



**FCC PART 15C  
TEST REPORT  
No. 2012WLN0438**

for

**TCT Mobile Limited**

**HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone**

**Type: Beetle 2SIM US**

**Market Name: ONETOUCH 4030E**

With

**FCC ID: RAD316**

**Hardware Version: Proto**

**Software Version: vFA2**

**Issued Date: 2012-12-24**



*DAR accreditation (DIN EN ISO/IEC 17025): No. D-PL-12123-01-01*

*FCC 2.948 Listed: No.733176*

*IC O.A.T.S listed: No.6629B*

**Note:**The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of TMC Beijing.

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## 1. TEST LABORATORY

### 1.1. Testing Location

Company Name: TMC Beijing, Telecommunication Metrology Center of MIIT  
Address: No. 52, Huayuan Bei Road, Haidian District, Beijing, P. R. China  
Postal Code: 100191  
Telephone: 008610623046332561  
Fax: 008610623046332504

### 1.2. Testing Environment

Normal Temperature: 15-30°C  
Extreme Temperature: -20/+55°C  
Relative Humidity: 30-60%  
Air Pressure 990hPa-1040hPa

Note: The climatic requirements above are general exclude the special requirements for dedicated test environments listed in section 5 and some specific test cases in other parts of this report.

### 1.3. Project data

Testing Start Date: 2012-11-28  
Testing End Date: 2012-12-21

### 1.4. Signature



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Sun Zhenyu

(Prepared this test report)



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Gao Hong

(Reviewed this test report)



---

Xiao Li

Deputy Director of the laboratory  
(Approved this test report)



## **2. CLIENT INFORMATION**

### **2.1. Applicant Information**

Company Name: TCT Mobile Limited  
Address /Post: 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,  
Pudong Area Shanghai, P.R. China. 201203  
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### **2.2. Manufacturer Information**

Company Name: TCT Mobile Limited  
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Pudong Area Shanghai, P.R. China. 201203  
Country: China  
Contact Gong Zhizhou  
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Telephone: 0086-21-61460890  
Fax: 0086-21-61460602

### 3. EQUIPMENT UNDER TEST(EUT) AND ANCILLARY EQUIPMENT(AE)

#### 3.1. About EUT

Description	HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone
Type	Beetle 2SIM US
Market name	ONETOUCH 4030E
FCC ID	RAD316
IC ID	/
With WLAN Function	Yes
Frequency Range	ISM 2400MHz~2483.5MHz
Type of Modulation	DSSS/CCK/OFDM
Number of Channels	11
Antenna	Integral Antenna
MAX Conducted Power	23.75dBm(CCK)
Power Supply	3.8V DC by Battery

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

#### 3.2. Internal Identification of EUT used during the test

EUT ID*	IMEI	HW Version	SW Version
EUT1	013460000051475	Proto	vFA2
EUT2	013460000050519	Proto	vFA2

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

#### 3.3. Internal Identification of AE used during the test

AE ID*	Description	Type	SN
AE1	Battery	CAB60B0000C1	/
AE2	Battery	CAB60B0000C2	/
AE3	Charger	CBA3007AG0C1	/
AE4	Charger	CBA3007AG0C3	/

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

#### 3.4. General Description

Equipment Under Test (EUT) is a model of HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone with integrated antenna. It consists of normal options: Battery and Charger.

Manual and specifications of the EUT were provided to fulfil the test.

Samples undergoing test were selected by the Client.

#### **4. Reference Documents**

##### **4.1. Documents supplied by applicant**

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

##### **4.2. REFERENCE DOCUMENTS FOR TESTING**

The following documents listed in this section are referred for testing.

FCC Part15	FCC CFR 47, Part 15, Subpart C: 15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.247 Operation within the bands 902-928MHz, 2400-2483.5 MHz, and 5725-5850 MHz.	Oct, 2009 Edition
ANSI C63.10	Procedures for testing compliance of a wide variety of unlicensed wireless devices	2009

## 5. LABORATORY ENVIRONMENT

**Shielding Room1** (6.0 meters×3.0 meters×2.7 meters) did not exceed following limits along the conducted RF performance testing:

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

**Semi-anechoic chamber** (10 meters×6.7meters×6.15meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 2 M ohm
Ground system resistance	< 0.5 Ω
Normalised site attenuation (NSA)	< ±3.5 dB, 3 m distance
Site voltage standing-wave ratio (S <sub>VSWR</sub> )	Between 0 and 6 dB, from 1GHz to 18GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 3000 MHz

**Shielding Room2** (7.30 meters×4.00 meters×3.80 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
Uniformity of field strength	Between 0 and 6 dB, from 80MHz to 3000 MHz

## 6. SUMMARY OF TEST RESULTS

### 6.1. Summary of Test Results

SUMMARY OF MEASUREMENT RESULTS	Sub-clause of Part15C	Sub-clause of IC	Verdict
Maximum Peak Output Power	15.247 (a)	/	<b>P</b>
Peak Power Spectral Density	15.247 (d)	/	<b>P</b>
Occupied 6dB Bandwidth	15.247 (d)	/	<b>P</b>
Band Edges Compliance	15.247 (b)	/	<b>P</b>
Transmitter Spurious Emission - Conducted	15.247	/	<b>P</b>
Transmitter Spurious Emission - Radiated	15.247, 15.205, 15.209	/	<b>P</b>
AC Powerline Conducted Emission	15.107, 15.207	/	<b>P</b>

Please refer to **ANNEX A** for detail.

The measurement is made according to ANSI C63.10.

Terms used in Verdict column

P	Pass, The EUT complies with the essential requirements in the standard.
NP	Not Perform, The test was not performed by TMC
NA	Not Applicable, The test was not applicable
F	Fail, The EUT does not comply with the essential requirements in the standard

### 6.2. Statements

TMC has evaluated the test cases requested by the client/manufacturer as listed in section 6.1 of this report for the EUT specified in section 3 according to the standards or reference documents listed in section 4.1.

This report only deals with the WLAN function among the features described in section 3.

This model is a variant product of the model Beetle US, which market name is ONE TOUCH 4030A; all test cases are not performed, and the test result has been derived from test report of Beetle US.

Test Conditions

T nom	Normal Temperature
T min	Low Temperature
T max	High Temperature
V nom	Normal Voltage
V min	Low Voltage
V max	High Voltage
H nom	Norm Humidity
A nom	Norm Air Pressure

For this report, all the test cases listed above are tested under Normal Temperature and Normal Voltage which is using a new battery, and also under norm humidity, the specific conditions as following:

Temperature	T nom	26°C
Voltage	V nom	3.8V(By battery)
Humidity	H nom	44%
Air Pressure	A nom	1010hPa

## **7. TEST EQUIPMENTS UTILIZED**

### **Conducted test system**

<b>No.</b>	<b>Equipment</b>	<b>Model</b>	<b>Serial Number</b>	<b>Manufacturer</b>	<b>Calibration Due date</b>
1	Vector Signal Analyzer	FSQ40	200089	Rohde & Schwarz	2013-07-19
2	Spectrum Analyzer	MS2687B	6200819812	Anritsu	2013-09-22
3	Test Receiver	ESS	847151/015	Rohde & Schwarz	2013-10-30
4	LISN	ESH2-Z5	829991/012	Rohde & Schwarz	2013-08-12

### **Radiated emission test system**

<b>No.</b>	<b>Equipment</b>	<b>Model</b>	<b>Serial Number</b>	<b>Manufacturer</b>	<b>Calibration Due date</b>
1	Test Receiver	ESI40	831564/002	Rohde & Schwarz	2013-08-11
2	BiLog Antenna	3142B	9908-1403	EMCO	2013-03-15
3	Dual-Ridge Waveguide Horn Antenna	3115	9906-5827	EMCO	2013-12-25
4	Dual-Ridge Waveguide Horn Antenna	3116	2661	EMCO	2013-06-30

### **Anechoic chamber**

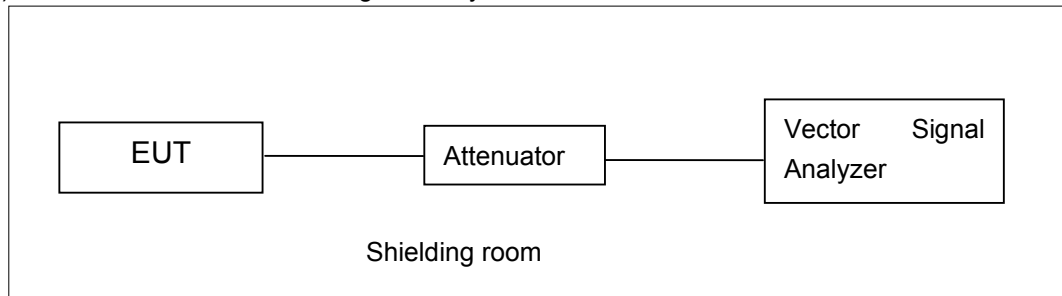
Anechoic chamber by Frankonia German.

## ANNEX A: MEASUREMENT RESULTS

### A.1. Measurement Method

#### A.1.1. Conducted Measurements

- 1). Connect the EUT to the test system correctly.
- 2). Set the EUT to the required work mode.
- 3). Set the EUT to the required channel.
- 4). Set the spectrum analyzer to start measurement.
- 5). Record the values. Vector Signal Analyzer

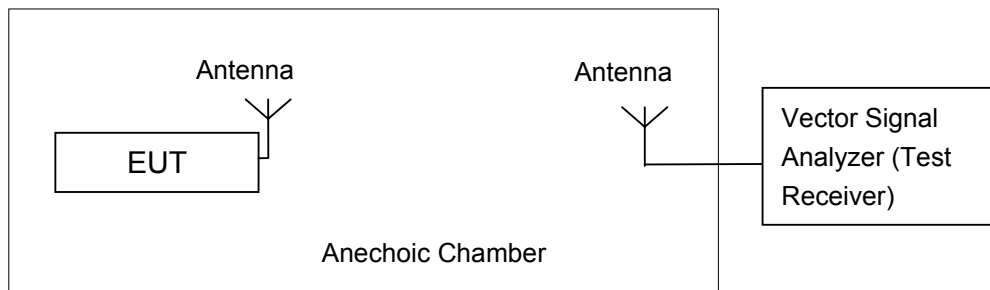


#### A.1.2. Radiated Emission Measurements

In the case of radiated emission, the used settings are as follows,

Sweep frequency from 30 MHz to 1GHz, RBW = 100 kHz, VBW = 300 kHz;

Sweep frequency from 1 GHz to 26GHz, RBW = 1MHz, VBW = 10Hz;



The measurement is made according to ANSI C63.10

## A.2. Maximum Output Power

### Measurement Limit and Method:

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

The measurement is made according to ANSI C63.10, and EUT is operating in continuous transmitting mode.

### Measurement Uncertainty:

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

#### Measurement Results:

#### 802.11b/g mode

Mode	Data Rate (Mbps)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11b	1	19.93	/	/
	2	20.19	/	/
	5.5	21.61	/	/
	11	22.92	23.50	23.75
802.11g	6	22.70	/	/
	9	22.63	/	/
	12	22.47		
	18	22.43	/	/
	24	22.99	23.34	23.56
	36	22.87	/	/
	48	22.91	/	/
	54	22.89	/	/

The data rate 11Mbps and 24Mbps are selected as worse condition, and the following cases are performed with this condition.

#### 802.11n-HT20 mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11n (20MHz)	MCS0	19.52	/	/
	MCS1	19.31	/	/
	MCS2	19.19	/	/
	MCS3	19.10	/	/
	MCS4	19.58	/	/
	MCS5	19.72	20.13	20.60
	MCS6	19.66	/	/



	MCS7	19.65	/	/
--	------	-------	---	---

The data rate MCS5 is selected as worse condition, and the following cases are performed with this condition.

**802.11n-HT40 mode**

Mode	Data Rate (Index)	Test Result (dBm)		
		2422MHz (Ch3)	2437MHz (Ch6)	2452 MHz (Ch9)
802.11n (40MHz)	MCS0	18.40	/	/
	MCS1	18.21	/	/
	MCS2	18.22	/	/
	MCS3	18.48	/	/
	MCS4	18.42	/	/
	MCS5	18.51	18.61	19.00
	MCS6	18.48	/	/
	MCS7	18.43	/	/

The data rate MCS5 is selected as worse condition, and the following cases are performed with this condition.

**Conclusion: PASS**

**A.2.2. Maximum Average Output Power-conducted**

**802.11b/g mode**

Mode	Test Result (dBm)		
	2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11b	16.50	16.93	16.98
802.11g	13.18	13.69	13.87

**802.11n-HT20 mode**

Mode	Test Result (dBm)		
	2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11n (20MHz)	10.98	11.39	11.68

**802.11n-HT40 mode**

Mode	Test Result (dBm)		
	2422MHz (Ch3)	2437MHz (Ch6)	2452 MHz (Ch9)
802.11n (40MHz)	9.32	9.79	10.06

**Conclusion: PASS**

### A.3. Peak Power Spectral Density

**Measurement Limit:**

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

The measurement is made according to ANSI C63.10

**Measurement Uncertainty:**

Measurement Uncertainty	0.75dB
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**Measurement Results:**

**802.11b/g mode**

Mode	Channel	Power Spectral Density ( dBm/3 kHz )		Conclusion
		Fig.	Value	
802.11b	1	Fig.1	-4.31	P
	6	Fig.2	-4.54	P
	11	Fig.3	-4.74	P
802.11g	1	Fig.4	-8.72	P
	6	Fig.5	-6.63	P
	11	Fig.6	-7.97	P

**802.11n-HT20 mode**

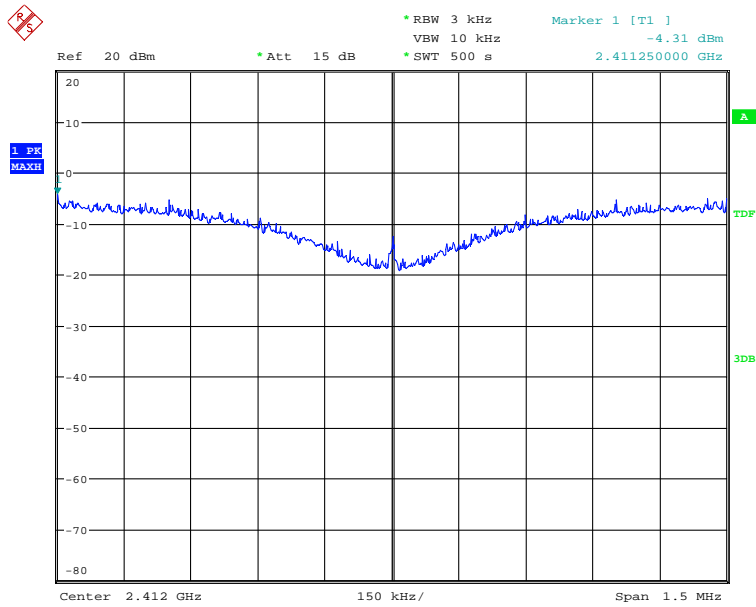
Mode	Channel	Power Spectral Density ( dBm/3 kHz )		Conclusion
		Fig.	Value	
802.11n (20MHz)	1	Fig.7	-12.95	P
	6	Fig.8	-12.87	P
	11	Fig.9	-12.20	P

**802.11n-HT40 mode**

Mode	Channel	Power Spectral Density ( dBm/3 kHz )		Conclusion
		Fig.	Value	
802.11n (40MHz)	3	Fig.10	-17.31	P
	6	Fig.11	-16.04	P
	9	Fig.12	-17.14	P

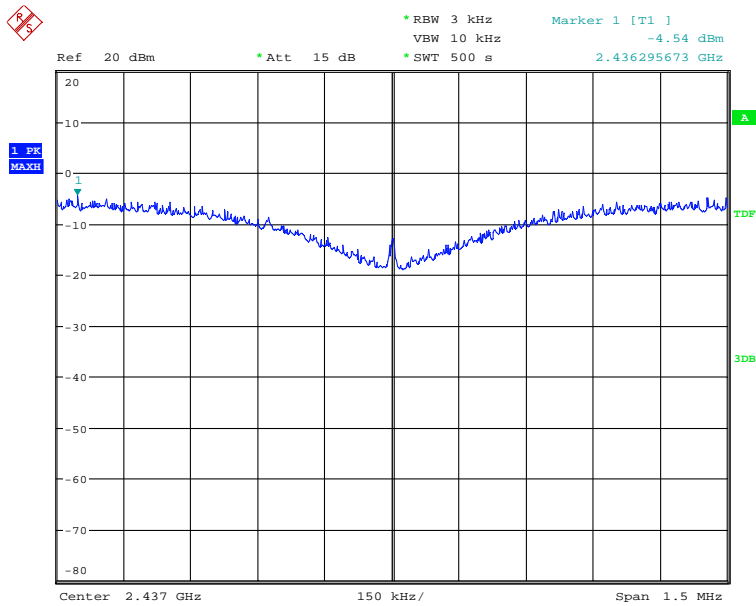
**Conclusion: PASS**

**Test graphs as below:**



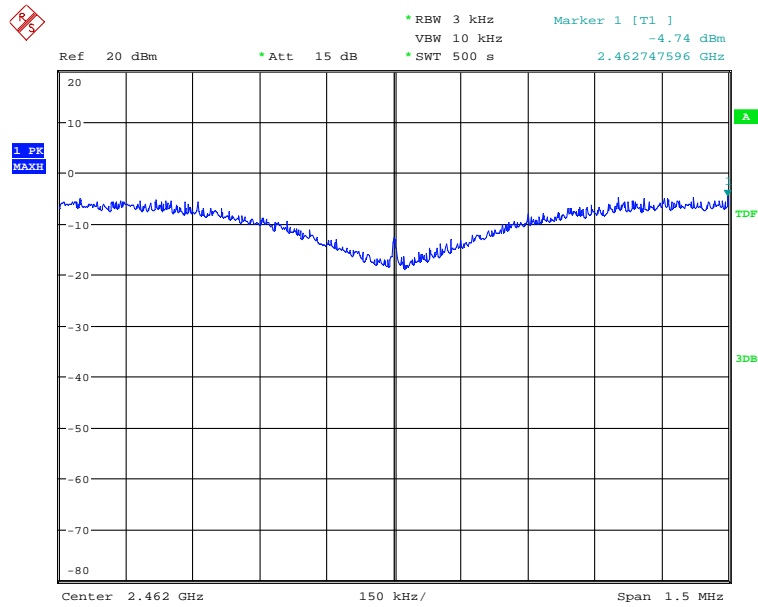
Date: 6.DEC.2012 14:42:00

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



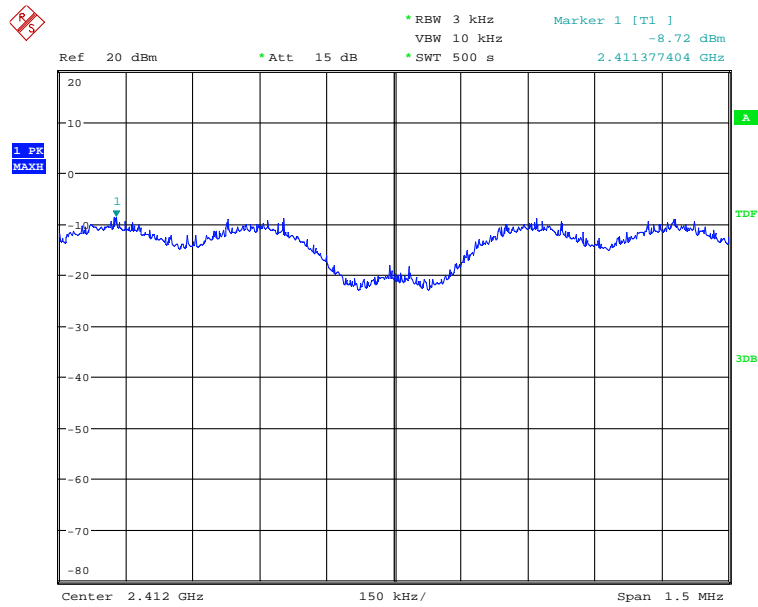
Date: 6.DEC.2012 14:50:43

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



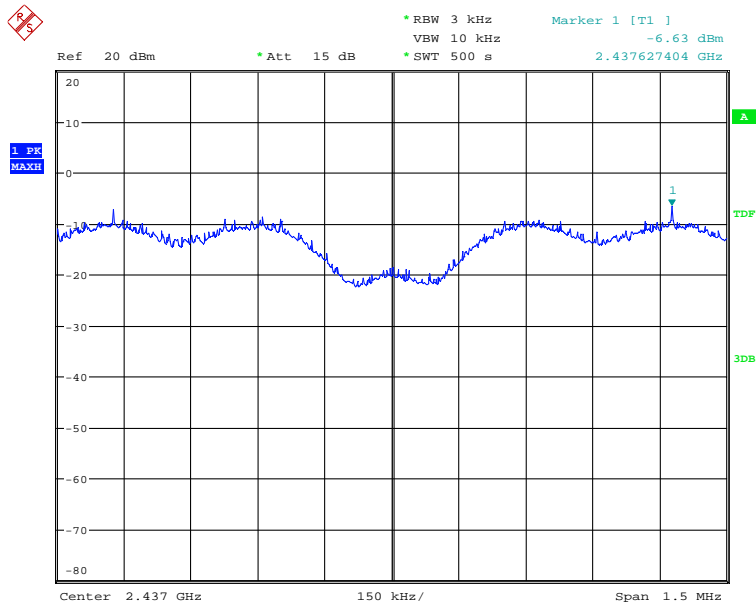
Date: 6.DEC.2012 14:59:43

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



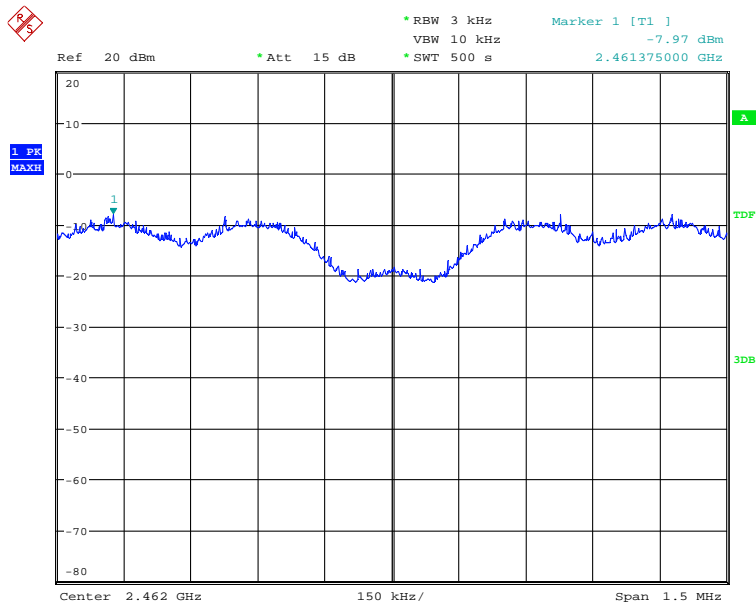
Date: 6.DEC.2012 15:21:08

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



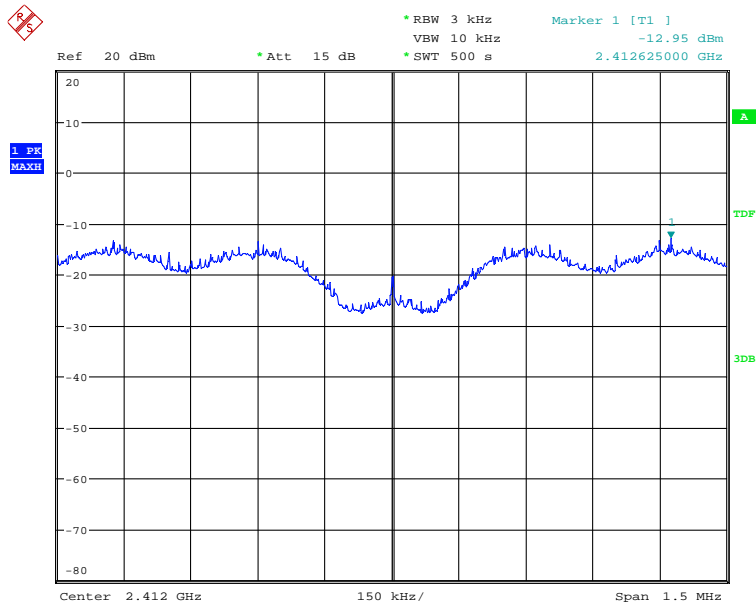
Date: 6.DEC.2012 15:31:01

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



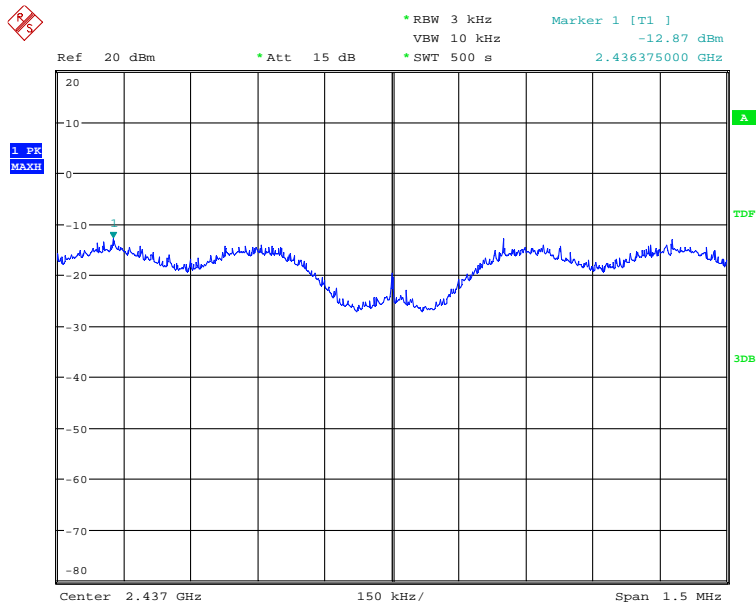
Date: 6.DEC.2012 15:39:44

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



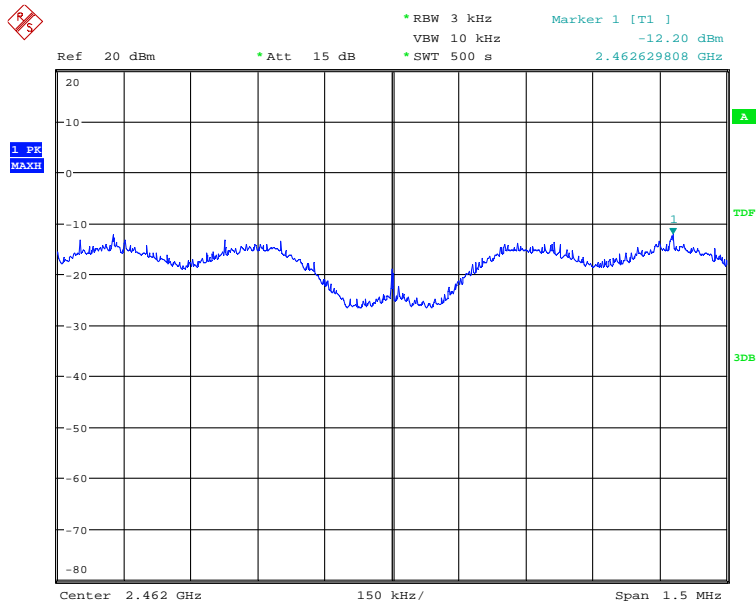
Date: 5.DEC.2012 16:24:53

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



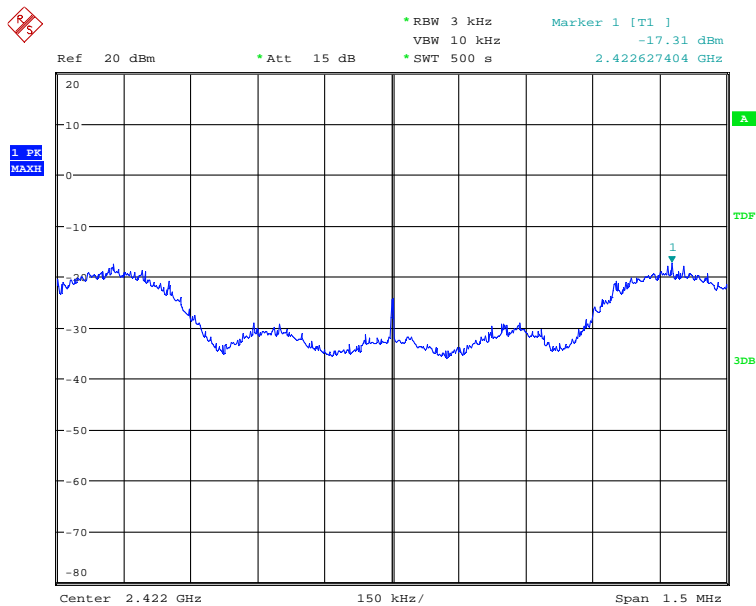
Date: 5.DEC.2012 16:33:42

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



Date: 5.DEC.2012 16:51:46

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



Date: 5.DEC.2012 17:06:03

**Fig. 10 Power Spectral Density (802.11n-40MHz, Ch 3)**





#### A.4. Occupied 6dB Bandwidth

##### Measurement Limit:

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

The measurement is made according to ANSI C63.10

##### 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.13	9936	P
	6	Fig.14	9295	P
	11	Fig.15	9872	P
802.11g	1	Fig.16	16282	P
	6	Fig.17	16282	P
	11	Fig.18	15897	P

##### 802.11n-HT20 mode

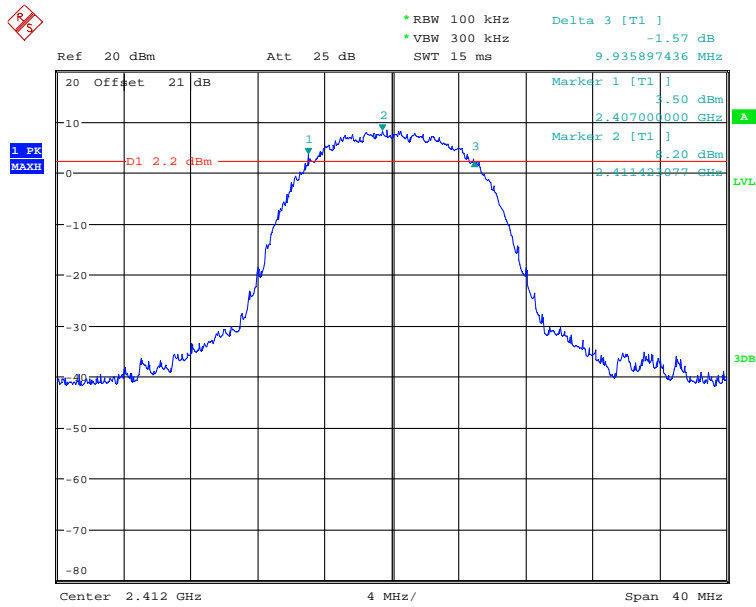
Mode	Channel	Occupied 6dB Bandwidth ( kHz)		conclusion
802.11n (20MHz)	1	Fig.19	17692	P
	6	Fig.20	17692	P
	11	Fig.21	17821	P

##### 802.11n-HT40 mode

Mode	Channel	Occupied 6dB Bandwidth ( kHz)		conclusion
802.11n (40MHz)	3	Fig.22	35769	P
	6	Fig.23	35897	P
	9	Fig.24	35769	P

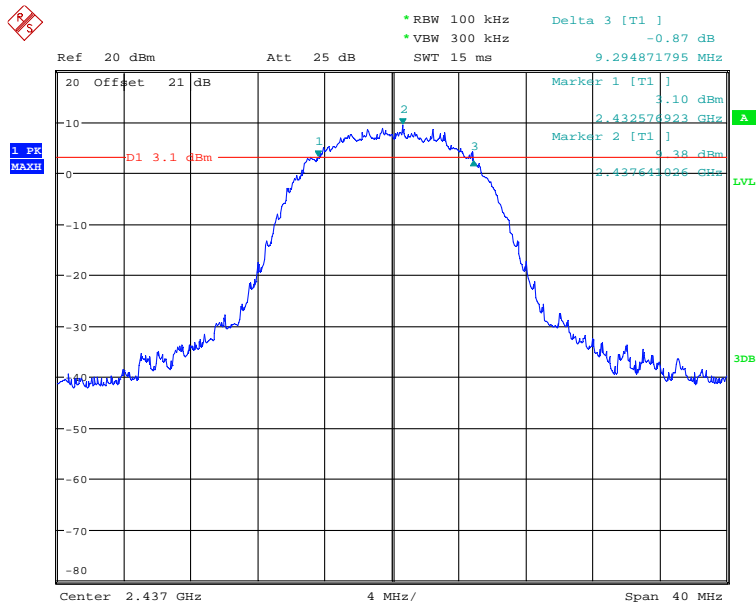
**Conclusion: PASS**

**Test graphs as below:**



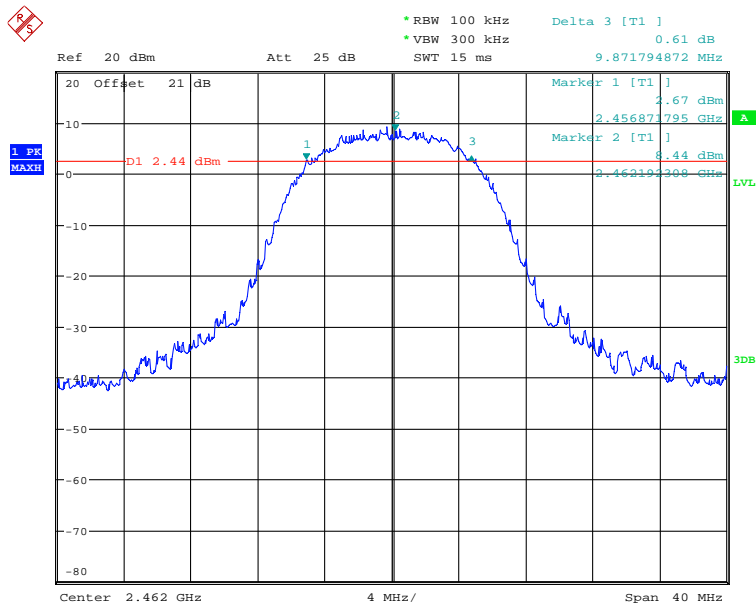
Date: 6.DEC.2012 15:51:09

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



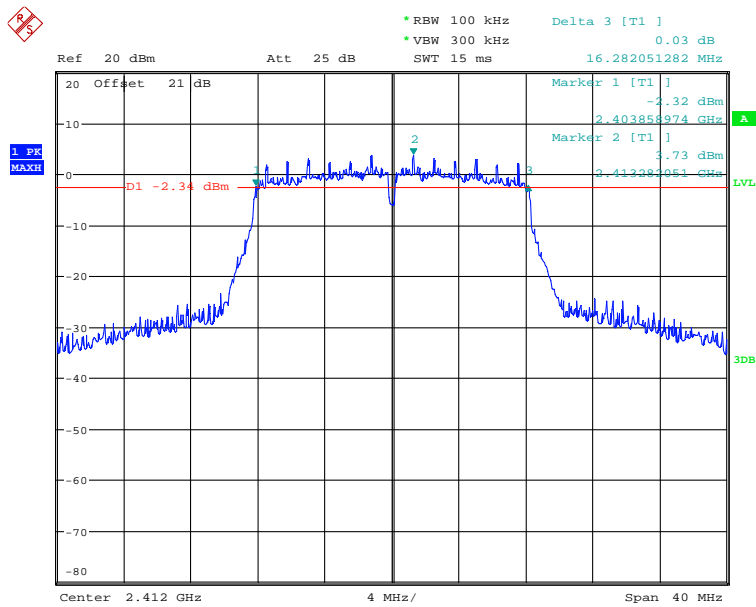
Date: 6.DEC.2012 15:52:42

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



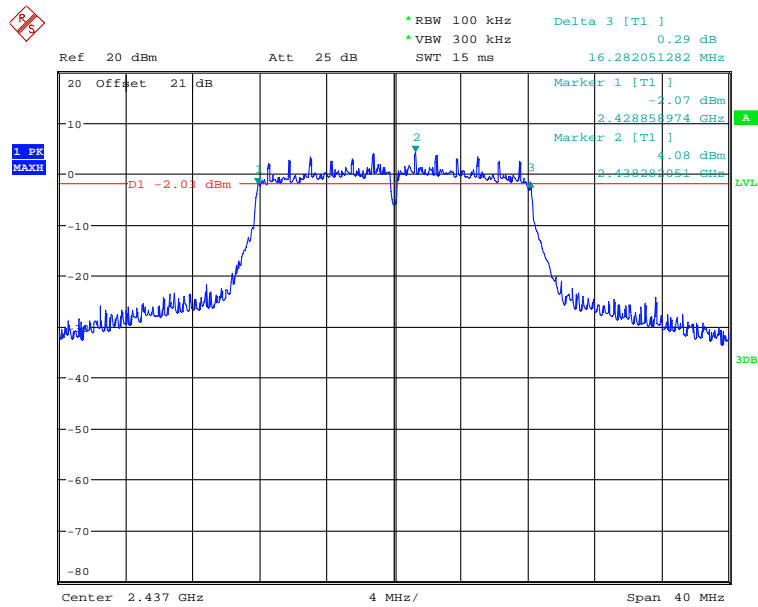
Date: 6.DEC.2012 15:54:14

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



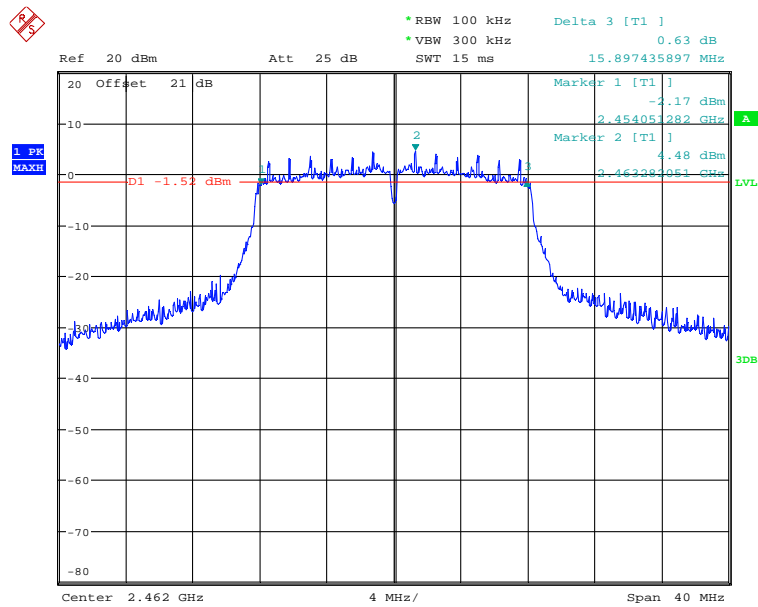
Date: 6.DEC.2012 15:56:11

Fig. 16 Occupied 6dB Bandwidth (802.11g, Ch 1)



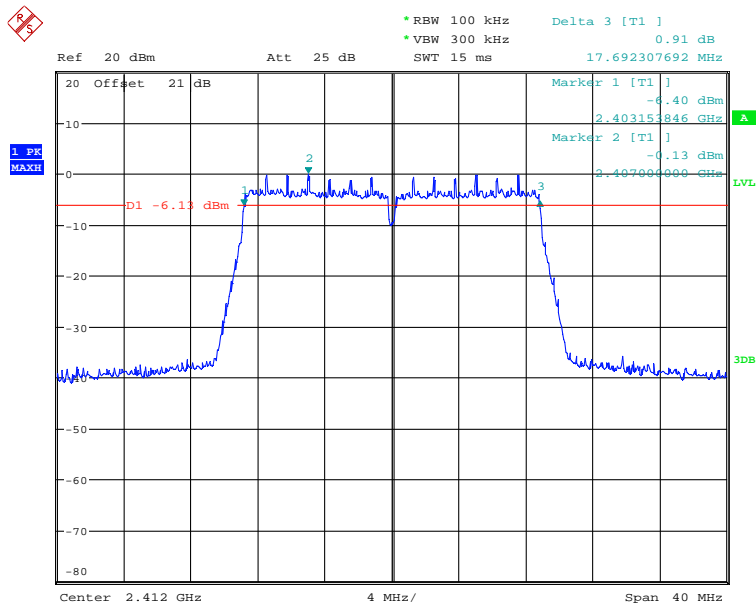
Date: 6.DEC.2012 15:57:37

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



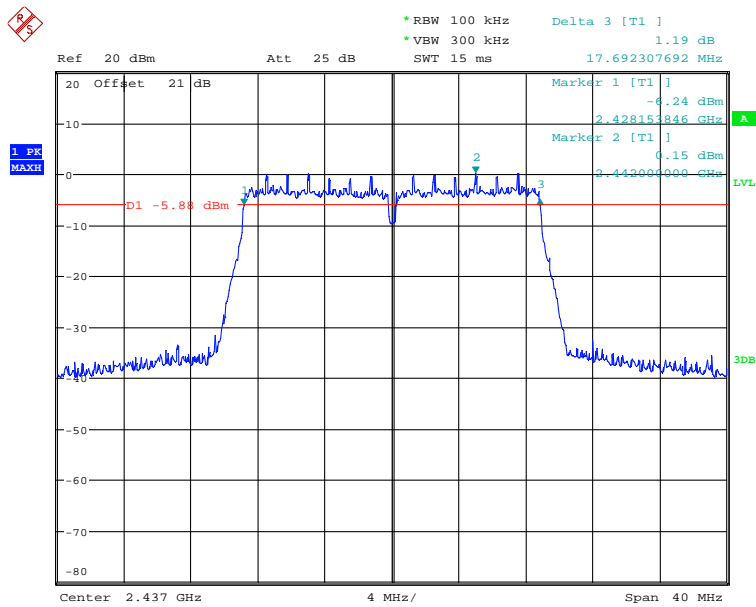
Date: 6.DEC.2012 16:02:47

**Fig. 18 Occupied 6dB Bandwidth (802.11g, Ch 11)**



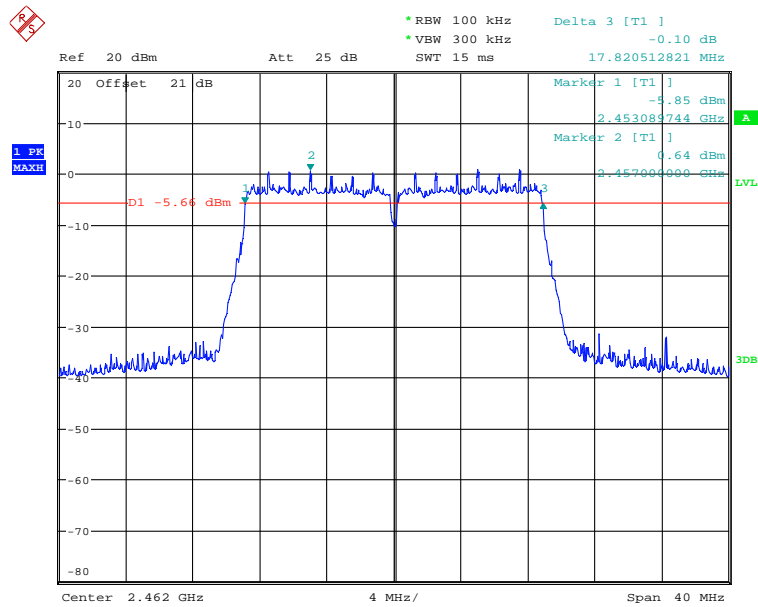
Date: 6.DEC.2012 16:07:16

**Fig. 19 Occupied 6dB Bandwidth (802.11n-20MHz, Ch 1)**



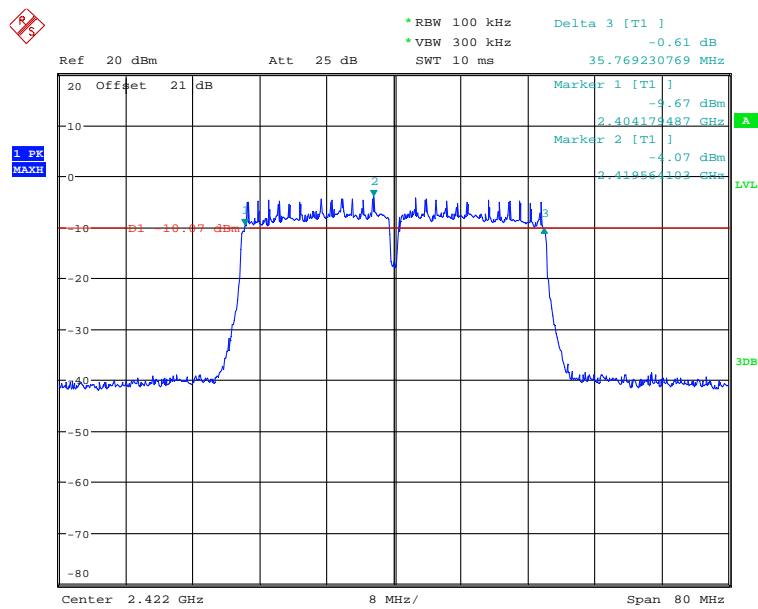
Date: 6.DEC.2012 16:12:11

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



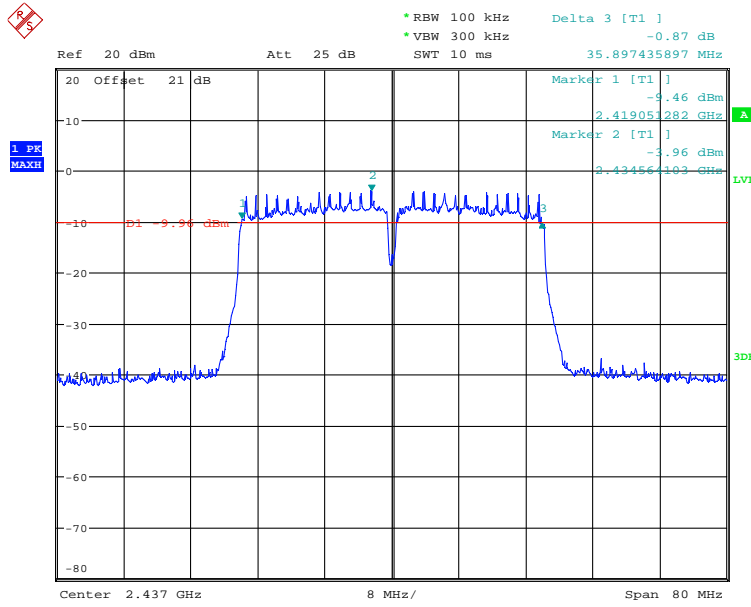
Date: 6.DEC.2012 16:15:10

**Fig. 21 Occupied 6dB Bandwidth (802.11n-20MHz, Ch 11)**



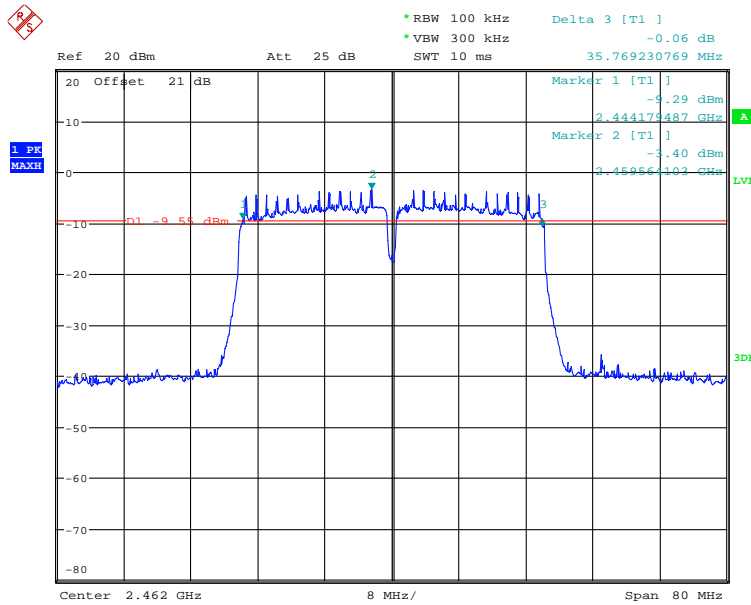
Date: 6.DEC.2012 16:17:04

**Fig. 22 Occupied 6dB Bandwidth (802.11n-40MHz, Ch 3)**



Date: 6.DEC.2012 16:18:22

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



Date: 6.DEC.2012 16:19:36

**Fig. 24 Occupied 6dB Bandwidth (802.11n-40MHz, Ch 9)**



## A.5. Band Edges Compliance

### Measurement Limit:

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

The measurement is made according to ANSI C63.10

### Measurement Uncertainty:

Measurement Uncertainty	0.75dB
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### Measurement Result:

#### 802.11b/g mode

Mode	Channel	Test Results	Conclusion
802.11b	1	Fig.25	P
	11	Fig.26	P
802.11g	1	Fig.27	P
	11	Fig.28	P

#### 802.11n-HT20 mode

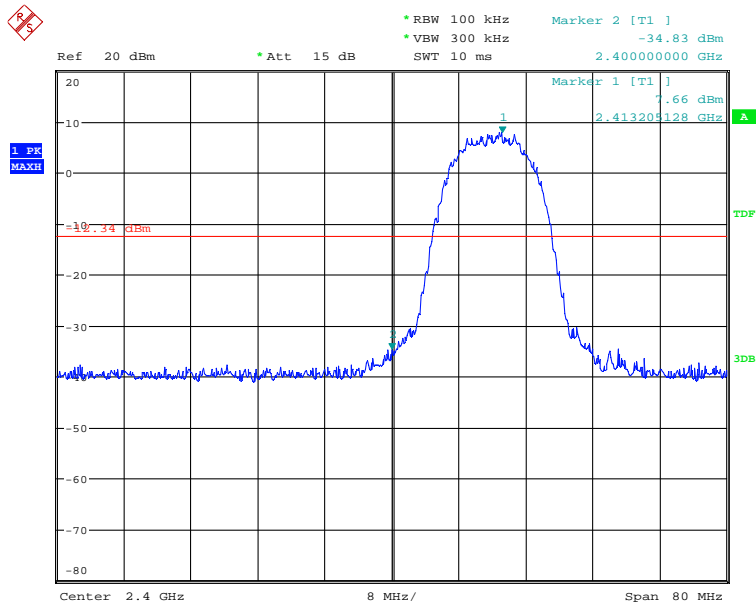
Mode	Channel	Test Results	Conclusion
802.11n (20MHz)	1	Fig.29	P
	11	Fig.30	P

#### 802.11n-HT40 mode

Mode	Channel	Test Results	Conclusion
802.11n (40MHz)	3	Fig.31	P
	9	Fig.32	P

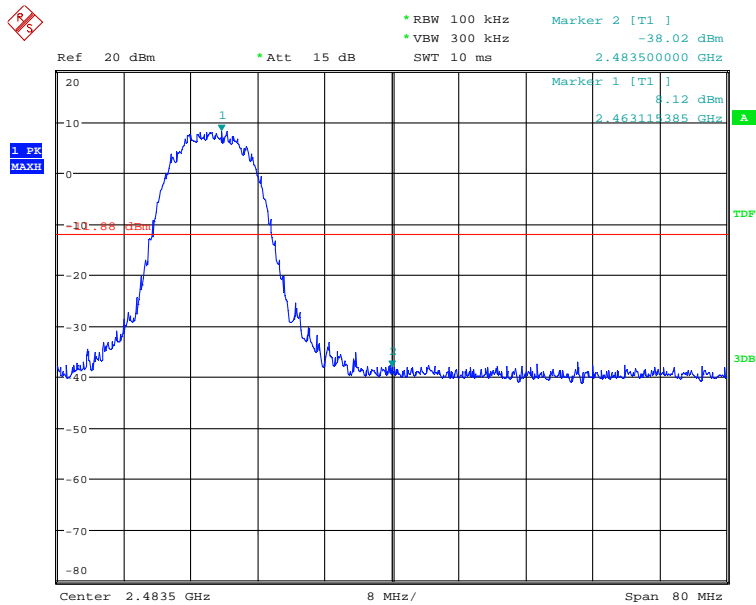
**Conclusion: PASS**

Test graphs as below:



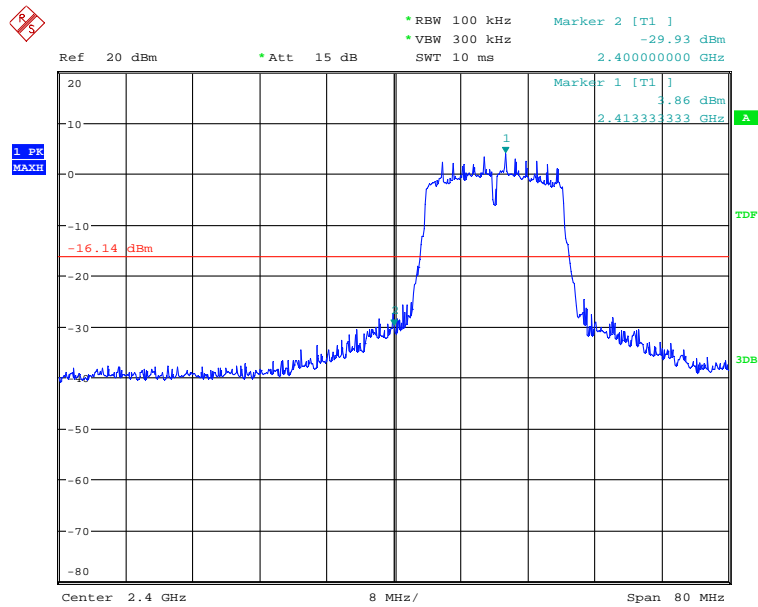
Date: 5.DEC.2012 19:09:33

**Fig. 25 Band Edges (802.11b, Ch 1)**



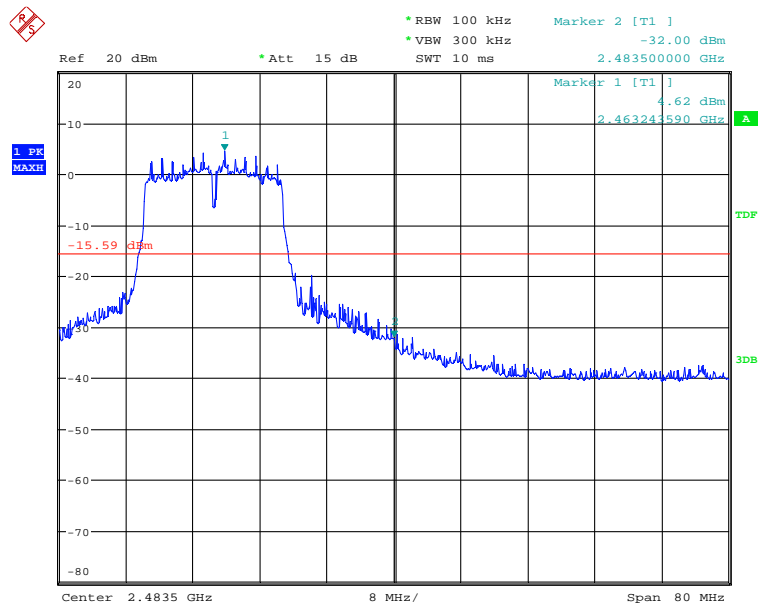
Date: 5.DEC.2012 19:09:58

**Fig. 26 Band Edges (802.11b, Ch 11)**



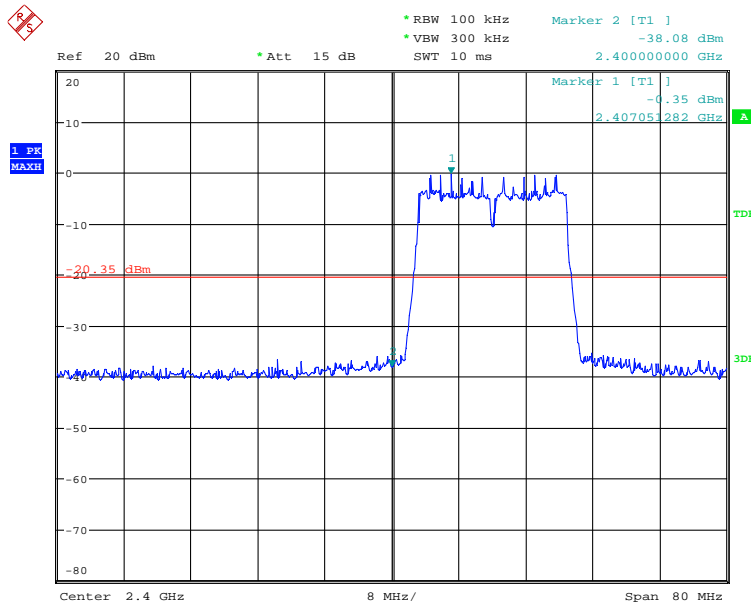
Date: 5.DEC.2012 19:10:32

**Fig. 27 Band Edges (802.11g, Ch 1)**



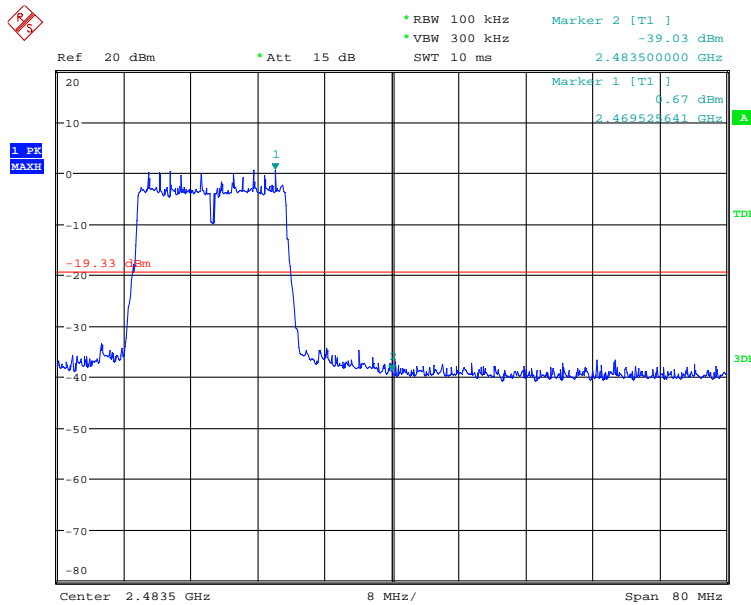
Date: 5.DEC.2012 19:10:54

**Fig. 28 Band Edges (802.11g, Ch 11)**



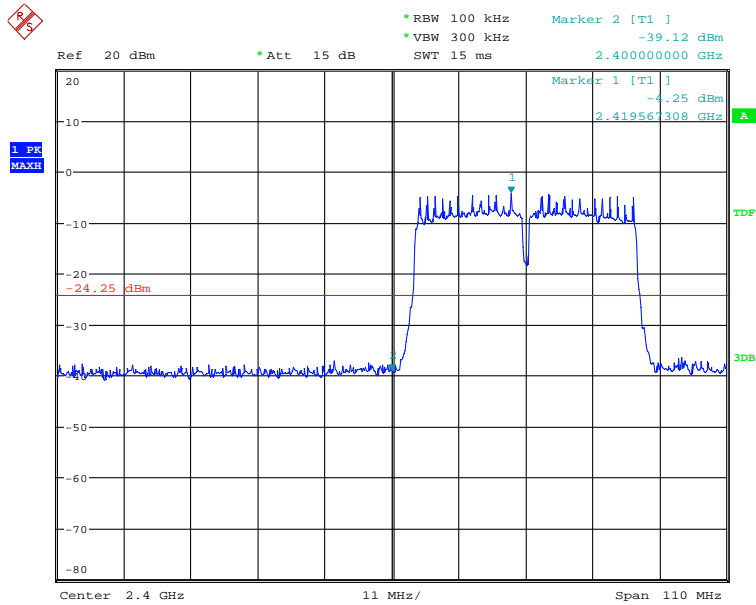
Date: 5.DEC.2012 19:11:34

Fig. 29 Band Edges (802.11n-20MHz, Ch 1)



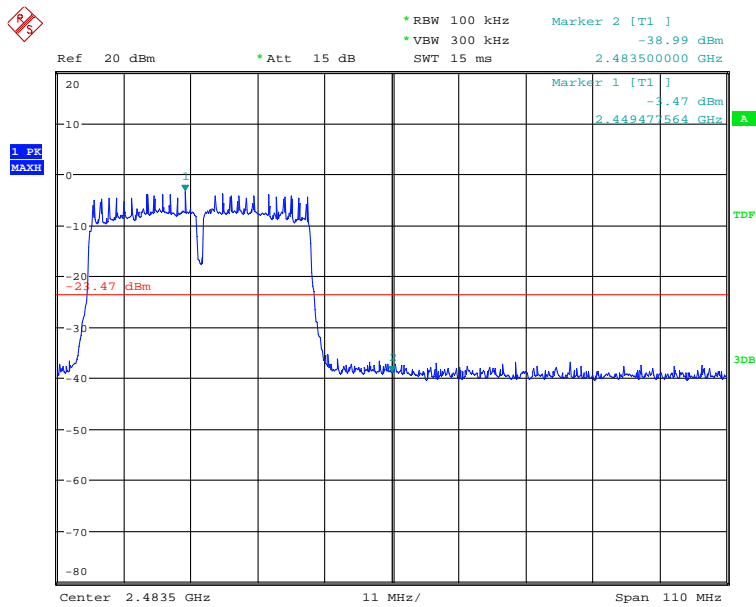
Date: 5.DEC.2012 19:11:55

Fig. 30 Band Edges (802.11n-20MHz, Ch 11)



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

Fig. 31 Band Edges (802.11n-40MHz, Ch 3)



Date: 5.DEC.2012 19:12:37

Fig. 32 Band Edges (802.11n-40MHz, Ch 9)

## A.6. Transmitter Spurious Emission

### A.6.1 Transmitter Spurious Emission - Conducted

#### Measurement Limit:

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

The measurement is made according to ANSI C63.10

#### Measurement Uncertainty:

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

#### Measurement Results:

##### 802.11b/g mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11b	1	2.412 GHz	Fig.33	P
		30 MHz ~ 1 GHz	Fig.34	P
		1 GHz ~ 2.5 GHz	Fig.35	P
		2.5 GHz ~ 7.5 GHz	Fig.36	P
		7.5 GHz ~ 10 GHz	Fig.37	P
		10 GHz ~ 15 GHz	Fig.38	P
		15 GHz ~ 20 GHz	Fig.39	P
		20 GHz ~ 26 GHz	Fig.40	P
	6	2.437 GHz	Fig.41	P
		30 MHz ~ 1 GHz	Fig.42	P
		1 GHz ~ 2.5 GHz	Fig.43	P
		2.5 GHz ~ 7.5 GHz	Fig.44	P
		7.5 GHz ~ 10 GHz	Fig.45	P
		10 GHz ~ 15 GHz	Fig.46	P
		15 GHz ~ 20 GHz	Fig.47	P
		20 GHz ~ 26 GHz	Fig.48	P
	11	2.462 GHz	Fig.49	P
		30 MHz ~ 1 GHz	Fig.50	P
		1 GHz ~ 2.5 GHz	Fig.51	P
		2.5 GHz ~ 7.5 GHz	Fig.52	P

		7.5 GHz ~ 10 GHz	Fig.53	P
		10 GHz ~ 15 GHz	Fig.54	P
		15 GHz ~ 20 GHz	Fig.55	P
		20 GHz ~ 26 GHz	Fig.56	P
802.11g	1	2.412 GHz	Fig.57	P
		30 MHz ~ 1 GHz	Fig.58	P
		1 GHz ~ 2.5 GHz	Fig.59	P
		2.5 GHz ~ 7.5 GHz	Fig.60	P
		7.5 GHz ~ 10 GHz	Fig.61	P
		10 GHz ~ 15 GHz	Fig.62	P
		15 GHz ~ 20 GHz	Fig.63	P
		20 GHz ~ 26 GHz	Fig.64	P
	6	2.437 GHz	Fig.65	P
		30 MHz ~ 1 GHz	Fig.66	P
		1 GHz ~ 2.5 GHz	Fig.67	P
		2.5 GHz ~ 7.5 GHz	Fig.68	P
		7.5 GHz ~ 10 GHz	Fig.69	P
		10 GHz ~ 15 GHz	Fig.70	P
		15 GHz ~ 20 GHz	Fig.71	P
		20 GHz ~ 26 GHz	Fig.72	P
	11	2.462 GHz	Fig.73	P
		30 MHz ~ 1 GHz	Fig.74	P
		1 GHz ~ 2.5 GHz	Fig.75	P
		2.5 GHz ~ 7.5 GHz	Fig.76	P
		7.5 GHz ~ 10 GHz	Fig.77	P
		10 GHz ~ 15 GHz	Fig.78	P
		15 GHz ~ 20 GHz	Fig.79	P
		20 GHz ~ 26 GHz	Fig.80	P

**802.11n-HT20 mode**

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11n (20MHz)	1	2.412 GHz	Fig.81	P
		30 MHz ~ 1 GHz	Fig.82	P
		1 GHz ~ 2.5 GHz	Fig.83	P
		2.5 GHz ~ 7.5 GHz	Fig.84	P
		7.5 GHz ~ 10 GHz	Fig.85	P
		10 GHz ~ 15 GHz	Fig.86	P
		15 GHz ~ 20 GHz	Fig.87	P
		20 GHz ~ 26 GHz	Fig.88	P
	6	2.437 GHz	Fig.89	P
		30 MHz ~ 1 GHz	Fig.90	P
		1 GHz ~ 2.5 GHz	Fig.91	P
		2.5 GHz ~ 7.5 GHz	Fig.92	P
		7.5 GHz ~ 10 GHz	Fig.93	P
		10 GHz ~ 15 GHz	Fig.94	P
		15 GHz ~ 20 GHz	Fig.95	P
		20 GHz ~ 26 GHz	Fig.96	P
	11	2.462 GHz	Fig.97	P
		30 MHz ~ 1 GHz	Fig.98	P
		1 GHz ~ 2.5 GHz	Fig.99	P
		2.5 GHz ~ 7.5 GHz	Fig.100	P
		7.5 GHz ~ 10 GHz	Fig.101	P
		10 GHz ~ 15 GHz	Fig.102	P
		15 GHz ~ 20 GHz	Fig.103	P
		20 GHz ~ 26 GHz	Fig.104	P

**802.11n-HT40 mode**

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11n (40MHz)	3	2.422 GHz	Fig.105	P
		30 MHz ~ 1 GHz	Fig.106	P
		1 GHz ~ 2.5 GHz	Fig.107	P
		2.5 GHz ~ 7.5 GHz	Fig.108	P
		7.5 GHz ~ 10 GHz	Fig.109	P
		10 GHz ~ 15 GHz	Fig.110	P
		15 GHz ~ 20 GHz	Fig.111	P
		20 GHz ~ 26 GHz	Fig.112	P
	6	2.437 GHz	Fig.113	P
		30 MHz ~ 1 GHz	Fig.114	P
		1 GHz ~ 2.5 GHz	Fig.115	P
		2.5 GHz ~ 7.5 GHz	Fig.116	P
		7.5 GHz ~ 10 GHz	Fig.117	P
		10 GHz ~ 15 GHz	Fig.118	P

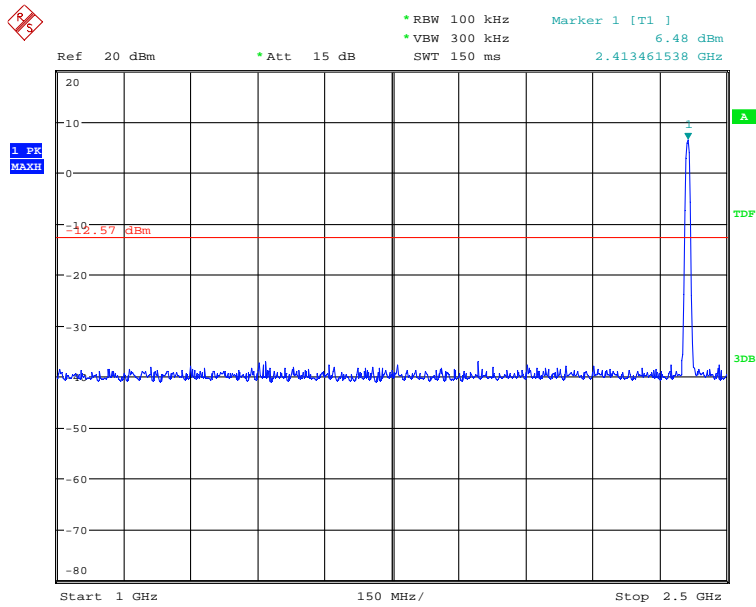


		15 GHz ~ 20 GHz	Fig.119	P
		20 GHz ~ 26 GHz	Fig.120	P
	9	2.452 GHz	Fig.121	P
		30 MHz ~ 1 GHz	Fig.122	P
		1 GHz ~ 2.5 GHz	Fig.123	P
		2.5 GHz ~ 7.5 GHz	Fig.124	P
		7.5 GHz ~ 10 GHz	Fig.125	P
		10 GHz ~ 15 GHz	Fig.126	P
		15 GHz ~ 20 GHz	Fig.127	P
		20 GHz ~ 26 GHz	Fig.128	P

**Conclusion: PASS**

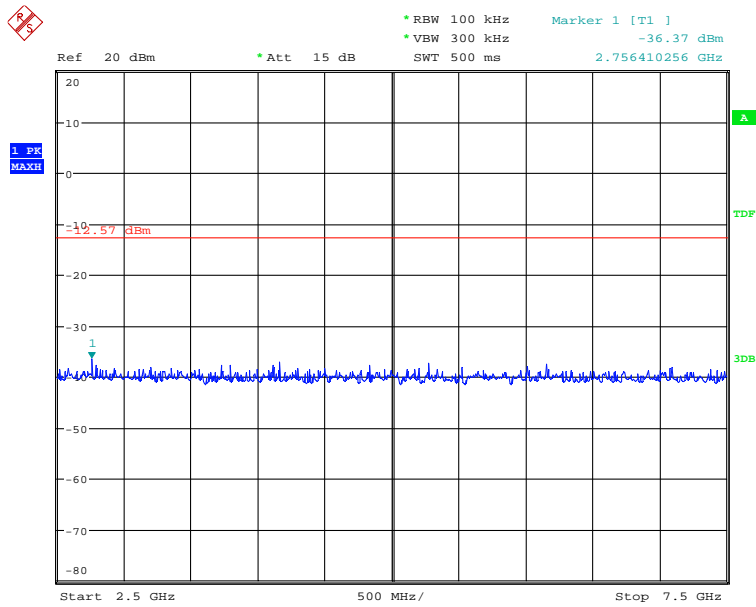
**Test graphs as below:**





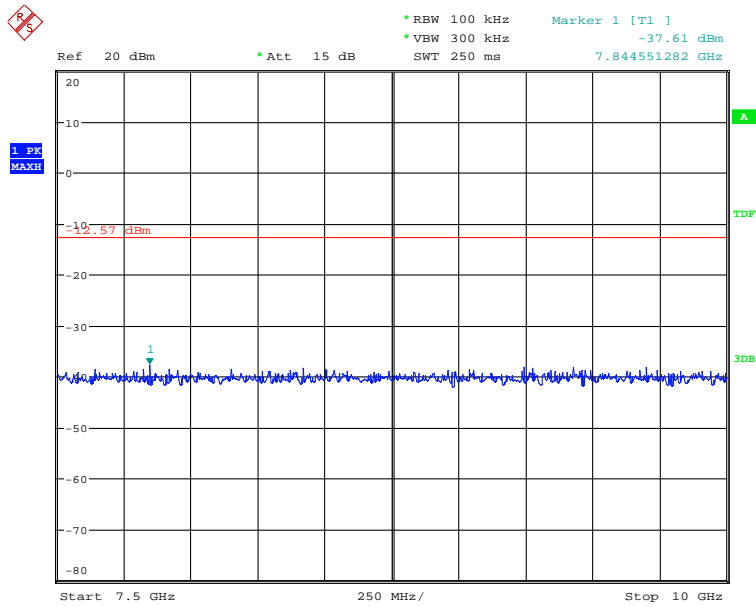
Date: 6.DEC.2012 09:46:25

Fig. 35 Conducted Spurious Emission (802.11b, Ch1, 1 GHz-2.5 GHz)



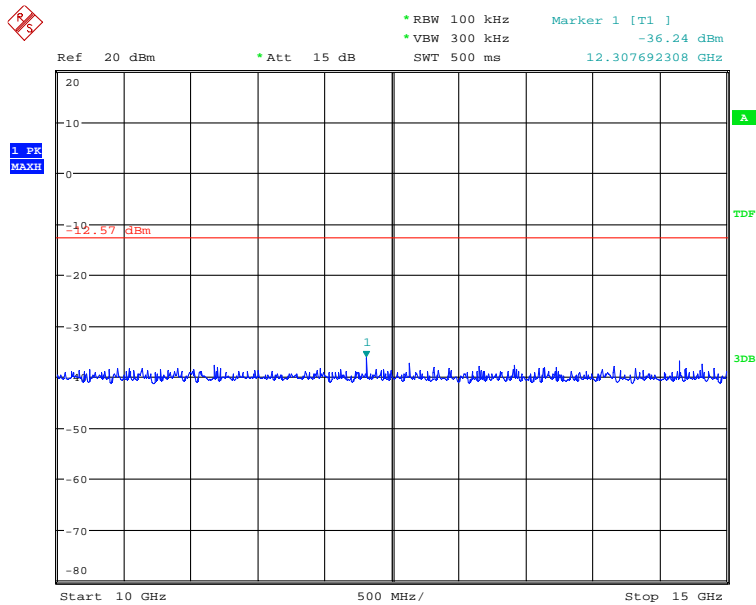
Date: 6.DEC.2012 09:46:32

Fig. 36 Conducted Spurious Emission (802.11b, Ch1, 2.5 GHz-7.5 GHz)



Date: 6.DEC.2012 09:46:39

**Fig. 37 Conducted Spurious Emission (802.11b, Ch1, 7.5 GHz-10 GHz)**

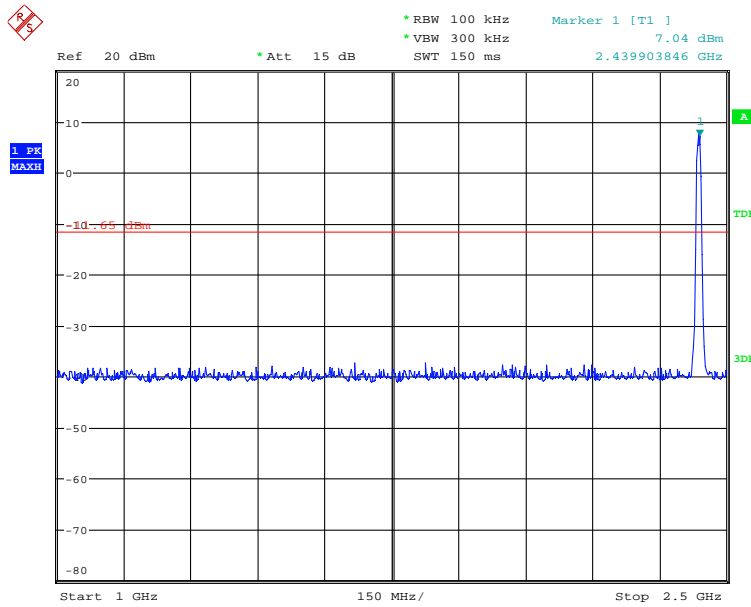


Date: 6.DEC.2012 09:46:45

**Fig. 38 Conducted Spurious Emission (802.11b, Ch1, 10 GHz-15 GHz)**

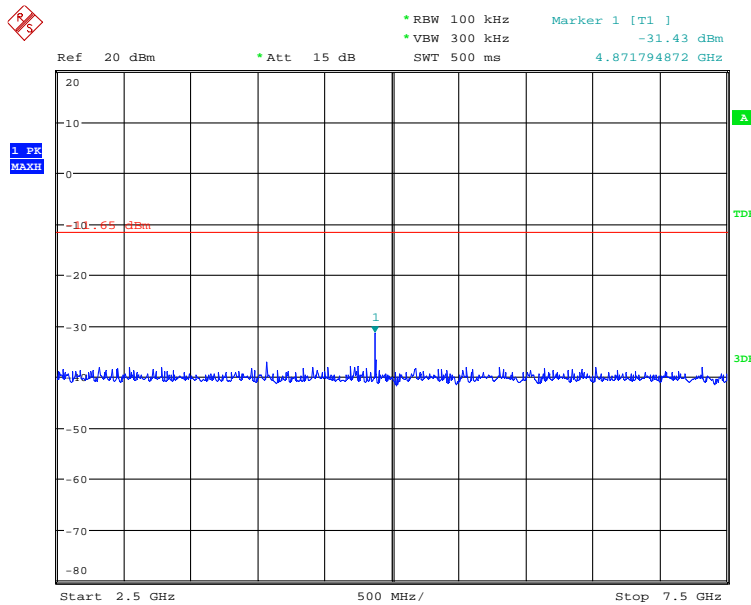






Date: 6.DEC.2012 09:47:30

**Fig. 43 Conducted Spurious Emission (802.11b, Ch6, 1 GHz-2.5 GHz)**



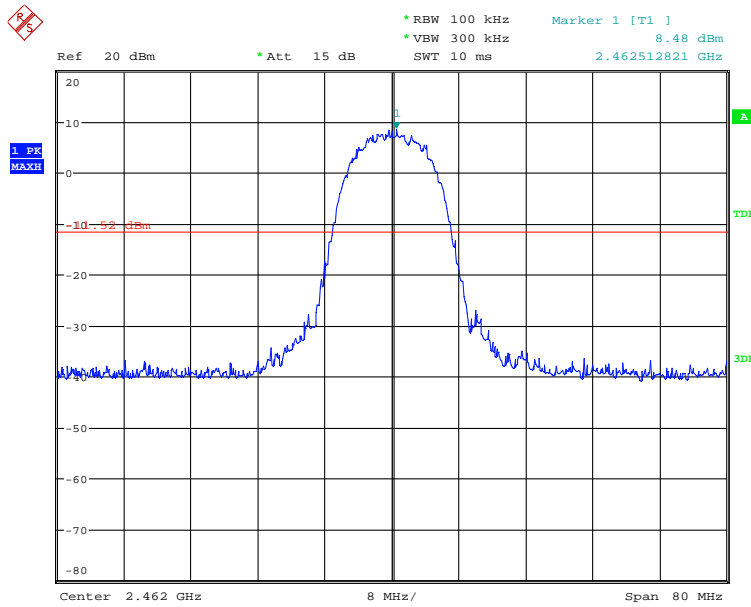
Date: 6.DEC.2012 09:47:36

**Fig. 44 Conducted Spurious Emission (802.11b, Ch6, 2.5 GHz-7.5 GHz)**



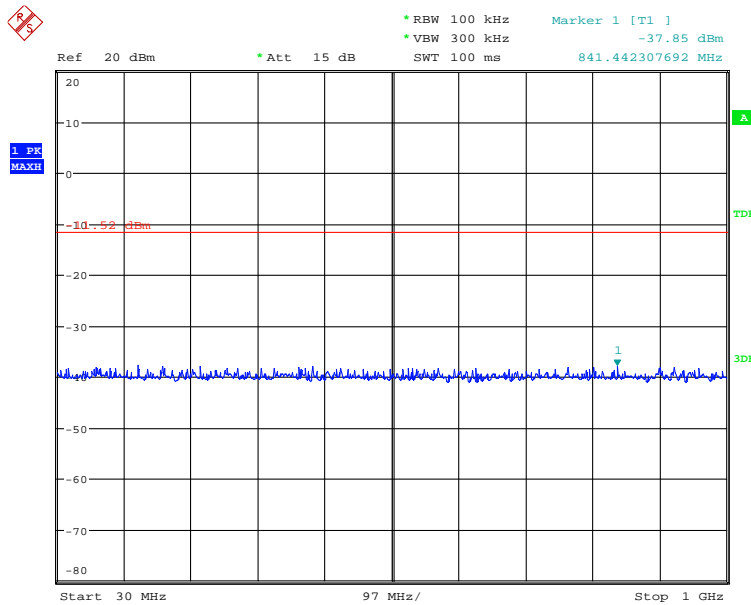






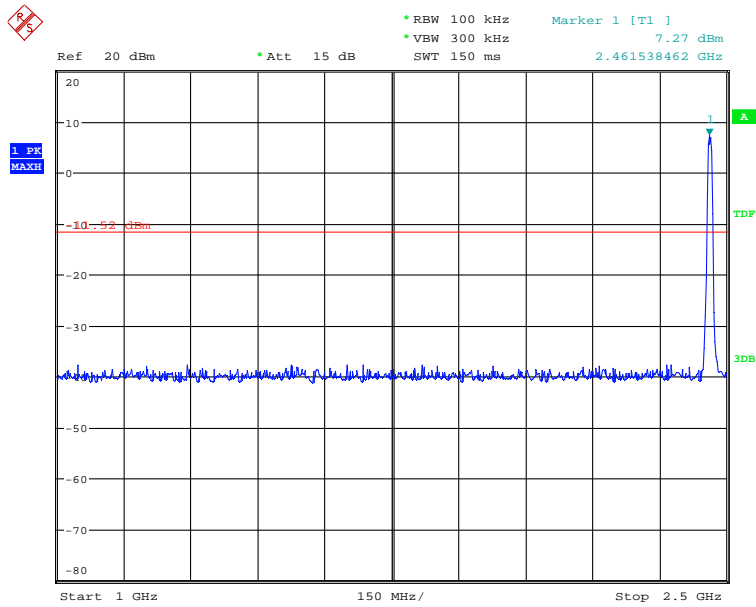
Date: 6.DEC.2012 09:48:22

Fig. 49 Conducted Spurious Emission (802.11b, Ch11, Center Frequency)



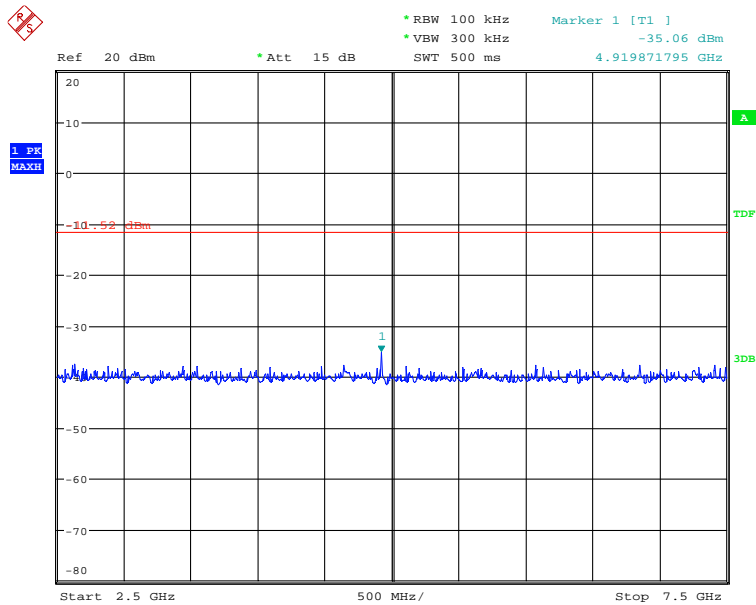
Date: 6.DEC.2012 09:48:29

Fig. 50 Conducted Spurious Emission (802.11b, Ch11, 30 MHz-1 GHz)



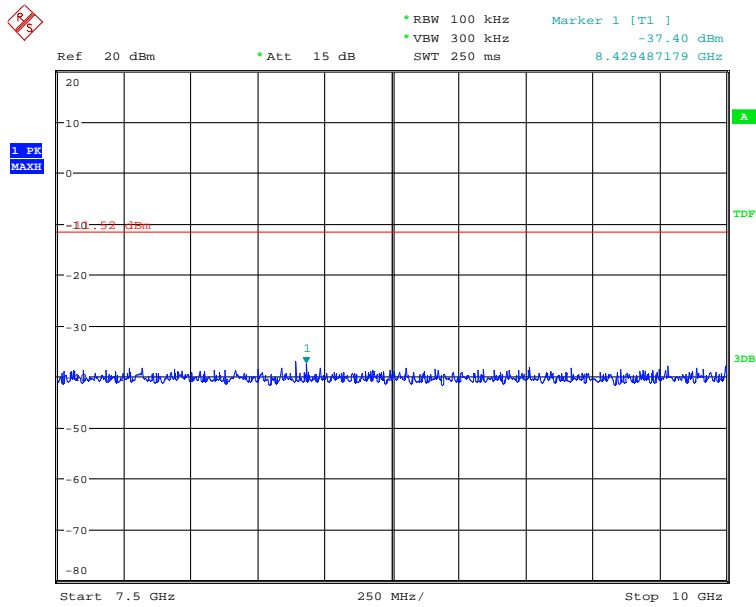
Date: 6.DEC.2012 09:48:36

Fig. 51 Conducted Spurious Emission (802.11b, Ch11, 1 GHz-2.5 GHz)



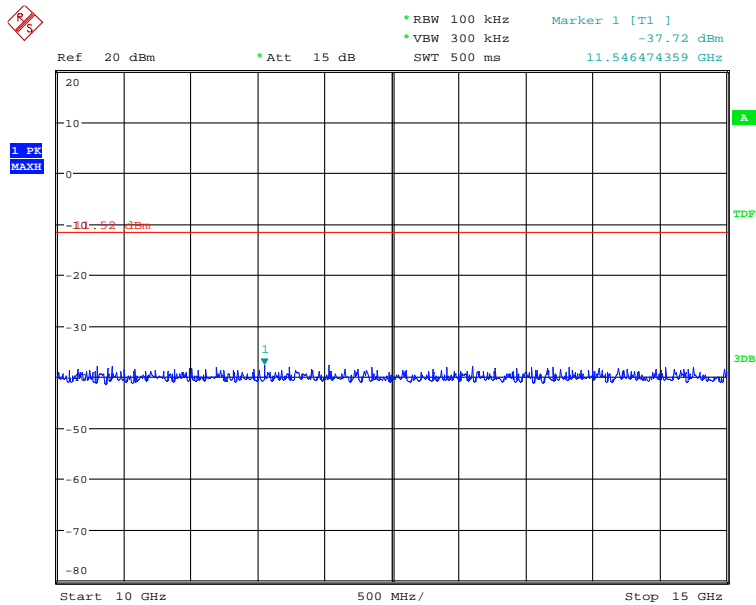
Date: 6.DEC.2012 09:48:42

Fig. 52 Conducted Spurious Emission (802.11b, Ch11, 2.5 GHz-7.5 GHz)



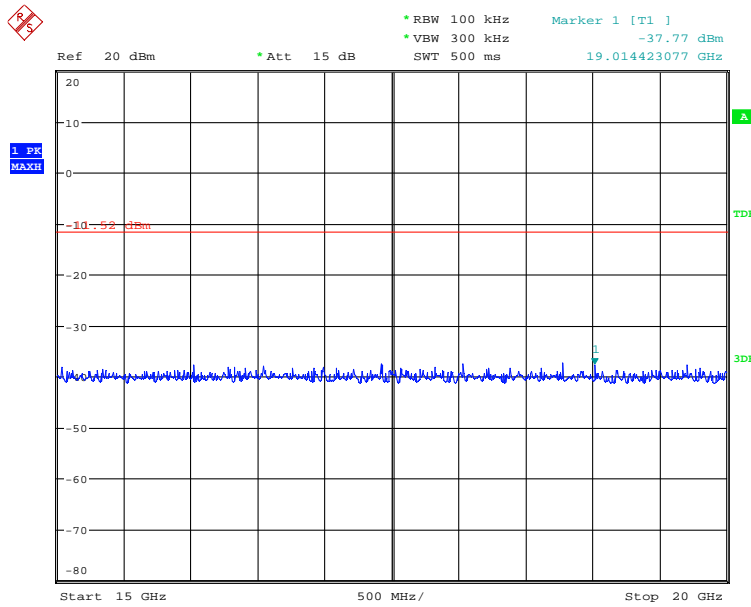
Date: 6.DEC.2012 09:48:49

Fig. 53 Conducted Spurious Emission (802.11b, Ch11, 7.5 GHz-10 GHz)



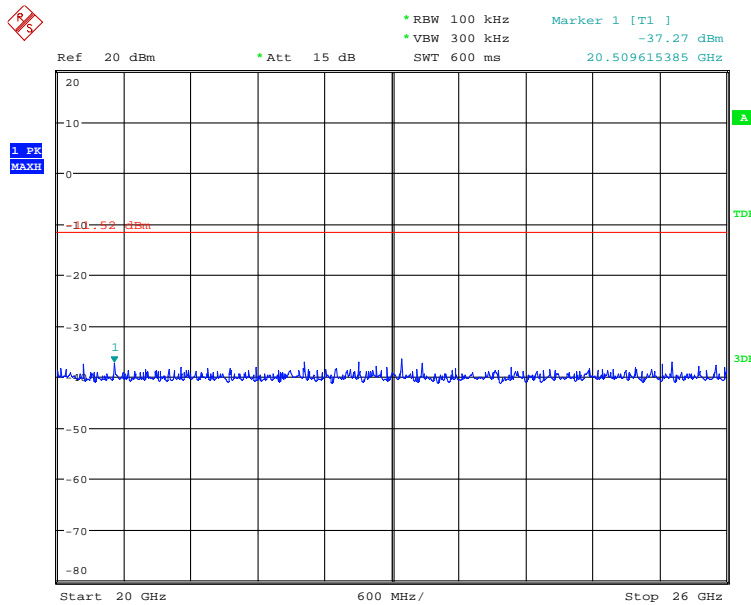
Date: 6.DEC.2012 09:48:56

Fig. 54 Conducted Spurious Emission (802.11b, Ch11, 10 GHz-15 GHz)



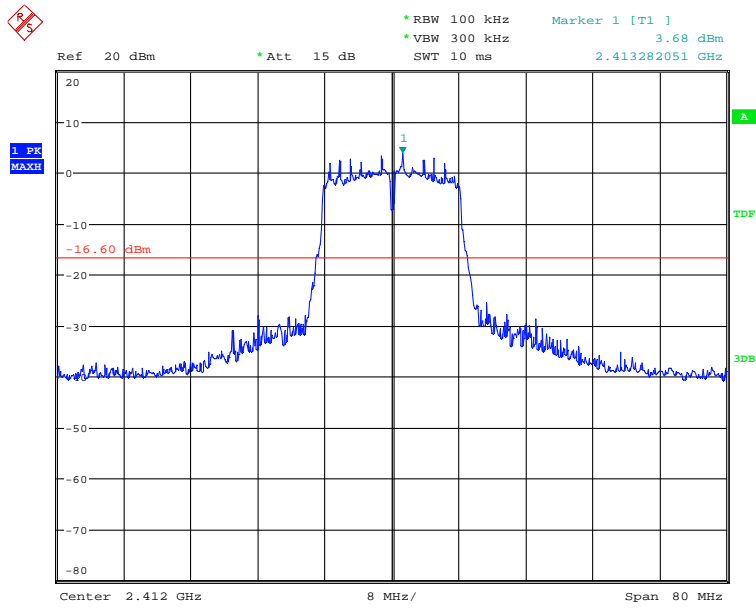
Date: 6.DEC.2012 09:49:02

Fig. 55 Conducted Spurious Emission (802.11b, Ch11, 15 GHz-20 GHz)



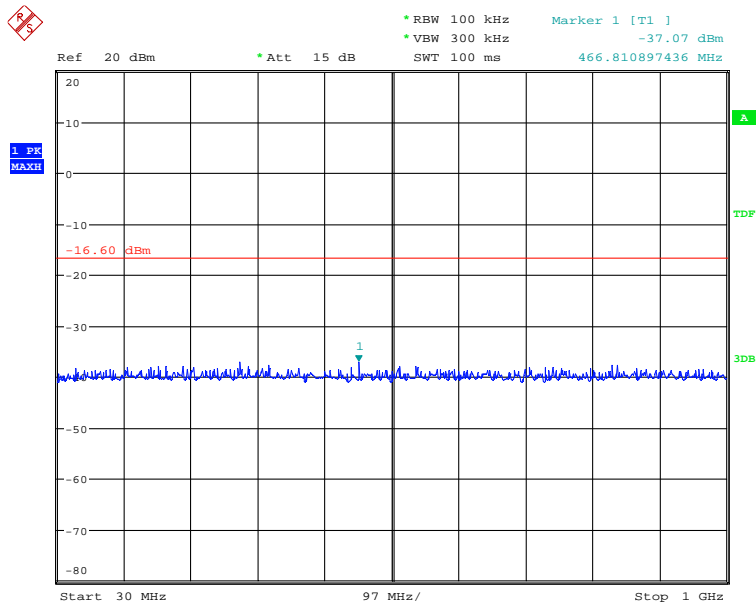
Date: 6.DEC.2012 09:49:09

Fig. 56 Conducted Spurious Emission (802.11b, Ch11, 20 GHz-26 GHz)



Date: 6.DEC.2012 09:49:43

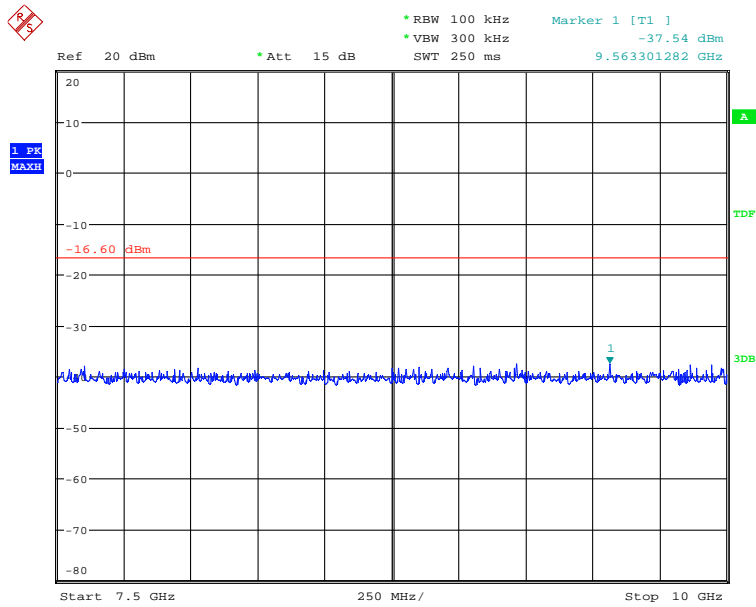
Fig. 57 Conducted Spurious Emission (802.11g, Ch1, Center Frequency)



Date: 6.DEC.2012 09:49:49

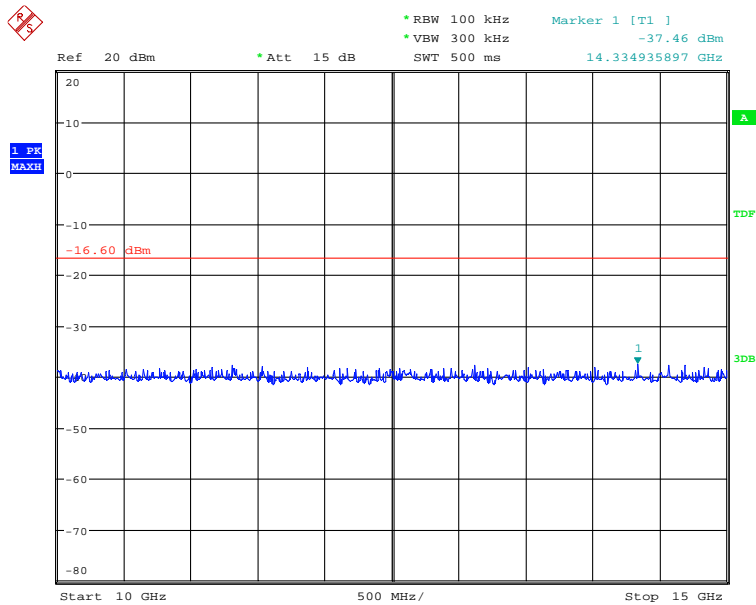
Fig. 58 Conducted Spurious Emission (802.11g, Ch1, 30 MHz-1 GHz)





Date: 6.DEC.2012 09:50:09

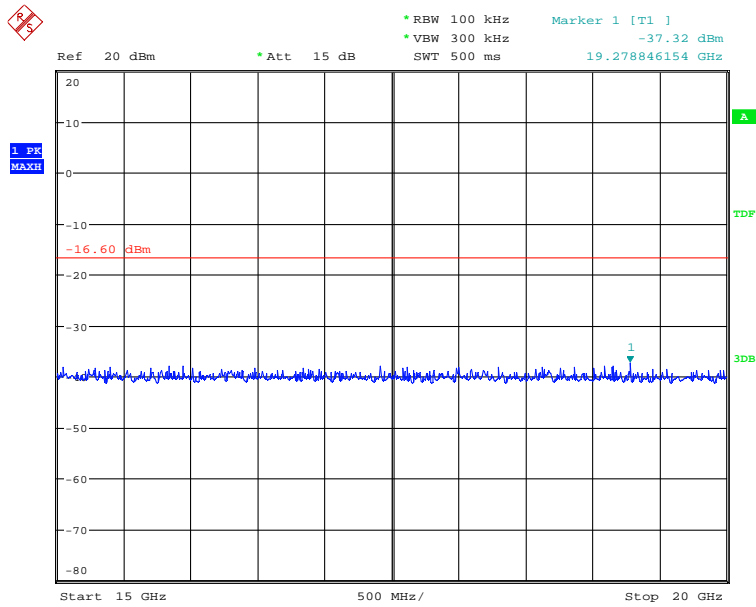
Fig. 61 Conducted Spurious Emission (802.11g, Ch1, 7.5 GHz-10 GHz)



Date: 6.DEC.2012 09:50:16

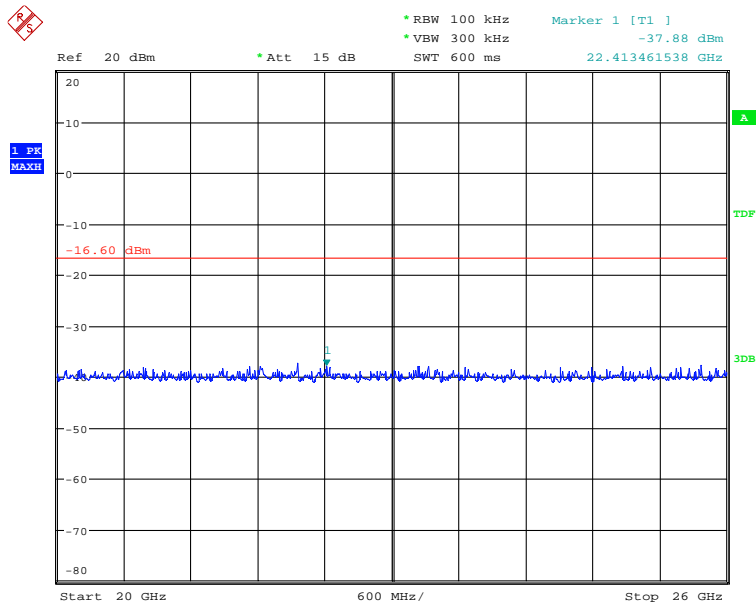
Fig. 62 Conducted Spurious Emission (802.11g, Ch1, 10 GHz-15 GHz)





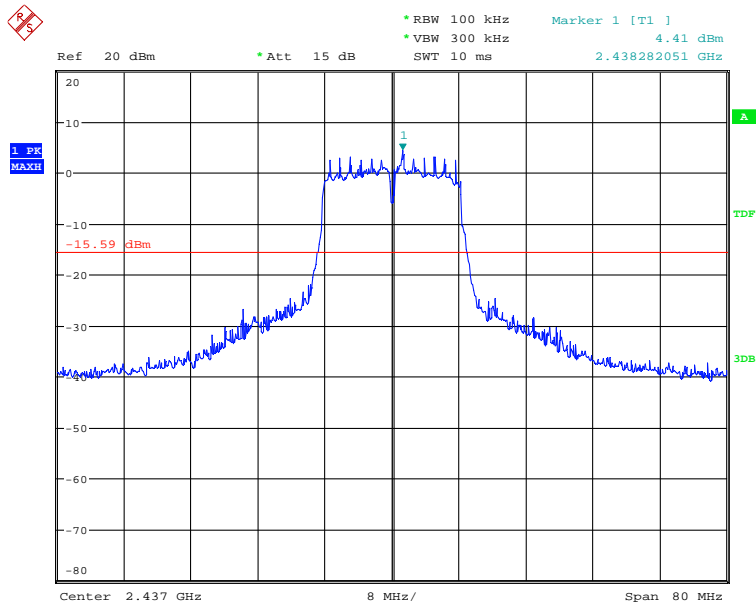
Date: 6.DEC.2012 09:50:22

**Fig. 63 Conducted Spurious Emission (802.11g, Ch1, 15 GHz-20 GHz)**



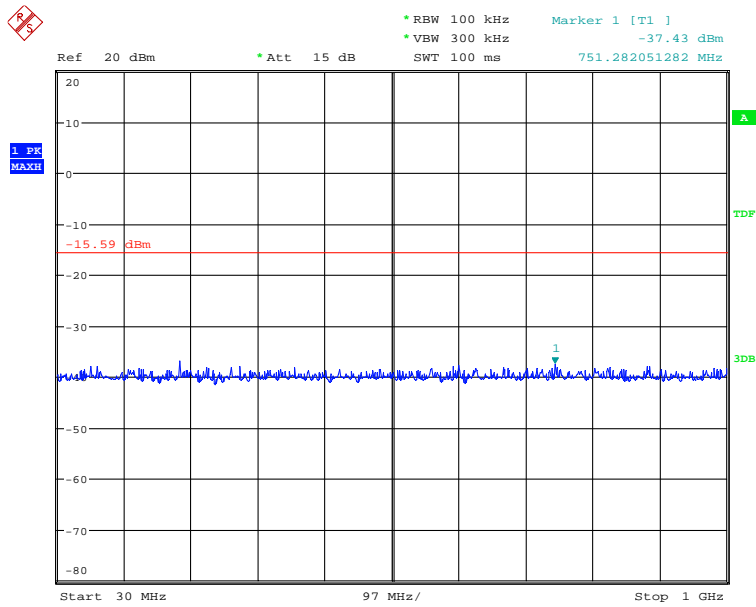
Date: 6.DEC.2012 09:50:29

**Fig. 64 Conducted Spurious Emission (802.11g, Ch1, 20 GHz-26 GHz)**



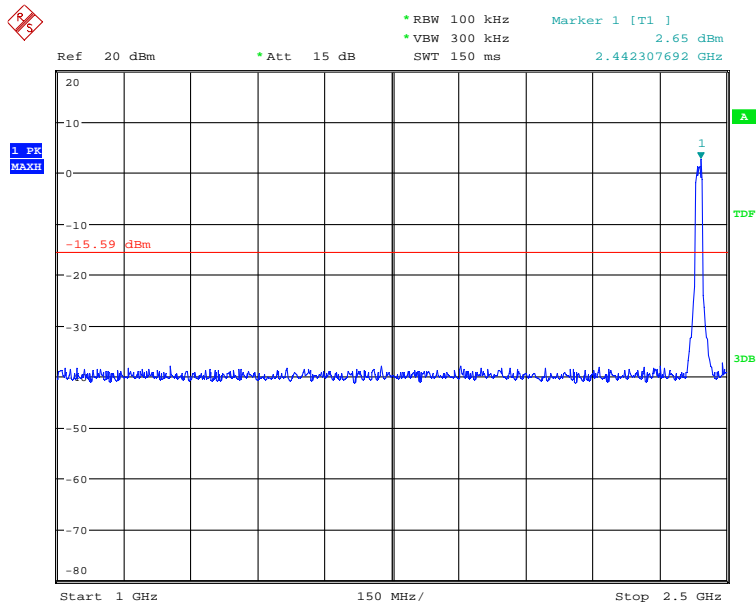
Date: 6.DEC.2012 09:51:49

Fig. 65 Conducted Spurious Emission (802.11g, Ch6, Center Frequency)



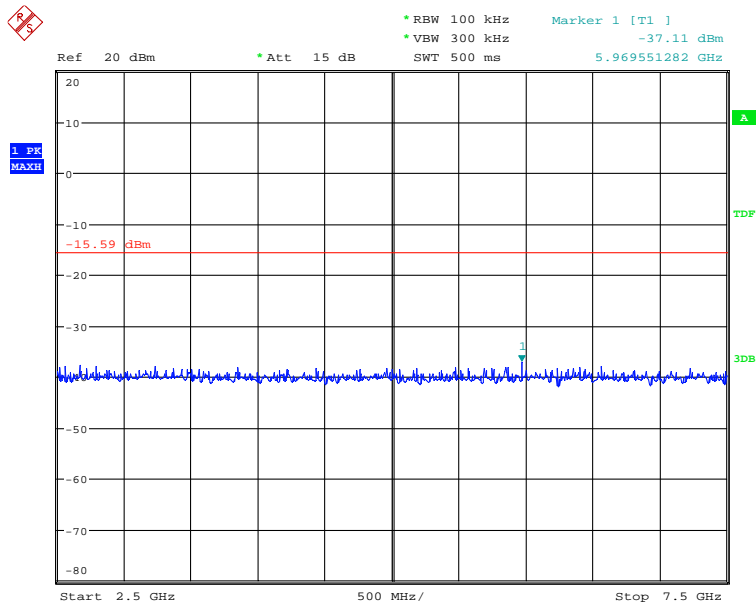
Date: 6.DEC.2012 09:51:56

Fig. 66 Conducted Spurious Emission (802.11g, Ch6, 30 MHz-1 GHz)



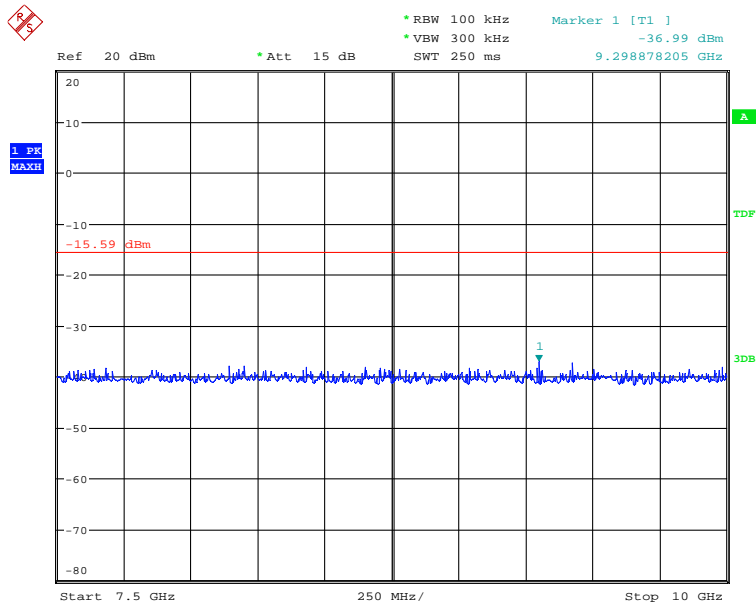
Date: 6.DEC.2012 09:52:02

Fig. 67 Conducted Spurious Emission (802.11g, Ch6, 1 GHz-2.5 GHz)



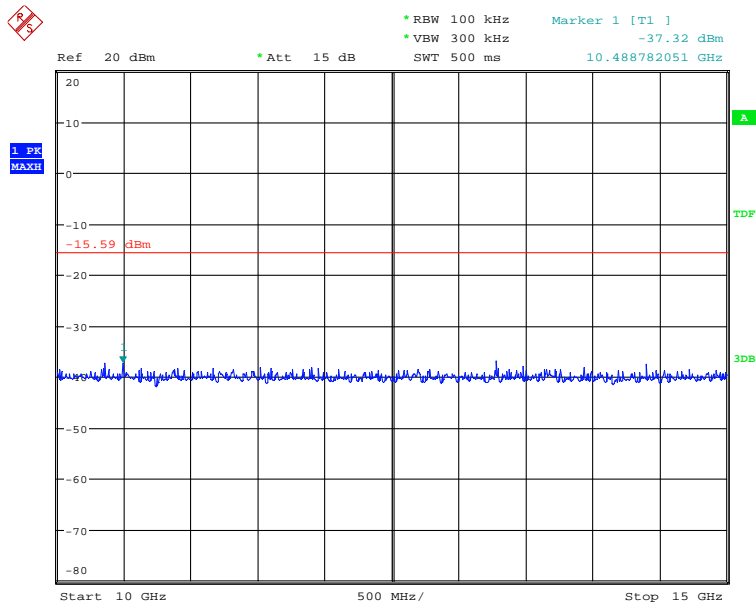
Date: 6.DEC.2012 09:52:09

Fig. 68 Conducted Spurious Emission (802.11g, Ch6, 2.5 GHz-7.5 GHz)



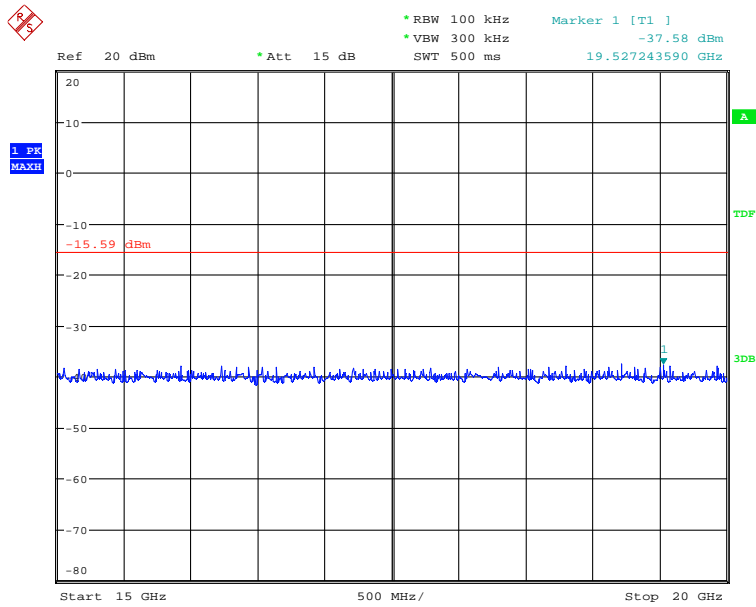
Date: 6.DEC.2012 09:52:15

Fig. 69 Conducted Spurious Emission (802.11g, Ch6, 7.5 GHz-10 GHz)



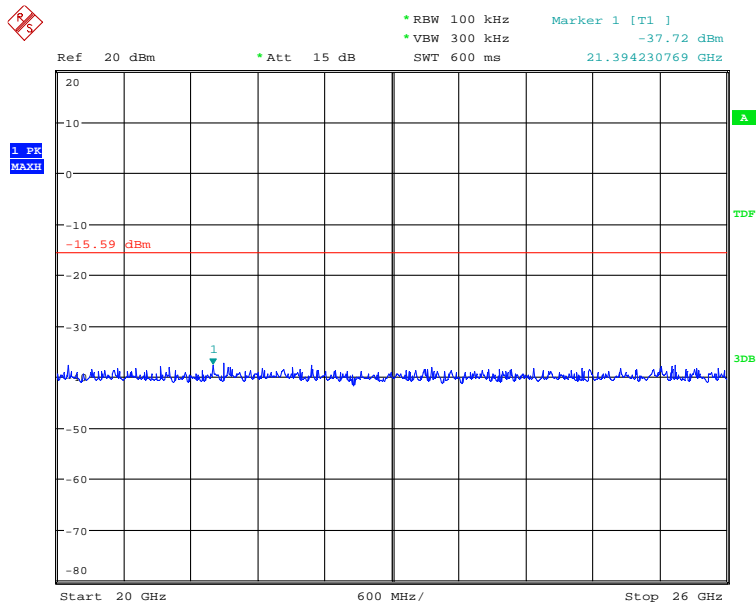
Date: 6.DEC.2012 09:52:22

Fig. 70 Conducted Spurious Emission (802.11g, Ch6, 10 GHz-15 GHz)



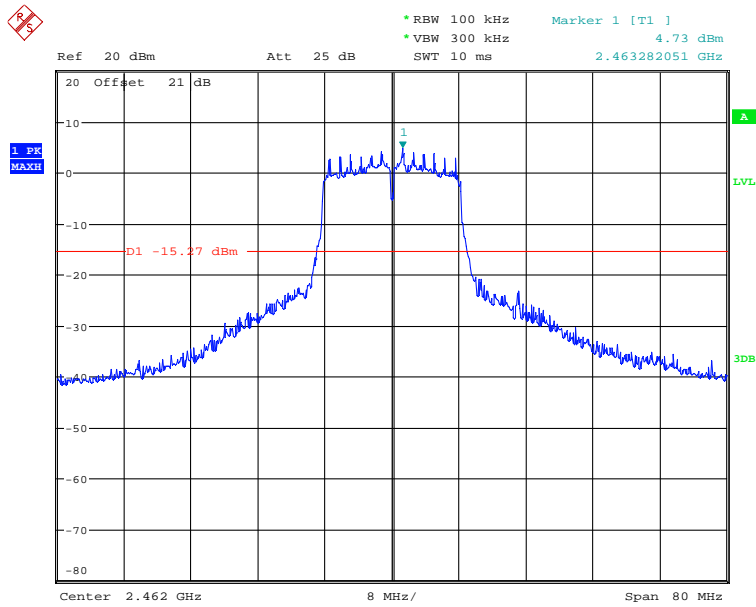
Date: 6.DEC.2012 09:52:29

**Fig. 71 Conducted Spurious Emission (802.11g, Ch6, 15 GHz-20 GHz)**



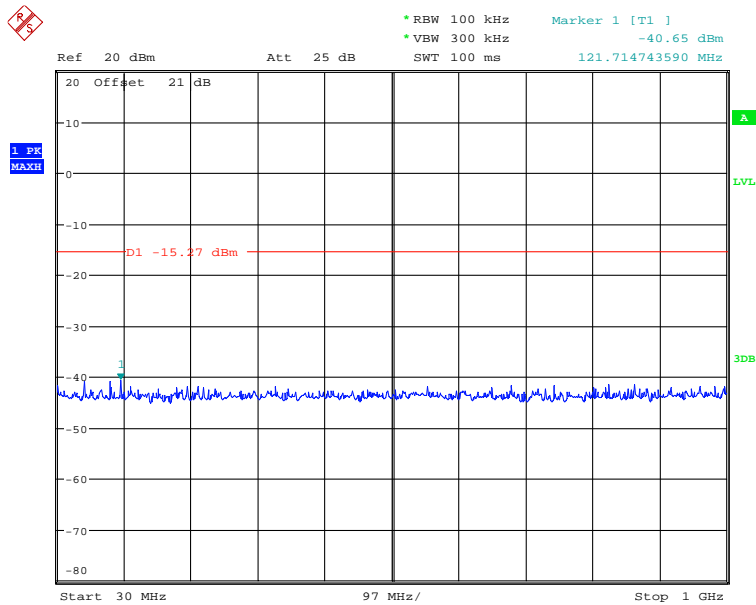
Date: 6.DEC.2012 09:52:35

**Fig. 72 Conducted Spurious Emission (802.11g, Ch6, 20 GHz-26 GHz)**



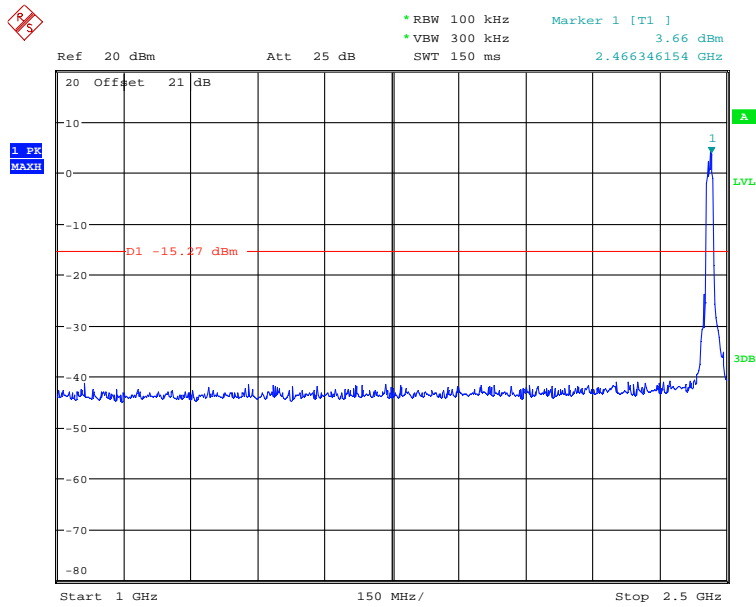
Date: 6.DEC.2012 16:22:21

Fig. 73 Conducted Spurious Emission (802.11g, Ch11, Center Frequency)



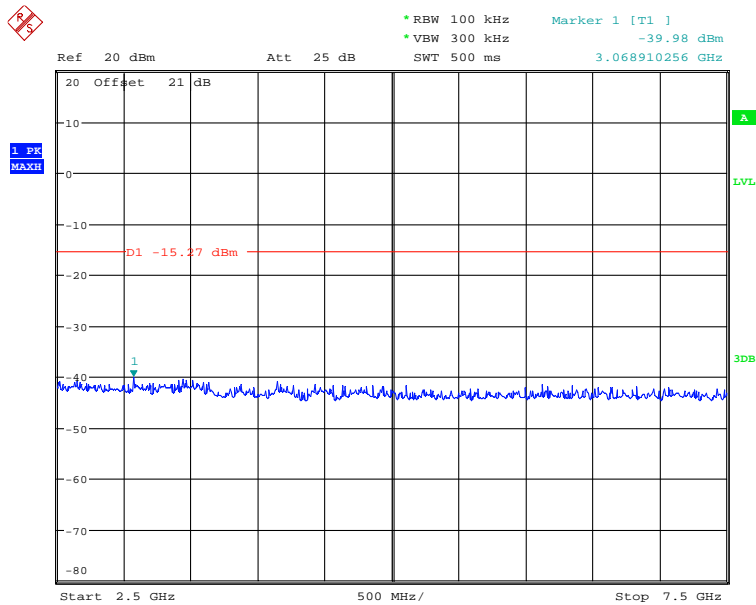
Date: 6.DEC.2012 16:22:39

Fig. 74 Conducted Spurious Emission (802.11g, Ch11, 30 MHz-1 GHz)



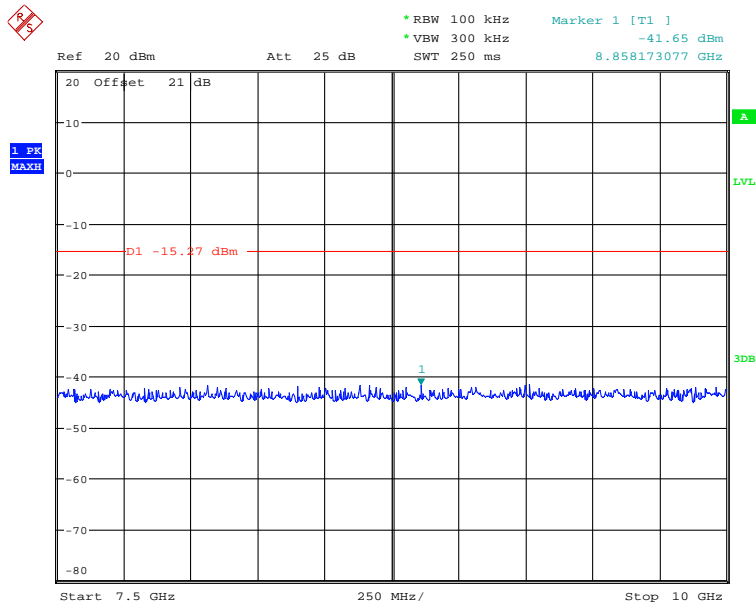
Date: 6.DEC.2012 16:22:54

Fig. 75 Conducted Spurious Emission (802.11g, Ch11, 1 GHz-2.5 GHz)



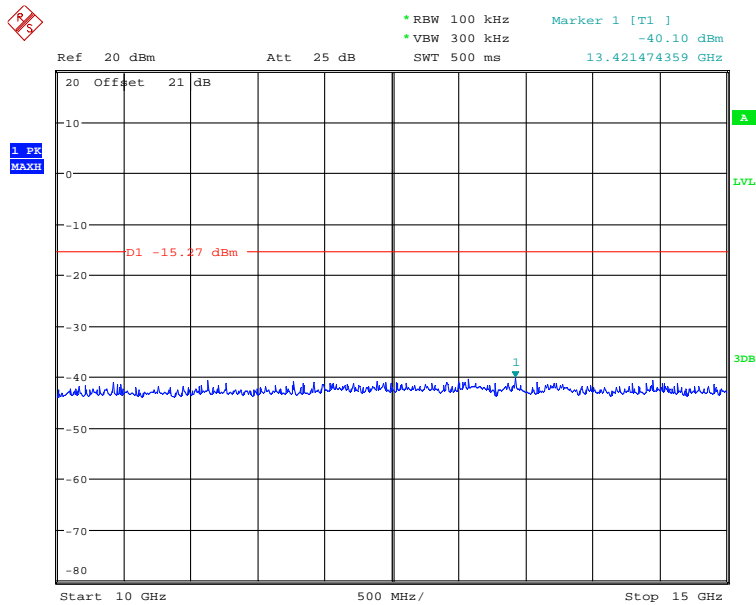
Date: 6.DEC.2012 16:23:15

Fig. 76 Conducted Spurious Emission (802.11g, Ch11, 2.5 GHz-7.5 GHz)



Date: 6.DEC.2012 16:23:34

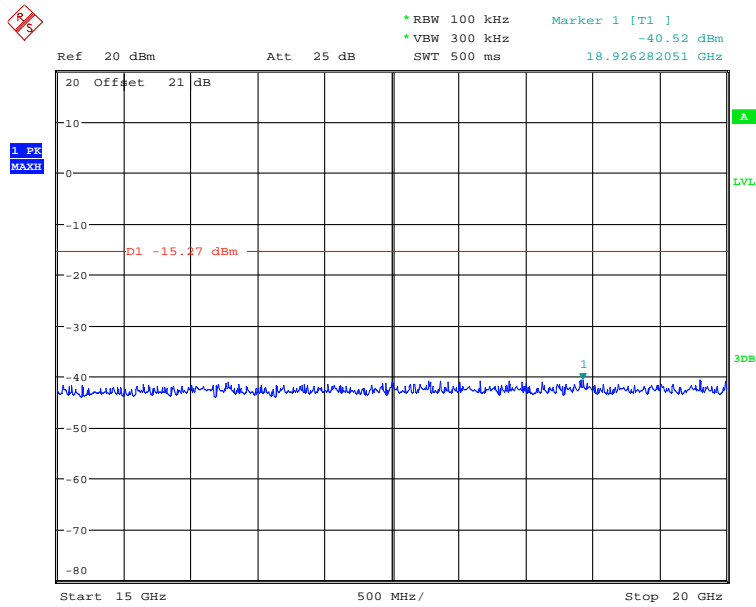
Fig. 77 Conducted Spurious Emission (802.11g, Ch11, 7.5 GHz-10 GHz)



Date: 6.DEC.2012 16:24:09

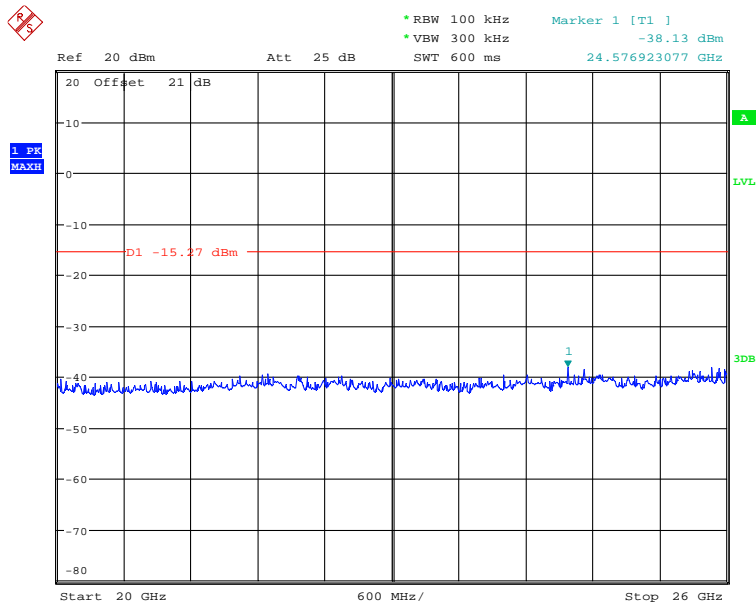
Fig. 78 Conducted Spurious Emission (802.11g, Ch11, 10 GHz-15 GHz)





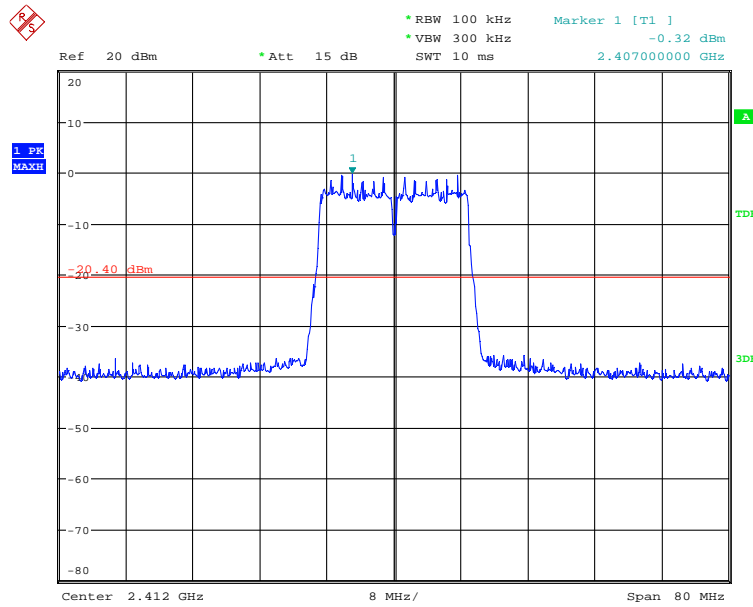
Date: 6.DEC.2012 16:24:30

Fig. 79 Conducted Spurious Emission (802.11g, Ch11, 15 GHz-20 GHz)



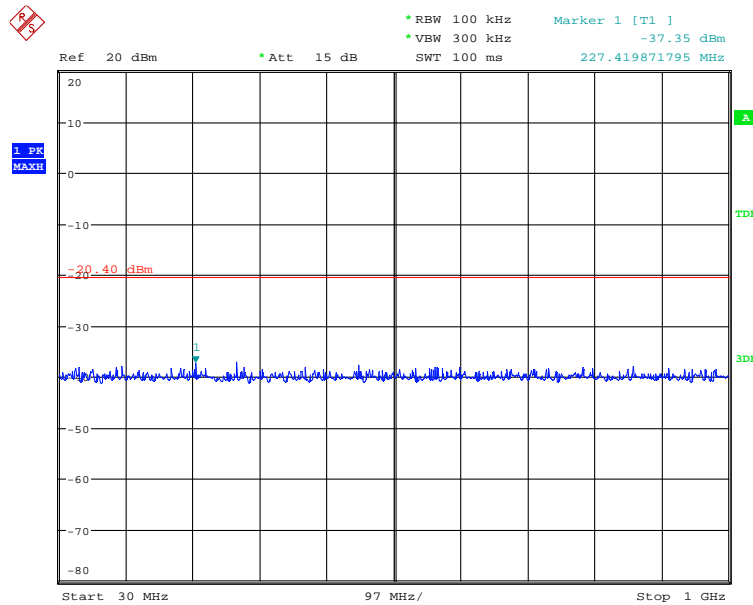
Date: 6.DEC.2012 16:24:49

Fig. 80 Conducted Spurious Emission (802.11g, Ch11, 20 GHz-26 GHz)



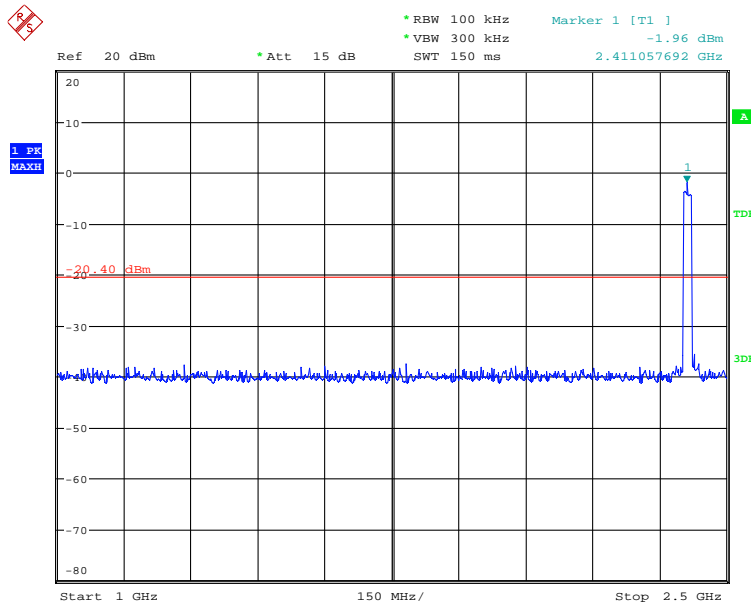
Date: 6.DEC.2012 12:41:34

**Fig. 81 Conducted Spurious Emission (802.11n-HT20, Ch1, Center Frequency)**



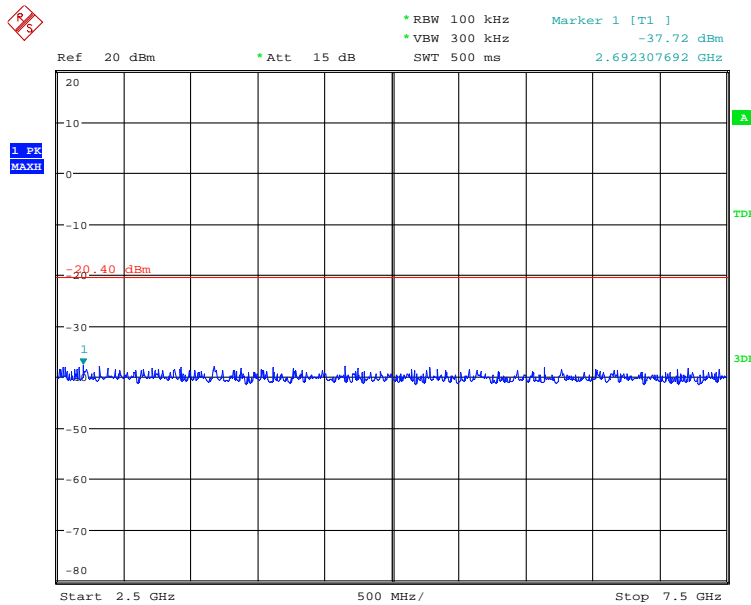
Date: 6.DEC.2012 12:41:40

**Fig. 82 Conducted Spurious Emission (802.11n-HT20, Ch1, 30 MHz-1 GHz)**



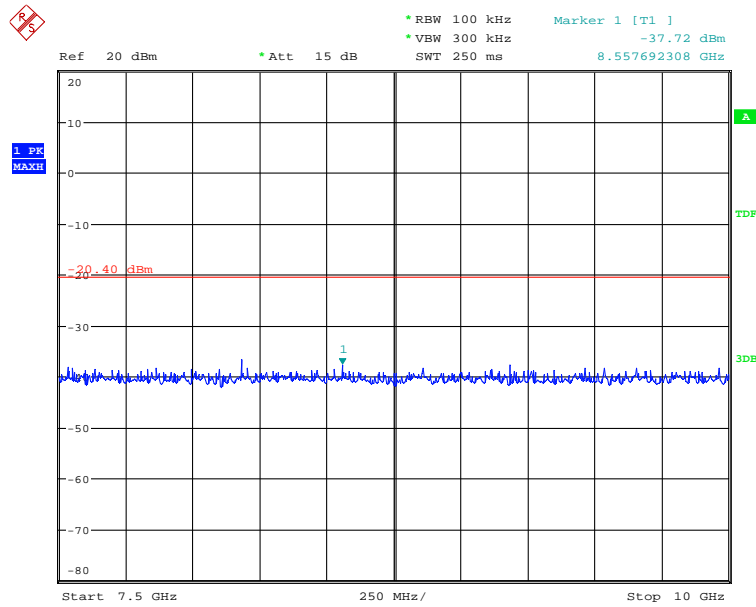
Date: 6.DEC.2012 12:41:46

Fig. 83 Conducted Spurious Emission (802.11n-HT20, Ch1, 1 GHz-2.5 GHz)



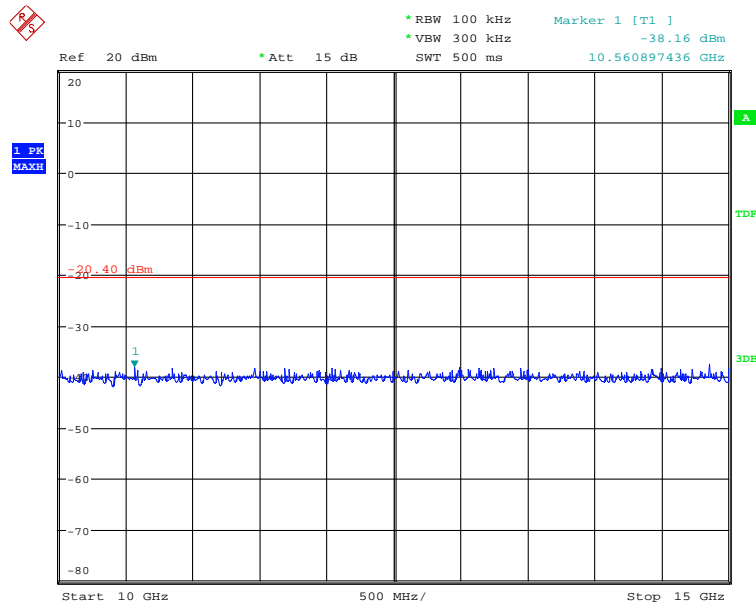
Date: 6.DEC.2012 12:41:52

Fig. 84 Conducted Spurious Emission (802.11n-HT20, Ch1, 2.5 GHz-7.5 GHz)



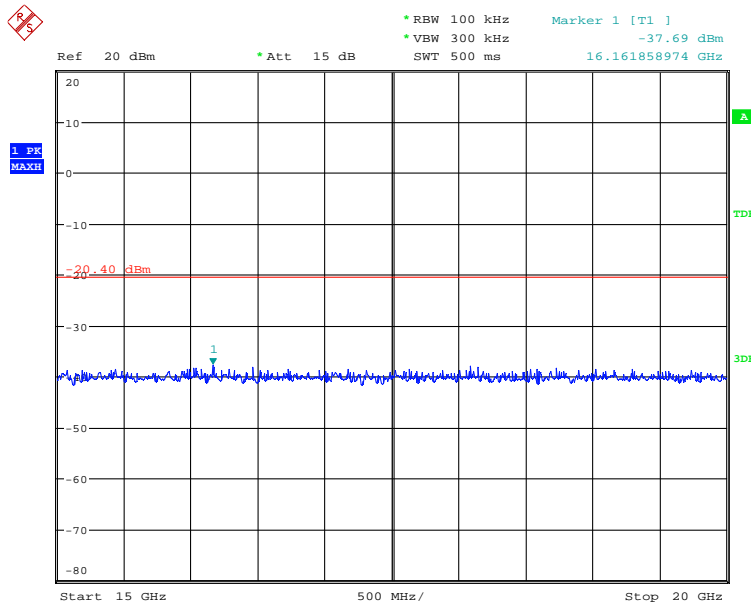
Date: 6.DEC.2012 12:41:58

Fig. 85 Conducted Spurious Emission (802.11n-HT20, Ch1, 7.5 GHz-10 GHz)



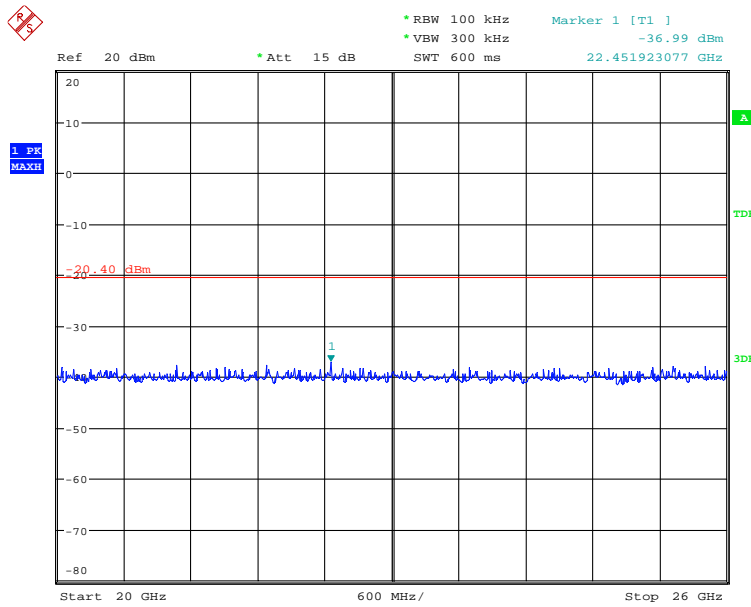
Date: 6.DEC.2012 12:42:04

Fig. 86 Conducted Spurious Emission (802.11n-HT20, Ch1, 10 GHz-15 GHz)



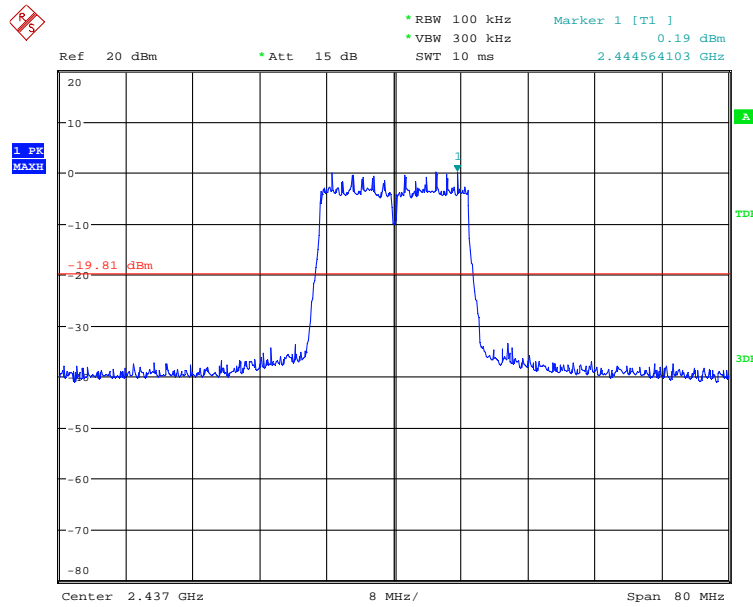
Date: 6.DEC.2012 12:42:09

Fig. 87 Conducted Spurious Emission (802.11n-HT20, Ch1, 15 GHz-20 GHz)



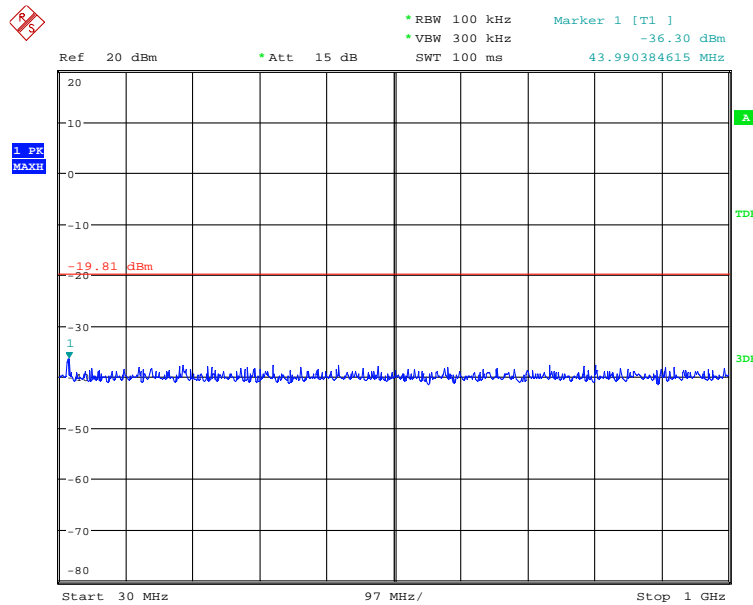
Date: 6.DEC.2012 12:42:15

Fig. 88 Conducted Spurious Emission (802.11n-HT20, Ch1, 20 GHz-26 GHz)



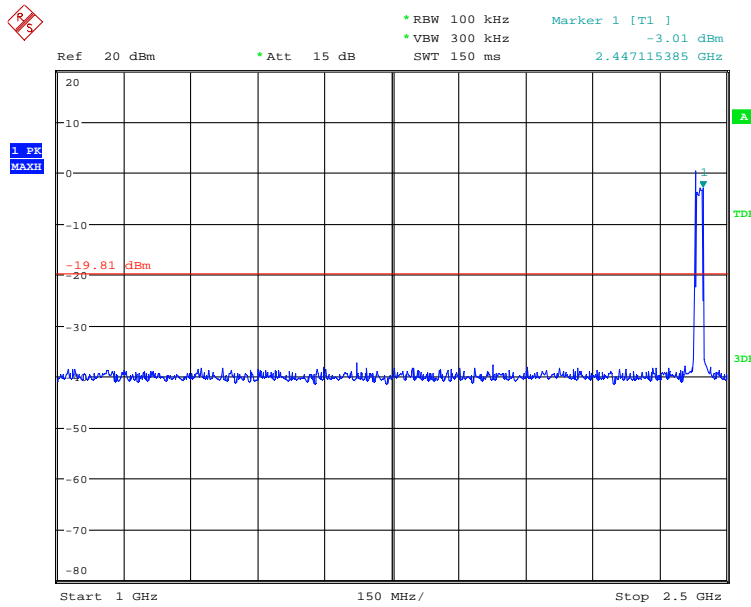
Date: 6.DEC.2012 12:42:36

Fig. 89 Conducted Spurious Emission (802.11n-HT20, Ch6, Center Frequency)



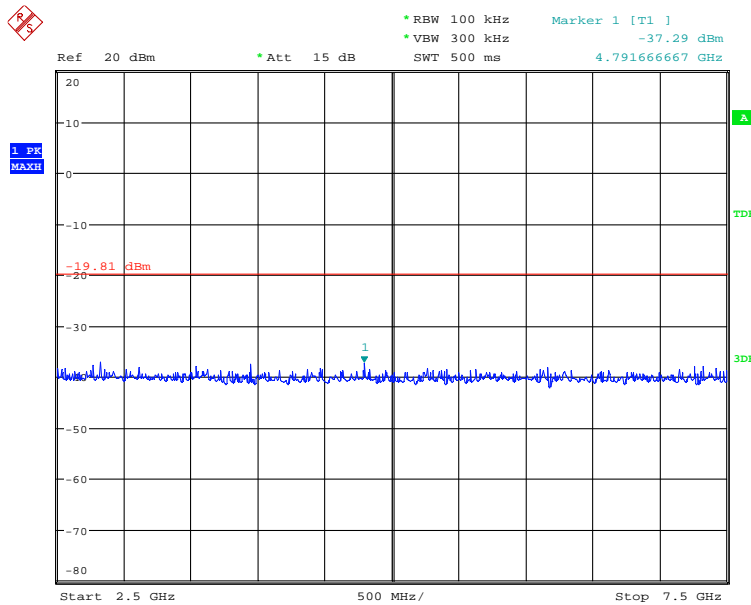
Date: 6.DEC.2012 12:42:42

Fig. 90 Conducted Spurious Emission (802.11n-HT20, Ch6, 30 MHz-1 GHz)



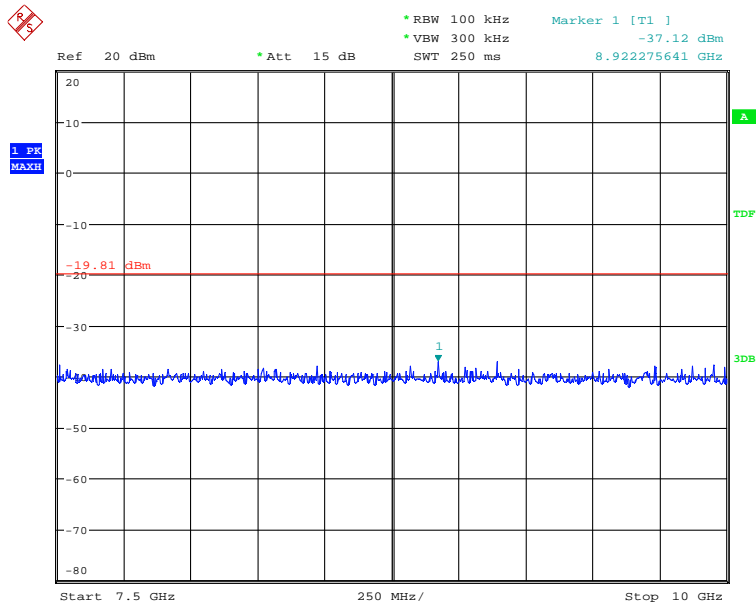
Date: 6.DEC.2012 12:42:47

Fig. 91 Conducted Spurious Emission (802.11n-HT20, Ch6, 1 GHz-2.5 GHz)



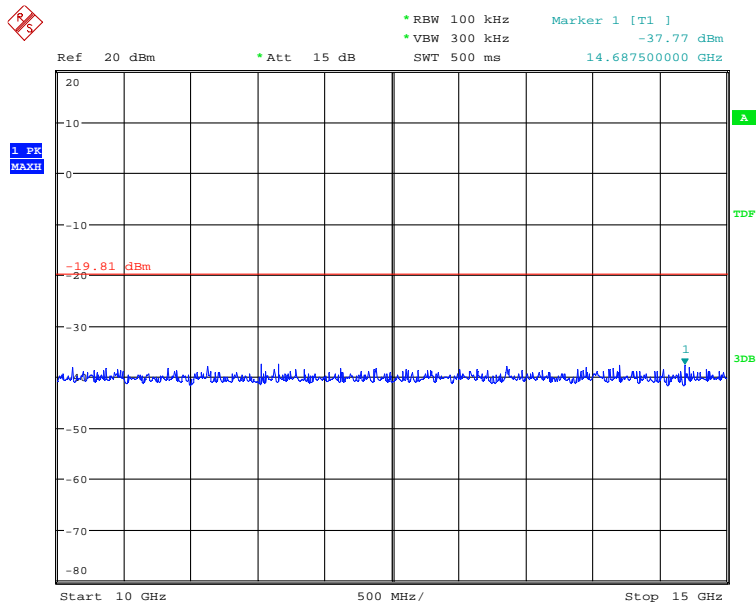
Date: 6.DEC.2012 12:42:53

Fig. 92 Conducted Spurious Emission (802.11n-HT20, Ch6, 2.5 GHz-7.5 GHz)



Date: 6.DEC.2012 12:42:59

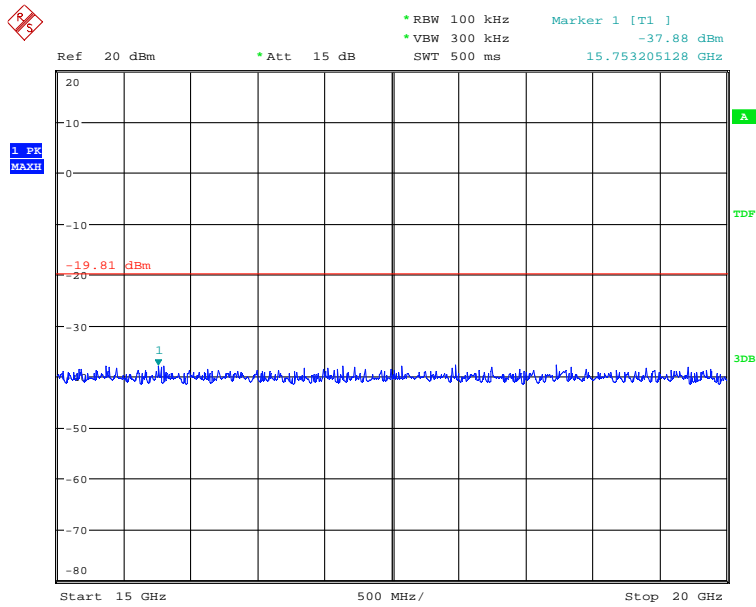
**Fig. 93 Conducted Spurious Emission (802.11n-HT20, Ch6, 7.5 GHz-10 GHz)**



Date: 6.DEC.2012 12:43:05

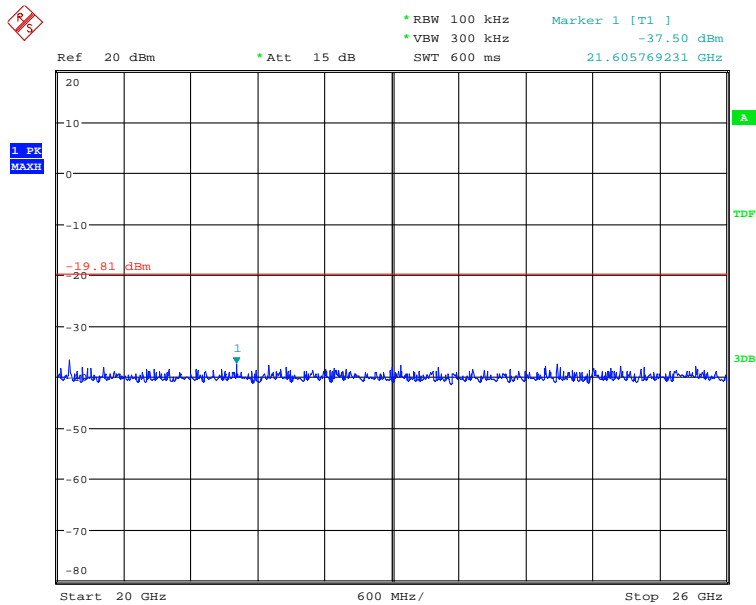
**Fig. 94 Conducted Spurious Emission (802.11n-HT20, Ch6, 10 GHz-15 GHz)**





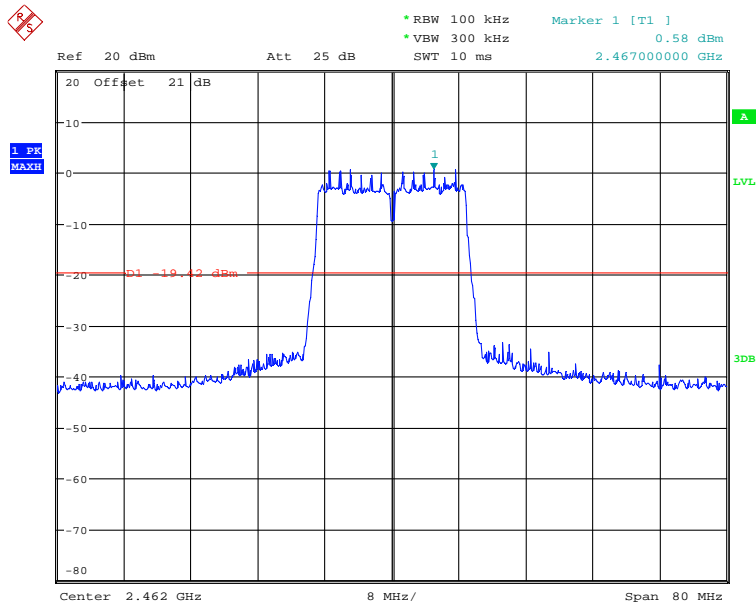
Date: 6.DEC.2012 12:43:11

Fig. 95 Conducted Spurious Emission (802.11n-HT20, Ch6, 15 GHz-20 GHz)



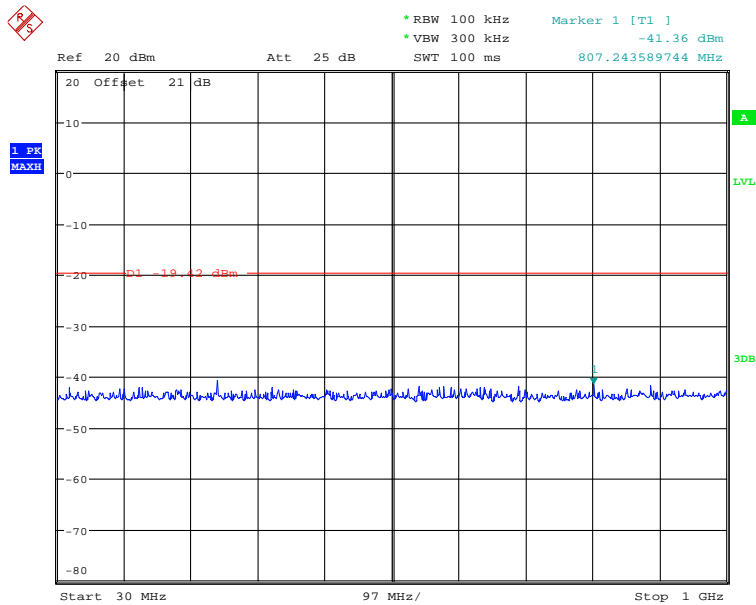
Date: 6.DEC.2012 12:43:16

Fig. 96 Conducted Spurious Emission (802.11n-HT20, Ch6, 20 GHz-26 GHz)



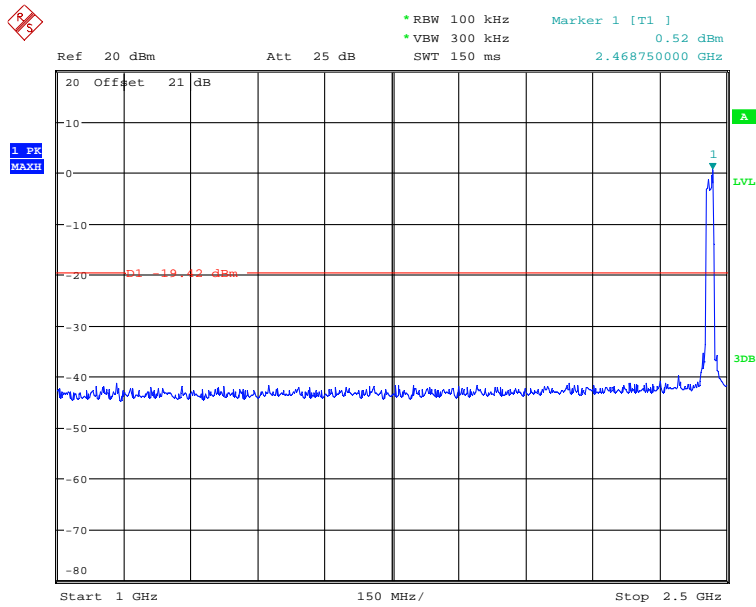
Date: 6.DEC.2012 16:25:49

Fig. 97 Conducted Spurious Emission (802.11n-HT20, Ch11, Center Frequency)



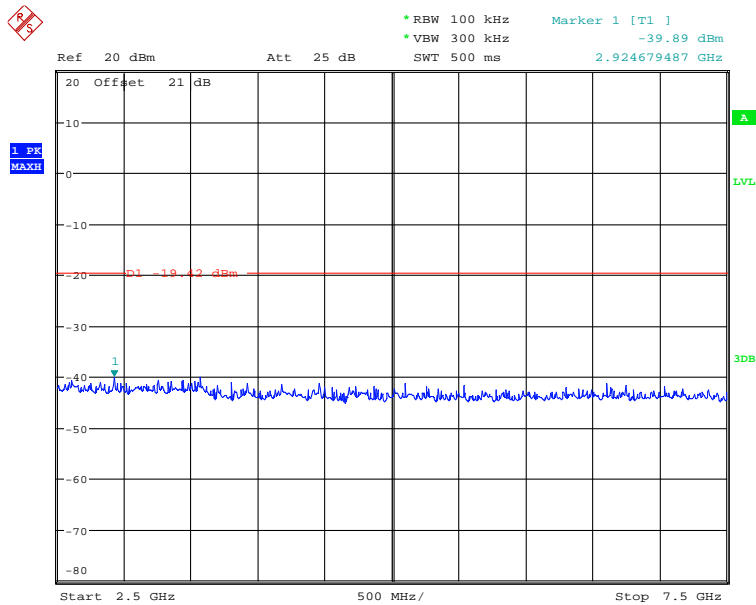
Date: 6.DEC.2012 16:26:06

Fig. 98 Conducted Spurious Emission (802.11n-HT20, Ch11, 30 MHz-1 GHz)



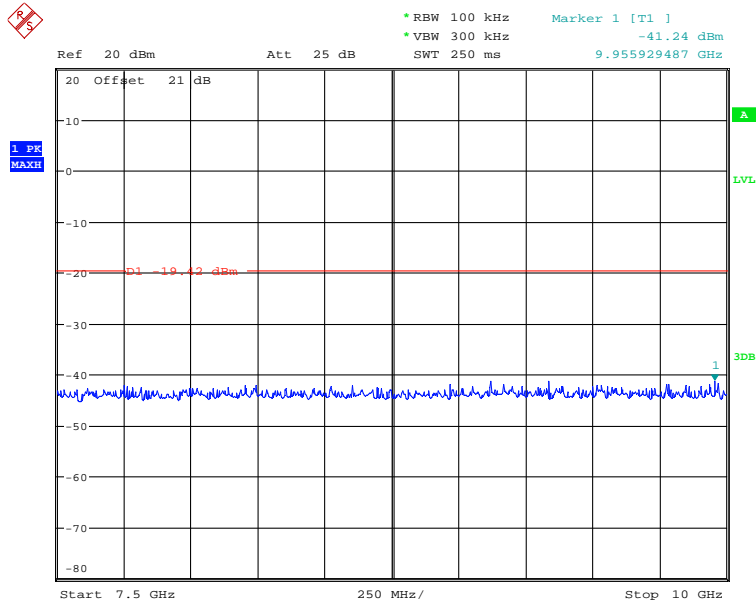
Date: 6.DEC.2012 16:26:25

Fig. 99 Conducted Spurious Emission (802.11n-HT20, Ch11, 1 GHz-2.5 GHz)



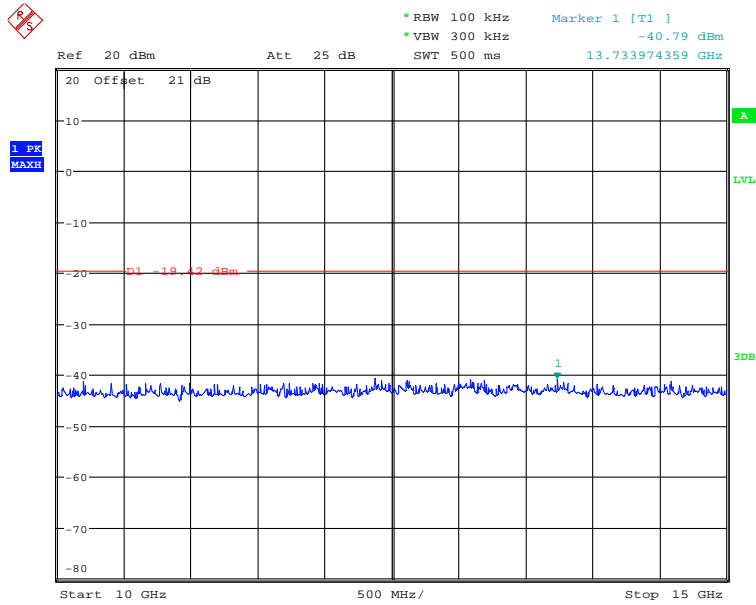
Date: 6.DEC.2012 16:29:45

Fig. 100 Conducted Spurious Emission (802.11n-HT20, Ch11, 2.5 GHz-7.5 GHz)



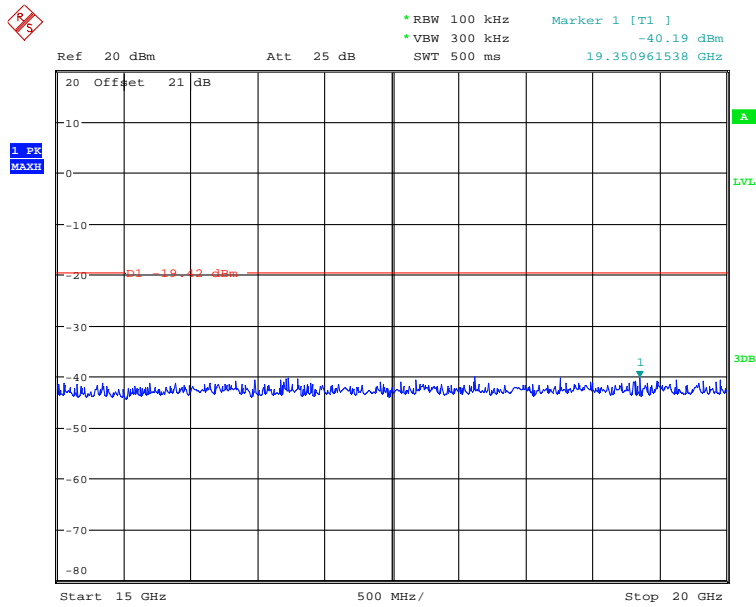
Date: 6.DEC.2012 16:30:00

Fig. 101 Conducted Spurious Emission (802.11n-HT20, Ch11, 7.5 GHz-10 GHz)



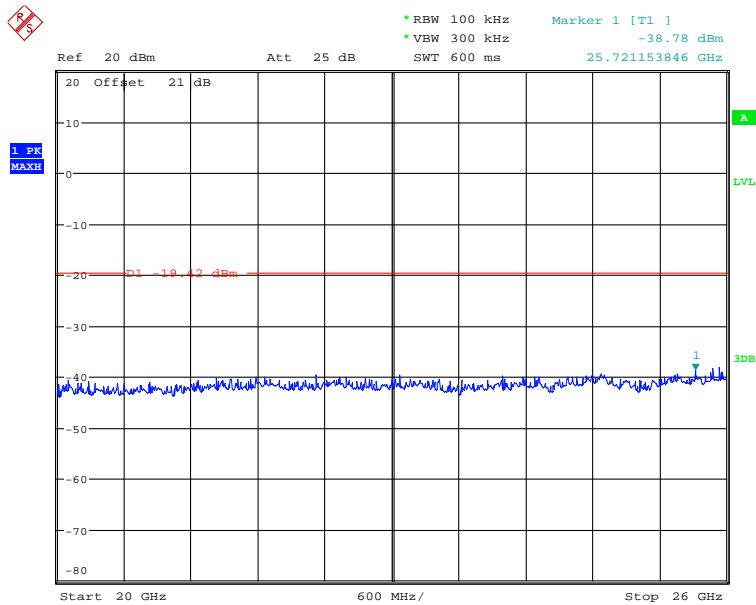
Date: 6.DEC.2012 16:30:15

Fig. 102 Conducted Spurious Emission (802.11n-HT20, Ch11, 10 GHz-15 GHz)



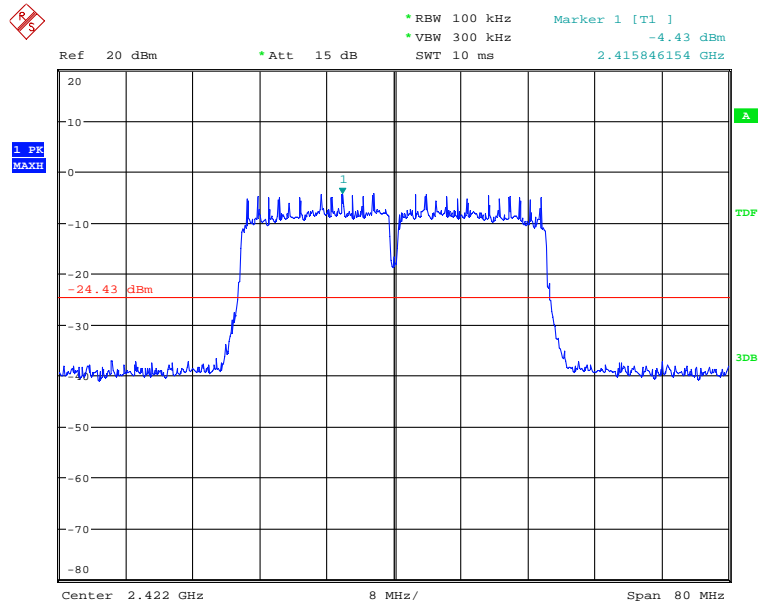
Date: 6.DEC.2012 16:30:31

Fig. 103 Conducted Spurious Emission (802.11n-HT20, Ch11, 15 GHz-20 GHz)



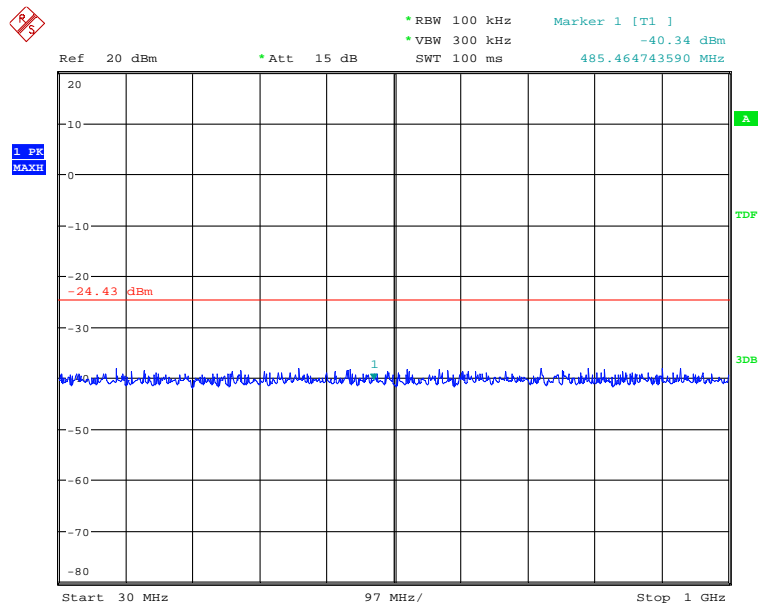
Date: 6.DEC.2012 16:30:47

Fig. 104 Conducted Spurious Emission (802.11n-HT20, Ch11, 20 GHz-26 GHz)



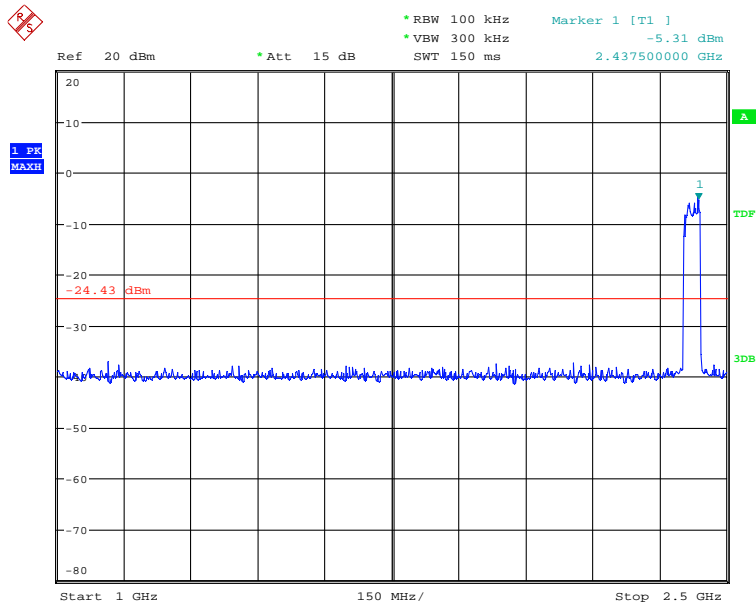
Date: 6.DEC.2012 12:44:46

Fig. 105 Conducted Spurious Emission (802.11n-HT40, Ch3, Center Frequency)



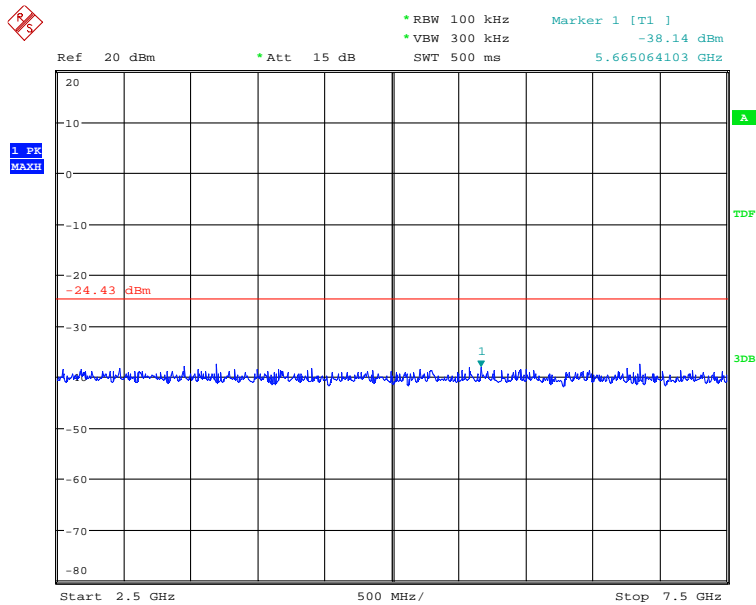
Date: 6.DEC.2012 12:44:49

Fig. 106 Conducted Spurious Emission (802.11n-HT40, Ch3, 30 MHz-1 GHz)



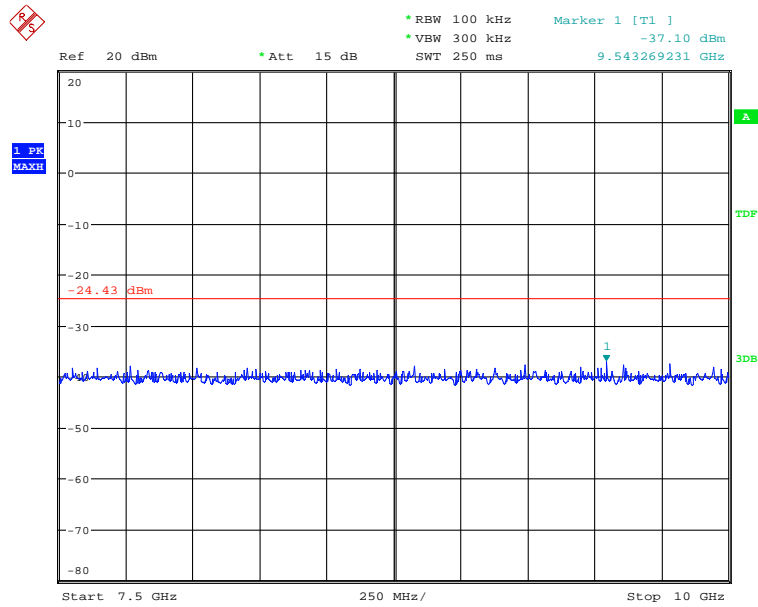
Date: 6.DEC.2012 12:44:56

Fig. 107 Conducted Spurious Emission (802.11n-HT40, Ch3, 1 GHz-2.5 GHz)



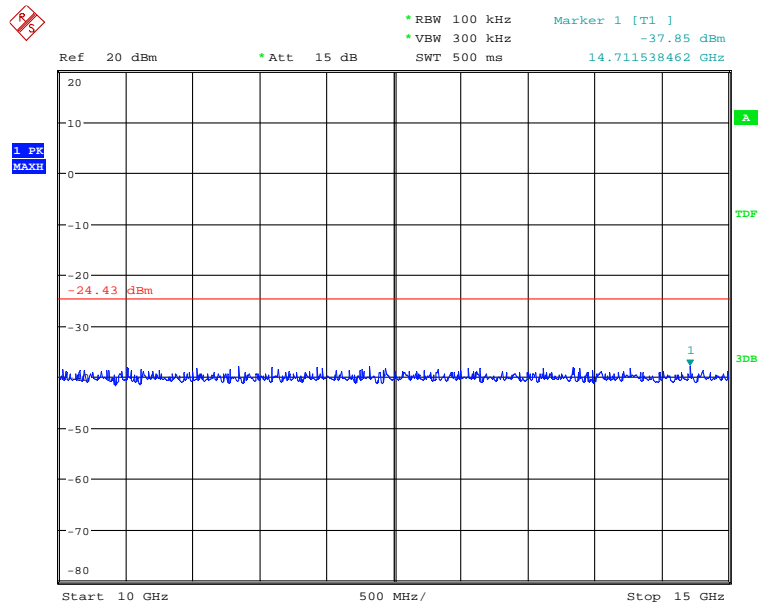
Date: 6.DEC.2012 12:45:02

Fig. 108 Conducted Spurious Emission (802.11n-HT40, Ch3, 2.5 GHz-7.5 GHz)



Date: 6.DEC.2012 12:45:08

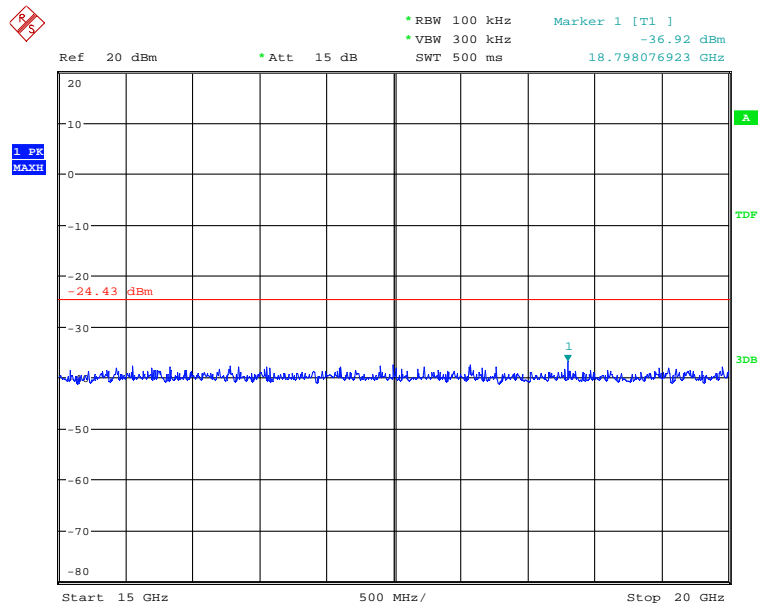
**Fig. 109 Conducted Spurious Emission (802.11n-HT40, Ch3, 7.5 GHz-10 GHz)**



Date: 6.DEC.2012 12:45:15

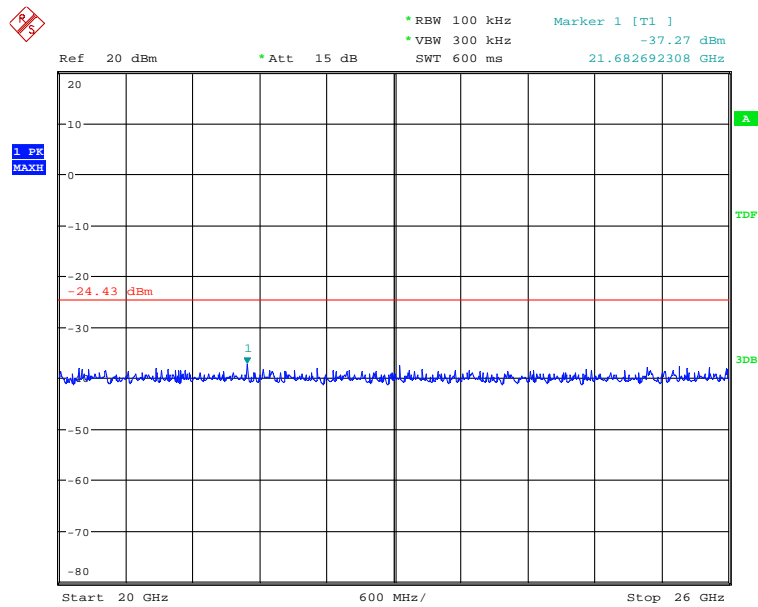
**Fig. 110 Conducted Spurious Emission (802.11n-HT40, Ch3, 10 GHz-15 GHz)**





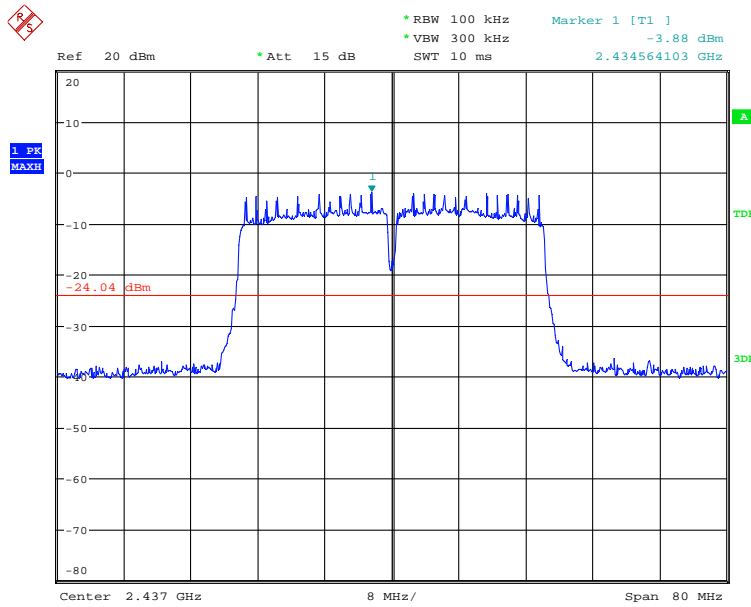
Date: 6.DEC.2012 12:45:24

**Fig. 111 Conducted Spurious Emission (802.11n-HT40, Ch3, 15 GHz-20 GHz)**



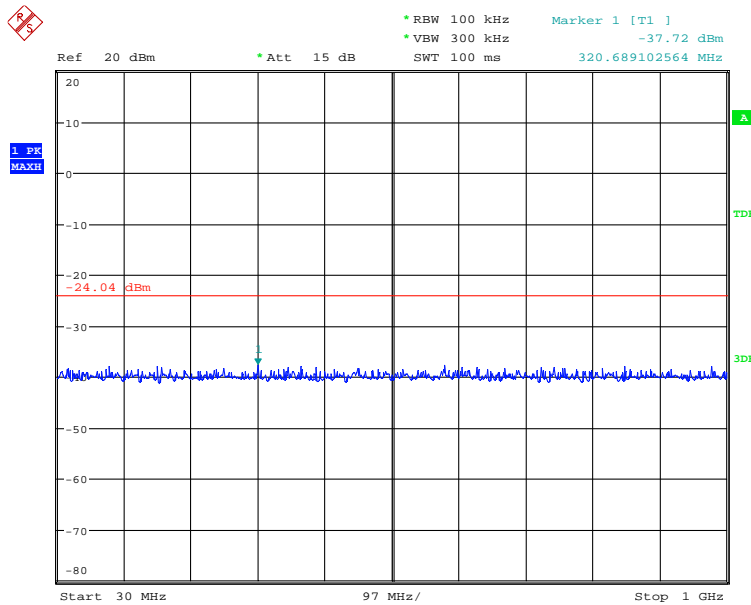
Date: 6.DEC.2012 12:45:30

**Fig. 112 Conducted Spurious Emission (802.11n-HT40, Ch3, 20 GHz-26 GHz)**



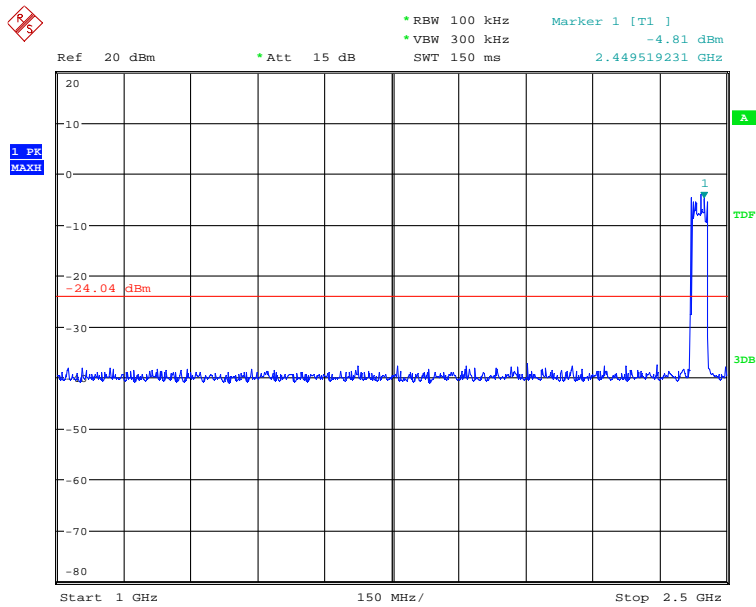
Date: 6.DEC.2012 12:47:30

Fig. 113 Conducted Spurious Emission (802.11n-HT40, Ch6, Center Frequency)



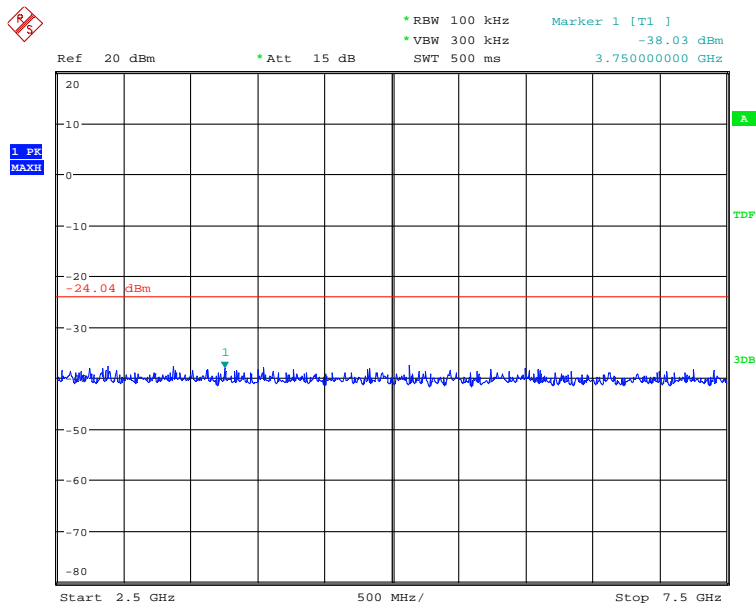
Date: 6.DEC.2012 12:47:36

Fig. 114 Conducted Spurious Emission (802.11n-HT40, Ch6, 30 MHz-1 GHz)



Date: 6.DEC.2012 12:47:43

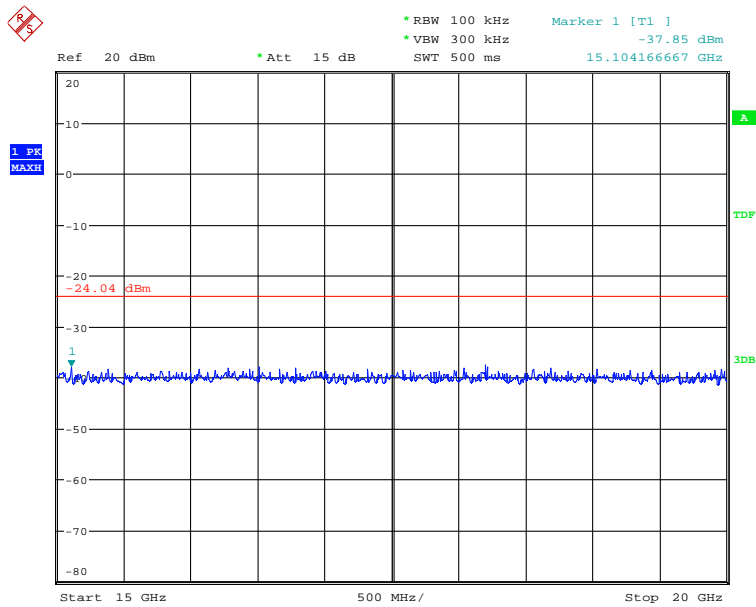
Fig. 115 Conducted Spurious Emission (802.11n-HT40, Ch6, 1 GHz-2.5 GHz)



Date: 6.DEC.2012 12:47:49

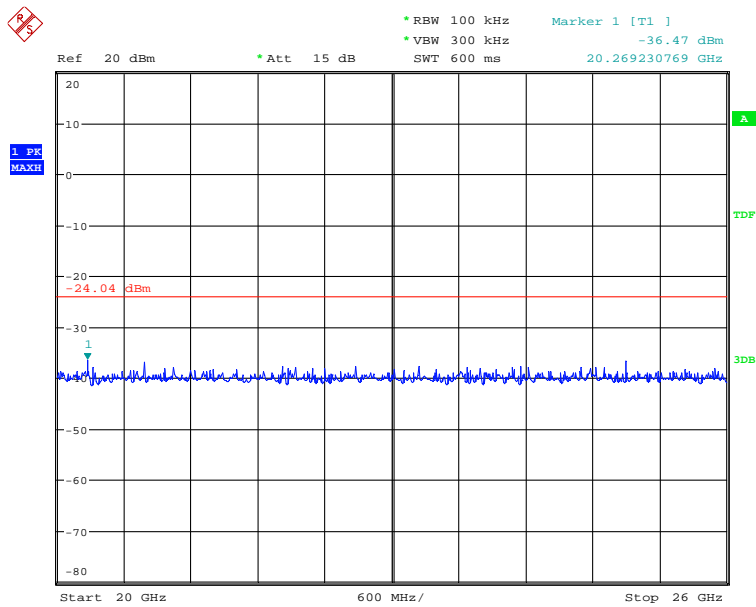
Fig. 116 Conducted Spurious Emission (802.11n-HT40, Ch6, 2.5 GHz-7.5 GHz)





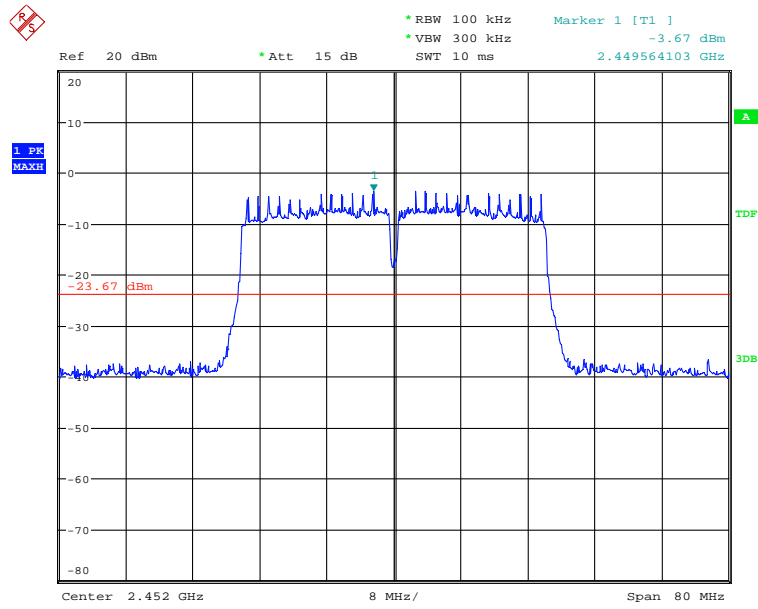
Date: 6.DEC.2012 12:48:09

Fig. 119 Conducted Spurious Emission (802.11n-HT40, Ch6, 15 GHz-20 GHz)



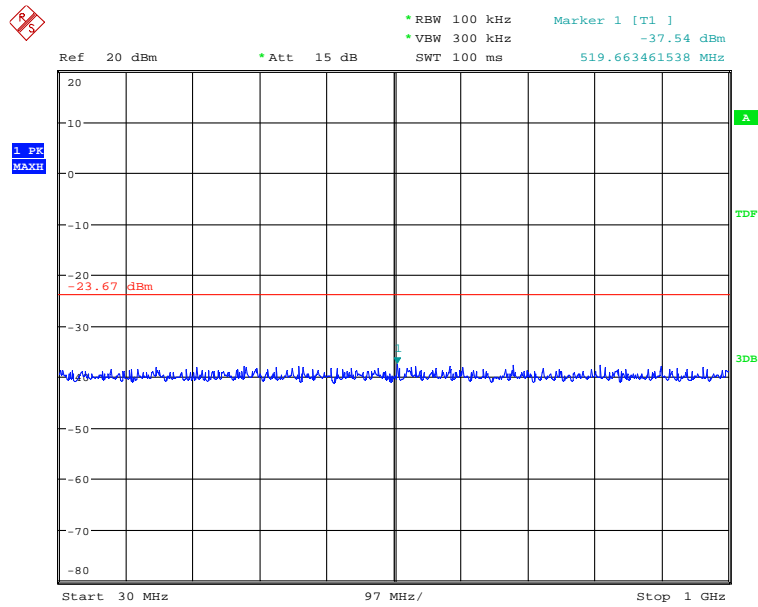
Date: 6.DEC.2012 12:48:15

Fig. 120 Conducted Spurious Emission (802.11n-HT40, Ch6, 20 GHz-26 GHz)



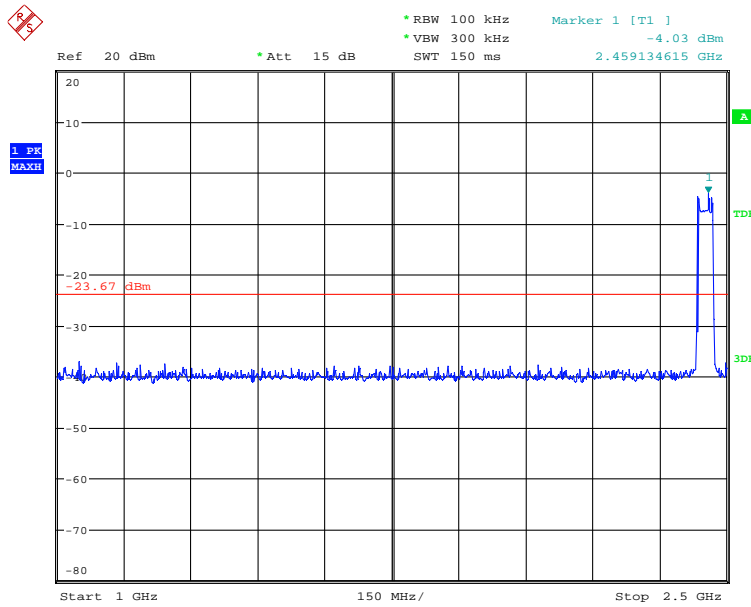
Date: 6.DEC.2012 12:48:35

Fig. 121 Conducted Spurious Emission (802.11n-HT40, Ch9, Center Frequency)



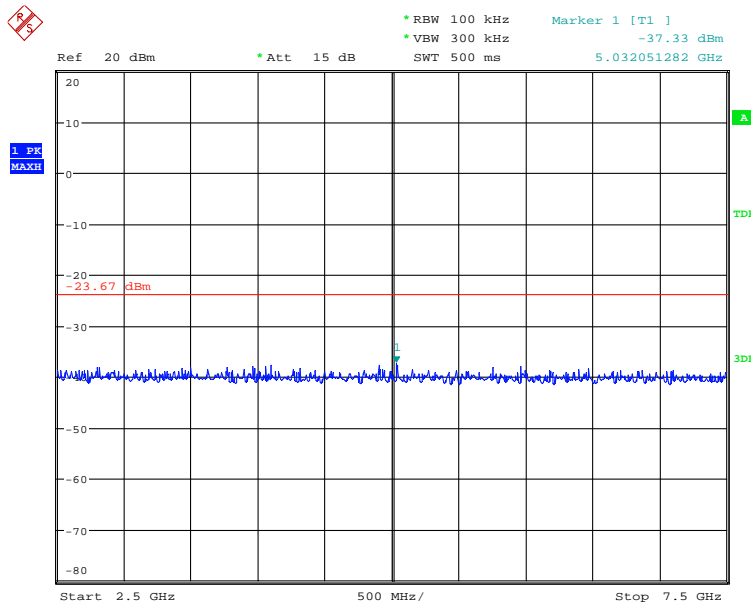
Date: 6.DEC.2012 12:48:42

Fig. 122 Conducted Spurious Emission (802.11n-HT40, Ch9, 30 MHz-1 GHz)



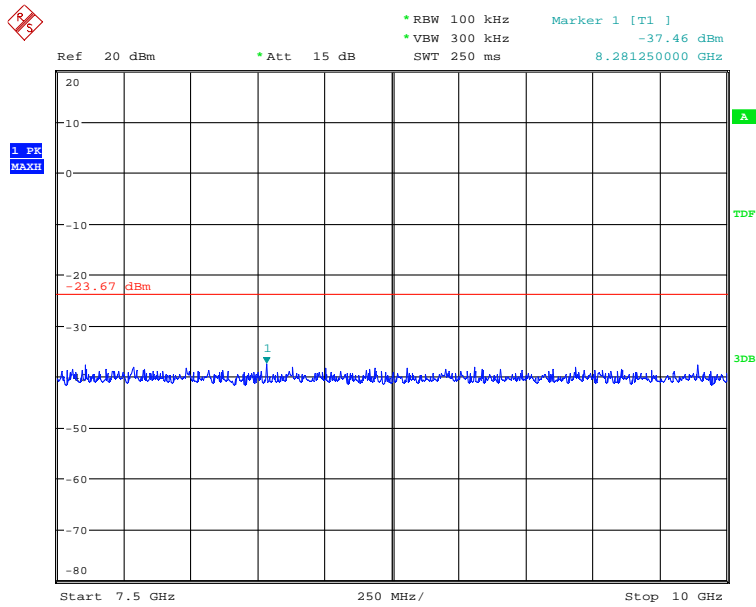
Date: 6.DEC.2012 12:48:49

Fig. 123 Conducted Spurious Emission (802.11n-HT40, Ch9, 1 GHz-2.5 GHz)



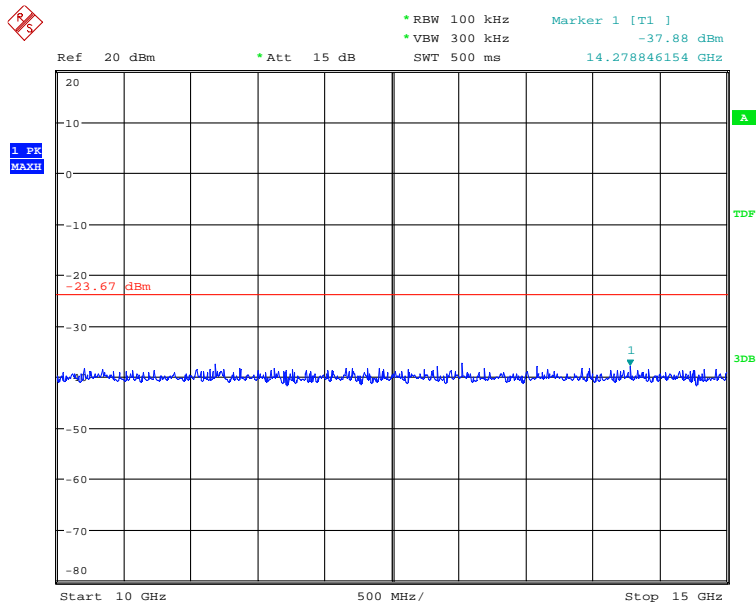
Date: 6.DEC.2012 12:48:55

Fig. 124 Conducted Spurious Emission (802.11n-HT40, Ch9, 2.5 GHz-7.5 GHz)



Date: 6.DEC.2012 12:49:02

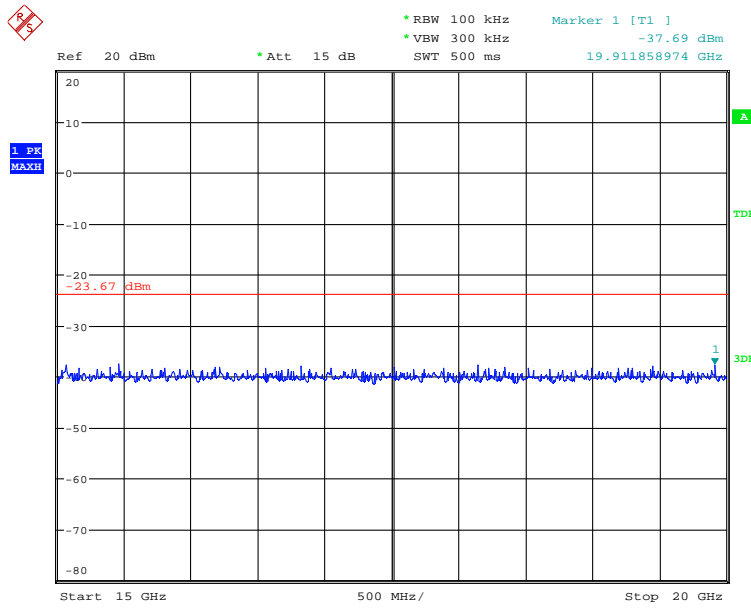
**Fig. 125 Conducted Spurious Emission (802.11n-HT40, Ch9, 7.5 GHz-10 GHz)**



Date: 6.DEC.2012 12:49:09

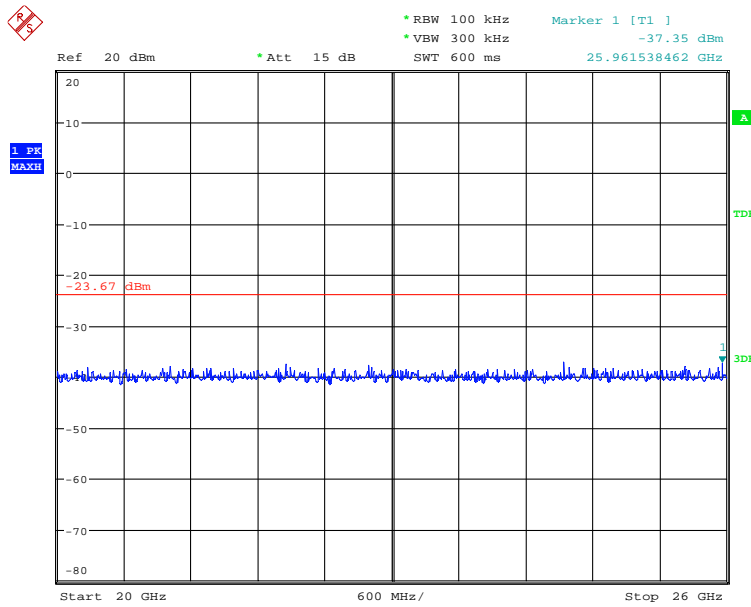
**Fig. 126 Conducted Spurious Emission (802.11n-HT40, Ch9, 10 GHz-15 GHz)**





Date: 6.DEC.2012 12:49:15

Fig. 127 Conducted Spurious Emission (802.11n-HT40, Ch9, 15 GHz-20 GHz)



Date: 6.DEC.2012 12:49:22

Fig. 128 Conducted Spurious Emission (802.11n-HT40, Ch9, 20 GHz-26 GHz)

### A.6.2 Transmitter Spurious Emission - Radiated

#### Measurement Limit:

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

In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

The measurement is made according to ANSI C63.10.

#### Limit in restricted band:

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

#### Test Condition

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

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

**Measurement Results:**

**802.11b/g mode**

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11b	Power	2.38GHz ~2.45GHz	Fig.129	P
	1	30 MHz ~1 GHz	Fig.130	P
		1 GHz ~ 3 GHz	Fig.131	P
		3 GHz ~ 18 GHz	Fig.132	P
	6	30 MHz ~1 GHz	Fig.133	P
		1 GHz ~ 3 GHz	Fig.134	P
		3 GHz ~ 18 GHz	Fig.135	P
	Power	2.45GHz ~2.5GHz	Fig.136	P
	11	30 MHz ~1 GHz	Fig.137	P
		1 GHz ~ 3 GHz	Fig.138	P
		3 GHz ~ 18 GHz	Fig.139	P
	802.11g	Power	2.38GHz ~2.43GHz	Fig.140
1		30 MHz ~1 GHz	Fig.141	P
		1 GHz ~ 3 GHz	Fig.142	P
		3 GHz ~ 18 GHz	Fig.143	P
6		30 MHz ~1 GHz	Fig.144	P
		1 GHz ~ 3 GHz	Fig.145	P
		3 GHz ~ 18 GHz	Fig.146	P
Power		2.45GHz ~2.5GHz	Fig.147	P
11		30 MHz ~1 GHz	Fig.148	P
		1 GHz ~ 3 GHz	Fig.149	P
		3 GHz ~ 18 GHz	Fig.150	P

**802.11n mode**

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n (20MHz)	Power	2.38GHz ~2.45GHz	Fig.151	P
	1	30 MHz ~1 GHz	Fig.152	P
		1 GHz ~ 3 GHz	Fig.153	P
		3 GHz ~ 18 GHz	Fig.154	P
	6	30 MHz ~1 GHz	Fig.155	P
		1 GHz ~ 3 GHz	Fig.156	P
		3 GHz ~ 18 GHz	Fig.157	P
	Power	2.45GHz ~2.5GHz	Fig.158	P
	11	30 MHz ~1 GHz	Fig.159	P
		1 GHz ~ 3 GHz	Fig.160	P
		3 GHz ~ 18 GHz	Fig.161	P
	802.11n (40MHz)	Power	2.38GHz ~2.45GHz	Fig.162
3		30 MHz ~1 GHz	Fig.163	P
		1 GHz ~ 3 GHz	Fig.164	P

		3 GHz ~ 18 GHz	Fig.165	P
	6	30 MHz ~1 GHz	Fig.166	P
		1 GHz ~ 3 GHz	Fig.167	P
		3 GHz ~ 18 GHz	Fig.168	P
	Power	2.45GHz ~2.5GHz	Fig.169	P
	9	30 MHz ~1 GHz	Fig.170	P
		1 GHz ~ 3 GHz	Fig.171	P
		3 GHz ~ 18 GHz	Fig.172	P
/	All channels	18 GHz~ 26.5 GHz	Fig.173	P

**Conclusion: PASS**

**Note:**

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

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

The measurement results are obtained as described below:

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

**802.11b**

Ch1

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P <sub>Mea</sub> (dBuV/m)	Polarization
2429.600	50.1	-30.1	32.6	47.553	V
2398.200	50.0	-30.3	30.8	49.527	H
2430.000	49.8	-30.1	32.6	47.253	H
2399.000	49.7	-30.3	30.8	49.227	V
2399.600	49.7	-30.3	30.8	49.227	H
2430.400	49.7	-30.1	32.6	47.153	H

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P <sub>Mea</sub> (dBuV/m)	Polarization
2455.600	51.0	-29.7	32.6	48.099	V
2423.800	51.0	-30.1	32.6	48.453	H
2423.600	50.8	-30.1	32.6	48.253	H
2456.000	50.7	-29.7	32.6	47.799	V
2456.200	50.5	-29.7	32.6	47.599	H
2455.800	50.4	-29.7	32.6	47.499	H

Ch11

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P <sub>Mea</sub> (dBuV/m)	Polarization
2481.000	51.0	-30.3	32.6	48.673	V
2487.200	51.0	-30.3	32.6	48.673	H
2488.400	50.9	-29.9	32.6	48.209	H
2448.600	50.9	-29.7	32.6	47.999	V
2487.000	50.8	-30.3	32.6	48.473	H
2488.600	50.7	-29.9	32.6	48.009	H

**802.11g**

Ch1

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P <sub>Mea</sub> (dBuV/m)	Polarization
2433.600	51.0	-30.1	32.6	48.453	V
2392.200	50.7	-30.3	30.8	50.227	H
2434.000	50.6	-30.1	32.6	48.053	H
2434.200	50.6	-30.1	32.6	48.053	V
2433.800	50.4	-30.1	32.6	47.853	H
2391.400	50.3	-30.3	30.8	49.827	H

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P <sub>Mea</sub> (dBuV/m)	Polarization
2458.000	51.0	-29.7	32.6	48.099	V
2458.200	50.9	-29.7	32.6	47.999	H
2458.600	50.9	-29.7	32.6	47.999	H
2459.000	50.6	-29.7	32.6	47.699	V
2458.800	50.6	-29.7	32.6	47.699	H
2417.400	50.4	-30.1	32.6	47.853	H

Ch11

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P <sub>Mea</sub> (dBuV/m)	Polarization
2484.600	51.0	-30.3	32.6	48.673	V
2441.800	50.9	-29.7	32.6	47.999	H
2485.400	50.8	-30.3	32.6	48.473	H
2442.000	50.8	-29.7	32.6	47.899	V
2485.200	50.7	-30.3	32.6	48.373	H
2485.600	50.6	-30.3	32.6	48.273	H

**802.11n-HT20**

Ch1

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P <sub>Mea</sub> (dBuV/m)	Polarization
2391.200	51.0	-30.3	30.8	50.527	V
2435.800	50.9	-30.1	32.6	48.353	H
2391.000	50.9	-30.3	30.8	50.427	H
2436.200	50.7	-30.1	32.6	48.153	V
2390.800	50.7	-30.3	30.8	50.227	H
2390.200	50.4	-30.2	30.8	49.779	H

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P <sub>Mea</sub> (dBuV/m)	Polarization
2416.600	51.0	-30.1	32.6	48.453	V
2460.000	51.0	-29.7	32.6	48.099	H
2460.800	50.9	-29.7	32.6	47.999	H
2416.400	50.9	-30.1	32.6	48.353	V
2416.000	50.8	-30.1	32.6	48.253	H
2459.600	50.8	-29.7	32.6	47.899	H

Ch11

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P <sub>Mea</sub> (dBuV/m)	Polarization
2440.000	51.0	-29.7	32.6	48.099	V
2440.200	50.9	-29.7	32.6	47.999	H
2487.400	50.9	-30.3	32.6	48.573	H
2487.800	50.8	-29.9	32.6	48.109	V
2488.600	50.8	-29.9	32.6	48.109	H
2488.000	50.7	-29.9	32.6	48.009	H

**802.11n-HT40**

Ch3

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P <sub>Mea</sub> (dBuV/m)	Polarization
2447.200	50.2	-29.7	32.6	47.299	V
2447.600	50.1	-29.7	32.6	47.199	H
2396.800	50.1	-30.3	30.8	49.627	H
2399.800	50.0	-30.3	30.8	49.527	V
2448.000	50.0	-29.7	32.6	47.099	H
2446.400	50.0	-29.7	32.6	47.099	H

Ch6

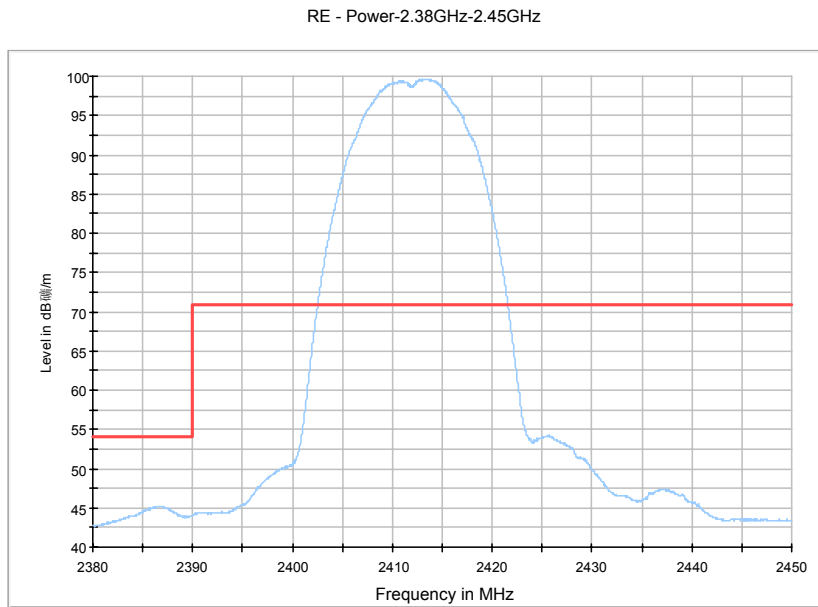
Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P <sub>Mea</sub> (dBuV/m)	Polarization
2458.400	51.0	-29.7	32.6	48.099	V
2413.800	51.0	-30.3	32.6	48.727	H
2414.800	51.0	-30.1	32.6	48.453	H
2459.000	50.9	-29.7	32.6	47.999	V
2415.000	50.9	-30.1	32.6	48.353	H
2414.000	50.7	-30.3	32.6	48.427	H

Ch9

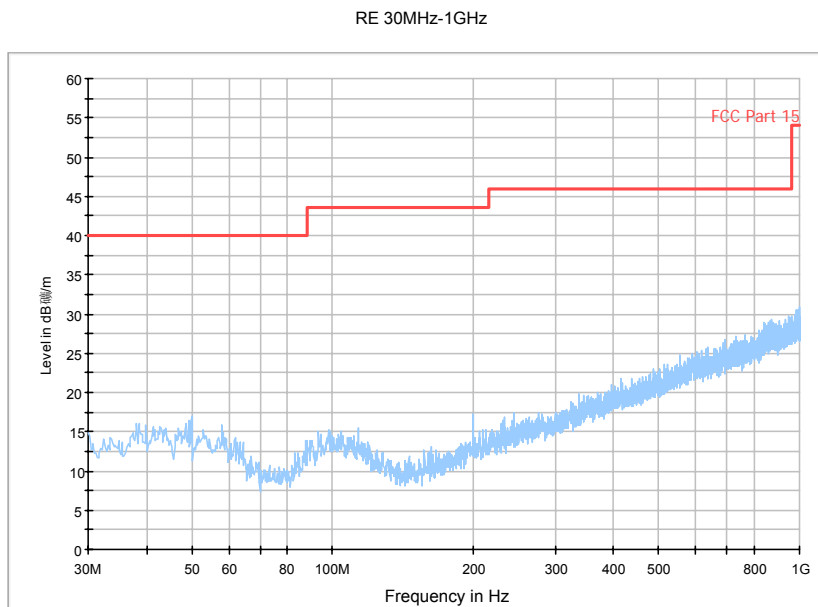
Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P <sub>Mea</sub> (dBuV/m)	Polarization
2428.800	50.9	-30.1	32.6	48.353	V
2428.000	50.9	-30.1	32.6	48.353	H
2429.600	50.9	-30.1	32.6	48.353	H
2430.000	50.8	-30.1	32.6	48.253	V
2476.600	50.8	-30.3	32.6	48.473	H
2429.200	50.8	-30.1	32.6	48.253	H

**Test graphs as below:**

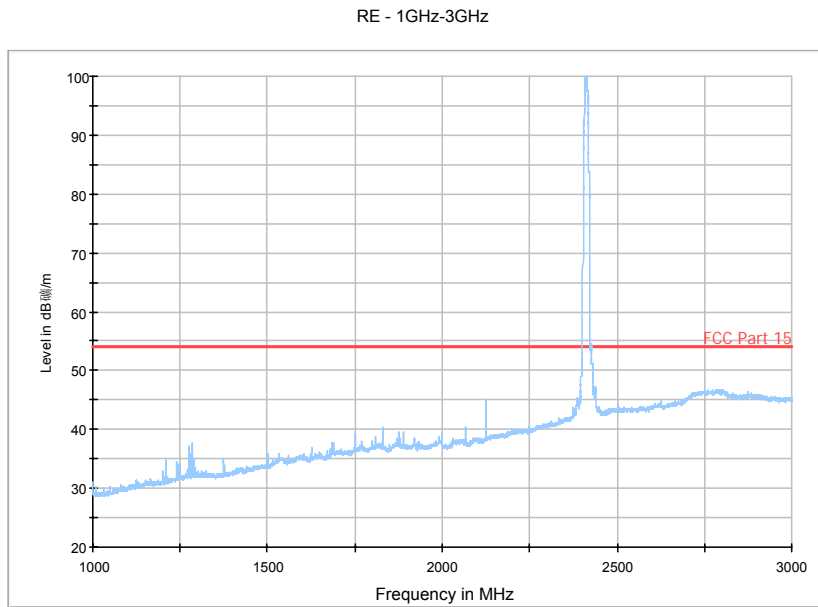




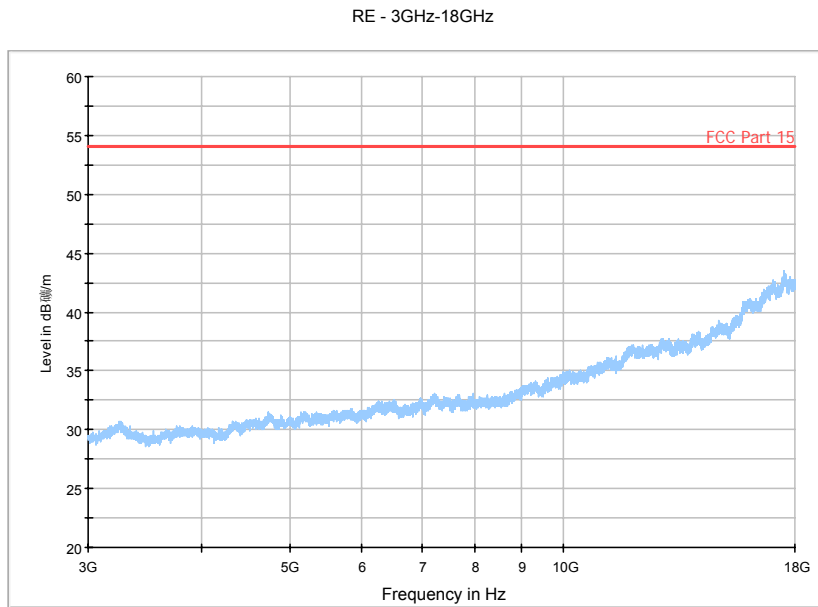
**Fig. 129 Radiated Spurious Emission (Power): 802.11b, ch1, 2.38 GHz - 245GHz**



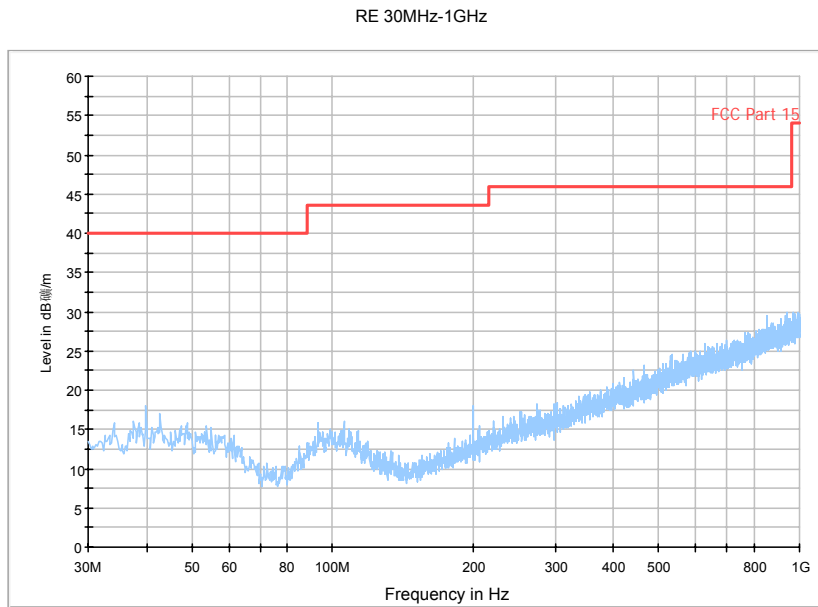
**Fig. 130 Radiated Spurious Emission (802.11b, Ch1, 30 MHz-1 GHz)**



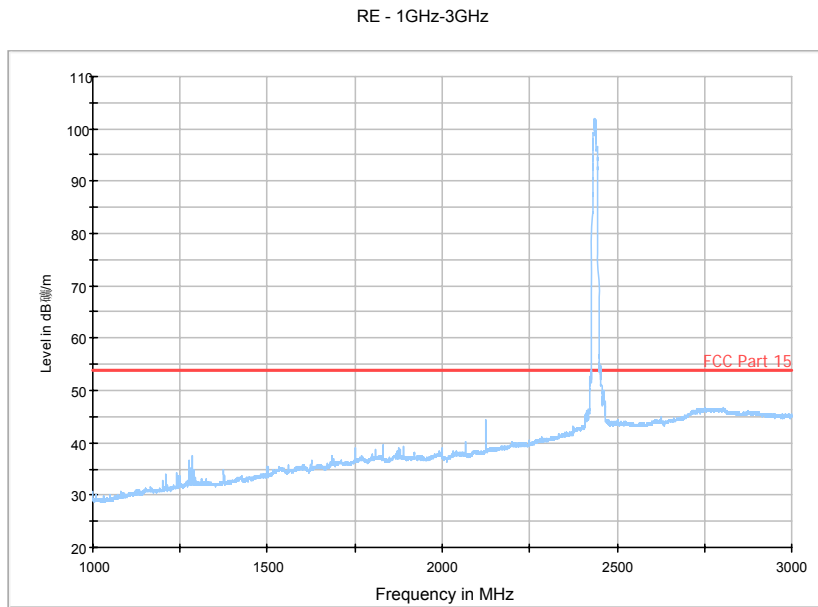
**Fig. 131 Radiated Spurious Emission (802.11b, Ch1, 1 GHz-3 GHz)**



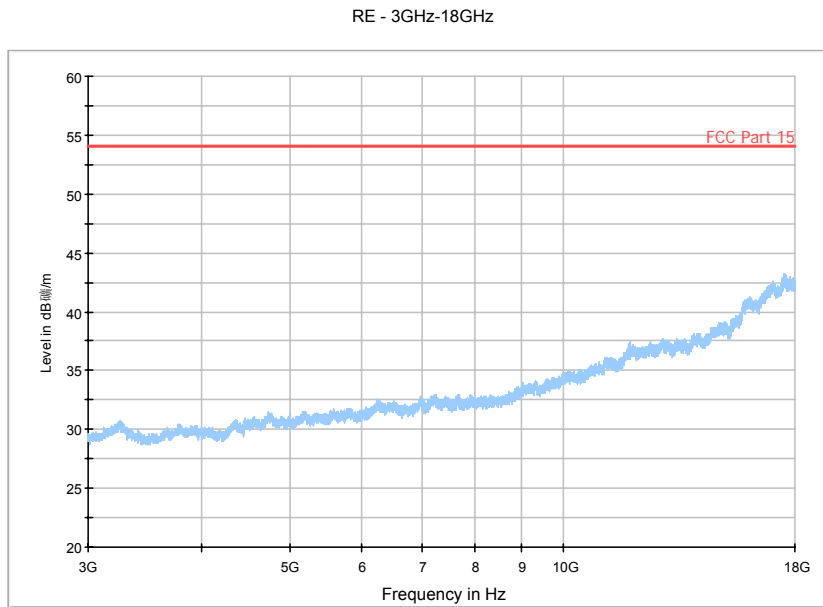
**Fig. 132 Radiated Spurious Emission (802.11b, Ch1, 3 GHz-18 GHz)**



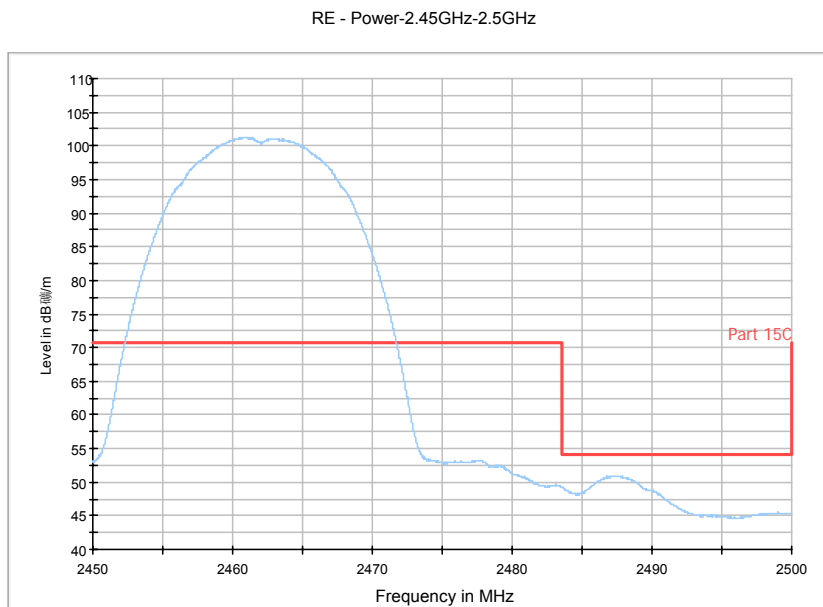
**Fig. 133 Radiated Spurious Emission (802.11b, Ch6, 30 MHz-1 GHz)**



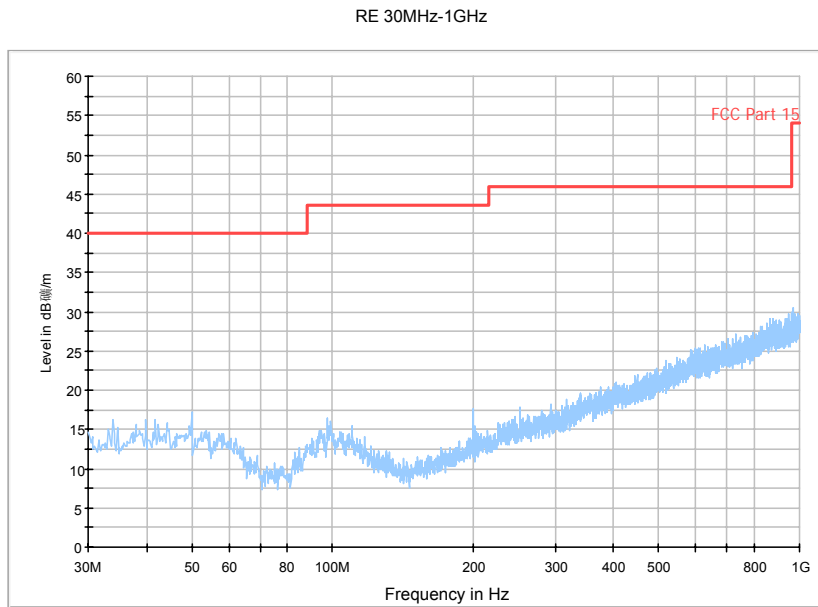
**Fig. 134 Radiated Spurious Emission (802.11b, Ch6, 1 GHz-3 GHz)**



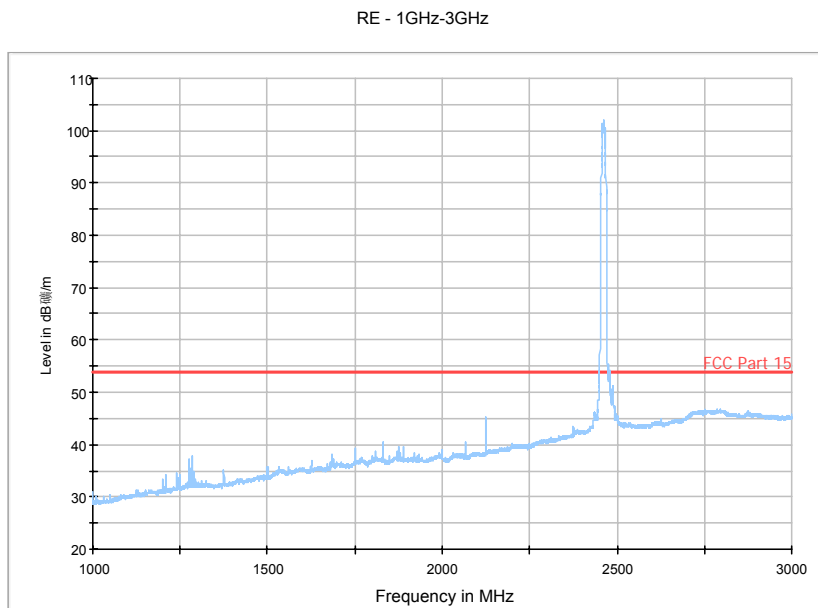
**Fig. 135 Radiated Spurious Emission (802.11b, Ch6, 3 GHz-18 GHz)**



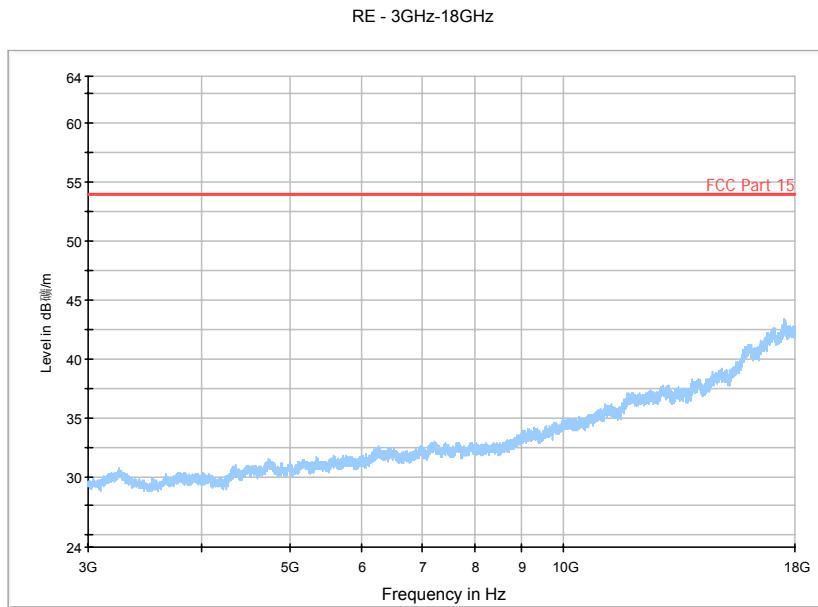
**Fig. 136 Radiated Spurious Emission (Power): 802.11b, ch11, 2.45 GHz - 2.50GHz**



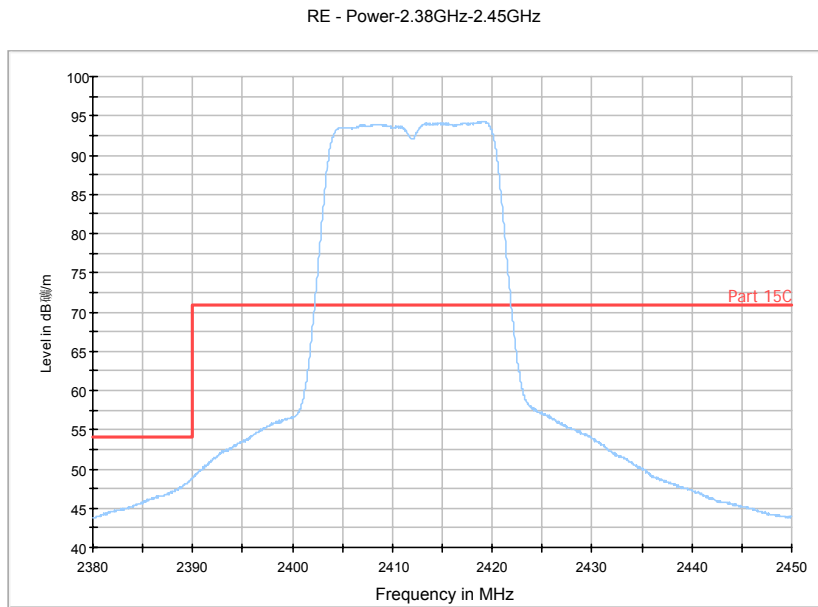
**Fig. 137 Radiated Spurious Emission (802.11b, Ch11, 30 MHz-1 GHz)**



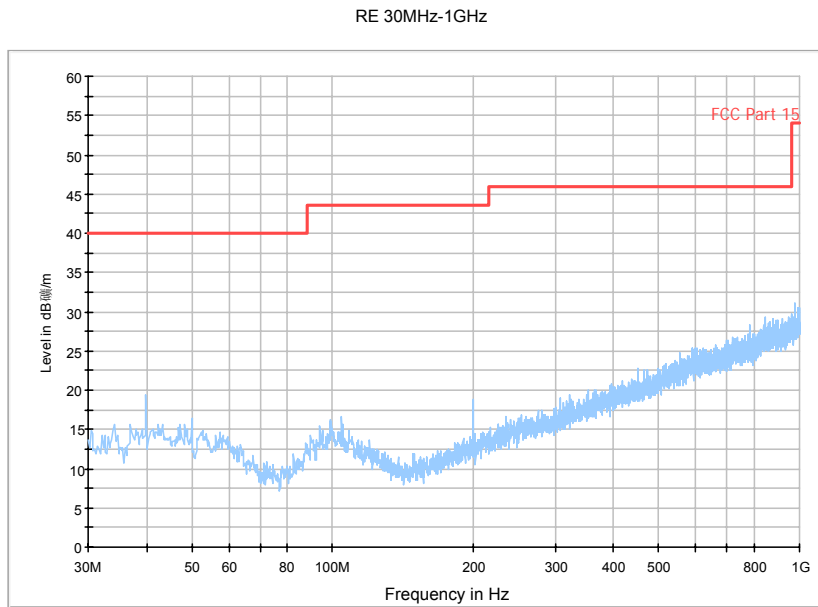
**Fig. 138 Radiated Spurious Emission (802.11b, Ch11, 1 GHz-3 GHz)**



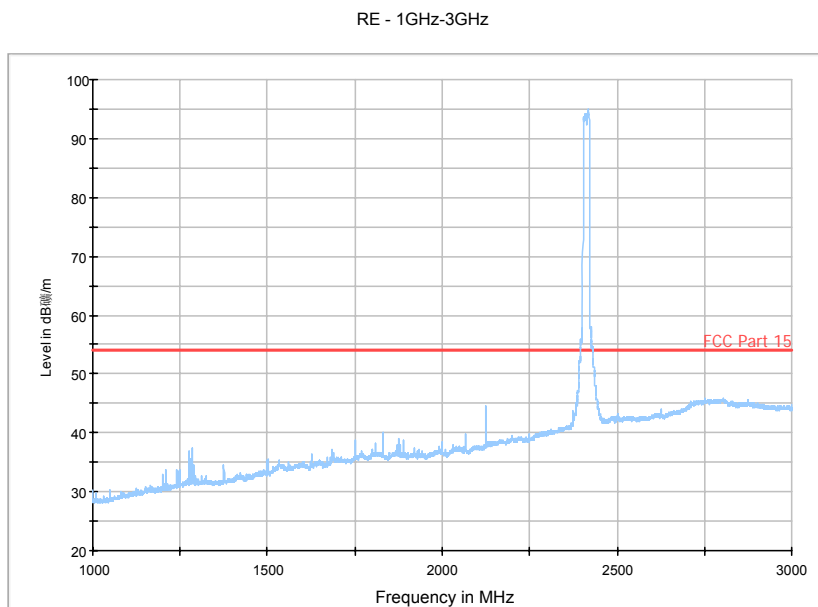
**Fig. 139 Radiated Spurious Emission (802.11b, Ch11, 3 GHz-18 GHz)**



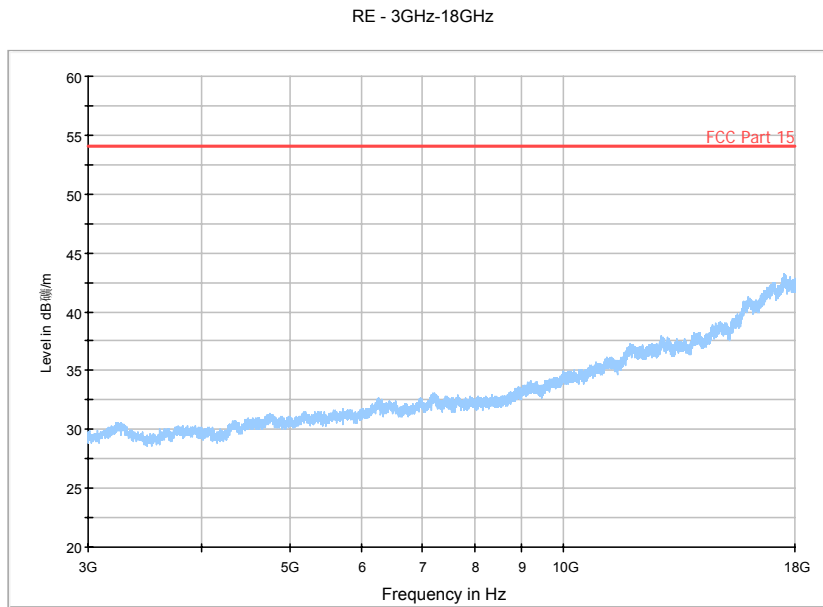
**Fig. 140 Radiated Spurious Emission (Power): 802.11g, ch1, 2.38 GHz - 2.45GHz**



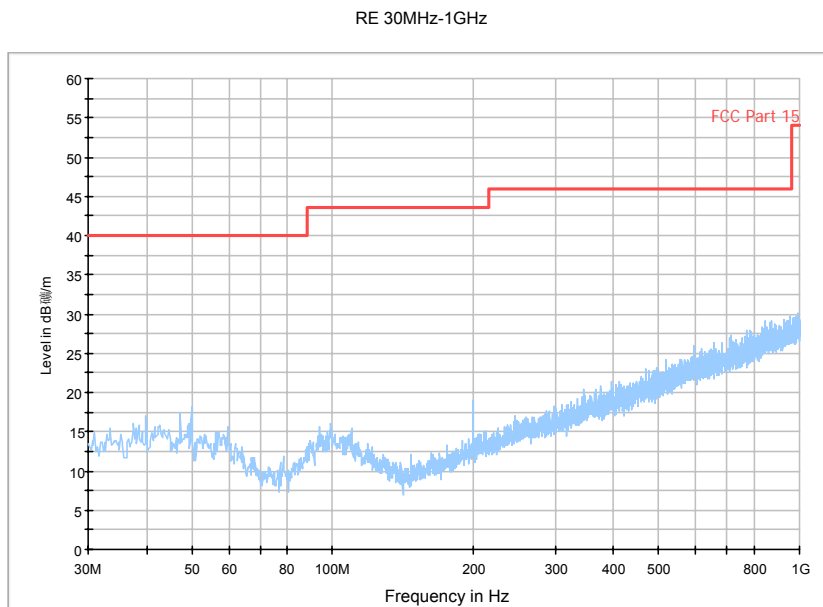
**Fig. 141 Radiated Spurious Emission (802.11g, Ch1, 30 MHz-1 GHz)**



**Fig. 142 Radiated Spurious Emission (802.11g, Ch1, 1 GHz-3 GHz)**

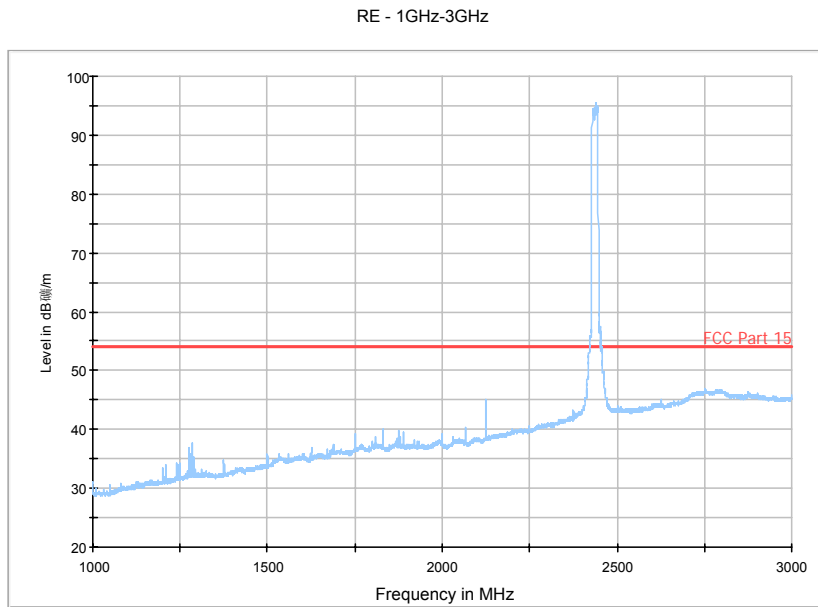


**Fig. 143 Radiated Spurious Emission (802.11g, Ch1, 3 GHz-18 GHz)**

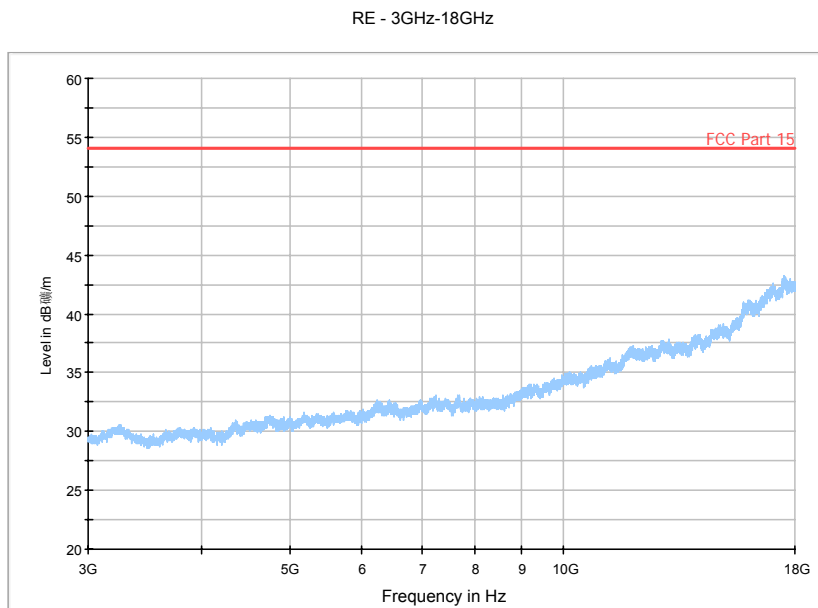


**Fig. 144 Radiated Spurious Emission (802.11g, Ch6, 30 MHz-1 GHz)**

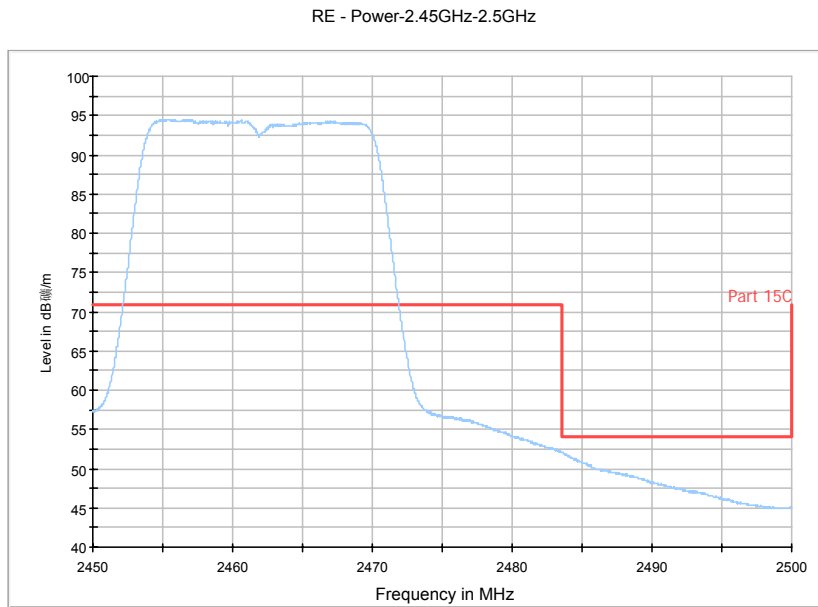




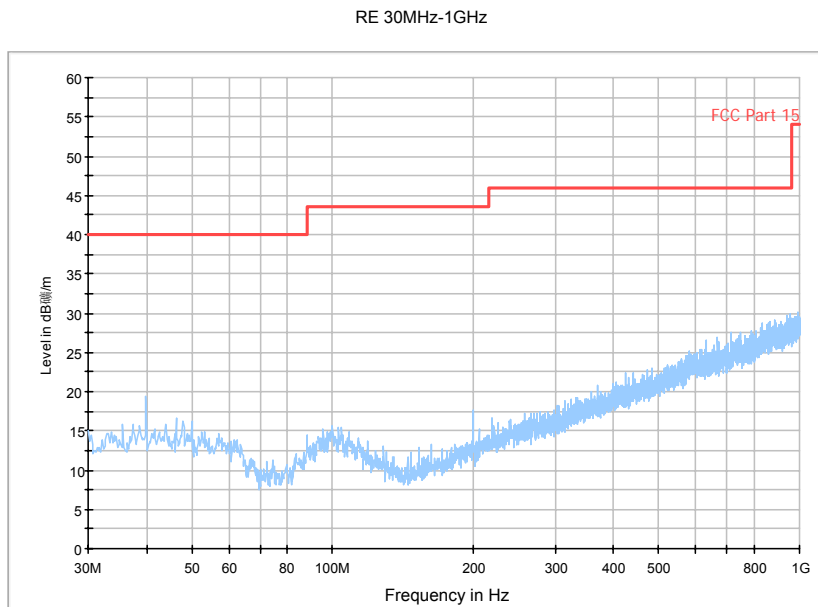
**Fig. 145 Radiated Spurious Emission (802.11g, Ch6, 1 GHz-3 GHz)**



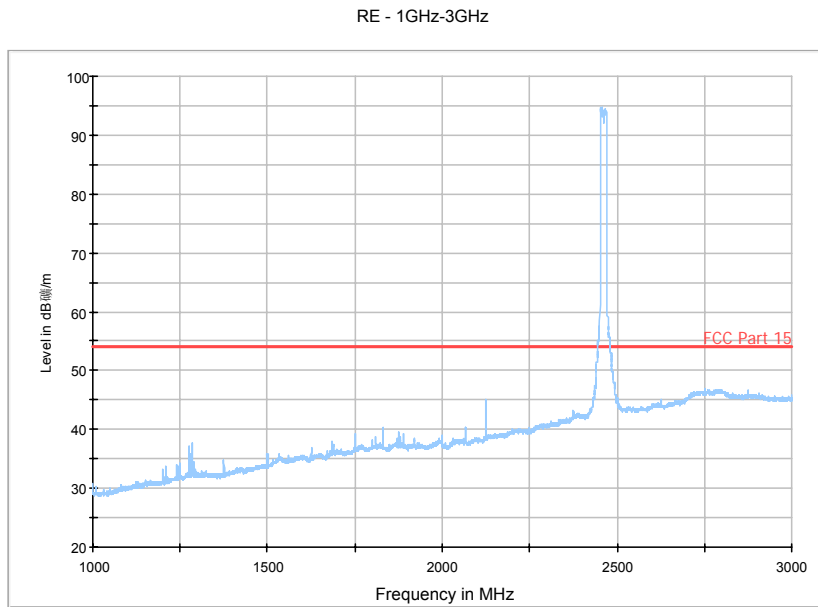
**Fig. 146 Radiated Spurious Emission (802.11g, Ch6, 3 GHz-18 GHz)**



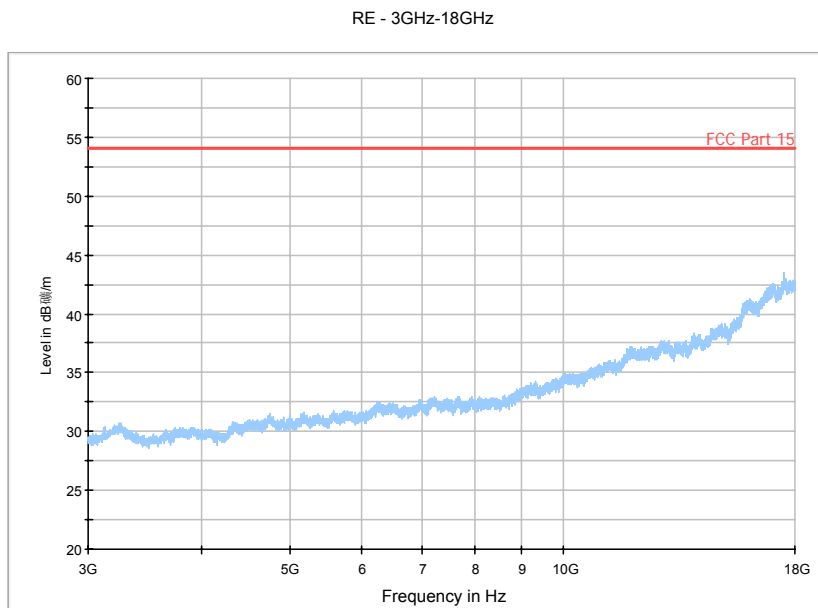
**Fig. 147 Radiated Spurious Emission (Power): 802.11g, ch11, 2.45 GHz - 2.50GHz**



**Fig. 148 Radiated Spurious Emission (802.11g, Ch11, 30 MHz-1 GHz)**



**Fig. 149 Radiated Spurious Emission (802.11g, Ch11, 1 GHz-3 GHz)**



**Fig. 150 Radiated Spurious Emission (802.11g, Ch11, 3 GHz-18 GHz)**

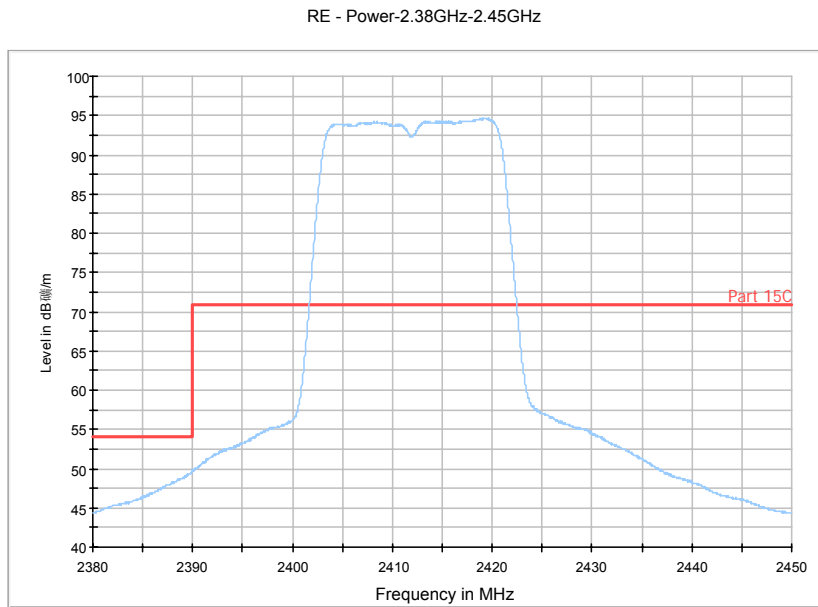


Fig. 151 Radiated Spurious Emission (Power): 802.11n-20MHz, ch1, 2.38 GHz - 2.45GHz

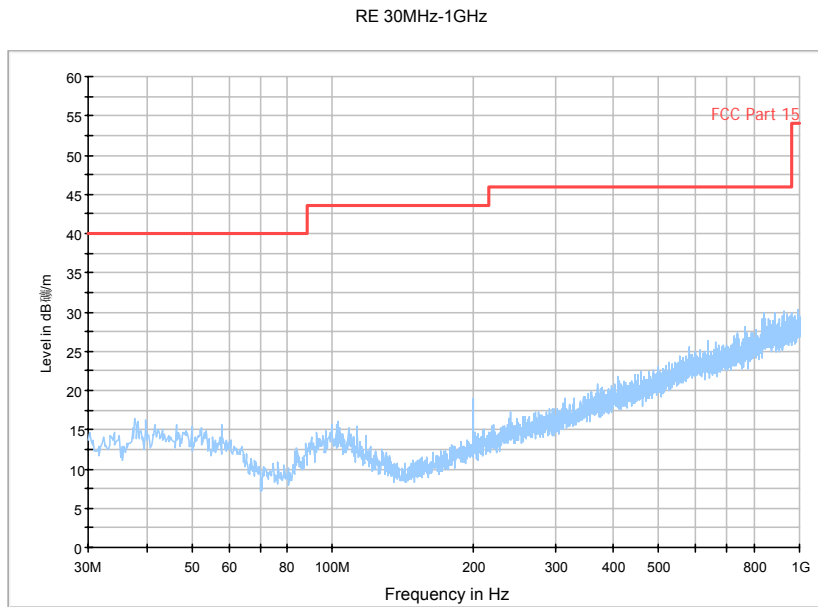
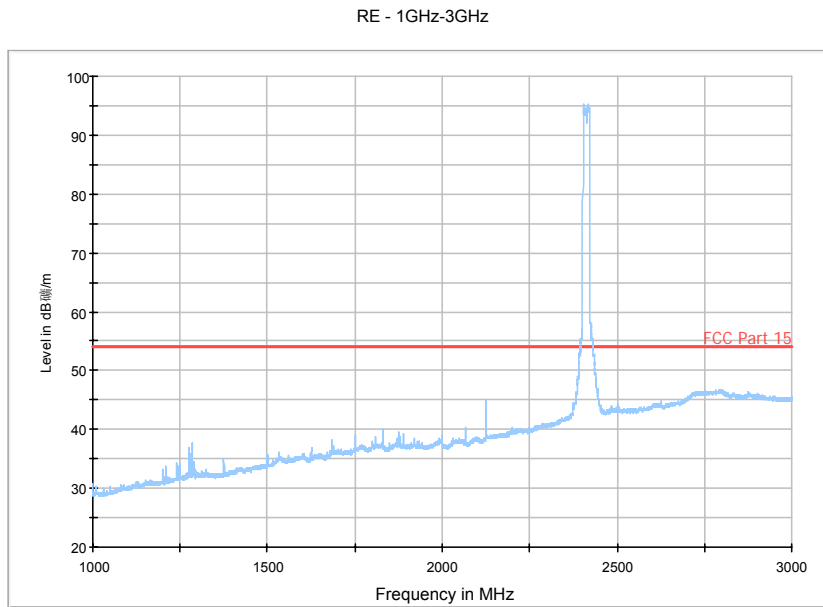
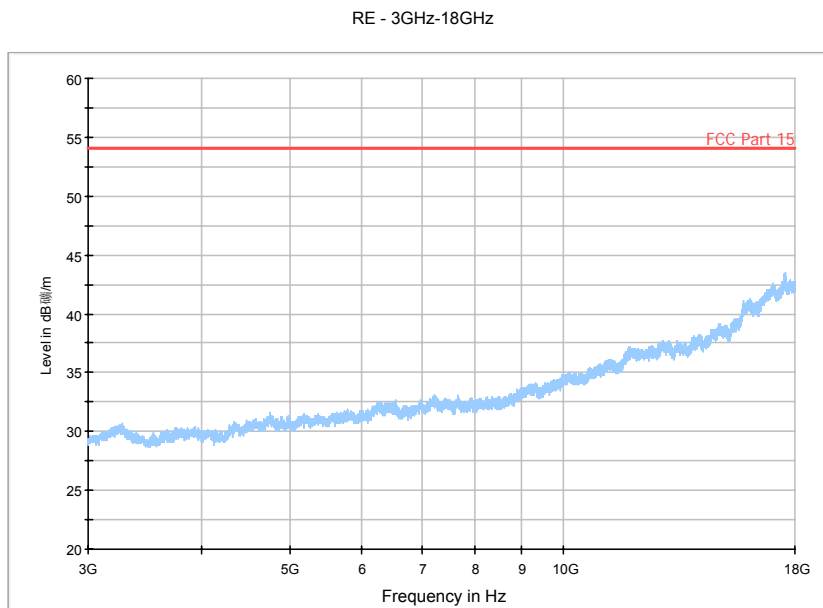


Fig. 152 Radiated Spurious Emission (802.11n-20MHz, Ch1, 30 MHz-1 GHz)



**Fig. 153 Radiated Spurious Emission (802.11n-20MHz, Ch1, 1 GHz-3 GHz)**



**Fig. 154 Radiated Spurious Emission (802.11n-20MHz, Ch1, 3 GHz-18 GHz)**

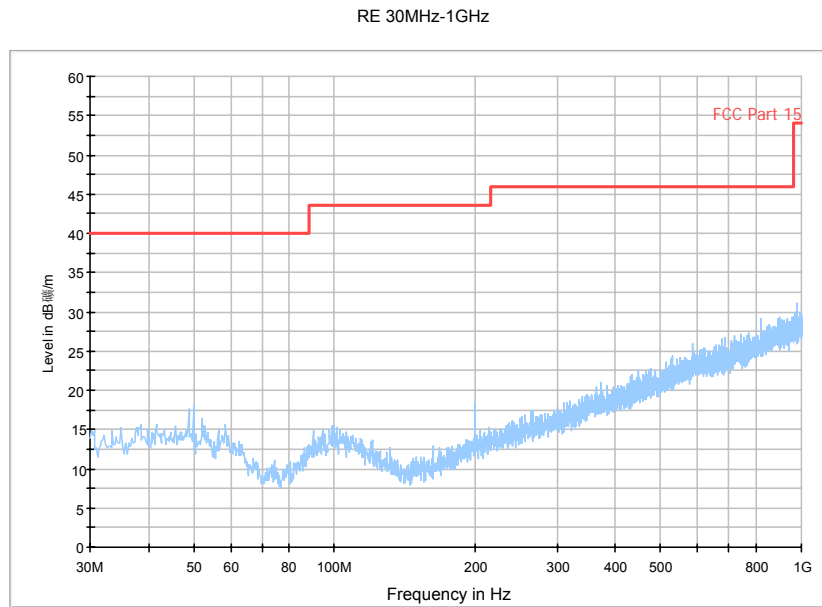


Fig. 155 Radiated Spurious Emission (802.11n-20MHz, Ch6, 30 MHz-1 GHz)

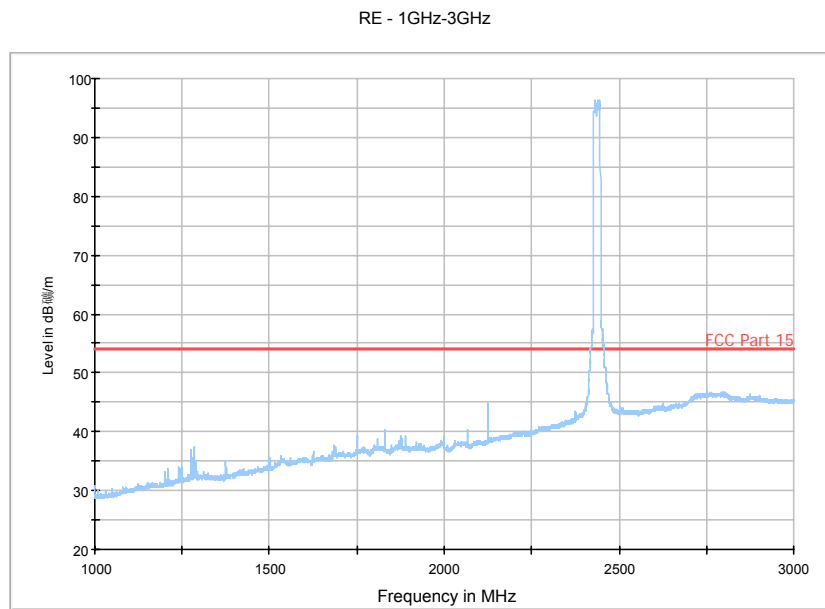
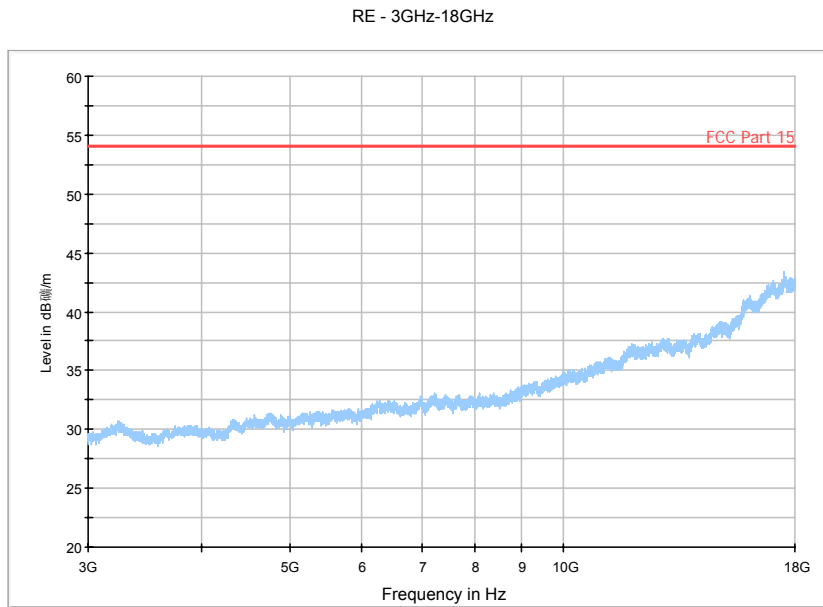
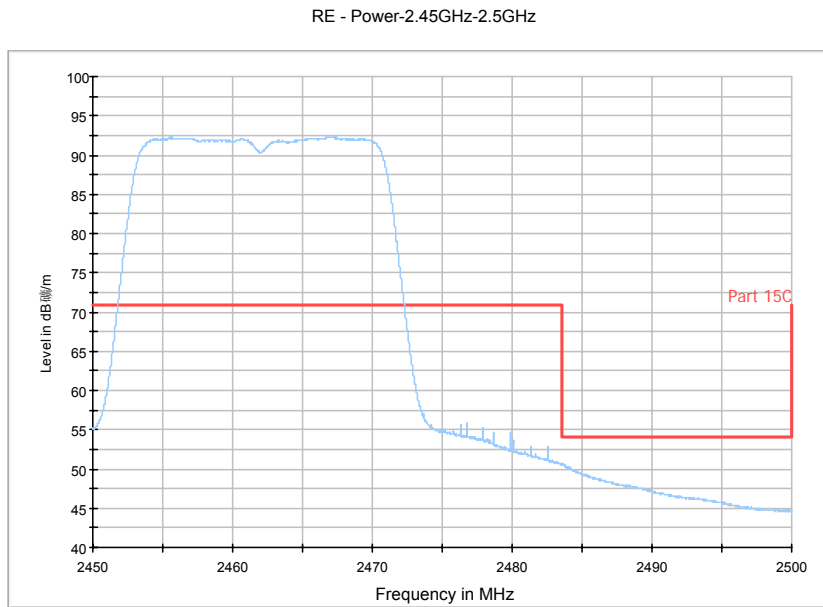


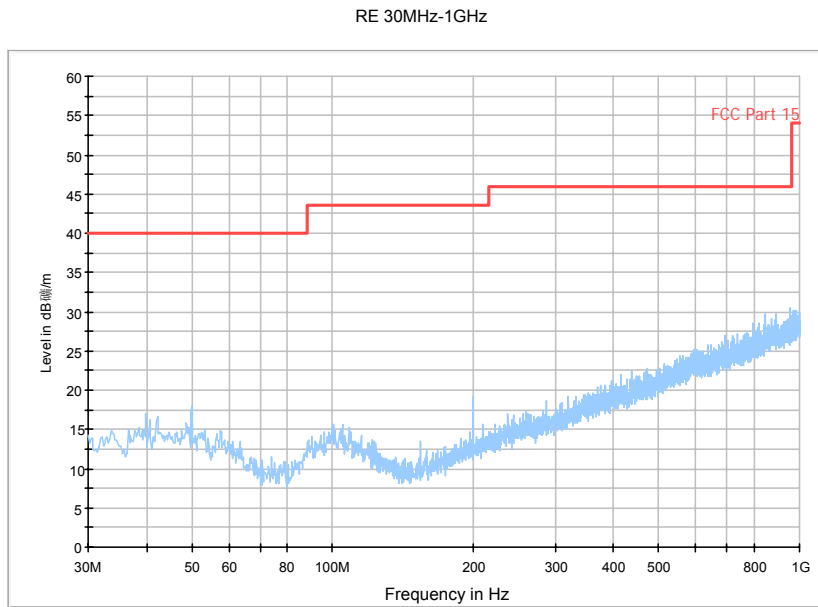
Fig. 156 Radiated Spurious Emission (802.11n-20MHz, Ch6, 1 GHz-3 GHz)



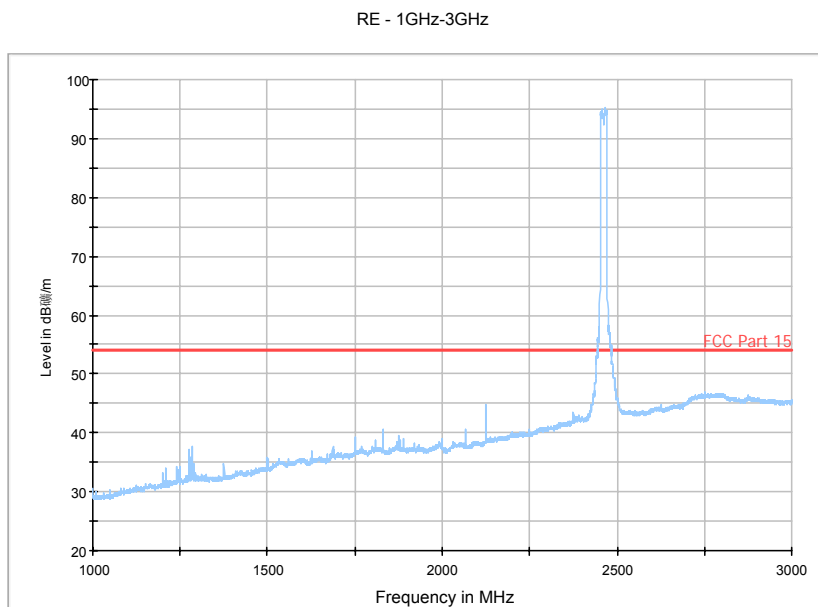
**Fig. 157 Radiated Spurious Emission (802.11n-20MHz, Ch6, 3 GHz-18 GHz)**



**Fig. 158 Radiated Spurious Emission (Power): 802.11n-20MHz, ch11, 2.45 GHz - 2.50GHz**

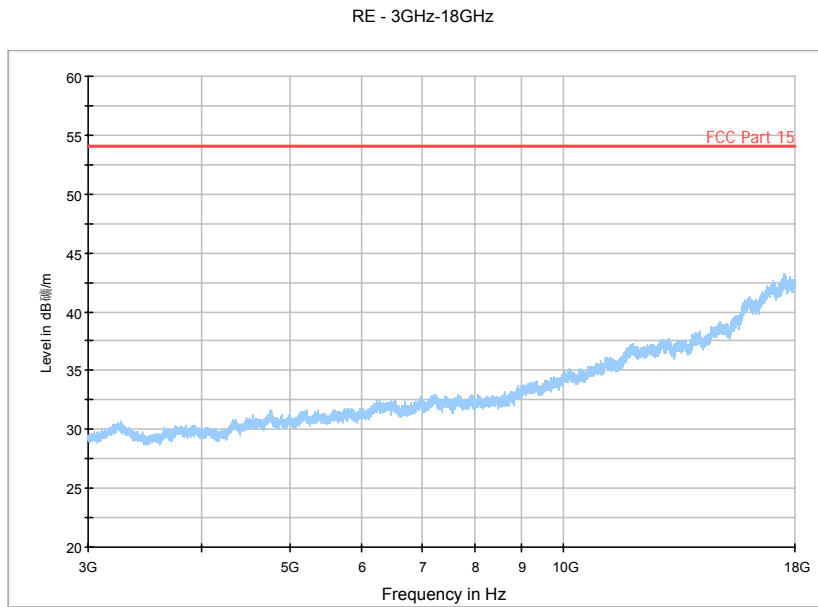


**Fig. 159 Radiated Spurious Emission (802.11n-20MHz, Ch11, 30 MHz-1 GHz)**

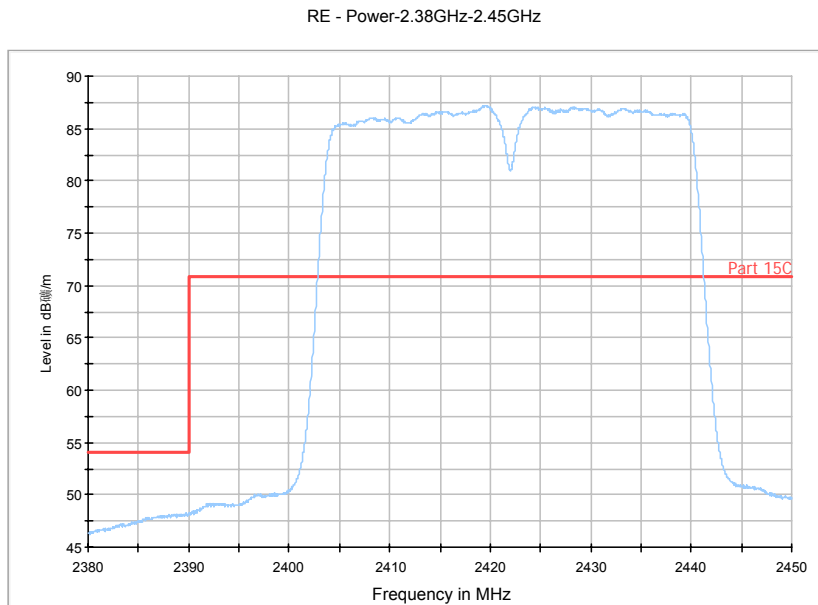


**Fig. 160 Radiated Spurious Emission (802.11n-20MHz, Ch11, 1 GHz-3 GHz)**

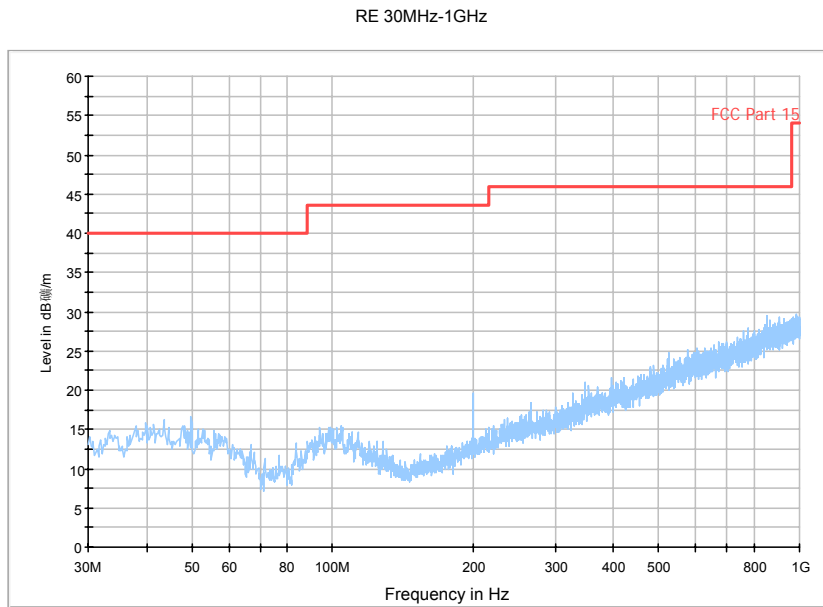




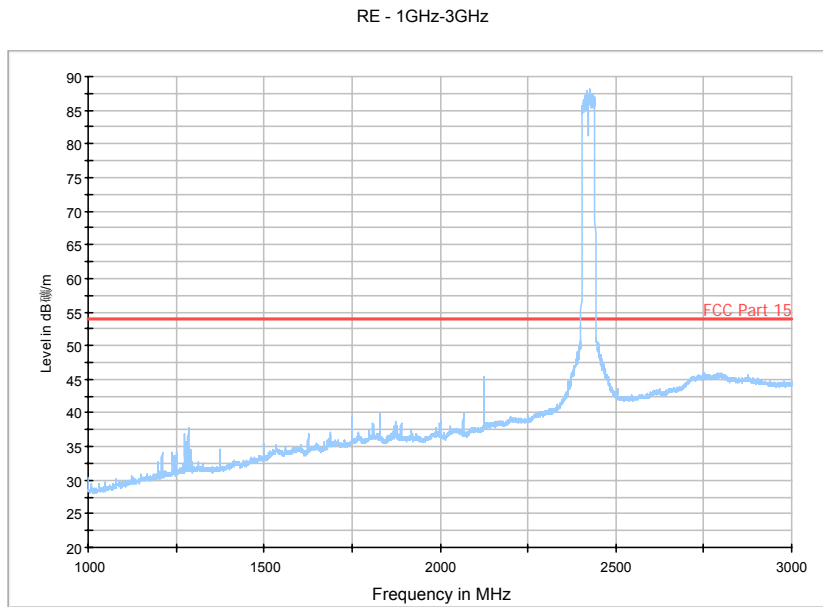
**Fig. 161 Radiated Spurious Emission (802.11n-20MHz, Ch11, 3 GHz-18 GHz)**



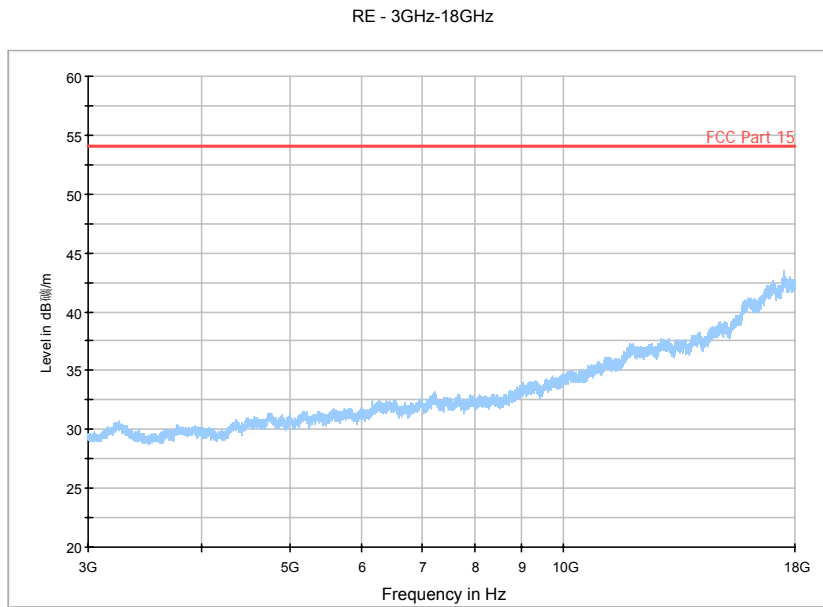
**Fig. 162 Radiated Spurious Emission (Power): 802.11n-40MHz, ch3, 2.38 GHz - 2.45GHz**



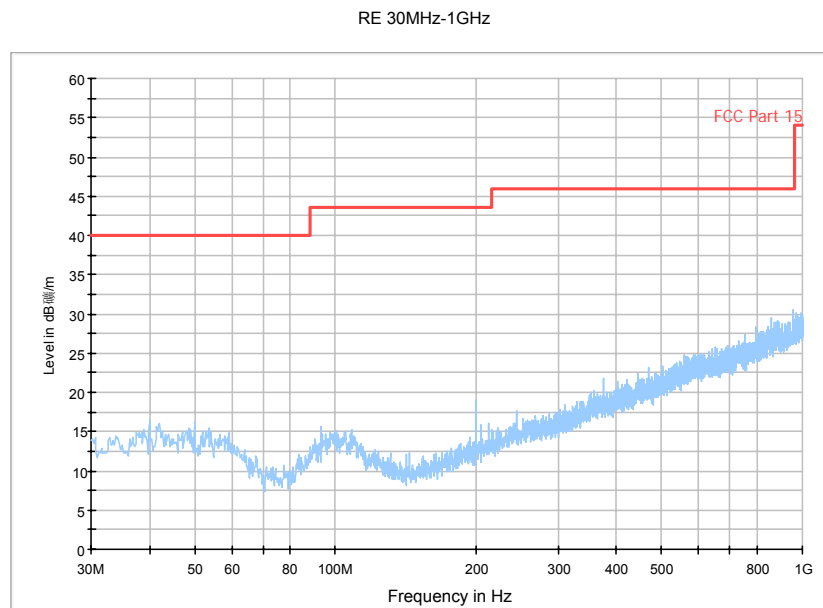
**Fig. 163 Radiated Spurious Emission (802.11n-40MHz, Ch3, 30 MHz-1 GHz)**



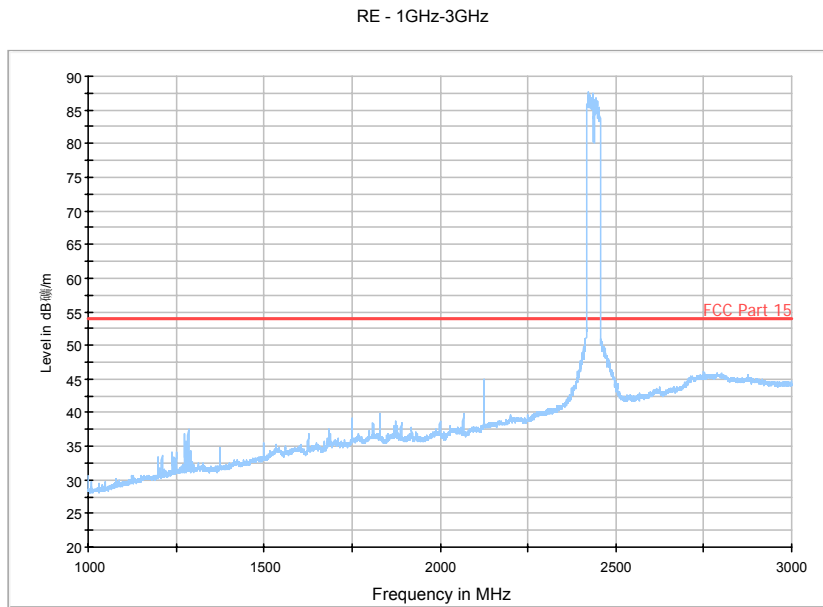
**Fig. 164 Radiated Spurious Emission (802.11n-40MHz, Ch3, 1 GHz-3 GHz)**



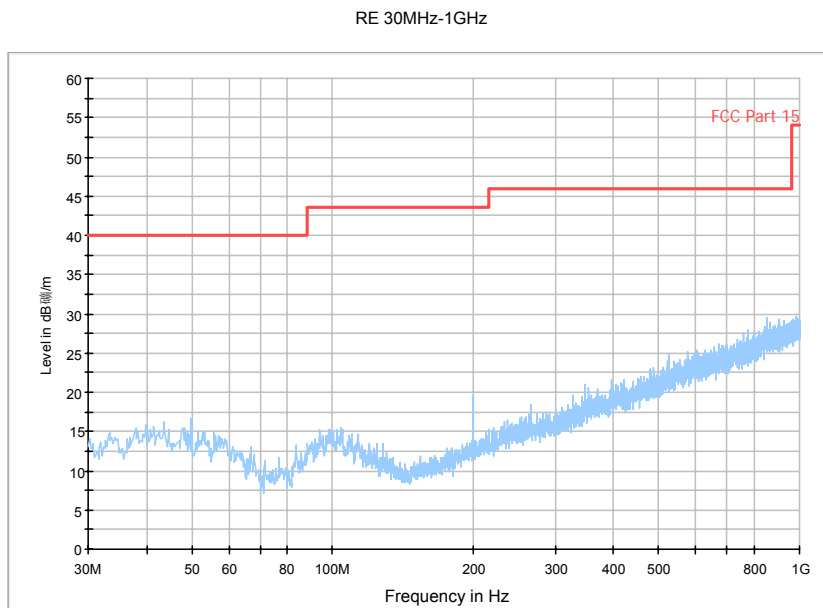
**Fig. 165 Radiated Spurious Emission (802.11n-40MHz, Ch3, 3 GHz-18 GHz)**



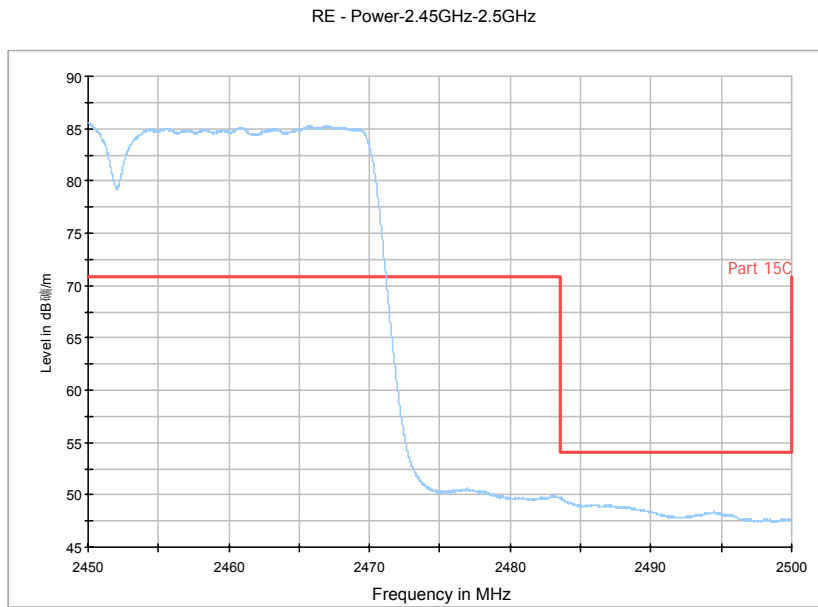
**Fig. 166 Radiated Spurious Emission (802.11n-40MHz, Ch6, 30 MHz-1 GHz)**



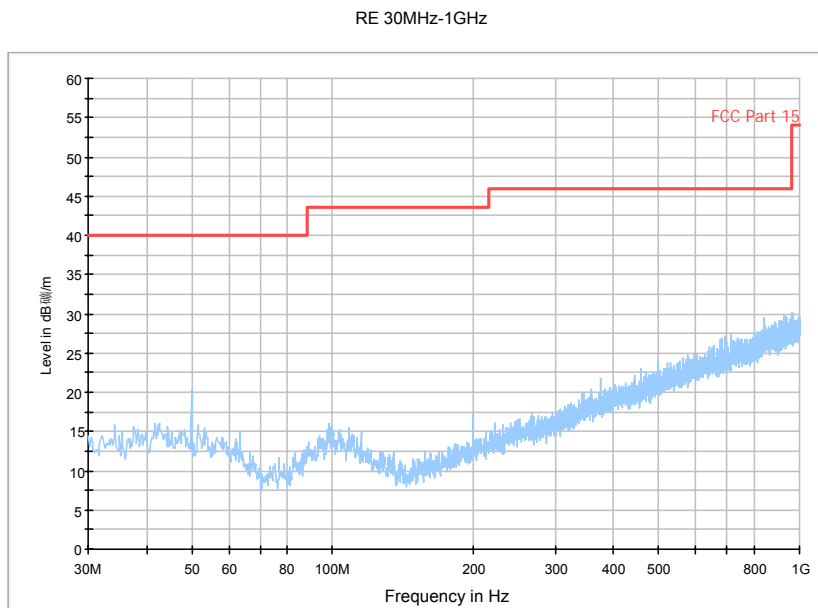
**Fig. 167 Radiated Spurious Emission (802.11n-40MHz, Ch6, 1 GHz-3 GHz)**



**Fig. 168 Radiated Spurious Emission (802.11n-40MHz, Ch6, 3 GHz-18 GHz)**



**Fig. 169 Radiated Spurious Emission (Power): 802.11n-40MHz, ch9, 2.45 GHz - 2.50GHz**



**Fig. 170 Radiated Spurious Emission (802.11n-40MHz, Ch9, 30 MHz-1 GHz)**

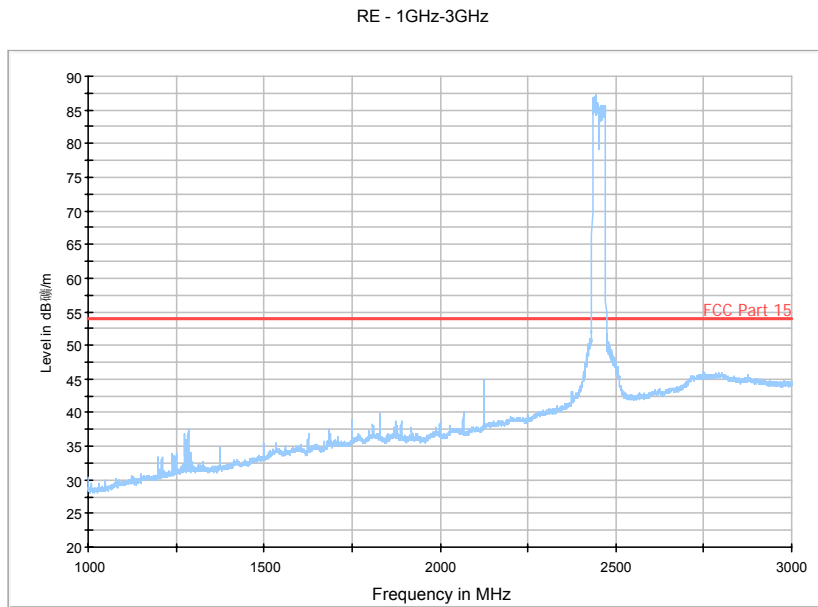


Fig. 171 Radiated Spurious Emission (802.11n-40MHz, Ch9, 1 GHz-3 GHz)

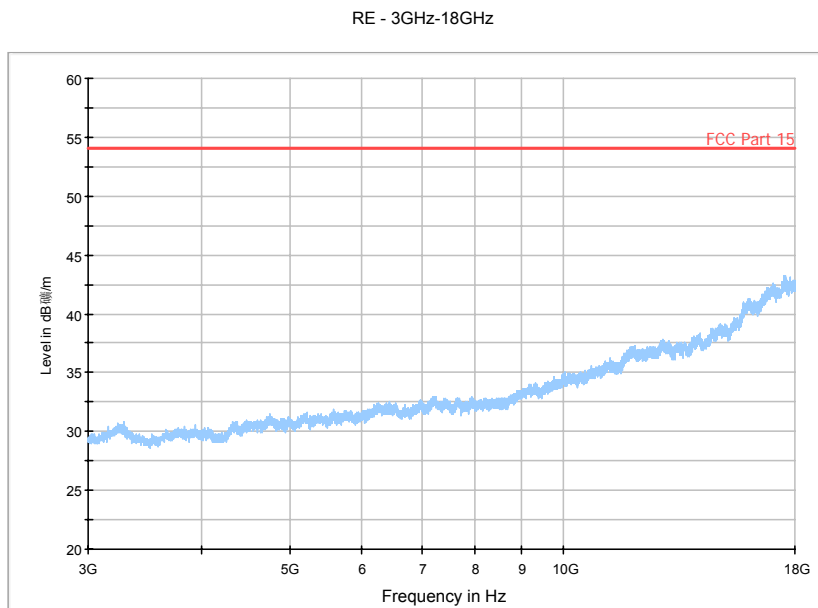
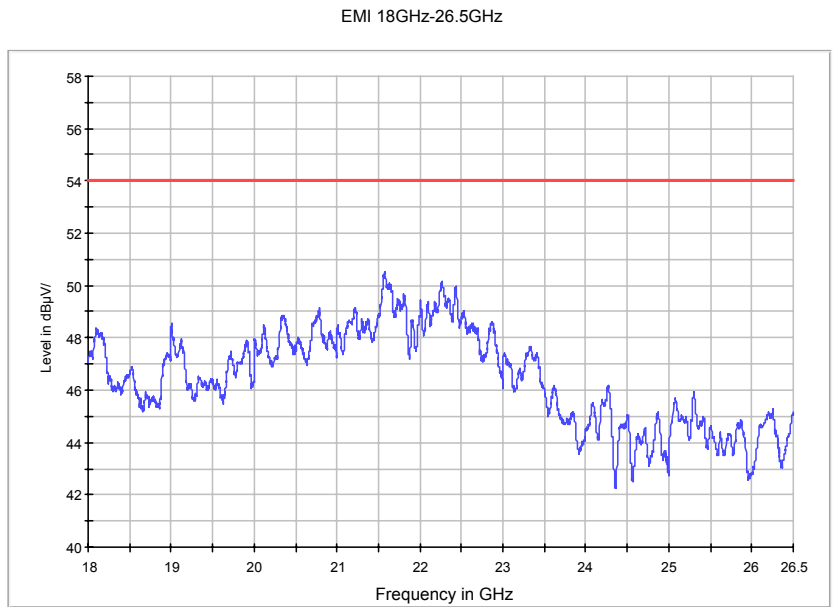


Fig. 172 Radiated Spurious Emission (802.11n-40MHz, Ch9, 3 GHz-18 GHz)



**Fig. 173 Radiated Spurious Emission (All channels): 18GHz – 26.5GHz**

### A.7. AC Powerline Conducted Emission

**Test Condition:**

Voltage (V)	Frequency (Hz)
120	60

**Measurement Result and limit:**

WLAN (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dB $\mu$ V)	Result (dB $\mu$ V)				Conclusion
		With charger 1				
		802.11b	802.11g	802.11n HT20	802.11n HT40	
0.15 to 0.5	66 to 56	Fig. 174	Fig. 175	Fig. 176	Fig. 177	P
0.5 to 5	56					
5 to 30	60					

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

WLAN (Average Limit)

Frequency range (MHz)	Average Limit (dB $\mu$ V)	Result (dB $\mu$ V)				Conclusion
		With charger 1				
		802.11b	802.11g	802.11n HT20	802.11n HT40	
0.15 to 0.5	56 to 46	Fig.174	Fig.175	Fig.176	Fig.177	P
0.5 to 5	46					
5 to 30	50					

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.



WLAN (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dB $\mu$ V)	Result (dB $\mu$ V)				Conclusion
		With charger 2				
		802.11b	802.11g	802.11n HT20	802.11n HT40	
0.15 to 0.5	67 to 56	Fig. 178	Fig. 179	Fig. 180	Fig. 181	P
0.5 to 5	56					
5 to 30	60					

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

WLAN (Average Limit)

Frequency range (MHz)	Average Limit (dB $\mu$ V)	Result (dB $\mu$ V)				Conclusion
		With charger 2				
		802.11b	802.11g	802.11n HT20	802.11n HT40	
0.15 to 0.5	56 to 46	Fig.178	Fig.179	Fig.180	Fig.181	P
0.5 to 5	46					
5 to 30	50					

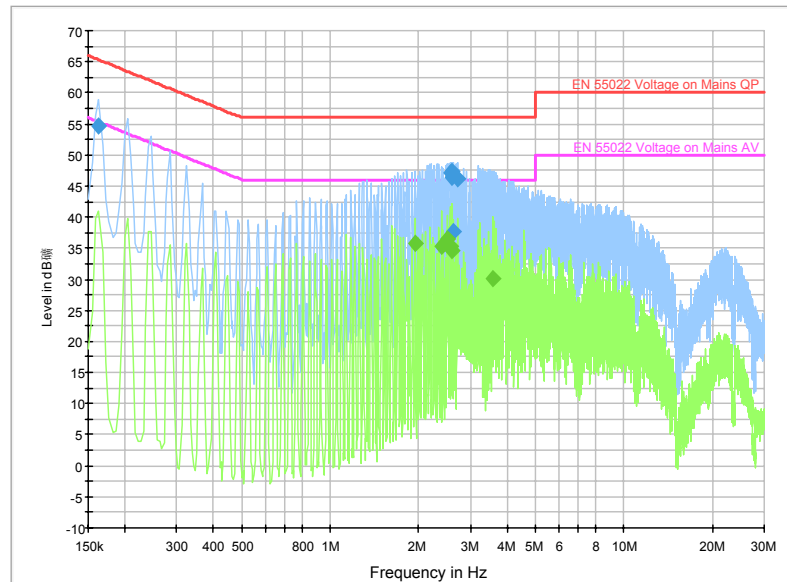
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

The measurement is made according to ANSI C63.10

The measurement is made according to ANSI C63.10

**Conclusion: PASS**

**Test graphs as below:**



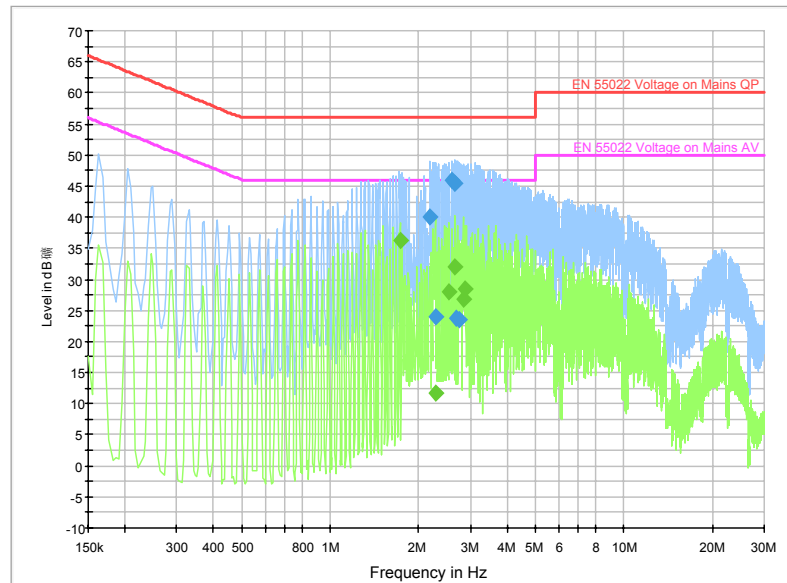
**Fig. 174 AC Powerline Conducted Emission-802.11b (charger 1)**

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.163500	54.7	GND	L1	10.0	10.6	65.3
2.553000	47.1	GND	L1	10.0	8.9	56.0
2.584500	46.5	GND	L1	10.0	9.5	56.0
2.593500	47.3	GND	L1	10.0	8.7	56.0
2.616000	37.7	GND	L1	10.0	18.3	56.0
2.706000	46.3	GND	L1	10.0	9.7	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
1.945500	35.9	GND	L1	10.0	10.1	46.0
2.391000	35.4	GND	L1	10.0	10.6	46.0
2.512500	36.5	GND	L1	10.0	9.5	46.0
2.553000	35.2	GND	L1	10.0	10.8	46.0
2.593500	34.7	GND	L1	10.0	11.3	46.0
3.565500	30.2	GND	L1	10.0	15.8	46.0



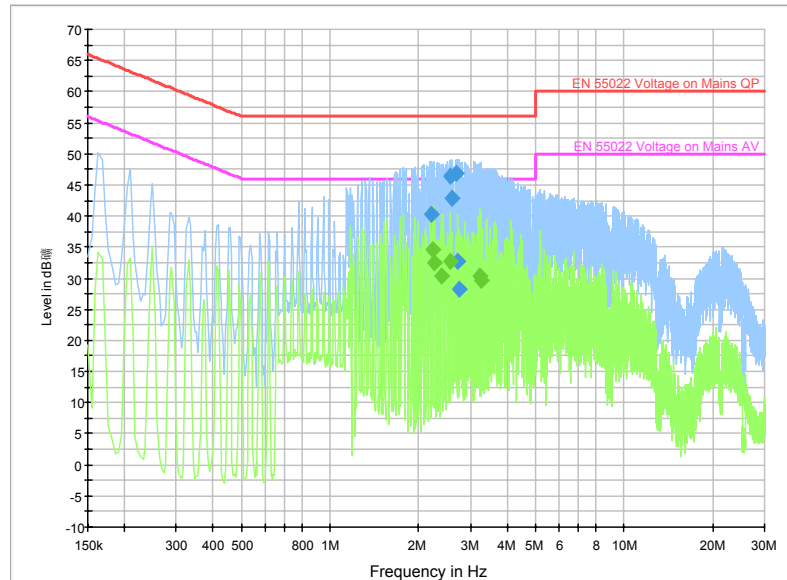
**Fig. 175 AC Powerline Conducted Emission-802.11g (charger 1)**

Final Result 1

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
2.193000	40.0	GND	L1	10.0	16.0	56.0
2.274000	24.0	GND	L1	10.0	32.0	56.0
2.584500	45.9	GND	L1	10.0	10.1	56.0
2.665500	45.5	GND	L1	10.0	10.5	56.0
2.692500	23.8	GND	L1	10.0	32.2	56.0
2.733000	23.5	GND	L1	10.0	32.5	56.0

Final Result 2

Frequency (MHz)	Average (dB $\mu$ V)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
1.725000	36.3	GND	L1	10.0	9.7	46.0
2.274000	11.6	GND	L1	10.0	34.4	46.0
2.539500	28.0	GND	L1	10.0	18.0	46.0
2.665500	32.0	GND	L1	10.0	14.0	46.0
2.827500	26.9	GND	L1	10.0	19.1	46.0
2.868000	28.6	GND	L1	10.0	17.4	46.0



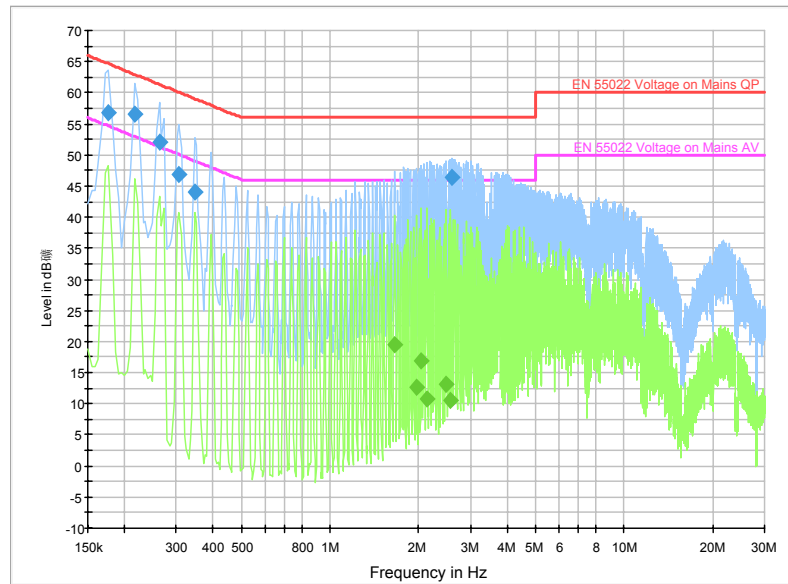
**Fig. 176 AC Powerline Conducted Emission-802.11n-HT20 (charger 1)**

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.220000	40.3	GND	L1	10.0	15.7	56.0
2.553000	46.4	GND	L1	10.0	9.6	56.0
2.584500	42.9	GND	L1	10.0	13.1	56.0
2.679000	46.8	GND	L1	10.0	9.2	56.0
2.710500	32.8	GND	L1	10.0	23.2	56.0
2.751000	28.2	GND	L1	10.0	27.8	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.229000	34.6	GND	L1	10.0	11.4	46.0
2.269500	32.5	GND	L1	10.0	13.5	46.0
2.391000	30.2	GND	L1	10.0	15.8	46.0
2.557500	32.8	GND	L1	10.0	13.2	46.0
3.219000	30.2	GND	L1	10.0	15.8	46.0
3.259500	29.6	GND	L1	10.0	16.4	46.0



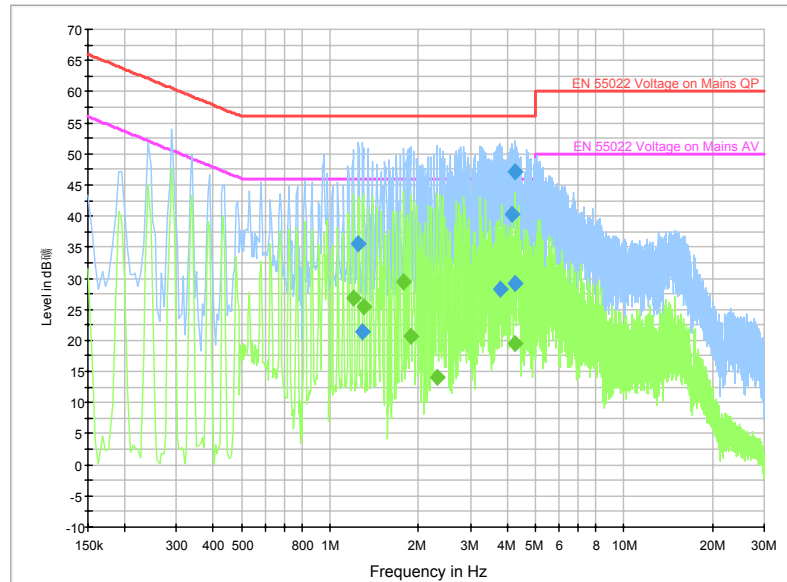
**Fig. 177 AC Powerline Conducted Emission-802.11n-HT40 (charger 1)**

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.177000	56.7	GND	L1	10.0	7.9	64.6
0.217500	56.5	GND	L1	10.0	6.4	62.9
0.262500	52.2	GND	L1	10.0	9.2	61.4
0.307500	46.9	GND	L1	10.0	13.2	60.0
0.348000	44.1	GND	L1	10.0	14.9	59.0
2.607000	46.4	GND	L1	10.0	9.6	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
1.657500	19.5	GND	L1	10.0	26.5	46.0
1.963500	12.6	GND	L1	10.0	33.4	46.0
2.044500	16.9	GND	L1	10.0	29.1	46.0
2.139000	10.8	GND	L1	10.0	35.2	46.0
2.485500	13.2	GND	L1	10.0	32.8	46.0
2.575500	10.5	GND	L1	10.0	35.5	46.0



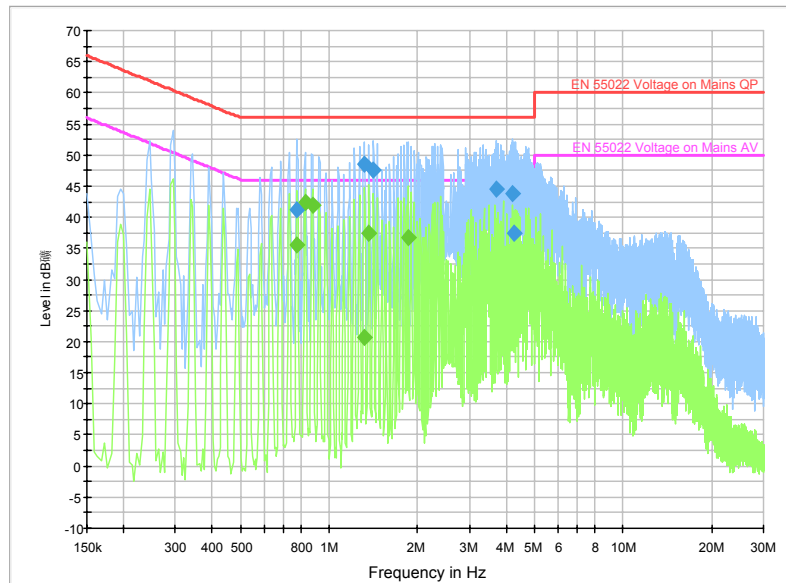
**Fig. 178 AC Powerline Conducted Emission-802.11b (charger 2)**

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.248000	35.5	GND	L1	10.0	20.5	56.0
1.293000	21.5	GND	L1	10.0	34.5	56.0
3.804000	28.2	GND	L1	10.0	27.8	56.0
4.137000	40.3	GND	L1	10.0	15.7	56.0
4.231500	47.2	GND	L1	10.0	8.8	56.0
4.240500	29.2	GND	L1	10.0	26.8	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.203000	26.8	GND	L1	10.0	19.2	46.0
1.297500	25.3	GND	L1	10.0	20.7	46.0
1.783500	29.5	GND	L1	10.0	16.5	46.0
1.878000	20.6	GND	L1	10.0	25.4	46.0
2.310000	14.1	GND	L1	10.0	31.9	46.0
4.240500	19.4	GND	L1	10.0	26.6	46.0



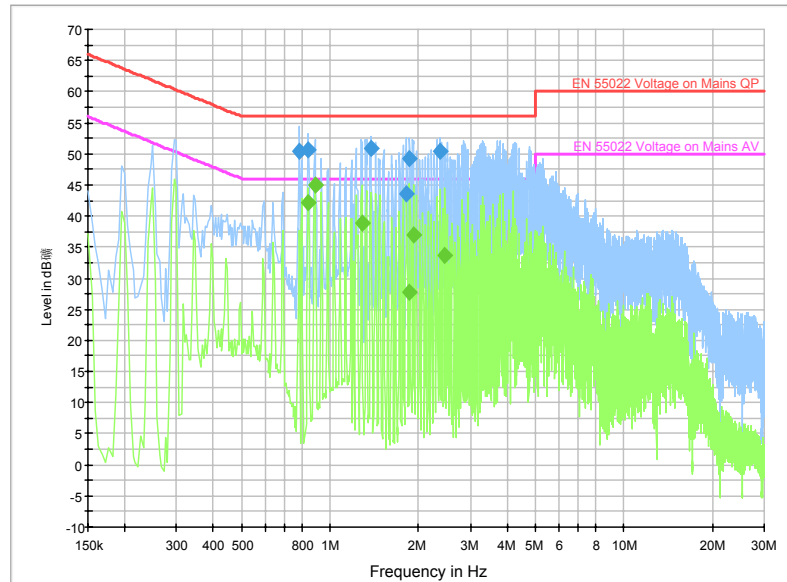
**Fig. 179 AC Powerline Conducted Emission-802.11g (charger 2)**

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.775500	41.1	GND	L1	10.0	14.9	56.0
1.315500	48.5	GND	L1	10.0	7.5	56.0
1.414500	47.6	GND	L1	10.0	8.4	56.0
3.714000	44.6	GND	N	10.0	11.4	56.0
4.204500	43.8	GND	N	10.0	12.2	56.0
4.231500	37.5	GND	N	10.0	18.5	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.780000	35.6	GND	L1	10.0	10.4	46.0
0.829500	42.5	GND	L1	10.0	3.5	46.0
0.879000	41.9	GND	L1	10.0	4.1	46.0
1.315500	20.6	GND	L1	10.0	25.4	46.0
1.365000	37.4	GND	L1	10.0	8.6	46.0
1.855500	36.7	GND	L1	10.0	9.3	46.0



**Fig. 180 AC Powerline Conducted Emission-802.11n-HT20 (charger 2)**

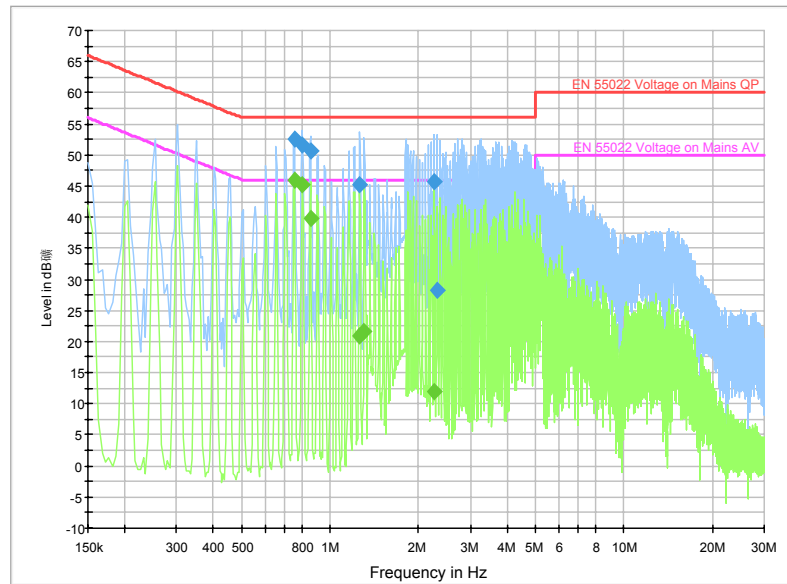
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.789000	50.5	GND	L1	10.0	5.5	56.0
0.843000	50.6	GND	L1	10.0	5.4	56.0
1.378500	51.0	GND	L1	10.0	5.0	56.0
1.815000	43.5	GND	L1	10.0	12.5	56.0
1.869000	49.2	GND	L1	10.0	6.8	56.0
2.364000	50.3	GND	L1	10.0	5.7	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.843000	42.1	GND	L1	10.0	3.9	46.0
0.888000	45.0	GND	L1	10.0	1.0	46.0
1.279500	38.8	GND	L1	10.0	7.2	46.0
1.869000	27.7	GND	L1	10.0	18.3	46.0
1.918500	37.0	GND	L1	10.0	9.0	46.0
2.463000	33.7	GND	L1	10.0	12.3	46.0





**Fig. 181 AC Powerline Conducted Emission-802.11n-HT40 (charger 2)**

Final Result 1

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.757500	52.5	GND	L1	10.0	3.5	56.0
0.807000	51.5	GND	L1	10.0	4.5	56.0
0.856500	50.6	GND	L1	10.0	5.4	56.0
1.257000	45.3	GND	L1	10.0	10.7	56.0
2.265000	45.6	GND	L1	10.0	10.4	56.0
2.314500	28.3	GND	L1	10.0	27.7	56.0

Final Result 2

Frequency (MHz)	Average (dB $\mu$ V)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.757500	45.9	GND	L1	10.0	0.1	46.0
0.807000	45.2	GND	L1	10.0	0.8	46.0
0.856500	39.9	GND	L1	10.0	6.1	46.0
1.257000	20.9	GND	L1	10.0	25.1	46.0
1.306500	21.7	GND	L1	10.0	24.3	46.0
2.265000	11.8	GND	L1	10.0	34.2	46.0

\*\*\* END OF REPORT BODY \*\*\*