



Full

TEST REPORT

No. ECIT-2012-0138-RF-WLAN

For

Client : CT Asia

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

Model Name : DASH4.0

FCC ID: YHLBLUDASH40

Hardware Version: Q203_MAIN_PCB_V2.1

Software Version: Q203_PUBLIC_V0.5.5_S1026

Issued date: 2013-02-21

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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1. General Information

1.1 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.

1.2 Statements

The product name DASH4.0, supporting WCDMA /GSM/WLAN, manufactured by CT Asia 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.



1.3 Testing Laboratory information

1.3.1. Testing Location

Company Name: ECIT Shanghai, East China Institute of Telecommunications
Address: 7F, G Area, No. 668, Beijing East Road, Huangpu District, Shanghai,
P. R. China
Postal Code: 200001
Telephone: 00862163843300
Fax: 00862163843301
FCC Registration NO.: 489729

1.3.2. Testing Environment

Normal Temperature: 15-35°C
Extreme Temperature: N/A
Relative Humidity: 20-75%

1.3.3. Project data

Project Leader: Liu Jianquan
Testing Start Date: 04,12,2012
Testing End Date: 06,01,2013

1.3.4. Signature

Wang Daming
(Testing Engineer)

Yu Naiping
(Reviewed this test report)

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





1.4 Details of applicant or manufacturer

1.4.1. Applicant Information

Company Name: CT Asia
Address /Post: Unit 01, 15/F, Seaview Centre, 139-141 Hoi bun road,
Kwun Tong, Kowloon, Hongkong
Country: China
Telephone: 852-27931198

1.4.2. Manufacturer Information

Company Name: Shanghai Ragentek Communication Technology Co. ,Ltd.
Address /Post: Building D10-D11, No. 58-60, Lane 3188, Xiupu Road,
PuDong District, Shanghai, PRC
Country: China
Telephone: +86-21-60352628

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

2.1. About EUT

EUT Description	WCDMA/GSM (GPRS) Dual-Mode Digital Mobile Phone
Model name	DASH4.0
UMTS Frequency Band	WCDMA BandII and V
GSM Frequency Band	GSM850/900/1800/1900
WLAN Frequency	2400MHz-2483.5MHz
WLAN Channel	Channel1-Channel11
WLAN type of modulation	802.11b:DSSS 802.11g/n: OFDM
Nominal Voltage	3.7V
Extreme High Voltage	4.2V
Extreme Low Voltage	3.5V

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

2.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
No.1	86804801281771	Q203_MAIN_PC B_V2.1	Q203_PUBLIC_V0.5. 5_S1026	2012-12-04

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



2.3. Internal Identification of AE used during the test

AE ID*	Description	SN
AE1	RF cable	---
AE2	---	---



3. Reference Documents

3.1. 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.	Oct,2009 Edition
ANSI C63.4	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9KHz to 40GHz	2009
KDB558074	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247.	2012

4. 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	3.7V
Humidity	Hnom	32%
Air Pressure	Anom	1010hPa

5. Test result

5.1. Maximum Output Power

Measurement Limit and method:

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

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

Measurement Uncertainty:

Measurement Uncertainty	0.75dB
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5.1.1. 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	15.93		
	2	15.97		
	5.5	15.86		
	11	15.99	15.85	15.63
802.11g	6	20.11		
	9	20.22		
	12	19.48		
	18	19.06		
	24	20.16		
	36	20.98	21.04	21.10
	48	19.19		
	54	19.20		

The data rate 11Mbps and 36Mbps 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	19.42		
	MCS1	19.41		
	MCS2	19.01		
	MCS3	19.98	19.41	19.37
	MCS4	17.62		
	MCS5	17.90		
	MCS6	16.49		
	MCS7	15.65		
802.11n(40MHz)	MCS0	/	/	/
	MCS1	/	/	/
	MCS2	/	/	/
	MCS3	/	/	/
	MCS4	/	/	/
	MCS5	/	/	/
	MCS6	/	/	/
	MCS7	/	/	/

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

5.1.2. Maximum Average Output Power-conducted

802.11b/g mode

Mode	Test Result(dBm)		
	2412MHz(Ch1)	2437MHz(Ch6)	2462MHz(Ch11)
802.11b	12.39	12.34	12.28
802.11g	12.28	12.21	12.23

802.11n mode

Mode	Test Result(dBm)		
	2412MHz(Ch1)	2437MHz(Ch6)	2462MHz(Ch11)
802.11n(20MHz)	12.15	10.94	10.90
802.11n(40MHz)	/	/	/

Conclusion: PASS

5.2. Peak Power Spectral Density

Measure Limit:

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

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

Measurement Uncertainty:

Measurement Uncertainty	0.75dB
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Measurement Results:

802.11b/g mode

Mode	Channel	Power Spectral Density(dBm/3kHz)		Conclusion
802.11b	1	Fig.1	-11.02	P
	6	Fig.2	-11.47	P
	11	Fig.3	-11.01	P
802.11g	1	Fig.4	-13.72	P
	6	Fig.5	-14.05	P
	11	Fig.6	-13.98	P

802.11n mode

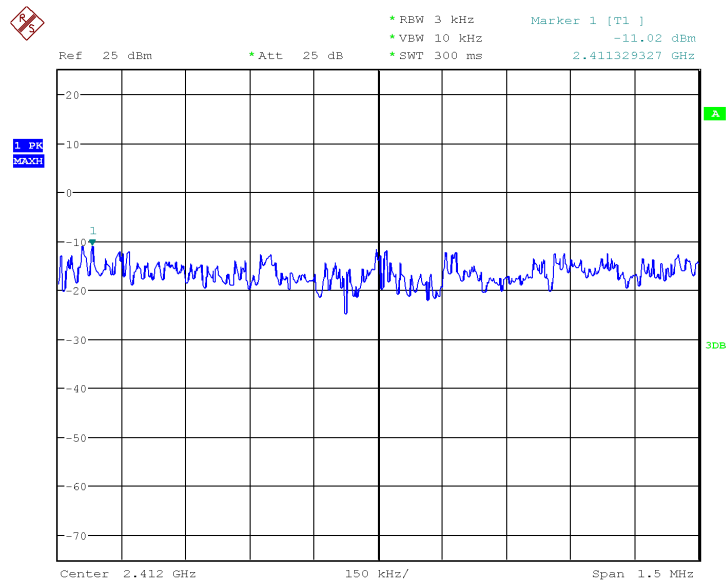
Mode	Channel	Power Spectral Density(dBm/3kHz)		Conclusion
802.11n(20MHz)	1	Fig.7	-15.08	P
	6	Fig.8	-15.77	P
	11	Fig.9	-15.94	P



802.11g(40MHz)	1	/		P
	6	/		P
	11	/		P

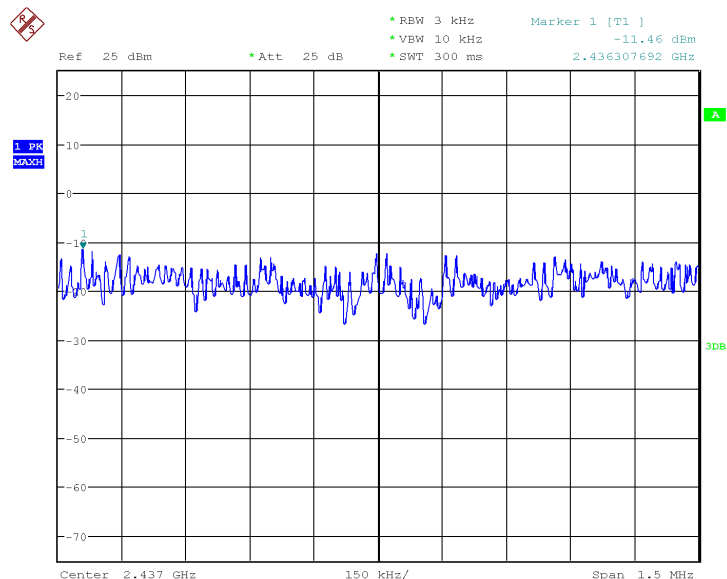
Conclusion: PASS

Test graphs as below:



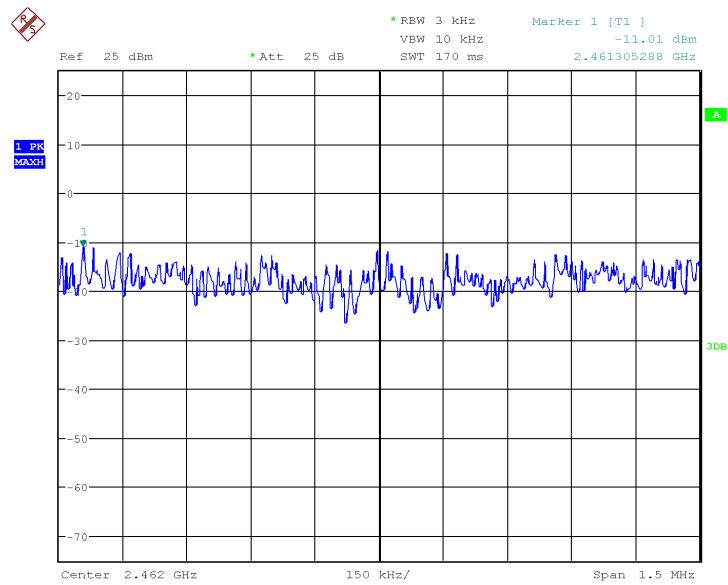
Date: 5.DEC.2012 16:21:49

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



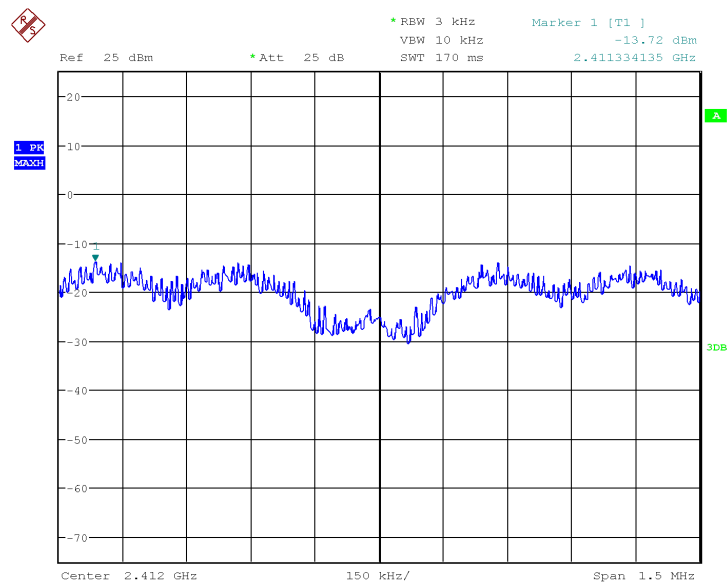
Date: 5.DEC.2012 16:22:57

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



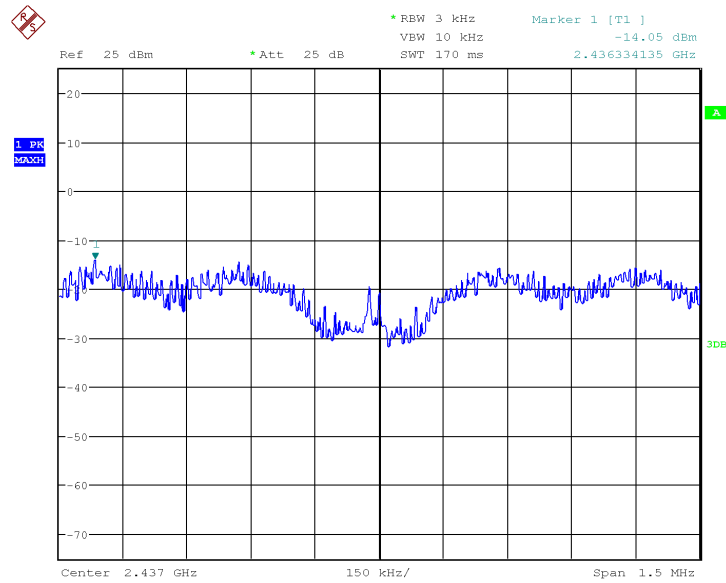
Date: 5.DEC.2012 16:24:23

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



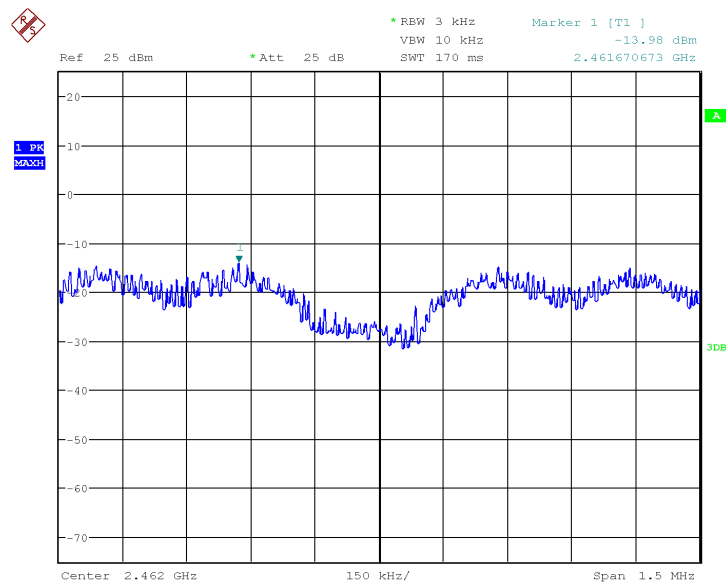
Date: 5.DEC.2012 16:26:47

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



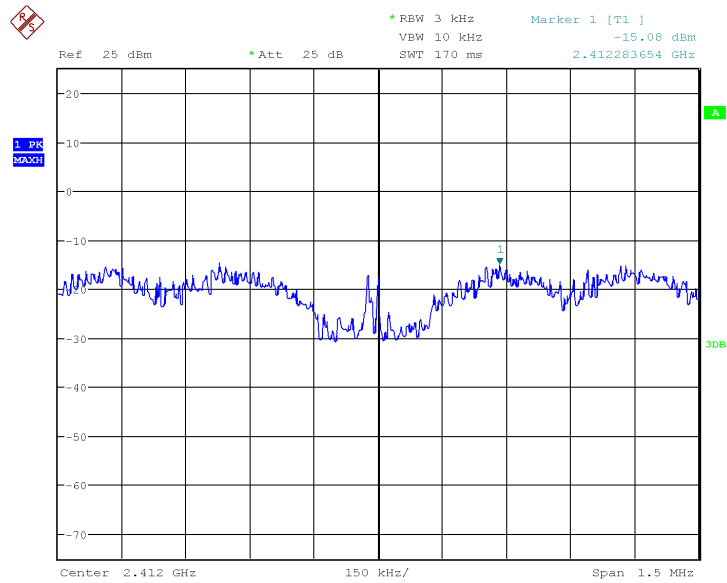
Date: 5.DEC.2012 16:27:32

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



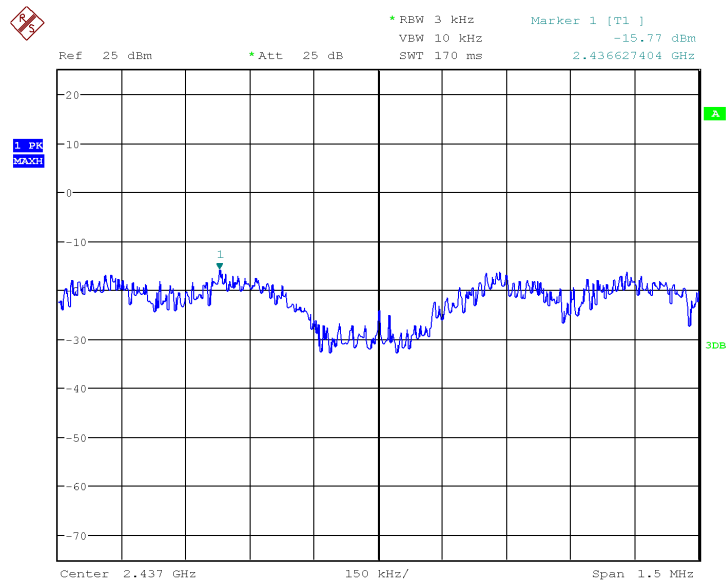
Date: 5.DEC.2012 16:28:31

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



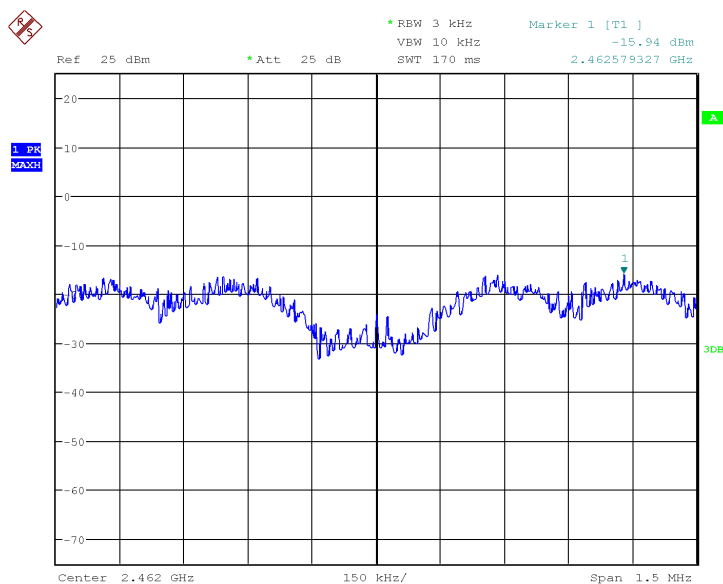
Date: 5.DEC.2012 16:29:47

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



Date: 5.DEC.2012 16:30:35

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



Date: 5.DEC.2012 16:31:39

Fig.9 Power Spectral Density (802.11n-20MHz,Ch11)

5.3. Occupied 6dB Bandwidth

Measurement Limit:

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

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

Measurement Uncertainty:

Measurement Uncertainty	60.80Hz
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Measurement Result:

802.11b/g mode

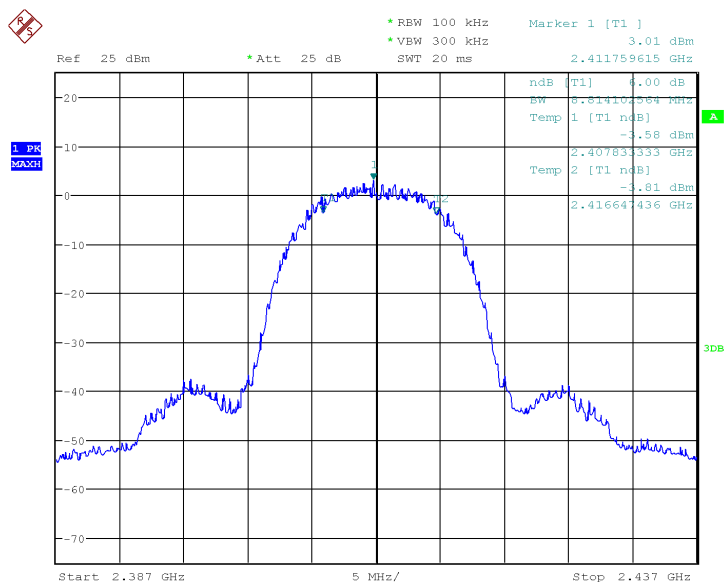
Mode	Channel	Occupied 6dB Bandwidth(KHz)		Conclusion
802.11b	1	Fig.10	8814.10	P
	6	Fig.11	8333.33	P
	11	Fig.12	8814.10	P
802.11g	1	Fig.13	8092.95	P
	6	Fig.14	8092.95	P
	11	Fig.15	8092.95	P

802.11n mode

Mode	Channel	Occupied 6dB Bandwidth(KHz)		Conclusion
802.11n(20MHz)	1	Fig.16	8653.85	P
	6	Fig.17	8733.97	P
	11	Fig.18	8733.97	P
802.11n(40MHz)	1	/		P
	6	/		P
	11	/		P

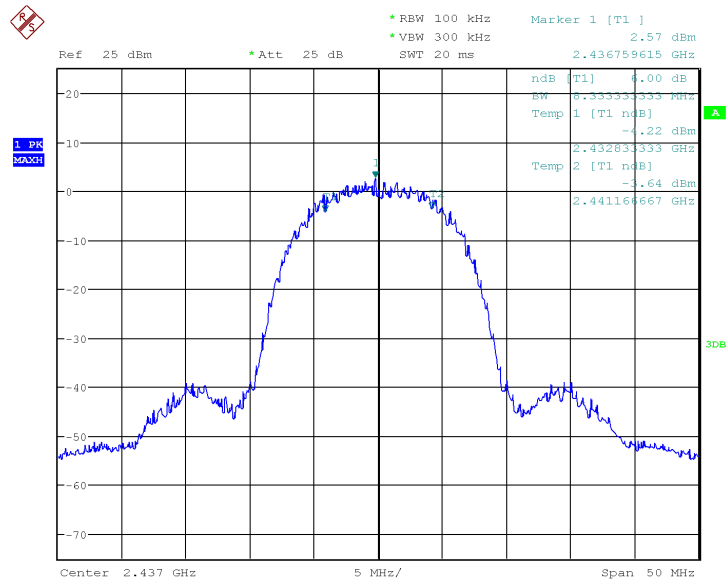
Conclusion: PASS

Test graphs as below:



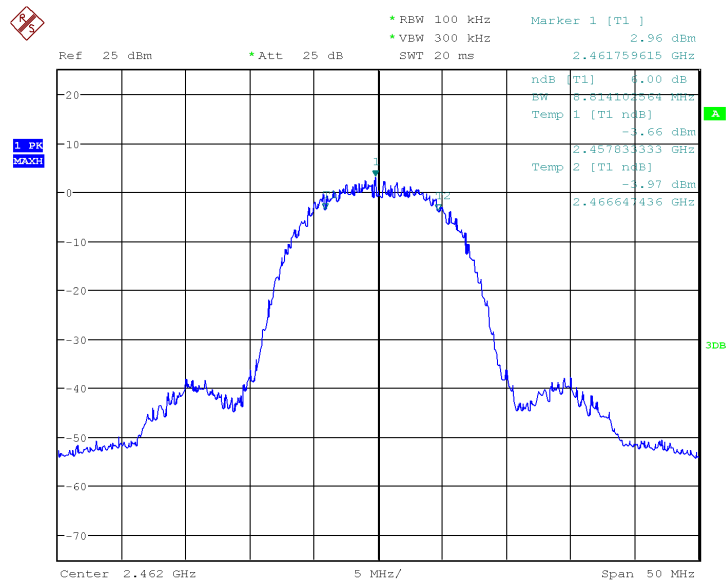
Date: 5.DEC.2012 16:49:35

Fig.10 Occupied 6dB Bandwidth (802.11b, Ch1)



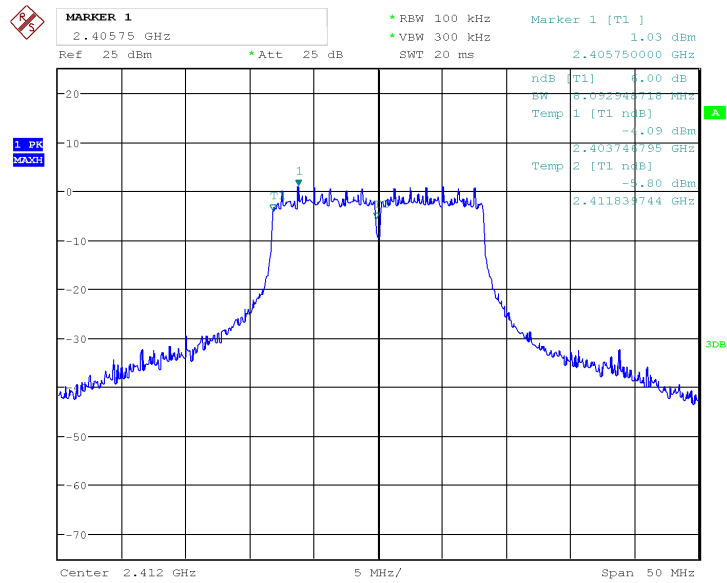
Date: 5.DEC.2012 16:50:59

Fig.11 Occupied 6dB Bandwidth (802.11b, Ch6)



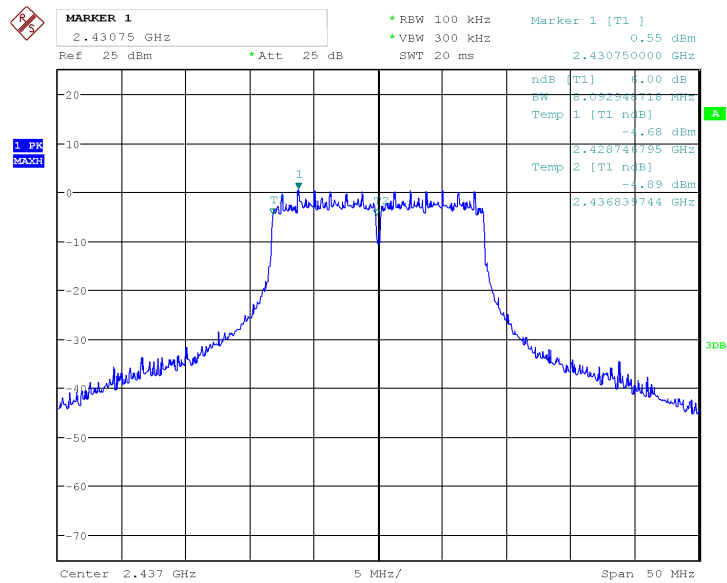
Date: 5.DEC.2012 16:53:05

Fig.12 Occupied 6dB Bandwidth (802.11b, Ch11)



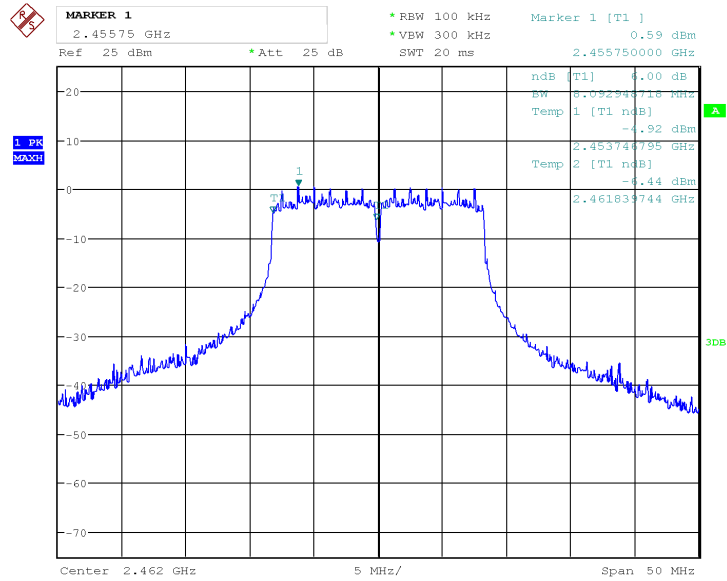
Date: 5.DEC.2012 16:54:40

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



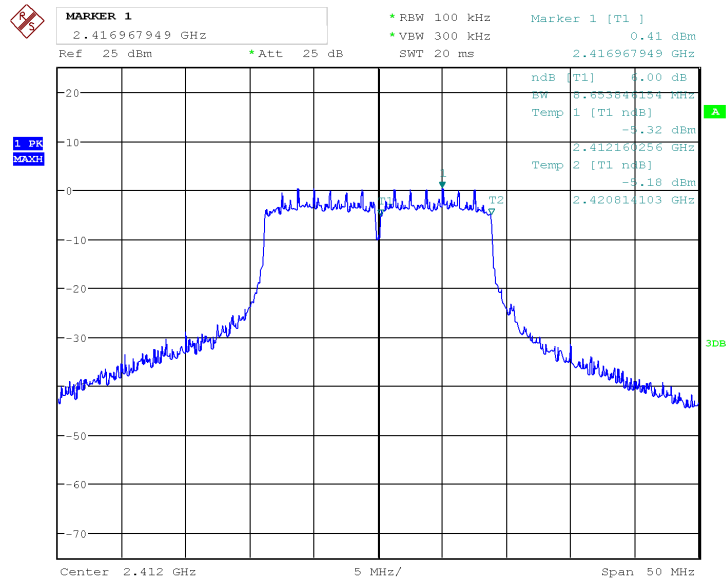
Date: 5.DEC.2012 16:55:48

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



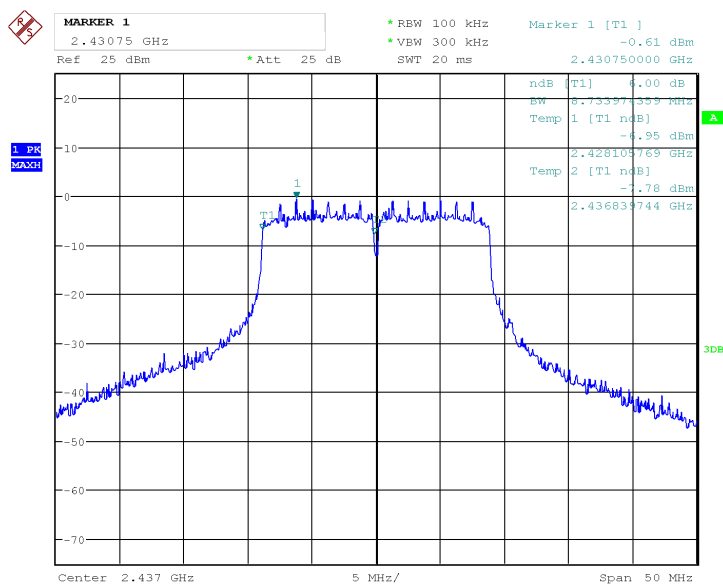
Date: 5.DEC.2012 16:56:55

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



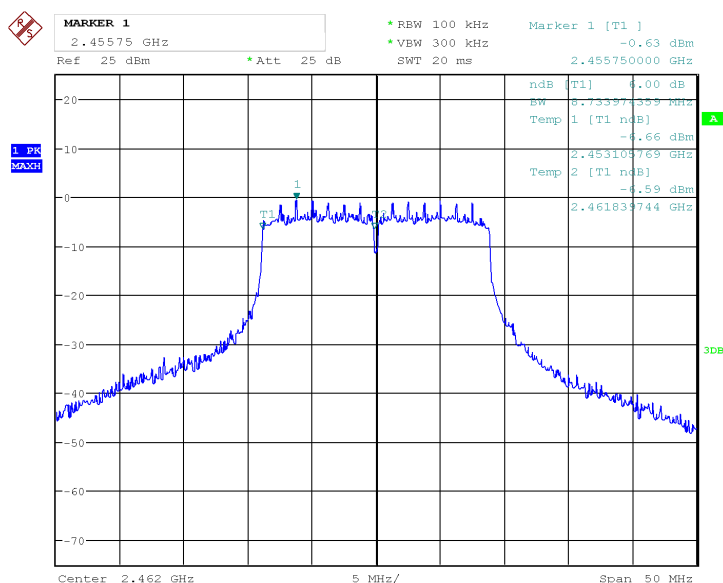
Date: 5.DEC.2012 16:58:23

Fig.16 Occupied 6dB Bandwidth (802.11n-20MHz, Ch1)



Date: 5.DEC.2012 16:59:19

Fig.17 Occupied 6dB Bandwidth (802.11n-20MHz, Ch6)



Date: 5.DEC.2012 17:00:47

Fig.18 Occupied 6dB Bandwidth (802.11n-20MHz, Ch11)

5.4. Band Edges Compliance

Measurement Limit:

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

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

Measurement Uncertainty:



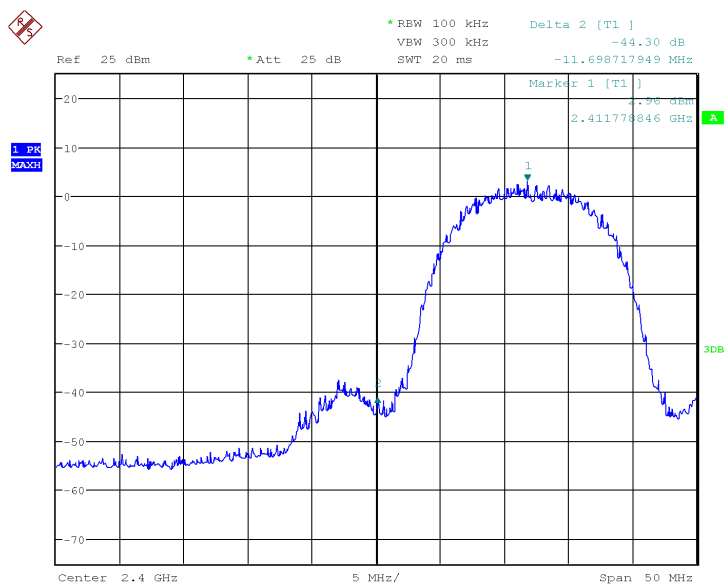
Measurement Uncertainty	0.75dB
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802.11b/g mode

Mode	Channel	Test Results	Conclusion
802.11b	1	Fig.19	P
	11	Fig.20	P
802.11g	1	Fig.21	P
	11	Fig.22	P

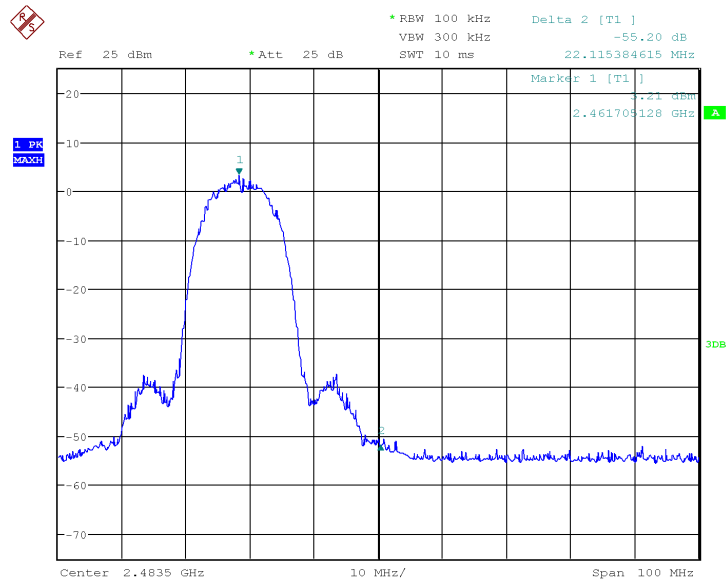
802.11n mode

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

Conclusion: PASS**Test graphs as blew:**

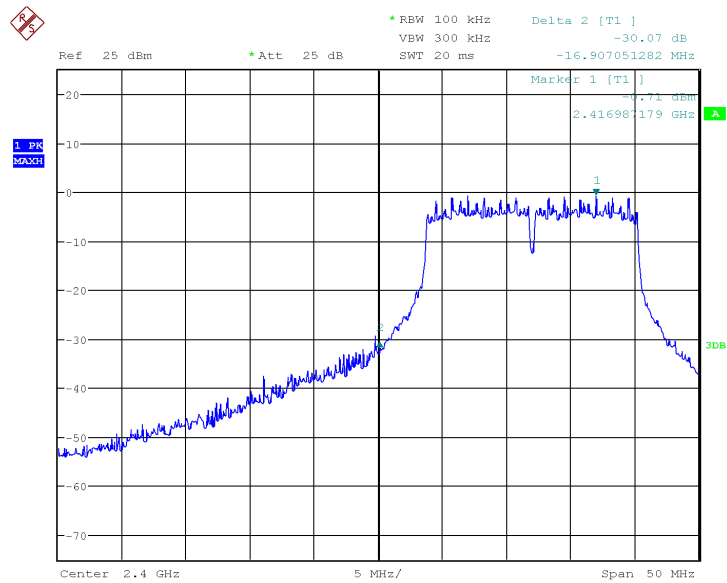
Date: 5.DEC.2012 18:29:08

Fig.19 Band Edges (802.11b, Ch1)



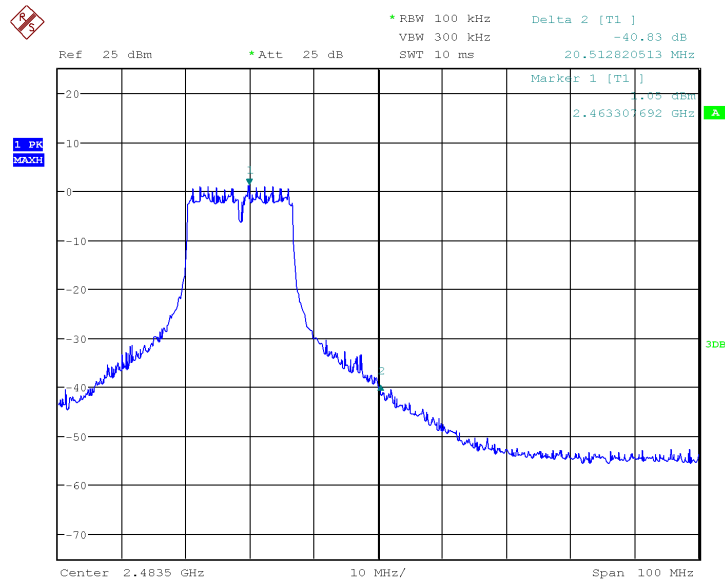
Date: 5.DEC.2012 18:42:18

Fig.20 Band Edges (802.11b, Ch11)



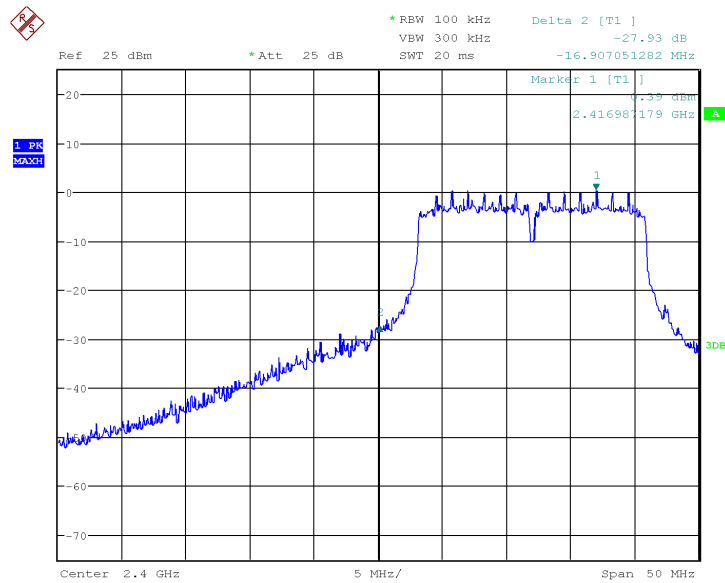
Date: 5.DEC.2012 18:30:15

Fig.21 Band Edges (802.11g, Ch1)



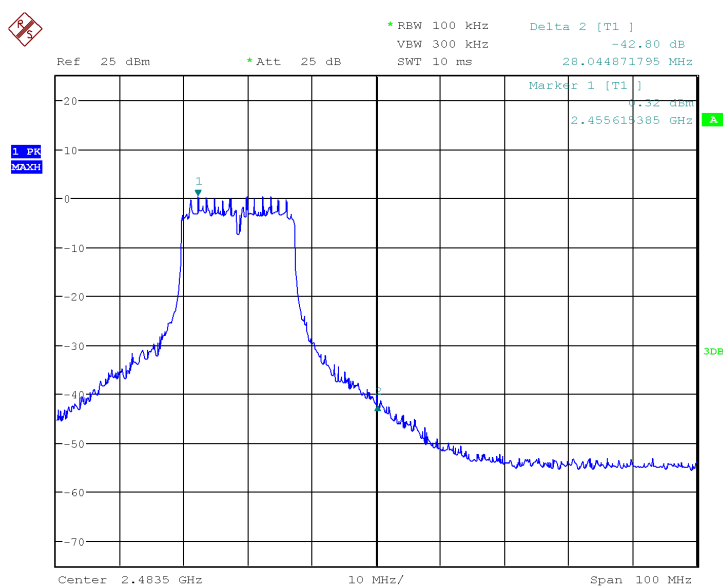
Date: 5.DEC.2012 18:43:15

Fig.22 Band Edges (802.11g, Ch11)



Date: 5.DEC.2012 18:31:02

Fig.23 Band Edges (802.11n-20MHz, Ch1)



Date: 5.DEC.2012 18:44:42

Fig.24 Band Edges (802.11b-20MHz, Ch11)

5.5. Transmitter Spurious Emission-conducted

Measurement Limit:

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

This measurement is according to ANSI C63.4 and KDB558074.

Measurement Uncertainty:

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

Measurement Result:

802.11b/g mode

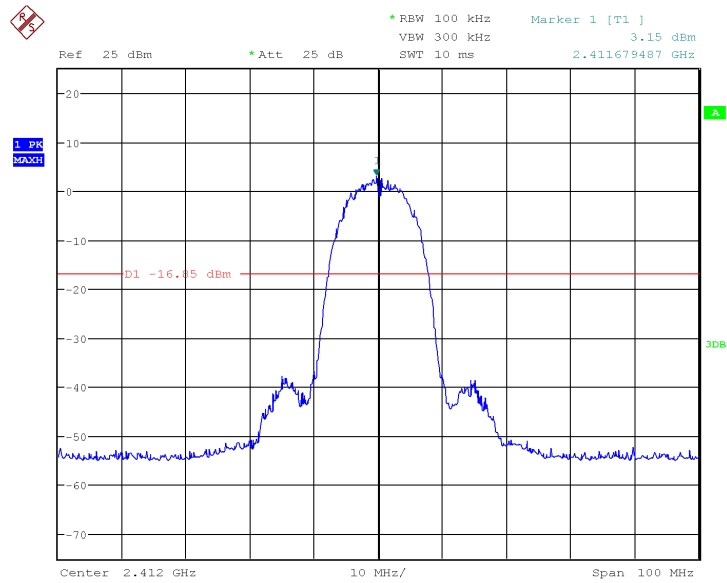
Mode	Channel	Frequency Range	Test Results	Conclusion
802.11b	1	2.412GHz	Fig.25	P

		30MHz~26GHz	Fig.26	P
		2.437GHz	Fig.27	P
	6	30MHz~26GHz	Fig.28	P
	11	2.472GHz	Fig.29	P
		30MHz~26GHz	Fig.30	P
802.11g	1	2.412GHz	Fig.31	P
		30MHz~26GHz	Fig.32	P
	6	2.437GHz	Fig.33	P
		30MHz~26GHz	Fig.34	P
	11	2.472GHz	Fig.35	P
		30MHz~26GHz	Fig.36	P

802.11n mode

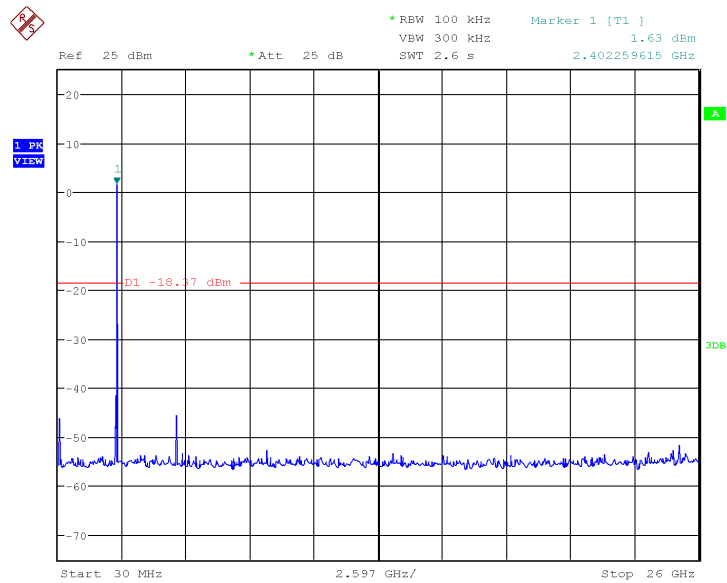
Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n(20MHz)	1	2.412GHz	Fig.37	P
		30MHz~26GHz	Fig.38	P
	6	2.437GHz	Fig.39	P
		30MHz~26GHz	Fig.40	P
	11	2.472GHz	Fig.41	P
		30MHz~26GHz	Fig.42	P
802.11n(40MHz)	1	/	/	/
		/	/	/
	6	/	/	/
		/	/	/
	11	/	/	/
		/	/	/

Conclusion: PASS
Test graphs as below:



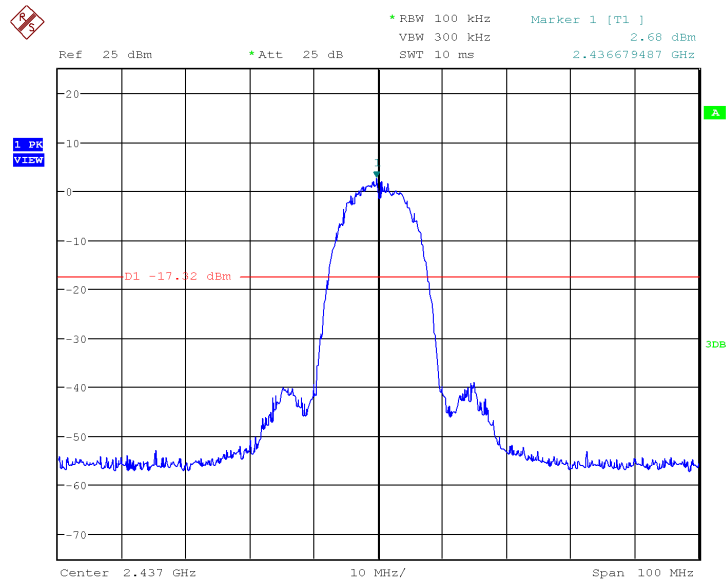
Date: 5.DEC.2012 18:58:48

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



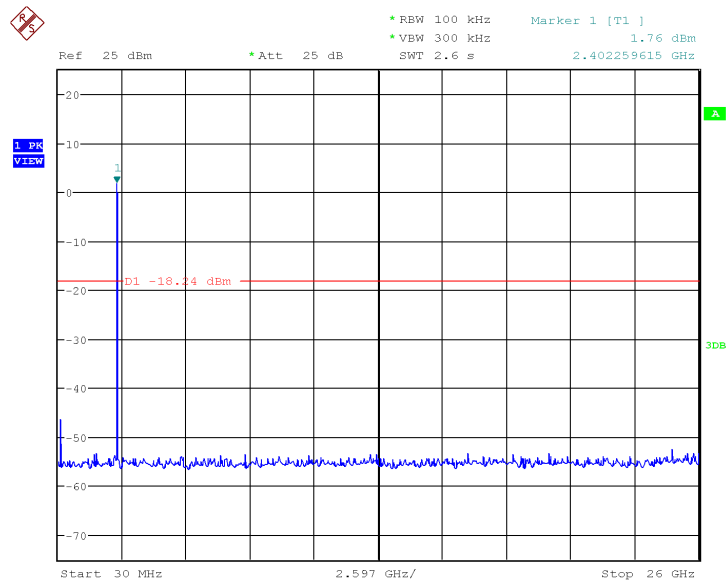
Date: 5.DEC.2012 19:00:46

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



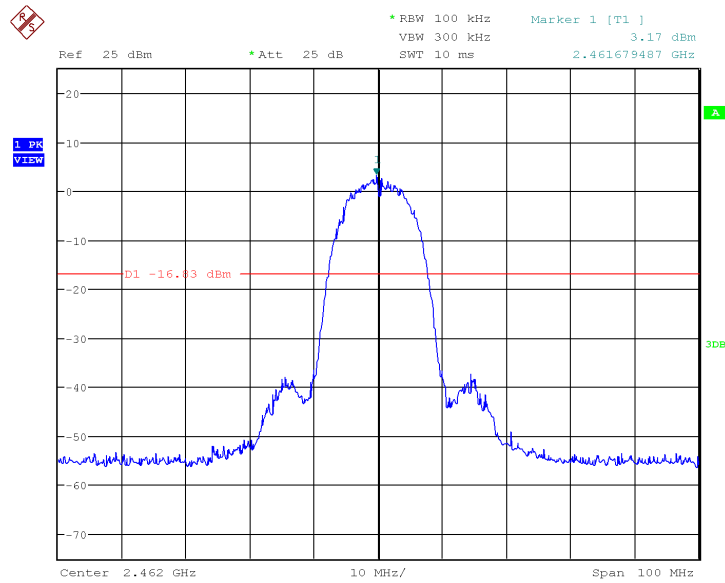
Date: 5.DEC.2012 19:01:59

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



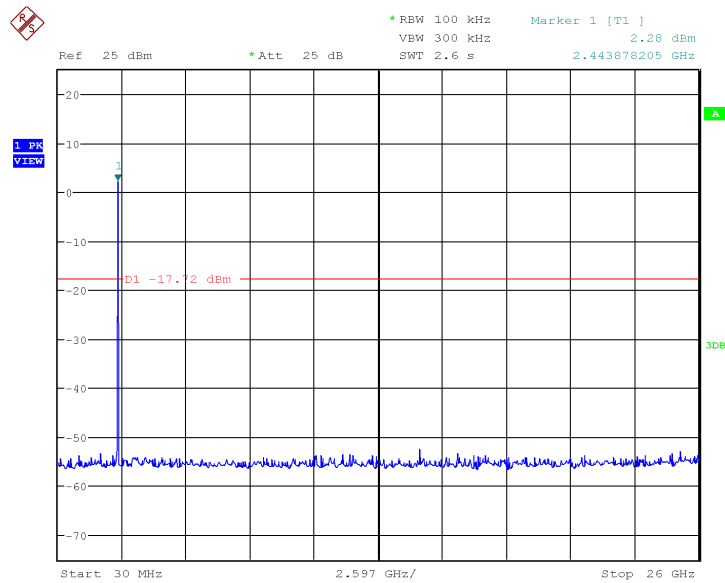
Date: 5.DEC.2012 19:03:09

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



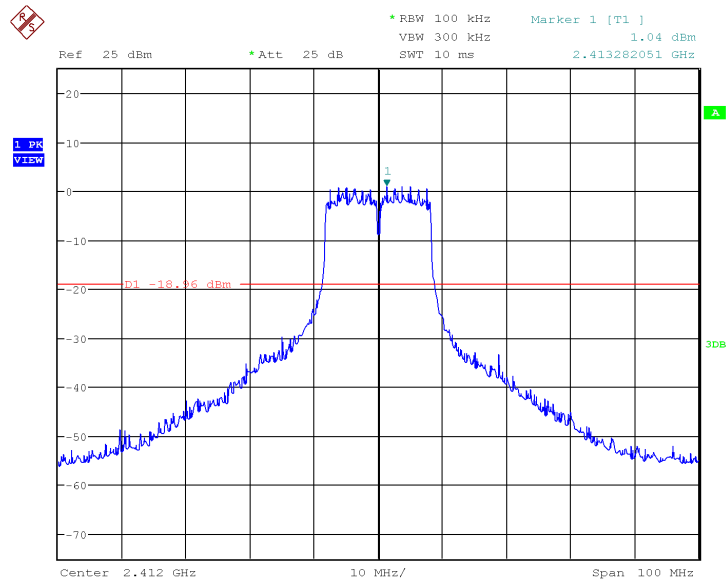
Date: 5.DEC.2012 19:04:23

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



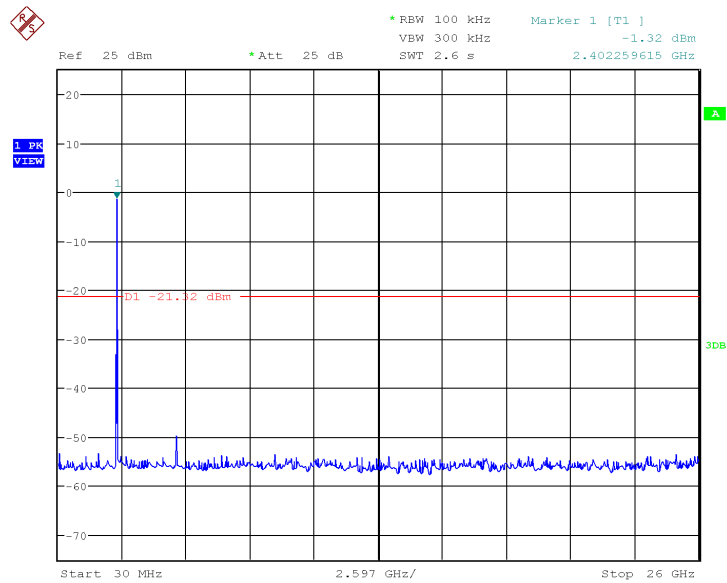
Date: 5.DEC.2012 19:05:18

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



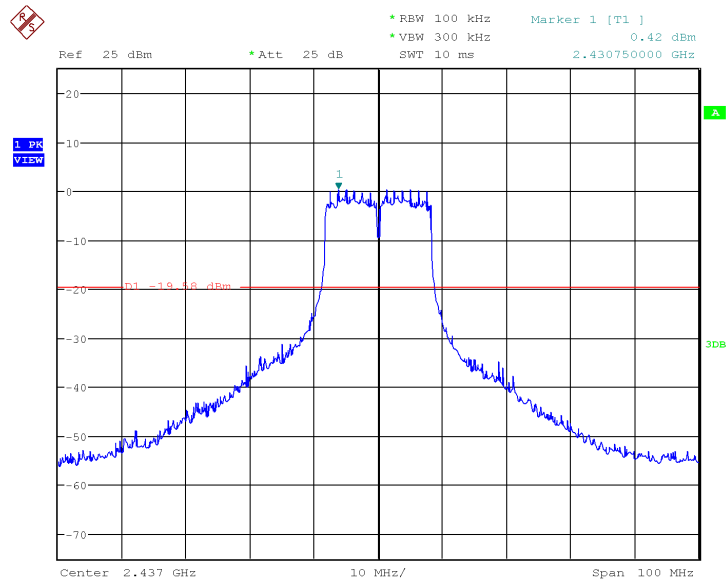
Date: 5.DEC.2012 19:11:32

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



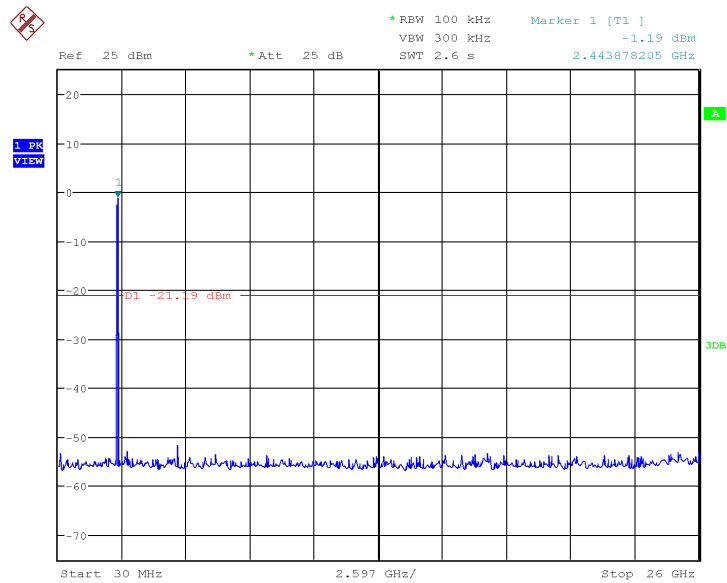
Date: 5.DEC.2012 19:12:19

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



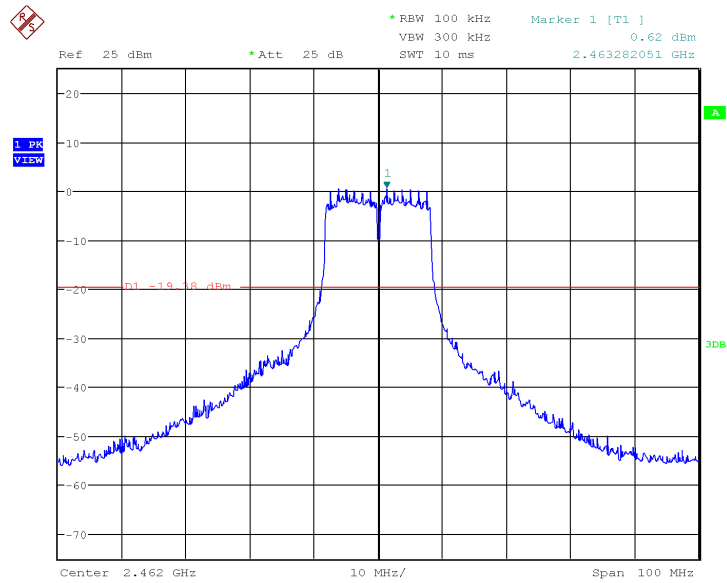
Date: 5.DEC.2012 19:13:33

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



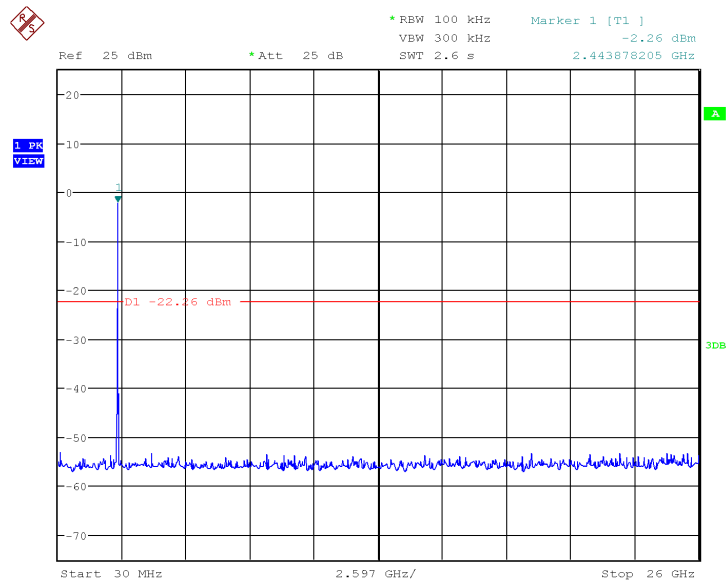
Date: 5.DEC.2012 19:14:13

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



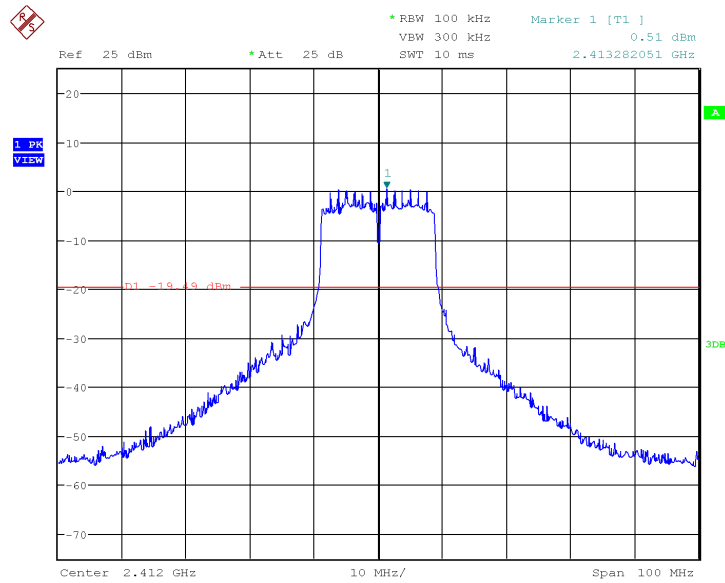
Date: 5.DEC.2012 19:15:08

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



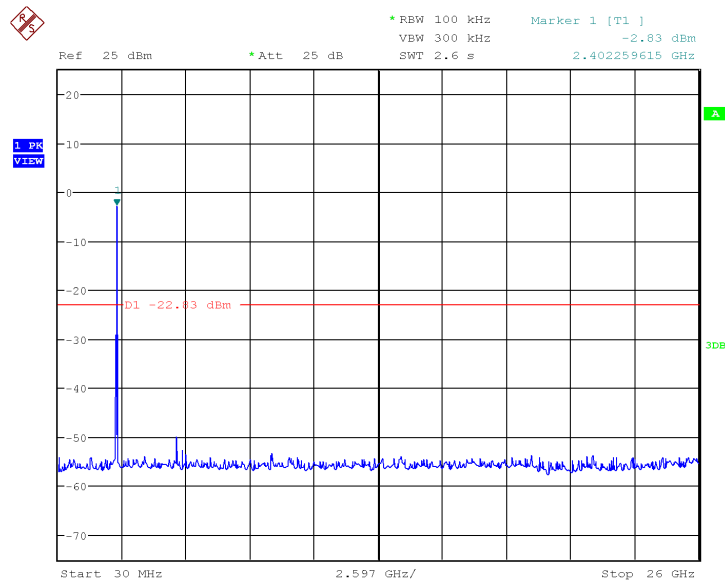
Date: 5.DEC.2012 19:15:49

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



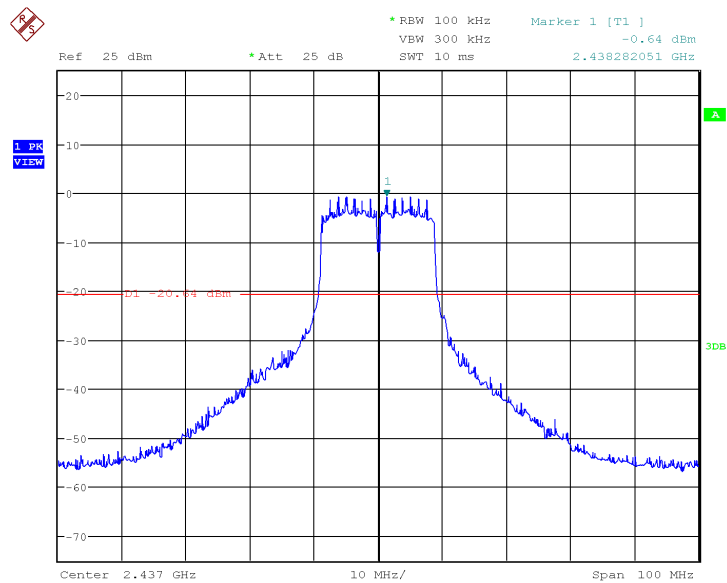
Date: 5.DEC.2012 19:16:45

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



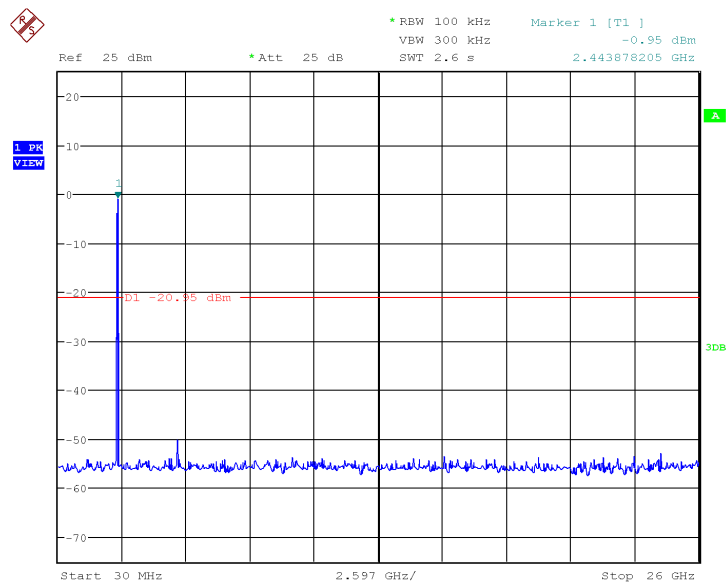
Date: 5.DEC.2012 19:17:24

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



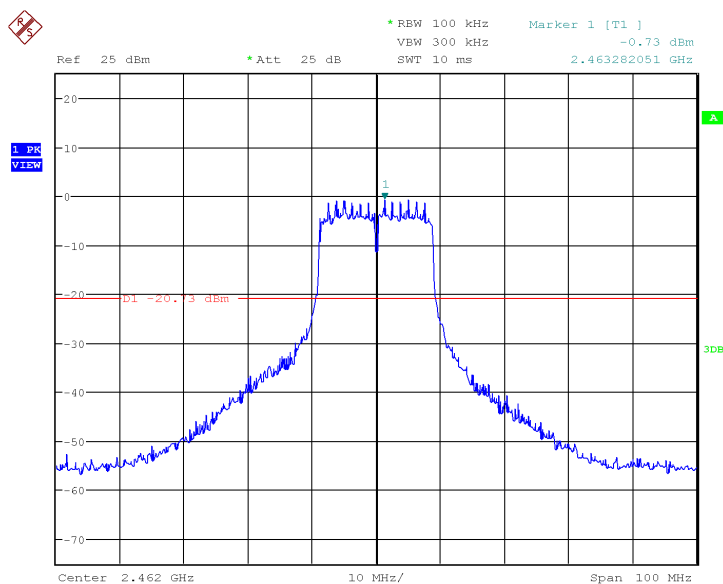
Date: 5.DEC.2012 19:18:29

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



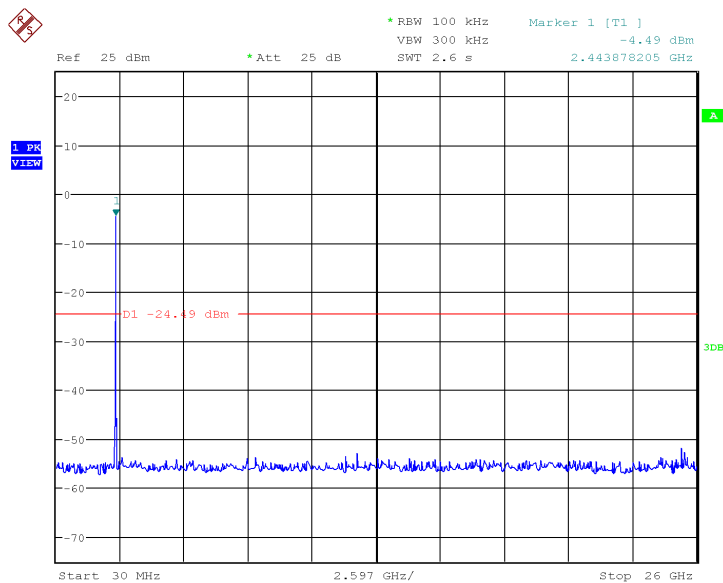
Date: 5.DEC.2012 19:19:07

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



Date: 5.DEC.2012 19:20:04

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



Date: 5.DEC.2012 19:20:50

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

5.6. Transmitter Spurious Emission-Radiated

Measurement Limit:

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

In addition, radiated emissions which fall in the restricted bands, as defined in 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 C63.4 and KDB558704.

Limit in restricted band:

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

Test condition:

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 orthogonal 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.44	P
	Power	2.45GHz~2.5GHz	Fig.45	P
	1	30MHz~1GHz	Fig.46	P

		1GHz~3GHz	Fig.47	P
		3GHz~18GHz	Fig.48	P
802.11g	Power	2.38GHz~2.45GHz	Fig.49	P
	Power	2.45GHz~2.5GHz	Fig.50	P
	11	30MHz~1GHz	Fig.51	P
		1GHz~3GHz	Fig.52	P
		3GHz~18GHz	Fig.53	P

802.11n mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n(20MHz)	Power	2.38GHz~2.45GHz	Fig.54	P
	Power	2.45GHz~2.5GHz	Fig.55	P
	1	30MHz~1GHz	Fig.56	P
		1GHz~3GHz	Fig.57	P
		3GHz~18GHz	Fig.58	P
/	All channels	18GHz~26.5GHz	Fig.59	P

Conclusion: PASS

Note:

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

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

The measurement results are obtained as described below:

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

802.11b mode
Ch1 30MHz~1GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
38.938680	33.7	0.86	32.84	V
90.723040	28.6	1.56	27.04	V
246.046740	15.7	3.32	12.38	H
384.084540	14.5	4.50	10.00	V
896.015960	20.6	7.28	13.32	H

**Ch1 1GHz~3GHz**

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
2823.740000	41.3	16.66	24.64	H
2880.152000	41.6	16.58	25.02	V

Ch1 3GHz~18GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
7925.201000	31.7	9.62	22.08	V
17225.491000	37.8	14.19	23.61	V
17520.539000	38.8	15.29	23.51	H

802.11g**Ch11 30MHz~1GHz**

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
36.532600	34.2	0.80	33.40	V
384.011660	38.4	4.50	33.90	V
399.993940	36.5	4.47	32.03	H
767.985800	34.3	6.51	27.78	V
891.334720	20.7	7.14	13.56	H

Ch11 1GHz~3GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
1763.418000	32.4	12.83	19.57	H
2842.700000	41.2	16.38	24.82	H

Ch11 3GHz~18GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
4929.237000	30.2	6.40	23.80	V
6719.794000	30.5	8.11	22.39	V
17524.589000	39.0	14.30	24.70	H

**802.11n-20MHz****Ch1 30MHz~1GHz**

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
38.968860	33.7	0.85	32.85	V
383.947220	23.1	4.50	18.60	H
767.938940	21.6	6.44	15.16	H

Ch1 1GHz~3GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
1800.084000	33.1	12.99	20.11	V
2699.936000	40.7	15.87	24.83	V
2872.752000	41.4	16.58	24.82	H

Ch1 3GHz~18GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
4822.257000	33.8	6.60	27.20	V
6303.280000	30.2	8.26	21.94	V
16771.201000	37.4	14.03	23.37	H
16955.939000	37.5	13.23	24.27	V

All Ch 18GHz~26.5GHz

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	PMea(dBuV/m)	Polarity
19625.786000	49.0	6.97	42.03	H
20684.980000	47.7	6.97	40.73	H
22119.789000	45.3	3.05	42.05	H
23627.899000	43.8	3.05	40.75	H
24606.319000	43.4	3.05	40.35	H
25644.558000	43.6	3.05	40.55	H

Test graphs as below:

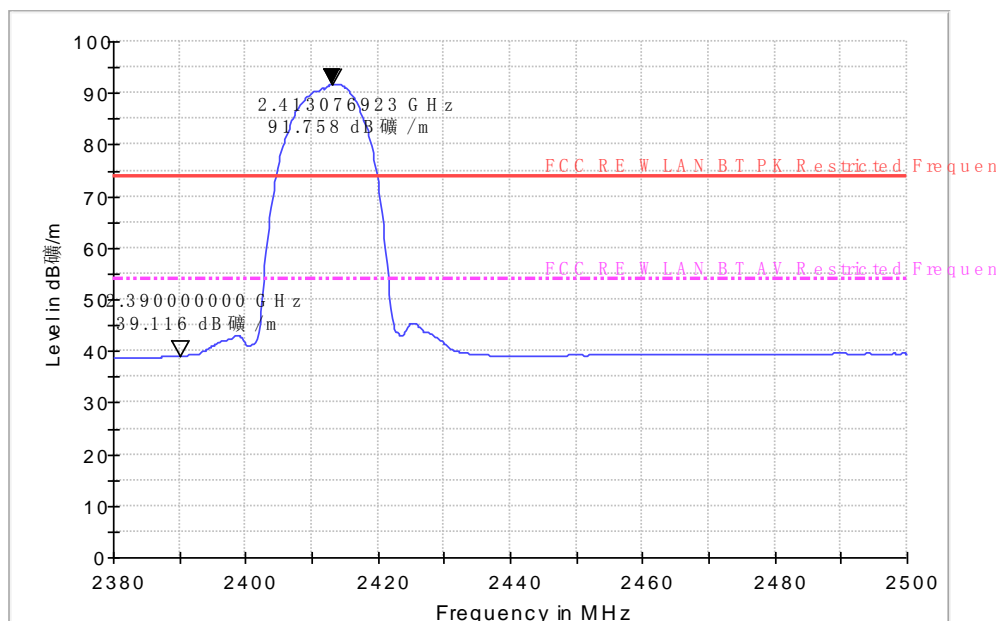


Fig.44 Radiated emission (Power): 802.11b, low channel

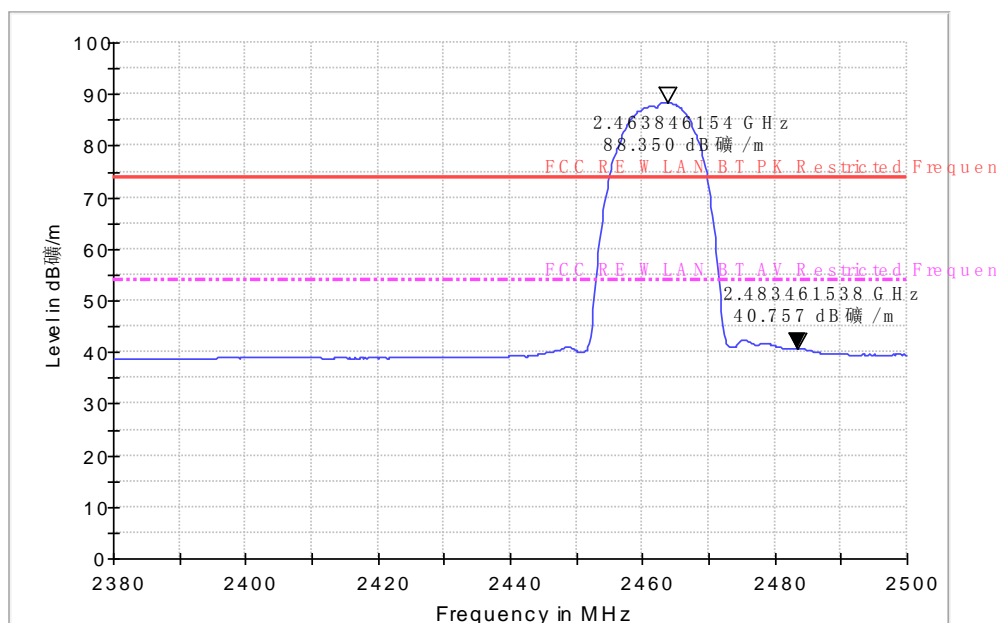


Fig.45 Radiated emission (Power): 802.11b, high channel

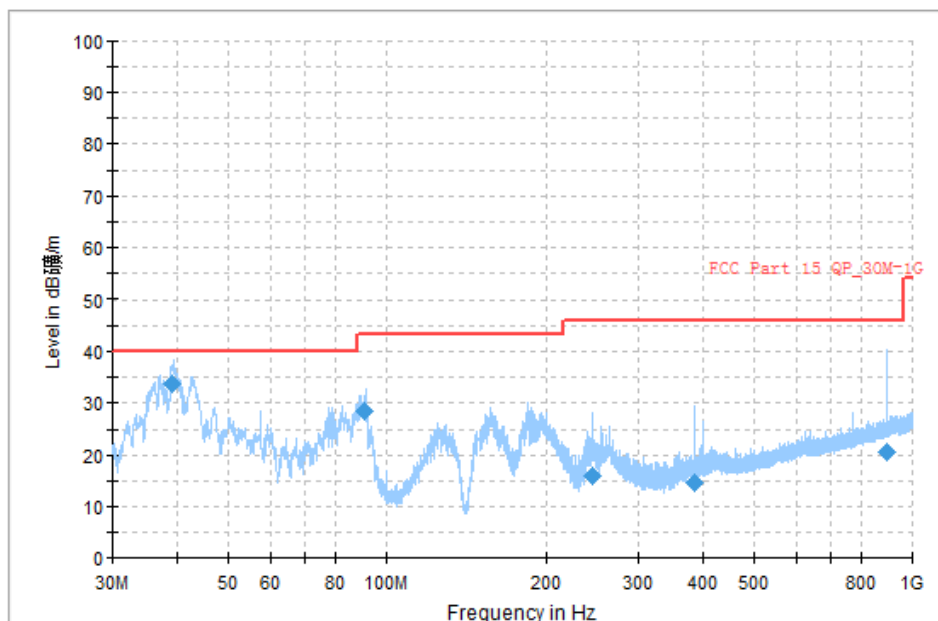


Fig.46 Radiated Spurious Emission (802.11b,Ch1,30MHz~1GHz)

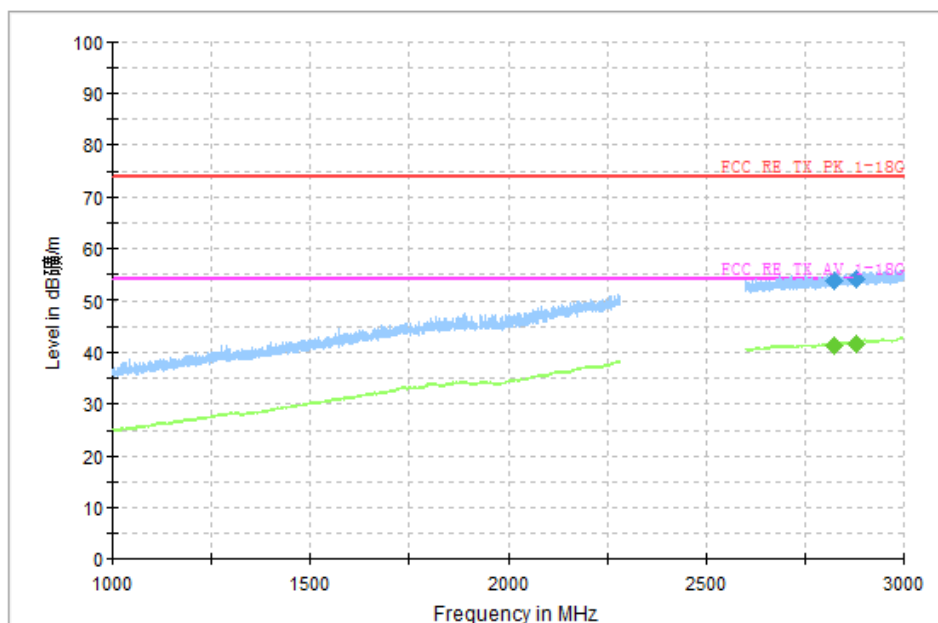


Fig.47 Radiated Spurious Emission (802.11b,Ch1,1GHz~4GHz)

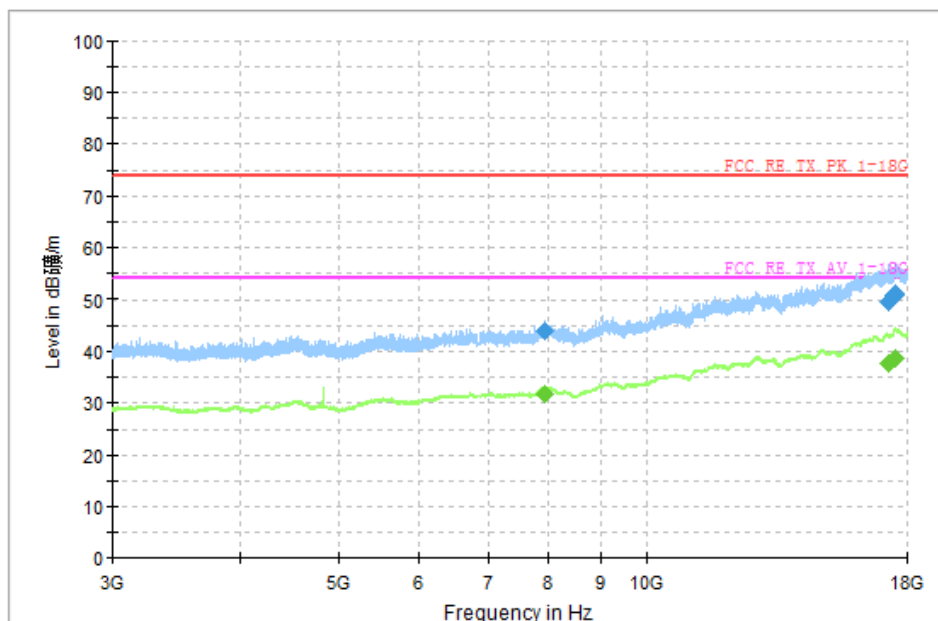


Fig.48 Radiated Spurious Emission (802.11b,Ch1,4GHz~18GHz)

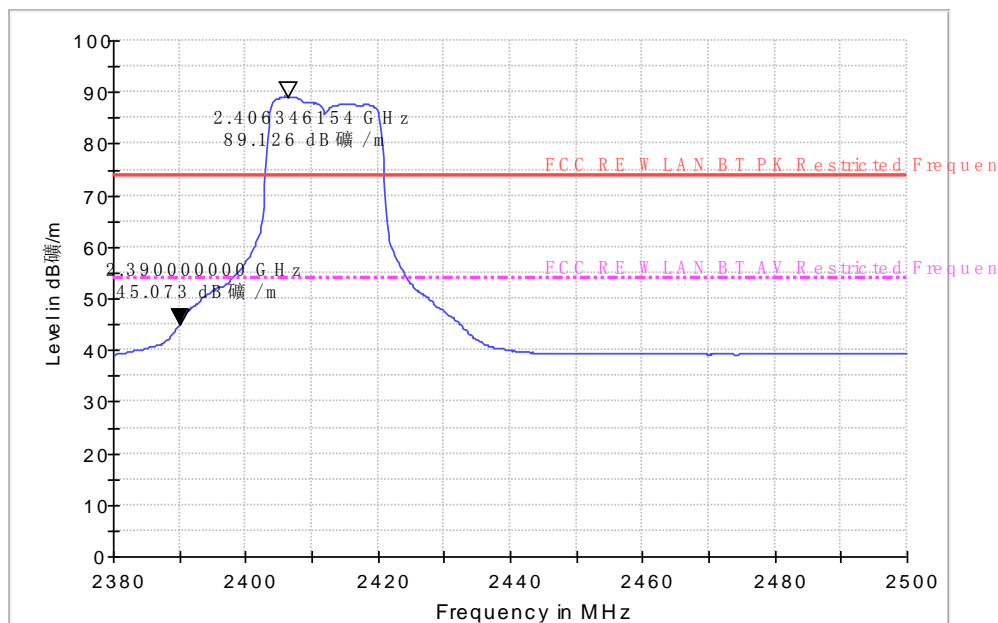


Fig.49 Radiated emission (Power): 802.11g, low channel

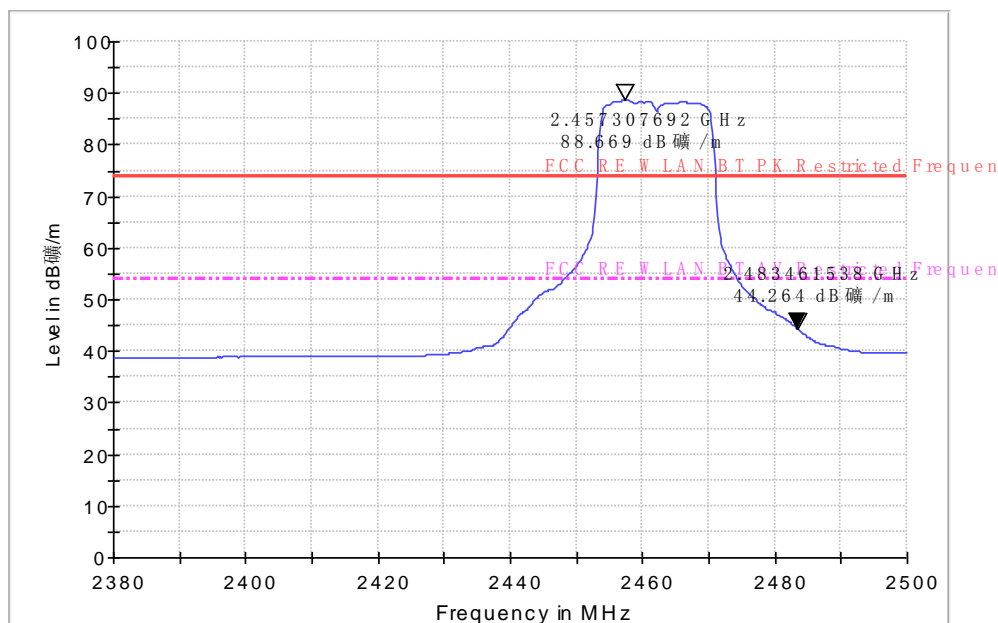


Fig.50 Radiated emission (Power): 802.11g, high channel

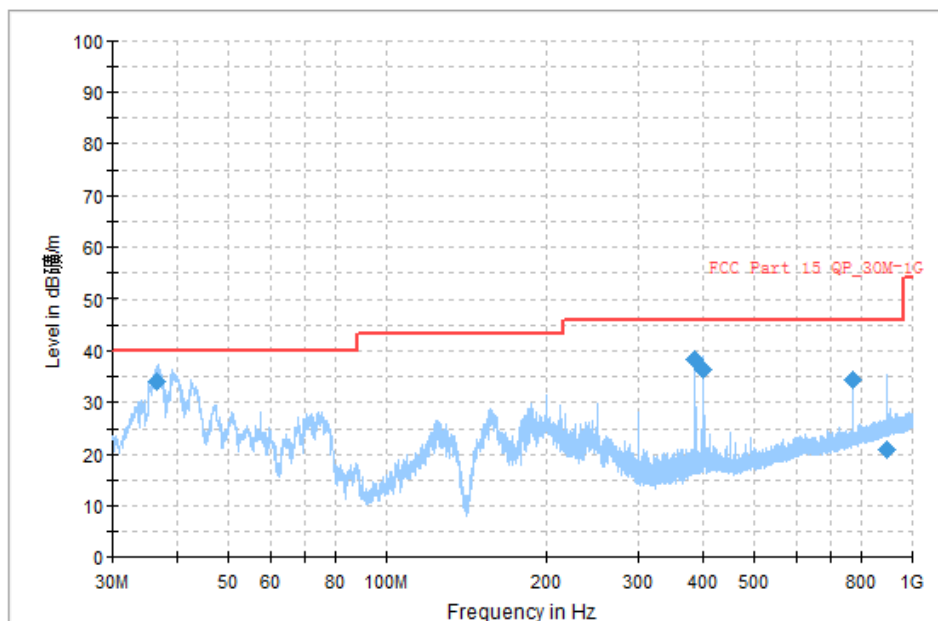


Fig.51 Radiated Spurious Emission (802.11g,Ch11,30MHz~1GHz)

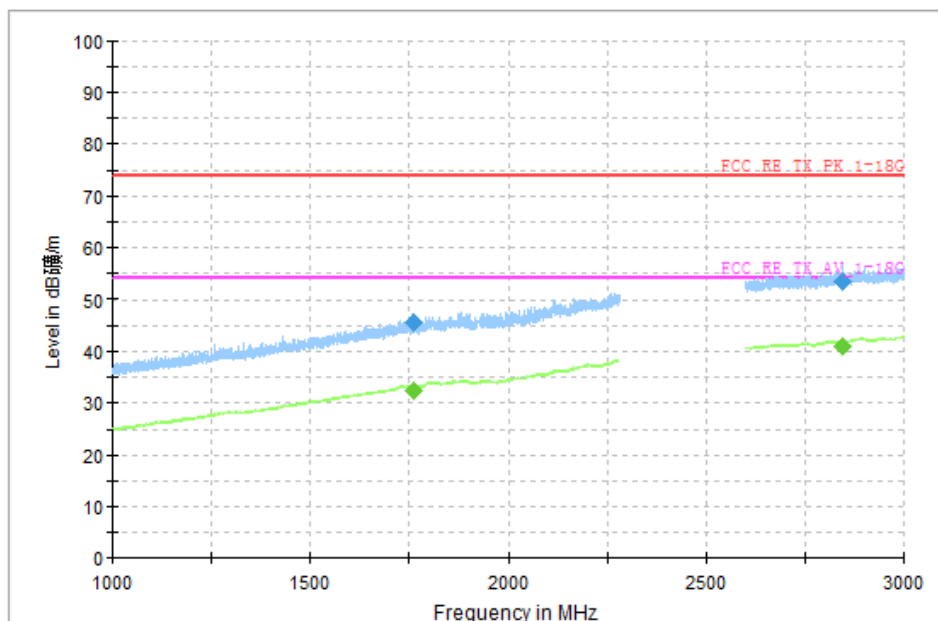


Fig.52 Radiated Spurious Emission (802.11g,Ch11,1GHz~4GHz)

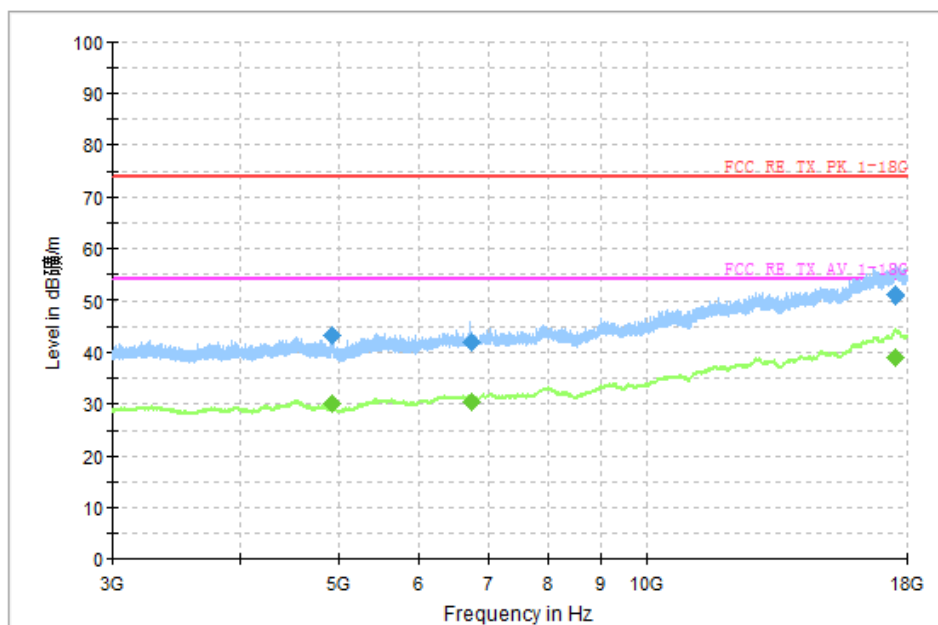


Fig.53 Radiated Spurious Emission (802.11g,Ch11,4GHz~18GHz)

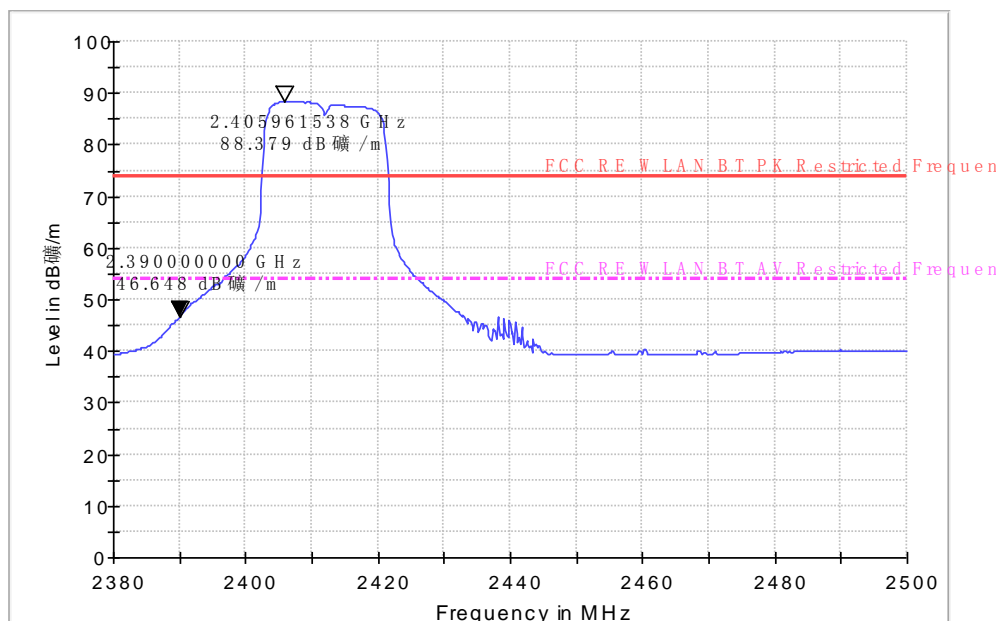


Fig.54 Radiated emission (Power): 802.11n, low channel

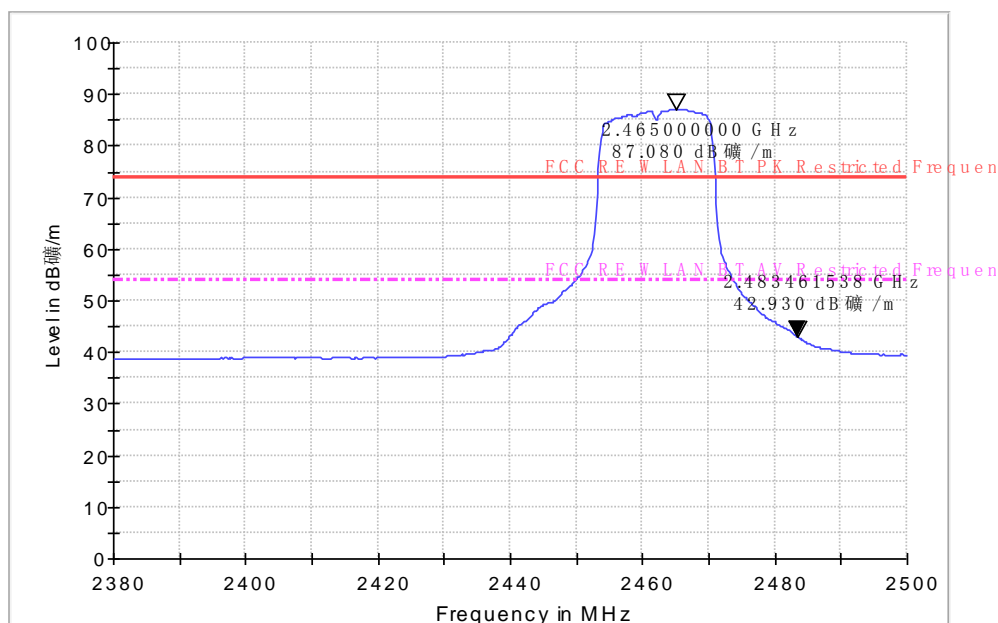


Fig.55 Radiated emission (Power): 802.11n, high channel

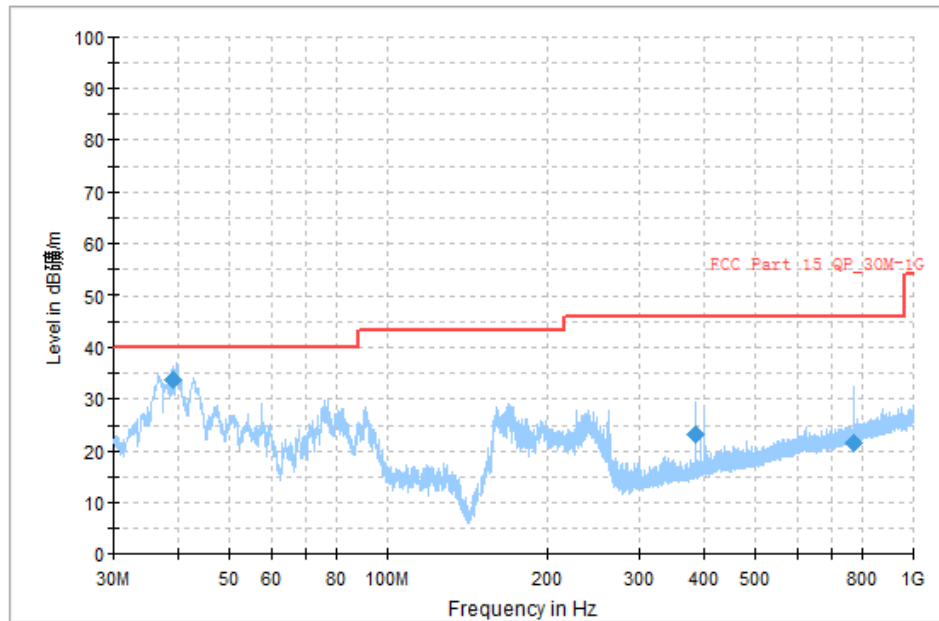


Fig.56 Radiated Spurious Emission (802.11 n-20MHz,Ch1,30MHz~1GHz)

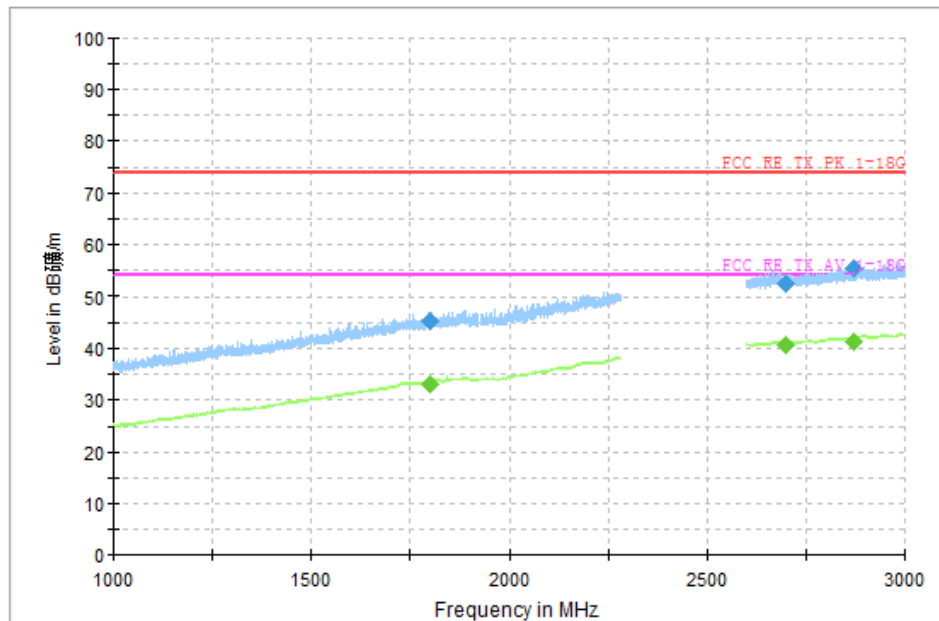


Fig.57 Radiated Spurious Emission (802.11 n-20MHz,Ch1,1GHz~4GHz)

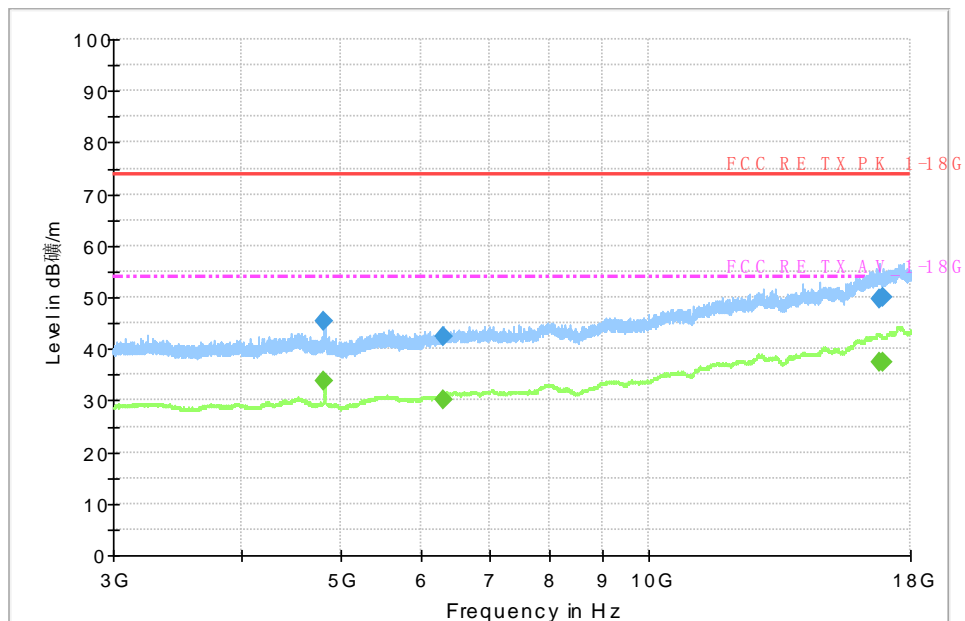


Fig.58 Radiated Spurious Emission (802.11 n-20MHz,Ch1,4GHz~18GHz)

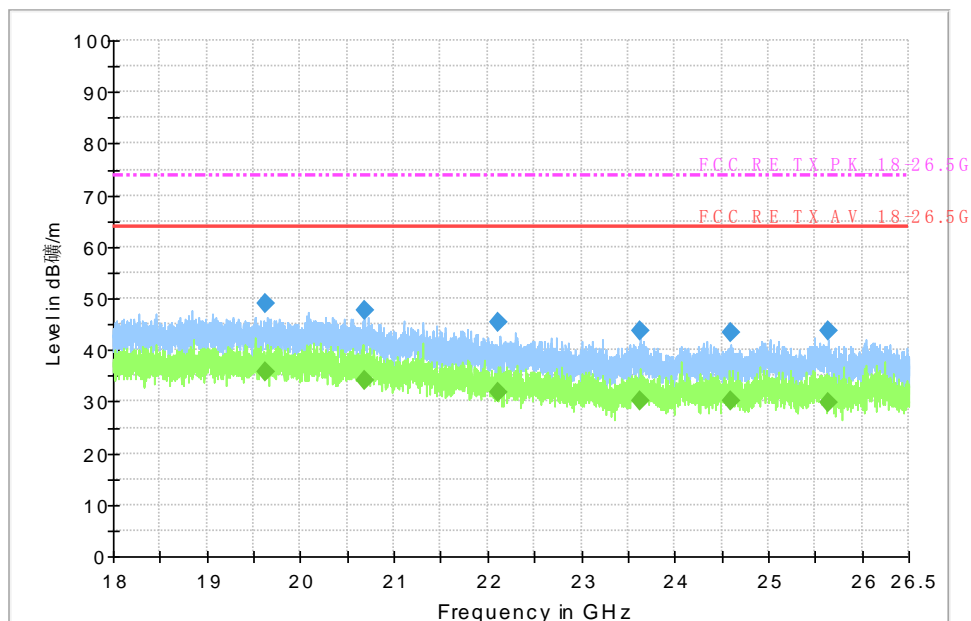


Fig.59 Radiated emission: GFSK, 18 GHz – 26.5 GHz

5.7. AC powerline Conducted Emission

Test condition:

Voltage (V)	Frequency (Hz)
120	60

Measurement Result and Limit:



WLAN (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dBuV)	Result (dBuV)		Conclusion
		With charger		
		802.11n	Idle	
0.15 to 0.5	66 to 56	Fig.60	Fig.61	P
0.5 to 5	66			
5 to 30	60			
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5MHz.				

WLAN (Average Limit)

Frequency range (MHz)	Average Limit (dBuV)	Result (dBuV)		Conclusion
		With charger		
		802.11n	Idle	
0.15 to 0.5	55 to 46	Fig.60	Fig.61	P
0.5 to 5	46			
5 to 30	50			
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5MHz.				

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

Conclusion: PASS

Test graphs as below:

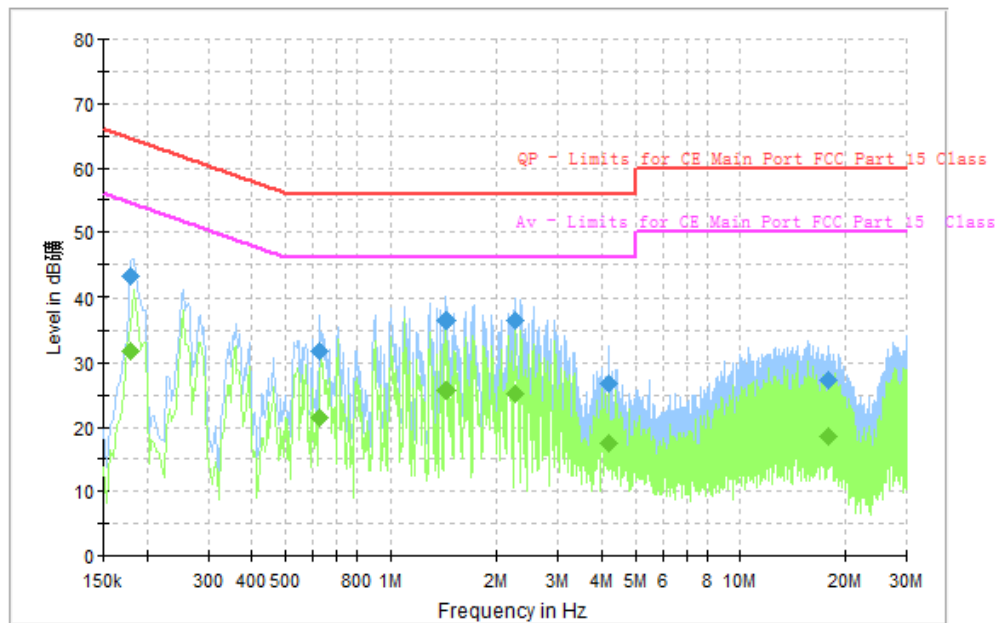


Fig.60 AC Powerline Conducted Emission 802.11n

Measurement result: "QP"

Frequency (MHz)	QuasiPeak (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.179850	43.1	1000.0	9.000	On	L1	10.2	21.4	64.5
0.623869	31.8	1000.0	9.000	On	L1	10.1	24.2	56.0
1.444744	36.6	1000.0	9.000	On	L1	9.9	19.4	56.0
2.254425	36.6	1000.0	9.000	On	L1	9.8	19.4	56.0
4.183481	26.8	1000.0	9.000	On	L1	9.8	29.2	56.0
17.892094	27.3	1000.0	9.000	On	L1	9.9	32.7	60.0

Measurement result: "AV"

Frequency (MHz)	Average (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.179850	31.8	1000.0	9.000	On	L1	10.2	22.7	54.5
0.623869	21.5	1000.0	9.000	On	L1	10.1	24.5	46.0
1.444744	25.8	1000.0	9.000	On	L1	9.9	20.2	46.0
2.254425	25.1	1000.0	9.000	On	L1	9.8	20.9	46.0
4.183481	17.4	1000.0	9.000	On	L1	9.8	28.6	46.0
17.892094	18.6	1000.0	9.000	On	L1	9.9	31.4	50.0

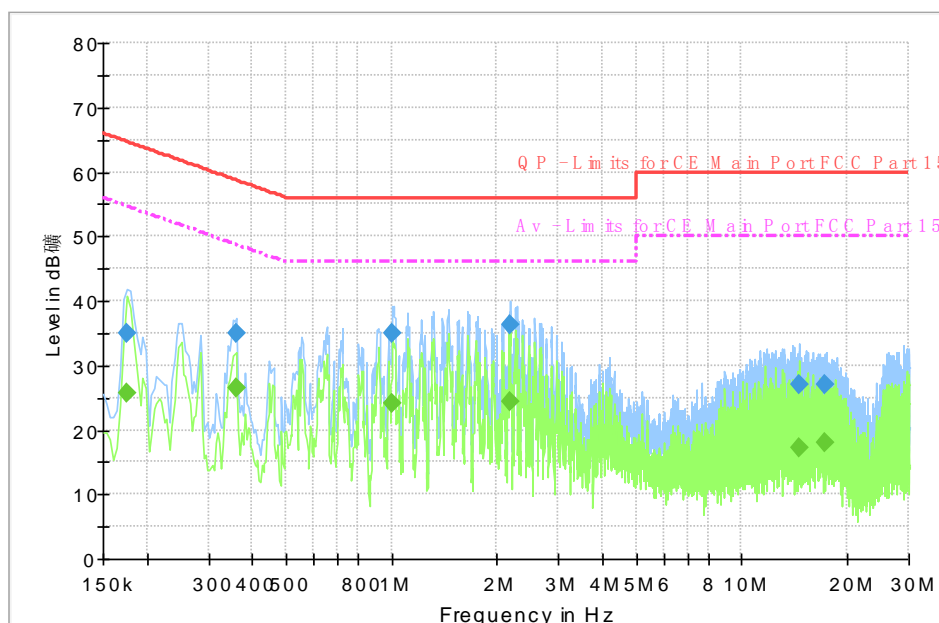


Fig.61 AC Powerline Conducted Emission Idle

Measurement result: “QP”

Frequency (MHz)	QuasiPeak (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.176119	35.0	1000.0	9.000	On	N	10.2	29.7	64.7
0.358950	34.9	1000.0	9.000	On	L1	10.1	23.9	58.8
1.008188	35.0	1000.0	9.000	On	L1	9.9	21.0	56.0
2.179800	36.3	1000.0	9.000	On	L1	9.8	19.7	56.0
14.556356	26.9	1000.0	9.000	On	L1	9.9	33.1	60.0
17.242856	27.0	1000.0	9.000	On	L1	9.9	33.0	60.0

Measurement result: “AV”

Frequency (MHz)	Average (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.176119	25.6	1000.0	9.000	On	N	10.2	29.1	54.7
0.358950	26.5	1000.0	9.000	On	L1	10.1	22.3	48.8
1.008188	24.2	1000.0	9.000	On	L1	9.9	21.8	46.0
2.179800	24.4	1000.0	9.000	On	L1	9.8	21.6	46.0
14.556356	17.3	1000.0	9.000	On	L1	9.9	32.7	50.0
17.242856	17.9	1000.0	9.000	On	L1	9.9	32.1	50.0

6. 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 Due date
1	Vector Signal Analyzer	FSQ26	101096	R&S	2013-10-17
2	DC Power Supply	ZUP60-14	LOC-220Z006	TDL-Lambda	2013-11-30

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date
1	Universal Radio Communication Tester	CMU200	123102	R&S	2013-09-10
2	Test Receiver	ESU40	100307	R&S	2013-11-07
3	Trilog Antenna	VULB9163	19-162515	Schwarzbeck	2014-11-11
4	Double Ridged Guide Antenna	ETS-3117	00135885	ETS	2014-04-29
5	Double Ridged Guide Antenna	ETS-3117	00135890	ETS	2014-04-28
6	Test receiver	ESCI	101235	R&S	2013-11-07

7	2-Line V-Network	ENV216	101380	R&S	2013-11-07
8	Biconical VHF-UHF broad band antenna	SWB-VUBA9 117	9117-266	SCHWARZBE CK	2013/11/11
9	Horn antenna(18.0 -26.5GHz)	3160_09	LM6321	ETS-LINDGR EN	2013/11/22
10	Signal conditioning unit(0.1-18G Hz)	SCU18	10155	R/S	2013/11/03
11	Signal conditioning unit(0.1-18G Hz)	SCU18	10146	R/S	2013/11/03
12	Horn antenna(18.0 -26.5GHz)	3160_09	00086671	ETS-LINDGR EN	2013/06/15
13	Amplifier	AFS4-001026 50-42-8P-4	1405286	MITEQ	2013/06/09
14	Amplifier	SCV26	10025	R&S	2013/11/09

Anechoic chamber

Fully anechoic chamber by Frankonia German.

7. 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 °C, Max. = 30 °C
-------------	----------------------------

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

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

Temperature	Min. = 15 $^{\circ}\text{C}$, Max. = 35 $^{\circ}\text{C}$
Relative humidity	Min. =30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 k Ω
Ground system resistance	< 0.5 Ω

Fully-anechoic chamber1 (6.8 metersx3.08 metersx3.53 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 $^{\circ}\text{C}$, Max. = 30 $^{\circ}\text{C}$
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 k Ω
Ground system resistance	< 0.5 Ω
Uniformity of field strength	Between 0 and 6 dB, from 80MHz to 3000 MHz

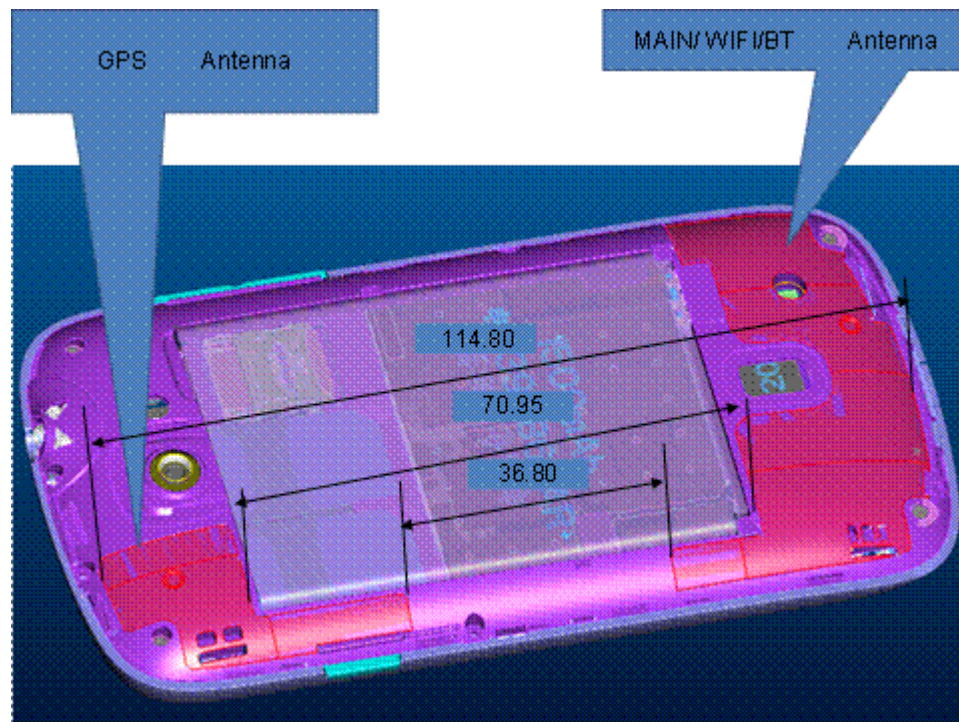
Fully-anechoic chamber2 (Tapered Section: 8.75 metersx3.66 metersx3.66 meters, Rectangular Section: 7.32 metersx3.97 metersx3.66 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 $^{\circ}\text{C}$, Max. = 30 $^{\circ}\text{C}$
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 k Ω
Ground system resistance	< 0.5 Ω



Uniformity of field strength	Between 0 and 6 dB, from 30MHz to 40000MHz
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ANNEX A EUT Photos



ANNEX B Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

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