



FCC PART 15C TEST REPORT No.2012WLN0362

for

ZTE CORPORATION

WCDMA/GSM (GPRS) Dual-Mode Digital Mobile Phone

Model: ZTE V880E

With

FCC ID: Q78-ZTEV880E

Hardware Version: p8pA

Software Version: GB_AM_P772A11V1.0.0B01

Issued Date: 2012-04-26



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Rat

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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.

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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℃
Extreme Temperature: -20/+55℃
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 Start Date: 2012-04-06
Testing End Date: 2012-04-27

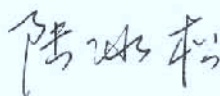
1.4. Signature



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

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2.2. Manufacturer Information

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Postal Code: 518057
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3. EQUIPMENT UNDER TEST(EUT) AND ANCILLARY EQUIPMENT(AE)

3.1. About EUT

Description	WCDMA/GSM (GPRS) Dual-Mode Digital Mobile Phone
Model	ZTE V880E
FCC ID	Q78-ZTEV880E
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	21.68dBm(CCK)
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	/	p8pA	GB_AM_P772A11V1.0.0B01
EUT2	/	p8pA	GB_AM_P772A11V1.0.0B01

*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	Li3717T43P3h565751	/
AE2	Charger	STC-A22O50I700USBA-Z	/

*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 WCDMA/GSM (GPRS) Dual-Mode Digital 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.

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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 D01	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247	January 18, 2012

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 D01 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	3.7V(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	2012-07-19
2	Spectrum Analyzer	MS2687B	6200819812	Anritsu	2012-09-22
3	Test Receiver	ESS	847151/015	Rohde & Schwarz	2012-10-30
4	LISN	ESH2-Z5	829991/012	Rohde & Schwarz	2012-08-12

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date
1	Test Receiver	ESI40	831564/002	Rohde & Schwarz	2012-08-11
2	BiLog Antenna	3142B	9908-1403	EMCO	2013-03-15
3	Dual-Ridge Waveguide Horn Antenna	3115	9906-5827	EMCO	2012-12-25

Anechoic chamber

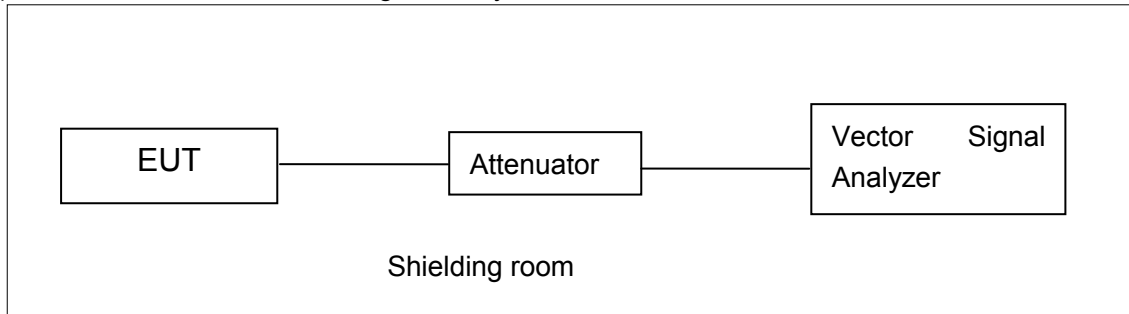
Anechoic chamber by Frankonia German.

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

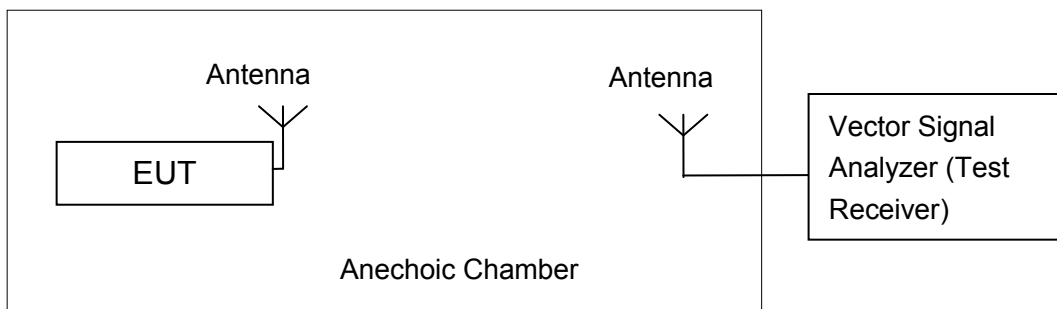


A.1.2. Radiated Emission Measurements

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 D01

A.2. Maximum 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 D01, and power output option 1 (RBW=20MHz) in KDB558074 D01 is used for the test. EUT is operating in continuous transmitting mode

Measurement Uncertainty:

Measurement Uncertainty	0.75dB
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A.2.1. Maximum Peak Output Power-conducted

Measurement Results:

802.11b/g mode

Mode	Data Rate (Mbps)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11b	1	20.00	/	/
	2	20.43	/	/
	5.5	20.90	/	/
	11	21.68	21.46	21.33
802.11g	6	18.35	/	/
	9	17.89	/	/
	12	18.29	/	/
	18	17.84	/	/
	24	19.56	/	/
	36	19.68	/	/
	48	20.37	20.46	20.18
	54	20.27	/	/

The data rate 11Mbps and 48Mbps are selected as worse condition, and the following cases are performed with this condition.

802.11n-HT20MHz mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11n (20MHz)	MCS0	20.05	/	/
	MCS1	19.73	/	/
	MCS2	20.22		
	MCS3	20.80	/	/
	MCS4	20.87	/	/
	MCS5	21.03	20.62	20.97

	MCS6	20.57	/	/
	MCS7	20.62	/	/

The data rate MCS3 is selected as worse condition, and the following cases are performed with this condition.

802.11n-HT40MHz mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2422MHz (Ch3)	2437MHz (Ch6)	2452 MHz (Ch9)
802.11n (40MHz)	MCS0	/	/	/
	MCS1	/	/	/
	MCS2	/	/	/
	MCS3	/	/	/
	MCS4	/	/	/
	MCS5	/	/	/
	MCS6	/	/	/
	MCS7	/	/	/

A.2.2. Maximum Average Output Power-conducted

802.11b/g mode

Mode	Test Result (dBm)		
	2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11b	13.72	14.02	14.10
802.11g	12.31	12.39	12.28

802.11n-HT20MHz mode

Mode	Test Result (dBm)		
	2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11n (20MHz)	11.48	11.56	11.41

802.11n-HT40MHz mode

Mode	Test Result (dBm)		
	2422MHz (Ch3)	2437MHz (Ch6)	2452 MHz (Ch9)
802.11n (40MHz)	/	/	/

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 D01

Measurement Uncertainty:

Measurement Uncertainty	0.75dB
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Measurement Results:

802.11b/g mode

Mode	Channel	Power Spectral Density (dBm/3 kHz)		Conclusion
802.11b	1	Fig.1	-10.50	P
	6	Fig.2	-10.57	P
	11	Fig.3	-10.72	P
802.11g	1	Fig.4	-11.97	P
	6	Fig.5	-12.24	P
	11	Fig.6	-12.57	P

802.11n-HT20MHz mode

Mode	Channel	Power Spectral Density (dBm/3 kHz)		Conclusion
802.11n (20MHz)	1	Fig.7	-14.33	P
	6	Fig.8	-12.31	P
	11	Fig.9	-14.15	P
802.11n (40MHz)	3	/	/	/
	6	/	/	/
	9	/	/	/

Conclusion: PASS

Test graphs as below:

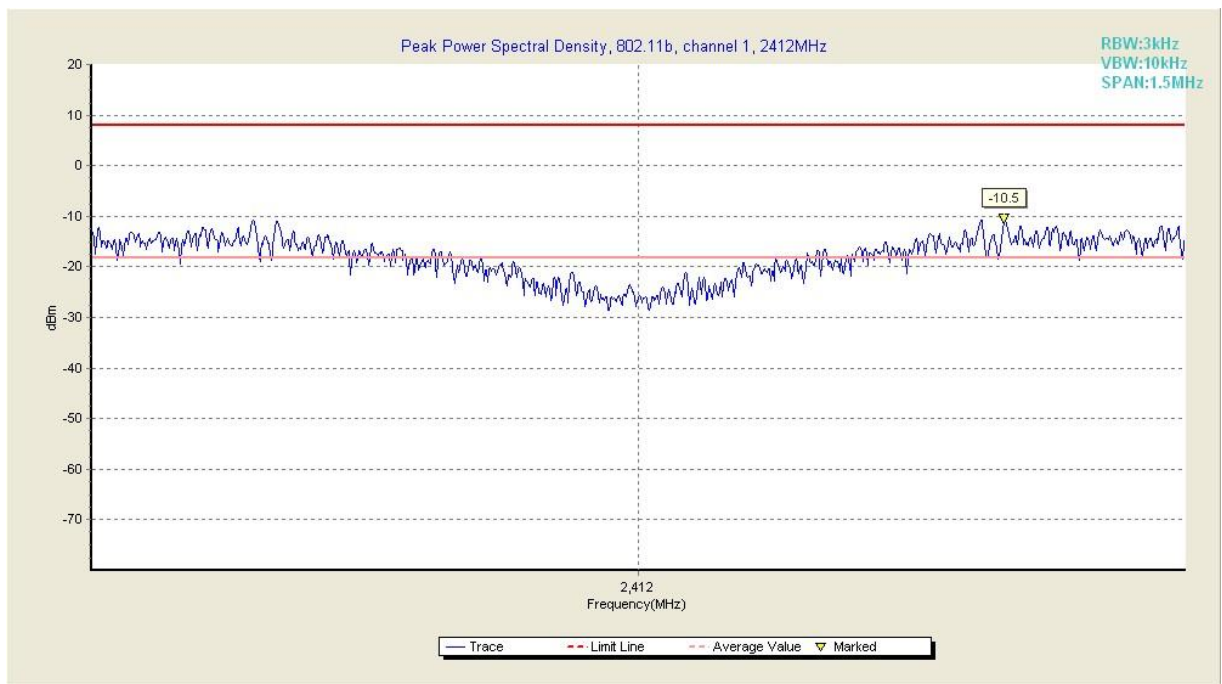


Fig. 1 Power Spectral Density (802.11b, Ch 1)

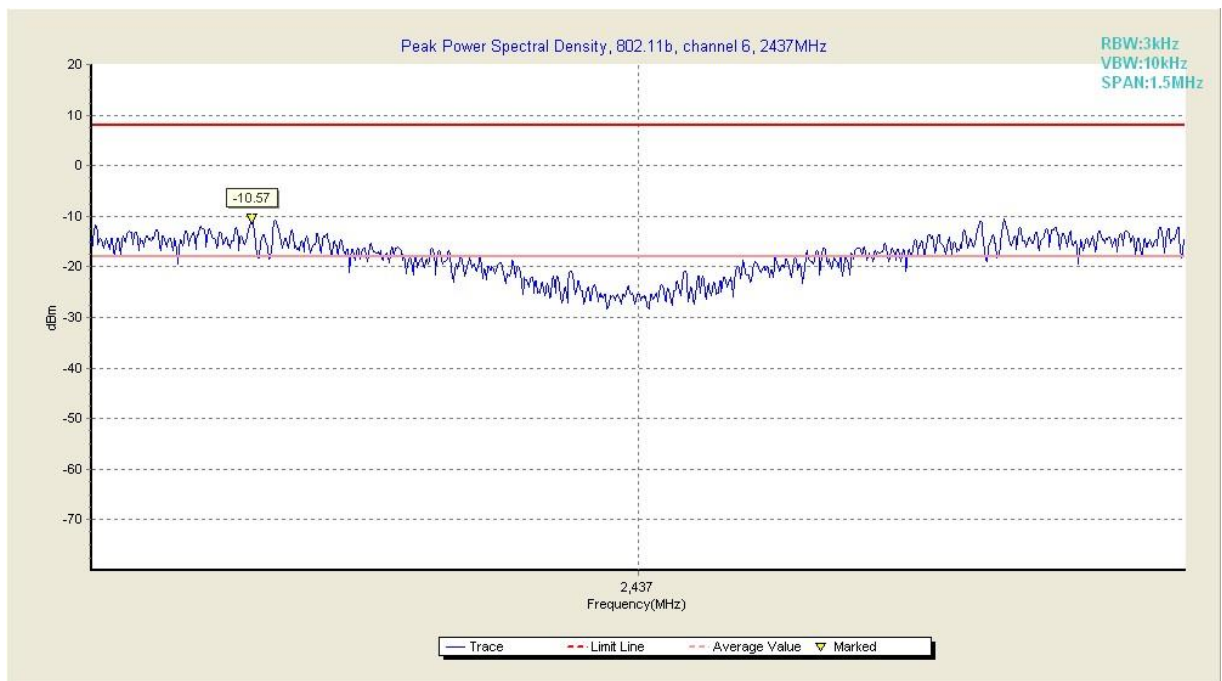


Fig. 2 Power Spectral Density (802.11b, Ch 6)

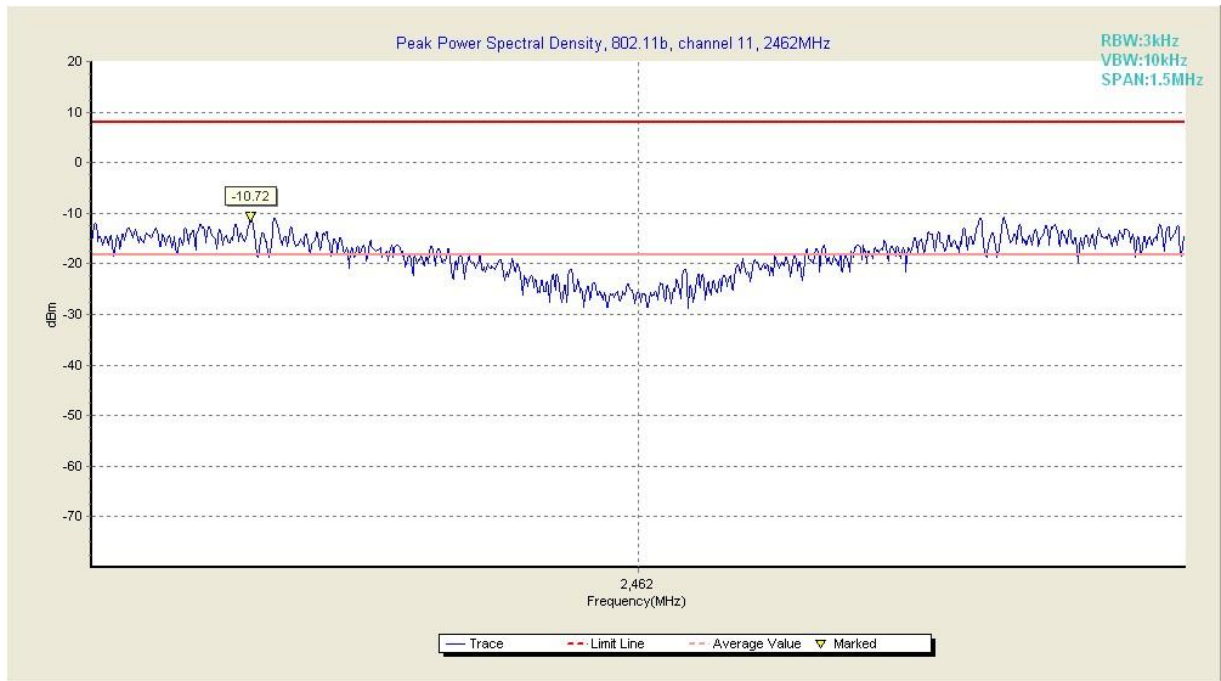
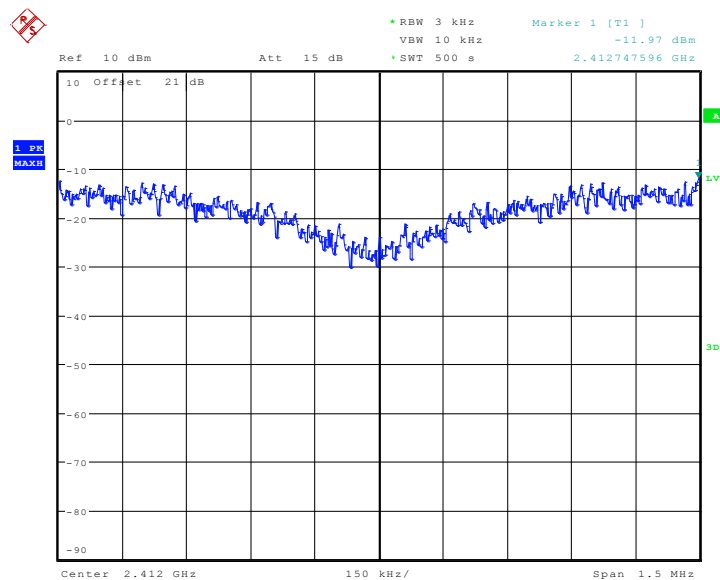
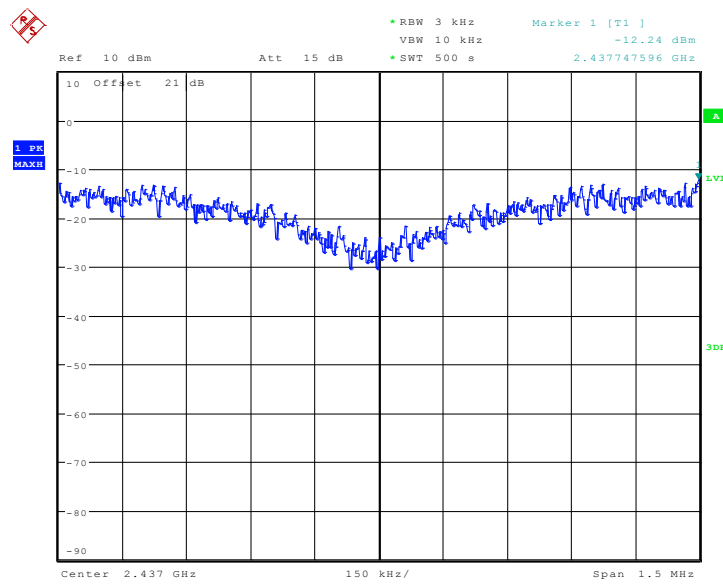


Fig. 3 Power Spectral Density (802.11b, Ch 11)



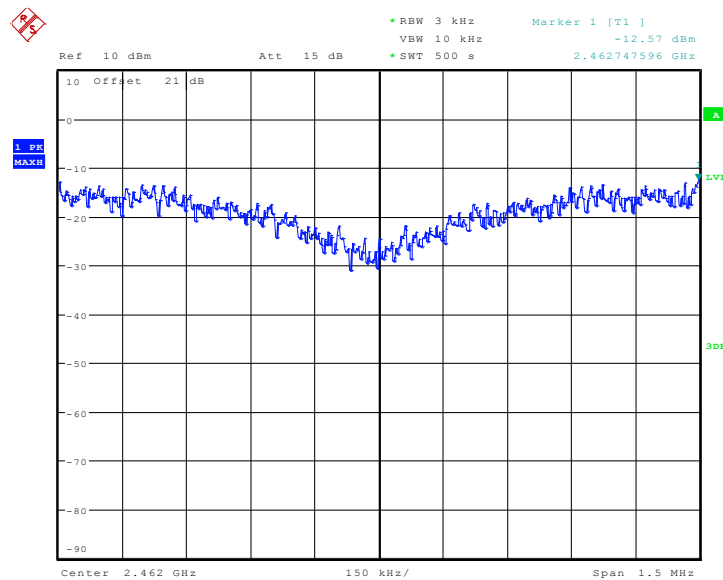
Date: 27.APR.2012 05:14:18

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



Date: 27.APR.2012 05:23:52

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



Date: 27.APR.2012 05:45:40

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

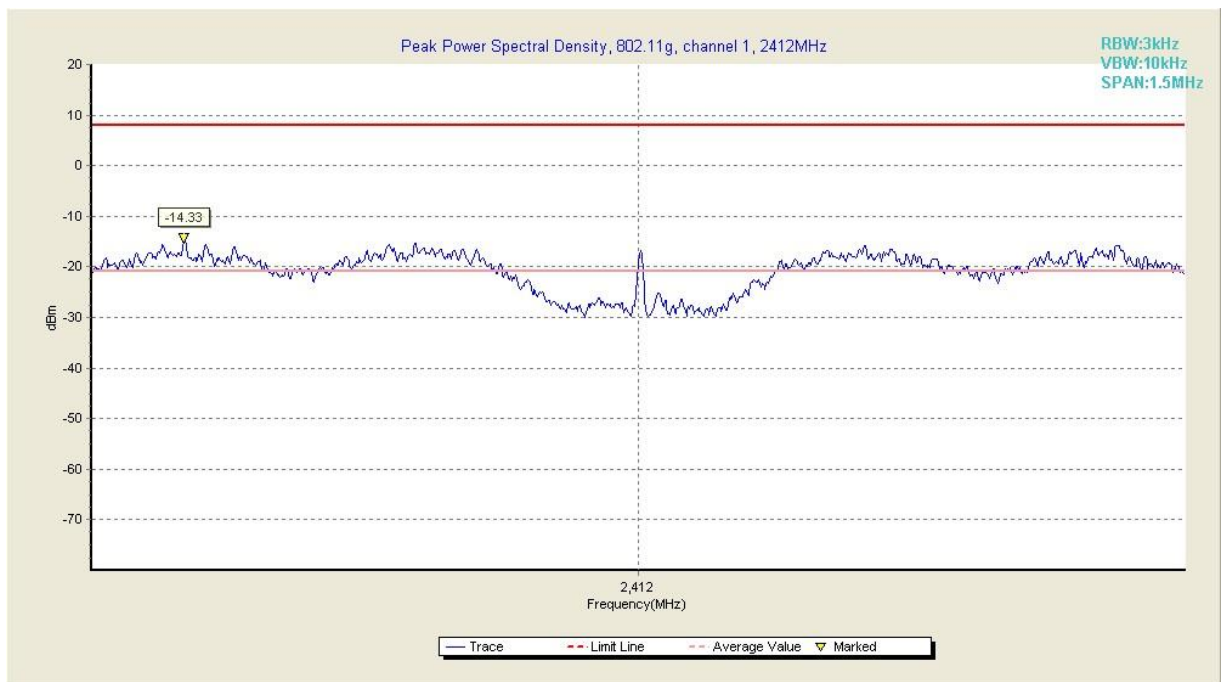


Fig. 7 Power Spectral Density (802.11n-20MHz, Ch 1)

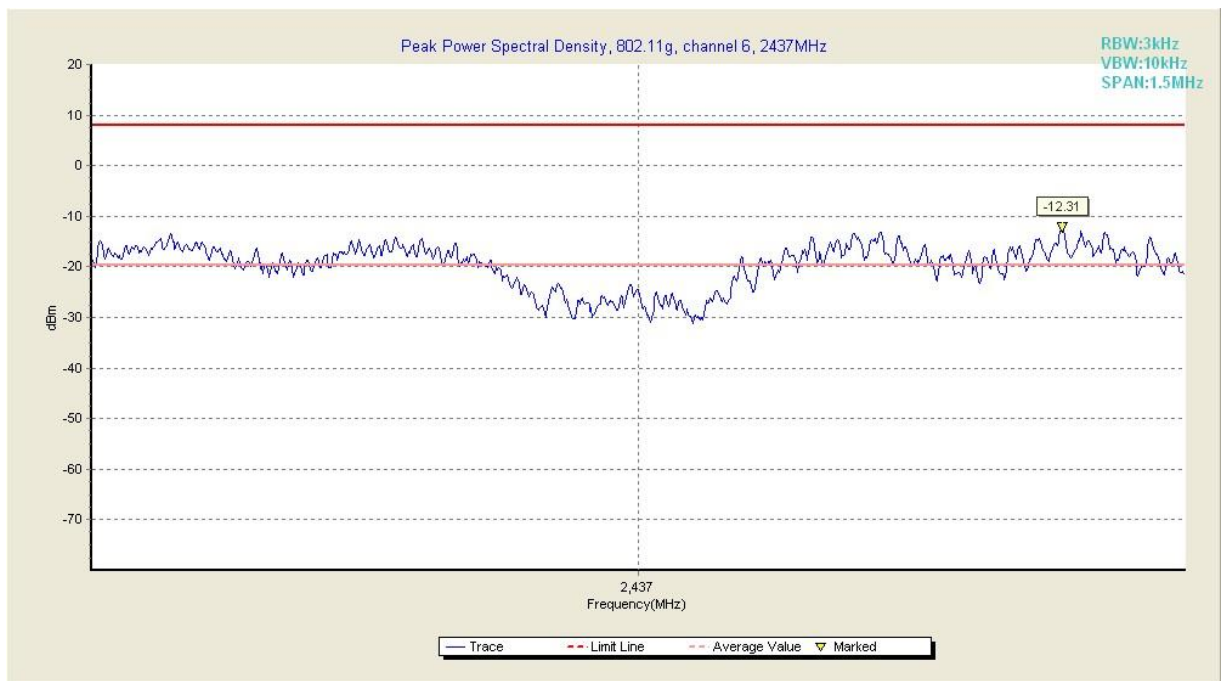


Fig. 8 Power Spectral Density (802.11n-20MHz, Ch 6)

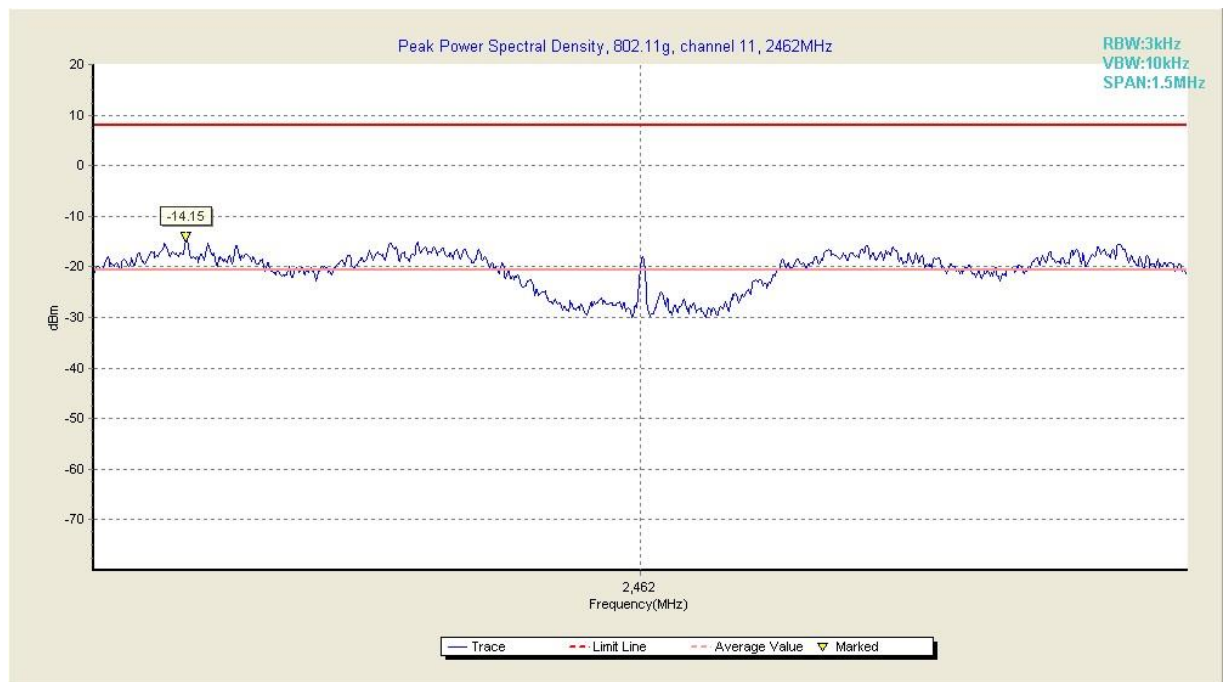


Fig. 9 Power Spectral Density (802.11n-20MHz, Ch 11)

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 D01

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.10	10100	P
	6	Fig.11	10150	P
	11	Fig.12	10150	P
802.11g	1	Fig.13	16150	P
	6	Fig.14	16150	P
	11	Fig.15	16550	P

802.11n mode

Mode	Channel	Occupied 6dB Bandwidth (kHz)		conclusion
802.11n (20MHz)	1	Fig.16	17750	P
	6	Fig.17	17700	P
	11	Fig.18	17700	P
802.11n (40MHz)	3	/	/	/
	6	/	/	/
	9	/	/	/

Conclusion: PASS

Test graphs as below:

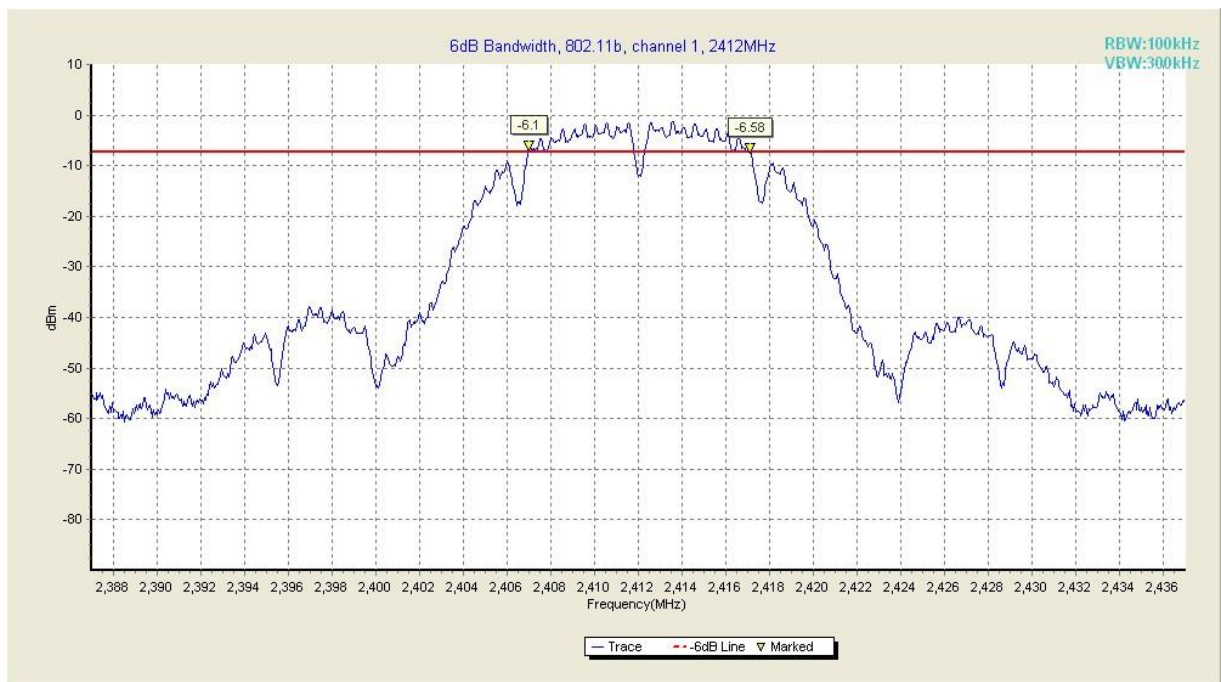


Fig. 10 Occupied 6dB Bandwidth (802.11b, Ch 1)

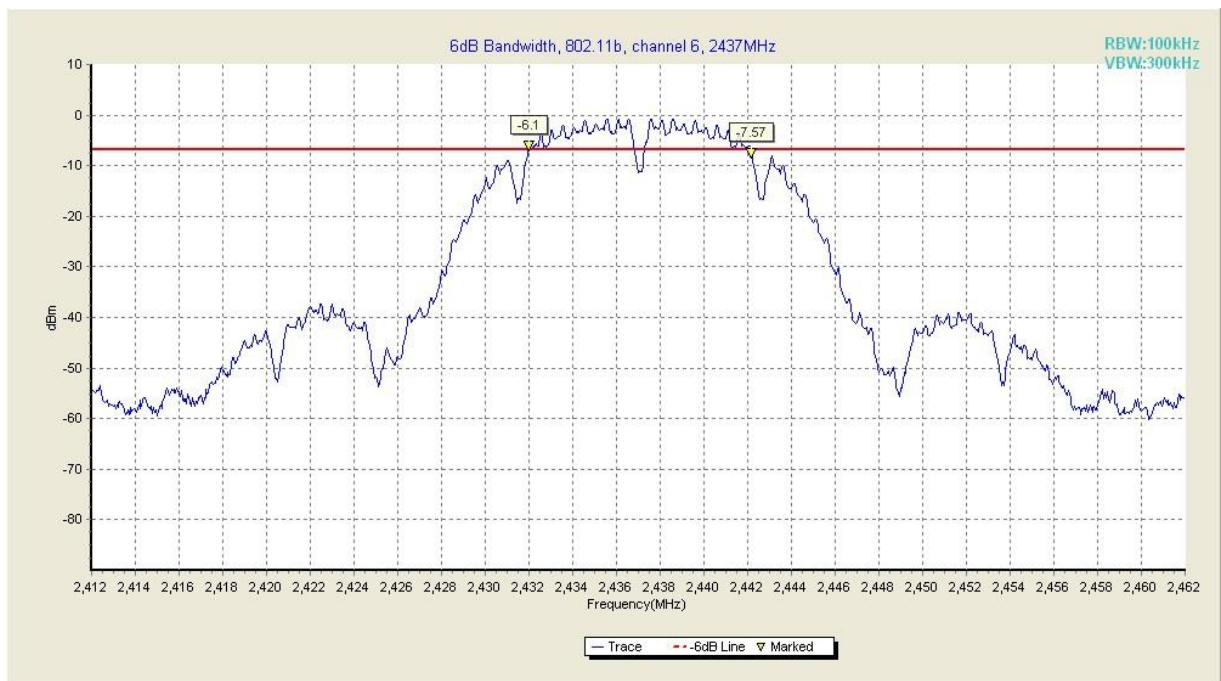


Fig. 11 Occupied 6dB Bandwidth (802.11b, Ch 6)

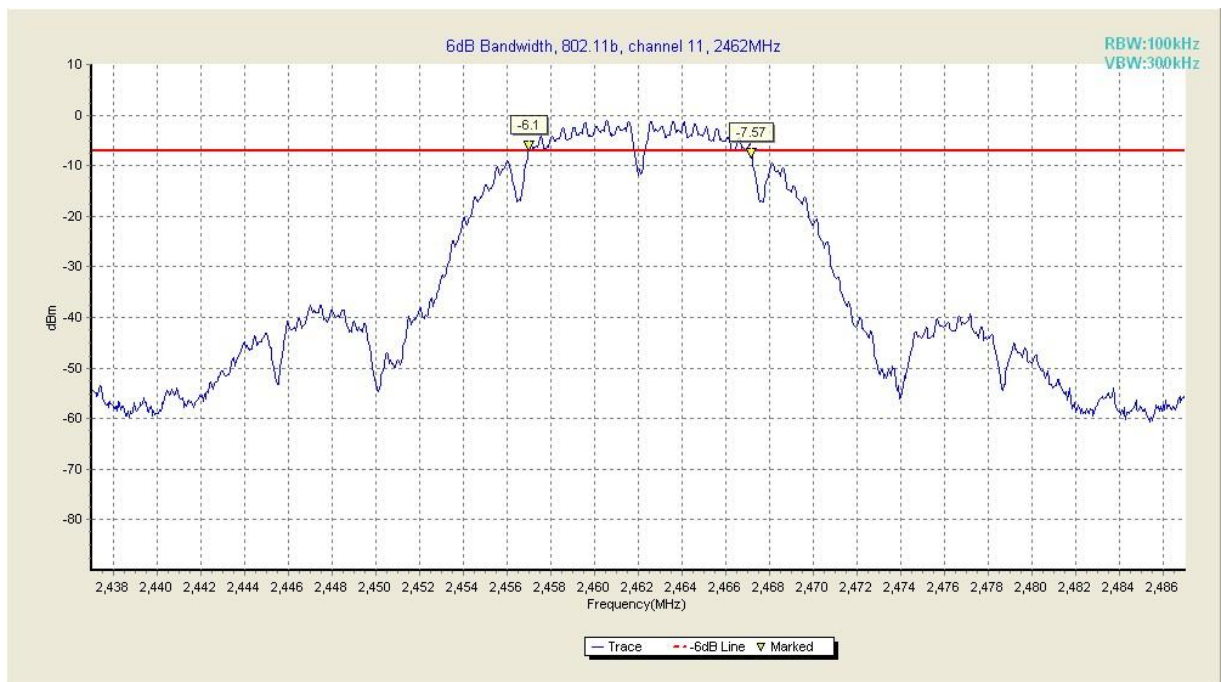


Fig. 12 Occupied 6dB Bandwidth (802.11b, Ch 11)

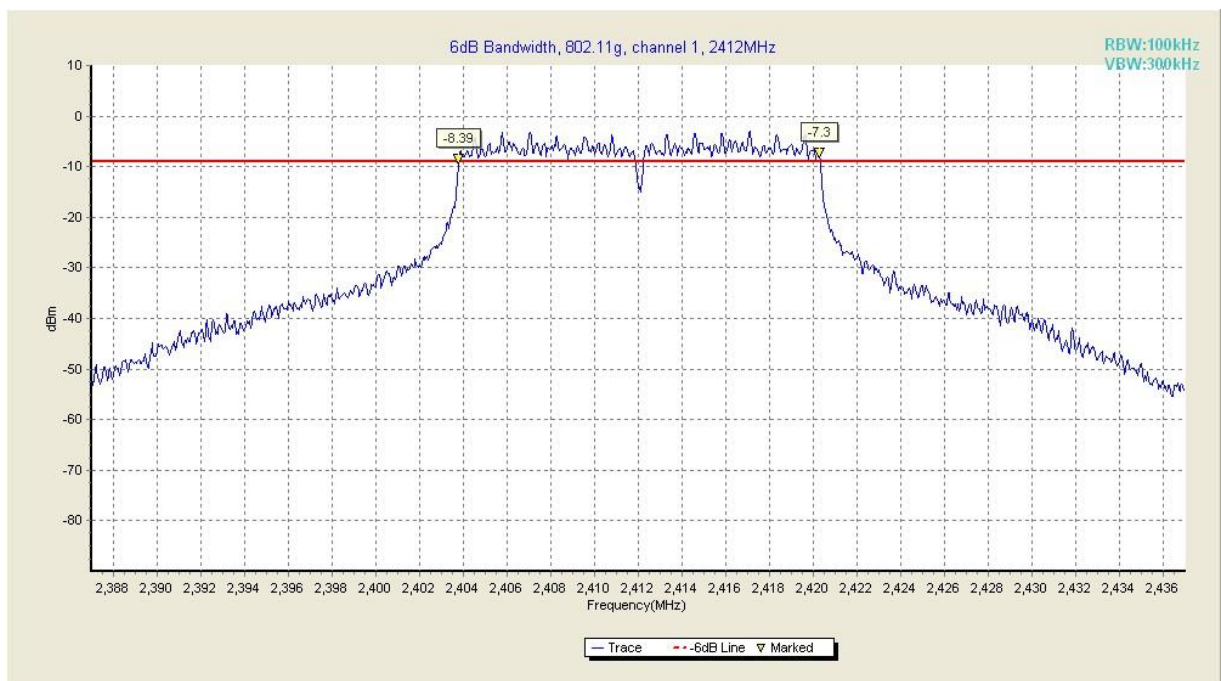


Fig. 13 Occupied 6dB Bandwidth (802.11g, Ch 1)

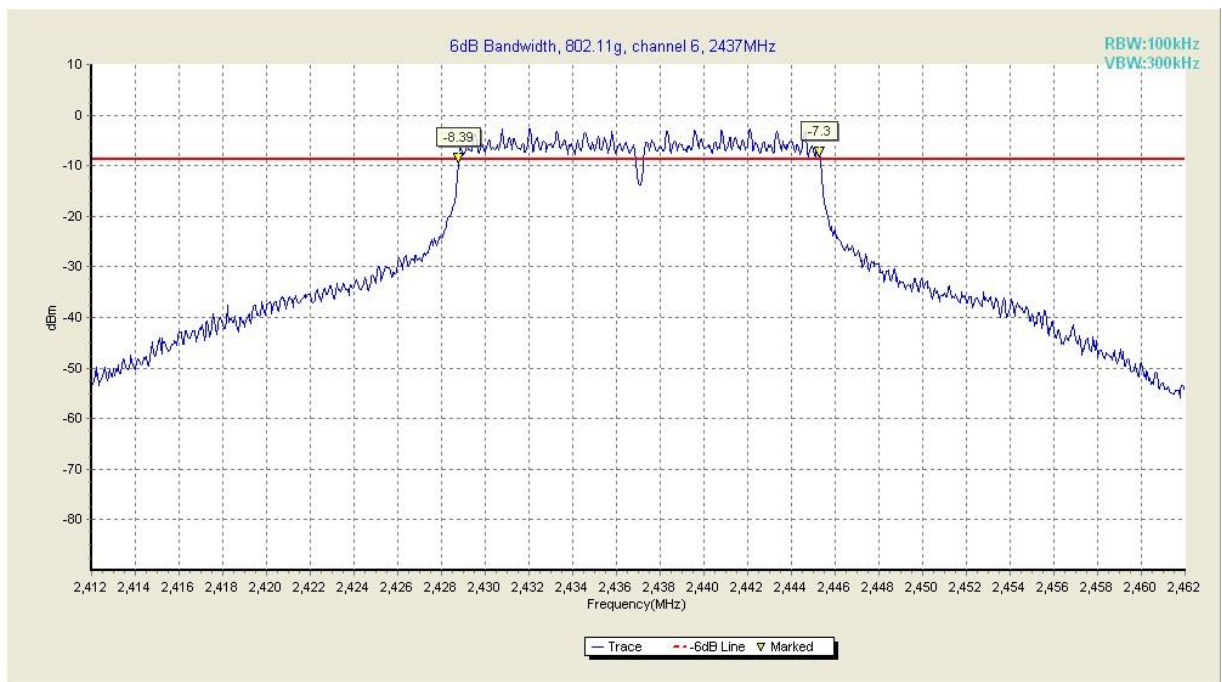


Fig. 14 Occupied 6dB Bandwidth (802.11g, Ch 6)

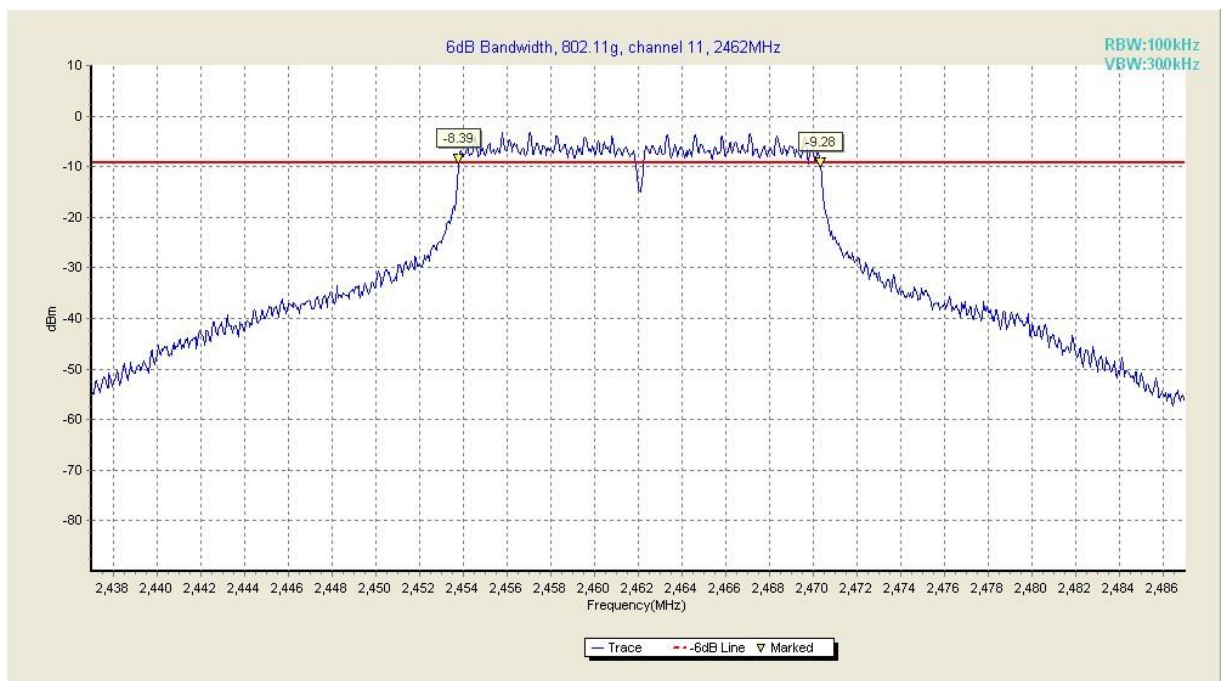


Fig. 15 Occupied 6dB Bandwidth (802.11g, Ch 11)

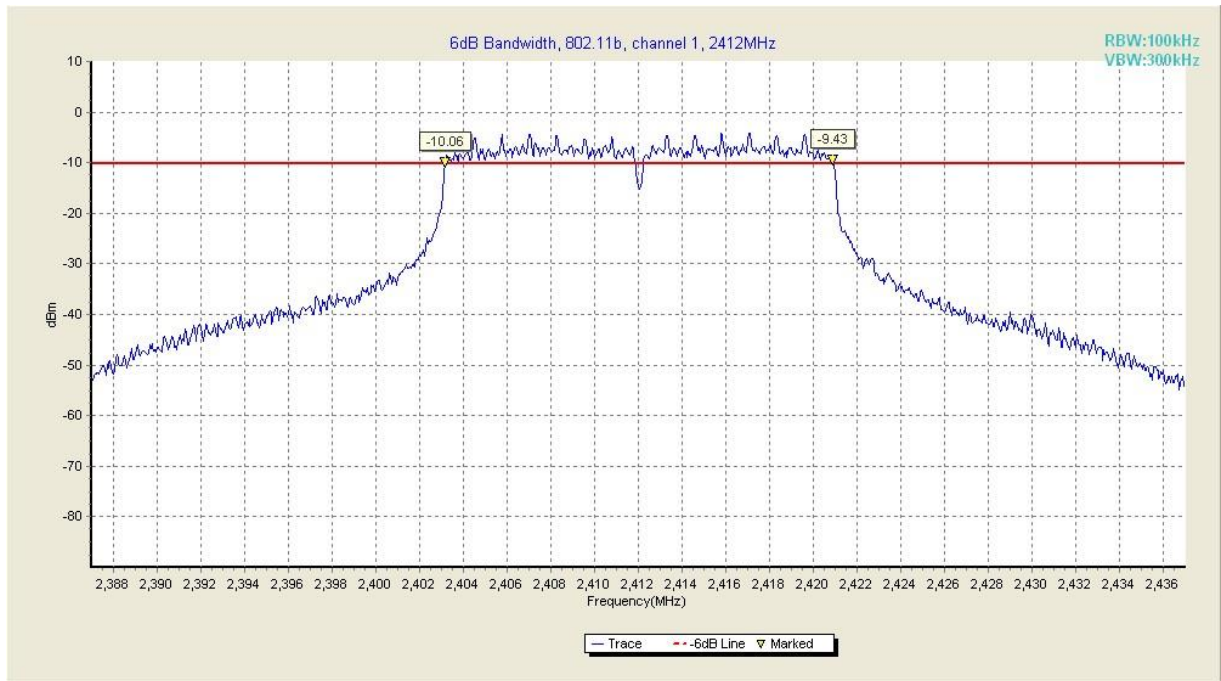


Fig. 16 Occupied 6dB Bandwidth (802.11n-20MHz, Ch 1)

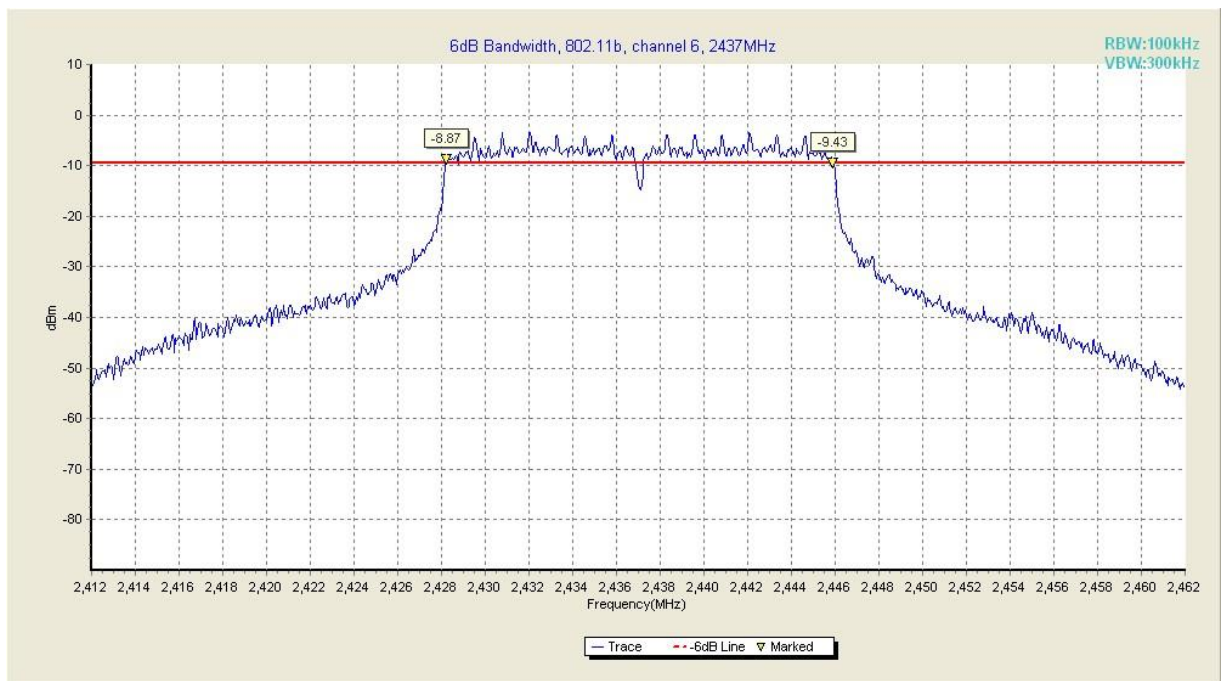


Fig. 17 Occupied 6dB Bandwidth (802.11n-20MHz, Ch 6)

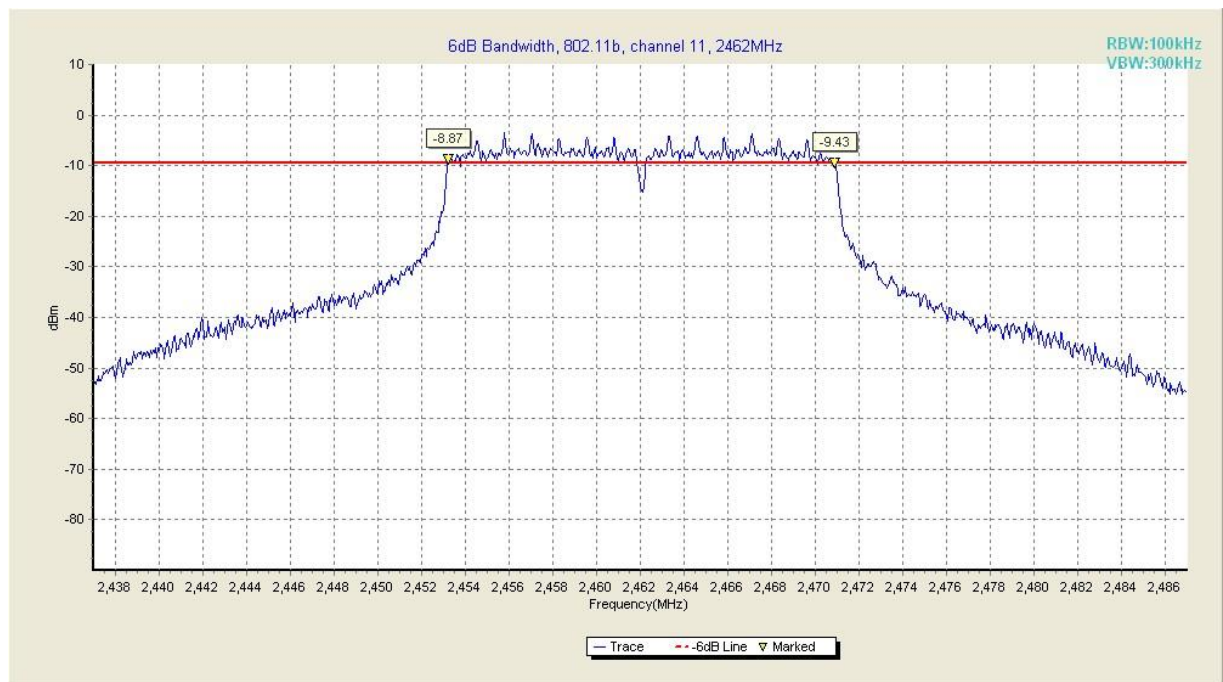


Fig. 18 Occupied 6dB Bandwidth (802.11n-20MHz, Ch 11)

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 D01

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.19	P
	11	Fig.20	P
802.11g	1	Fig.21	P
	11	Fig.22	P

802.11n mode

Mode	Channel	Test Results	Conclusion
802.11n (20MHz)	1	Fig.23	P
	11	Fig.24	P
802.11n (40MHz)	3	/	/
	9	/	/

Conclusion: PASS

Test graphs as below:

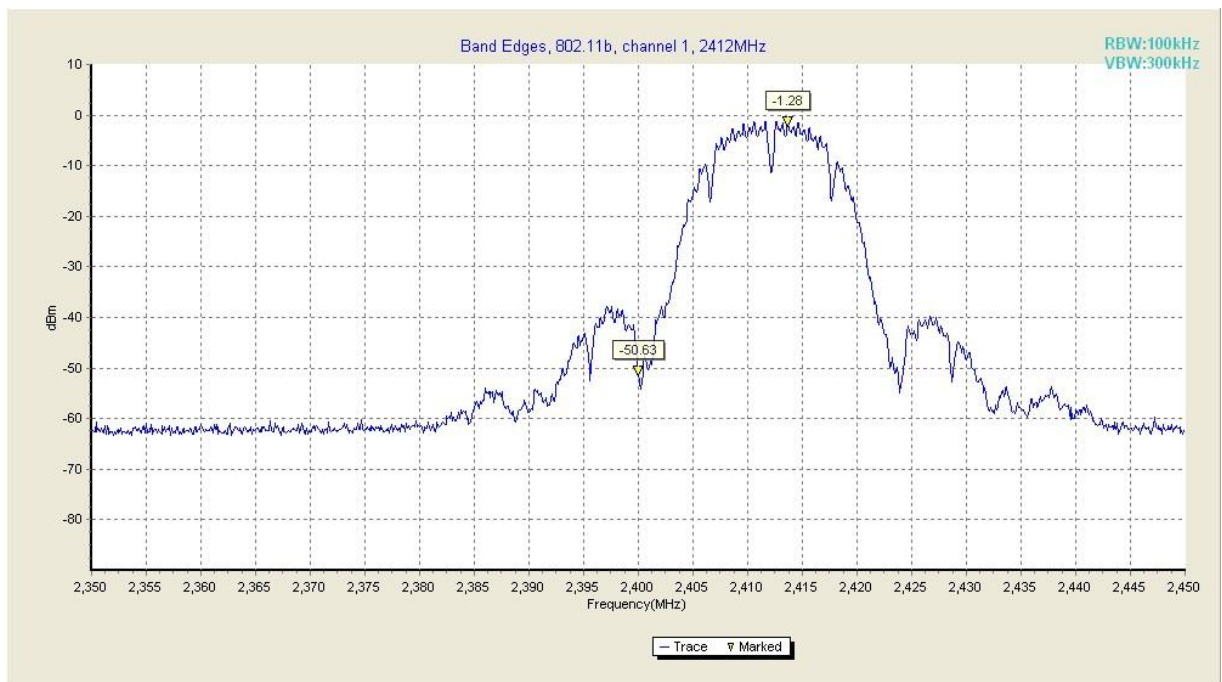


Fig. 19 Band Edges (802.11b, Ch 1)

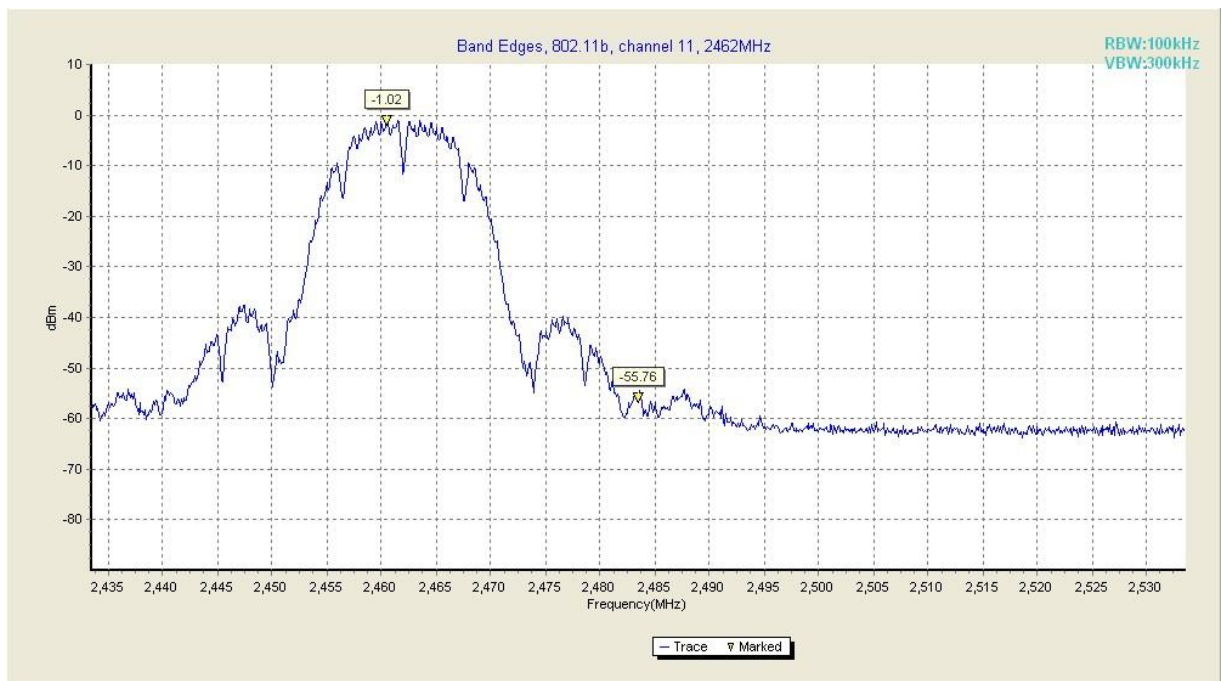


Fig. 20 Band Edges (802.11b, Ch 11)

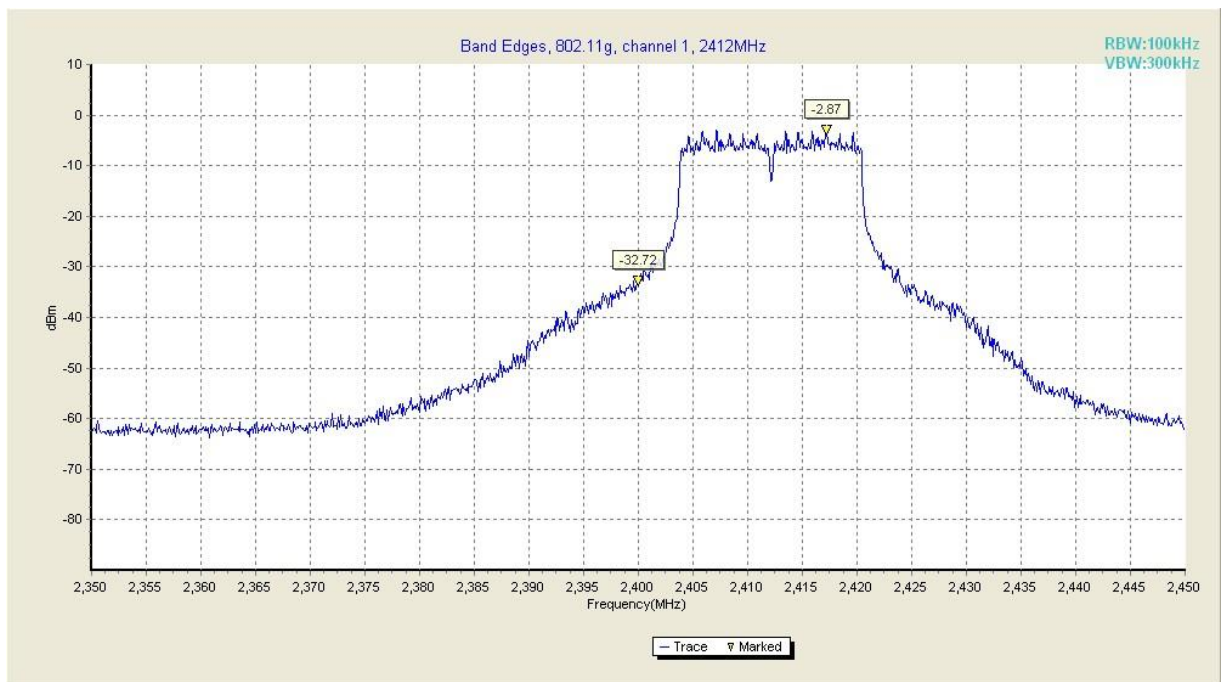


Fig. 21 Band Edges (802.11g, Ch 1)

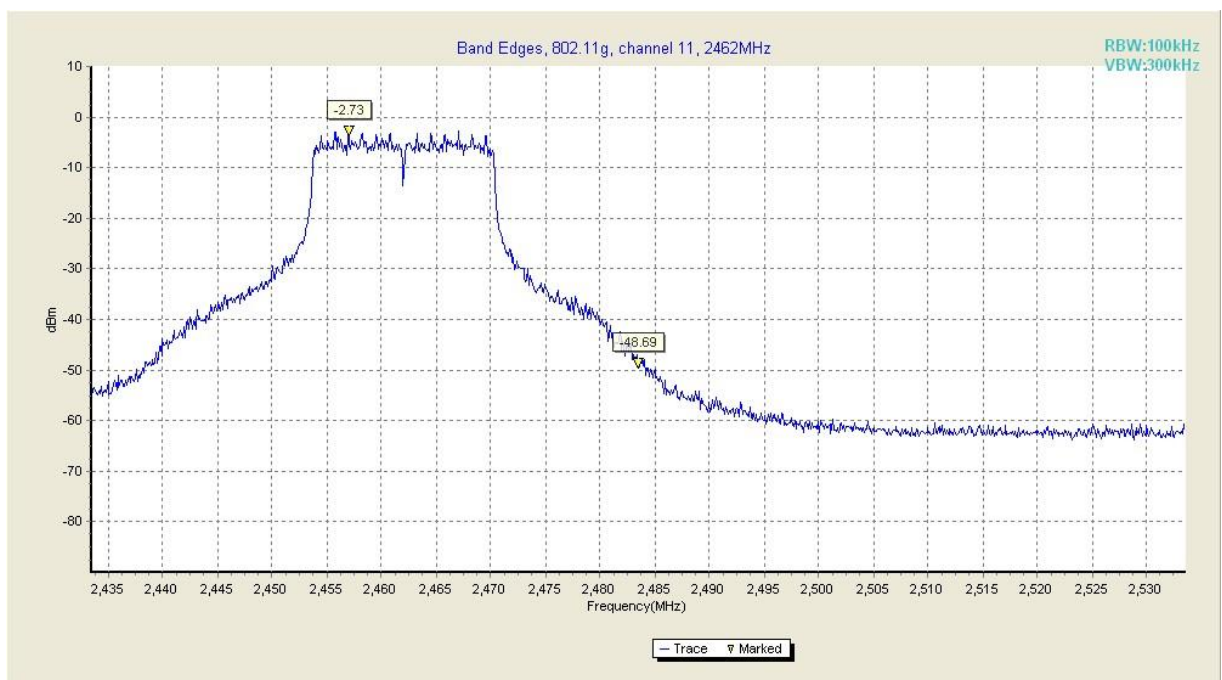


Fig. 22 Band Edges (802.11g, Ch 11)



Fig. 23 Band Edges (802.11n-20MHz, Ch 1)

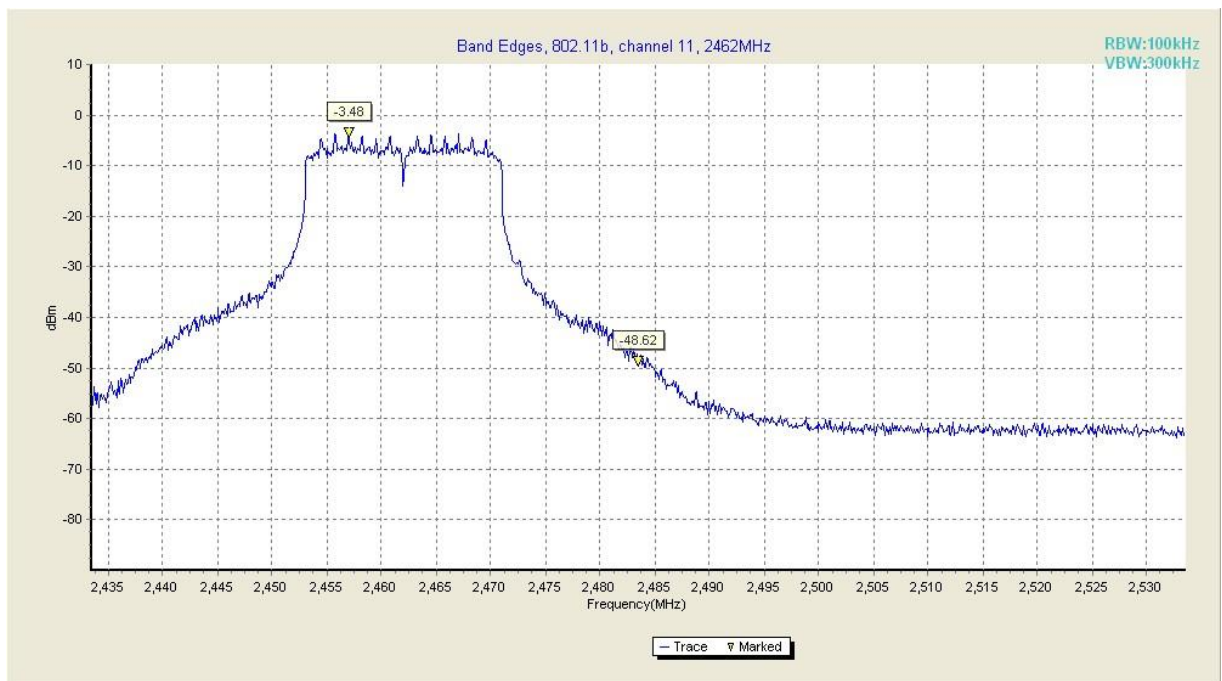


Fig. 24 Band Edges (802.11n-20MHz, Ch 11)

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 D01

Measurement Uncertainty:

Frequency Range	Uncertainty
$30\text{MHz} \leq f \leq 2\text{GHz}$	0.63
$2\text{GHz} \leq f \leq 3.6\text{GHz}$	0.82
$3.6\text{GHz} \leq f \leq 8\text{GHz}$	1.55
$8\text{GHz} \leq f \leq 20\text{GHz}$	1.86
$20\text{GHz} \leq f \leq 22\text{GHz}$	1.90
$22\text{GHz} \leq f \leq 26\text{GHz}$	2.20

Measurement Results:

802.11b/g mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11b	1	2.412 GHz	Fig.25	P
		30 MHz ~ 26 GHz	Fig.26	P
	6	2.437 GHz	Fig.27	P
		30 MHz ~ 26 GHz	Fig.28	P
	11	2.462 GHz	Fig.29	P
		30 MHz ~ 26 GHz	Fig.30	P
802.11g	1	2.412 GHz	Fig.31	P
		30 MHz ~ 26 GHz	Fig.32	P
	6	2.437 GHz	Fig.33	P
		30 MHz ~ 26 GHz	Fig.34	P
	11	2.462 GHz	Fig.35	P
		30 MHz ~ 26 GHz	Fig.36	P

802.11n mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11n (20MHz)	1	2.412 GHz	Fig.37	P
		30 MHz ~ 26 GHz	Fig.38	P
	6	2.437 GHz	Fig.39	P
		30 MHz ~ 26 GHz	Fig.40	P
	11	2.462 GHz	Fig.41	P

		30 MHz ~ 26 GHz	Fig.42	P
802.11n (40MHz)	3	2.422 GHz	/	/
		30 MHz ~ 26 GHz	/	/
	6	2.437 GHz	/	/
		30 MHz ~ 26 GHz	/	/
	9	2.452 GHz	/	/
		30 MHz ~ 26 GHz	/	/

Conclusion: PASS

Test graphs as below:

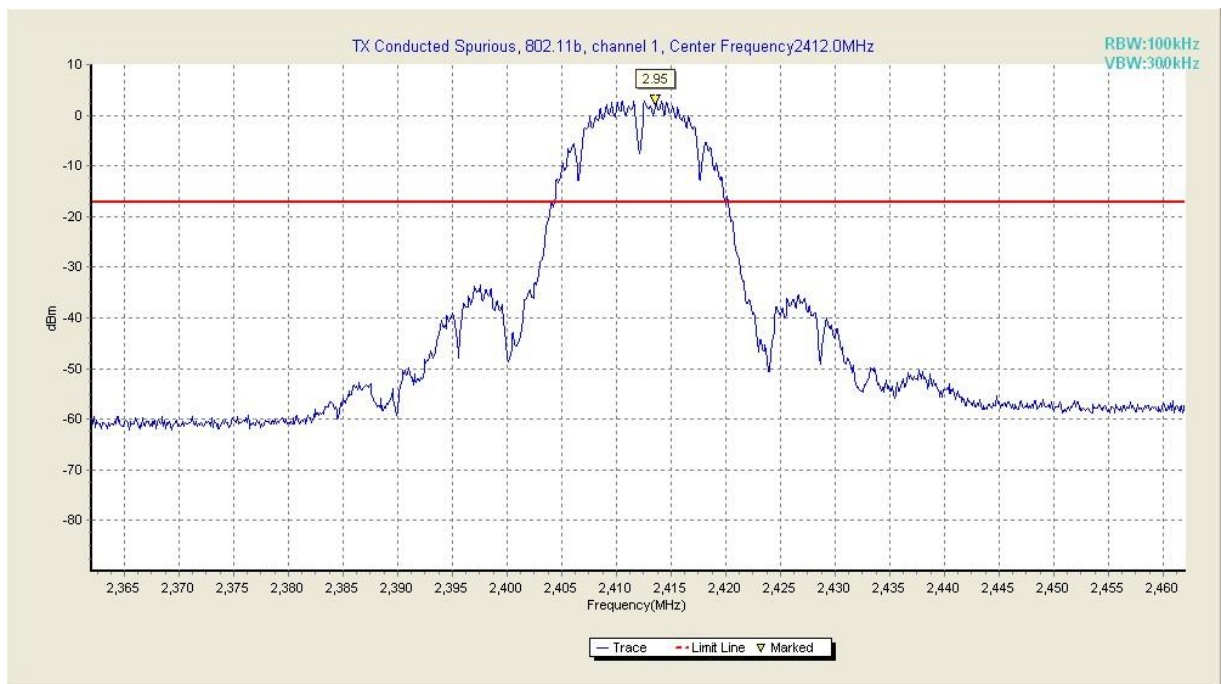


Fig. 25 Conducted Spurious Emission (802.11b, Ch1, Center Frequency)

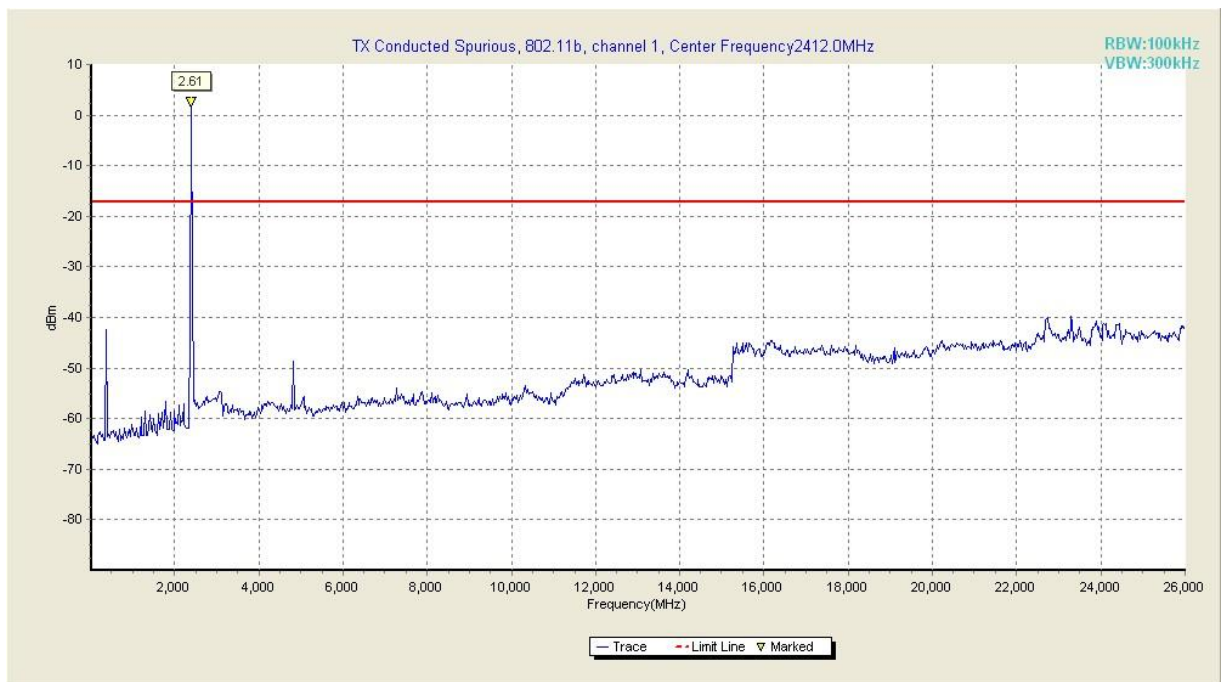


Fig. 26 Conducted Spurious Emission (802.11b, Ch1, 30 MHz-26 GHz)

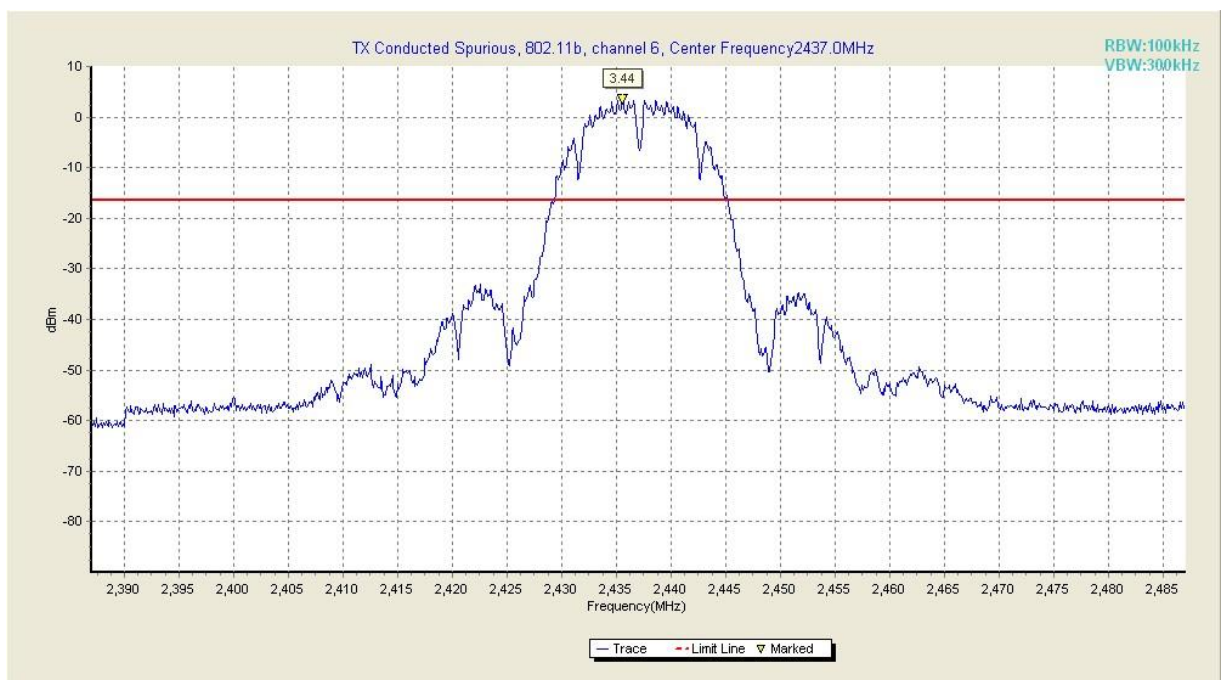


Fig. 27 Conducted Spurious Emission (802.11b, Ch6, Center Frequency)

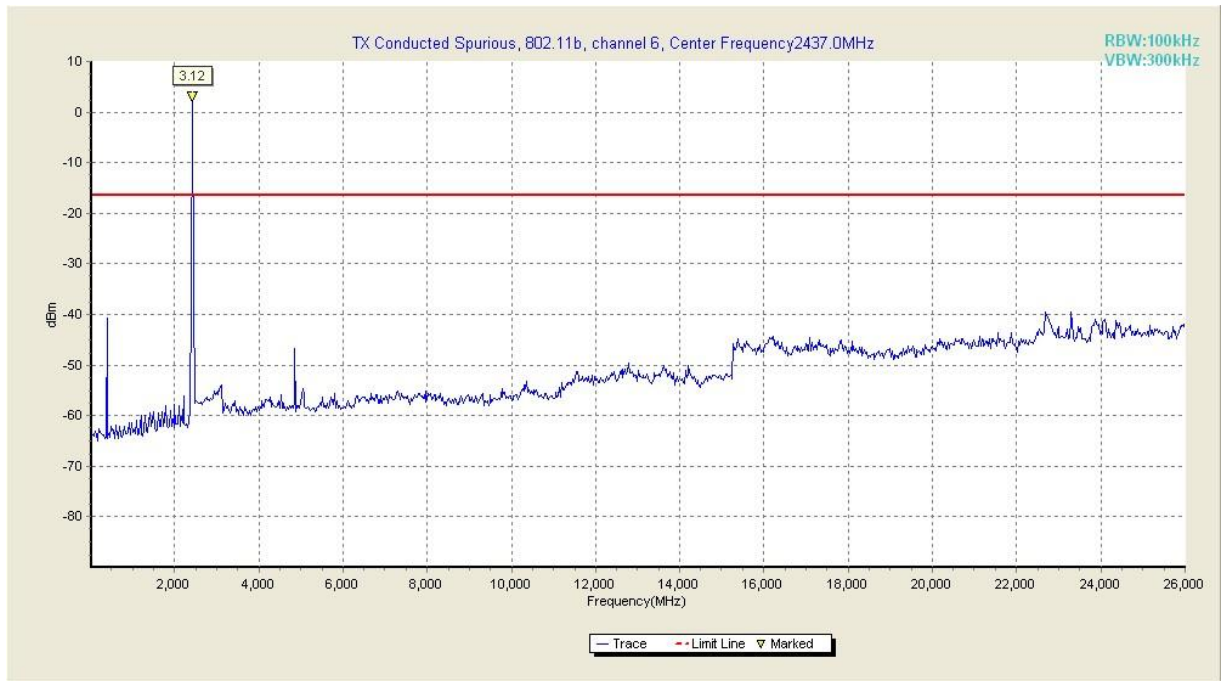


Fig. 28 Conducted Spurious Emission (802.11b, Ch6, 30 MHz-26 GHz)

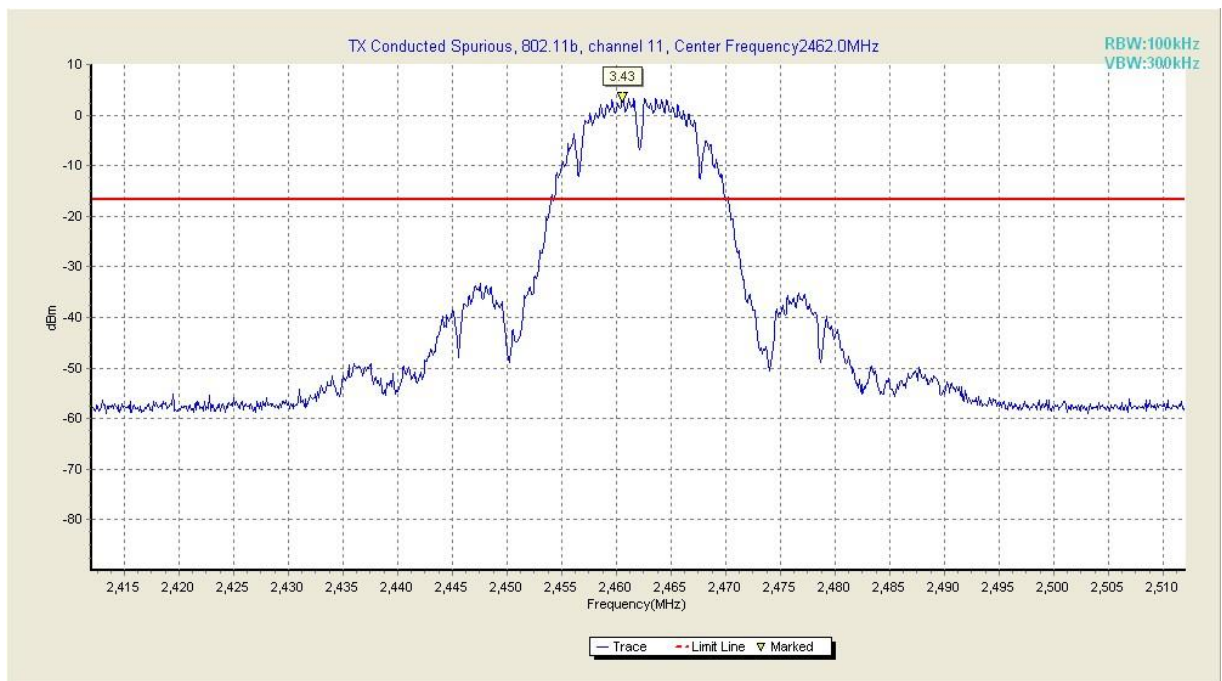


Fig. 29 Conducted Spurious Emission (802.11b, Ch11, Center Frequency)

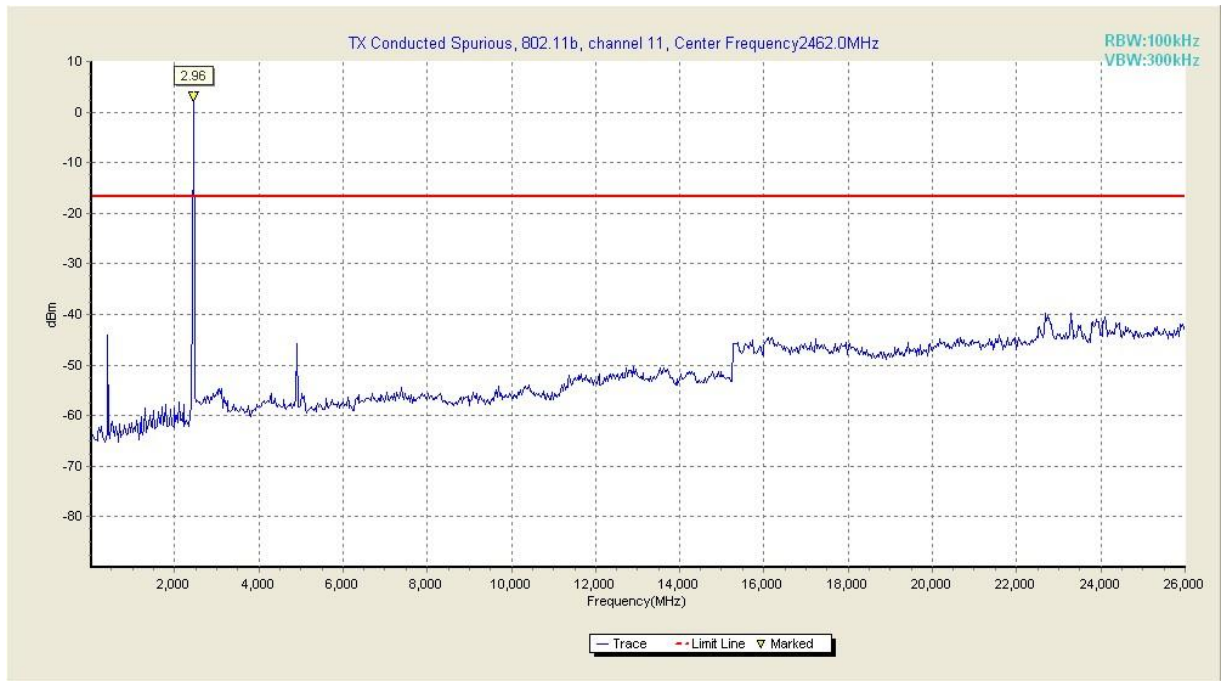


Fig. 30 Conducted Spurious Emission (802.11b, Ch11, 30 MHz-26 GHz)

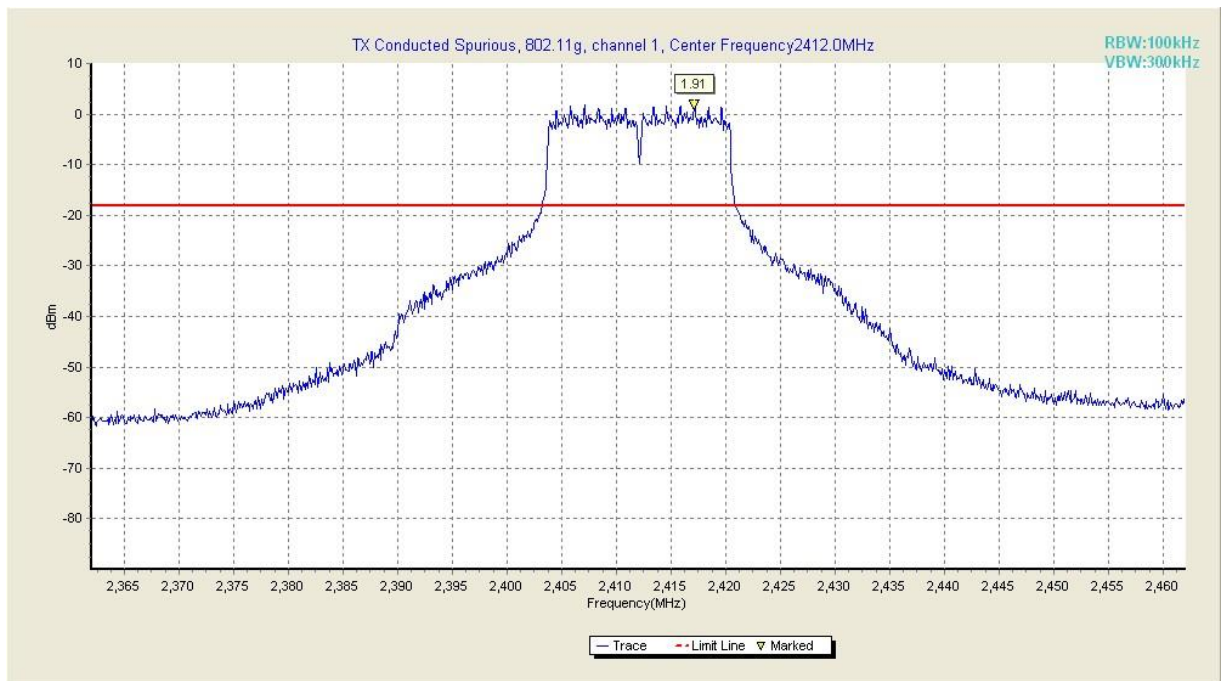


Fig. 31 Conducted Spurious Emission (802.11g, Ch1, Center Frequency)

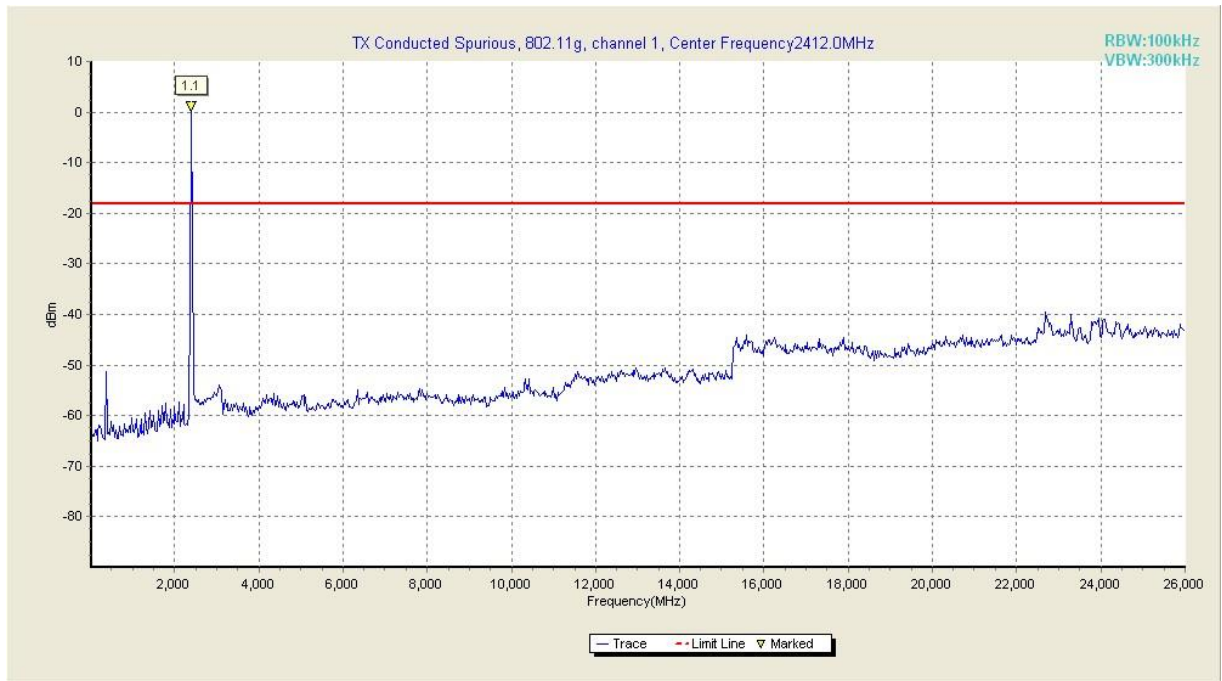


Fig. 32 Conducted Spurious Emission (802.11g, Ch1, 30 MHz-26 GHz)

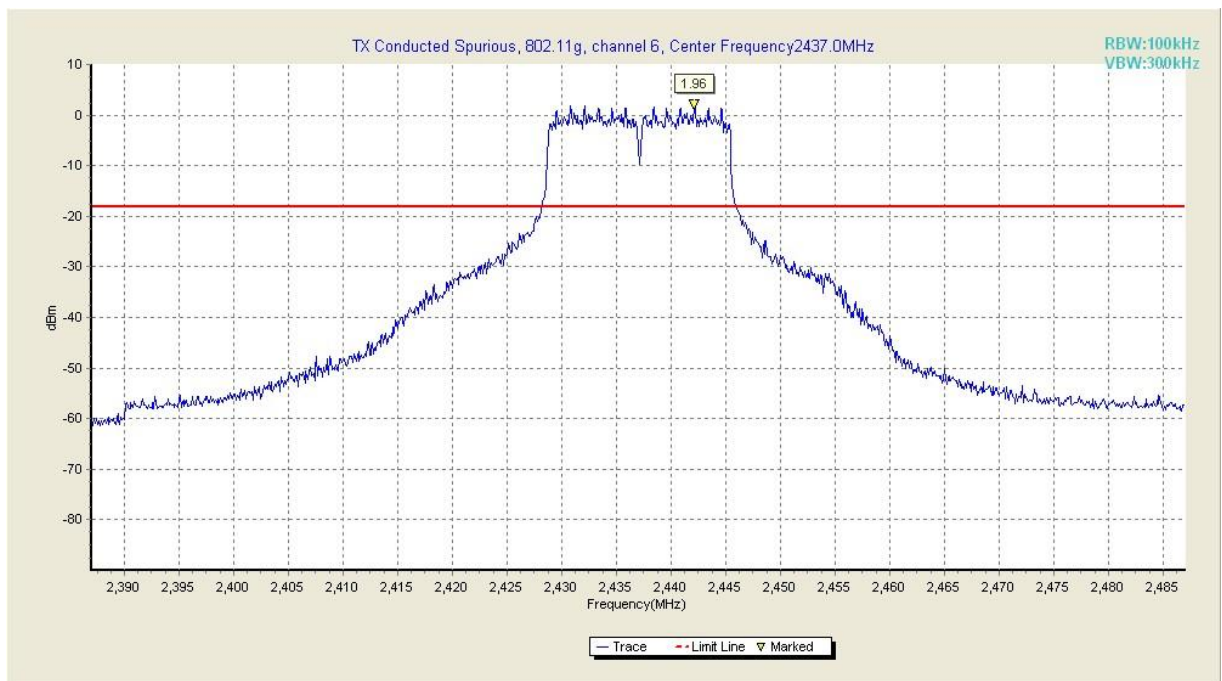


Fig. 33 Conducted Spurious Emission (802.11g, Ch6, Center Frequency)

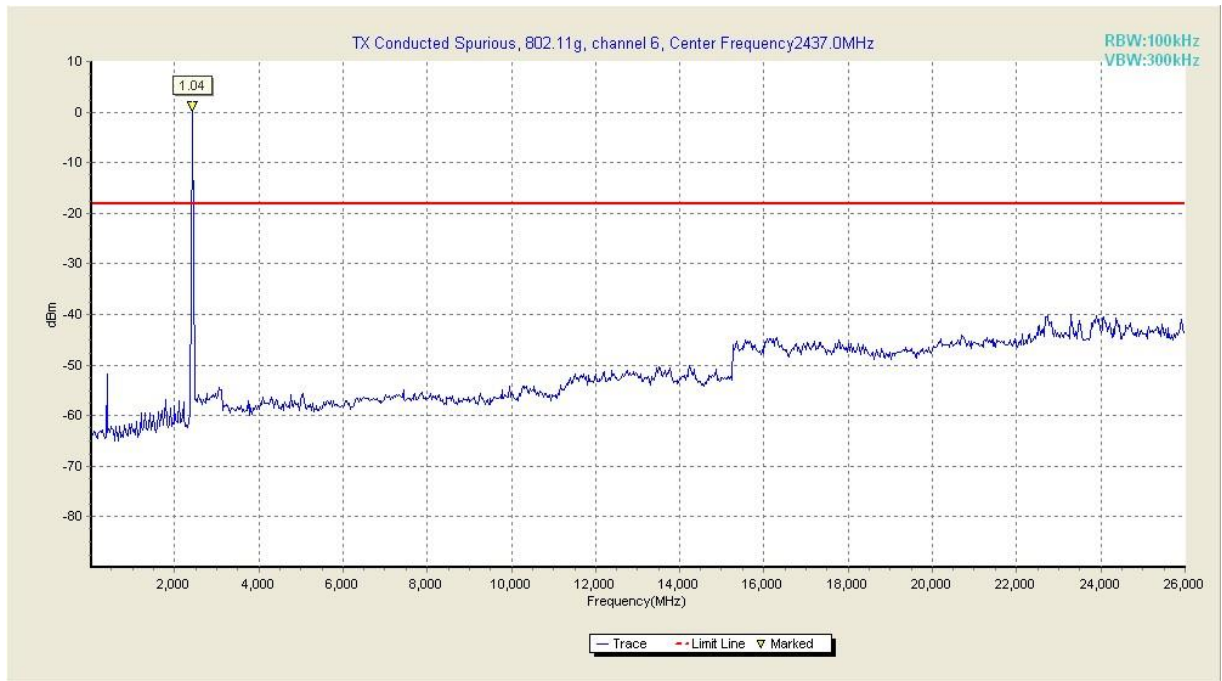


Fig. 34 Conducted Spurious Emission (802.11g, Ch6, 30 MHz-26 GHz)

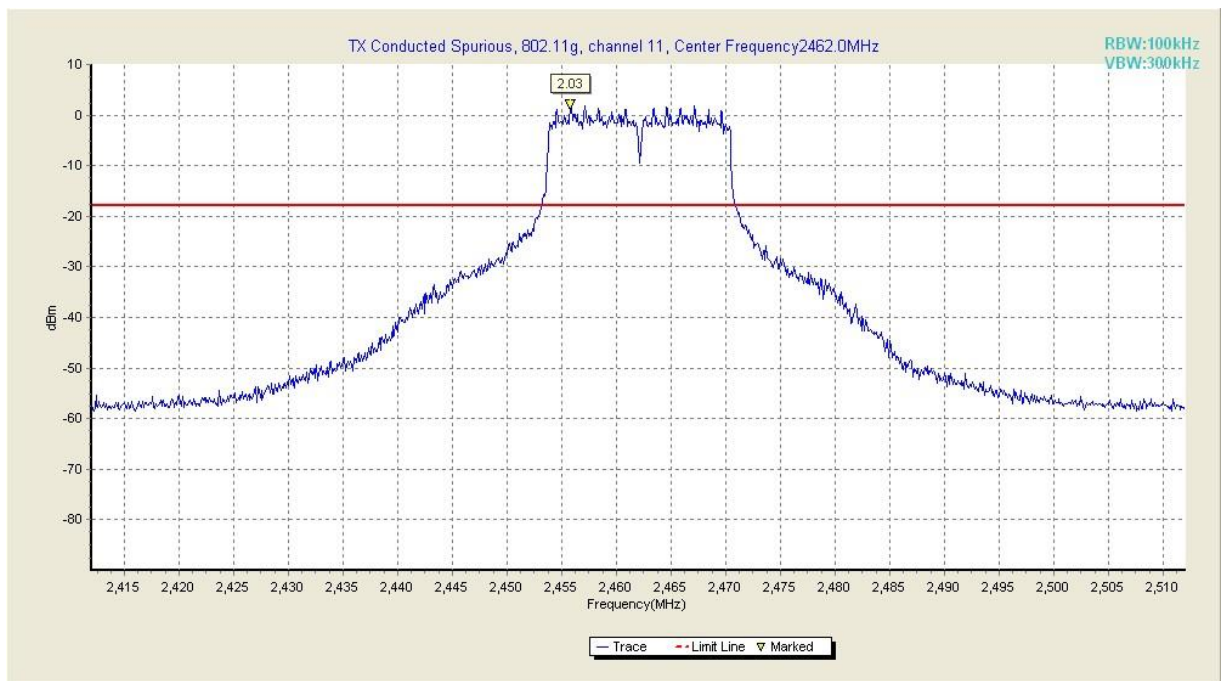


Fig. 35 Conducted Spurious Emission (802.11g, Ch11, Center Frequency)

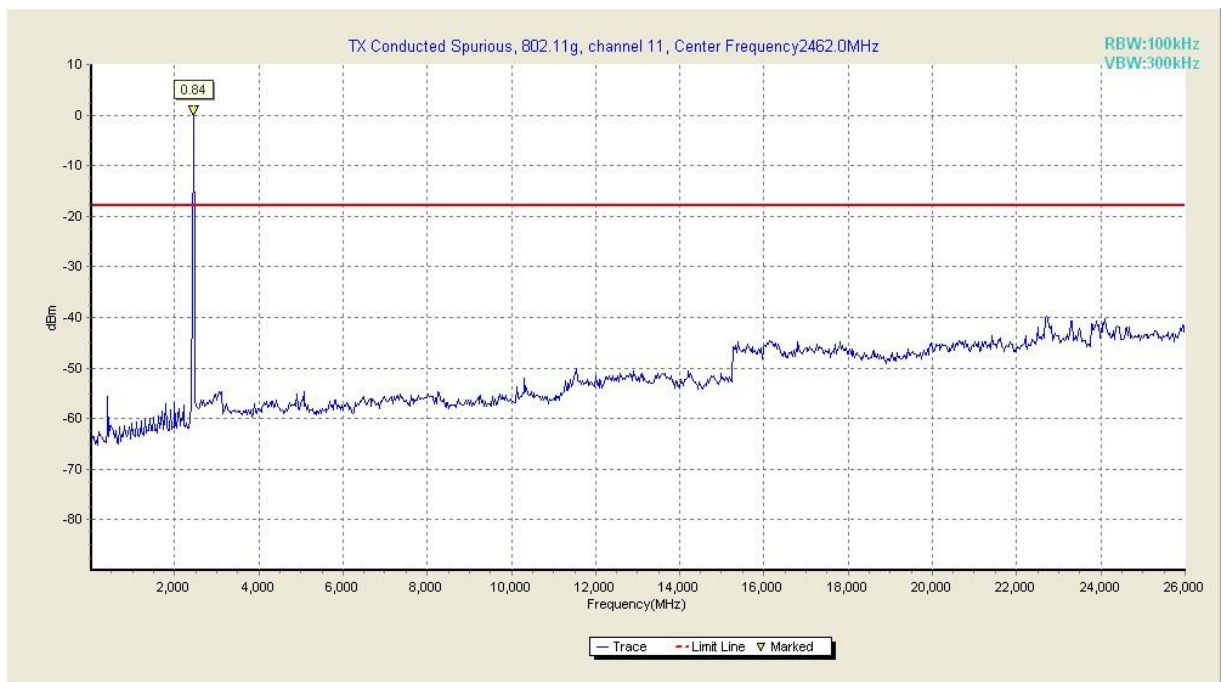


Fig. 36 Conducted Spurious Emission (802.11g, Ch11, 30 MHz-26 GHz)

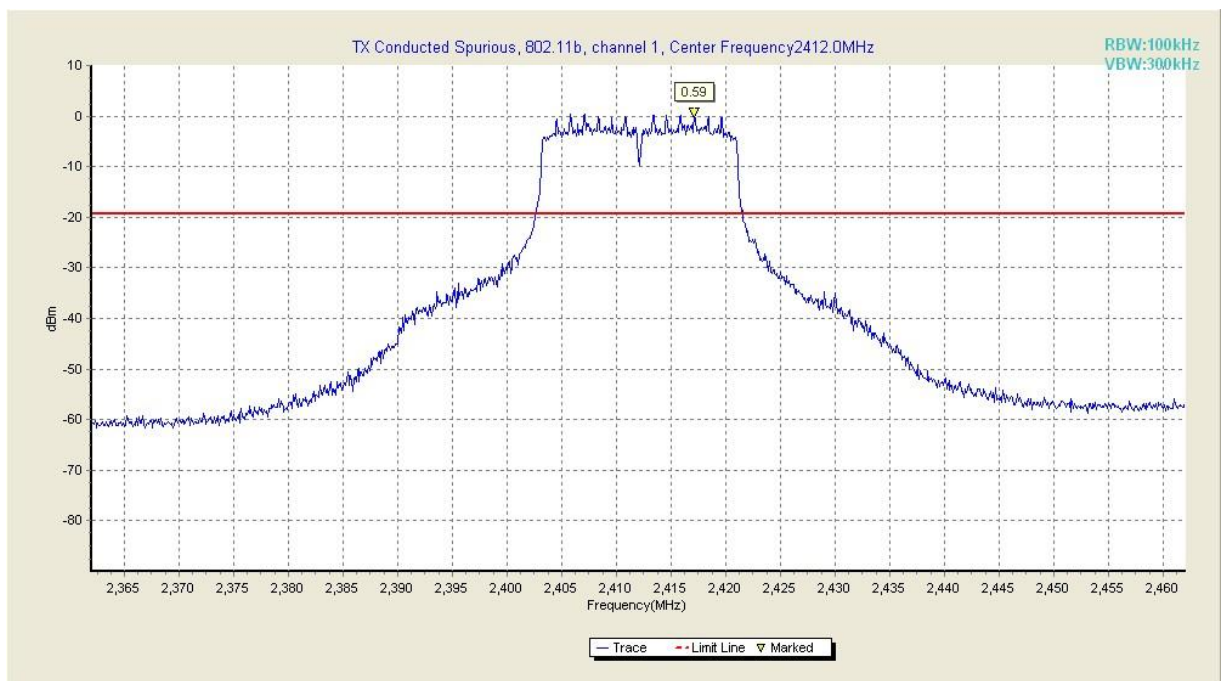


Fig. 37 Conducted Spurious Emission (802.11n-20MHz, Ch1, Center Frequency)

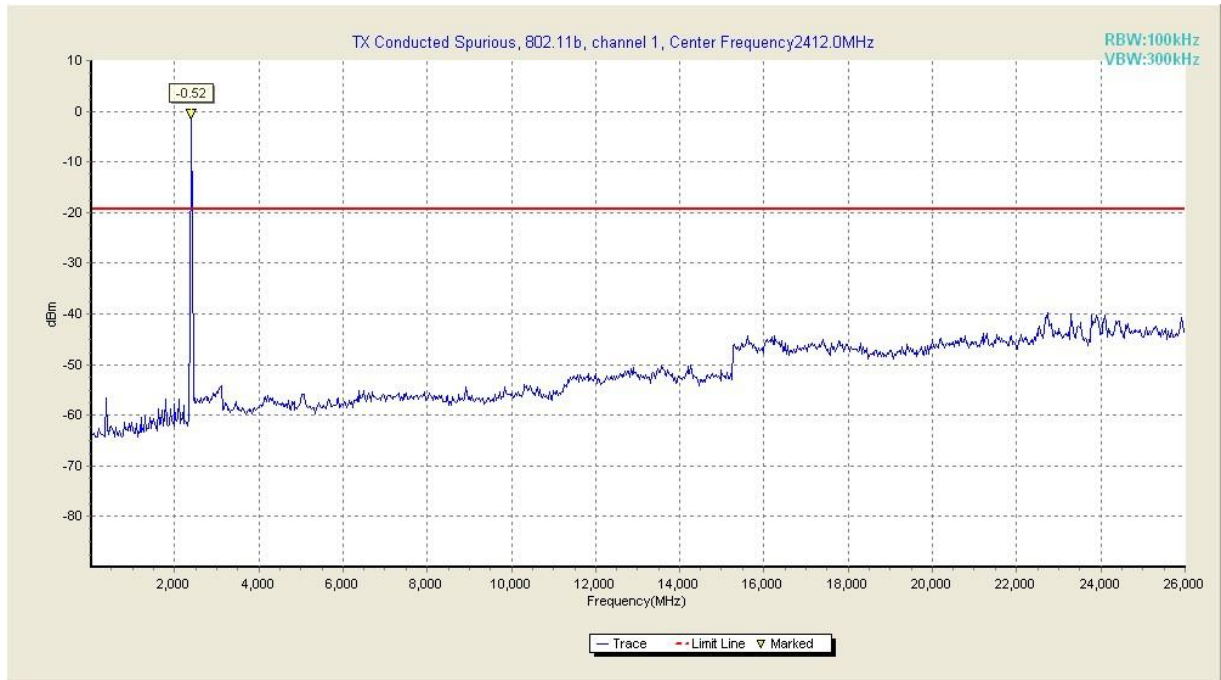


Fig. 38 Conducted Spurious Emission (802.11n-20MHz, Ch1, 30 MHz-26 GHz)

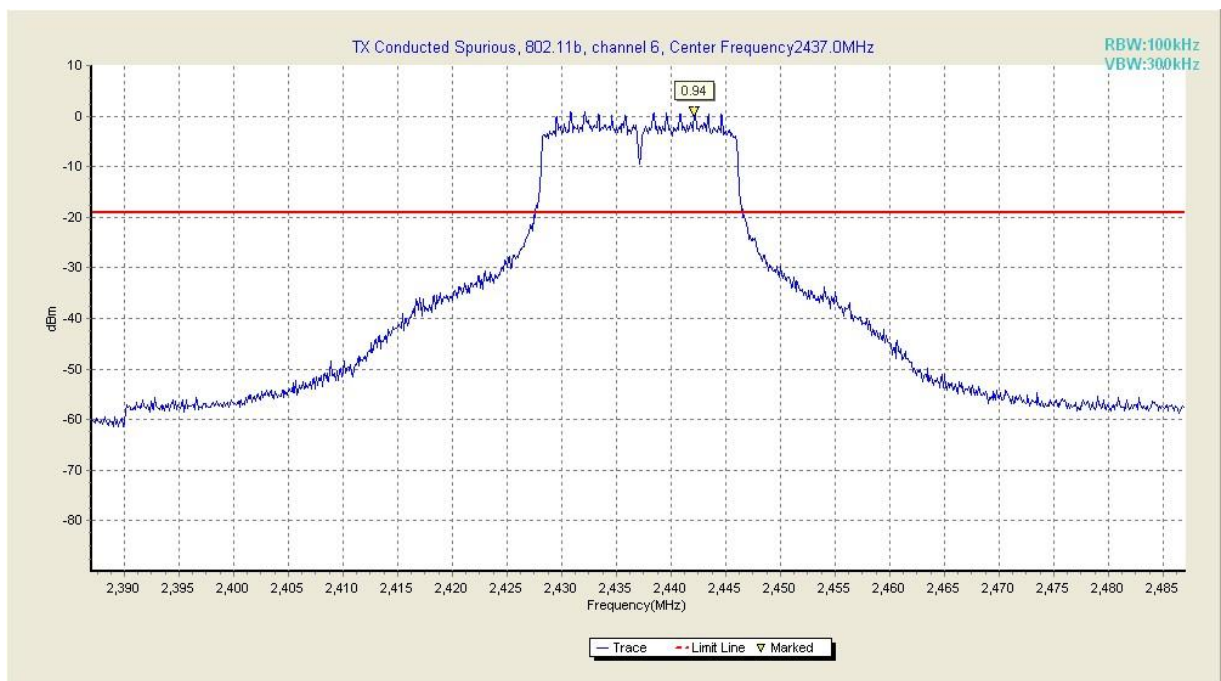


Fig. 39 Conducted Spurious Emission (802.11n-20MHz, Ch6, Center Frequency)

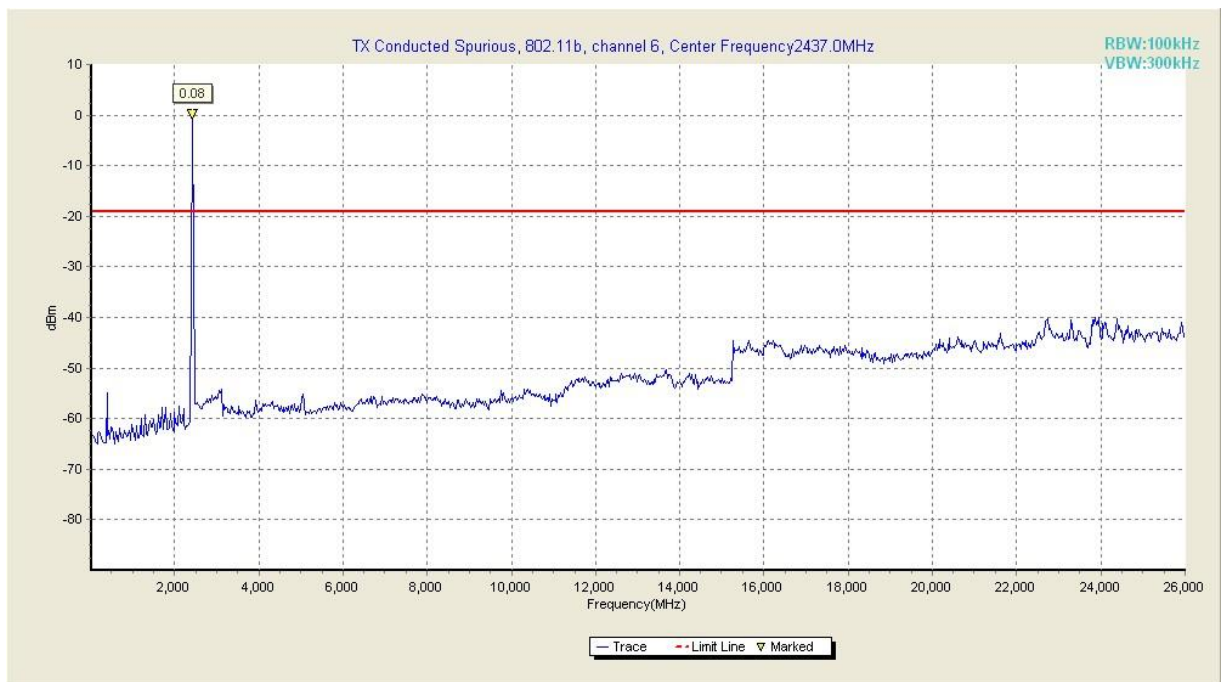


Fig. 40 Conducted Spurious Emission (802.11n-20MHz, Ch6, 30 MHz-26 GHz)

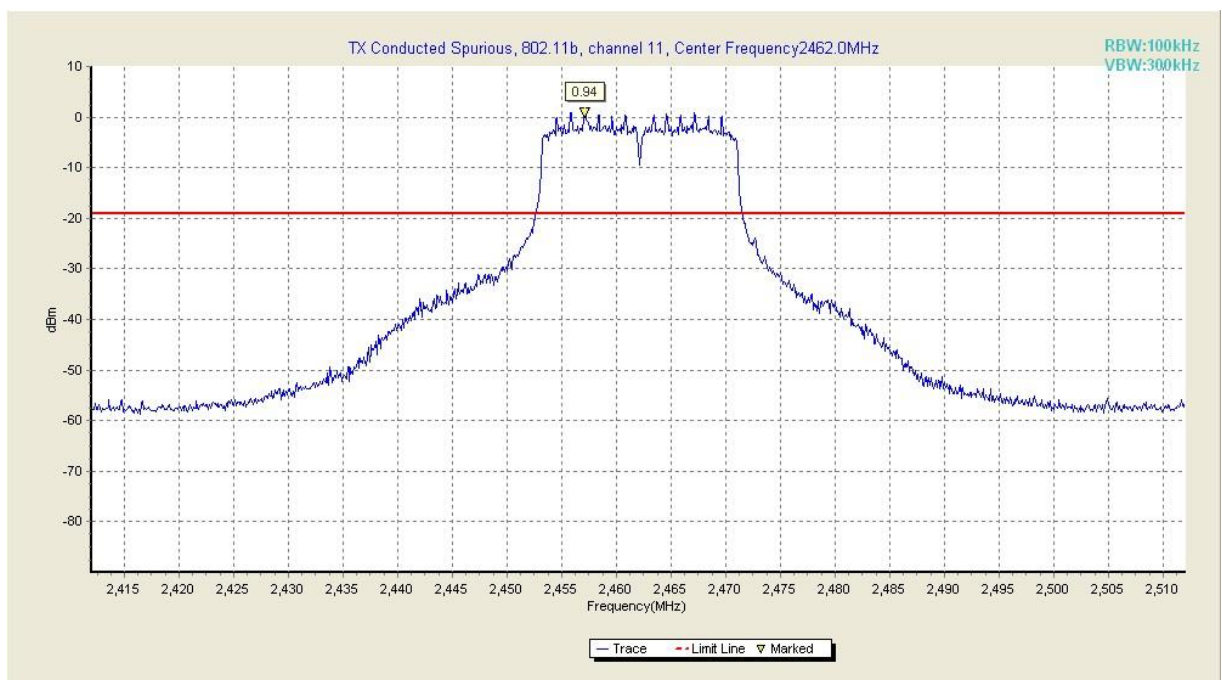


Fig. 41 Conducted Spurious Emission (802.11n-20MHz, Ch11, Center Frequency)

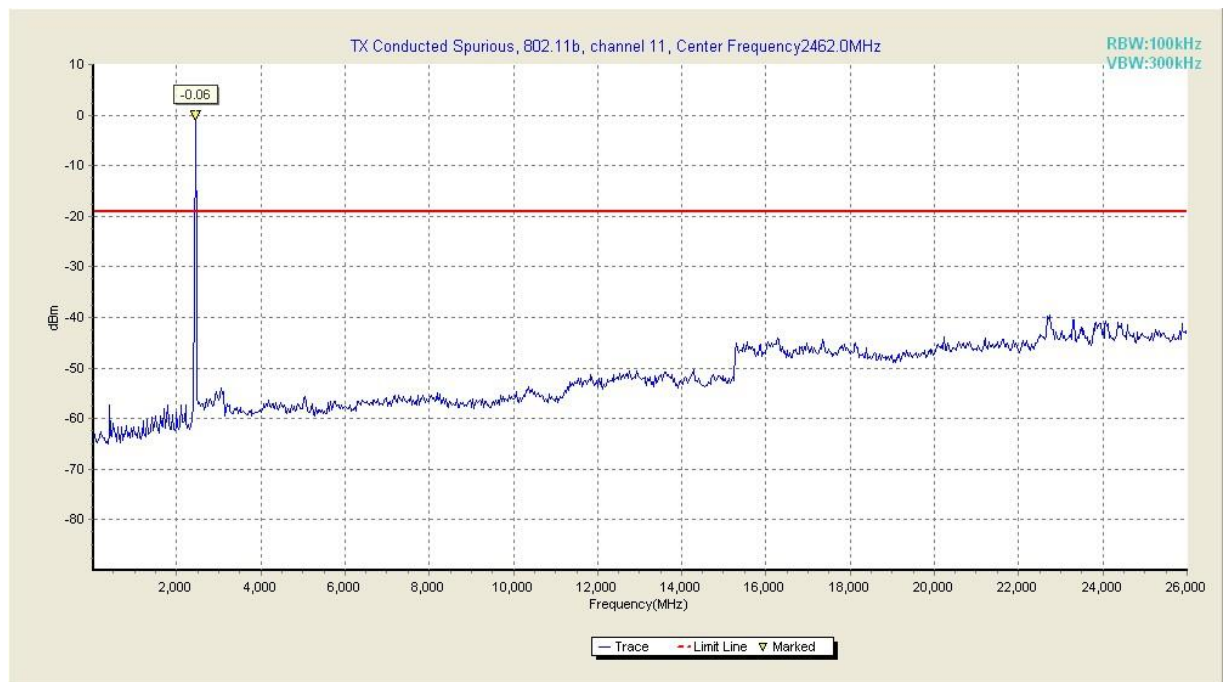


Fig. 42 Conducted Spurious Emission (802.11n-20MHz, Ch11, 30 MHz-26 GHz)

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 D01.

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 ~2.45GHz	Fig.43	P
	1	30 MHz ~1 GHz	Fig.44	P
		1 GHz ~ 4 GHz	Fig.45	P
		4 GHz ~ 18 GHz	Fig.46	P
	6	30 MHz ~1 GHz	Fig.47	P
		1 GHz ~ 4 GHz	Fig.48	P
		4 GHz ~ 18 GHz	Fig.49	P
	Power	2.45GHz ~2.5GHz	Fig.50	P
	11	30 MHz ~1 GHz	Fig.51	P
		1 GHz ~ 4 GHz	Fig.52	P
		4 GHz ~ 18 GHz	Fig.53	P
802.11g	Power	2.38GHz ~2.43GHz	Fig.54	P
	1	30 MHz ~1 GHz	Fig.55	P
		1 GHz ~ 4 GHz	Fig.56	P
		4 GHz ~ 18 GHz	Fig.57	P
	6	30 MHz ~1 GHz	Fig.58	P
		1 GHz ~ 4 GHz	Fig.59	P
		4 GHz ~ 18 GHz	Fig.60	P
	Power	2.45GHz ~2.5GHz	Fig.61	P
	11	30 MHz ~1 GHz	Fig.62	P
		1 GHz ~ 4 GHz	Fig.63	P
		4 GHz ~ 18 GHz	Fig.64	P

802.11n mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n (20MHz)	Power	2.38GHz ~2.45GHz	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
802.11n (40MHz)	Power	2.38GHz ~2.45GHz	/	/
	3	30 MHz ~1 GHz	/	/
		1 GHz ~ 4 GHz	/	/

		4 GHz ~ 18 GHz	/	/
	6	30 MHz ~1 GHz	/	/
		1 GHz ~ 4 GHz	/	/
		4 GHz ~ 18 GHz	/	/
	Power	2.45GHz ~2.5GHz	/	/
	9	30 MHz ~1 GHz	/	/
		1 GHz ~ 4 GHz	/	/
		4 GHz ~ 18 GHz	/	/
/	All channels	18 GHz~ 26.5 GHz	Fig.76	P

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:

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

802.11b
Ch1

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2414.83	84.49	-18.7	27.5	75.69	HORIZONTAL
2410.822	83.66	-18.7	27.5	74.86	HORIZONTAL
2406.814	78.34	-18.7	27.5	69.54	VERTICAL
2418.838	76.42	-18.7	27.5	67.62	VERTICAL
2402.806	58.93	-18.7	27.5	50.13	HORIZONTAL
2422.846	50.86	-18.8	27.5	42.16	VERTICAL

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2438.878	86.18	-18.9	27.5	77.58	HORIZONTAL
2434.87	85.86	-18.9	27.5	77.26	VERTICAL
2442.886	80.9	-18.9	27.5	72.3	VERTICAL
2430.862	76.8	-18.9	27.5	68.2	HORIZONTAL
2446.894	63.18	-18.9	27.5	54.58	HORIZONTAL
2426.854	53.84	-18.8	27.5	45.14	VERTICAL

Ch11

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2462.926	85.06	-18.6	27.5	76.16	VERTICAL
2458.918	83.69	-18.7	27.5	74.89	VERTICAL
2466.934	82.49	-18.6	27.5	73.59	HORIZONTAL
2454.91	73.73	-18.7	27.5	64.93	VERTICAL
2470.942	68.1	-18.4	27.5	59	HORIZONTAL
2450.902	50.86	-18.7	27.5	42.06	HORIZONTAL

802.11g
Ch1

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2418.838	79.92	-18.7	27.5	71.12	HORIZONTAL
2414.83	79.61	-18.7	27.5	70.81	VERTICAL
2406.814	78.45	-18.7	27.5	69.65	HORIZONTAL
2410.822	78.13	-18.7	27.5	69.33	VERTICAL
2402.806	68.18	-18.7	27.5	59.38	VERTICAL
2422.846	60.92	-18.8	27.5	52.22	HORIZONTAL

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2442.886	80.99	-18.9	27.5	72.39	HORIZONTAL
2434.87	80.79	-18.9	27.5	72.19	HORIZONTAL
2438.878	80.66	-18.9	27.5	72.06	VERTICAL
2430.862	79.78	-18.9	27.5	71.18	VERTICAL
2446.894	70.91	-18.9	27.5	62.31	VERTICAL
2426.854	60.93	-18.8	27.5	52.23	HORIZONTAL

Ch11

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2458.918	80.06	-18.7	27.5	71.26	HORIZONTAL
2466.934	80.02	-18.6	27.5	71.12	HORIZONTAL
2462.926	79.2	-18.6	27.5	70.3	VERTICAL
2454.91	78.9	-18.7	27.5	70.1	VERTICAL
2470.942	74.01	-18.4	27.5	64.91	VERTICAL
2450.902	55.36	-18.7	27.5	46.56	HORIZONTAL

802.11n-20MHz
Ch1

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2418.838	79.62	-18.7	27.5	70.82	VERTICAL
2414.83	78.99	-18.7	27.5	70.19	VERTICAL
2406.814	77.87	-18.7	27.5	69.07	HORIZONTAL
2410.822	77.51	-18.7	27.5	68.71	VERTICAL
2402.806	70.56	-18.7	27.5	61.76	HORIZONTAL
2422.846	65.9	-18.8	27.5	57.2	HORIZONTAL

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2442.886	80.48	-18.9	27.5	71.88	HORIZONTAL
2434.87	80.22	-18.9	27.5	71.62	HORIZONTAL
2438.878	80.14	-18.9	27.5	71.54	VERTICAL
2430.862	79.47	-18.9	27.5	70.87	VERTICAL
2446.894	73.35	-18.9	27.5	64.75	HORIZONTAL
2426.854	65.76	-18.8	27.5	57.06	VERTICAL

Ch11

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2466.934	78.44	-18.6	27.5	69.54	HORIZONTAL
2458.918	78.4	-18.7	27.5	69.6	HORIZONTAL
2454.91	78.3	-18.7	27.5	69.5	HORIZONTAL
2462.926	77.53	-18.6	27.5	68.63	VERTICAL
2470.942	74.31	-18.4	27.5	65.21	VERTICAL
2466.934	78.44	-18.6	27.5	69.54	VERTICAL

802.11n-40MHz
Ch3

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
/	/	/	/	/	/
/	/	/	/	/	/
/	/	/	/	/	/
/	/	/	/	/	/
/	/	/	/	/	/
/	/	/	/	/	/

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
/	/	/	/	/	/
/	/	/	/	/	/
/	/	/	/	/	/
/	/	/	/	/	/
/	/	/	/	/	/
/	/	/	/	/	/

Ch9

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
/	/	/	/	/	/
/	/	/	/	/	/
/	/	/	/	/	/
/	/	/	/	/	/
/	/	/	/	/	/
/	/	/	/	/	/

Test graphs as below:

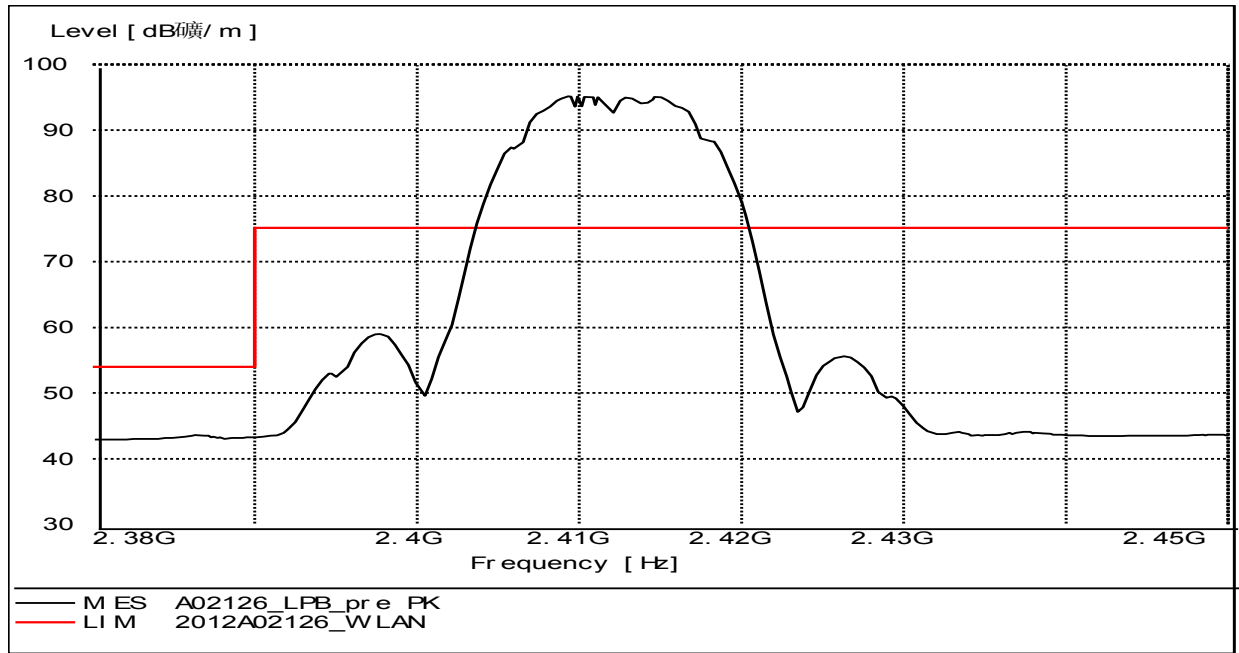


Fig. 43 Radiated Spurious Emission (Power): 802.11b, ch1, 2.38 GHz - 245GHz

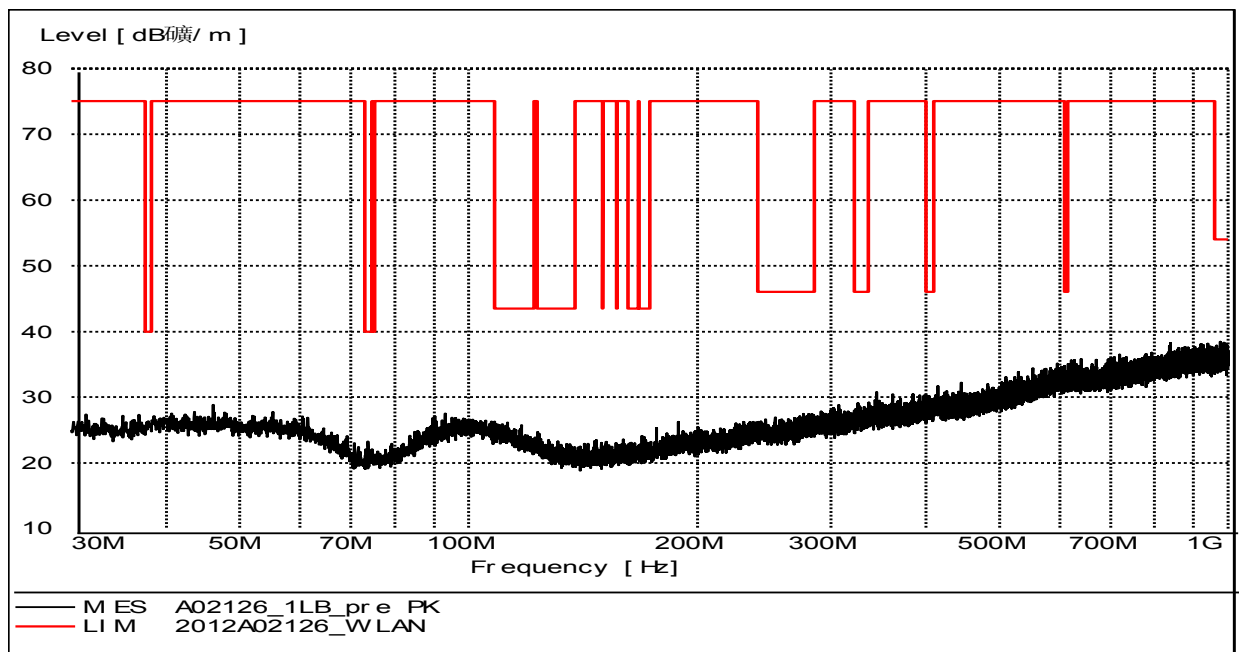


Fig. 44 Radiated Spurious Emission (802.11b, Ch1, 30 MHz-1 GHz)

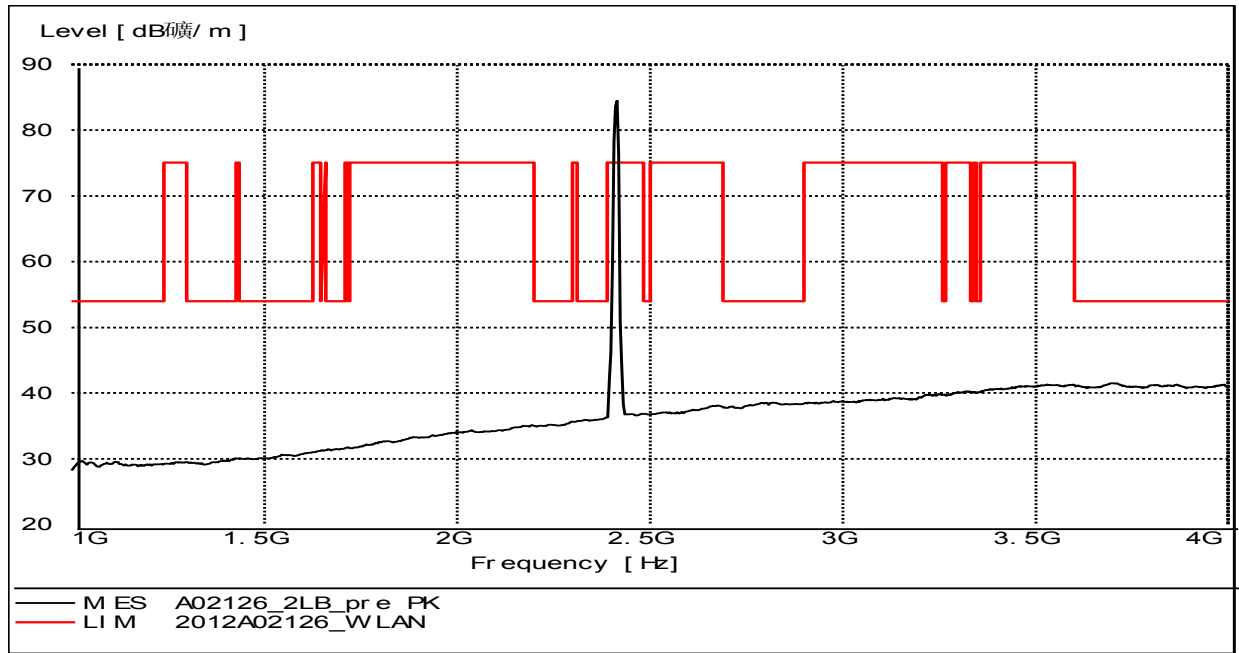


Fig. 45 Radiated Spurious Emission (802.11b, Ch1, 1 GHz-4 GHz)

FCC 4-18G

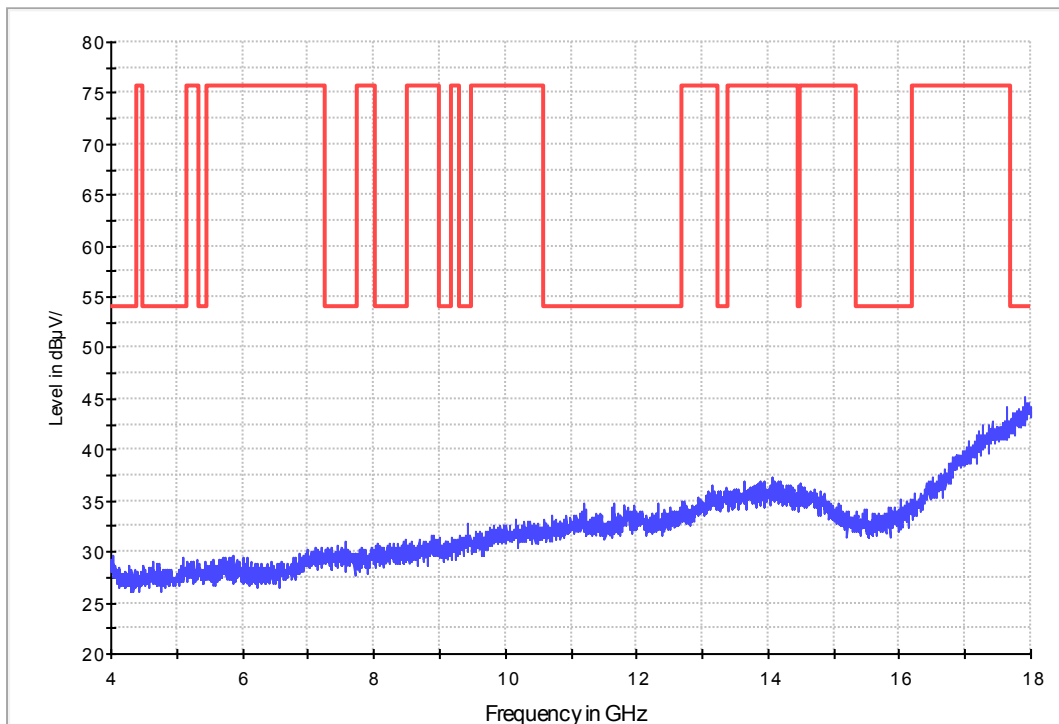


Fig. 46 Radiated Spurious Emission (802.11b, Ch1, 4 GHz-18 GHz)

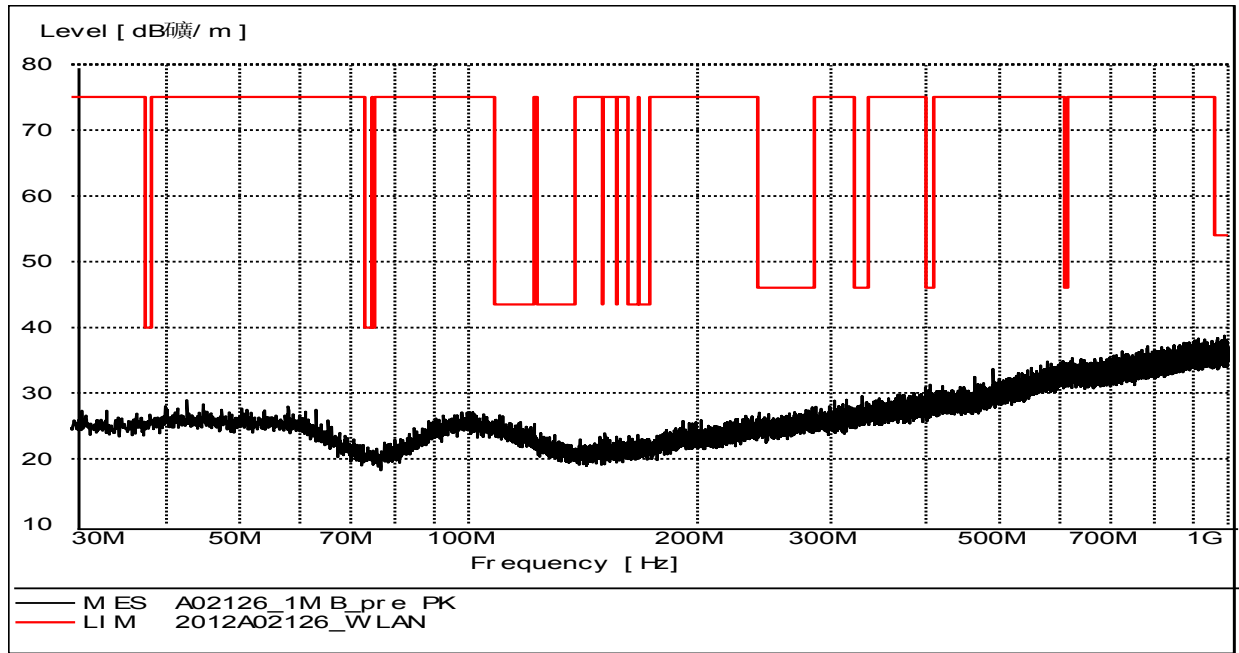


Fig. 47 Radiated Spurious Emission (802.11b, Ch6, 30 MHz-1 GHz)

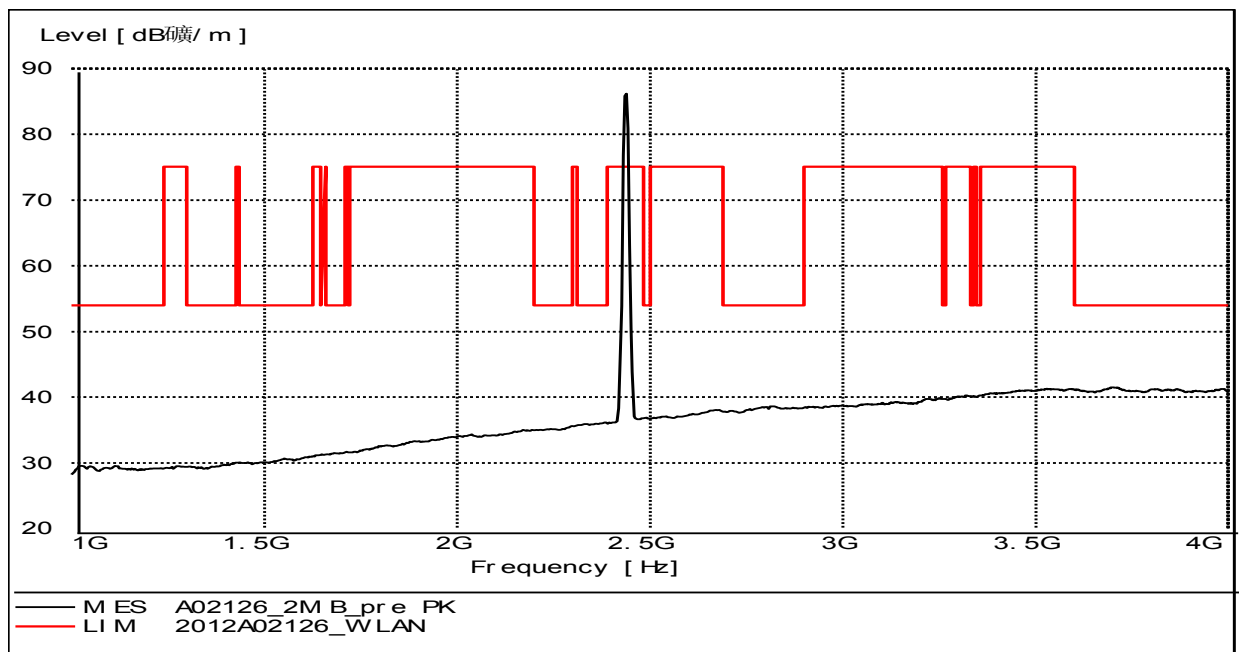


Fig. 48 Radiated Spurious Emission (802.11b, Ch6, 1 GHz-4 GHz)

FCC 4-18G

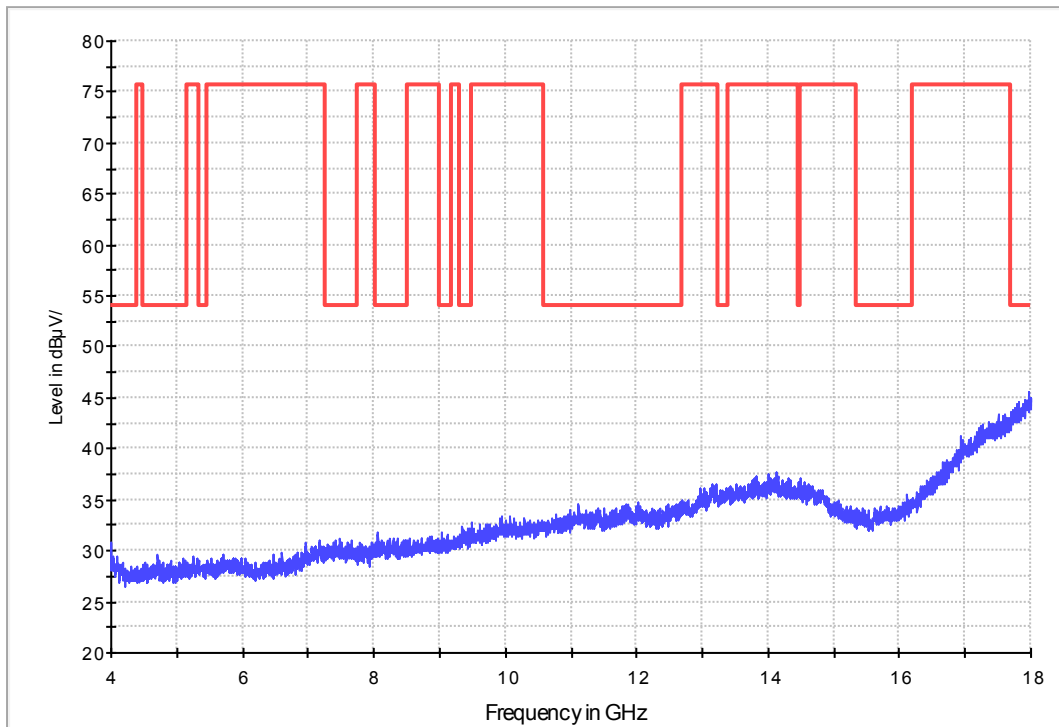


Fig. 49 Radiated Spurious Emission (802.11b, Ch6, 4 GHz-18 GHz)

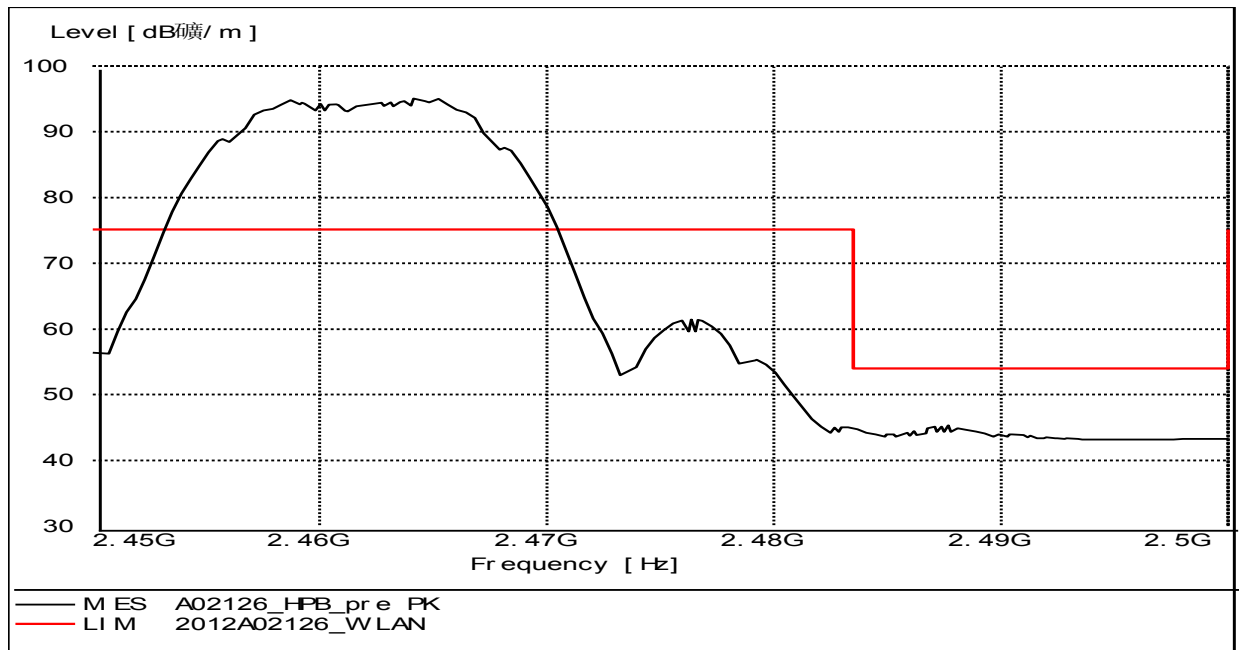


Fig. 50 Radiated Spurious Emission (Power): 802.11b, ch11, 2.45 GHz - 2.50GHz

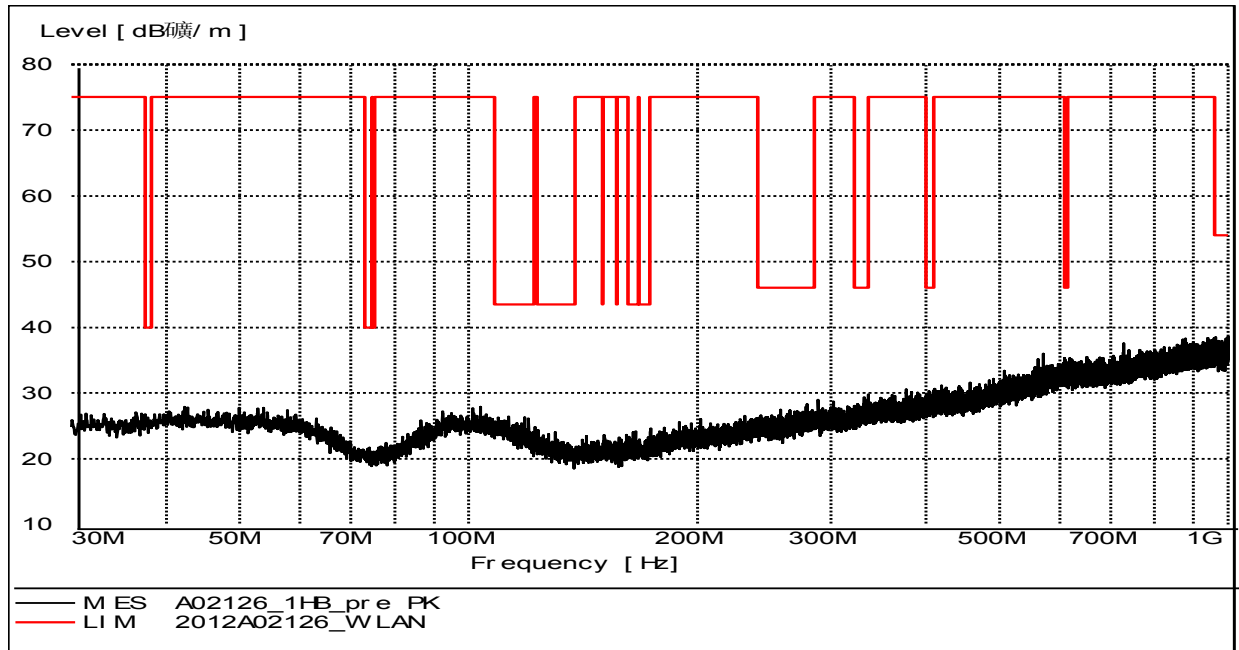


Fig. 51 Radiated Spurious Emission (802.11b, Ch11, 30 MHz-1 GHz)

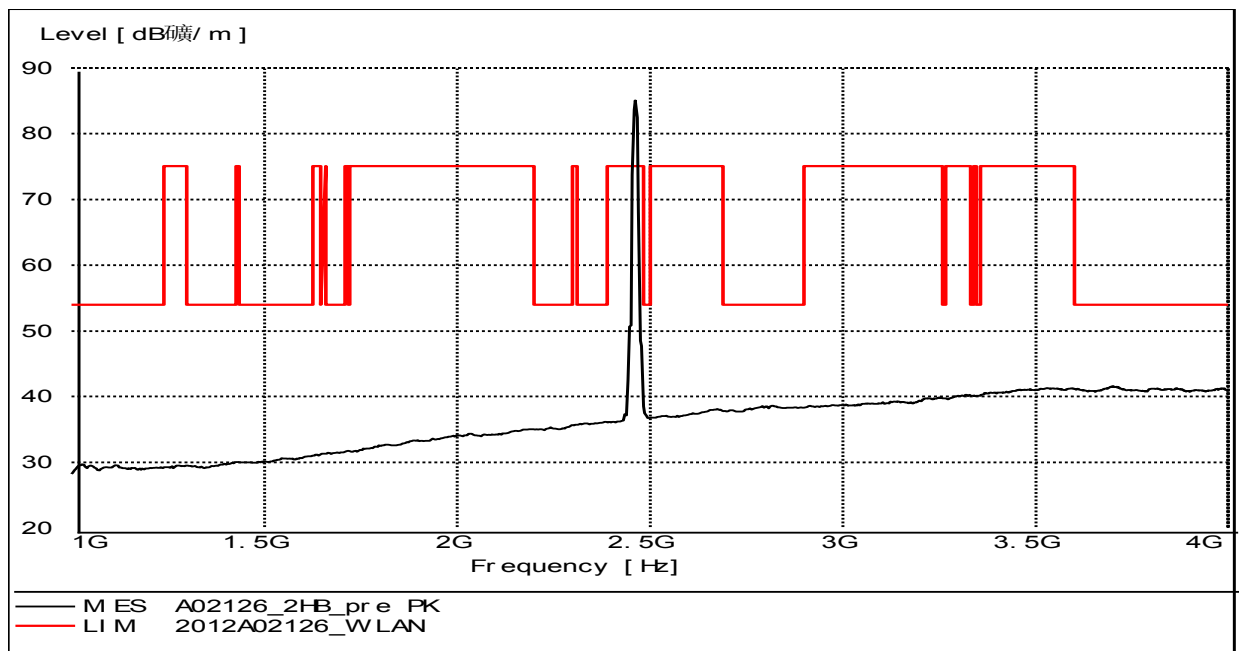


Fig. 52 Radiated Spurious Emission (802.11b, Ch11, 1 GHz-4 GHz)

FCC 4-18G

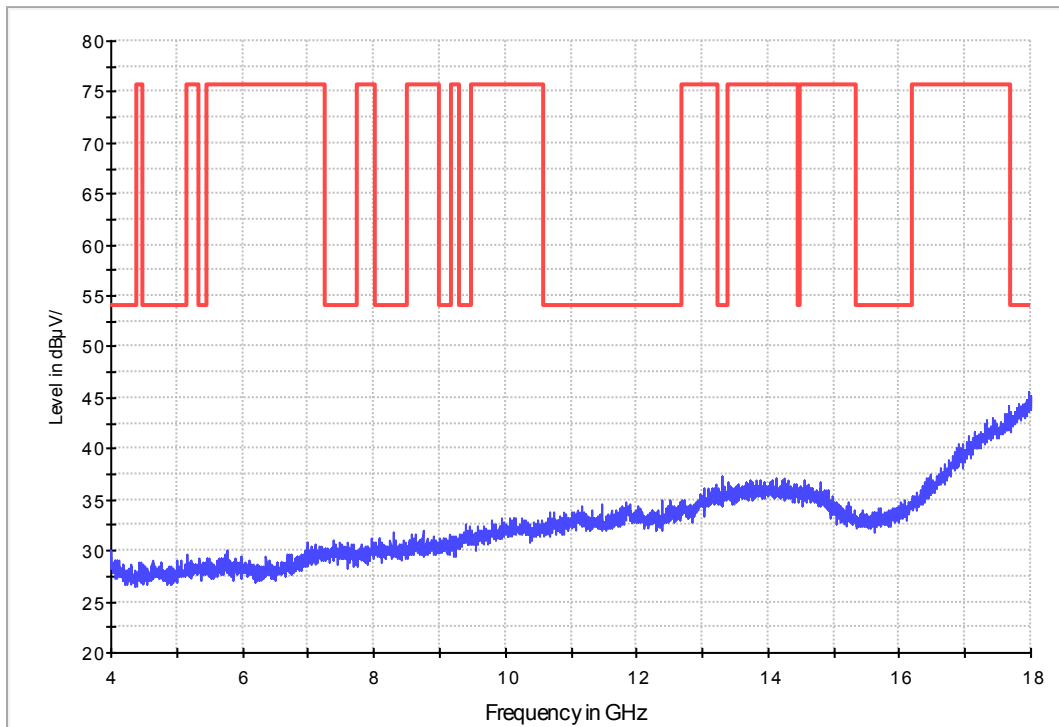


Fig. 53 Radiated Spurious Emission (802.11b, Ch11, 4 GHz-18 GHz)

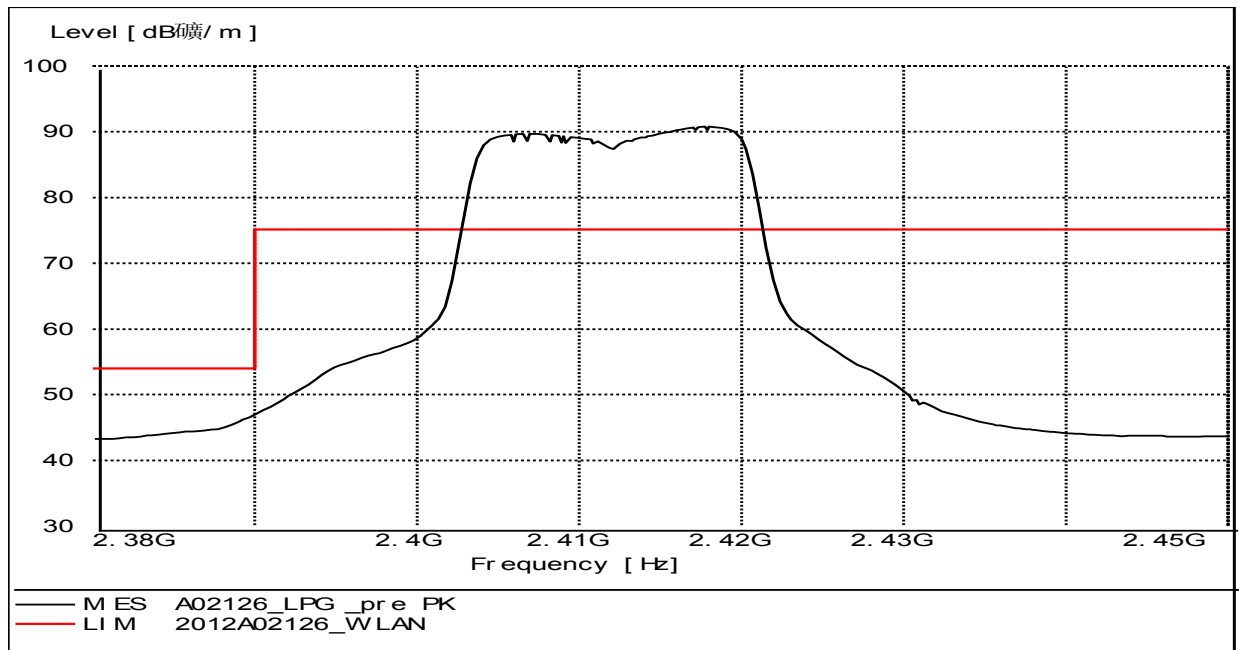


Fig. 54 Radiated Spurious Emission (Power): 802.11g, ch1, 2.38 GHz - 2.45GHz

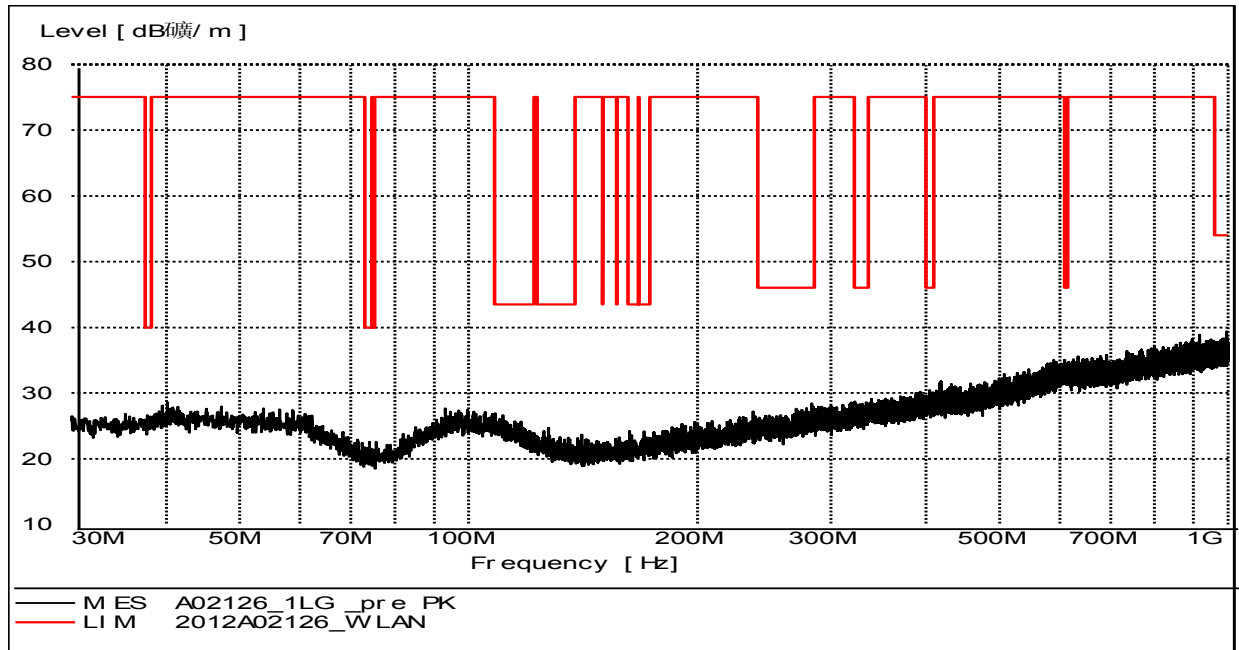


Fig. 55 Radiated Spurious Emission (802.11g, Ch1, 30 MHz-1 GHz)

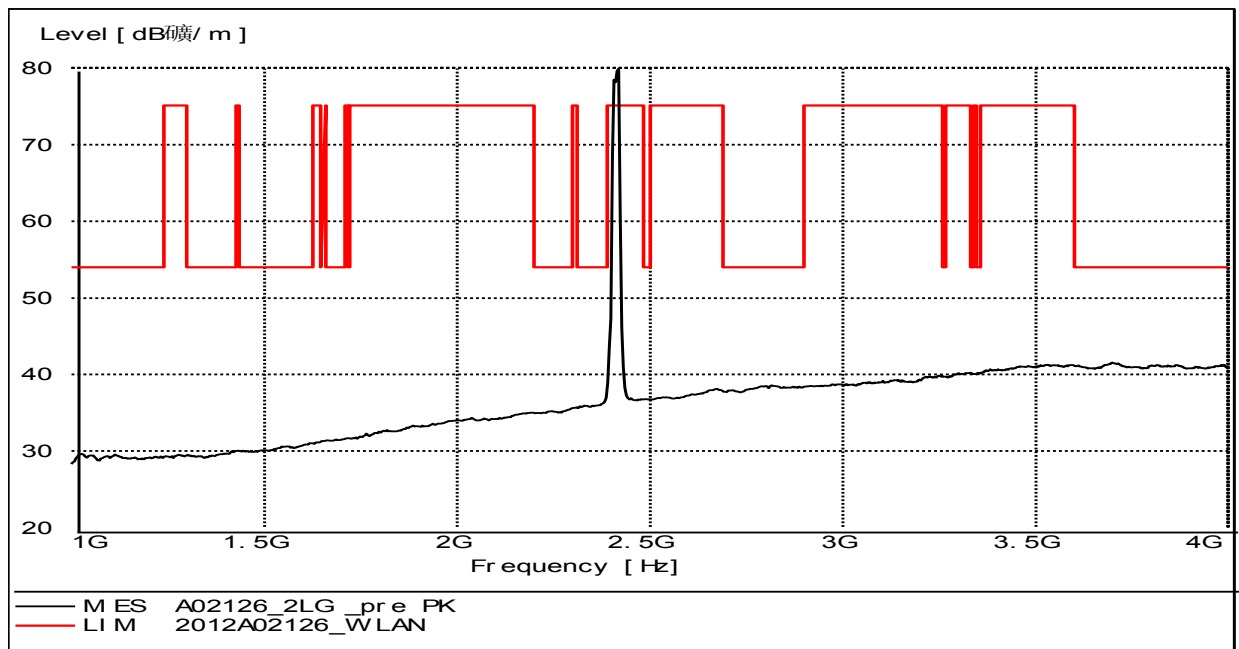


Fig. 56 Radiated Spurious Emission (802.11g, Ch1, 1 GHz-4 GHz)

FCC 4-18G

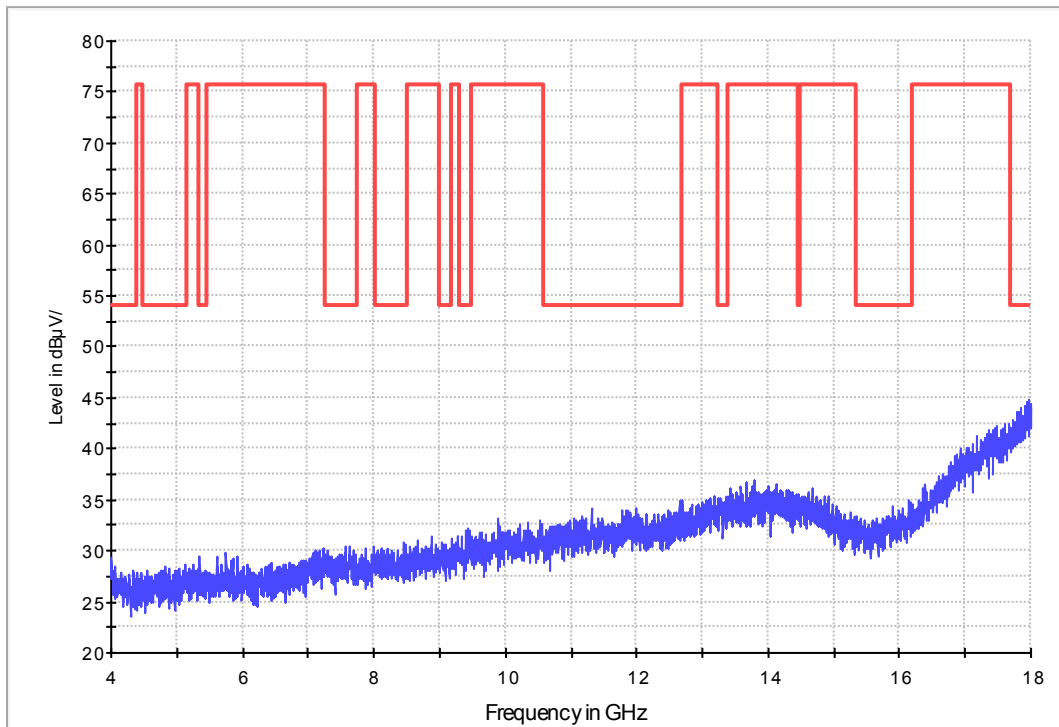


Fig. 57 Radiated Spurious Emission (802.11g, Ch1, 4 GHz-18 GHz)

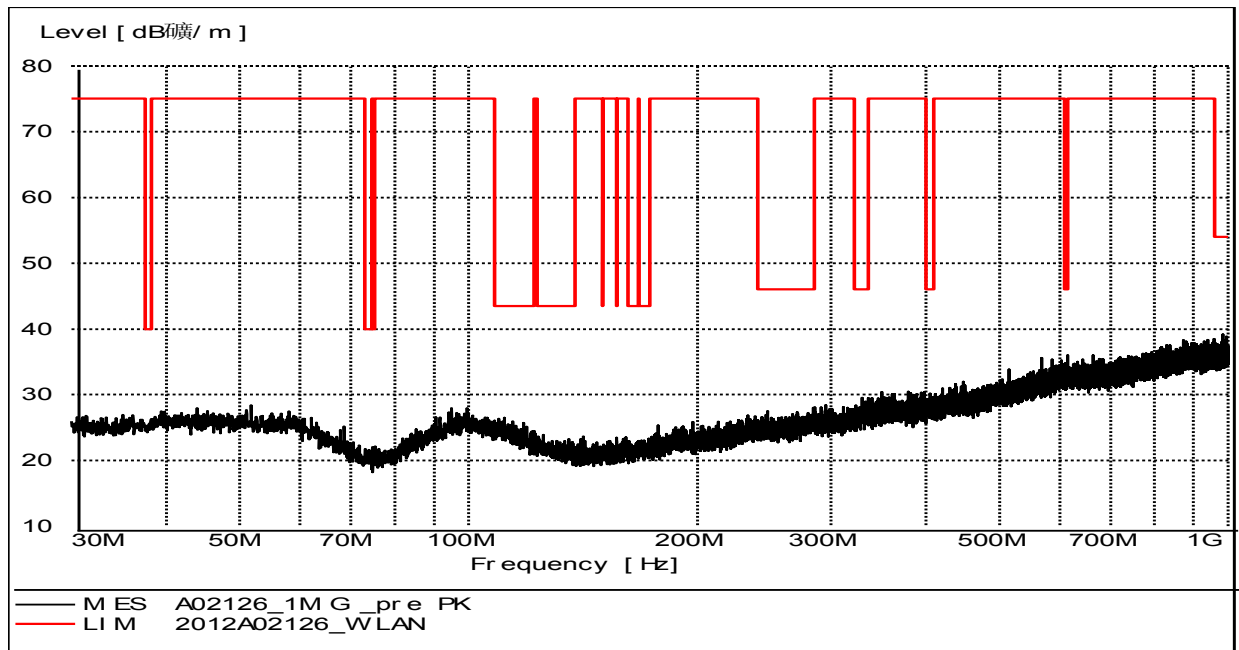


Fig. 58 Radiated Spurious Emission (802.11g, Ch6, 30 MHz-1 GHz)

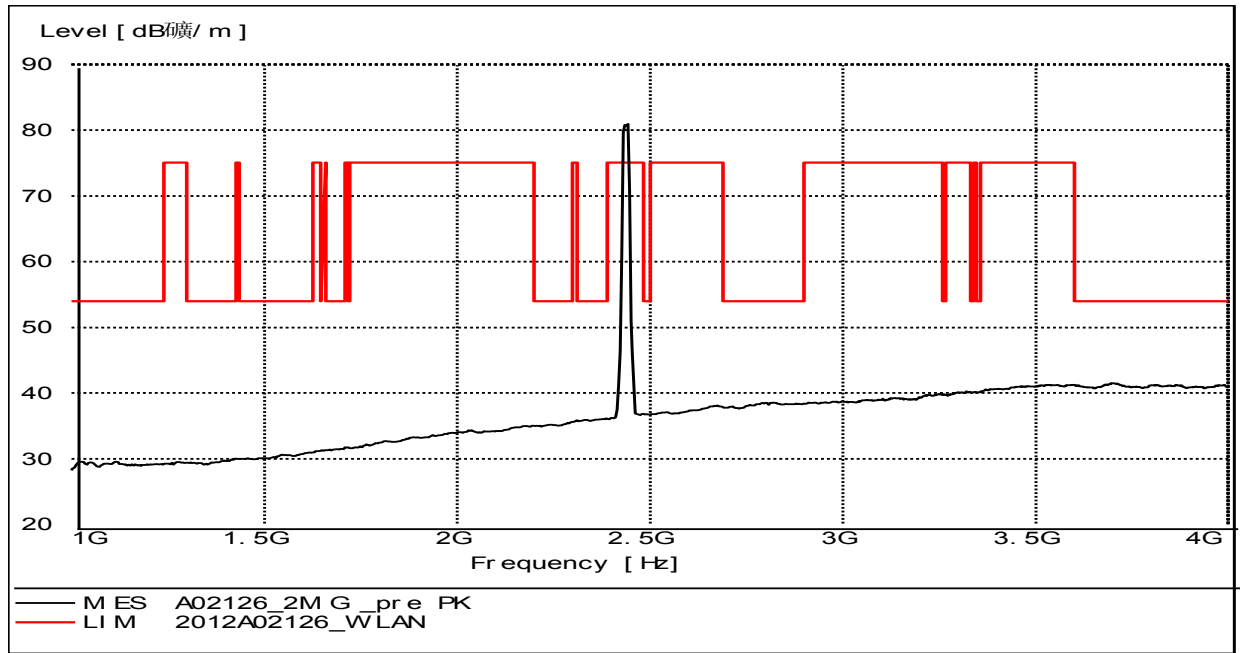
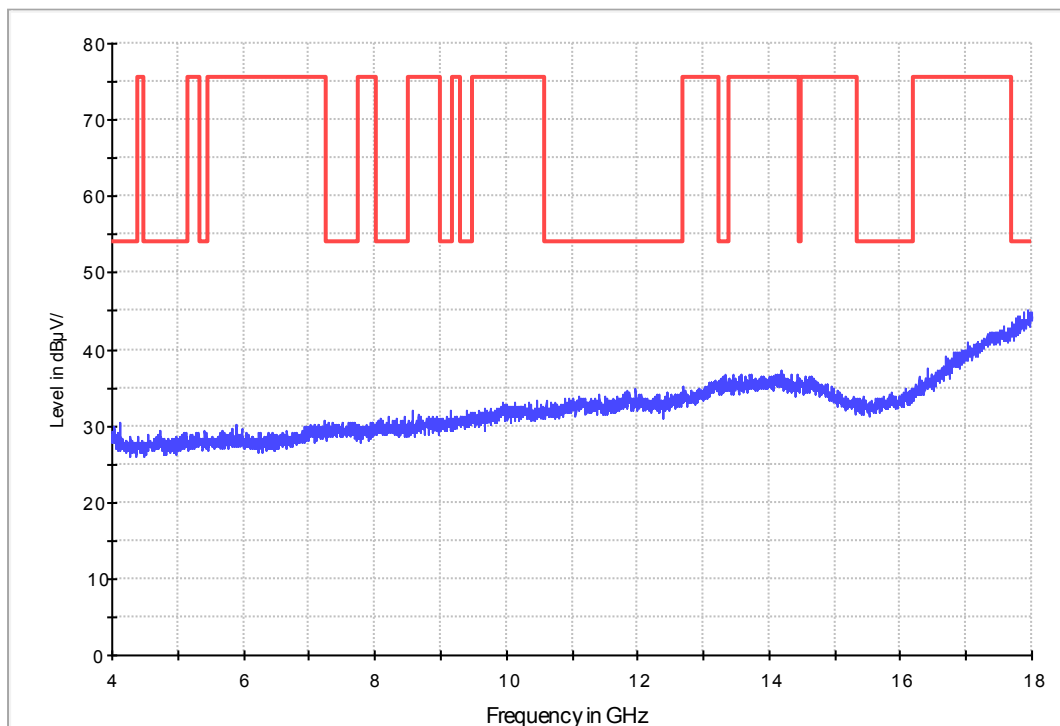


Fig. 59 Radiated Spurious Emission (802.11g, Ch6, 1 GHz-4 GHz)

FCC 4-18G



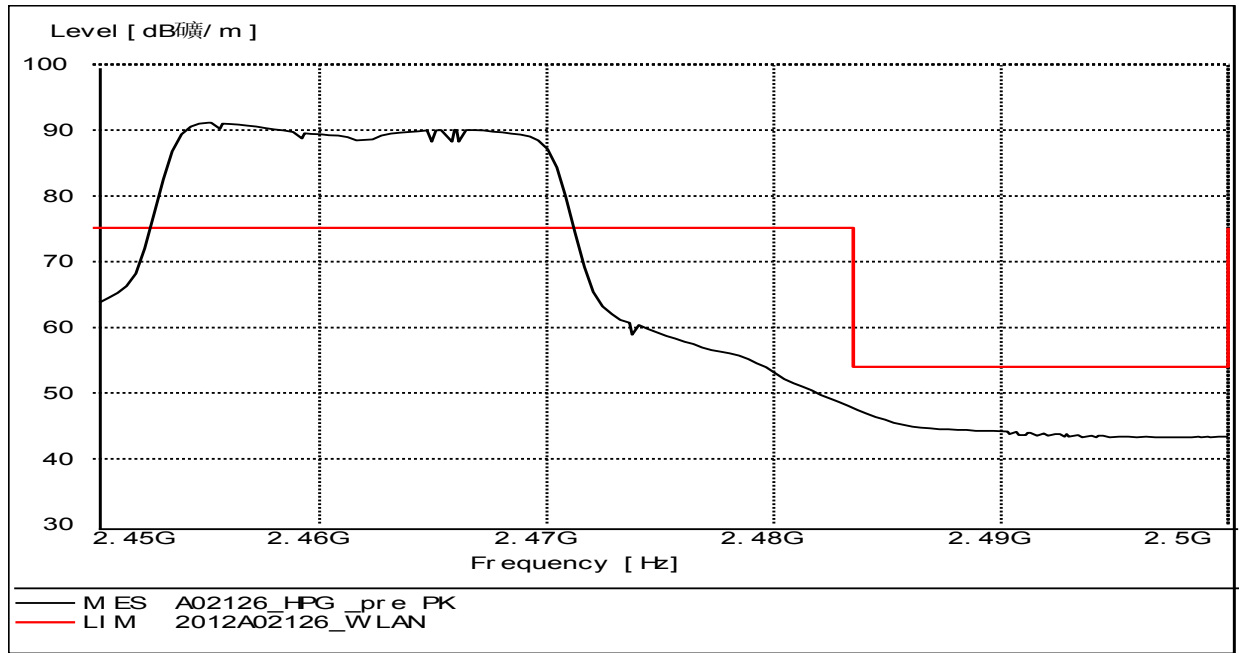


Fig. 61 Radiated Spurious Emission (Power): 802.11g, ch11, 2.45 GHz - 2.50GHz

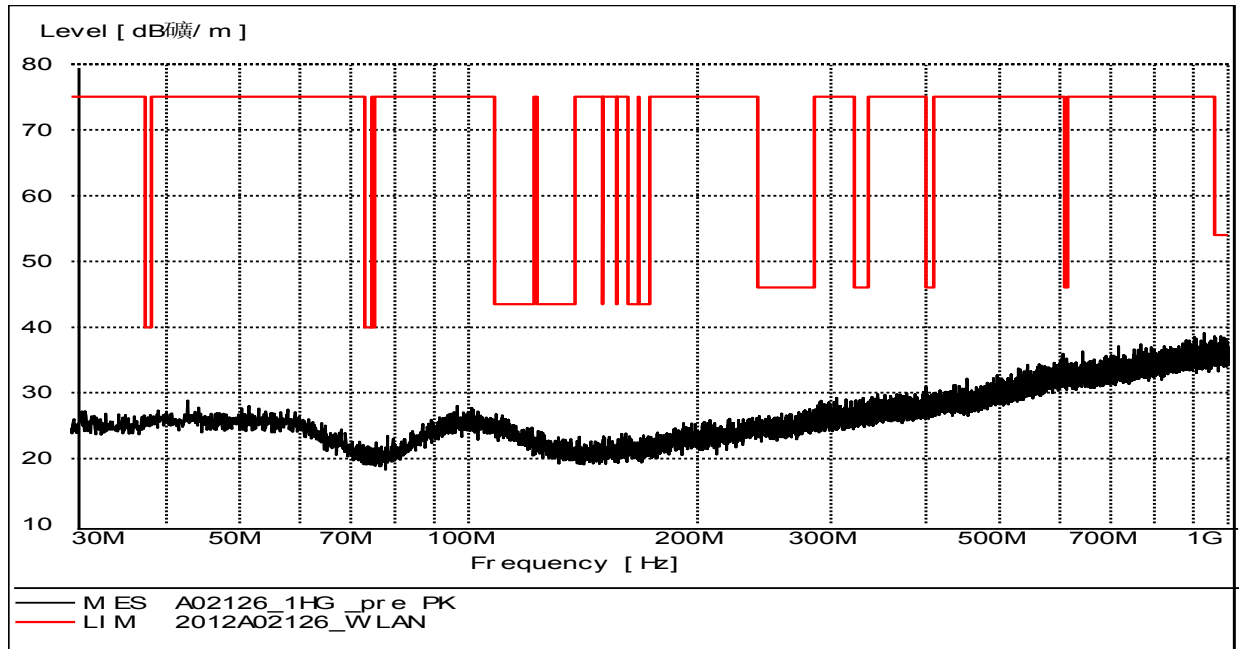


Fig. 62 Radiated Spurious Emission (802.11g, Ch11, 30 MHz-1 GHz)

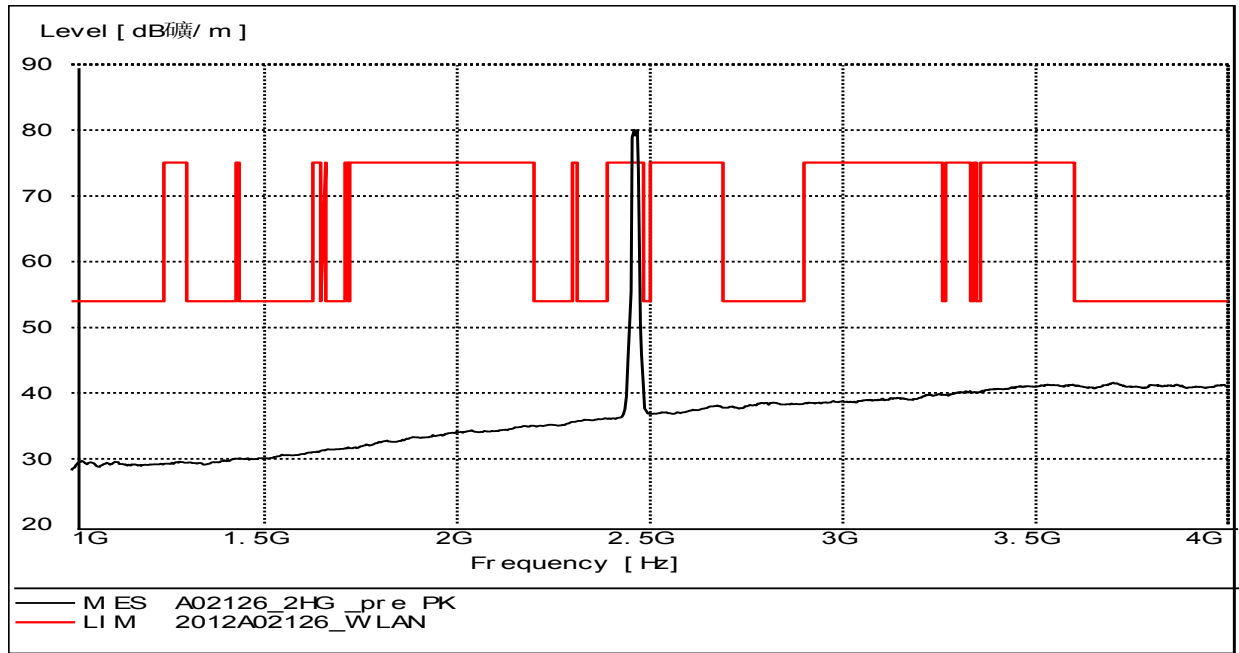


Fig. 63 Radiated Spurious Emission (802.11g, Ch11, 1 GHz-4 GHz)

FCC 4-18G

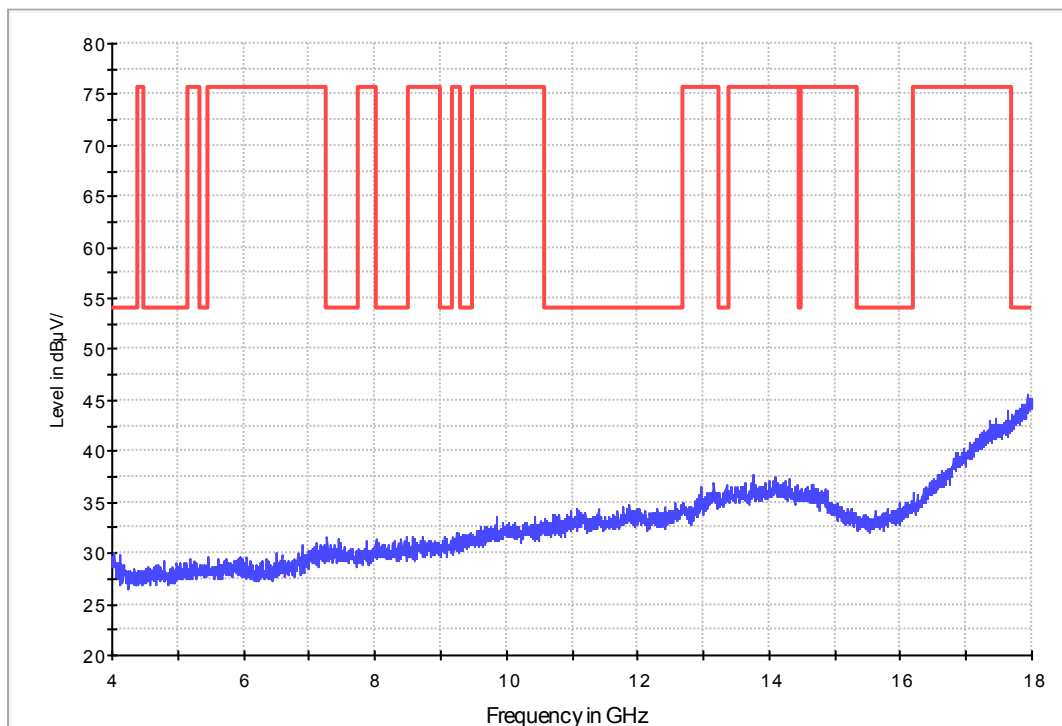


Fig. 64 Radiated Spurious Emission (802.11g, Ch11, 4 GHz-18 GHz)

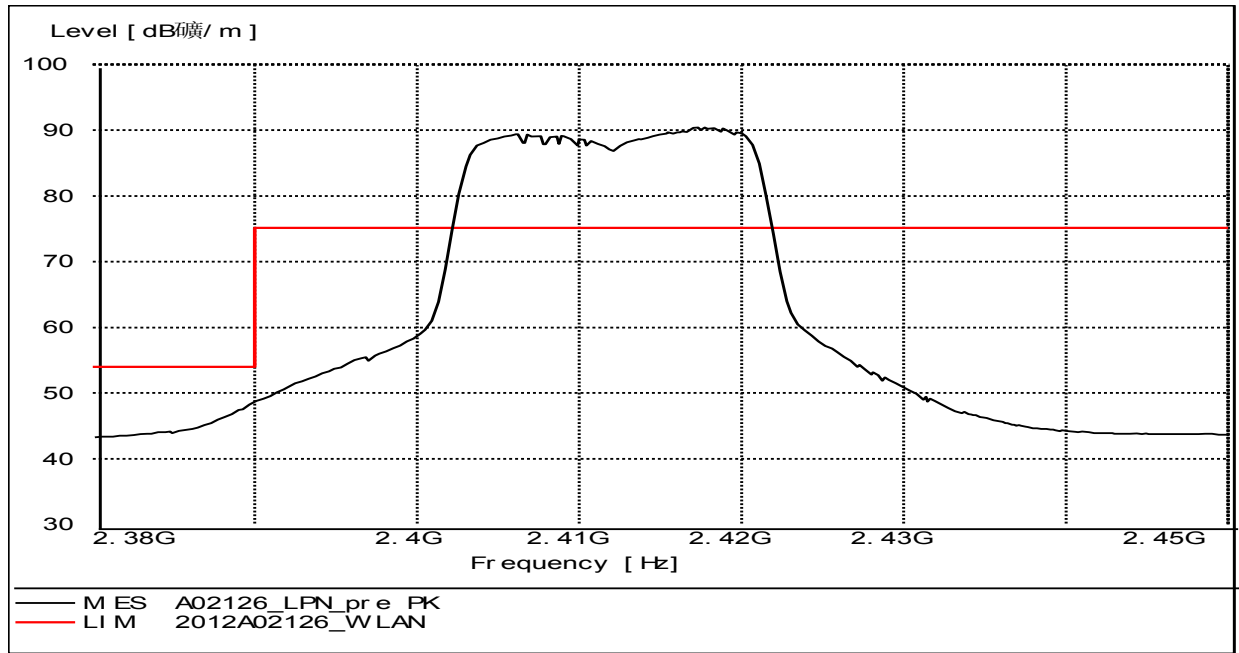


Fig. 65 Radiated Spurious Emission (Power): 802.11n-20MHz, ch1, 2.38 GHz - 2.45GHz

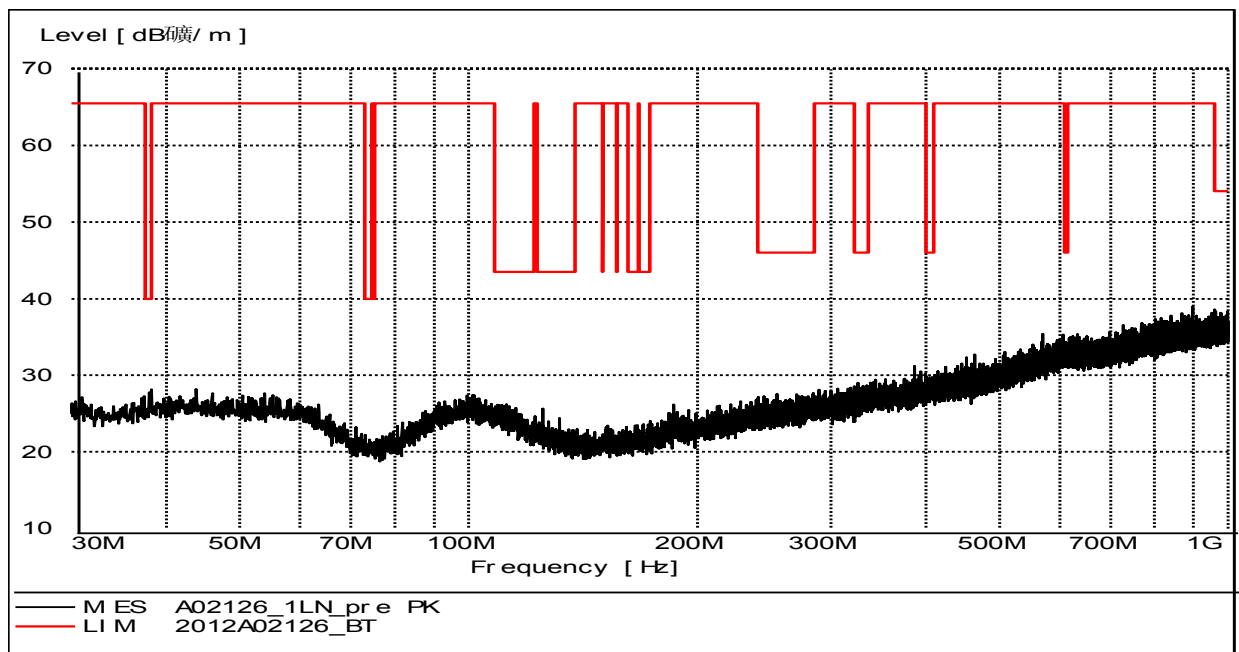


Fig. 66 Radiated Spurious Emission (802.11n-20MHz, Ch1, 30 MHz-1 GHz)

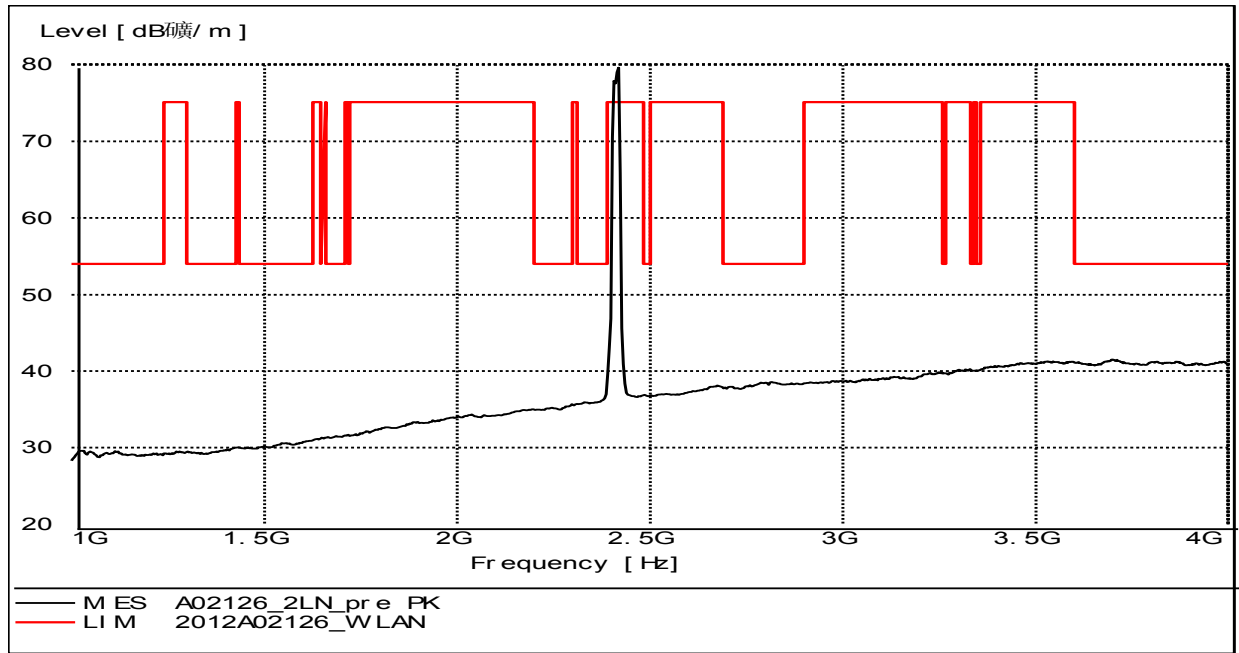


Fig. 67 Radiated Spurious Emission (802.11n-20MHz, Ch1, 1 GHz-4 GHz)

FCC 4-18G

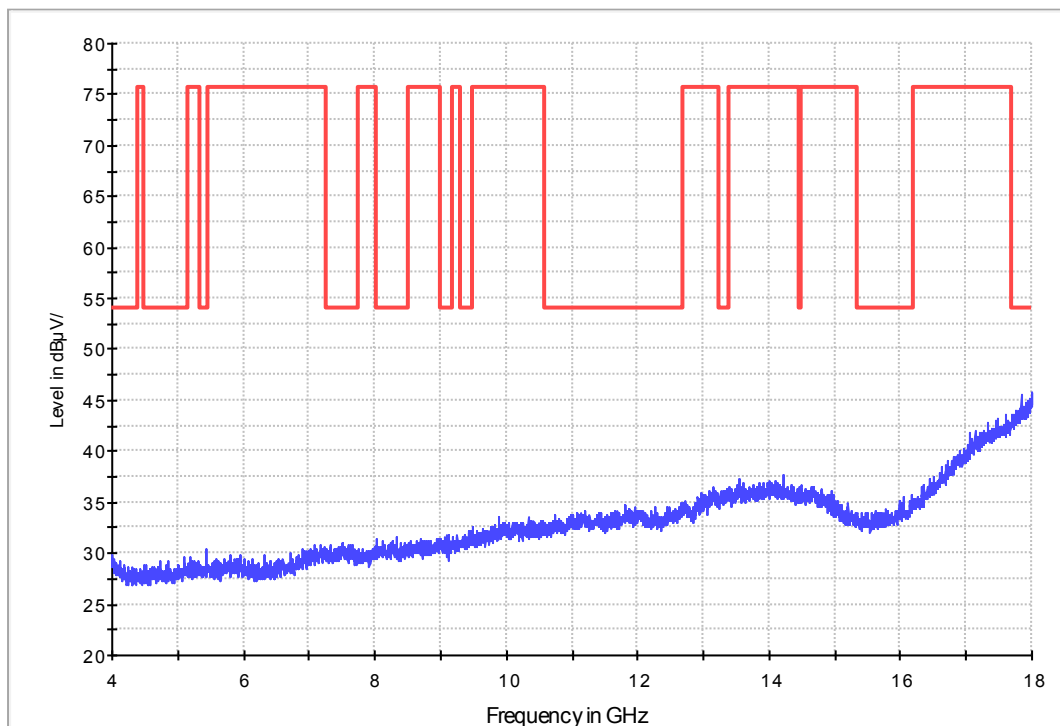


Fig. 68 Radiated Spurious Emission (802.11n-20MHz, Ch1, 4 GHz-18 GHz)

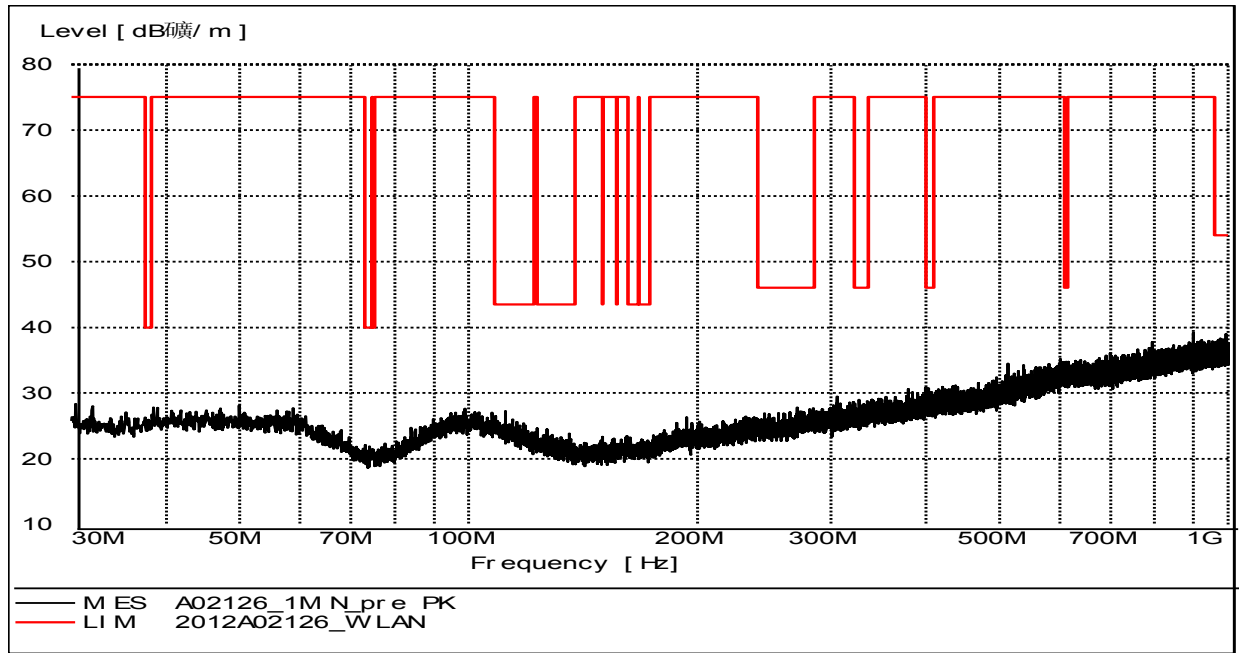


Fig. 69 Radiated Spurious Emission (802.11n-20MHz, Ch6, 30 MHz-1 GHz)

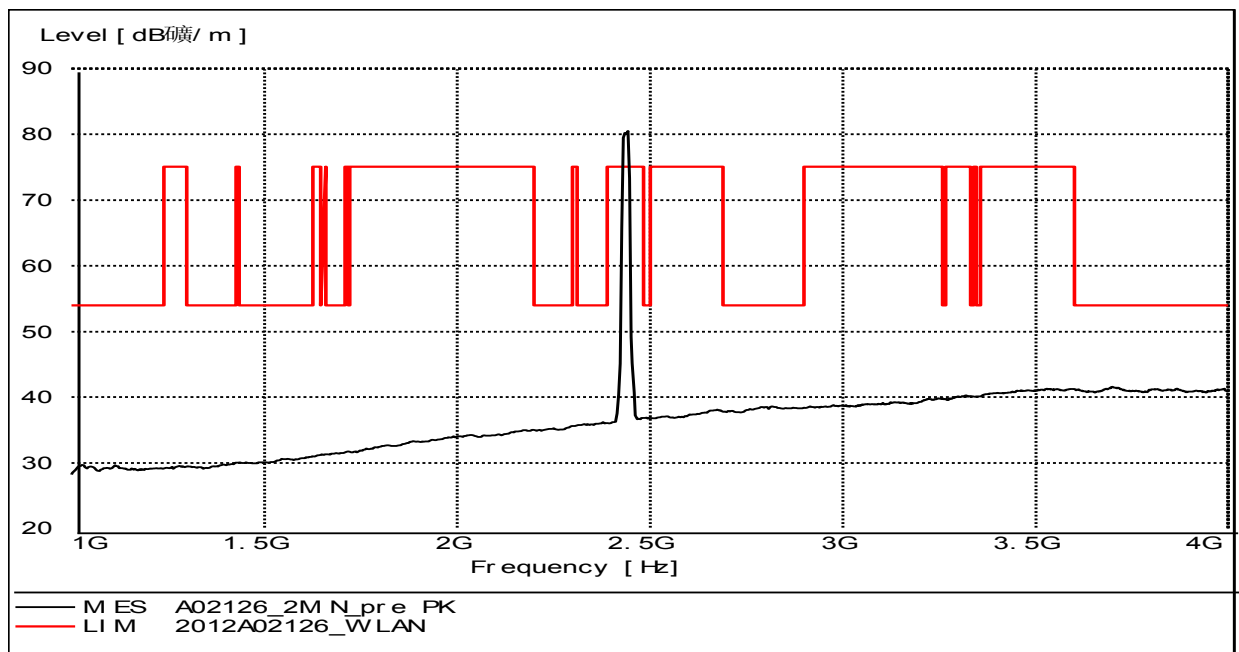


Fig. 70 Radiated Spurious Emission (802.11n-20MHz, Ch6, 1 GHz-4 GHz)

FCC 4-18G

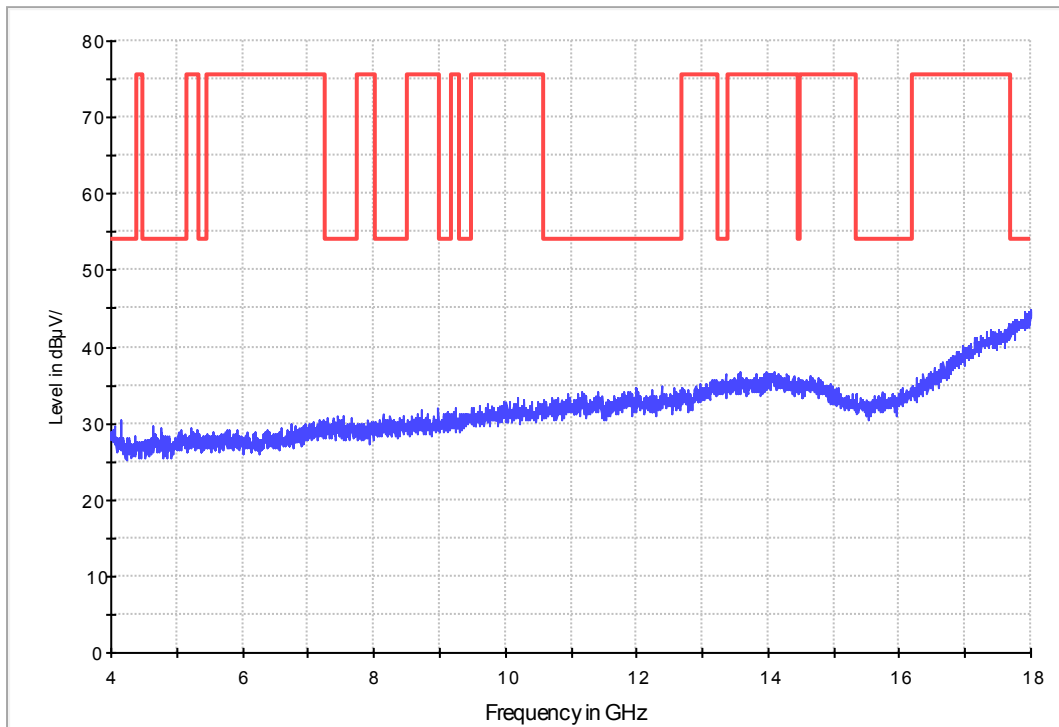


Fig. 71 Radiated Spurious Emission (802.11n-20MHz, Ch6, 4 GHz-18 GHz)

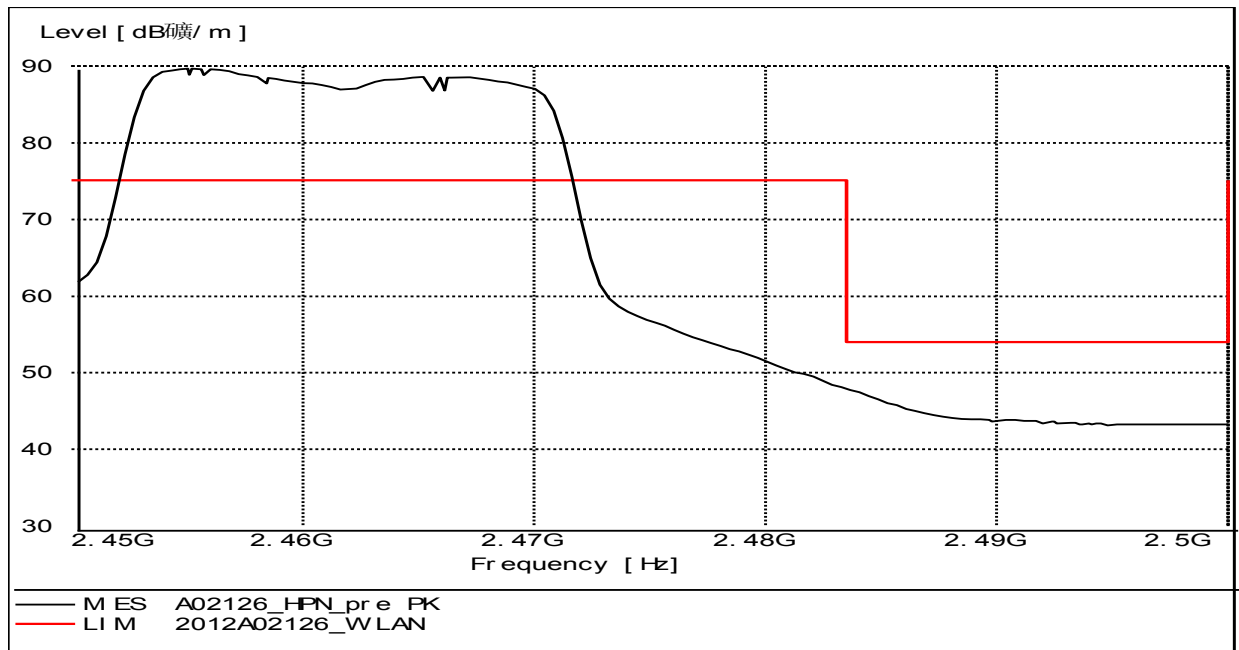


Fig. 72 Radiated Spurious Emission (Power): 802.11n-20MHz, ch11, 2.45 GHz - 2.50GHz

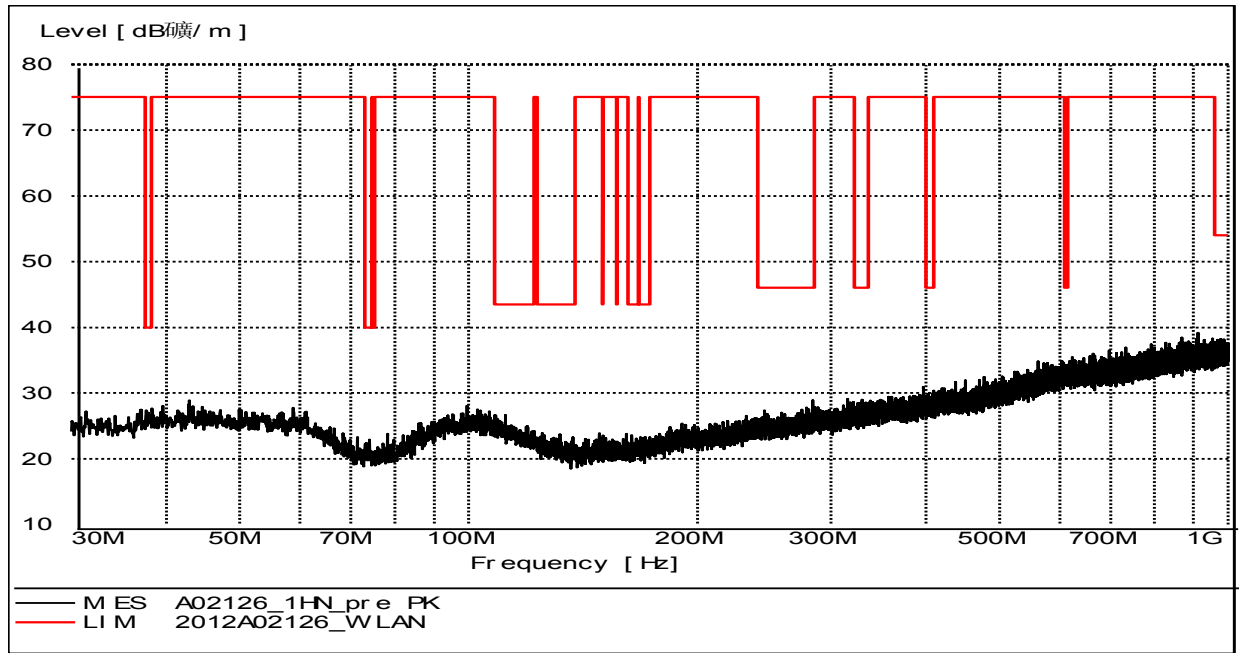


Fig. 73 Radiated Spurious Emission (802.11n-20MHz, Ch11, 30 MHz-1 GHz)

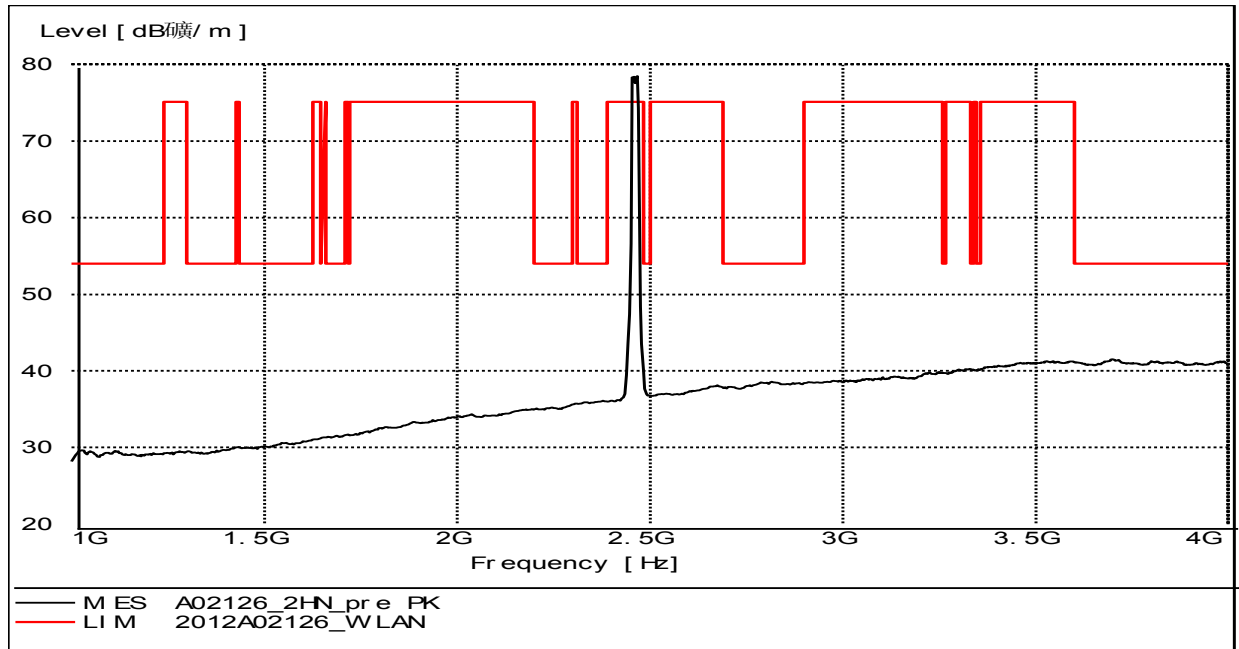


Fig. 74 Radiated Spurious Emission (802.11n-20MHz, Ch11, 1 GHz-4 GHz)

FCC 4-18G

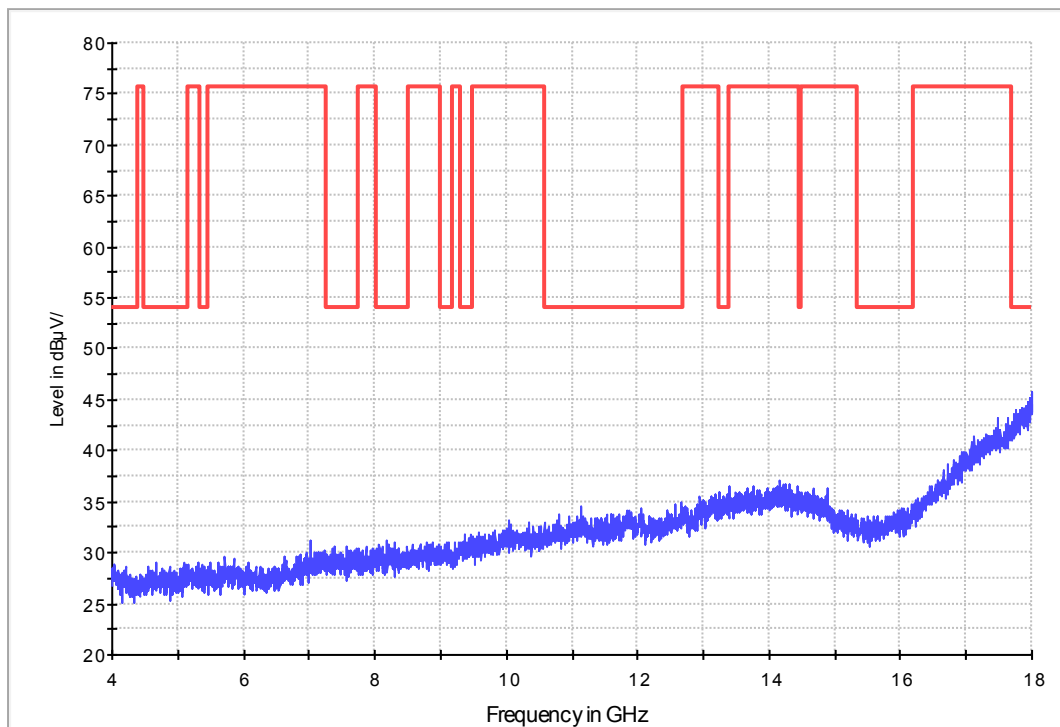


Fig. 75 Radiated Spurious Emission (802.11n-20MHz, Ch11, 4 GHz-18 GHz)

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 (dBμV)	Result (dBμV)			Conclusion
		With charger			
		802.11b	802.11g	802.11n	
0.15 to 0.5	66 o 56	Fig. 77	Fig.78	Fig.79	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 (dBμV)	Result (dBμV)			Conclusion
		With charger			
		802.11b	802.11g	802.11n	
0.15 to 0.5	56 to 46	Fig.77	Fig.78	Fig.79	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 D01

Conclusion: PASS

Test graphs as below:

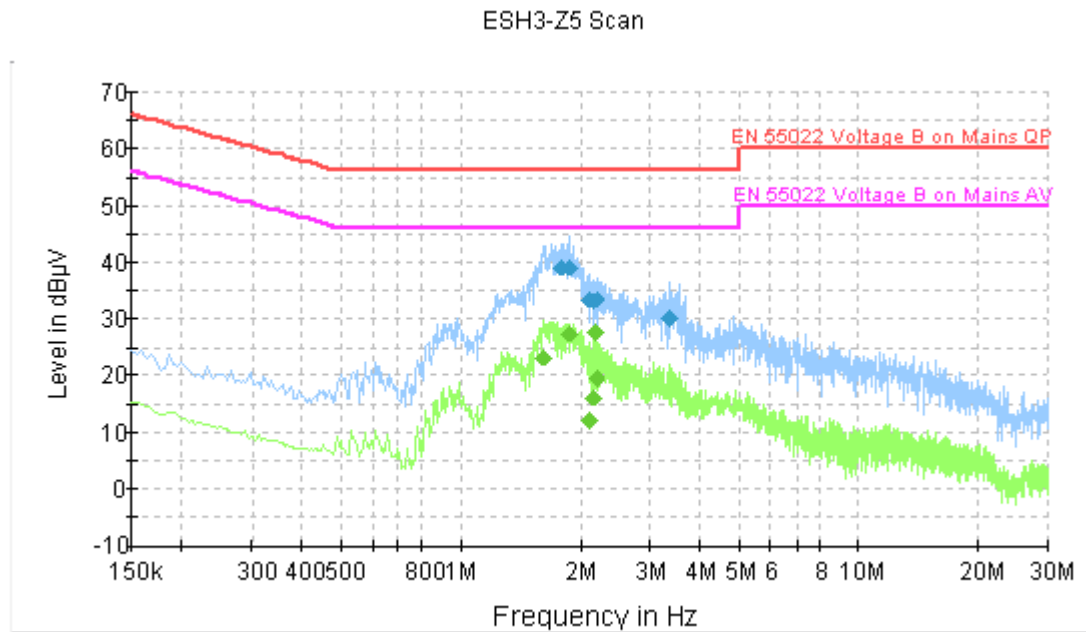


Fig. 76 AC Powerline Conducted Emission-802.11b

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.792500	39.0	GND	L1	9.8	17.0	56.0
1.878000	38.9	GND	L1	9.8	17.1	56.0
2.110855	33.5	GND	L1	9.8	22.5	56.0
2.166401	33.1	GND	L1	9.8	22.9	56.0
2.196913	33.3	GND	L1	9.8	22.7	56.0
3.362309	29.9	GND	L1	9.8	26.1	56.0

Final Result 2

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.621500	23.2	GND	L1	9.8	22.8	46.0
1.878000	27.6	GND	L1	9.8	18.4	46.0
2.123546	12.1	GND	L1	9.8	33.9	46.0
2.166401	16.1	GND	L1	9.8	29.9	46.0
2.188152	27.7	GND	L1	9.8	18.3	46.0
2.210121	19.6	GND	N	9.8	26.4	46.0

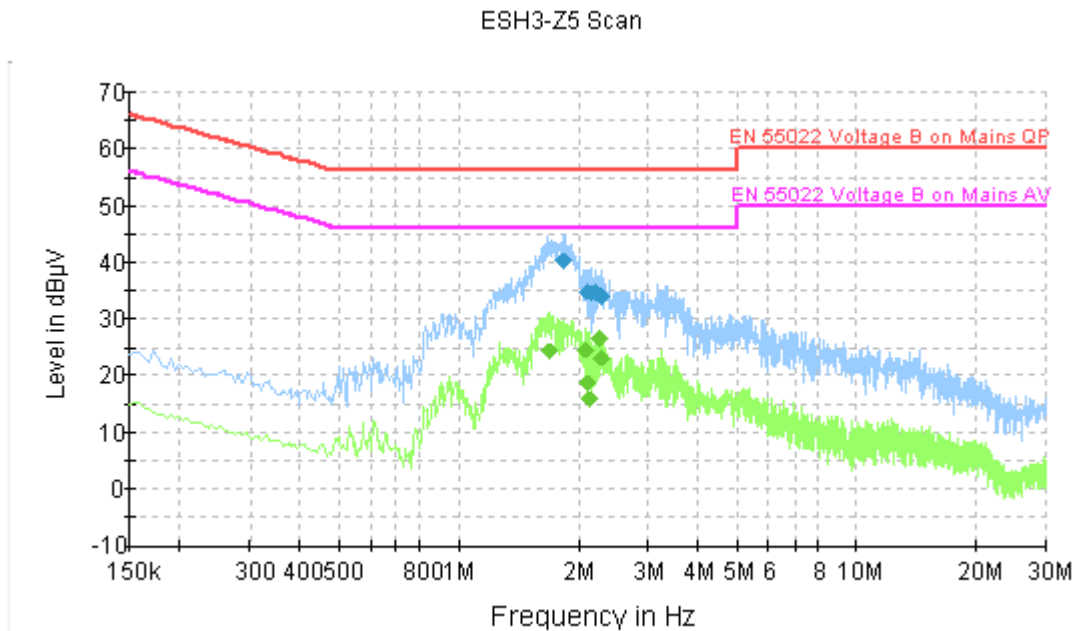


Fig. 77 AC Powerline Conducted Emission-802.11g

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.851000	40.2	GND	L1	9.8	15.8	56.0
2.123546	34.8	GND	L1	9.8	21.2	56.0
2.166401	34.6	GND	L1	9.8	21.4	56.0
2.210121	34.5	GND	L1	9.8	21.5	56.0
2.223408	34.8	GND	L1	9.8	21.2	56.0
2.277361	34.1	GND	L1	9.8	21.9	56.0

Final Result 2

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.693500	24.2	GND	L1	9.8	21.8	46.0
2.073237	24.5	GND	N	9.8	21.5	46.0
2.115077	18.7	GND	L1	9.8	27.3	46.0
2.136313	15.9	GND	L1	9.8	30.1	46.0
2.259233	26.7	GND	L1	9.8	19.3	46.0
2.281916	23.3	GND	L1	9.8	22.7	46.0

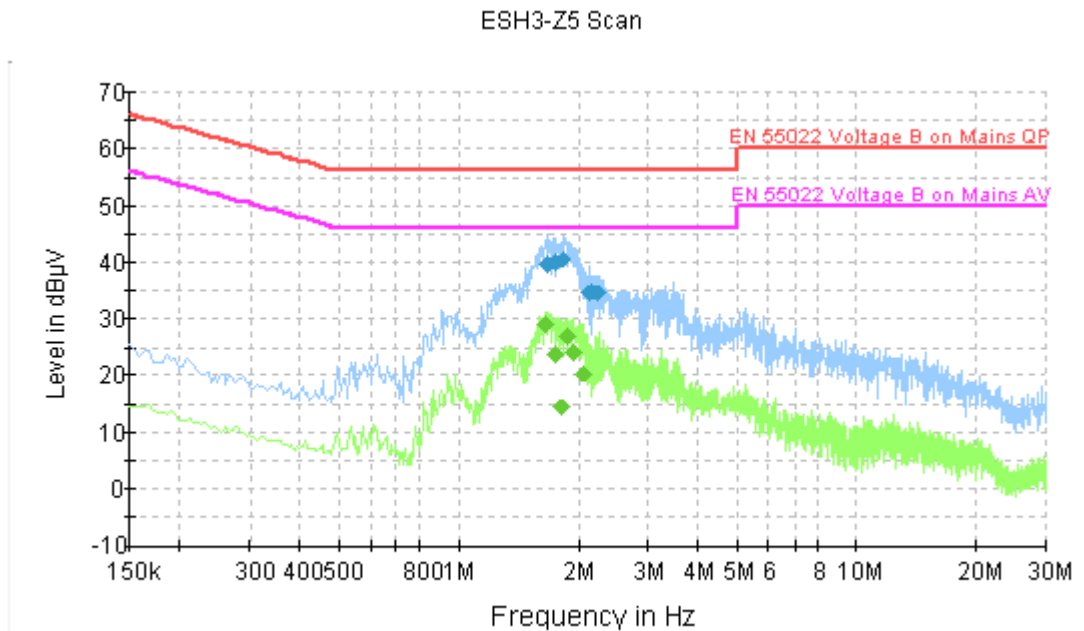


Fig. 78 AC Powerline Conducted Emission-802.11n

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.666500	39.6	GND	L1	9.8	16.4	56.0
1.747500	40.1	GND	L1	9.8	15.9	56.0
1.837500	40.5	GND	L1	9.8	15.5	56.0
2.136313	34.5	GND	L1	9.8	21.5	56.0
2.166401	34.7	GND	L1	9.8	21.3	56.0
2.232311	34.5	GND	L1	9.8	21.5	56.0

Final Result 2

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.653000	29.1	GND	L1	9.8	16.9	46.0
1.765500	23.8	GND	N	9.8	22.2	46.0
1.815000	14.4	GND	N	9.8	31.6	46.0
1.878000	26.9	GND	L1	9.8	19.1	46.0
1.959000	23.9	GND	L1	9.8	22.1	46.0
2.060847	20.3	GND	L1	9.8	25.7	46.0

*** END OF REPORT BODY ***