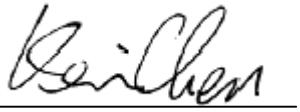
EMC
TEST REPORT

Report No. : EME-050551
Model No. : DWL-G820, WAP-G06
Issued Date : July 1, 2005

Applicant : D-Link Corporation Inc.
No. 8, Li-shing Road VII, Science-based Industrial Park, Hsinchu, Taiwan

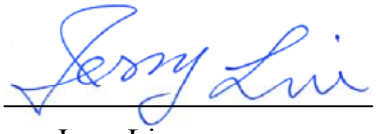
Test By : Intertek Testing Services Taiwan Ltd.
No. 11, Lane 275, Ko-Nan 1 Street, Chia-Tung Li, Shiang-Shan District, Hsinchu City, Taiwan

Project Engineer



Kevin Chen

Reviewed By



Jerry Liu

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Summary of Tests

Wireless 108G Gaming / Bridge Adapter-Model: DWL-G820
FCC ID: KA2WLG820B1

Test	Reference	Results
Minimum 6dB Bandwidth test	15.247(a)(2)	Complies
Maximum Output Power test	15.247(b)	Complies
Radiated Spurious Emission test	15.205, 15.209	Complies
Power Spectrum Density test	15.247(e)	Complies
Emission on the Band Edge test	15.247(d)	Complies
AC Power Line Conducted Emission test	15.207	Complies

1. General information

1.1 Identification of the EUT

Applicant	: D-Link Corporation Inc.
Product	: Wireless 108G Gaming / Bridge Adapter
Model No.	: DWL-G820
FCC ID.	: KA2WLG820B1
Frequency Range	: 2412MHz ~ 2462MHz
Channel Number	: 11channels
Frequency of Each Channel	: 2412MHz, 2417MHz, 2422MHz, 2427MHz, 2432MHz, 2437MHz, 2442MHz, 2447MHz, 2452MHz, 2457MHz, 2462MHz
Type of Modulation	: DSSS, OFDM
Rated Power	: 100-120Vac, 50-60Hz with adapter (JTA0302A)
Power Cord	: N/A
Data Cable	: RJ-45 UTP Cat.5 10meter × 1
Sample Received	: May 30, 2005
Test Date(s)	: May 30, 2005 ~ June 30, 2005

A FCC DoC report has been generated for the client.

1.2 Additional information about the EUT

The EUT is a Wireless 108G Gaming / Bridge Adapter, and was defined as information technology equipment.

The DWL-G820 works with any Ethernet-ready game console, making it ideal for both head-to-head and online gaming. Use Wireless Gaming/ Bridge Adapters to wirelessly connect two game systems to each other or use one to connect your system to a wireless network.

And when not gaming, you can use the DWL-G820 to make any Ethernet-enabled device, such as a media set-top box, wireless, The DWL-G820 is a true plug & play device that requires no configuration and is ready to work right out of the box.

The Wireless Gaming/Bridge Adapter is also highly configurable, using any Java-enabled Web browser. With support for several advanced features, including Wi-Fi Protected Access (WPA) and 128-bit WEP encryption, the Wireless Gaming/ Bridge Adapter also protects your wireless signal.

The DWL-G820 uses D-Ling 108G Technology for data transfer rates that are 15x faster than standard 802.11b rates and works with all 802.11g networks. The device is also backwards

compatible with 802.1b wireless networks. This Gaming Adapter provides lag-free performance and allows your gaming console to join your wireless network.

Intertek verified that WAP-G06 is series model to DWL-G820 (EUT), for these models are identical in hardware aspect, and the difference is in model number only.

According to the hardware aspect, Intertek verified the model listed as below is series model to DWL-G820 (EUT), the difference please refer to the following table:

Trade Name	Model No.
D-Link	DWL-G820
Alpha	WAP-G06

For more detail features, please refer to User's manual as file name “Installation guide.pdf”

1.3 Antenna description

The antenna is affixed to the EUT using a unique connector, which allows for replacement of a broken antenna, but DOES NOT use a standard antenna jack or electrical connector.

Antenna Gain : 2.0dBi max
Antenna Type : Dipole antenna
Connector Type : SMA Reverse

1.4 Peripherals equipment

Peripherals	Manufacturer	Product No.	Serial No.	FCC ID
Notebook PC	HP	XE_3	TW20705468	FCC DoC Approved
AP	SMC	WG 4005-17 2 (A3)	C-G 3030232-1-1-3*1000	FCC DoC Approved

2. Test specifications

2.1 Test standard

The EUT was performed according to the procedures in FCC Part 15 Subpart C Section § 15.205、§15.207、§15.209、§15.247 and ANSI C63.4/2003.

The test of radiated measurements according to FCC Part15 Section 15.33(a) had been conducted and the field strength of this frequency band were all meet limit requirement, thus we evaluate the EUT pass the specified test.

2.2 Operation mode

The EUT was connected to laptop via RJ-45 UTP Cat.5 Cable (10m), and the test program “art.exe” was run under windows OS, which provide by manufacturer.

During conducted emission test, the EUT functioned in normal mode and communicated with AP. While in other test, it worked in the status of continuously transmitting.

With individual verifying, the maximum output power was found at 11Mbps data rate for 802.11b mode and 6Mbps data rate for 802.11g modes. The final tests were executed under these conditions and recorded in this report individually.

2.3 Test equipment

Equipment	Brand	Frequency range	Model No.	Intertek ID No.	Next Cal. Date
EMI Test Receiver	Rohde & Schwarz	9kHz~2.75GHz	ESCS 30	EC303	04/17/2006
EMI Test Receiver	Rohde & Schwarz	20Hz~26.5GHz	ESMI	EC317	07/14/2005
Spectrum Analyzer	Rohde & Schwarz	9kHz~30GHz	FSP 30	EC353	07/13/2005
Spectrum Analyzer	Rohde & Schwarz	20Hz~40GHz	FSEK 30	EC365	10/18/2005
Horn Antenna	SCHWARZBECK	1GHz~18GHz	BBHA 9120 D	EC371	12/22/2007
Horn Antenna	SCHWARZBECK	14GHz~40GHz	BBHA 9170	EC351	07/08/2007
Bilog Antenna	SCHWARZBECK	25MHz~2GHz	VULB 9168	EC347	12/23/2007
Pre-Amplifier	MITEQ	100MHz~26.5GHz	919981	EC373	12/30/2005
Pre-Amplifier	MITEQ	26GHz~40GHz	828825	EC374	01/28/2006
Wideband Peak Power Meter/ Sensor	Anritsu	100MHz~18GHz	ML2497A/ MA2491A	EC396	10/18/2005
Controller	HDGmbH	N/A	CM 100	EP346	N/A
Antenna Tower	HDGmbH	N/A	MA 240	EP347	N/A
LISN	Rohde & Schwarz	9KHz~30MHz	ESH3-Z5	EC344	01/13/2006

Note: 1. The above equipments are within the valid calibration period.
2. The test antennas (receiving antenna) are calibration per 3 years.

3. Minimum 6dB Bandwidth test

3.1 Operating environment

Temperature:	25	℃
Relative Humidity:	56	%
Atmospheric Pressure:	1023	hPa

3.2 Test setup & procedure

The minimum 6dB bandwidth per FCC §15.247(a)(2) was measured using a 50 ohm spectrum analyzer with the resolutions bandwidth set at 100kHz, the video bandwidth set at 300kHz, and the SPAN>>RBW. The test was performed at 3 channels (lowest, middle and highest channel). The minimum 6-dB modulation bandwidth is in the following Table.

3.3 Measured data of Minimum 6dB Bandwidth test results

Test Mode: 802.11b operating mode (DSSS Modulation)

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit
1	2412	11.18236473	＞500kHz
6	2437	11.54308617	＞500kHz
11	2462	11.58316633	＞500kHz

Test Mode: 802.11g operating mode (OFDM Modulation)

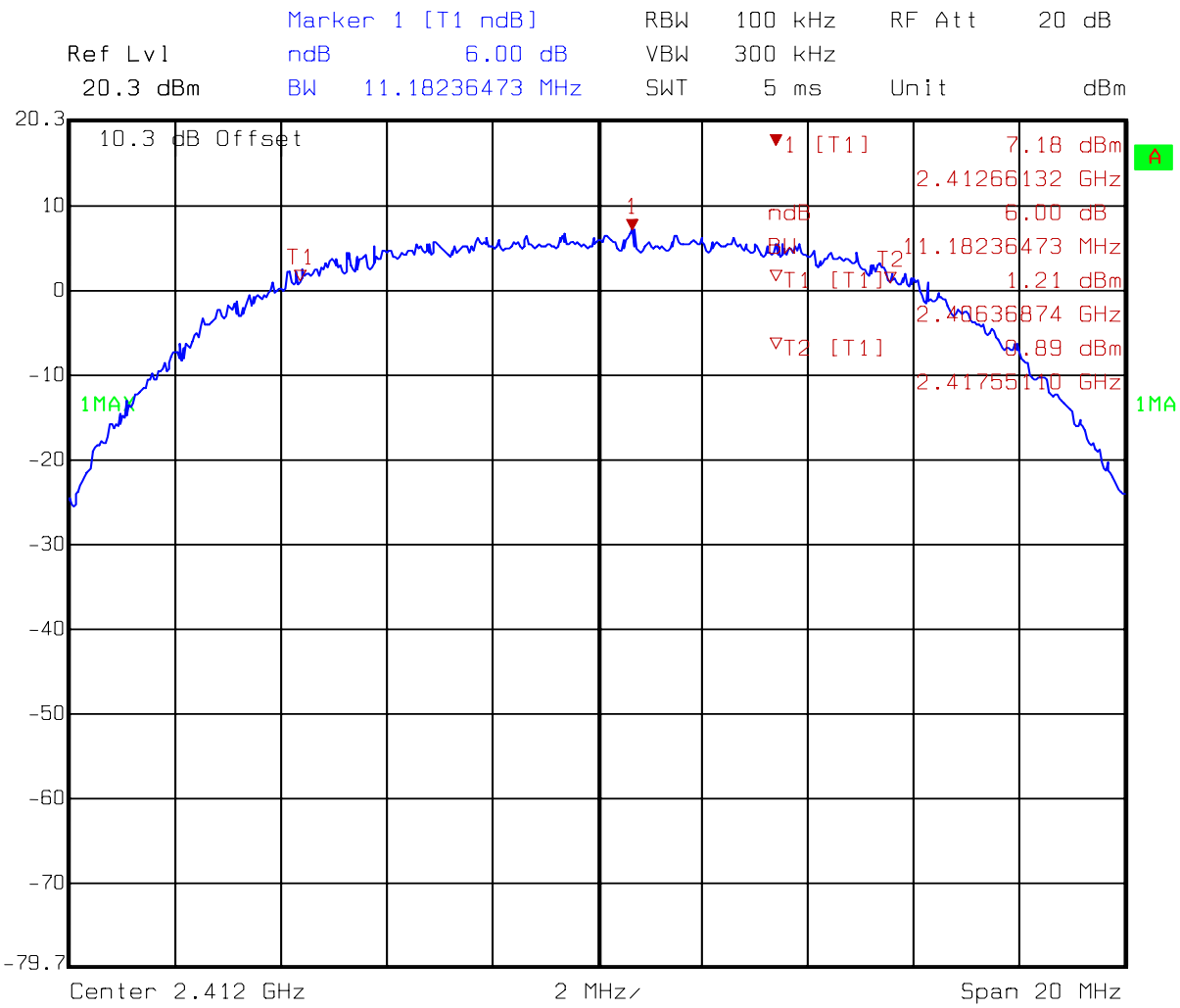
Channel	Frequency (MHz)	Bandwidth (MHz)	Limit
1	2412	16.43286573	＞500kHz
6	2437	16.35270541	＞500kHz
11	2462	16.47294589	＞500kHz

Test Mode: Turbo mode

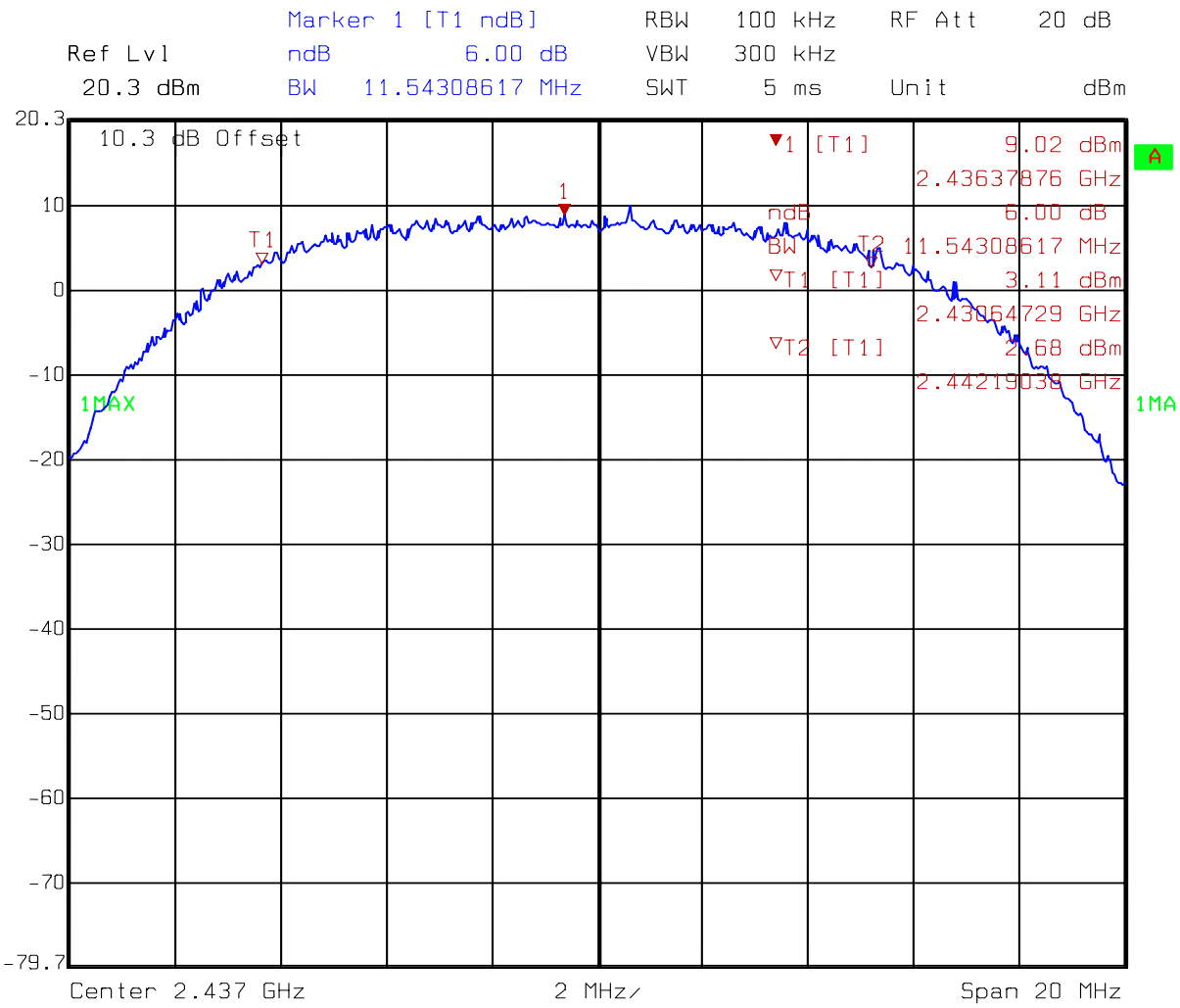
Channel	Frequency (MHz)	Bandwidth (MHz)	Limit
6	2437	32.86573146	＞500kHz

Please see the plot below.

Test Mode: 802.11b(DSSS Modulation) operating mode



Comment A: 6dB BW
11b CH1
Date: 29.JUN.2005 10:33:39



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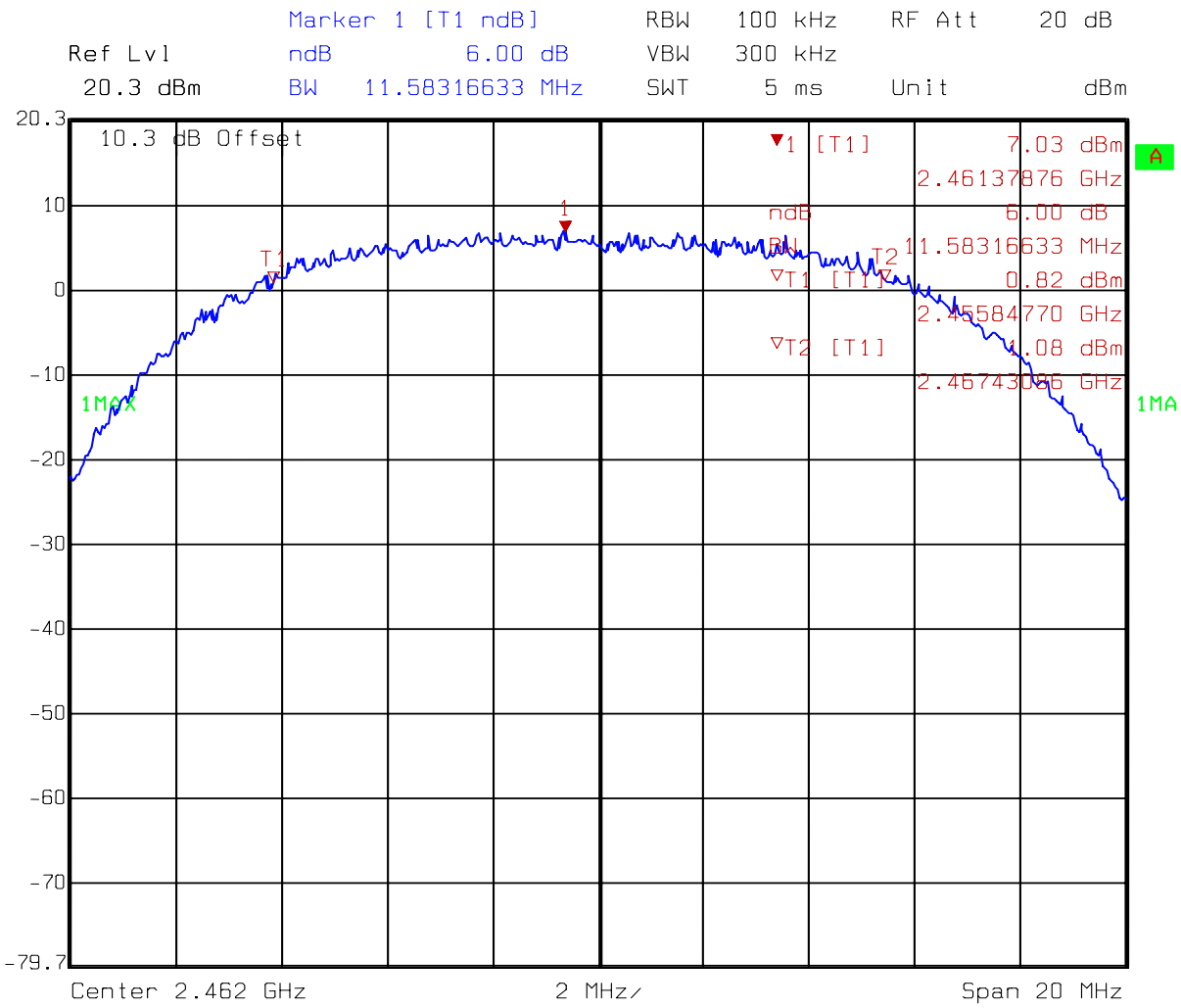
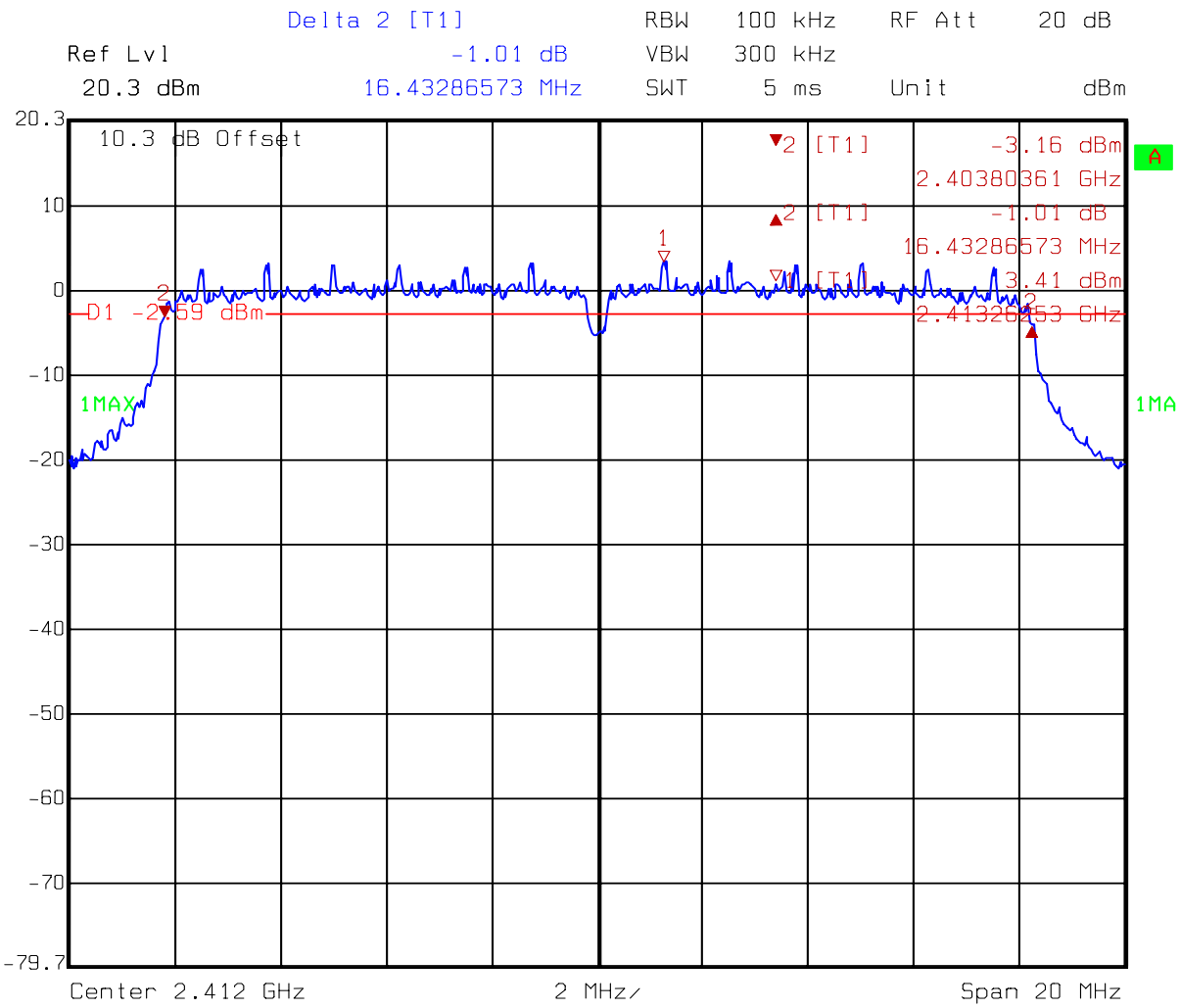
11b CH6
Date: 29.JUN.2005 10:32:21



Comment A: 6dB BW
11b CH11
Date: 29.JUN.2005 10:34:51

Test Mode: 802.11g(OFDM Modulation) operating mode



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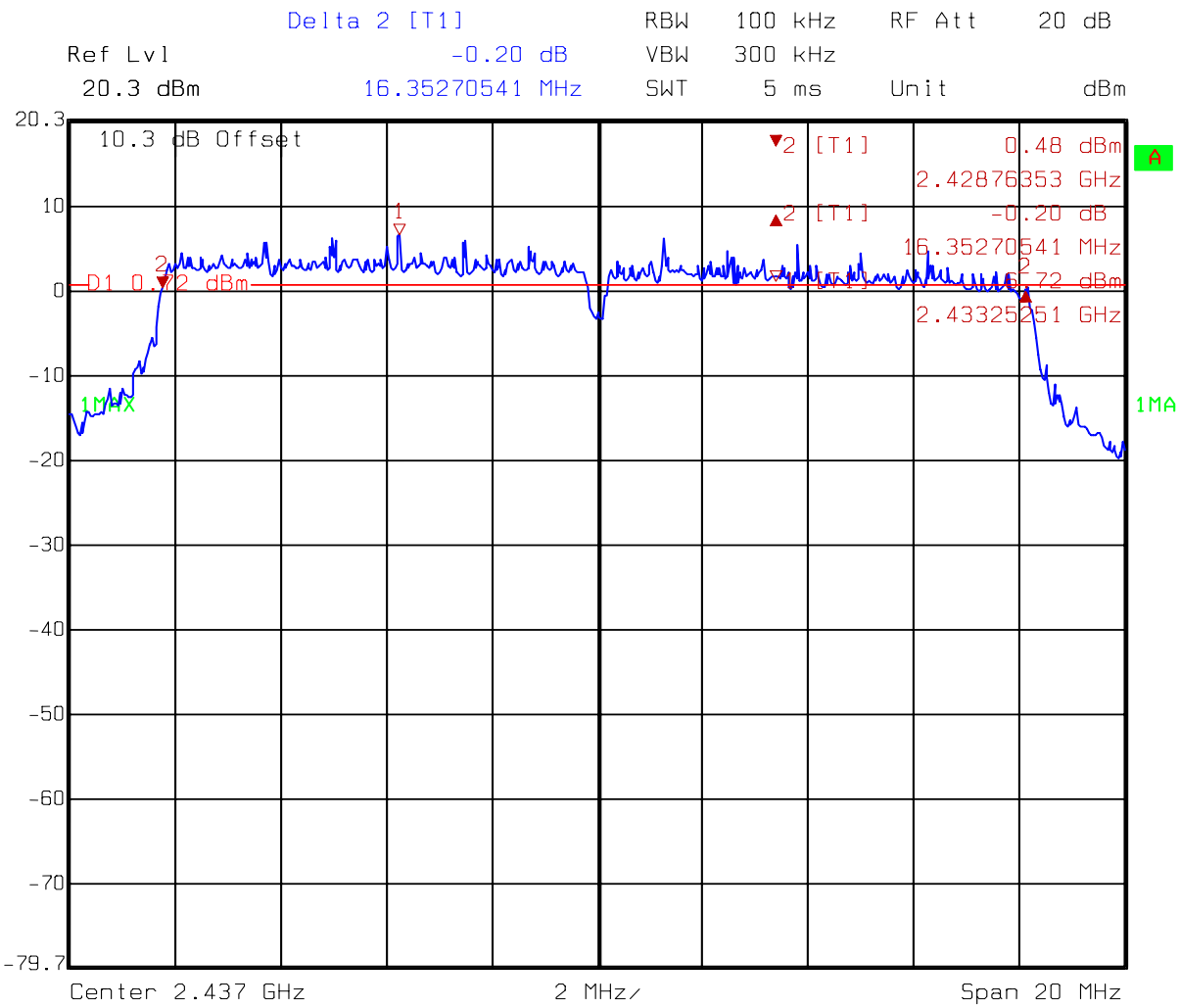
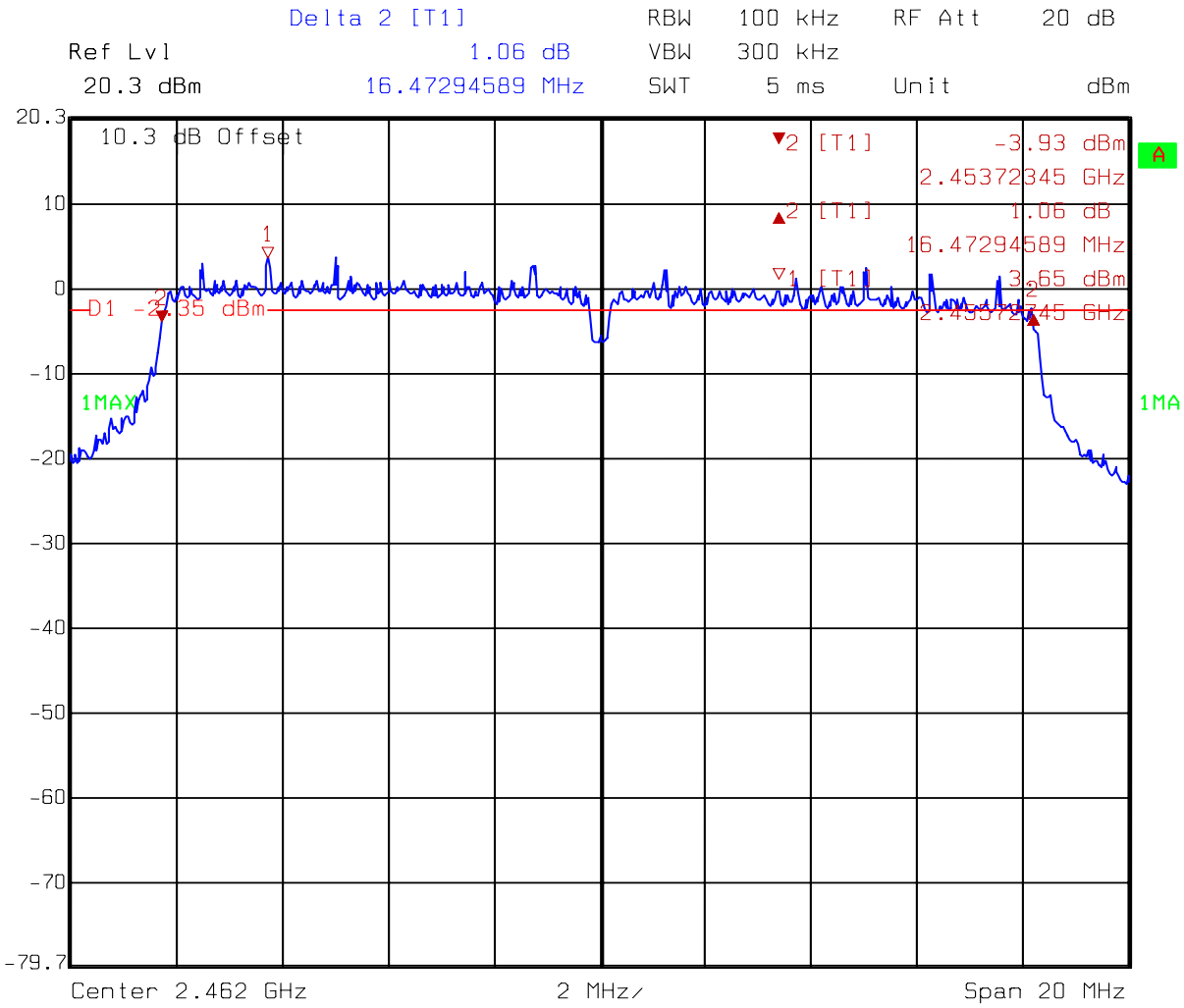
11g CH1
Date: 29.JUN.2005 10:39:29

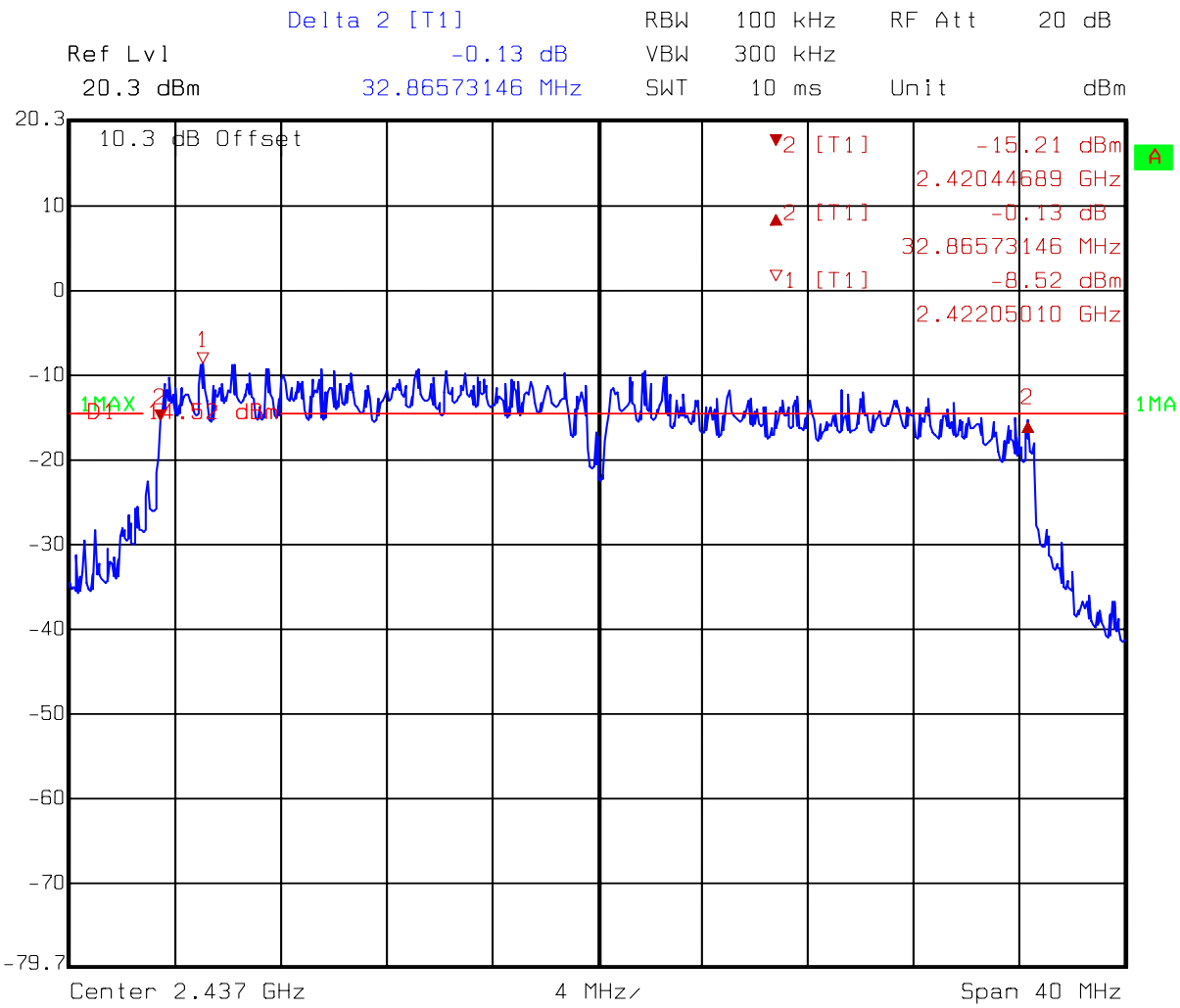


Comment A: 6dB BW
11g CH6
Date: 29.JUN.2005 10:42:01



Comment A: 6dB BW
11g CH11
Date: 29.JUN.2005 10:47:57

Test Mode: Turbo mode



Comment A: 6dB BW
11g CH6 (Turbo mode)
Date: 29.JUN.2005 10:45:32

4. Maximum Output Power test

4.1 Operating environment

Temperature: 20 ℃
Relative Humidity: 55 %
Atmospheric Pressure: 1023 hPa

4.2 Test setup & procedure

The power output per FCC §15.247(b) was measured on the EUT using a 50 ohm SMA cable connected to peak power meter via power sensor. Power was read directly and cable loss correction (0.3 dB) was added to the reading to obtain power at the EUT antenna terminals. The test was performed at 3 channels (lowest, middle and highest channel).

4.3 Measured data of Maximum Output Power test results

Test Mode: 802.11b operating mode (DSSS Modulation)

Channel	Freq. (MHz)	C.L. (dB)	Reading (dBm)	Conducted Peak Output Power		Limit (W)
				(dBm)	(mW)	
1	2412.000	0.3	18.56	18.86	76.91304	1.00
6	2437.000	0.3	20.51	20.81	120.5036	1.00
11	2462.000	0.3	18.65	18.95	78.52356	1.00

Remark:
Conducted Peak Output Power = Reading + C.L.

Test Mode: 802.11g operating mode (OFDM Modulation)

Channel	Freq. (MHz)	C.L. (dB)	Reading (dBm)	Conducted Peak Output Power		Limit (W)
				(dBm)	(mW)	
1	2412.000	0.3	22.18	22.48	177.0109	1.00
6	2437.000	0.3	23.68	23.98	250.0345	1.00
11	2462.000	0.3	22.43	22.73	187.4995	1.00

Remark:
Conducted Peak Output Power = Reading + C.L.

Test Mode: Turbo mode

Channel	Freq. (MHz)	C.L. (dB)	Reading (dBm)	Conducted Peak Output Power		Limit (W)
				(dBm)	(mW)	
6	2437.00	0.3	23.13	23.43	220.2926	1.00

Remark:

Conducted Peak Output Power = Reading + C.L.

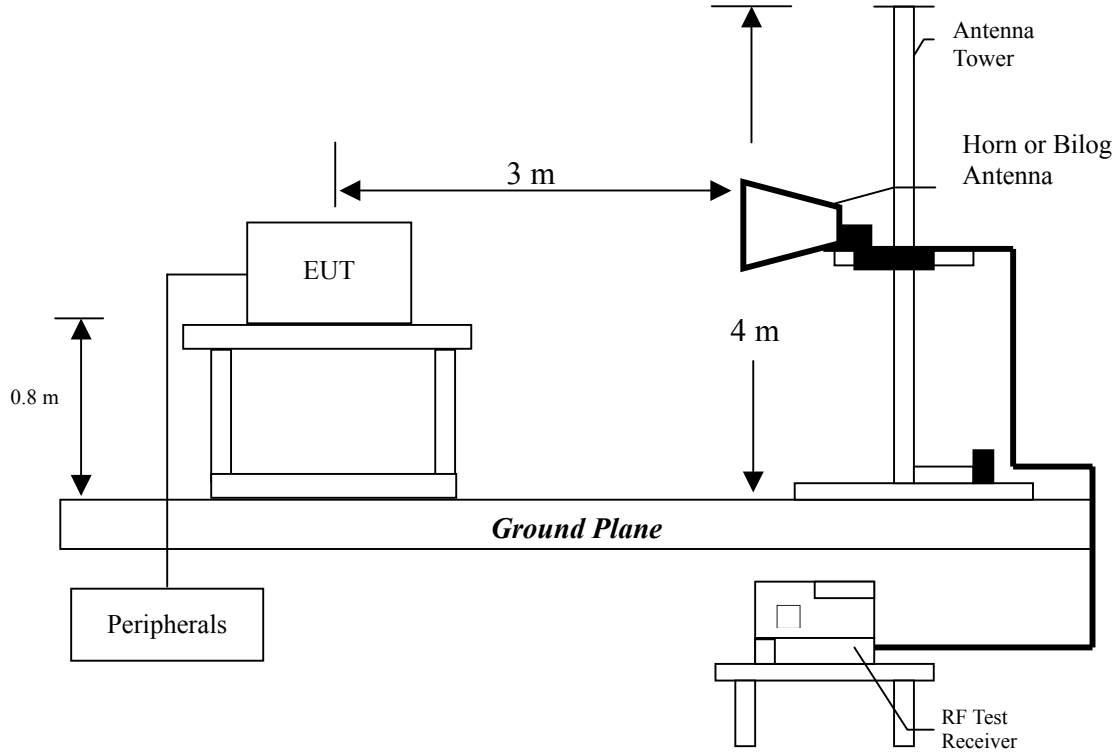
5. Radiated Emission test

5.1 Operating environment

Temperature:	23	℃
Relative Humidity:	53	%
Atmospheric Pressure:	1023	hPa

5.2 Test setup & procedure

The Diagram below shows the test setup, which is utilized to make these measurements.



Radiated emissions were invested cover the frequency range from 30MHz to 1000MHz using a receiver RBW of 120kHz record QP reading, and the frequency over 1GHz using a spectrum analyzer RBW of 1MHz and 10Hz VBW record Average reading. (15.209 paragraph), the Peak reading (1MHz RBW/VBW) recorded also on the report.

The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.

The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent 3 meter reading using inverse scaling with distance.

The EUT configuration please refer to the "Spurious set-up photo.pdf".

5.3 Emission limits

The spurious Emission shall test through the 10th harmonic. 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).

Frequency (MHz)	Limits (dB μ V/m@3m)
30-88	40
88-216	43.5
216-960	46
Above 960	54

Remark:
1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

Uncertainty was calculated in accordance with NAMAS NIS 81.
Expanded uncertainty (k=2) of radiated emission measurement is 4.98 dB.

5.4 Radiated spurious emission test data

The radiated spurious emissions at

Frequency(MHz)	Margin
63.950	-2.88
63.950	-2.81
249.220	-4.56
749.740	-4.78
809.880	-4.98

are less than uncertainty. This is within the stated measurement uncertainty, this may affect compliance determined in other test arrangements.

5.4.1 Measurement results: frequencies equal to or less than 1 GHz

The test was performed on EUT under 802.11b continuously transmitting mode. Channel 1, 6, 11 were verified. The worst case occurred at 802.11b Tx at channel 1.

EUT : DWL-G820
Worst Case Condition : 802.11b Tx at channel 1

Antenna Polariz. (V/H)	Freq. (MHz)	Receiver Detector	Corr. Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
V	55.220	QP	12.90	21.47	34.37	40.00	-5.64	400.00	204.00
V	63.950	QP	12.23	24.89	37.12	40.00	-2.88	400.00	281.00
V	249.220	QP	12.22	19.93	32.15	46.00	-13.86	400.00	353.00
V	374.350	QP	15.06	17.51	32.57	46.00	-13.43	234.79	142.00
V	450.010	QP	17.68	15.83	33.51	46.00	-12.49	219.65	142.00
V	499.480	QP	18.43	19.30	37.73	46.00	-8.28	180.08	290.00
H	125.060	QP	11.62	26.73	38.35	43.50	-5.16	100.00	160.00
H	249.220	QP	12.36	28.55	40.91	46.00	-5.09	100.00	238.00
H	374.350	QP	15.48	22.79	38.27	46.00	-7.74	100.00	195.00
H	499.480	QP	18.64	20.17	38.81	46.00	-7.19	100.00	225.00
H	749.740	QP	22.95	17.46	40.41	46.00	-5.59	100.00	210.00
H	900.090	QP	24.59	15.98	40.57	46.00	-5.44	227.49	320.00

Remark:
1. Corr. Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Corr. Factor

The test was performed on EUT under 802.11gcontinuously transmitting mode. Channel 1, 6, 11 were verified. The worst case occurred at 802.11g Tx channel 1.

EUT : DWL-G820
Worst Case Condition : 802.11g Tx at channel 1

Antenna Polariz. (V/H)	Freq. (MHz)	Receiver Detector	Corr. Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
V	55.220	QP	12.90	21.48	34.38	40.00	-5.63	400.00	62.00
V	63.950	QP	12.23	24.96	37.19	40.00	-2.81	400.00	144.00
V	374.350	QP	15.06	16.35	31.41	46.00	-14.59	234.65	97.00
V	450.010	QP	17.68	15.69	33.37	46.00	-12.63	192.45	125.00
V	499.480	QP	18.43	19.42	37.85	46.00	-8.16	187.37	23.00
V	624.610	QP	20.75	16.85	37.60	46.00	-8.40	126.91	291.00
H	125.060	QP	11.62	26.51	38.13	43.50	-5.38	100.00	36.00
H	249.220	QP	12.36	29.08	41.44	46.00	-4.56	100.00	342.00
H	374.350	QP	15.48	22.41	37.89	46.00	-8.11	100.00	237.00
H	749.740	QP	22.95	18.27	41.22	46.00	-4.78	100.00	195.00
H	809.880	QP	23.62	17.40	41.02	46.00	-4.98	100.00	216.00
H	900.090	QP	24.59	15.93	40.52	46.00	-5.49	225.57	97.00

Remark:

1. Corr. Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Corr. Factor

5.4.2 Measurement results: frequency above 1GHz

EUT : DWL-G820
Test Condition : 802.11b Tx at channel 1

Test Result:
No spurious emission was found above the spectrum analyzer's noise floor.
The noise floor are listed as below:

Noise floor level

For PK:
1GHz-3GHz: 20dBuV
3GHz-14GHz: 27dBuV
14GHz-26.5GHz: 39dBuV
26.5GHz-40GHz: 41.5dBuV

For AV:
1GHz-3GHz: 10dBuV
3GHz-14GHz: 16dBuV
14GHz-26.5GHz: 28dBuV
26.5GHz-40GHz: 31.5dBuV

EUT : DWL-G820
Test Condition : 802.11b Tx at channel 6

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Ant. high (cm)	Turn Table angle (degree)
4860.000	PK	V	36.07	37.77	44.80	46.50	74.00	-27.50	132.61	341.00
4860.000	AV	V	36.07	37.77	30.41	32.11	54.00	-21.89	132.61	341.00
7320.000	PK	V	36.18	43.97	44.40	52.19	74.00	-21.81	150.46	190.00
7320.000	AV	V	36.18	43.97	34.96	42.75	54.00	-11.25	150.46	190.00

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1GHz to 25GHz.The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

Noise floor level is:

For PK:
1GHz-3GHz: 20dBuV
3GHz-14GHz: 27dBuV
14GHz-26.5GHz: 39dBuV

For AV:
1GHz-3GHz: 10dBuV
3GHz-14GHz: 16dBuV
14GHz-26.5GHz: 28dBuV

EUT : DWL-G820
Test Condition : 802.11b Tx at channel 11

Test Result:
No spurious emission was found above the spectrum analyzer's noise floor.
The noise floor are listed as below:

Noise floor level

For PK:
1GHz-3GHz: 20dBuV
3GHz-14GHz: 27dBuV
14GHz-26.5GHz: 39dBuV
26.5GHz-40GHz: 41.5dBuV

For AV:
1GHz-3GHz: 10dBuV
3GHz-14GHz: 16dBuV
14GHz-26.5GHz: 28dBuV
26.5GHz-40GHz: 31.5dBuV

EUT : DWL-G820
Test Condition : 802.11g Tx at channel 1

Test Result:
No spurious emission was found above the spectrum analyzer's noise floor.
The noise floor are listed as below:

Noise floor level

For PK:
1GHz-3GHz: 20dBuV
3GHz-14GHz: 27dBuV
14GHz-26.5GHz: 39dBuV
26.5GHz-40GHz: 41.5dBuV

For AV:
1GHz-3GHz: 10dBuV
3GHz-14GHz: 16dBuV
14GHz-26.5GHz: 28dBuV
26.5GHz-40GHz: 31.5dBuV

EUT : DWL-G820
Test Condition : 802.11g Tx at channel 6

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Ant. high (cm)	Turn Table angle (degree)
7290.000	PK	V	36.18	43.97	38.71	46.50	74.00	-27.50	195.86	26.00
7290.000	AV	V	36.18	43.97	24.32	32.11	54.00	-21.89	195.86	26.00

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1GHz to 25GHz.The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

Noise floor level is:

For PK:
1GHz-3GHz: 20dBuV
3GHz-14GHz: 27dBuV
14GHz-26.5GHz: 39dBuV

For AV:
1GHz-3GHz: 10dBuV
3GHz-14GHz: 16dBuV
14GHz-26.5GHz: 28dBuV

EUT : DWL-G820
Test Condition : 802.11g Tx at channel 11

Test Result:
No spurious emission was found above the spectrum analyzer's noise floor.
The noise floor are listed as below:

Noise floor level

For PK:
1GHz-3GHz: 20dBuV
3GHz-14GHz: 27dBuV
14GHz-26.5GHz: 39dBuV
26.5GHz-40GHz: 41.5dBuV

For AV:
1GHz-3GHz: 10dBuV
3GHz-14GHz: 16dBuV
14GHz-26.5GHz: 28dBuV
26.5GHz-40GHz: 31.5dBuV

EUT : DWL-G820
Test Condition : Turbo mode

Test Result:
No spurious emission was found above the spectrum analyzer's noise floor.
The noise floor are listed as below:

Noise floor level

For PK:
1GHz-3GHz: 20dBuV
3GHz-14GHz: 27dBuV
14GHz-26.5GHz: 39dBuV
26.5GHz-40GHz: 41.5dBuV

For AV:
1GHz-3GHz: 10dBuV
3GHz-14GHz: 16dBuV
14GHz-26.5GHz: 28dBuV
26.5GHz-40GHz: 31.5dBuV

6. Power Spectrum Density test

6.1 Operating environment

Temperature:	25	℃
Relative Humidity:	56	%
Atmospheric Pressure	1023	hPa

6.2 Test setup & procedure

The power spectrum density per FCC §15.247(d) was measured from the antenna port of the EUT using a 50ohm spectrum analyzer with the resolution bandwidth set at 3kHz, the video bandwidth set at 10kHz, a span of 1.5 MHz, and the sweep time set at 500 seconds. Power Density was read directly correction was added to the reading to obtain power at the EUT antenna terminals. The test was performed at 3 channels (lowest, middle and highest channel). The Power Spectral Density measured result is in the following table.

6.3 Measured data of Power Spectrum Density test results

Test Mode: 802.11b operating (DSSS Modulation) mode

Channel	Frequency (MHz)	Measured level (dBm)	Limit (dBm)
1	2412	-4.53	8
6	2437	-5.18	8
11	2462	-5.80	8

Test Mode: 802.11g operating (OFDM Modulation) mode

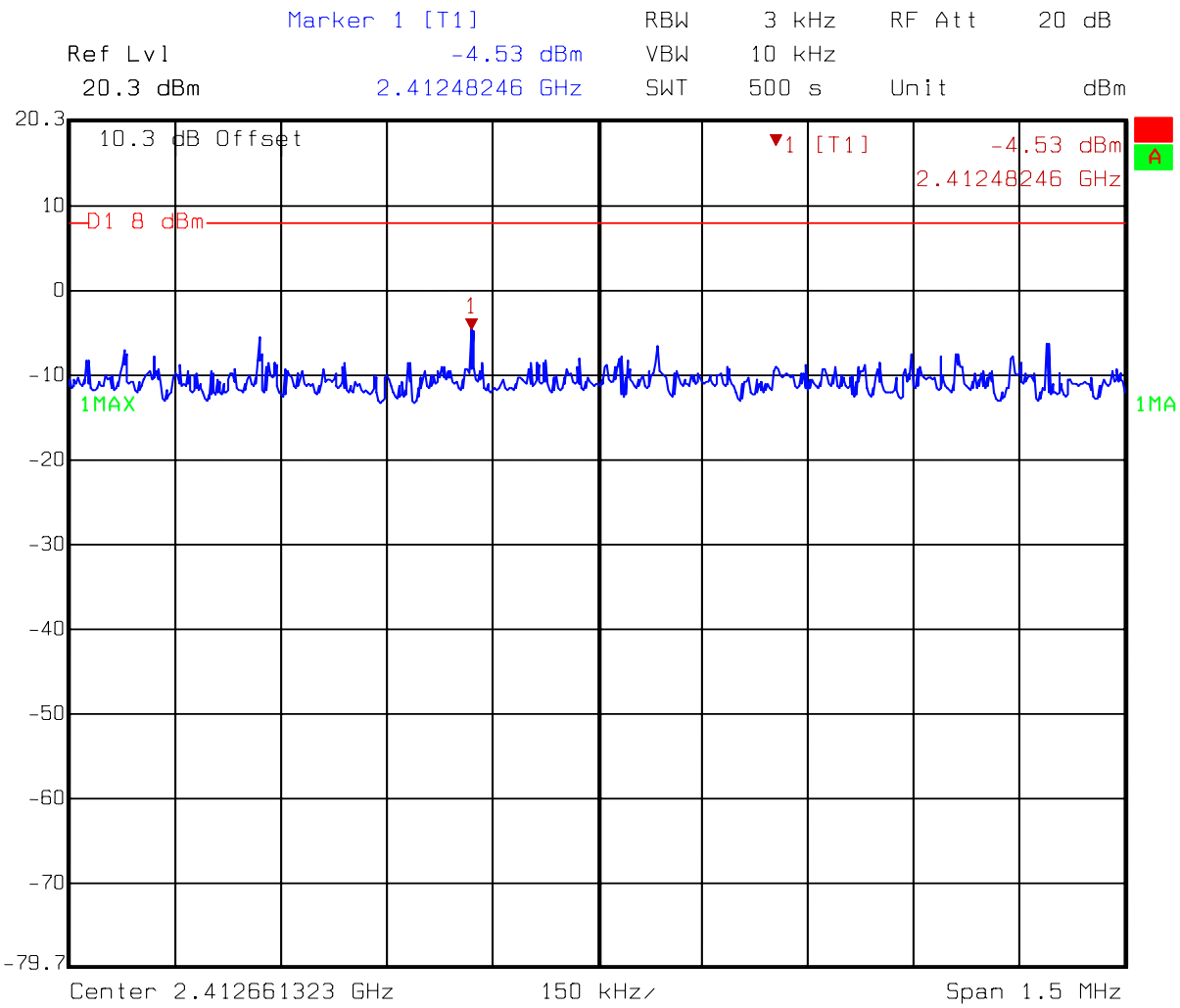
Channel	Frequency (MHz)	Measured level (dBm)	Limit (dBm)
1	2412	-10.11	8
6	2437	-9.75	8
11	2462	-10.78	8

Test Mode: Turbo mode

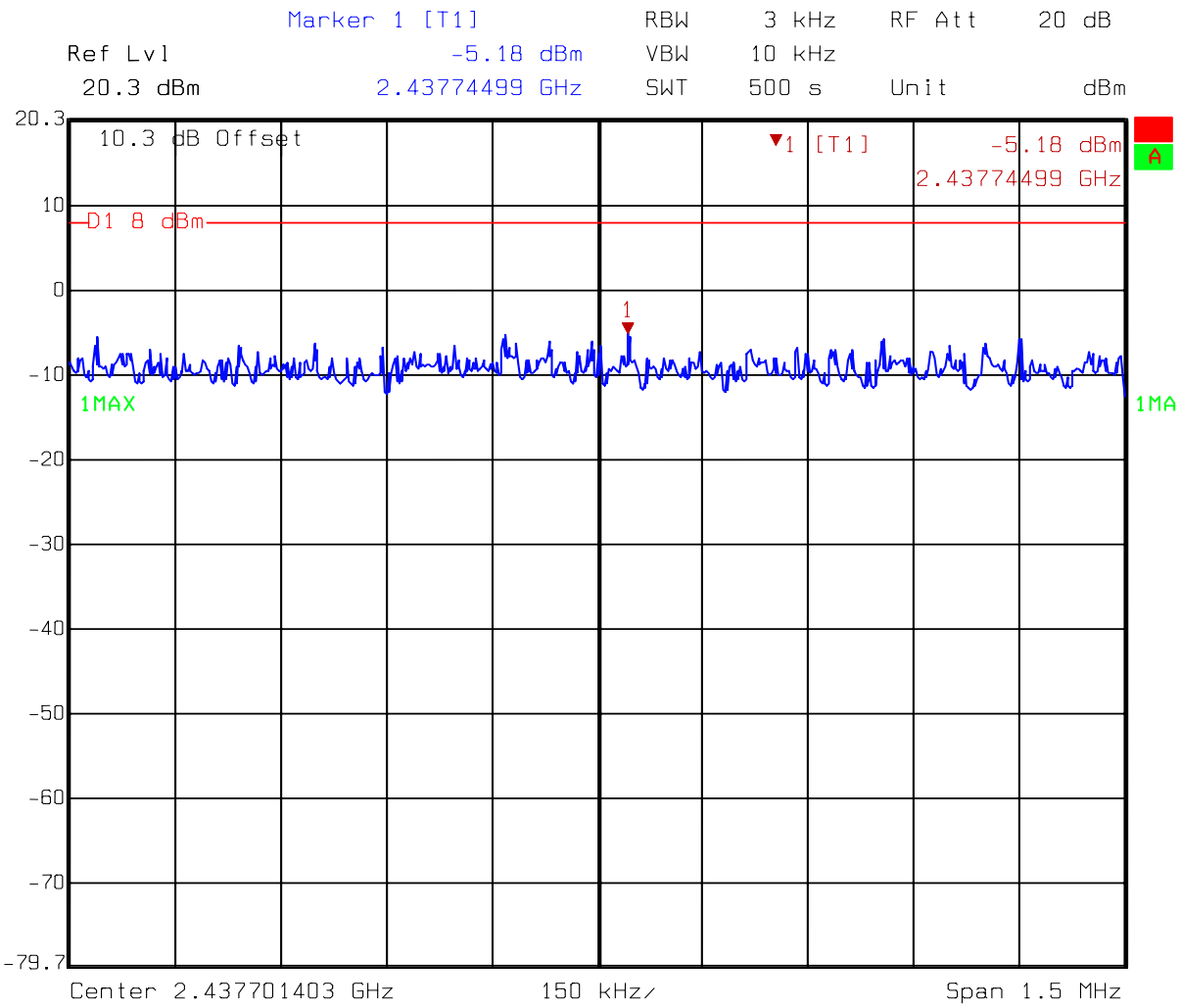
Channel	Frequency (MHz)	Measured level (dBm)	Limit (dBm)
6	2437	-20.79	8

Please see the plot below.

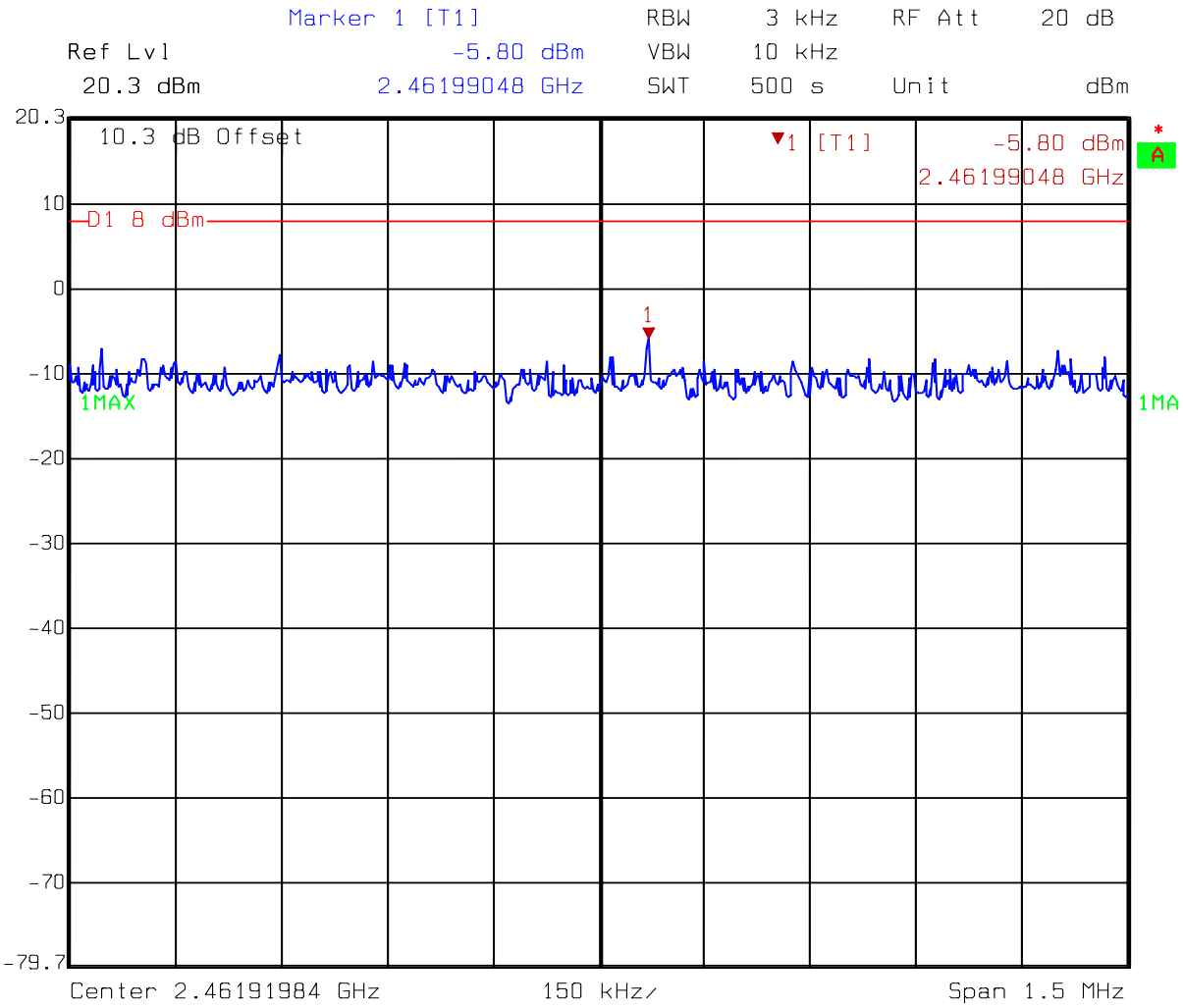
Test Mode: 802.11b operating (DSSS Modulation) mode



Comment A: Power Density
11b CH1
Date: 29.JUN.2005 10:53:06

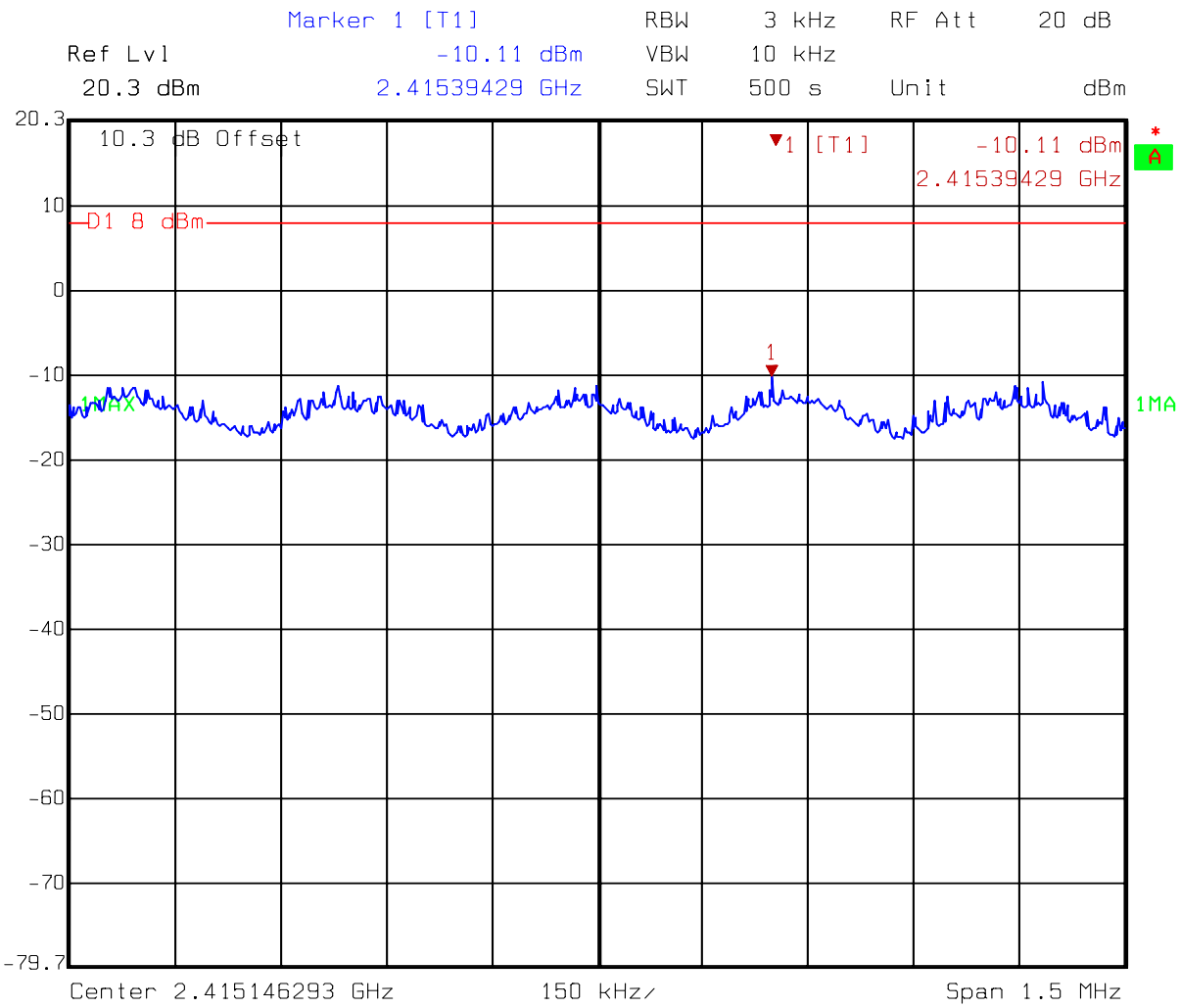


Comment A: Power Density
11b CH6
Date: 29.JUN.2005 10:55:16

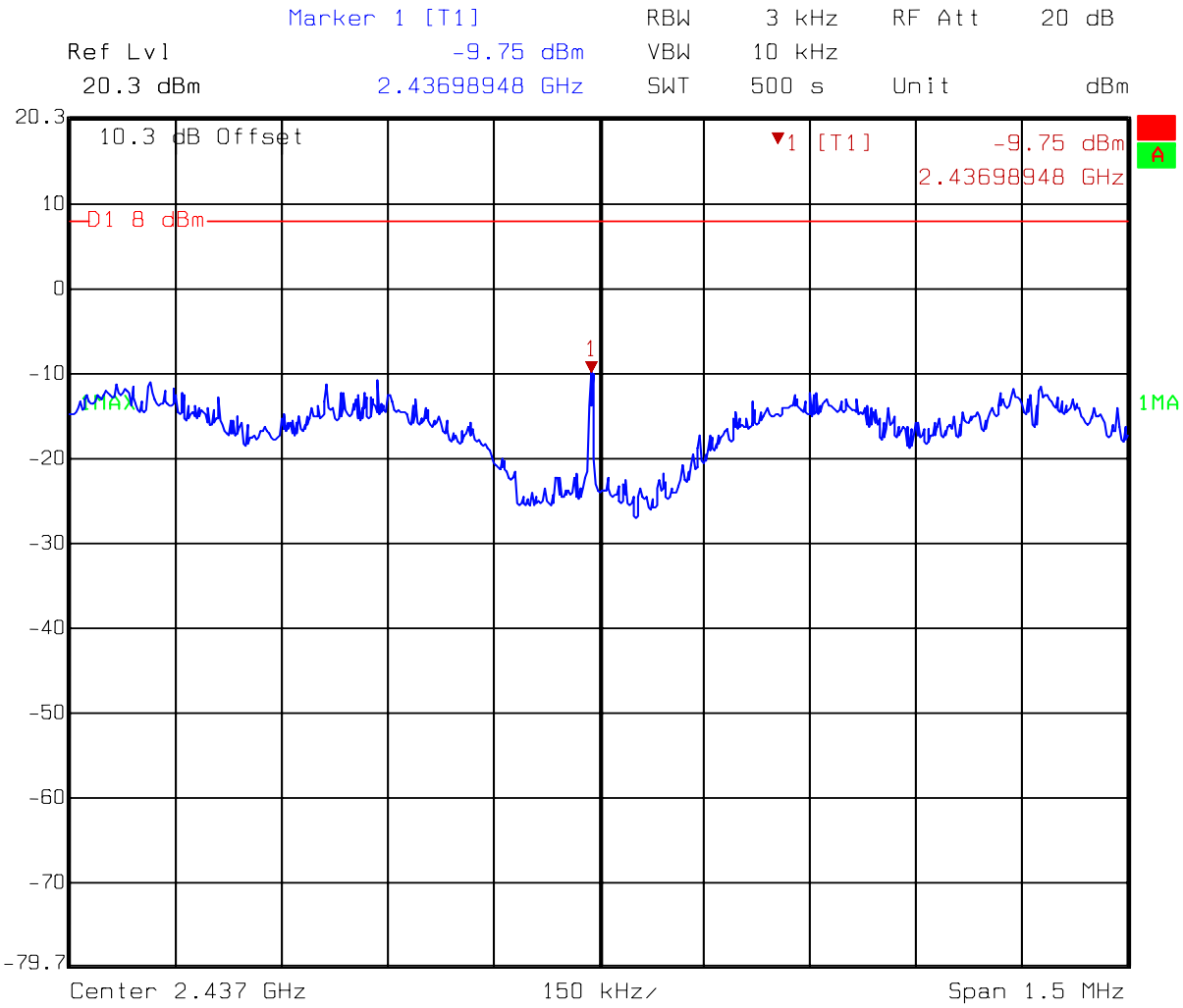


Comment A: Power Density
11b CH11
Date: 29.JUN.2005 10:57:30

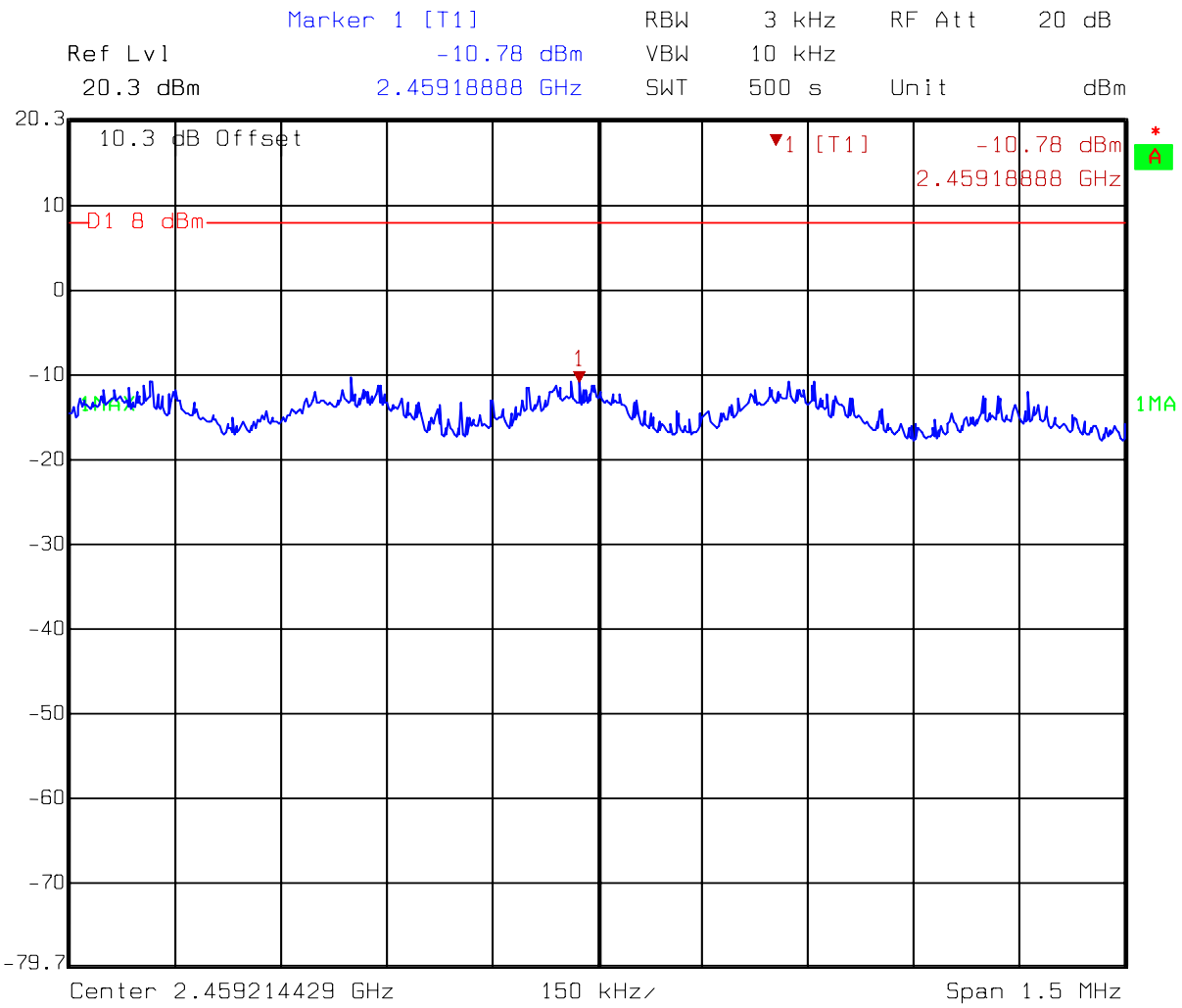
Test Mode: 802.11g operating mode (OFDM Modulation)



Comment A: Power Density
11g CH1
Date: 29.JUN.2005 11:09:30

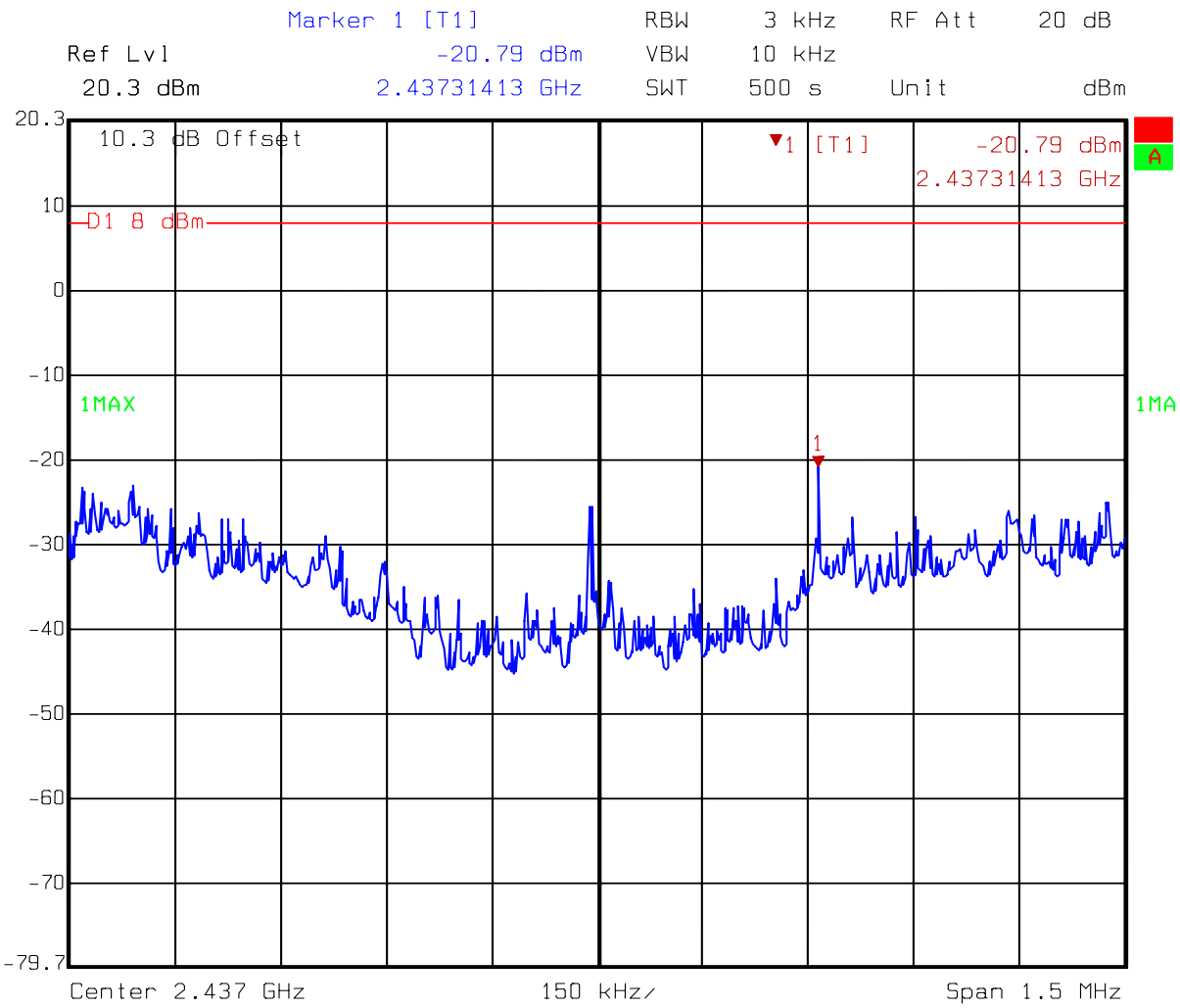


Comment A: Power Density
11g CH6
Date: 29.JUN.2005 11:02:07



Comment A: Power Density
11g CH11
Date: 29.JUN.2005 10:59:30

Test Mode: Turbo mode



Comment A: Power Density
11g CH6(Turbo mode)
Date: 29.JUN.2005 11:06:53

7. Emission on the band edge

In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 KHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

7.1 Operating environment

Temperature:	23	℃
Relative Humidity:	53	%
Atmospheric Pressure	1023	hPa

7.2 Test setup & procedure

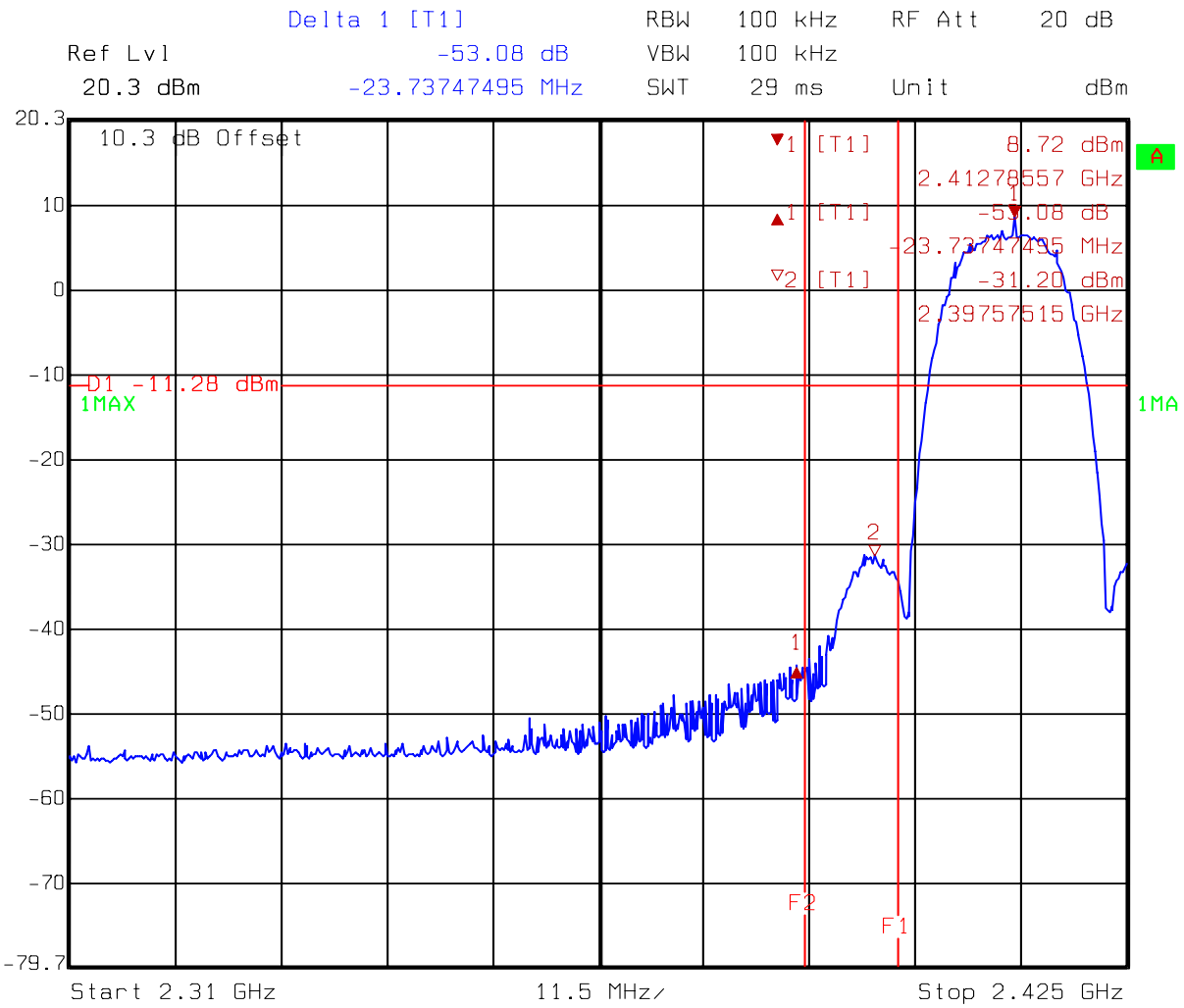
The output of EUT was connected to spectrum analyzer via a 50ohm cable.

The setting of spectrum analyzer is:

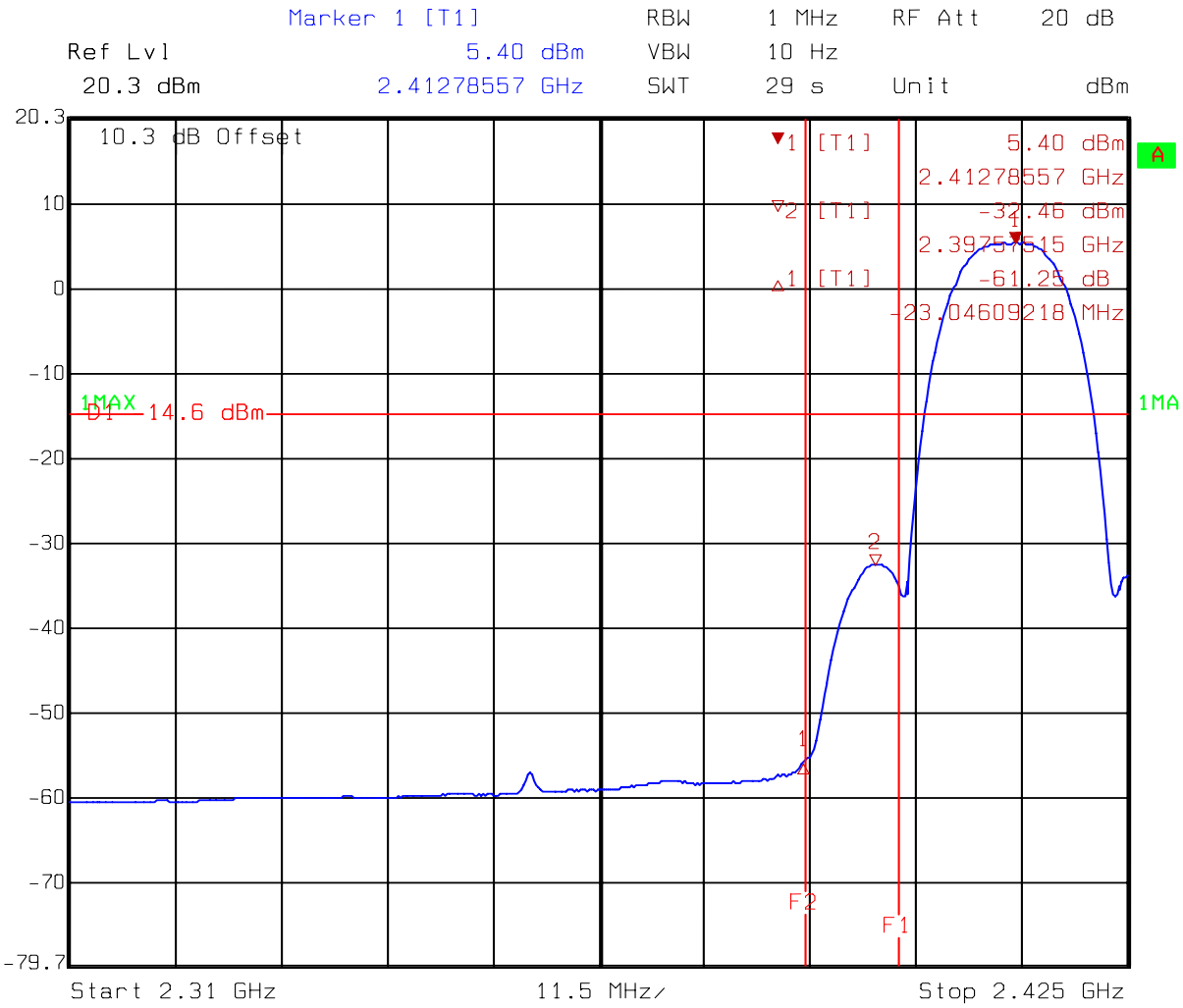
Peak: RBW = VBW = 100KHz
Average : RBW= 1MHz, VBW = 10Hz

Please see the test plot below.

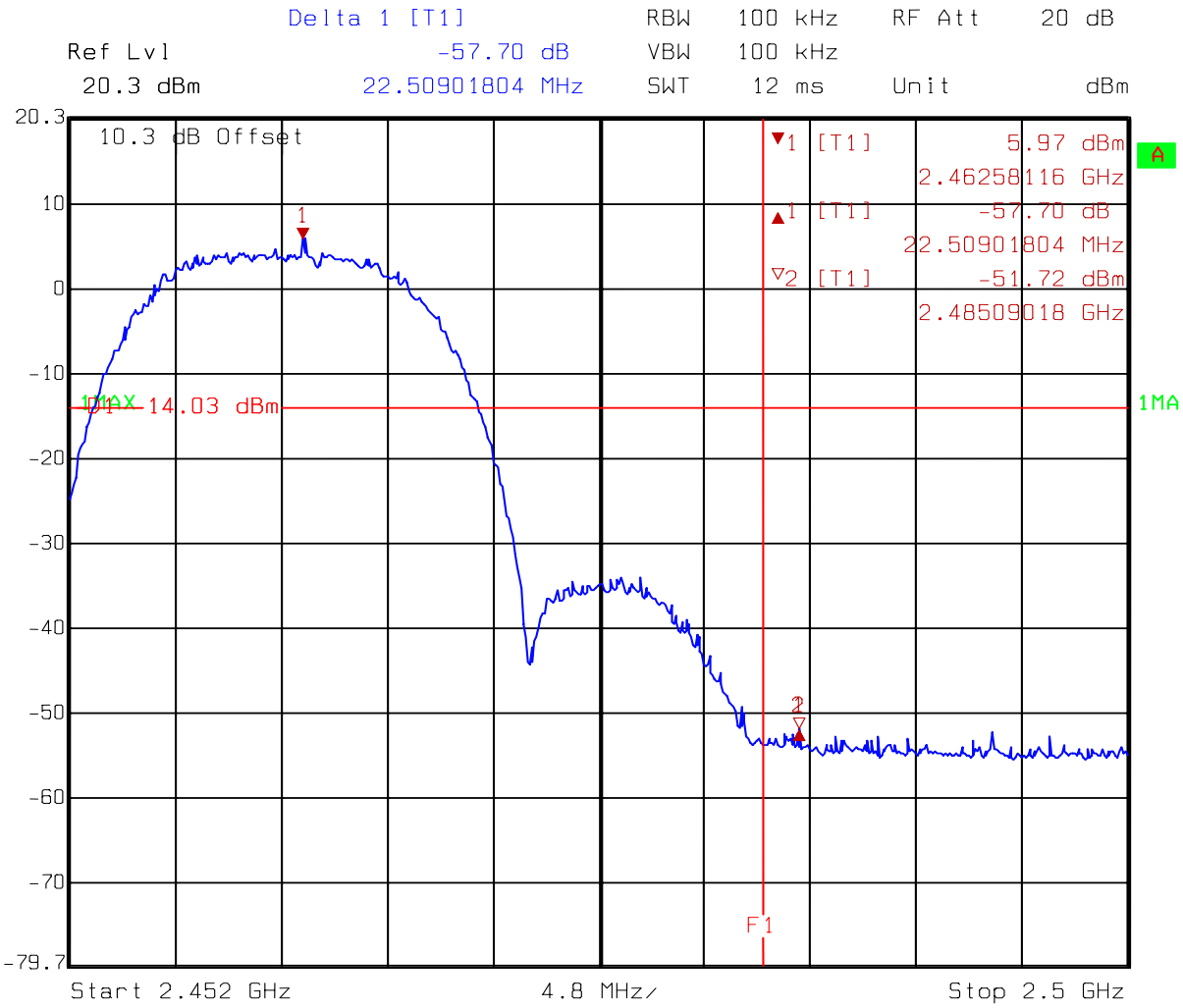
Test Mode: 802.11b operating mode (DSSS Modulation)



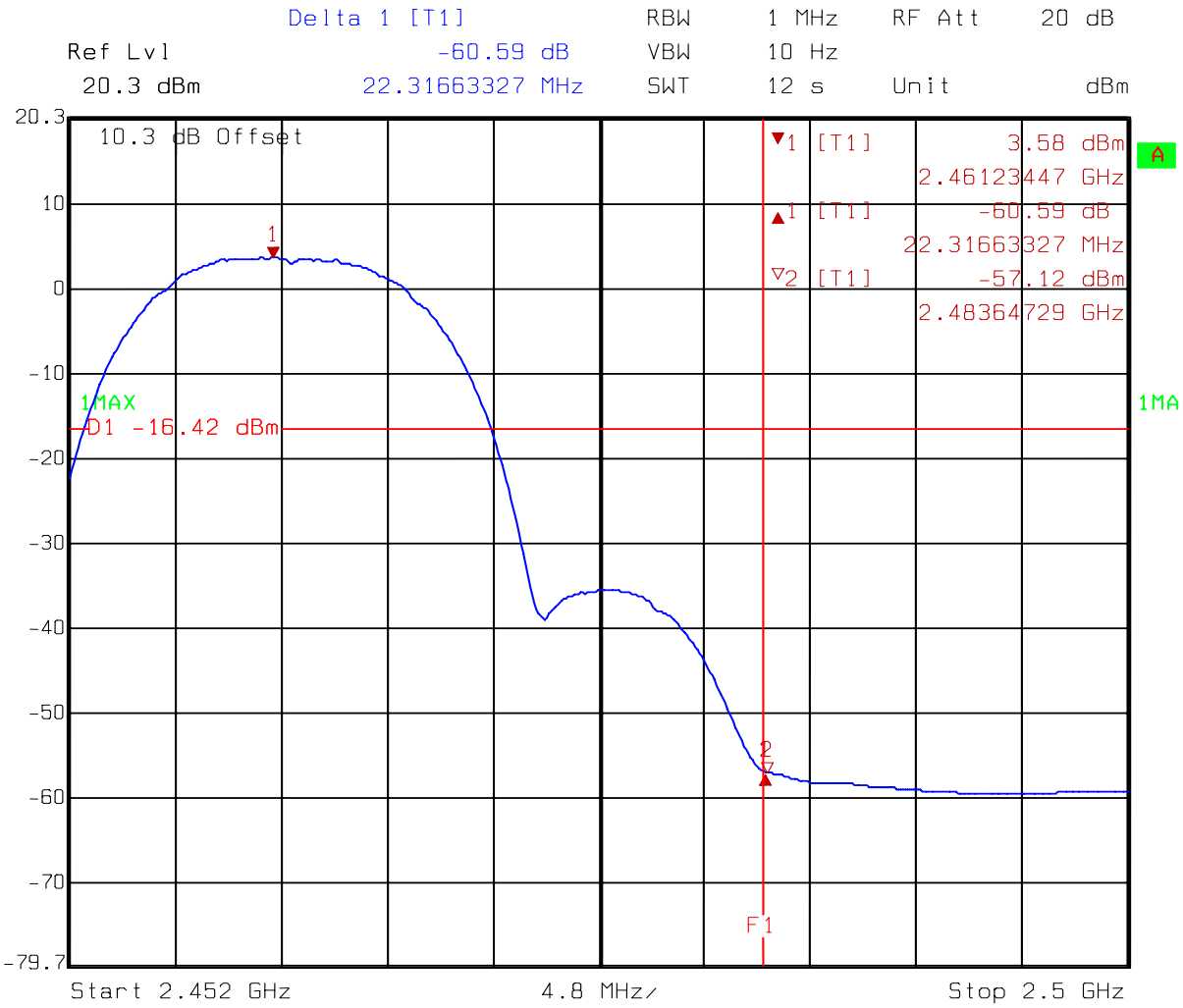
Comment A: Band-edge at 11b ch1
F1=2400MHz F2=2390MHz
Date: 29.JUN.2005 15:02:02



Comment A: Band-edge at 11b ch1
F1=2400MHz F2=2390MHz
Date: 29.JUN.2005 11:26:20

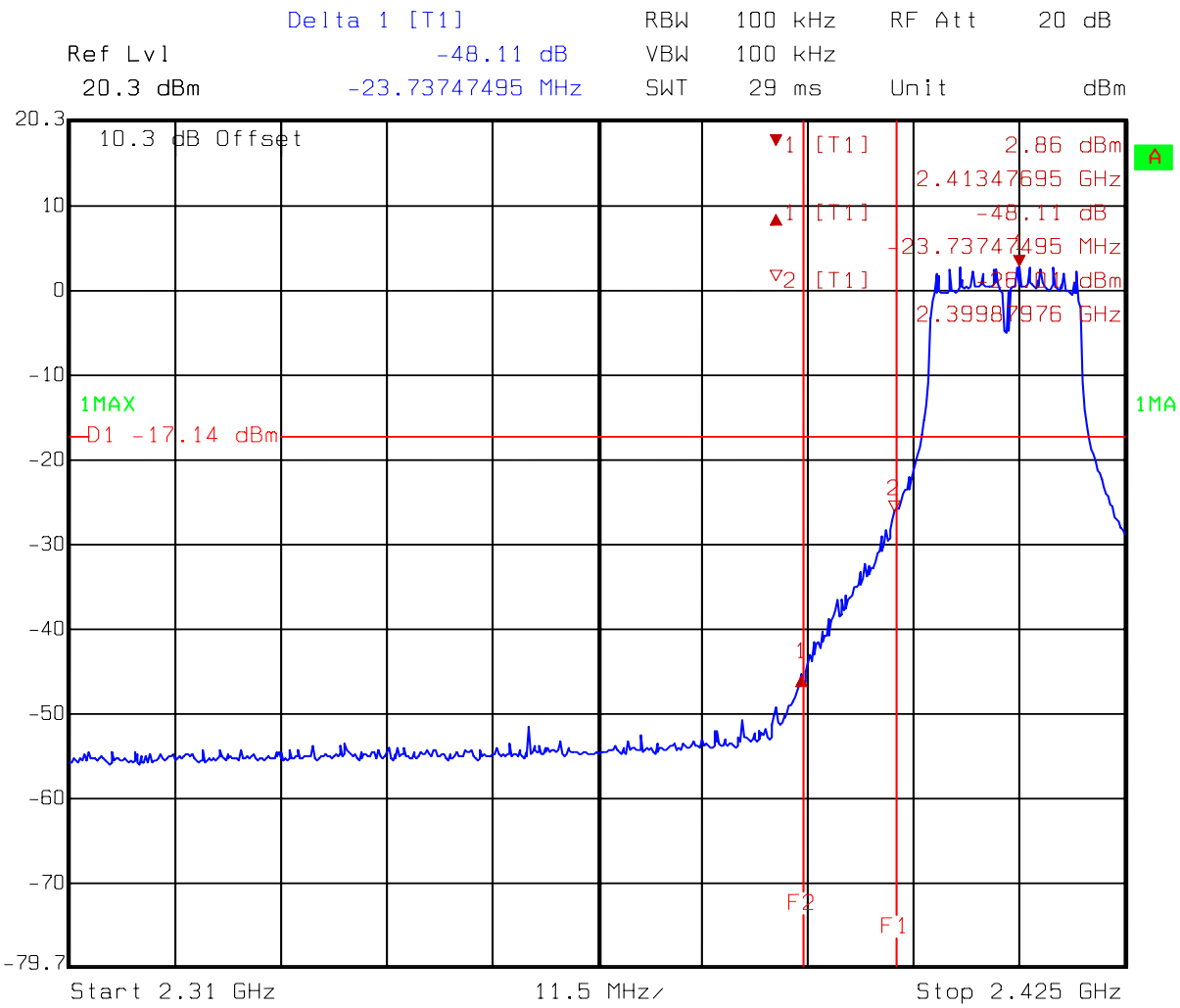


Comment A: Band-edge at 11b ch11
F1=2483.5MHz
Date: 29.JUN.2005 11:58:30

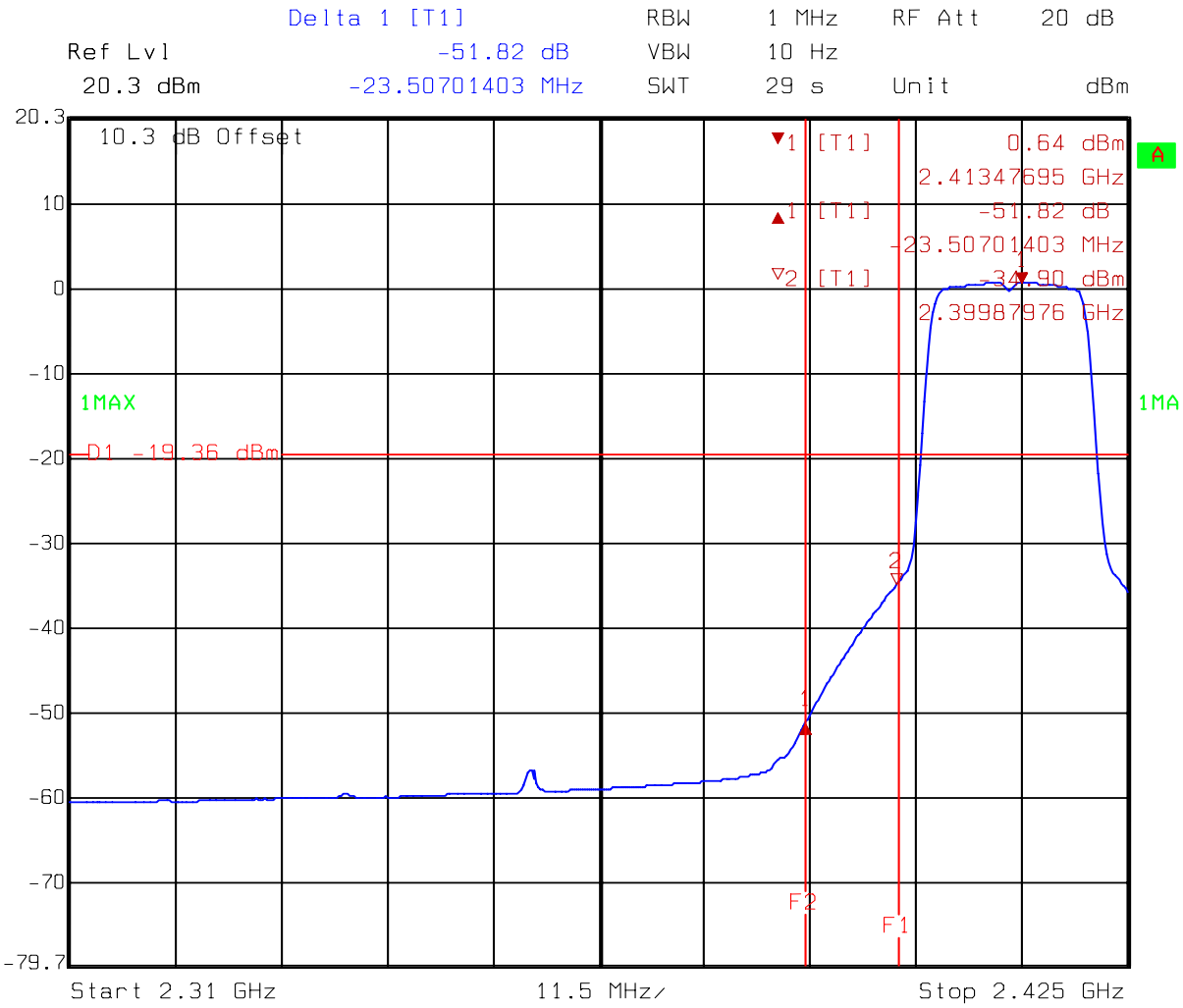


Comment A: Band-edge at 11b ch11
F1=2483.5MHz
Date: 29.JUN.2005 11:55:03

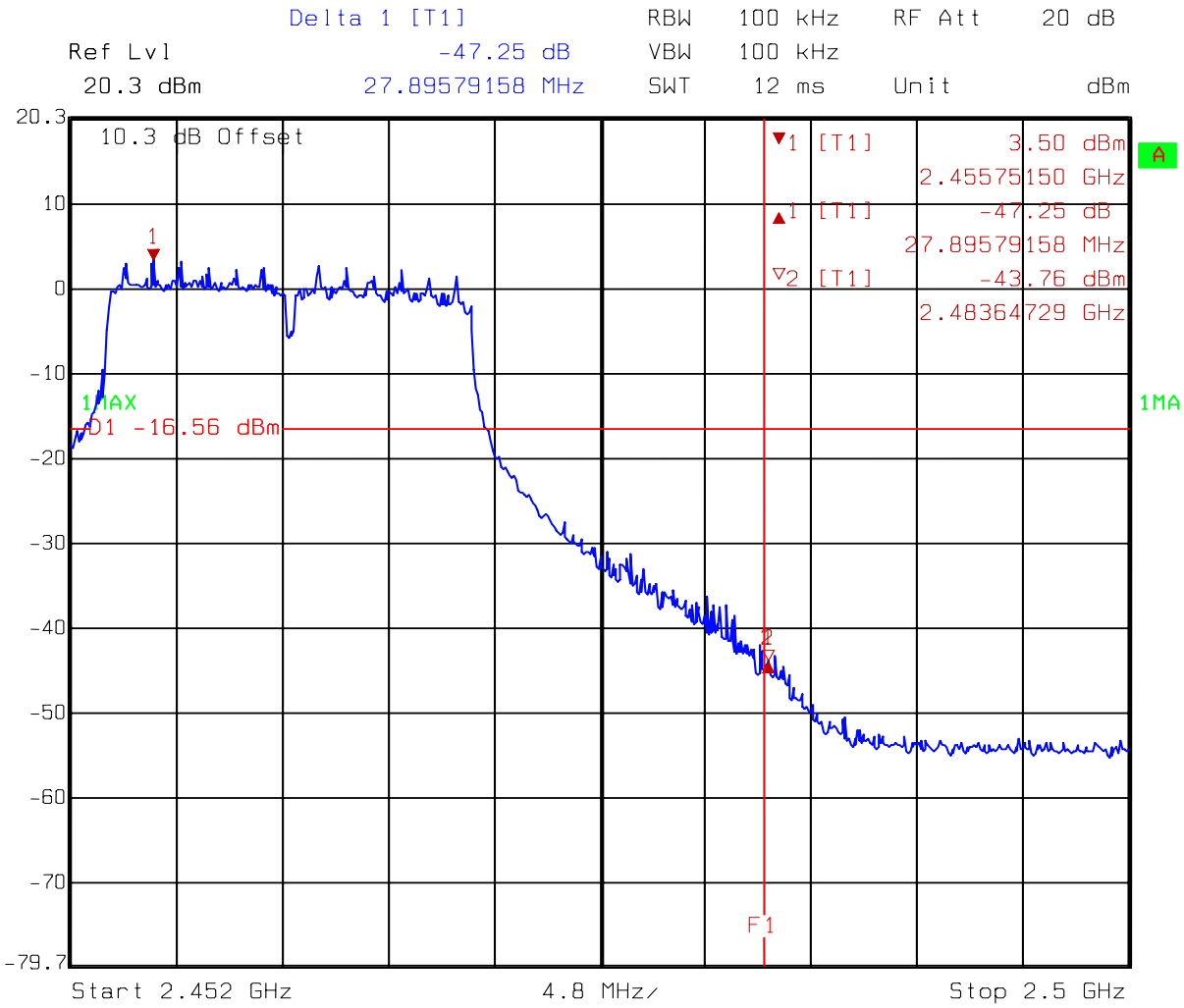
Test Mode: 802.11g operating mode (OFDM Modulation)



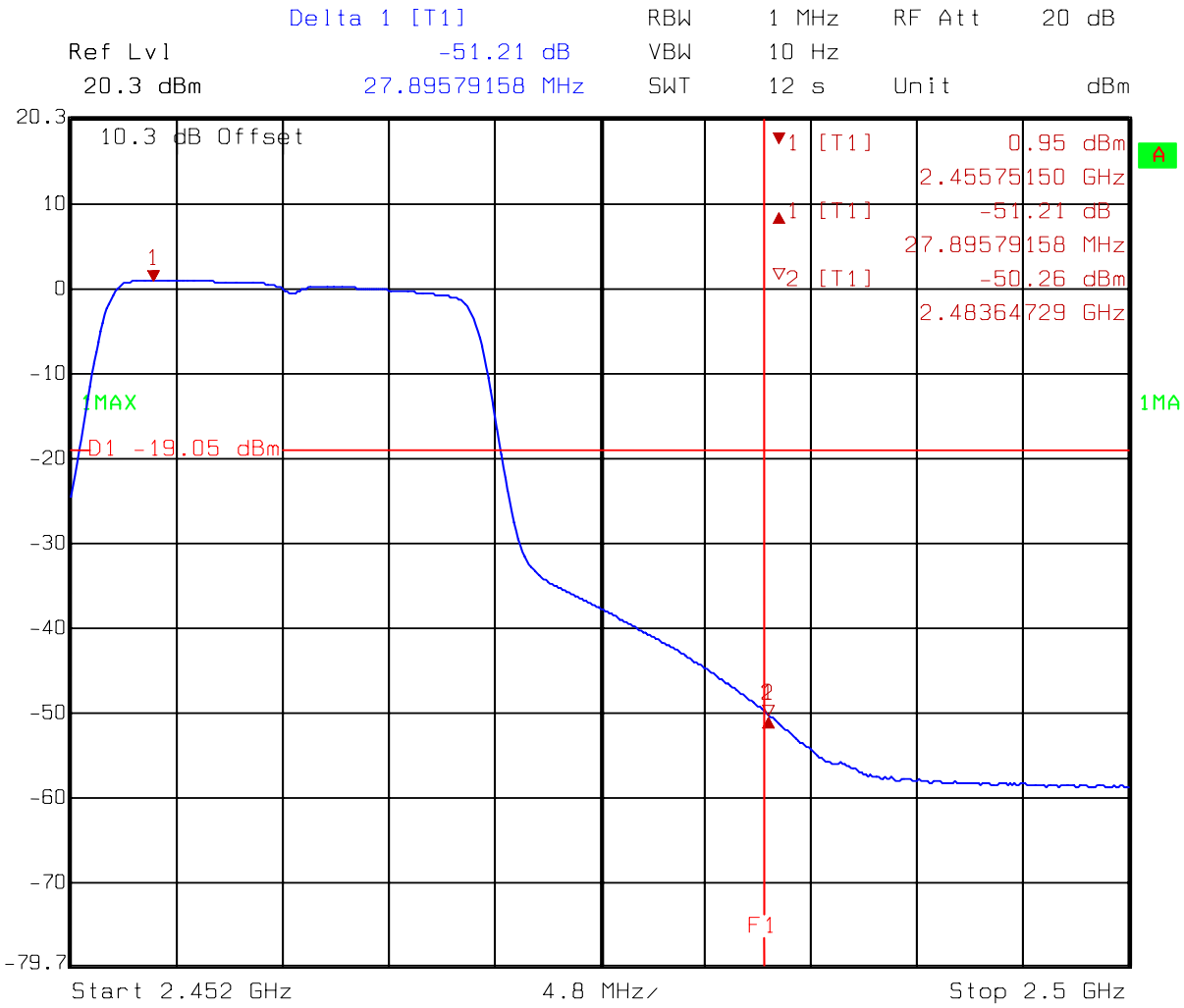
Comment A: Band-edge at 11g ch1
F1=2400MHz F2=2390MHz
Date: 29.JUN.2005 11:42:14



Comment A: Band-edge at 11g ch1
F1=2400MHz F2=2390MHz
Date: 29.JUN.2005 11:33:02



Comment A: Band-edge at 11g ch11
F1=2483.5MHz
Date: 29.JUN.2005 11:47:55



Comment A: Band-edge at 11g ch11
F1=2483.5MHz
Date: 29.JUN.2005 11:50:46

7.3 Test Result

Test Mode: 802.11b operating mode (DSSS Modulation)

Channel	Detector	Radiated Method	Conducted Method	The Max. Field Strength in Restrict Band (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
		Max. Field Strength of Fundamental @3m (dBuV/m)	Between Carrier Max. Power and Local Max. Emission in Restrict Band (dBc)			
		A	B	C	D	E
1 (lowest)	PK	114.390	53.08	61.31	74.00	-12.69
	AV	105.570	61.25	44.32	54.00	-9.68
11 (highest)	PK	112.770	57.70	55.07	74.00	-18.93
	AV	104.540	60.59	43.95	54.00	-10.05

Remark: 1. C = A – B
2. E = C – D

Test Mode: 802.11b operating mode (DSSS Modulation)

Channel	Detector	Radiated Method	Conducted Method	The Max. Field Strength in Restrict Band (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
		Max. Field Strength of Fundamental @3m (dBuV/m)	Between Carrier Max. Power and Local Max. Emission in Restrict Band (dBc)			
		A	B	C	D	E
1 (lowest)	PK	108.400	48.11	60.29	74.00	-13.71
	AV	98.350	51.82	46.53	54.00	-7.47
11 (highest)	PK	111.000	47.25	63.75	74.00	-10.25
	AV	100.150	51.21	48.94	54.00	-5.06

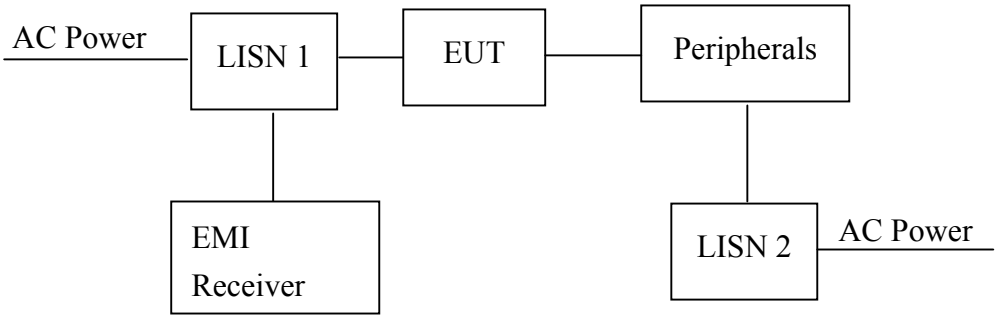
Remark: 1. C = A – B
2. E = C – D

8. Power Line Conducted Emission test §FCC 15.207

8.1 Operating environment

Temperature:	22	℃
Relative Humidity:	55	%
Atmospheric Pressure	1023	hPa

8.2 Test setup & procedure



The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a 50 ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination.
Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4/2003 on conducted measurement.
The bandwidth of the field strength meter (R & S Test Receiver ESCS 30) is set at 9kHz.

The EUT configuration please refer to the “Conducted set-up photo.pdf”.

8.3 Emission limit

Freq. (MHz)	Conducted Limit (dBuV)	
	Q.P.	Ave.
0.15~0.50	66 – 56*	56 – 46*
0.50~5.00	56	46
5.00~30.0	60	50

*Decreases with the logarithm of the frequency.

8.4 Uncertainty of Conducted Emission

Expanded uncertainty (k=2) of conducted emission measurement is 2.6 dB.

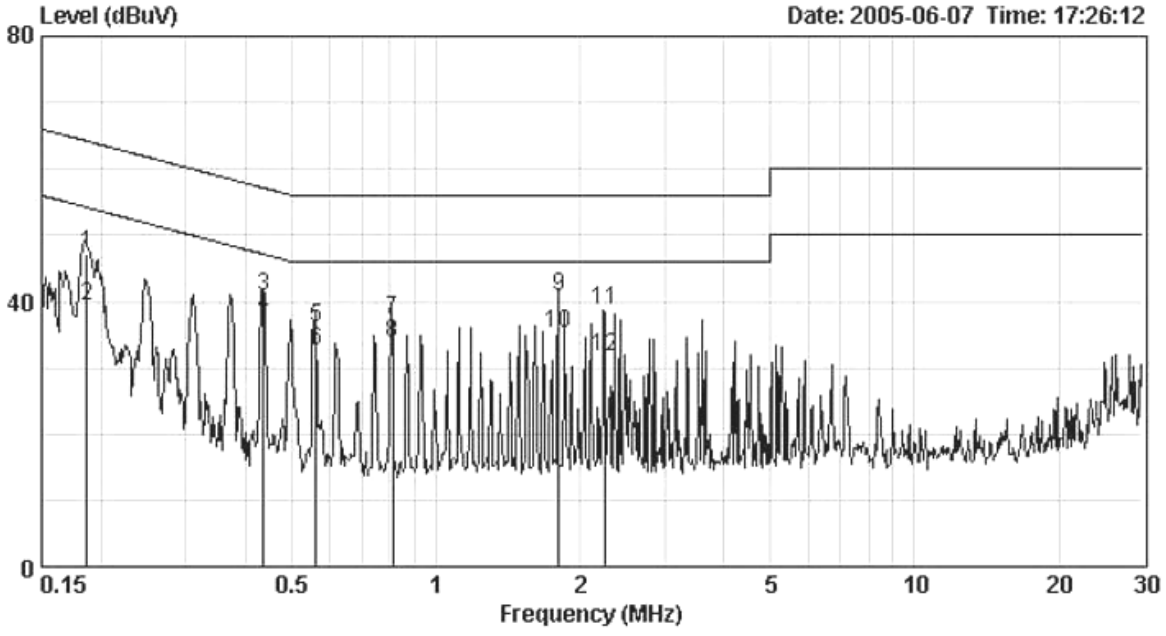
8.5 Power Line Conducted Emission test data

The test was performed the 802.11b and 802.11g normal operating modes, the worst case was occurred at 802.11g normal operating mode.

Phase : Line
EUT : DWL-G820
Worst Case : 802.11g normal operating mode

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level AV (dBuV)	Limit Av (dBuV)	Margin (dB) Qp	Margin (dB) Av
0.186	0.10	47.17	64.21	39.15	54.21	-17.04	-15.06
0.437	0.10	40.59	57.12	37.70	47.12	-16.53	-9.42
0.562	0.10	35.99	56.00	32.66	46.00	-20.01	-13.34
0.811	0.10	37.09	56.00	33.80	46.00	-18.91	-12.20
1.807	0.10	40.65	56.00	35.03	46.00	-15.35	-10.97
2.245	0.11	38.69	56.00	31.53	46.00	-17.31	-14.47

Remark:
1. Correction Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)



Phase : Neutral
EUT : DWL-G820
Worst Case : 802.11g normal operating mode

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level AV (dBuV)	Limit Av (dBuV)	Margin (dB) Qp	Margin (dB) Av
0.189	0.10	43.02	64.09	35.96	54.09	-21.07	-18.13
0.439	0.10	38.85	57.08	35.09	47.08	-18.23	-11.99
0.812	0.10	37.73	56.00	33.94	46.00	-18.27	-12.06
1.561	0.10	39.61	56.00	35.47	46.00	-16.39	-10.53
2.563	0.13	43.53	56.00	36.27	46.00	-12.47	-9.73
3.500	0.17	34.83	56.00	24.52	46.00	-21.17	-21.48

Remark:
1. Correction Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)