



FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

Notebook Computer

Model: RK886EX

Trade Name: CReTE

Issued to

CRETE SYSTEMS INC.

**7F, No. 250, Sec. 3, Pei Shen Rd., Shen Keng Hsiang,
Taipei County, Taiwan.**

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: CRETE SYSTEMS INC.
7F, No. 250, Sec. 3, Pei Shen Rd., Shen Keng Hsiang,
Taipei County, Taiwan.

Equipment Under Test: Notebook Computer

Trade Name: CReTE

Model: RK886EX

Date of Test: May 7 ~ June 1, 2007

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 15 Subpart C	No non-compliance noted

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:

Reviewed by:

Johnny Liu

Johnny Liu
Section Manager
Compliance Certification Services Inc.

Gina Lo for

Amanda Wu
Section Manager
Compliance Certification Services Inc.



2. EUT DESCRIPTION

Product	Notebook Computer
Trade Name	CReTE
Model Number	RK886EX
Model Discrepancy	N/A
Power Supply	1. Power Adapter: Trade Name / Model Number: EPS / F10903-A I/P: 100-240V, 50-60Hz, 1.2A FUSE RATING: T3.15A, 250V O/P: 19V, 4.75A 2. Rechargeable Lithium-Ion Battery: Model Number: BR83A 11.1V, 6600mAH
Frequency Range	IEEE 802.11a mode: 5.745~5.825 GHz IEEE 802.11b/g mode: 2.412~2.462 GHz
Transmit Power	IEEE 802.11a mode: 14.77 dBm IEEE 802.11b mode: 15.64 dBm IEEE 802.11g mode: 18.15 dBm
Modulation Technique	IEEE 802.11a: OFDM (QPSK, BPSK, 16-QAM, 64-QAM) 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 802.11a: 108, 54, 48, 36, 24, 18, 12, 9, 6 Mbps IEEE 802.11b: 11, 5.5, 2, 1 Mbps IEEE 802.11g: 54, 48, 36, 24, 18, 12, 11, 9, 6, 5.5, 2, 1Mbps
Number of Channels	IEEE 802.11a mode: 5 Channels IEEE 802.11b/g mode: 11 Channels
Enclosure Material Type	Magnesium-aluminum
Antenna Specification	IEEE 802.11a: -2.53 dBi IEEE 802.11b/g: -4.29 dBi
Antenna Designation	IEEE 802.11a: PIFA Antenna IEEE 802.11b/g: PIFA 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: **IR5RK886EX** 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 - 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

- (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: RK886EX) had been tested under operating condition.

Software used to control the EUT for staying in continuous transmitting mode was programmed. The worst case data rate is determined as the data rate with highest output power.

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

IEEE 802.11a mode:

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

IEEE 802.11b mode:

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

IEEE 802.11g 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.

Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360131	01/30/2008

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	11/13/2007
Switch Controller	TRC	Switch Controller	SC94050010	05/04/2008
4 Port Switch	TRC	4 Port Switch	SC94050020	05/04/2008
Horn-Antenna	TRC	HA-0502	06	06/05/2008
Horn-Antenna	TRC	HA-0801	04	05/04/2008
Horn-Antenna	TRC	HA-1201A	01	07/10/2007
Horn-Antenna	TRC	HA-1301A	01	07/18/2007
Bilog- Antenna	Sunol Sciences	JB3	A030205	03/08/2008
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	09/25/2008
Test S/W	LABVIEW (V 6.1)			

Remark: The measurement uncertainty is less than +/-2.0065dB (30MHz ~ 1GHz), +/-3.0958dB (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	10/31/2007
TWO-LINE V-NETWORK 9kHz-30MHz	SCHAFFNER	NNB41	03/10013	06/12/2008
LISN 10kHz-100MHz	EMCO	3825/2	9106-1809	04/01/2008
Test S/W	LABVIEW (V 6.1)			

Remark: The measurement uncertainty is less than +/- 2.81dB, 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

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	 Testing Laboratory 0363
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 2324C-3, IC 2324C-5) / 3M Semi Anechoic Chamber (IC 6106) to perform RSS 212 Issue 1	 IC 2324C-3 IC 2324C-5 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

No.	Device Type	Model	Series No.	FCC ID	Brand	Data Cable	Power Cord
1.	LCD Monitor	173P	DI17H4JXB04968Y	IFAXDM1414	Samsung	Shielded, 1.8m with 2 cores	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
2.	LCD Monitor	L1740	CNK5220VH8	FCC DoC	HP	Shielded, 1.8m with 2 cores	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
3.	Printer	STYLUS C60	DR3K039633	FCC DoC	EPSON	Shielded, 1.8m	Unshielded, 1.8m
4.	Modem	DM-1414	304012269	IFAXDM1414	ACEEX	Shielded, 1.8m	Unshielded, 1.8m
5.	Modem	DM-1414	0304012261	IFAXDM1414	ACEEX	Shielded, 1.8m	Unshielded, 1.8m
6.	USB 2.0 External HDD	F12-U	A0100214-31d0014	FCC DoC	TeraSyS	Shielded, 1.8m	N/A
7.	USB 2.0 External HDD	F12-U	A0100214-31d0028	FCC DoC	TeraSyS	Shielded, 1.8m	N/A
8.	USB 2.0 External HDD	F12-U	A0100214-2Bq0039	FCC DoC	TeraSyS	Shielded, 1.8m	N/A
9.	Earphone	980180-0121	N/A	FCC DoC	LABTEC	Unshielded, 1.8m	N/A
10.	Multimedia Earphone	Axis-301	N/A	FCC DoC	LABTEC	Shielded, 1.8m	N/A
11.	Walkman	RQ-L10	HB004471	FCC DoC	Panasonic	Shielded, 1.8m	N/A
12.	USB Mouse	MO19UCA	20440964	FCC DoC	HP	Shielded, 1.8m	N/A
13.	USB Keyboard	KU-9978	B463AOAGALT097	FCC DoC	Compaq	Shielded, 1.8m	N/A

Remark:

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



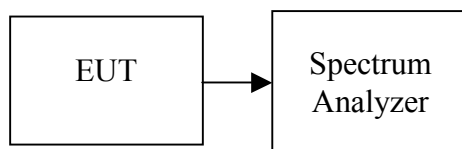
7. FCC PART 15.247 REQUIREMENTS

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 = 100kHz, VBW = RBW, Span = 50MHz, 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 mode

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2412	8580	>500	PASS
Mid	2437	9000		PASS
High	2462	9000		PASS

Test mode: IEEE 802.11g mode

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

Test mode: IEEE 802.11a mode

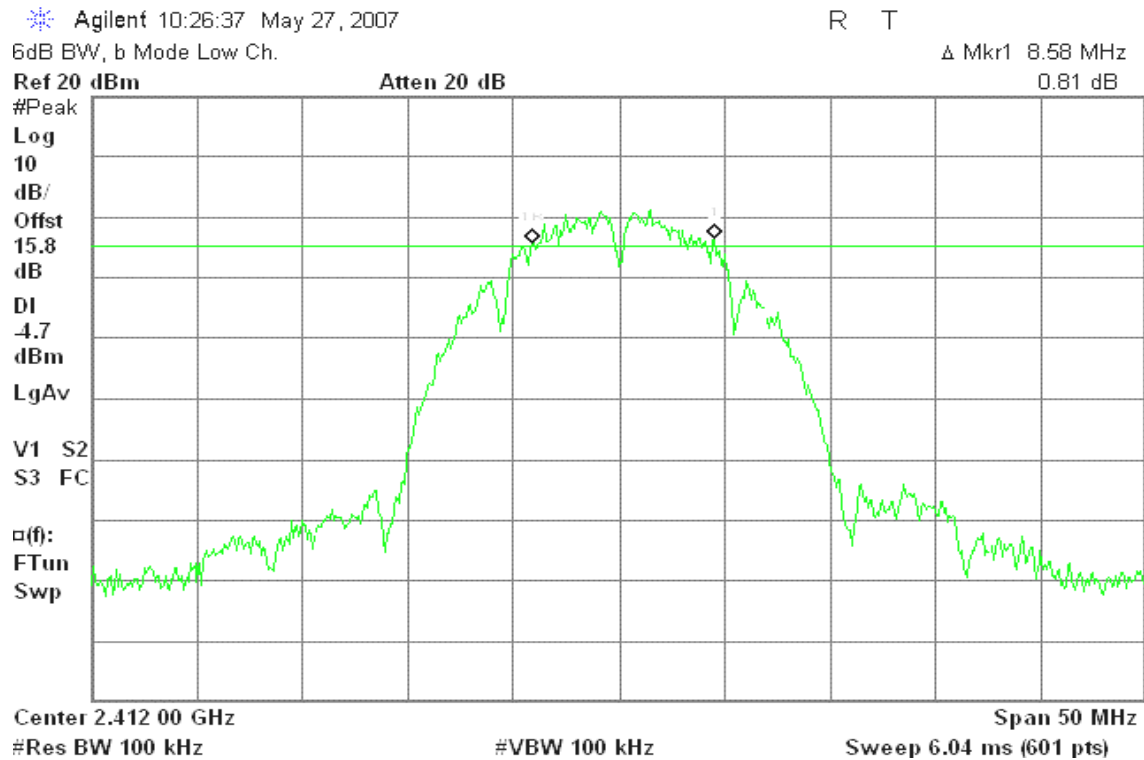
Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	5745	16580	>500	PASS
Mid	5785	15670		PASS
High	5825	16580		PASS



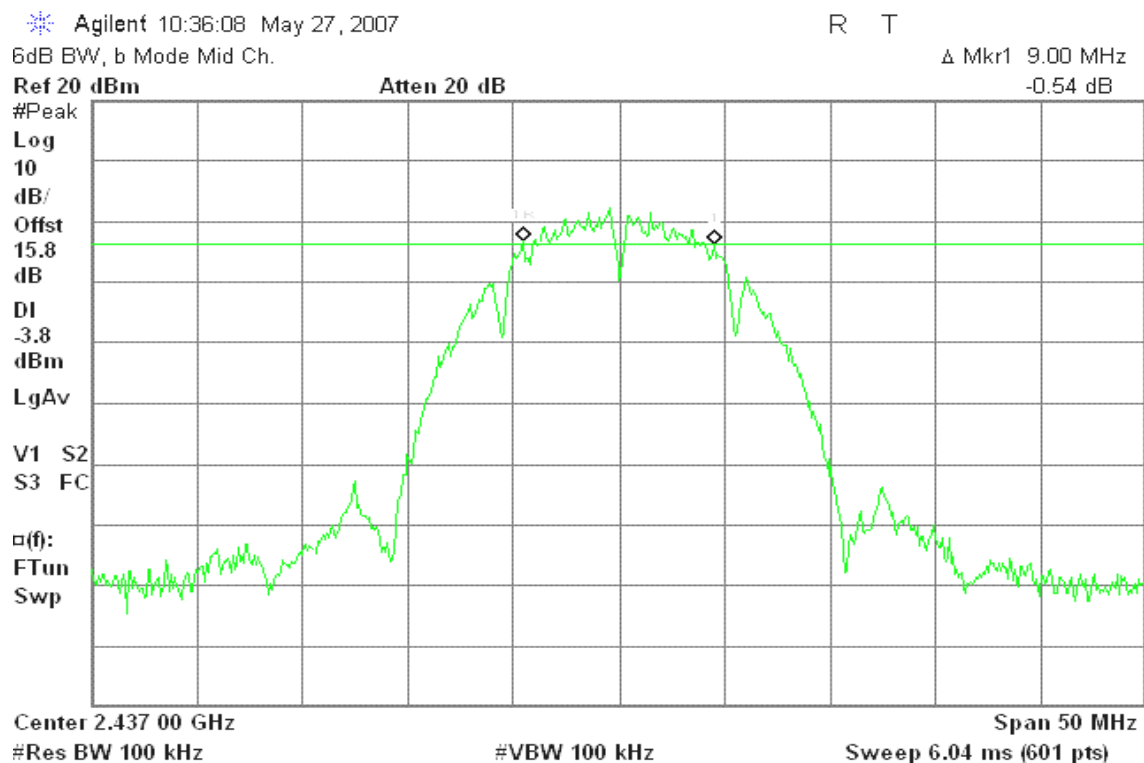
Test Plot

IEEE 802.11b mode

CH Low



CH Mid





CH High

Agilent 10:56:29 May 27, 2007

R T

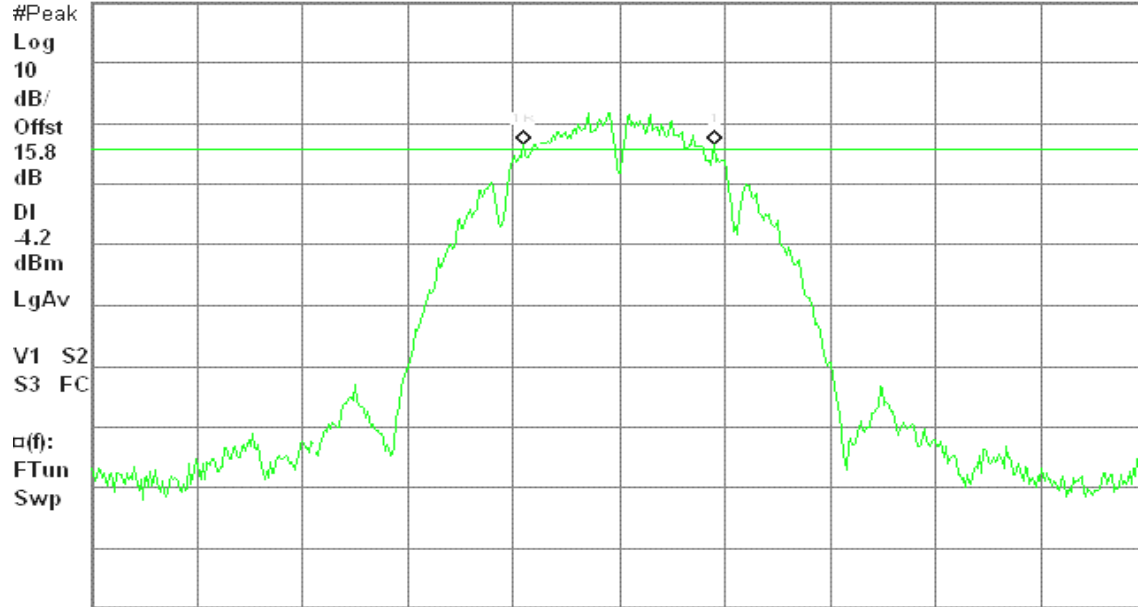
6dB BW, b Mode High Ch.

Δ Mkr1 9.00 MHz

Ref 20 dBm

Atten 20 dB

0.05 dB



IEEE 802.11g mode

CH Low

Agilent 11:05:38 May 27, 2007

R T

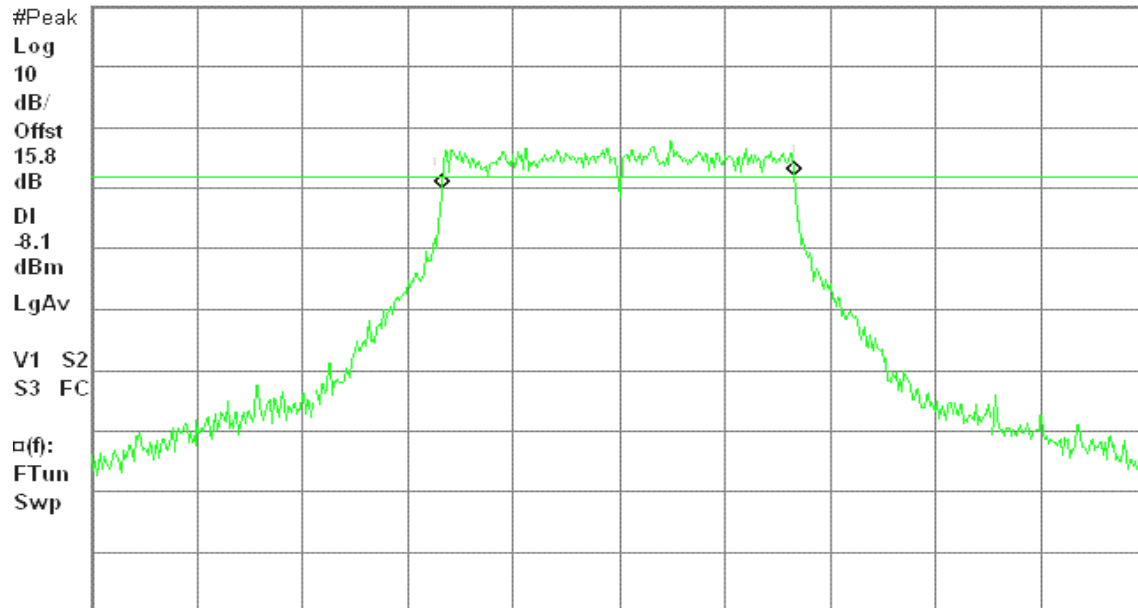
6dB BW, g Mode Low Ch.

Δ Mkr1 16.58 MHz

Ref 20 dBm

Atten 20 dB

1.89 dB





CH Mid

Agilent 11:19:11 May 27, 2007

R T

6dB BW, g Mode Mid Ch.

Δ Mkr1 16.67 MHz

Ref 20 dBm

Atten 20 dB

-0.07 dB

#Peak

Log

10

dB/

Offst

15.8

dB

DI

-8.9

dBm

LgAv

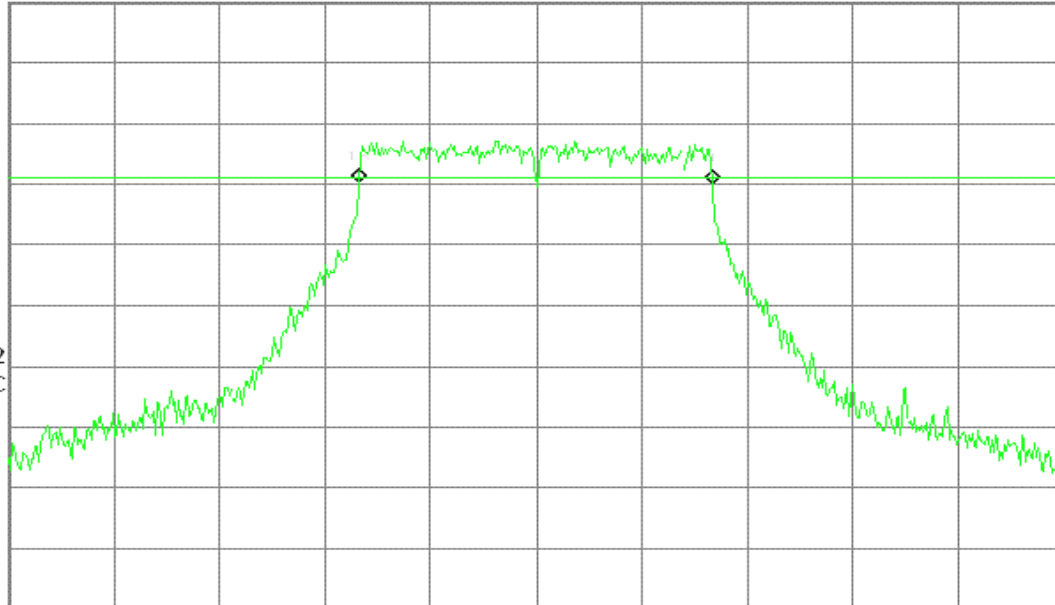
V1 S2

S3 FC

$\alpha(f)$:

FTun

Swp



Center 2.437 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

CH High

Agilent 11:26:50 May 27, 2007

R T

6dB BW, g Mode High Ch.

Δ Mkr1 16.58 MHz

Ref 20 dBm

Atten 20 dB

1.41 dB

#Peak

Log

10

dB/

Offst

15.8

dB

DI

-7.8

dBm

LgAv

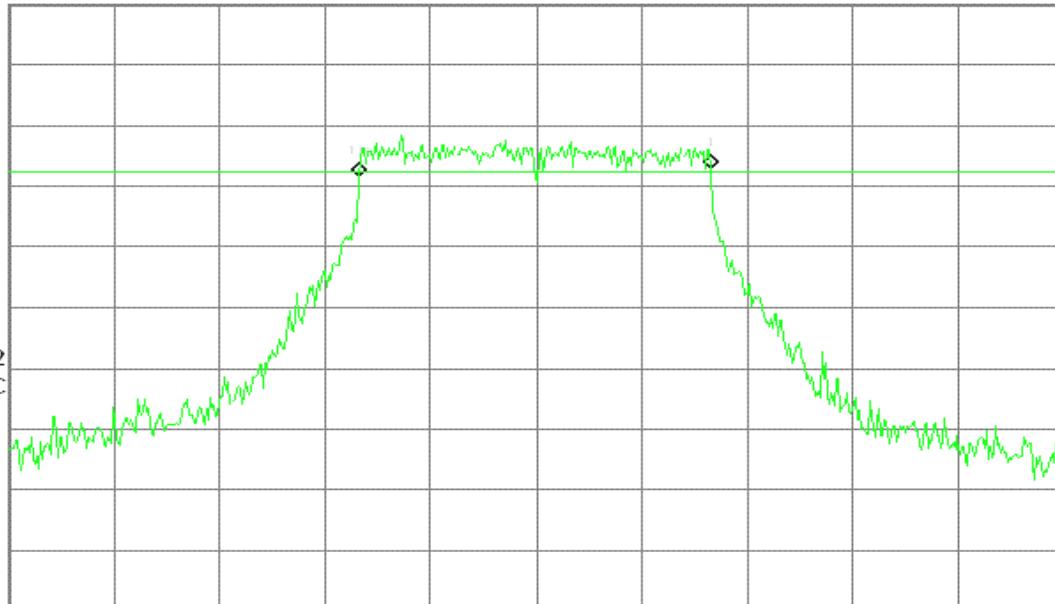
V1 S2

S3 FC

$\alpha(f)$:

FTun

Swp



Center 2.462 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)



IEEE 802.11a mode

CH Low

Agilent 17:34:33 May 31, 2007

R T

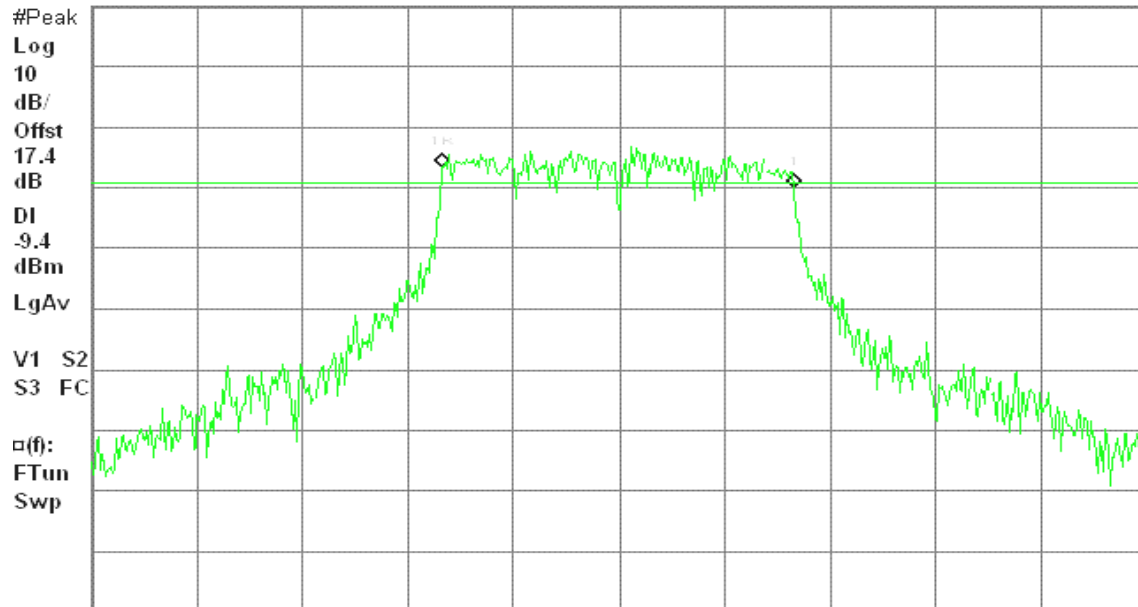
6dB BW, a Mode Low Ch.

Δ Mkr1 16.58 MHz

Ref 20 dBm

Atten 20 dB

-3.58 dB



Center 5.745 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

CH Mid

Agilent 18:01:01 May 31, 2007

R T

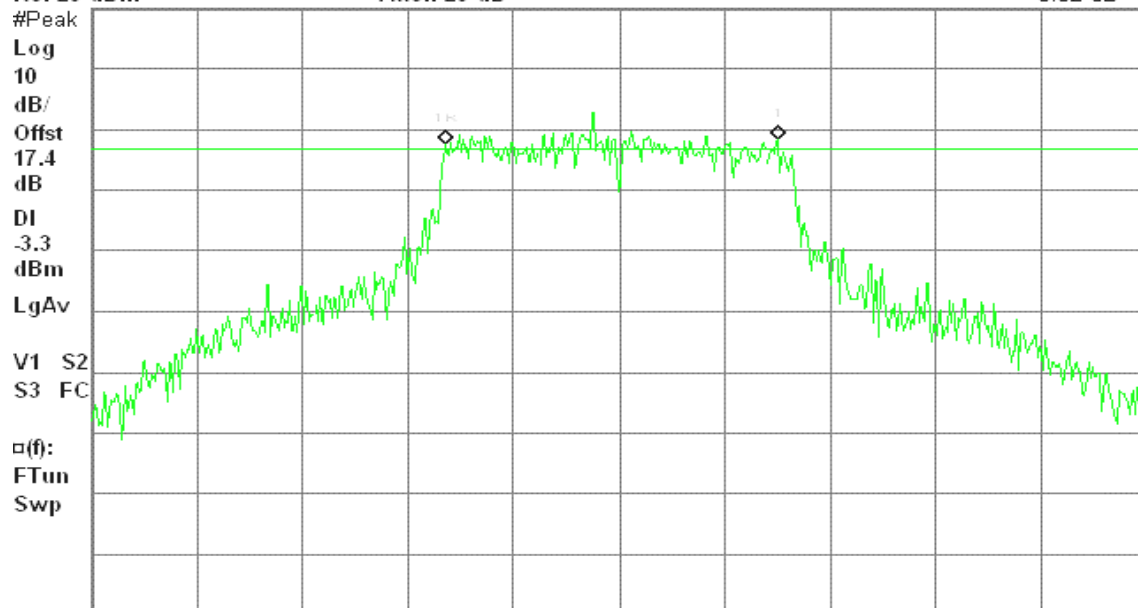
6dB BW, a Mode Mid Ch.

Δ Mkr1 15.67 MHz

Ref 20 dBm

Atten 20 dB

0.82 dB



Center 5.785 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)



CH High

Agilent 18:08:51 May 31, 2007

R T

6dB BW, a Mode High Ch.

Δ Mkr1 16.58 MHz

Ref 20 dBm

Atten 20 dB

2.56 dB

#Peak

Log

10

dB/

Offst

17.4

dB

DI

-6.7

dBm

LgAv

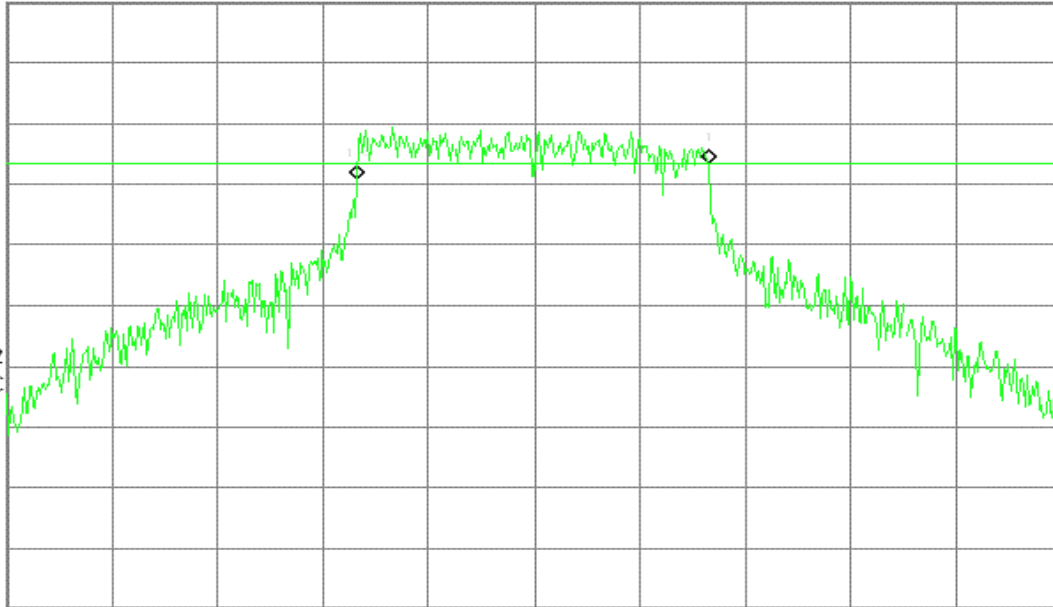
V1 S2

S3 FC

□(f):

FTun

Swp



Center 5.825 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)



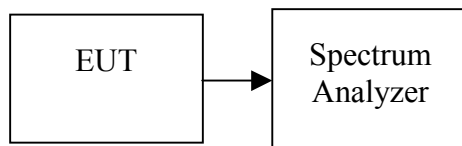
7.2 PEAK POWER

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 mode**

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	14.77	0.02999	1	PASS
Mid	2437	14.77	0.02999		PASS
High	2462	14.64	0.02911		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	15.04	0.03192	1	PASS
Mid	2437	15.52	0.03565		PASS
High	2462	15.64	0.03664		PASS

Test mode: IEEE 802.11a mode

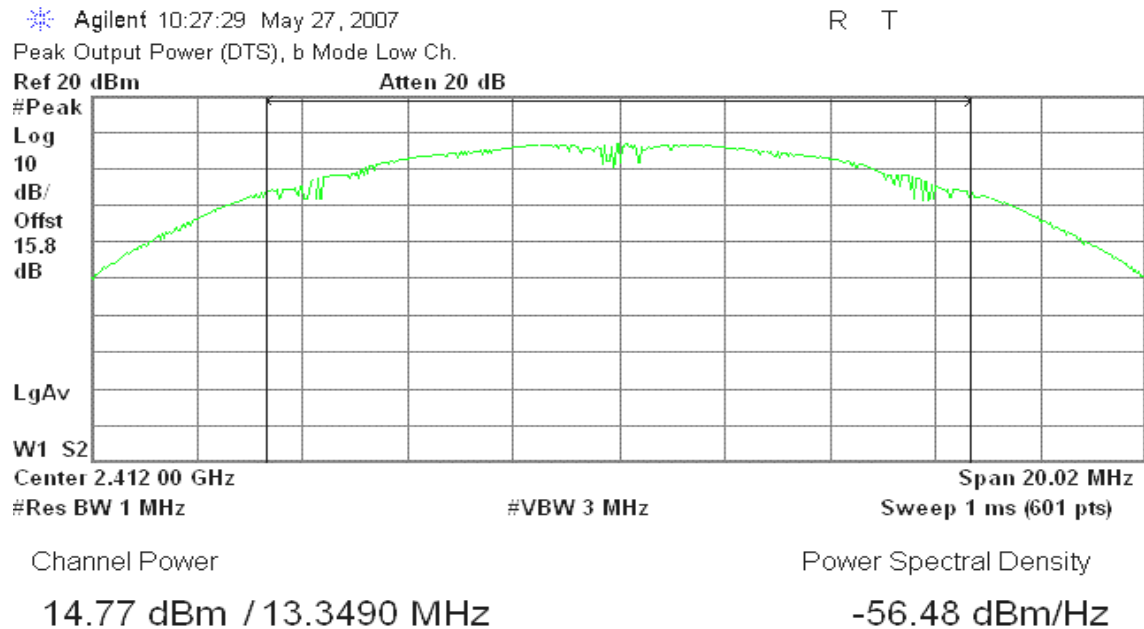
Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	5745	15.08	0.03221	1	PASS
Mid	5785	18.15	0.06531		PASS
High	5825	17.77	0.05984		PASS



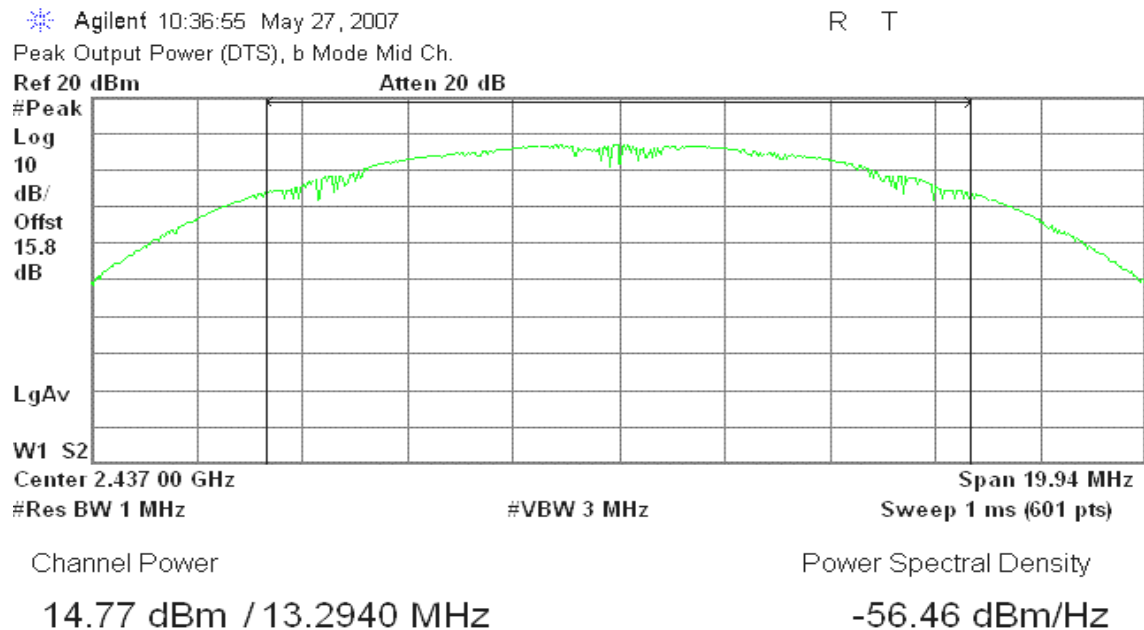
Test Plot

IEEE 802.11b mode

CH Low



CH Mid





CH High

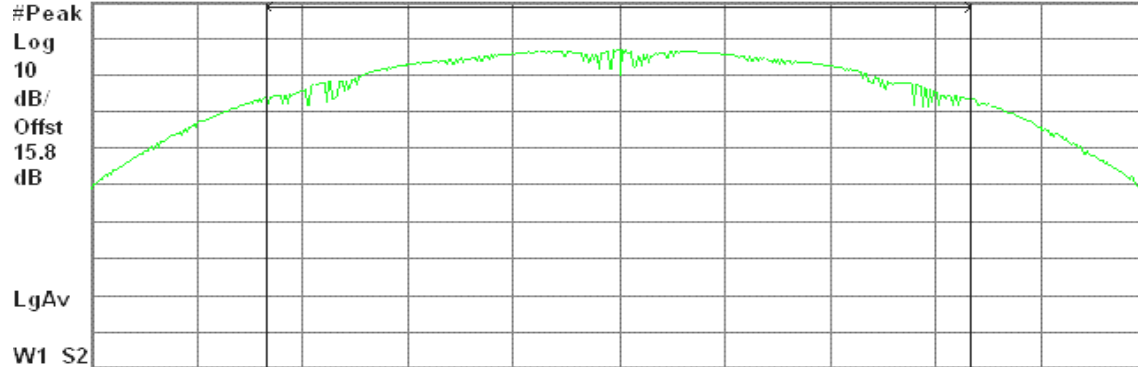
Agilent 10:57:13 May 27, 2007

R T

Peak Output Power (DTS), b Mode High Ch.

Ref 20 dBm

Atten 20 dB



Center 2.462 00 GHz

Span 19.99 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

14.64 dBm / 13.3270 MHz

-56.61 dBm/Hz

IEEE 802.11g mode

CH Low

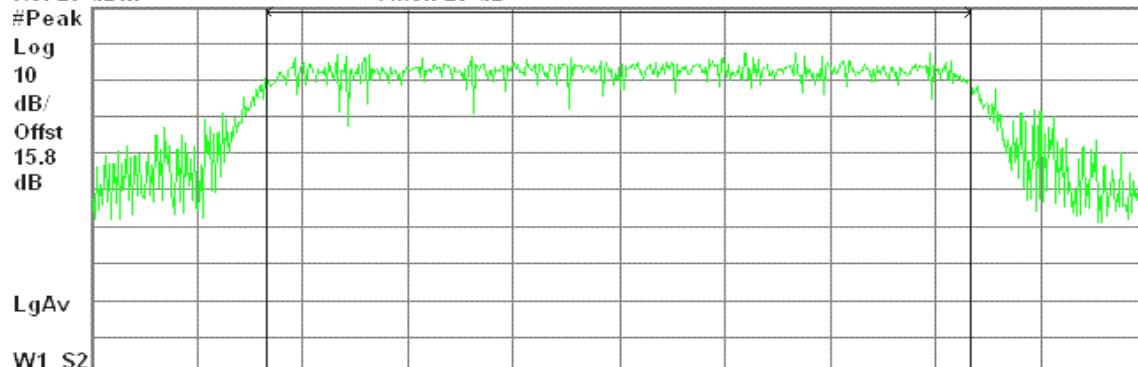
Agilent 11:06:57 May 27, 2007

R T

Peak Output Power (DTS), g Mode Low Ch.

Ref 20 dBm

Atten 20 dB



Center 2.412 00 GHz

Span 25.22 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

15.04 dBm / 16.8130 MHz

-57.22 dBm/Hz



CH Mid

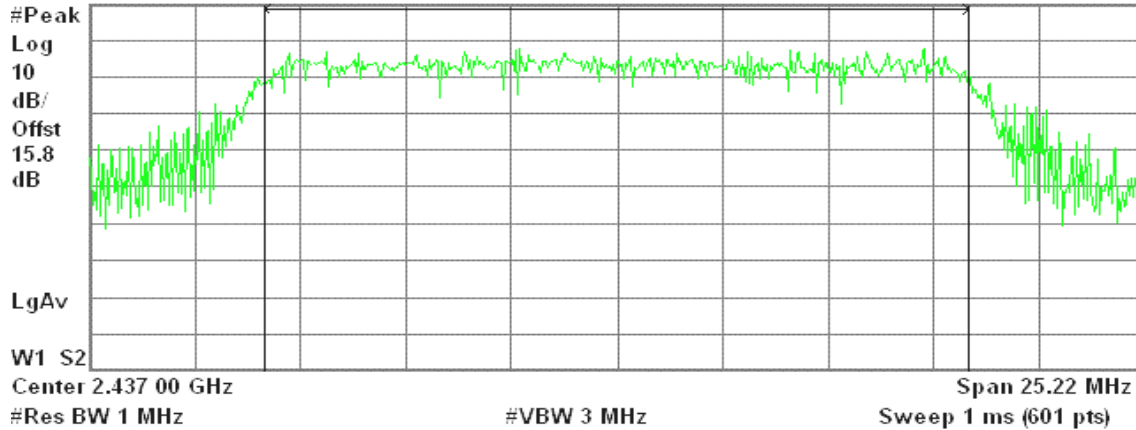
Agilent 11:21:25 May 27, 2007

R T

Peak Output Power (DTS), g Mode Mid Ch.

Ref 20 dBm

Atten 20 dB



Channel Power

15.52 dBm / 16.8120 MHz

Power Spectral Density

-56.73 dBm/Hz

CH High

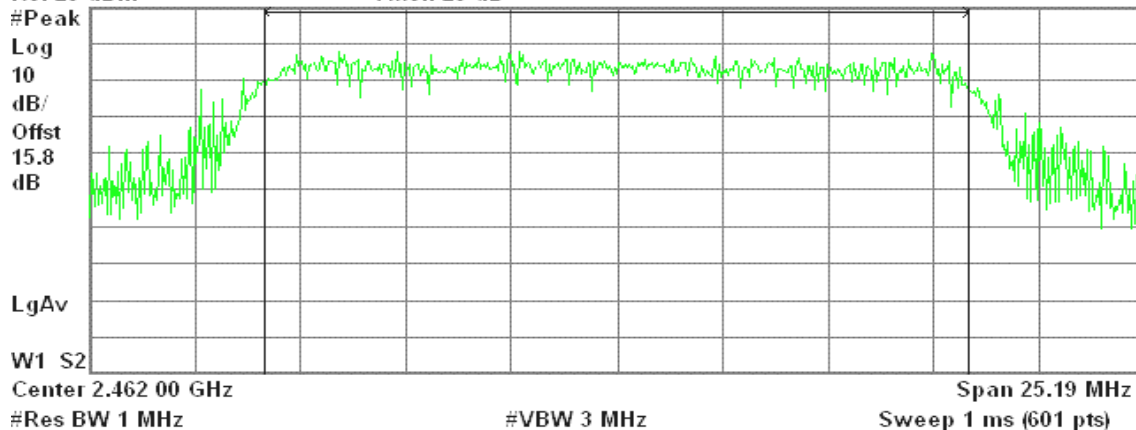
Agilent 11:27:34 May 27, 2007

R T

Peak Output Power (DTS), g Mode High Ch.

Ref 20 dBm

Atten 20 dB



Channel Power

15.64 dBm / 16.7940 MHz

Power Spectral Density

-56.61 dBm/Hz



IEEE 802.11a mode

CH Low

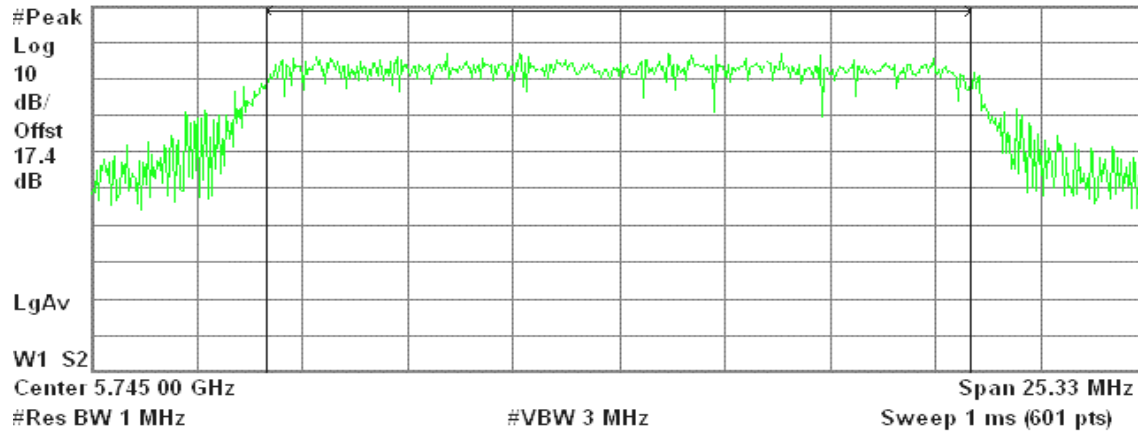
Agilent 17:35:37 May 31, 2007

R T

Peak Output Power, a Mode Low Ch.

Ref 20 dBm

Atten 20 dB



Channel Power

Power Spectral Density

15.08 dBm / 16.8850 MHz

-57.20 dBm/Hz

CH Mid

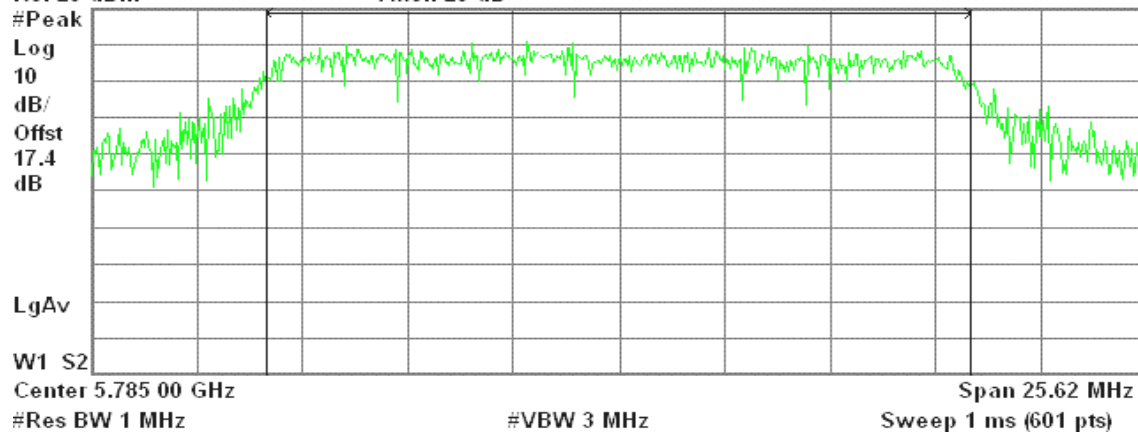
Agilent 18:01:57 May 31, 2007

R T

Peak Output Power, a Mode Mid Ch.

Ref 20 dBm

Atten 20 dB



Channel Power

Power Spectral Density

18.15 dBm / 17.0800 MHz

-54.17 dBm/Hz



CH High

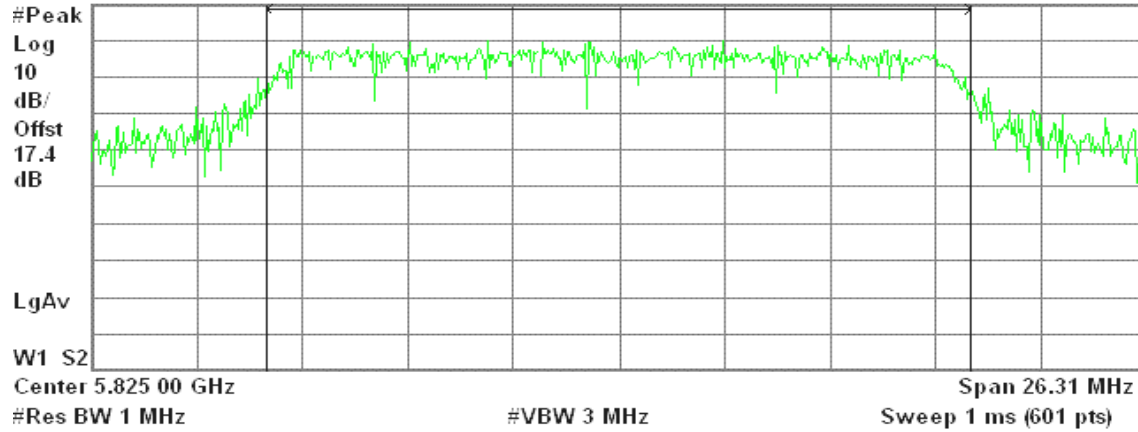
Agilent 18:15:10 May 31, 2007

R T

Peak Output Power (DTS), a Mode High Ch.

Ref 20 dBm

Atten 20 dB



Channel Power

17.77 dBm / 17.5430 MHz

Power Spectral Density

-54.67 dBm/Hz

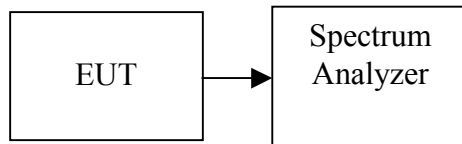


7.3 AVERAGE POWER

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)	Output Power (W)
Low	2412	12.26	0.01683
Mid	2437	12.14	0.01637
High	2462	11.87	0.01538

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2412	11.26	0.01337
Mid	2437	11.81	0.01517
High	2462	12.12	0.01629

Test mode: IEEE 802.11a mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	5745	11.39	0.01377
Mid	5785	14.43	0.02773
High	5825	14.70	0.02951



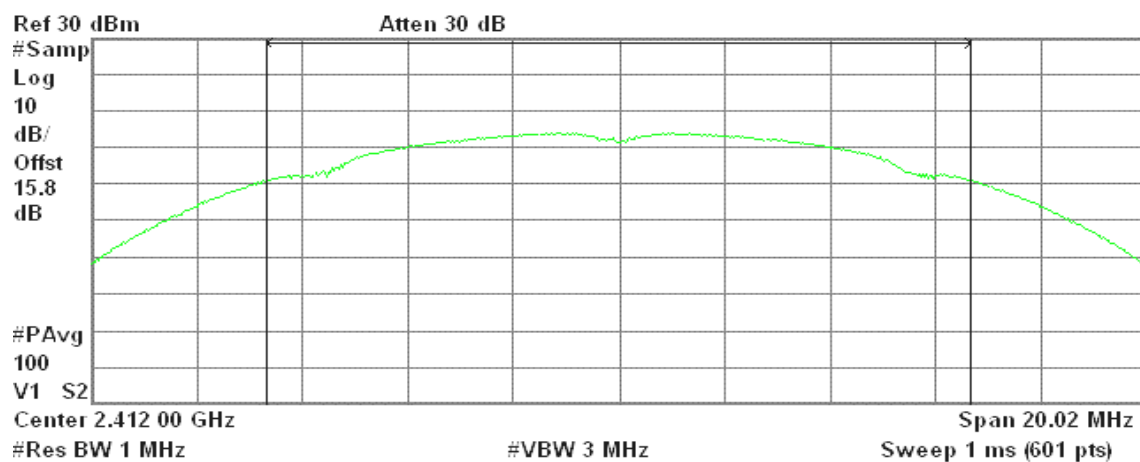
Test Plot

IEEE 802.11b mode

CH Low

Agilent 10:28:22 May 27, 2007

R T



Channel Power

12.26 dBm / 13.3490 MHz

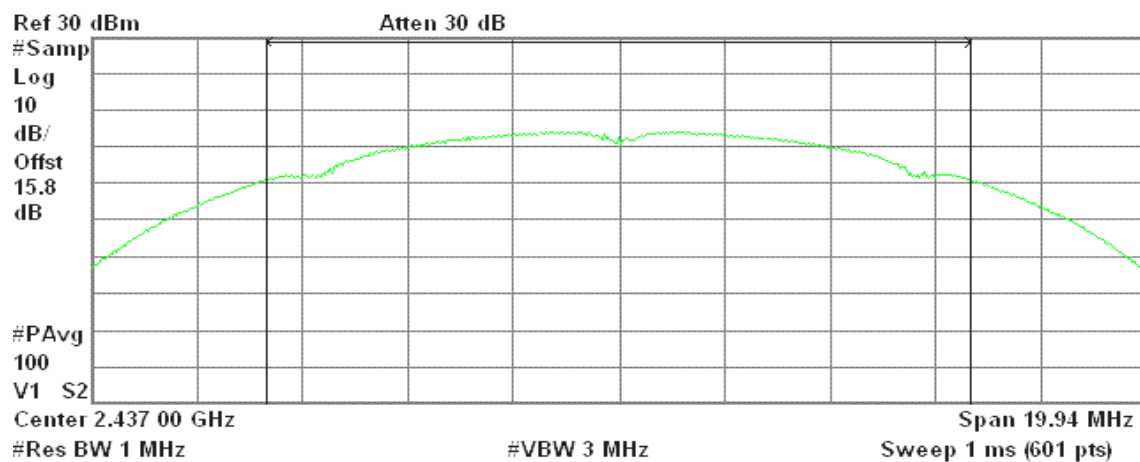
Power Spectral Density

-59.00 dBm/Hz

CH Mid

Agilent 10:37:25 May 27, 2007

R T



Channel Power

12.14 dBm / 13.2940 MHz

Power Spectral Density

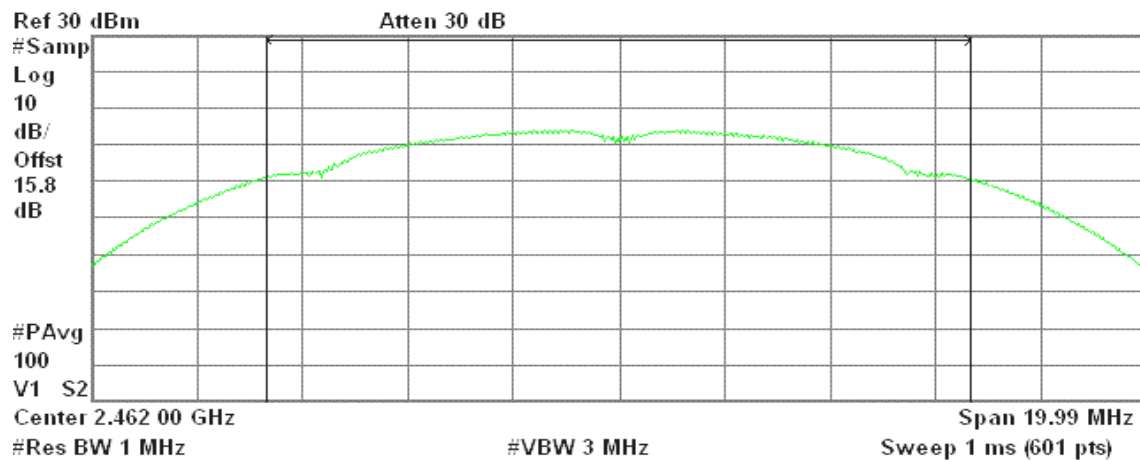
-59.09 dBm/Hz



CH High

✱ Agilent 10:57:46 May 27, 2007

R T



Channel Power

11.87 dBm / 13.3270 MHz

Power Spectral Density

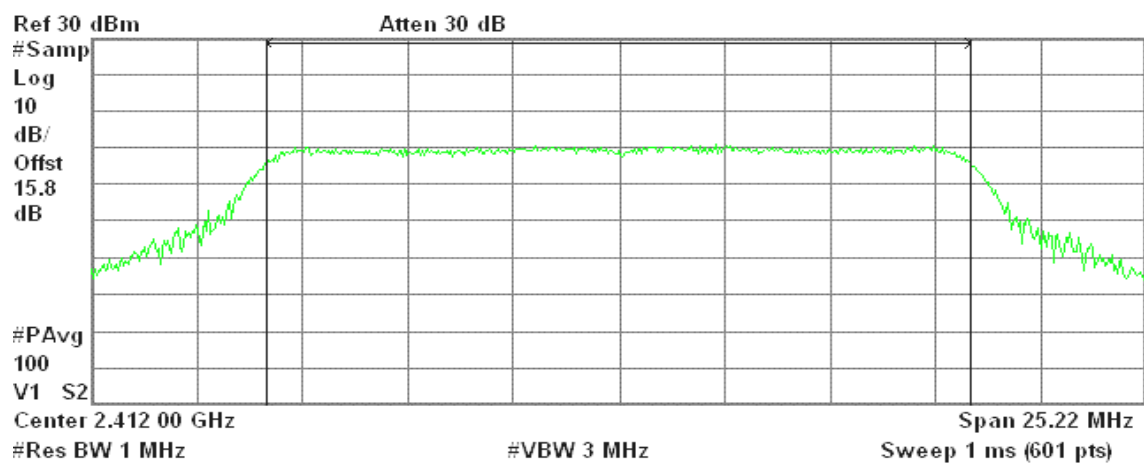
-59.37 dBm/Hz

IEEE 802.11g mode

CH Low

✱ Agilent 11:07:32 May 27, 2007

R T



Channel Power

11.26 dBm / 16.8130 MHz

Power Spectral Density

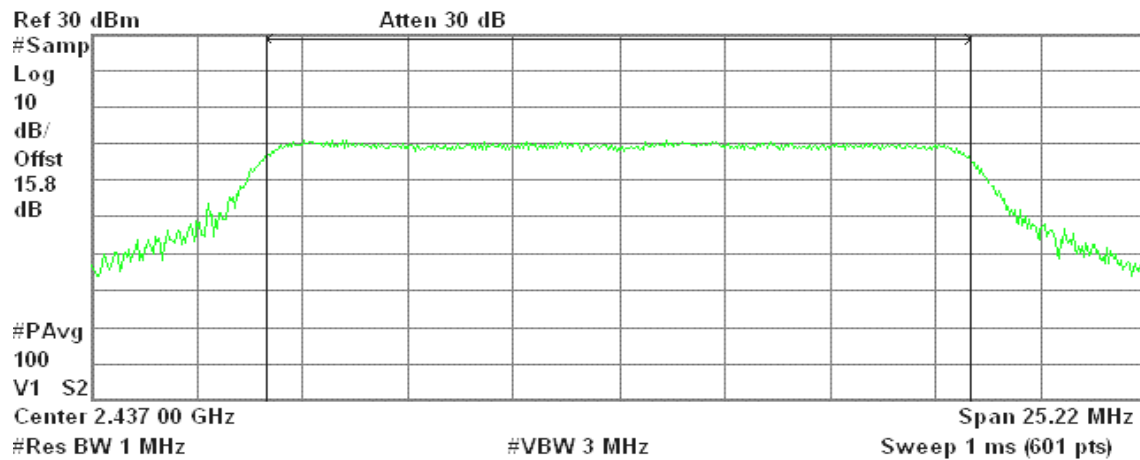
-61.00 dBm/Hz



CH Mid

* Agilent 11:21:51 May 27, 2007

R T



Channel Power

11.81 dBm / 16.8120 MHz

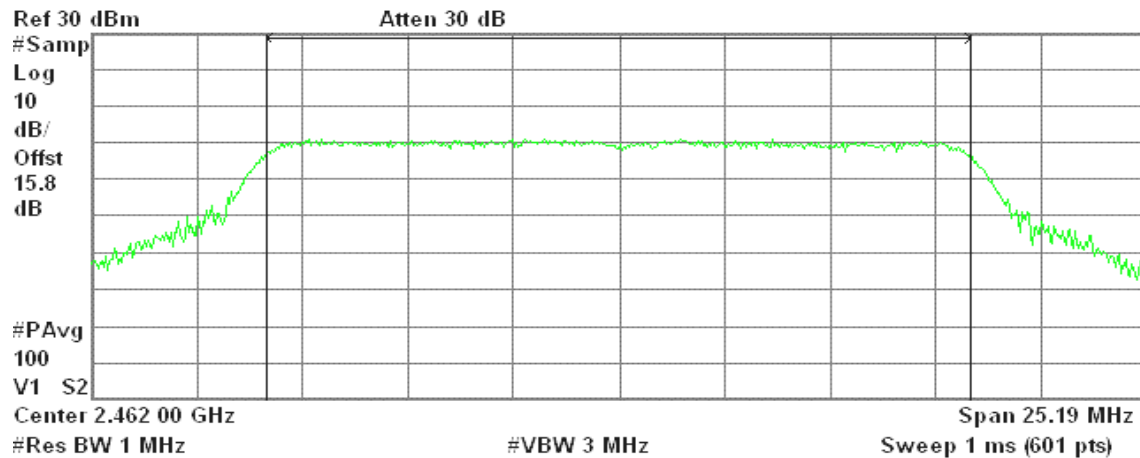
Power Spectral Density

-60.45 dBm/Hz

CH High

* Agilent 11:28:00 May 27, 2007

R T



Channel Power

12.12 dBm / 16.7940 MHz

Power Spectral Density

-60.13 dBm/Hz



IEEE 802.11a mode

CH Low

Agilent 17:36:22 May 31, 2007

R T

Avg Output Power, a Mode Low Ch.

Ref 30 dBm

Atten 30 dB

#Samp

Log

10

dB/

Offst

17.4

dB

#PAvg

79

V1 S2

Center 5.745 00 GHz

Span 25.33 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

11.39 dBm / 16.8850 MHz

-60.89 dBm/Hz

CH Mid

Agilent 18:02:44 May 31, 2007

R L

AVG Output Power, a Mode Mid Ch.

Ref 30 dBm

Atten 30 dB

#Samp

Log

10

dB/

Offst

17.4

dB

#PAvg

84

V1 S2

Center 5.785 00 GHz

Span 25.62 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

14.43 dBm / 17.0800 MHz

-57.90 dBm/Hz



CH High

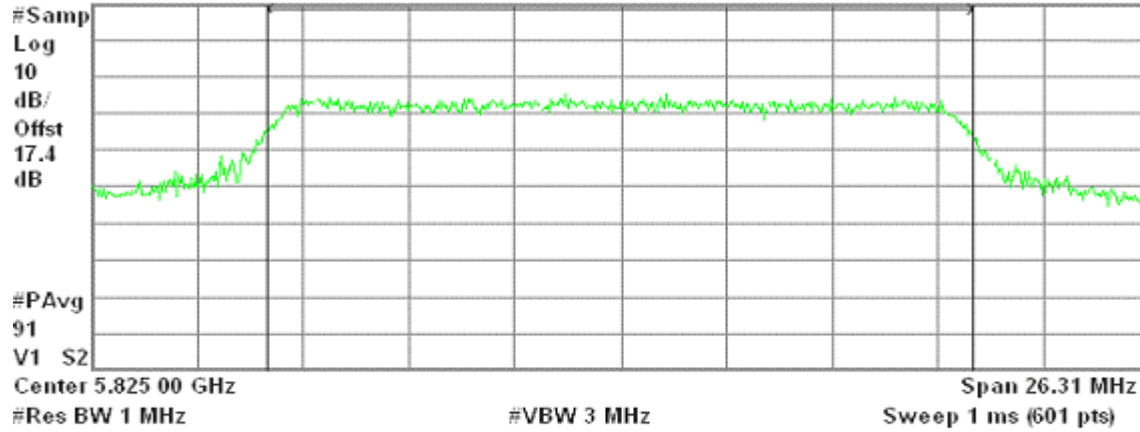
Agilent 18:10:20 May 31, 2007

R T

AVG Output Power, a Mode High Ch.

Ref 30 dBm

Atten 30 dB



Channel Power

14.70 dBm / 17.5430 MHz

Power Spectral Density

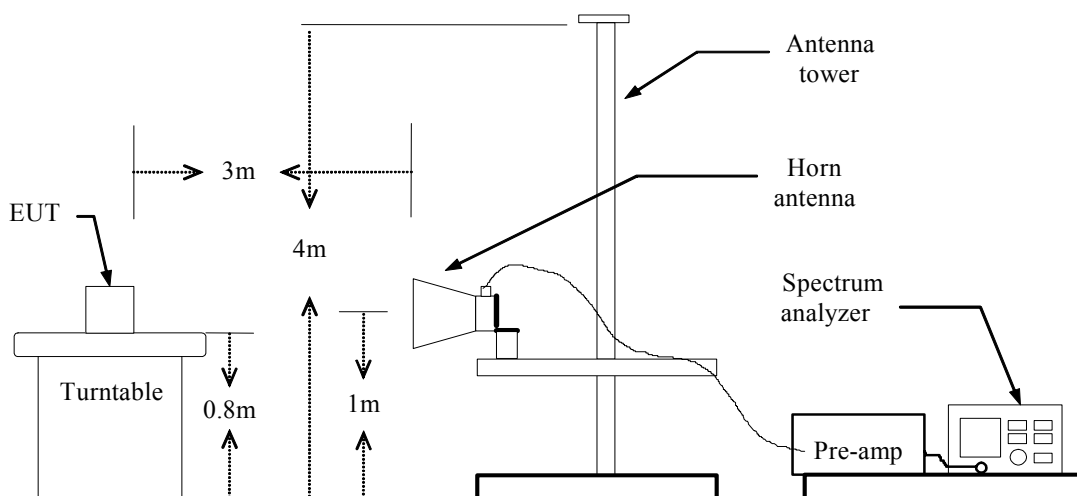
-57.74 dBm/Hz

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 mode / CH Low)

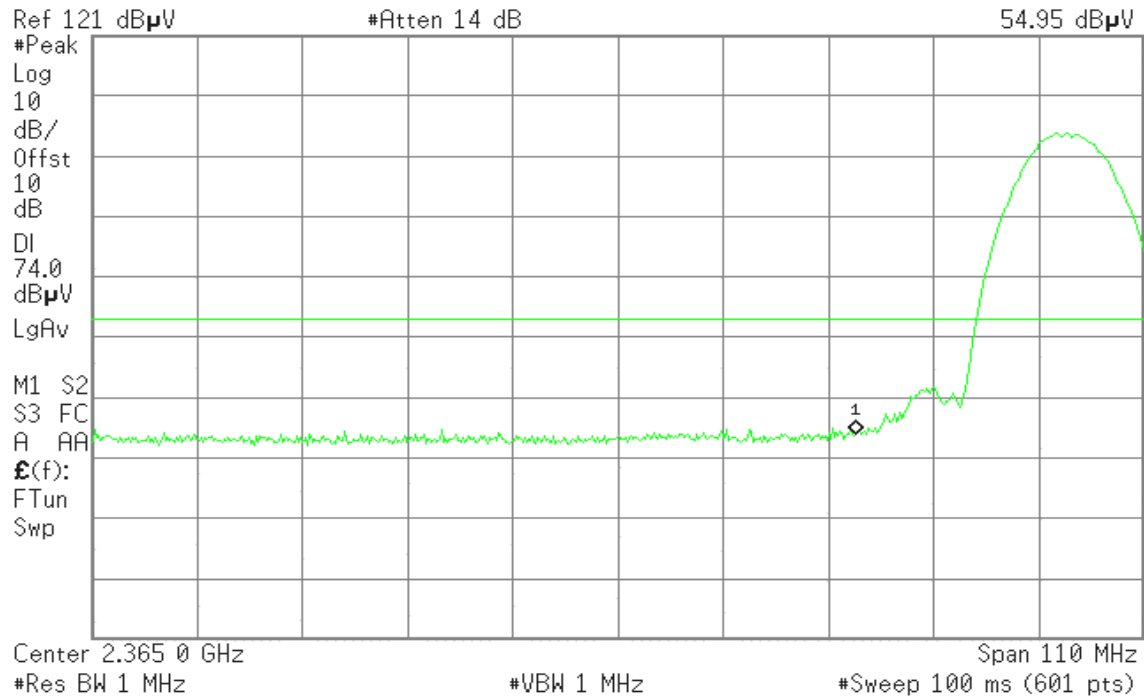
Detector mode: Peak

Polarity: Vertical

Agilent 16:38:54 May 18, 2007

R T

Mkr1 2.390 0 GHz
54.95 dB μ V



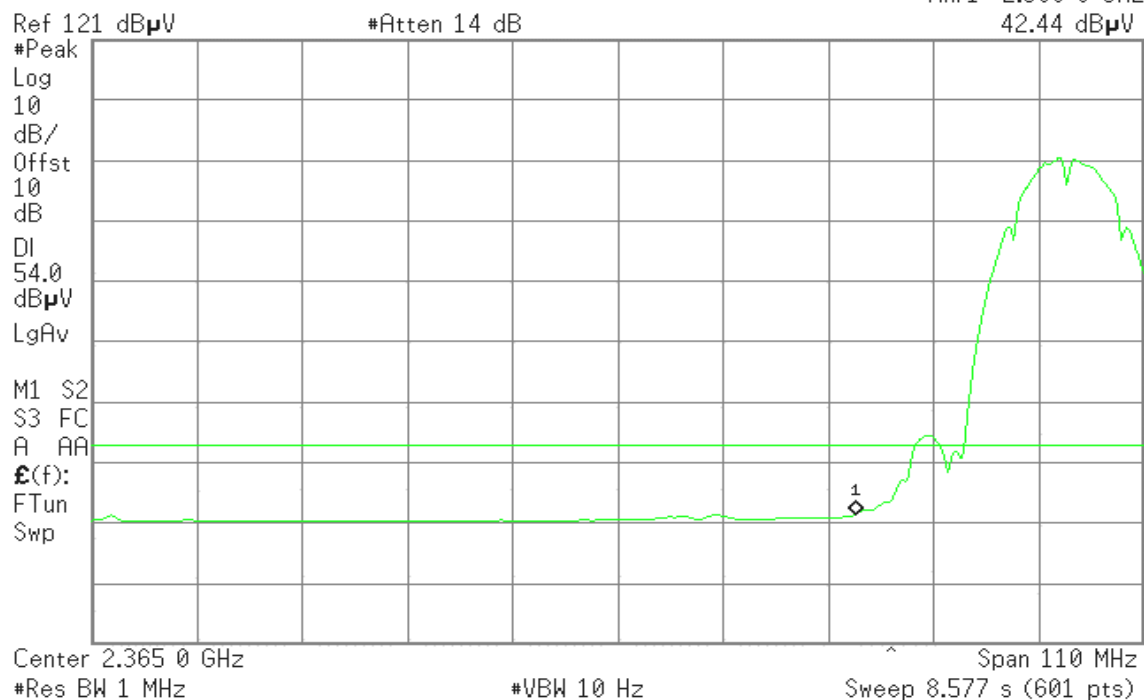
Detector mode: Average

Polarity: Vertical

Agilent 16:40:32 May 18, 2007

R T

Mkr1 2.390 0 GHz
42.44 dB μ V





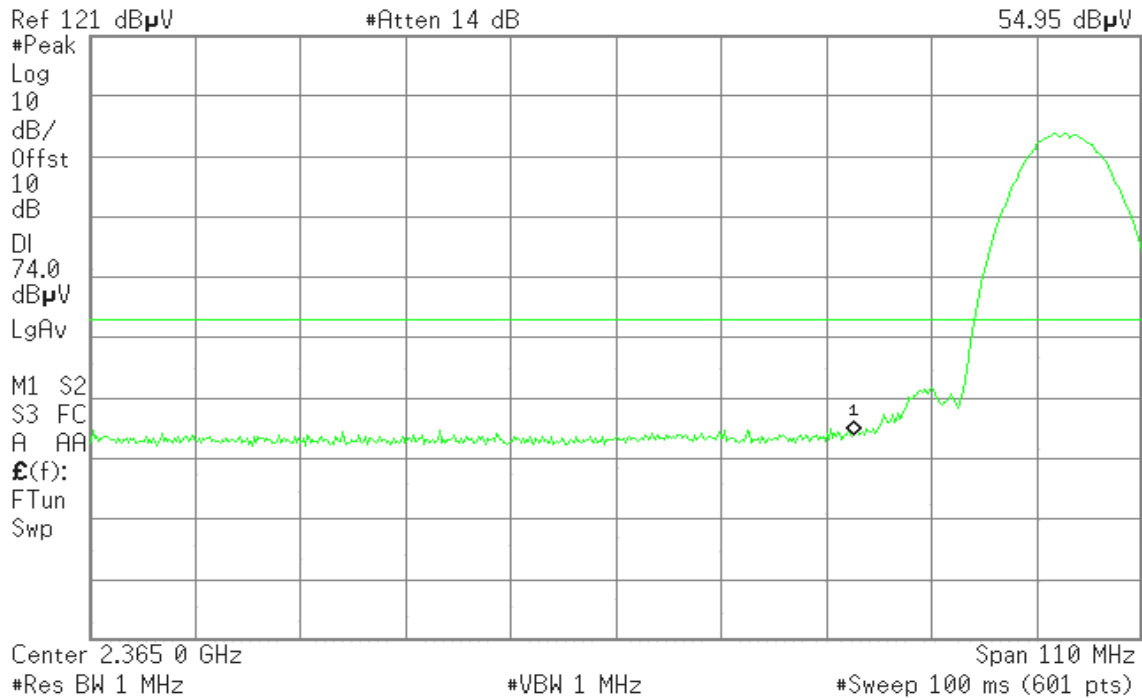
Detector mode: Peak

Polarity: Horizontal

Agilent 16:38:54 May 18, 2007

R T

Mkr1 2.390 0 GHz
54.95 dB μ V



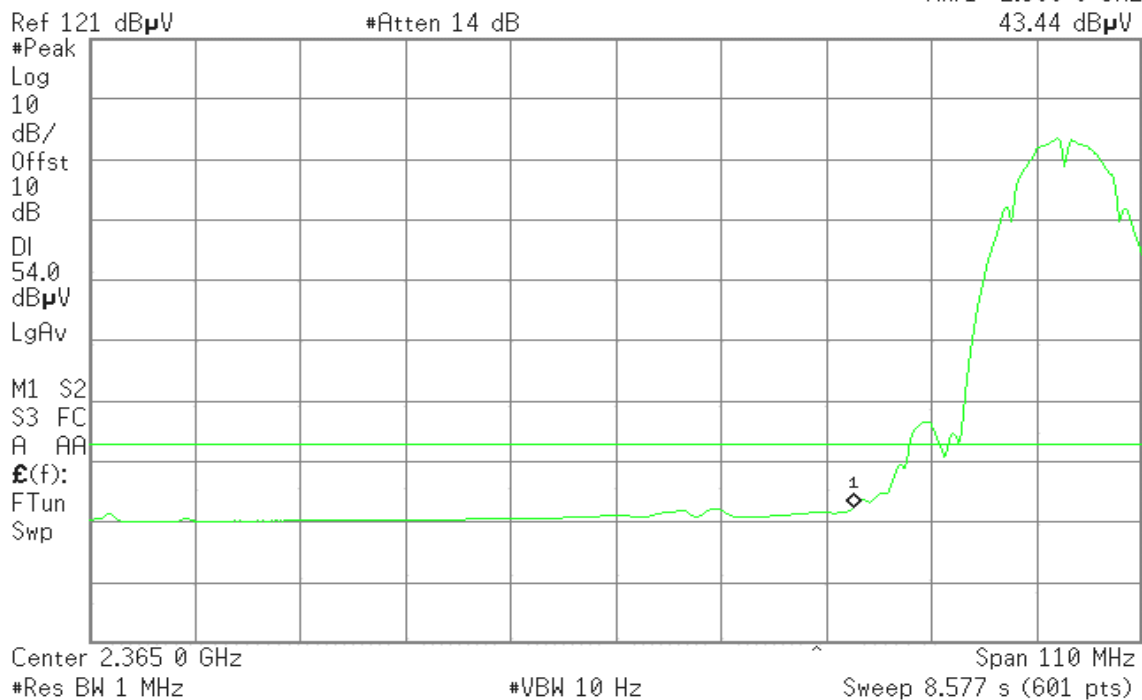
Detector mode: Average

Polarity: Horizontal

Agilent 16:46:45 May 18, 2007

R T

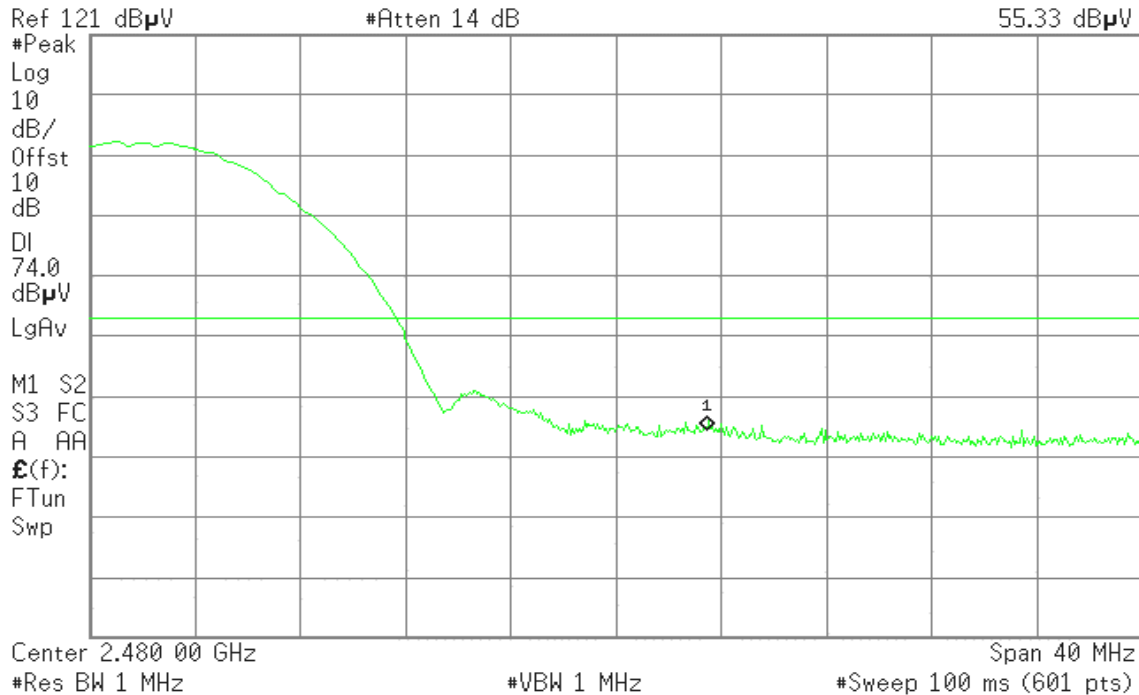
Mkr1 2.390 0 GHz
43.44 dB μ V



**Band Edges (IEEE 802.11b mode / CH High)****Detector mode: Peak****Polarity: Vertical**

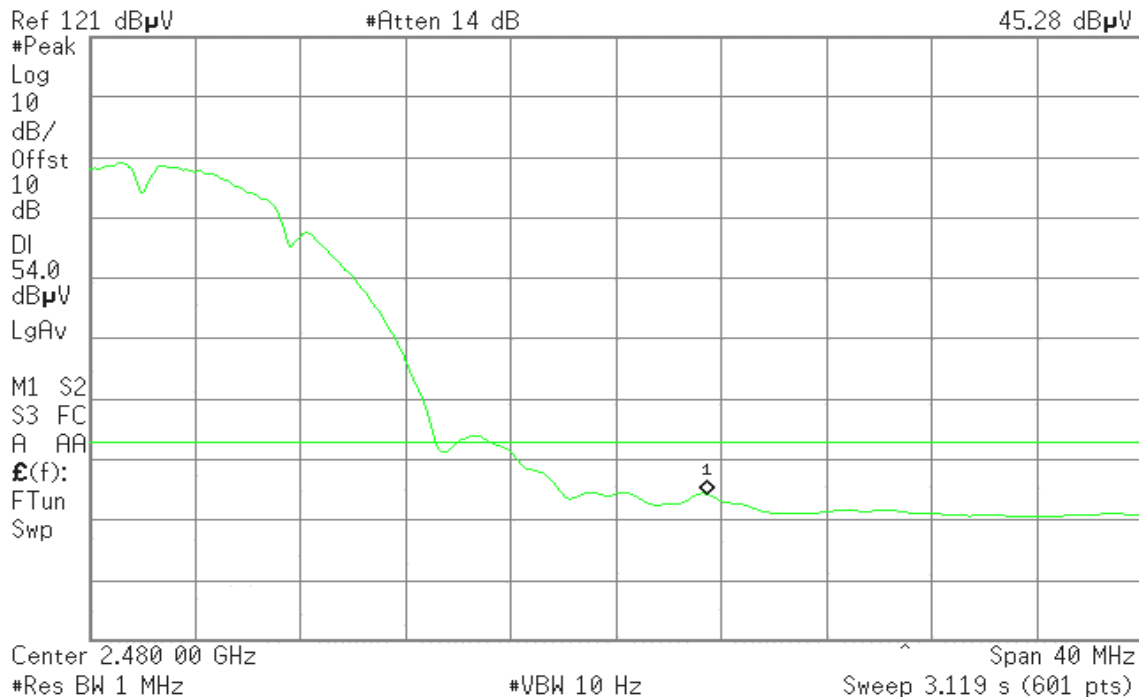
* Agilent 16:59:38 May 18, 2007

R T

Mkr1 2.483 50 GHz
55.33 dB μ V**Detector mode: Average****Polarity: Vertical**

* Agilent 17:00:16 May 18, 2007

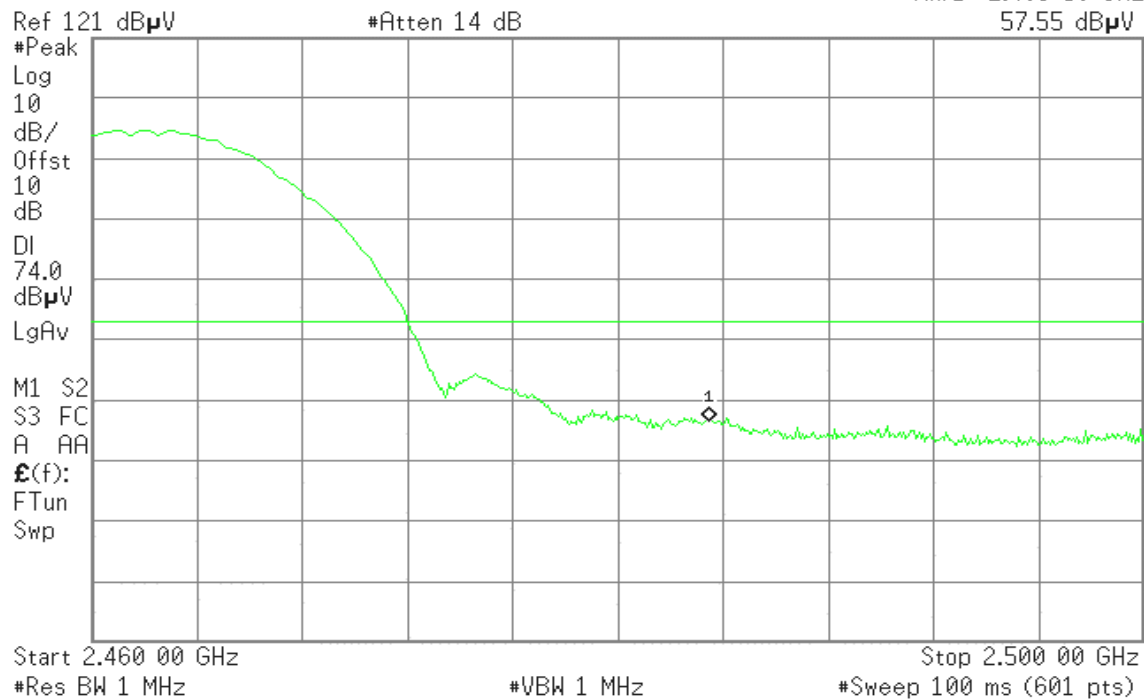
R T

Mkr1 2.483 50 GHz
45.28 dB μ V

**Detector mode: Peak****Polarity: Horizontal**

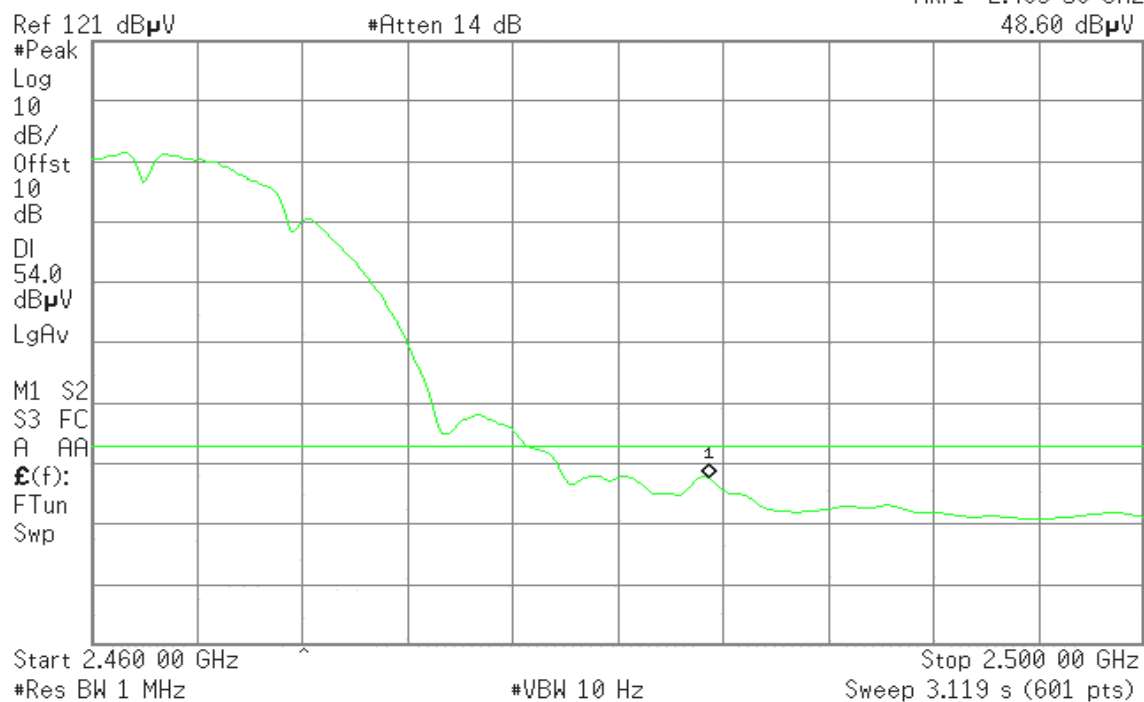
* Agilent 16:52:04 May 18, 2007

R T

Mkr1 2.483 50 GHz
57.55 dB μ V**Detector mode: Average****Polarity: Horizontal**

* Agilent 16:52:56 May 18, 2007

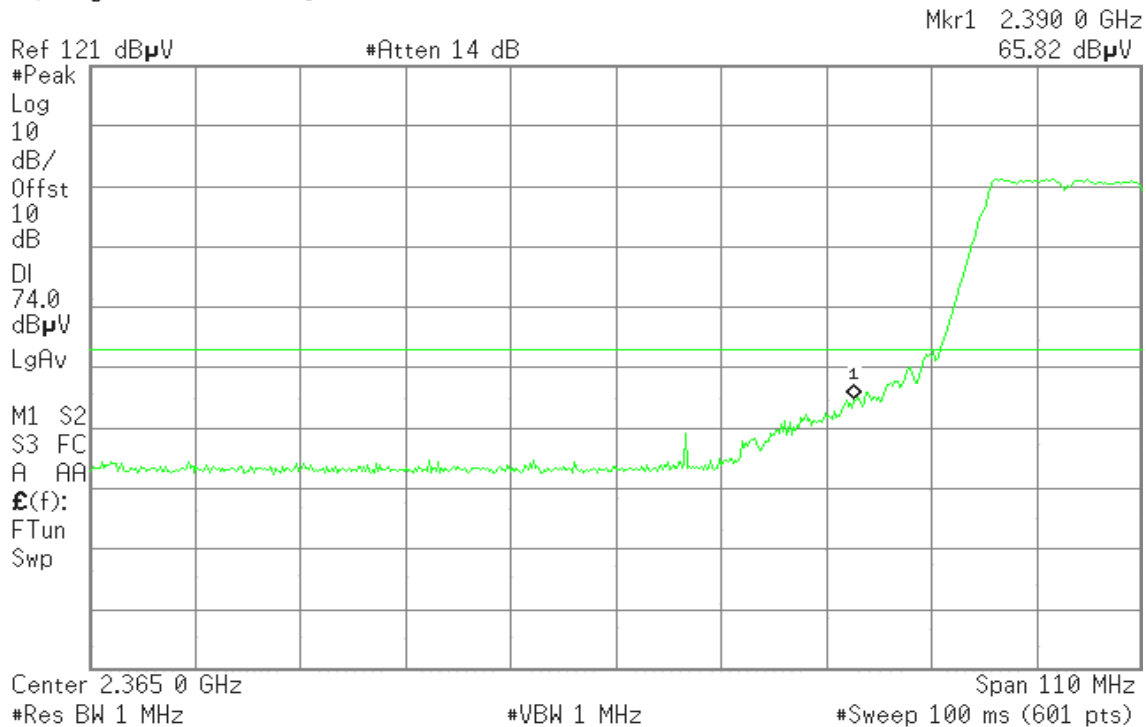
R T

Mkr1 2.483 50 GHz
48.60 dB μ V

**Band Edges (IEEE 802.11g mode / CH Low)****Detector mode: Peak****Polarity: Vertical**

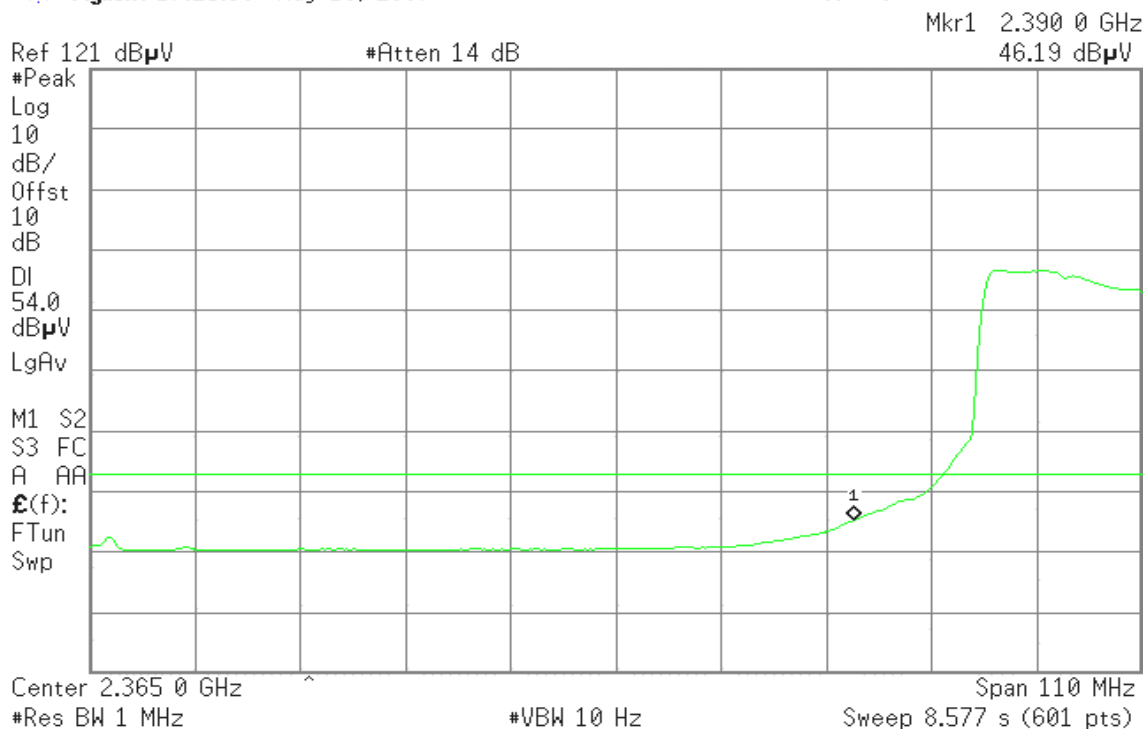
* Agilent 17:24:35 May 18, 2007

R T

**Detector mode: Average****Polarity: Vertical**

* Agilent 17:25:30 May 18, 2007

R T



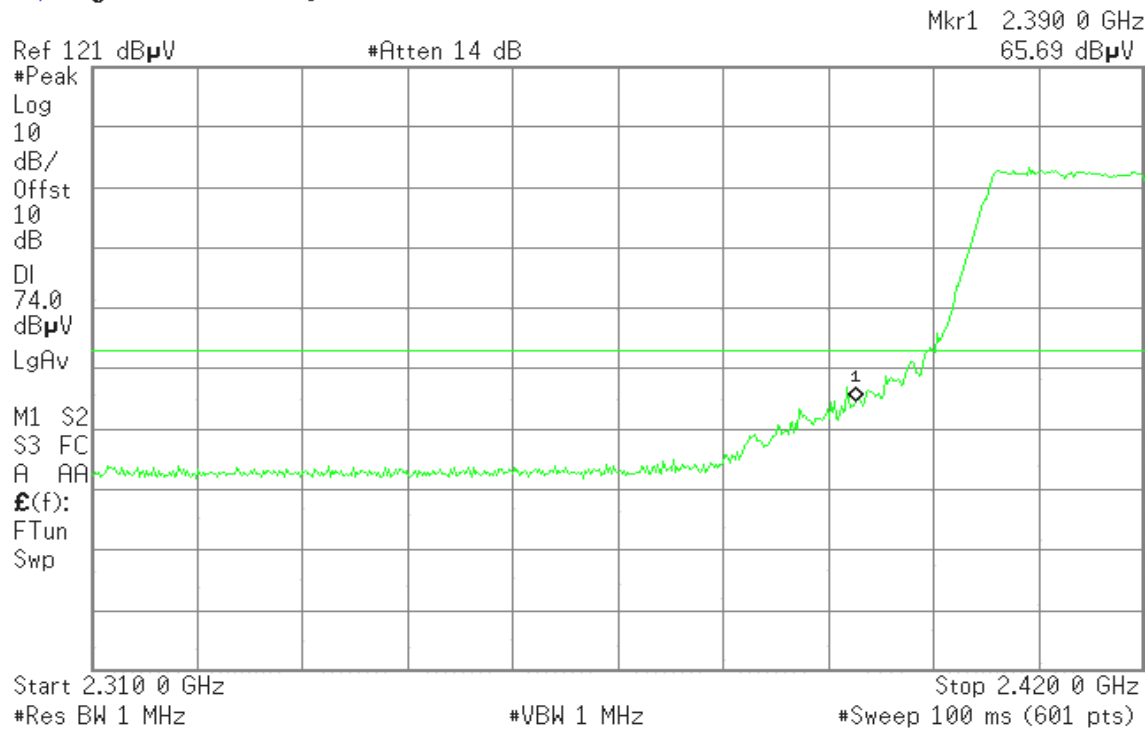


Detector mode: Peak

Polarity: Horizontal

Agilent 17:19:00 May 18, 2007

R T

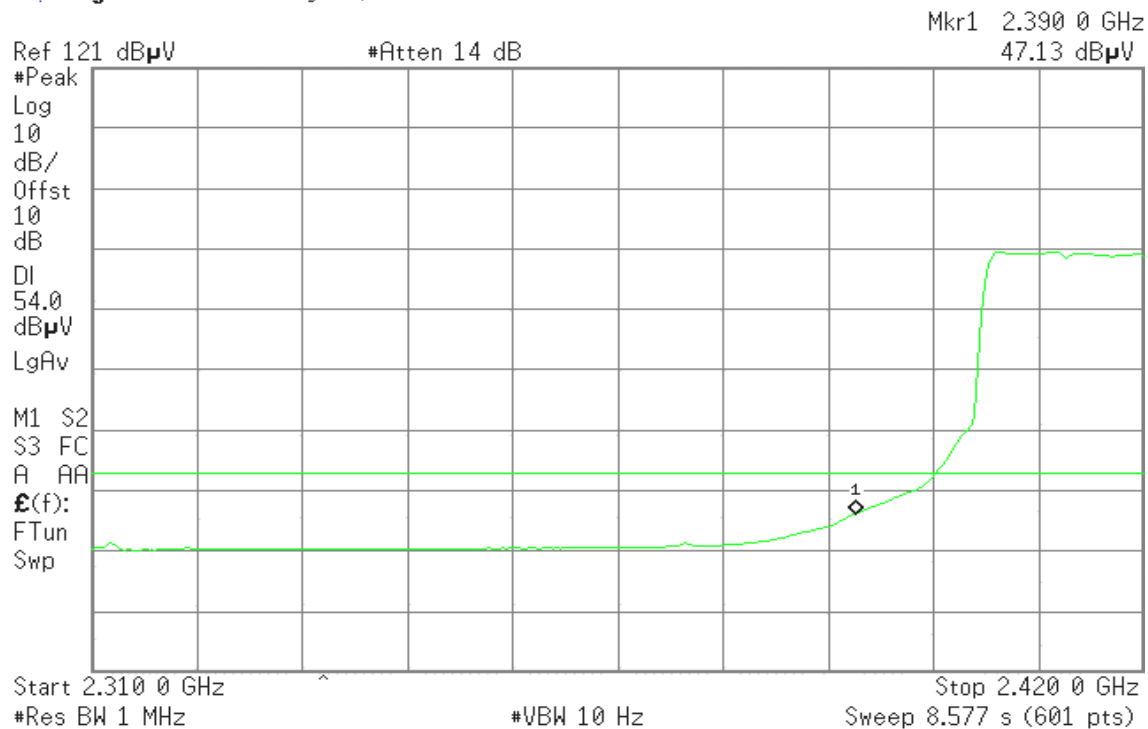


Detector mode: Average

Polarity: Horizontal

Agilent 17:19:34 May 18, 2007

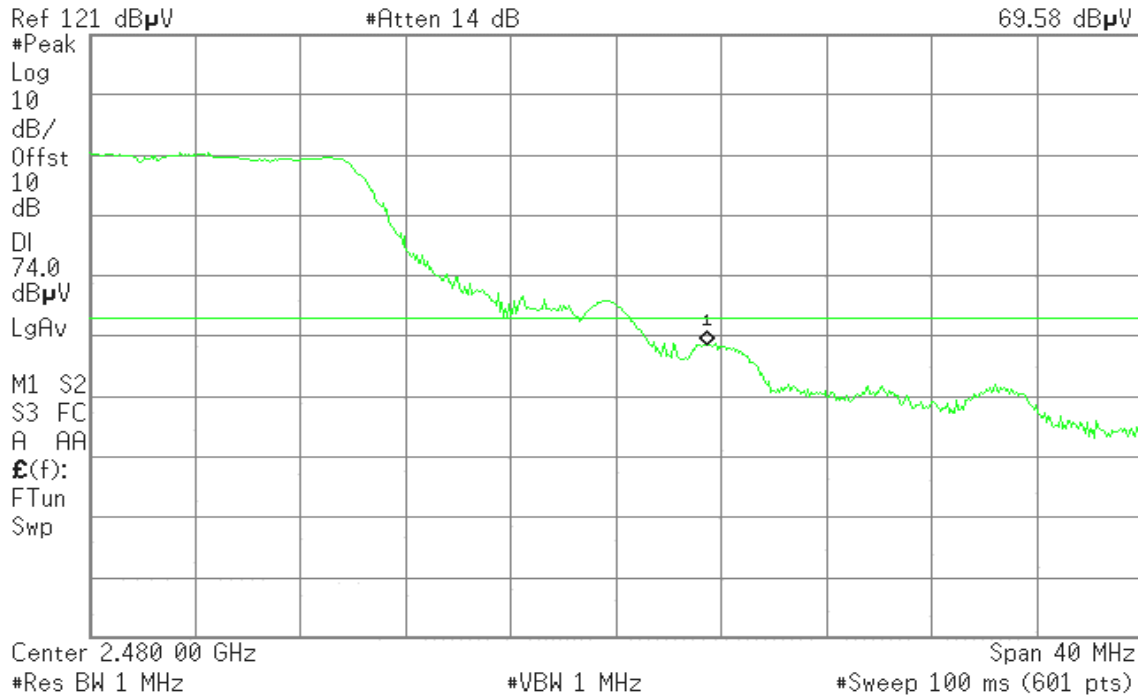
R T



**Band Edges (IEEE 802.11g mode / CH High)****Detector mode: Peak****Polarity: Vertical**

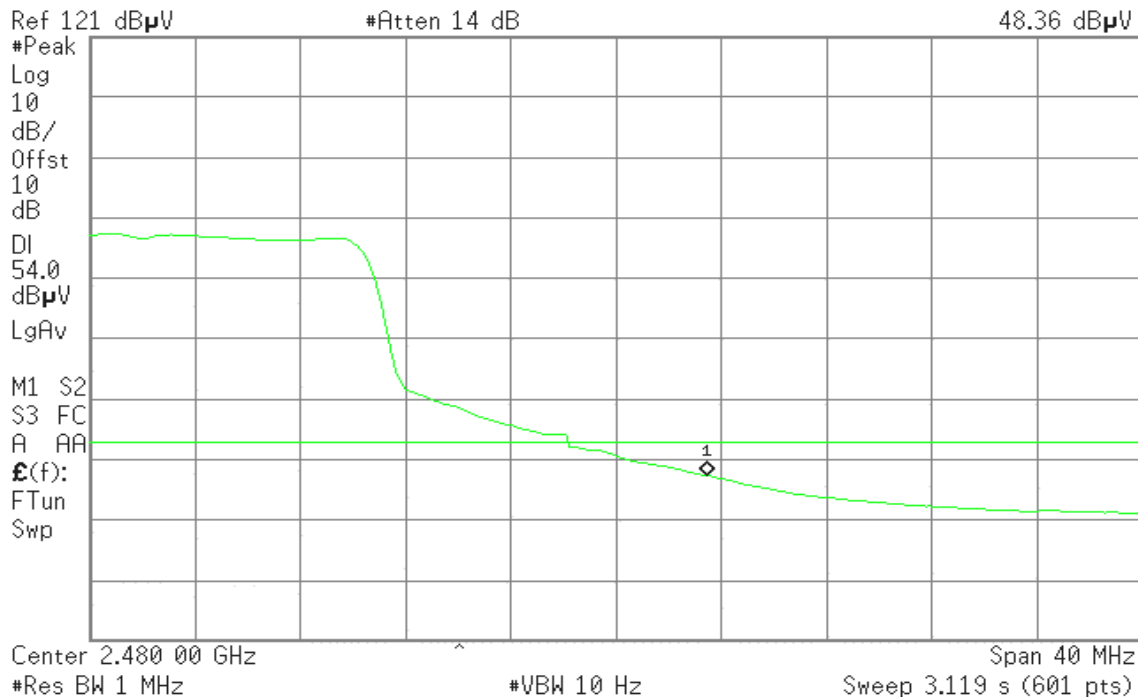
* Agilent 17:07:56 May 18, 2007

R T

Mkr1 2.483 50 GHz
69.58 dB μ V**Detector mode: Average****Polarity: Vertical**

* Agilent 17:08:36 May 18, 2007

R T

Mkr1 2.483 50 GHz
48.36 dB μ V



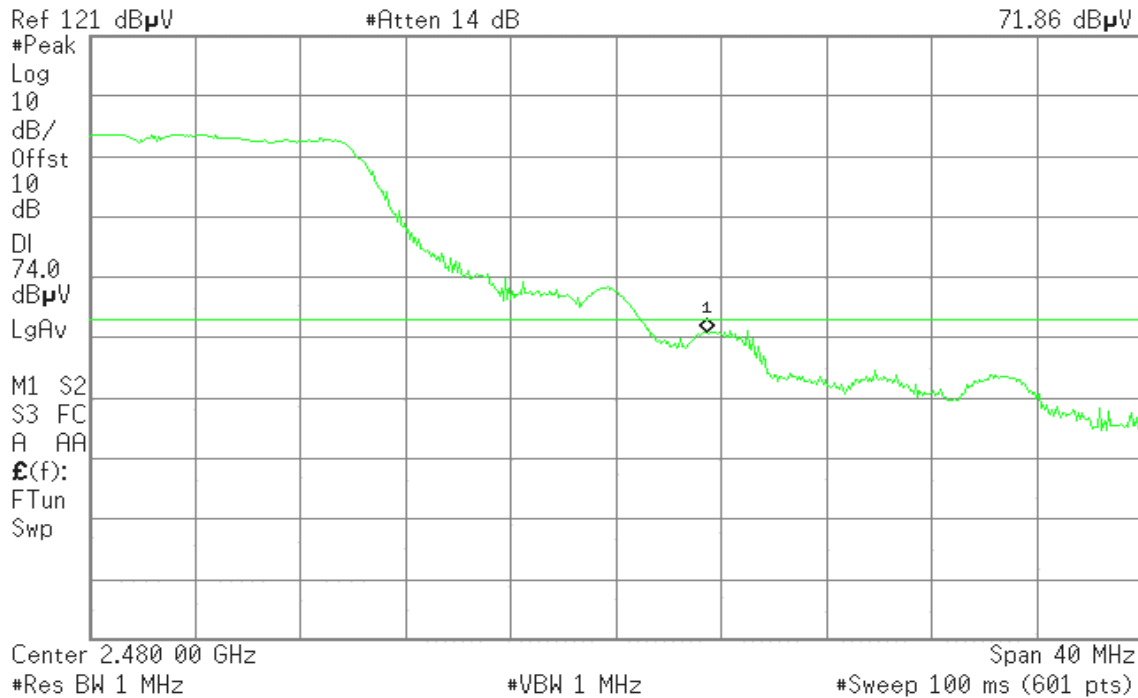
Detector mode: Peak

Polarity: Horizontal

Agilent 17:12:58 May 18, 2007

R T

Mkr1 2.483 50 GHz
71.86 dB μ V



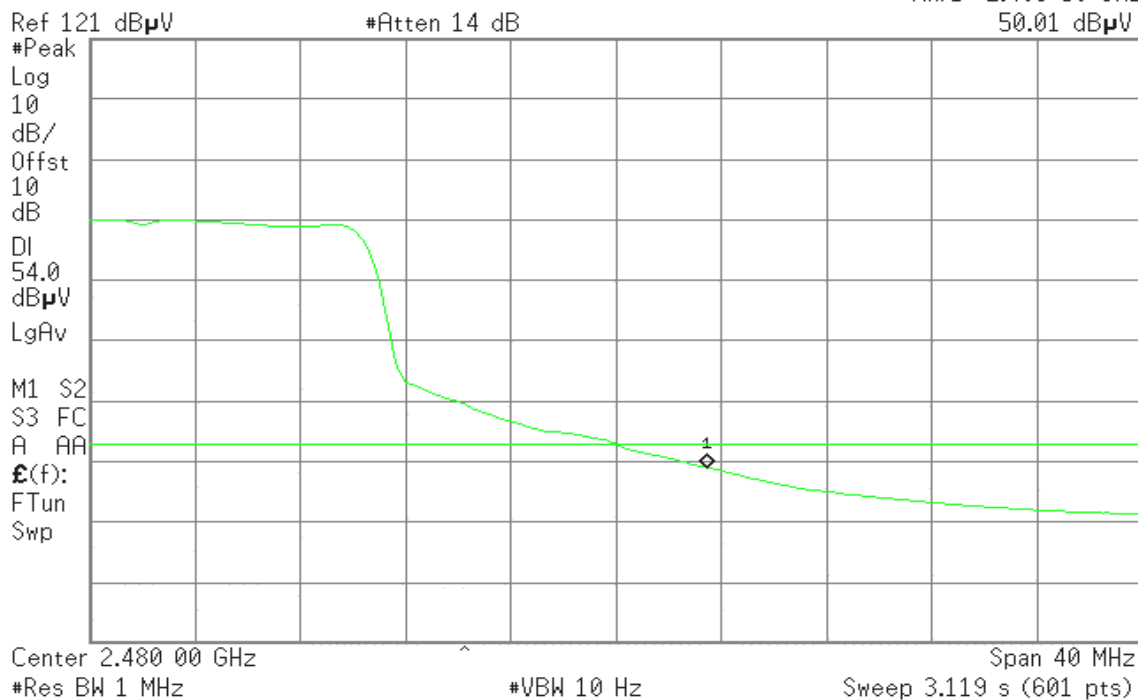
Detector mode: Average

Polarity: Horizontal

Agilent 17:13:41 May 18, 2007

R T

Mkr1 2.483 50 GHz
50.01 dB μ V



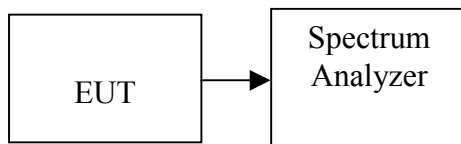


7.5 PEAK POWER SPECTRAL DENSITY

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 = 3kHz, VBW = 10kHz, Span = 300kHz, Sweep=100s.
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 mode**

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-11.91	8.00	PASS
Mid	2437	-12.84		PASS
High	2462	-12.88		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-14.16	8.00	PASS
Mid	2437	-14.01		PASS
High	2462	-12.20		PASS

Test mode: IEEE 802.11a mode

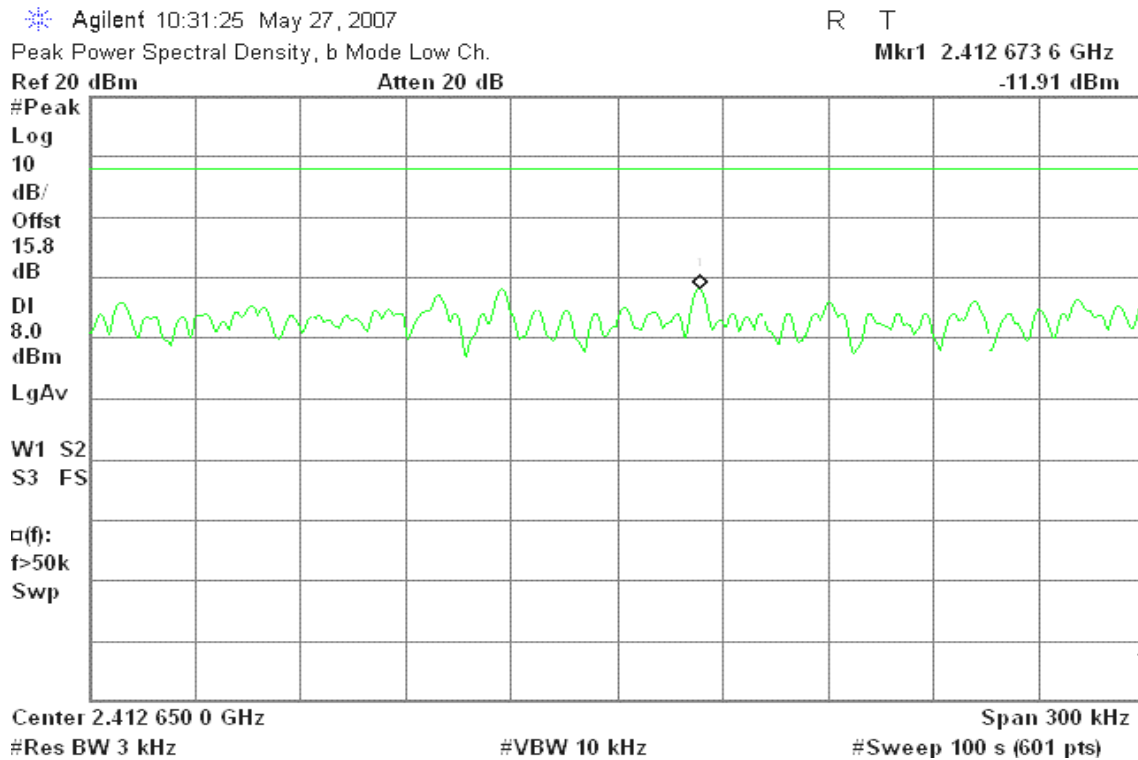
Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	5745	-15.51	8.00	PASS
Mid	5785	-11.89		PASS
High	5825	-12.12		PASS



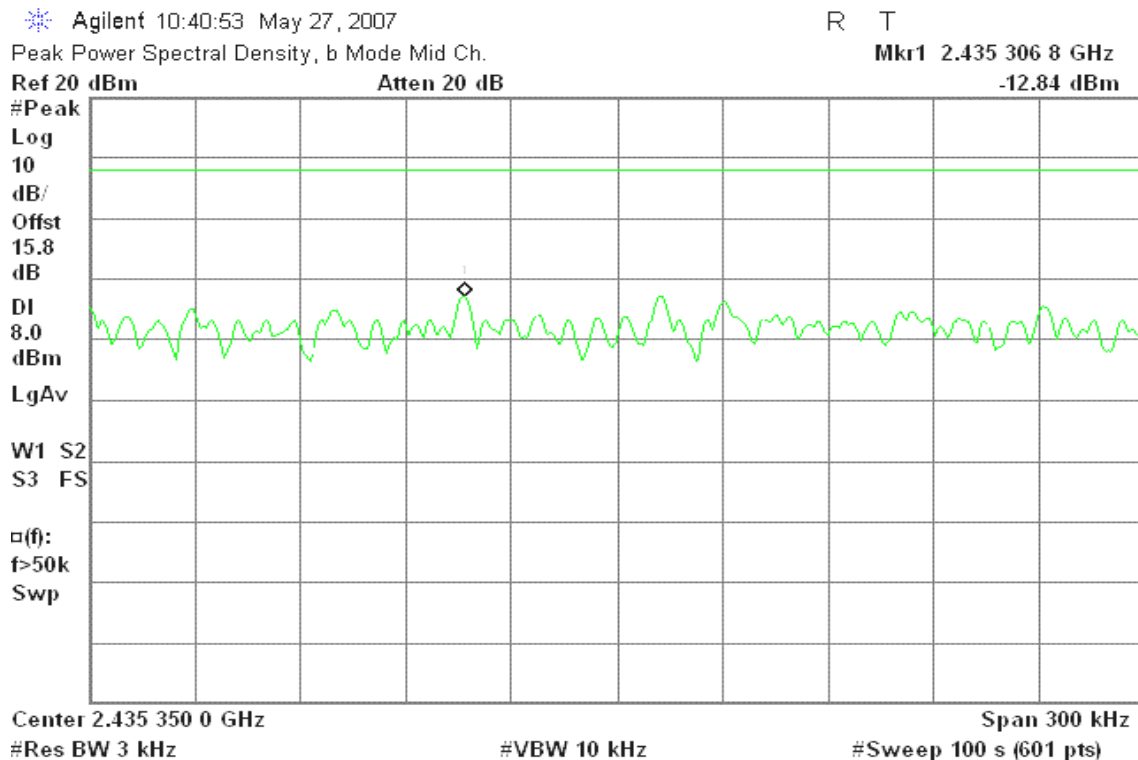
Test Plot

IEEE 802.11b mode

CH Low

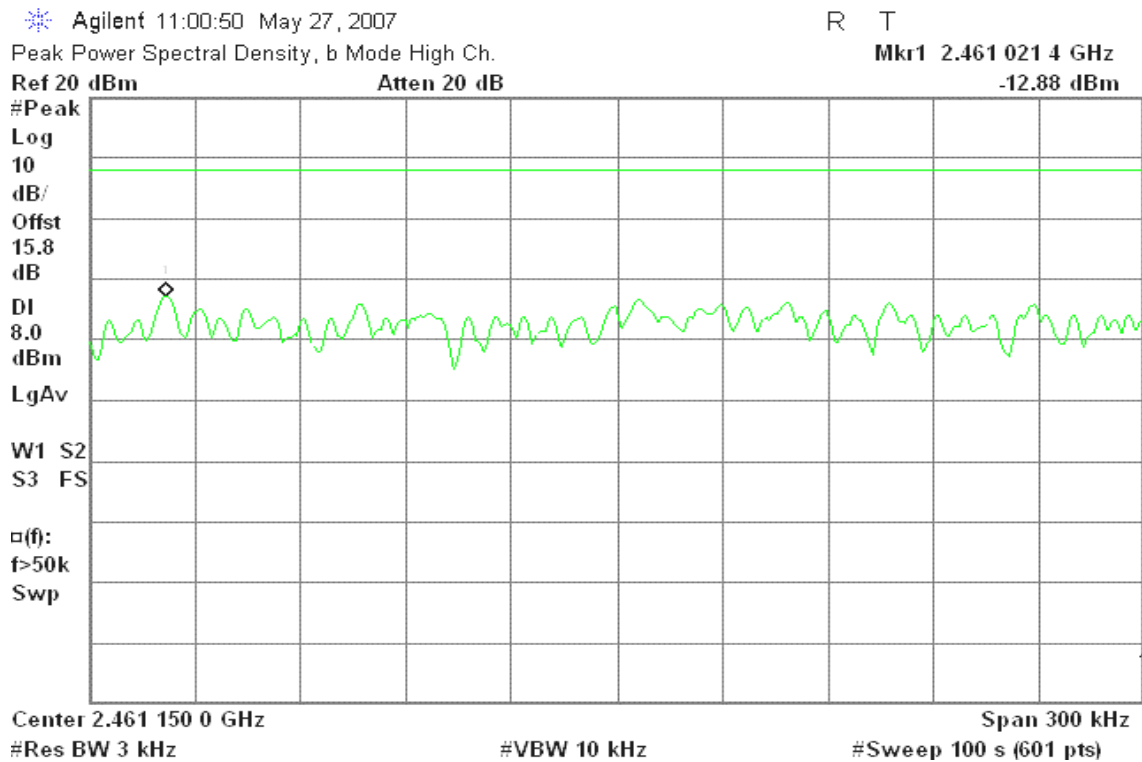


CH Mid



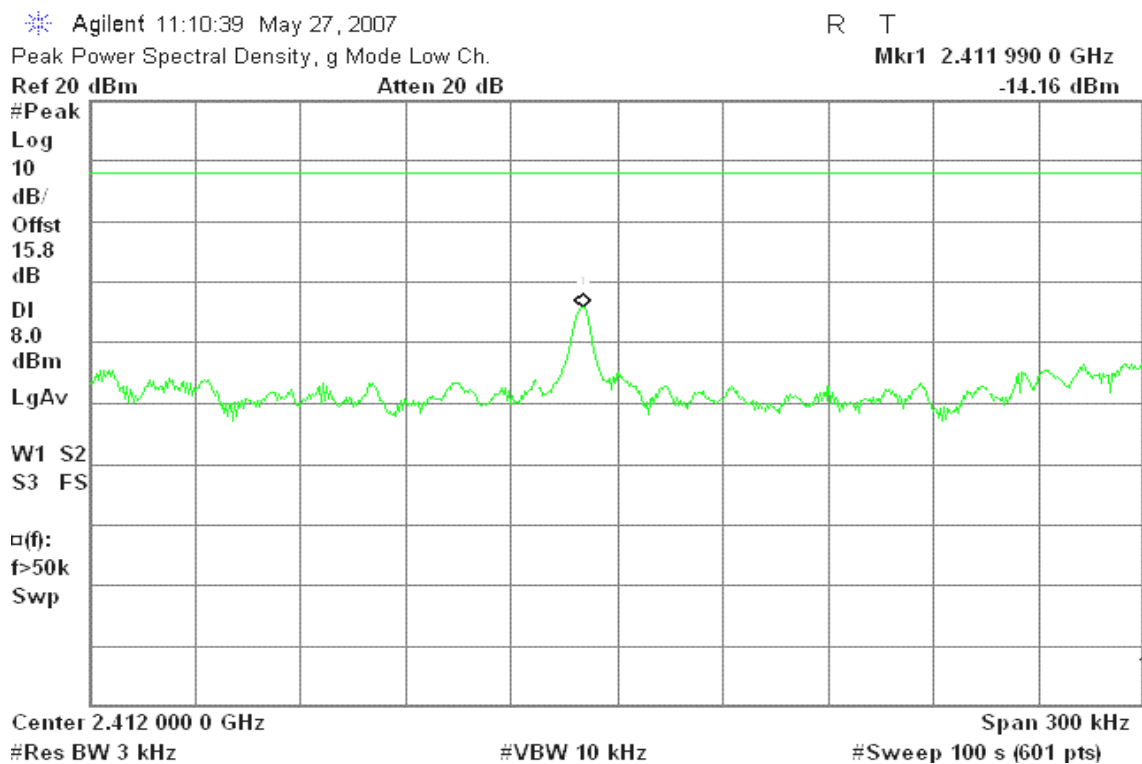


CH High



IEEE 802.11g mode

CH Low





CH Mid

Agilent 11:24:14 May 27, 2007

R T

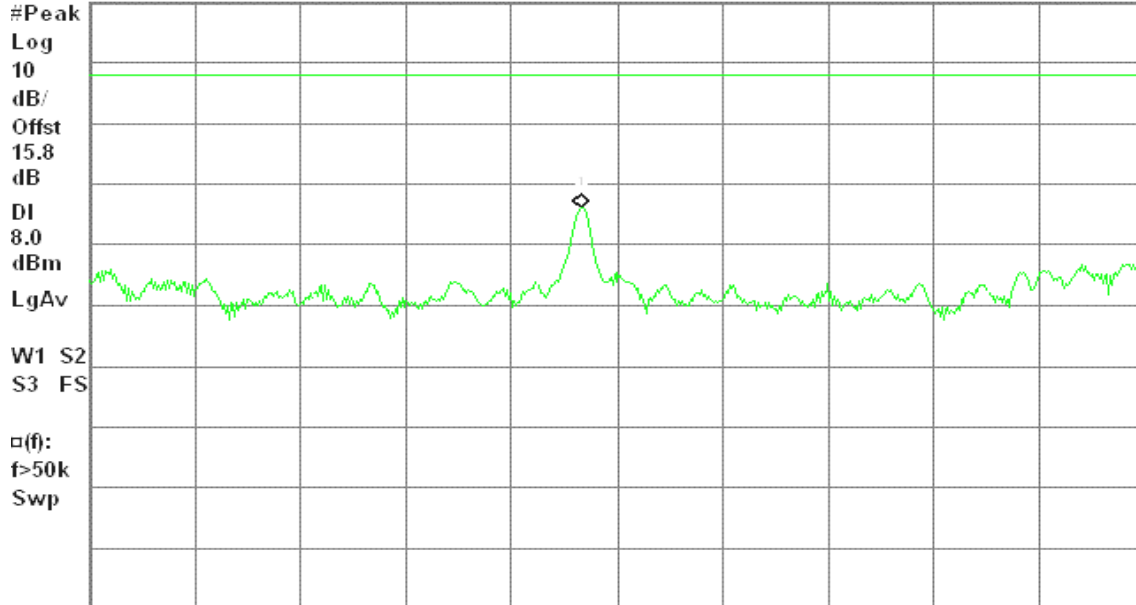
Peak Power Spectral Density, g Mode Mid Ch.

Mkr1 2.436 989 5 GHz

Ref 20 dBm

Atten 20 dB

-14.01 dBm



Center 2.437 000 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

CH High

Agilent 11:39:45 May 27, 2007

R T

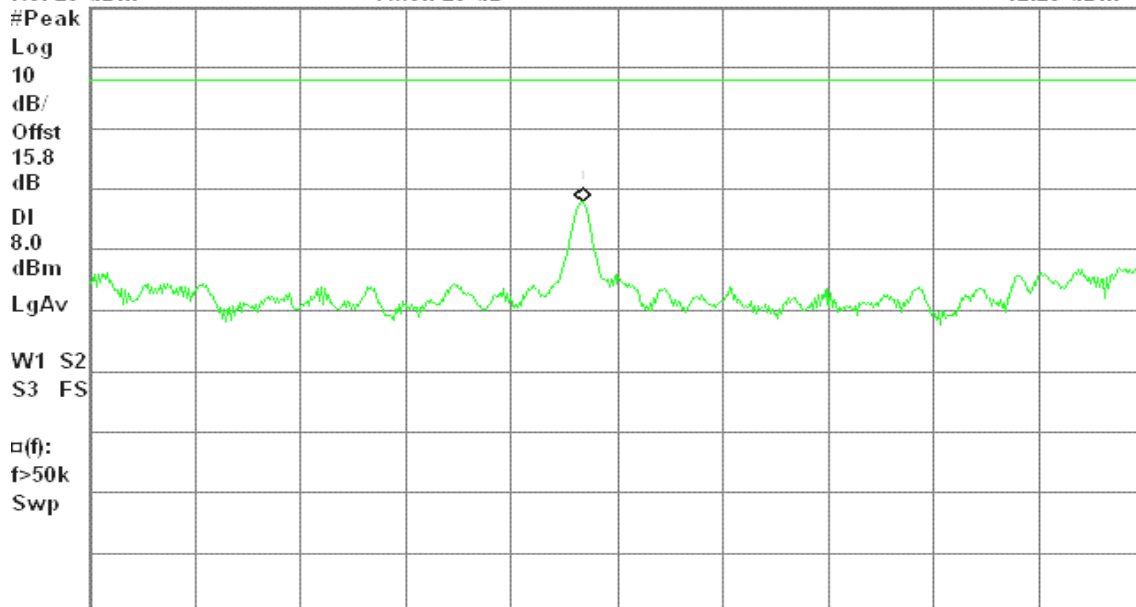
Peak Power Spectral Density, g Mode High Ch.

Mkr1 2.461 990 0 GHz

Ref 20 dBm

Atten 20 dB

-12.20 dBm



Center 2.462 000 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)



IEEE 802.11a mode

CH Low

Agilent 17:40:03 May 31, 2007

R T

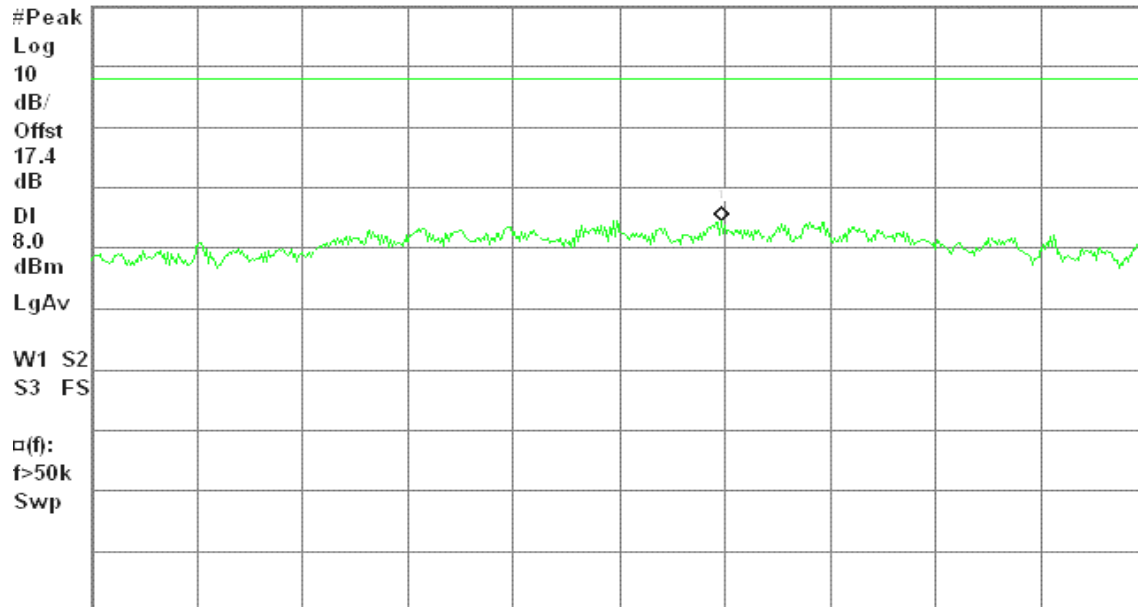
Peak Power Spectral Density, a Mode Low Ch.

Mkr1 5.737 479 1 GHz

Ref 20 dBm

Atten 20 dB

-15.51 dBm



Center 5.737 450 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

CH Mid

Agilent 18:05:00 May 31, 2007

R T

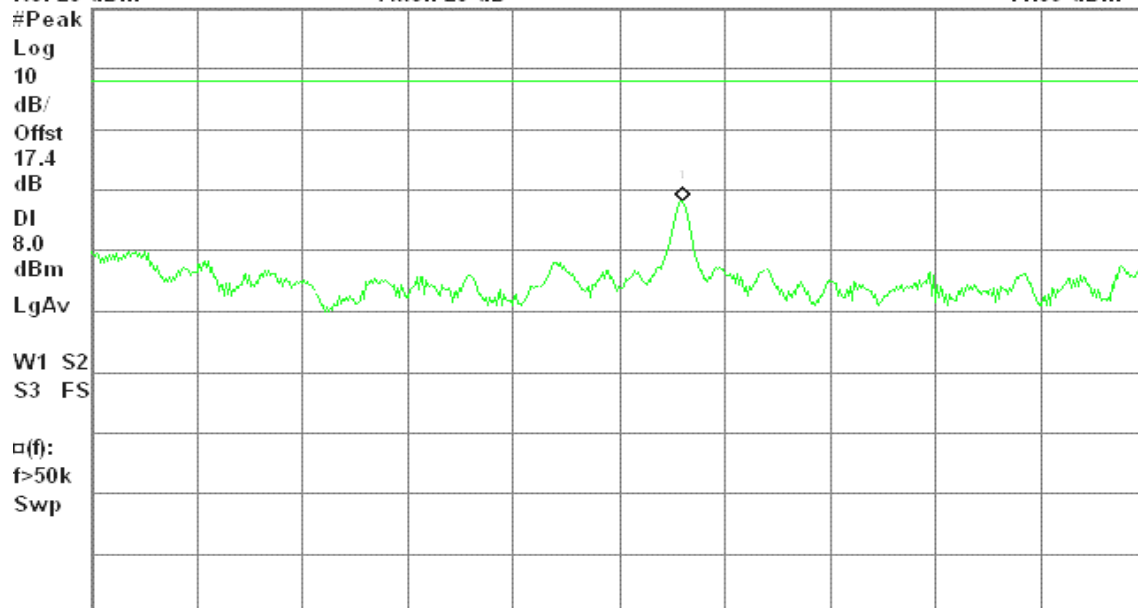
Peak Power Spectral Density, a Mode Mid Ch.

Mkr1 5.784 968 1 GHz

Ref 20 dBm

Atten 20 dB

-11.89 dBm



Center 5.784 950 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)



CH High

Agilent 18:12:37 May 31, 2007

R T

Peak Power Spectral Density, a Mode High Ch.

Mkr1 5.824 969 6 GHz

Ref 20 dBm

Atten 20 dB

-12.12 dBm

#Peak

Log

10

dB/

Offst

17.4

dB

DI

8.0

dBm

LgAv

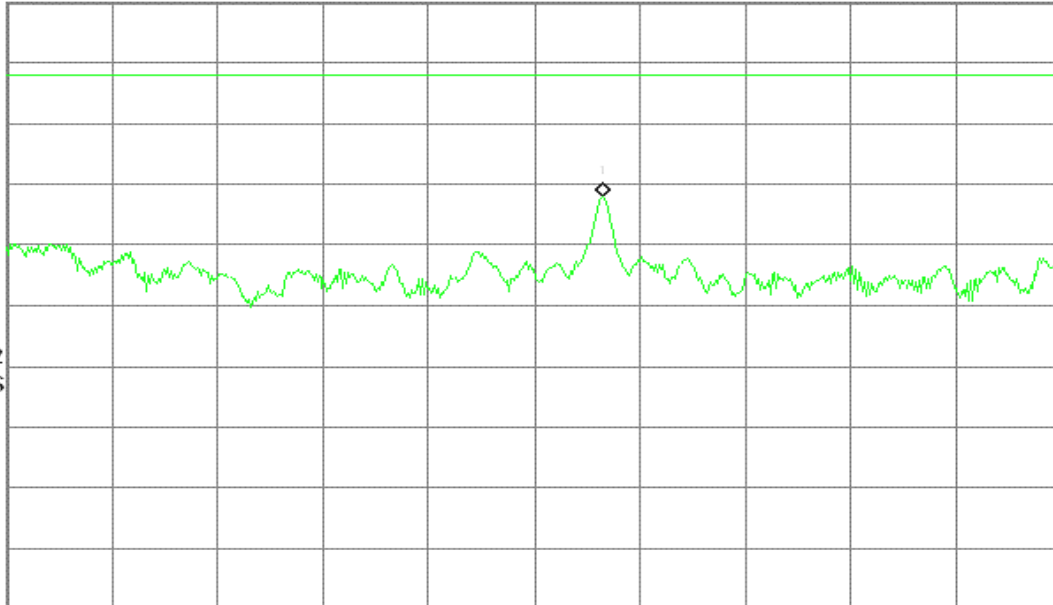
W1 S2

S3 FS

□(f):

f>50k

Swp



Center 5.824 950 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)



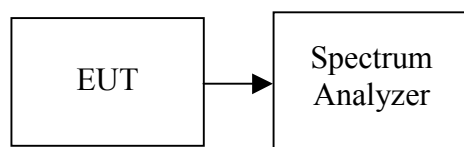
7.6 SPURIOUS EMISSIONS

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 100 kHz.

Measurements are made over the 13GHz to 26GHz range for IEEE 802.11b/g, 20GHz to 40GHz range for IEEE 802.11a with the transmitter set to the lowest, middle, and highest channels.

TEST RESULTS

No non-compliance noted.

**Test Plot****IEEE 802.11b mode / CH Low****13GHz ~ 26GHz**

Agilent 10:32:37 May 27, 2007

R T

Spurious, b Mode Low Ch.

Mkr1 2.42 GHz

Ref 20 dBm

Atten 20 dB

-0.16 dBm

#Peak

Log

10

dB/

Offst

15.8

dB

DI

-20.2

dBm

LgAv

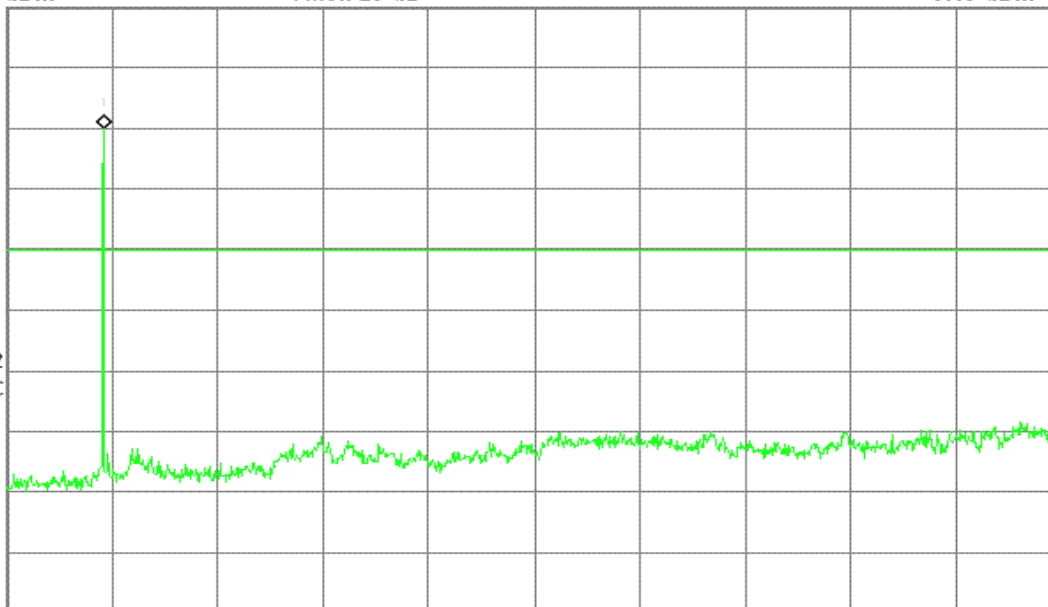
V1 S2

S3 FC

□(f):

FTun

Swp



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

IEEE 802.11b mode / CH Mid**13GHz ~ 26GHz**

Agilent 10:45:49 May 27, 2007

R L

Spurious, b Mode Mid Ch.

Mkr1 2.45 GHz

Ref 20 dBm

Atten 20 dB

1.28 dBm

#Peak

Log

10

dB/

Offst

15.8

dB

DI

-21.3

dBm

LgAv

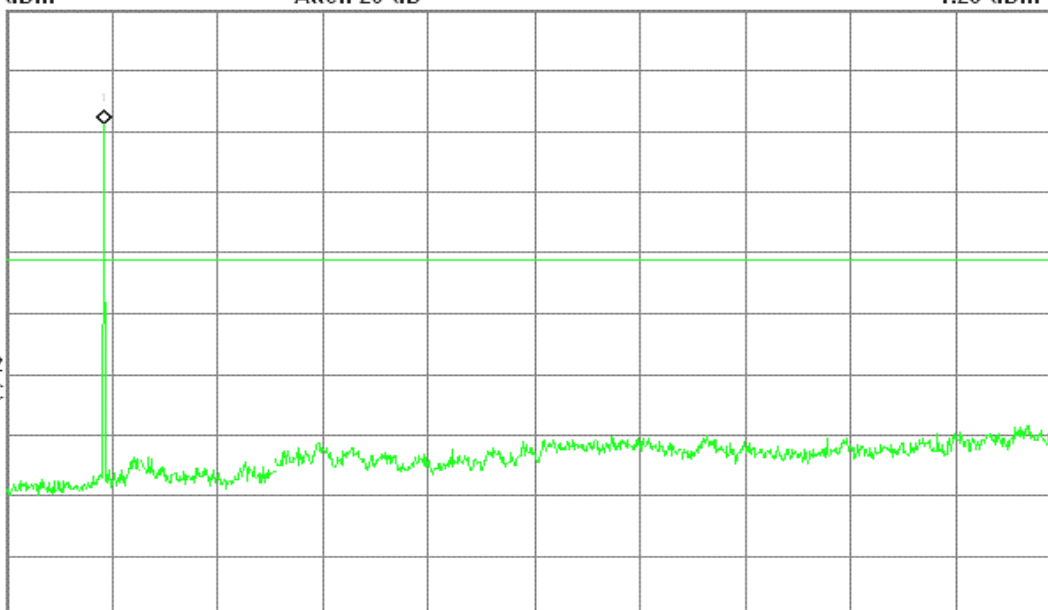
V1 S2

S3 FC

□(f):

FTun

Swp



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)



IEEE 802.11b mode / CH High

13GHz ~ 26GHz

Agilent 11:02:55 May 27, 2007

R T

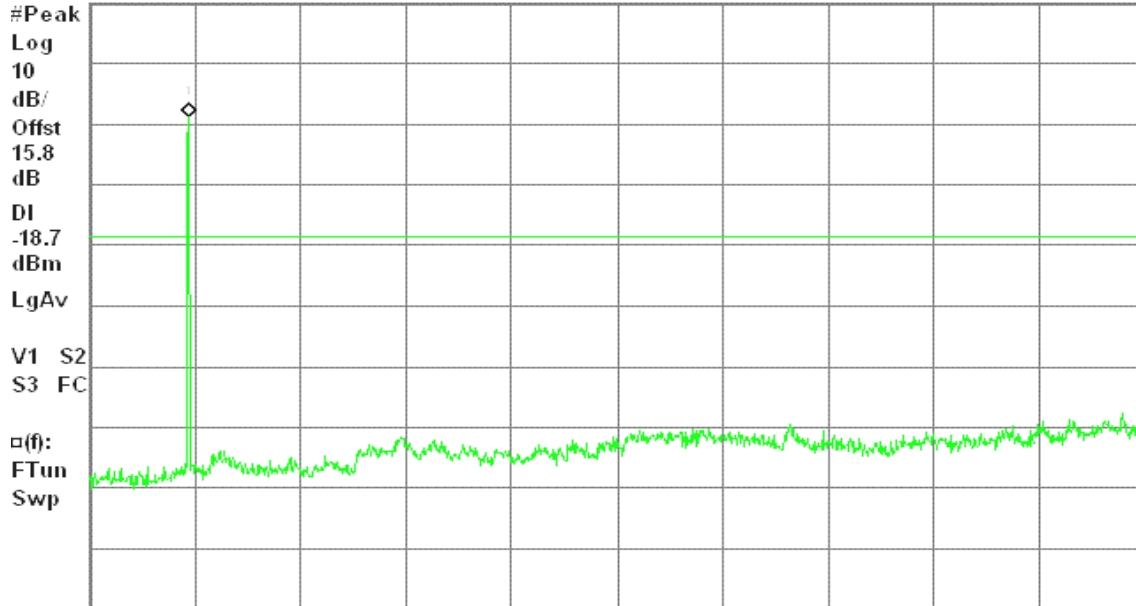
Spurious, b Mode High Ch.

Mkr1 2.47 GHz

Ref 20 dBm

Atten 20 dB

1.27 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

IEEE 802.11g mode / CH Low

13GHz ~ 26GHz

Agilent 11:13:48 May 27, 2007

R T

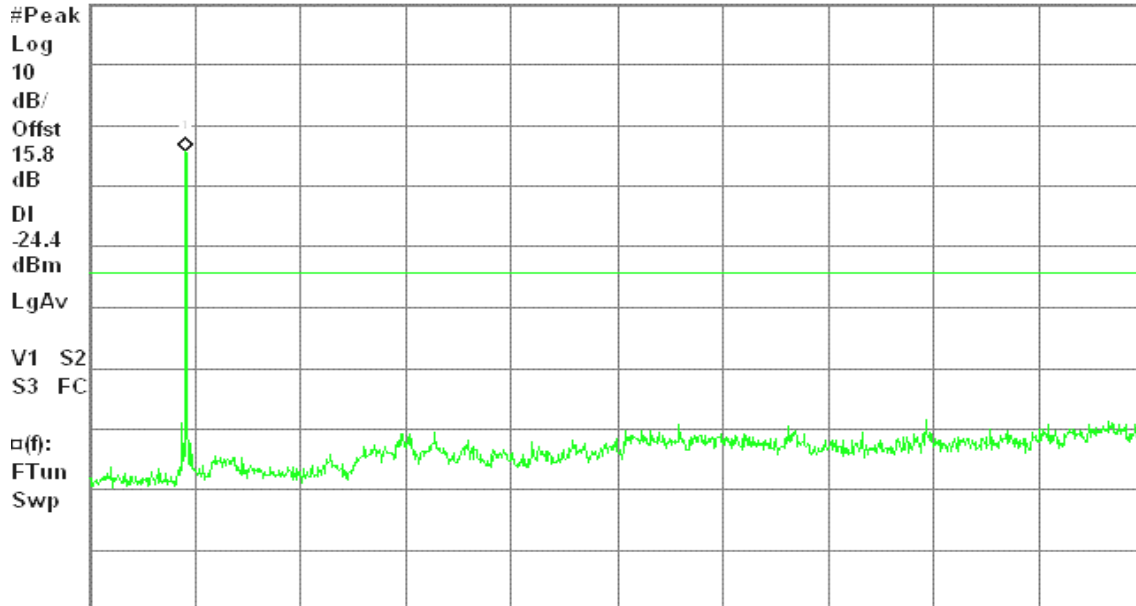
Spurious, g Mode Low Ch.

Mkr1 2.39 GHz

Ref 20 dBm

Atten 20 dB

-4.40 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)



IEEE 802.11g mode / CH Mid

13GHz ~ 26GHz

Agilent 11:25:40 May 27, 2007

R T

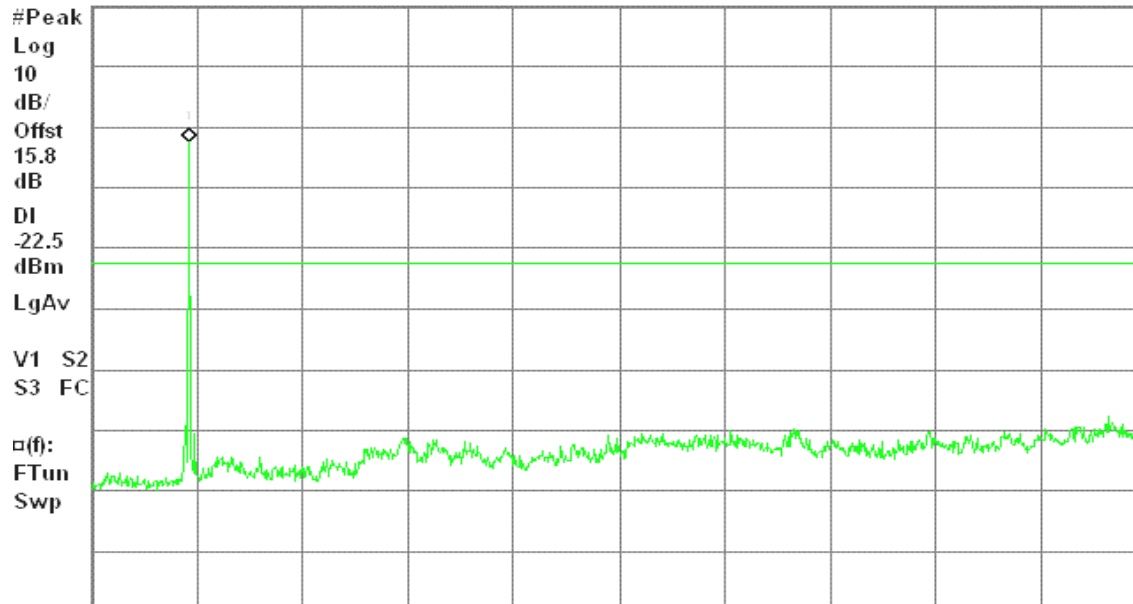
Spurious, g Mode Mid Ch.

Mkr1 2.45 GHz

Ref 20 dBm

Atten 20 dB

-2.46 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

IEEE 802.11g mode / CH High

13GHz ~ 26GHz

Agilent 11:31:13 May 27, 2007

R T

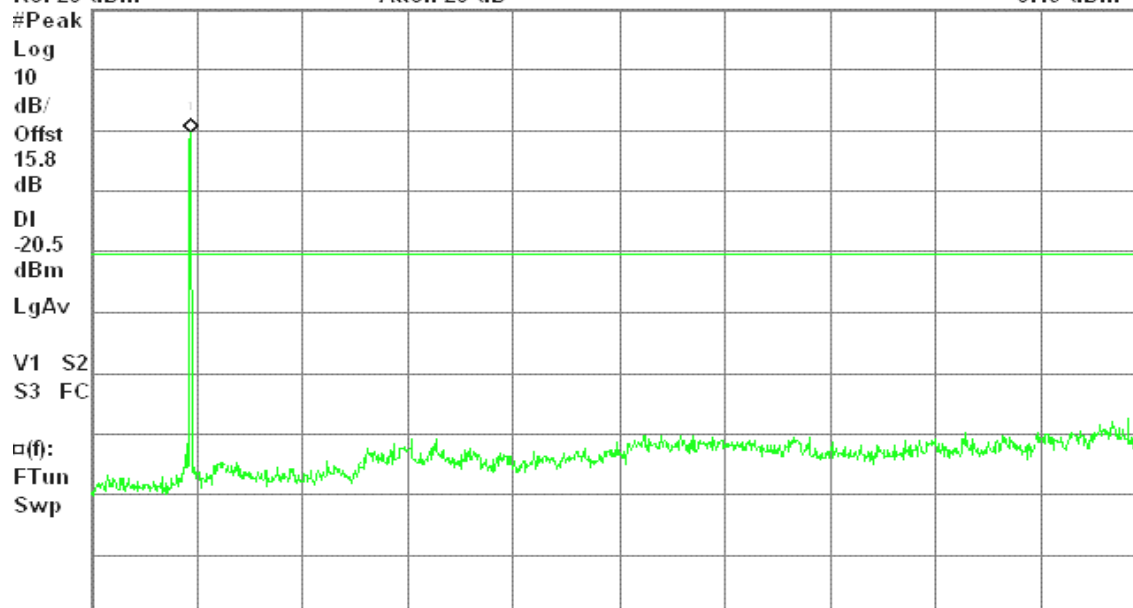
Spurious, g Mode High Ch.

Mkr1 2.47 GHz

Ref 20 dBm

Atten 20 dB

-0.49 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

**IEEE 802.11a mode / CH Low****20GHz ~ 40GHz**

* Agilent 17:41:28 May 31, 2007

R T

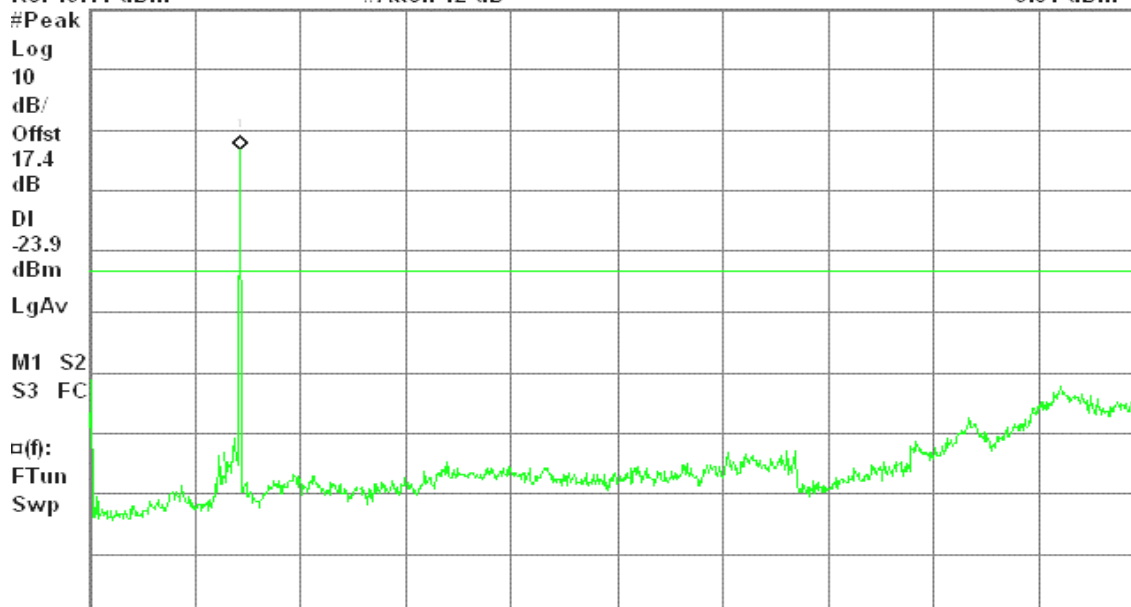
Spurious, a Mode Low Ch.

Mkr1 5.75 GHz

Ref 19.41 dBm

#Atten 12 dB

-3.81 dBm



Center 20.02 GHz

Span 39.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 4.819 s (1001 pts)

IEEE 802.11a mode / CH Mid**20GHz ~ 40GHz**

* Agilent 18:07:17 May 31, 2007

R T

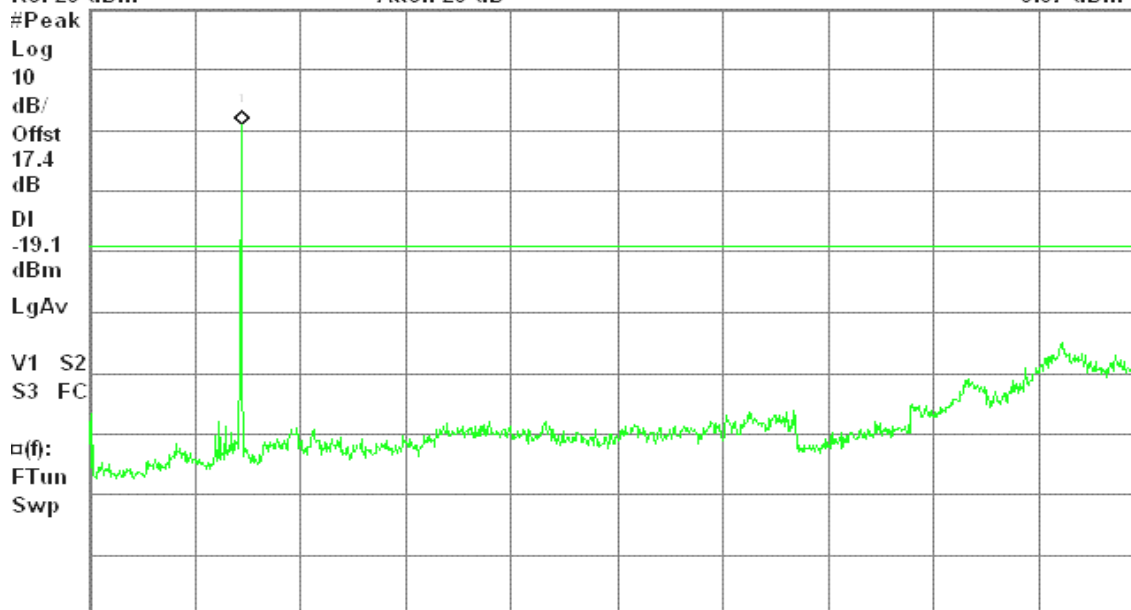
Spurious, a Mode Mid Ch.

Mkr1 5.79 GHz

Ref 20 dBm

Atten 20 dB

0.87 dBm



Center 20.02 GHz

Span 39.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 4.819 s (1001 pts)



IEEE 802.11a mode / CH High

20GHz ~ 40GHz

Agilent 18:14:26 May 31, 2007

R T

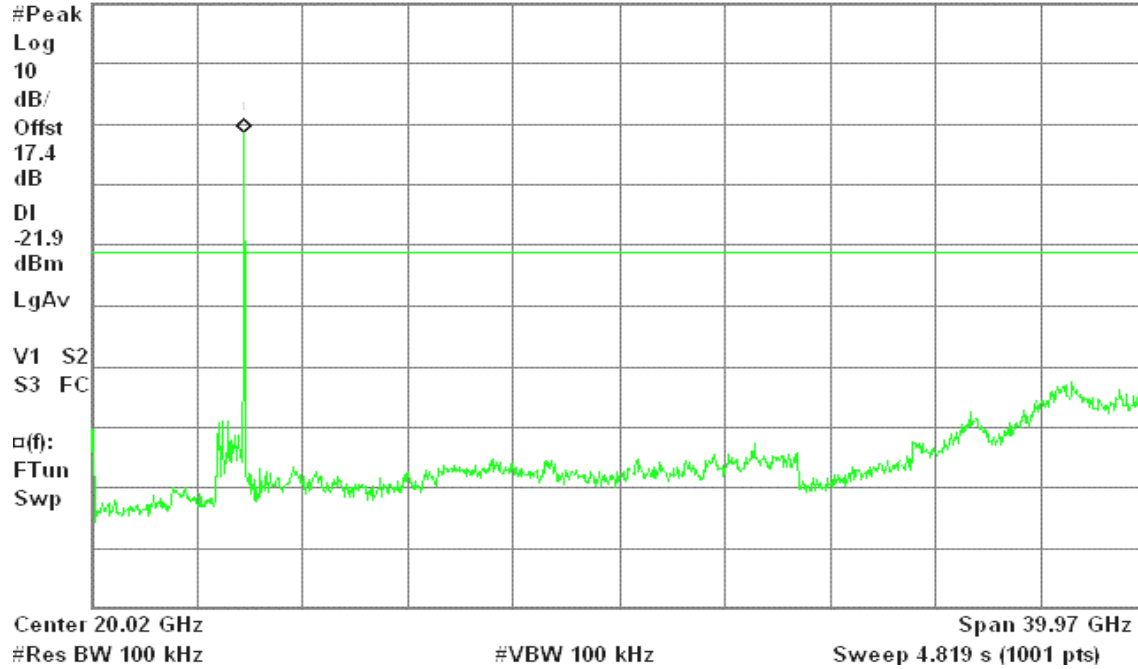
Spurious, a Mode High Ch.

Mkr1 5.83 GHz

Ref 19.41 dBm

#Atten 12 dB

-1.88 dBm





7.6.2 Radiated Emissions

LIMIT

1. 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

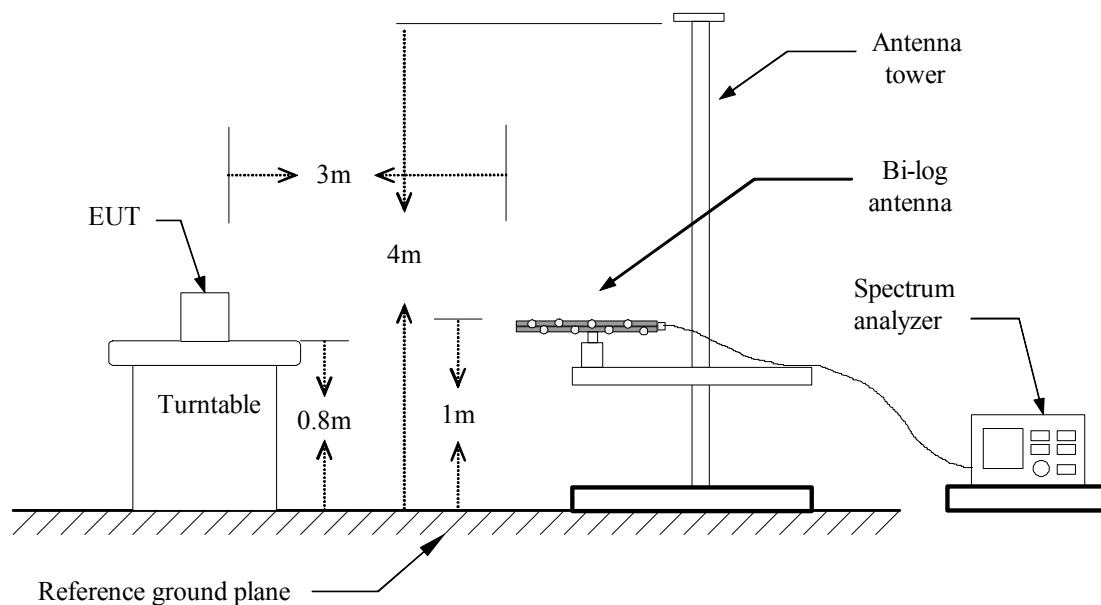
Remark: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of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

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

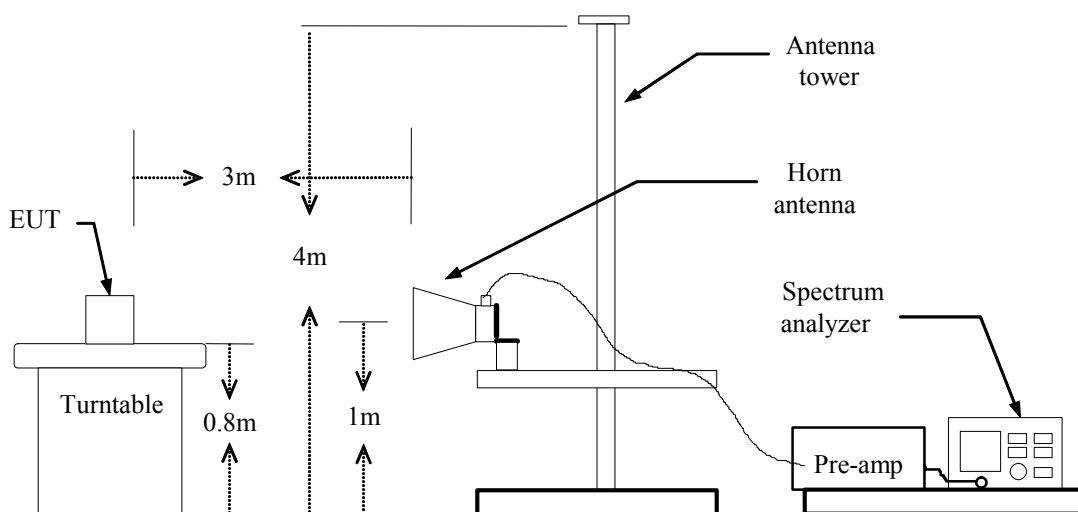
Frequency (MHz)	Field Strength ($\mu\text{V/m}$ at 3-meter)	Field Strength (dB $\mu\text{V/m}$ at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

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

No non-compliance noted

Below 1 GHz

Operation Mode: Normal Link

Test Date: May 18, 2007

Temperature: 20°C

Tested by: Wolf Huang

Humidity: 50% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
227.23	V	53.24	-14.83	38.42	46.00	-7.58	Peak
261.18	V	54.61	-13.84	40.77	46.00	-5.23	Peak
422.85	V	44.77	-9.16	35.61	46.00	-10.39	Peak
553.80	V	42.85	-6.80	36.05	46.00	-9.95	Peak
799.53	V	41.25	-3.16	38.08	46.00	-7.92	Peak
912.70	V	38.43	-1.80	36.63	46.00	-9.37	Peak
227.23	H	51.82	-14.83	37.00	46.00	-9.00	Peak
261.18	H	54.43	-13.84	40.59	46.00	-5.41	Peak
422.85	H	42.64	-9.16	33.48	46.00	-12.52	Peak
618.47	H	42.29	-5.60	36.69	46.00	-9.31	Peak
814.08	H	41.82	-2.82	39.00	46.00	-7.00	Peak
912.70	H	40.81	-1.80	39.01	46.00	-6.99	Peak

Remark:

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

**Above 1 GHz****Operation Mode:** Tx / IEEE 802.11b mode / CH Low**Test Date:** May 18, 2007**Temperature:** 20°C**Tested by:** Wolf Huang**Humidity:** 50% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1070.00	V	55.95	---	-10.68	45.27	---	74.00	54.00	-8.73	Peak
2003.33	V	45.37	---	-5.00	40.38	---	74.00	54.00	-13.62	Peak
2995.00	V	46.08	---	-2.46	43.62	---	74.00	54.00	-10.38	Peak
4826.67	V	45.26	---	0.56	45.82	---	74.00	54.00	-8.18	Peak
N/A										
1175.00	H	48.75	---	-10.51	38.24	---	74.00	54.00	-15.76	Peak
1723.33	H	47.38	---	-7.75	39.63	---	74.00	54.00	-14.37	Peak
4826.67	H	45.97	---	0.56	46.52	---	74.00	54.00	-7.48	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 mode / CH Mid**Test Date:** May 18, 2007**Temperature:** 20°C**Tested by:** Wolf Huang**Humidity:** 50% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1070.00	V	54.00	---	-10.68	43.32	---	74.00	54.00	-10.68	Peak
1431.67	V	50.06	---	-10.09	39.97	---	74.00	54.00	-14.03	Peak
2995.00	V	46.24	---	-2.46	43.78	---	74.00	54.00	-10.22	Peak
4873.33	V	45.66	---	0.60	46.26	---	74.00	54.00	-7.74	Peak
9750.00	V	42.08	---	11.75	53.83	---	74.00	54.00	-0.17	Peak
N/A										
1140.00	H	49.74	---	-10.56	39.17	---	74.00	54.00	-14.83	Peak
1758.33	H	48.24	---	-7.41	40.84	---	74.00	54.00	-13.16	Peak
4873.33	H	47.17	---	0.60	47.77	---	74.00	54.00	-6.23	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. $\text{Margin (dB)} = \text{Remark result (dBuV/m)} - \text{Average limit (dBuV/m)}$.

**Operation Mode:** Tx / IEEE 802.11b mode / CH High**Test Date:** May 18, 2007**Temperature:** 20°C**Tested by:** Wolf Huang**Humidity:** 50% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1070.00	V	53.57	---	-10.68	42.89	---	74.00	54.00	-11.11	Peak
1431.67	V	50.43	---	-10.09	40.35	---	74.00	54.00	-13.65	Peak
2995.00	V	44.43	---	-2.46	41.97	---	74.00	54.00	-12.03	Peak
9850.00	V	40.06	---	11.97	52.03	---	74.00	54.00	-1.97	Peak
N/A										
1175.00	H	48.87	---	-10.51	38.36	---	74.00	54.00	-15.64	Peak
1758.33	H	47.84	---	-7.41	40.43	---	74.00	54.00	-13.57	Peak
2831.67	H	43.40	---	-2.89	40.52	---	74.00	54.00	-13.48	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. $\text{Margin (dB)} = \text{Remark result (dBuV/m)} - \text{Average limit (dBuV/m)}$.

**Operation Mode:** Tx / IEEE 802.11g mode / CH Low**Test Date:** May 18, 2007**Temperature:** 20°C**Tested by:** Wolf Huang**Humidity:** 50% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1070.00	V	53.09	---	-10.68	42.42	---	74.00	54.00	-11.58	Peak
1431.67	V	50.70	---	-10.09	40.61	---	74.00	54.00	-13.39	Peak
2995.00	V	45.62	---	-2.46	43.16	---	74.00	54.00	-10.84	Peak
N/A										
1140.00	H	49.36	---	-10.56	38.80	---	74.00	54.00	-15.20	Peak
1758.33	H	47.77	---	-7.41	40.37	---	74.00	54.00	-13.63	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. $\text{Margin (dB)} = \text{Remark result (dBuV/m)} - \text{Average limit (dBuV/m)}$.

**Operation Mode:** Tx / IEEE 802.11g mode / CH Mid**Test Date:** May 18, 2007**Temperature:** 20°C**Tested by:** Wolf Huang**Humidity:** 50% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1070.00	V	52.48	---	-10.68	41.80	---	74.00	54.00	-12.20	Peak
1431.67	V	50.40	---	-10.09	40.31	---	74.00	54.00	-13.69	Peak
2995.00	V	44.96	---	-2.46	42.51	---	74.00	54.00	-11.49	Peak
N/A										
1140.00	H	49.01	---	-10.56	38.45	---	74.00	54.00	-15.55	Peak
1758.33	H	47.54	---	-7.41	40.14	---	74.00	54.00	-13.86	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. $\text{Margin (dB)} = \text{Remark result (dBuV/m)} - \text{Average limit (dBuV/m)}$.

**Operation Mode:** Tx / IEEE 802.11g mode / CH High**Test Date:** May 18, 2007**Temperature:** 20°C**Tested by:** Wolf Huang**Humidity:** 50% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1070.00	V	53.07	---	-10.68	42.39	---	74.00	54.00	-11.61	Peak
1431.67	V	50.15	---	-10.09	40.06	---	74.00	54.00	-13.94	Peak
2995.00	V	45.28	---	-2.46	42.82	---	74.00	54.00	-11.18	Peak
N/A										
1140.00	H	48.78	---	-10.56	38.22	---	74.00	54.00	-15.78	Peak
1723.33	H	47.46	---	-7.75	39.70	---	74.00	54.00	-14.30	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. $\text{Margin (dB)} = \text{Remark result (dBuV/m)} - \text{Average limit (dBuV/m)}$.

**Operation Mode:** Tx / IEEE 802.11a mode / CH Low**Test Date:** June 1, 2007**Temperature:** 25°C**Tested by:** Wolf Huang**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
1000.00	V	62.03	---	-10.79	51.23	---	74.00	54.00	-2.77	Peak
2995.00	V	47.13	---	-2.46	44.67	---	74.00	54.00	-9.33	Peak
5153.33	V	48.11	---	0.93	49.05	---	74.00	54.00	-4.95	Peak
5748.33	V	48.37	---	1.75	50.11	---	74.00	54.00	-3.89	Peak
6611.67	V	45.51	---	3.21	48.72	---	74.00	54.00	-5.28	Peak
N/A										
2003.33	H	48.39	---	-5.00	43.39	---	74.00	54.00	-10.61	Peak
4931.67	H	48.66	---	0.66	49.31	---	74.00	54.00	-4.69	Peak
5165.00	H	50.81	---	0.95	51.76	---	74.00	54.00	-2.24	Peak
5538.33	H	49.91	---	1.46	51.37	---	74.00	54.00	-2.63	Peak
5736.67	H	50.64	---	1.73	52.37	---	74.00	54.00	-1.63	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. $\text{Margin (dB)} = \text{Remark result (dBuV/m)} - \text{Average limit (dBuV/m)}$.

**Operation Mode:** Tx / IEEE 802.11a mode / CH Mid**Test Date:** June 1, 2007**Temperature:** 20°C**Tested by:** Wolf Huang**Humidity:** 50% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1070.00	V	60.50	---	-10.68	49.82	---	74.00	54.00	-4.18	Peak
2995.00	V	47.92	---	-2.46	45.46	---	74.00	54.00	-8.54	Peak
5176.67	V	47.28	---	0.97	48.25	---	74.00	54.00	-5.75	Peak
5550.00	V	48.31	---	1.48	49.78	---	74.00	54.00	-4.22	Peak
5783.33	V	47.38	---	1.80	49.18	---	74.00	54.00	-4.82	Peak
N/A										
1070.00	H	52.79	---	-10.68	42.11	---	74.00	54.00	-11.89	Peak
5188.33	H	52.81	---	0.98	53.79	---	74.00	54.00	-0.21	Peak
5550.00	H	51.72	---	1.48	53.20	---	74.00	54.00	-0.80	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. $\text{Margin (dB)} = \text{Remark result (dBuV/m)} - \text{Average limit (dBuV/m)}$.

**Operation Mode:** Tx / IEEE 802.11a mode / CH High**Test Date:** June 1, 2007**Temperature:** 20°C**Tested by:** Wolf Huang**Humidity:** 50% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1000.00	V	62.12	---	-10.79	51.33	---	74.00	54.00	-2.67	Peak
2995.00	V	47.71	---	-2.46	45.26	---	74.00	54.00	-8.74	Peak
5223.33	V	50.67	---	1.03	51.70	---	74.00	54.00	-2.30	Peak
N/A										
4850.00	H	48.32	---	0.58	48.89	---	74.00	54.00	-5.11	Peak
5001.67	H	52.10	---	0.73	52.82	---	74.00	54.00	-1.18	Peak
5211.67	H	61.07	48.67	1.01	62.08	49.68	74.00	54.00	-4.32	AVG
5585.00	H	50.64	---	1.52	52.16	---	74.00	54.00	-1.84	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. $\text{Margin (dB)} = \text{Remark result (dBuV/m)} - \text{Average limit (dBuV/m)}$.



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:** May 7, 2007
Temperature: 25°C **Tested by:** Snake Shan
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
0.178	30.400	30.320	0.143	30.543	30.463	64.564	54.564	-34.020	-24.100	L1
0.313	26.980	26.400	0.100	27.080	26.500	59.889	49.889	-32.809	-23.389	L1
1.074	26.120	25.620	0.100	26.220	25.720	56.000	46.000	-29.780	-20.280	L1
1.638	27.630	27.440	0.100	27.730	27.540	56.000	46.000	-28.270	-18.460	L1
2.271	28.190	27.530	0.100	28.290	27.630	56.000	46.000	-27.710	-18.370	L1
4.541	35.250	34.330	0.154	35.404	34.484	56.000	46.000	-20.596	-11.516	L1
0.443	30.100	28.480	0.100	30.200	28.580	57.004	47.004	-26.804	-18.424	L2
0.893	29.720	29.660	0.100	29.820	29.760	56.000	46.000	-26.180	-16.240	L2
1.338	23.680	22.760	0.100	23.780	22.860	56.000	46.000	-32.220	-23.140	L2
2.064	31.480	31.190	0.100	31.580	31.290	56.000	46.000	-24.420	-14.710	L2
2.930	32.250	29.880	0.100	32.350	29.980	56.000	46.000	-23.650	-16.020	L2
4.799	26.960	24.330	0.180	27.140	24.510	56.000	46.000	-28.860	-21.490	L2

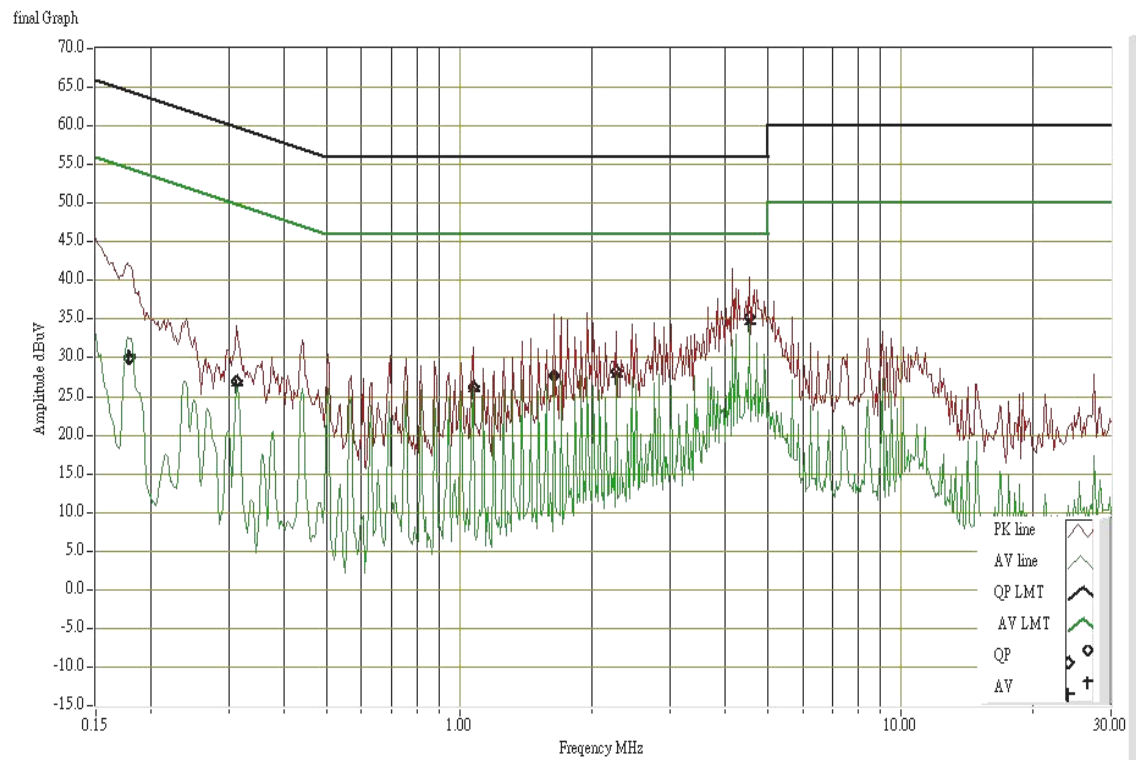
Remark:

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



Test Plots

Conducted emissions (Line 1)



Conducted emissions (Line 2)

