



**FCC PART 15  
TEST REPORT  
No. 2013WLN0855**

**for**

**Sony Mobile Communications AB**

**GSM/WCDMA/LTE Mobile Phone**

**Type: PM-0764-BV**

**FCC ID: PY7PM-0764**

**With**

**Hardware Version: AP1**

**Software Version: 19.0.B.0.228**

**Issued Date: 2014-03-17**

**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 LATORATORY

### 1.1. Testing Location

Company Name: TMC Beijing, Telecommunication Metrology Center of MIIT  
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### 1.2. Project data

Testing Start Date: 2014-02-17  
Testing End Date: 2014-03-17

### 1.3. Signature



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Xu Zhongfei

(Prepared this test report)



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Jiang Afang

(Reviewed this test report)



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Xiao Li

Deputy Director of the laboratory

(Approved this test report)

## **2. CLIENT INFORMATION**

### **2.1. Applicant Information**

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

### **2.2. Manufacturer Information**

Company Name: Sony Mobile Communications AB  
Address /Post: Mobilvägen, 22188 Lund, Sweden  
City: Lund  
Postal Code: 22188  
Country: Sweden  
Contact: Nilsson, Mikael  
Telephone: +46 703 227503  
Fax: +46 706 127385

### 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, HSDPA, HSUPA, LTE FDD bands 2/4/17, Bluetooth (EDR and BLE), ANT+, WLAN ( 802.11 a/ac/b/g/n), NFC, FM, GPS mobile phone
Type	PM-0764-BV
FCC ID	PY7PM-0764
WLAN Frequency Range	ISM Bands: -5150MHz~5250MHz -5250MHz~5350MHz -5470MHz~5725MHz
Type of modulation	OFDM
Antenna	Integral Antenna
MAX Conducted Power	15.10dBm(OFDM)
MAX Radiated Power	18.20dBm(OFDM)
Extreme Temperature	-20/+55°C
Extreme vol. Limits	3.5VDC to 4.1VDC (nominal: 3.7VDC)

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	CB512687E9	004402451862720	AP1	19.0.B.0.228
EUT2	CB5126887W	004402451862803	AP1	19.0.B.0.228

\*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	4413W32301274SEM0600.1
AE2	USB Cable	AI-0401	132907DD00F432C

\*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 embedded battery.

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

It has MP3, camera, USB memory, FM radio, GPS receiver, NFC, Bluetooth (EDR), ANT+, WLAN (802.11 a/ac/b/g/n) and Wi-Fi hotspot functions. For WLAN 802.11n, it supports 20MHz and 40MHz bandwidths on both 2.4GHz band and 5GHz/5.8GHz bands. For WLAN 802.11ac, it supports 20MHz, 40MHz and 80MHz bandwidths on both 2.4GHz band and 5GHz/5.8GHz bands. It consists of normal options: USB cable and travel 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	Title 47 of the Code of Federal Regulations; Chapter I Part 15 - Radio frequency devices	Oct, 2012
UNII: KDB 789033	Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E	April, 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 Part15E	Sub-clause of IC	Verdict
Maximum Output Power	15.407	/	P
Power Spectral Density	15.407	/	P
Occupied 26dB Bandwidth	15.403	/	P
Band edge compliance	15.407	/	P
Transmitter spurious emissions radiated	15.407	/	P
Spurious emissions radiated < 30 MHz	15.407	/	P
Spurious emissions conducted < 30 MHz	15.407	/	P
Peak Excursion	15.407	/	P
Frequency Stability	15.407	/	NA
Transmit Power Control	15.407	/	NA

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

Terms used in Verdict column

P	Pass, The EUT complies with the essential requirements in the standard.
NM	Not measured, The test was not measured 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/manufacture 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°C
Voltage	3.7V
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	2013-10-29	2014-10-28
3	LISN	ESH2-Z5	829991/012	Rohde & Schwarz	2013-4-15	2014-08-12
4	Shielding Room	S81	/	ETS-Lindgren	/	/

### Radiated emission test system

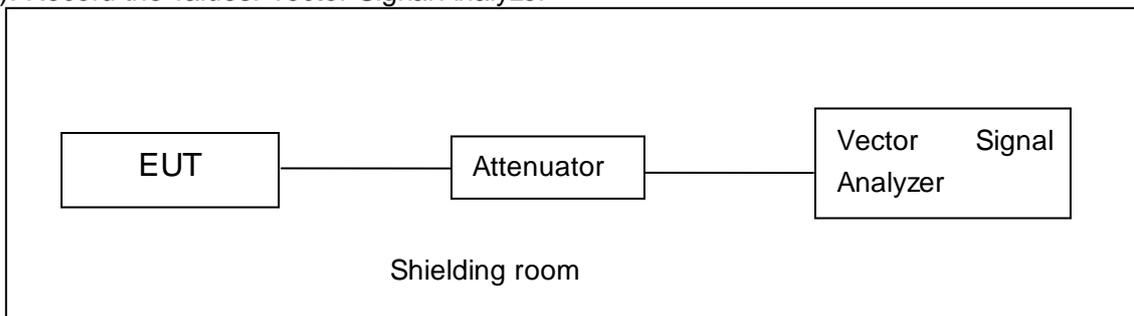
No.	Equipment	Model	Serial Number	Manufacturer	Calibration date	Calibration Due date
1	Test Receiver	ESCI	100344	Rohde & Schwarz	2013-11-8	2014-11-7
2	Test Receiver	ESCI 7	100948	Rohde & Schwarz	2013-07-19	2014-07-18
3	BiLog Antenna	VULB9163	9163-514	Schwarzbeck	2011-11-11	2014-11-10
4	Dual-Ridge Waveguide Horn Antenna	3117	00119024	ETS-Lindgren	2014-2-2	2017-2-1
5	Dual-Ridge Waveguide Horn Antenna	3116	2661	EMCO	2011-7-1	2014-06-30
6	Loop antenna	HFH2-Z2	829324/007	Rohde & Schwarz	2011-12-21	2014-12-20
7	Semi-anechoic chamber	/	CT000332-1074	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

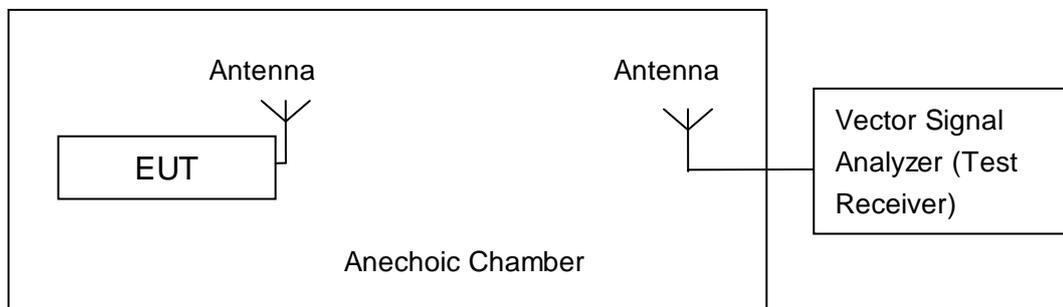


#### A.1.2. Radiated Emission Measurements

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 KDB 789033

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 output Power

### Measurement Limit and Method:

Standard	Frequency (MHz)	Limit (dBm)
FCC CRF Part 15.407(a)	5150MHz~5250MHz	17dBm or 4+10logB
	5250MHz~5350MHz	24dBm or 11+10logB
	5470MHz~5725MHz	24dBm or 11+10logB

Limit use the less value, and B is the 26dB bandwidth.

The measurement method SA-1 is made according to KDB 789033

### Measurement Uncertainty:

Measurement Uncertainty	0.75dB
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### A.2.1. Output Power Verification

This test is only for mode verification, and the selected mode will be used for the future measurement.

### Measurement Results:

OFDM/a mode	Maximum Conducted Power (dBm)							
data rate (Mbps)	6	9	12	18	24	36	48	54
36 (5180 MHz)	14.96	14.89	14.85	14.71	14.57	14.33	14.21	14.01

OFDM/n-HT20 mode	Maximum Conducted Power (dBm)							
data rate (Mbps)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
36 (5180 MHz)	15.10	15.02	14.99	14.82	14.57	13.70	13.59	13.55

OFDM/n-HT40 mode	Maximum Conducted Power (dBm)							
data rate (Index)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
38 (5190 MHz)	14.45	14.31	14.15	13.83	13.53	12.52	12.45	11.81

OFDM/ac-HT80 mode	Maximum Conducted Power (dBm)									
data rate (Index)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
42 (5210 MHz)	12.05	11.58	11.40	11.06	10.94	9.53	9.42	9.29	8.96	8.85

Selected data rate for all measurement:

OFDM /a-mode: 6Mbps

OFDM /n-HT20 mode: MCS0

OFDM /n-HT40 mode: MCS0

OFDM /ac-HT80 mode: MCS0

### A.2.2. Antenna Gain

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

Band 5150MHz to 5350MHz,

Test	Channel					
	Low (5180MHz)	Middle (5200MHz)	High (5240MHz)	Low (5260MHz)	Middle (5280MHz)	High (5320MHz)
Tnom,Vnom						
<b>Conducted Power(dBm)</b>	24.70	24.47	24.18	24.14	24.02	23.30
<b>Radiated Power(dBm)</b>	26.54	26.36	26.40	26.71	26.69	26.83
<b>Gain(dBi)</b>	1.84	1.89	2.22	2.57	2.67	3.53

Band 5470MHz to 5725MHz,

Test	Channel		
	Low(5500MHz)	Middle(5600MHz)	High(5700MHz)
Tnom,Vnom			
<b>Conducted Power(dBm)</b>	23.31	23.24	23.42
<b>Radiated Power(dBm)</b>	27.07	26.68	26.73
<b>Gain(dBi)</b>	3.76	3.44	3.31

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

### A.2.3. Maximum Output Power

#### Measurement Results:

#### 802.11a mode

Type	Test Result					
	5180MHz (Ch36)	5200MHz (Ch40)	5240MHz (Ch48)	5260MHz (Ch52)	5280MHz (Ch56)	5320 MHz (Ch64)
Conducted(dBm)	14.96	14.94	14.43	15.01	14.82	14.09
radiated(dBm)	16.80	16.83	16.65	17.58	17.49	17.62

Type	Test Result		
	5500MHz (Ch100)	5580MHz (Ch116)	5700MHz (Ch140)
conducted(dBm)	14.44	14.61	14.77
radiated(dBm)	18.20	18.05	18.08

**802.11n-HT20 mode**

Type	Test Result					
	5180MHz (Ch36)	5200MHz (Ch40)	5240MHz (Ch48)	5260MHz (Ch52)	5280MHz (Ch56)	5320 MHz (Ch64)
conducted(dBm)	15.26	15.17	14.66	15.02	14.96	14.14
radiated(dBm)	16.94	16.91	16.88	17.59	17.63	17.67

Type	Test Result		
	5500MHz (Ch100)	5580MHz (Ch116)	5700MHz (Ch140)
conducted(dBm)	14.42	14.63	14.84
radiated(dBm)	18.18	18.07	18.15

**802.11n-HT40 mode**

Type	Test Result			
	5190MHz (Ch38)	5230MHz (Ch46)	5270MHz (Ch55)	5310 MHz (Ch63)
conducted(dBm)	14.45	14.17	14.63	13.63
radiated(dBm)	16.29	16.39	17.20	17.16

Type	Test Result		
	5510MHz (Ch102)	5550MHz (Ch110)	5670MHz (Ch134)
conducted(dBm)	13.83	14.15	14.14
radiated(dBm)	17.59	17.59	17.45

**802.11ac-HT80 mode**

Type	Test Result		
	5210MHz (Ch42)	5290MHz (Ch58)	5530MHz (Ch106)
conducted(dBm)	12.05	12.45	11.91
radiated(dBm)	13.94	14.67	15.67

**Conclusion: PASS**

### A.3. Peak Power Spectral Density (conducted)

**Measurement Limit:**

Standard	Frequency (MHz)	Limit (dBm/MHz)
FCC CRF Part 15.407(a)	5150MHz~5250MHz	4
	5250MHz~5350MHz	11
	5470MHz~5725MHz	11

The output power measurement method SA-1 is made according to KDB 789033

**Measurement Uncertainty:**

Measurement Uncertainty	0.75dB
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**Measurement Results:**

Mode	Channel	Power Spectral Density (dBm/MHz)	Conclusion
802.11a	5180 MHz	3.44	P
	5200 MHz	2.62	P
	5240 MHz	2.23	P
	5260 MHz	4.82	P
	5280 MHz	4.73	P
	5320 MHz	4.21	P
	5500 MHz	4.51	P
	5580 MHz	4.32	P
	5700 MHz	4.94	P
802.11n HT20	5180 MHz	3.36	P
	5200 MHz	2.93	P
	5240 MHz	3.01	P
	5260 MHz	5.38	P
	5280 MHz	4.75	P
	5320 MHz	3.93	P
	5500 MHz	4.30	P
	5580 MHz	4.70	P
	5700 MHz	5.10	P
802.11n HT40	5190 MHz	1.77	P
	5230 MHz	1.50	P
	5270 MHz	1.65	P
	5310 MHz	0.79	P
	5510 MHz	1.27	P
	5550 MHz	1.52	P
	5670 MHz	1.78	P
802.11ac HT80	5210 MHz	-2.93	P
	5290 MHz	-2.44	P
	5530 MHz	-2.01	P

**Conclusion: PASS**

#### A.4. Occupied 26dB Bandwidth(conducted)

##### Measurement Limit:

Standard	Limit (kHz)
FCC 47 CFR Part 15.403 (i)	/

The measurement is made according to KDB 789033

##### Measurement Uncertainty:

Measurement Uncertainty	60.80Hz
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##### Measurement Result:

Mode	Channel	Occupied 26dB Bandwidth ( kHz)		conclusion
		Fig.	Value	
802.11a	5180 MHz	Fig.1	24300	P
	5200 MHz	Fig.2	23850	P
	5240 MHz	Fig.3	24950	P
	5260 MHz	Fig.4	28700	P
	5280 MHz	Fig.5	28000	P
	5320 MHz	Fig.6	26900	P
	5500 MHz	Fig.7	35750	P
	5580 MHz	Fig.8	33300	P
802.11n HT20	5700 MHz	Fig.9	33150	P
	5180 MHz	Fig.10	24350	P
	5200 MHz	Fig.11	26350	P
	5240 MHz	Fig.12	28000	P
	5260 MHz	Fig.13	28350	P
	5280 MHz	Fig.14	27600	P
	5320 MHz	Fig.15	27550	P
	5500 MHz	Fig.16	35000	P
802.11n HT40	5580 MHz	Fig.17	39850	P
	5700 MHz	Fig.18	42600	P
	5190 MHz	Fig.19	60400	P
	5230 MHz	Fig.20	45760	P
	5270 MHz	Fig.21	49200	P
	5310 MHz	Fig.22	54880	P
	5510 MHz	Fig.23	55040	P
802.11ac HT80	5550 MHz	Fig.24	67680	P
	5670 MHz	Fig.25	61840	P
	5210 MHz	Fig.26	85120	P
802.11ac HT80	5290 MHz	Fig.27	84960	P
	5530 MHz	Fig.28	84960	P

**Conclusion: PASS**

Test graphs as below:

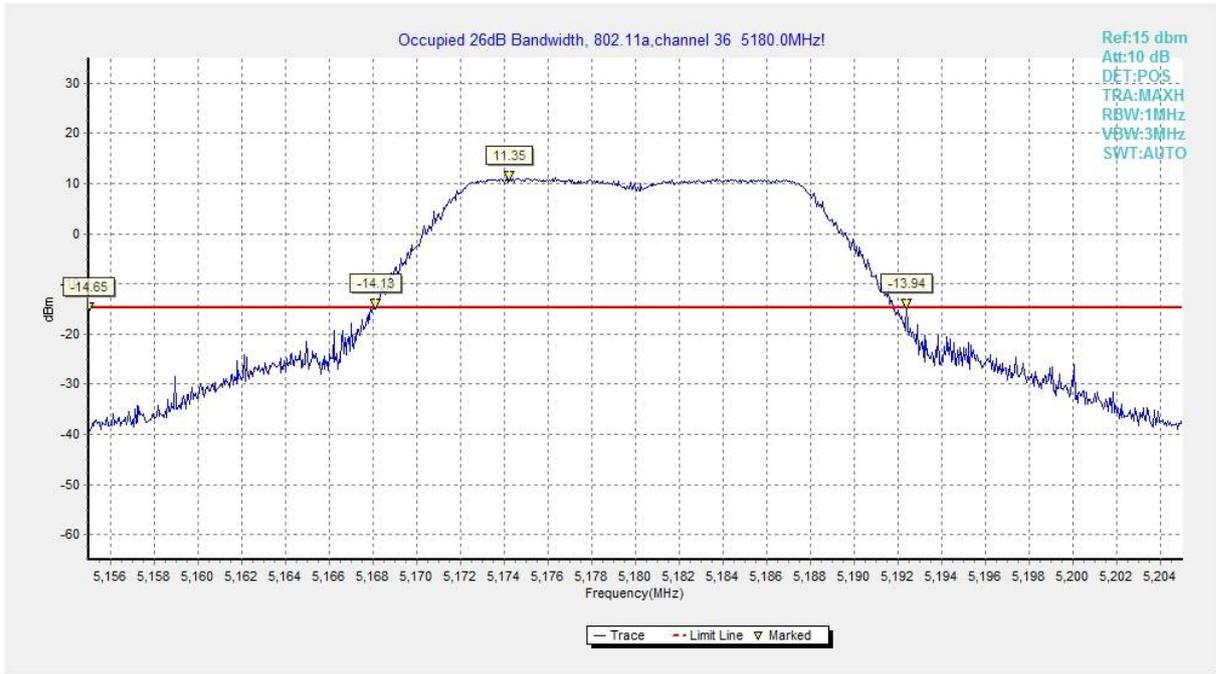


Fig. 1 Occupied 26dB Bandwidth (802.11a, 5180MHz)

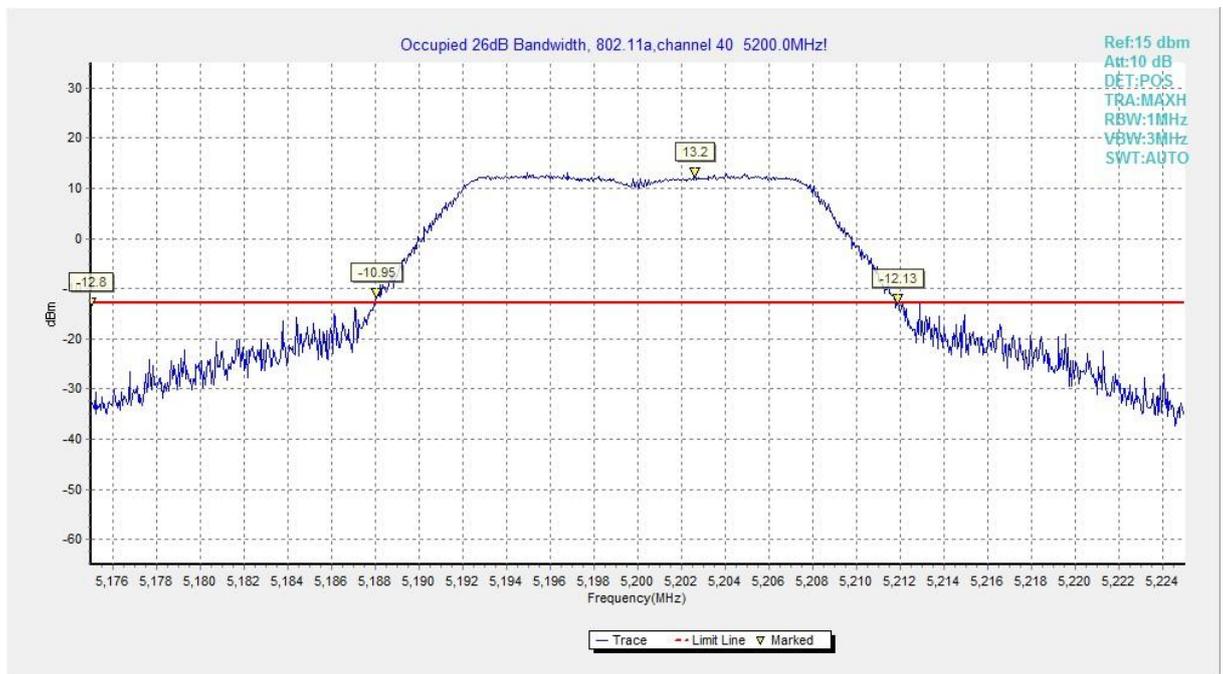


Fig. 2 Occupied 26dB Bandwidth (802.11a, 5200MHz)

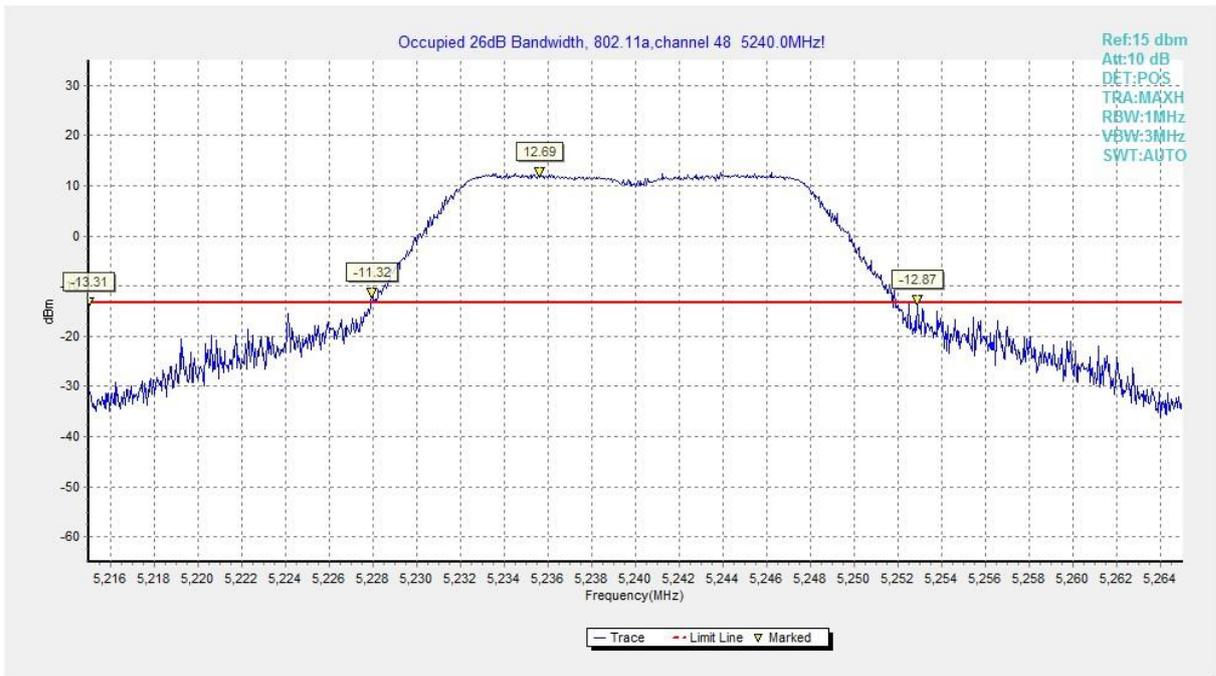


Fig. 3 Occupied 26dB Bandwidth (802.11a, 5240MHz)

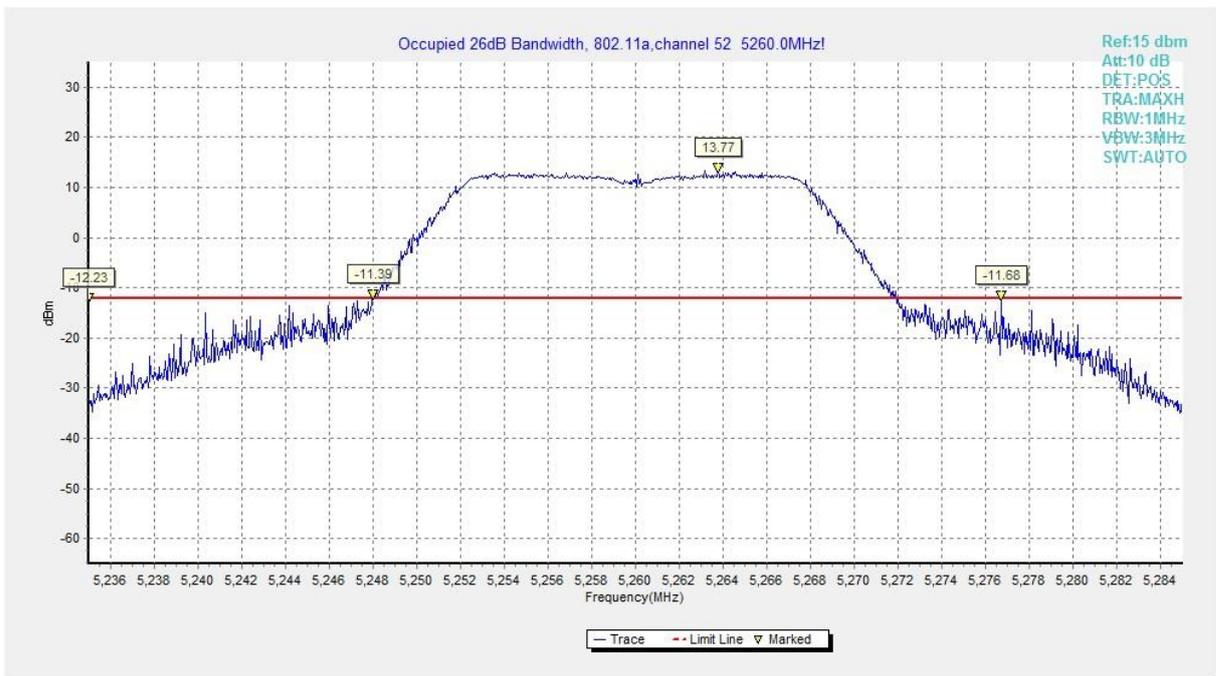


Fig. 4 Occupied 26dB Bandwidth (802.11a, 5260MHz)

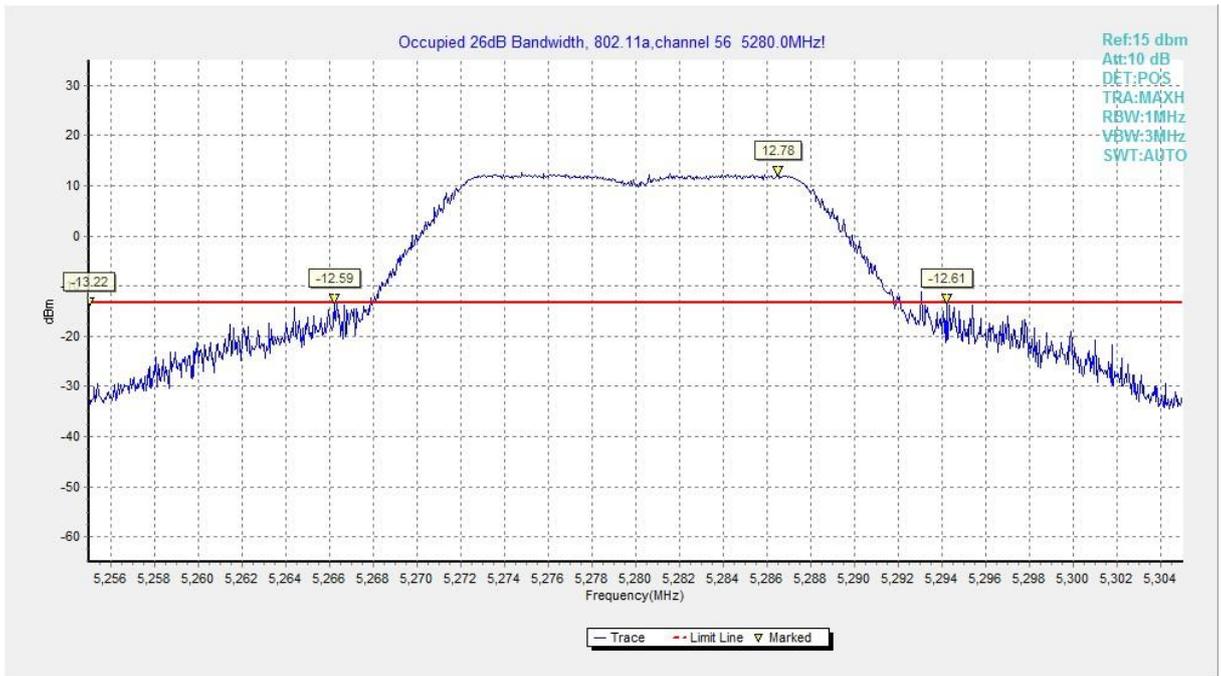


Fig. 5 Occupied 26dB Bandwidth (802.11a, 5280MHz)

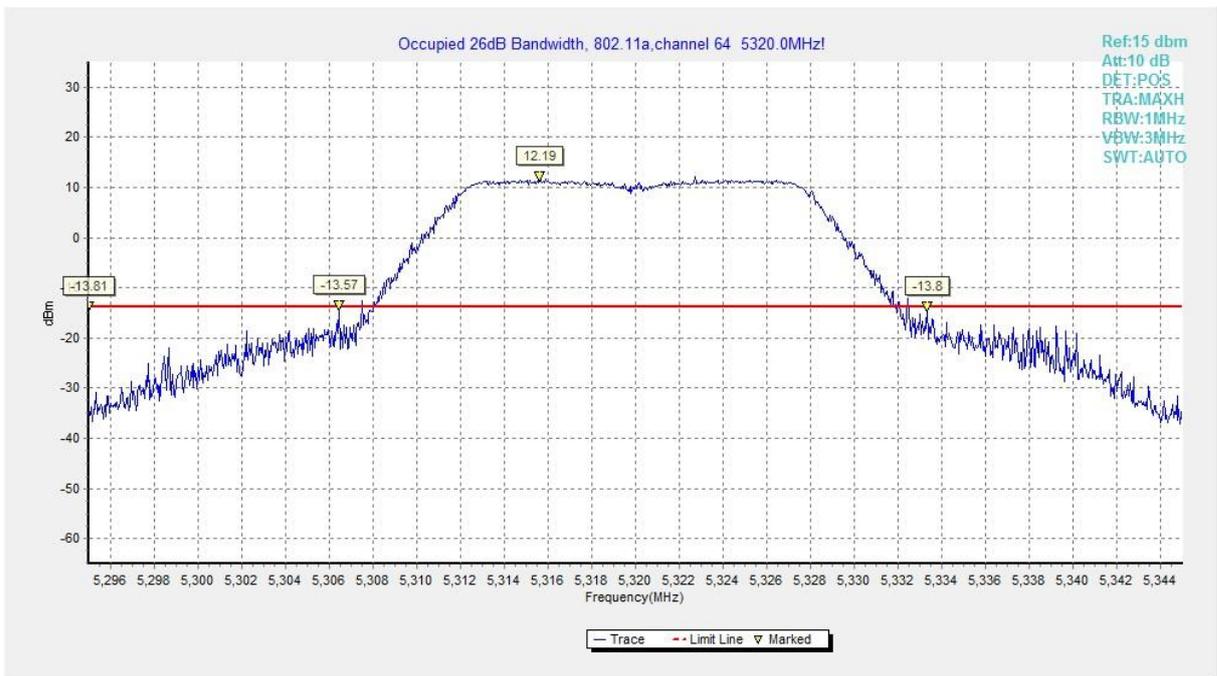
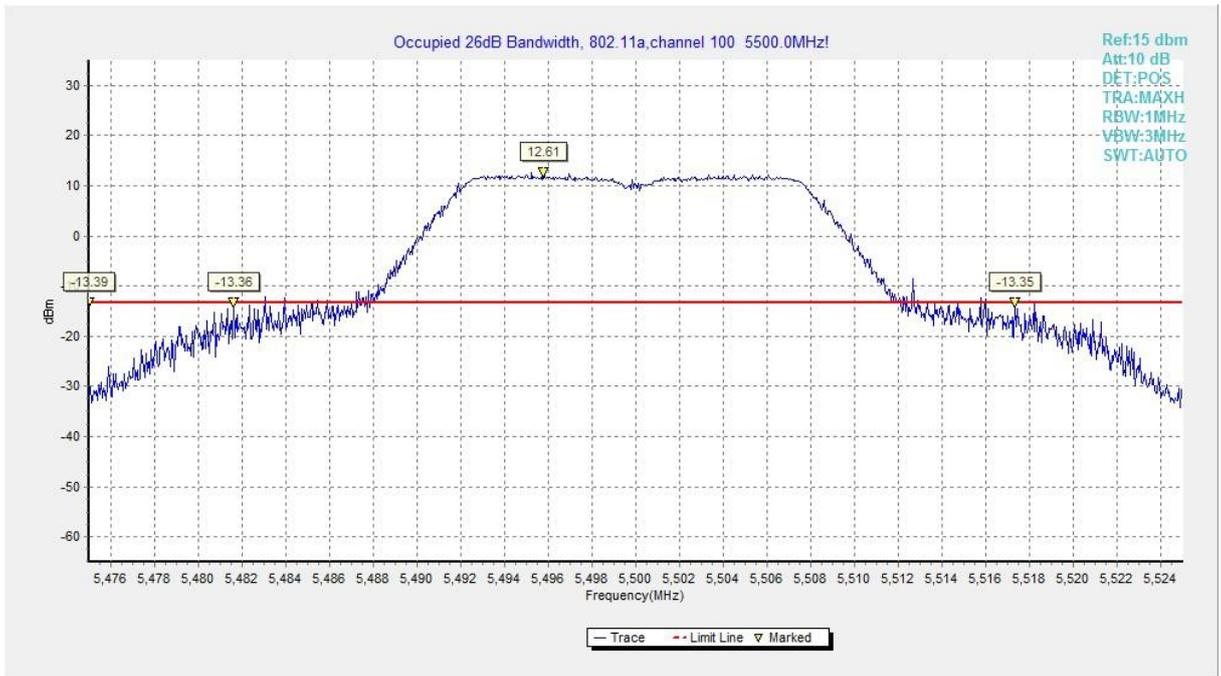


Fig. 6 Occupied 26dB Bandwidth (802.11a, 5320MHz)



**Fig. 7 Occupied 26dB Bandwidth (802.11a, 5500MHz)**



**Fig. 8 Occupied 26dB Bandwidth (802.11a, 5580MHz)**



Fig. 9 Occupied 26dB Bandwidth (802.11a, 5700MHz)

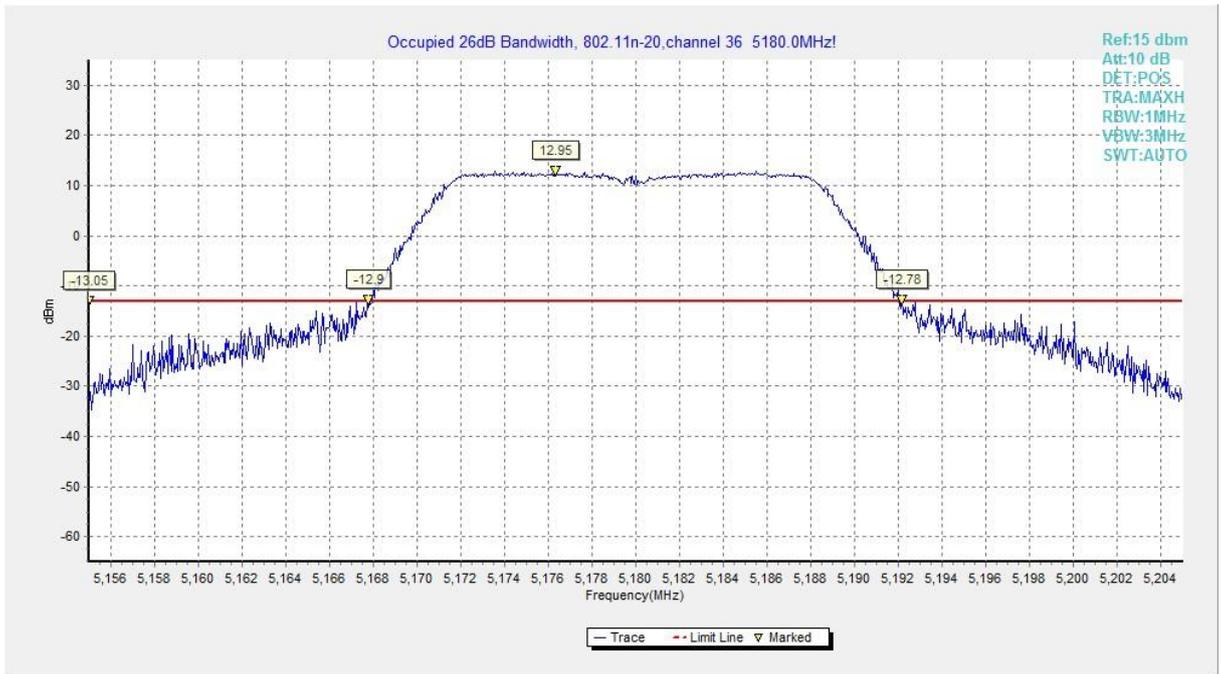


Fig. 10 Occupied 26dB Bandwidth (802.11n-HT20, 5180MHz)

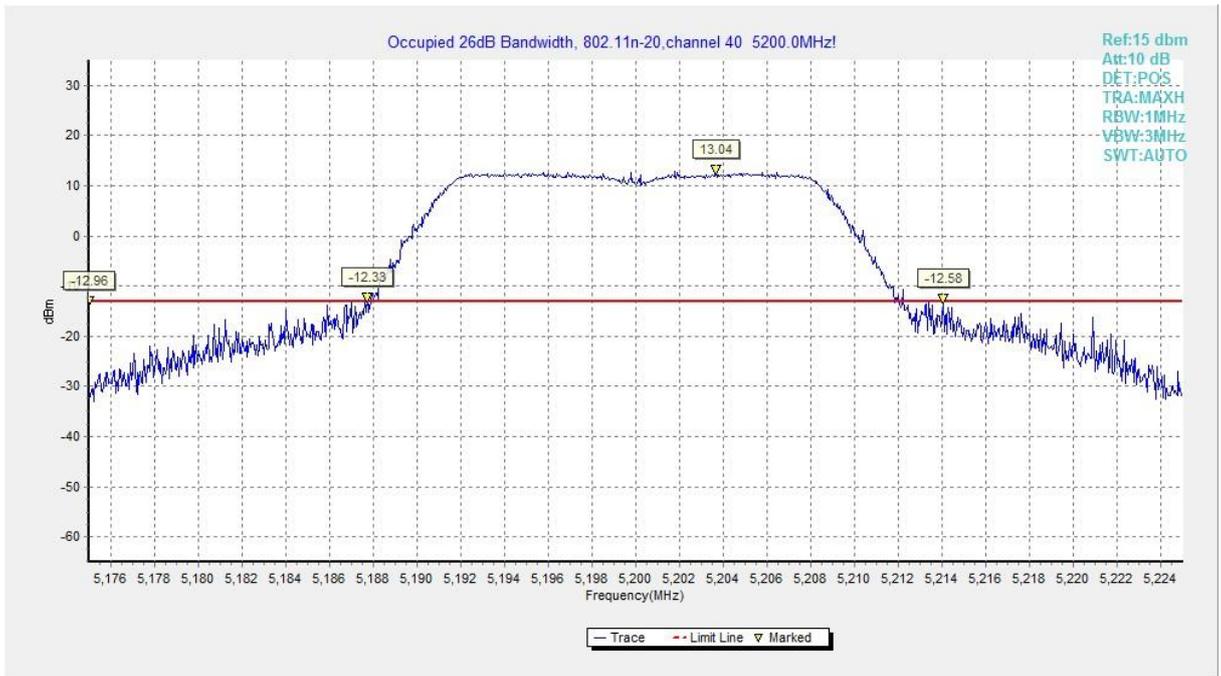


Fig. 11 Occupied 26dB Bandwidth (802.11n-HT20, 5200MHz)

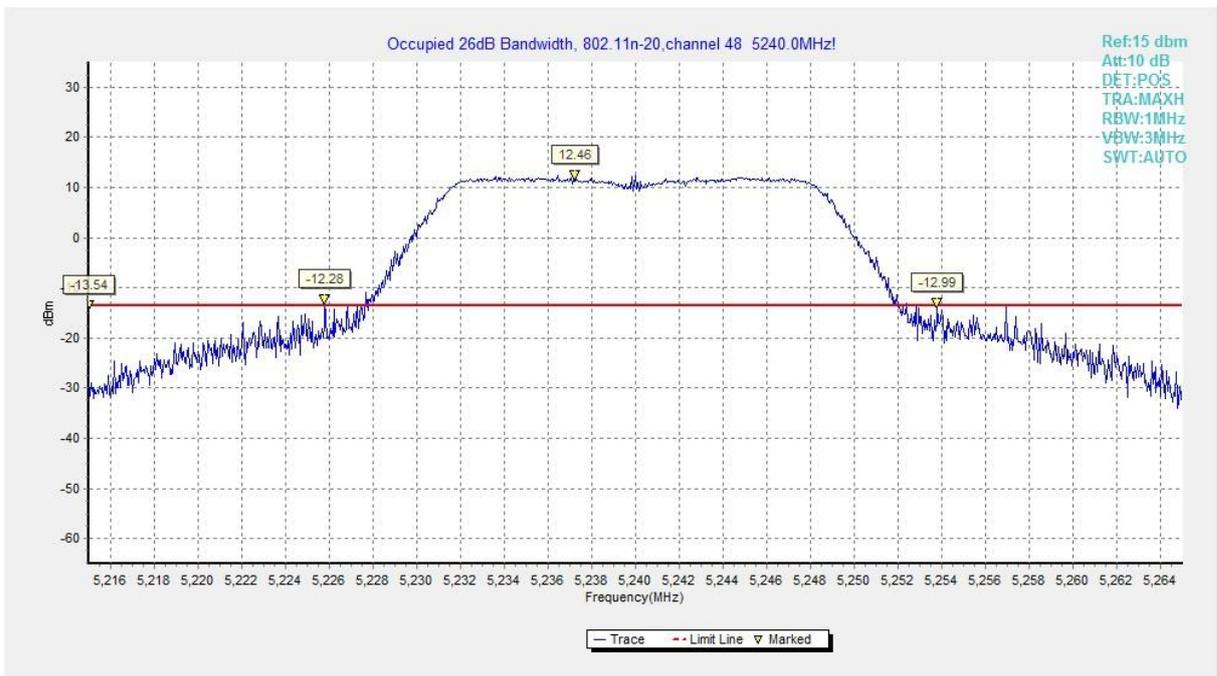


Fig. 12 Occupied 26dB Bandwidth (802.11n-HT20, 5240MHz)

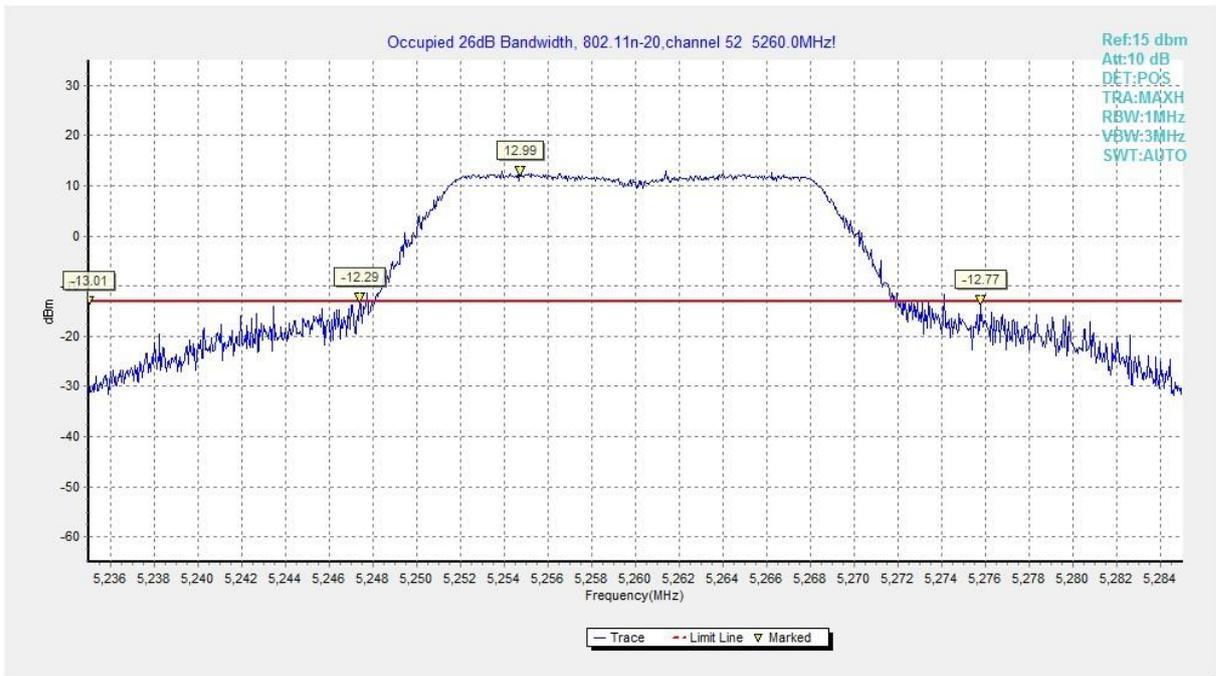


Fig. 13 Occupied 26dB Bandwidth (802.11n-HT20, 5260MHz)

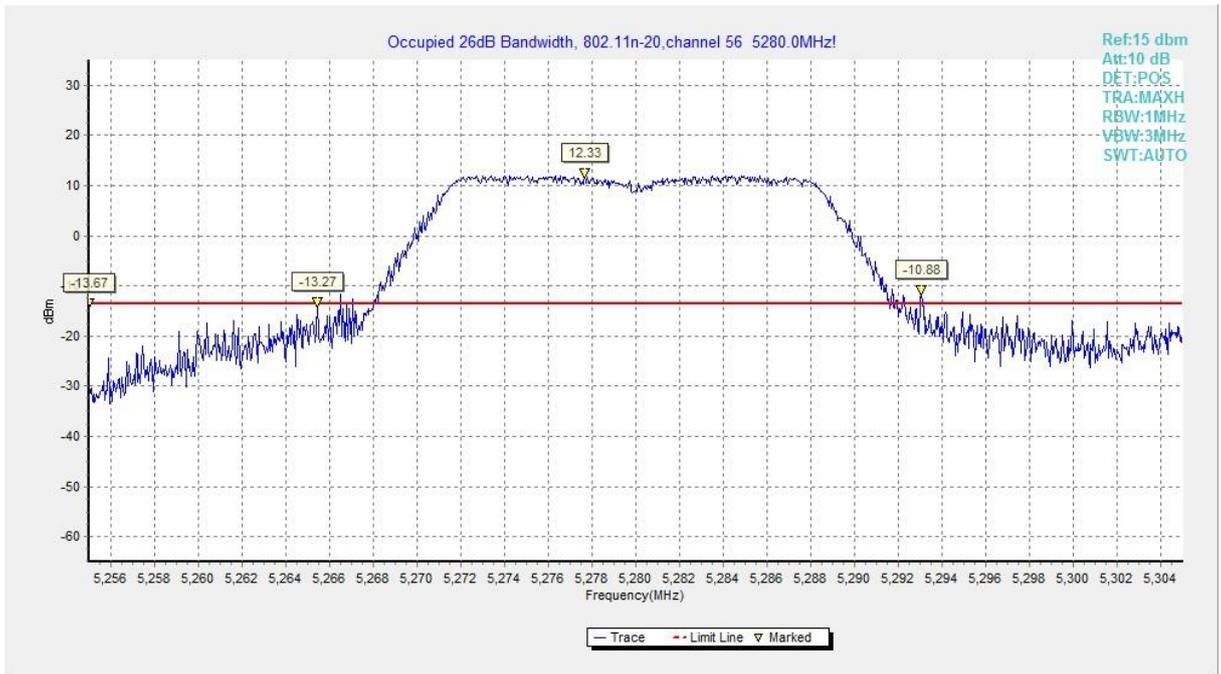


Fig. 14 Occupied 26dB Bandwidth (802.11n-HT20, 5280MHz)

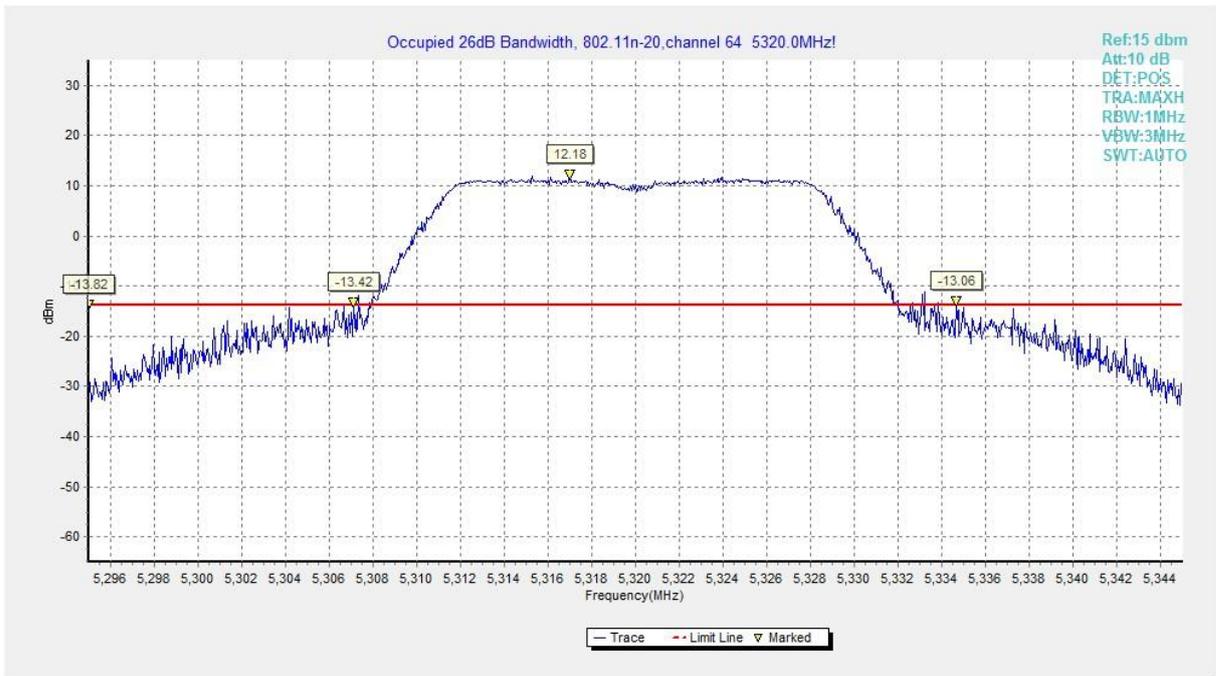


Fig. 15 Occupied 26dB Bandwidth (802.11n-HT20, 5320MHz)

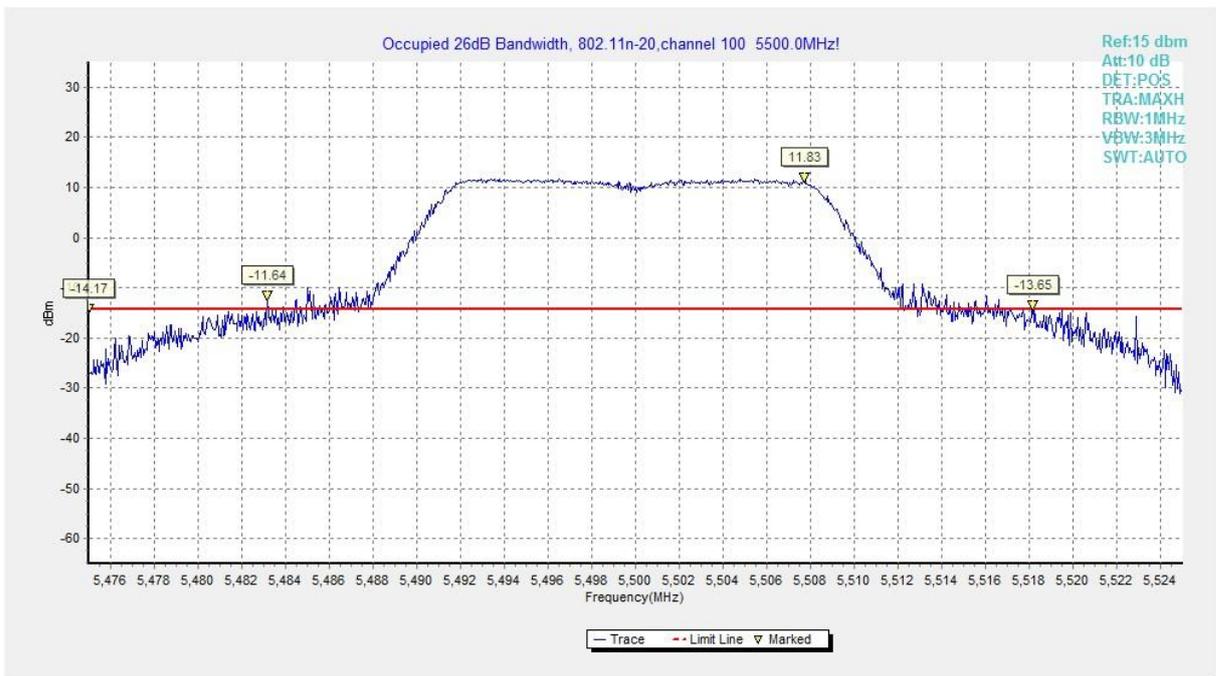


Fig. 16 Occupied 26dB Bandwidth (802.11n-HT20, 5500MHz)

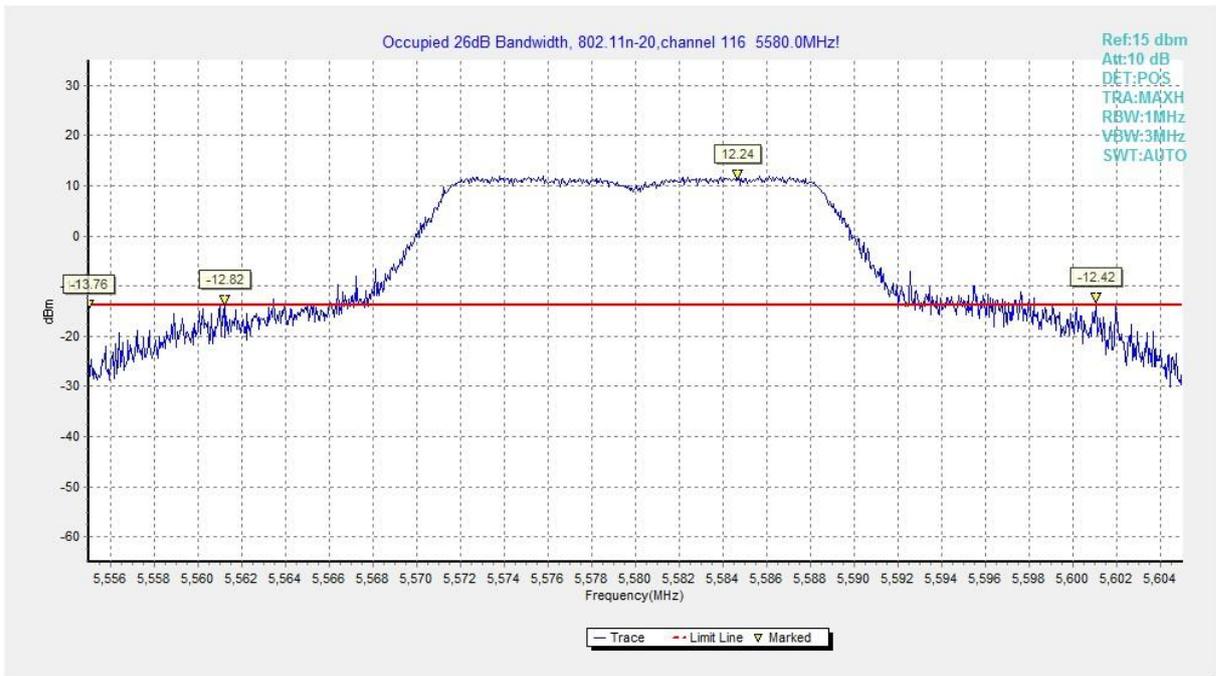


Fig. 17 Occupied 26dB Bandwidth (802. 11n-HT20, 5580MHz)

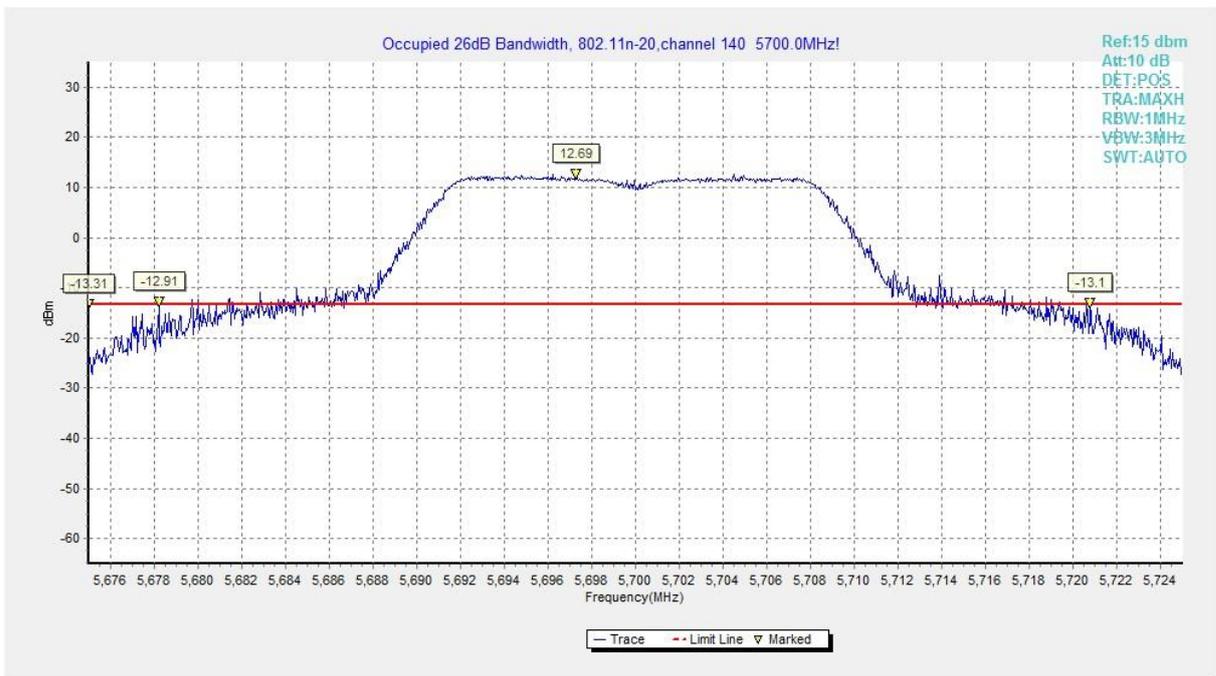


Fig. 18 Occupied 26dB Bandwidth (802. 11n-HT20, 5700MHz)

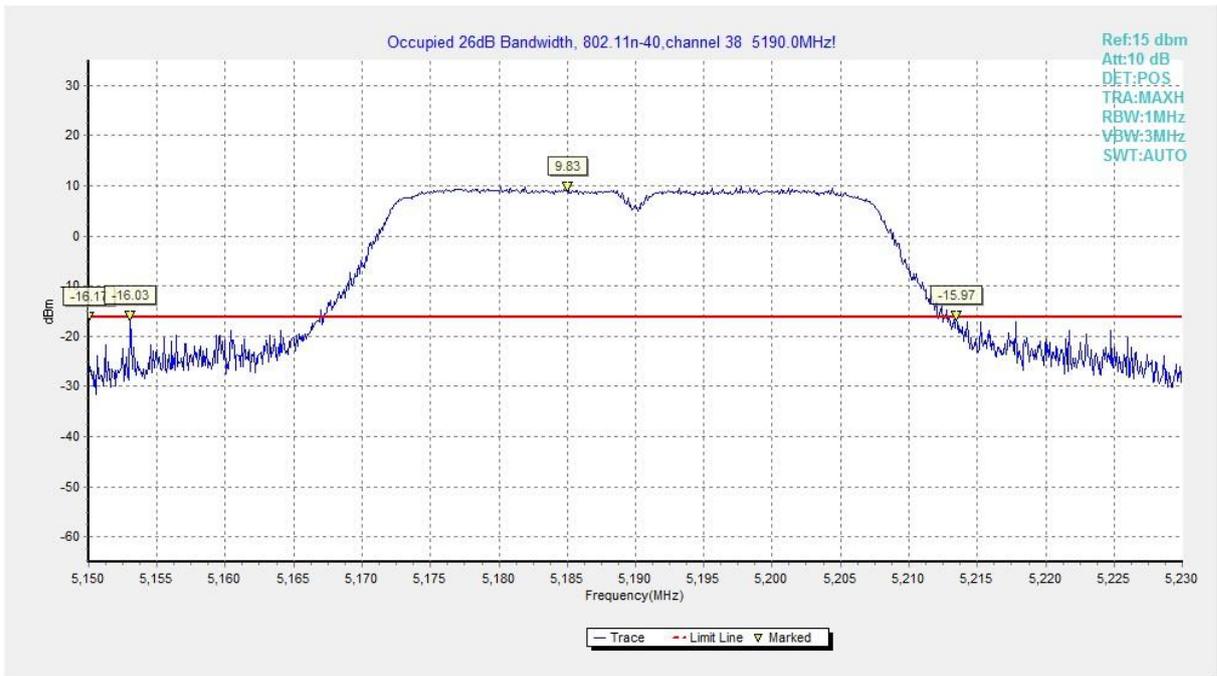


Fig. 19 Occupied 26dB Bandwidth (802.11n-HT40, 5190MHz)

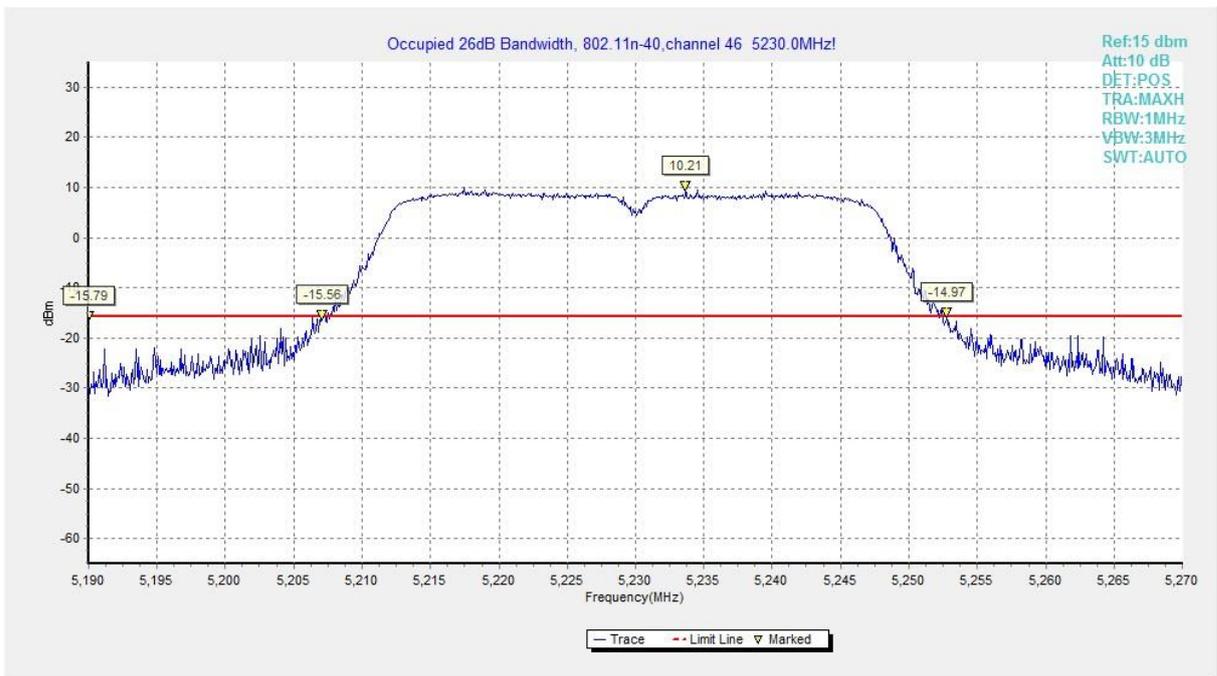


Fig. 20 Occupied 26dB Bandwidth (802.11n-HT40, 5230MHz)

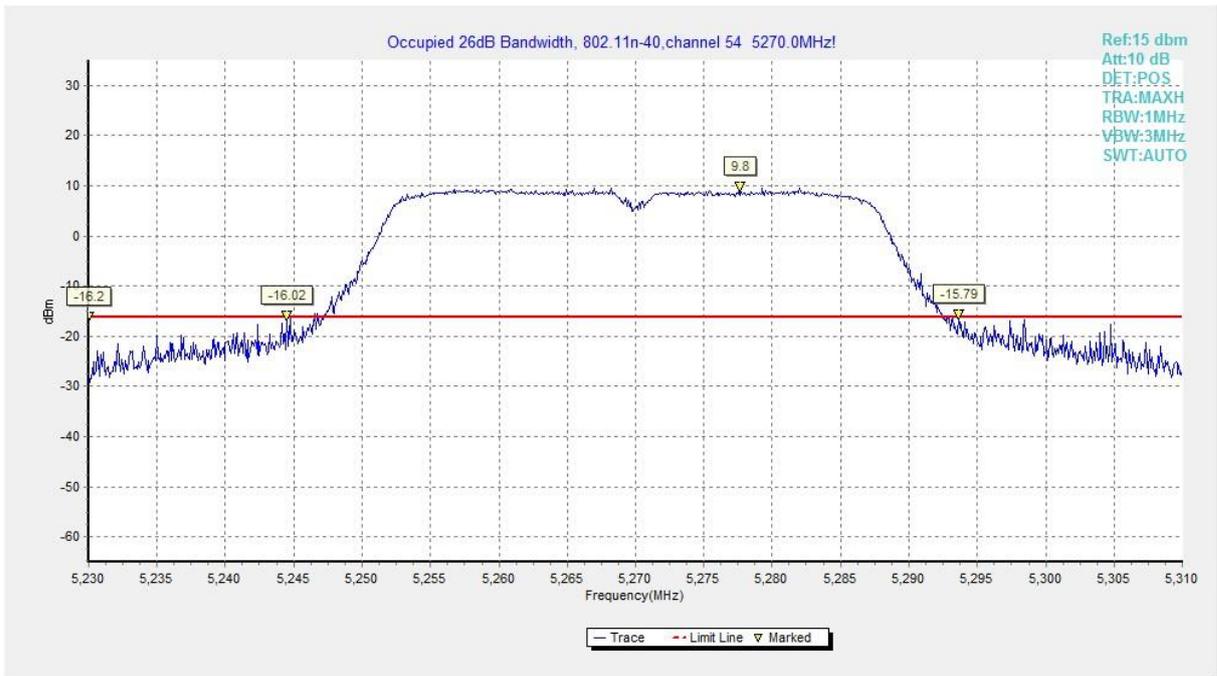


Fig. 21 Occupied 26dB Bandwidth (802.11n-HT40, 5270MHz)



Fig. 22 Occupied 26dB Bandwidth (802.11n-HT40, 5310MHz)

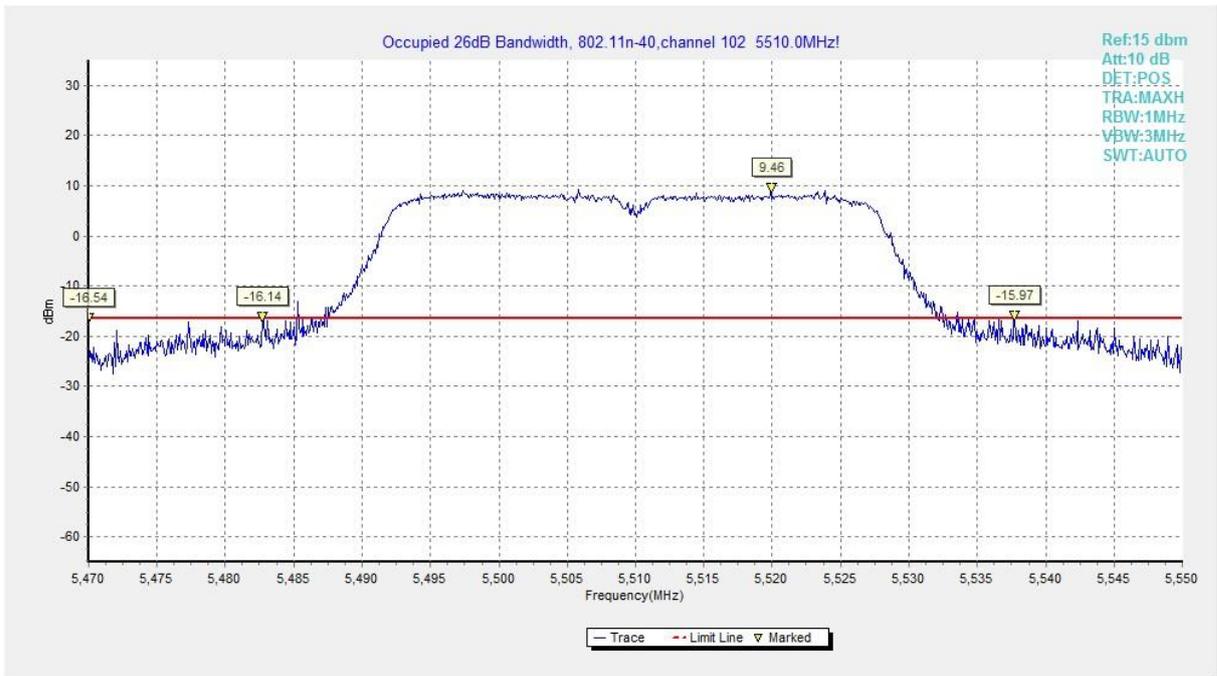


Fig. 23 Occupied 26dB Bandwidth (802. 11n-HT40, 5510MHz)

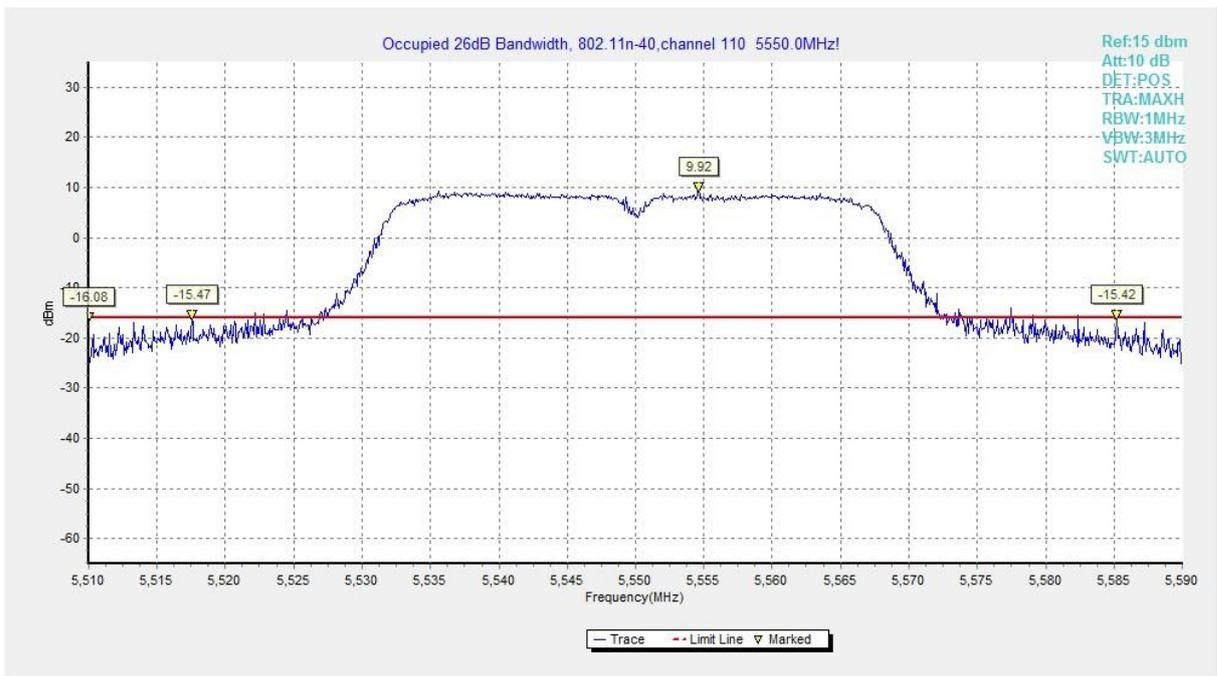


Fig. 24 Occupied 26dB Bandwidth (802. 11n-HT40, 5550MHz)

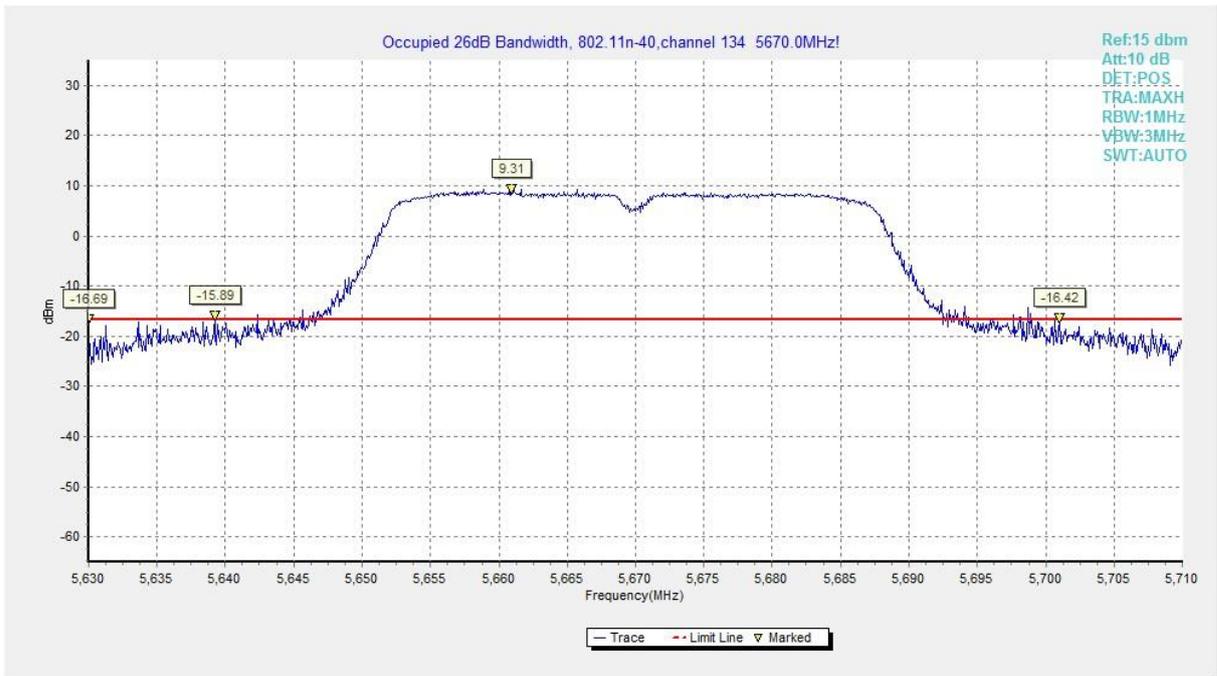


Fig. 25 Occupied 26dB Bandwidth (802. 11n-HT40, 5670MHz)

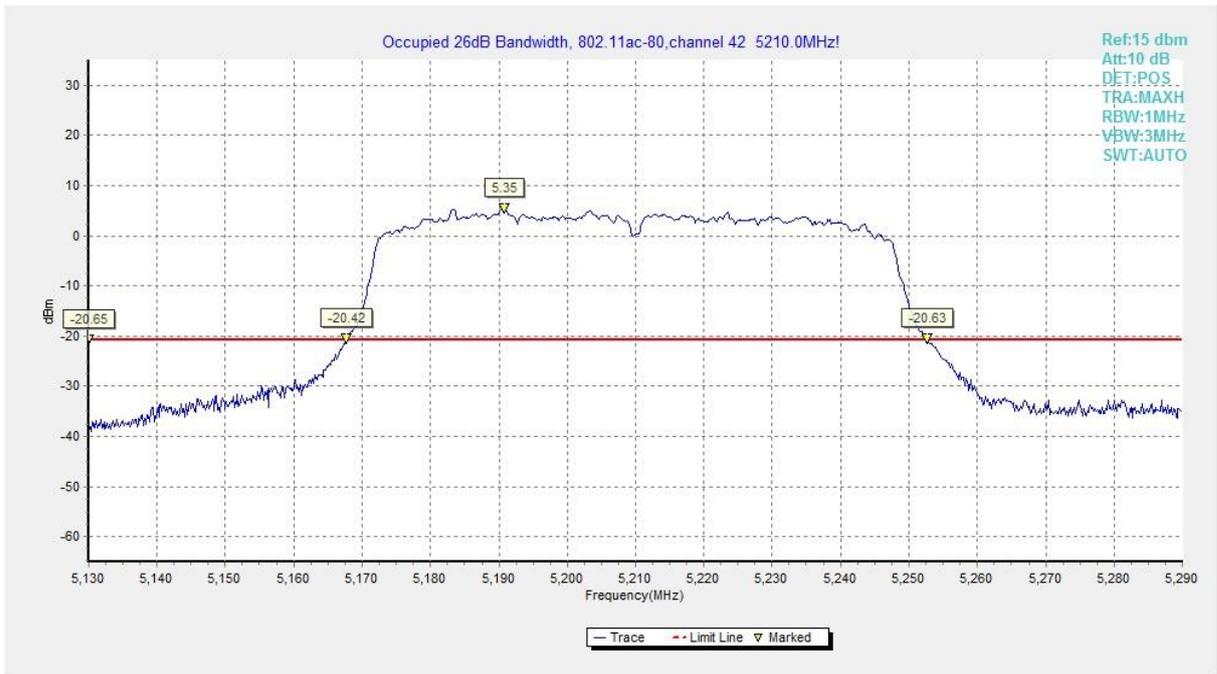


Fig. 26 Occupied 26dB Bandwidth (802. 11ac-HT80, 5210MHz)

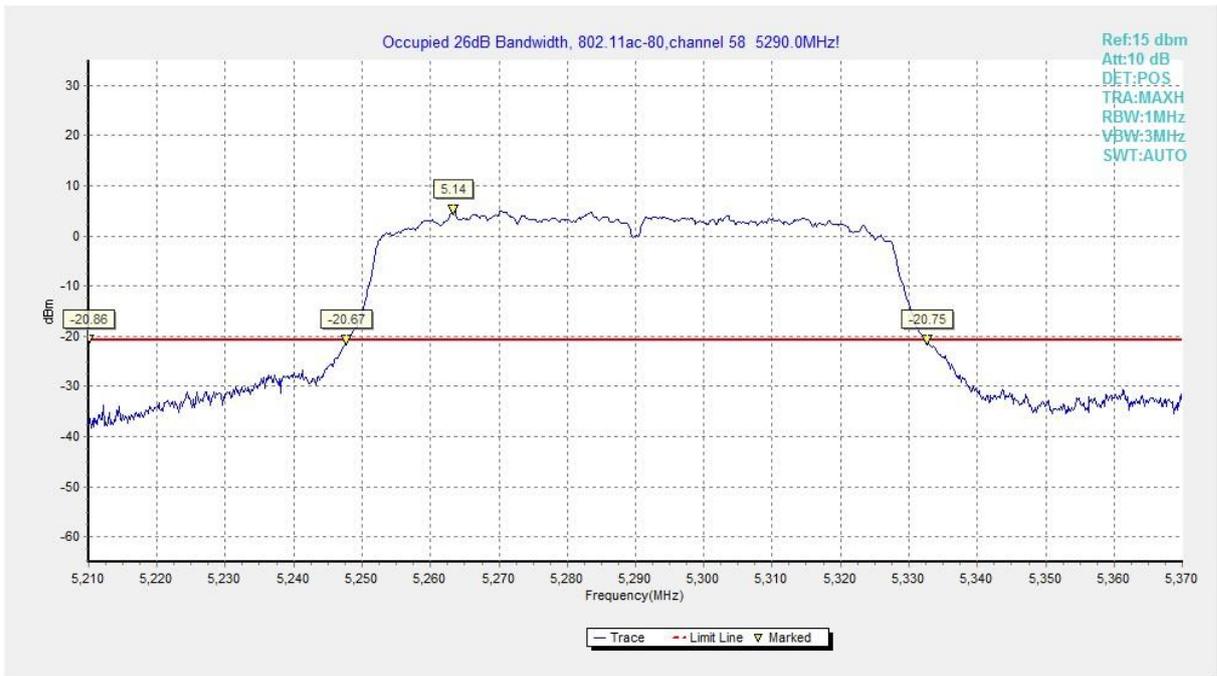


Fig. 27 Occupied 26dB Bandwidth (802.11ac-HT80, 5290MHz)

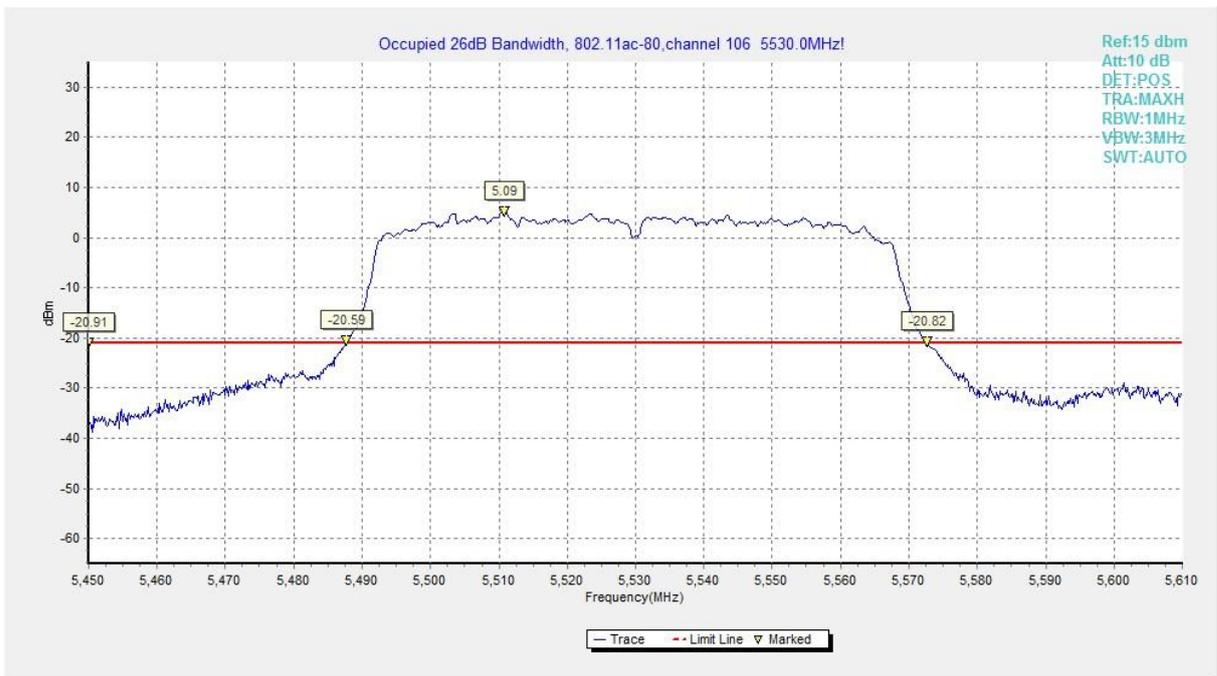


Fig. 28 Occupied 26dB Bandwidth (802.11ac-HT80, 5530MHz)

## A.5. Band Edges Compliance

### A5.1 Band Edges - conducted

#### Measurement Limit:

Standard	Limit (dBc)
FCC 47 CFR Part 15.407	> 20

The measurement is made according to KDB 789033

#### Measurement Uncertainty:

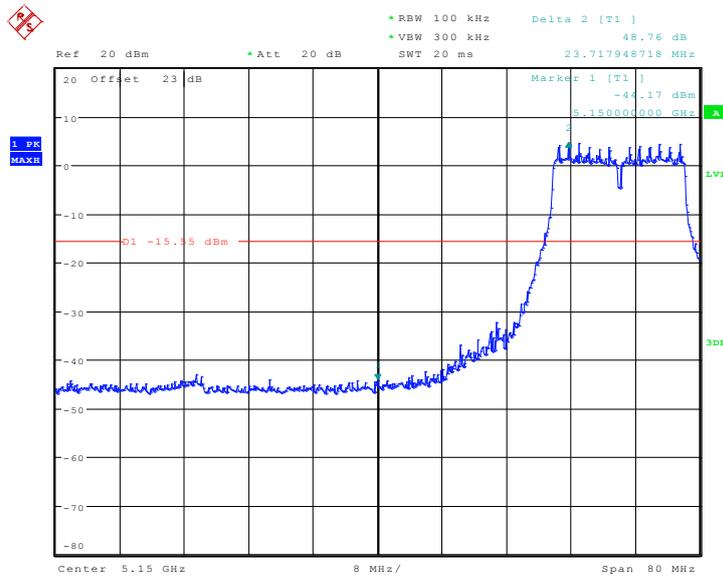
Measurement Uncertainty	0.75dB
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#### Measurement Result:

Mode	Channel	Test Results	Conclusion
802.11a	5180 MHz	Fig.29	P
	5320 MHz	Fig.30	P
	5500 MHz	Fig.31	P
802.11n HT20	5180 MHz	Fig.32	P
	5320 MHz	Fig.33	P
	5500 MHz	Fig.34	P
802.11n HT40	5190 MHz	Fig.35	P
	5310 MHz	Fig.36	P
	5510 MHz	Fig.37	P
802.11ac HT80	5210 MHz	Fig.38	P
	5290 MHz	Fig.39	P
	5530 MHz	Fig.40	P

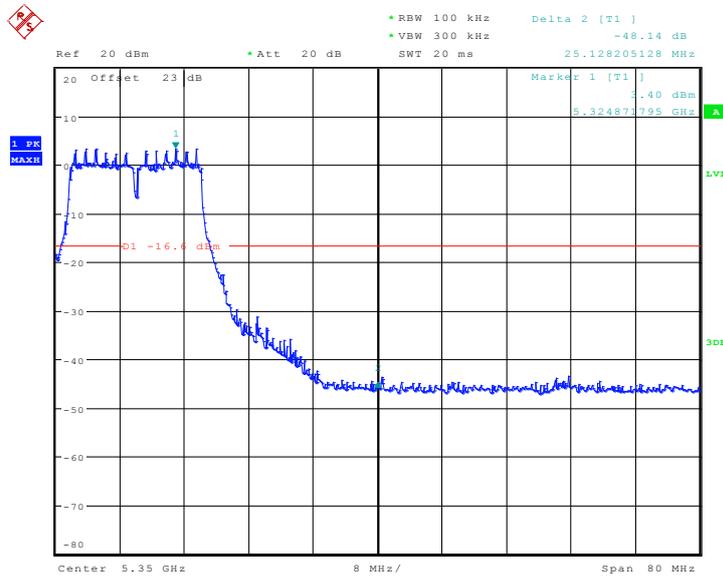
**Conclusion: PASS**

Test graphs as below:



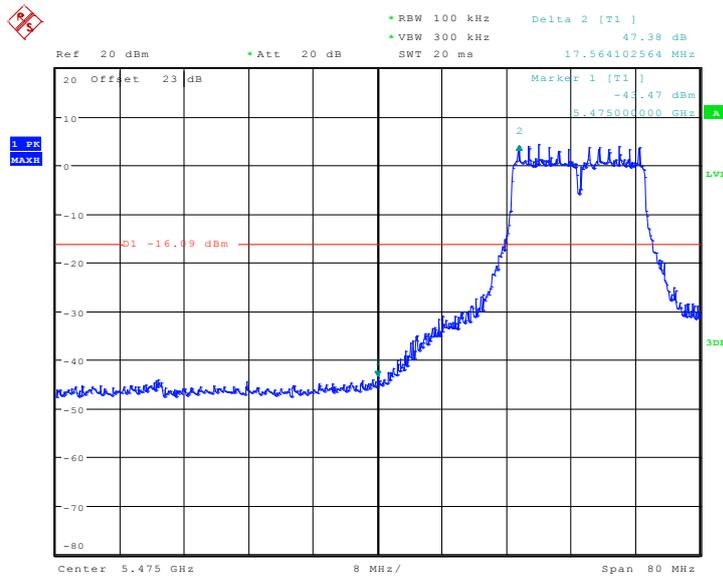
Date: 5.MAR.2014 20:03:15

**Fig. 29 Band Edges (802.11a, 5180MHz)**



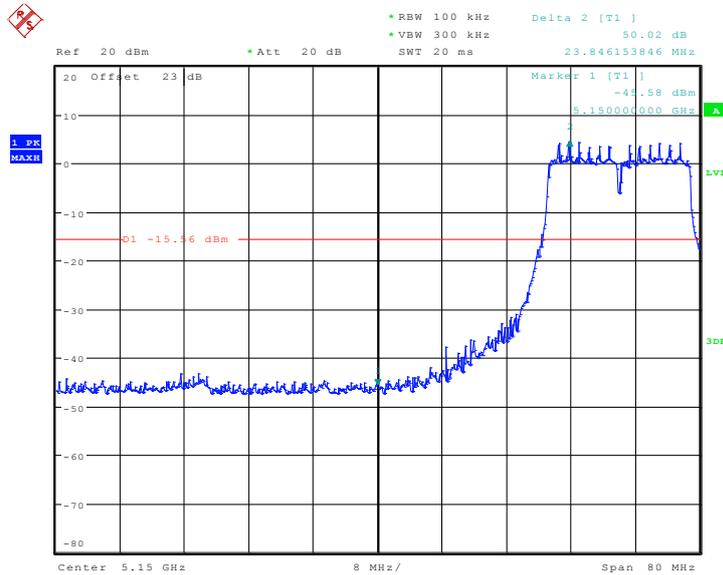
Date: 5.MAR.2014 20:01:38

**Fig. 30 Band Edges (802.11a, 5320MHz)**



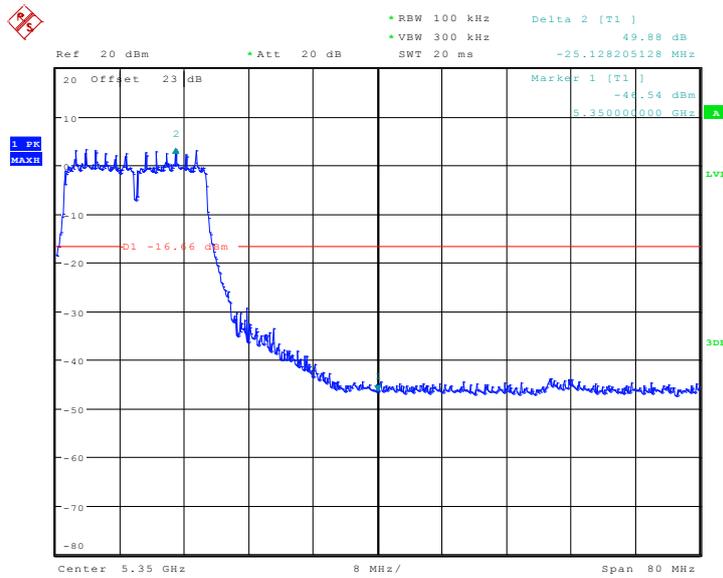
Date: 5.MAR.2014 20:04:08

**Fig. 31 Band Edges (802.11a, 5500MHz)**



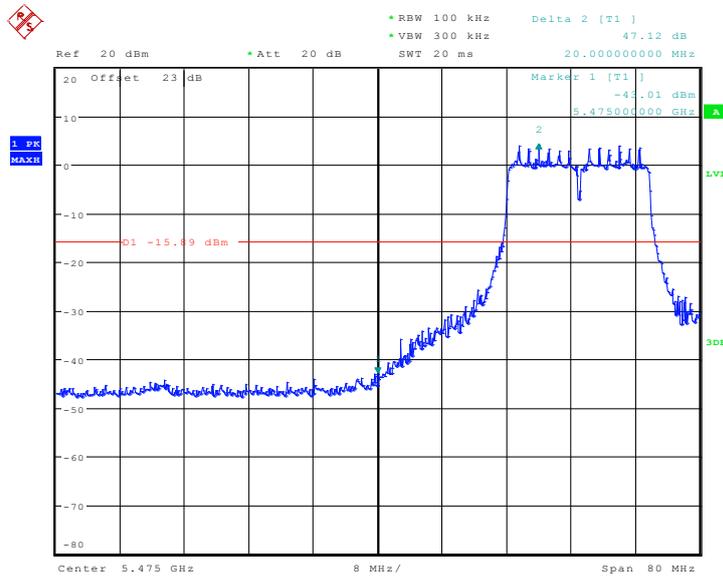
Date: 5.MAR.2014 20:04:55

**Fig. 32 Band Edges (802.11n-HT20, 5180MHz)**



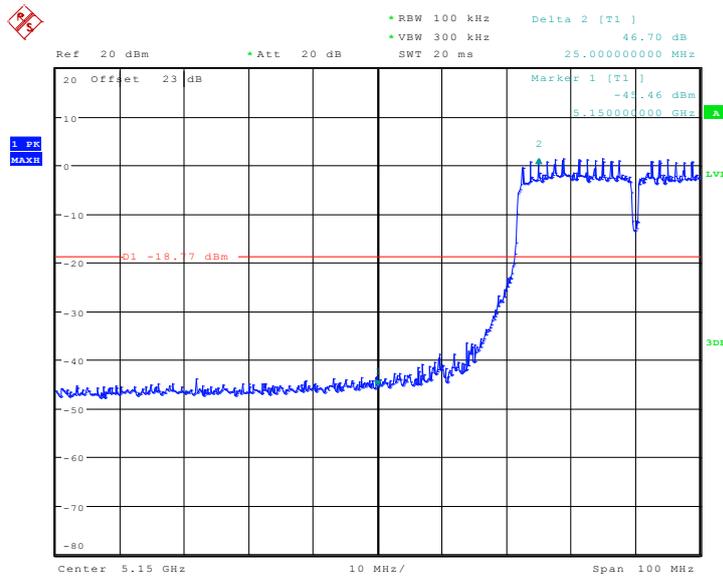
Date: 5.MAR.2014 20:05:57

**Fig. 33 Band Edges (802.11n-HT20, 5320MHz)**



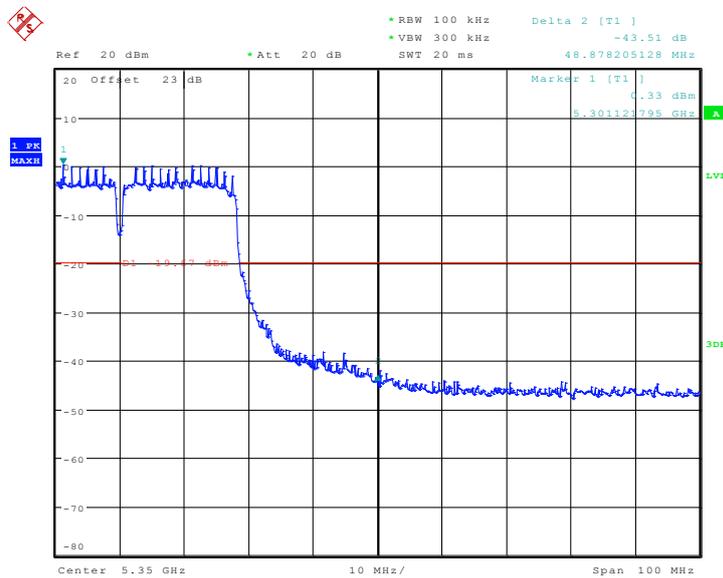
Date: 5.MAR.2014 20:06:44

**Fig. 34 Band Edges (802.11n-HT20, 5500MHz)**



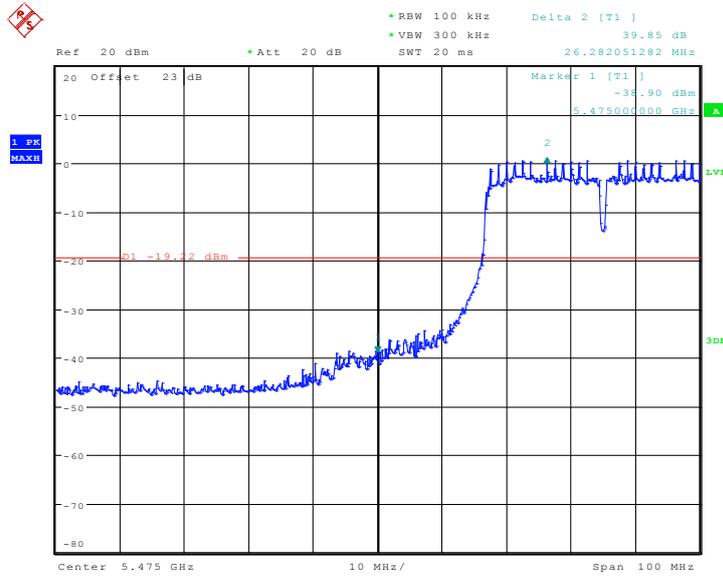
Date: 5.MAR.2014 20:08:42

**Fig. 35 Band Edges (802.11n-HT40, 5190MHz)**



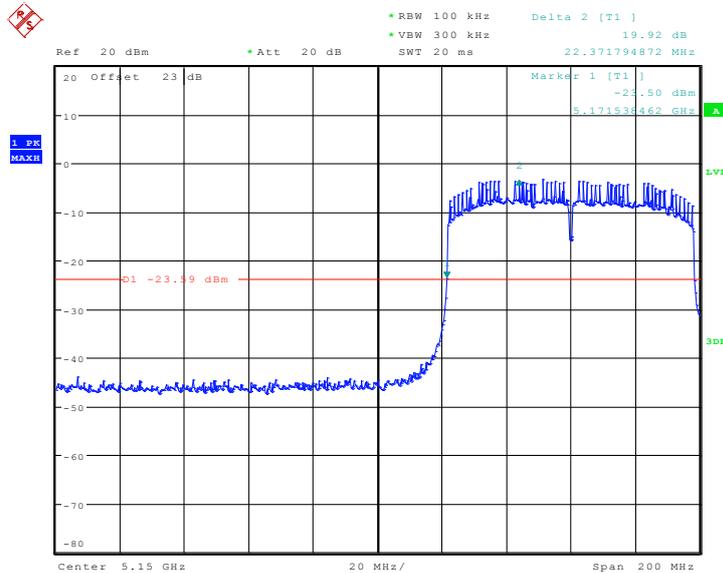
Date: 5.MAR.2014 20:09:29

**Fig. 36 Band Edges (802.11n-HT40, 5310MHz)**



Date: 5.MAR.2014 20:10:16

**Fig. 37 Band Edges (802.11n-HT40, 5510MHz)**



Date: 5.MAR.2014 19:57:03

**Fig. 38 Band Edges (802.11ac-HT80, 5210MHz)**



### A5.2 Band Edges - Radiated

#### Measurement Limit:

Standard	Limit (dBc)
FCC 47 CFR Part 15.407	> 20

The measurement is made according to KDB 789033

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)).

#### Measurement Uncertainty:

Measurement Uncertainty	0.75dB
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#### Measurement Result:

Mode	Channel	Test Results	Conclusion
802.11a	5180 MHz	Fig.41	P
	5320 MHz	Fig.42	P
	5500 MHz	Fig.43	P
802.11n HT20	5180 MHz	Fig.44	P
	5320 MHz	Fig.45	P
	5500 MHz	Fig.46	P
802.11n HT40	5190 MHz	Fig.47	P
	5310 MHz	Fig.48	P
	5510 MHz	Fig.49	P
802.11ac HT80	5210 MHz	Fig.50	P
	5290 MHz	Fig.51	P
	5530 MHz	Fig.52	P

**Conclusion: PASS**

**Test graphs as below:**

RE-Power\_5.125G-5.175GHz

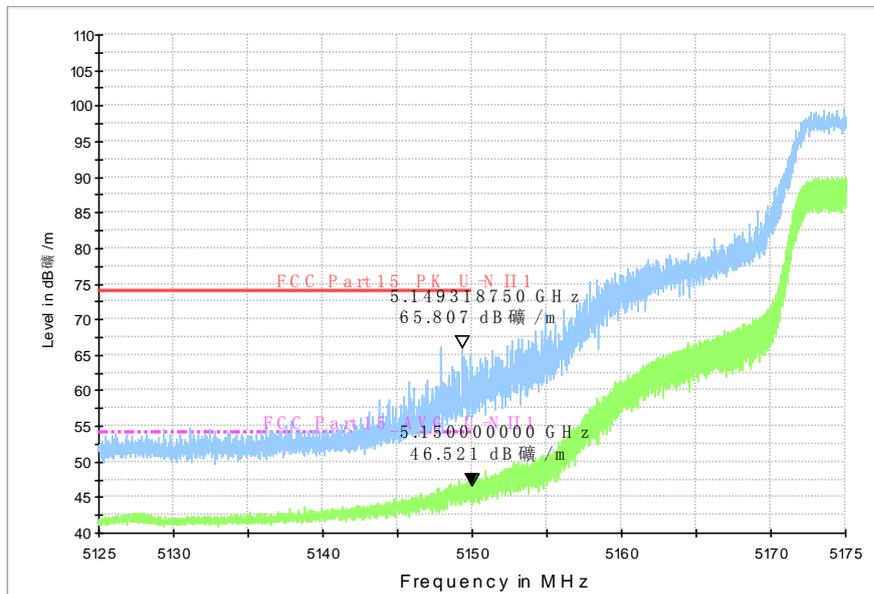


Fig. 41 Band Edges (802.11a, 5180MHz)

RE-Power\_5.325G-5.375GHz

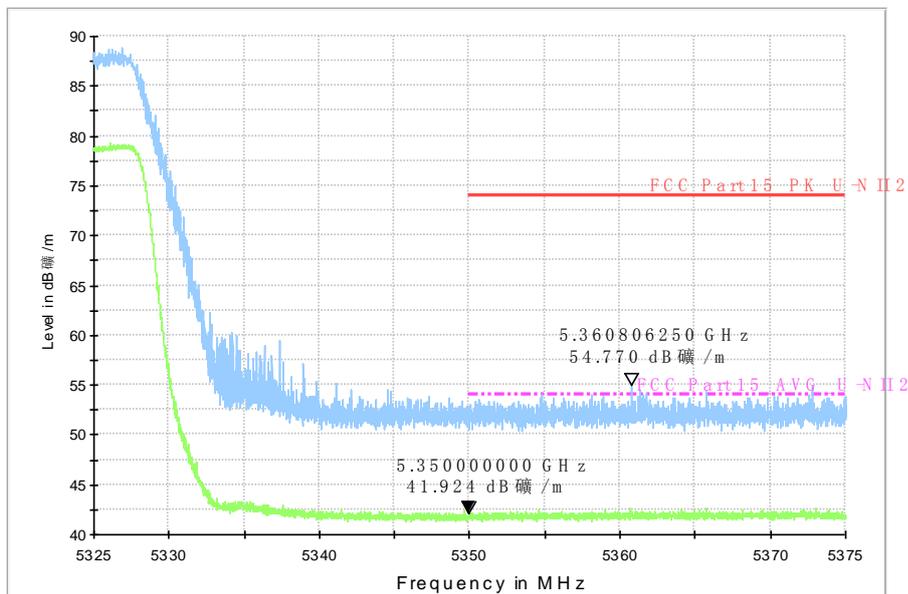
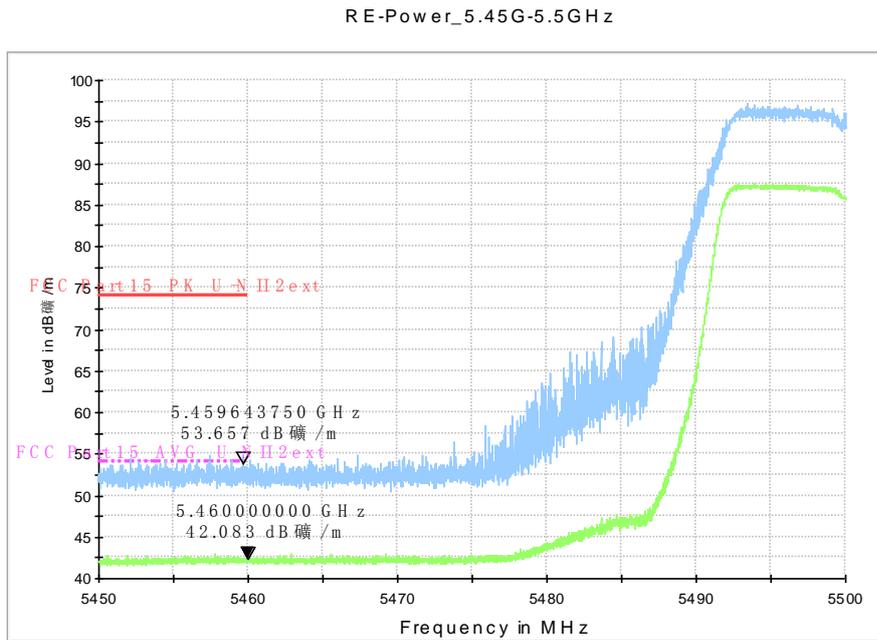
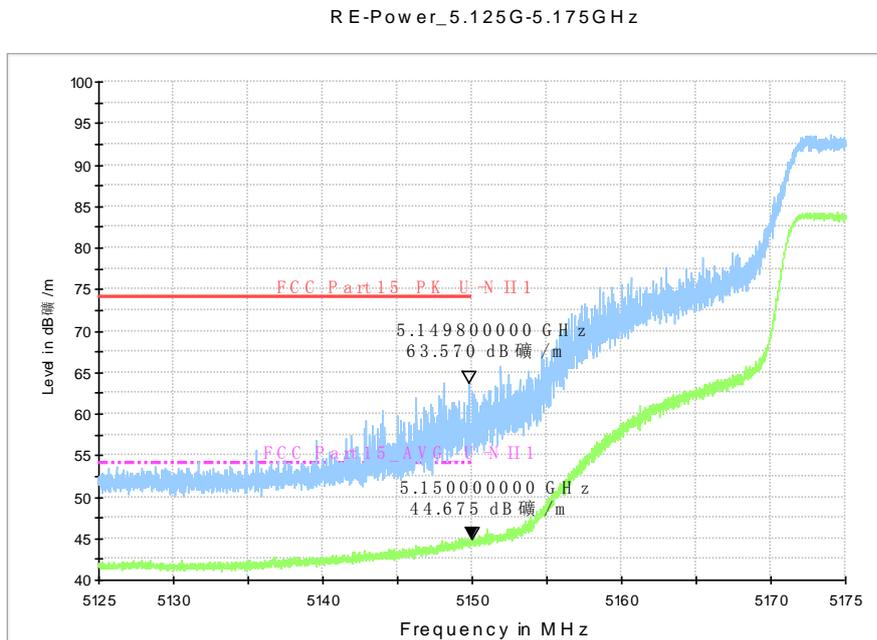


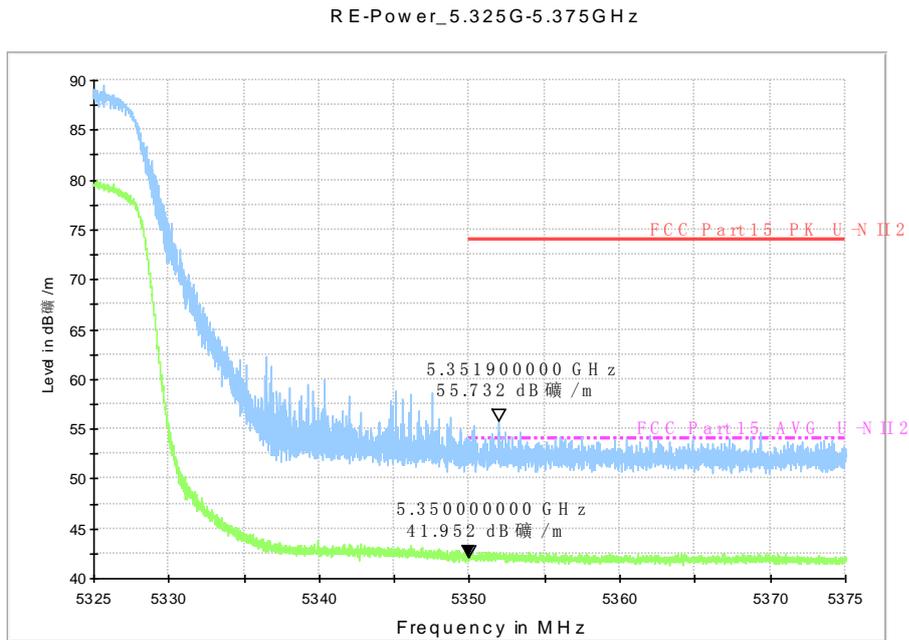
Fig. 42 Band Edges (802.11a, 5320MHz)



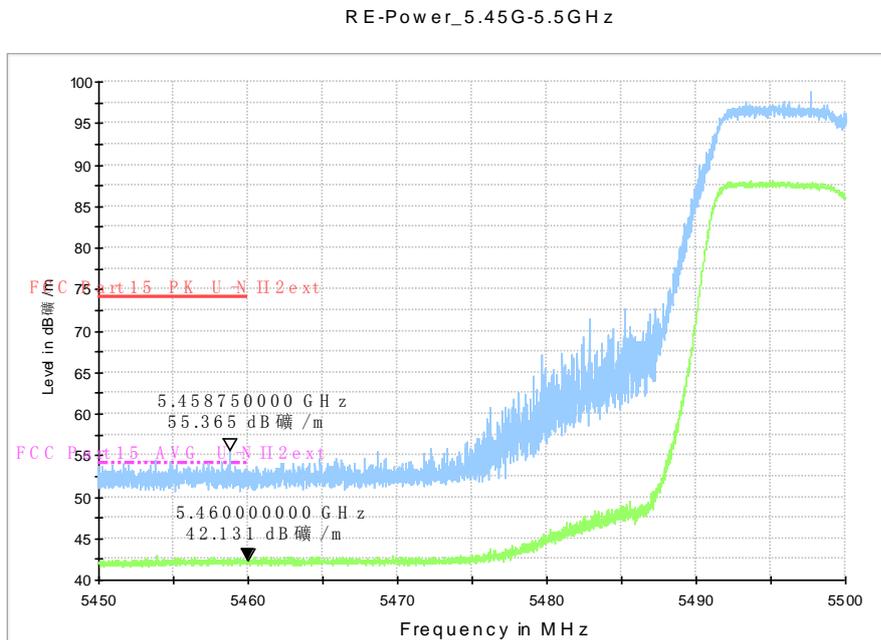
**Fig. 43 Band Edges (802.11a, 5550MHz)**



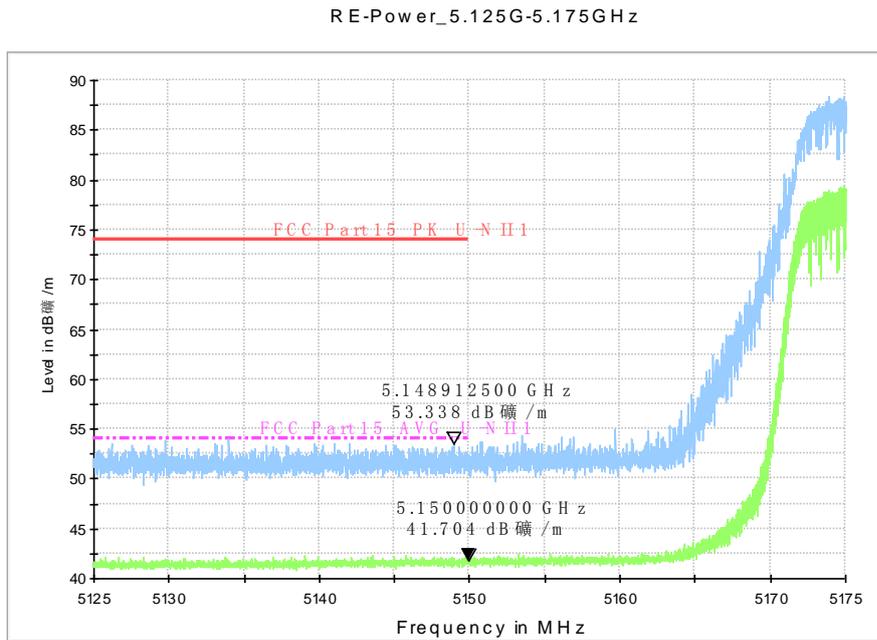
**Fig. 44 Band Edges (802.11n-HT20, 5180MHz)**



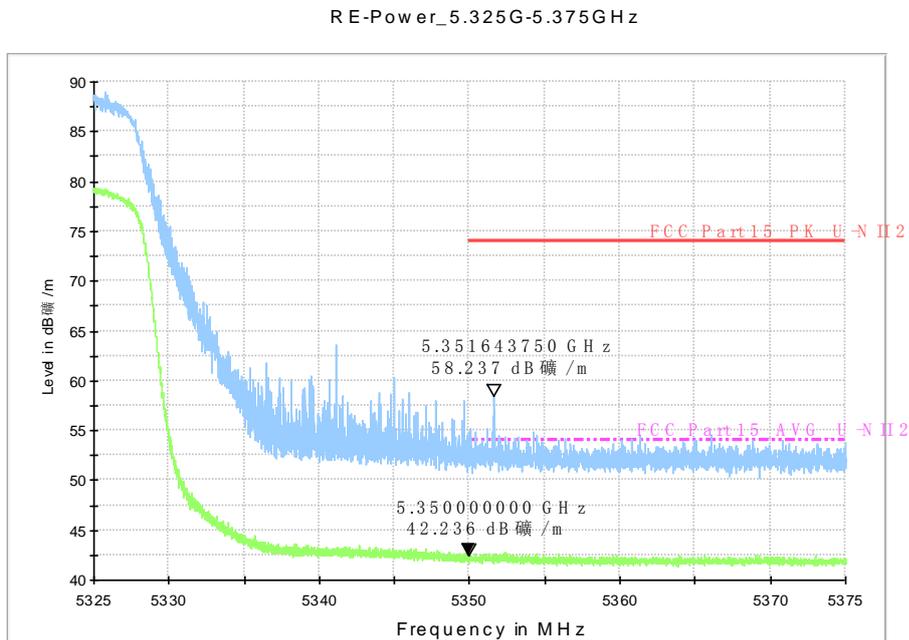
**Fig. 45 Band Edges (802.11n-HT20, 5320MHz)**



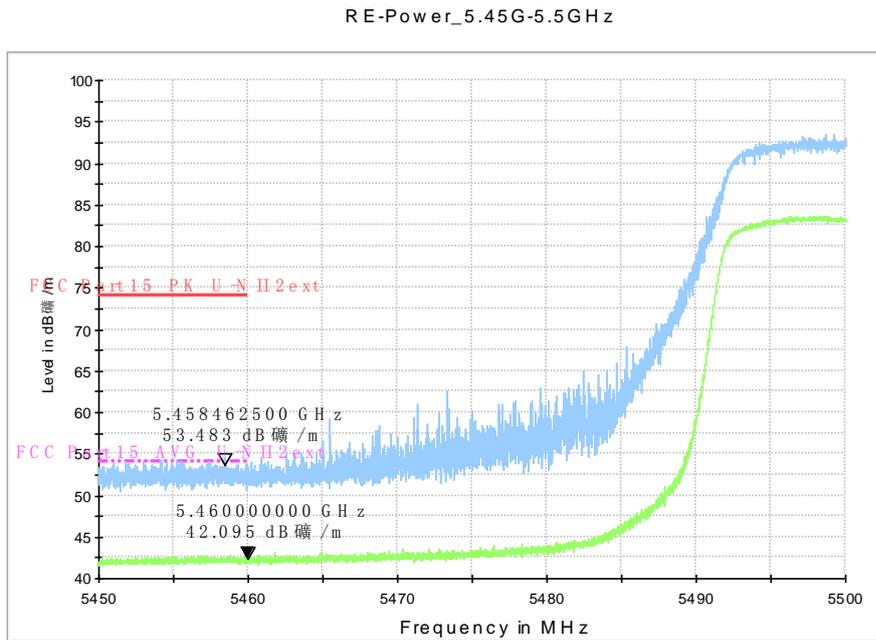
**Fig. 46 Band Edges (802.11n-HT20, 5500MHz)**



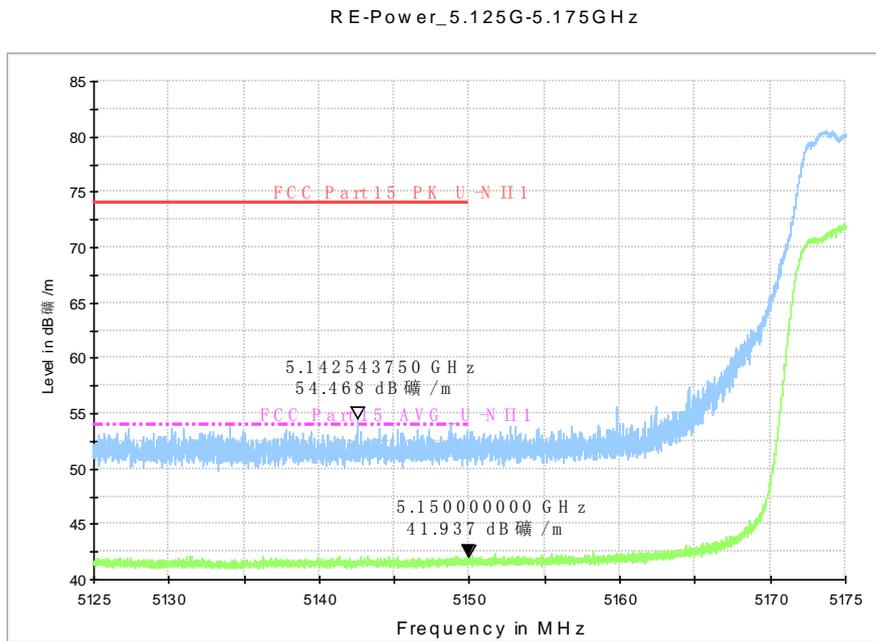
**Fig. 47 Band Edges (802.11n-HT40, 5190MHz)**



**Fig. 48 Band Edges (802.11n-HT40, 5310MHz)**



**Fig. 49 Band Edges (802.11n-HT40, 5510MHz)**



**Fig. 50 Band Edges (802.11ac-HT80, 5210MHz)**

RE-Power\_5.325G-5.375GHz

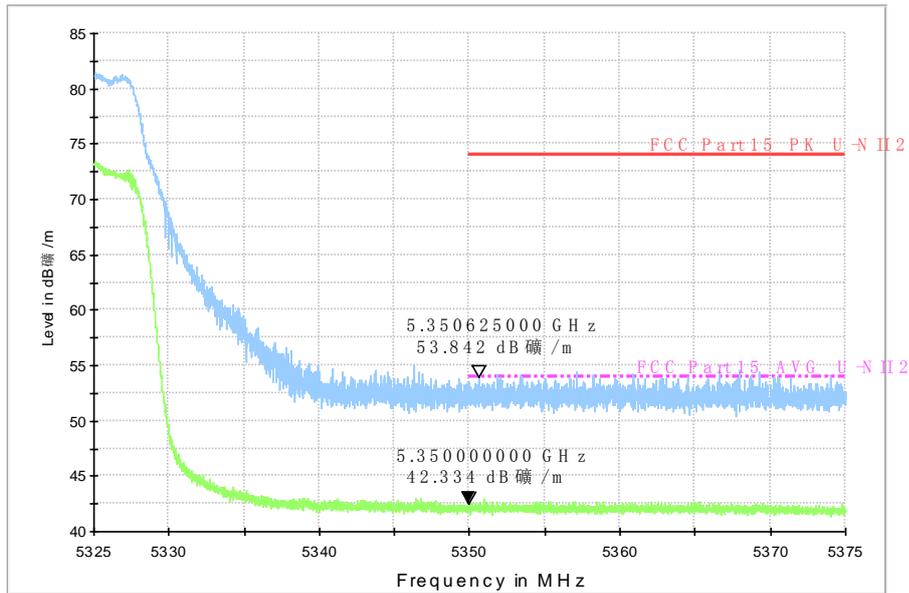


Fig. 51 Band Edges (802.11ac-HT80, 5290MHz)

RE-Power\_5.45G-5.5GHz

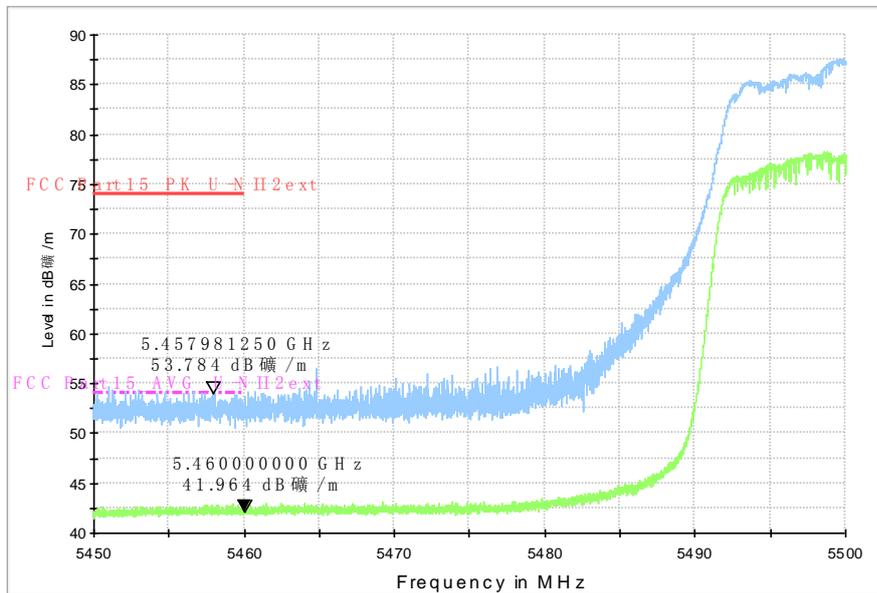


Fig. 52 Band Edges (802.11ac-HT80, 5530MHz)

## A.6. Transmitter Spurious Emission

### Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.407	-27 dBm/MHz

The measurement is made according to KDB 789033

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)).

### Limit in restricted band:

Frequency of emission (MHz)	Field strength(dB $\mu$ V/m)	Measurement distance(m)
30-88	40.0	3
88-216	43.5	3
216-960	46.0	3
Above 960	54.0	3

Note: for frequency range below 960MHz, the limit in 15.209 is defined in 10m test distance. The limit used above is calculated from 10m to 3m

### Measurement uncertainty:

Expanded measurement uncertainty for this test item is U =3.9 dB, k=2.

### Measurement Results:

802.11a mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11a	36(5180MHz)	30 MHz ~1 GHz	Fig.53	P
		1 GHz ~ 6 GHz	Fig.54	P
		6 GHz ~ 18 GHz	Fig.55	P
	40(5200MHz)	30 MHz ~1 GHz	Fig.56	P
		1 GHz ~ 6 GHz	Fig.57	P
		6 GHz ~ 18 GHz	Fig.58	P
	48(5240MHz)	30 MHz ~1 GHz	Fig.59	P
		1 GHz ~ 6 GHz	Fig.60	P
		6 GHz ~ 18 GHz	Fig.61	P
	All Channel	18 GHz ~ 26.5 GHz	Fig.62	P
		26.5 GHz ~ 40 GHz	Fig.63	P
	52(5260MHz)	30 MHz ~1 GHz	Fig.64	P
		1 GHz ~ 6 GHz	Fig.65	P
		6 GHz ~ 18 GHz	Fig.66	P
	56(5280MHz)	30 MHz ~1 GHz	Fig.67	P
		1 GHz ~ 6 GHz	Fig.68	P
		6 GHz ~ 18 GHz	Fig.69	P
	64(5320MHz)	30 MHz ~1 GHz	Fig.70	P
		1 GHz ~ 6 GHz	Fig.71	P
		6 GHz ~ 18 GHz	Fig.72	P
	All Channel	18 GHz ~ 26.5 GHz	Fig.73	P
		26.5 GHz ~ 40 GHz	Fig.74	P
	100(5500MHz)	30 MHz ~1 GHz	Fig.75	P
		1 GHz ~ 6 GHz	Fig.76	P
		6 GHz ~ 18 GHz	Fig.77	P
	116(5580MHz)	30 MHz ~1 GHz	Fig.78	P
		1 GHz ~ 6 GHz	Fig.79	P
		6 GHz ~ 18 GHz	Fig.80	P
	140(5700MHz)	30 MHz ~1 GHz	Fig.81	P
		1 GHz ~ 6 GHz	Fig.82	P
		6 GHz ~ 18 GHz	Fig.83	P
	All Channel	18 GHz ~ 26.5 GHz	Fig.84	P
		26.5 GHz ~ 40 GHz	Fig.85	P

802.11n-HT20 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n HT20	36(5180MHz)	30 MHz ~1 GHz	Fig.86	P
		1 GHz ~ 6 GHz	Fig.87	P
		6 GHz ~ 18 GHz	Fig.88	P
	40(5200MHz)	30 MHz ~1 GHz	Fig.89	P
		1 GHz ~ 6 GHz	Fig.90	P
		6 GHz ~ 18 GHz	Fig.91	P
	48(5240MHz)	30 MHz ~1 GHz	Fig.92	P
		1 GHz ~ 6 GHz	Fig.93	P
		6 GHz ~ 18 GHz	Fig.94	P
	All Channel	18 GHz ~ 26.5 GHz	Fig.95	P
		26.5 GHz ~ 40 GHz	Fig.96	P
	52(5260MHz)	30 MHz ~1 GHz	Fig.97	P
		1 GHz ~ 6 GHz	Fig.98	P
		6 GHz ~ 18 GHz	Fig.99	P
	56(5280MHz)	30 MHz ~1 GHz	Fig.100	P
		1 GHz ~ 6 GHz	Fig.101	P
		6 GHz ~ 18 GHz	Fig.102	P
	64(5320MHz)	30 MHz ~1 GHz	Fig.103	P
		1 GHz ~ 6 GHz	Fig.104	P
		6 GHz ~ 18 GHz	Fig.105	P
	All Channel	18 GHz ~ 26.5 GHz	Fig.106	P
		26.5 GHz ~ 40 GHz	Fig.107	P
	100(5500MHz)	30 MHz ~1 GHz	Fig.108	P
		1 GHz ~ 6 GHz	Fig.109	P
		6 GHz ~ 18 GHz	Fig.110	P
	116(5580MHz)	30 MHz ~1 GHz	Fig.111	P
		1 GHz ~ 6 GHz	Fig.112	P
		6 GHz ~ 18 GHz	Fig.113	P
	140(5700MHz)	30 MHz ~1 GHz	Fig.114	P
		1 GHz ~ 6 GHz	Fig.115	P
6 GHz ~ 18 GHz		Fig.116	P	
All Channel	18 GHz ~ 26.5 GHz	Fig.117	P	
	26.5 GHz ~ 40 GHz	Fig.118	P	

**802.11n-HT40 mode**

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n HT40	38(5190MHz)	30 MHz ~1 GHz	Fig.119	P
		1 GHz ~ 6 GHz	Fig.120	P
		6 GHz ~ 18 GHz	Fig.121	P
	46(5230MHz)	30 MHz ~1 GHz	Fig.122	P
		1 GHz ~ 6 GHz	Fig.123	P
		6 GHz ~ 18 GHz	Fig.124	P
	All Channel	18 GHz ~ 26.5 GHz	Fig.125	P
		26.5 GHz ~ 40 GHz	Fig.126	P
	54(5270MHz)	30 MHz ~1 GHz	Fig.127	P
		1 GHz ~ 6 GHz	Fig.128	P
		6 GHz ~ 18 GHz	Fig.129	P
	62(5310MHz)	30 MHz ~1 GHz	Fig.130	P
		1 GHz ~ 6 GHz	Fig.131	P
		6 GHz ~ 18 GHz	Fig.132	P
	All Channel	18 GHz ~ 26.5 GHz	Fig.133	P
		26.5 GHz ~ 40 GHz	Fig.134	P
	102(5510MHz)	30 MHz ~1 GHz	Fig.135	P
		1 GHz ~ 6 GHz	Fig.136	P
		6 GHz ~ 18 GHz	Fig.137	P
	110(5550MHz)	30 MHz ~1 GHz	Fig.138	P
		1 GHz ~ 6 GHz	Fig.139	P
		6 GHz ~ 18 GHz	Fig.140	P
	134(5670MHz)	30 MHz ~1 GHz	Fig.141	P
		1 GHz ~ 6 GHz	Fig.142	P
6 GHz ~ 18 GHz		Fig.143	P	
All Channel	18 GHz ~ 26.5 GHz	Fig.144	P	
	26.5 GHz ~ 40 GHz	Fig.145	P	

**802.11ac-HT80 mode**

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11ac HT80	42(5210MHz)	30 MHz ~1 GHz	Fig.146	P
		1 GHz ~ 3 GHz	Fig.147	P
		6 GHz ~ 18 GHz	Fig.148	P
	58(5290MHz)	30 MHz ~1 GHz	Fig.149	P
		1 GHz ~ 3 GHz	Fig.150	P
		6 GHz ~ 18 GHz	Fig.151	P
	106(5530MHz)	30 MHz ~1 GHz	Fig.152	P
		1 GHz ~ 3 GHz	Fig.153	P
		6 GHz ~ 18 GHz	Fig.154	P
	All Channel	18 GHz ~ 26.5 GHz	Fig.155	P
		26.5 GHz ~ 40 GHz	Fig.156	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:

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

**802.11a**

The worse case is measured in channel 52

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	$P_{Mea}$ (dBuV/m)	Polarization
17944.500	53.8	-17.7	45.6	25.9	V
17899.500	53.4	-18.5	45.6	26.3	H
17749.500	53.3	-18.5	45.6	26.2	H
17938.500	53.3	-17.7	45.6	25.4	H
17940.000	53.2	-17.7	45.6	25.3	V
17806.500	53.0	-18.5	45.6	25.9	H

**802.11n-HT20**

The worse case is measured in channel 36

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	$P_{Mea}$ (dBuV/m)	Polarization
5149.800	63.6	-35.1	34.6	64.100	H
17845.500	54.4	-18.5	45.6	27.300	V
17733.000	54.4	-18.9	45.6	27.700	H
17824.500	54.3	-18.5	45.6	27.200	V
17826.000	53.8	-18.5	45.6	26.700	H
17734.500	53.7	-18.9	45.6	27.000	V

**802.11n-HT40**

The worse case is measured in channel 54

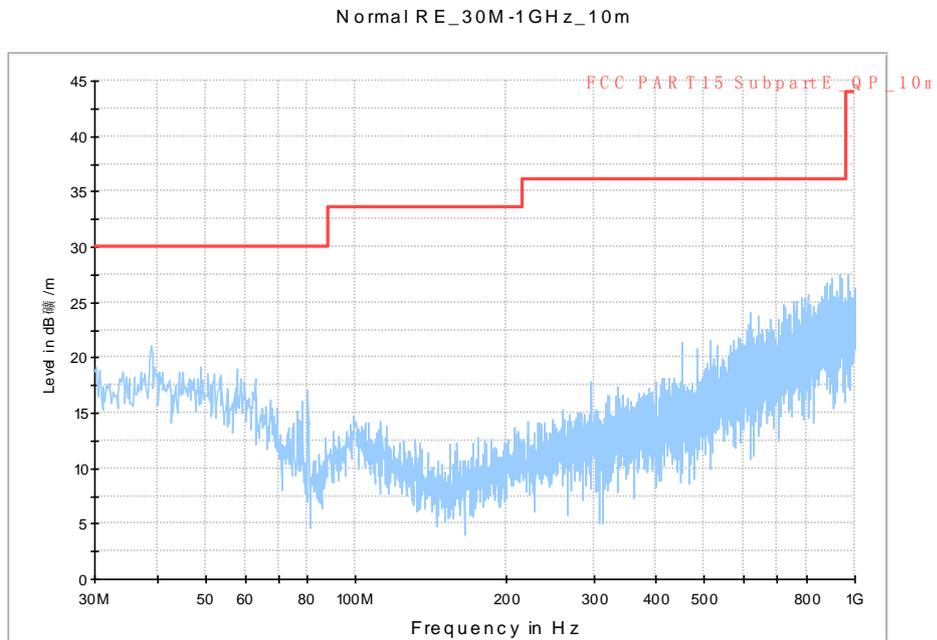
Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	$P_{Mea}$ (dBuV/m)	Polarization
17991.000	54.6	-17.7	45.6	26.7	H
17844.000	54.3	-18.5	45.6	27.2	V
17974.500	53.6	-17.7	45.6	25.7	H
17955.000	53.4	-17.7	45.6	25.5	V
17821.500	53.3	-18.5	45.6	26.2	V
17598.000	53.2	-18.9	45.6	26.5	H

**802.11ac-HT80**

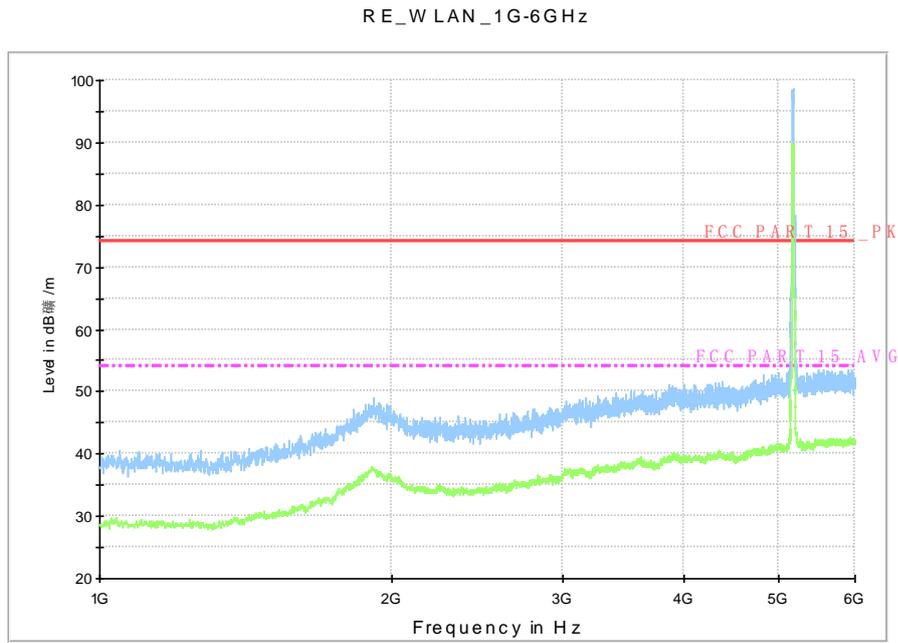
The worse case is measured in channel 58

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P <sub>Mea</sub> (dBuV/m)	Polarization
5350.625	53.8	-34.8	34.6	54.000	V
17527.500	53.8	-19.2	45.6	27.400	V
17820.000	53.6	-18.5	45.6	26.500	H
17793.000	53.3	-18.5	45.6	26.200	V
17956.500	53.3	-17.7	45.6	25.400	H
17977.500	52.6	-17.7	45.6	24.700	H

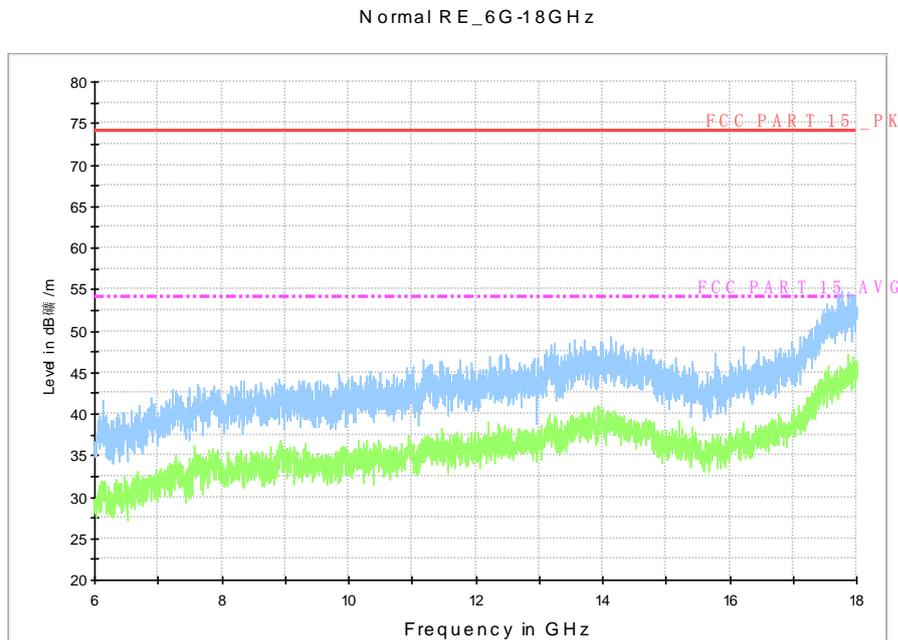
Test graphs as below:



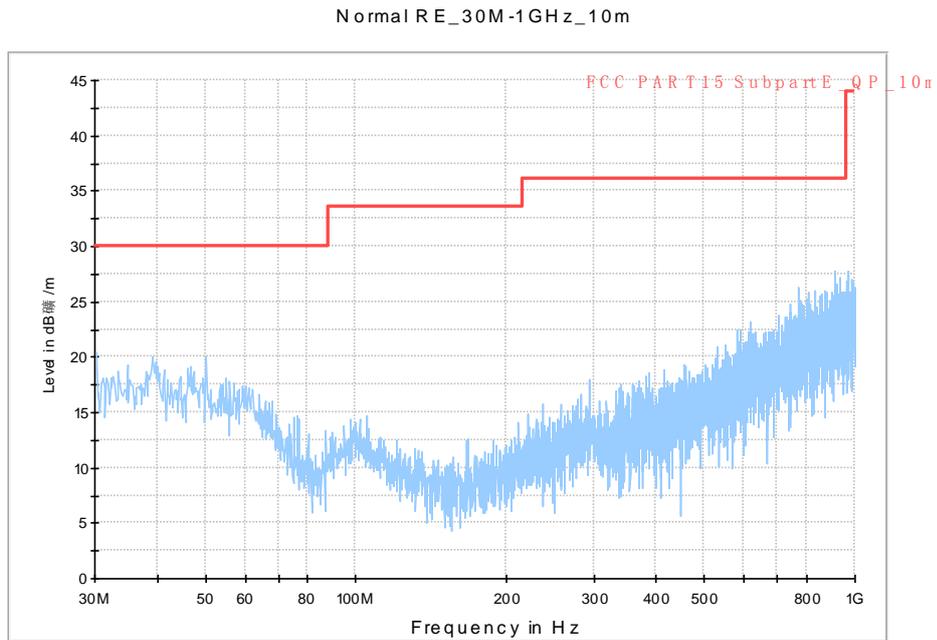
**Fig. 53 Radiated Spurious Emission (802.11 a, ch36, 30 MHz-1 GHz)**



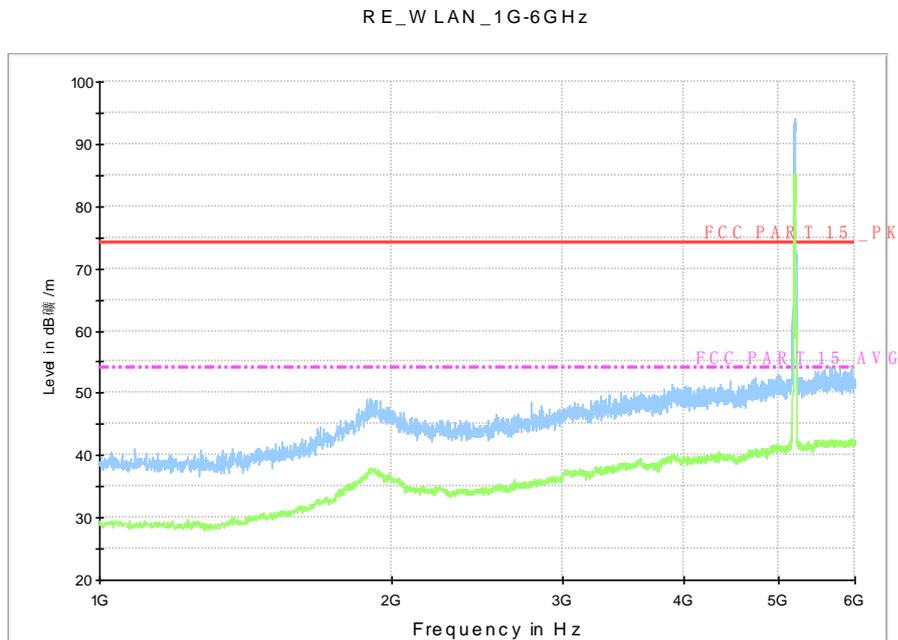
**Fig. 54 Radiated Spurious Emission (802.11a, ch36, 1 GHz-6 GHz)**



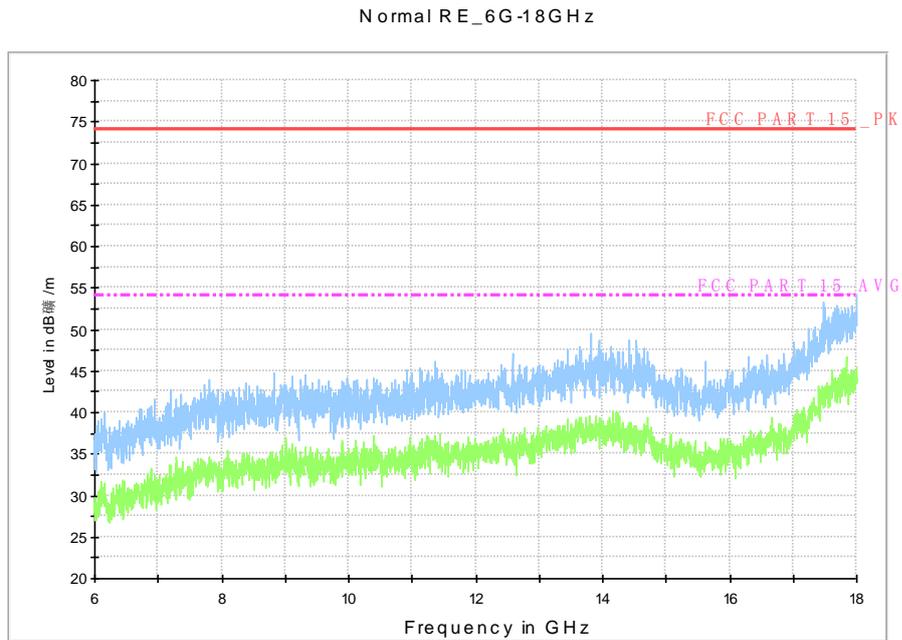
**Fig. 55 Radiated Spurious Emission (802.11a, ch36, 6 GHz-18 GHz)**



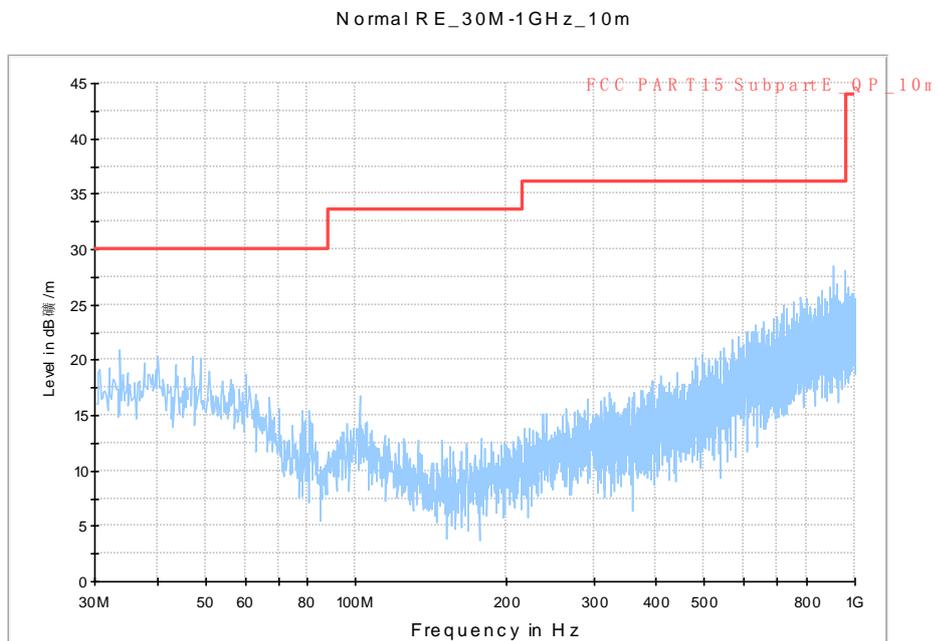
**Fig. 56 Radiated Spurious Emission (802.11a, ch40, 30 MHz-1 GHz)**



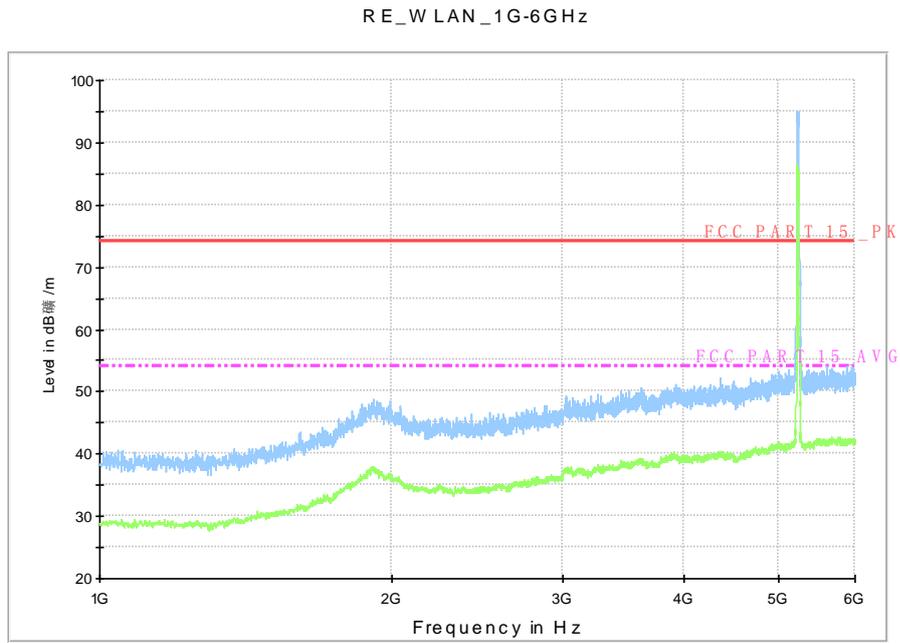
**Fig. 57 Radiated Spurious Emission (802.11a, ch40, 1 GHz-6 GHz)**



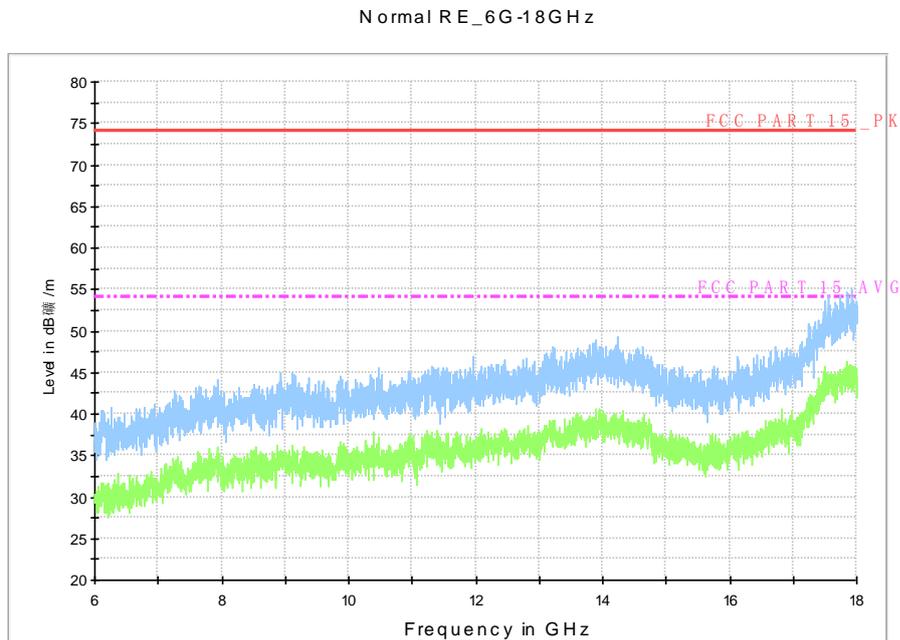
**Fig. 58 Radiated Spurious Emission (802.11a, ch40, 6 GHz-18 GHz)**



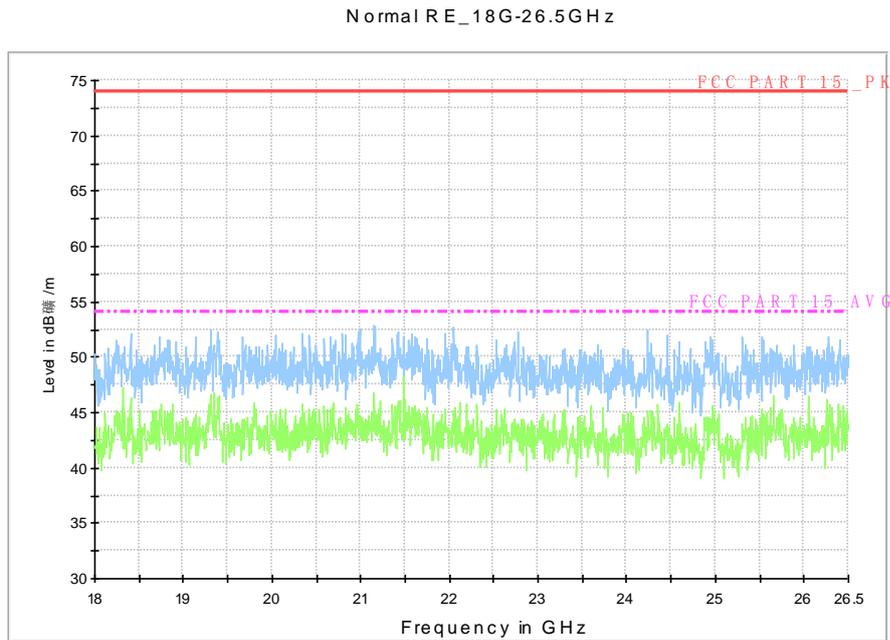
**Fig. 59 Radiated Spurious Emission (802.11a, ch48, 30 MHz-1 GHz)**



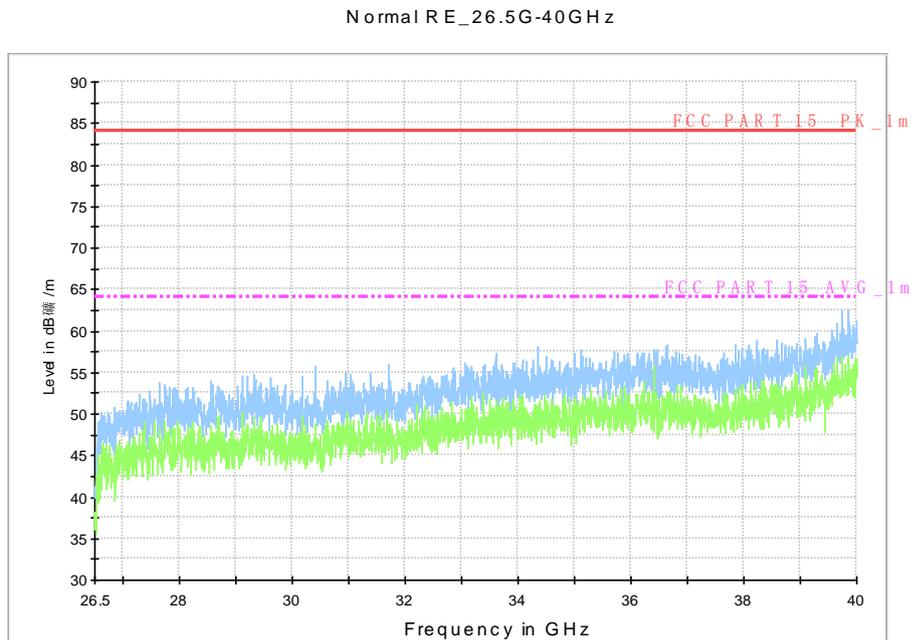
**Fig. 60 Radiated Spurious Emission (802.11a, ch48, 1 GHz-6 GHz)**



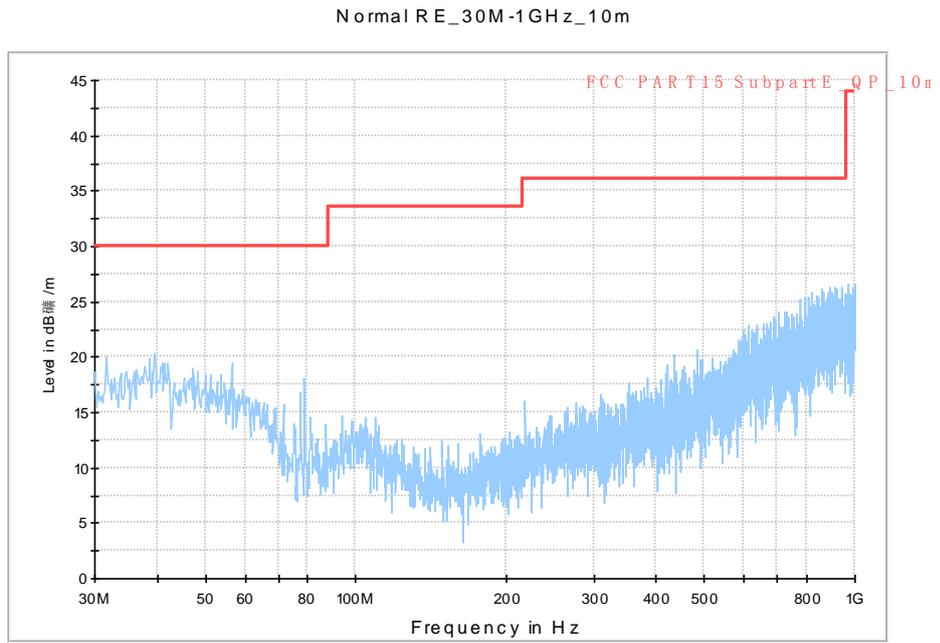
**Fig. 61 Radiated Spurious Emission (802.11a, ch48, 6 GHz-18 GHz)**



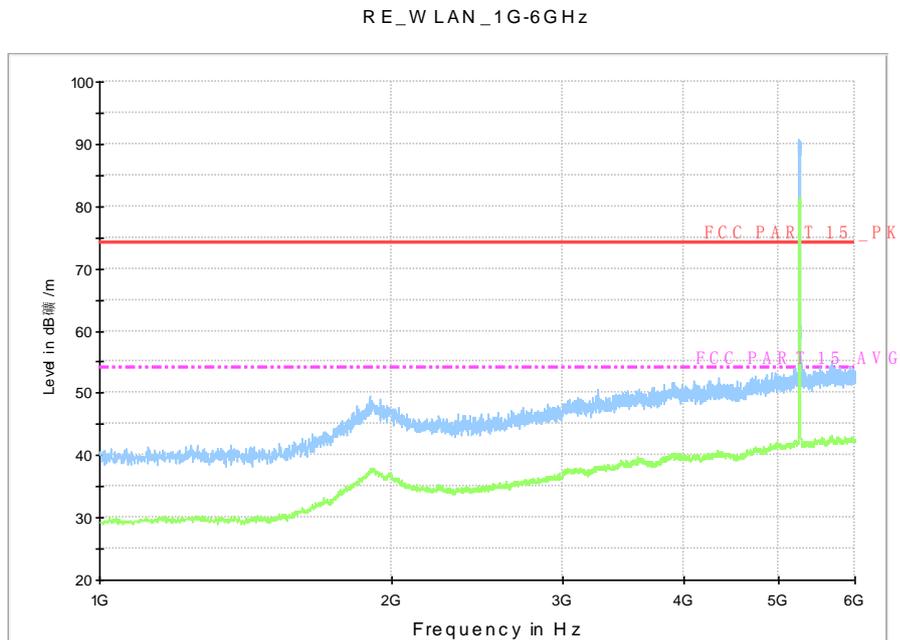
**Fig. 62 Radiated Spurious Emission (802.11a, UNII1, 18 GHz-26.5 GHz)**



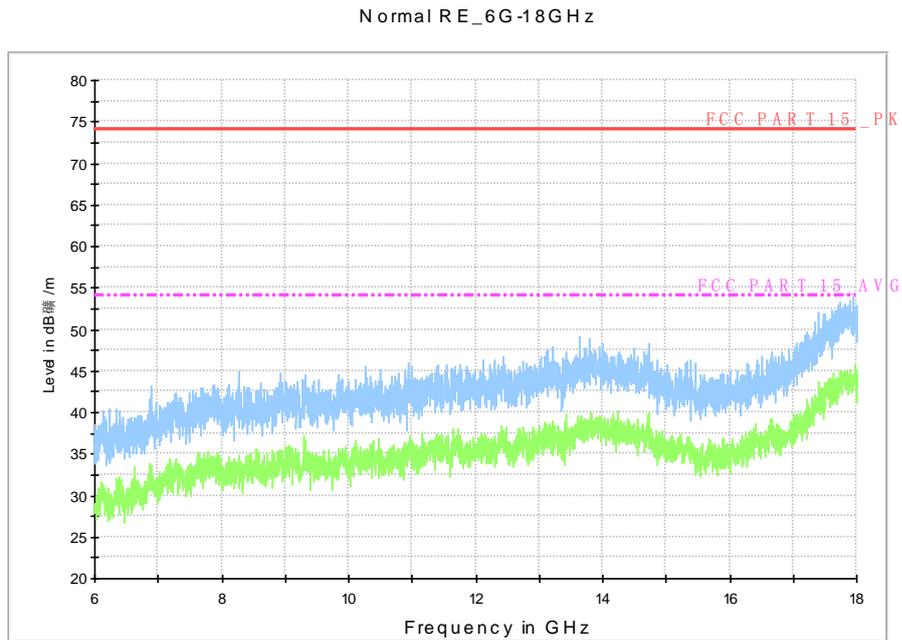
**Fig. 63 Radiated Spurious Emission (802.11a, UNII1, 26.5 GHz-40 GHz)**



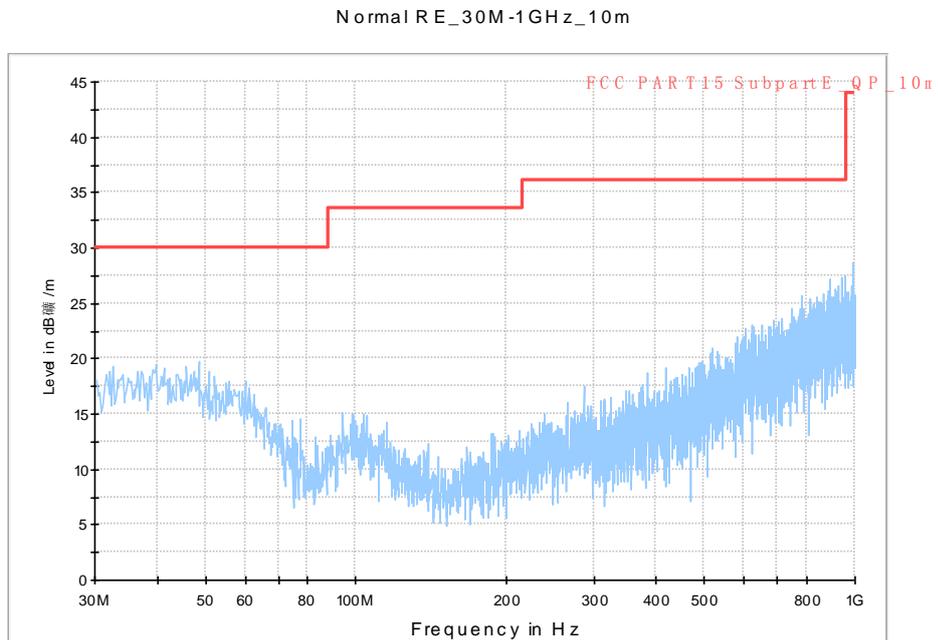
**Fig. 64 Radiated Spurious Emission (802.11a, ch52, 30 MHz-1 GHz)**



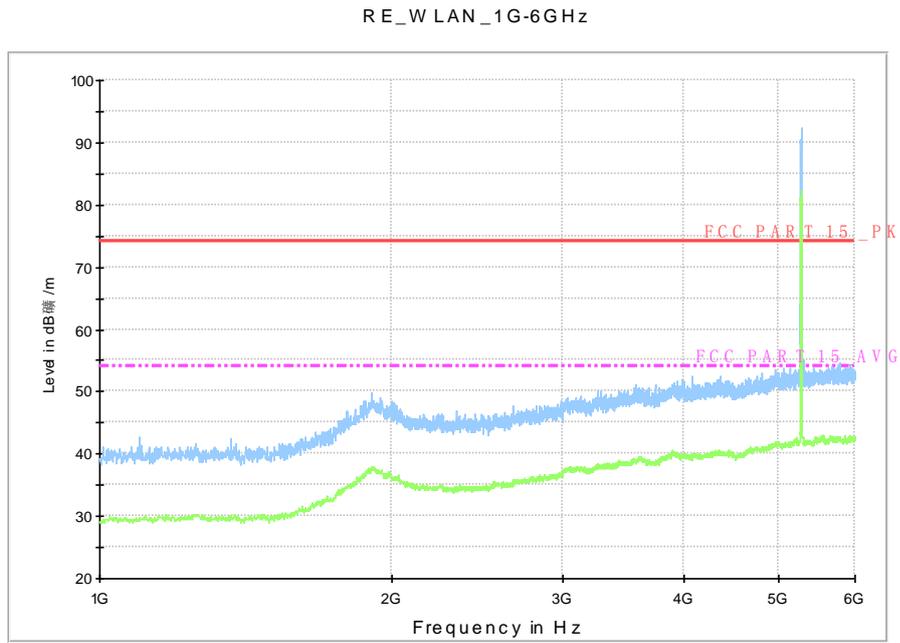
**Fig. 65 Radiated Spurious Emission (802.11a, ch52, 1 GHz-6 GHz)**



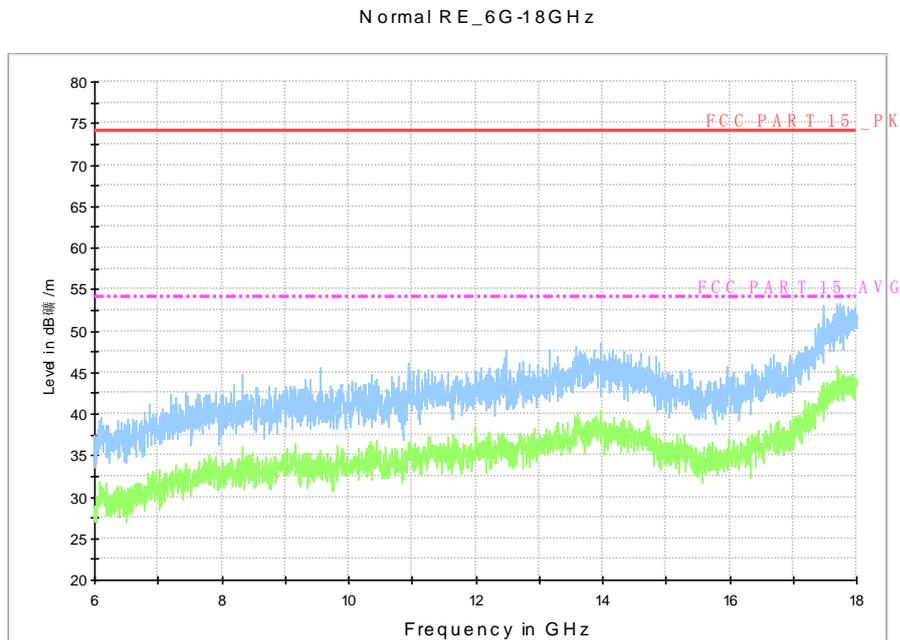
**Fig. 66 Radiated Spurious Emission (802.11a, ch52, 6 GHz-18 GHz)**



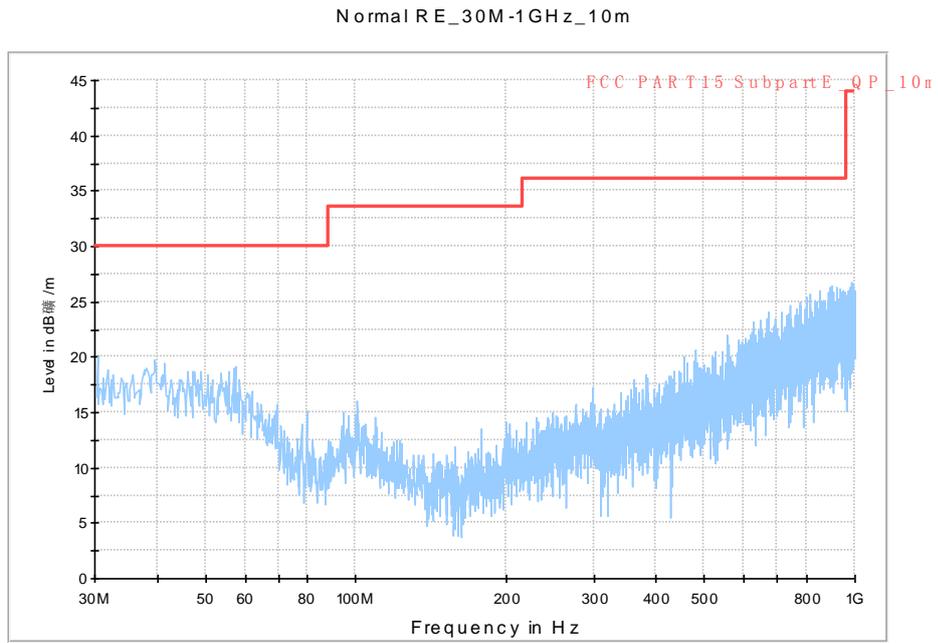
**Fig. 67 Radiated Spurious Emission (802.11a, ch56, 30 MHz-1 GHz)**



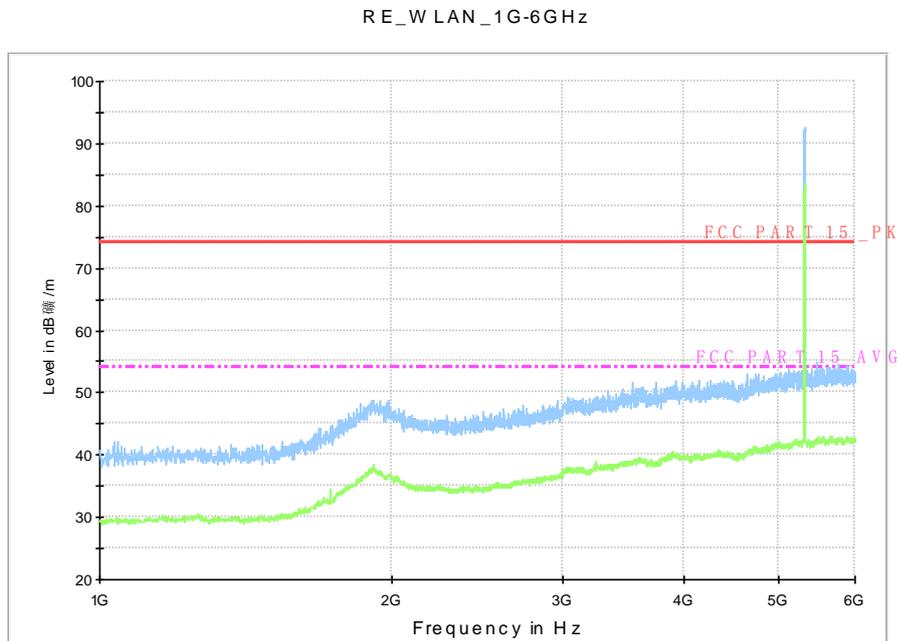
**Fig. 68 Radiated Spurious Emission (802.11a, ch56, 1 GHz-6 GHz)**



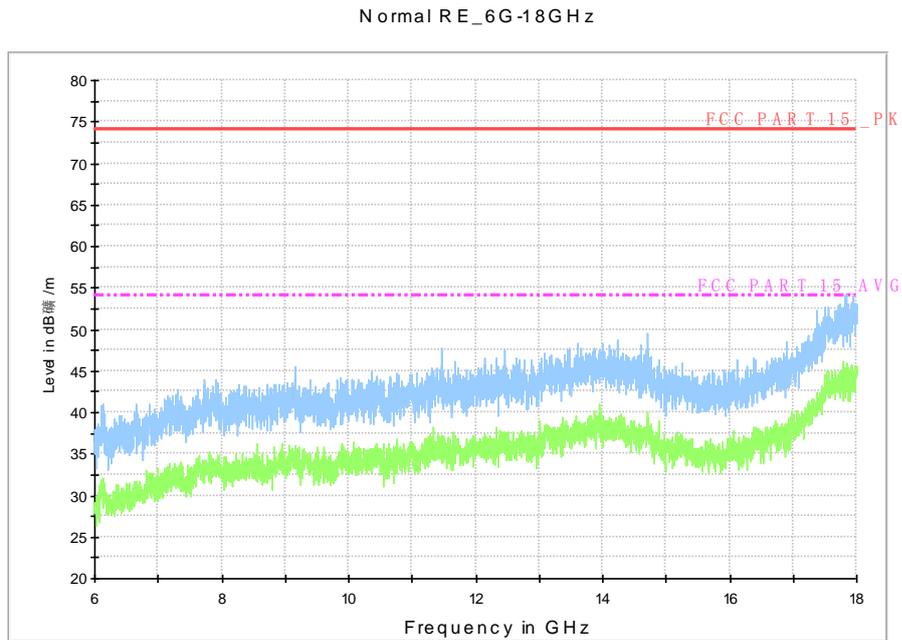
**Fig. 69 Radiated Spurious Emission (802.11a, ch56, 6 GHz-18 GHz)**



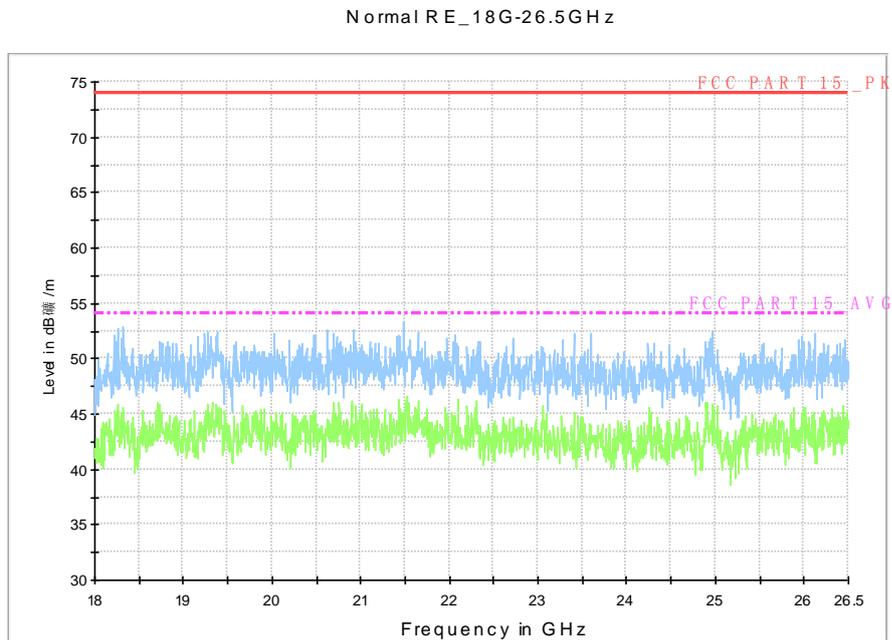
**Fig. 70 Radiated Spurious Emission (802.11a, ch64, 30 MHz-1 GHz)**



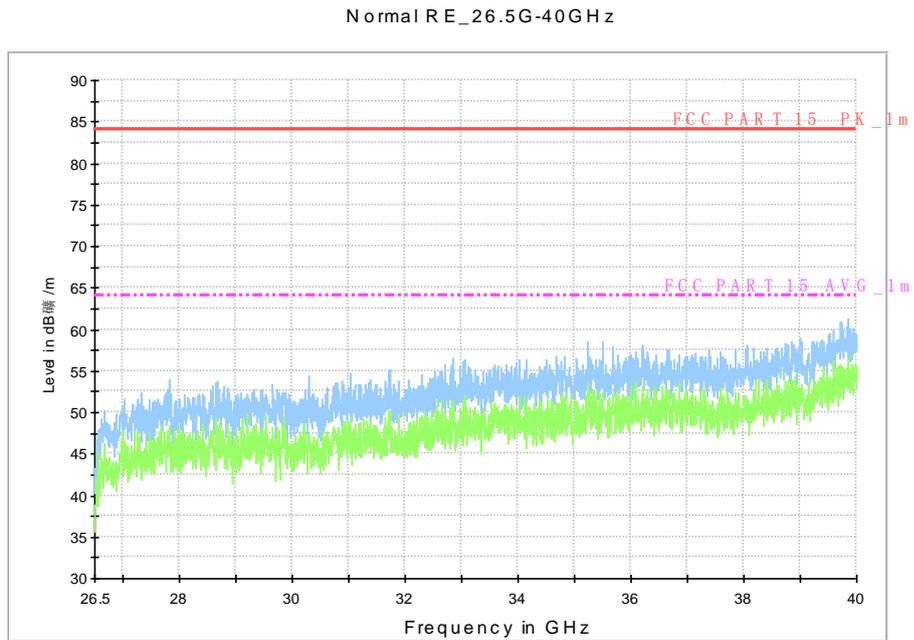
**Fig. 71 Radiated Spurious Emission (802.11a, ch64, 1 GHz-6 GHz)**



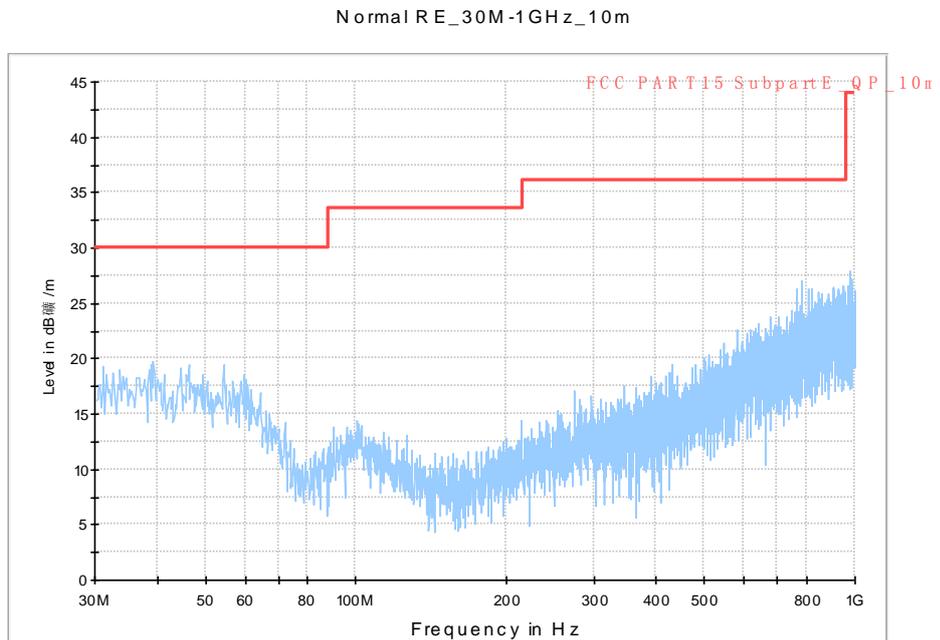
**Fig. 72 Radiated Spurious Emission (802.11a, ch64, 6 GHz-18 GHz)**



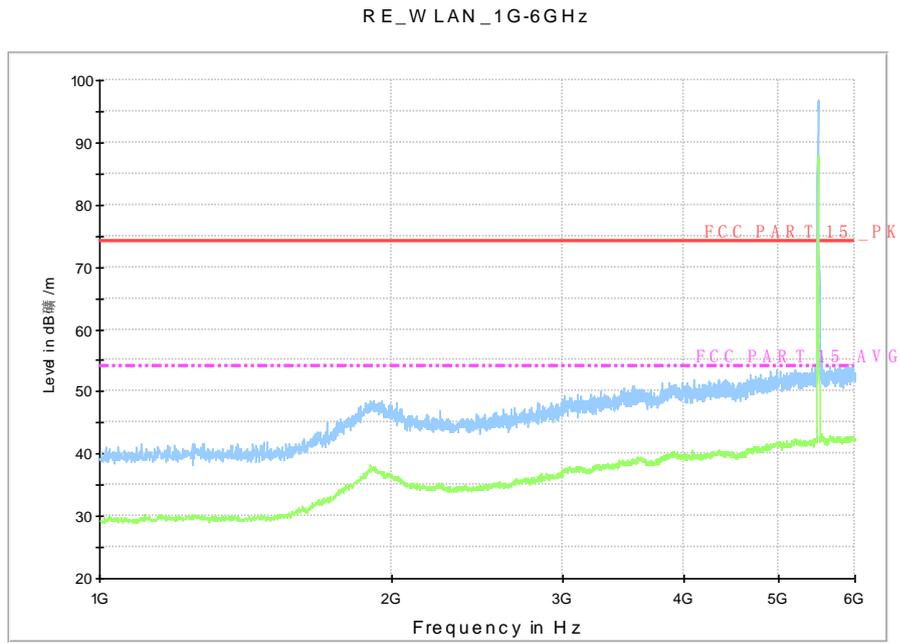
**Fig. 73 Radiated Spurious Emission (802.11a, UNII2, 18 GHz-26.5 GHz)**



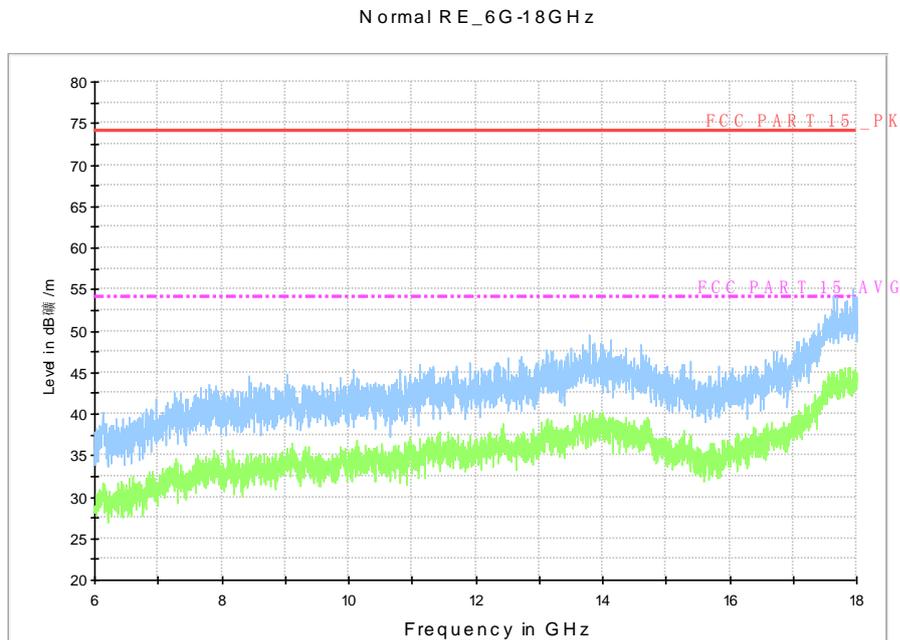
**Fig. 74 Radiated Spurious Emission (802.11a, UNII2, 26.5 GHz-40 GHz)**



**Fig. 75 Radiated Spurious Emission (802.11a, ch100, 30 MHz-1 GHz)**



**Fig. 76 Radiated Spurious Emission (802.11a, ch100, 1 GHz-6 GHz)**



**Fig. 77 Radiated Spurious Emission (802.11a, ch100, 6 GHz-18 GHz)**