FCC PART 15
TEST REPORT
No. 2013WLN0736

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

Test Laboratory:
TMC Beijing, Telecommunication Metrology Center of Ministry of Industry and Information Technology
No. 52, Huayuan Bei Road, Haidian District, Beijing, P.R.China 100191
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CONTENTS

1. TEST LATORATORY

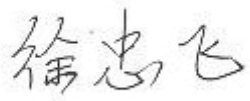
1.1. Testing Location

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

1.2. Project data

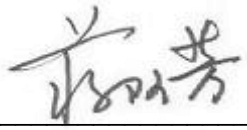
Testing Start Date:	2013-08-14
Testing End Date:	2013-10-15

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	Ma, Gang
Telephone:	+86-10-58656312
Fax:	+86-10-58659049

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	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 Bands: -5150MHz~5250MHz -5250MHz~5350MHz -5470MHz~5725MHz
Type of modulation	OFDM
Antenna	Integral Antenna
MAX Conducted Power	17.97dBm(OFDM)
MAX Radiated Power	17.21dBm(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	Title 47 of the Code of Federal Regulations; Chapter I Part 15 - Radio frequency devices	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
UNII: KDB 789033	Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E	2012-09

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/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

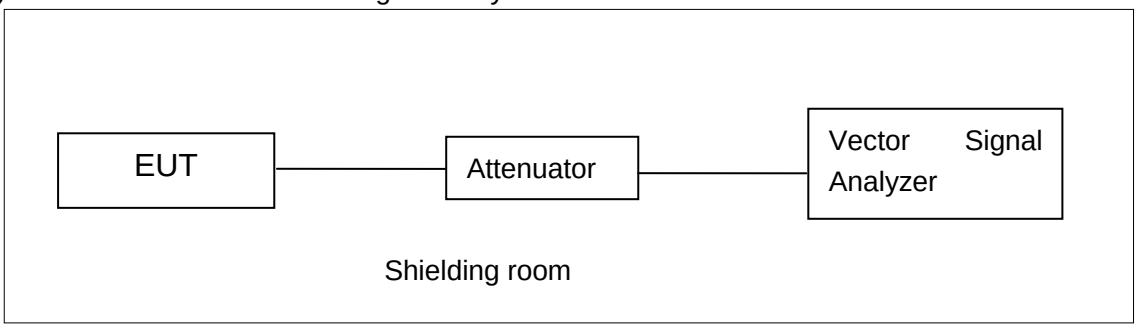
No.	Equipment	Model	Serial Number	Manufacturer	Calibration date	Calibration Due date
1	Test Receiver	ESU26	100376	Rohde & Schwarz	2012-11-8	2013-11-7
2	BiLog Antenna	VULB9163	9163-514	Schwarzbeck	2011-11-11	2014-11-10
3	Dual-Ridge Waveguide Horn Antenna	3117	00119024	ETS-Lindgren	2011-2-2	2014-2-1
4	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

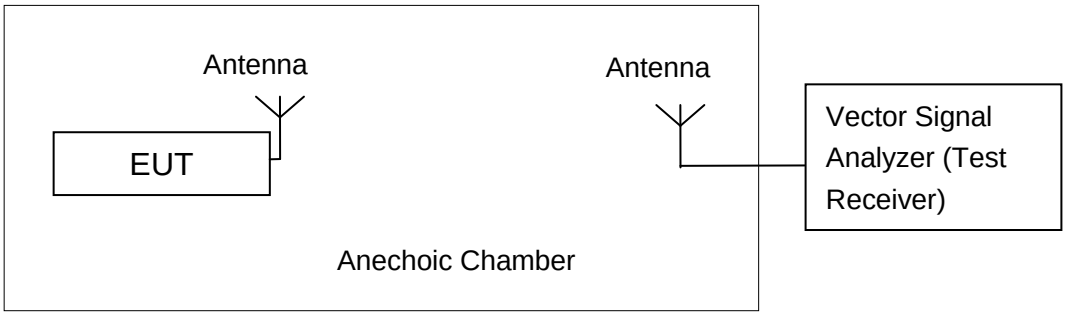
A.1.1. Conducted Measurements

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

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)	15.89	15.78	15.72	15.58	15.41	15.23	15.06	14.93

OFDM/n-HT20 mode	Maximum Conducted Power (dBm)							
data rate (Mbps)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
36 (5180 MHz)	16.62	16.45	16.37	16.26	16.03	13.71	13.65	11.73

OFDM/n-HT40 mode	Maximum Conducted Power (dBm)							
data rate (Index)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
38 (5190 MHz)	16.81	16.77	16.55	16.36	16.01	15.79	14.83	14.73

OFDM/ac-HT80 mode	Maximum Conducted Power (dBm)							
data rate (Index)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
42 (5210 MHz)	9.45	9.41	9.35	9.28	9.18	9.28	9.26	9.27

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.

Test	Channel		
Tnom,Vnom	Low(5180MHz)	Middle (5320MHz)	High(5700MHz)
Conducted Power(dBm)	22.86	22.67	21.31
Radiated Power(dBm)	22.80	22.20	18.25
Gain(dBi)	-0.06	-0.47	-3.06

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)	15.89	15.84	16.14	16.24	16.47	16.50
radiated(dBm)	15.83	15.78	16.08	15.77	16.00	16.03

Type	Test Result		
	5500MHz (Ch100)	**5600MHz (Ch120)**	**5700MHz (Ch140)**
conducted(dBm)	16.78	16.60	16.78
radiated(dBm)	13.72	13.54	13.72

802.11n-HT20 mode

Type	Test Result					
	5180MHz (Ch36)	**5200MHz (Ch40)**	**5240MHz (Ch48)**	**5260MHz (Ch52)**	**5280MHz (Ch56)**	**5320 MHz (Ch64)**
Conducted(dBm)	16.95	16.97	16.98	17.29	17.55	17.51
radiated(dBm)	16.89	16.91	16.92	16.82	17.08	17.04

Type	Test Result		
	5500MHz (Ch100)	**5600MHz (Ch120)**	**5700MHz (Ch140)**
conducted(dBm)	17.75	17.37	17.56
radiated(dBm)	14.69	14.31	14.50

802.11n-HT40 mode

Type	Test Result			
	5190MHz (Ch38)	5230MHz (Ch46)	5270MHz (Ch55)	5310 MHz (Ch63)
conducted(dBm)	16.89	16.96	17.51	17.68
radiated(dBm)	16.83	16.90	17.04	17.21

Type	Test Result		
	5510MHz (Ch102)	5590MHz (Ch118)	5670MHz (Ch134)
conducted(dBm)	17.97	17.31	17.65
radiated(dBm)	14.91	14.25	14.59

802.11ac-HT80 mode

Type	Test Result		
	5210MHz (Ch42)	5290MHz (Ch58)	5530MHz (Ch106)
conducted(dBm)	9.46	9.21	9.69
radiated(dBm)	9.40	8.74	6.63

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

Measurement Results:

Mode	Channel	Power Spectral Density (dBm/MHz)	Conclusion
802.11a	5180 MHz	-8.17	P
	5200 MHz	-8.04	P
	5240 MHz	-7.65	P
	5260 MHz	-7.54	P
	5280 MHz	-6.47	P
	5320 MHz	-8.31	P
	5500 MHz	-7.38	P
	5600 MHz	-8.14	P
	5700 MHz	-6.37	P
802.11n HT20	5180 MHz	-6.14	P
	5200 MHz	-6.62	P
	5240 MHz	-6.71	P
	5260 MHz	-7.35	P
	5280 MHz	-7.94	P
	5320 MHz	-7.31	P
	5500 MHz	-5.26	P
	5600 MHz	-7.77	P
	5700 MHz	-7.81	P
802.11n HT40	5190 MHz	-10.05	P
	5230 MHz	-10.05	P
	5270 MHz	-9.88	P
	5310 MHz	-10.40	P
	5510 MHz	-9.40	P
	5590 MHz	-10.01	P
	5670 MHz	-10.23	P
802.11ac HT80	5210 MHz	-22.54	P
	5290 MHz	-22.04	P
	5530 MHz	-21.71	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

Measurement Result:

Mode	Channel	Occupied 26dB Bandwidth (kHz)		conclusion
802.11a	5180 MHz	Fig.1	21458	P
	5200 MHz	Fig.2	21234	P
	5240 MHz	Fig.3	21394	P
	5260 MHz	Fig.4	21186	P
	5280 MHz	Fig.5	21394	P
	5320 MHz	Fig.6	21635	P
	5500 MHz	Fig.7	21394	P
	5600 MHz	Fig.8	21635	P
	5700 MHz	Fig.9	21875	P
802.11n HT20	5180 MHz	Fig.10	21795	P
	5200 MHz	Fig.11	21234	P
	5240 MHz	Fig.12	21474	P
	5260 MHz	Fig.13	21506	P
	5280 MHz	Fig.14	21635	P
	5320 MHz	Fig.15	21635	P
	5500 MHz	Fig.16	21715	P
	5600 MHz	Fig.17	21474	P
	5700 MHz	Fig.18	21715	P
802.11n HT40	5190 MHz	Fig.19	40865	P
	5230 MHz	Fig.20	41186	P
	5270 MHz	Fig.21	41090	P
	5310 MHz	Fig.22	41827	P
	5510 MHz	Fig.23	40545	P
	5590 MHz	Fig.24	41090	P
	5670 MHz	Fig.25	40545	P
802.11ac HT80	5210 MHz	Fig.26	78269	P
	5290 MHz	Fig.27	78462	P
	5530 MHz	Fig.28	78462	P

Conclusion: PASS

Test graphs as below:

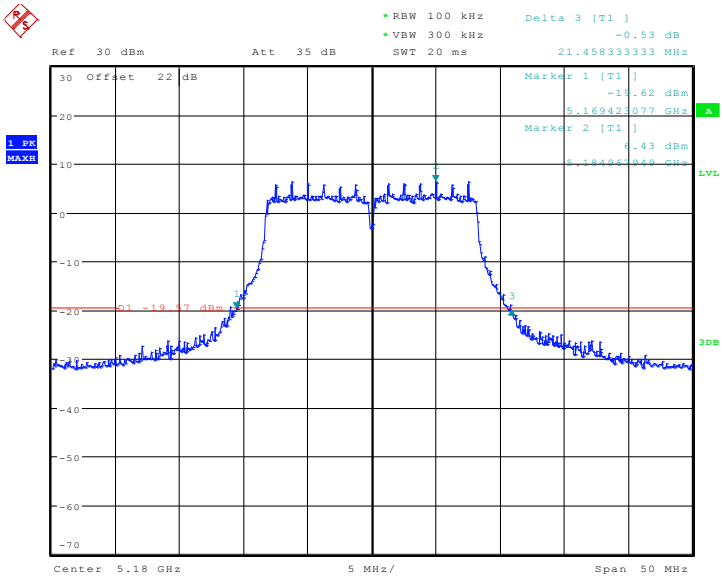


Fig. 1 Occupied 26dB Bandwidth (802.11a, 5180MHz)

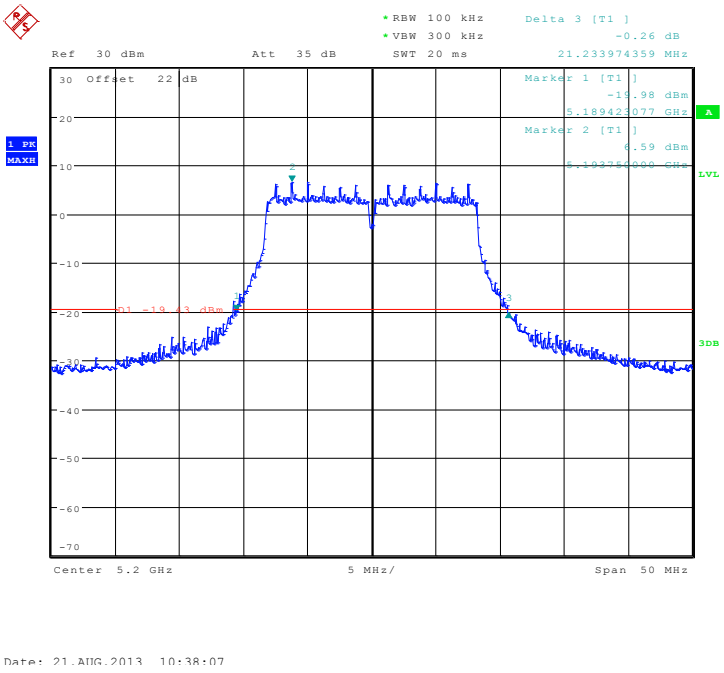


Fig. 2 Occupied 26dB Bandwidth (802.11a, 5200MHz)

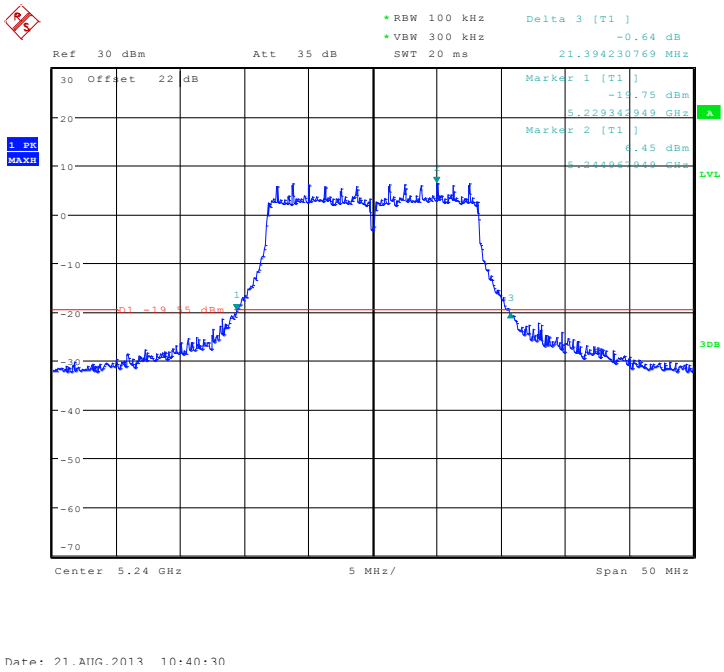


Fig. 3 Occupied 26dB Bandwidth (802.11a, 5240MHz)

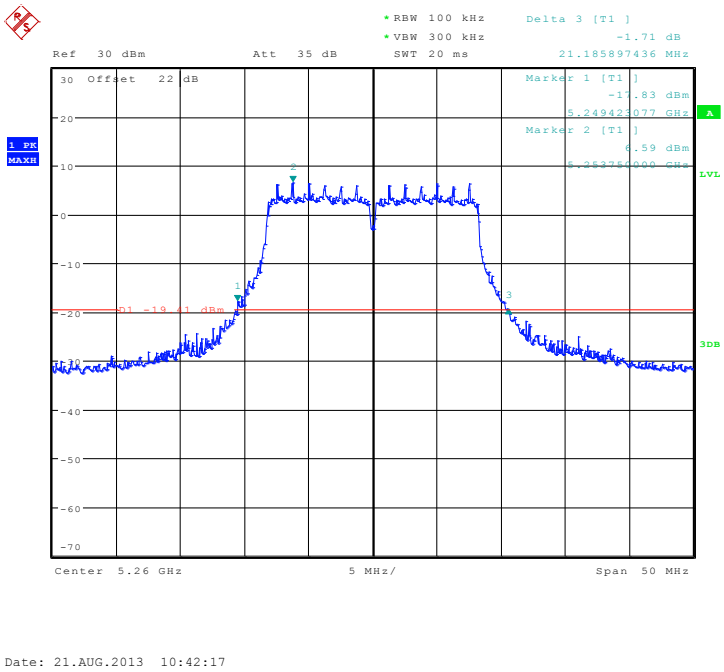


Fig. 4 Occupied 26dB Bandwidth (802.11a, 5260MHz)

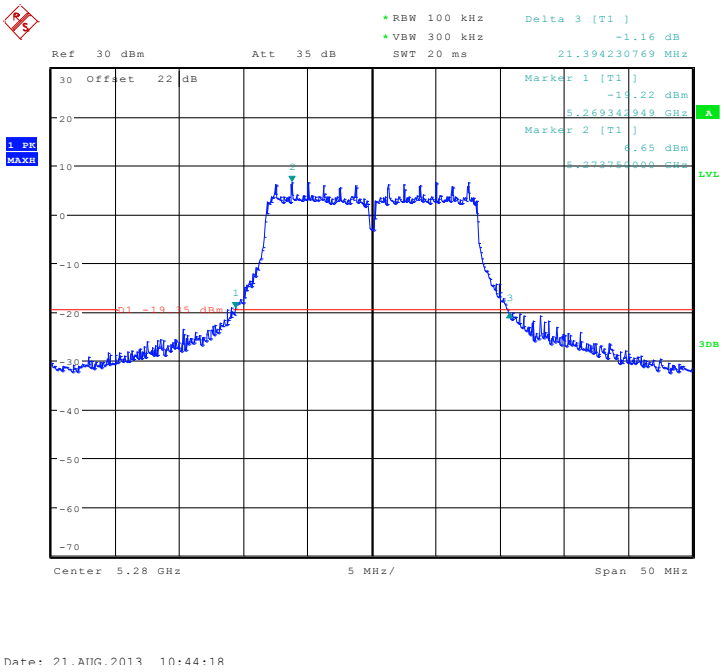


Fig. 5 Occupied 26dB Bandwidth (802.11a, 5280MHz)

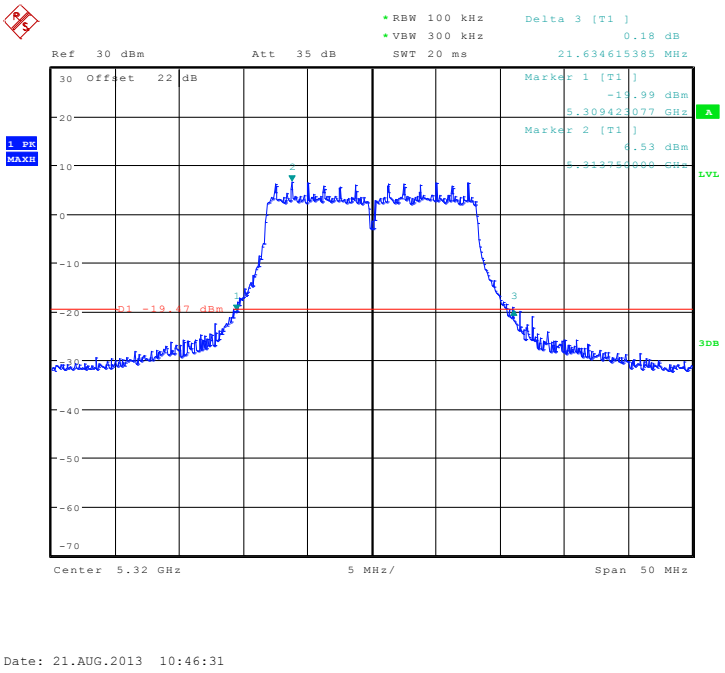


Fig. 6 Occupied 26dB Bandwidth (802.11a, 5320MHz)

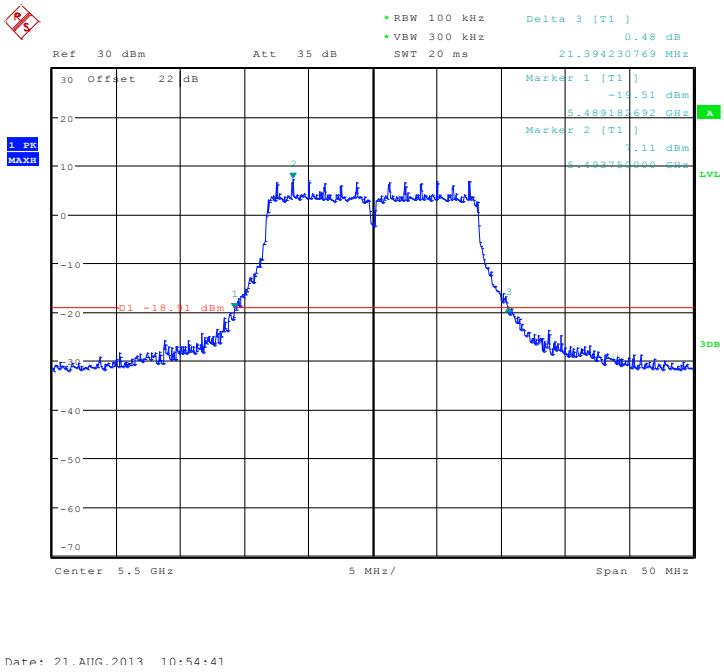


Fig. 7 Occupied 26dB Bandwidth (802.11a, 5500MHz)

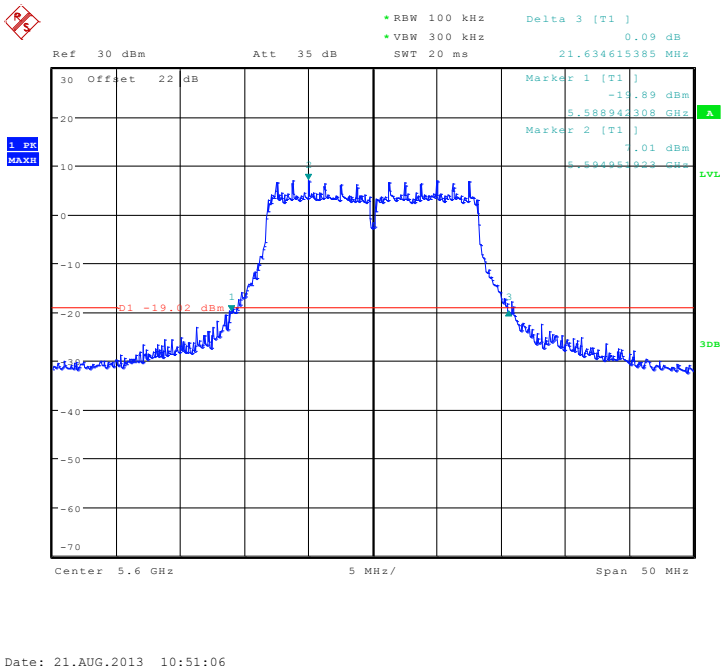


Fig. 8 Occupied 26dB Bandwidth (802.11a, 5600MHz)

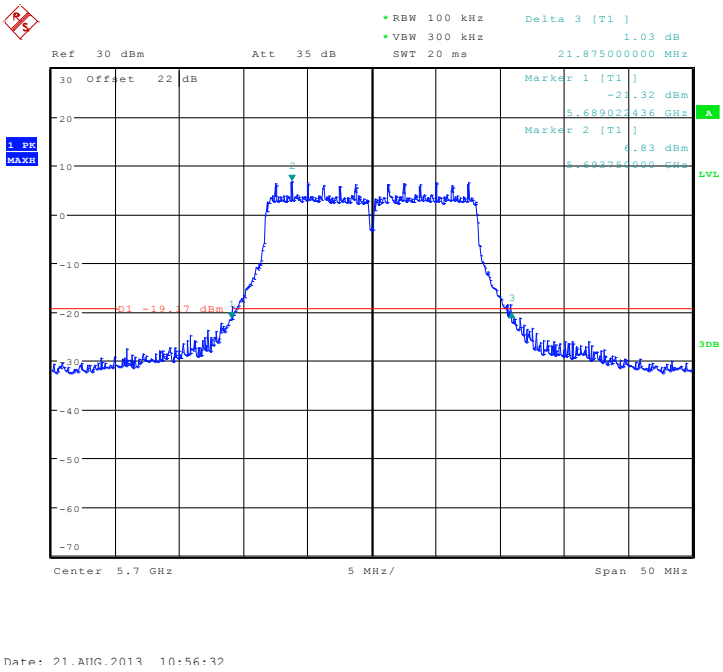


Fig. 9 Occupied 26dB Bandwidth (802.11a, 5700MHz)

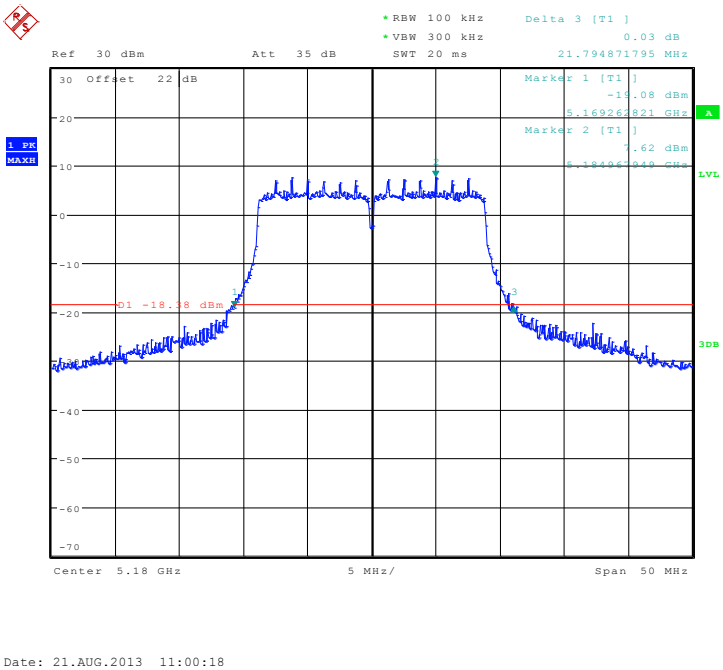


Fig. 10 Occupied 26dB Bandwidth (802.11n-HT20, 5180MHz)

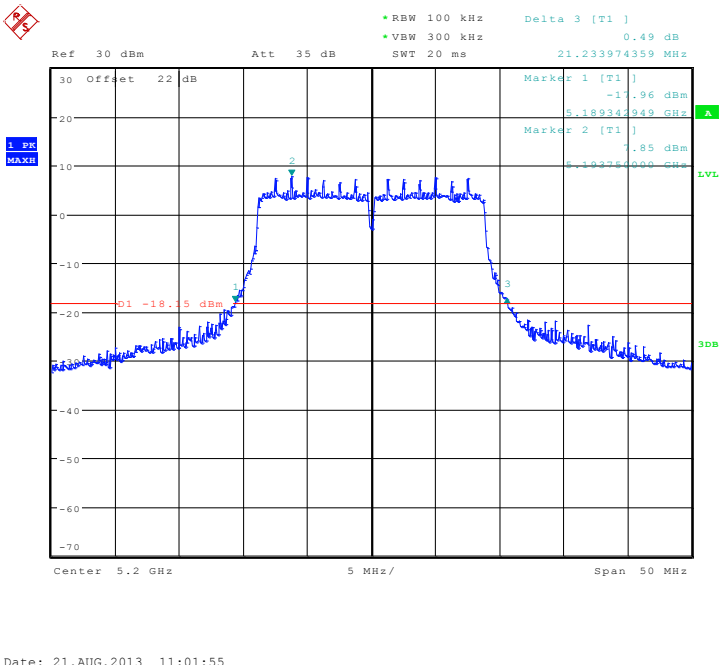


Fig. 11 Occupied 26dB Bandwidth (802.11n-HT20, 5200MHz)

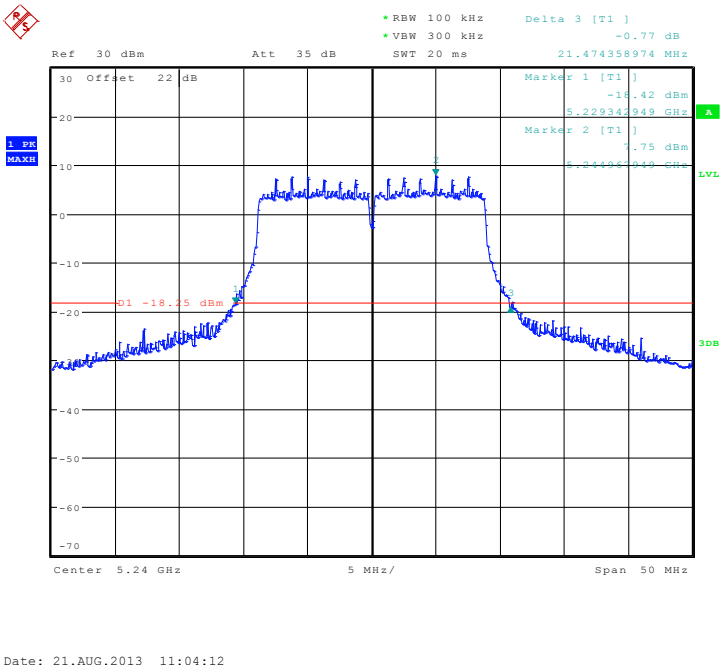


Fig. 12 Occupied 26dB Bandwidth (802.11n-HT20, 5240MHz)

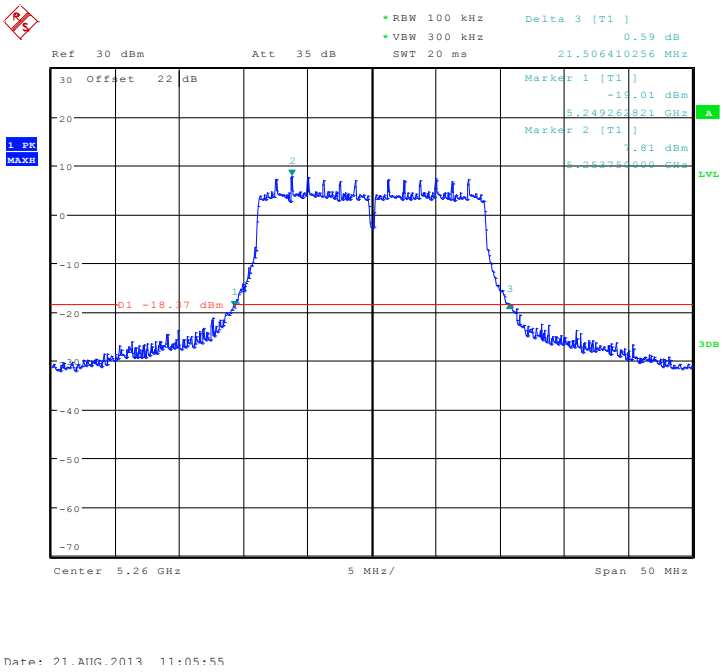


Fig. 13 Occupied 26dB Bandwidth (802.11n-HT20, 5260MHz)

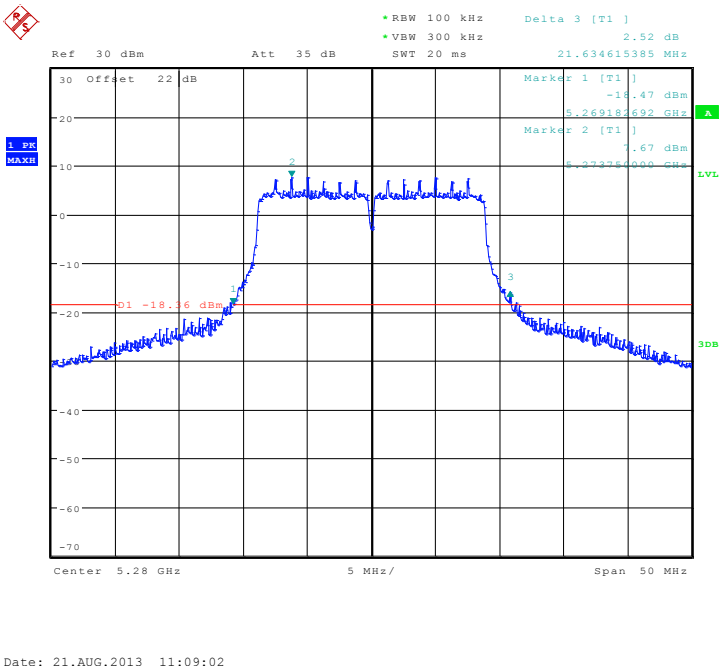


Fig. 14 Occupied 26dB Bandwidth (802.11n-HT20, 5280MHz)

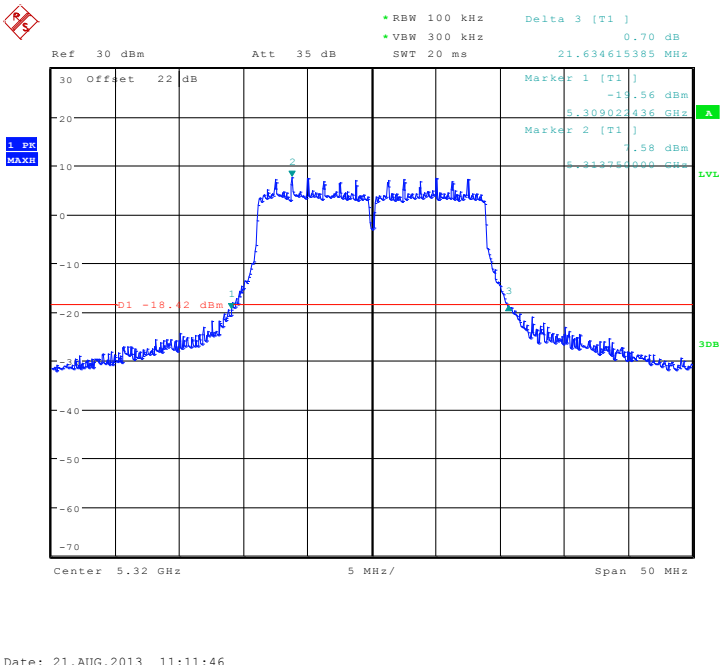


Fig. 15 Occupied 26dB Bandwidth (802.11n-HT20, 5320MHz)

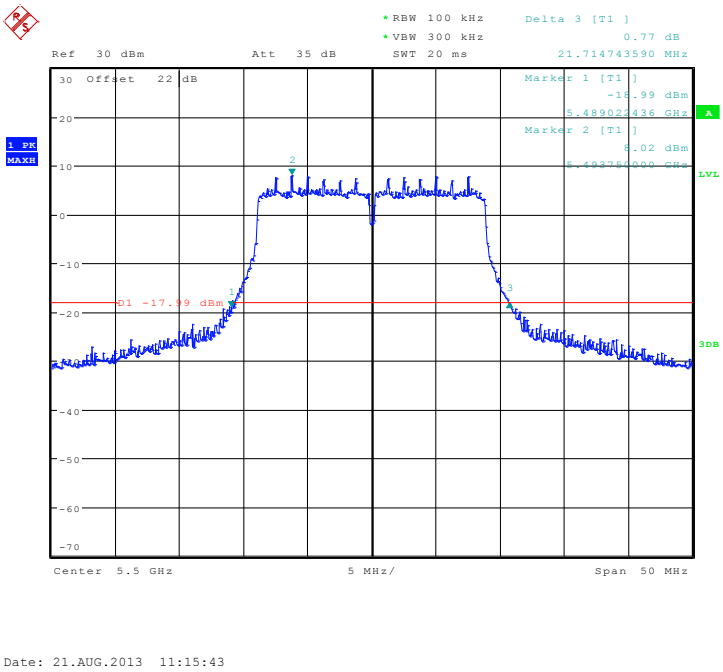


Fig. 16 Occupied 26dB Bandwidth (802. 11n-HT20, 5500MHz)

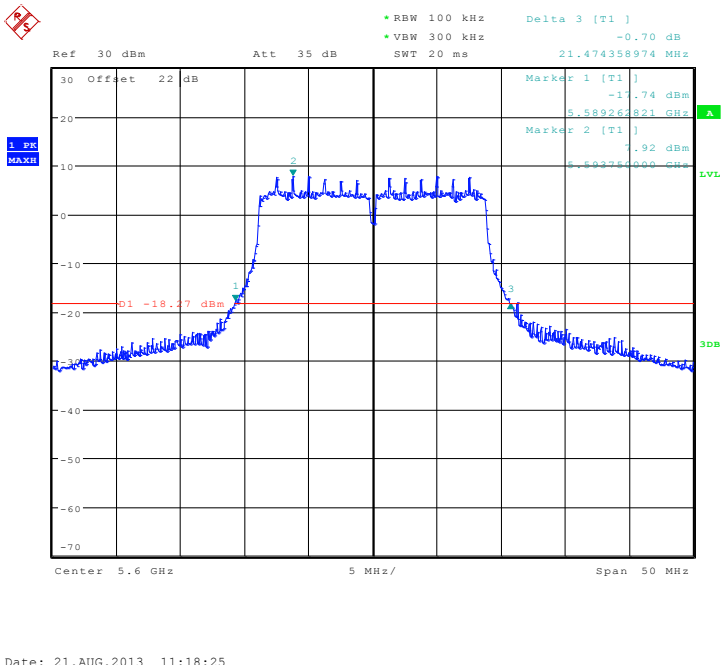


Fig. 17 Occupied 26dB Bandwidth (802. 11n-HT20, 5600MHz)

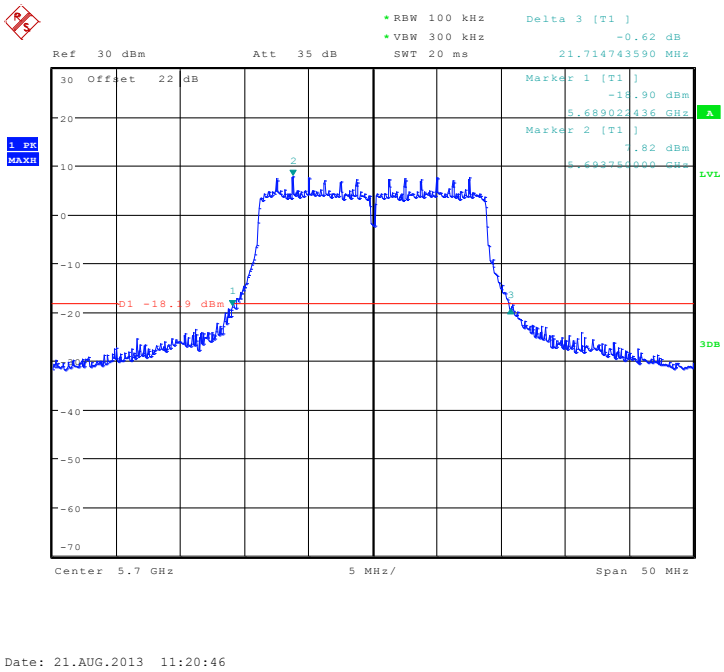


Fig. 18 Occupied 26dB Bandwidth (802. 11n-HT20, 5700MHz)

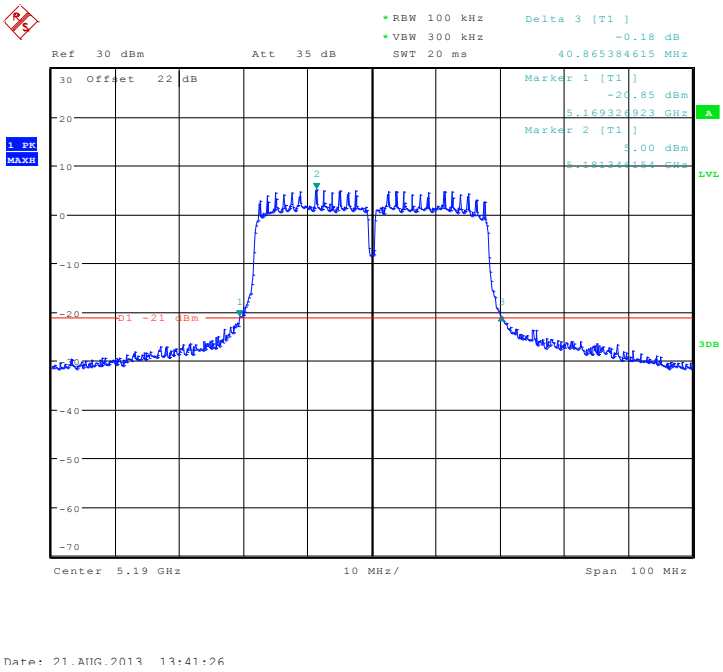


Fig. 19 Occupied 26dB Bandwidth (802.11n-HT40, 5190MHz)

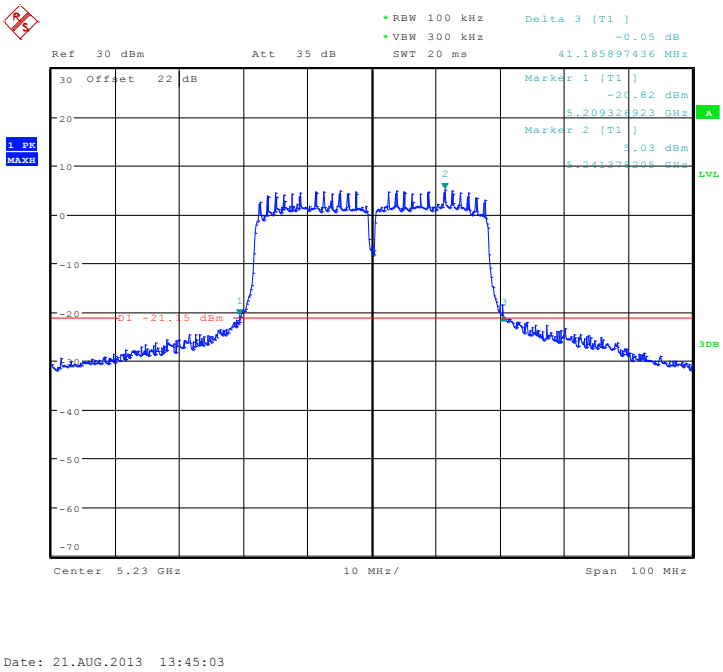


Fig. 20 Occupied 26dB Bandwidth (802.11n-HT40, 5230MHz)

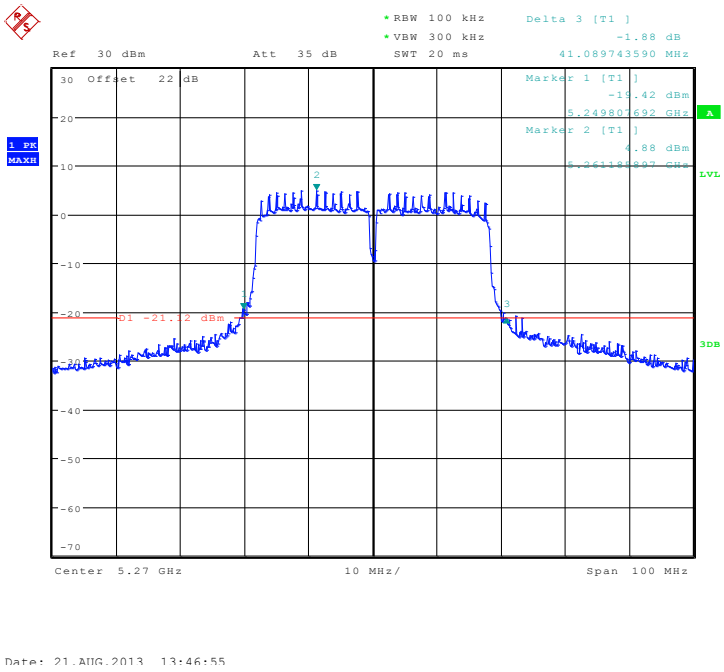


Fig. 21 Occupied 26dB Bandwidth (802.11n-HT40, 5270MHz)

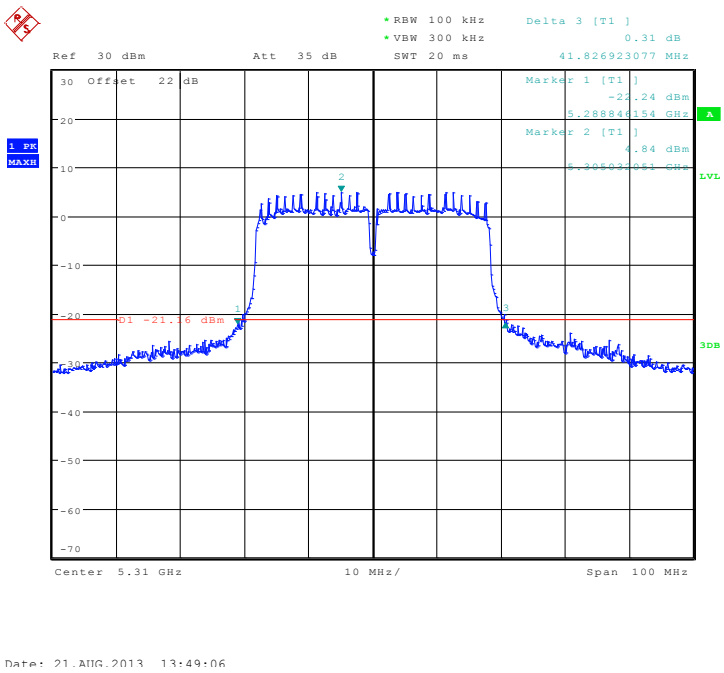


Fig. 22 Occupied 26dB Bandwidth (802.11n-HT40, 5310MHz)

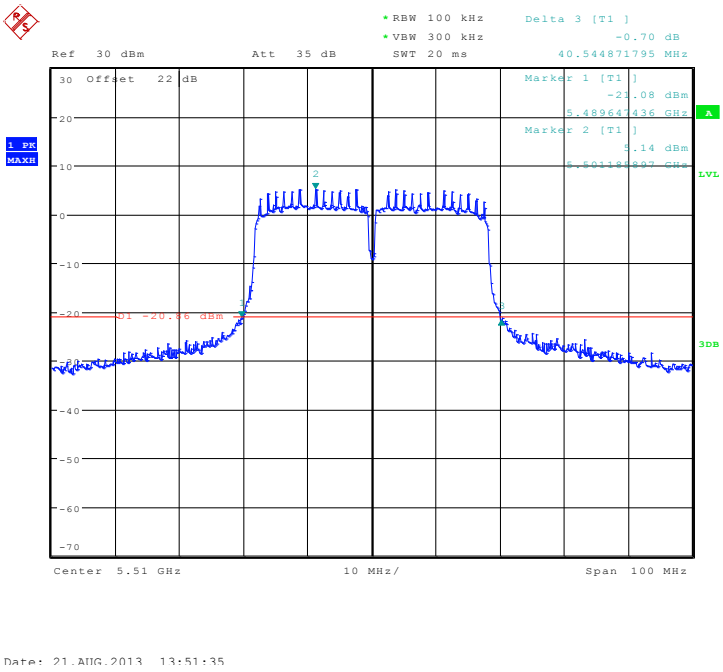


Fig. 23 Occupied 26dB Bandwidth (802. 11n-HT40, 5510MHz)

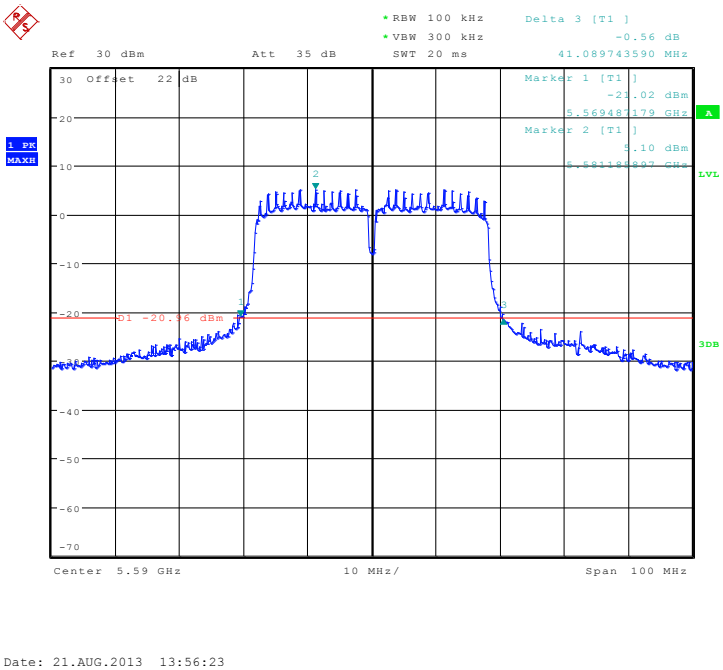


Fig. 24 Occupied 26dB Bandwidth (802. 11n-HT40, 5590MHz)

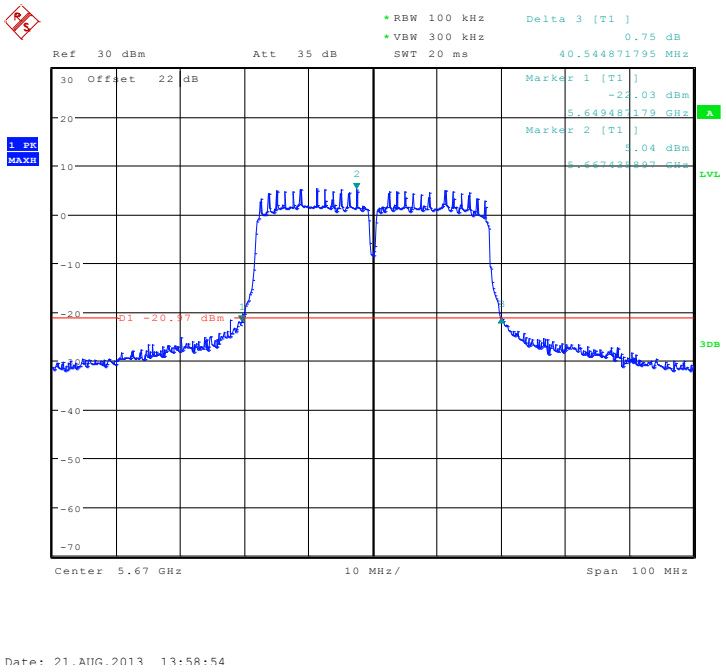


Fig. 25 Occupied 26dB Bandwidth (802. 11n-HT40, 5670MHz)

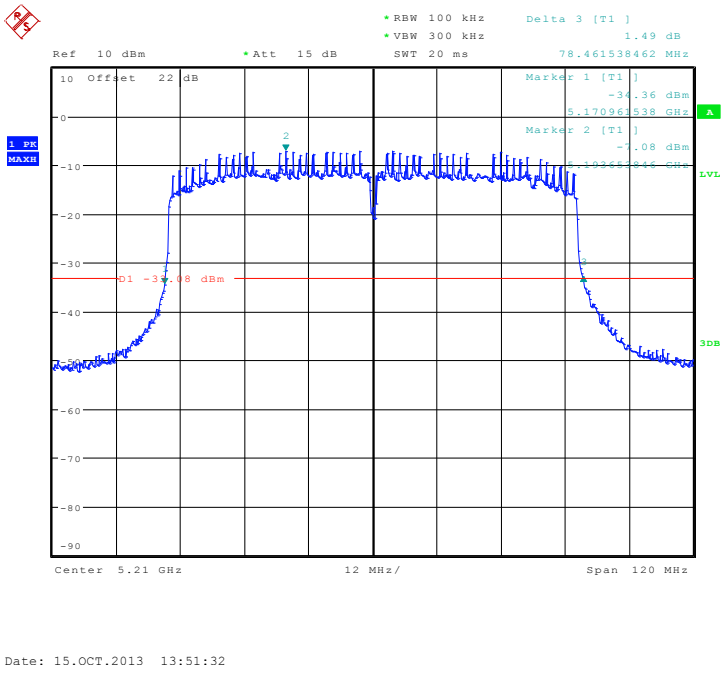


Fig. 26 Occupied 26dB Bandwidth (802. 11ac-HT80, 5210MHz)

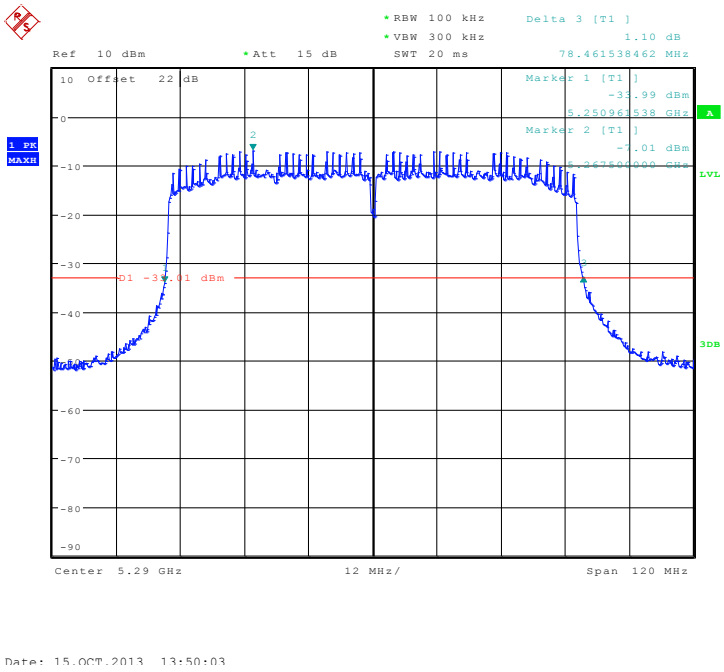


Fig. 27 Occupied 26dB Bandwidth (802. 11ac-HT80, 5290MHz)

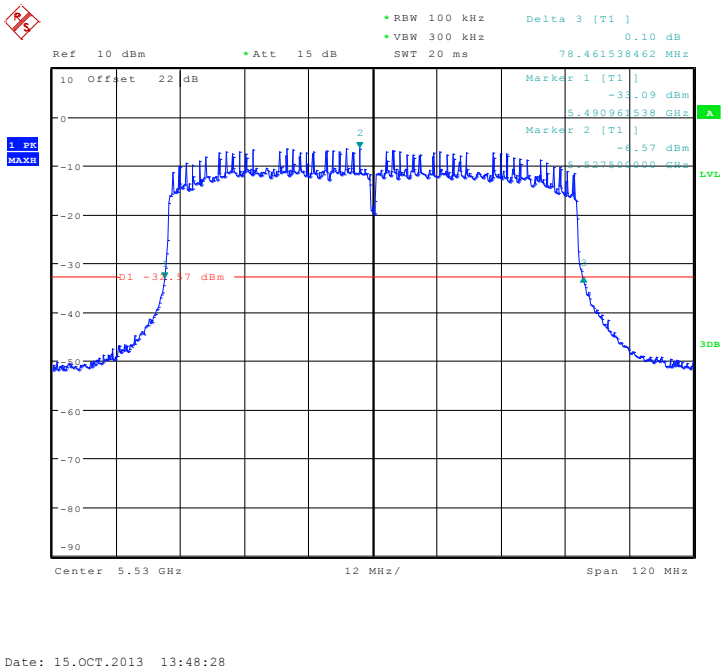


Fig. 28 Occupied 26dB Bandwidth (802. 11ac-HT80, 5530MHz)

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

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:

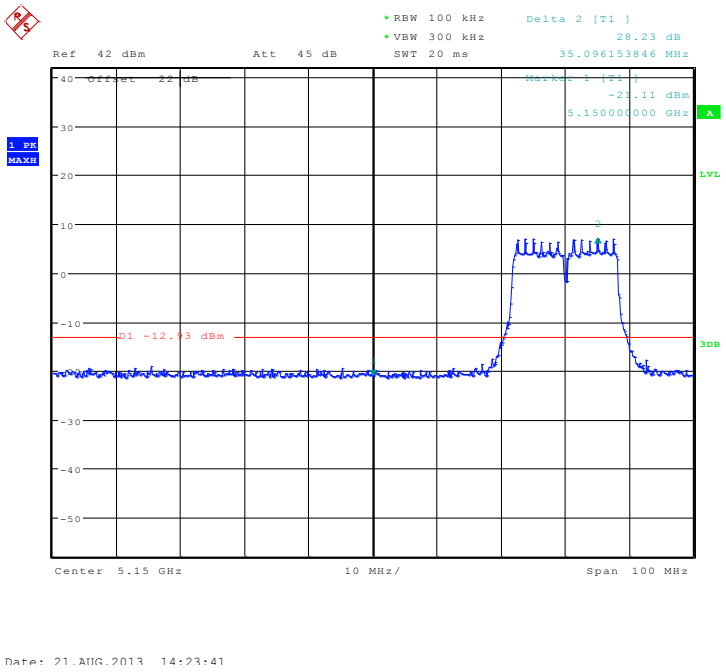


Fig. 29 Band Edges (802.11a, 5180MHz)

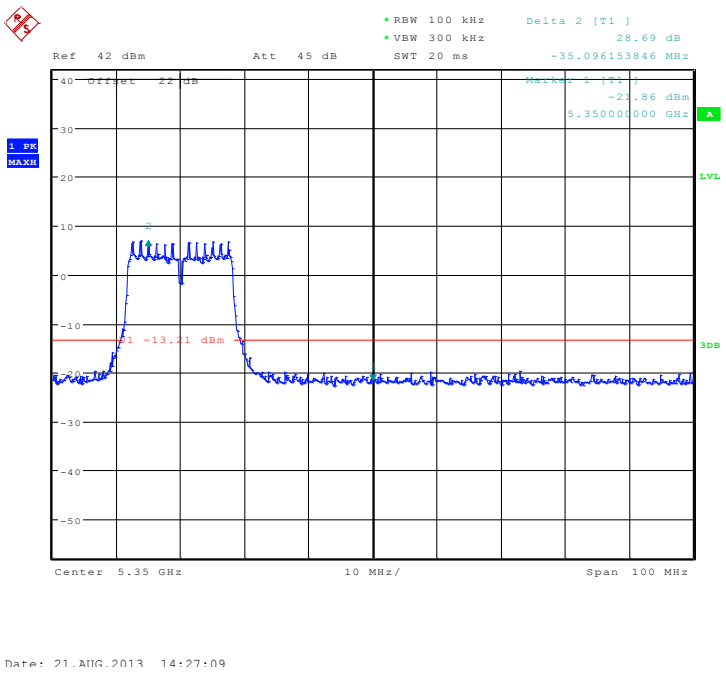


Fig. 30 Band Edges (802.11a, 5320MHz)

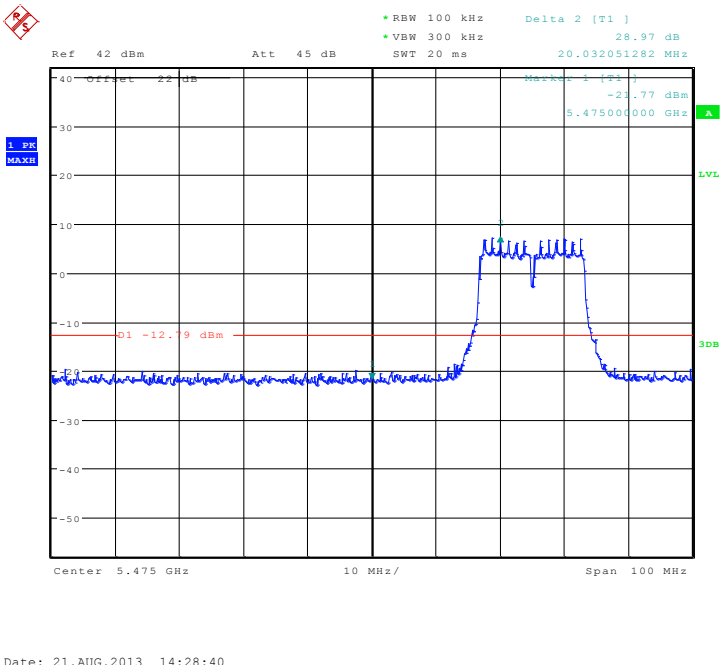


Fig. 31 Band Edges (802.11a, 5500MHz)

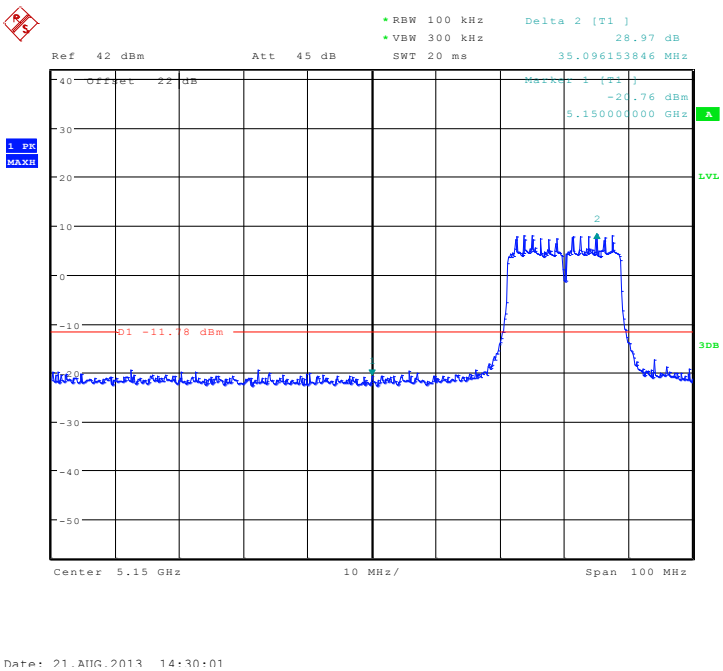


Fig. 32 Band Edges (802.11n-HT20, 5180MHz)

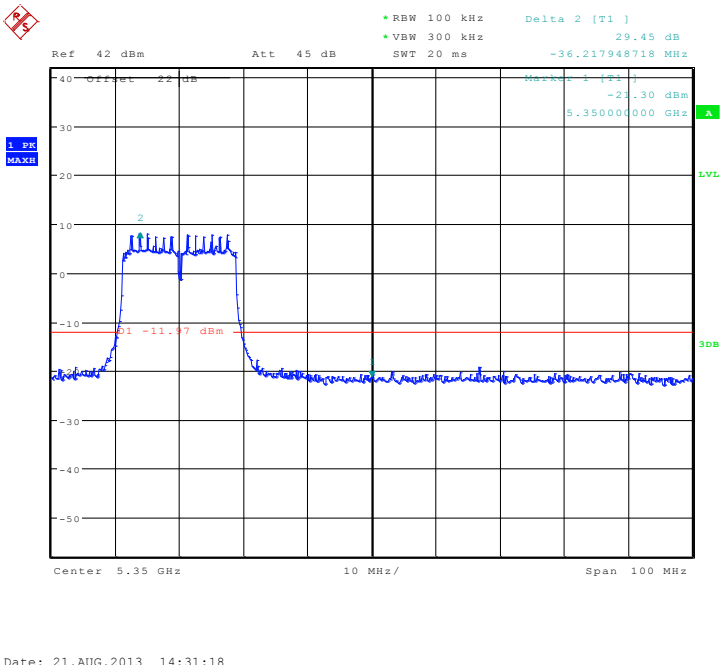


Fig. 33 Band Edges (802.11n-HT20, 5320MHz)

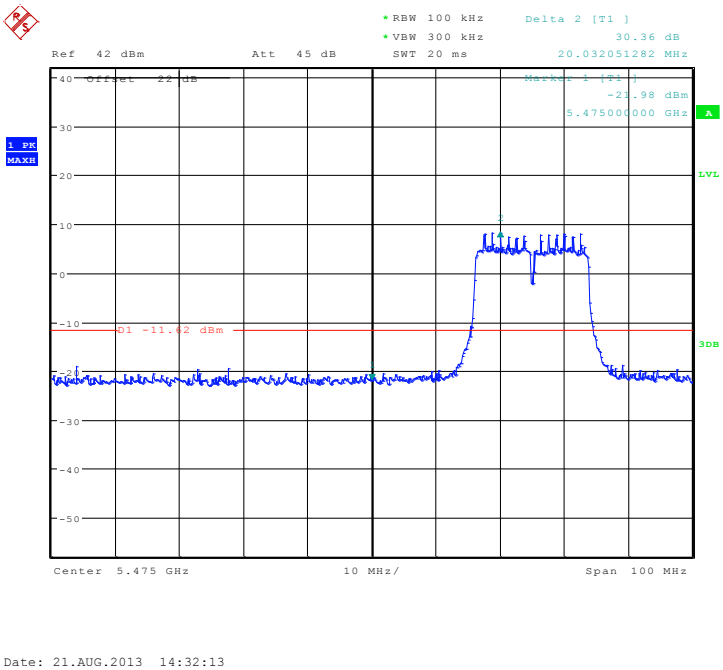


Fig. 34 Band Edges (802.11n-HT20, 5500MHz)

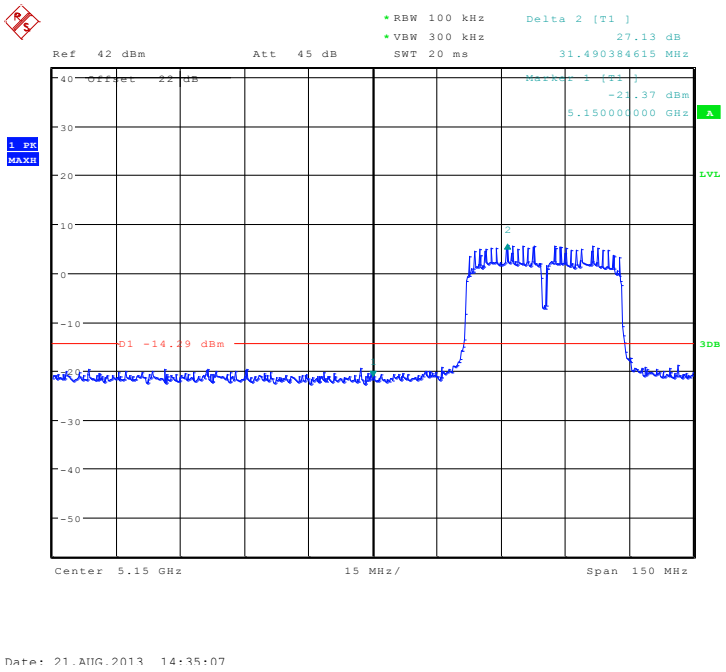


Fig. 35 Band Edges (802.11n-HT40, 5190MHz)

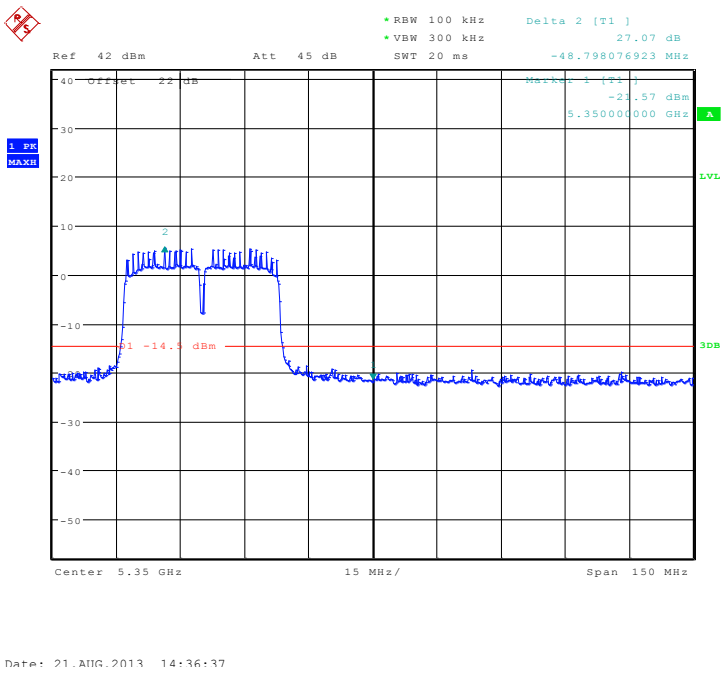


Fig. 36 Band Edges (802.11n-HT40, 5310MHz)

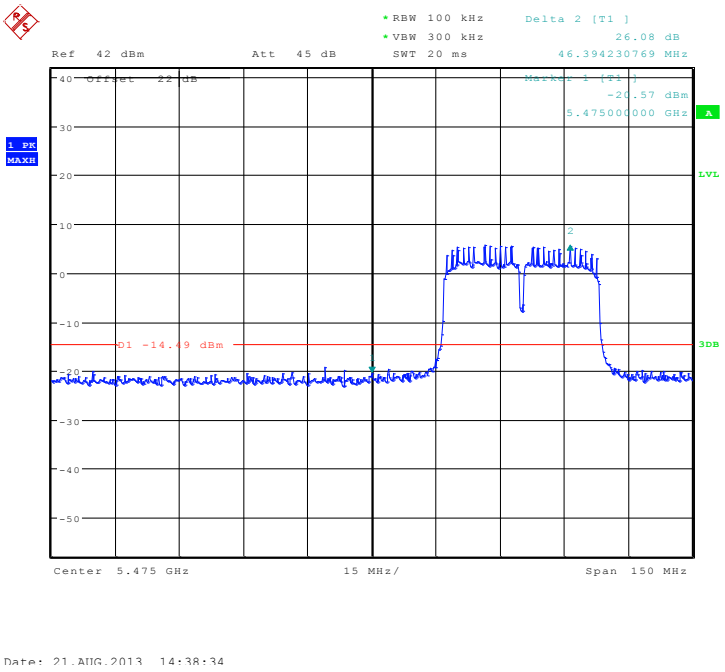


Fig. 37 Band Edges (802.11n-HT40, 5510MHz)

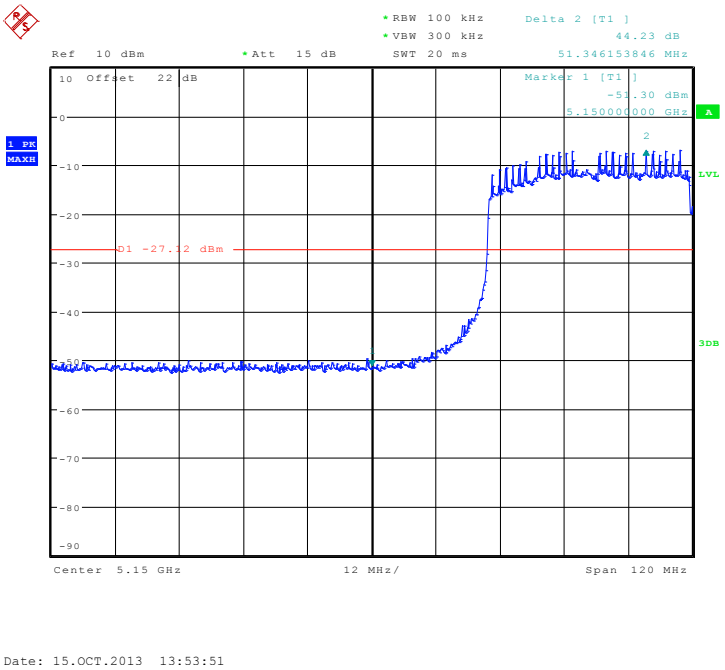


Fig. 38 Band Edges (802.11ac-HT80, 5210MHz)

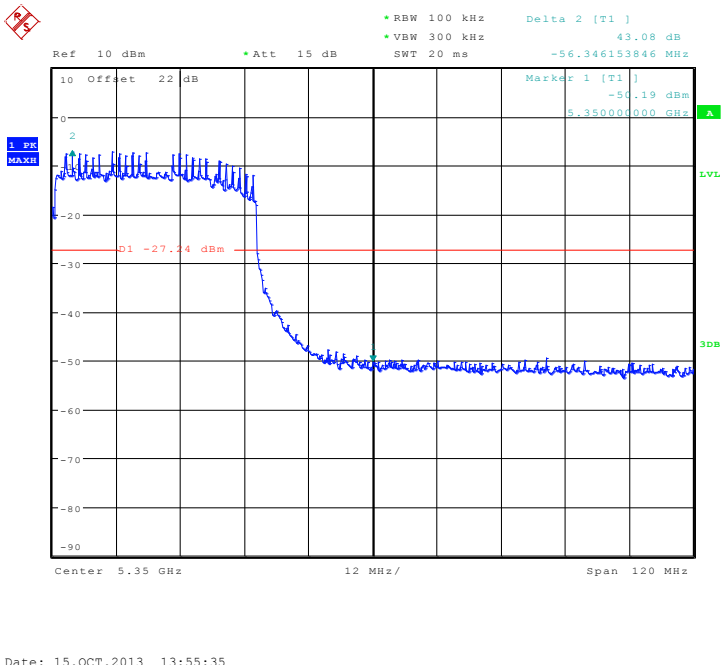


Fig. 39 Band Edges (802.11ac-HT80, 5290MHz)

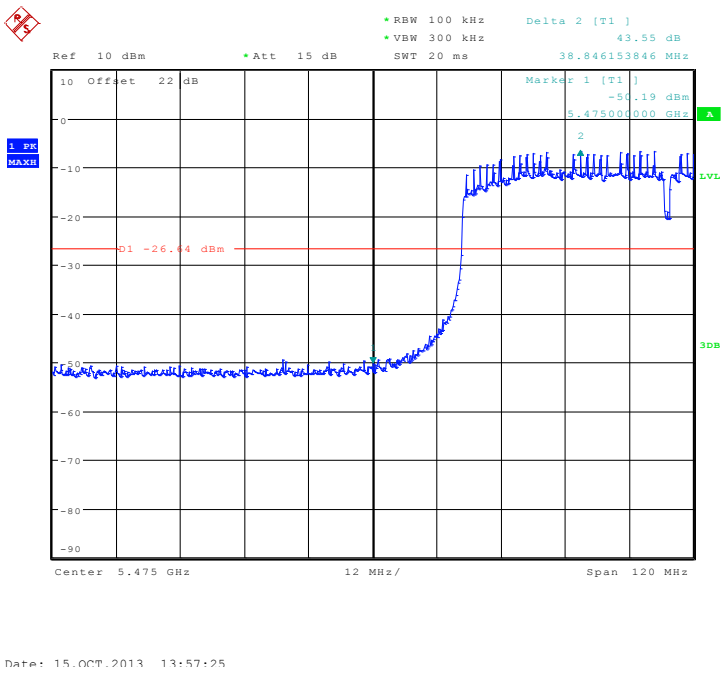


Fig. 40 Band Edges (802.11ac-HT80, 5530MHz)

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

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:

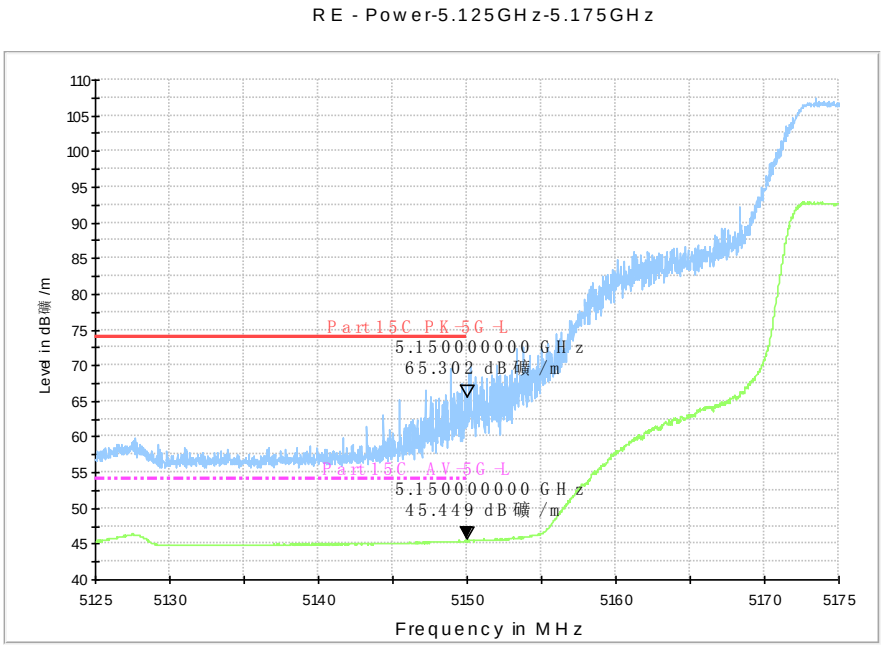


Fig. 41 Band Edges (802.11a, 5180MHz)

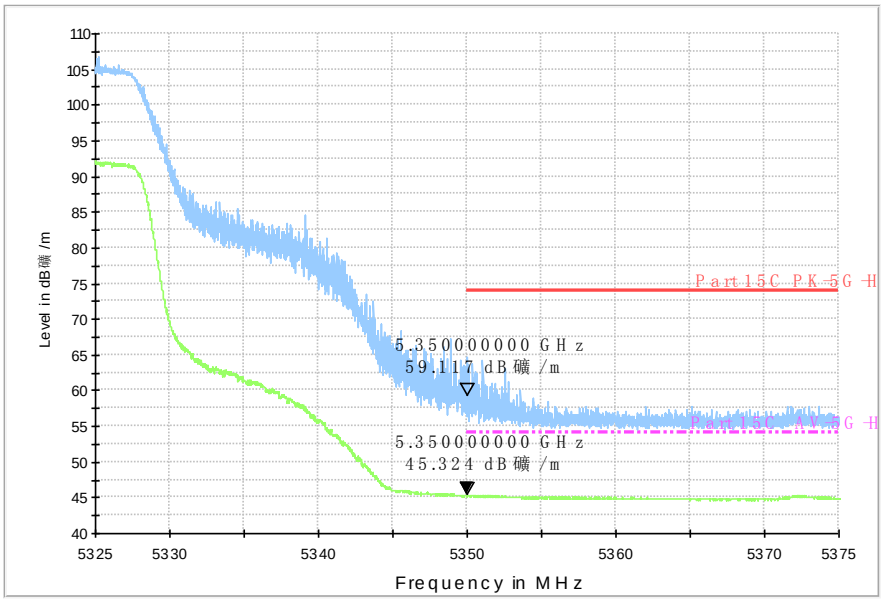


Fig. 42 Band Edges (802.11a, 5320MHz)

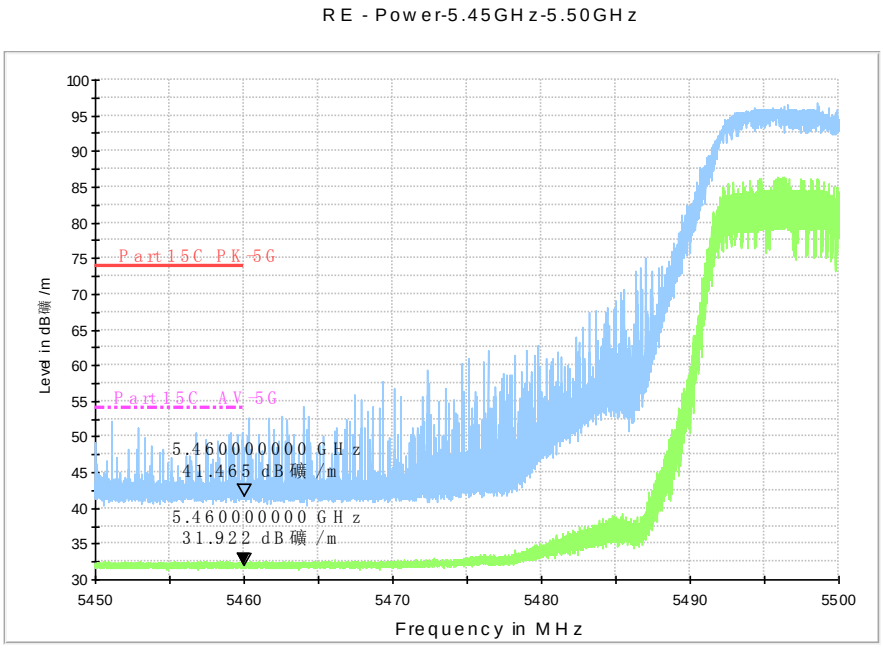


Fig. 43 Band Edges (802.11a, 5500MHz)

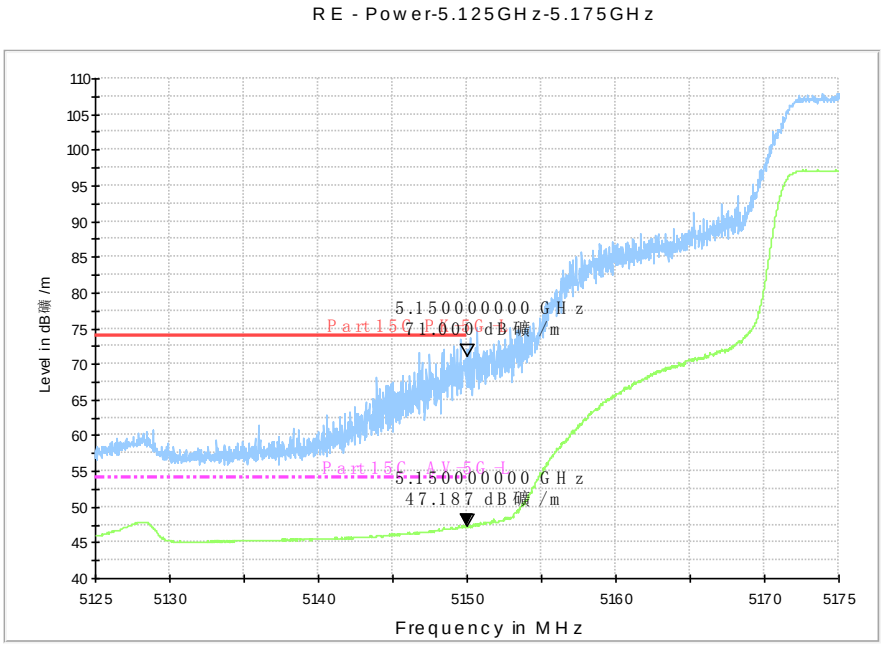


Fig. 44 Band Edges (802.11n-HT20, 5180MHz)

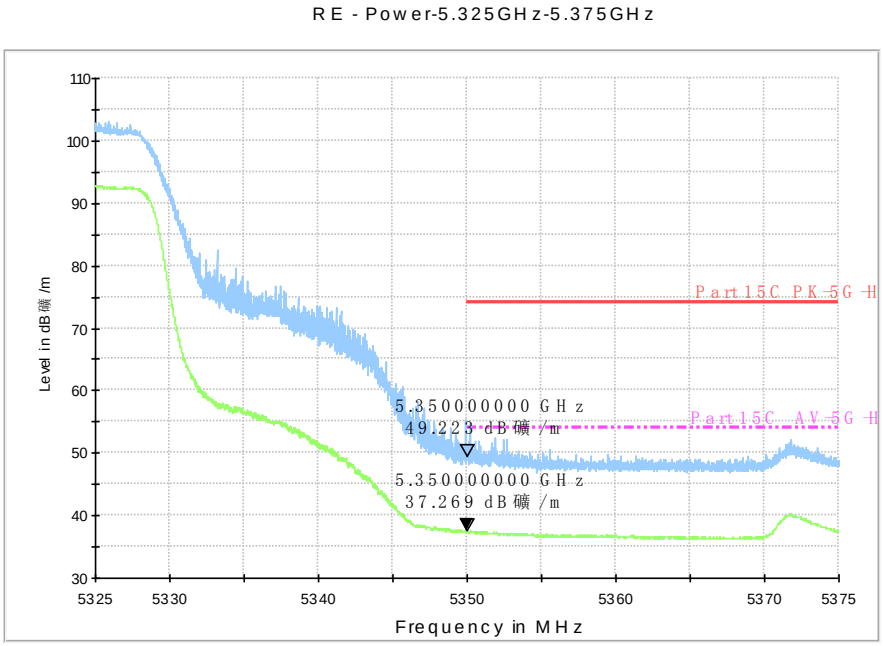


Fig. 45 Band Edges (802.11n-HT20, 5320MHz)

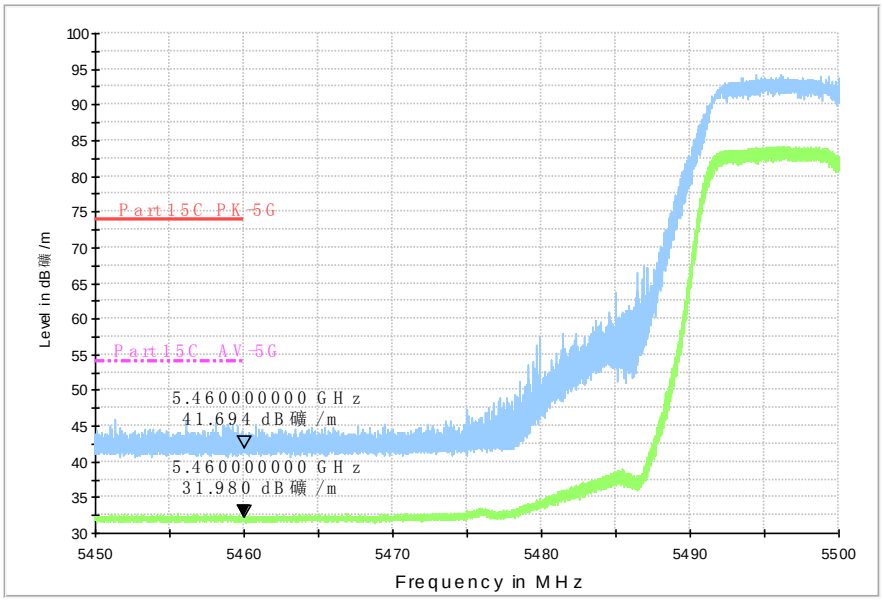


Fig. 46 Band Edges (802.11n-HT20, 5500MHz)

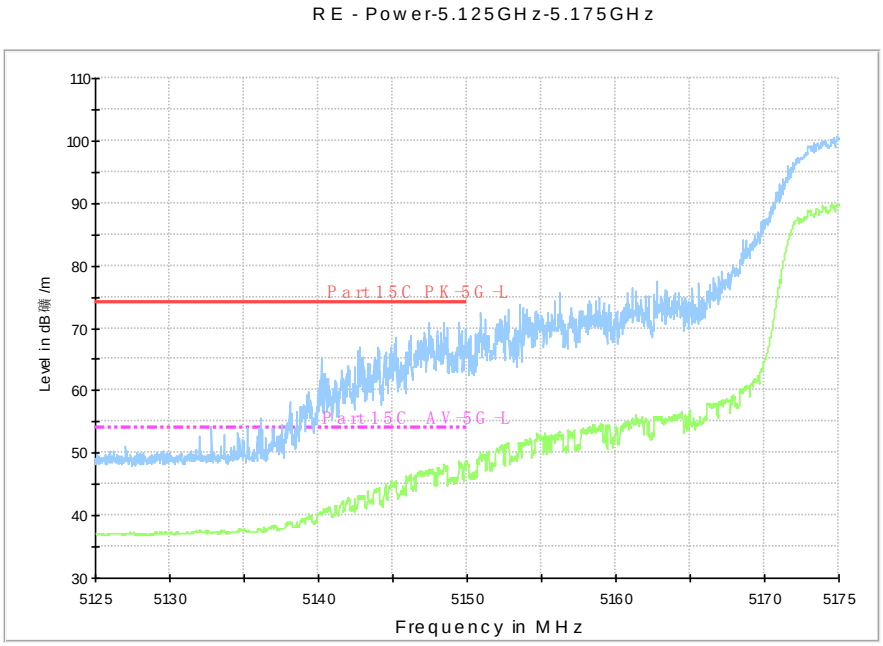


Fig. 47 Band Edges (802.11n-HT40, 5190MHz)

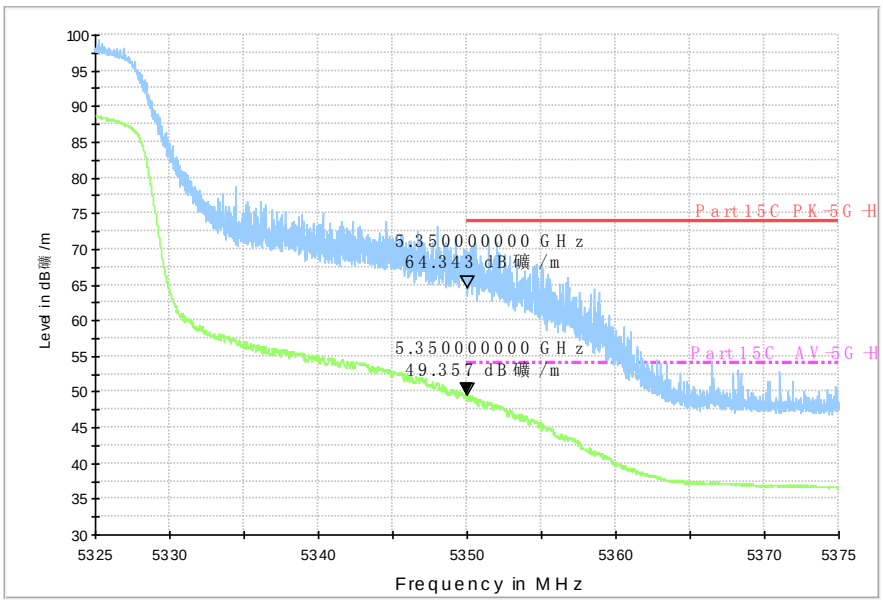


Fig. 48 Band Edges (802.11n-HT40, 5310MHz)

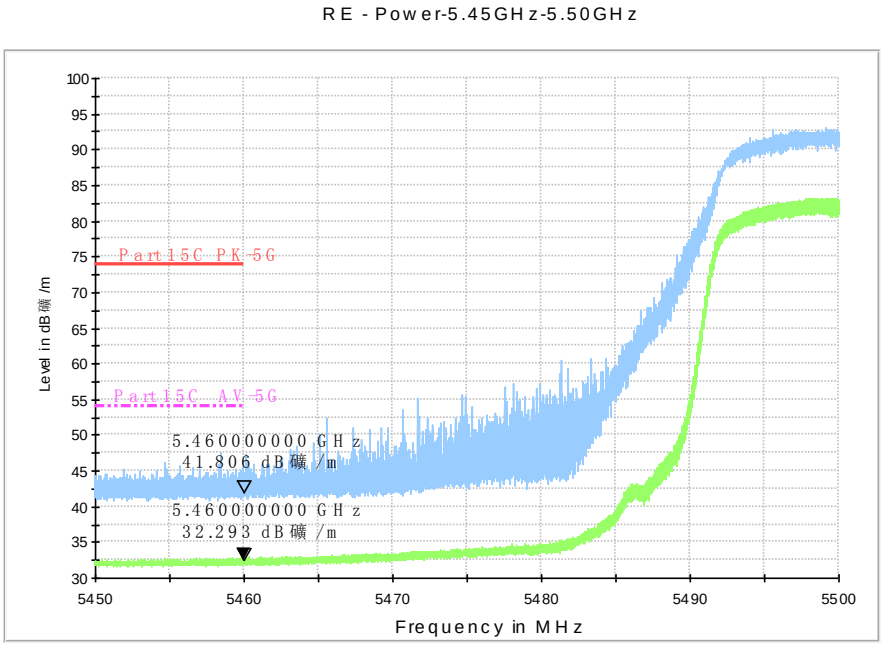


Fig. 49 Band Edges (802.11n-HT40, 5510MHz)

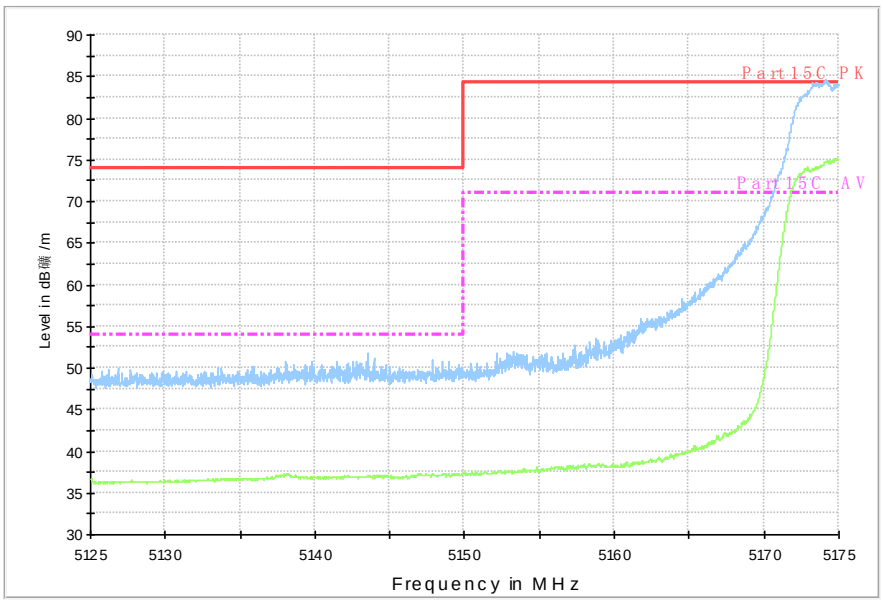


Fig. 50 Band Edges (802.11ac-HT80, 5210MHz)

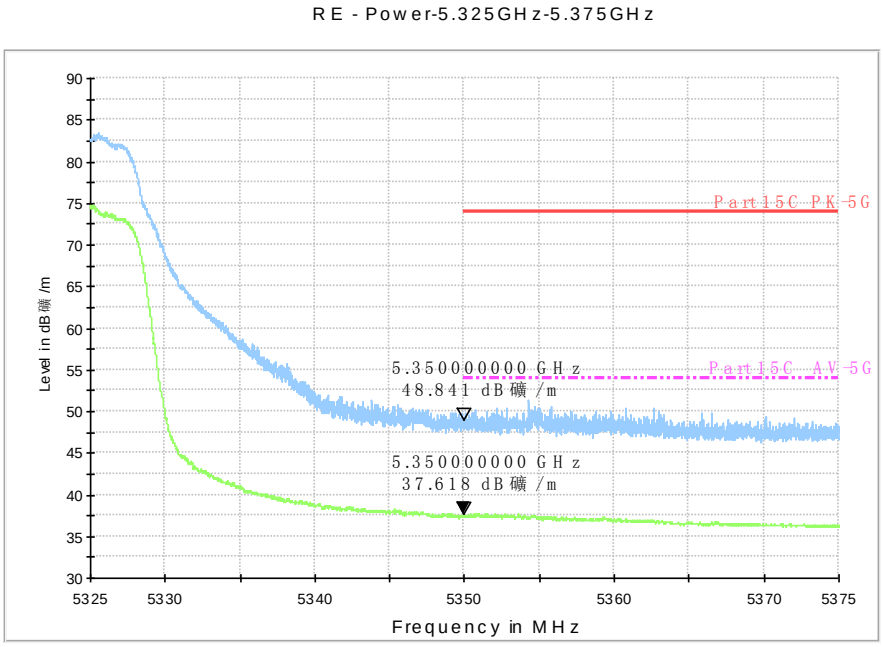


Fig. 51 Band Edges (802.11ac-HT80, 5290MHz)

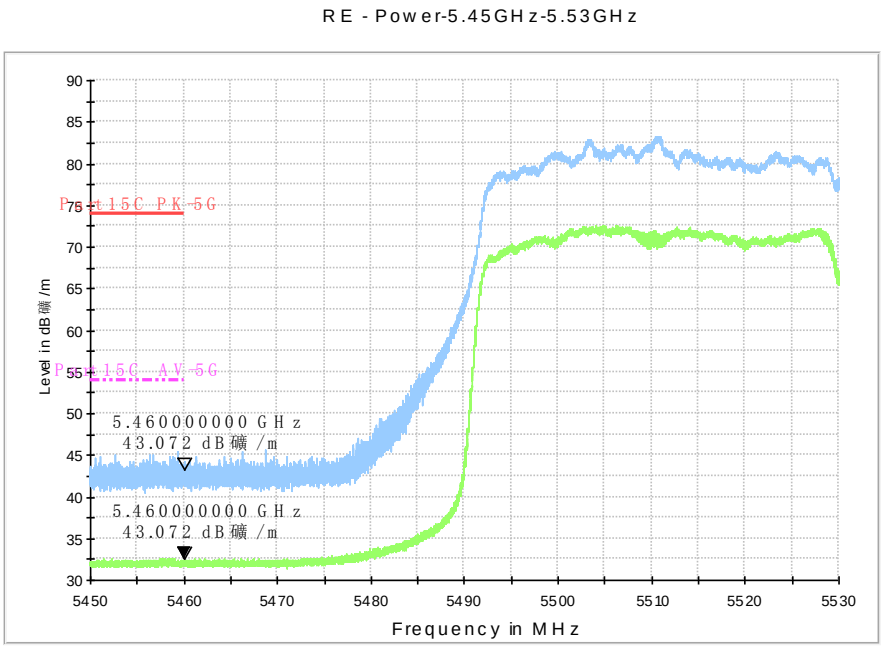


Fig. 52 Band Edges (802.11ac-HT80, 5530MHz)

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(dBμV/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 ~ 3 GHz	Fig.54	P
		3 GHz ~ 6 GHz	Fig.55	P
		6 GHz ~ 18 GHz	Fig.56	P
		18 GHz ~ 26.5 GHz	Fig.57	P
		26.5 GHz ~ 40 GHz	Fig.58	P
	40(5200MHz)	30 MHz ~1 GHz	Fig.59	P
		1 GHz ~ 3 GHz	Fig.60	P
		3 GHz ~ 6 GHz	Fig.61	P
		6 GHz ~ 18 GHz	Fig.62	P
		18 GHz ~ 26.5 GHz	Fig.63	P
		26.5 GHz ~ 40 GHz	Fig.64	P
	48(5240MHz)	30 MHz ~1 GHz	Fig.65	P
		1 GHz ~ 3 GHz	Fig.66	P
		3 GHz ~ 6 GHz	Fig.67	P
		6 GHz ~ 18 GHz	Fig.68	P
		18 GHz ~ 26.5 GHz	Fig.69	P
		26.5 GHz ~ 40 GHz	Fig.70	P
	52(5260MHz)	30 MHz ~1 GHz	Fig.71	P
		1 GHz ~ 3 GHz	Fig.72	P
		3 GHz ~ 6 GHz	Fig.73	P
		6 GHz ~ 18 GHz	Fig.74	P
		18 GHz ~ 26.5 GHz	Fig.75	P
		26.5 GHz ~ 40 GHz	Fig.76	P
	56(5280MHz)	30 MHz ~1 GHz	Fig.77	P
		1 GHz ~ 3 GHz	Fig.78	P
		3 GHz ~ 6 GHz	Fig.79	P
		6 GHz ~ 18 GHz	Fig.80	P
		18 GHz ~ 26.5 GHz	Fig.81	P
		26.5 GHz ~ 40 GHz	Fig.82	P
	64(5320MHz)	30 MHz ~1 GHz	Fig.83	P
		1 GHz ~ 3 GHz	Fig.84	P
		3 GHz ~ 6 GHz	Fig.85	P
		6 GHz ~ 18 GHz	Fig.86	P
		18 GHz ~ 26.5 GHz	Fig.87	P
		26.5 GHz ~ 40 GHz	Fig.88	P

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11a	100(5500MHz)	30 MHz ~1 GHz	Fig.89	P
		1 GHz ~ 3 GHz	Fig.90	P
		3 GHz ~ 6 GHz	Fig.91	P
		6 GHz ~ 18 GHz	Fig.92	P
		18 GHz ~ 26.5 GHz	Fig.93	P
		26.5 GHz ~ 40 GHz	Fig.94	P
	120(5600MHz)	30 MHz ~1 GHz	Fig.95	P
		1 GHz ~ 3 GHz	Fig.96	P
		3 GHz ~ 6 GHz	Fig.97	P
		6 GHz ~ 18 GHz	Fig.98	P
		18 GHz ~ 26.5 GHz	Fig.99	P
		26.5 GHz ~ 40 GHz	Fig.100	P
	140(5700MHz)	30 MHz ~1 GHz	Fig.101	P
		1 GHz ~ 3 GHz	Fig.102	P
		3 GHz ~ 6 GHz	Fig.103	P
		6 GHz ~ 18 GHz	Fig.104	P
		18 GHz ~ 26.5 GHz	Fig.105	P
		26.5 GHz ~ 40 GHz	Fig.106	P

802.11n-HT20 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n HT20	36(5180MHz)	30 MHz ~1 GHz	Fig.107	P
		1 GHz ~ 3 GHz	Fig.108	P
		3 GHz ~ 6 GHz	Fig.109	P
		6 GHz ~ 18 GHz	Fig.110	P
		18 GHz ~ 26.5 GHz	Fig.111	P
		26.5 GHz ~ 40 GHz	Fig.112	P
	40(5200MHz)	30 MHz ~1 GHz	Fig.113	P
		1 GHz ~ 3 GHz	Fig.114	P
		3 GHz ~ 6 GHz	Fig.115	P
		6 GHz ~ 18 GHz	Fig.116	P
		18 GHz ~ 26.5 GHz	Fig.117	P
		26.5 GHz ~ 40 GHz	Fig.118	P
	48(5240MHz)	30 MHz ~1 GHz	Fig.119	P
		1 GHz ~ 3 GHz	Fig.120	P
		3 GHz ~ 6 GHz	Fig.121	P
		6 GHz ~ 18 GHz	Fig.122	P
		18 GHz ~ 26.5 GHz	Fig.123	P
		26.5 GHz ~ 40 GHz	Fig.124	P
	52(5260MHz)	30 MHz ~1 GHz	Fig.125	P
		1 GHz ~ 3 GHz	Fig.126	P
		3 GHz ~ 6 GHz	Fig.127	P
		6 GHz ~ 18 GHz	Fig.128	P
		18 GHz ~ 26.5 GHz	Fig.129	P
		26.5 GHz ~ 40 GHz	Fig.130	P
	56(5280MHz)	30 MHz ~1 GHz	Fig.131	P
		1 GHz ~ 3 GHz	Fig.132	P
		3 GHz ~ 6 GHz	Fig.133	P
		6 GHz ~ 18 GHz	Fig.134	P
		18 GHz ~ 26.5 GHz	Fig.135	P
		26.5 GHz ~ 40 GHz	Fig.136	P
	64(5320MHz)	30 MHz ~1 GHz	Fig.137	P
		1 GHz ~ 3 GHz	Fig.138	P
		3 GHz ~ 6 GHz	Fig.139	P
		6 GHz ~ 18 GHz	Fig.140	P
		18 GHz ~ 26.5 GHz	Fig.141	P
		26.5 GHz ~ 40 GHz	Fig.142	P

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n HT20	100(5500MHz)	30 MHz ~1 GHz	Fig.143	P
		1 GHz ~ 3 GHz	Fig.144	P
		3 GHz ~ 6 GHz	Fig.145	P
		6 GHz ~ 18 GHz	Fig.146	P
		18 GHz ~ 26.5 GHz	Fig.147	P
		26.5 GHz ~ 40 GHz	Fig.148	P
	120(5600MHz)	30 MHz ~1 GHz	Fig.149	P
		1 GHz ~ 3 GHz	Fig.150	P
		3 GHz ~ 6 GHz	Fig.151	P
		6 GHz ~ 18 GHz	Fig.152	P
		18 GHz ~ 26.5 GHz	Fig.153	P
		26.5 GHz ~ 40 GHz	Fig.154	P
	140(5700MHz)	30 MHz ~1 GHz	Fig.155	P
		1 GHz ~ 3 GHz	Fig.156	P
		3 GHz ~ 6 GHz	Fig.157	P
		6 GHz ~ 18 GHz	Fig.158	P
		18 GHz ~ 26.5 GHz	Fig.159	P
		26.5 GHz ~ 40 GHz	Fig.160	P

802.11n-HT40 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n HT40	38(5190MHz)	30 MHz ~1 GHz	Fig.161	P
		1 GHz ~ 3 GHz	Fig.162	P
		3 GHz ~ 6 GHz	Fig.163	P
		6 GHz ~ 18 GHz	Fig.164	P
		18 GHz ~ 26.5 GHz	Fig.165	P
		26.5 GHz ~ 40 GHz	Fig.166	P
	46(5230MHz)	30 MHz ~1 GHz	Fig.167	P
		1 GHz ~ 3 GHz	Fig.168	P
		3 GHz ~ 6 GHz	Fig.169	P
		6 GHz ~ 18 GHz	Fig.170	P
		18 GHz ~ 26.5 GHz	Fig.171	P
		26.5 GHz ~ 40 GHz	Fig.172	P
	54(5270MHz)	30 MHz ~1 GHz	Fig.173	P
		1 GHz ~ 3 GHz	Fig.174	P
		3 GHz ~ 6 GHz	Fig.175	P
		6 GHz ~ 18 GHz	Fig.176	P
		18 GHz ~ 26.5 GHz	Fig.177	P
		26.5 GHz ~ 40 GHz	Fig.178	P
	62(5310MHz)	30 MHz ~1 GHz	Fig.179	P
		1 GHz ~ 3 GHz	Fig.180	P
		3 GHz ~ 6 GHz	Fig.181	P
		6 GHz ~ 18 GHz	Fig.182	P
		18 GHz ~ 26.5 GHz	Fig.183	P
		26.5 GHz ~ 40 GHz	Fig.184	P

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n HT40	102(5510MHz)	30 MHz ~1 GHz	Fig.185	P
		1 GHz ~ 3 GHz	Fig.186	P
		3 GHz ~ 6 GHz	Fig.187	P
		6 GHz ~ 18 GHz	Fig.188	P
		18 GHz ~ 26.5 GHz	Fig.189	P
		26.5 GHz ~ 40 GHz	Fig.190	P
	118(5590MHz)	30 MHz ~1 GHz	Fig.191	P
		1 GHz ~ 3 GHz	Fig.192	P
		3 GHz ~ 6 GHz	Fig.193	P
		6 GHz ~ 18 GHz	Fig.194	P
		18 GHz ~ 26.5 GHz	Fig.195	P
		26.5 GHz ~ 40 GHz	Fig.196	P
	134(5670MHz)	30 MHz ~1 GHz	Fig.197	P
		1 GHz ~ 3 GHz	Fig.198	P
		3 GHz ~ 6 GHz	Fig.199	P
		6 GHz ~ 18 GHz	Fig.200	P
		18 GHz ~ 26.5 GHz	Fig.201	P
		26.5 GHz ~ 40 GHz	Fig.202	P

802.11ac-HT80 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11ac HT80	42(5210MHz)	30 MHz ~1 GHz	Fig.203	P
		1 GHz ~ 3 GHz	Fig.204	P
		3 GHz ~ 6 GHz	Fig.205	P
		6 GHz ~ 18 GHz	Fig.206	P
		18 GHz ~ 26.5 GHz	Fig.207	P
		26.5 GHz ~ 40 GHz	Fig.208	P
	106(5530MHz)	30 MHz ~1 GHz	Fig.209	P
		1 GHz ~ 3 GHz	Fig.210	P
		3 GHz ~ 6 GHz	Fig.211	P
		6 GHz ~ 18 GHz	Fig.212	P
		18 GHz ~ 26.5 GHz	Fig.213	P
		26.5 GHz ~ 40 GHz	Fig.214	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

802.11a

The worse case is measured in channel 64

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17847.000	58.3	-22.9	42.3	38.873	VERTICAL
17454.000	57.9	-23.7	42.6	39.023	HORIZONTAL
17461.800	57.8	-22.8	42.6	37.985	VERTICAL
17433.000	57.7	-23.7	42.7	38.683	VERTICAL
17705.400	57.5	-22.8	42.8	37.511	HORIZONTAL
17486.400	57.5	-22.8	43.0	37.245	VERTICAL

802.11n-HT20

The worse case is measured in channel 64

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17871.600	57.9	-22.9	42.7	38.053	VERTICAL
17527.800	57.8	-22.8	42.9	37.655	HORIZONTAL
17424.600	57.6	-23.7	42.7	38.613	VERTICAL
17536.200	57.4	-22.8	42.9	37.255	VERTICAL
17964.600	57.4	-22.9	42.7	37.583	HORIZONTAL
17915.400	57.1	-22.9	42.7	37.333	VERTICAL

802.11n-HT40

The worse case is measured in channel 62

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17143.200	57.6	-23.7	42.2	39.053	VERTICAL
17938.800	57.5	-22.9	42.4	37.993	HORIZONTAL
17473.800	57.5	-22.8	42.6	37.685	HORIZONTAL
17622.600	57.3	-22.8	42.8	37.325	VERTICAL
17329.200	57.2	-23.7	42.6	38.293	HORIZONTAL
17430.600	57.2	-23.7	42.7	38.183	HORIZONTAL

802.11ac-HT80

The worse case is measured in channel 42

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17502.600	58.6	-22.8	42.8	38.615	VERTICAL
17885.400	57.7	-22.9	42.5	38.093	HORIZONTAL
17656.200	57.4	-22.8	42.7	37.571	VERTICAL
17739.600	57.3	-22.8	42.1	38.061	VERTICAL
17546.400	57.3	-22.8	42.9	37.155	HORIZONTAL
17452.200	57.3	-23.7	42.6	38.423	VERTICAL

Test graphs as below:

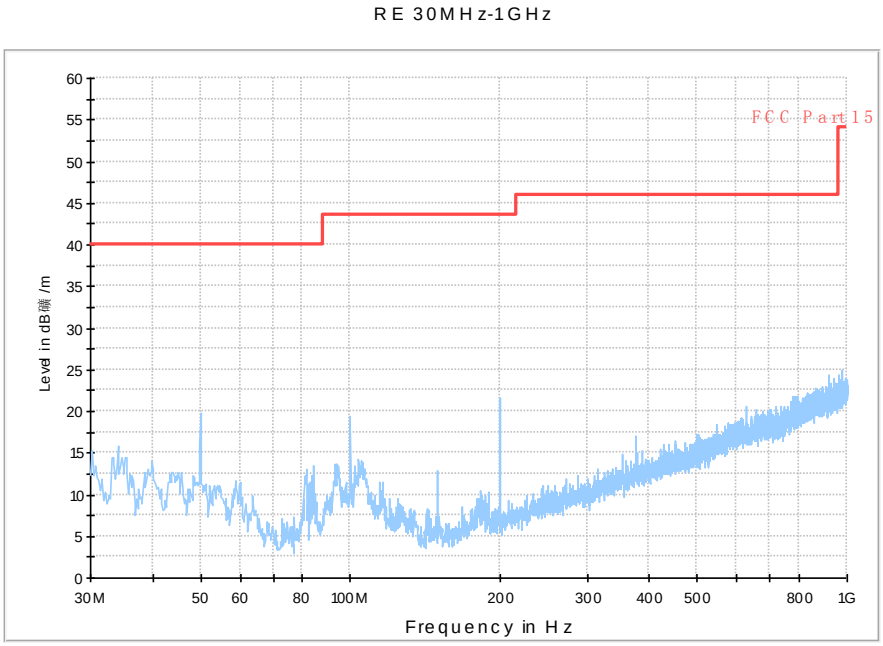


Fig. 53 Radiated Spurious Emission (802.11a, ch36, 30 MHz-1 GHz)

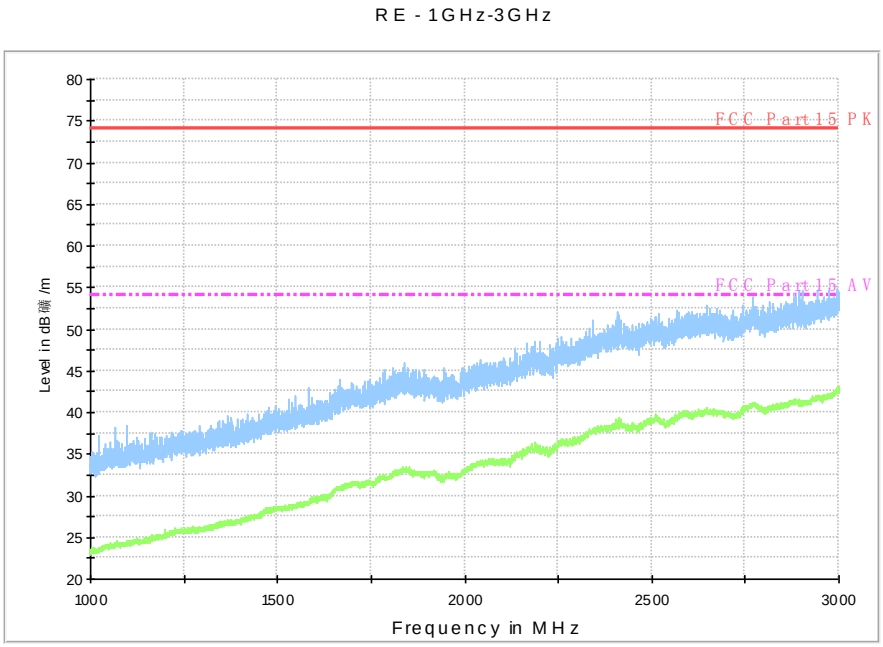


Fig. 54 Radiated Spurious Emission (802.11a, ch36, 1 GHz-3 GHz)