Full

TEST REPORT

No. I15D00109-WLA

For

Client : VSN Technologies Inc. d/b/a VSN Mobil

Production : WCDMA Digital Mobile Phone

Model Name : V.45s

Model Number: V2003

FCC ID: 2AA9WV2003

Hardware Version: V01

Software Version: V04_20150629_UP39_H456_NEXTEL_SINGLE_MP

Issued date: 2015-11-25

Test Laboratory:

ECIT Shanghai, East China Institute of Telecommunications

Add: 7-8F, G Area, No.668, Beijing East Road, Huangpu District, Shanghai, P. R. China

Tel: (+86)-021-63843300, E-Mail: welcome@ecit.org.cn

Revision Version

Report Number	Revision	Date	Memo
I15D00109-WLA	00	2015-08-24	Initial creation of test report
I15D00109-WLA	01	2015-11-25	Second creation of test report

CONTENTS

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

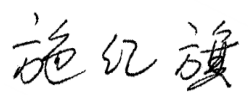
1.2. Testing Environment

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

1.3. Project data

Project Leader:	Wang Yaqiong
Testing Start Date:	2015-07-28
Testing End Date:	2015-08-21

1.4. Signature



Shi Hongqi
(Prepared this test report)

Liu Jianquan
(Reviewed this test report)

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

2. Client Information

2.1. Applicant Information

Company Name:	VSN Technologies Inc. d/b/a VSN Mobil
Address:	1975 E. Sunrise Blvd. Suite 400, Fort Lauderdale FL
Telephone:	954-609-4912
Postcode:	33304

2.2. Manufacturer Information

Company Name:	Mobiwire Mobiles (Ningbo) Co., Ltd
Address:	No.999,Dacheng East Road,Fenghua City,Zhejiang
Telephone:	+86-0574-59550618
Postcode:	315500

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

3.1. About EUT

EUT Description	WCDMA Digital Mobile Phone
Model name	V.45s
UMTS Frequency Band	WCDMA Band 850/1700/1900
GSM Frequency Band	GSM850/900/1800/1900
Bluetooth Frequency	2402MHz-2480Mhz
Bluetooth Channel	Channel0-Channel78
Bluetooth Modulation	GMSK;π/4 DQPSK;8DPSK
BLE Frequency	2402MHz-2480Mhz
BLE Channel	Channel0-Channel39
BLE Modulation	GFSK
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	4.2V
Extreme Low Voltage	3.6V

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
N01	867091021972139	V01	V04_20150629_UP39_H456_NEXTEL_SINGLE_MP	2015-07-27

*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.

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.	2014
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	/	P

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	3.8V
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 V.45s, supporting GSM/GPRS/WCDMA/HSDPA/HSUPA/WLAN/BT/BLE/GPS, manufactured by Mobiwire Mobiles (Ningbo) 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)
802.11b	1	16.50	/	/
	2	16.54	15.89	14.92
	5.5	16.31	/	/
	11	16.37	/	/
802.11g	6	17.48	/	/
	9	17.79	16.79	16.82
	12	17.43	/	/
	18	17.56	/	/

	24	17.68	/	/
	36	17.72	/	/
	48	17.58	/	/
	54	17.66	/	/

The data rate 2Mbps and 9Mbps 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)
802.11n(20MHz)	MCS0	16.99	/	/
	MCS1	17.91	/	/
	MCS2	17.50	/	/
	MCS3	17.75	/	/
	MCS4	17.73	/	/
	MCS5	18.00	/	/
	MCS6	18.15	16.96	16.31
	MCS7	17.63	/	/
802.11n(40MHz)	MCS0	16.68	/	/
	MCS1	17.31	/	/
	MCS2	17.42	/	/
	MCS3	17.30	/	/
	MCS4	17.30	/	/
	MCS5	17.76	/	/
	MCS6	17.78	16.87	15.68
	MCS7	17.75	/	/

The data rate MCS6 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(Ch1)	2437MHz(Ch6)	2462MHz(Ch11)
802.11b	14.35	14.01	13.12
802.11g	11.32	10.57	9.73

802.11n mode

Mode	Test Result(dBm)		
	2412MHz(Ch1)	2437MHz(Ch6)	2462MHz(Ch11)
802.11n(20MHz)	11.79	11.19	10.14
802.11n(40MHz)	11.98	10.79	9.70

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	-8.903	P
	6	Fig.2	-9.536	P
	11	Fig.3	-10.528	P
802.11g	1	Fig.4	-18.297	P
	6	Fig.5	-19.134	P
	11	Fig.6	-20.090	P

802.11n mode

Mode	Channel	Power Spectral Density(dBm/3kHz)		Conclusion
802.11n(20MHz)	1	Fig.7	-15.956	P
	6	Fig.8	-16.559	P
	11	Fig.9	-17.406	P
802.11g(40MHz)	3	Fig.10	-17.113	P
	6	Fig.11	-17.232	P
	11	Fig.12	-18.848	P

Conclusion: PASS

Test graphs as below:

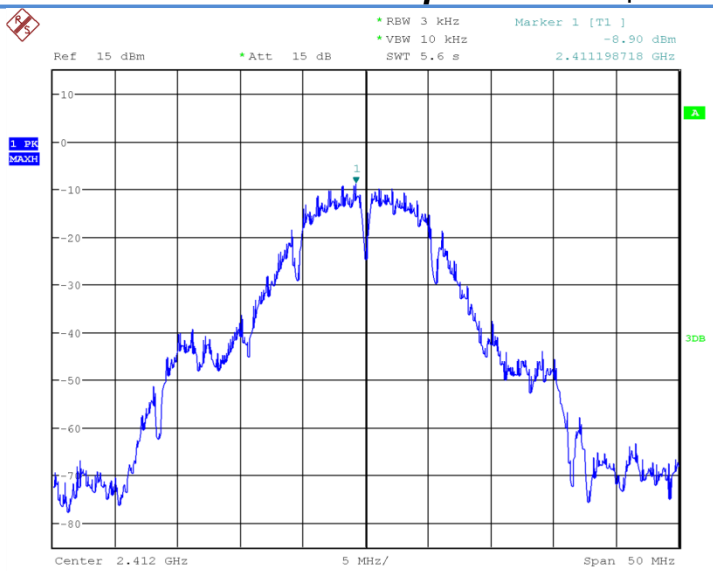


Fig.1 Power Spectral Density (802.1b,Ch1)

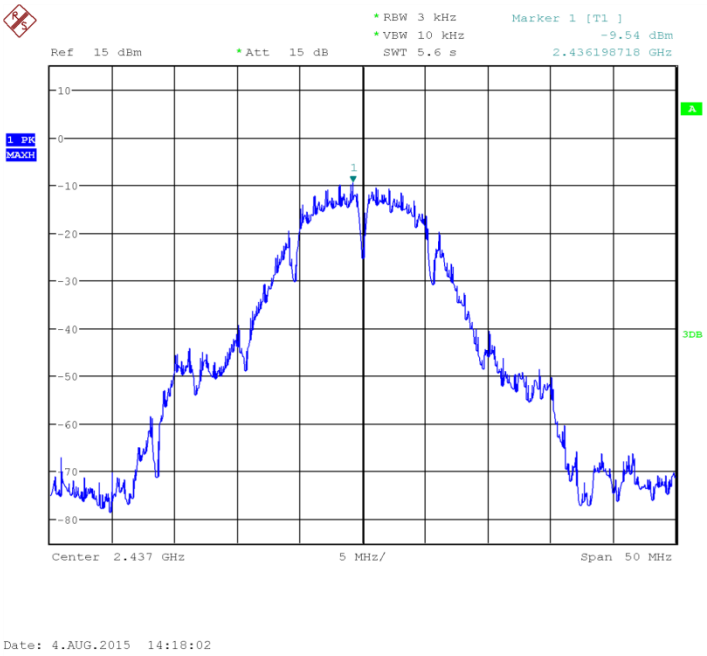


Fig.2 Power Spectral Density (802.1b,Ch6)

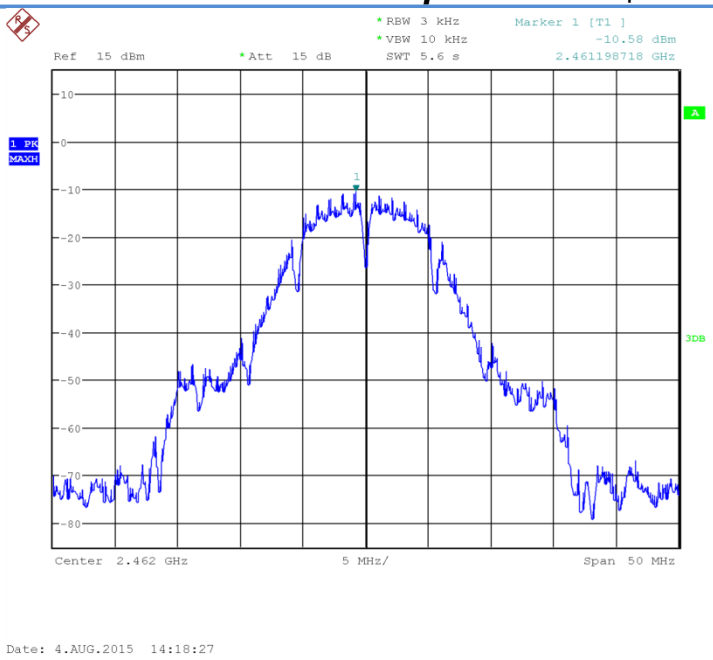


Fig.3 Power Spectral Density (802.1b,Ch11)

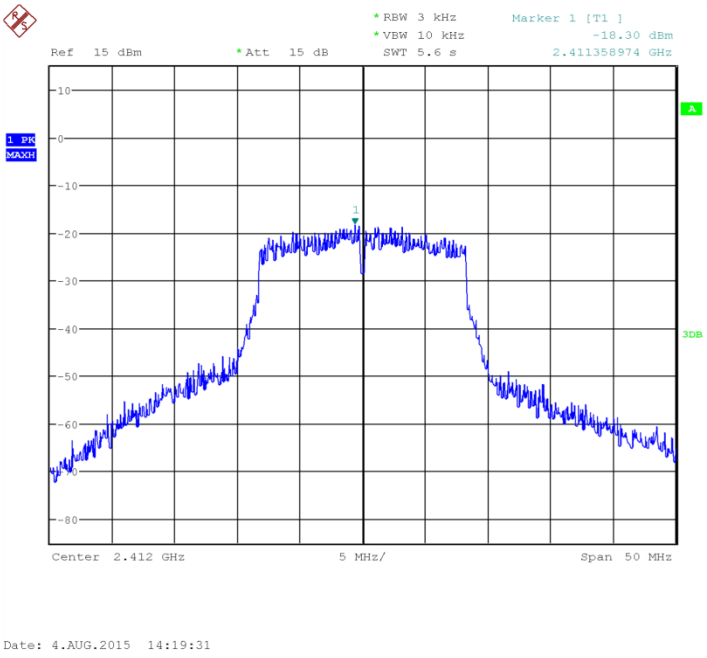


Fig.4 Power Spectral Density (802.1g,Ch1)

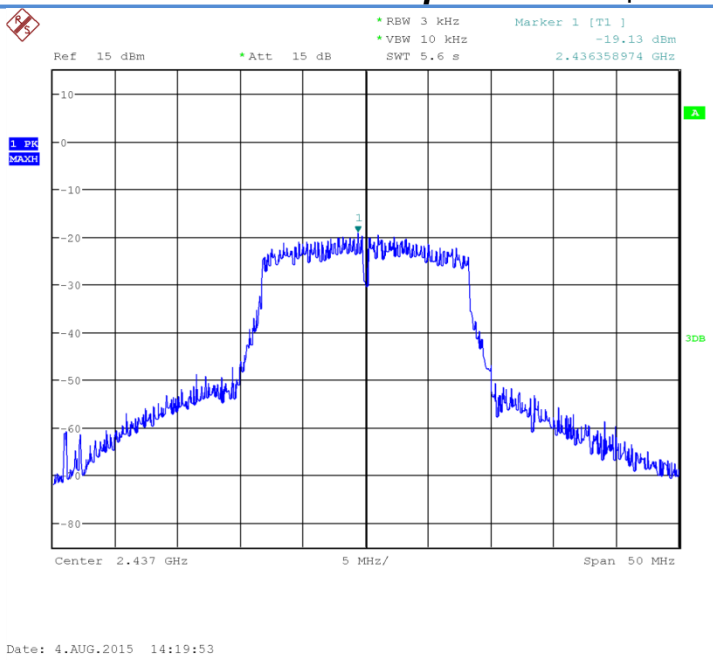


Fig.5 Power Spectral Density (802.1g,Ch6)

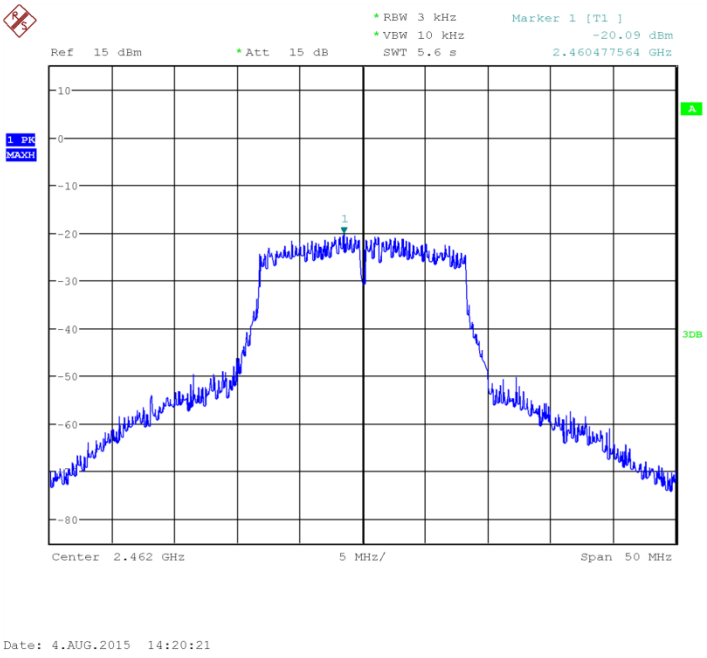


Fig.6 Power Spectral Density (802.1g,Ch11)

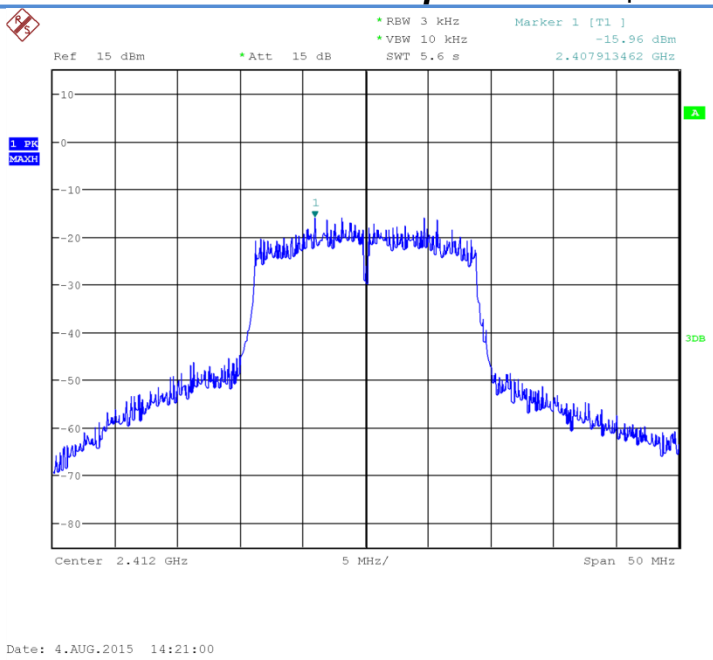


Fig.7 Power Spectral Density (802.1n-20MHz,Ch1)

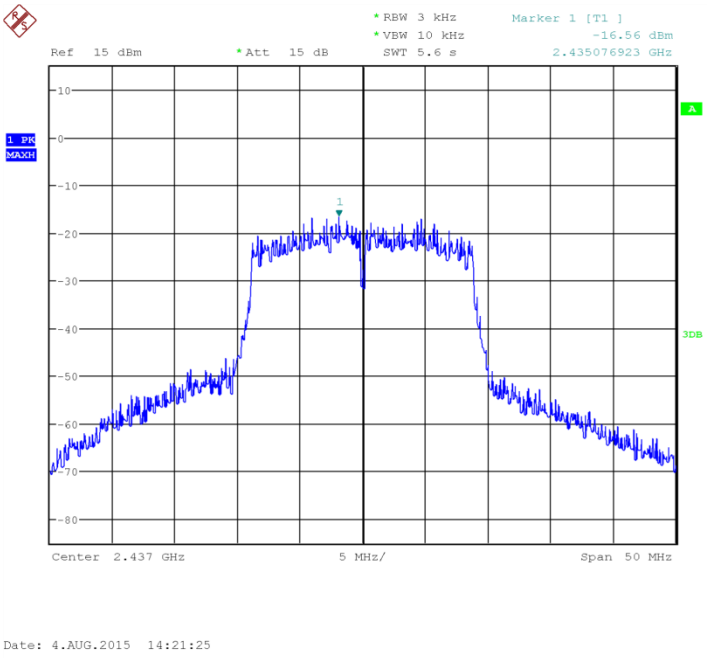


Fig.8 Power Spectral Density (802.1n-20MHz,Ch6)

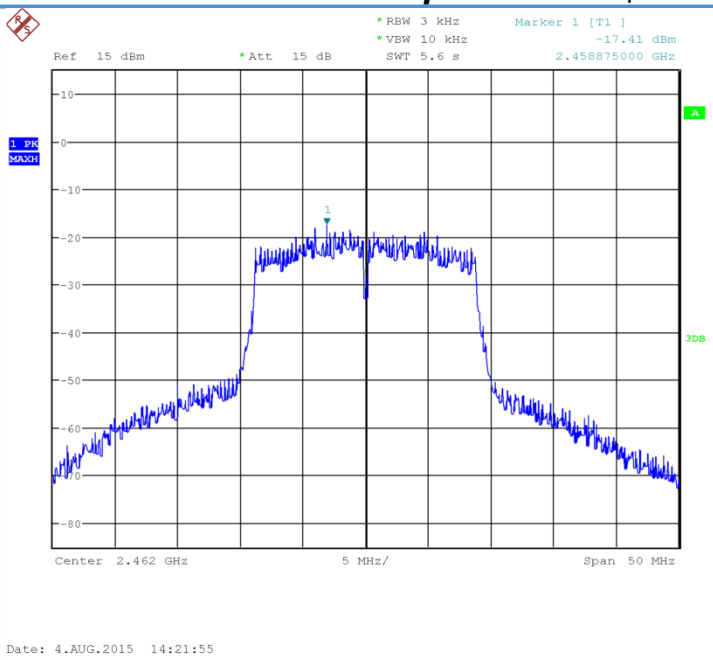


Fig.9 Power Spectral Density (802.1n-20MHz,Ch11)

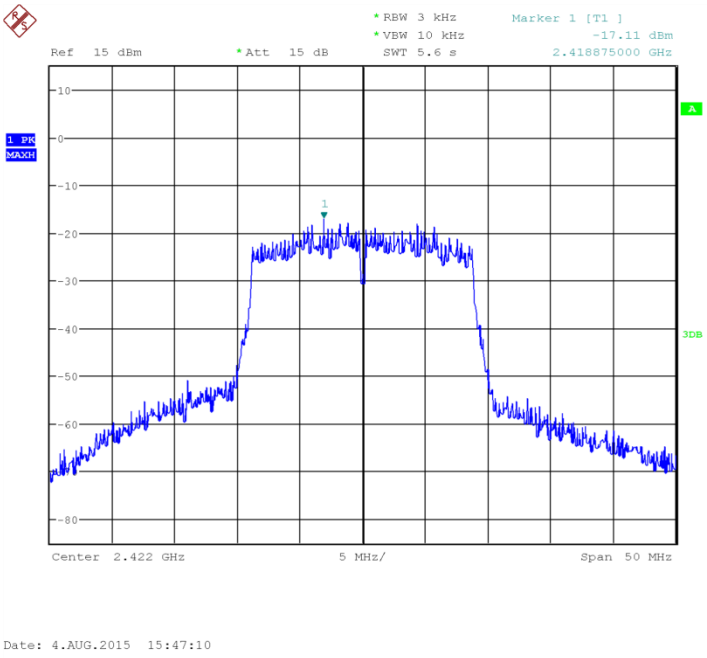


Fig.10 Power Spectral Density (802.1n-40MHz,Ch3)

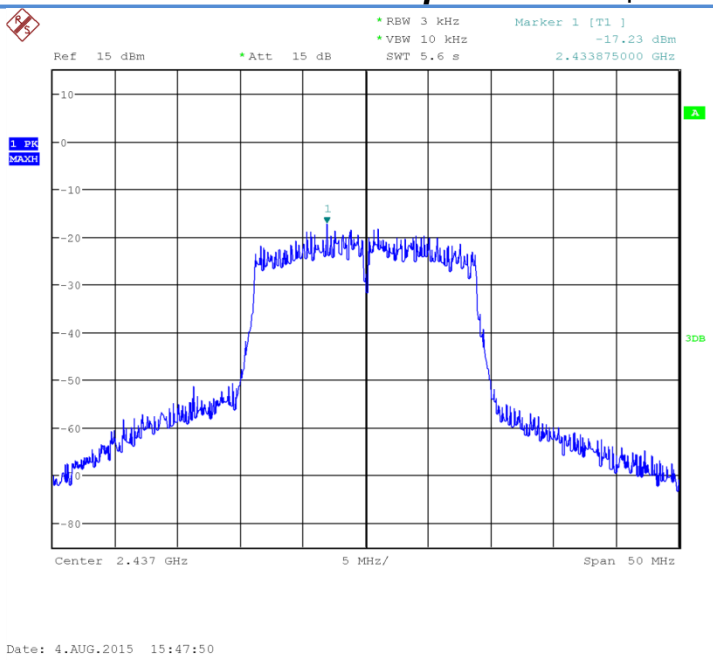


Fig.11 Power Spectral Density (802.1n-40MHz,Ch6)

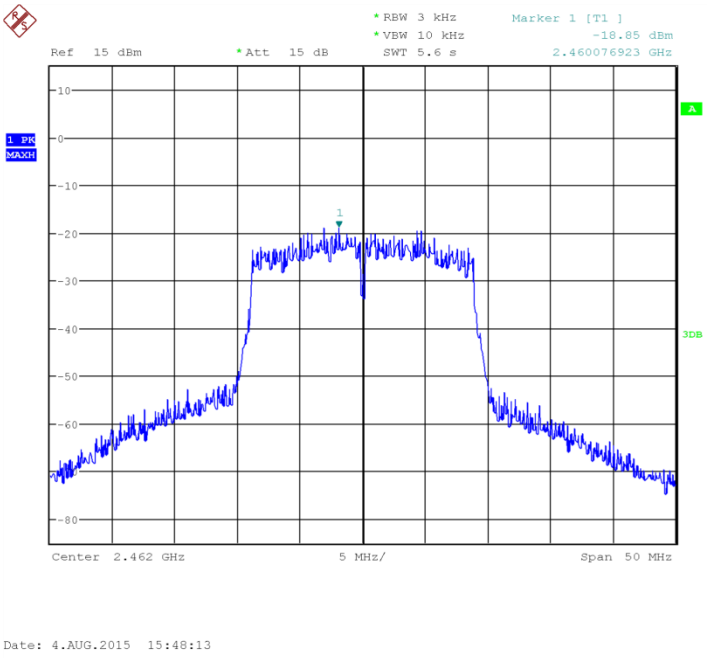


Fig.12 Power Spectral Density (802.1n-40MHz,Ch11)

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.13	10.016	P
	6	Fig.14	10.016	P
	11	Fig.15	9.936	P
802.11g	1	Fig.16	16.506	P
	6	Fig.17	16.506	P
	11	Fig.18	16.506	P

802.11n mode

Mode	Channel	Occupied 6dB Bandwidth(MHz)		Conclusion
802.11n(20MHz)	1	Fig.19	17.788	P
	6	Fig.20	17.788	P
	11	Fig.21	17.788	P
802.11n(40MHz)	3	Fig.22	35.256	P

	6	Fig.23	35.256	P
	11	Fig.24	35.256	P

Conclusion: PASS

Test graphs as below:

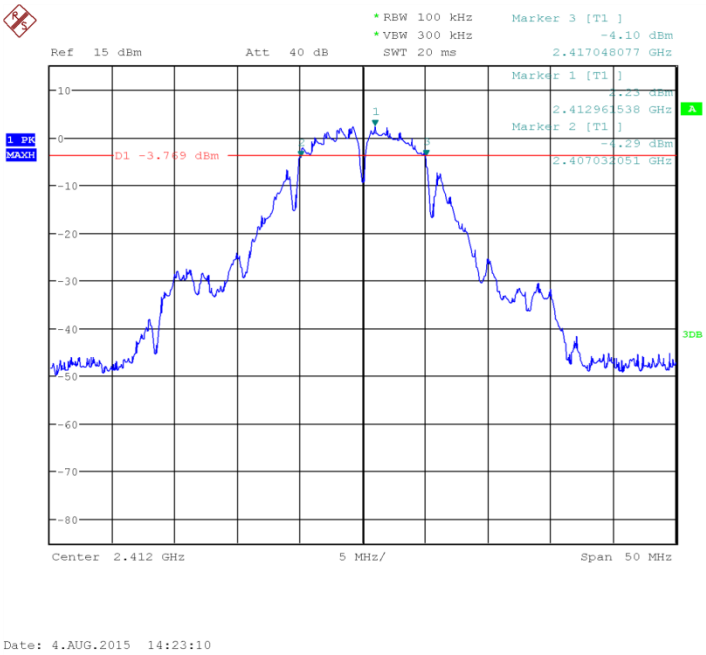


Fig.13 Occupied 6dB Bandwidth (802.11b, Ch1)

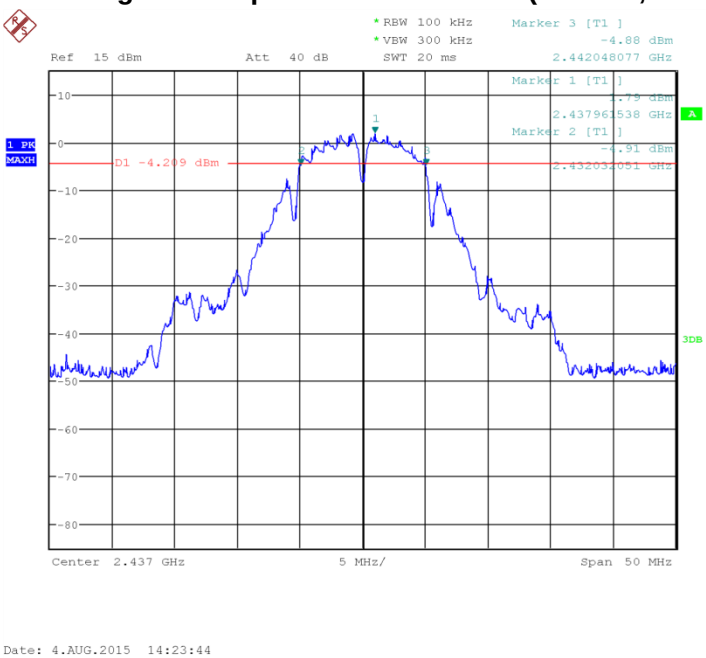


Fig.14 Occupied 6dB Bandwidth (802.11b, Ch6)

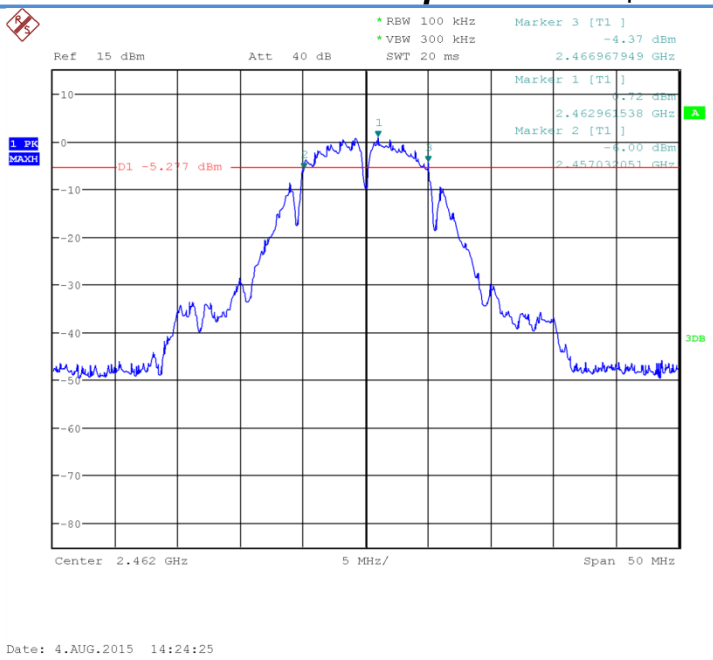


Fig.15 Occupied 6dB Bandwidth (802.11b, Ch11)

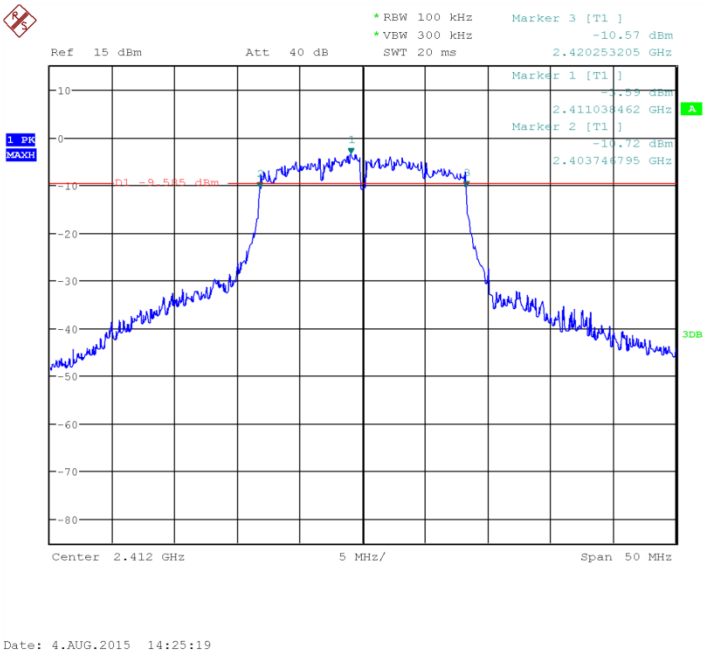


Fig.16 Occupied 6dB Bandwidth (802.11g, Ch1)

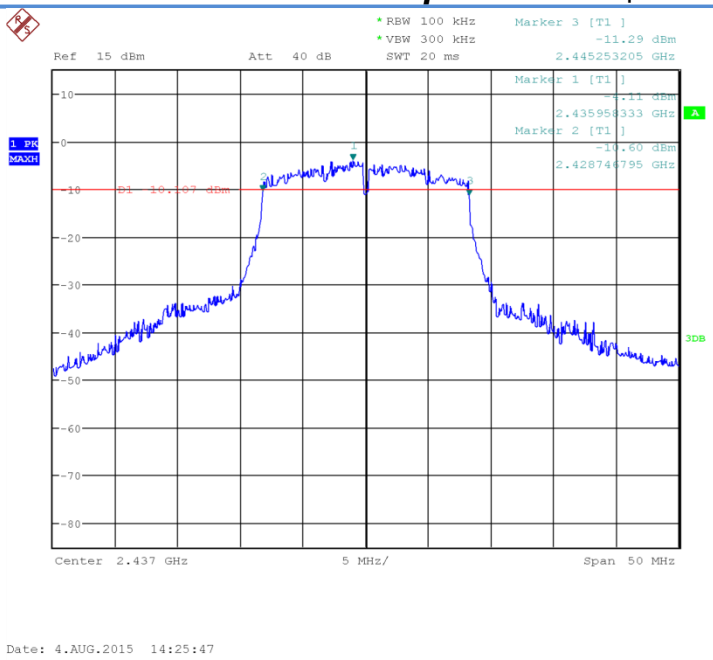


Fig.17 Occupied 6dB Bandwidth (802.11g, Ch6)

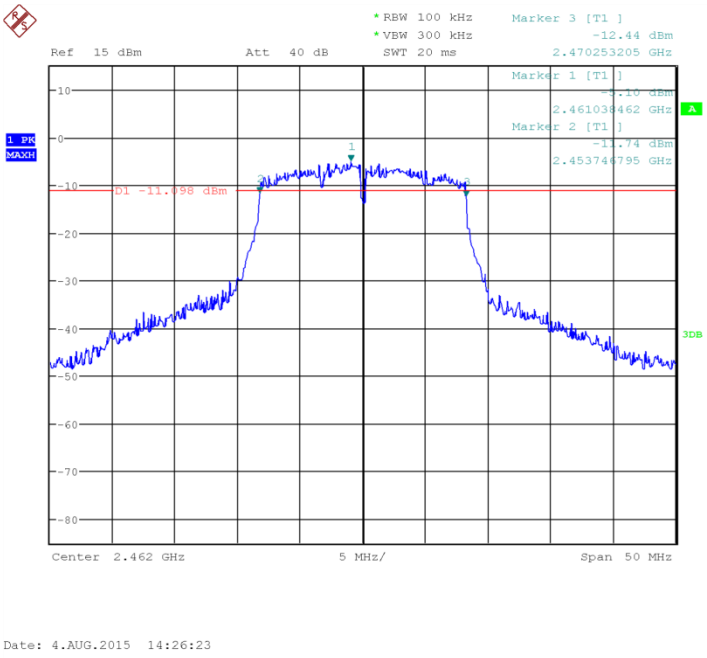


Fig.18 Occupied 6dB Bandwidth (802.11g, Ch11)

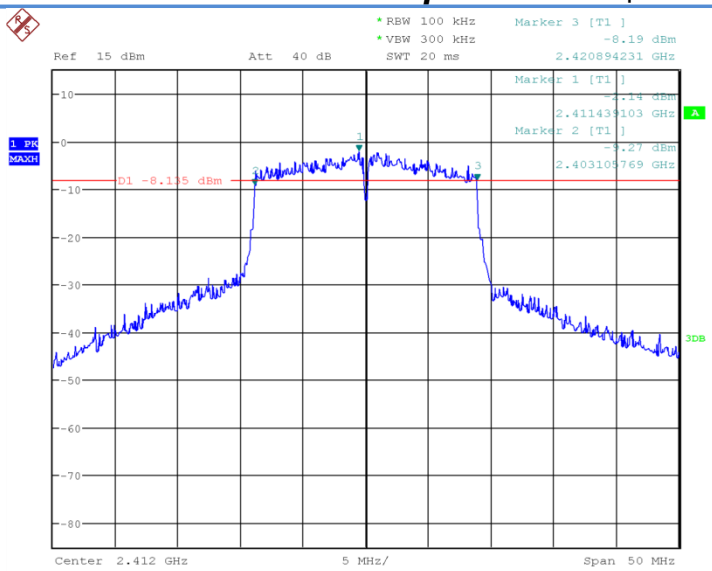


Fig.19 Occupied 6dB Bandwidth (802.11n-20MHz, Ch1)

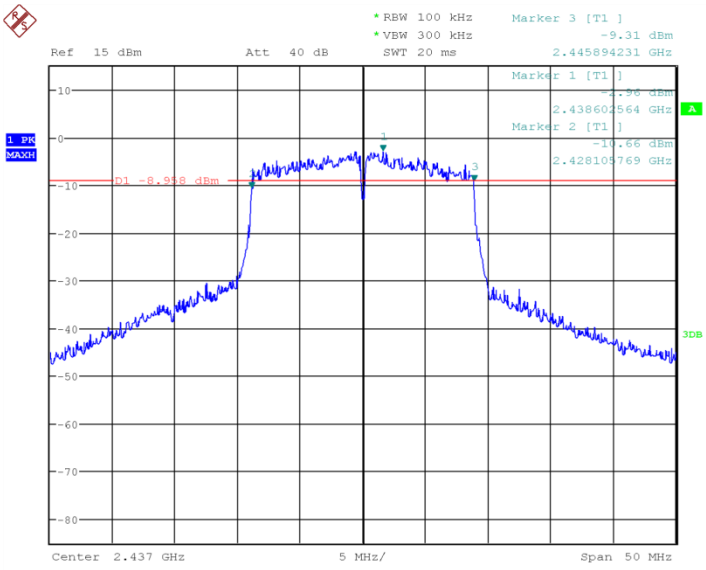


Fig.20 Occupied 6dB Bandwidth (802.11n-20MHz, Ch6)

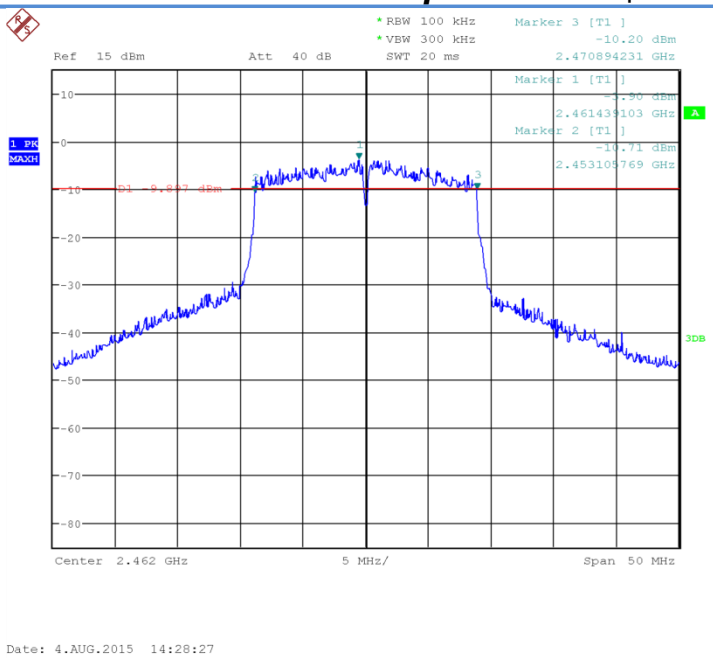


Fig.21 Occupied 6dB Bandwidth (802.11n-20MHz, Ch11)

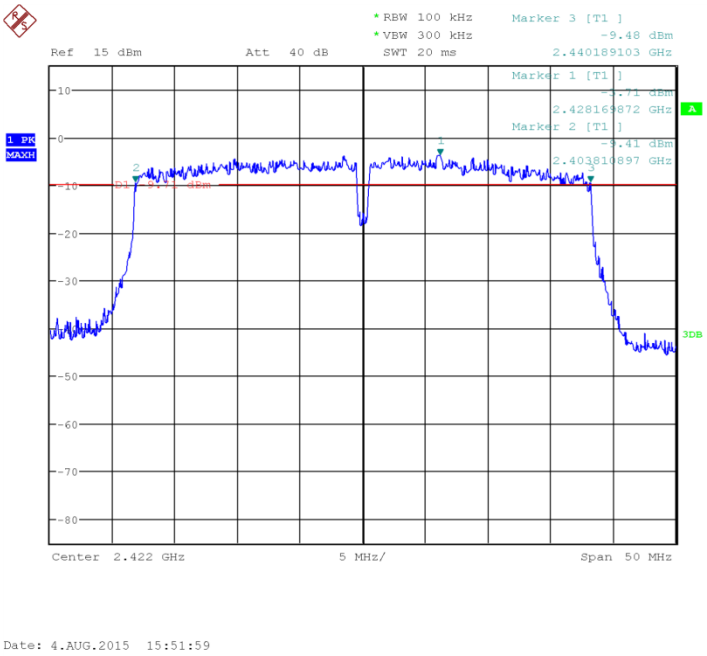


Fig.22 Occupied 6dB Bandwidth (802.11n-40MHz, Ch3)

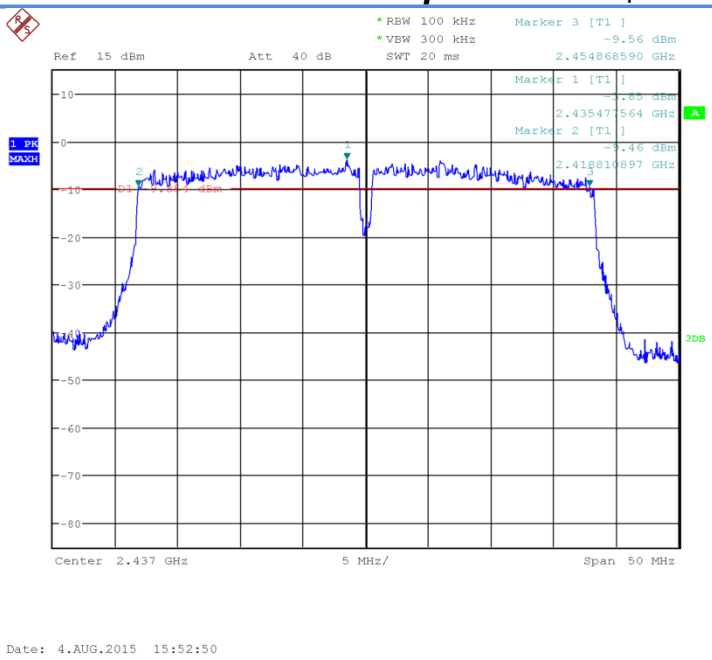


Fig.23 Occupied 6dB Bandwidth (802.11n-40MHz, Ch6)

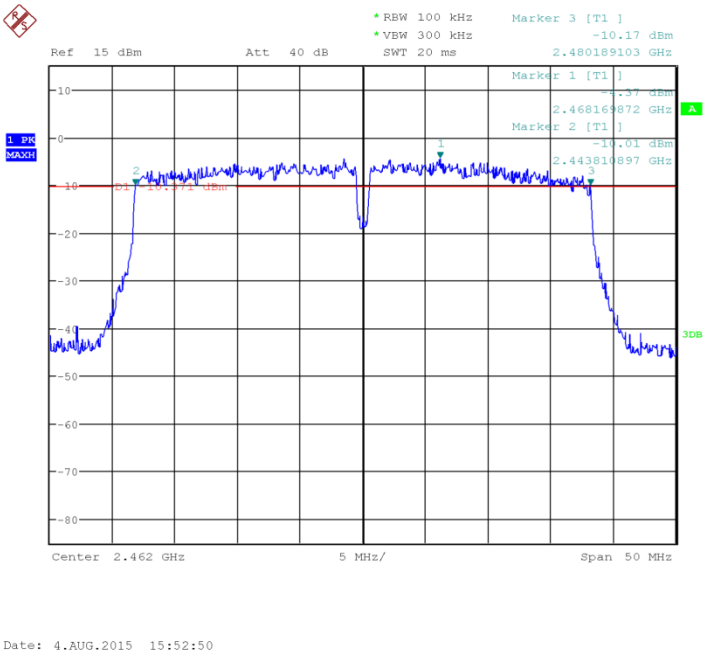


Fig.24 Occupied 6dB Bandwidth (802.11n-40MHz, Ch11)

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
802.11g	1	Fig.27	P
	11	Fig.28	P

802.11n mode

Mode	Channel	Test Results	Conclusion
802.11n(20MHz)	1	Fig.29	P
	11	Fig.30	P
802.11(40MHz)	3	Fig.31	P
	11	Fig.32	P

Conclusion: PASS

Test graphs as blew:

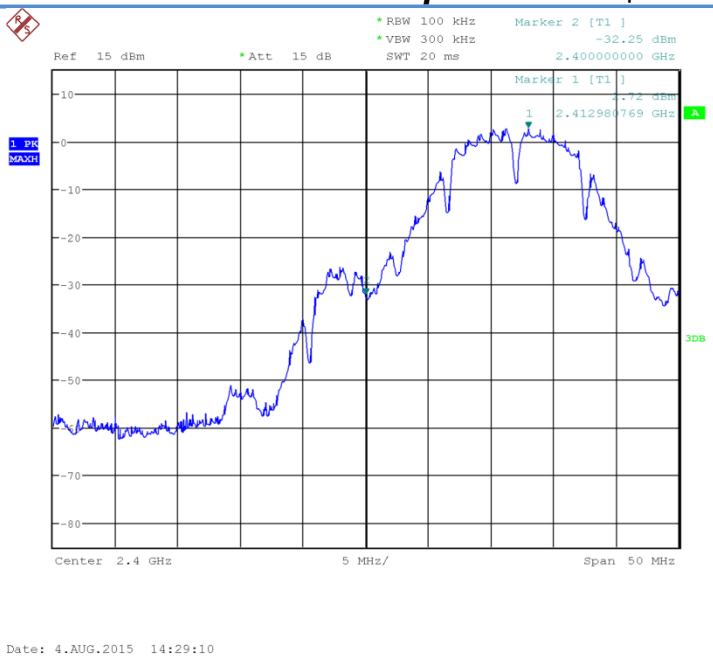


Fig.25 Band Edges (802.11b, Ch1)

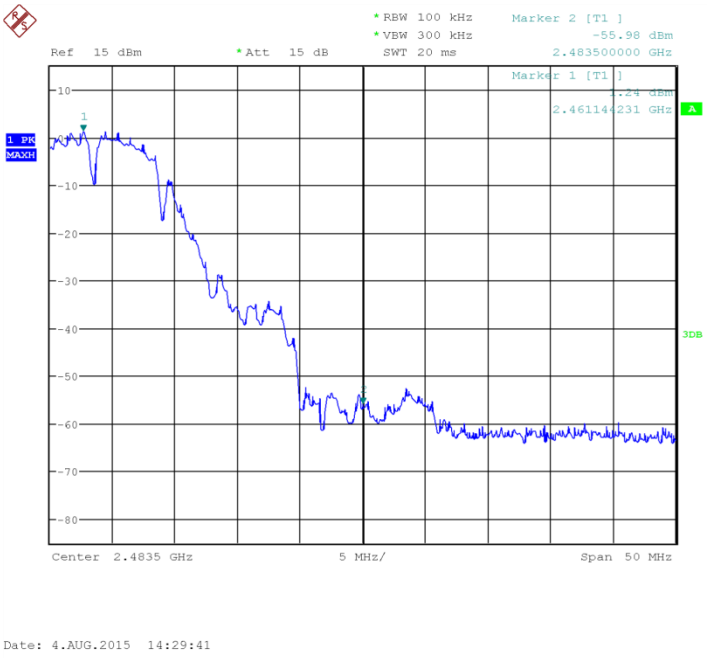


Fig.26 Band Edges (802.11b, Ch11)

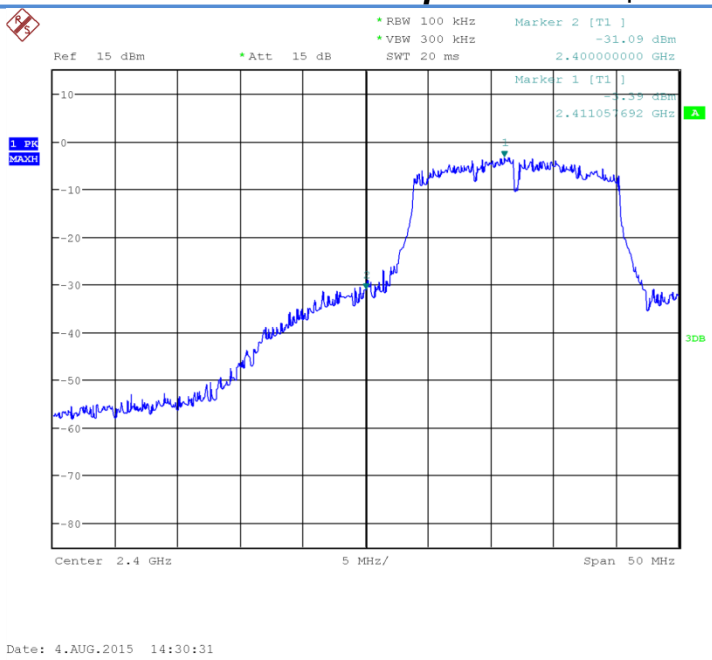


Fig.27 Band Edges (802.11g, Ch1)

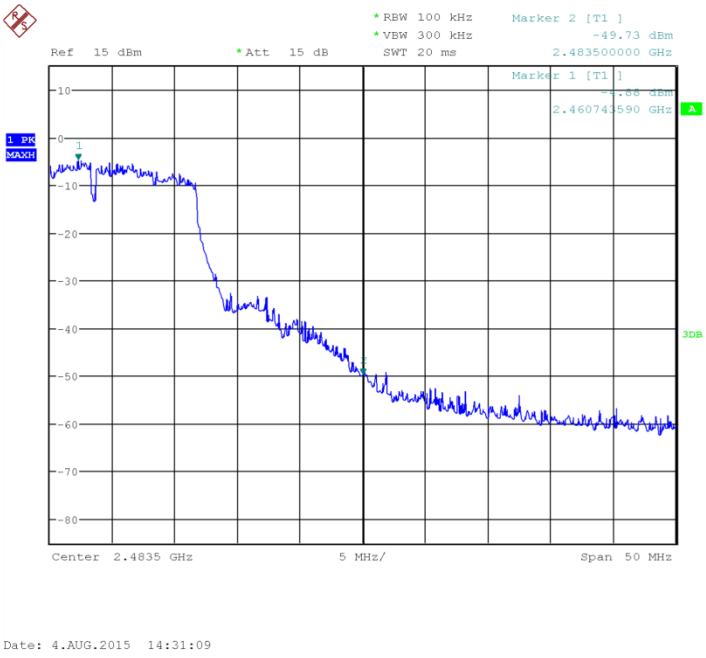


Fig.28 Band Edges (802.11g, Ch11)

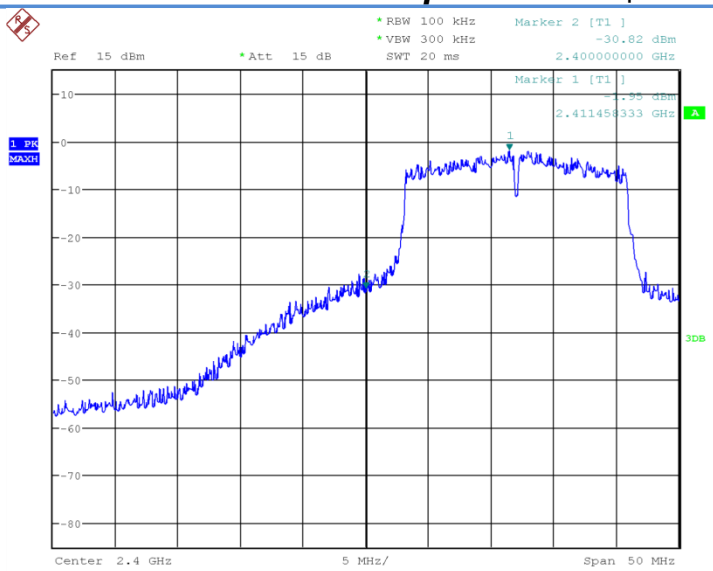


Fig.29 Band Edges (802.11n-20MHz, Ch1)

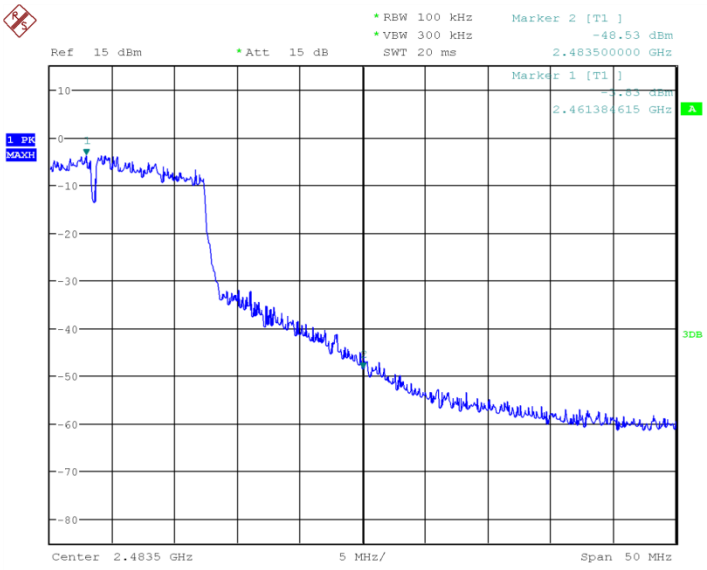


Fig.30 Band Edges (802.11n-20MHz, Ch11)

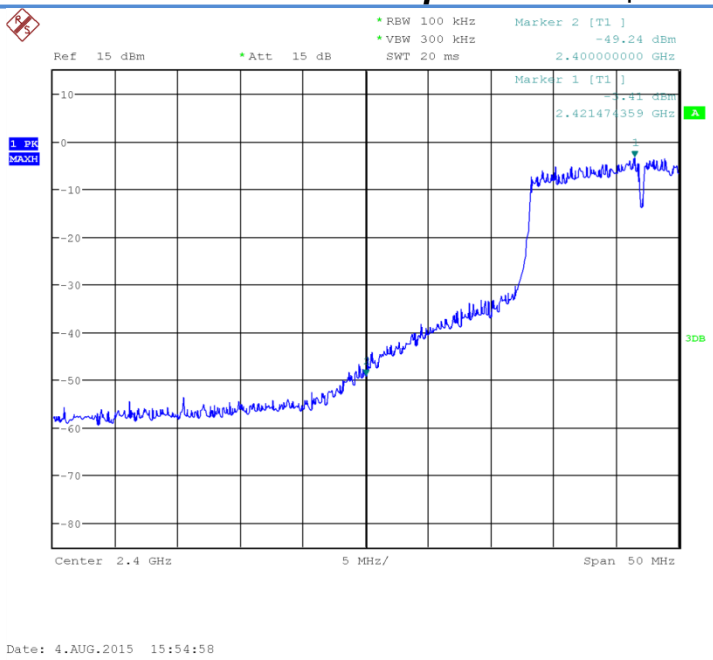


Fig.31 Band Edges (802.11n-40MHz, Ch3)

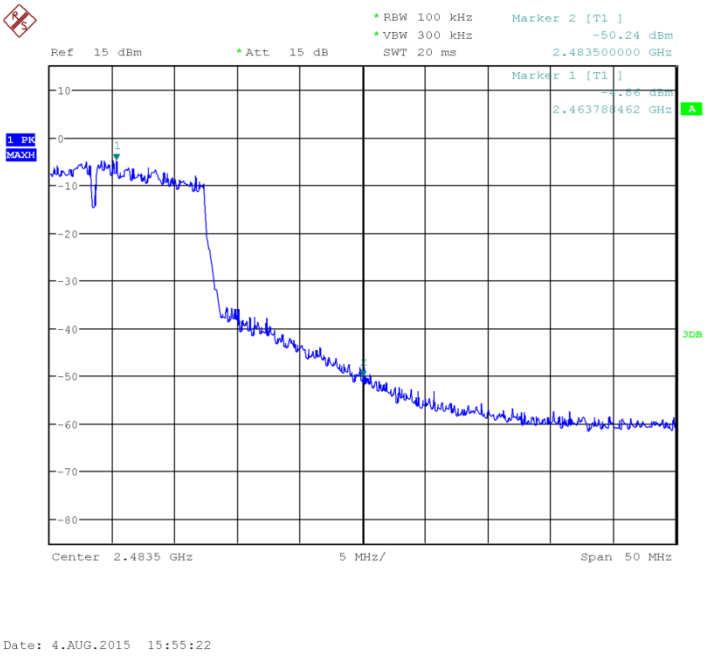


Fig.32 Band Edges (802.11n-40MHz, Ch11)

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.33	P
		30MHz~26GHz	Fig.34	P
	6	2.437GHz	Fig.35	P
		30MHz~26GHz	Fig.36	P
	11	2.472GHz	Fig.37	P
		30MHz~26GHz	Fig.38	P
802.11g	1	2.412GHz	Fig.39	P
		30MHz~26GHz	Fig.40	P
	6	2.437GHz	Fig.41	P
		30MHz~26GHz	Fig.42	P
	11	2.472GHz	Fig.43	P
		30MHz~26GHz	Fig.44	P

802.11n mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n(20MHz)	1	2.412GHz	Fig.45	P
		30MHz~26GHz	Fig.46	P
	6	2.437GHz	Fig.47	P
		30MHz~26GHz	Fig.48	P
	11	2.472GHz	Fig.49	P
		30MHz~26GHz	Fig.50	P

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n(40MHz)	3	2.422GHz	Fig.51	P
		30MHz~26GHz	Fig.52	P
	6	2.437GHz	Fig.53	P
		30MHz~26GHz	Fig.54	P

	11	2.472GHz	Fig.55	P
		30MHz~26GHz	Fig.56	P

Conclusion: PASS

Test graphs as below:

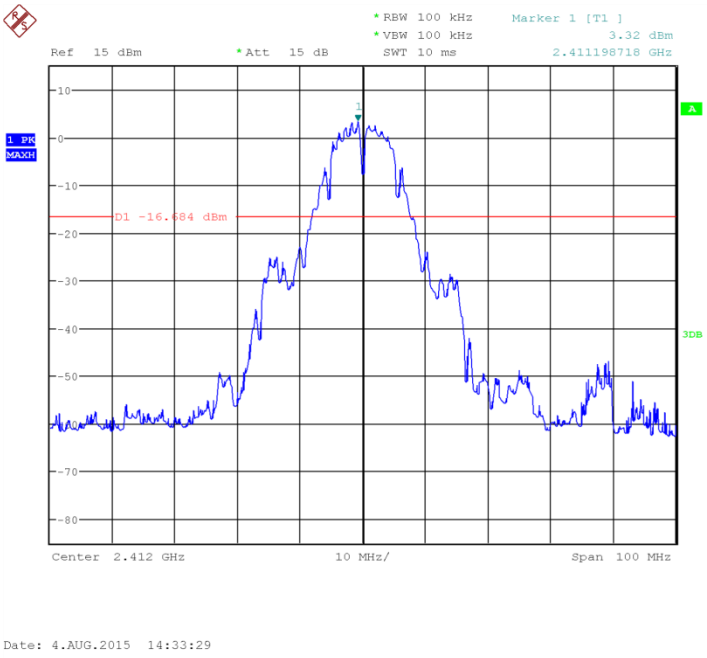


Fig 33. Conducted Spurious Emission (802.11b, Ch1)

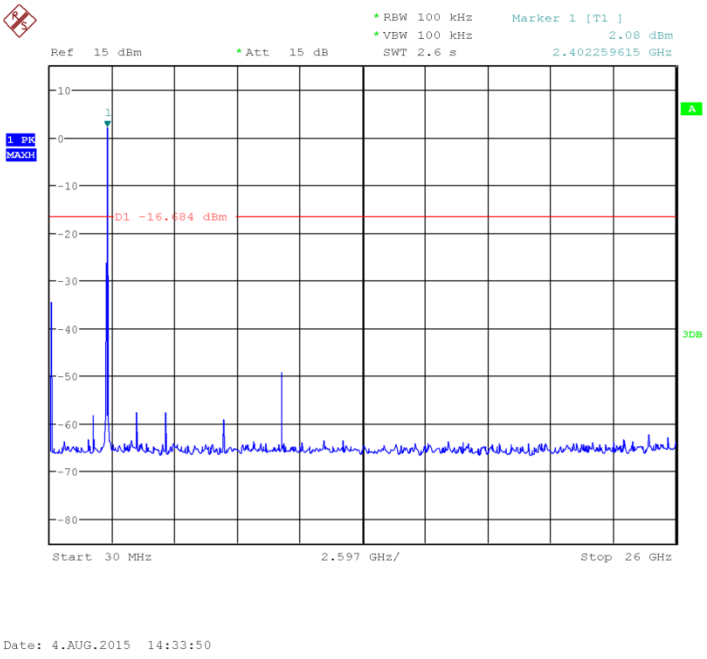


Fig 34. Conducted Spurious Emission (802.11b, Ch1, 30MHz~26GHz)

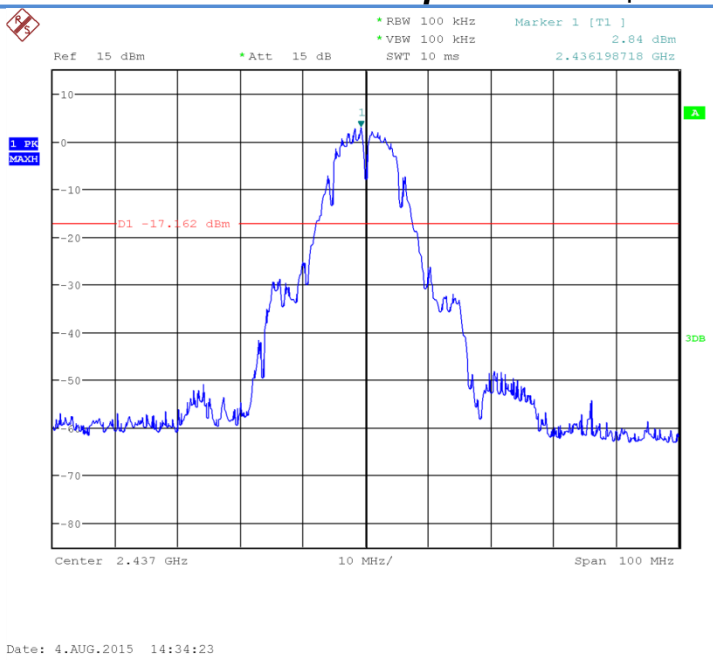


Fig 35. Conducted Spurious Emission (802.11b, Ch6)

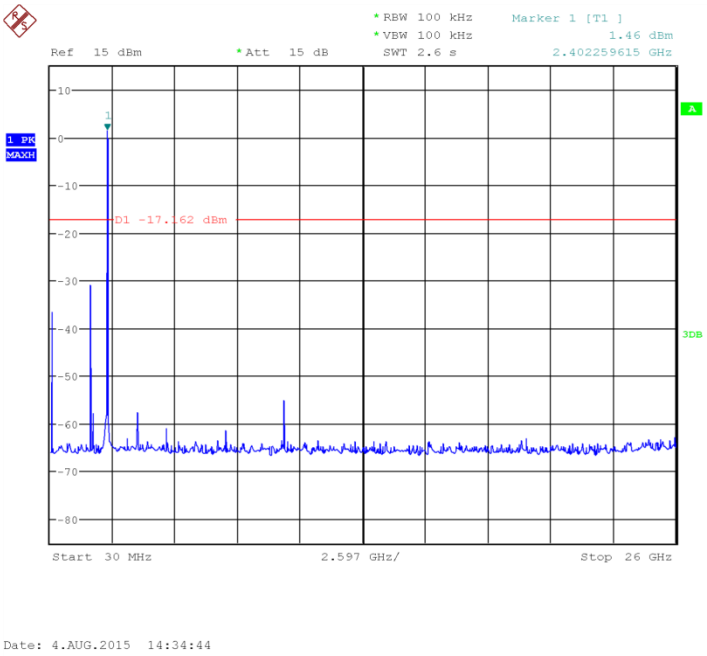


Fig 36. Conducted Spurious Emission (802.11b, Ch6, 30MHz~26GHz)

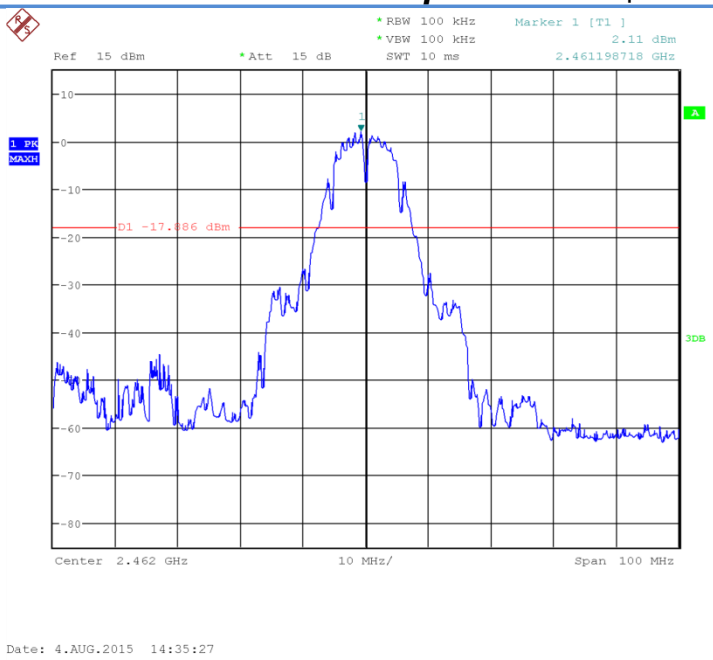


Fig 37. Conducted Spurious Emission (802.11b, Ch11)

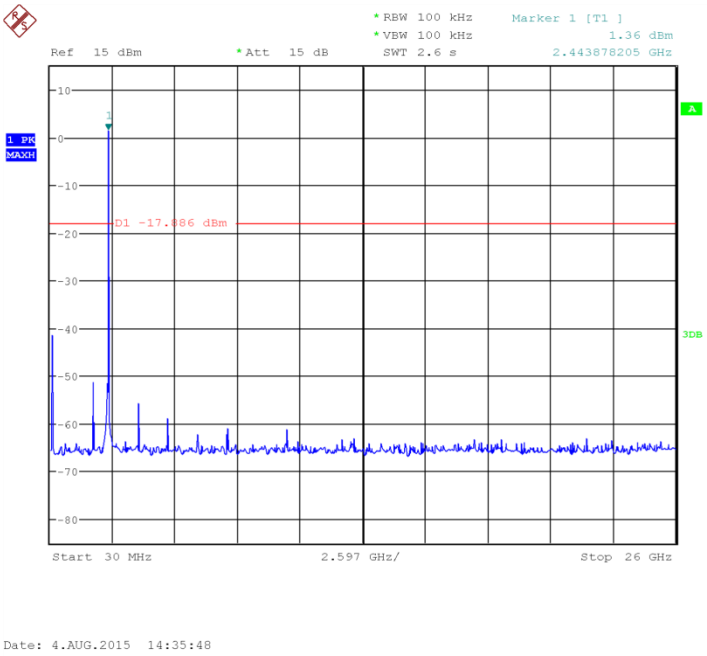


Fig 38. Conducted Spurious Emission (802.11b, Ch11, 30MHz~26GHz)

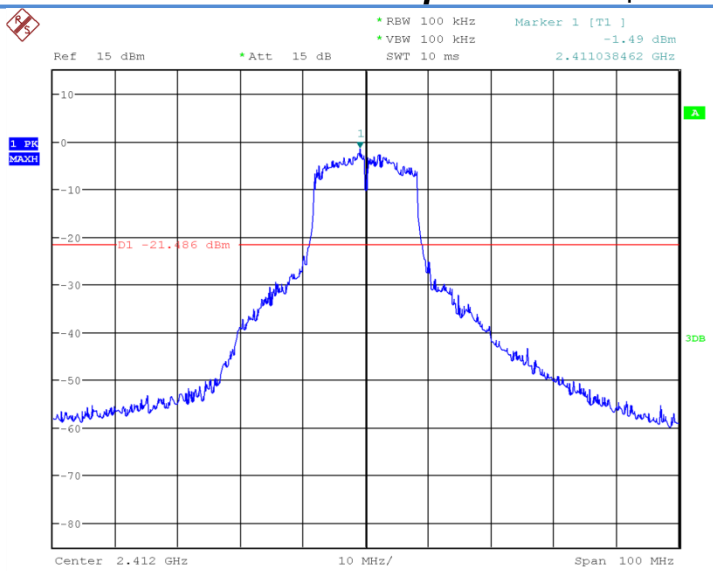


Fig 39. Conducted Spurious Emission (802.11g, Ch1)

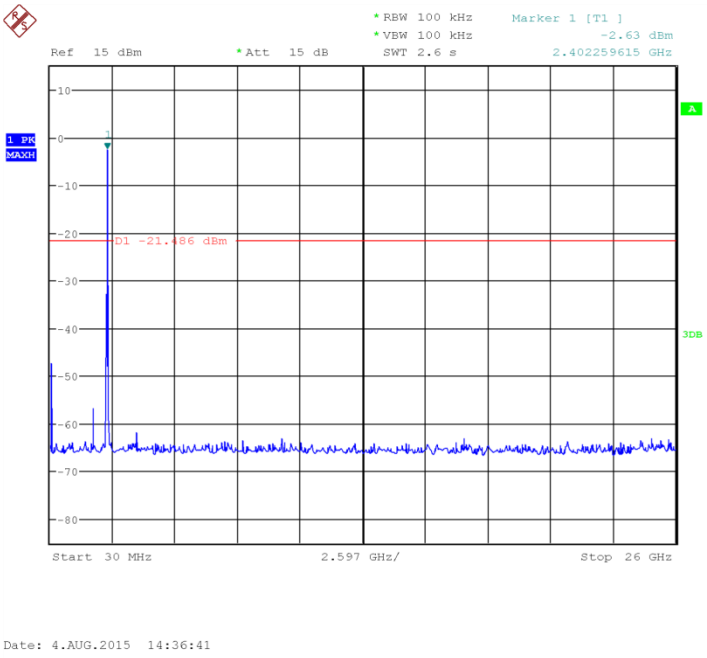


Fig 40. Conducted Spurious Emission (802.11g, Ch1, 30MHz~26GHz)

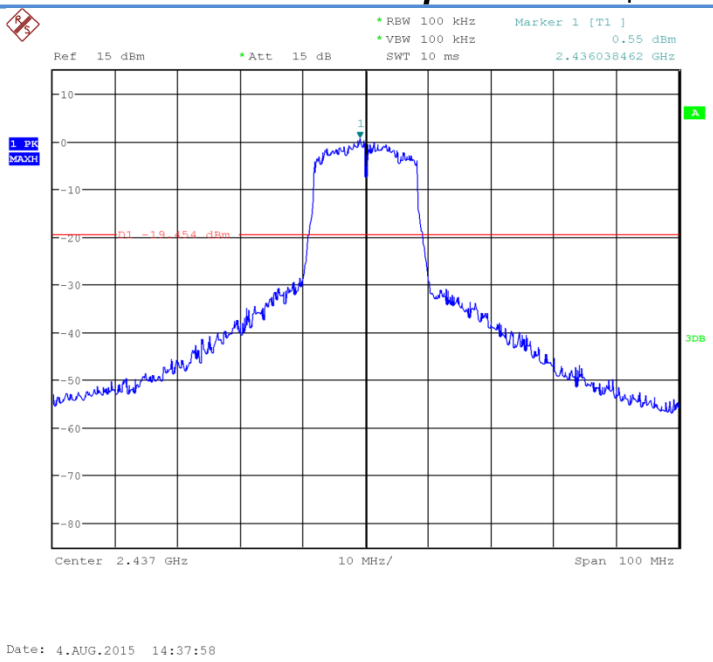


Fig 41. Conducted Spurious Emission (802.11g, Ch6)

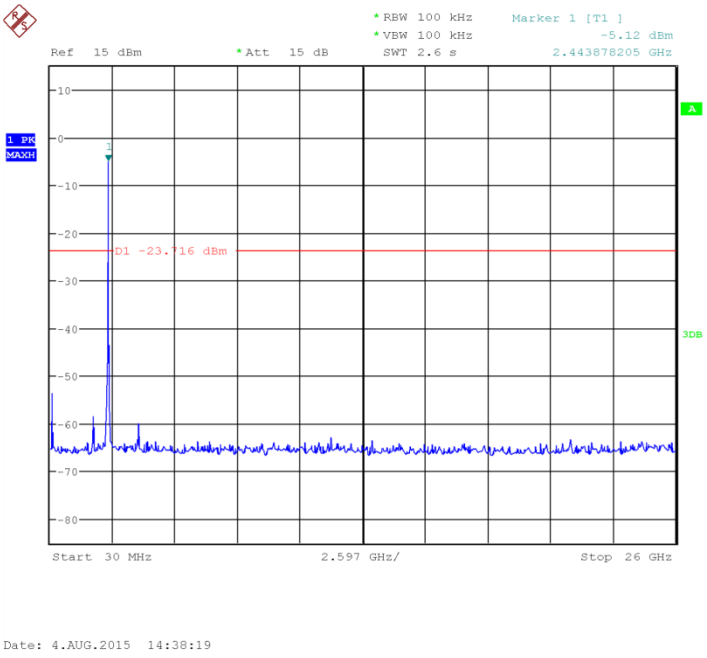


Fig 42. Conducted Spurious Emission (802.11g, Ch6, 30MHz~26GHz)

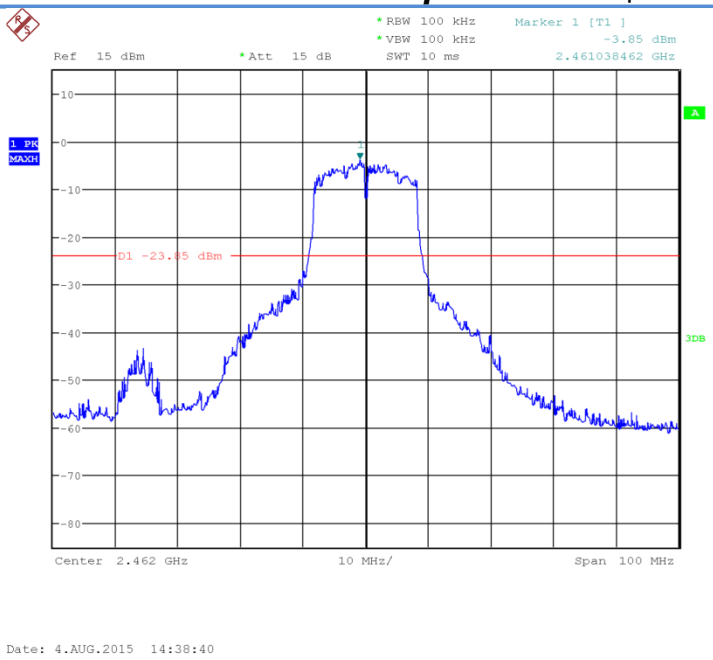


Fig 43. Conducted Spurious Emission (802.11g, Ch11)

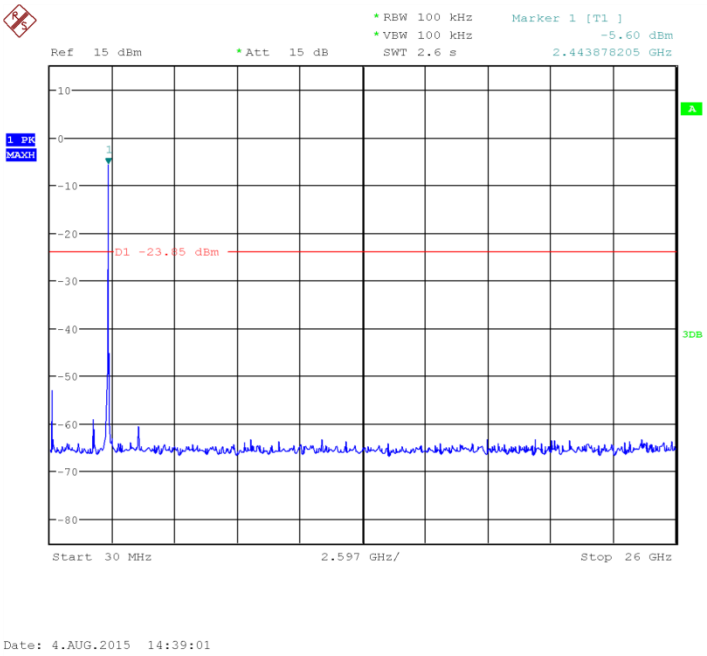


Fig 44. Conducted Spurious Emission (802.11g, Ch11, 30MHz~26GHz)

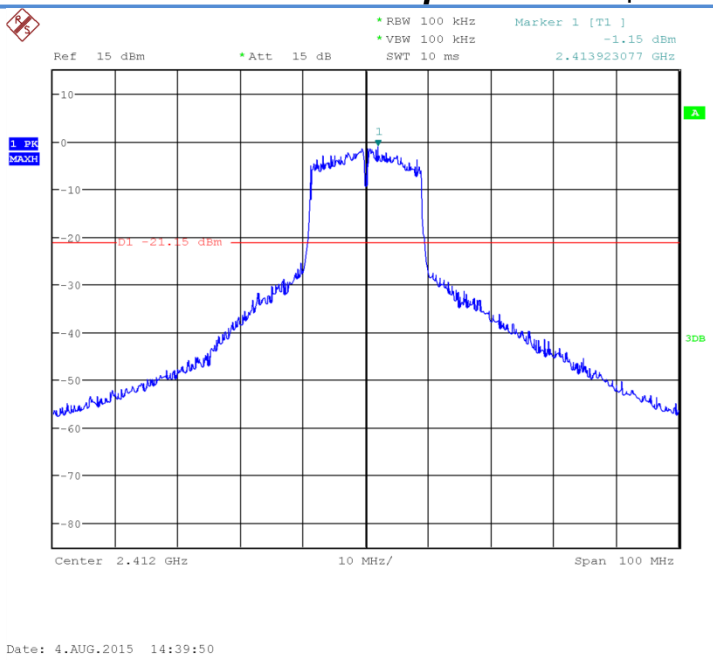


Fig 45. Conducted Spurious Emission (802.11n-20MHz, Ch1)

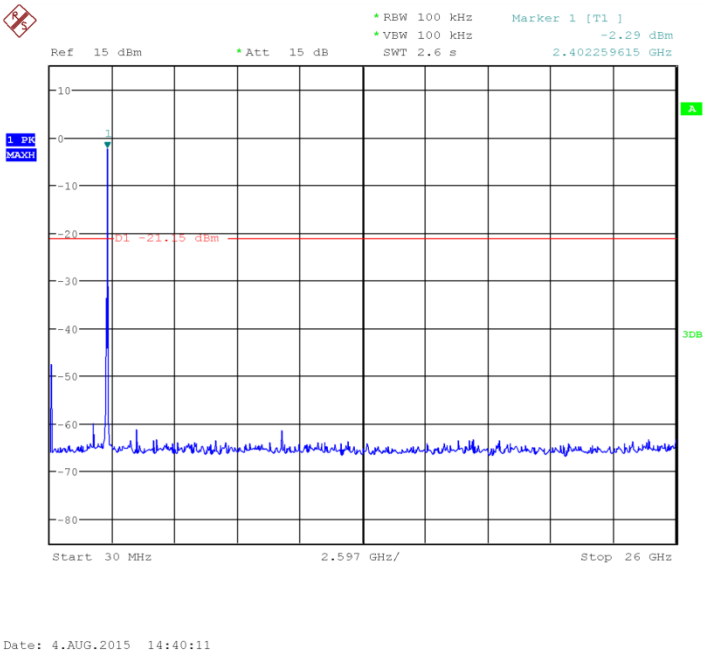


Fig 46. Conducted Spurious Emission (802.11n-20MHz, Ch1, 30MHz~26GHz)

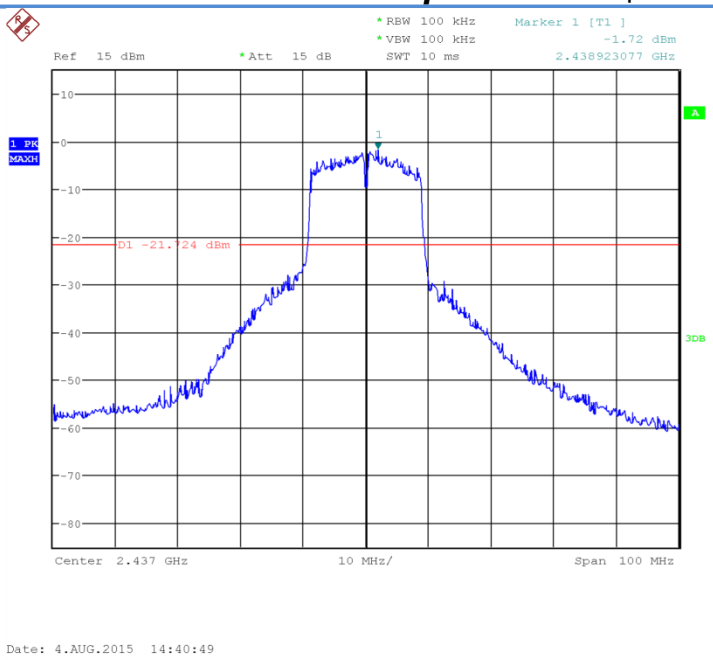


Fig 47. Conducted Spurious Emission (802.11n-20MHz, Ch6)

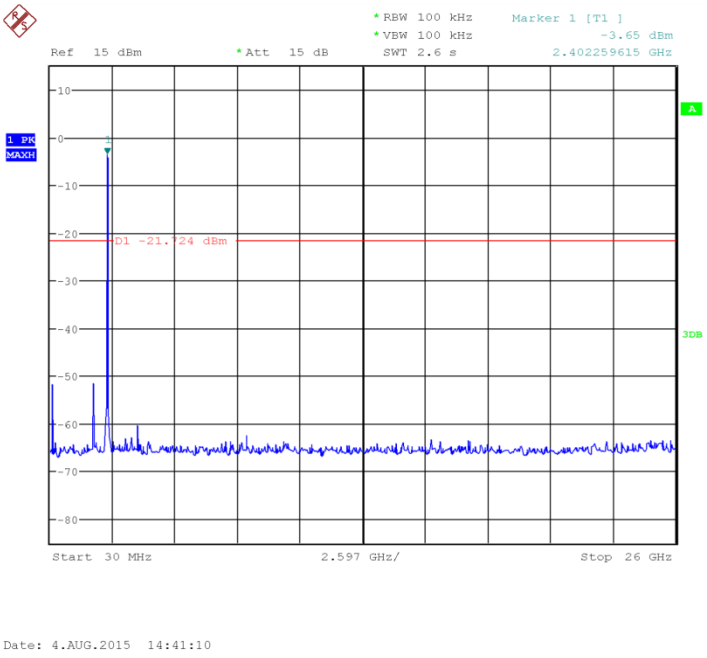


Fig 48. Conducted Spurious Emission (802.11n-20MHz, Ch6, 30MHz~26GHz)

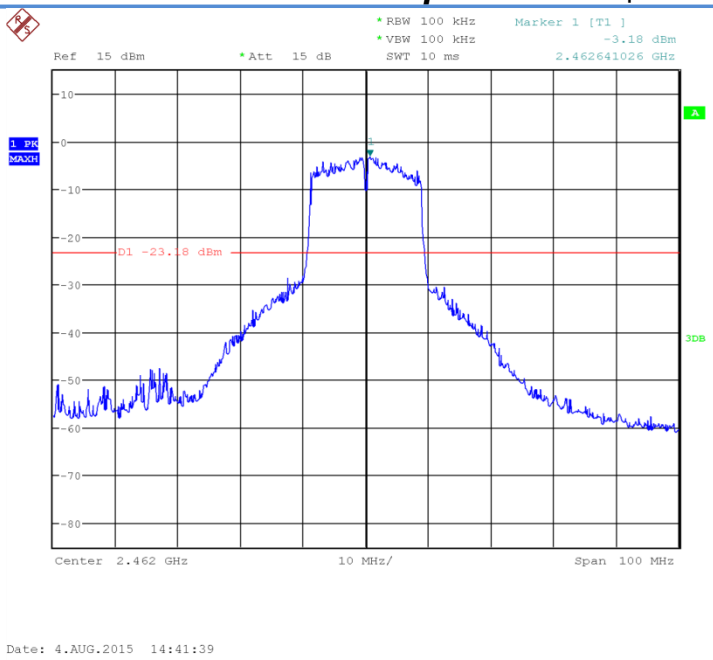


Fig 49. Conducted Spurious Emission (802.11n-20MHz, Ch11)

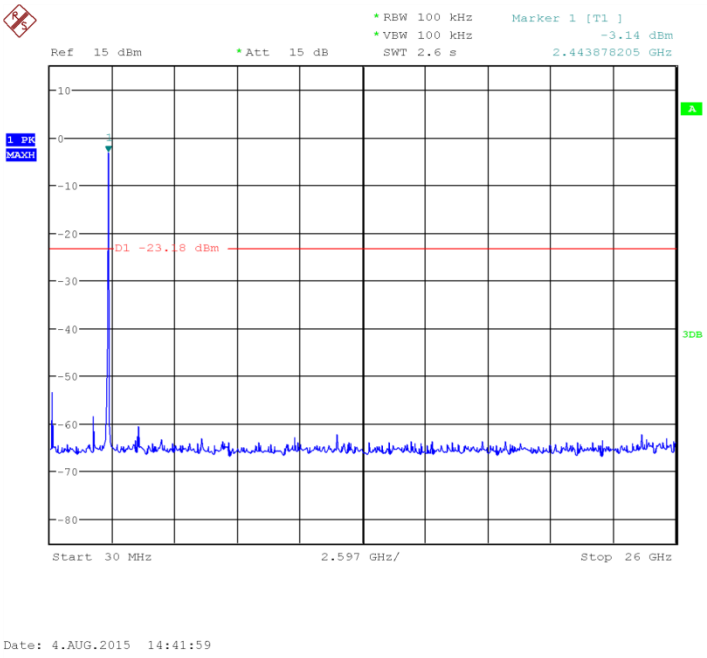


Fig 50. Conducted Spurious Emission (802.11n-40MHz, Ch11, 30MHz~26GHz)

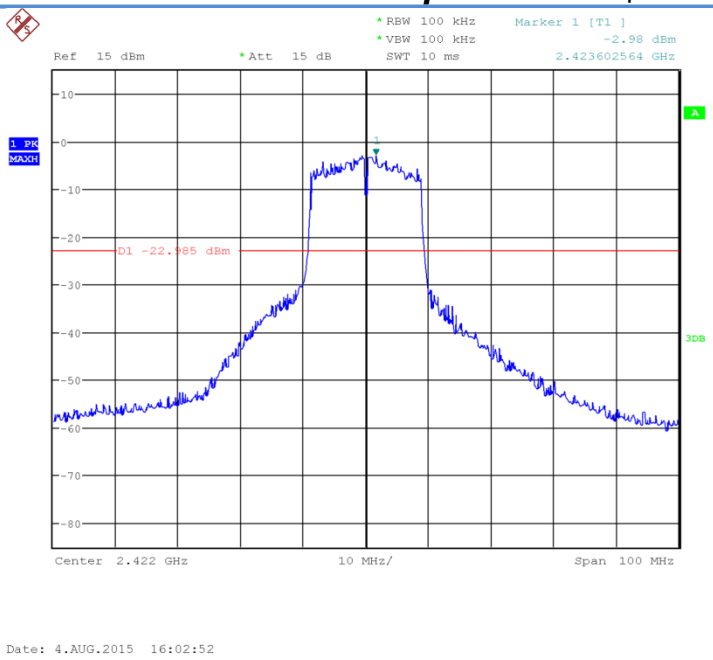


Fig 51. Conducted Spurious Emission (802.11n-40MHz, Ch3)

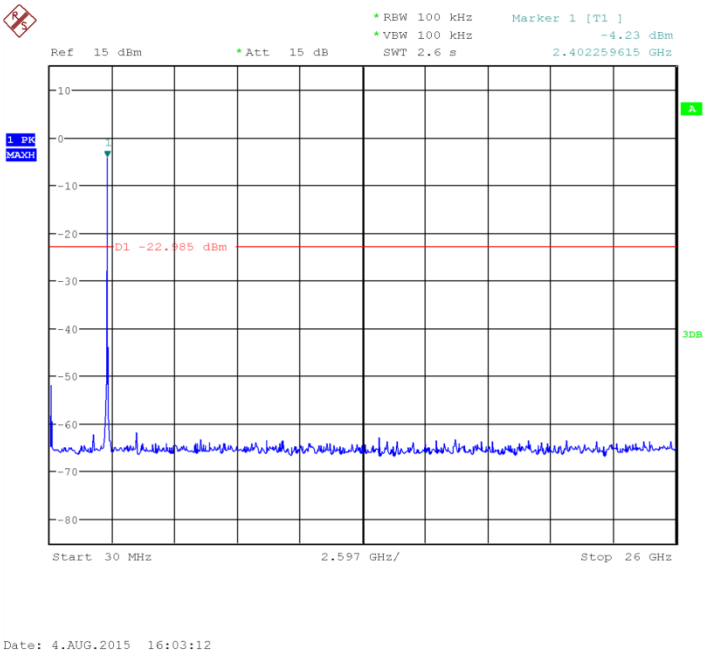


Fig 52. Conducted Spurious Emission (802.11n-40MHz, Ch3, 30MHz~26GHz)

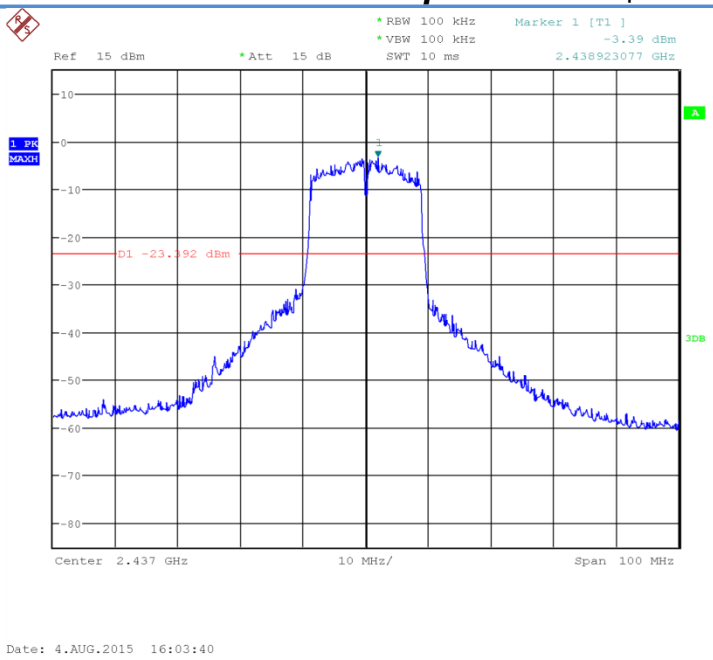


Fig 53. Conducted Spurious Emission (802.11n-40MHz, Ch6)

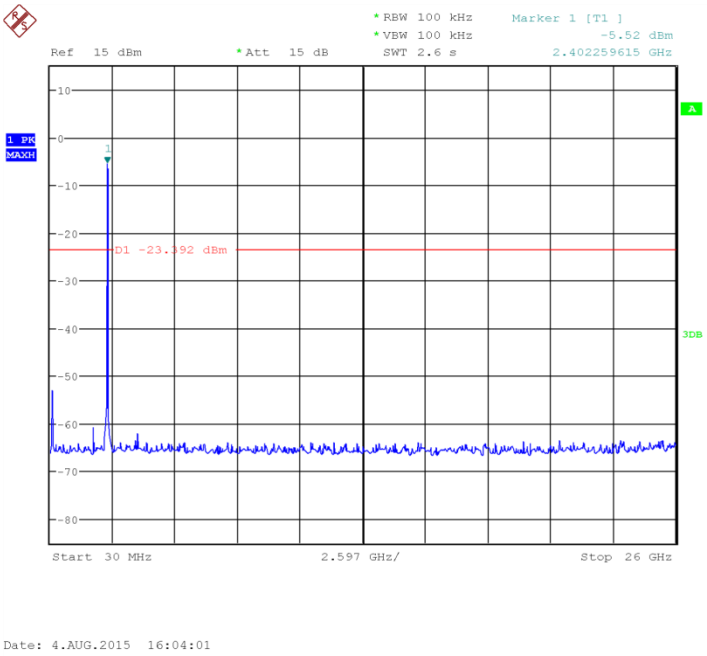


Fig 54. Conducted Spurious Emission (802.11n-40MHz, Ch6, 30MHz~26GHz)

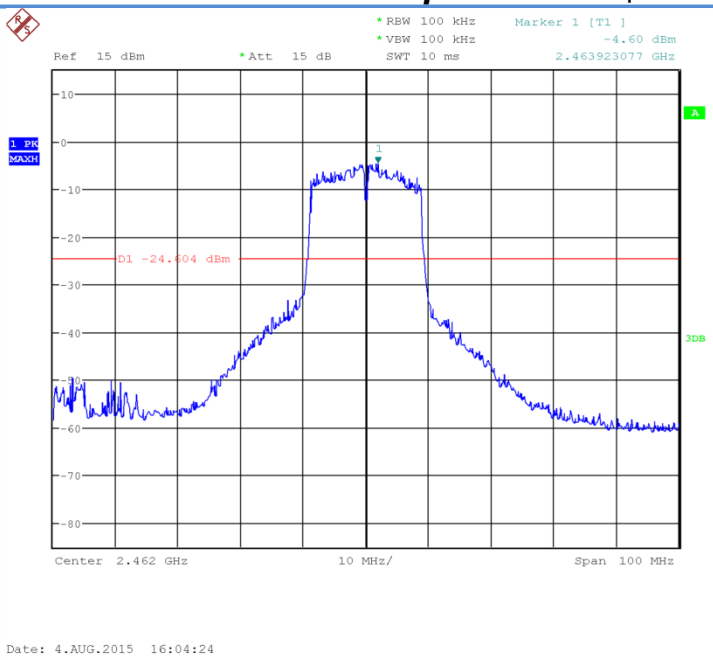


Fig 55. Conducted Spurious Emission (802.11n-40MHz, Ch11)

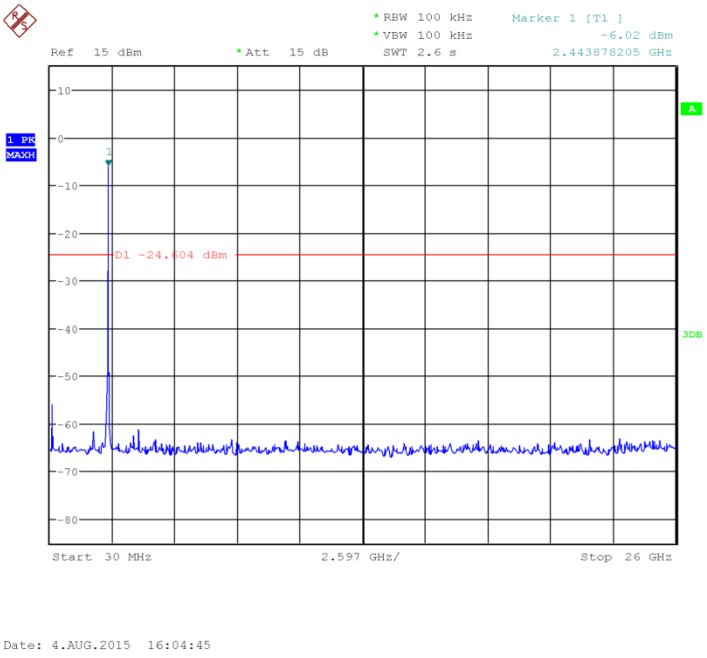


Fig 56. Conducted Spurious Emission (802.11n-40MHz, Ch11, 30MHz~26GHz)

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 57.	P
	Power	2.45GHz~2.5GHz	Fig 58.	P
	1	30MHz~1GHz	Fig 59.	P
		1GHz~3GHz	Fig 60.	P
		3GHz~18GHz	Fig 61.	P
802.11g	Power	2.38GHz~2.45GHz	Fig 62.	P
	Power	2.45GHz~2.5GHz	Fig 63.	P
	11	30MHz~1GHz	Fig 64.	P
		1GHz~3GHz	Fig 65.	P
		3GHz~18GHz	Fig 66.	P

802.11n mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n(20MHz)	Power	2.38GHz~2.45GHz	Fig 67.	P
	Power	2.45GHz~2.5GHz	Fig 68.	P
	1	30MHz~1GHz	Fig 69.	P
		1GHz~3GHz	Fig 70.	P
		3GHz~18GHz	Fig 71.	P
/	All channels	18GHz~26.5GHz	Fig 72.	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

Ch1 30MHz~1GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity

33.412168	13.82	-26	39.82	V
34.706364	11.24	-25.9	37.14	V
53.432128	8.23	-25	33.23	H
135.069768	2.94	-27.3	30.24	V
158.960204	3.26	-26.7	29.96	V
254.41794	8.46	-22	30.46	H

Ch1 1GHz~3GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2643.701153	52.53	9.4	43.13	V
2691.015193	52.49	9.7	42.79	H
2820.955769	54.6	10.8	43.8	H
2889.060193	54.45	11.4	43.05	V
2935.713461	55.39	12.1	43.29	V
2982.968077	56.23	13.2	43.03	V

Ch1 3GHz~18GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
4848.1538	42.62	0.9	41.72	V
7476.747467	45.15	6	39.15	V
11021.2246	50.15	14.2	35.95	V
13099.03287	52.61	16.8	35.81	H
16147.8912	59.52	25.2	34.32	V
17602.4732	62.58	29.5	33.08	H

802.11g

Ch1 30MHz~1GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
34.14236	17.28	-26	43.28	V

49.93656	7.63	-25	32.63	V
143.07432	2.84	-27.3	30.14	H
166.465796	3.78	-26.2	29.98	H
238.836988	7.38	-22.7	30.08	V
252.616096	8.39	-22	30.39	H

Ch1 1GHz~3GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2670.657115	53.61	9.6	44.01	H
2767.681346	53.94	10.2	43.74	V
2897.990385	54.6	11.5	43.1	H
2935.503846	54.86	12.1	42.76	H
2951.345385	56.77	12.3	44.47	V
2990.823077	56.61	13.4	43.21	H

Ch1 3GHz~18GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
4848.1538	42.62	0.9	41.72	V
7476.747467	45.15	6	39.15	V
11021.2246	50.15	14.2	35.95	V
13099.03287	52.61	16.8	35.81	H
16147.8912	59.52	25.2	34.32	V
17602.4732	62.58	29.5	33.08	H

802.11n-20MHz

Ch11 30MHz~1GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
50.489804	9.46	-25	34.46	V
52.641216	7.83	-25	32.83	V
62.49422	5.96	-25.9	31.86	V

69.811632	4.28	-28.2	32.48	V
99.615656	6.53	-24.3	30.83	V
137.411428	2.71	-27.3	30.01	H

Ch11 1GHz~3GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2619.496154	51.91	9.1	42.81	H
2761.103077	53.48	10.2	43.28	H
2816.315193	53.95	10.8	43.15	V
2881.895	54.48	11.4	43.08	H
2921.903654	54.58	11.8	42.78	H
2982.003077	56.71	13.2	43.51	V

Ch11 3GHz~18GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
3878.507667	41.27	-1.3	42.57	V
9313.702067	47.28	8.8	38.48	H
12487.86647	53.84	15.2	38.64	V
14909.63753	56.76	22.2	34.56	V
16544.211	59.69	26.4	33.29	V
17473.23433	60.79	28.9	31.89	H

All Ch 18GHz~26.5GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
21179.000000	45.48	6.97	38.51	V
22748.950000	41.63	3.05	38.58	H
23684.800000	41.59	3.05	38.54	H
24633.400000	40.05	3.05	37.00	V

25567.550000	43.01	2.90	40.11	H
26066.500000	42.06	2.90	39.16	V

Test graphs as below:

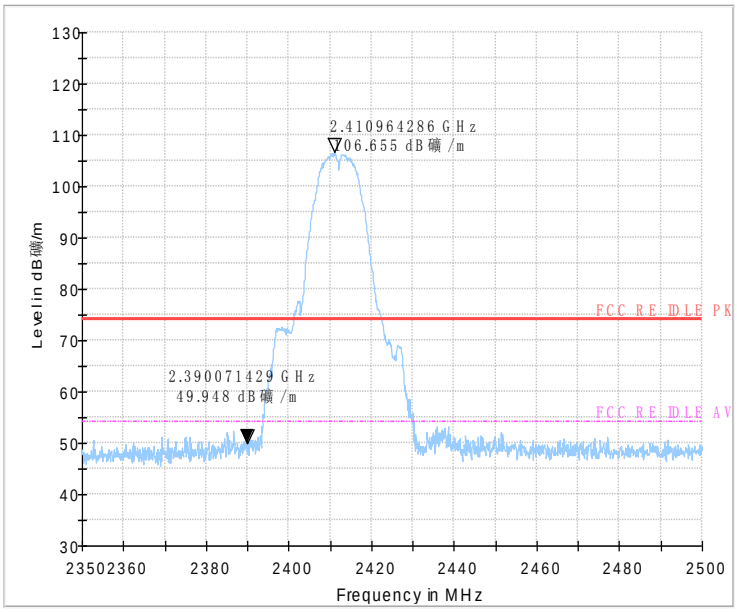


Fig 57. Radiated emission (Power): 802.11b, low channel

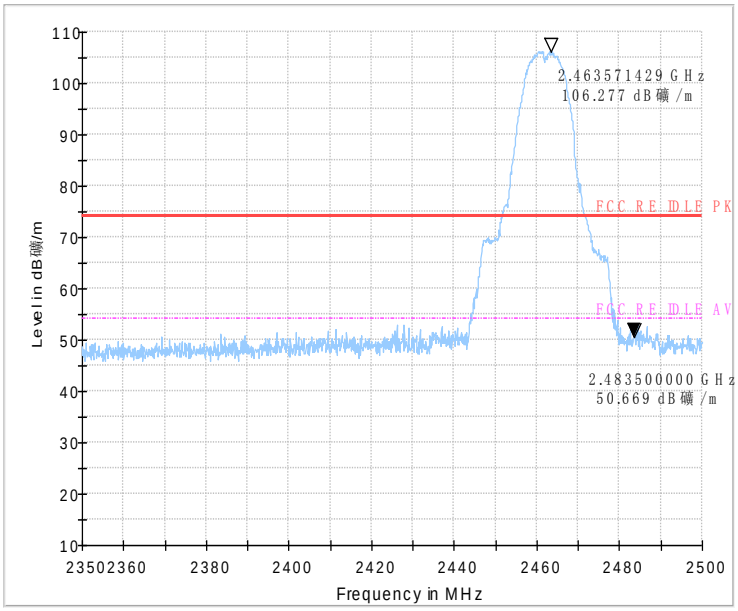


Fig 58. Radiated emission (Power): 802.11b, high channel

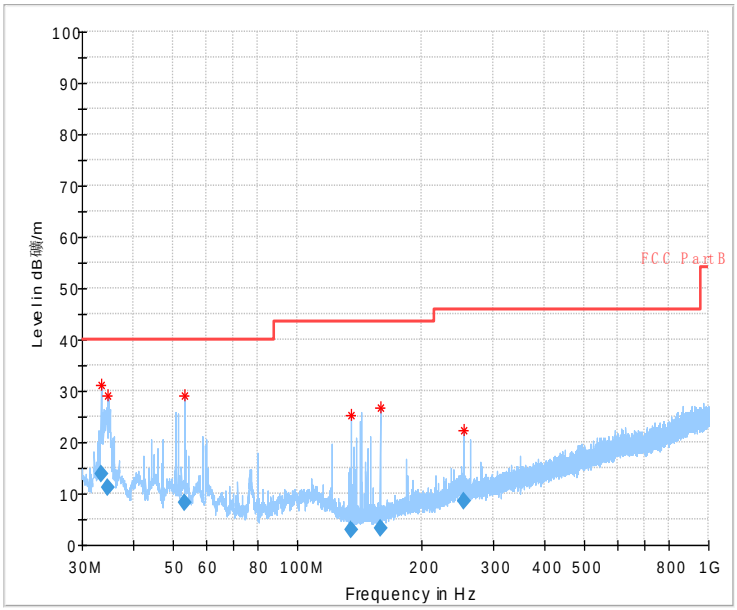


Fig 59. Radiated Spurious Emission (802.11b,Ch1,30MHz~1GHz)

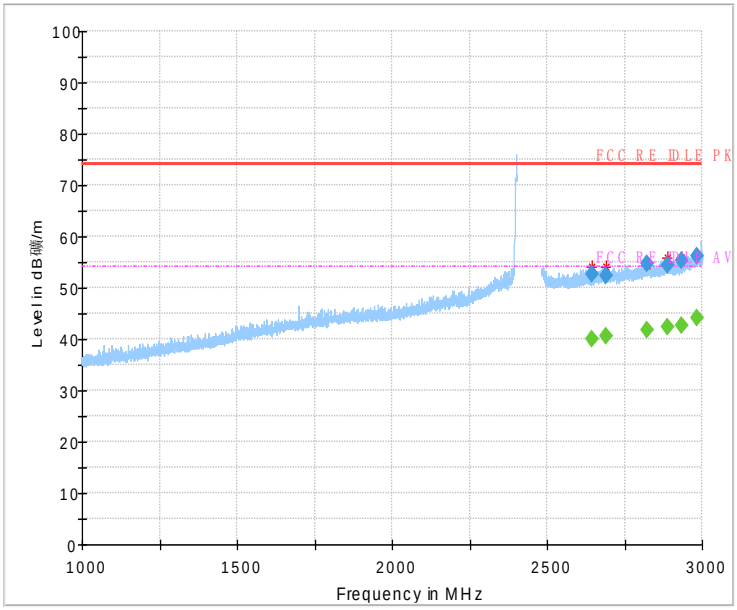


Fig 60. Radiated Spurious Emission (802.11b,Ch1,1GHz~3GHz)

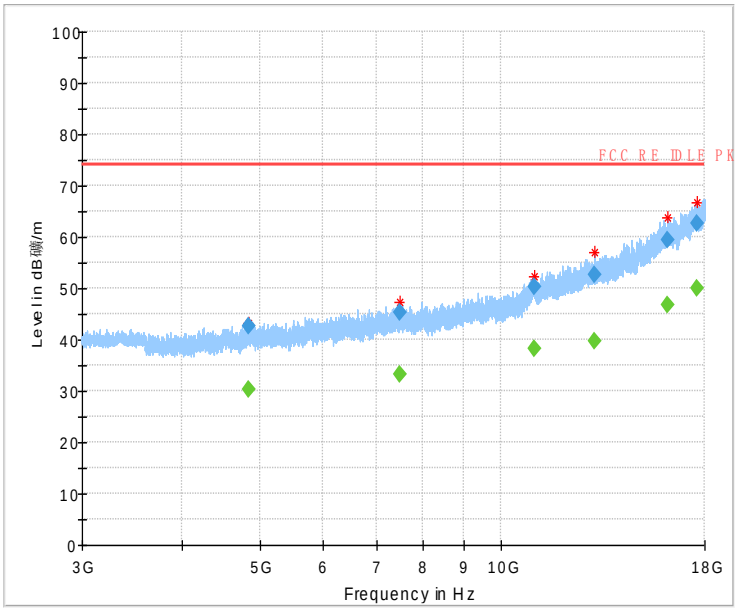
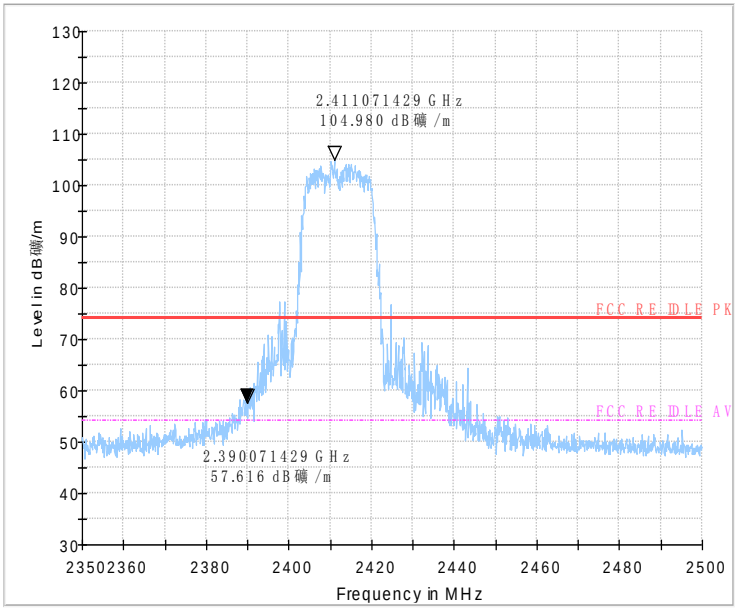
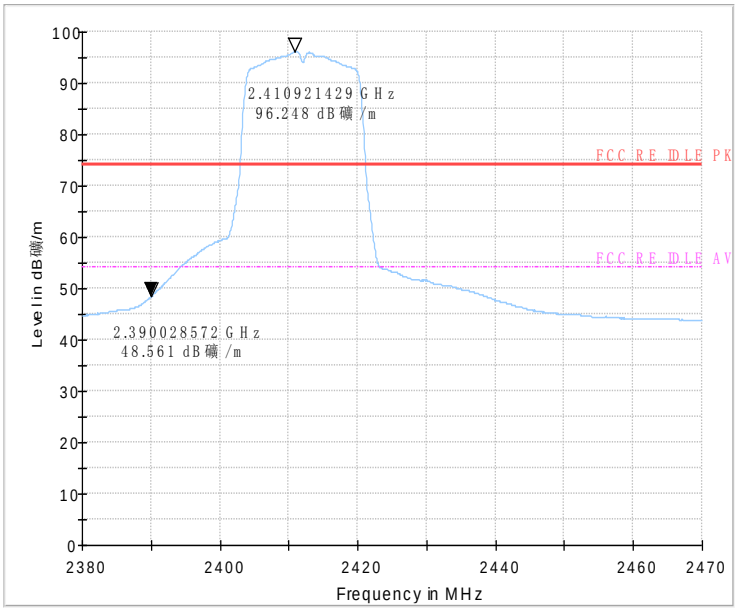


Fig 61. Radiated Spurious Emission (802.11b,Ch1,3GHz~18GHz)

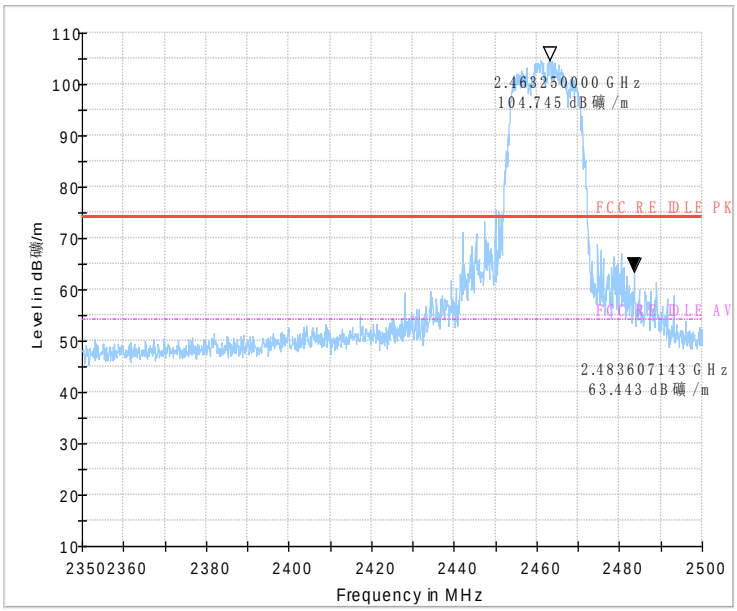


Peak

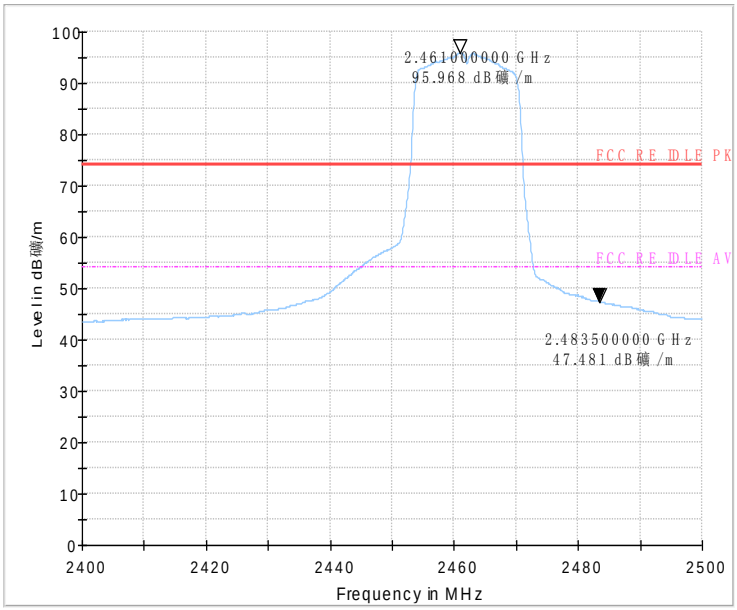


(AV)

Fig 62. Radiated emission (Power): 802.11g, low channel



Peak



(AV)

Fig 63. Radiated emission (Power): 802.11g, high channel

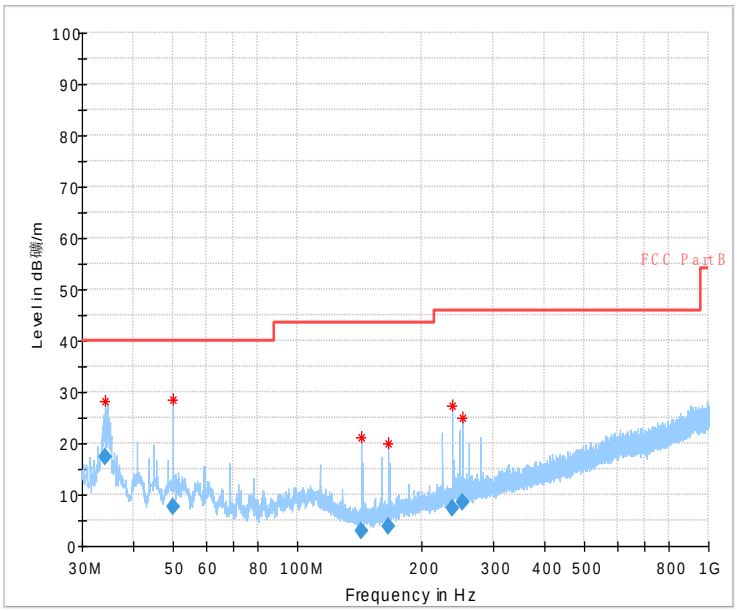


Fig 64. Radiated Spurious Emission (802.11g,Ch11,30MHz~1GHz)

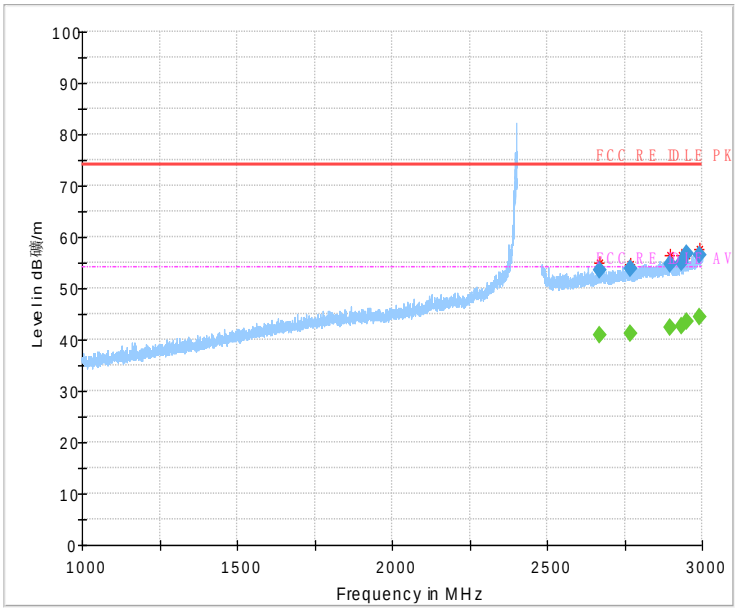


Fig 65. Radiated Spurious Emission (802.11g,Ch11,1GHz~3GHz)

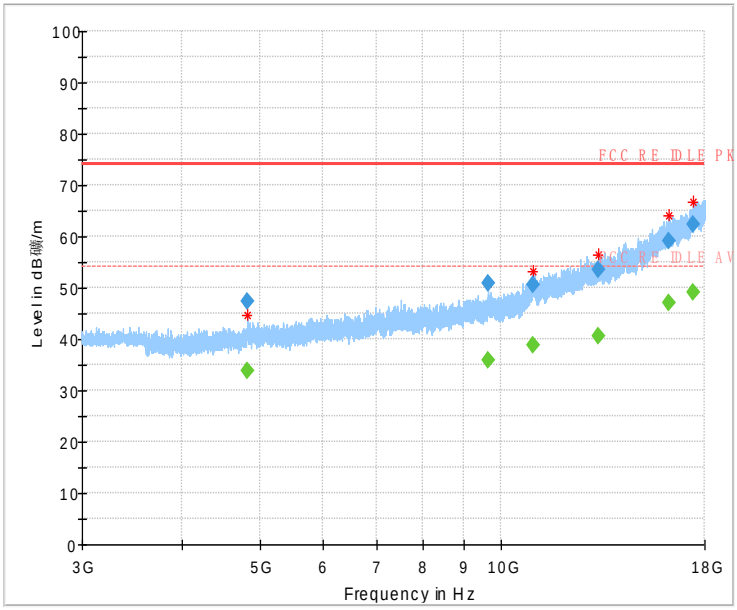
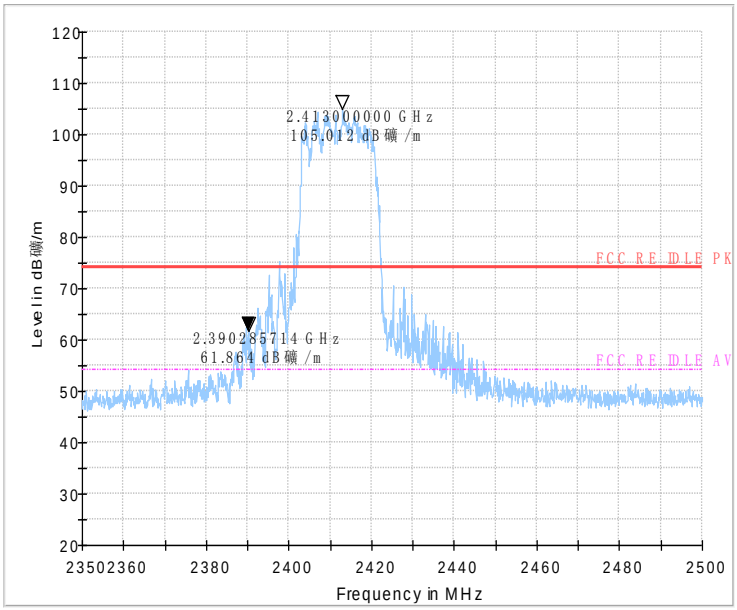
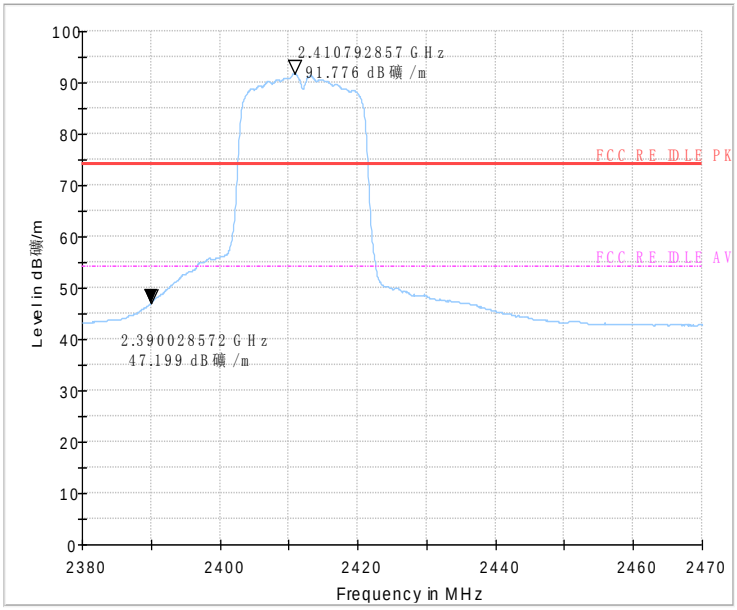


Fig 66. Radiated Spurious Emission (802.11g,Ch11,3GHz~18GHz)

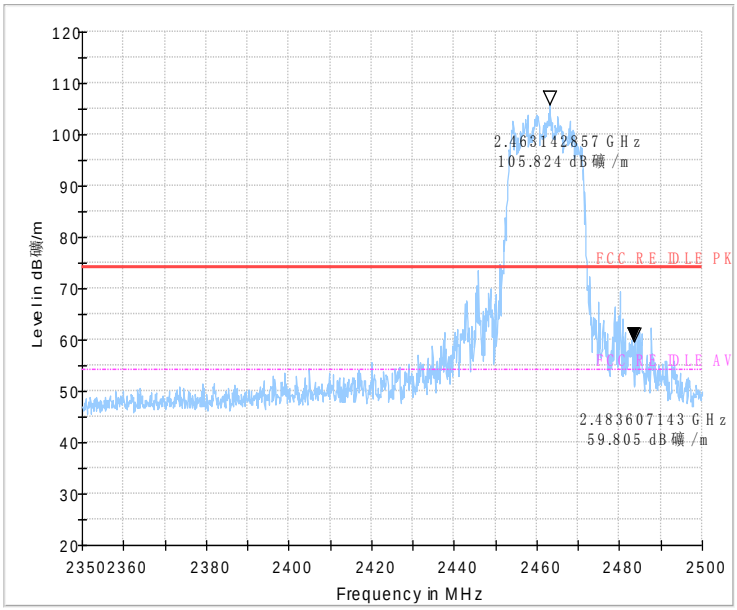


Peak

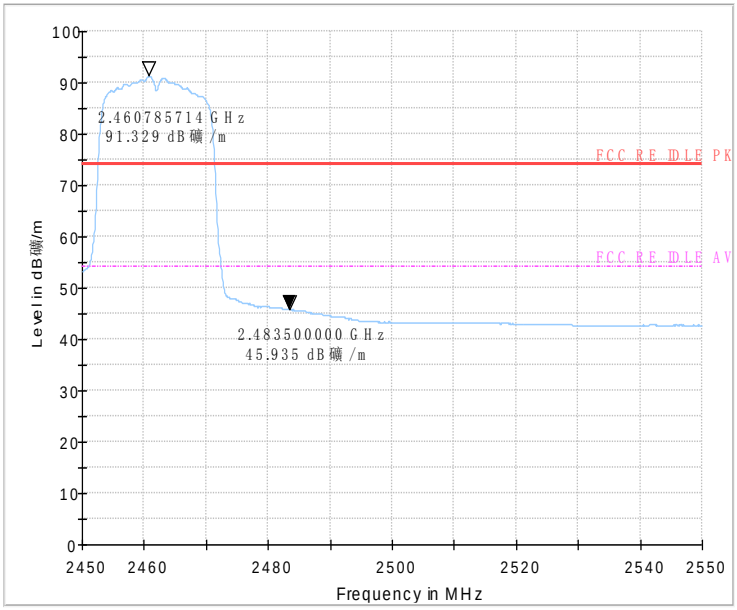


AV

Fig 67. Radiated emission (Power): 802.11n, low channel



Peak



AV

Fig 68. Radiated emission (Power): 802.11n, high channel

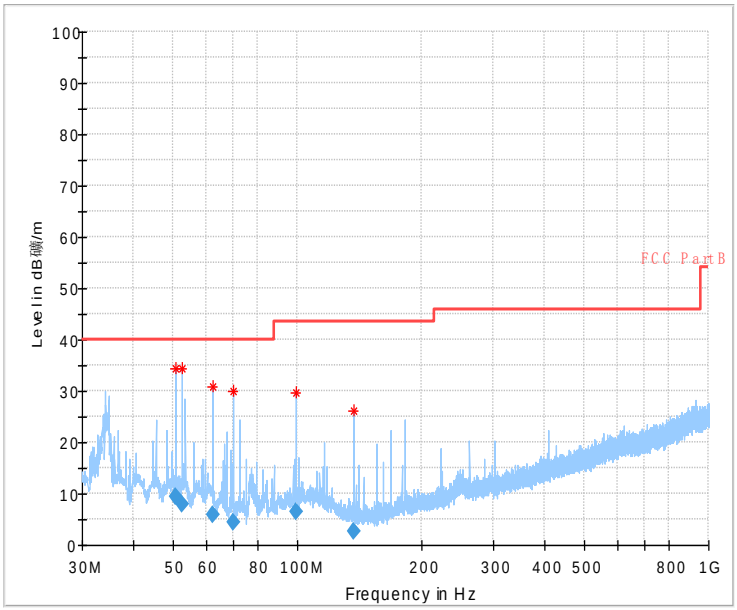


Fig 69. Radiated Spurious Emission (802.11 n-20MHz,Ch1,30MHz~1GHz)

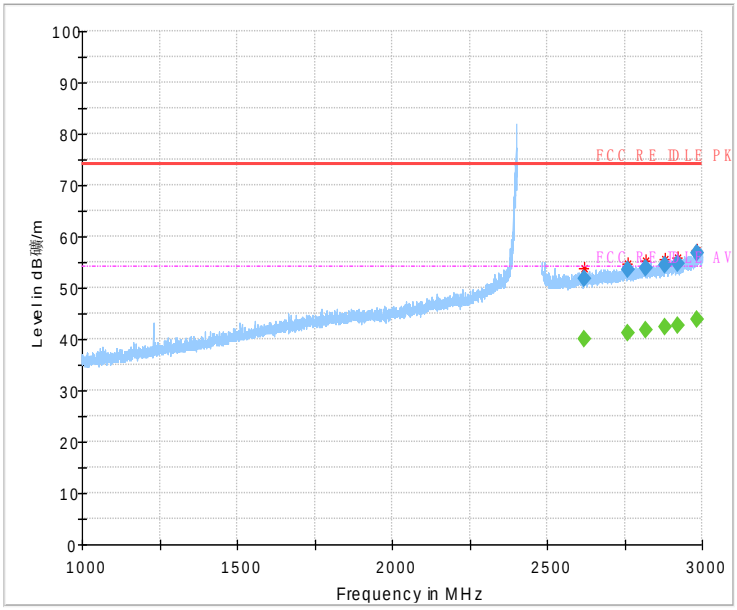


Fig 70. Radiated Spurious Emission (802.11 n-20MHz,Ch1,1GHz~3GHz)

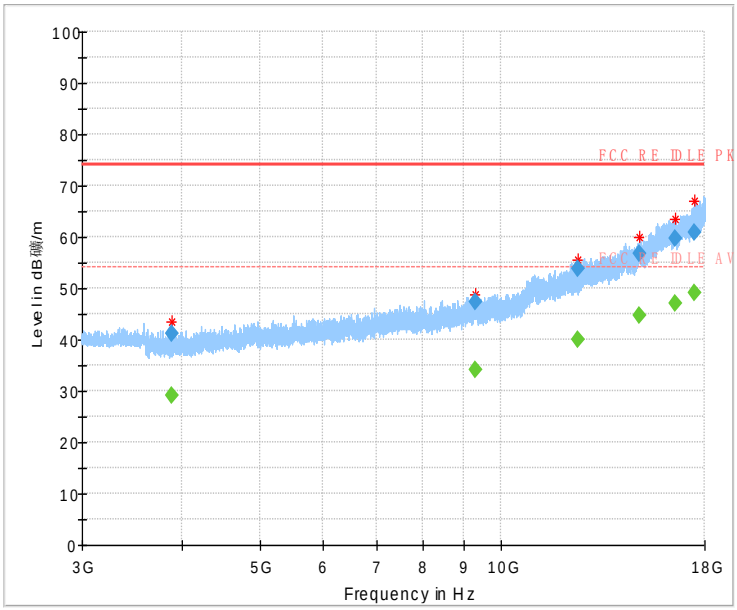


Fig 71. Radiated Spurious Emission (802.11 n-20MHz,Ch1,3GHz~18GHz)

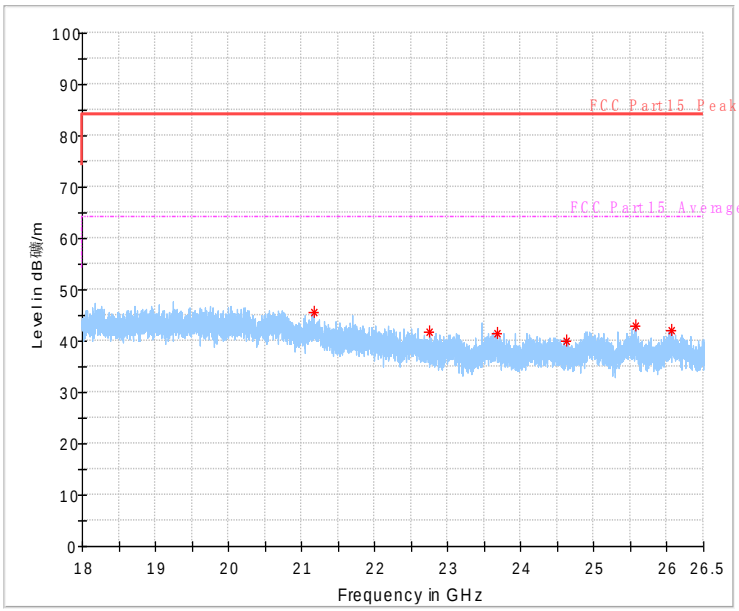


Fig 72. Radiated emission: GFSK, 18 GHz – 26.5 GHz

7. Test Equipments and Ancillaries Used For Tests

The test equipments and ancillaries used are as follows.

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Date	Cal.interval
1	Vector Signal Analyser	FSQ26	101096	Rohde&Schwarz	2015-05-13	1
2	DC Power Supply	ZUP60-14	LOC-220Z006-0007	TDL-Lambda	2015-05-13	1

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Date	Cal.interval
1	Universal Radio Communicati	CMU200	123126	R&S	2015-05-13	1
2	Test Receiver	ESU40	100307	R&S	2015-05-13	1
3	Trilog Antenna	VULB9163	VULB9163-515	Schwarzbeck	2014-11-05	3
4	Double Ridged Guide Antenna	ETS-3117	00135885	ETS	2014-05-06	3
5	2-Line V-Network	ENV216	101380	R&S	2015-05-13	1

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

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

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

Fully-anechoic chamber1 (6.8 meters×3.08 meters×3.53 meters) did not exceed following limits along the EMC testing:

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

Fully-anechoic chamber2 (Tapered Section: 8.75 meters×3.66 meters×3.66 meters, Rectangular Section: 7.32 meters×3.97 meters×3.66 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 30 ℃
Relative humidity	Min. = 35 %, Max. = 60 %

Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
Uniformity of field strength	Between 0 and 6 dB, from 30MHz to 40000MHz

ANNEX A. Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

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