

EMC TEST REPORT

Report No. : EME-040509

Model No. : GUA-100

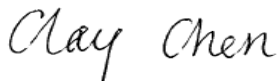
Issued Date : Jul. 1, 2004

Applicant : Cellvision Systems Inc.
18F-7, No. 79 Sec. 1, Hsin Taiwu Road, Hsichih,
Taipei, Taiwan

Test By : Intertek Testing Services Taiwan Ltd.
No. 11, Lane 275, Ko-Nan 1 Street, Chia-Tung Li,
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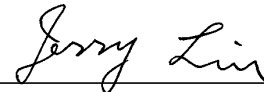
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Project Engineer

Handwritten signature of Clay Chen in black ink.

Clay Chen

Reviewed By

Handwritten signature of Jerry Liu in black ink.

Jerry Liu

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Summary of Tests**802.11g Wireless USB2.0 Adapter-Model: GUA-100
FCC ID: QTRGUA10001**

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(d)	Complies
Power Line Conducted Emission test	15.207	Complies

1. General information

1.1 Identification of the EUT

Applicant : Cellvision Systems Inc.
Product : 802.11g Wireless USB2.0 Adapter
Model No. : GUA-100
FCC ID. : QTRGUA10001
Frequency Range : 2412MHz ~ 2462 MHz
Channel Number : 11 channels
Frequency of Each Channel : 2412MHz, 2417MHz, 2422MHz, 2427MHz, 2432MHz, 2437MHz, 2442MHz, 2447MHz, 2452MHz, 2457MHz, 2462MHz
Type of Modulation : DSSS, OFDM
Rated Power : 5Vdc
Power Cord : N/A
Sample Received : May 26, 2004
Test Date(s) : May 26, 2004 ~ June 29, 2004

1.2 Additional information about the EUT

The EUT is a 802.11g Wireless USB2.0 Adapter, and was defined as information technology equipment.

The models TEW-424UB and NGU-100 are identical to model GUA-100 (EUT), the different model number for different brand serves as marketing strategy as below

Trade Name	Model Number
Cellvision	GUA-100
Trendware	TEW-424UB
Nefusion	NGU-100

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

1.3 Antenna description

The EUT uses a permanently connected antenna.

Antenna Gain : -1dBi max

Antenna Type : Chip antenna

Connector Type : N/A

1.4 Peripherals equipment

Peripherals	Manufacturer	Product No.	Serial No.	FCC ID
Notebook	DELL	PP02X	8Y210A04	FCC DoC Approved
Printer	HP	C2642A	TH86K1N2ZB	FCC DoC Approved
Modem	Dynalink	V1456VQE	00V230A00051494	FCC DoC Approved
AP	SMC	WG 4005-17 2 (A3)	C-G 3030232-1-1-3*1000	FCC DoC Approved

Data Cable: USB2.0 Cable 1.8m Length

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 C63.4/2001.

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

During the conduction test, the EUT was linked with the Access Point.

During the other tests, the EUT was operated in transmitting continuously.

After verifying the maximum output power, we found the maximum output power was occurred at 11Mbps data rate in 802.11b with low channel and at 6 Mbps data rate in 802.11g with low channel. The final test was executed under this condition and recorded in this report individually.

2.3 Test equipment

Equipment	Brand	Frequency range	Model No.	Intertek ID No.	Last Cal. Date
EMI Test Receiver	Rohde & Schwarz	9kHz~2.75GHz	ESCS 30	EC303	6/16/2003
EMI Test Receiver	Rohde & Schwarz	20Hz~26.5GHz	ESMI	EC317	6/24/2003
Spectrum Analyzer	Rohde & Schwarz	9kHz~30GHz	FSP 30	EC353	7/19/2003
Spectrum Analyzer	Rohde & Schwarz	20Hz~40GHz	FSEK 30	EC365	10/20/2003
Horn Antenna	EMCO	1GHz~18GHz	3115	EC332	10/15/2003
Horn Antenna	SCHWARZBECK	15GHz~40GHz	BBHA 9170	EC351	6/21/2003
Bilog Antenna	SCHWARZBECK	25MHz~1.7GHz	VULB 9160	EC350	6/21/2003
Turn Table	HDGmbH	N/A	DS 420S	EP317-3	N/A
Antenna Tower	HDGmbH	N/A	MA 240	EP317-2	N/A
Pre-Amplifier	MITER	100MHz~26.5GHz	919981	EC373	5/13/2004
Pre-Amplifier	MITER	26GHz~40GHz	828825	EC374	5/13/2004
Crystal Detector	Agilent	10MHz~18GHz	8472B	-	N/A
Signal Generator	Rohde & Schwarz	20MHz~27GHz	SMR27	EC354	8/16/2003
Two Channel Digital Storage Oscilloscope	Tektronix	N/A	TDS1012	-	8/16/2003
LISN	Rohde & Schwarz	9KHz~30MHz	ESH3-Z5	EC344	1/20/2004

Note: The above equipments are within the valid calibration period.

3. Minimum 6dB Bandwidth test

3.1 Operating environment

Temperature: 22 °C
 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 DSSS Modulation

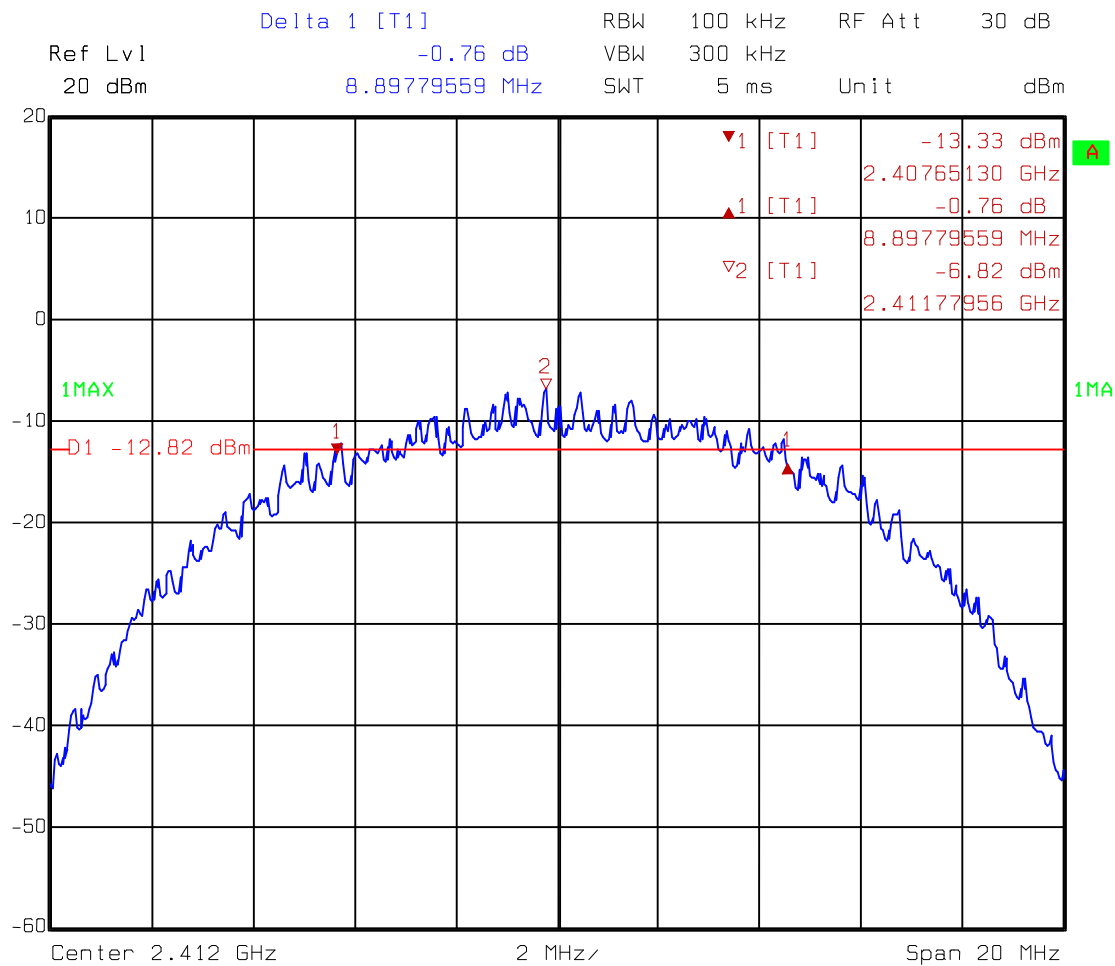
Channel	Frequency (MHz)	Bandwidth (MHz)	Limit
1	2412	8.90	> 500kHz
6	2437	9.58	> 500kHz
11	2462	8.94	> 500kHz

Test Mode: 802.11g OFDM Modulation

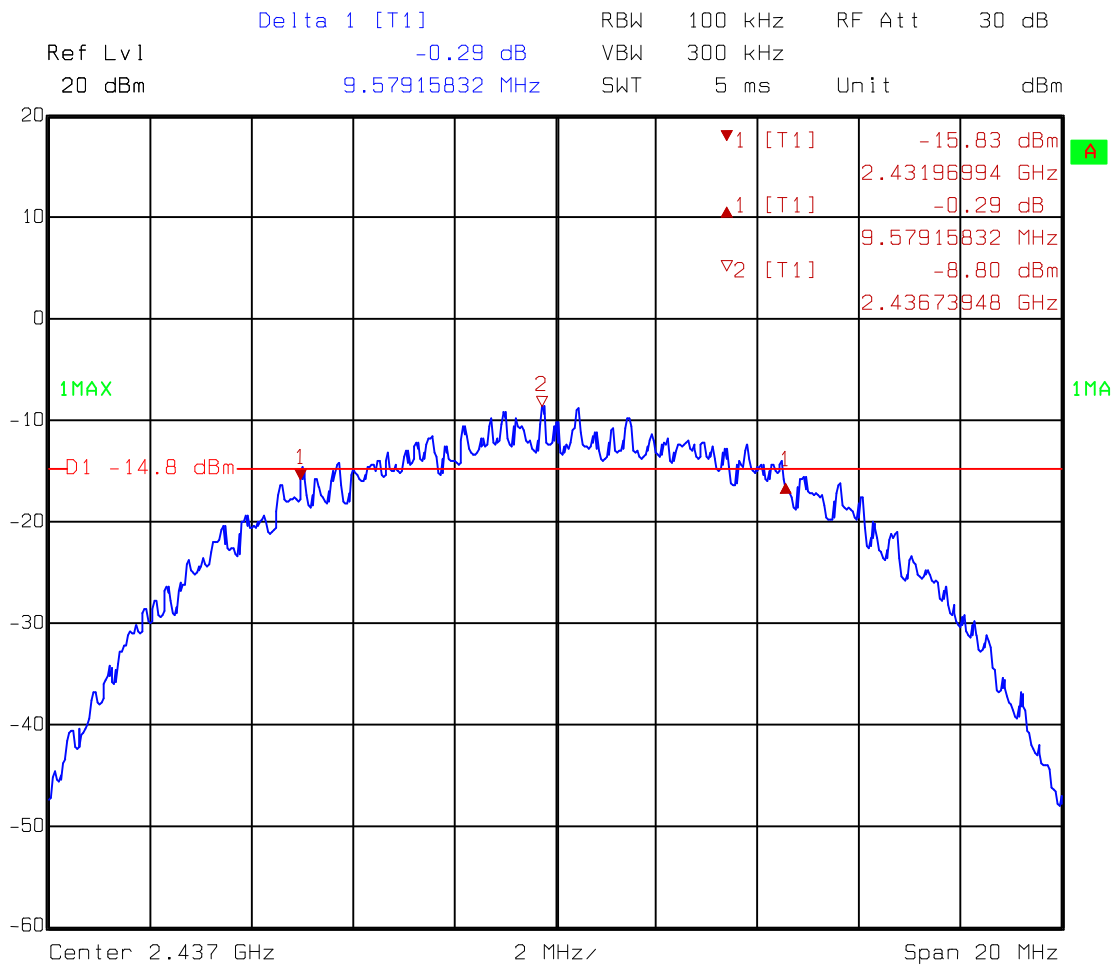
Channel	Frequency (MHz)	Bandwidth (MHz)	Limit
1	2412	16.43	> 500kHz
6	2437	16.43	> 500kHz
11	2462	16.43	> 500kHz

Please see the plot below.

Test Mode: 802.11b DSSS Modulation

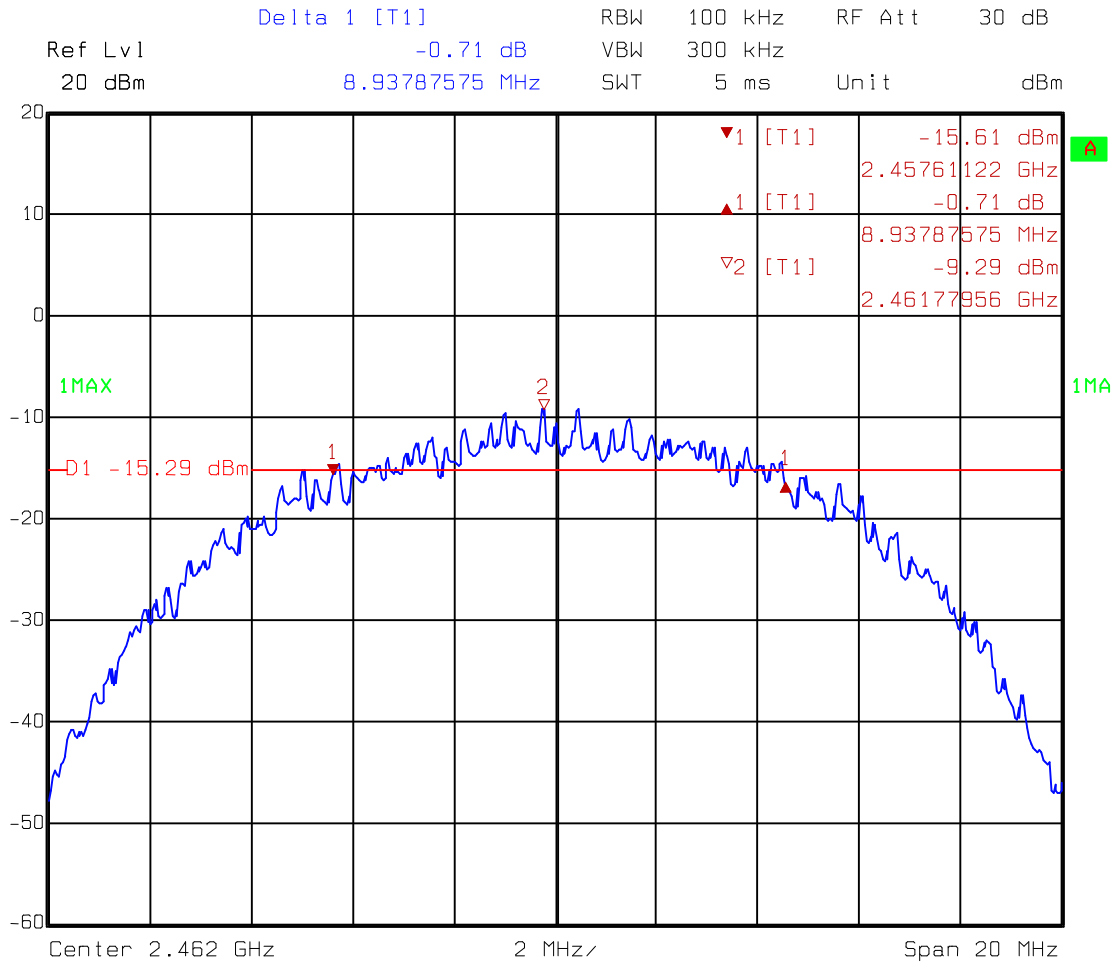


Comment A: 6dB bandwidth at low channel (EC365) 802.11b
Date: 23.JUN.2004 10:30:43



Comment A: 6dB bandwidth at middle channel (EC365) 802.11b

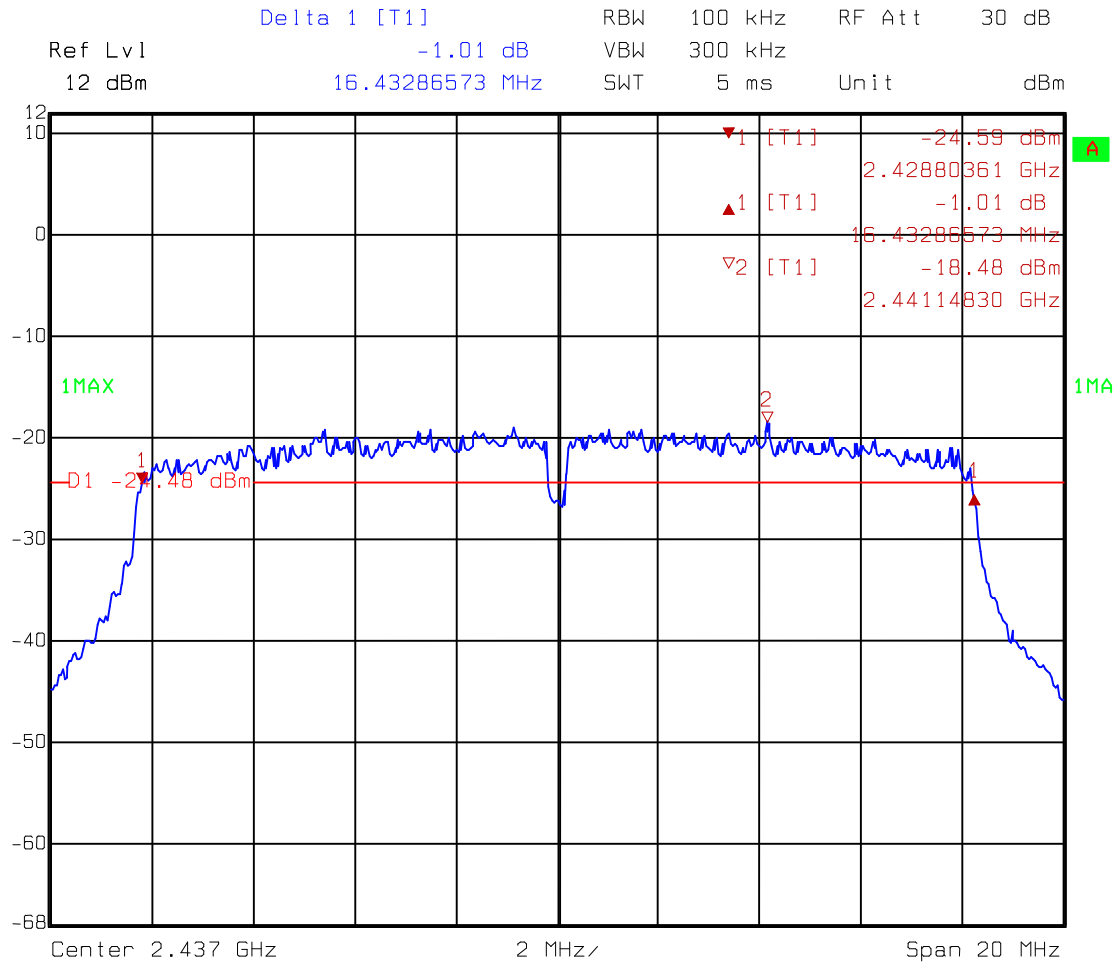
Date: 23.JUN.2004 10:37:22



Comment A: 6dB bandwidth at high channel (EC365) 802.11b

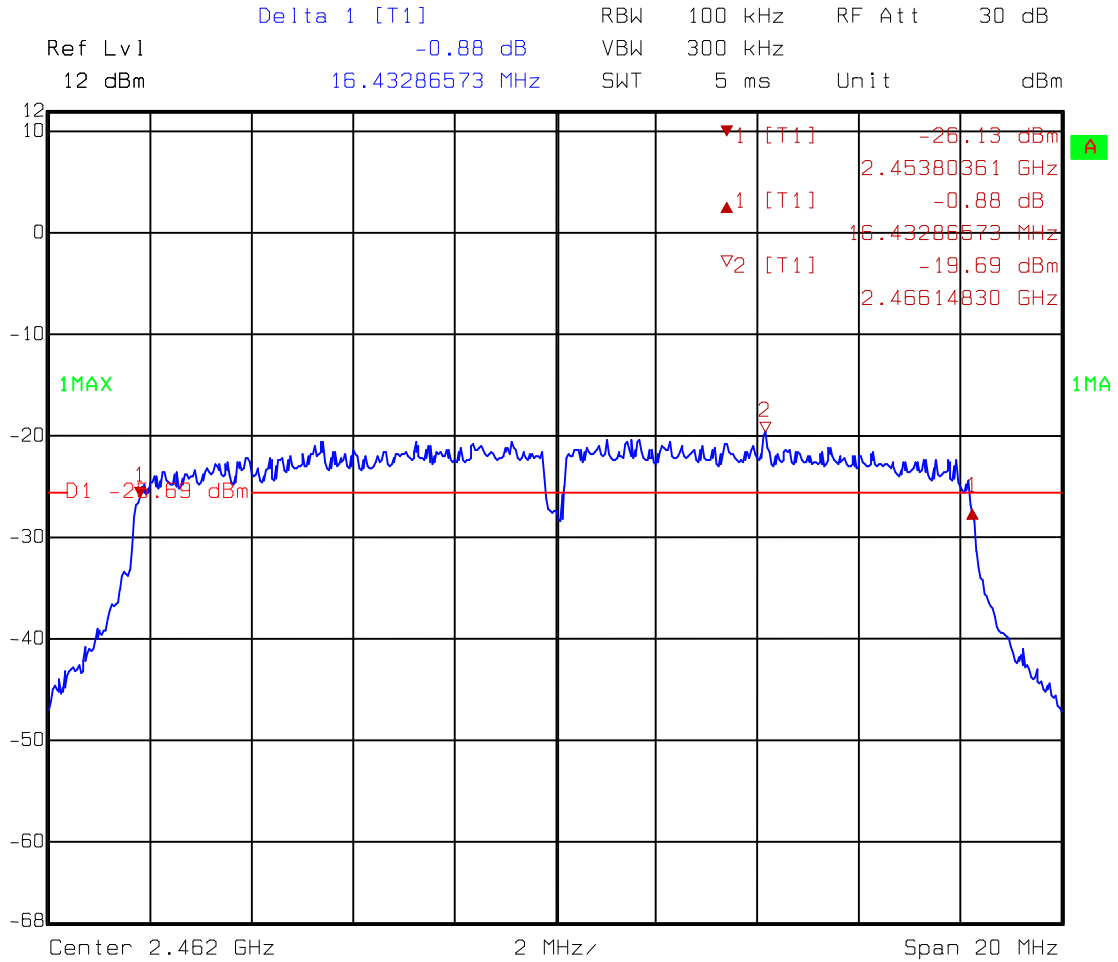
Date: 23.JUN.2004 10:42:53

Comment A: 6dB bandwidth at low channel (EC365) 802.11g
Date: 23.JUN.2004 10:07:02



Comment A: 6dB bandwidth at middle channel (EC365) 802.11g

Date: 23.JUN.2004 10:05:03



Comment A: 6dB bandwidth at high channel (EC365) 802.11g

Date: 23.JUN.2004 10:01:59

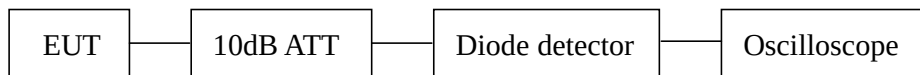
4. Maximum Output Power test

4.1 Operating environment

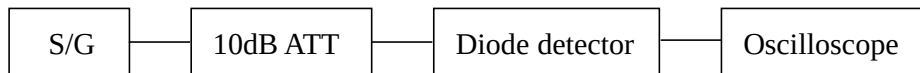
Temperature: 25 °C
 Relative Humidity: 59 %
 Atmospheric Pressure 1023 hPa

4.2 Test setup & procedure

A:



B:



1. The output of the transmitter via a 10 dB attenuator and coupled to a diode detector.
2. The output of the diode detector connected to the vertical channel of an oscilloscope. The observed trace of the oscilloscope shall be recorded as “A”.
3. The transmitter replaced by a signal generator. The output frequency of the signal made equal to the center of the frequency range occupied by the transmitter and unmodulated.
4. The output of the signal generator raised to reach the peak of trace “A” named X.
5. The signal generator output level X (dBm) is the transmitter peak output power.

4.3 Measured data of Maximum Output Power test results

Test Mode: 802.11b DSSS Modulation

Channel	Frequency (MHz)	Reading (dBm)	Output Power		Limit (dBm)
			(dBm)	(mW)	
Lowest	2412	19.89	19.89	97.50	30
Middle	2437	19.13	19.13	81.85	30
Highest	2462	18.53	18.53	71.29	30

Test Mode: 802.11g OFDM Modulation

Channel	Frequency (MHz)	Reading (dBm)	Output Power		Limit (dBm)
			(dBm)	(mW)	
1	2412	19.68	19.68	92.90	30
6	2437	19.33	19.33	85.70	30
11	2462	18.71	18.71	74.30	30

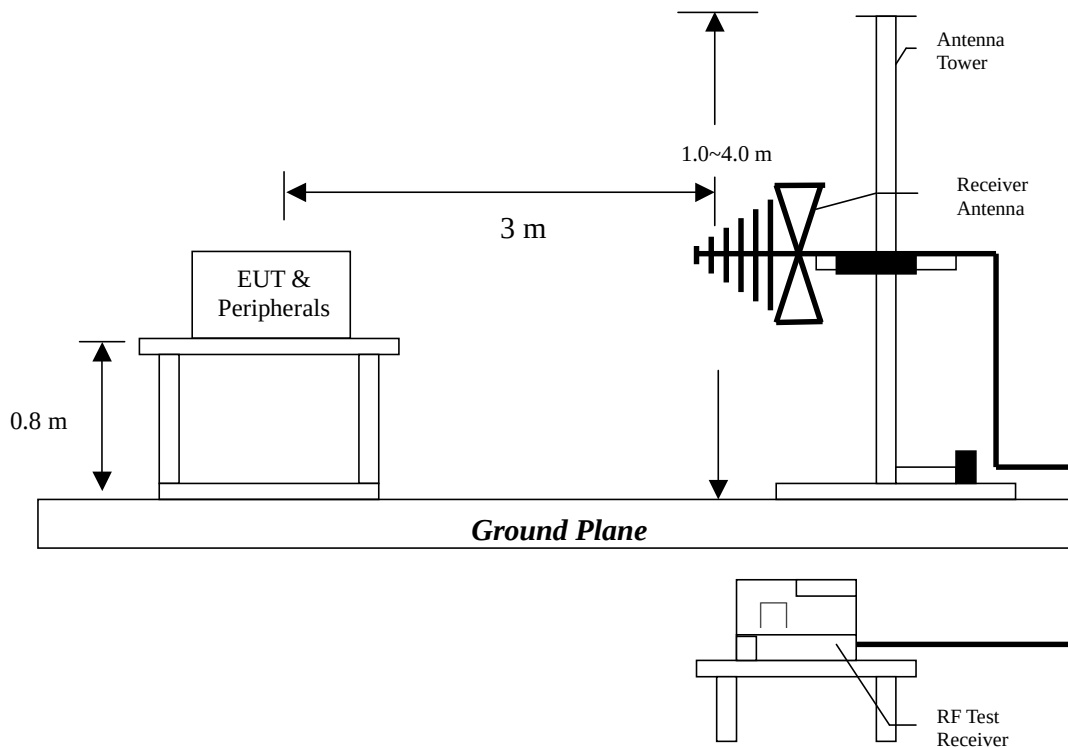
5. Radiated Emission test

5.1 Operating environment

Temperature:	25	°C	(10-40°C)
Relative Humidity:	55	%	(10-90%)
Atmospheric Pressure	1023	hPa	(860-1060hPa)

5.2 Test setup & procedure

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



Radiated emissions were investigated 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 three-meter reading using inverse scaling with distance.

The EUT configuration please refers 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.

Expanded uncertainty (k=2) of conducted emission measurement is ± 2.02 dB.

5.4 Radiated spurious emission test data

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

EUT : GUA-100

Worst Case Condition : 802.11b Tx at channel 1

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
359.820	QP	V	15.43	18.24	33.67	46.00	-12.33	152.00	302.00
480.130	QP	V	18.29	19.58	37.87	46.00	-8.13	141.00	228.00
526.680	QP	V	19.31	23.19	42.50	46.00	-3.50	104.00	312.00
575.170	QP	V	20.18	13.73	33.91	46.00	-12.09	204.00	107.00
635.370	QP	V	21.24	12.87	34.11	46.00	-11.89	158.00	166.00
796.360	QP	V	24.28	13.01	37.29	46.00	-8.71	100.00	147.00
119.280	QP	H	12.39	20.41	32.80	43.50	-10.70	141.00	228.00
152.350	QP	H	14.88	23.67	38.55	43.50	-4.95	122.00	208.00
199.740	QP	H	13.01	26.91	39.92	43.50	-3.58	163.00	101.00
278.040	QP	H	13.31	24.20	37.51	46.00	-8.49	108.00	209.00
359.880	QP	H	15.43	23.21	38.64	46.00	-7.36	255.00	332.00
480.130	QP	H	18.29	17.48	35.77	46.00	-10.23	182.00	308.00

Remark:

1. Corrected Level = Reading Level + Correction Factor

2. Correction Factor = Antenna Factor + Cable Loss

EUT : GUA-100

Worst Case Condition : 802.11g Tx at channel 1

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
132.840	QP	V	13.53	17.44	30.97	43.50	-12.53	107.00	52.00
359.880	QP	V	15.43	17.05	32.48	46.00	-13.52	122.00	147.00
480.040	QP	V	18.29	21.04	39.33	46.00	-6.67	155.00	272.00
526.670	QP	V	19.31	22.84	42.15	46.00	-3.85	100.00	218.00
575.180	QP	V	20.18	14.57	34.75	46.00	-11.25	187.00	107.00
799.810	QP	V	24.34	17.55	41.89	46.00	-4.11	107.00	23.00
119.180	QP	H	12.39	21.77	34.16	43.50	-9.34	241.00	111.00
199.970	QP	H	12.91	25.74	38.65	43.50	-4.85	198.00	104.00
278.320	QP	H	13.31	23.65	36.96	46.00	-9.04	171.00	241.00
359.880	QP	H	15.43	21.74	37.17	46.00	-8.83	108.00	98.00
371.320	QP	H	15.68	19.41	35.09	46.00	-10.91	100.00	158.00
478.180	QP	H	18.25	17.52	35.77	46.00	-10.23	152.00	224.00

Remark:

1. Corrected Level = Reading Level + Correction Factor

2. Correction Factor = Antenna Factor + Cable Loss

5.4.2 Measurement results: frequency above 1GHz

EUT : GUA-100

Test Condition : 802.11b Tx at channel 1

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
4823.980	PK	V	39.59	35.57	47.79	43.77	74.00	-30.23	171.00	214.00
4823.980	AV	V	39.59	35.57	30.75	26.73	54.00	-27.27	171.00	214.00
4823.980	PK	H	39.59	35.57	46.64	42.62	74.00	-31.38	133.00	119.00
4823.980	AV	H	39.59	35.57	30.43	26.41	54.00	-27.59	133.00	119.00

Remark:

1. Corrected Level = Reading Level + Correction Factor – Preamp
2. Correction Factor = Antenna Factor + Cable Loss
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.

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 : GUA-100

Test Condition : 802.11b Tx at channel 6

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
4873.970	PK	V	39.59	35.57	47.56	43.54	74.00	-30.46	169.00	208.00
4873.970	AV	V	39.59	35.57	30.57	26.55	54.00	-27.45	169.00	208.00
4873.970	PK	H	39.59	35.57	46.16	42.14	74.00	-31.86	131.00	125.00
4873.970	AV	H	39.59	35.57	29.75	25.73	54.00	-28.27	131.00	125.00

Remark:

1. Corrected Level = Reading Level + Correction Factor – Preamp
2. Correction Factor = Antenna Factor + Cable Loss
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.

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 : GUA-100

Test Condition : 802.11b Tx at channel 11

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
4923.980	PK	V	39.59	35.57	46.13	42.11	74.00	-31.89	172.00	223.00
4923.980	AV	V	39.59	35.57	29.05	25.03	54.00	-28.97	172.00	223.00
4923.980	PK	H	39.59	35.57	45.91	41.89	74.00	-32.11	133.00	121.00
4923.980	AV	H	39.59	35.57	28.77	24.75	54.00	-29.25	133.00	121.00

Remark:

1. Corrected Level = Reading Level + Correction Factor – Preamp
2. Correction Factor = Antenna Factor + Cable Loss
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.

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 : GUA-100

Test Condition : 802.11g Tx at channel 1

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
4823.970	PK	V	39.59	35.57	46.58	42.56	74.00	-31.44	179.00	207.00
4823.970	AV	V	39.59	35.57	30.53	26.51	54.00	-27.49	179.00	207.00
4823.970	PK	H	39.59	35.57	46.33	42.31	74.00	-31.69	131.00	124.00
4823.970	AV	H	39.59	35.57	30.20	26.18	54.00	-27.82	131.00	124.00

Remark:

1. Corrected Level = Reading Level + Correction Factor – Preamp
2. Correction Factor = Antenna Factor + Cable Loss
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.

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 : GUA-100

Test Condition : 802.11g Tx at channel 6

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
4873.980	PK	V	39.59	35.57	47.44	43.42	74.00	-30.58	173.00	213.00
4873.980	AV	V	39.59	35.57	30.46	26.44	54.00	-27.56	173.00	213.00
4873.980	PK	H	39.59	35.57	46.09	42.07	74.00	-31.93	129.00	119.00
4873.980	AV	H	39.59	35.57	29.64	25.62	54.00	-28.38	129.00	119.00

Remark:

1. Corrected Level = Reading Level + Correction Factor – Preamp
2. Correction Factor = Antenna Factor + Cable Loss
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.

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 : GUA-100

Test Condition : 802.11g Tx at channel 11

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV)	Limit @ 3 m (dBuV)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
4923.980	PK	V	39.59	35.57	46.10	42.08	74.00	-31.92	166.00	222.00
4923.980	AV	V	39.59	35.57	28.80	24.78	54.00	-29.22	166.00	222.00
4923.980	PK	H	39.59	35.57	45.70	41.68	74.00	-32.32	130.00	123.00
4923.980	AV	H	39.59	35.57	28.70	24.68	54.00	-29.32	130.00	123.00

Remark:

1. Corrected Level = Reading Level + Correction Factor – Preamp
2. Correction Factor = Antenna Factor + Cable Loss
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.

For PK:

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

For AV:

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

6. Power Spectrum Density test

6.1 Operating environment

Temperature: 25 °C
 Relative Humidity: 55 %
 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 and cable loss (2.13dB)/external attenuator (10dB) 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 DSSS Modulation

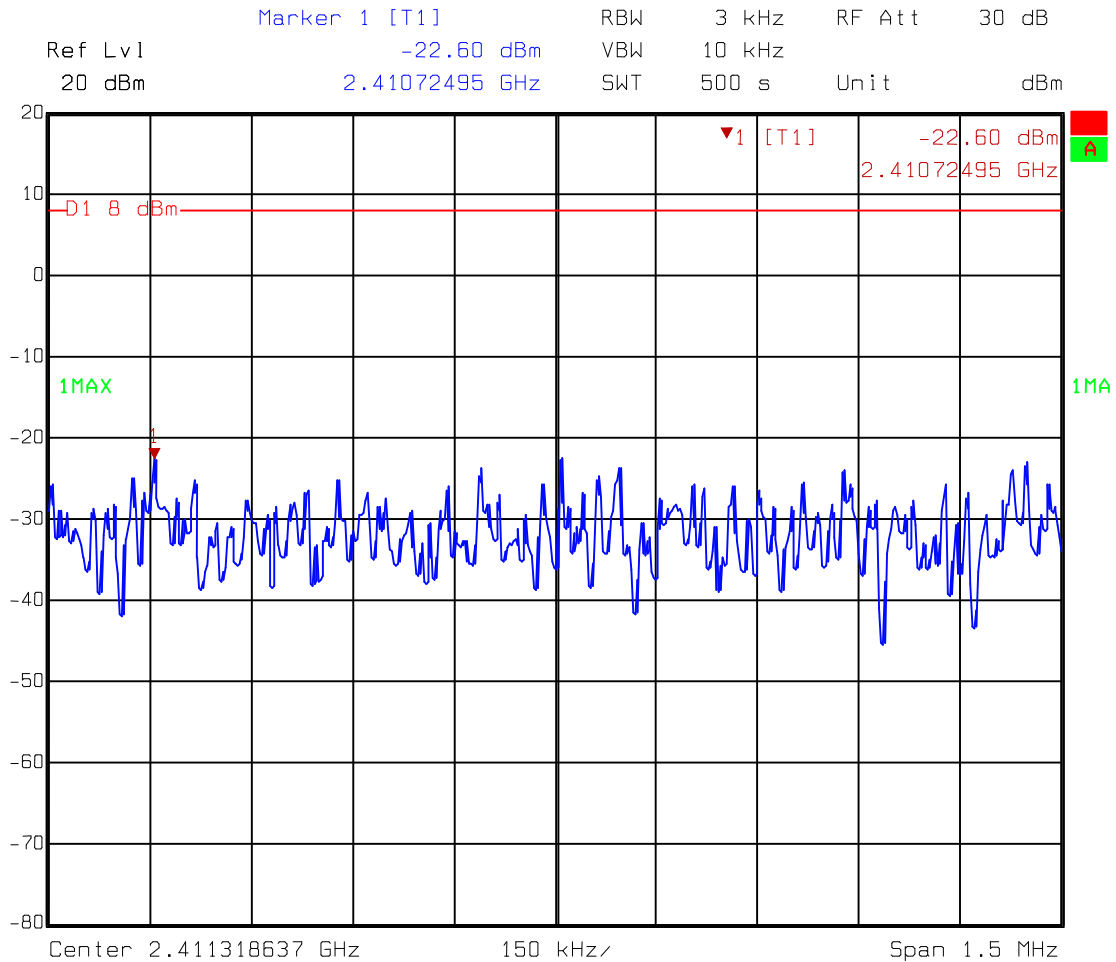
Channel	Frequency (MHz)	Measured level (dBm)	Limit (dBm)
1	2412	-10.47	8
6	2437	-11.47	8
11	2462	-11.67	8

Test Mode: 802.11g OFDM Modulation

Channel	Frequency (MHz)	Measured level (dBm)	Limit (dBm)
1	2412	-21.23	8
6	2437	-22.33	8
11	2462	-22.97	8

Please see the plot below.

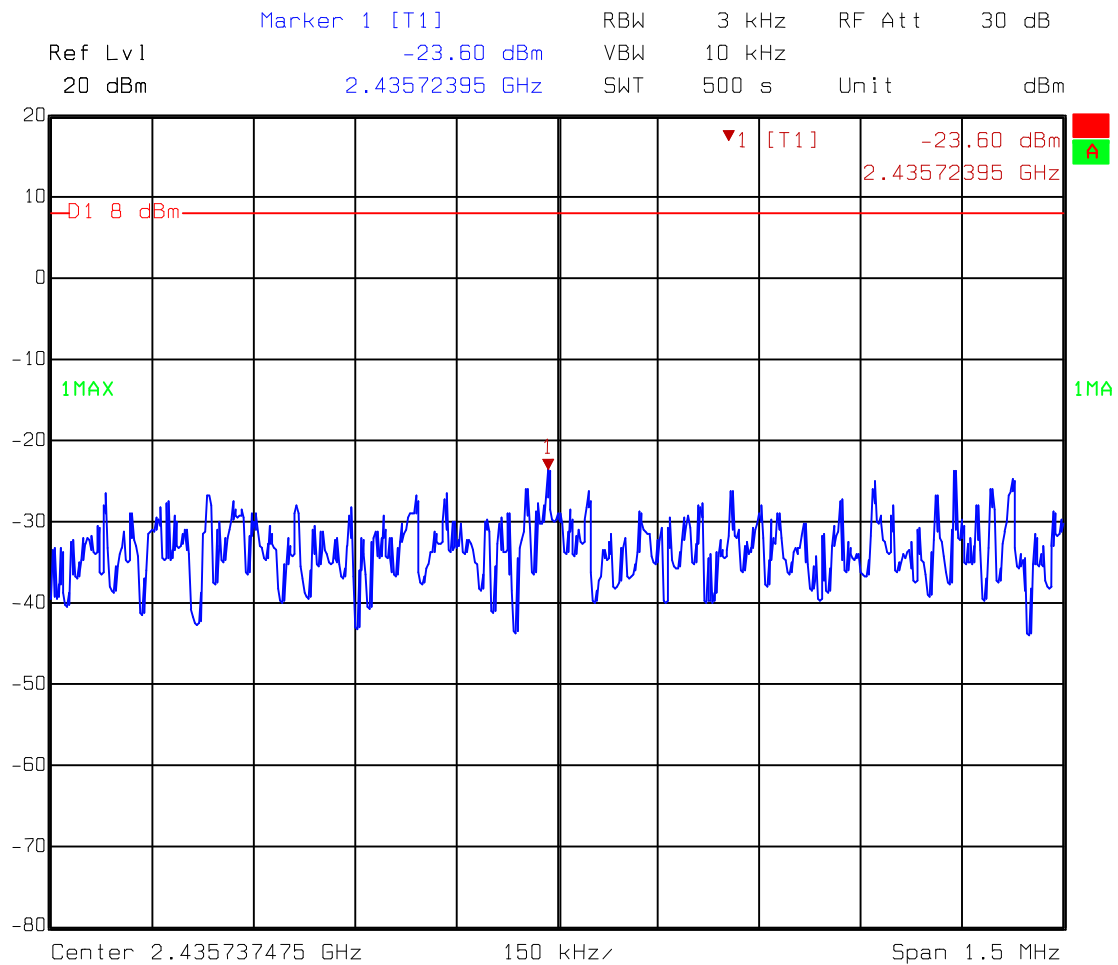
Test Mode: 802.11b DSSS Modulation



Comment A: Power spectrum density at low channel

ATT=10dB CL=2.13dB (EC365) 802.11b

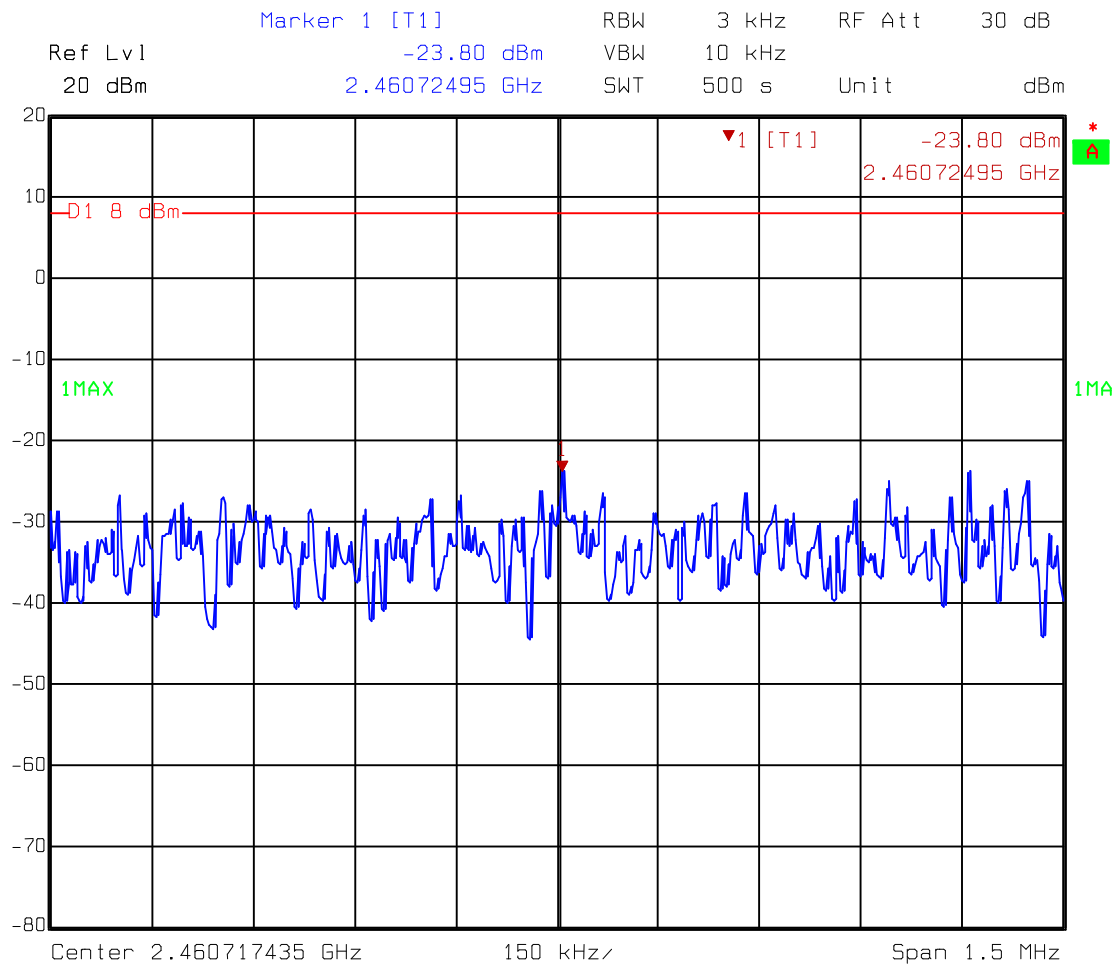
Date: 23.JUN.2004 10:32:34



Comment A: Power spectrum density at middle channel

ATT=10dB CL=2.13dB (EC365) 802.11b

Date: 23.JUN.2004 10:35:29

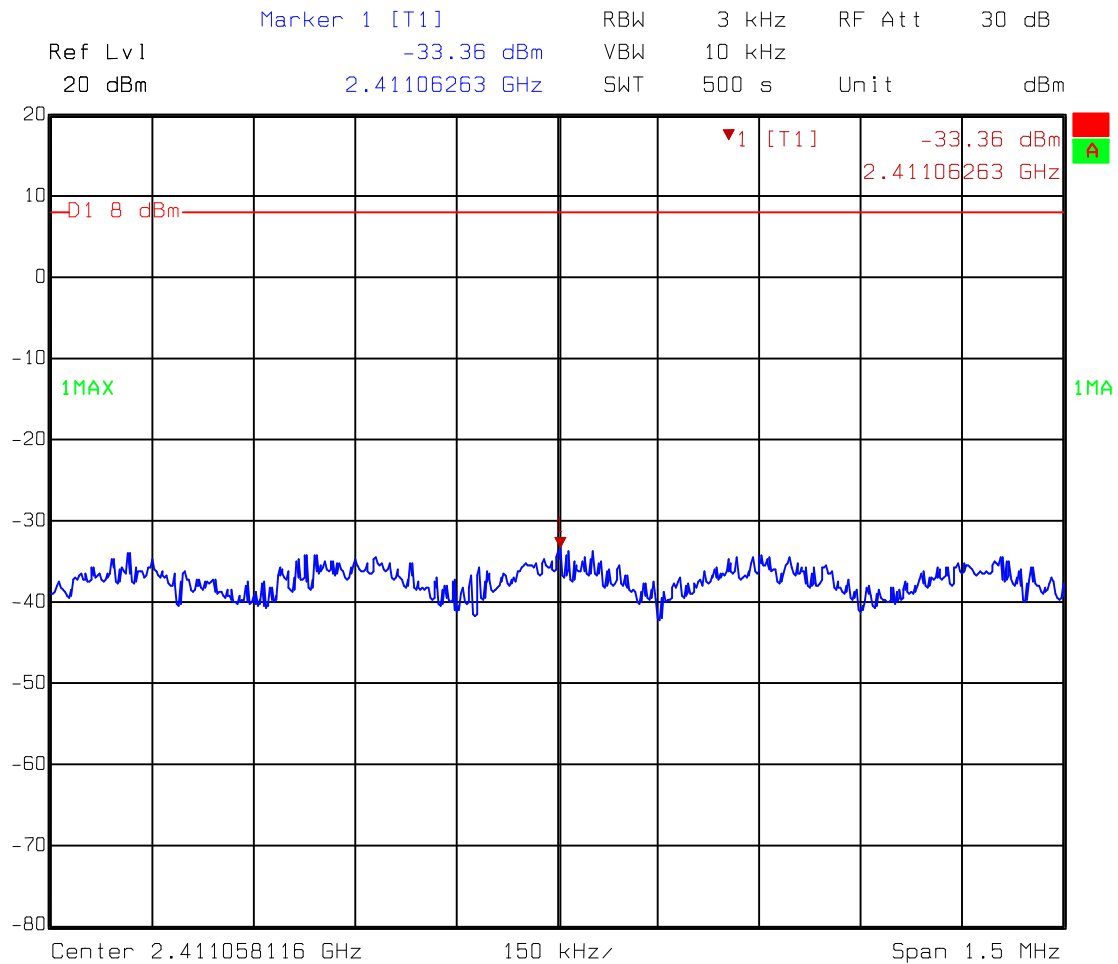


Comment A: Power spectrum density at high channel

ATT=10dB CL=2.13dB (EC365) 802.11b

Date: 23.JUN.2004 10:45:07

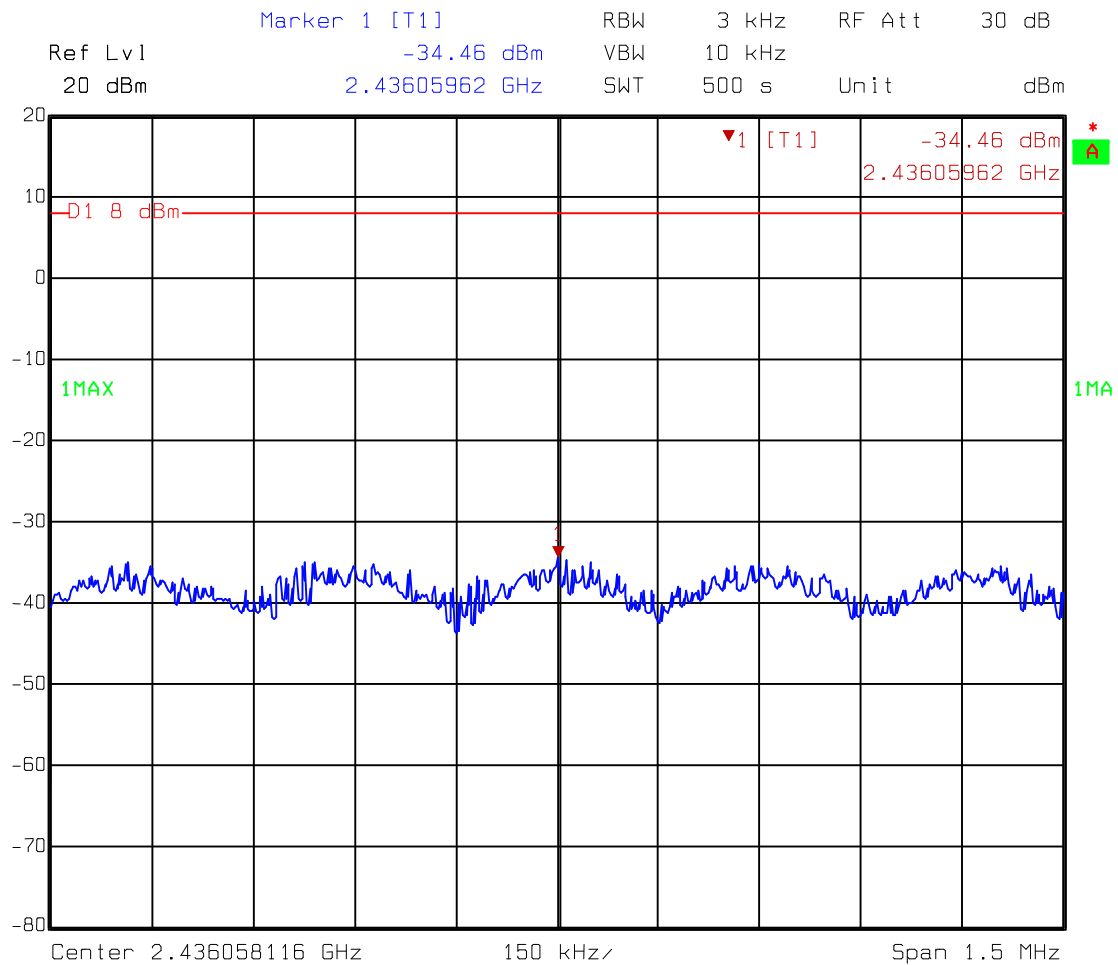
Test Mode: 802.11g OFDM Modulation



Comment A: Power spectrum density at low channel

ATT=10dB CL=2.13dB (EC365) 802.11g

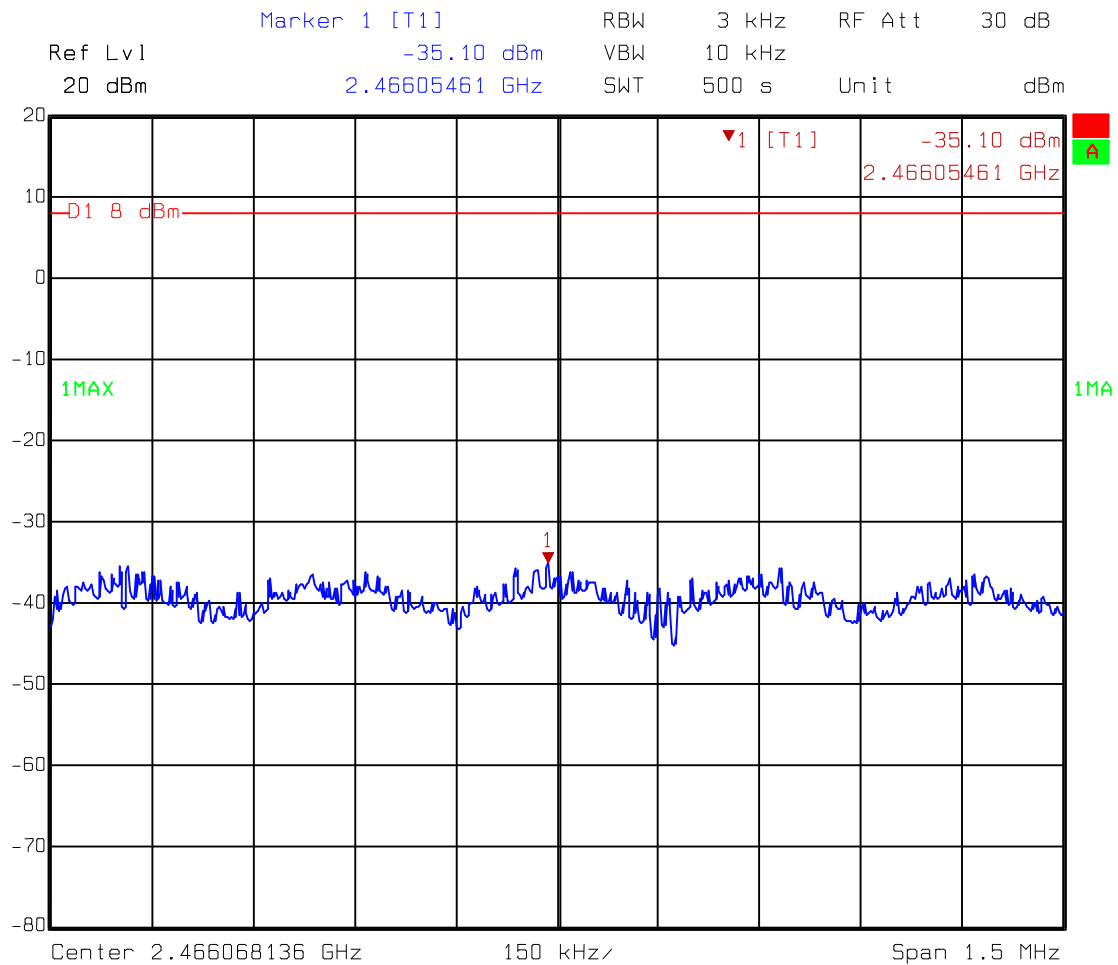
Date: 23.JUN.2004 10:11:55



Comment A: Power spectrum density at middle channel

ATT=10dB CL=2.13dB (EC365) 802.11g

Date: 23.JUN.2004 10:15:12



Comment A: Power spectrum density at high channel

ATT=10dB CL=2.13dB (EC365) 802.11g

Date: 23.JUN.2004 10:22:30

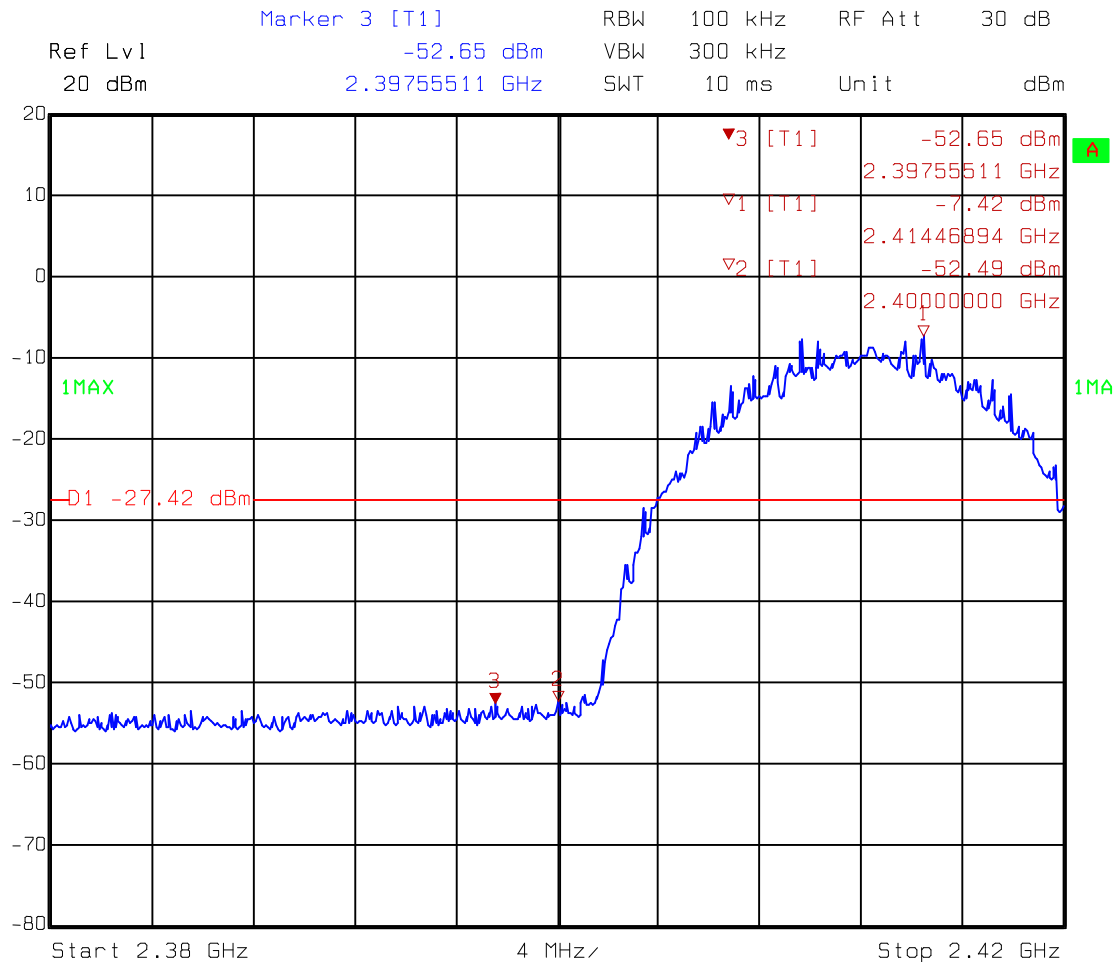
7. Emission on the band edge §FCC 15.247(C)

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.

Please see the plot below.

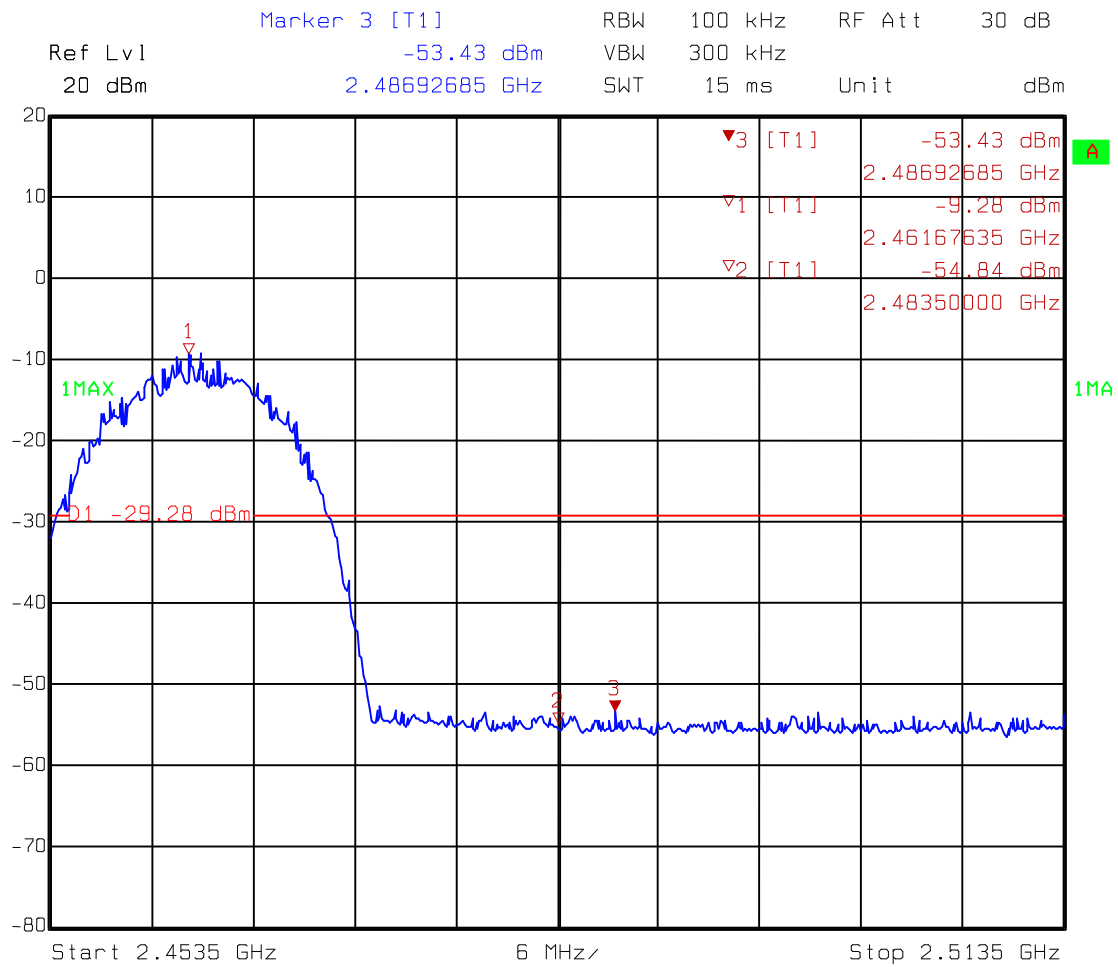
7.1 Band-edge (Conducted method)

Test Mode: 802.11b DSSS Modulation



Comment A: Band-edge at low channel (EC365) 802.11b

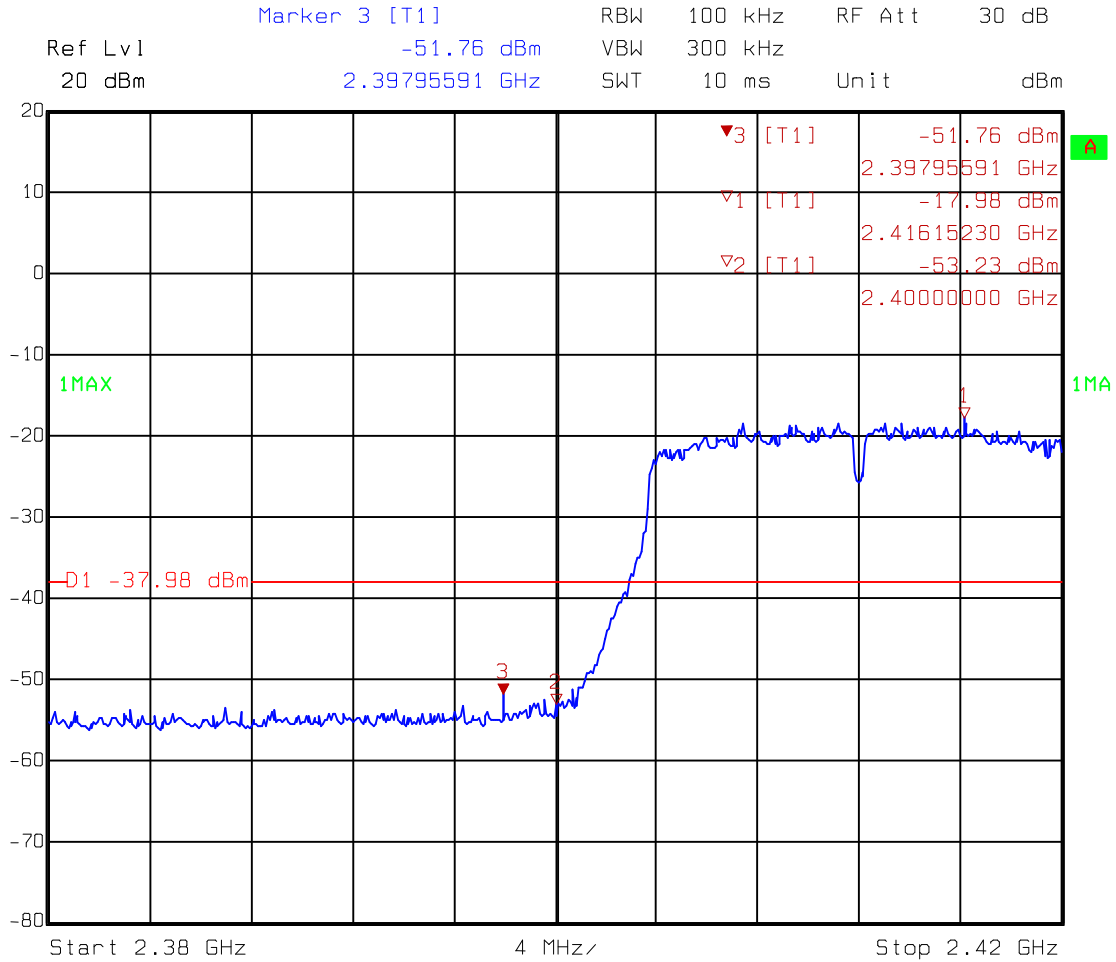
Date: 23.JUN.2004 10:28:50



Comment A: Band-edge at high channel (EC365) 802.11b

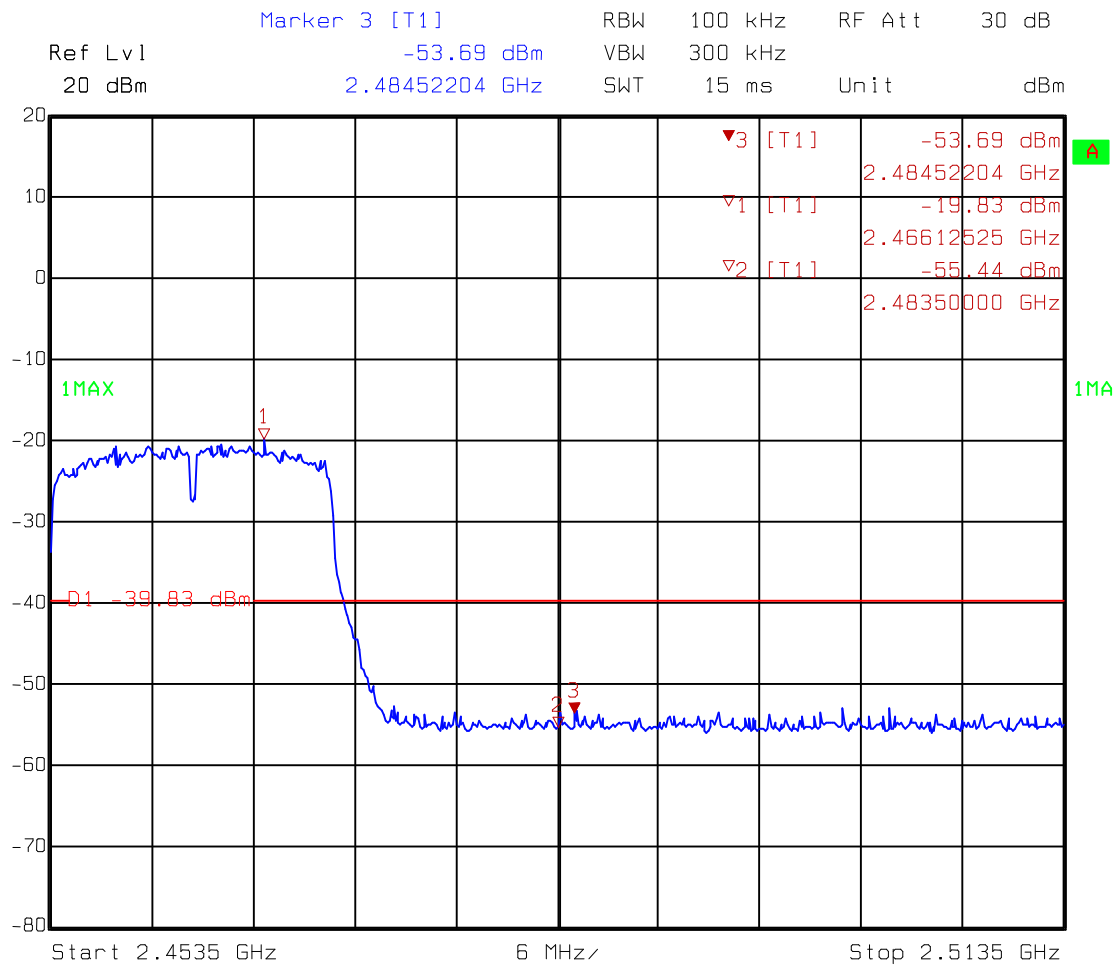
Date: 23.JUN.2004 10:46:45

Test Mode: 802.11g OFDM Modulation



Comment A: Band-edge at low channel (EC365) 802.11g

Date: 23.JUN.2004 10:10:09

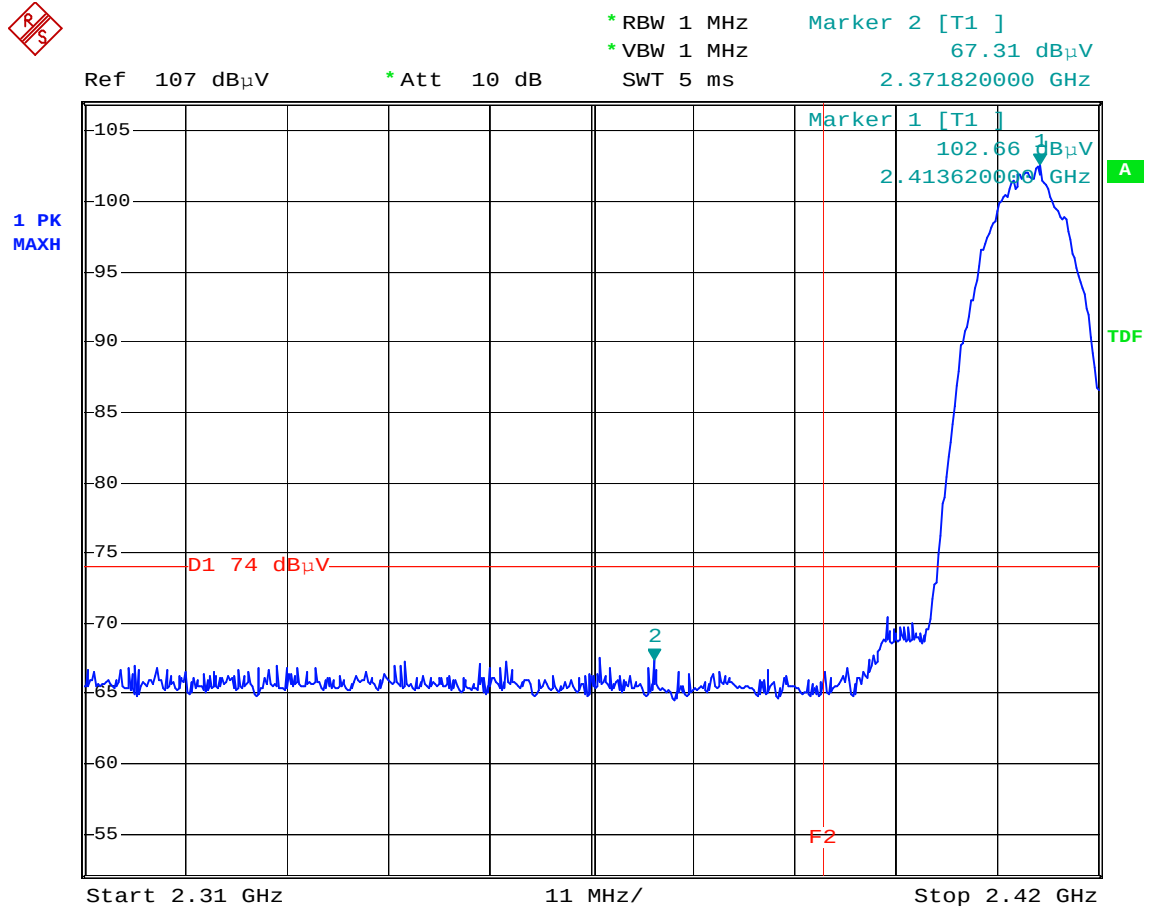


Comment A: Band-edge at high channel (EC365) 802.11g

Date: 23.JUN.2004 10:25:32

7.2 Band-edge (Radiated method)

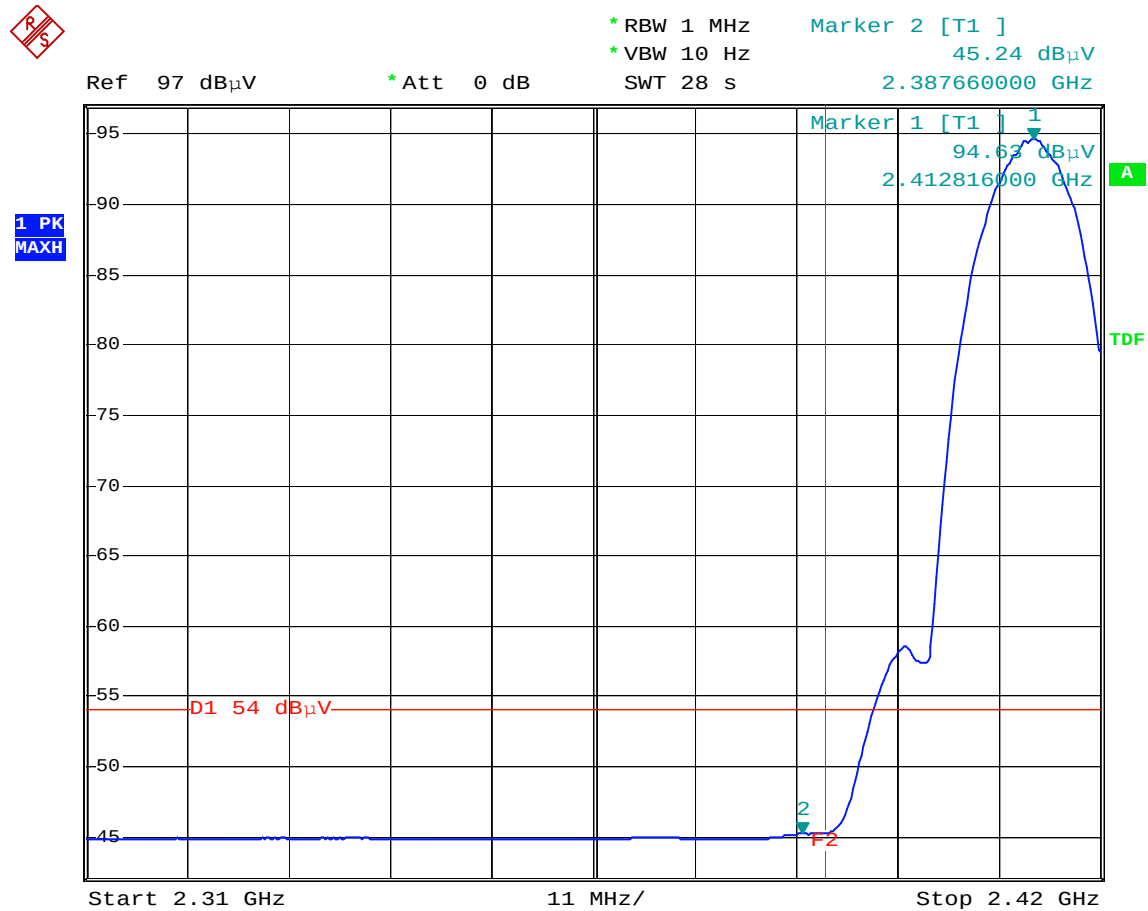
Test Mode: 802.11b DSSS Modulation



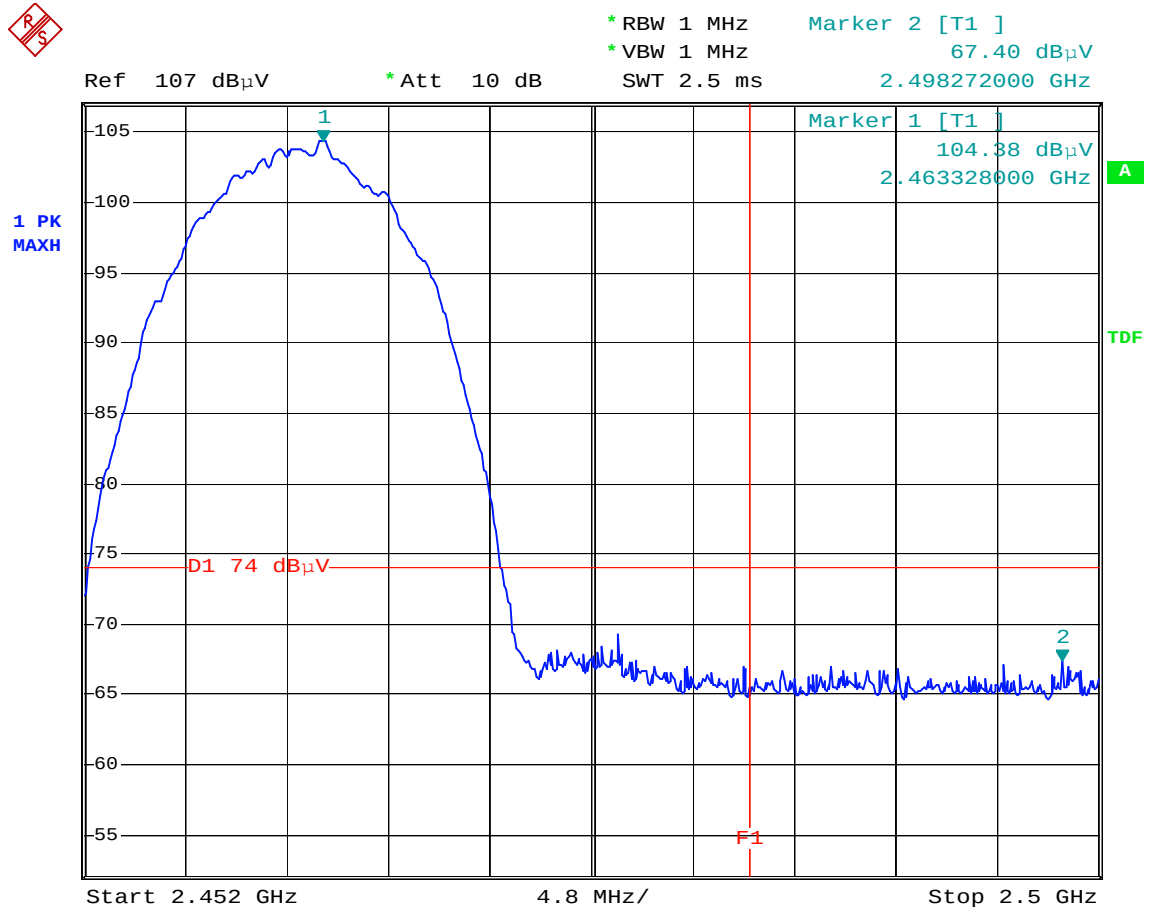
Comment: Band-edge test at low channel

Comment: Peak detector F2=2390MHz 802.11b

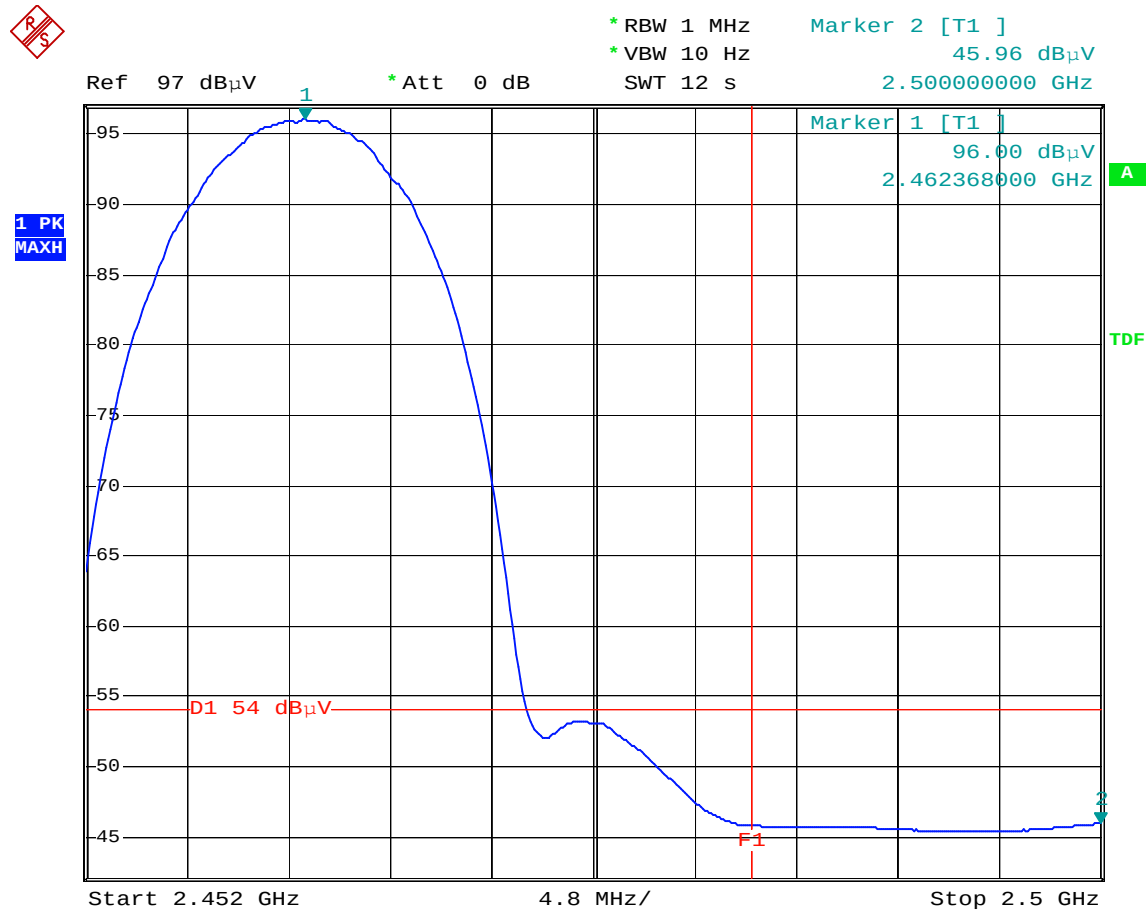
Date: 26.MAY.2004 11:29:00



Comment: Band-edge test at low channel
 Comment: Average detector F2=2390MHz 802.11b
 Date: 26.MAY.2004 11:30:34

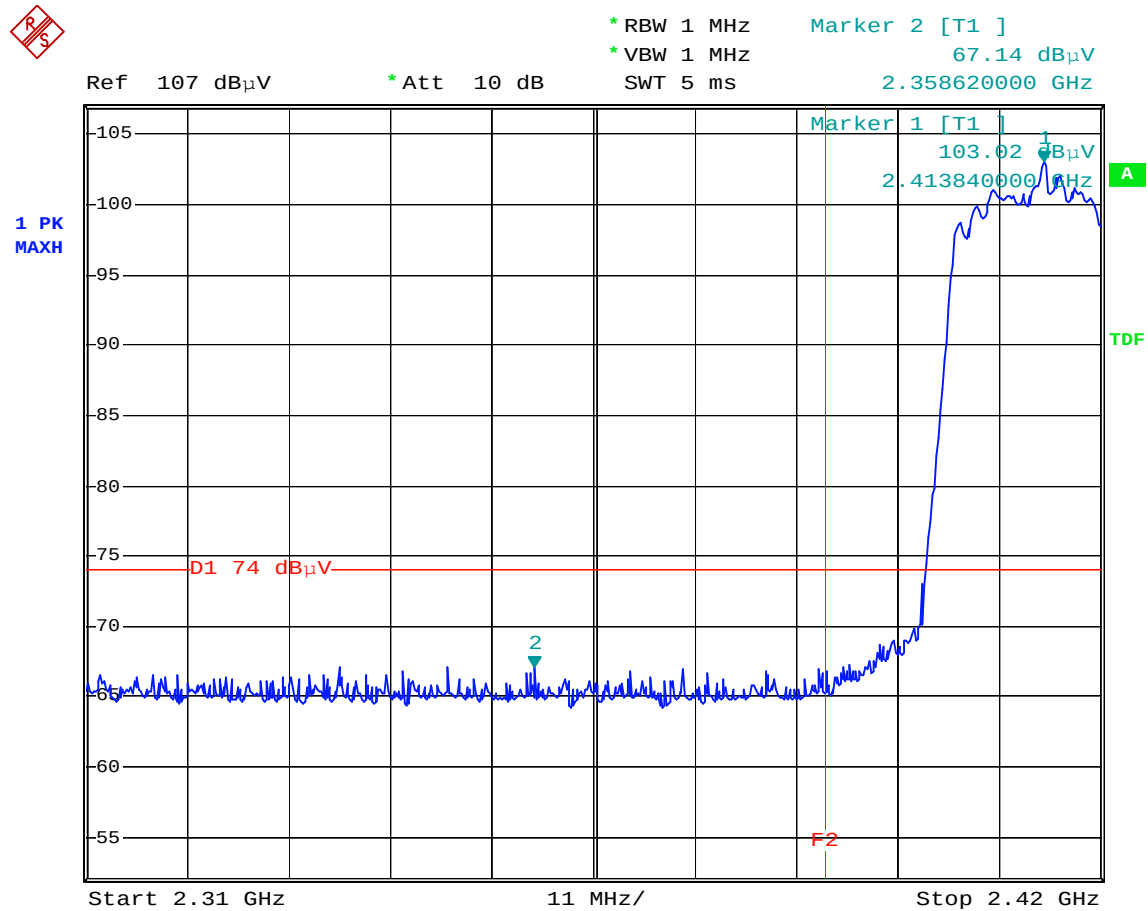


Comment: Band-edge test at high channel
 Comment: Peak detector F1=2483.5MHz 802.11b
 Date: 26.MAY.2004 11:23:19

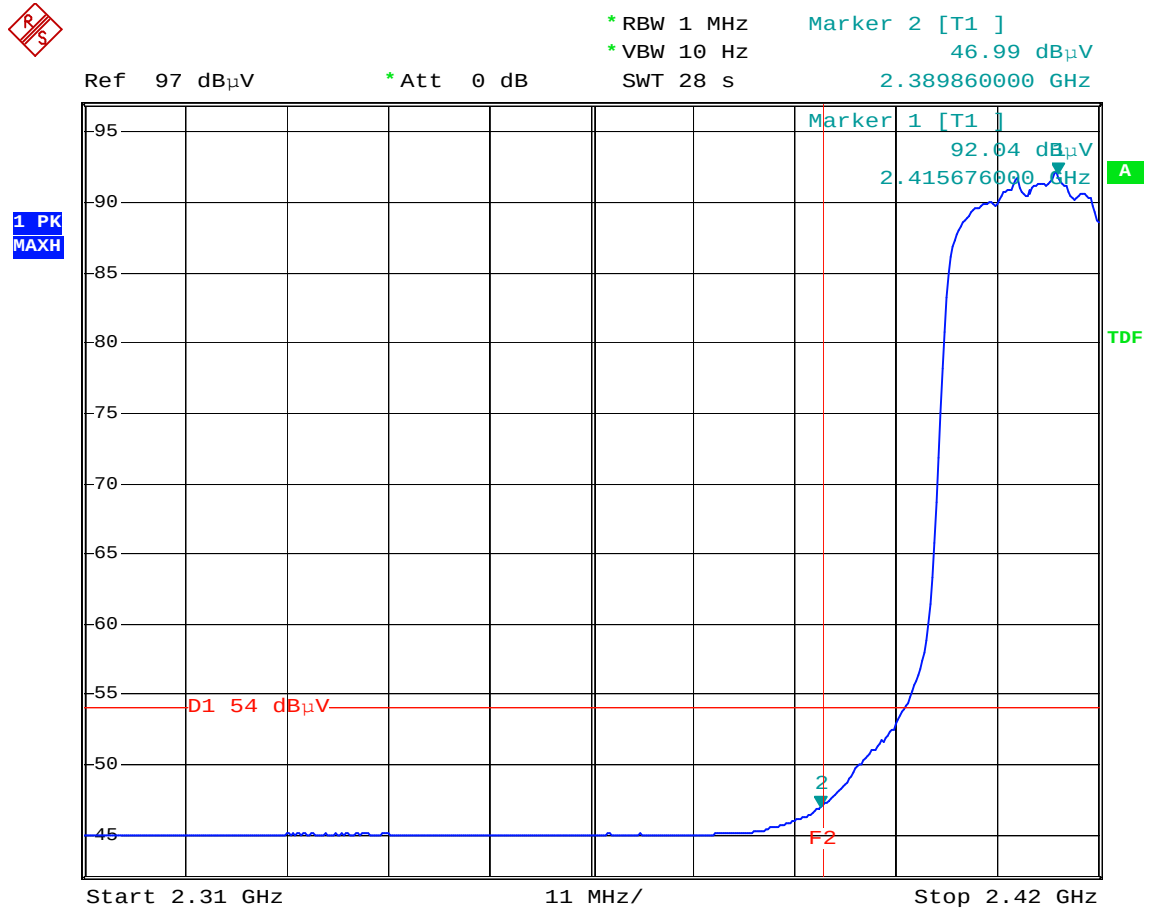


Comment: Band-edge test at high channel
 Comment: Average detector F1=2483.5MHz 802.11b
 Date: 26.MAY.2004 11:24:48

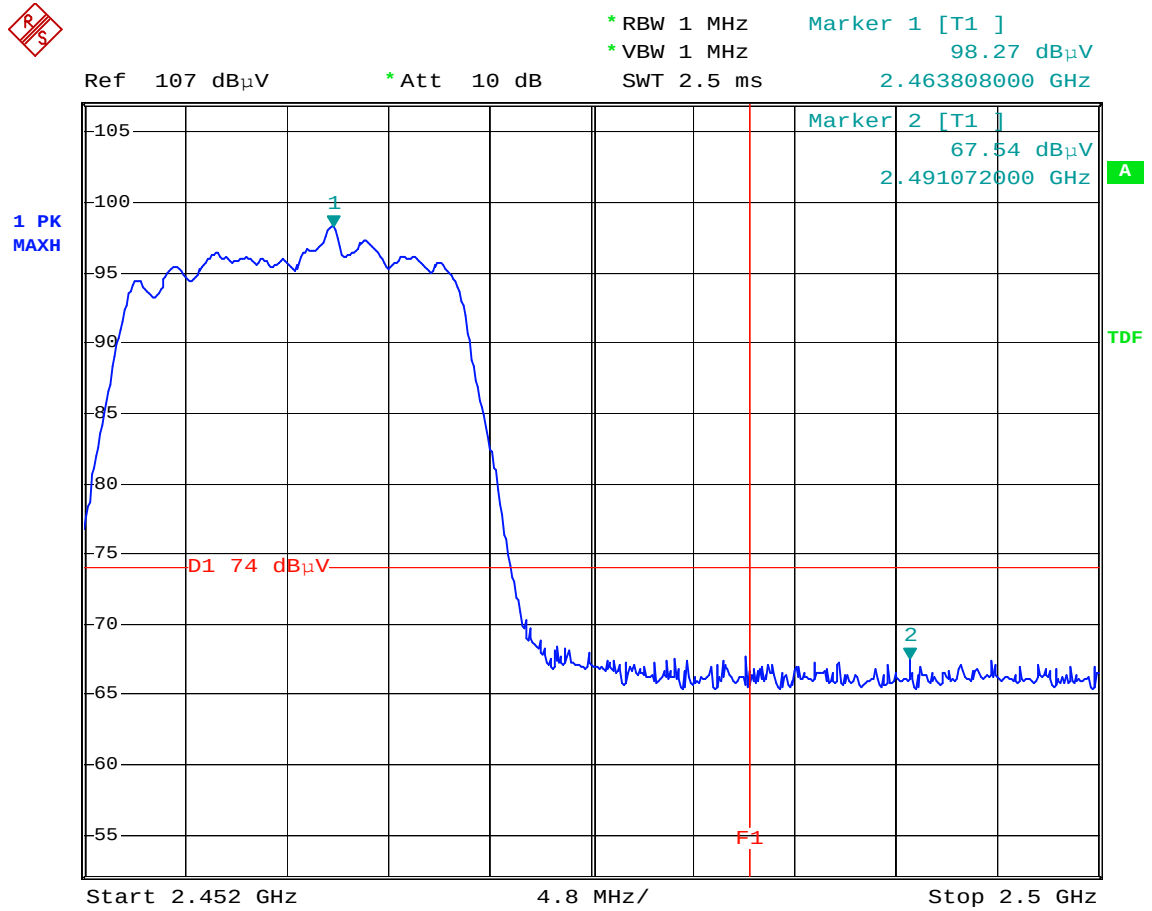
Test Mode: 802.11g OFDM Modulation



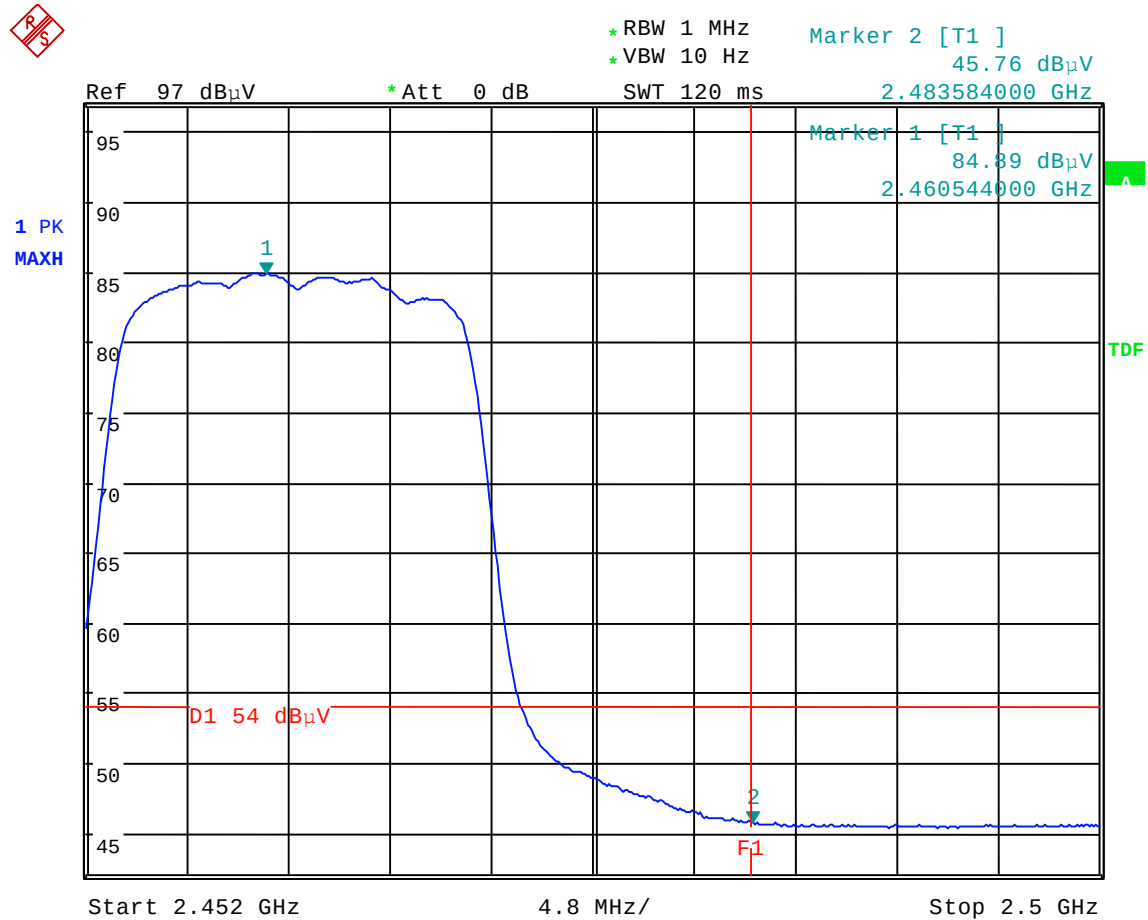
Comment: Band-edge test at low channel
 Comment: Peak detector F2=2390MHz 802.11g
 Date: 26.MAY.2004 11:35:15



Comment: Band-edge test at low channel
 Comment: Average detector F2=2390MHz 802.11g
 Date: 26.MAY.2004 11:36:52



Comment: Band-edge test at high channel
 Comment: Peak detector F1=2483.5MHz 802.11g
 Date: 26.MAY.2004 11:45:58



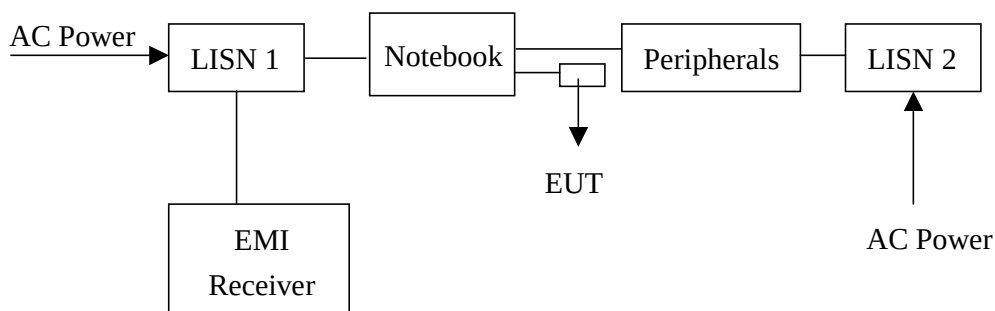
Comment: Band-edge test at high channel
 Comment: Average detector F1=2483.5MHz 802.11g
 Date: 26 MAY 2004 11:40:22

8. Power Line Conducted Emission test §FCC 15.207

8.1 Operating environment

Temperature:	21	°C	(10-40°C)
Relative Humidity:	63	%	(10-90%)
Atmospheric Pressure	1023	hPa	(860-1061hPa)

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 C63.4/1992 on conducted measurement. The AC power conducted emissions was investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz. (15.207 paragraph)

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

Please see the plot below.

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.

8.3 Power Line Conducted Emission test data

(1) Line

EUT : GUA-100

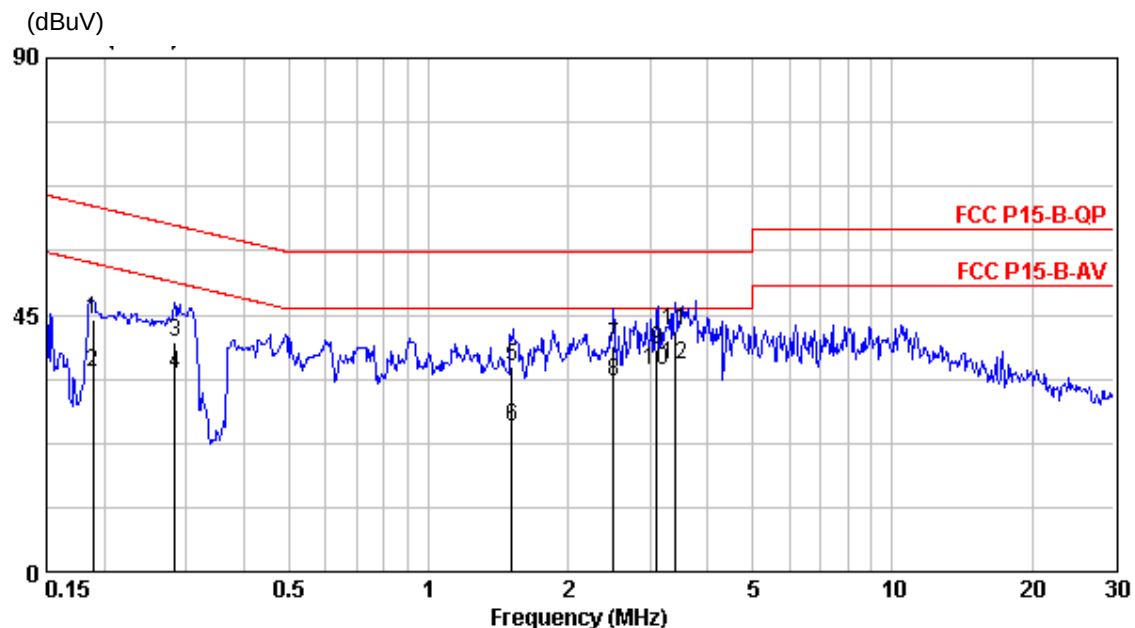
Worst case Condition : Normal Operating mode

Freq. (MHz)	Correction Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
0.189	0.10	44.05	64.08	-20.03	QP
0.189	0.10	34.82	54.08	-19.26	AVERAGE
0.284	0.10	40.10	60.71	-20.61	QP
0.284	0.10	34.67	50.71	-16.04	AVERAGE
1.512	0.10	35.96	56.00	-20.04	QP
1.512	0.10	25.41	46.00	-20.59	AVERAGE
2.498	0.13	39.65	56.00	-16.35	QP
2.498	0.13	33.36	46.00	-12.64	AVERAGE
3.098	0.16	39.06	56.00	-16.94	QP
3.098	0.16	35.23	46.00	-10.77	AVERAGE
3.409	0.17	42.36	56.00	-13.64	QP
3.409	0.17	36.15	46.00	-9.85	AVERAGE

Remark:

1. Correction Factor (dB)= LISN Factor (dB) + Cable Loss (dB)

2. Margin (dB) = Level (dBuV) – Limit (dBuV)



(2) Neutral

EUT : GUA-100

Worst case Condition : Normal Operating mode

Freq. (MHz)	Correction Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
0.150	0.10	39.89	66.00	-26.11	QP
0.150	0.10	35.68	56.00	-20.32	AVERAGE
1.599	0.10	31.27	56.00	-24.73	QP
1.599	0.10	23.32	46.00	-22.68	AVERAGE
1.875	0.10	36.85	56.00	-19.15	QP
1.875	0.10	25.06	46.00	-20.94	AVERAGE
2.498	0.13	39.33	56.00	-16.67	QP
2.498	0.13	36.17	46.00	-9.83	AVERAGE
3.098	0.16	41.90	56.00	-14.10	QP
3.098	0.16	38.13	46.00	-7.87	AVERAGE
3.710	0.19	43.44	56.00	-12.56	QP
3.710	0.19	39.98	46.00	-6.02	AVERAGE

Remark:

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

