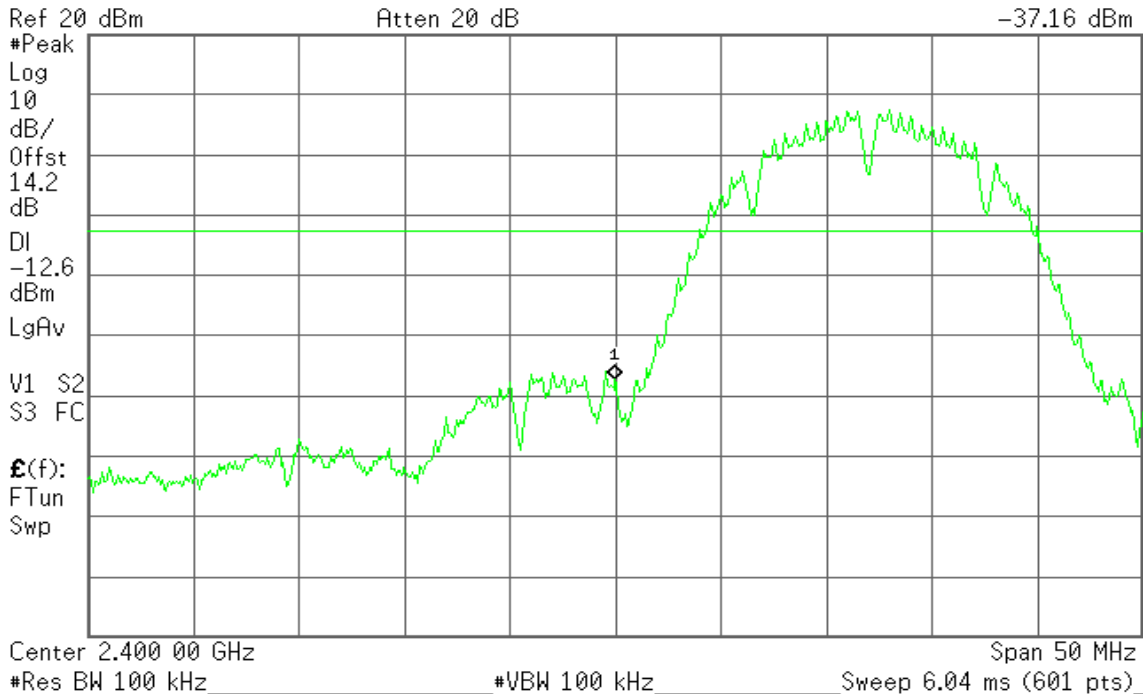


### Conducted Band Edges (IEEE 802.11b mode / CH Low)

Agilent 20:25:11 Jul 24, 2012

R T

Mkr1 2.400 00 GHz  
-37.16 dBm

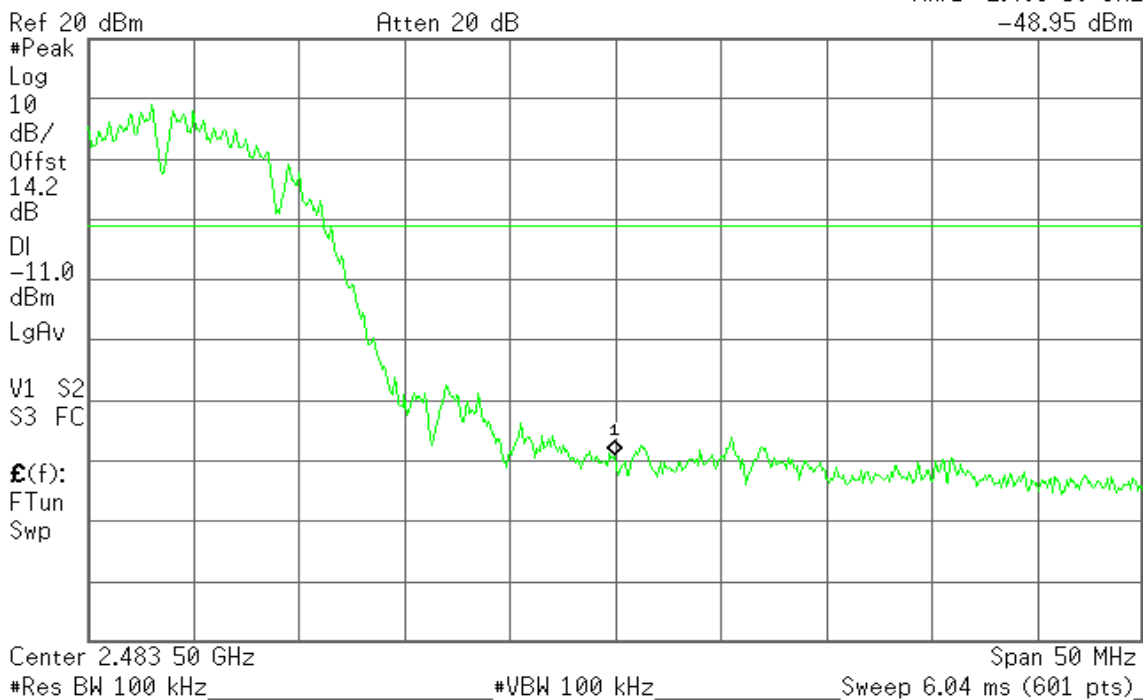


### Conducted Band Edges (IEEE 802.11b mode / CH High)

Agilent 20:00:29 Jul 24, 2012

R T

Mkr1 2.483 50 GHz  
-48.95 dBm





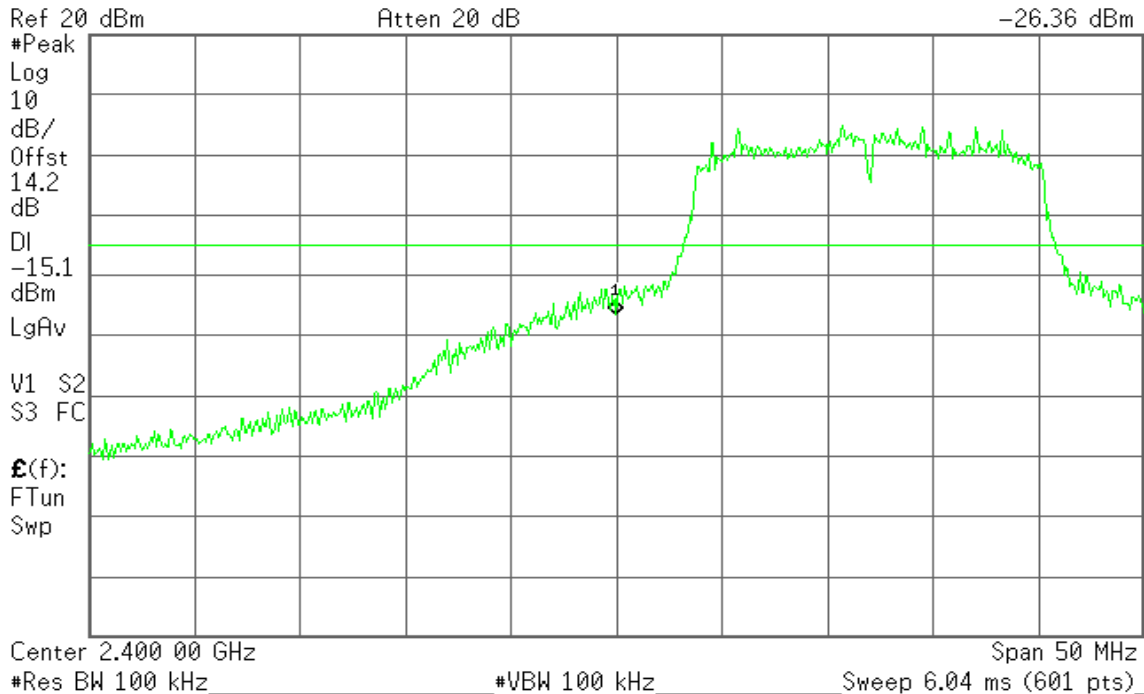


### Conducted Band Edges (IEEE 802.11g mode / CH Low)

Agilent 20:52:02 Jul 24, 2012

R T

Mkr1 2.400 00 GHz  
-26.36 dBm

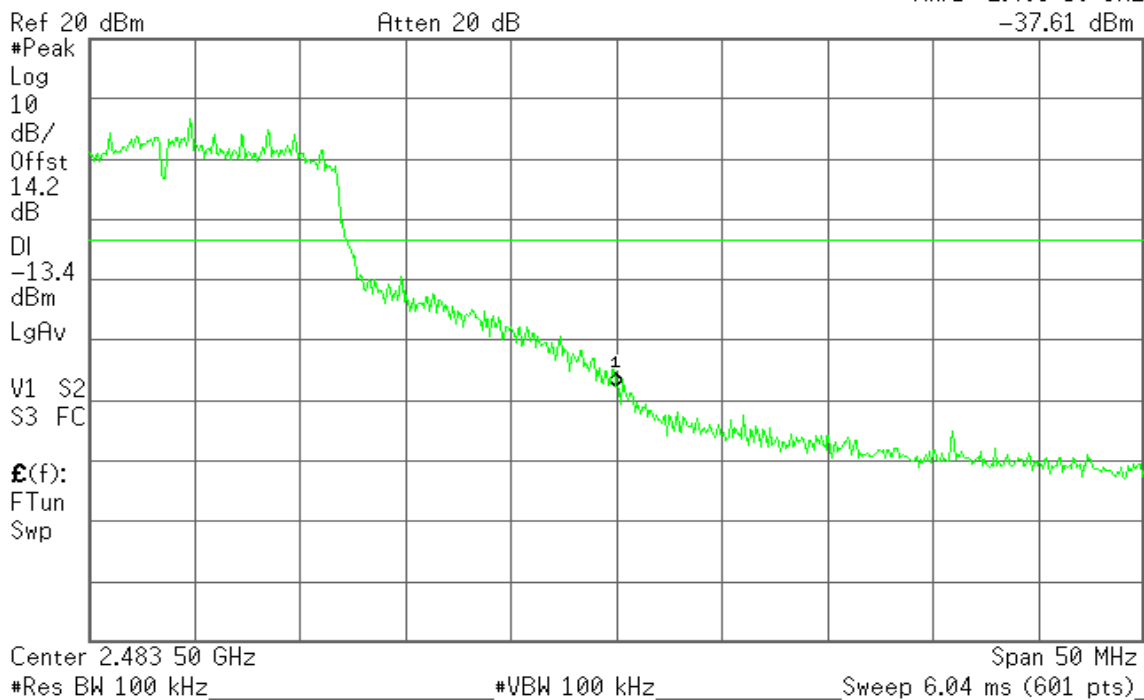


### Conducted Band Edges (IEEE 802.11g mode / CH High)

Agilent 20:41:38 Jul 24, 2012

R T

Mkr1 2.483 50 GHz  
-37.61 dBm



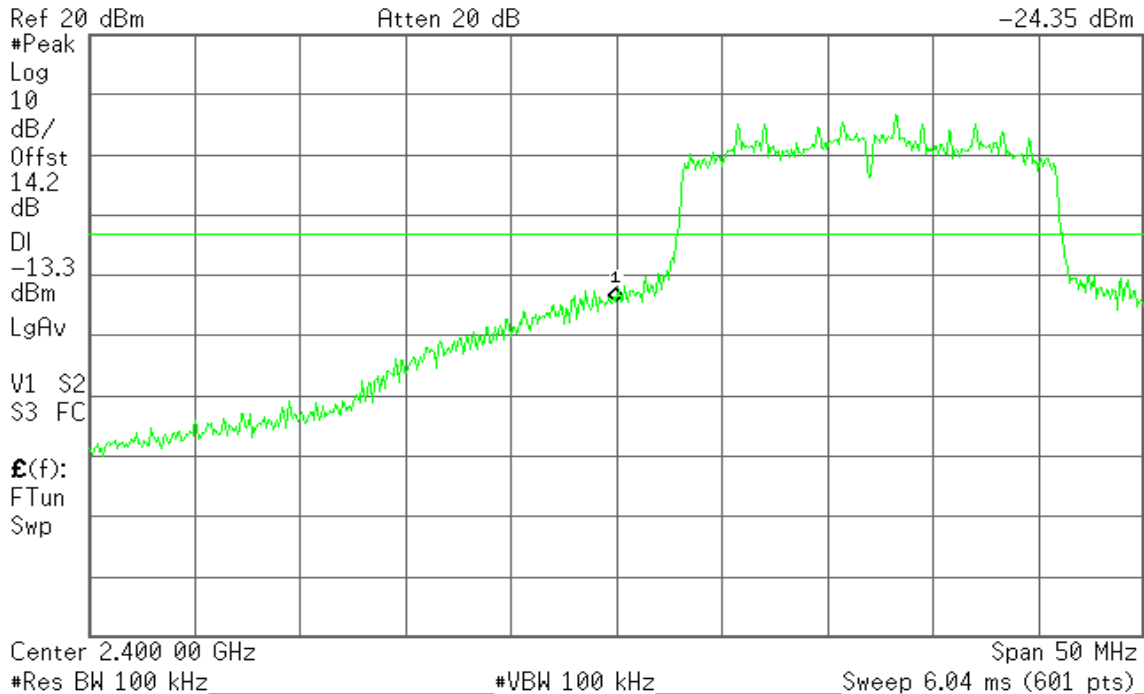


### Conducted Band Edges (IEEE 802.11n HT20 MHz mode / CH Low)

Agilent 21:42:23 Jul 24, 2012

R T

Mkr1 2.400 00 GHz  
-24.35 dBm

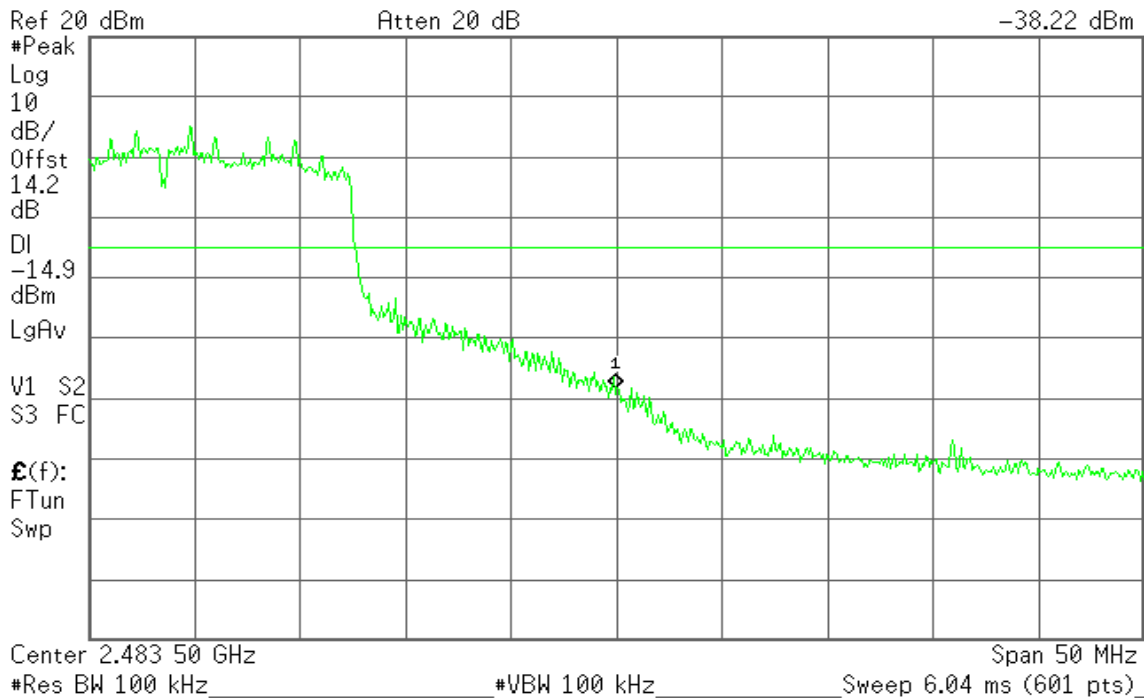


### Conducted Band Edges (IEEE 802.11n HT20 MHz mode / CH High)

Agilent 21:11:03 Jul 24, 2012

R T

Mkr1 2.483 50 GHz  
-38.22 dBm



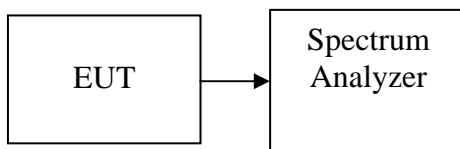


## 7.6 PEAK POWER SPECTRAL DENSITY

### LIMIT

1. According to §15.247(e) & RSS-210 §A8.2, 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.
2. According to §15.247(f) & RSS-210 §A8.3, the digital modulation operation of the hybrid system, with the frequency hopping turned off, shall comply with the power density requirements of paragraph (d) of this section.

### Test Configuration



### TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. Set the RBW = 100 kHz, VBW 300 kHz, span 5-30% greater than EBW, Detector = peak, Trace mode = max hold, Sweep = auto couple. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where  $BWCF = 10\log(3 \text{ kHz}/100 \text{ kHz} = -15.2 \text{ dB})$ . Record the maximum reading. Repeat the above procedure until the measurements for all frequencies are completed.

### TEST RESULTS

*No non-compliance noted*



**Test Data**

**Test mode: IEEE 802.11b mode**

Channel	Frequency (MHz)	100kHz PPSD (dBm)	3kHz PPSD (dBm)	Limit (dBm)	Result
Low	2412	8.57	-6.63	8	PASS
Mid	2442	8.68	-6.52		PASS
High	2462	8.79	-6.41		PASS

**Test mode: IEEE 802.11g mode**

Channel	Frequency (MHz)	100kHz PPSD (dBm)	3kHz PPSD (dBm)	Limit (dBm)	Result
Low	2412	6.23	-8.97	8	PASS
Mid	2442	7.2	-8.00		PASS
High	2462	7.13	-8.07		PASS

**Test mode: IEEE 802.11n HT 20 MHz mode**

Channel	Frequency (MHz)	100kHz PPSD (dBm)	3kHz PPSD (dBm)	Limit (dBm)	Result
Low	2412	6.94	-8.26	8	PASS
Mid	2442	6.99	-8.21		PASS
High	2462	6	-9.20		PASS

**Test mode: IEEE 802.11a mode**

Channel	Frequency (MHz)	100kHz PPSD (dBm)	3kHz PPSD (dBm)	Limit (dBm)	Result
Low	5745	1.08	-14.12	8	PASS
Mid	5785	1.48	-13.72		PASS
High	5825	2.87	-12.33		PASS

**Test mode: IEEE 802.11n HT 20 MHz mode**

Channel	Frequency (MHz)	100kHz PPSD (dBm)	3kHz PPSD (dBm)	Limit (dBm)	Result
Low	5745	1.39	-13.81	8	PASS
Mid	5785	0.47	-14.73		PASS
High	5825	2.47	-12.73		PASS



### Test Plot

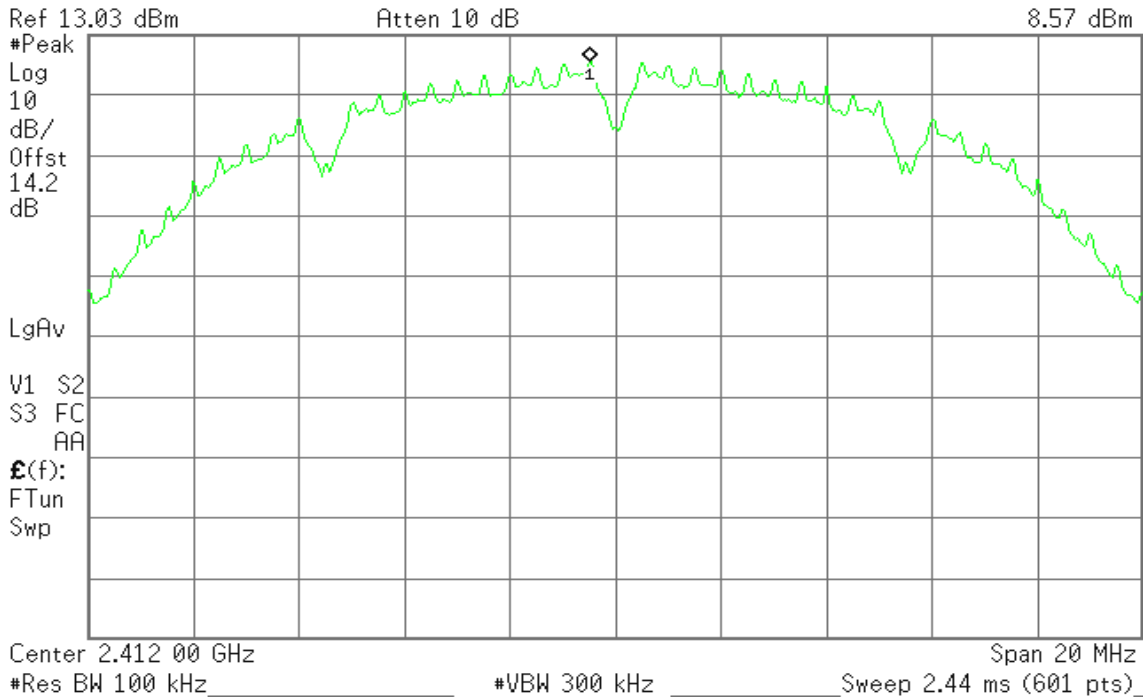
#### IEEE 802.11b mode

#### PPSD (CH Low)

Agilent 19:48:45 Jul 24, 2012

R T

Mkr1 2.411 50 GHz  
8.57 dBm

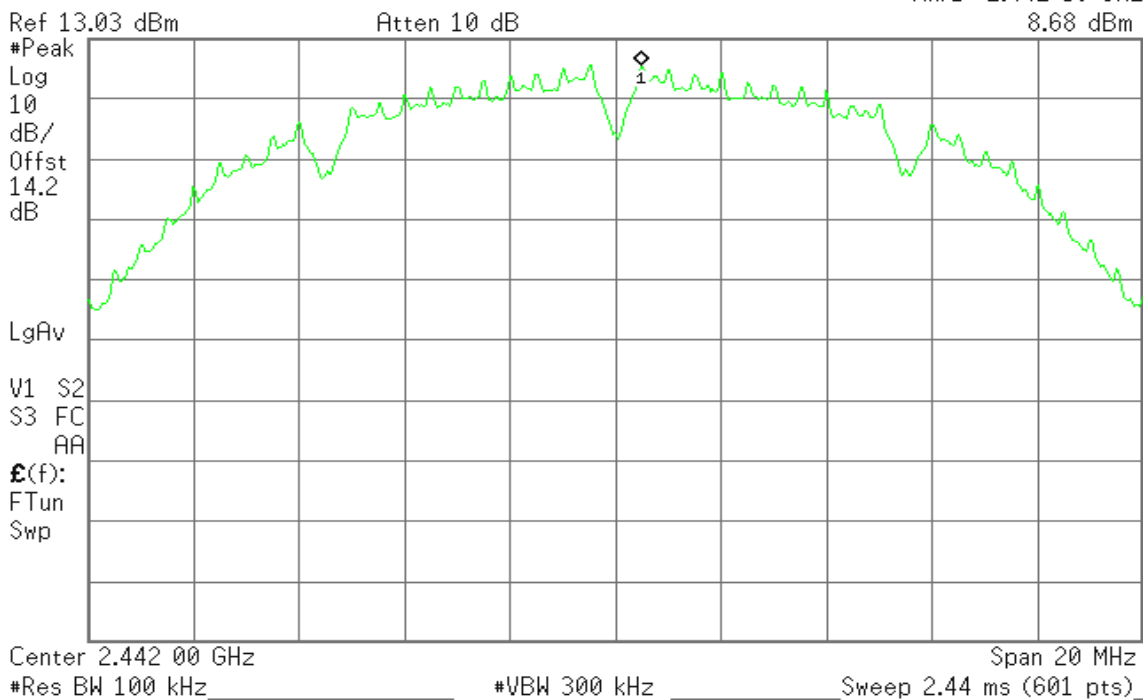


#### PPSD (CH Mid)

Agilent 19:49:43 Jul 24, 2012

R T

Mkr1 2.442 50 GHz  
8.68 dBm



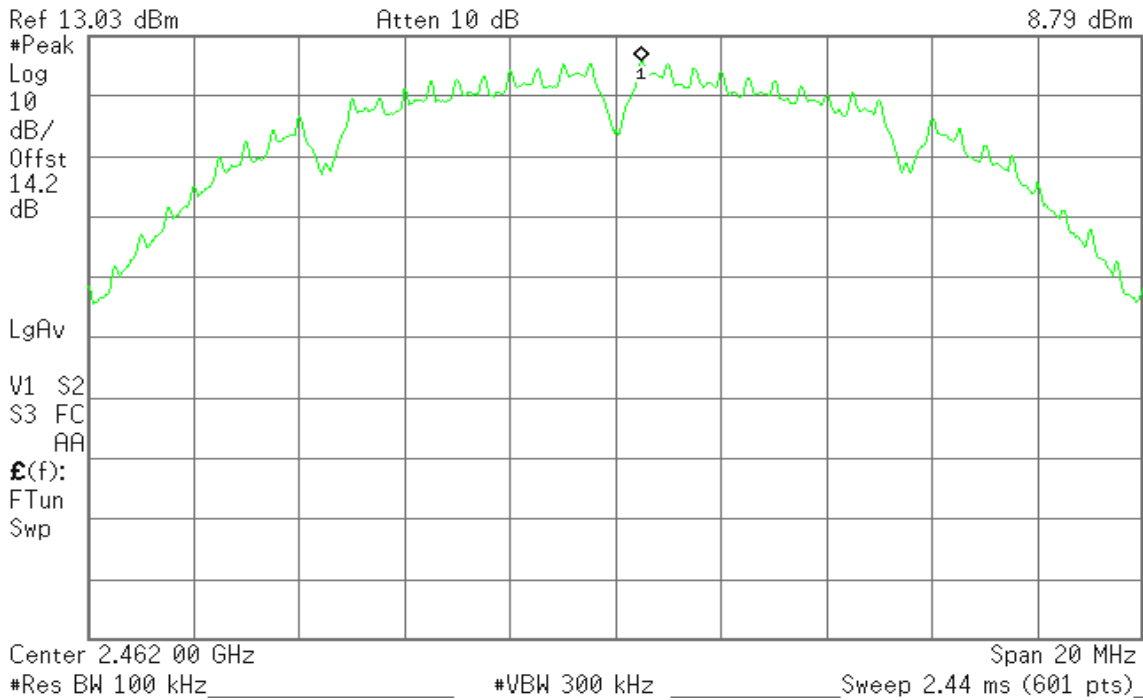


### PPSD (CH High)

Agilent 19:50:28 Jul 24, 2012

R T

Mkr1 2.462 50 GHz  
8.79 dBm



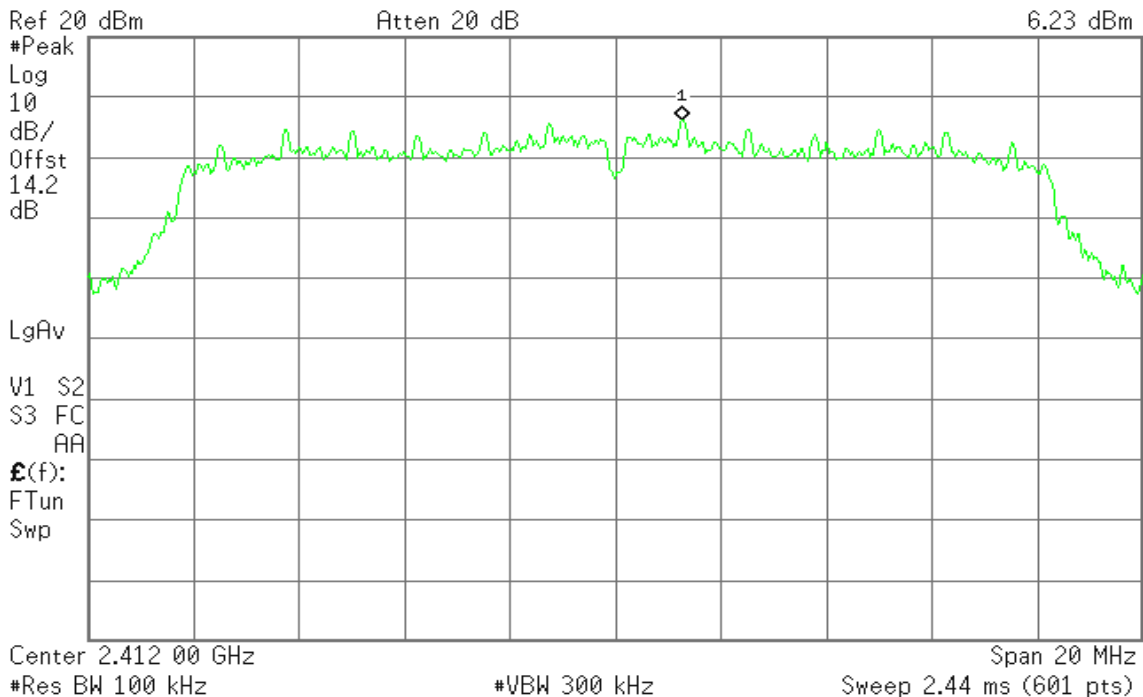
### IEEE 802.11g mode

### PPSD (CH Low)

Agilent 20:29:18 Jul 24, 2012

R T

Mkr1 2.413 27 GHz  
6.23 dBm



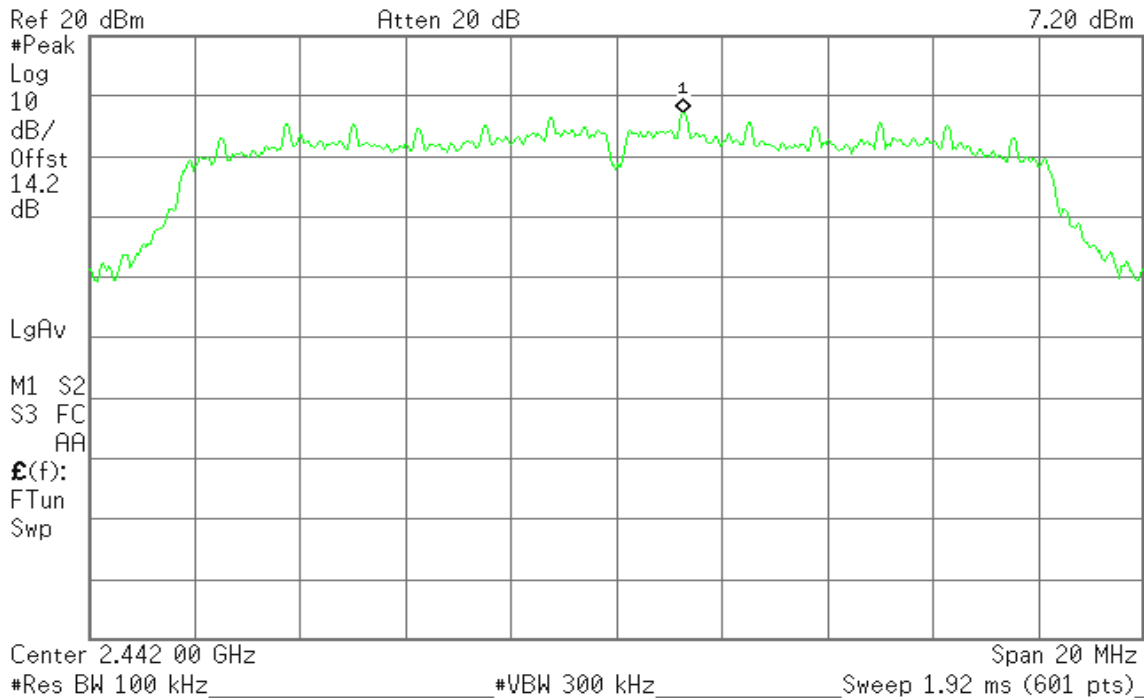


### PPSD (CH Mid)

Agilent 20:35:57 Jul 24, 2012

R T

Mkr1 2.443 27 GHz  
7.20 dBm

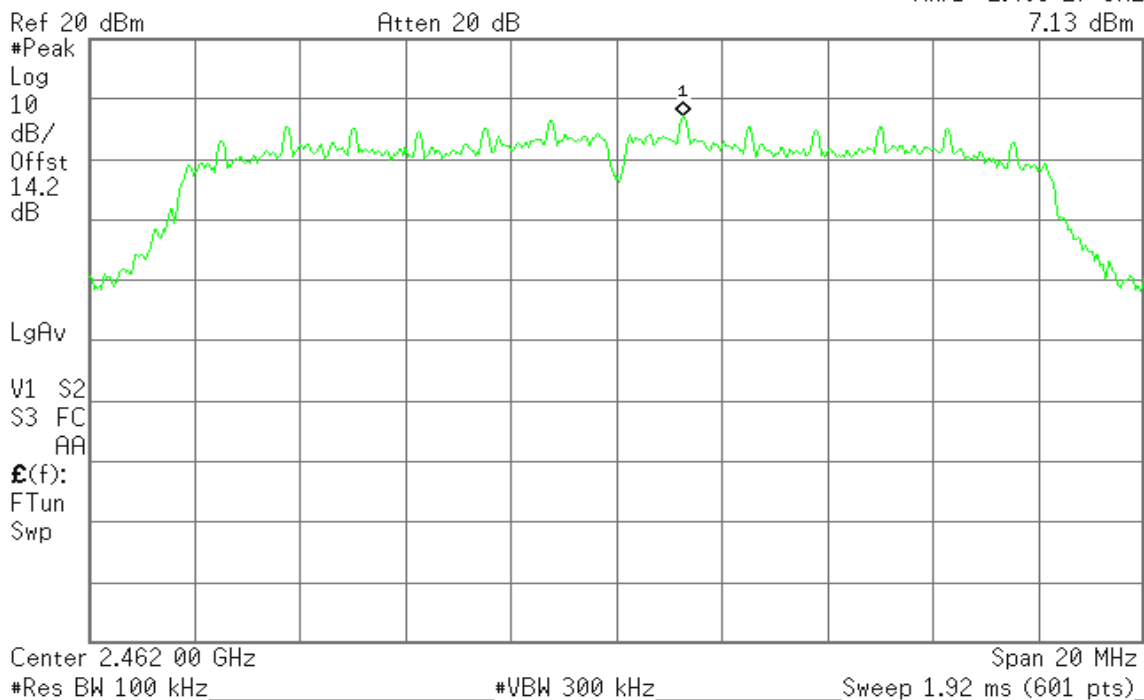


### PPSD (CH High)

Agilent 20:37:59 Jul 24, 2012

R T

Mkr1 2.463 27 GHz  
7.13 dBm





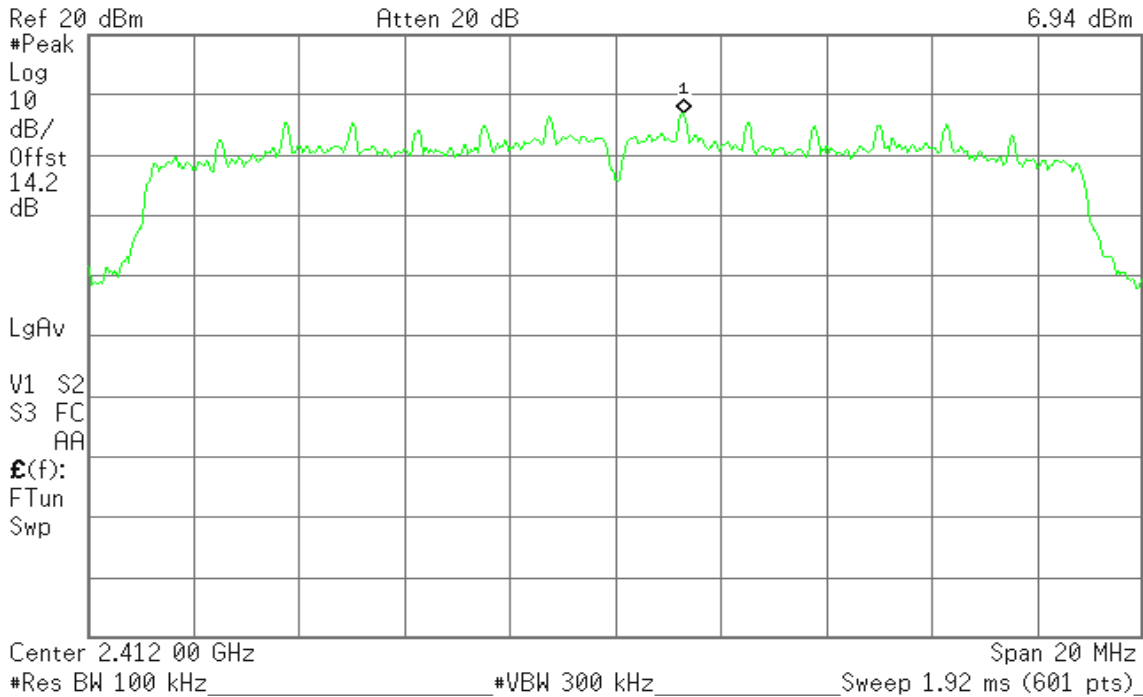
### IEEE 802.11n HT 20 MHz mode

#### PPSD (CH Low)

Agilent 20:58:26 Jul 24, 2012

R T

Mkr1 2.413 30 GHz  
6.94 dBm

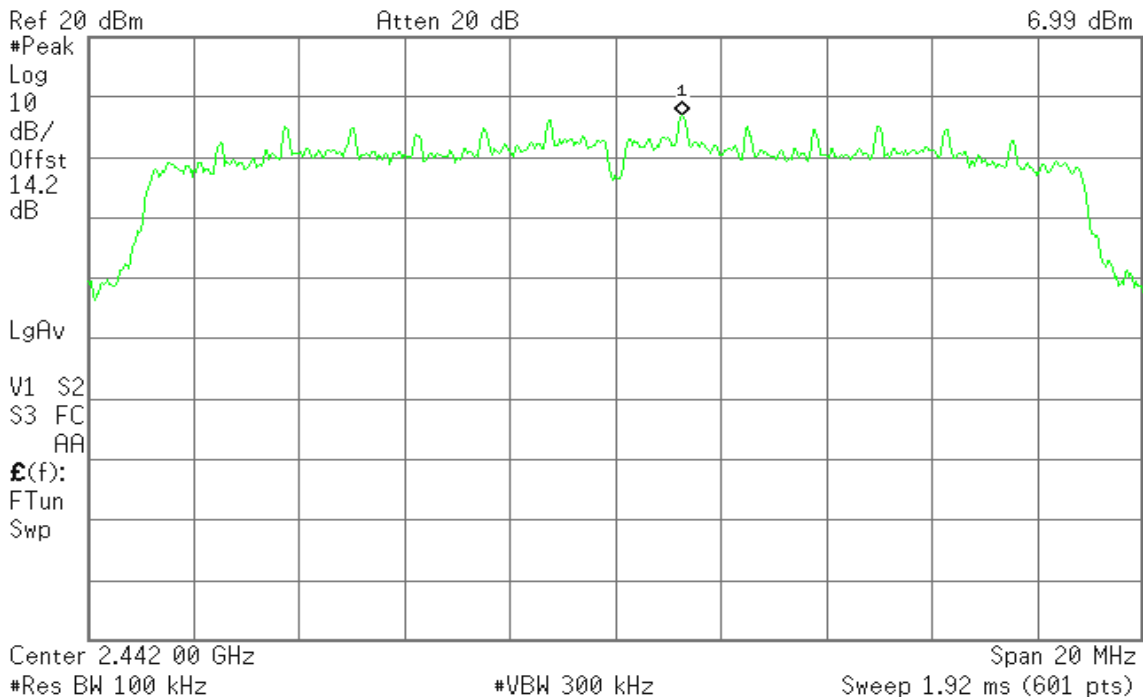


#### PPSD (CH Mid)

Agilent 21:00:19 Jul 24, 2012

R T

Mkr1 2.443 27 GHz  
6.99 dBm





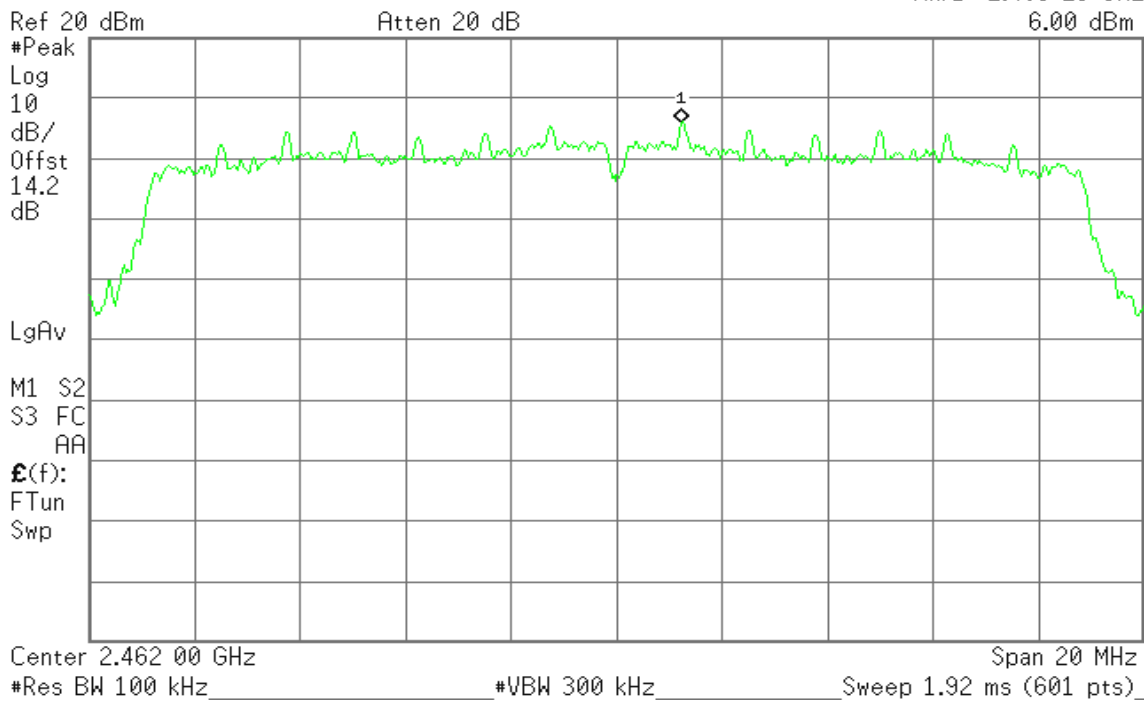


### PPSD (CH High)

Agilent 21:05:47 Jul 24, 2012

R T

Mkr1 2.463 23 GHz  
6.00 dBm



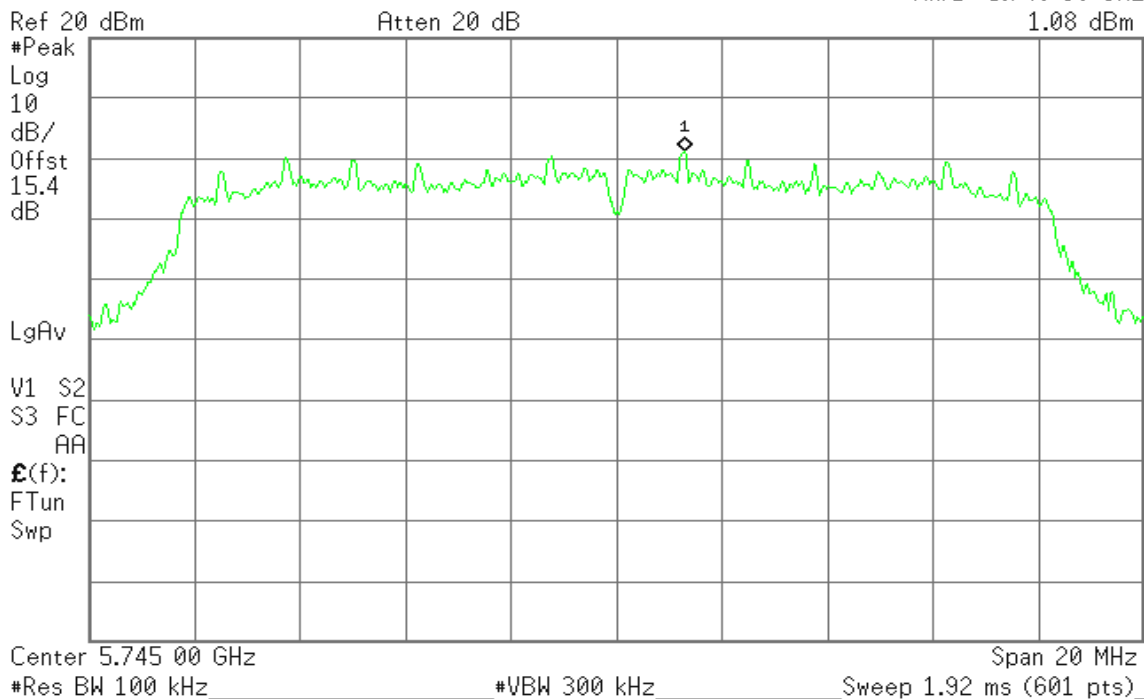
### IEEE 802.11a mode

### PPSD (CH Low)

Agilent 19:36:42 Jul 25, 2012

R T

Mkr1 5.746 30 GHz  
1.08 dBm



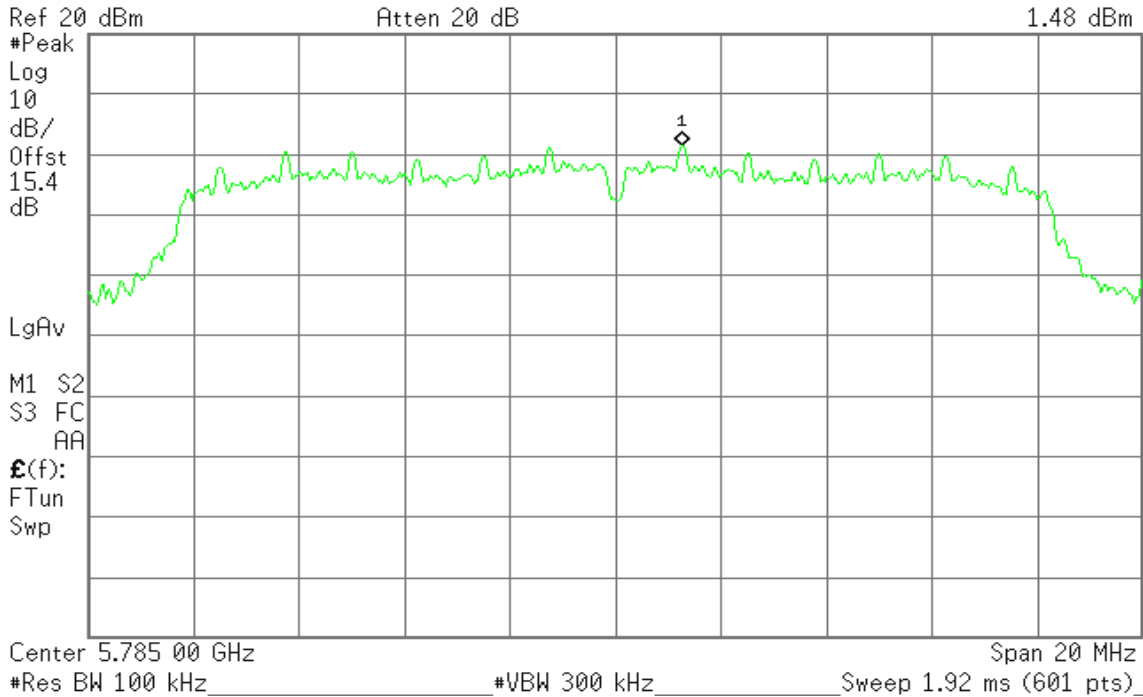


### PPSD (CH Mid)

Agilent 19:41:58 Jul 25, 2012

R T

Mkr1 5.786 27 GHz  
1.48 dBm

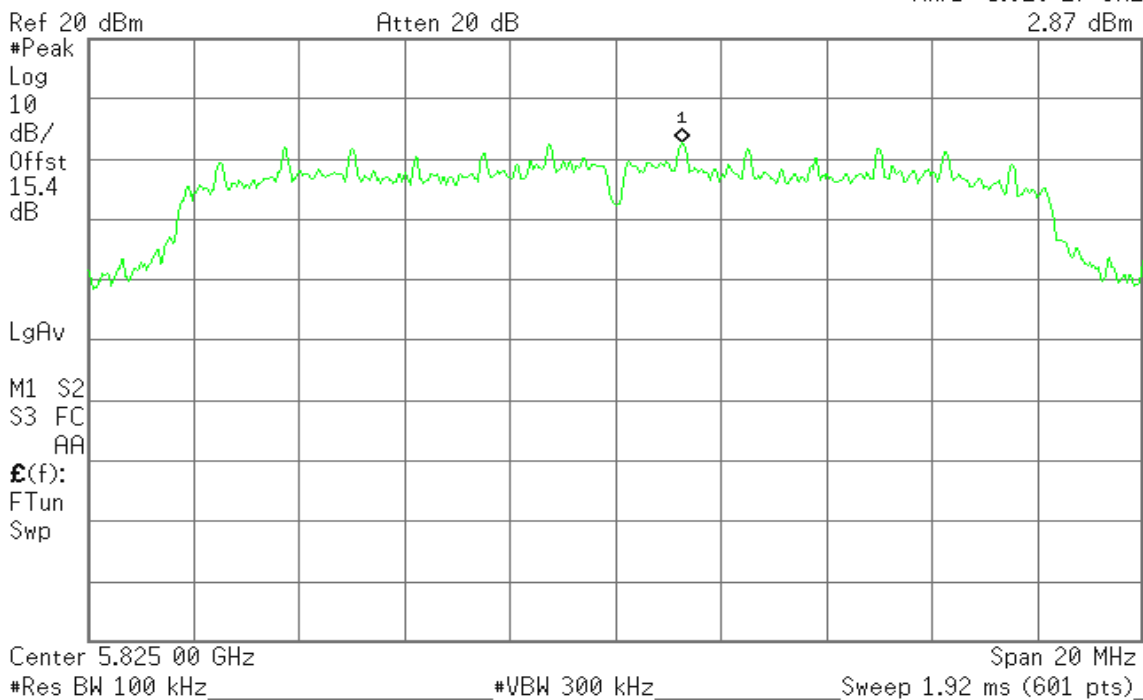


### PPSD (CH High)

Agilent 19:44:08 Jul 25, 2012

R T

Mkr1 5.826 27 GHz  
2.87 dBm





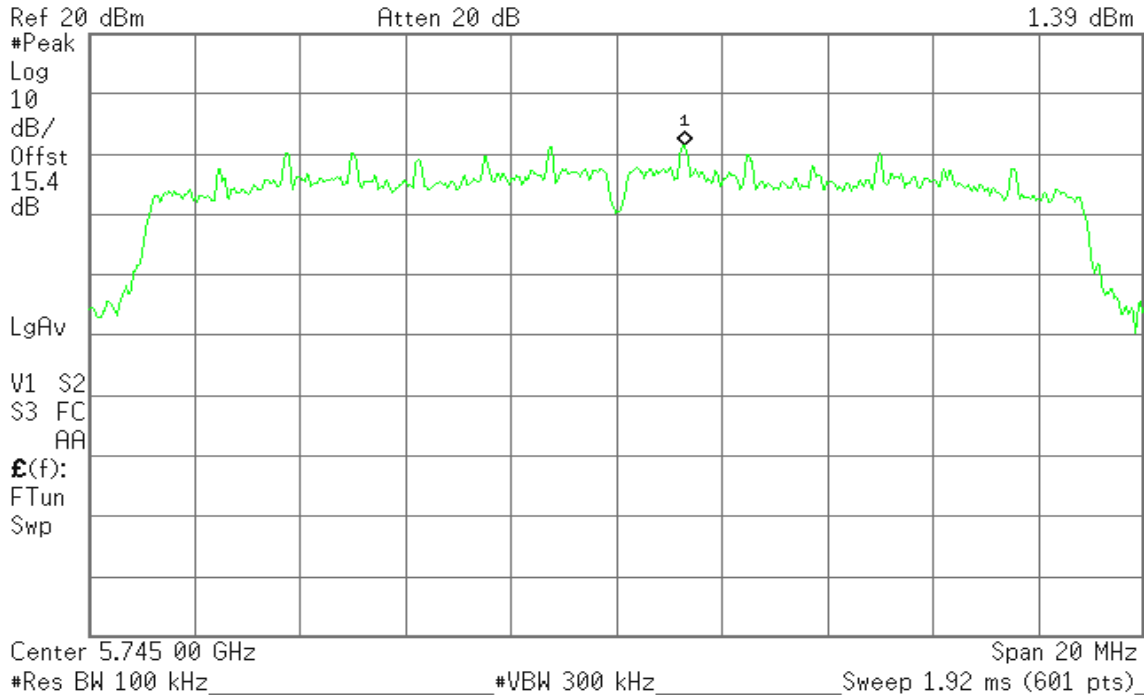
### IEEE 802.11n HT 20 MHz mode

#### PPSD (CH Low)

Agilent 17:58:34 Jul 25, 2012

R T

Mkr1 5.746 30 GHz  
1.39 dBm

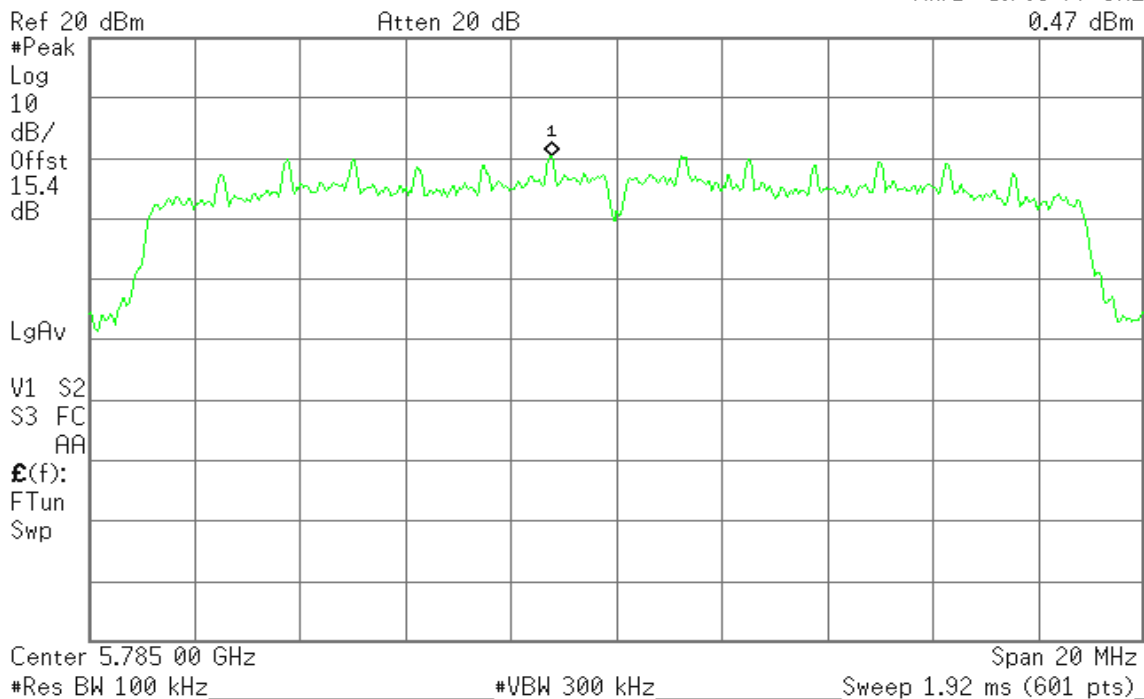


#### PPSD (CH Mid)

Agilent 17:56:31 Jul 25, 2012

R T

Mkr1 5.783 77 GHz  
0.47 dBm



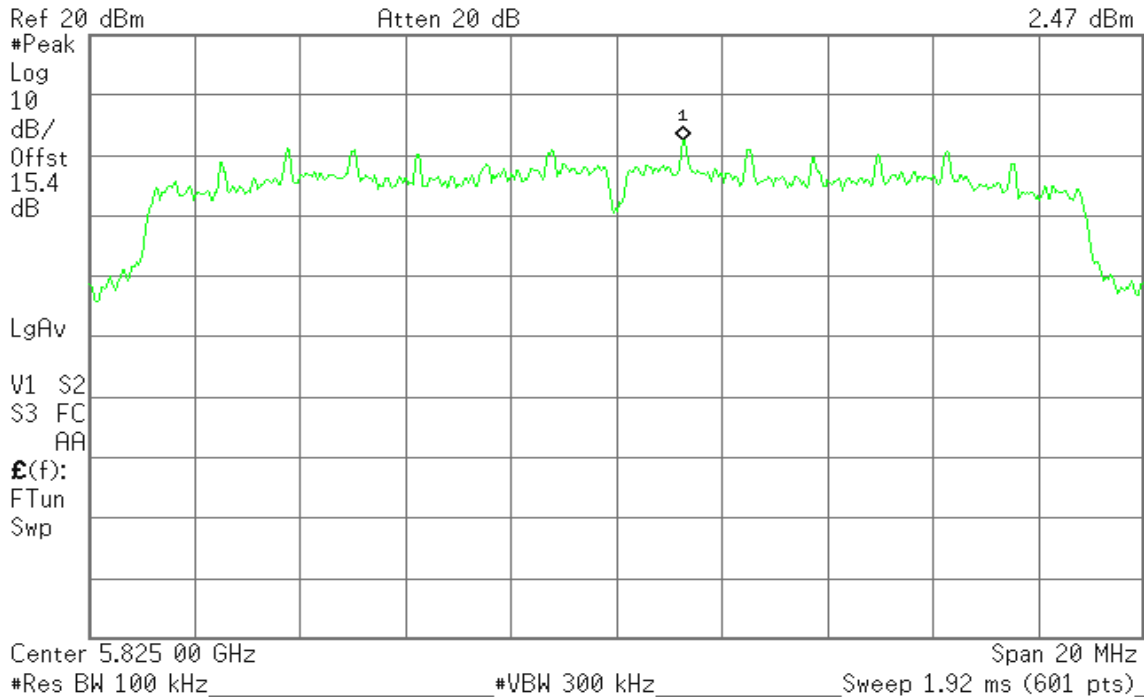


### PPSD (CH High)

Agilent 17:54:44 Jul 25, 2012

R T

Mkr1 5.826 27 GHz  
2.47 dBm





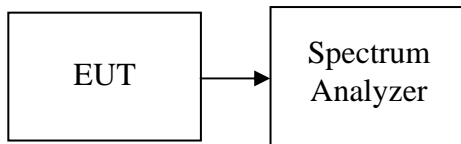
## 7.7 SPURIOUS EMISSIONS

### 7.7.1 Conducted Measurement

#### LIMIT

According to §15.247(d) & RSS-210 §A8.5, in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional 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. 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 Section 15.205(c)).

#### Test Configuration



#### TEST PROCEDURE

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 100 kHz.

Measurements are made over the 30MHz to 26GHz range for IEEE 802.11b/g, 30MHz to 40GHz range for IEEE 802.11a with the transmitter set to the lowest, middle, and highest channels.

#### TEST RESULTS

*No non-compliance noted*



**Test Plot**

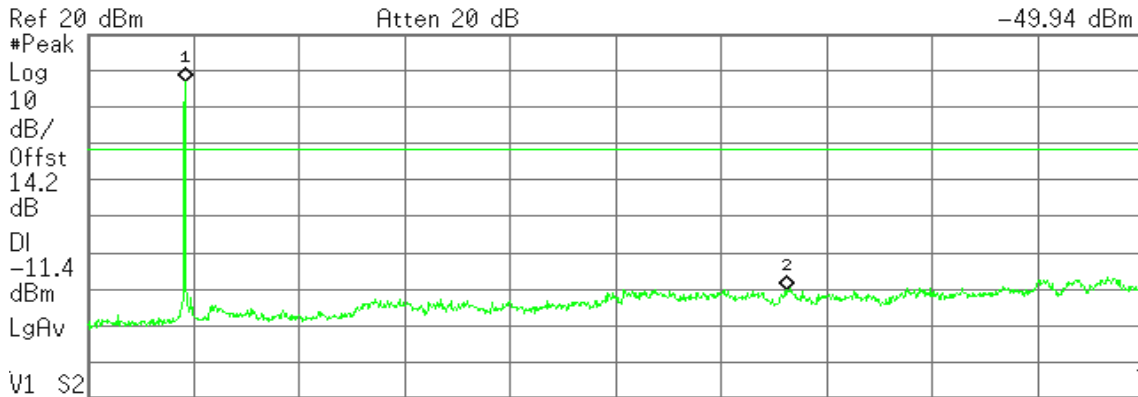
**IEEE 802.11b mode**

**CH Low**

Agilent 20:27:08 Jul 24, 2012

R T

Mkr2 17.25 GHz  
-49.94 dBm



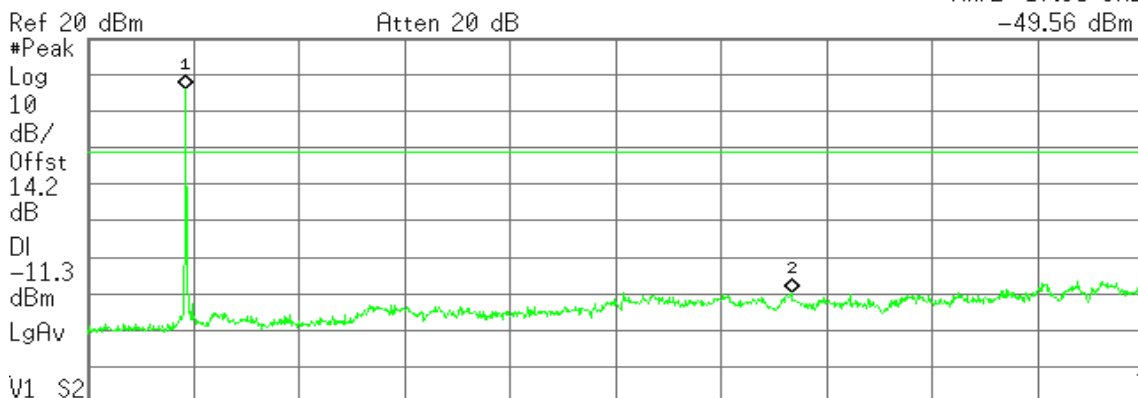
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.42 GHz	6.86 dBm
2	(1)	Freq	17.25 GHz	-49.94 dBm

**CH Mid**

Agilent 20:05:15 Jul 24, 2012

R T

Mkr2 17.35 GHz  
-49.56 dBm



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.45 GHz	6.01 dBm
2	(1)	Freq	17.35 GHz	-49.56 dBm

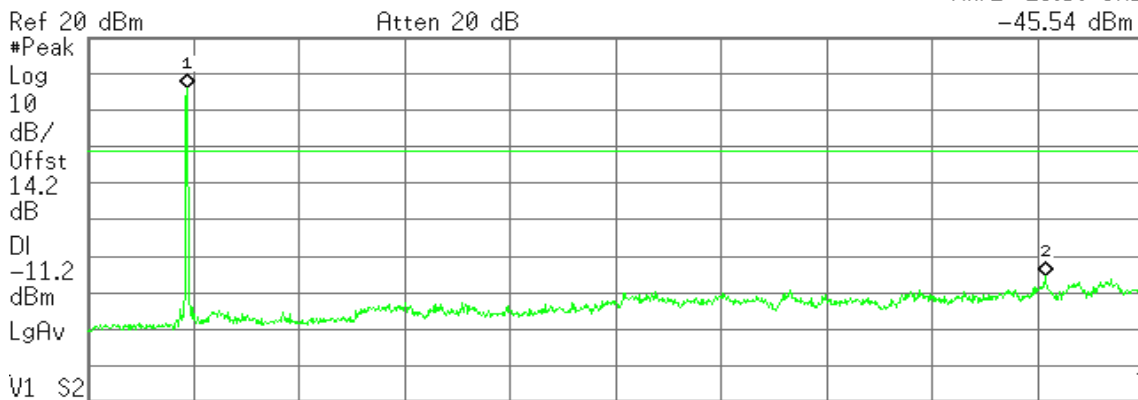


### CH High

Agilent 20:01:27 Jul 24, 2012

R T

Mkr2 23.58 GHz  
-45.54 dBm



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.47 GHz	6.27 dBm
2	(1)	Freq	23.58 GHz	-45.54 dBm

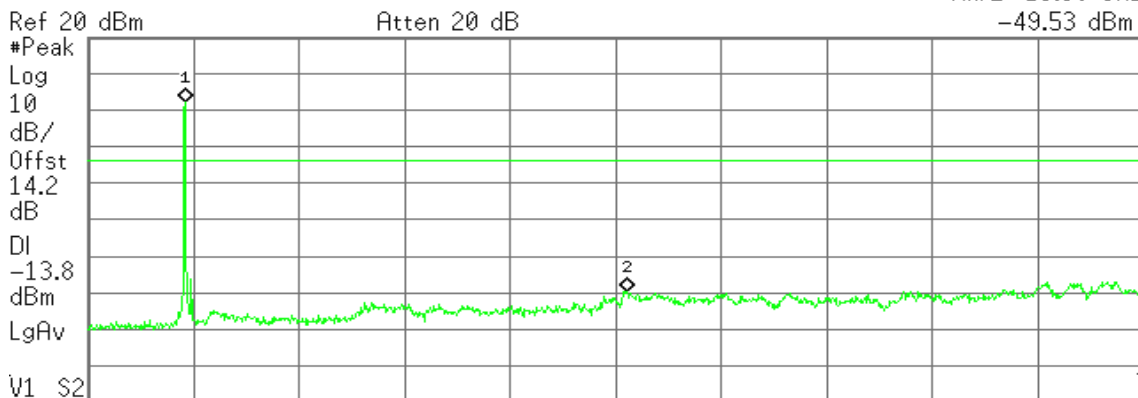
### IEEE 802.11g mode

#### CH Low

Agilent 20:53:21 Jul 24, 2012

R T

Mkr2 13.30 GHz  
-49.53 dBm



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.42 GHz	2.31 dBm
2	(1)	Freq	13.30 GHz	-49.53 dBm

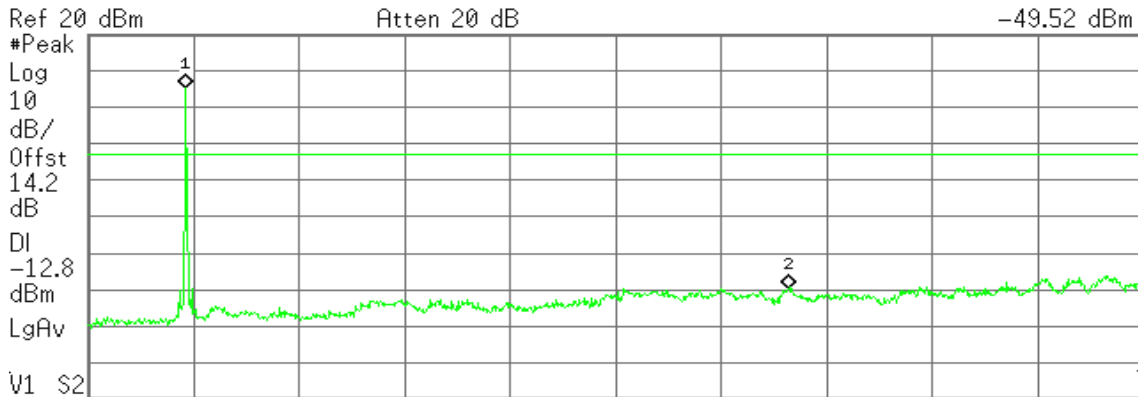


### CH Mid

Agilent 20:49:24 Jul 24, 2012

R T

Mkr2 17.27 GHz  
-49.52 dBm



V1 S2  
 Start 30 MHz Stop 26.00 GHz  
 #Res BW 100 kHz #VBW 100 kHz Sweep 3.131 s (1001 pts)

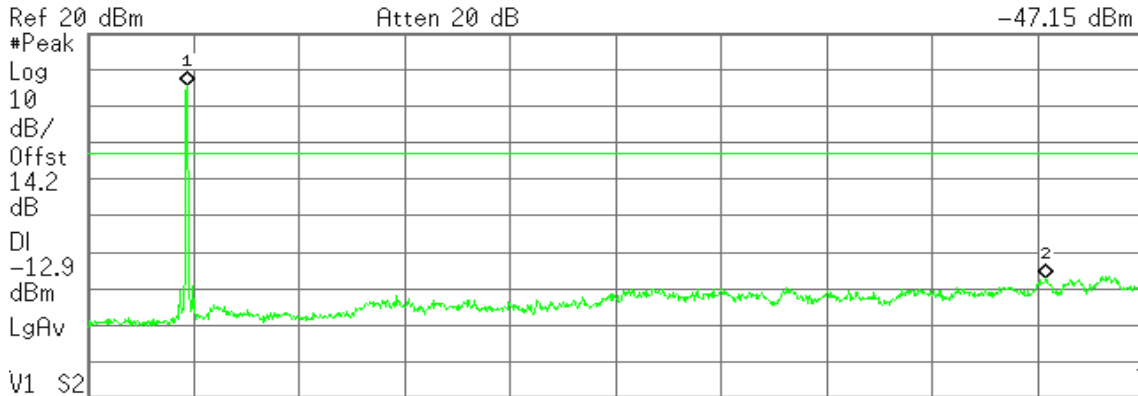
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.45 GHz	5.43 dBm
2	(1)	Freq	17.27 GHz	-49.52 dBm

### CH High

Agilent 20:42:53 Jul 24, 2012

R T

Mkr2 23.61 GHz  
-47.15 dBm



V1 S2  
 Start 30 MHz Stop 26.00 GHz  
 #Res BW 100 kHz #VBW 100 kHz Sweep 3.131 s (1001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.47 GHz	5.81 dBm
2	(1)	Freq	23.61 GHz	-47.15 dBm





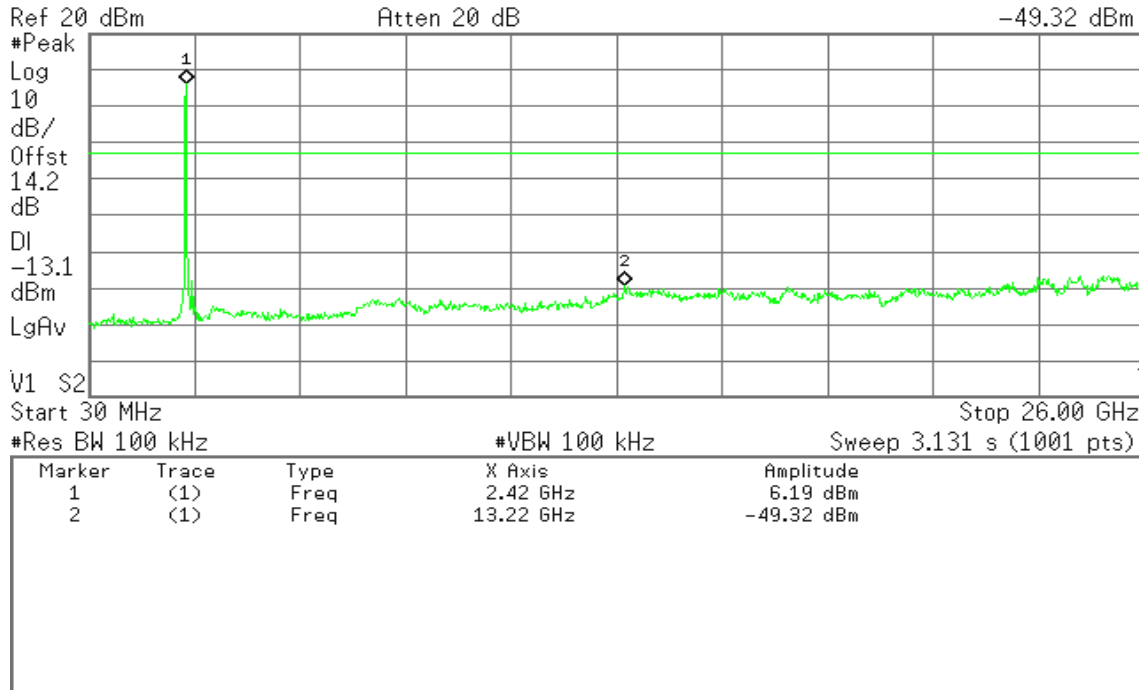
### IEEE 802.11n HT 20 MHz mode

#### CH Low

Agilent 21:25:36 Jul 24, 2012

R T

Mkr2 13.22 GHz  
-49.32 dBm

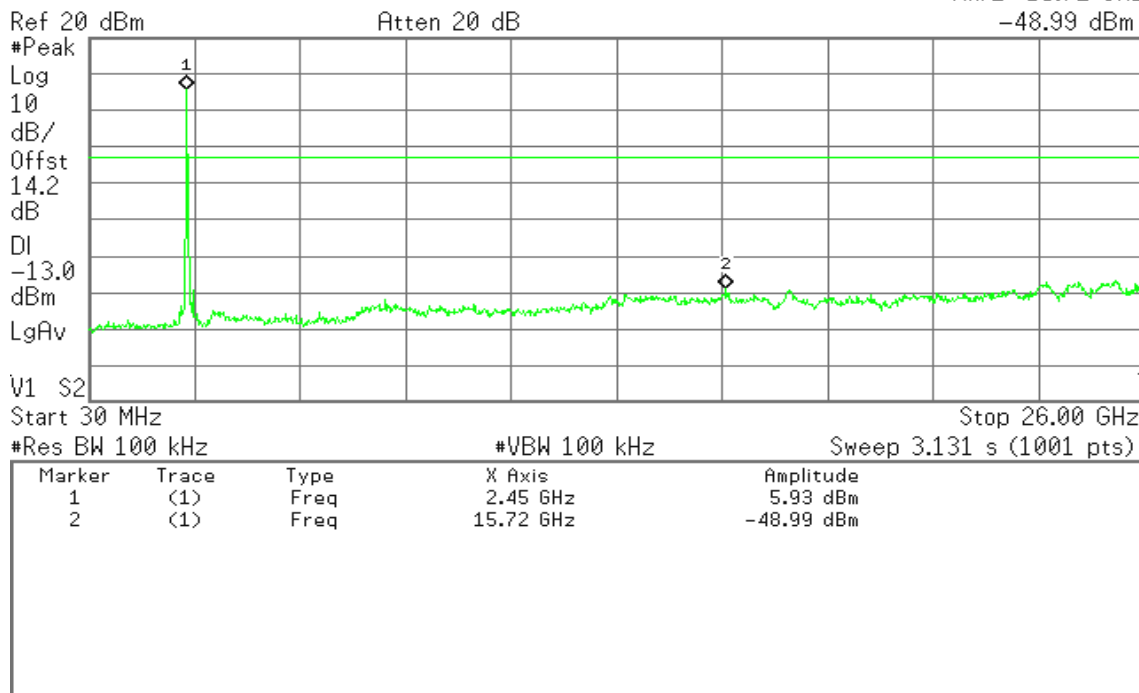


#### CH Mid

Agilent 21:19:03 Jul 24, 2012

R T

Mkr2 15.72 GHz  
-48.99 dBm



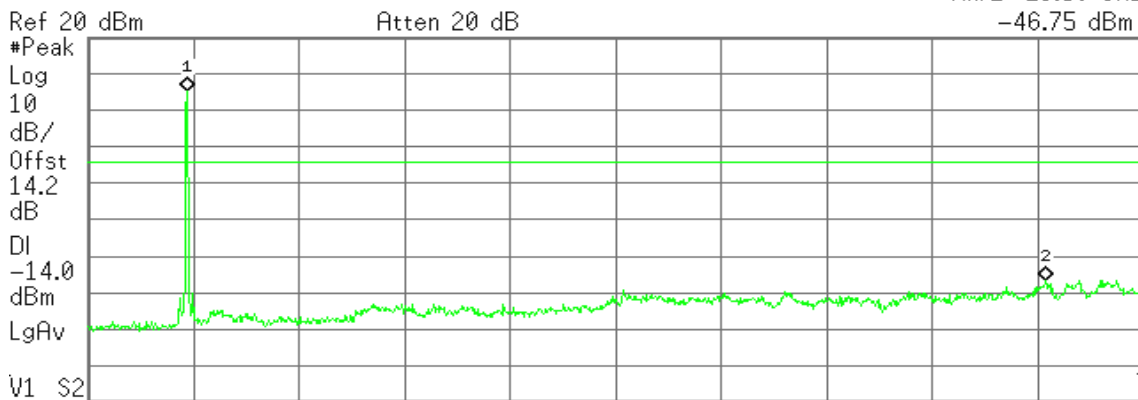


### CH High

Agilent 21:14:19 Jul 24, 2012

R T

Mkr2 23.58 GHz  
-46.75 dBm



#Res BW 100 kHz #VBW 100 kHz Sweep 3.131 s (1001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.47 GHz	5.45 dBm
2	(1)	Freq	23.58 GHz	-46.75 dBm

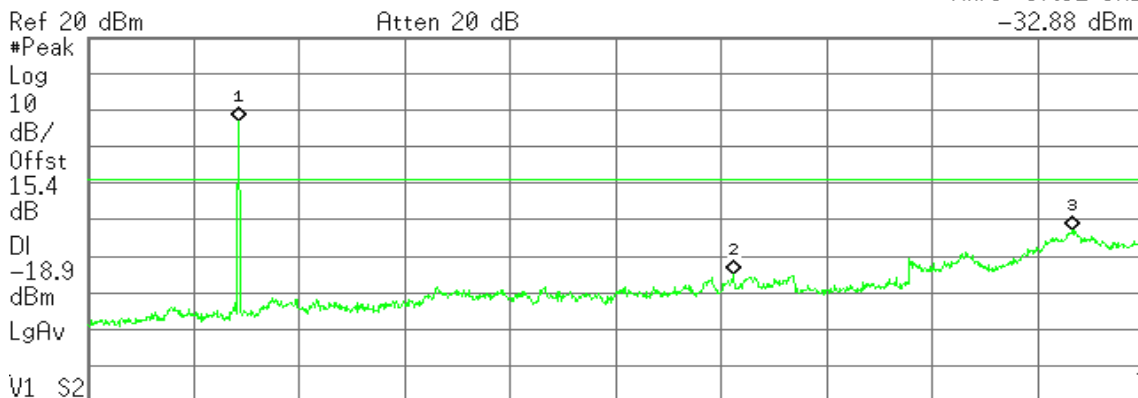
### IEEE 802.11a mode

#### CH Low

Agilent 19:56:38 Jul 25, 2012

R T

Mkr3 37.32 GHz  
-32.88 dBm



#Res BW 100 kHz #VBW 100 kHz Sweep 4.819 s (1001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	5.75 GHz	-2.89 dBm
2	(1)	Freq	24.45 GHz	-45.11 dBm
3	(1)	Freq	37.32 GHz	-32.88 dBm

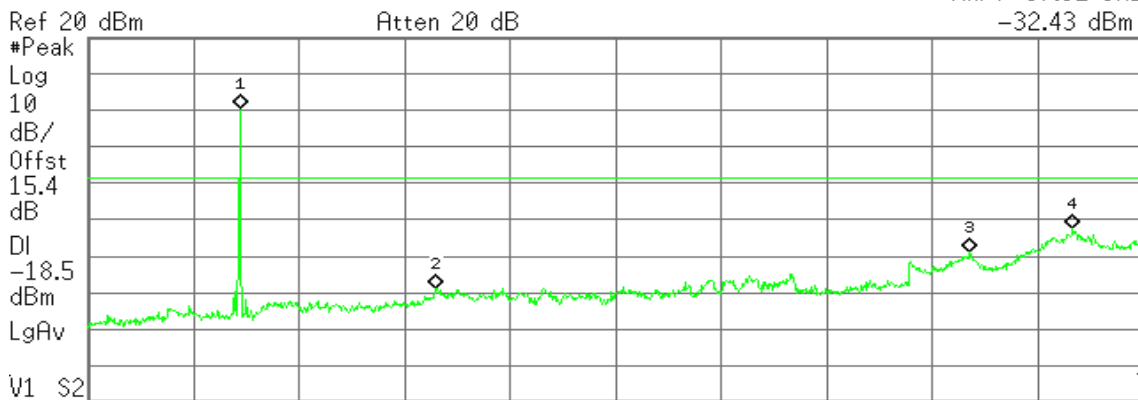


### CH Mid

Agilent 19:51:57 Jul 25, 2012

R T

Mkr4 37.32 GHz  
-32.43 dBm



Start 30 MHz Stop 40.00 GHz  
#Res BW 100 kHz #VBW 100 kHz Sweep 4.819 s (1001 pts)

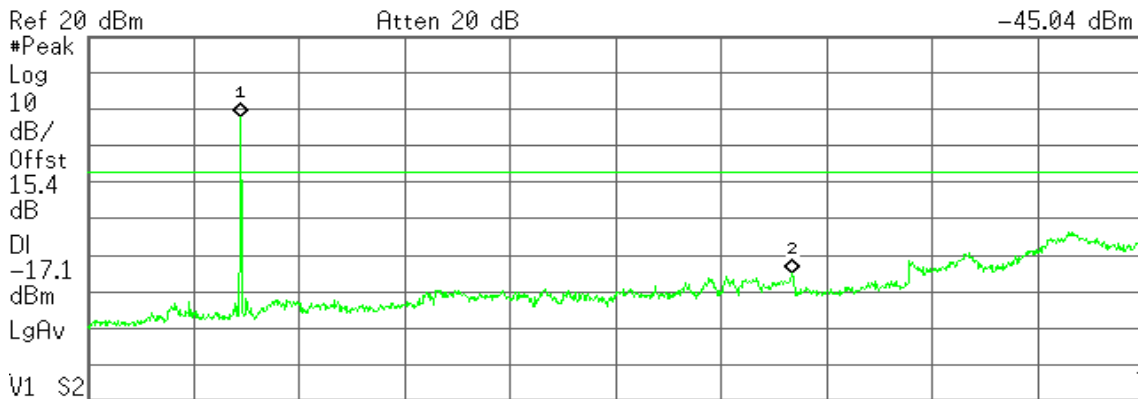
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	5.79 GHz	0.31 dBm
2	(1)	Freq	13.22 GHz	-48.64 dBm
3	(1)	Freq	33.44 GHz	-39.06 dBm
4	(1)	Freq	37.32 GHz	-32.43 dBm

### CH High

Agilent 19:47:26 Jul 25, 2012

R T

Mkr2 26.73 GHz  
-45.04 dBm



Start 30 MHz Stop 40.00 GHz  
#Res BW 100 kHz #VBW 100 kHz Sweep 4.819 s (1001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	5.83 GHz	-2.07 dBm
2	(1)	Freq	26.73 GHz	-45.04 dBm



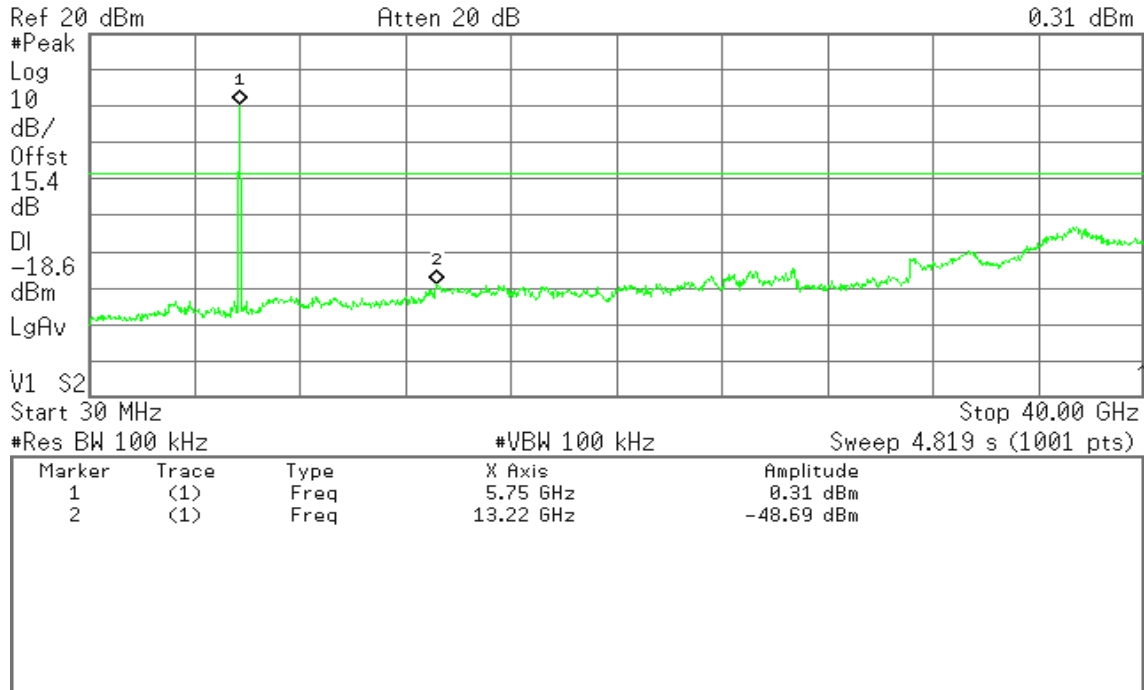
### IEEE 802.11n HT 20 MHz mode

#### CH Low

Agilent 18:42:26 Jul 25, 2012

R T

Mkr1 5.75 GHz  
0.31 dBm

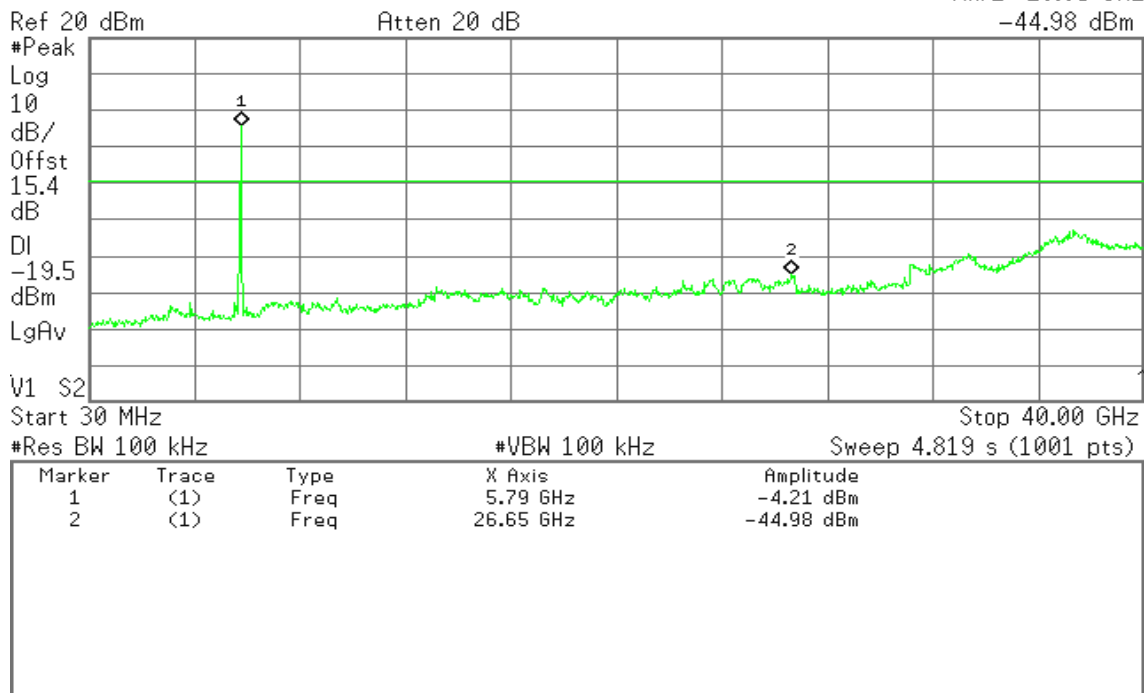


#### CH Mid

Agilent 18:47:06 Jul 25, 2012

R T

Mkr2 26.65 GHz  
-44.98 dBm



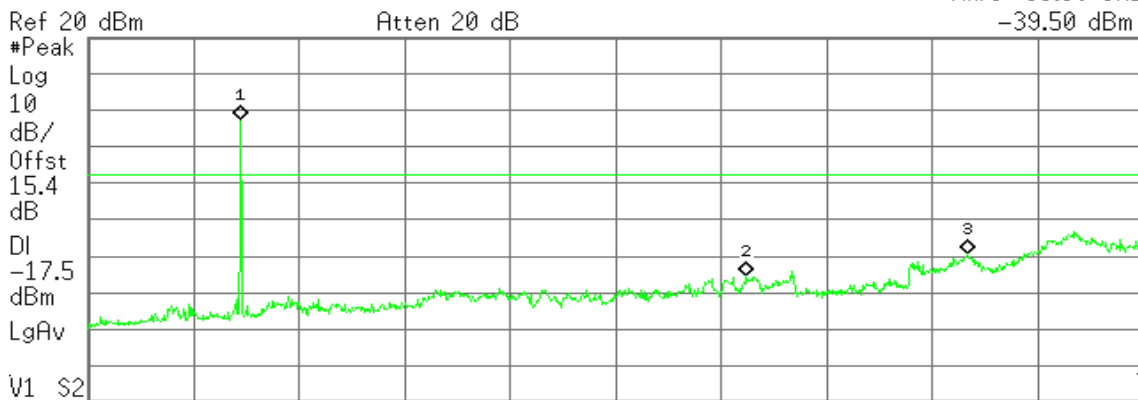


### CH High

Agilent 18:51:04 Jul 25, 2012

R T

Mkr3 33.36 GHz  
-39.50 dBm



Start 30 MHz #Res BW 100 kHz #VBW 100 kHz Sweep 4.819 s (1001 pts) Stop 40.00 GHz

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	5.83 GHz	-2.72 dBm
2	(1)	Freq	24.97 GHz	-45.42 dBm
3	(1)	Freq	33.36 GHz	-39.50 dBm



### 7.7.2 Radiated Emissions

#### LIMIT

All spurious emissions shall comply with the limits of §15.209(a) and RSS-Gen Table 2 & Table 5.

#### RSS-Gen Table 2 & Table 5: General Field Strength Limits for Transmitters and Receivers at Frequencies Above 30 MHz <sup>(Note)</sup>

Frequency (MHz)	Field Strength microvolts/m at 3 metres (watts, e.i.r.p.)	
	Transmitters	Receivers
30-88	100 (3 nW)	100 (3 nW)
88-216	150 (6.8 nW)	150 (6.8 nW)
216-960	200 (12 nW)	200 (12 nW)
Above 960	500 (75 nW)	500 (75 nW)

**Note:** \*Measurements for compliance with limits in the above table may be performed at distances other than 3 metres, in accordance with Section 7.2.7.

Transmitting devices are not permitted in Table 1 bands or, unless stated otherwise, in TV bands (54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz and 614-806 MHz).

#### RSS-Gen Table 6: General Field Strength Limits for Transmitters at Frequencies Below 30 MHz (Transmit)

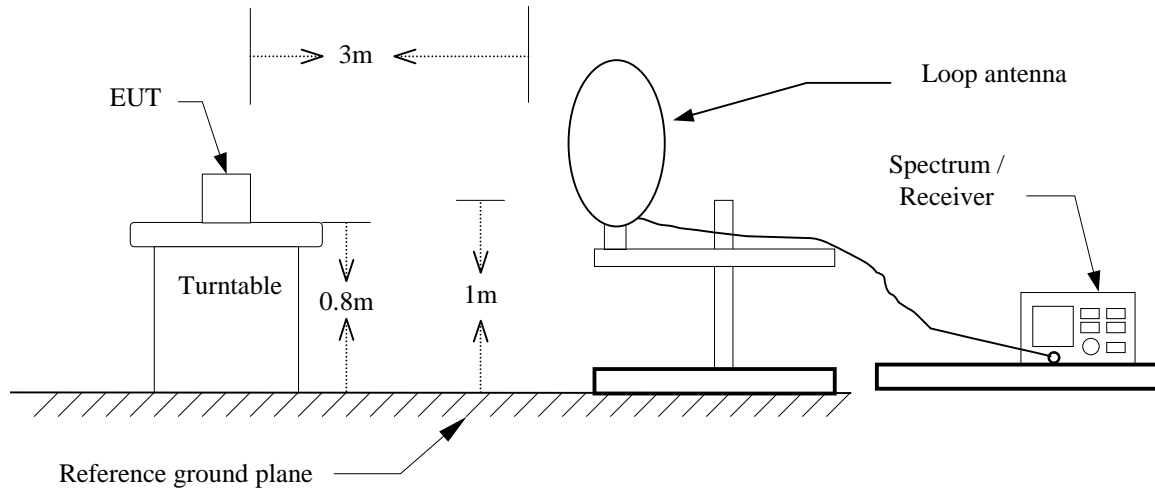
Frequency	Field Strength (microvolts/m)	Magnetic H-Field (microamperes/m)	Measurement Distance (metres)
9-490 kHz	2,400/F (F in kHz)	2,400/377F (F in kHz)	3000
490-1,705 kHz	24,000/F (F in kHz)	24,000/377F (F in kHz)	30
1.705-30 MHz	30	N/A	30

**Note:** The emission limits for the bands 9-90 kHz and 110-490 kHz are based on measurements employing an average detector.

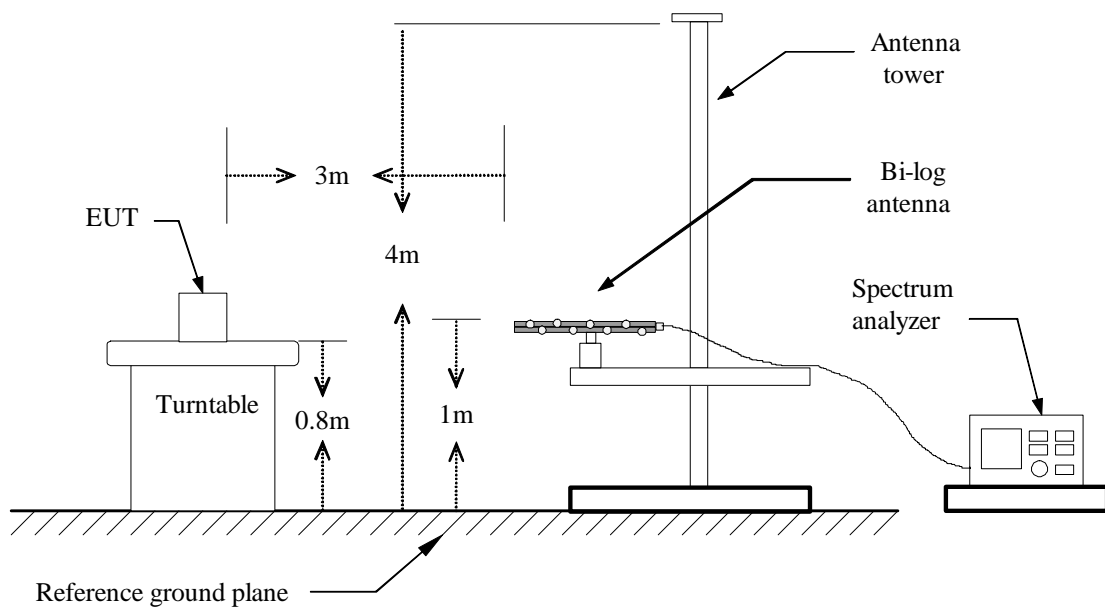


### Test Configuration

9kHz ~ 30MHz

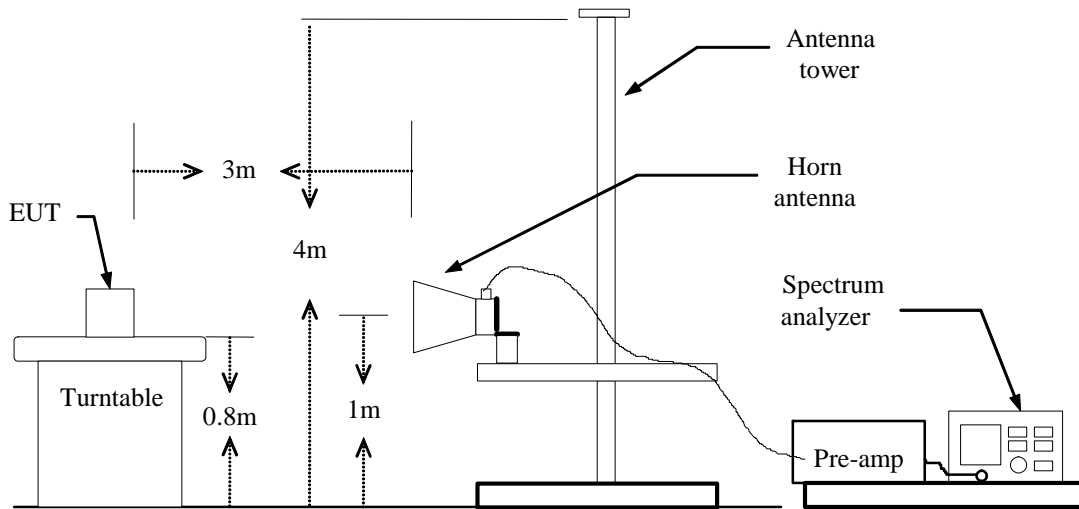


30MHz ~ 1GHz





Above 1 GHz







## **TEST PROCEDURE**

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:  
Below 1GHz:  
RBW=100kHz / VBW=300kHz / Sweep=AUTO  
Above 1GHz:  
(a) PEAK: RBW=1MHz / VBW=3MHz / Sweep=AUTO  
(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
7. Repeat above procedures until the measurements for all frequencies are complete.



**Below 1GHz**

**Operation Mode:** Normal Link                      **Test Date:** July 23, 2012  
**Temperature:** 26°C                                      **Tested by:** Shawn Wu  
**Humidity:** 50% RH                                      **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
47.78	50.05	-16.97	33.08	40.00	-6.92	Peak	V
84.97	56.12	-18.31	37.81	40.00	-2.19	QP	V
96.28	55.51	-16.87	38.64	43.50	-4.86	QP	V
138.32	45.06	-12.68	32.38	43.50	-11.12	Peak	V
448.72	36.27	-8.66	27.62	46.00	-18.38	Peak	V
639.48	34.87	-6.32	28.55	46.00	-17.45	Peak	V
84.97	56.23	-18.31	37.92	40.00	-2.08	QP	H
96.28	57.67	-16.87	40.80	43.50	-2.70	QP	H
149.63	48.14	-12.96	35.17	43.50	-8.33	Peak	H
162.57	48.81	-13.36	35.45	43.50	-8.05	Peak	H
354.95	41.37	-10.22	31.15	46.00	-14.85	Peak	H
639.48	43.04	-6.32	36.72	46.00	-9.28	Peak	H

**Remark:**

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.*
3. *Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Margin (dB) = Result (dBuV/m) – Limit (dBuV/m).*



**Above 1 GHz**

**Operation Mode:** TX / IEEE 802.11b / CH Low

**Test Date:** July 7, 2012

**Temperature:** 26°C

**Tested by:** Shawn Wu

**Humidity:** 50 % RH

**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
2263.33	54.14	---	-3.03	51.11	---	74.00	54.00	-2.89	Peak	V
4825.00	68.65	57.56	-12.30	56.35	45.26	74.00	54.00	-8.74	AVG	V
N/A										
2570.00	56.84	44.31	-2.77	54.06	41.54	74.00	54.00	-12.46	AVG	H
4825.00	65.84	53.64	-12.30	53.54	41.34	74.00	54.00	-12.66	AVG	H
N/A										

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: TX / IEEE 802.11b / CH Mid

Test Date: July 7, 2012

Temperature: 26°C

Tested by: Shawn Wu

Humidity: 50 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
2340.00	55.08	41.42	-2.53	52.55	38.89	74.00	54.00	-15.11	AVG	V
4883.33	69.62	56.85	-12.13	57.49	44.72	74.00	54.00	-9.28	AVG	V
N/A										
2303.33	54.66	---	-2.68	51.98	---	74.00	54.00	-2.02	Peak	H
4883.33	66.42	55.05	-12.13	54.29	42.92	74.00	54.00	-11.08	AVG	H
N/A										

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: TX / IEEE 802.11b / CH High

Test Date: July 7, 2012

Temperature: 26°C

Tested by: Shawn Wu

Humidity: 50 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
2333.33	54.82	43.32	-2.55	52.27	40.77	74.00	54.00	-13.23	AVG	V
4925.00	67.78	55.67	-12.00	55.78	43.67	74.00	54.00	-10.33	AVG	V
N/A										
2376.67	54.84	42.58	-2.38	52.47	40.20	74.00	54.00	-13.80	AVG	H
4925.00	65.42	53.15	-12.00	53.41	41.15	74.00	54.00	-12.85	AVG	H
N/A										

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: TX / IEEE 802.11g / CH Low

Test Date: July 7, 2012

Temperature: 26°C

Tested by: Shawn Wu

Humidity: 50 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
1066.67	63.21	43.66	-11.00	52.21	32.66	74.00	54.00	-21.34	AVG	V
4825.00	65.06	52.65	-12.30	52.76	40.35	74.00	54.00	-13.65	AVG	V
N/A										
2563.33	56.11	46.31	-2.78	53.33	43.53	74.00	54.00	-10.47	AVG	H
4825.00	61.28	---	-12.30	48.99	---	74.00	54.00	-5.01	Peak	H
N/A										

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: TX / IEEE 802.11g / CH Mid

Test Date: July 7, 2012

Temperature: 26°C

Tested by: Shawn Wu

Humidity: 50 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
2266.67	54.54	---	-3.00	51.54	---	74.00	54.00	-2.46	Peak	V
4883.33	66.47	55.93	-12.13	54.35	43.80	74.00	54.00	-10.20	AVG	V
N/A										
2353.33	54.46	---	-2.47	51.98	---	74.00	54.00	-2.02	Peak	H
4891.67	63.96	51.49	-12.10	51.86	39.39	74.00	54.00	-14.16	AVG	H
N/A										

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: TX / IEEE 802.11g / CH High

Test Date: July 7, 2012

Temperature: 26°C

Tested by: Shawn Wu

Humidity: 50 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
1060.00	65.83	44.43	-11.01	54.82	33.42	74.00	54.00	-20.58	AVG	V
4925.00	65.17	55.03	-12.00	53.17	43.03	74.00	54.00	-10.97	AVG	V
N/A										
2703.33	54.54	---	-2.59	51.95	---	74.00	54.00	-2.05	Peak	H
4925.00	67.20	52.42	-12.00	55.19	40.42	74.00	54.00	-13.58	AVG	H
N/A										

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).





Operation Mode: TX / IEEE 802.11n HT 20 MHz mode / CH Low

Test Date: July 7, 2012

Temperature: 26°C

Tested by: Shawn Wu

Humidity: 50 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
1063.33	63.34	44.55	-11.00	52.33	33.55	74.00	54.00	-20.45	AVG	V
4825.00	63.57	---	-12.30	51.27	---	74.00	54.00	-2.73	Peak	V
7233.33	57.61	---	-7.39	50.22	---	74.00	54.00	-3.78	Peak	V
N/A										
2566.67	55.88	45.89	-2.78	53.10	43.11	74.00	54.00	-10.89	AVG	H
4825.00	60.97	---	-12.30	48.68	---	74.00	54.00	-5.32	Peak	H
N/A										

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: TX / IEEE 802.11n HT 20 MHz mode / CH Mid

Test Date: July 7, 2012

Temperature: 26°C

Tested by: Shawn Wu

Humidity: 50 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
1066.67	64.53	43.88	-11.00	53.53	32.88	74.00	54.00	-21.12	AVG	V
4883.33	66.71	55.47	-12.13	54.59	43.34	74.00	54.00	-10.66	AVG	V
N/A										
2530.00	55.78	42.23	-2.83	52.95	39.40	74.00	54.00	-14.60	AVG	H
2596.67	55.64	41.10	-2.73	52.91	38.37	74.00	54.00	-1.09	AVG	H
4883.33	63.96	---	-12.13	51.83	---	74.00	54.00	-2.17	Peak	H
N/A										

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: TX / IEEE 802.11n HT 20 MHz mode / CH High

Test Date: July 7, 2012

Temperature: 26°C

Tested by: Shawn Wu

Humidity: 50 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
2240.00	55.71	41.40	-3.25	52.47	38.15	74.00	54.00	-15.85	AVG	V
4925.00	64.14	51.63	-12.00	52.13	39.63	74.00	54.00	-14.37	AVG	V
N/A										
2616.67	54.63	---	-2.71	51.92	---	74.00	54.00	-2.08	Peak	H
4916.67	61.15	---	-12.03	49.13	---	74.00	54.00	-4.87	Peak	H
N/A										

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: TX / IEEE 802.11a mode / CH Low

Test Date: July 23, 2012

Temperature: 26°C

Tested by: Shawn Wu

Humidity: 50 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1828.33	68.87	---	-20.72	48.15	---	68.30	54.00	-5.85	Peak	V
N/A										
1840.00	68.69	---	-20.62	48.07	---	68.30	54.00	-5.93	Peak	H
N/A										

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: TX / IEEE 802.11a mode / CH Mid

Test Date: July 23, 2012

Temperature: 26°C

Tested by: Shawn Wu

Humidity: 50 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1840.00	68.91	---	-20.62	48.30	---	68.30	54.00	-5.70	Peak	V
N/A										
1816.67	68.46	---	-20.83	47.63	---	68.30	54.00	-6.37	Peak	H
N/A										

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: TX / IEEE 802.11a mode / CH High

Test Date: July 23, 2012

Temperature: 26°C

Tested by: Shawn Wu

Humidity: 50 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1863.33	67.33	---	-20.40	46.93	---	68.30	54.00	-7.07	Peak	V
N/A										
1840.00	69.52	---	-20.62	48.91	---	68.30	54.00	-5.09	Peak	H
N/A										

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: TX / IEEE 802.11n HT 20 MHz mode / CH Low

Test Date: July 23, 2012

Temperature: 26°C

Tested by: Shawn Wu

Humidity: 50 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
1921.67	68.54	---	-19.87	48.67	---	68.30	54.00	-5.33	Peak	V
N/A										
1758.33	69.14	---	-21.36	47.78	---	68.30	54.00	-6.52	Peak	H
N/A										

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: TX / IEEE 802.11n HT 20 MHz mode / CH Mid

Test Date: July 23, 2012

Temperature: 26°C

Tested by: Shawn Wu

Humidity: 50 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
1875.00	68.74	---	-20.30	48.44	---	68.30	54.00	-5.56	Peak	V
N/A										
1898.33	68.39	---	-20.08	48.31	---	68.30	54.00	-5.69	Peak	H
N/A										

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).





Operation Mode: TX / IEEE 802.11n HT 20 MHz mode / CH High

Test Date: July 23, 2012

Temperature: 26°C

Tested by: Shawn Wu

Humidity: 50 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
1828.33	68.52	---	-20.72	47.79	---	68.30	54.00	-6.21	Peak	V
N/A										
1816.67	68.14	---	-20.83	47.31	---	68.30	54.00	-6.69	Peak	H
N/A										

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



## 7.8 POWERLINE CONDUCTED EMISSIONS

### LIMIT

According to §15.207(a) & RSS-Gen §7.2.4, except when the requirements applicable to a given device state otherwise, for any licence-exempt radiocommunication device equipped to operate from the public utility AC power supply, either directly or indirectly, the radio frequency voltage that is conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in Table 2. The tighter limit applies at the frequency range boundaries.

The conducted emissions shall be measured with a 50 ohm/50 microhenry line impedance stabilization network.

### RSS-Gen Table 2 – AC Power Lines Conducted Emission Limits

Frequency Range (MHz)	Conducted limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15 to 0.5	66 to 56*	56 to 46*
0.5 to 5	56	46
5 to 30	60	50

*\*Decreases with the logarithm of the frequency*

### Test Configuration

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

### TEST 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.



## TEST RESULTS

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.

### Test Data

**Operation Mode:** Normal Link                      **Test Date:** August 3, 2012  
**Temperature:** 26°C                                      **Tested by:** David Shu  
**Humidity:** 60% RH

Freq. (MHz)	QP Reading (dBuV)	AV Reading (dBuV)	Corr. factor (dB/m)	QP Result (dBuV/m)	AV Result (dBuV/m)	QP Limit (dBuV)	AV Limit (dBuV)	QP Margin (dB)	AV Margin (dB)	Note
0.2018	48.73	39.11	0.06	48.79	39.17	63.54	53.54	-14.75	-14.37	L1
0.2687	41.13	34.67	0.06	41.19	34.73	61.16	51.16	-19.97	-16.43	L1
0.4712	37.17	35.52	0.07	37.24	35.59	56.49	46.49	-19.25	-10.90	L1
2.1535	35.37	35.29	0.08	35.45	35.37	56.00	46.00	-20.55	-10.63	L1
3.8552	14.42	2.32	0.12	14.54	2.44	56.00	46.00	-41.46	-43.56	L1
5.2553	33.08	24.44	0.14	33.22	24.58	60.00	50.00	-26.78	-25.42	L1
0.2004	47.96	37.23	0.03	47.99	37.26	63.59	53.59	-15.60	-16.33	L2
0.4712	34.42	28.50	0.02	34.44	28.52	56.49	46.49	-22.05	-17.97	L2
1.0035	20.99	18.86	0.03	21.02	18.89	56.00	46.00	-34.98	-27.11	L2
1.5476	29.84	29.23	0.04	29.88	29.27	56.00	46.00	-26.12	-16.73	L2
3.3033	27.63	14.24	0.06	27.69	14.30	56.00	46.00	-28.31	-31.70	L2
5.1815	38.72	32.41	0.09	38.81	32.50	60.00	50.00	-21.19	-17.50	L2

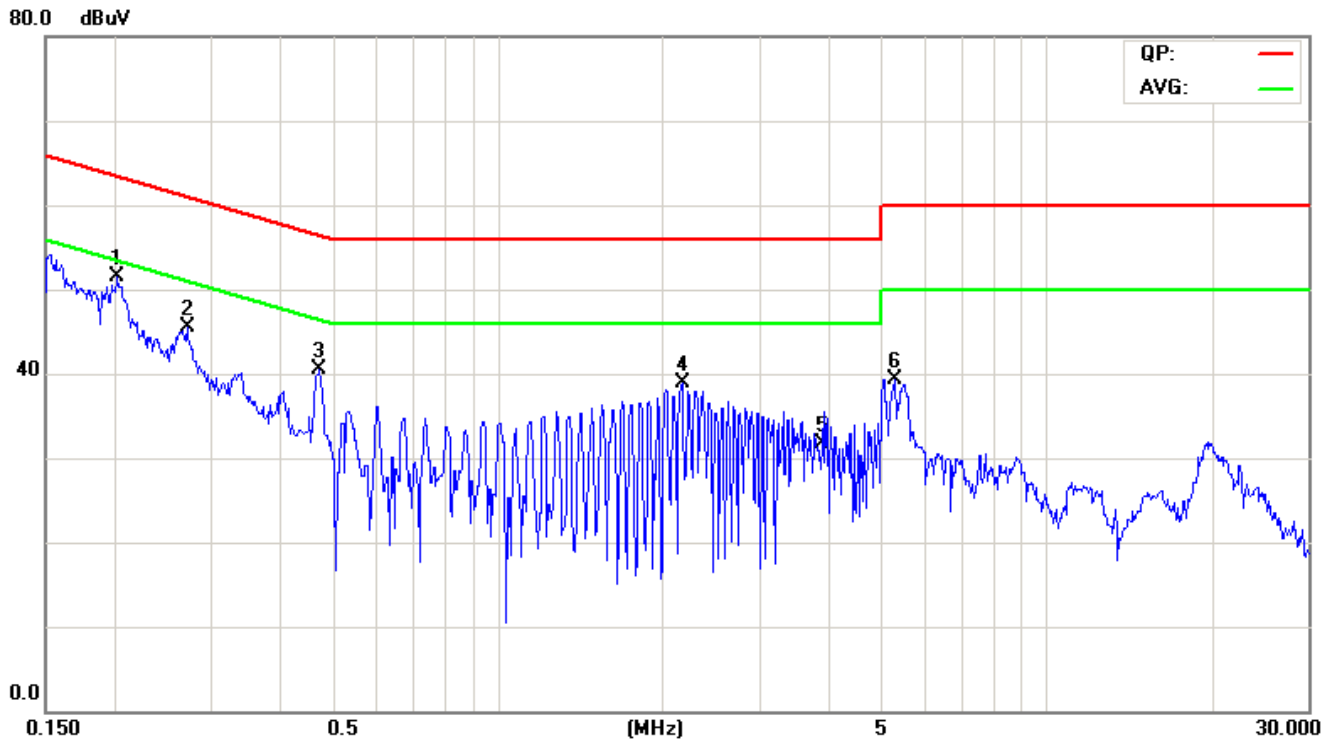
### **Remark:**

1. Measuring frequencies from 0.15 MHz to 30MHz.
2. The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Quasi-peak detector and average detector.
3. The IF bandwidth of SPA between 0.15MHz and 30MHz was 10 kHz; the IF bandwidth of Test Receiver between 0.15MHz and 30MHz was 9 kHz;
4. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)



**Test Plots**

*Conducted emissions (Line 1)*



*Conducted emissions (Line 2)*

