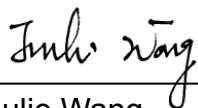


EMC TEST REPORT

Report No. : TS08070091-EME**Model No. : NWA1100****Issued Date : Jul. 31, 2008****Applicant: ZyXEL Communications Corporation.
6, Innovation Rd II, Science-Based Industrial Park,
Hsinchu, Taiwan****Test Method/
Standard: CFR 47 FCC Part 15.247, 15.205, 15.207, 15.209,
ANSI C63.4 2003****Test By: Intertek Testing Services Taiwan Ltd.
No. 11, Lane 275, Ko-Nan 1 Street, Chia-Tung Li,
Shiang-Shan District, Hsinchu City, Taiwan**

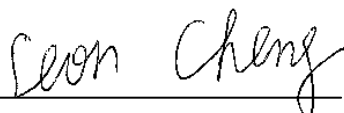
This test report consists of 56 pages in total. It may be duplicated completely for legal use with the allowance of the applicant. It shall not be reproduced except in full, without the written approval of Intertek Laboratory. The test result(s) in this report only applies to the tested sample(s).

Report Engineer



Julie Wang

Project Engineer



Leon Cheng

Reviewed By



Jimmie Liu

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1. Summary of Test Data

Test/Requirement Description	Applicable Rule	Result
Minimum 6 dB Bandwidth	15.247(a)(2)	Pass
Maximum Output Power	15.247(b)	Pass
Power Spectral Density	15.247(e)	Pass
RF Antenna Conducted Spurious	15.247(d)	Pass
Radiated Spurious Emission	15.247(d), 15.205, 15.209	Pass
Emission on the Band Edge	15.247(d)	Pass
AC Power Line Conducted Emission	15.207	Pass

2. General Information

Identification of the EUT

Applicant:	ZyXEL Communications Corporation
Product:	802.11g WLAN Business Access Point
Model No.:	NWA1100
FCC ID.:	I88NWA1100
Frequency Range:	2412 MHz ~ 2462 MHz
Channel Number:	11 channels for 2412 MHz ~ 2462 MHz
Rated Power:	100-240 Vac, 50-60 Hz with Adapter (LEI, MU12-2120100-A1)
Power Cord:	N/A
Data Cable:	RJ-45 UTP Cat.5 3 meter × 1
Sample Received:	Jul. 14, 2008
Test Date(s):	Jul 16, 2008 ~ Jul. 17, 2008
Note 1:	This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.
Note 2:	When determining the test conclusion, the Measurement Uncertainty of test has been considered.

Description of EUT

The EUT is an 802.11g WLAN Business Access Point, and was defined as information technology equipment.

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

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 : 3 dBi max
Antenna Type : Dipole antenna
Connector Type : SMA Jack Reverse

Operation mode

The EUT was supplied with 120 Vac, 60 Hz and it was run in TX mode that was controlled by “ART” program.

The EUT was transmitted continuously during the test.

With individual verifying, the maximum output power was found at 1 Mbps data rate for 802.11b mode and 6 Mbps data rate for 802.11g mode. The final tests were executed under these conditions and recorded in this report individually.

11b (ch6 2437 MHz)	
Data rate	PK
1 Mbps	26.27
2 Mbps	26.26
5.5 Mbps	26.17
11 Mbps	26.20

11g (ch6 2437 MHz)	
Data rate	PK
6 Mbps	28.84
9 Mbps	28.62
12 Mbps	28.64
18 Mbps	28.65
24 Mbps	28.70
36 Mbps	28.63
48 Mbps	28.58
54 Mbps	28.62

3. Maximum 6 dB Bandwidth

Name of Test	Maximum 6 dB Bandwidth
Base Standard	FCC 15.247 (a)(2)

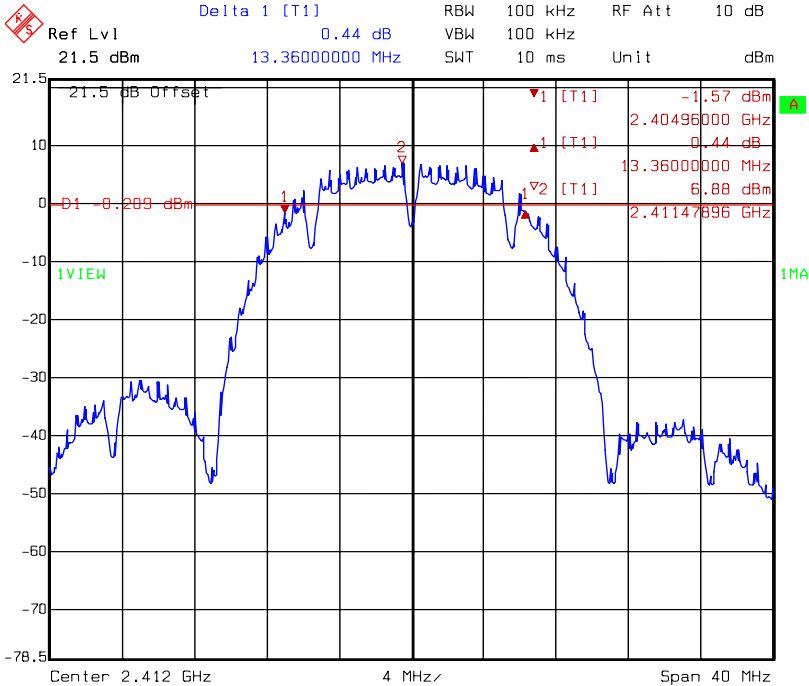
Test Result: Complies
Test Method: See Appendix B
Measurement Data: See Table & plots below

Note: The EUT was tested while in a continuous transmit mode and the worst case data rates are 1 Mbps for 802.11b and 6 Mbps for 802.11g. The EUT was tuned to a low, middle and high channel.

Table1. Maximum 6 dB Bandwidth

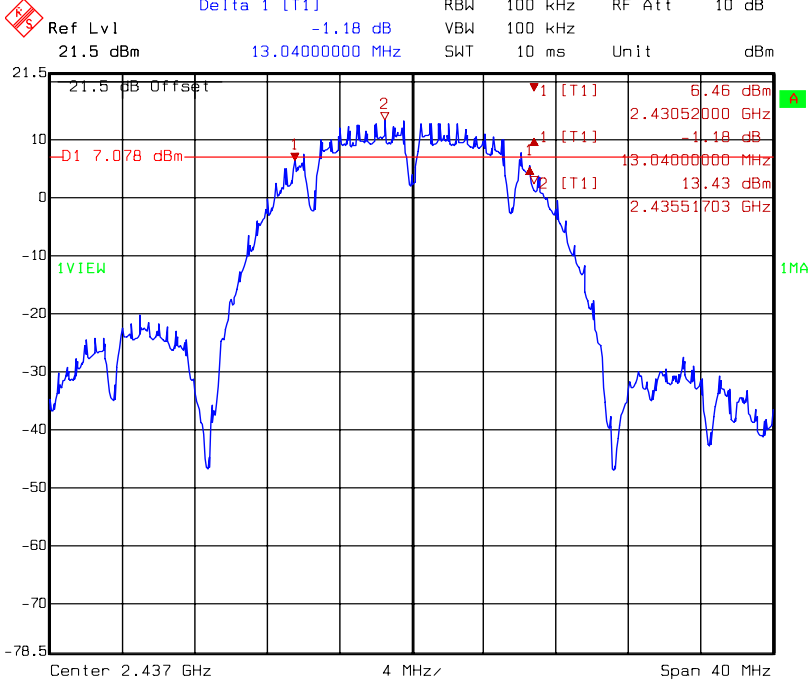
Mode	Channel	Frequency (MHz)	Bandwidth (MHz)	Min. Limit (MHz)	Pass/Fail
802.11b	1	2412	13.36	0.5	Pass
	6	2437	13.04	0.5	Pass
	11	2462	12.64	0.5	Pass
802.11g	1	2412	16.72	0.5	Pass
	6	2437	16.64	0.5	Pass
	11	2462	16.64	0.5	Pass

6 dB Bandwidth @ 802.11b mode channel 1



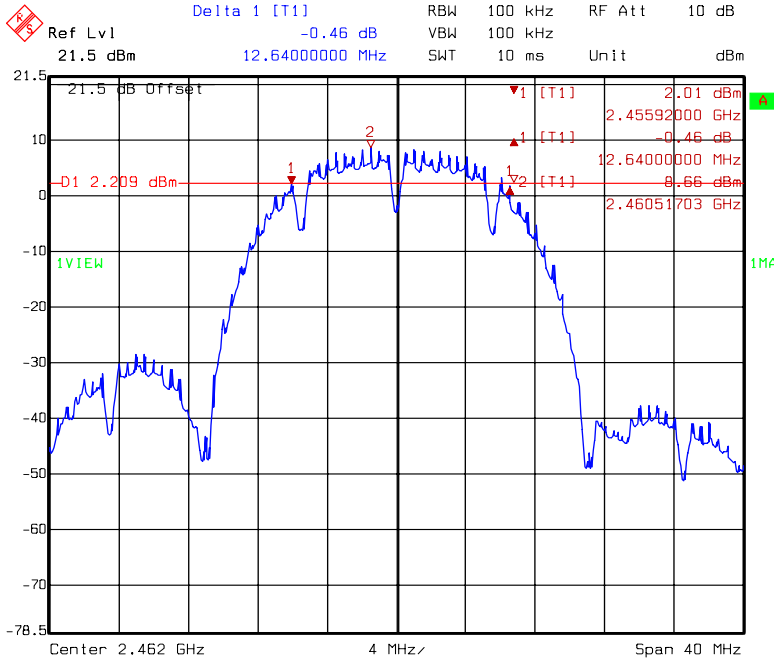
Title: 6dB Band-Width
 Comment A: CH 1 at 802.11b mode
 Date: 17.JUL.2008 11:58:49

6 dB Bandwidth @ 802.11b mode channel 6



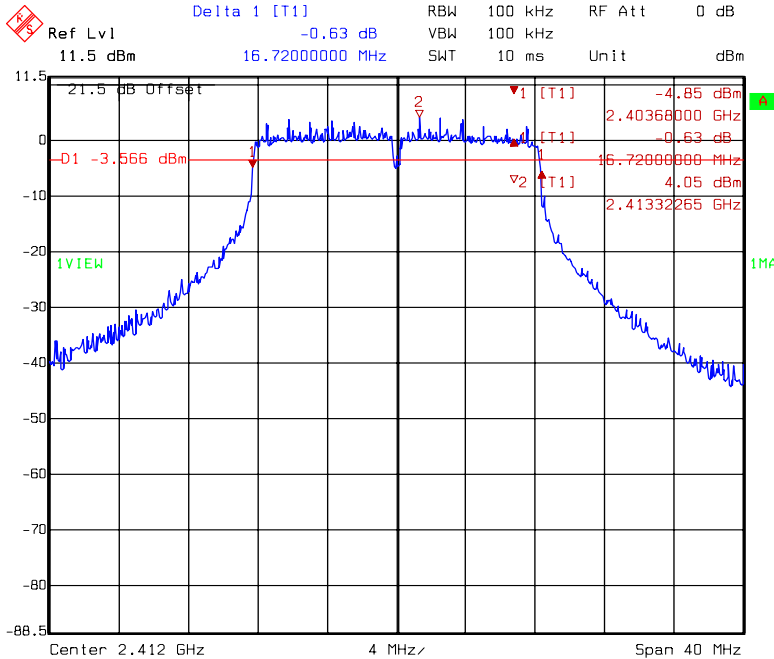
Title: 6dB Band-Width
 Comment A: CH 6 at 802.11b mode
 Date: 17.JUL.2008 12:02:07

6 dB Bandwidth @ 802.11b mode channel 11



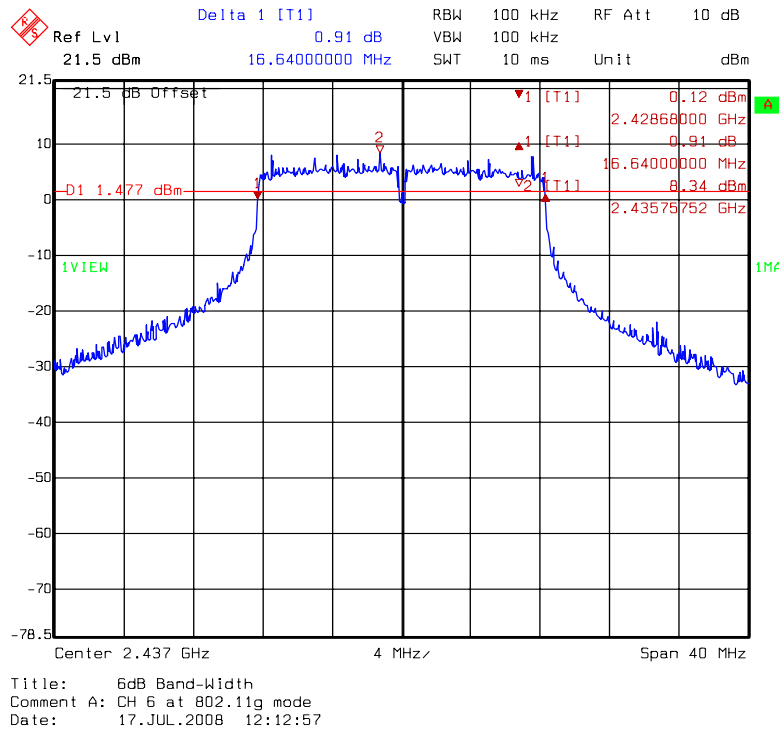
Title: 6dB Band-Width
Comment A: CH 11 at 802.11b mode
Date: 17.JUL.2008 12:06:10

6 dB Bandwidth @ 802.11g mode channel 1

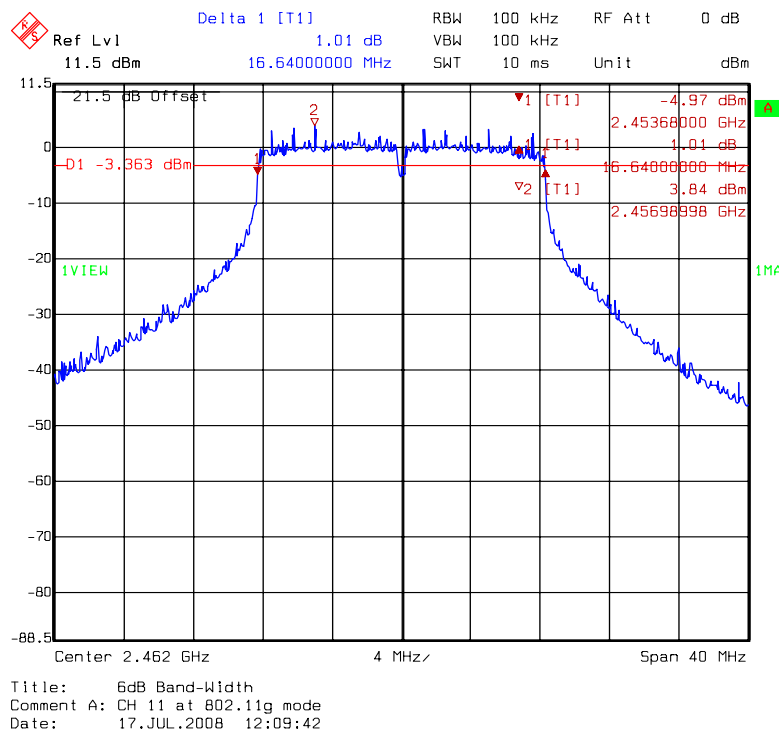


Title: 6dB Band-Width
Comment A: CH 1 at 802.11g mode
Date: 17.JUL.2008 12:16:20

6 dB Bandwidth @ 802.11g mode channel 6



6 dB Bandwidth @ 802.11g mode channel 11



4. 99 % Occupied Bandwidth

Name of Test	99 % Occupied Bandwidth
Base Standard	None; for reporting purposes only

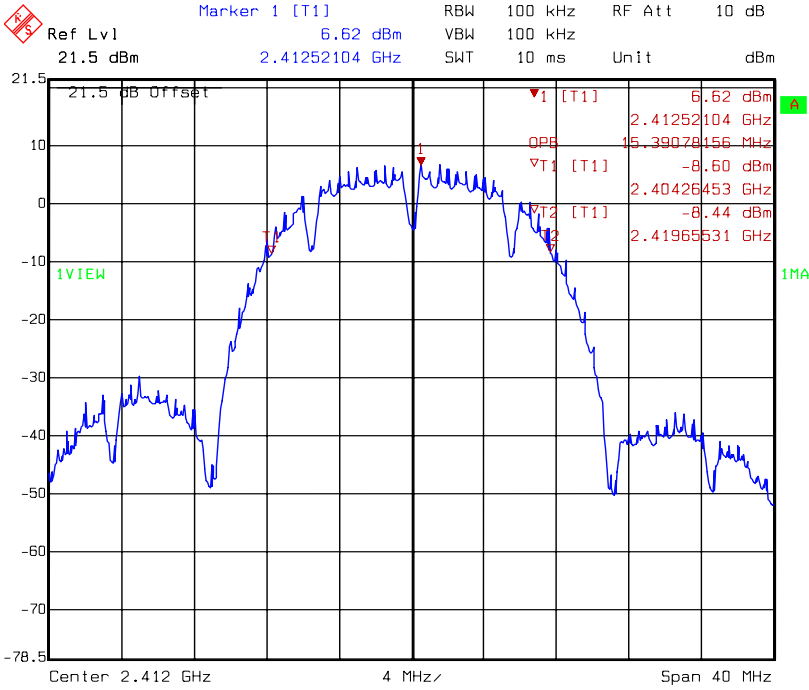
Test Result: Complies
Test Method: See Appendix B
Measurement Data: See Table & plots below

Note: The EUT was tested while in a continuous transmit mode and the worst case data rates are 1 Mbps for 802.11b and 6 Mbps for 802.11g. The EUT was tuned to a low, middle and high channel.

Table2. 99 % Occupied Bandwidth

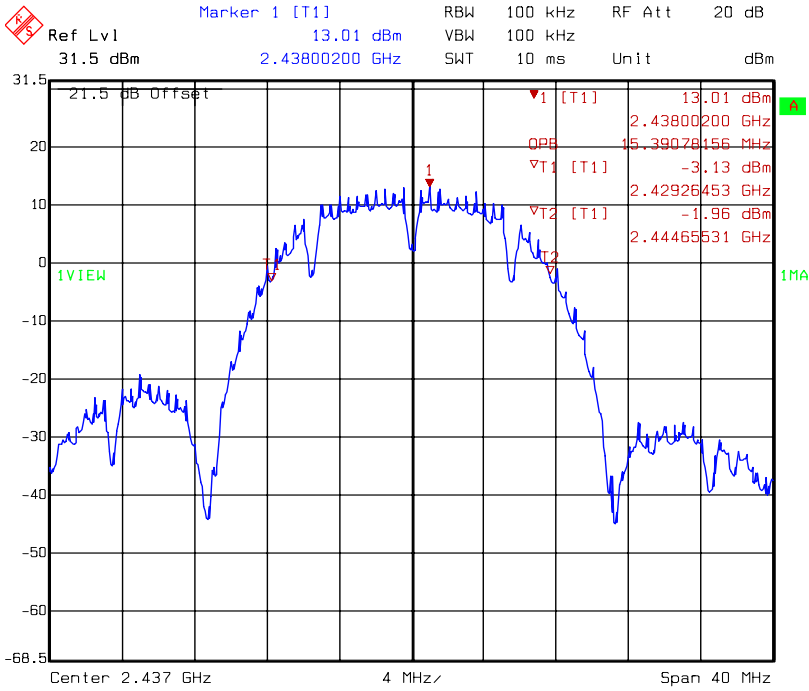
Mode	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)
802.11b	1	2412	15.39
	6	2437	15.39
	11	2462	15.31
802.11g	1	2412	16.51
	6	2437	16.51
	11	2462	16.51

99 % Occupied Bandwidth @ 802.11b mode channel 1



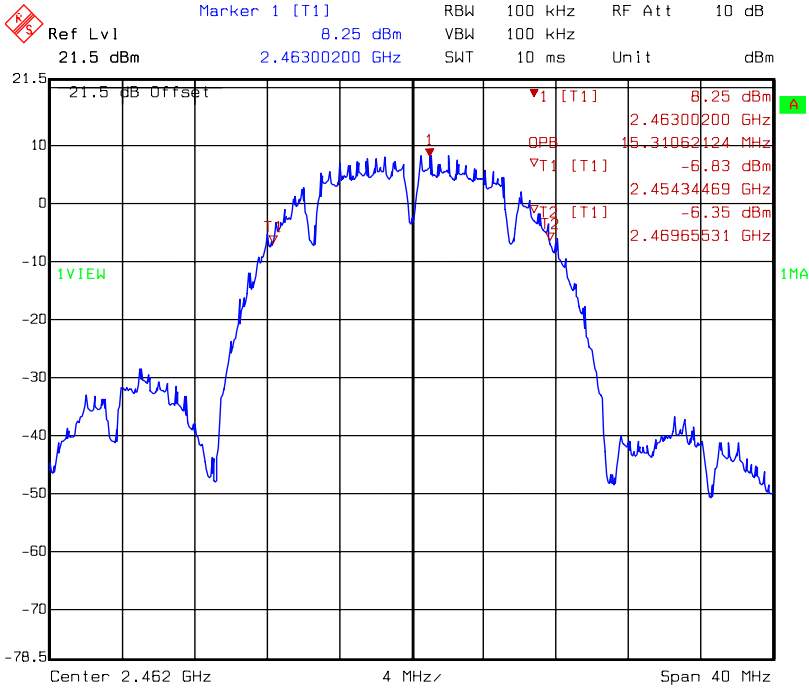
Title: Occupied Band-Width
 Comment A: CH 1 at 802.11b mode
 Date: 17.JUL.2008 12:00:43

99 % Occupied Bandwidth @ 802.11b mode channel 6

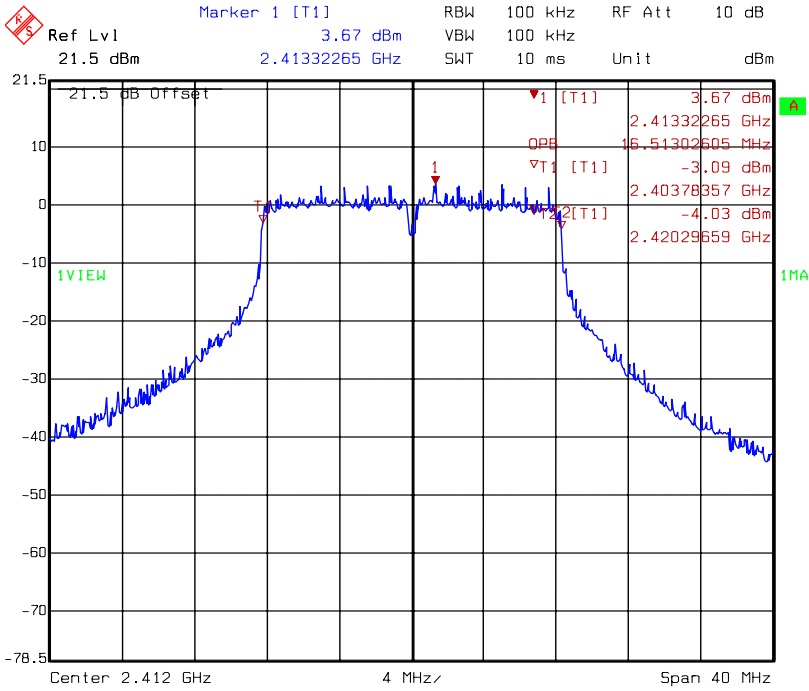


Title: Occupied Band-Width
 Comment A: CH 6 at 802.11b mode
 Date: 17.JUL.2008 12:04:07

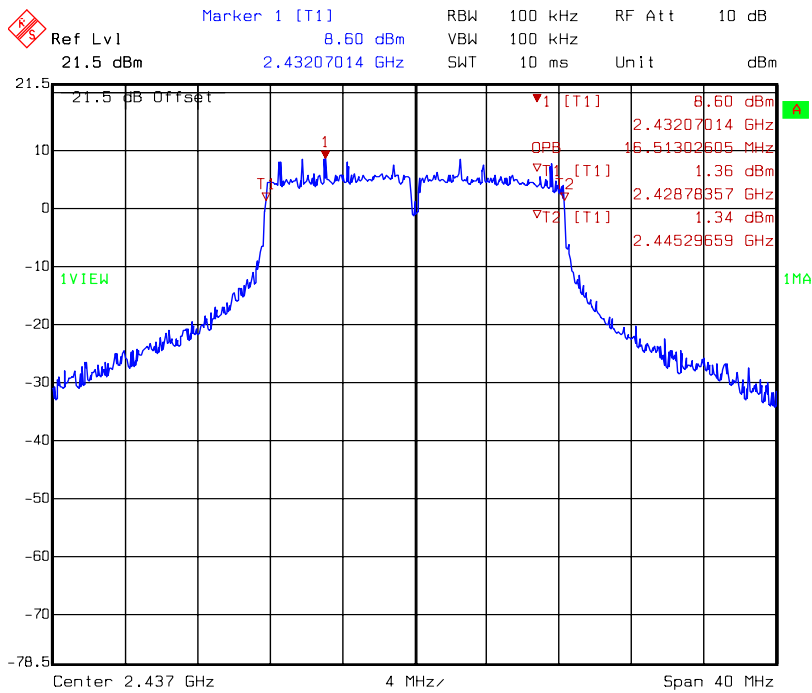
99 % Occupied Bandwidth @ 802.11b mode channel 11



99 % Occupied Bandwidth @ 802.11g mode channel 1

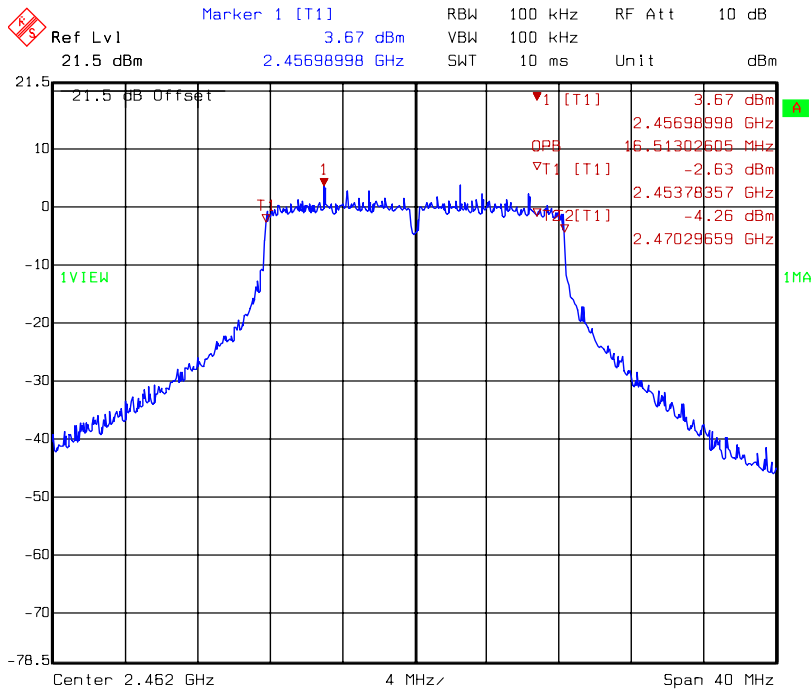


99 % Occupied Bandwidth @ 802.11g mode channel 6



Title: Occupied Band-Width
Comment A: CH 6 at 802.11g mode
Date: 17.JUL.2008 12:14:50

99 % Occupied Bandwidth @ 802.11g mode channel 11



Title: Occupied Band-Width
Comment A: CH 11 at 802.11g mode
Date: 17.JUL.2008 12:11:32

5. Maximum Output Power

Name of Test	Maximum output power
Base Standard	FCC 15.247(b)

Measurement Uncertainty: ±2dB (k=2)

Test Result: Complies

Test Method: See Appendix A

Measurement Data: See Table below

Note: The EUT was tested while in a continuous transmit mode and the worst case data rates are 1 Mbps for 802.11b and 6 Mbps for 802.11g. The EUT was tuned to a low, middle and high channel.

Table3. Maximum output power

Mode	Channel	Frequency (MHz)	C.L. (dB)	Reading (dBm)	Conducted Peak Output Power		Limit (W)
					(dBm)	(mW)	
802.11b	1	2412	2	18.46	20.46	111.17	1
	6	2437	2	24.27	26.27	423.64	1
	11	2462	2	20.20	22.20	165.96	1
802.11g	1	2412	2	24.36	26.36	432.51	1
	6	2437	2	26.84	28.84	765.60	1
	11	2462	2	24.15	26.15	412.10	1

6. Power Spectral Density

Name of Test	Power Spectral Density
Base Standard	FCC 15.247(e)

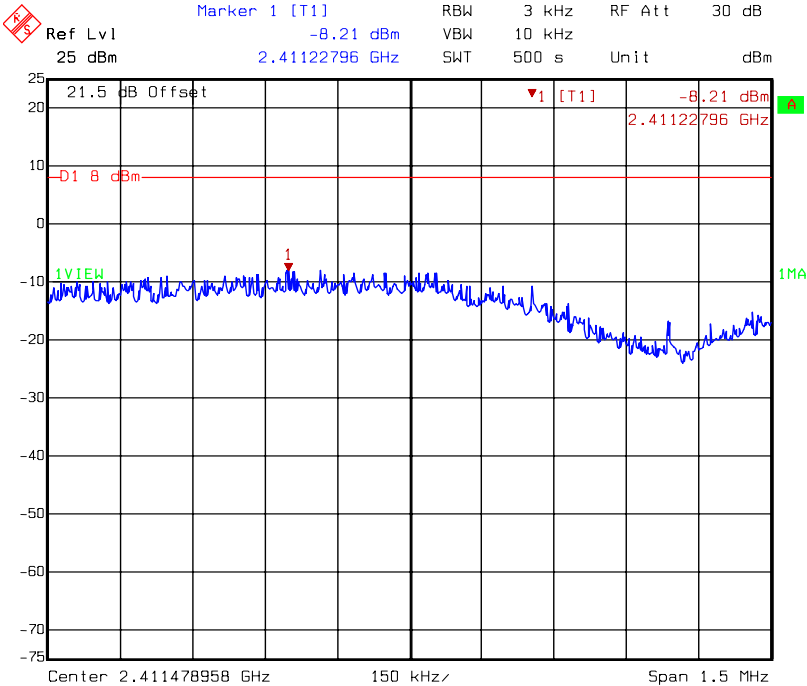
Test Result: Complies
Test Method: See Appendix B
Measurement Data: See Table & plots below

Note: The EUT was tested while in a continuous transmit mode and the worst case data rates are 1 Mbps for 802.11b and 6 Mbps for 802.11g. The EUT was tuned to a low, middle and high channel.

Table4. Power Spectral Density

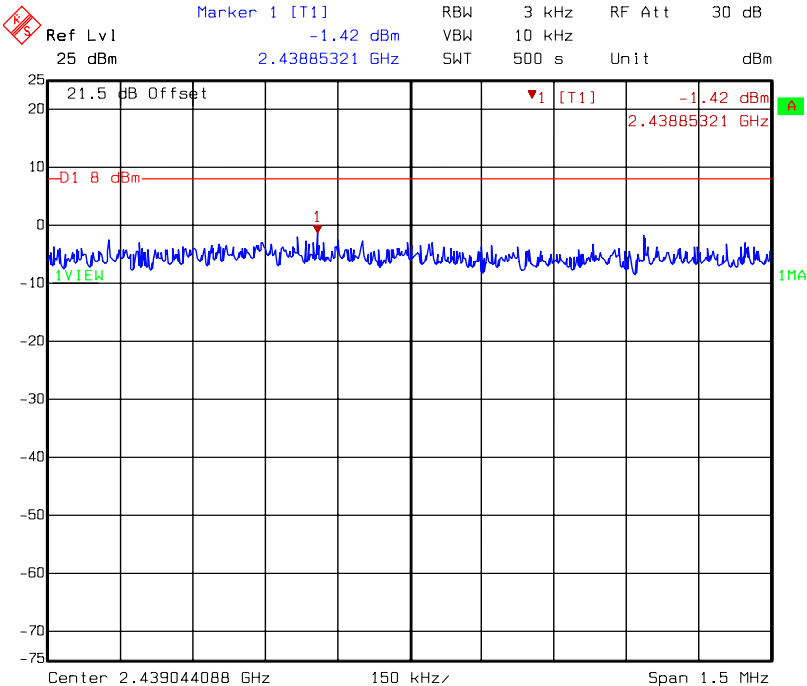
Mode	Channel	Frequency (MHz)	Power spectrum density (dBm)	Limit (dBm)
802.11b	1	2412	-8.21	8
	6	2437	-1.42	8
	11	2462	-5.41	8
802.11g	1	2412	-9.90	8
	6	2437	-5.02	8
	11	2462	-10.06	8

Power Spectral Density @ 802.11b mode channel 1



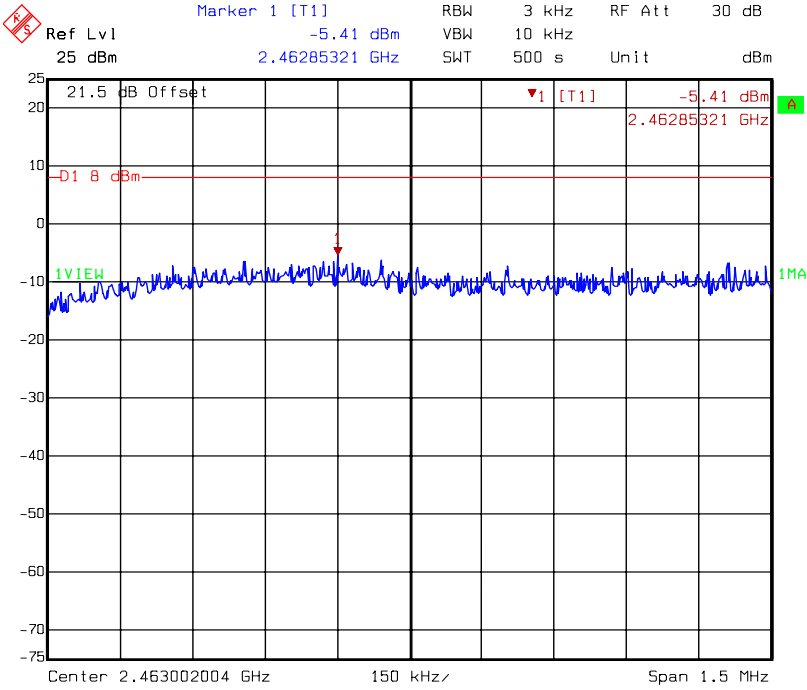
Title: Power density
 Comment A: CH 1 at 802.11b mode
 Date: 17.JUL.2008 11:59:05

Power Spectral Density @ 802.11b mode channel 6



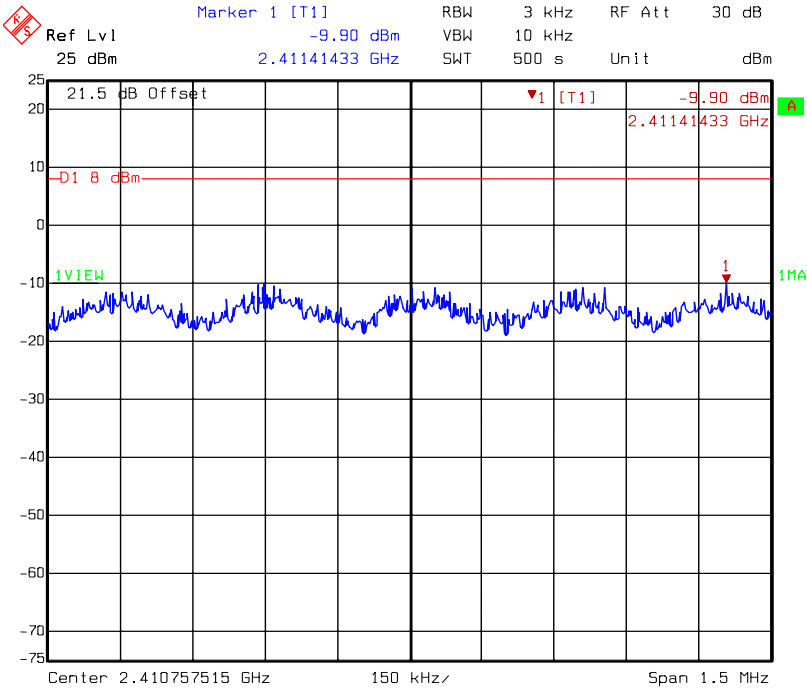
Title: Power density
 Comment A: CH 6 at 802.11b mode
 Date: 17.JUL.2008 12:02:23

Power Spectral Density @ 802.11b mode channel 11



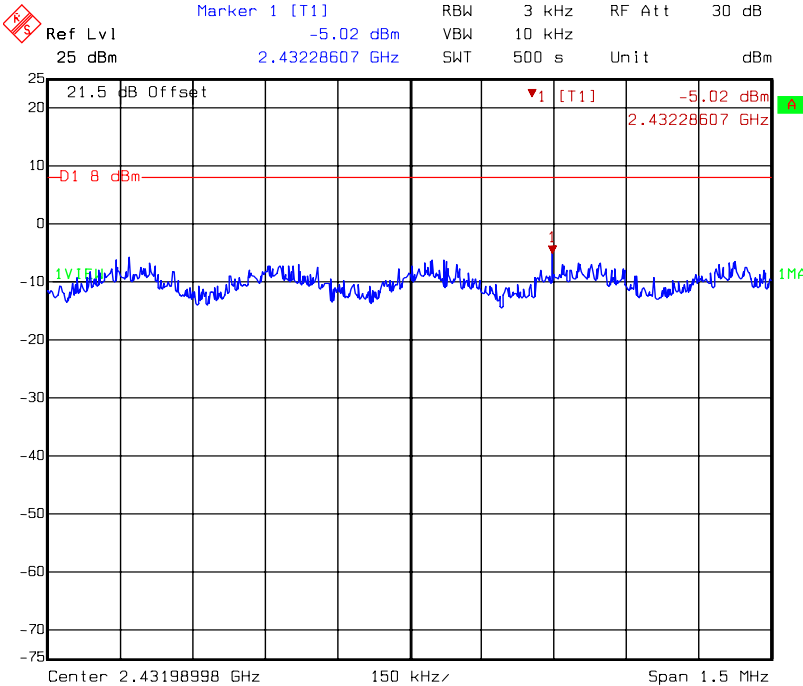
Title: Power density
 Comment A: CH 11 at 802.11b mode
 Date: 17.JUL.2008 12:06:26

Power Spectral Density @ 802.11g mode channel 1



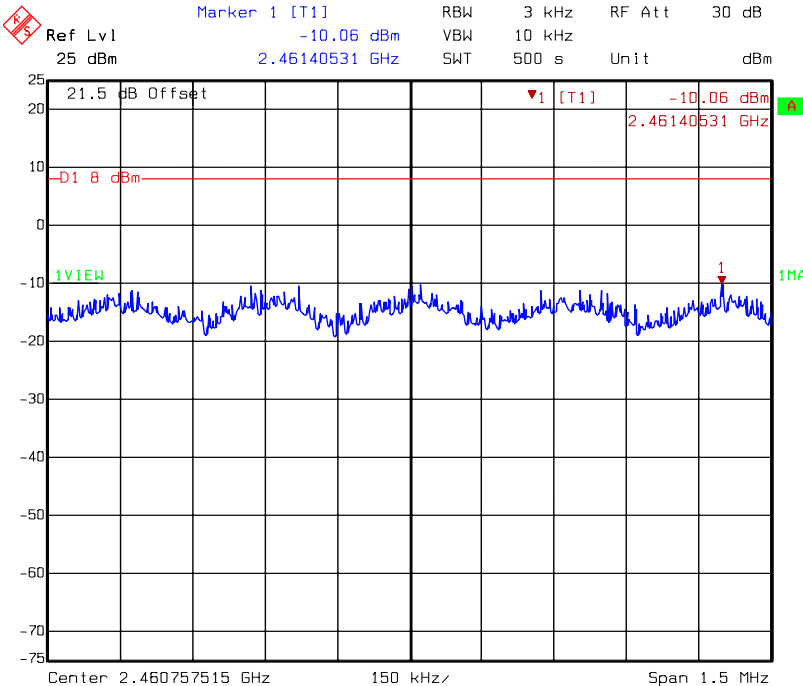
Title: Power density
 Comment A: CH 1 at 802.11g mode
 Date: 17.JUL.2008 12:16:36

Power Spectral Density @ 802.11g mode channel 6



Title: Power density
 Comment A: CH 6 at 802.11g mode
 Date: 17.JUL.2008 12:13:13

Power Spectral Density @ 802.11g mode channel 11



Title: Power density
 Comment A: CH 11 at 802.11g mode
 Date: 17.JUL.2008 12:09:58

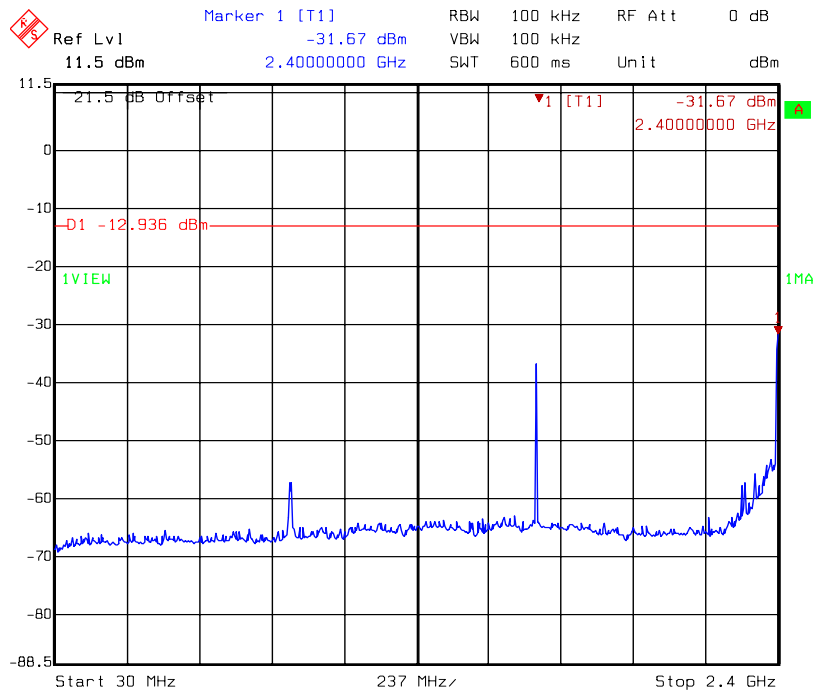
7. RF Antenna conducted Spurious

Name of Test	RF Antenna Conducted Spurious
Base Standard	FCC 15.247(d)

Test Result: Complies
Test Method: See Appendix C
Measurement Data: See plots below

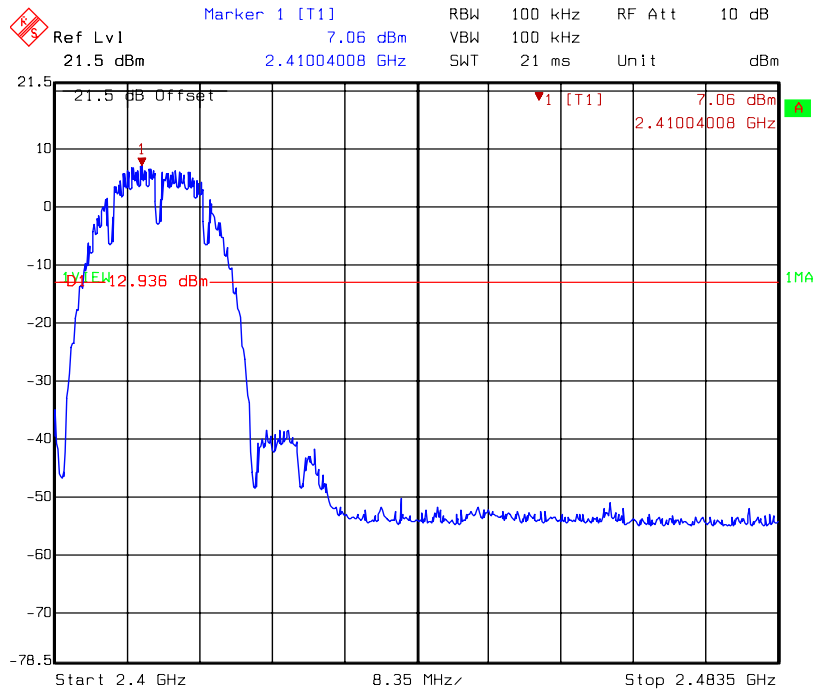
Note: (1) The EUT was tested while in a continuous transmit mode and the worst case data rates are 1Mbps for 802.11b and 6Mbps for 802.11g. The EUT was tuned to a low, middle and high channel.
(2) The EUT operating at 2.4 GHz ISM band. Frequency Range scanned from 30 MHz to 25 GHz.

conducted spurious @ 802.11b mode channel 1 (1 of 3)



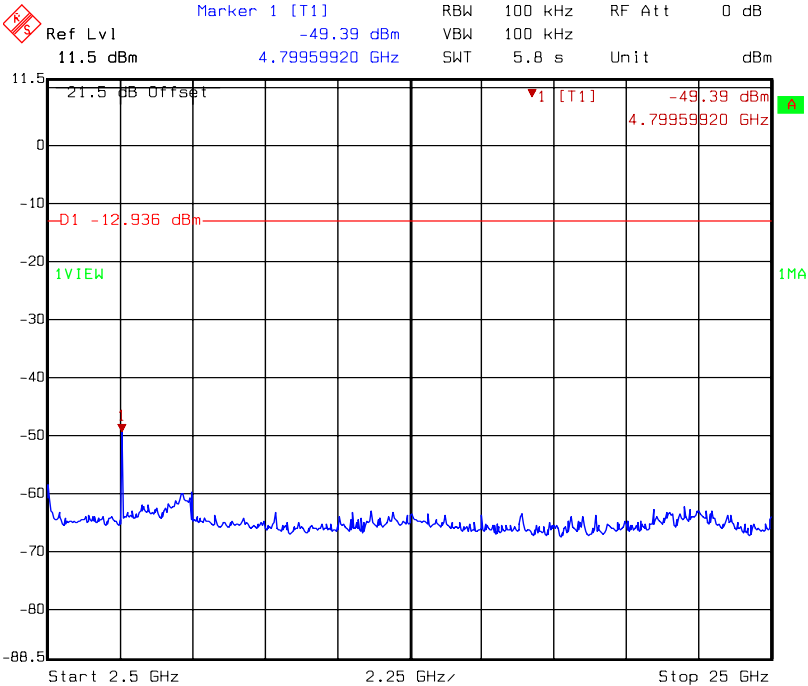
Title: Conductive-Spurious
Comment A: CH 1 at 802.11b mode 30MHz~2400MHz
Date: 17.JUL.2008 11:59:50

conducted spurious @ 802.11b mode channel 1 (2 of 3)



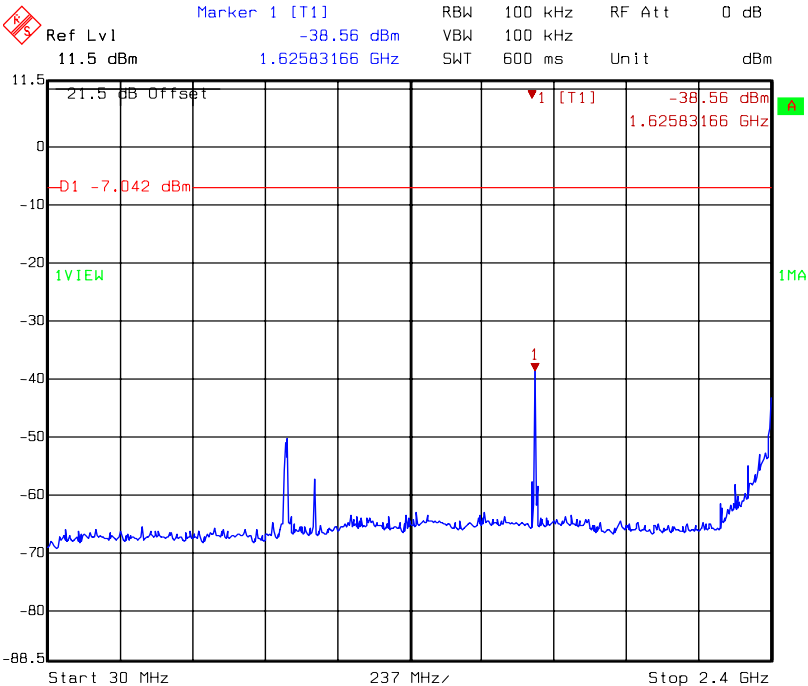
Title: Conductive-Spurious
Comment A: CH 1 at 802.11b mode 2400MHz~2483.5MHz
Date: 17.JUL.2008 11:59:29

conducted spurious @ 802.11b mode channel 1 (3 of 3)



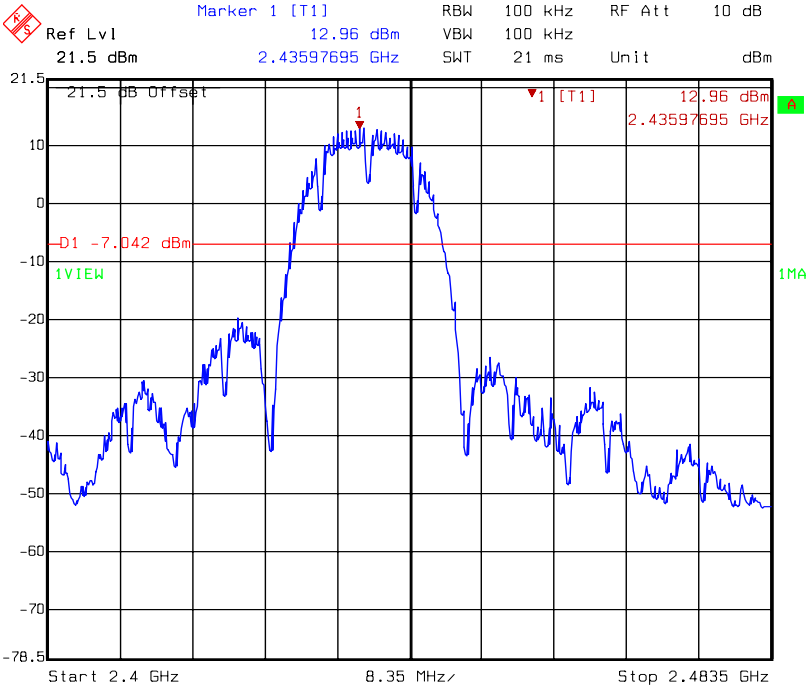
Title: Conductive-Spurious
Comment A: CH 1 at 802.11b mode 2483.5MHz~25GHz
Date: 17.JUL.2008 12:00:17

conducted spurious @ 802.11b mode channel 6 (1 of 3)



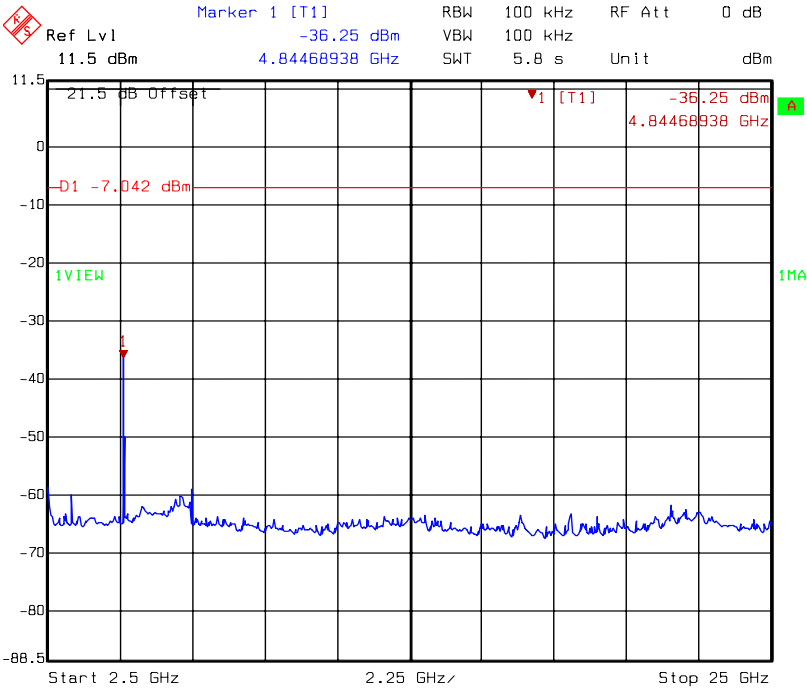
Title: Conductive-Spurious
Comment A: CH 6 at 802.11b mode 30MHz~2400MHz
Date: 17.JUL.2008 12:03:07

conducted spurious @ 802.11b mode channel 6 (2 of 3)



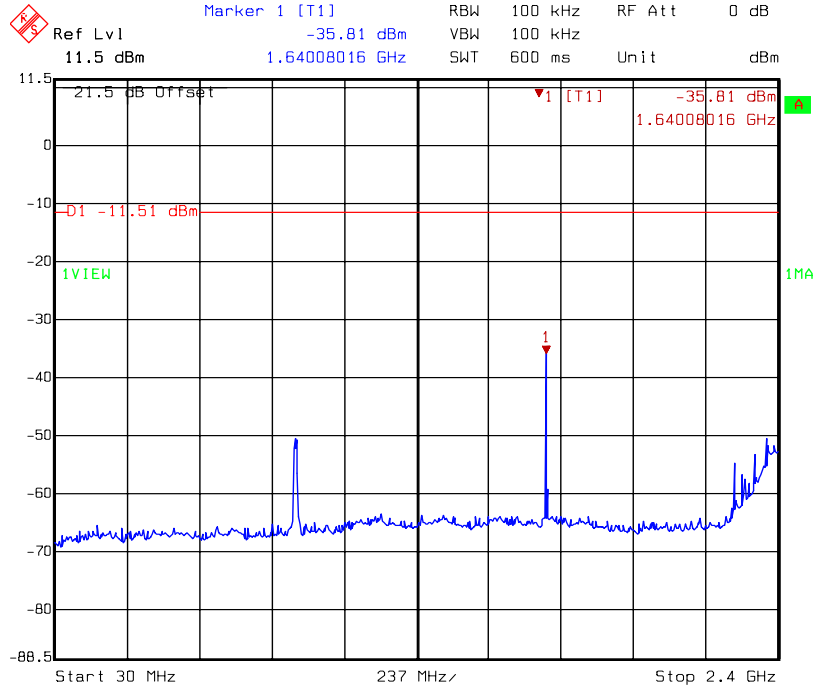
Title: Conductive-Spurious
 Comment A: CH 6 at 802.11b mode 2400MHz~2483.5MHz
 Date: 17.JUL.2008 12:02:46

conducted spurious @ 802.11b mode channel 6 (3 of 3)



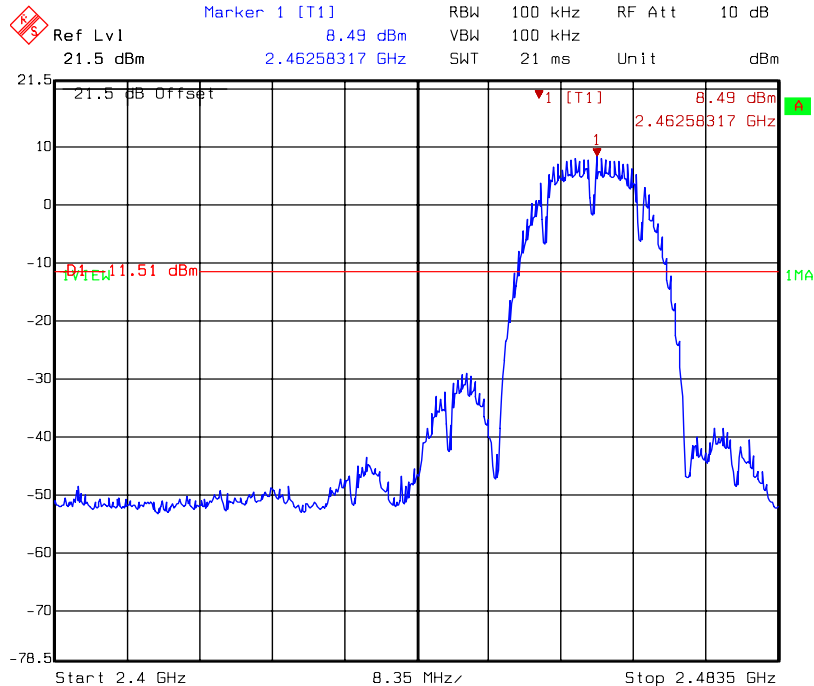
Title: Conductive-Spurious
 Comment A: CH 6 at 802.11b mode 2483.5MHz~25GHz
 Date: 17.JUL.2008 12:03:35

conducted spurious @ 802.11b mode channel 11 (1 of 3)



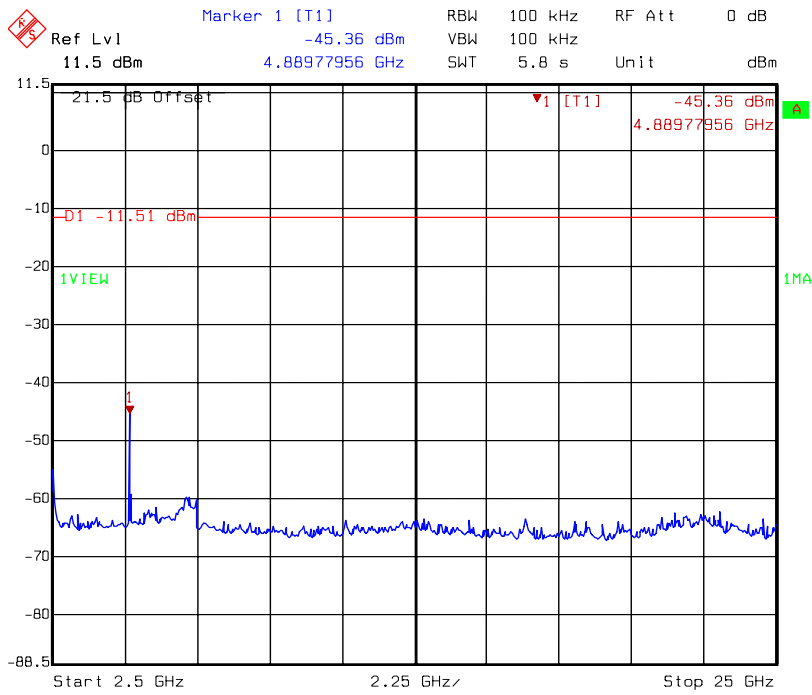
Title: Conductive-Spurious
 Comment A: CH 11 at 802.11b mode 30MHz~2400MHz
 Date: 17.JUL.2008 12:07:10

conducted spurious @ 802.11b mode channel 11 (2 of 3)



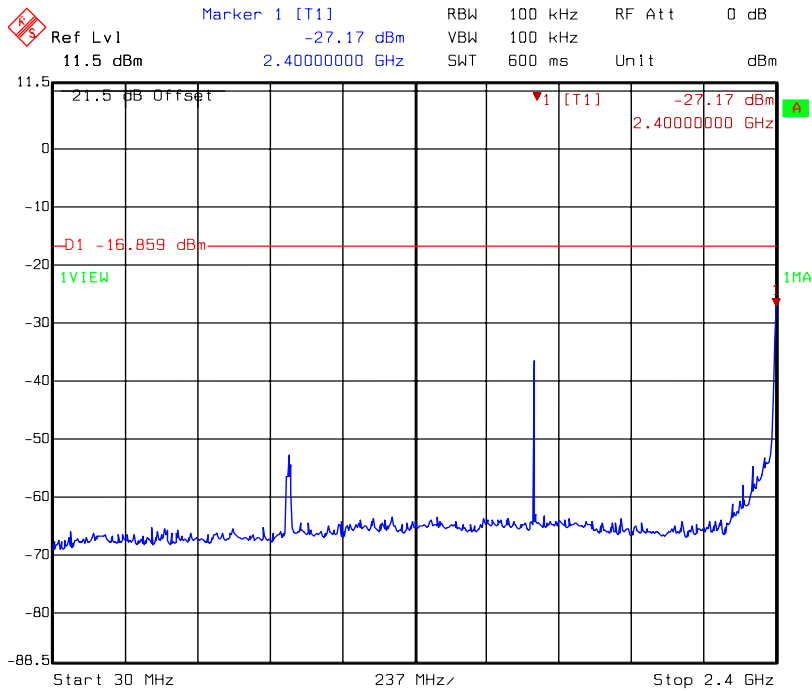
Title: Conductive-Spurious
 Comment A: CH 11 at 802.11b mode 2400MHz~2483.5MHz
 Date: 17.JUL.2008 12:06:49

conducted spurious @ 802.11b mode channel 11 (3 of 3)



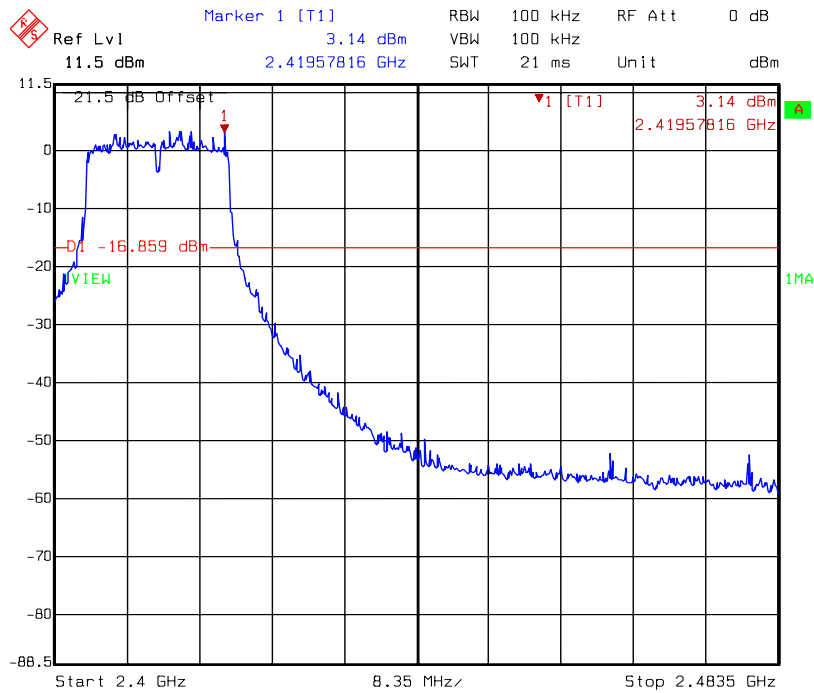
Title: Conductive-Spurious
Comment A: CH 11 at 802.11b mode 2483.5MHz~25GHz
Date: 17.JUL.2008 12:07:37

conducted spurious @ 802.11g mode channel 1 (1 of 3)



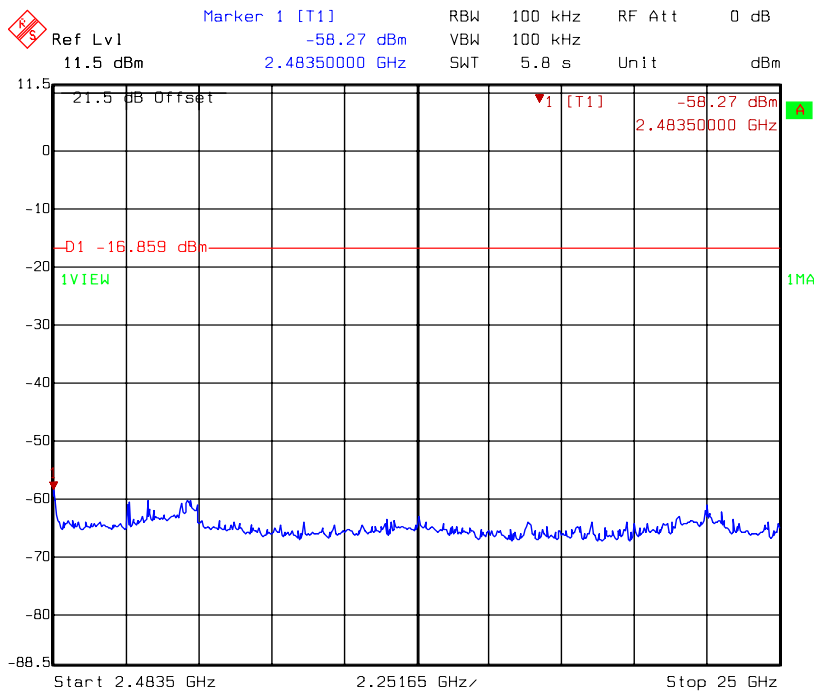
Title: Conductive-Spurious
Comment A: CH 1 at 802.11g mode 30MHz~2400MHz
Date: 17.JUL.2008 12:17:17

conducted spurious @ 802.11g mode channel 1 (2 of 3)



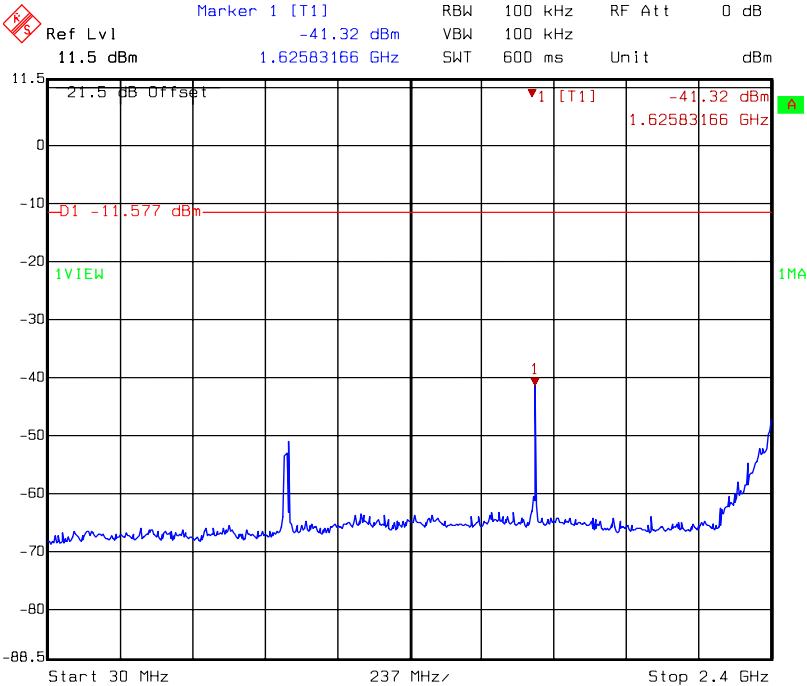
Title: Conductive-Spurious
Comment A: CH 1 at 802.11g mode 2400MHz~2483.5MHz
Date: 17.JUL.2008 12:16:56

conducted spurious @ 802.11g mode channel 1 (3 of 3)



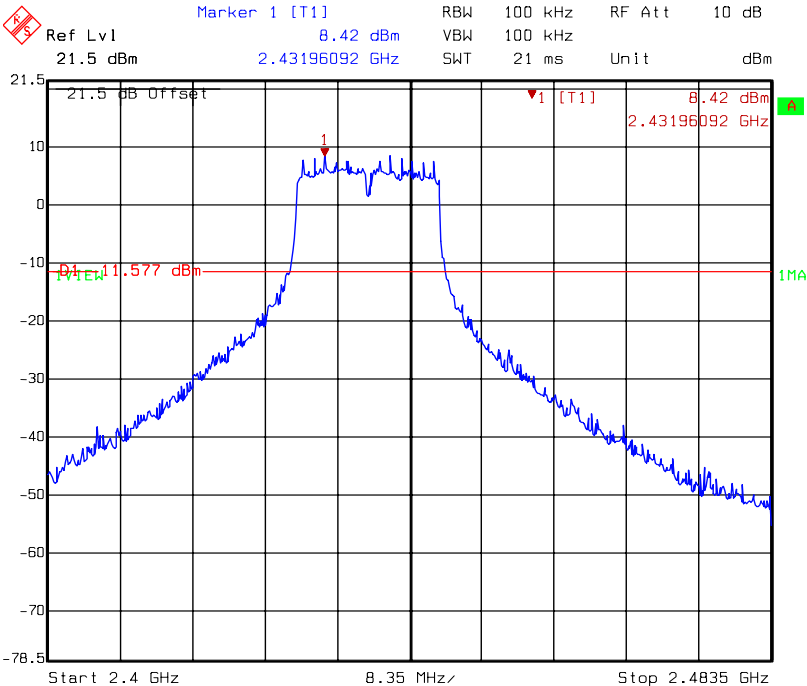
Title: Conductive-Spurious
Comment A: CH 1 at 802.11g mode 2483.5MHz~25000MHz
Date: 17.JUL.2008 12:17:44

conducted spurious @ 802.11g mode channel 6 (1 of 3)



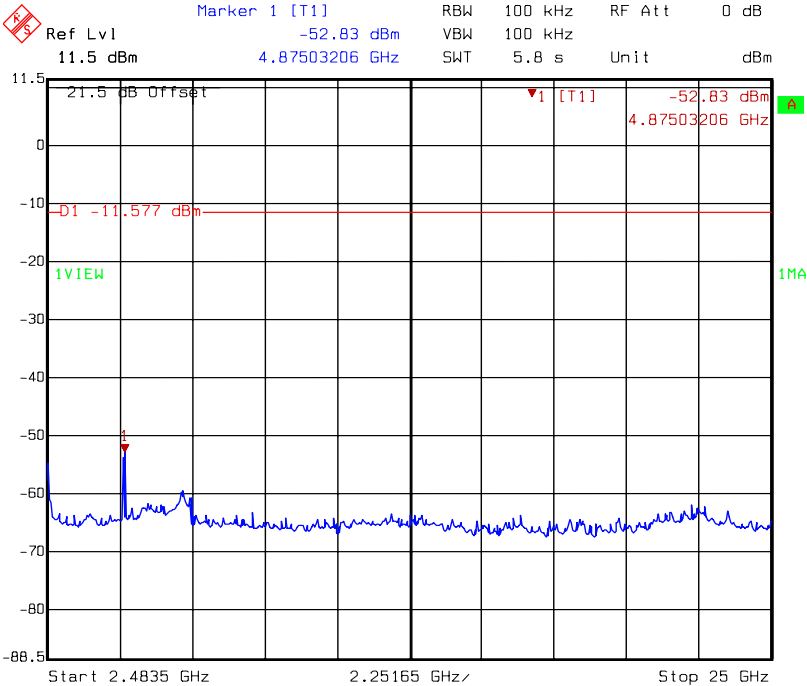
Title: Conductive-Spurious
 Comment A: CH 6 at 802.11g mode 30MHz~2400MHz
 Date: 17.JUL.2008 12:13:57

conducted spurious @ 802.11g mode channel 6 (2 of 3)



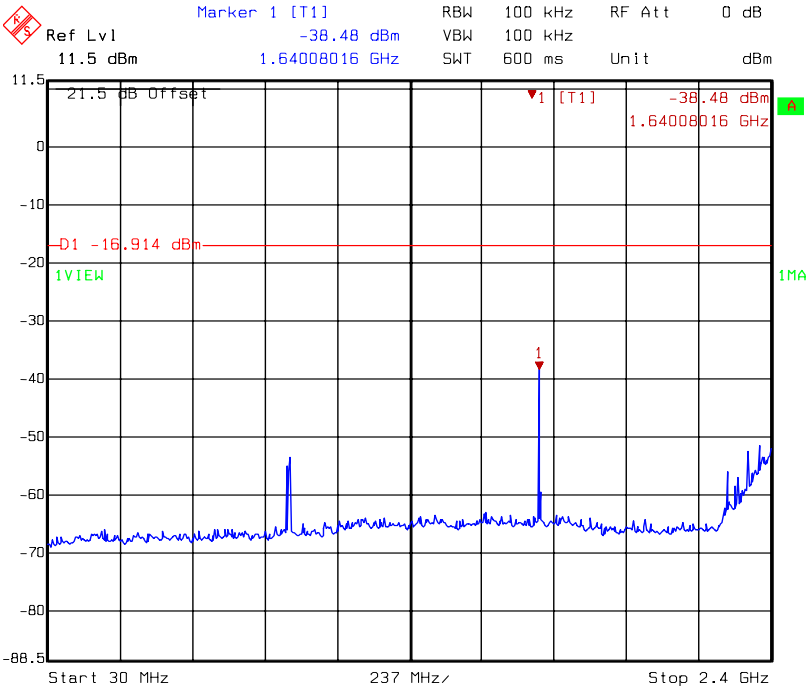
Title: Conductive-Spurious
 Comment A: CH 6 at 802.11g mode 2400MHz~2483.5MHz
 Date: 17.JUL.2008 12:13:36

conducted spurious @ 802.11g mode channel 6 (3 of 3)



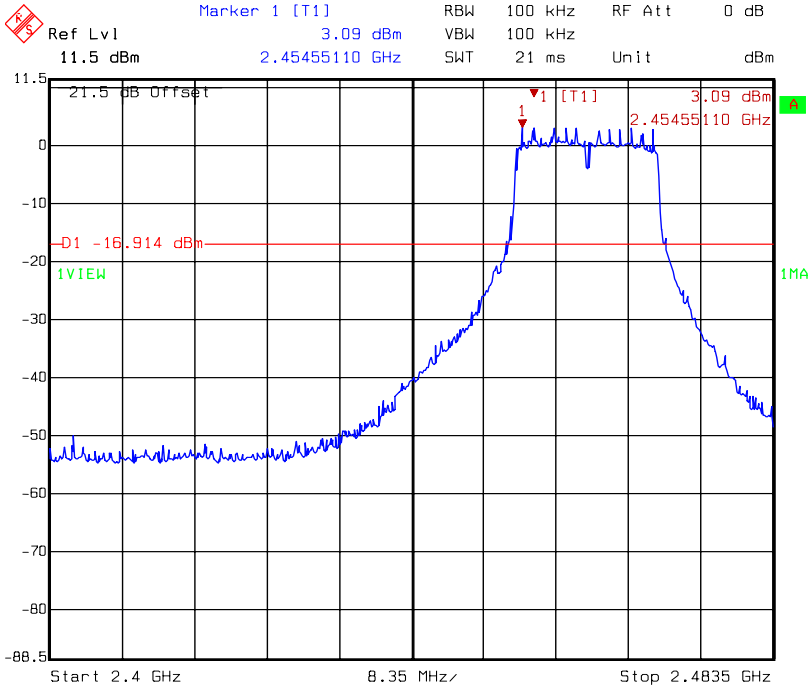
Title: Conductive-Spurious
 Comment A: CH 6 at 802.11g mode 2483.5MHz~25000MHz
 Date: 17.JUL.2008 12:14:24

conducted spurious @ 802.11g mode channel 11 (1 of 3)



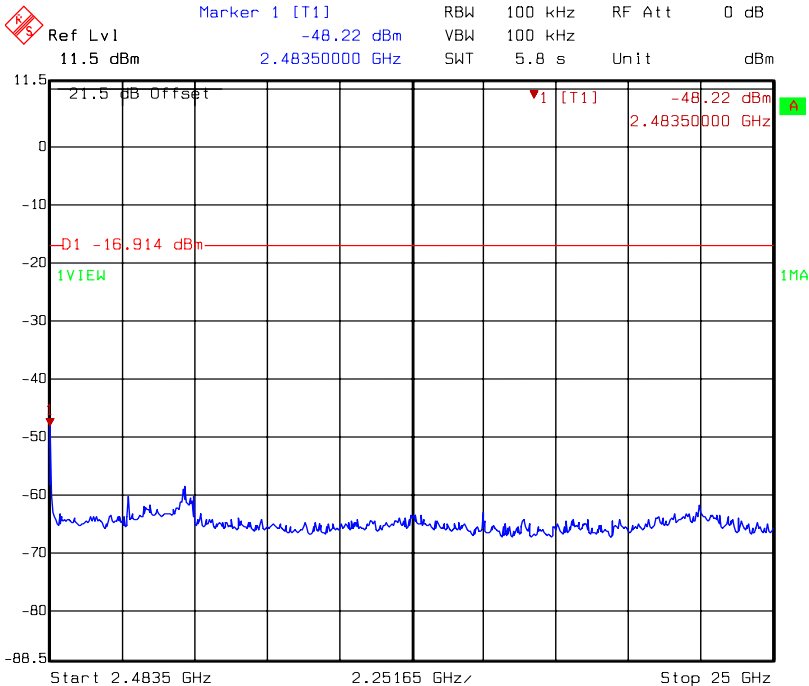
Title: Conductive-Spurious
 Comment A: CH 11 at 802.11g mode 30MHz~2400MHz
 Date: 17.JUL.2008 12:10:40

conducted spurious @ 802.11g mode channel 11 (2 of 3)



Title: Conductive-Spurious
 Comment A: CH 11 at 802.11g mode 2400MHz~2483.5MHz
 Date: 17.JUL.2008 12:10:18

conducted spurious @ 802.11g mode channel 11 (3 of 3)



Title: Conductive-Spurious
 Comment A: CH 11 at 802.11g mode 2483.5MHz~25000MHz
 Date: 17.JUL.2008 12:11:07

8. Radiated Spurious Emission

Name of Test	Radiated Spurious Emission
Base Standard	FCC 15.247(d), 15.209, 15.205

Test Result: Complies
Test Method: See Appendix D
Measurement Data: See Tables below

Note: (1) The EUT was tested while in a continuous transmit mode and the worst case data rates are 1 Mbps for 802.11b and 6 Mbps for 802.11g. The EUT was tuned to a low, middle and high channel.
(2) The EUT operating at 2.4 GHz ISM band. Frequency Range scanned from 30 MHz to 25 GHz.

Measurement results: frequencies equal to or less than 1 GHz

The test was performed on EUT under 802.11b and 802.11g continuously transmitting mode. The worst case occurred at 802.11b Tx channel 6.

EUT : NWA1100
Worst Case : 802.11b Tx at channel 6

Antenna Polariz. (V/H)	Freq. (MHz)	Receiver Detector	Corr. Factor (dB/m)	Reading (dBUV)	Corrected Level (dBUV/m)	Limit @ 3 m (dBUV/m)	Margin (dB)
V	43.580	QP	12.71	23.35	36.06	40.00	-3.94
V	58.130	QP	12.48	25.83	38.31	40.00	-1.69
V	65.890	QP	11.16	26.63	37.79	40.00	-2.21
V	74.620	QP	10.06	25.39	35.45	40.00	-4.55
V	249.220	QP	12.35	20.99	33.34	46.00	-12.66
V	374.350	QP	15.75	15.74	31.49	46.00	-14.51
H	65.890	QP	11.99	15.86	27.85	40.00	-12.15
H	125.060	QP	11.97	20.29	32.26	43.50	-11.24
H	165.800	QP	13.63	18.51	32.14	43.50	-11.36
H	249.220	QP	12.62	27.69	40.31	46.00	-5.69
H	749.740	QP	23.02	11.08	34.10	46.00	-11.90
H	874.870	QP	24.35	12.40	36.75	46.00	-9.25

Remark:

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

Measurement results: frequency above 1GHz

EUT : NWA1100
Test Condition : 802.11b Tx at channel 1

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4824.00	PK	V	36.07	37.77	39.17	40.87	54	-13.13
4824.00	PK	H	36.07	37.77	38.14	39.84	54	-14.16

Remark:

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

EUT : NWA1100
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/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4874.00	PK	V	36.07	37.77	46.64	48.34	54	-5.66
4874.00	PK	H	36.07	37.77	39.91	41.61	54	-12.39

Remark:

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

EUT : NWA1100
 Test Condition : 802.11b Tx at channel 11

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4924.00	PK	V	36.07	37.77	38.30	40.00	54	-14.00
4924.00	PK	H	36.07	37.77	38.49	40.19	54	-13.81

Remark:

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

EUT : NWA1100
 Test Condition : 802.11g Tx at channel 1

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4824.00	PK	V	36.07	37.77	38.16	39.86	54	-14.14
4824.00	PK	H	36.07	37.77	38.50	40.20	54	-13.80

Remark:

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

EUT : NWA1100
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/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4874.00	PK	V	36.07	37.77	38.31	40.01	54	-13.99
4874.00	PK	H	36.07	37.77	37.61	39.31	54	-14.69

Remark:

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

EUT : NWA1100
Test Condition : 802.11g Tx at channel 11

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4924.00	PK	V	36.07	37.77	37.05	38.75	54	-15.25
4924.00	PK	H	36.07	37.77	37.71	39.41	54	-14.59

Remark:

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

9. Emission on Band Edge

Name of Test	Emission Band Edge
Base Standard	FCC 15.247(d)

Test Result: Complies
Test Method: See Appendix D
Measurement Data: See Tables & plots below

Note: The EUT was tested while in a continuous transmit mode and the worst case data rates are 1 Mbps for 802.11b and 6 Mbps for 802.11g. The EUT was tuned to a low, middle and high channel.

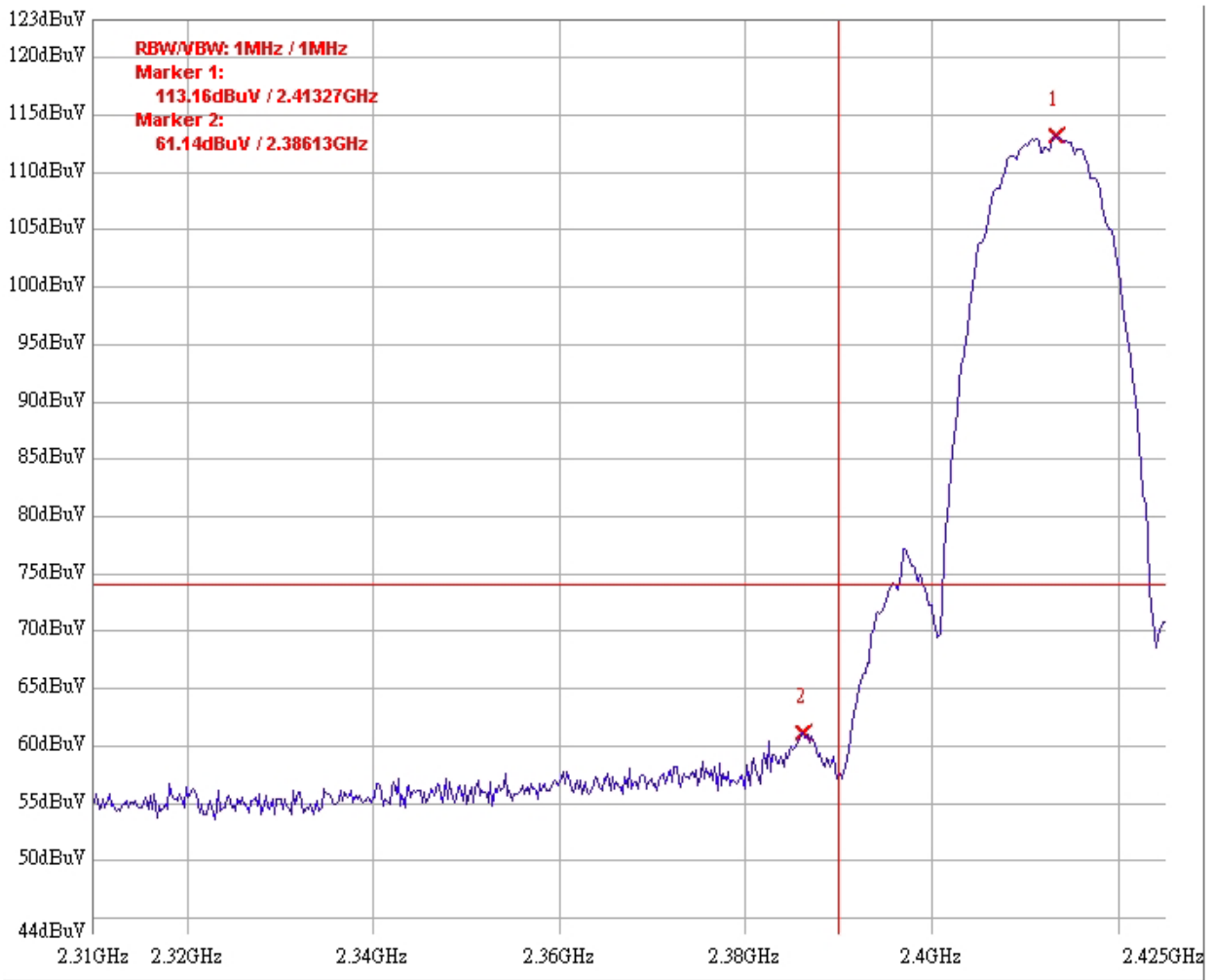
Test Mode: 802.11b

Channel	Measurement Freq.Band (MHz)	Detector	The Max. Field Strength in Restrict Band (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
1 (lowest)	2310-2390	PK	61.14	74	-12.86
		AV	53.06	54	-0.94
11 (highest)	2483.5-2500	PK	62.16	74	-11.84
		AV	52.00	54	-2.00

Test Mode: 802.11g

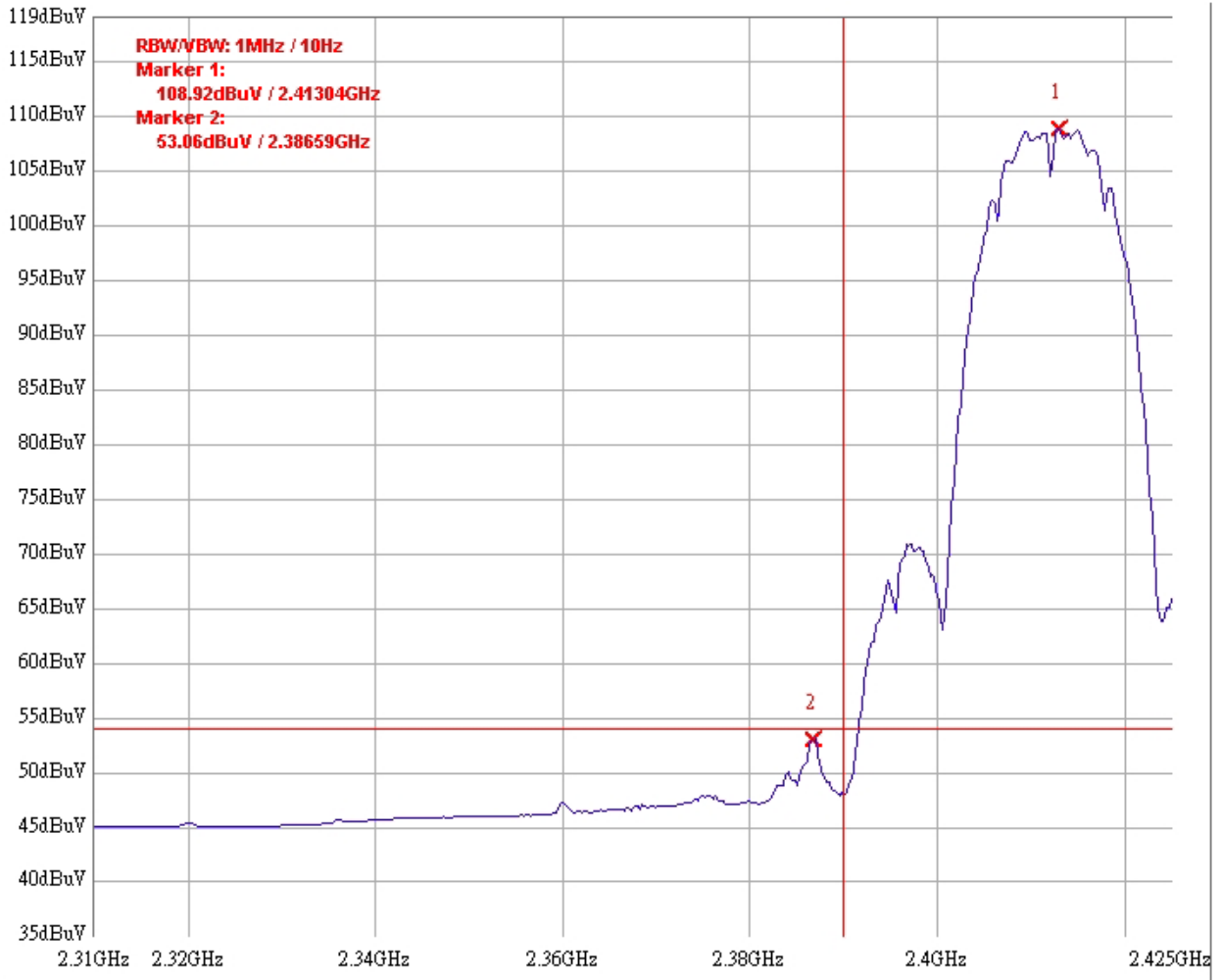
Channel	Measurement Freq.Band (MHz)	Detector	The Max. Field Strength in Restrict Band (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
1 (lowest)	2310-2390	PK	69.52	74	-4.48
		AV	52.98	54	-1.02
11 (highest)	2483.5-2500	PK	67.81	74	-6.19
		AV	52.41	54	-1.59

Test Mode: 802.11b mode (CH 1 PK)



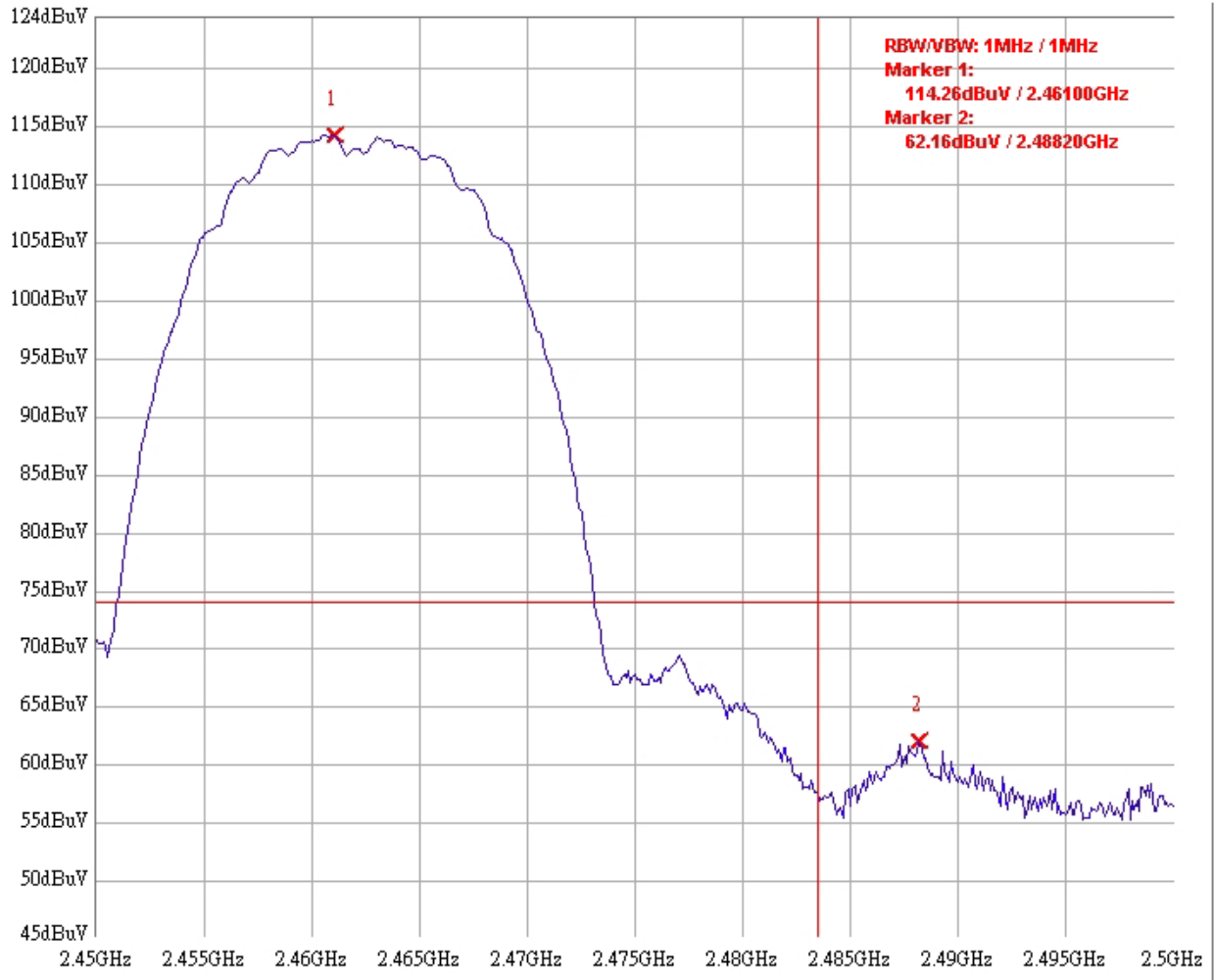
Band-edge
11b ch1 sweep time:5 ms
PK

Test Mode: 802.11b mode (CH 1 AV)



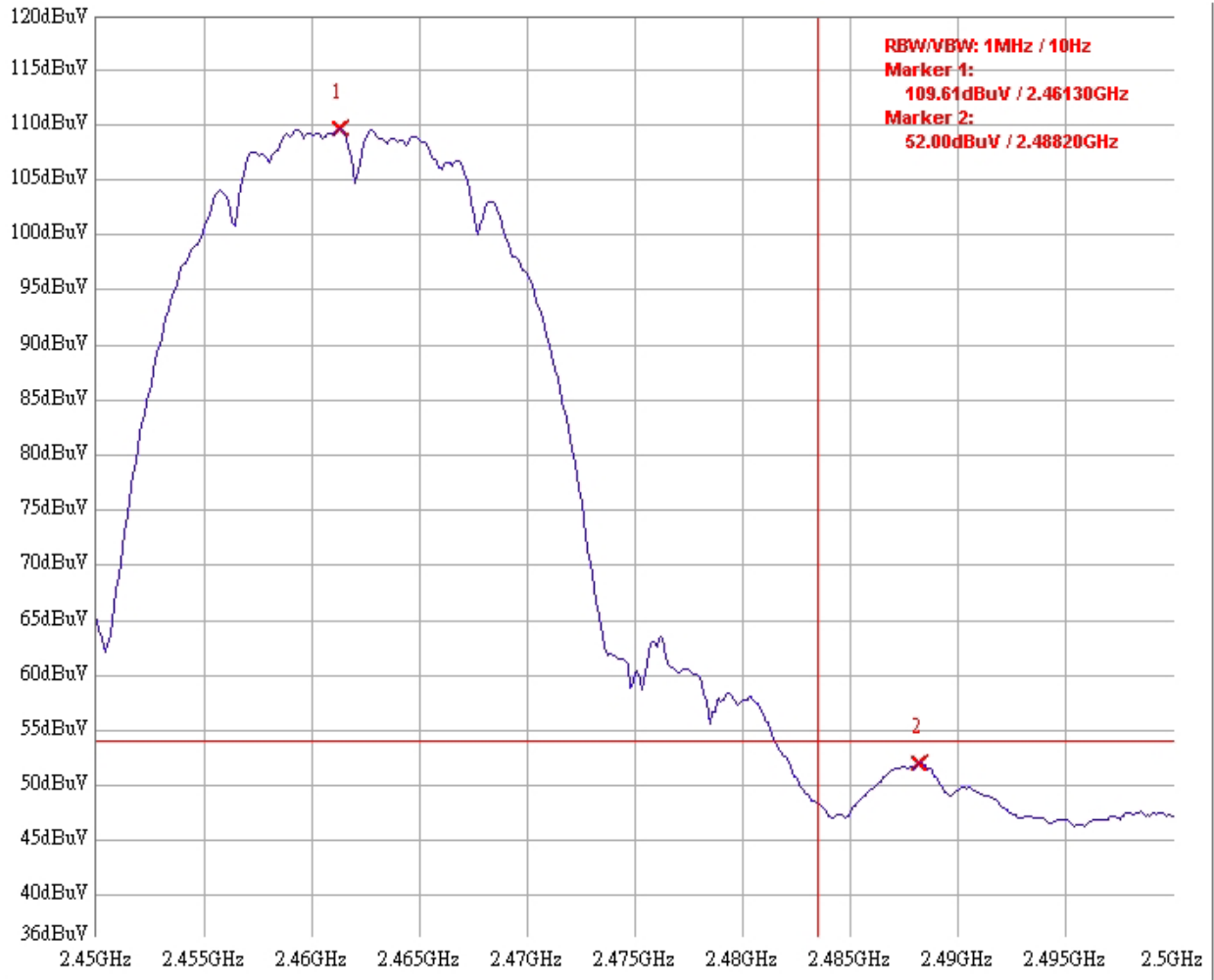
Band-edge
11b chl sweep time:29 Sec
AV

Test Mode: 802.11b mode (CH 11 PK)



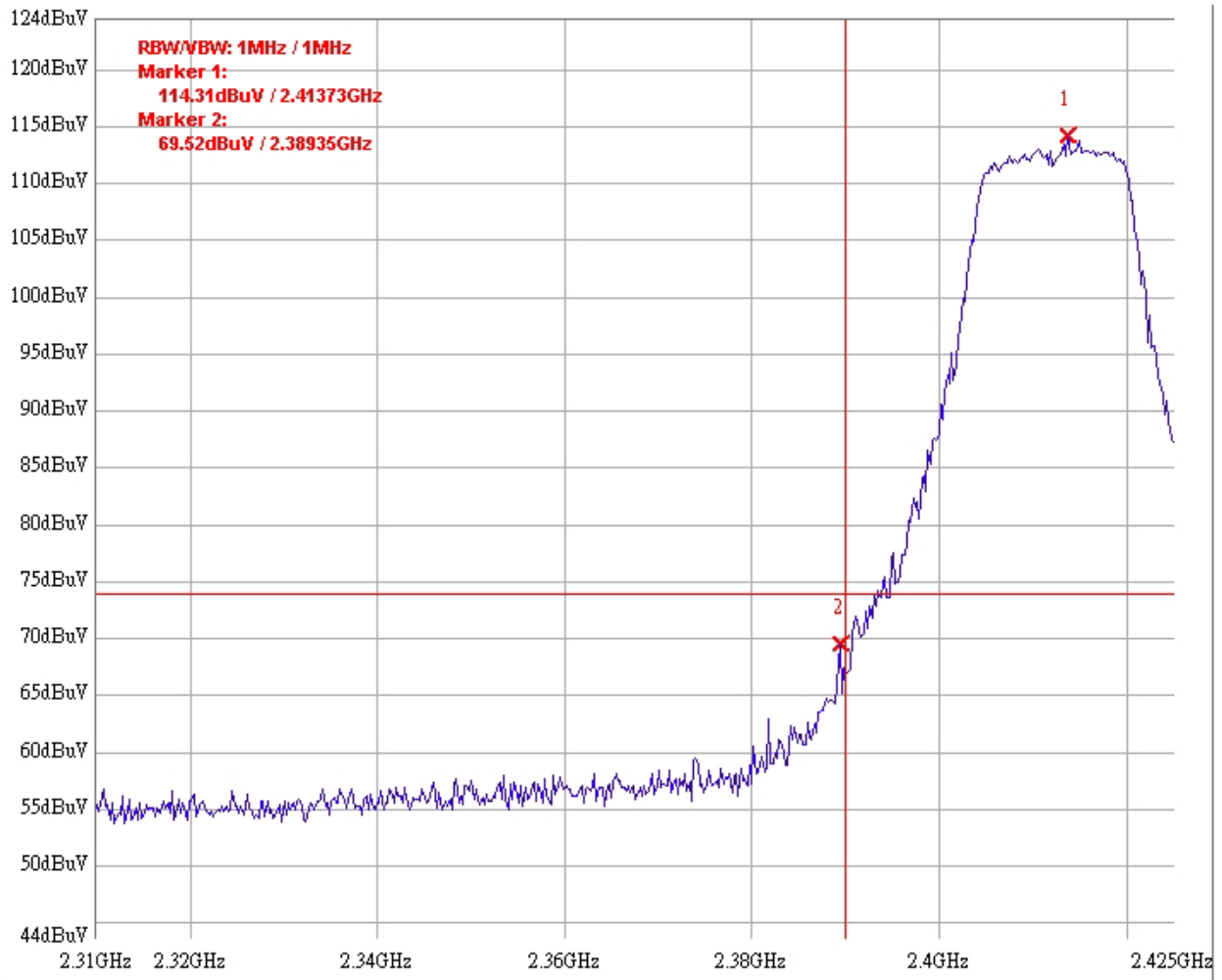
Band-edge
11b ch11 sweep time:2.5 ms
PK

Test Mode: 802.11b mode (CH 11 AV)



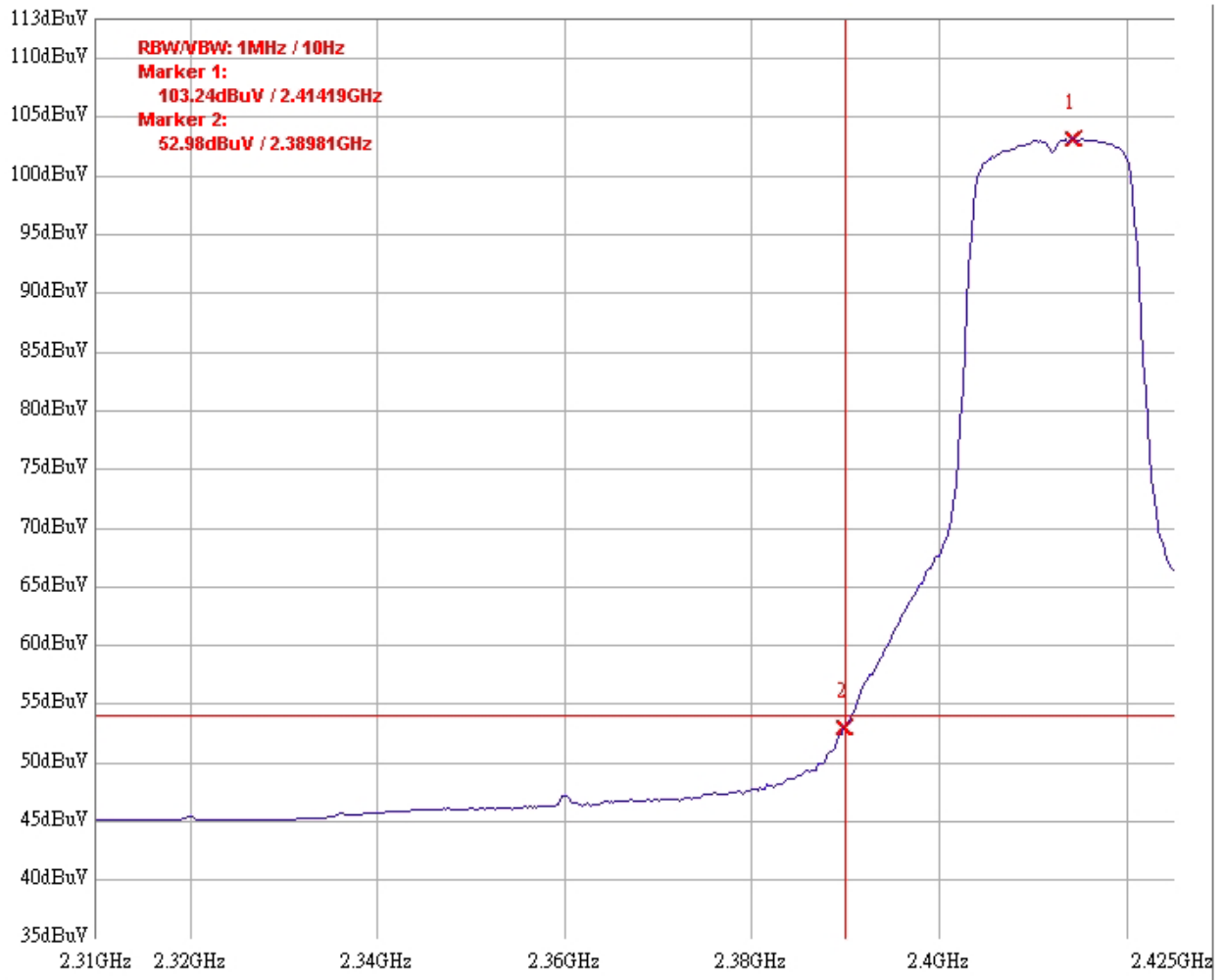
Band-edge
11b ch11 sweep time:12.5 s
AV

Test Mode: 802.11g mode (CH 1 PK)



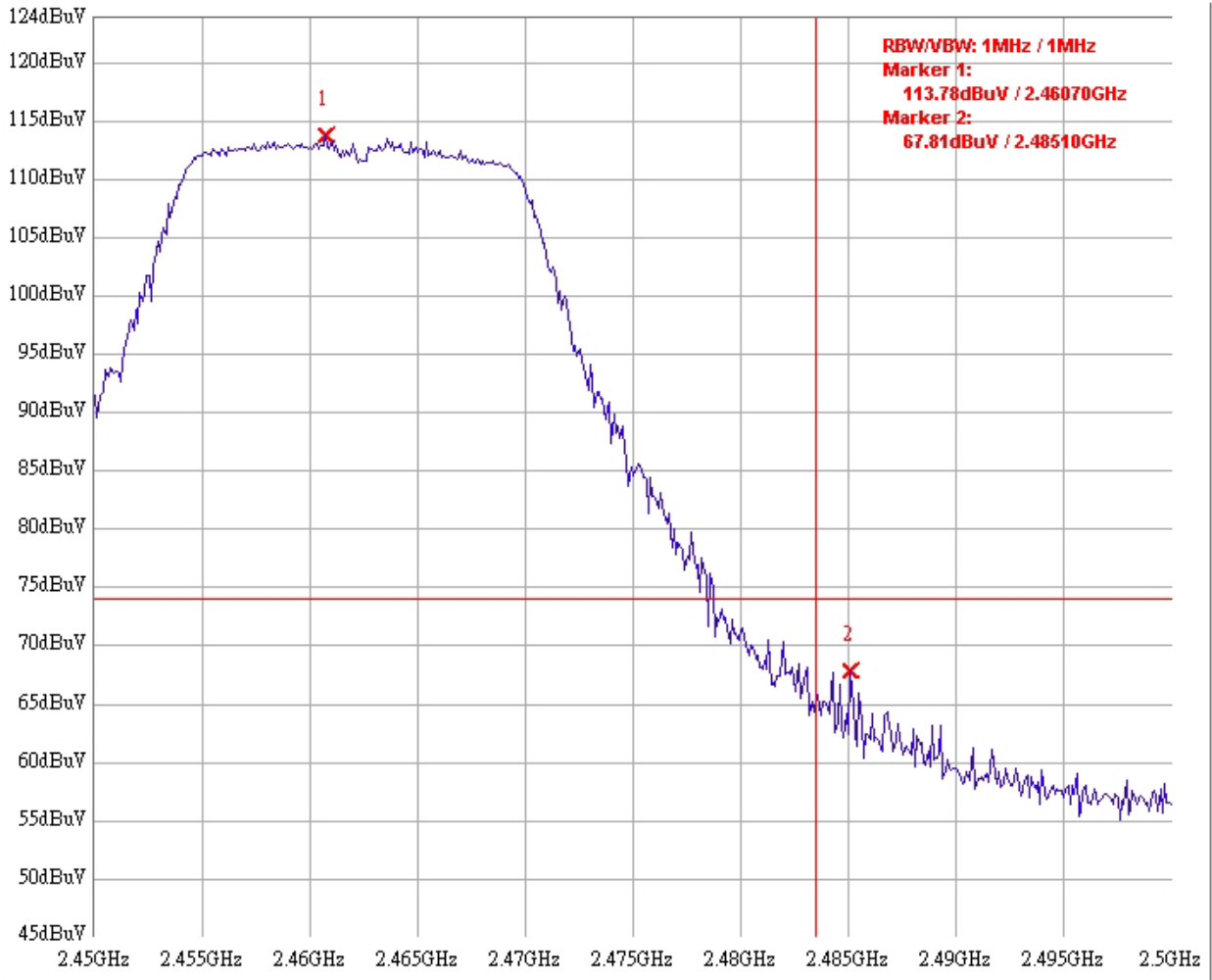
Band-edge
11g chl sweep time:5ms
PK

Test Mode: 802.11g mode (CH 1 AV)



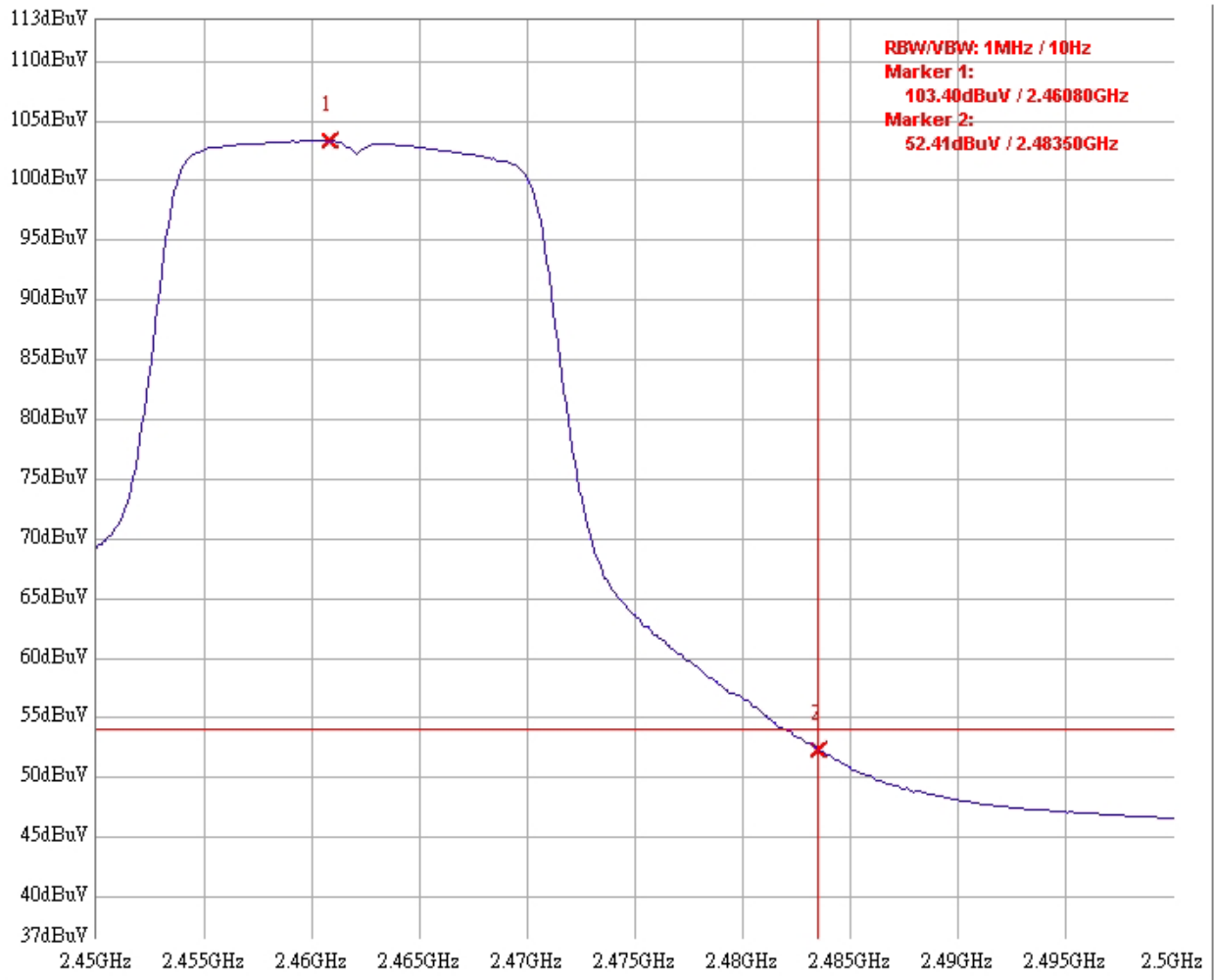
Band-edge
11g chl sweep time:29s
AV

Test Mode: 802.11g mode (CH 11 PK)



Band-edge
11g ch11 sweep time:2.5ms
PK

Test Mode: 802.11g mode (CH 11 AV)



Band-edge
11g ch11 sweep time:12.5s
AV

10. AC power line conducted emission

Name of Test	AC power line conducted emission
Base Standard	FCC 15.207

Test Result: Complies
Test Method: See Appendix E
Measurement Data: See Tables & plots below

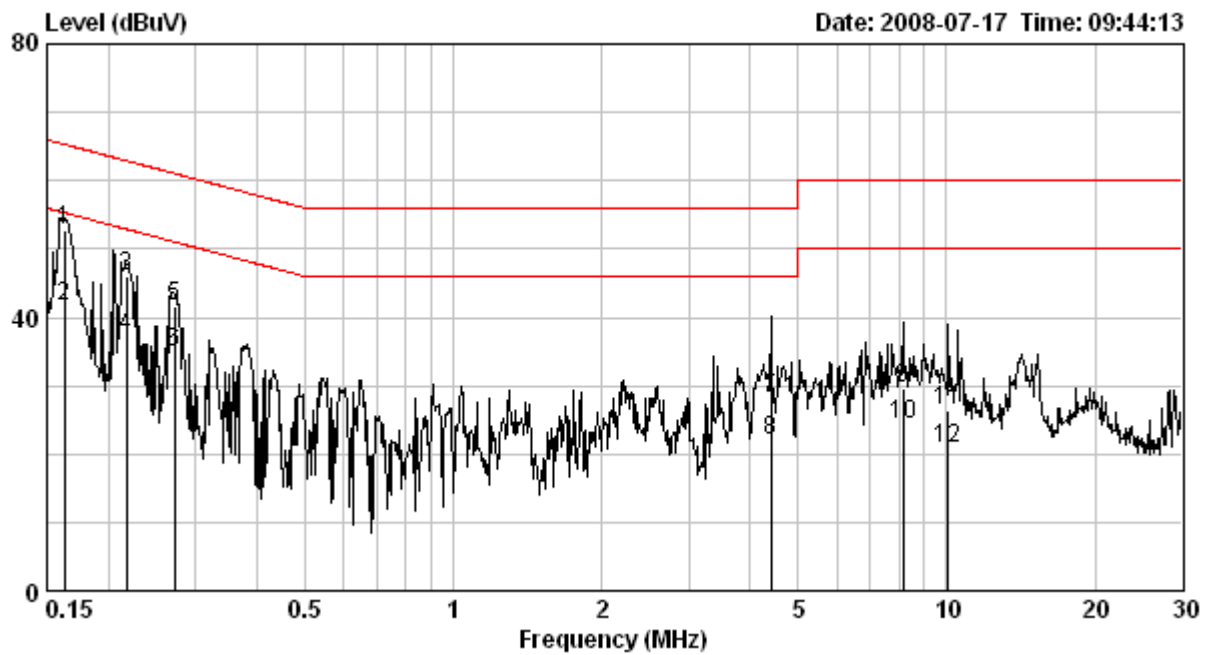
Note: The EUT was tested while in normal communication mode.

Phase : Line
EUT : NWA1100
Test Condition : Normal operating mode

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level AV (dBuV)	Limit Av (dBuV)	Margin (dB)	
						Qp	Av
0.16	0.81	52.75	65.34	41.58	55.34	-12.59	-13.76
0.22	0.72	46.05	62.92	37.26	52.92	-16.87	-15.66
0.27	0.50	41.52	61.07	34.77	51.07	-19.55	-16.30
4.41	0.32	28.24	56.00	21.86	46.00	-27.76	-24.14
8.15	0.46	29.47	60.00	24.23	50.00	-30.53	-25.77
10.07	0.51	26.43	60.00	20.78	50.00	-33.57	-29.22

Remark:

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

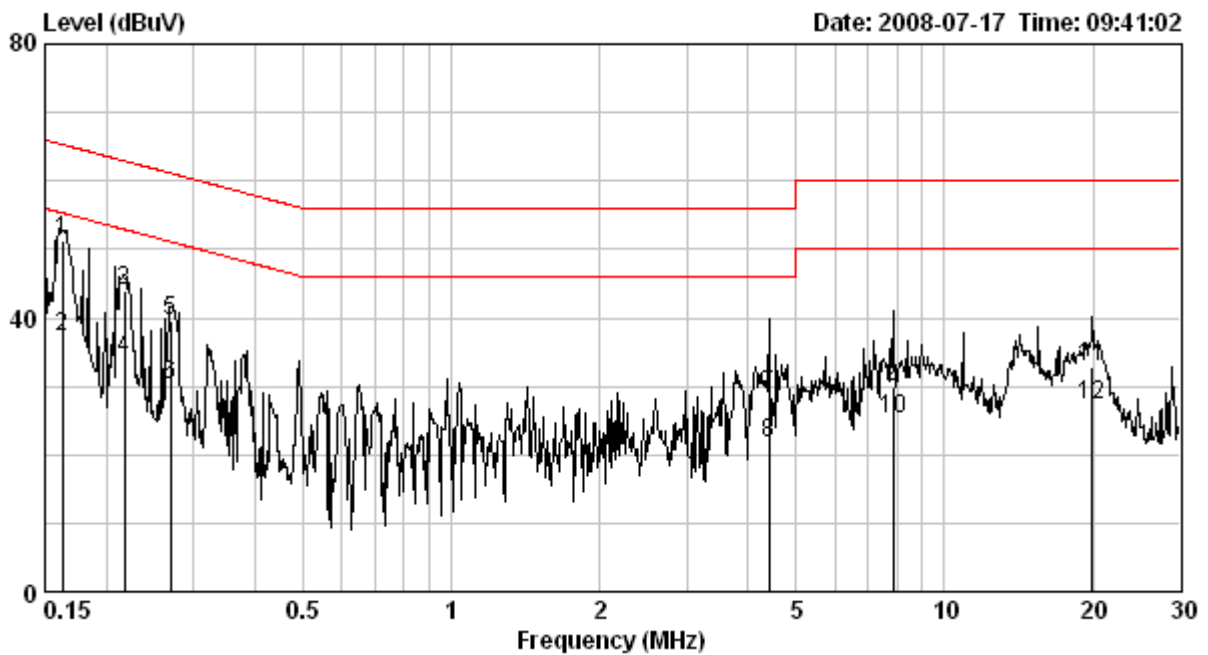


Phase : Neutral
 EUT : NWA1100
 Test Condition : Normal operating mode

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level Av (dBuV)	Limit Av (dBuV)	Margin (dB)	
						Qp	Av
0.16	0.11	51.17	65.34	37.30	55.34	-14.17	-18.04
0.22	0.11	44.10	62.92	34.14	52.92	-18.82	-18.78
0.27	0.11	39.70	61.12	30.13	51.12	-21.42	-20.99
4.41	0.30	28.75	56.00	21.78	46.00	-27.25	-24.22
7.85	0.38	29.83	60.00	25.07	50.00	-30.17	-24.93
19.95	0.52	32.95	60.00	27.25	50.00	-27.05	-22.75

Remark:

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



APPENDICES

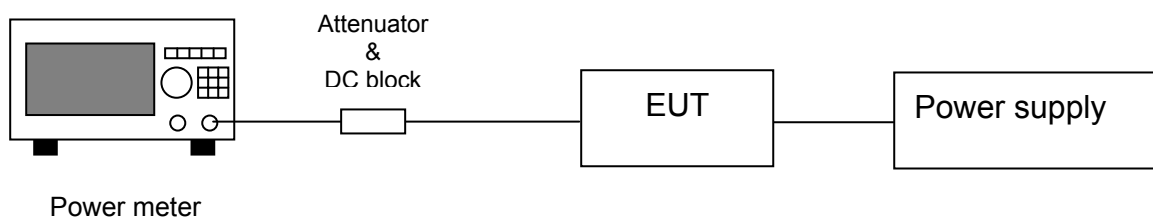
Appendix A: 2.1046 - RF Power Output

A1. Method of Measurement:

Reference FCC document: KDB558074

The peak power at antenna terminals is measured using a Wideband Peak Power Meter. Power output is measured with the maximum rated input level.

A2. Test Diagram:



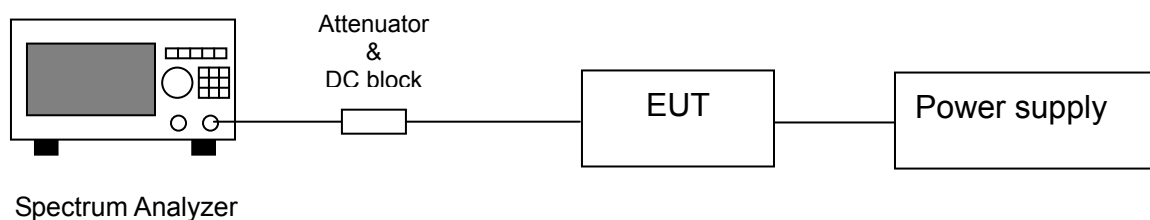
Appendix B: 2.1049 - Occupied Bandwidth

B1. Method of Measurement:

Reference FCC document: KDB558074

A portion of the transmitted signal is coupled to a Spectrum Analyzer with a resolution bandwidth of at least 1 % of the bandwidth of the transmitted signal. The resolution bandwidth is chosen so as not to reduce the peak level of the measured waveform. The appropriate bandwidth mask is applied to the output waveform to verify compliance.

B1. Test Diagram:



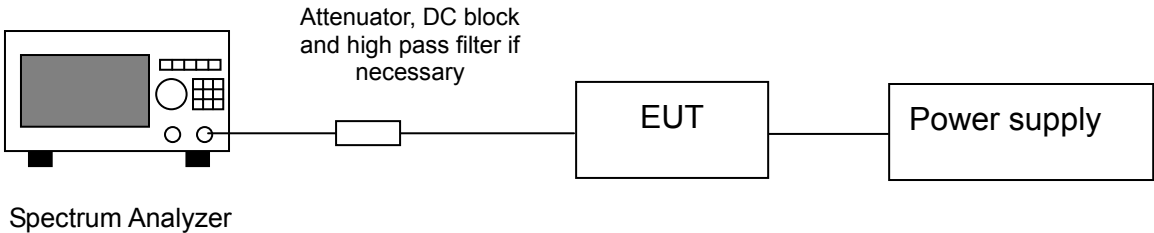
Appendix C: 2.1051 - Spurious Emission at Antenna Terminal

C1. Method of Measurement:

Reference FCC document: KDB558074

The measurements were performed from 30 MHz to 25 GHz RF antenna conducted per FCC 15.247 (d) was measured from the EUT antenna port using a 50 ohm spectrum analyzer with the resolution bandwidth set at 100 kHz, and the video bandwidth set at 100 kHz. Harmonics and spurious noise must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. The table below is the results from the highest emission for each channel within the authorized band. This table was used to determine the spurious limits for each channel.

C2. Test Diagram:



Appendix D: 2.1053 – Field Strength of Spurious Radiation

D1. Method of Measurement:

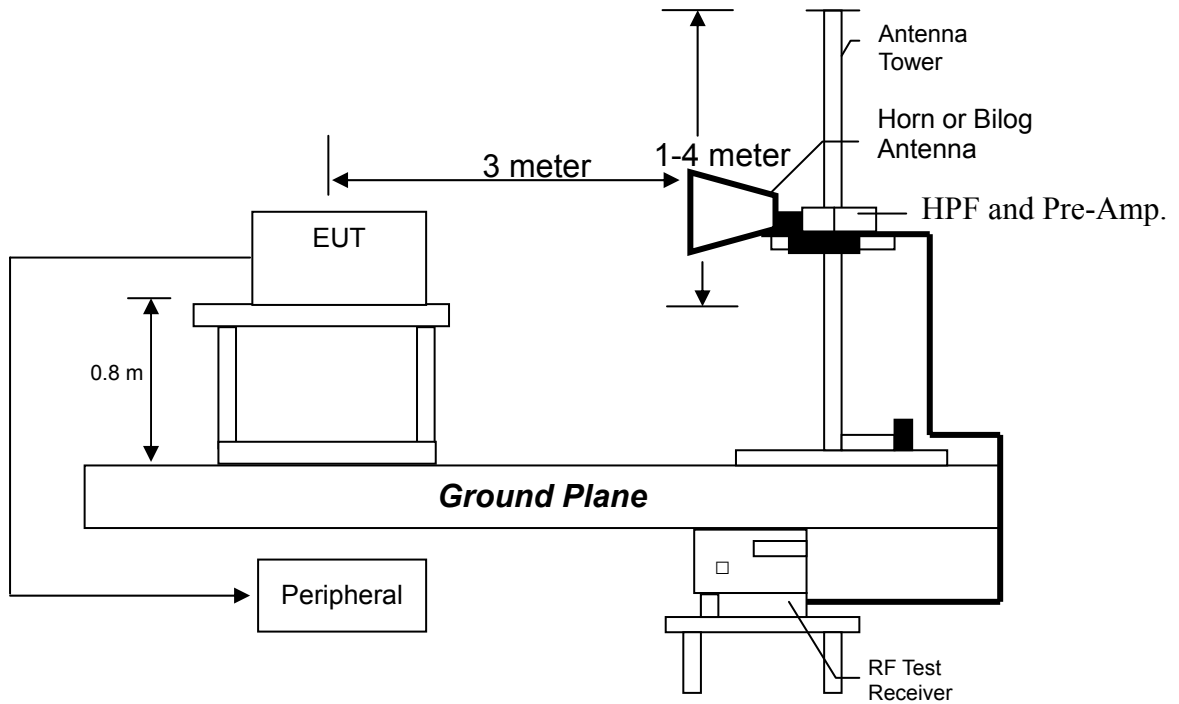
Reference FCC document: KDB558074, ANSI C63.4

The frequency range from 30 MHz to 1000 MHz using Bilog Antenna.
The frequency range over 1 GHz using Horn Antenna.

Radiated emissions were investigated cover the frequency range from 30 MHz to 1000 MHz using a receiver RBW of 120 kHz record QP reading, and the frequency over 1 GHz using a spectrum analyzer RBW of 1 MHz and 10 Hz VBW record Average reading. (15.209 paragraph), the Peak reading (1 MHz 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 meters reading using inverse scaling with distance.

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

D2. Test Diagram:



D3. Emission Limit:

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 (dBµV/m@ 3 meter)
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

Appendix E: 15.207 – AC power line conducted emission

E1. Method of Measurement:

Reference FCC document: KDB558074, ANSI C63.4

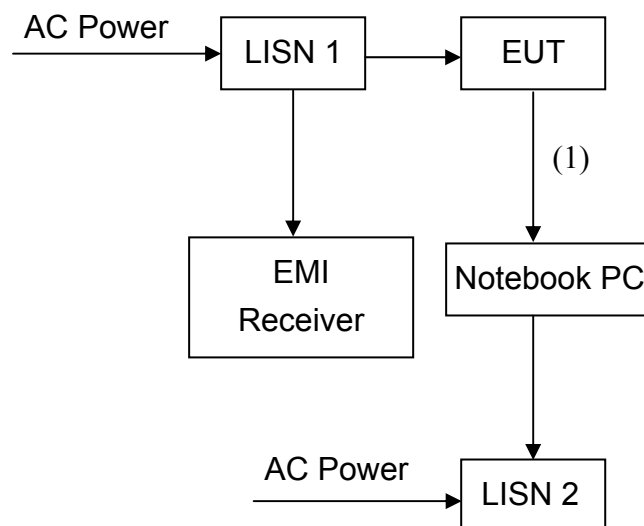
The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a 50 ohm/50 uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50 ohm/ 50 uH coupling impedance with 50 ohm 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 9 kHz.

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

E2. Test Diagram:



(1) RJ-45 UTP Cat.5 3 meter

E3. 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.

Appendix F: Test Equipment List

Equipment	Brand	Model No.
EMI Test Receiver	Rohde & Schwarz	ESCS 30
Spectrum Analyzer	Rohde & Schwarz	FSP 30
Spectrum Analyzer	Rohde & Schwarz	FSEK 30
Signal Generator	Rohde & Schwarz	SMR27
Horn Antenna	SCHWARZBECK	BBHA 9120 D
Horn Antenna	SCHWARZBECK	BBHA 9170
Bilog Antenna	SCHWARZBECK	VULB 9168
Pre-Amplifier	MITEQ	919981
Pre-Amplifier	MITEQ	828825
Controller	HDGmbH	CM 100
Antenna Tower	HDGmbH	MA 2400
LISN	Rohde & Schwarz	ESH3-Z5
Wideband Peak Power Meter/ Sensor	Anritsu	ML2487A/ MA2491A
Temperature Humidity Test Chamber	Juror	TR-4010

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

Measurement Uncertainty:

Measurement uncertainty was calculated in accordance with NAMAS NIS 81.

Parameter	Uncertainty
Radiated Emission	±4.98 dB
Conducted Emission	±2.6 dB

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