



FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

Wireless Module

Model: J27H003

Trade Name: Hon Hai

Issued to

Hon Hai Precision Ind. Co., Ltd.

**5F-1, 5 Hsin-An Road, HsinChu Science-Based Industrial Park,
Taiwan, R.O.C.**

Issued by

Compliance Certification Services Inc.

**No. 81-1, Lane 210, Bade Rd. 2, Luchu Hsiang,
Taoyuan Hsien, (338) Taiwan, R.O.C.**

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1. TEST RESULT CERTIFICATION

Applicant: Hon Hai Precision Ind. Co., Ltd.
5F-1, 5 Hsin-An Road, HsinChu Science-Based Industrial Park,
Taiwan, R.O.C.

Equipment Under Test: Wireless Module

Trade Name: Hon Hai

Model: J27H003

Date of Test: October 26 ~ November 9, 2006

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 15 Subpart C	No non-compliance noted
Deviation from Applicable Standard	
The radiated emissions below 3GHz were tested at Compliance Certification Services. (U.S.A. Lab.) The test equipments were listed in page 9 and the test data were recorded in page 46~49.	

We hereby certify that:

The above equipment was tested by Compliance Certification Services 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 15.207, 15.209, 15.247.

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

Approved by:

Gavin Lim
Section Manager
Compliance Certification Services Inc.

Reviewed by:

Amanda Wu
Section Manager
Compliance Certification Services Inc.



2. EUT DESCRIPTION

Product	Wireless Module
Trade Name	Hon Hai
Model Number	J27H003
Model Discrepancy	N/A
Power Supply	Powered from host device.
Frequency Range	2412 ~ 2462 MHz
Transmit Power	IEEE 802.11b: 21.71 dBm IEEE 802.11g: 21.97 dBm
Modulation Technique	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: DSSS (CCK, DQPSK, DBPSK) + OFDM (QPSK, BPSK, 16-QAM, 64-QAM)
Transmit Data Rate	IEEE 802.11b: 11, 5.5, 2, 1 Mbps IEEE 802.11g: 54, 48, 36, 24, 18, 12, 11, 9, 6, 5.5, 2, 1 Mbps
Number of Channels	11 Channels
Antenna Specification	Gain: 1.87 dBi
Antenna Designation	Omni Antenna

Remark:

1. The sample selected for test was production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for FCC ID: **MCLJ27H003** filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.



3. TEST METHODOLOGY

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

3.1 EUT CONFIGURATION

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

3.2 EUT EXERCISE

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

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

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

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

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4.



3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

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

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
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
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	(²)
13.36 - 13.41	322 - 335.4		

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

² Above 38.6

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



3.5 DESCRIPTION OF TEST MODES

The EUT (model: J27H003) had been tested under operating condition.

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

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

The worst case data rate is determined as the data rate with highest output power.

Radiated emissions below 3GHz were tested at Compliance Certification Services (U.S.A. Lab.) since the test kit used in U.S.A. yield a better emission rather than the test kit used in Taiwan.

IEEE802.11b mode:

Channel Low(2412MHz), Channel Mid(2437MHz) and Channel High(2462MHz) with 1Mbps data rate were chosen for full testing.

IEEE802.11g mode:

Channel Low(2412MHz), Channel Mid(2437MHz) and Channel High(2462MHz) with 6Mbps data rate were chosen for full testing.



4. INSTRUMENT CALIBRATION

4.1 MEASURING INSTRUMENT CALIBRATION

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

4.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

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

Taiwan Laboratory

Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360131	01/18/2007
Spectrum Analyzer	R&S	FSEK30	10026	03/22/2007

3M Semi Anechoic Chamber				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US42510252	08/02/2007
Test Receiver	Rohde&Schwarz	ESCI	100064	11/05/2007
Switch Controller	TRC	Switch Controller	SC94050010	05/05/2007
4 Port Switch	TRC	4 Port Switch	SC94050020	05/05/2007
Horn-Antenna	TRC	HA-0502	06	06/06/2007
Horn-Antenna	TRC	HA-0801	04	05/05/2007
Horn-Antenna	TRC	HA-1201A	01	07/10/2007
Horn-Antenna	TRC	HA-1301A	01	07/18/2007
Bilog- Antenna	Sunol Sciences	JB3	A030205	03/09/2007
Turn Table	Max-Full	MFT-120S	T120S940302	N.C.R.
Antenna Tower	Max-Full	MFA-430	A440940302	N.C.R.
Controller	Max-Full	MF-CM886	CC-C-1F-13	N.C.R.
Site NSA	CCS	N/A	FCC: 965860 IC: IC 6106	09/26/2008
Test S/W	LABVIEW (V 6.1)			

Remark: The measurement uncertainty is less than $\pm 2.0065\text{dB}$ (30MHz ~ 1GHz), $\pm 3.0958\text{dB}$ (Above 1GHz) which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.

Powerline Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI TEST RECEIVER 9kHz-30MHz	ROHDE & SCHWARZ	ESHS30	828144/003	09/26/2007
TWO-LINE V-NETWORK 9kHz-30MHz	SCHAFFNER	NNB41	03/10013	06/14/2007
LISN 10kHz-100MHz	EMCO	3825/2	9106-1809	03/20/2007
Test S/W	LABVIEW (V 6.1)			

Remark: The measurement uncertainty is less than $\pm 2.81\text{dB}$, which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.

**U.S.A. Laboratory**

Radiated Emissions Test Equipment List				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	2238	04/22/2007
Preamplifier, 1 ~ 26 GHz	Miteq	NSP2600-SP	924342	09/02/2007
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent / HP	E4446A	MY43360112	05/03/2007
EMI Receiver, 9 kHz ~ 2.9 GHz	Agilent / HP	8542E	3942A00286	02/04/2007
RF Filter Section	Agilent / HP	85420E	3705A00256	02/04/2007
Antenna, Bilog 30 MHz ~ 2 GHz	Sunol Sciences	JB1	A121003	09/03/2007

Remark: The measurement uncertainty is less than +4.5dB / -2.9dB, which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.



5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

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

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

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

☒ No.11, Wugong 6th Rd., Wugu Industrial Park, Taipei Hsien 248, Taiwan

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

☒ No.81-1, Lane 210, Bade 2nd Rd., Luchu Hsiang, Taoyuan Hsien 338, Taiwan

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

☒ 561F Monterey Road, Morgan Hill, CA95037

Tel: (408) 463-0885 / Fax: (408) 463-0888

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 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 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	A2LA	EN 55011, EN 55014-1/2, CISPR 11, CISPR 14-1/2, EN 55022, EN 55015, CISPR 22, CISPR 15, AS/NZS 3548, VCCI V3 (2001), CFR 47, FCC Part 15/18, CNS 13783-1, CNS 13439, CNS 13438, CNS 13803, CNS 14115, EN 55024, IEC 801-2, IEC 801-3, IEC 801-4, IEC/EN 61000-3-2, EIC/EN 61000-3-3, IEC/EN 61000-4-2/3/4/5/6/8/11, EN 50081-1/ EN 61000-6-3, EN 50081-2/EN 61000-6-4, EN 50081-2/EN 61000-6-1: 2001	 0824-01
USA	FCC	3/10 meter Open Area Test Sites (93105, 90471) / 3M Semi Anechoic Chamber (965860) to perform FCC Part 15/18 measurements	 93105, 90471 965860
Japan	VCCI	3/10 meter Open Area Test Sites to perform conducted/radiated measurements	 R-393/1066/725/879 C-402/747/912
Norway	NEMKO	EN 50081-1/2, EN 50082-1/2, IEC 61000-6-1/2, EN 50091-2, EN 50130-4, EN 55011, EN 55013, EN 55014-1/2, EN 55015, EN 55022, EN 55024, EN 61000-3-2/3, EN 61326-1, IEC 61000-4-2/3/4/5/6/8/11, EN 60601-1-2, EN 300 328, EN 300 422-2, EN 301 419-1, EN 301 489-01/03/07/08/09/17, EN 301 419-2/3, EN 300 454-2, EN 301 357-2	 ELA 124a ELA 124b ELA 124c
Taiwan	TAF	EN 300 328, EN 300 220-1, EN 300 220-2, EN 300 220-3, 47 CFR FCC Part 15 Subpart C, EN 61000-3-2, EN 61000-3-3, CNS 13439, CNS 13783-1, CNS 14115, CNS 13438, AS/NZS CISPR 22, CNS 13022-1, IEC 61000-4-2/3/4/5/6/8/11, CNS 13022-2/3	
Taiwan	BSMI	CNS 13438, CNS 13783-1, CNS 13439, CNS 14115	 SL2-IS-E-0014 SL2-IN-E-0014 SL2-A1-E-0014 SL2-R1-E-0014 SL2-R2-E-0014 SL2-L1-E-0014
Canada	Industry Canada	3/10 meter Open Area Test Sites (IC 3991-3, IC 3991-4) / 3M Semi Anechoic Chamber (IC 6106) to perform RSS 212 Issue 1	 IC 3991-3 IC 3991-4 IC 6106

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



6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

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

6.2 SUPPORT EQUIPMENT

Taiwan Laboratory

No.	Device Type	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1.	PC	Dell	DCTA	21G1K1S	05056	N/A	Unshielded, 1.8m
2.	LCD Monitor	LG	L1740PQ	503KGXA2K858	BEJL17NU	Unshielded, 1.8m with 2 cores	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
3.	Keyboard	Dell	Sk-8115	N/A	FCC DoC	Shielded, 1.8m	N/A
4.	USB Mouse	Dell	MO56UO	408031121	FCC DoC	Shielded, 1.8m	N/A
5.	Test kit	N/A	N/A	N/A	FCC DoC	N/A	N/A
6.	Wireless Router (Remote)	ASUS	WL-500g	471GA12838	MSQWL500G	N/A	Unshielded, 1.8m

Remark:

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

U.S.A. Laboratory

No.	Device Type	Manufacturer	Model Number	Serial Number	FCC ID
1.	Monitor	LG	L1750S	512MXXQ0B570	DoC
2.	Keyboard	HP	SK-2502	HR804076021	GYUR41SK
3.	Mouse	HP	M-S34	LZB74708572	DZL211029
4.	Desktop PC	Dell	DHM	FNC491X	FCC DoC
5.	Test kit	N/A	N/A	N/A	FCC DoC



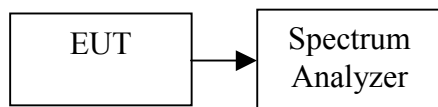
7. FCC PART 15.247 REQUIREMENTS

7.1 6DB BANDWIDTH

LIMIT

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

Test Configuration



TEST PROCEDURE

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 = 100 kHz, VBW = RBW, Span = 50 MHz, 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)	Bandwidth (kHz)	Limit (kHz)	Result
Low	2412	10170	>500	PASS
Mid	2437	10080		PASS
High	2462	10670		PASS

Test mode: IEEE 802.11g

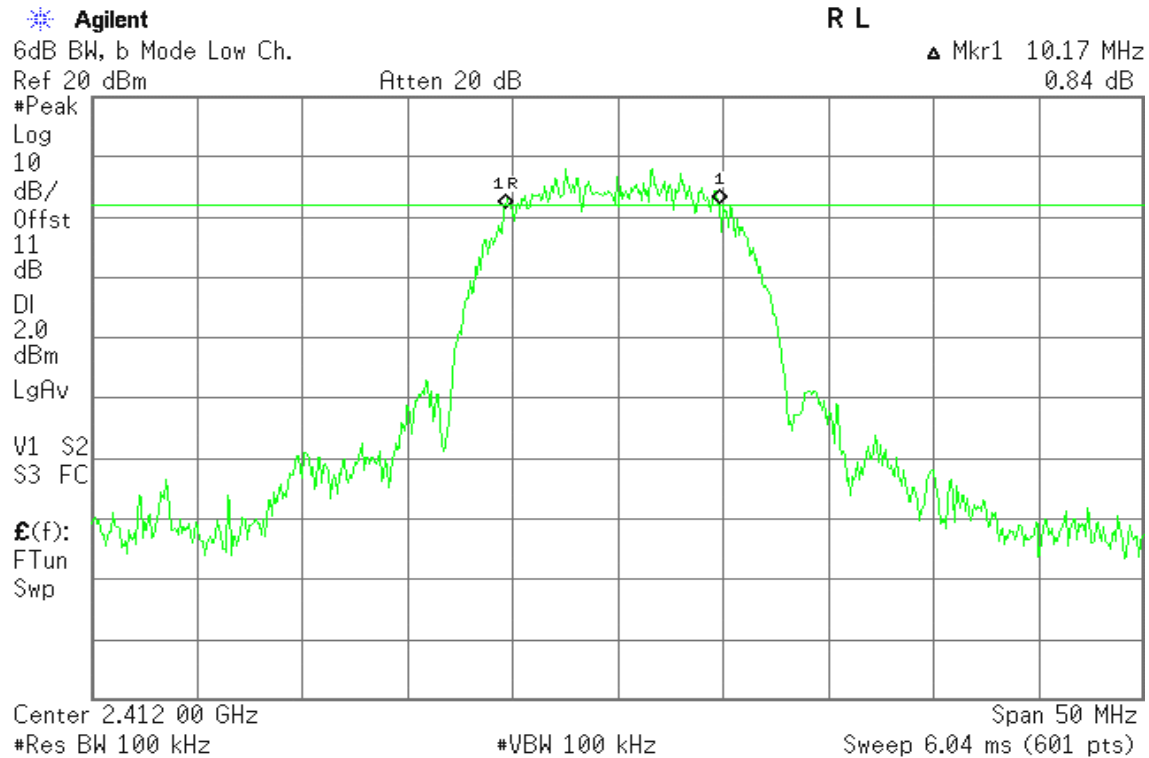
Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Result
Low	2412	16580	>500	PASS
Mid	2437	16420		PASS
High	2462	16670		PASS



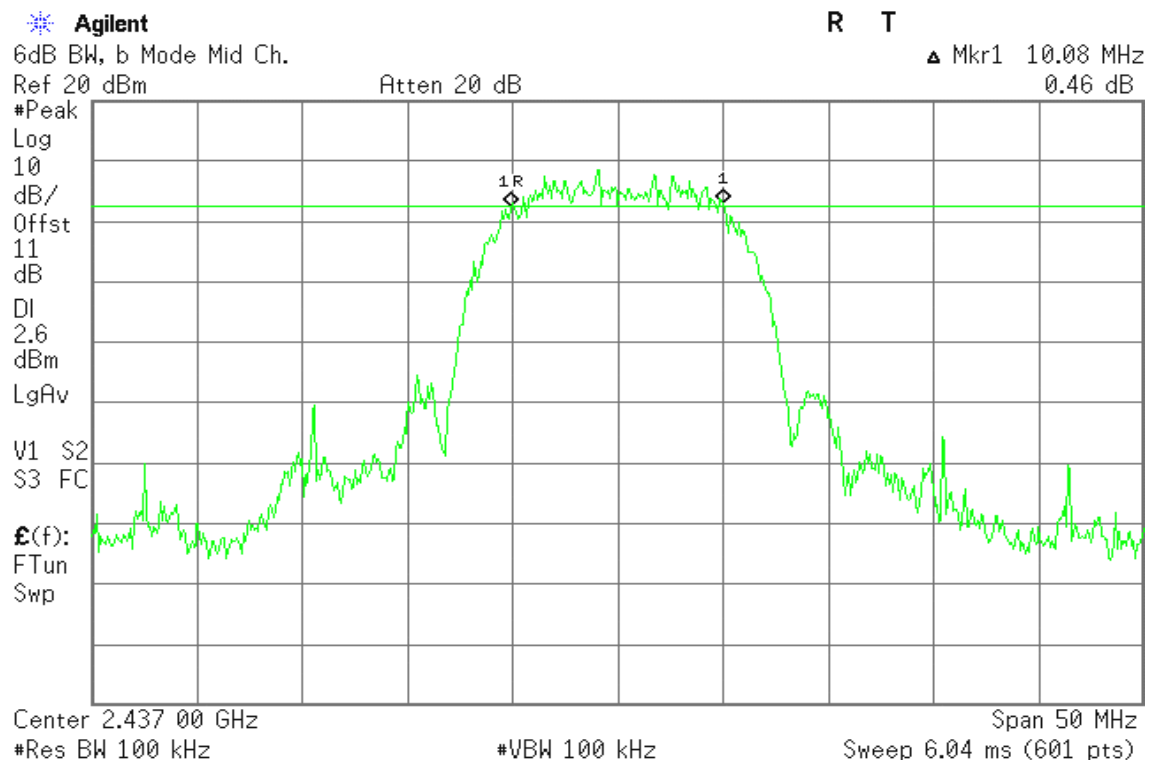
Test Plot

IEEE 802.11b

6dB Bandwidth (CH Low)

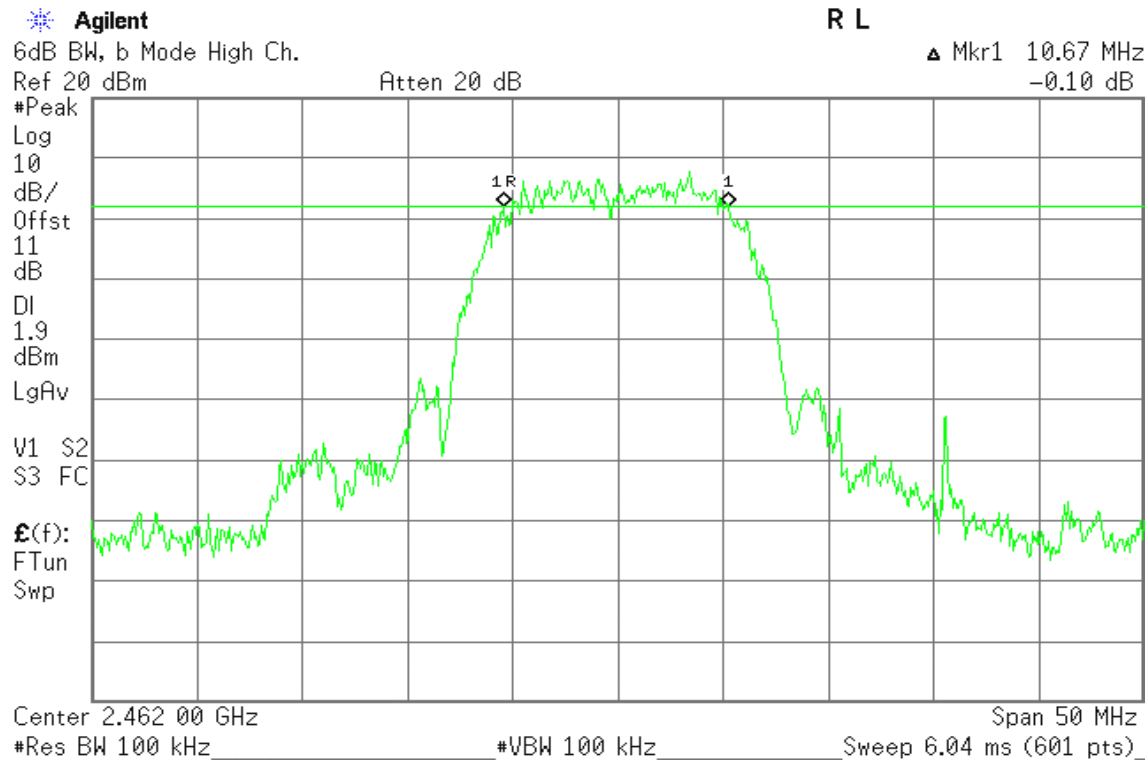


6dB Bandwidth (CH Mid)



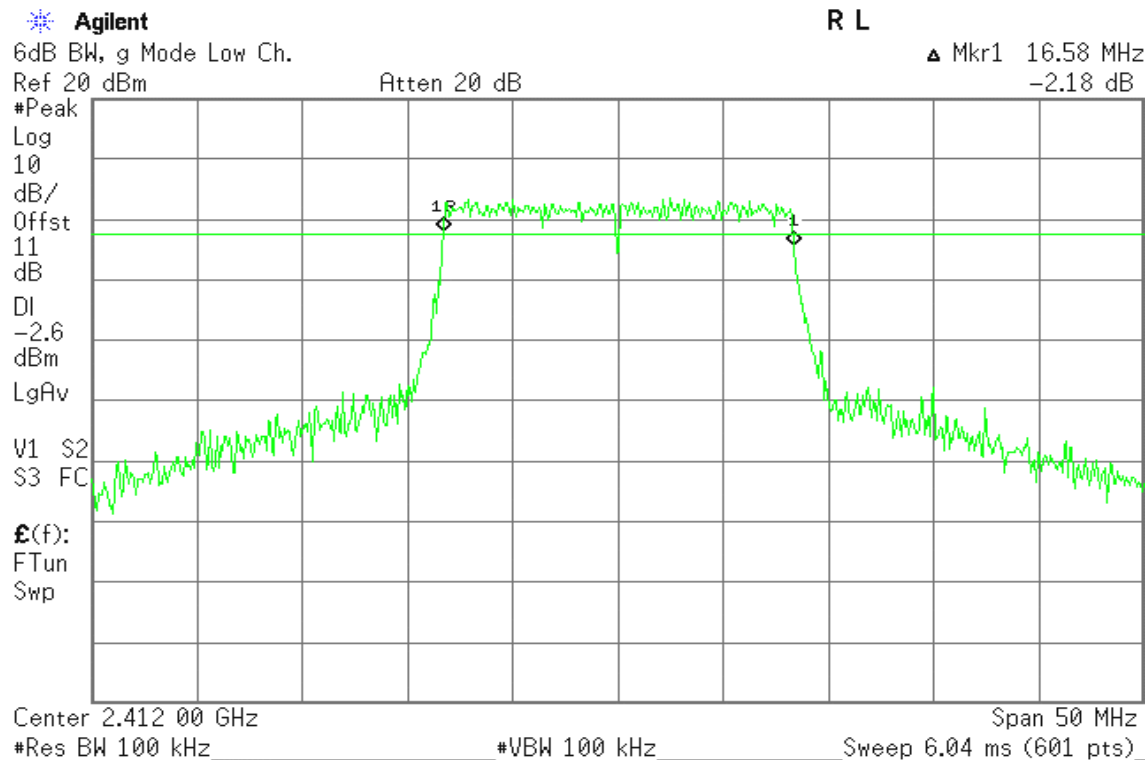


6dB Bandwidth (CH High)



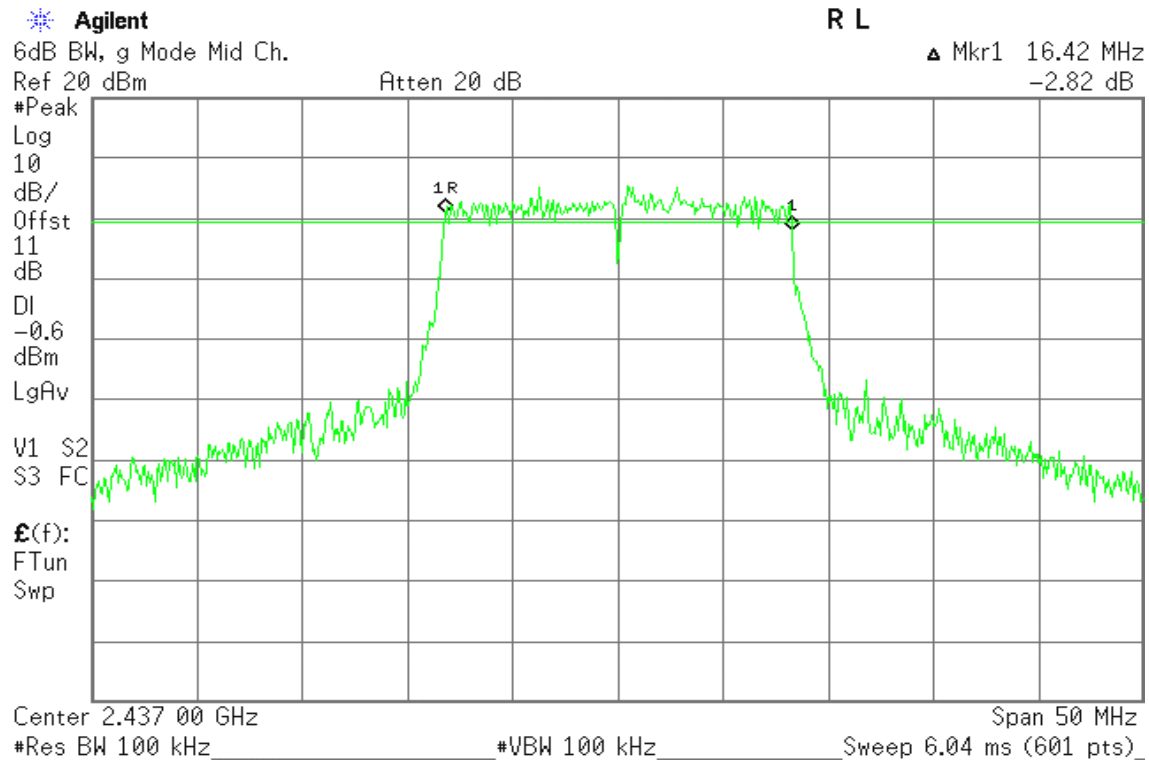
IEEE 802.11g

6dB Bandwidth (CH Low)

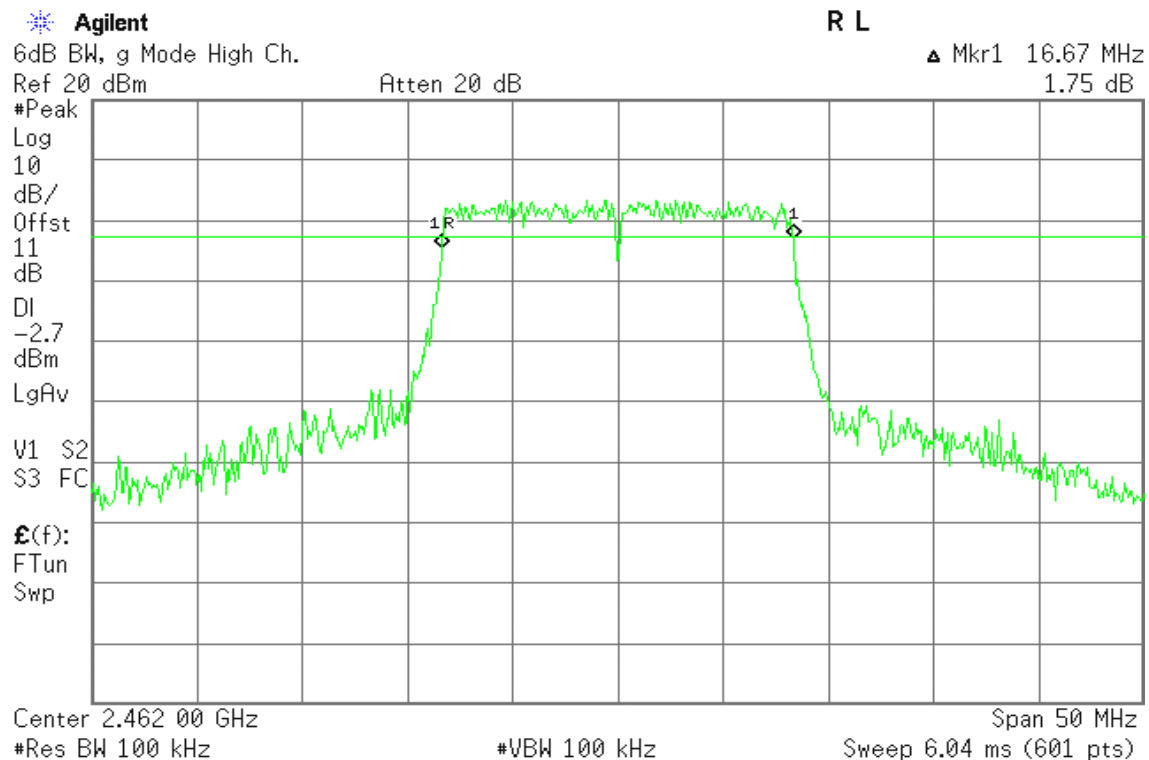




6dB Bandwidth (CH Mid)



6dB Bandwidth (CH High)





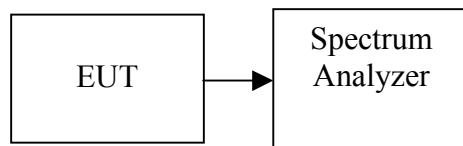
7.2 PEAK POWER

LIMIT

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

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

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

Test Data

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	21.71	0.14825	1.00	PASS
Mid	2437	21.38	0.13740		PASS
High	2462	21.26	0.13366		PASS

Test mode: IEEE 802.11g

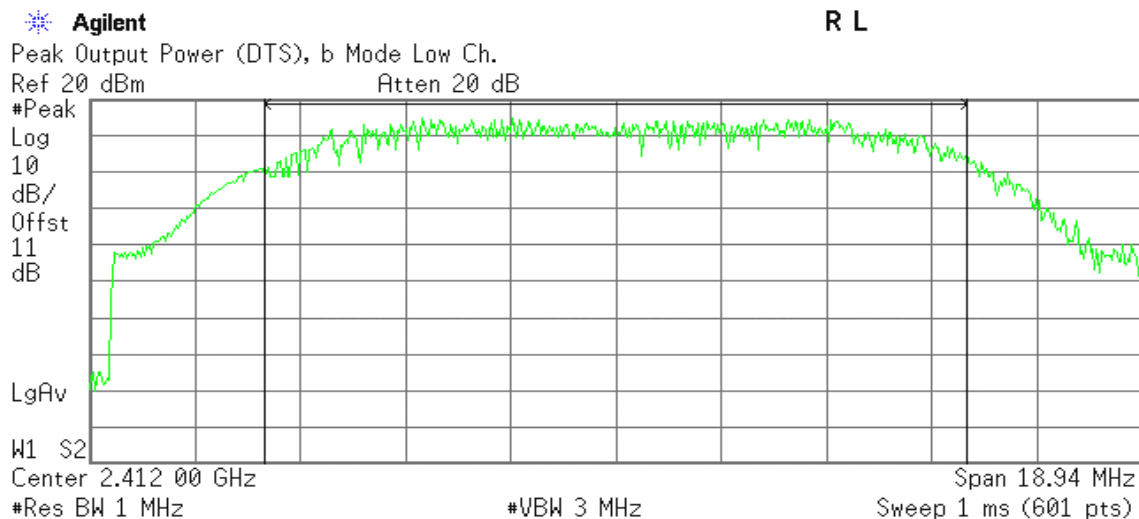
Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	21.97	0.15740	1.00	PASS
Mid	2437	21.87	0.15382		PASS
High	2462	21.56	0.14322		PASS



Test Plot

IEEE 802.11b

Peak Power (CH Low)



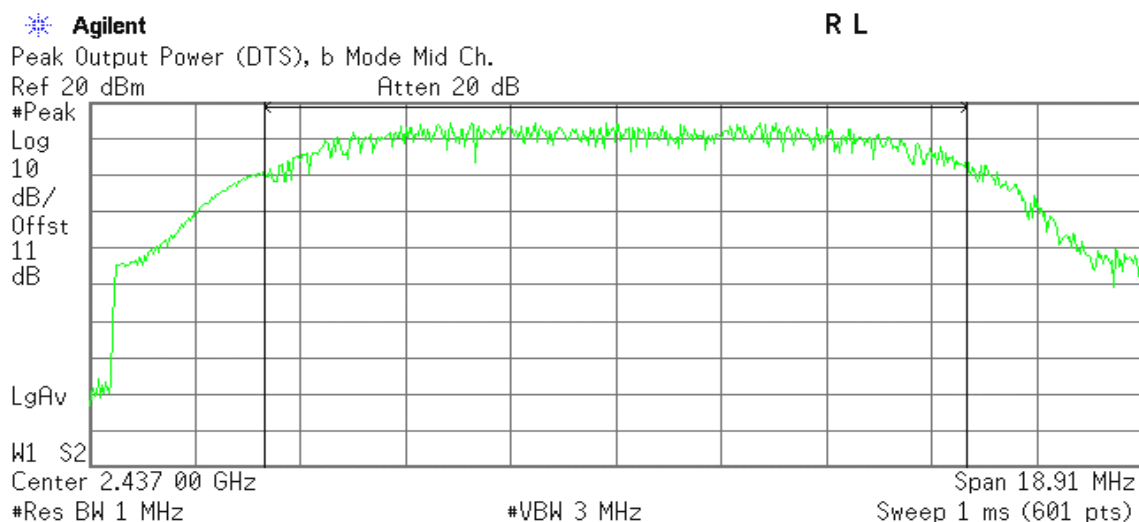
Channel Power

21.71 dBm /12.6270 MHz

Power Spectral Density

-49.31 dBm/Hz

Peak Power (CH Mid)



Channel Power

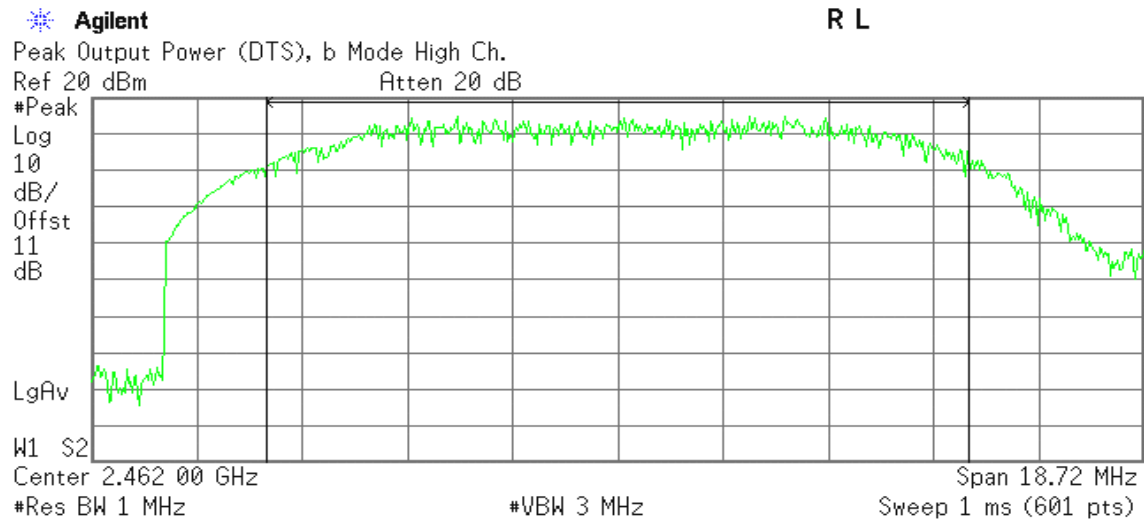
21.38 dBm /12.6070 MHz

Power Spectral Density

-49.63 dBm/Hz



Peak Power (CH High)



Channel Power

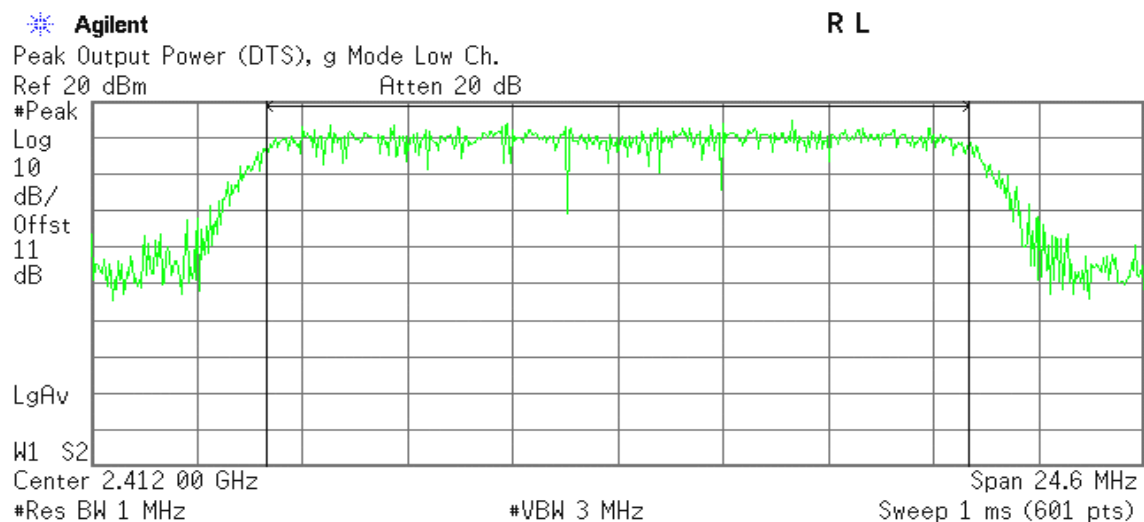
21.26 dBm /12.4770 MHz

Power Spectral Density

-49.70 dBm/Hz

IEEE 802.11g

Peak Power (CH Low)



Channel Power

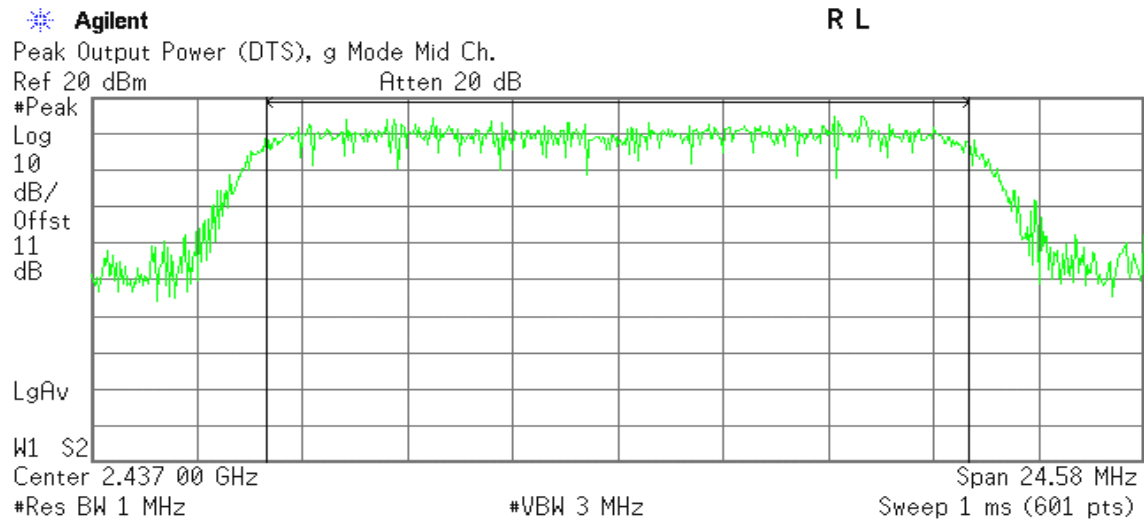
21.97 dBm /16.4020 MHz

Power Spectral Density

-50.18 dBm/Hz



Peak Power (CH Mid)



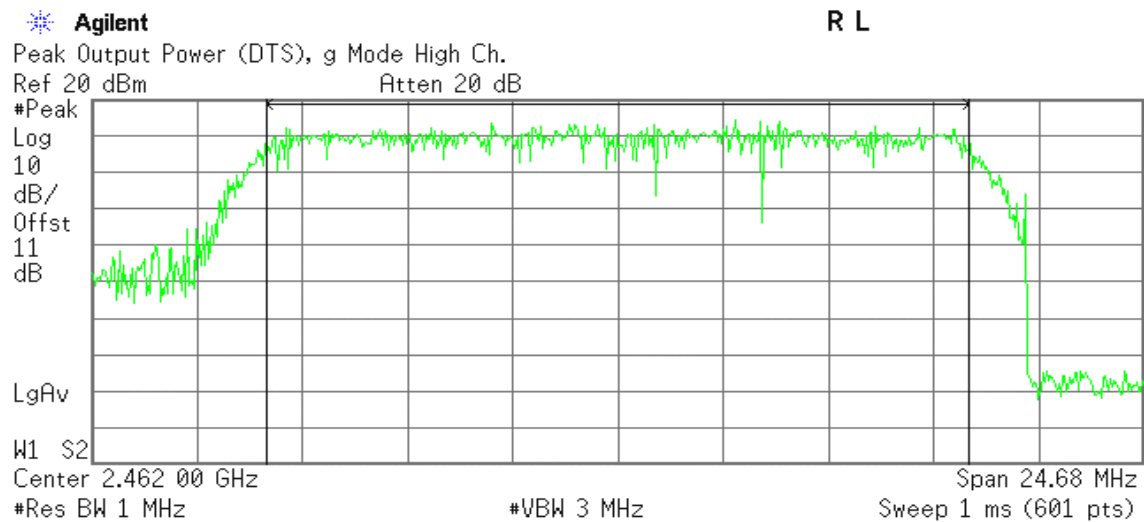
Channel Power

21.87 dBm /16.3840 MHz

Power Spectral Density

-50.28 dBm/Hz

Peak Power (CH High)



Channel Power

21.56 dBm /16.4540 MHz

Power Spectral Density

-50.60 dBm/Hz

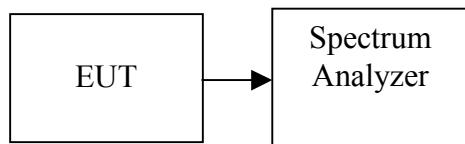


7.3 AVERAGE POWER

LIMIT

None; for reporting purposes only.

Test Configuration



TEST PROCEDURE

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

TEST RESULTS

No non-compliance noted.

Test Data

Test mode: IEEE 802.11b mode

Channel	Frequency (MHz)	Output Power (dBm)
Low	2412	17.14
Mid	2437	17.78
High	2462	17.05

Test mode: IEEE 802.11g mode

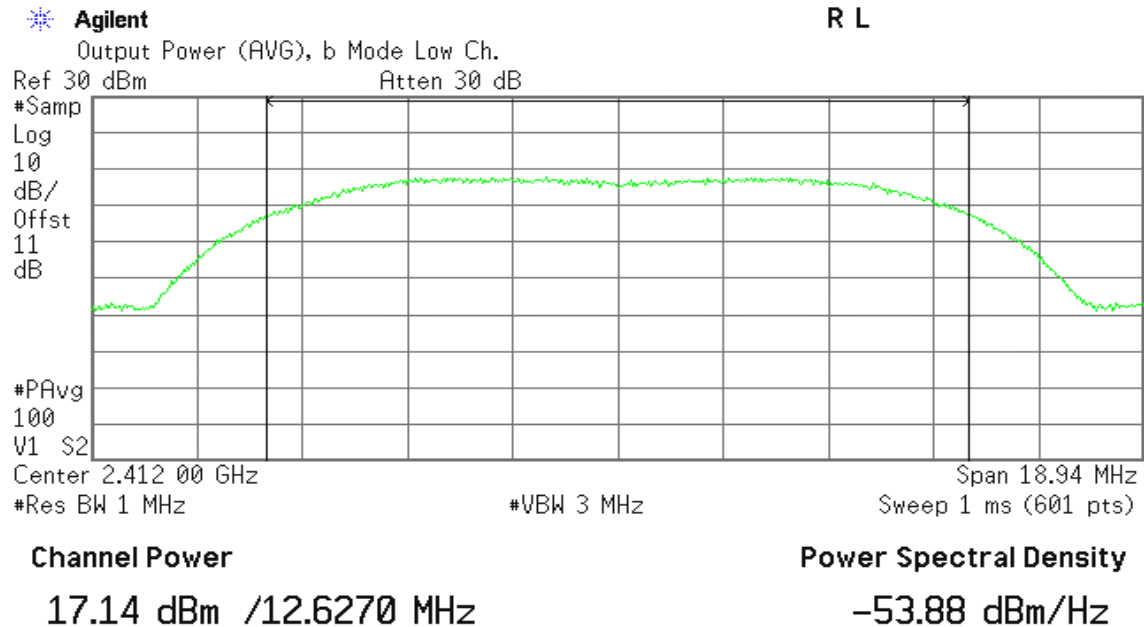
Channel	Frequency (MHz)	Output Power (dBm)
Low	2412	18.07
Mid	2437	17.98
High	2462	17.53



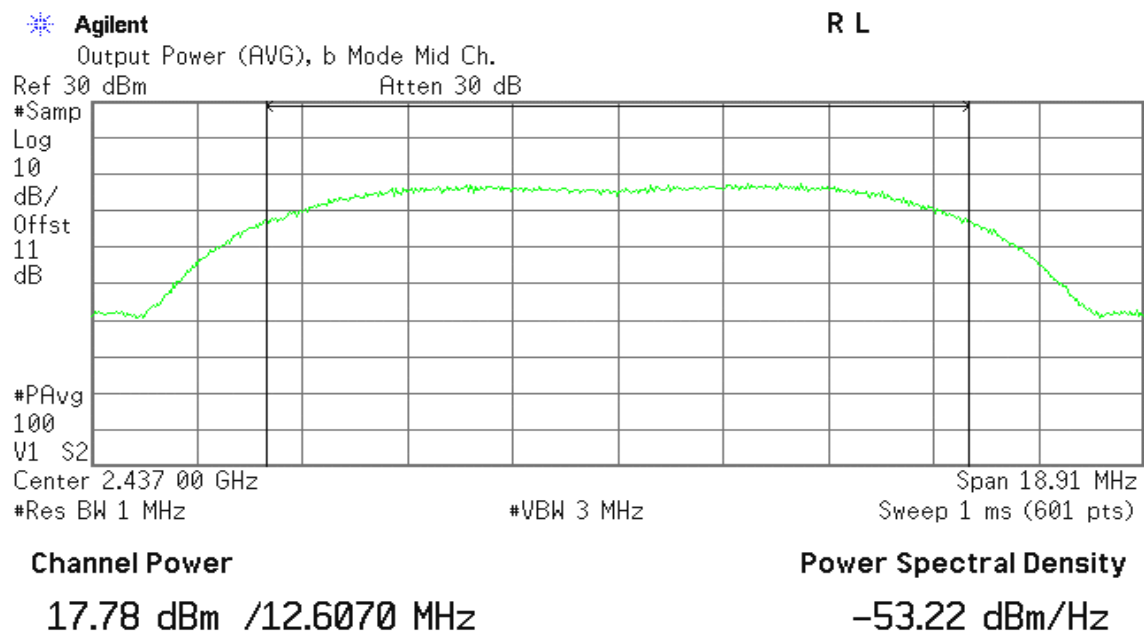
Test Plot

IEEE 802.11b

CH Low



CH Mid





CH High

Agilent

R L

Output Power (AVG), b Mode High Ch.

Ref 30 dBm

Atten 30 dB

#Samp

Log

10

dB/

Offst

11

dB

#PAvg

100

V1 S2

Center 2.462 00 GHz

Span 18.72 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

17.05 dBm /12.4770 MHz

-53.91 dBm/Hz

IEEE 802.11g

CH Low

Agilent

R L

Output Power (AVG), g Mode Low Ch.

Ref 30 dBm

Atten 30 dB

#Samp

Log

10

dB/

Offst

11

dB

#PAvg

100

V1 S2

Center 2.412 00 GHz

Span 24.6 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

18.07 dBm /16.4020 MHz

-54.08 dBm/Hz



CH Mid



Agilent

R L

Output Power (AVG), g Mode Mid Ch.

Ref 30 dBm

Atten 30 dB

#Samp

Log

10

dB/

Offst

11

dB

#PAvg

100

V1 S2

Center 2.437 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

Span 24.58 MHz

Sweep 1 ms (601 pts)

Channel Power

17.98 dBm /16.3840 MHz

Power Spectral Density

-54.16 dBm/Hz

CH High



Agilent

R L

Output Power (AVG), g Mode High Ch.

Ref 30 dBm

Atten 30 dB

#Samp

Log

10

dB/

Offst

11

dB

#PAvg

100

V1 S2

Center 2.462 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

Span 24.68 MHz

Sweep 1 ms (601 pts)

Channel Power

17.53 dBm /16.4540 MHz

Power Spectral Density

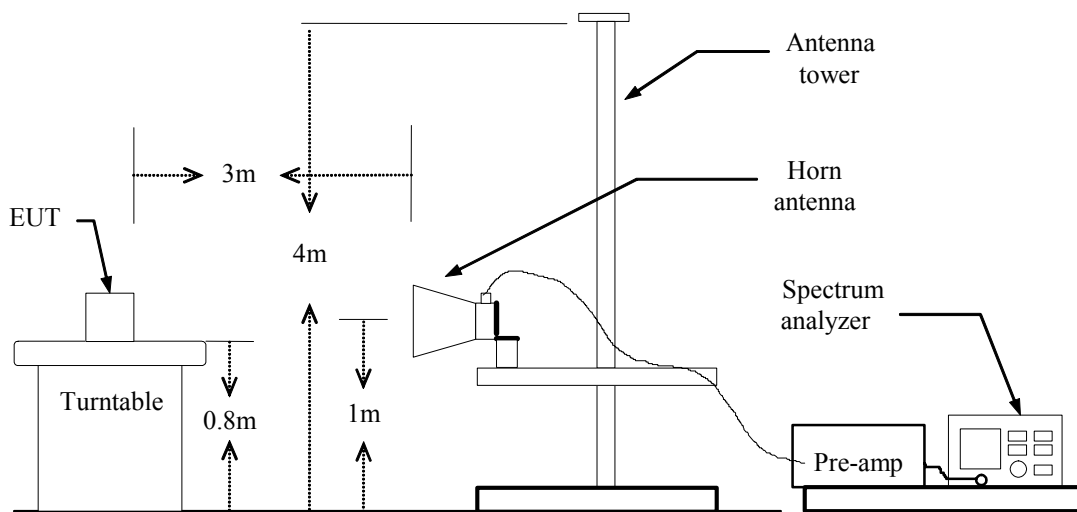
-54.64 dBm/Hz

7.4 BAND EDGES MEASUREMENT

LIMIT

According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)).

Test Configuration



TEST PROCEDURE

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.



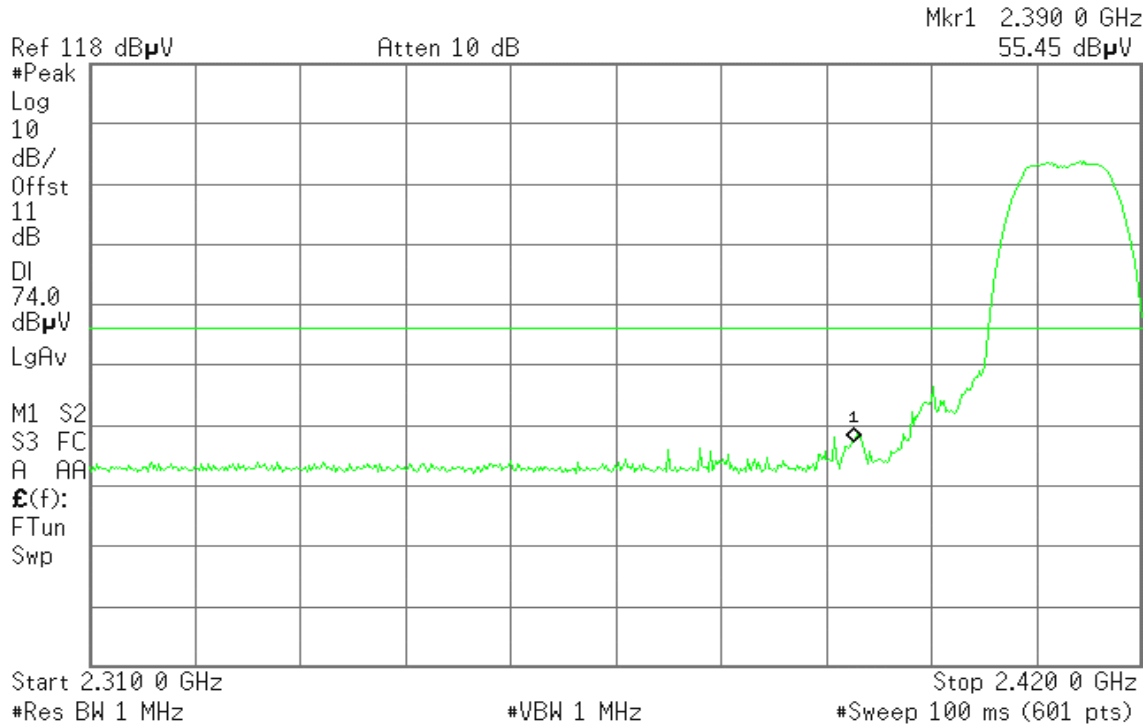
Band Edges (IEEE 802.11b / CH Low)

Detector mode: Peak

Polarity: Vertical

Agilent 08:13:48 Oct 26, 2006

R T

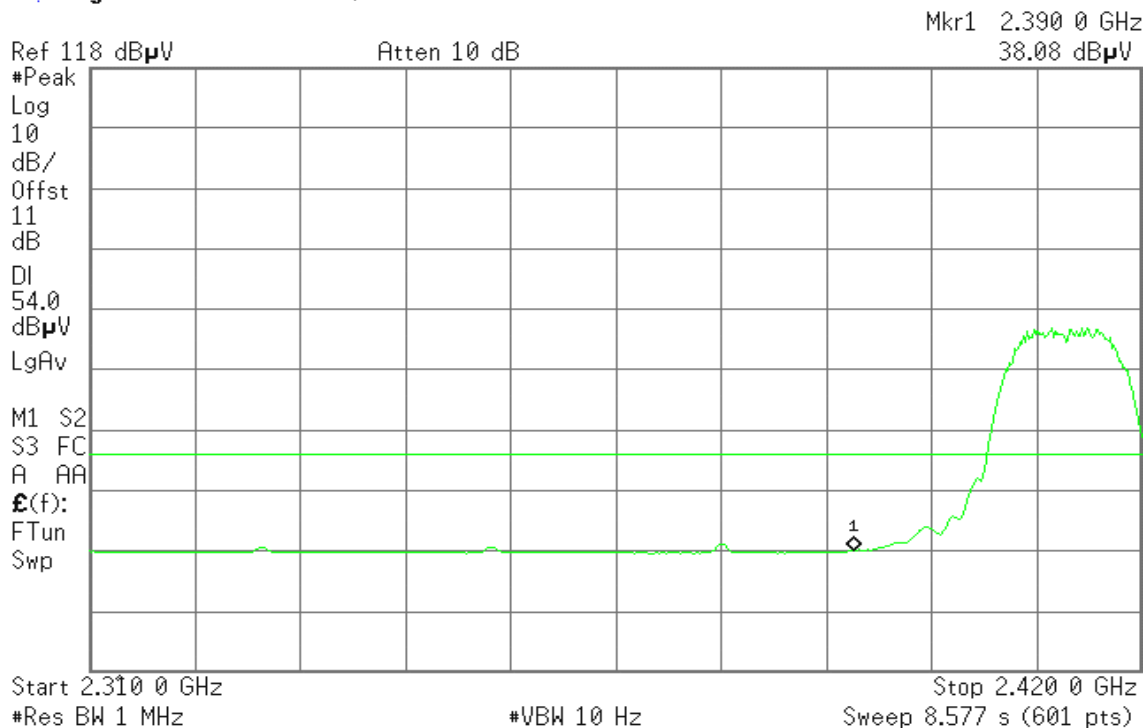


Detector mode: Average

Polarity: Vertical

Agilent 08:14:42 Oct 26, 2006

T



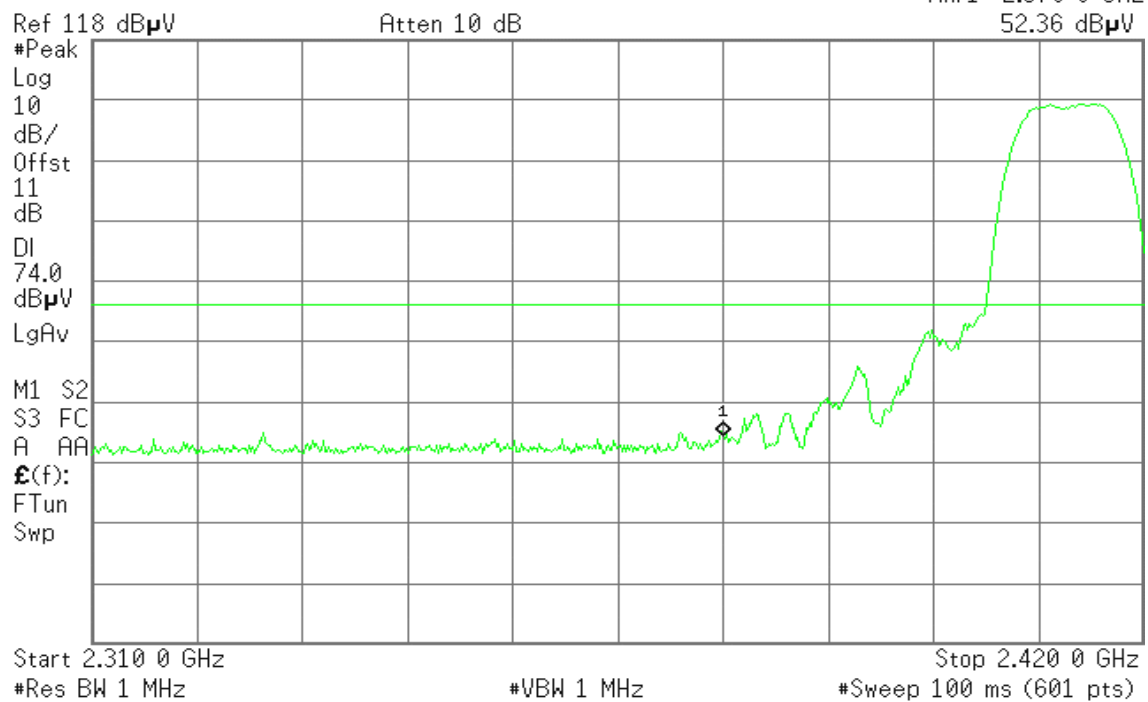


Detector mode: Peak

Polarity: Horizontal

Agilent 08:20:29 Oct 26, 2006

T

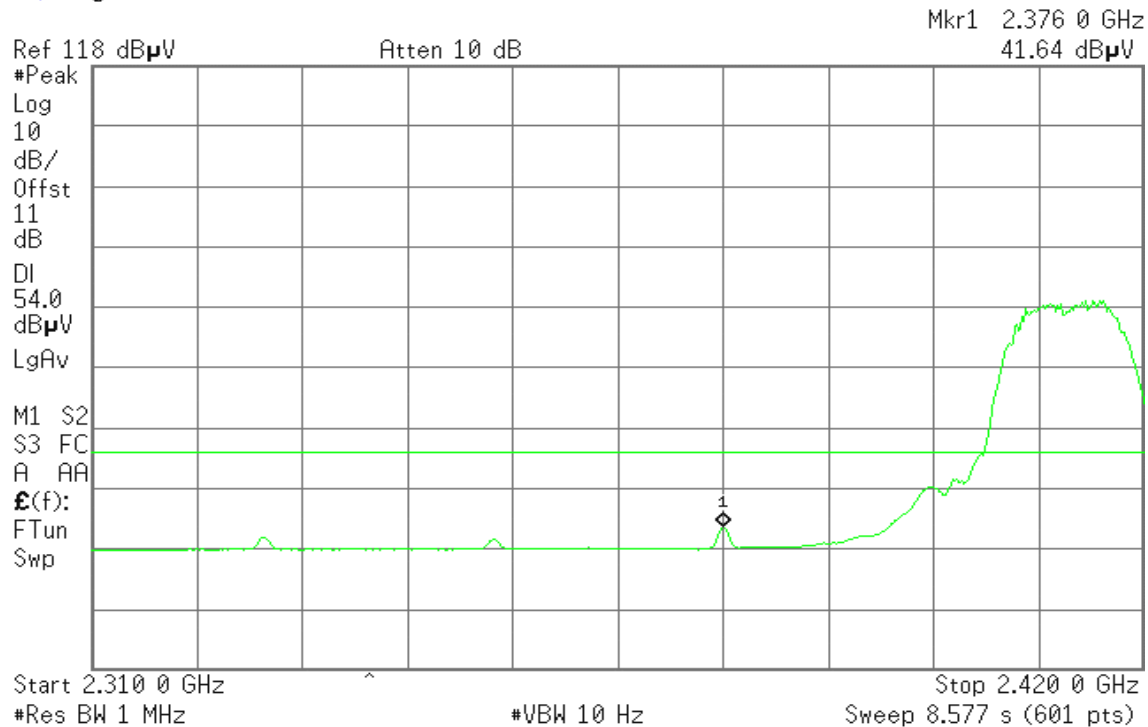


Detector mode: Average

Polarity: Horizontal

Agilent 08:19:13 Oct 26, 2006

T





Band Edges (IEEE 802.11b / CH High)

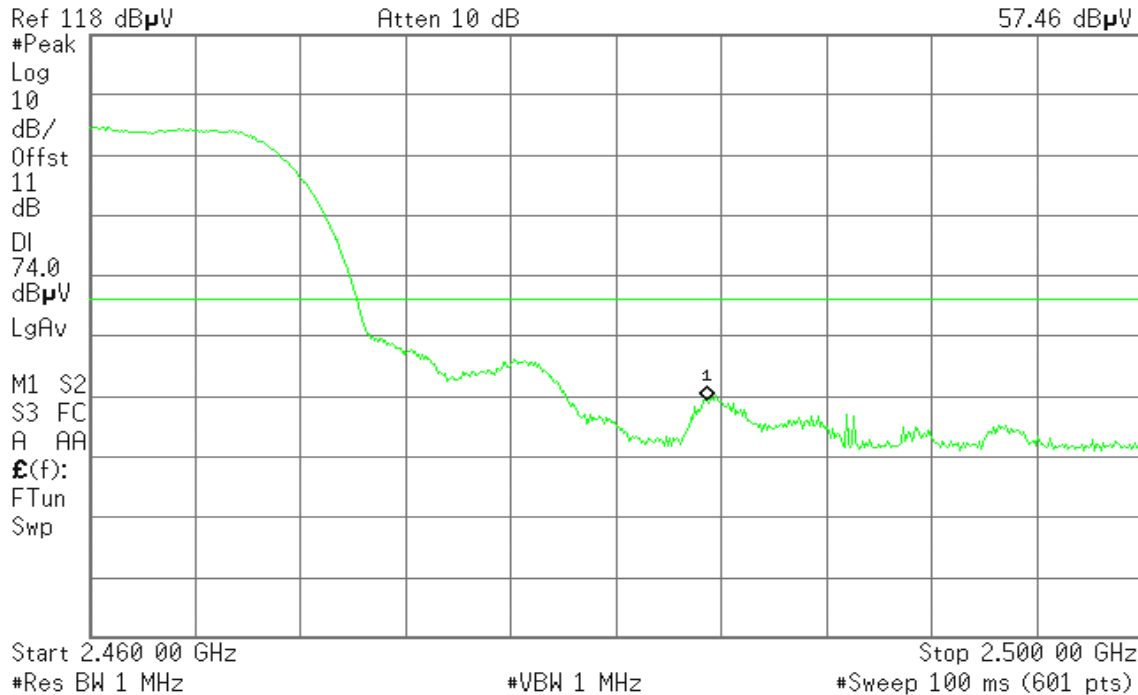
Detector mode: Peak

Polarity: Vertical

Agilent 08:31:29 Oct 26, 2006

T

Mkr1 2.483 50 GHz
57.46 dBμV



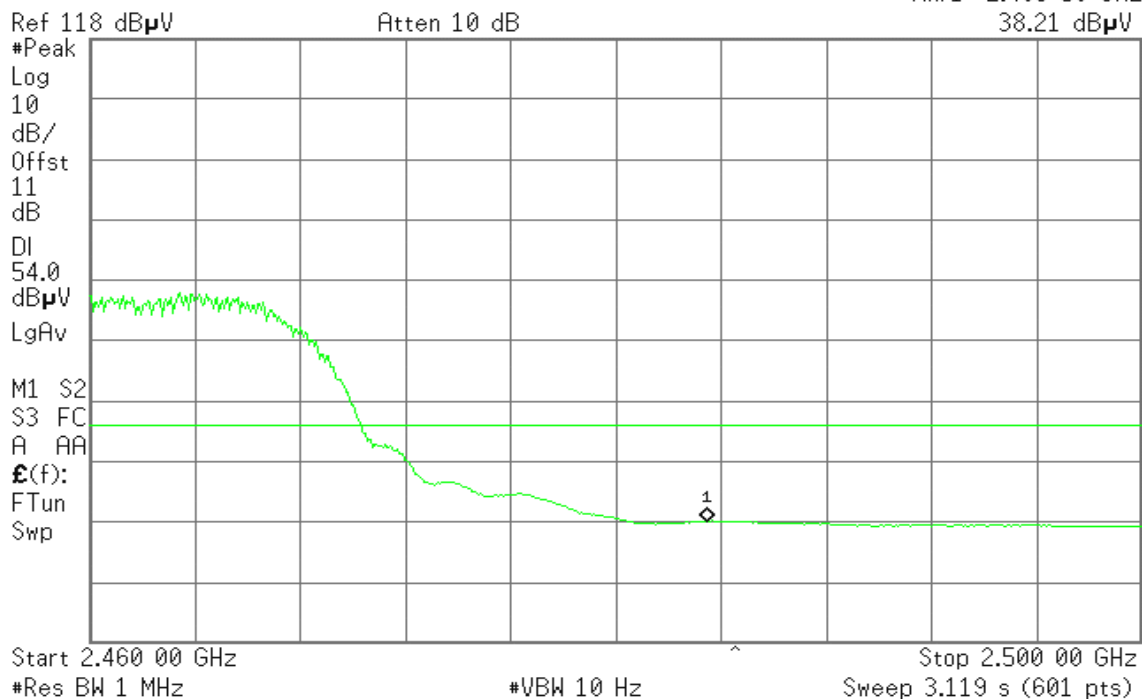
Detector mode: Average

Polarity: Vertical

Agilent 08:30:21 Oct 26, 2006

T

Mkr1 2.483 50 GHz
38.21 dBμV





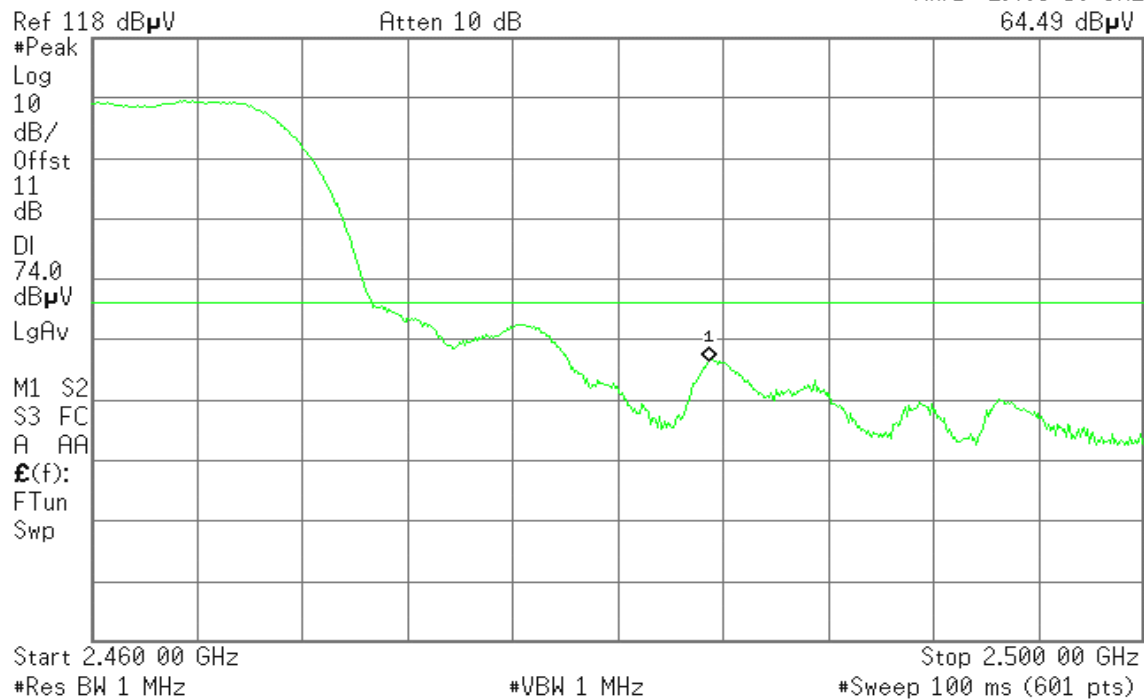
Detector mode: Peak

Polarity: Horizontal

Agilent 08:26:49 Oct 26, 2006

T

Mkr1 2.483 50 GHz
64.49 dB μ V



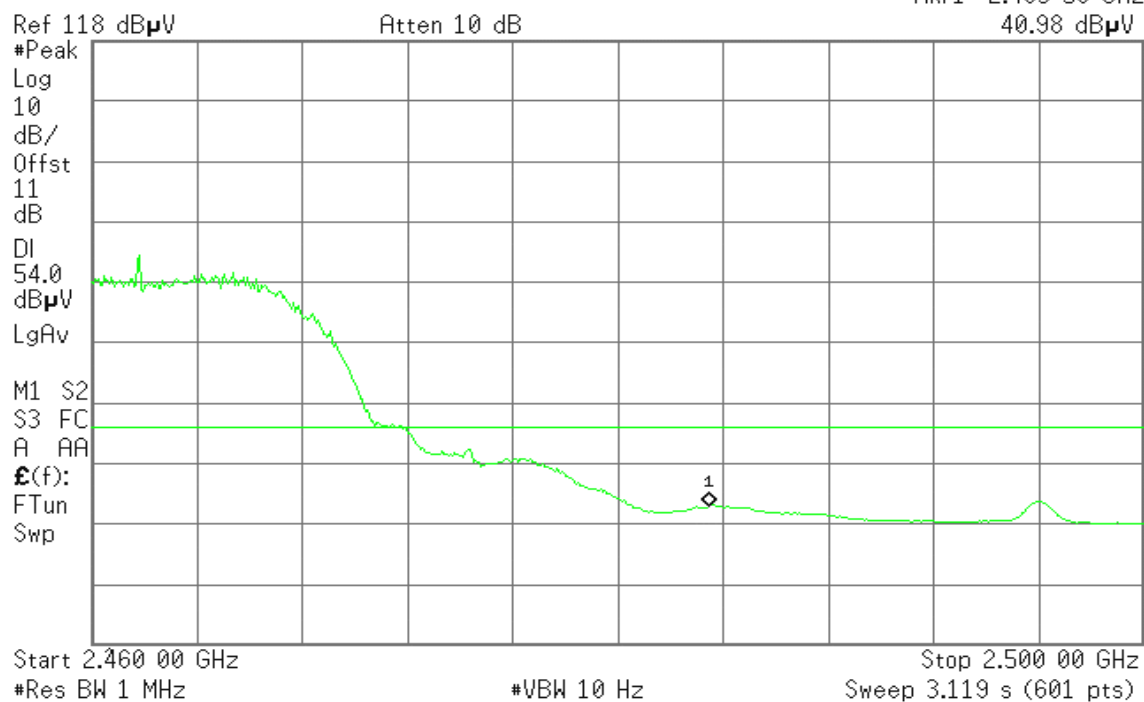
Detector mode: Average

Polarity: Horizontal

Agilent 08:25:51 Oct 26, 2006

T

Mkr1 2.483 50 GHz
40.98 dB μ V





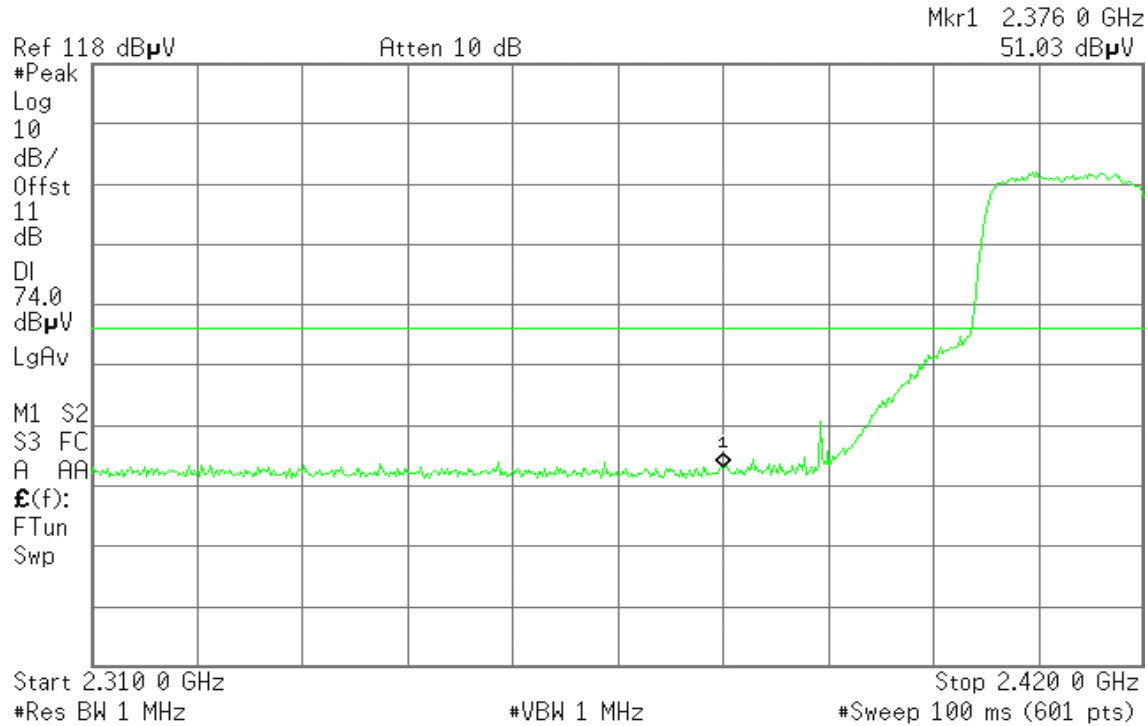
Band Edges (IEEE 802.11g / CH Low)

Detector mode: Peak

Polarity: Vertical

Agilent 08:56:05 Oct 26, 2006

T

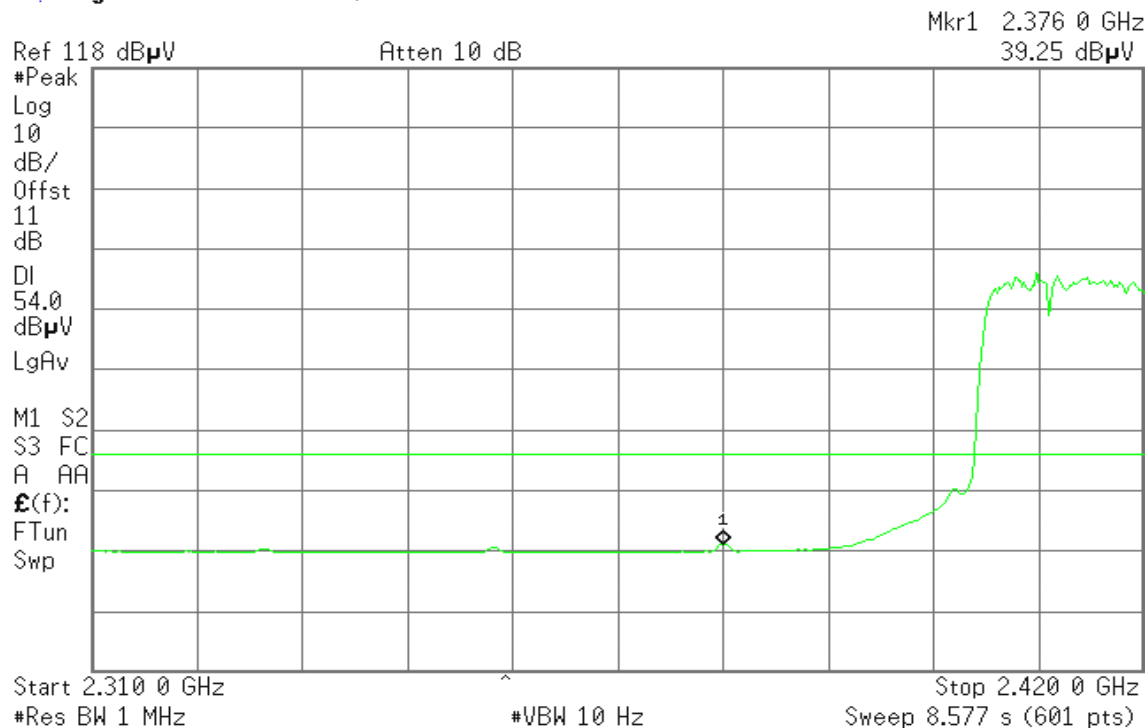


Detector mode: Average

Polarity: Vertical

Agilent 08:55:22 Oct 26, 2006

T



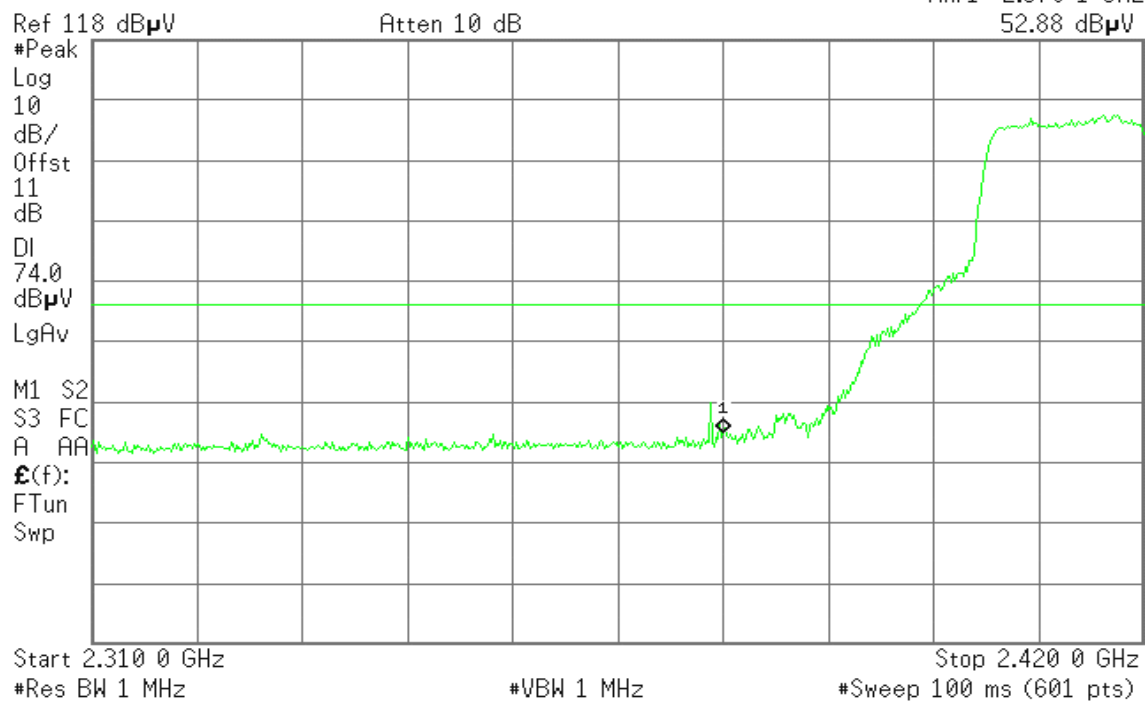


Detector mode: Peak

Polarity: Horizontal

Agilent 08:51:57 Oct 26, 2006

T

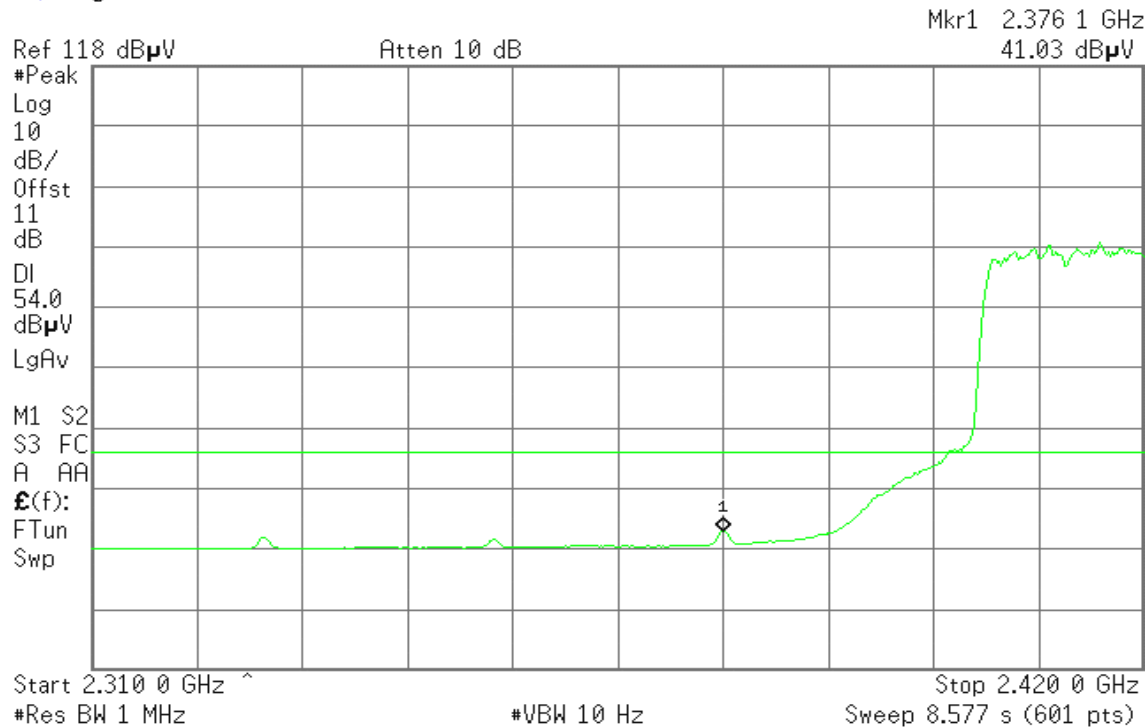


Detector mode: Average

Polarity: Horizontal

Agilent 08:51:04 Oct 26, 2006

T





Band Edges (IEEE 802.11g / CH High)

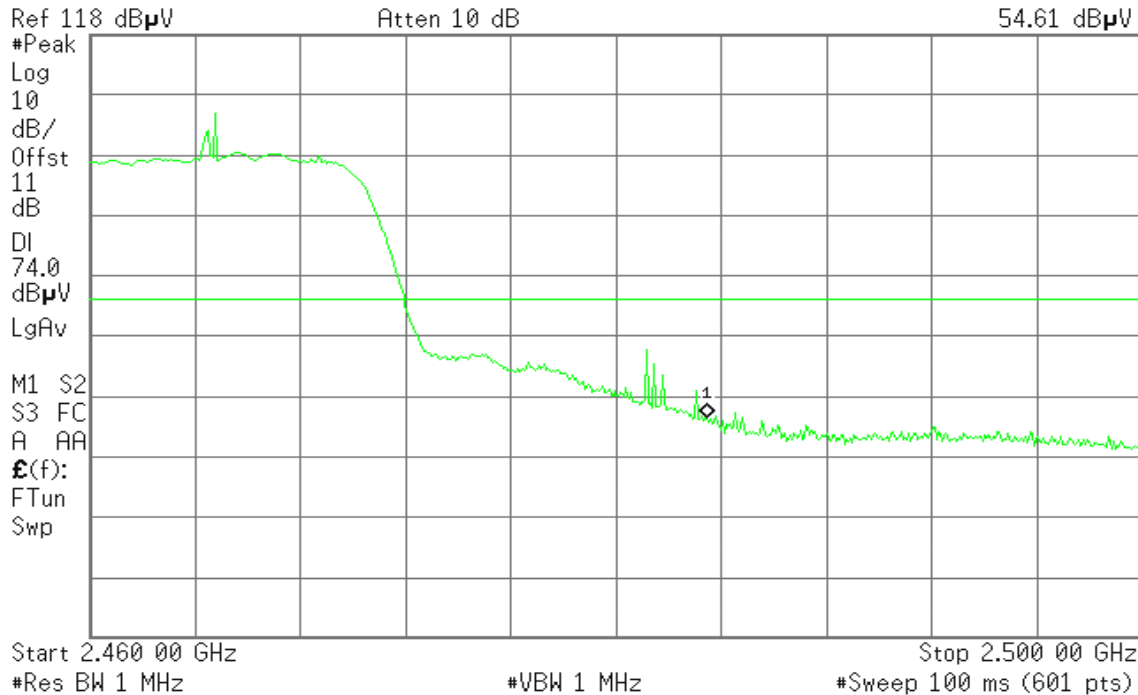
Detector mode: Peak

Polarity: Vertical

Agilent 08:40:59 Oct 26, 2006

T

Mkr1 2.483 50 GHz
54.61 dB μ V



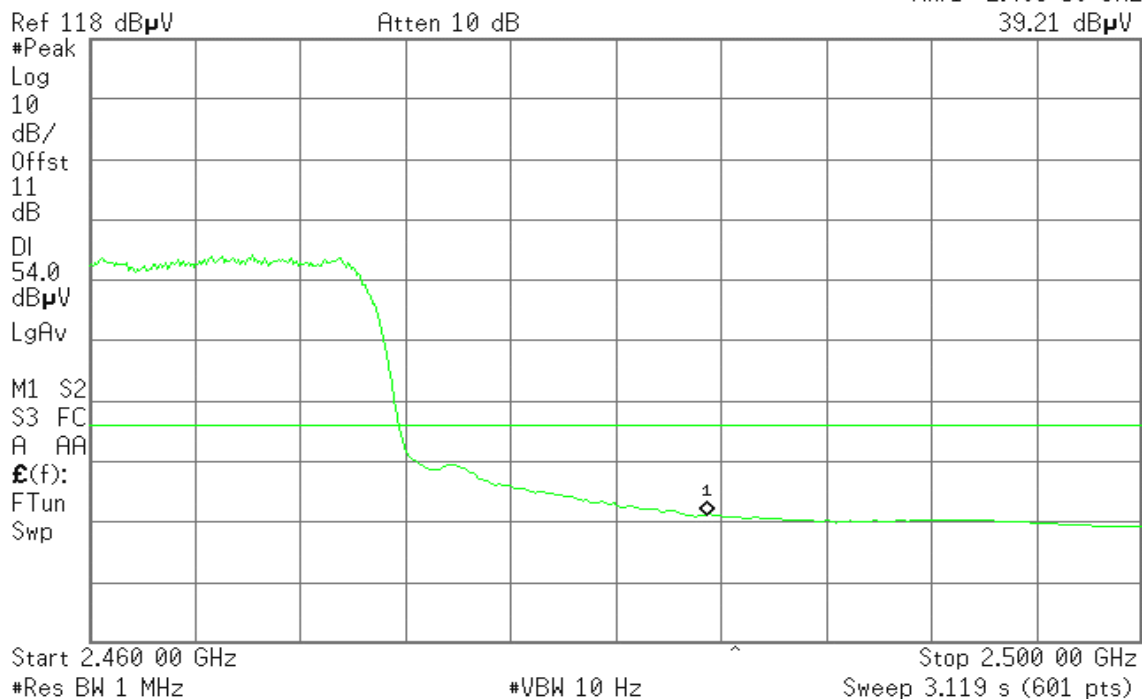
Detector mode: Average

Polarity: Vertical

Agilent 08:39:50 Oct 26, 2006

T

Mkr1 2.483 50 GHz
39.21 dB μ V





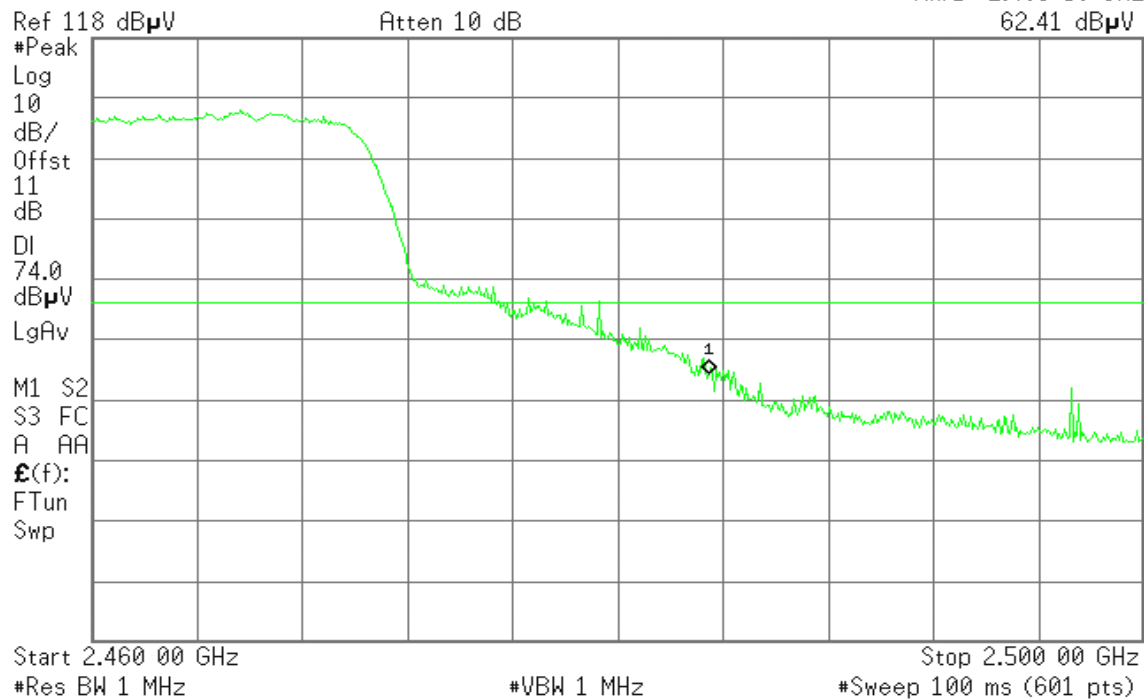
Detector mode: Peak

Polarity: Horizontal

Agilent 08:46:21 Oct 26, 2006

T

Mkr1 2.483 50 GHz
62.41 dB μ V



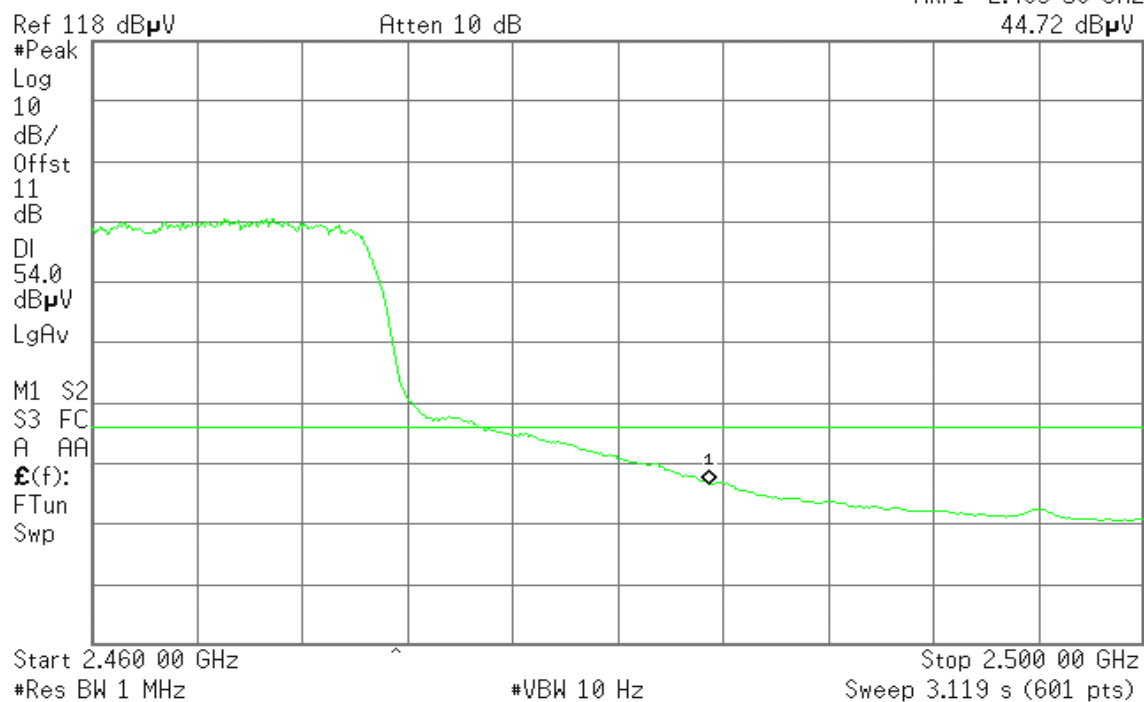
Detector mode: Average

Polarity: Horizontal

Agilent 08:45:20 Oct 26, 2006

T

Mkr1 2.483 50 GHz
44.72 dB μ V



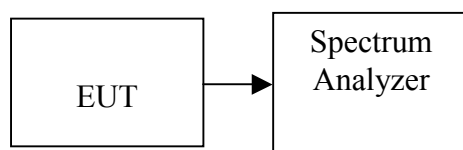


7.5 PEAK POWER SPECTRAL DENSITY

LIMIT

1. According to §15.247(e), for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.
2. According to §15.247(f), the digital modulation operation of the hybrid system, with the frequency hopping turned off, shall comply with the power density requirements of paragraph (d) of this section.

Test Configuration



TEST PROCEDURE

1. 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.
2. Set the spectrum analyzer as RBW = 3 kHz, VBW = 10 kHz, Span = 300 kHz, Sweep = 100 s
3. Record the max reading.
4. Repeat the above procedure until the measurements for all frequencies are completed.



TEST RESULTS

No non-compliance noted

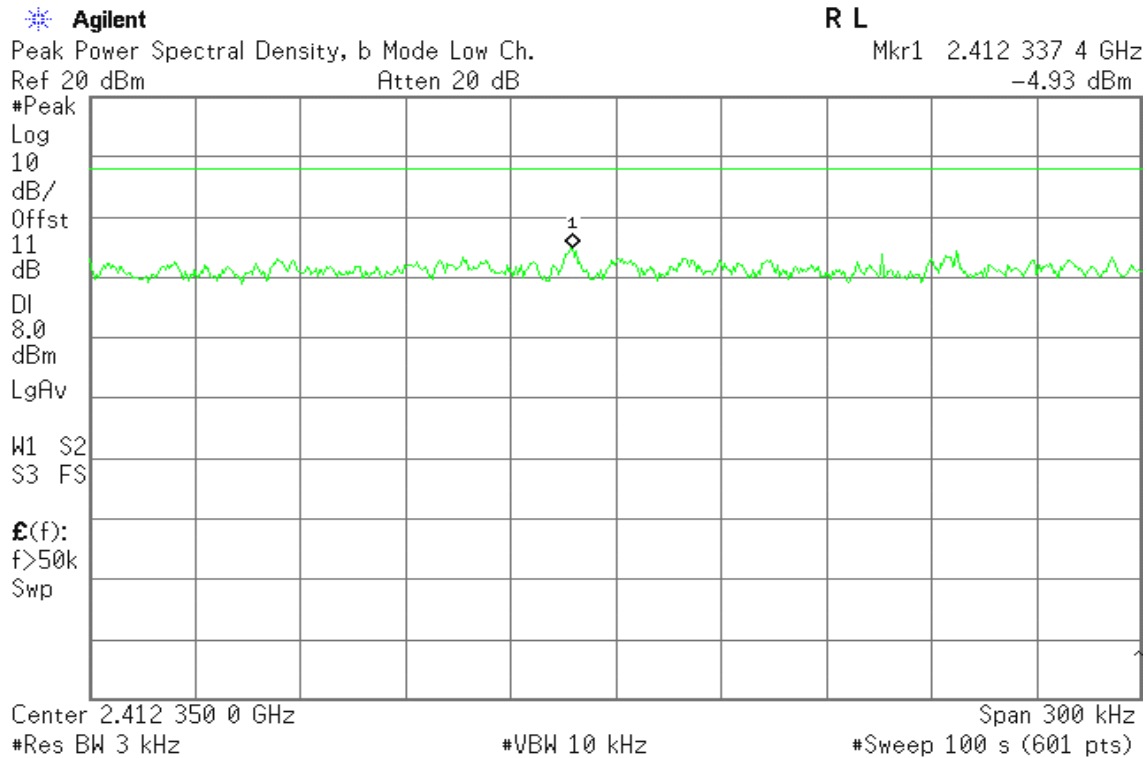
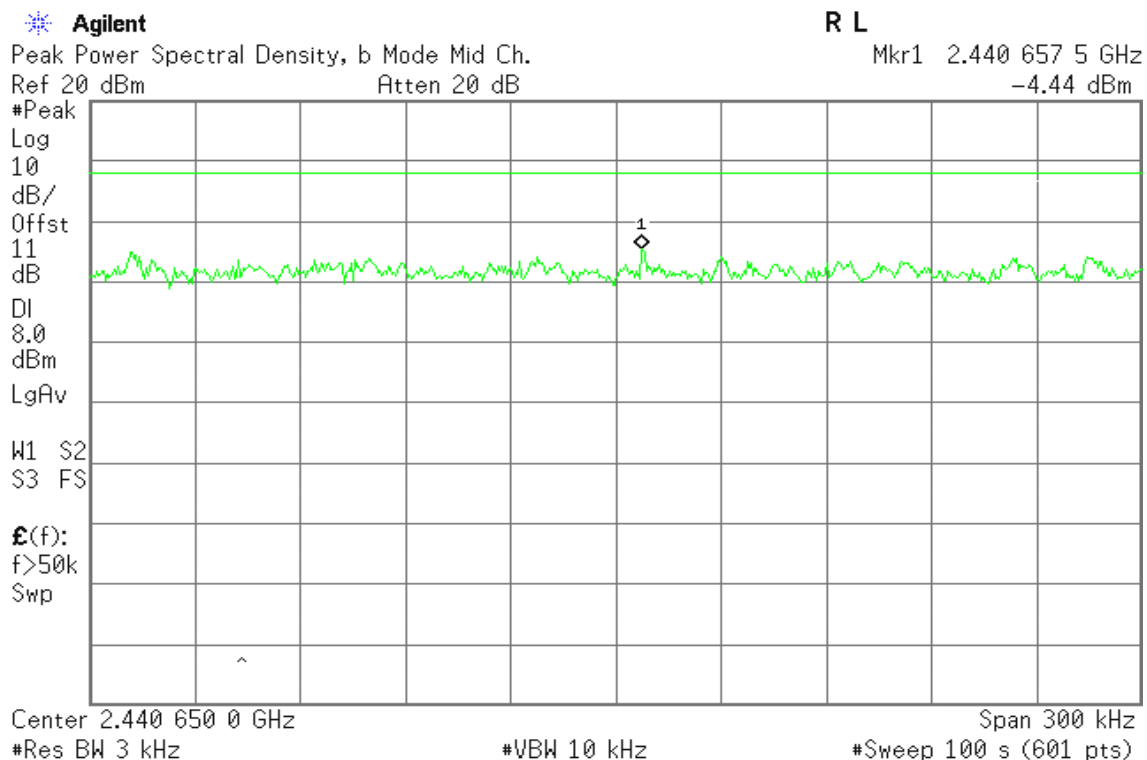
Test Data

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-4.93	8.00	PASS
Mid	2437	-4.44		PASS
High	2462	-5.64		PASS

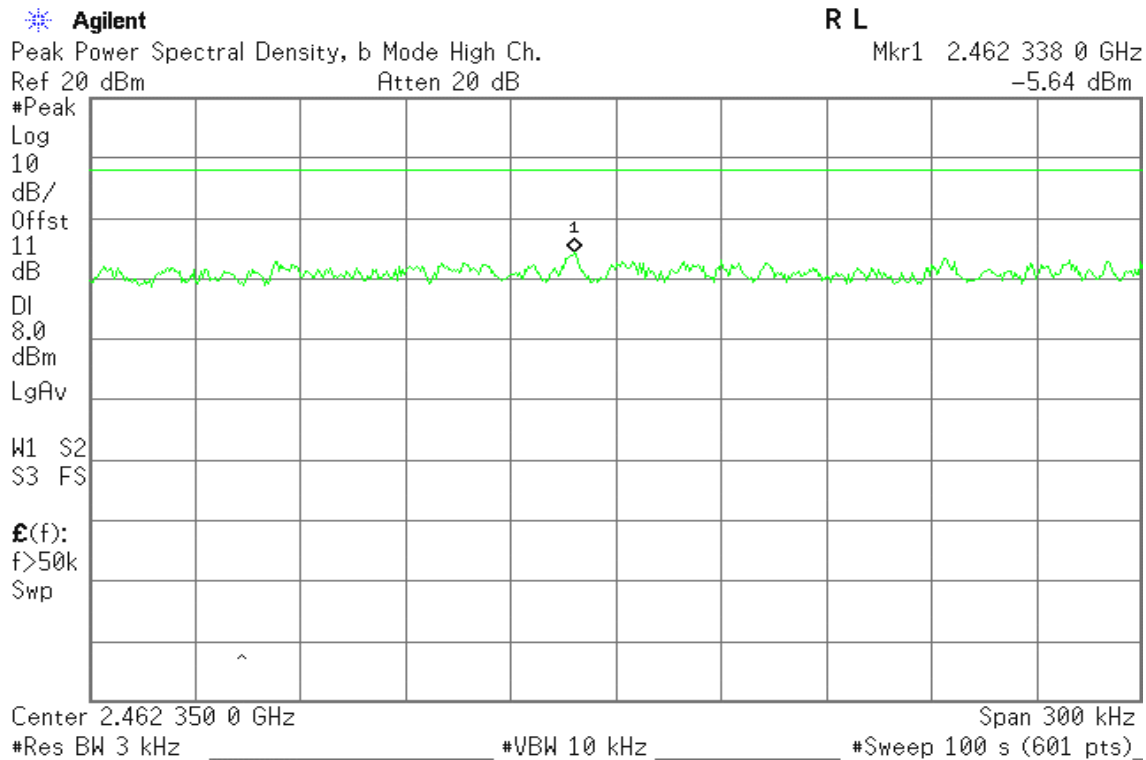
Test mode: IEEE 802.11g

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-5.71	8.00	PASS
Mid	2437	-6.57		PASS
High	2462	-7.12		PASS

**Test Plot****IEEE 802.11b****PPSD (CH Low)****PPSD (CH Mid)**

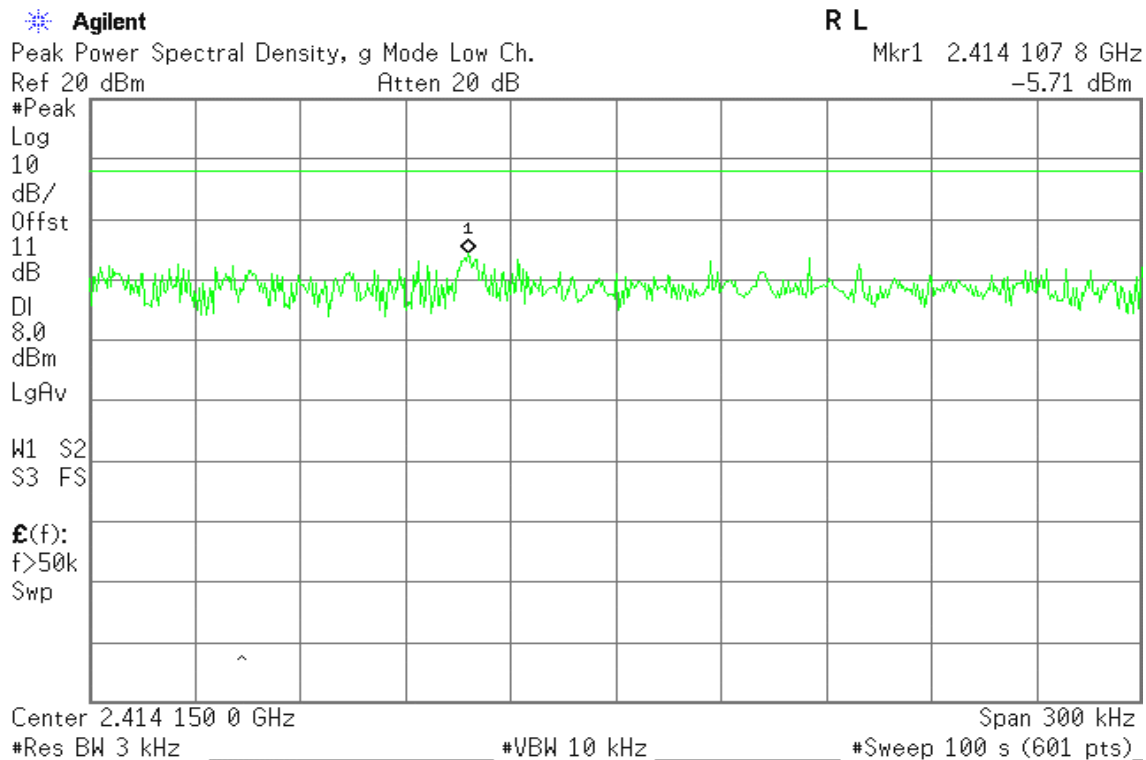


PPSD (CH High)



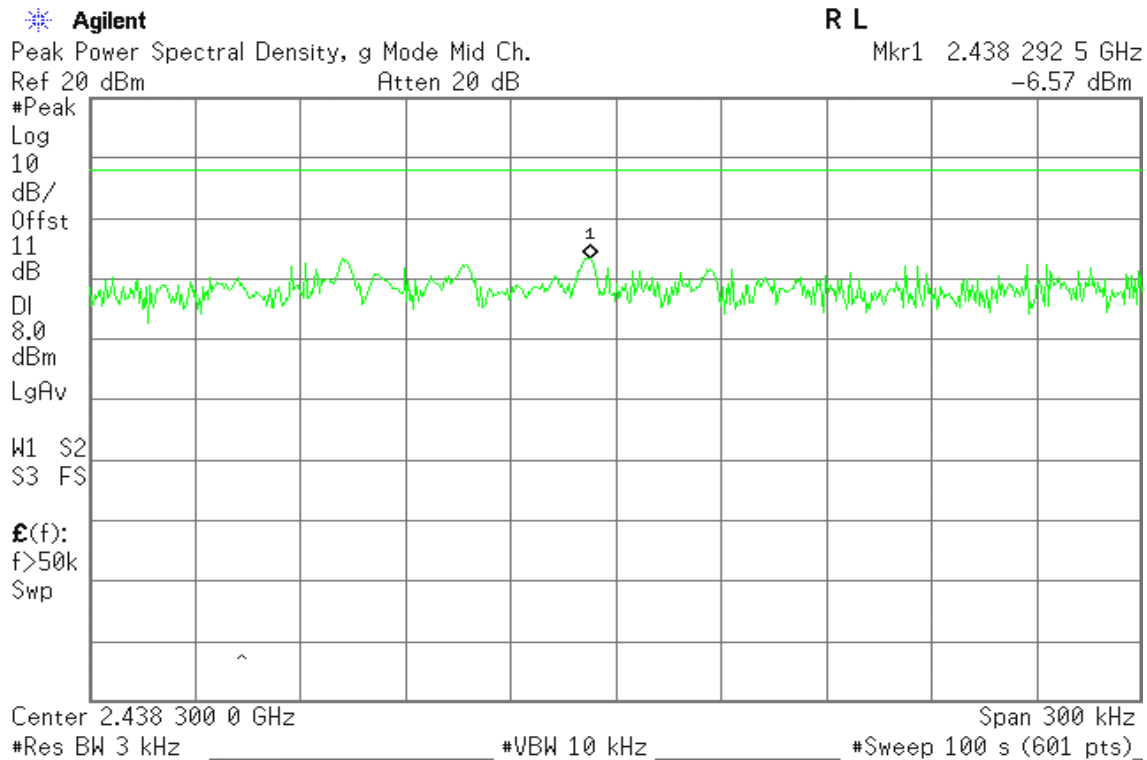
IEEE 802.11g

PPSD (CH Low)

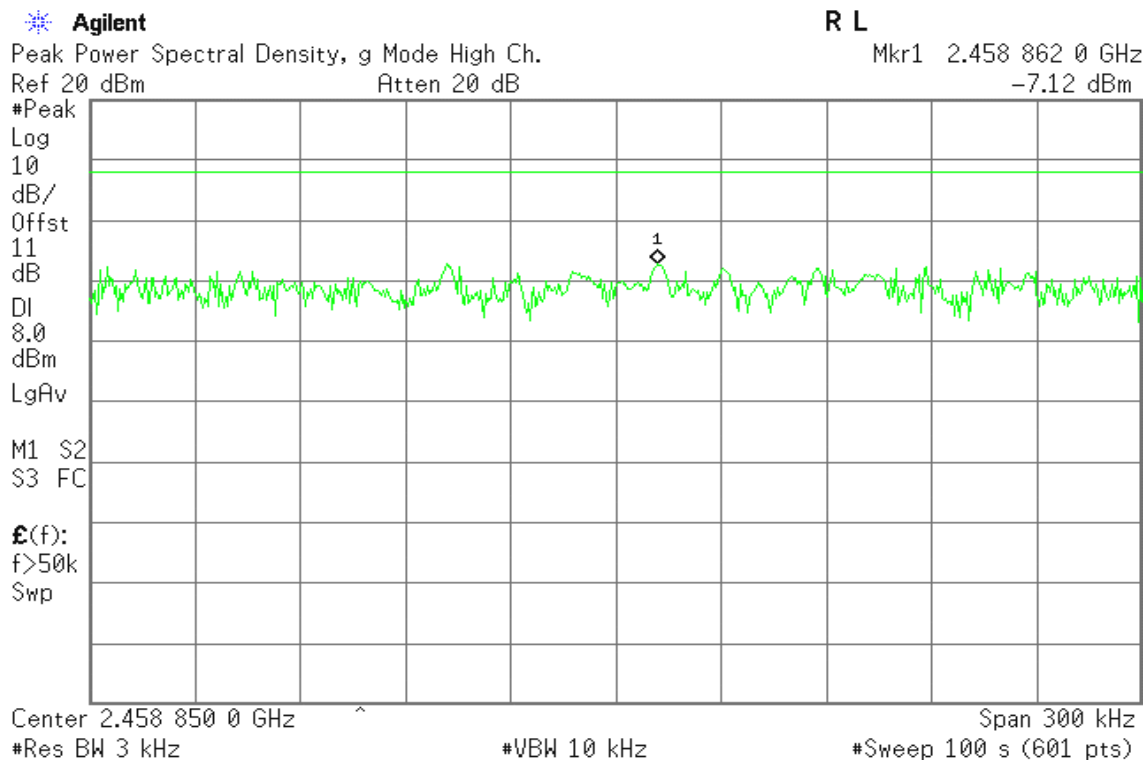




PPSD (CH Mid)



PPSD (CH High)





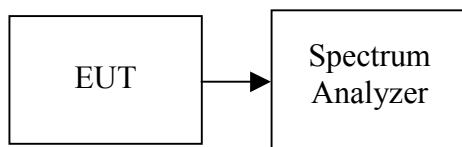
7.6 SPURIOUS EMISSIONS

7.6.1 Conducted Measurement

LIMIT

According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)).

Test Configuration



TEST PROCEDURE

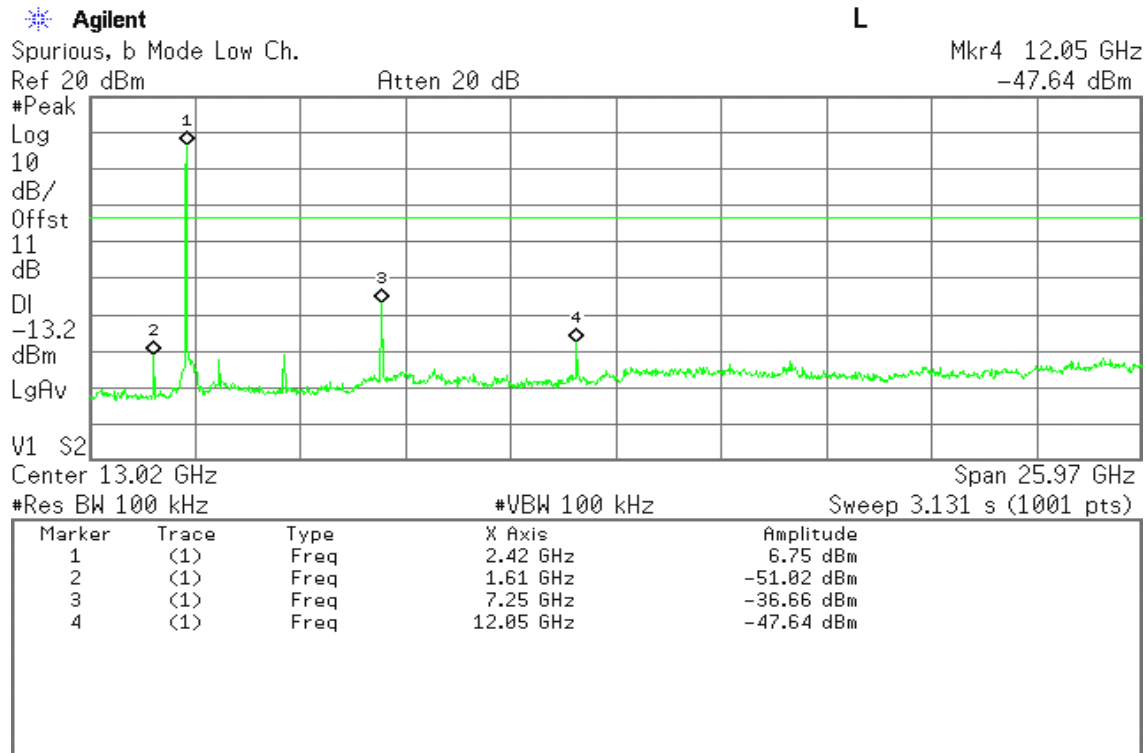
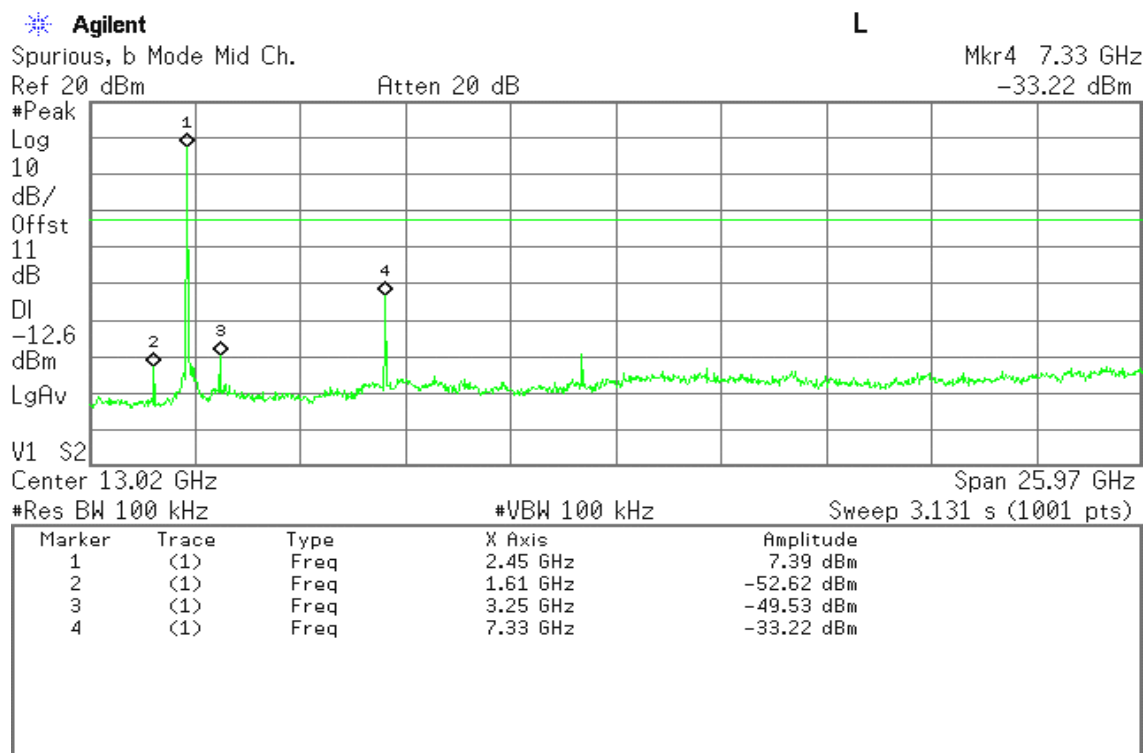
Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 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

**Test Plot****IEEE 802.11b****CH Low****CH Mid**

**CH High**

Agilent

L

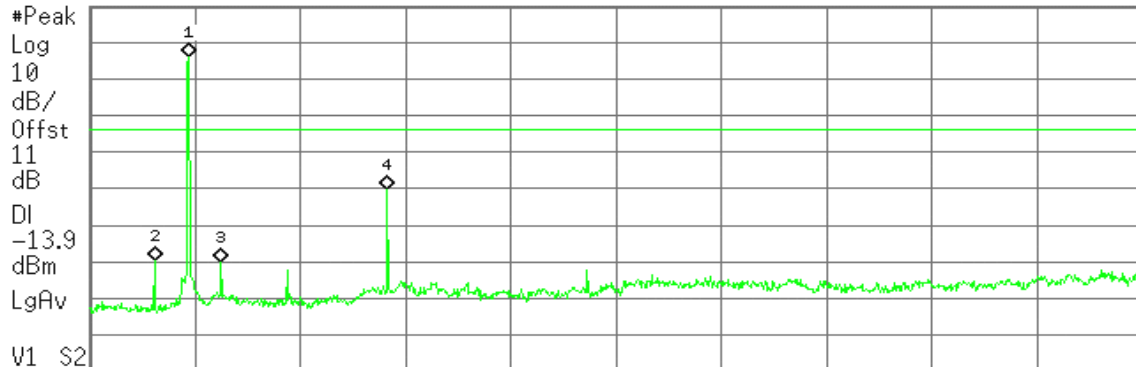
Spurious, b Mode High Ch.

Ref 20 dBm

Atten 20 dB

Mkr4 7.38 GHz

-30.16 dBm



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.47 GHz	6.08 dBm
2	(1)	Freq	1.64 GHz	-49.63 dBm
3	(1)	Freq	3.28 GHz	-50.06 dBm
4	(1)	Freq	7.38 GHz	-30.16 dBm

IEEE 802.11g**CH Low**

Agilent

L

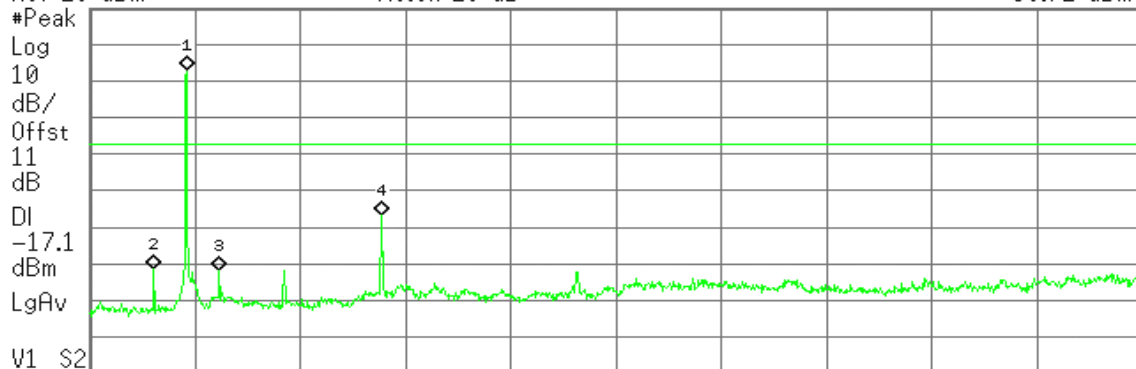
Spurious, g Mode Low Ch.

Ref 20 dBm

Atten 20 dB

Mkr4 7.25 GHz

-36.72 dBm



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.42 GHz	2.91 dBm
2	(1)	Freq	1.61 GHz	-51.60 dBm
3	(1)	Freq	3.22 GHz	-51.79 dBm
4	(1)	Freq	7.25 GHz	-36.72 dBm

**CH Mid**

Agilent

R T

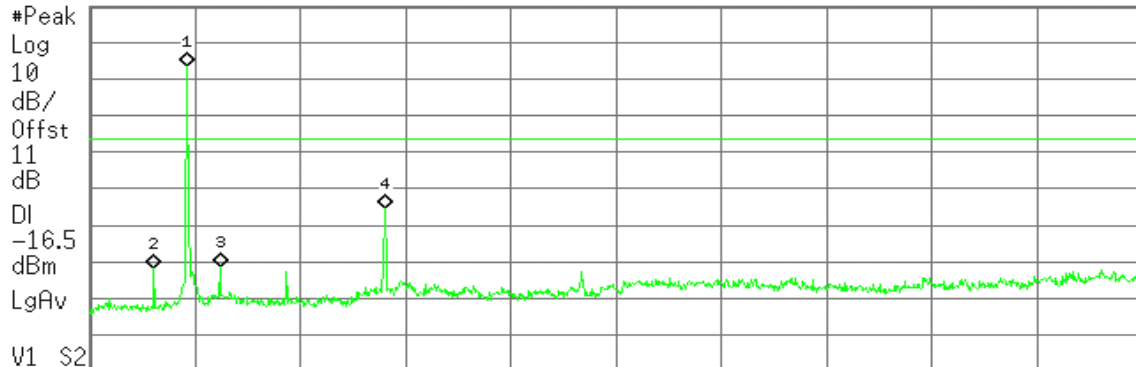
Spurious, g Mode Mid Ch.

Ref 20 dBm

Atten 20 dB

Mkr4 7.33 GHz

-35.20 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.45 GHz	3.54 dBm
2	(1)	Freq	1.61 GHz	-51.70 dBm
3	(1)	Freq	3.25 GHz	-51.29 dBm
4	(1)	Freq	7.33 GHz	-35.20 dBm

CH High

Agilent

L

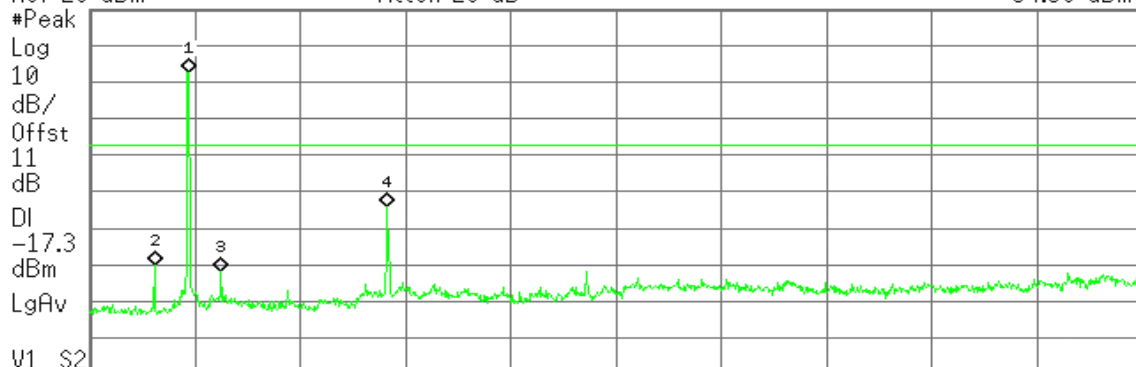
Spurious, g Mode High Ch.

Ref 20 dBm

Atten 20 dB

Mkr4 7.38 GHz

-34.30 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.47 GHz	2.72 dBm
2	(1)	Freq	1.64 GHz	-50.14 dBm
3	(1)	Freq	3.28 GHz	-51.94 dBm
4	(1)	Freq	7.38 GHz	-34.30 dBm



7.6.2 RADIATED EMISSIONS

LIMIT

1. According to §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 ($\mu\text{V/m}$)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

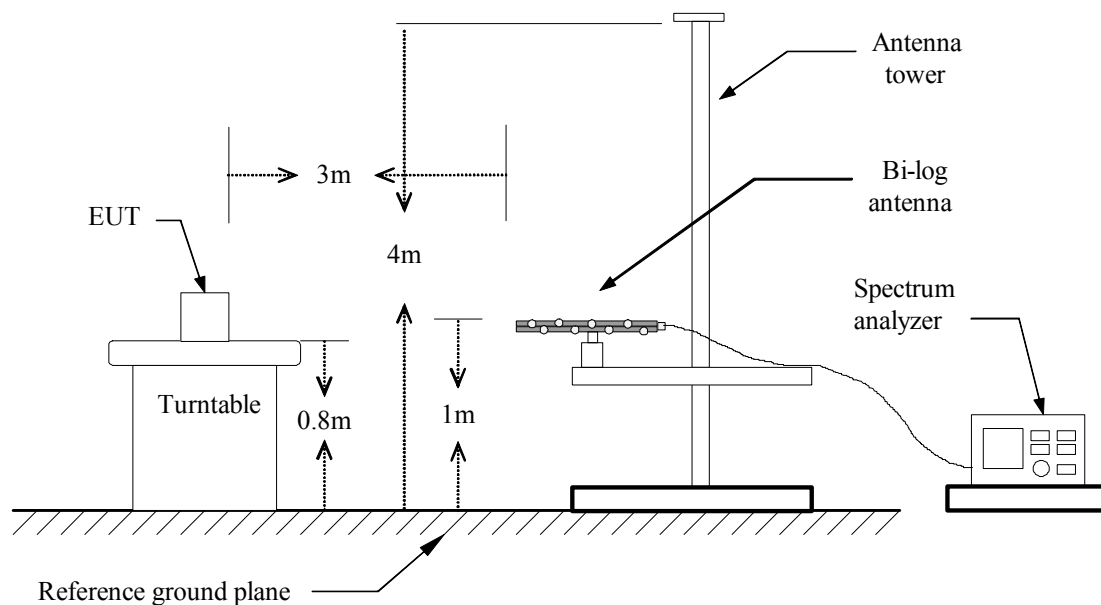
Remark: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of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

2. In the emission table above, the tighter limit applies at the band edges.

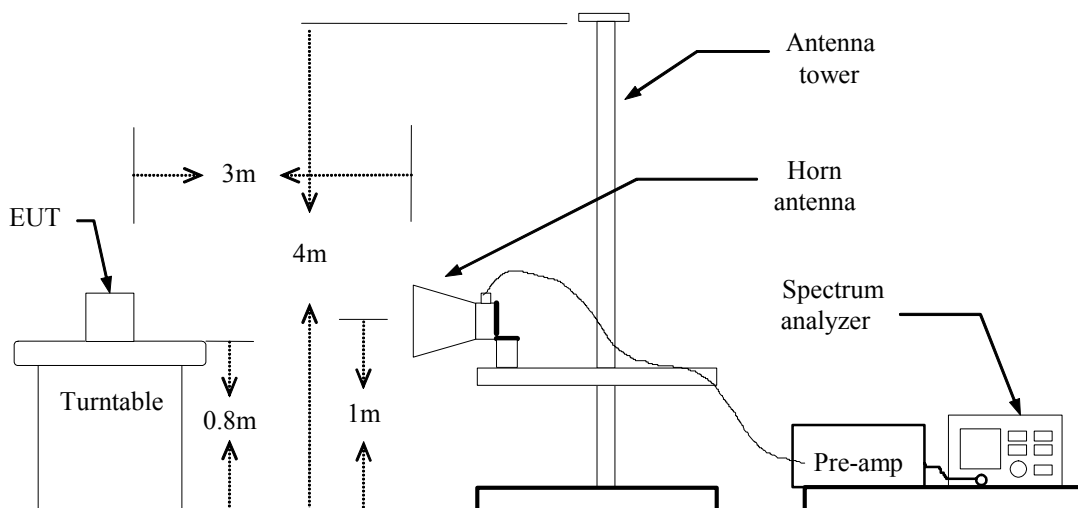
Frequency (MHz)	Field Strength ($\mu\text{V/m}$ at 3-meter)	Field Strength (dB $\mu\text{V/m}$ at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Test Configuration

Below 1 GHz



Above 1 GHz





TEST PROCEDURE

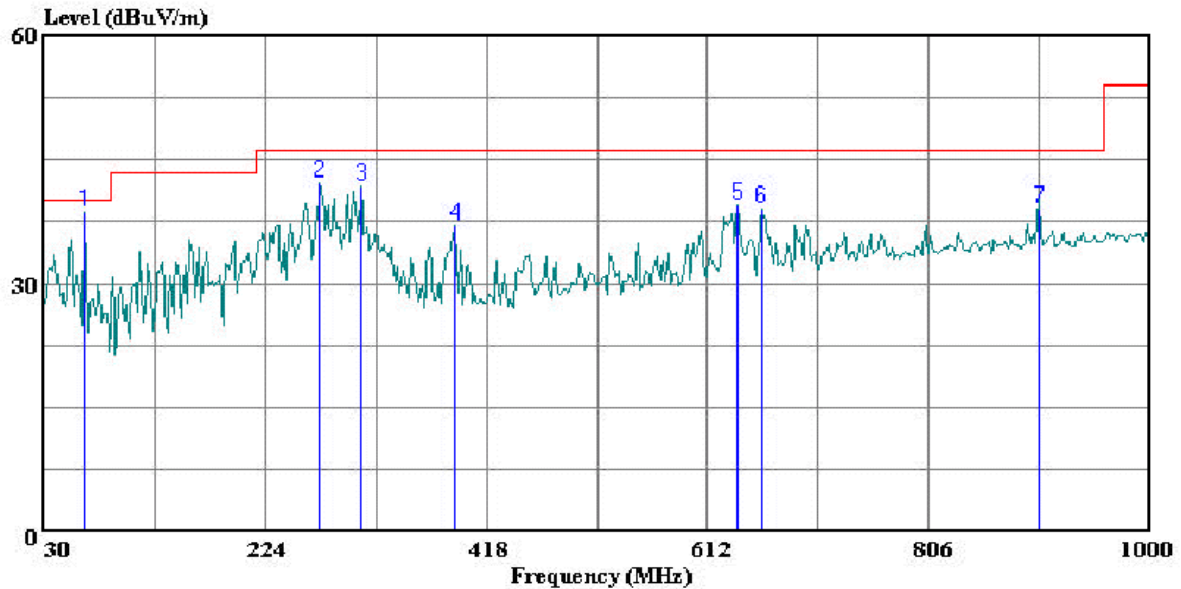
1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure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



TEST RESULTS

Below 1GHz

Data#: 6 File#: 06I10695emi.EMI Date: 11-08-2006 Time: 11:01:56



(Audix ATC)

Trace: 5

Ref Trace:

Condition: FCC CLASS-B VERTICAL

Test Operator:: WilliamZhuang

Company: : Broadcom

Project #: : 06I10695

Configuration:: EUT / PC

Mode of Oper.: TX

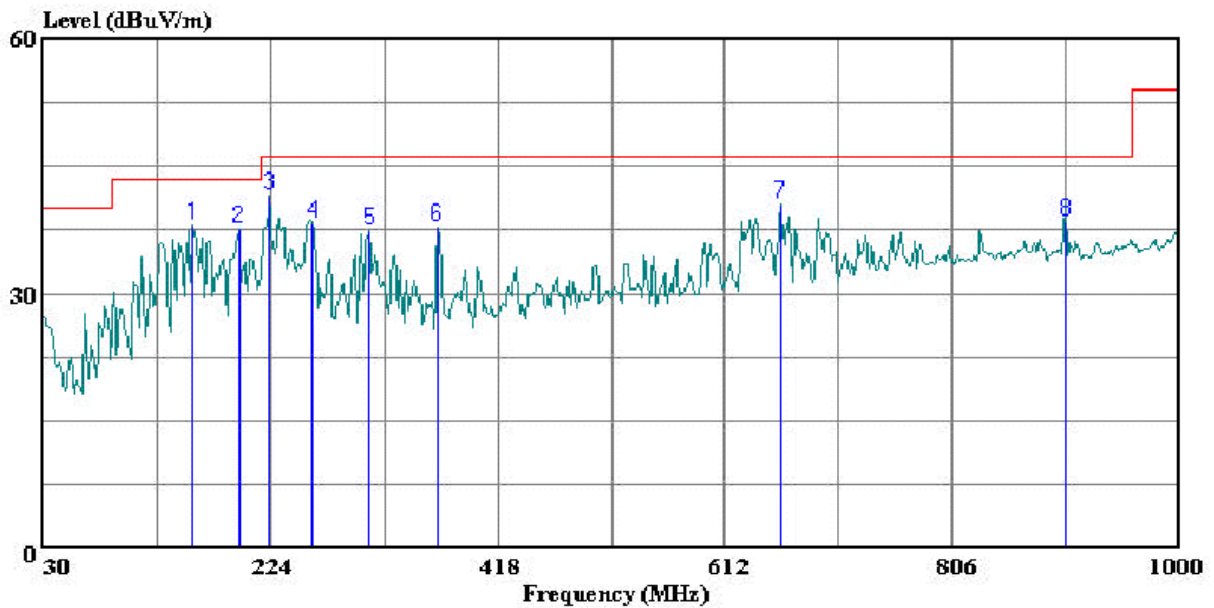
Target: : FCC Class B

Page: 1

	Freq	Read		Limit	Over	
	MHz	Level	Factor	Level	Line	Limit
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB
1	65.890	29.60	9.09	38.69	40.00	-1.31
2	271.530	27.42	14.65	42.07	46.00	-3.93
3	308.390	25.87	15.87	41.74	46.00	-4.26
4	390.840	19.11	17.83	36.94	46.00	-9.06
5	638.190	17.26	22.15	39.41	46.00	-6.59
6	659.530	16.54	22.49	39.03	46.00	-6.97
7	903.000	13.14	25.95	39.08	46.00	-6.92
						Peak



Data#: 4 File#: 06I10695emi.EMI Date: 11-08-2006 Time: 10:53:00



(Auxiliary ATC)

Trace: 3

Ref Trace:

Condition: FCC CLASS-B HORIZONTAL

Test Operator:: WilliamZhuang

Company: : Broadcom

Project #: : 06I10695

Configuration:: EUT / PC

Mode of Oper.: TX

Target: : FCC Class B

Page: 1

	Freq	Read		Limit	Over	
	MHz	Level	Factor	Level	Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB
1	158.040	24.08	13.89	37.97	43.50	-5.53 Peak
2	196.840	23.69	14.00	37.69	43.50	-5.81 Peak
3	223.030	28.78	12.72	41.50	46.00	-4.50 Peak
4	259.890	24.04	14.25	38.29	46.00	-7.71 Peak
5	308.390	21.45	15.87	37.32	46.00	-8.68 Peak
6	366.590	20.41	17.31	37.72	46.00	-8.28 Peak
7	659.530	17.96	22.49	40.45	46.00	-5.55 Peak
8	903.000	12.50	25.95	38.45	46.00	-7.55 Peak

**1 GHz – 3GHz****TX / IEEE 802.11b**

High Frequency Measurement																	
Compliance Certification Services, Morgan Hill Open Field Site																	
Company:Broadcom																	
Project #:06110695																	
Date:11/9/2006																	
Test Engineer:William Zhuang																	
Configuration:EUT/PC																	
Mode:Tx On, b Mode																	
Average Power Meter: Low = xx dBm, Mid = xx dBm, High = xx dBm																	
Test Equipment:																	
Horn 1-18GHz T60; S/N: 2238 @3m				Pre-amplifier 1-26GHz T87 Miteq 924342				Pre-amplifier 26- 				Horn > 18GHz 					
Hi Frequency Cables																	
2 foot cable William 177079009				3 foot cable 				12 foot cable Can 187209002				HPF 		Reject Filter R_001		Peak Measurements RBW=VBW=1MHz Average Measurements RBW=1MHz ; VBW=10Hz	
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)		
High Ch. 11, 2462MHz																	
1.333	3.0	66.4	52.3	26.3	2.3	-44.9	0.0	0.0	50.1	36.0	74	54	-23.9	-18.0	V		
1.603	3.0	64.8	61.1	26.9	2.4	-44.8	0.0	0.0	49.4	45.6	74	54	-24.6	-8.4	V		
2.003	3.0	55.2	50.1	27.9	2.6	-44.8	0.0	0.0	40.9	35.8	74	54	-33.1	-18.2	V		
1.333	3.0	67.1	53.2	26.3	2.3	-44.9	0.0	0.0	50.8	36.9	74	54	-23.2	-17.1	H		
1.603	3.0	65.1	61.9	26.9	2.4	-44.8	0.0	0.0	49.6	46.4	74	54	-24.4	-7.6	H		
2.003	3.0	58.8	54.5	27.9	2.6	-44.8	0.0	0.0	44.5	40.2	74	54	-29.5	-13.8	H		
Mid Ch. 6, 2437MHz																	
1.333	3.0	66.7	51.2	26.3	2.3	-44.9	0.0	0.0	50.4	34.9	74	54	-23.6	-19.1	V		
1.603	3.0	60.5	55.2	26.9	2.4	-44.8	0.0	0.0	45.0	39.7	74	54	-29.0	-14.3	V		
2.003	3.0	54.3	49.8	27.9	2.6	-44.8	0.0	0.0	40.0	35.5	74	54	-34.0	-18.5	V		
1.333	3.0	67.2	52.3	26.3	2.3	-44.9	0.0	0.0	50.9	36.0	74	54	-23.1	-18.0	H		
1.603	3.0	66.0	64.6	26.9	2.4	-44.8	0.0	0.0	50.5	49.1	74	54	-23.5	-4.9	H		
2.003	3.0	59.2	54.1	27.9	2.6	-44.8	0.0	0.0	44.9	39.8	74	54	-29.1	-14.2	H		
Low Ch. 1, 2412MHz																	
1.333	3.0	61.8	47.0	26.3	2.3	-44.9	0.0	0.0	45.5	30.7	74	54	-28.5	-23.3	V		
1.603	3.0	60.8	57.7	26.9	2.4	-44.8	0.0	0.0	45.4	42.2	74	54	-28.6	-11.8	V		
2.003	3.0	55.5	49.1	27.9	2.6	-44.8	0.0	0.0	41.2	34.8	74	54	-32.8	-19.2	V		
1.333	3.0	65.5	50.5	26.3	2.3	-44.9	0.0	0.0	49.2	34.2	74	54	-24.8	-19.8	H		
1.603	3.0	65.0	62.7	26.9	2.4	-44.8	0.0	0.0	49.6	47.3	74	54	-24.4	-6.7	H		
2.003	3.0	58.5	53.9	27.9	2.6	-44.8	0.0	0.0	44.2	39.6	74	54	-29.8	-14.4	H		
															H		
															H		
Rev. 5.1.6																	
f	Measurement Frequency			Amp	Preamp Gain			Avg Lim	Average Field Strength Limit								
Dist	Distance to Antenna			D Corr	Distance Correct to 3 meters			Pk Lim	Peak Field Strength Limit								
Read	Analyzer Reading			Avg	Average Field Strength @ 3 m			Avg Mar	Margin vs. Average Limit								
AF	Antenna Factor			Peak	Calculated Peak Field Strength			Pk Mar	Margin vs. Peak Limit								
CL	Cable Loss			HPF	High Pass Filter												



TX / IEEE 802.11g

High Frequency Measurement															
Compliance Certification Services, Morgan Hill Open Field Site															
Company:Broadcom															
Project #:06110695															
Date:11/9/2006															
Test Engineer:William Zhuang															
Configuration:EUT/PC															
Mode:Tx On, g Mode															
Average Power Meter: Low = xx dBm, Mid = xx dBm, High = xx dBm															
Test Equipment:															
Horn 1-18GHz		Pre-amplifier 1-26GHz		Pre-amplifier 26-		Horn > 18GHz									
T60; S/N: 2238 @3m		T87 Miteq 924342													
Hi Frequency Cables															
2 foot cable		3 foot cable		12 foot cable		HPF		Reject Filter		Peak Measurements RBW=VBW=1MHz Average Measurements RBW=1MHz ; VBW=10Hz					
William 177079009				Can 187209002				R_001							
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
High Ch. 11, 2462MHz															
1.063	3.0	66.1	51.9	25.6	2.2	-44.9	0.0	0.0	49.0	34.8	74	54	-25.0	-19.2	V
1.333	3.0	63.7	49.2	26.3	2.3	-44.9	0.0	0.0	47.4	32.9	74	54	-26.6	-21.1	V
1.603	3.0	60.7	57.4	26.9	2.4	-44.8	0.0	0.0	45.2	41.9	74	54	-28.8	-12.1	V
1.727	3.0	63.9	41.1	27.3	2.5	-44.8	0.0	0.0	48.8	26.0	74	54	-25.2	-28.0	V
1.860	3.0	59.0	41.7	27.6	2.5	-44.8	0.0	0.0	44.3	27.0	74	54	-29.7	-27.0	V
2.003	3.0	55.8	50.2	27.9	2.6	-44.8	0.0	0.0	41.5	35.9	74	54	-32.5	-18.1	V
1.063	3.0	69.7	51.0	25.6	2.2	-44.9	0.0	0.0	52.6	33.9	74	54	-21.4	-20.1	H
1.333	3.0	65.5	50.9	26.3	2.3	-44.9	0.0	0.0	49.2	34.6	74	54	-24.8	-19.4	H
1.603	3.0	69.9	51.6	26.9	2.4	-44.8	0.0	0.0	54.5	36.1	74	54	-19.5	-17.9	H
1.727	3.0	64.3	41.7	27.3	2.5	-44.8	0.0	0.0	49.2	26.6	74	54	-24.8	-27.4	H
1.860	3.0	2.1	44.4	27.6	2.5	-44.8	0.0	0.0	-12.6	29.7	74	54	-86.6	-24.3	H
2.003	3.0	60.0	56.2	27.9	2.6	-44.8	0.0	0.0	45.7	41.9	74	54	-28.3	-12.1	H
Mid Ch. 6, 2437MHz															
1.063	3.0	66.9	51.2	25.6	2.2	-44.9	0.0	0.0	49.8	34.0	74	54	-24.2	-20.0	V
1.333	3.0	64.3	49.3	26.3	2.3	-44.9	0.0	0.0	48.0	33.0	74	54	-26.0	-21.0	V
1.603	3.0	64.6	61.8	26.9	2.4	-44.8	0.0	0.0	49.1	46.3	74	54	-24.9	-7.7	V
1.727	3.0	66.1	41.5	27.3	2.5	-44.8	0.0	0.0	51.0	26.4	74	54	-23.0	-27.6	V
1.860	3.0	58.1	47.0	27.6	2.5	-44.8	0.0	0.0	43.4	32.3	74	54	-30.6	-21.7	V
2.003	3.0	60.9	57.0	27.9	2.6	-44.8	0.0	0.0	46.6	42.7	74	54	-27.4	-11.3	V
1.063	3.0	64.7	50.2	25.6	2.2	-44.9	0.0	0.0	47.6	33.1	74	54	-26.4	-20.9	H
1.333	3.0	66.0	51.0	26.3	2.3	-44.9	0.0	0.0	49.7	34.7	74	54	-24.3	-19.3	H
1.603	3.0	65.1	62.5	26.9	2.4	-44.8	0.0	0.0	49.6	47.0	74	54	-24.4	-7.0	H
1.727	3.0	64.0	41.9	27.3	2.5	-44.8	0.0	0.0	48.9	26.8	74	54	-25.1	-27.2	H
1.860	3.0	62.9	44.5	27.6	2.5	-44.8	0.0	0.0	48.1	29.8	74	54	-25.9	-24.2	H
2.003	3.0	56.6	47.2	27.9	2.6	-44.8	0.0	0.0	42.3	32.9	74	54	-31.7	-21.1	H
Low Ch. 1, 2412MHz															
1.063	3.0	64.7	47.8	25.6	2.2	-44.9	0.0	0.0	47.6	30.7	74	54	-26.4	-23.3	V
1.333	3.0	67.0	51.1	26.3	2.3	-44.9	0.0	0.0	50.7	34.8	74	54	-23.3	-19.2	V
1.603	3.0	61.1	58.2	26.9	2.4	-44.8	0.0	0.0	45.6	42.7	74	54	-28.4	-11.3	V
1.727	3.0	59.5	40.4	27.3	2.5	-44.8	0.0	0.0	44.4	25.2	74	54	-29.6	-28.8	V
1.860	3.0	57.8	48.3	27.6	2.5	-44.8	0.0	0.0	43.1	33.6	74	54	-30.9	-20.4	V
2.003	3.0	55.9	50.8	27.9	2.6	-44.8	0.0	0.0	41.7	36.5	74	54	-32.3	-17.5	V
1.063	3.0	65.8	45.4	25.6	2.2	-44.9	0.0	0.0	48.7	28.3	74	54	-25.3	-25.7	H
1.333	3.0	65.6	50.7	26.3	2.3	-44.9	0.0	0.0	49.3	34.4	74	54	-24.7	-19.6	H
1.603	3.0	65.4	62.7	26.9	2.4	-44.8	0.0	0.0	49.9	47.2	74	54	-24.1	-6.8	H
1.727	3.0	64.7	41.3	27.3	2.5	-44.8	0.0	0.0	49.6	26.2	74	54	-24.4	-27.8	H
1.860	3.0	64.0	46.5	27.6	2.5	-44.8	0.0	0.0	49.3	31.8	74	54	-24.7	-22.2	H
2.003	3.0	60.3	55.6	27.9	2.6	-44.8	0.0	0.0	46.0	41.4	74	54	-28.0	-12.6	H
															H
															H

Rev. 5.1.6

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

**Above 3 GHz****Operation Mode:** TX / IEEE 802.11b / CH Low**Test Date:** October 26, 2006**Temperature:** 25°C**Tested by:** Jason Chang**Humidity:** 55% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
3166.67	V	48.48	---	-7.12	41.35	---	74.00	54.00	-12.65	Peak
3991.67	V	48.86	---	-6.25	42.61	---	74.00	54.00	-11.39	Peak
4825.00	V	45.91	---	-4.55	41.36	---	74.00	54.00	-12.64	Peak
4983.33	V	46.74	---	-4.46	42.28	---	74.00	54.00	-11.72	Peak
6000.00	V	50.45	---	-2.60	47.85	---	74.00	54.00	-6.15	Peak
N/A										
3000.00	H	47.50	---	-7.33	40.17	---	74.00	54.00	-13.83	Peak
3991.67	H	48.34	---	-6.25	42.09	---	74.00	54.00	-11.91	Peak
4825.00	H	48.26	---	-4.55	43.71	---	74.00	54.00	-10.29	Peak
4991.67	H	47.07	---	-4.46	42.61	---	74.00	54.00	-11.39	Peak
N/A										

Remark:

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

**Operation Mode:** TX / IEEE 802.11b / CH Mid**Test Date:** October 27, 2006**Temperature:** 25°C**Tested by:** Jason Chang**Humidity:** 55% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
3991.67	V	49.40	---	-6.25	43.15	---	74.00	54.00	-10.85	Peak
4925.00	V	48.36	---	-4.49	43.86	---	74.00	54.00	-10.14	Peak
6000.00	V	49.93	---	-2.60	47.33	---	74.00	54.00	-6.67	Peak
7383.33	V	47.26	---	2.14	49.41	---	74.00	54.00	-4.59	Peak
N/A										
3991.67	H	46.08	---	-6.25	39.83	---	74.00	54.00	-14.17	Peak
4875.00	H	45.35	---	-4.52	40.83	---	74.00	54.00	-13.17	Peak
7308.33	H	44.42	---	2.10	46.51	---	74.00	54.00	-7.49	Peak
N/A										

Remark:

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

**Operation Mode:** TX / IEEE 802.11b / CH High**Test Date:** October 27, 2006**Temperature:** 25°C**Tested by:** Jason Chang**Humidity:** 55% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
3991.67	V	49.40	---	-6.25	43.15	---	74.00	54.00	-10.85	Peak
4925.00	V	48.36	---	-4.49	43.86	---	74.00	54.00	-10.14	Peak
6000.00	V	49.93	---	-2.60	47.33	---	74.00	54.00	-6.67	Peak
N/A										
3991.67	H	45.91	---	-6.25	39.66	---	74.00	54.00	-14.34	Peak
4925.00	H	44.59	---	-4.49	40.10	---	74.00	54.00	-13.90	Peak
7383.33	H	46.22	---	2.14	48.36	---	74.00	54.00	-5.64	Peak
N/A										

Remark:

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

**Operation Mode:** TX / IEEE 802.11g / CH Low**Test Date:** October 27, 2006**Temperature:** 25°C**Tested by:** Jason Chang**Humidity:** 55% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
3025.00	V	48.33	---	-7.30	41.03	---	74.00	54.00	-12.97	Peak
3991.67	V	50.23	---	-6.25	43.98	---	74.00	54.00	-10.02	Peak
6000.00	V	50.47	---	-2.60	47.87	---	74.00	54.00	-6.13	Peak
N/A										
3191.67	H	45.74	---	-7.09	38.64	---	74.00	54.00	-15.36	Peak
3991.67	H	47.67	---	-6.25	41.42	---	74.00	54.00	-12.58	Peak
4991.67	H	45.08	---	-4.46	40.63	---	74.00	54.00	-13.37	Peak
N/A										

Remark:

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

**Operation Mode:** TX / IEEE 802.11g / CH Mid**Test Date:** October 27, 2006**Temperature:** 25°C**Tested by:** Jason Chang**Humidity:** 55% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
3991.67	V	48.44	---	-6.25	42.19	---	74.00	54.00	-11.81	Peak
4875.00	V	48.01	---	-4.52	43.49	---	74.00	54.00	-10.51	Peak
6000.00	V	50.05	---	-2.60	47.45	---	74.00	54.00	-6.55	Peak
N/A										
3191.67	H	45.49	---	-7.09	38.40	---	74.00	54.00	-15.60	Peak
3991.67	H	46.24	---	-6.25	39.99	---	74.00	54.00	-14.01	Peak
N/A										

Remark:

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

**Operation Mode:** TX / IEEE 802.11g / CH High**Test Date:** October 27, 2006**Temperature:** 25°C**Tested by:** Jason Chang**Humidity:** 55% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
3991.67	V	48.85	---	-6.25	42.60	---	74.00	54.00	-11.40	Peak
4925.00	V	45.73	---	-4.49	41.24	---	74.00	54.00	-12.76	Peak
4983.33	V	45.84	---	-4.46	41.37	---	74.00	54.00	-12.63	Peak
6000.00	V	49.74	---	-2.60	47.14	---	74.00	54.00	-6.86	Peak
7383.33	V	45.98	---	2.14	48.13	---	74.00	54.00	-5.87	Peak
N/A										
3166.67	H	44.86	---	-7.12	37.74	---	74.00	54.00	-16.26	Peak
3991.67	H	46.47	---	-6.25	40.22	---	74.00	54.00	-13.78	Peak
4991.67	H	44.47	---	-4.46	40.01	---	74.00	54.00	-13.99	Peak
7391.67	H	45.44	---	2.15	47.59	---	74.00	54.00	-6.41	Peak
N/A										

Remark:

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



7.7 POWERLINE CONDUCTED EMISSIONS

LIMIT

According to §15.207(a), except as shown in paragraphs (b) and (c) of 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

* Decreases with the logarithm of the frequency.

Test Configuration

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

TEST PROCEDURE

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

**TEST RESULTS**

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

Test Data

Operation Mode: Normal Link **Test Date:** November 2, 2006
Temperature: 25°C **Tested by:** Jason Chang
Humidity: 55% RH

Freq. (MHz)	QP Reading (dBuV)	AV Reading (dBuV)	Corr. factor (dB)	QP Result (dBuV)	AV Result (dBuV)	QP Limit (dBuV)	AV Limit (dBuV)	QP Margin (dB)	AV Margin (dB)	Note
0.623	40.760	37.690	0.100	40.860	37.790	56.000	46.000	-15.140	-8.210	L1
1.040	41.630	41.020	0.100	41.730	41.120	56.000	46.000	-14.270	-4.880	L1
1.455	40.730	40.020	0.100	40.830	40.120	56.000	46.000	-15.170	-5.880	L1
2.912	33.930	32.270	0.100	34.030	32.370	56.000	46.000	-21.970	-13.630	L1
3.604	32.710	29.400	0.100	32.810	29.500	56.000	46.000	-23.190	-16.500	L1
18.609	32.490	22.730	1.089	33.579	23.819	60.000	50.000	-26.421	-26.181	L1
0.205	43.590	43.120	0.100	43.690	43.220	63.392	53.392	-19.702	-10.172	L2
0.832	41.210	40.020	0.100	41.310	40.120	56.000	46.000	-14.690	-5.880	L2
1.524	40.850	40.660	0.100	40.950	40.760	56.000	46.000	-15.050	-5.240	L2
2.218	38.080	36.990	0.100	38.180	37.090	56.000	46.000	-17.820	-8.910	L2
3.604	33.470	29.800	0.100	33.570	29.900	56.000	46.000	-22.430	-16.100	L2
18.609	32.880	23.100	1.089	33.969	24.189	60.000	50.000	-26.031	-25.811	L2

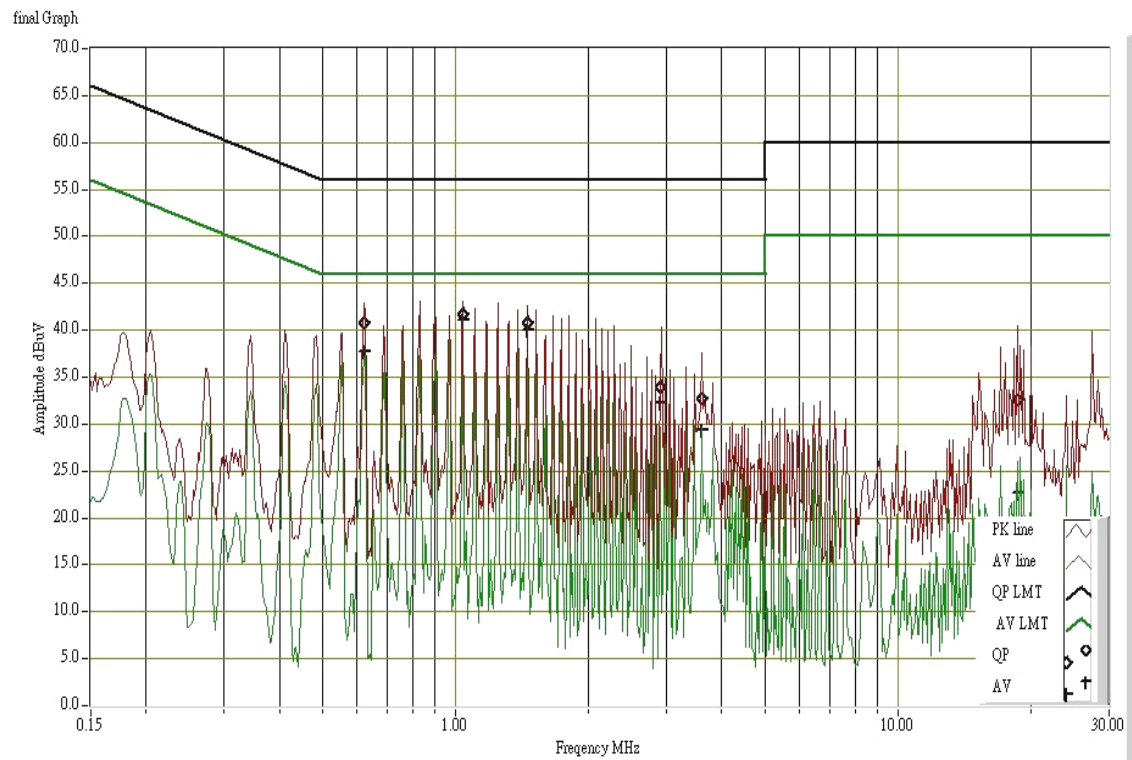
Remark:

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



Test Plots

Conducted emissions (Line 1)



Conducted emissions (Line 2)

