FCC PART 15C
TEST REPORT
No. I19N02247-WLAN

For

Doro AB

LTE phone

Model Name: DSB-0230

With

Hardware Version: 1031

Software Version:

MAGIC01A-S10A_DSB0230_123_USERDEBUG_190925

FCC ID: WS5DSB0230

Issued Date: 2019-11-19

Designation Number: CN1210

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 SAICT.

Test Laboratory:

Shenzhen Academy of Information and Communications Technology

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I19N02247-WLAN	Rev.0	1st edition	2019-11-19

CONTENTS

1. Test Laboratory

1.1. Testing Location

Location: Shenzhen Academy of Information and Communications Technology
Address: Building G, Shenzhen International Innovation Center, No.1006 Shennan Road, Futian District, Shenzhen, Guangdong Province, China
Postal Code: 518026
Telephone: +86(0)755-33322000
Fax: +86(0)755-33322001

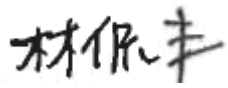
1.2. Testing Environment

Normal Temperature: 15-35℃
Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2019-10-08
Testing End Date: 2019-10-25

1.4. Signature



Lin Kanfeng
(Prepared this test report)

Tang Weisheng
(Reviewed this test report)

Zhang Bojun
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	Doro AB
Address:	Jörgen Kocksgatan 1B SE-211 20 Malmö Sweden
Contact:	Per Carlenhag
Email:	per.carlenhag@doro.com
Telephone:	+46 46 280 5000
Fax:	+46 46 280 5001

2.2. Manufacturer Information

Company Name:	CK TELECOM LTD.
Address:	Technology Road. High-Tech Development Zone. Heyuan, Guangdong, P.R.China
Contact:	mourong xie
Email:	mourong.xie@ck-telecom.com
Telephone:	0755-26739100 ext.8514
Fax:	0755-26739600

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

3.1. About EUT

Description	LTE phone
Model Name	DSB-0230
Brand Name	Doro
RF Protocol	IEEE 802.11 b/g/n-HT20
Operating Frequency	2412MHz~2462MHz
Number of Channels	11
Antenna Type	Integrated
Antenna Gain	0.7dBi
Power Supply	3.85V DC by Battery
FCC ID	WS5DSB0230
Condition of EUT as received	No abnormality in appearance

Note: Components list, please refer to documents of the manufacturer.

3.2. Internal Identification of EUT

EUT ID*	IMEI	HW Version	SW Version	Receive Date
EUT1	358707100008323	1031	MAGIC01A-S10A_DSB0230_123_USERDEBUG_190925	2019-10-08

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

3.3. Internal Identification of AE

AE ID*	Description	Mode	Manufacturer
AE1	Battery	DBV 3000A	Dongguang HongDe Battery Co.,Ltd
AE2	Charger	UT-133E-5100BY	Shenzhen BaiJunDa Electronic Co., LTD
AE3	Charger	A806A-050100U-UK1	Dongguan Aohai Power Technology Co., LTD

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

3.4. General Description

The Equipment under Test (EUT) is a model of LTE phone with integrated antenna and battery.
It consists of normal options: travel charger, USB cable and Phone.
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.

Reference	Title	Version
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	2018
ANSI C63.10	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices	2013

5. Test Results

5.1. Summary of Test Results

No	Test cases	Sub-clause of Part 15C	Verdict
0	Antenna Requirement	15.203	**P**
1	Maximum Output Power	15.247 (b)	**P**
2	Peak Power Spectral Density	15.247 (e)	**P**
3	6dB Bandwidth	15.247 (a)	**P**
4	Band Edges Compliance	15.247 (d)	**P**
5	Conducted Emission	15.247 (d)	**P**
6	Radiated Emission	15.247, 15.205, 15.209	**P**
7	AC Power line Conducted	15.207	**P**

See **ANNEX A** for details.

5.2. Statements

SAICT has evaluated the test cases requested by the applicant/manufacturer as listed in section 5.1 of this report, for the EUT specified in section 3, according to the standards or reference documents listed in section 4.2.

5.3. Terms used in the result table

Terms used in Verdict column

P	Pass
NA	Not Available
F	Fail

Abbreviations

AC	Alternating Current
AFH	Adaptive Frequency Hopping
BW	Band Width
E.I.R.P.	equivalent isotropic radiated power
ISM	Industrial, Scientific and Medical
R&TTE	Radio and Telecommunications Terminal Equipment
RF	Radio Frequency
Tx	Transmitter

5.4. Laboratory Environment

Semi-anechoic chamber

Temperature	Min. = 15 ˚C, Max. = 35 ˚C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	0.014 MHz - 1 MHz, > 60 dB; 1 MHz - 1000 MHz, > 90 dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4 Ω
Normalised site attenuation (NSA)	< ±4 dB, 3m/10m distance, from 30 to 1000 MHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 3000 MHz

Shielded room

Temperature	Min. = 15 ˚C, Max. = 35 ˚C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	0.014 MHz - 1 MHz, > 60 dB; 1 MHz - 1000 MHz, > 90 dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4 Ω

Fully-anechoic chamber

Temperature	Min. = 15 ˚C, Max. = 35 ˚C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	0.014 MHz - 1MHz, > 60dB; 1 MHz - 1000 MHz, > 90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4 Ω
Voltage Standing Wave Ratio (VSWR)	≤ 6 dB, from 1 to 18 GHz, 3m distance

6. Test Facilities Utilized

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date	Calibration Period
1	Vector Signal Analyzer	FSV40	100903	Rohde & Schwarz	2020-01-16	1 year
2	Power Sensor	U2021XA	MY55430013	Agilent	2020-01-16	1 year
3	Data Acquisiton	U2531A	TW55443507	Agilent	/	/

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date	Calibration Period
1	LISN	ESH2-Z5	100196	R&S	2020-01-03	1 year
2	Test Receiver	ESCI	100701	R&S	2020-08-06	1 year
3	Loop Antenna	HLA6120	35779	TESEQ	2022-05-01	3 year
4	BiLog Antenna	VULB9163	9163 329	Schwarzbeck	2020-02-17	3 year
5	Horn Antenna	3117	00066585	ETS-Lindgren	2022-03-04	3 year
6	Test Receiver	ESR7	101675	R&S	2020-07-18	1 year
7	Spectrum Analyzer	FSP 40	100378	R&S	2019-12-13	1 year
8	Chamber	FACT5-2.0	4166	ETS-Lindgren	2021-05-12	3 year
9	Antenna	QSH-SL-1 8-26-S-20	17013	Q-par	2020-01-15	3 year
10	Antenna	QSH-SL-2 6-40-K-20	17014	Q-par	2020-01-11	3 year

Test software

No.	Equipment	Manufacturer	Version
1	TechMgr Software	CAICT	2.1.1
2	EMC32	Rohde & Schwarz	8.53.0
3	EMC32	Rohde & Schwarz	10.01.00

EUT is engineering software provided by the customer to control the transmitting signal.
The EUT was programmed to be in continuously transmitting mode.

Anechoic chamber

Fully anechoic chamber by ETS-Lindgren

7. Measurement Uncertainty

Test Name	Uncertainty	
1. RF Output Power - Conducted	±1.32dB	
2.Power Spectral Density - Conducted	±2.32dB	
3.Occupied channel bandwidth - Conducted	±66Hz	
4 Transmitter Spurious Emission - Conducted	30MHz≤f≤1GHz	±1.41dB
	1GHz≤f≤7GHz	±1.92dB
	7GHz≤f≤13GHz	±2.31dB
	13GHz≤f≤26GHz	±2.61dB
5. Transmitter Spurious Emission - Radiated	9kHz≤f≤30MHz	±1.84dB
	30MHz≤f≤1GHz	±4.90dB
	1GHz≤f≤18GHz	±5.12dB
	18GHz≤f≤40GHz	±4.66dB
6. AC Power line Conducted Emission	150kHz≤f≤30MHz	±3.10dB

ANNEX A: Detailed Test Results

A.0 Antenna requirement

Measurement Limit:

Standard	Requirement
FCC CRF Part 15.203	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

Conclusion: The Directional gains of antenna used for transmitting is 0.7dBi. The RF transmitter uses an integrate antenna without connector.

A.1 Test Configuration

A.1.1 Conducted Measurements

The measurement is made according to ANSI C63.10.

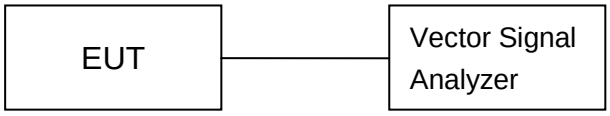
1). Connect the EUT to the test system correctly.

2). Set the EUT to the required work mode.

3). Set the EUT to the required channel.

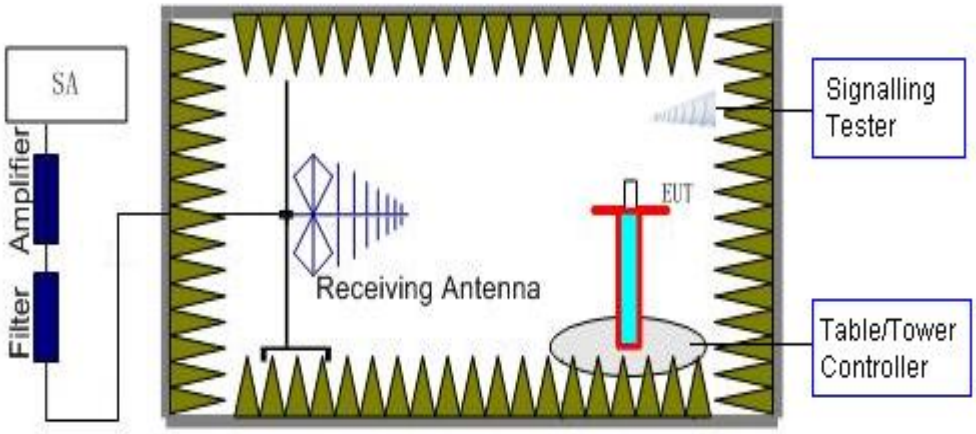
4). Set the spectrum analyzer to start measurement.

5). Record the values.



A.1.2 Radiated Measurements

Test setup: EUT was placed on a 1.5 meter high non-conductive table at a 3 meter test distance from the receive antenna. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT and adjusting the receiving antenna polarization.



A.2 Maximum Output Power - Conduced

Measurement of method :See ANSI C63.10-Clause 11.9.2.3.2

Method AVGPM-G is a measurement using a gated RF average power meter.

Alternatively, measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Because the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

Measurement Limit:

Standard	Limit (dBm)	E.I.R.P Limit (dBm)
FCC CRF Part 15.247(b)	< 30	< 36

Measurement Results:

Mode	Channel	Frequency (MHz)	Average Conducted Power (dBm)	E.I.R.P (dBm)	Conclusion
802.11b	CH 1	2412	15.99	16.69	P
	CH 6	2437	15.67	16.37	P
	CH 11	2462	15.56	16.26	P
802.11g	CH 1	2412	14.51	15.21	P
	CH 6	2437	14.18	14.88	P
	CH 11	2462	14.03	14.73	P
802.11n HT20	CH 1	2412	14.55	15.25	P
	CH 6	2437	14.27	14.97	P
	CH 11	2462	14.07	14.77	P

Note: E.I.R.P value = Conducted values (with conducted samples) + Antenna Gain.

Note: Worst-case data rates as provided by the client were: 1Mbps (802.11b), 6Mbps (802.11g), MCS0 (802.11n). The following cases and test graphs are performed with this condition. The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

A.3 Peak Power Spectral Density

Measurement Limit:

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

Measurement Results:

Mode	Channel	Frequency (MHz)	Test Results (dBm)		Conclusion
802.11b	CH 1	2412	Fig.1	-6.80	**P**
	CH 6	2437	Fig.2	-6.37	**P**
	CH 11	2462	Fig.3	-6.91	**P**
802.11g	CH 1	2412	Fig.4	-9.46	**P**
	CH 6	2437	Fig.5	-9.67	**P**
	CH 11	2462	Fig.6	-9.56	**P**
802.11n HT20	CH 1	2412	Fig.7	-10.62	**P**
	CH 6	2437	Fig.8	-10.95	**P**
	CH 11	2462	Fig.9	-10.50	**P**

See below for test graphs.
Conclusion: PASS

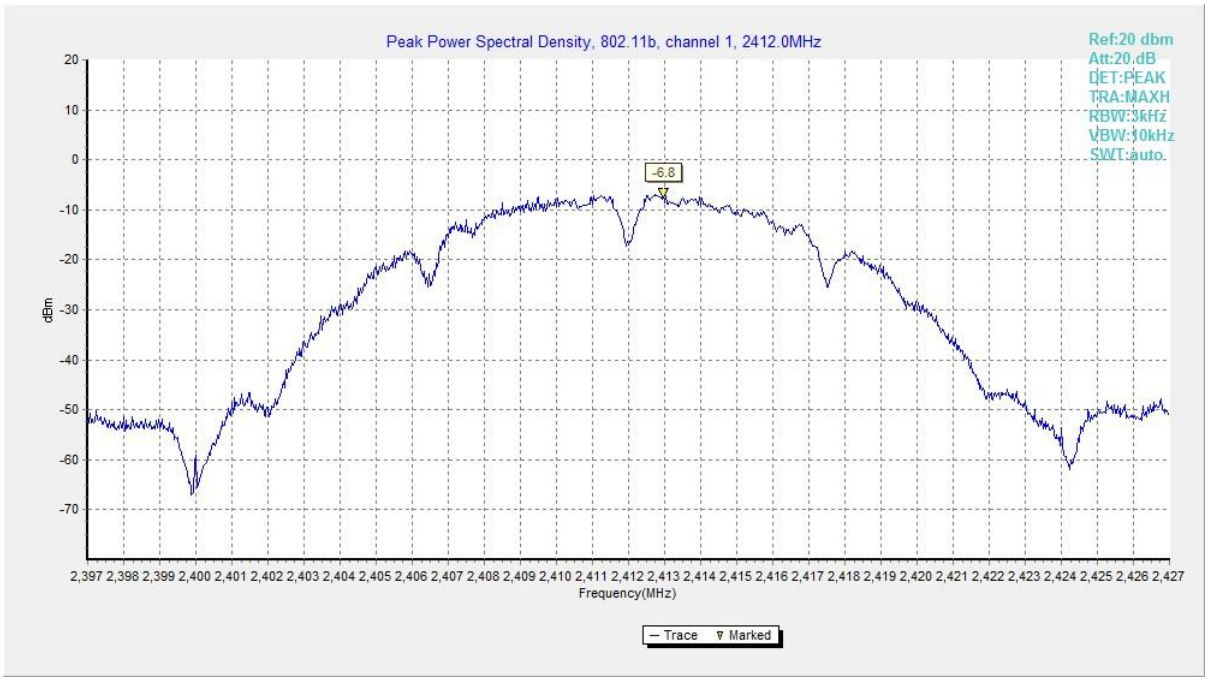


Fig.1 Power Spectral Density (802.11b, CH 1)

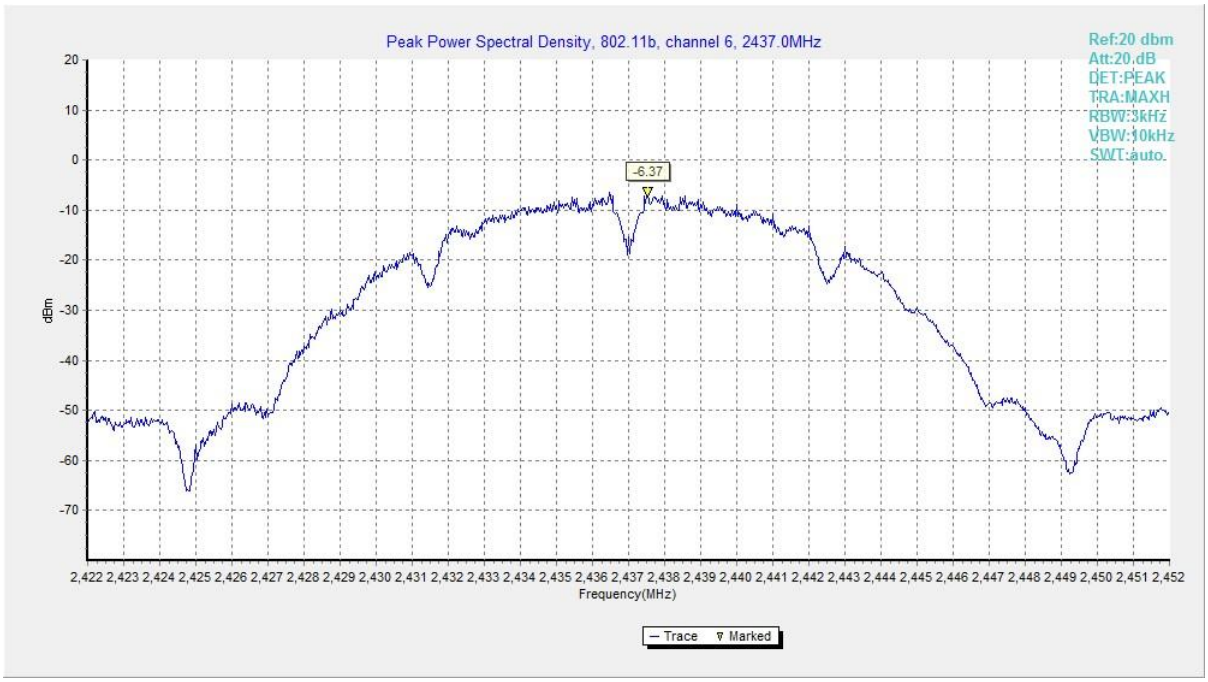


Fig.2 Power Spectral Density (802.11b, CH 6)

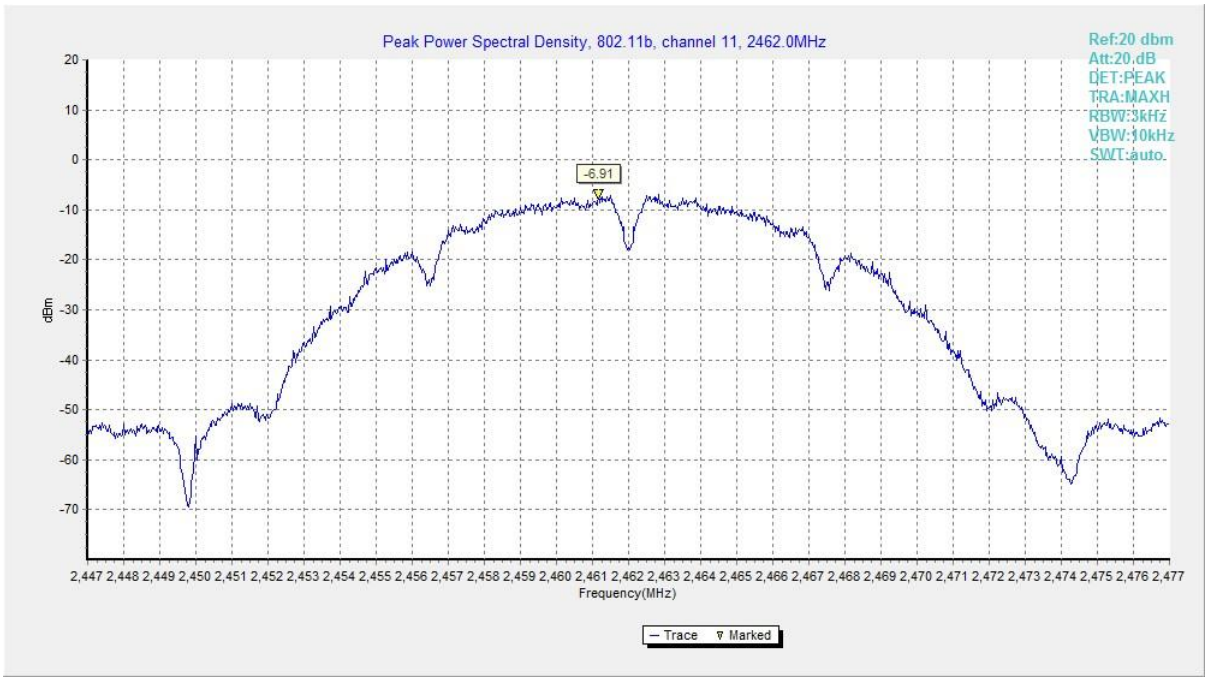


Fig.3 Power Spectral Density (802.11b, CH 11)

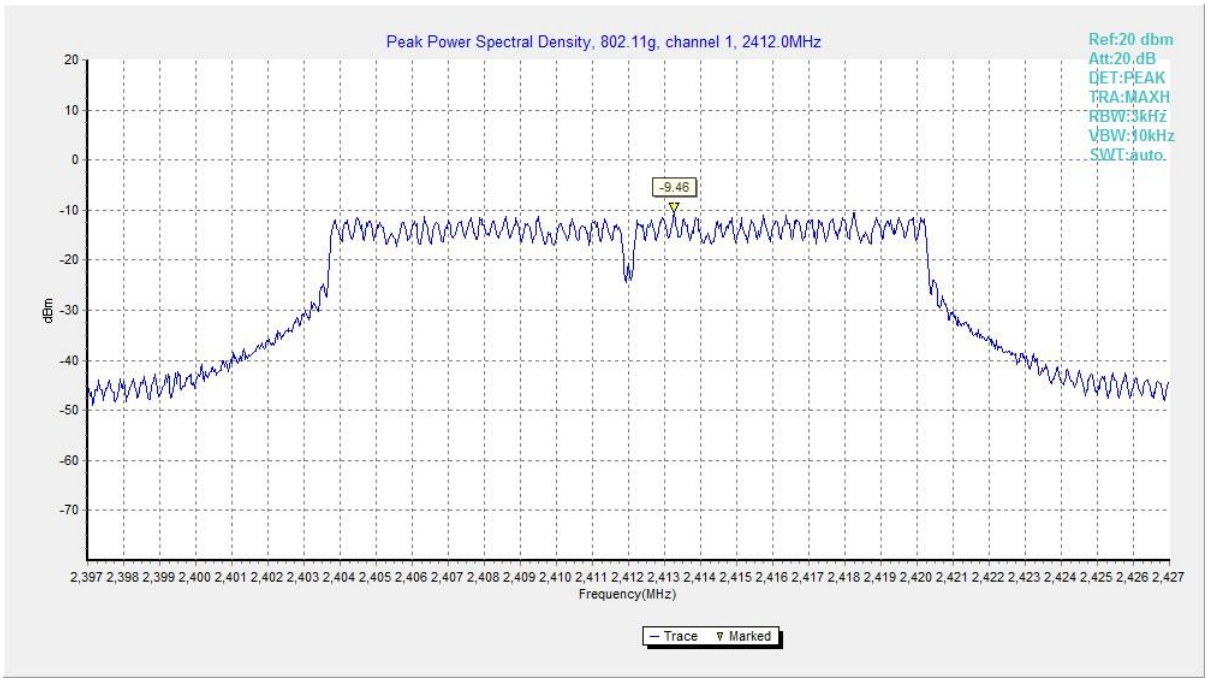


Fig.4 Power Spectral Density (802.11g, CH 1)

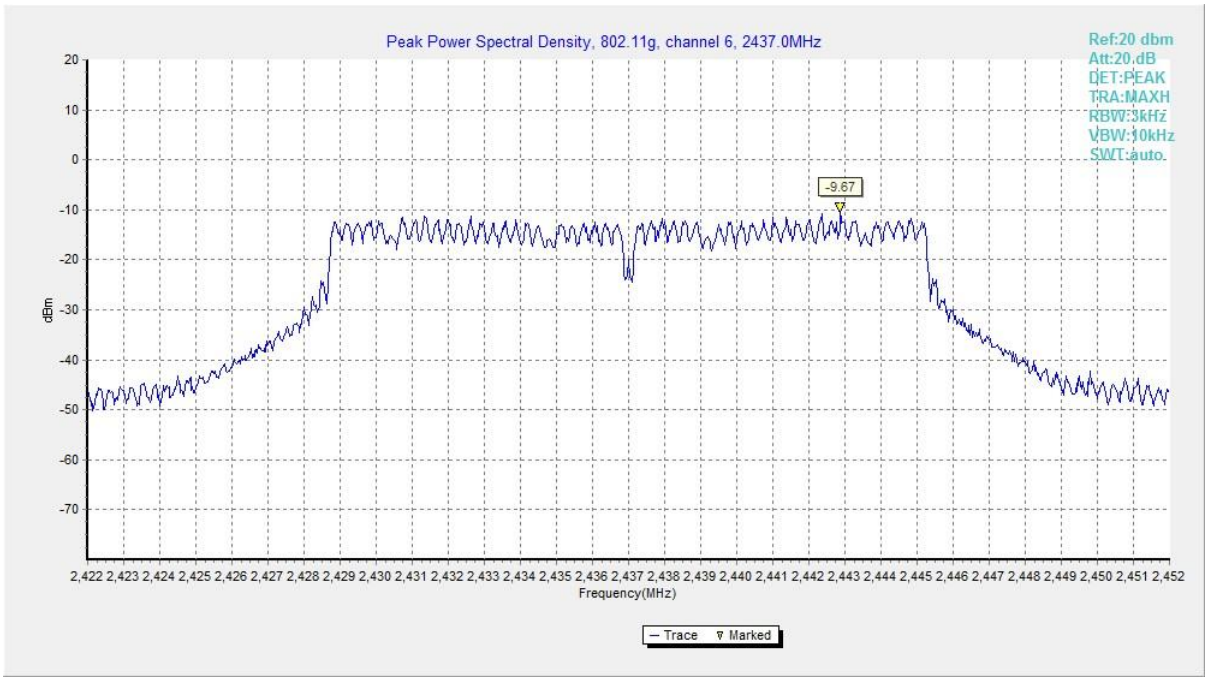


Fig.5 Power Spectral Density (802.11g, CH 6)

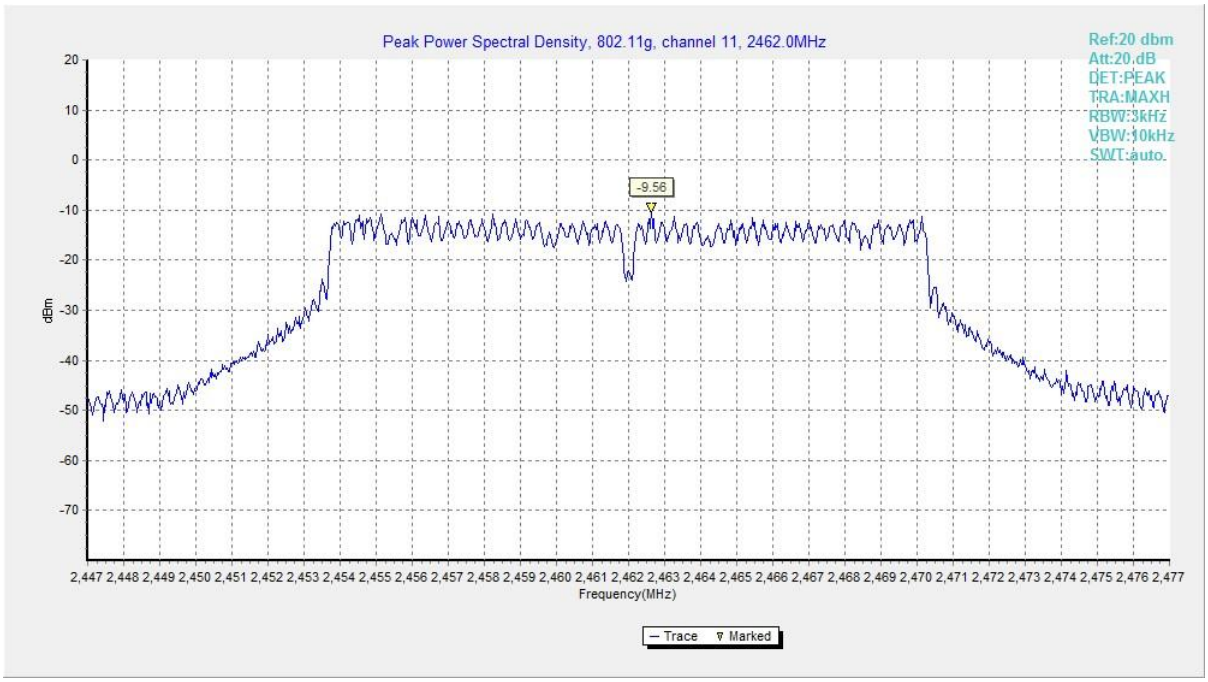


Fig.6 Power Spectral Density (802.11g, CH 11)

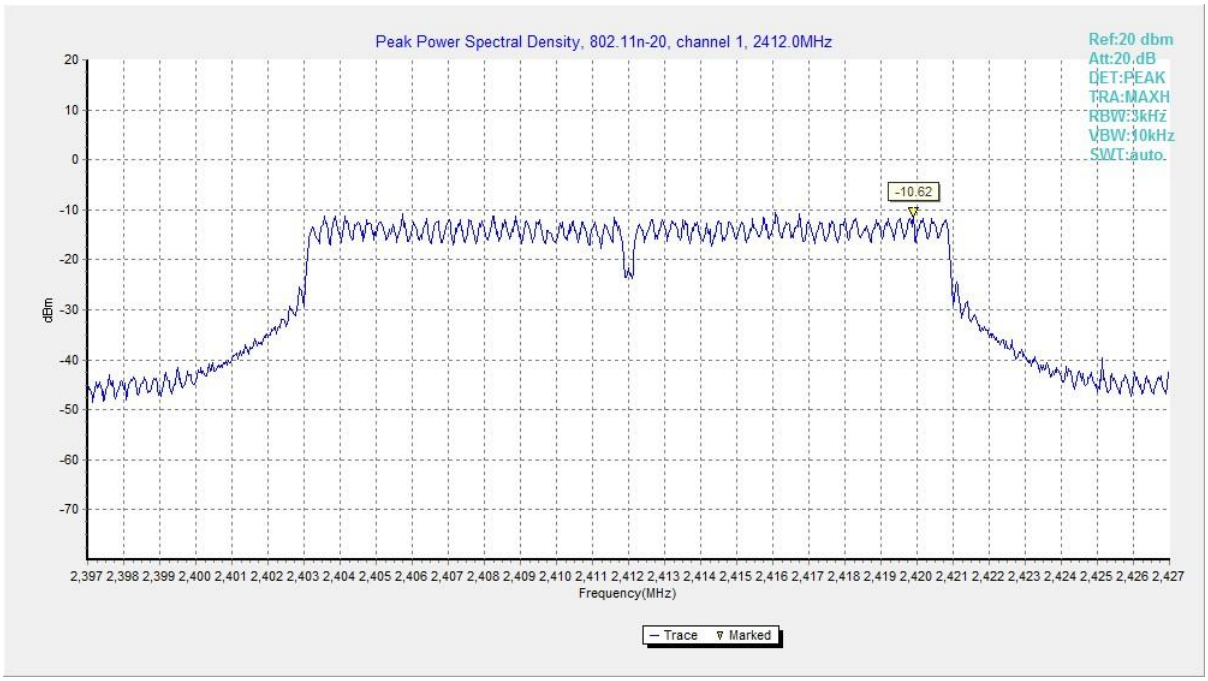


Fig.7 Power Spectral Density (802.11n HT20, CH 1)

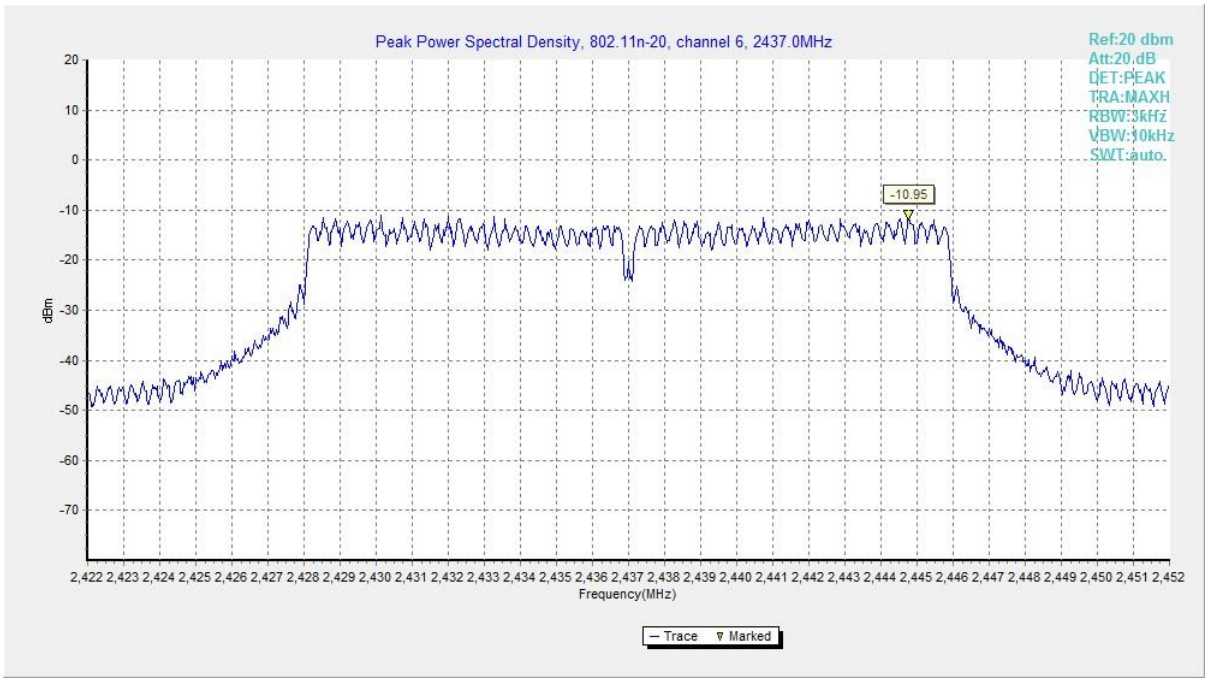


Fig.8 Power Spectral Density (802.11n HT20, CH 6)

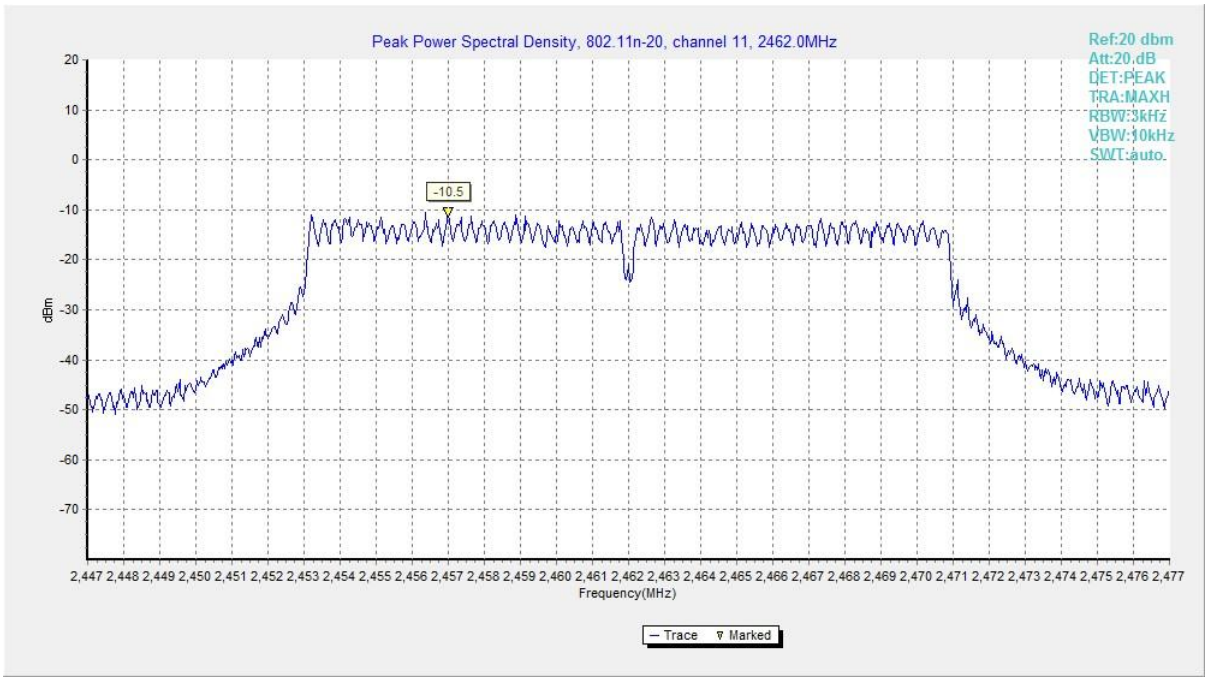


Fig.9 Power Spectral Density (802.11n HT20, CH 11)

A.4 6dB Bandwidth

Measurement Limit:

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

Measurement Result:

Mode	Channel	Frequency (MHz)	Test Results (kHz)		Conclusion
802.11b	CH 1	2412	Fig.10	8500	**P**
	CH 6	2437	Fig.11	8050	**P**
	CH 11	2462	Fig.12	8550	**P**
802.11g	CH 1	2412	Fig.13	16350	**P**
	CH 6	2437	Fig.14	16350	**P**
	CH 11	2462	Fig.15	16300	**P**
802.11n HT20	CH 1	2412	Fig.16	17550	**P**
	CH 6	2437	Fig.17	17600	**P**
	CH 11	2462	Fig.18	17600	**P**

See below for test graphs.
Conclusion: PASS

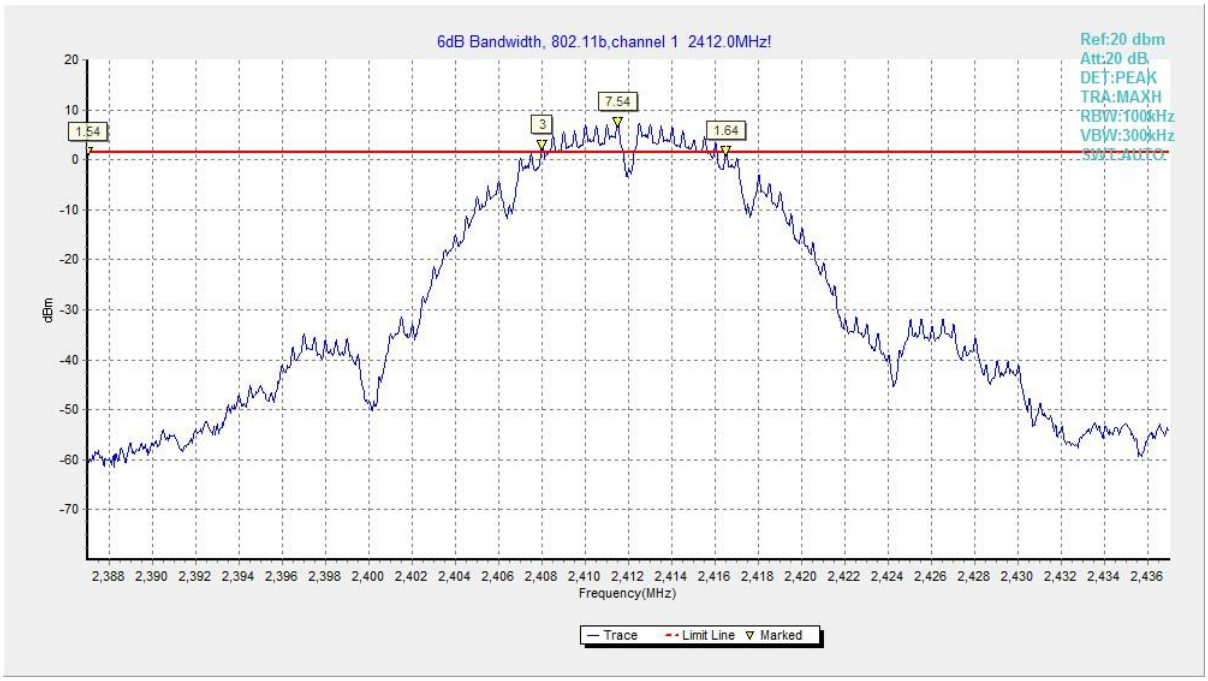


Fig.10 6dB Bandwidth (802.11b, CH 1)

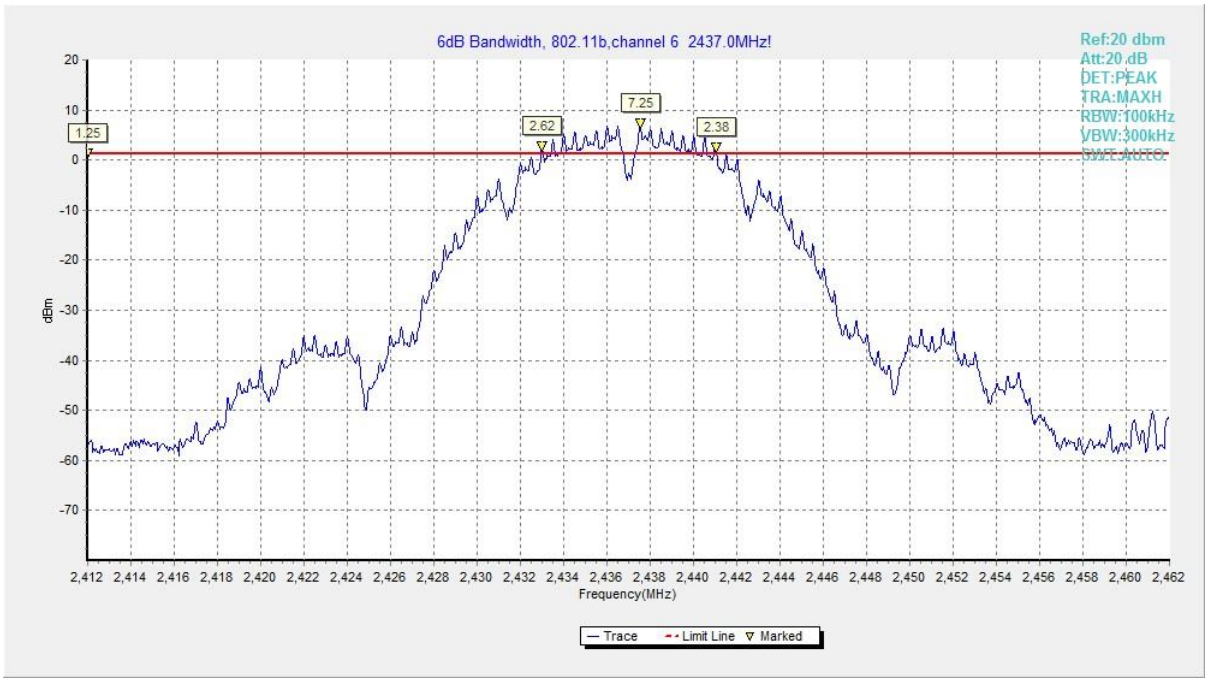


Fig.11 6dB Bandwidth (802.11b, CH 6)

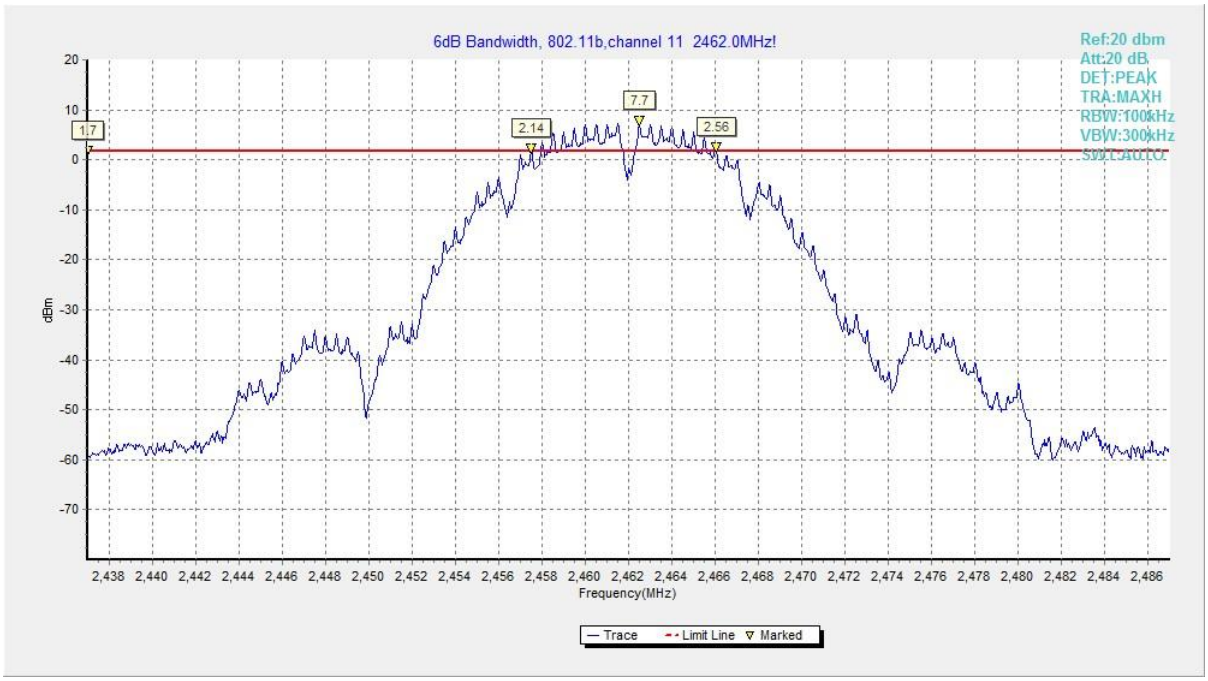


Fig.12 6dB Bandwidth (802.11b, CH 11)

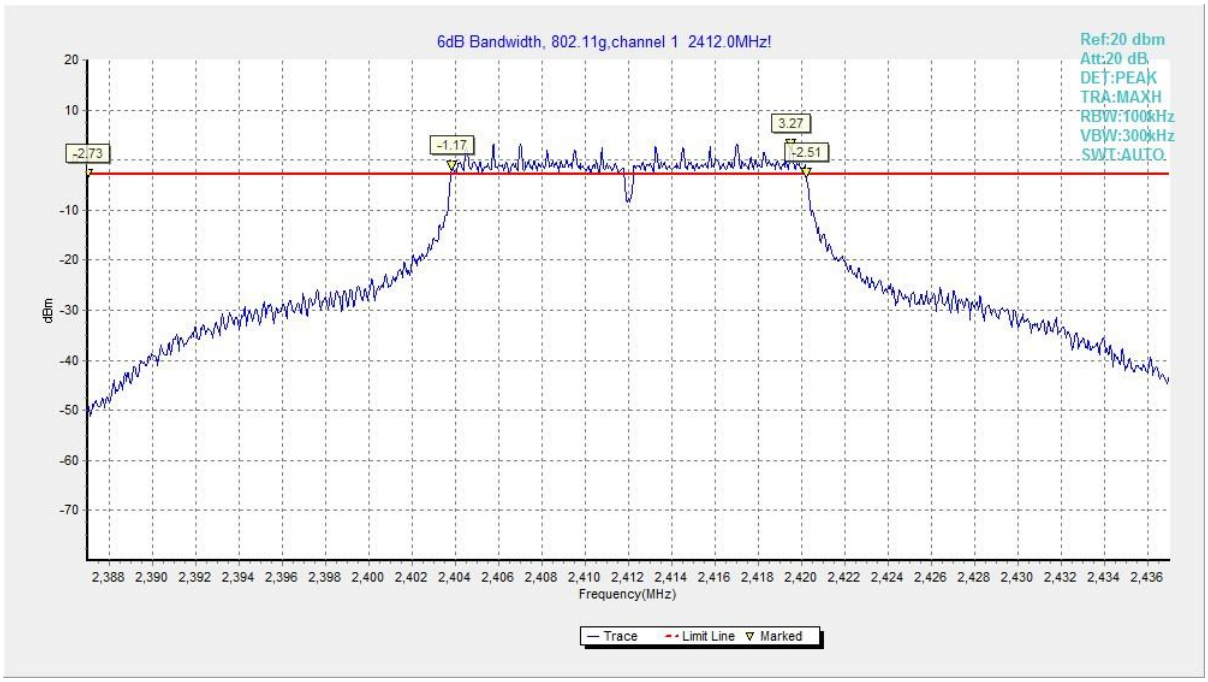


Fig.13 6dB Bandwidth (802.11g, CH 1)

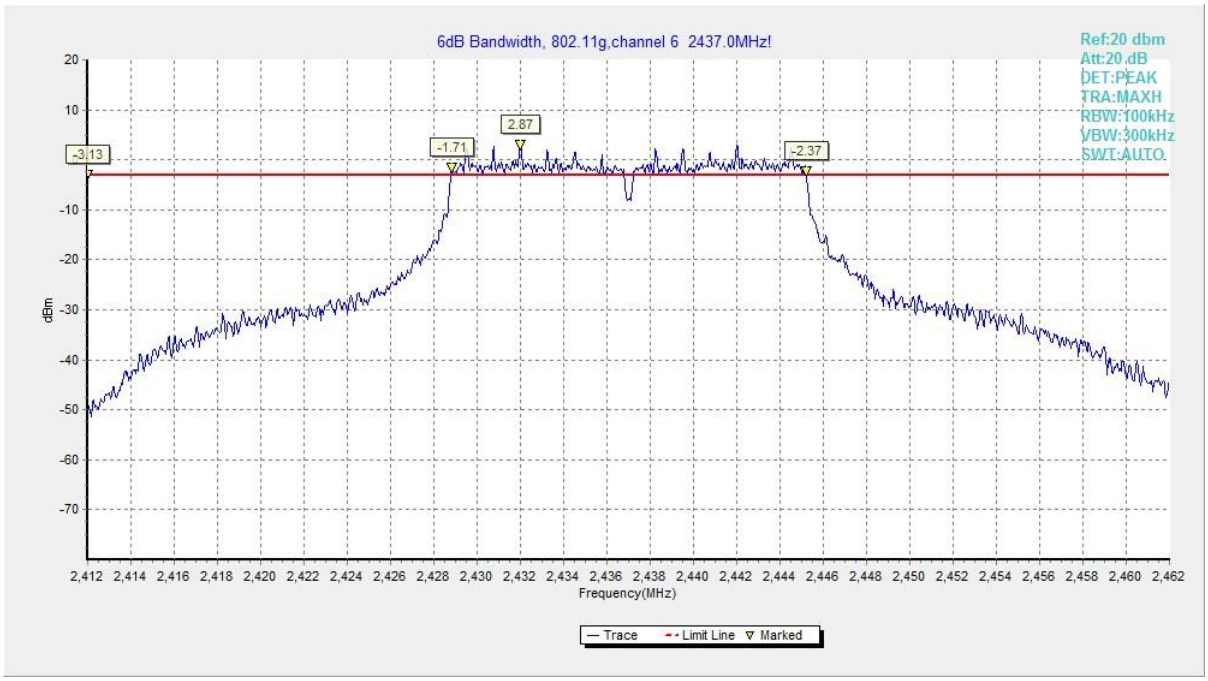


Fig.14 6dB Bandwidth (802.11g, CH 6)

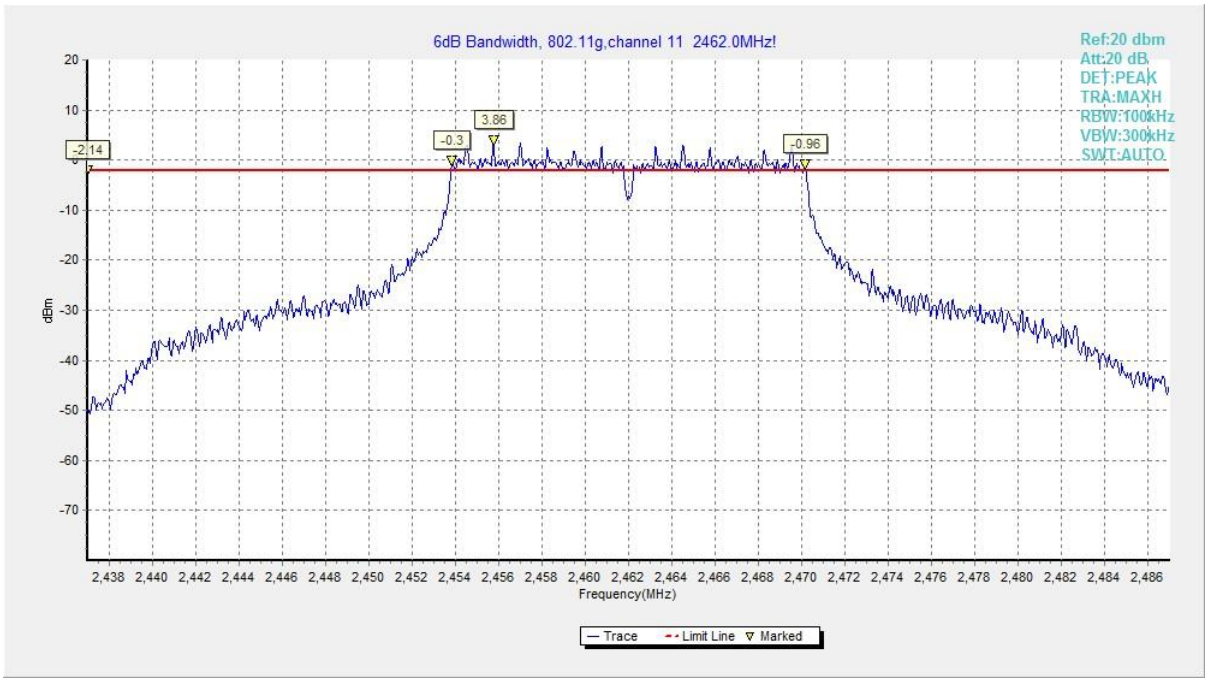


Fig.15 6dB Bandwidth (802.11g, CH 11)

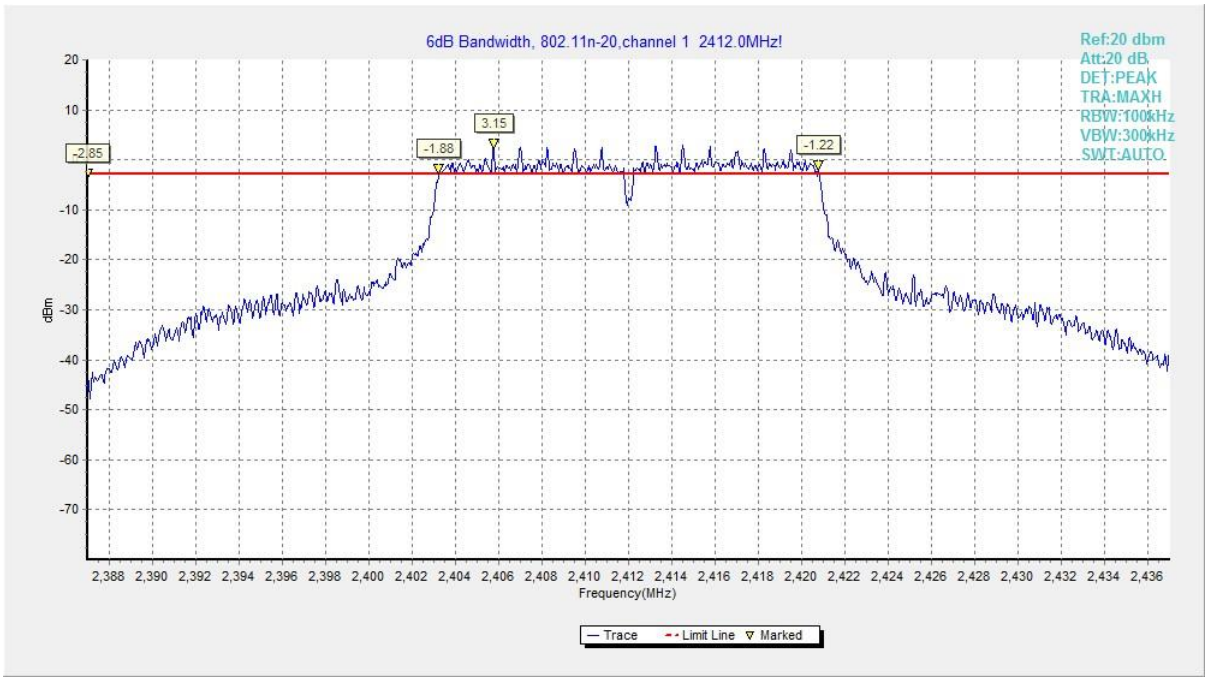


Fig.16 6dB Bandwidth (802.11n HT20, CH 1)

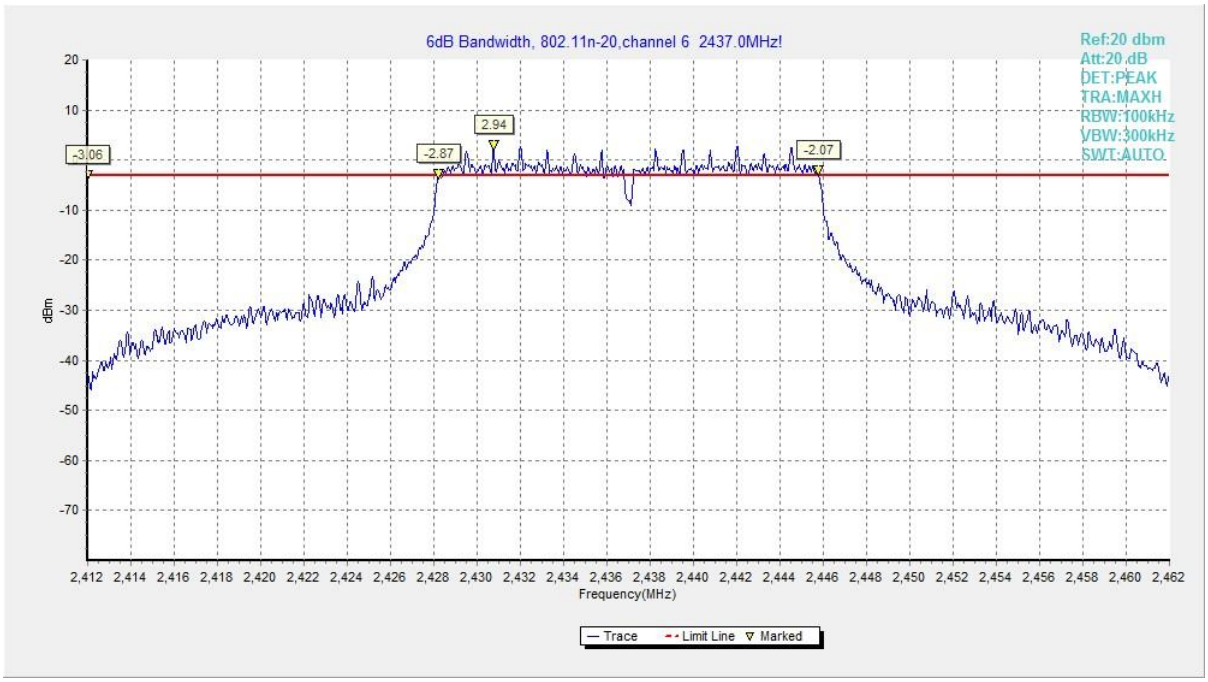


Fig.17 6dB Bandwidth (802.11n HT20, CH 6)

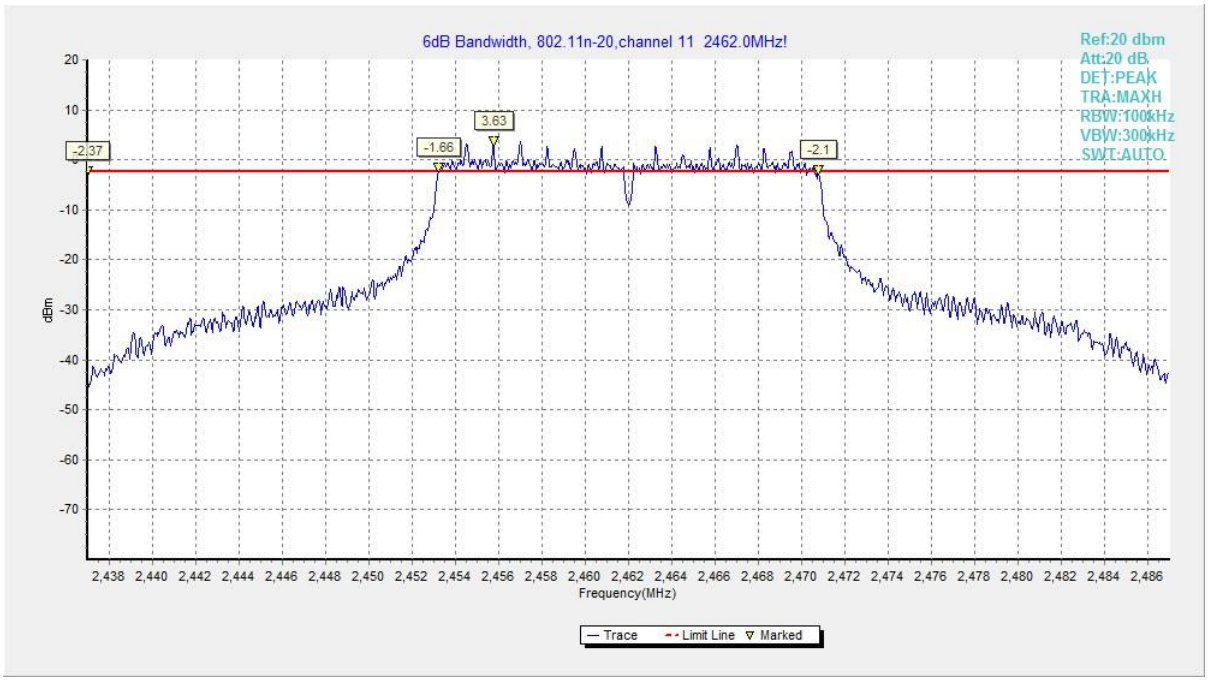


Fig.18 6dB Bandwidth (802.11n HT20, CH 11)

A.5 Band Edges Compliance

Measurement Limit:

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

Measurement Result:

Mode	Channel	Frequency (MHz)	Test Results (dB)		Conclusion
802.11b	CH1	2412	Fig.19	54.64	**P**
	CH11	2462	Fig.20	60.14	**P**
802.11g	CH1	2412	Fig.21	29.20	**P**
	CH11	2462	Fig.22	41.07	**P**
802.11n HT20	CH1	2412	Fig.23	29.21	**P**
	CH11	2462	Fig.24	38.85	**P**

See below for test graphs.
Conclusion: PASS

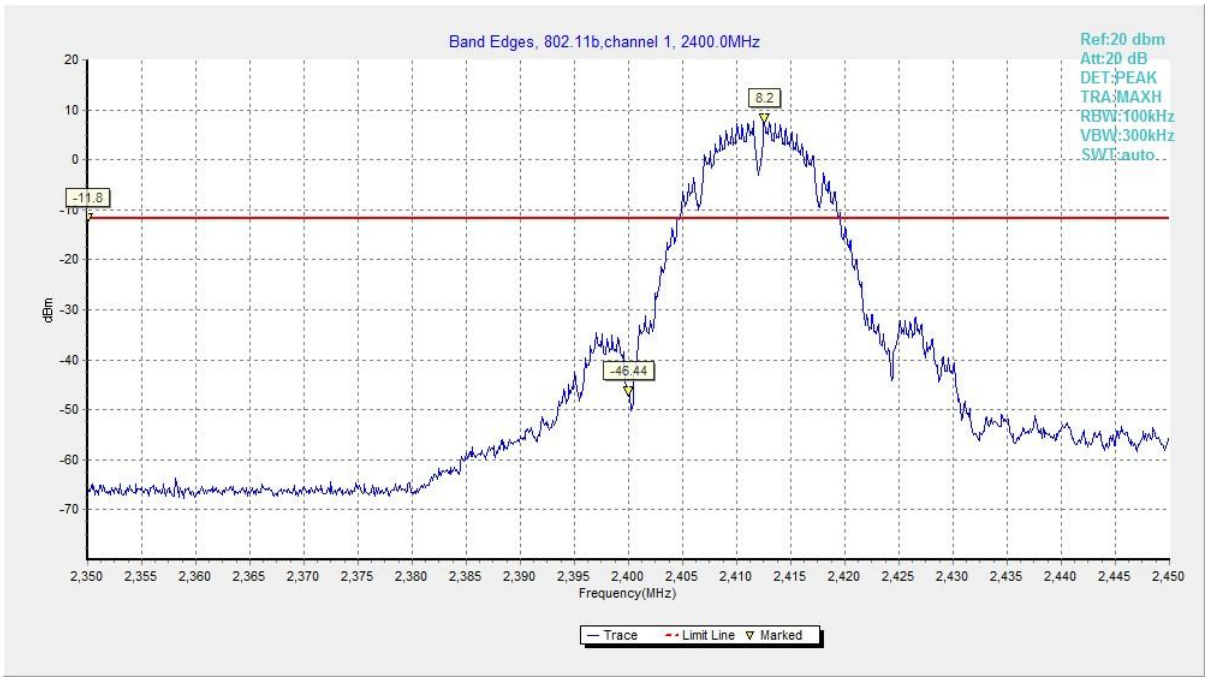


Fig.19 Band Edges (802.11b, CH 1)

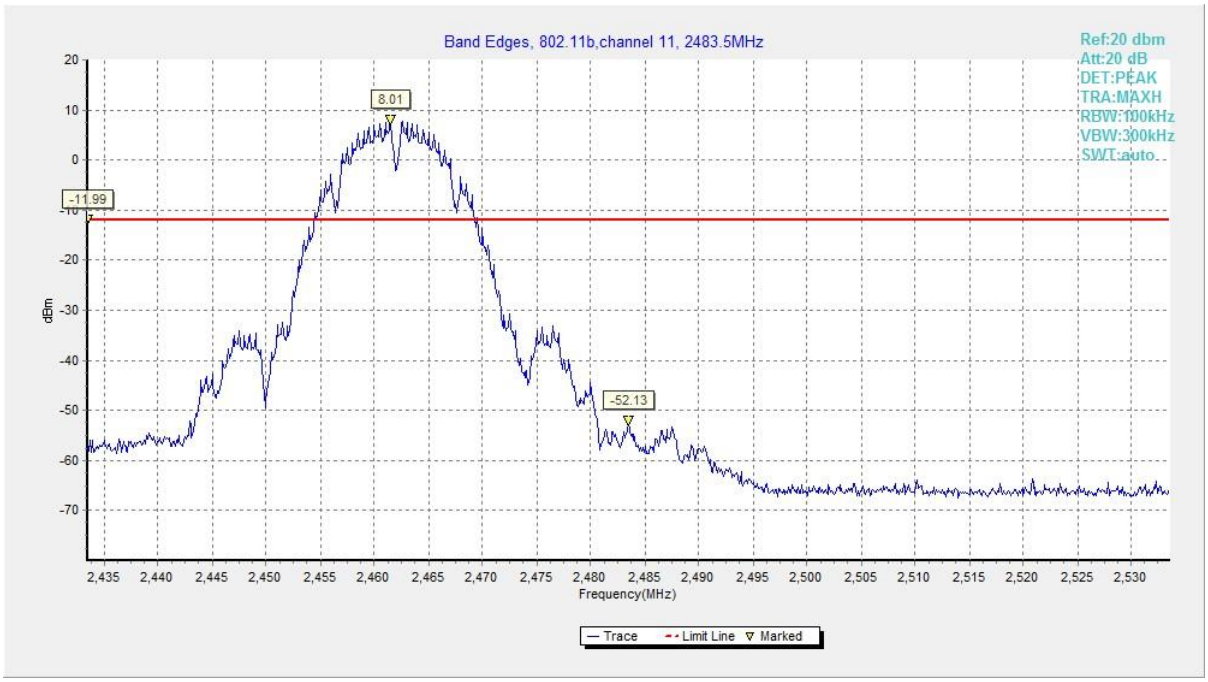


Fig.20 Band Edges (802.11b, CH 11)

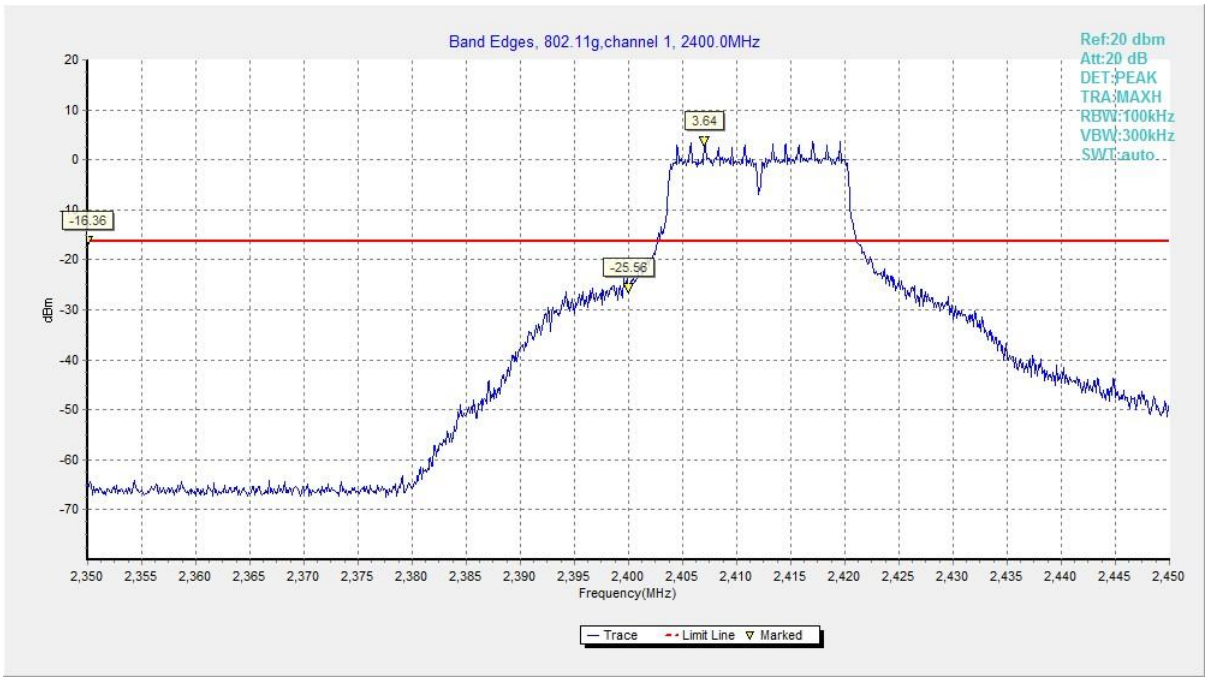


Fig.21 Band Edges (802.11g, CH 1)

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

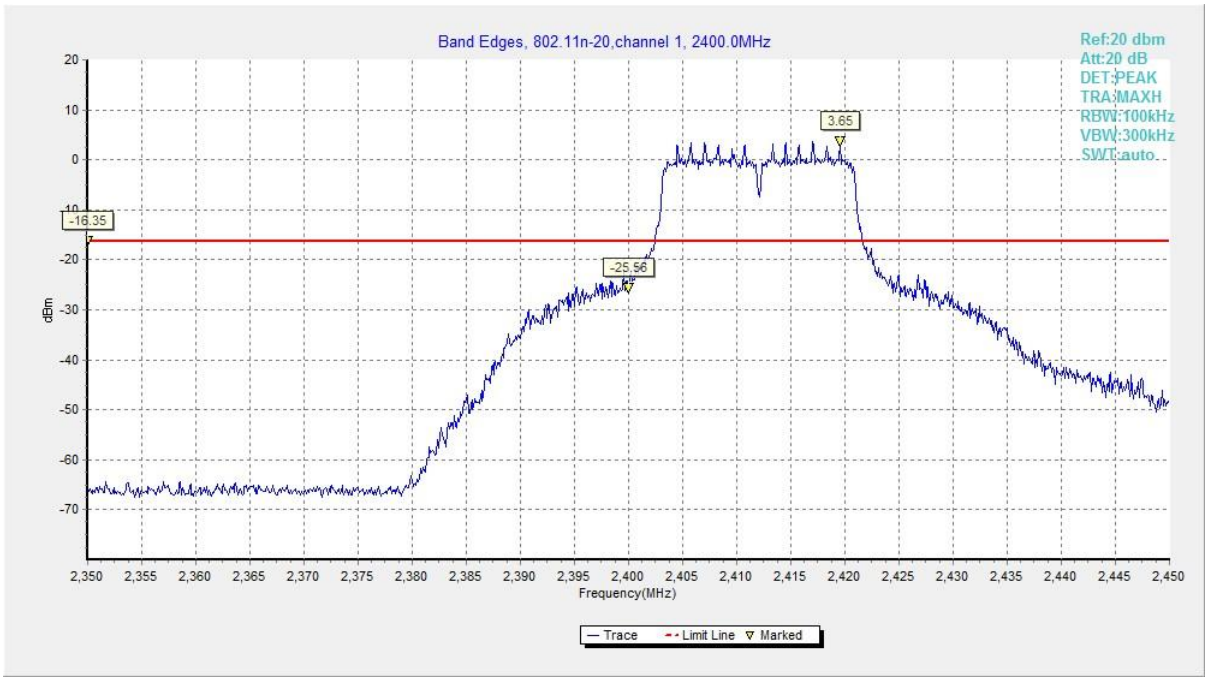


Fig.23 Band Edges (802.11n HT20, CH 1)

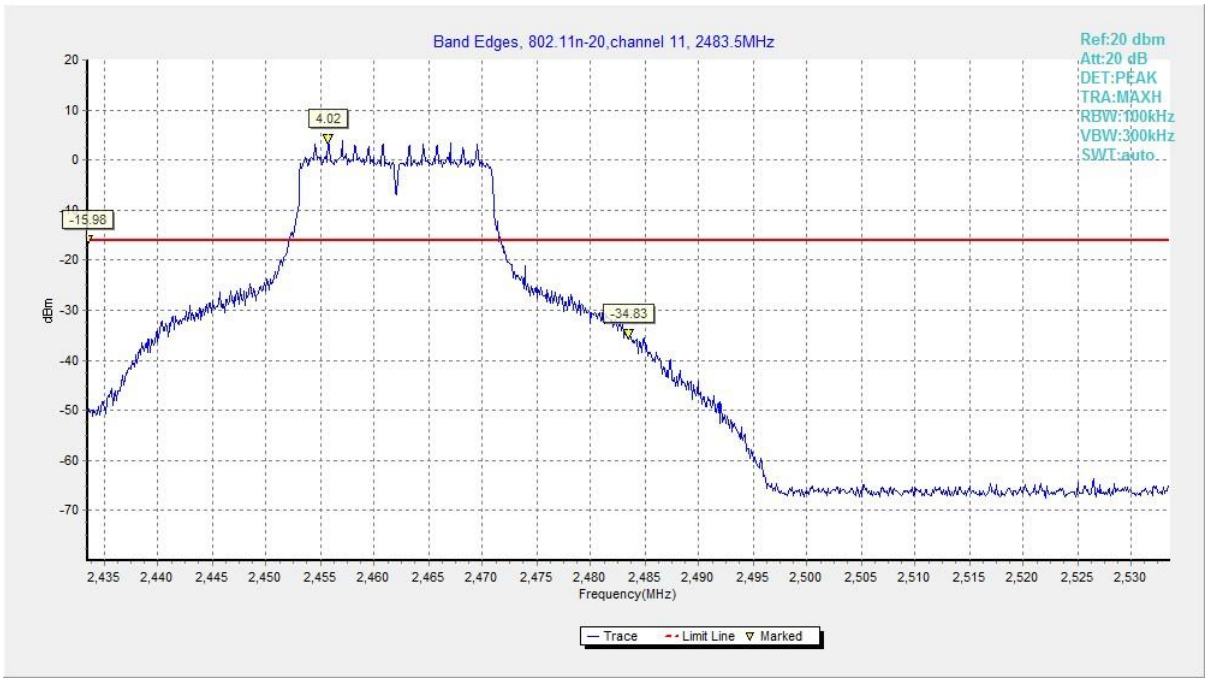


Fig.24 Band Edges (802.11n HT20, CH 11)

A.6 Conducted Emission

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247 (d)	30dB below peak output power in 100kHz bandwidth

Measurement Results:

Mode	Channel	Frequency (MHz)	Frequency Range	Test Results	Conclusion
802.11b	CH 1	2412	30MHz-26GHz	Fig.25	**P**
	CH 6	2437	30MHz-26GHz	Fig.26	**P**
	CH 11	2462	30MHz-26GHz	Fig.27	**P**
802.11g	CH 1	2412	30MHz-26GHz	Fig.28	**P**
	CH 6	2437	30MHz-26GHz	Fig.29	**P**
	CH 11	2462	30MHz-26GHz	Fig.30	**P**
802.11n HT20	CH 1	2412	30MHz-26GHz	Fig.31	**P**
	CH 6	2437	30MHz-26GHz	Fig.32	**P**
	CH 11	2462	30MHz-26GHz	Fig.33	**P**

See below for test graphs.
Conclusion: PASS
Note: Peak above the limit line is the carrier frequency.

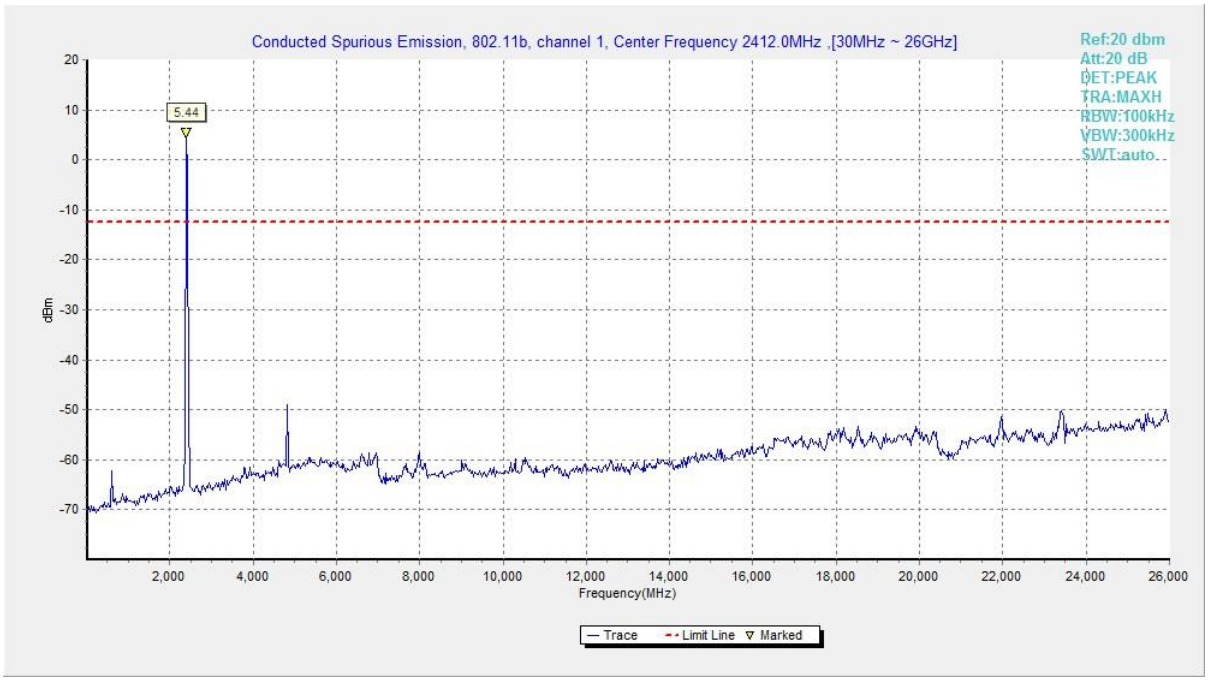


Fig.25 Conducted Spurious Emission (802.11b, CH1)

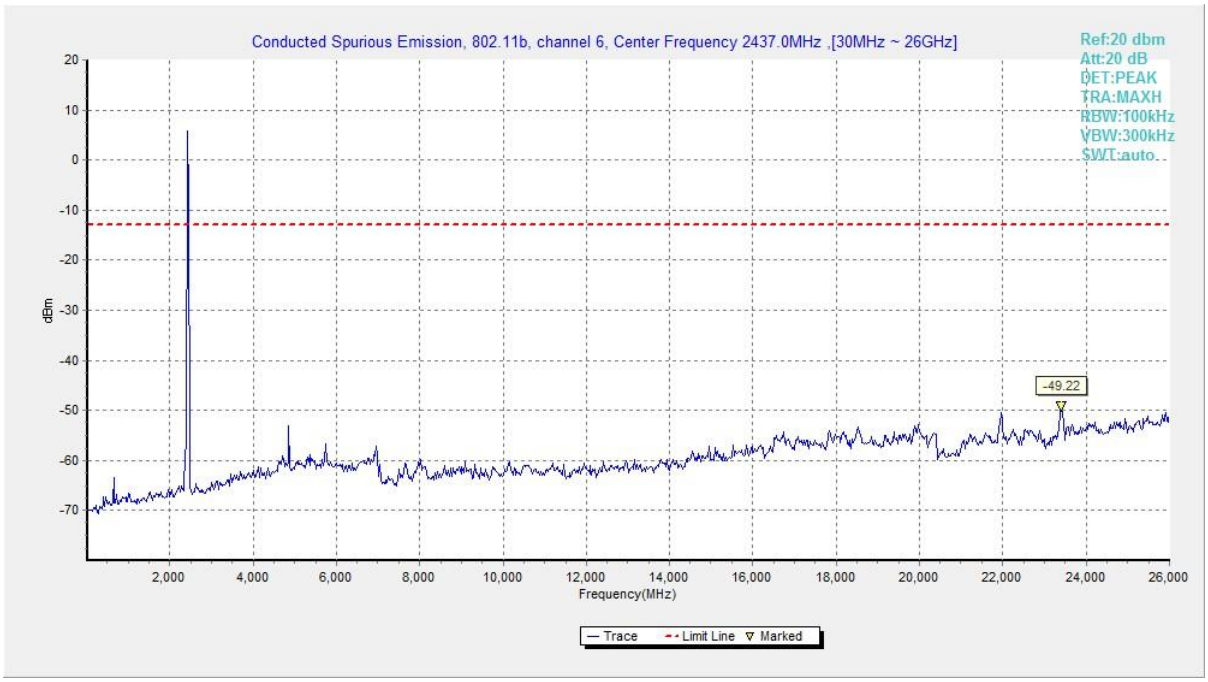


Fig.26 Conducted Spurious Emission (802.11b, CH6)

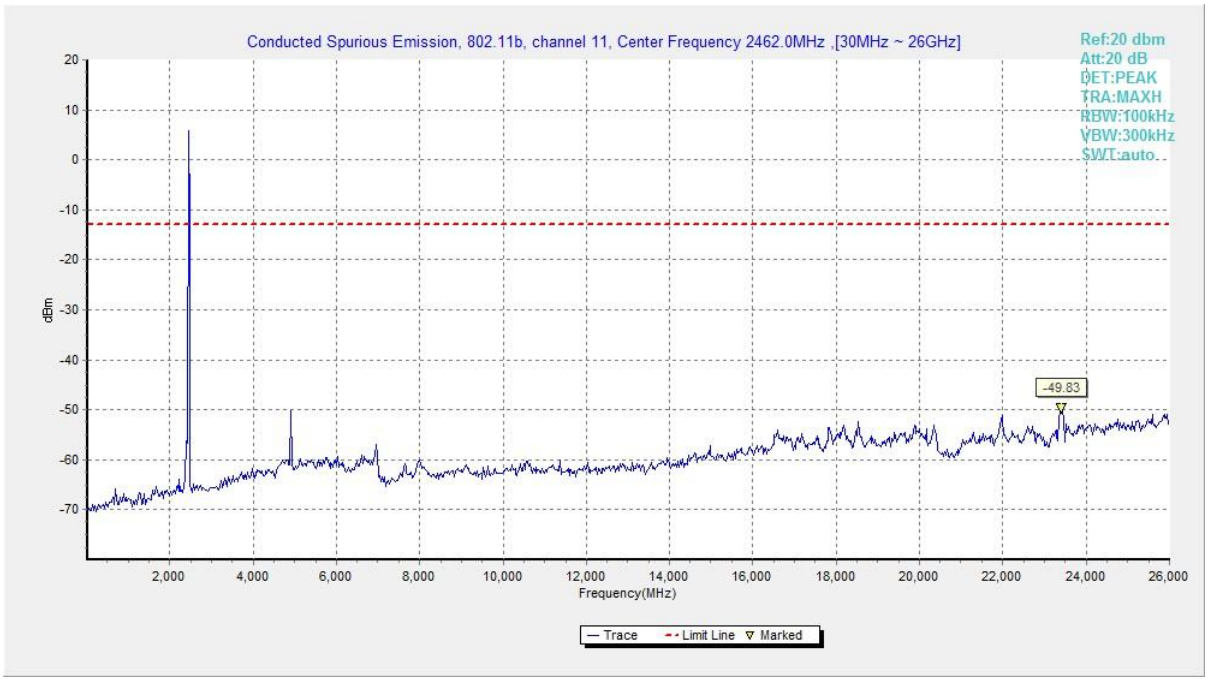


Fig.27 Conducted Spurious Emission (802.11b, CH11)

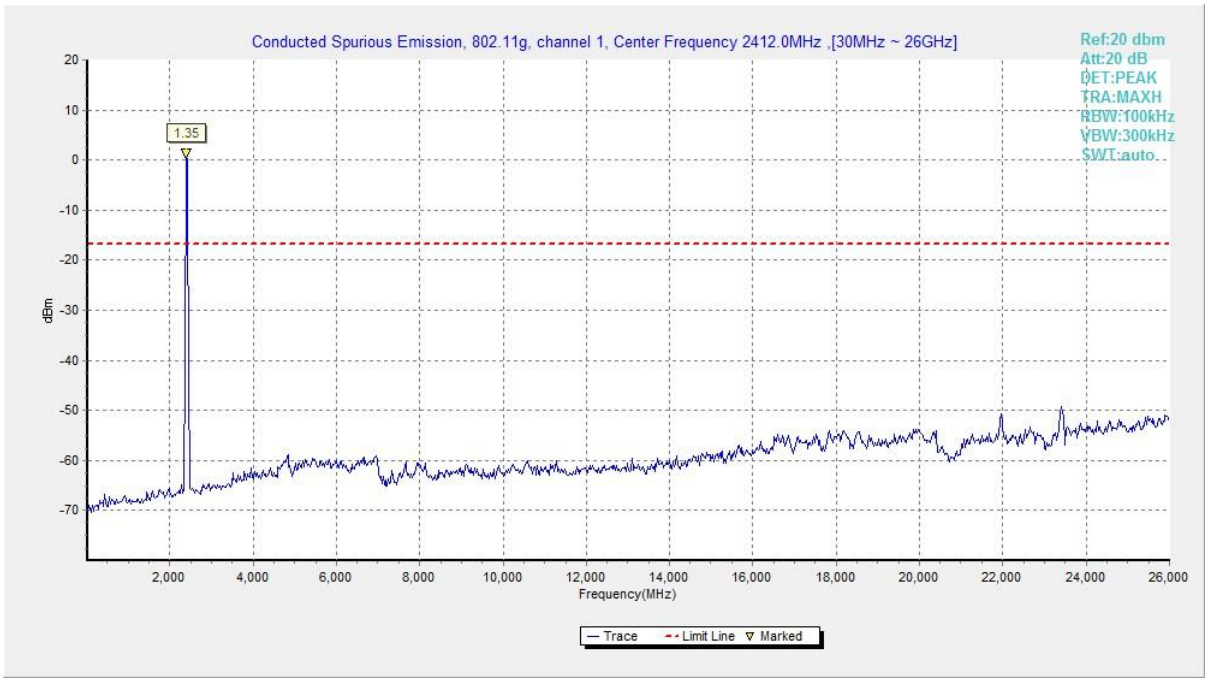


Fig.28 Conducted Spurious Emission (802.11g, CH1)

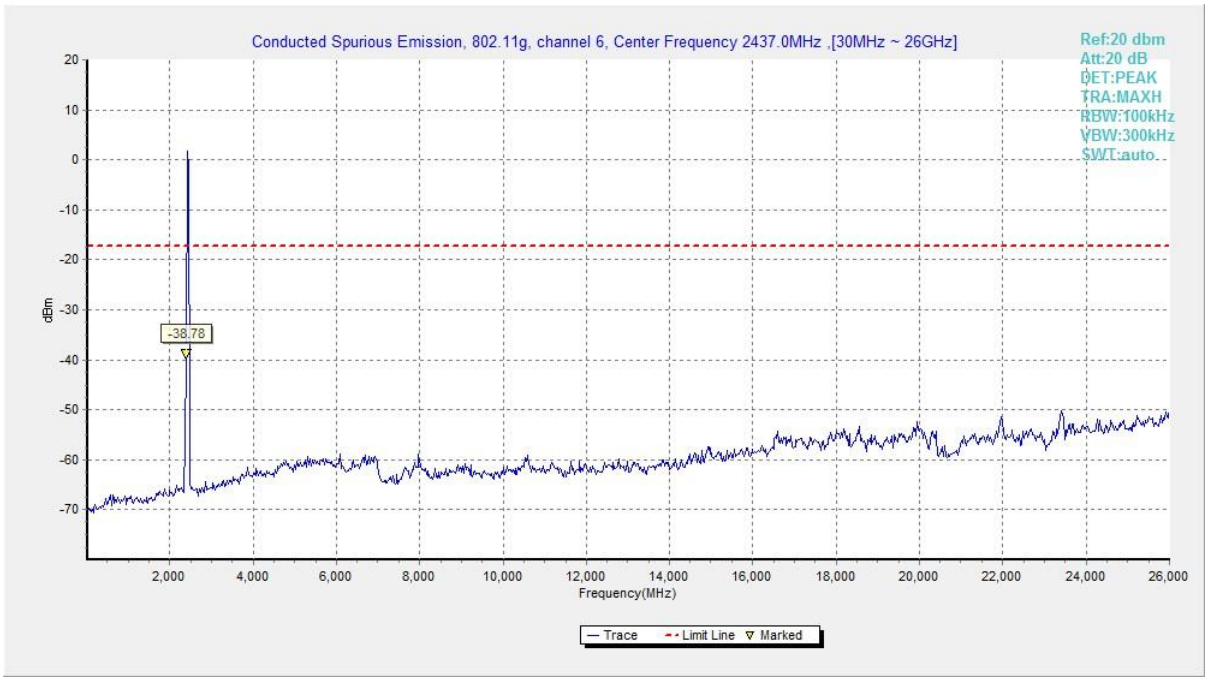


Fig.29 Conducted Spurious Emission (802.11g, CH6)

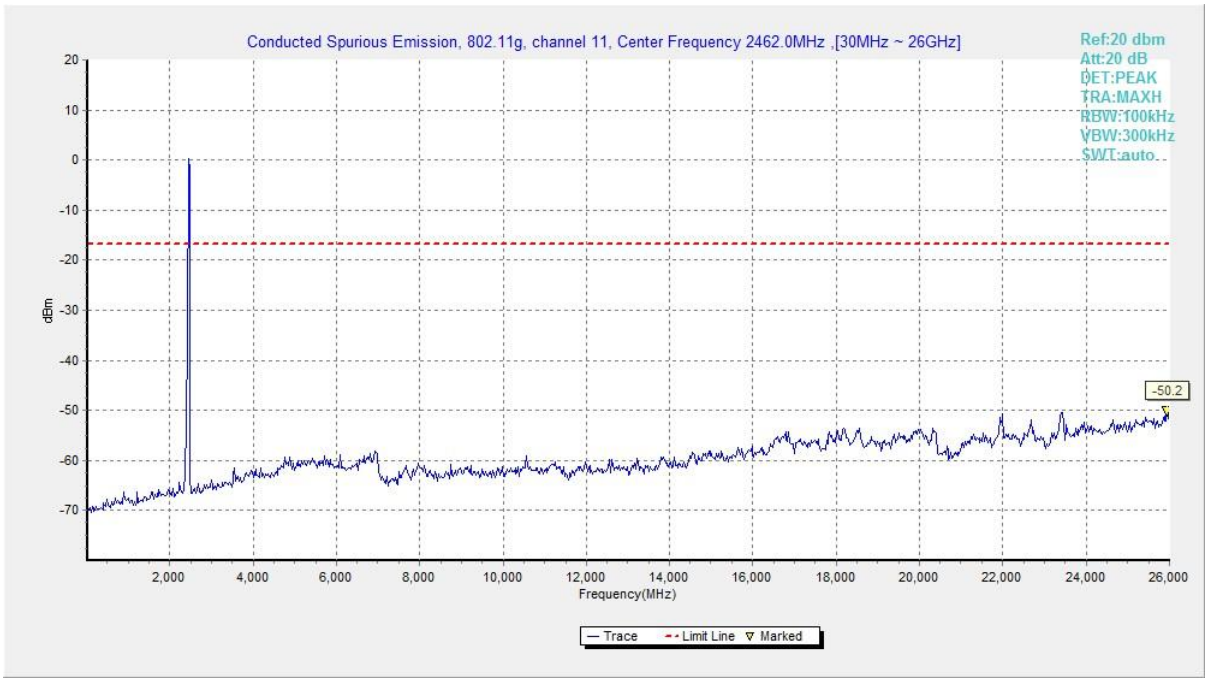


Fig.30 Conducted Spurious Emission (802.11g, CH11)

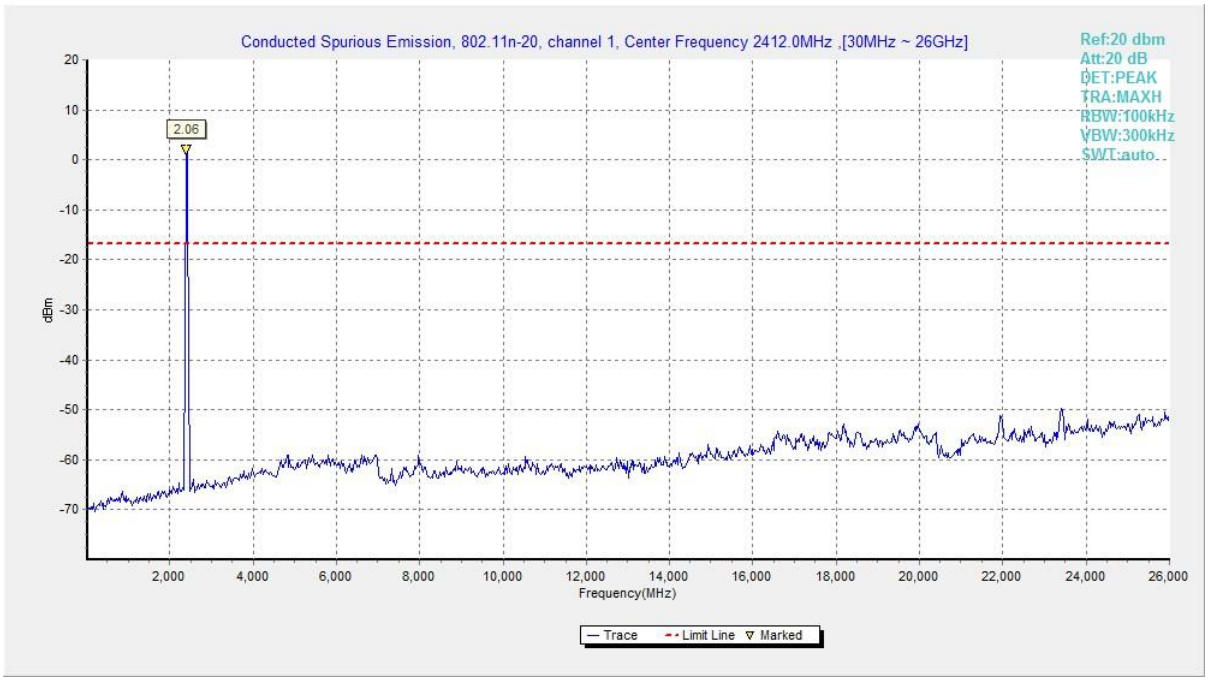


Fig.31 Conducted Spurious Emission (802.11n HT20, CH1)

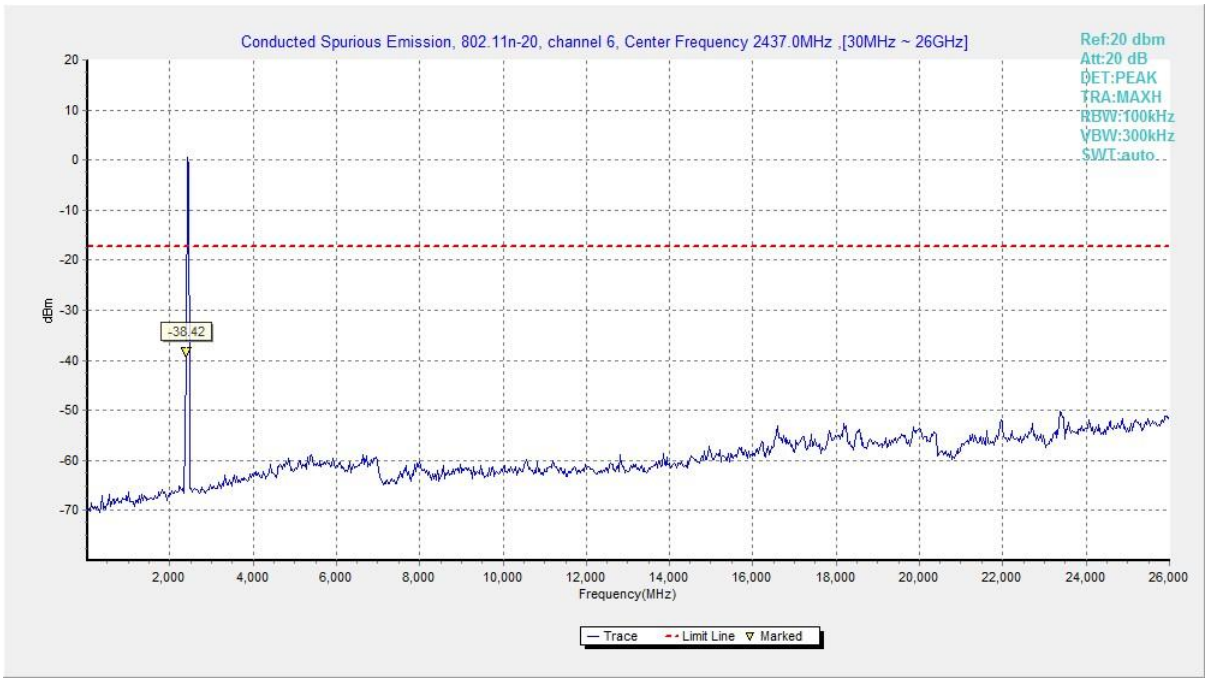


Fig.32 Conducted Spurious Emission (802.11n HT20, CH6)

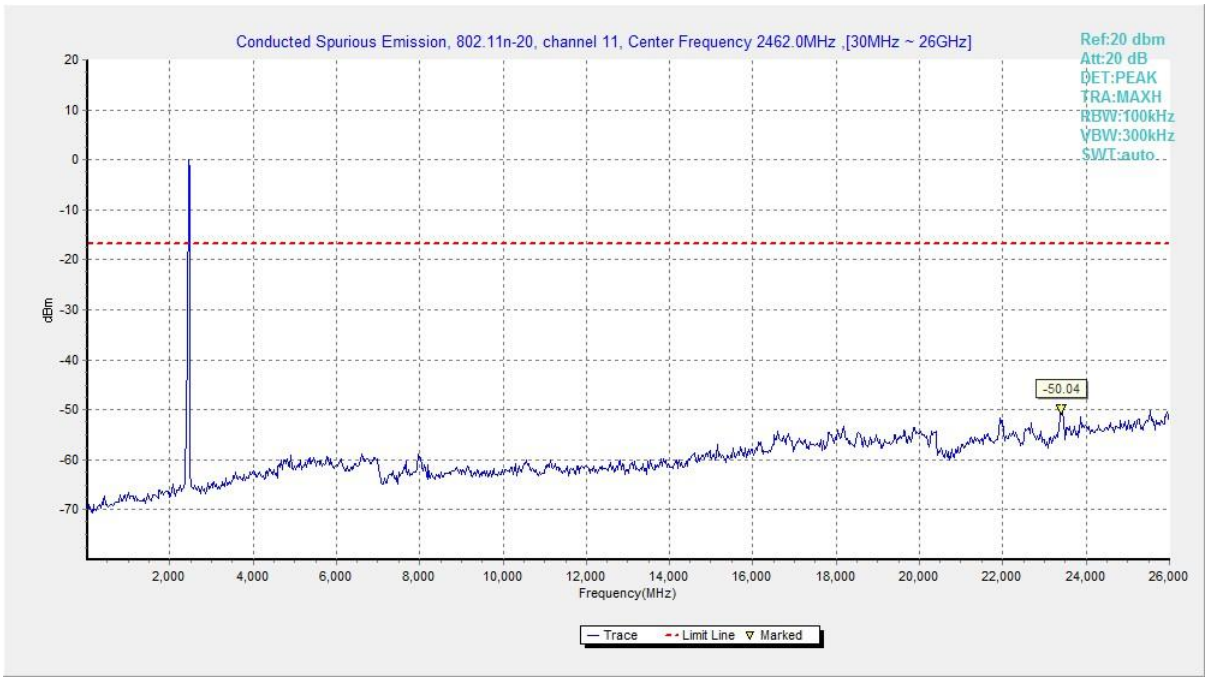


Fig.33 Conducted Spurious Emission (802.11n HT20, CH11)

A.7 Radiated Emission

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)).

Limit in restricted band:

Frequency of emission (MHz)	Field strength (μV/m)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

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	120kHz/300kHz	5
1000-4000	1MHz/3MHz	15
4000-18000	1MHz/3MHz	40
18000-26500	1MHz/3MHz	20

Note: According to the performance evaluation, the radiated emission margin of EUT is over 20dB in the band from 9kHz to 30MHz. Therefore, the measurement starts from 30MHz to tenth harmonic. The measurement results include the horizontal polarization and vertical polarization measurements.

Measurement Results:

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11b	CH 1	1 GHz ~ 18 GHz	Fig.34	**P**
	CH 6	1 GHz ~ 18 GHz	Fig.35	**P**
	CH 11	1 GHz ~ 18 GHz	Fig.36	**P**
	Restricted Band (CH1)	2.38 GHz ~ 2.45 GHz	Fig.37	**P**
	Restricted Band (CH11)	2.45 GHz ~ 2.5 GHz	Fig.38	**P**
802.11g	CH 1	1 GHz ~ 18 GHz	Fig.39	**P**
	CH 6	1 GHz ~ 18 GHz	Fig.40	**P**
	CH 11	1 GHz ~ 18 GHz	Fig.41	**P**
	Restricted Band (CH1)	2.38 GHz ~ 2.45 GHz	Fig.42	**P**
	Restricted Band (CH11)	2.45 GHz ~ 2.5 GHz	Fig.43	**P**
802.11n HT20	CH 1	1 GHz ~ 18 GHz	Fig.44	**P**
	CH 6	1 GHz ~ 18 GHz	Fig.45	**P**
	CH 11	1 GHz ~ 18 GHz	Fig.46	**P**
	Restricted Band (CH1)	2.38 GHz ~ 2.45 GHz	Fig.47	**P**
	Restricted Band (CH11)	2.45 GHz ~ 2.5 GHz	Fig.48	**P**
/	All Channels	9 kHz ~ 30 MHz	Fig.49	**P**
		30 MHz ~ 1 GHz	Fig.50	**P**
		18 GHz ~ 26.5 GHz	Fig.51	**P**

Worst-Case Result:

802.11b CH1 (1-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
13961.500000	53.14	74.00	20.86	V	17.1
14534.000000	53.91	74.00	20.09	V	17.9
15576.500000	54.94	74.00	19.07	V	19.6
16257.000000	56.41	74.00	17.59	V	21.0
17049.000000	56.79	74.00	17.21	V	22.2
17467.000000	56.84	74.00	17.16	V	22.4

Frequency (MHz)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
13941.500000	41.64	54.00	12.36	V	17.2
14563.000000	42.23	54.00	11.77	V	17.9
15576.500000	43.41	54.00	10.59	V	19.6
15667.500000	44.67	54.00	9.33	V	20.1
16645.000000	45.29	54.00	8.71	V	21.9
17700.000000	44.87	54.00	9.13	V	23.2

802.11g CH1 (1GHz-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
13505.500000	53.30	74.00	20.70	V	16.7
14669.500000	53.22	74.00	20.78	V	17.8
15556.500000	54.85	74.00	19.15	V	19.4
15651.000000	56.12	74.00	17.88	V	20.0
16644.500000	58.25	74.00	15.75	V	21.9
17694.000000	57.06	74.00	16.94	V	23.1

Frequency (MHz)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
13957.000000	41.43	54.00	12.57	V	17.1
14559.500000	41.72	54.00	12.28	V	17.9
15572.500000	43.37	54.00	10.63	V	19.6
15654.500000	44.64	54.00	9.36	V	20.0
16586.500000	45.03	54.00	8.97	V	22.2
17699.500000	44.88	54.00	9.12	V	23.1

802.11n HT20 CH1 (1GHz-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
13971.000000	53.37	74.00	20.63	V	17.1
14690.000000	54.45	74.00	19.55	V	17.8
15112.000000	54.28	74.00	19.72	V	18.3
15673.000000	55.99	74.00	18.01	V	20.1
17070.500000	56.66	74.00	17.34	V	21.9
17709.500000	56.52	74.00	17.48	V	23.1

Frequency (MHz)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
13957.000000	41.44	54.00	12.56	V	17.1
14685.000000	41.78	54.00	12.22	V	17.8
15576.500000	43.14	54.00	10.86	V	19.6
15657.500000	44.64	54.00	9.36	V	20.1
17048.500000	45.16	54.00	8.84	V	22.2
17699.500000	44.82	54.00	9.18	V	23.1

Note:

A "reference path loss" is established and the A_{Rpl} is the attenuation of “reference path loss”, and Antenna Factor, 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} + Cable Loss + Antenna Factor - Gain of the preamplifier

See below for test graphs.

Conclusion: PASS

Note: Peak above the limit line is the carrier frequency.

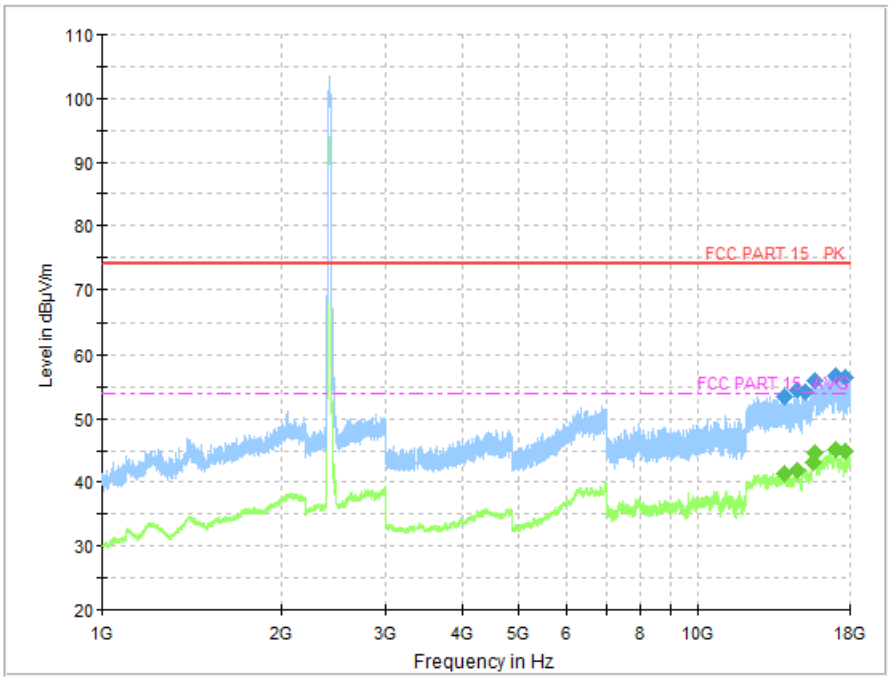


Fig.34 Radiated Spurious Emission (802.11b, CH1, 1GHz-18GHz)

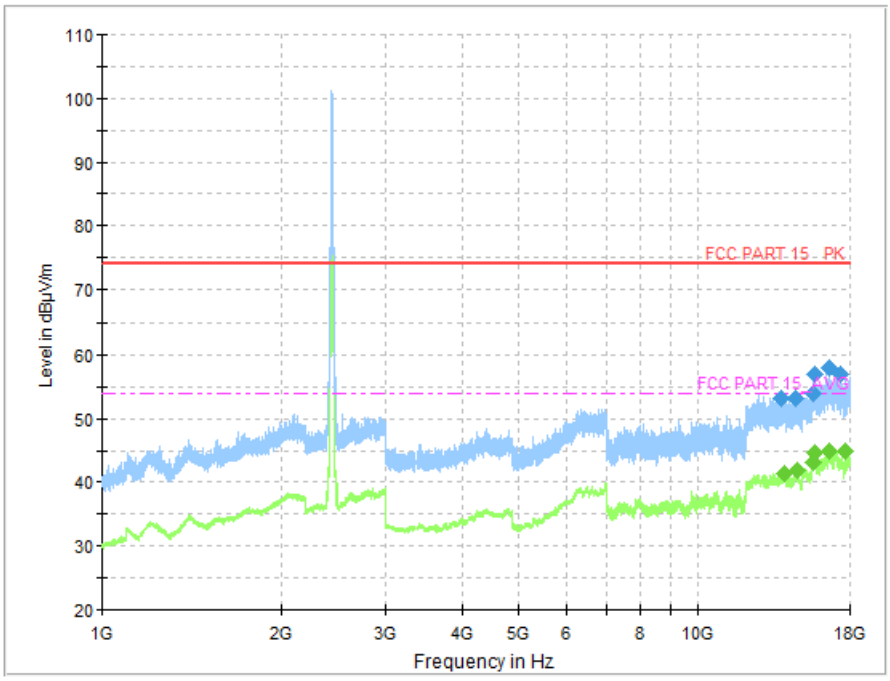


Fig.35 Radiated Spurious Emission (802.11b, CH6, 1GHz-18GHz)

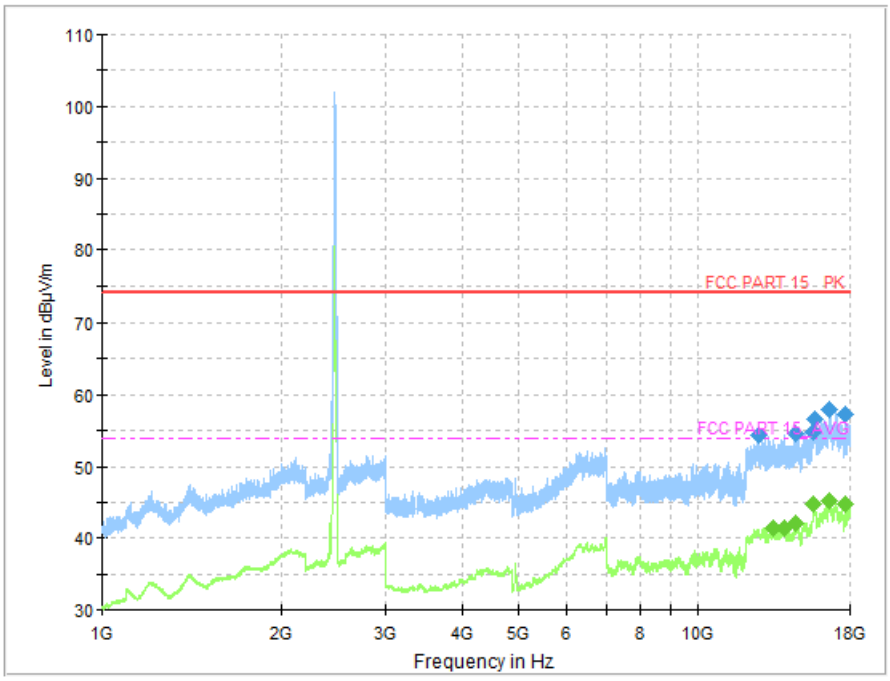


Fig.36 Radiated Spurious Emission (802.11b, CH11, 1GHz-18GHz)

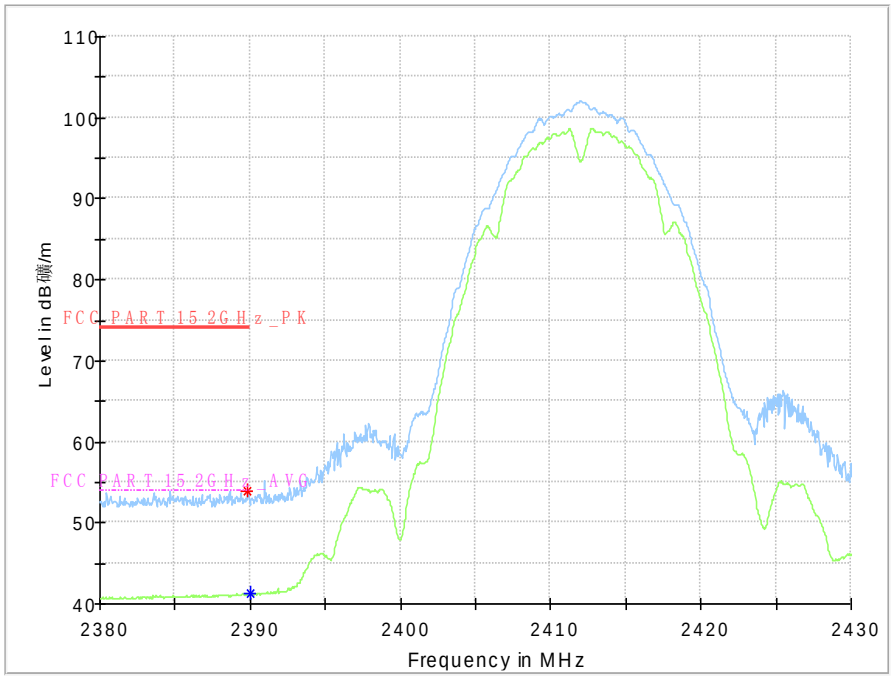


Fig.37 Radiated Restricted Band (802.11b, CH1, 2.38GHz~2.45GHz)

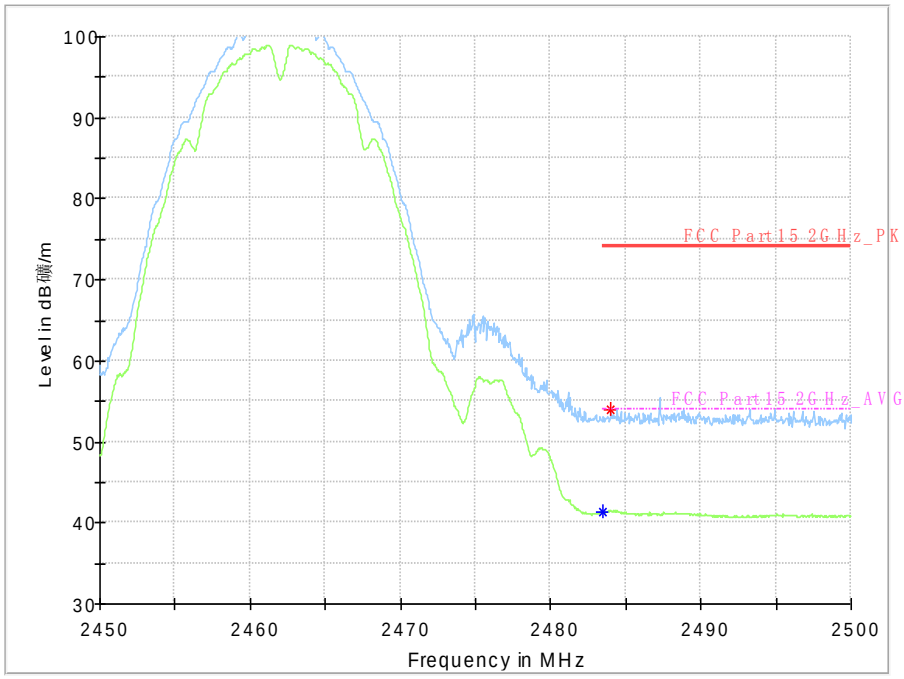


Fig.38 Radiated Restricted Band (802.11b, CH11, 2.45GHz~2.5GHz)

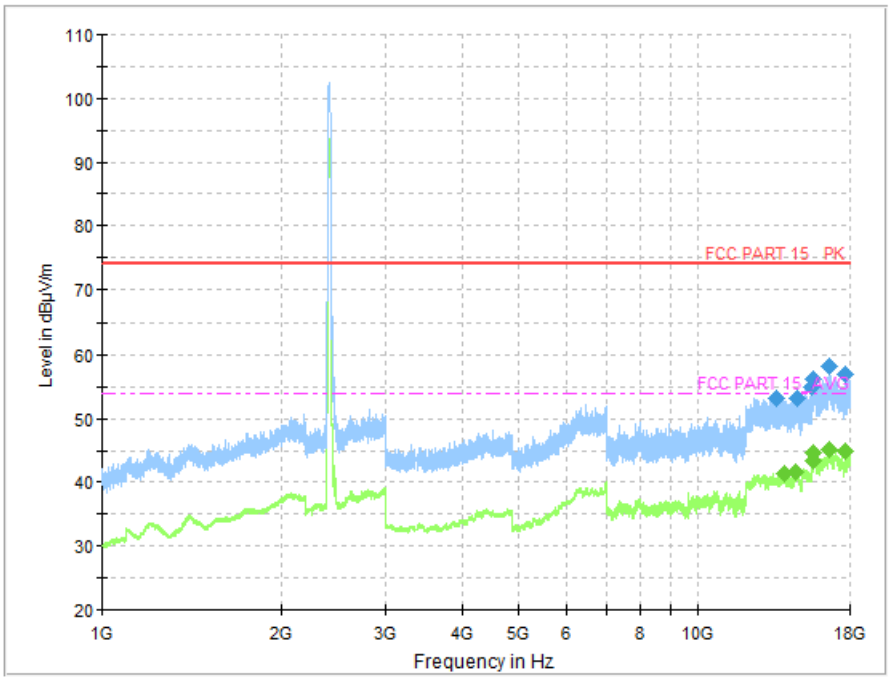


Fig.39 Radiated Spurious Emission (802.11g, CH1, 1GHz-18GHz)

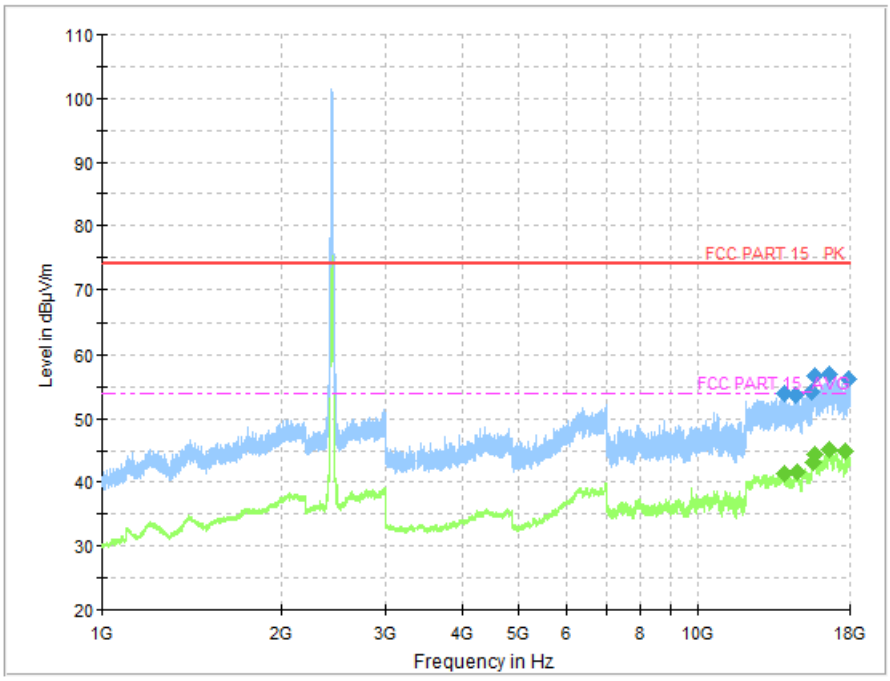


Fig.40 Radiated Spurious Emission (802.11g, CH6, 1 GHz-18GHz)

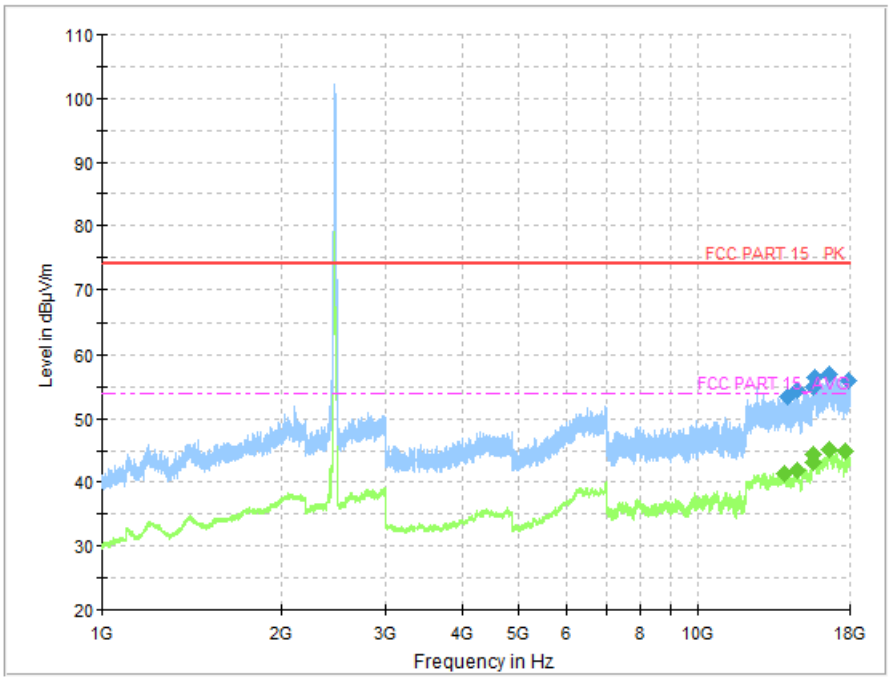


Fig.41 Radiated Spurious Emission (802.11g, CH11, 1GHz-18GHz)

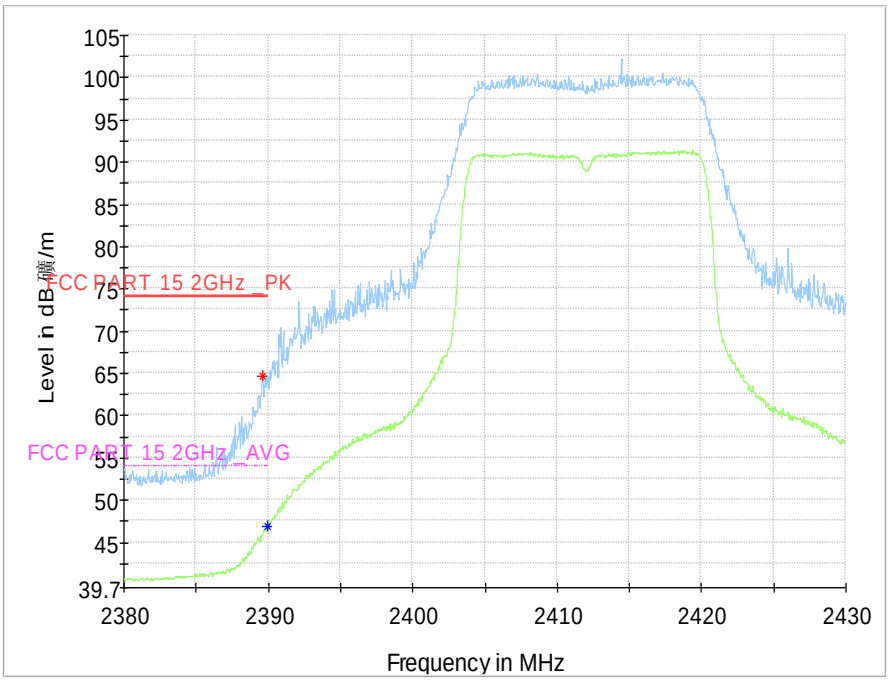


Fig.42 Radiated Restricted Band (802.11g, CH1, 2.38GHz~2.45GHz)

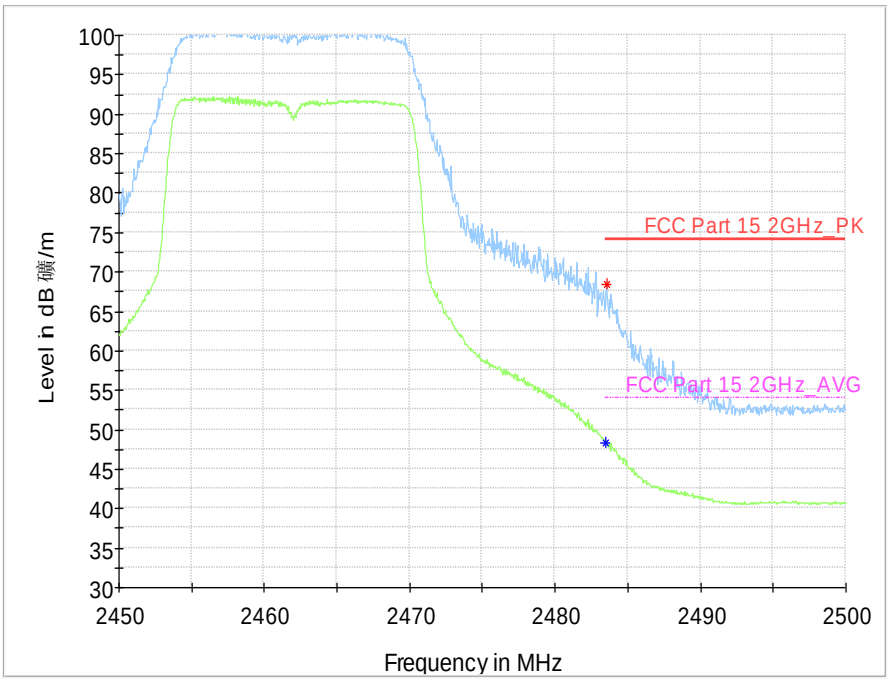


Fig.43 Radiated Restricted Band (802.11g, CH11, 2.45GHz~2.5GHz)

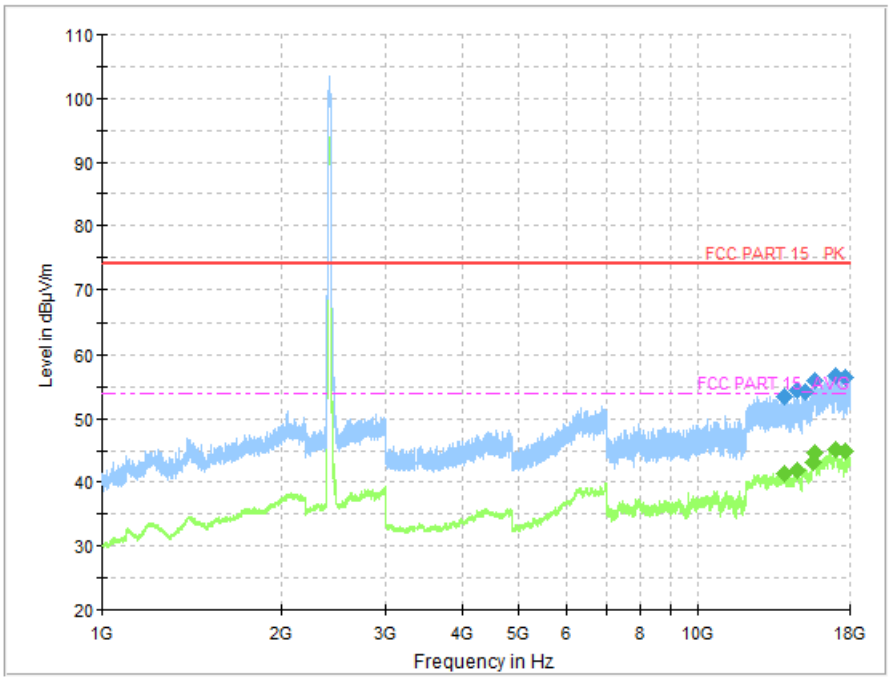


Fig.44 Radiated Spurious Emission (802.11n HT20, CH1, 1GHz-18GHz)

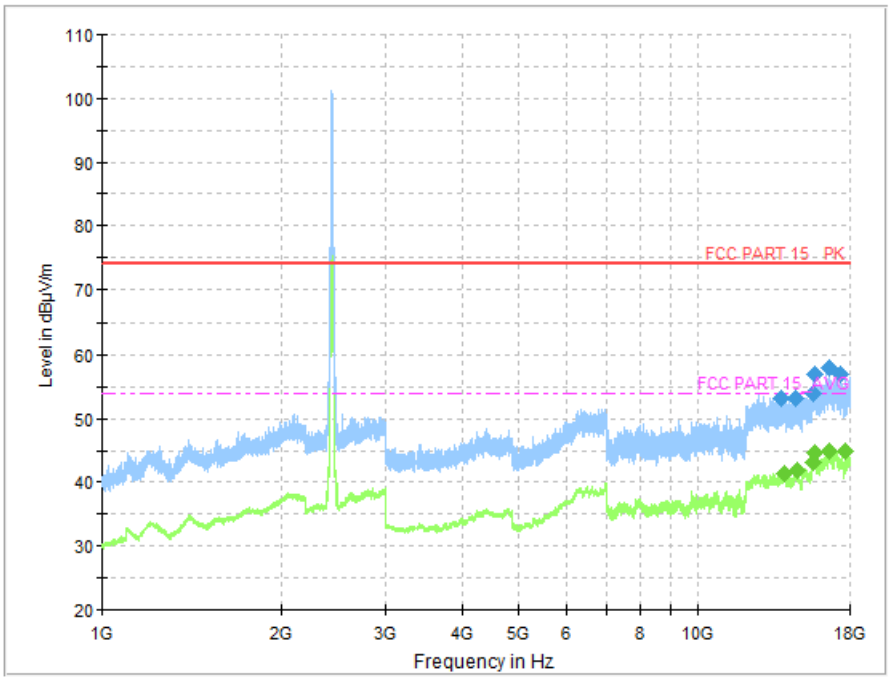


Fig.45 Radiated Spurious Emission (802.11n HT20, CH6, 1GHz-18GHz)

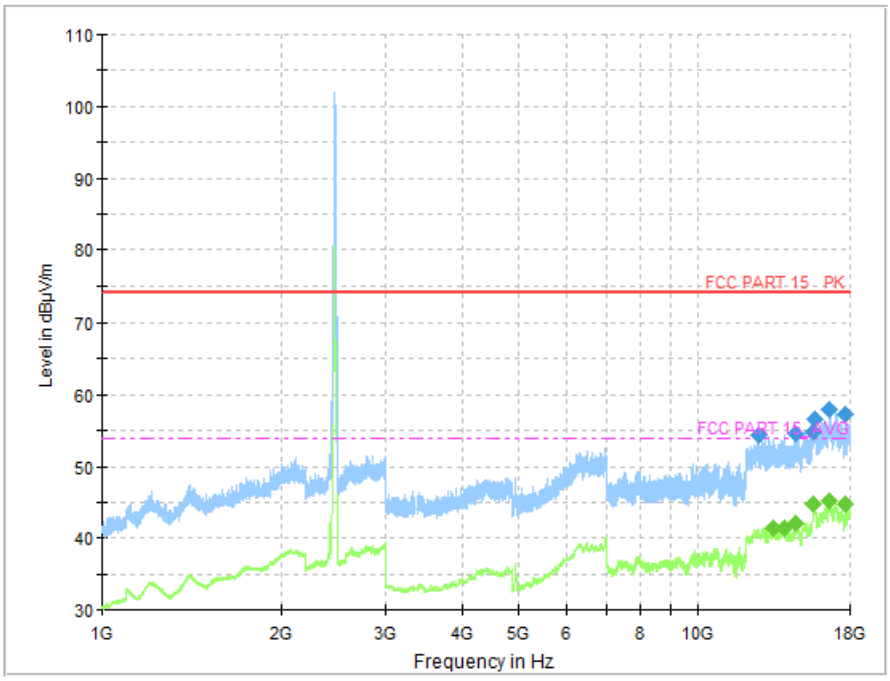


Fig.46 Radiated Spurious Emission (802.11n HT20, CH11, 1GHz-18GHz)

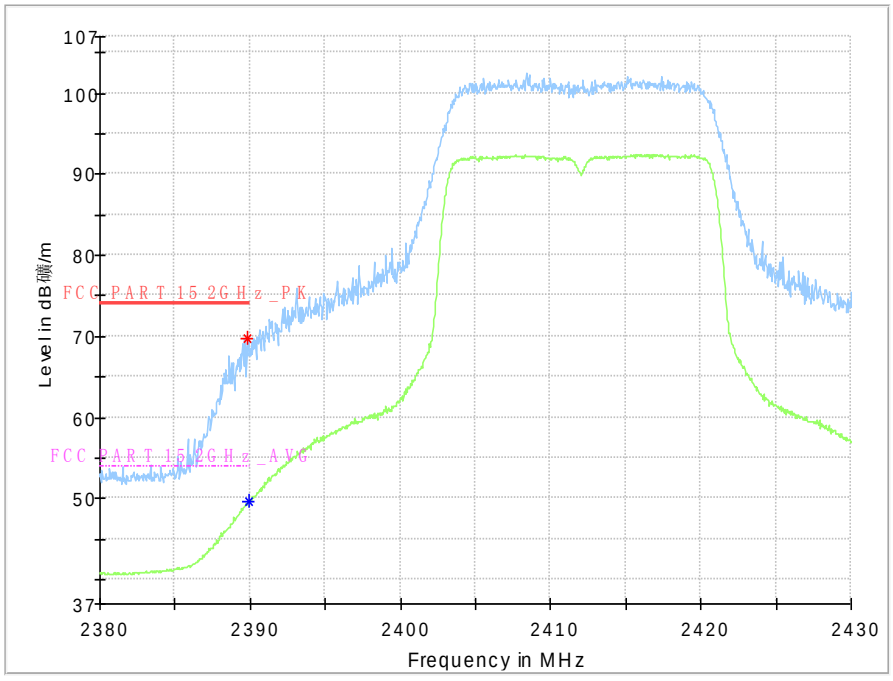


Fig.47 Radiated Restricted Band (802.11n HT20, CH1, 2.38GHz~2.45GHz)

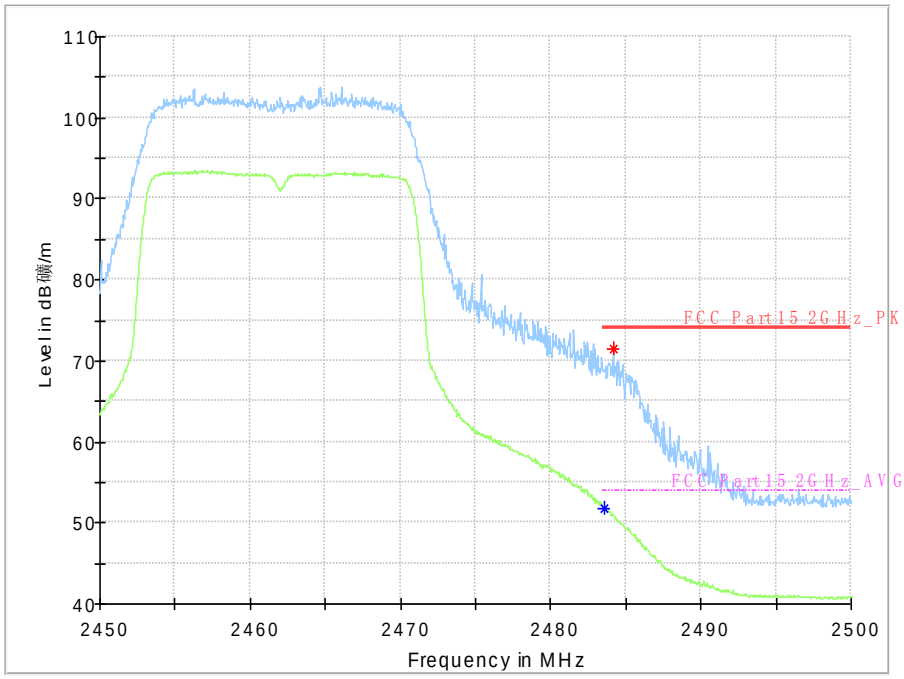


Fig.48 Radiated Restricted Band (802.11n HT20, CH11, 2.45GHz~2.5GHz)

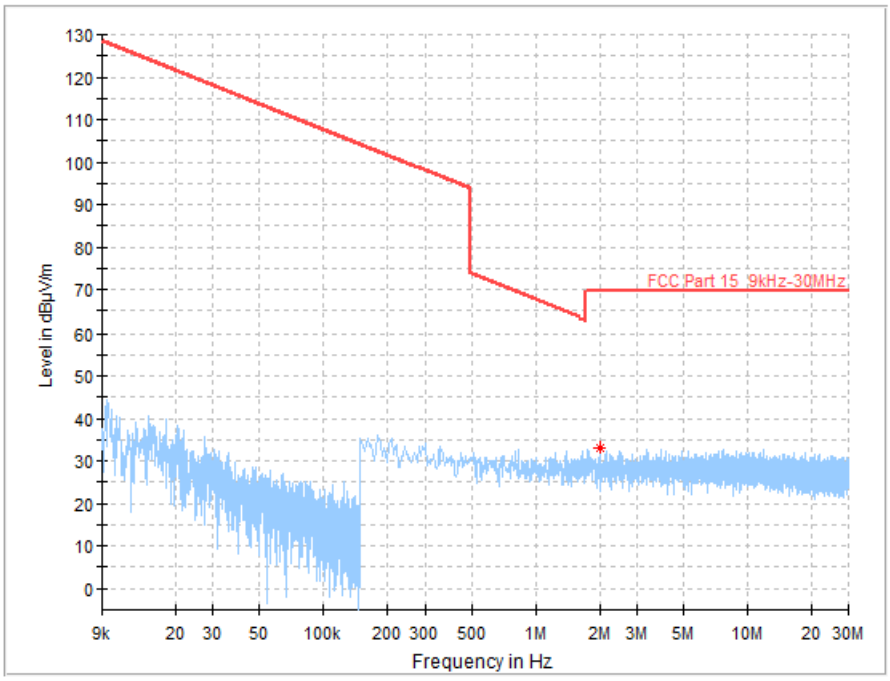


Fig.49 Radiated Spurious Emission (All Channels, 9KHz-30MHz)

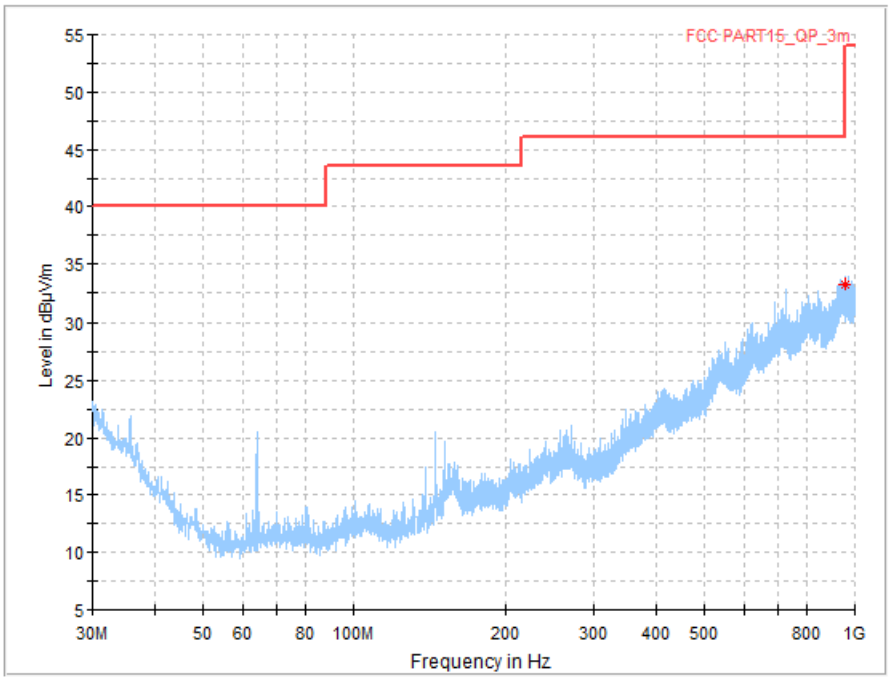


Fig.50 Radiated Spurious Emission (All Channels, 30MHz-1GHz)

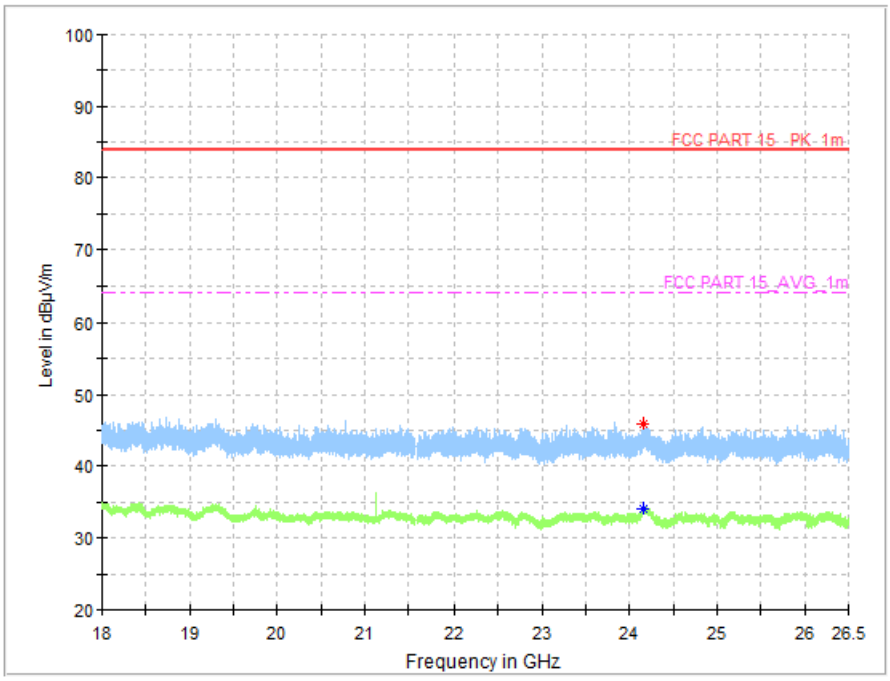


Fig.51 Radiated Spurious Emission (All Channels, 18GHz-26.5GHz)

A.8 AC Power line Conducted Emission

Test Condition:

Voltage (V)	Frequency (Hz)
120	60

Measurement Result and limit:

WLAN (Quasi-peak Limit) - AE2

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	66 to 56	Fig.52	Fig.53	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) - AE2

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	56 to 46	Fig.52	Fig.53	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.				

WLAN (Quasi-peak Limit) - AE3

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	66 to 56	Fig.54	Fig.55	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) - AE3

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	56 to 46	Fig.54	Fig.55	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.				

Test Condition:

Voltage (V)	Frequency (Hz)
240	60

Measurement Result and limit:

WLAN (Quasi-peak Limit) - AE2

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	66 to 56	Fig.56	Fig.57	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) - AE2

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	56 to 46	Fig.56	Fig.57	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.				

WLAN (Quasi-peak Limit) - AE3

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	66 to 56	Fig.58	Fig.59	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) - AE3

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	56 to 46	Fig.58	Fig.59	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.				

Note: The measurement results include the L1 and N measurements.

See below for test graphs.

Conclusion: PASS

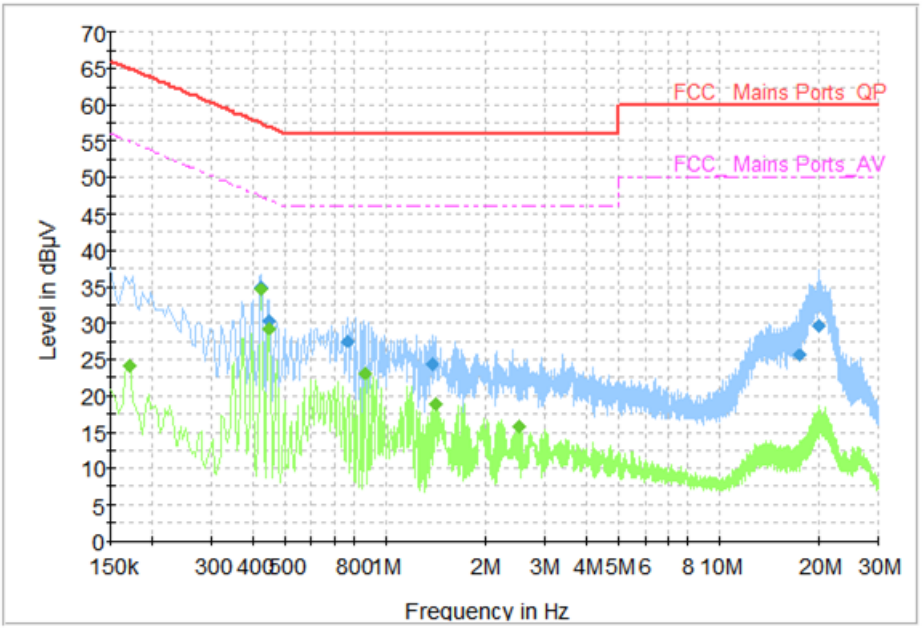


Fig.52 AC Power line Conducted Emission (Traffic, AE2, 120V)

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.422000	34.98	57.41	22.43	L1	ON	9.7
0.446000	30.39	56.95	26.56	L1	ON	9.7
0.766000	27.57	56.00	28.43	N	ON	9.7
1.378000	24.29	56.00	31.71	L1	ON	9.7
17.494000	25.59	60.00	34.41	N	ON	10.2
19.894000	29.64	60.00	30.36	N	ON	10.4

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.170000	24.10	54.96	30.86	N	ON	9.6
0.422000	34.55	47.41	12.86	L1	ON	9.7
0.446000	29.33	46.95	17.62	L1	ON	9.7
0.866000	23.06	46.00	22.94	L1	ON	9.7
1.406000	18.89	46.00	27.11	L1	ON	9.7
2.502000	15.78	46.00	30.22	L1	ON	9.7

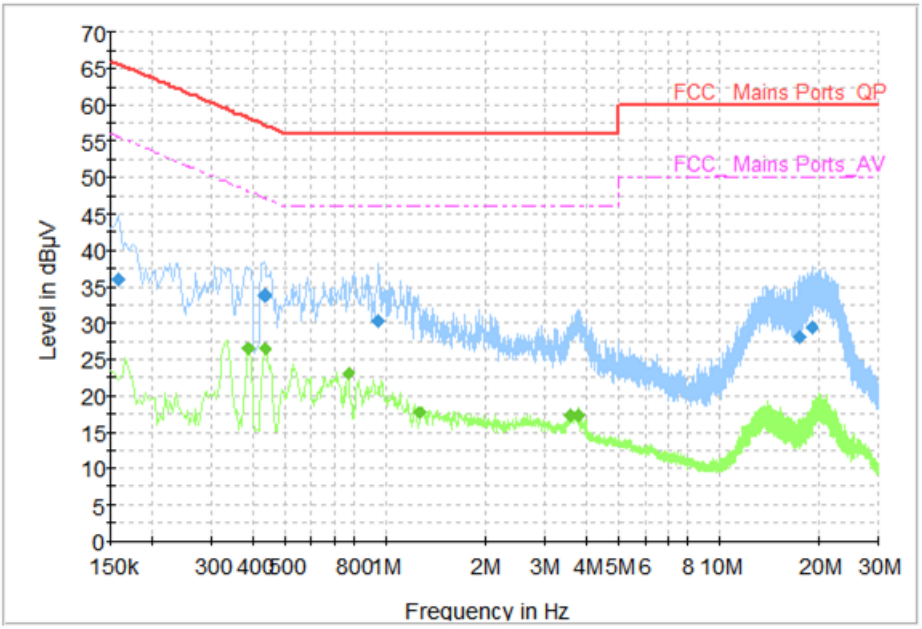


Fig.53 AC Power line Conducted Emission (Idle, AE2, 120V)

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.158000	35.92	65.57	29.65	L1	ON	9.7
0.430000	33.85	57.25	23.40	N	ON	9.7
0.434000	33.86	57.18	23.31	N	ON	9.7
0.950000	30.34	56.00	25.66	N	ON	9.7
17.510000	27.96	60.00	32.04	N	ON	10.2
18.990000	29.39	60.00	30.61	N	ON	10.3

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.386000	26.39	48.15	21.76	L1	ON	9.7
0.434000	26.47	47.18	20.71	N	ON	9.7
0.774000	23.06	46.00	22.94	N	ON	9.7
1.274000	17.70	46.00	28.30	L1	ON	9.7
3.590000	17.34	46.00	28.66	N	ON	9.7
3.782000	17.28	46.00	28.72	N	ON	9.7

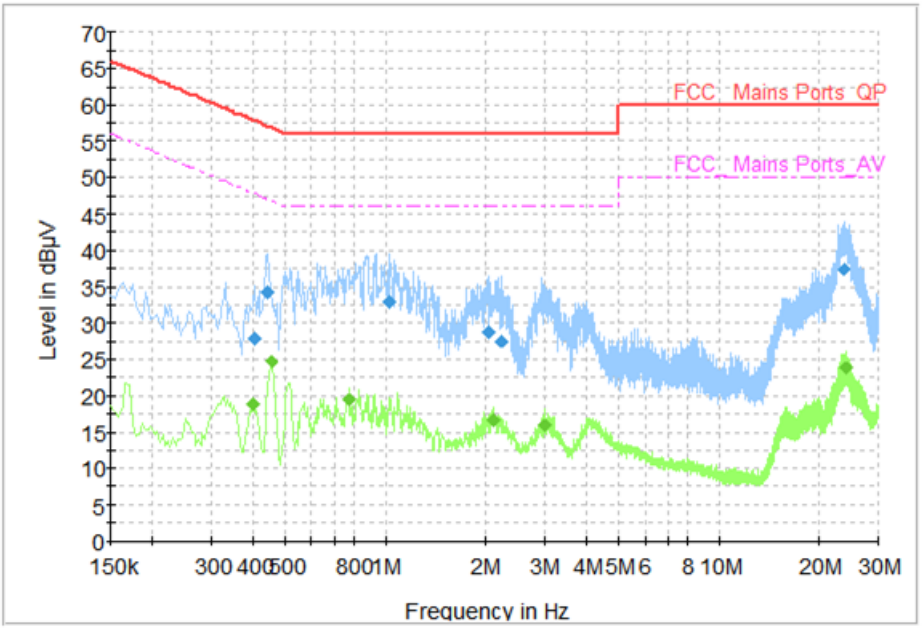


Fig.54 AC Power line Conducted Emission (Traffic, AE3, 120V)

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.406000	27.89	57.73	29.84	N	ON	9.7
0.442000	34.21	57.02	22.81	N	ON	9.7
1.030000	33.05	56.00	22.95	N	ON	9.7
2.034000	28.75	56.00	27.26	N	ON	9.7
2.214000	27.51	56.00	28.49	N	ON	9.7
23.702000	37.46	60.00	22.54	N	ON	10.3

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.402000	18.85	47.81	28.97	L1	ON	9.7
0.454000	24.63	46.80	22.17	L1	ON	9.7
0.778000	19.32	46.00	26.68	N	ON	9.7
2.094000	16.50	46.00	29.50	N	ON	9.7
2.994000	15.86	46.00	30.14	N	ON	9.7
23.942000	23.87	50.00	26.13	N	ON	10.3

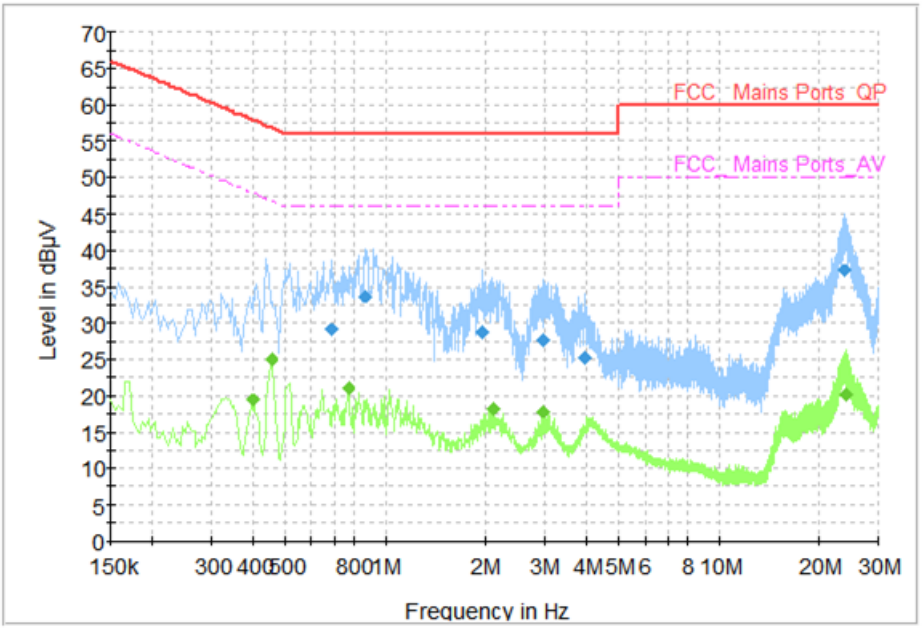


Fig.55 AC Power line Conducted Emission (Idle, AE3, 120V)

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.690000	29.12	56.00	26.88	N	ON	9.7
0.870000	33.63	56.00	22.37	N	ON	9.7
1.946000	28.82	56.00	27.18	N	ON	9.7
2.978000	27.71	56.00	28.29	N	ON	9.7
3.930000	25.29	56.00	30.71	N	ON	9.7
23.742000	37.29	60.00	22.71	N	ON	10.3

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.402000	19.41	47.81	28.40	L1	ON	9.7
0.454000	25.01	46.80	21.79	L1	ON	9.7
0.774000	20.94	46.00	25.06	N	ON	9.7
2.110000	18.24	46.00	27.76	N	ON	9.7
2.978000	17.80	46.00	28.20	N	ON	9.7
23.934000	20.18	50.00	29.82	N	ON	10.3

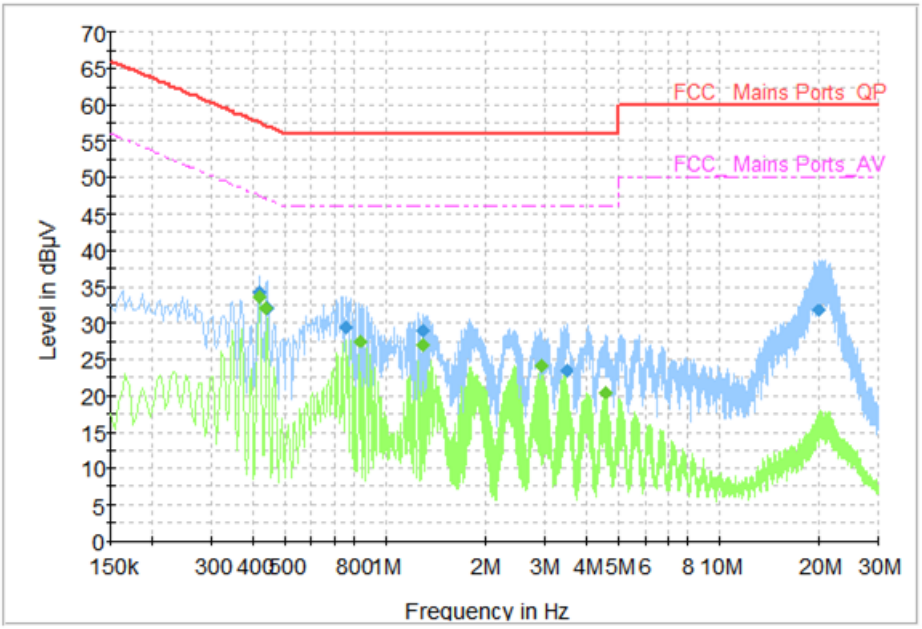


Fig.56 AC Power line Conducted Emission (Traffic, AE2, 240V)

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.418000	34.28	57.49	23.21	L1	ON	9.7
0.442000	32.12	57.02	24.90	L1	ON	9.7
0.758000	29.51	56.00	26.49	L1	ON	9.7
1.294000	28.86	56.00	27.14	L1	ON	9.7
3.474000	23.37	56.00	32.63	N	ON	9.7
20.002000	31.70	60.00	28.30	N	ON	10.4

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.418000	33.57	47.49	13.92	L1	ON	9.7
0.438000	32.01	47.10	15.09	L1	ON	9.7
0.834000	27.52	46.00	18.48	L1	ON	9.7
1.294000	27.05	46.00	18.95	L1	ON	9.7
2.934000	24.08	46.00	21.92	L1	ON	9.7
4.574000	20.48	46.00	25.52	L1	ON	9.8

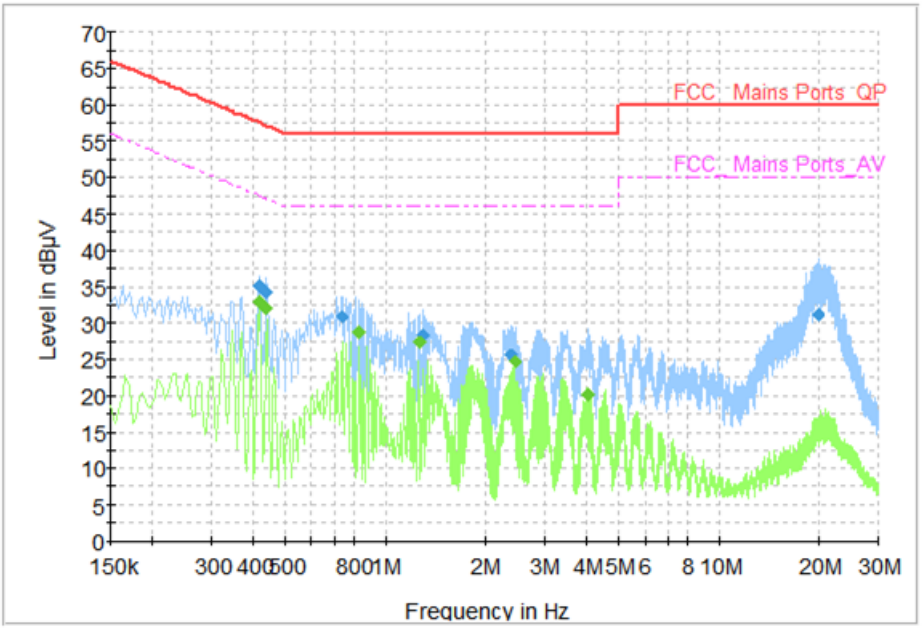


Fig.57 AC Power line Conducted Emission (Idle, AE2, 240V)

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.414000	35.06	57.57	22.50	L1	ON	9.7
0.438000	34.19	57.10	22.90	L1	ON	9.7
0.738000	30.93	56.00	25.07	L1	ON	9.7
1.294000	28.31	56.00	27.69	L1	ON	9.7
2.370000	25.53	56.00	30.47	L1	ON	9.7
19.798000	31.20	60.00	28.80	N	ON	10.4

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.418000	32.94	47.49	14.54	L1	ON	9.7
0.438000	32.09	47.10	15.01	L1	ON	9.7
0.830000	28.80	46.00	17.20	L1	ON	9.7
1.270000	27.31	46.00	18.69	L1	ON	9.7
2.446000	24.64	46.00	21.36	L1	ON	9.7
4.062000	20.08	46.00	25.92	L1	ON	9.7

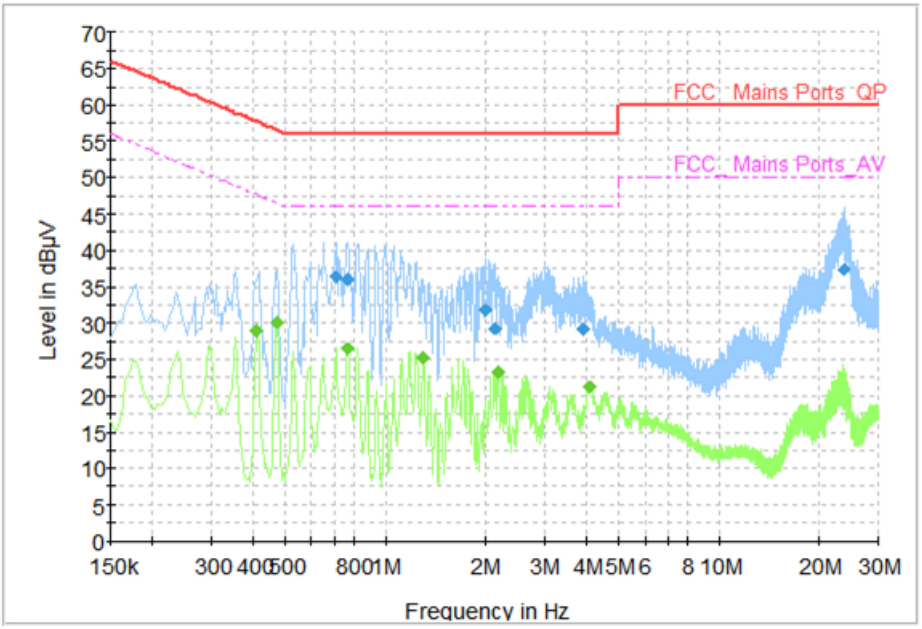


Fig.58 AC Power line Conducted Emission (Traffic, AE3, 240V)

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.706000	36.39	56.00	19.61	N	ON	9.7
0.766000	35.92	56.00	20.08	N	ON	9.7
1.998000	31.72	56.00	24.28	N	ON	9.7
2.126000	29.26	56.00	26.74	N	ON	9.7
3.910000	29.18	56.00	26.82	N	ON	9.7
23.634000	37.39	60.00	22.61	N	ON	10.3

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.410000	28.93	47.65	18.72	L1	ON	9.7
0.470000	30.11	46.51	16.40	L1	ON	9.7
0.766000	26.50	46.00	19.50	L1	ON	9.7
1.290000	25.27	46.00	20.73	L1	ON	9.7
2.174000	23.22	46.00	22.78	L1	ON	9.7
4.098000	21.15	46.00	24.85	L1	ON	9.7

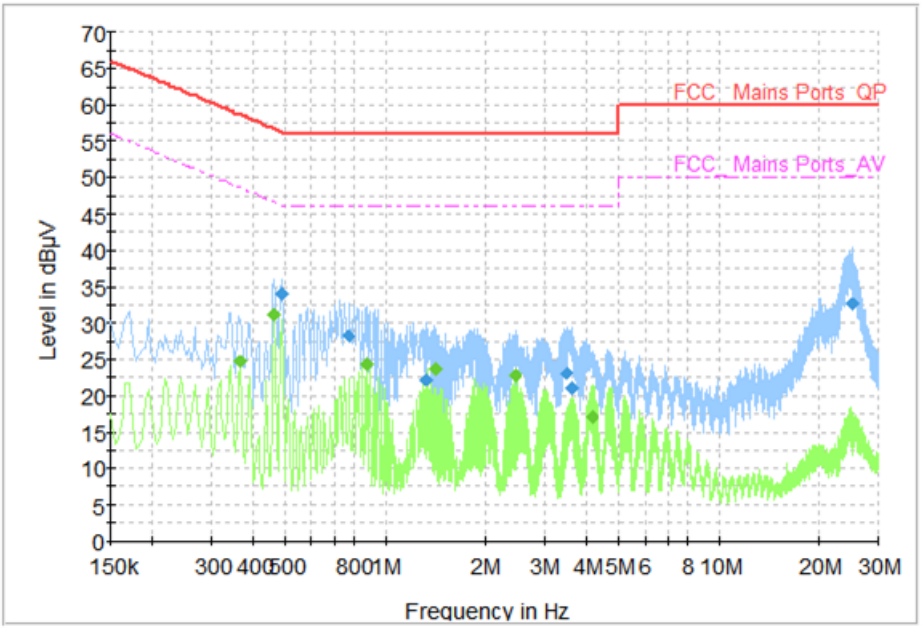


Fig.59 AC Power line Conducted Emission (Idle, AE3, 240V)

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.486000	34.03	56.24	22.20	N	ON	9.7
0.774000	28.21	56.00	27.79	N	ON	9.7
1.330000	22.29	56.00	33.71	N	ON	9.7
3.486000	23.05	56.00	32.95	N	ON	9.7
3.610000	20.95	56.00	35.05	N	ON	9.7
25.078000	32.62	60.00	27.38	N	ON	10.2

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.366000	24.77	48.59	23.82	L1	ON	9.7
0.462000	31.26	46.66	15.40	L1	ON	9.7
0.874000	24.37	46.00	21.63	L1	ON	9.7
1.406000	23.61	46.00	22.39	L1	ON	9.7
2.450000	22.80	46.00	23.20	L1	ON	9.7
4.170000	17.06	46.00	28.94	L1	ON	9.7

*****END OF REPORT*****