FCC PART 15C
TEST REPORT
No. 2013WLN0734

for

Sony Mobile Communications AB

GSM/WCDMA/LTE mobile phone

Type: PM-0590-BV

With

FCC ID: PY7PM-0590

Hardware Version: AP1

Software Version: 14.1.F.0.111

Issued Date: 2013-11-07

DAkkS
Deutsche
Akkreditierungsstelle
D-PL-12123-01-01

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CONTENTS

1. TEST LATORATORY

1.1. Testing Location

Company Name:	TMC Beijing, Telecommunication Metrology Center of MIIT
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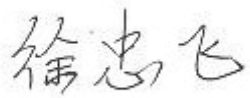
Postal Code:	100191
Telephone:	+86-10-62304633-2561
Fax:	+86-10-62304633-2504

1.2. Project data

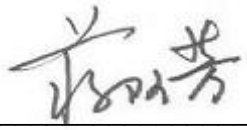
Testing Start Date:	2013-07-30
Testing End Date:	2013-10-15

1.3. Signature



Xu Zhongfei

(Prepared this test report)



Jiang Afang

(Reviewed this test report)

Xiao Li

Deputy Director of the laboratory

(Approved this test report)

2. CLIENT INFORMATION

2.1. Applicant Information

Company Name:	Sony Mobile Communications AB
Address /Post:	Sony Mobile R&D Center, No. 16, Guangshun South Street, Chaoyang District
City:	Beijing
Postal Code:	100102
Country:	China
Contact Person:	Ma, Gang
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2.2. Manufacturer Information

Company Name:	Sony Mobile Communications AB
Address /Post:	Sony Mobile R&D Center, No. 16, Guangshun South Street, Chaoyang District
City:	Beijing
Postal Code:	100102
Country:	China
Contact Person:	Ma, Gang
Telephone:	+86-10-58656312
Fax:	+86-10-58659049

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

3.1. About EUT

Description	GSM 850/900/1800/1900 quad bands, GPRS, EDGE, WCDMA FDD bands 1/2/4/5/8, HSDPA, HSUPA, LTE FDD bands 4/17, Bluetooth (EDR and 4.0), ANT+, WLAN (802.11 a/ac/b/g/n), NFC, FM, GPS mobile phone
Type	PM-0590-BV
FCC ID	PY7PM-0590
WLAN Frequency Range	ISM Band: 2400MHz~2483.5MHz
Type of modulation	DSSS/CCK/OFDM
Number of Channels	11
Antenna	Internal
MAX Conducted Power	23.95dBm(OFDM)
MAX Radiated Power	27.07dBm(OFDM)
Extreme Temperature	-30/+55°C
Extreme vol. Limits	3.6VDC to 4.2VDC (nominal: 3.8VDC)

Note: Photographs of EUT are shown in ANNEX C of this test report. Components list, please refer to documents of the manufacturer; it is also included in the original test record of Telecommunication Metrology Center of MIIT of People's Republic of China.

3.2. Internal Identification of EUT used during the test

EUT ID*	S/N	IMEI	HW Version	SW Version
EUT1	CB5A1U337R	004402451403483	AP1	14.1.F.0.111
EUT2	CB5A1U1C5J	004402541409456	AP1	14.1.F.0.111

*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	Travel Charger	AC-0400-EU	8512W19 100198
AE2	USB Cable	AI-0401	123107D30009FA0

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

3.4. General Description

The Equipment Under Test (EUT) is a model of GSM/WCDMA/LTE mobile phone with integrated antenna and inbuilt battery.

The EUT supports GSM 850/900/1800/1900MHz bands, WCDMA FDD band 1/2/4/5/8 and LTE FDD bands 4/17. It supports GPRS service with multi-slots class 12 and EGPRS service with multi-slots class 12. The HSDPA and HSUPA features are also supported.

It has MP3, camera, USB memory, Mobile High-Definition Link (MHL), FM radio, GPS receiver, NFC, Bluetooth (EDR and Bluetooth 4.0), ANT+, WLAN (802.11 a/ac/b/g/n) and Wi-Fi hotspot functions. For WLAN 802.11n, it supports 20MHz bandwidth on 2.4GHz band and 20MHz/40MHz bandwidths on 5GHz/5.8GHz band. For WLAN 802.11 ac, it supports 20MHz/40MHz/80MHz bandwidths.
It includes normal options: travel charger, USB cable, MHL dongle and HDMI cable.
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, 2012
ANSI C63.4	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2003
KDB558074	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247	2013

5. LABORATORY ENVIRONMENT

Conducted RF performance testing is performed in shielding room.

EMC performance testing is performed in Semi-anechoic chamber.

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 (b)	/	**P**
Peak Power Spectral Density	15.247 (e)	/	**P**
Occupied 6dB Bandwidth	15.247 (a)	/	**P**
Band Edges Compliance	15.247 (d)	/	**P**
Transmitter Spurious Emission - Conducted	15.247 (d)	/	**P**
Transmitter Spurious Emission - Radiated	15.247, 15.209	/	**P**
AC Powerline Conducted Emission	15.107, 15.207	/	**P**

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

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.

6.3. Test Conditions

For this report, all the test cases are tested under normal temperature and normal voltage, and also under norm humidity, the specific condition is shown as follows:

Temperature	26℃
Voltage	3.8V
Humidity	44%

7. TEST EQUIPMENTS UTILIZED

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration date	Calibration Due date
1	Vector Signal Analyzer	FSQ40	200089	Rohde & Schwarz	2013-07-08	2014-07-07
2	Test Receiver	ESS	847151/015	Rohde & Schwarz	2012-12-29	2013-10-30
3	LISN	ESH2-Z5	829991/012	Rohde & Schwarz	2013-4-15	2014-08-12
4	Shielding Room	S81	/	ETS-Lindgren	/	/

Radiated emission test system

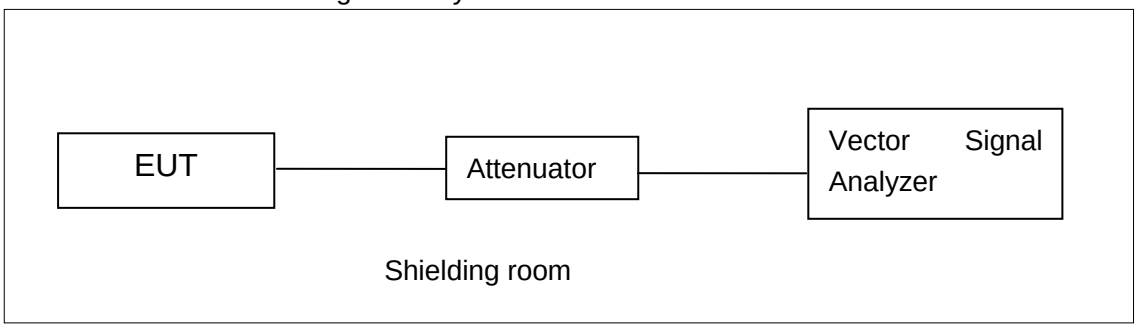
No.	Equipment	Model	Serial Number	Manufacturer	Calibration date	Calibration Due date
1	Test Receiver	ESU26	100376	Rohde & Schwarz	2012-11-8	2013-11-7
2	BiLog Antenna	VULB9163	9163-514	Schwarzbeck	2011-11-11	2014-11-10
3	Dual-Ridge Waveguide Horn Antenna	3117	00119024	ETS-Lindgren	2011-2-2	2014-2-1
4	Dual-Ridge Waveguide Horn Antenna	3116	2661	EMCO	2011-7-1	2014-06-30
5	Loop antenna	HFH2-Z2	829324/007	Rohde & Schwarz	2011-12-21	2014-12-20
6	Semi-anechoic chamber	/	CT000332-1074	Frankonia German	/	/

ANNEX A: MEASUREMENT RESULTS

A.1. Measurement Method

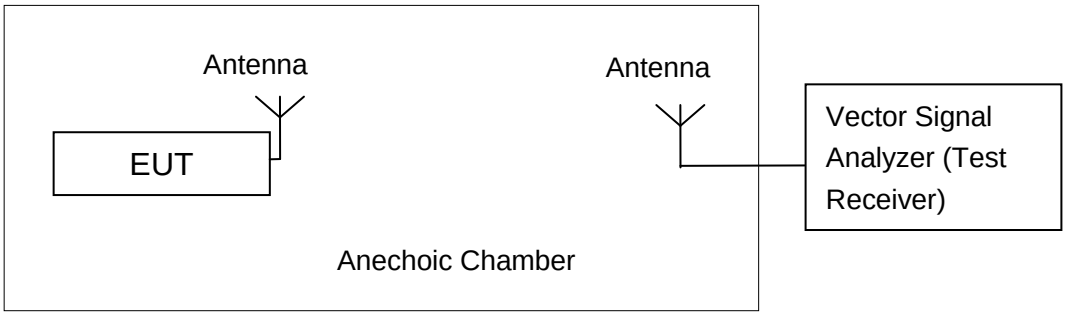
A.1.1. Conducted Measurements

Connect the EUT to the test system as follow shows.
Set the EUT to the required work mode.
Set the EUT to the required channel.
Set the Vector Signal Analyzer and start measurement.
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 KDB558074.
The radiated emission test is performed in semi-anechoic chamber. The distance from the EUT to the reference point of measurement antenna is 3m. The test is carried out on both vertical and horizontal polarization and only maximization result of both polarizations is kept. During the test, the turntable is rotated 360° and the measurement antenna is moved from 1m to 4m to get the maximization result.

A.2. Maximum Peak Output Power

Measurement Limit and Method:

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

The measurement is made according to KDB558074, and option 1 is used for peak power measurement.

Measurement Uncertainty:

Measurement Uncertainty	0.75dB

A.2.1. Antenna Gain

The antenna gain of the complete system is calculated by the difference of radiated power and the conducted power of the EUT.

Test	Channel		
Tnom,Vnom	Low	Middle	High
Conducted Power(dBm)	20.19	20.98	21.18
Radiated Power(dBm)	22.99	22.55	21.88
Gain(dBi)	2.80	1.57	0.70

Antenna Gain = Radiated value (with radiated sample) - Conducted values (with conducted samples)

A.2.2. Maximum Peak Output Power-conducted

Measurement Results:

802.11b mode

Mode	Data Rate (Mbps)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11b	1	22.60	/	/
	2	22.83	/	/
	5.5	24.42	/	/
	11	25.63	25.29	26.33

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

802.11g mode

Mode	Data Rate (Mbps)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11g	6	24.53	/	/
	9	24.52	/	/
	12	24.29	/	/
	18	24.24	/	/
	24	24.60	24.40	25.19
	36	24.58	/	/
	48	24.58	/	/
	54	24.52	/	/

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

802.11n mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11n (20MHz)	MCS0	25.69	/	/
	MCS1	25.47	/	/
	MCS2	25.42	/	/
	MCS3	25.87	25.53	26.21
	MCS4	25.83	/	/
	MCS5	22.86	/	/
	MCS6	22.85	/	/
	MCS7	22.24	/	/

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

Conclusion: PASS

A.2.3. Maximum Peak Output Power-Radiated

Measurement Results:

Mode	Test Result (dBm)					
	2412MHz (Ch1)		2437MHz (Ch6)		2462 MHz (Ch11)	
	Conducted	Radiated	Conducted	Radiated	Conducted	Radiated
802.11b	25.63	28.43	25.29	26.86	26.33	27.03
802.11g	24.60	27.40	24.40	25.97	25.19	25.89
802.11n	25.87	28.67	25.53	27.10	26.21	26.91

Radiated value = Conducted values (with conducted samples) + Antenna Gain.

Conclusion: PASS

A.3. Peak Power Spectral Density

Measurement Limit:

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

The measurement is made according to KDB558074, and option 1 is used for peak power spectral density measurement.

Measurement Uncertainty:

Measurement Uncertainty	0.75dB

Note: Configuration information to be tested as follows:

Modulation type and data rate:

802.11b	802.11g	802.11n
11Mbps(CCK)	24Mbps(OFDM)	MCS3(OFDM)

Measurement Results:

Mode	Channel	Power Spectral Density (dBm/3 kHz)	Conclusion
802.11b	1	-4.00	P
	6	-4.27	P
	11	-4.14	P
802.11g	1	-9.13	P
	6	-9.30	P
	11	-9.83	P
802.11n	1	-7.65	P
	6	-8.06	P
	11	-7.98	P

Conclusion: PASS

A.4. Occupied 6dB Bandwidth

Measurement Limit:

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

The measurement is made according to KDB558074.

Measurement Uncertainty:

Measurement Uncertainty	60.80Hz

Note: Configuration information to be tested as follows:

Modulation type and data rate:

802.11b	802.11g	802.11n
11Mbps(CCK)	24Mbps(OFDM)	MCS3(OFDM)

Measurement Result:

Mode	Channel	Occupied 6dB Bandwidth (kHz)		conclusion
802.11b	1	Fig.1	9135	P
	6	Fig.2	8654	P
	11	Fig.3	8814	P
802.11g	1	Fig.4	16567	P
	6	Fig.5	16667	P
	11	Fig.6	16683	P
802.11n	1	Fig.7	17869	P
	6	Fig.8	17869	P
	11	Fig.9	17869	P

Conclusion: PASS

Test graphs as below:

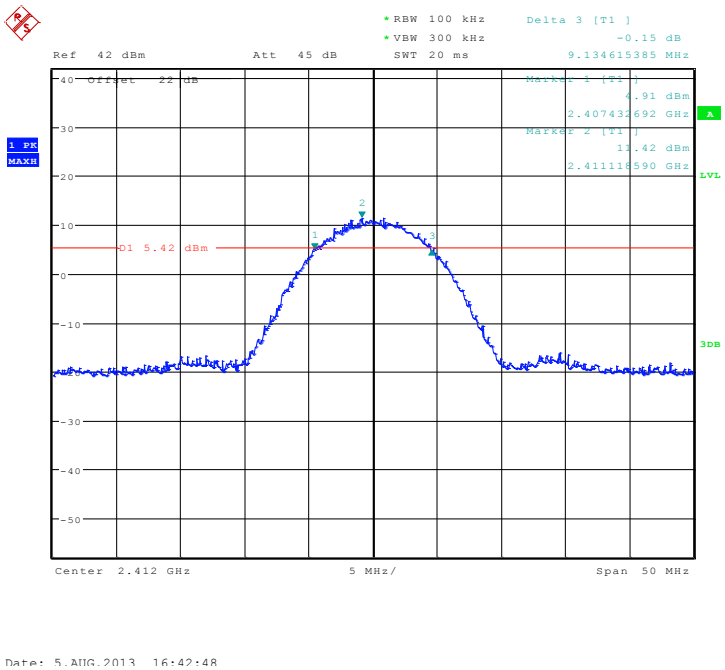


Fig. 1 Occupied 6dB Bandwidth (802.11b, Ch 1)

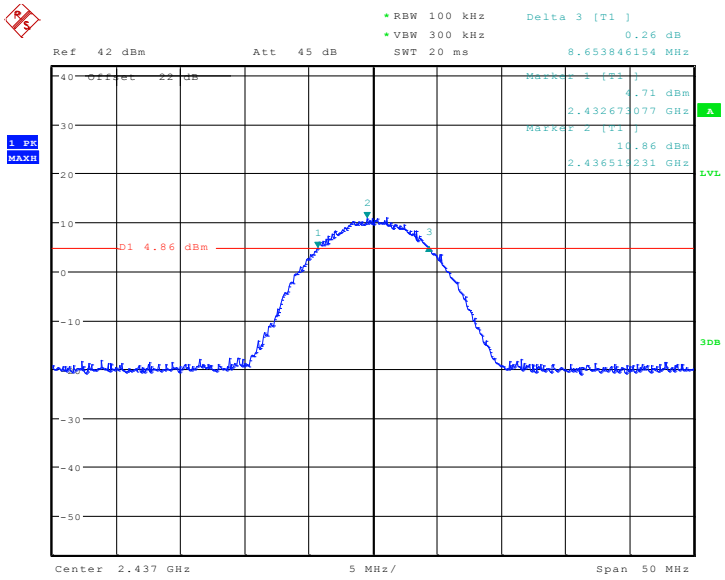


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Fig. 2 Occupied 6dB Bandwidth (802.11b, Ch 6)

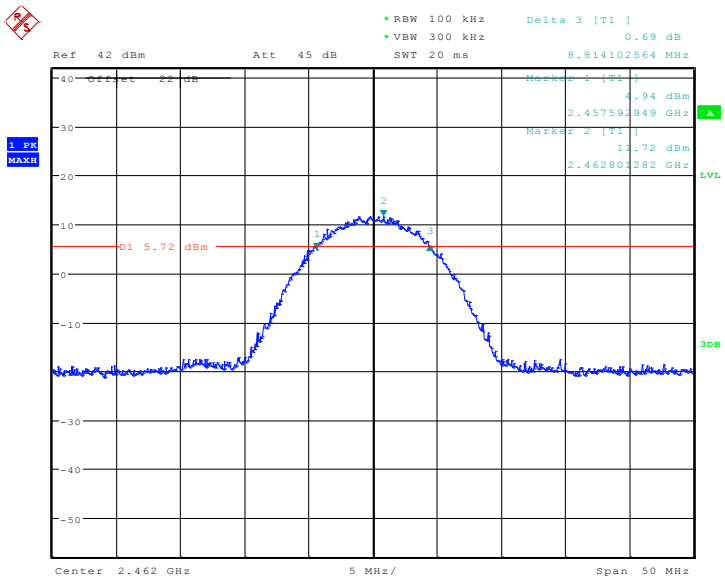

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Fig. 3 Occupied 6dB Bandwidth (802.11b, Ch 11)

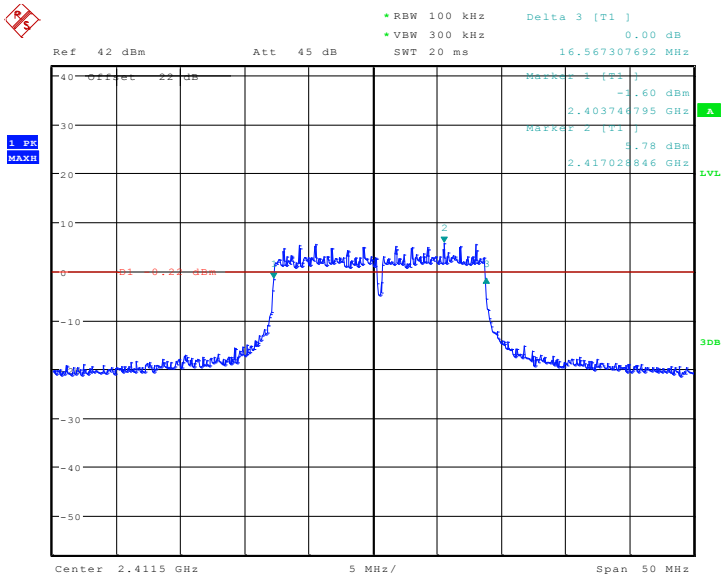

Fig. 4 Occupied 6dB Bandwidth (802.11g, Ch 1)

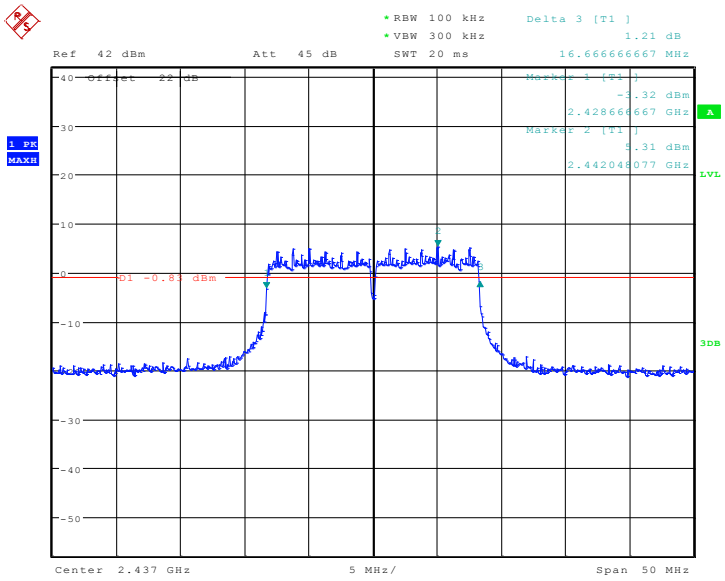

Fig. 5 Occupied 6dB Bandwidth (802.11g, Ch 6)

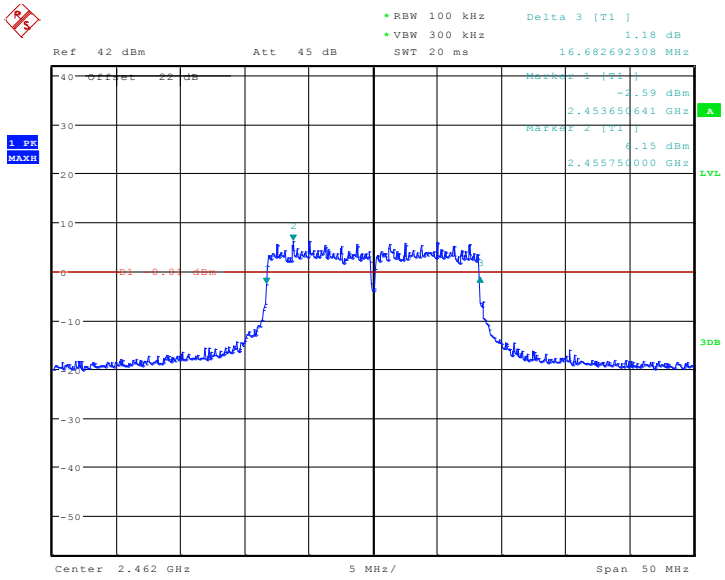

Fig. 6 Occupied 6dB Bandwidth (802.11g, Ch 11)

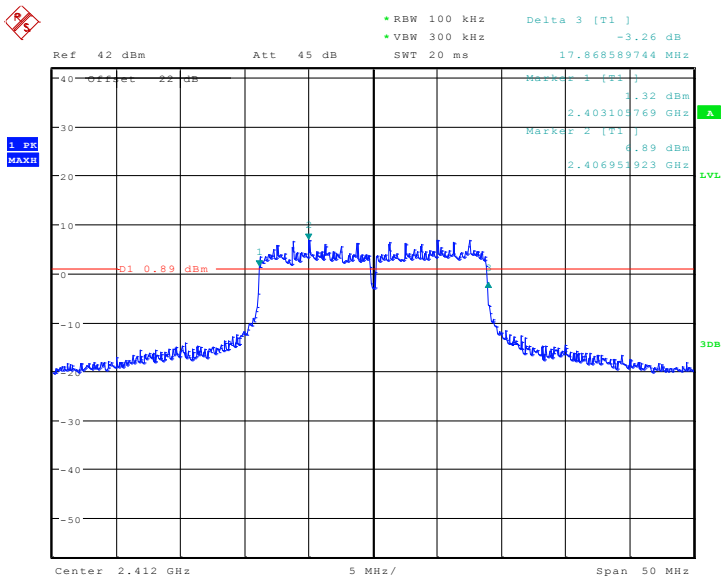

Fig. 7 Occupied 6dB Bandwidth (802.11n-HT20, Ch 1)

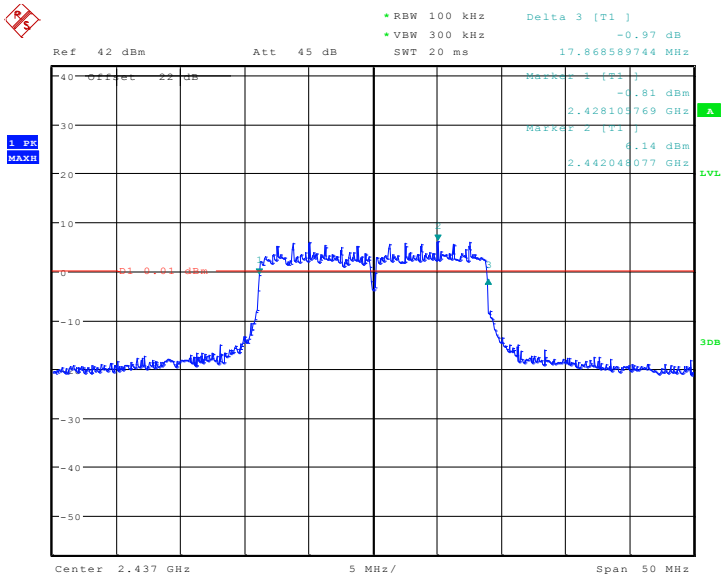

Fig. 8 Occupied 6dB Bandwidth (802.11n-HT20, Ch 6)

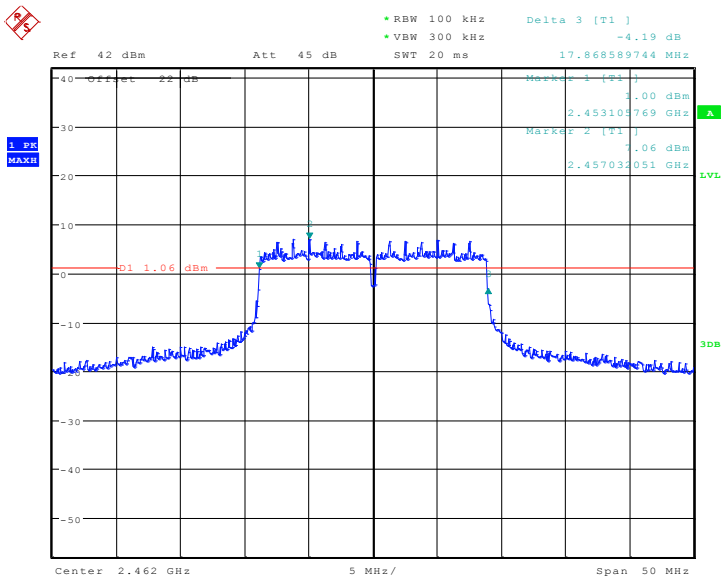

Fig. 9 Occupied 6dB Bandwidth (802.11n-HT20, Ch 11)

A.5. Band Edges Compliance

Measurement Limit:

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

The measurement is made according to KDB558074

Measurement Uncertainty:

Measurement Uncertainty	0.75dB

Note: Configuration information to be tested as follows:

Modulation type and data rate:

802.11b	802.11g	802.11n
11Mbps(CCK)	24Mbps(OFDM)	MCS3(OFDM)

Measurement Result:

Mode	Channel	Test Results	Conclusion
802.11b	1	Fig.10	P
	11	Fig.11	P
802.11g	1	Fig.12	P
	11	Fig.13	P
802.11n	1	Fig.14	P
	11	Fig.15	P

Conclusion: PASS

Test graphs as below:

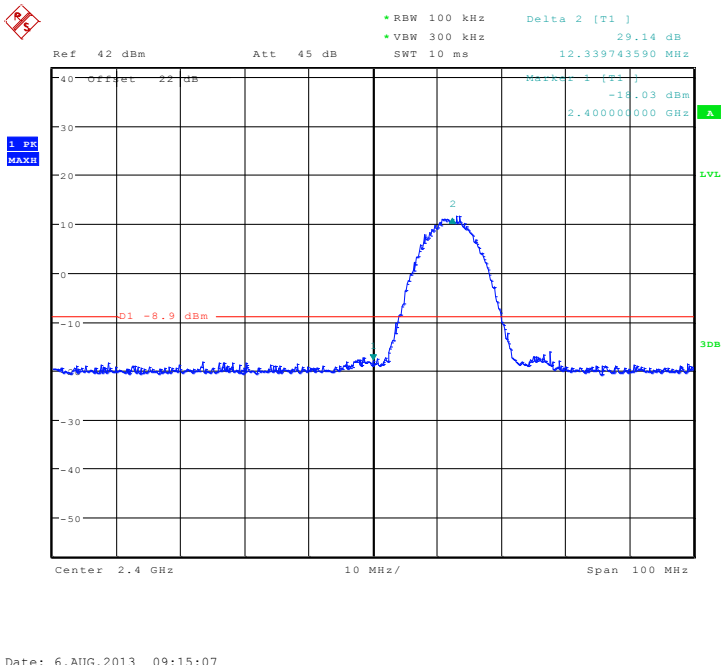

Fig. 10 Band Edges (802.11b, Ch 1)

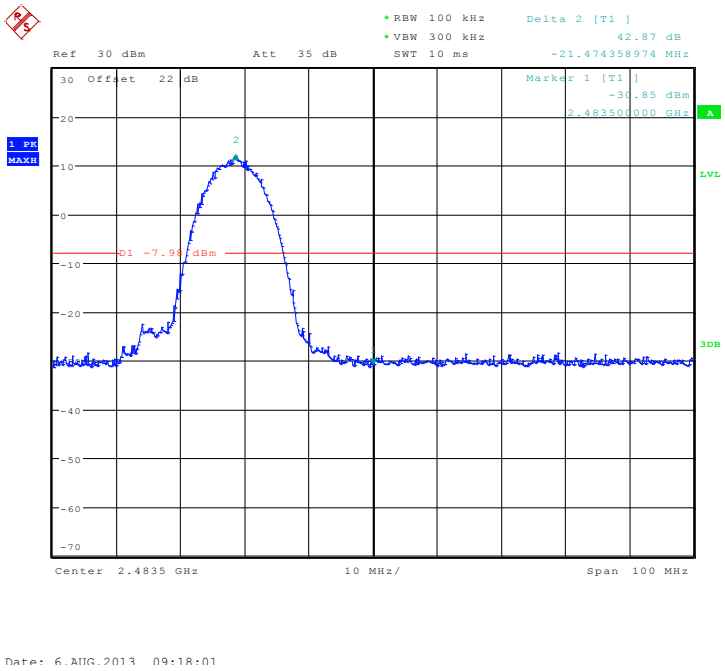

Fig. 11 Band Edges (802.11b, Ch 11)

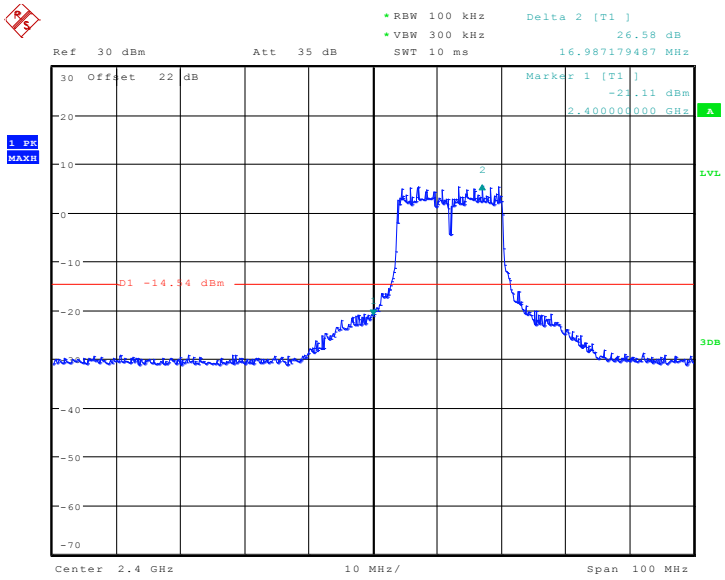

Fig. 12 Band Edges (802.11g, Ch 1)

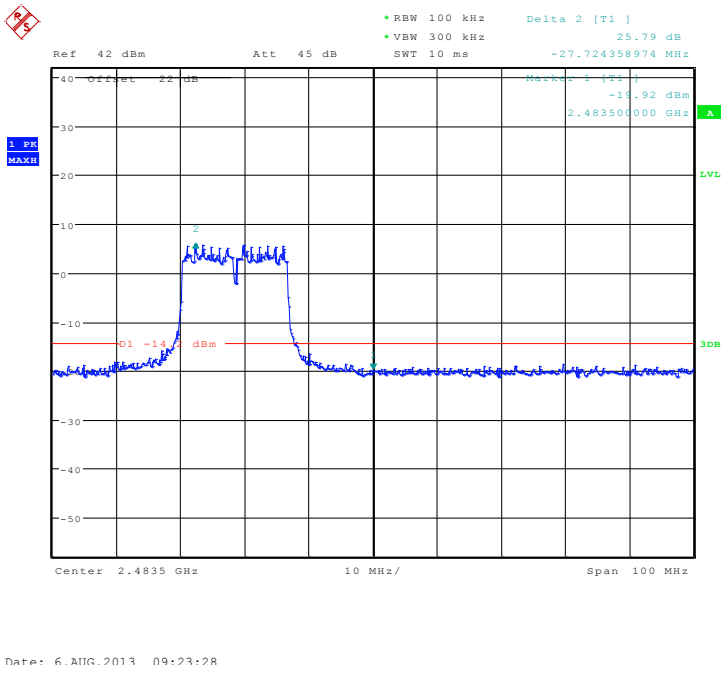

Fig. 13 Band Edges (802.11g, Ch 11)

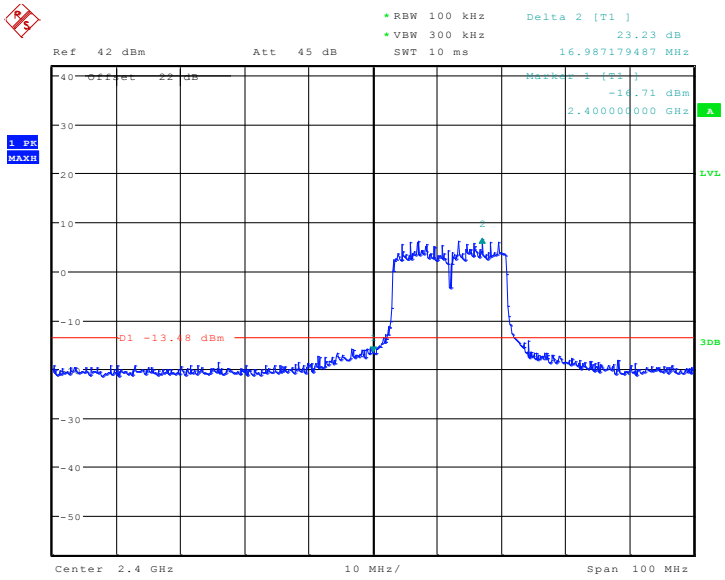

Fig. 14 Band Edges (802.11n-HT20, Ch 1)

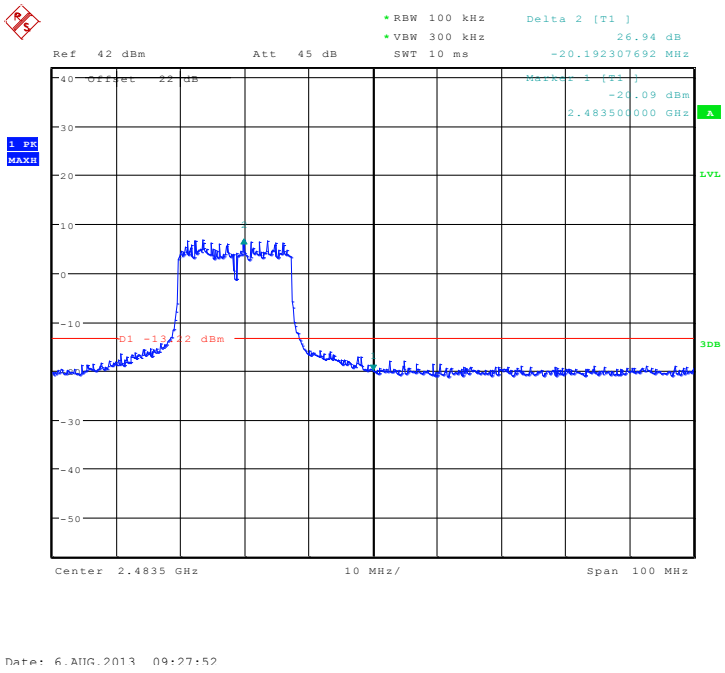

Fig. 15 Band Edges (802.11n-HT20, Ch 11)

A.6. Transmitter Spurious Emission

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 KDB558074.

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)).

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

Measurement Uncertainty:

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

Note: Configuration information to be tested as follows:

Modulation type and data rate:

802.11b	802.11g	802.11n
11Mbps(CCK)	24Mbps(OFDM)	MCS3(OFDM)

A.6.1 Transmitter Spurious Emission - Conducted

Measurement Results:

802.11b mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11b	1	2.412 GHz	Fig.16	P
		30 MHz ~ 1 GHz	Fig.17	P
		1 GHz ~ 2.5 GHz	Fig.18	P
		2.5 GHz ~ 7.5 GHz	Fig.19	P
		7.5 GHz ~ 10 GHz	Fig.20	P
		10 GHz ~ 15 GHz	Fig.21	P
		15 GHz ~ 20 GHz	Fig.22	P
		20 GHz ~ 26 GHz	Fig.23	P
	6	2.437 GHz	Fig.24	P
		30 MHz ~ 1 GHz	Fig.25	P
		1 GHz ~ 2.5 GHz	Fig.26	P
		2.5 GHz ~ 7.5 GHz	Fig.27	P
		7.5 GHz ~ 10 GHz	Fig.28	P
		10 GHz ~ 15 GHz	Fig.29	P
		15 GHz ~ 20 GHz	Fig.30	P
		20 GHz ~ 26 GHz	Fig.31	P
	11	2.462 GHz	Fig.32	P
		30 MHz ~ 1 GHz	Fig.33	P
		1 GHz ~ 2.5 GHz	Fig.34	P
		2.5 GHz ~ 7.5 GHz	Fig.35	P
		7.5 GHz ~ 10 GHz	Fig.36	P
		10 GHz ~ 15 GHz	Fig.37	P
		15 GHz ~ 20 GHz	Fig.38	P
		20 GHz ~ 26 GHz	Fig.39	P

802.11g mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11g	1	2.412 GHz	Fig.40	P
		30 MHz ~ 1 GHz	Fig.41	P
		1 GHz ~ 2.5 GHz	Fig.42	P
		2.5 GHz ~ 7.5 GHz	Fig.43	P
		7.5 GHz ~ 10 GHz	Fig.44	P
		10 GHz ~ 15 GHz	Fig.45	P
		15 GHz ~ 20 GHz	Fig.46	P
		20 GHz ~ 26 GHz	Fig.47	P
	6	2.437 GHz	Fig.48	P
		30 MHz ~ 1 GHz	Fig.49	P
		1 GHz ~ 2.5 GHz	Fig.50	P
		2.5 GHz ~ 7.5 GHz	Fig.51	P
		7.5 GHz ~ 10 GHz	Fig.52	P
		10 GHz ~ 15 GHz	Fig.53	P
		15 GHz ~ 20 GHz	Fig.54	P
		20 GHz ~ 26 GHz	Fig.55	P
	11	2.462 GHz	Fig.56	P
		30 MHz ~ 1 GHz	Fig.57	P
		1 GHz ~ 2.5 GHz	Fig.58	P
		2.5 GHz ~ 7.5 GHz	Fig.59	P
		7.5 GHz ~ 10 GHz	Fig.60	P
		10 GHz ~ 15 GHz	Fig.61	P
		15 GHz ~ 20 GHz	Fig.62	P
		20 GHz ~ 26 GHz	Fig.63	P

802.11n-HT20 mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11n (20MHz)	1	2.412 GHz	Fig.64	P
		30 MHz ~ 1 GHz	Fig.65	P
		1 GHz ~ 2.5 GHz	Fig.66	P
		2.5 GHz ~ 7.5 GHz	Fig.67	P
		7.5 GHz ~ 10 GHz	Fig.68	P
		10 GHz ~ 15 GHz	Fig.69	P
		15 GHz ~ 20 GHz	Fig.70	P
		20 GHz ~ 26 GHz	Fig.71	P
	6	2.437 GHz	Fig.72	P
		30 MHz ~ 1 GHz	Fig.73	P
		1 GHz ~ 2.5 GHz	Fig.74	P
		2.5 GHz ~ 7.5 GHz	Fig.75	P
		7.5 GHz ~ 10 GHz	Fig.76	P
		10 GHz ~ 15 GHz	Fig.77	P
		15 GHz ~ 20 GHz	Fig.78	P
		20 GHz ~ 26 GHz	Fig.79	P
	11	2.462 GHz	Fig.80	P
		30 MHz ~ 1 GHz	Fig.81	P
		1 GHz ~ 2.5 GHz	Fig.82	P
		2.5 GHz ~ 7.5 GHz	Fig.83	P
		7.5 GHz ~ 10 GHz	Fig.84	P
		10 GHz ~ 15 GHz	Fig.85	P
		15 GHz ~ 20 GHz	Fig.86	P
		20 GHz ~ 26 GHz	Fig.87	P

Conclusion: PASS

Test graphs as below:

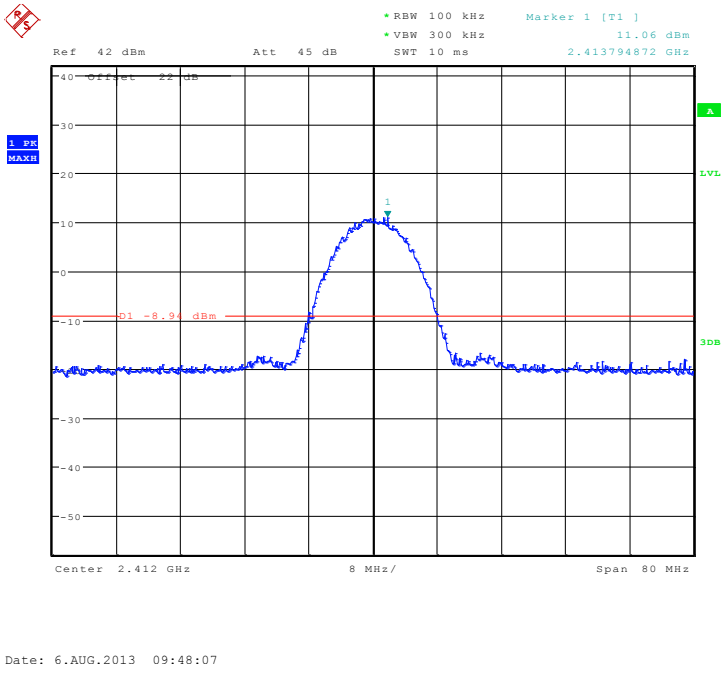

Fig. 16 Conducted Spurious Emission (802.11b, Ch1, Center Frequency)

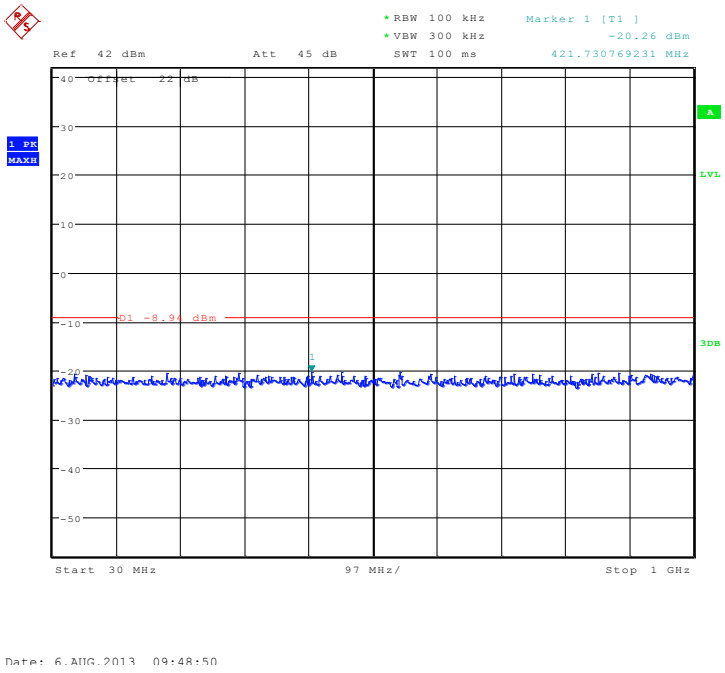

Fig. 17 Conducted Spurious Emission (802.11b, Ch1, 30 MHz-1 GHz)

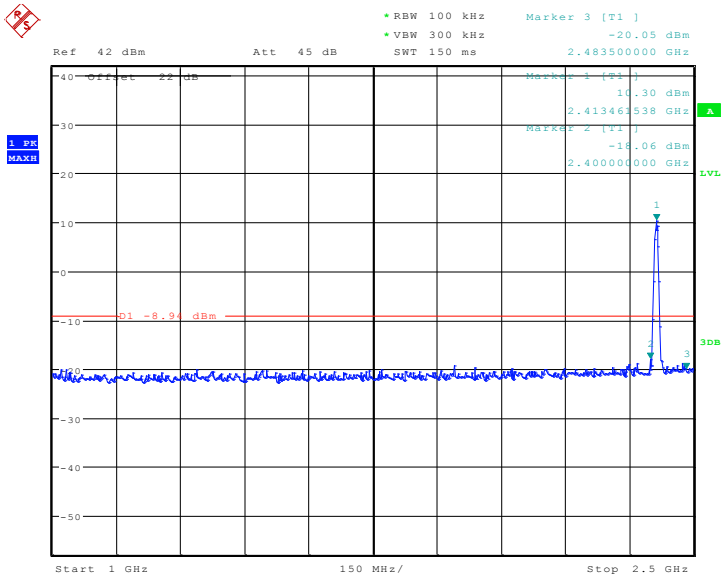

Fig. 18 Conducted Spurious Emission (802.11b, Ch1, 1 GHz-2.5 GHz)

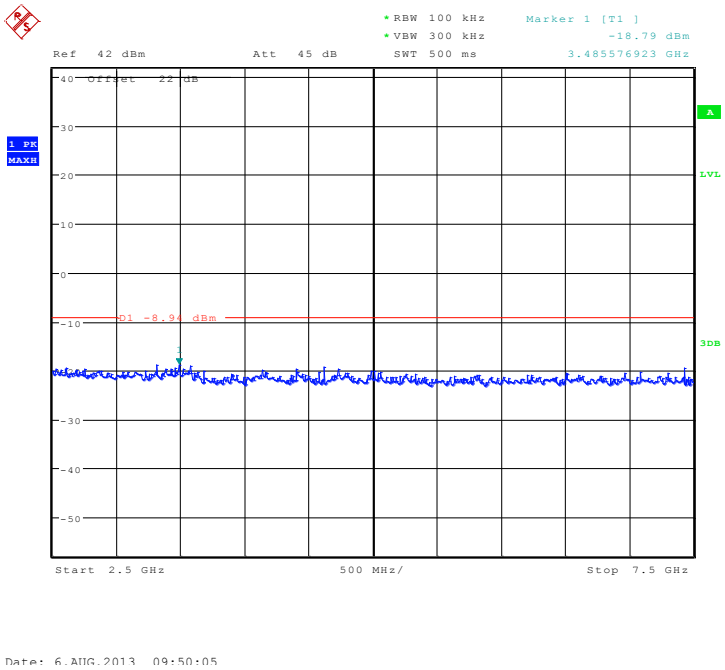

Fig. 19 Conducted Spurious Emission (802.11b, Ch1, 2.5 GHz-7.5 GHz)

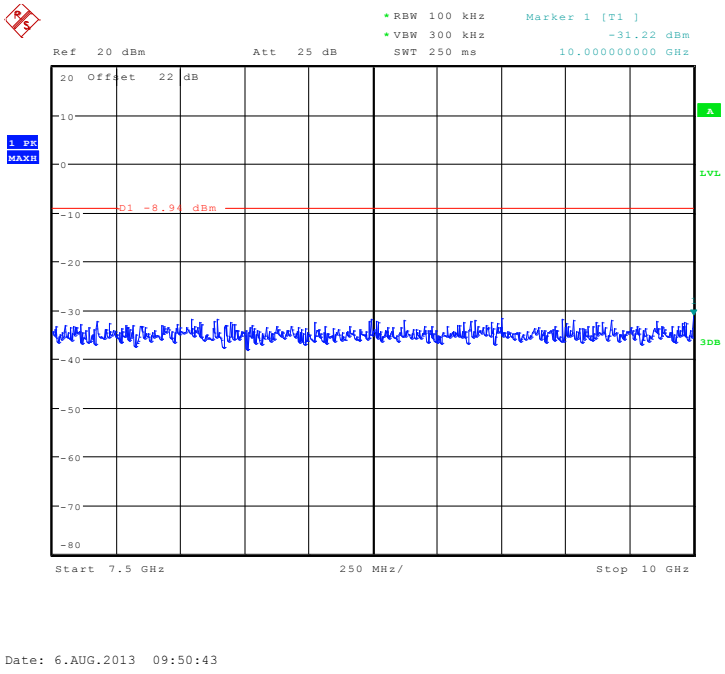

Fig. 20 Conducted Spurious Emission (802.11b, Ch1, 7.5 GHz-10 GHz)

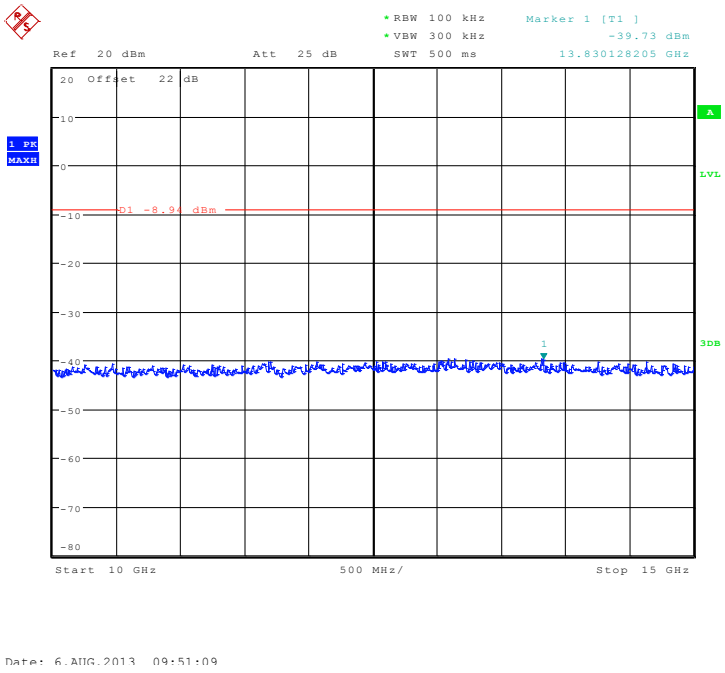

Fig. 21 Conducted Spurious Emission (802.11b, Ch1, 10 GHz-15 GHz)

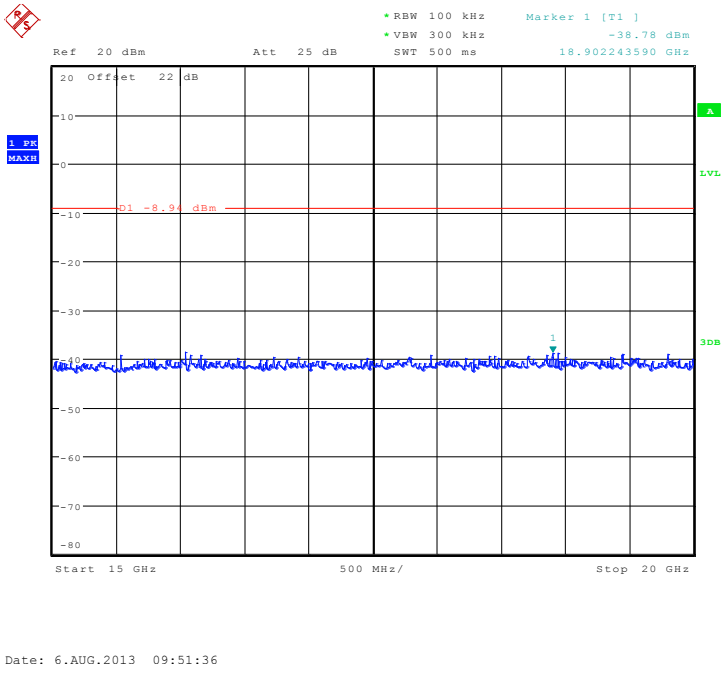

Fig. 22 Conducted Spurious Emission (802.11b, Ch1, 15 GHz-20 GHz)

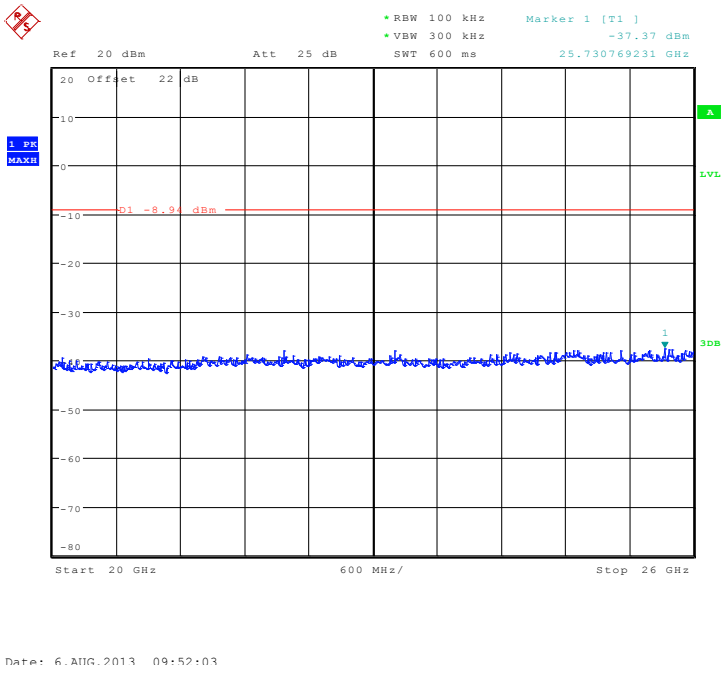

Fig. 23 Conducted Spurious Emission (802.11b, Ch1, 20 GHz-26 GHz)

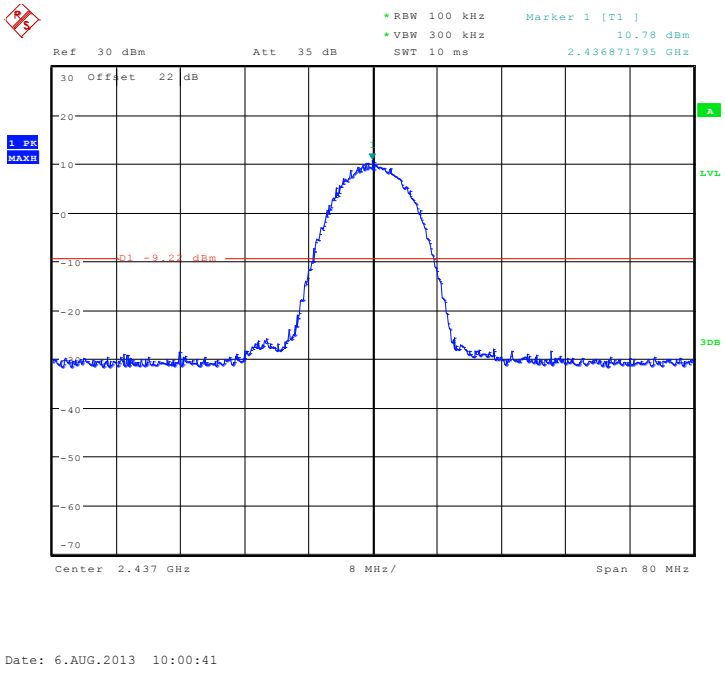

Fig. 24 Conducted Spurious Emission (802.11b, Ch6, Center Frequency)

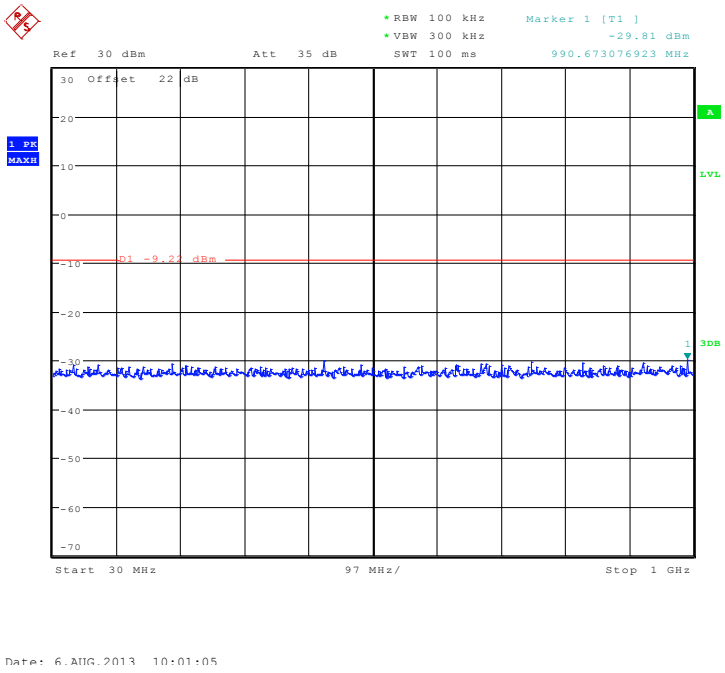

Fig. 25 Conducted Spurious Emission (802.11b, Ch6, 30 MHz-1 GHz)

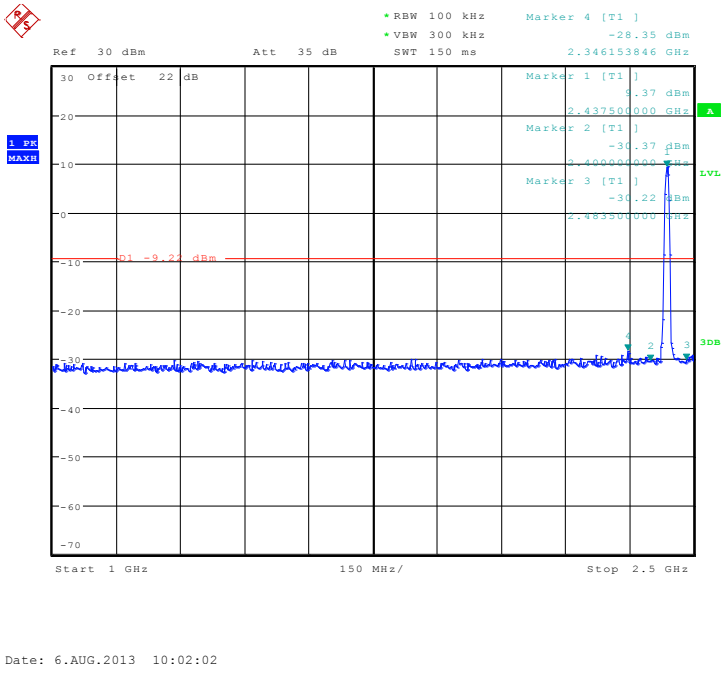

Fig. 26 Conducted Spurious Emission (802.11b, Ch6, 1 GHz-2.5 GHz)

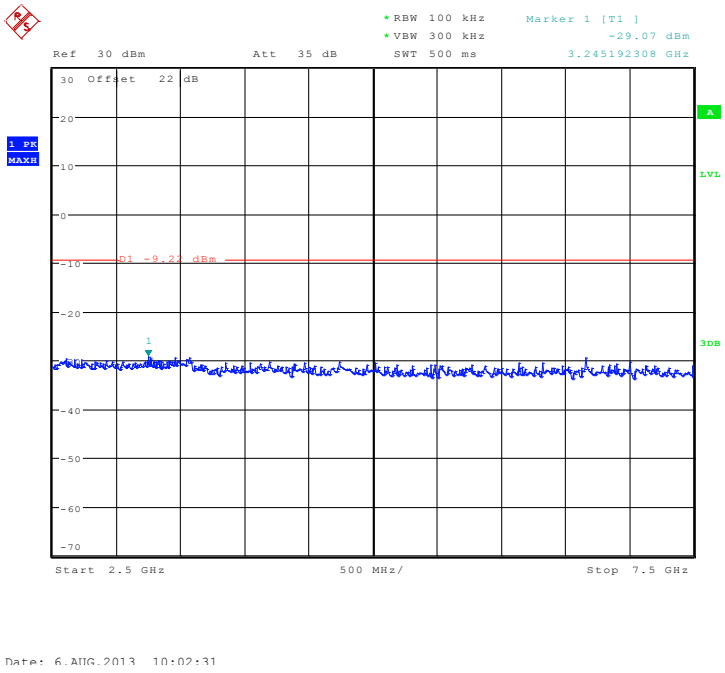

Fig. 27 Conducted Spurious Emission (802.11b, Ch6, 2.5 GHz-7.5 GHz)

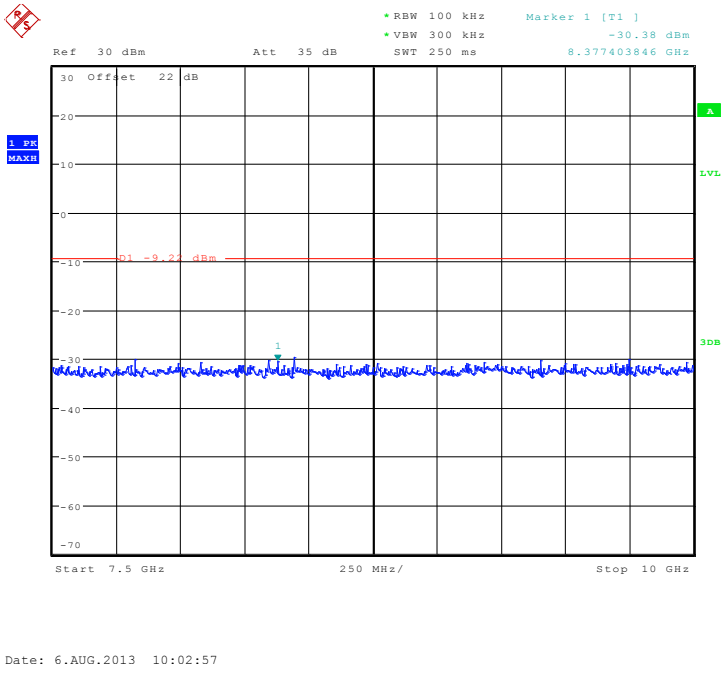

Fig. 28 Conducted Spurious Emission (802.11b, Ch6, 7.5 GHz-10 GHz)

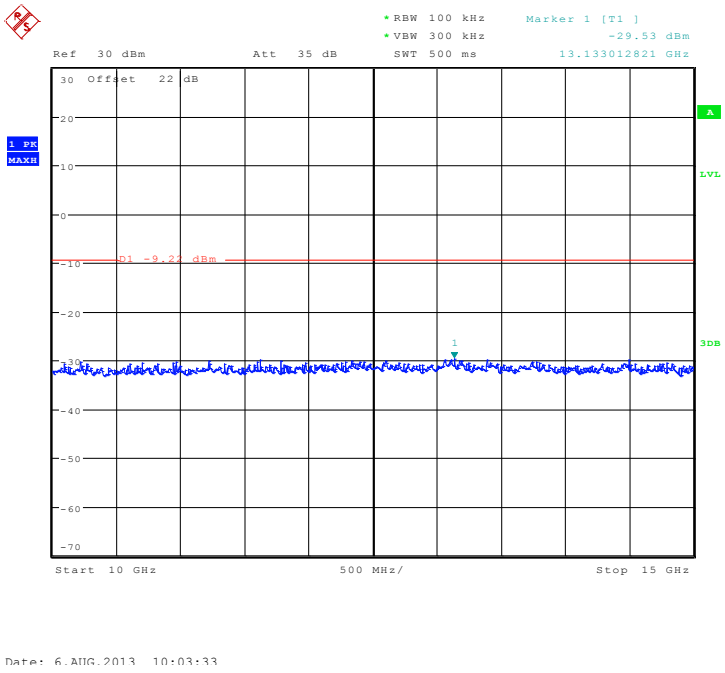

Fig. 29 Conducted Spurious Emission (802.11b, Ch6, 10 GHz-15 GHz)

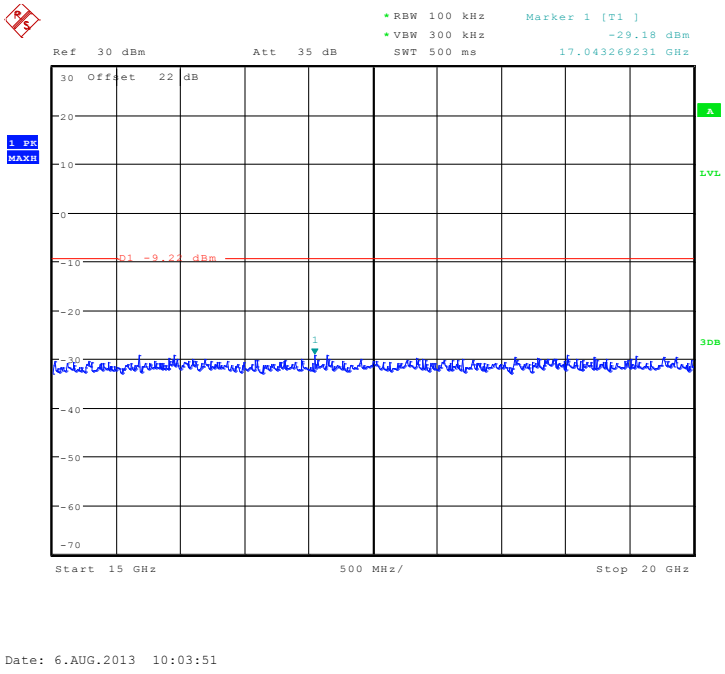

Fig. 30 Conducted Spurious Emission (802.11b, Ch6, 15 GHz-20 GHz)

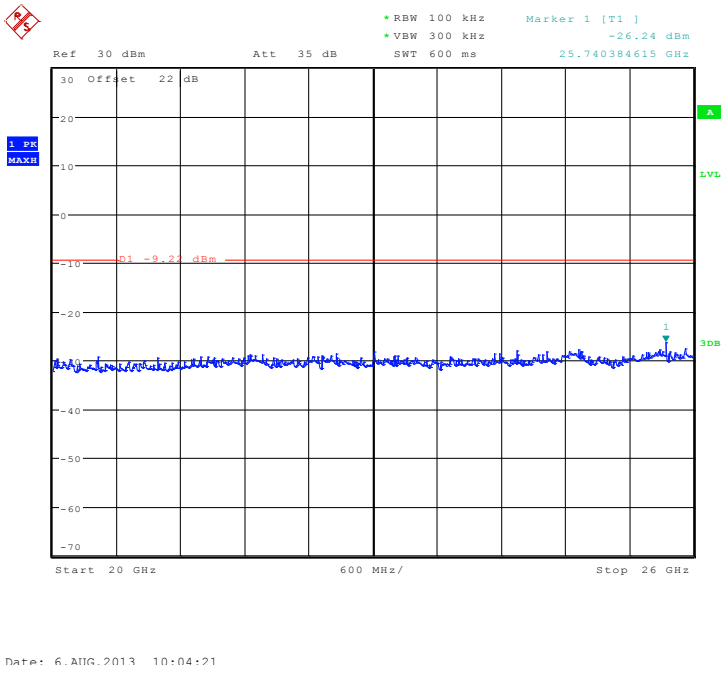

Fig. 31 Conducted Spurious Emission (802.11b, Ch6, 20 GHz-26 GHz)

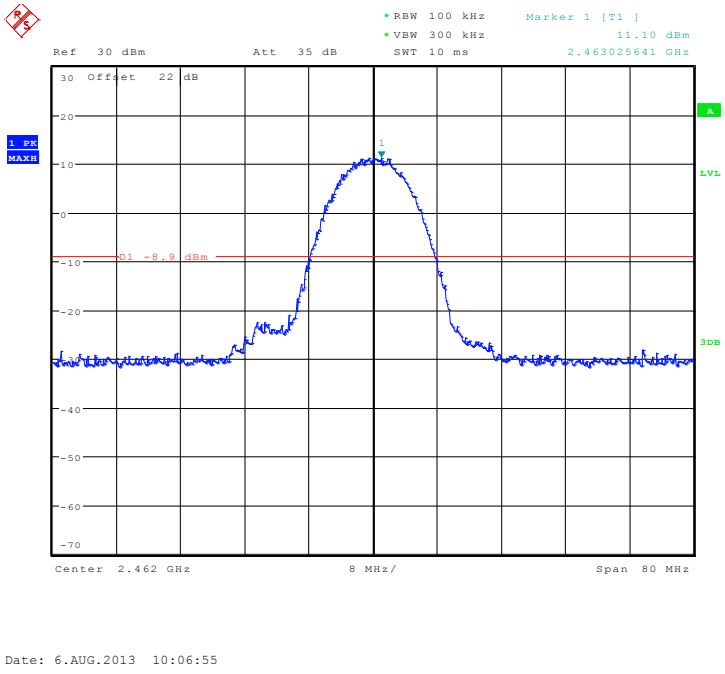

Fig. 32 Conducted Spurious Emission (802.11b, Ch11, Center Frequency)

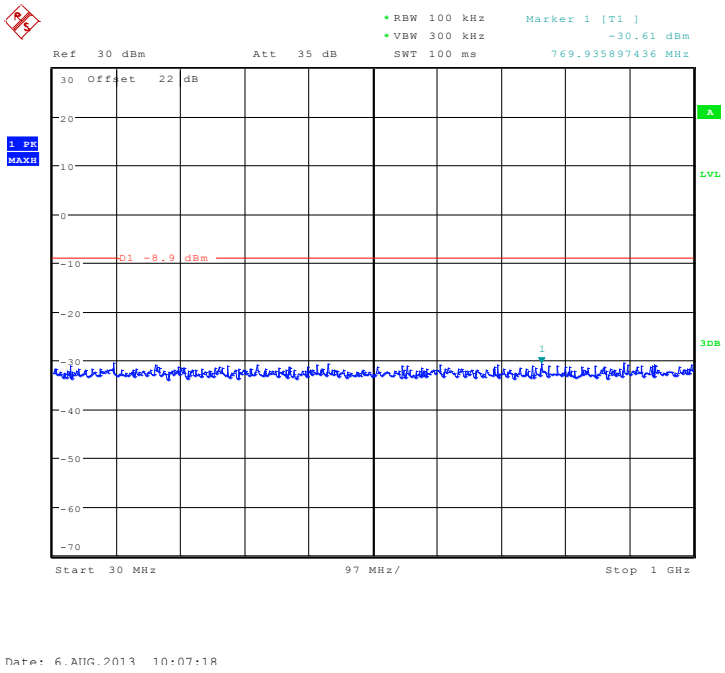

Fig. 33 Conducted Spurious Emission (802.11b, Ch11, 30 MHz-1 GHz)

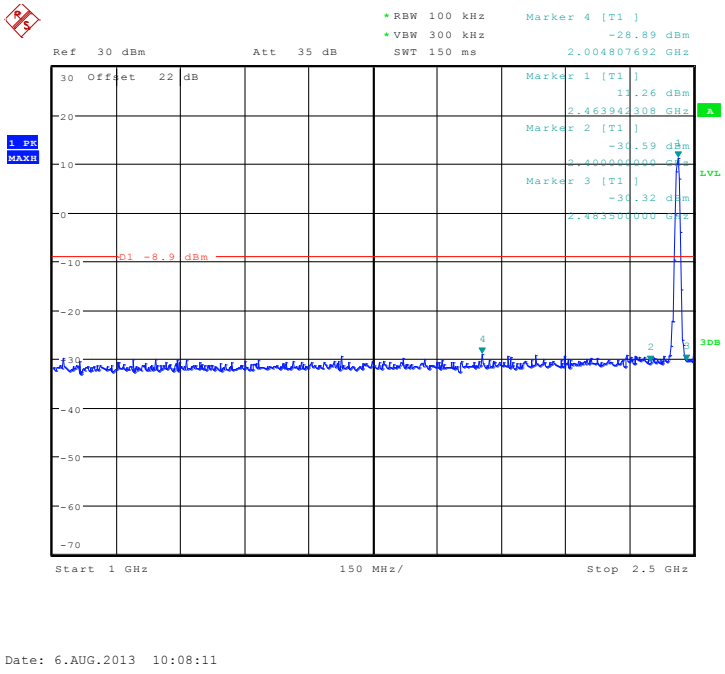

Fig. 34 Conducted Spurious Emission (802.11b, Ch11, 1 GHz-2.5 GHz)

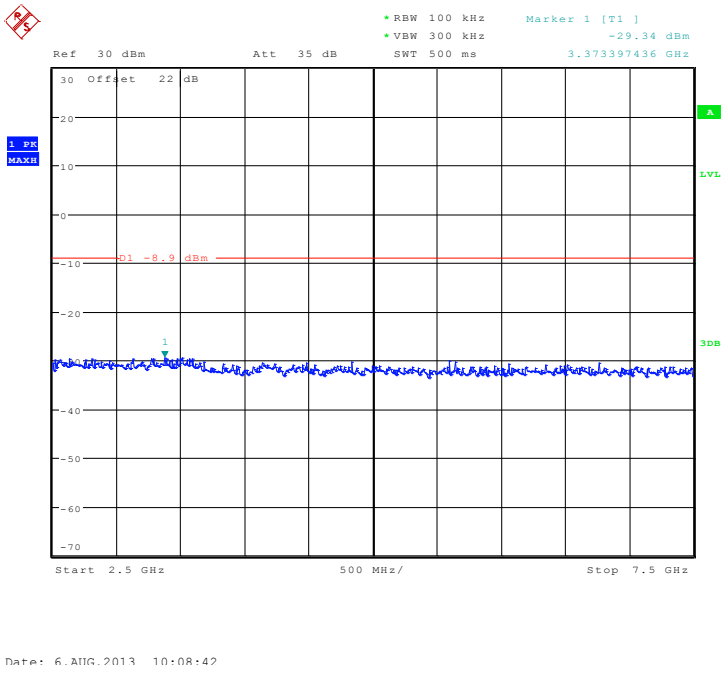

Fig. 35 Conducted Spurious Emission (802.11b, Ch11, 2.5 GHz-7.5 GHz)

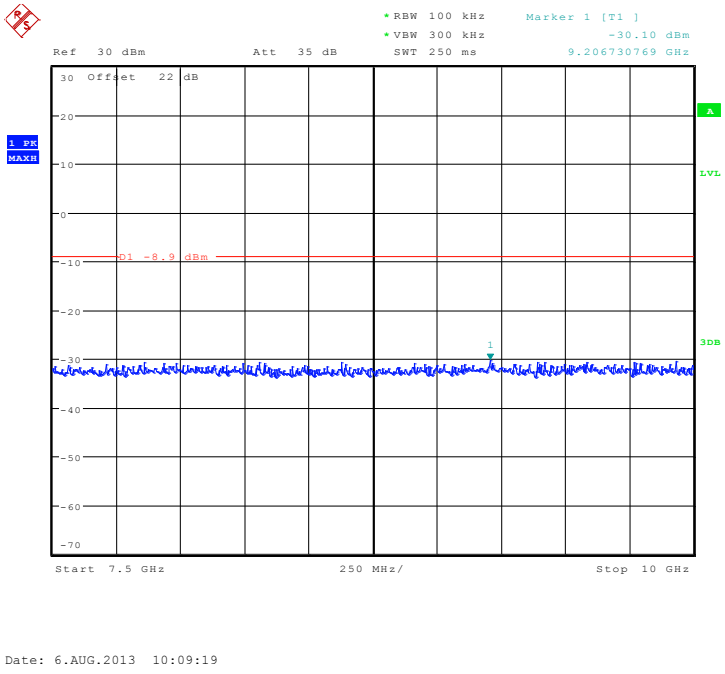

Fig. 36 Conducted Spurious Emission (802.11b, Ch11, 7.5 GHz-10 GHz)

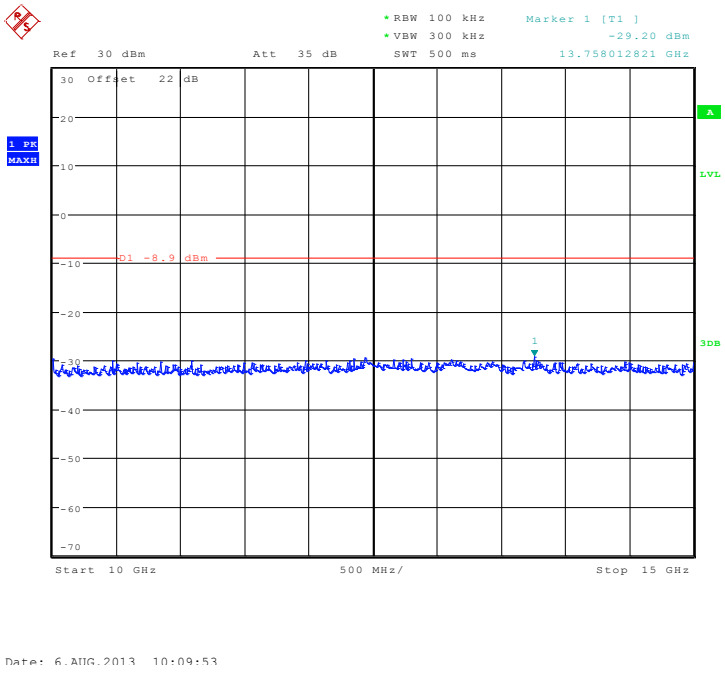

Fig. 37 Conducted Spurious Emission (802.11b, Ch11, 10 GHz-15 GHz)

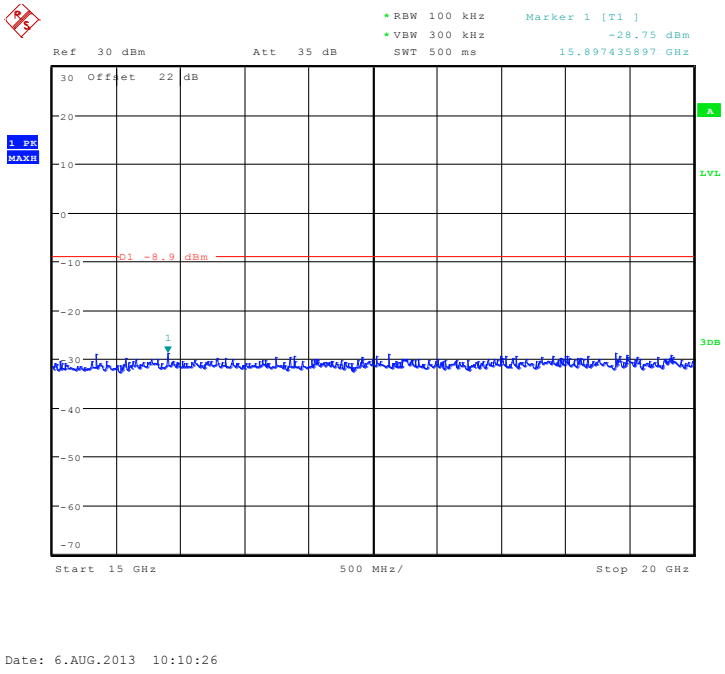

Fig. 38 Conducted Spurious Emission (802.11b, Ch11, 15 GHz-20 GHz)

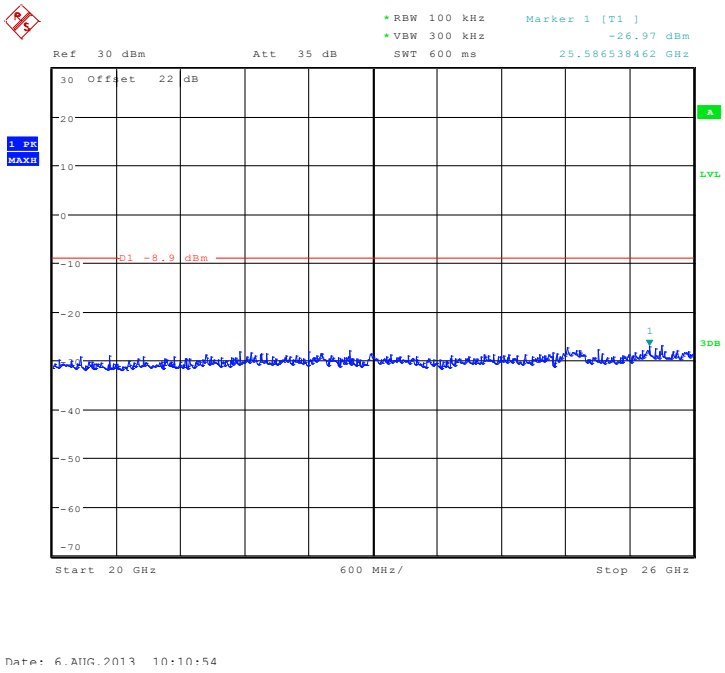

Fig. 39 Conducted Spurious Emission (802.11b, Ch11, 20 GHz-26 GHz)

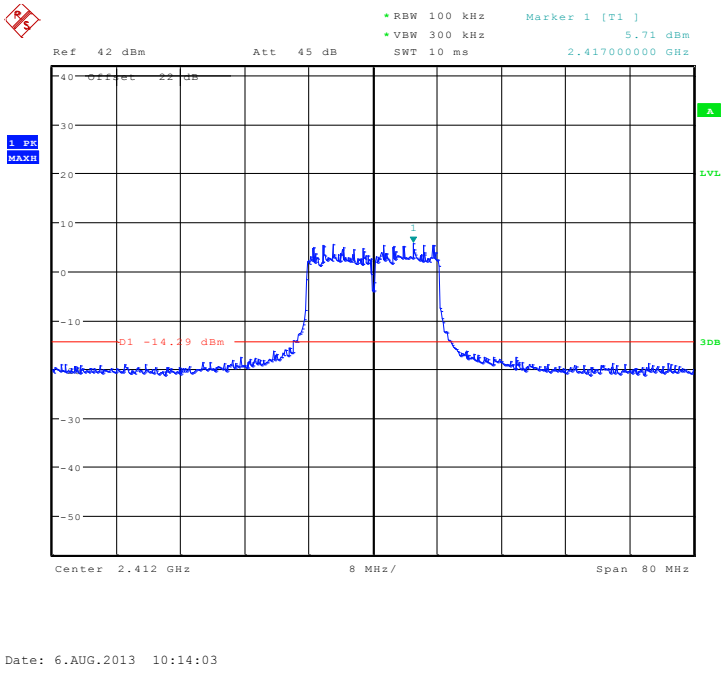

Fig. 40 Conducted Spurious Emission (802.11g, Ch1, Center Frequency)

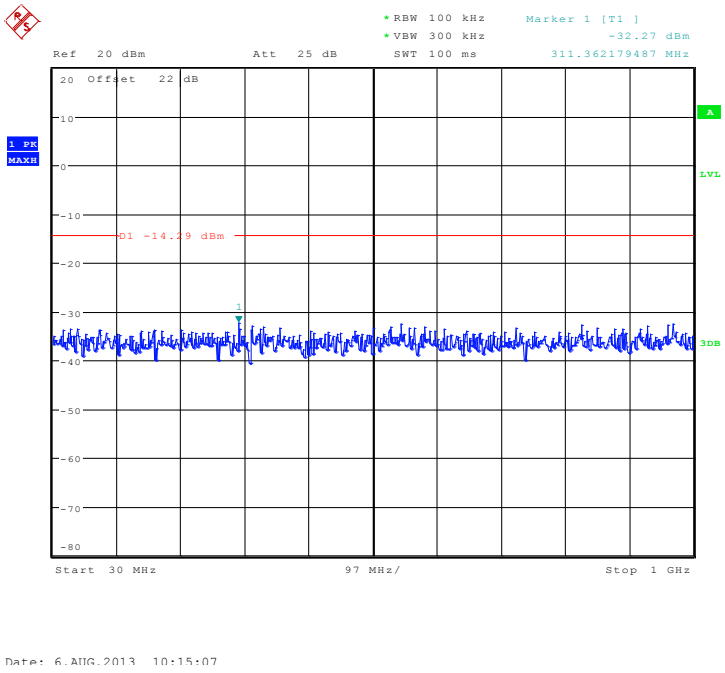

Fig. 41 Conducted Spurious Emission (802.11g, Ch1, 30 MHz-1 GHz)

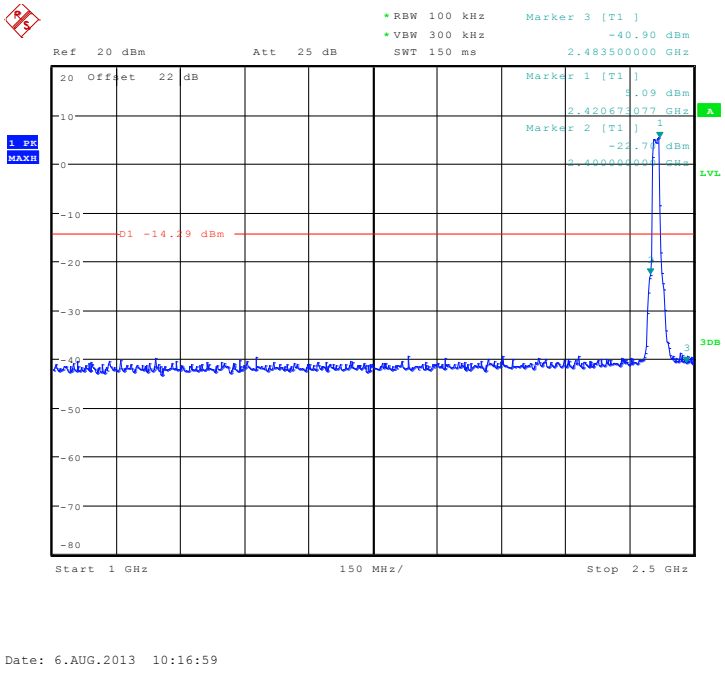

Fig. 42 Conducted Spurious Emission (802.11g, Ch1, 1 GHz-2.5 GHz)

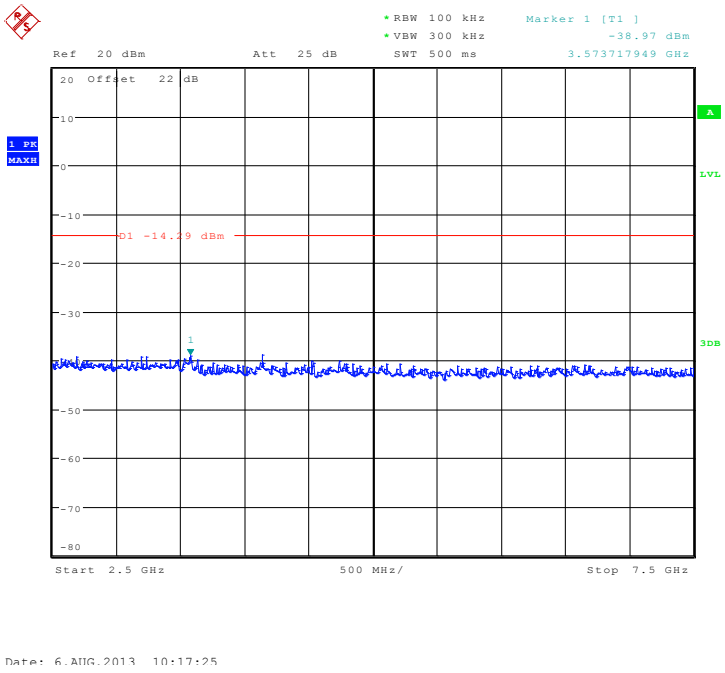

Fig. 43 Conducted Spurious Emission (802.11g, Ch1, 2.5 GHz-7.5 GHz)

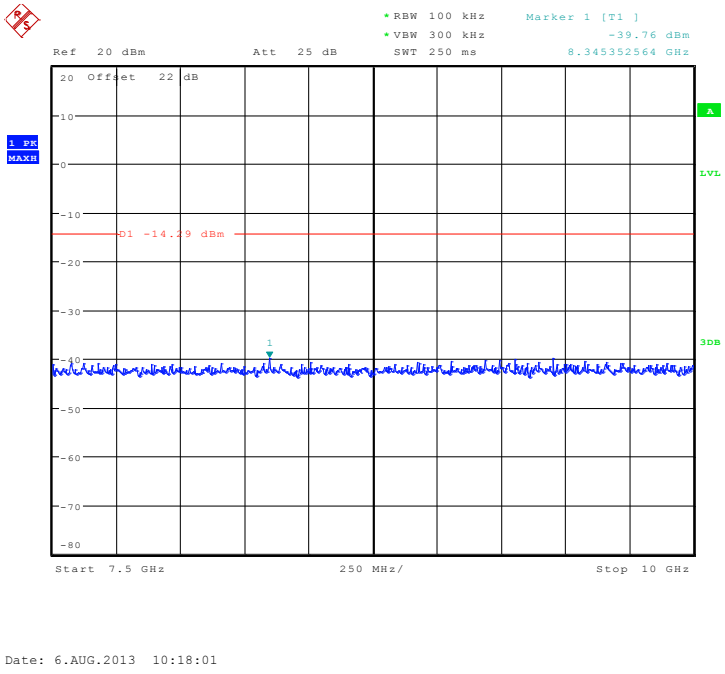

Fig. 44 Conducted Spurious Emission (802.11g, Ch1, 7.5 GHz-10 GHz)

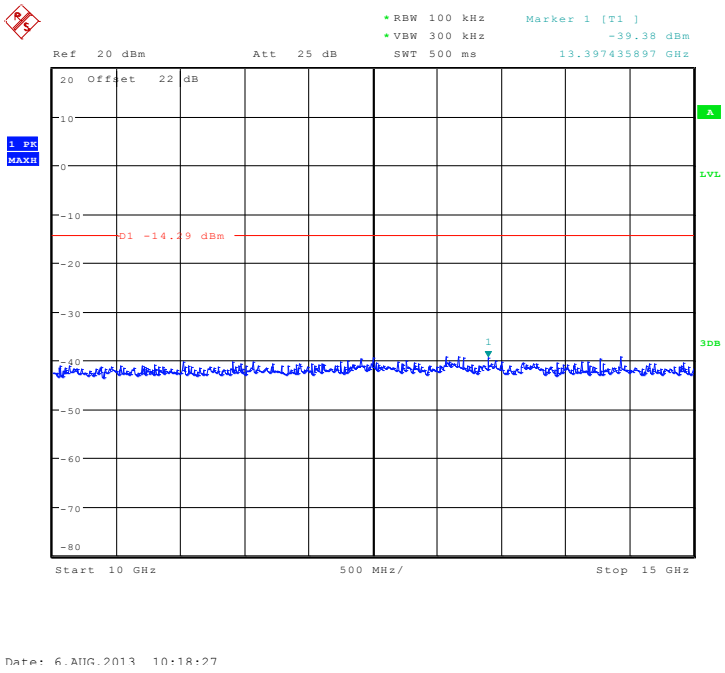

Fig. 45 Conducted Spurious Emission (802.11g, Ch1, 10 GHz-15 GHz)

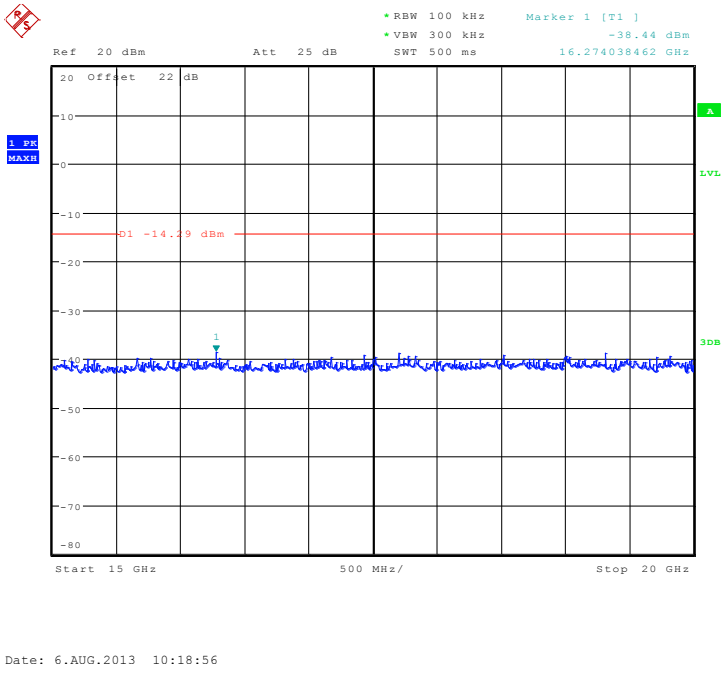

Fig. 46 Conducted Spurious Emission (802.11g, Ch1, 15 GHz-20 GHz)

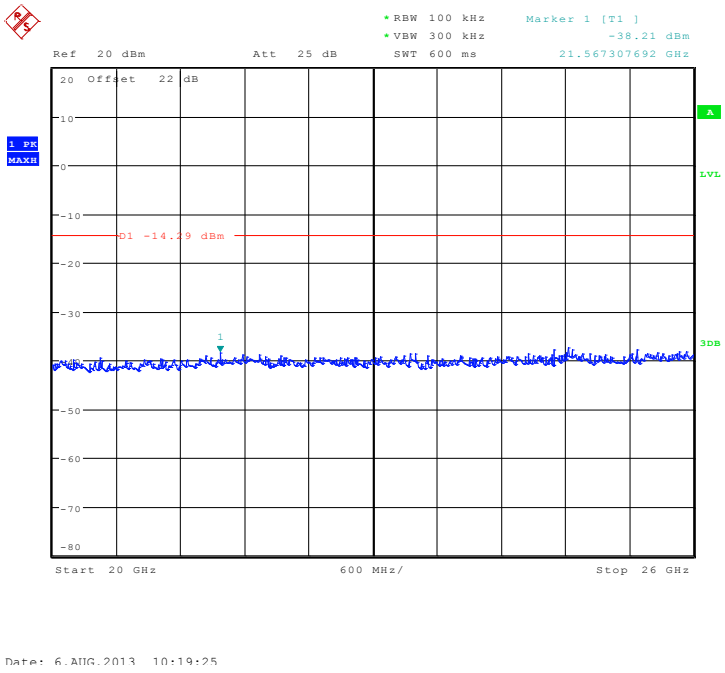

Fig. 47 Conducted Spurious Emission (802.11g, Ch1, 20 GHz-26 GHz)

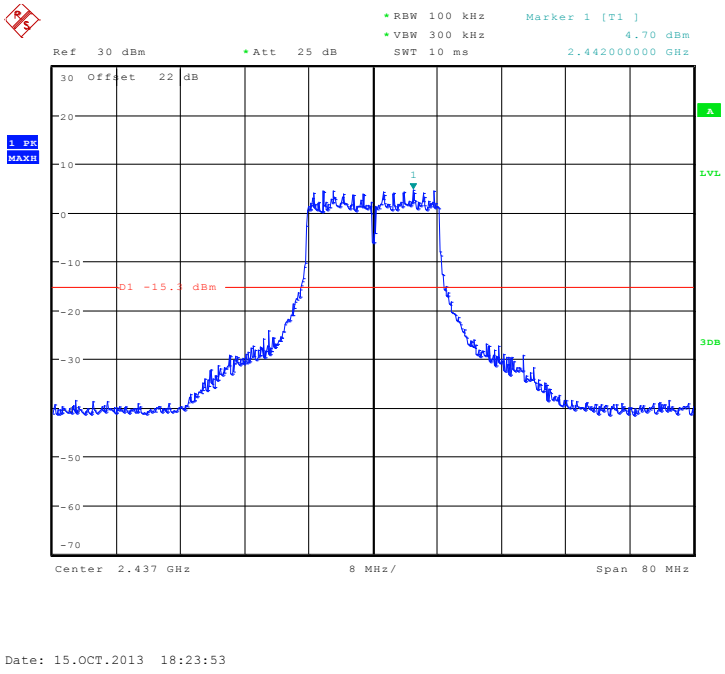

Fig. 48 Conducted Spurious Emission (802.11g, Ch6, Center Frequency)

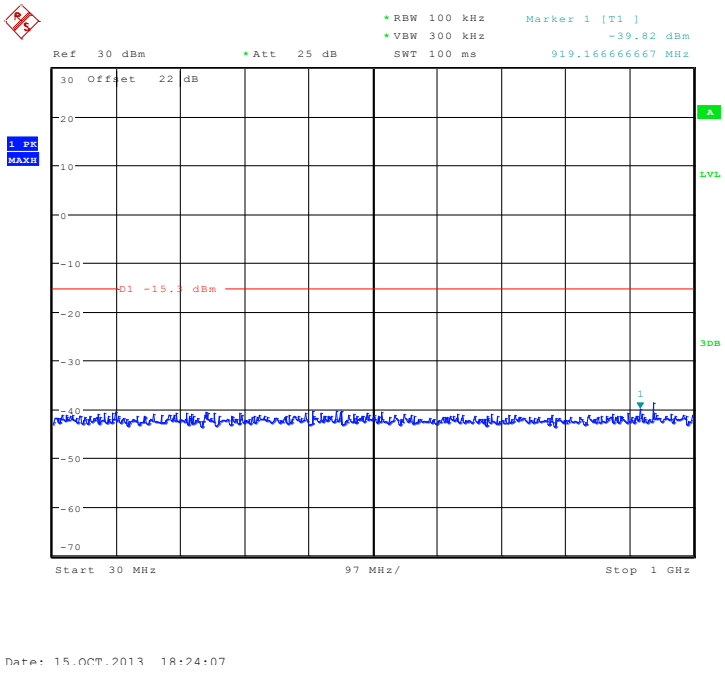

Fig. 49 Conducted Spurious Emission (802.11g, Ch6, 30 MHz-1 GHz)

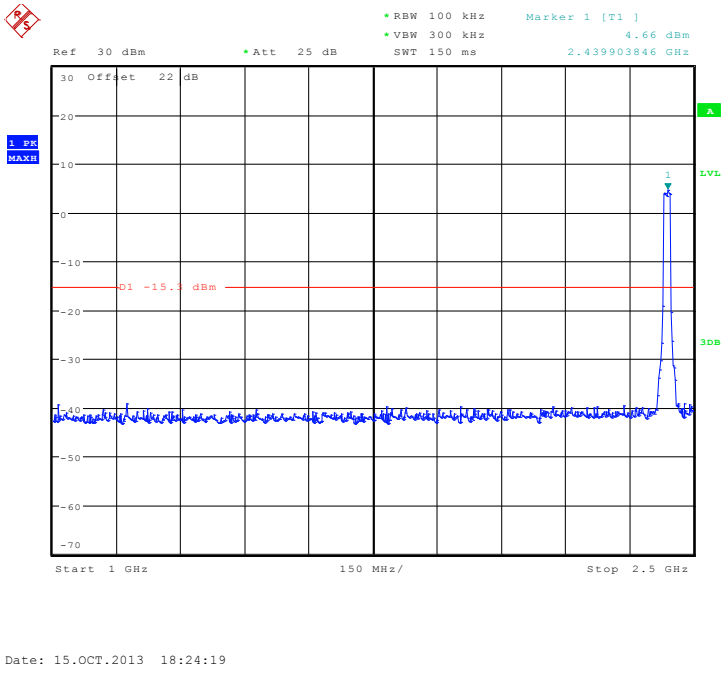

Fig. 50 Conducted Spurious Emission (802.11g, Ch6, 1 GHz-2.5 GHz)

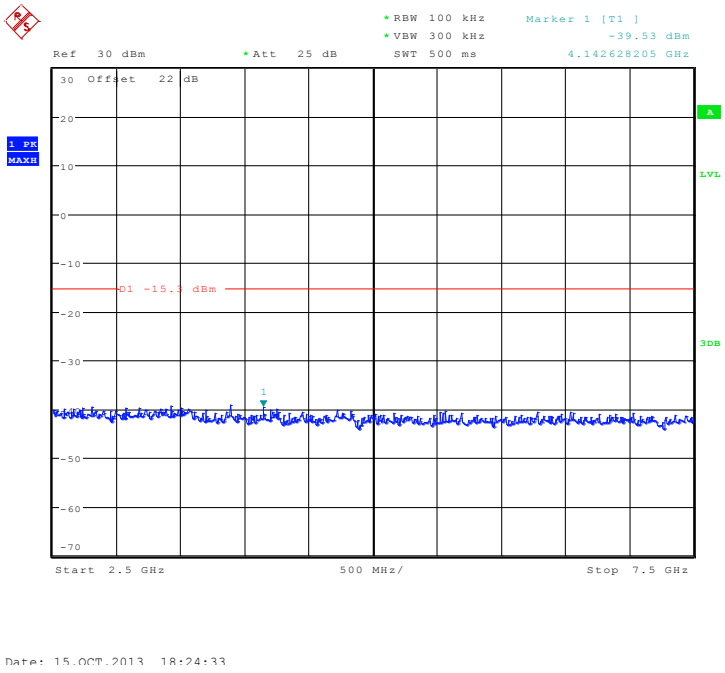

Fig. 51 Conducted Spurious Emission (802.11g, Ch6, 2.5 GHz-7.5 GHz)

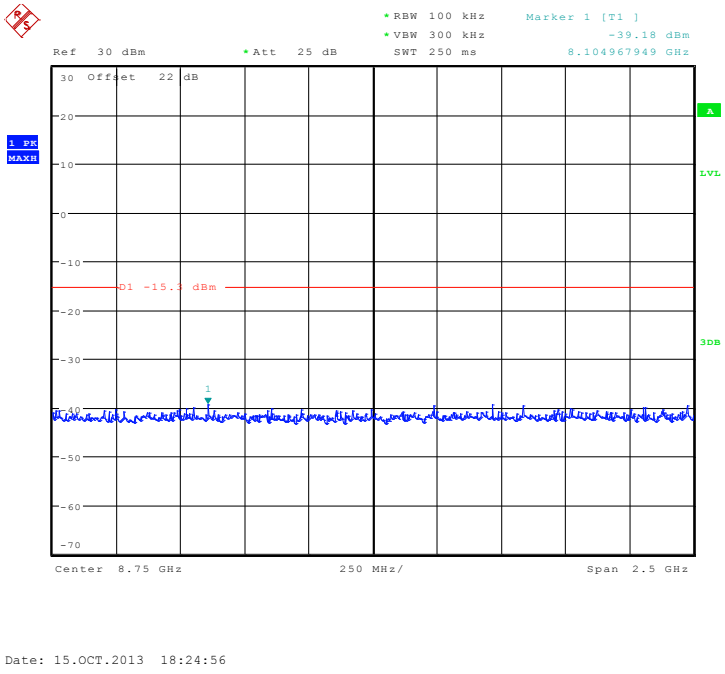

Fig. 52 Conducted Spurious Emission (802.11g, Ch6, 7.5 GHz-10 GHz)

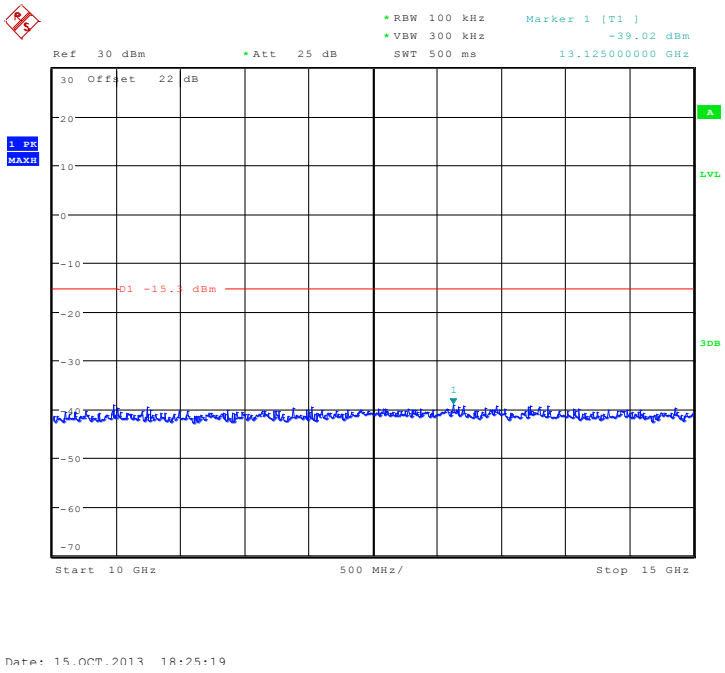

Fig. 53 Conducted Spurious Emission (802.11g, Ch6, 10 GHz-15 GHz)

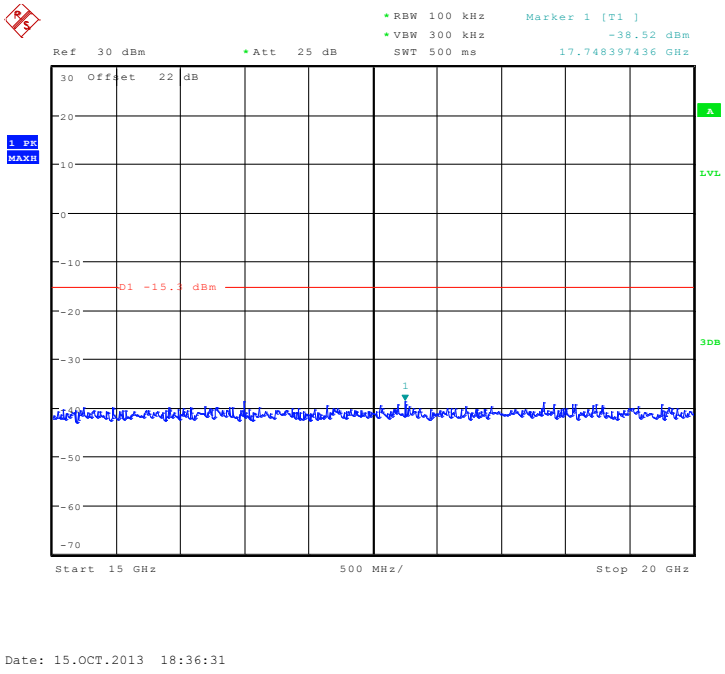

Fig. 54 Conducted Spurious Emission (802.11g, Ch6, 15 GHz-20 GHz)

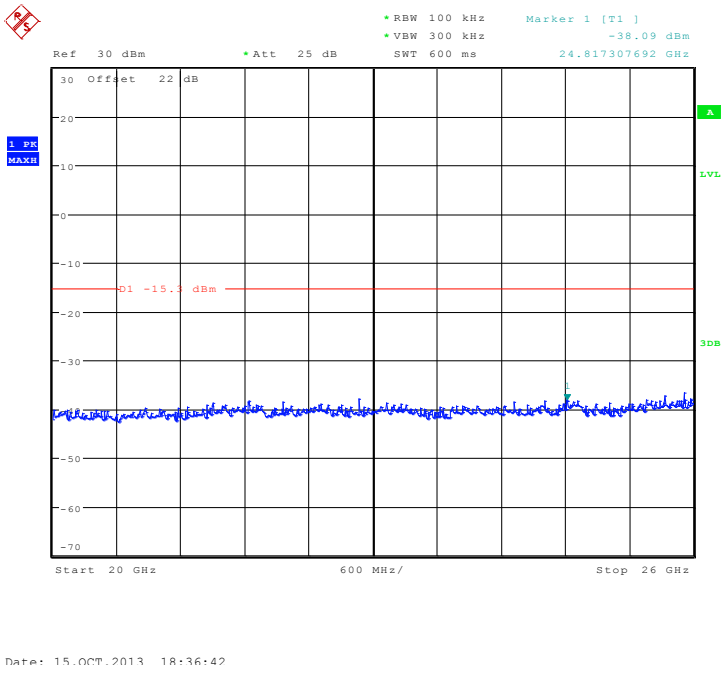

Fig. 55 Conducted Spurious Emission (802.11g, Ch6, 20 GHz-26 GHz)

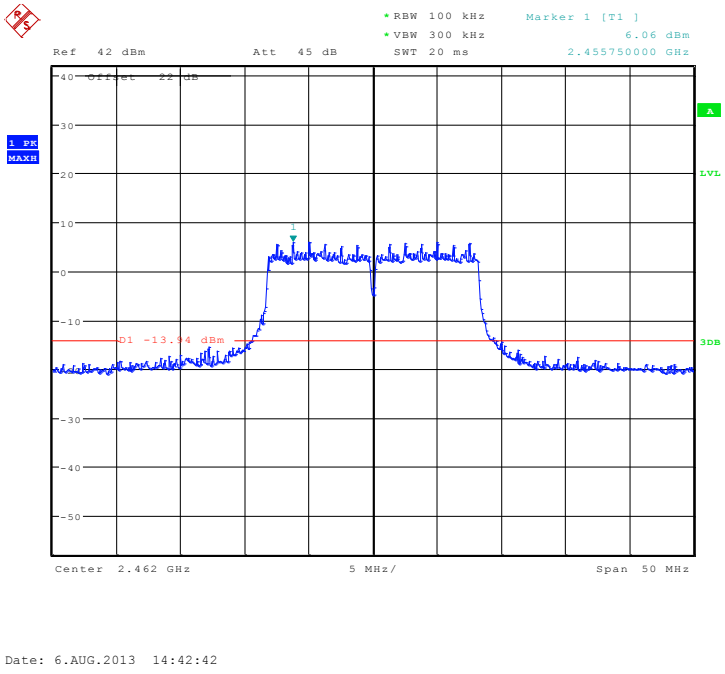

Fig. 56 Conducted Spurious Emission (802.11g, Ch11, Center Frequency)

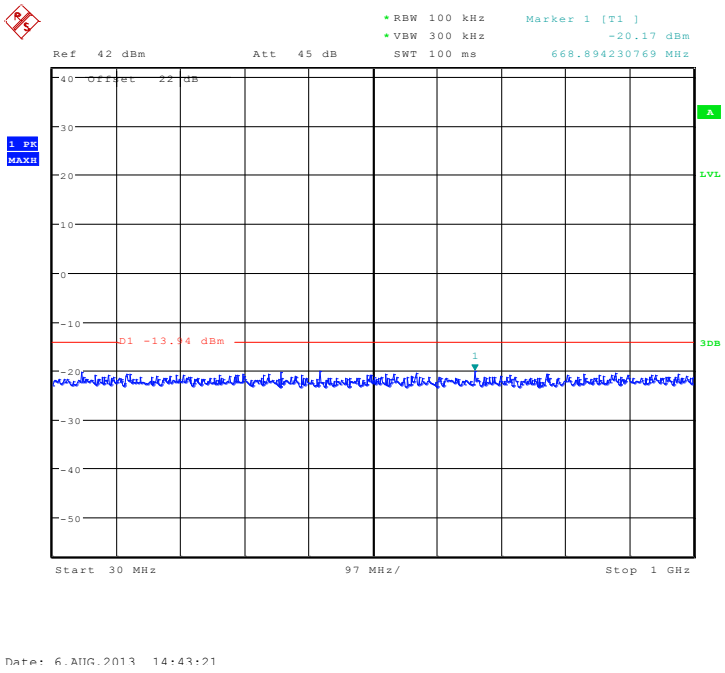

Fig. 57 Conducted Spurious Emission (802.11g, Ch11, 30 MHz-1 GHz)

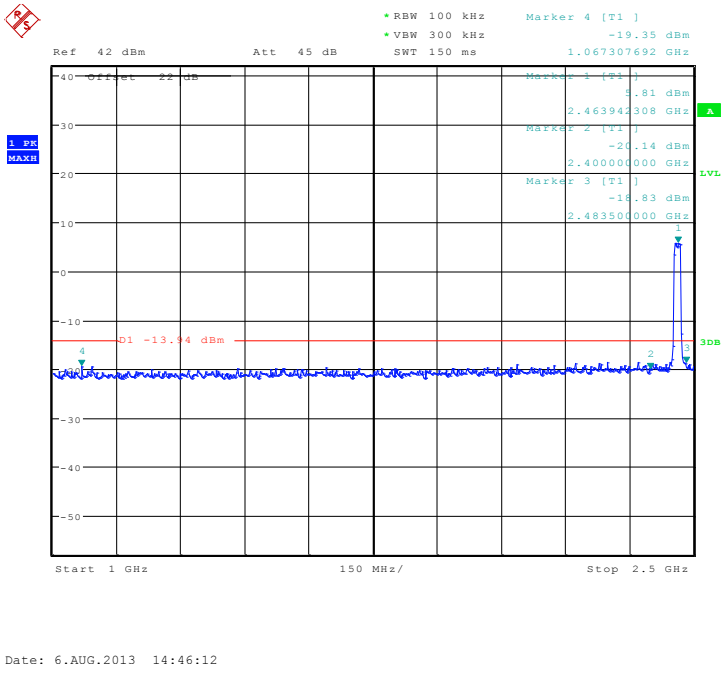

Fig. 58 Conducted Spurious Emission (802.11g, Ch11, 1 GHz-2.5 GHz)

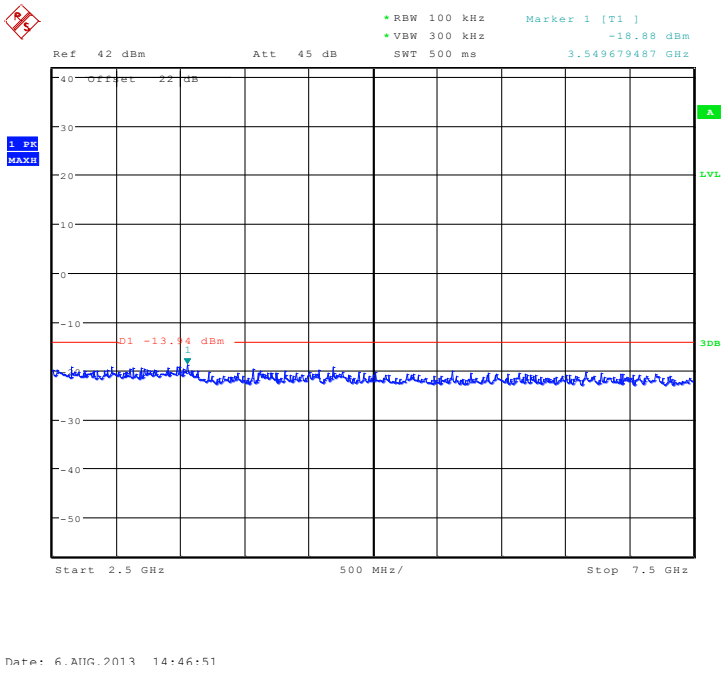

Fig. 59 Conducted Spurious Emission (802.11g, Ch11, 2.5 GHz-7.5 GHz)

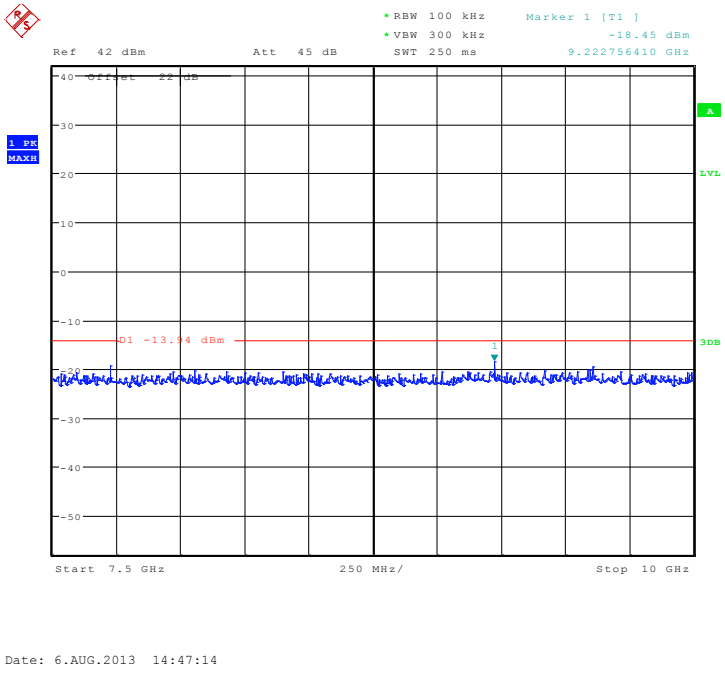

Fig. 60 Conducted Spurious Emission (802.11g, Ch11, 7.5 GHz-10 GHz)

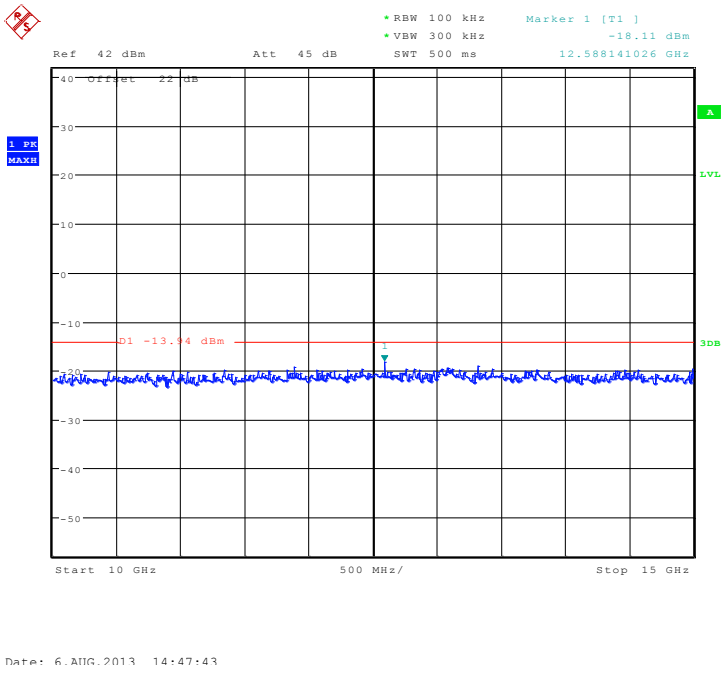

Fig. 61 Conducted Spurious Emission (802.11g, Ch11, 10 GHz-15 GHz)

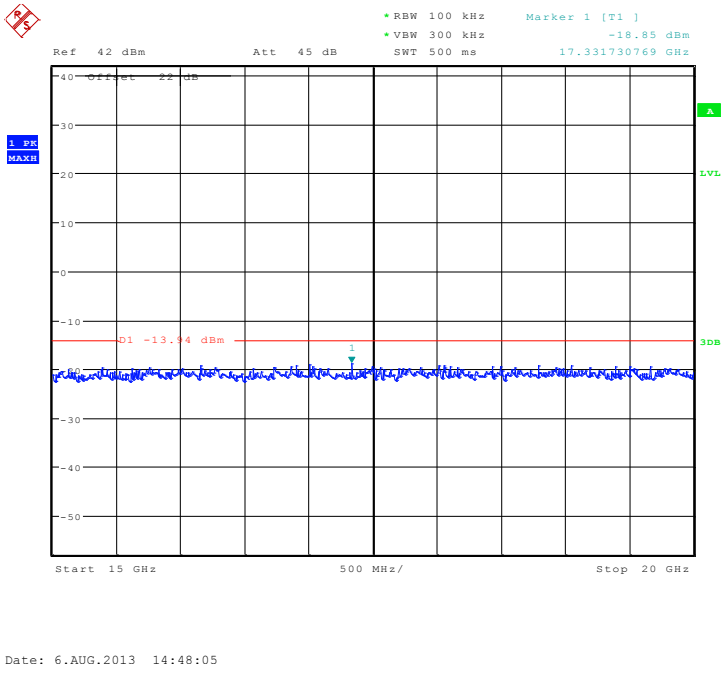

Fig. 62 Conducted Spurious Emission (802.11g, Ch11, 15 GHz-20 GHz)

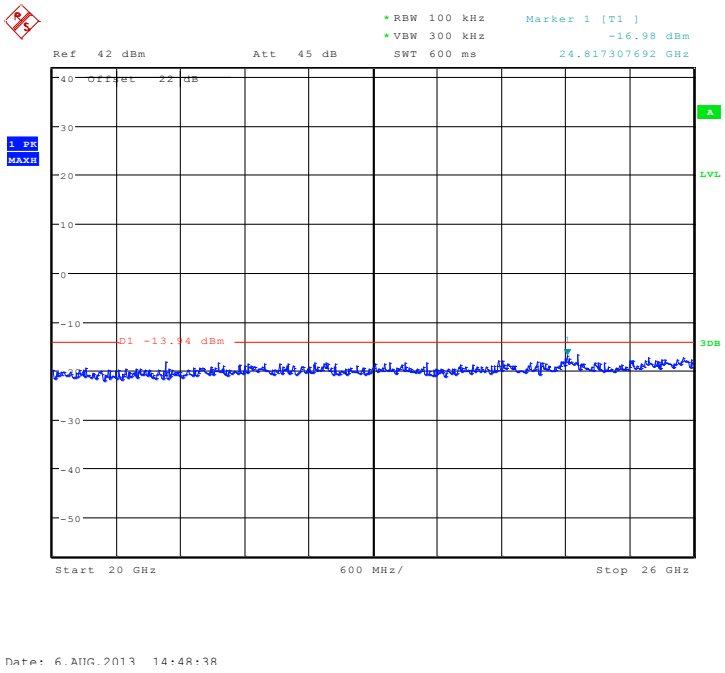

Fig. 63 Conducted Spurious Emission (802.11g, Ch11, 20 GHz-26 GHz)

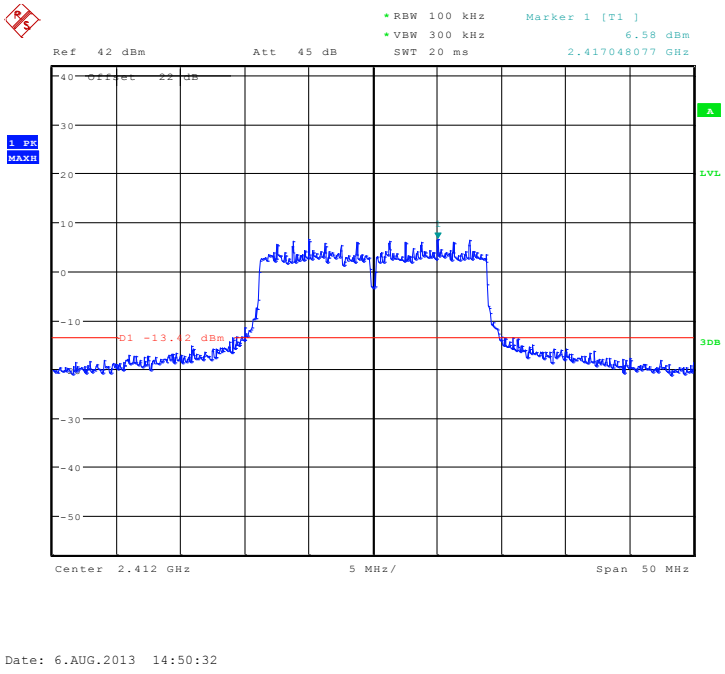

Fig. 64 Conducted Spurious Emission (802.11n-HT20, Ch1, Center Frequency)

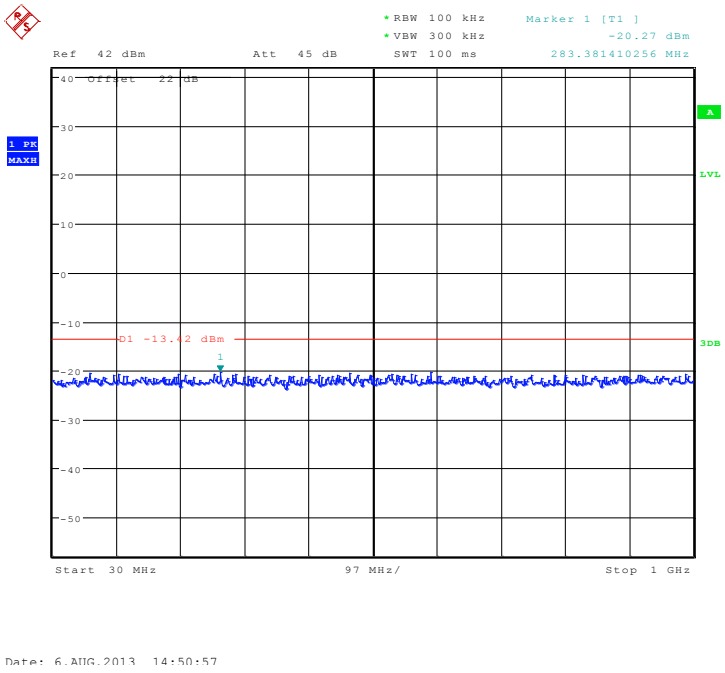

Fig. 65 Conducted Spurious Emission (802.11n-HT20, Ch1, 30 MHz-1 GHz)

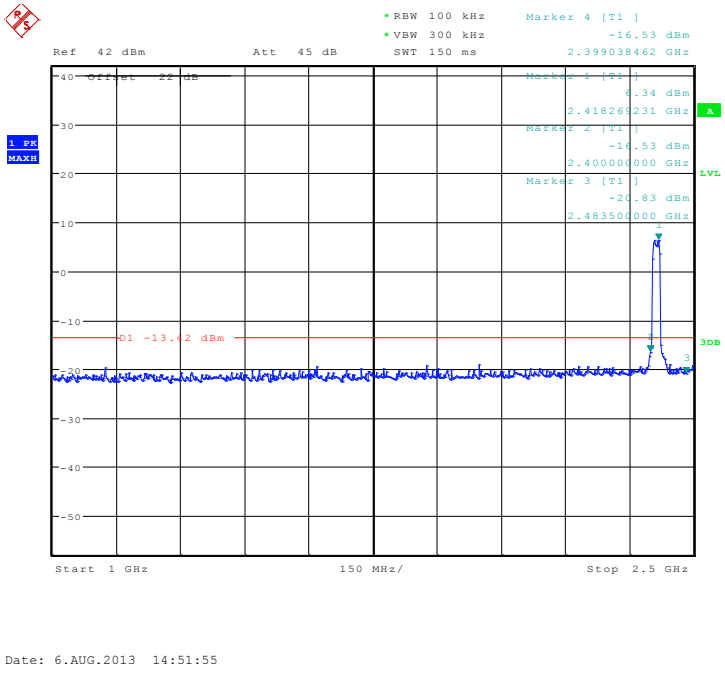

Fig. 66 Conducted Spurious Emission (802.11n-HT20, Ch1, 1 GHz-2.5 GHz)

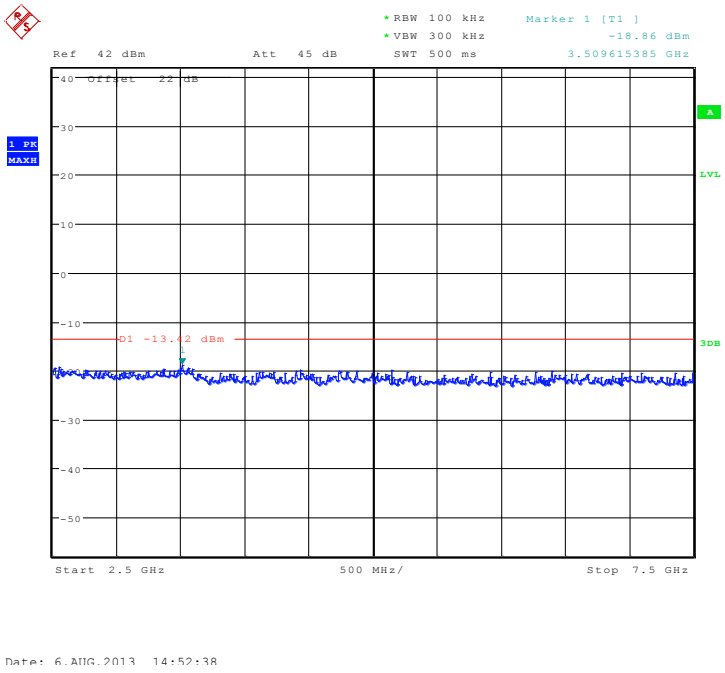

Fig. 67 Conducted Spurious Emission (802.11n-HT20, Ch1, 2.5 GHz-7.5 GHz)

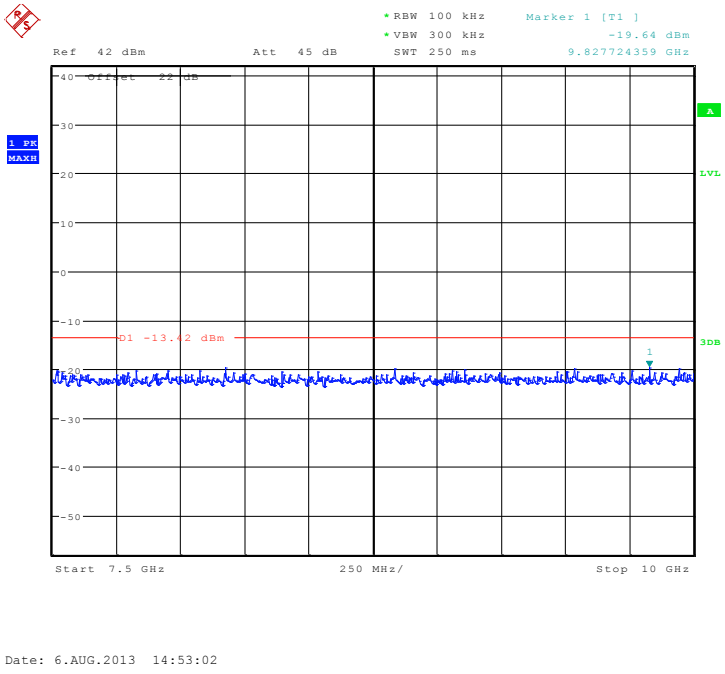

Fig. 68 Conducted Spurious Emission (802.11n-HT20, Ch1, 7.5 GHz-10 GHz)

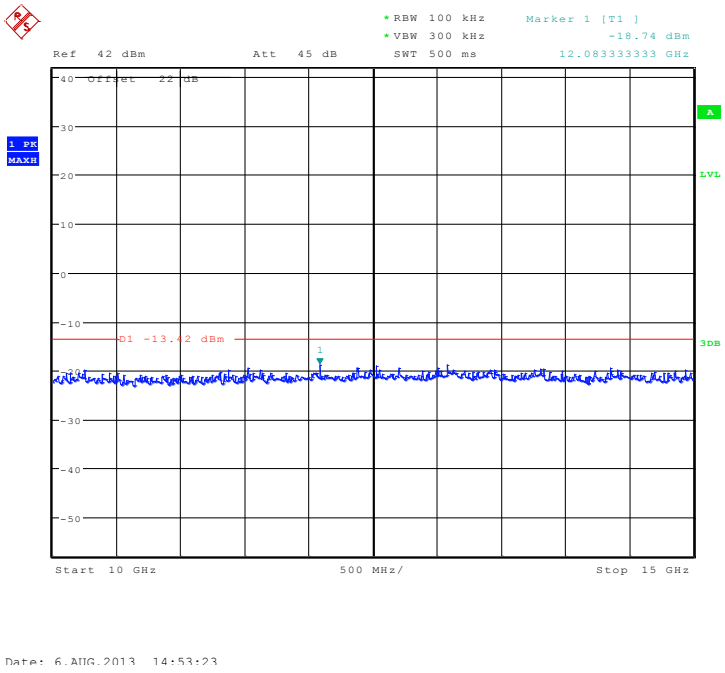

Fig. 69 Conducted Spurious Emission (802.11n-HT20, Ch1, 10 GHz-15 GHz)

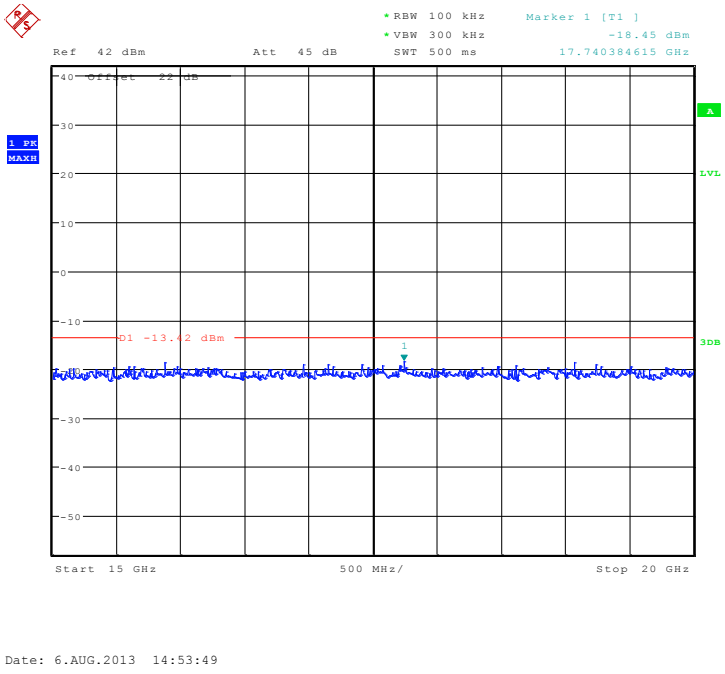

Fig. 70 Conducted Spurious Emission (802.11n-HT20, Ch1, 15 GHz-20 GHz)

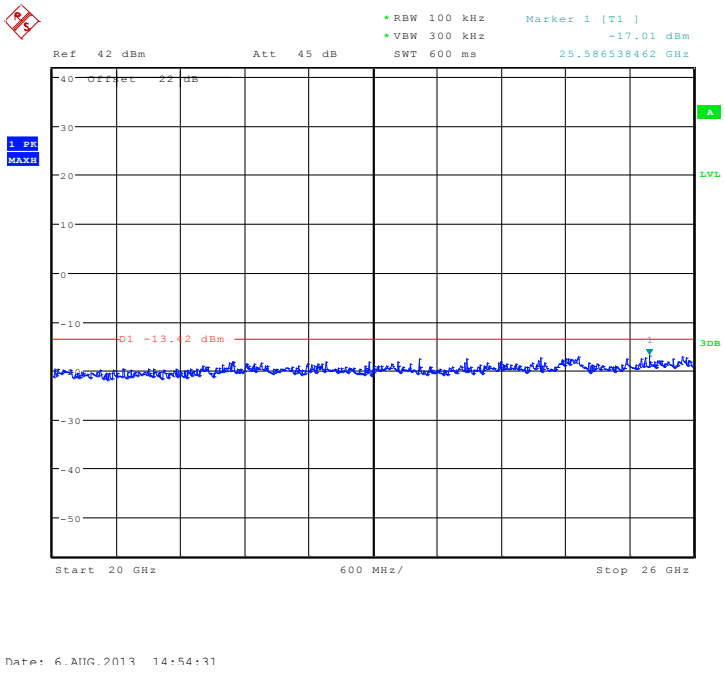

Fig. 71 Conducted Spurious Emission (802.11n-HT20, Ch1, 20 GHz-26 GHz)

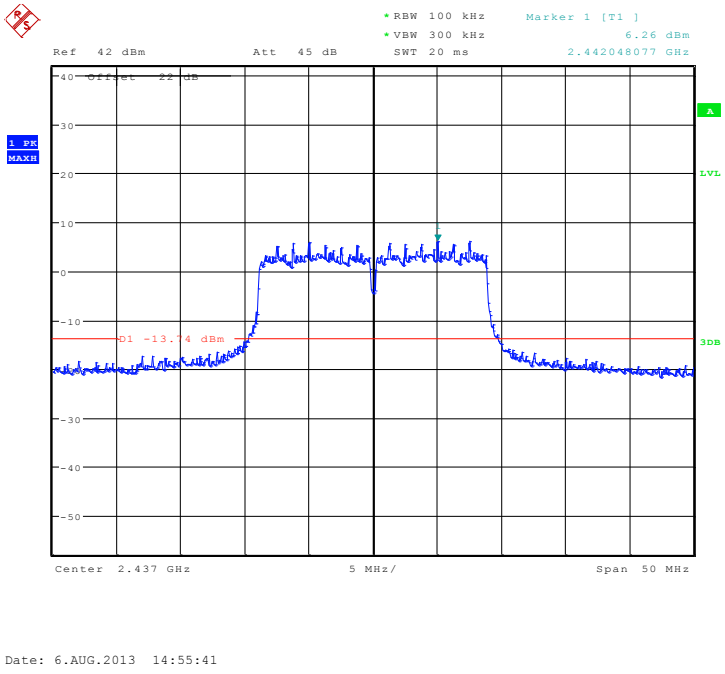

Fig. 72 Conducted Spurious Emission (802.11n-HT20, Ch6, Center Frequency)

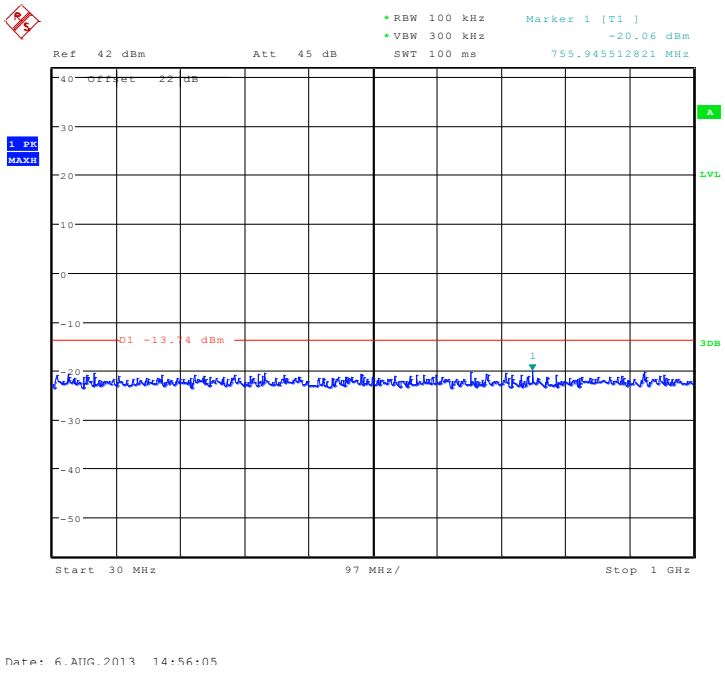

Fig. 73 Conducted Spurious Emission (802.11n-HT20, Ch6, 30 MHz-1 GHz)

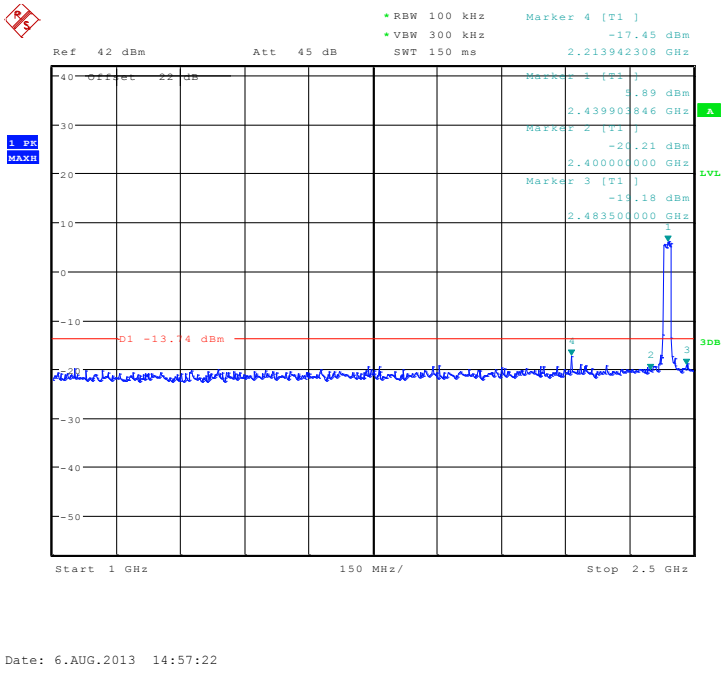

Fig. 74 Conducted Spurious Emission (802.11n-HT20, Ch6, 1 GHz-2.5 GHz)

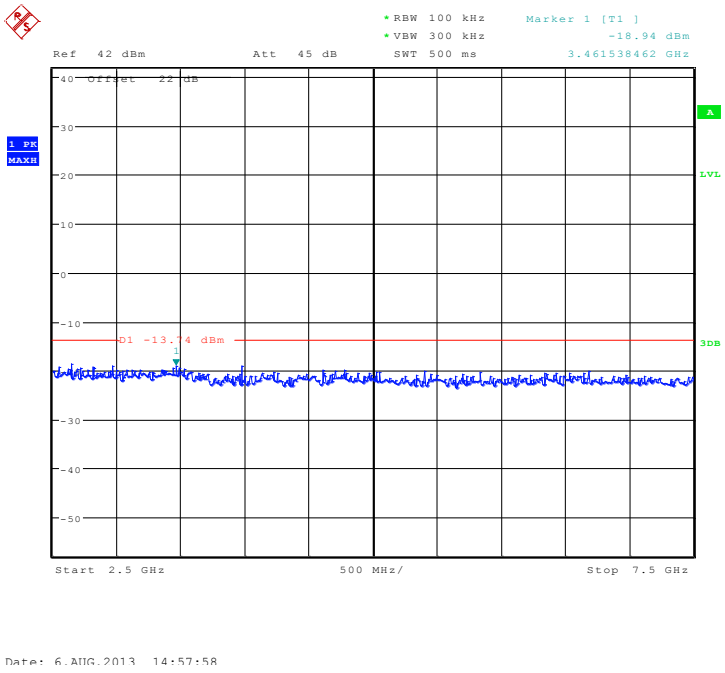

Fig. 75 Conducted Spurious Emission (802.11n-HT20, Ch6, 2.5 GHz-7.5 GHz)

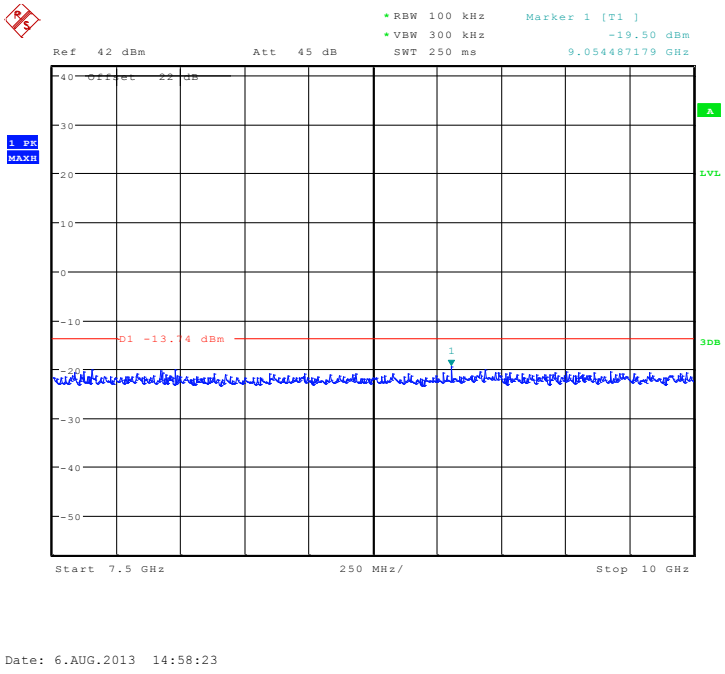

Fig. 76 Conducted Spurious Emission (802.11n-HT20, Ch6, 7.5 GHz-10 GHz)

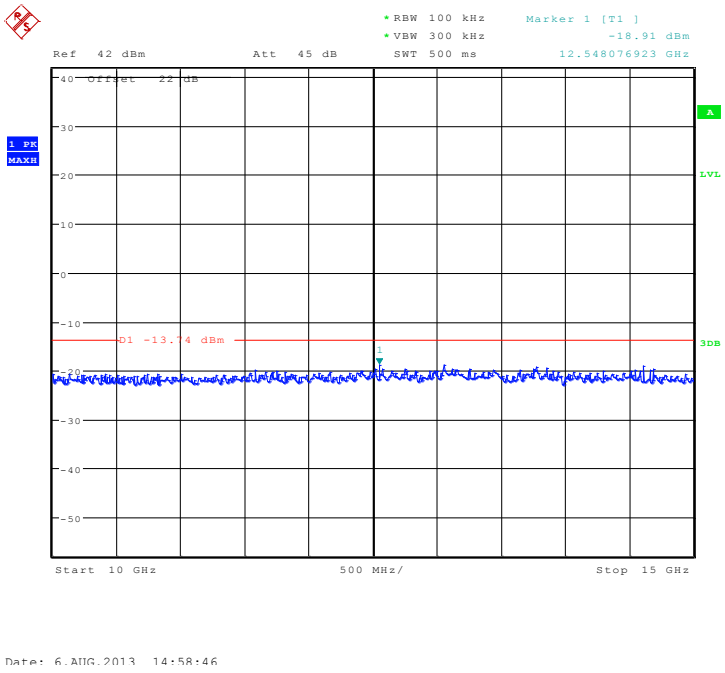

Fig. 77 Conducted Spurious Emission (802.11n-HT20, Ch6, 10 GHz-15 GHz)

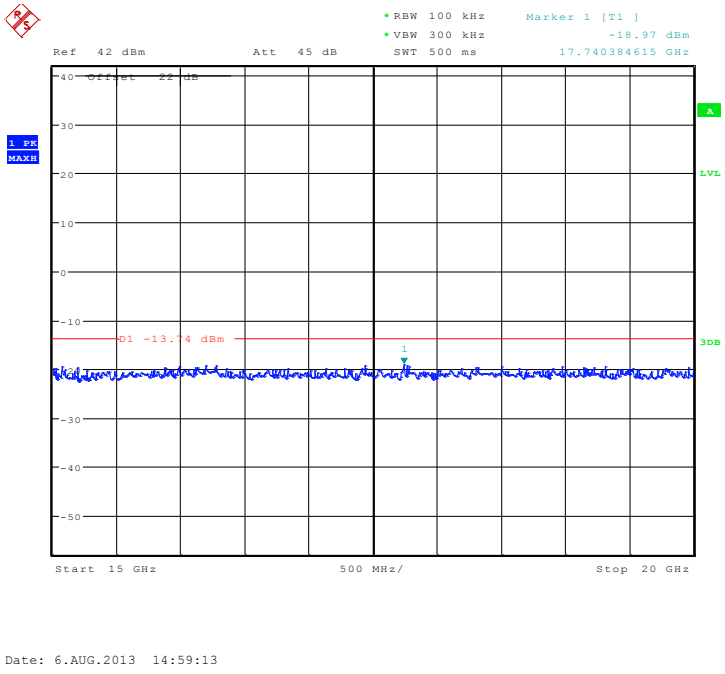

Fig. 78 Conducted Spurious Emission (802.11n-HT20, Ch6, 15 GHz-20 GHz)

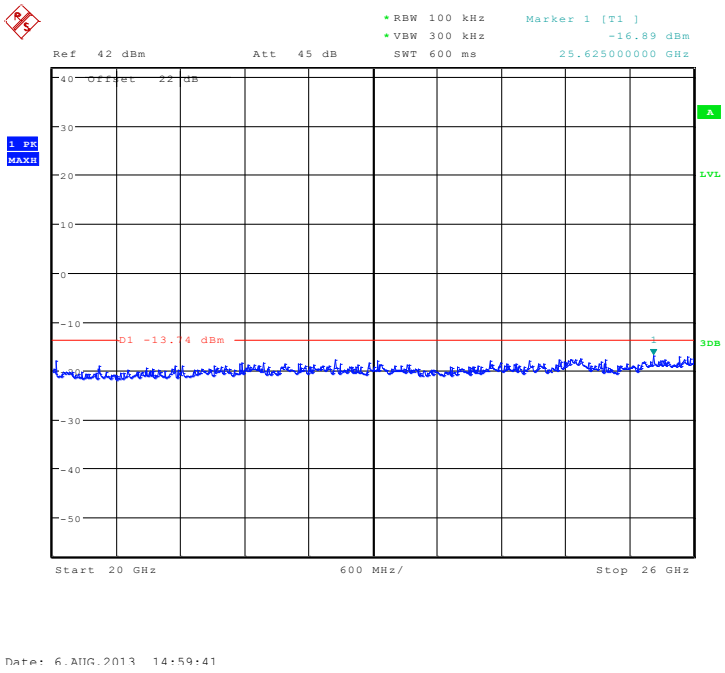

Fig. 79 Conducted Spurious Emission (802.11n-HT20, Ch6, 20 GHz-26 GHz)

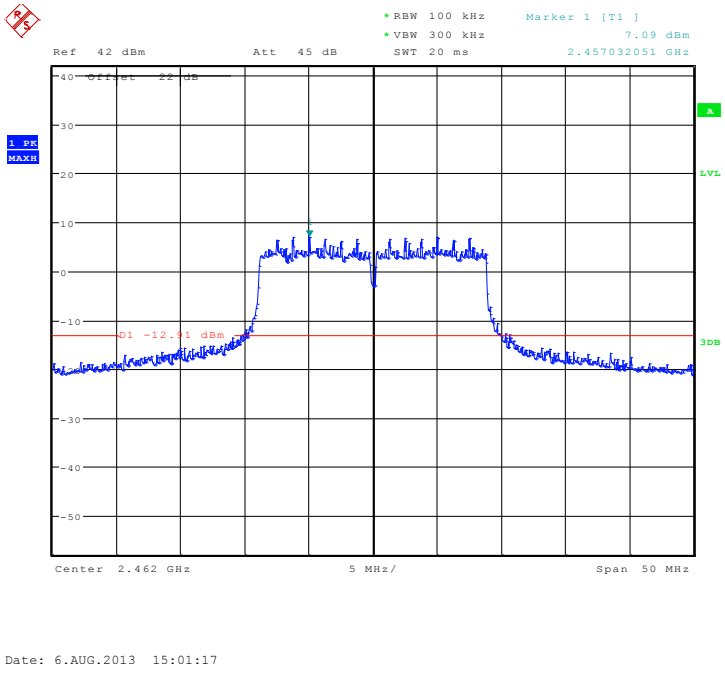

Fig. 80 Conducted Spurious Emission (802.11n-HT20, Ch11, Center Frequency)

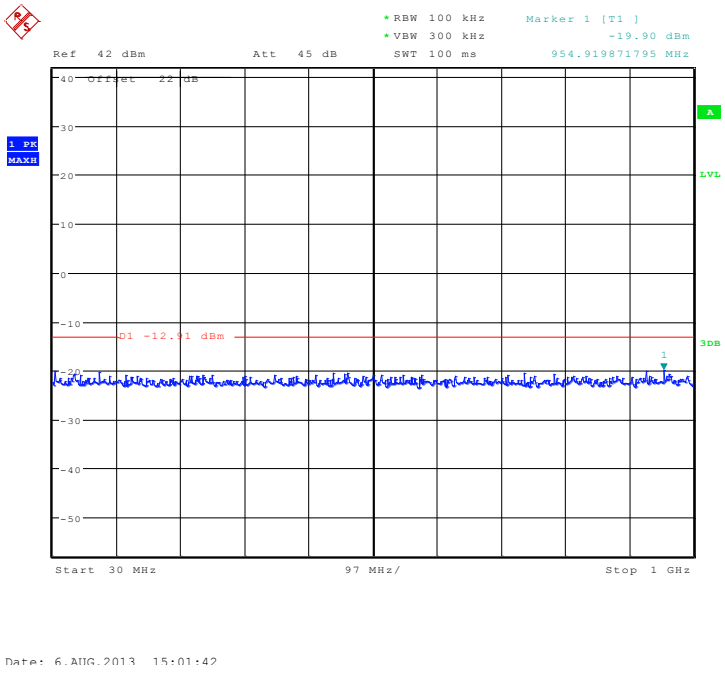

Fig. 81 Conducted Spurious Emission (802.11n-HT20, Ch11, 30 MHz-1 GHz)

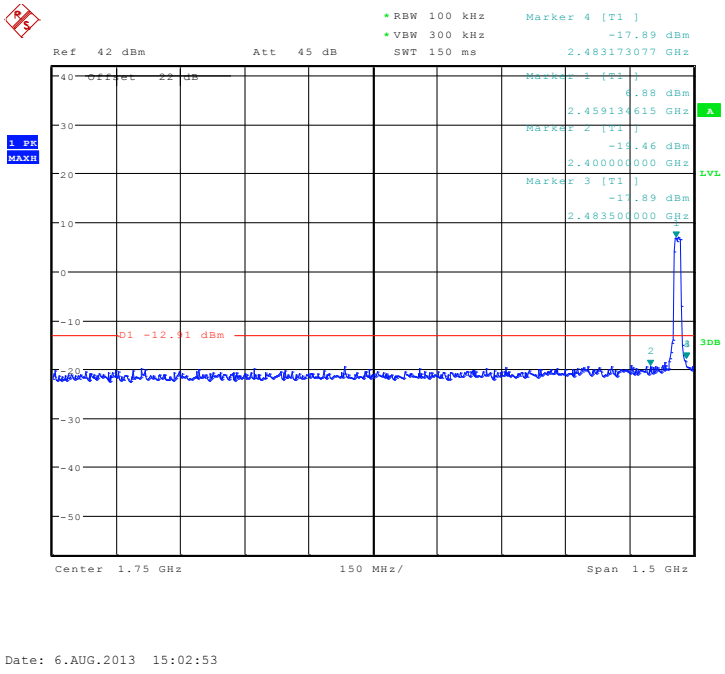

Fig. 82 Conducted Spurious Emission (802.11n-HT20, Ch11, 1 GHz-2.5 GHz)

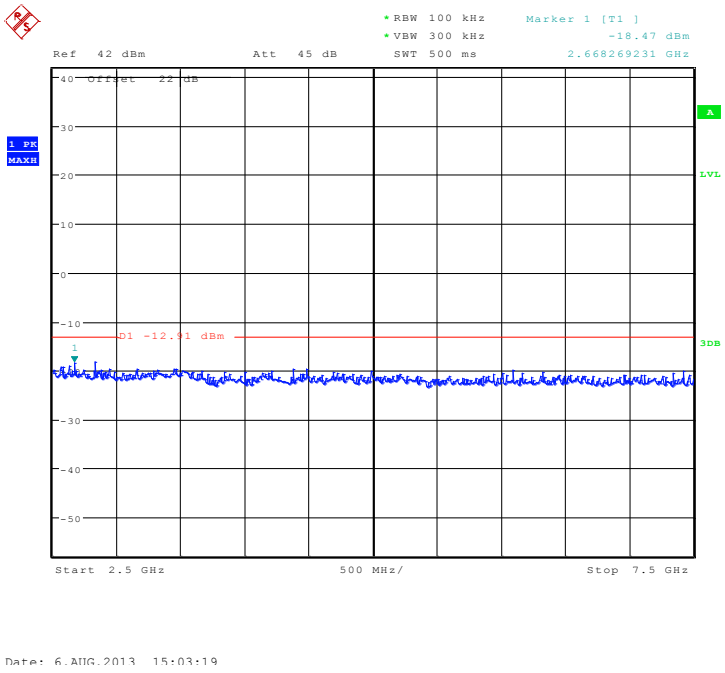

Fig. 83 Conducted Spurious Emission (802.11n-HT20, Ch11, 2.5 GHz-7.5 GHz)

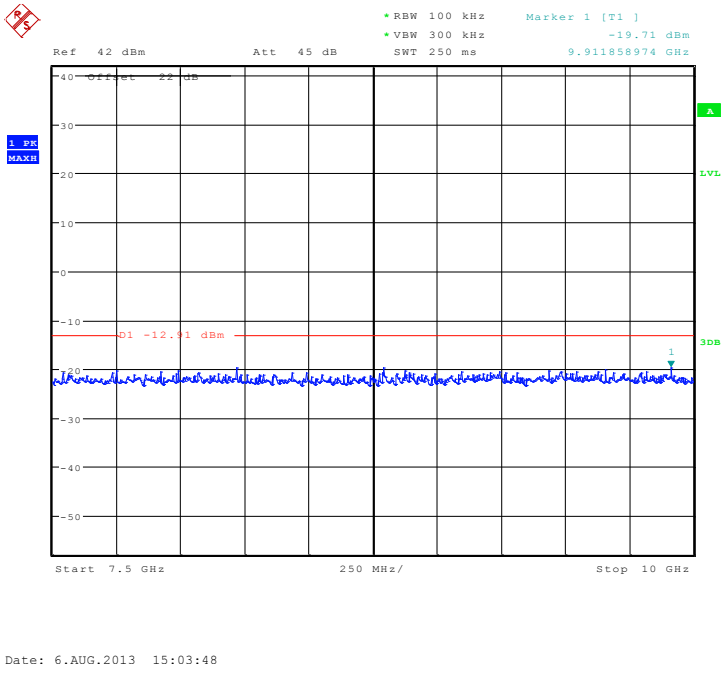

Fig. 84 Conducted Spurious Emission (802.11n-HT20, Ch11, 7.5 GHz-10 GHz)

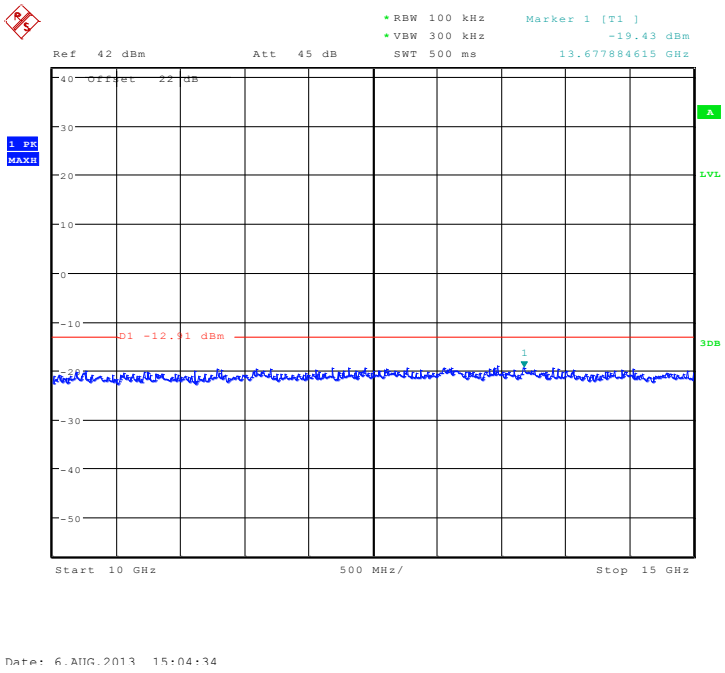

Fig. 85 Conducted Spurious Emission (802.11n-HT20, Ch11, 10 GHz-15 GHz)

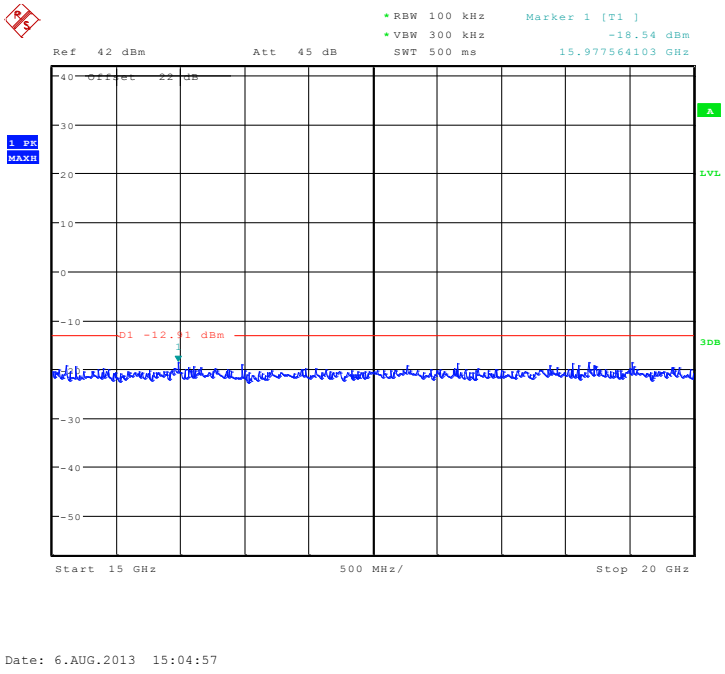

Fig. 86 Conducted Spurious Emission (802.11n-HT20, Ch11, 15 GHz-20 GHz)

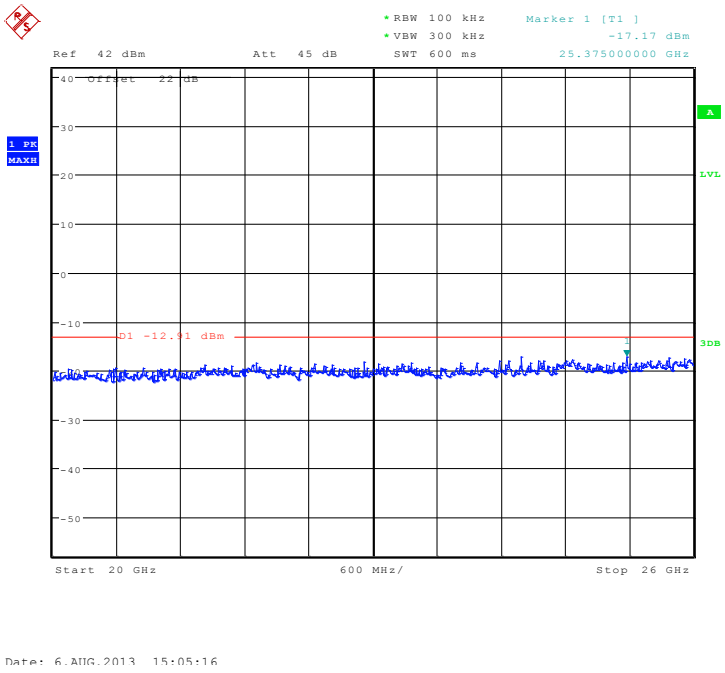

Fig. 87 Conducted Spurious Emission (802.11n-HT20, Ch11, 20 GHz-26 GHz)

A.6.2 Transmitter Spurious Emission - Radiated

Limit in restricted band:

Measurement Results:

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11b	Power	2.38GHz ~2.45GHz	Fig.88	P
	1	30 MHz ~1 GHz	Fig.89	P
		1 GHz ~ 3 GHz	Fig.90	P
		3 GHz ~ 18 GHz	Fig.91	P
	6	30 MHz ~1 GHz	Fig.92	P
		1 GHz ~ 3 GHz	Fig.93	P
		3 GHz ~ 18 GHz	Fig.94	P
	Power	2.45GHz ~2.5GHz	Fig.95	P
	11	30 MHz ~1 GHz	Fig.96	P
		1 GHz ~ 3 GHz	Fig.97	P
		3 GHz ~ 18 GHz	Fig.98	P
802.11g	Power	2.38GHz ~2.45GHz	Fig.99	P
	1	30 MHz ~1 GHz	Fig.100	P
		1 GHz ~ 3 GHz	Fig.101	P
		3 GHz ~ 18 GHz	Fig.102	P
	6	30 MHz ~1 GHz	Fig.103	P
		1 GHz ~ 3 GHz	Fig.104	P
		3 GHz ~ 18 GHz	Fig.105	P
	Power	2.45GHz~2.5GHz	Fig.106	P
	11	30 MHz ~1 GHz	Fig.107	P
		1 GHz ~ 3 GHz	Fig.108	P
		3 GHz ~ 18 GHz	Fig.109	P
802.11n-HT20	Power	2.38GHz ~2.45GHz	Fig.110	P
	1	30 MHz ~1 GHz	Fig.111	P
		1 GHz ~ 3 GHz	Fig.112	P
		3 GHz ~ 18 GHz	Fig.113	P
	6	30 MHz ~1 GHz	Fig.114	P
		1 GHz ~ 3 GHz	Fig.115	P
		3 GHz ~ 18 GHz	Fig.116	P
	Power	2.45GHz~2.5GHz	Fig.117	P
	11	30 MHz ~1 GHz	Fig.118	P
		1 GHz ~ 3 GHz	Fig.119	P
		3 GHz ~ 18 GHz	Fig.120	P
/	All channels	18 GHz~ 26.5 GHz	Fig.121	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:

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

These recorded emissions around 21GHz are highest noise floor levels since no higher spurious emission is detected.

802.11b

Ch1

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17889.000	57.6	-22.9	42.5	37.993	VERTICAL
17562.750	57.6	-22.8	42.3	38.125	HORIZONTAL
17480.250	57.6	-22.8	43.0	37.345	HORIZONTAL
17623.500	57.6	-22.8	42.8	37.625	VERTICAL
17511.000	57.6	-22.8	42.8	37.615	VERTICAL
17976.750	57.6	-22.9	42.3	38.223	HORIZONTAL

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17988.000	58.4	-22.5	42.3	38.667	VERTICAL
17635.500	58.4	-22.8	42.7	38.571	HORIZONTAL
17762.250	58.1	-22.8	42.2	38.771	VERTICAL
17387.250	58.0	-23.7	42.8	38.923	VERTICAL
17645.250	57.8	-22.8	42.7	37.971	VERTICAL
17934.750	57.7	-22.9	42.4	38.193	VERTICAL

Ch11

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17496.750	57.4	-22.8	43.0	37.145	HORIZONTAL
17485.500	57.1	-22.8	43.0	36.845	VERTICAL
17492.250	56.7	-22.8	43.0	36.445	HORIZONTAL
17522.250	55.7	-22.8	42.8	35.715	VERTICAL
17503.500	55.5	-22.8	42.8	35.515	VERTICAL
17565.000	56.1	-22.8	42.3	36.625	VERTICAL

802.11g

Ch1

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17477.250	57.7	-22.8	43.0	37.445	VERTICAL
17484.000	57.6	-22.8	43.0	37.345	HORIZONTAL
17537.250	57.6	-22.8	42.9	37.455	VERTICAL
17952.000	57.5	-22.9	42.7	37.683	VERTICAL
17716.500	57.5	-22.8	42.8	37.511	HORIZONTAL
17493.000	57.4	-22.8	43.0	37.145	VERTICAL

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17731.500	57.7	-22.8	42.1	38.461	VERTICAL
17582.250	57.6	-22.8	42.7	37.675	HORIZONTAL
17523.750	57.6	-22.8	42.8	37.615	VERTICAL
17454.000	57.6	-23.7	42.6	38.723	VERTICAL
17998.500	57.6	-22.5	42.3	37.867	HORIZONTAL
17048.250	57.6	-23.9	43.6	37.830	VERTICAL

Ch11

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17997.750	58.0	-22.5	42.3	38.267	VERTICAL
17972.250	57.9	-22.9	42.7	38.083	HORIZONTAL
17418.000	57.7	-23.7	42.7	38.713	VERTICAL
17455.500	57.7	-23.7	42.6	38.823	VERTICAL
17653.500	57.7	-22.8	42.7	37.871	HORIZONTAL
17609.250	57.6	-22.8	42.8	37.625	VERTICAL

802.11n-HT20

Ch1

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17580.750	59.0	-22.8	42.7	39.075	HORIZONTAL
17385.750	58.7	-23.7	42.8	39.623	VERTICAL
17477.250	58.0	-22.8	43.0	37.745	HORIZONTAL
17649.000	57.9	-22.8	42.7	38.071	HORIZONTAL
17928.750	57.8	-22.9	42.4	38.293	HORIZONTAL
17765.250	57.7	-22.8	42.2	38.371	HORIZONTAL

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17498.250	58.2	-22.8	43.0	37.945	HORIZONTAL
17995.500	58.0	-22.5	42.3	38.267	HORIZONTAL
17671.500	57.8	-22.8	42.7	37.971	HORIZONTAL
17968.500	57.7	-22.9	42.7	37.883	VERTICAL
17734.500	57.7	-22.8	42.1	38.461	HORIZONTAL
17493.000	57.6	-22.8	43.0	37.345	VERTICAL

Ch11

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17683.500	58.3	-22.8	42.3	38.801	VERTICAL
17614.500	58.3	-22.8	42.8	38.325	HORIZONTAL
17936.250	58.1	-22.9	42.4	38.593	HORIZONTAL
17466.000	58.0	-22.8	42.6	38.185	HORIZONTAL
17772.750	58.0	-22.8	42.2	38.671	HORIZONTAL
16959.750	57.9	-23.9	43.5	38.250	HORIZONTAL

Measurement Uncertainty:

Frequency Range	Uncertainty(dB)
f ≤ 1GHz	3.9
f>1GHz	4.3

Test graphs as below:

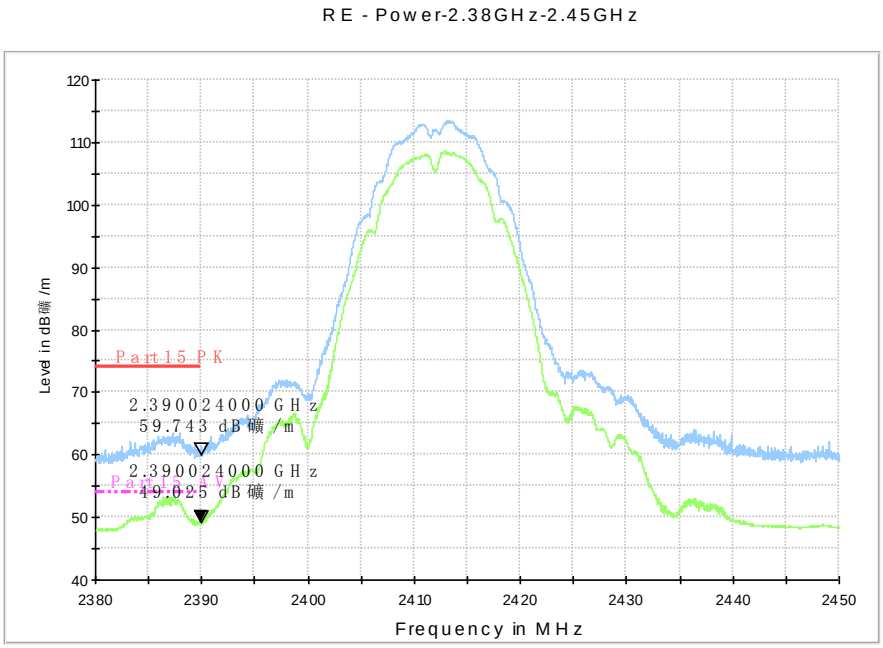

Fig. 88 Radiated Spurious Emission (Power): 802.11b, ch1, 2.38 GHz - 2.45GHz

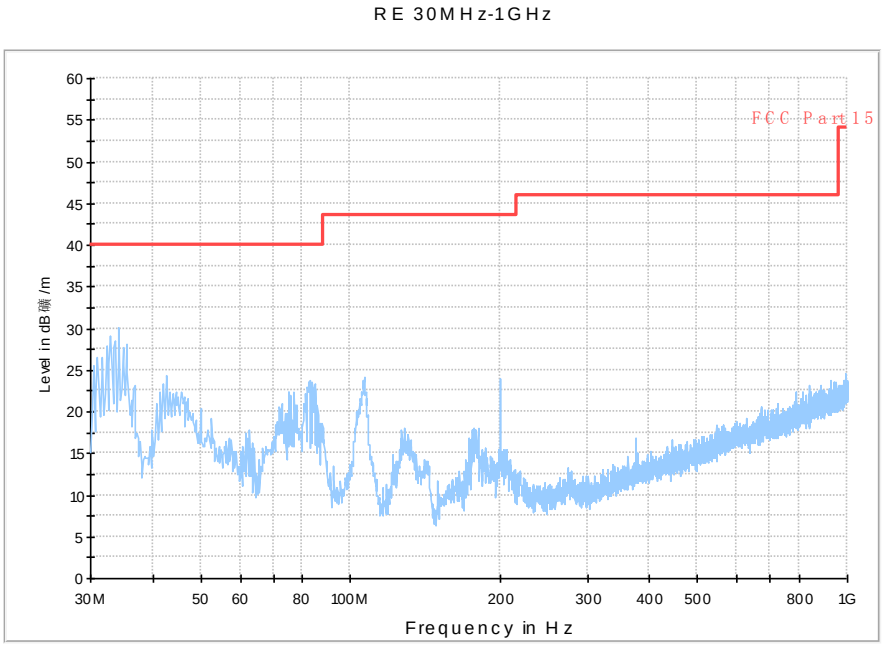

Fig. 89 Radiated Spurious Emission (802.11b, Ch1, 30 MHz-1 GHz)

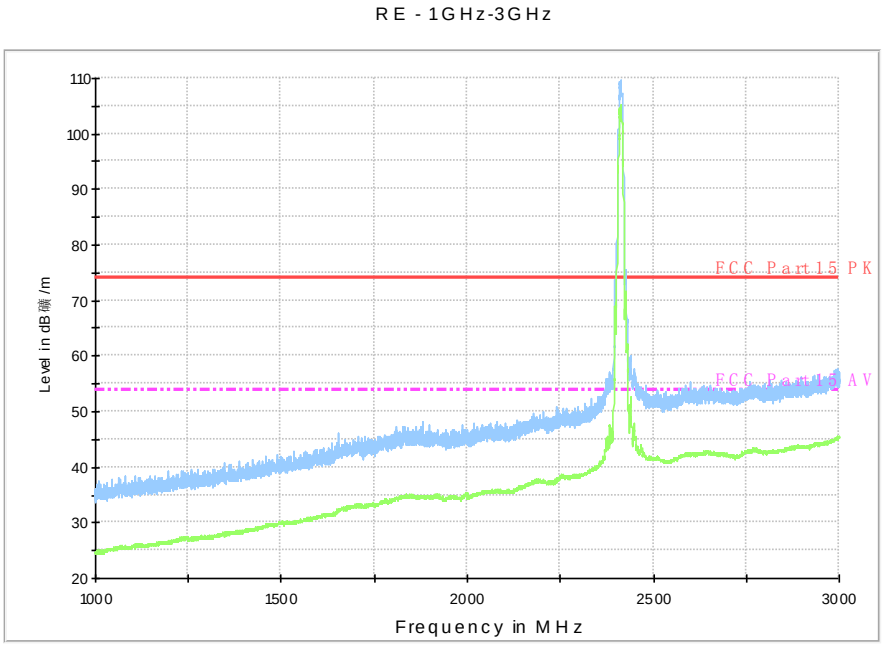

Fig. 90 Radiated Spurious Emission (802.11b, Ch1, 1 GHz-3 GHz)

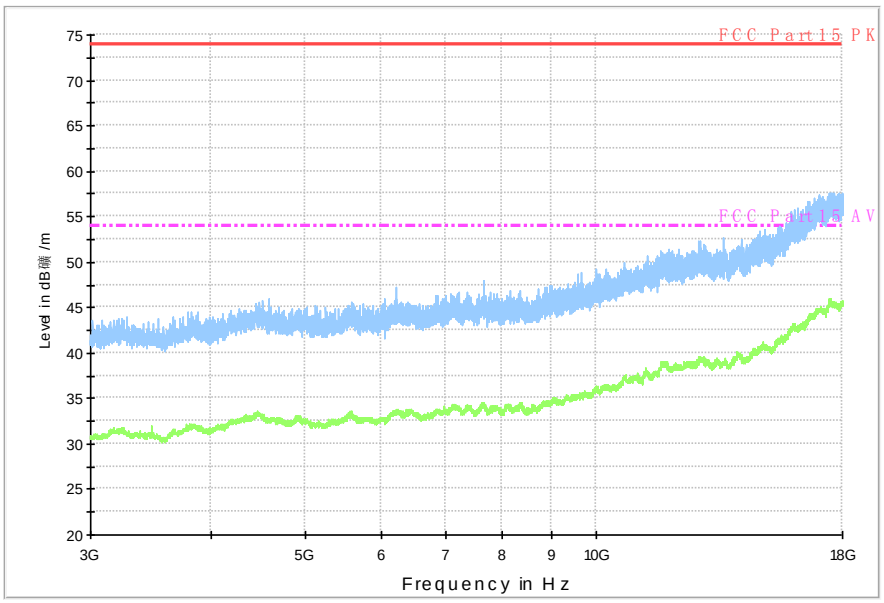

Fig. 91 Radiated Spurious Emission (802.11b, Ch1, 3 GHz-18 GHz)

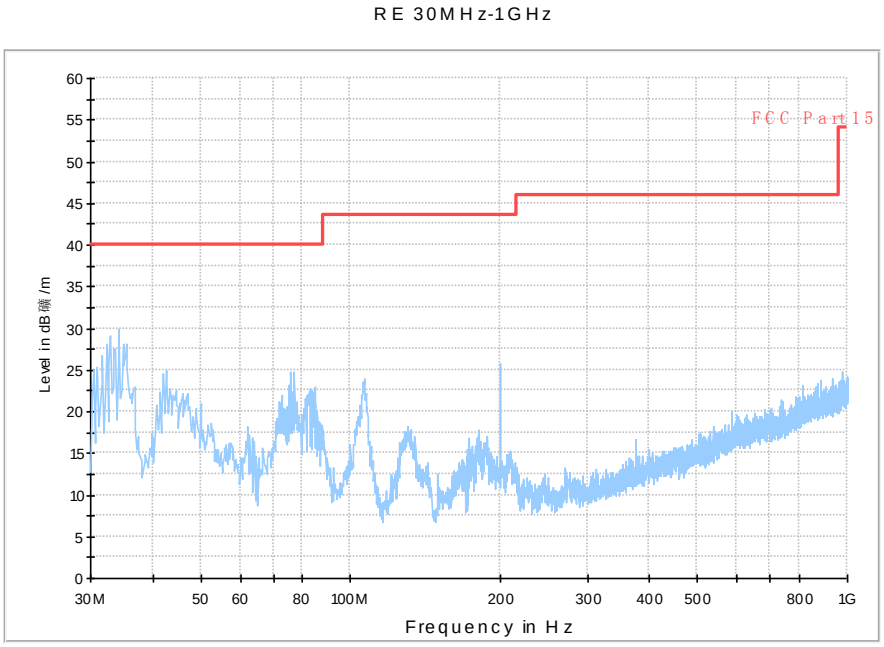

Fig. 92 Radiated Spurious Emission (802.11b, Ch6, 30 MHz-1 GHz)

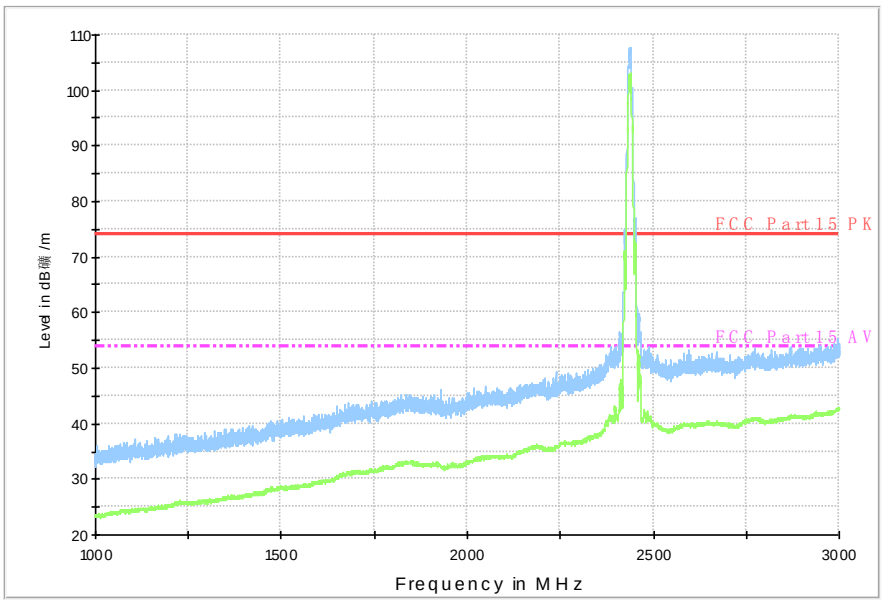

Fig. 93 Radiated Spurious Emission (802.11b, Ch6, 1 GHz-3 GHz)

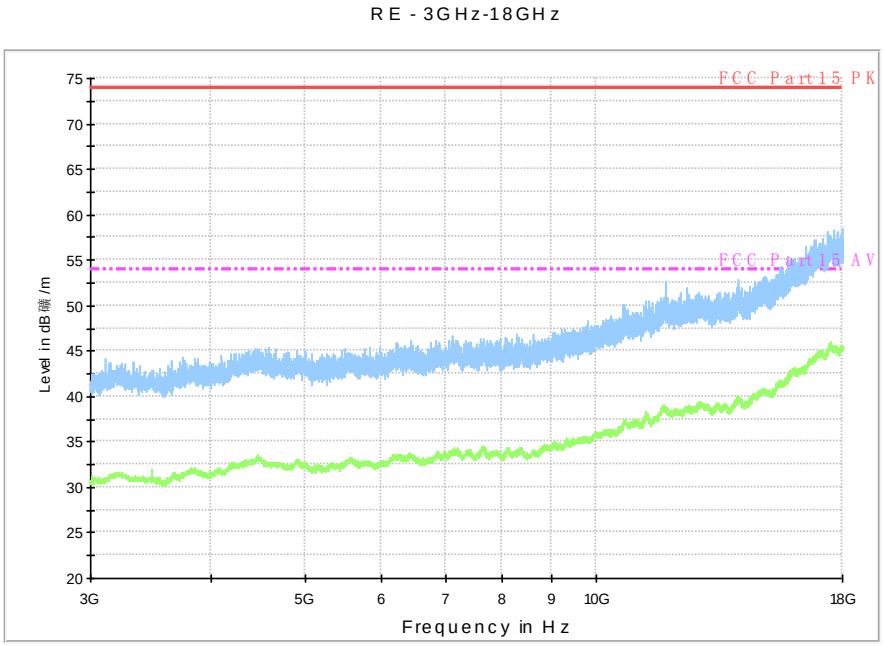

Fig. 94 Radiated Spurious Emission (802.11b, Ch6, 3 GHz-18 GHz)

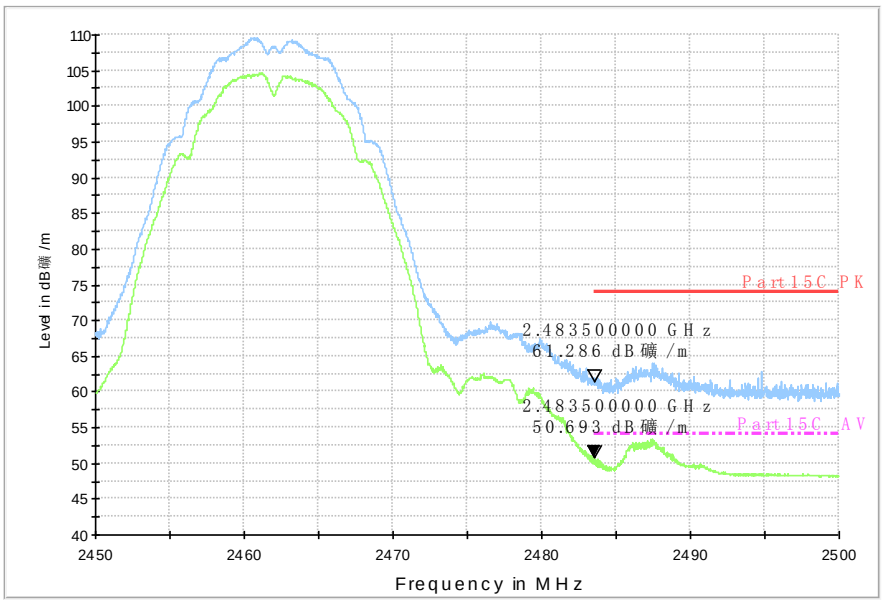

Fig. 95 Radiated Spurious Emission (Power): 802.11b, ch11, 2.45 GHz - 2.5GHz

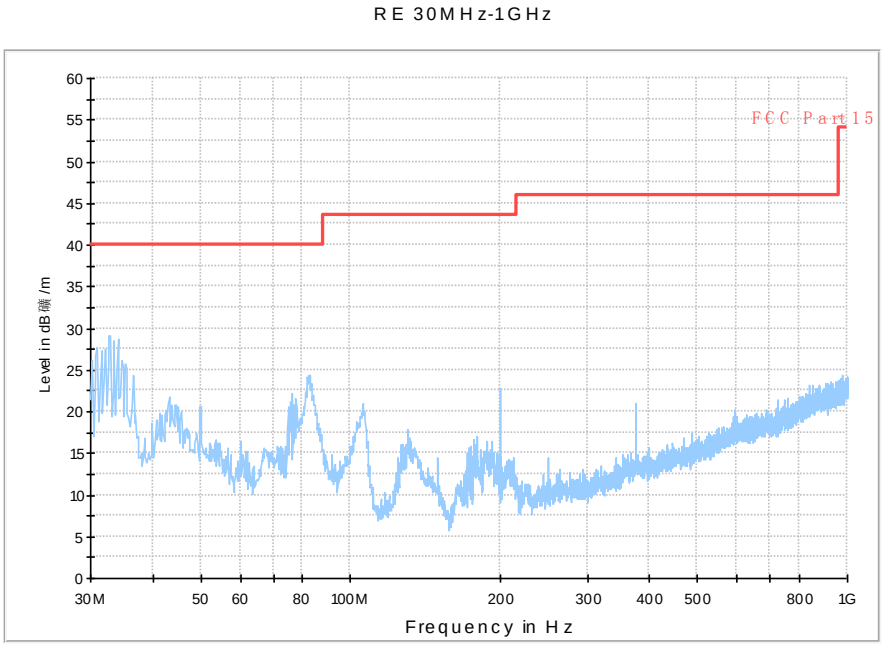

Fig. 96 Radiated Spurious Emission (802.11b, Ch11, 30 MHz-1 GHz)

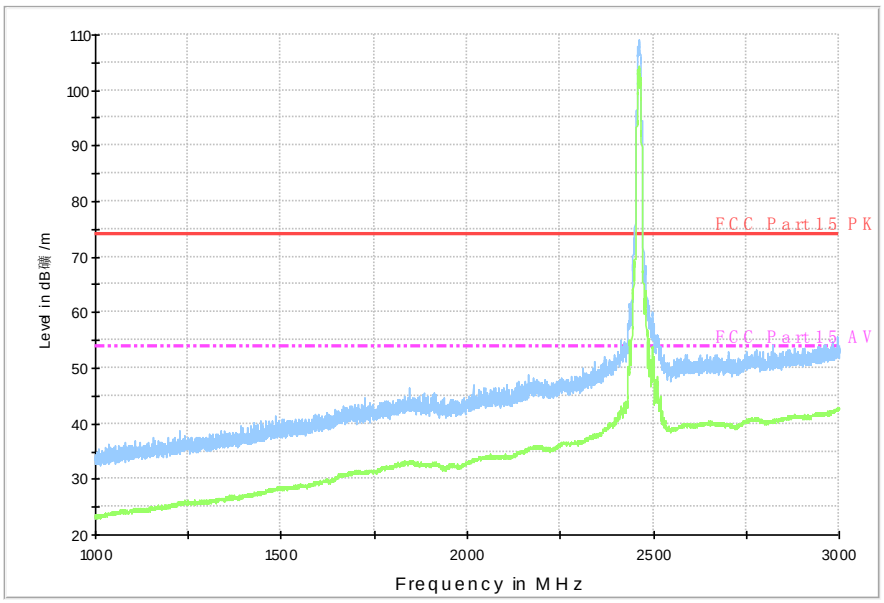

Fig. 97 Radiated Spurious Emission (802.11b, Ch11, 1 GHz-3 GHz)

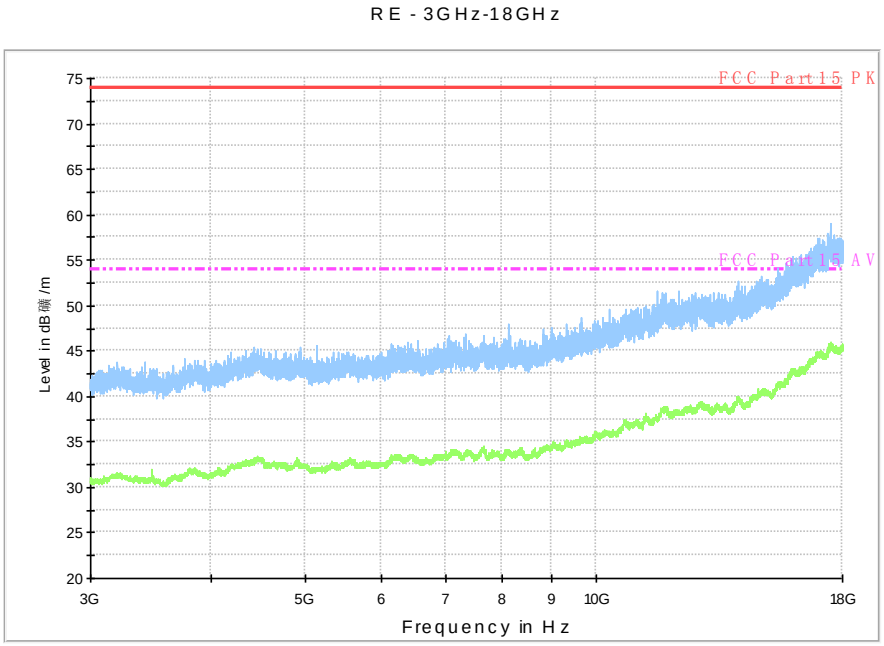

Fig. 98 Radiated Spurious Emission (802.11b, Ch11, 3 GHz-18 GHz)

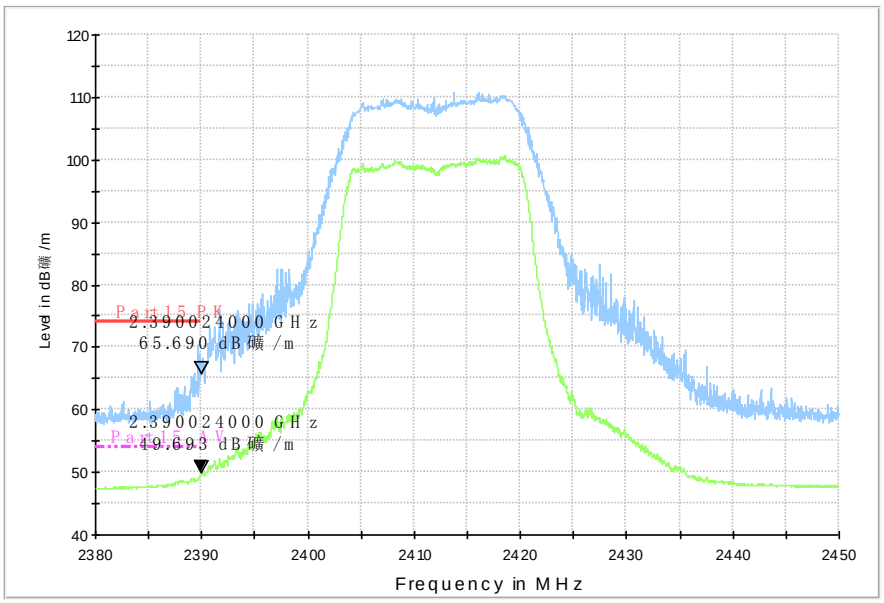

Fig. 99 Radiated Spurious Emission (Power): 802.11g, ch1, 2.38 GHz - 2.45GHz

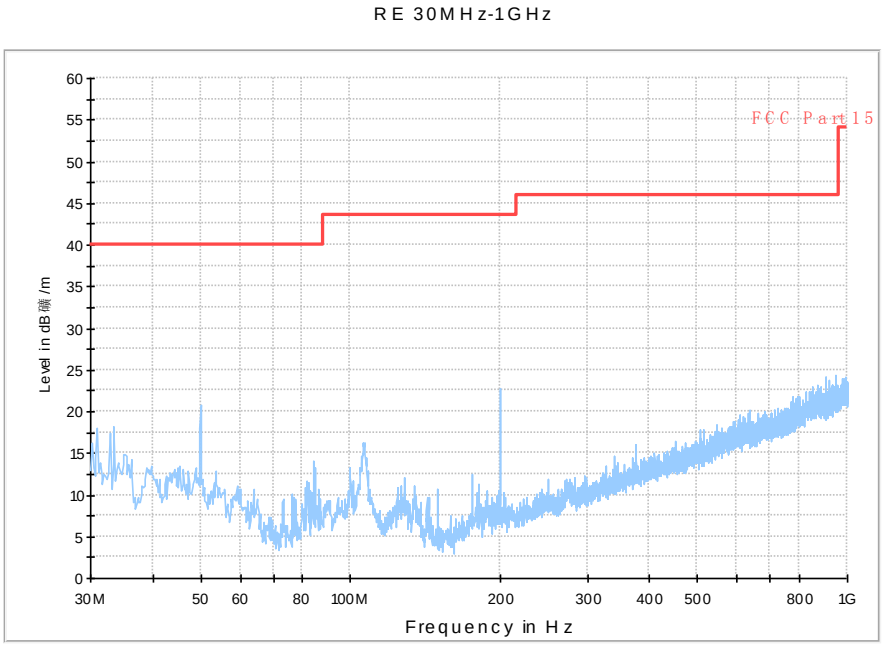

Fig. 100 Radiated Spurious Emission (802.11g, Ch1, 30 MHz-1 GHz)

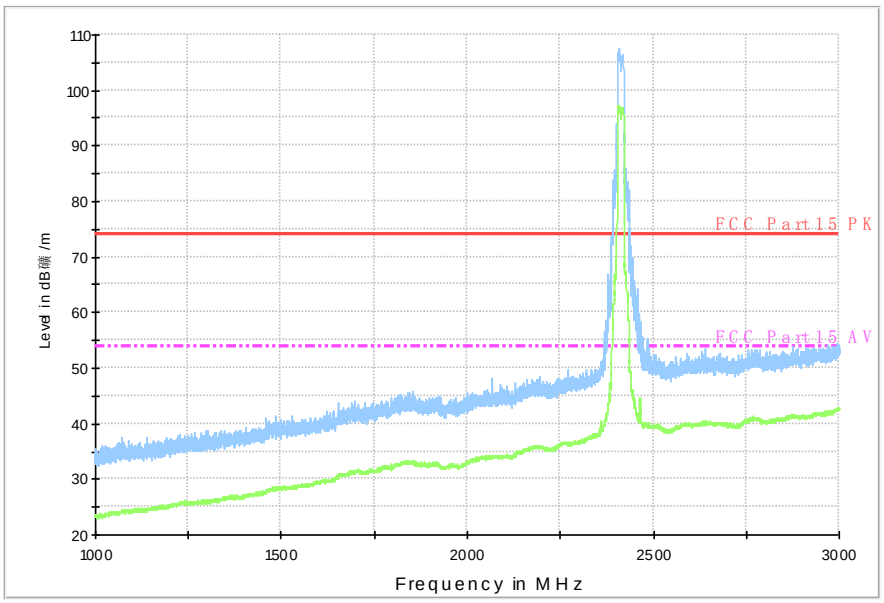

Fig. 101 Radiated Spurious Emission (802.11g, Ch1, 1 GHz-3 GHz)

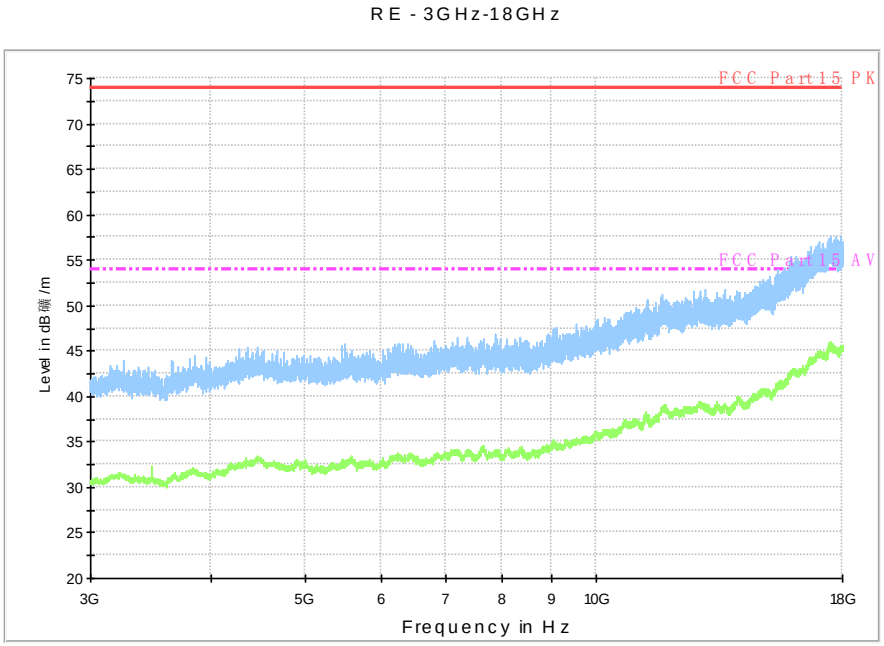

Fig. 102 Radiated Spurious Emission (802.11g, Ch1, 3 GHz-18 GHz)

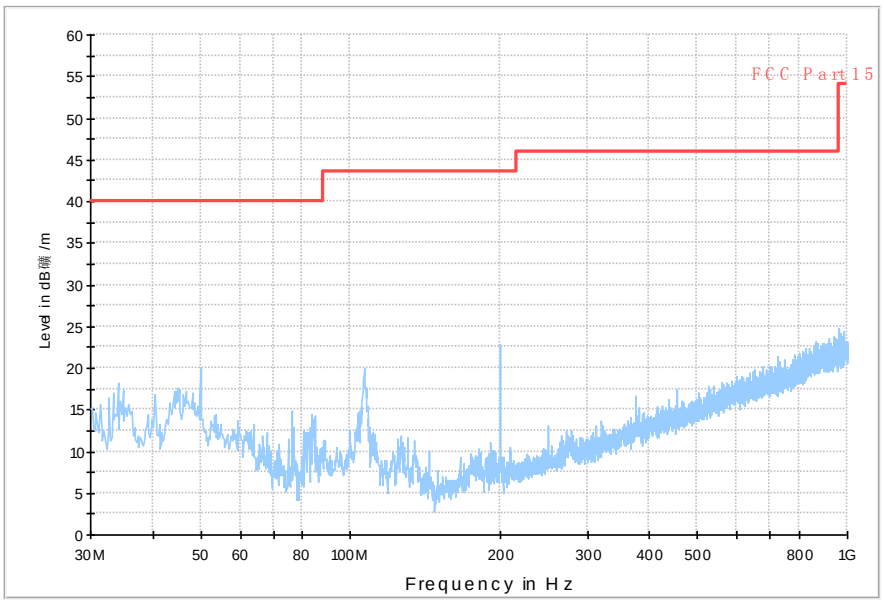

Fig. 103 Radiated Spurious Emission (802.11g, Ch6, 30 MHz-1 GHz)

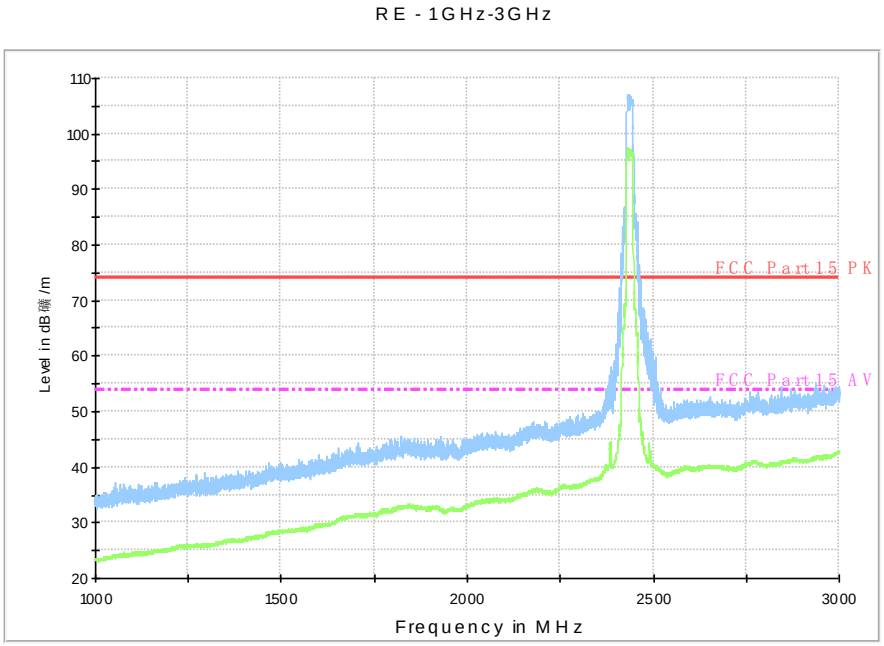

Fig. 104 Radiated Spurious Emission (802.11g, Ch6, 1 GHz-3 GHz)

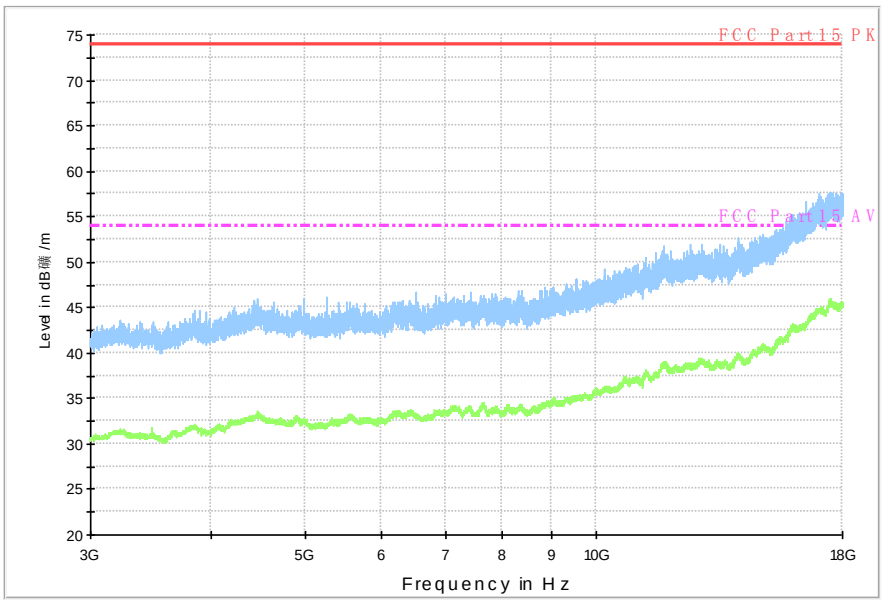

Fig. 105 Radiated Spurious Emission (802.11g, Ch6, 3 GHz-18 GHz)

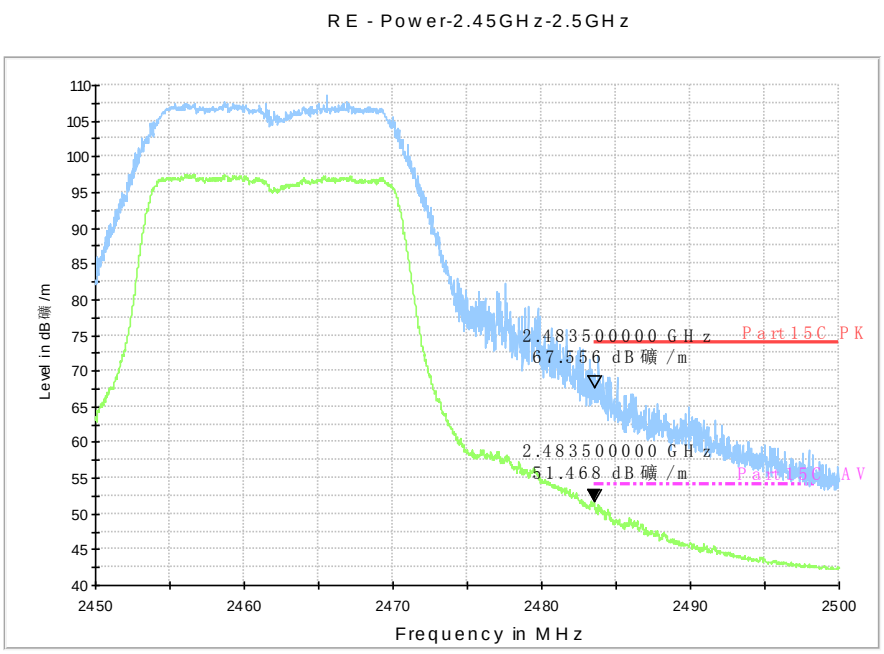

Fig. 106 Radiated Spurious Emission (Power): 802.11g, ch11, 2.45 GHz - 2.5GHz

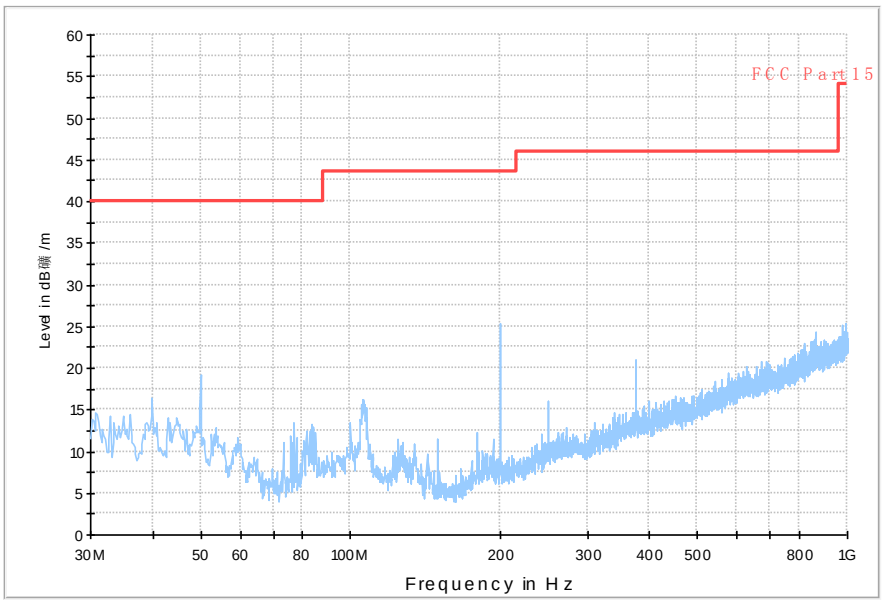

Fig. 107 Radiated Spurious Emission (802.11g, Ch11, 30 MHz-1 GHz)

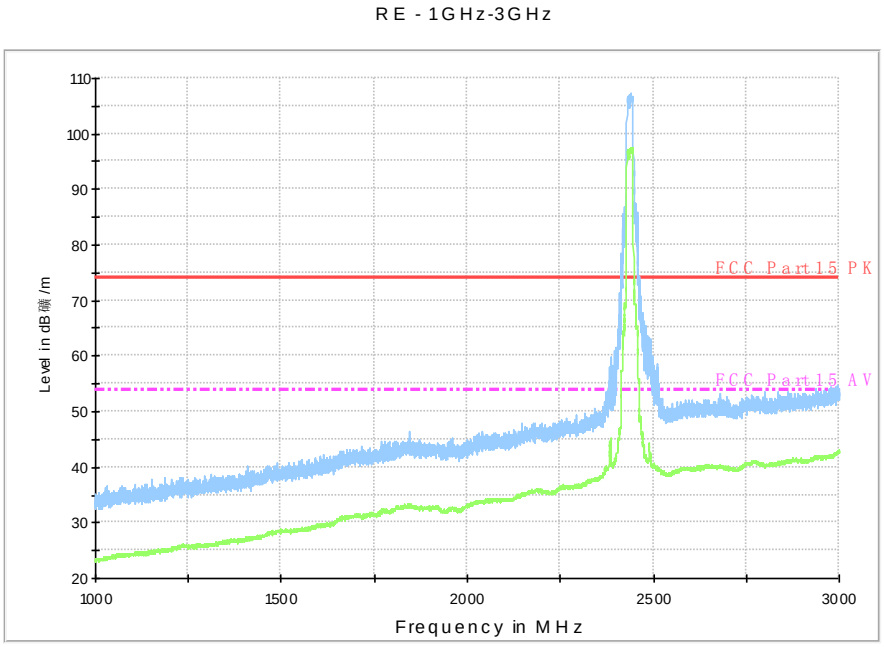

Fig. 108 Radiated Spurious Emission (802.11g, Ch11, 1 GHz-3 GHz)

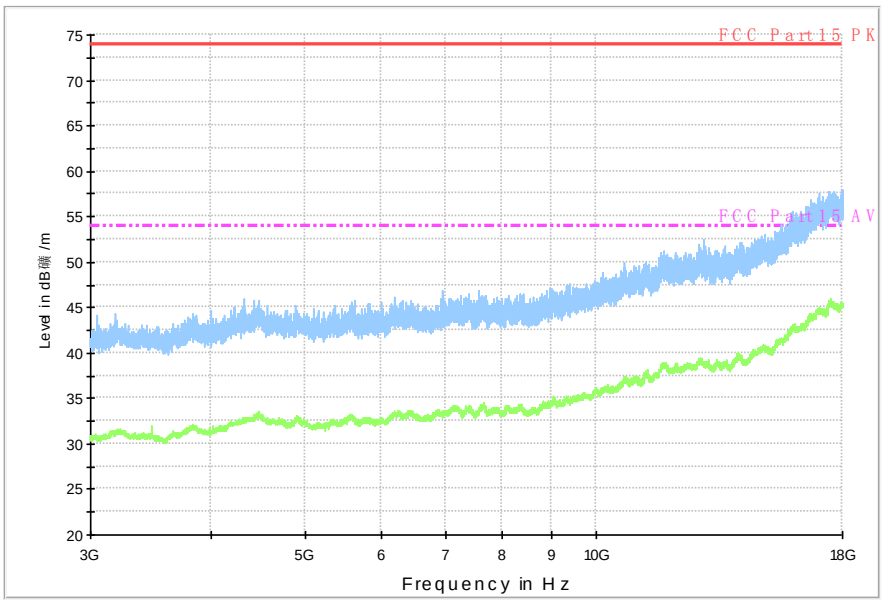

Fig. 109 Radiated Spurious Emission (802.11g, Ch11, 3 GHz-18 GHz)

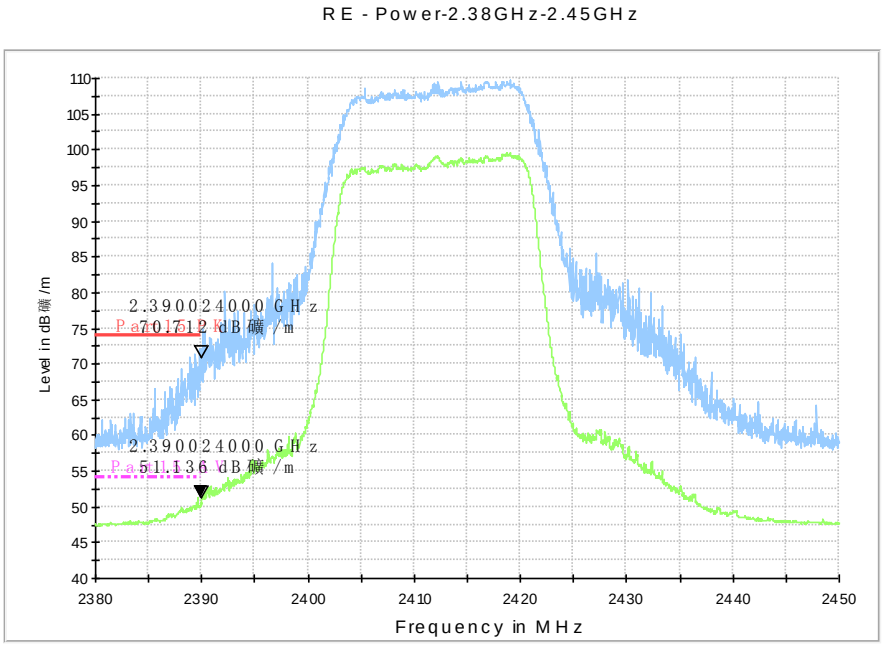

Fig. 110 Radiated Spurious Emission (Power): 802.11n-HT20, ch1, 2.38 GHz - 2.45GHz

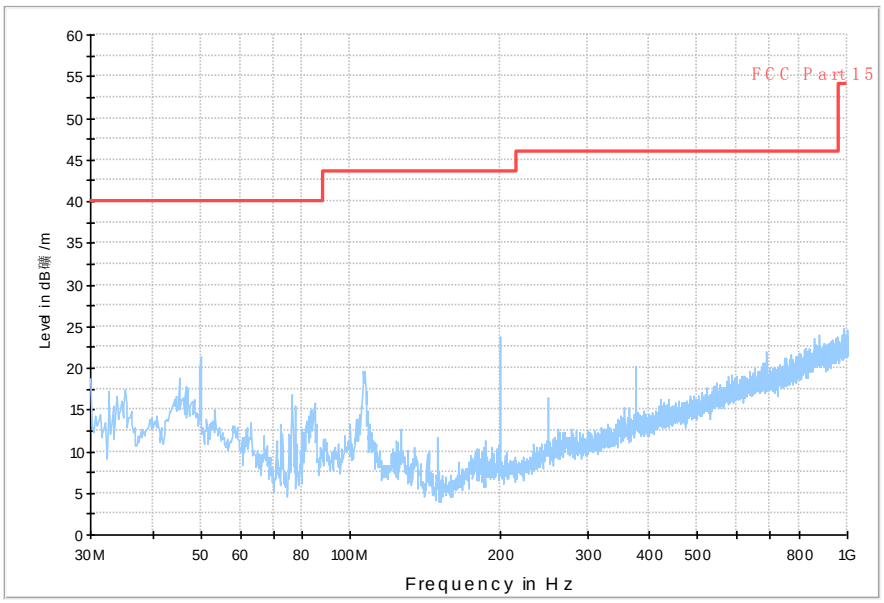

Fig. 111 Radiated Spurious Emission (802.11n-HT20, Ch1, 30 MHz-1 GHz)

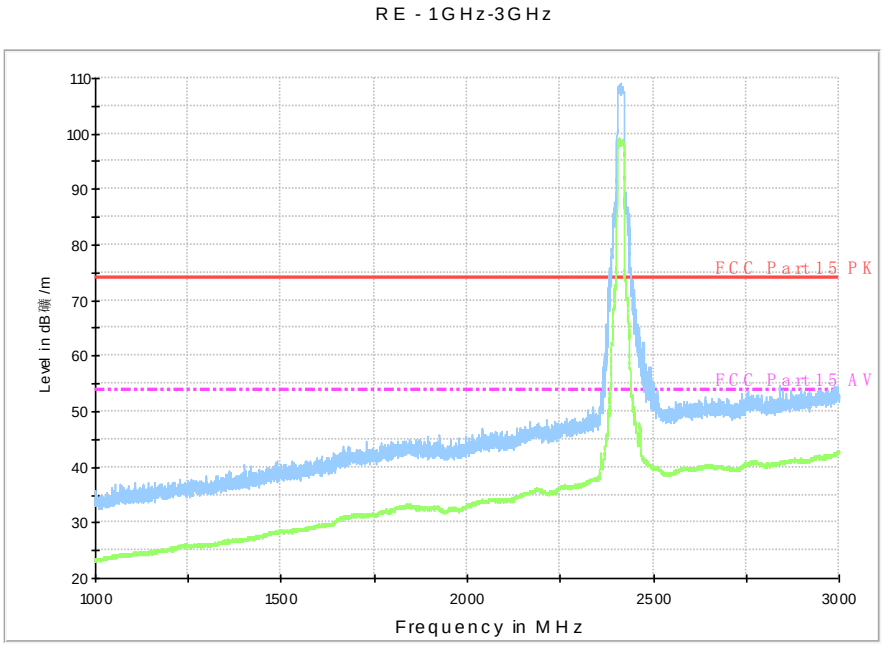

Fig. 112 Radiated Spurious Emission (802.11n-HT20, Ch1, 1 GHz-3 GHz)

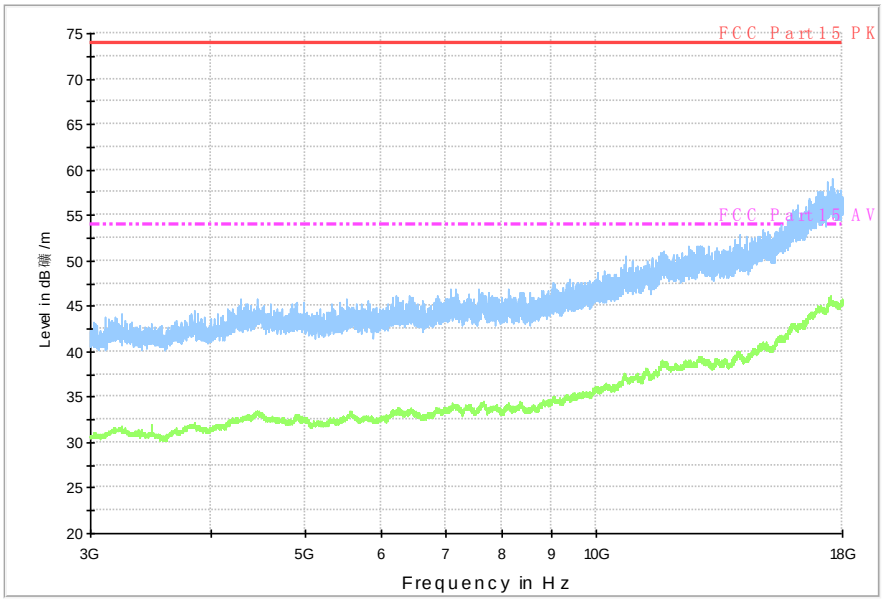

Fig. 113 Radiated Spurious Emission (802.11n-HT20, Ch1, 3 GHz-18 GHz)

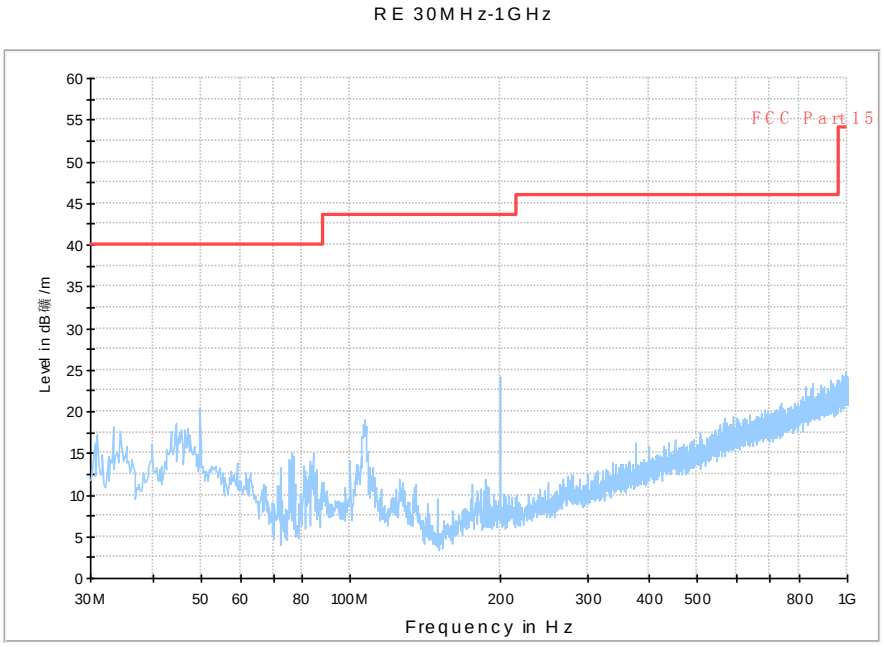

Fig. 114 Radiated Spurious Emission (802.11n-HT20, Ch6, 30 MHz-1 GHz)

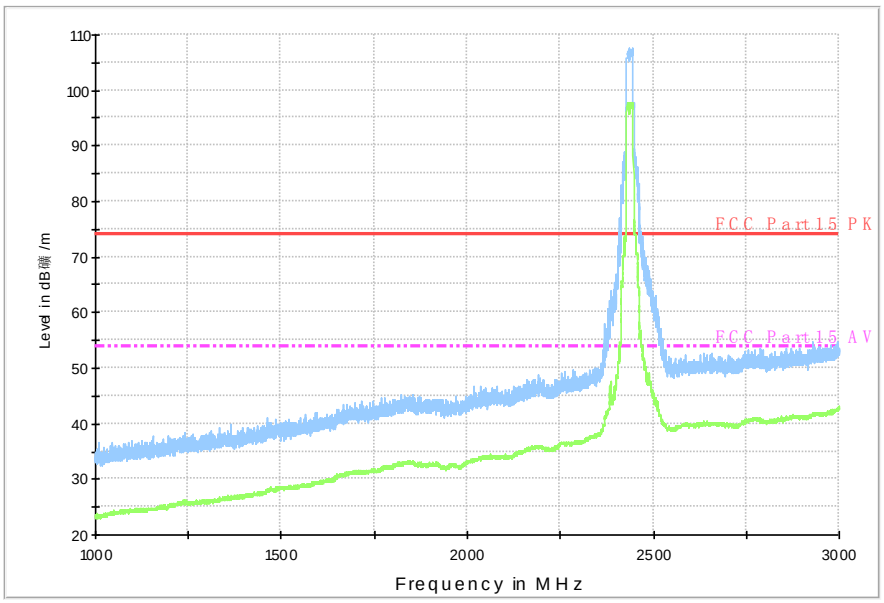

Fig. 115 Radiated Spurious Emission (802.11n-HT20, Ch6, 1 GHz-3 GHz)

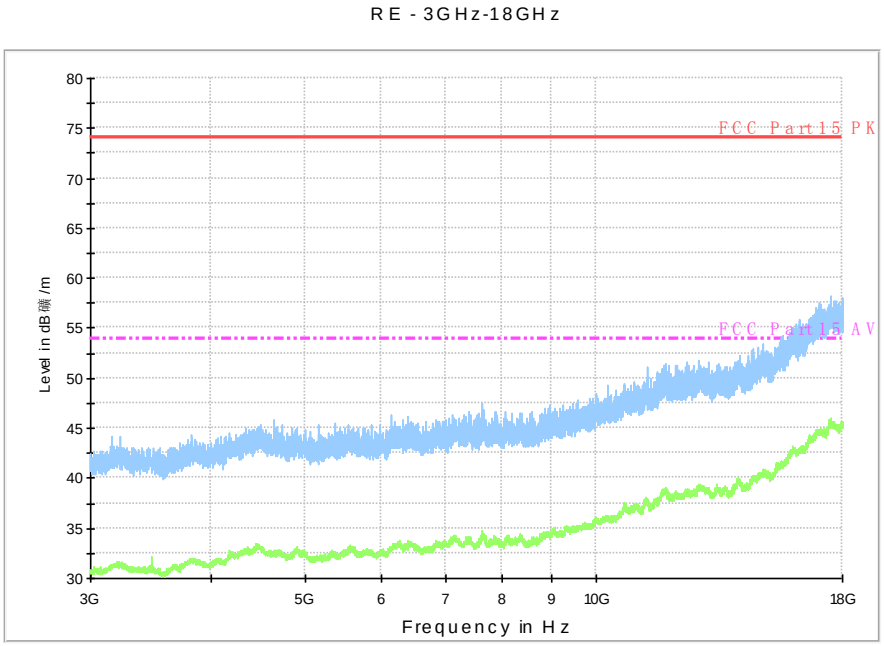

Fig. 116 Radiated Spurious Emission (802.11n-HT20, Ch6, 3 GHz-18 GHz)

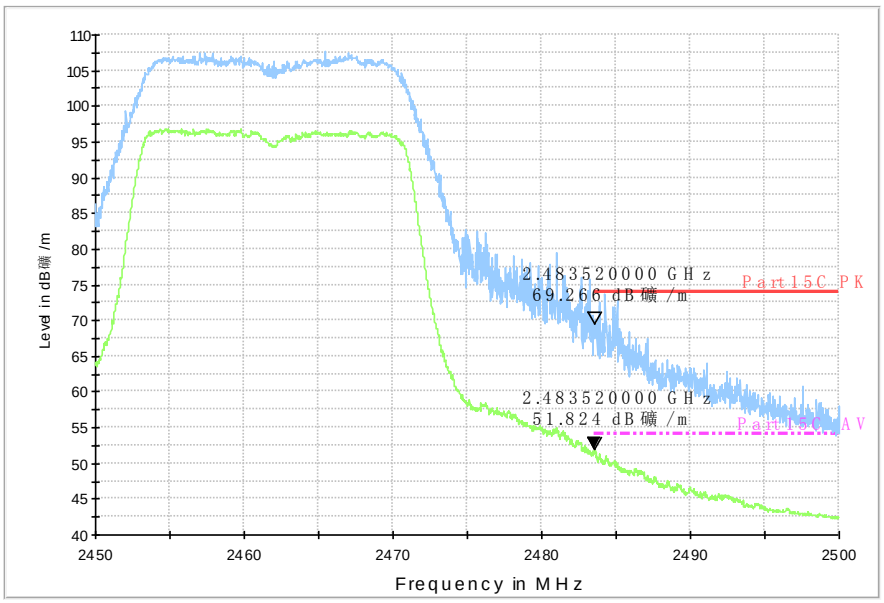

Fig. 117 Radiated Spurious Emission (Power): 802.11n-HT20, ch11, 2.45 GHz - 2.5GHz

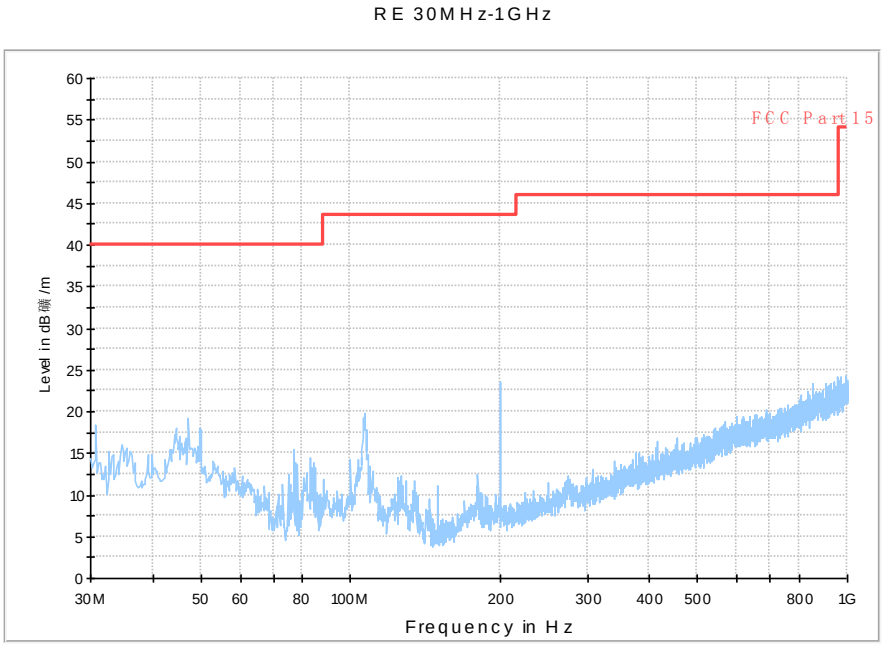

Fig. 118 Radiated Spurious Emission (802.11n-HT20, Ch11, 30 MHz-1 GHz)

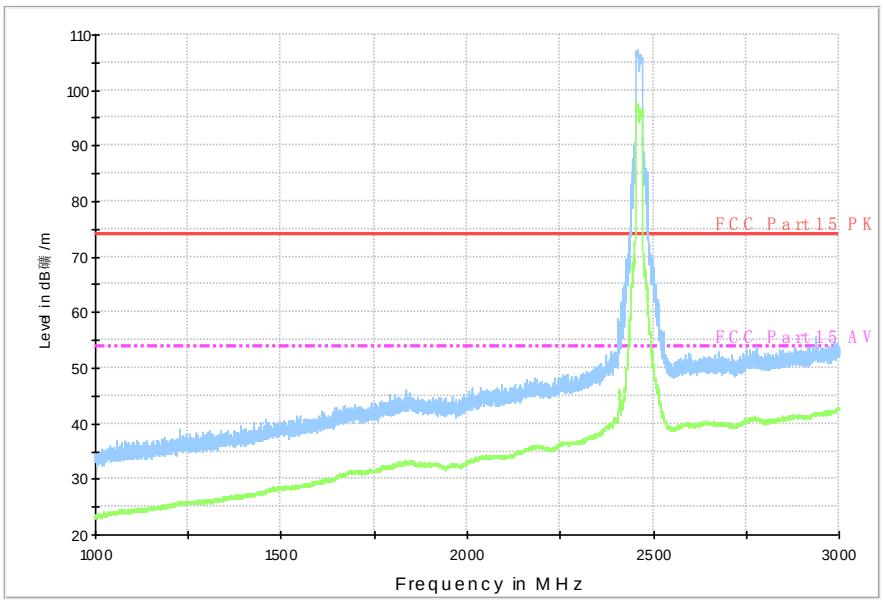

Fig. 119 Radiated Spurious Emission (802.11n-HT20, Ch11, 1 GHz-3 GHz)

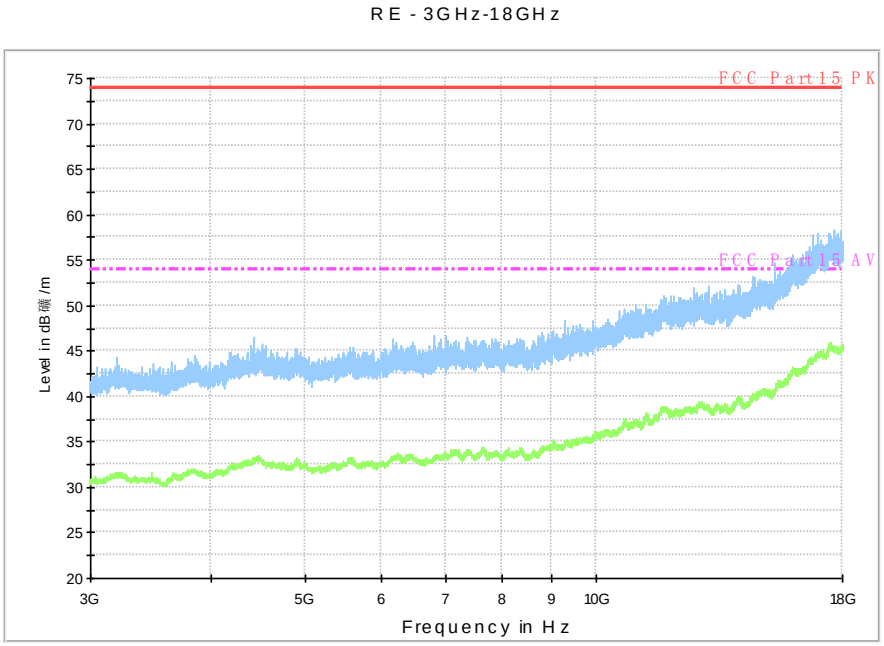

Fig. 120 Radiated Spurious Emission (802.11n-HT20, Ch11, 3 GHz-18 GHz)

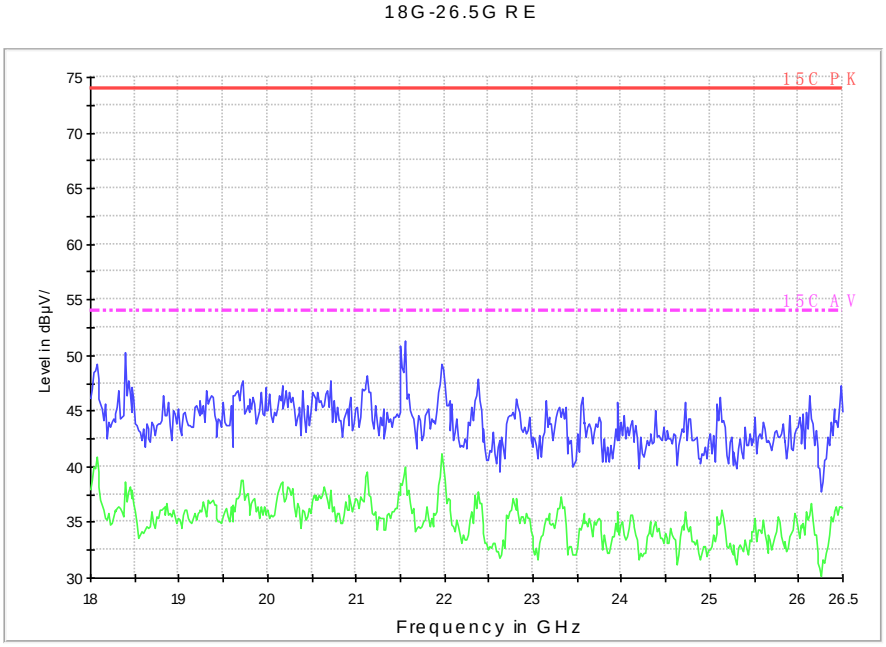

Fig. 121 Radiated emission: 18 GHz – 26.5 GHz

A.7. AC Powerline Conducted Emission

Test Condition:

Voltage（V）	Frequency（Hz）
110	60

Measurement Result and limit:

WLAN (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		With charger		
		802.11b	Idle	
0.15 to 0.5	66 to 56	Fig.122	Fig.123	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 (dBμV)	Result (dBμV)		Conclusion
		With charger		
		802.11b	Idle	
0.15 to 0.5	56 to 46	Fig.122	Fig.123	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 KDB558074

Note: Expanded measurement uncertainty for this test item is U =3.2dB, k=2.

Conclusion: PASS

Test graphs as below:

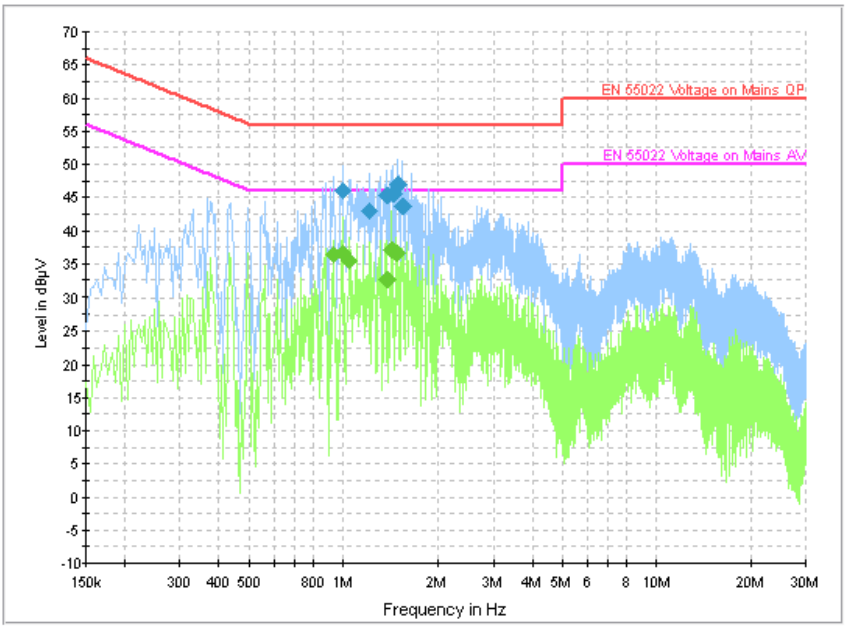

Fig. 122 AC Powerline Conducted Emission-802.11b

Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Measurement Result 1:

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.996001	46.1	GND	L1	9.9	9.9	56.0
1.212001	43.0	GND	L1	9.9	13.0	56.0
1.378501	45.2	GND	L1	9.9	10.8	56.0
1.437001	45.5	GND	L1	9.9	10.5	56.0
1.486501	47.0	GND	L1	9.9	9.0	56.0
1.554001	43.6	GND	L1	9.9	12.4	56.0

Measurement Result 2:

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.928501	36.3	GND	L1	9.9	9.7	46.0
0.996001	36.6	GND	L1	9.9	9.4	46.0
1.045501	35.4	GND	L1	9.9	10.6	46.0
1.378501	32.7	GND	L1	9.9	13.3	46.0
1.423501	37.0	GND	L1	9.9	9.0	46.0
1.482001	36.5	GND	L1	9.9	9.5	46.0

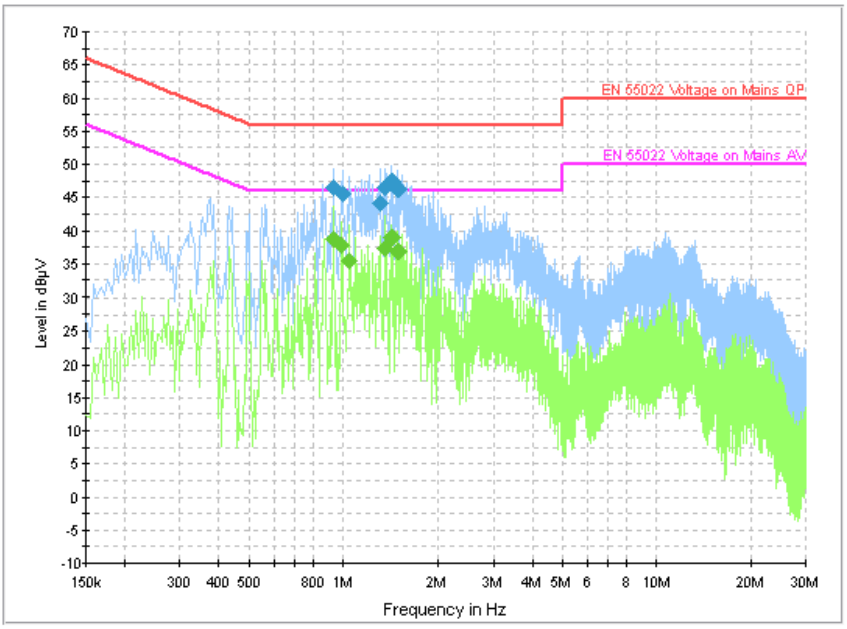

Fig. 123 AC Powerline Conducted Emission-Idle

Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Measurement Result 1:

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.933001	46.4	GND	L1	9.9	9.6	56.0
0.996001	45.5	GND	L1	9.9	10.5	56.0
1.315501	44.2	GND	L1	9.9	11.8	56.0
1.365001	46.5	GND	L1	9.9	9.5	56.0
1.428001	47.4	GND	L1	9.9	8.6	56.0
1.491001	46.3	GND	L1	9.9	9.7	56.0

Measurement Result 2:

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.933001	38.6	GND	L1	9.9	7.4	46.0
0.991501	37.8	GND	L1	9.9	8.2	46.0
1.050001	35.5	GND	L1	9.9	10.5	46.0
1.365001	37.3	GND	L1	9.9	8.7	46.0
1.428001	38.9	GND	L1	9.9	7.1	46.0
1.491001	36.7	GND	L1	9.9	9.3	46.0