



**FCC PART 15C
TEST REPORT
No.2011WLN0214**

for

TCT MOBILE LIMITED

GSM/GPRS/EDGE 850/1900 DUAL BAND MOBILE PHONE

Type: Onyx wifi A

Market Name: one touch 813A

With

FCC ID: RAD172

Hardware Version: PIO

Software Version: SW460

Issued Date: 2011-04-19



DAR accreditation (DIN EN ISO/IEC 17025): No. DGA-PL-114/01-02

FCC 2.948 Listed: No.733176

No. DGA-PL-114/01-02

IC O.A.T.S listed: No.6629A-1

Note:The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of TMC Beijing.

Test Laboratory:

TMC Beijing, Telecommunication Metrology Center of Ministry of Industry and Information Technology

No. 52, Huayuan Bei Road, Haidian District, Beijing, P. R. China, 100191

Tel:+86(0)10-62304633, Fax:+86(0)10-62304793 Email:welcom@emcite.com. www.emcite.com

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1. Test Laboratory

1.1. Testing Location

Company Name: TMC Beijing, Telecommunication Metrology Center of MIIT
Address: No. 52, Huayuan Bei Road, Haidian District, Beijing, P. R. China
Postal Code: 100191
Telephone: 00861062304633
Fax: 00861062304793

1.2. Testing Environment

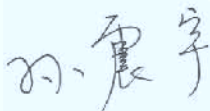
Normal Temperature: 15-30°C
Extreme Temperature: -20/+55°C
Relative Humidity: 30-60%
Air Pressure 990hPa-1040hPa

Note: The climatic requirements above are general exclude the special requirements for dedicated test environments listed in section 5 and some specific test cases in other parts of this report.

1.3. Project data

Testing End Date: 2011-04-08

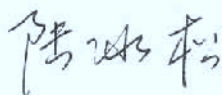
1.4. Signature



Sun Zhenyu
(Prepared this test report)



Gao Hong
(Reviewed this test report)



Lu Bingsong
Deputy Director of the laboratory
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name: TCT MOBILE LIMITED
Address /Post: 5F, E building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,
Pudong Area Shanghai, P.R. China. 201203
City: Shanghai
Postal Code: 201203
Country: China
Contact Gong Zhizhou
Email zhizhou.gong@jrdcom.com
Telephone: 0086-21-61460890
Fax: 0086-21-61460602

2.2. Manufacturer Information

Company Name: TCT MOBILE LIMITED
Address /Post: 5F, E building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,
Pudong Area Shanghai, P.R. China. 201203
City: Shanghai
Postal Code: 201203
Country: China
Contact Gong Zhizhou
Email zhizhou.gong@jrdcom.com
Telephone: 0086-21-61460890
Fax: 0086-21-61460602

3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	GSM/GPRS/EDGE 850/1900 DUAL BAND MOBILE PHONE
Type	Onyx wifi A
FCC ID	RAD172
IC ID	/
With WLAN Function	Yes
Frequency Range	ISM 2400MHz~2483.5MHz
Type of Modulation	DSSS/CCK/OFDM
Number of Channels	11
Antenna	Integral Antenna
MAX Conducted Power	23.59dBm(OFDM)
Power Supply	3.7V DC by Battery

Note: Photographs of EUT are shown in ANNEX C of this test report.

3.2. Internal Identification of EUT used during the test

EUT ID*	IMEI	HW Version	SW Version
EUT1	012640000010172	PIO	SW460
EUT2	012640000010115	PIO	SW460

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE used during the test

AE ID*	Description	Type	SN
AE1	Battery	CAB31L0000C1	/
AE2	Battery	CAB31L0000C2	/
AE3	Travel Adapter	CBA3120AG0C2	/
AE4	Travel Adapter	CBA3001AG0C1	/

*AE ID: is used to identify the test sample in the lab internally.

3.4. General Description

Equipment Under Test (EUT) is a model of GSM/GPRS/EDGE 850/1900 DUAL BAND MOBILE PHONE with integrated antenna. It consists of normal options: Battery and Charger.

Manual and specifications of the EUT were provided to fulfil the test.

Samples undergoing test were selected by the Client.

4. Reference Documents

4.1. Documents supplied by applicant

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

FCC Part15	FCC CFR 47, Part 15, Subpart C: 15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.247 Operation within the bands 902–928MHz, 2400–2483.5 MHz, and 5725–5850 MHz.	Oct, 2009 Edition
ANSI C63.4	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2009
KDB558074	Measurement of Digital Transmission Systems Operating under Section 15.247	March 23, 2005

5. LABORATORY ENVIRONMENT

Shielding Room1 (6.0 meters×3.0 meters×2.7 meters) did not exceed following limits along the conducted RF performance testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Ground system resistance	< 0.5 Ω
Uniformity of field strength	Between 0 and 6 dB, from 80MHz to 3000 MHz

Control room did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. =30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω

Semi-anechoic chamber (23 meters×17meters×10meters) did not exceed following limits along the EMC testing::

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
Normalised site attenuation (NSA)	< ±3.2 dB, 10 m distance, from 30 to 1000 MHz
Uniformity of field strength	Between 0 and 6 dB, from 80MHz to 3000 MHz

Shielding Room2 (7.30 meters×4.00 meters×3.80 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
Uniformity of field strength	Between 0 and 6 dB, from 80MHz to 3000 MHz

6. SUMMARY OF TEST RESULTS

6.1. Summary of Test Results

SUMMARY OF MEASUREMENT RESULTS	Sub-clause of Part15C	Sub-clause of IC	Verdict
Maximum Peak Output Power	15.247 (a)	/	P
Peak Power Spectral Density	15.247 (d)	/	P
Occupied 6dB Bandwidth	15.247 (d)	/	P
Band Edges Compliance	15.247 (b)	/	P
Transmitter Spurious Emission - Conducted	15.247	/	P
Transmitter Spurious Emission - Radiated	15.247, 15.209, 15.209	/	P
AC Powerline Conducted Emission	15.107, 15.207	/	P

Please refer to **ANNEX A** for detail.

The measurement is made according to Public notice KDB558074 and ANSI C63.4.

Terms used in Verdict column

P	Pass, The EUT complies with the essential requirements in the standard.
NP	Not Perform, The test was not performed by TMC
NA	Not Applicable, The test was not applicable
F	Fail, The EUT does not comply with the essential requirements in the standard

6.2. Statements

TMC has evaluated the test cases requested by the client/manufacturer as listed in section 6.1 of this report for the EUT specified in section 3 according to the standards or reference documents listed in section 4.1.

This report only deals with the WLAN function among the features described in section 3.

Test Conditions

T nom	Normal Temperature
T min	Low Temperature
T max	High Temperature
V nom	Normal Voltage
V min	Low Voltage
V max	High Voltage
H nom	Norm Humidity
A nom	Norm Air Pressure

For this report, all the test case listed above are tested under Normal Temperature and Normal Voltage, and also under norm humidity, the specific conditions as following:

Temperature	T nom	26°C
Voltage	V nom	3.6V(By battery)
Humidity	H nom	44%
Air Pressure	A nom	1010hPa

7. Test Equipments Utilized

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date
1	Vector Signal Analyzer	FSQ40	200089	Rohde & Schwarz	2011-07-19
2	Test Receiver	ESS	847151/015	Rohde & Schwarz	2011-10-30
3	LISN	ESH2-Z5	829991/012	Rohde & Schwarz	2011-08-12

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date
1	Test Receiver	ESI40	831564/002	Rohde & Schwarz	2011-08-11
2	BiLog Antenna	3142B	9908-1403	EMCO	2012-03-15
3	Dual-Ridge Waveguide Horn Antenna	3115	9906-5827	EMCO	2011-12-25

Anechoic chamber

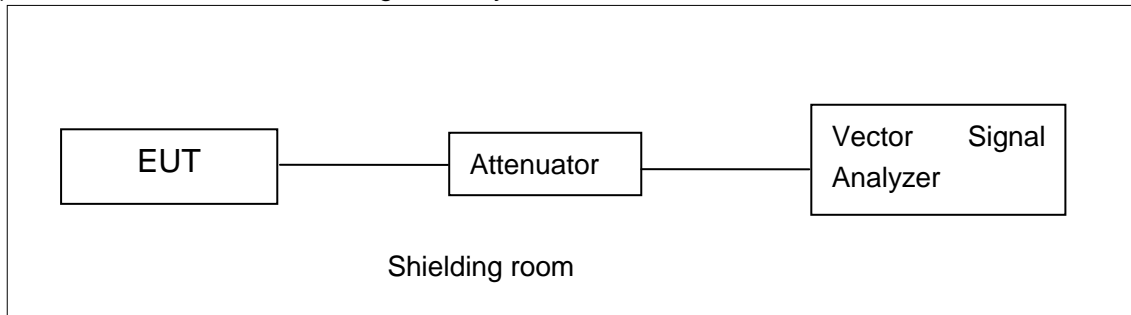
Anechoic chamber by Frankonia German.

ANNEX A: MEASUREMENT RESULTS

A.1. Measurement Method

A.1.1. Conducted Measurements

- 1). Connect the EUT to the test system correctly.
- 2). Set the EUT to the required work mode.
- 3). Set the EUT to the required channel.
- 4). Set the spectrum analyzer to start measurement.
- 5). Record the values. Vector Signal Analyzer

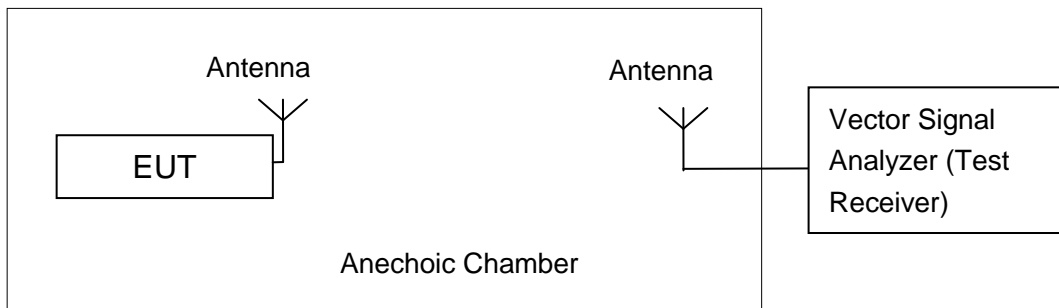


A.1.2. Radiated Emission Measurements

In the case of radiated emission, the used settings are as follows,

Sweep frequency from 30 MHz to 1GHz, RBW = 100 kHz, VBW = 300 kHz;

Sweep frequency from 1 GHz to 26GHz, RBW = 1MHz, VBW = 10Hz;



The measurement is made according to ANSI C63.4 and KDB558074

A.2. Maximum Peak Output Power

Measurement Limit and Method:

Standard	Limit (dBm)
FCC CRF Part 15.247(b)	< 30

The measurement is made according to ANSI C63.4 and KDB558074, and power output option 1 (RBW=20MHz) in KDB558074 is used for the test. EUT is operating in continuous transmitting mode

Measurement Uncertainty:

Measurement Uncertainty	0.75dB
-------------------------	--------

A.2.1. Maximum Peak Output Power

Measurement Results:

802.11b/g mode

Mode	Data Rate (Mbps)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11b	1	20.27	/	/
	2	20.38	/	/
	5.5	21.55	/	/
	11	23.02	23.43	23.59
802.11g	6	22.27	/	/
	9	22.23	/	/
	12	21.92	/	/
	18	21.88/	/	/
	24	22.31	/	/
	36	22.32	/	/
	48	22.39	/	/
	54	22.40	22.87	23.06

The data rate 11Mbps and 54Mbps are selected as worse condition, and the following cases are performed with this condition.

Conclusion: PASS

A.3. Peak Power Spectral Density

Measurement Limit:

Standard	Limit
FCC CRF Part 15.247(d)	< 8 dBm/3 kHz

The measurement is made according to ANSI C63.4 and KDB558074

Measurement Uncertainty:

Measurement Uncertainty	0.75dB
-------------------------	--------

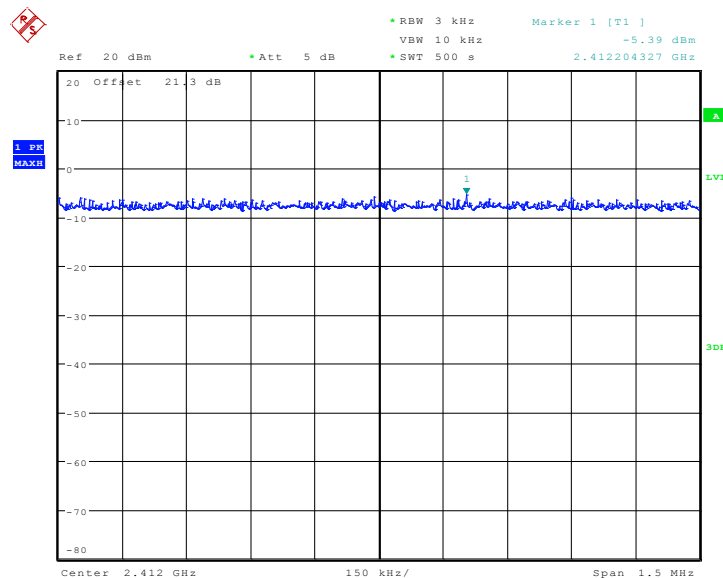
Measurement Results:

802.11b/g mode

Mode	Channel	Power Spectral Density (dBm/3 kHz)		Conclusion
802.11b	1	Fig.1	-5.39	P
	6	Fig.2	-3.87	P
	11	Fig.3	-4.25	P
802.11g	1	Fig.4	-7.67	P
	6	Fig.5	-7.86	P
	11	Fig.6	-7.79	P

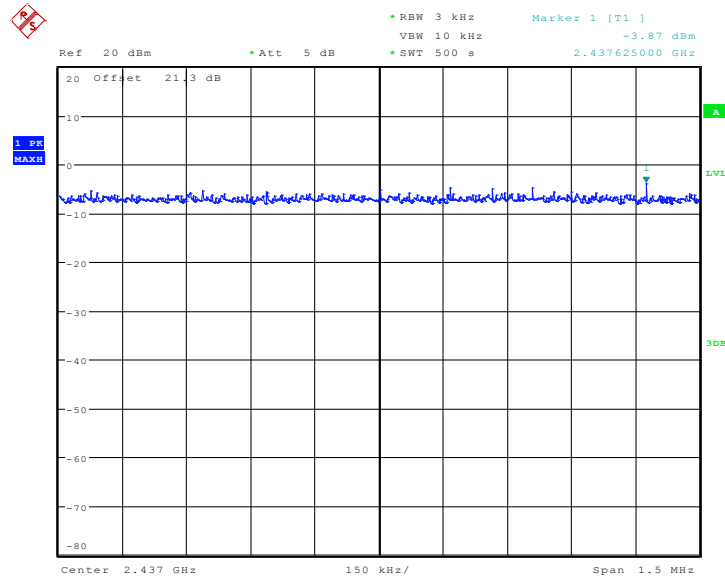
Conclusion: PASS

Test graphs as below:



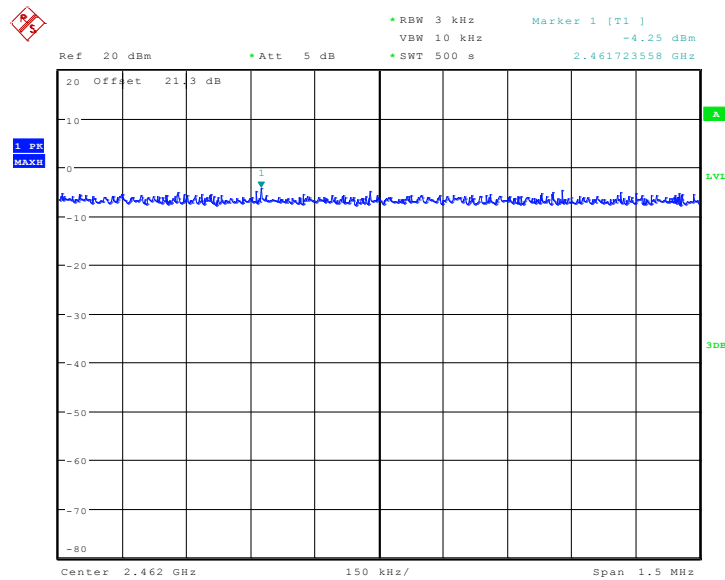
Date: 1.APR.2011 11:15:02

Fig. 1 Power Spectral Density (802.11b, Ch 1)



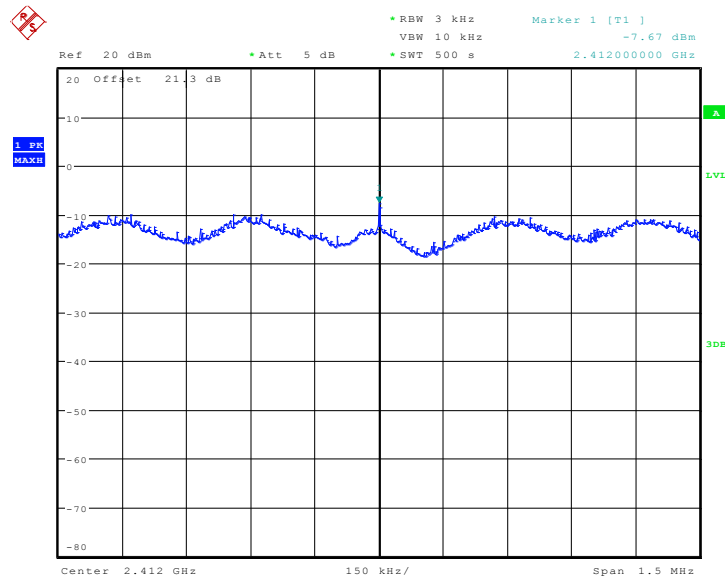
Date: 1.APR.2011 11:06:33

Fig. 2 Power Spectral Density (802.11b, Ch 6)



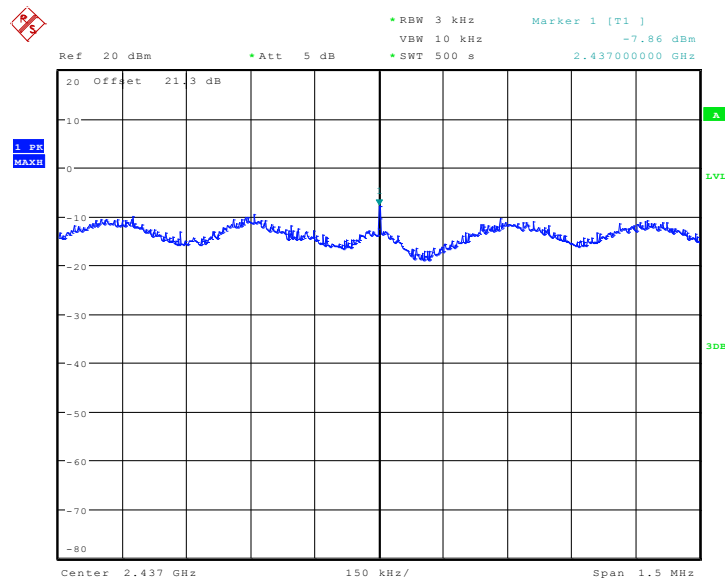
Date: 1.APR.2011 11:32:41

Fig. 3 Power Spectral Density (802.11b, Ch 11)



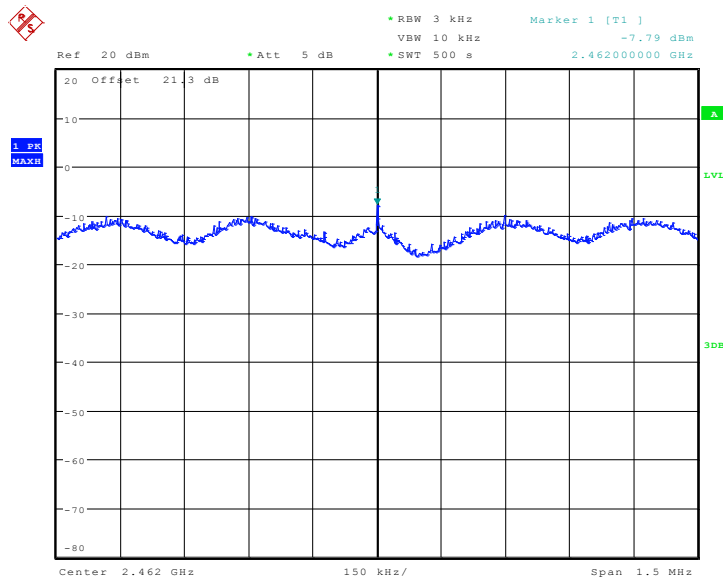
Date: 1.APR.2011 14:18:25

Fig. 4 Power Spectral Density (802.11g, Ch 1)



Date: 1.APR.2011 14:29:04

Fig. 5 Power Spectral Density (802.11g, Ch 6)



Date: 1.APR.2011 14:50:01

Fig. 6 Power Spectral Density (802.11g, Ch 11)

A.4. Occupied 6dB Bandwidth

Measurement Limit:

Standard	Limit (kHz)
FCC 47 CFR Part 15.247 (a)	≥ 500

The measurement is made according to ANSI C63.4 and KDB558074

Measurement Uncertainty:

Measurement Uncertainty	60.80Hz
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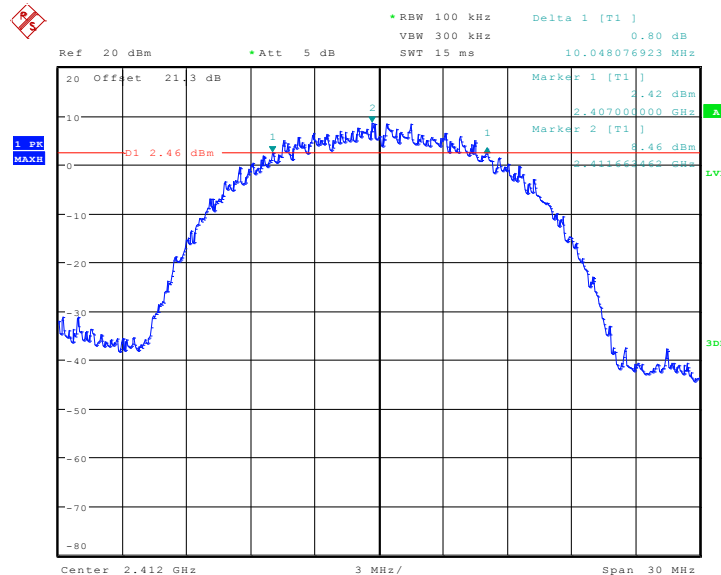
Measurement Result:

802.11b/g mode

Mode	Channel	Occupied 6dB Bandwidth (kHz)		conclusion
802.11b	1	Fig.7	10048	P
	6	Fig.8	10577	P
	11	Fig.9	10096	P
802.11g	1	Fig.10	16538	P
	6	Fig.11	16538	P
	11	Fig.12	16538	P

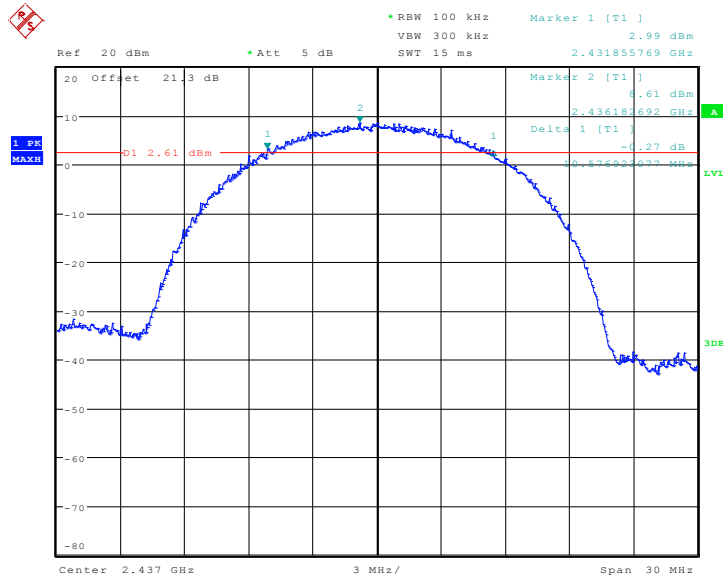
Conclusion: PASS

Test graphs as below:



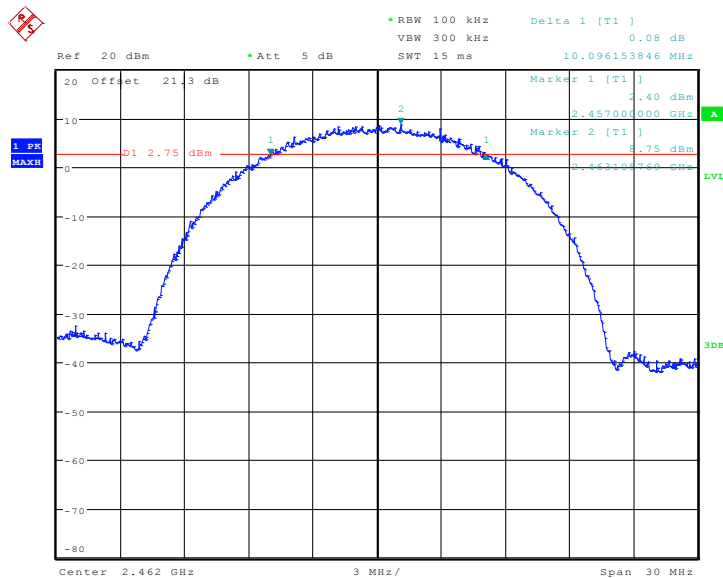
Date: 1.APR.2011 09:18:54

Fig. 7 Occupied 6dB Bandwidth (802.11b, Ch 1)



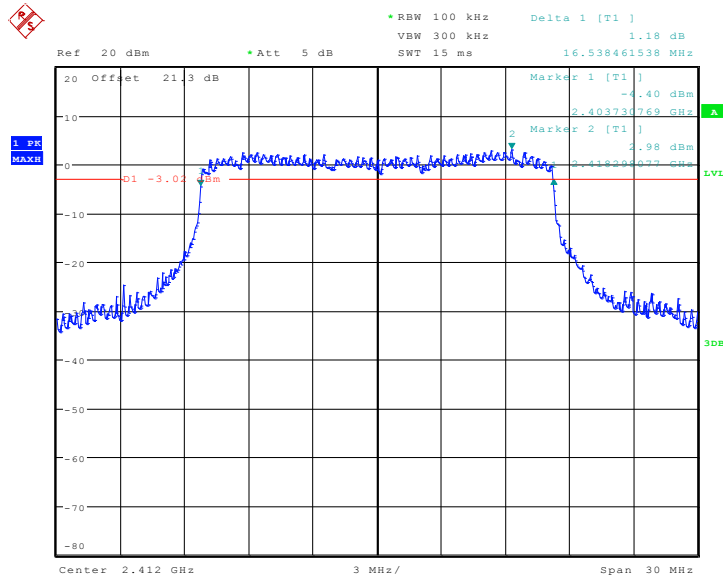
Date: 1.APR.2011 09:32:15

Fig. 8 Occupied 6dB Bandwidth (802.11b, Ch 6)



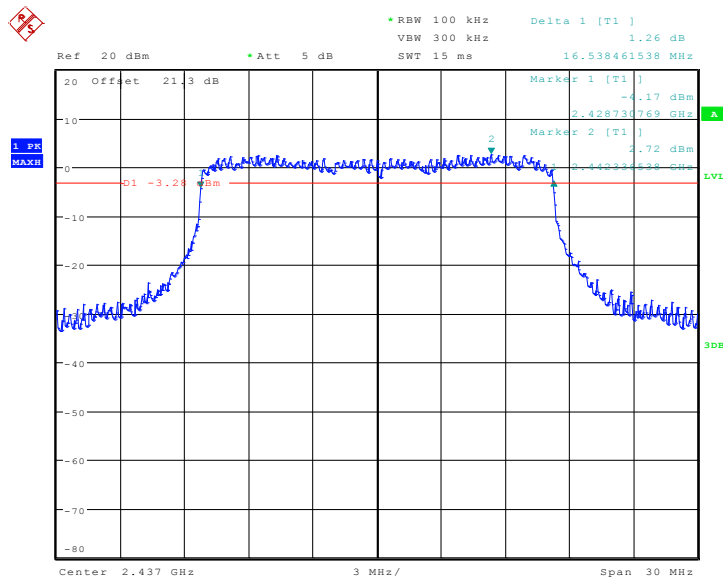
Date: 1.APR.2011 09:29:44

Fig. 9 Occupied 6dB Bandwidth (802.11b, Ch 11)



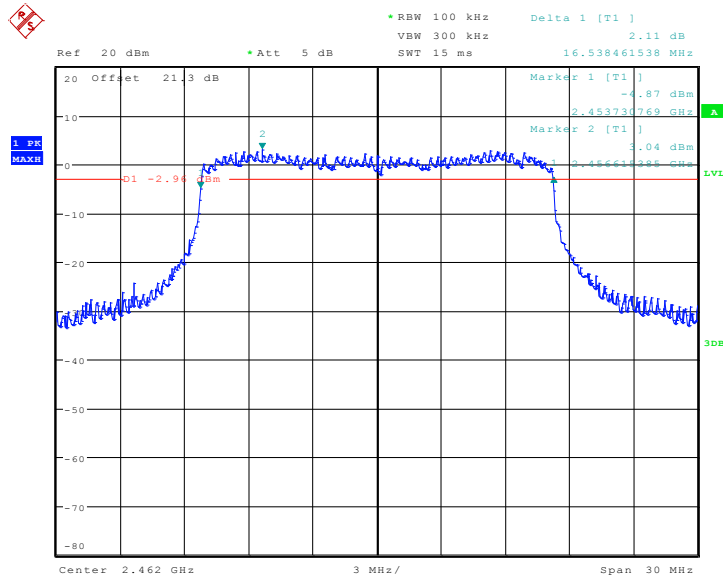
Date: 1.APR.2011 09:24:14

Fig. 10 Occupied 6dB Bandwidth (802.11g, Ch 1)



Date: 1.APR.2011 09:26:12

Fig. 11 Occupied 6dB Bandwidth (802.11g, Ch 6)



Date: 1.APR.2011 09:27:57

Fig. 12 Occupied 6dB Bandwidth (802.11g, Ch 11)

A.5. Band Edges Compliance

Measurement Limit:

Standard	Limit (dBc)
FCC 47 CFR Part 15.247 (d)	> 20

The measurement is made according to ANSI C63.4 and KDB558074

Measurement Uncertainty:

Measurement Uncertainty	0.75dB
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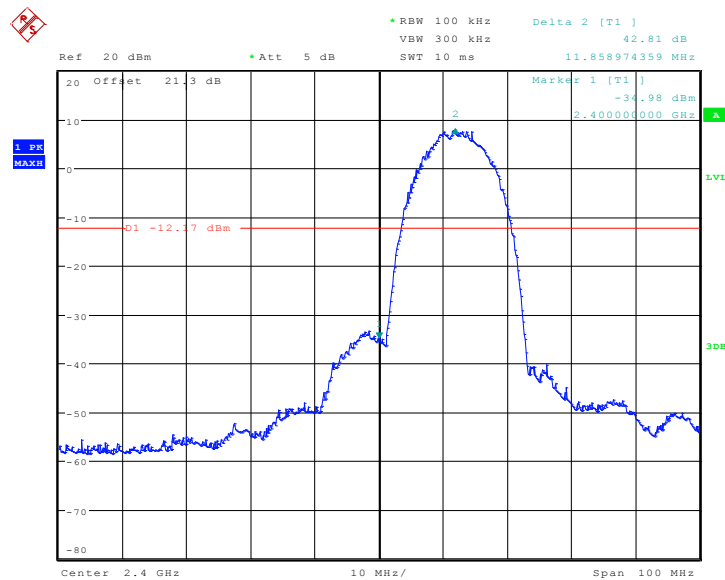
Measurement Result:

802.11b/g mode

Mode	Channel	Test Results	Conclusion
802.11b	1	Fig.13	P
	11	Fig.14	P
802.11g	1	Fig.15	P
	11	Fig.16	P

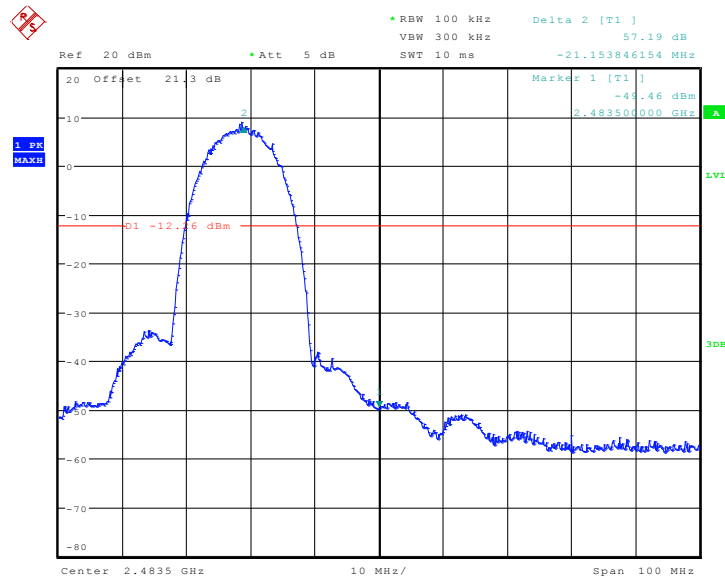
Conclusion: PASS

Test graphs as below:



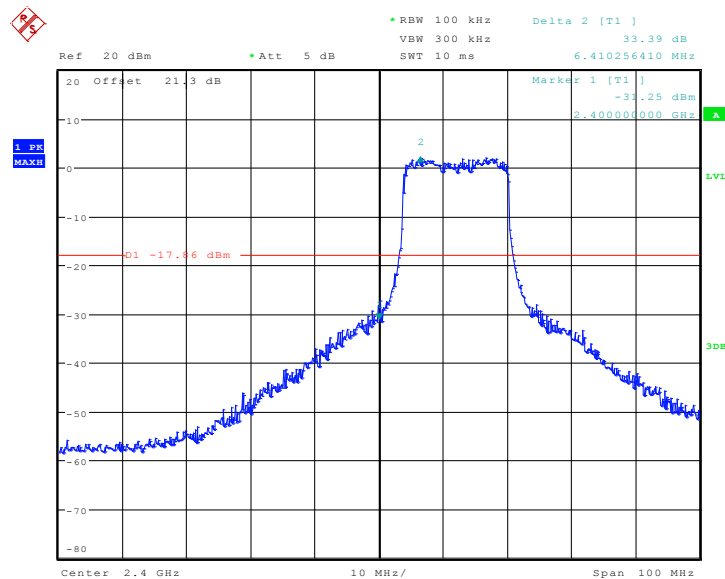
Date: 1.APR.2011 09:36:35

Fig. 13 Band Edges (802.11b, Ch 1)



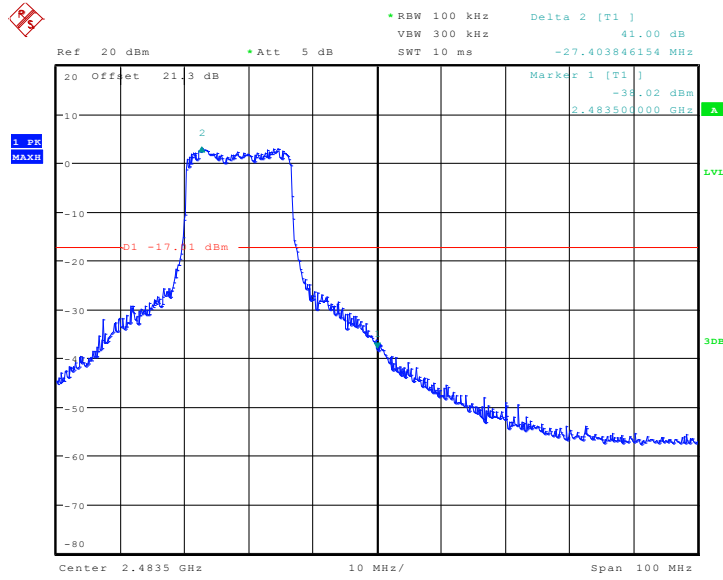
Date: 1.APR.2011 09:34:27

Fig. 14 Band Edges (802.11b, Ch 11)



Date: 1.APR.2011 09:38:40

Fig. 15 Band Edges (802.11g, Ch 1)



Date: 1.APR.2011 09:42:19

Fig. 16 Band Edges (802.11g, Ch 11)

A.6. Transmitter Spurious Emission

A.6.1 Transmitter Spurious Emission - Conducted

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247 (d)	20dB below peak output power in 100 kHz bandwidth

The measurement is made according to ANSI C63.4 and KDB558074

Measurement Uncertainty:

Frequency Range	Uncertainty
30MHz ≤ f ≤ 2GHz	0.63
2GHz ≤ f ≤ 3.6GHz	0.82
3.6GHz ≤ f ≤ 8GHz	1.55
8GHz ≤ f ≤ 20GHz	1.86
20GHz ≤ f ≤ 22GHz	1.90
22GHz ≤ f ≤ 26GHz	2.20

Measurement Results:

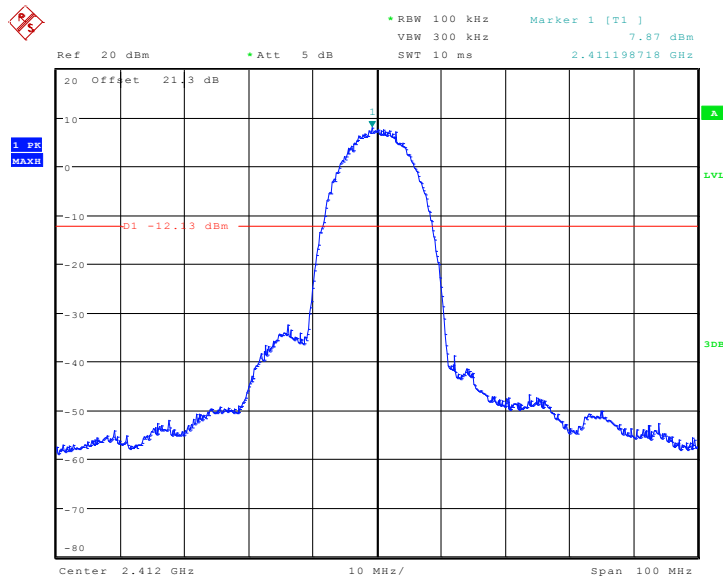
802.11b/g mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11b	1	2.412 GHz	Fig.17	P
		30 MHz ~ 1 GHz	Fig.18	P
		1GHz-2.5GHz	Fig.19	P
		2.5GHz-7.5GHz	Fig.20	P
		7.5GHz-10GHz	Fig.21	P
		10GHz-15GHz	Fig.22	P
		15GHz-20GHz	Fig.23	P
		20GHz-26GHz	Fig.24	P
	6	2.437 GHz	Fig.25	P
		30 MHz ~ 1 GHz	Fig.26	P
		1GHz-2.5GHz	Fig.27	P
		2.5GHz-7.5GHz	Fig.28	P
		7.5GHz-10GHz	Fig.29	P
		10GHz-15GHz	Fig.30	P
		15GHz-20GHz	Fig.31	P
		20GHz-26GHz	Fig.32	P
	11	2.462 GHz	Fig.33	P
		30 MHz ~ 1 GHz	Fig.34	P
		1GHz-2.5GHz	Fig.35	P
		2.5GHz-7.5GHz	Fig.36	P

		7.5GHz-10GHz	Fig.37	P
		10GHz-15GHz	Fig.38	P
		15GHz-20GHz	Fig.39	P
		20GHz-26GHz	Fig.40	P
802.11g	1	2.412 GHz	Fig.41	P
		30 MHz ~ 1 GHz	Fig.42	P
		1GHz-2.5GHz	Fig.43	P
		2.5GHz-7.5GHz	Fig.44	P
		7.5GHz-10GHz	Fig.45	P
		10GHz-15GHz	Fig.46	P
		15GHz-20GHz	Fig.47	P
		20GHz-26GHz	Fig.48	P
	6	2.437 GHz	Fig.49	P
		30 MHz ~ 1 GHz	Fig.50	P
		1GHz-2.5GHz	Fig.51	P
		2.5GHz-7.5GHz	Fig.52	P
		7.5GHz-10GHz	Fig.53	P
		10GHz-15GHz	Fig.54	P
		15GHz-20GHz	Fig.55	P
		20GHz-26GHz	Fig.56	P
	11	2.462 GHz	Fig.57	P
		30 MHz ~ 1 GHz	Fig.58	P
		1GHz-2.5GHz	Fig.59	P
		2.5GHz-7.5GHz	Fig.60	P
		7.5GHz-10GHz	Fig.61	P
		10GHz-15GHz	Fig.62	P
		15GHz-20GHz	Fig.63	P
		20GHz-26GHz	Fig.64	P

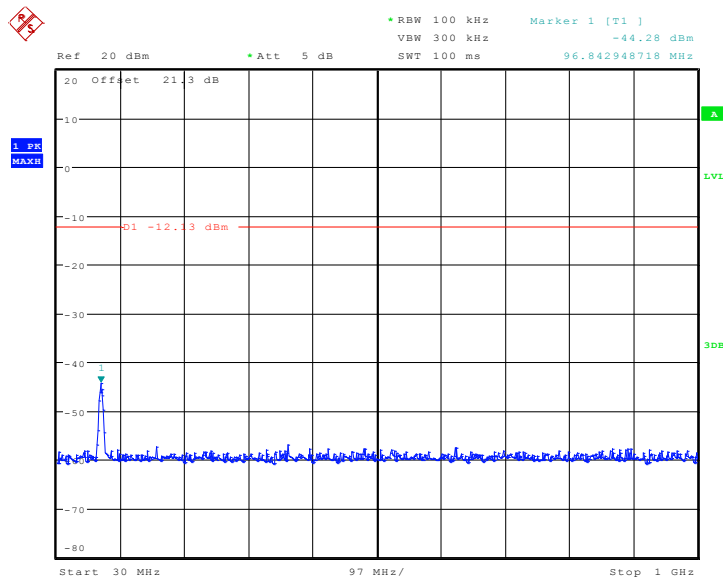
Conclusion: PASS

Test graphs as below:



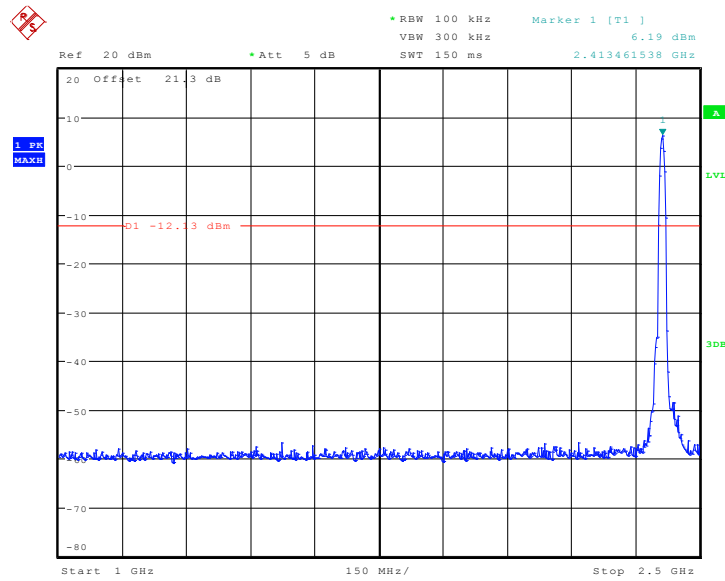
Date: 1.APR.2011 10:43:52

Fig. 17 Conducted Spurious Emission (802.11b, Ch1, Center Frequency)



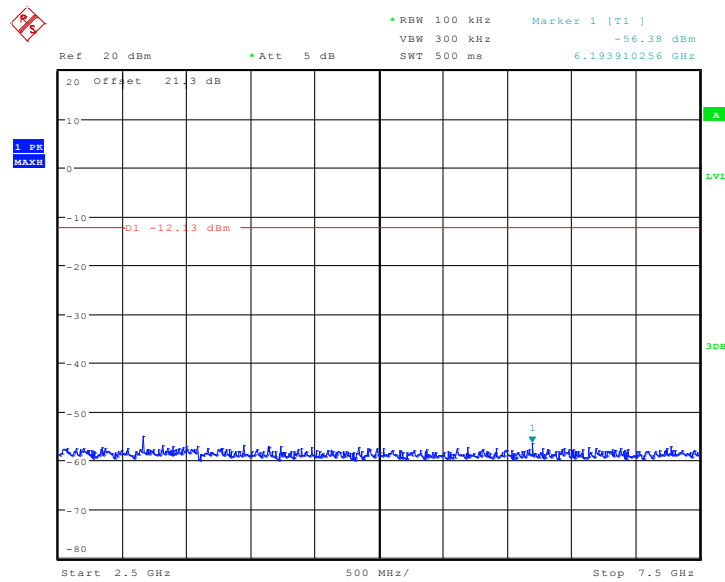
Date: 1.APR.2011 10:44:06

Fig. 18 Conducted Spurious Emission (802.11b, Ch1, 30 MHz-1 GHz)



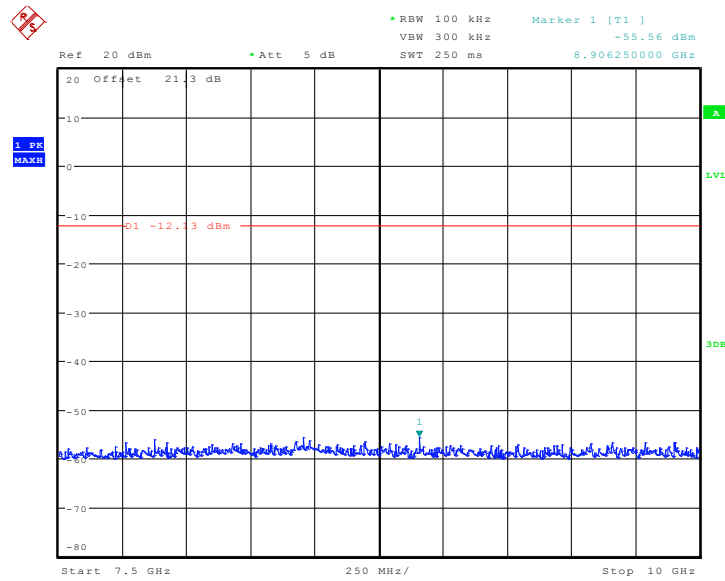
Date: 1.APR.2011 10:44:23

Fig. 19 Conducted Spurious Emission (802.11b, Ch1, 1 GHz-2.5 GHz)



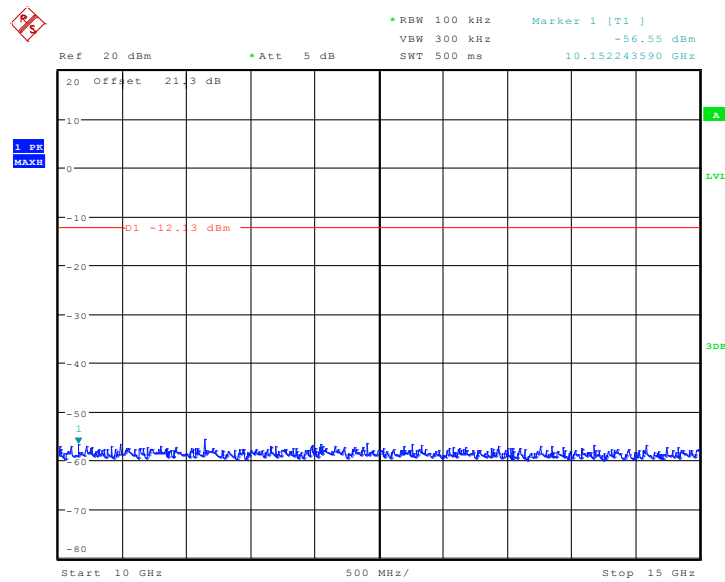
Date: 1.APR.2011 10:44:43

Fig. 20 Conducted Spurious Emission (802.11b, Ch1, 2.5 GHz-7.5 GHz)



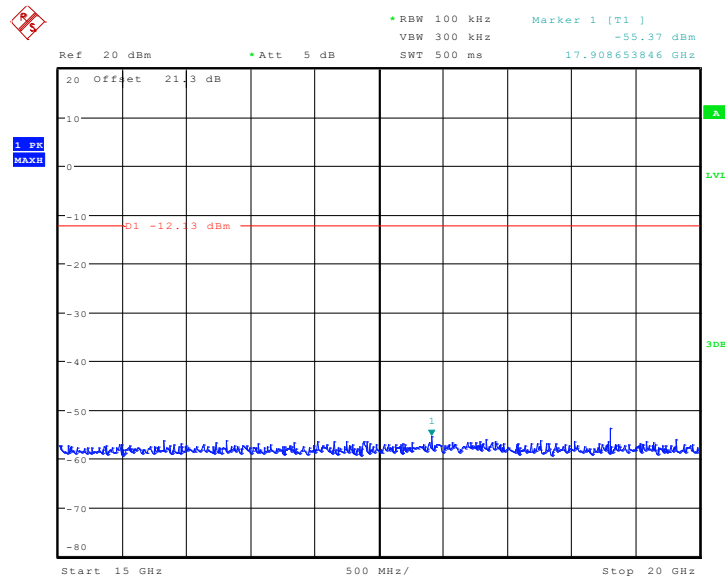
Date: 1.APR.2011 10:45:02

Fig. 21 Conducted Spurious Emission (802.11b, Ch1, 7.5 GHz-10 GHz)



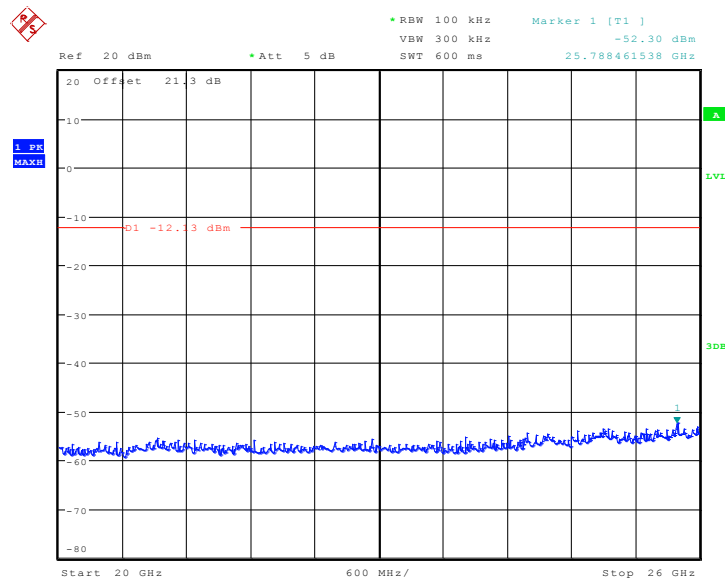
Date: 1.APR.2011 10:45:29

Fig. 22 Conducted Spurious Emission (802.11b, Ch1, 10 GHz-15 GHz)



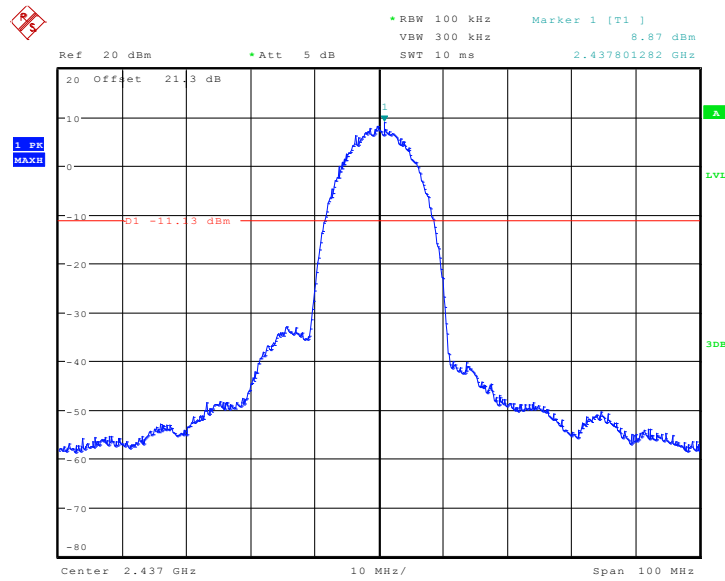
Date: 1.APR.2011 10:45:45

Fig. 23 Conducted Spurious Emission (802.11b, Ch1, 15 GHz-20 GHz)



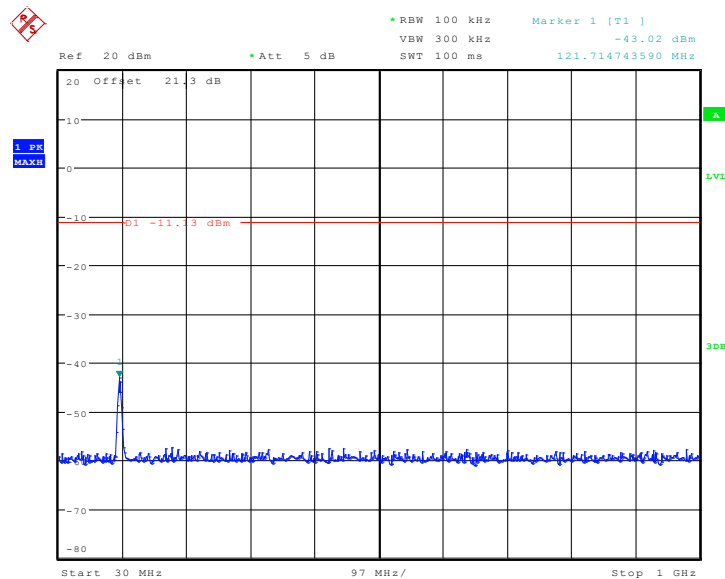
Date: 1.APR.2011 10:46:00

Fig. 24 Conducted Spurious Emission (802.11b, Ch1, 20 GHz-26 GHz)



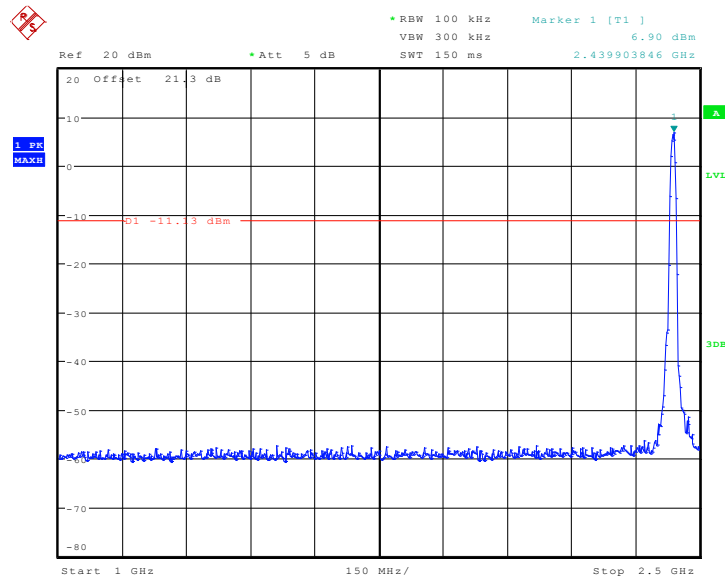
Date: 1.APR.2011 10:46:56

Fig. 25 Conducted Spurious Emission (802.11b, Ch6, Center Frequency)



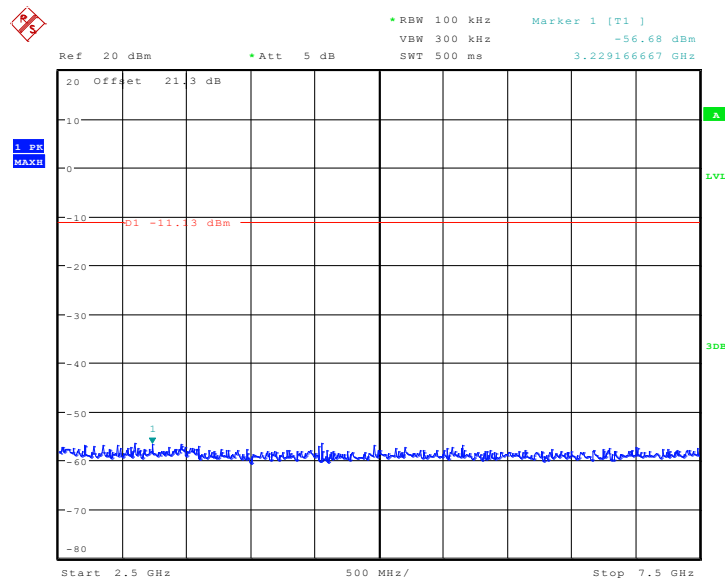
Date: 1.APR.2011 10:47:08

Fig. 26 Conducted Spurious Emission (802.11b, Ch6, 30 MHz-1 GHz)



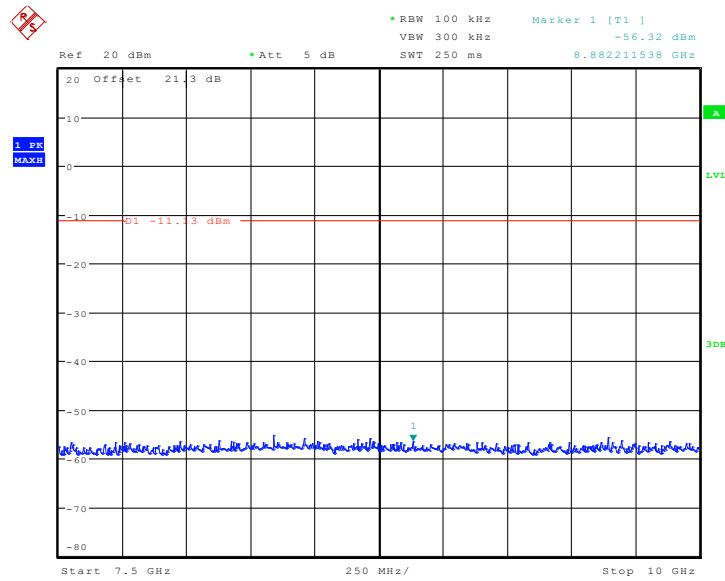
Date: 1.APR.2011 10:47:25

Fig. 27 Conducted Spurious Emission (802.11b, Ch6, 1 GHz-2.5 GHz)



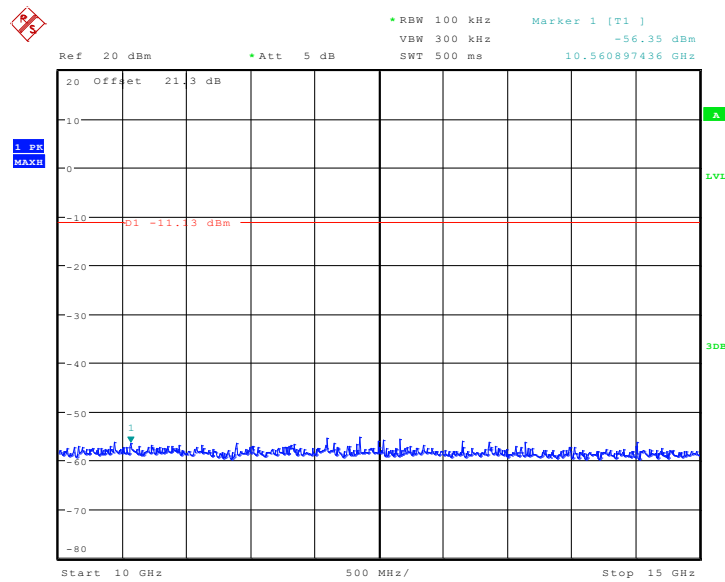
Date: 1.APR.2011 10:47:41

Fig. 28 Conducted Spurious Emission (802.11b, Ch6, 2.5 GHz-7.5 GHz)



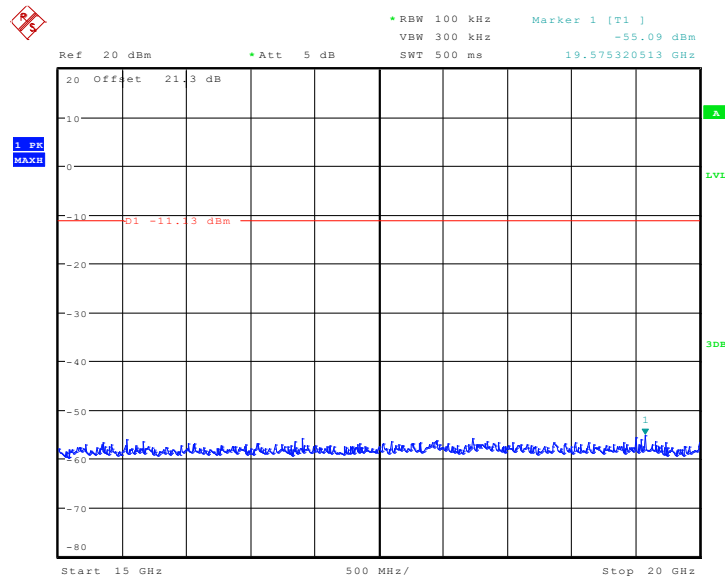
Date: 1.APR.2011 10:48:17

Fig. 29 Conducted Spurious Emission (802.11b, Ch6, 7.5 GHz-10 GHz)



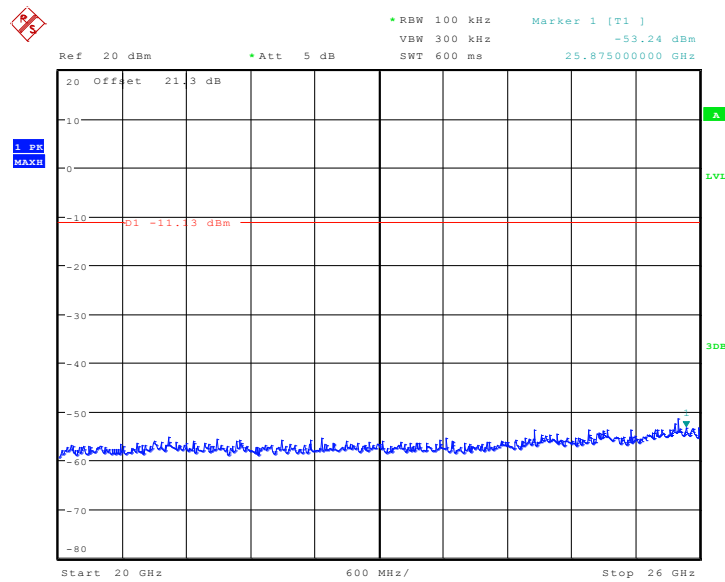
Date: 1.APR.2011 10:48:36

Fig. 30 Conducted Spurious Emission (802.11b, Ch6, 10 GHz-15 GHz)



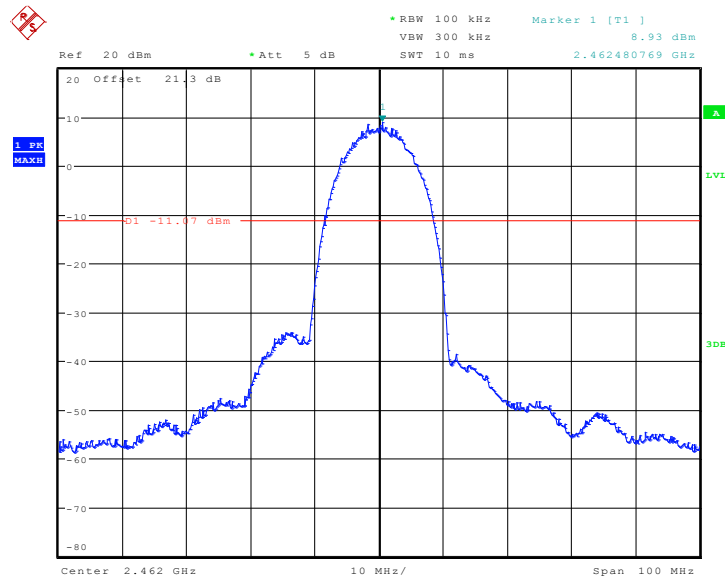
Date: 1.APR.2011 10:48:52

Fig. 31 Conducted Spurious Emission (802.11b, Ch6, 15 GHz-20 GHz)



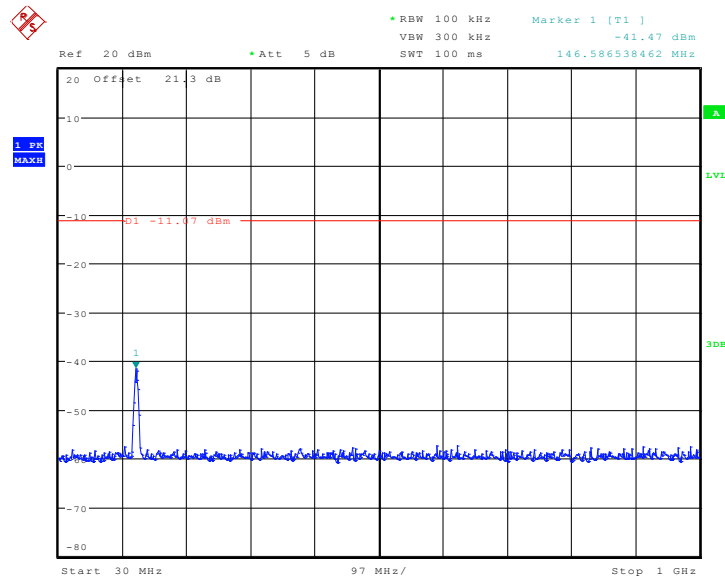
Date: 1.APR.2011 10:49:12

Fig. 32 Conducted Spurious Emission (802.11b, Ch6, 20 GHz-26 GHz)



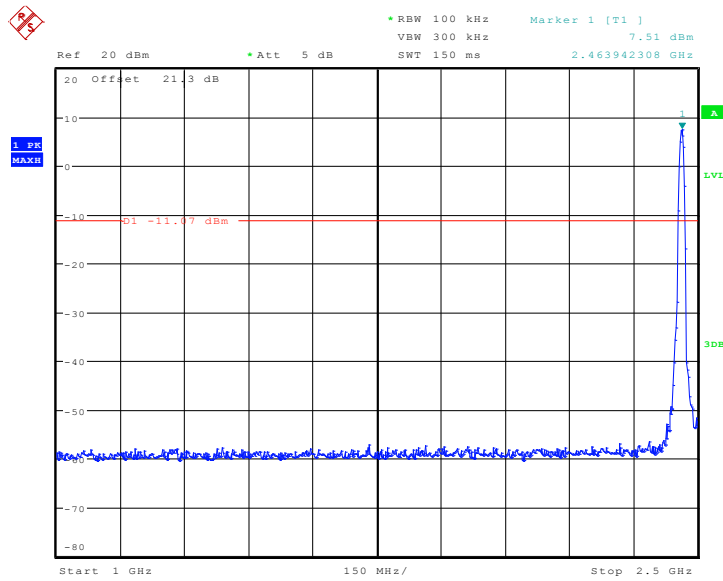
Date: 1.APR.2011 10:40:15

Fig. 33 Conducted Spurious Emission (802.11b, Ch11, Center Frequency)



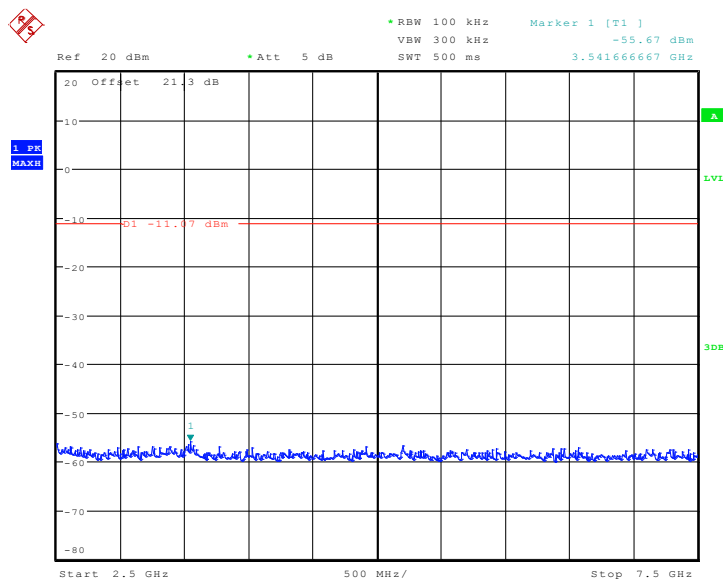
Date: 1.APR.2011 10:40:36

Fig. 34 Conducted Spurious Emission (802.11b, Ch11, 30 MHz-1 GHz)



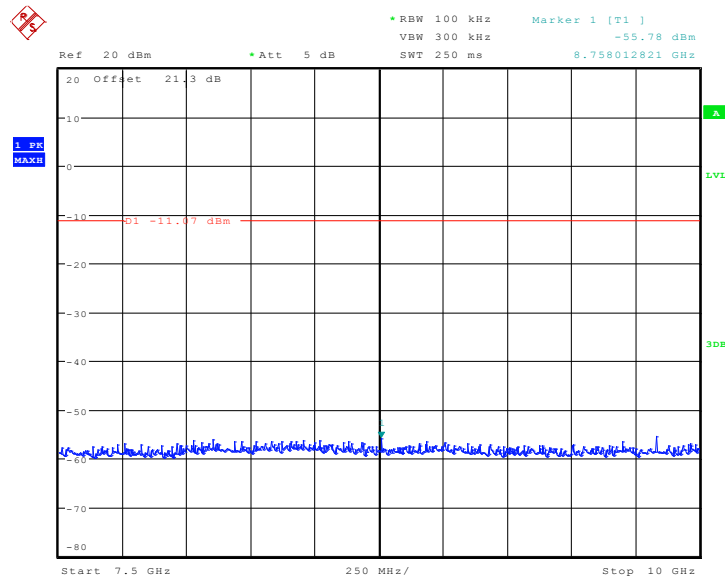
Date: 1.APR.2011 10:40:54

Fig. 35 Conducted Spurious Emission (802.11b, Ch11, 1 GHz-2.5 GHz)



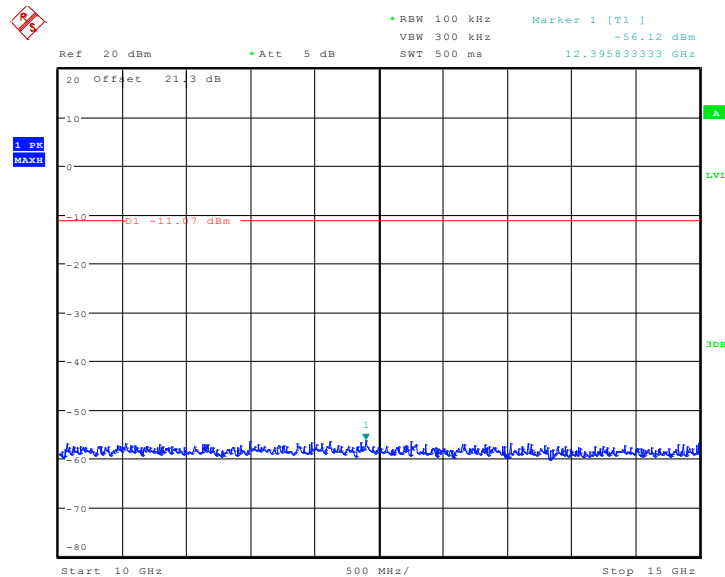
Date: 1.APR.2011 10:41:19

Fig. 36 Conducted Spurious Emission (802.11b, Ch11, 2.5 GHz-7.5 GHz)



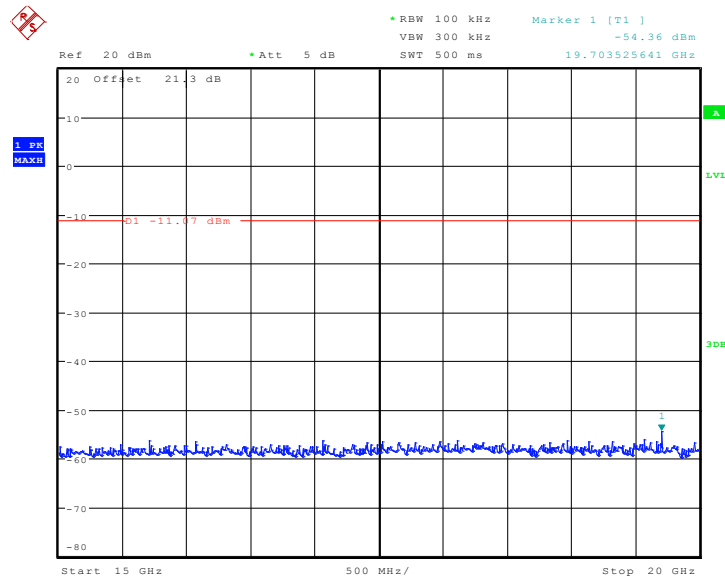
Date: 1.APR.2011 10:41:38

Fig. 37 Conducted Spurious Emission (802.11b, Ch11, 7.5 GHz-10 GHz)



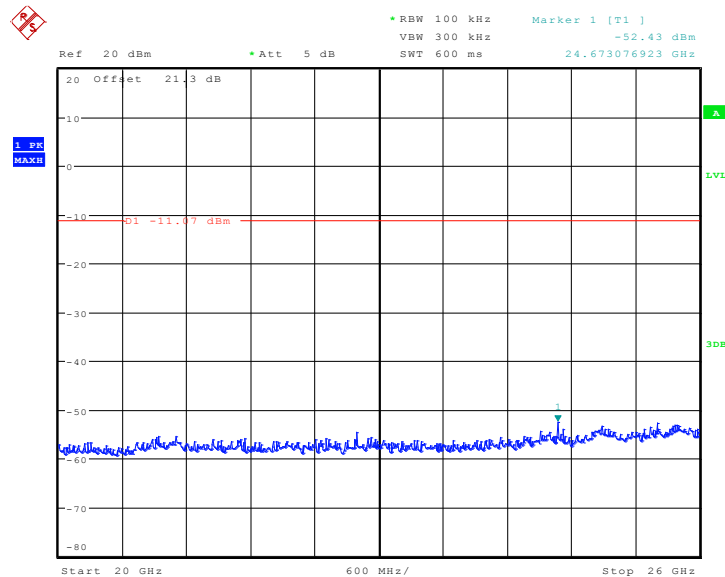
Date: 1.APR.2011 10:41:54

Fig. 38 Conducted Spurious Emission (802.11b, Ch11, 10 GHz-15 GHz)



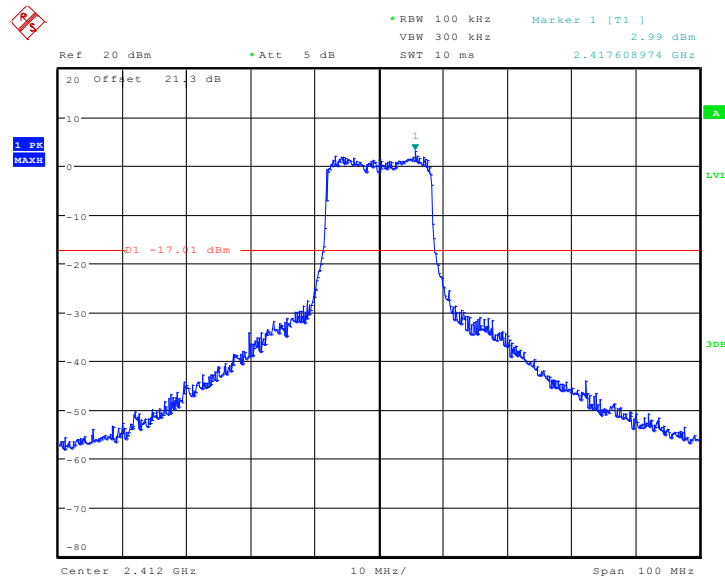
Date: 1.APR.2011 10:42:12

Fig. 39 Conducted Spurious Emission (802.11b, Ch11, 15 GHz-20 GHz)



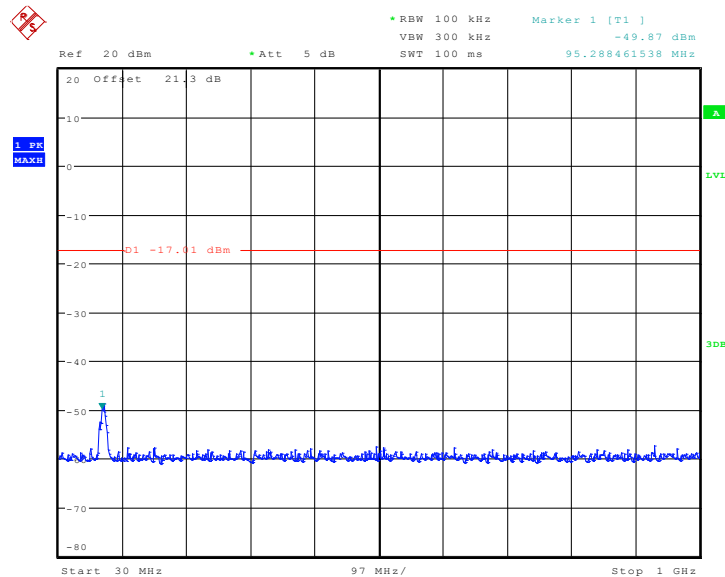
Date: 1.APR.2011 10:42:26

Fig. 40 Conducted Spurious Emission (802.11b, Ch11, 20 GHz-26 GHz)



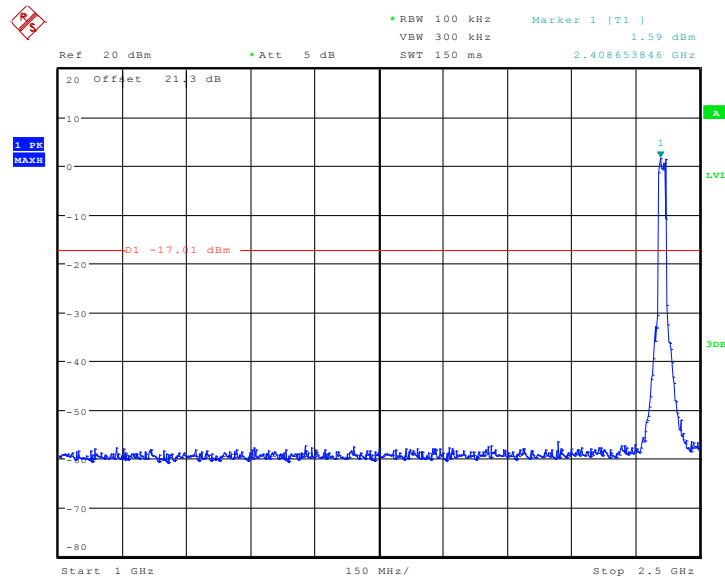
Date: 1.APR.2011 10:23:35

Fig. 41 Conducted Spurious Emission (802.11g, Ch1, Center Frequency)



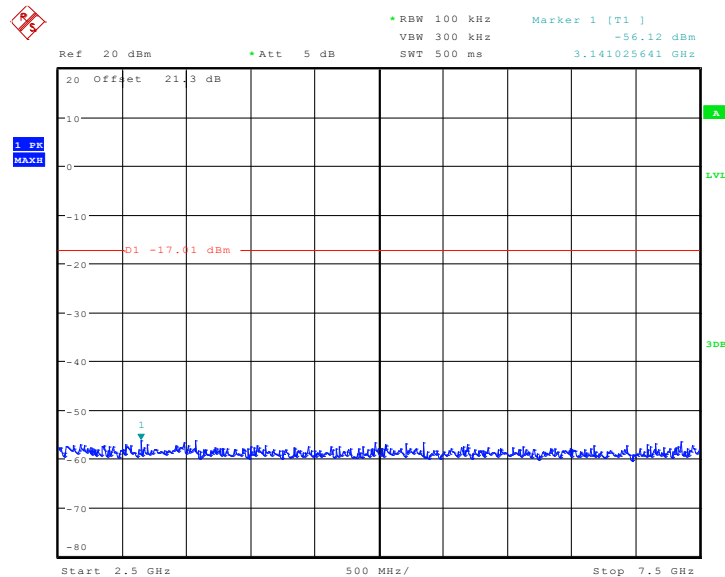
Date: 1.APR.2011 10:24:10

Fig. 42 Conducted Spurious Emission (802.11g, Ch1, 30 MHz-1 GHz)



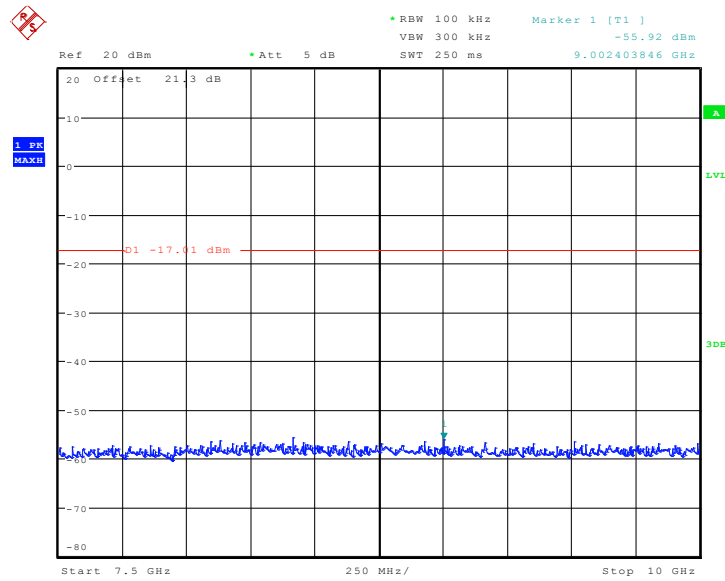
Date: 1.APR.2011 10:24:36

Fig. 43 Conducted Spurious Emission ((802.11g, Ch1, 1 GHz-2.5 GHz)



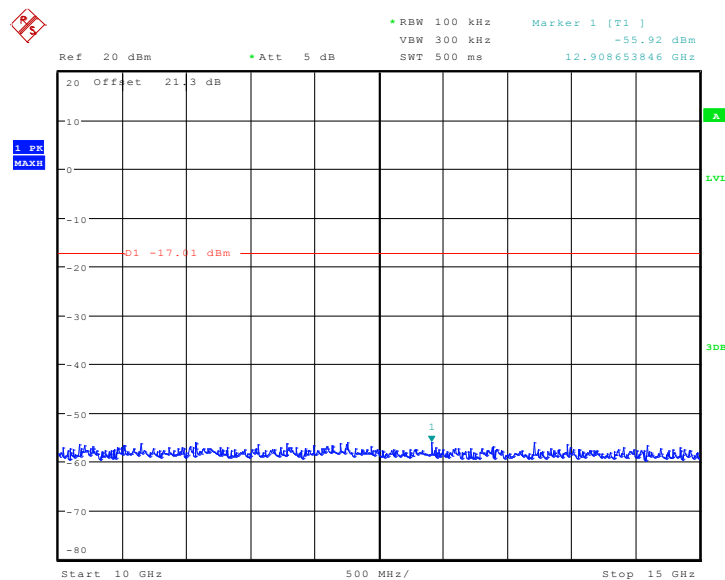
Date: 1.APR.2011 10:25:03

Fig. 44 Conducted Spurious Emission ((802.11g, Ch1, 2.5 GHz-7.5 GHz)



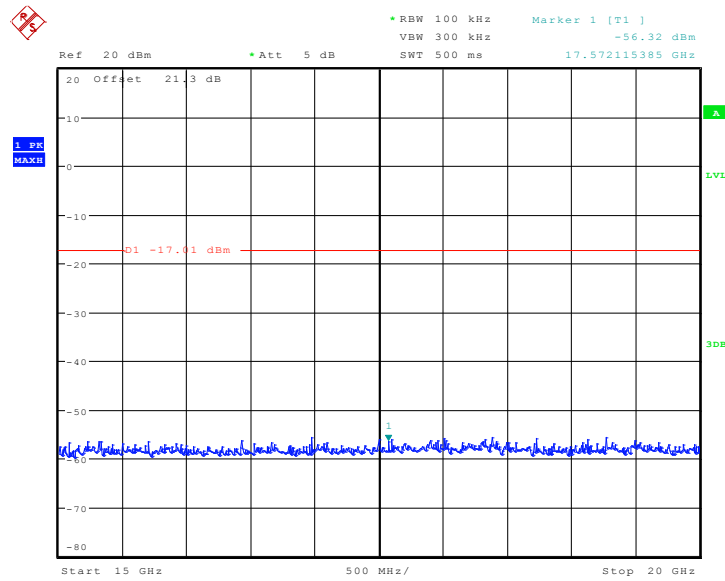
Date: 1.APR.2011 10:25:25

Fig. 45 Conducted Spurious Emission ((802.11g, Ch1, 7.5 GHz-10 GHz)



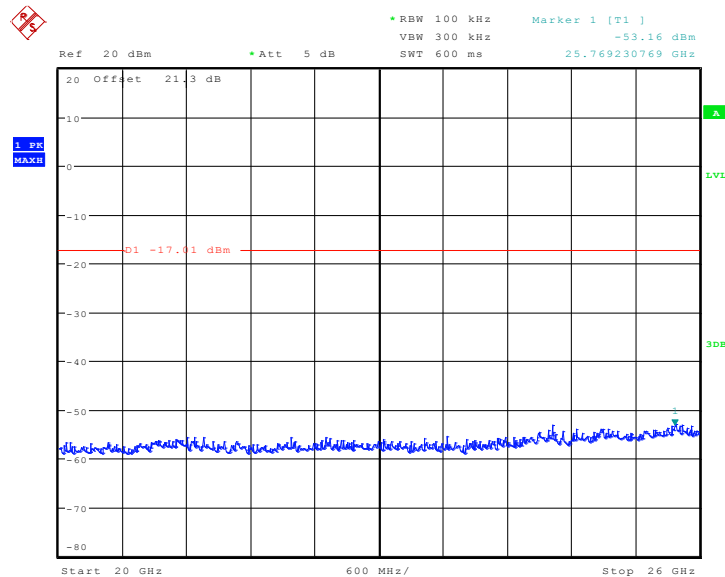
Date: 1.APR.2011 10:25:50

Fig. 46 Conducted Spurious Emission ((802.11g, Ch1, 10 GHz-15 GHz)



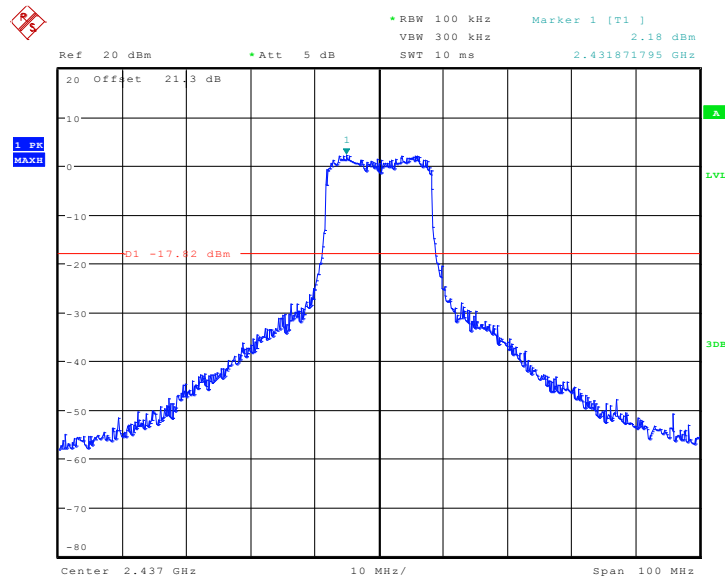
Date: 1.APR.2011 10:26:11

Fig. 47 Conducted Spurious Emission ((802.11g, Ch1, 15 GHz-20 GHz)



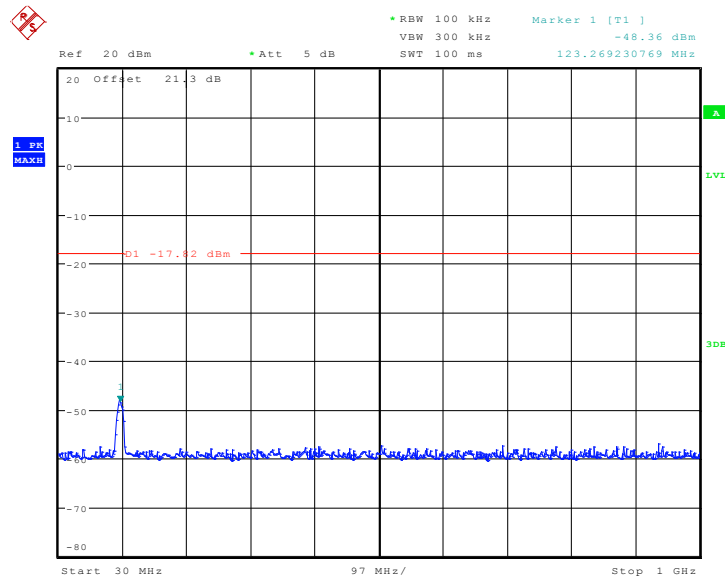
Date: 1.APR.2011 10:26:29

Fig. 48 Conducted Spurious Emission ((802.11g, Ch1, 20 GHz-26 GHz)



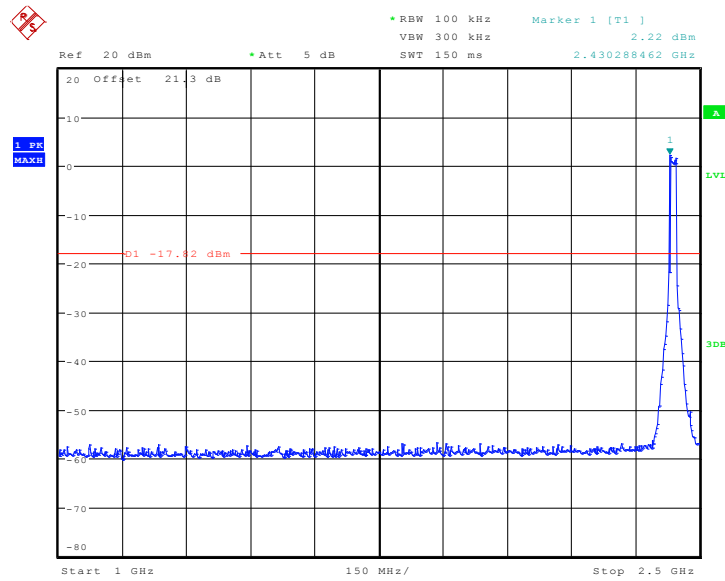
Date: 1.APR.2011 10:27:42

Fig. 49 Conducted Spurious Emission ((802.11g, Ch6, Center Frequency)



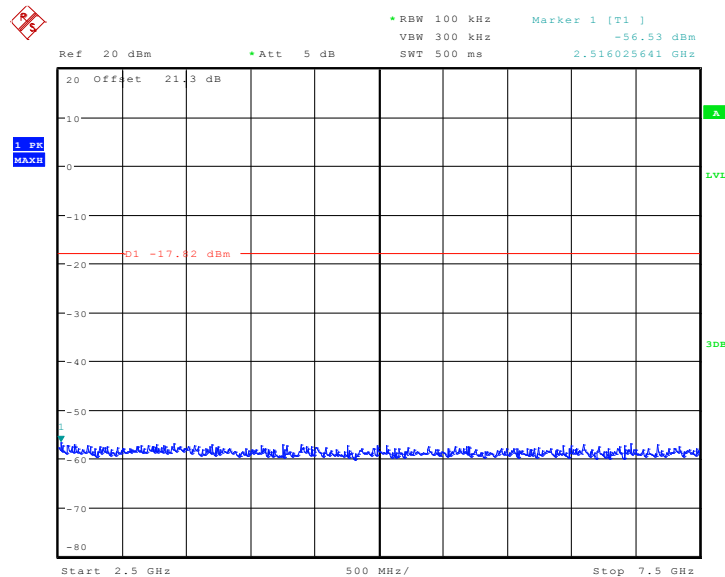
Date: 1.APR.2011 10:28:15

Fig. 50 Conducted Spurious Emission ((802.11g, Ch6, 30 MHz-1 GHz)



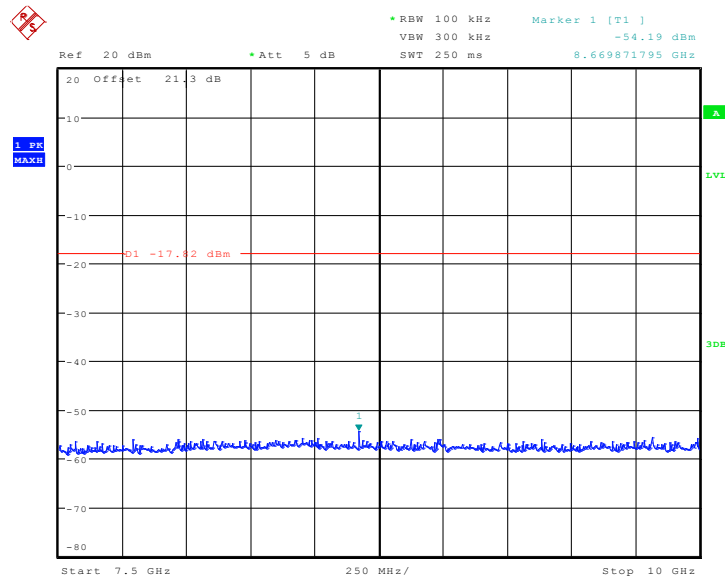
Date: 1.APR.2011 10:28:58

Fig. 51 Conducted Spurious Emission ((802.11g, Ch6, 1 GHz-2.5 GHz)



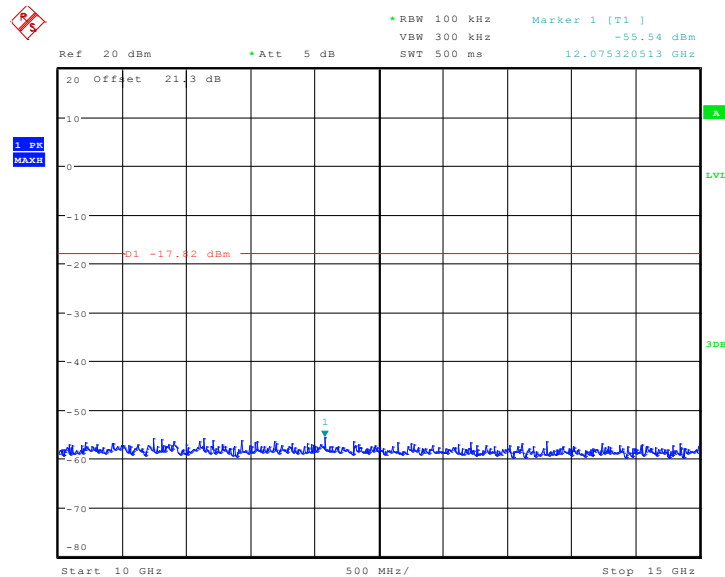
Date: 1.APR.2011 10:29:22

Fig. 52 Conducted Spurious Emission ((802.11g, Ch6, 2.5 GHz-7.5 GHz)



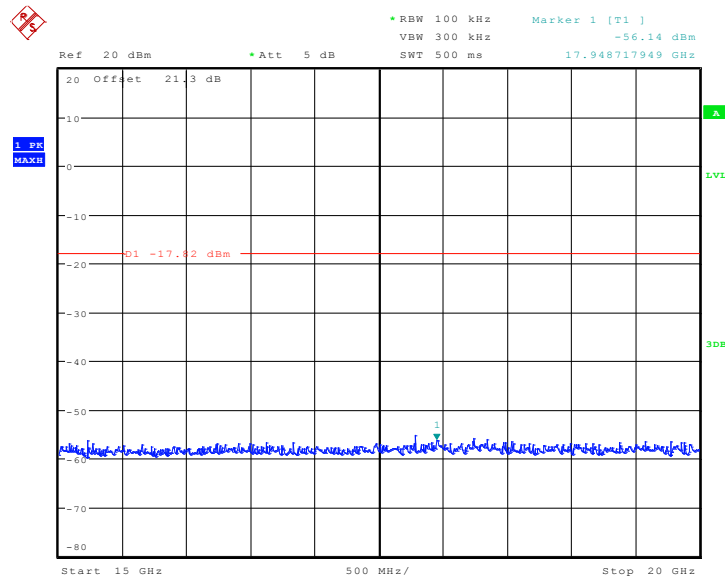
Date: 1.APR.2011 10:30:33

Fig. 53 Conducted Spurious Emission ((802.11g, Ch6, 7.5 GHz-10 GHz)



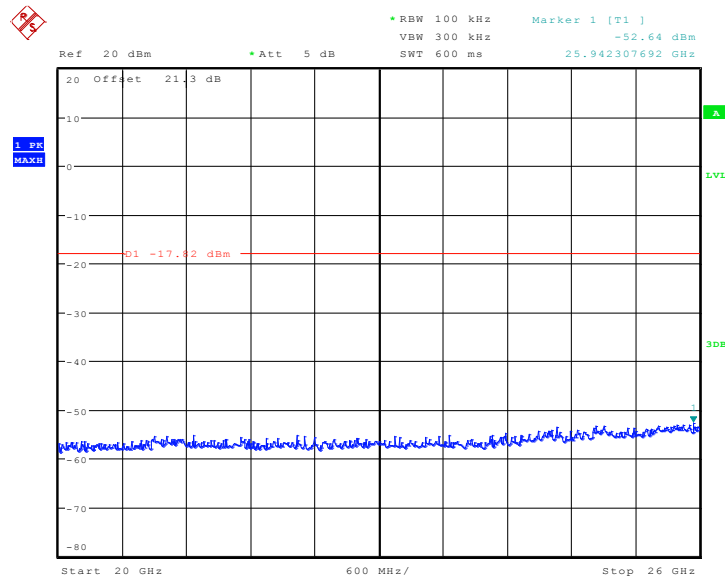
Date: 1.APR.2011 10:30:55

Fig. 54 Conducted Spurious Emission ((802.11g, Ch6, 10 GHz-15 GHz)



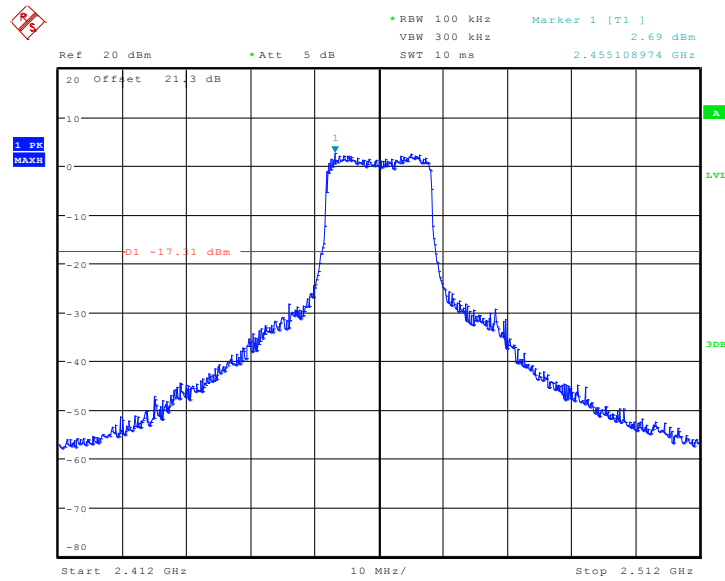
Date: 1.APR.2011 10:31:13

Fig. 55 Conducted Spurious Emission ((802.11g, Ch6, 15 GHz-20 GHz)



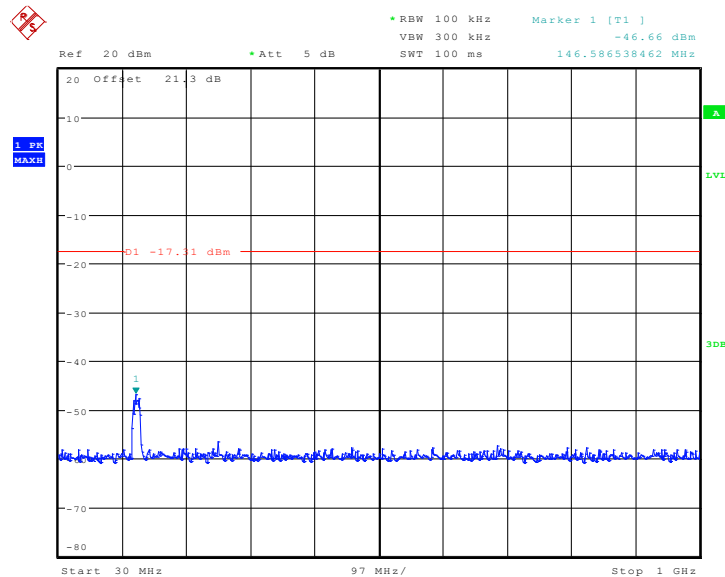
Date: 1.APR.2011 10:31:48

Fig. 56 Conducted Spurious Emission ((802.11g, Ch6, 20 GHz-26 GHz)



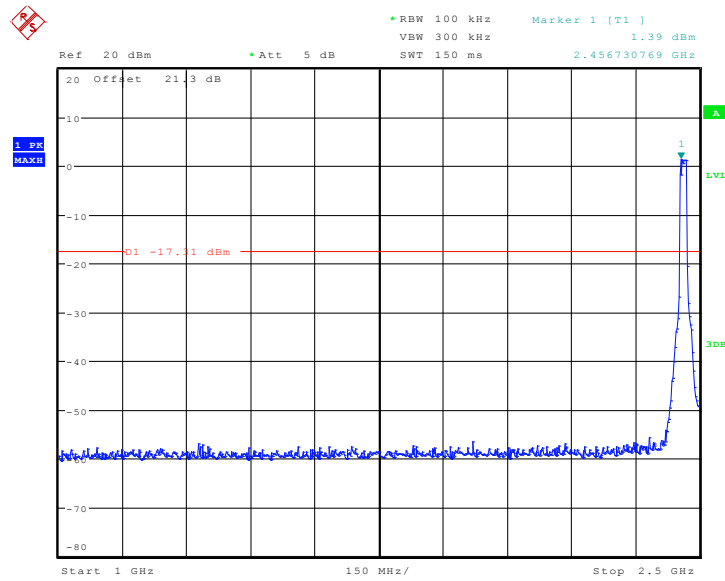
Date: 1.APR.2011 10:33:45

Fig. 57 Conducted Spurious Emission ((802.11g, Ch11, Center Frequency)



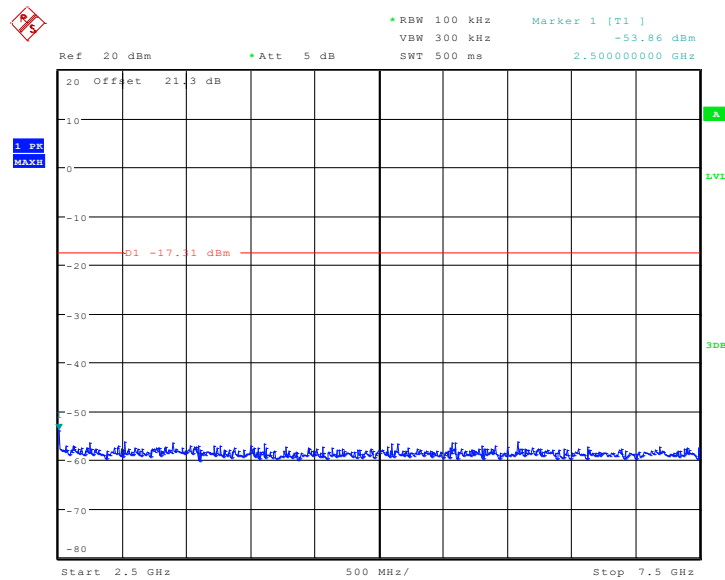
Date: 1.APR.2011 10:34:02

Fig. 58 Conducted Spurious Emission ((802.11g, Ch11, 30 MHz-1 GHz)



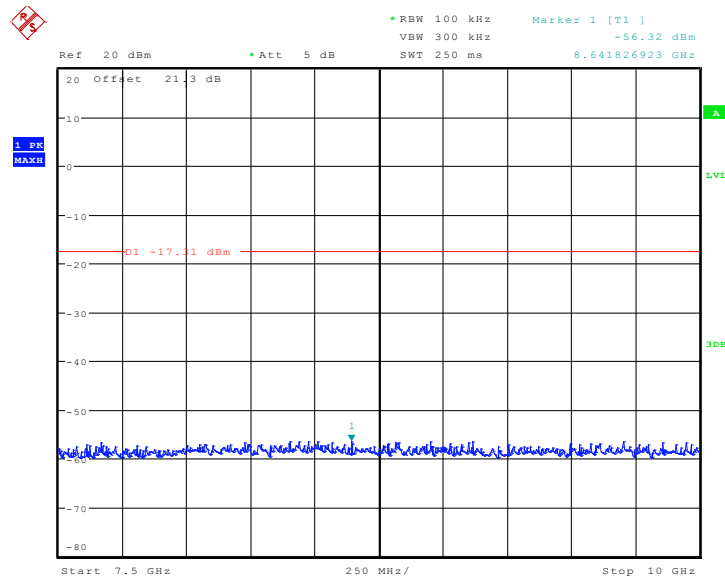
Date: 1.APR.2011 10:34:24

Fig. 59 Conducted Spurious Emission ((802.11g, Ch11, 1 GHz-2.5 GHz)



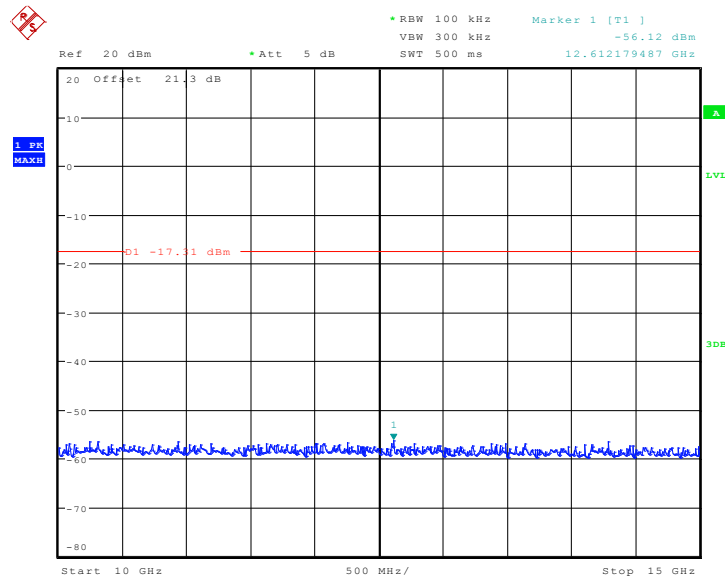
Date: 1.APR.2011 10:35:22

Fig. 60 Conducted Spurious Emission ((802.11g, Ch11, 2.5 GHz-7.5 GHz)



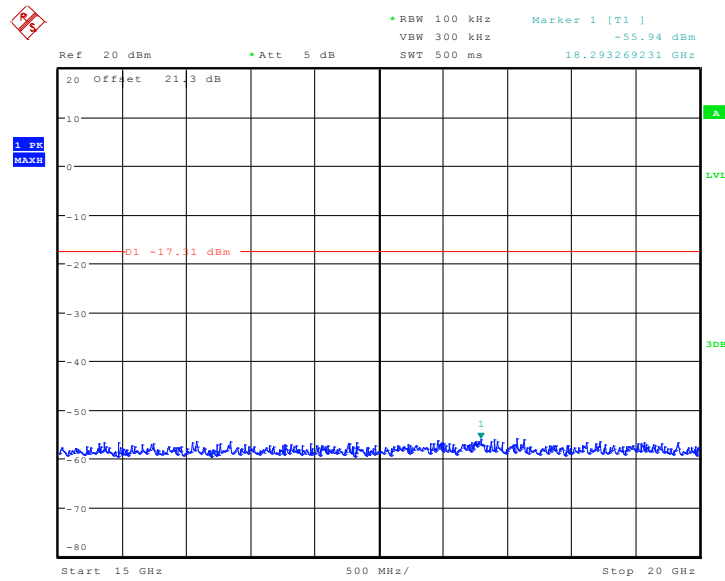
Date: 1.APR.2011 10:35:40

Fig. 61 Conducted Spurious Emission ((802.11g, Ch11, 7.5 GHz-10 GHz)



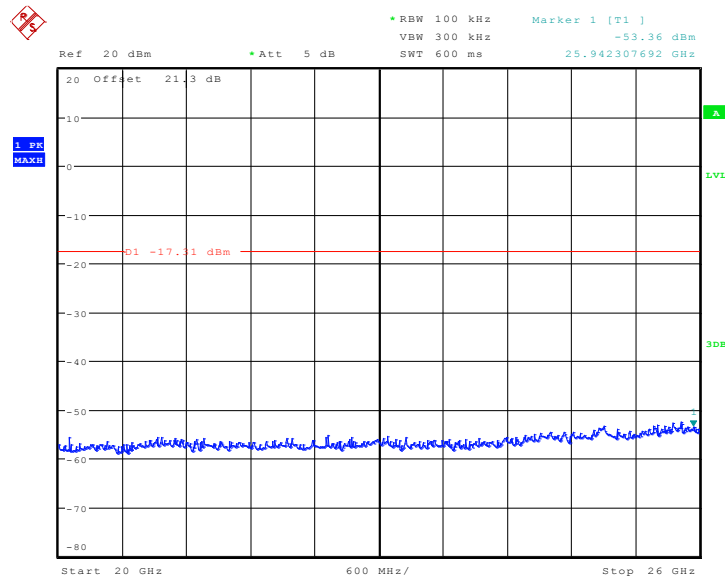
Date: 1.APR.2011 10:36:08

Fig. 62 Conducted Spurious Emission ((802.11g, Ch11, 10 GHz-15 GHz)



Date: 1.APR.2011 10:36:26

Fig. 63 Conducted Spurious Emission ((802.11g, Ch11, 15 GHz-20 GHz)



Date: 1.APR.2011 10:36:52

Fig. 64 Conducted Spurious Emission ((802.11g, Ch11, 20 GHz-26 GHz)

A.6.2 Transmitter Spurious Emission - Radiated

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247, 15.205, 15.209	20dB below peak output power

In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

The measurement is made according to ANSI C63.4 and KDB558074.

Limit in restricted band:

Frequency of emission (MHz)	Field strength(uV/m)	Field strength(dBuV/m)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Test Condition

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	100KHz/300KHz	5
1000-4000	1MHz/1MHz	15
4000-18000	1MHz/1MHz	40
18000-26500	1MHz/1MHz	20

Measurement Results:

802.11b/g mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11b	Power	2.38GHz ~2.43GHz	Fig.65	P
	1	30 MHz ~1 GHz	Fig.66	P
		1 GHz ~ 4 GHz	Fig.67	P
		4 GHz ~ 18 GHz	Fig.68	P
	6	30 MHz ~1 GHz	Fig.69	P
		1 GHz ~ 4 GHz	Fig.70	P
		4 GHz ~ 18 GHz	Fig.71	P
	Power	2.45GHz ~2.5GHz	Fig.72	P
	11	30 MHz ~1 GHz	Fig.73	P
		1 GHz ~ 4 GHz	Fig.74	P
		4 GHz ~ 18 GHz	Fig.75	P
	802.11g	Power	2.38GHz ~2.43GHz	Fig.76
1		30 MHz ~1 GHz	Fig.77	P
		1 GHz ~ 4 GHz	Fig.78	P
		4 GHz ~ 18 GHz	Fig.79	P
6		30 MHz ~1 GHz	Fig.80	P
		1 GHz ~ 4 GHz	Fig.81	P
		4 GHz ~ 18 GHz	Fig.82	P
Power		2.45GHz ~2.5GHz	Fig.83	P
11		30 MHz ~1 GHz	Fig.84	P
		1 GHz ~ 4 GHz	Fig.85	P
		4 GHz ~ 18 GHz	Fig.86	P
/		All channels	18 GHz~ 26.5 GHz	Fig.87

Conclusion: PASS

Note:

A "reference path loss" is established and the A_{Rpl} is the attenuation of "reference path loss", and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

P_{Mea} is the field strength recorded from the instrument.

The measurement results are obtained as described below:

$$\text{Result} = P_{Mea} + A_{Rpl} = P_{Mea} + \text{Cable Loss} + \text{Antenna Factor}$$

802.11b

Ch1

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2398.798	61.19	-18.8	27.5	52.49	HORIZONTAL
2394.79	59.35	-18.8	27.5	50.65	VERTICAL
3693.387	50.93	-19.2	33.4	36.73	HORIZONTAL
3709.419	50.85	-19.1	33.4	36.55	HORIZONTAL
3989.98	50.8	-18.8	33.4	36.2	HORIZONTAL
3569.138	50.48	-19.2	33.4	36.28	HORIZONTAL

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
3490.982	51.3	-18.9	31.2	39	HORIZONTAL
3478.958	50.97	-19	31.2	38.77	VERTICAL
3679.359	50.56	-19.2	33.4	36.36	VERTICAL
3476.954	50.54	-19	31.2	38.34	HORIZONTAL
3689.379	50.54	-19.2	33.4	36.34	HORIZONTAL
3460.922	50.52	-19.3	31.2	38.62	VERTICAL

Ch11

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
3801.603	51.5	-19.2	33.4	37.3	VERTICAL
3701.403	51.09	-19.1	33.4	36.79	VERTICAL
3511.022	50.87	-19	33.4	36.47	HORIZONTAL
3807.615	50.6	-19.2	33.4	36.4	VERTICAL
3519.038	50.54	-19	33.4	36.14	VERTICAL
3967.936	50.52	-19	33.4	36.12	VERTICAL

802.11g

Ch1

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2390.782	57.94	-18.8	27.5	49.24	HORIZONTAL
2386.774	52.76	-18.7	27.5	43.96	HORIZONTAL
2382.766	52.21	-18.7	27.5	43.41	HORIZONTAL
3997.996	50.69	-19.2	33.4	36.49	HORIZONTAL
3693.387	50.57	-19.2	33.4	36.37	HORIZONTAL
3865.731	50.56	-19.2	33.4	36.36	HORIZONTAL

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
3490.982	51.3	-18.9	31.2	39	VERTICAL
3478.958	50.97	-19	31.2	38.77	VERTICAL
3679.359	50.56	-19.2	33.4	36.36	VERTICAL
3476.954	50.54	-19	31.2	38.34	VERTICAL
3689.379	50.54	-19.2	33.4	36.34	HORIZONTAL
3460.922	50.52	-19.3	31.2	38.62	HORIZONTAL

Ch11

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
3801.603	51.5	-19.2	33.4	37.3	HORIZONTAL
3701.403	51.09	-19.1	33.4	36.79	VERTICAL
3511.022	50.87	-19	33.4	36.47	VERTICAL
3807.615	50.6	-19.2	33.4	36.4	HORIZONTAL
3519.038	50.54	-19	33.4	36.14	HORIZONTAL
3967.936	50.52	-19	33.4	36.12	HORIZONTAL

Test graphs as below:

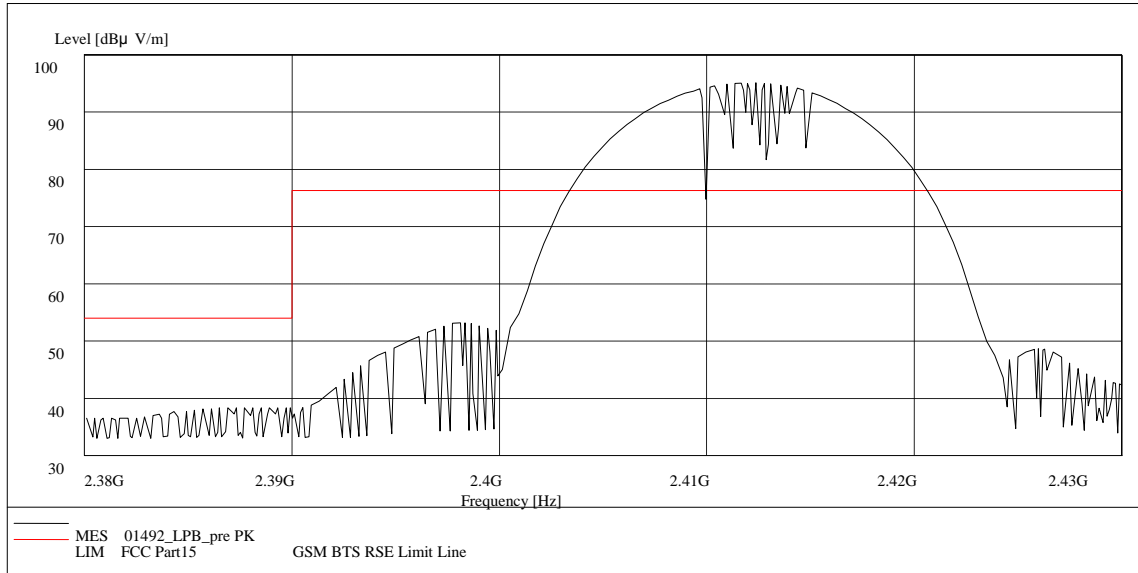


Fig. 65 Radiated Spurious Emission (Power): 802.11b, ch1, 2.38 GHz - 243GHz

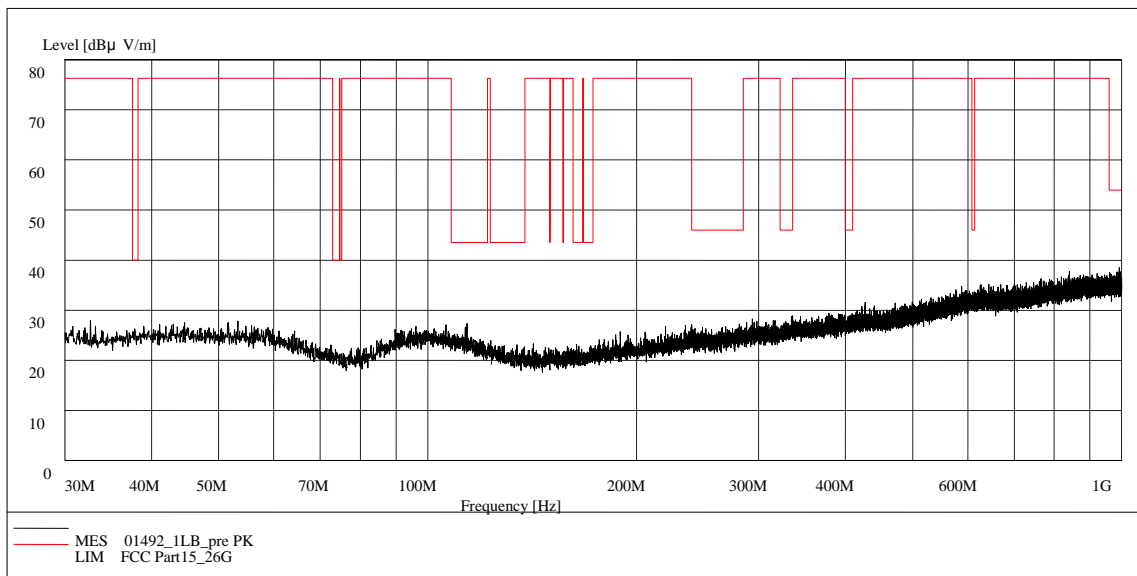


Fig. 66 Radiated Spurious Emission (802.11b, Ch1, 30 MHz-1 GHz)

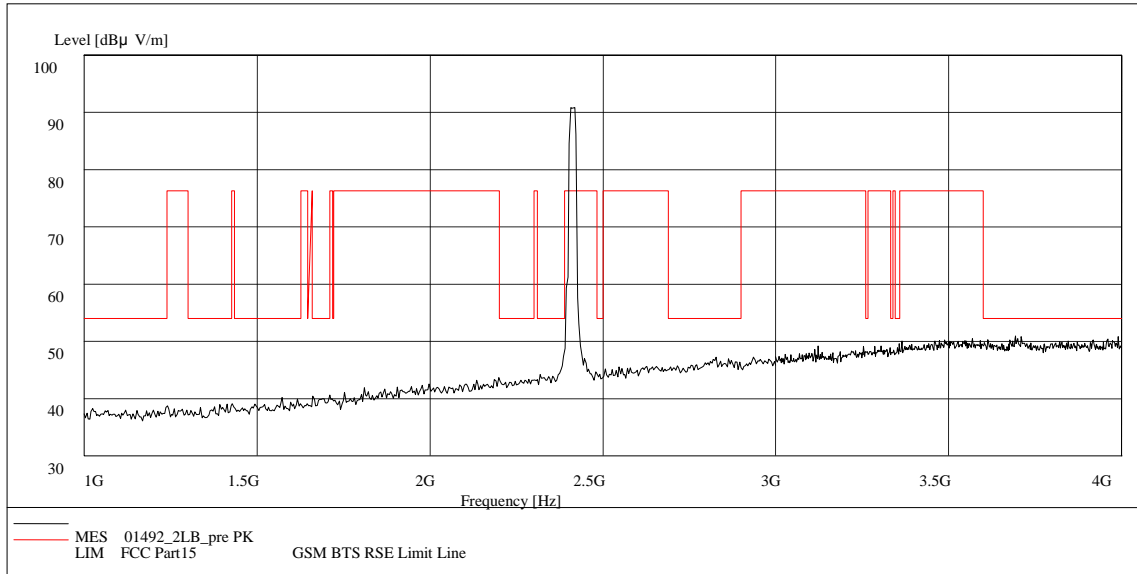


Fig. 67 Radiated Spurious Emission (802.11b, Ch1, 1 GHz-4 GHz)

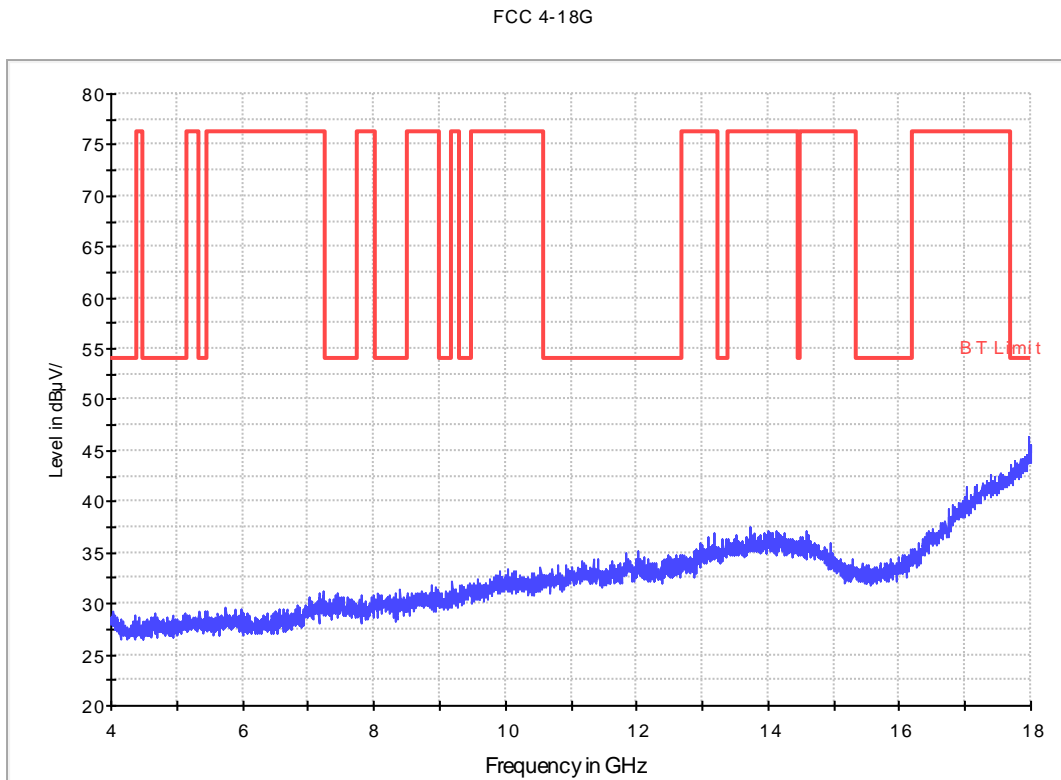


Fig. 68 Radiated Spurious Emission (802.11b, Ch1, 4 GHz-18 GHz)

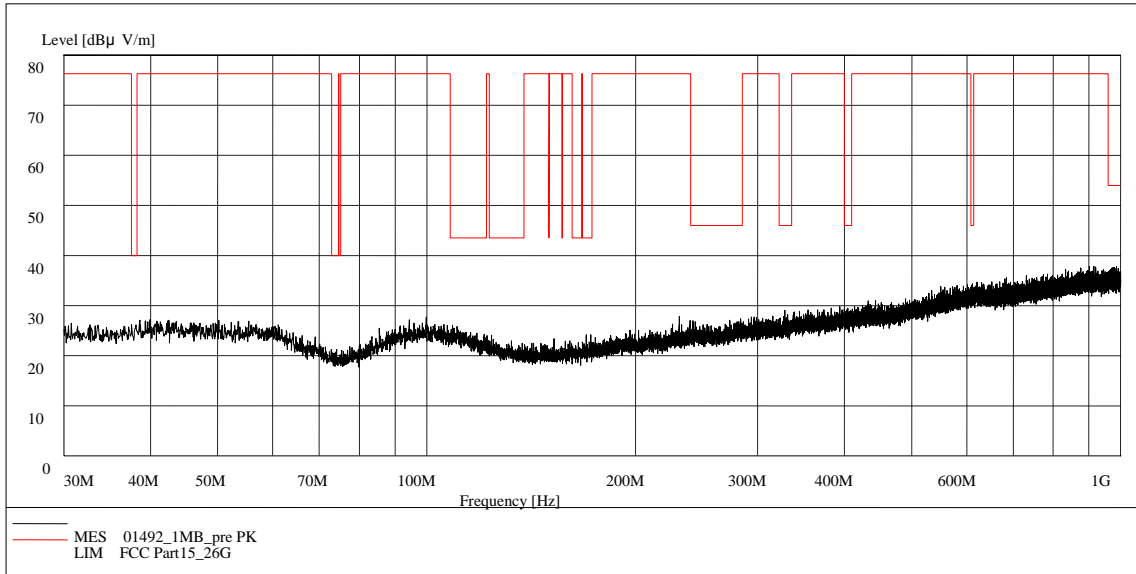


Fig. 69 Radiated Spurious Emission (802.11b, Ch6, 30 MHz-1 GHz)

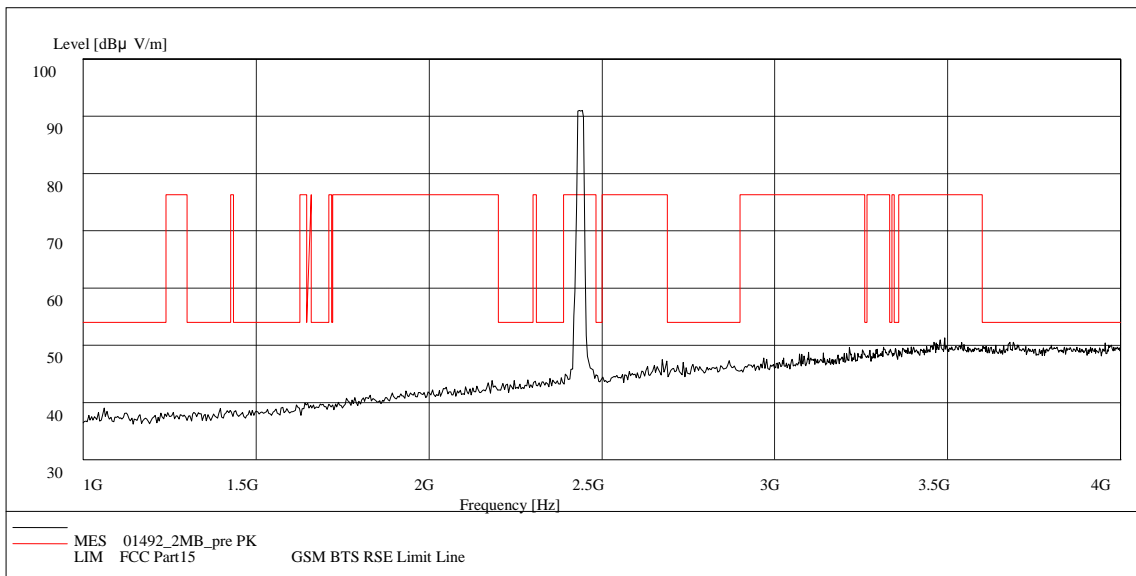


Fig. 70 Radiated Spurious Emission (802.11b, Ch6, 1 GHz-4 GHz)

FCC 4-18G

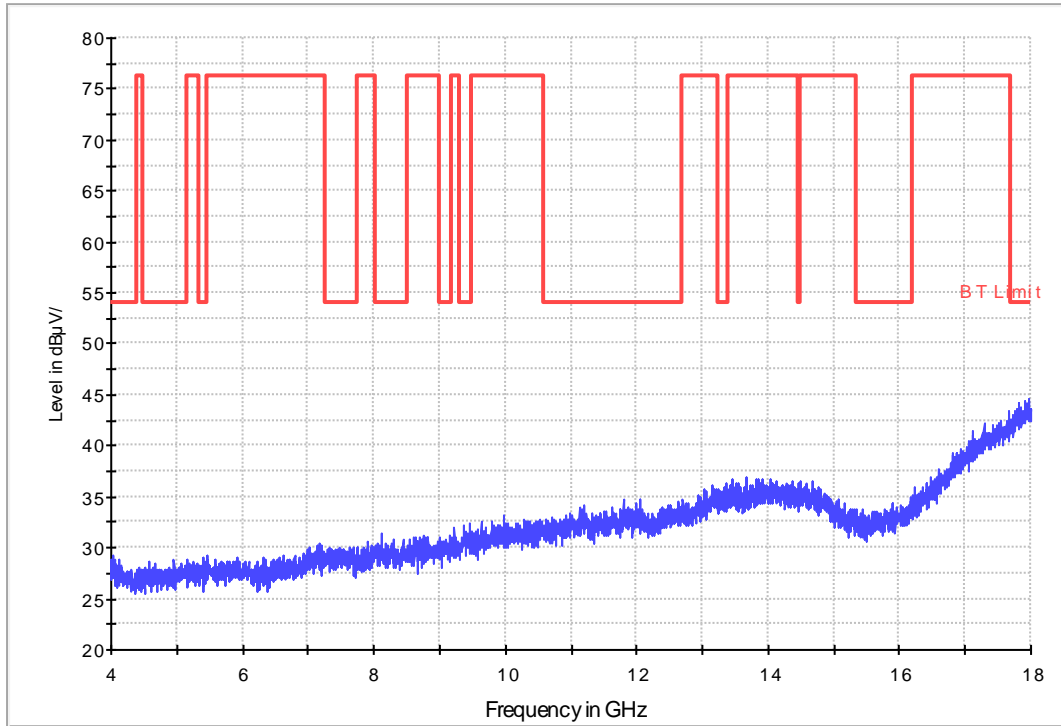


Fig. 71 Radiated Spurious Emission (802.11b, Ch6, 4 GHz-18 GHz)

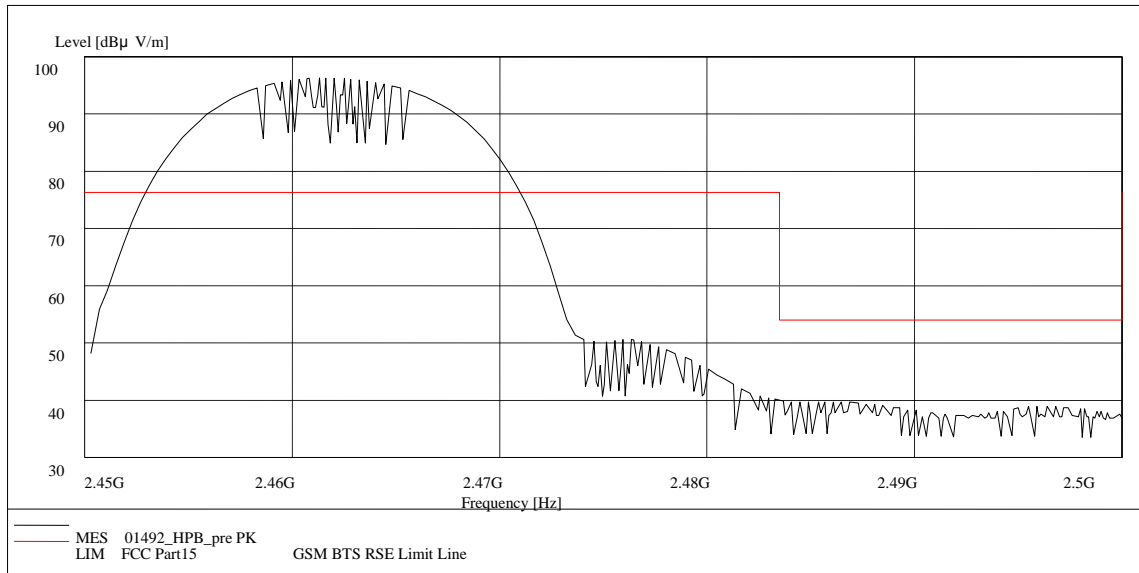


Fig. 72 Radiated Spurious Emission (Power): 802.11b, ch11, 2.45 GHz - 2.50GHz

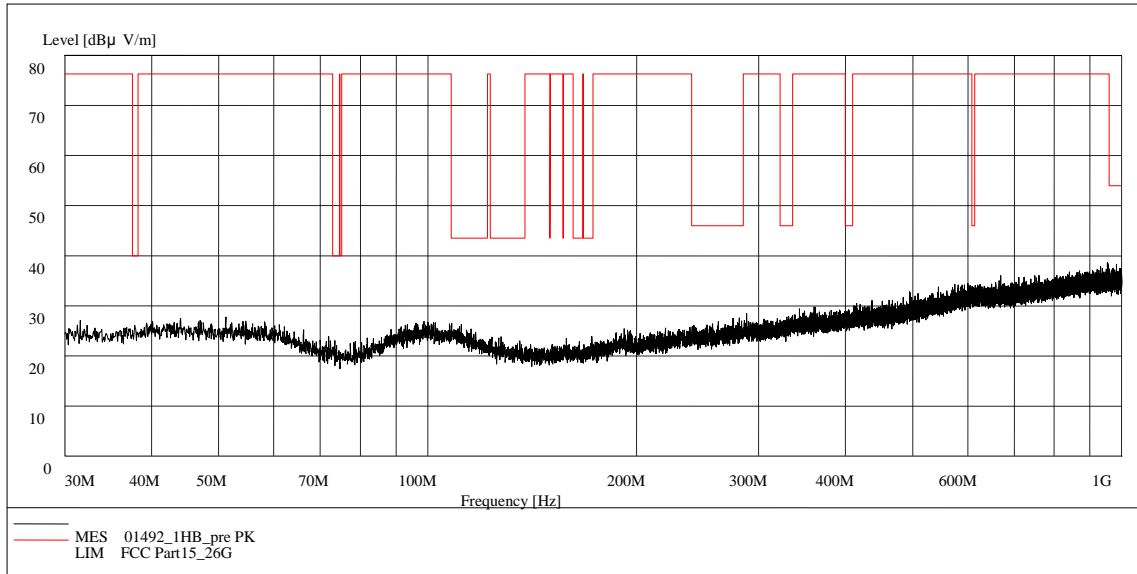


Fig. 73 Radiated Spurious Emission (802.11b, Ch11, 30 MHz-1 GHz)

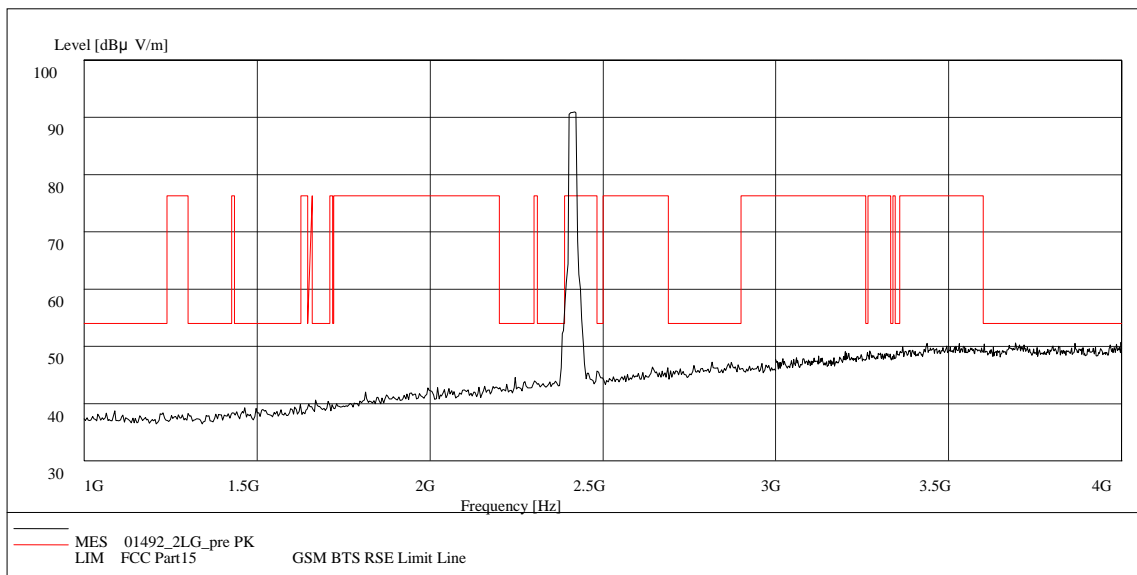


Fig. 74 Radiated Spurious Emission (802.11b, Ch11, 1 GHz-4 GHz)

FCC 4-18G

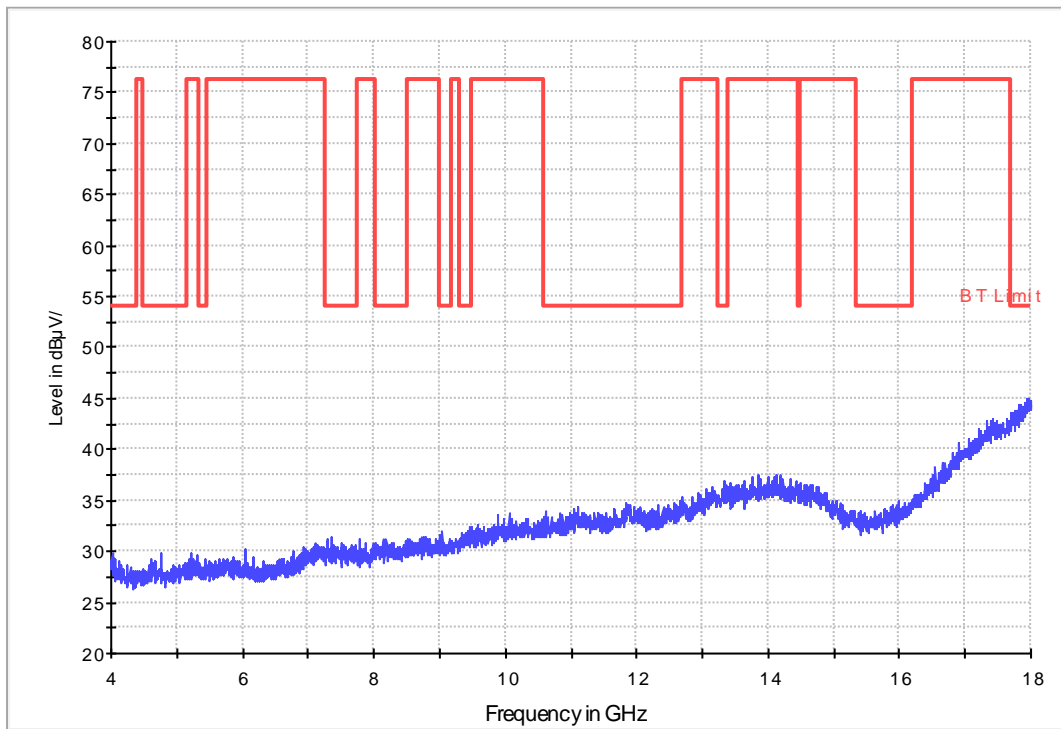


Fig. 75 Radiated Spurious Emission (802.11b, Ch11, 4 GHz-18 GHz)

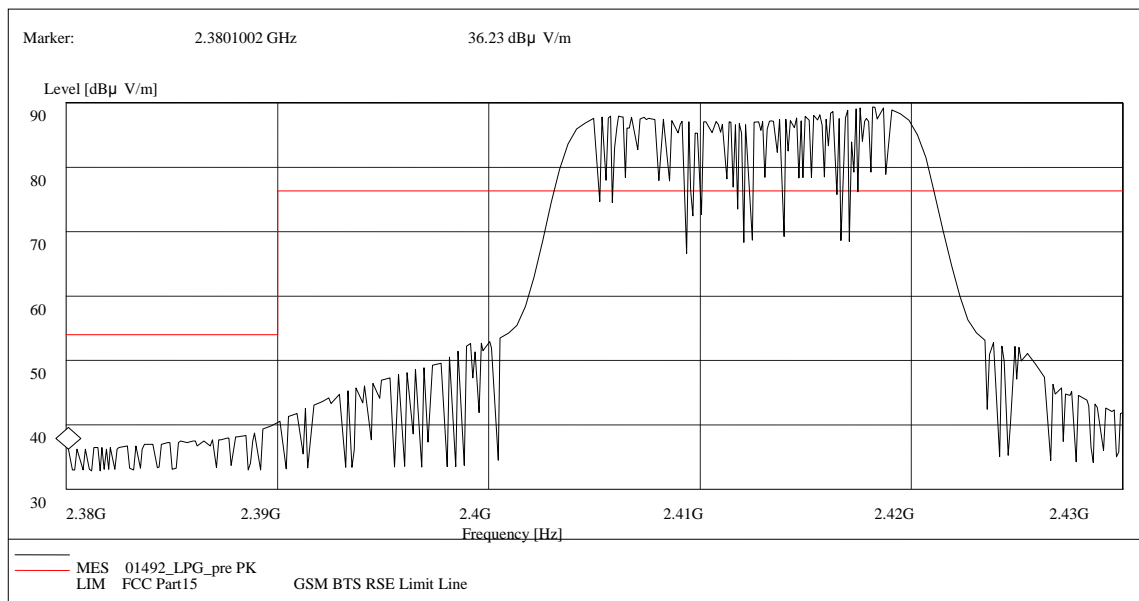


Fig. 76 Radiated Spurious Emission (Power): 802.11g, ch1, 2.38 GHz - 2.43GHz

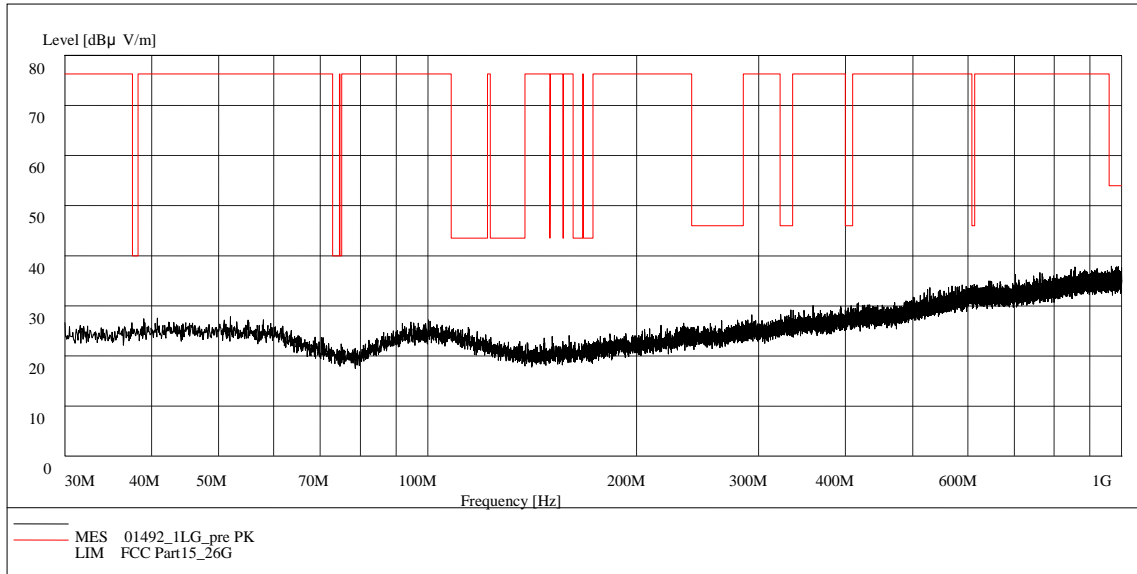


Fig. 77 Radiated Spurious Emission (802.11g, Ch1, 30 MHz-1 GHz)

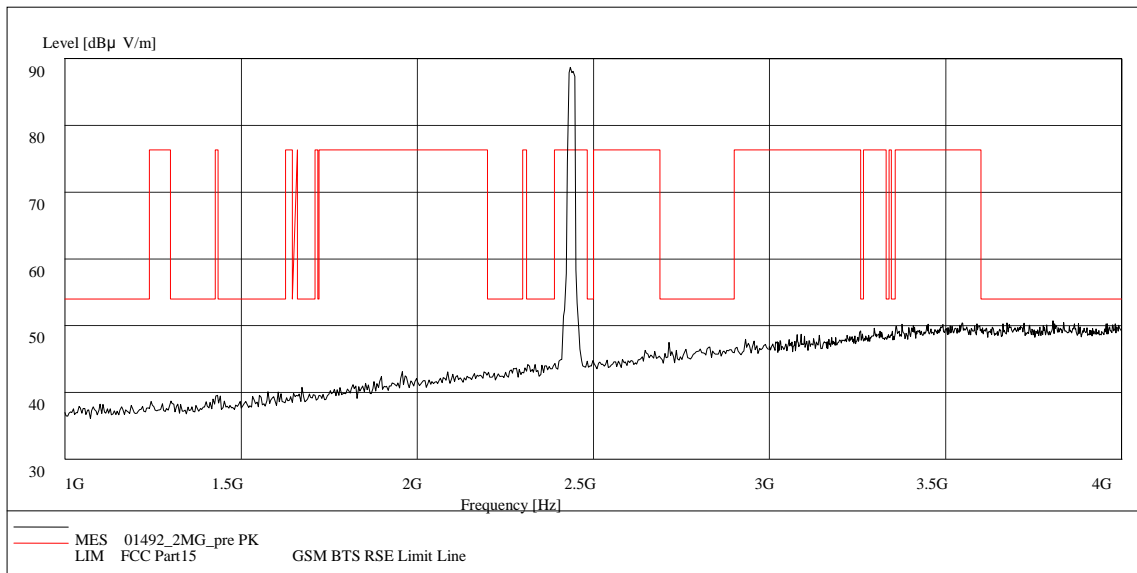


Fig. 78 Radiated Spurious Emission (802.11g, Ch1, 1 GHz-4 GHz)

FCC 4-18G

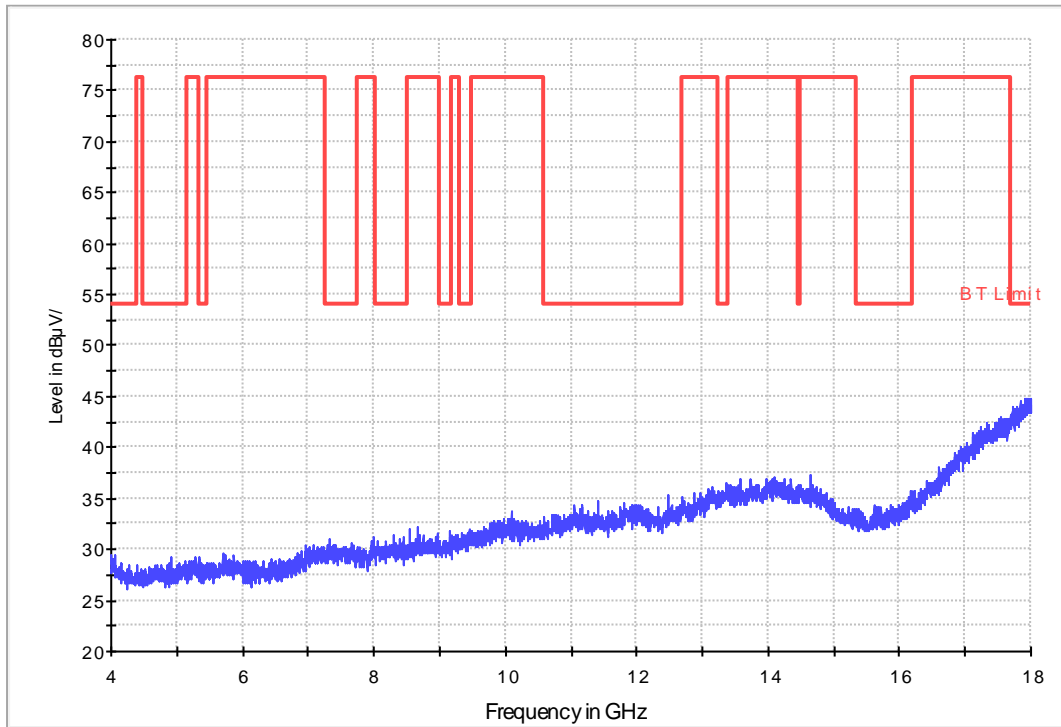


Fig. 79 Radiated Spurious Emission (802.11g, Ch1, 4 GHz-18 GHz)

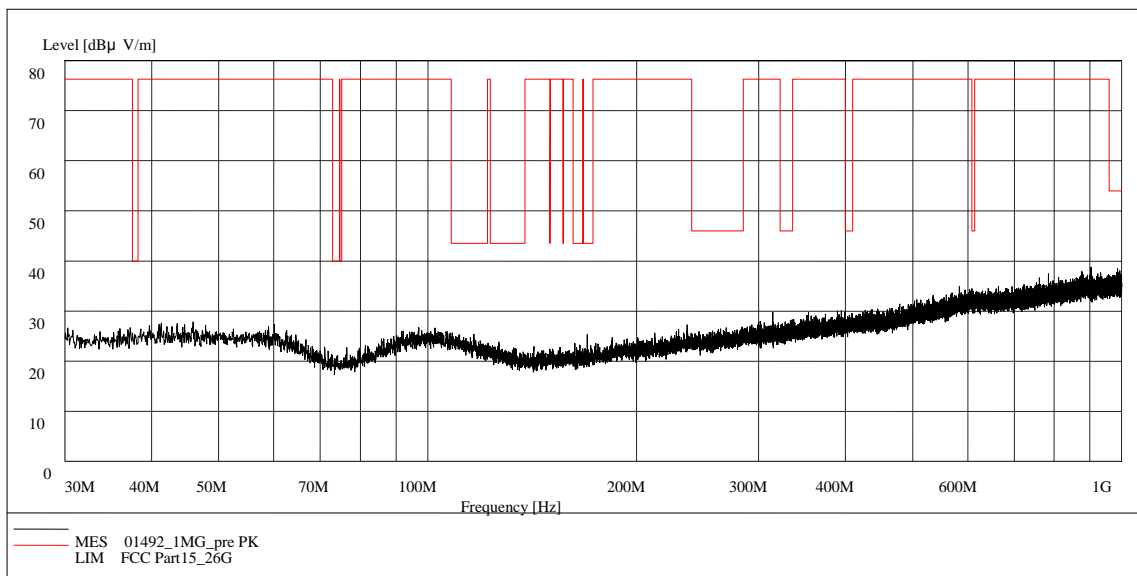


Fig. 80 Radiated Spurious Emission (802.11g, Ch6, 30 MHz-1 GHz)

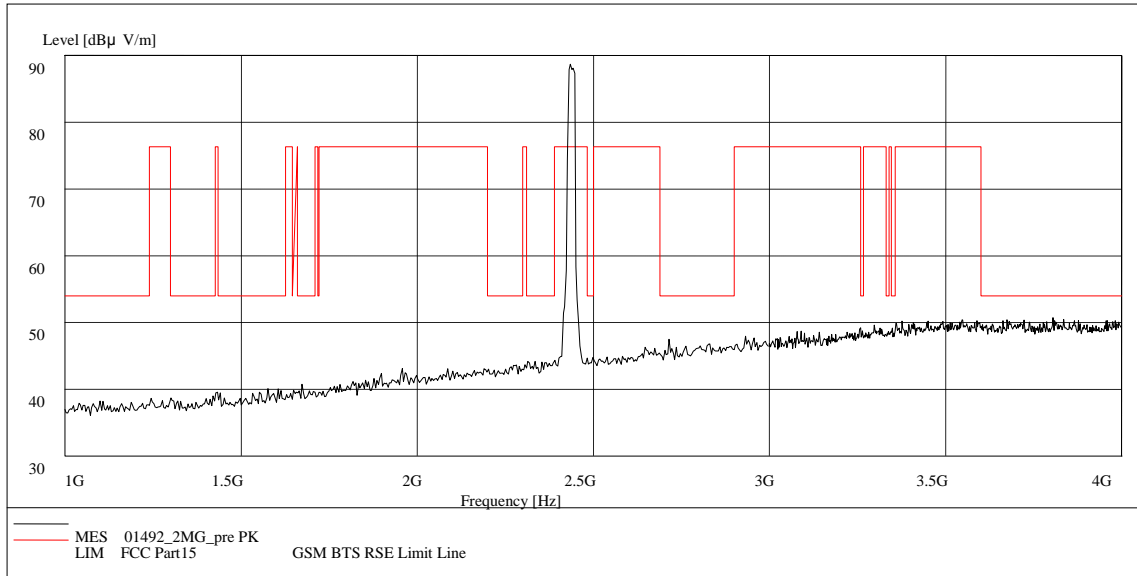


Fig. 81 Radiated Spurious Emission (802.11g, Ch6, 1 GHz-4 GHz)

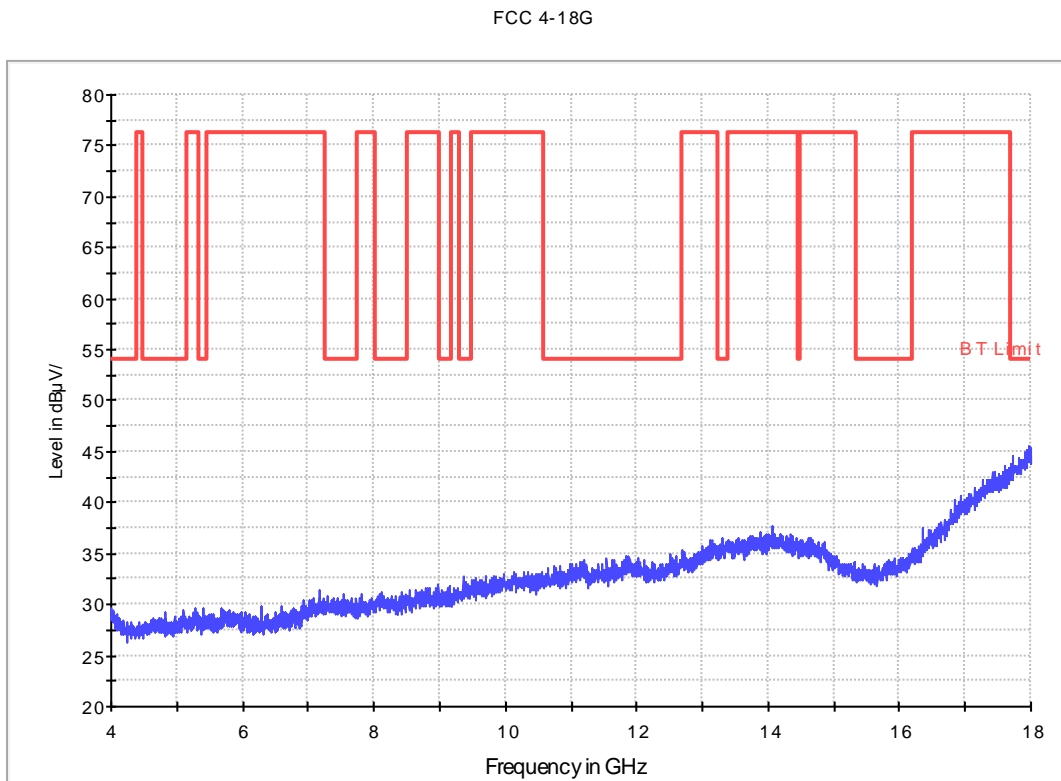


Fig. 82 Radiated Spurious Emission (802.11g, Ch6, 4 GHz-18 GHz)

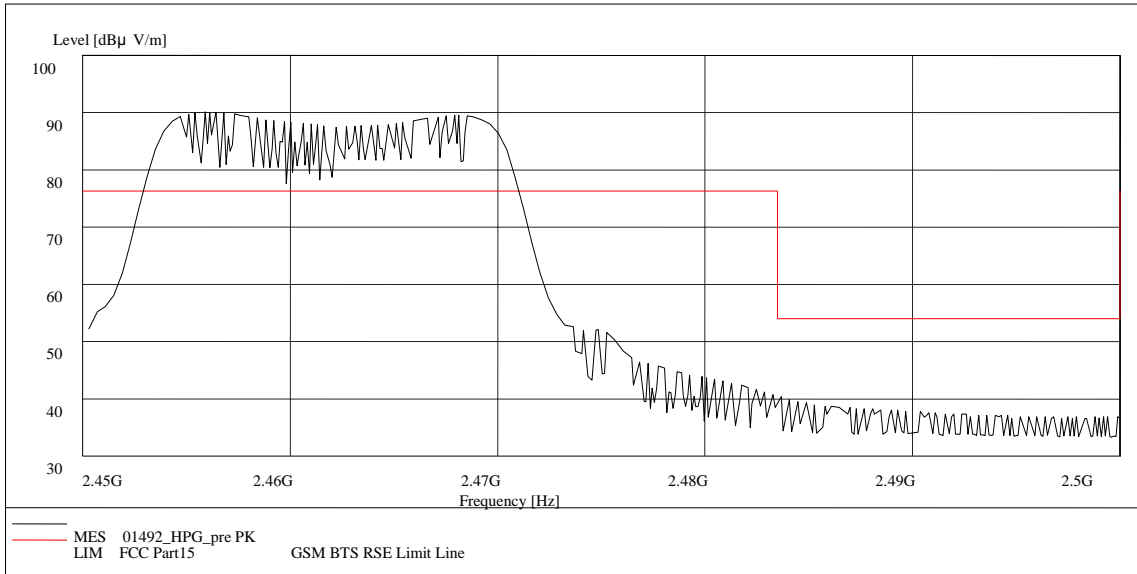


Fig. 83 Radiated Spurious Emission (Power): 802.11g, ch11, 2.45 GHz - 2.50GHz

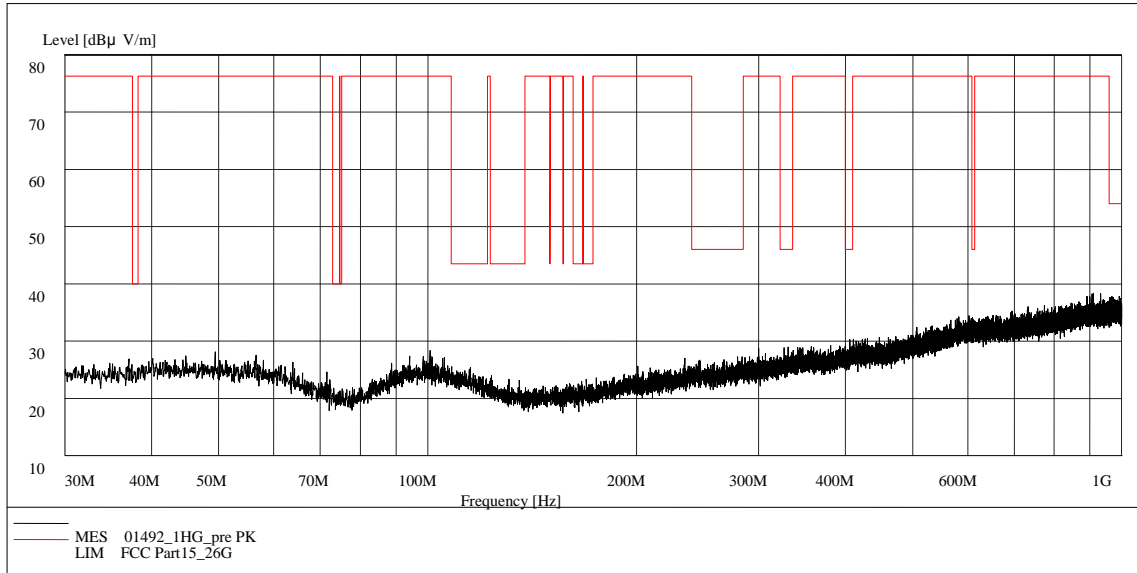


Fig. 84 Radiated Spurious Emission (802.11g, Ch11, 30 MHz-1 GHz)

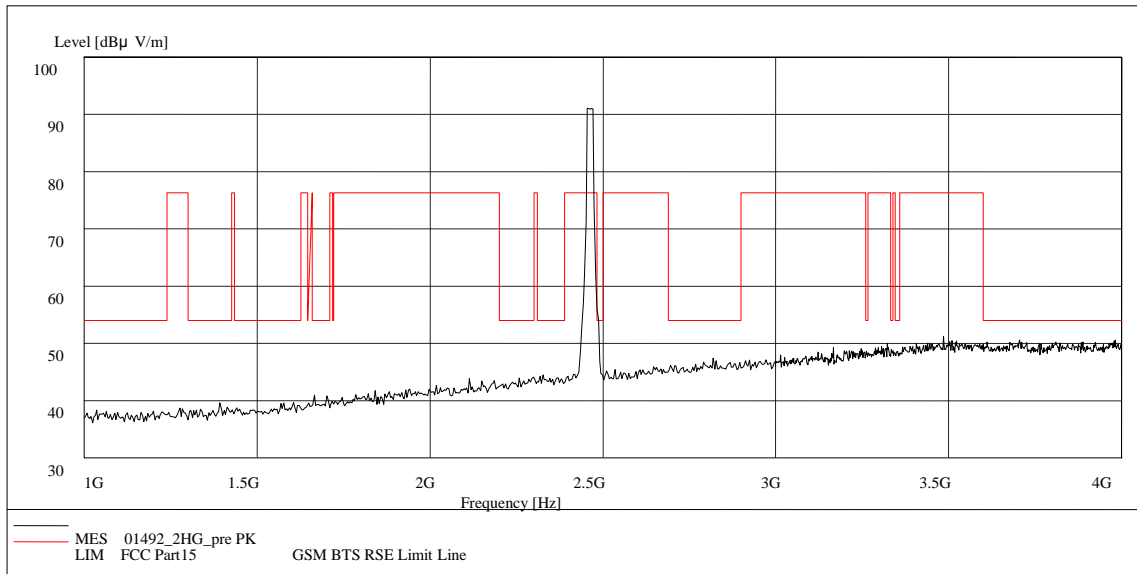


Fig. 85 Radiated Spurious Emission (802.11g, Ch11, 1 GHz-4 GHz)

FCC 4-18G

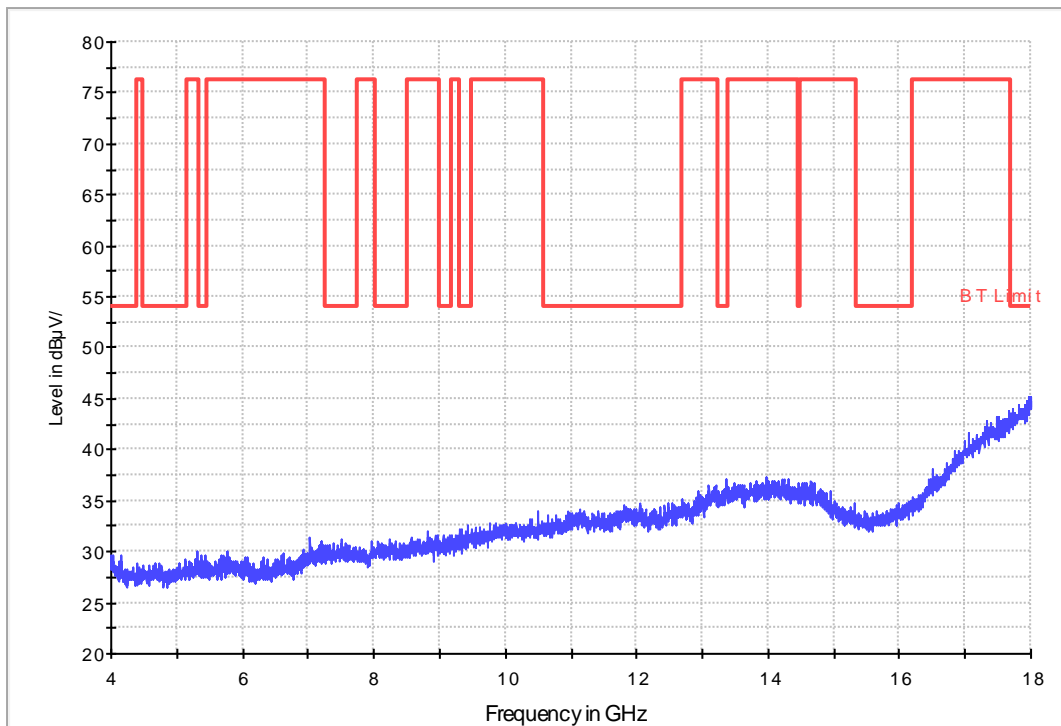


Fig. 86 Radiated Spurious Emission (802.11g, Ch11, 4 GHz-18 GHz)

Copy of FCC 18-26.5G

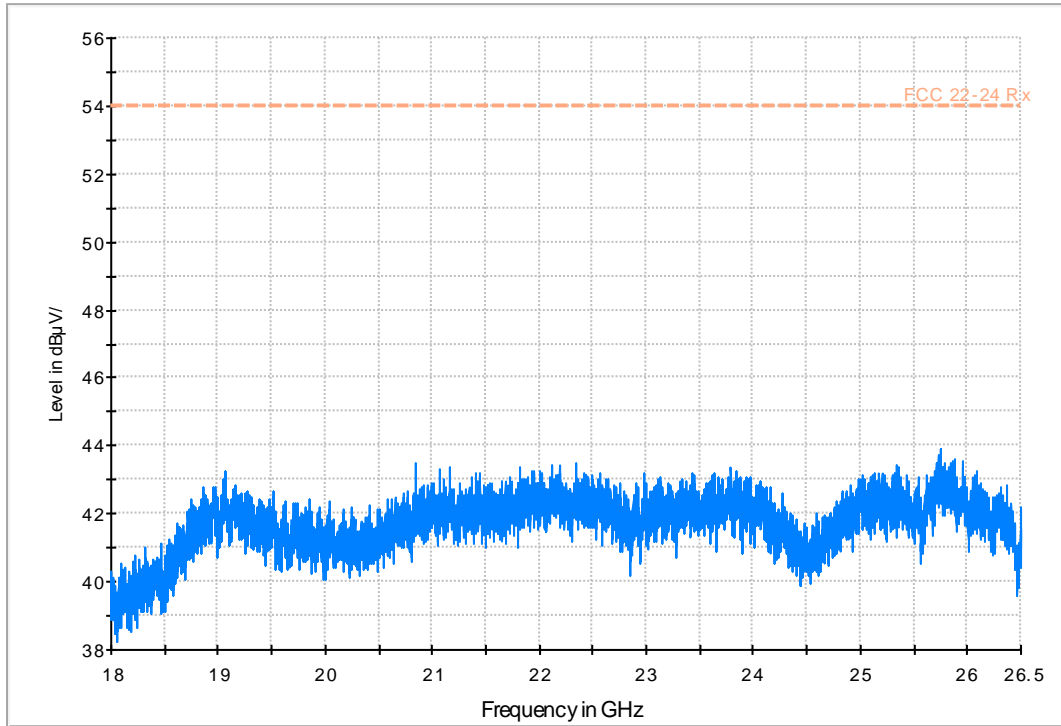


Fig. 87 Radiated emission: 18 GHz - 26.5 GHz

A.7. AC Powerline Conducted Emission

Test Condition:

Voltage (V)	Frequency (Hz)
120	60

Measurement Result and limit:

WLAN (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Result (dB μ V)		Conclusion
		With charger		
		802.11b	802.11g	
0.15 to 0.5	66 to 56	Fig. 88	Fig.89	P
0.5 to 5	56			
5 to 30	60			

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

WLAN (Average Limit)

Frequency range (MHz)	Average Limit (dB μ V)	Result (dB μ V)		Conclusion
		With charger		
		802.11b	802.11n	
0.15 to 0.5	56 to 46	Fig.88	Fig.89	P
0.5 to 5	46			
5 to 30	50			

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

The measurement is made according to ANSI C63.4 and KDB558074

Conclusion: PASS

Test graphs as below:

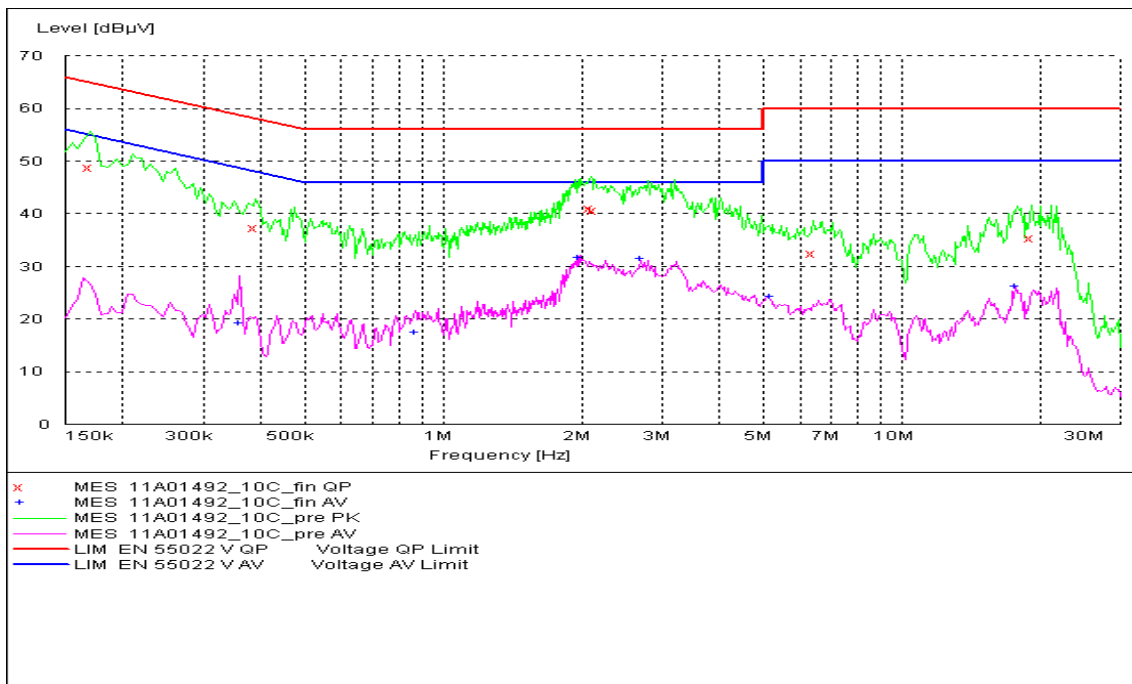


Fig. 88 AC Powerline Conducted Emission-802.11b

MEASUREMENT RESULT: "11A01492_10C_fin QP "

Frequency (MHz)	Level (dBµV)	Transd (dB)	Limit (dBµV)	Margin (dB)	Line	PE
0.170000	48.80	10.1	65.00	16.10	N	GND
0.390000	37.30	10.1	58.00	20.80	N	GND
2.097941	40.90	10.1	56.00	15.10	L1	GND
2.148695	40.60	10.1	56.00	15.50	L1	GND
6.401293	32.50	10.2	60.00	27.50	N	GND
19.222998	35.40	10.3	60.00	24.60	N	GND

MEASUREMENT RESULT: "11A01492_10C_fin AV"

Frequency (MHz)	Level (dBµV)	Transd (dB)	Limit (dBµV)	Margin (dB)	Line	PE
0.360000	19.20	10.1	49.00	29.50	L1	GND
0.870000	17.40	10.1	46.00	28.60	L1	GND
1.985000	31.70	10.1	46.00	14.30	L1	GND
2.707262	31.40	10.1	46.00	14.70	L1	GND
5.162182	24.20	10.2	50.00	25.80	L1	GND
17.750713	26.30	10.3	50.00	23.70	L1	GND

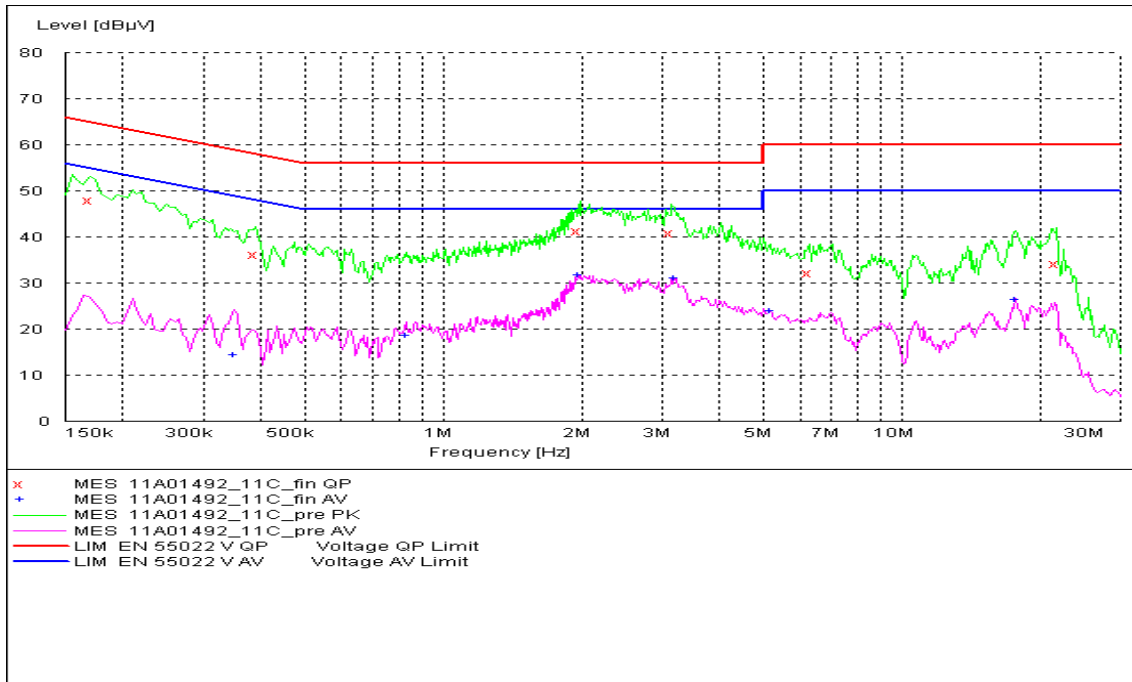


Fig. 89 AC Powerline Conducted Emission-802.11g

MEASUREMENT RESULT: "11A01492_11C_fin QP"

Frequency (MHz)	Level (dBµV)	Transd (dB)	Limit (dBµV)	Margin (dB)	Line	PE
0.170000	47.90	10.1	65.00	17.10	N	GND
0.390000	36.20	10.1	58.00	21.90	N	GND
1.985000	41.40	10.1	56.00	14.60	N	GND
3.149781	40.90	10.1	56.00	15.10	L1	GND
6.300088	32.10	10.2	60.00	27.90	L1	GND
21.836832	34.10	10.3	60.00	25.90	N	GND

MEASUREMENT RESULT: "11A01492_11C_fin AV"

Frequency (MHz)	Level (dBµV)	Transd (dB)	Limit (dBµV)	Margin (dB)	Line	PE
0.350000	14.40	10.1	49.00	34.60	N	GND
0.830000	18.60	10.1	46.00	27.40	L1	GND
1.970000	31.70	10.1	46.00	14.30	L1	GND
3.200379	31.00	10.1	46.00	15.00	N	GND
5.162182	24.00	10.2	50.00	26.00	L1	GND
17.750713	26.50	10.3	50.00	23.50	L1	GND

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