



FCC 47 CFR PART 15 SUBPART C AND ANSI C63.4 : 2003

TEST REPORT

For

802.11 b/g/n 2T3R Mini PCI Card

Model: WLC-123NR

Trade Name: N/A

Issued to

**CHUNG NAM ELECTRONICS CO., LTD.
12/F, CHUNG NAM BUILDING, NO.1 LOCKHARD ROAD,
WANCHAI, HONGKONG**

Issued by

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1. TEST REPORT CERTIFICATION

Applicant: CHUNG NAM ELECTRONICS CO., LTD.
12/F, CHUNG NAM BUILDING, NO.1 LOCKHARD ROAD, WANCHAI, HONGKONG

Manufacturer: CHUNG NAM ELECTRONICS CO., LTD.
12/F, CHUNG NAM BUILDING, NO.1 LOCKHARD ROAD, WANCHAI, HONGKONG

Equipment Under Test: 802.11 b/g/n 2T3R Mini PCI Card

Trade Name: N/A

Model: WLC-123NR

Date of Test: November 22, 2007- January 21, 2008, and May 12, 2008

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC Part 15 Subpart C AND ANSI C63.4:2003	No non-compliance noted

We hereby certify that:

The above equipment was tested by Compliance Certification Services (Shenzhen) Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4: 2003 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15 Subpart C.

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

Approved by:

Tested By:

Tom Gan

Clinton Kao/ Manager
COMPLIANCE CERTIFICATION
SERVICES (SHENZHEN) INC.

Reviewed By:

Vincent Yao / Assistant manager
COMPLIANCE CERTIFICATION
SERVICES (SHENZHEN) INC.



2. EUT DESCRIPTION

Product Name	802.11 b/g/n 2T3R Mini PCI Card
Model Number	WLC-123NR
Frequency Range	IEEE 802.11b/g, 802.11n HT20 : 2412MHz~2462MHz IEEE 802.11n HT40 : 2422MHz~2452MHz
Transmit Power	IEEE 802.11b : 20.41dBm; IEEE 802.11g : 20.10dBm; IEEE 802.11n HT20 : 21.92dBm; IEEE 802.11n HT40 : 22.11dBm
Channel Spacing	IEEE 802.11b/g ,802.11n HT20/HT40 : 5MHz
Channel Number	IEEE 802.11b/g ,802.11n HT20 : 11 Channels IEEE 802.11n HT40 : 7 Channels
Transmit Data Rate	IEEE 802.11b : 11, 5.5, 2, 1 Mbps IEEE 802.11g : 54, 48, 36, 24, 18, 12, 9, 6 Mbps IEEE 802.11n HT20 : 130, 117 ,104, 78, 65, 58.5, 52, 39, 26, 19.5, 13, 6.5 Mbps IEEE 802.11n HT40 : 270, 243 ,216, 162, 135, 121.5, 108, 81, 54, 40.5, 27, 13.5Mbps
Type of Modulation	IEEE 802.11b : DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g : OFDM (64QAM, 16AQM, QPSK, BPSK) IEEE 802.11n HT20/40 : OFDM (64QAM, 16QAM, QPSK, BPSK)
Frequency Selection	by software / firmware
Antenna Type	Dipole Antenna, Peak Gain 1.8 dBi (XY-Z) at 2.4GHz (× 2)
Power Source	Powered by the Notebook
Note	Ralink RF Module Model:RT2860T

Remark:

1. This submittal(s) (test report) is intended for FCC ID: Q72WLC123NR filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.
2. For more details, please refer to the User's manual of the EUT.



3. DESCRIPTION OF TEST MODES

The EUT is an 802.11n MIMO transceiver in Mini PCI Adapter form factor. It has two transmitter chains and three receive chains (2 × 3 configurations). The 2 × 3 configuration is implemented with two outside chains (Chain 0 and 1). 11b/g mode, only examines Chain 0, because only Chain 0 is functional according to the user driver of Ralink. The power is transmitted from TX0 only at 11b/g normal mode in Ralink solution. The RF chipset is manufactured by Ralink Technology, Corp. The antenna peak gain 1.8dBi (highest gain) were chosen for full testing.

IEEE 802.11b, 802.11g, 802.11n HT20 mode

The EUT had been tested under operating condition. There are three channels have been tested as following :

Channel	Frequency (MHz)
Low	2412
Middle	2437
High	2462

IEEE 802.11b mode : 1Mbps data rate (worst case) were chosen for full testing. IEEE 802.11g mode : 6Mbps data rate (worst case) were chosen for full testing. IEEE 802.11n HT20 mode : 6.5Mbps data rate (worst case) were chosen for full testing.

IEEE 802.11n HT40 mode

The EUT had been tested under operating condition. There are three channels have been tested as following :

Channel	Frequency (MHz)
Low	2422
Middle	2437
High	2452

IEEE 802.11n HT40 mode : 6.5Mbps data rate (worst case) were chosen for full testing.

The worst-case data rates are determined according to the description above, based on the investigations by measuring the PSD and average power across all the data rates, bandwidths, modulations and spatial stream modes.

The worst-case channel is determined as the channel with the highest output power. The highest measured output power was at 2437 MHz.



4. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4 and FCC CRF 47 2.1046, 2046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, 15.207, 15.209 and 15.247.

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

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

No. 5, Jinao industrial park, No.35 Jukeng Road, Dashuikeng Village, Guanlan Town, Baoan District, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4: 2003 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

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

5.3 LABORATORY ACCREDITATIONS LISTINGS

The following accreditation bodies accredit and approve our laboratories, based on ISO/IEC 17025.

USA	FCC
Japan	VCCI
Canada	INDUSTRY CANADA,
Taiwan	TAF, BSMI

Copies of granted accreditation certificates are available for downloading from our web site, <http://www.ccsemc.com>.



6. CALIBRATION AND UNCERTAINTY

6.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer’s recommendations, and is traceable to recognized national standards.

6.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in ETR 028:

Measurement	Uncertainty
Conducted emissions	± 3.59 dB
Radiated Emission	± 2.65 dB

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

7. SETUP OF EQUIPMENT UNDER TEST

7.1 SETUP CONFIGURATION OF EUT

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

7.2 SUPPORT EQUIPMENT

Device Type	Brand	Model	FCC ID	Series No.	Data Cable	Power Cord
Notebook	TOSHIBA	Satellite A100	DoC	Y6317320Q	Unshielded 1.5m	Unshielded 1.8m

Notes:

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.



7.3 EUT OPERATING CONDITION

1. Set up all computers like the setup diagram.
2. The “RT2860QA.exe” software was used for testing.

The EUT driver software installed in the host support equipment during testing was RT2860T RT2860QA Driver.

(1) TX Mode:

- Tx Data Rate:** **MCS=0; 1Mbps Bandwidth 20** (IEEE 802.11b mode)
 MCS=0; 6Mbps Bandwidth 20 (IEEE 802.11g mode)
 MCS=0; 6.5Mbps Bandwidth 20 (IEEE 802.11n HT20 mode)
 MCS=0; 6.5Mbps Bandwidth 40 (IEEE 802.11n HT40 mode)

Power control

- IEEE 802.11b Channel Low (2412MHz) TX Power0 **0E** (only chain0 TX)
- IEEE 802.11b Channel Mid (2437MHz) TX Power0 **0E** (only chain0 TX)
- IEEE 802.11b Channel High (2462MHz) TX Power0 **0B** (only chain0 TX)
- IEEE 802.11g Channel Low (2412MHz) TX Power0 **0C** (only chain0 TX)
- IEEE 802.11g Channel Mid (2437MHz) TX Power0 **12** (only chain0 TX)
- IEEE 802.11g Channel High (2462MHz) TX Power0 **08** (only chain0 TX)
- IEEE 802.11n HT20 Channel Low (2412MHz) TX Power0 **09** / TX Power1 **09**
- IEEE 802.11n HT20 Channel Mid (2437MHz) TX Power0 **10** / TX Power1 **12**
- IEEE 802.11n HT20 Channel High (2462MHz) TX Power0 **09** / TX Power1 **0E**
- IEEE 802.11n HT40 Channel Low (2422MHz) TX Power0 **06** / TX Power1 **0D**
- IEEE 802.11n HT40 Channel Mid (2437MHz) TX Power0 **11** / TX Power1 **12**
- IEEE 802.11n HT40 Channel High (2452MHz) TX Power0 **06** / TX Power1 **0B**

(2) RX Mode : Start RX

3. All of the function are under run.
4. Start test.



8. APPLICABLE LIMITS AND TEST RESULTS

8.1 6dB BANDWIDTH

LIMIT

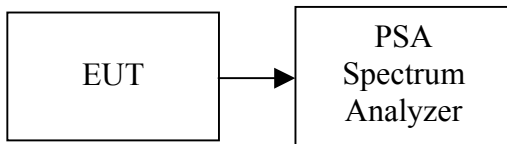
§ 15.207(a) (2) For direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
PSA Spectrum Analyzer	Agilent	E4446A	US44300399	02/05/2008

Remark: Each piece of equipment is scheduled for calibration once a year.

TEST CONFIGURATION



TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 100kHz, VBW = RBW, Span = 20/40MHz, Sweep = auto.
4. Mark the peak frequency and -6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.



TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	6dB Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
Low	2412	12170	500	PASS
Mid	2437	12230	500	PASS
High	2462	12370	500	PASS

Test mode: IEEE 802.11g

Channel	Frequency (MHz)	6dB Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
Low	2412	16600	500	PASS
Mid	2437	16630	500	PASS
High	2462	16600	500	PASS

IEEE 802.11n HT20 mode (Two TX)

Channel	Frequency (MHz)	6dB Bandwidth (kHz)		Limit (kHz)	Margin (kHz)
		Chain 0	Chain 1		
Low	2412	17700	17730	500	PASS
Mid	2437	17700	17700	500	PASS
High	2462	17700	17730	500	PASS

IEEE 802.11n HT40 mode (Two TX)

Channel	Frequency (MHz)	6dB Bandwidth (kHz)		Limit (kHz)	Margin (kHz)
		Chain 0	Chain 1		
Low	2422	36530	36330	500	PASS
Mid	2437	36530	36400	500	PASS
High	2452	36400	36470	500	PASS



Test Plot

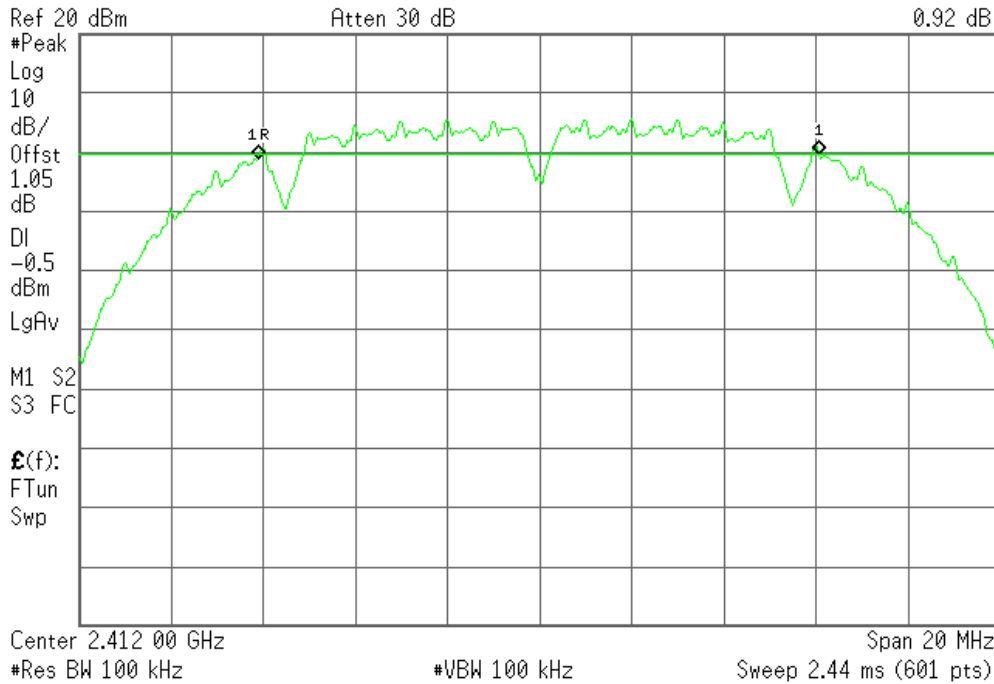
802.11b mode

6dB Bandwidth (CH Low)

Agilent 14:36:07 Jan 16, 2008

R T

Mkr1 12.17 MHz 0.92 dB

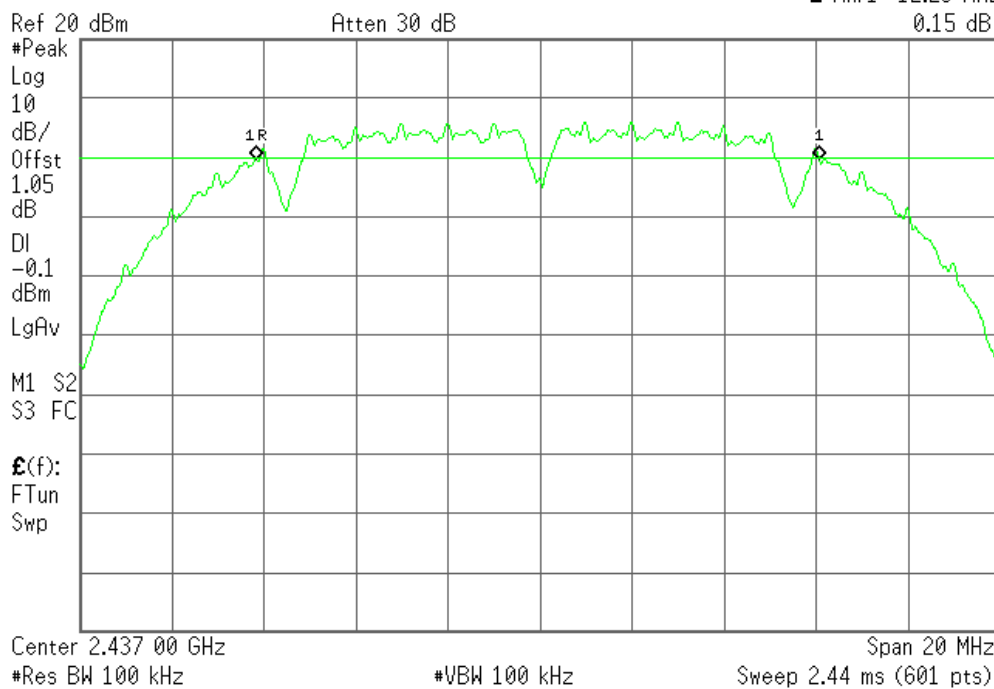


6dB Bandwidth (CH Mid)

Agilent 14:39:55 Jan 16, 2008

R T

Mkr1 12.23 MHz 0.15 dB



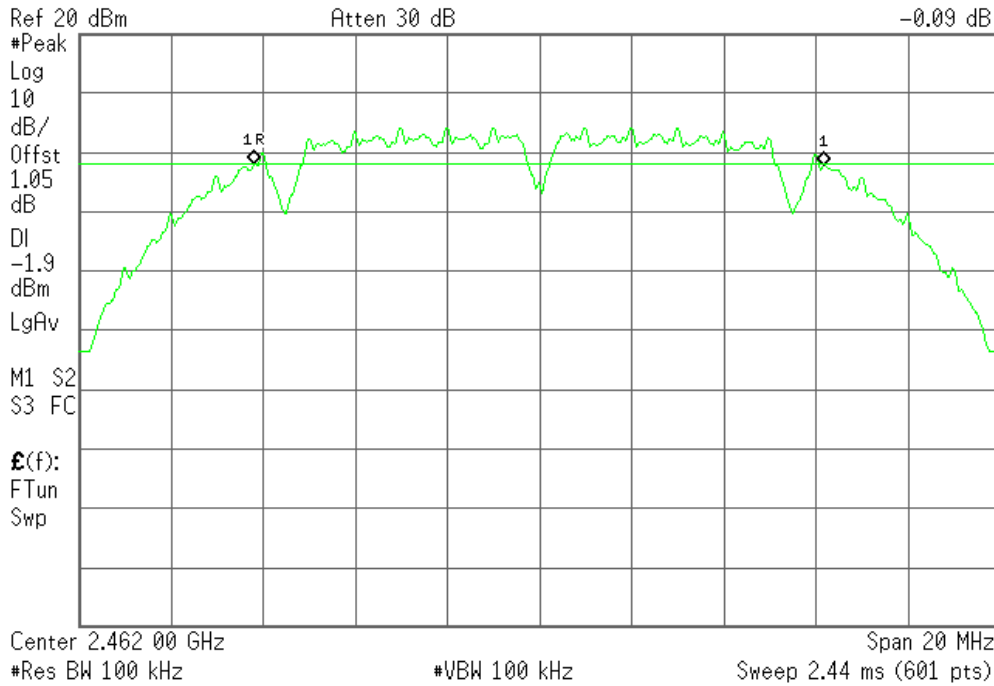


6dB Bandwidth (CH High)

Agilent 14:42:37 Jan 16, 2008

R T

Mkr1 12.37 MHz
-0.09 dB



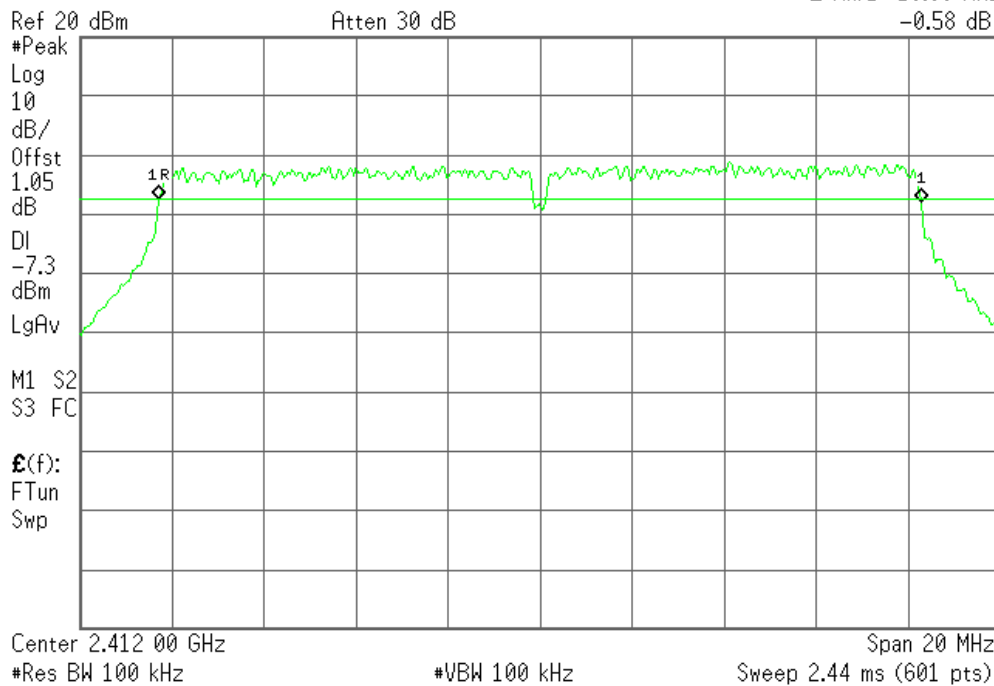
802.11g mode

6dB Bandwidth (CH Low)

Agilent 14:45:22 Jan 16, 2008

R T

Mkr1 16.60 MHz
-0.58 dB



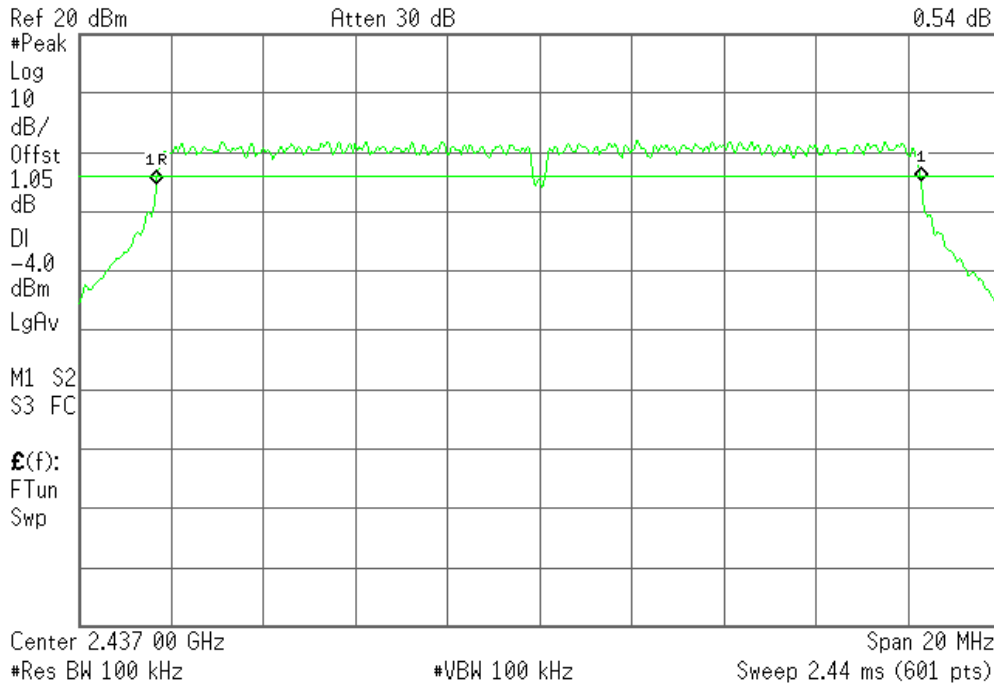


6dB Bandwidth (CH Mid)

Agilent 14:48:00 Jan 16, 2008

R T

Mkr1 16.63 MHz
0.54 dB

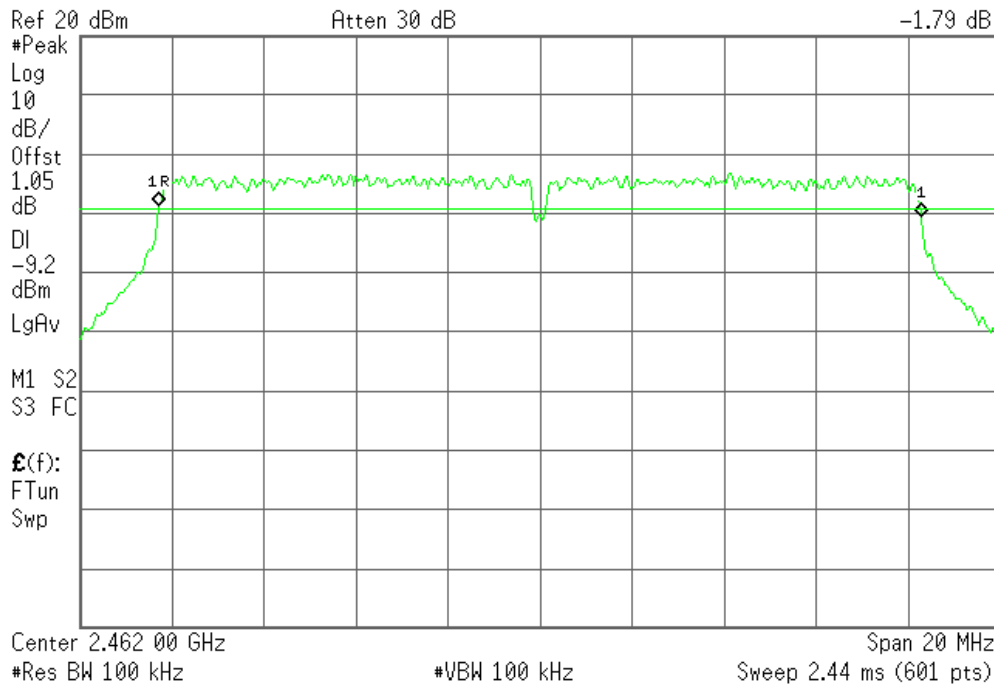


6dB Bandwidth (CH High)

Agilent 14:50:07 Jan 16, 2008

R T

Mkr1 16.60 MHz
-1.79 dB





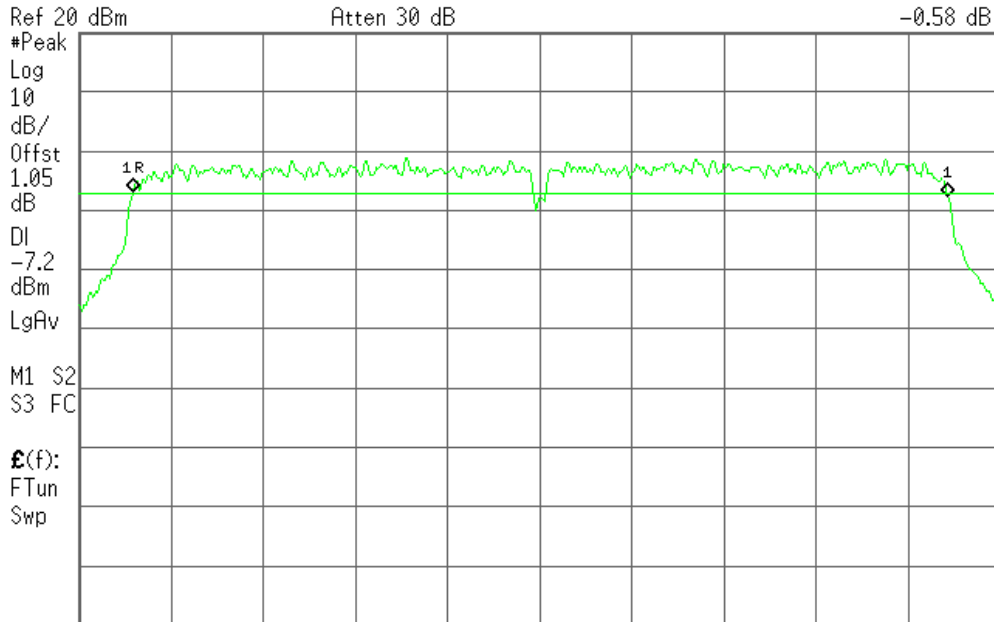
802.11n HT20 mode-Chain 0

6dB Bandwidth (CH Low)

Agilent 14:52:06 Jan 16, 2008

R T

Mkr1 17.70 MHz
-0.58 dB



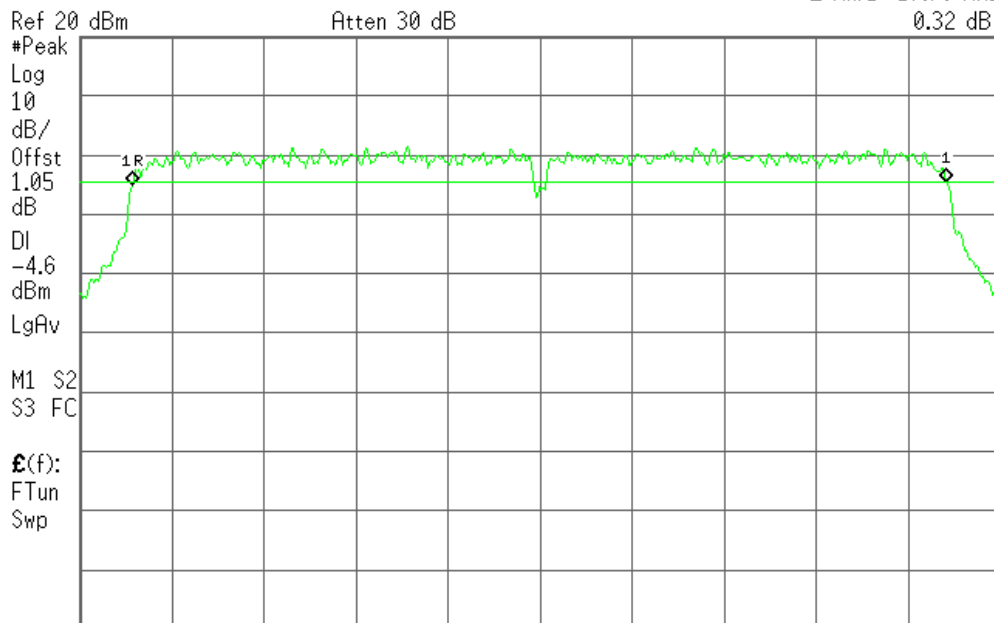
Center 2.412 00 GHz Span 20 MHz
#Res BW 100 kHz #VBW 100 kHz Sweep 2.44 ms (601 pts)

6dB Bandwidth (CH Mid)

Agilent 14:54:06 Jan 16, 2008

R T

Mkr1 17.70 MHz
0.32 dB



Center 2.437 00 GHz Span 20 MHz
#Res BW 100 kHz #VBW 100 kHz Sweep 2.44 ms (601 pts)

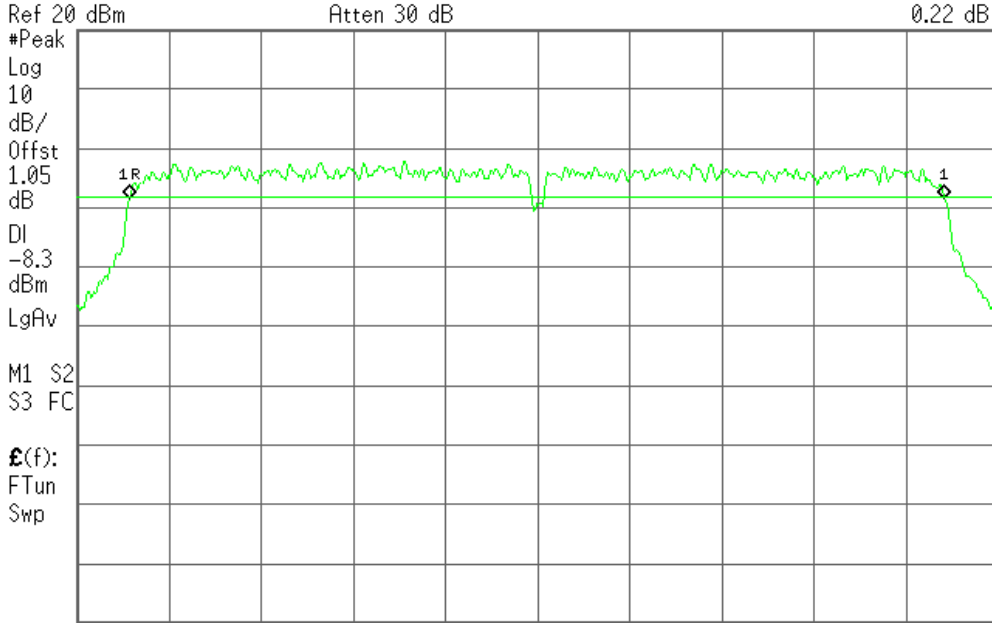


6dB Bandwidth (CH High)

Agilent 14:56:59 Jan 16, 2008

R T

Mkr1 17.70 MHz
0.22 dB



Center 2.462 00 GHz Span 20 MHz
#Res BW 100 kHz #VBW 100 kHz Sweep 2.44 ms (601 pts)

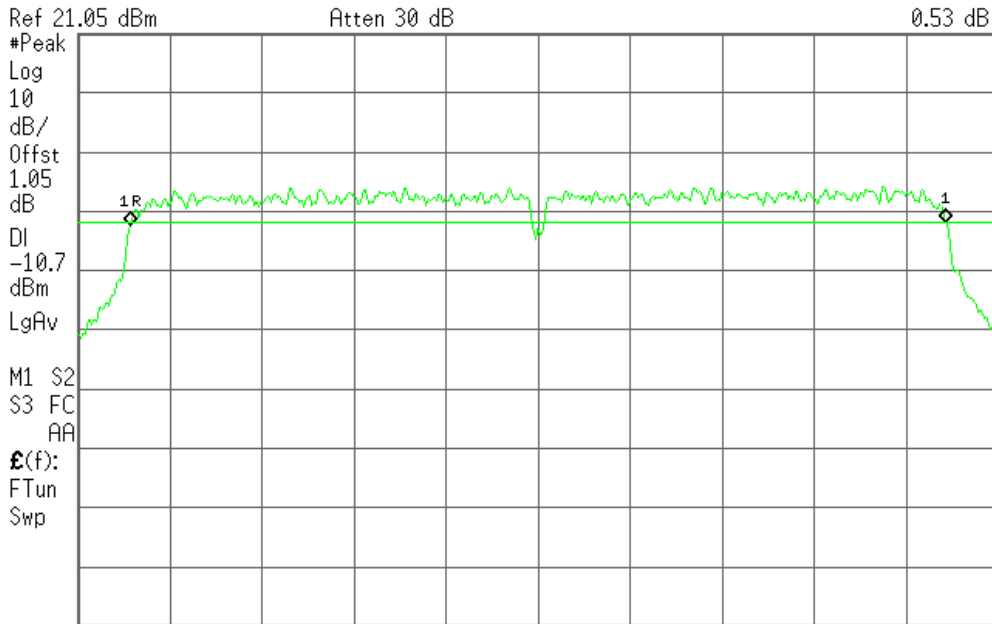
802.11n HT20 mode-Chain 1

6dB Bandwidth (CH Low)

Agilent 18:29:36 Jan 16, 2008

R T

Mkr1 17.73 MHz
0.53 dB



Center 2.412 00 GHz Span 20 MHz
#Res BW 100 kHz #VBW 100 kHz Sweep 2.44 ms (601 pts)

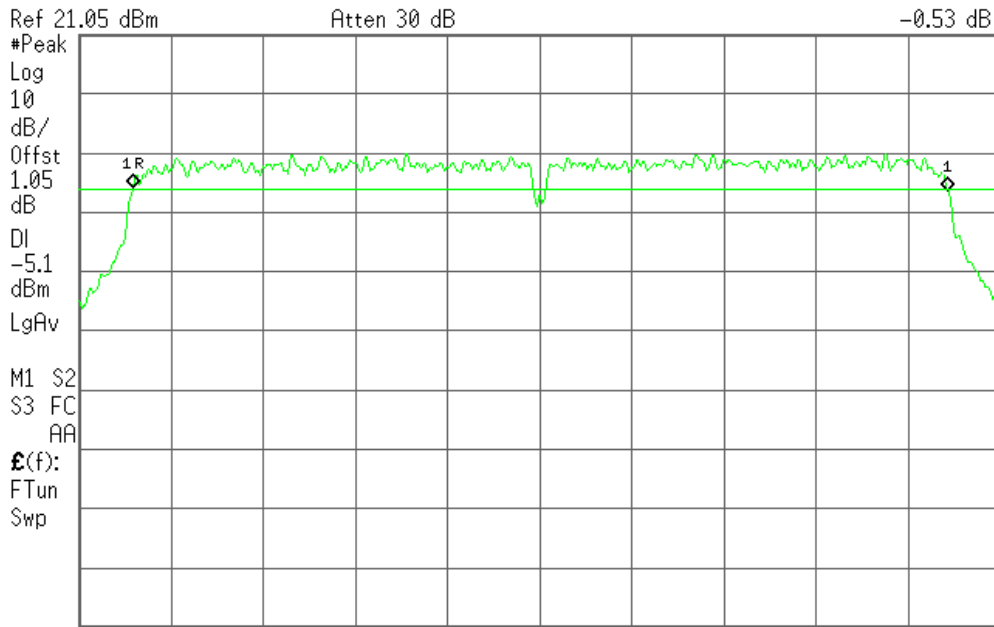


6dB Bandwidth (CH Mid)

Agilent 18:31:33 Jan 16, 2008

R T

Mkr1 17.70 MHz
-0.53 dB

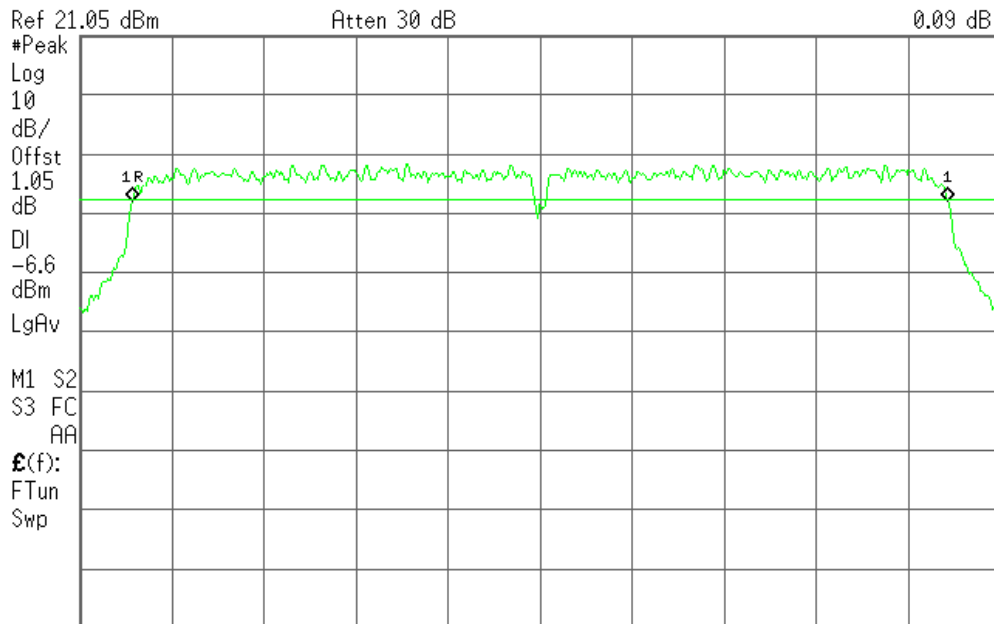


6dB Bandwidth (CH High)

Agilent 18:33:09 Jan 16, 2008

R T

Mkr1 17.73 MHz
0.09 dB





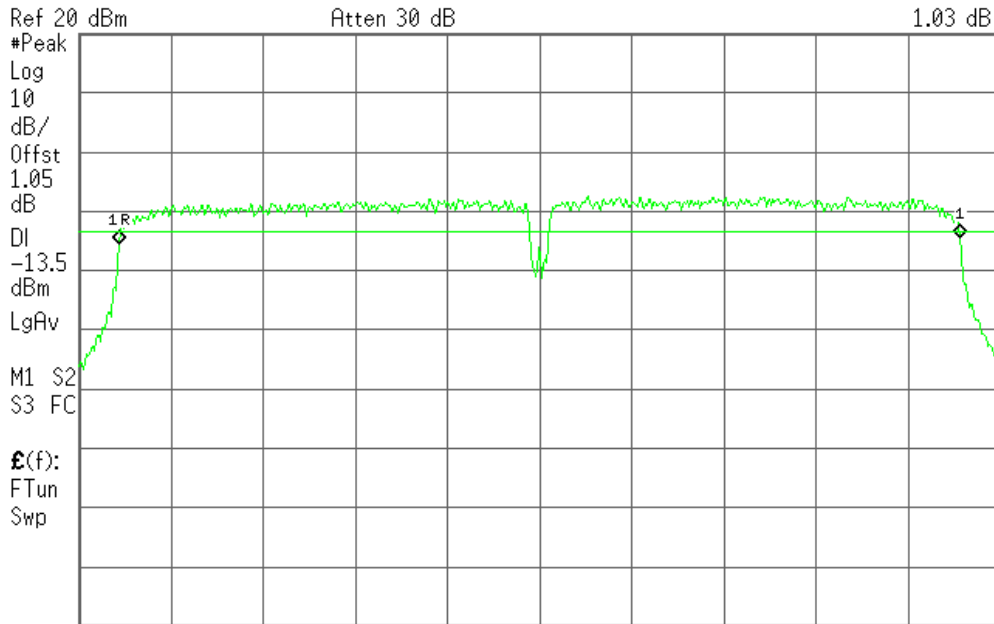
802.11n HT40 mode-Chain 0

6dB Bandwidth (CH Low)

Agilent 15:02:58 Jan 16, 2008

R T

Mkr1 36.53 MHz
1.03 dB



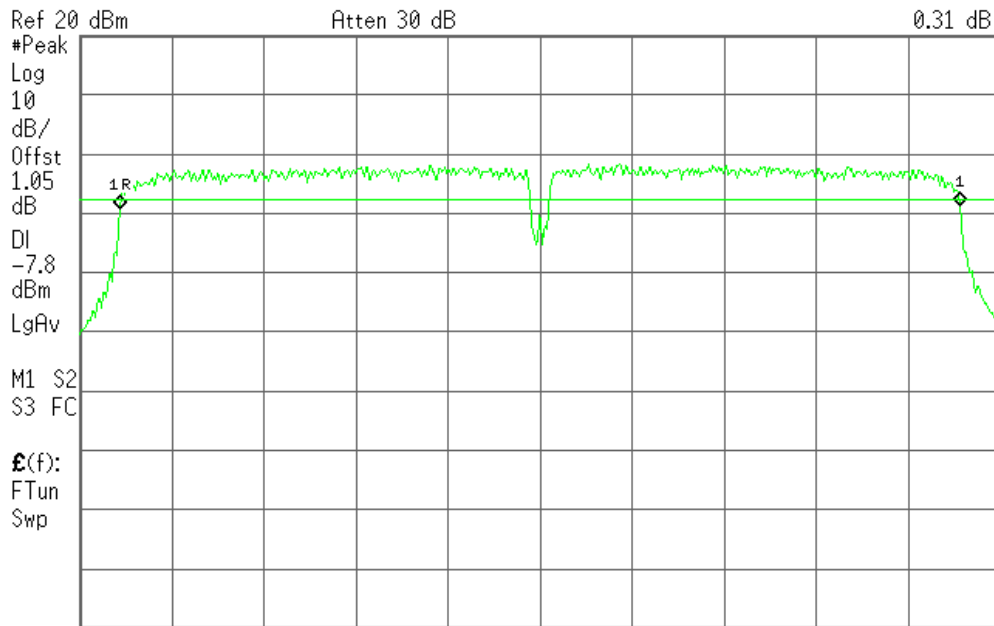
Center 2.422 00 GHz Span 40 MHz
#Res BW 100 kHz #VBW 100 kHz Sweep 4.84 ms (601 pts)

6dB Bandwidth (CH Mid)

Agilent 15:07:06 Jan 16, 2008

R T

Mkr1 36.53 MHz
0.31 dB



Center 2.437 00 GHz Span 40 MHz
#Res BW 100 kHz #VBW 100 kHz Sweep 4.84 ms (601 pts)

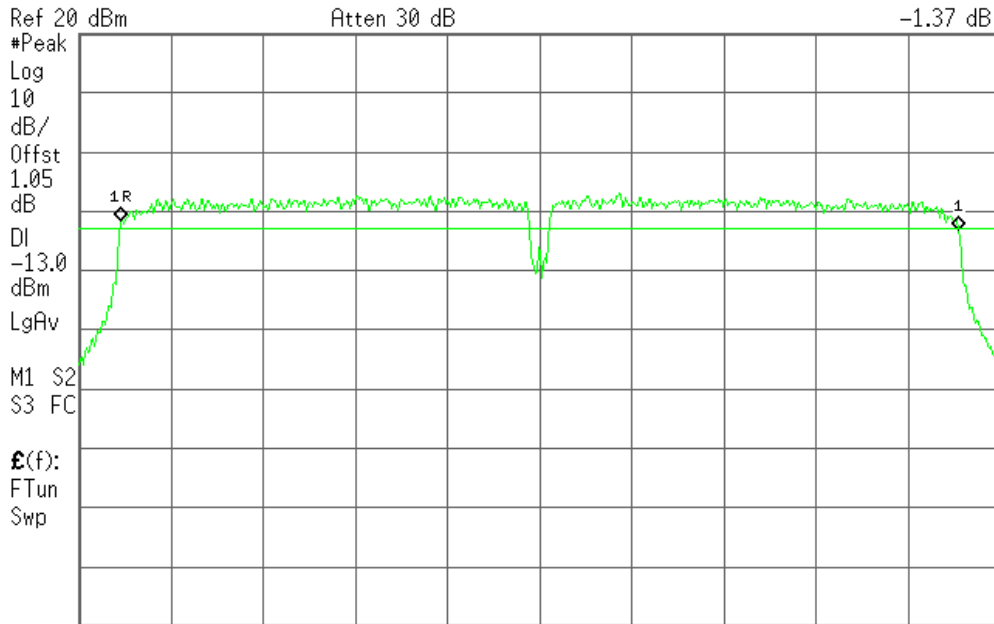


6dB Bandwidth (CH High)

Agilent 15:09:06 Jan 16, 2008

R T

Mkr1 36.40 MHz
-1.37 dB



Start 2.432 00 GHz

Stop 2.472 00 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 4.84 ms (601 pts)

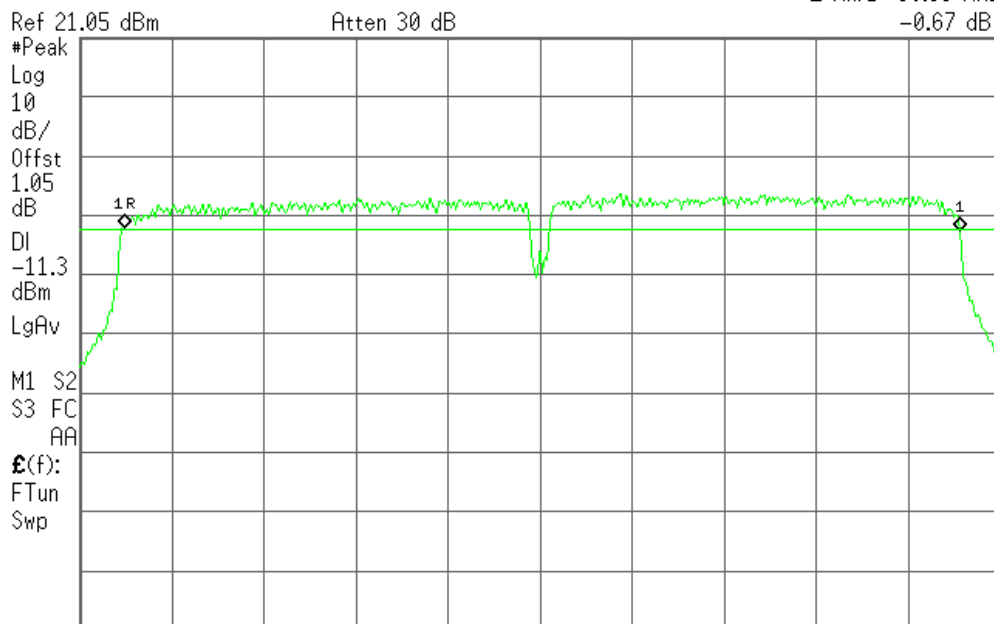
802.11n HT40 mode-Chain 1

6dB Bandwidth (CH Low)

Agilent 18:38:50 Jan 16, 2008

R T

Mkr1 36.33 MHz
-0.67 dB



Center 2.422 00 GHz

Span 40 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 4.84 ms (601 pts)

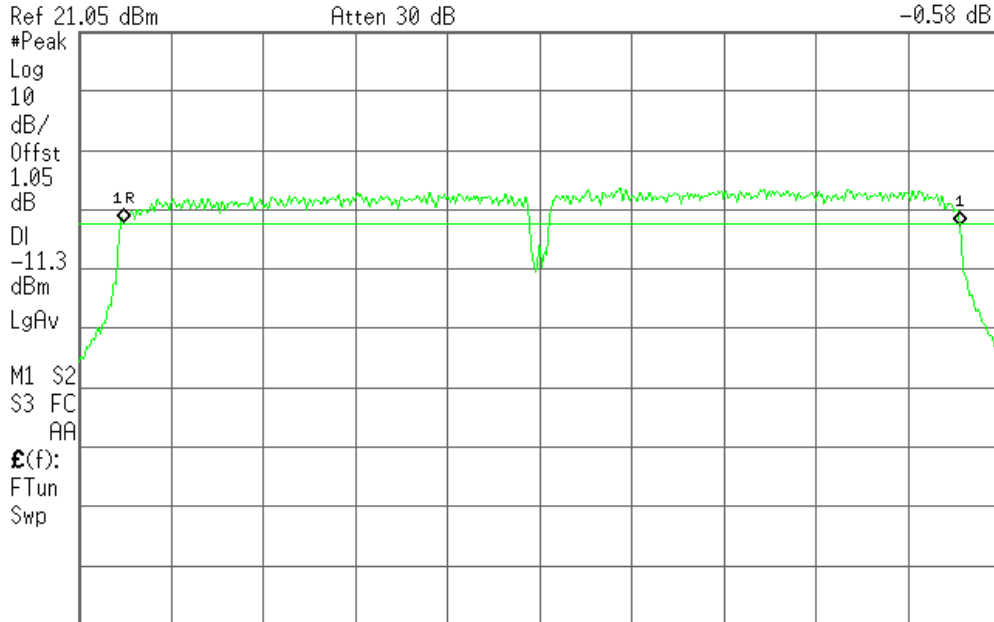


6dB Bandwidth (CH Mid)

Agilent 18:44:54 Jan 16, 2008

R T

Mkr1 36.40 MHz
-0.58 dB



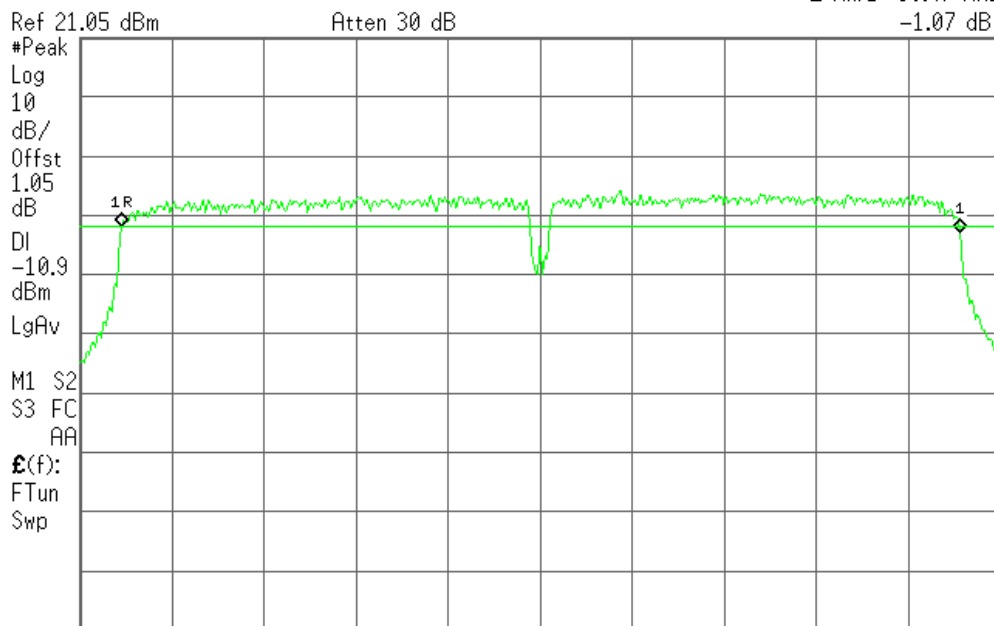
Center 2.437 00 GHz Span 40 MHz
#Res BW 100 kHz #VBW 100 kHz Sweep 4.84 ms (601 pts)

6dB Bandwidth (CH High)

Agilent 18:59:32 Jan 16, 2008

R T

Mkr1 36.47 MHz
-1.07 dB



Center 2.452 00 GHz Span 40 MHz
#Res BW 100 kHz #VBW 100 kHz Sweep 4.84 ms (601 pts)



8.2 MAXIMUM PEAK OUTPUT POWER

LIMIT

§ 15.247(b) The maximum peak output power of the intentional radiator shall not exceed the following :

§ 15.247(b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands : 1 watt.

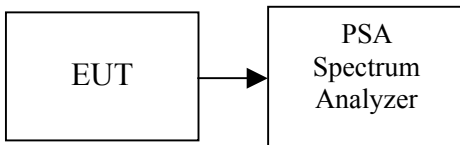
§ 15.247(b) (4) Except as shown in paragraphs (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2), and (b)(3) of this section , as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
PSA Spectrum Analyzer	Agilent	E4446A	US44300399	02/05/2008

Remark: Each piece of equipment is scheduled for calibration once a year.

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output is connected to the Spectrum analyzer. The Spectrum analyzer is set to the peak power detection.



TEST RESULTS

No non-compliance noted

Total peak power calculation formula:

$10 \log (10^{\text{Chain 0 Power} / 10} + 10^{\text{Chain1 Power} / 10})$.

The maximum antenna gain is 1.8dBi for other than fixed, point-to-point operations, therefore the limit is 30 dBm(1W). In the legacy mode, the effective antenna gain is $1.8 + 10 \times \text{Log} (2) = 4.81 \text{ dBi}$.

Test Data

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	19.81	0.09572	1	PASS
Md	2437	20.41	0.10990		PASS
Hgh	2462	17.34	0.05420		PASS

Remark:

1. At finial test to get the worst-case emission at 1Mbps.
2. The cable assembly insertion loss of 1 dB was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

Test mode: IEEE 802.11g

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	16.35	0.04315	1	PASS
Md	2437	20.10	0.10233		PASS
Hgh	2462	14.79	0.03013		PASS

Remark:

1. At finial test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 1 dB was Entered as an offset in the spectrum analyzer to allow for direct reading of power.



Test mode: IEEE 802.11n HT20 mode (Two TX)

Channel	Frequency (MHz)	Output Power (dBm)		Output Power Total(dBm)	Output Power (W)	Limit (W)	Result
		Chain0	Chain1				
Low	2412	16.44	12.99	18.06	0.06396	1	PASS
Md	2437	19.12	18.69	21.92	0.15562		PASS
Hgh	2462	15.54	17.31	19.52	0.08964		PASS

Remark:

1. At final test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 1 dB was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

Test mode: IEEE 802.11n HT40 mode (Two TX)

Channel	Frequency (MHz)	Output Power (dBm)		Output Power Total(dBm)	Output Power (W)	Limit (W)	Result
		Chain0	Chain1				
Low	2422	13.83	15.21	17.58	0.05734	1	PASS
Md	2437	19.49	18.67	22.11	0.16254		PASS
Hgh	2452	14.02	15.36	17.75	0.05959		PASS

Remark:

1. At final test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 1dB was Entered as an offset in the spectrum analyzer to allow for direct reading of power.



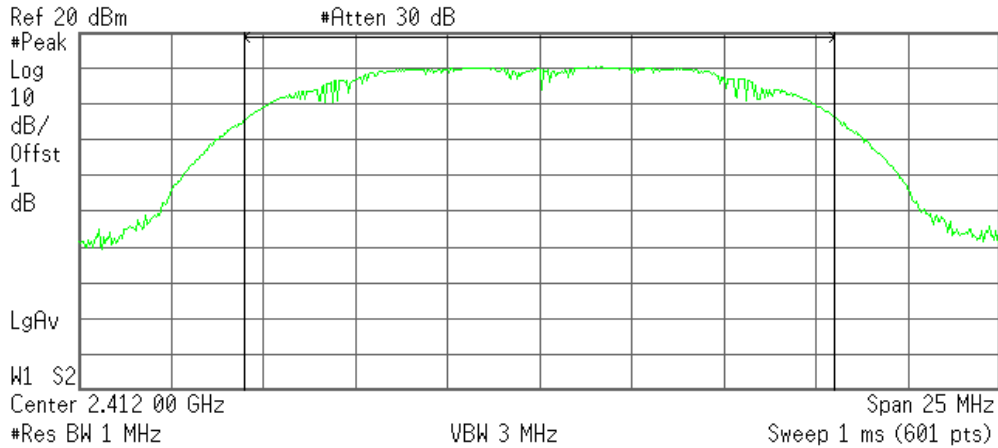
Test Plot

802.11b mode

Peak power (CH Low)

Agilent 05:21:14 Jan 16, 2008

R T



Channel Power

19.81 dBm /16.0000 MHz

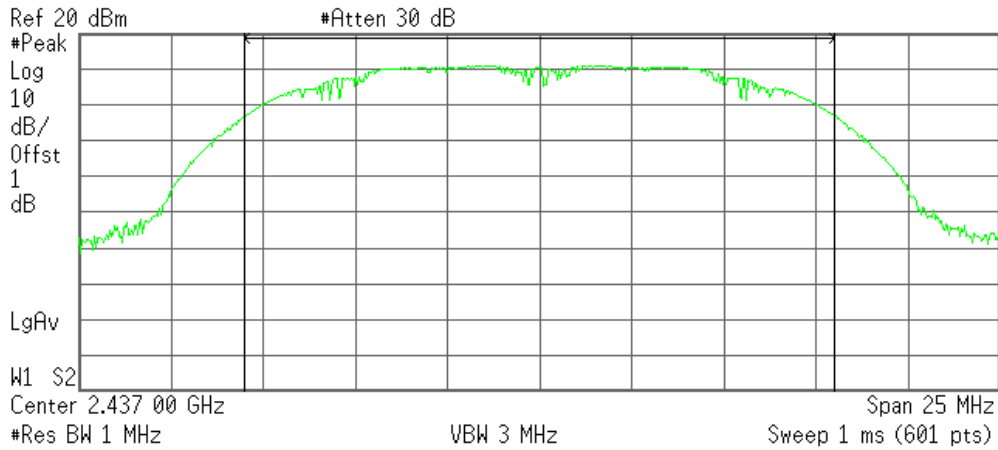
Power Spectral Density

-52.23 dBm/Hz

Peak power (CH Mid)

Agilent 05:20:34 Jan 16, 2008

R T



Channel Power

20.41 dBm /16.0000 MHz

Power Spectral Density

-51.63 dBm/Hz

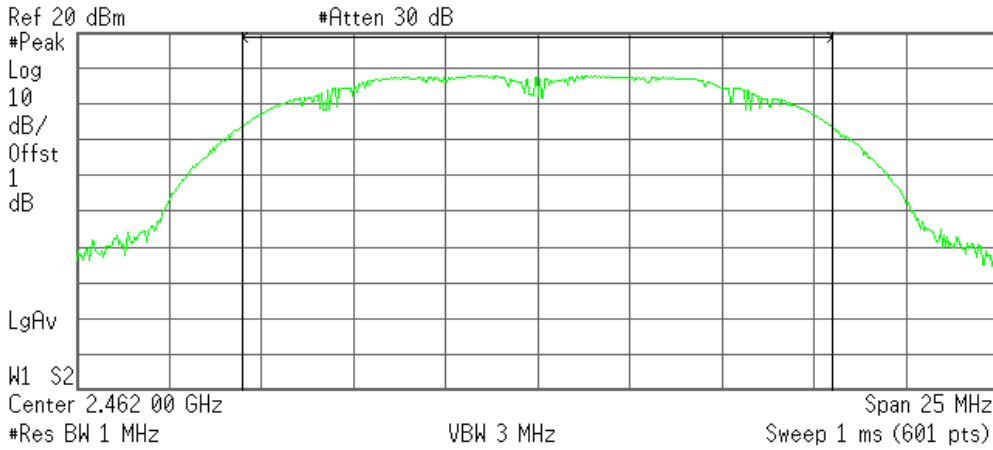


802.11b mode

Peak power (CH High)

Agilent 05:19:42 Jan 16, 2008

R T



Channel Power

17.34 dBm /16.0000 MHz

Power Spectral Density

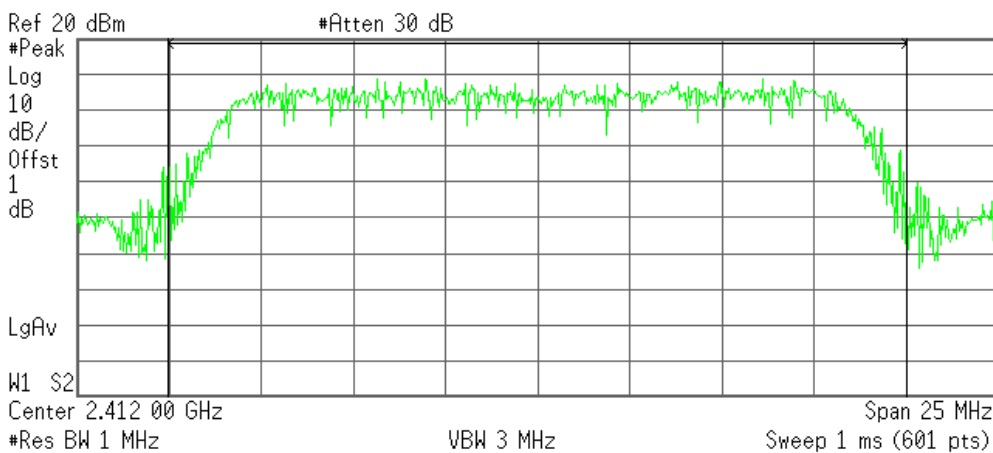
-54.70 dBm/Hz

802.11g mode

Peak power (CH Low)

Agilent 05:24:33 Jan 16, 2008

R T



Channel Power

16.35 dBm /20.0000 MHz

Power Spectral Density

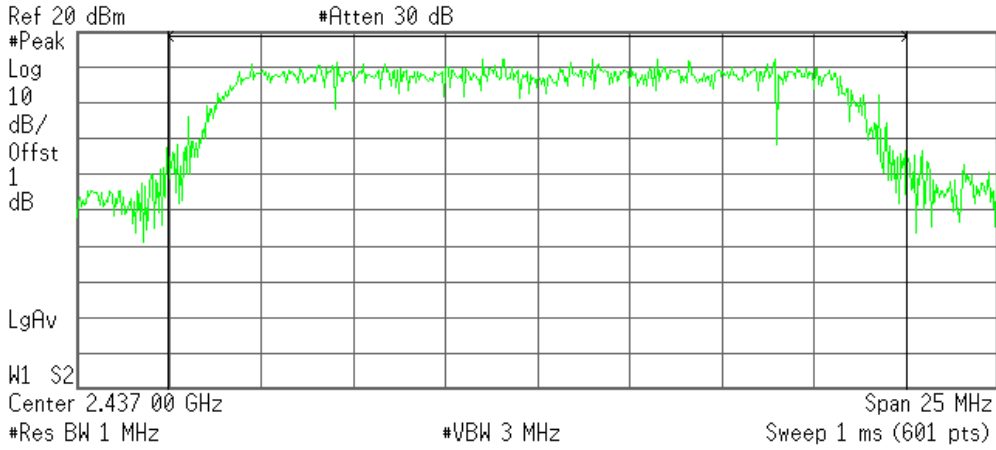
-56.66 dBm/Hz



Peak power (CH Mid)

Agilent 05:23:56 Jan 16, 2008

R T



Channel Power

20.10 dBm /20.0000 MHz

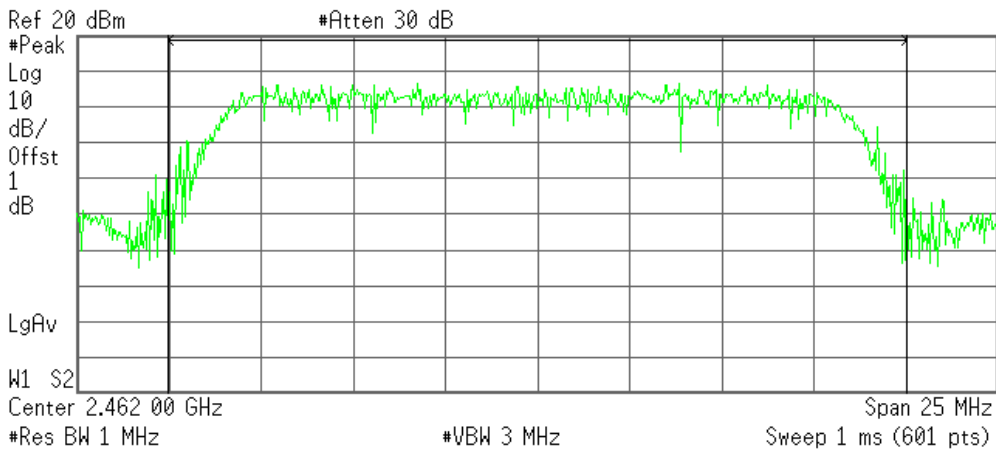
Power Spectral Density

-52.91 dBm/Hz

Peak power (CH High)

Agilent 05:25:26 Jan 16, 2008

R T



Channel Power

14.79 dBm /20.0000 MHz

Power Spectral Density

-58.23 dBm/Hz

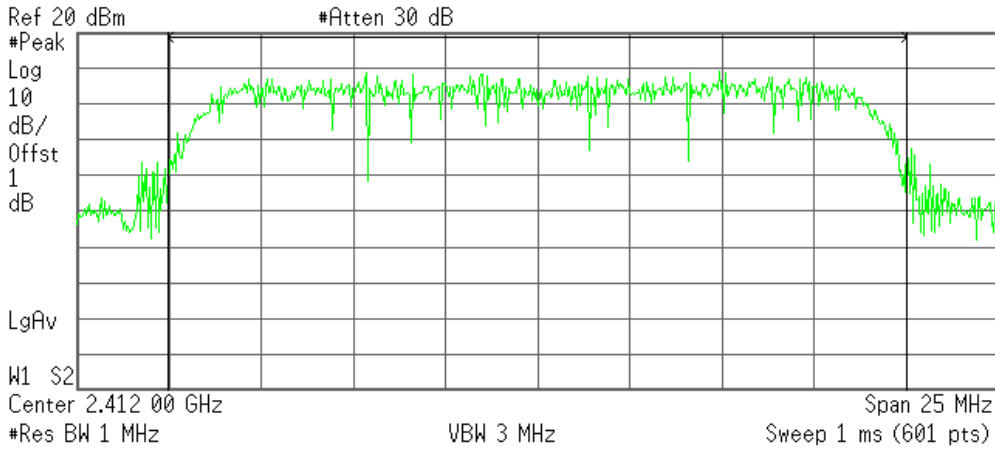


802.11n HT20 Mode – Chain 0

Peak power (CH Low)

Agilent 05:30:06 Jan 16, 2008

R T



Channel Power

16.44 dBm /20.0000 MHz

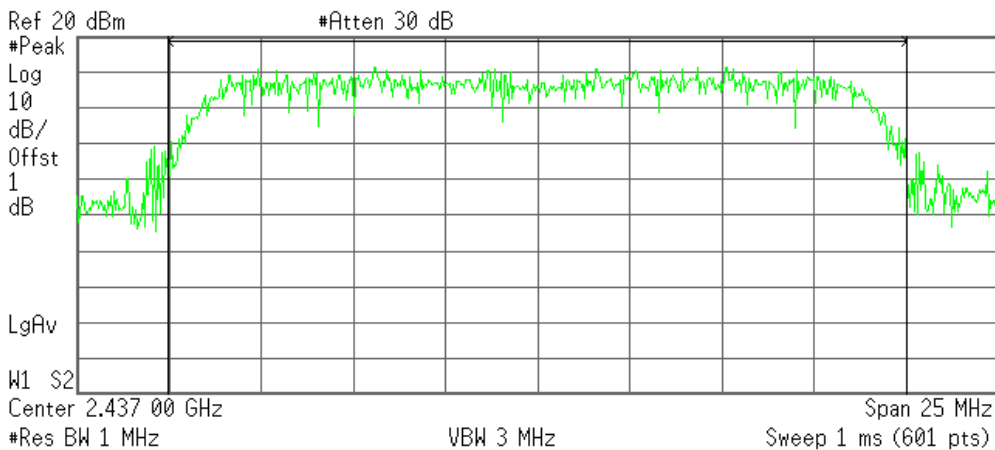
Power Spectral Density

-56.57 dBm/Hz

Peak power (CH Mid)

Agilent 05:29:14 Jan 16, 2008

R T



Channel Power

19.12 dBm /20.0000 MHz

Power Spectral Density

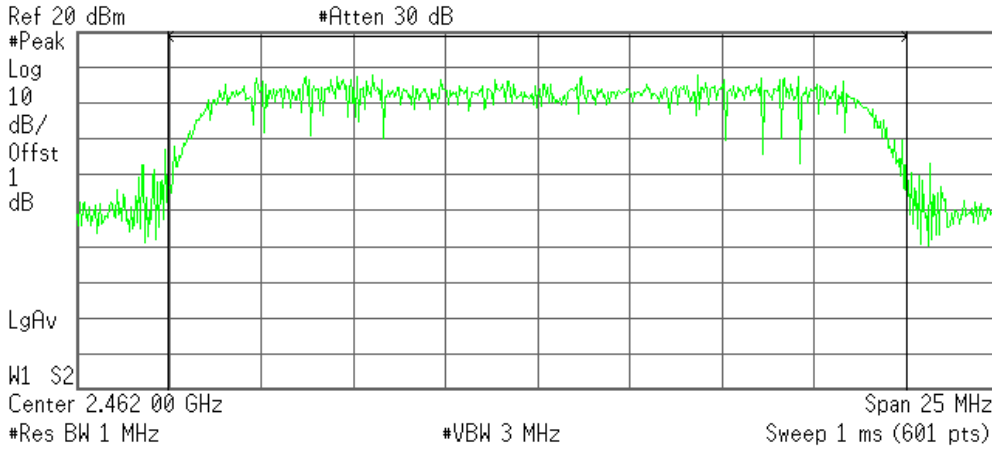
-53.89 dBm/Hz



Peak power (CH High)

Agilent 05:28:11 Jan 16, 2008

R T



Channel Power

15.54 dBm /20.0000 MHz

Power Spectral Density

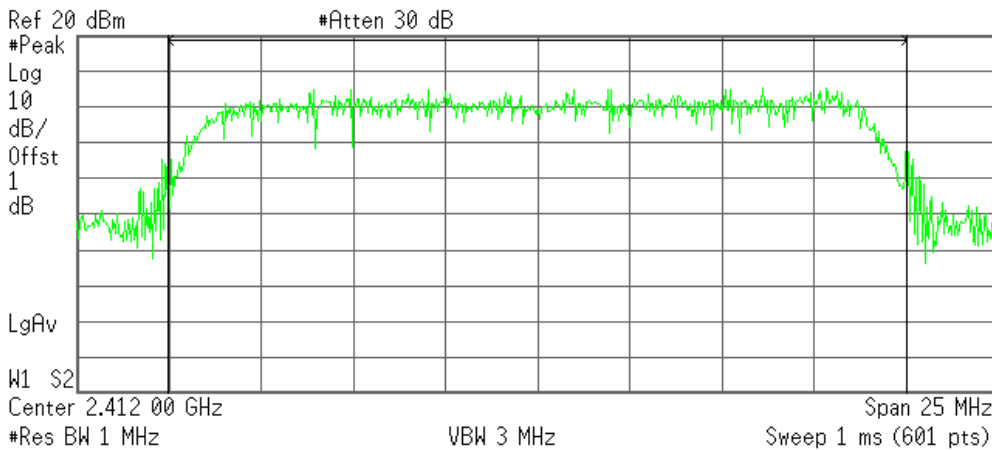
-57.47 dBm/Hz

802.11n HT20 Mode – Chain 1

Peak power (CH Low)

Agilent 05:41:33 Jan 16, 2008

R T



Channel Power

12.99 dBm /20.0000 MHz

Power Spectral Density

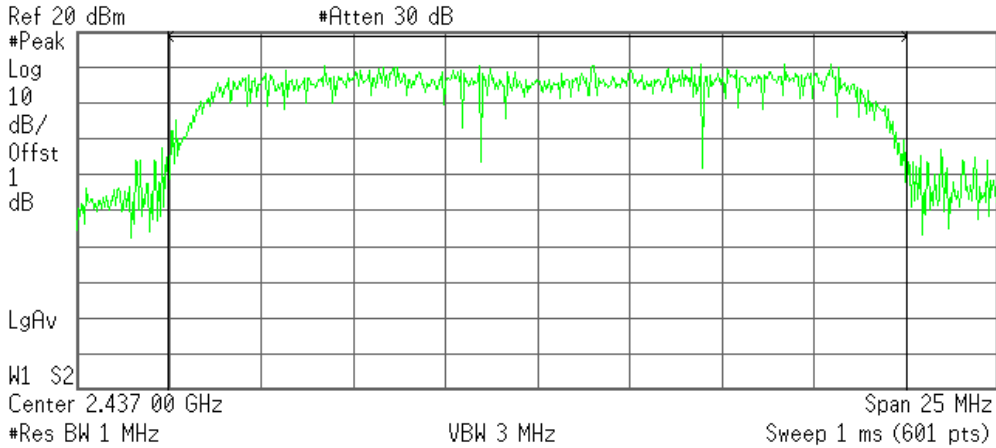
-60.02 dBm/Hz



Peak power (CH Mid)

Agilent 05:42:20 Jan 16, 2008

R T



Channel Power

18.69 dBm /20.0000 MHz

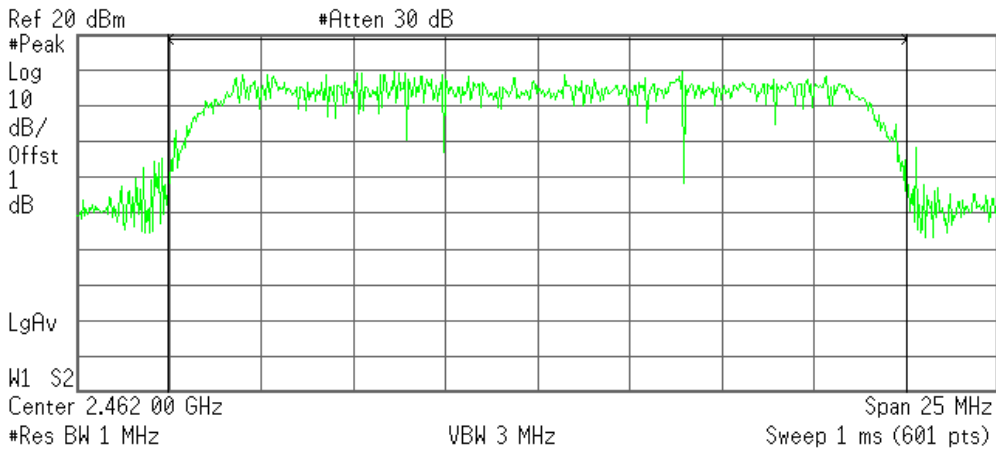
Power Spectral Density

-54.32 dBm/Hz

Peak power (CH High)

Agilent 05:43:10 Jan 16, 2008

R T



Channel Power

17.31 dBm /20.0000 MHz

Power Spectral Density

-55.70 dBm/Hz

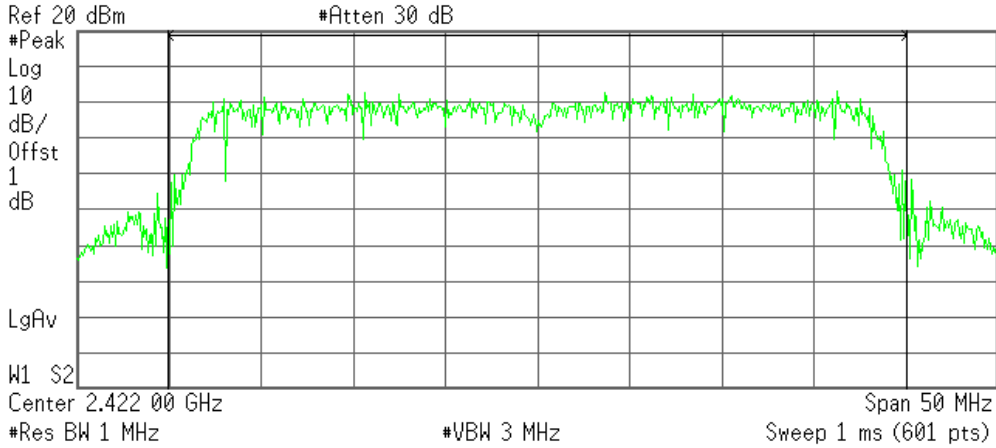


802.11n HT40 Mode – Chain 0

Peak power (CH Low)

Agilent 05:34:10 Jan 16, 2008

R T



Channel Power

13.83 dBm /40.0000 MHz

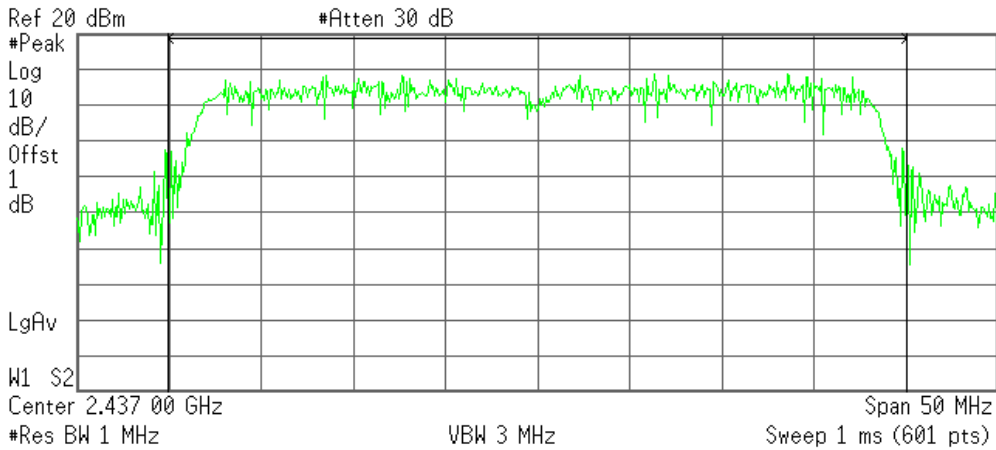
Power Spectral Density

-62.19 dBm/Hz

Peak power (CH Mid)

Agilent 05:35:13 Jan 16, 2008

R T



Channel Power

19.49 dBm /40.0000 MHz

Power Spectral Density

-56.53 dBm/Hz

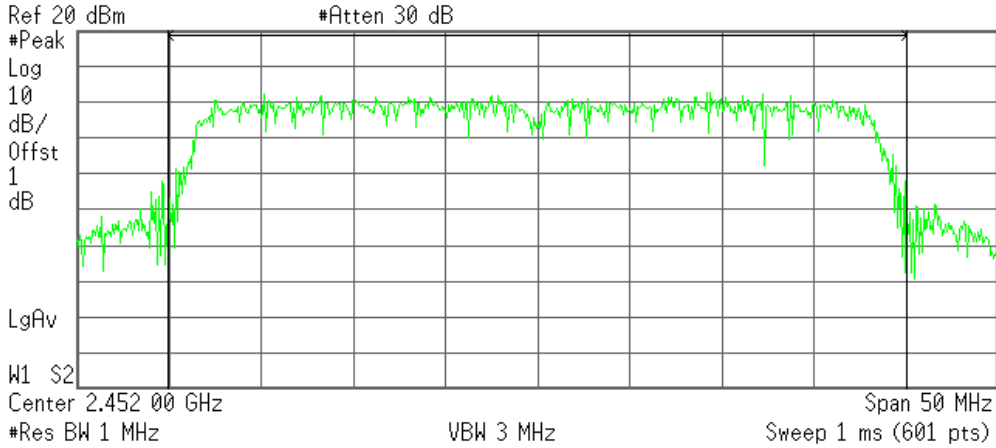


802.11n HT40 Mode – Chain 0

Peak power (CH High)

Agilent 05:36:17 Jan 16, 2008

R T



Channel Power

14.02 dBm /40.0000 MHz

Power Spectral Density

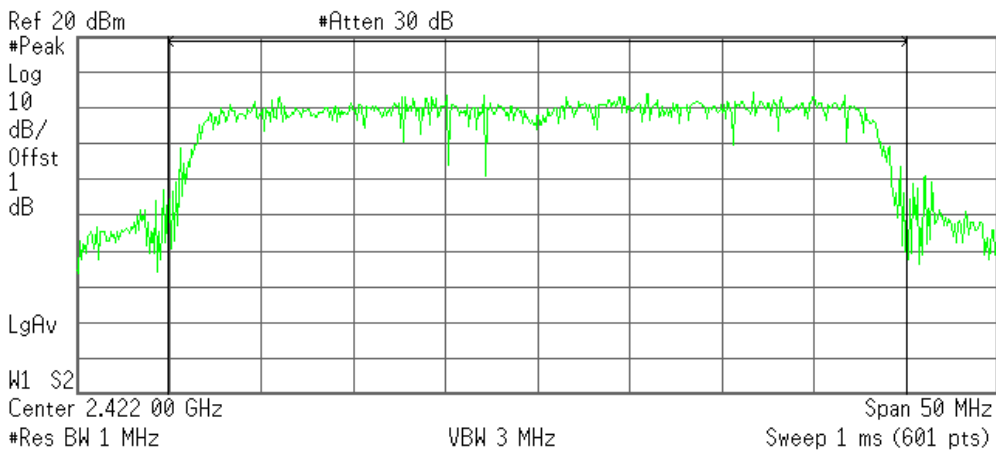
-62.00 dBm/Hz

802.11n HT40 Mode – Chain 1

Peak power (CH Low)

Agilent 05:40:14 Jan 16, 2008

R T



Channel Power

15.21 dBm /40.0000 MHz

Power Spectral Density

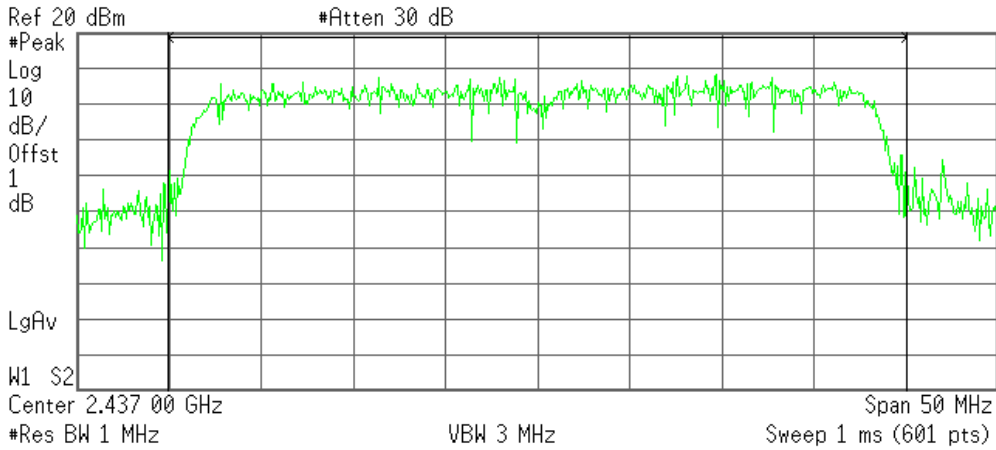
-60.81 dBm/Hz



Peak power (CH Mid)

Agilent 05:39:11 Jan 16, 2008

R T



Channel Power

18.67 dBm /40.0000 MHz

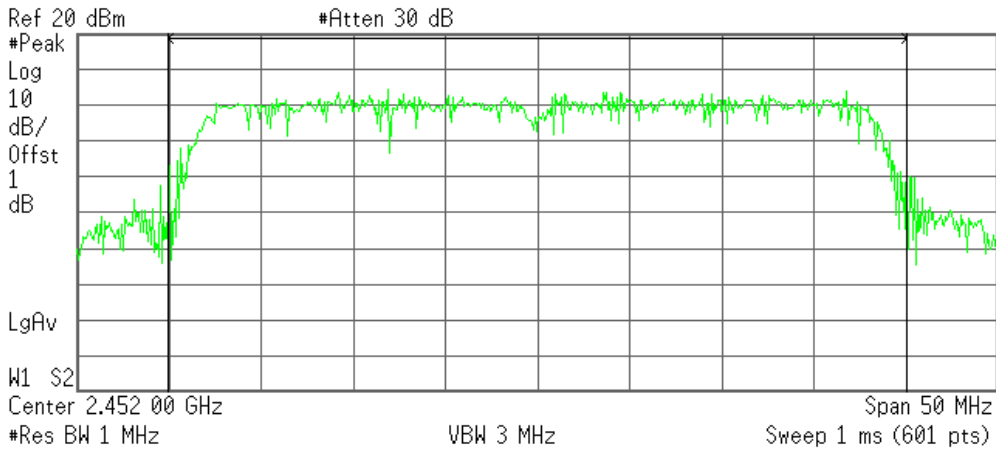
Power Spectral Density

-57.35 dBm/Hz

Peak power (CH High)

Agilent 05:37:55 Jan 16, 2008

R T



Channel Power

15.36 dBm /40.0000 MHz

Power Spectral Density

-60.66 dBm/Hz

8.3 POWER SPECTRAL DENSITY

LIMIT

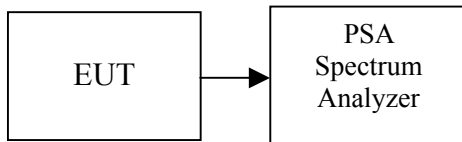
§ 15.247(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
PSA Spectrum Analyzer	Agilent	E4446A	US44300399	02/05/2008
Power Splitter	Mini-Circuits	ZN2PD-9G	SF078500430	07/30/2008

Remark: Each piece of equipment is scheduled for calibration once a year.

TEST CONFIGURATION



Combiner mode



TEST PROCEDURE

- Place the EUT on the table and set it in transmitting mode.
Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, Span = 300kHz, Sweep=100s
- Record the max. reading.
- Repeat the above procedure until the measurements for all frequencies are completed.



TEST RESULTS

No non-compliance noted

Total power spectral density calculation formula:
 $10 \log (10^{\text{Chain 0 PPSD}} / 10) + 10^{\text{Chain 1 PPSD}} / 10$

IEEE 802.11b Mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-17.59	8.00	PASS
Mid	2437	-16.62		PASS
High	2462	-18.08		PASS

Remark:

1. At final test to get the worst-case emission at 1Mbps.
2. The cable assembly insertion loss of 1.05 dB Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11g Mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-17.46	8.00	PASS
Mid	2437	-13.54		PASS
High	2462	-18.64		PASS

Remark:

1. At final test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 1.05 dB Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11n HT20 mode (Two TX)

Channel	Frequency (MHz)	PPSD		PPSD Total (dBm)	Limit (dBm)	Result
		Chain 0	Chain 1			
Low	2412	-18.55	-22.54	-17.09	8.00	PASS
Mid	2437	-13.81	-16.62	-11.98		PASS
High	2462	-17.90	-18.28	-15.08		PASS

Remark:

1. At final test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 1.05dB Entered as an offset in the spectrum analyzer to allow for direct reading of power.

**IEEE 802.11n HT40 mode (Two TX)**

Channel	Frequency (MHz)	PPSD		PPSD Total (dBm)	Limit (dBm)	Result
		Chain 0	Chain 1			
Low	2422	-20.73	-21.40	-18.04	8.00	PASS
Mid	2437	-14.65	-17.97	-12.99		PASS
High	2452	-20.43	-21.62	-17.97		PASS

Remark:

1. At final test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 1.05dB Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11b Combined mode (Two TX)

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-23.18	8.00	PASS
Mid	2437	-16.60		PASS
High	2462	-8.68		PASS

Remark:

1. At final test to get the worst-case emission at 1Mbps.
2. The cable assembly insertion loss of 4.5 dB Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11g Combined mode (Two TX)

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-17.92	8.00	PASS
Mid	2437	-14.48		PASS
High	2462	-19.41		PASS

Remark:

1. At final test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 4.5 dB Entered as an offset in the spectrum analyzer to allow for direct reading of power.



IEEE 802.11n HT20 Combined mode (Two TX)

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-20.10	8.00	PASS
Mid	2437	-15.00		PASS
High	2462	-19.59		PASS

Remark:

1. At final test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 4.5dB Entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11n HT40 Combined mode (Two TX)

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2422	-34.49	8.00	PASS
Mid	2437	-14.94		PASS
High	2452	-22.49		PASS

Remark:

1. At final test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 4.5dB Entered as an offset in the spectrum analyzer to allow for direct reading of power.



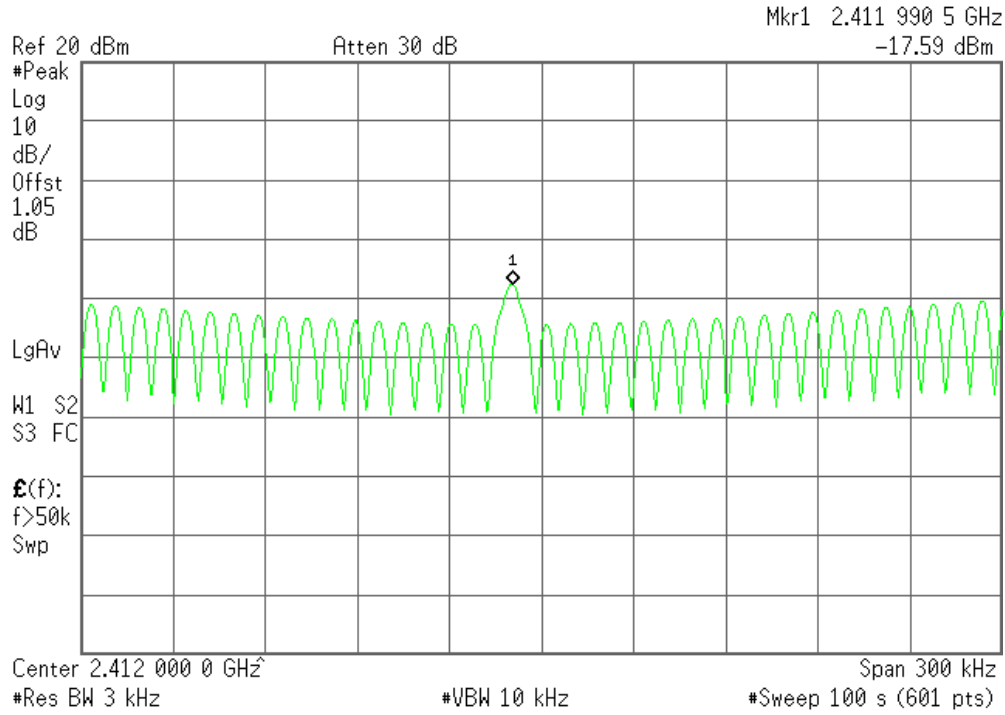
Test Plot

802.11b mode

PPSD (CH Low)

Agilent 08:48:40 Jan 16, 2008

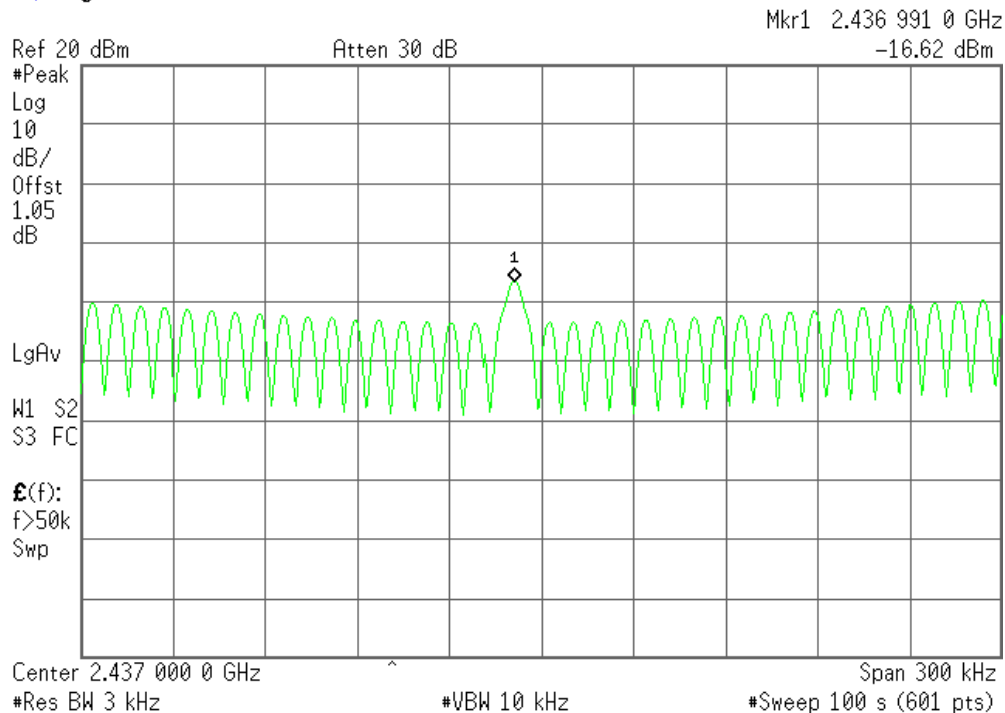
R



PPSD (CH Mid)

Agilent 08:51:14 Jan 16, 2008

R





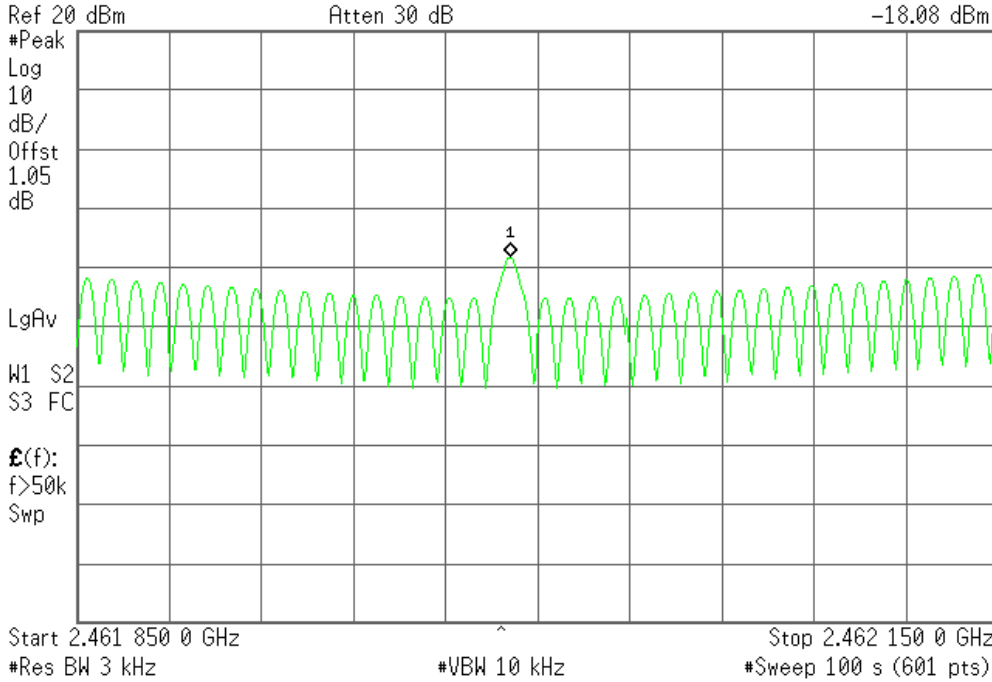
PPSD (CH High)

Agilent 08:54:13 Jan 16, 2008

R T

Mkr1 2.461 991 0 GHz

-18.08 dBm



802.11g mode

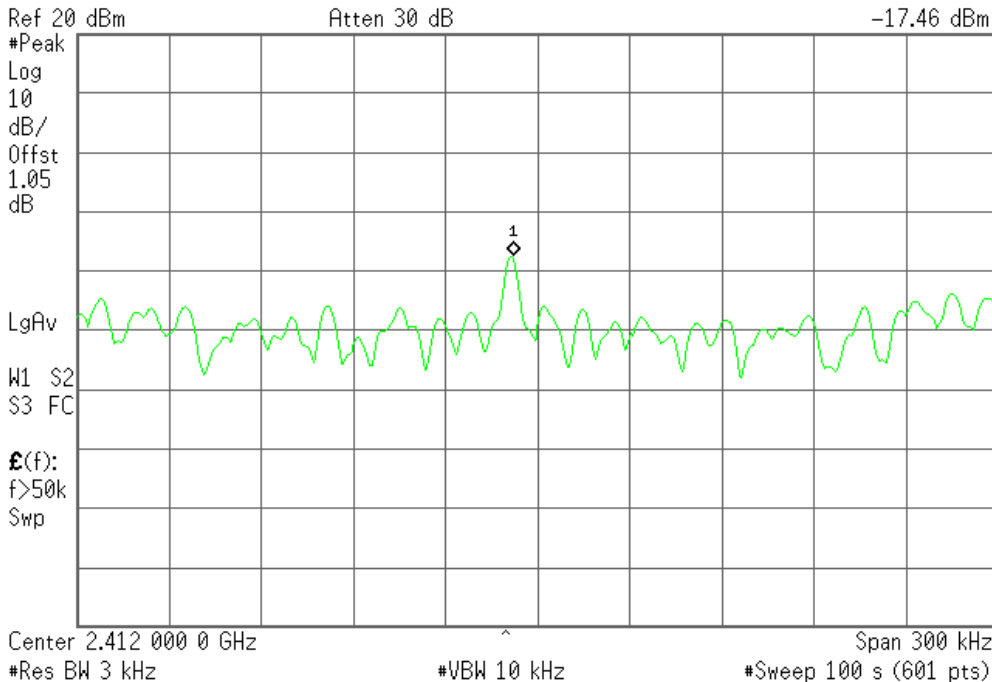
PPSD (CH Low)

Agilent 09:09:09 Jan 16, 2008

R

Mkr1 2.411 992 0 GHz

-17.46 dBm



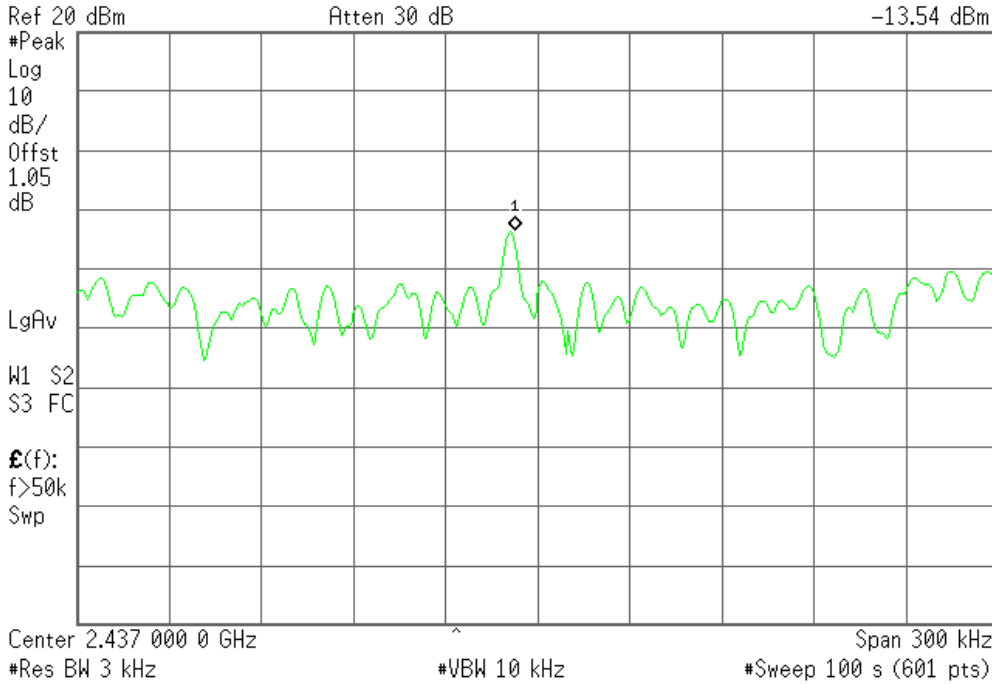


PPSD (CH Mid)

Agilent 09:02:17 Jan 16, 2008

R

Mkr1 2.436 992 5 GHz
-13.54 dBm

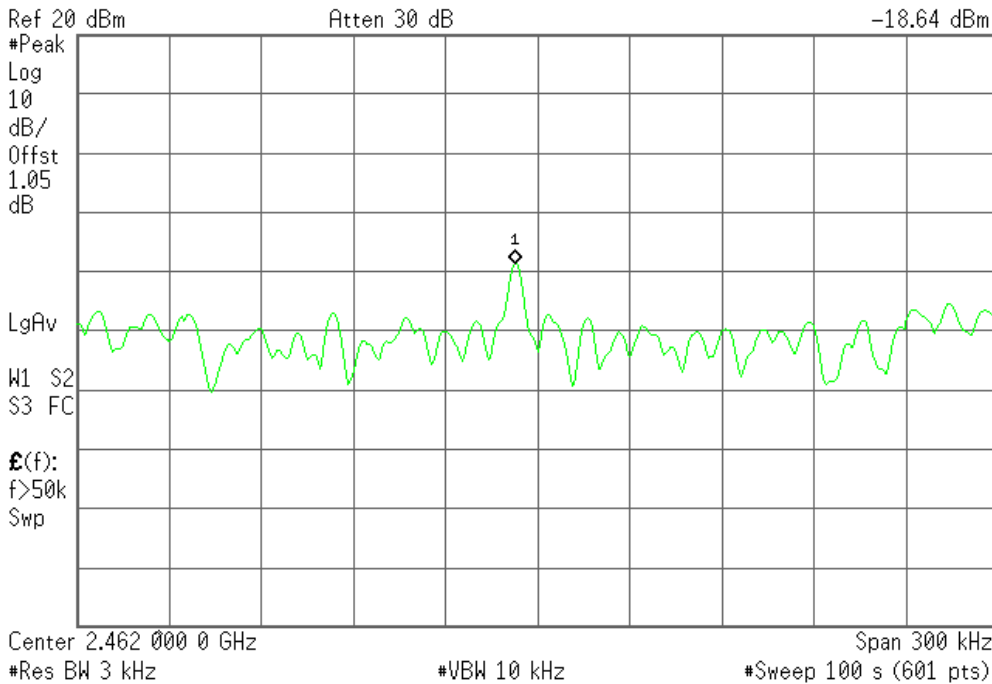


PPSD (CH High)

Agilent 09:06:00 Jan 16, 2008

R T

Mkr1 2.461 992 5 GHz
-18.64 dBm





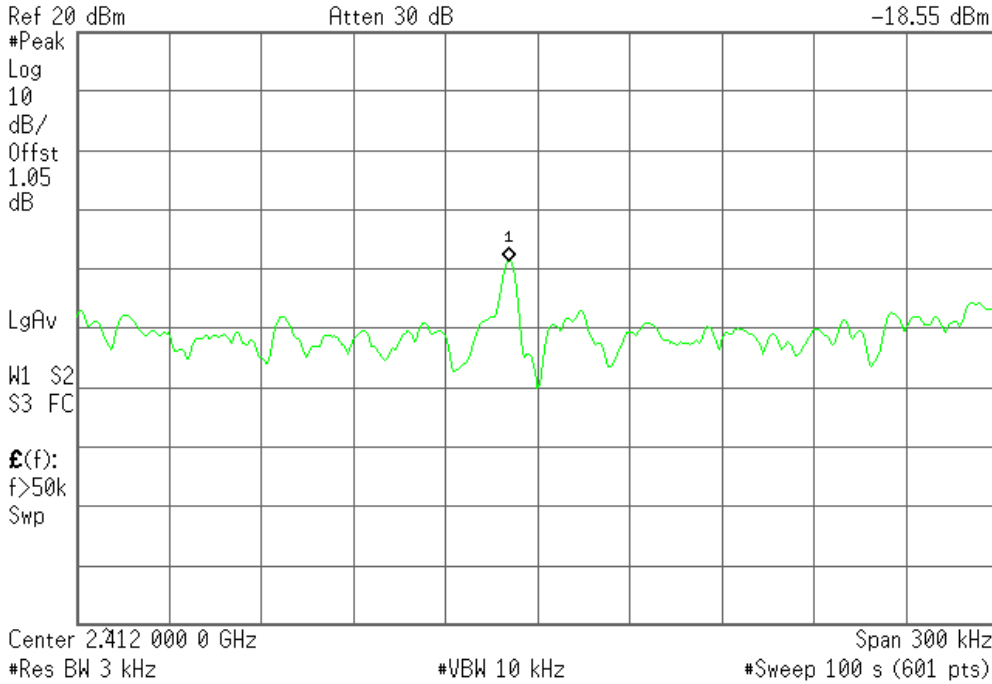
802.11n HT20 Mode-Chain 0

PPSD (CH Low)

Agilent 09:18:16 Jan 16, 2008

R T

Mkr1 2.411 990 5 GHz
-18.55 dBm

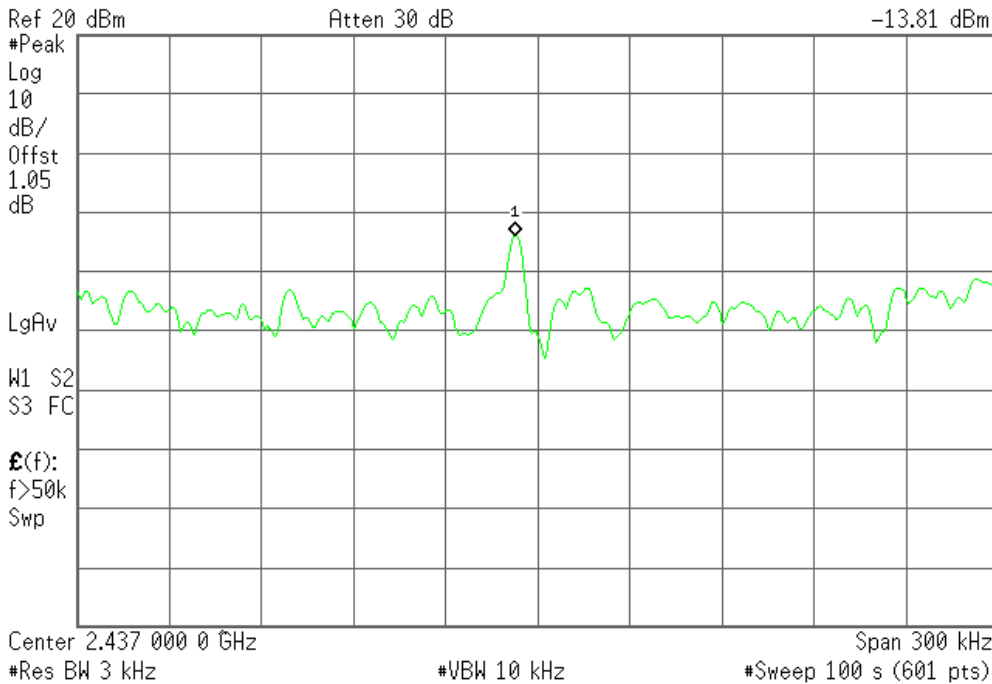


PPSD (CH Mid)

Agilent 09:24:24 Jan 16, 2008

R T

Mkr1 2.436 992 5 GHz
-13.81 dBm



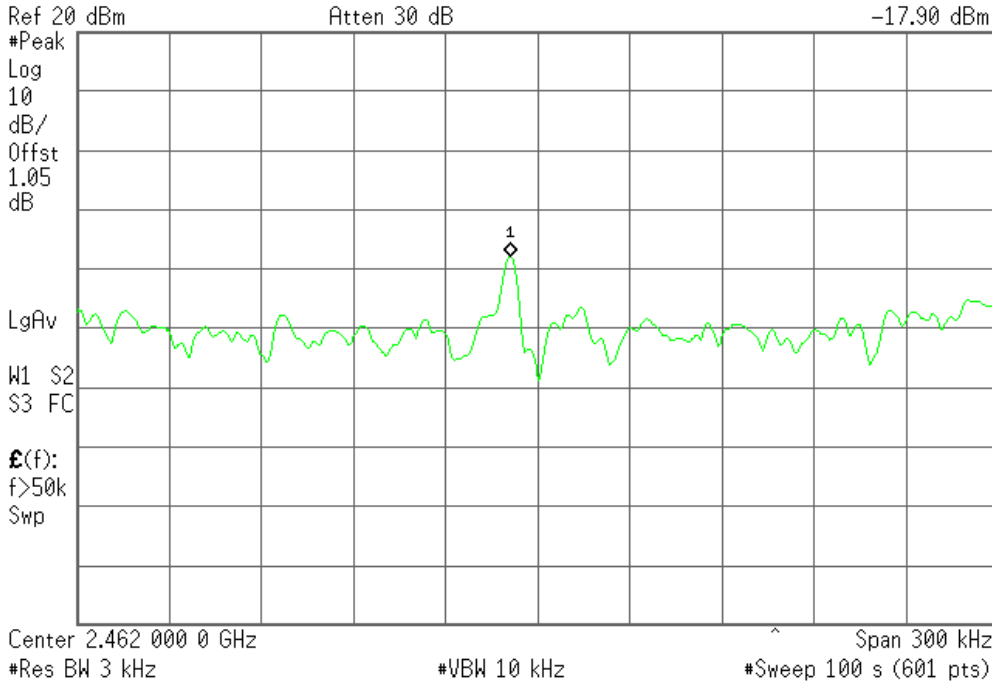


PPSD (CH High)

Agilent 09:27:56 Jan 16, 2008

R T

Mkr1 2.461 991 0 GHz
-17.90 dBm



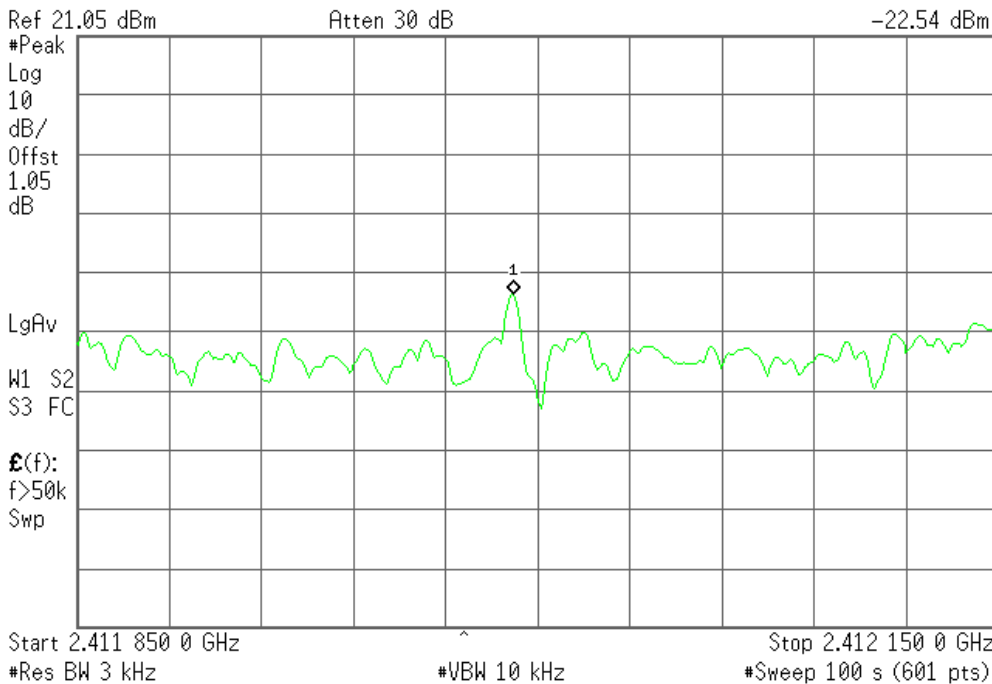
802.11n HT20 Mode-Chain 1

PPSD (CH Low)

Agilent 11:16:25 Jan 16, 2008

R

Mkr1 2.411 992 0 GHz
-22.54 dBm



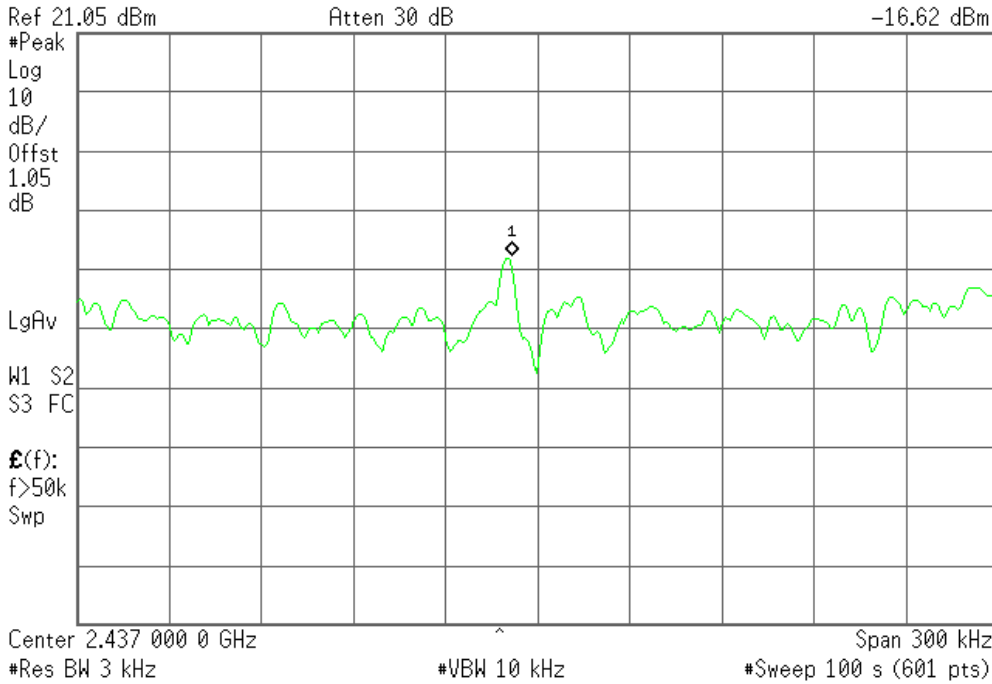


PPSD (CH Mid)

Agilent 11:19:13 Jan 16, 2008

R

Mkr1 2.436 991 5 GHz
-16.62 dBm

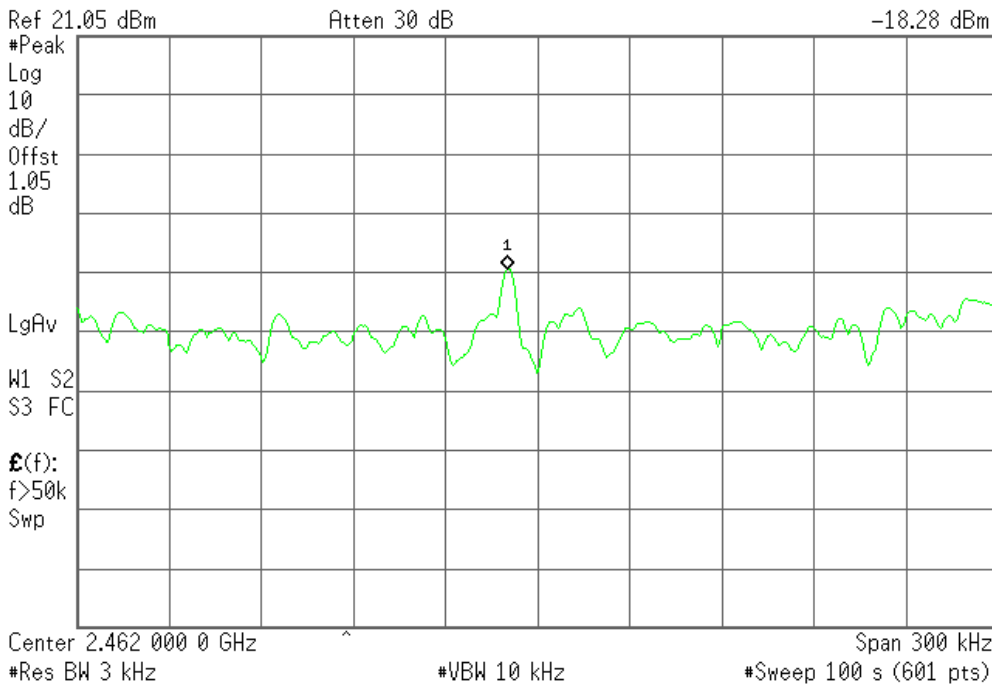


PPSD (CH High)

Agilent 11:29:08 Jan 16, 2008

R

Mkr1 2.461 990 0 GHz
-18.28 dBm





802.11n HT40 Mode-Chain 0

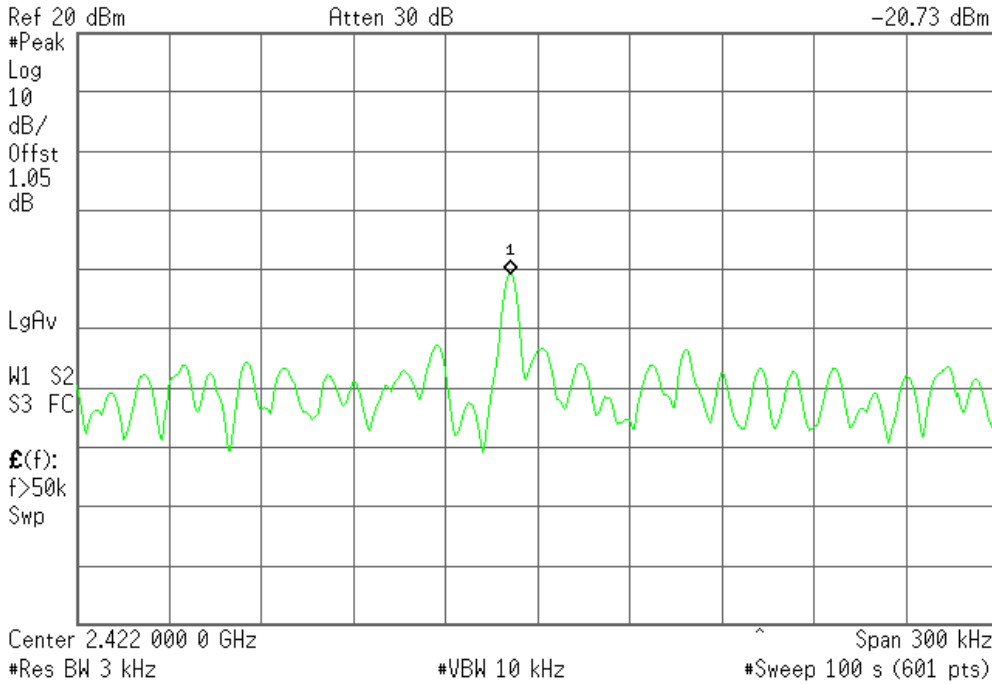
PPSD (CH Low)

Agilent 09:40:34 Jan 16, 2008

R T

Mkr1 2.421 991 0 GHz

-20.73 dBm



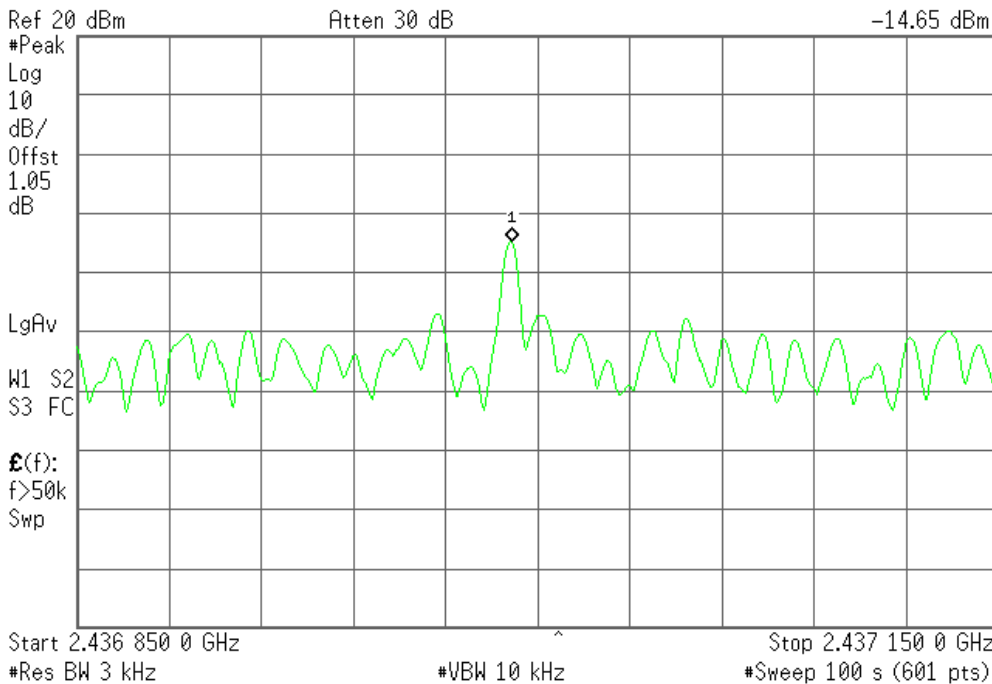
PPSD (CH Mid)

Agilent 09:34:22 Jan 16, 2008

R T

Mkr1 2.436 991 5 GHz

-14.65 dBm





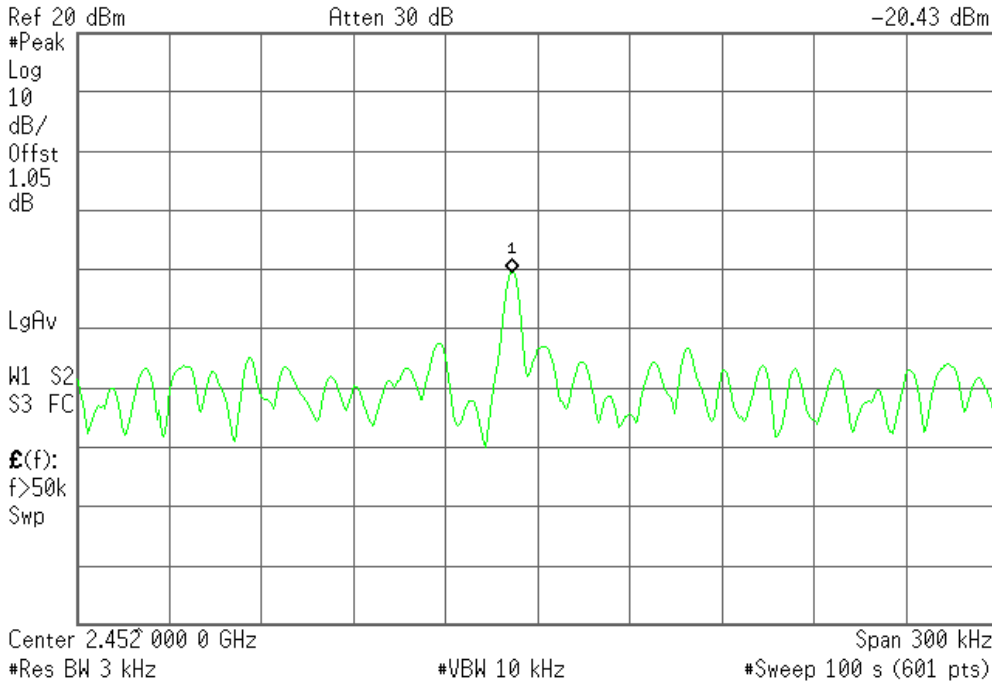
PPSD (CH High)

Agilent 09:37:02 Jan 16, 2008

R T

Mkr1 2.451 991 5 GHz

-20.43 dBm



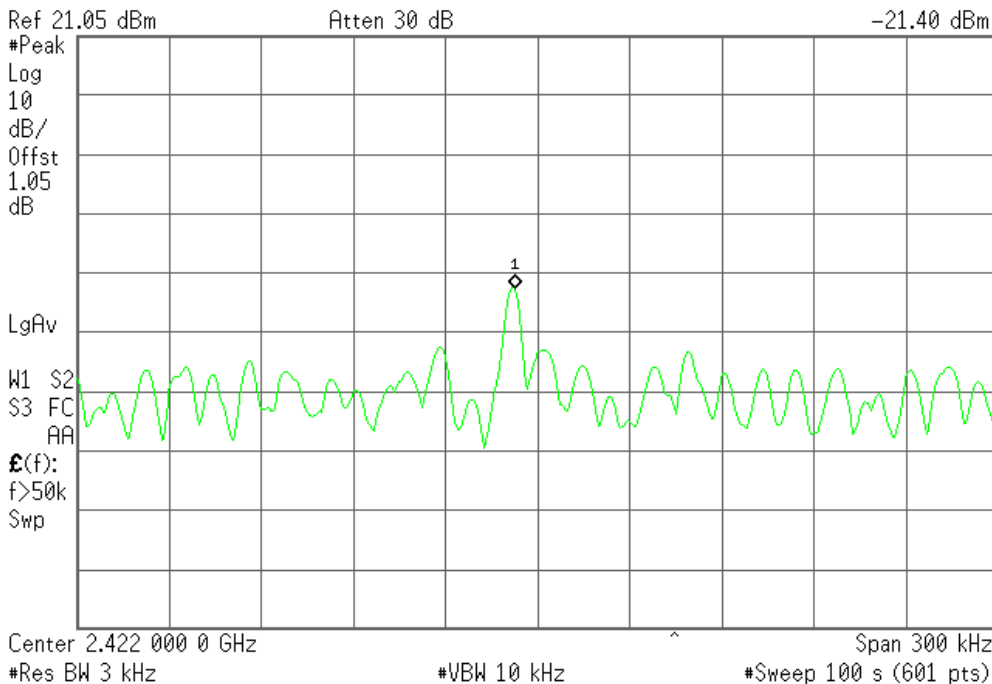
802.11n HT40 Mode-Chain 1

PPSD (CH Low)

Agilent 11:07:43 Jan 16, 2008

Mkr1 2.421 992 5 GHz

-21.40 dBm



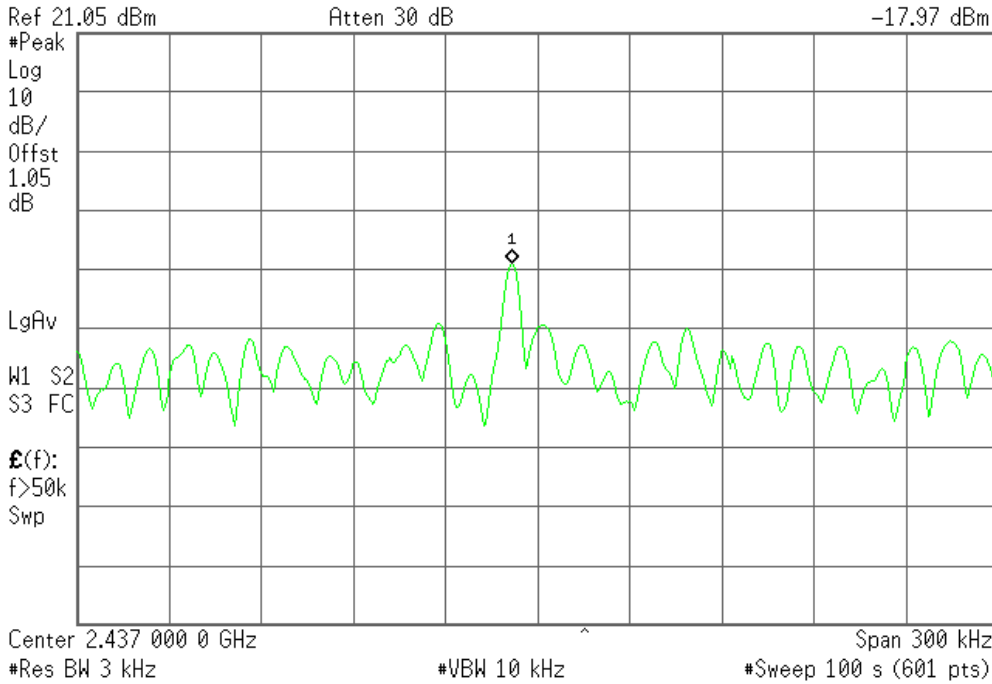


PPSD (CH Mid)

Agilent 11:10:04 Jan 16, 2008

R

Mkr1 2.436 991 5 GHz
-17.97 dBm

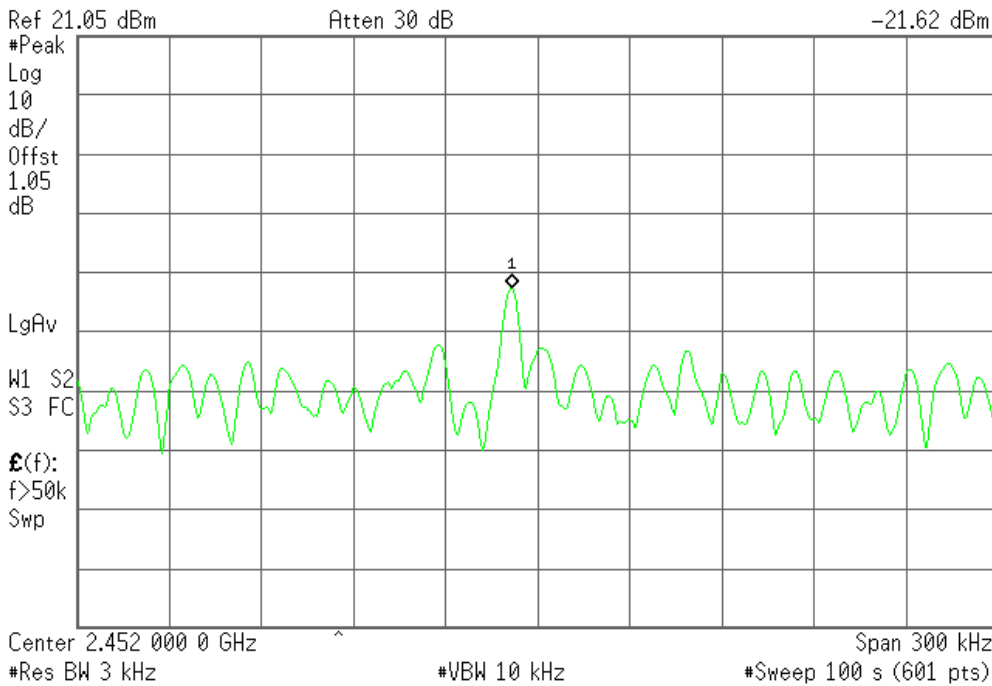


PPSD (CH High)

Agilent 11:12:42 Jan 16, 2008

R T

Mkr1 2.451 991 5 GHz
-21.62 dBm





IEEE 802.11b Combined mode (Two TX)

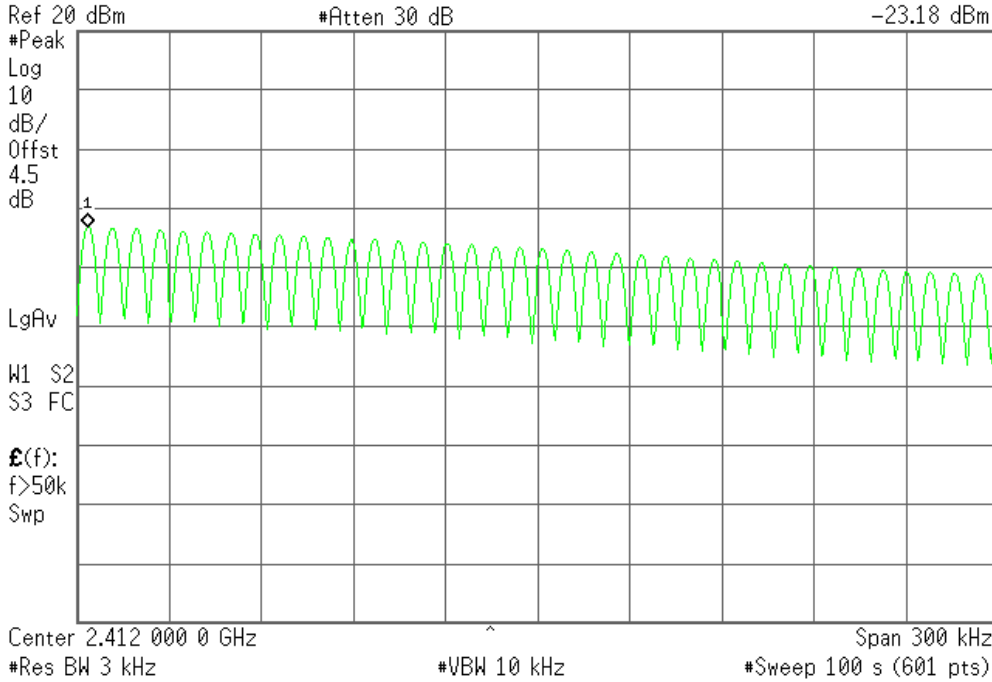
PPSD (CH Low)

Agilent 15:17:28 May 5, 2008

R T

Mkr1 2.411 852 4 GHz

-23.18 dBm



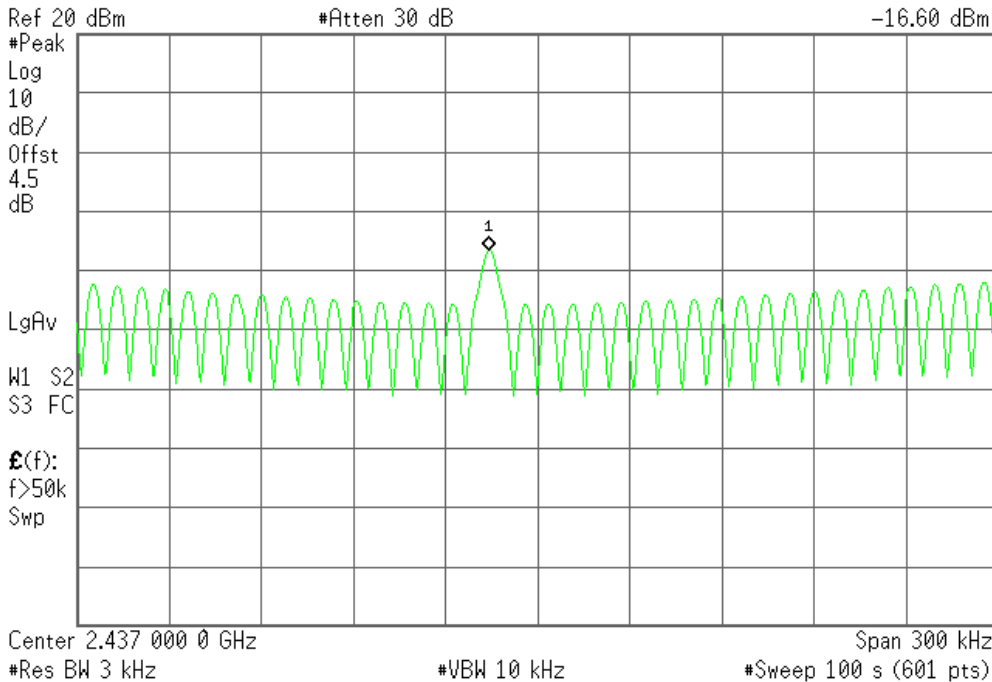
PPSD (CH Mid)

Agilent 15:07:28 May 5, 2008

R T

Mkr1 2.436 983 9 GHz

-16.60 dBm





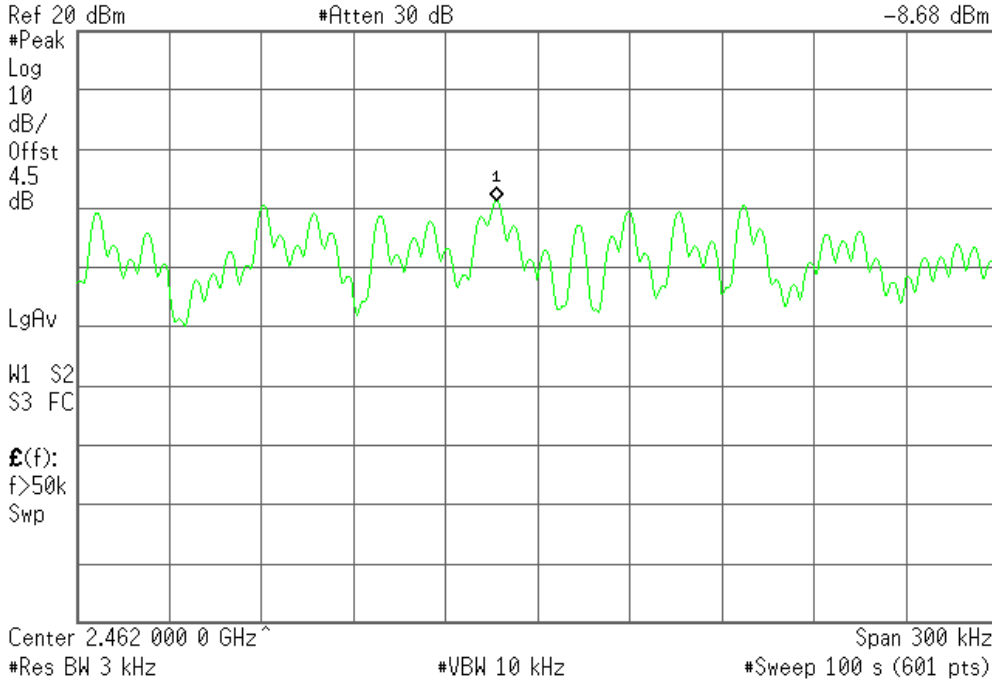
PPSD (CH High)

Agilent 15:12:09 May 5, 2008

R T

Mkr1 2.461 986 4 GHz

-8.68 dBm



IEEE 802.11g Combined mode (Two TX)

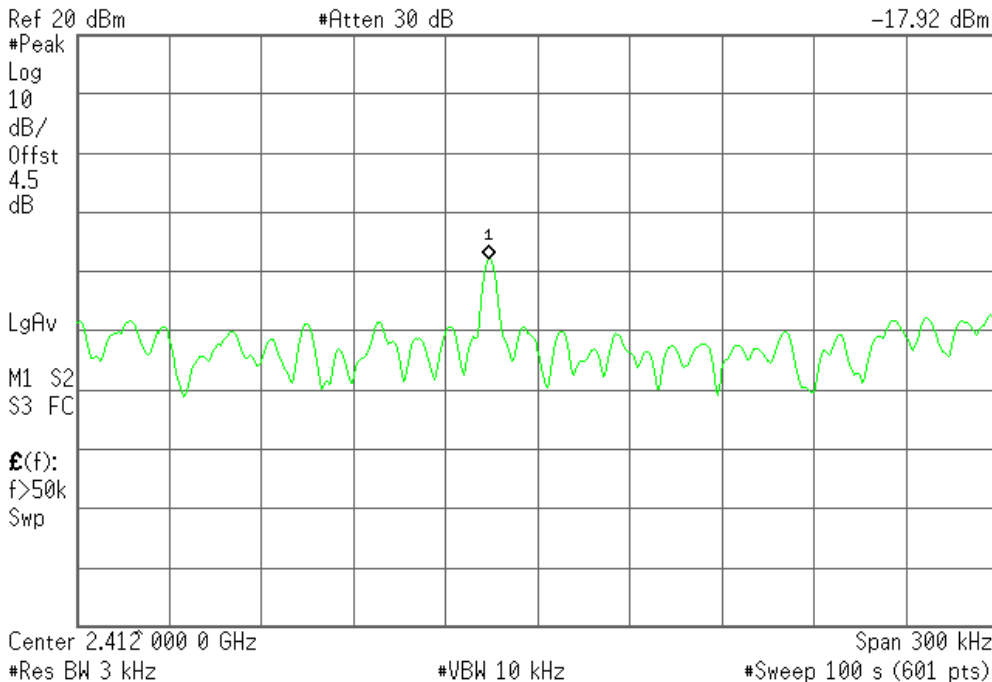
PPSD (CH Low)

Agilent 15:17:21 May 5, 2008

R T

Mkr1 2.411 983 9 GHz

-17.92 dBm





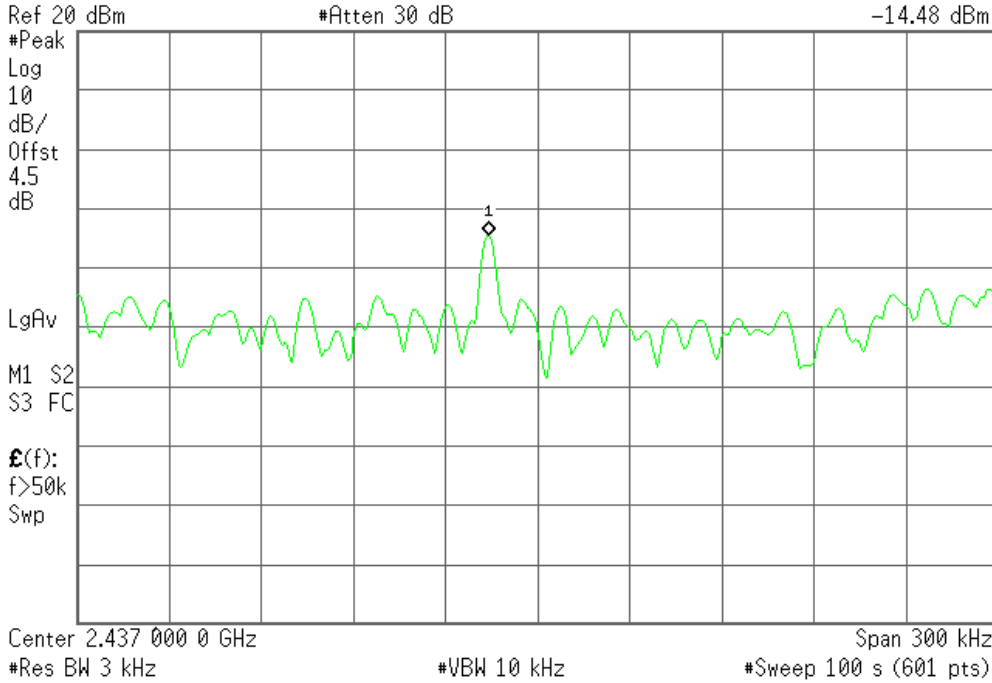
PPSD (CH Mid)

Agilent 15:19:56 May 5, 2008

R T

Mkr1 2.436 983 9 GHz

-14.48 dBm



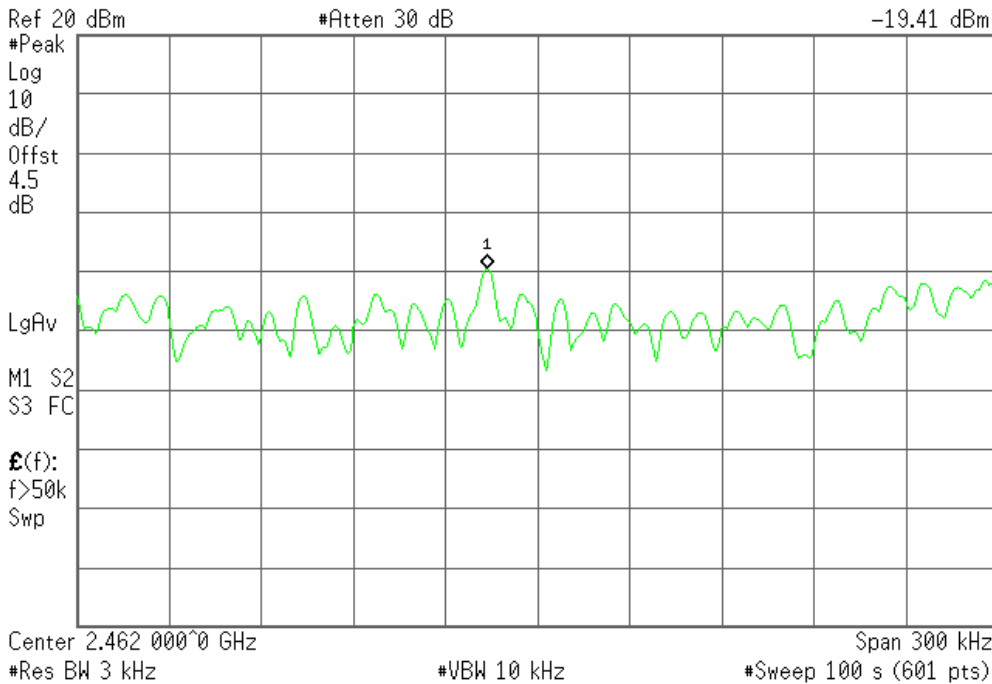
PPSD (CH High)

Agilent 15:22:42 May 5, 2008

R T

Mkr1 2.461 983 4 GHz

-19.41 dBm





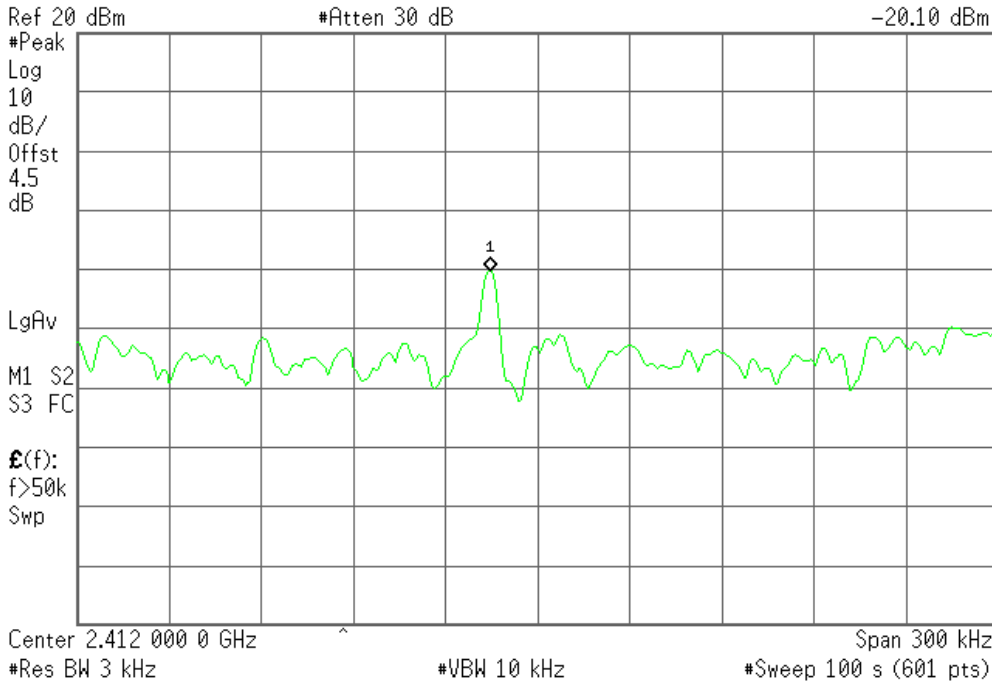
IEEE 802.11n HT20 Combined mode (Two TX)

PPSD (CH Low)

Agilent 15:25:54 May 5, 2008

R T

Mkr1 2.411 984 4 GHz
-20.10 dBm

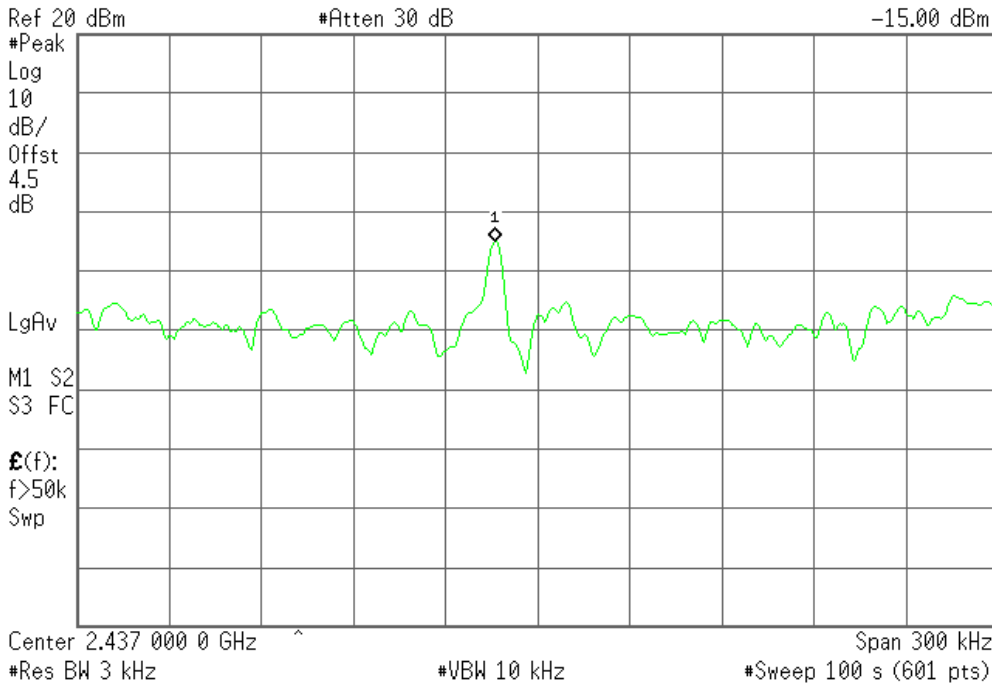


PPSD (CH Mid)

Agilent 15:32:26 May 5, 2008

R T

Mkr1 2.436 985 9 GHz
-15.00 dBm



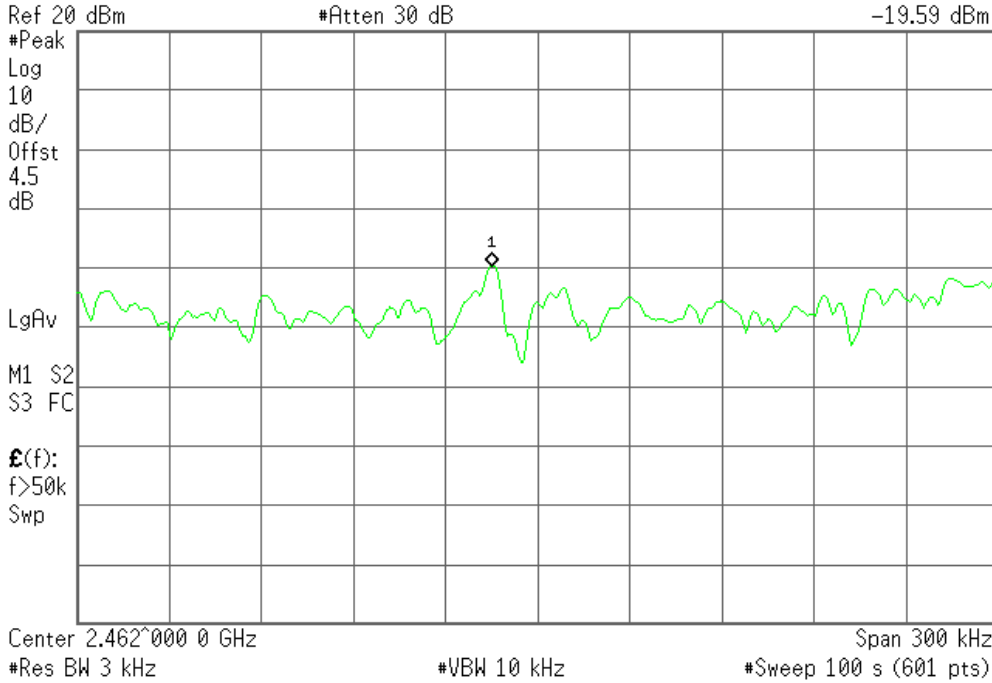


PPSD (CH High)

Agilent 15:35:40 May 5, 2008

R T

Mkr1 2.461 984 9 GHz
-19.59 dBm



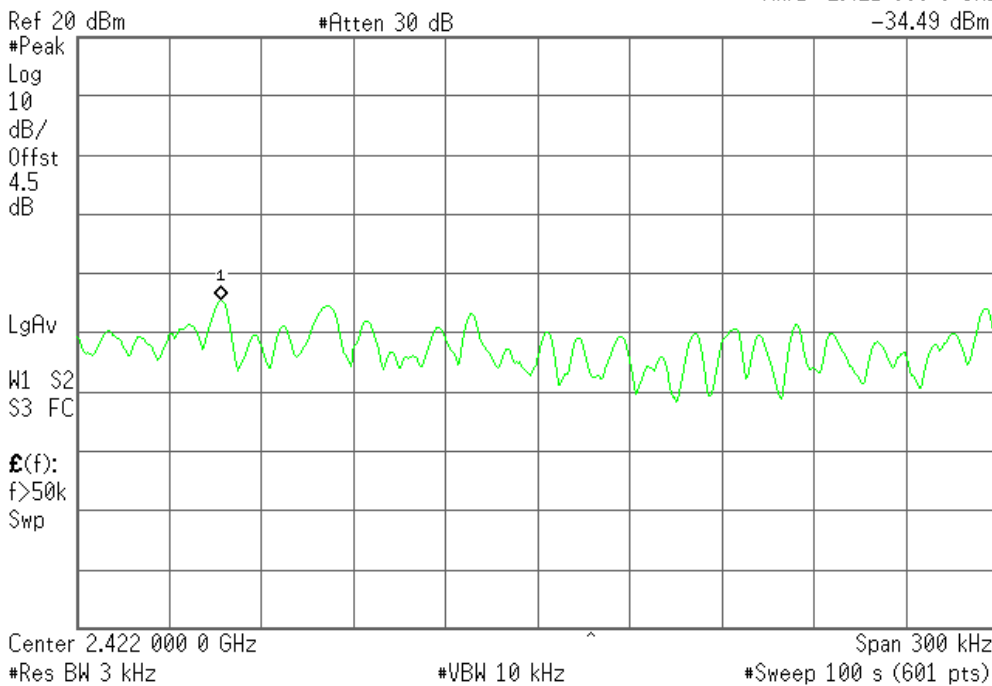
IEEE 802.11n HT40 Combined mode (Two TX)

PPSD (CH Low)

Agilent 16:13:44 May 5, 2008

R T

Mkr1 2.421 896 9 GHz
-34.49 dBm





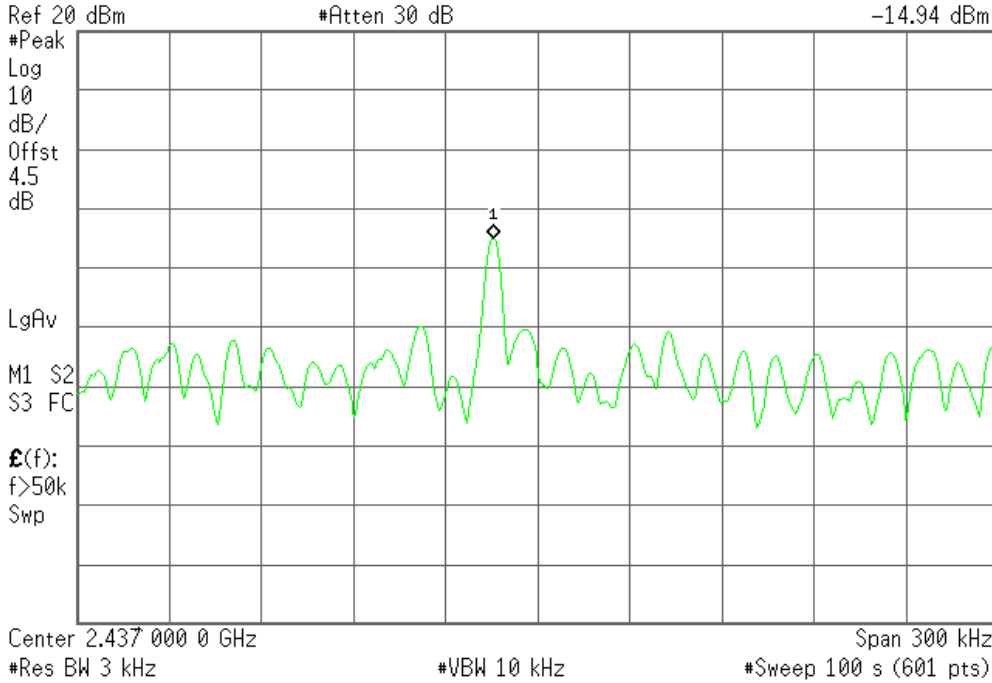
PPSD (CH Mid)

Agilent 16:03:52 May 5, 2008

R T

Mkr1 2.436 985 4 GHz

-14.94 dBm



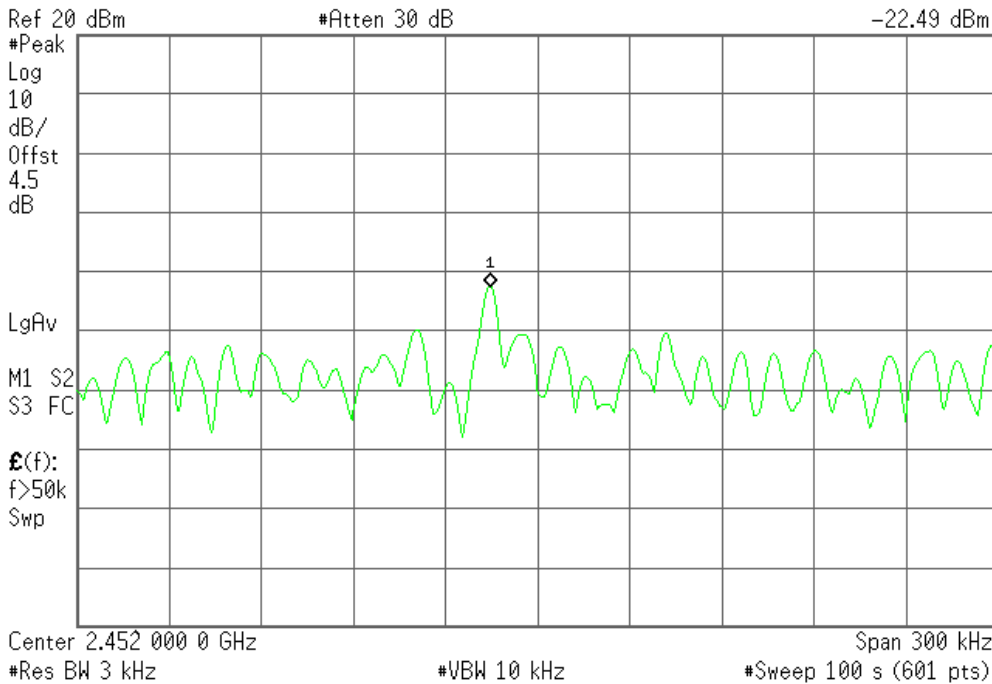
PPSD (CH High)

Agilent 16:06:05 May 5, 2008

R T

Mkr1 2.451 984 4 GHz

-22.49 dBm



8.4 CONDUCTED SPURIOUS EMISSION

LIMITS

§ 15.247(d) In any 100 kHz bandwidth outside the frequency band 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.

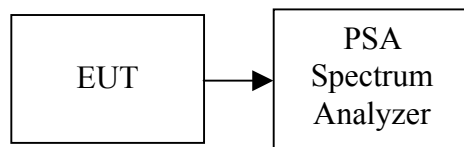
Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
PSA Spectrum Analyzer	Agilent	E4446A	US44300399	02/05/2008
Power Splitter	Mini-Circuits	ZN2PD-9G	SF078500430	07/30/2008

Remark: Each piece of equipment is scheduled for calibration once a year.

TEST CONFIGURATION



Combiner mode



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 with the transmitter set to the lowest, middle, and highest channels.

TEST RESULTS

No non-compliance noted

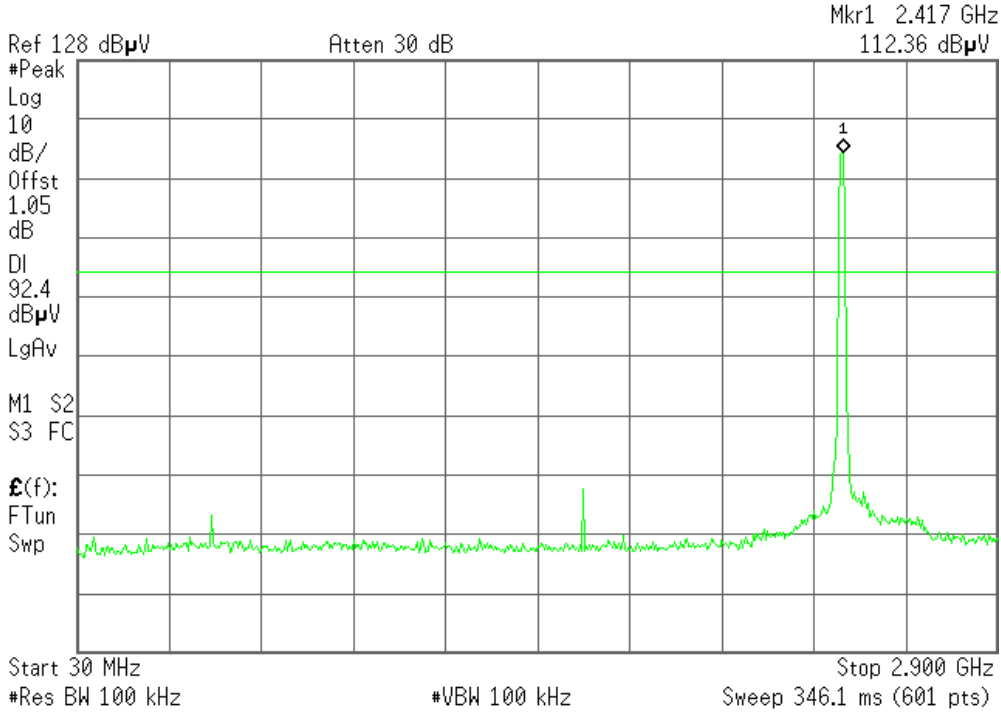


IEEE 802.11b / CH Low

30MHz ~ 2.9GHz

Agilent 12:53:42 Jan 16, 2008

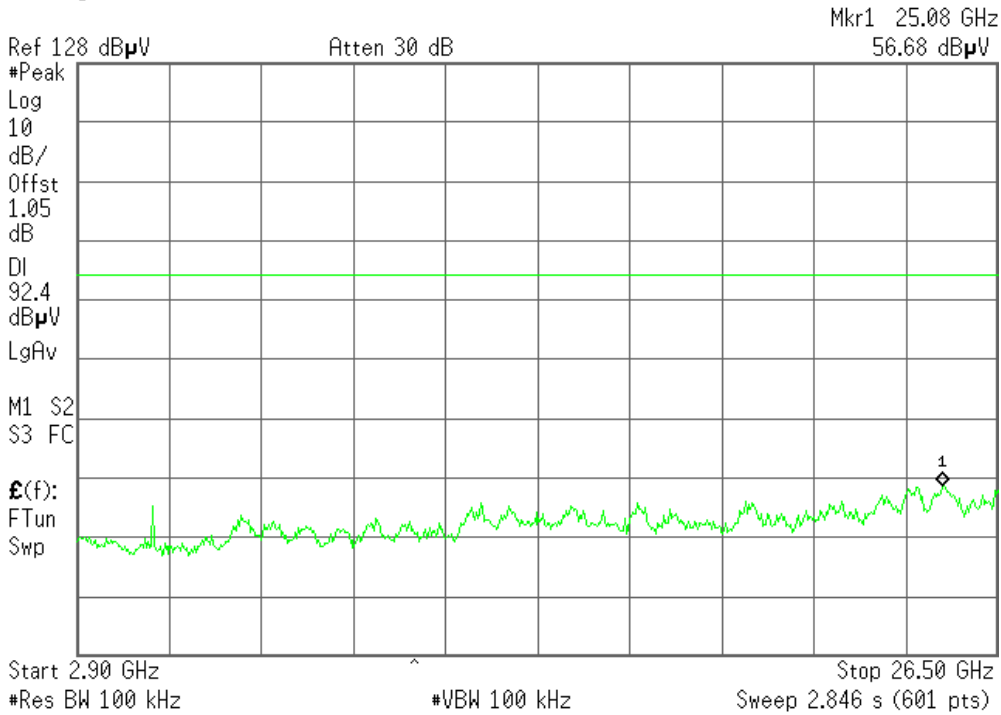
R T



2.9GHz ~ 26.5GHz

Agilent 12:54:43 Jan 16, 2008

R T



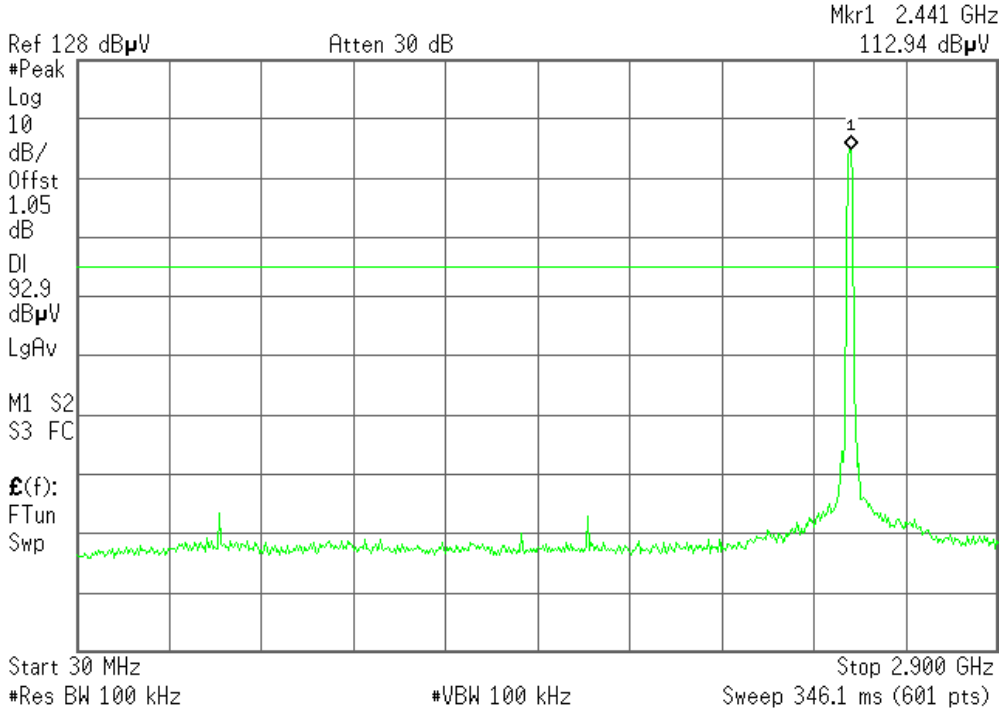


IEEE 802.11b / CH Mid

30MHz ~ 2.9GHz

Agilent 12:56:46 Jan 16, 2008

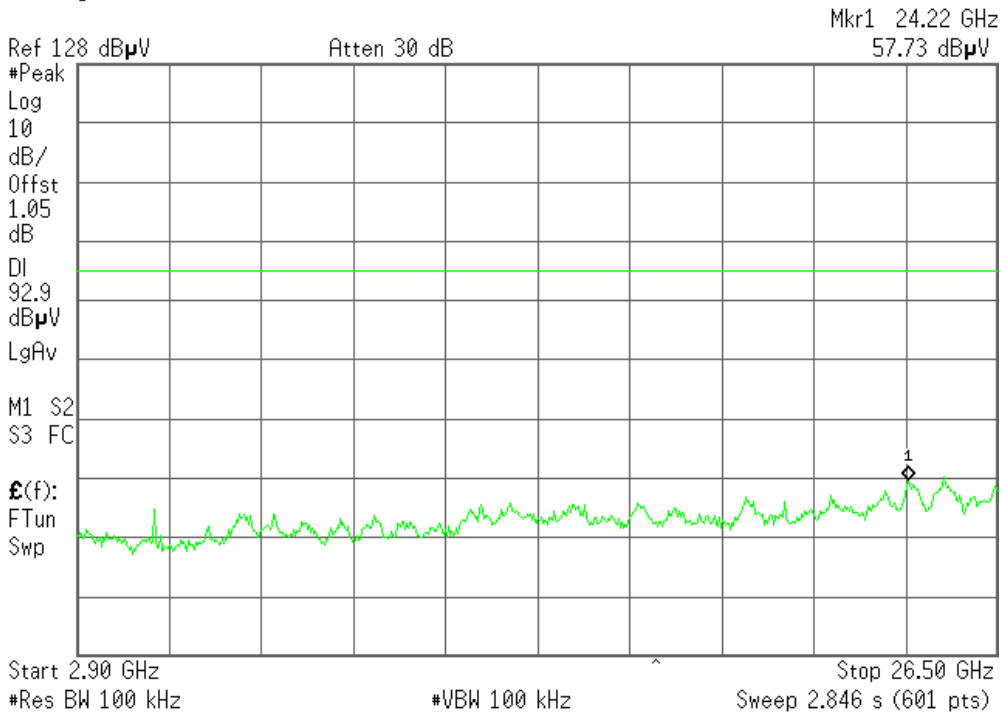
R T



2.9GHz ~ 26.5GHz

Agilent 12:58:13 Jan 16, 2008

R T



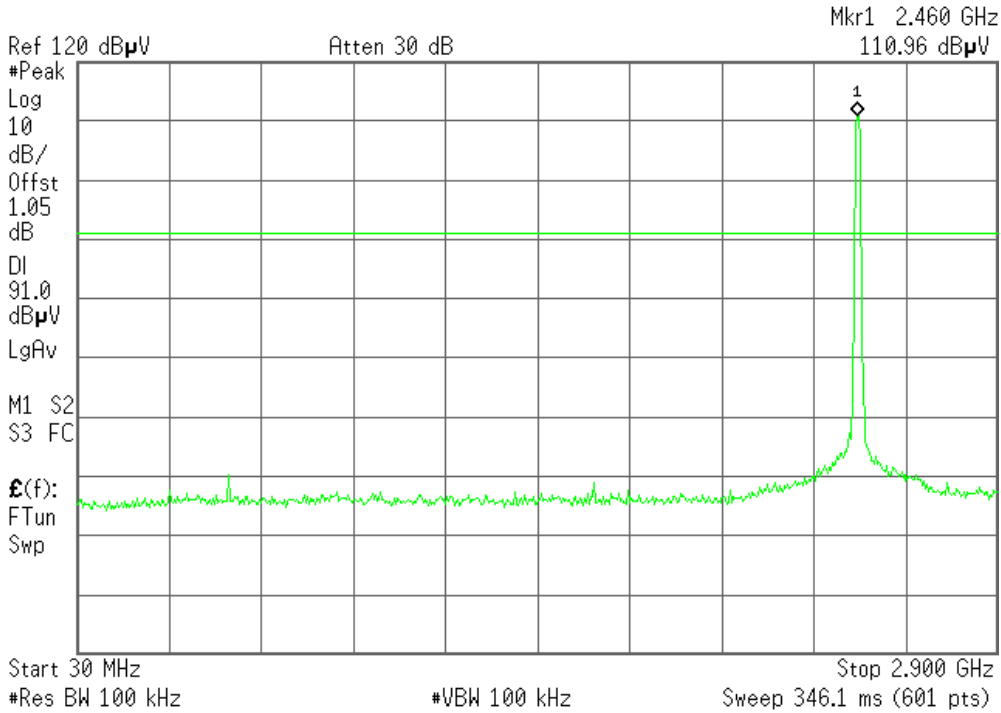


IEEE 802.11b / CH High

30MHz ~ 2.9GHz

Agilent 13:09:37 Jan 16, 2008

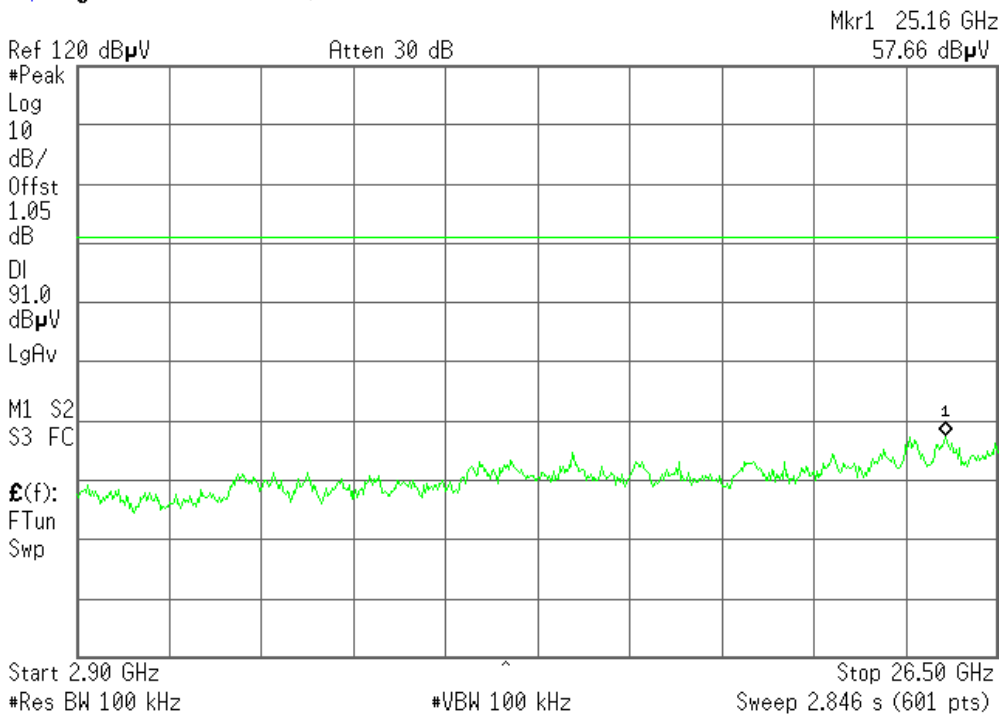
R



2.9GHz ~ 26.5GHz

Agilent 13:10:12 Jan 16, 2008

R T



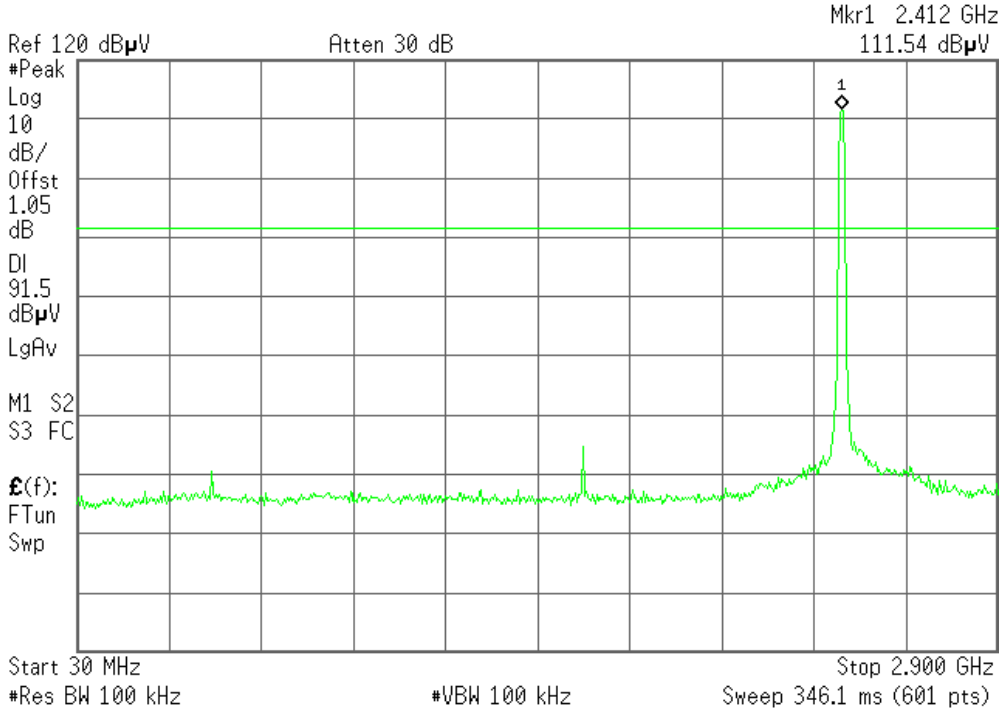


IEEE 802.11g / CH Low

30MHz ~ 2.9GHz

Agilent 13:12:27 Jan 16, 2008

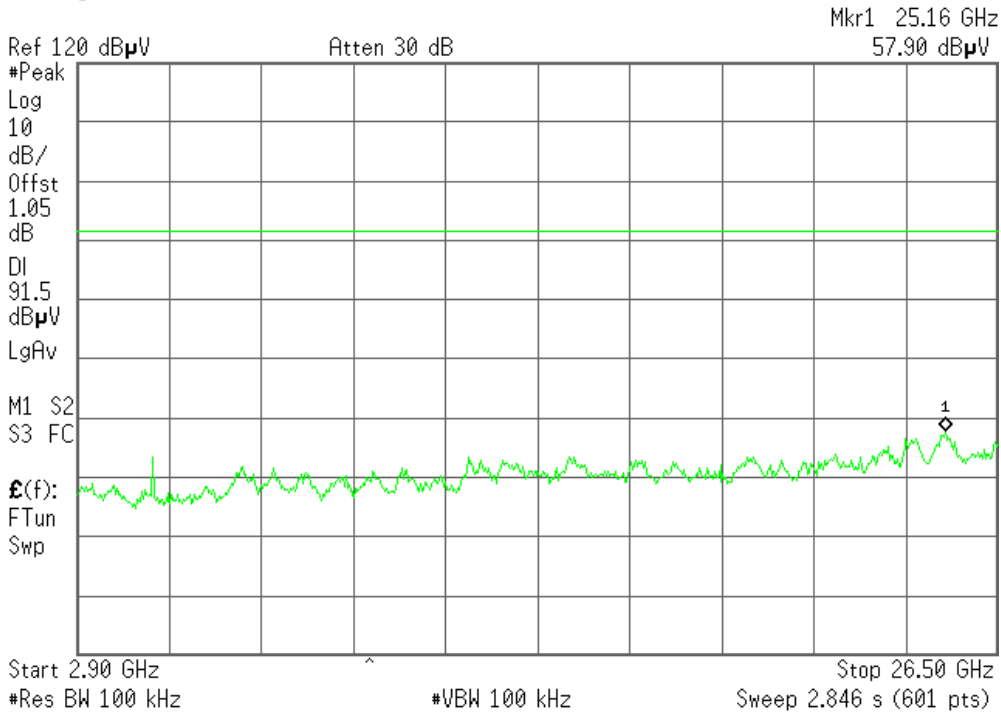
R



2.9GHz ~ 26.5GHz

Agilent 13:13:04 Jan 16, 2008

R



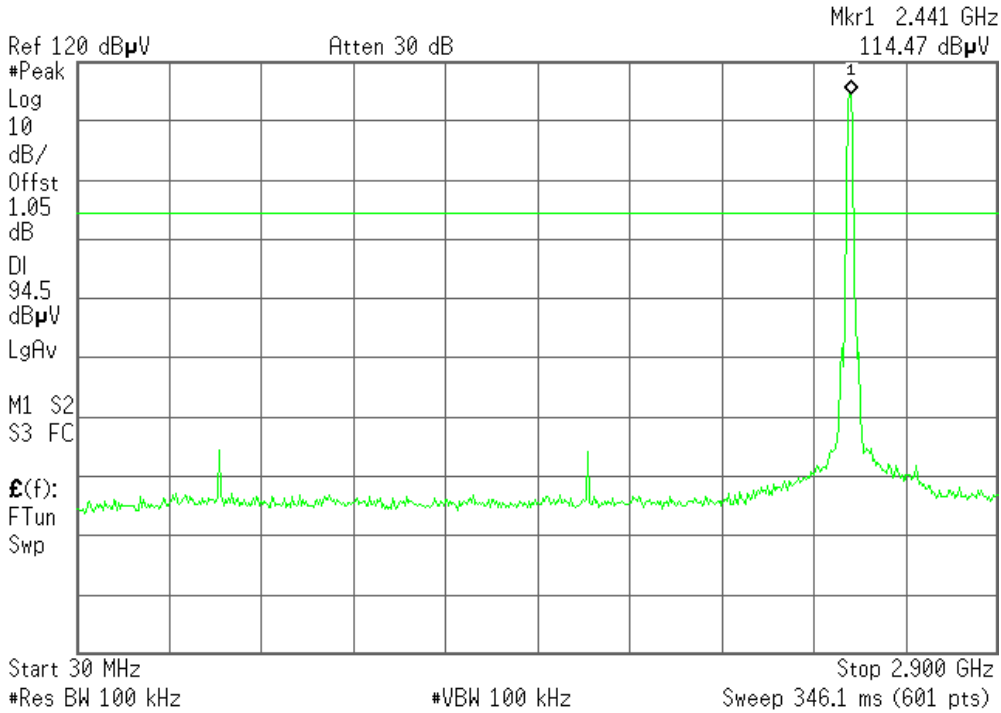


IEEE 802.11g / CH Mid

30MHz ~ 2.9GHz

Agilent 13:14:19 Jan 16, 2008

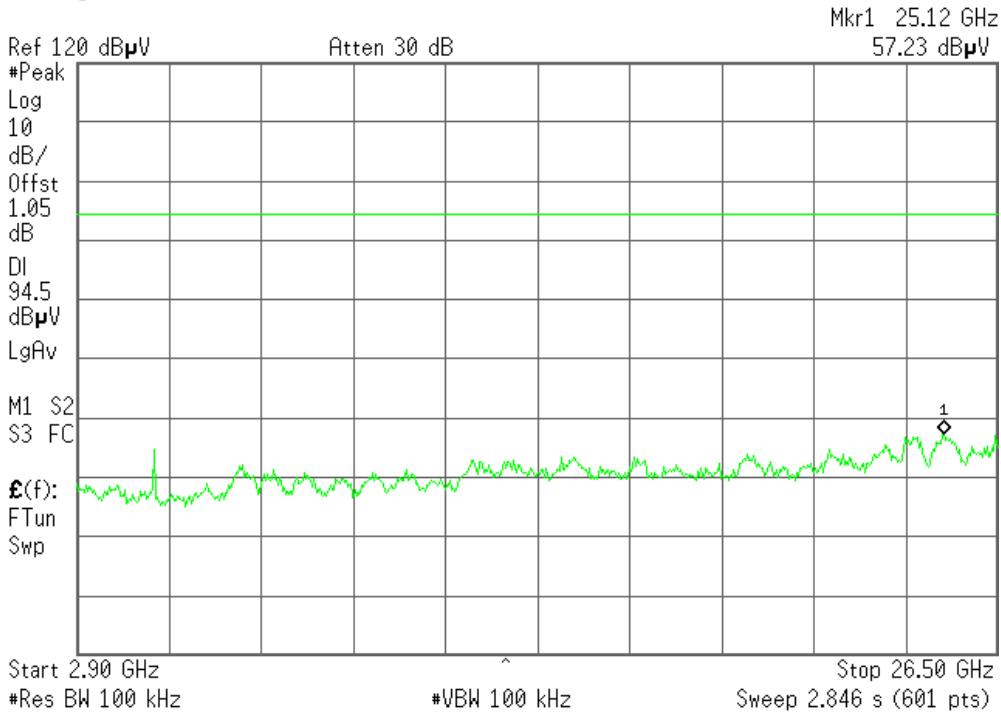
R



2.9GHz ~ 26.5GHz

Agilent 13:14:59 Jan 16, 2008

R



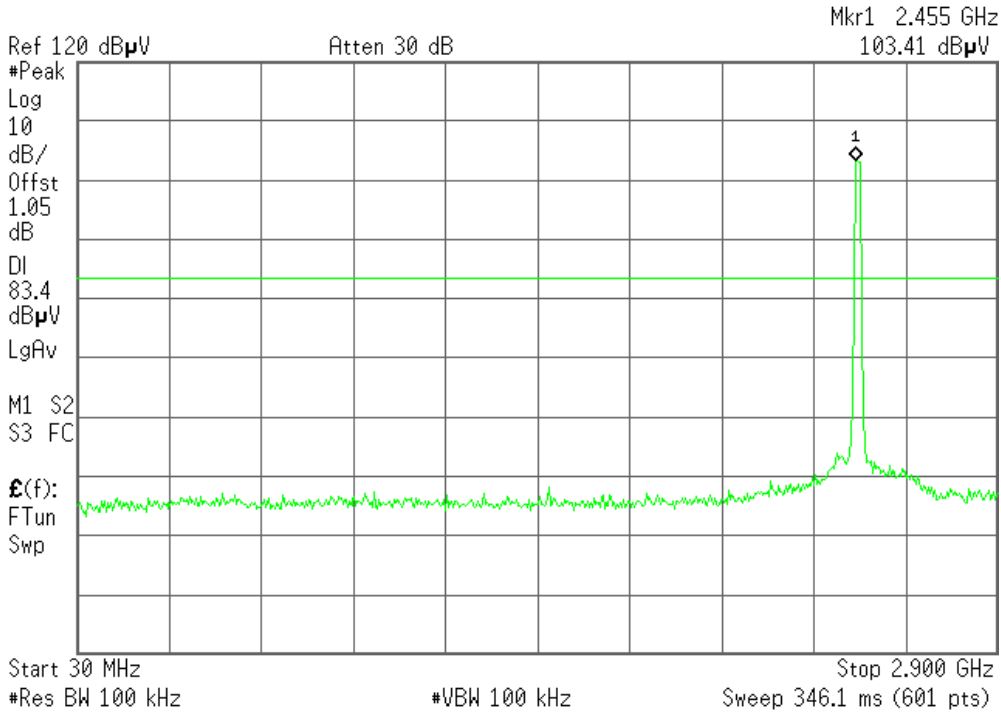


IEEE 802.11g / CH High

30MHz ~ 2.9GHz

Agilent 13:16:15 Jan 16, 2008

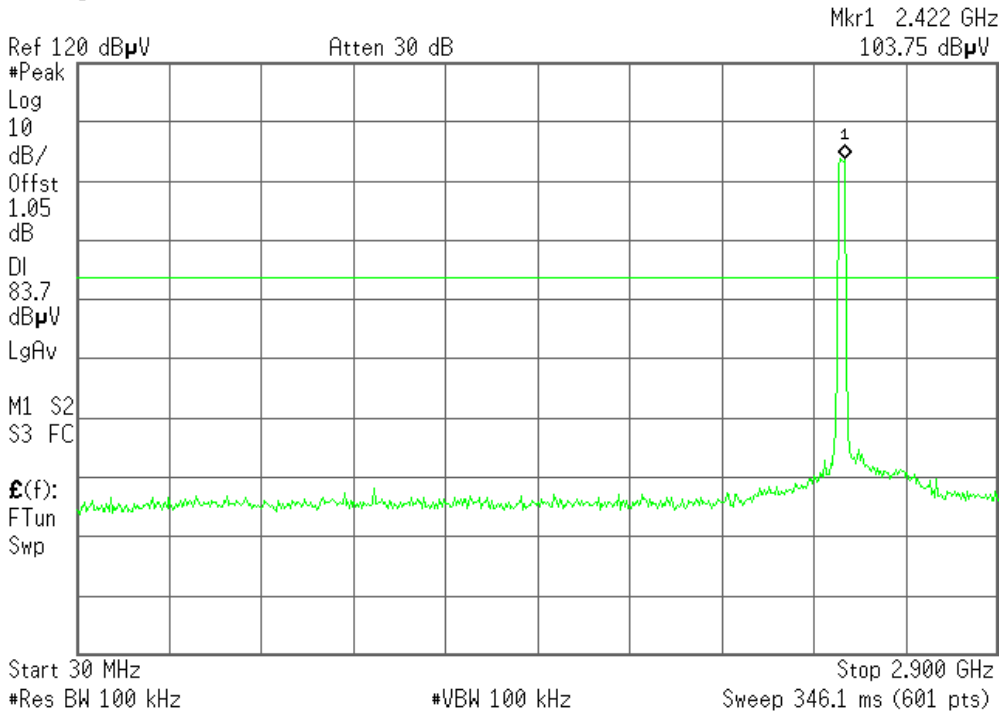
R T



2.9GHz ~ 26.5GHz

Agilent 13:18:23 Jan 16, 2008

R



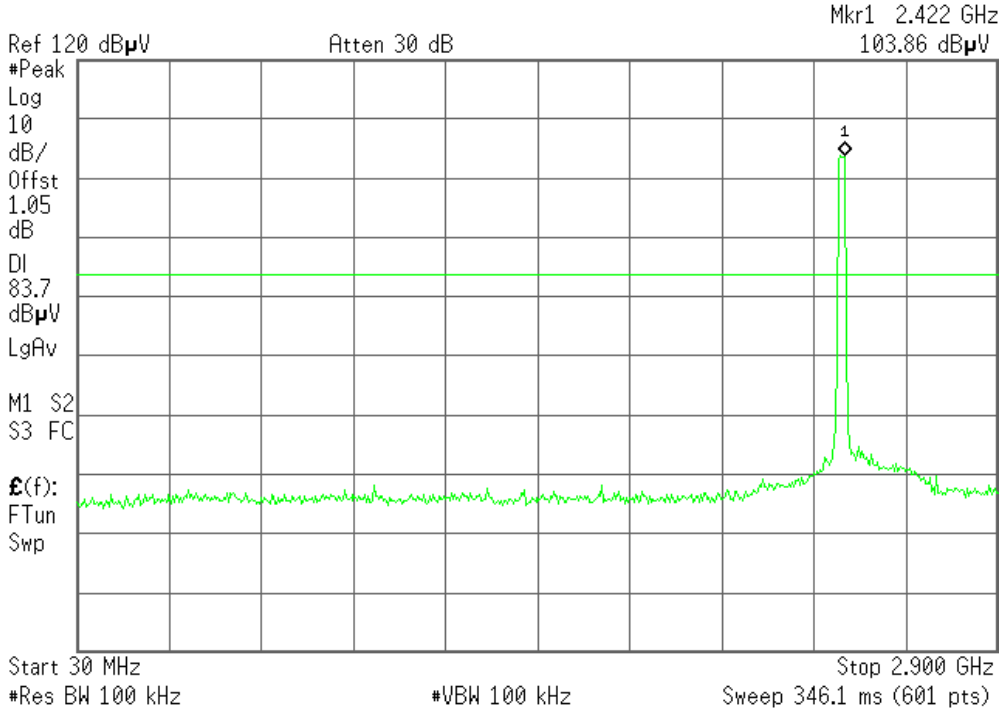


802.11n HT20 Mode-Chain 0 / CH Low

30MHz ~ 2.9GHz

Agilent 13:19:02 Jan 16, 2008

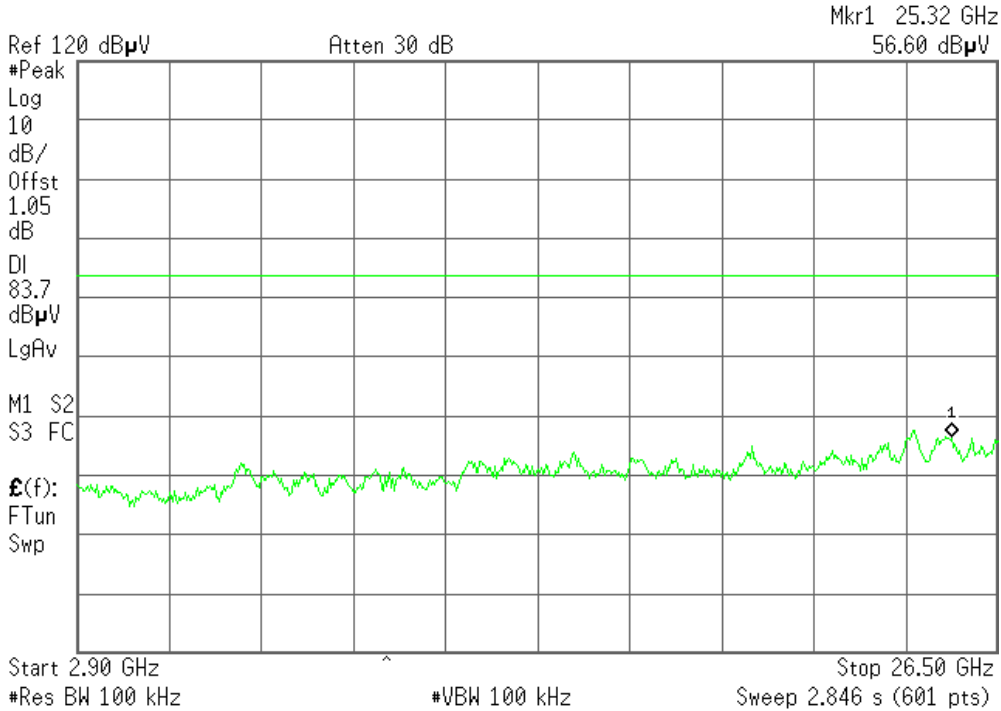
R



2.9GHz ~ 26.5GHz

Agilent 13:19:44 Jan 16, 2008

R



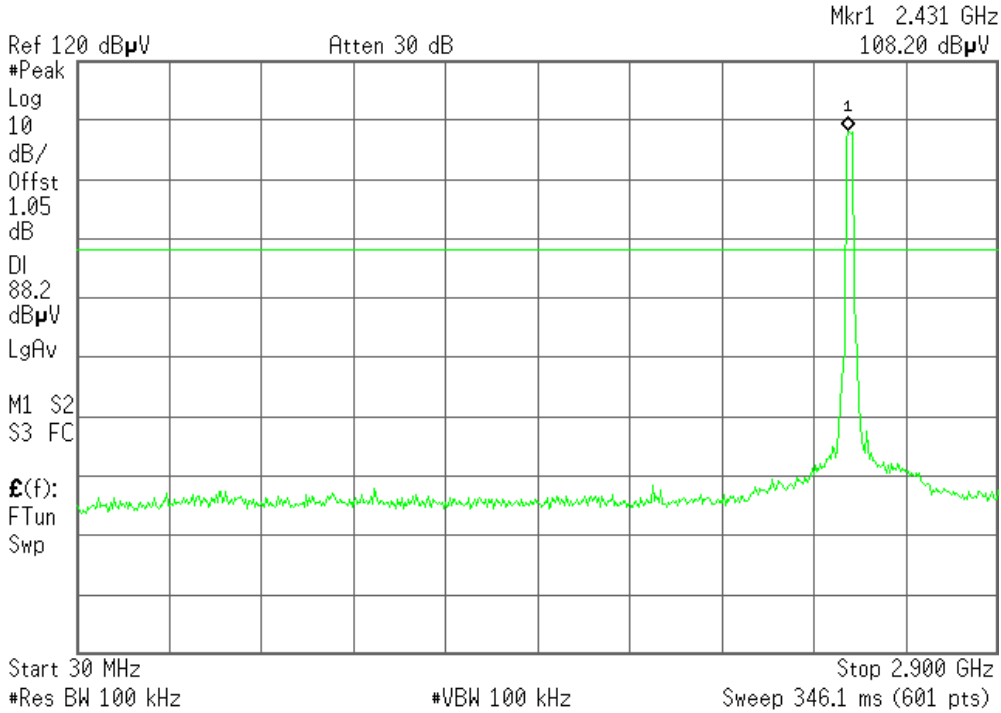


802.11n HT20 Mode-Chain 0 / CH Mid

30MHz ~ 2.9GHz

Agilent 13:23:42 Jan 16, 2008

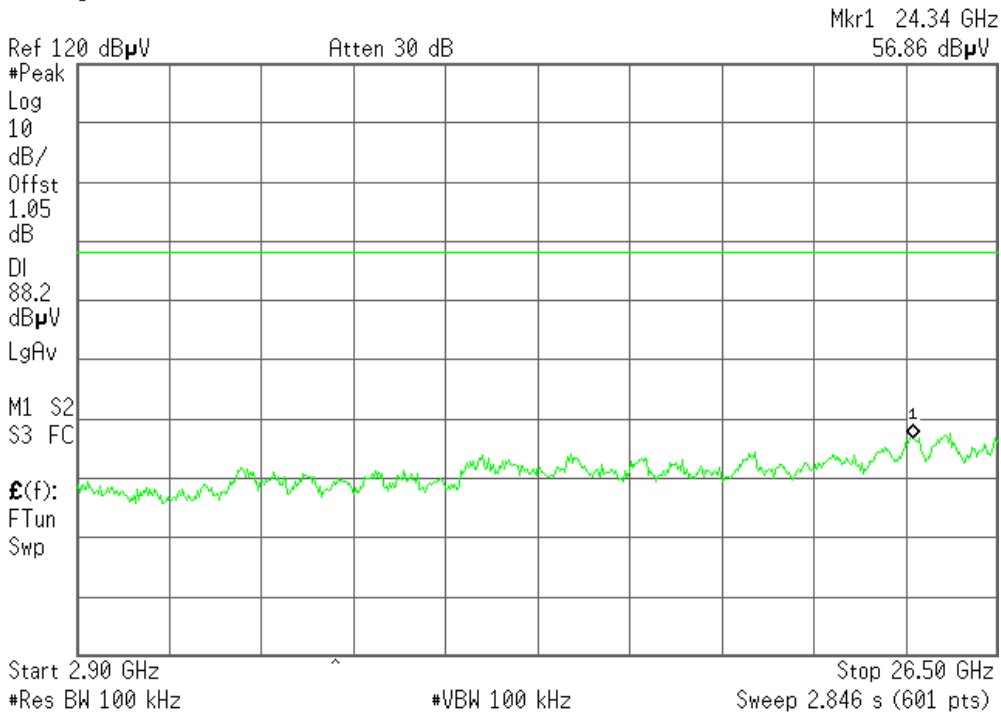
R



2.9GHz ~ 26.5GHz

Agilent 13:25:01 Jan 16, 2008

R



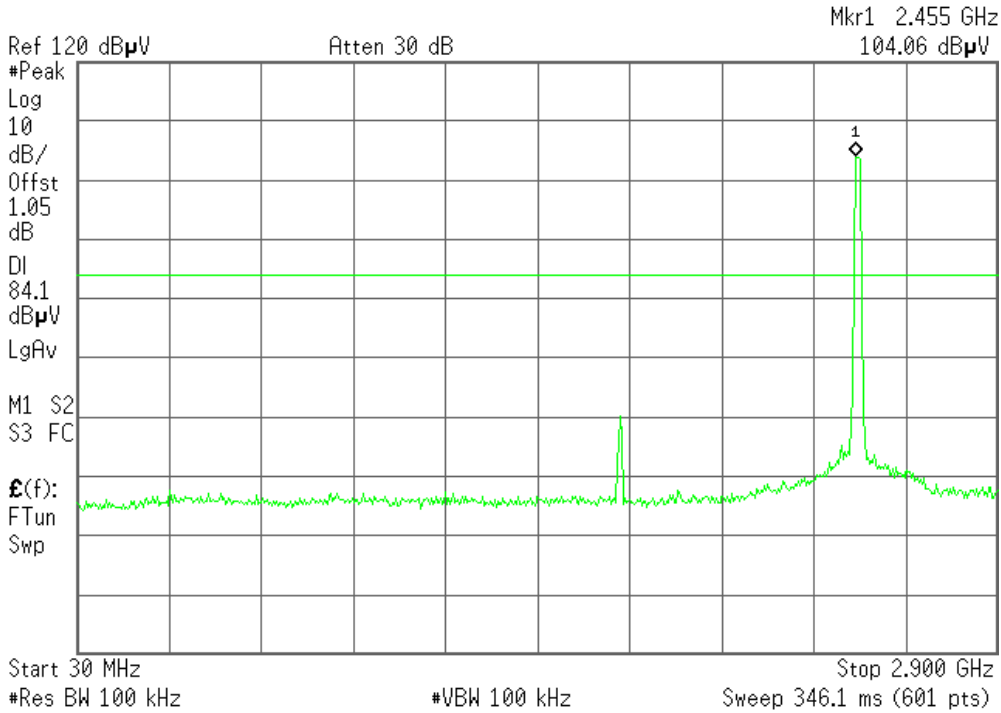


802.11n HT20 Mode-Chain 0 / CH High

30MHz ~ 2.9GHz

Agilent 13:28:19 Jan 16, 2008

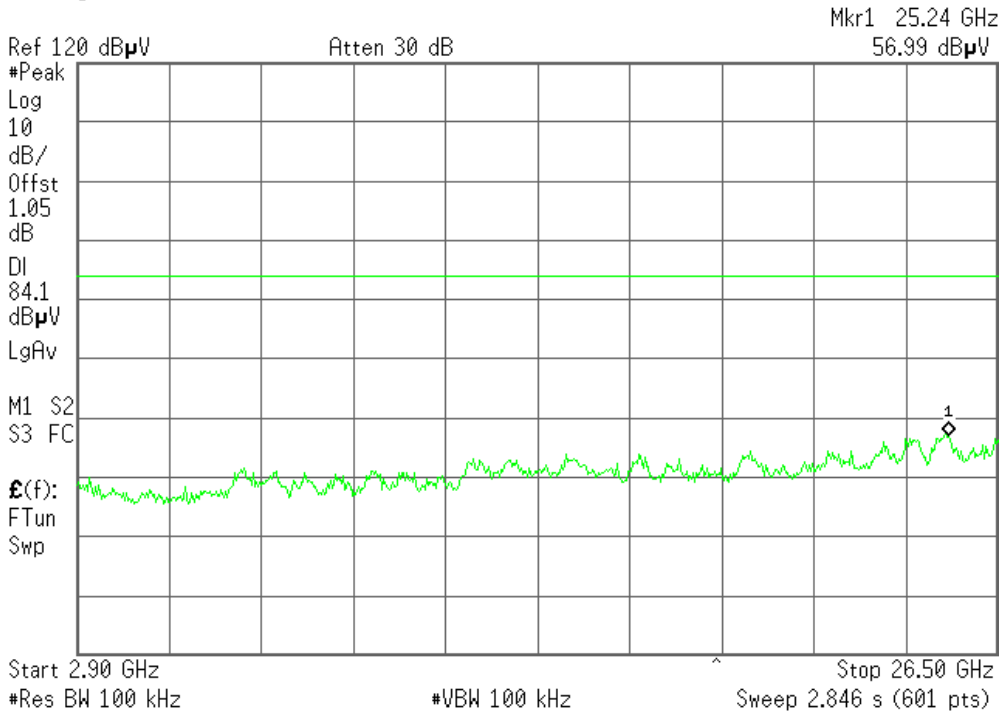
R



2.9GHz ~ 26.5GHz

Agilent 13:29:18 Jan 16, 2008

R



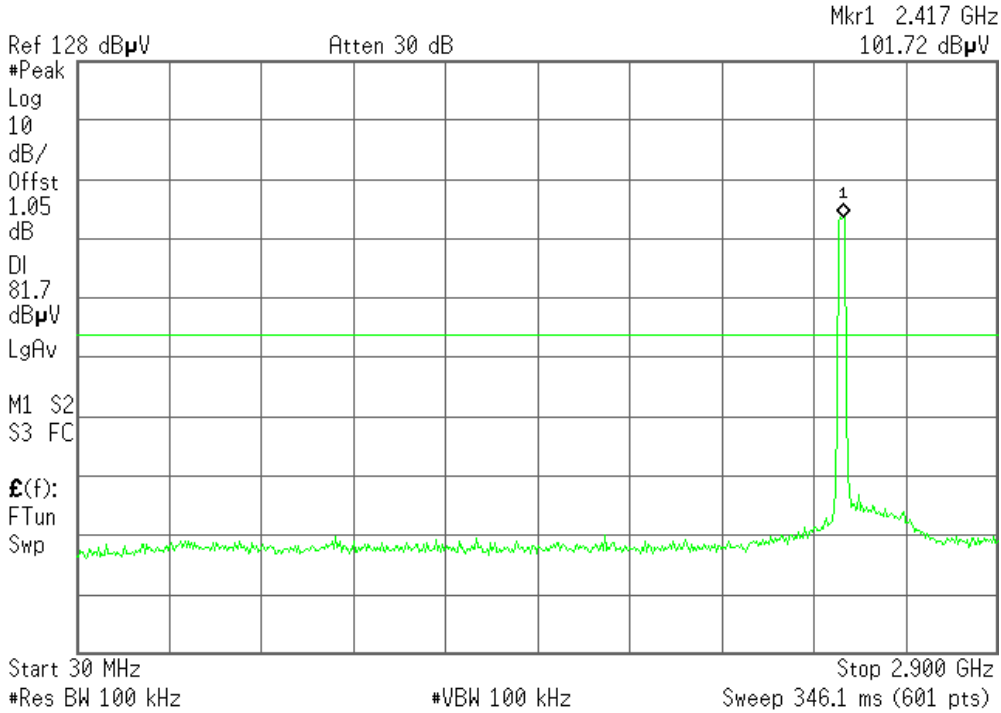


802.11n HT20 Mode-Chain 1 / CH Low

30MHz ~ 2.9GHz

Agilent 12:34:12 Jan 16, 2008

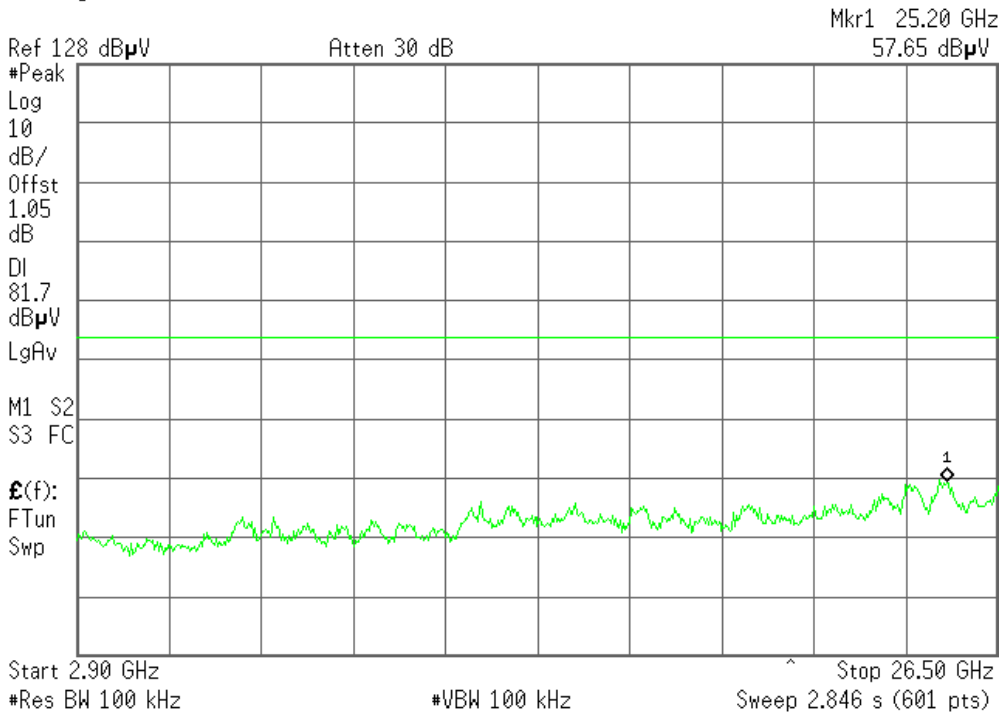
R T



2.9GHz ~ 26.5GHz

Agilent 12:35:17 Jan 16, 2008

R T



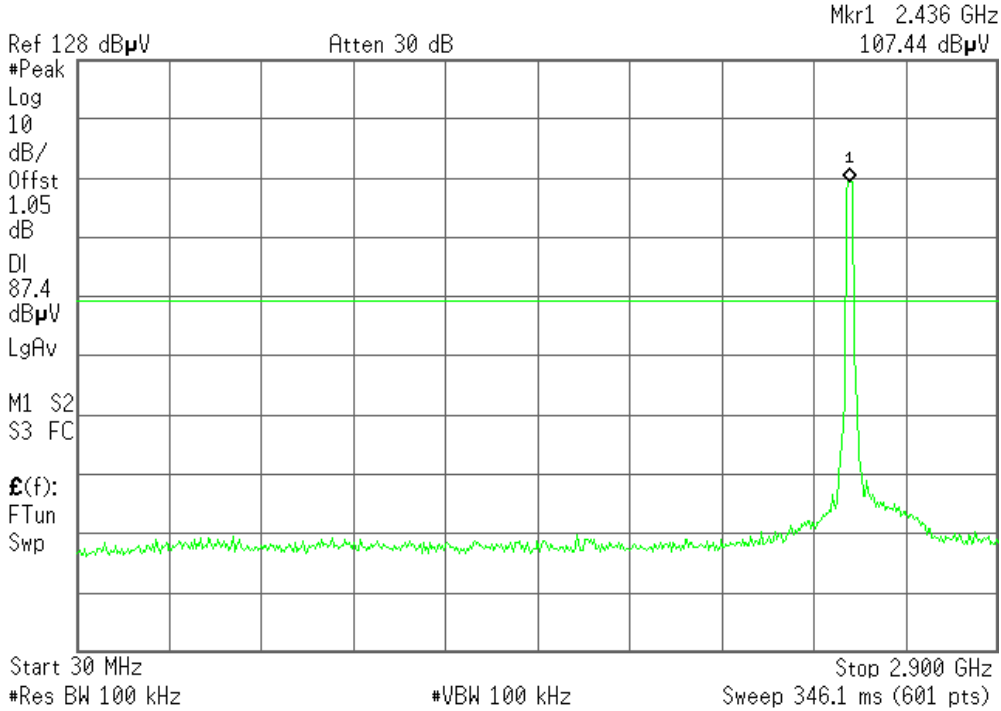


802.11n HT20 Mode-Chain 1 / CH Mid

30MHz ~ 2.9GHz

Agilent 12:37:40 Jan 16, 2008

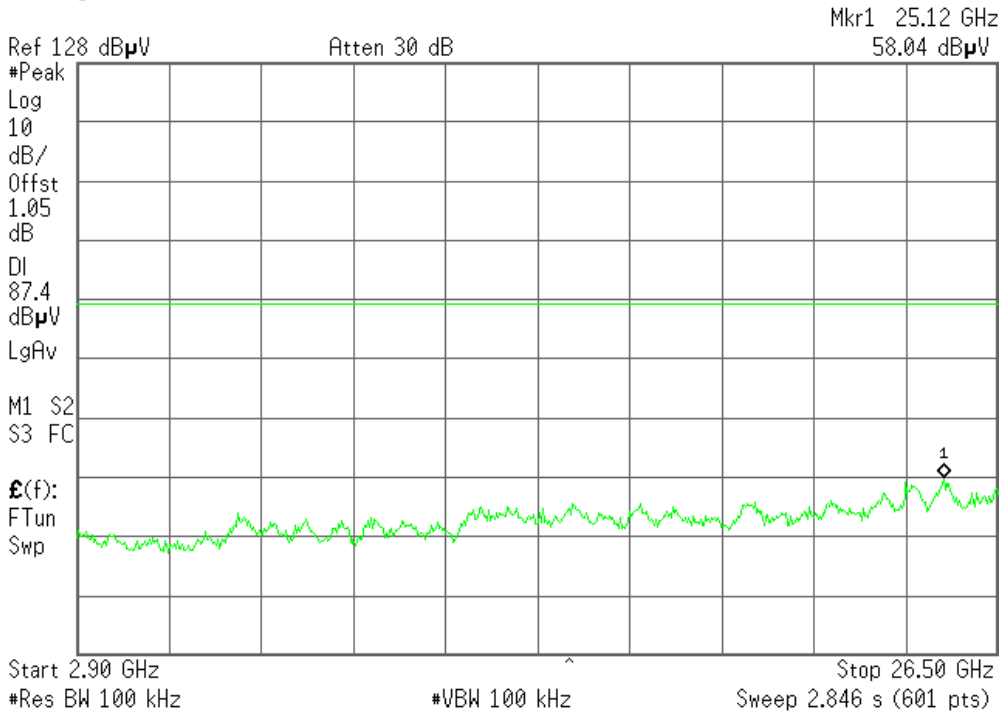
R T



2.9GHz ~ 26.5GHz

Agilent 12:38:27 Jan 16, 2008

R T



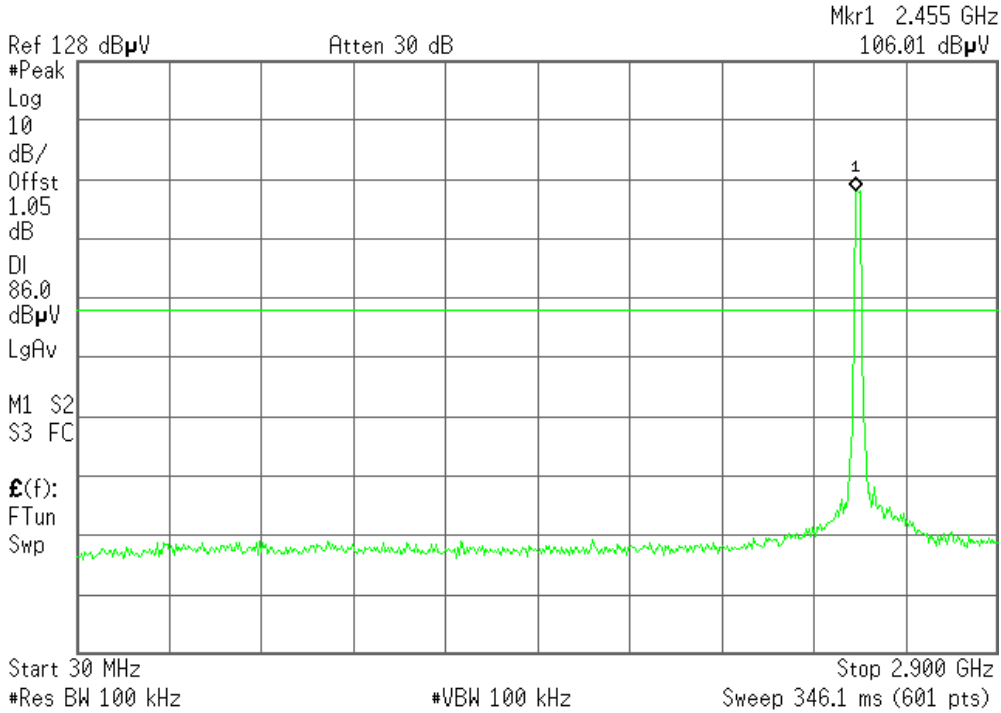


802.11n HT20 Mode-Chain 1 / CH High

30MHz ~ 2.9GHz

Agilent 12:40:09 Jan 16, 2008

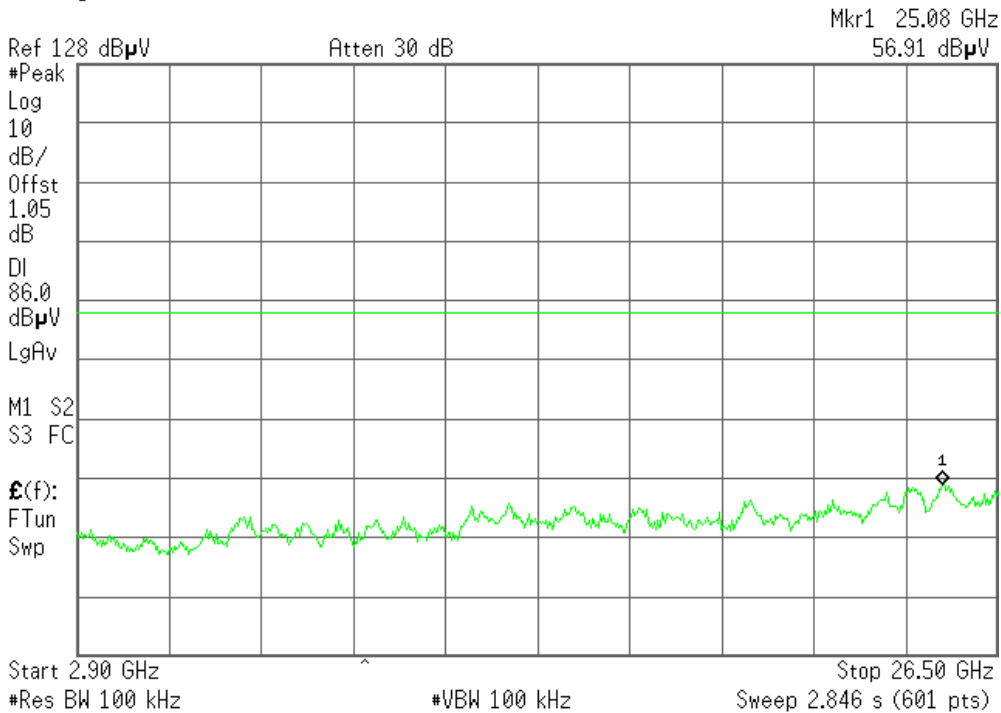
R T



2.9GHz ~ 26.5GHz

Agilent 12:40:54 Jan 16, 2008

R T



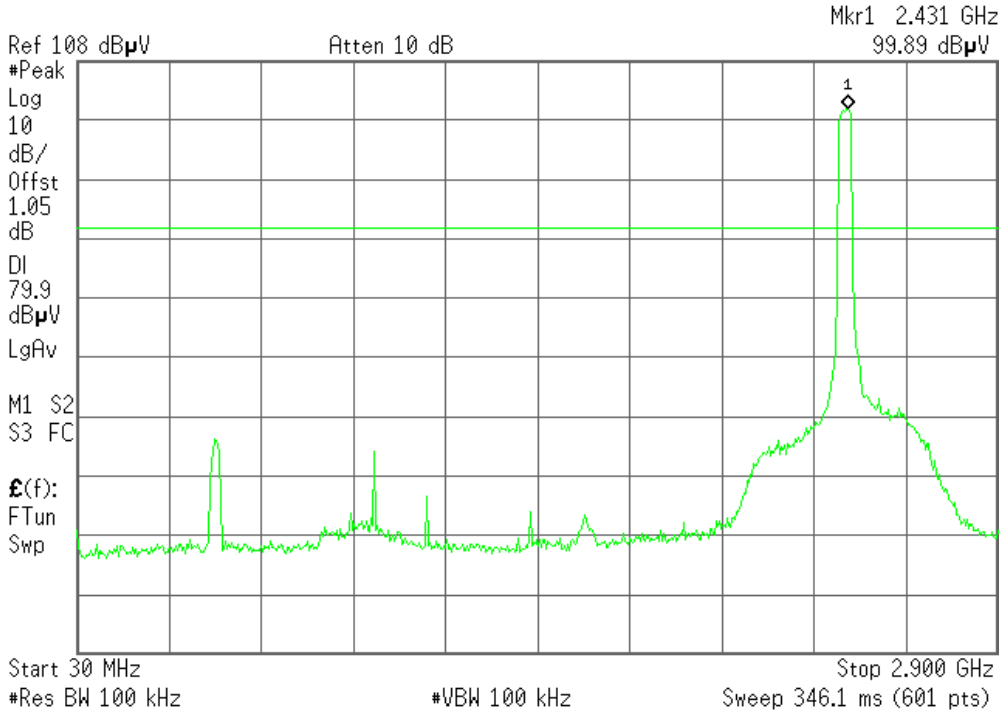


802.11n HT40 Mode-Chain 0 / CH Low

30MHz ~ 2.9GHz

Agilent 14:19:07 Jan 16, 2008

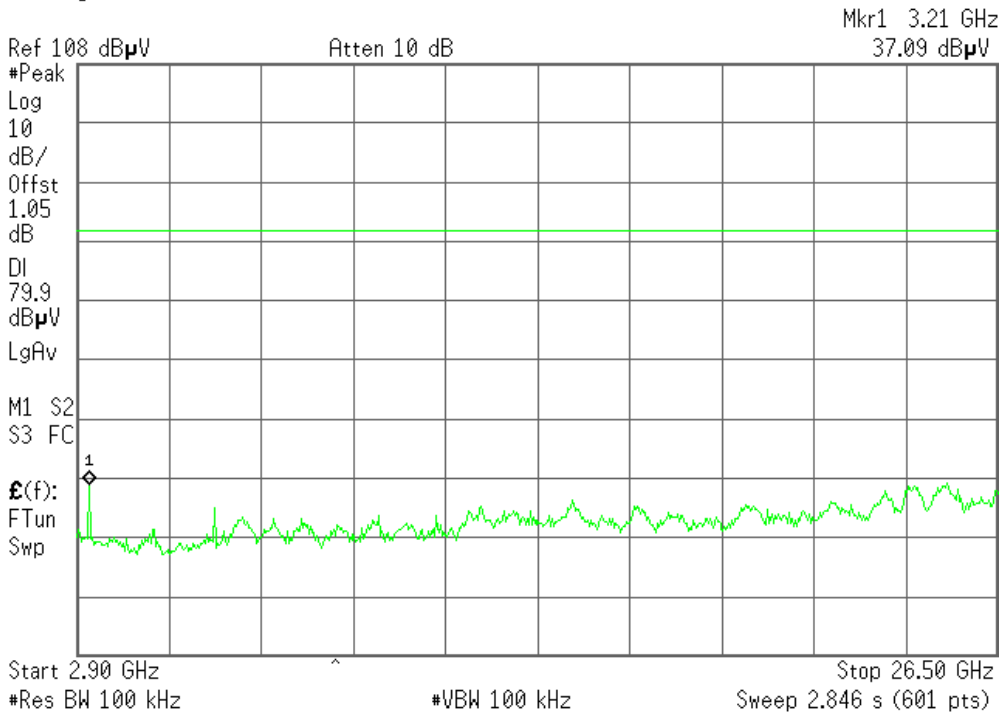
R T



2.9GHz ~ 26.5GHz

Agilent 14:19:54 Jan 16, 2008

R T



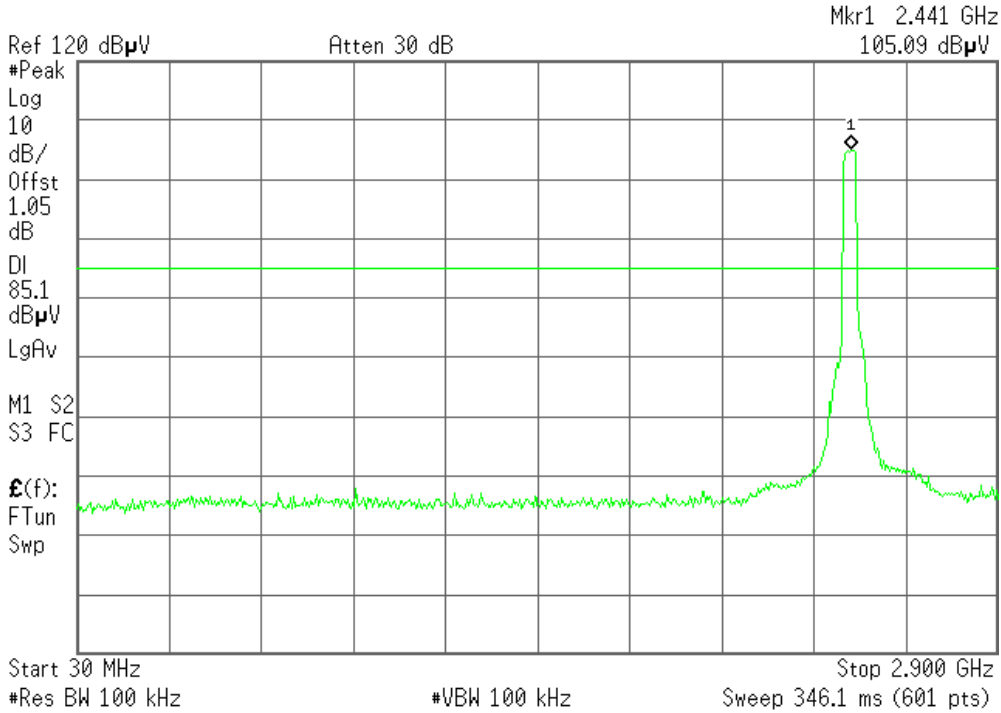


802.11n HT40 Mode-Chain 0 / CH Mid

30MHz ~ 2.9GHz

Agilent 14:21:26 Jan 16, 2008

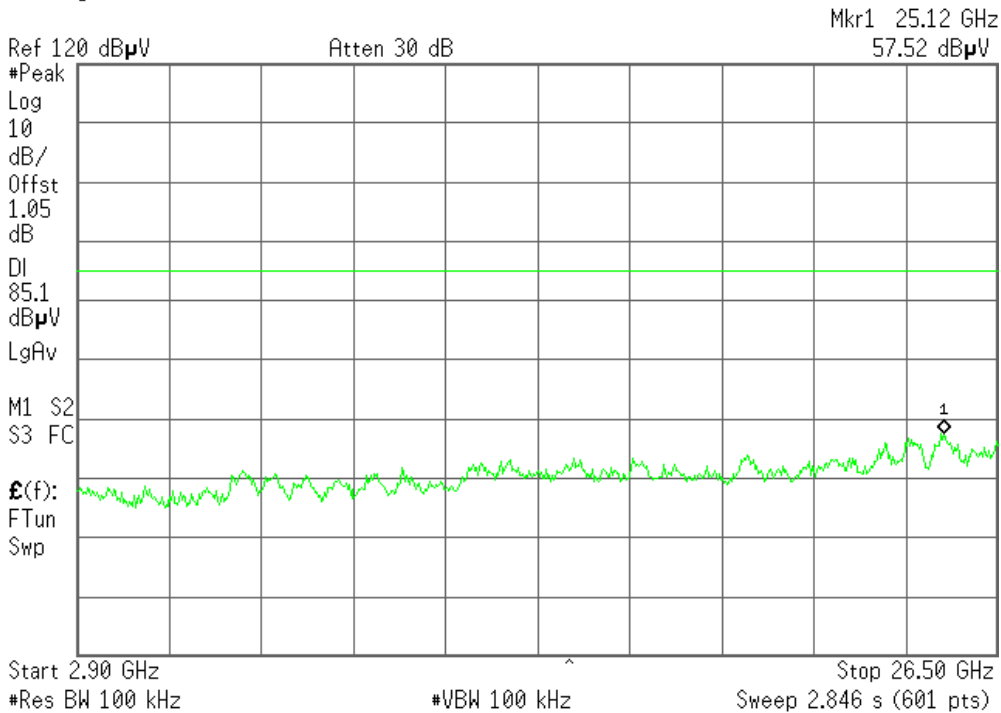
R T



2.9GHz ~ 26.5GHz

Agilent 14:22:00 Jan 16, 2008

R T



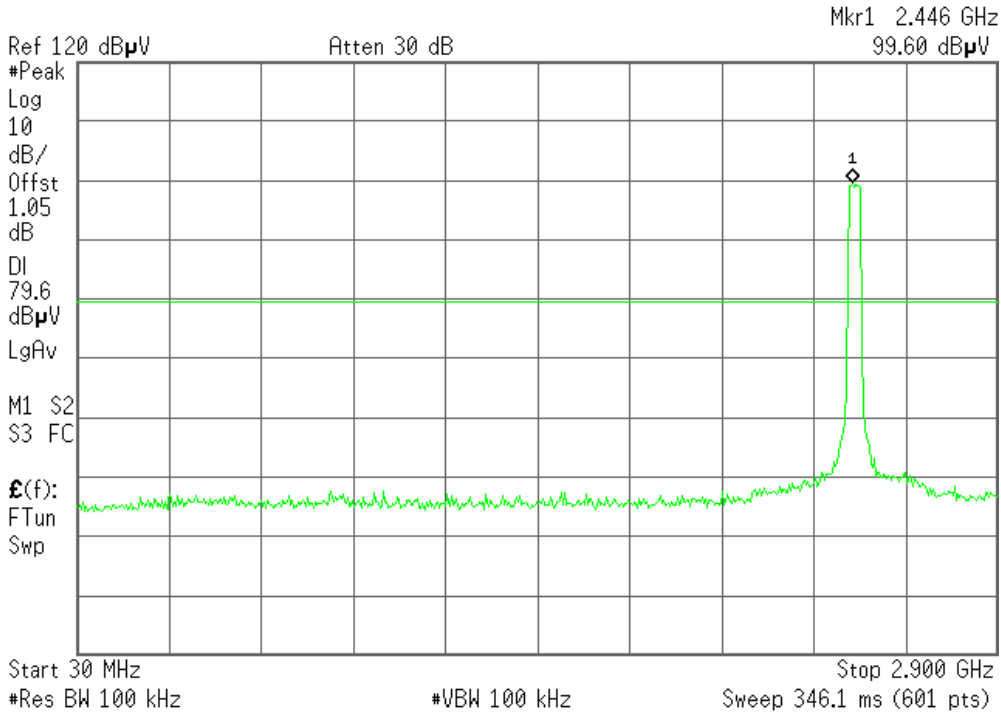


802.11n HT40 Mode-Chain 0 / CH High

30MHz ~ 2.9GHz

Agilent 14:23:27 Jan 16, 2008

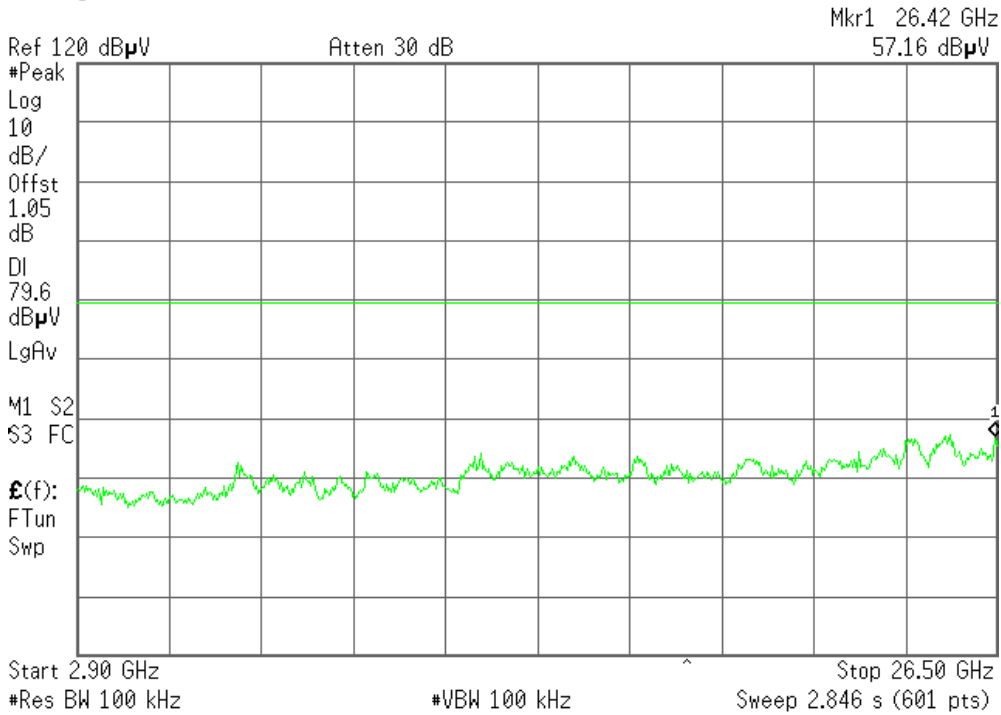
R T



2.9GHz ~ 26.5GHz

Agilent 14:24:15 Jan 16, 2008

R T



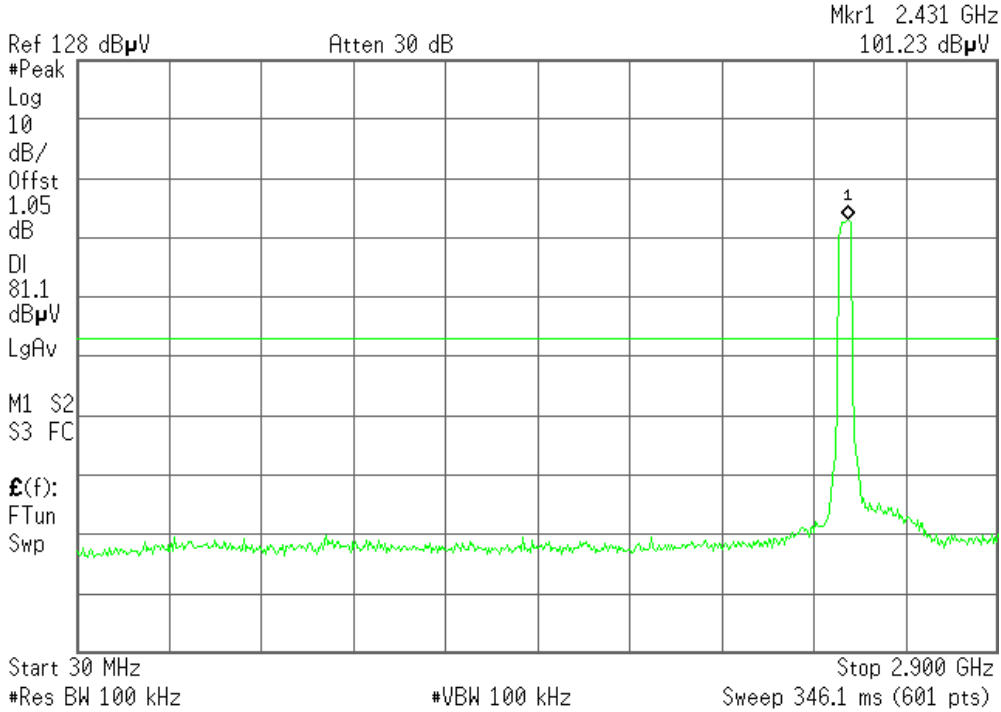


802.11n HT40 Mode-Chain 1 / CH Low

30MHz ~ 2.9GHz

Agilent 12:43:58 Jan 16, 2008

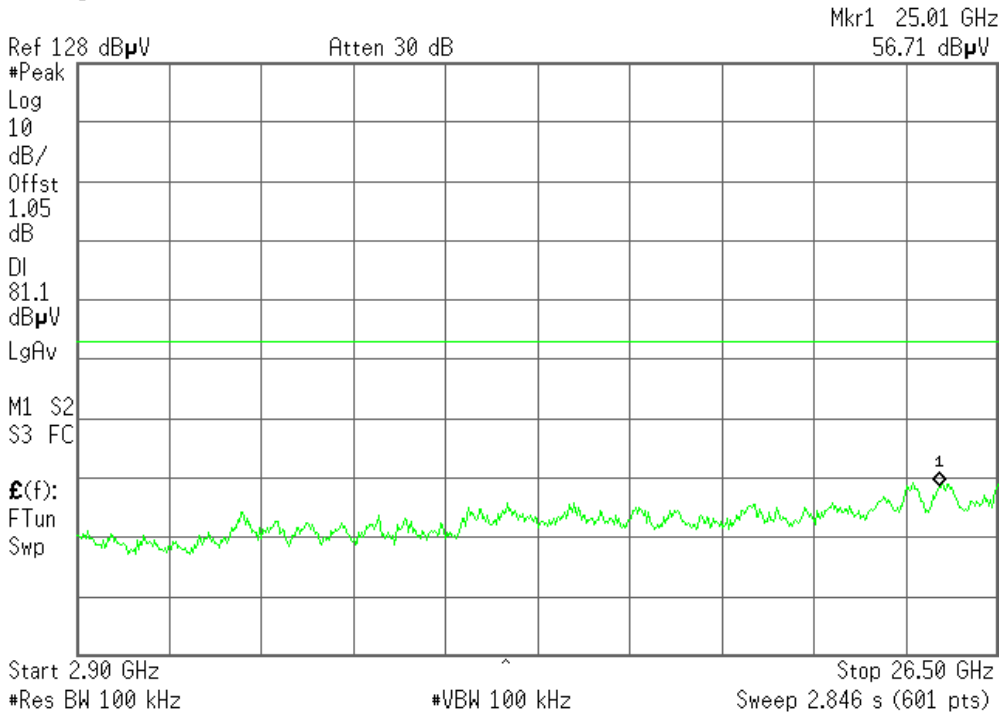
R T



2.9GHz ~ 26.5GHz

Agilent 12:44:46 Jan 16, 2008

R T



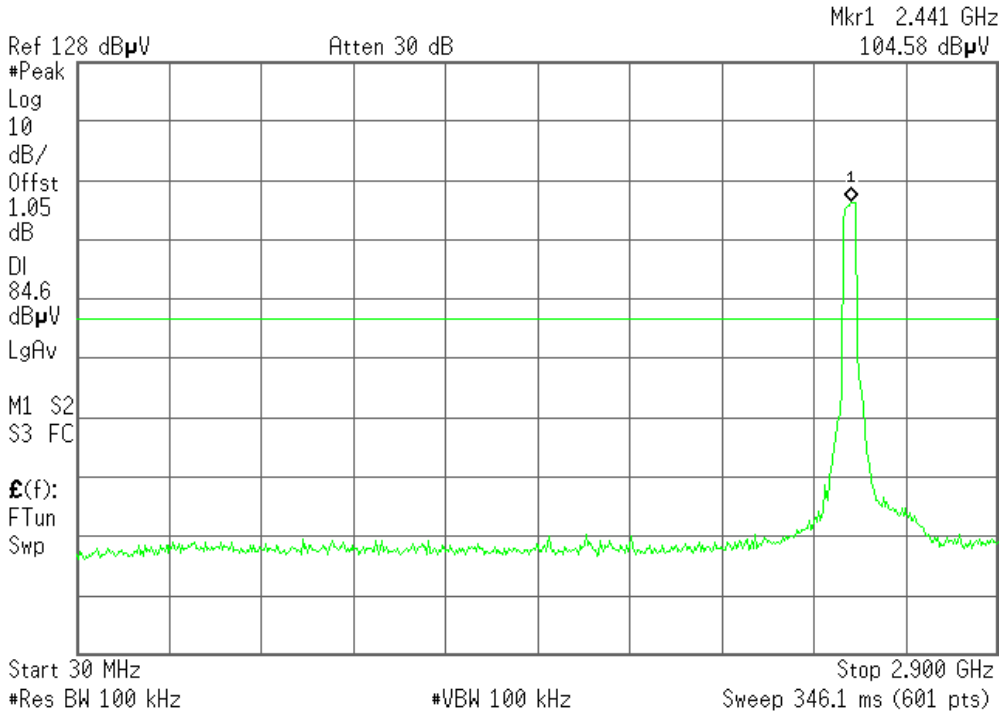


802.11n HT40 Mode-Chain 1 / CH Mid

30MHz ~ 2.9GHz

Agilent 12:47:04 Jan 16, 2008

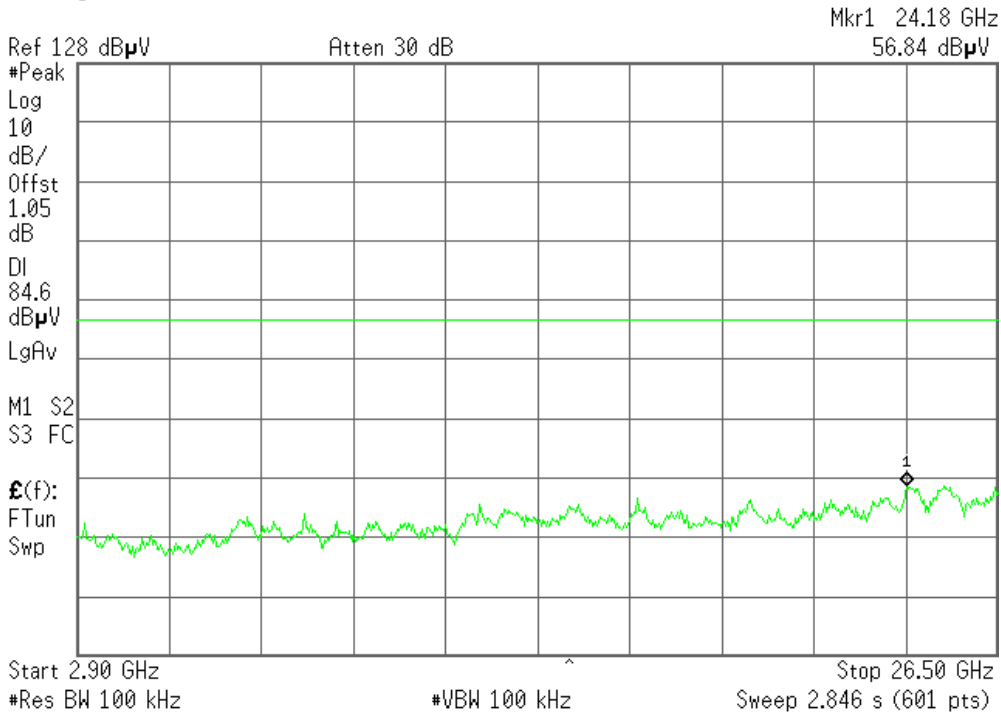
R T



2.9GHz ~ 26.5GHz

Agilent 12:47:48 Jan 16, 2008

R T



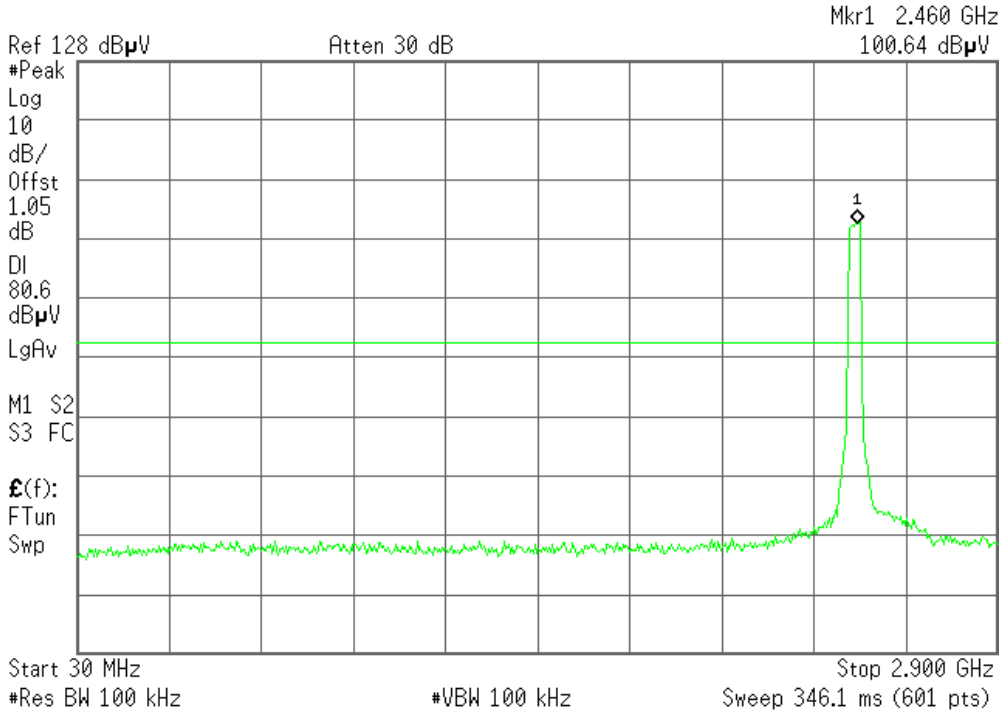


802.11n HT40 Mode-Chain 1 / CH High

30MHz ~ 2.9GHz

Agilent 12:49:21 Jan 16, 2008

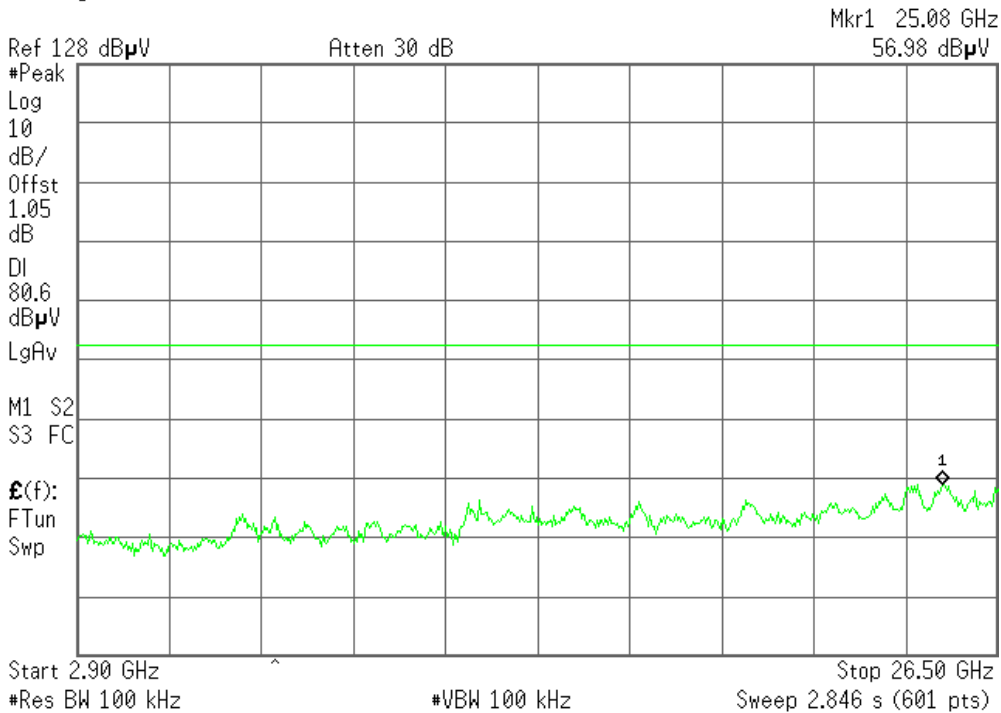
R T



2.9GHz ~ 26.5GHz

Agilent 12:50:08 Jan 16, 2008

R T



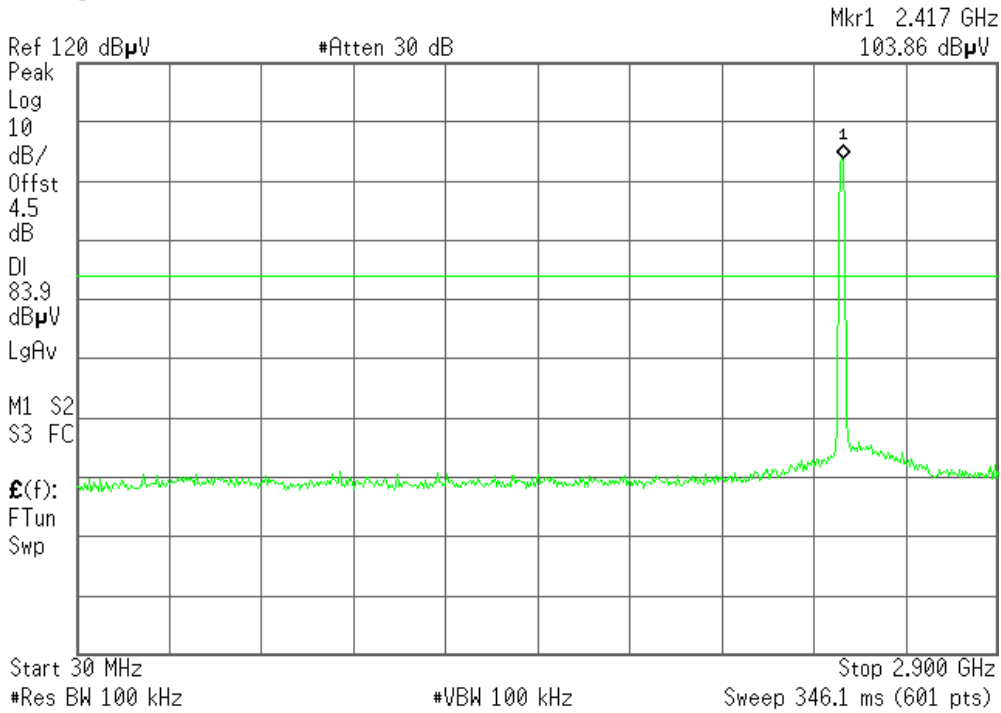


IEEE 802.11b Combined mode (Two TX)/ CH Low

30MHz ~ 2.9GHz

Agilent 16:47:40 May 5, 2008

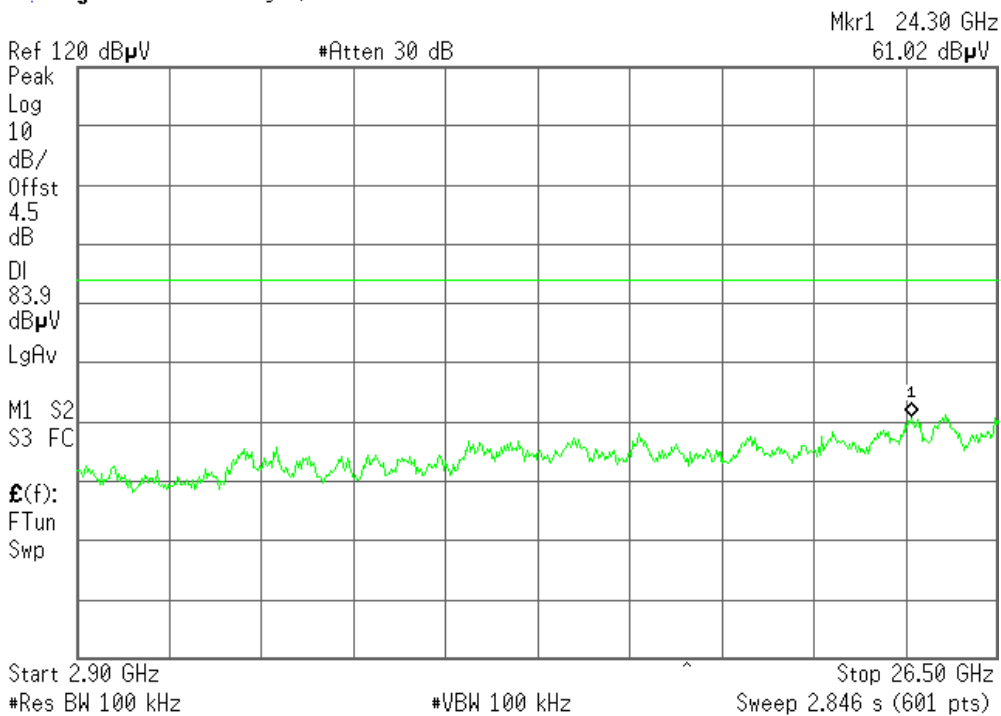
R T



2.9GHz ~ 26.5GHz

Agilent 16:48:13 May 5, 2008

R T



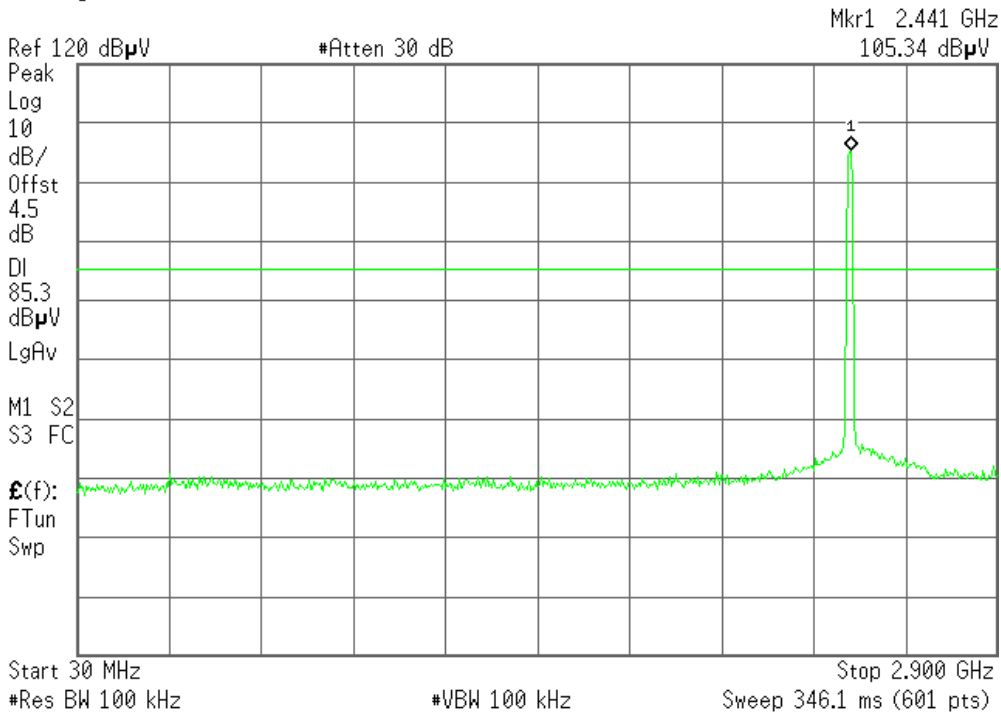


IEEE 802.11b Combined mode (Two TX)/ CH Mid

30MHz ~ 2.9GHz

Agilent 16:49:53 May 5, 2008

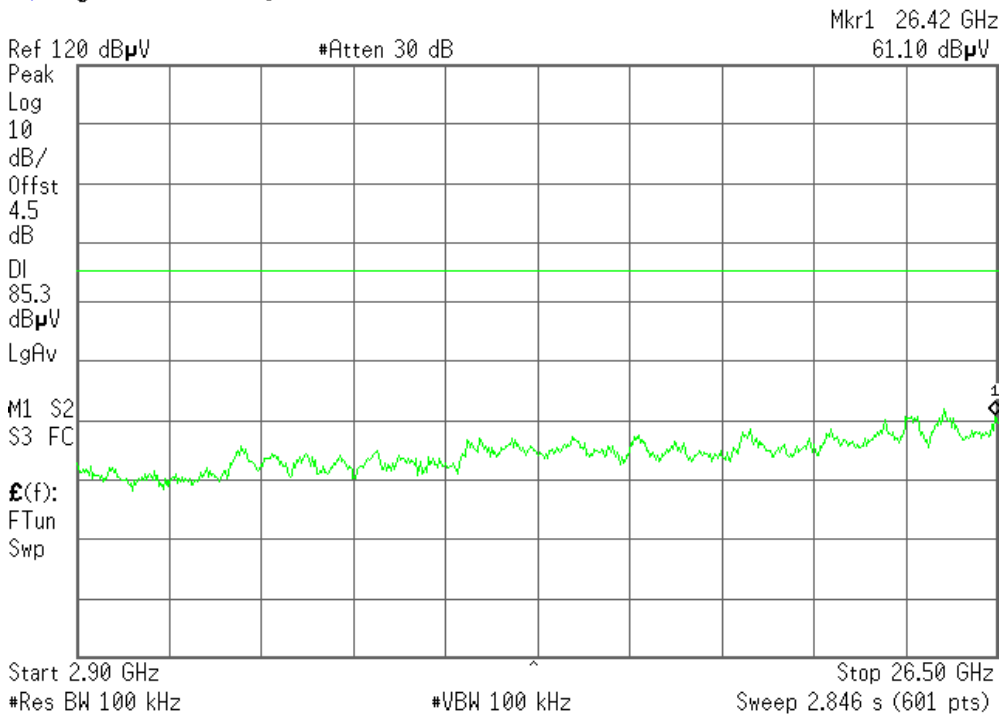
R T



2.9GHz ~ 26.5GHz

Agilent 16:50:37 May 5, 2008

R T



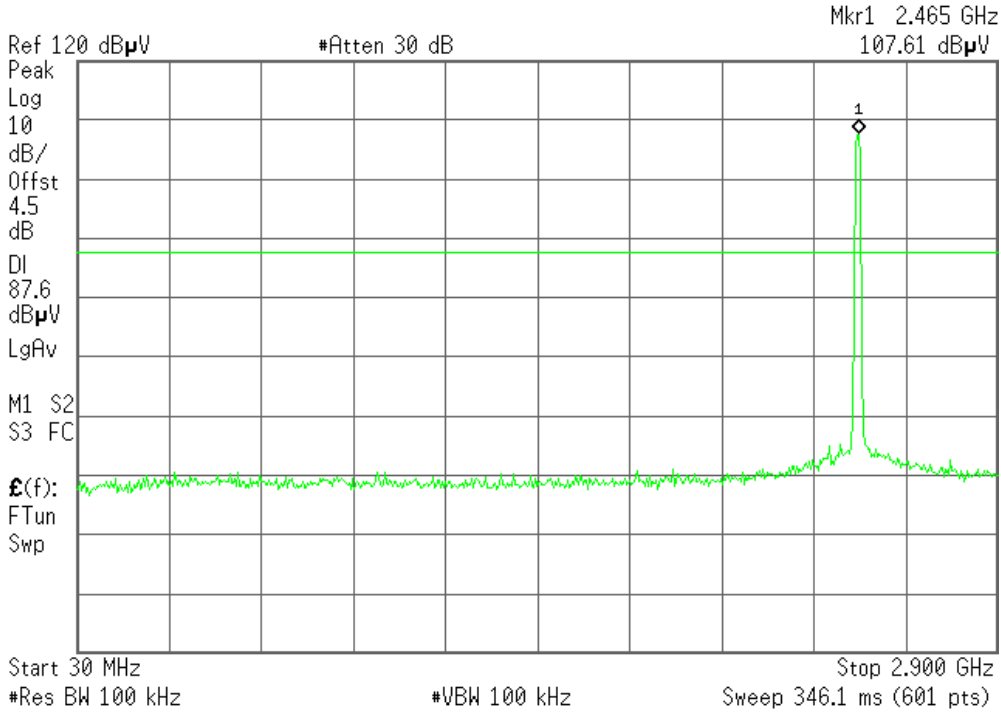


IEEE 802.11b Combined mode (Two TX) / CH High

30MHz ~ 2.9GHz

Agilent 16:52:09 May 5, 2008

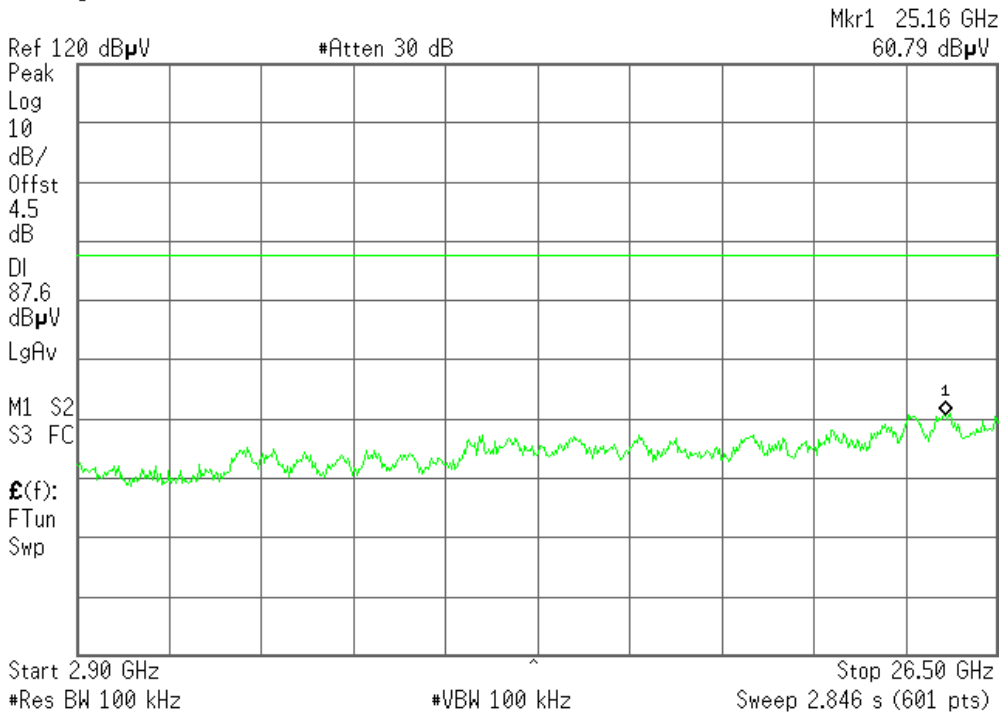
R T



2.9GHz ~ 26.5GHz

Agilent 16:52:52 May 5, 2008

R T



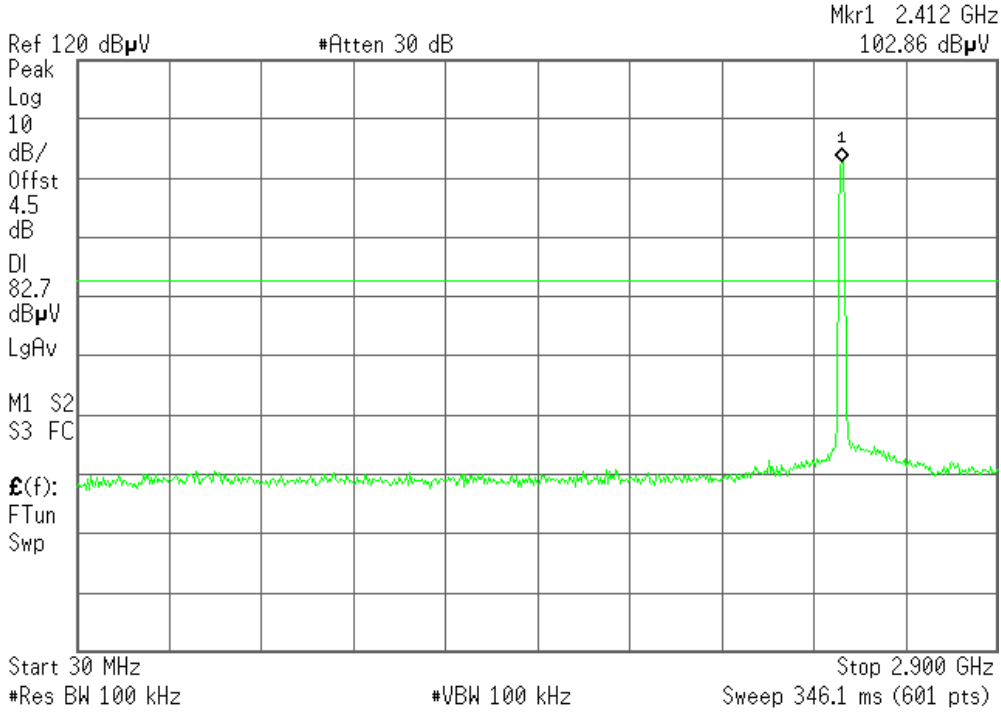


IEEE 802.11g Combined mode (Two TX)/ CH Low

30MHz ~ 2.9GHz

Agilent 17:04:29 May 5, 2008

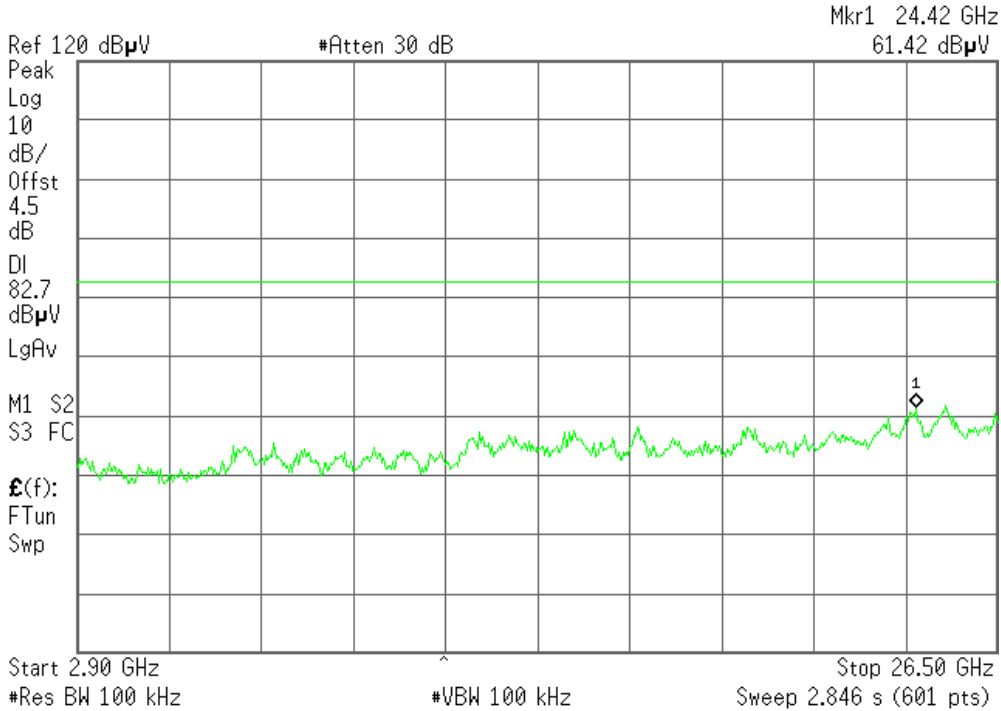
R T



2.9GHz ~ 26.5GHz

Agilent 17:04:58 May 5, 2008

R T



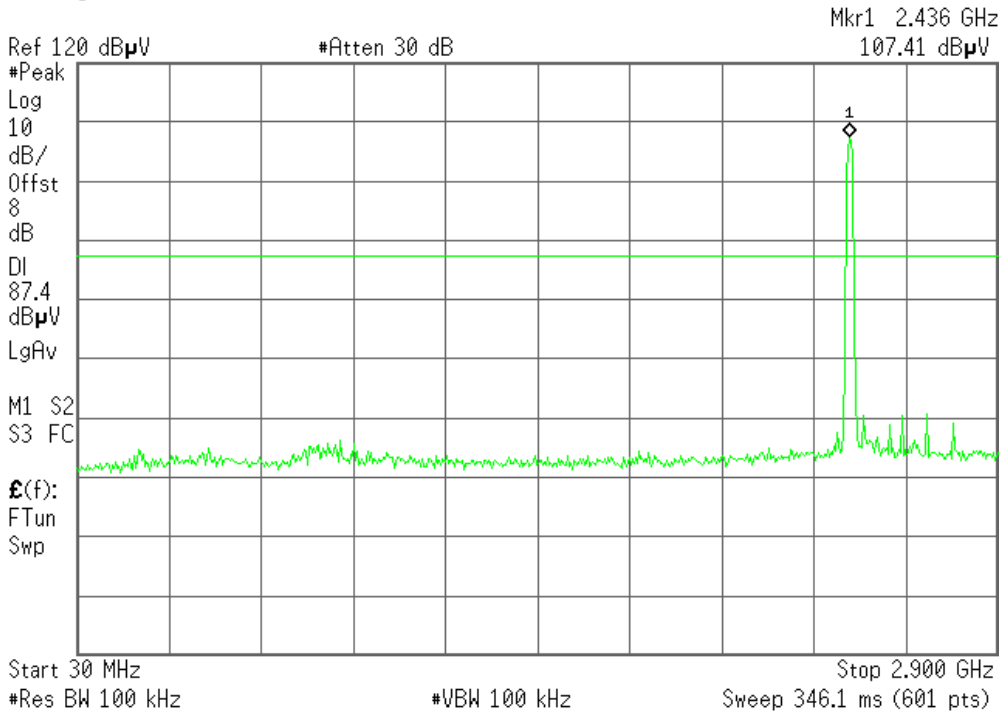


IEEE 802.11g Combined mode (Two TX)/ CH Mid

30MHz ~ 2.9GHz

Agilent 15:02:41 Apr 28, 2008

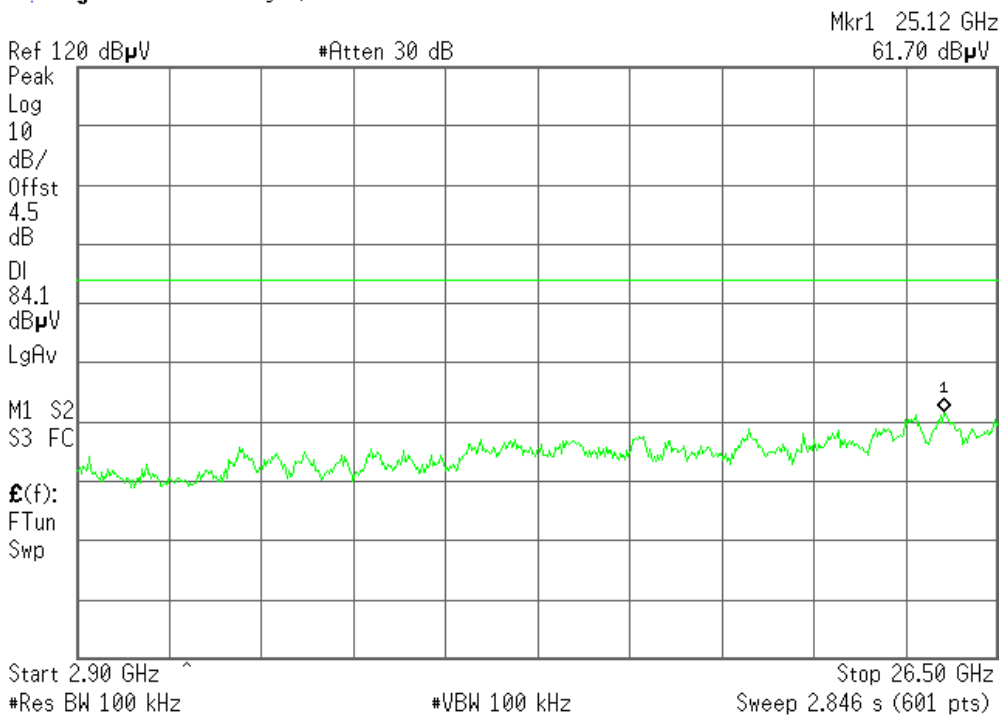
T



2.9GHz ~ 26.5GHz

Agilent 16:59:52 May 5, 2008

R T



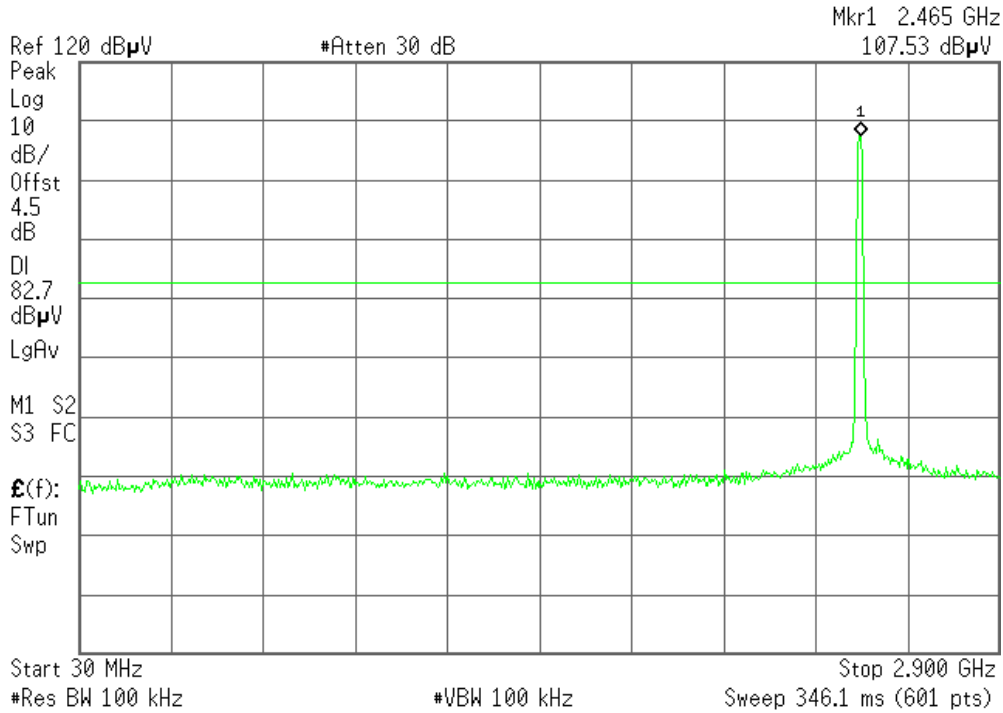


IEEE 802.11g Combined mode (Two TX) / CH High

30MHz ~ 2.9GHz

Agilent 17:06:25 May 5, 2008

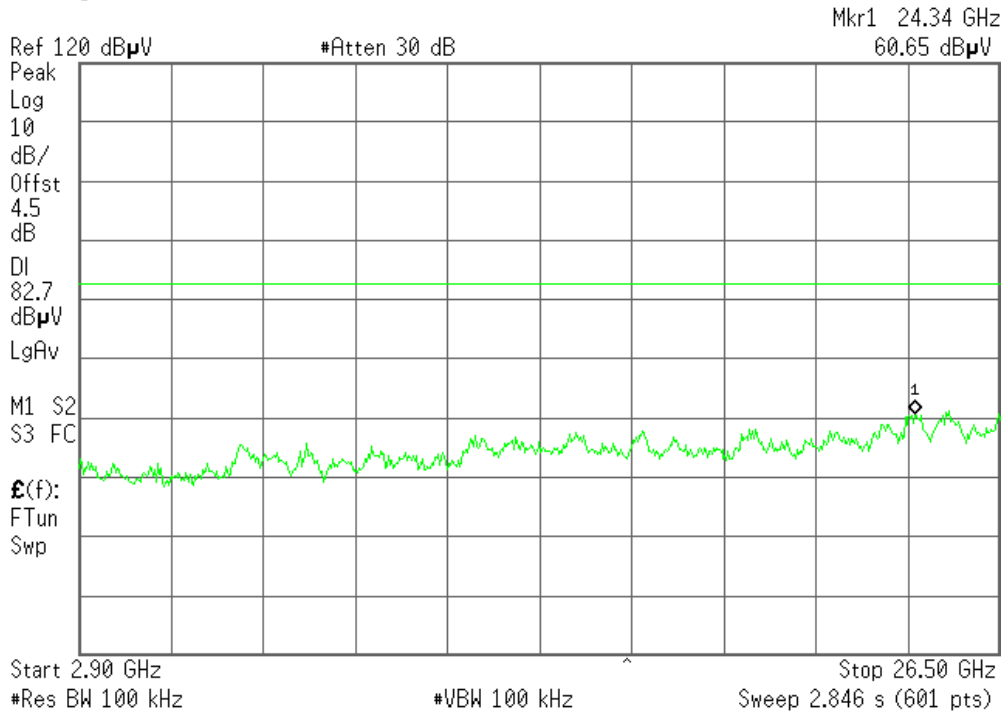
R T



2.9GHz ~ 26.5GHz

Agilent 17:07:02 May 5, 2008

R T



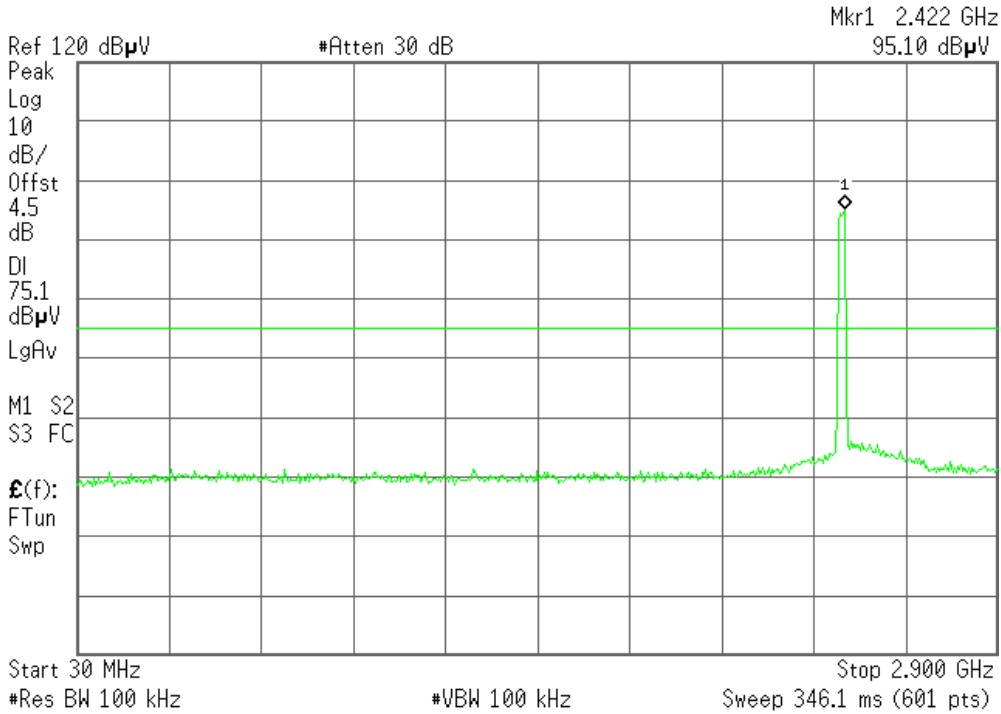


IEEE 802.11n HT20 Combined mode (Two TX)/ CH Low

30MHz ~ 2.9GHz

Agilent 17:14:51 May 5, 2008

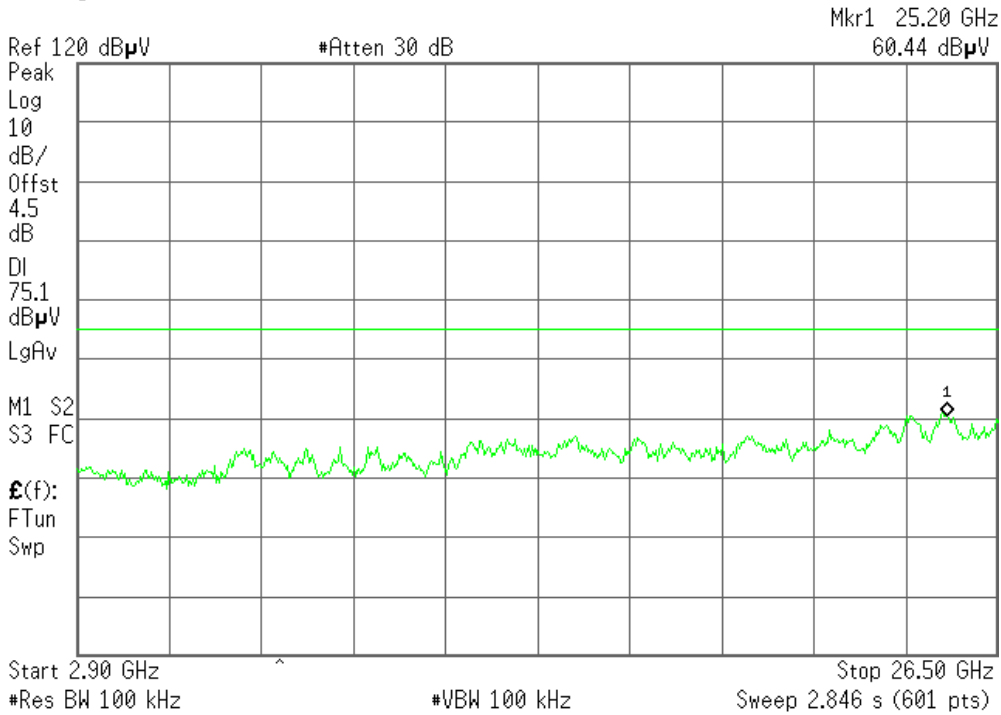
R T



2.9GHz ~ 26.5GHz

Agilent 17:15:37 May 5, 2008

R T



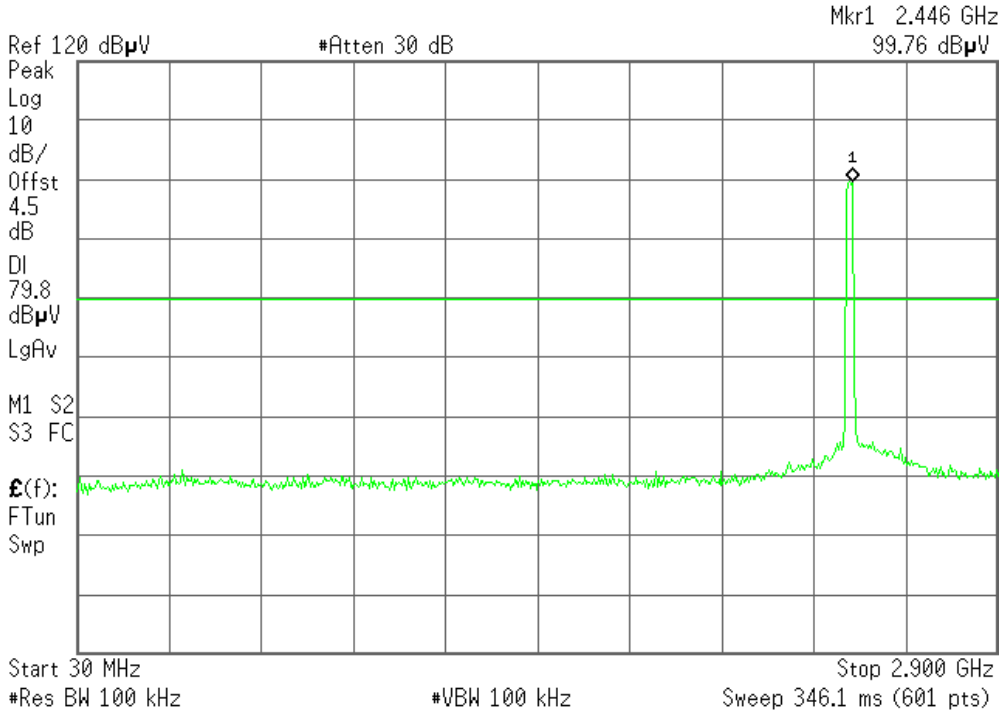


IEEE 802.11n HT20 Combined mode (Two TX)/ CH Mid

30MHz ~ 2.9GHz

Agilent 17:16:49 May 5, 2008

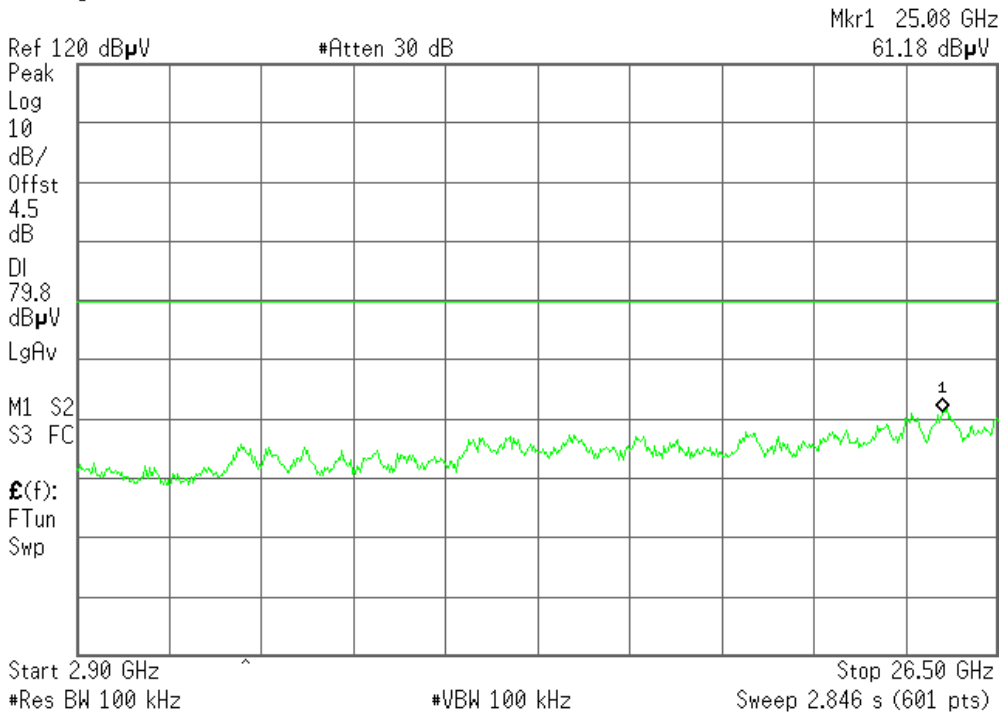
R T



2.9GHz ~ 26.5GHz

Agilent 17:17:32 May 5, 2008

R T



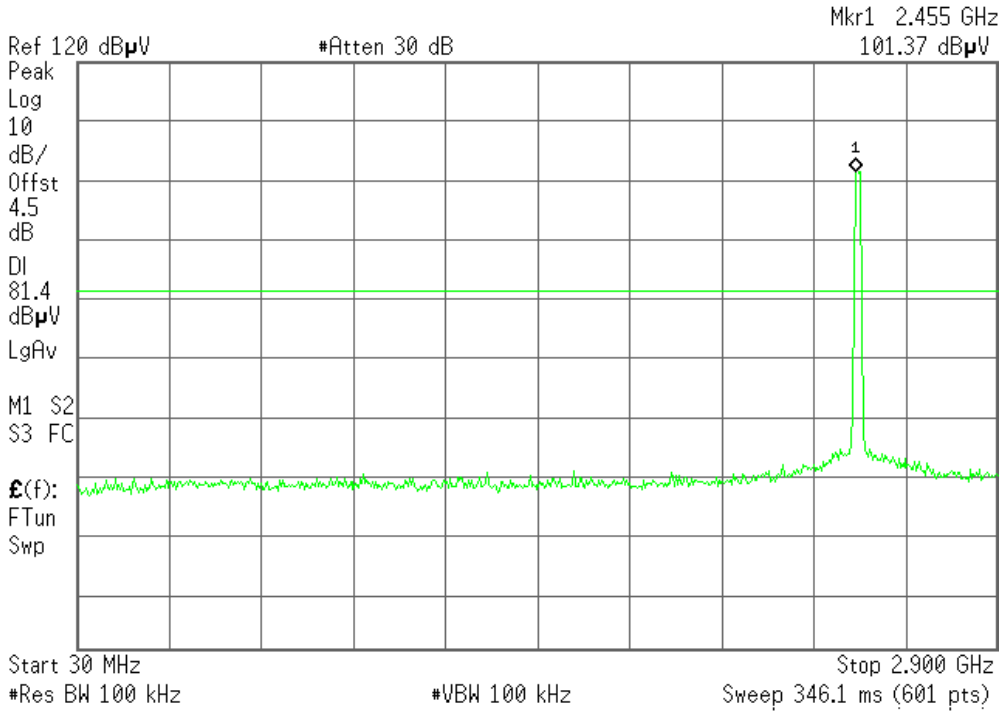


IEEE 802.11n HT20 Combined mode (Two TX)/ CH High

30MHz ~ 2.9GHz

Agilent 17:18:40 May 5, 2008

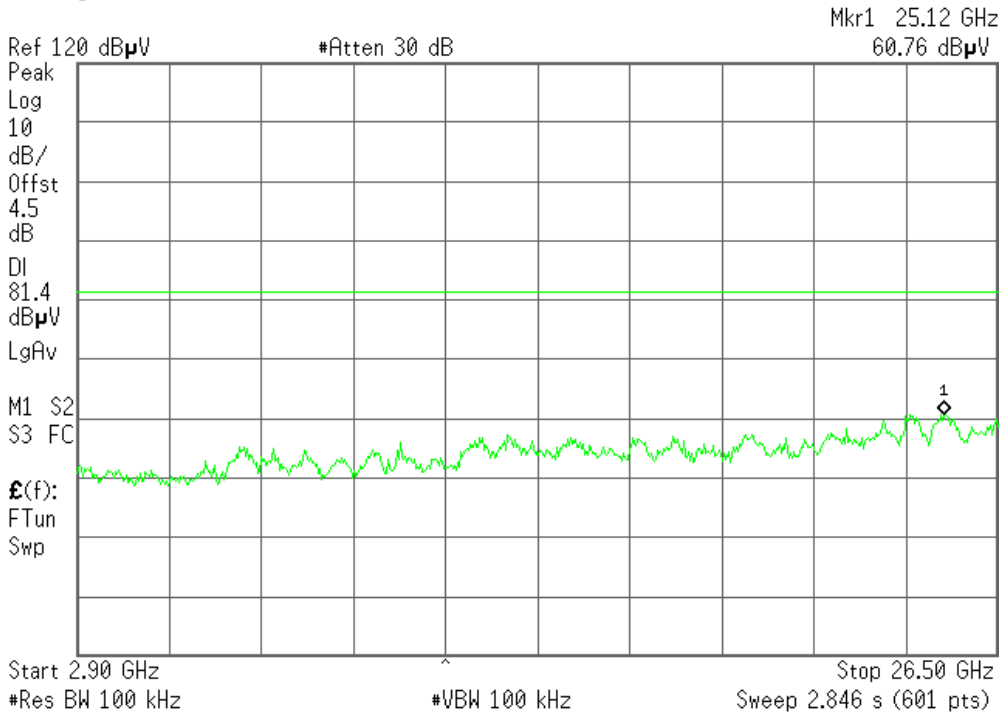
R T



2.9GHz ~ 26.5GHz

Agilent 17:19:08 May 5, 2008

R T



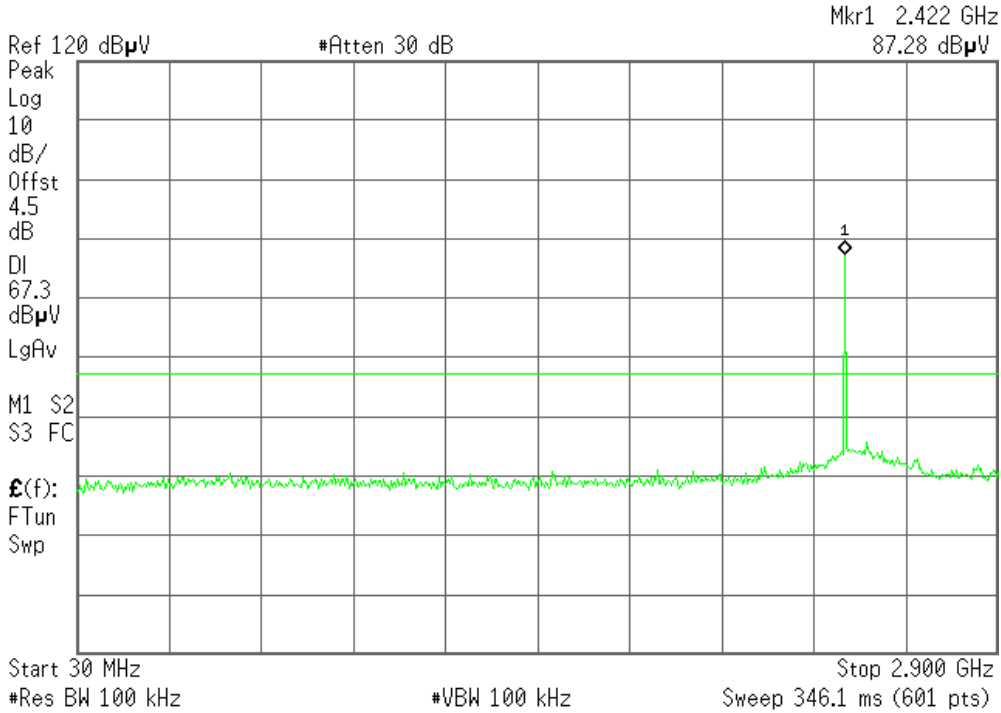


IEEE 802.11n HT40 Combined mode (Two TX)/ CH Low

30MHz ~ 2.9GHz

Agilent 17:21:03 May 5, 2008

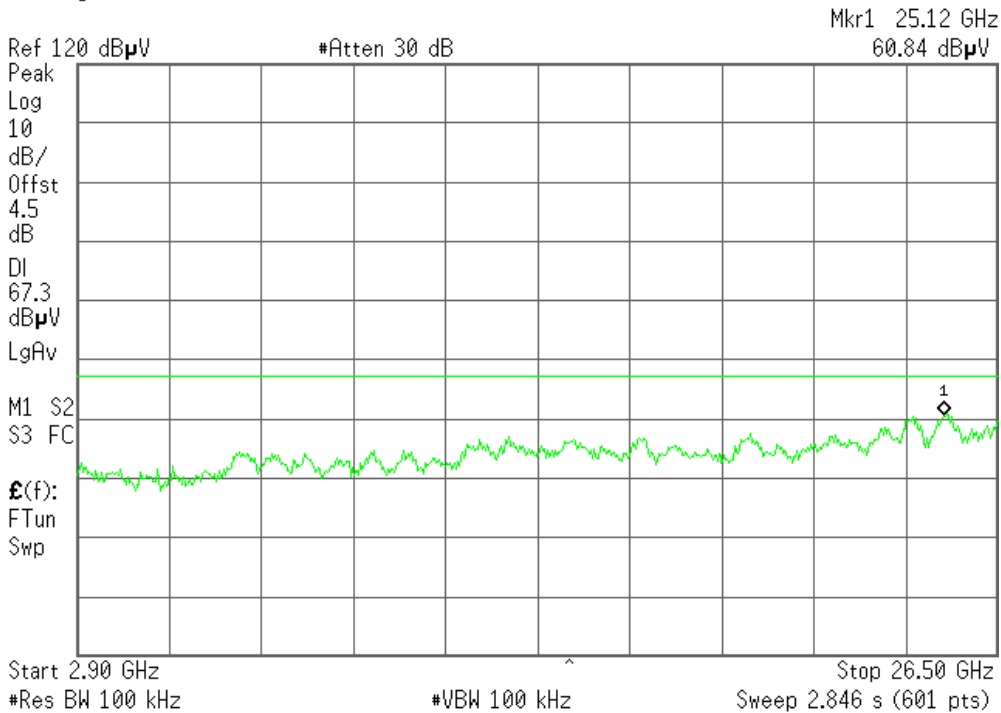
R T



2.9GHz ~ 26.5GHz

Agilent 17:21:28 May 5, 2008

R T



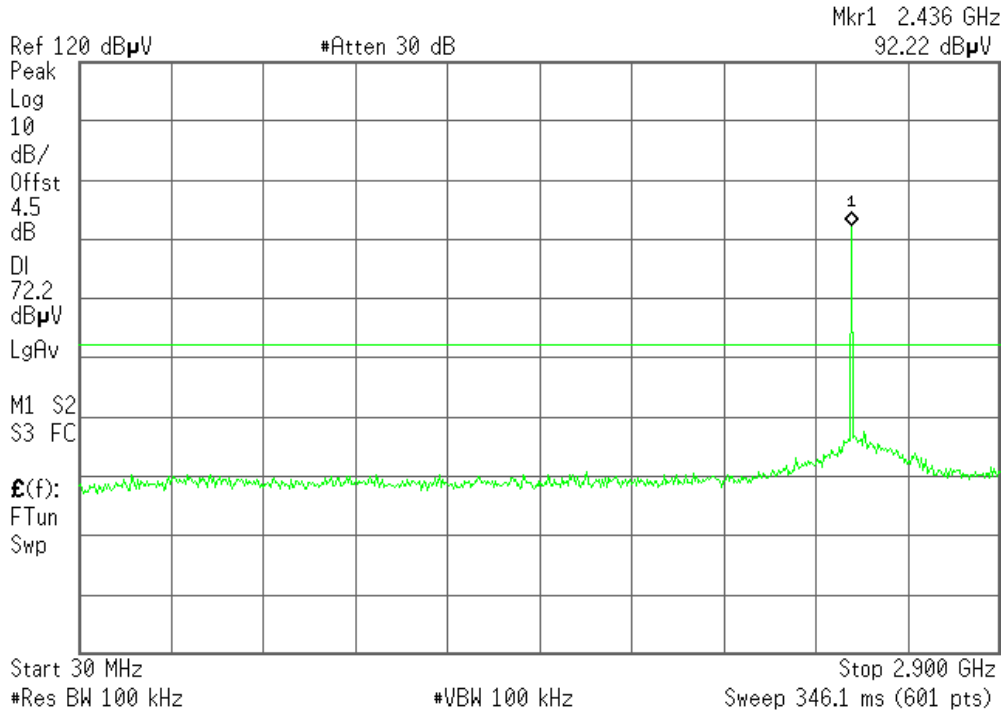


IEEE 802.11n HT40 Combined mode (Two TX)/ CH Mid

30MHz ~ 2.9GHz

Agilent 17:23:22 May 5, 2008

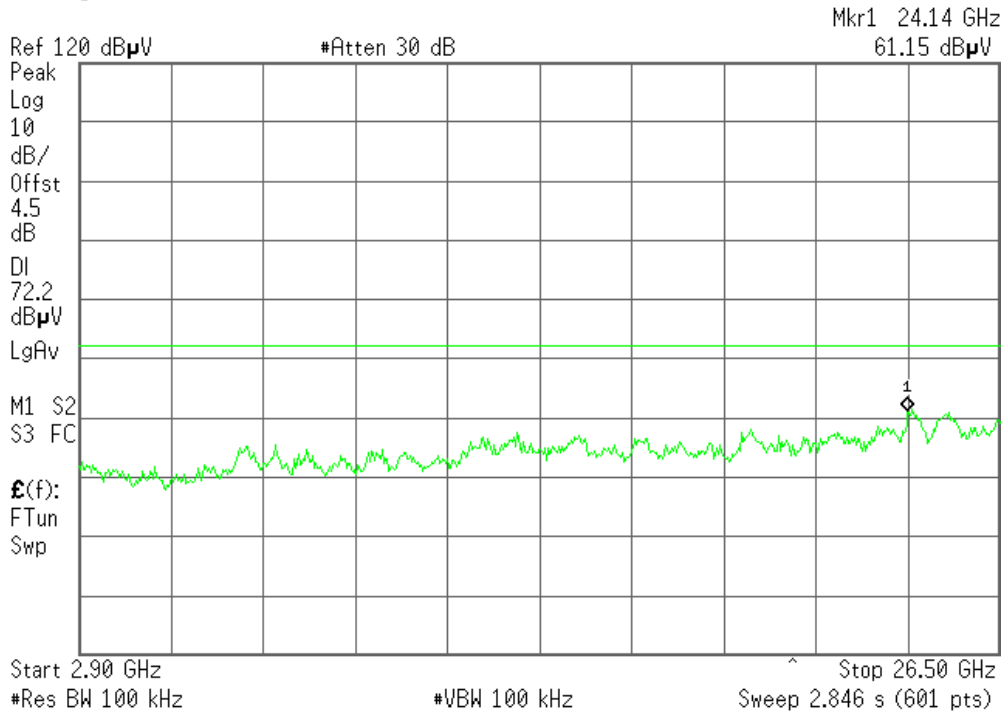
R T



2.9GHz ~ 26.5GHz

Agilent 17:23:52 May 5, 2008

R T



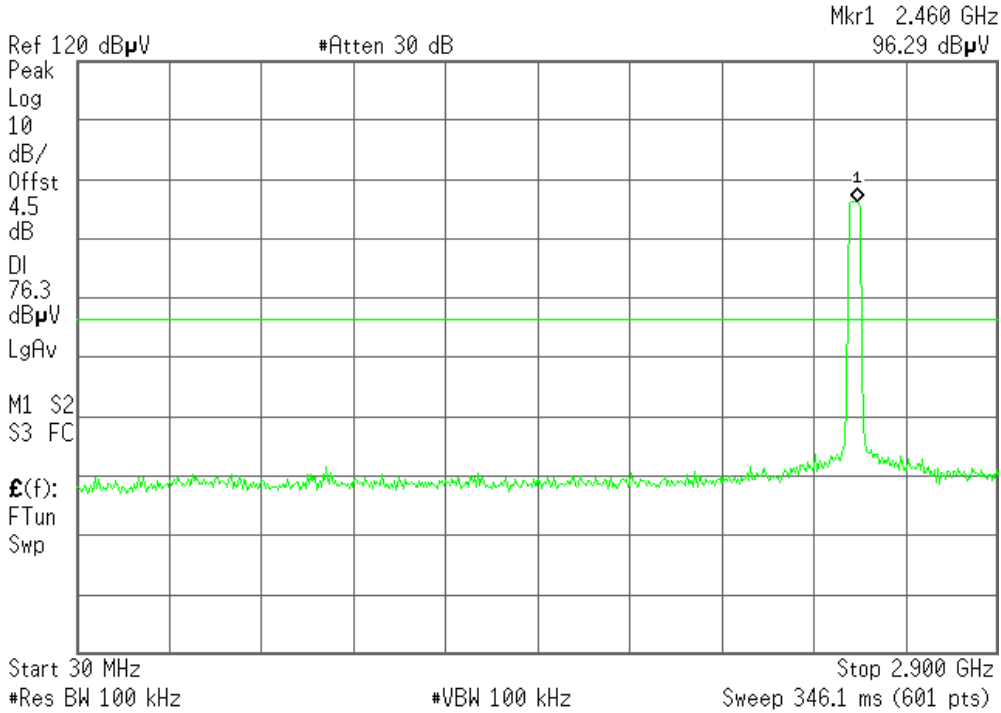


IEEE 802.11n HT40 Combined mode (Two TX)/ CH High

30MHz ~ 2.9GHz

Agilent 17:24:49 May 5, 2008

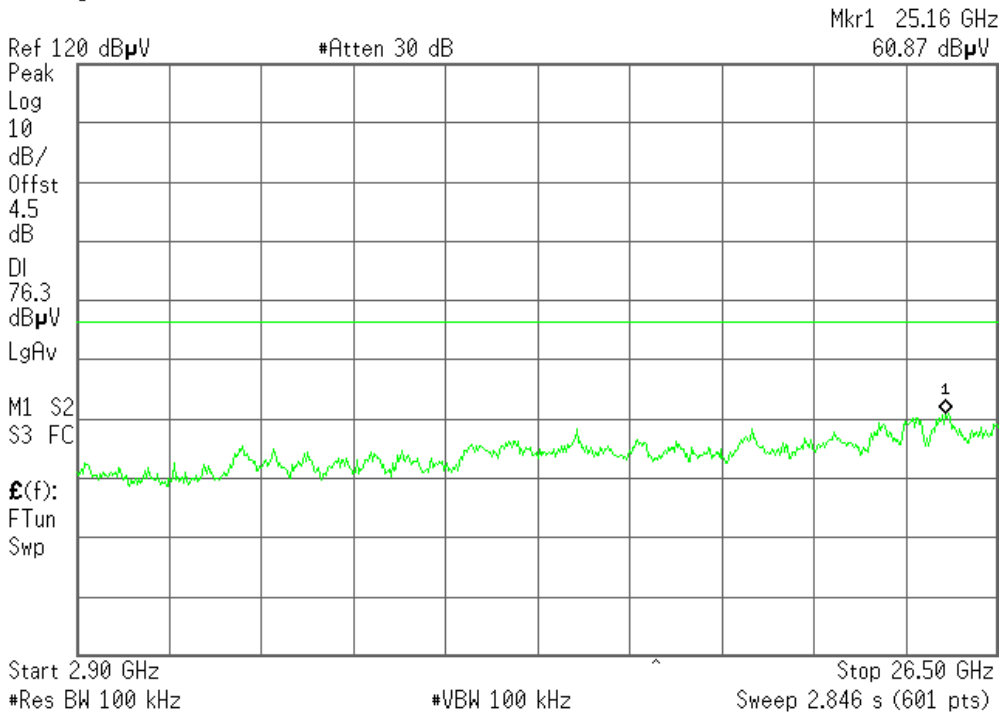
R T



2.9GHz ~ 26.5GHz

Agilent 17:25:14 May 5, 2008

R T





8.5 RADIATED EMISSIONS

8.5.1 TRANSMITTER RADIATED SUPURIOUS EMSSIONS

LIMITS

§ 15.205 (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
¹ 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
2. 17725 – 4.17775	37.5 – 38.25	1435 – 1626.5	9.0 – 9.2
2. 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 – 156.52525	2483.5 – 2500	17.7 – 21.4
8.37625 – 8.38675	156.7 – 156.9	2655 – 2900	22.01 – 23.12
8.41425 – 8.41475	162.0125 – 167.17	3260 – 3267	23.6 – 24.0
12.29 – 12.293	167.72 – 173.2	3332 – 3339	31.2 – 31.8
12.51975 – 12.52025	240 – 285	3345.8 – 3358	36.43 – 36.5
12.57675 – 12.57725	322 – 335.4	3600 – 4400	(²)
13.36 – 13.41			

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

§ 15.205 (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.

§ 15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table :

Frequency (MHz)	Field Strength (mV/m)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

Note: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.



§ 15.209 (b) In the emission table above, the tighter limit applies at the band edges.

Frequency (Hz)	Field Strength ($\mu\text{V/m}$ at 3-meter)	Field Strength ($\text{dB}\mu\text{V/m}$ at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

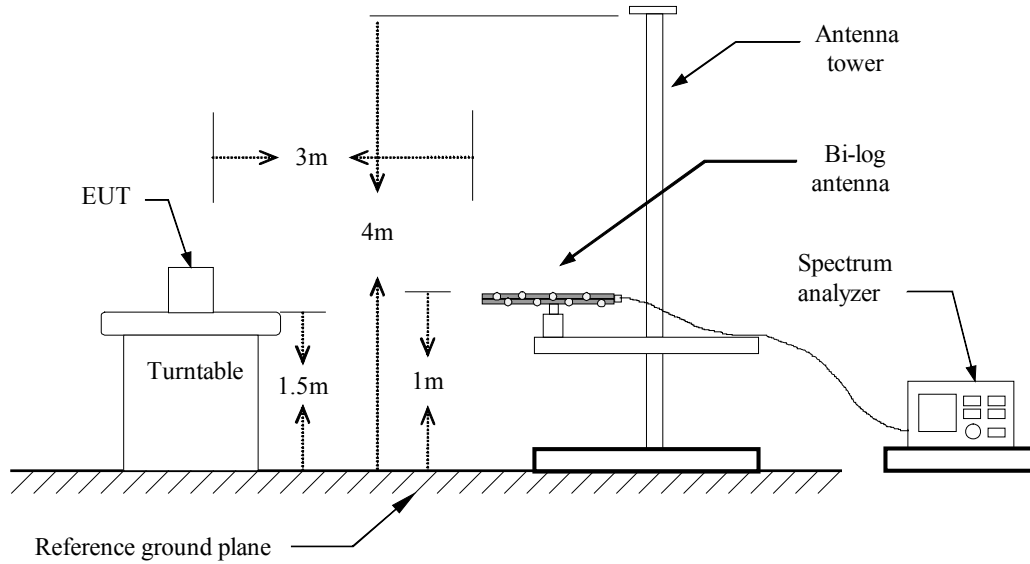
MEASUREMENT EQUIPMENT USED

966 RF CHAMBER 2				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
PSA Spectrum Analyzer	Agilent	E4446A	US44300399	02/05/2008
EMI Test Receiver	R&S	ESCI	1166.5950 03	01/13/2009
Pre-Amplifier	MITEQ	N/A	AFS42-00102650-42-10P-42	02/14/2008
Bilog Antenna	SCHWAZBECK	CBL6143	5082	06/09/2008
Turn Table	EMCO	2081-1.21	N/A	N.C.R
Antenna Tower	CT	N/A	N/A	N.C.R
Controller	CT	N/A	N/A	N.C.R
RF Comm. Test set	HP	8920B	US36142090	N.C.R
Site NSA	C&C	N/A	N/A	06/09/2008
Horn Antenna	TRC	N/A	N/A	03/04/2008

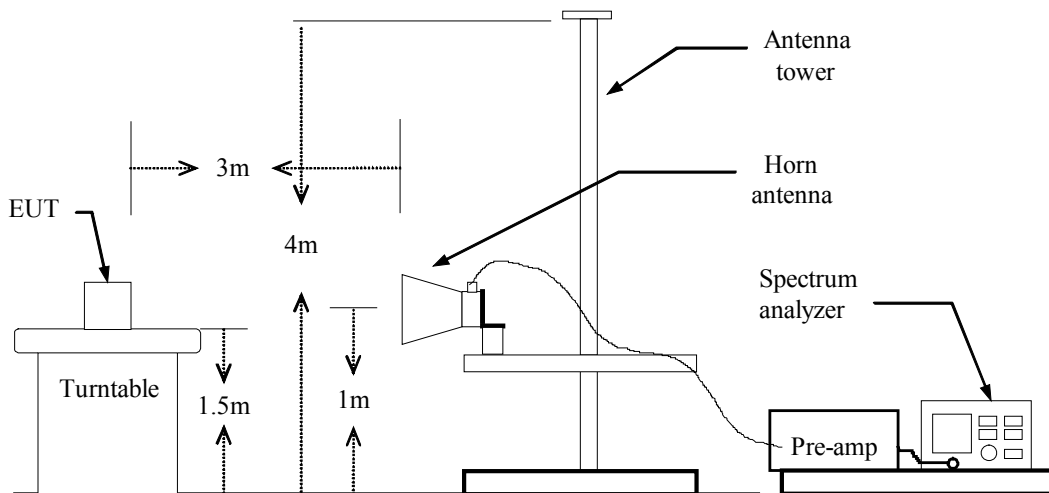
Remark: Each piece of equipment is scheduled for calibration once a year.

TEST CONFIGURATION

Below 1 GHz



Above 1 GHz





TEST PROCEDURE

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
2. While measuring the radiated emission below 1GHz, the EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. While measuring the radiated emission above 1GHz, the EUT was set 1 meters away from the interference-receiving antenna.
3. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarization of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Note :

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection and frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

**TEST RESULTS****Below 1 GHz****Operation Mode:** Normal link**Test Date:** January 19, 2008**Temperature:** 20°C**Tested by:** Tom**Humidity:** 70 % RH**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuv)	Factor (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
35.850	V	Peak	38.17	-9.12	29.05	40.00	-10.95
54.750	V	Peak	44.44	-16.38	28.06	40.00	-11.94
232.950	V	Peak	44.75	-12.88	31.87	46.00	-14.13
372.333	V	Peak	48.52	-9.00	39.52	46.00	-6.48
639.500	V	Peak	47.85	-5.12	42.73	46.00	-3.27
750.333	V	Peak	39.06	-4.34	34.72	46.00	-11.28
35.850	H	Peak	35.67	-9.12	26.55	40.00	-13.45
62.400	H	Peak	42.64	-17.43	25.21	40.00	-14.79
283.800	H	Peak	44.03	-11.49	32.54	46.00	-13.46
372.333	H	Peak	47.70	-9.00	38.70	46.00	-7.30
640.666	H	Peak	41.63	-5.11	36.52	46.00	-9.48
750.333	H	Peak	39.92	-4.34	35.58	46.00	-10.42

Notes:

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. 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.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.



Above 1 GHz

Operation Mode: TX / IEEE 802.11b / CH Low

Test Date: January 19, 2008

Temperature: 20°C

Tested by: Tom

Humidity: 56 % RH

Polarity: Ver. / Hor.

Antenna: DAC0 (TX0)

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1526.66	V	55.90	---	-9.32	46.58	---	74.00	54.00	-7.42	Peak
1926.66	V	55.95	---	-7.75	48.20	---	74.00	54.00	-5.80	Peak
2180.00	V	57.99	---	-6.75	51.24	---	74.00	54.00	-2.76	Peak
4858.33	V	46.45	---	0.74	47.19	---	74.00	54.00	-6.81	Peak
N/A										
1720.00	H	59.14	---	-8.56	50.58	---	74.00	54.00	-3.42	Peak
2063.33	H	57.61	---	-7.21	50.40	---	74.00	54.00	-3.60	Peak
2250.00	H	57.06	---	-6.47	50.59	---	74.00	54.00	-3.41	Peak
4875.00	H	47.21	---	0.77	47.98	---	74.00	54.00	-6.02	Peak
N/A										

Antenna: DAC1(TX1)

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1650.00	V	56.70	---	-8.83	47.87	---	74.00	54.00	-6.13	Peak
1763.33	V	56.25	---	-8.39	47.86	---	74.00	54.00	-6.14	Peak
2063.33	V	56.86	---	-7.21	49.65	---	74.00	54.00	-4.35	Peak
4833.33	V	45.20	---	0.69	45.89	---	74.00	54.00	-8.11	Peak
N/A										
1710.00	H	58.07	---	-8.60	49.47	---	74.00	54.00	-4.53	Peak
2100.00	H	56.75	---	-7.06	49.69	---	74.00	54.00	-4.31	Peak
2283.33	H	57.31	---	-6.34	50.97	---	74.00	54.00	-3.03	Peak
4916.66	H	45.91	---	0.66	46.57	---	74.00	54.00	-7.43	Peak
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.



Operation Mode: TX / IEEE 802.11b / CH Mid

Test Date: January 19, 2008

Temperature: 20°C

Tested by: Tom

Humidity: 70 % RH

Polarity: Ver. / Hor.

Antenna: DAC0(TX0)

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1286.66	V	58.32	---	-10.59	47.73	---	74.00	54.00	-6.27	Peak
1406.66	V	58.93	---	-9.93	49.00	---	74.00	54.00	-5.00	Peak
1500.00	V	58.63	---	-9.42	49.21	---	74.00	54.00	-4.79	Peak
4891.66	V	45.87	---	0.79	46.66	---	74.00	54.00	-7.34	Peak
N/A										
1393.33	H	57.86	---	-10.01	47.85	---	74.00	54.00	-6.15	Peak
1686.66	H	57.89	---	-8.69	49.20	---	74.00	54.00	-4.80	Peak
2070.00	H	56.74	---	-7.18	49.56	---	74.00	54.00	-4.44	Peak
4825.00	H	46.77	---	0.68	47.45	---	74.00	54.00	-6.55	Peak
N/A										

Antenna: DAC1(TX1)

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1330.00	V	59.36	---	-10.36	49.00	---	74.00	54.00	-5.00	Peak
1500.00	V	58.79	---	-9.42	49.37	---	74.00	54.00	-4.63	Peak
1720.00	V	58.10	---	-8.56	49.54	---	74.00	54.00	-4.46	Peak
4866.66	V	46.21	---	0.75	46.96	---	74.00	54.00	-7.04	Peak
N/A										
1333.33	H	59.00	---	-10.34	48.66	---	74.00	54.00	-5.34	Peak
1413.33	H	59.22	---	-9.90	49.32	---	74.00	54.00	-4.68	Peak
2230.00	H	56.86	---	-6.55	50.31	---	74.00	54.00	-3.69	Peak
4850.00	H	45.89	---	0.72	46.61	---	74.00	54.00	-7.39	Peak
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.



Operation Mode: TX / IEEE 802.11b / CH High

Test Date: January 19, 2008

Temperature: 20°C

Tested by: Tom

Humidity: 70 % RH

Polarity: Ver. / Hor.

Antenna: DAC0(TX0)

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1326.66	V	60.17	---	-10.37	49.80	---	74.00	54.00	-4.20	Peak
1500.00	V	60.87	---	-9.42	51.45	---	74.00	54.00	-2.55	Peak
1786.66	V	56.96	---	-8.30	48.66	---	74.00	54.00	-5.34	Peak
4900.00	V	45.47	---	0.81	46.28	---	74.00	54.00	-7.72	Peak
N/A										
1703.33	H	57.54	---	-8.62	48.92	---	74.00	54.00	-5.08	Peak
1860.00	H	57.33	---	-8.01	49.32	---	74.00	54.00	-4.68	Peak
2170.00	H	56.64	---	-6.79	49.85	---	74.00	54.00	-4.15	Peak
4883.33	H	46.10	---	0.78	46.88	---	74.00	54.00	-7.12	Peak
N/A										

Antenna: DAC1(TX1)

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1330.00	V	60.58	---	-10.36	50.22	---	74.00	54.00	-3.78	Peak
1496.66	V	61.28	---	-9.44	51.84	---	74.00	54.00	-2.16	Peak
1706.66	V	59.36	---	-8.61	50.75	---	74.00	54.00	-3.25	Peak
4925.00	V	46.73	---	0.85	47.58	---	74.00	54.00	-6.42	Peak
N/A										
1263.33	H	57.34	---	-10.72	46.62	---	74.00	54.00	-7.38	Peak
1356.66	H	57.74	---	-10.21	47.53	---	74.00	54.00	-6.47	Peak
1680.00	H	57.07	---	-8.71	48.36	---	74.00	54.00	-5.64	Peak
4950.00	H	45.80	---	0.89	46.69	---	74.00	54.00	-7.31	Peak
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.



Operation Mode: TX / IEEE 802.11g / CH Low

Test Date: January 19, 2008

Temperature: 20°C

Tested by: Tom

Humidity: 70 % RH

Polarity: Ver. / Hor.

Antenna: DAC0(TX0)

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1326.66	V	59.48	---	-9.44	50.04	---	74.00	54.00	-3.96	Peak
1496.66	V	58.55	---	-8.62	49.93	---	74.00	54.00	-4.07	Peak
1703.33	V	56.61	---	-6.76	49.85	---	74.00	54.00	-4.15	Peak
4808.33	V	46.58	---	0.65	47.23	---	74.00	54.00	-6.77	Peak
N/A										
1333.33	H	59.41	---	-10.34	49.07	---	74.00	54.00	-4.93	Peak
1656.66	H	56.08	---	-8.81	47.27	---	74.00	54.00	-6.73	Peak
2073.33	H	57.02	---	-7.17	49.85	---	74.00	54.00	-4.15	Peak
4825.00	H	46.59	---	0.68	47.27	---	74.00	54.00	-6.73	Peak
N/A										

Antenna: DAC1(TX1)

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1330.00	V	59.80	---	-10.36	49.44	---	74.00	54.00	-4.56	Peak
1710.00	V	58.65	---	-8.60	50.05	---	74.00	54.00	-3.95	Peak
2166.66	V	56.68	---	-6.80	49.88	---	74.00	54.00	-4.12	Peak
4816.66	V	45.59	---	0.66	46.25	---	74.00	54.00	-7.75	Peak
N/A										
1496.66	H	59.88	---	-9.44	50.44	---	74.00	54.00	-3.56	Peak
1790.00	H	56.45	---	-8.28	48.17	---	74.00	54.00	-5.83	Peak
2046.66	H	56.28	---	-7.28	49.00	---	74.00	54.00	-5.00	Peak
4816.66	H	46.31	---	0.66	46.97	---	74.00	54.00	-7.03	Peak
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.



Operation Mode: TX / IEEE 802.11g / CH Mid

Test Date: January 19, 2008

Temperature: 20°C

Tested by: Tom

Humidity: 70 % RH

Polarity: Ver. / Hor.

Antenna: DAC0(TX0)

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1430.00	V	57.71	---	-9.80	47.91	---	74.00	54.00	-6.09	Peak
1713.33	V	58.03	---	-8.58	49.45	---	74.00	54.00	-4.55	Peak
2106.66	V	57.05	---	-7.04	50.01	---	74.00	54.00	-3.99	Peak
4858.33	V	45.90	---	0.74	46.64	---	74.00	54.00	-7.36	Peak
N/A										
1500.00	H	59.49	---	-9.42	50.07	---	74.00	54.00	-3.93	Peak
1766.66	H	56.53	---	-8.37	48.16	---	74.00	54.00	-5.84	Peak
2160.00	H	56.78	---	-6.83	49.95	---	74.00	54.00	-4.05	Peak
4900.00	H	46.42	---	0.81	47.23	---	74.00	54.00	-6.77	Peak
N/A										

Antenna: DAC1(TX1)

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1326.66	V	56.94	---	-10.37	46.57	---	74.00	54.00	-7.43	Peak
1873.33	V	56.11	---	-7.96	48.15	---	74.00	54.00	-5.85	Peak
2130.00	V	58.89	---	-6.95	51.94	---	74.00	54.00	-2.06	Peak
4883.33	V	45.19	---	0.78	45.97	---	74.00	54.00	-8.03	Peak
N/A										
1393.33	H	57.24	---	-10.01	47.23	---	74.00	54.00	-6.77	Peak
1533.33	H	57.14	---	-9.29	47.85	---	74.00	54.00	-6.15	Peak
2210.00	H	56.84	---	-6.63	50.21	---	74.00	54.00	-3.79	Peak
4875.00	H	45.83	---	0.77	46.60	---	74.00	54.00	-7.40	Peak
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms



Operation Mode: TX / IEEE 802.11g / CH High

Test Date: January 19, 2008

Temperature: 20°C

Tested by: Tom

Humidity: 70 % RH

Polarity: Ver. / Hor.

Antenna: DAC0(TX0)

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1330.00	V	59.44	---	-10.36	49.08	---	74.00	54.00	-4.92	Peak
1500.00	V	59.32	---	-9.42	49.90	---	74.00	54.00	-4.10	Peak
2230.00	V	56.51	---	-6.55	49.96	---	74.00	54.00	-4.04	Peak
4966.66	V	45.21	---	0.92	46.13	---	74.00	54.00	-7.87	Peak
N/A										
1330.00	H	59.47	---	-10.36	49.11	---	74.00	54.00	-4.89	Peak
1650.00	H	56.33	---	-8.83	47.50	---	74.00	54.00	-6.50	Peak
2053.33	H	56.57	---	-7.25	49.32	---	74.00	54.00	-4.68	Peak
4883.33	H	46.13	---	0.78	46.91	---	74.00	54.00	-7.09	Peak
N/A										

Antenna: DAC1(TX1)

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1326.66	V	61.15	---	-10.37	50.78	---	74.00	54.00	-3.22	Peak
1746.66	V	56.63	---	-8.45	48.18	---	74.00	54.00	-5.82	Peak
2166.66	V	57.09	---	-6.80	50.29	---	74.00	54.00	-3.71	Peak
4916.66	V	46.06	---	0.84	46.90	---	74.00	54.00	-7.10	Peak
N/A										
1326.66	H	59.38	---	-10.37	49.01	---	74.00	54.00	-4.99	Peak
1493.33	H	58.90	---	-9.46	49.44	---	74.00	54.00	-4.56	Peak
2023.33	H	56.28	---	-7.37	48.91	---	74.00	54.00	-5.09	Peak
4908.33	H	45.43	---	0.82	46.25	---	74.00	54.00	-7.75	Peak
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.



Operation Mode: TX / IEEE 802.11n HT20 TX /CH Low

Test Date: January 19, 2008

Temperature: 20°C

Tested by: Tom

Humidity: 70 % RH

Polarity: Ver. / Hor.

Antenna: DAC0(TX0)

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1330.00	V	59.80	---	-10.36	49.44	---	74.00	54.00	-4.56	Peak
1496.66	V	59.85	---	-9.44	50.41	---	74.00	54.00	-3.59	Peak
2173.33	V	56.97	---	-6.77	50.20	---	74.00	54.00	-3.80	Peak
4858.33	V	46.51	---	0.74	47.25	---	74.00	54.00	-6.75	Peak
N/A										
1330.00	H	59.47	---	-10.36	49.11	---	74.00	54.00	-4.89	Peak
1986.66	H	56.47	---	-7.51	48.96	---	74.00	54.00	-5.04	Peak
2250.00	H	56.83	---	-6.47	50.36	---	74.00	54.00	-3.64	Peak
4866.66	H	46.48	---	0.75	47.23	---	74.00	54.00	-6.77	Peak
N/A										

Antenna: DAC1(TX1)

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1330.00	V	60.12	---	-10.36	49.76	---	74.00	54.00	-4.24	Peak
1500.00	V	58.90	---	-9.42	49.48	---	74.00	54.00	-4.52	Peak
2253.33	V	56.23	---	-6.46	49.77	---	74.00	54.00	-4.23	Peak
4858.33	V	46.10	---	0.74	46.84	---	74.00	54.00	-7.16	Peak
N/A										
1330.00	H	59.31	---	-10.36	48.95	---	74.00	54.00	-5.05	Peak
1966.66	H	56.60	---	-7.59	49.01	---	74.00	54.00	-4.99	Peak
2220.00	H	56.83	---	-6.59	50.24	---	74.00	54.00	-3.76	Peak
4833.33	H	44.83	---	0.69	45.52	---	74.00	54.00	-8.48	Peak
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.



Operation Mode: TX / IEEE 802.11n HT20 TX /CH Mid

Test Date: January 19, 2008

Temperature: 20°C

Tested by: Tom

Humidity: 70 % RH

Polarity: Ver. / Hor.

Antenna: DAC0(TX0)

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1333.33	V	58.89	---	-10.34	48.55	---	74.00	54.00	-5.45	Peak
1710.00	V	57.93	---	-8.60	49.33	---	74.00	54.00	-4.67	Peak
2200.00	V	57.07	---	-6.67	50.40	---	74.00	54.00	-3.60	Peak
4866.66	V	47.96	---	0.75	48.71	---	74.00	54.00	-5.29	Peak
N/A										
1440.00	H	56.23	---	-9.75	46.48	---	74.00	54.00	-7.52	Peak
1676.66	H	57.21	---	-8.73	48.48	---	74.00	54.00	-5.52	Peak
2086.66	H	56.48	---	-7.12	49.36	---	74.00	54.00	-4.64	Peak
4875.00	H	45.44	---	0.77	46.21	---	74.00	54.00	-7.79	Peak
N/A										

Antenna: DAC1(TX1)

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1403.33	V	57.45	---	-9.95	47.50	---	74.00	54.00	-6.50	Peak
1583.33	V	56.37	---	-9.09	47.28	---	74.00	54.00	-6.72	Peak
1896.66	V	56.70	---	-7.87	48.83	---	74.00	54.00	-5.17	Peak
4875.00	V	46.03	---	0.77	46.80	---	74.00	54.00	-7.20	Peak
N/A										
1723.33	H	56.30	---	-8.54	47.76	---	74.00	54.00	-6.24	Peak
1976.66	H	56.37	---	-7.55	48.82	---	74.00	54.00	-5.18	Peak
2190.00	H	57.00	---	-6.71	50.29	---	74.00	54.00	-3.71	Peak
4875.00	H	45.73	---	0.77	46.50	---	74.00	54.00	-7.50	Peak
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.



Operation Mode: TX / IEEE 802.11n HT20 TX /CH High

Test Date: January 19, 2008

Temperature: 20°C

Tested by: Tom

Humidity: 70 % RH

Polarity: Ver. / Hor.

Antenna: DAC0(TX0)

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1360.00	V	57.89	---	-10.19	47.70	---	74.00	54.00	-6.30	Peak
1760.00	V	56.25	---	-8.40	47.85	---	74.00	54.00	-6.15	Peak
2190.00	V	57.73	---	-6.71	51.02	---	74.00	54.00	-2.98	Peak
4950.00	V	45.76	---	0.89	46.65	---	74.00	54.00	-7.35	Peak
N/A										
1500.00	H	60.44	---	-9.42	51.02	---	74.00	54.00	-2.98	Peak
1716.66	H	58.92	---	-8.57	50.35	---	74.00	54.00	-3.65	Peak
2173.33	H	57.92	---	-6.77	51.15	---	74.00	54.00	-2.85	Peak
4933.33	H	45.44	---	0.87	46.31	---	74.00	54.00	-7.69	Peak
N/A										

Antenna: DAC1(TX1)

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1333.33	V	58.96	---	-10.34	48.62	---	74.00	54.00	-5.38	Peak
1496.66	V	58.61	---	-9.44	49.17	---	74.00	54.00	-4.83	Peak
2173.33	V	57.36	---	-6.77	50.59	---	74.00	54.00	-3.41	Peak
4925.00	V	46.24	---	0.85	47.09	---	74.00	54.00	-6.91	Peak
N/A										
1330.00	H	59.58	---	-10.36	49.22	---	74.00	54.00	-4.78	Peak
1703.33	H	58.93	---	-8.62	50.31	---	74.00	54.00	-3.69	Peak
2273.33	H	57.32	---	-6.38	50.94	---	74.00	54.00	-3.06	Peak
4950.00	H	45.64	---	0.89	46.53	---	74.00	54.00	-7.47	Peak
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.



Operation Mode: TX / IEEE 802.11n HT40 TX /CH Low

Test Date: January 19, 2008

Temperature: 20°C

Tested by: Tom

Humidity: 70 % RH

Polarity: Ver. / Hor.

Antenna: DAC0(TX0)

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1330.00	V	59.44	---	-10.36	49.08	---	74.00	54.00	-4.92	Peak
1493.33	V	59.24	---	-9.46	49.78	---	74.00	54.00	-4.22	Peak
2193.33	V	57.25	---	-6.69	50.56	---	74.00	54.00	-3.44	Peak
4825.00	V	46.77	---	0.68	47.45	---	74.00	54.00	-6.55	Peak
N/A										
1500.00	H	58.63	---	-9.42	49.21	---	74.00	54.00	-4.79	Peak
2033.33	H	56.48	---	-7.33	49.15	---	74.00	54.00	-4.85	Peak
2270.00	H	56.92	---	-6.39	50.53	---	74.00	54.00	-3.47	Peak
4825.00	H	46.23	---	0.68	46.91	---	74.00	54.00	-7.09	Peak
N/A										

Antenna: DAC1(TX1)

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1330.00	V	58.50	---	-10.36	48.14	---	74.00	54.00	-5.86	Peak
1496.66	V	60.08	---	-9.44	50.64	---	74.00	54.00	-3.36	Peak
1966.66	V	57.43	---	-7.59	49.84	---	74.00	54.00	-4.16	Peak
4833.33	V	45.38	---	0.69	46.07	---	74.00	54.00	-7.93	Peak
N/A										
1496.66	H	59.60	---	-9.44	50.16	---	74.00	54.00	-3.84	Peak
1700.00	H	58.33	---	-8.64	49.69	---	74.00	54.00	-4.31	Peak
2133.33	H	58.04	---	-6.93	51.11	---	74.00	54.00	-2.89	Peak
4841.66	H	45.98	---	0.71	46.69	---	74.00	54.00	-7.31	Peak
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.



Operation Mode: TX / IEEE 802.11n HT40 TX /CH Mid

Test Date: January 19, 2008

Temperature: 25°C

Tested by: Tom

Humidity: 70 % RH

Polarity: Ver. / Hor.

Antenna: DAC0(TX0)

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1350.00	V	57.53	---	-10.24	47.29	---	74.00	54.00	-6.71	Peak
1500.00	V	58.59	---	-9.42	49.17	---	74.00	54.00	-4.83	Peak
1686.66	V	58.66	---	-8.69	49.97	---	74.00	54.00	-4.03	Peak
4891.66	V	45.65	---	0.79	46.44	---	74.00	54.00	-7.56	Peak
N/A										
1500.00	H	59.80	---	-9.42	50.38	---	74.00	54.00	-3.62	Peak
1650.00	H	57.05	---	-8.83	48.22	---	74.00	54.00	-5.78	Peak
1720.00	H	58.13	---	-8.56	49.57	---	74.00	54.00	-4.43	Peak
4875.00	H	45.48	---	0.77	46.25	---	74.00	54.00	-7.75	Peak
N/A										

Antenna: DAC1(TX1)

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1700.00	V	58.63	---	-8.64	49.99	---	74.00	54.00	-4.01	Peak
1993.00	V	57.04	---	-7.49	49.55	---	74.00	54.00	-4.45	Peak
2300.00	V	57.13	---	-6.27	50.86	---	74.00	54.00	-3.14	Peak
4883.33	V	46.19	---	0.78	46.97	---	74.00	54.00	-7.03	Peak
N/A										
1496.66	H	59.85	---	-9.44	50.41	---	74.00	54.00	-3.59	Peak
1706.66	H	58.81	---	-8.61	50.20	---	74.00	54.00	-3.80	Peak
2036.66	H	57.33	---	-7.31	50.02	---	74.00	54.00	-3.98	Peak
4900.00	H	46.42	---	0.81	47.23	---	74.00	54.00	-6.77	Peak
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.



Operation Mode: TX / IEEE 802.11n HT40 /CH High

Test Date: January 19, 2008

Temperature: 25°C

Tested by: Tom

Humidity: 70 % RH

Polarity: Ver. / Hor.

Antenna: DAC0(TX0)

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1420.00	V	56.68	---	-9.86	46.82	---	74.00	54.00	-7.18	Peak
1716.66	V	58.93	---	-8.57	50.36	---	74.00	54.00	-3.64	Peak
1996.66	V	56.70	---	-7.47	49.23	---	74.00	54.00	-4.77	Peak
4933.33	V	46.63	---	0.87	47.50	---	74.00	54.00	-6.50	Peak
N/A										
1326.66	H	59.11	---	-10.37	48.74	---	74.00	54.00	-5.26	Peak
1716.66	H	57.66	---	-8.57	49.09	---	74.00	54.00	-4.91	Peak
2150.00	H	56.71	---	-6.87	49.84	---	74.00	54.00	-4.16	Peak
4883.33	H	46.44	---	0.78	47.22	---	74.00	54.00	-6.78	Peak
N/A										

Antenna: DAC1(TX1)

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1330.00	V	59.16	---	-10.36	48.80	---	74.00	54.00	-5.20	Peak
1496.66	V	58.85	---	-9.44	49.41	---	74.00	54.00	-4.59	Peak
2233.33	V	56.05	---	-6.54	49.51	---	74.00	54.00	-4.49	Peak
4833.33	V	46.93	---	0.69	47.62	---	74.00	54.00	-6.38	Peak
N/A										
1326.66	H	60.15	---	-10.37	49.78	---	74.00	54.00	-4.22	Peak
1706.66	H	59.10	---	-8.61	50.49	---	74.00	54.00	-3.51	Peak
2253.33	H	57.35	---	-6.46	50.89	---	74.00	54.00	-3.11	Peak
4875.00	H	46.64	---	0.77	47.41	---	74.00	54.00	-6.59	Peak
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms



Operation Mode: TX / IEEE 802.11b(Chain 0 + Chain 1) / CH Low Test Date: May 12, 2008

Temperature: 20°C Tested by: Tom

Humidity: 56 % RH Polarity: Ver. / Hor.

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1333.33	V	57.65	---	-10.34	47.31	---	74.00	54.00	-6.69	Peak
1786.67	V	56.11	---	-8.30	47.81	---	74.00	54.00	-6.19	Peak
2010.00	V	56.41	---	-7.42	48.99	---	74.00	54.00	-5.01	Peak
4825.00	V	48.58	---	0.68	49.26	---	74.00	54.00	-4.74	Peak
N/A										
1500.00	H	56.46	---	-9.42	47.04	---	74.00	54.00	-6.96	Peak
1983.33	H	56.03	---	-7.53	48.50	---	74.00	54.00	-5.50	Peak
2216.67	H	56.46	---	-6.60	49.86	---	74.00	54.00	-4.14	Peak
4841.67	H	45.96	---	0.71	46.67	---	74.00	54.00	-7.33	Peak
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.



Operation Mode: TX / IEEE 802.11b(Chain 0 + Chain 1) / CH Mid **Test Date:** May 12, 2008
Temperature: 20°C **Tested by:** Tom
Humidity: 70 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1066.67	V	60.72	---	-11.80	48.92	---	74.00	54.00	-5.08	Peak
1763.33	V	56.51	---	-8.39	48.12	---	74.00	54.00	-5.88	Peak
1910.00	V	55.99	---	-7.81	48.18	---	74.00	54.00	-5.82	Peak
4875.00	V	52.16	49.37	0.77	52.93	50.14	74.00	54.00	-3.86	AVG.
N/A										
1293.33	H	57.55	---	-10.56	46.99	---	74.00	54.00	-7.01	Peak
1613.33	H	56.55	---	-8.98	47.57	---	74.00	54.00	-6.43	Peak
1956.67	H	56.14	---	-7.63	48.51	---	74.00	54.00	-5.49	Peak
4875.00	H	49.92	---	0.77	50.69	---	74.00	54.00	-3.31	Peak
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.



Operation Mode: TX / IEEE 802.11b(Chain 0 + Chain 1) / CH₁ High **Test Date:** May 12, 2008
Temperature: 20°C **Tested by:** Tom
Humidity: 70 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1646.67	V	56.59	---	-8.85	47.74	---	74.00	54.00	-6.26	Peak
1903.33	V	56.06	---	-7.84	48.22	---	74.00	54.00	-5.78	Peak
2086.67	V	56.09	---	-7.12	48.97	---	74.00	54.00	-5.03	Peak
4925.00	V	55.62	51.28	0.85	56.47	52.13	74.00	54.00	-1.87	AVG.
N/A										
1713.33	H	55.97	---	-8.58	47.39	---	74.00	54.00	-6.61	Peak
1933.33	H	56.45	---	-7.72	48.73	---	74.00	54.00	-5.27	Peak
2113.33	H	56.99	---	-7.01	49.98	---	74.00	54.00	-4.02	Peak
4958.33	H	46.81	---	0.91	47.72	---	74.00	54.00	-6.28	Peak
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.



Operation Mode: TX / IEEE 802.11g(Chain 0 + Chain 1) / CH Low **Test Date:** May 12, 2008

Temperature: 20°C

Tested by: Tom

Humidity: 70 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1066.67	V	63.47	---	-11.80	51.67	---	74.00	54.00	-2.33	Peak
1676.67	V	55.99	---	-8.73	47.26	---	74.00	54.00	-6.74	Peak
2233.33	V	56.48	---	-6.54	49.94	---	74.00	54.00	-4.06	Peak
4825.00	V	46.02	---	0.68	46.70	---	74.00	54.00	-7.30	Peak
N/A										
1636.67	H	56.14	---	-8.88	47.26	---	74.00	54.00	-6.74	Peak
1800.00	H	57.32	---	-8.24	49.08	---	74.00	54.00	-4.92	Peak
2083.33	H	57.40	---	-7.13	50.27	---	74.00	54.00	-3.73	Peak
4833.33	H	52.35	49.53	0.69	53.04	50.22	74.00	54.00	-3.78	AVG.
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.



Operation Mode: TX / IEEE 802.11g(Chain 0 + Chain 1) / CH Mid Test Date: May 12, 2008

Temperature: 20°C

Tested by: Tom

Humidity: 70 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1233.33	V	59.09	---	-10.89	48.20	---	74.00	54.00	-5.80	Peak
1596.67	V	57.51	---	-9.04	48.47	---	74.00	54.00	-5.53	Peak
2136.67	V	57.64	---	-6.92	50.72	---	74.00	54.00	-3.28	Peak
4875.00	V	48.33	---	0.77	49.10	---	74.00	54.00	-4.90	Peak
N/A										
1693.33	H	56.34	---	-8.66	47.68	---	74.00	54.00	-6.32	Peak
1960.00	H	56.81	---	-7.62	49.19	---	74.00	54.00	-4.81	Peak
2130.00	H	56.95	---	-6.95	50.00	---	74.00	54.00	-4.00	Peak
4883.33	H	54.45	49.45	0.78	55.23	50.23	74.00	54.00	-3.77	AVG.
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms



Operation Mode: TX / IEEE 802.11g(Chain 0 + Chain 1)/ CH High Test Date: May 12, 2008

Temperature: 20°C

Tested by: Tom

Humidity: 70 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1063.33	V	60.22	---	-11.82	48.40	---	74.00	54.00	-5.60	Peak
1743.33	V	56.08	---	-8.47	47.61	---	74.00	54.00	-6.39	Peak
2066.67	V	56.20	---	-7.20	49.00	---	74.00	54.00	-5.00	Peak
4925.00	V	50.51	---	0.85	51.36	---	74.00	54.00	-2.64	Peak
N/A										
1730.00	H	57.24	---	-8.52	48.72	---	74.00	54.00	-5.28	Peak
1910.00	H	56.20	---	-7.81	48.39	---	74.00	54.00	-5.61	Peak
2143.33	H	58.00	---	-6.89	51.11	---	74.00	54.00	-2.89	Peak
4933.33	H	53.01	47.48	0.87	53.88	48.35	74.00	54.00	-5.65	AVG.
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.



Operation Mode: TX / IEEE 802.11n HT20 (Chain 0 + Chain 1)/CH Low **Test Date:** May 12, 2008
Temperature: 20°C **Tested by:** Tom
Humidity: 70 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1066.67	V	61.79	---	-11.80	49.99	---	74.00	54.00	-4.01	Peak
1596.67	V	57.68	---	-9.04	48.64	---	74.00	54.00	-5.36	Peak
2273.33	V	57.60	---	-6.38	51.22	---	74.00	54.00	-2.78	Peak
4833.33	V	45.14	---	0.69	45.83	---	74.00	54.00	-8.17	Peak
N/A										
1680.00	H	56.40	---	-8.71	47.69	---	74.00	54.00	-6.31	Peak
1823.33	H	55.89	---	-8.15	47.74	---	74.00	54.00	-6.26	Peak
2176.67	H	56.44	---	-6.76	49.68	---	74.00	54.00	-4.32	Peak
4825.00	H	45.54	---	0.68	46.22	---	74.00	54.00	-7.78	Peak
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.



Operation Mode: TX / IEEE 802.11n HT20 (Chain 0 + Chain 1) /CH Mid **Test Date:** May 12, 2008
Temperature: 20°C **Tested by:** Tom
Humidity: 70 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1490.00	V	56.65	---	-9.47	47.18	---	74.00	54.00	-6.82	Peak
1686.67	V	56.54	---	-8.69	47.85	---	74.00	54.00	-6.15	Peak
2000.00	V	57.22	---	-7.46	49.76	---	74.00	54.00	-4.24	Peak
4908.33	V	46.01	---	0.82	46.83	---	74.00	54.00	-7.17	Peak
N/A										
1470.00	H	55.87	---	-9.58	46.29	---	74.00	54.00	-7.71	Peak
1723.33	H	56.34	---	-8.54	47.80	---	74.00	54.00	-6.20	Peak
2023.33	H	56.38	---	-7.37	49.01	---	74.00	54.00	-4.99	Peak
4866.67	H	49.48	---	0.75	50.23	---	74.00	54.00	-3.77	Peak
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.



Operation Mode: TX / IEEE 802.11n HT20 (Chain 0 + Chain 1) /CH High **Test Date:** May 12, 2008

Temperature: 20°C **Tested by:** Tom

Humidity: 70 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1030.00	V	60.93	---	-12.01	48.92	---	74.00	54.00	-5.08	Peak
1510.00	V	57.23	---	-9.38	47.85	---	74.00	54.00	-6.15	Peak
2056.67	V	56.40	---	-7.24	49.16	---	74.00	54.00	-4.84	Peak
4916.67	V	49.36	---	0.84	50.20	---	74.00	54.00	-3.80	Peak
N/A										
1620.00	H	55.43	---	-8.95	46.48	---	74.00	54.00	-7.52	Peak
1743.33	H	56.43	---	-8.47	47.96	---	74.00	54.00	-6.04	Peak
1970.00	H	56.64	---	-7.58	49.06	---	74.00	54.00	-4.94	Peak
4925.00	H	48.84	---	0.85	49.69	---	74.00	54.00	-4.31	Peak
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.



Operation Mode: TX / IEEE 802.11n HT40 (Chain 0 + Chain 1) /CH Low **Test Date:** May 12, 2008
Temperature: 20°C **Tested by:** Tom
Humidity: 70 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1063.33	V	62.13	---	-11.82	50.31	---	74.00	54.00	-3.69	Peak
1576.67	V	57.10	---	-9.12	47.98	---	74.00	54.00	-6.02	Peak
1833.33	V	56.77	---	-8.11	48.66	---	74.00	54.00	-5.34	Peak
4883.33	V	47.10	---	0.78	47.88	---	74.00	54.00	-6.12	Peak
N/A										
1543.33	H	56.04	---	-9.25	46.79	---	74.00	54.00	-7.21	Peak
1683.33	H	56.52	---	-8.70	47.82	---	74.00	54.00	-6.18	Peak
1890.00	H	57.91	---	-7.89	50.02	---	74.00	54.00	-3.98	Peak
4841.67	H	45.51	---	0.71	46.22	---	74.00	54.00	-7.78	Peak
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.



Operation Mode: TX / IEEE 802.11n HT40 (Chain 0 + Chain 1) /CH Mid **Test Date:** May 12, 2008
Temperature: 25°C **Tested by:** Tom
Humidity: 70 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1296.67	V	57.90	---	-10.54	47.36	---	74.00	54.00	-6.64	Peak
1633.33	V	56.80	---	-8.90	47.90	---	74.00	54.00	-6.10	Peak
1870.00	V	56.42	---	-7.97	48.45	---	74.00	54.00	-5.55	Peak
4883.33	V	45.97	---	0.78	46.75	---	74.00	54.00	-7.25	Peak
N/A										
1526.67	H	56.29	---	-9.32	46.97	---	74.00	54.00	-7.03	Peak
1966.67	H	56.46	---	-7.59	48.87	---	74.00	54.00	-5.13	Peak
2163.33	H	56.10	---	-6.81	49.29	---	74.00	54.00	-4.71	Peak
4875.00	H	45.51	---	0.77	46.28	---	74.00	54.00	-7.72	Peak
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.



Operation Mode: TX / IEEE 802.11n HT40(Chain 0 + Chain 1) /CH High **Test Date:** May 12, 2008
Temperature: 25°C **Tested by:** Tom
Humidity: 70 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol. (H/V)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1623.33	V	56.96	---	-8.94	48.02	---	74.00	54.00	-5.98	Peak
1880.00	V	55.85	---	-7.93	47.92	---	74.00	54.00	-6.08	Peak
2190.00	V	56.72	---	-6.71	50.01	---	74.00	54.00	-3.99	Peak
4933.33	V	45.82	---	0.87	46.69	---	74.00	54.00	-7.31	Peak
N/A										
1600.00	H	55.72	---	-9.03	46.69	---	74.00	54.00	-7.31	Peak
1746.67	H	56.55	---	-8.45	48.10	---	74.00	54.00	-5.90	Peak
1996.67	H	56.52	---	-7.47	49.05	---	74.00	54.00	-4.95	Peak
4950.00	H	44.86	---	0.89	45.75	---	74.00	54.00	-8.25	Peak
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms

8.5.2 BAND EDGES MEASUREMENT

LIMIT

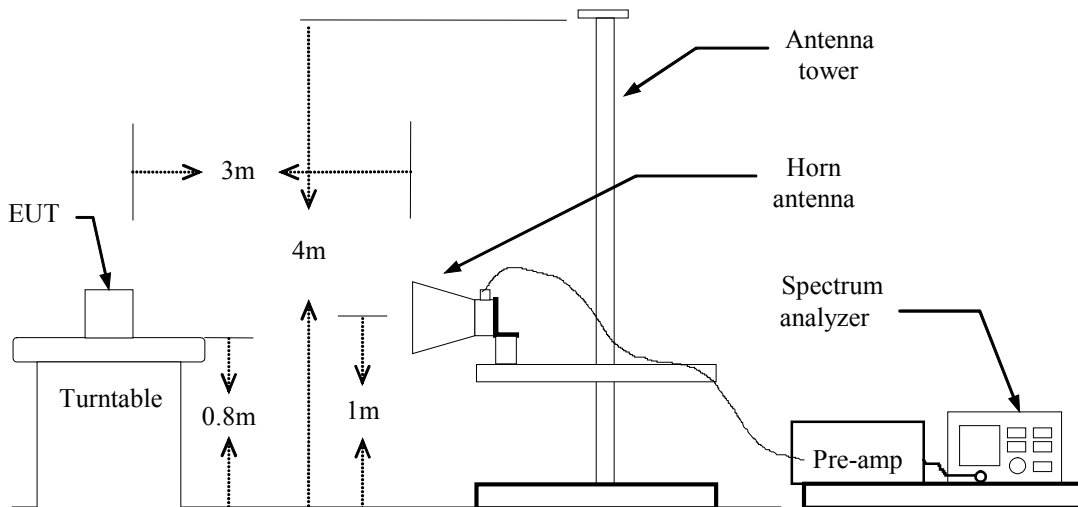
According to §15.247(c), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, 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).

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
PSA Spectrum Analyzer	Agilent	E4446A	US44300399	02/05/2008

Remark: Each piece of equipment is scheduled for calibration once a year.

TEST CONFIGURATION





TEST PROCEDURE

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=VBW=1MHz / Sweep=AUTO
 - (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

TEST RESULTS

Refer to attach spectrum analyzer data chart.

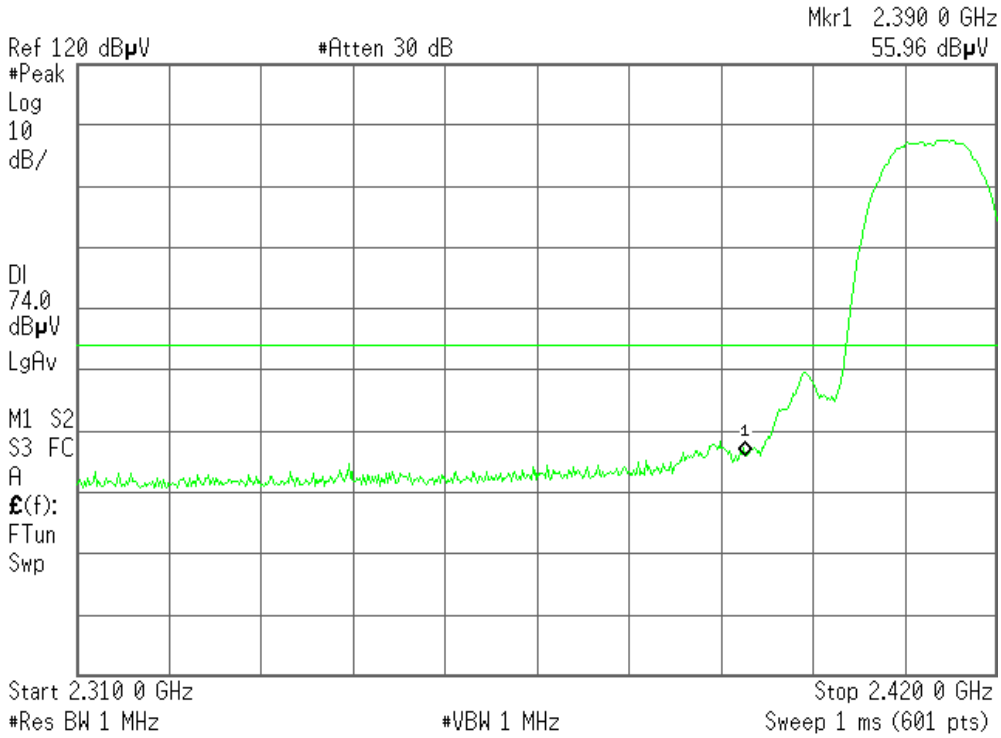


Band Edges (802.11b / CH Low)

Detector mode: Peak

Polarity: Vertical

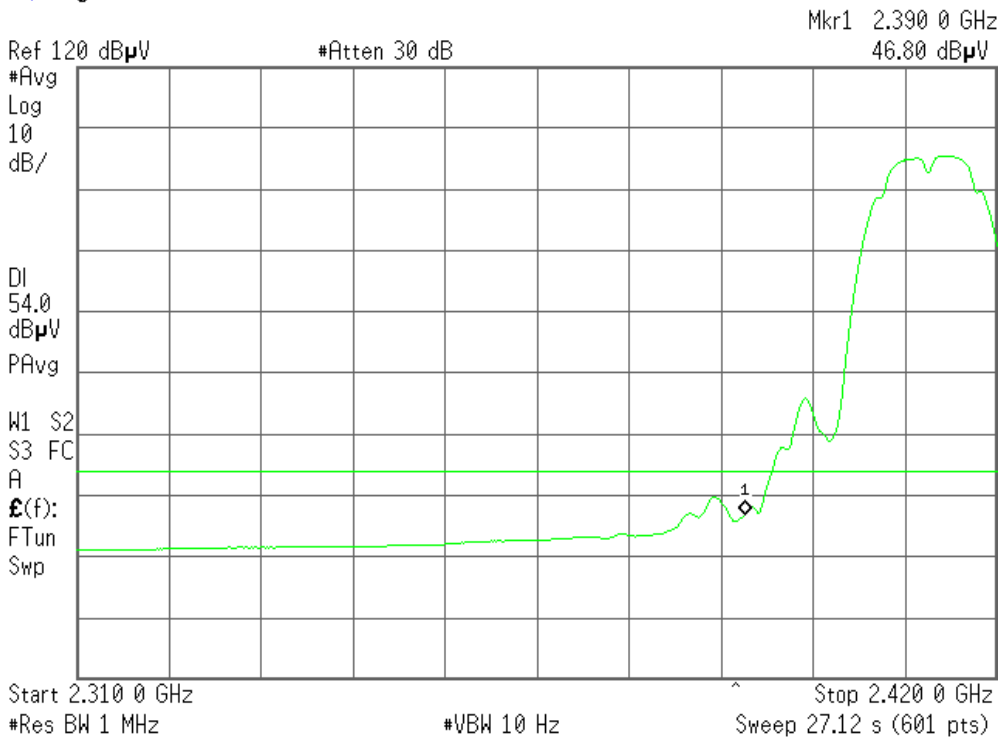
Agilent 12:08:08 15 Jan 2008



Detector mode: Average

Polarity: Vertical

Agilent 12:09:23 15 Jan 2008





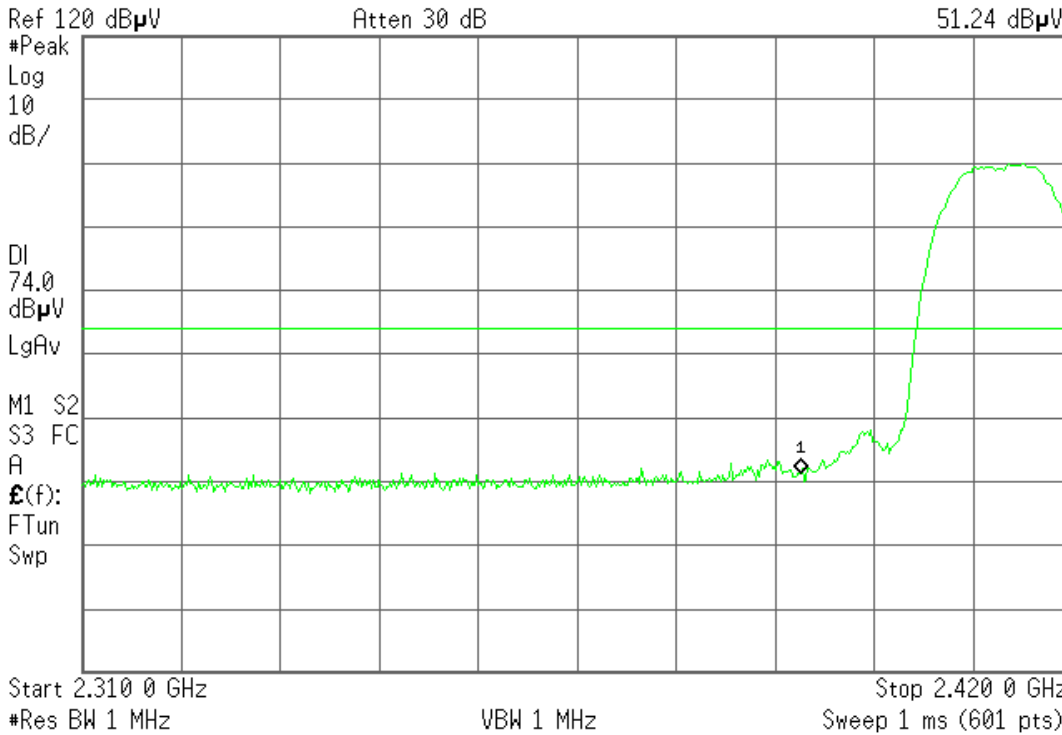
Detector mode: Peak

Polarity: Horizontal

Agilent 18:17:43 Jan 15, 2008

R T

Mkr1 2.390 0 GHz
51.24 dBµV



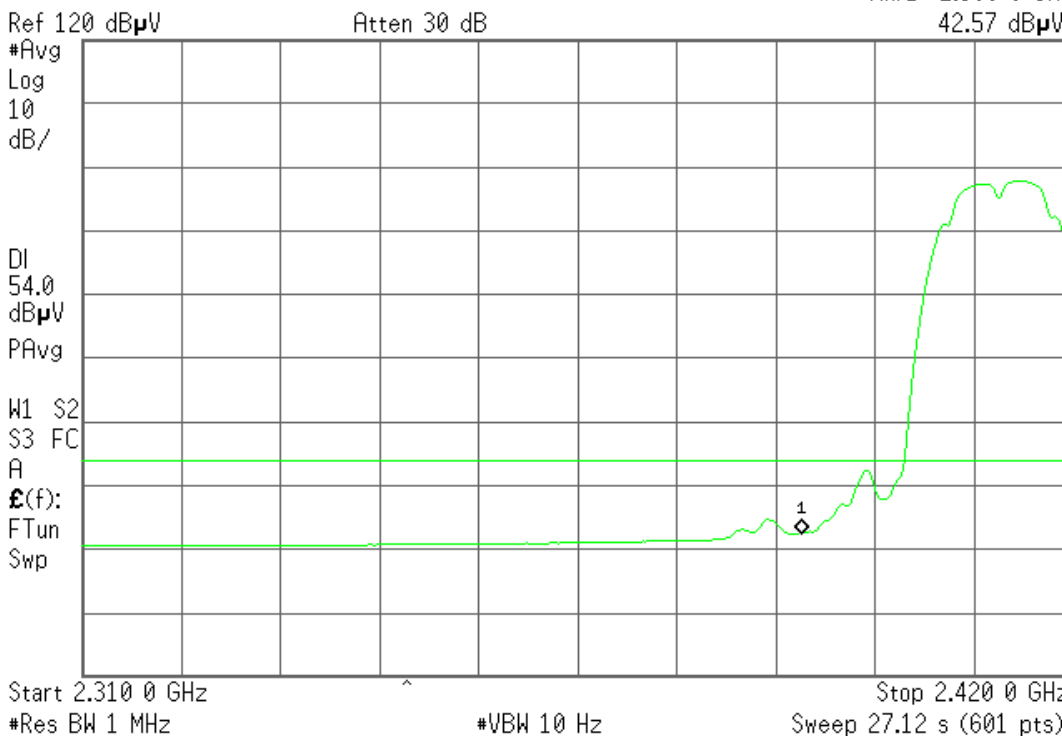
Detector mode: Average

Polarity: Horizontal

Agilent 18:17:19 Jan 15, 2008

R T

Mkr1 2.390 0 GHz
42.57 dBµV





Band Edges (802.11b / CH High)

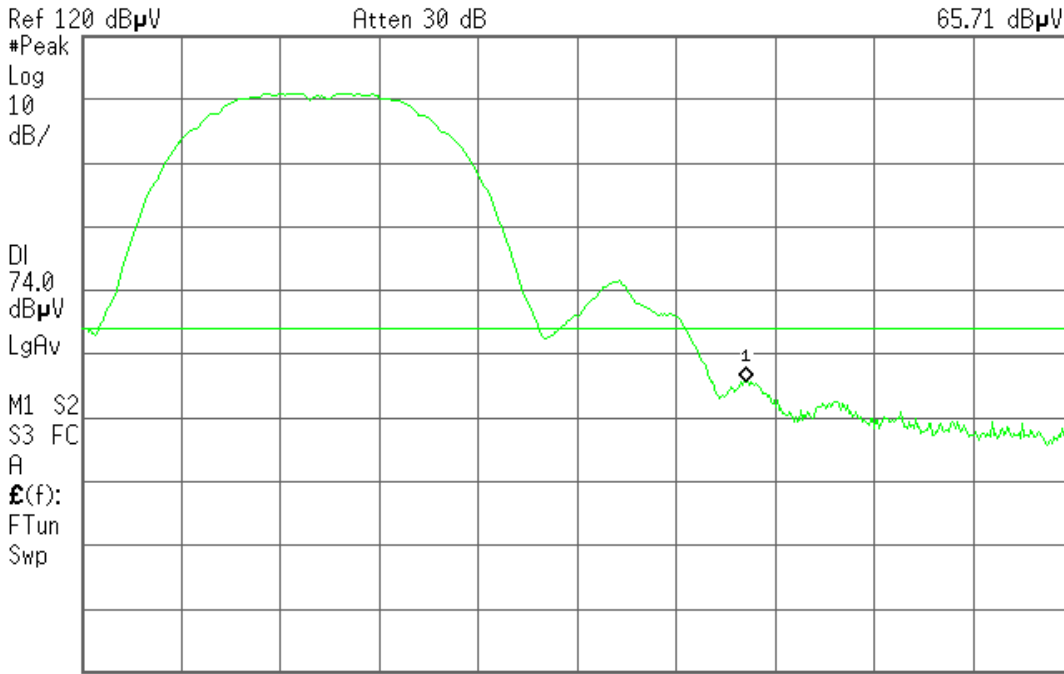
Detector mode: Peak

Polarity: Vertical

Agilent 14:16:50 Jan 15, 2008

R

Mkr1 2.483 50 GHz
65.71 dBμV



Start 2.450 00 GHz Stop 2.500 00 GHz
#Res BW 1 MHz VBW 1 MHz Sweep 1 ms (601 pts)

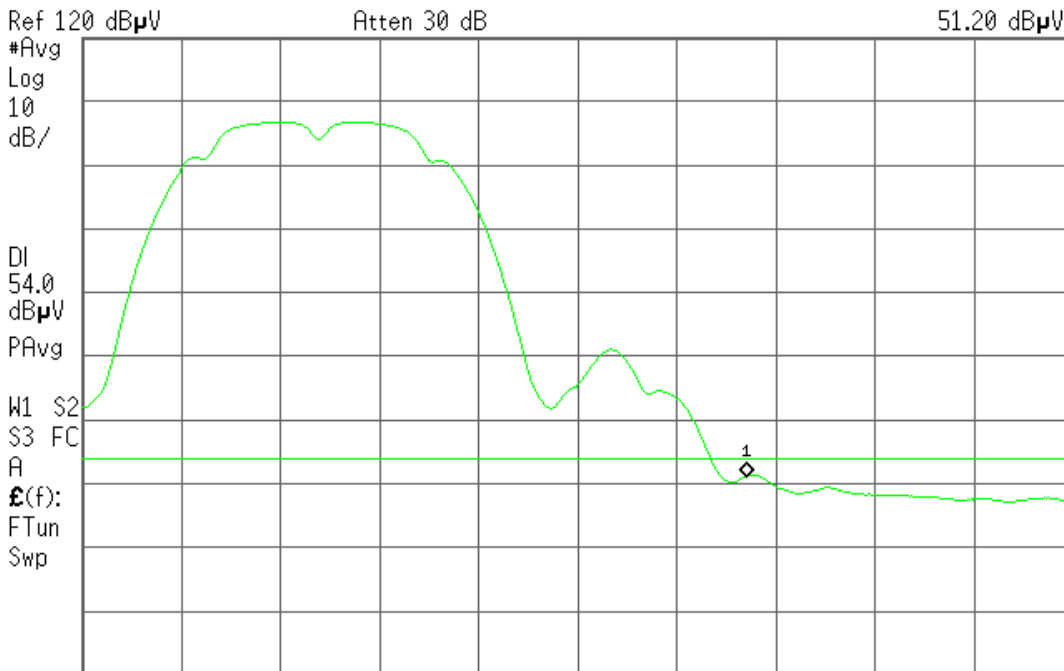
Detector mode: Average

Polarity: Vertical

Agilent 14:44:10 Jan 15, 2008

R

Mkr1 2.483 50 GHz
51.20 dBμV



Start 2.450 00 GHz Stop 2.500 00 GHz
#Res BW 1 MHz #VBW 10 Hz Sweep 12.33 s (601 pts)



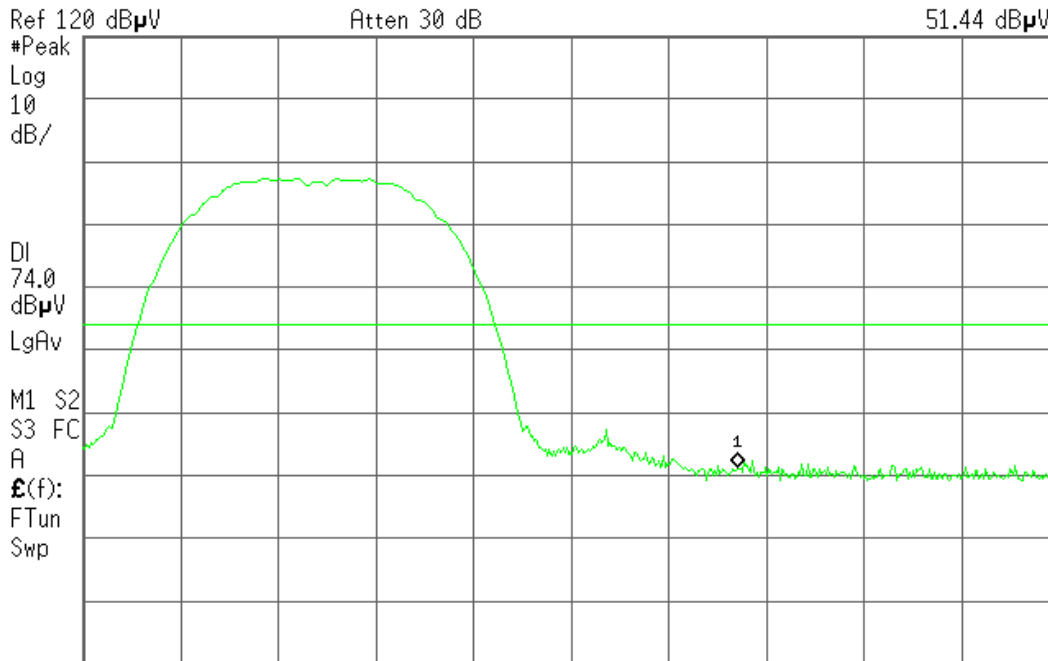
Detector mode: Peak

Polarity: Horizontal

Agilent 18:14:50 Jan 15, 2008

R T

Mkr1 2.483 50 GHz
51.44 dBμV



Start 2.450 00 GHz Stop 2.500 00 GHz
#Res BW 1 MHz VBW 1 MHz Sweep 1 ms (601 pts)

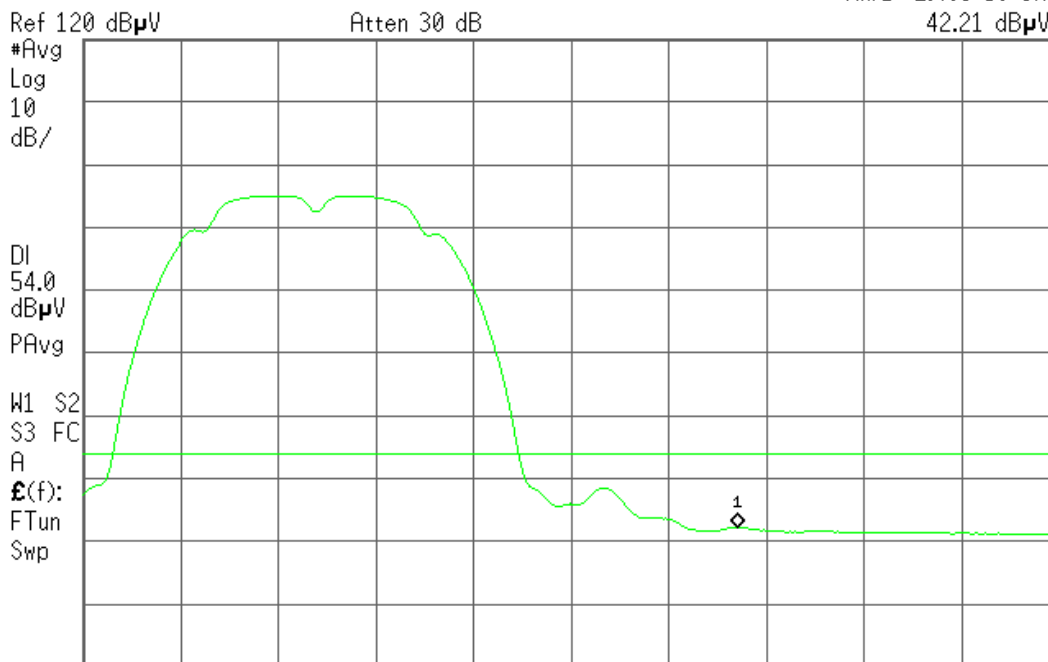
Detector mode: Average

Polarity: Horizontal

Agilent 18:15:22 Jan 15, 2008

R T

Mkr1 2.483 50 GHz
42.21 dBμV



Start 2.450 00 GHz Stop 2.500 00 GHz
#Res BW 1 MHz #VBW 10 Hz Sweep 12.33 s (601 pts)

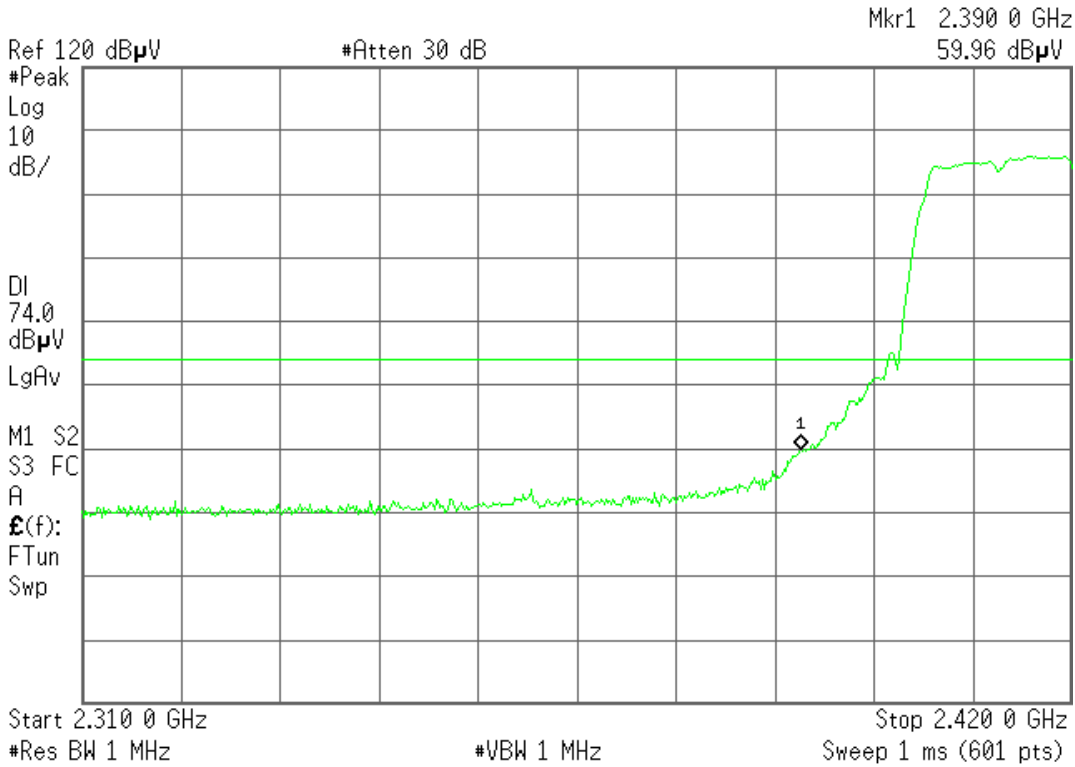


Band Edges (802.11g / CH Low)

Detector mode: Peak

Polarity: Vertical

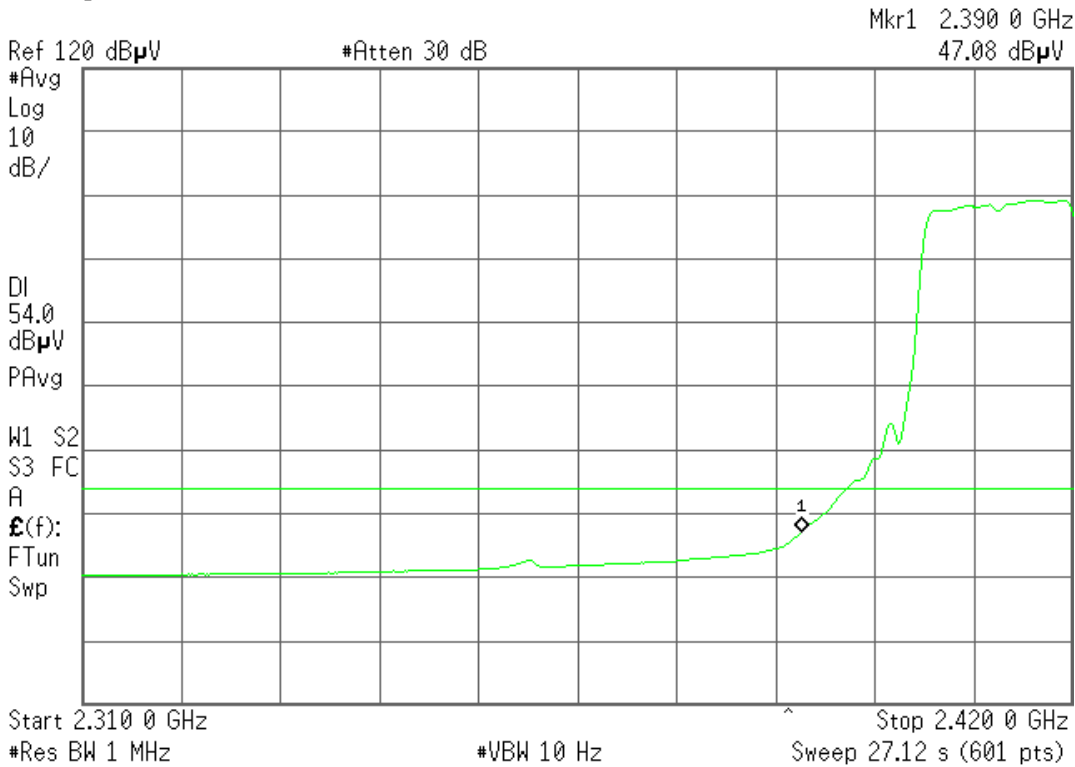
Agilent 11:55:58 15 Jan 2008



Detector mode: Average

Polarity: Vertical

Agilent 11:57:14 15 Jan 2008





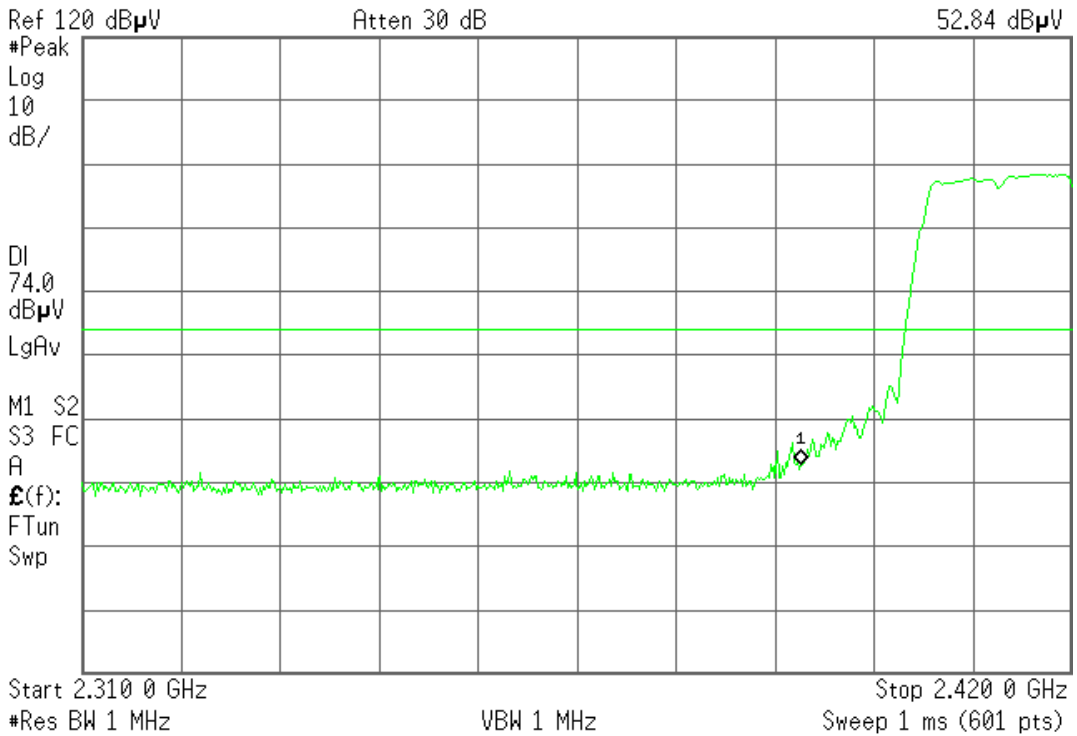
Detector mode: Peak

Polarity: Horizontal

Agilent 18:18:57 Jan 15, 2008

R T

Mkr1 2.390 0 GHz
52.84 dBμV



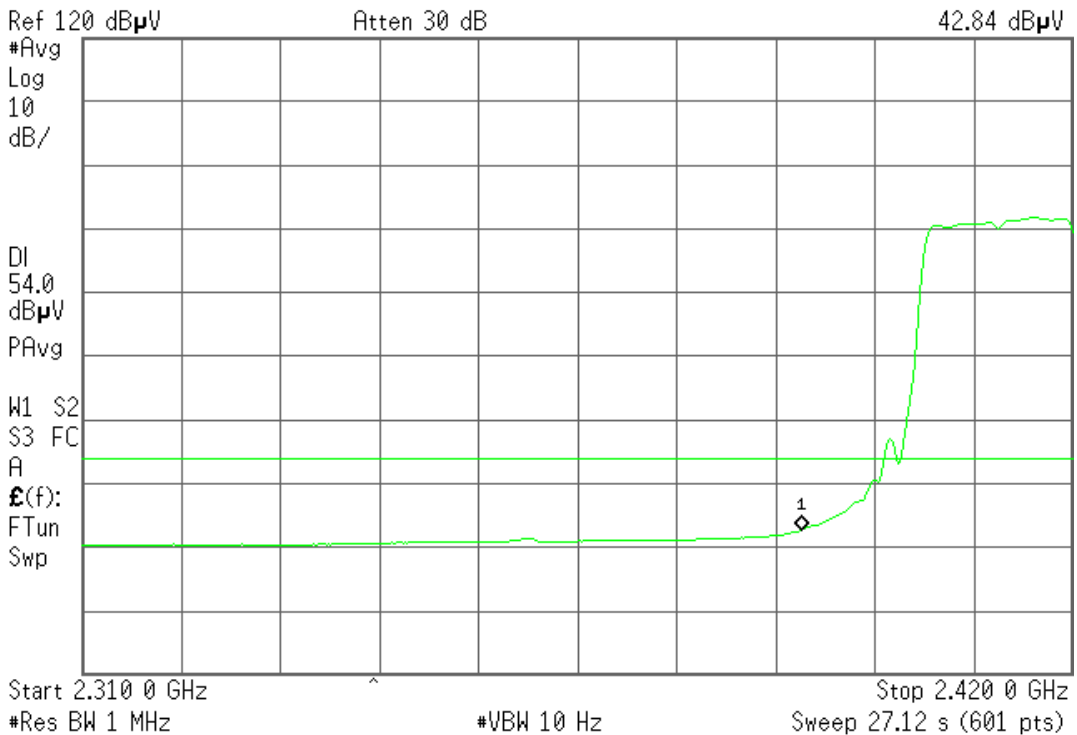
Detector mode: Average

Polarity: Horizontal

Agilent 18:19:45 Jan 15, 2008

R T

Mkr1 2.390 0 GHz
42.84 dBμV





Band Edges (802.11g / CH High)

Detector mode: Peak

Polarity: Vertical

Agilent 14:12:31 Jan 15, 2008

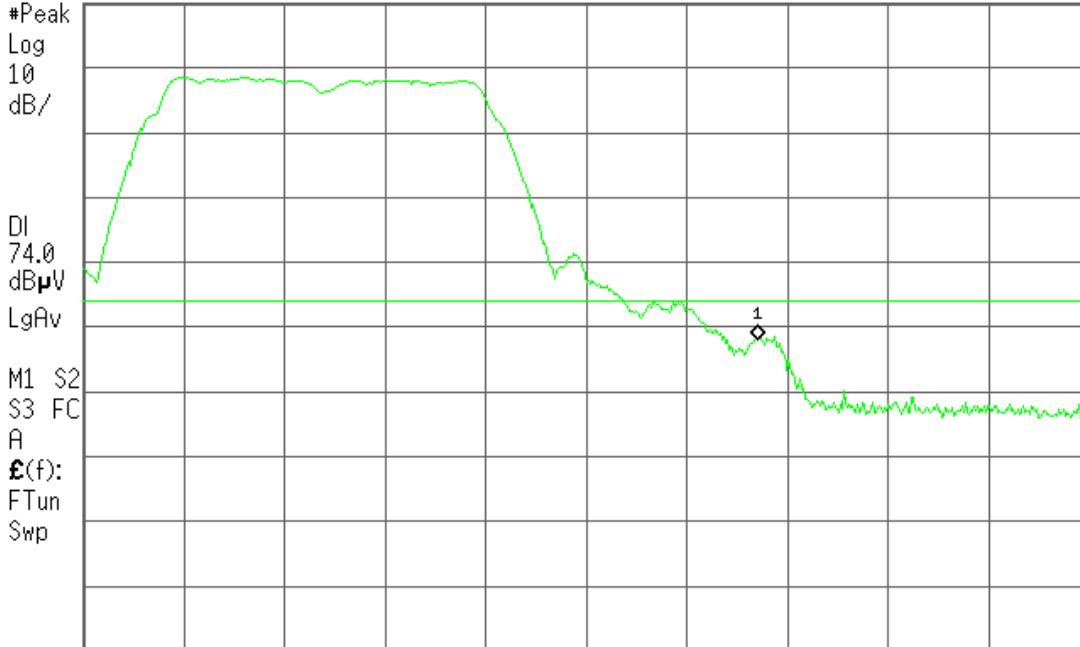
R

Mkr1 2.483 50 GHz

68.10 dBμV

Ref 120 dBμV

Atten 30 dB



Start 2.450 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

VBW 1 MHz

Sweep 1 ms (601 pts)

Detector mode: Average

Polarity: Vertical

Agilent 14:11:07 Jan 15, 2008

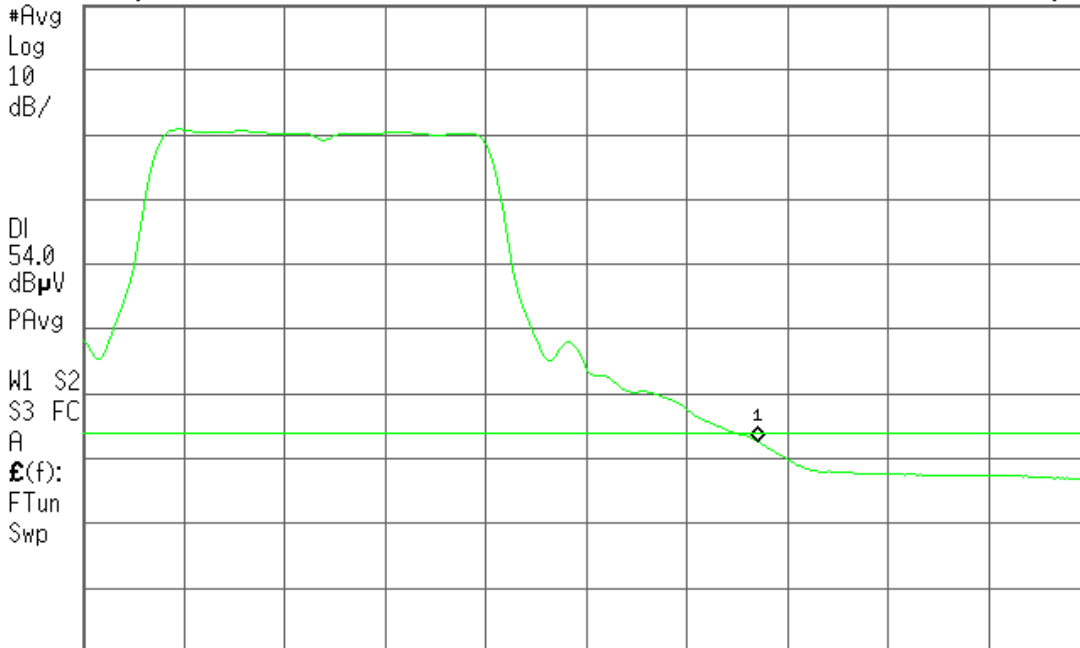
R

Mkr1 2.483 50 GHz

52.69 dBμV

Ref 120 dBμV

Atten 30 dB



Start 2.450 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Sweep 12.33 s (601 pts)



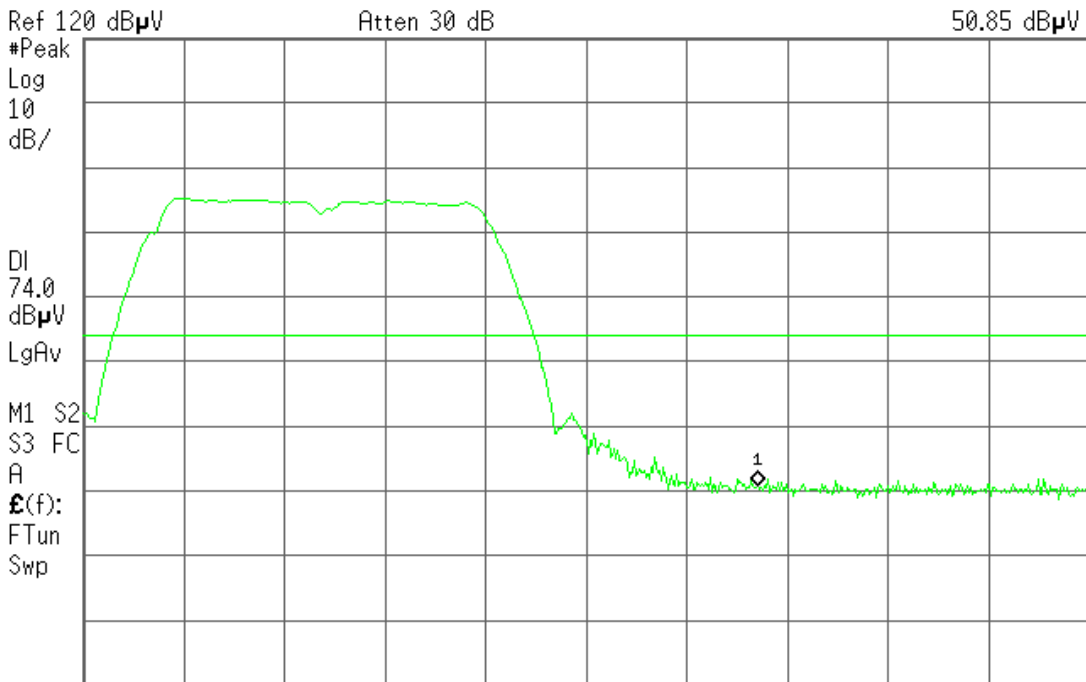
Detector mode: Peak

Polarity: Horizontal

Agilent 18:13:49 Jan 15, 2008

R T

Mkr1 2.483 50 GHz
50.85 dBμV



Start 2.450 00 GHz Stop 2.500 00 GHz
#Res BW 1 MHz VBW 1 MHz Sweep 1 ms (601 pts)

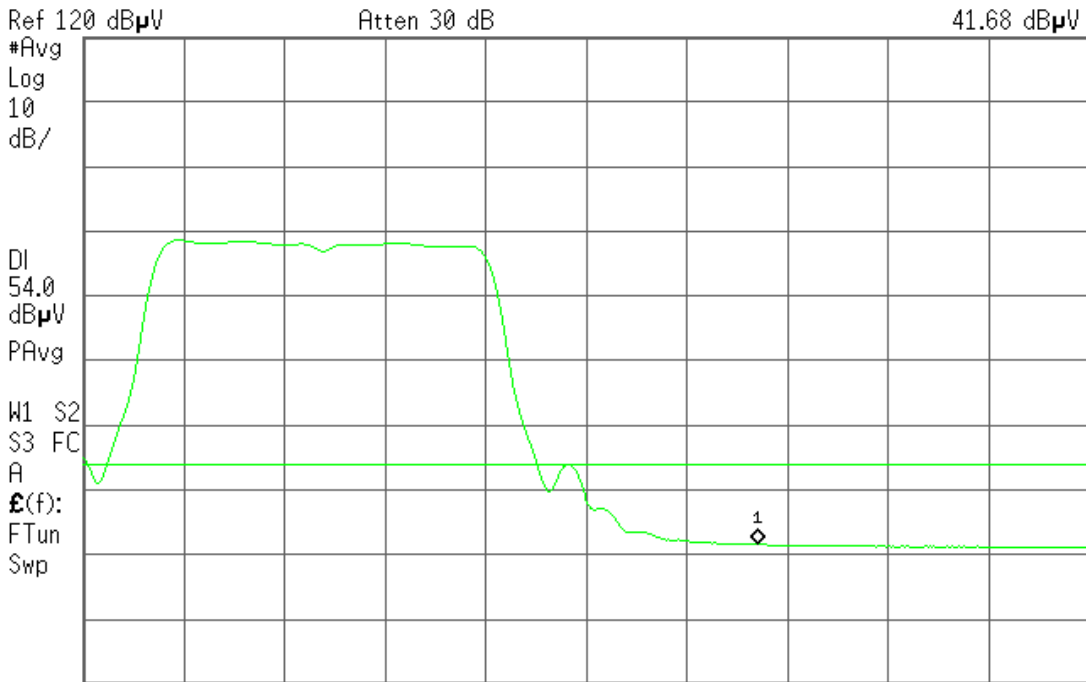
Detector mode: Average

Polarity: Horizontal

Agilent 18:13:17 Jan 15, 2008

R T

Mkr1 2.483 50 GHz
41.68 dBμV



Start 2.450 00 GHz Stop 2.500 00 GHz
#Res BW 1 MHz #VBW 10 Hz Sweep 12.33 s (601 pts)

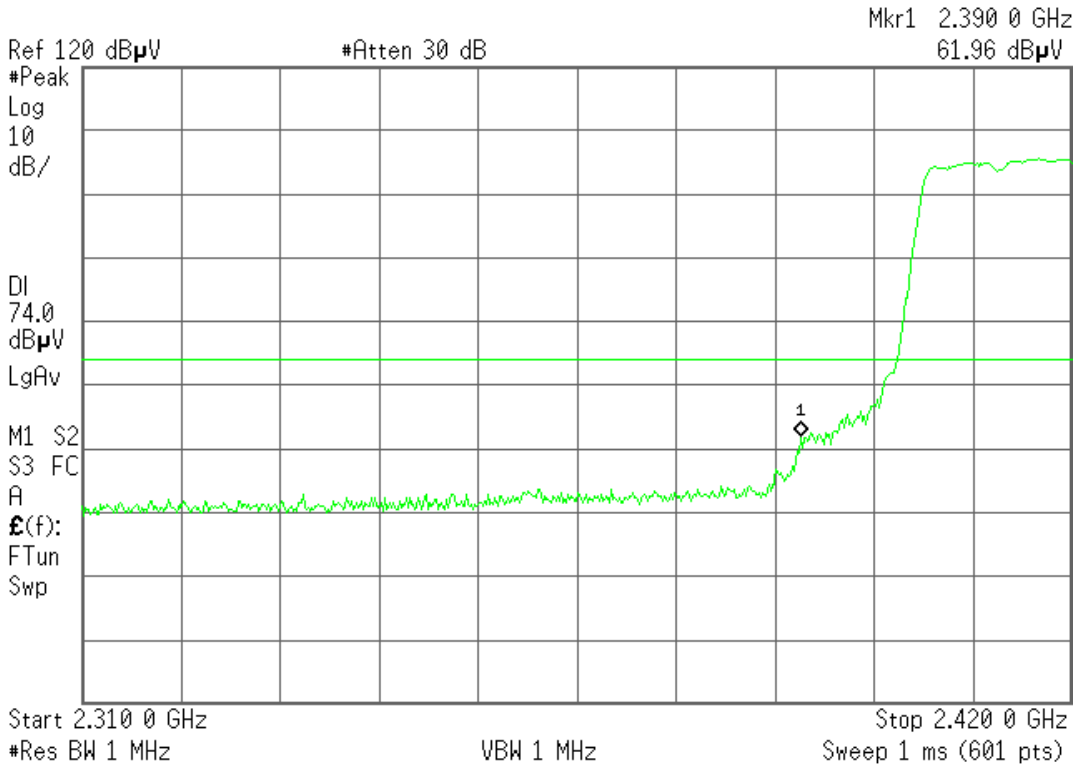


Band Edges (802.11n HT20 Mode / CH Low)

Detector mode: Peak

Polarity: Vertical

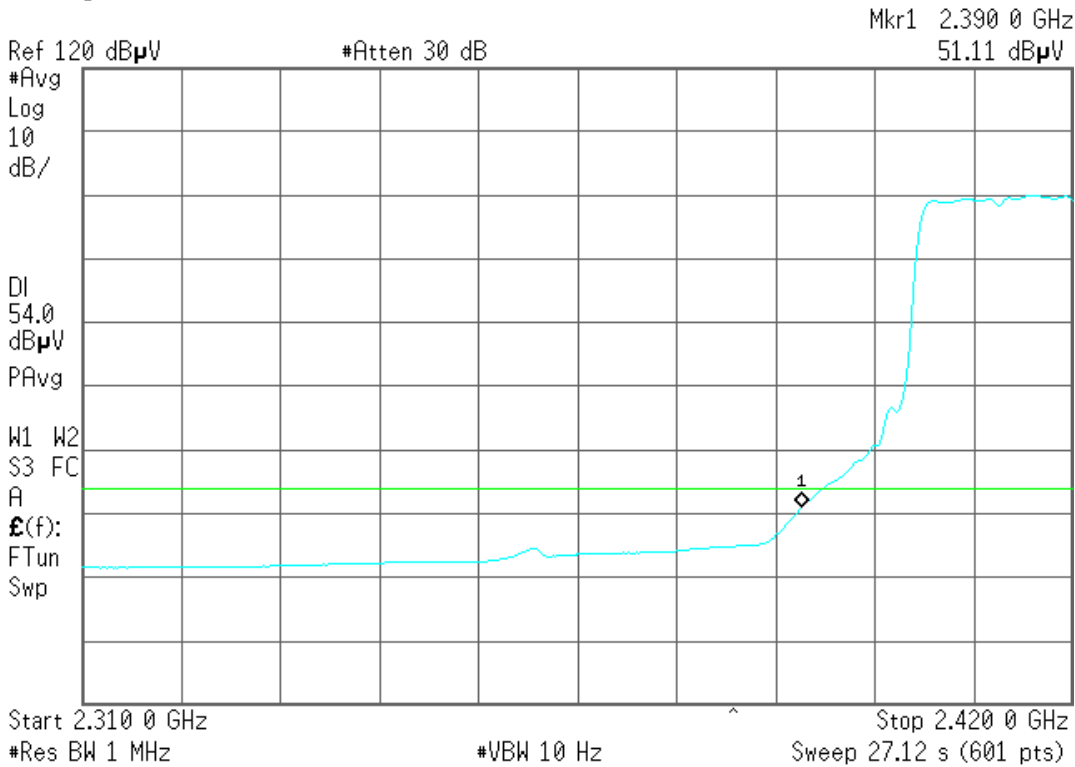
Agilent 12:13:09 15 Jan 2008



Detector mode: Average

Polarity: Vertical

Agilent 12:17:33 15 Jan 2008





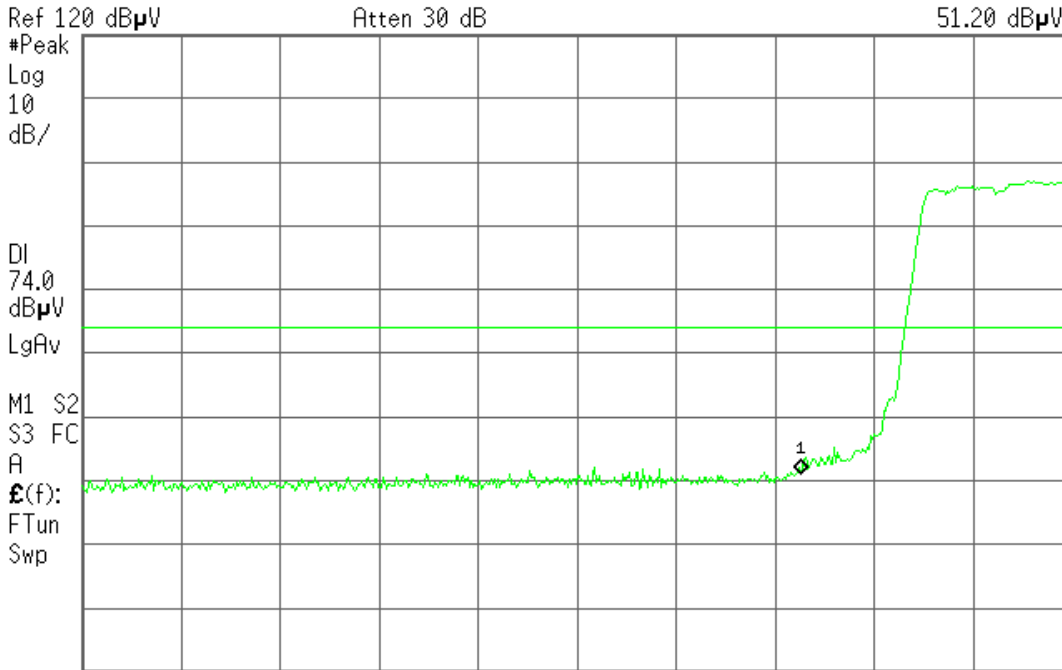
Detector mode: Peak

Polarity: Horizontal

Agilent 18:21:23 Jan 15, 2008

R T

Mkr1 2.390 0 GHz
51.20 dBµV



Start 2.310 0 GHz Stop 2.420 0 GHz
#Res BW 1 MHz VBW 1 MHz Sweep 1 ms (601 pts)

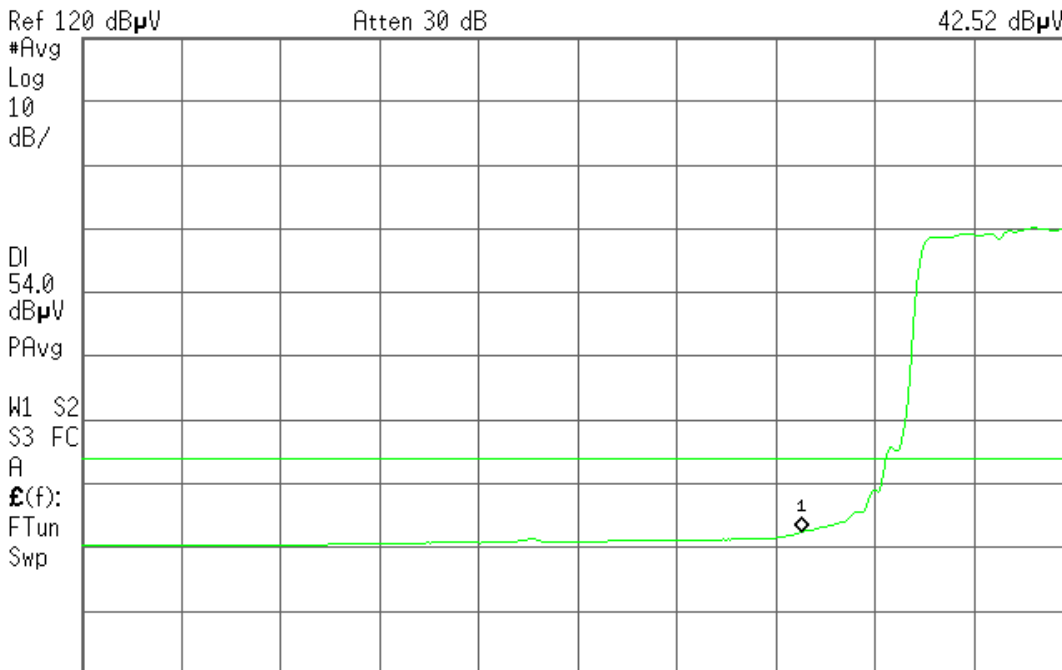
Detector mode: Average

Polarity: Horizontal

Agilent 18:20:53 Jan 15, 2008

R T

Mkr1 2.390 0 GHz
42.52 dBµV



Start 2.310 0 GHz Stop 2.420 0 GHz
#Res BW 1 MHz #VBW 10 Hz Sweep 27.12 s (601 pts)



Band Edges (802.11n HT20 Mode / CH High)

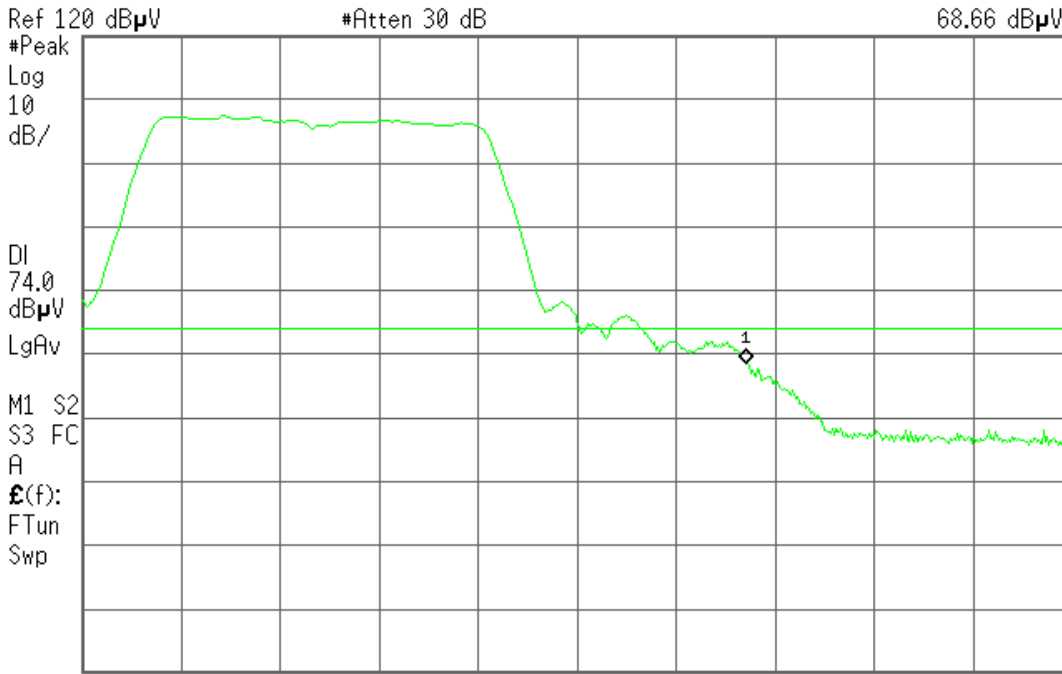
Detector mode: Peak

Polarity: Vertical

Agilent 13:45:03 15 Jan 2008

R

Mkr1 2.483 50 GHz
68.66 dBμV



Start 2.450 00 GHz Stop 2.500 00 GHz
#Res BW 1 MHz VBW 1 MHz Sweep 1 ms (601 pts)

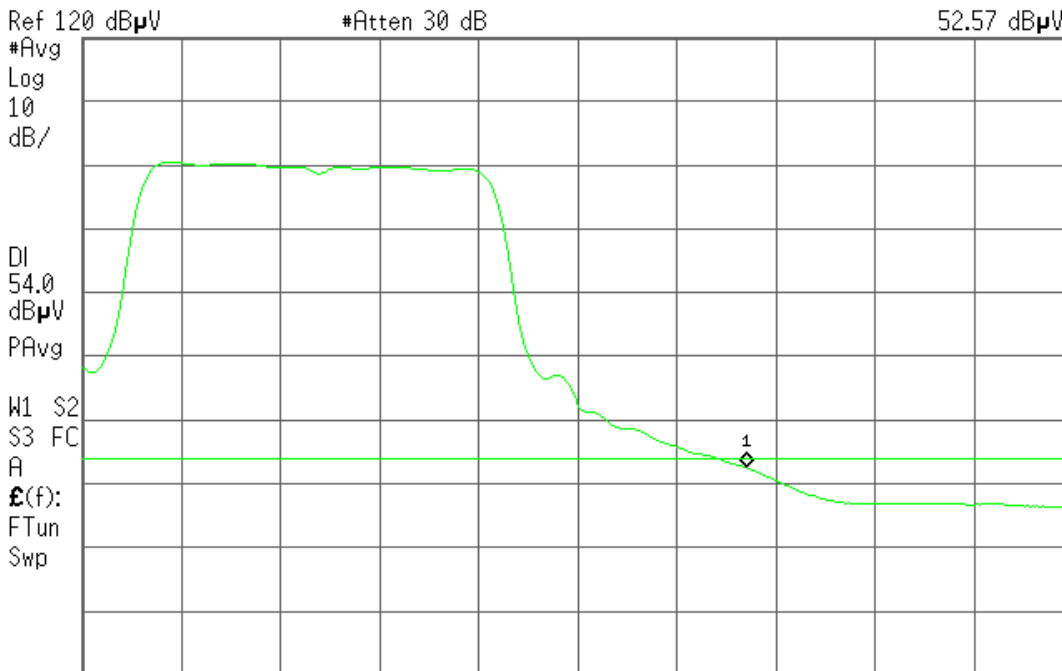
Detector mode: Average

Polarity: Vertical

Agilent 13:43:54 15 Jan 2008

R

Mkr1 2.483 50 GHz
52.57 dBμV



Start 2.450 00 GHz Stop 2.500 00 GHz
#Res BW 1 MHz #VBW 10 Hz Sweep 12.33 s (601 pts)



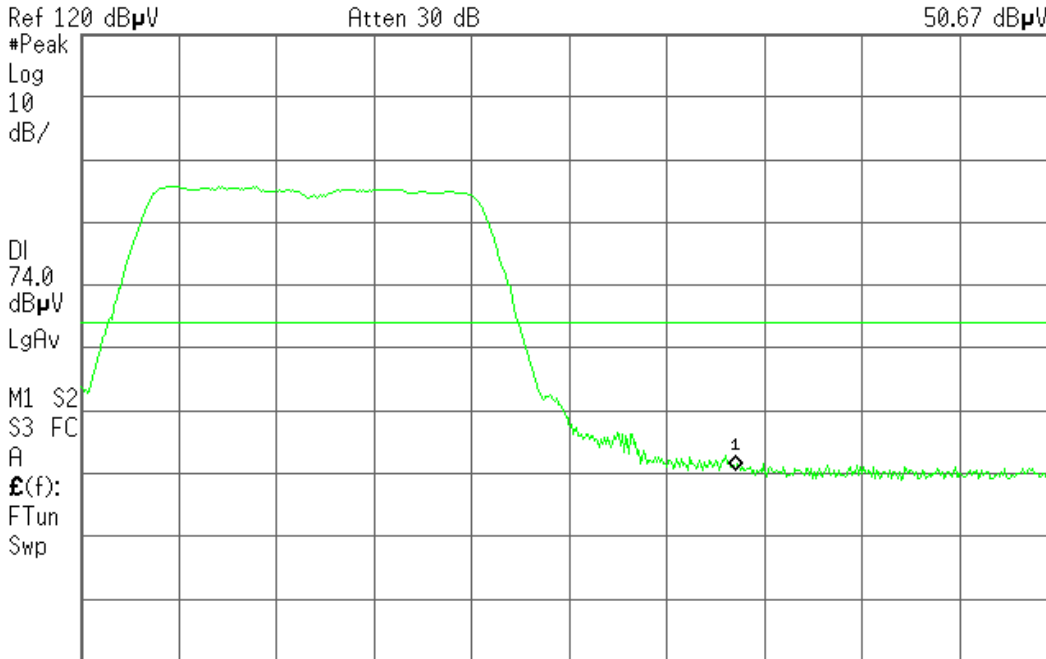
Detector mode: Peak

Polarity: Horizontal

Agilent 18:11:47 Jan 15, 2008

R T

Mkr1 2.483 50 GHz
50.67 dBμV



Start 2.450 00 GHz Stop 2.500 00 GHz
#Res BW 1 MHz VBW 1 MHz Sweep 1 ms (601 pts)

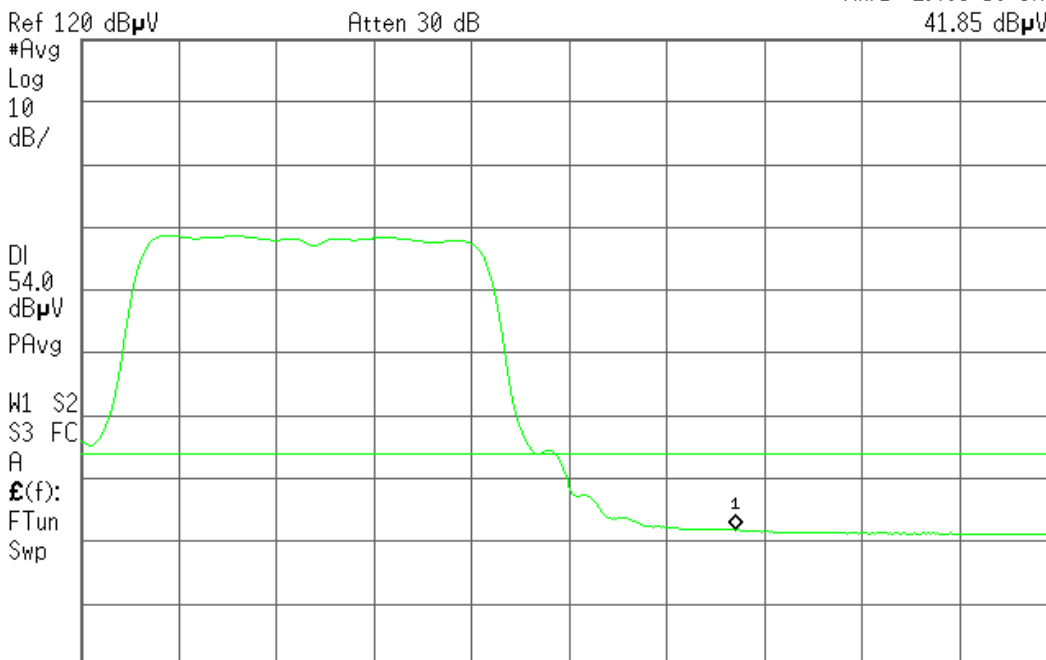
Detector mode: Average

Polarity: Horizontal

Agilent 18:12:19 Jan 15, 2008

R T

Mkr1 2.483 50 GHz
41.85 dBμV



Start 2.450 00 GHz Stop 2.500 00 GHz
#Res BW 1 MHz #VBW 10 Hz Sweep 12.33 s (601 pts)

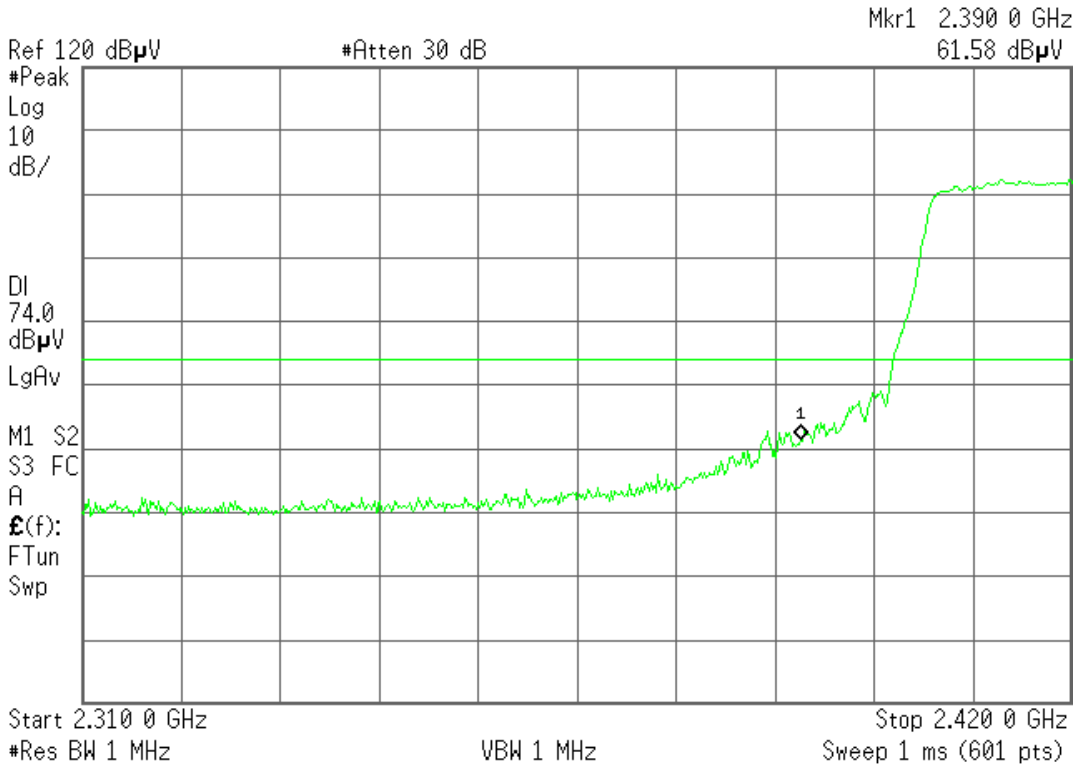


Band Edges (802.11n HT40 Mode / CH Low)

Detector mode: Peak

Polarity: Vertical

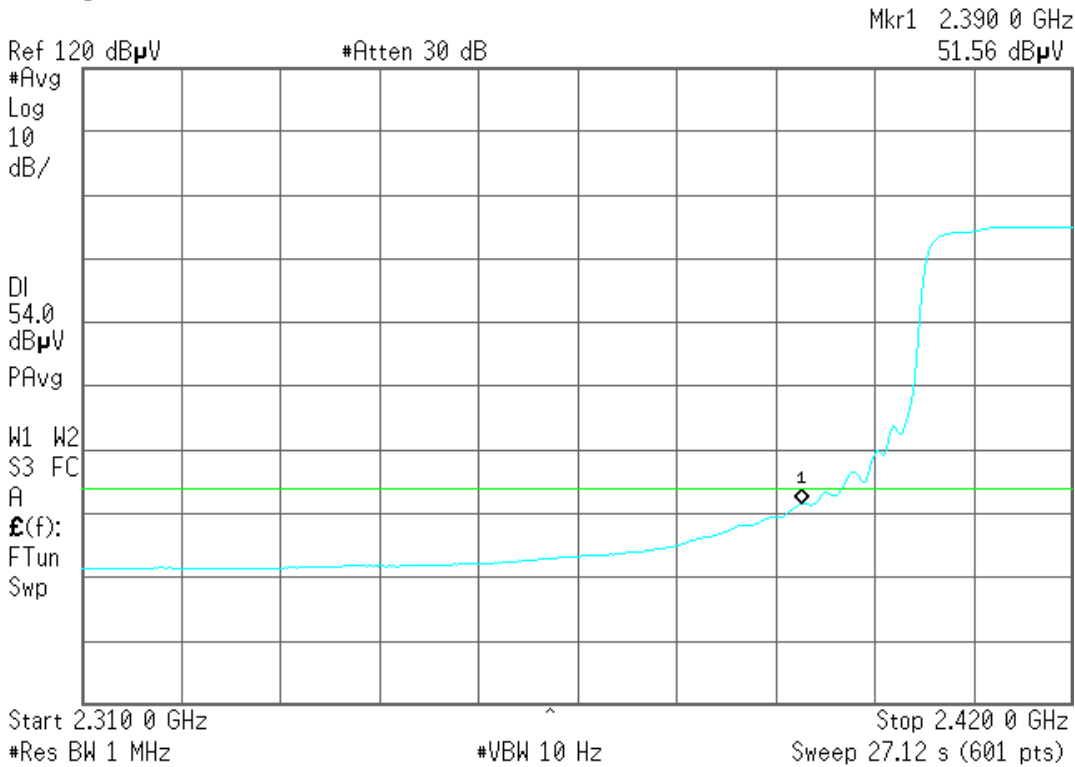
Agilent 12:22:15 15 Jan 2008



Detector mode: Average

Polarity: Vertical

Agilent 12:21:30 15 Jan 2008





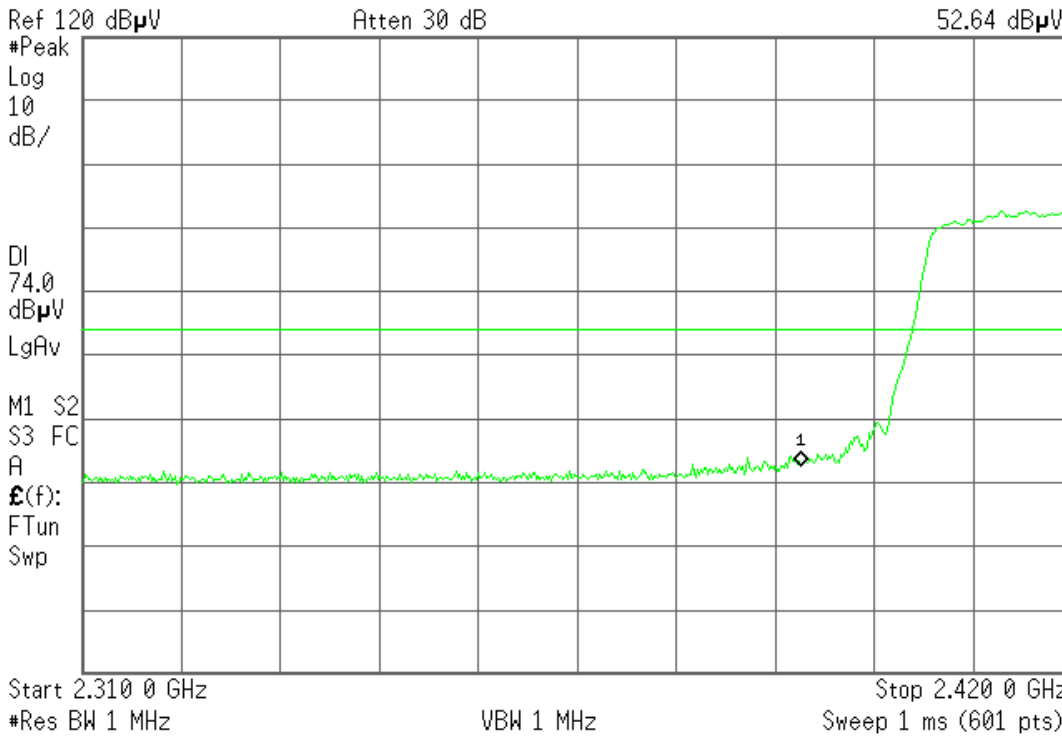
Detector mode: Peak

Polarity: Horizontal

Agilent 18:07:08 Jan 15, 2008

R T

Mkr1 2.390 0 GHz
52.64 dBµV



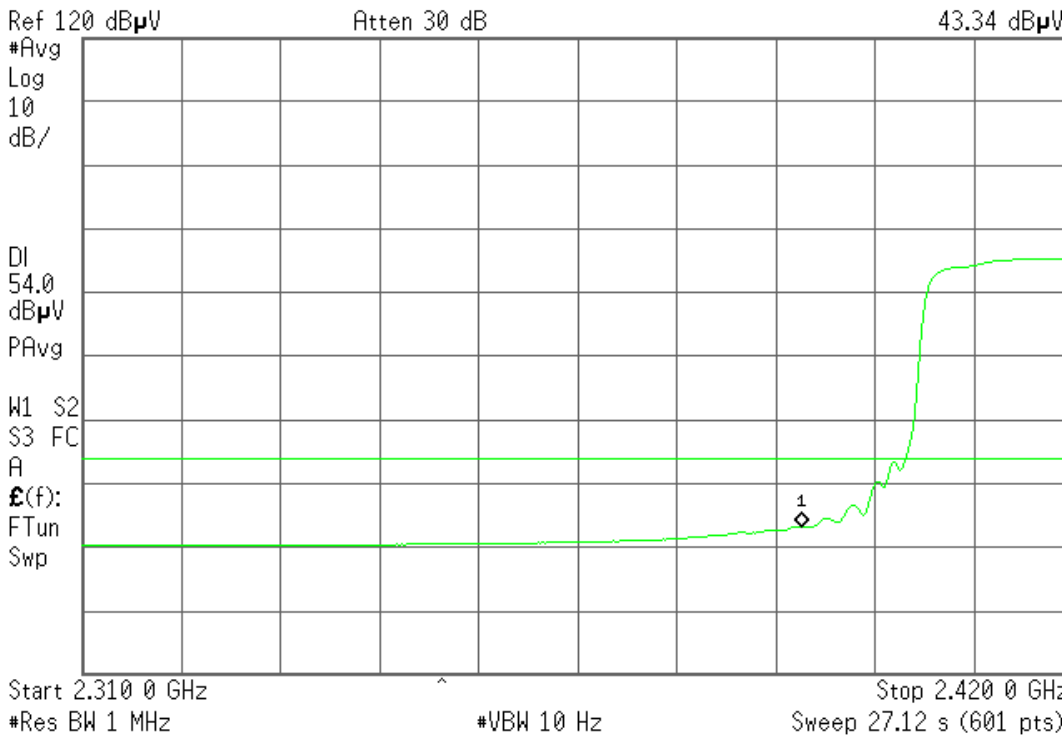
Detector mode: Average

Polarity: Horizontal

Agilent 18:08:01 Jan 15, 2008

R T

Mkr1 2.390 0 GHz
43.34 dBµV





Band Edges (802.11n HT40 Mode / CH High)

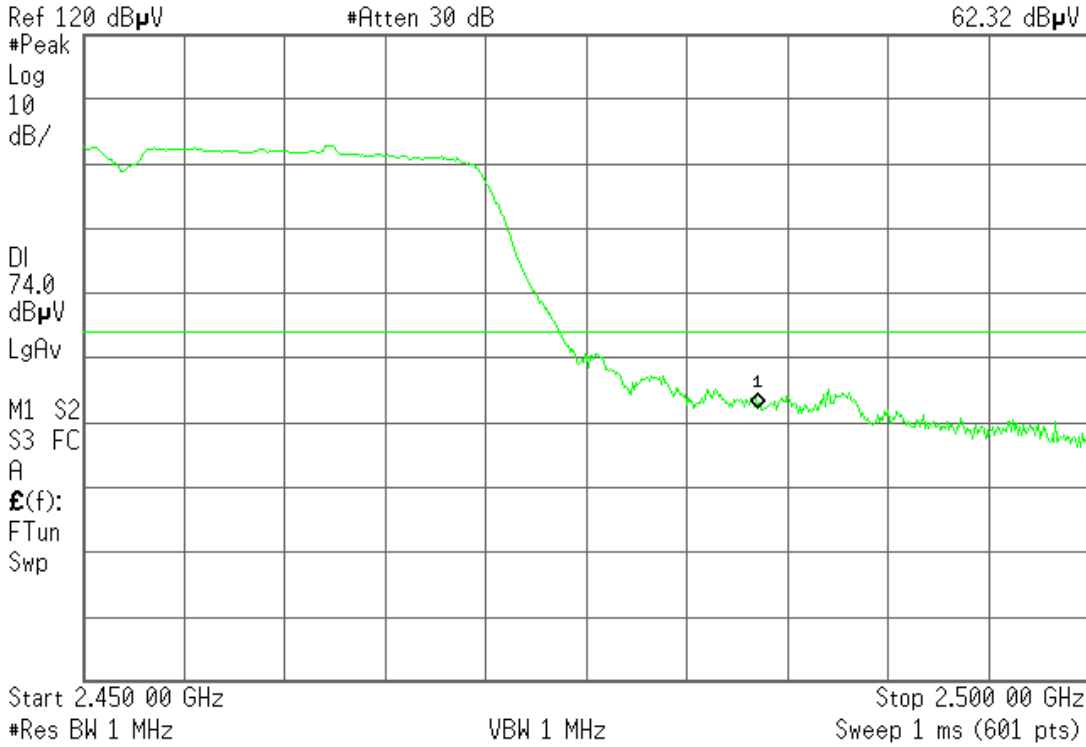
Detector mode: Peak

Polarity: Vertical

Agilent 13:40:48 15 Jan 2008

R

Mkr1 2.483 50 GHz
62.32 dB μ V



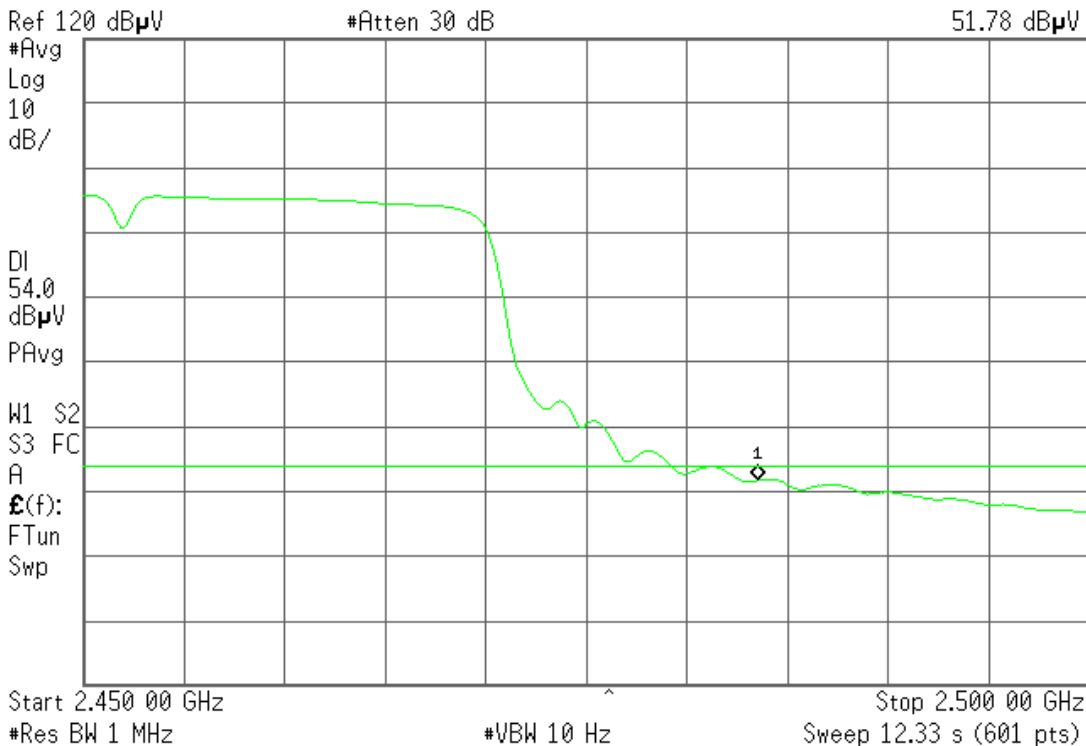
Detector mode: Average

Polarity: Vertical

Agilent 13:41:40 15 Jan 2008

R

Mkr1 2.483 50 GHz
51.78 dB μ V





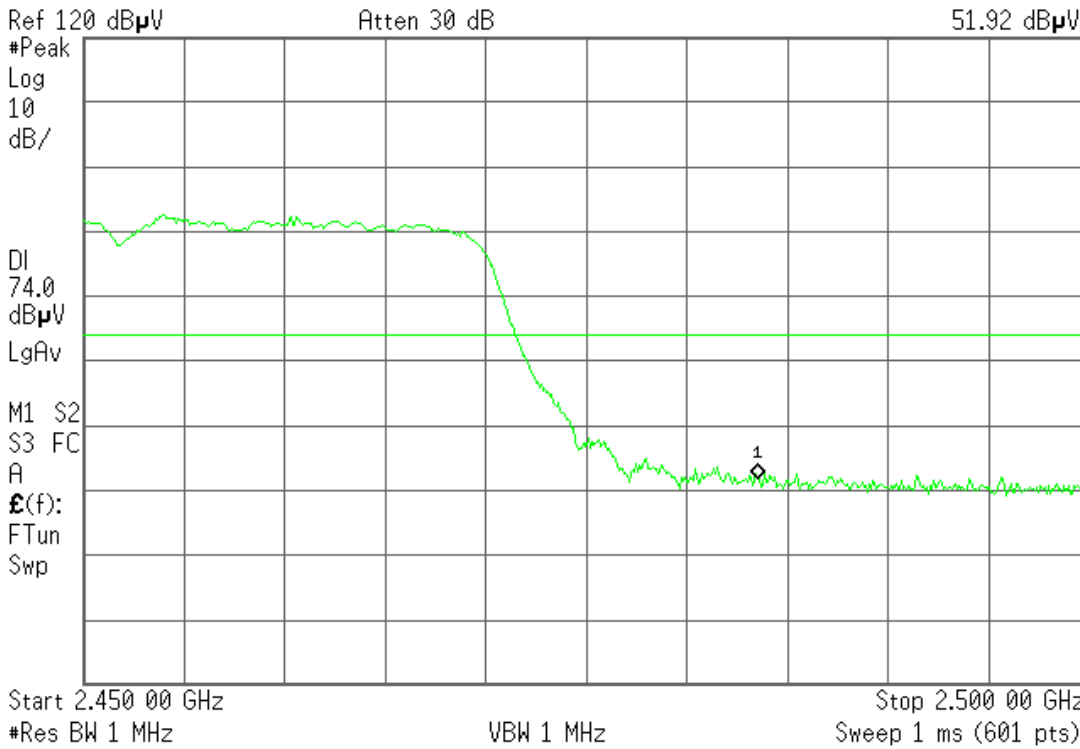
Detector mode: Peak

Polarity: Horizontal

Agilent 18:10:25 Jan 15, 2008

R T

Mkr1 2.483 50 GHz
51.92 dBµV



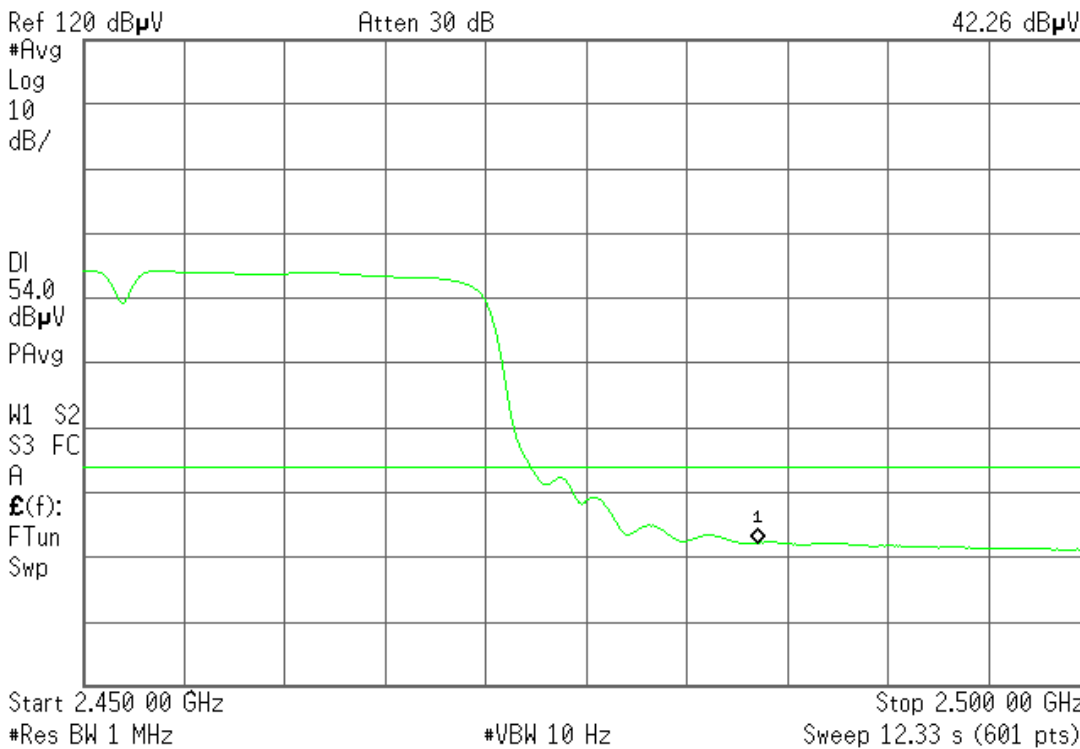
Detector mode: Average

Polarity: Horizontal

Agilent 18:09:33 Jan 15, 2008

R T

Mkr1 2.483 50 GHz
42.26 dBµV





8.6 POWERLINE CONDUCTED EMISSIONS

LIMITS

§ 15.207 (a) Except as shown in paragraph (b) and (c) this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

The lower limit applies at the boundary between the frequency ranges.

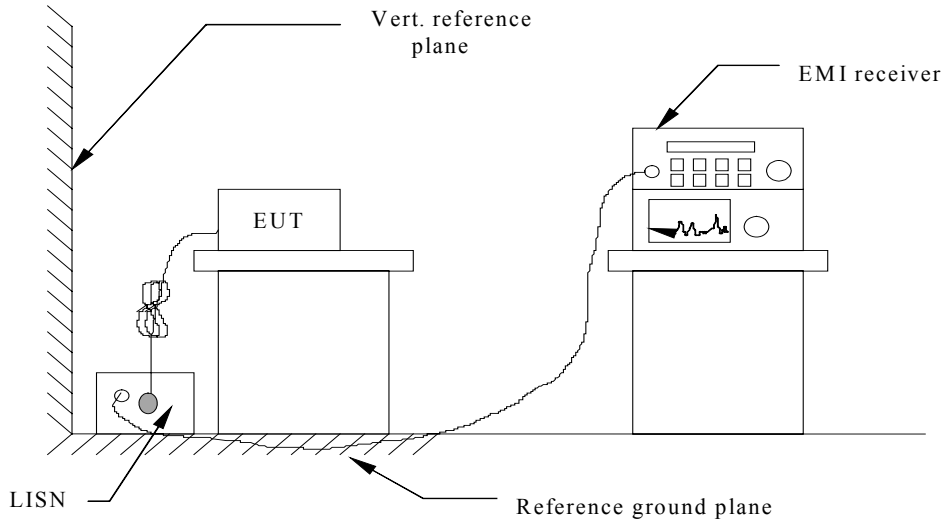
Frequency Range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

MEASUREMENT EQUIPMENT USED

Conducted Emission Test Site G				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
ESCI EMI TEST RECEIV.ESCI	ROHDE&SCHWARZ	1166.5950 03	100088	02/05/2008
LISN	EMCO	3825/2	1371	02/05/2008
LISN	EMCO	3825/2	8901-1459	02/05/2008

Remark: Each piece of equipment is scheduled for calibration once a year.

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**

Test Mode: Normal	Location: Site G
Model Name: WLC-123NR	Test Date: January 19, 2008
Tested by: Tom Gan	Test Results: Passed

FREQ MHz	PEAK RAW dBuV	Q.P. RAW dBuV	AVG RAW dBuV	Q.P. Limit dBuV	AVG Limit dBuV	Q.P. Margin dB	AVG Margin dB	NOTE
0.205	45.16	---	---	64.41	54.41	---	-9.25	L1
0.517	42.48	---	---	56.00	46.00	---	-3.52	L1
0.932	43.86	---	---	56.00	46.00	---	-2.14	L1
1.343	43.70	---	---	56.00	46.00	---	-2.30	L1
2.056	41.71	---	---	56.00	46.00	---	-4.29	L1
3.306	38.77	---	---	56.00	46.00	---	-7.23	L1
0.205	50.07	---	---	64.41	54.41	---	-4.34	L2
0.290	39.89	---	---	61.97	51.97	---	-12.08	L2
0.824	42.79	---	---	56.00	46.00	---	-3.21	L2
1.236	43.65	---	---	56.00	46.00	---	-2.35	L2
1.551	42.27	---	---	56.00	46.00	---	-3.73	L2
1.959	42.04	---	---	56.00	46.00	---	-3.96	L2

Note: The chart above shows the highest readings taken from the final data.

Remark:

1. The measuring frequencies range between 0.15 MHz and 30 MHz.
2. The emissions measured in the frequency range between 0.15 MHz and 30MHz were made with an instrument using Quasi-peak detector and Average detector.
3. “---” denotes the emission level was or more than 2dB below the Average limit, and no re-check was made.
4. The IF bandwidth of SPA between 0.15MHz and 30MHz was 10KHz. The IF bandwidth of Test Receiver between 0.15MHz and 30MHz was 9kHz.
5. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)

Note:

Freq. = Emission frequency in MHz

Factor (dB) = cable loss + Insertion loss of LISN+ Insertion loss of TRANSIENT LIMITER (The TRANSIENT LIMITER included 10 dB ATTENUATION)

Amptd dBuV = Uncorrected Analyzer/Receiver reading + cable loss + Insertion loss of LISN+ Insertion loss of TRANSIENT LIMITER,

Limit dBuV = Limit stated in standard

Margin dB = Reading in reference to limit Margin (dB) = Amptd (dBuV) – Limit (dBuV)

APPENDIX 1 PHOTOGRPHS OF TEST SETUP

LINE CONDUCTED EMISSION TEST





RADIATED EMISSION TEST

