Full

TEST REPORT

No. I16D00265-WLA

For

Client : Hisense International Co., Ltd

Production : Smartphone

Model Name : Hisense U963

FCC ID: 2ADOBU963

Hardware Version: V1.0

Software Version: L1348.6.01.01.MX05

Issued date: 2017-02-06

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 ECIT Shanghai.

Test Laboratory:

ECIT Shanghai, East China Institute of Telecommunications

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Revision Version

Report Number	Revision	Date	Memo
I16D00265-WLA	00	2017-02-06	Initial creation of test report

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1. Test Laboratory

1.1. Testing Location

Company Name:	ECIT Shanghai, East China Institute of Telecommunications
Address:	7-8F, G Area, No. 668, Beijing East Road, Huangpu District, Shanghai, P. R. China
Postal Code:	200001
Telephone:	(+86)-021-63843300
Fax:	(+86)-021-63843301

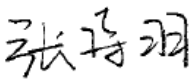
1.2. Testing Environment

Normal Temperature:	15-35℃
Extreme Temperature:	-10/+55℃
Relative Humidity:	20-75%

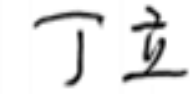
1.3. Project data

Project Leader:	Wang Yaqiong
Testing Start Date:	2016-12-21
Testing End Date:	2017-01-20

1.4. Signature



Zhang Shiyu
(Prepared this test report)



Ding Li
(Reviewed this test report)

Zheng Zhongbin
Director of the laboratory
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	Hisense International Co., Ltd
Address:	Floor 22, Hisense Tower, 17 Donghai Xi Road, Qingdao, 266071, China
Postcode:	266010
Email:	zhangkelin@hisense.com

2.2. Manufacturer Information

Company Name:	Hisense Communications Co., Ltd.
Address:	218 Qianwangang Road, Economic & Technological Development Zone, Qingdao, Shandong Province, P.R. China
Postcode:	266510
Email:	zhangmingyd@hisense.com

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

3.1. About EUT

EUT Description	Smartphone
Model name	Hisense U963
WLAN Frequency	2412MHz-2472MHz
WLAN Channel	Channel1-Channel13
WLAN type of modulation	802.11b:DSSS 802.11g/n: OFDM
Extreme Temperature	-10/+55℃
Nominal Voltage	3.8V
Extreme High Voltage	4.3V
Extreme Low Voltage	3.6 V

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

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
N03	002101541395046	V1.00	L1348.6.01.01.MX0	2016-12-20

*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	SN
AE1	RF cable	---
AE2	---	---

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

3.4. Main Supply of EUT

Part Name	Model Name	Supplier
LCD	TXDY500DFWPC-174	TONGXINGDA
Flash	KMFNX0012M-B214	Samsung

3.5. Secondary Supply of EUT

AE ID*	Description	SN
LCD	KBF8630-5.0	HOLITECH
Flash	H9TQ64A8GTCCUR-KUM	SK Hynix

4. Reference Documents

4.1. 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, 2400-2483.5MHz, and 5725-5850MHz.	Jun,2016 Edition
ANSI 63.10	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9KHz to 40GHz	2013

5. Summary of Test Results

A brief summary of the tests carried out is shown as following.

Measurement Items	Sub-clause of Part15C	Sub-clause of IC	Verdict
Maximum Peak Output Power	15.247(a)	/	P
Peak Power Spectral Density	15.247(e)	/	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,	/	P
AC Powerline Conducted Emission	15.107,15.207	/	NA

Please refer to part 5 for detail.

The measurements are 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 ECIT.
NA	Not Applicable, the test was not applicable.
F	Fail, the EUT does not comply with the essential requirements in the standard.

Test Conditions

Tnom	Normal temperature
Tmin	Low Temperature
Tmax	High Temperature
Vnom	Normal Voltage
Vmin	Low Voltage
Vmax	High Voltage
Hnom	Norm Humidity
Anom	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	Tnom	22℃
Voltage	Vnom	3.7V
Humidity	Hnom	32%
Air Pressure	Anom	1010hPa

5.1. Notes

All reported tests were carried out on a sample equipment to demonstrate limited compliance with section 3.

The test results of this test report relate exclusively to the item(s) tested as specified in section 5.

The following deviation from, additions to, or exclusions from the test specifications have been made. See section 3.

5.2. Statements

The product name Hisense U963, supporting GSM/GPRS/EDGE/WCDMA/HSDPA/HSUPA/WLAN/BT/BLE, manufactured by Hisense International Co., Ltd. is a new product for testing.

ECIT has verified that the compliance of the tested device specified in section 5 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 5 of this test report.

6. Test result

6.1. Maximum Output Power

6.1.1 Measurement Limit and method:

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

6.1.2 Test procedure

The measurement is according to ANSI C63.10 clause 11.2

1. The output power of EUT was connected to the spectrum analyzer. The path loss was compensated to the results for each measurement.
2. Enable EUT transmitter maximum power continuously.
3. Set RBW ≥ OBW, VBW ≥ 3RBW.
4. Detector : Peak.
5. Trace mode: Max Hold

6.1.3 Measurement Uncertainty:

Measurement Uncertainty	0.75dB

6.1.4 Maximum Peak Output Power-conducted

Measurement Results:

802.11b/g mode

Mode	Data Rate(Mbps)	Teat Result(dBm)				
		2412MHz(Ch1)	2437MHz(Ch6)	2462MHz(Ch11)	2467MHz (Ch12)	2472MHz (Ch13)
802.11b	1	16.13	16.79	16.81	10.33	10.24
	2	16.25	16.52	17.03	10.29	10.33
	5.5	16.42	16.85	17.05	10.76	10.47
	11	16.54	16.99	17.67	10.48	10.29
802.11g	6	15.34	16.02	16.19	15.84	15.76
	9	15.58	15.44	16.21	15.01	15.43
	12	15.27	15.63	16.18	15.22	15.09

	18	15.28	15.81	16.26	15.08	15.82
	24	15.46	15.79	16.33	15.79	15.54
	36	15.77	15.67	16.42	15.97	15.77
	48	15.98	15.98	16.58	15.85	15.62
	54	15.92	16.05	16.86	16.24	16.12

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

802.11n mode

Mode	Data Rate(Index)	Teat Result(dBm)				
		2412MHz(Ch1)	2437MHz (Ch6)	2462MHz (Ch11)	2467MHz (Ch12)	2472MHz(Ch13)
802.11n(20 MHz)	MCS0	8.38	9.12	9.79	8.79	8.45
	MCS1	8.46	9.2	9.85	8.52	8.23
	MCS2	8.39	9.13	9.85	8.49	8.21
	MCS3	8.49	9.32	10.1	9.26	8.96
	MCS4	8.46	9.42	10.16	9.34	8.87
	MCS5	8.42	9.29	10.13	9.28	8.79
	MCS6	8.68	9.49	10.32	9.52	9.02
	MCS7	8.7	10.06	10.55	9.57	9.33
802.11n(40 MHz)	MCS0	/	/	/	/	/
	MCS1	/	/	/	/	/
	MCS2	/	/	/	/	/
	MCS3	/	/	/	/	/
	MCS4	/	/	/	/	/
	MCS5	/	/	/	/	/
	MCS6	/	/	/	/	/
	MCS7	/	/	/	/	/

The data rate MCS7 is selected as worse condition, and the following case are performed with this condition.

6.1.5 Maximum Average Output Power-conducted

802.11b/g mode

Mode	Test Result(dBm)				
	2412MHz(Ch 1)	2437MHz(Ch 6)	2462MHz(Ch 11)	2467MHz(Ch 12)	2472MHz(Ch 13)
802.11 b	13.55	14.34	14.39	7.26	7.19
802.11 g	12.17	12.83	13.77	12.95	12.86

802.11n mode

Mode	Test Result(dBm)				
	2412MHz(Ch1)	2437MHz(Ch6)	2462MHz(Ch11)	2467MHz(Ch12)	2472MHz(Ch13)
802.11n(20MHz)	3.67	3.78	4.21	3.52	3.49

Conclusion: PASS

6.2. Peak Power Spectral Density

6.2.1 Measurement Limit:

Standard	Limit
FCC CFR Part 15.247(e)	< 8dBm/3 KHz

6.2.2 Test procedures

The measurement is according to ANSI C63.10 clause 11.10.

1. The output power of EUT was connected to the spectrum analyzer. The path loss was compensated to the results for each measurement.
2. Enable EUT transmitter maximum power continuously.
3. Set analyzer center frequency to DTS channel center frequency.
4. Set the span to 1.5 times the DTS bandwidth.
5. Set the RBW to 3 kHz $\leqslant$ RBW $\leqslant$ 100 kHz.
6. Set the VBW $\geqslant$ [3 $\times$ RBW].
7. Detector = peak.
8. Sweep time = auto couple.
9. Trace mode = max hold.

10. Allow trace to fully stabilize.
11. Use the peak marker function to determine the maximum amplitude level within the RBW.
12. If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.

6.2.3 Measurement Uncertainty:

Measurement Uncertainty	0.75dB

6.2.4 Measurement Results:

802.11b/g mode

Mode	Channel	Power Spectral Density(dBm/3kHz)		Conclusion
802.11b	1	Fig.1	-18.934	P
	6	Fig.2	-17.368	P
	11	Fig.3	-18.27	P
	12	Fig.4	-18.57	P
	13	Fig.5	-18.78	P
802.11g	1	Fig.6	-19.07	P
	6	Fig.7	-17.837	P
	11	Fig.8	-17.47	P
	12	Fig.9	-12.55	P
	13	Fig.10	-12.45	P

802.11n mode

Mode	Channel	Power Spectral Density(dBm/3kHz)		Conclusion
802.11n(20MHz)	1	Fig.11	-26.187	P
	6	Fig.12	-25.317	P
	11	Fig.13	-24.797	P
	12	Fig.14	-19.86	P
	13	Fig.15	-19.84	P

Conclusion: PASS

Test graphs as below:

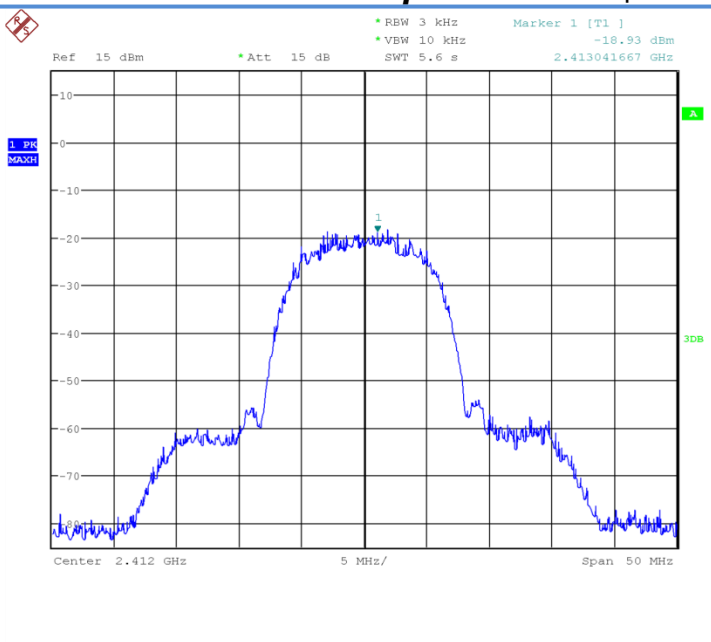


Fig.1 Power Spectral Density (802.1b,Ch1)

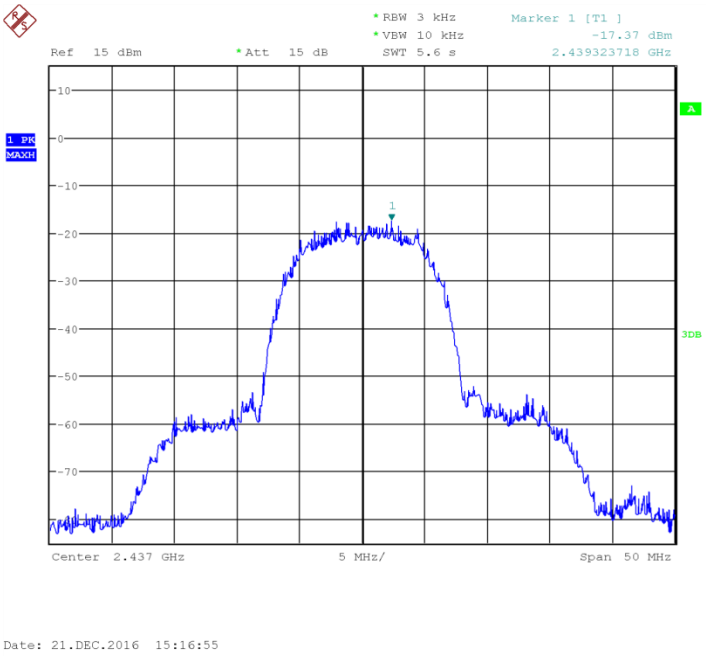


Fig.2 Power Spectral Density (802.1b,Ch6)

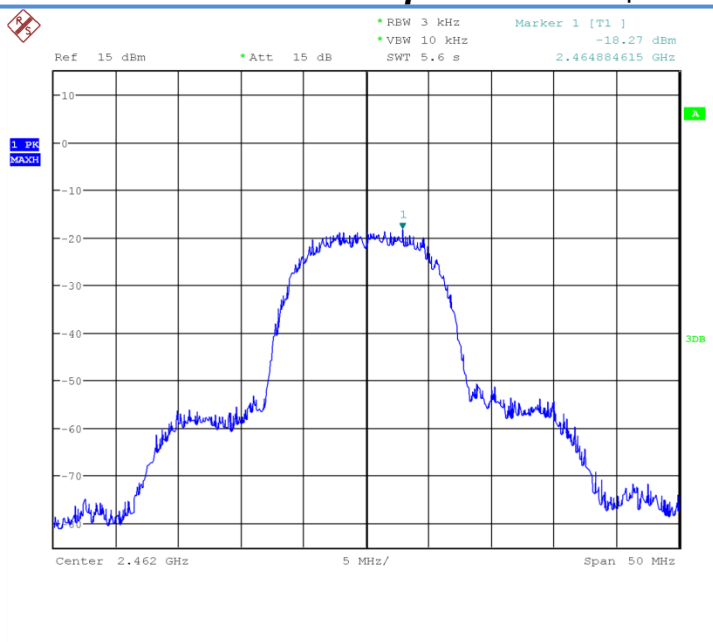


Fig.3 Power Spectral Density (802.1b,Ch11)

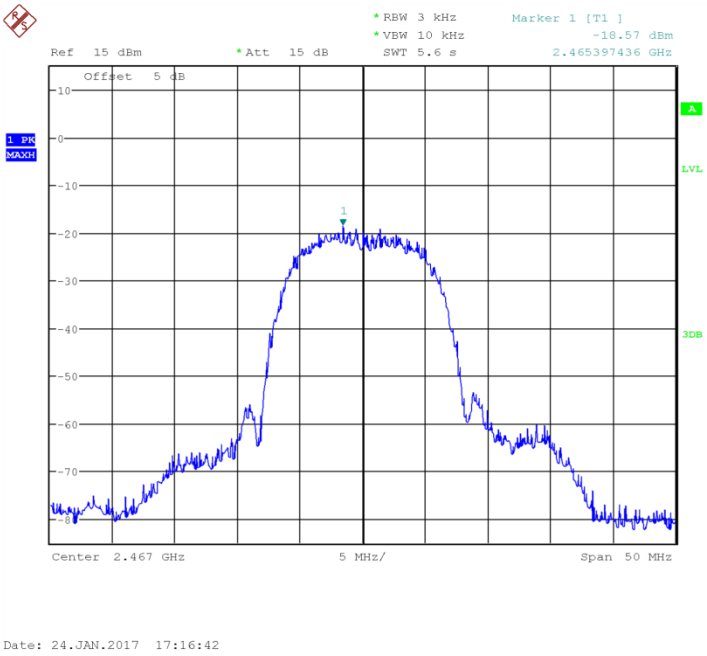


Fig.4 Power Spectral Density (802.1b,Ch12)

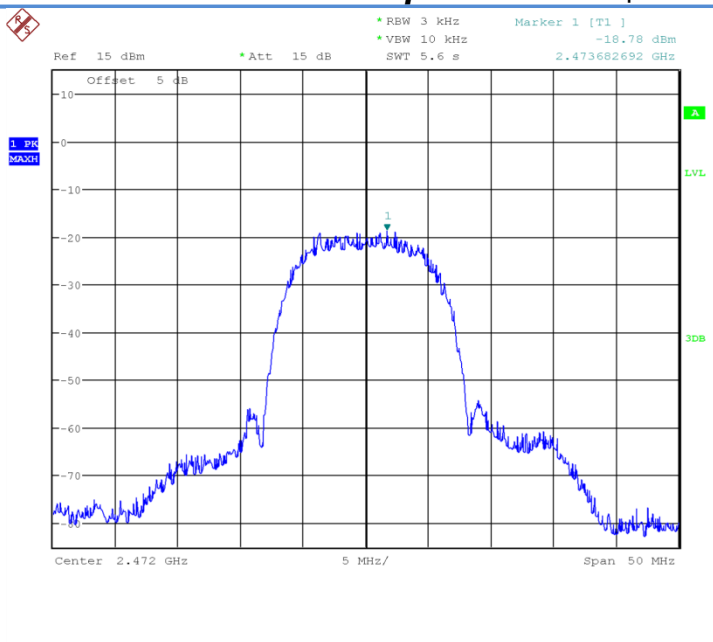


Fig.5 Power Spectral Density (802.1b,Ch13)

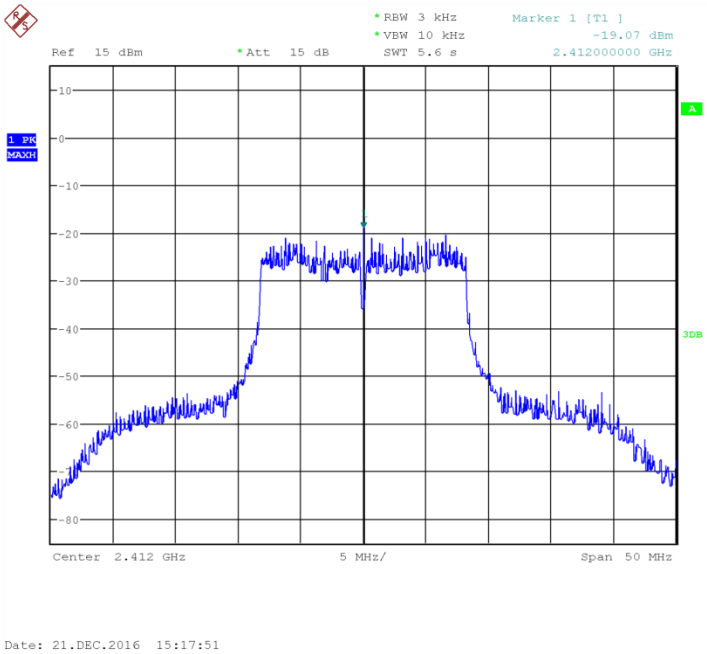


Fig.6 Power Spectral Density (802.1g,Ch1)

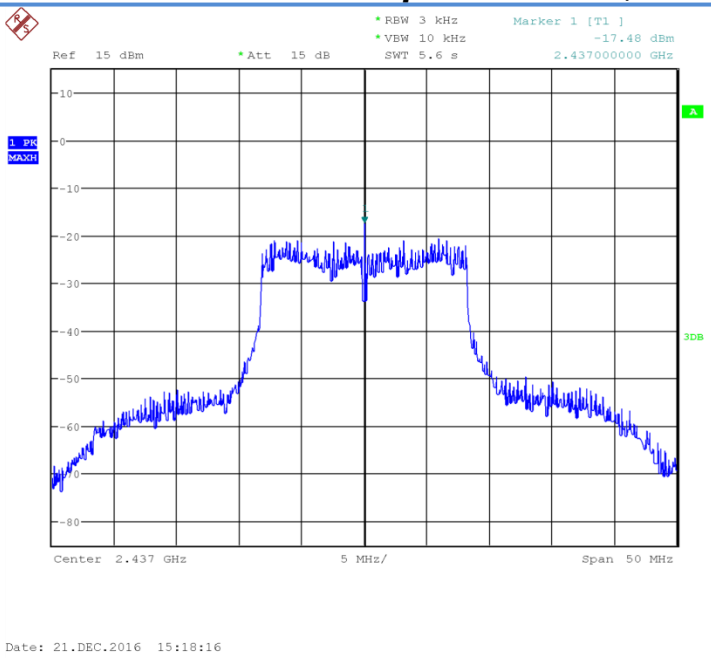


Fig.7 Power Spectral Density (802.1g,Ch6)

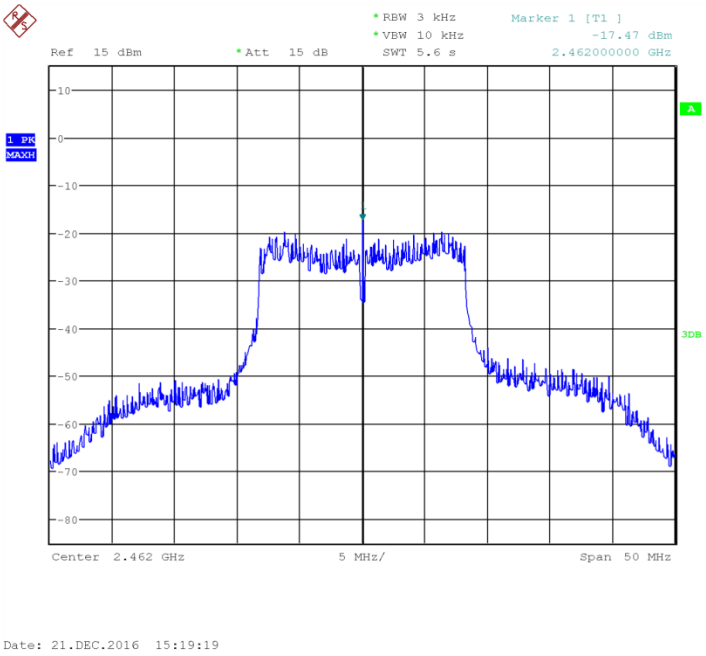


Fig.8 Power Spectral Density (802.1g,Ch11)

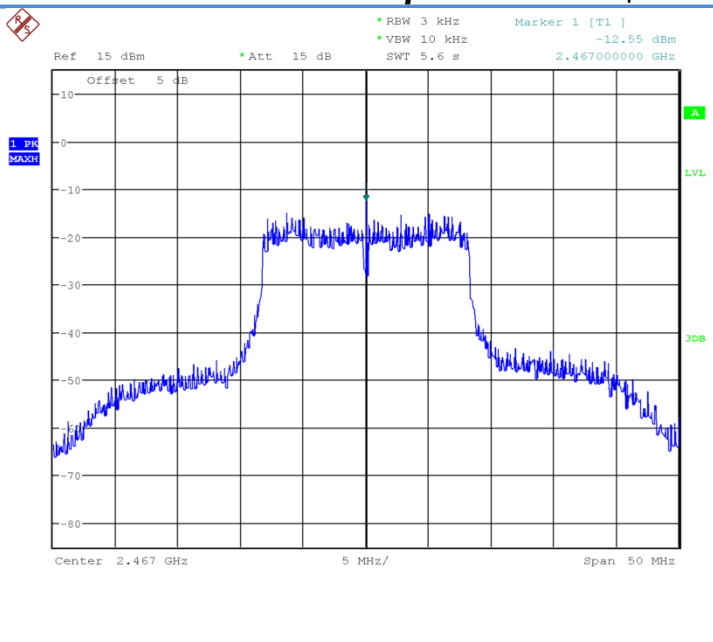


Fig.9 Power Spectral Density (802.1g,Ch12)

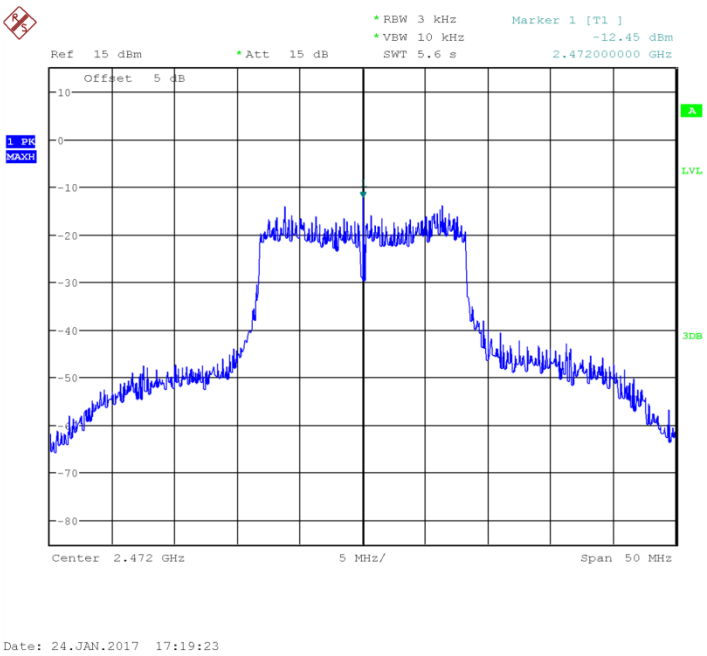


Fig.10 Power Spectral Density (802.1g,Ch13)

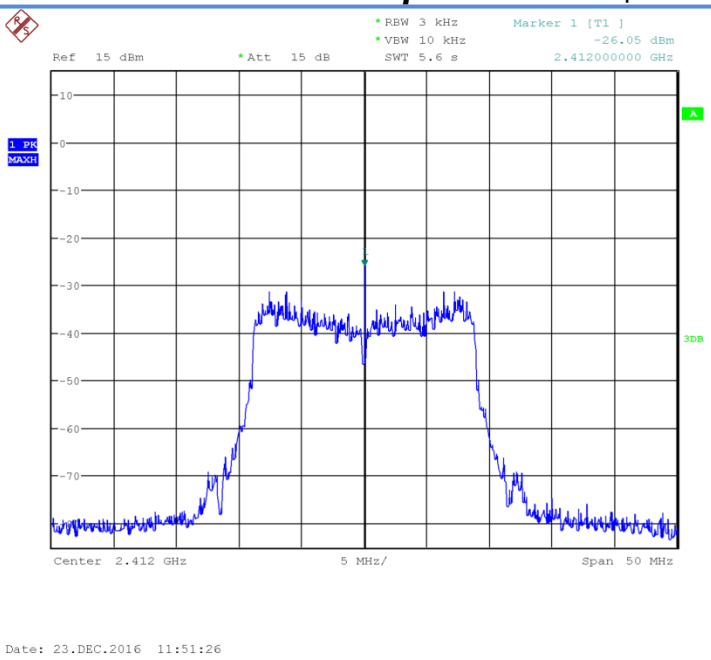


Fig.11 Power Spectral Density (802.1n-20MHz,Ch1)

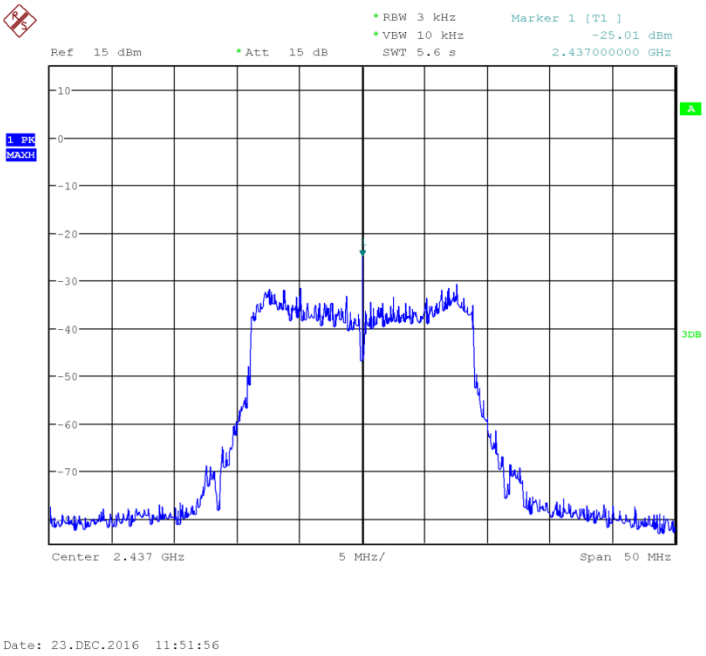


Fig.12 Power Spectral Density (802.1n-20MHz,Ch6)

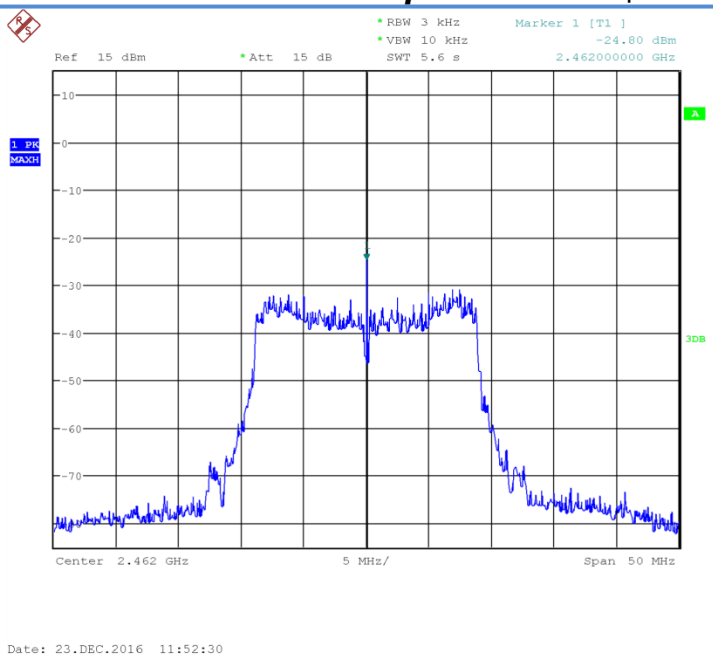


Fig.13 Power Spectral Density (802.1n-20MHz,Ch11)

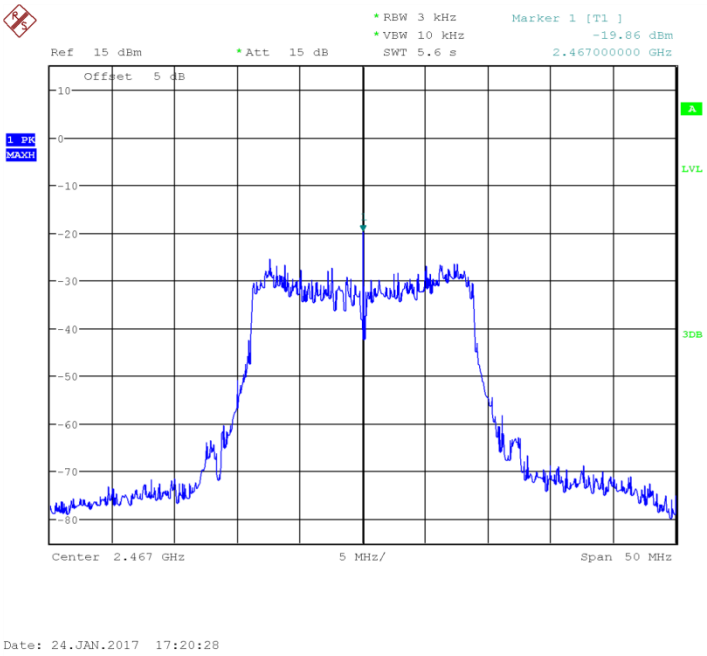


Fig.14 Power Spectral Density (802.1n-20MHz,Ch12)

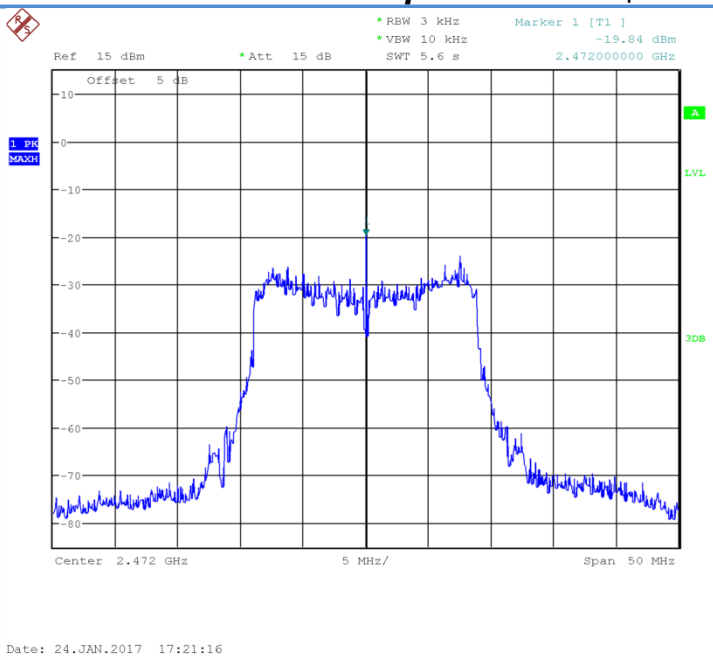


Fig.15 Power Spectral Density (802.1n-20MHz,Ch13)

6.3. Occupied 6dB Bandwidth

6.3.1 Measurement Limit:

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

6.3.2 Test procedure

The measurement is according to ANSI C63.10 clause 11.8.

1. The output power of EUT was connected to the spectrum analyzer. The path loss was compensated to the results for each measurement.
2. Enable EUT transmitter maximum power continuously.
3. Set RBW = 100 kHz.
4. Set the VBW ⩾ [3 × RBW].
5. Detector = peak.
6. Trace mode = max hold.
7. Sweep = auto couple.
8. Allow the trace to stabilize.
9. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the

fundamental emission.

6.3.4 Measurement Uncertainty:

Measurement Uncertainty	60.80Hz

6.3.5 Measurement Result:

802.11b/g mode

Mode	Channel	Occupied 6dB Bandwidth(MHz)		Conclusion
802.11b	1	Fig.16	10.497	P
	6	Fig.17	10.737	P
	11	Fig.18	10.737	P
802.11g	1	Fig.19	16.426	P
	6	Fig.20	16.426	P
	11	Fig.21	16.426	P

802.11n mode

Mode	Channel	Occupied 6dB Bandwidth(MHz)		Conclusion
802.11n(20MHz)	1	Fig.22	17.628	P
	6	Fig.23	17.628	P
	11	Fig.24	17.308	P

Conclusion: PASS

Test graphs as below:

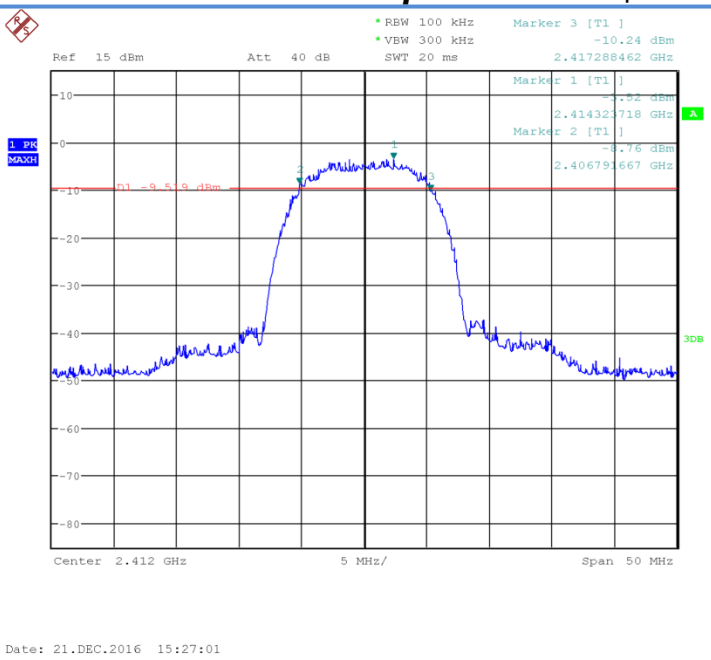


Fig.16 Occupied 6dB Bandwidth (802.11b, Ch1)

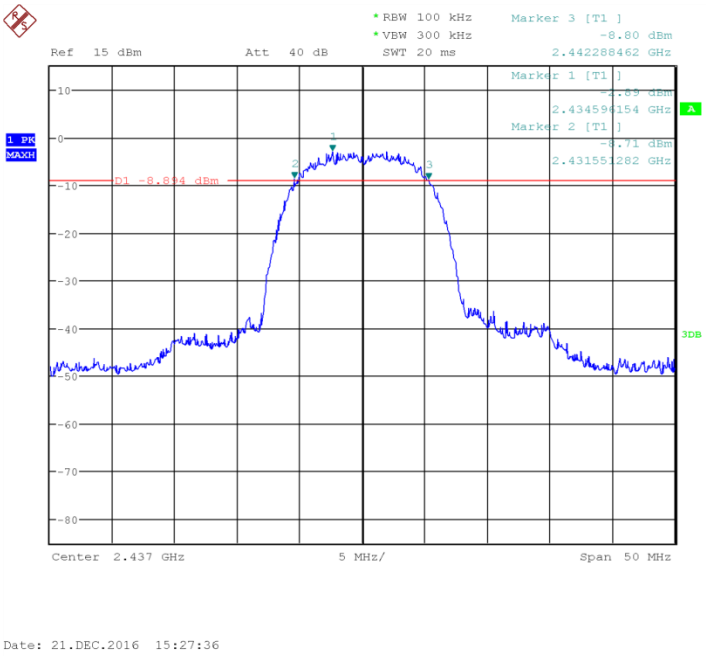


Fig.17 Occupied 6dB Bandwidth (802.11b, Ch6)

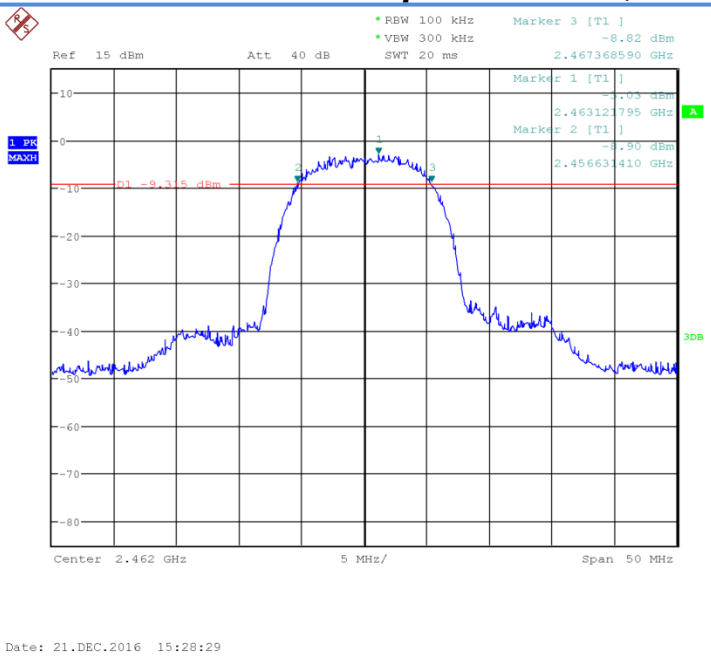


Fig.18 Occupied 6dB Bandwidth (802.11b, Ch11)

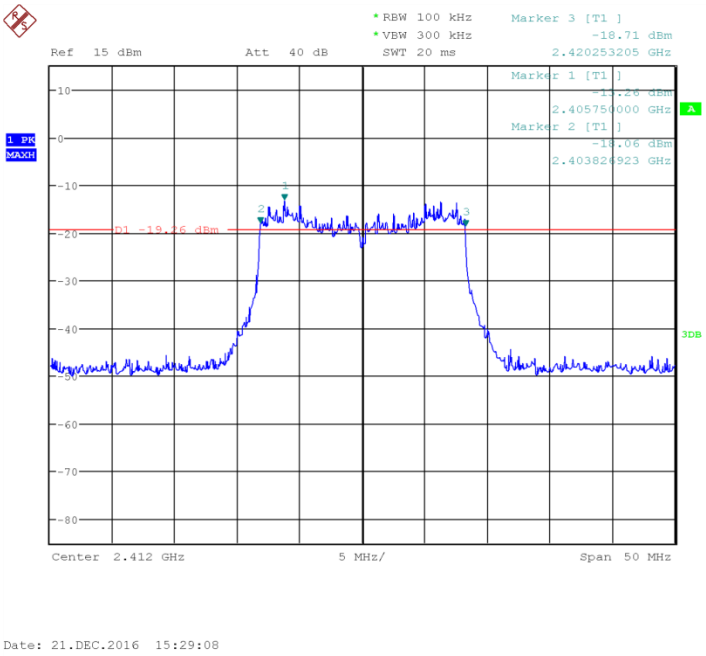


Fig.19 Occupied 6dB Bandwidth (802.11g, Ch1)

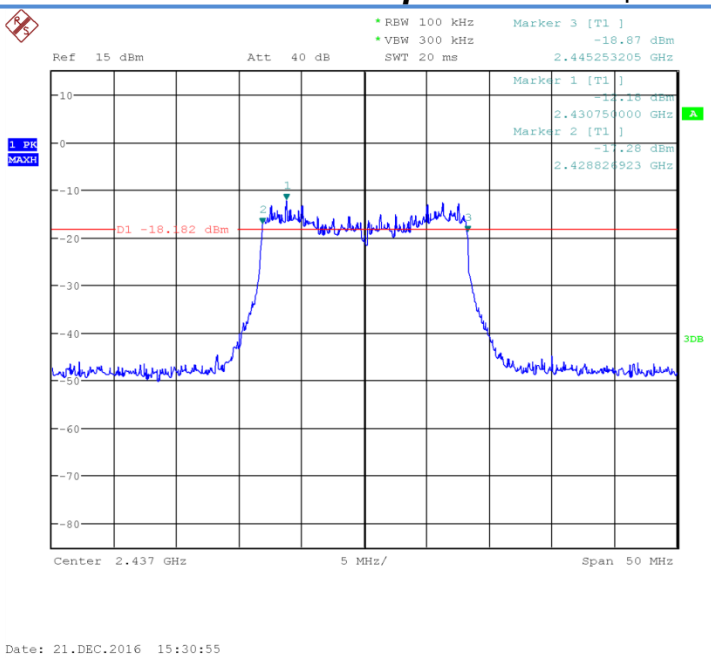


Fig.20 Occupied 6dB Bandwidth (802.11g, Ch6)

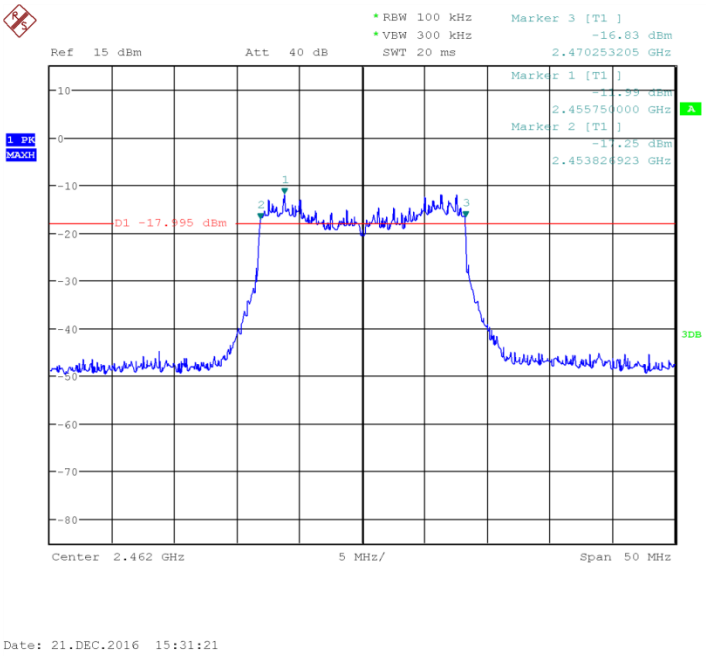


Fig.21 Occupied 6dB Bandwidth (802.11g, Ch11)

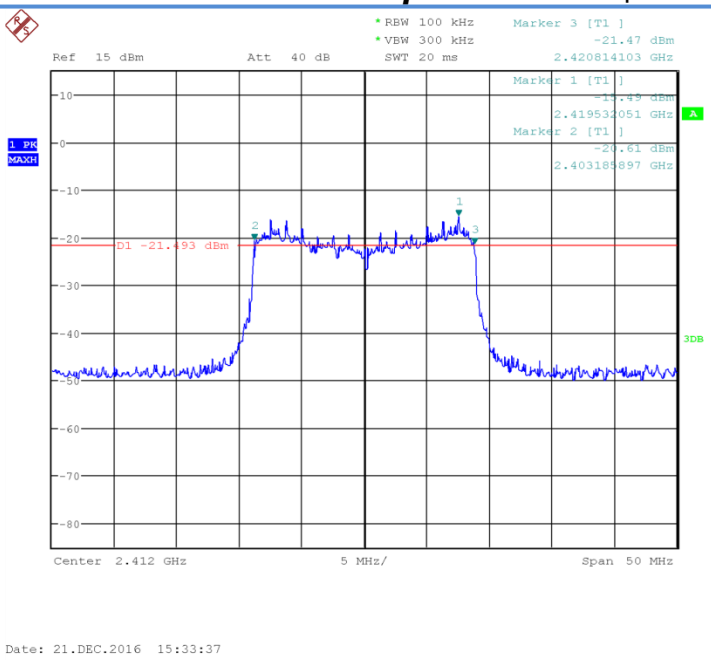


Fig.22 Occupied 6dB Bandwidth (802.11n-20MHz, Ch1)

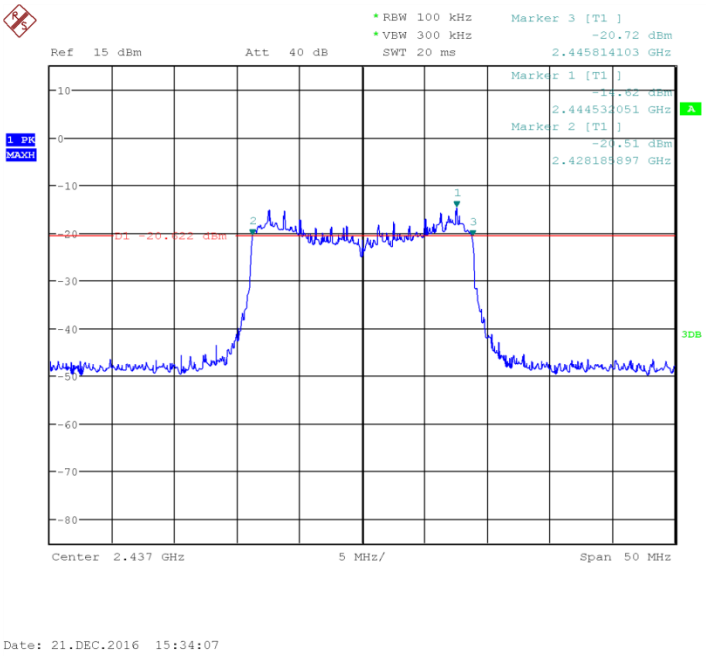


Fig.23 Occupied 6dB Bandwidth (802.11n-20MHz, Ch6)

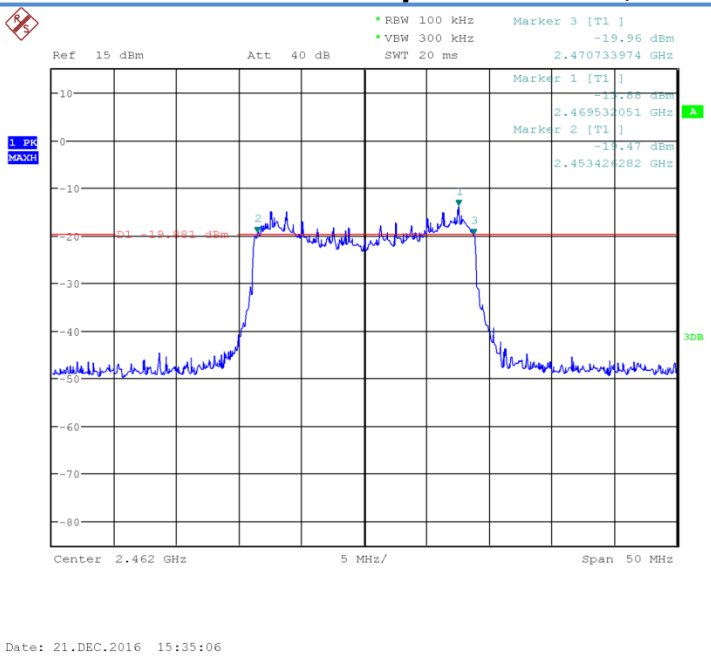


Fig.24 Occupied 6dB Bandwidth (802.11n-20MHz, Ch11)

6.4. Band Edges Compliance

6.4.1 Measurement Limit:

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

6.4.2 Test procedures

The measurement is according to ANSI C63.10 clause11.13.

1. The output power of EUT was connected to the spectrum analyzer. The path loss was compensated to the results for each measurement.
2. Enable EUT transmitter maximum power continuously.
3. Set instrument center frequency to the frequency of the emission to be measured (must be within 2MHz of the authorized band edge).
4. Set span to 2 MHz.
5. RBW = 100 kHz.
6. VBW ⩾ [3 × RBW].
7. Detector = peak.
8. Sweep time = auto.
9. Trace mode = max hold.
10. Allow sweep to continue until the trace stabilizes

6.4.3 Measurement Uncertainty:

Measurement Uncertainty	0.75dB

6.4.4 Measurement results

802.11b/g mode

Mode	Channel	Test Results	Conclusion
802.11b	1	Fig.25	P
	11	Fig.26	P
	12	Fig.27	P
	13	Fig.28	P
802.11g	1	Fig.29	P
	11	Fig.30	P
	12	Fig.31	P
	13	Fig.32	P

802.11n mode

Mode	Channel	Test Results	Conclusion
802.11n(20MHz)	1	Fig.33	P
	11	Fig.34	P
	12	Fig.35	P
	13	Fig.36	P

Conclusion: PASS

Test graphs as blew:

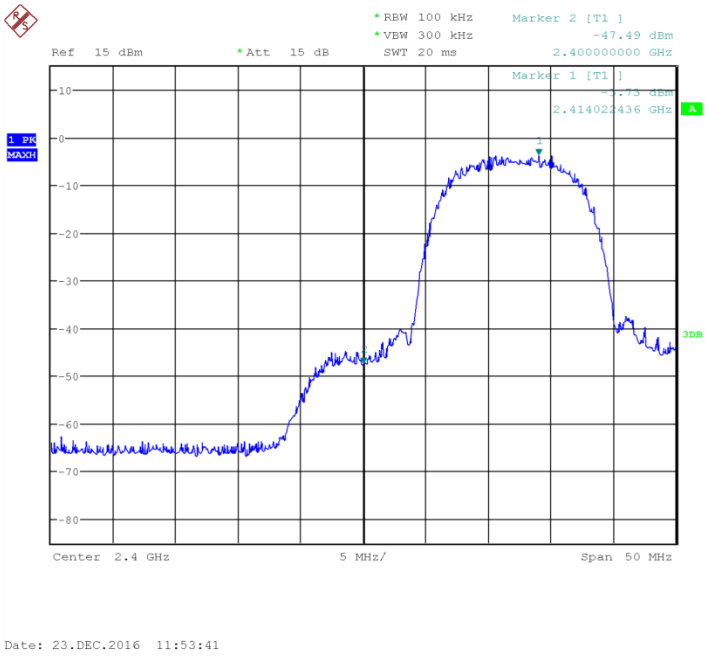


Fig.25 Band Edges (802.11b, Ch1)

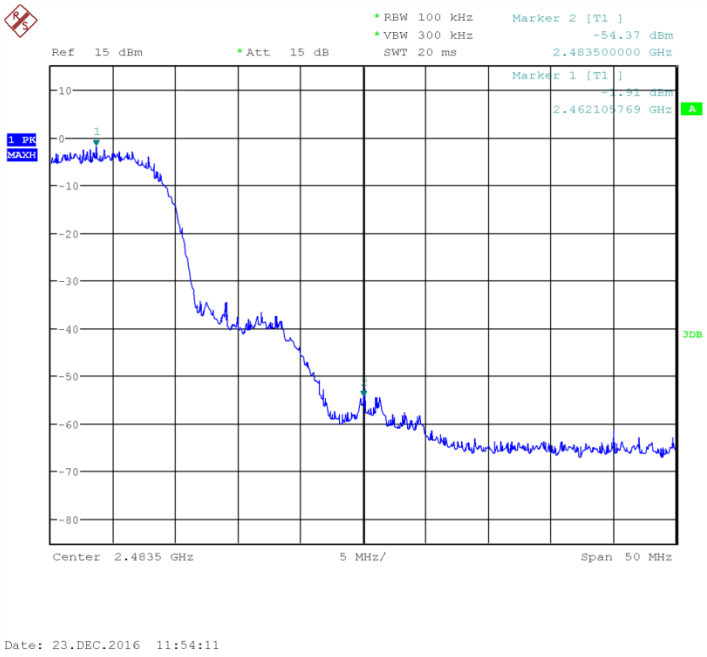


Fig.26 Band Edges (802.11b, Ch11)

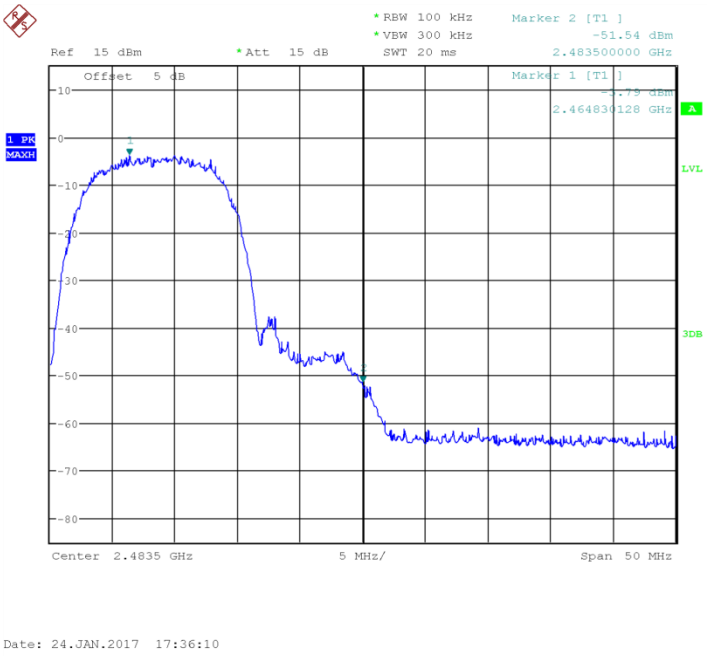


Fig.27 Band Edges (802.11b, Ch12)

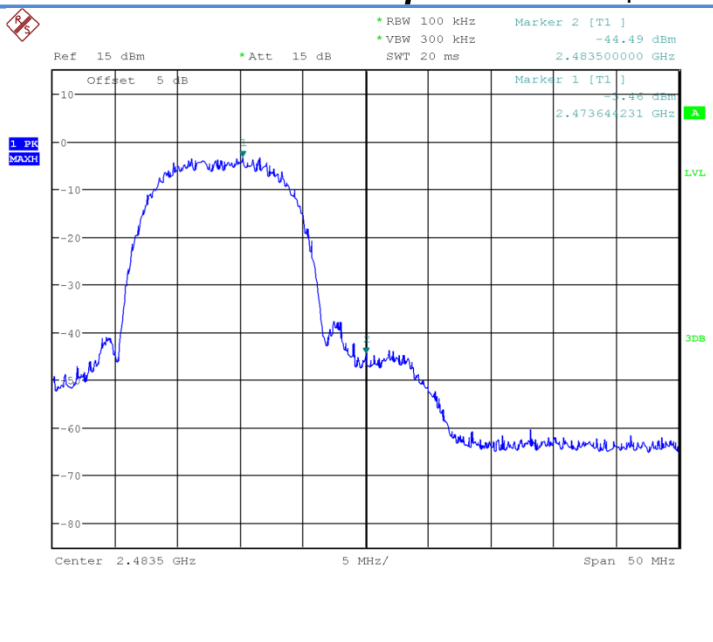


Fig.28 Band Edges (802.11b, Ch13)

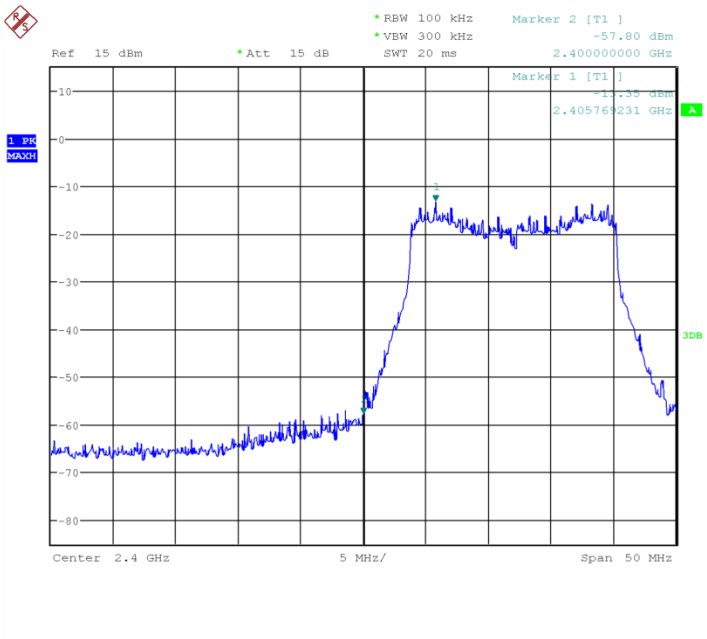


Fig.29 Band Edges (802.11g, Ch1)

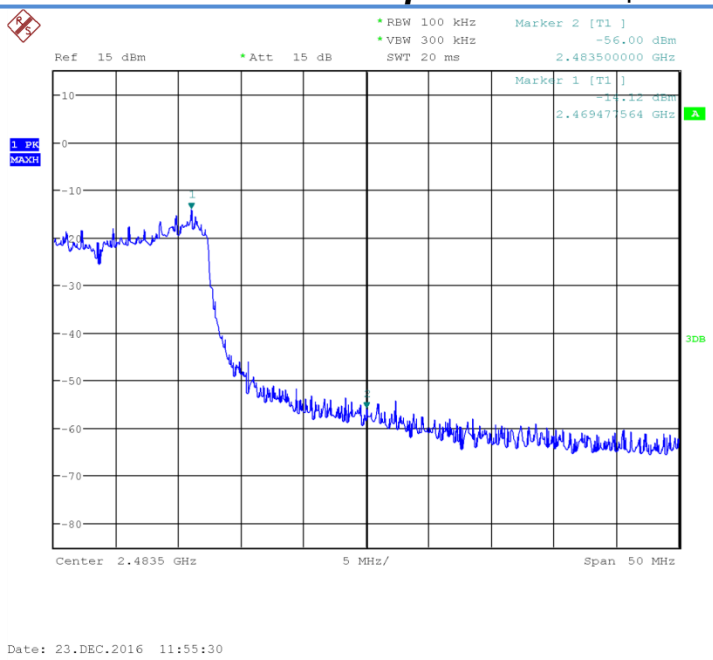


Fig.30 Band Edges (802.11g, Ch11)

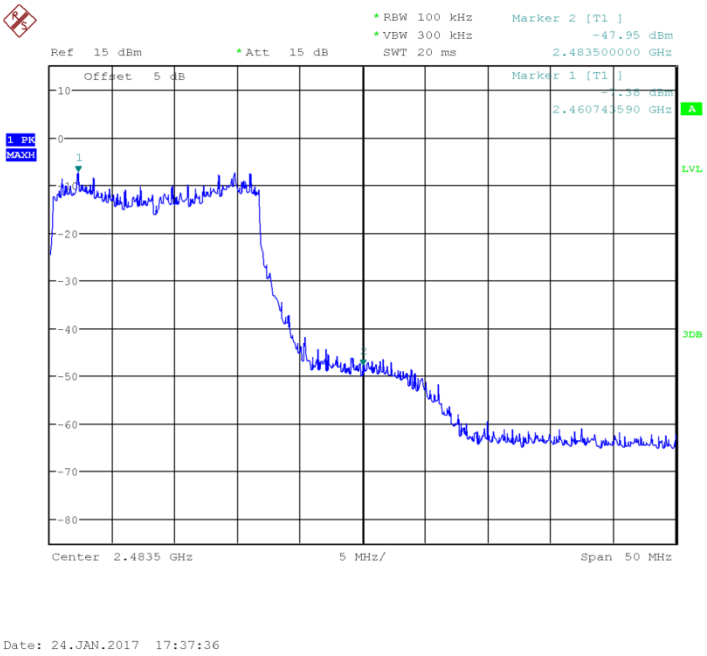


Fig.31 Band Edges (802.11g, Ch12)

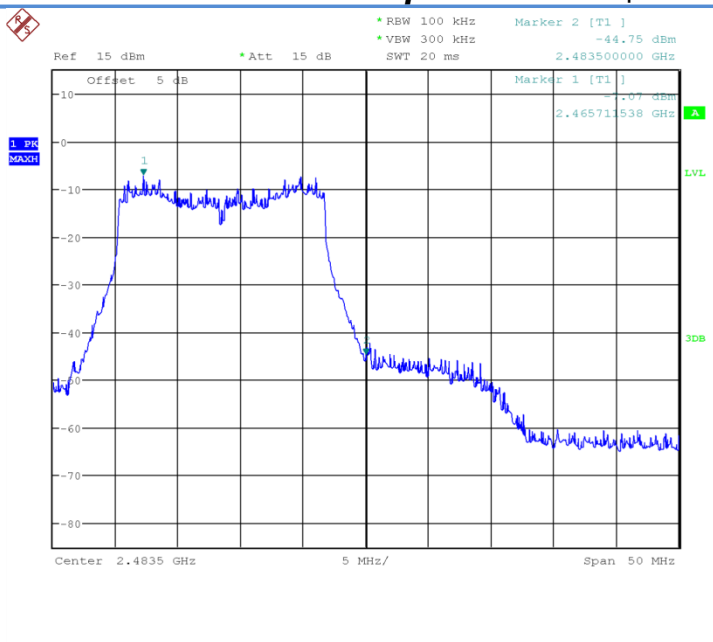


Fig.32 Band Edges (802.11g, Ch13)

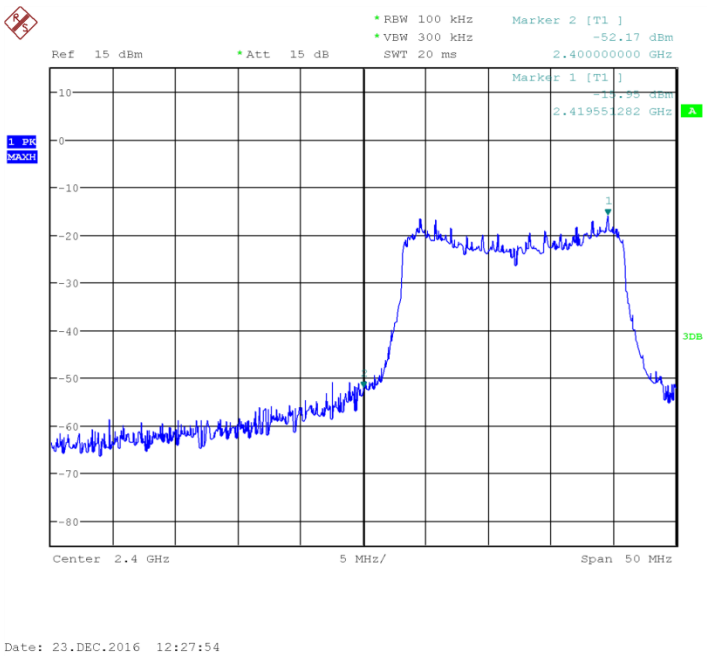


Fig.33 Band Edges (802.11n-20MHz, Ch1)

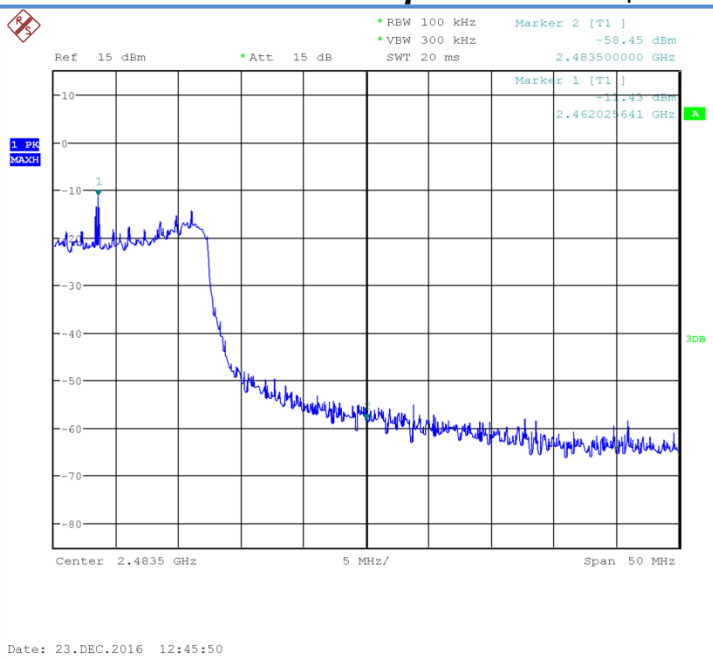


Fig.34 Band Edges (802.11b-20MHz, Ch11)

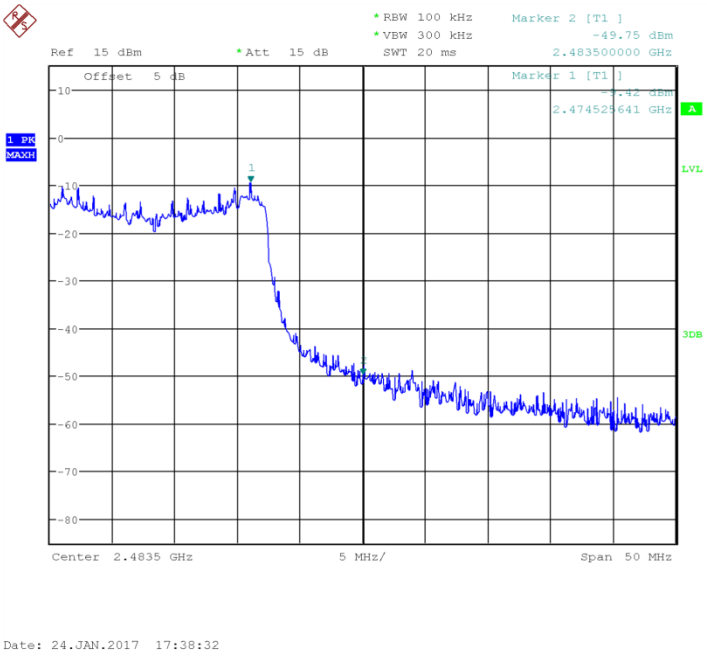


Fig.35 Band Edges (802.11b-20MHz, Ch12)

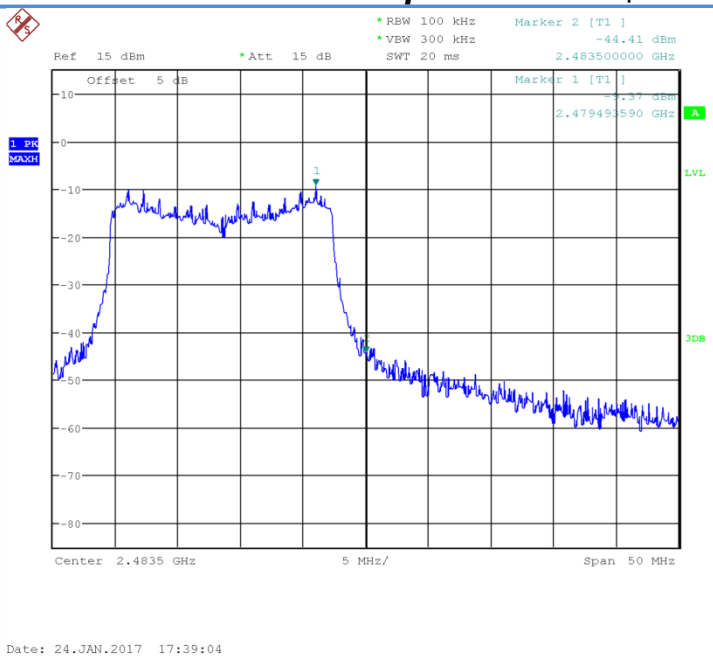


Fig.36 Band Edges (802.11b-20MHz, Ch13)

6.5. Transmitter Spurious Emission-conducted

6.5.1 Measurement Limit:

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

6.5.2 Test procedures

This measurement is according to ANSI C63.10 clause 11.11.

1. The output power of EUT was connected to the spectrum analyzer. The path loss was compensated to the results for each measurement.
2. Enable EUT transmitter maximum power continuously.

Reference level measurement

3. Set instrument center frequency to DTS channel center frequency.
4. Set the span to ≥ 1.5 times the DTS bandwidth.
5. Set the RBW = 100 kHz.
6. Set the VBW ≥ [3 × RBW].
7. Detector = peak.
8. Sweep time = auto couple.
9. Trace mode = max hold.
10. Allow trace to fully stabilize.
11. Use the peak marker function to determine the maximum PSD level.

Emission level measurement

12. Set the center frequency and span to encompass frequency range to be measured.
13. Set the RBW = 100 kHz.
14. Set the VBW ⩾ [3 × RBW].
15. Detector = peak.
16. Sweep time = auto couple.
17. Trace mode = max hold.
18. Allow trace to fully stabilize.
19. Use the peak marker function to determine the maximum amplitude level.

6.5.3 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

6.5.4 Measurement Result:

802.11b/g mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11b	1	2.412GHz	Fig.37	P
		30MHz~26GHz	Fig.38	P
	6	2.437GHz	Fig.39	P
		30MHz~26GHz	Fig.40	P
	11	2.472GHz	Fig.41	P
		30MHz~26GHz	Fig.42	P
802.11g	1	2.412GHz	Fig.43	P
		30MHz~26GHz	Fig.44	P
	6	2.437GHz	Fig.45	P
		30MHz~26GHz	Fig.46	P

	11	2.472GHz	Fig.47	P
		30MHz~26GHz	Fig.48	P

802.11n mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n(20MHz)	1	2.412GHz	Fig.49	P
		30MHz~26GHz	Fig.50	P
	6	2.437GHz	Fig.51	P
		30MHz~26GHz	Fig.52	P
	11	2.472GHz	Fig.53	P
		30MHz~26GHz	Fig.54	P

Conclusion: PASS

Test graphs as below:

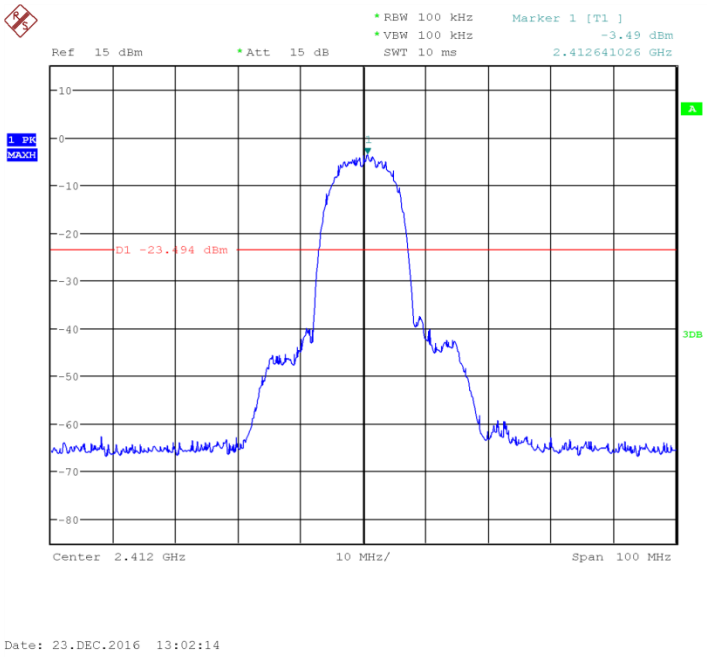


Fig.37 Conducted Spurious Emission (802.11b, Ch1)

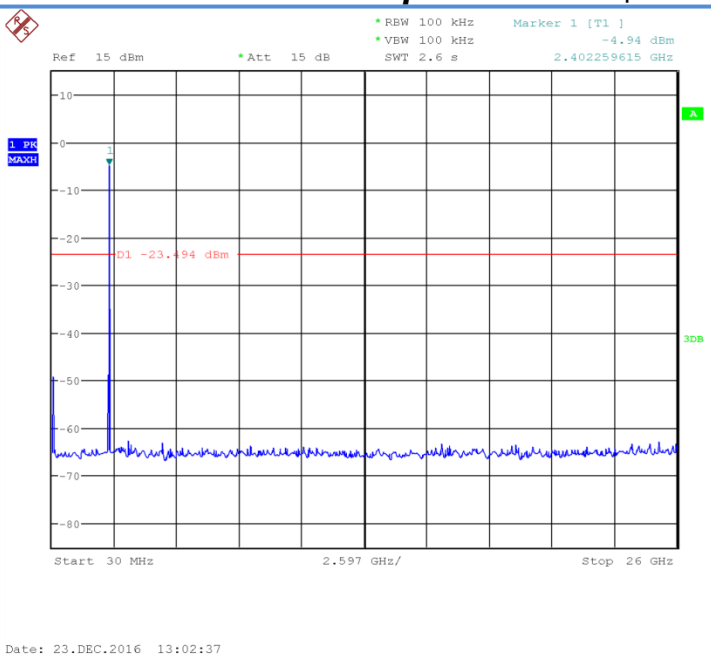


Fig.38 Conducted Spurious Emission (802.11b, Ch1, 30MHz~26GHz)

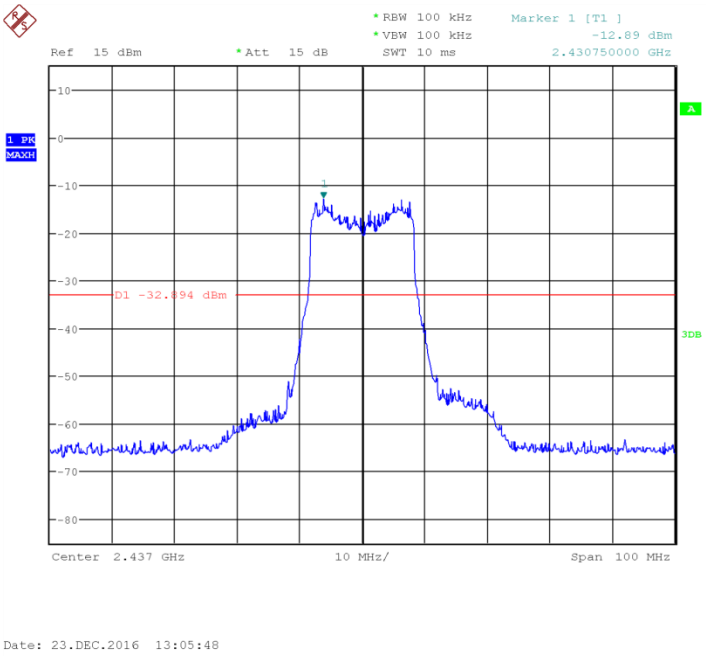


Fig.39 Conducted Spurious Emission (802.11b, Ch6)

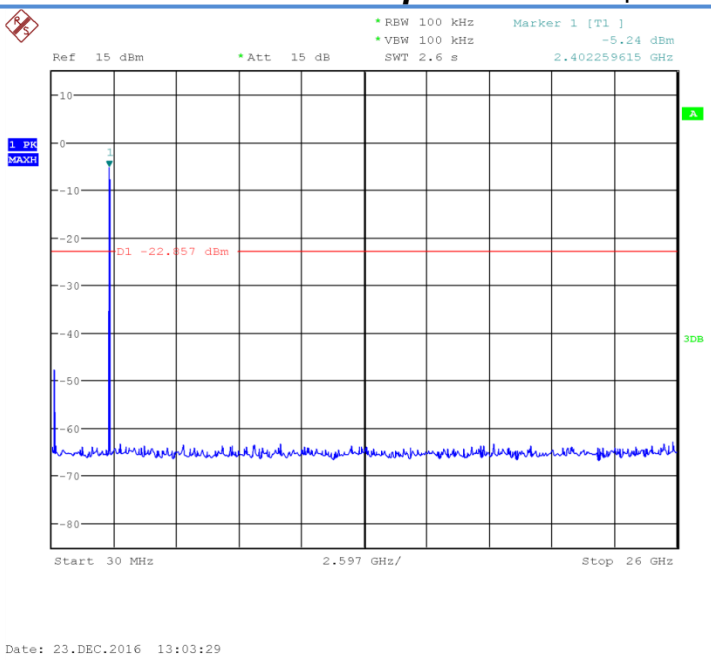


Fig.40 Conducted Spurious Emission (802.11b, Ch6, 30MHz~26GHz)

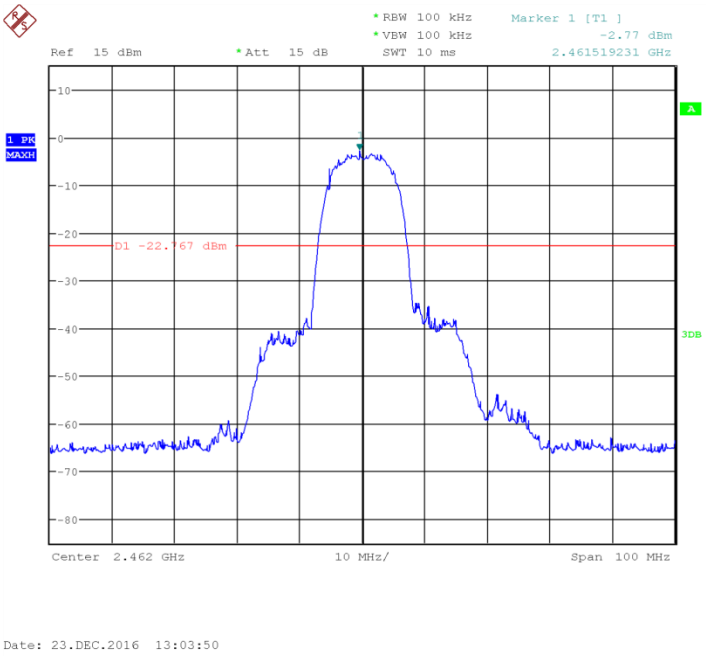


Fig.41 Conducted Spurious Emission (802.11b, Ch11)

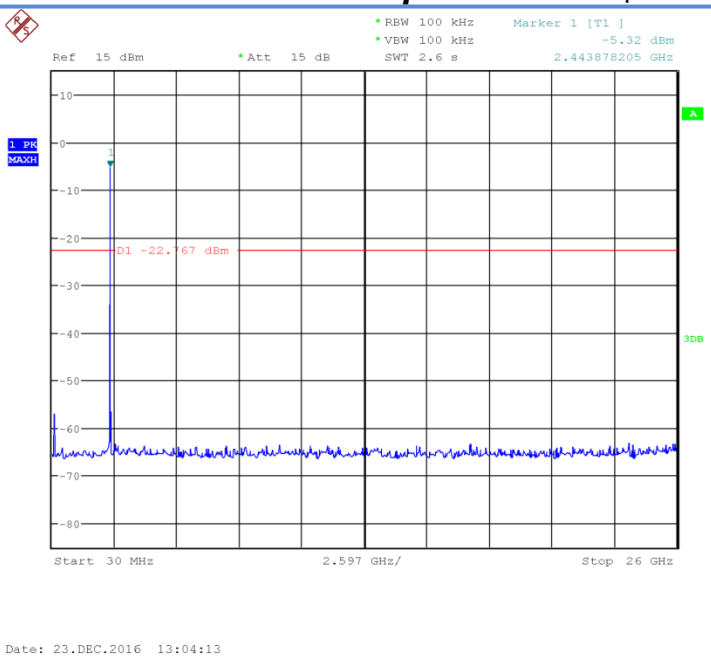


Fig.42 Conducted Spurious Emission (802.11b, Ch11, 30MHz~26GHz)

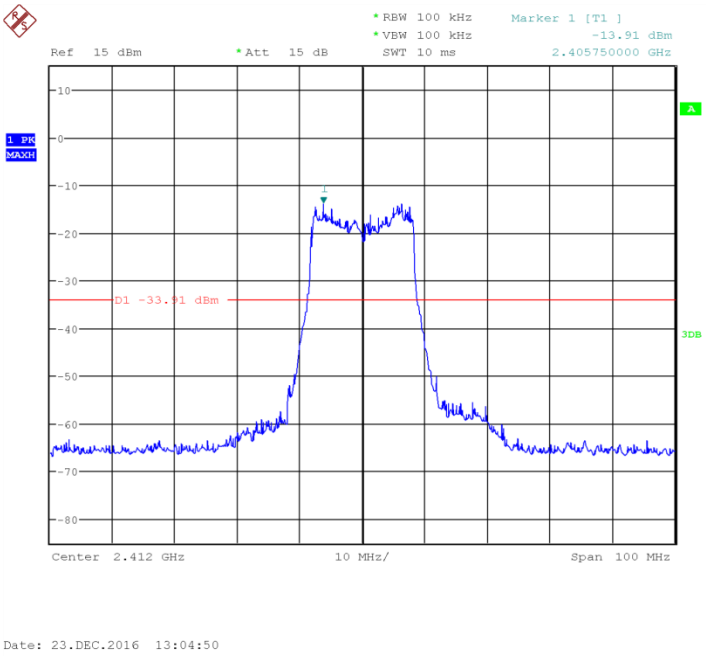


Fig.43 Conducted Spurious Emission (802.11g, Ch1)

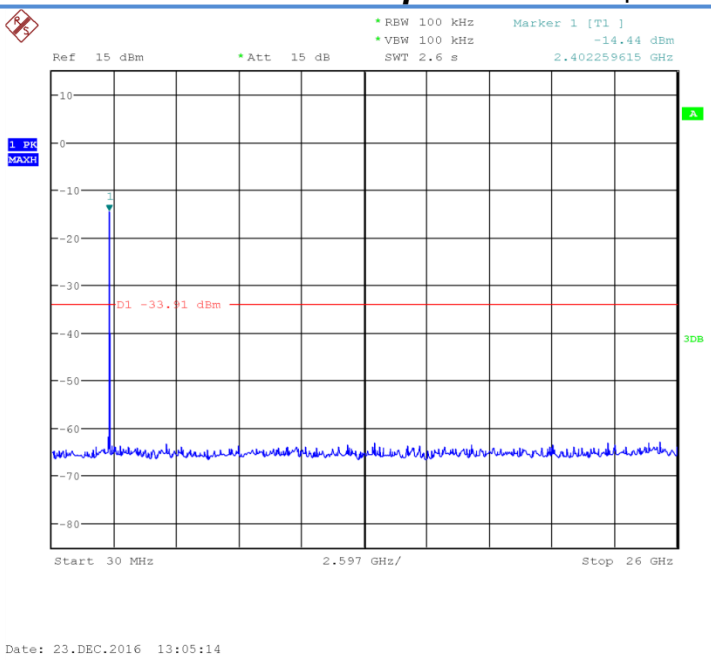


Fig.44 Conducted Spurious Emission (802.11g, Ch1, 30MHz~26GHz)

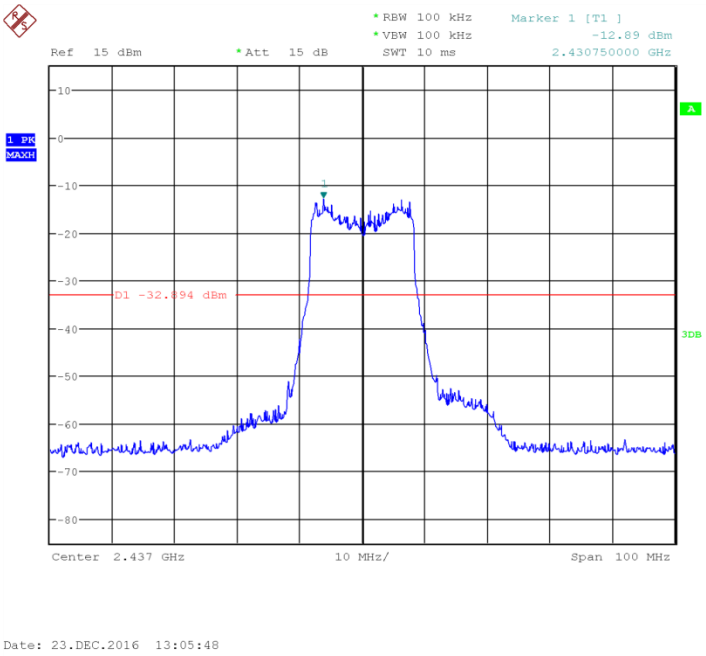


Fig.45 Conducted Spurious Emission (802.11g, Ch6)

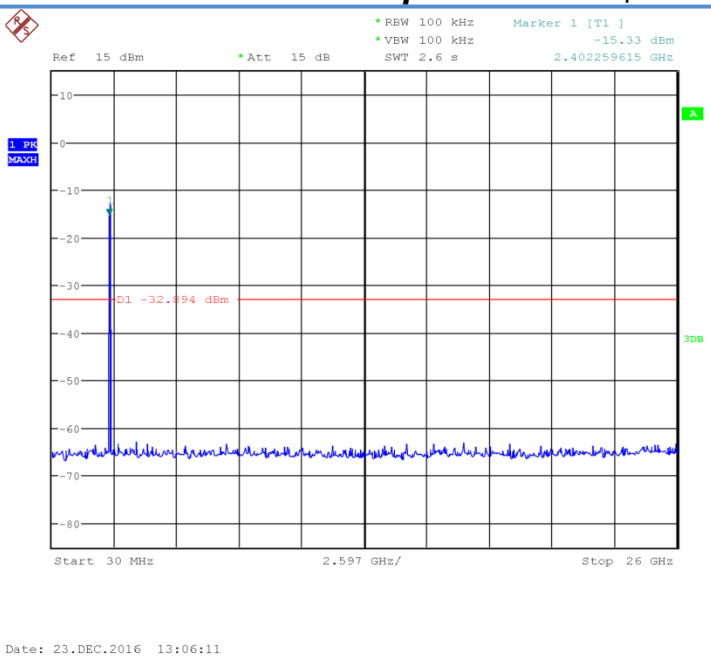


Fig.46 Conducted Spurious Emission (802.11g, Ch6, 30MHz~26GHz)

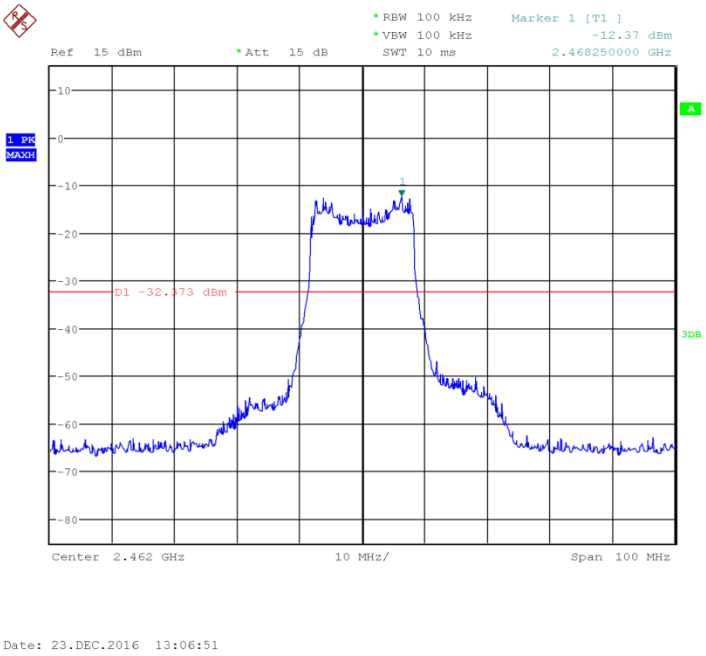


Fig.47 Conducted Spurious Emission (802.11g, Ch11)

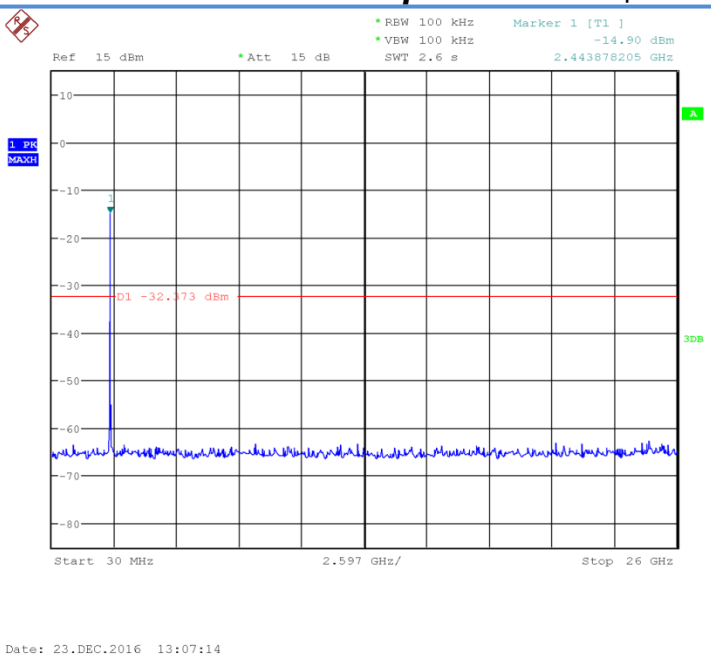


Fig.48 Conducted Spurious Emission (802.11g, Ch11, 30MHz~26GHz)

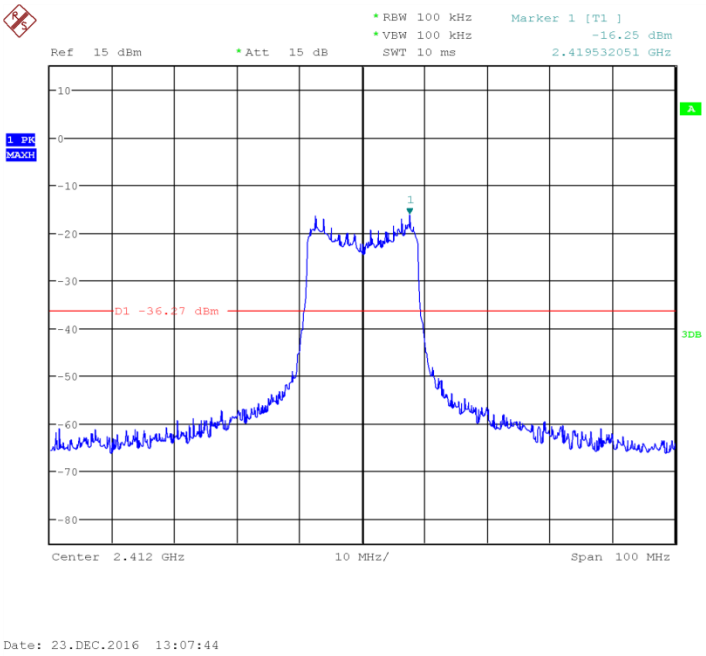


Fig.49 Conducted Spurious Emission (802.11n-20MHz, Ch1)

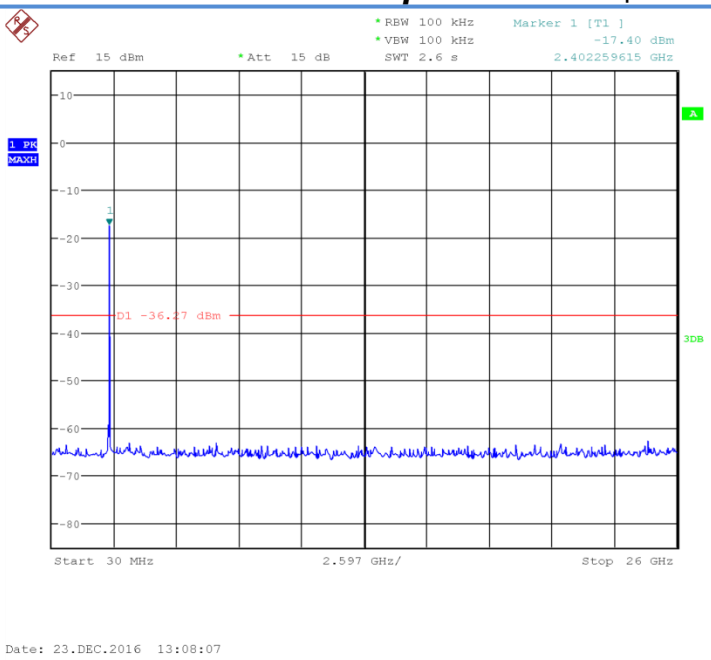


Fig.50 Conducted Spurious Emission (802.11n-20MHz, Ch1, 30MHz~26GHz)

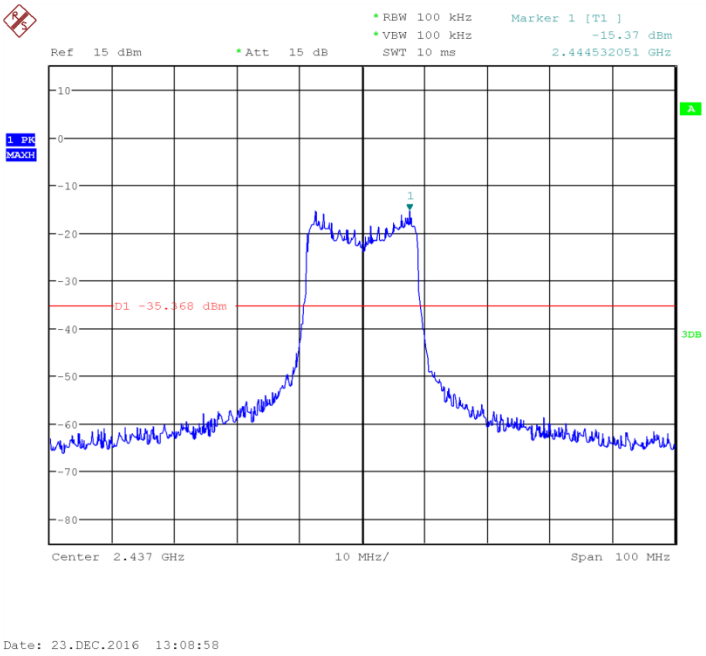


Fig.51 Conducted Spurious Emission (802.11n-20MHz, Ch6)

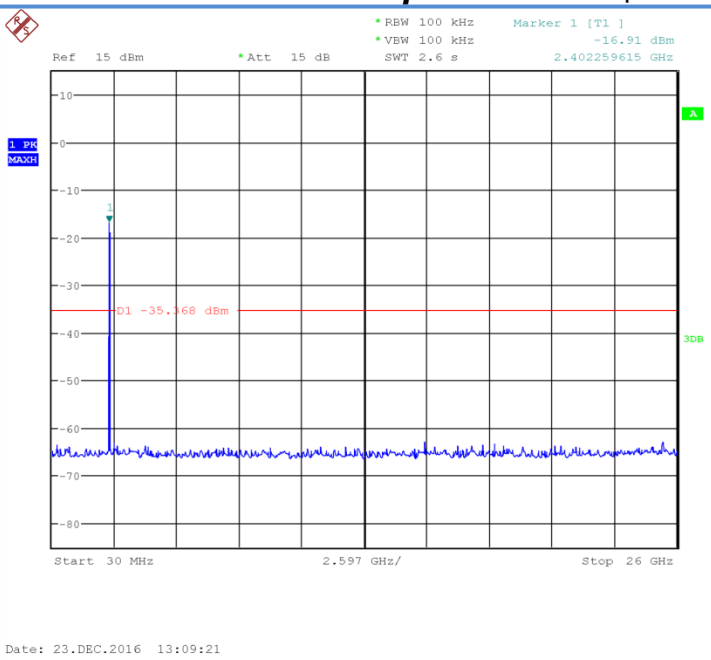


Fig.52 Conducted Spurious Emission (802.11n-20MHz, Ch6, 30MHz~26GHz)

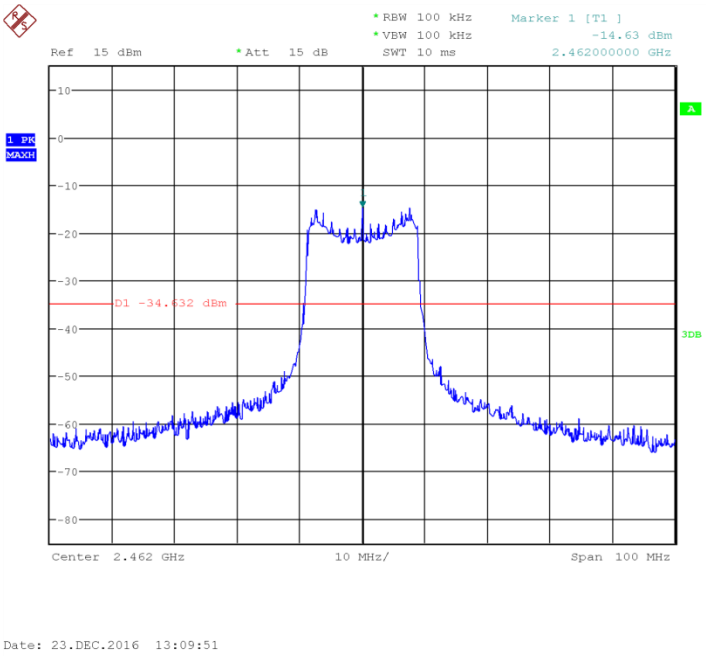


Fig.53 Conducted Spurious Emission (802.11n-20MHz, Ch11)

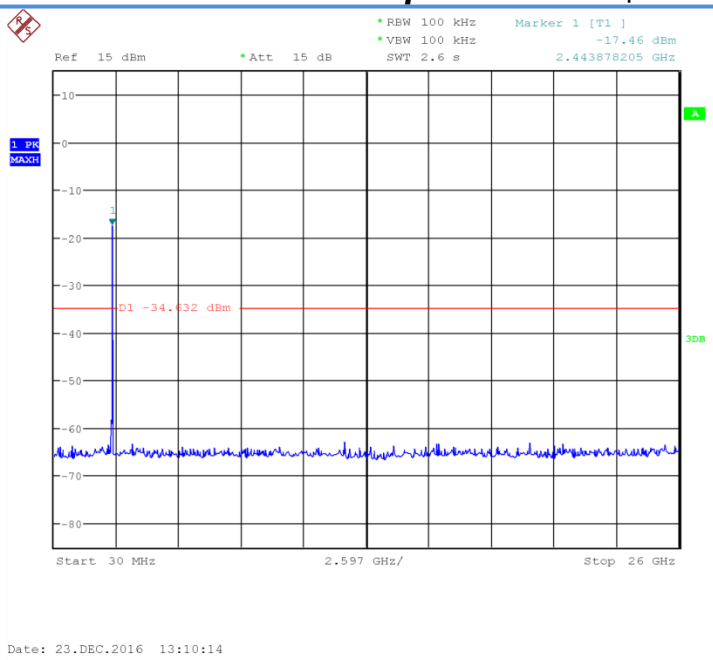


Fig.54 Conducted Spurious Emission (802.11n-20MHz, Ch11, 30MHz~26GHz)

6.6. Transmitter Spurious Emission-Radiated

6.6.1 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 25.205(a), must also comply with the radiated emission limits specified in 15.209(a)(see 15.205(c)). The measurement is according to ANSI C63.10 clause 11.11 and 11.12.

6.6.2 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

6.6.3 Test procedures

Portable, small, lightweight, or modular devices that may be handheld, worn on the body, or placed on a table during operation shall be positioned on a nonconducting platform, the top of which is 80 cm above the reference ground plane. The preferred area occupied by

the EUT arrangement is 1 m by 1.5 m, but it may be larger or smaller to accommodate various sized EUTs. For testing purposes, ceiling- and wall-mounted devices also shall be positioned on a tabletop (see also ANSI C63.4-2009 section 6.3.4 and 6.3.5). In making any tests involving handheld, body-worn, or ceiling-mounted equipment, it is essential to recognize that the measured levels may be dependent on the orientation (attitude) of the three orthogonal axes of the EUT. Thus, exploratory tests as specified in 8.3.1 shall be carried out for various axes orientations to determine the attitude having maximum or near-maximum emission level.

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

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

802.11b/g mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11b	Power	2.38GHz~2.45GHz	Fig.55	P
	Power	2.45GHz~2.5GHz	Fig.56	P
	11	30MHz~1GHz	Fig.57	P
		1GHz~3GHz	Fig.58	P
		3GHz~18GHz	Fig.59	P
	12	2.38GHz~2.45GHz	Fig.60	P
	12	2.45GHz~2.5GHz	Fig.61	P
	13	2.38GHz~2.45GHz	Fig.62	P
	13	2.45GHz~2.5GHz	Fig.63	P
802.11g	Power	2.38GHz~2.45GHz	Fig.64	P
	Power	2.45GHz~2.5GHz	Fig.65	P

	11	30MHz~1GHz	Fig.66	P
		1GHz~3GHz	Fig.67	P
		3GHz~18GHz	Fig.68	P
	12	2.38GHz~2.45GHz	Fig.69	P
	12	2.45GHz~2.5GHz	Fig.70	P
	13	2.38GHz~2.45GHz	Fig.71	P
	13	2.45GHz~2.5GHz	Fig.72	P

802.11n mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n(20MHz)	Power	2.38GHz~2.45GHz	Fig.73	P
	Power	2.45GHz~2.5GHz	Fig.74	P
	11	30MHz~1GHz	Fig.75	P
		1GHz~3GHz	Fig.76	P
		3GHz~18GHz	Fig.77	P
	12	2.38GHz~2.45GHz	Fig.78	P
	12	2.45GHz~2.5GHz	Fig.79	P
	13	2.38GHz~2.45GHz	Fig.80	P
	13	2.45GHz~2.5GHz	Fig.81	P

Conclusion: PASS

Note:

A ”reference path loss” is established and A_{Rpi} 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:

ARpi = Cable loss + Antenna Gain-Preamplifier gain

Result = P_{Mea} + Cable loss + Antenna Gain-Preamplifier gain = P_{Mea} + ARpi .

802.11b mode

Ch11 30MHz~1GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
34.104460	9.86	-26.8	36.66	V
35.356184	8.35	-26.7	35.05	V
49.450160	7.47	-25.8	33.27	V
633.065460	16.31	-12.6	28.91	H
827.312964	18.97	-10.1	29.07	V
927.305476	21.62	-7.6	29.22	H

Ch11 1GHz~3GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2630.203846	52.22	9.1	43.12	V
2707.038846	52.41	9.4	43.01	V
2773.990769	52.01	9.6	42.41	V
2822.895384	52.81	10.3	42.51	V
2894.177308	53.87	10.8	43.07	V
2957.602693	54.04	10.8	43.24	V

Ch11 3GHz~18GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
13094.364267	52.29	16.8	35.49	V
14426.748933	54.50	19.6	34.9	V
15710.839333	57.69	23.9	33.79	V
16507.953133	59.27	26.8	32.47	H
16985.527667	60.24	27.1	33.14	V

17611.524600	62.19	29.4	32.79	H

802.11g

Ch11 30MHz~1GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
33.753720	16.60	-26.8	43.4	V
34.684864	16.23	-26.8	43.03	V
57.788628	6.81	-25.9	32.71	V
220.913940	13.44	-24.5	37.94	V
609.835264	16.42	-12.8	29.22	V
901.261448	20.82	-8.0	28.82	V

Ch11 1GHz~3GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2617.837693	51.75	9.0	42.75	H
2674.408077	52.36	9.4	42.96	H
2751.403654	52.47	9.4	43.07	V
2820.033846	53.26	10.2	43.06	H
2884.071538	53.22	10.8	42.42	H
2945.501923	53.54	10.7	42.84	H

Ch11 3GHz~18GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
11475.324533	51.83	14.5	37.33	V
12736.954200	52.95	16.6	36.35	H
13898.403400	53.15	18.5	34.65	V
15673.425933	57.00	23.6	33.4	V
16231.852733	59.27	25.5	33.77	H

17607.762133	61.58	29.5	32.08	V

802.11n-20MHz

Ch11 30MHz~1GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
34.723396	11.27	-26.8	38.07	V
36.108624	7.78	-26.6	34.38	V
220.930644	13.14	-24.5	37.64	V
564.455276	15.21	-13.8	29.01	V
688.014540	16.96	-12.1	29.06	V
931.839752	21.44	-7.6	29.04	V

Ch11 1GHz~3GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2364.118400	50.07	7.6	42.47	V
2525.931731	59.75	8.3	51.45	H
2662.131730	52.72	9.4	43.32	V
2757.670769	52.01	9.4	42.61	H
2853.379231	53.29	10.8	42.49	V
2969.285192	52.87	11.0	41.87	V

Ch11 3GHz~18GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
12240.136533	51.09	14.8	36.29	V
13126.613333	52.72	16.9	35.82	V
14282.871733	54.25	20.5	33.75	H
15580.793600	57.24	23.0	34.24	H
16168.390133	58.98	25.4	33.58	H

17580.300867	62.28	29.5	32.78	H

Second Supply:

802.11g

Ch11 30MHz~1GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
33.73136	11.45	-26.8	38.25	V
62.633728	4.49	-26.8	31.29	V
645.41192	16.3	-12.6	28.9	H
734.369164	17.43	-11.7	29.13	H
794.740616	18.17	-10.7	28.87	H
898.168604	20.76	-8.2	28.96	H

Ch11 1GHz~3GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2669.4175	52.78	9.4	43.38	H
2724.77577	52.6	9.4	43.2	V
2783.62577	53.05	9.6	43.45	V
2896.654231	53.73	10.8	42.93	V
2934.371923	53.49	10.7	42.79	V
2985.553654	54.86	11.2	43.66	H

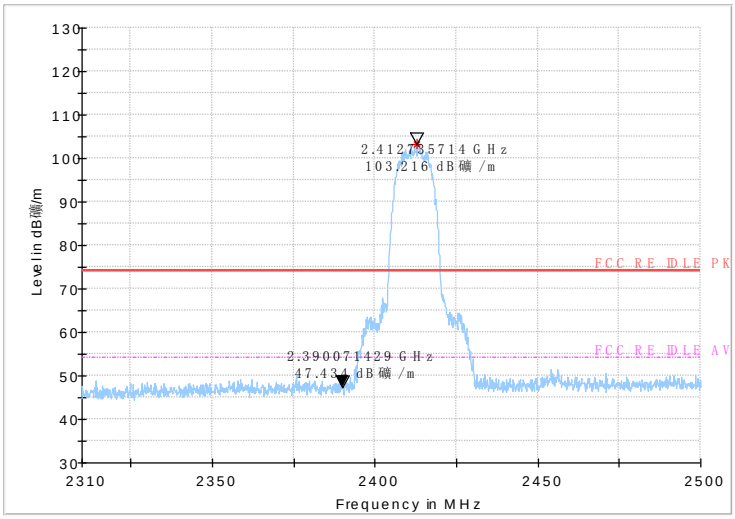
Ch11 3GHz~18GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
15448.6534	56.59	23.3	33.29	V
15781.46973	57.3	24.5	32.8	H
16211.34853	58.83	25.7	33.13	V
16562.60913	58.69	26.1	32.59	H

17153.16067	61.31	26.9	34.41	H
17632.48713	62.51	29.2	33.31	H

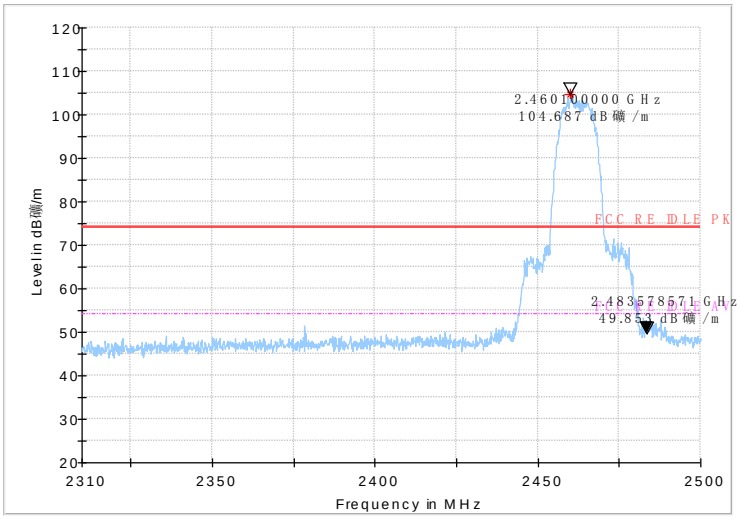
Test graphs as below:

First Supply



Peak detector

Fig.55 Radiated emission (Power): 802.11b, low channel



Peak detector

Fig.56 Radiated emission (Power): 802.11b, channel 11

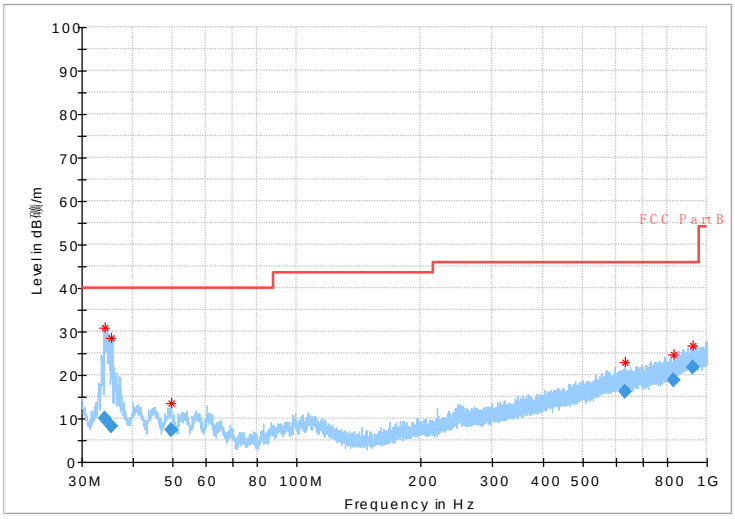


Fig.57 Radiated Spurious Emission (802.11b,Ch11,30MHz~1GHz)

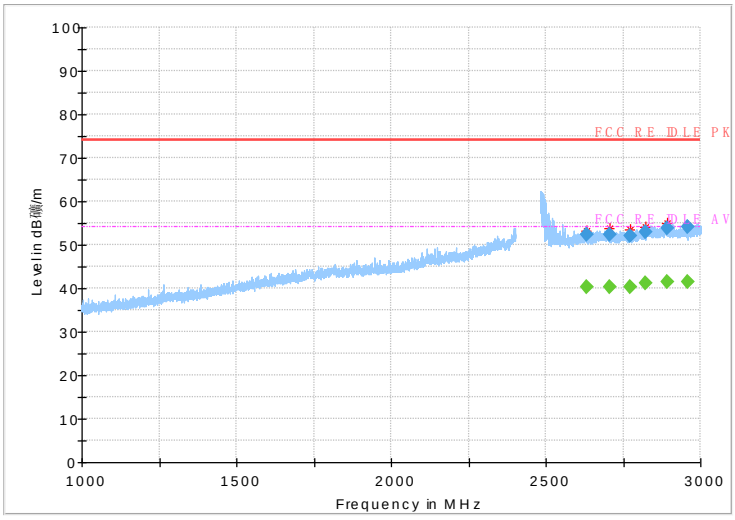


Fig.58 Radiated Spurious Emission (802.11b,Ch11,1GHz~3GHz)

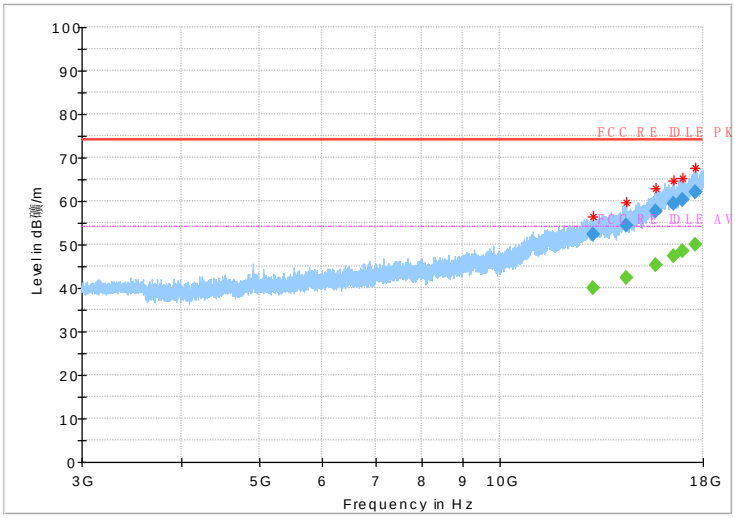
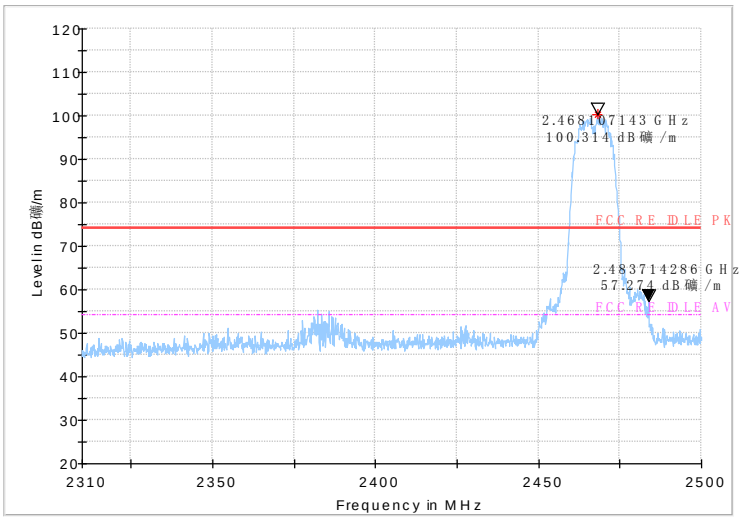
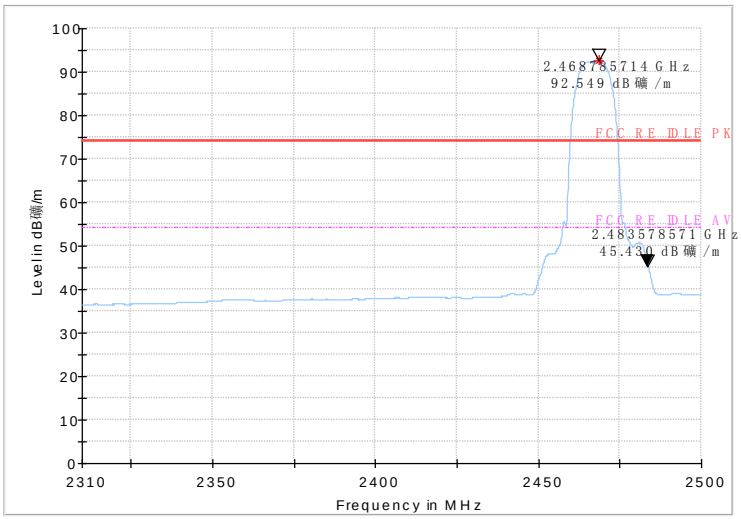


Fig.59 Radiated Spurious Emission (802.11b,Ch11,3GHz~18GHz)



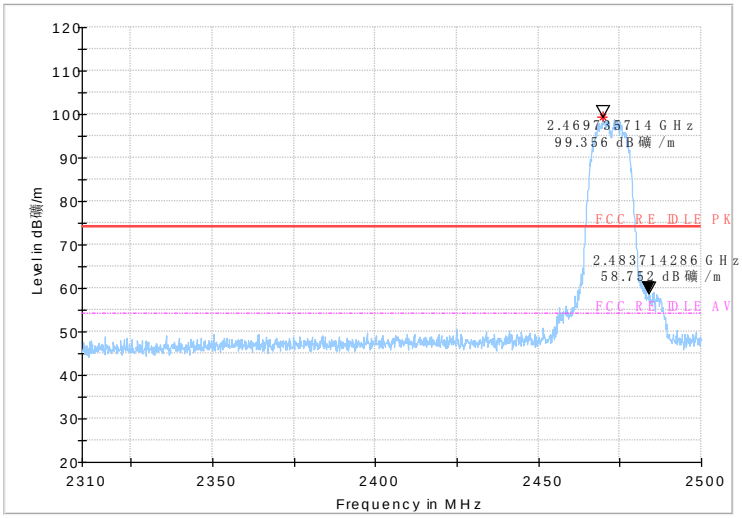
Peak detector

Fig.60 Radiated emission (Power): 802.11b, channel 12



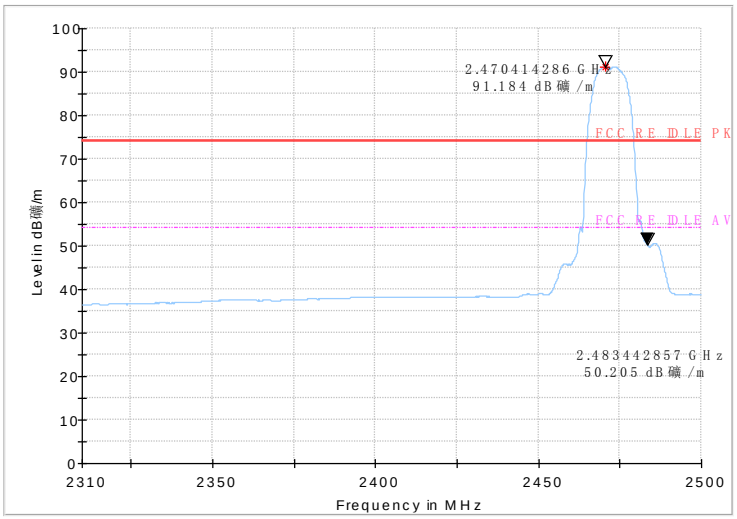
AV detector

Fig.61 Radiated emission (Power): 802.11b, channel 12



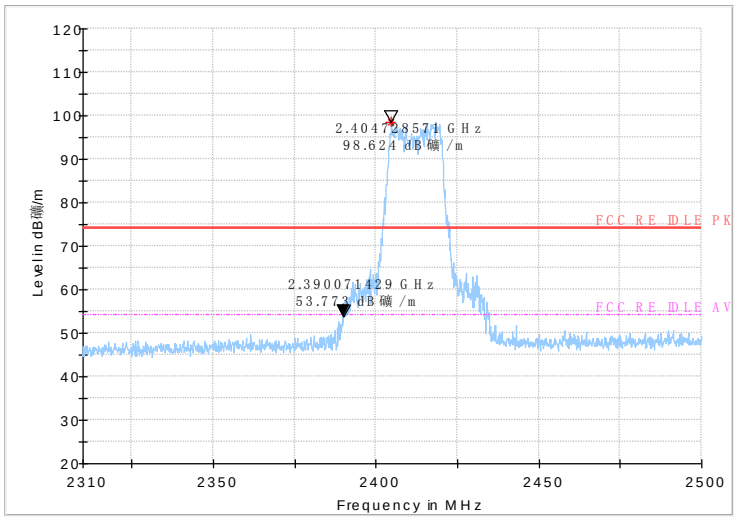
Peak detector

Fig.62 Radiated emission (Power): 802.11b, channel 13

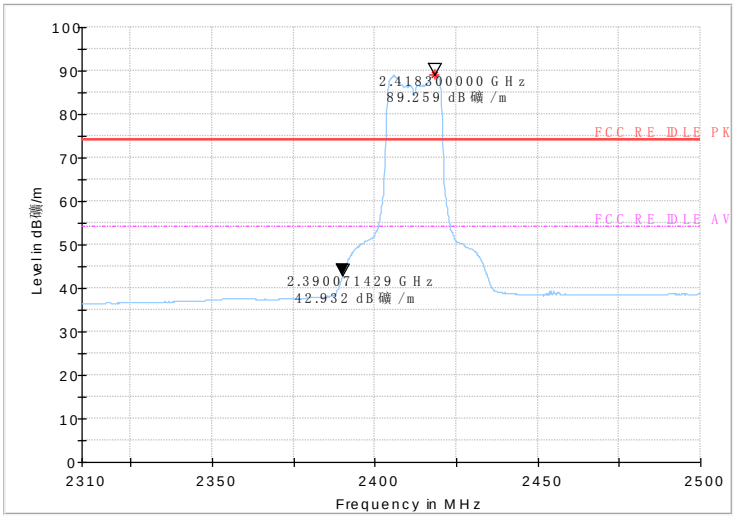


AV detector

Fig.63 Radiated emission (Power): 802.11b, channel 13

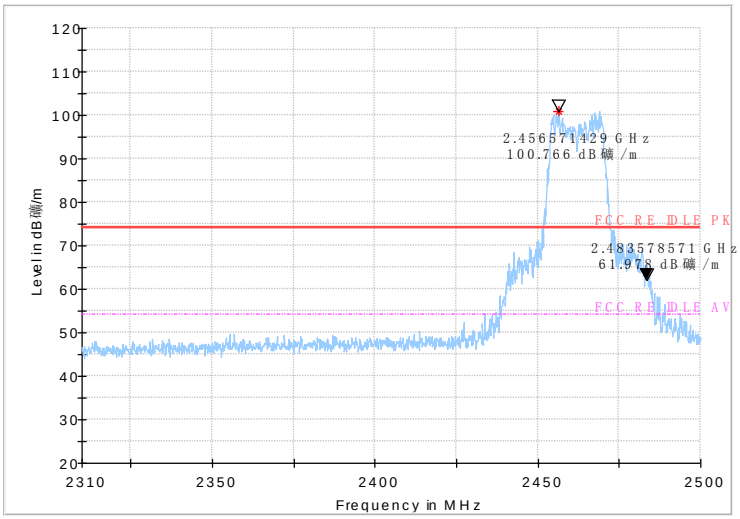


Peak detector



AV detector

Fig.64 Radiated emission (Power): 802.11g, low channel



Peak detector

Fig.65 Radiated emission (Power): 802.11g, channel 11

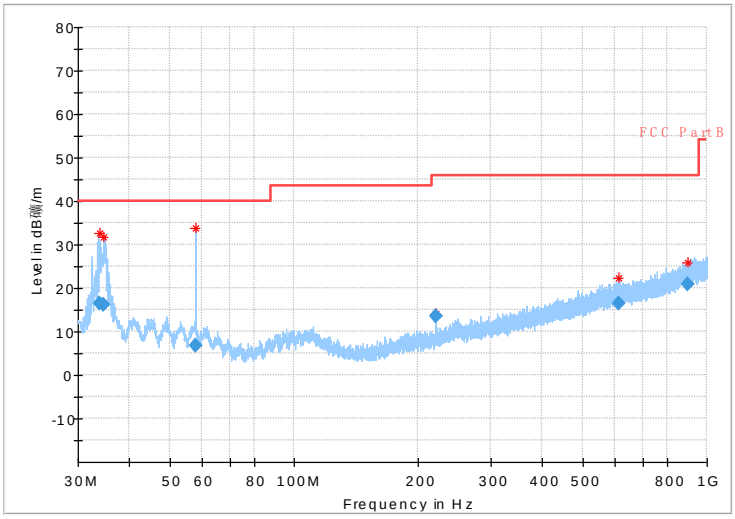


Fig.66 Radiated Spurious Emission (802.11g,Ch11,30MHz~1GHz)

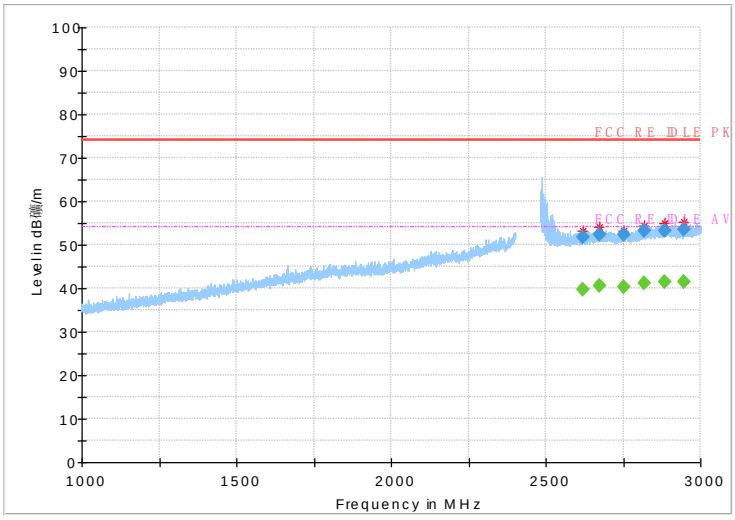


Fig.67 Radiated Spurious Emission (802.11g,Ch11,1GHz~3GHz)

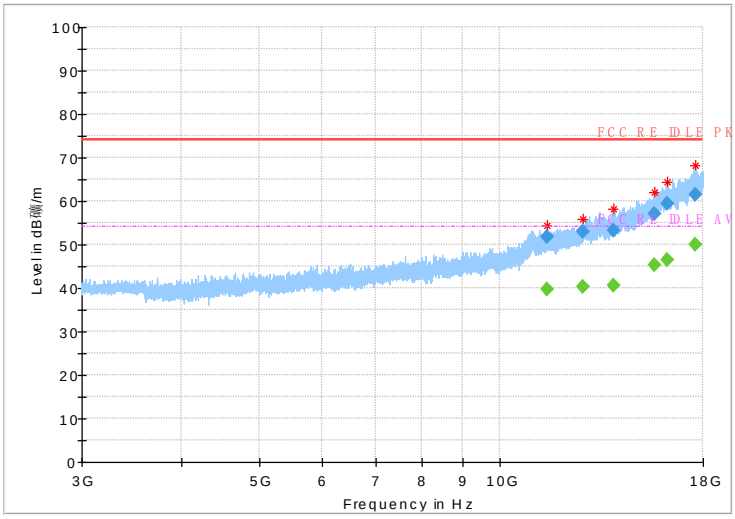
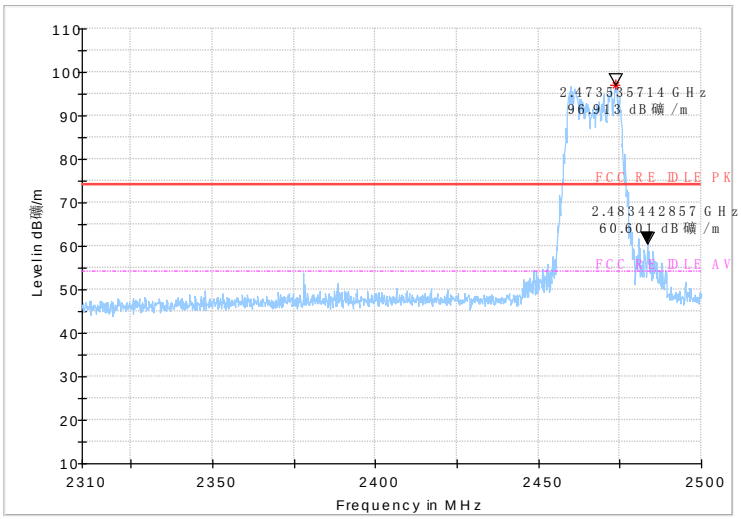
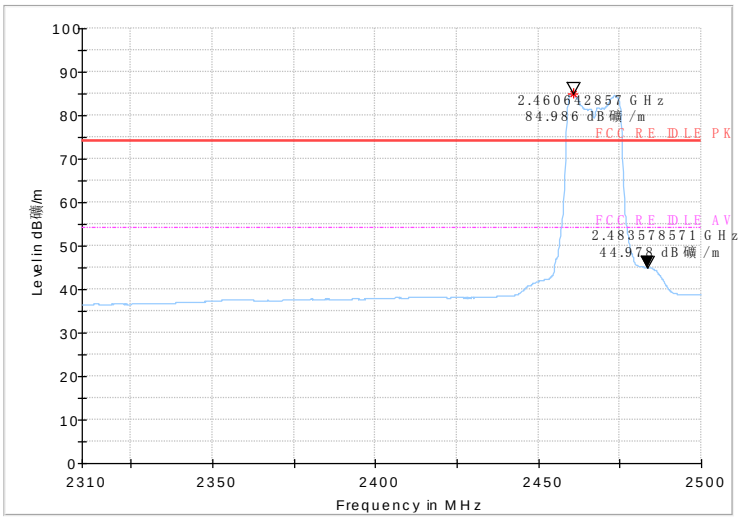


Fig.68 Radiated Spurious Emission (802.11g,Ch11,3GHz~18GHz)



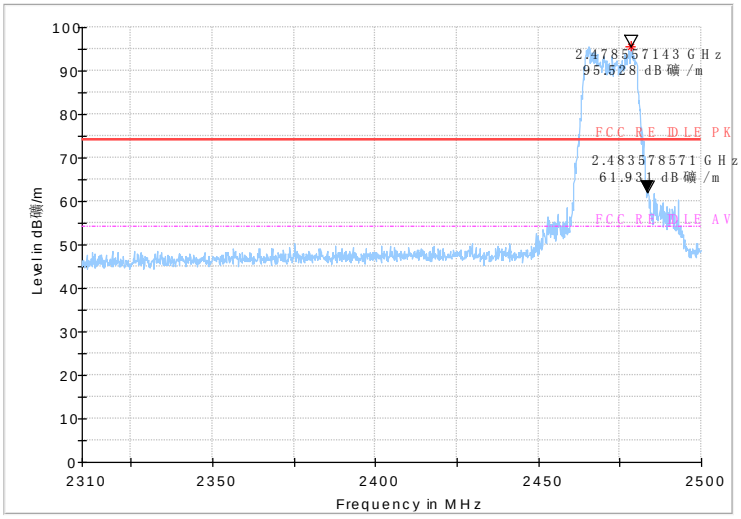
Peak detector

Fig.69 Radiated emission (Power): 802.11g, channel 12



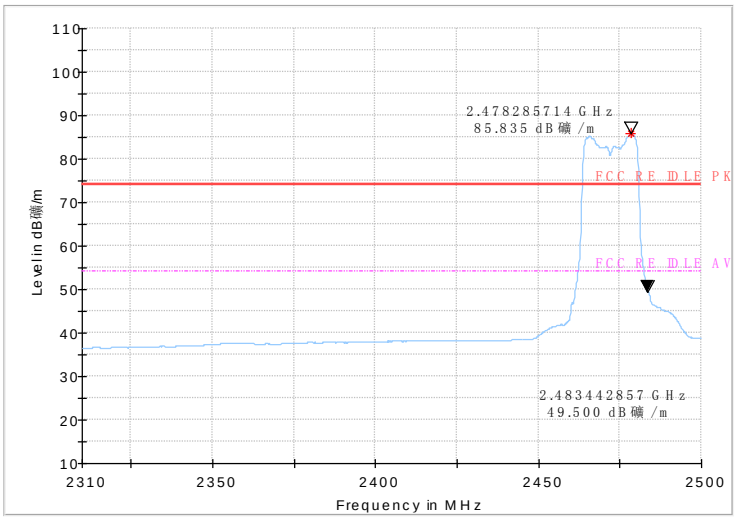
AV detector

Fig.70 Radiated emission (Power): 802.11g, channel 12



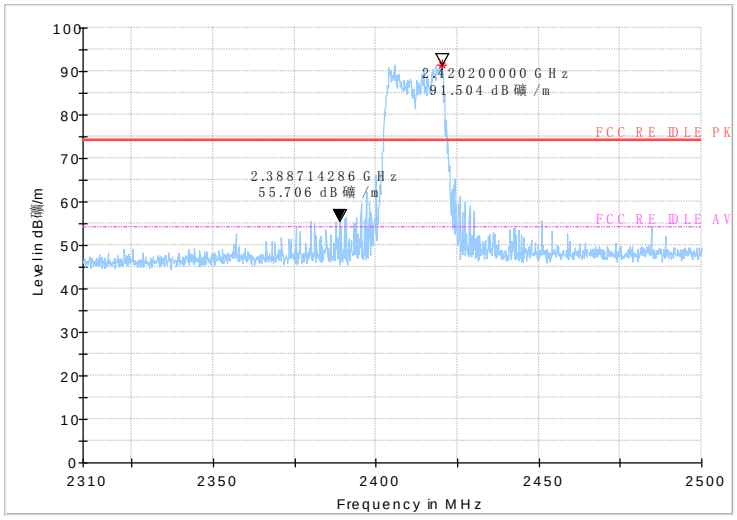
Peak detector

Fig.71 Radiated emission (Power): 802.11g, channel 13

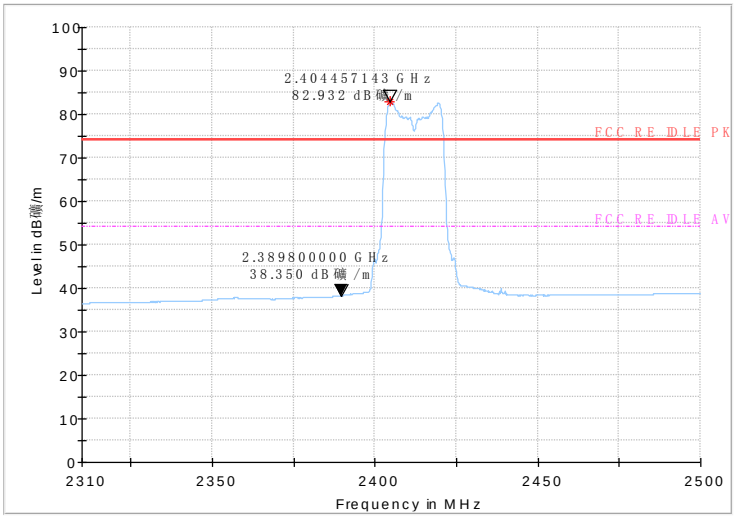


AV detector

Fig.72 Radiated emission (Power): 802.11g, channel 13

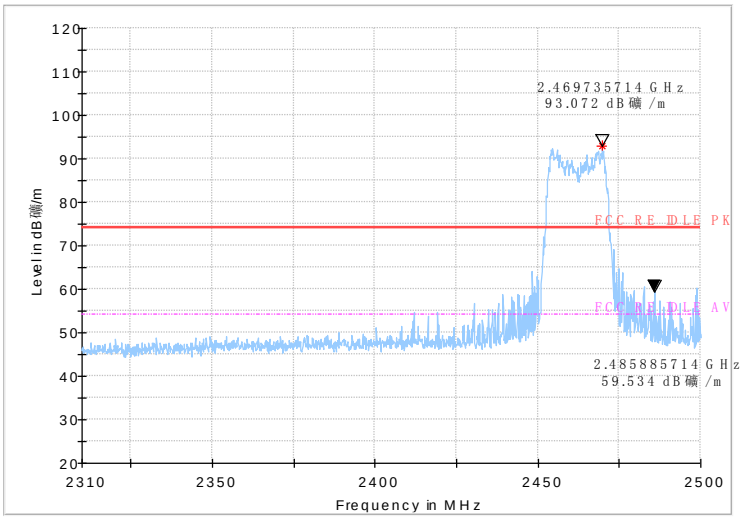


Peak detector

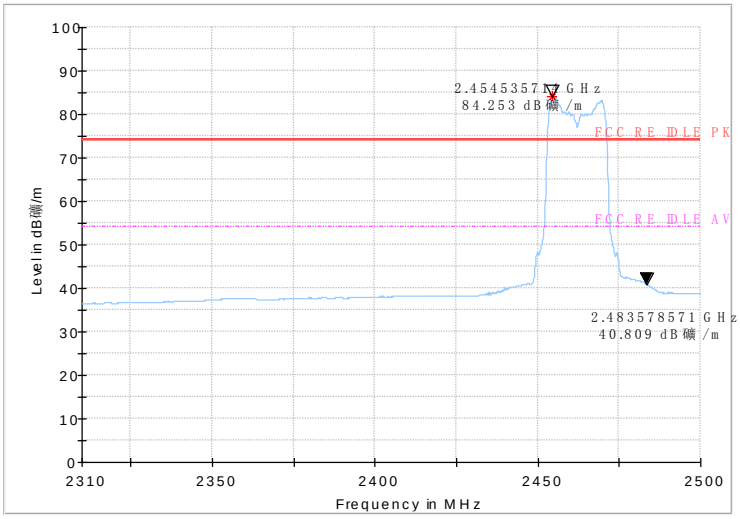


AV detector

Fig.73 Radiated emission (Power): 802.11n, low channel



Peak detector



AV detector

Fig.74 Radiated emission (Power): 802.11n, channel 11

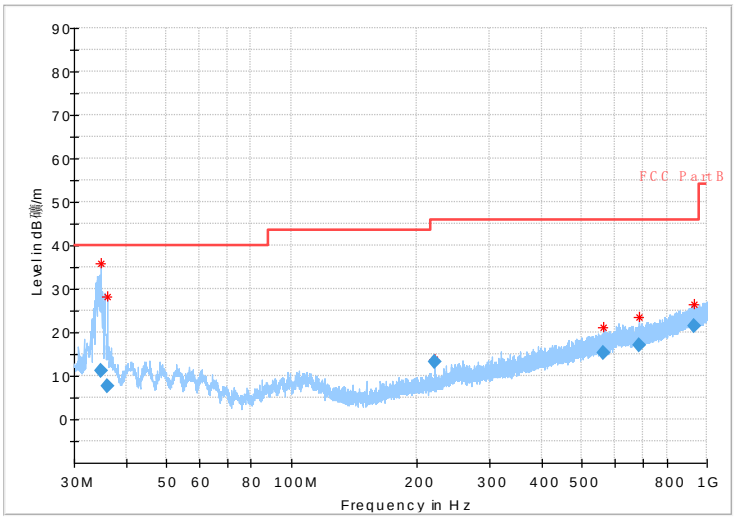


Fig.75 Radiated Spurious Emission (802.11 n-20MHz,Ch11,30MHz~1GHz)

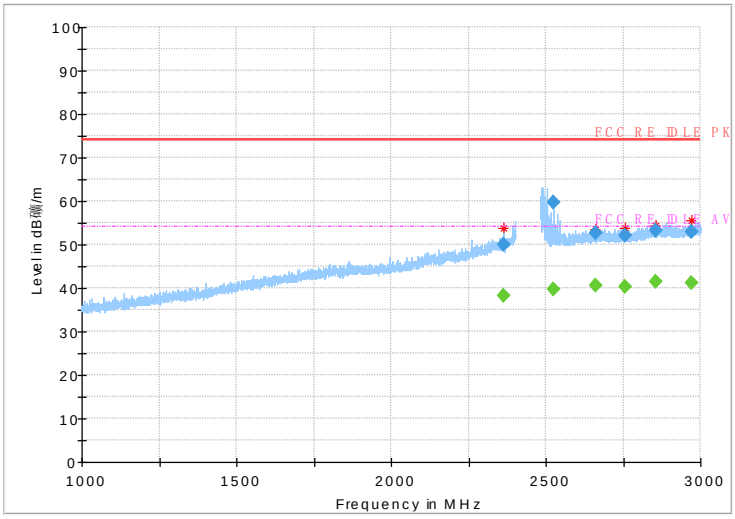


Fig.76 Radiated Spurious Emission (802.11 n-20MHz,Ch11,1GHz~3GHz)

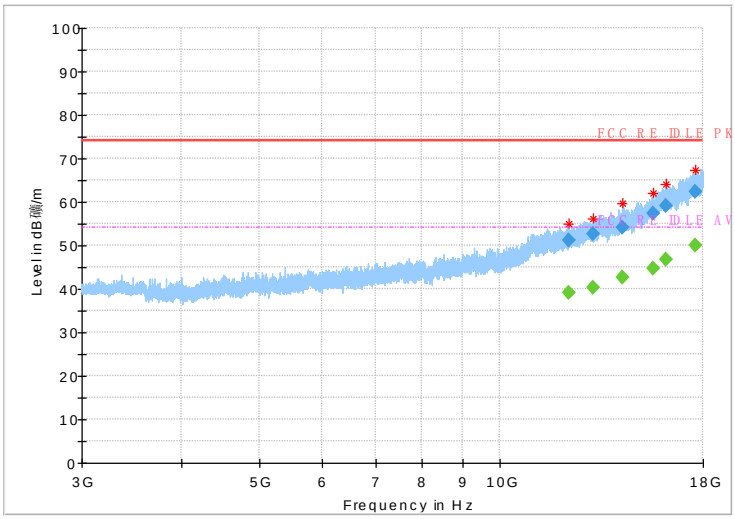
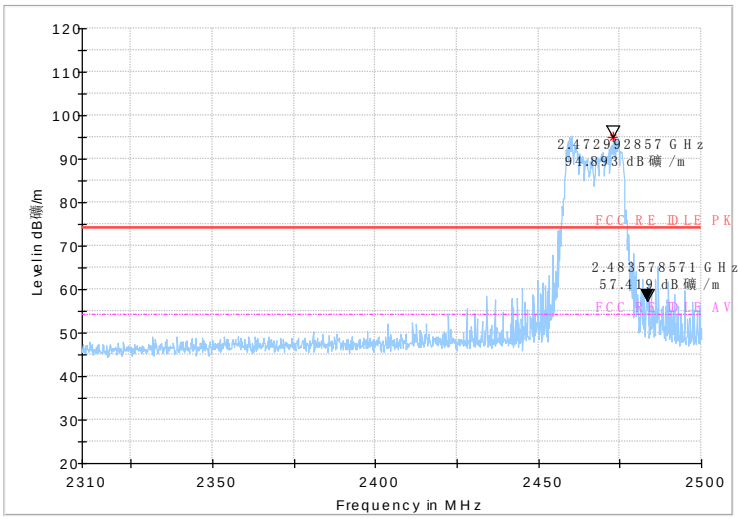
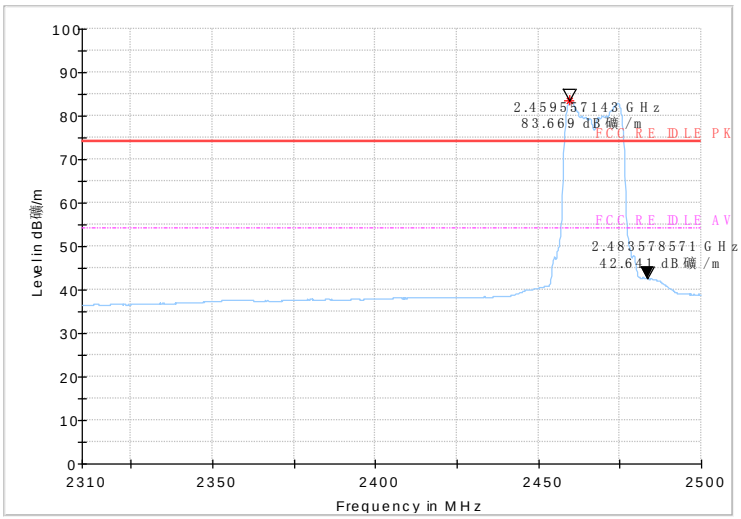


Fig.77 Radiated Spurious Emission (802.11 n-20MHz,Ch11,3GHz~18GHz)



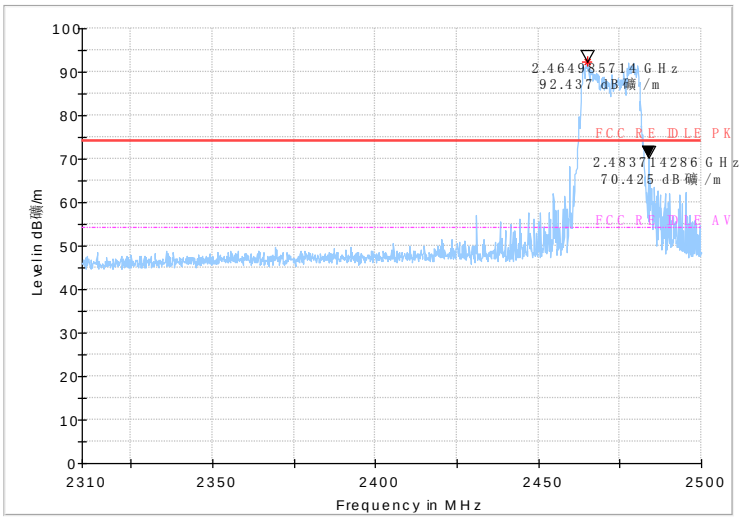
Peak detector

Fig.78 Radiated emission (Power): 802.11n, channel 12



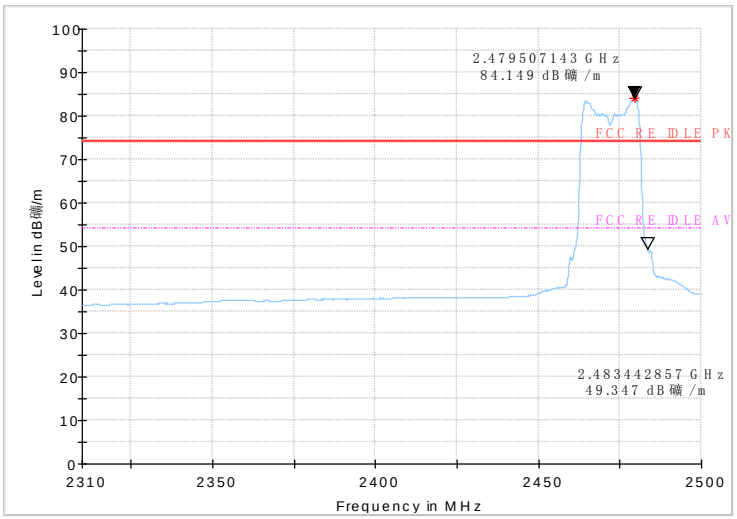
AV detector

Fig.79 Radiated emission (Power): 802.11n, channel 12



Peak detector

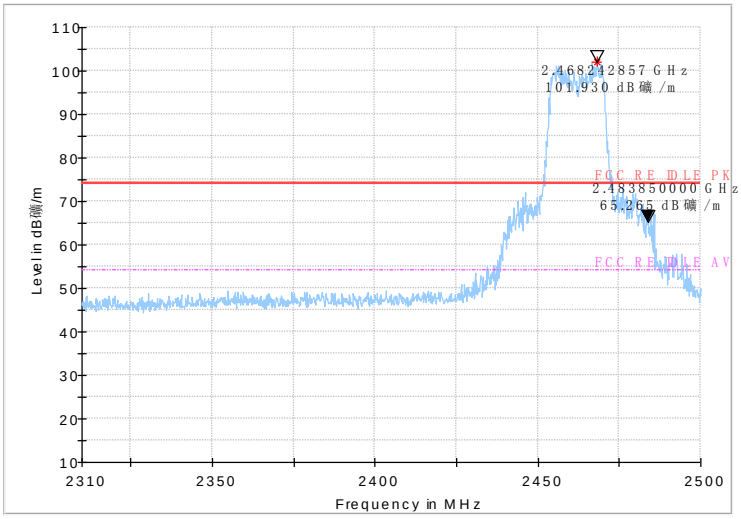
Fig.80 Radiated emission (Power): 802.11n, channel 13



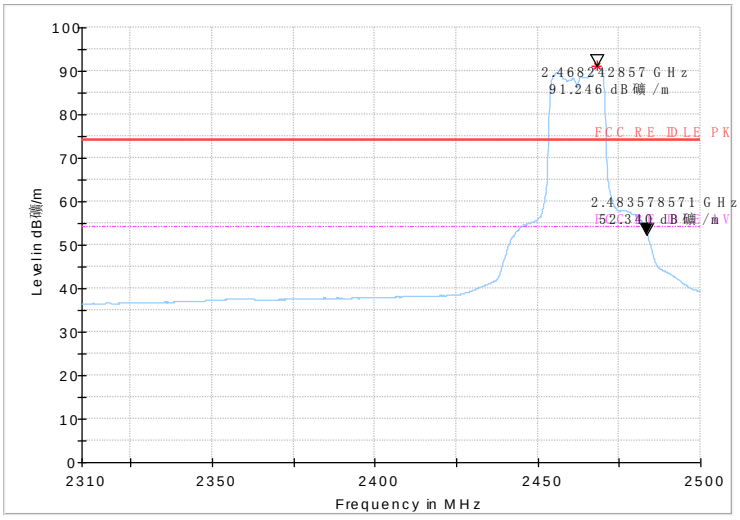
AV detector

Fig.81 Radiated emission (Power): 802.11n, channel 13

Second Supply



Peak detector



AV detector

Fig.58 Radiated emission (Power): 802.11g, high channel

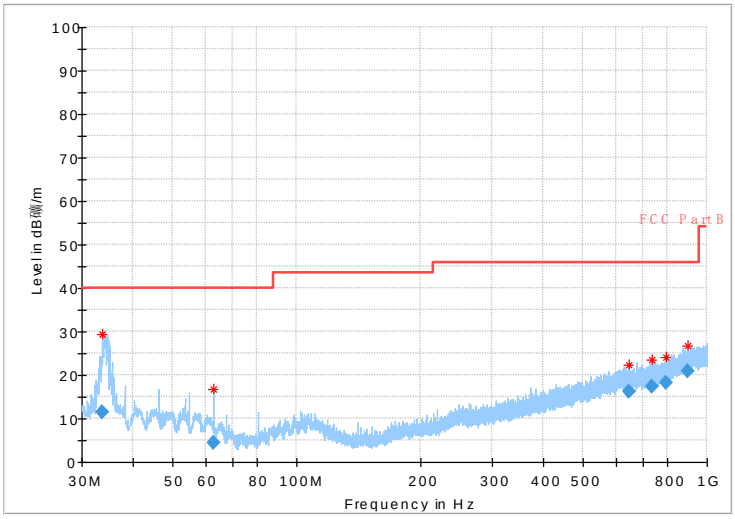


Fig.59 Radiated Spurious Emission (802.11 g,Ch11,3GHz~18GHz)

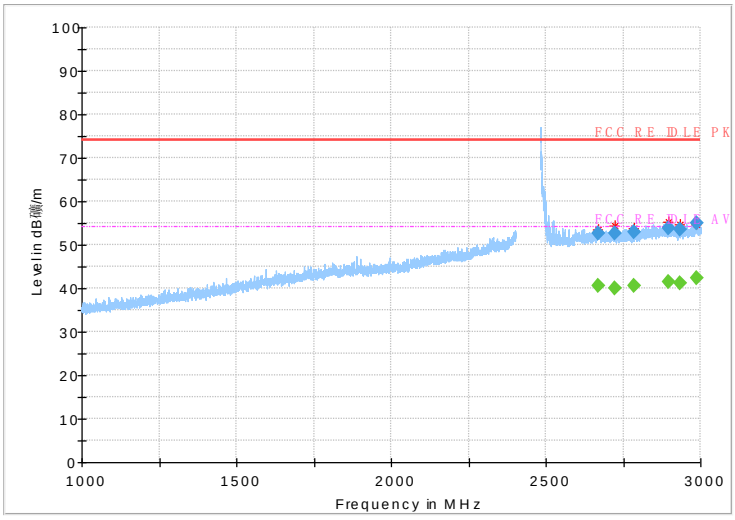


Fig.60 Radiated Spurious Emission (802.11g,Ch11,3GHz~18GHz)

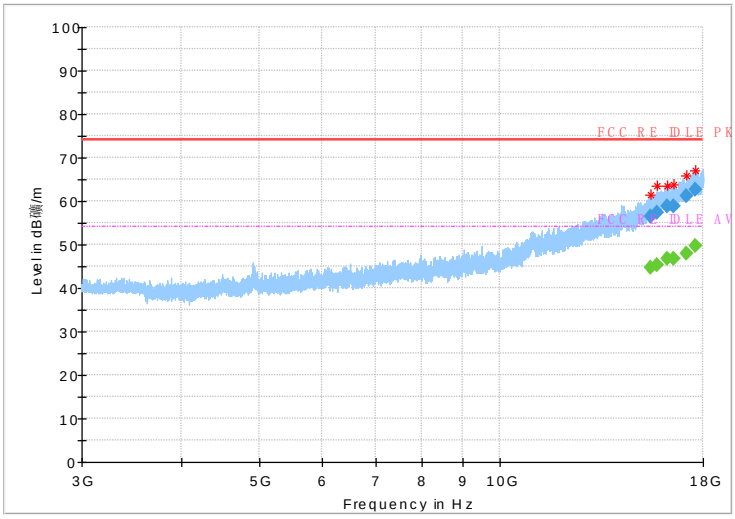


Fig.61 Radiated Spurious Emission (802.11g,Ch11,3GHz~18GHz)

7. Test Equipment and Ancillaries Used For Tests

The test equipment and ancillaries used are as follows.

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date
1	Vector Signal Analyser	FSQ26	101096	R&S	2017-05-11
2	DC Power Supply	ZUP60-14	LOC-220Z006	TDL-Lambda	2017-05-11

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date
1	Universal Radio Communication Tester	CMU200	123101	R&S	2017-05-11
3	Test Receiver	ESU40	100307	R&S	2017-05-11
4	Trilog Antenna	VULB9163	VULB9163-515	Schwarzbeck	2017-11-04
5	Double Ridged Guide Antenna	ETS-3117	135885	ETS	2017-05-05
8	2-Line V-Network	ENV216	101380	R&S	2017-05-11

Anechoic chamber

Fully anechoic chamber by Frankonia German.

8. Test 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 ℃, Max. = 35 ℃
Relative humidity	Min. = 25 %, Max. = 75 %
Shielding effectiveness	> 110 dB
Ground system resistance	< 0.5 Ω

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

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. =25 %, Max. = 75 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω

Fully-anechoic chamber1 (6.9 meters×10.9 meters×5.4 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. = 25 %, Max. = 75 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
VSWR	Between 0 and 6 dB, from 1GHz to 18GHz
Site Attenuation Deviation	Between -4 and 4 dB,30MHz to 1GHz
Uniformity of field strength	Between 0 and 6 dB, from 80MHz to 3000 MHz

ANNEX A. Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

ANNEX B. Accreditation Certificate

Accredited Laboratory

A2LA has accredited

EAST CHINA INSTITUTE OF TELECOMMUNICATIONS

Shanghai, People's Republic of China

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets the requirements of any additional program requirements in the field of Electrical. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009*).

Presented this 10th day of December 2014.

President & CEO
For the Accreditation Council
Certificate Number 3682.01
Valid to February 28, 2017

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

************End The Report************