Full

TEST REPORT

No. I18D00022-SRD07

For

Client : Datalogic S.r.l.

Production : Smartphone

Model Name : MEMOR 10

FCC ID : U4GDL35US

Hardware Version: V00 (US)

Software Version: 0.02.06D.20180716-userdebug-customer1

Issued date: 2018-11-15

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of ECIT Shanghai.

Test Laboratory:

ECIT Shanghai, East China Institute of Telecommunications

Add: 7-8F, G Area, No.668, Beijing East Road, Huangpu District, Shanghai, P. R. China

Tel: (+86)-021-63843300, E-Mail: welcome@ecit.org.cn

Revision Version

Report Number	Revision	Date	Memo
I18D00022-SRD07	00	2018-10-30	Initial creation of test report
I18D00022-SRD07	01	2018-11-14	Second creation of test report
I18D00022-SRD07	02	2018-11-15	Third creation of test report

CONTENTS

1. Test Laboratory

1.1. Testing Location

Company Name:	ECIT Shanghai, East China Institute of Telecommunications
Address:	7-8F, G Area, No. 668, Beijing East Road, Huangpu District, Shanghai, P. R. China
Postal Code:	200001
Telephone:	(+86)-021-63843300
Fax:	(+86)-021-63843301
FCC registration No	958356

1.2. Testing Environment

Normal Temperature:	15-35℃
Extreme Temperature:	-30/+50℃
Relative Humidity:	20-75%

1.3. Project data

Project Leader:	Yu Anlu
Testing Start Date:	2018-07-14
Testing End Date:	2018-10-30

1.4. Signature

Yang Dejun
(Prepared this test report)

Shi Hongqi
(Reviewed this test report)

Zheng Zhongbin
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	Datalogic S.r.l.
Address:	Via San Vitalino no. 13, Calderara di Reno – 40012 (BO) - Italy
Telephone:	+39 051 314 72 16
Postcode:	/

2.2. Manufacturer Information

Company Name:	Datalogic S.r.l.
Address:	Via San Vitalino no. 13, Calderara di Reno – 40012 (BO) - Italy
Telephone:	+39 051 314 72 16
Postcode:	/

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

3.1. About EUT

EUT Description	Smartphone
Model name	MEMOR 10
WLAN Frequency Range(5G)	ISM Bands: 5150MHz~5350MHz 5470MHz~5725MHz
GSM Frequency Band	GSM850/GSM900/GSM1800/GSM1900
UMTS Frequency Band	Band Ⅰ/BandⅡ/BandⅣ/Band Ⅴ/BandⅧ
CDMA Frequency Band	BC0/BC1
LTE Frequency Band	LTE 2/4/5/7/12/13/17/25/26
Additional Communication Function	BT4.2,BLE; WiFi 802.11a,b,g,n,ac;NFC,GPS; GLONASS; WLC, Beidou.
WLAN type of modulation	OFDM
Extreme Temperature	-30/+50℃
Nominal Voltage	3.8V
Extreme High Voltage	4.35V
Extreme Low Voltage	3.6V

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

3.2. Internal Identification of EUT used during the test

First Supply

EUT ID*	Model Name	SN or IMEI	HW Version	SW Version	Date of receipt
N17	MEMOR 10	359737090202608	V00 (US)	0.02.06D.20180716-userdebug-customer1	2018-07-04
N10	MEMOR 10	359737090203796	V00 (US)	0.02.06D.20180716-userdebug-customer1	2018-07-04

*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	SN
AE1	RF cable	---
AE2	---	---

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

4. Reference Documents

4.1. Reference Documents for testing

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

Reference	Title	Version
FCC Part15	Title 47 of the Code of Federal Regulations; Chapter I Part 15 - Radio frequency devices	2017/10/1
ANSI 63.10	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices	2013
UNII: KDB 789033	Information Infrastructure (U-NII) Devices - Part 15, Subpart E	2017
KDB905462	COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED-NATIONAL INFORMATION INFRASTRUCTURE DEVICES OPERATING IN THE 5250-5350 MHz AND 5470-5725 MHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION	2016

5. Summary of Test Results

A brief summary of the tests carried out is shown as following.

SUMMARY OF MEASUREMENT RESULTS	Sub-clause of Part15E	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 section 6 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 ECIT.
NA	Not Applicable, the test was not applicable.
F	Fail, the EUT does not comply with the essential requirements in the standard.

Test Conditions

Tnom	Normal temperature
Tmin	Low Temperature
Tmax	High Temperature
Vnom	Normal Voltage
Vmin	Low Voltage
Vmax	High Voltage
Hnom	Norm Humidity
Anom	Norm Air Pressure

For this report, all the test case listed above are tested under Normal Temperature and Normal Voltage, and also under norm humidity, the specific conditions as following:

Temperature	Tnom	25℃
Voltage	Vnom	3.8V
Humidity	Hnom	47%

5.1. Notes

All reported tests were carried out on a sample equipment to demonstrate limited compliance with section 3.

The test results of this test report relate exclusively to the item(s) tested as specified in section 5.

5.2. Statements

The MEMOR 10, supporting GSM/GPRS/EDGE/WCDMA/LTE/CDMA/BT/BLE/NFC/WLAN, manufactured by Datalogic S.r.l., which is a new product for testing.

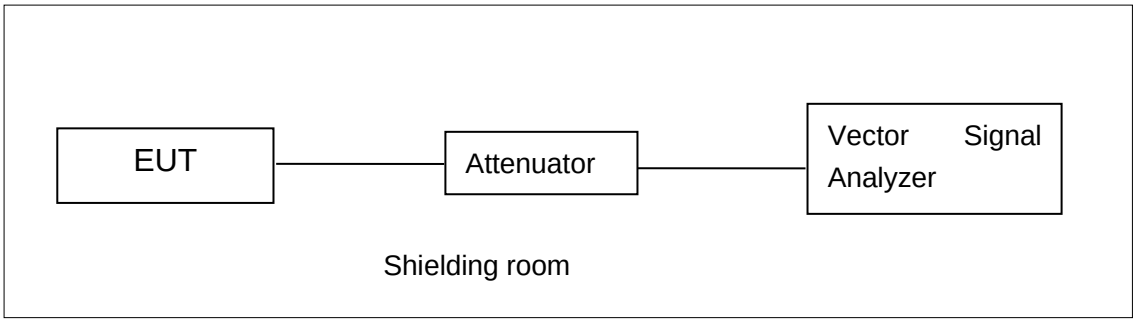
ECIT has verified that the compliance of the tested device specified in section 5 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 5 of this test report.

6. Test result

6.1. Measurement Method

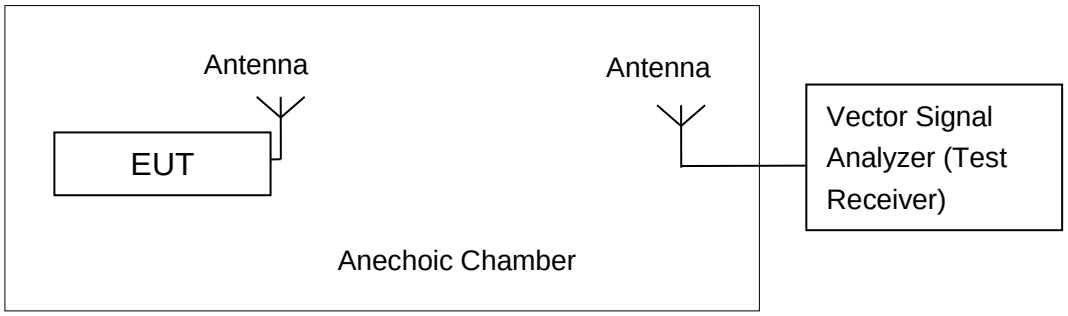
6.1.1. Conducted Measurements

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



6.1.2. 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.

6.2. Maximum output Power

Measurement Limit and Method:

Standard	Frequency (MHz)	Limit (dBm)
FCC CRF Part 15.407(a)	5150MHz~5250MHz	24dBm
	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

Set the spectrum analyzer in the following:

Detector: RMS.

RBW=1MHz.

VBW=3MHz.

Sweep time = AUTO.

Span:30MHz (for 20MHz); 50MHz (for 40MHz).

Measurement Results:

802.11a mode

U-NII-1

Mode	Data Rate(Mbps)	Teat Result(dBm)		
		5180MHz	5200MHz	5240MHz
802.11a	6	13.8	13.44	13.21

U-NII-2a

Mode	Data Rate(Mbps)	Teat Result(dBm)		
		5260MHz	5300MHz	5320MHz
802.11a	6	13.21	13.03	13.22

U-NII-2c

Mode	Data Rate(Mbps)	Teat Result(dBm)		
		5500MHz	5600MHz	5700MHz
802.11a	MCS0	12.45	12.78	13.86

The data rate MCS0 is selected as worse condition, and the following cases are performed with this condition.

802.11n-HT20 mode

U-NII-1

Mode	Data Rate(Index)	Teat Result(dBm)		
		5180MHz	5200MHz	5240MHz
802.11n(20MHz)	MCS0	13.67	13.32	13.05

U-NII-2a

Mode	Data Rate(Index)	Teat Result(dBm)		
		5260MHz	5300MHz	5320MHz
802.11n(20MHz)	MCS0	13.1	12.78	12.98

U-NII-2c

Mode	Data Rate(Mbps)	Teat Result(dBm)		
		5500MHz	5600MHz	5700MHz
802.11n(20MHz)	MCS0	12.4	12.9	13.44

The data rate MCS0 is selected as worse condition, and the following cases are performed with this condition.

802.11n-HT40 mode

U-NII-1

Mode	Data Rate(Index)	Teat Result(dBm)		
		5190MHz	/	5230MHz
802.11n(40MHz)	MCS0	13.71	/	13.02

U-NII-2a

Mode	Data Rate(Index)	Teat Result(dBm)		
		5270MHz	/	5310MHz
802.11n(40MHz)	MCS0	13.10	/	12.96

U-NII-2c

Mode	Data Rate(Index)	Teat Result(dBm)		
		5510MHz	5590MHz	5670MHz
802.11n(40MHz)	MCS0	12.59	12.79	13.61

The data rate MCS0 is selected as worse condition, and the following cases are performed with this condition.

802.11ac-HT20 mode

U-NII-1

Mode	Data Rate(Index)	Teat Result(dBm)		
		5180MHz	5200MHz	5240MHz
802.11ac(20MHz)	MCS0	13.69	13.32	13.06

U-NII-2a

Mode	Data Rate(Index)	Teat Result(dBm)		
		5260MHz	5300MHz	5320MHz
802.11ac(20MHz)	MCS0	13.06	12.95	12.96

U-NII-2c

Mode	Data Rate(Mbps)	Teat Result(dBm)		
		5500MHz	5600MHz	5700MHz
802.11ac(20MHz)	MCS0	12.44	12.91	13.44

The data rate MCS0 is selected as worse condition, and the following cases are performed with this condition.

802.11ac-HT40 mode

U-NII-1

Mode	Data Rate(Index)	Teat Result(dBm)		
		5190MHz	/	5230MHz
802.11ac(40MHz)	MCS0	13.49	/	13.01

U-NII-2a

Mode	Data Rate(Index)	Teat Result(dBm)		
		5270MHz	/	5310MHz
802.11ac(40MHz)	MCS0	13.11	/	12.99

U-NII-2c

Mode	Data Rate(Index)	Teat Result(dBm)		
		5510MHz	5590MHz	5670MHz
802.11ac(40MHz)	MCS0	12.77	12.93	13.65

The data rate MCS0 is selected as worse condition, and the following cases are performed with this condition.

6.3. Peak Power Spectral Density (conducted)

Measurement Limit:

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

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

Measurement Results:

Mode	Channel	Power Spectral Density (dBm/MHz)		Conclusion
802.11a	5180 MHz	Fig.1	6.902	P
	5200 MHz	Fig.2	6.699	P
	5240 MHz	Fig.3	6.063	P
	5260 MHz	Fig.4	6.469	P
	5300 MHz	Fig.5	6.136	P
	5320 MHz	Fig.6	6.262	P
	5500 MHz	Fig.7	6.555	P
	5600 MHz	Fig.8	6.507	P
	5700 MHz	Fig.9	7.787	P
802.11n HT20	5180 MHz	Fig.10	6.331	P
	5200 MHz	Fig.11	6.204	P
	5240 MHz	Fig.12	5.943	P
	5260 MHz	Fig.13	6.338	P
	5300 MHz	Fig.14	6.268	P
	5320 MHz	Fig.15	5.839	P
	5500 MHz	Fig.16	5.465	P
	5600 MHz	Fig.17	6.665	P
	5700 MHz	Fig.18	7.551	P
802.11n HT40	5190 MHz	Fig.19	4.614	P
	5230 MHz	Fig.20	3.582	P

	5270 MHz	Fig.21	3.581	P
	5310 MHz	Fig.22	3.873	P
	5510 MHz	Fig.23	3.063	P
	5590 MHz	Fig.24	3.957	P
	5670 MHz	Fig.25	4.809	P
802.11ac HT20	5180 MHz	Fig.26	6.499	P
	5200 MHz	Fig.27	6.054	P
	5240 MHz	Fig.28	5.859	P
	5260 MHz	Fig.29	6.276	P
	5300 MHz	Fig.30	6.111	P
	5320 MHz	Fig.31	6.023	P
	5500 MHz	Fig.32	5.769	P
	5600 MHz	Fig.33	6.62	P
	5700 MHz	Fig.34	7.496	P
802.11ac HT40	5190 MHz	Fig.35	4.39	P
	5230 MHz	Fig.36	3.383	P
	5270 MHz	Fig.37	3.607	P
	5310 MHz	Fig.38	3.618	P
	5510 MHz	Fig.39	3.417	P
	5590 MHz	Fig.40	4.046	P
	5670 MHz	Fig.41	4.849	P

Conclusion: PASS

Test graphs as below:

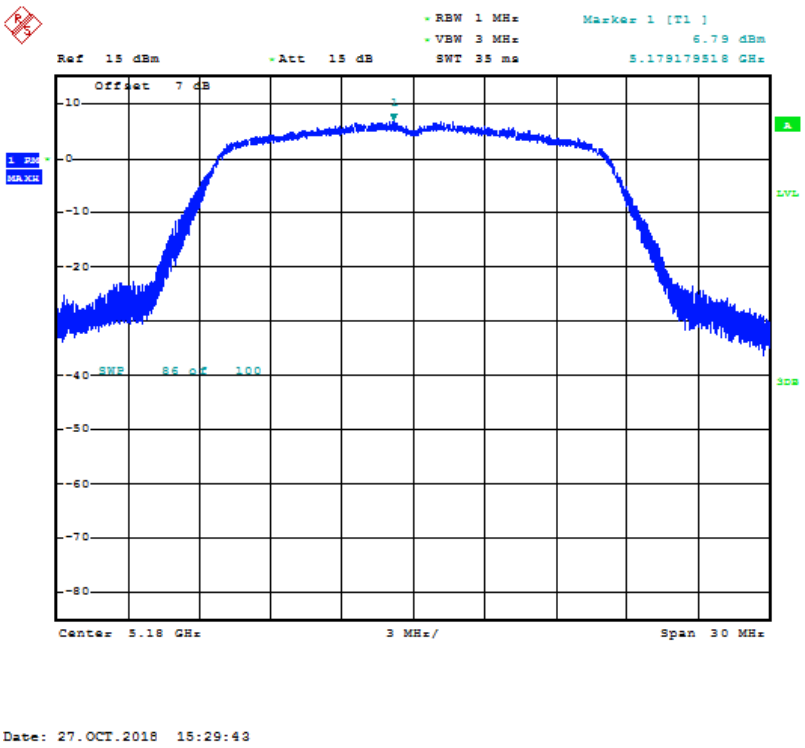


Fig. 1 Power Spectral Density (802.11a, 5180MHz)

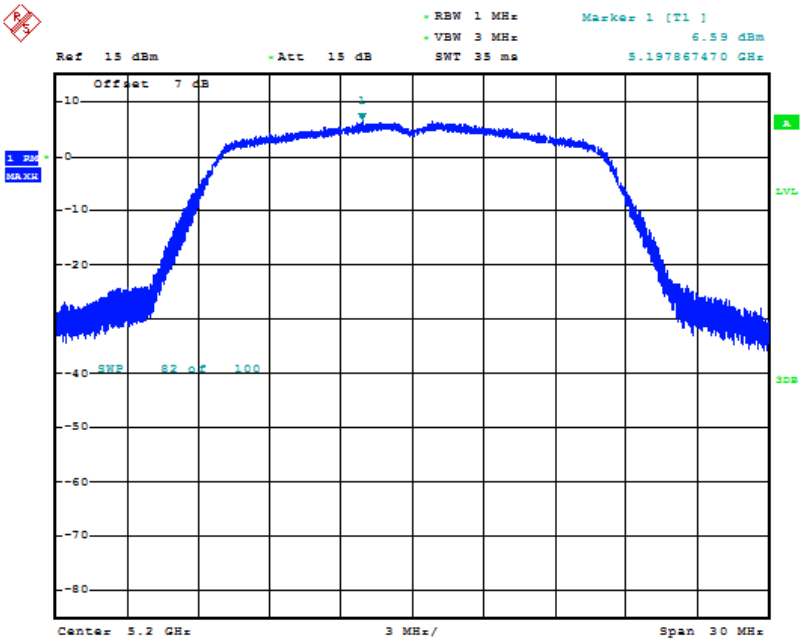


Fig. 2 Power Spectral Density (802.11a, 5200MHz)

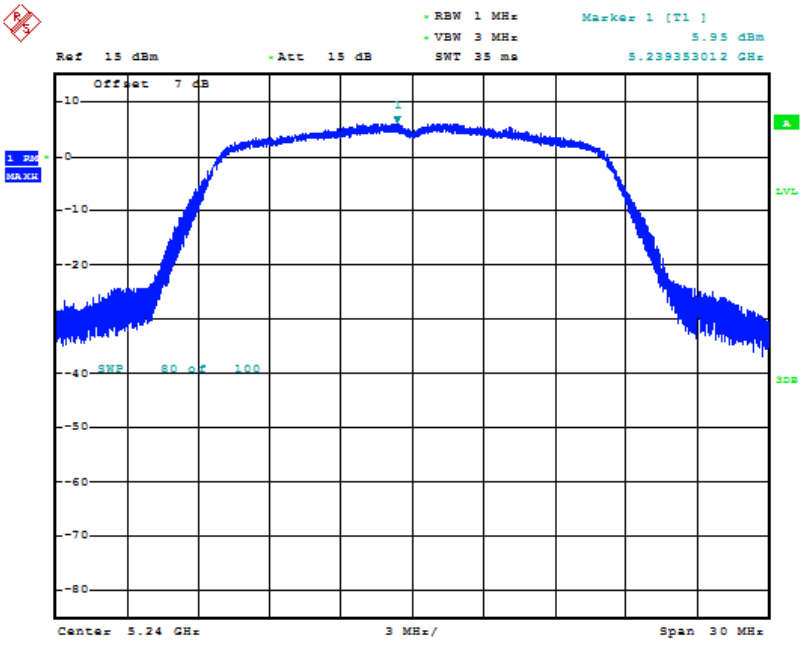


Fig. 3 Power Spectral Density (802.11a, 5240MHz)

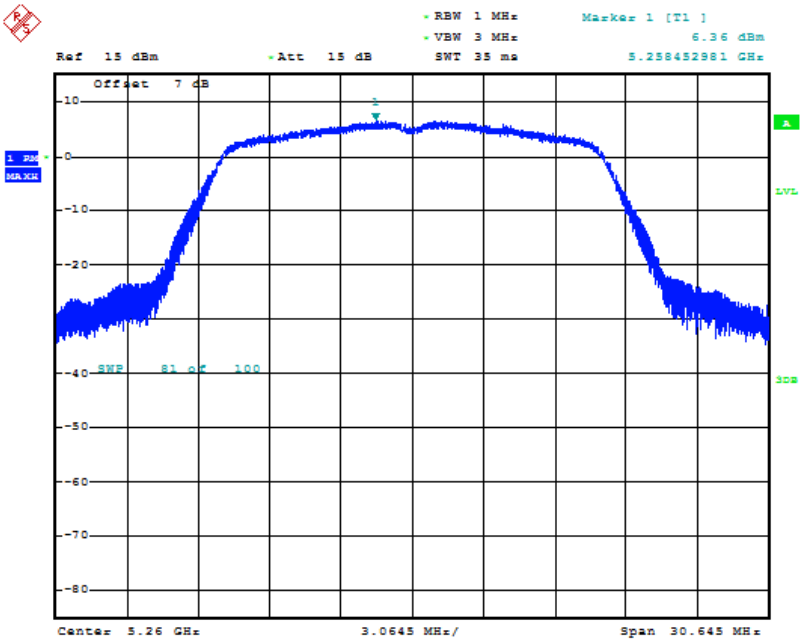


Fig. 4 Power Spectral Density (802.11a, 5260MHz)

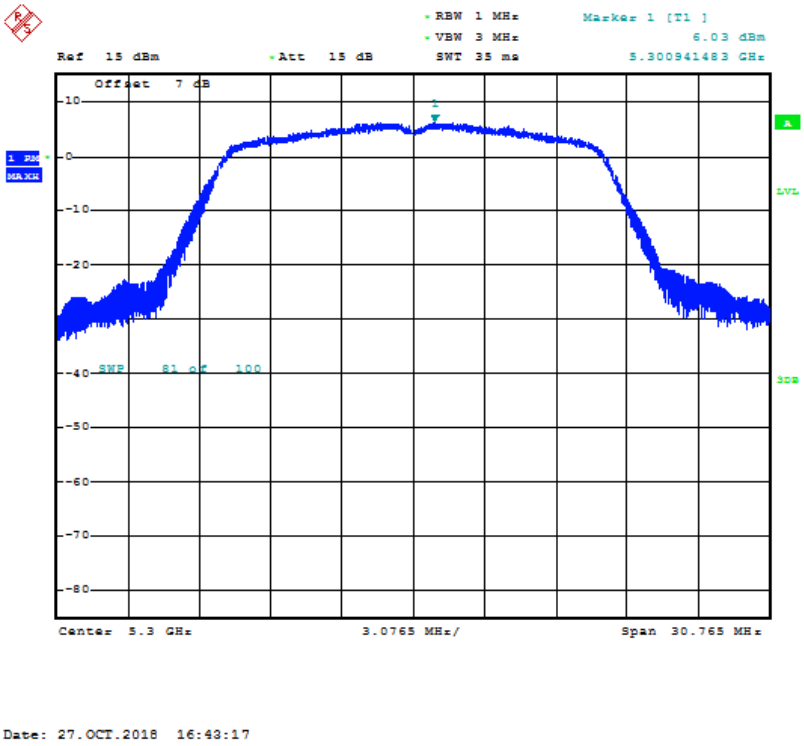


Fig. 5 Power Spectral Density (802.11a, 5300MHz)

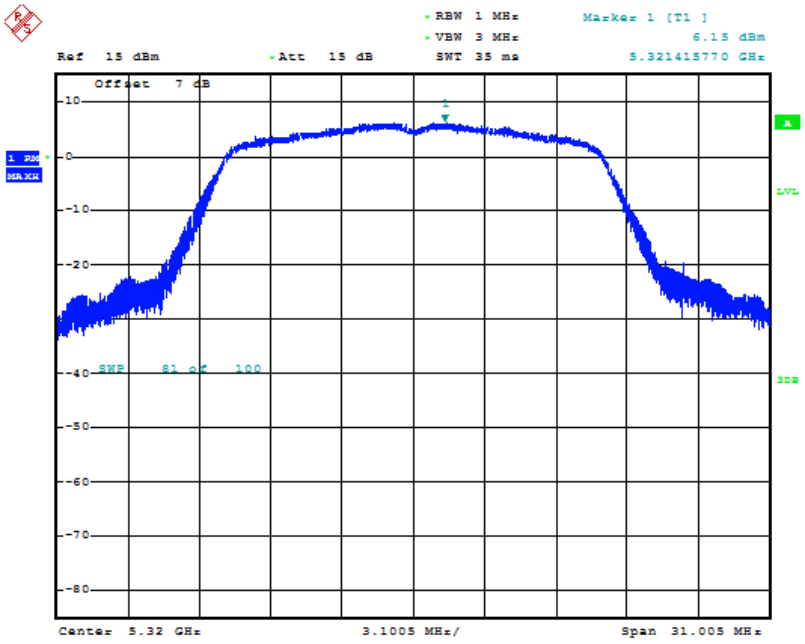


Fig. 6 Power Spectral Density (802.11a, 5320MHz)

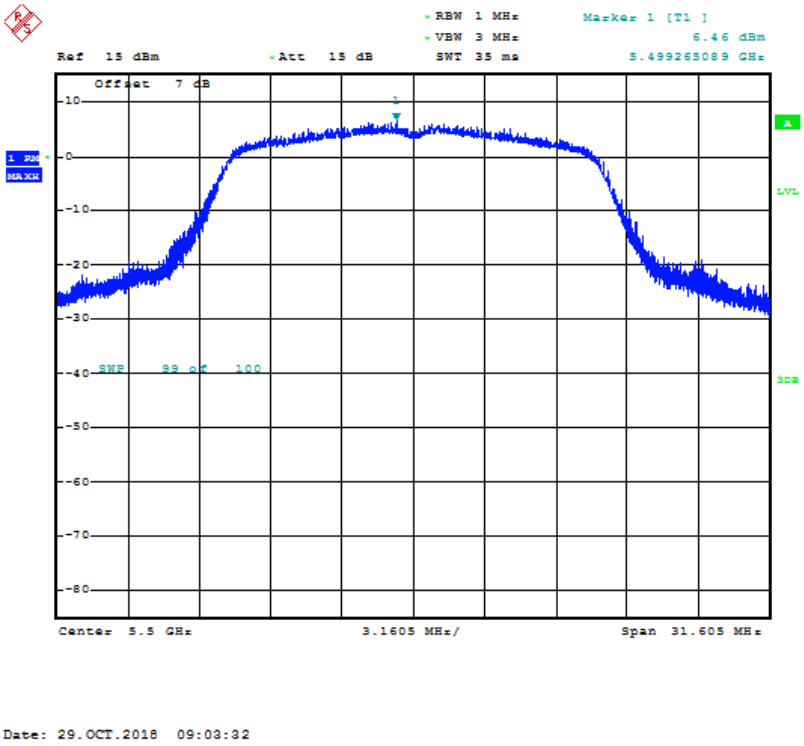


Fig. 7 Power Spectral Density (802.11a, 5500MHz)

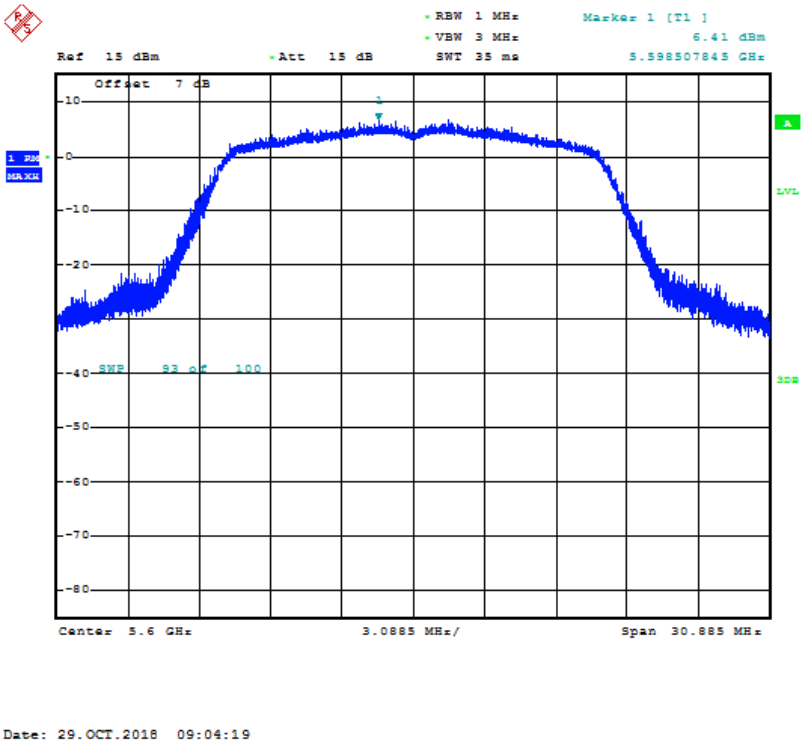


Fig. 8 Power Spectral Density (802.11a, 5600MHz)

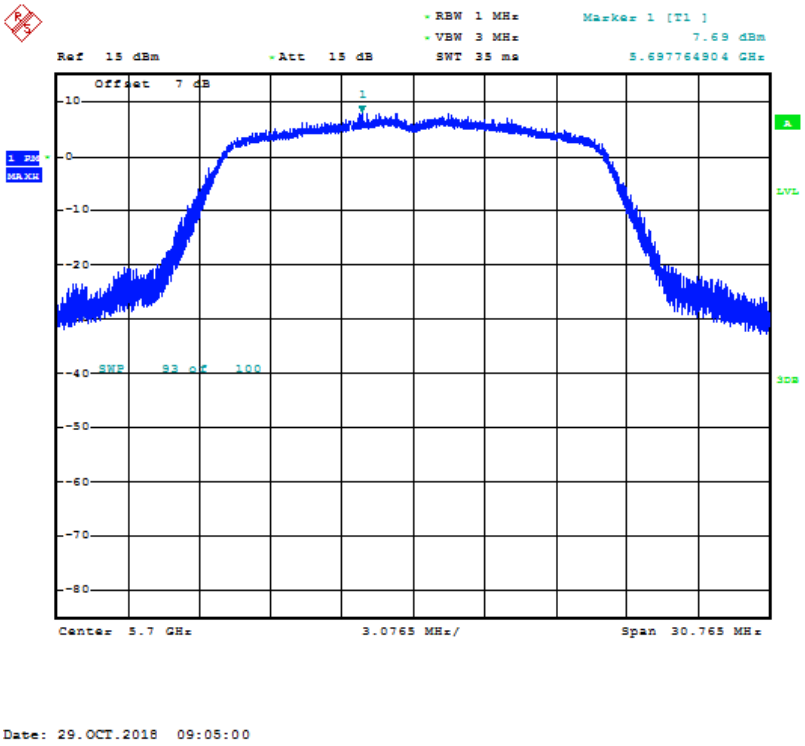


Fig. 9 Power Spectral Density (802.11a, 5700MHz)

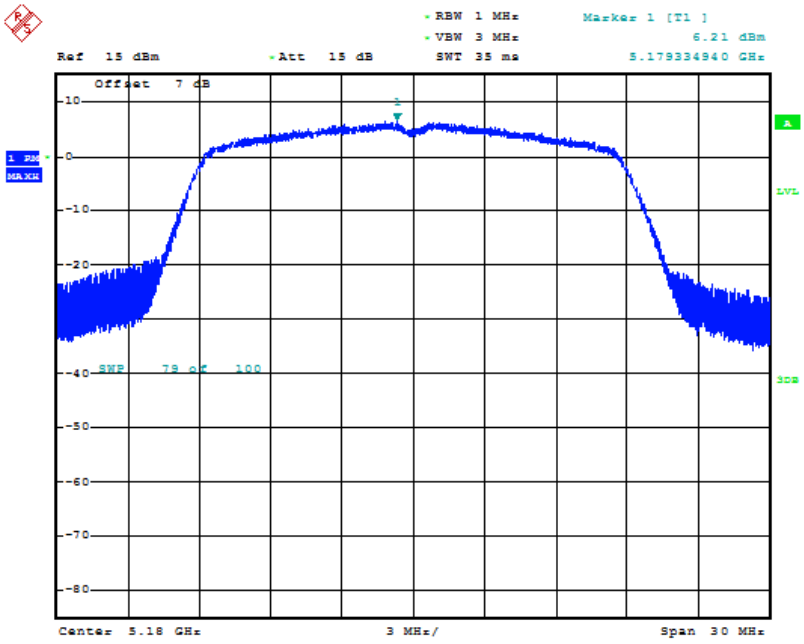


Fig. 10 Power Spectral Density (802.11n-HT20, 5180MHz)

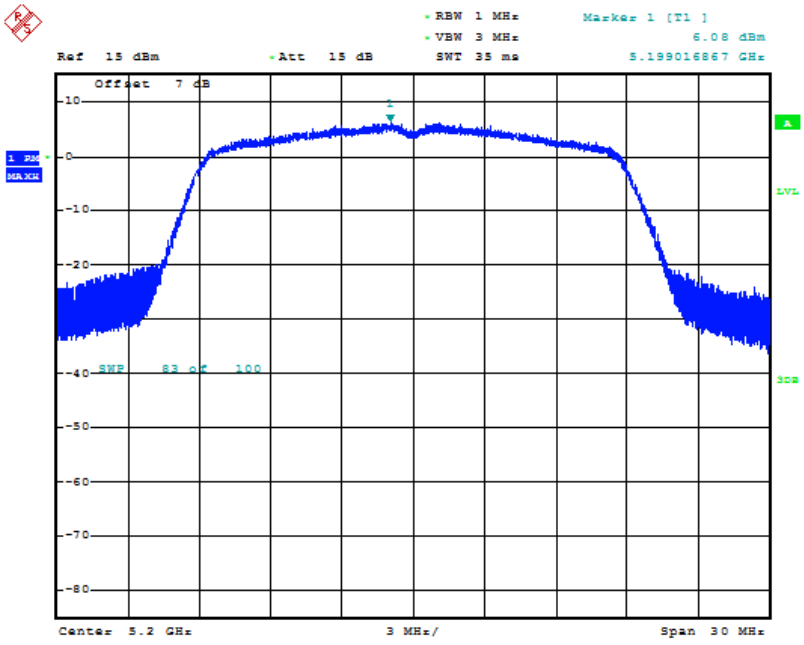


Fig. 11 Power Spectral Density (802.11n-HT20, 5200MHz)

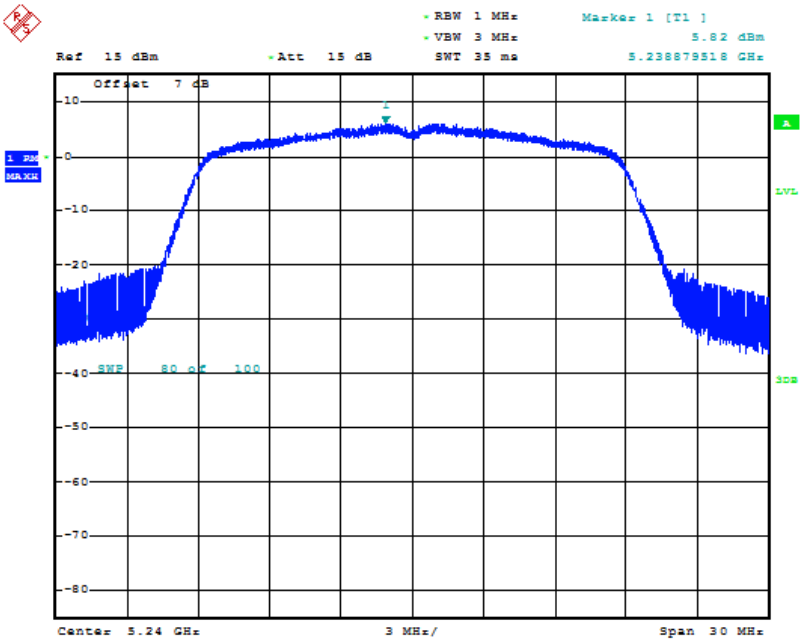


Fig. 12 Power Spectral Density (802.11n-HT20, 5240MHz)

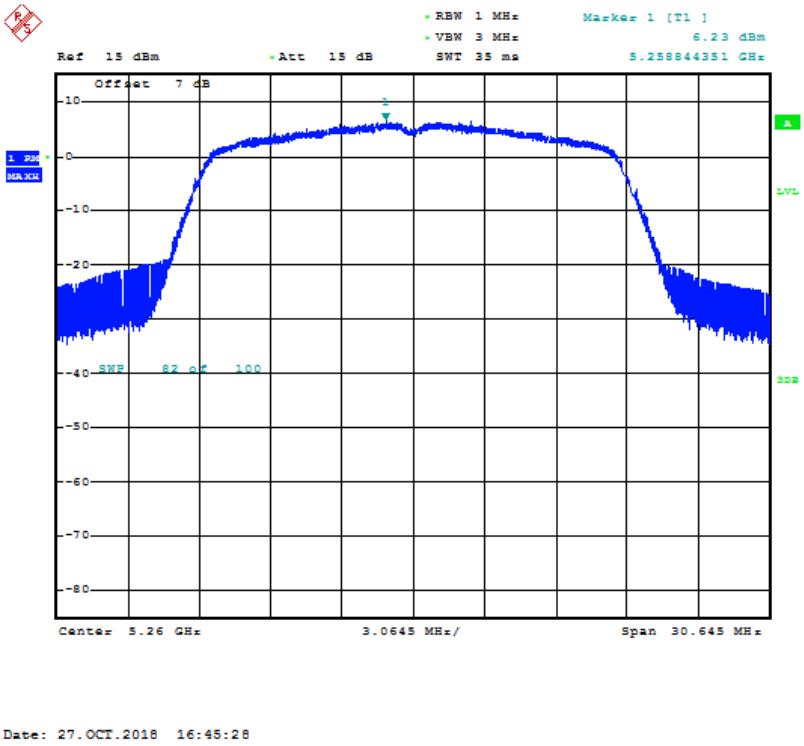


Fig. 13 Power Spectral Density (802.11n-HT20, 5260MHz)

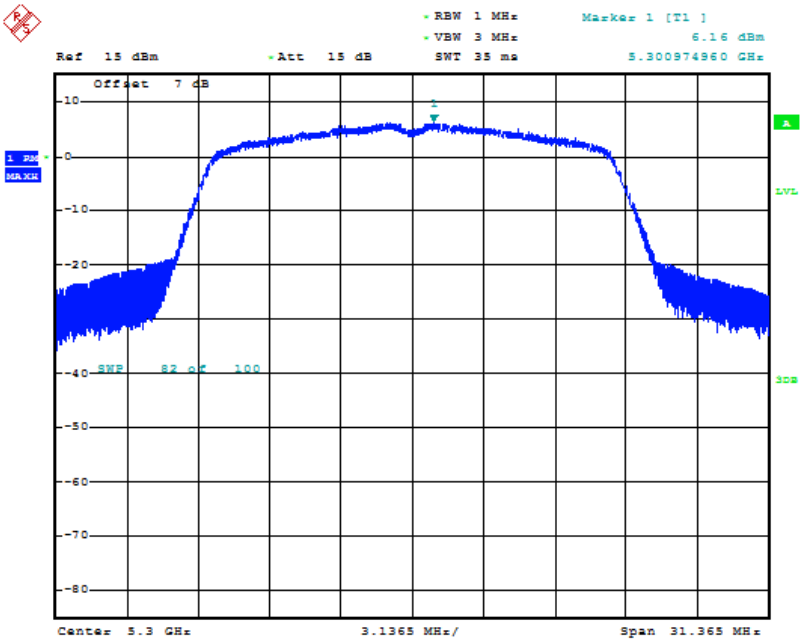


Fig. 14 Power Spectral Density (802.11n-HT20, 5300MHz)

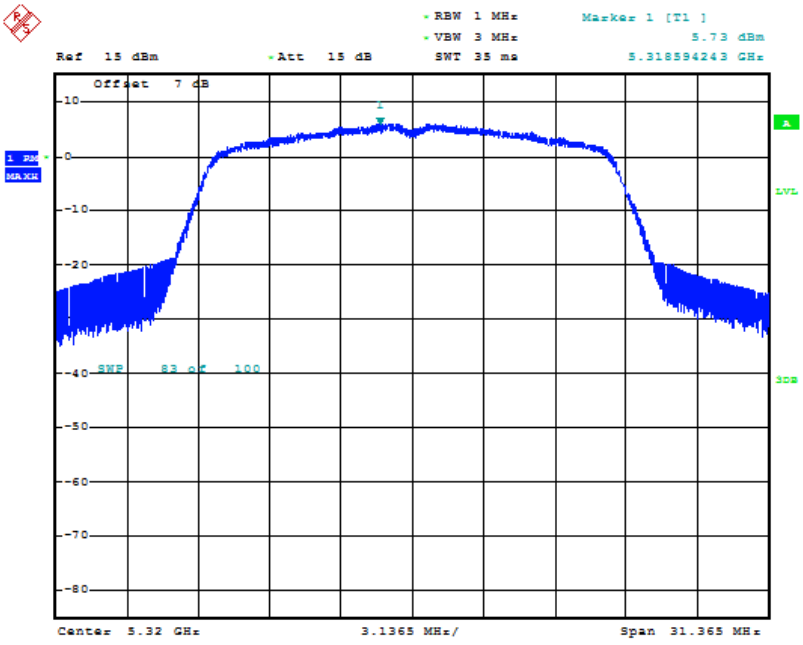


Fig. 15 Power Spectral Density (802.11n-HT20, 5320MHz)

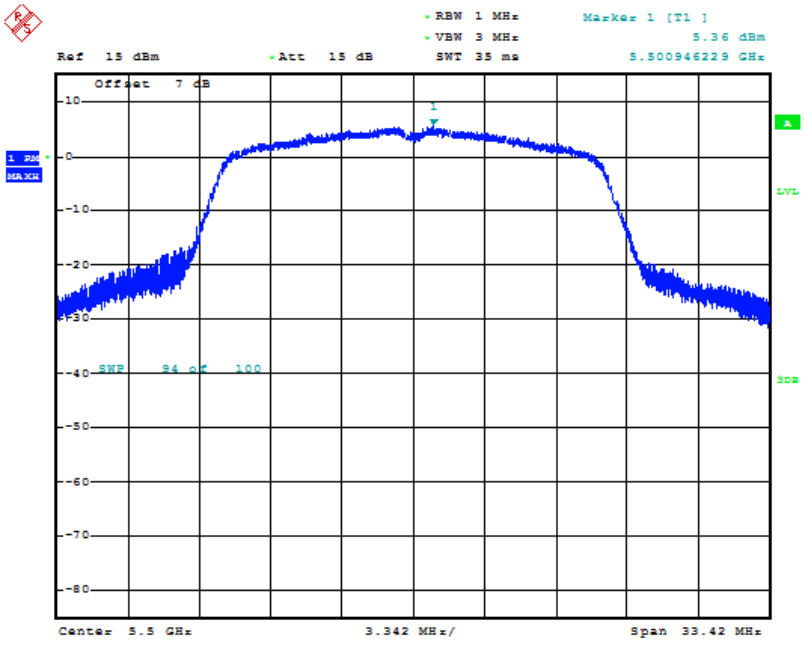


Fig. 16 Power Spectral Density (802.11n-HT20, 5500MHz)

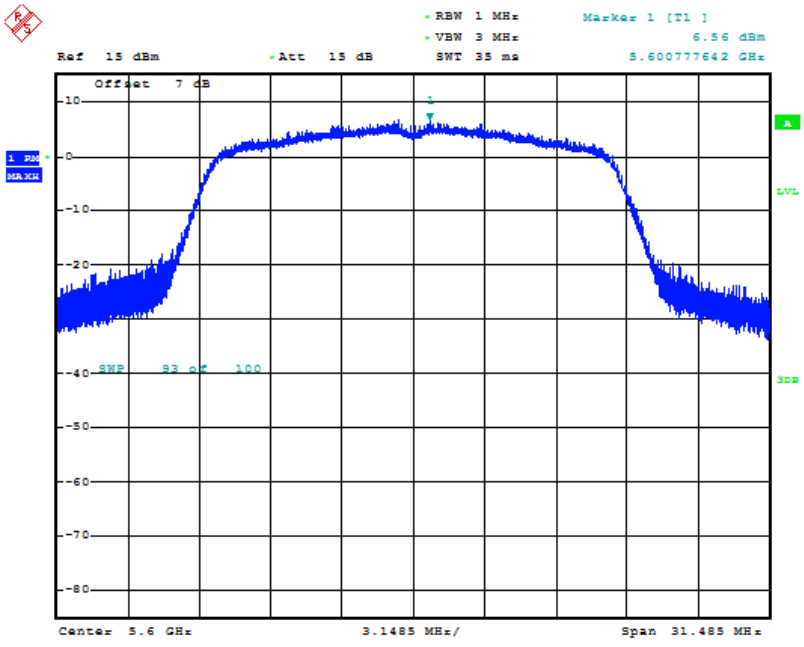


Fig. 17 Power Spectral Density (802.11n-HT20, 5600MHz)

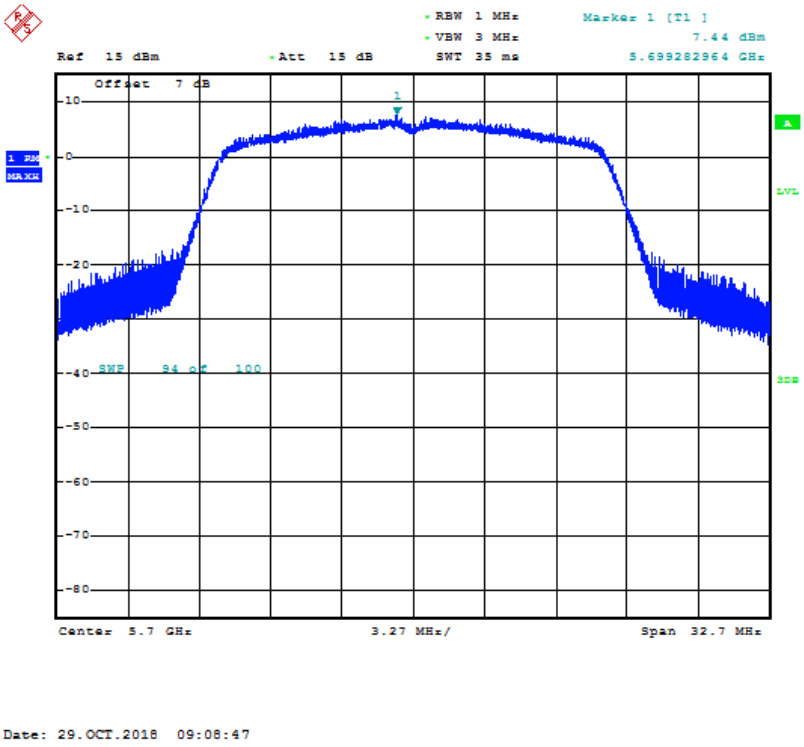


Fig. 18 Power Spectral Density (802.11n-HT20, 5700MHz)

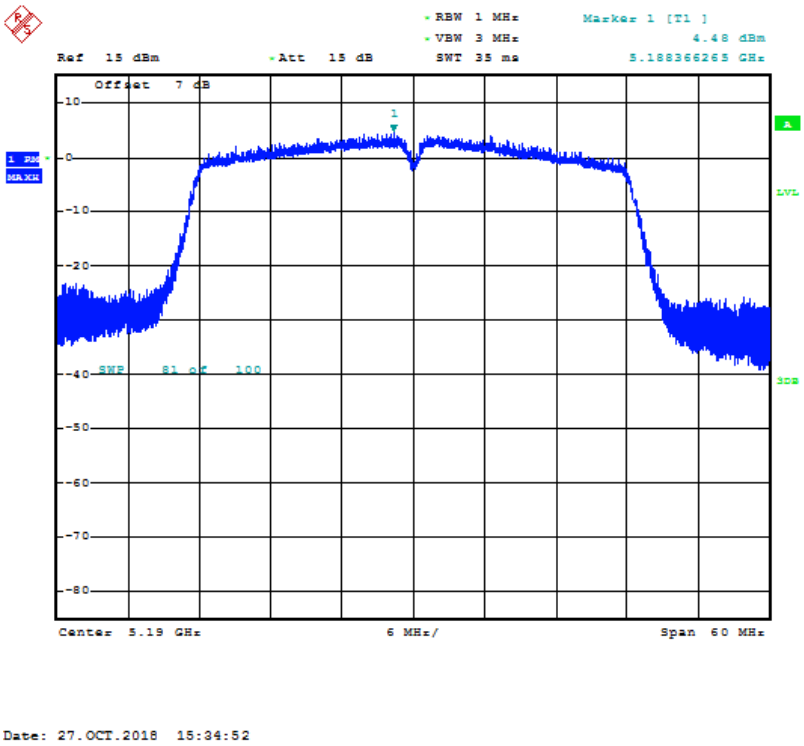


Fig. 19 Power Spectral Density (802.11n-HT40, 5190MHz)

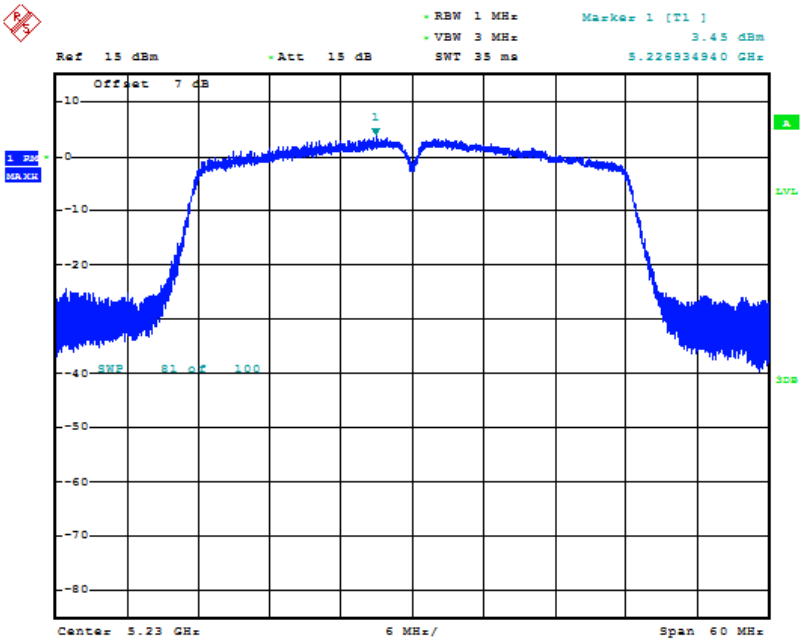


Fig. 20 Power Spectral Density (802.11n-HT40, 5230MHz)

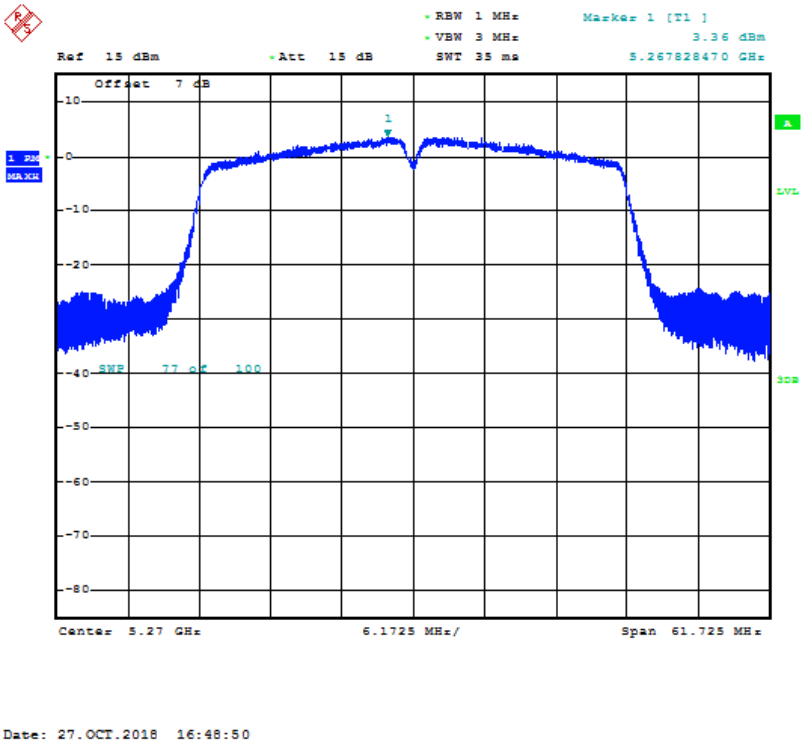


Fig. 21 Power Spectral Density (802.11n-HT40, 5270MHz)

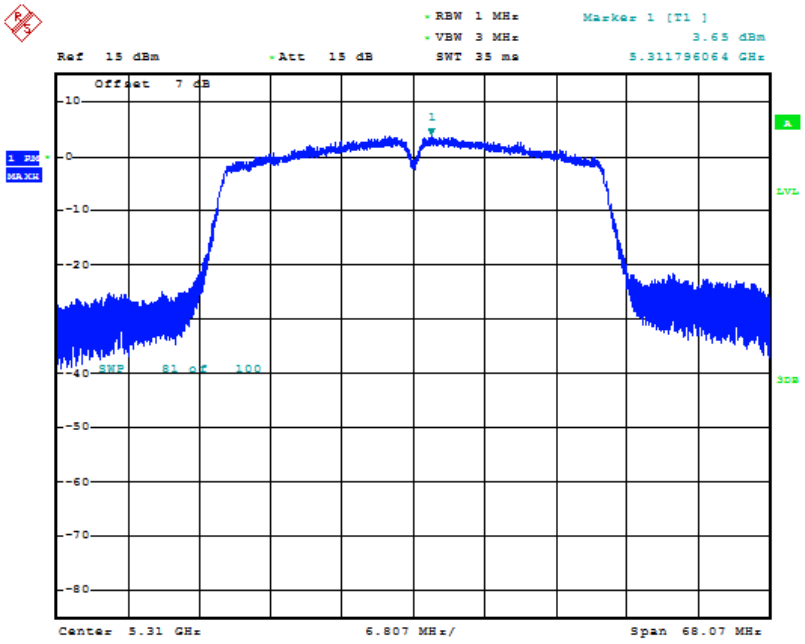


Fig. 22 Power Spectral Density (802.11n-HT40, 5310MHz)

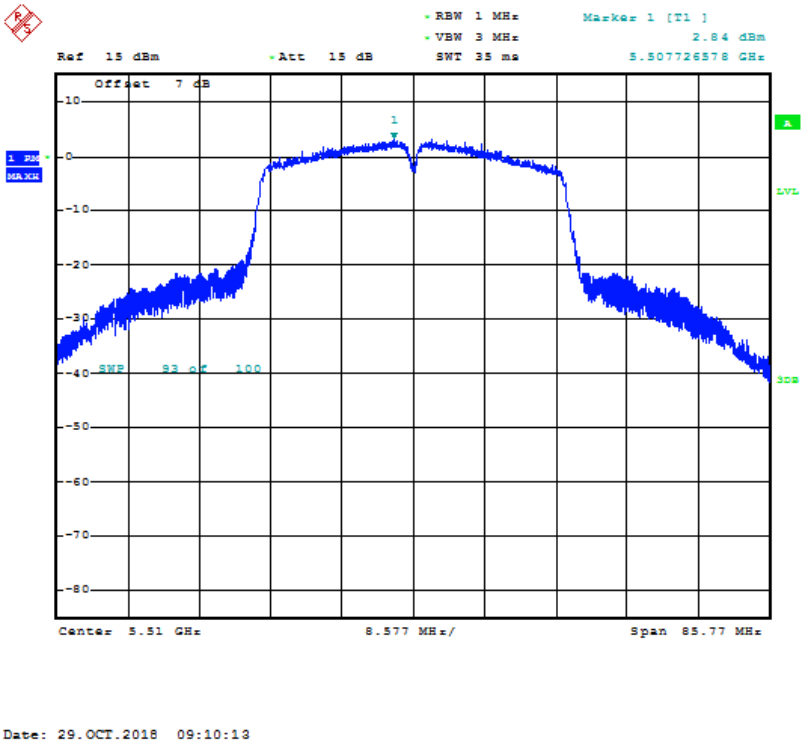


Fig. 23 Power Spectral Density (802.11n-HT40, 5510MHz)

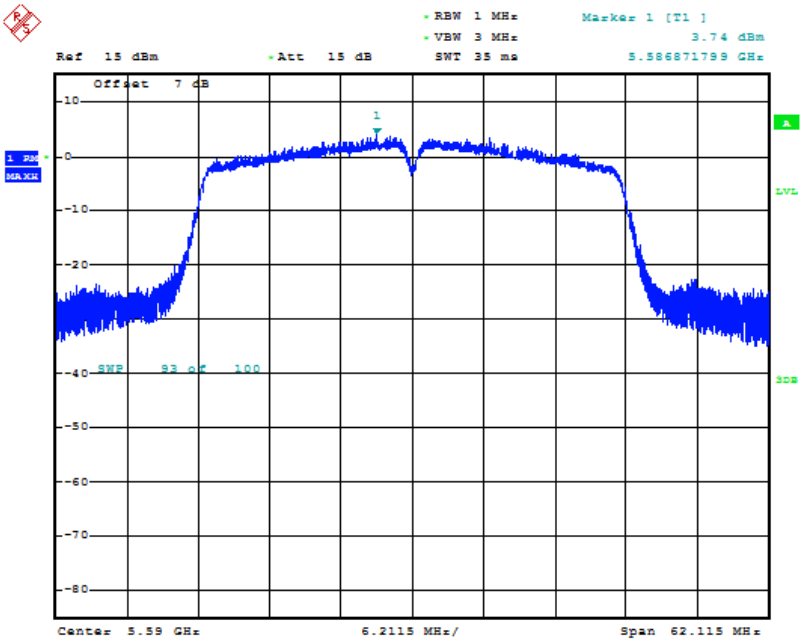


Fig. 24 Power Spectral Density (802.11n-HT40, 5590MHz)

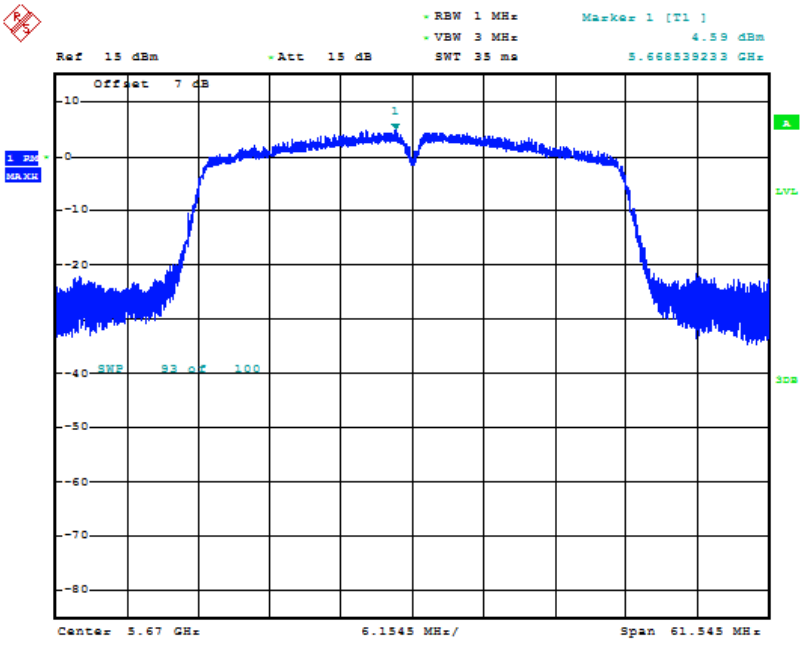


Fig. 25 Power Spectral Density (802.11n-HT40, 5670MHz)

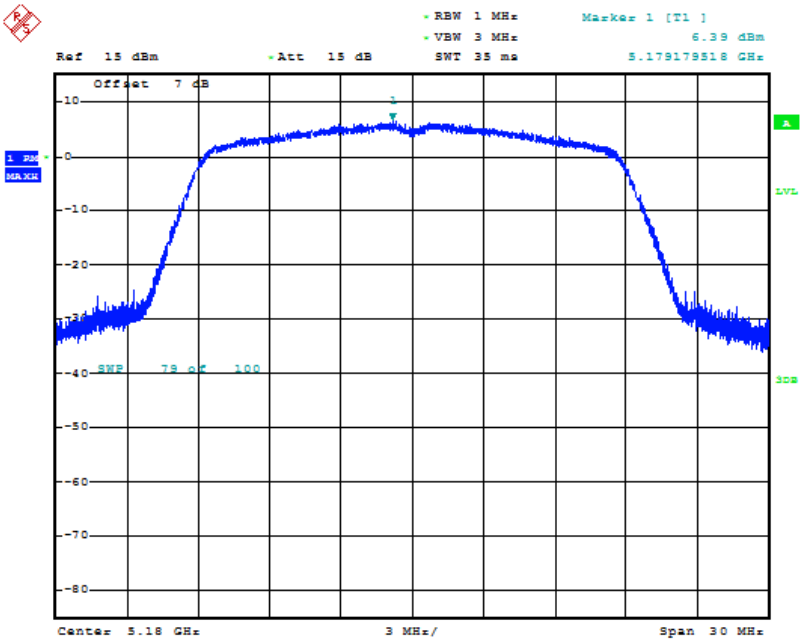


Fig. 26 Power Spectral Density (802.11ac-HT20, 5180MHz)

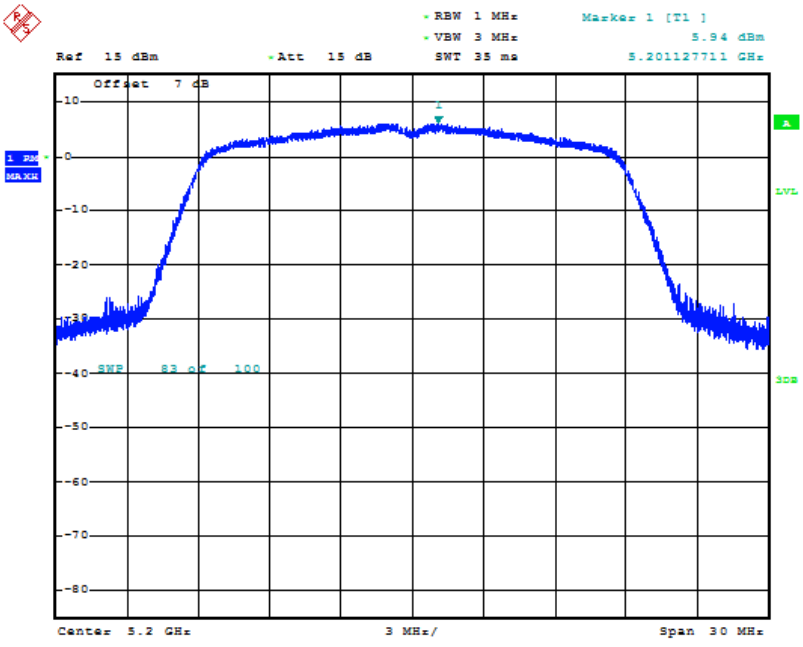


Fig. 27 Power Spectral Density (802.11ac-HT20, 5200MHz)

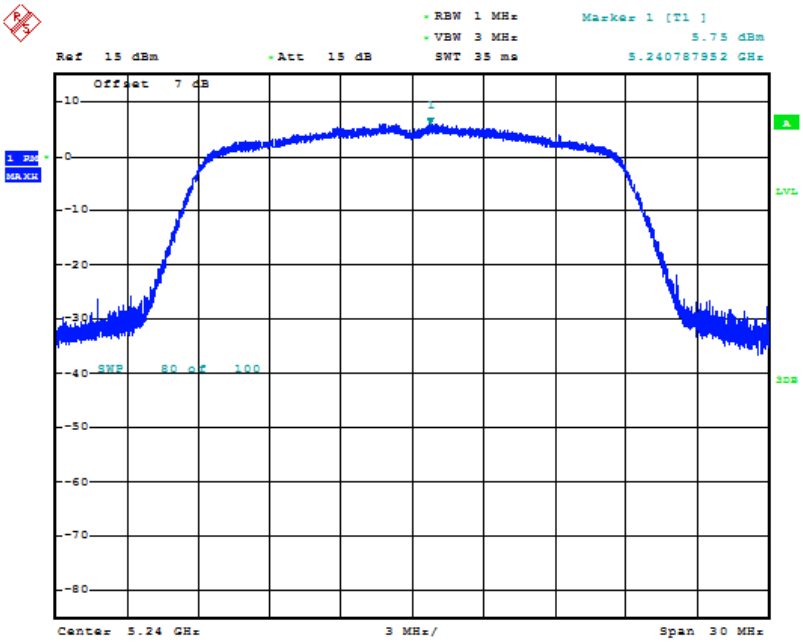


Fig. 28 Power Spectral Density (802.11ac-HT20, 5240MHz)

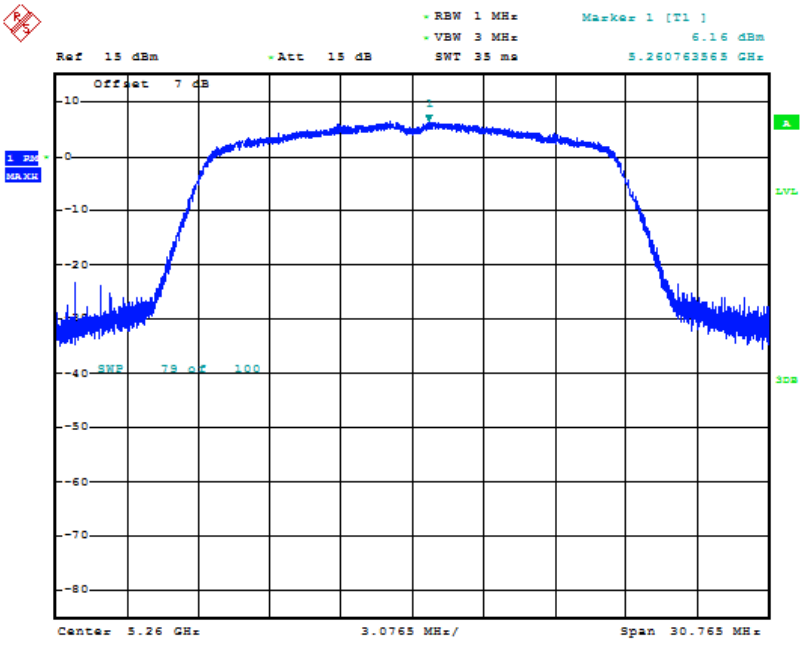


Fig. 29 Power Spectral Density (802.11ac-HT20, 5260MHz)

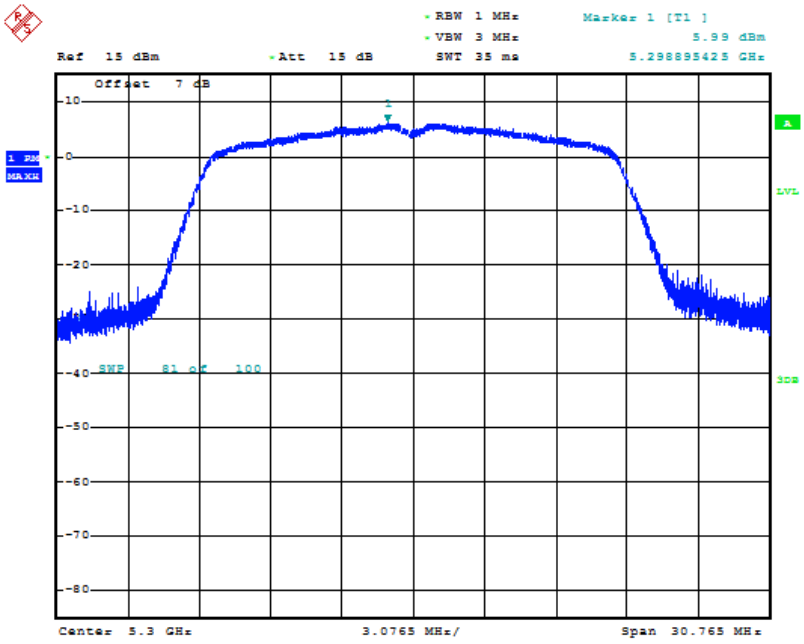


Fig. 30 Power Spectral Density (802.11ac-HT20, 5300MHz)

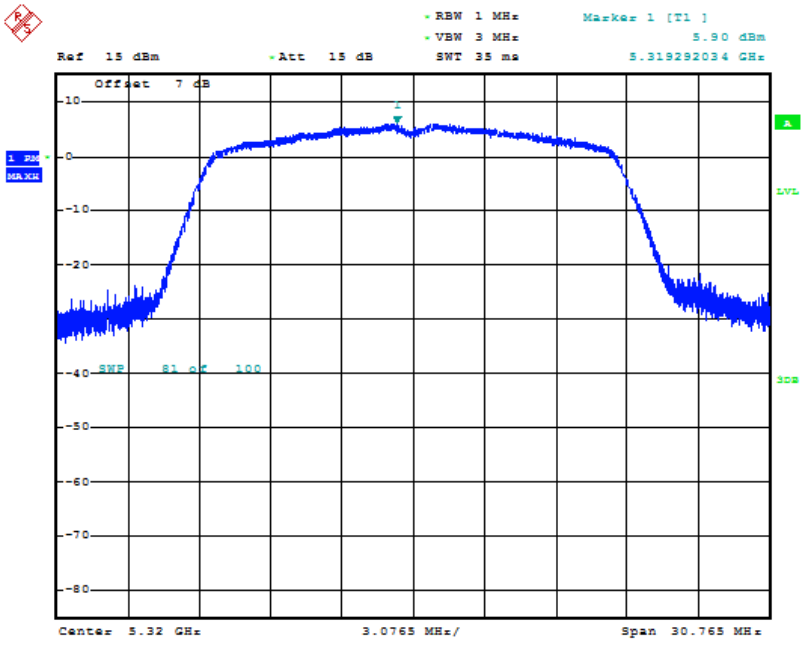


Fig. 31 Power Spectral Density (802.11ac-HT20, 5320MHz)

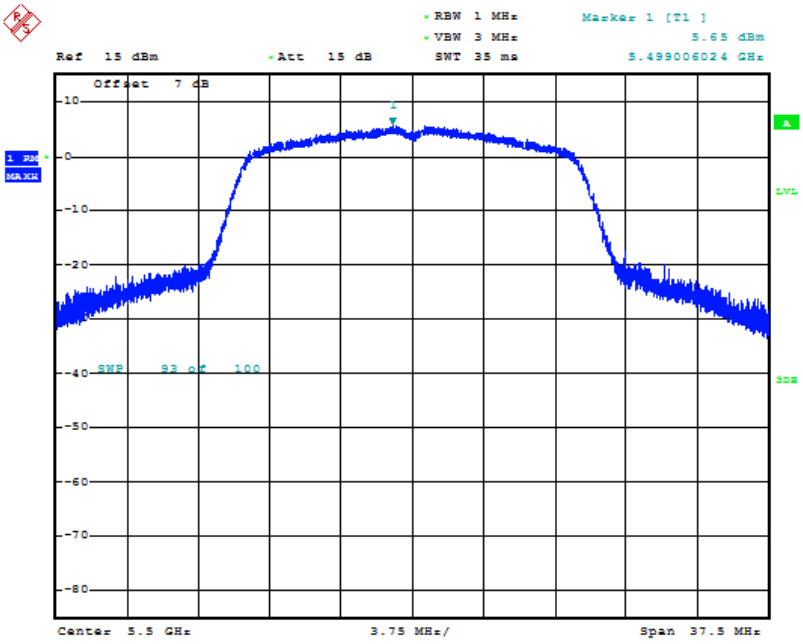


Fig. 32 Power Spectral Density (802.11ac-HT20, 5500MHz)

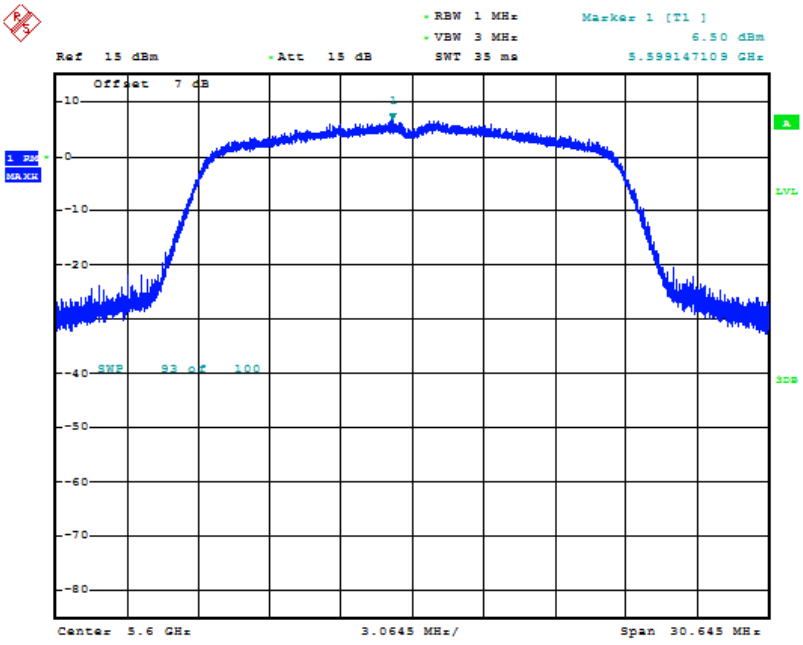


Fig. 33 Power Spectral Density (802.11ac-HT20, 5600MHz)

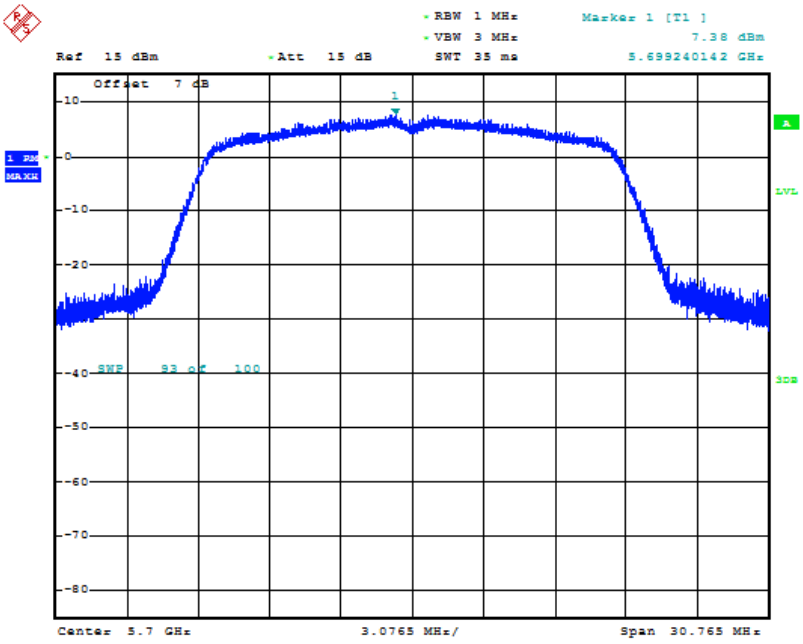


Fig. 34 Power Spectral Density (802.11ac-HT20, 5700MHz)

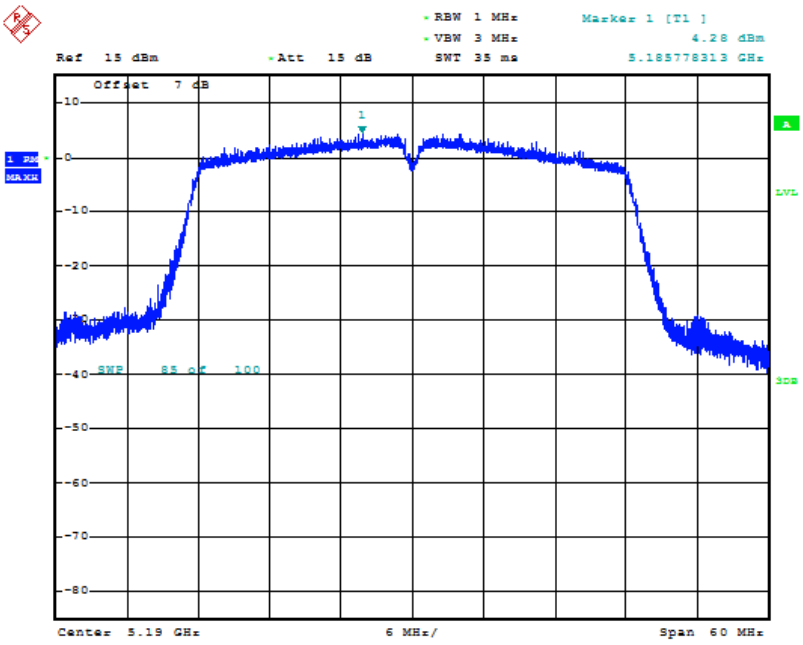


Fig. 35 Power Spectral Density (802.11ac-HT40, 5190MHz)

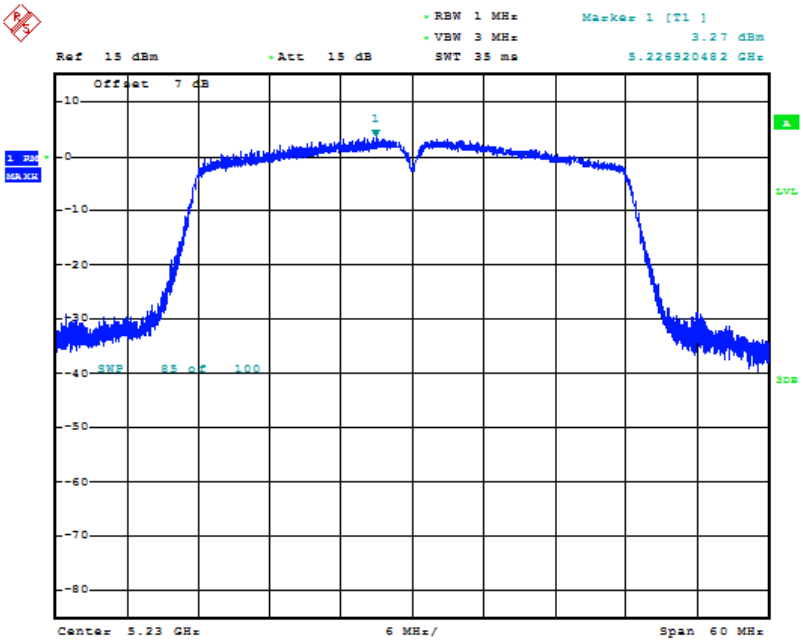


Fig. 36 Power Spectral Density (802.11ac-HT40, 5230MHz)

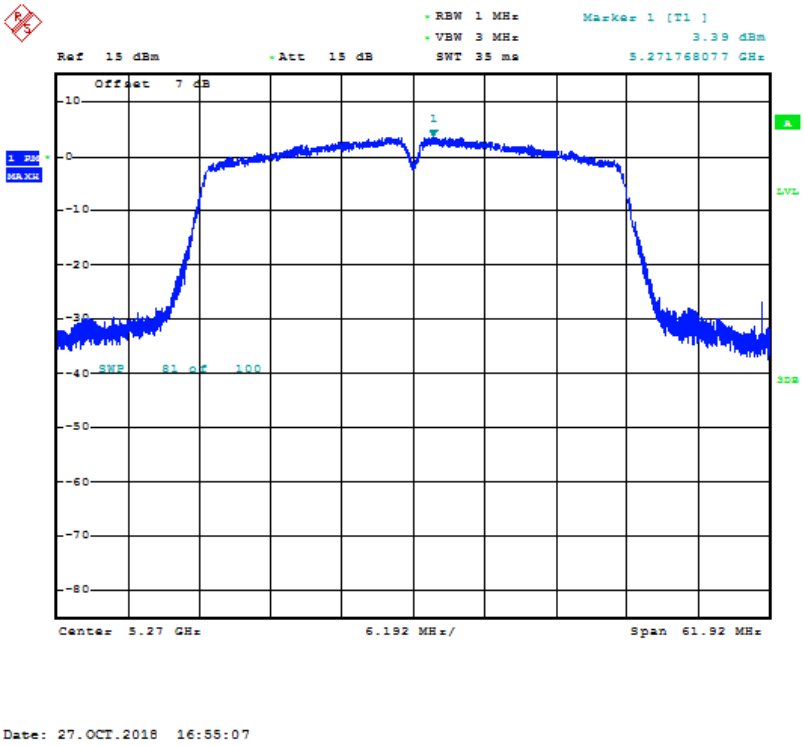


Fig. 37 Power Spectral Density (802.11ac-HT40, 5270MHz)

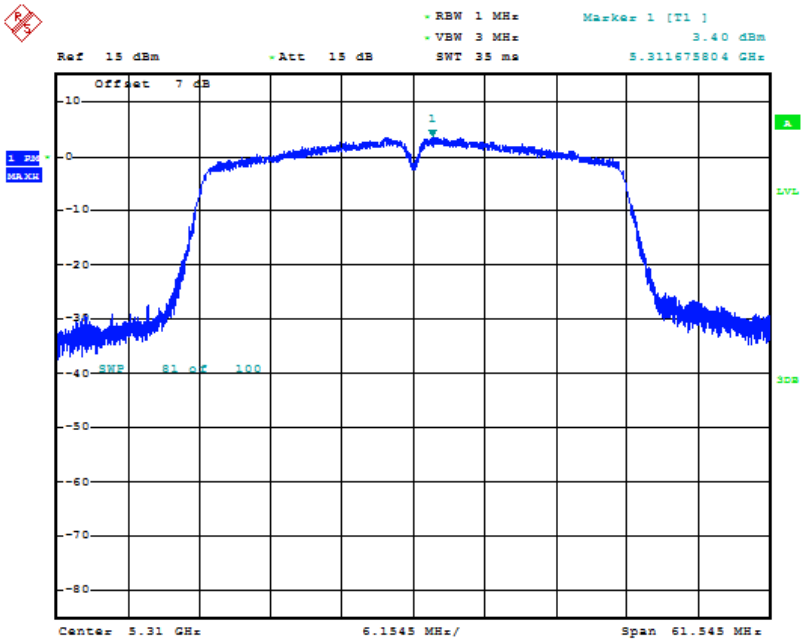


Fig. 38 Power Spectral Density (802.11ac-HT40, 5310MHz)

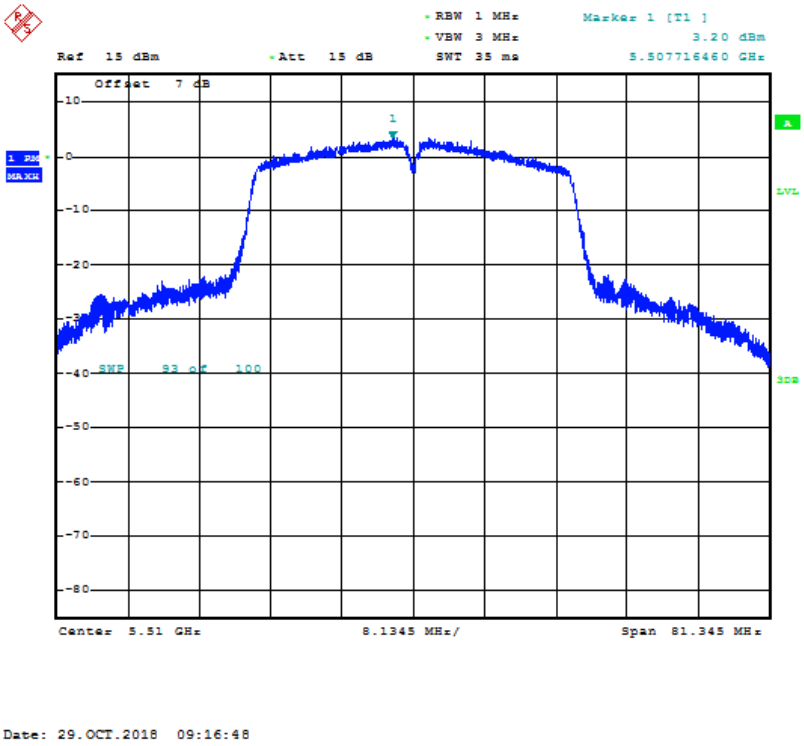


Fig. 39 Power Spectral Density (802.11ac-HT40, 5510MHz)

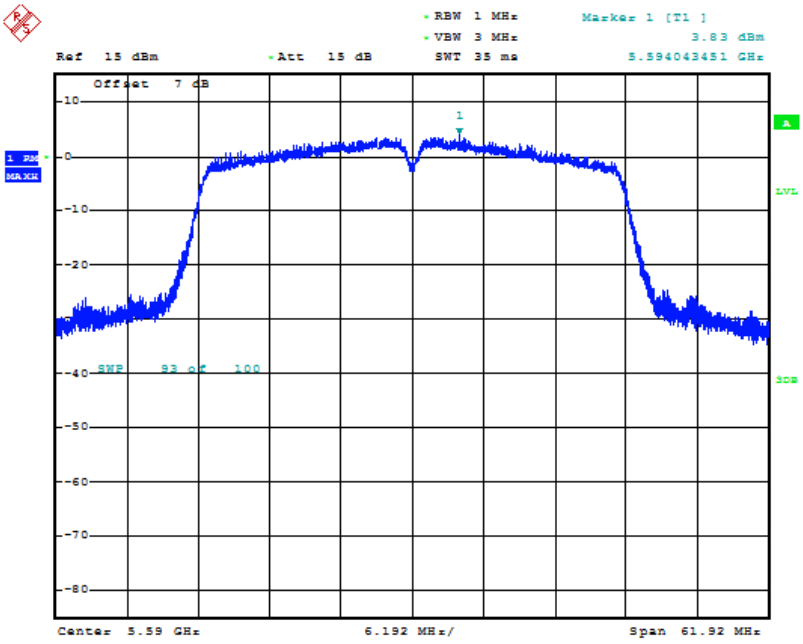


Fig. 40 Power Spectral Density (802.11ac-HT40, 5590MHz)

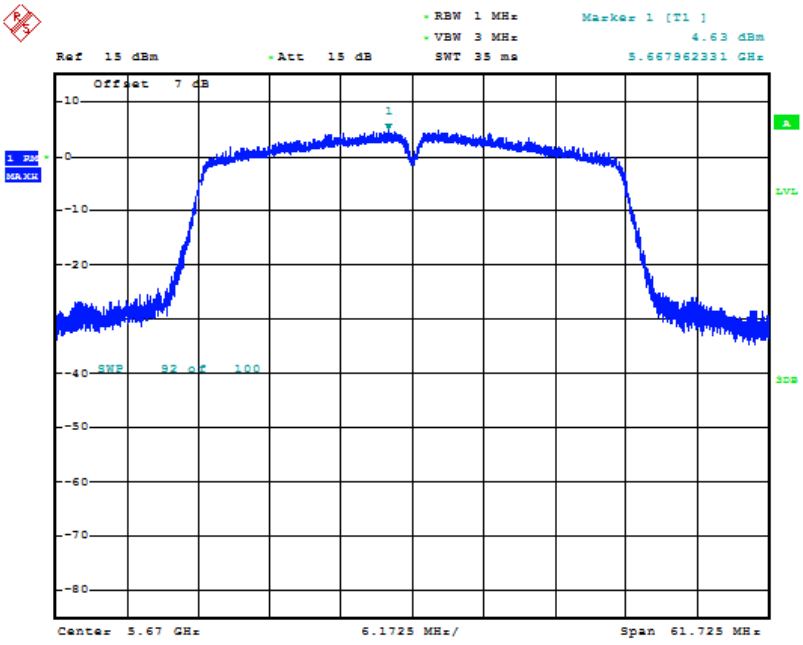


Fig. 41 Power Spectral Density (802.11ac-HT40, 5670MHz)

6.4. Occupied 26dB Bandwidth(conducted)

Measurement Limit:

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

The measurement is made according to KDB 789033

Measurement Result:

Mode	Channel	Occupied 26dB Bandwidth (MHz)		conclusion
802.11a	5180 MHz	Fig.42	20.43	P
	5200 MHz	Fig.43	20.43	P
	5240 MHz	Fig.44	20.35	P
	5260 MHz	Fig.45	20.43	P
	5300 MHz	Fig.46	20.51	P
	5320 MHz	Fig.47	20.67	P
	5500 MHz	Fig.48	21.07	P
	5600 MHz	Fig.49	20.59	P
	5700 MHz	Fig.50	20.51	P
802.11n HT20	5180 MHz	Fig.51	20.43	P
	5200 MHz	Fig.52	20.51	P
	5240 MHz	Fig.53	20.51	P
	5260 MHz	Fig.54	20.43	P
	5300 MHz	Fig.55	20.91	P
	5320 MHz	Fig.56	20.91	P
	5500 MHz	Fig.57	22.28	P
	5600 MHz	Fig.58	20.99	P
	5700 MHz	Fig.59	21.8	P
802.11n HT40	5190 MHz	Fig.60	40.9	P
	5230 MHz	Fig.61	41.03	P
	5270 MHz	Fig.62	41.15	P
	5310 MHz	Fig.63	41.15	P
	5510 MHz	Fig.64	41.03	P
	5590 MHz	Fig.65	41.41	P
	5670 MHz	Fig.66	41.03	P
802.11ac HT20	5180 MHz	Fig.67	20.51	P
	5200 MHz	Fig.68	20.51	P
	5240 MHz	Fig.69	20.51	P
	5260 MHz	Fig.70	20.51	P
	5300 MHz	Fig.71	20.51	P
	5320 MHz	Fig.72	20.51	P
	5500 MHz	Fig.73	25	P
	5600 MHz	Fig.74	20.43	P

	5700 MHz	Fig.75	20.51	P
802.11ac HT40	5190 MHz	Fig.76	41.15	P
	5230 MHz	Fig.77	41.03	P
	5270 MHz	Fig.78	41.28	P
	5310 MHz	Fig.79	41.03	P
	5510 MHz	Fig.80	41.15	P
	5590 MHz	Fig.81	41.28	P
	5670 MHz	Fig.82	41.15	P

Conclusion: PASS

Test graphs as below:

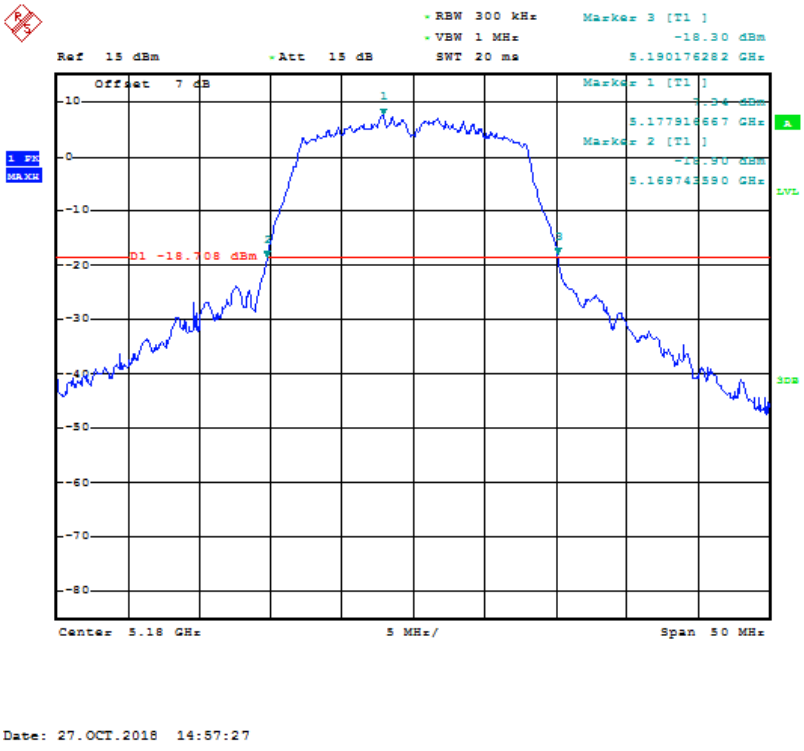


Fig. 42 Occupied 26dB Bandwidth (802.11a, 5180MHz)

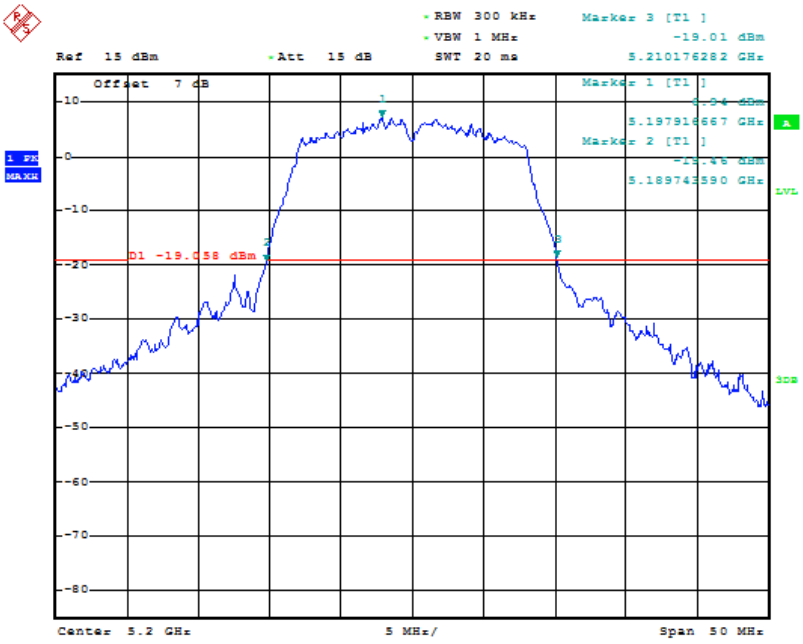


Fig. 43 Occupied 26dB Bandwidth (802.11a, 5200MHz)

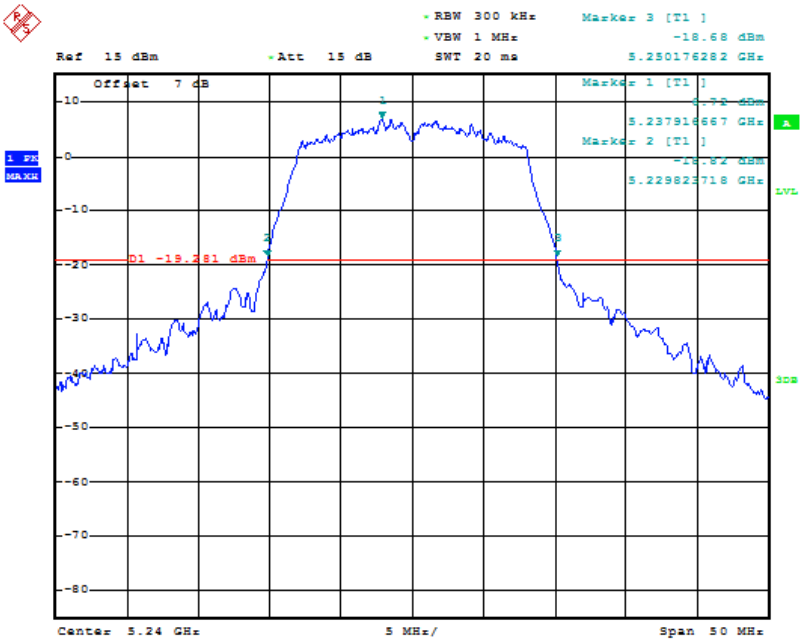


Fig. 44 Occupied 26dB Bandwidth (802.11a, 5240MHz)

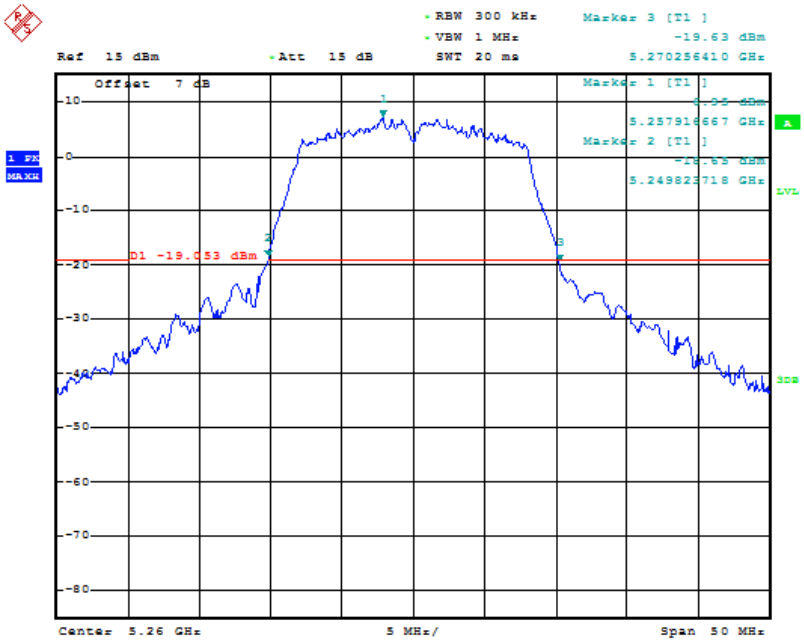


Fig. 45 Occupied 26dB Bandwidth (802.11a, 5260MHz)

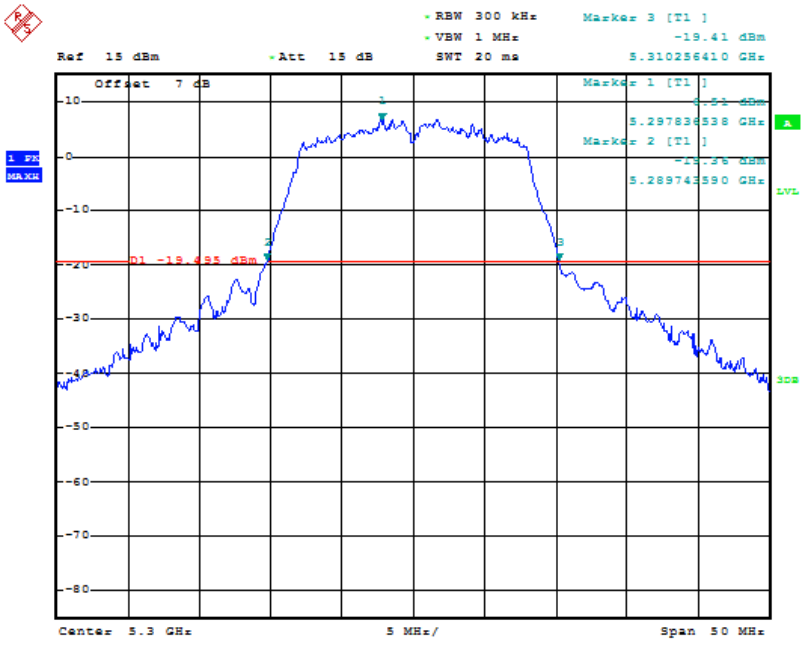


Fig. 46 Occupied 26dB Bandwidth (802.11a, 5300MHz)

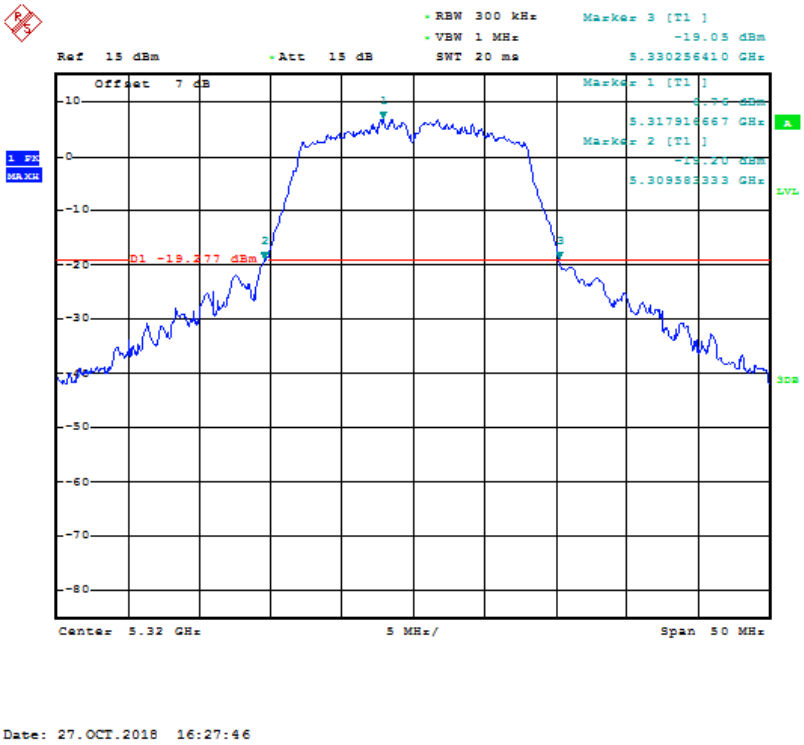


Fig. 47 Occupied 26dB Bandwidth (802.11a, 5320MHz)

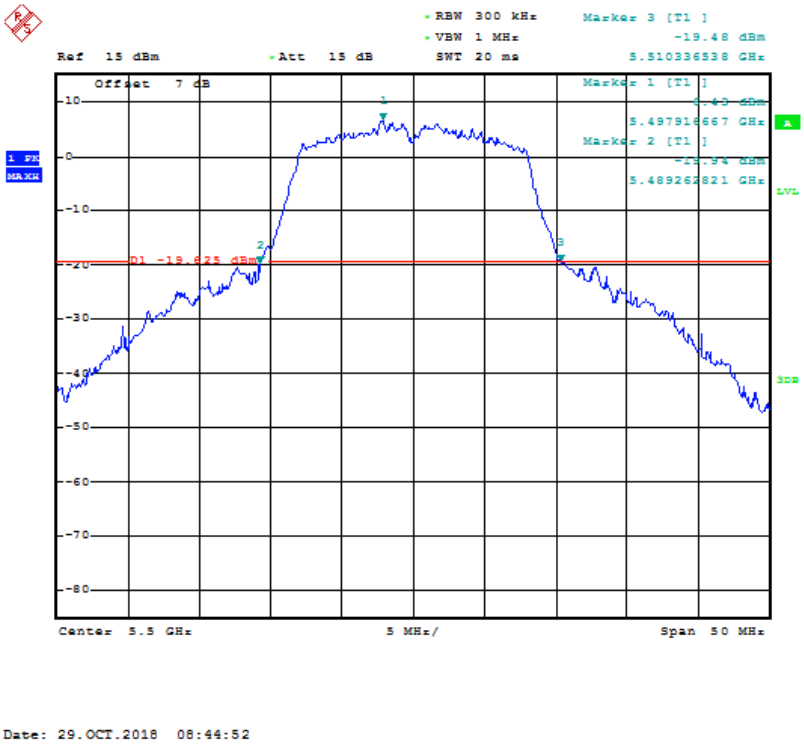


Fig. 48 Occupied 26dB Bandwidth (802.11a, 5500MHz)

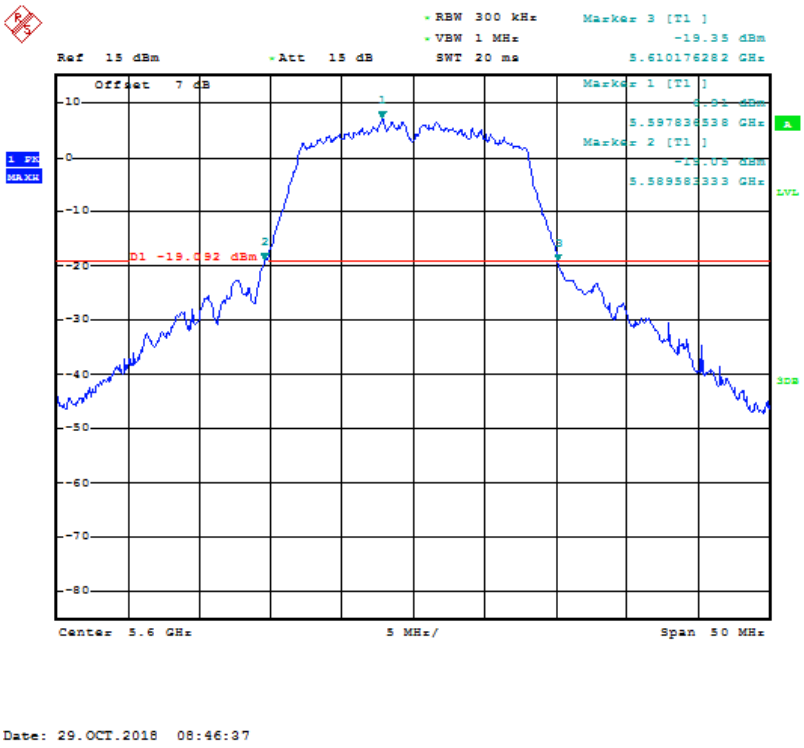


Fig. 49 Occupied 26dB Bandwidth (802.11a, 5600MHz)

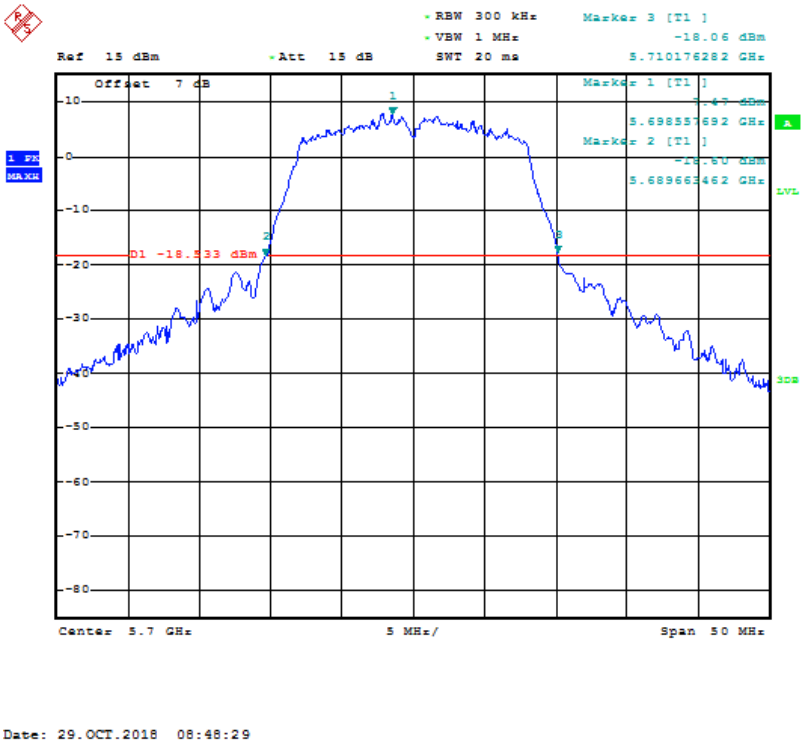


Fig. 50 Occupied 26dB Bandwidth (802.11a, 5700MHz)

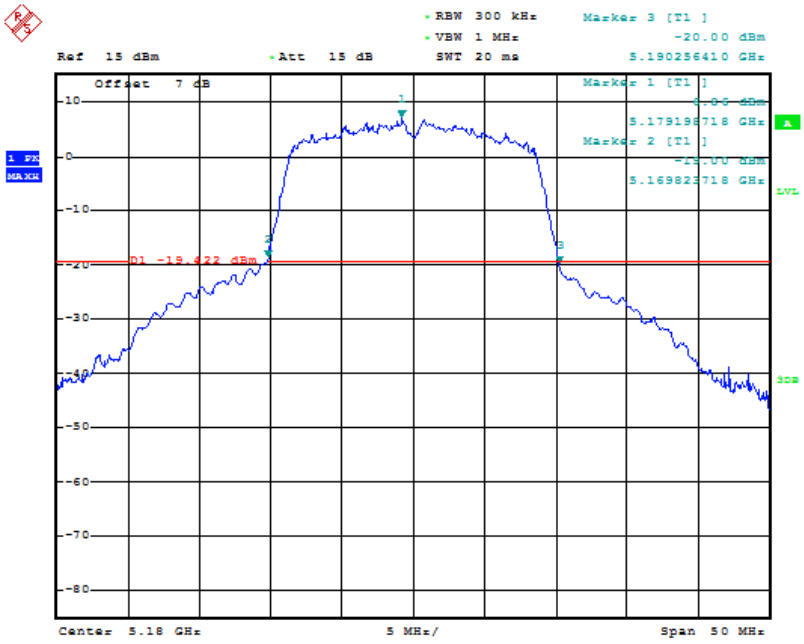


Fig. 51 Occupied 26dB Bandwidth (802.11n-HT20, 5180MHz)

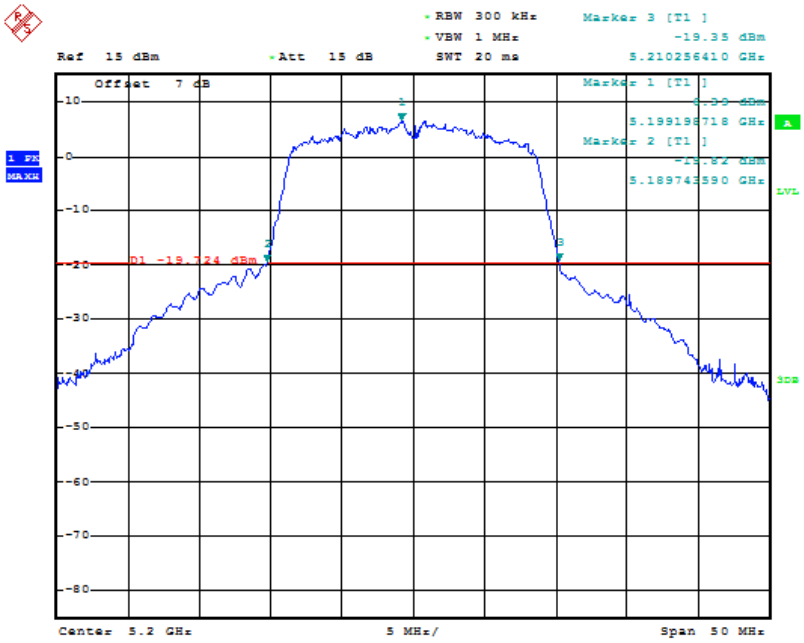


Fig. 52 Occupied 26dB Bandwidth (802.11n-HT20, 5200MHz)

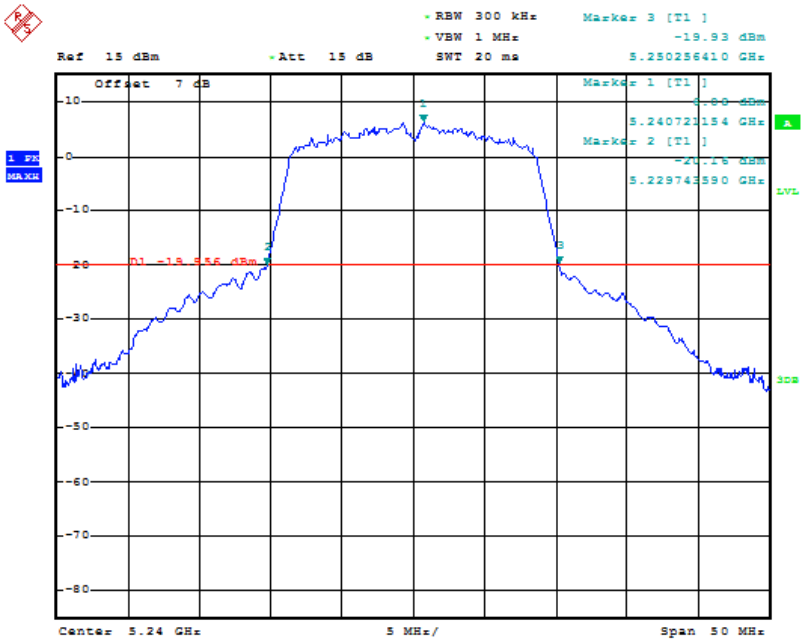


Fig. 53 Occupied 26dB Bandwidth (802.11n-HT20, 5240MHz)

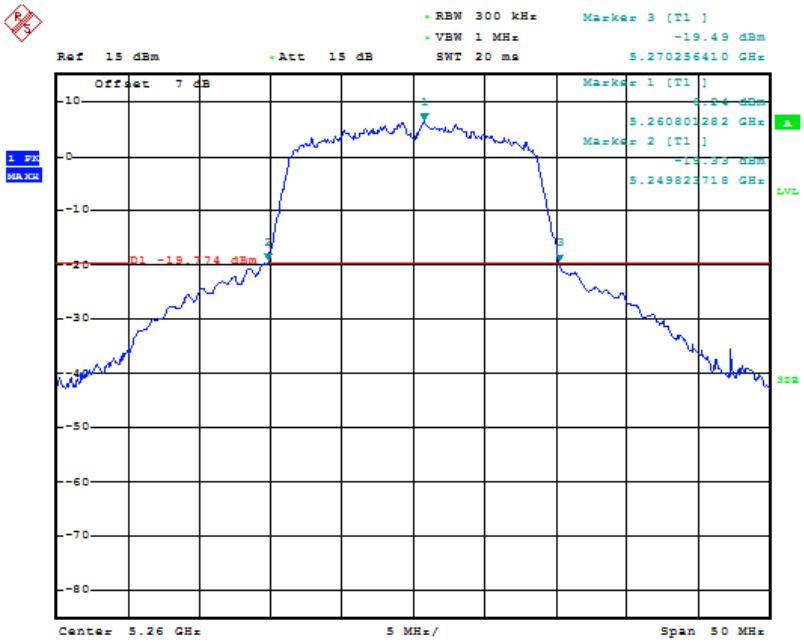


Fig. 54 Occupied 26dB Bandwidth (802.11n-HT20, 5260MHz)

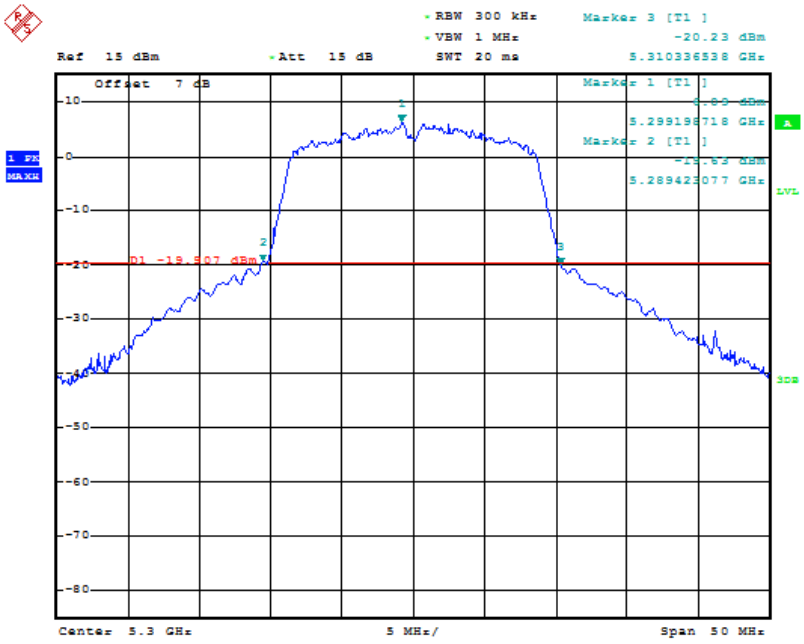


Fig. 55 Occupied 26dB Bandwidth (802.11n-HT20, 5300MHz)

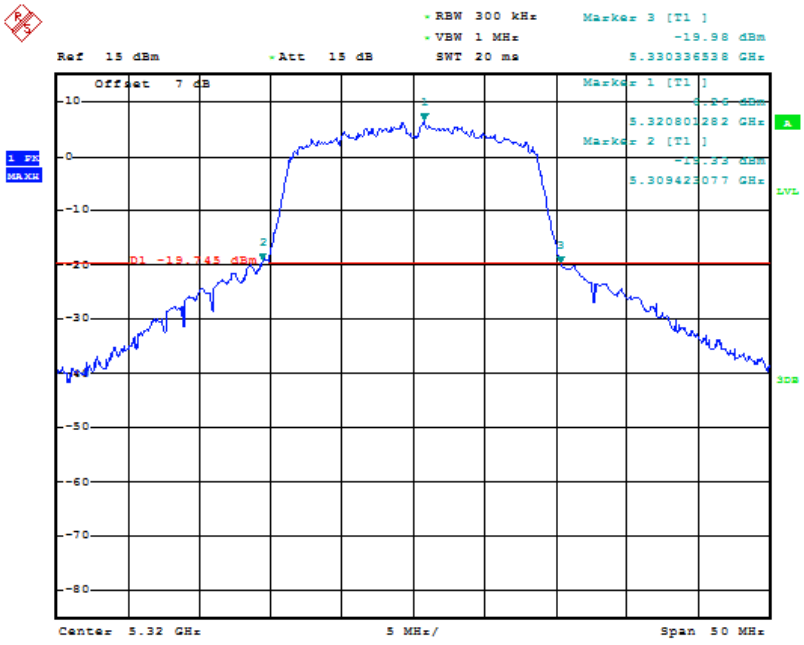


Fig. 56 Occupied 26dB Bandwidth (802.11n-HT20, 5320MHz)

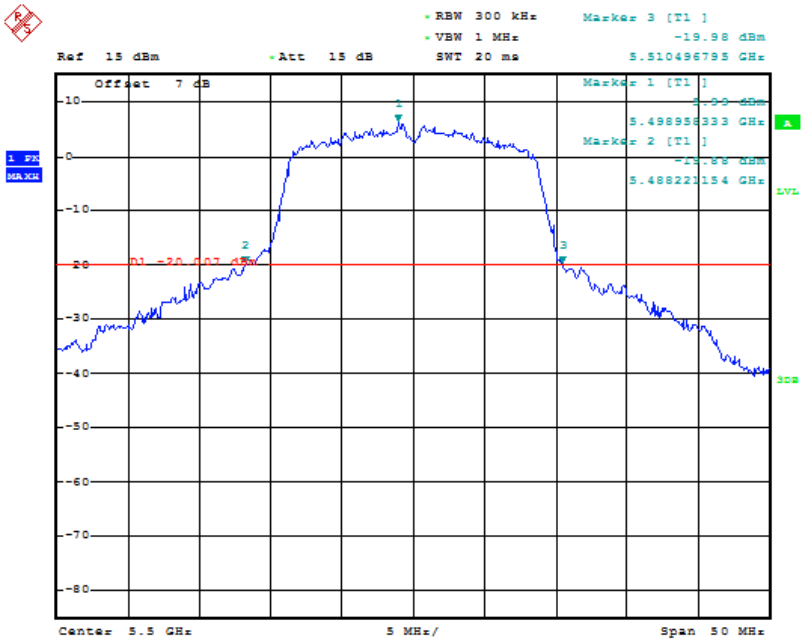


Fig. 57 Occupied 26dB Bandwidth (802.11n-HT20, 5500MHz)

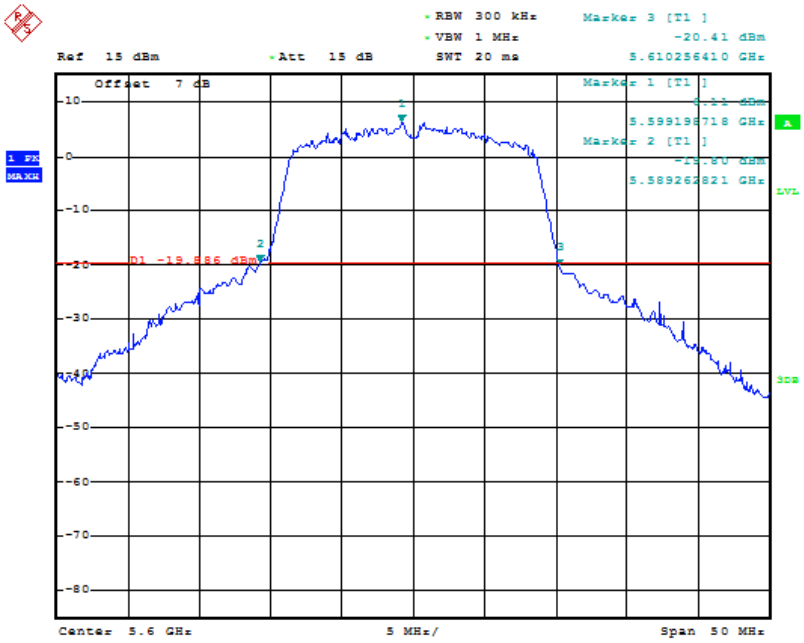


Fig. 58 Occupied 26dB Bandwidth (802.11n-HT20, 5600MHz)

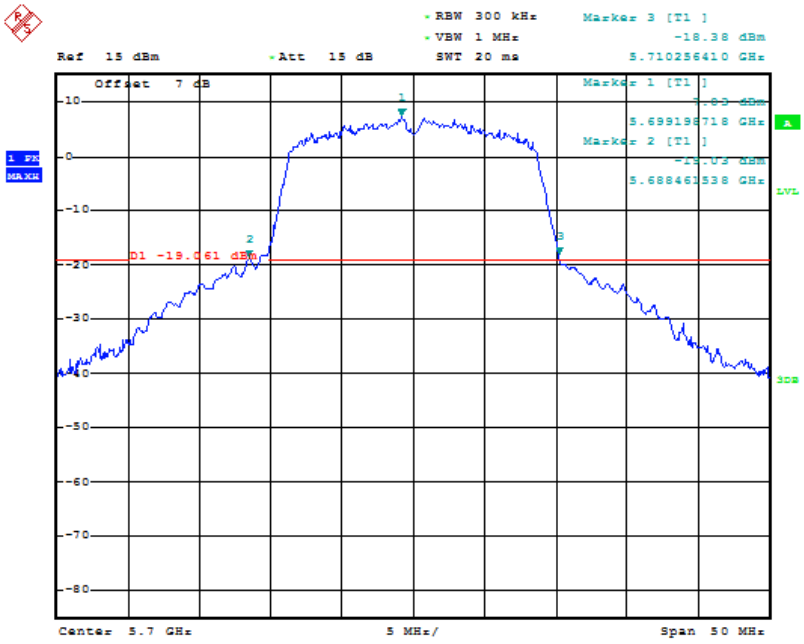


Fig. 59 Occupied 26dB Bandwidth (802.11n-HT20, 5700MHz)

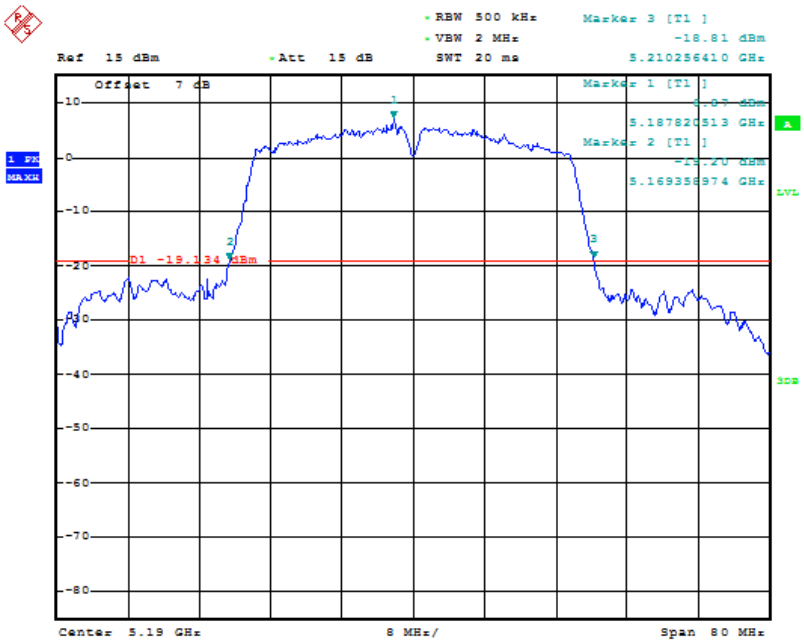


Fig. 60 Occupied 26dB Bandwidth (802.11n-HT40, 5190MHz)

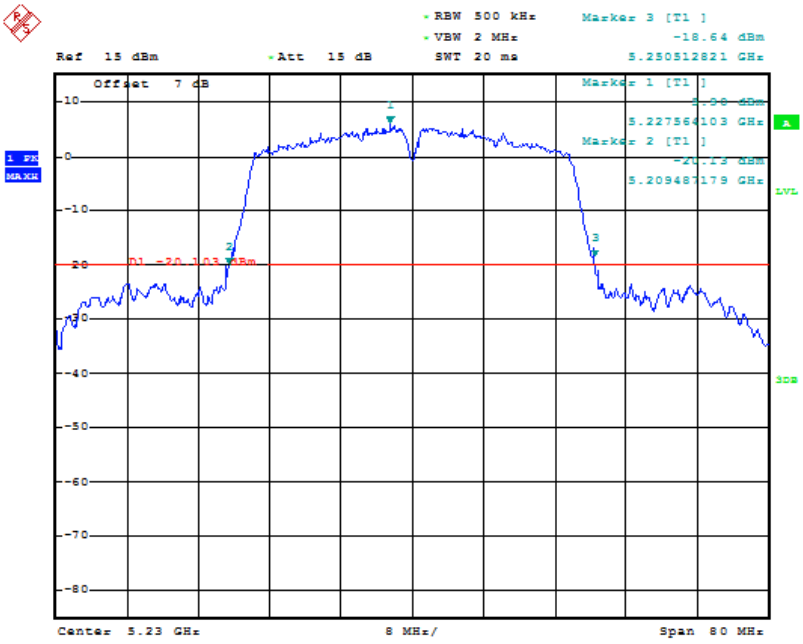


Fig. 61 Occupied 26dB Bandwidth (802.11n-HT40, 5230MHz)

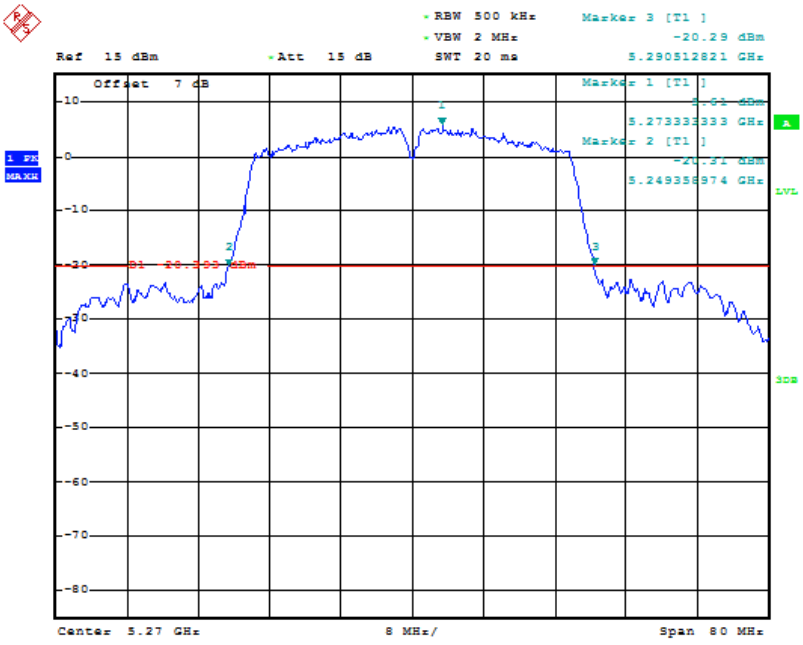


Fig. 62 Occupied 26dB Bandwidth (802.11n-HT40, 5270MHz)

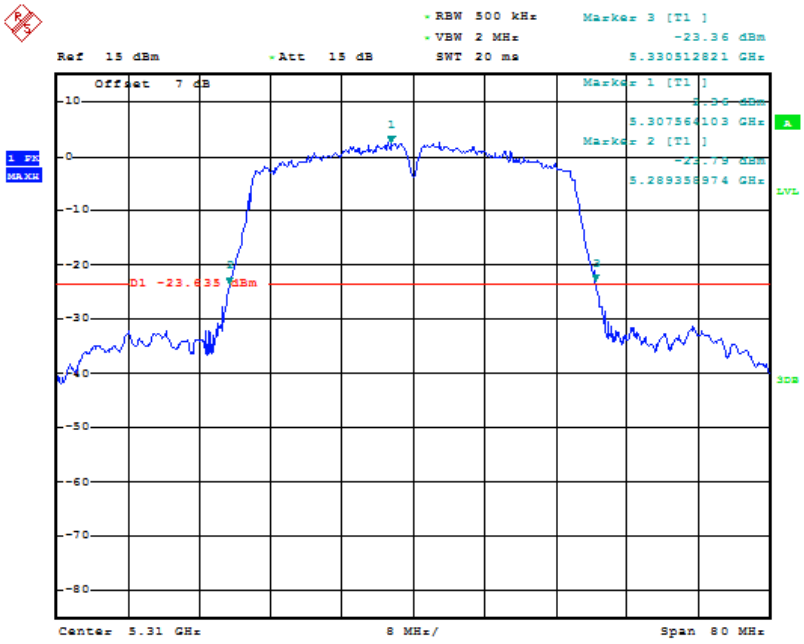


Fig. 63 Occupied 26dB Bandwidth (802.11n-HT40, 5310MHz)

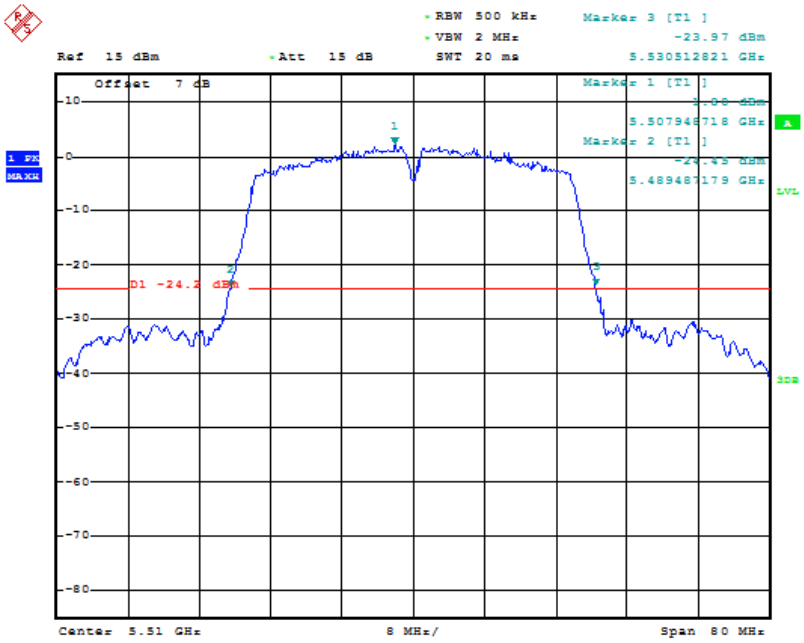


Fig. 64 Occupied 26dB Bandwidth (802.11n-HT40, 5510MHz)

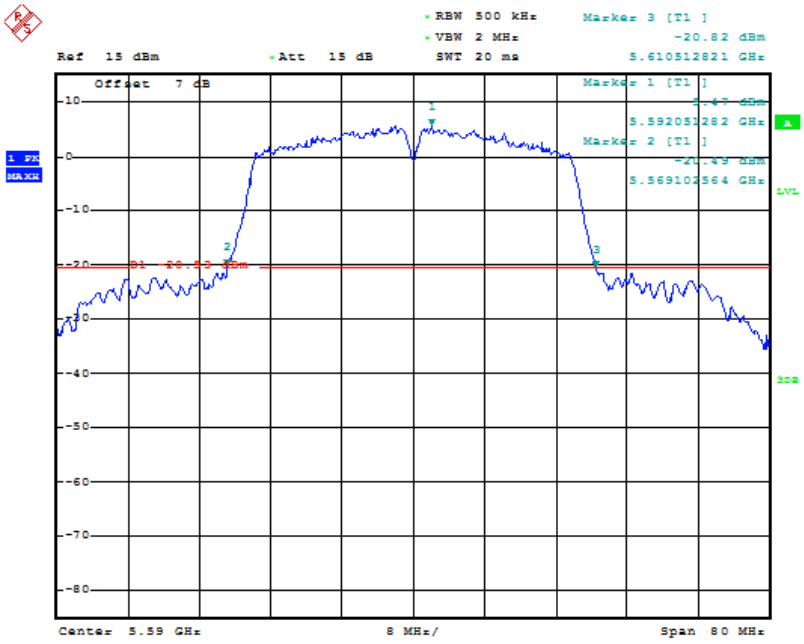


Fig. 65 Occupied 26dB Bandwidth (802.11n-HT40, 5590MHz)

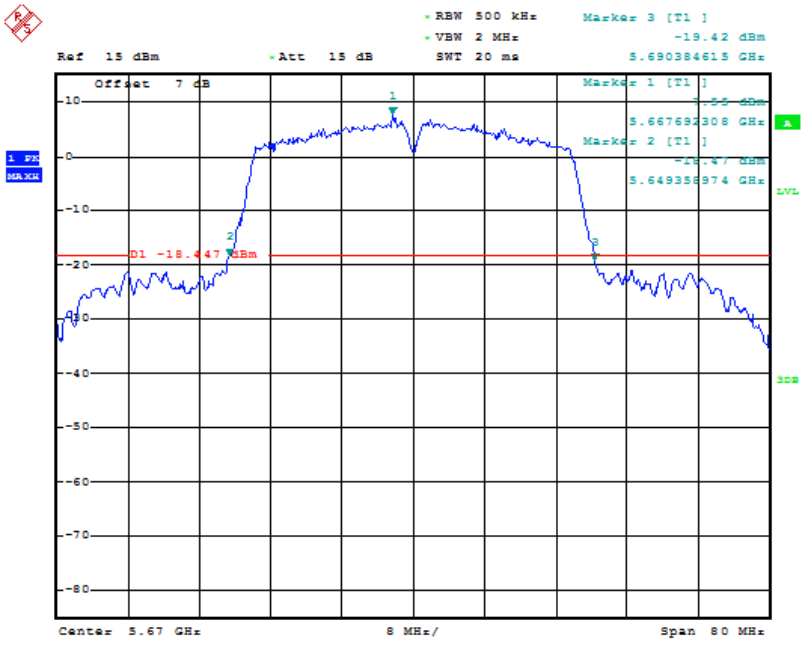


Fig. 66 Occupied 26dB Bandwidth (802.11n-HT40, 5670MHz)

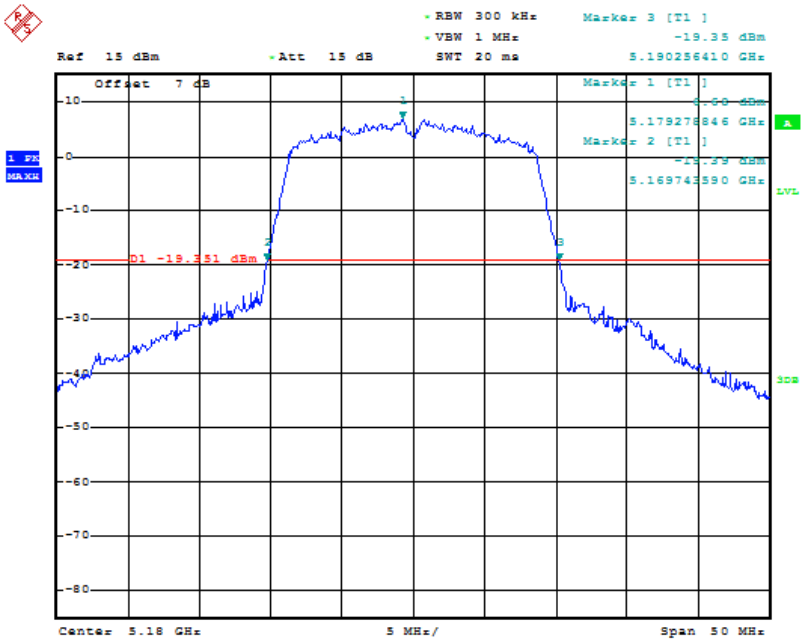


Fig. 67 Occupied 26dB Bandwidth (802.11ac-HT20, 5180MHz)

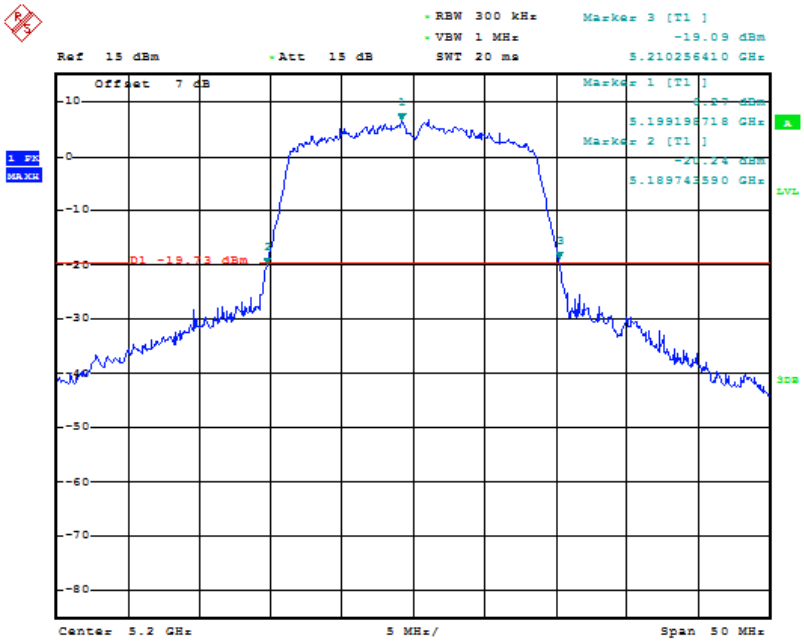


Fig. 68 Occupied 26dB Bandwidth (802.11ac-HT20, 5200MHz)

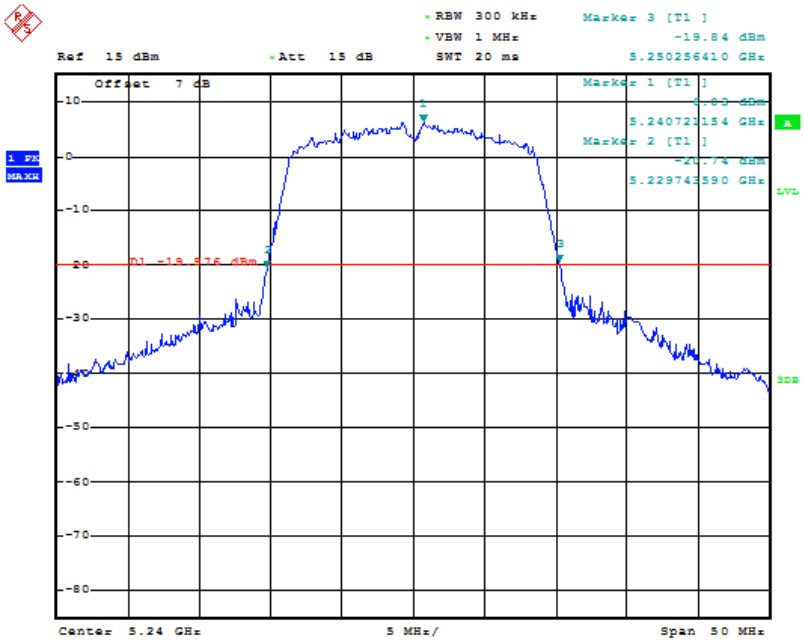


Fig. 69 Occupied 26dB Bandwidth (802.11ac-HT20, 5240MHz)

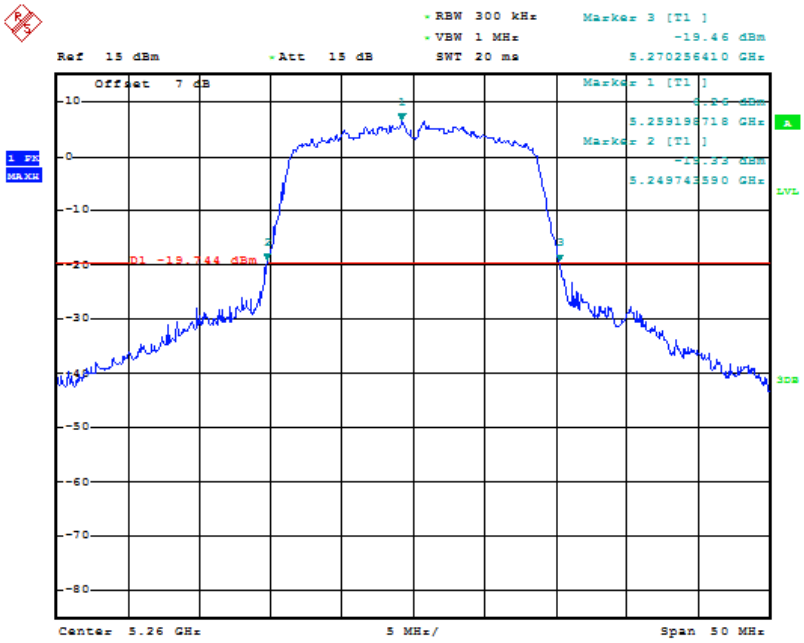


Fig. 70 Occupied 26dB Bandwidth (802.11ac-HT20, 5260MHz)

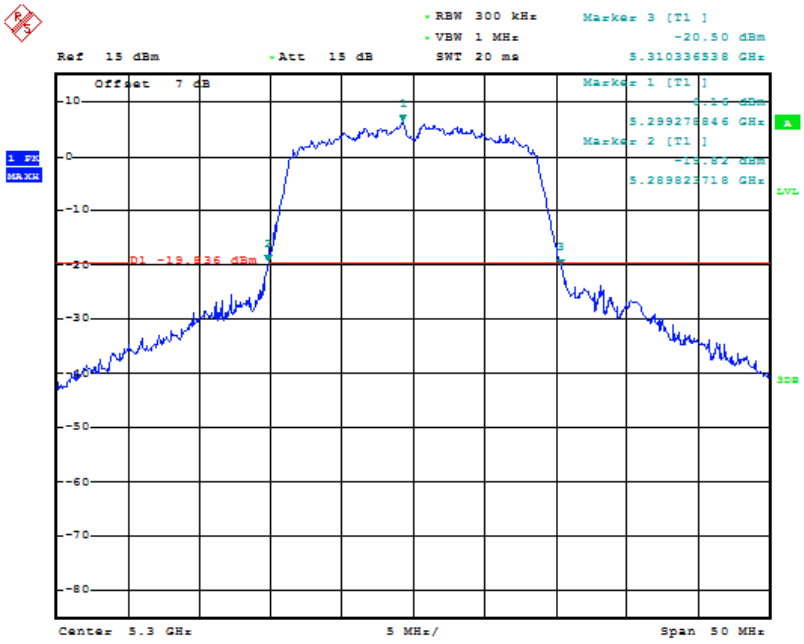


Fig. 71 Occupied 26dB Bandwidth (802.11ac-HT20, 5300MHz)

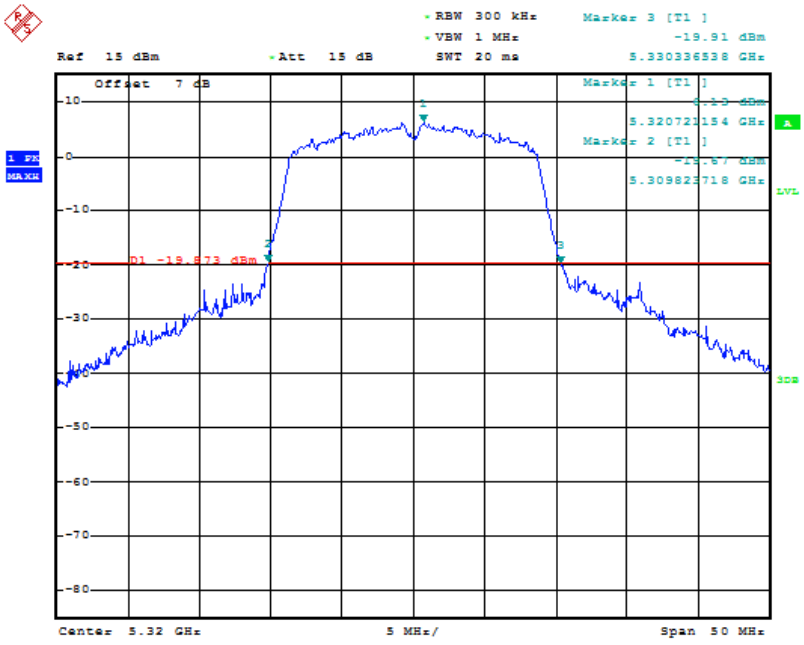


Fig. 72 Occupied 26dB Bandwidth (802.11ac-HT20, 5320MHz)

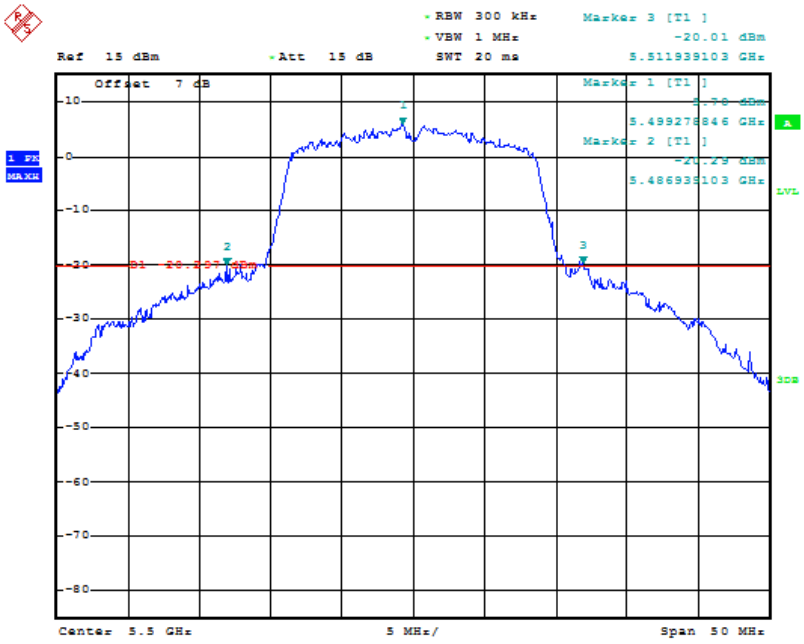


Fig. 73 Occupied 26dB Bandwidth (802.11ac-HT20, 5500MHz)

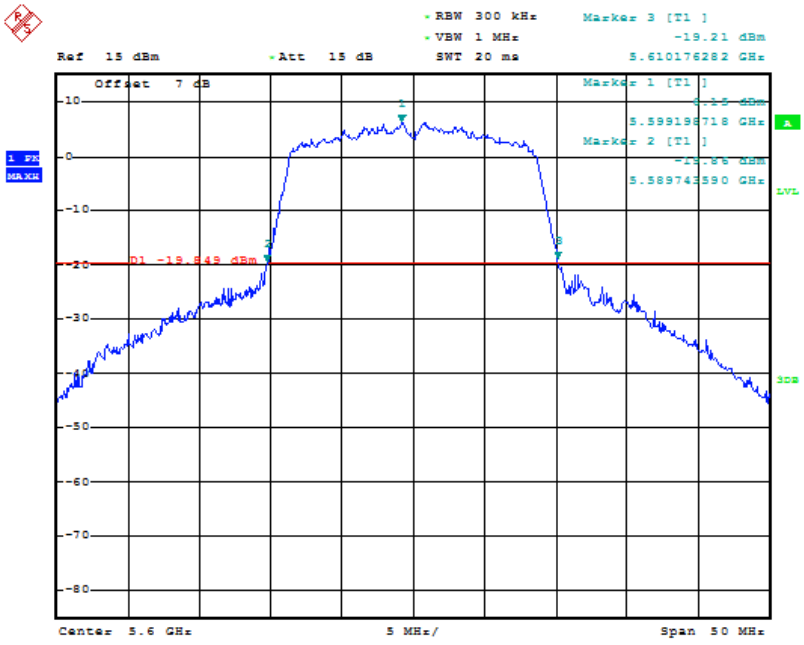


Fig. 74 Occupied 26dB Bandwidth (802.11ac-HT20, 5600MHz)

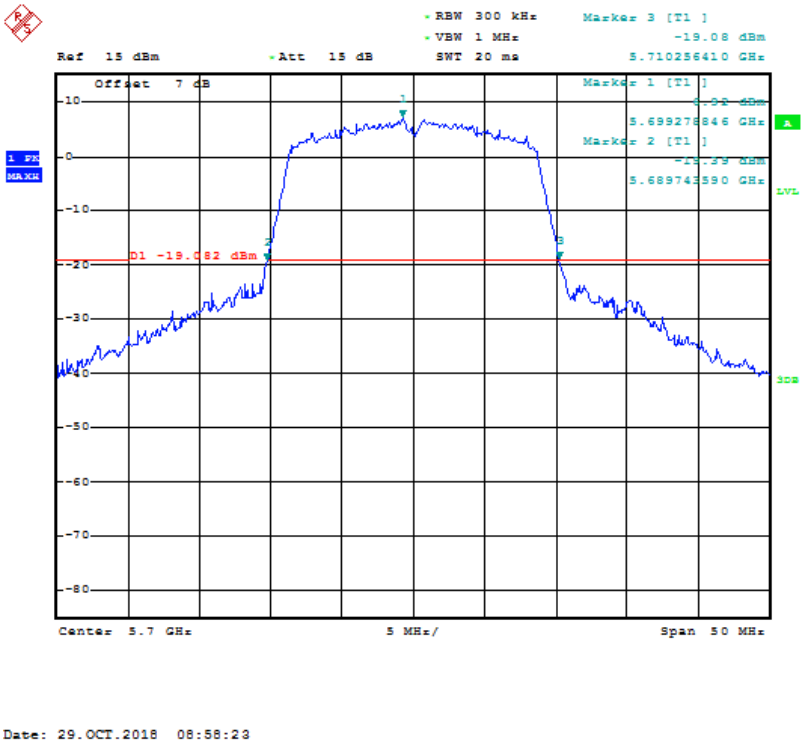


Fig. 75 Occupied 26dB Bandwidth (802.11ac-HT20, 5700MHz)

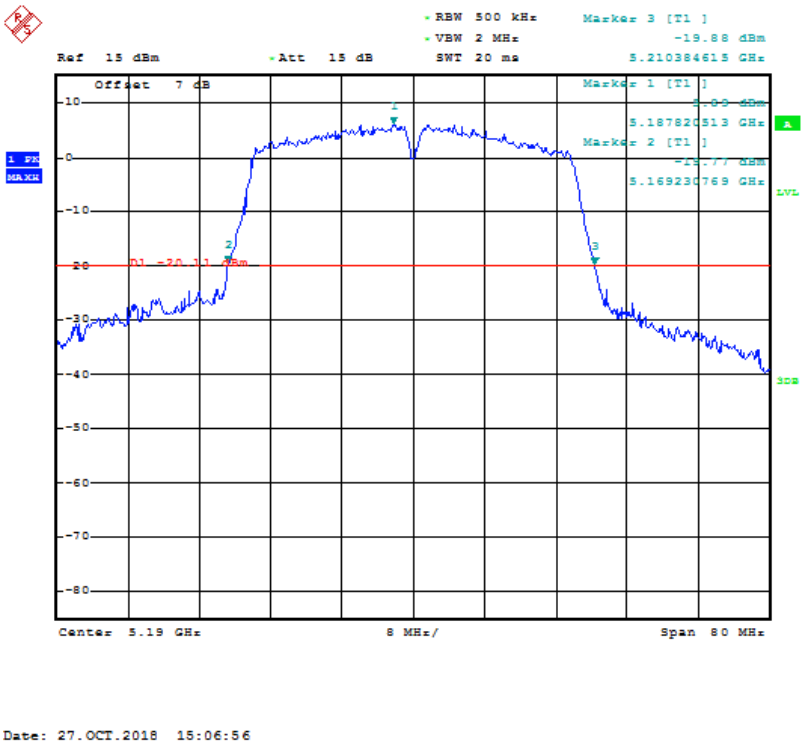


Fig. 76 Occupied 26dB Bandwidth (802.11ac-HT40, 5190MHz)

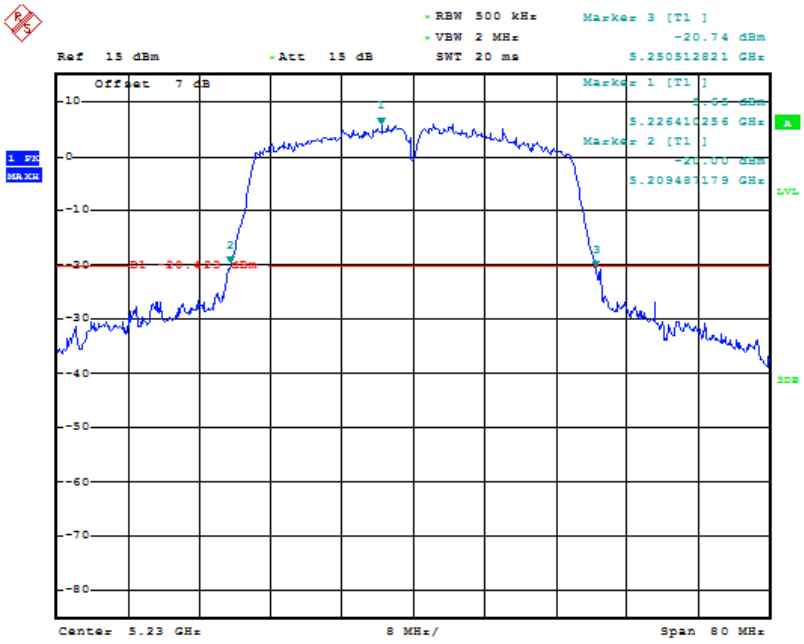


Fig. 77 Occupied 26dB Bandwidth (802.11ac-HT40, 5230MHz)

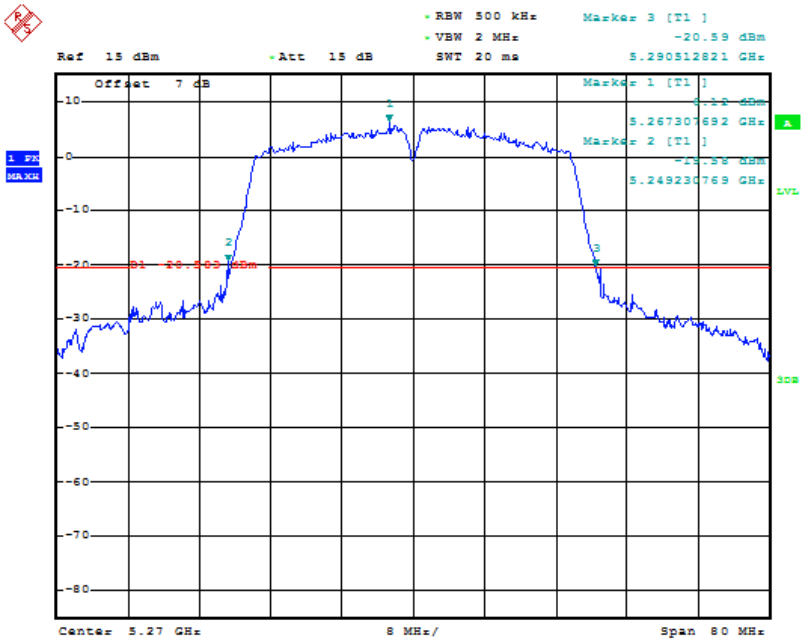


Fig. 78 Occupied 26dB Bandwidth (802.11ac-HT40, 5270MHz)

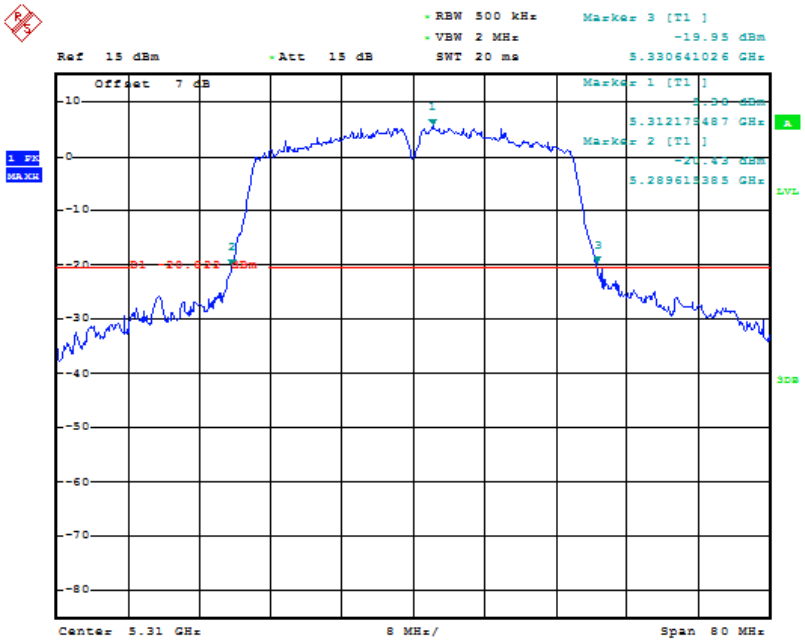


Fig. 79 Occupied 26dB Bandwidth (802.11ac-HT40, 5310MHz)

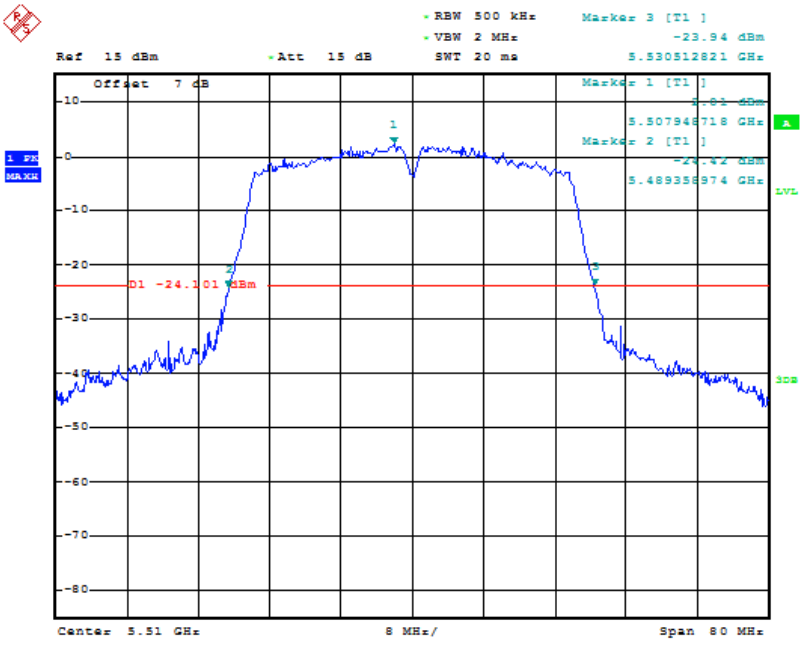


Fig. 80 Occupied 26dB Bandwidth (802.11ac-HT40, 5510MHz)

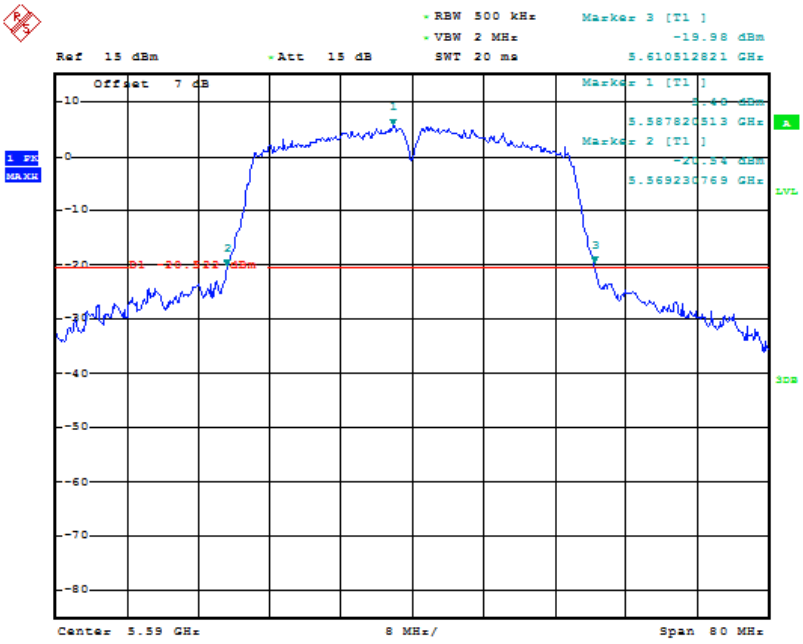


Fig. 81 Occupied 26dB Bandwidth (802.11ac-HT40, 5590MHz)

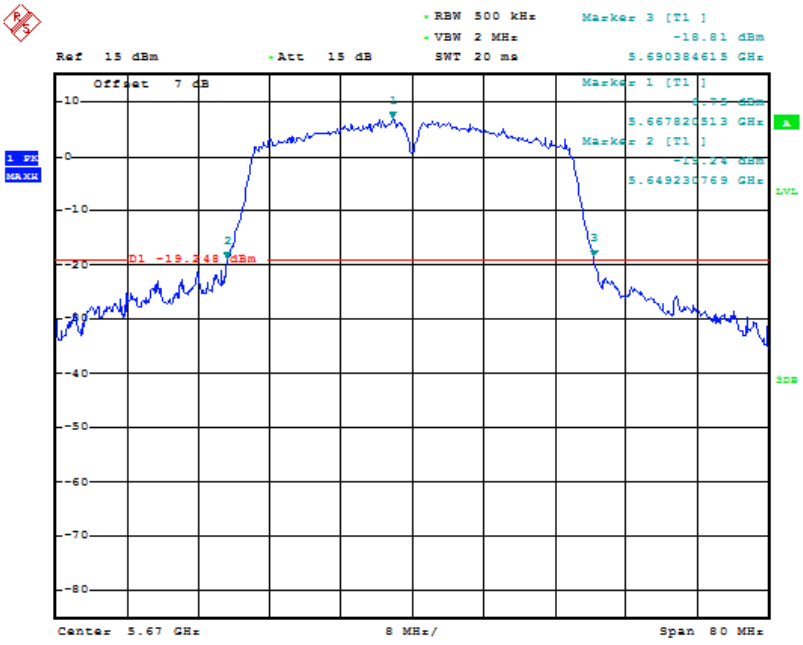


Fig. 82 Occupied 26dB Bandwidth (802.11ac-HT40, 5670MHz)

6.5. 99% Occupied Bandwidth(conducted)

Measurement Limit:

Standard	Limit (MHz)
FCC 47 CFR Part 15.407 (e)	/

The measurement is made according to KDB 789033

Measurement Result:

Mode	Channel	99% Occupied Bandwidth (MHz)		conclusion
802.11a	5180 MHz	Fig.83	16.907	P
	5200 MHz	Fig.84	16.907	P
	5240 MHz	Fig.85	16.907	P
	5260 MHz	Fig.86	16.907	P
	5300 MHz	Fig.87	16.907	P
	5320 MHz	Fig.88	16.907	P
	5500 MHz	Fig.89	17.067	P
	5600 MHz	Fig.90	16.907	P
	5700 MHz	Fig.91	16.907	P
802.11n HT20	5180 MHz	Fig.92	17.788	P
	5200 MHz	Fig.93	17.788	P
	5240 MHz	Fig.94	17.788	P
	5260 MHz	Fig.95	17.788	P
	5300 MHz	Fig.96	17.788	P
	5320 MHz	Fig.97	17.708	P
	5500 MHz	Fig.98	17.949	P
	5600 MHz	Fig.99	17.788	P
	5700 MHz	Fig.100	17.788	P
802.11n HT40	5190 MHz	Fig.101	36.795	P
	5230 MHz	Fig.102	36.667	P
	5270 MHz	Fig.103	36.795	P
	5310 MHz	Fig.104	36.795	P
	5510 MHz	Fig.105	37.179	P
	5590 MHz	Fig.106	36.923	P
	5670 MHz	Fig.107	36.923	P
802.11ac HT20	5180 MHz	Fig.108	17.708	P
	5200 MHz	Fig.109	17.788	P
	5240 MHz	Fig.110	17.708	P
	5260 MHz	Fig.111	17.708	P
	5300 MHz	Fig.112	17.708	P
	5320 MHz	Fig.113	17.788	P
	5500 MHz	Fig.114	17.949	P
	5600 MHz	Fig.115	17.708	P

	5700 MHz	Fig.116	17.708	P
802.11ac HT40	5190 MHz	Fig.117	36.538	P
	5230 MHz	Fig.118	36.667	P
	5270 MHz	Fig.119	36.538	P
	5310 MHz	Fig.120	36.667	P
	5510 MHz	Fig.121	36.923	P
	5590 MHz	Fig.122	36.667	P
	5670 MHz	Fig.123	36.667	P

Conclusion: PASS

Test graphs as below:

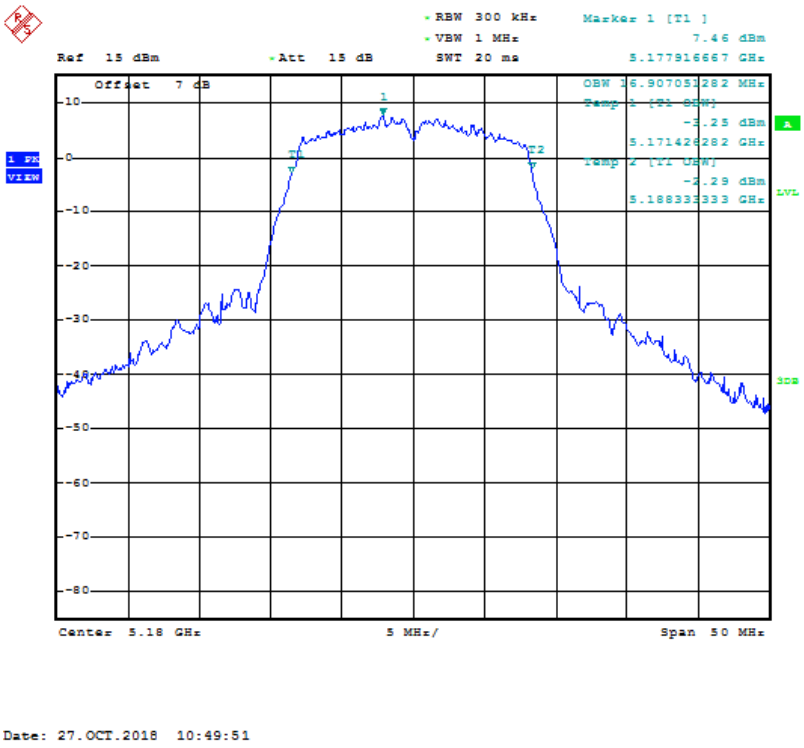


Fig. 83 99% Occupied Bandwidth (802.11a, 5180MHz)

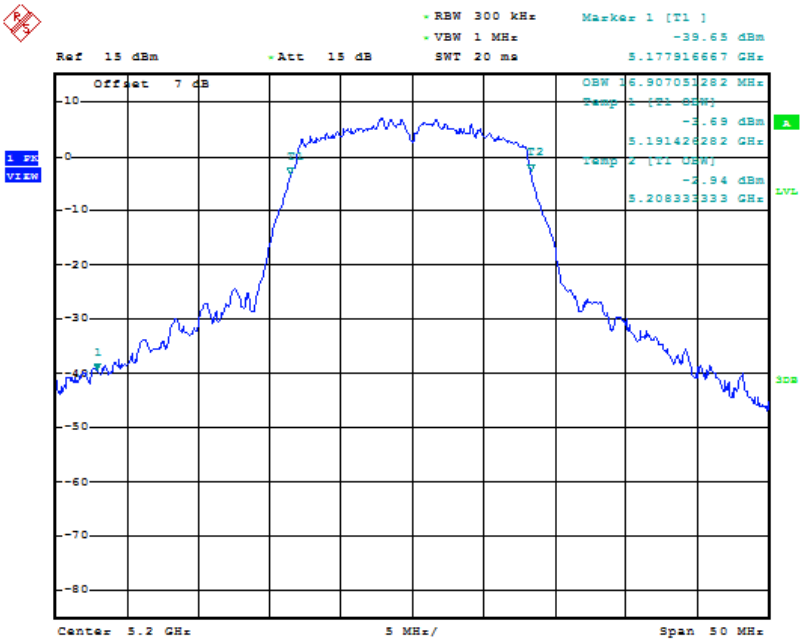


Fig. 84 99% Occupied Bandwidth (802.11a, 5200MHz)

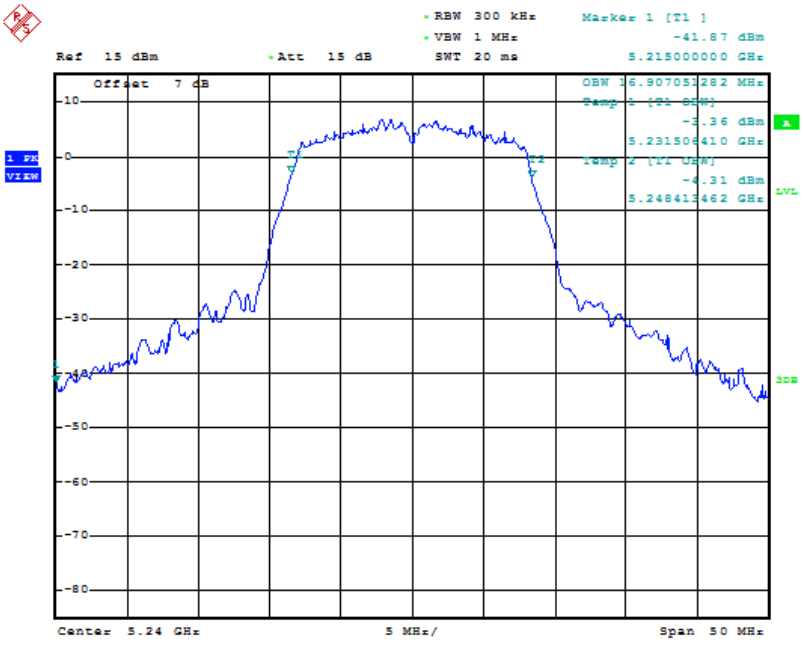


Fig. 85 99% Occupied Bandwidth (802.11a, 5240MHz)

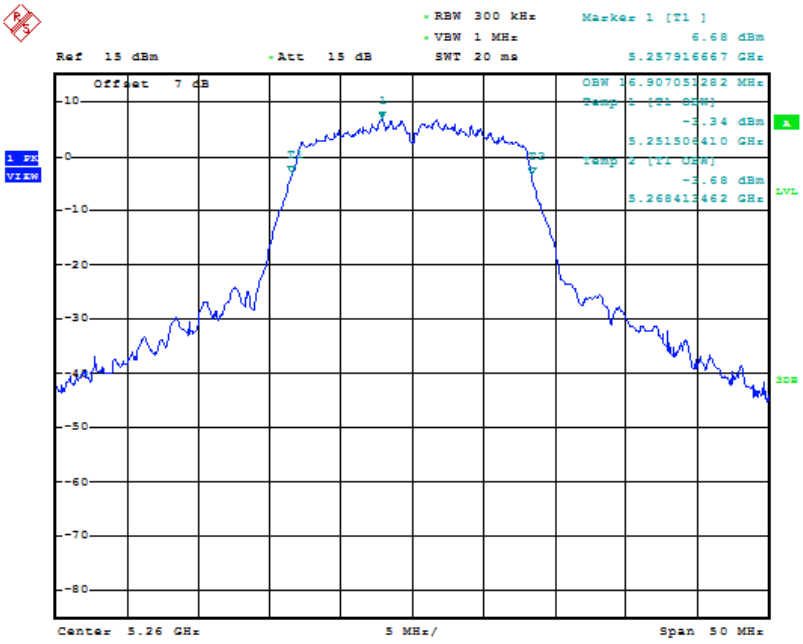


Fig. 86 99% Occupied Bandwidth (802.11a, 5260MHz)

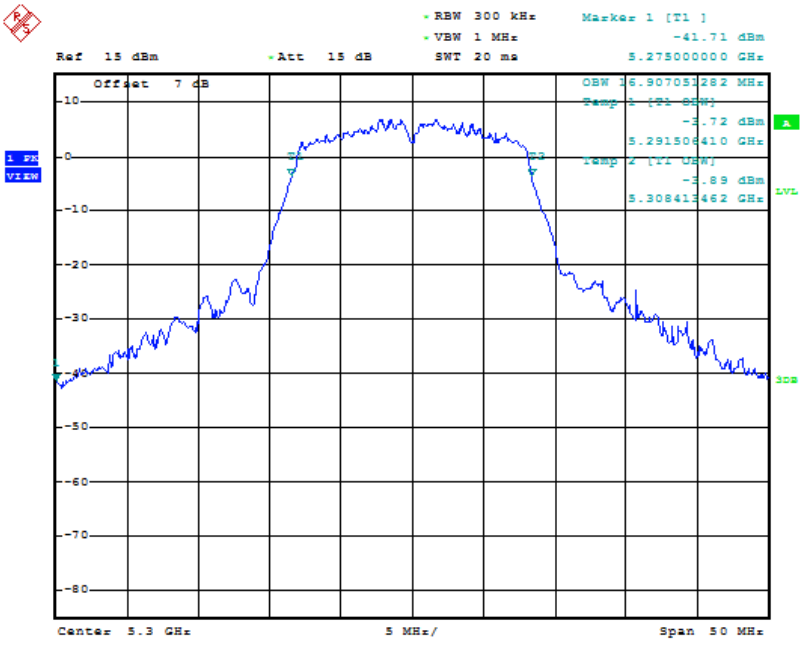


Fig. 87 99% Occupied Bandwidth (802.11a, 5300MHz)

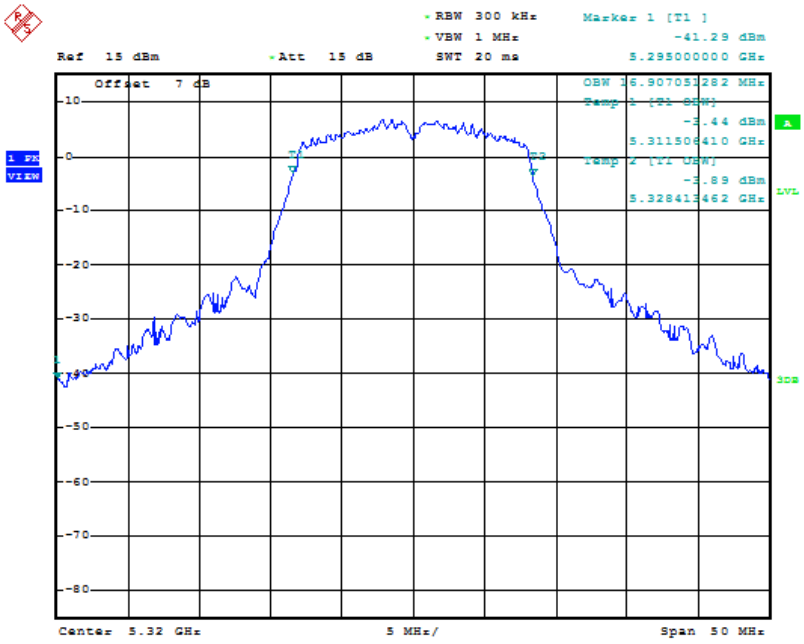


Fig. 88 99% Occupied Bandwidth (802.11a, 5320MHz)

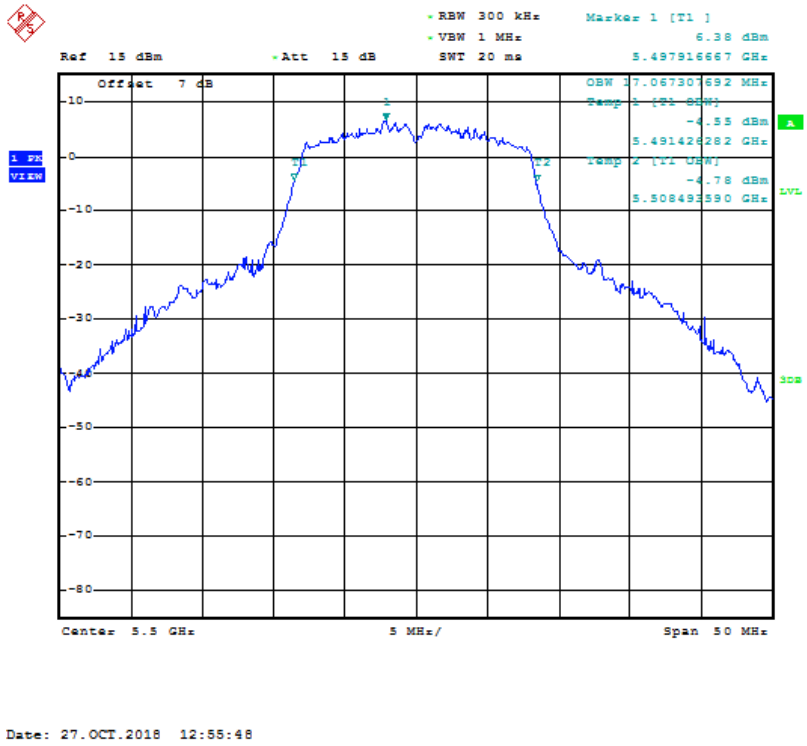


Fig. 89 99% Occupied Bandwidth (802.11a, 5500MHz)

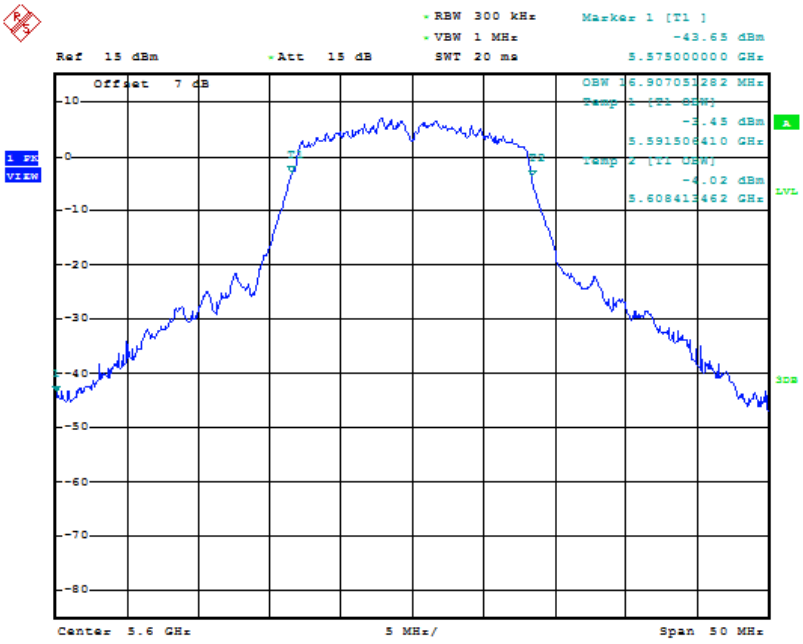


Fig. 90 99% Occupied Bandwidth (802.11a, 5600MHz)

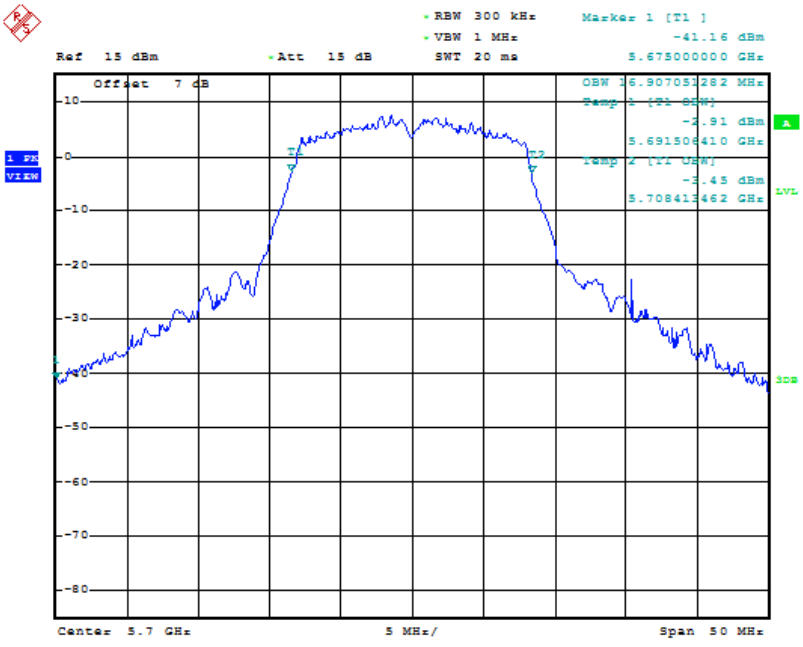


Fig. 91 99% Occupied Bandwidth (802.11a, 5700MHz)

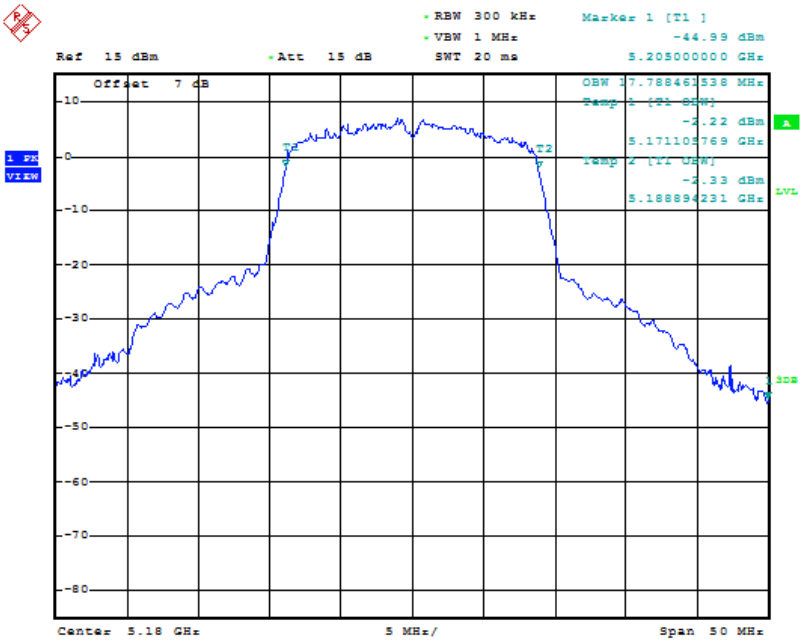


Fig. 92 99% Occupied Bandwidth (802.11n-HT20, 5180MHz)

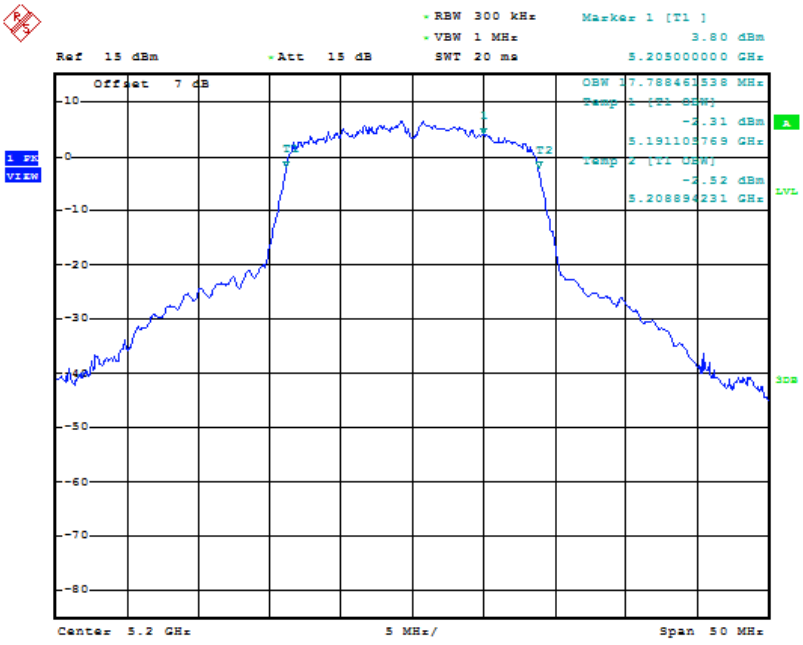


Fig. 93 99% Occupied Bandwidth (802.11n-HT20, 5200MHz)

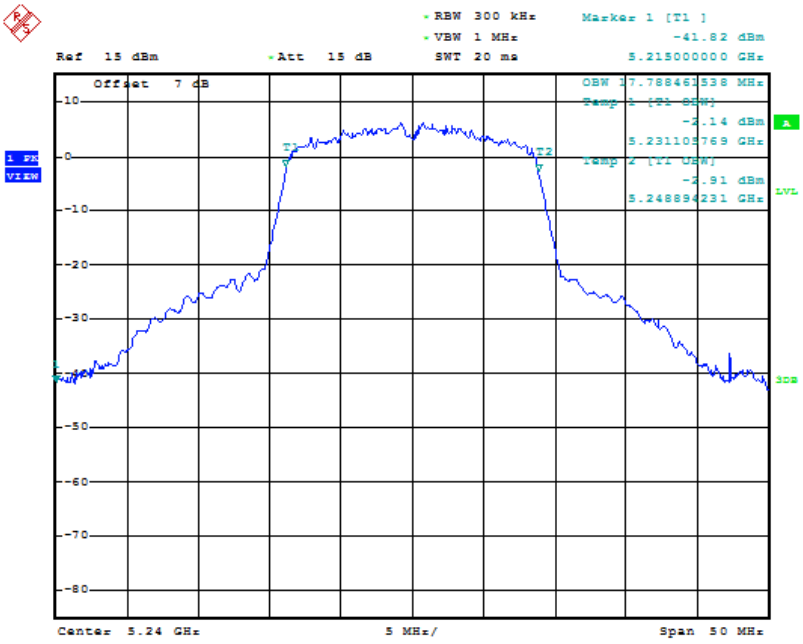


Fig. 94 99% Occupied Bandwidth (802.11n-HT20, 5240MHz)

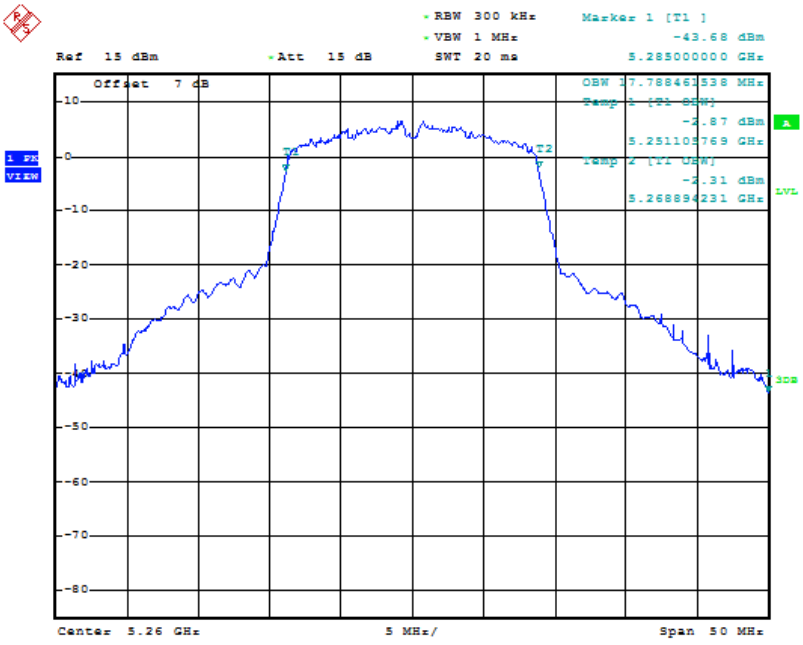


Fig. 95 99% Occupied Bandwidth (802.11n-HT20, 5260MHz)

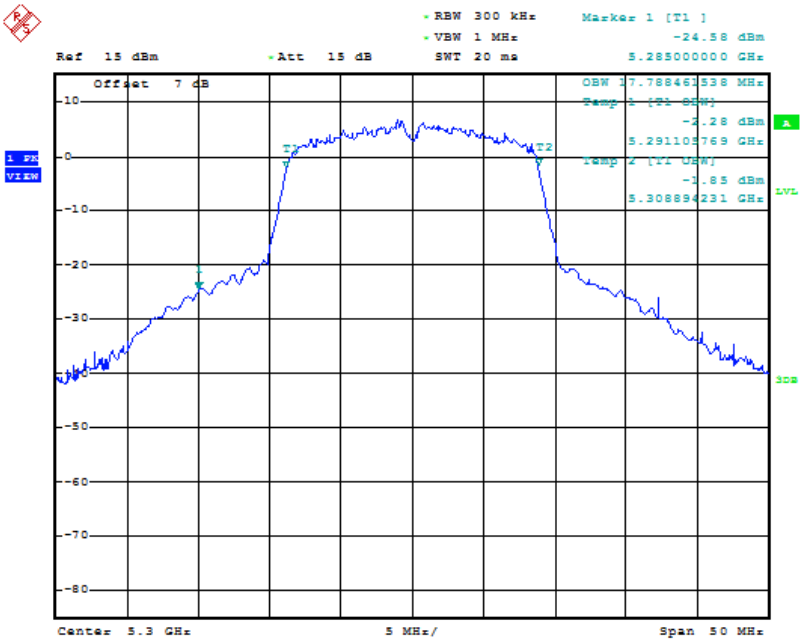


Fig. 96 99% Occupied Bandwidth (802.11n-HT20, 5300MHz)

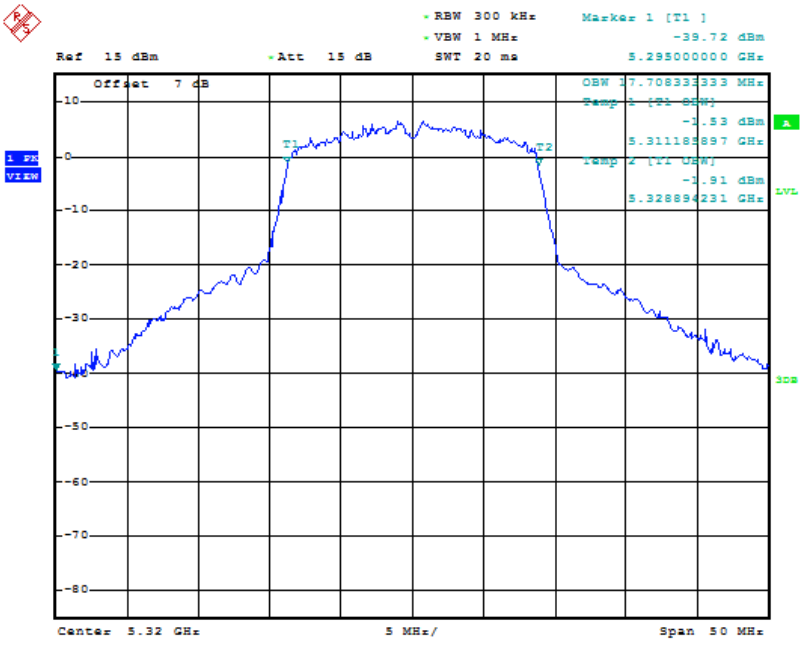


Fig. 97 99% Occupied Bandwidth (802.11n-HT20, 5320MHz)

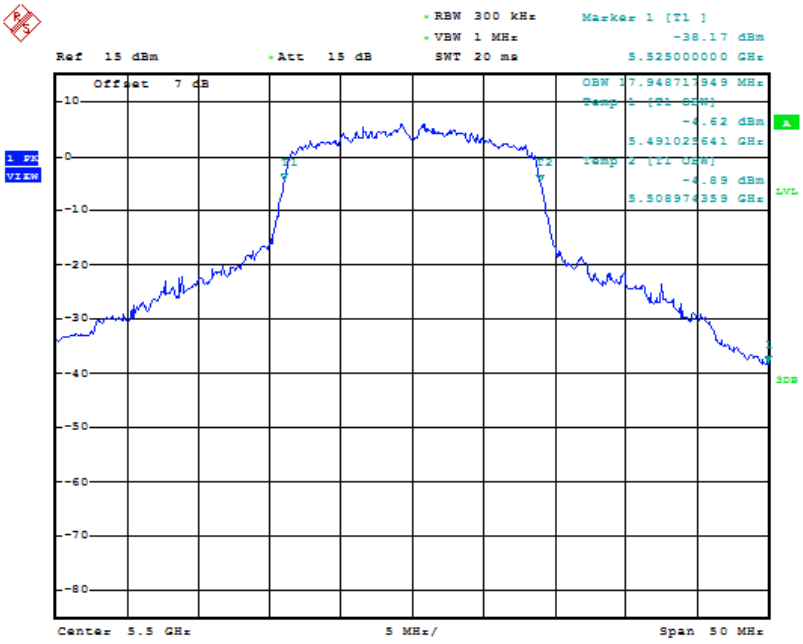


Fig. 98 99% Occupied Bandwidth (802.11n-HT20, 5500MHz)

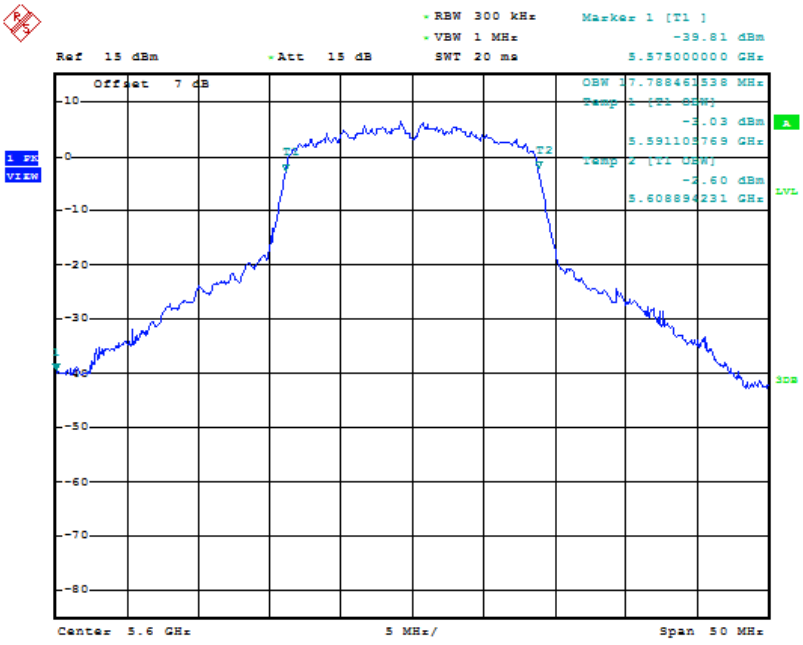


Fig. 99 99% Occupied Bandwidth (802.11n-HT20, 5600MHz)

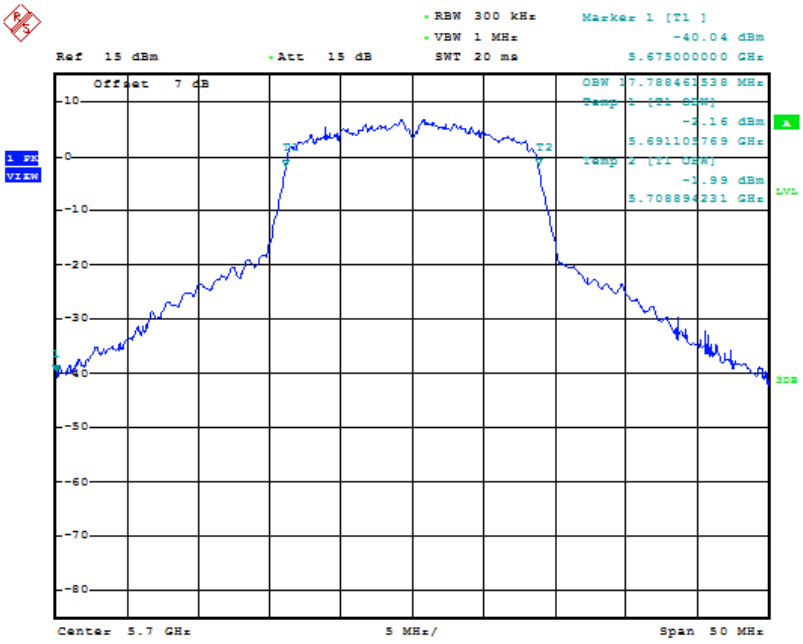


Fig. 100 99% Occupied Bandwidth (802.11n-HT20, 5700MHz)

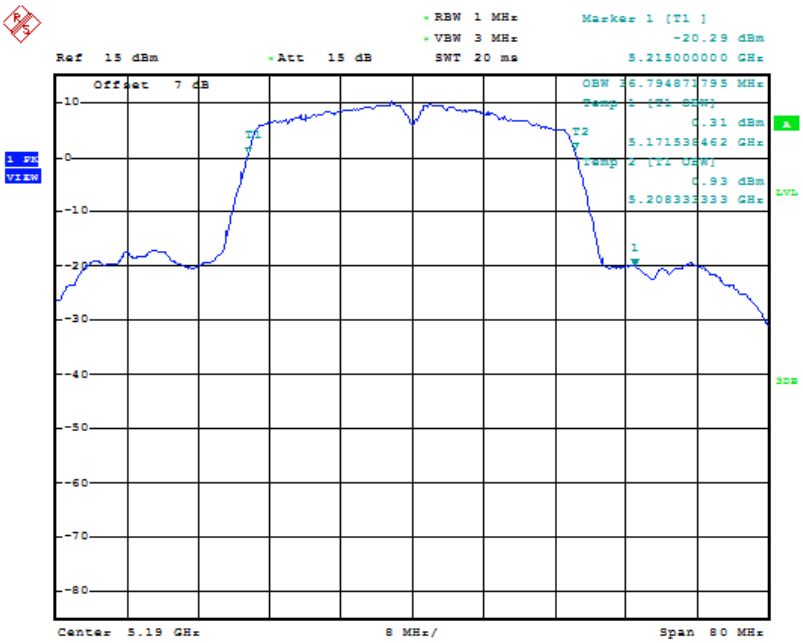


Fig. 101 99% Occupied Bandwidth (802.11n-HT40, 5190MHz)

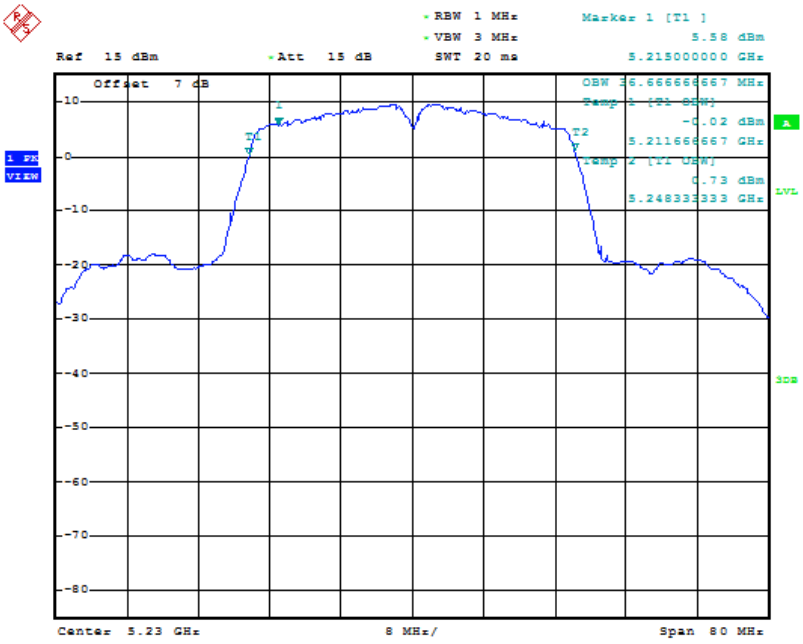


Fig. 102 99% Occupied Bandwidth (802.11n-HT40, 5230MHz)

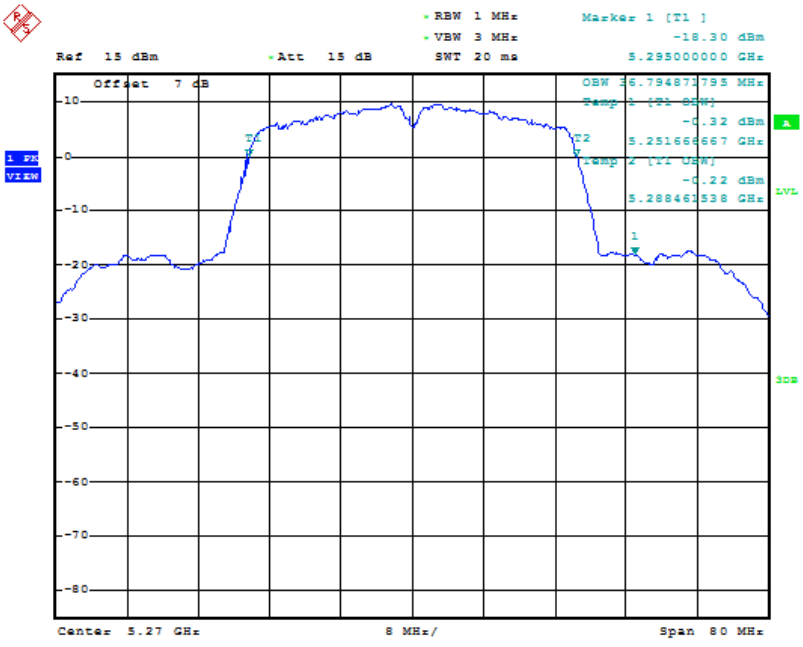


Fig. 103 99% Occupied Bandwidth (802.11n-HT40, 5270MHz)

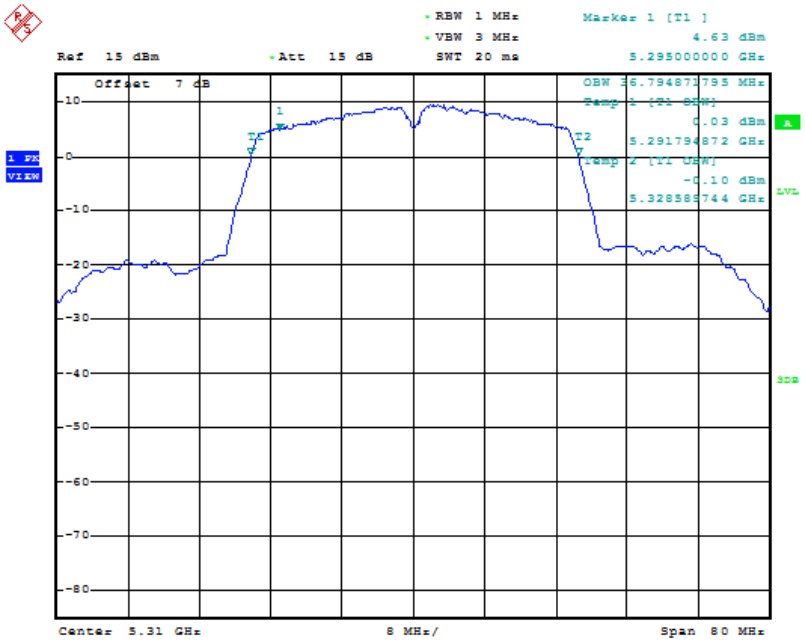


Fig. 104 99% Occupied Bandwidth (802.11n-HT40, 5310MHz)

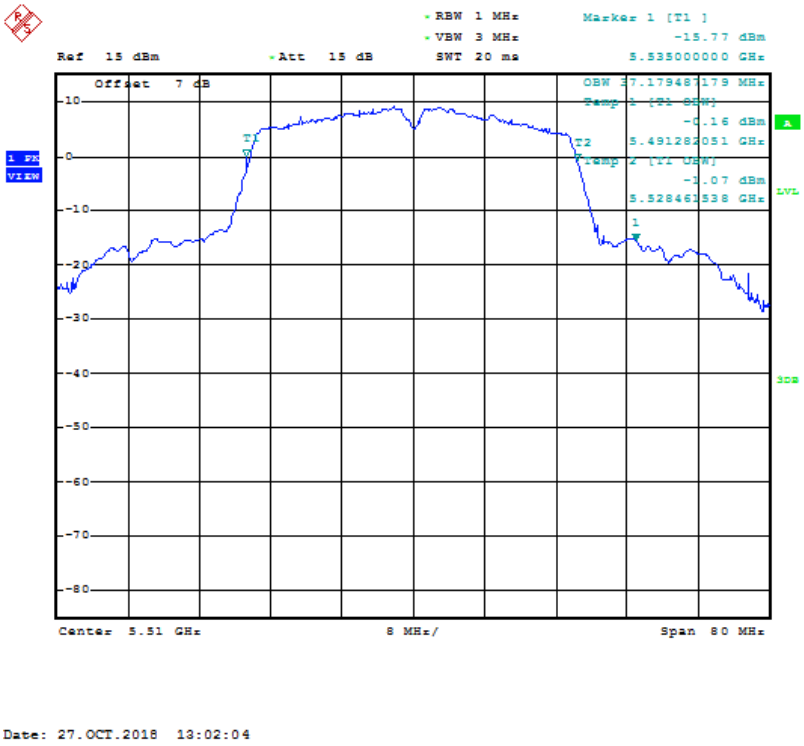


Fig. 105 99% Occupied Bandwidth (802.11n-HT40, 5510MHz)

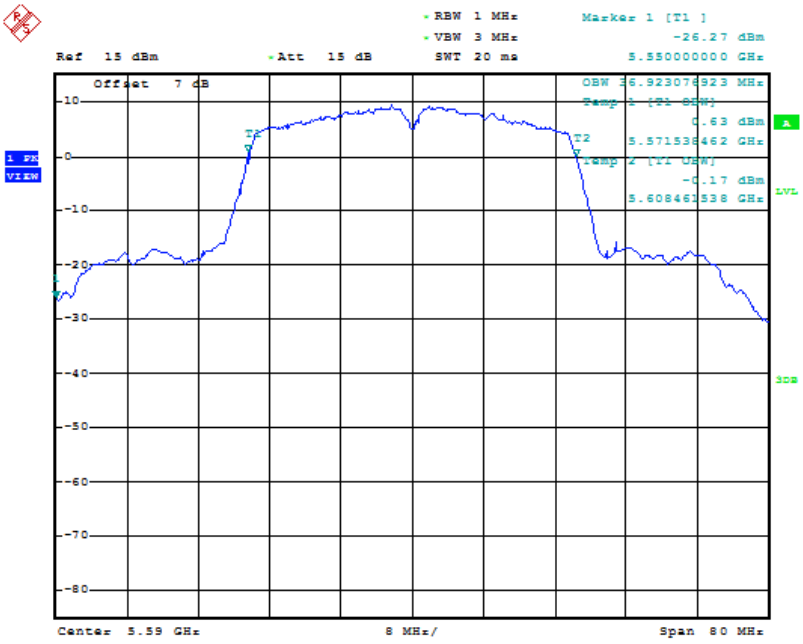


Fig. 106 99% Occupied Bandwidth (802.11n-HT40, 5590MHz)

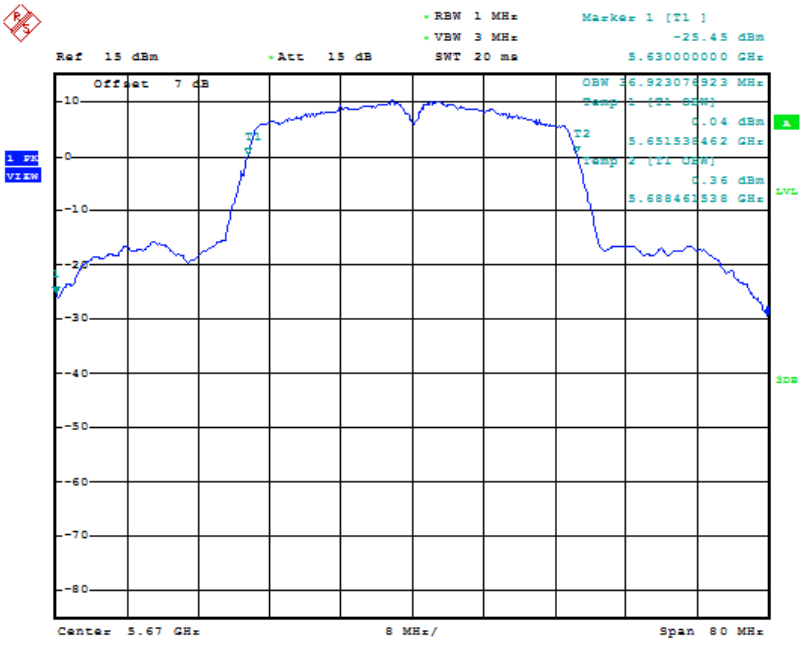


Fig. 107 99% Occupied Bandwidth (802.11n-HT40, 5670MHz)

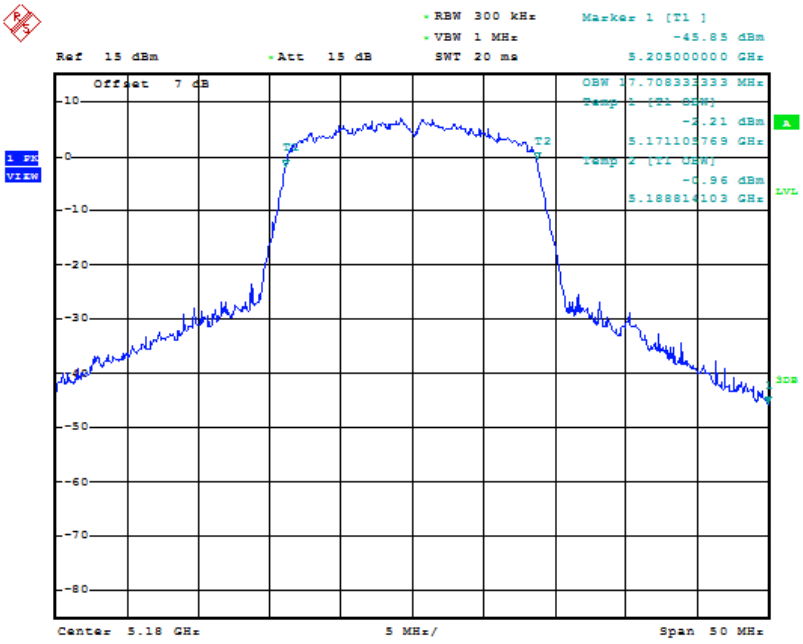


Fig. 108 99% Occupied Bandwidth (802.11ac-HT20, 5180MHz)

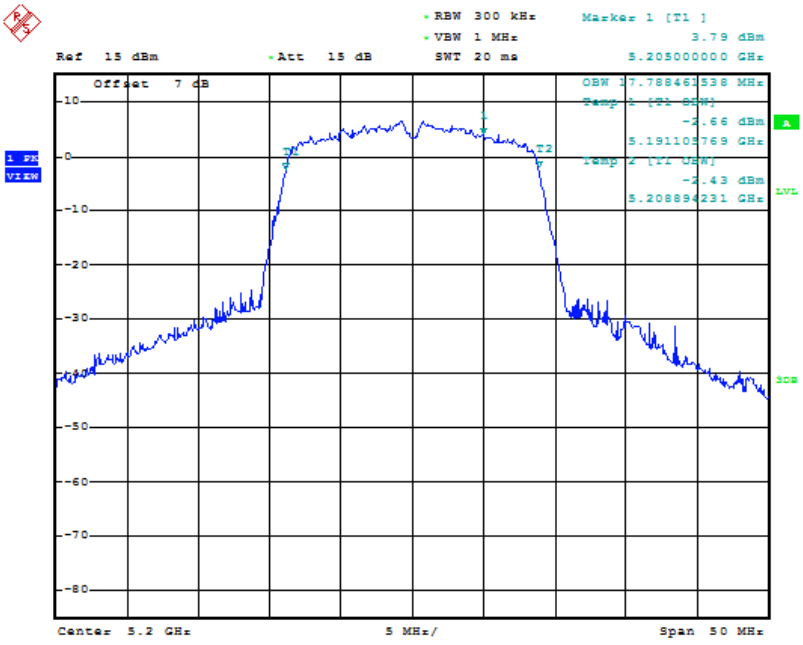


Fig. 109 99% Occupied Bandwidth (802.11ac-HT20, 5200MHz)

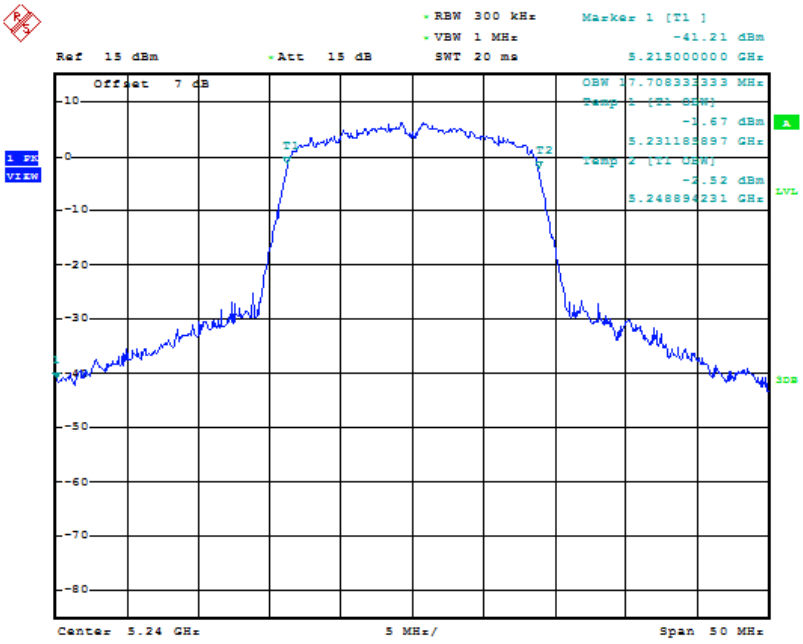


Fig. 110 99% Occupied Bandwidth (802.11ac-HT20, 5240MHz)

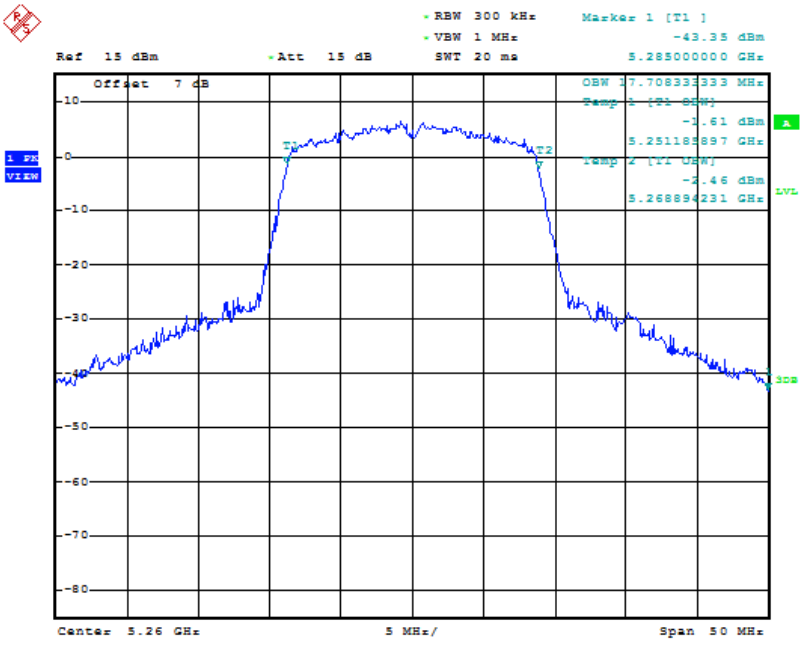


Fig. 111 99% Occupied Bandwidth (802.11ac-HT20, 5260MHz)

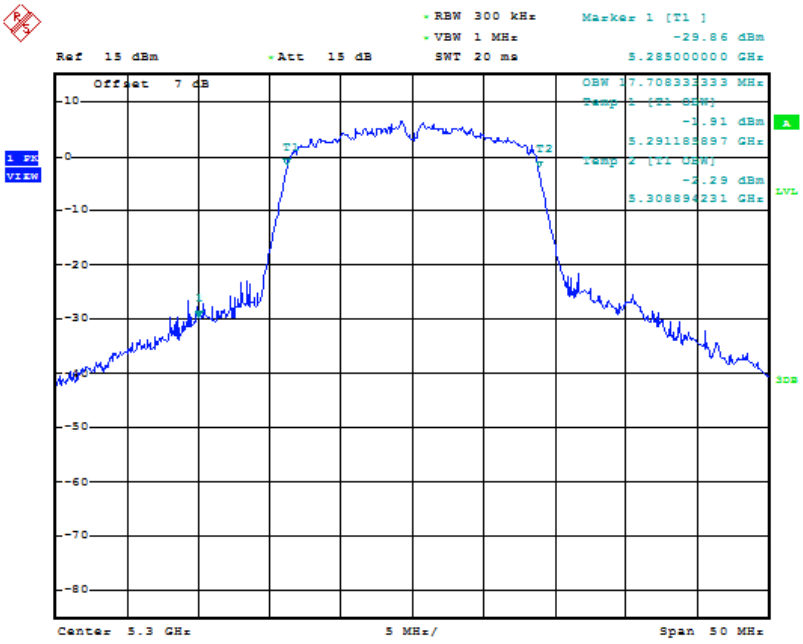


Fig. 112 99% Occupied Bandwidth (802.11ac-HT20, 5300MHz)

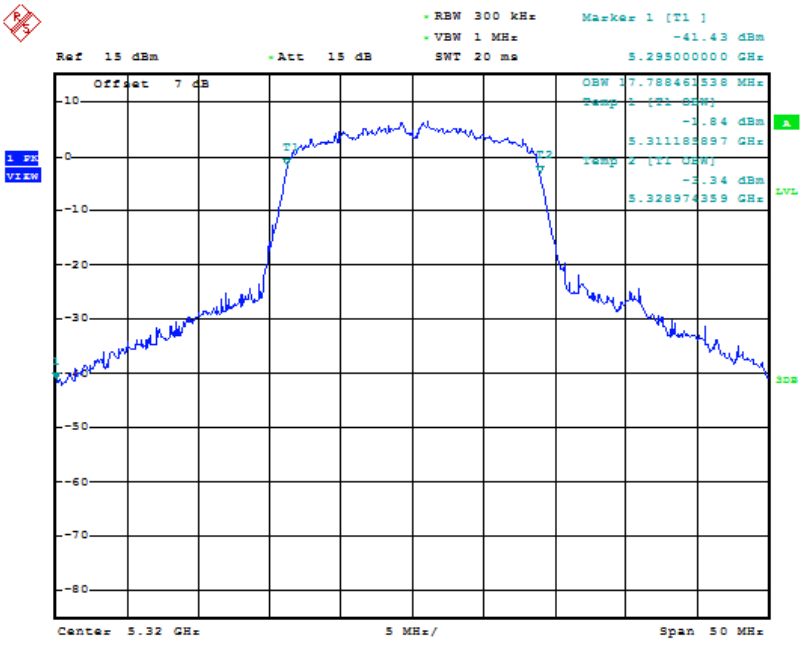


Fig. 113 99% Occupied Bandwidth (802.11ac-HT20, 5320MHz)

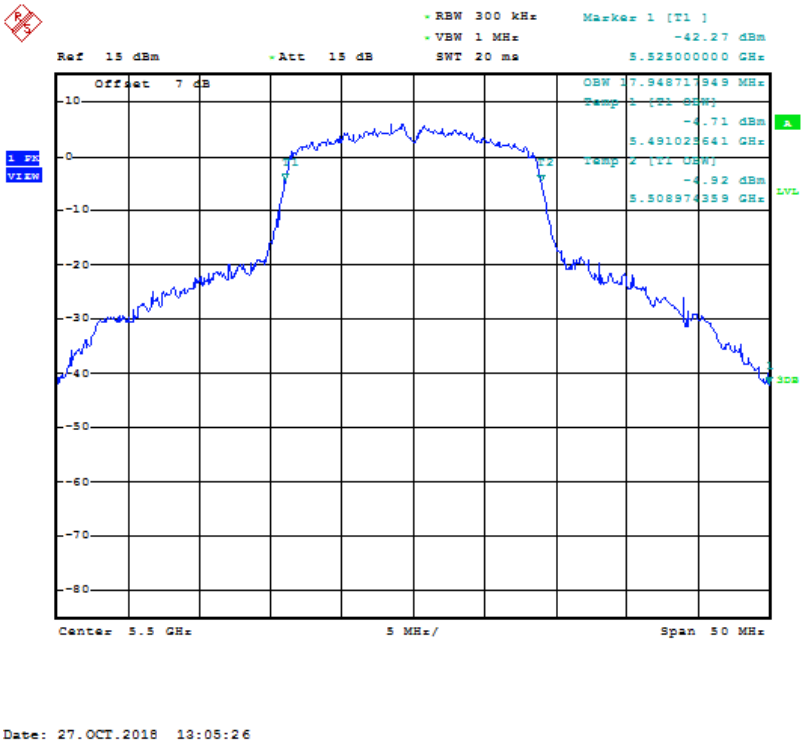


Fig. 114 99% Occupied Bandwidth (802.11ac-HT20, 5500MHz)

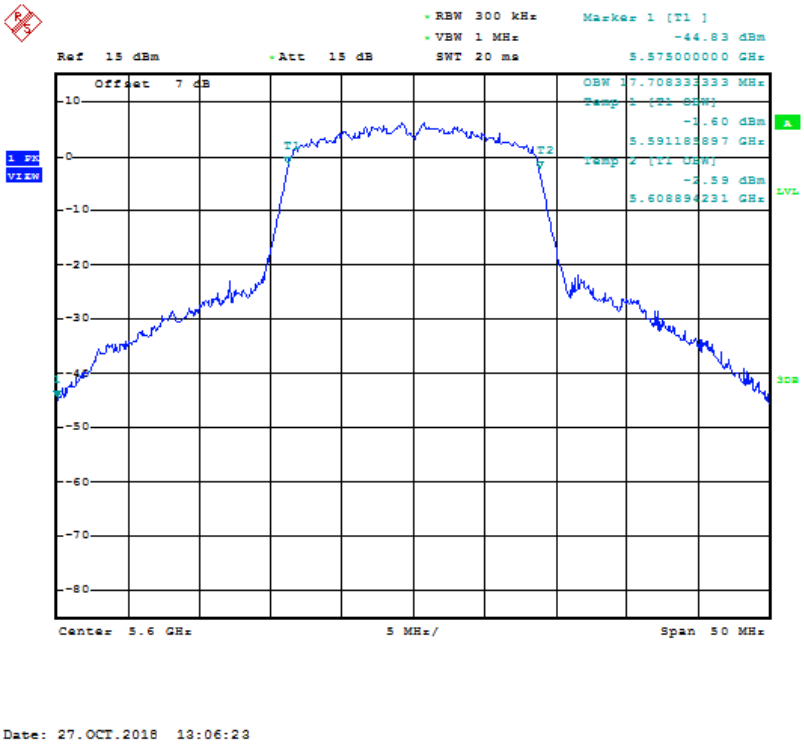


Fig. 115 99% Occupied Bandwidth (802.11ac-HT20, 5600MHz)

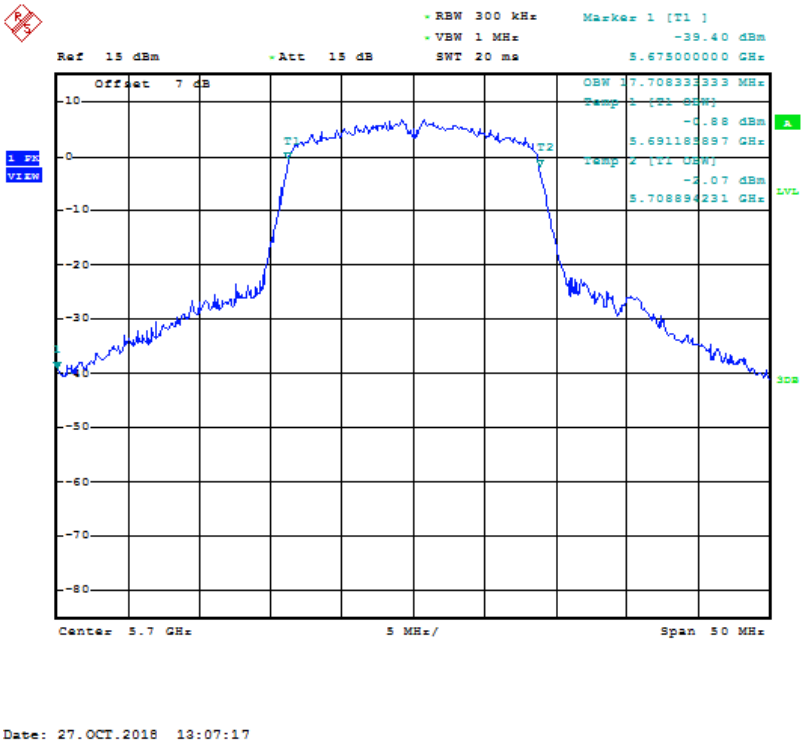


Fig. 116 99% Occupied Bandwidth (802.11ac-HT20, 5700MHz)

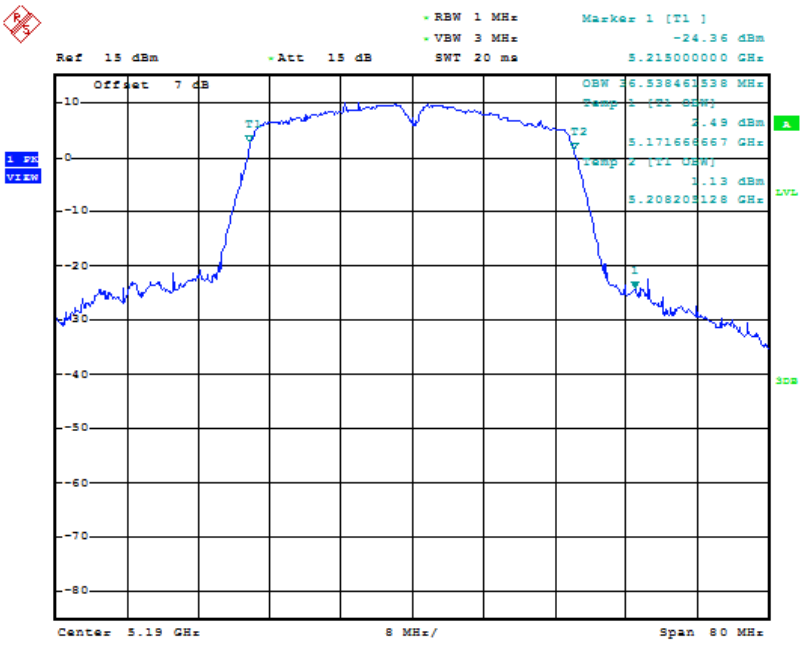


Fig. 117 99% Occupied Bandwidth (802.11ac-HT40, 5190MHz)

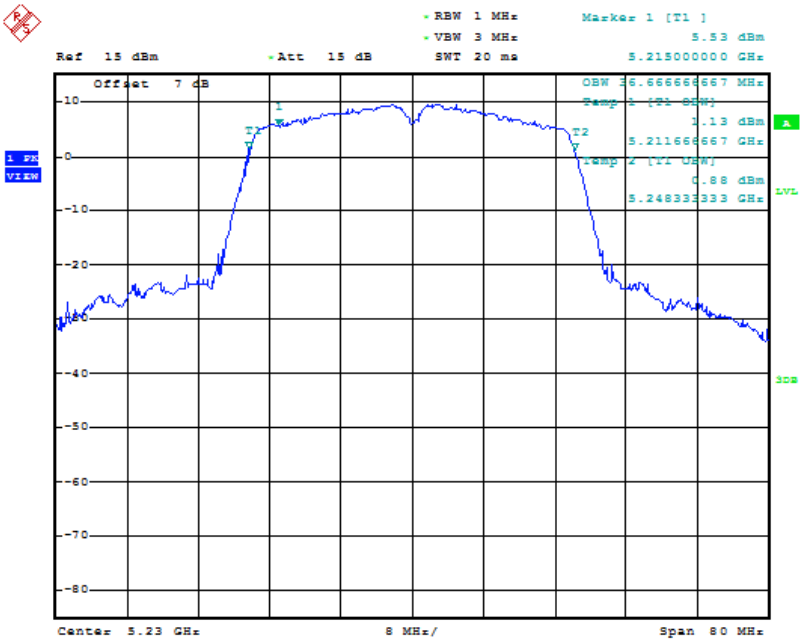


Fig. 118 99% Occupied Bandwidth (802.11ac-HT40, 5230MHz)

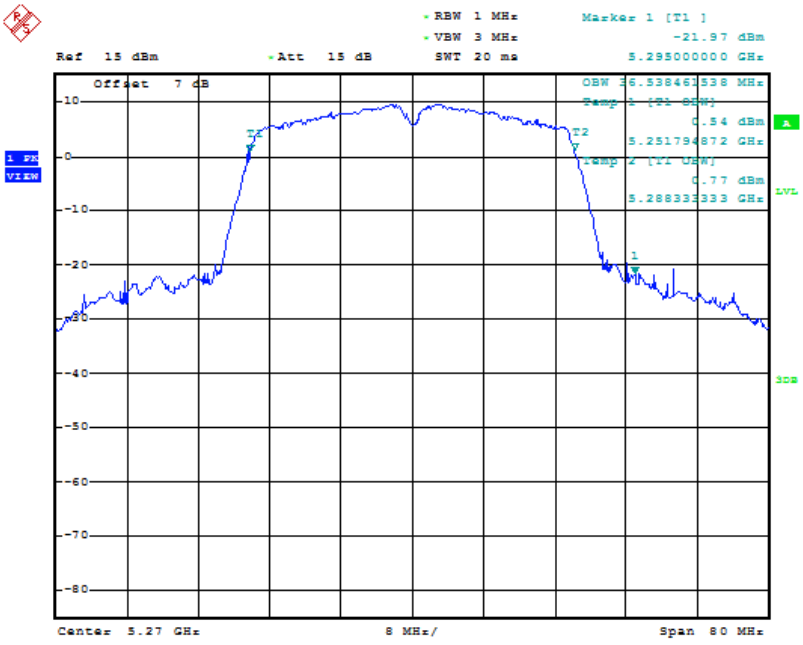


Fig. 119 99% Occupied Bandwidth (802.11ac-HT40, 5270MHz)

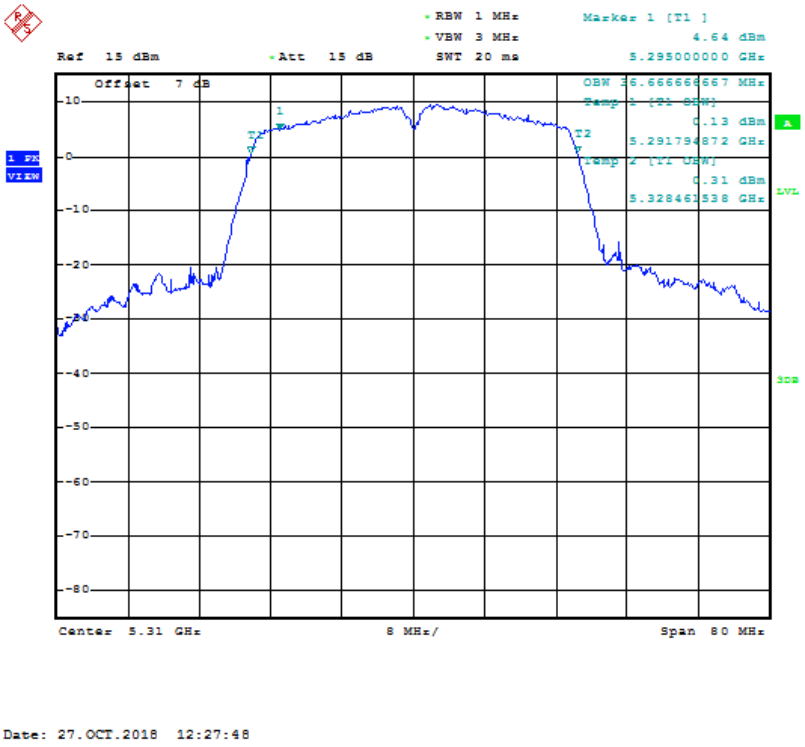


Fig. 120 99% Occupied Bandwidth (802.11ac-HT40, 5310MHz)

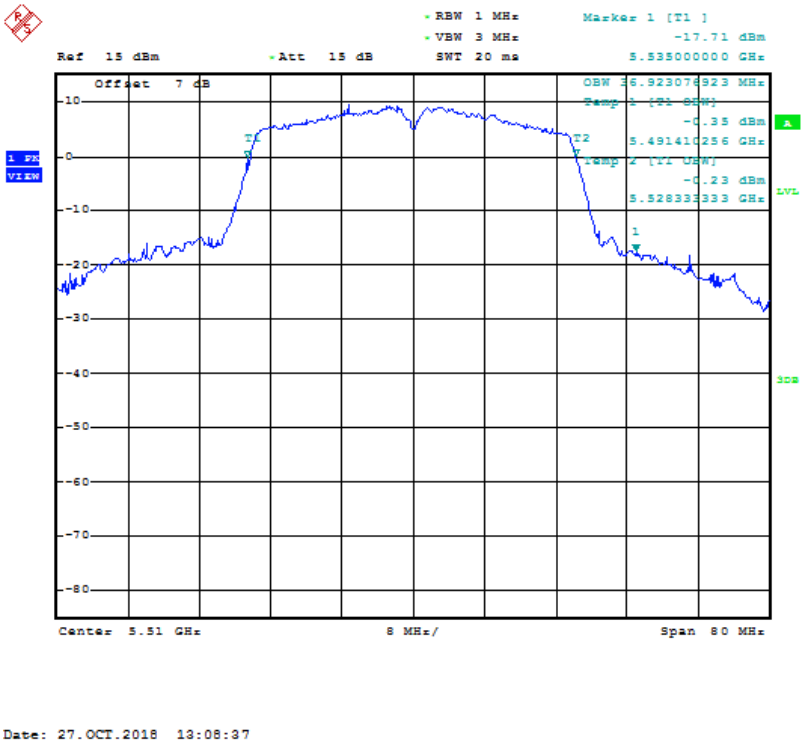


Fig. 121 99% Occupied Bandwidth (802.11ac-HT40, 5510MHz)

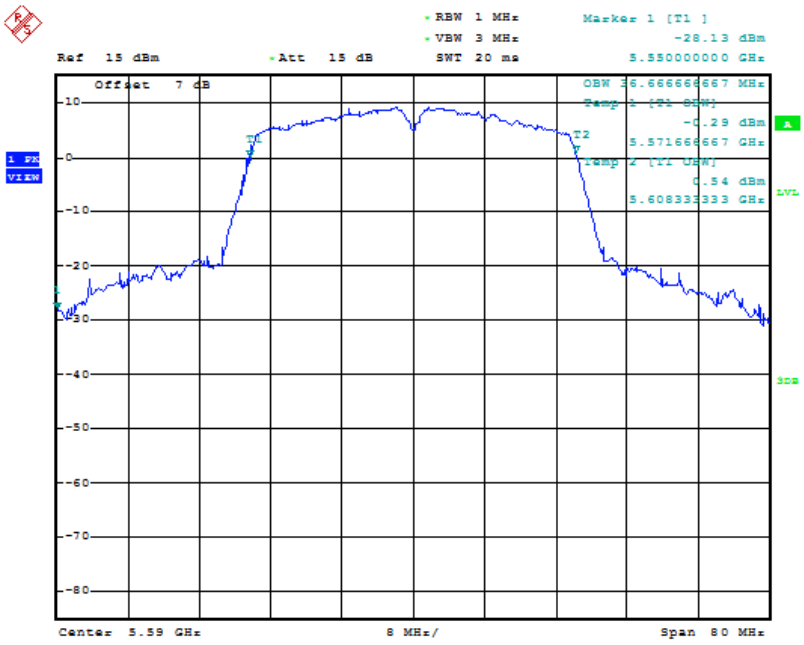


Fig. 122 99% Occupied Bandwidth (802.11ac-HT40, 5590MHz)

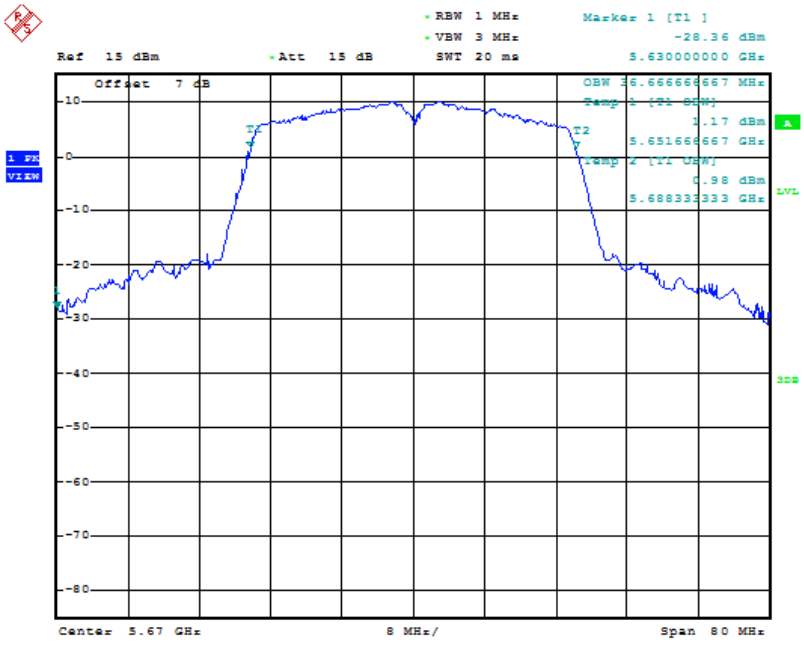


Fig. 123 99% Occupied Bandwidth (802.11ac-HT40, 5670MHz)

6.6. Band Edges Compliance

6.6.1 Band Edges - conducted

Measurement Limit:

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

The measurement is made according to KDB 789033

Measurement Result:

Mode	Channel	Test Results	Conclusion
802.11a	5180 MHz	Fig.124	P
	5320 MHz	Fig.125	P
	5500 MHz	Fig.126	P
	5700 MHz	Fig.127	P
802.11n HT20	5180 MHz	Fig.128	P
	5320 MHz	Fig.129	P
	5500 MHz	Fig.130	P
	5700 MHz	Fig.131	P
802.11n HT40	5190 MHz	Fig.132	P
	5310 MHz	Fig.133	P
	5510 MHz	Fig.134	P
	5670 MHz	Fig.135	P
802.11ac HT20	5180 MHz	Fig.136	P
	5320 MHz	Fig.137	P
	5500 MHz	Fig.138	P
	5700 MHz	Fig.139	P
802.11ac HT40	5190 MHz	Fig.140	P
	5310 MHz	Fig.141	P
	5510 MHz	Fig.142	P
	5670 MHz	Fig.143	P

Conclusion: PASS

Test graphs as below:

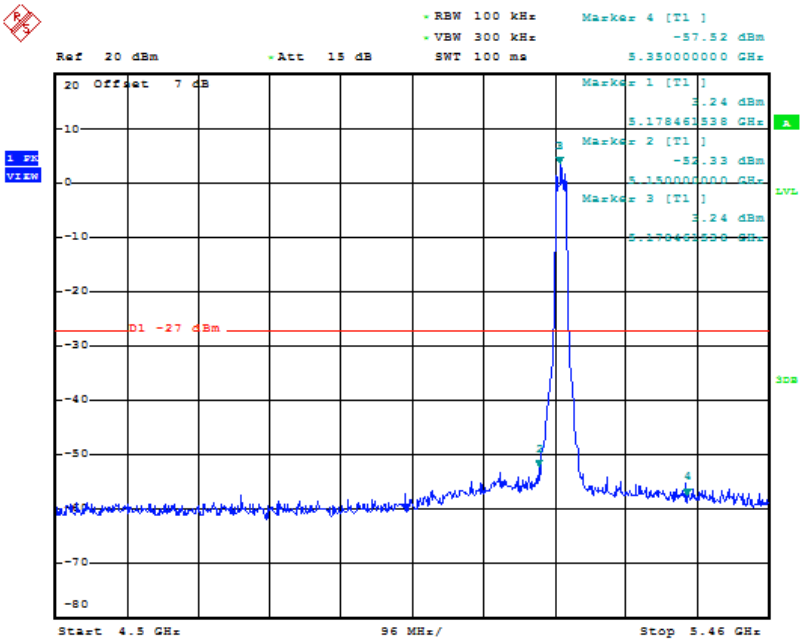


Fig. 124 Band Edges (802.11a, 5180MHz)

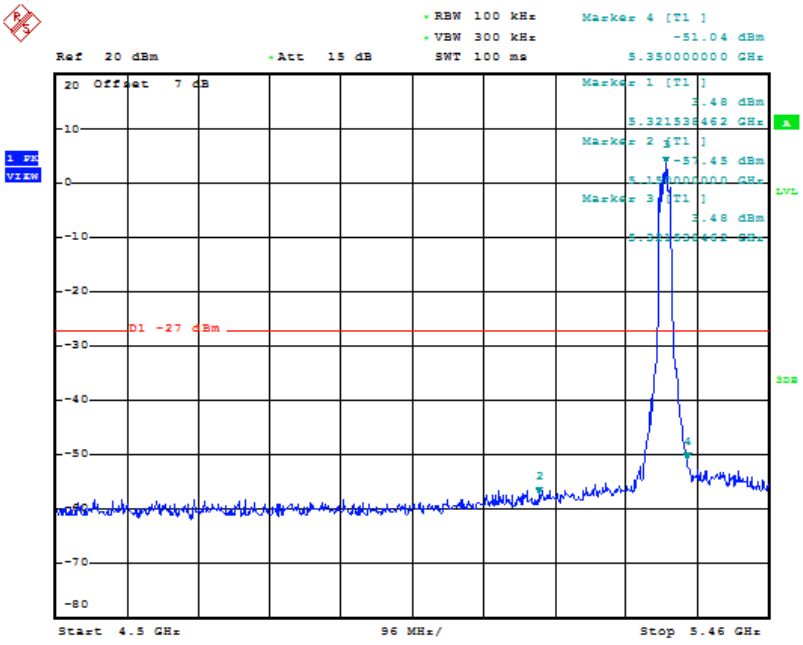


Fig. 125 Band Edges (802.11a, 5320MHz)

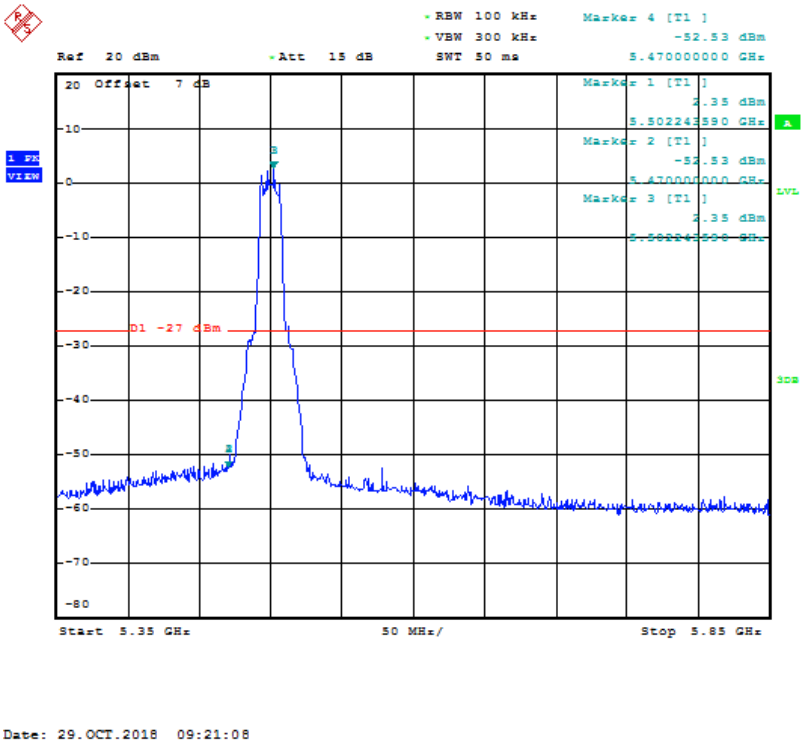


Fig. 126 Band Edges (802.11a, 5500MHz)

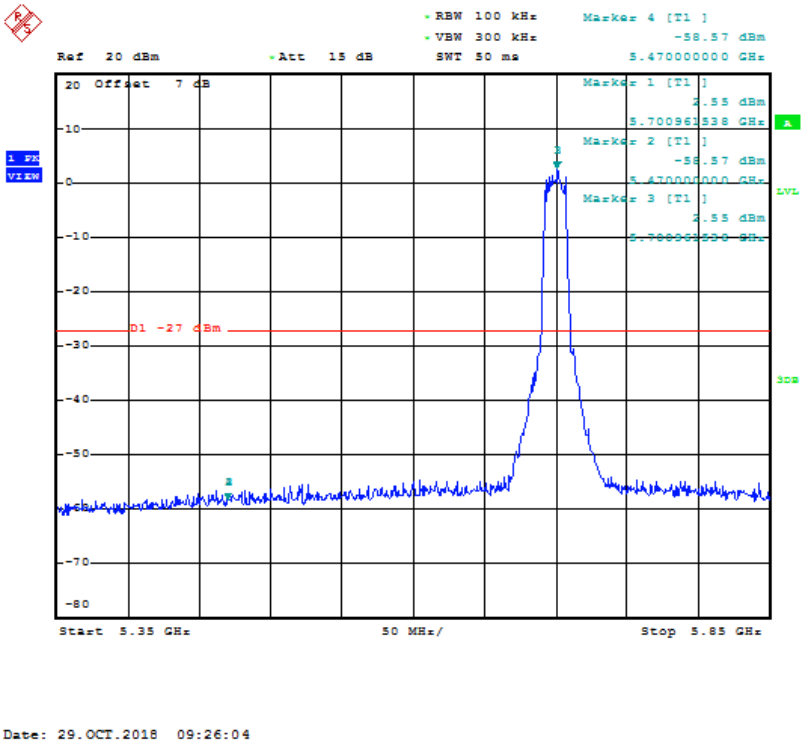


Fig. 127 Band Edges (802.11a, 5700MHz)

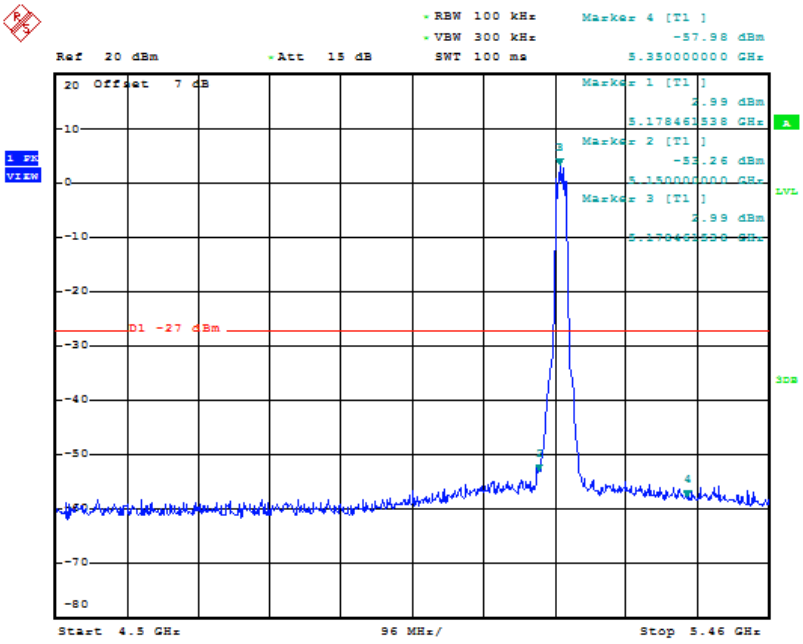


Fig. 128 Band Edges (802.11n-HT20, 5180MHz)

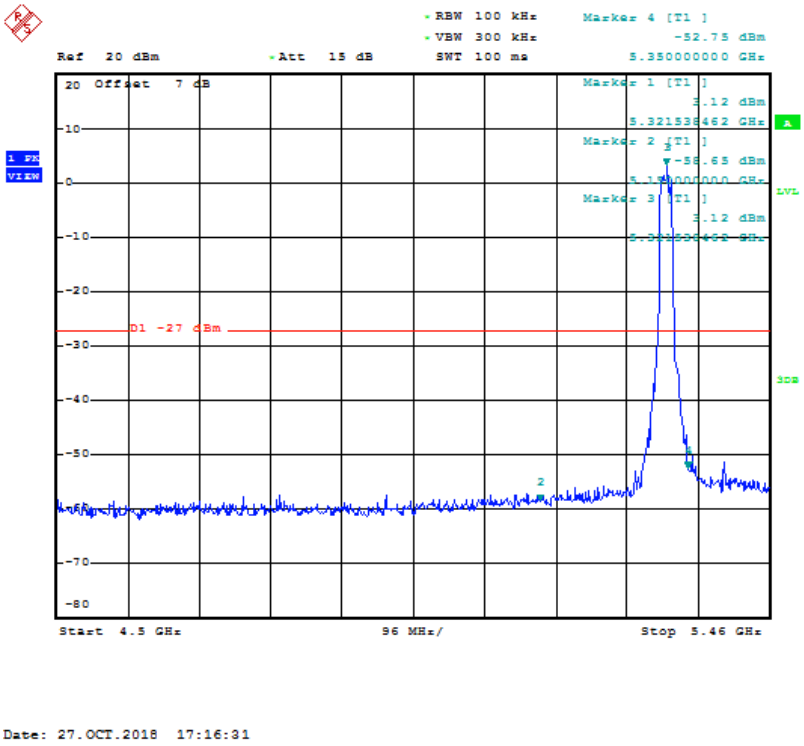


Fig. 129 Band Edges (802.11n-HT20, 5320MHz)

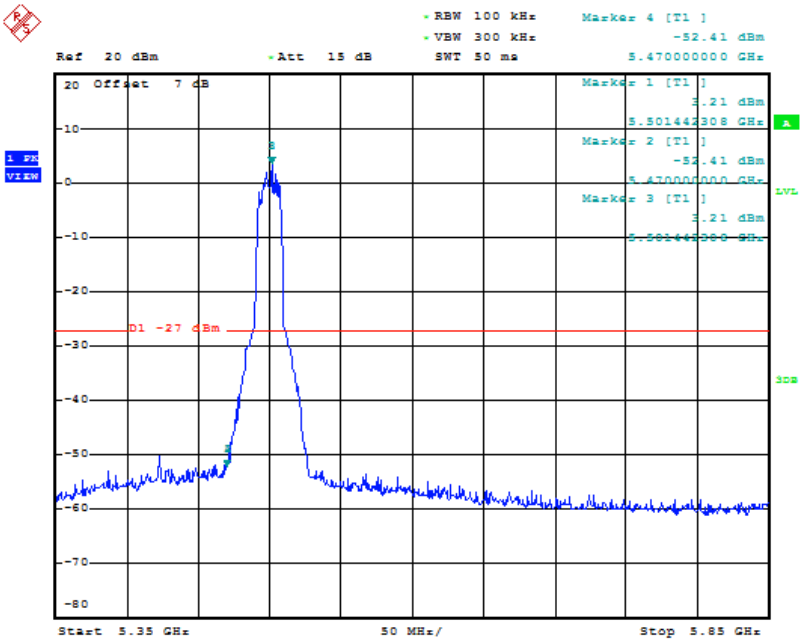


Fig. 130 Band Edges (802.11n-HT20, 5500MHz)

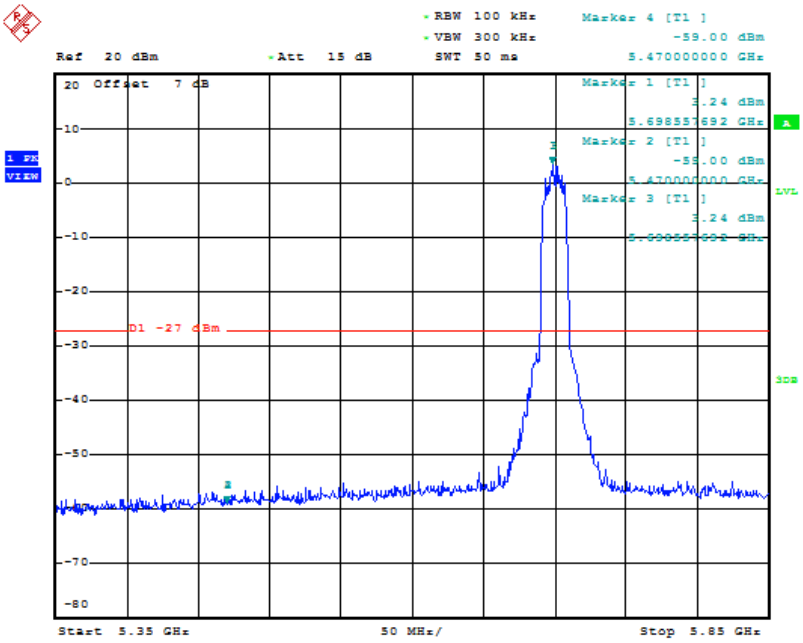


Fig. 131 Band Edges (802.11n-HT20, 5700MHz)

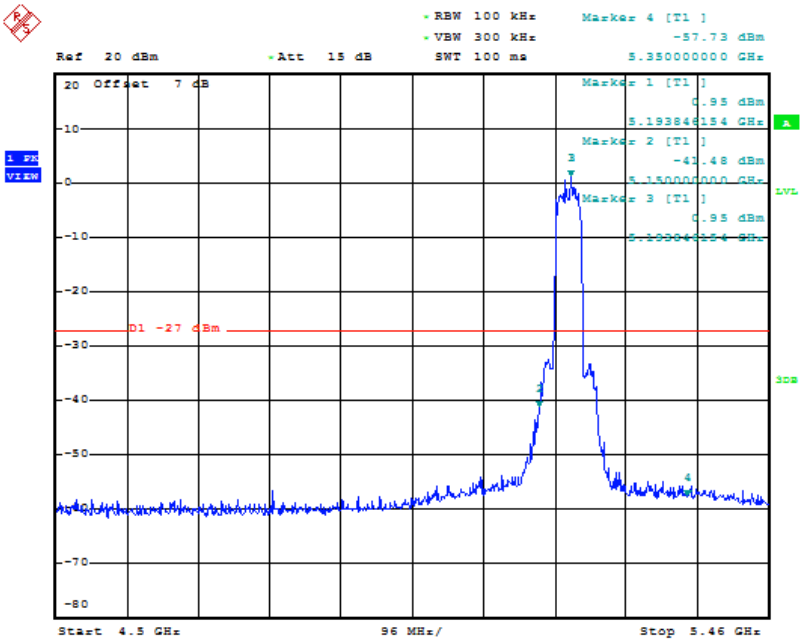


Fig. 132 Band Edges (802.11n-HT40, 5190MHz)

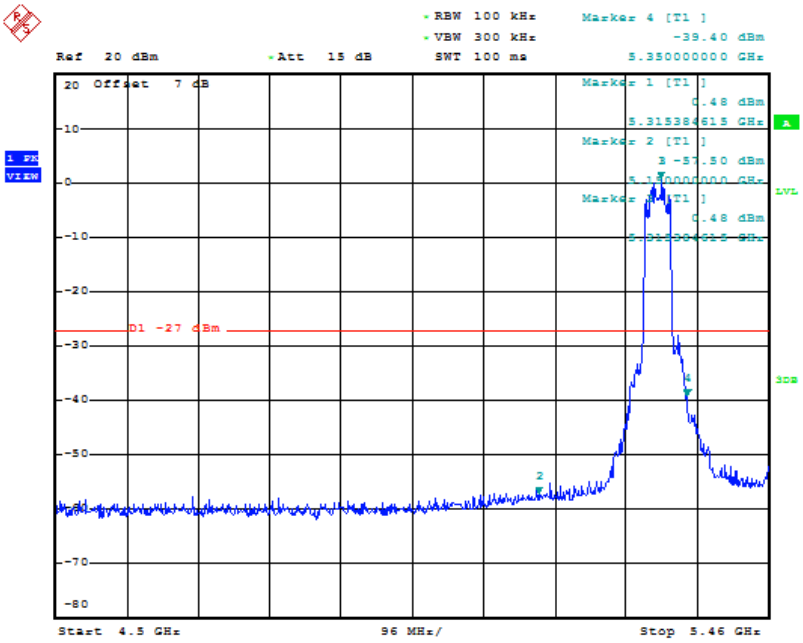


Fig. 133 Band Edges (802.11n-HT40, 5310MHz)

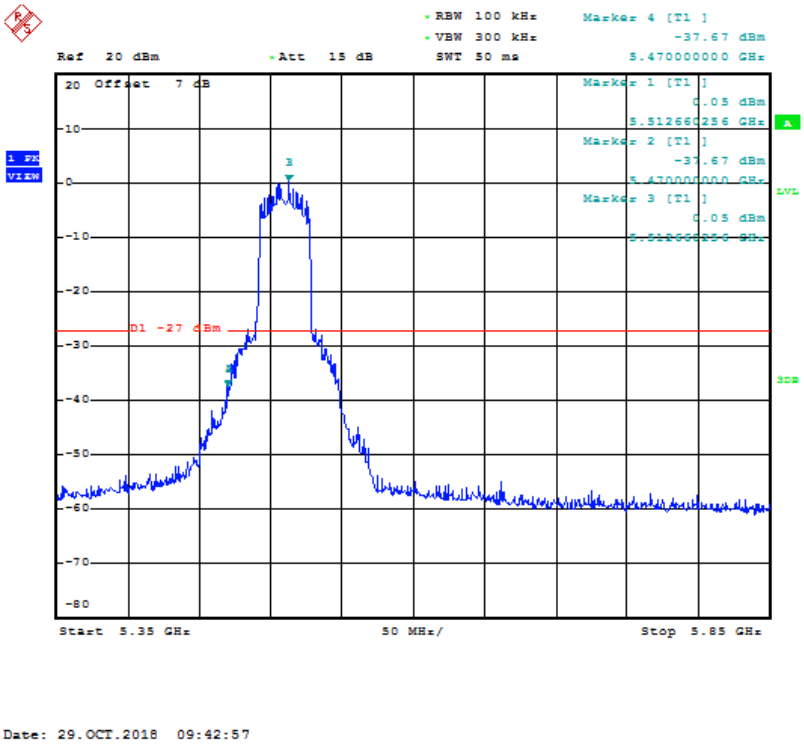


Fig. 134 Band Edges (802.11n-HT40, 5510MHz)

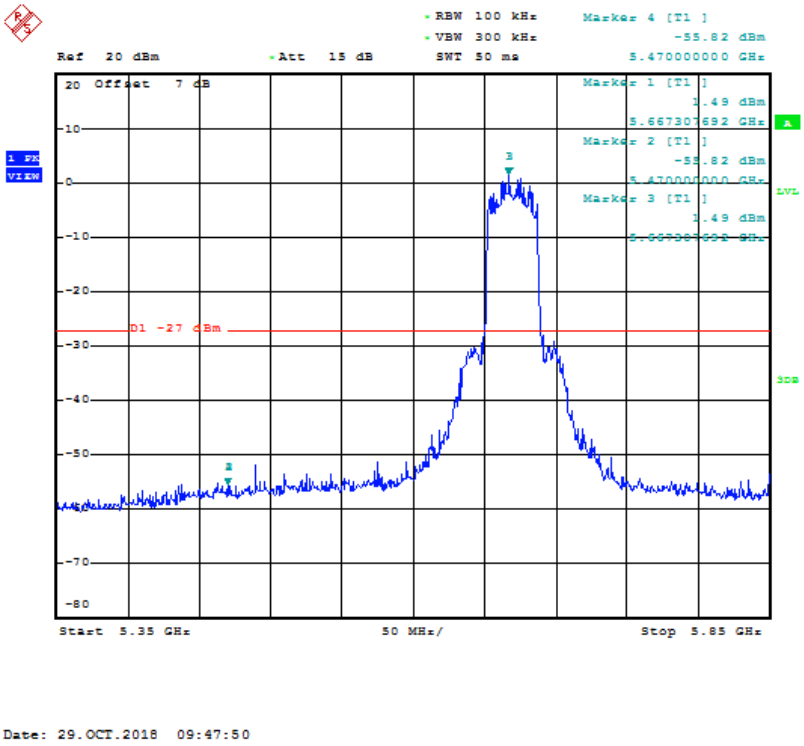


Fig. 135 Band Edges (802.11n-HT40, 5670MHz)

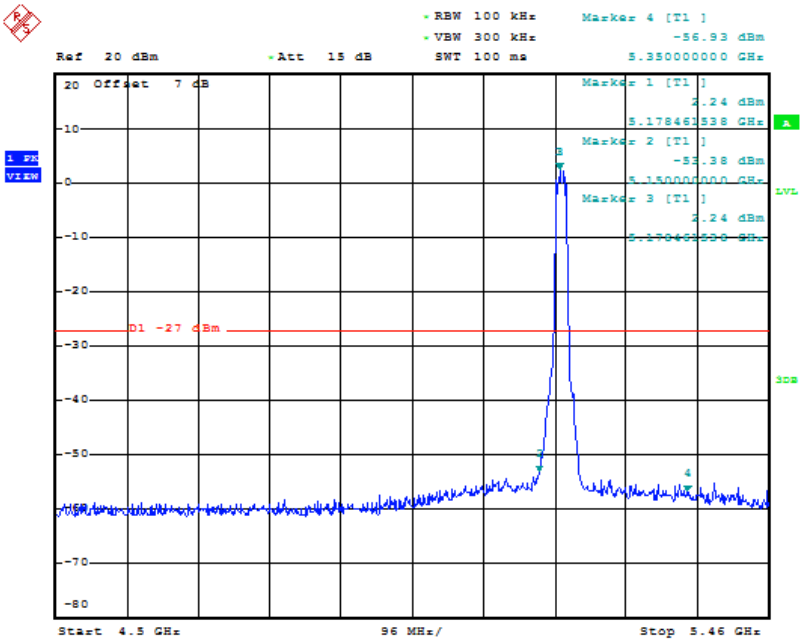


Fig. 136 Band Edges (802.11ac-HT20, 5180MHz)

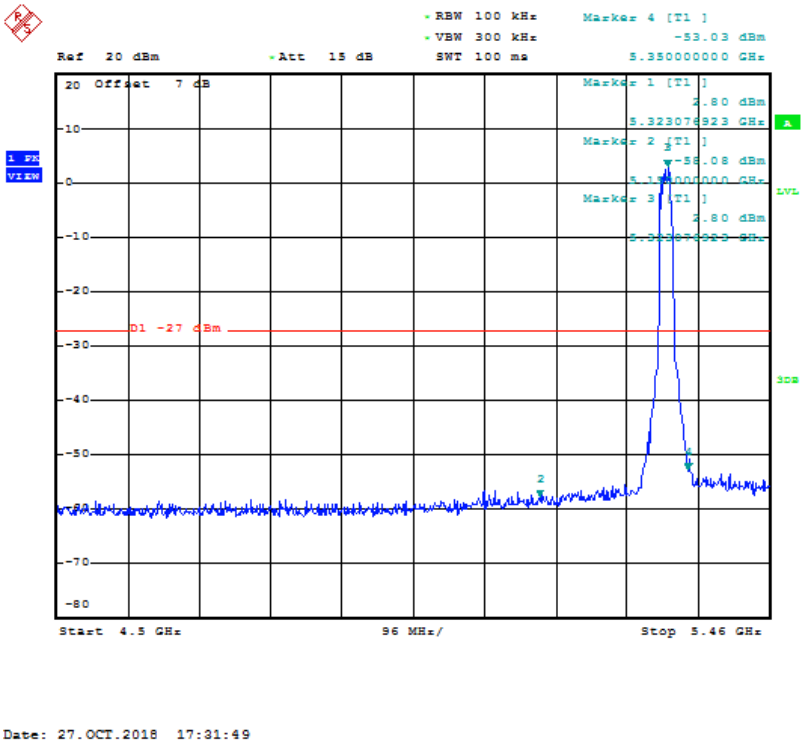


Fig. 137 Band Edges (802.11ac-HT20, 5320MHz)

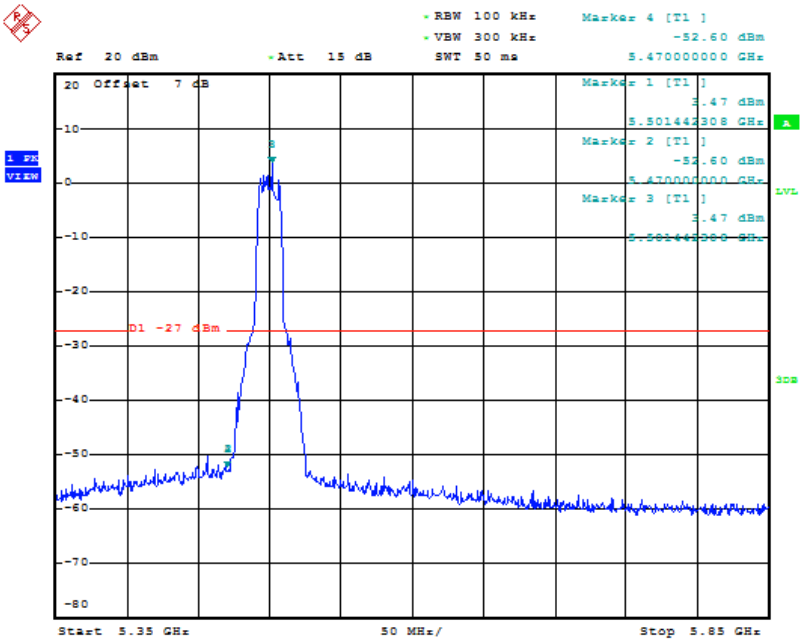


Fig. 138 Band Edges (802.11ac-HT20, 5500MHz)

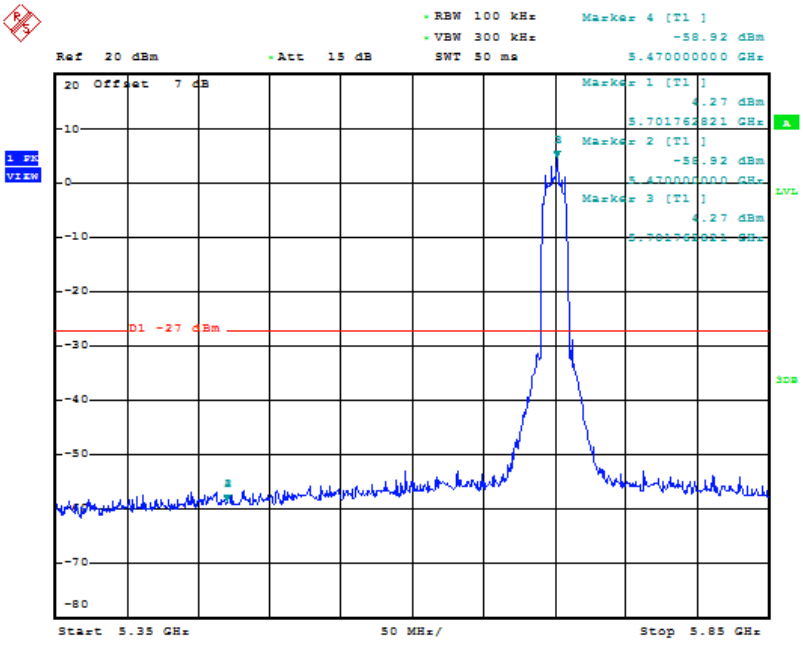


Fig. 139 Band Edges (802.11ac-HT20, 5700MHz)

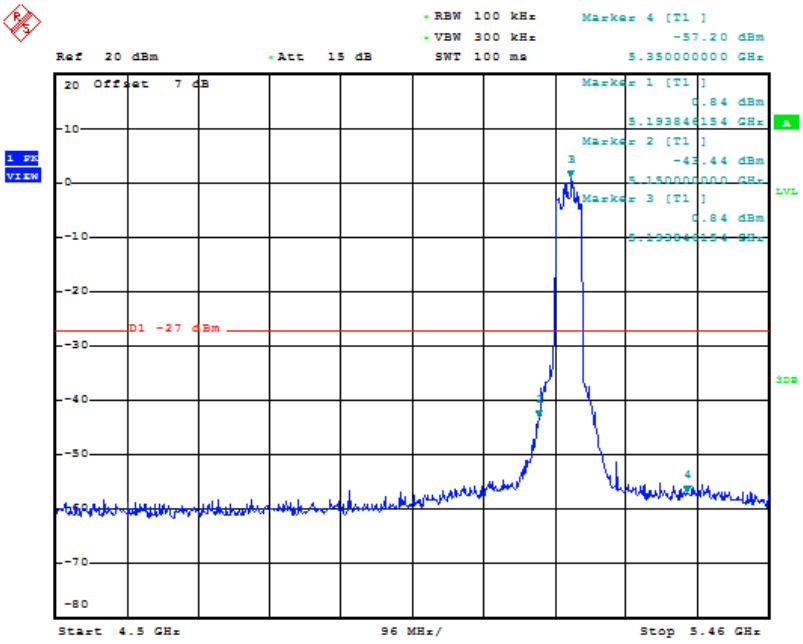


Fig. 140 Band Edges (802.11ac-HT40, 5190MHz)

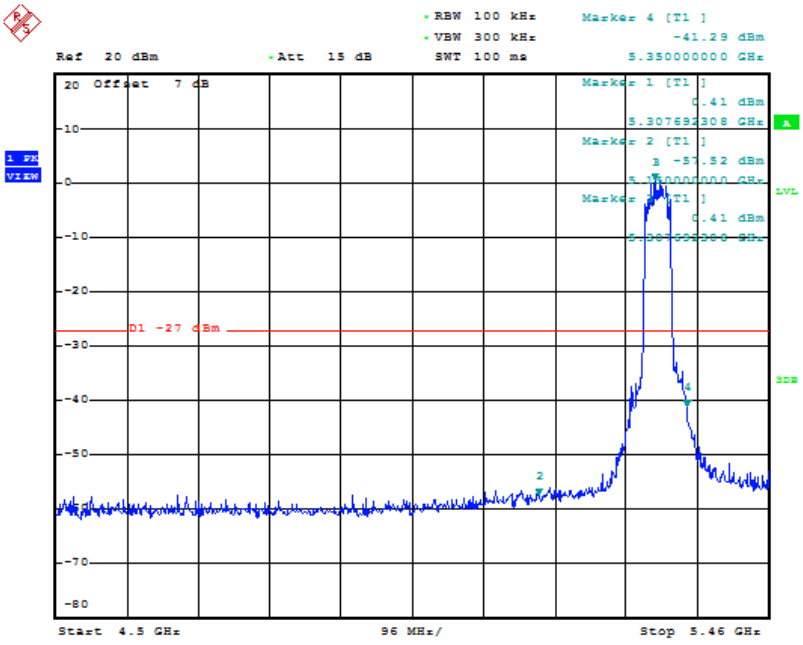


Fig. 141 Band Edges (802.11ac-HT40, 5310MHz)

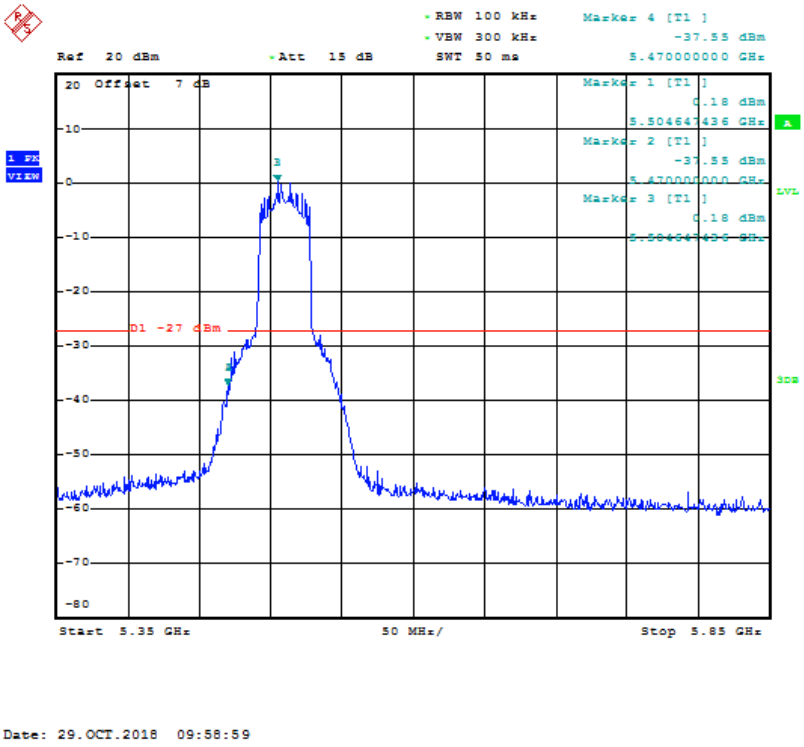


Fig. 142 Band Edges (802.11ac-HT40, 5510MHz)

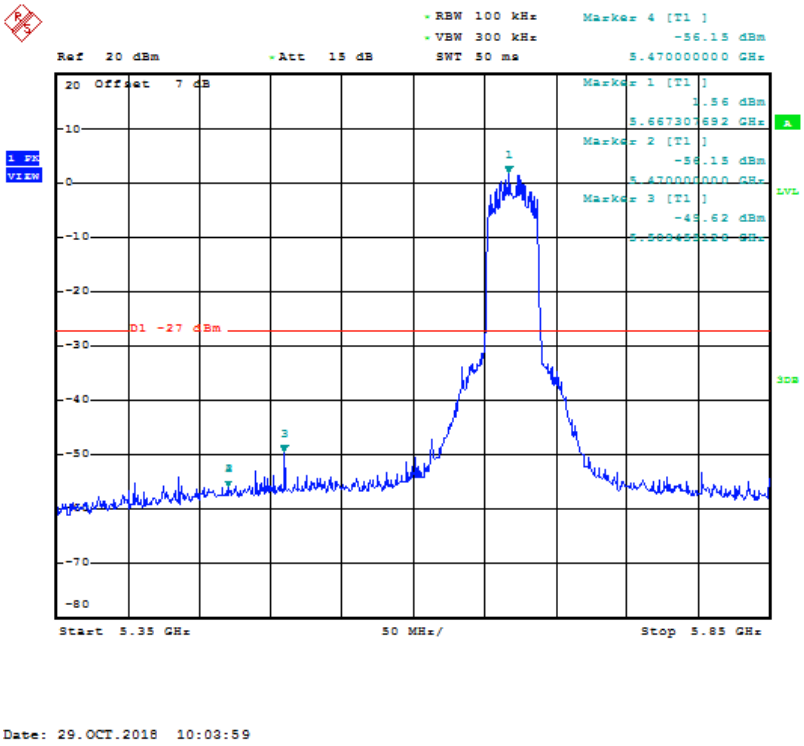


Fig. 143 Band Edges (802.11ac-HT40, 5670MHz)

6.6.2 Band Edges - Radiated

Measurement Limit:

Standard	Limit (dB μ V/m)	
FCC 47 CFR Part 15.209	Peak	74
	Average	54

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:

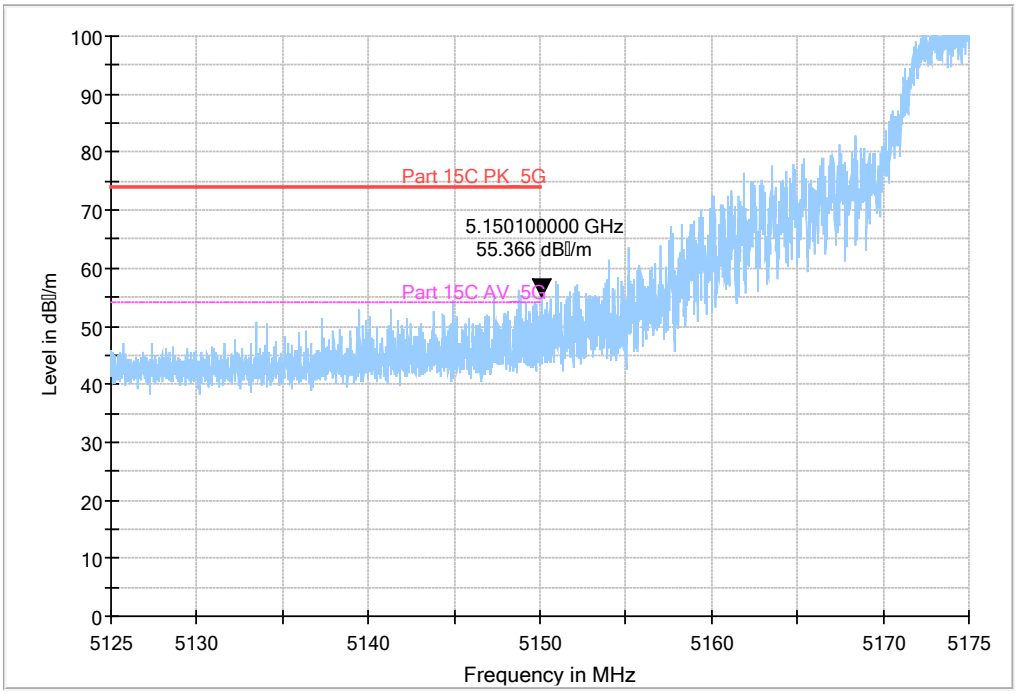
Measurement Uncertainty	0.75dB

Measurement Result:

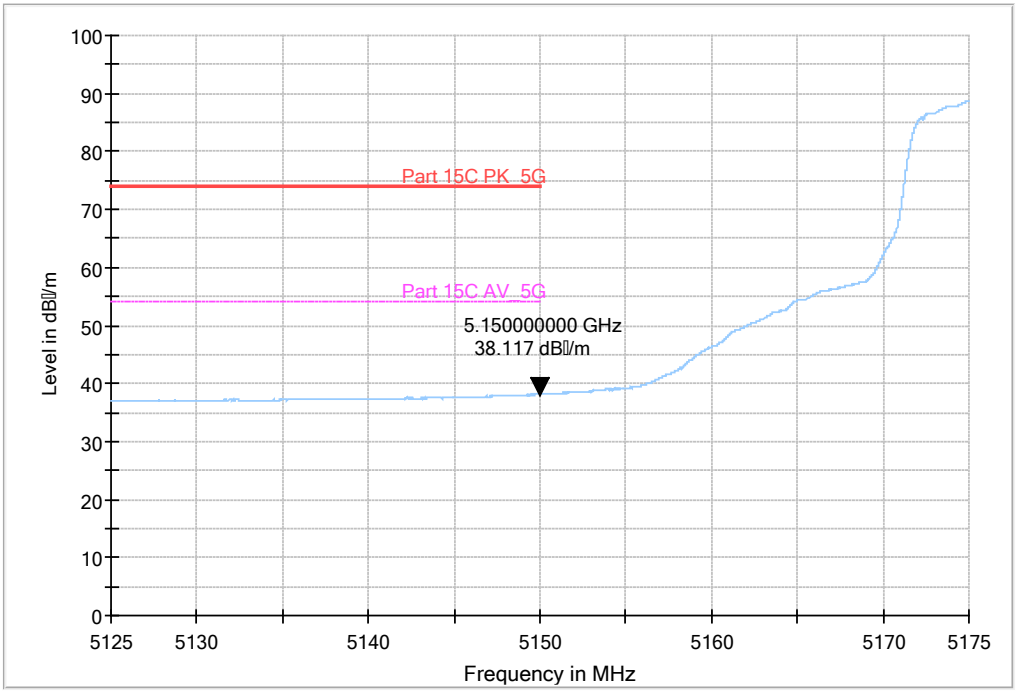
Mode	Channel	Test Results	Conclusion
802.11a	5180 MHz	Fig.144	P
	5320 MHz	Fig.145	P
	5500 MHz	Fig.146	P
	5700 MHz	Fig.147	P
802.11n HT20	5180 MHz	Fig.148	P
	5320 MHz	Fig.149	P
	5500 MHz	Fig.150	P
	5700 MHz	Fig.151	P
802.11n HT40	5190 MHz	Fig.152	P
	5310 MHz	Fig.153	P
	5510 MHz	Fig.154	P
	5670 MHz	Fig.155	P
802.11ac HT20	5180 MHz	Fig.156	P
	5320 MHz	Fig.157	P
	5500 MHz	Fig.158	P
	5700 MHz	Fig.159	P
802.11ac HT40	5190 MHz	Fig.160	P
	5310 MHz	Fig.161	P
	5510 MHz	Fig.162	P
	5670 MHz	Fig.163	P

Conclusion: PASS

Test graphs as below:

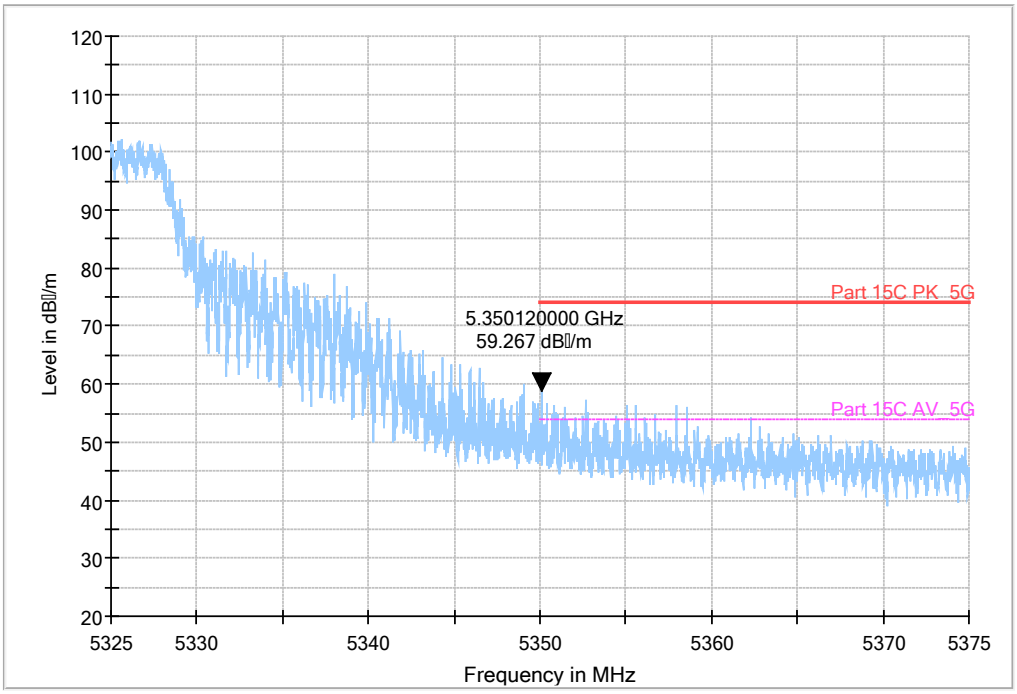


Peak

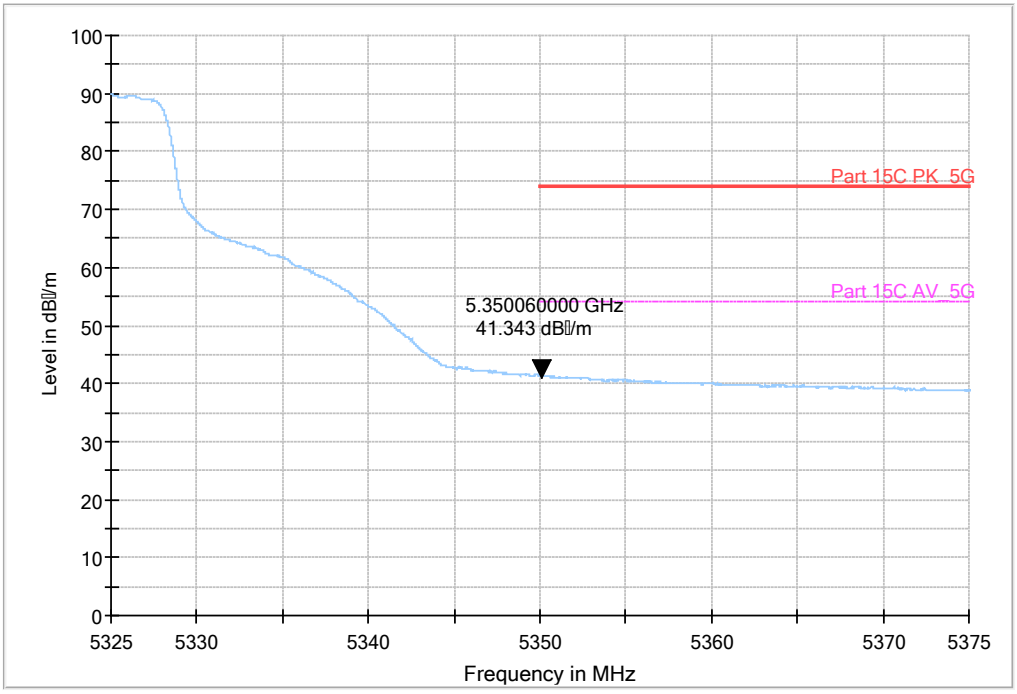


Average

Fig. 144 Band Edges (802.11a, 5180MHz)

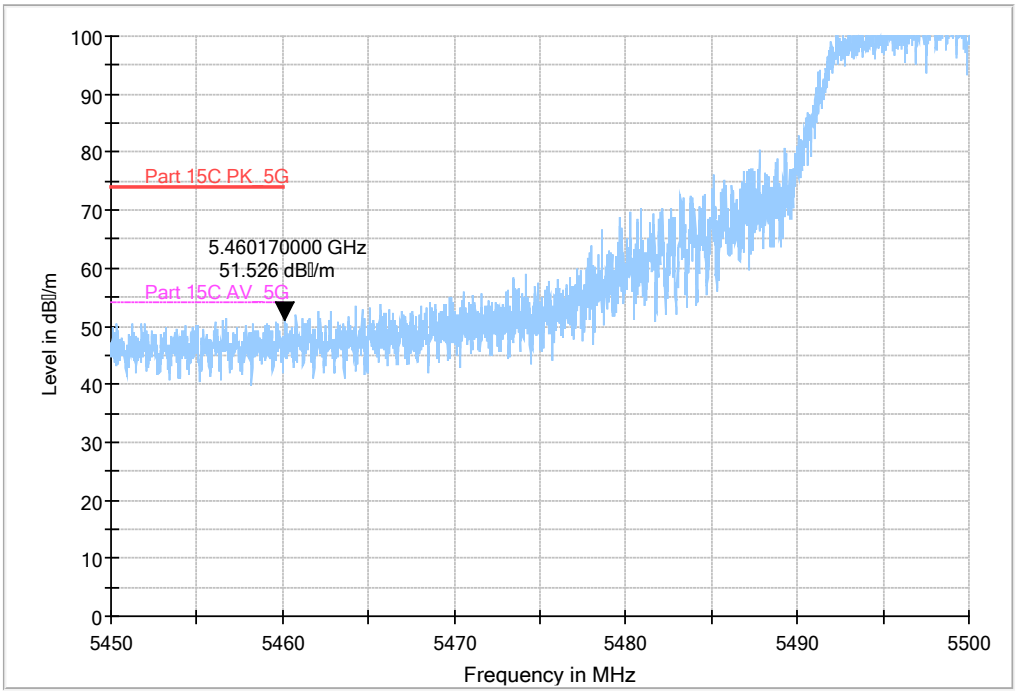


Peak

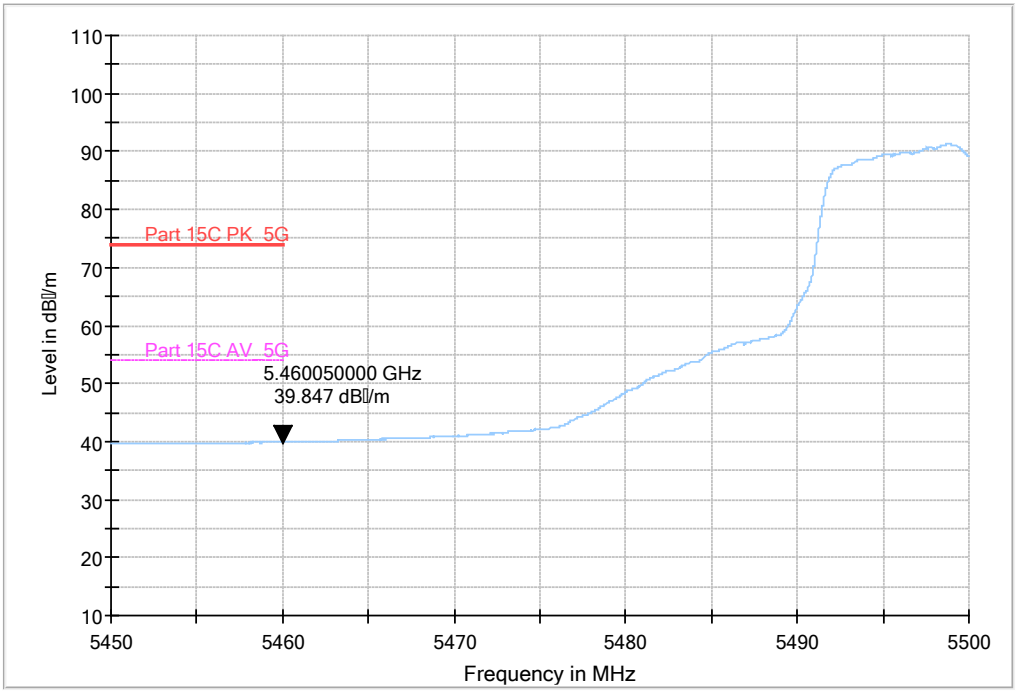


Average

Fig. 145 Band Edges (802.11a, 5320MHz)

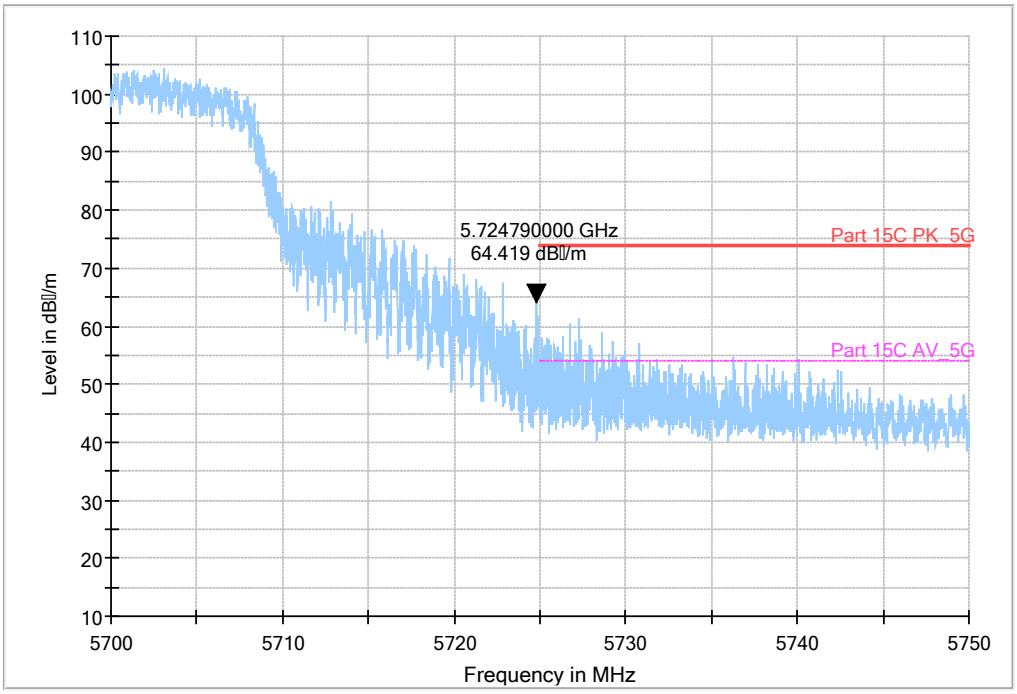


Peak

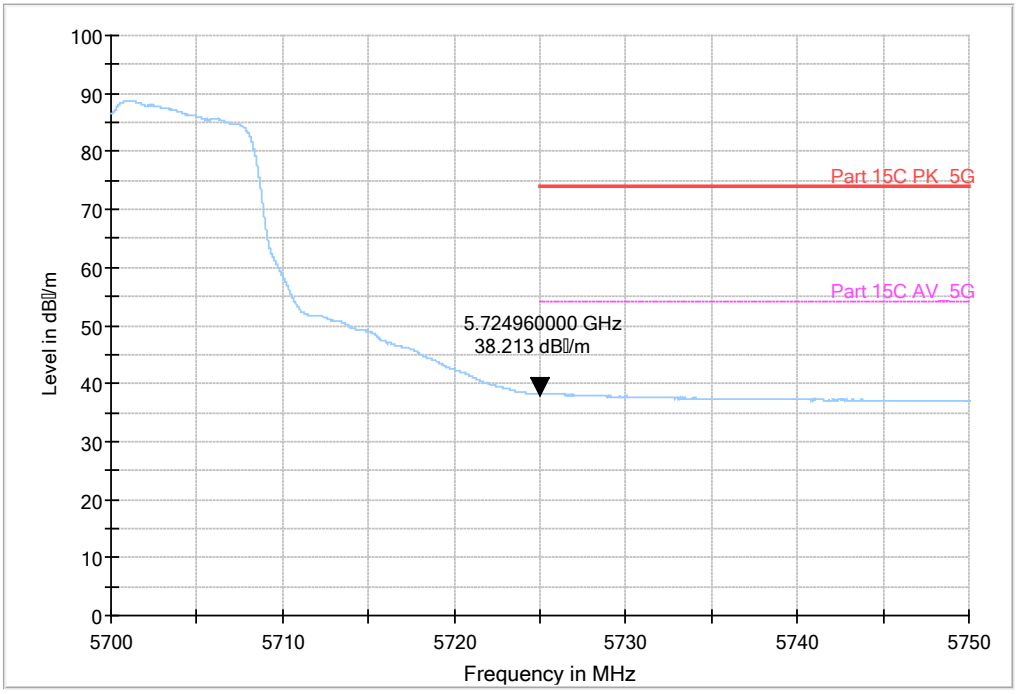


Average

Fig. 146 Band Edges (802.11a, 5500MHz)

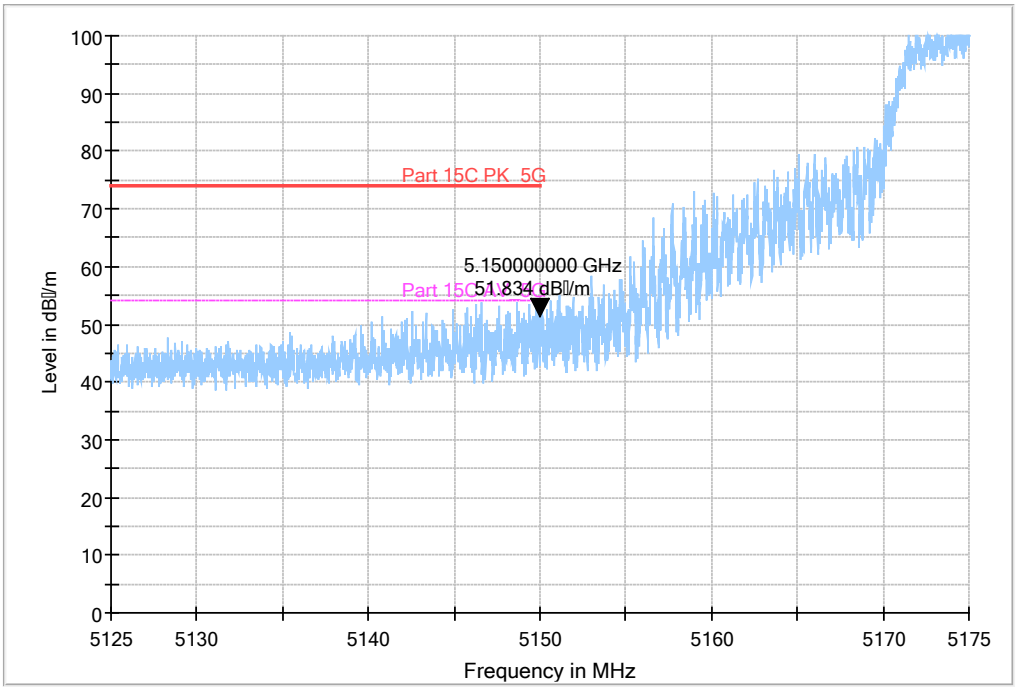


Peak

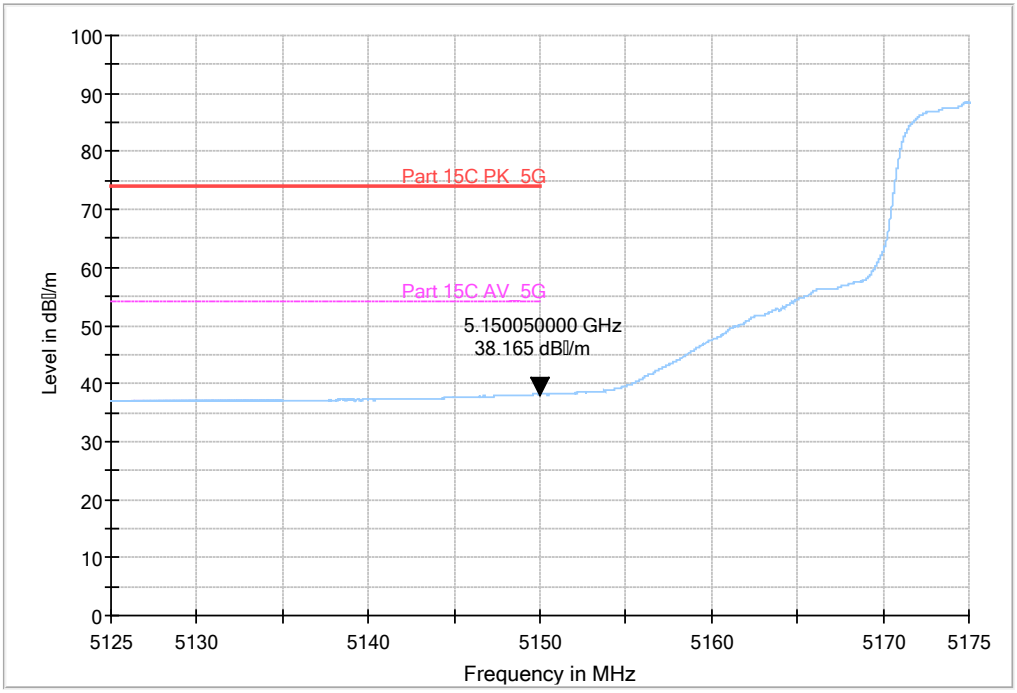


Average

Fig. 147 Band Edges (802.11a, 5700MHz)

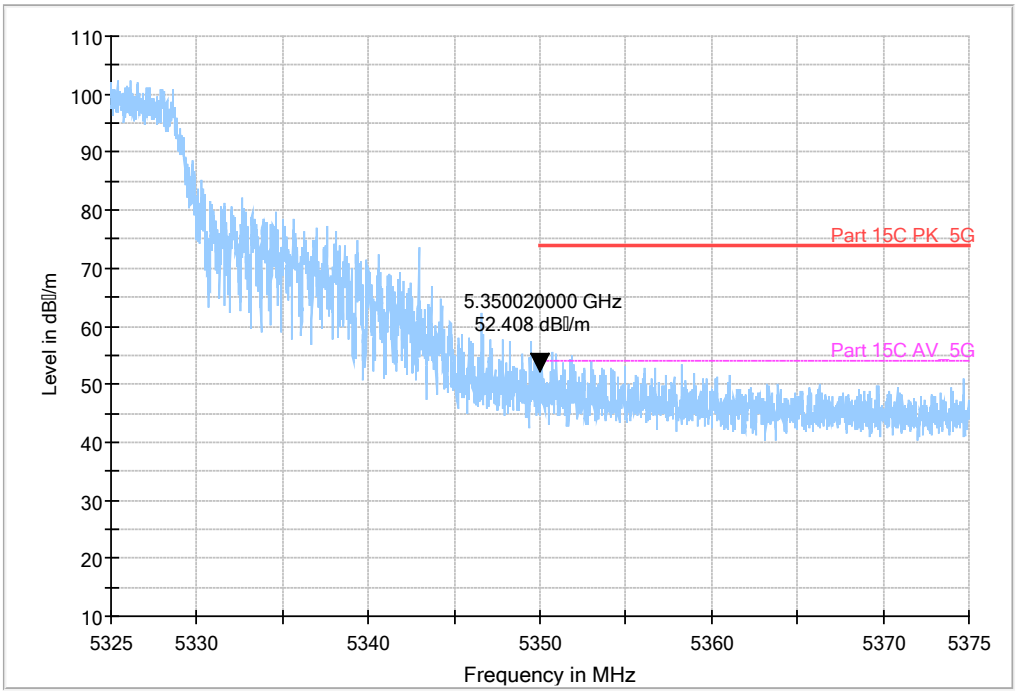


Peak

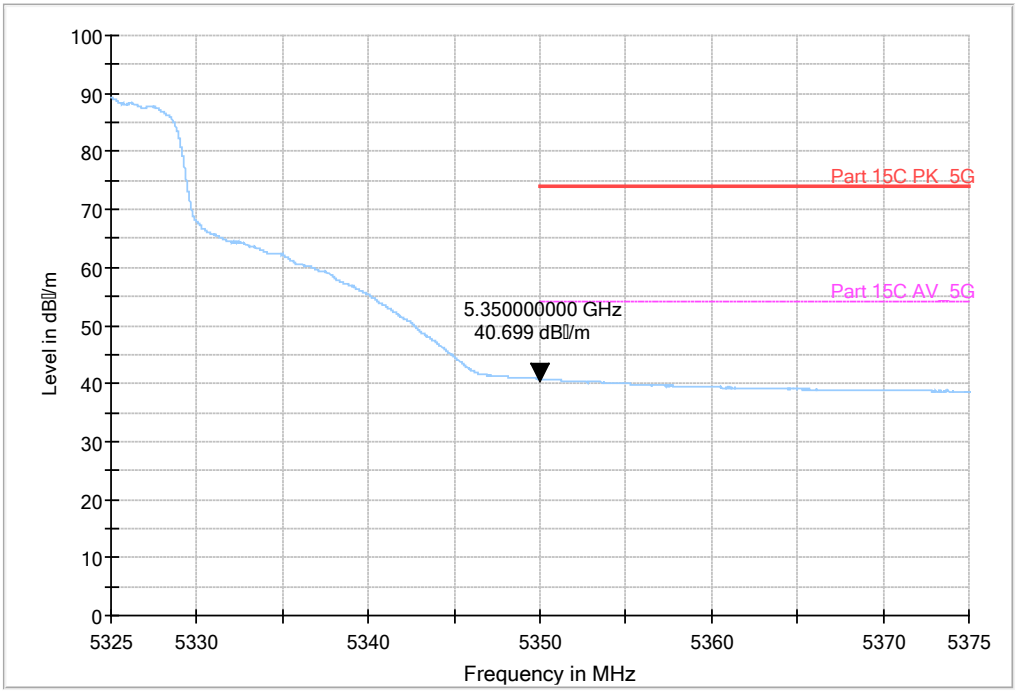


Average

Fig. 148 Band Edges (802.11n-HT20, 5180MHz)

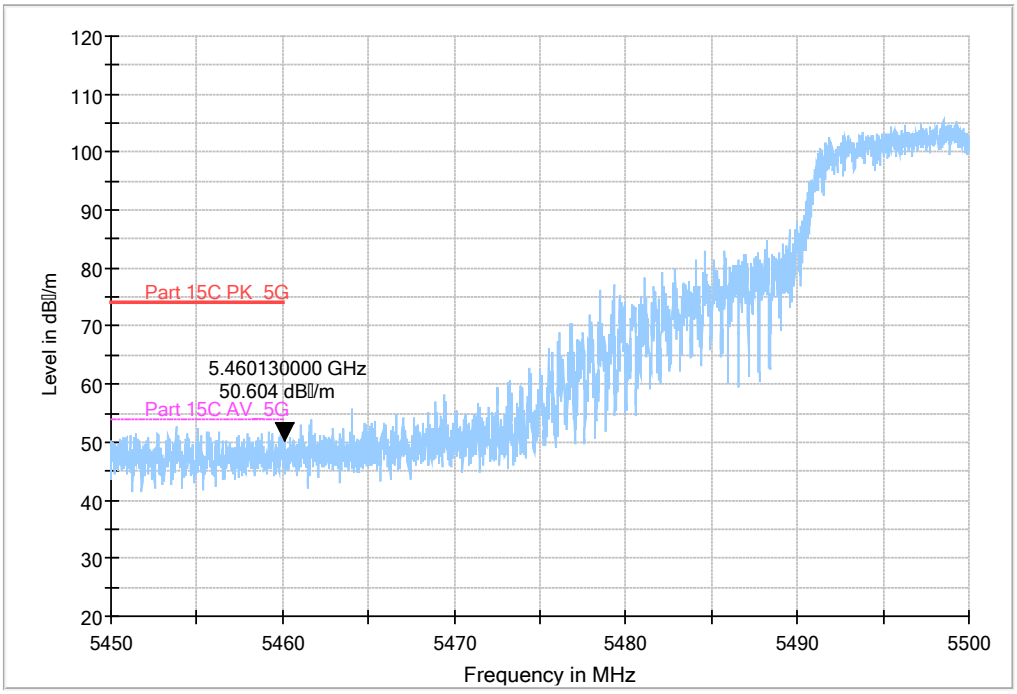


Peak

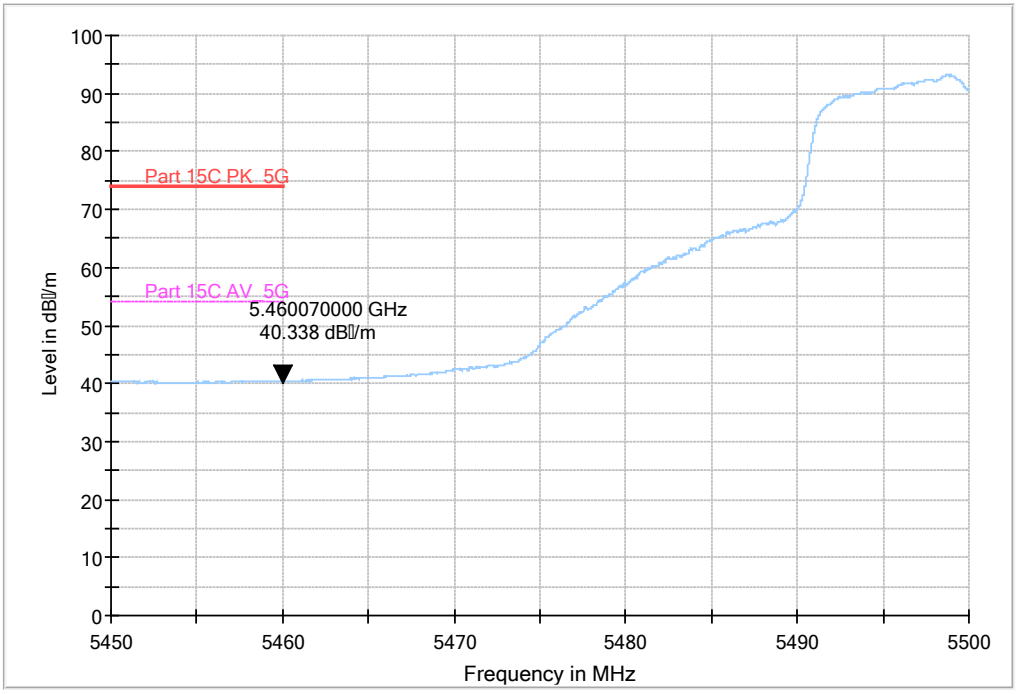


Average

Fig. 149 Band Edges (802.11n-HT20, 5320MHz)

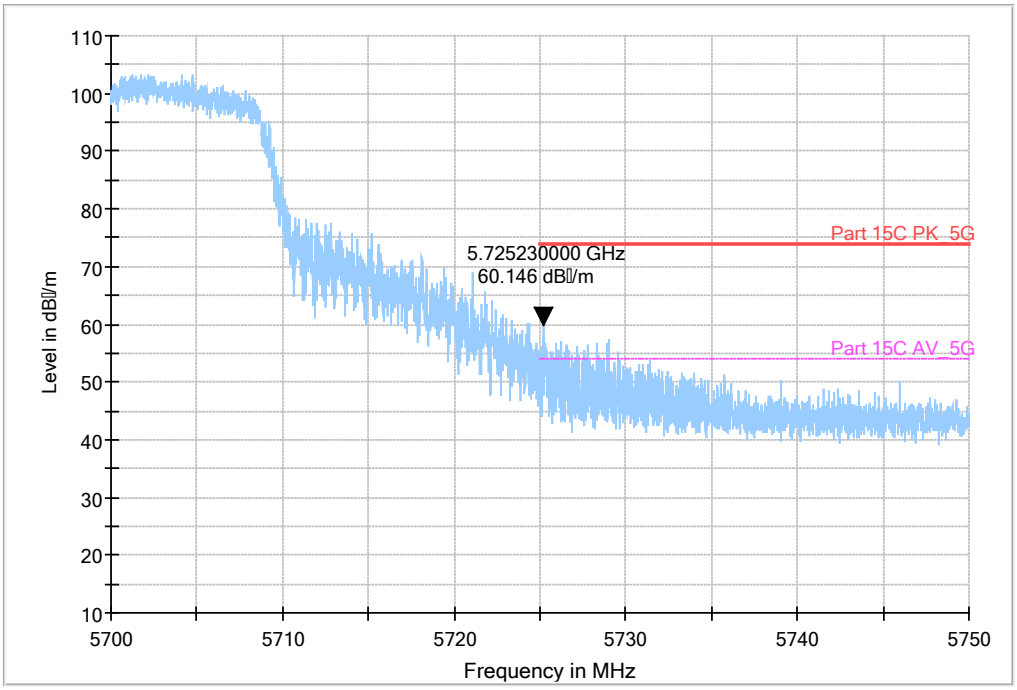


Peak

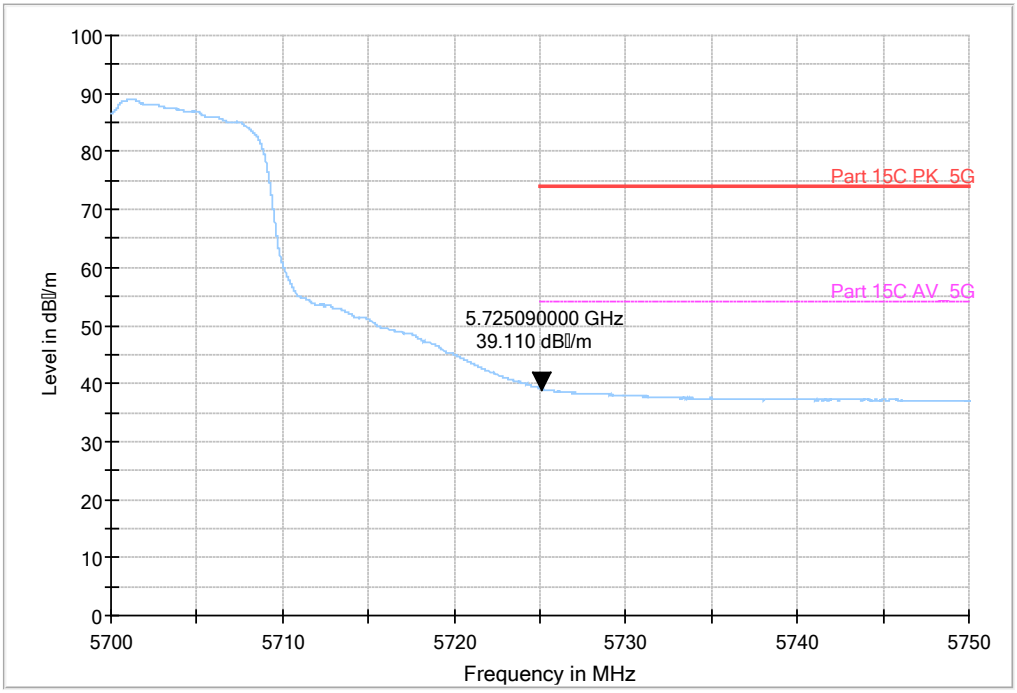


Average

Fig. 150 Band Edges (802.11n-HT20, 5500MHz)

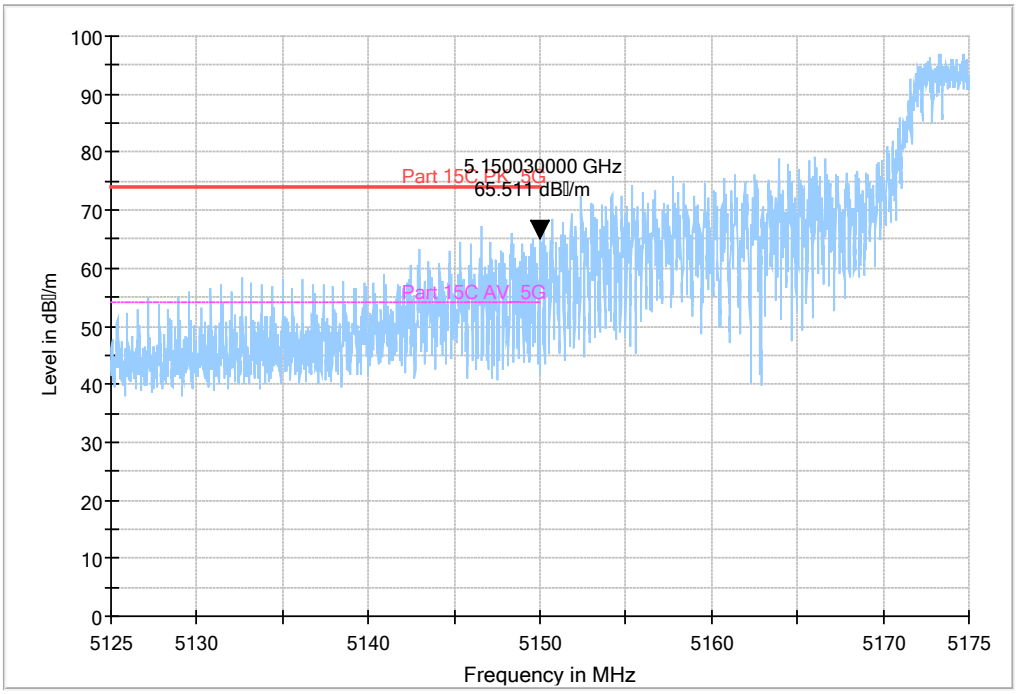


Peak

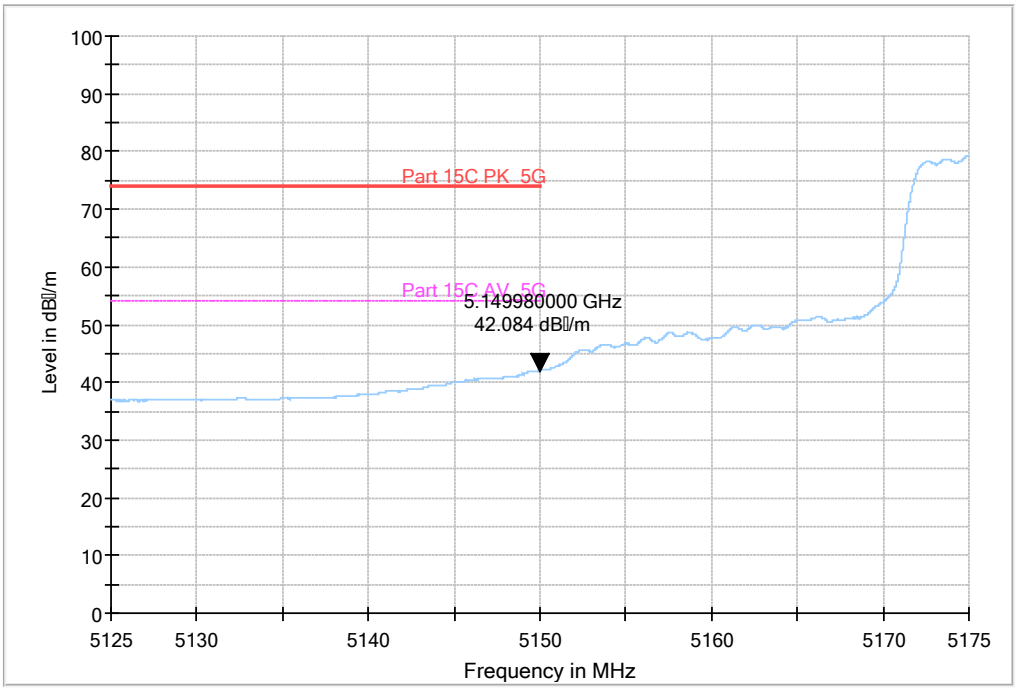


Average

Fig. 151 Band Edges (802.11n-HT20, 5700MHz)

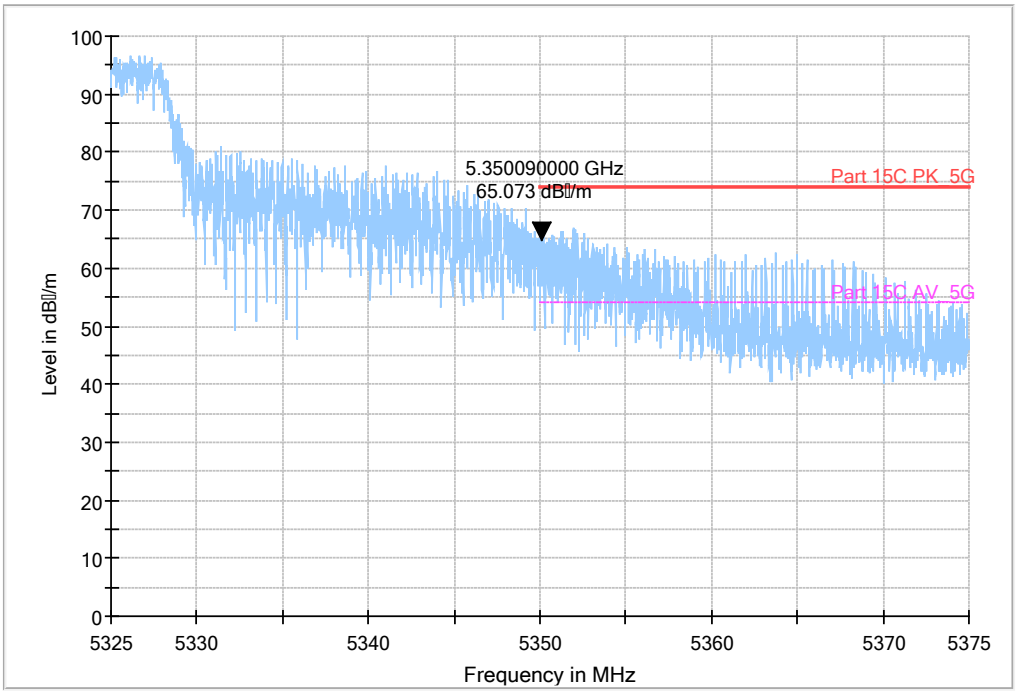


Peak

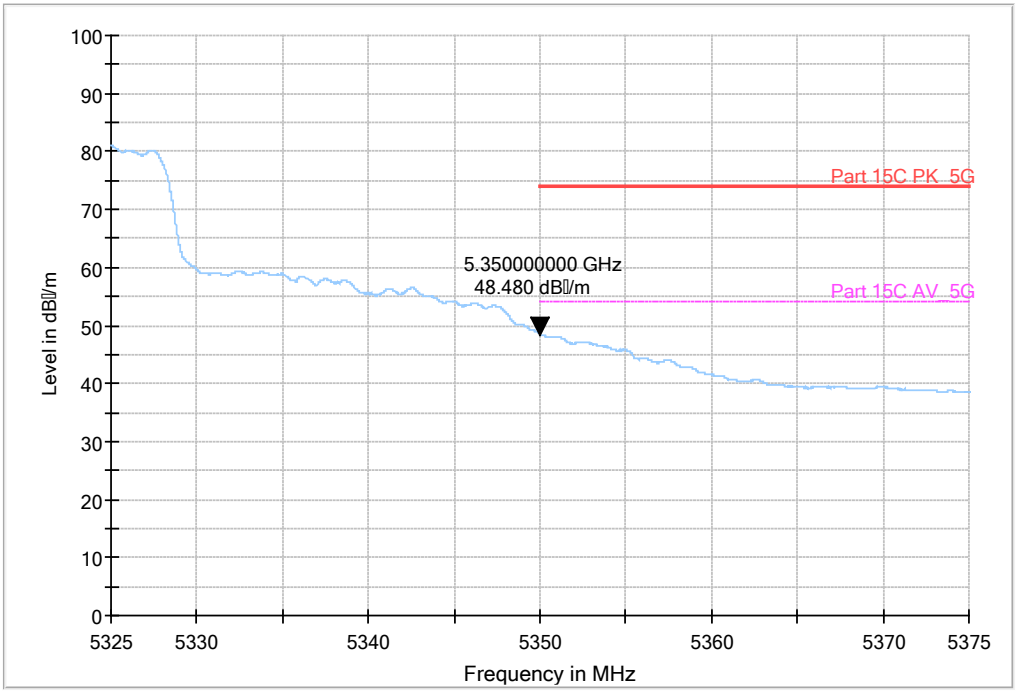


Average

Fig. 152 Band Edges (802.11n-HT40, 5190MHz)

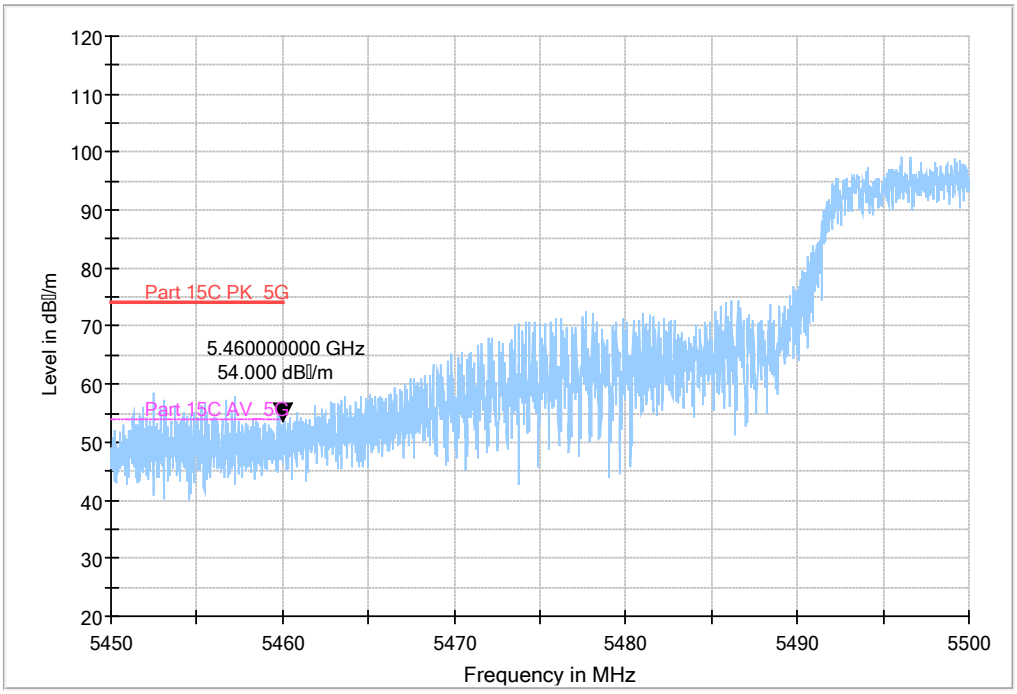


Peak

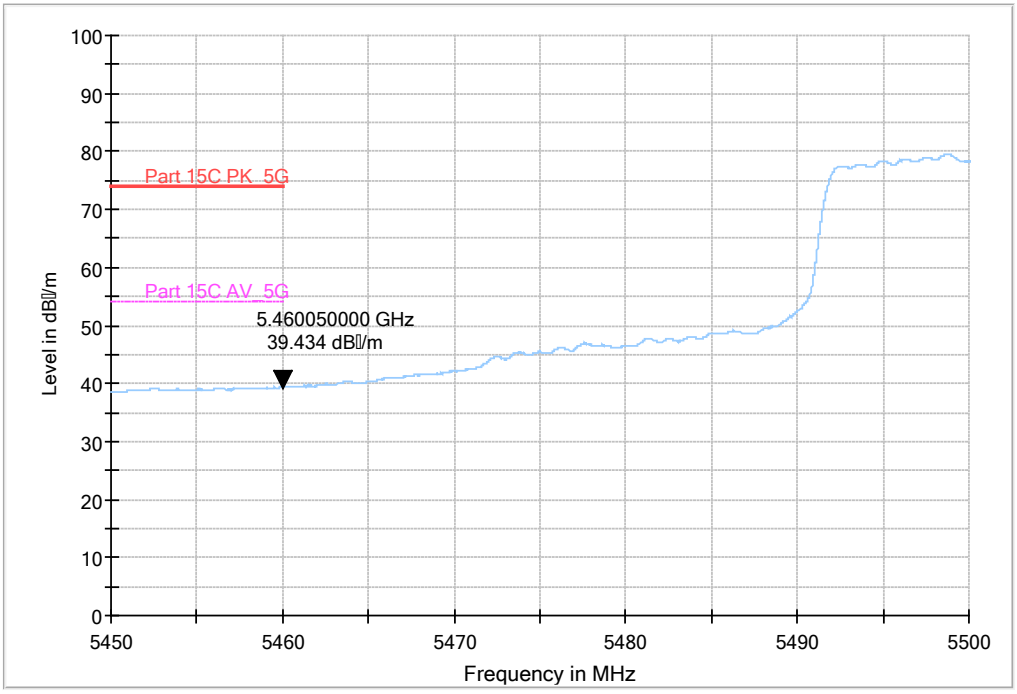


Average

Fig. 153 Band Edges (802.11n-HT40, 5310MHz)

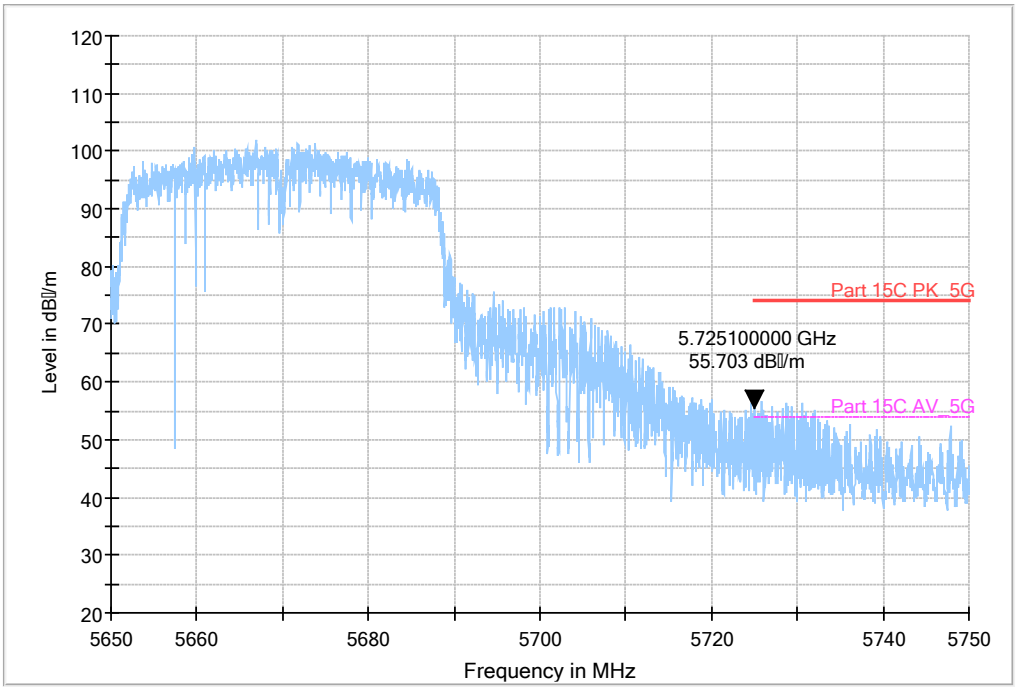


Peak

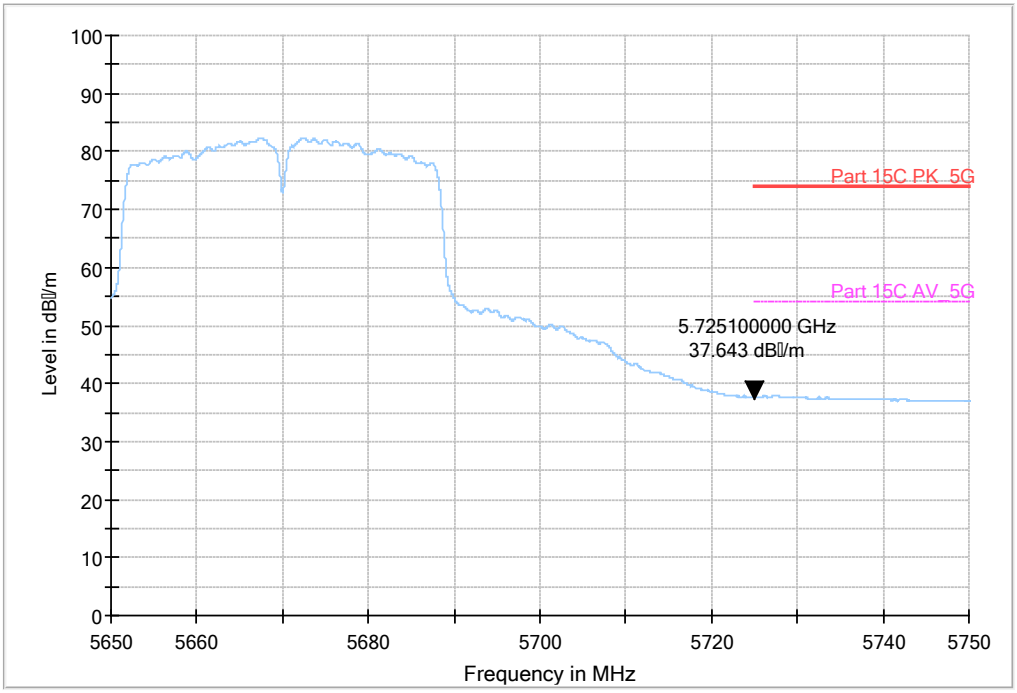


Average

Fig. 154 Band Edges (802.11n-HT40, 5510MHz)

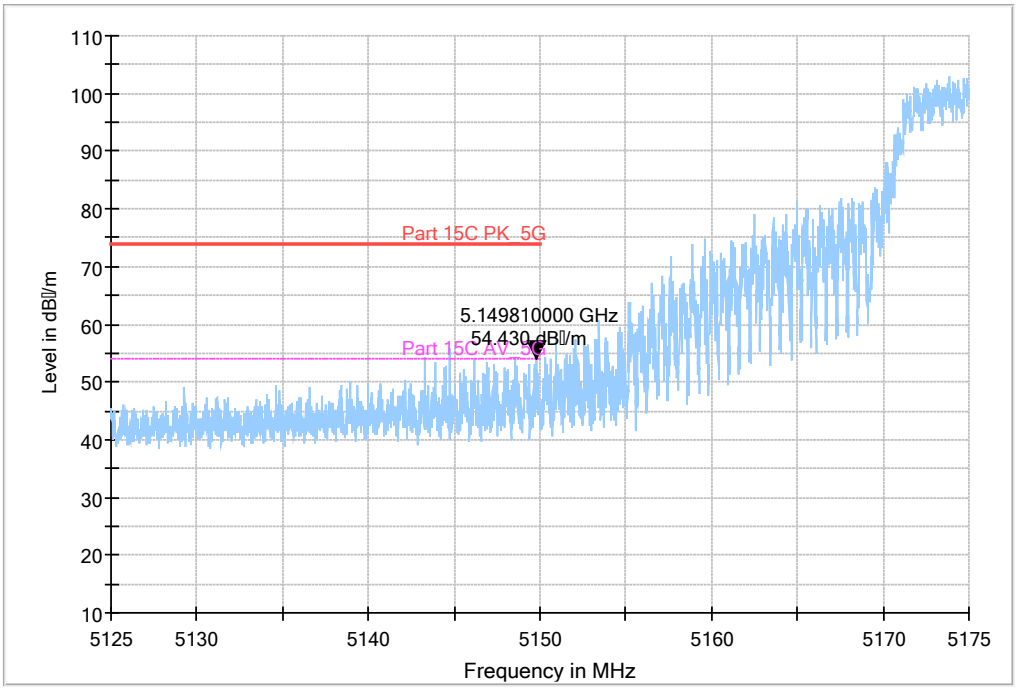


Peak

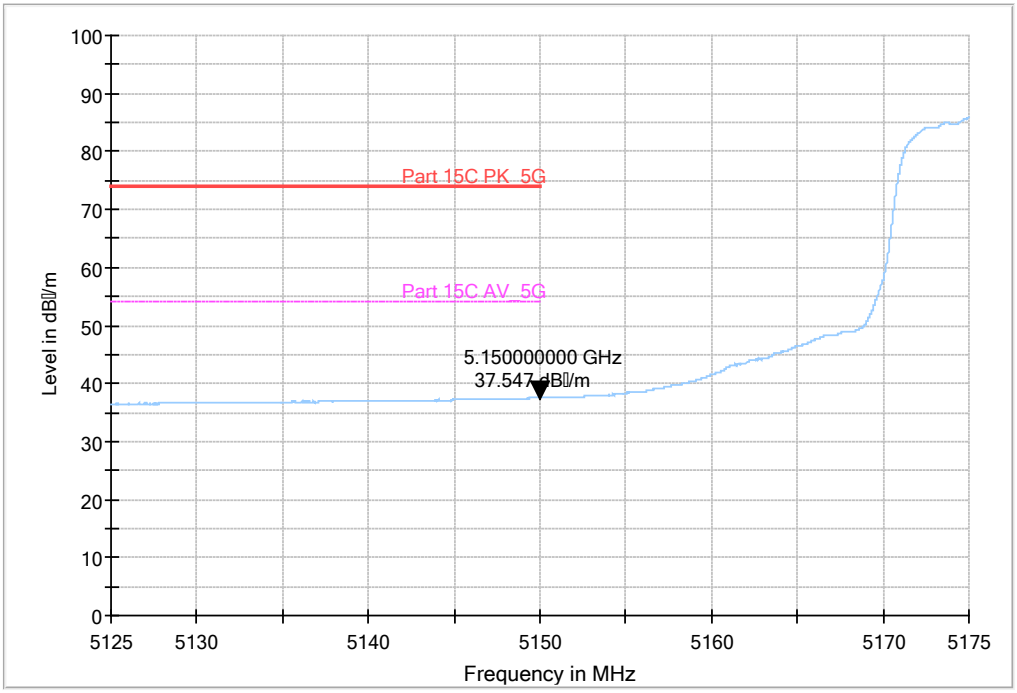


Average

Fig. 155 Band Edges (802.11n-HT40, 5670MHz)

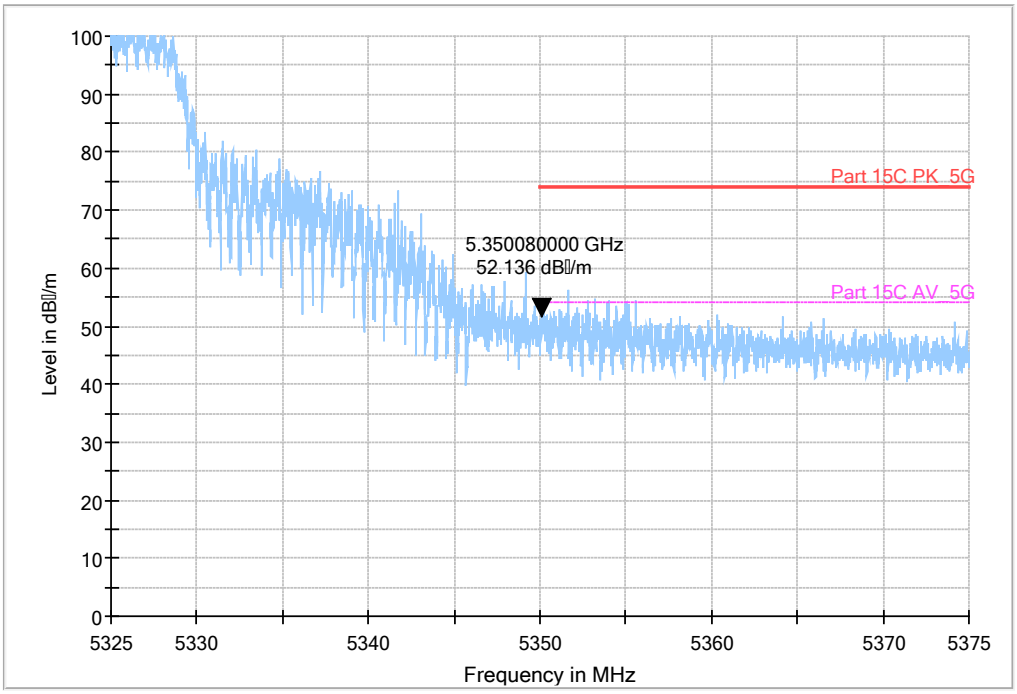


Peak

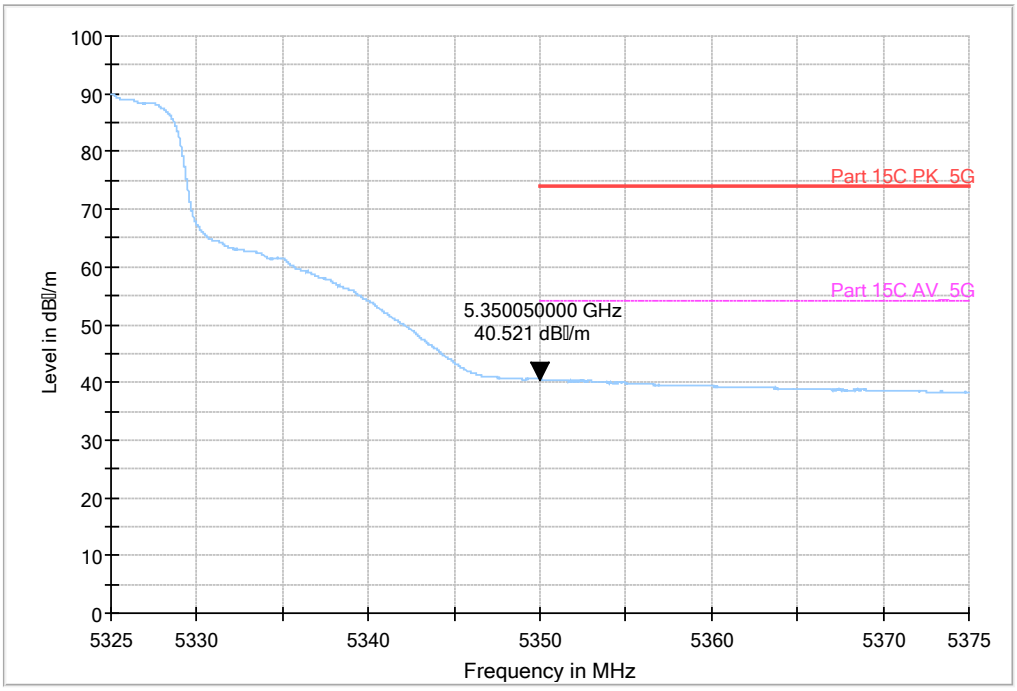


Average

Fig. 156 Band Edges (802.11ac-HT20, 5180MHz)

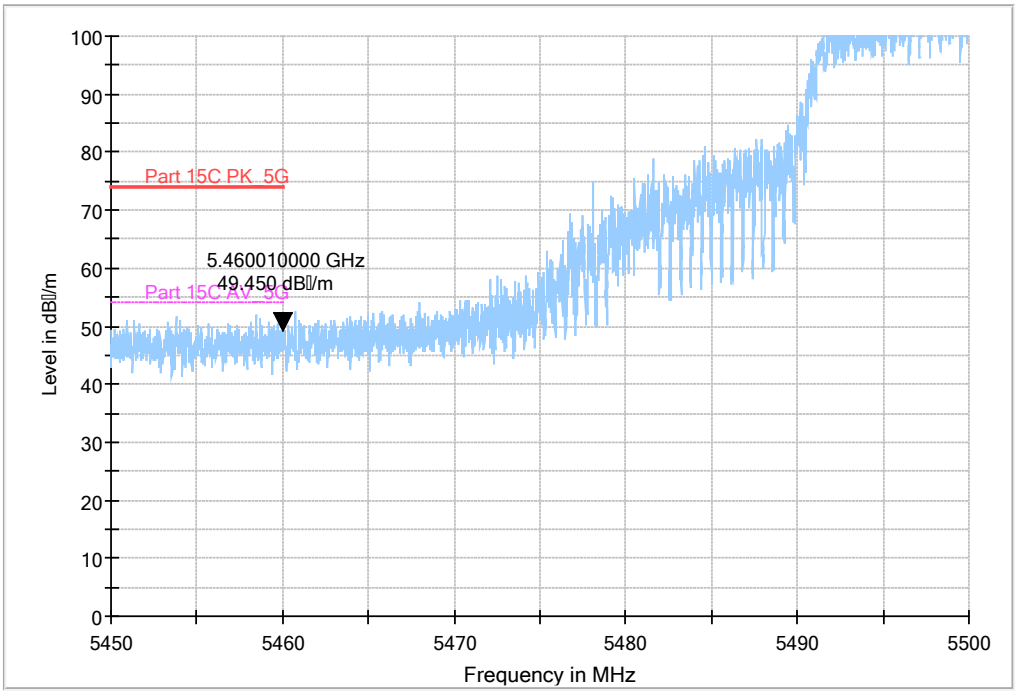


Peak

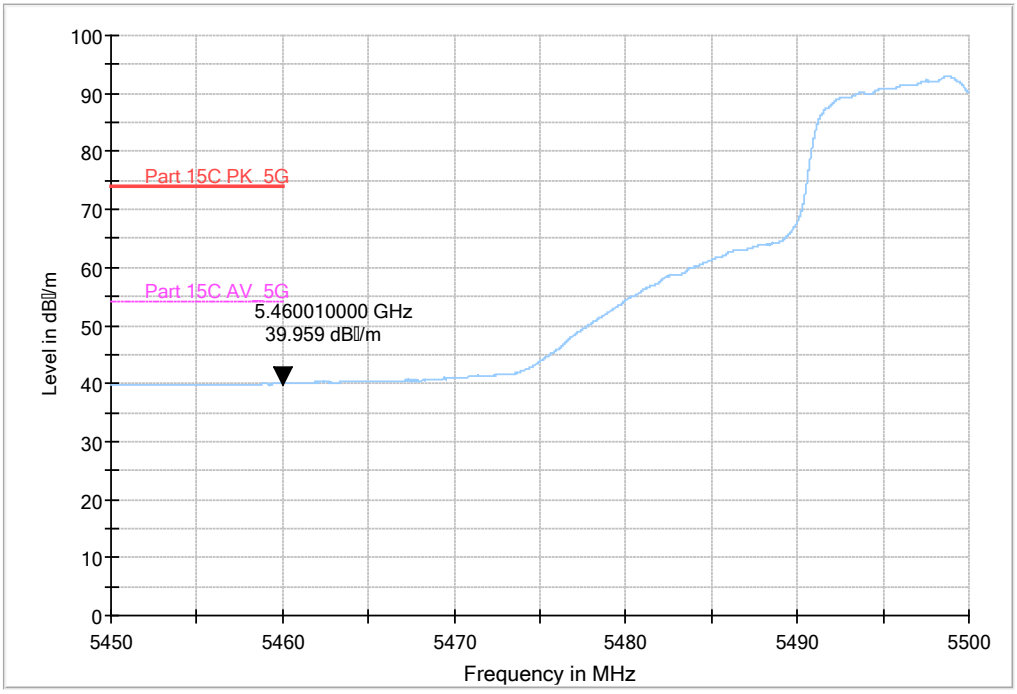


Average

Fig. 157 Band Edges (802.11ac-HT20, 5320MHz)

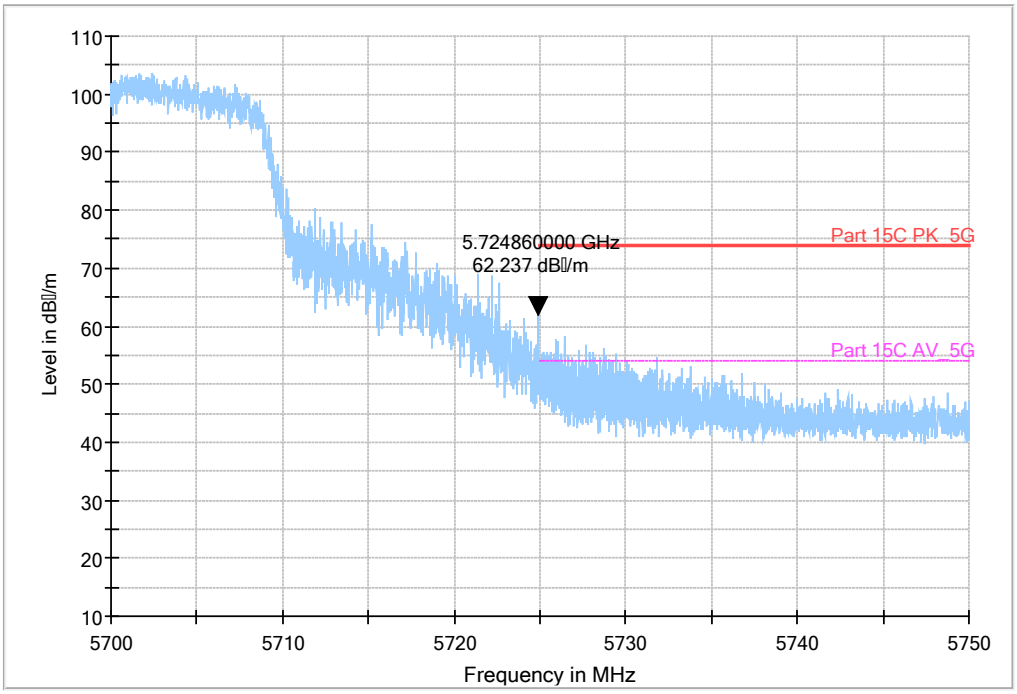


Peak

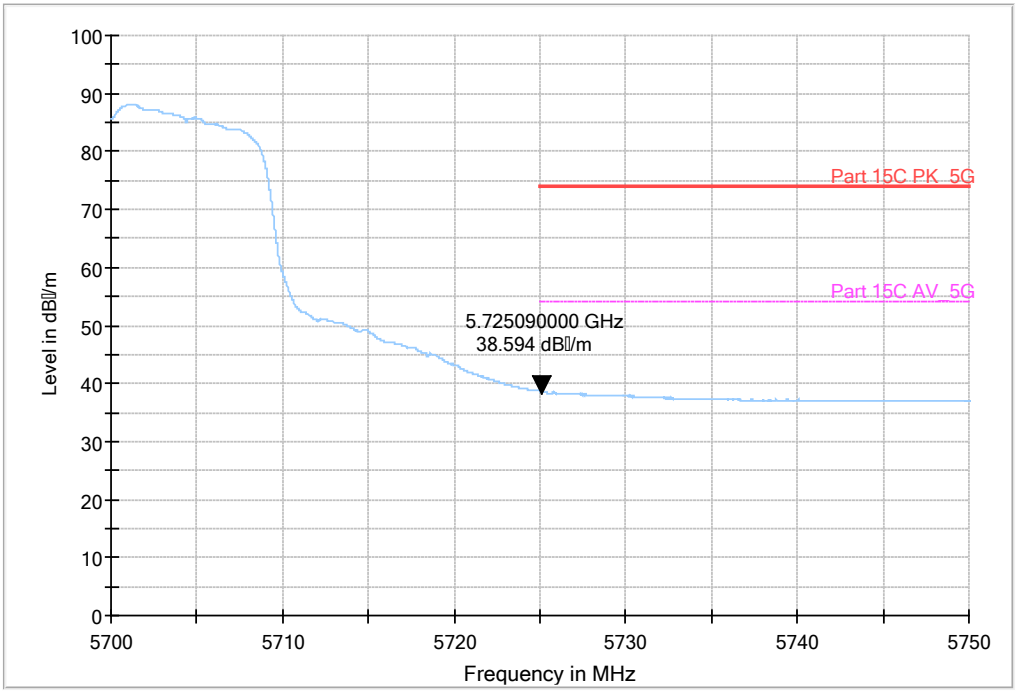


Average

Fig. 158 Band Edges (802.11ac-HT20, 5500MHz)

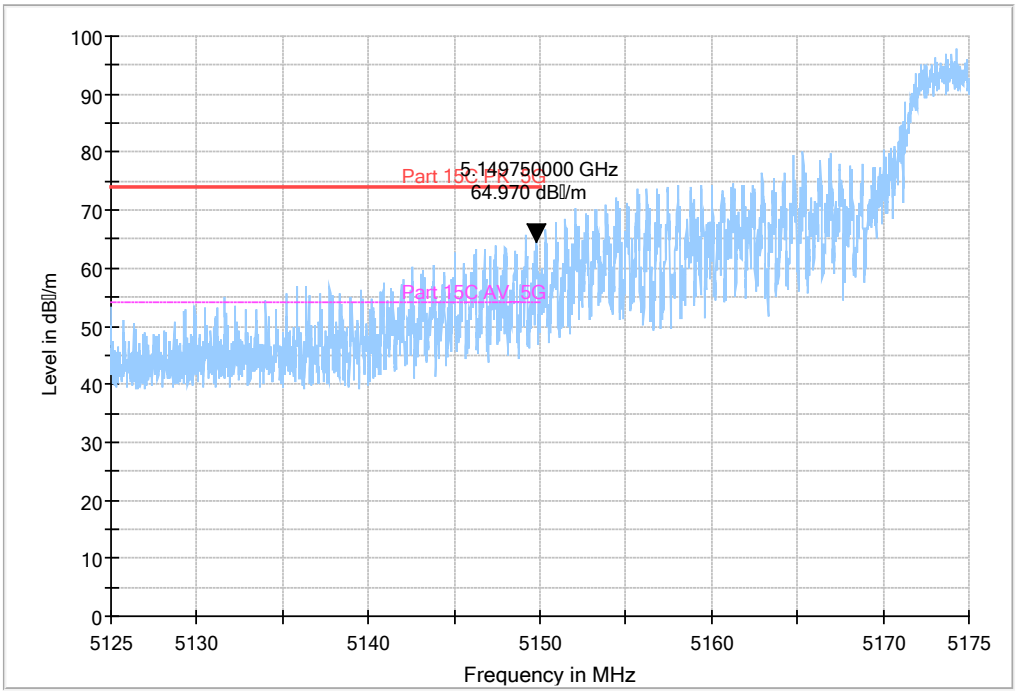


Peak

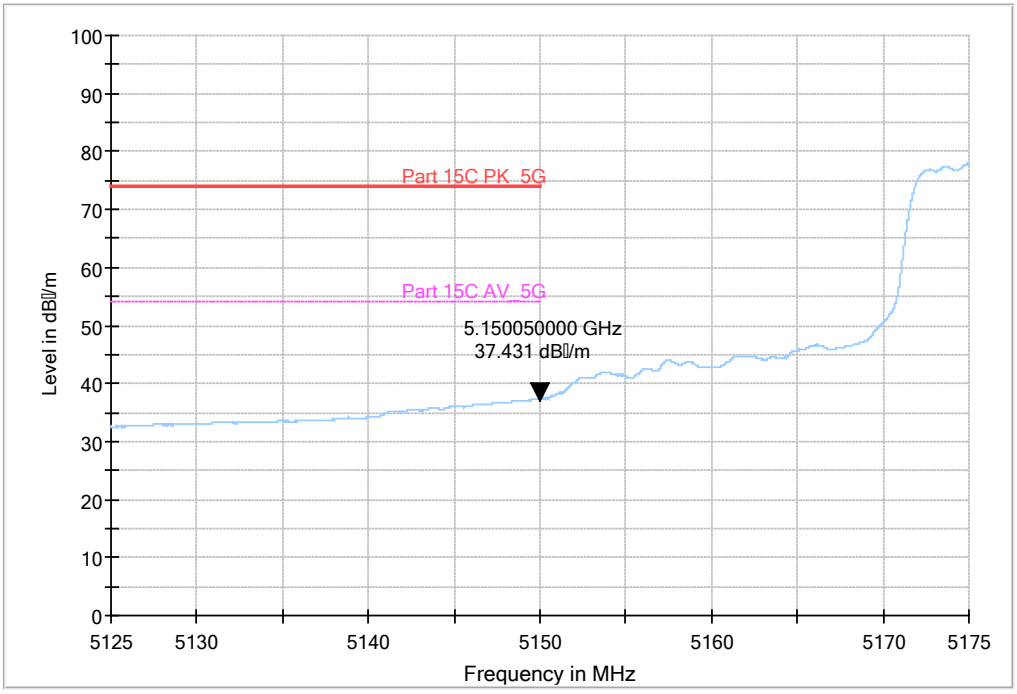


Average

Fig. 159 Band Edges (802.11ac-HT20, 5700MHz)

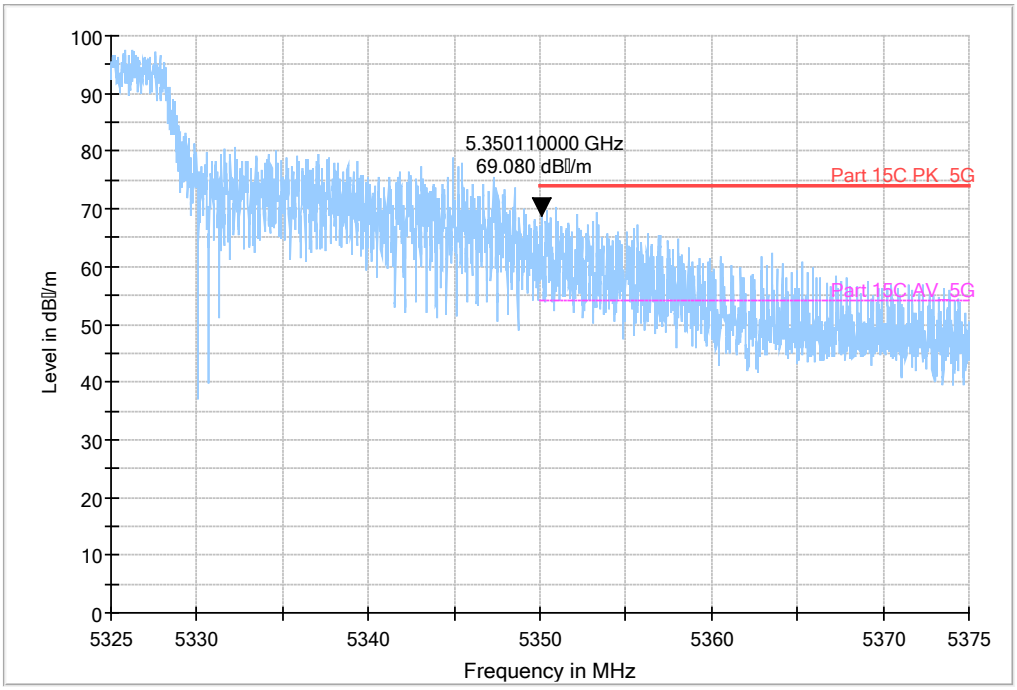


Peak

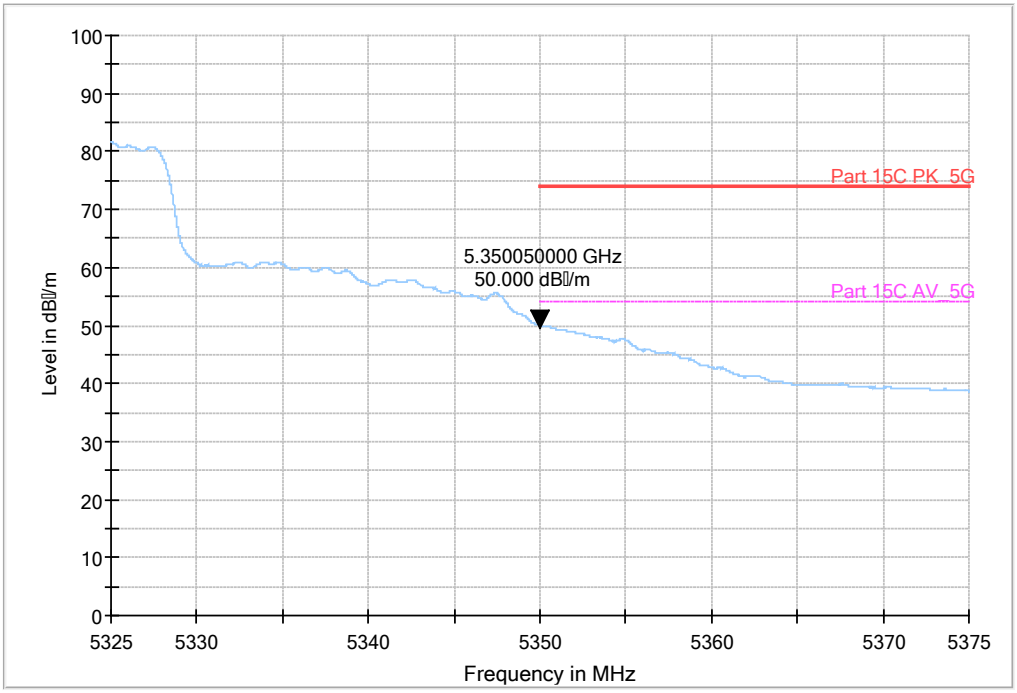


Average

Fig. 160 Band Edges (802.11ac-HT40, 5190MHz)

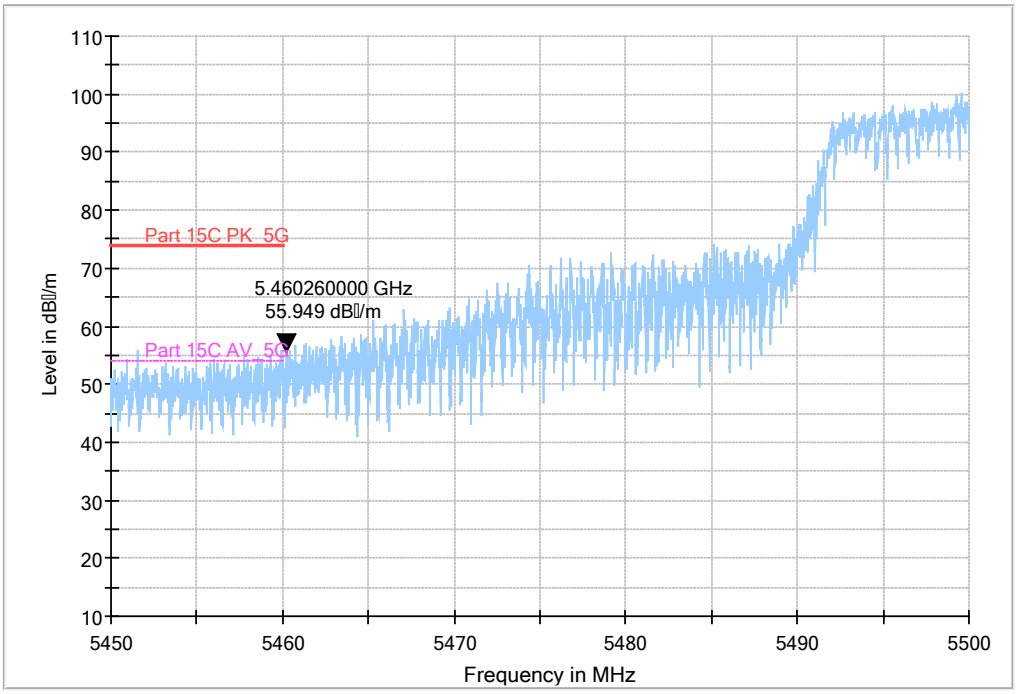


Peak

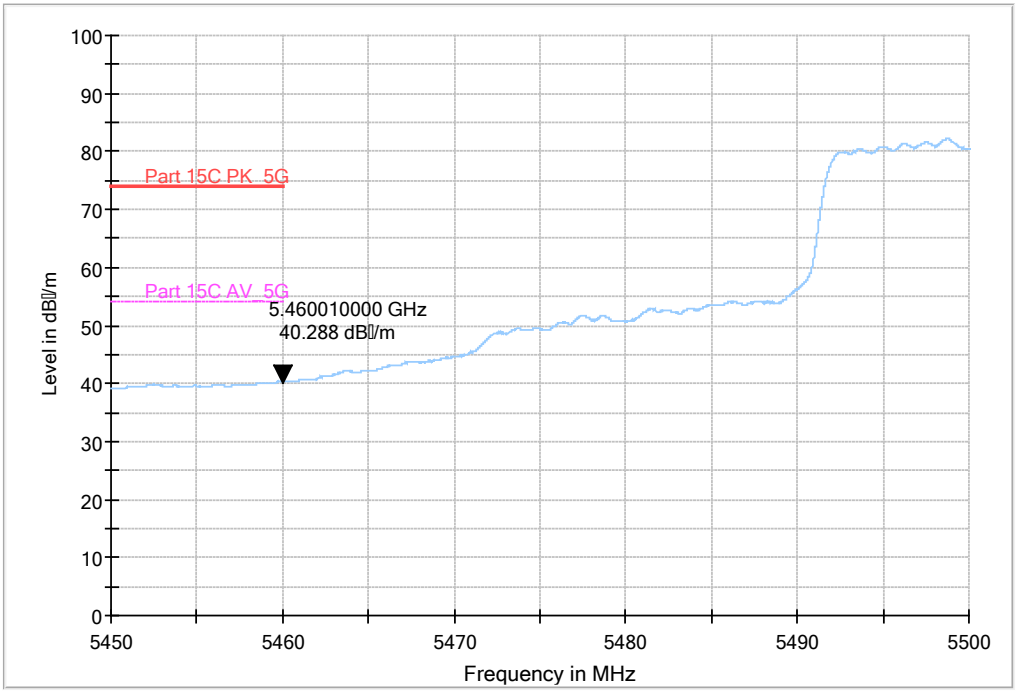


Average

Fig. 161 Band Edges (802.11ac-HT40, 5310MHz)

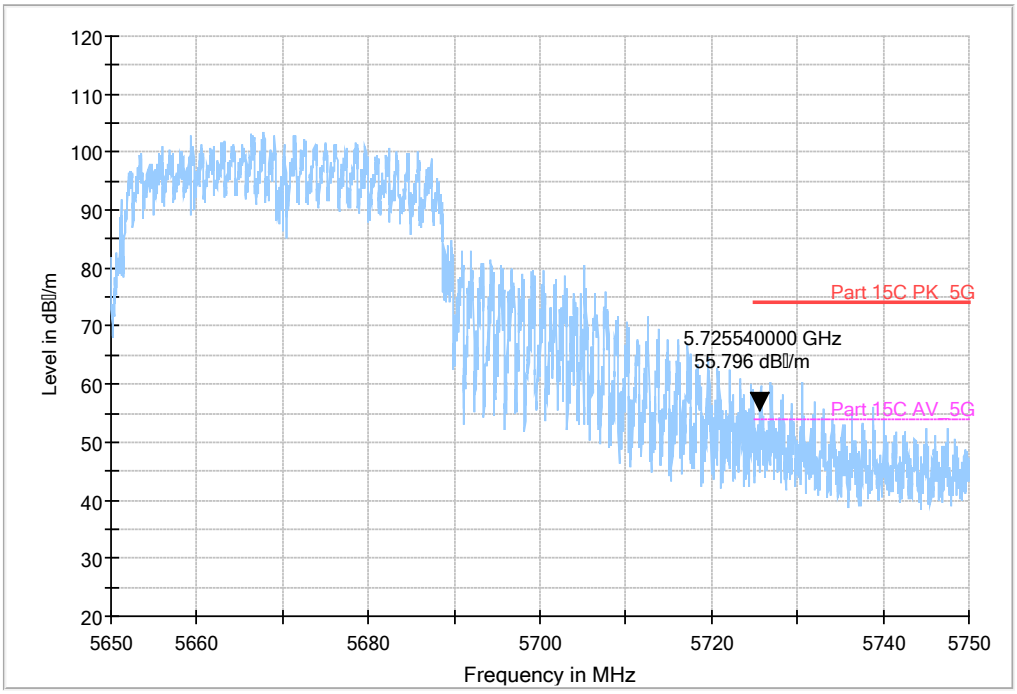


Peak

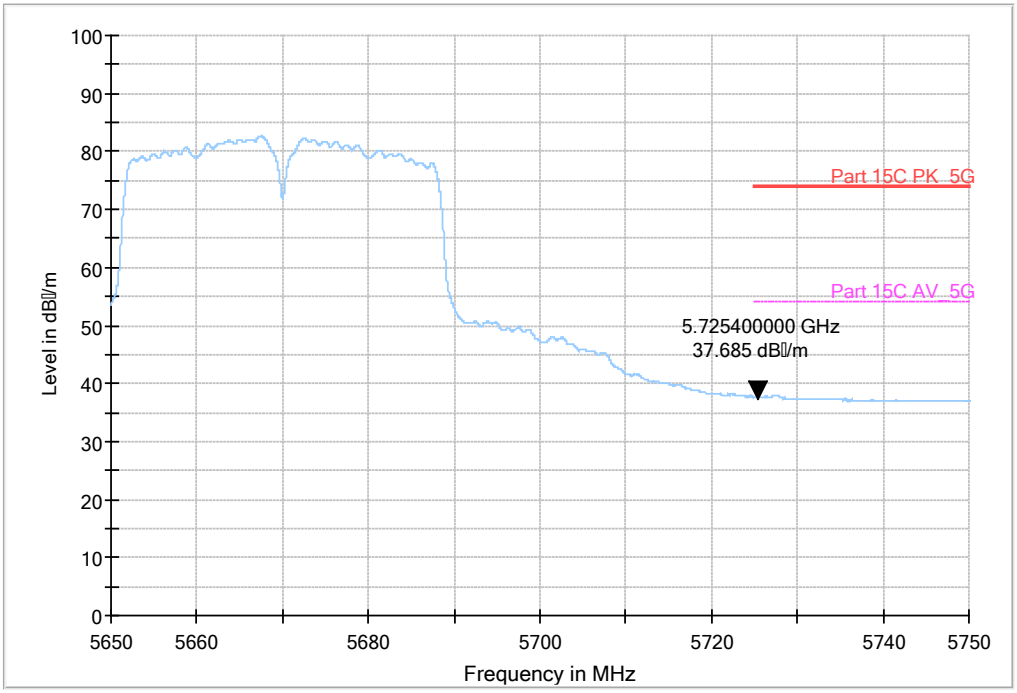


Average

Fig. 162 Band Edges (802.11ac-HT40, 5510MHz)



Peak



Average

Fig. 163 Band Edges (802.11ac-HT40, 5670MHz)

6.7. Transmitter Spurious Emission

Measurement Limit:

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

Method of Measurement:

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)).

The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna. The radiated emissions measurements were made in a typical installation configuration.

During the test, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turntable shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing.

Set the spectrum analyzer in the following:

Below 1GHz(detector: Peak and Quasi-Peak)

RBW=100kHz / VBW=300kHz / Sweep=AUTO

Above 1GHz(detector: Peak):

(a) PEAK: RBW=1MHz / VBW=3MHz / Sweep=AUTO

(b) AVERAGE: RBW=1MHz / VBW=3MHz / Sweep= AUTO

Limit in restricted band:

Frequency of emission (MHz)	Field strength(dBμV/m)	Measurement distance(m)
0.009-0.490	129-94	3
0.490-1.705	74-63	3
1.705-30	70	3
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

Modulation type and data rate tested (worse case):

Mode	Data rate	Channel

802.11a	6Mbps	140(5700MHz)
802.11n-HT20	MCS0	36(5180MHz)
802.11n-HT40	MCS0	38(5190MHz)
802.11ac-HT20	MCS0	36(5180MHz)
802.11ac-HT40	MCS0	38(5190MHz)

Measurement Results:

802.11a mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11a	140(5700MHz)	30 MHz ~ 1 GHz	Fig.164	P
		1 GHz ~ 8 GHz	Fig.165	P
		8 GHz ~ 18 GHz	Fig.166	P
		18 GHz ~ 26.5 GHz	Fig.167	P
		26.5 GHz ~ 40 GHz	Fig.168	P

802.11n-HT20 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n-HT20	36(5180MHz)	30 MHz ~ 1 GHz	Fig.169	P
		1 GHz ~ 8 GHz	Fig.170	P
		8 GHz ~ 18 GHz	Fig.171	P
		18 GHz ~ 26.5 GHz	Fig.172	P
		26.5 GHz ~ 40 GHz	Fig.173	P

802.11n-HT40 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n HT40	38(5190MHz)	30 MHz ~ 1 GHz	Fig.174	P
		1 GHz ~ 8 GHz	Fig.175	P
		8 GHz ~ 18 GHz	Fig.176	P
		18 GHz ~ 26.5 GHz	Fig.177	P
		26.5 GHz ~ 40 GHz	Fig.178	P

802.11ac-HT20 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11ac-HT20	36(5180MHz)	30 MHz ~ 1 GHz	Fig.179	P
		1 GHz ~ 8 GHz	Fig.180	P
		8 GHz ~ 18 GHz	Fig.181	P
		18 GHz ~ 26.5 GHz	Fig.182	P
		26.5 GHz ~ 40 GHz	Fig.183	P

802.11ac-HT40 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n HT40	38(5190MHz)	30 MHz ~ 1 GHz	Fig.184	P
		1 GHz ~ 8 GHz	Fig.185	P
		8 GHz ~ 18 GHz	Fig.186	P
		18 GHz ~ 26.5 GHz	Fig.187	P
		26.5GHz ~ 40 GHz	Fig.188	P

Radiated Spurious Emission (9kHz-30MHz)

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n HT40	134(5670MHz)	9kHz~30 MHz	Fig.189	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

Channel 140 (30MHz ~1GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
34.3	21.03	-22	43.03	V
37.0	14.87	-22	36.87	V
84.7	12.52	-26	38.52	V
190.4	10.13	-25	35.13	H
489.5	15.66	-17	32.66	V
837.7	21.99	-11	32.99	H

Channel 140 (1GHz ~ 8GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
6117.8	44.85	5	39.85	V
6403.8	45.65	6	39.65	V
6841.0	48.61	7	41.61	H
7193.4	46.95	7	39.95	H
7356.4	46.69	7	39.69	V
7707.8	47.37	8	39.37	H

Channel 140 (8GHz ~ 18GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
13827.8	53.62	19	34.62	V
15107.8	55.65	21	34.65	H
15557.2	54.11	21	33.11	V
16220.6	55.94	22	33.94	V
17101.2	65.74	24	41.74	H
17689.0	56.97	24	32.97	H

Channel 140 (8GHz ~ 18GHz)(Average)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity

15107.8	42.64	21	21.64	H
15557.2	42.64	21	21.64	V
16220.6	43.39	22	21.39	V
17101.2	48.6	24	24.6	H
17689.0	44.57	24	20.57	H

Channel 140 (18GHz ~ 26.5GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
19015.8	40.29	-5	45.29	V
20745.5	40.6	-4	44.6	H
21321.0	39.57	-4	43.57	V
22497.4	44.5	-3	47.5	H
23023.5	43.39	-3	46.39	H
24675.0	44.75	-2	46.75	H

Channel 140 (26.5GHz ~ 40GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
28006.6	44.77	0	44.77	H
30801.1	45.44	0	45.44	V
34002.0	46.03	1	45.03	V
35535.6	46.58	1	45.58	V
36912.6	45.7	2	43.7	H
39076.6	50.03	4	46.03	V

802.11n-HT20

Channel 36 (30MHz ~1GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
33.5	20.86	-22	42.86	V
34.4	20.61	-22	42.61	V
36.7	15.41	-22	37.41	V

72.9	14.08	-26	40.08	V
197.0	8.61	-25	33.61	V
776.8	20.77	-12	32.77	H

Channel 36 (1GHz ~ 8GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
5417.6	47.55	4	43.55	V
5634.6	45.89	5	40.89	V
6376.8	45.63	6	39.63	V
6617.4	46.48	6	40.48	H
7020.6	46.62	7	39.62	H
7832.2	48.1	8	40.1	H

Channel 36 (8GHz ~ 18GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
8286.4	47.38	9	38.38	V
13741.0	53.72	19	34.72	H
14917.4	54.09	20	34.09	H
15769.4	55.07	22	33.07	H
16754.8	55.47	23	32.47	V
17459.6	56.89	24	32.89	H

Channel 36 (8GHz ~ 18GHz)(Average)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
14917.4	41.91	20	21.91	H
15769.4	43.18	22	21.18	H
16754.8	43.68	23	20.68	V
17459.6	44.62	24	20.62	H

Channel 36 (18GHz ~ 26.5GHz)

Frequency	Result	ARpl (dB)	PMea	Polarity

(MHz)	(dBμV/m)		(dBμV/m)	
19043.0	40.36	-5	45.36	H
19792.6	40.99	-5	45.99	V
21014.1	41.4	-4	45.4	H
22577.2	43.67	-3	46.67	H
24652.1	45.12	-2	47.12	V
26061.4	46.6	-2	48.6	V

Channel 36 (26.5GHz ~ 40GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
27886.4	42.87	0	42.87	H
30037.0	43.17	-1	44.17	H
31283.0	45.74	0	45.74	V
34434.0	46.63	1	45.63	V
36805.9	45.69	2	43.69	H
38944.3	49.99	4	45.99	H

802.11n-HT40

Channel 38(30MHz ~ 1GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
33.9	13.05	-22	35.05	V
34.3	13.46	-22	35.46	V
35.1	11.55	-22	33.55	V
37.2	11.33	-21	32.33	V
72.2	6.75	-26	32.75	V
220.9	15.29	-24	39.29	V

Channel 38 (1GHz ~ 8GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
5645.4	46.11	5	41.11	H

6290.2	45.55	6	39.55	H
6644.0	47	6	41	H
7097.4	47.73	7	40.73	V
7456.6	48.26	7	41.26	H
7759.0	47.81	8	39.81	H

Channel 38 (8GHz ~ 18GHz)(Peak)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
8303.0	48.52	9	39.52	V
15675.2	55.32	22	33.32	V
16112.6	55.89	22	33.89	V
16454.8	54.68	23	31.68	V
17024.4	57.08	24	33.08	V
17790.8	57.01	24	33.01	V

Channel 38 (8GHz ~ 18GHz)(Average)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
15675.2	43.4	22	21.4	V
16112.6	44.06	22	22.06	V
16454.8	43.02	23	20.02	V
17024.4	44.81	24	20.81	V
17790.8	44.25	24	20.25	V

Channel 38 (18GHz ~ 26.5GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
18615.4	39.57	-6	45.57	H
19999.2	38.81	-5	43.81	V
21401.7	42.41	-4	46.41	H
22376.6	43.89	-3	46.89	H
23363.5	44.91	-3	47.91	H

24912.2	44.53	-2	46.53	H

Channel 38 (26.5GHz ~ 40GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
28311.7	44.21	-1	45.21	H
30166.6	43.67	-1	44.67	V
31324.9	44.8	0	44.8	H
34405.6	46.3	1	45.3	H
36594.0	46.17	2	44.17	V
38898.4	50.2	4	46.2	H

802.11ac-HT20

Channel 36(30MHz ~ 1GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
34.5	20.02	-22	42.02	V
36.0	15.68	-22	37.68	V
54.4	11.69	-21	32.69	V
74.3	14.15	-26	40.15	V
165.1	9.84	-27	36.84	H
661.6	19.07	-14	33.07	V

Channel 36(1GHz ~ 8GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
5761.0	45.94	5	40.94	V
6323.4	46.4	6	40.4	H
6590.6	46.6	6	40.6	V
7191.4	47.67	7	40.67	H
7705.6	47.03	8	39.03	V
7888.6	48.41	9	39.41	H

Channel 36(8GHz ~ 18GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
8286.4	47.38	9	38.38	V
13741.0	53.72	19	34.72	H
14917.4	54.09	20	34.09	H
15769.4	55.07	22	33.07	H
16754.8	55.47	23	32.47	V
17459.6	56.89	24	32.89	H

Channel 36(8GHz ~ 18GHz) (Average)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
14917.4	41.91	20	21.91	H
15769.4	43.18	22	21.18	H
16754.8	43.68	23	20.68	V
17459.6	44.62	24	20.62	H

Channel 36(18GHz ~ 26.5GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
18998.8	39.51	-5	44.51	H
20648.6	42.15	-4	46.15	V
21744.2	44.08	-3	47.08	H
23499.5	44.6	-3	47.6	V
24896.9	45.5	-2	47.5	V
25973.0	48.09	-2	50.09	H

Channel 36(26.5GHz ~ 40GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
27856.8	44.43	0	44.43	V
29575.3	43.85	-1	44.85	V
30779.5	45.41	0	45.41	H
32179.4	45.66	0	45.66	H

35613.8	47.39	1	46.39	V
36943.6	47.98	2	45.98	V

802.11ac-HT40

Channel 38(30MHz ~ 1GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
33.7	10.89	-22	32.89	V
34.0	11.36	-22	33.36	V
93.0	7.63	-25	32.63	V
158.8	5.59	-27	32.59	H
162.5	5.86	-27	32.86	H
292.5	11.18	-22	33.18	H

Channel 38 (1GHz ~ 8GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
6072.8	45.51	5	40.51	V
6635.8	48.02	6	42.02	H
6951.8	45.91	7	38.91	V
7124.4	46.74	7	39.74	V
7442.4	46.86	7	39.86	V
7750.8	48.33	8	40.33	H

Channel 38 (8GHz ~ 18GHz)(Peak)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
6072.8	45.51	5	40.51	V
6635.8	48.02	6	42.02	H
6951.8	45.91	7	38.91	V
7124.4	46.74	7	39.74	V
7442.4	46.86	7	39.86	V
7750.8	48.33	8	40.33	H

Channel 38 (8GHz ~ 18GHz)(Average)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
15727.2	43.27	22	21.27	V
15851.0	43.29	22	21.29	H
16186.2	43.52	22	21.52	V
17161.0	44.51	24	20.51	H

Channel 38 (18GHz ~ 26.5GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
19217.2	40.58	-6	46.58	V
20363.0	41.66	-5	46.66	V
21279.3	44.55	-4	48.55	V
23034.6	45.86	-3	48.86	H
23304.0	44.48	-3	47.48	H
26064.8	47.25	-2	49.25	H

Channel 38 (26.5GHz ~ 40GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
27852.7	45.6	0	45.6	H
30825.4	45.22	0	45.22	V
32233.4	45.58	0	45.58	H
34421.8	46.62	1	45.62	H
36899.0	47.77	2	45.77	H
38857.9	50.73	4	46.73	H

Test graphs as below:

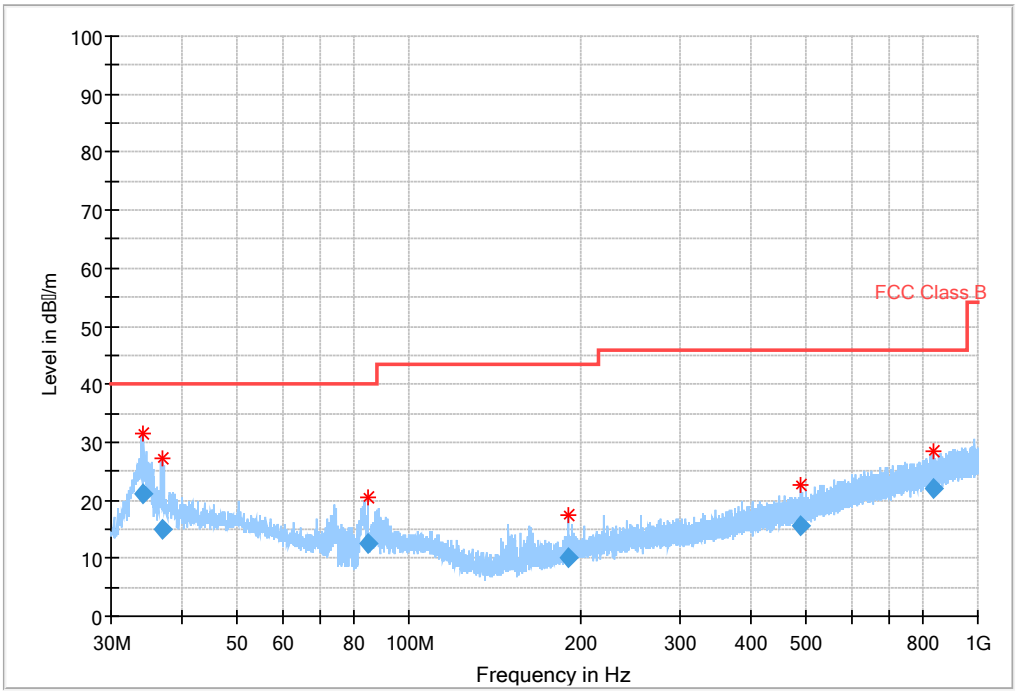


Fig. 164 Radiated Spurious Emission (802.11a, ch140, 30 MHz-1 GHz)

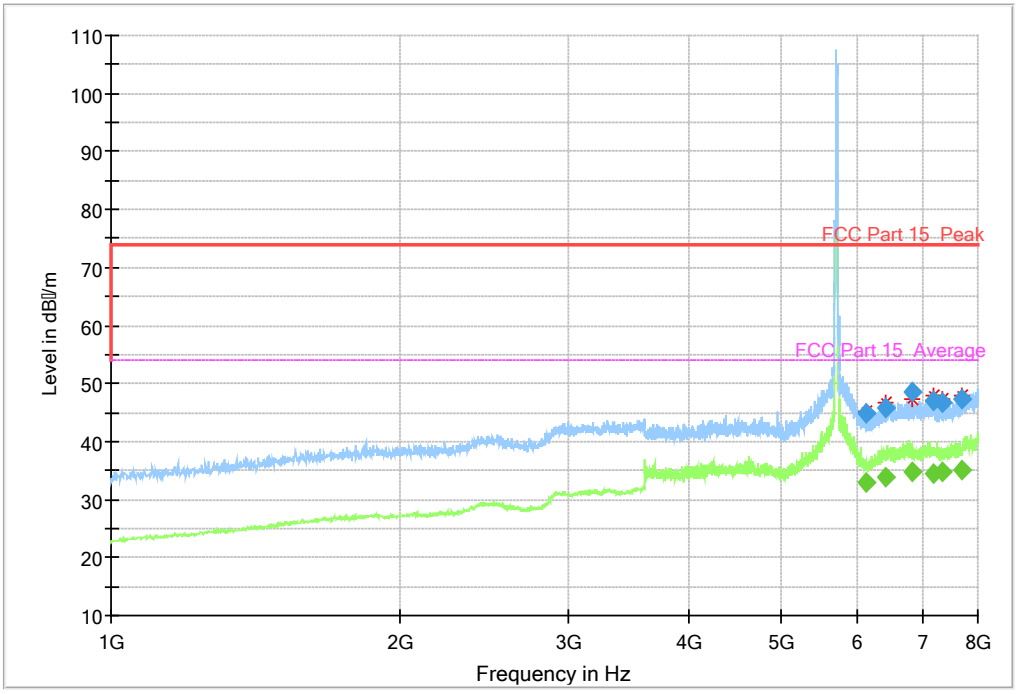


Fig. 165 Radiated Spurious Emission (802.11a, ch140, 1 GHz-8 GHz)

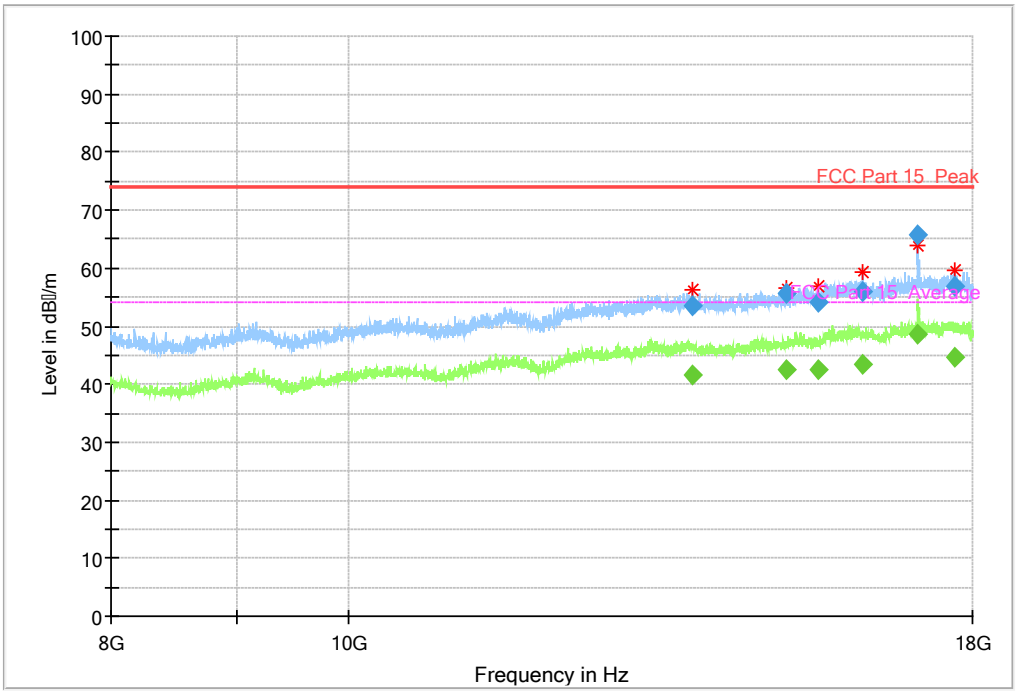


Fig. 166 Radiated Spurious Emission (802.11a, ch140, 8 GHz-18 GHz)

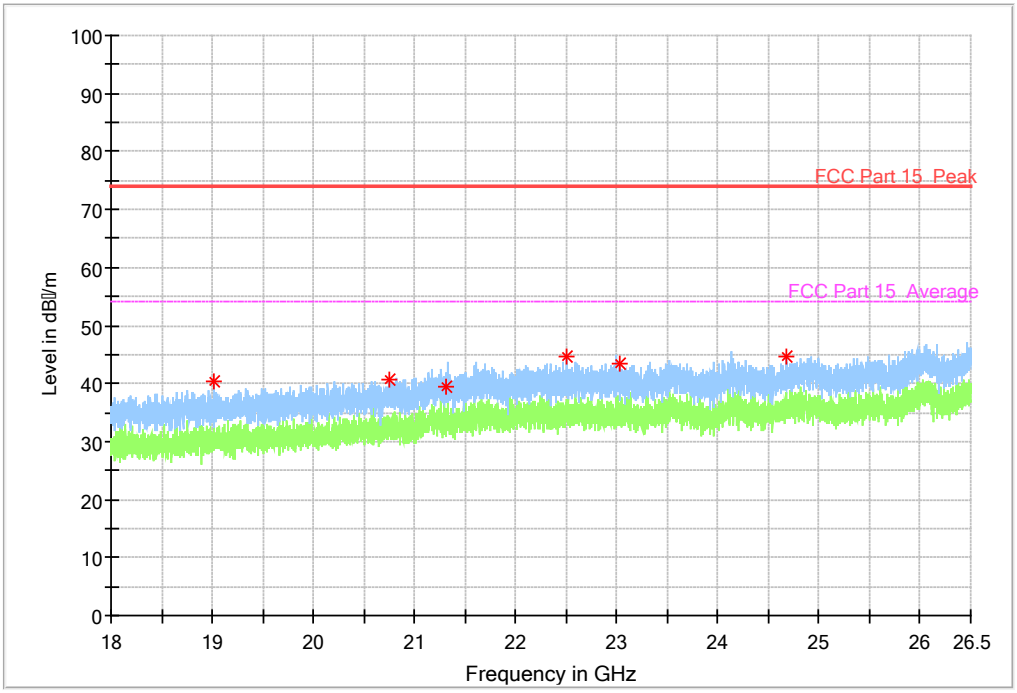


Fig. 167 Radiated Spurious Emission (802.11a, ch140, 18 GHz-26.5 GHz)

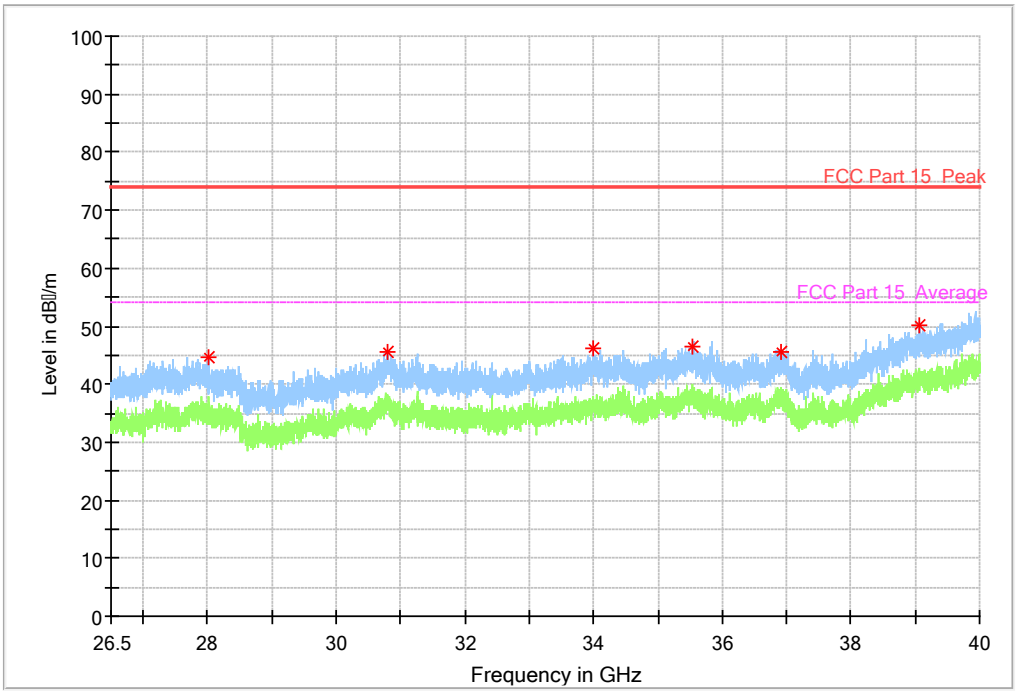


Fig. 168 Radiated Spurious Emission (802.11a, ch140, 26.5 GHz-40 GHz)

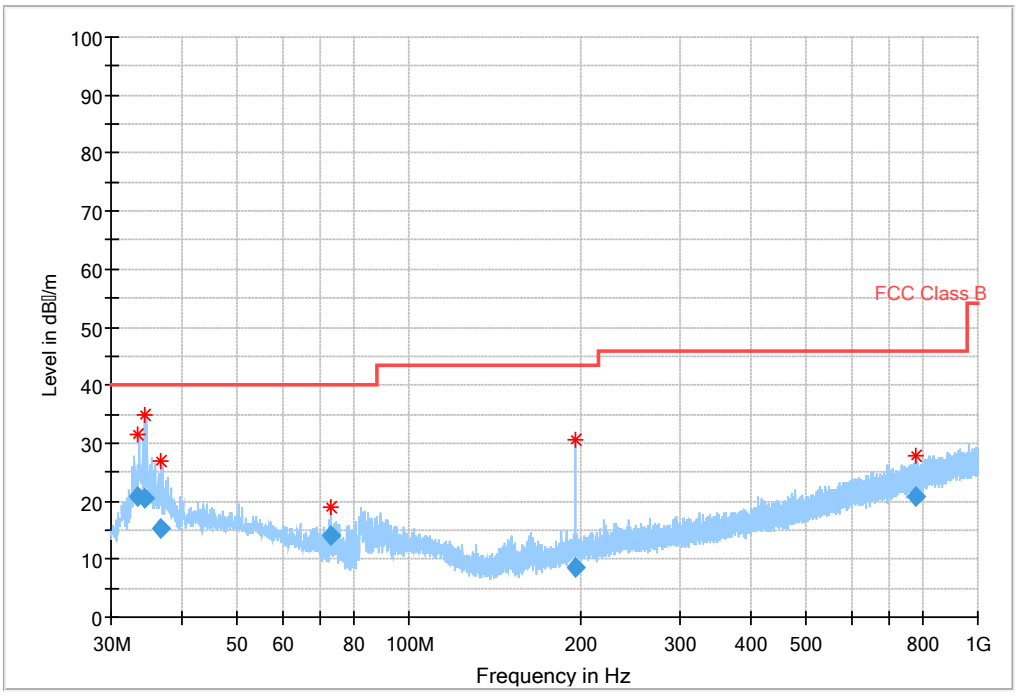


Fig. 169 Radiated Spurious Emission (802.11n-HT20, ch36, 30 MHz-1 GHz)

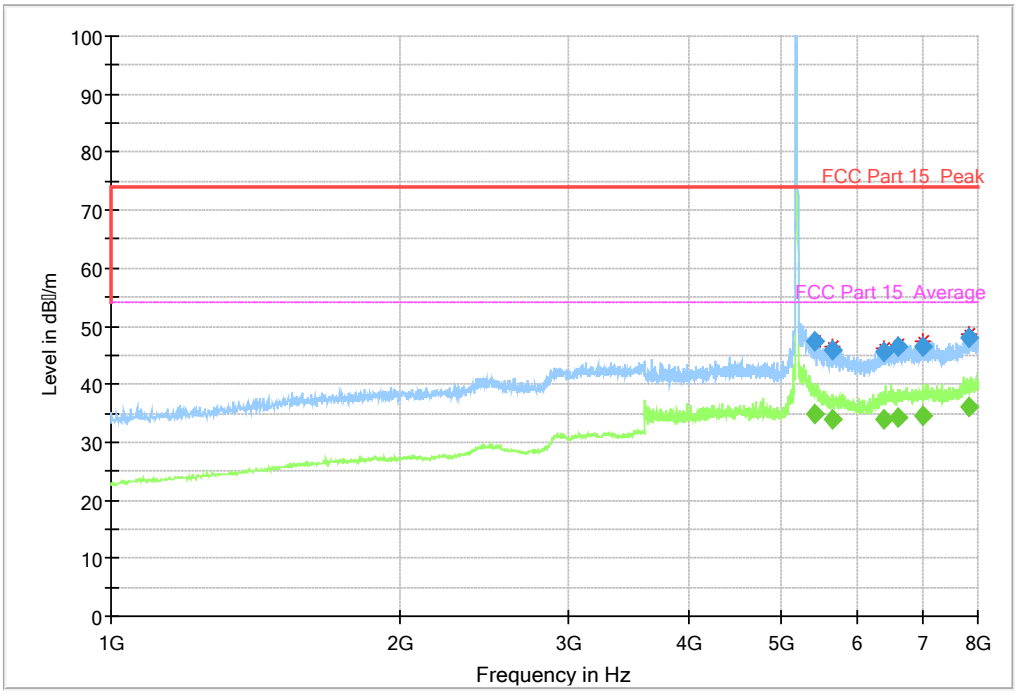


Fig. 170 Radiated Spurious Emission (802.11n-HT20, ch36, 1 GHz-8 GHz)

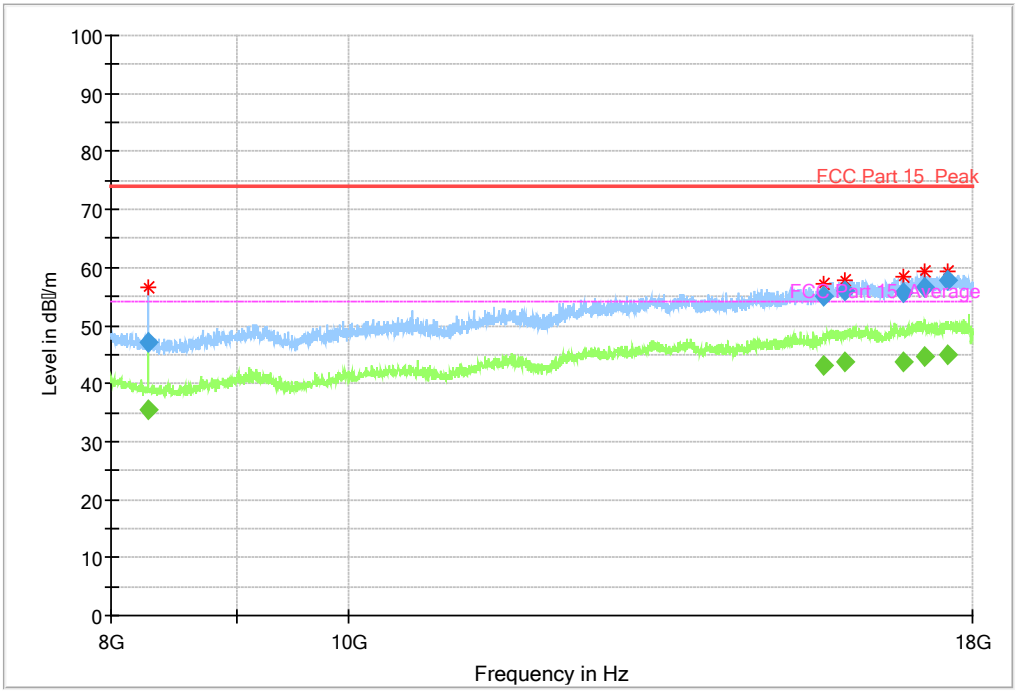


Fig. 171 Radiated Spurious Emission (802.11n-HT20, ch36, 8 GHz-18 GHz)

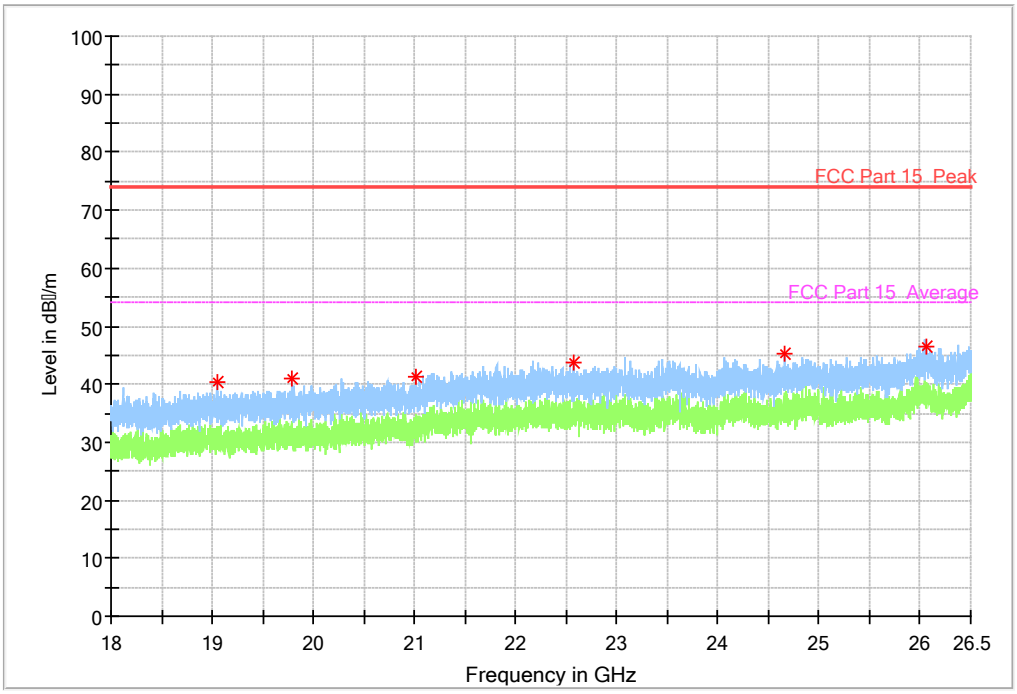


Fig. 172 Radiated Spurious Emission (802.11n-HT20, ch36, 18 GHz-26.5 GHz)

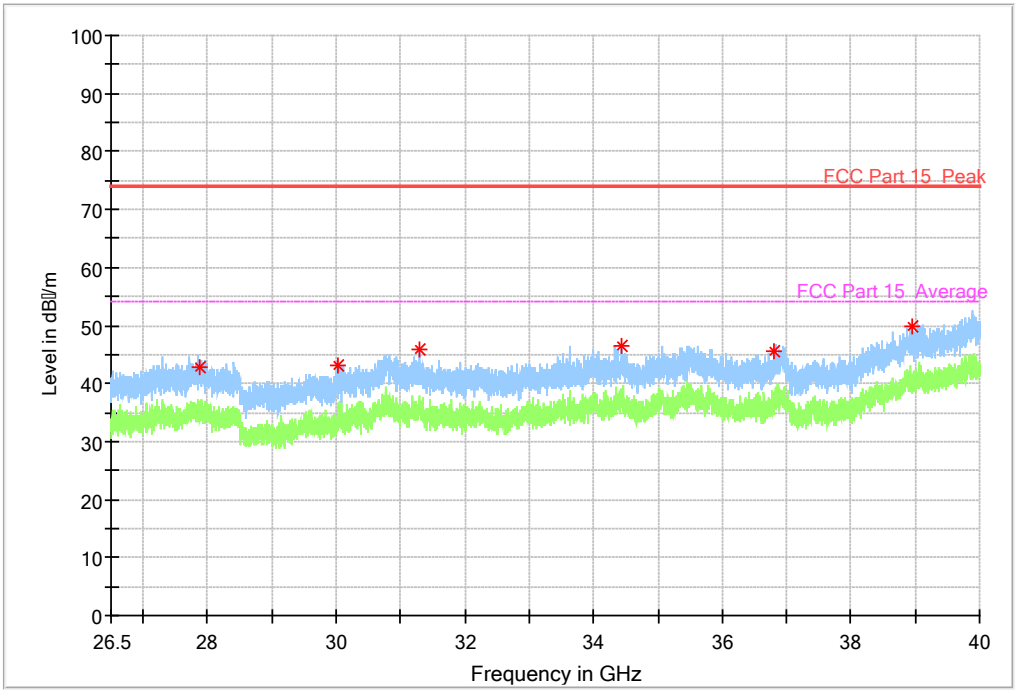


Fig. 173 Radiated Spurious Emission (802.11n-HT20, ch36, 26.5 GHz-40 GHz)

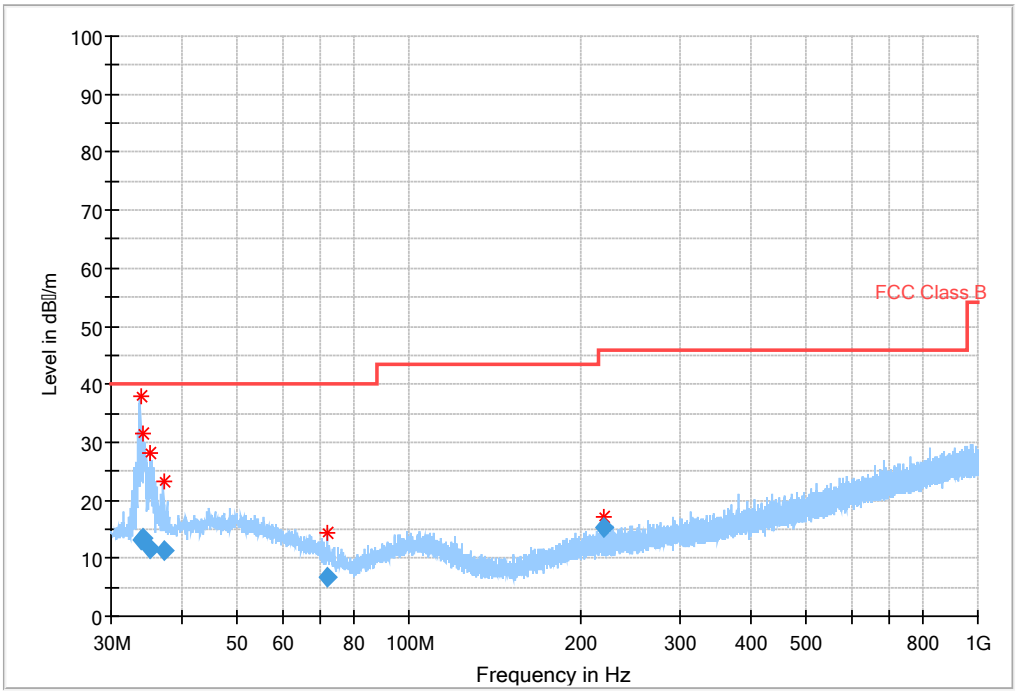


Fig. 174 Radiated Spurious Emission (802.11n-HT40, ch38, 30 MHz-1 GHz)

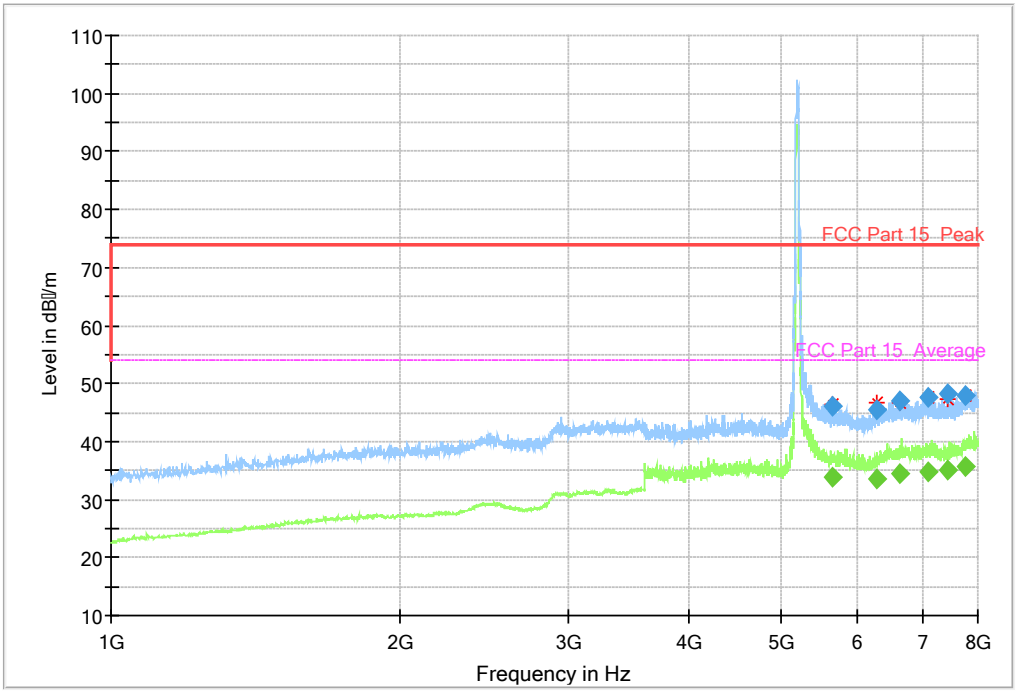


Fig. 175 Radiated Spurious Emission (802.11n-HT40, ch38, 1 GHz-8 GHz)

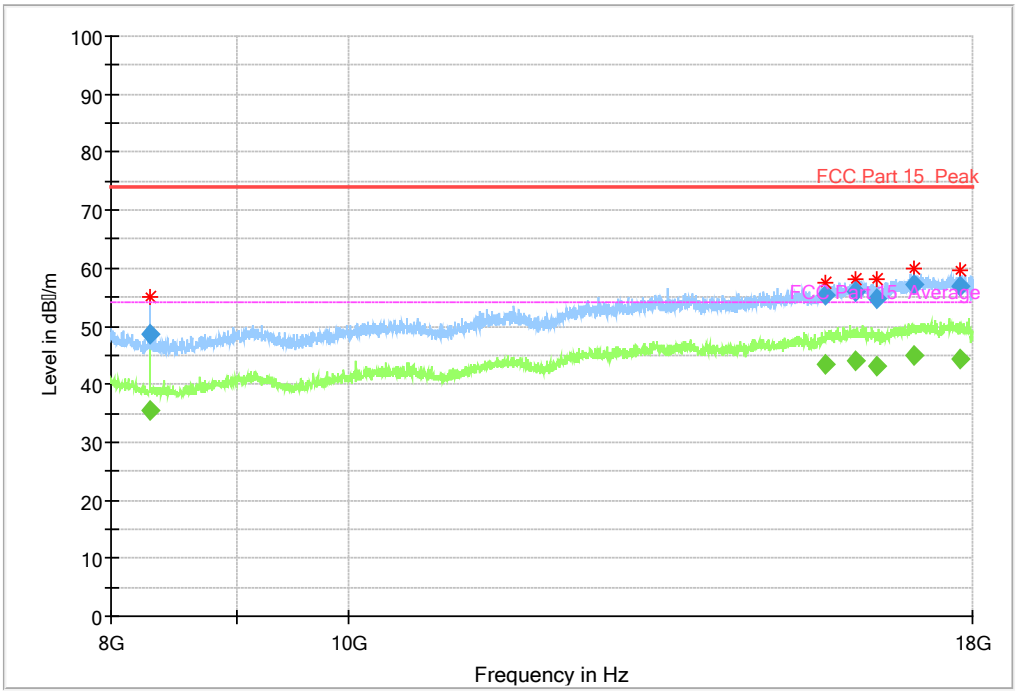


Fig. 176 Radiated Spurious Emission (802.11n-HT40, ch38, 8 GHz-18 GHz)

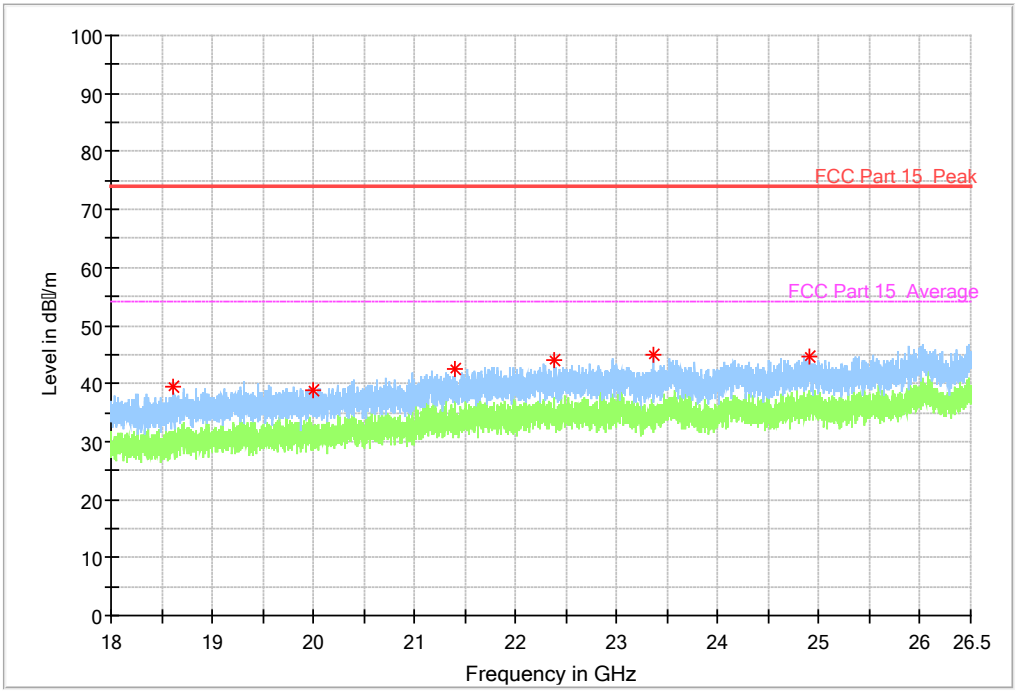


Fig. 177 Radiated Spurious Emission (802.11n-HT40, ch38, 18 GHz-26.5 GHz)

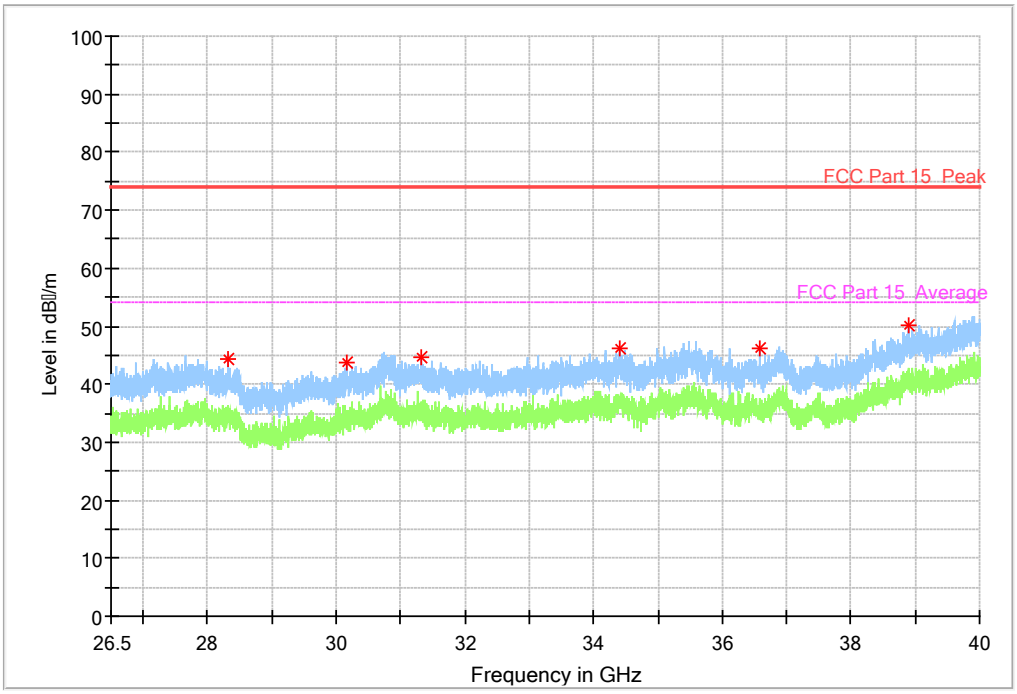


Fig. 178 Radiated Spurious Emission (802.11n-HT40, ch38, 26.5 GHz-40 GHz)

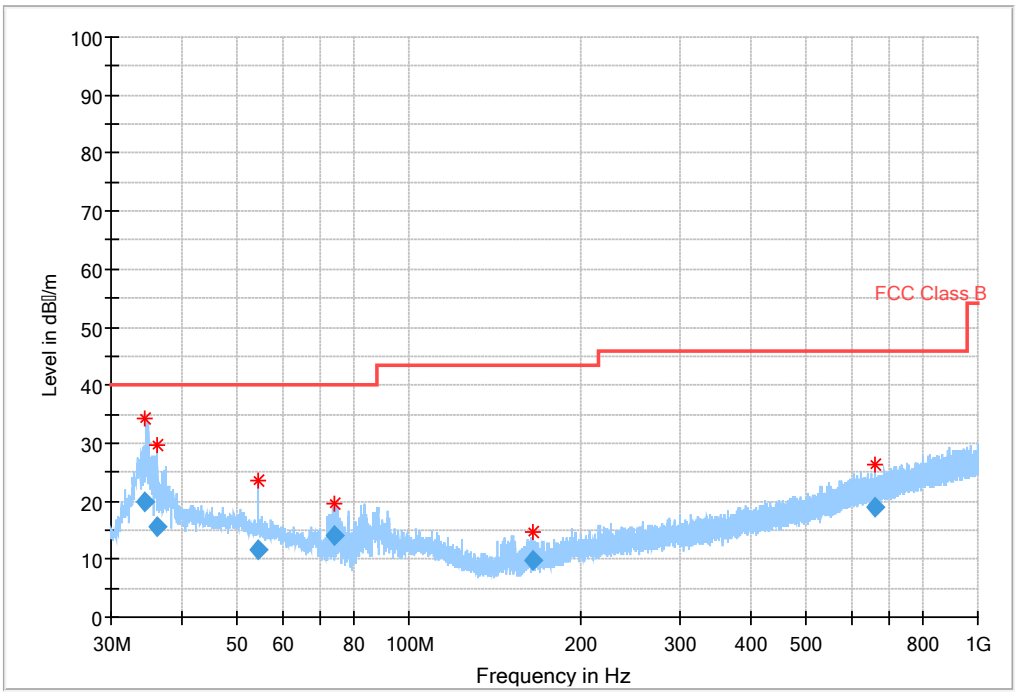


Fig. 179 Radiated Spurious Emission (802.11ac-HT20, ch36, 30 MHz-1 GHz)

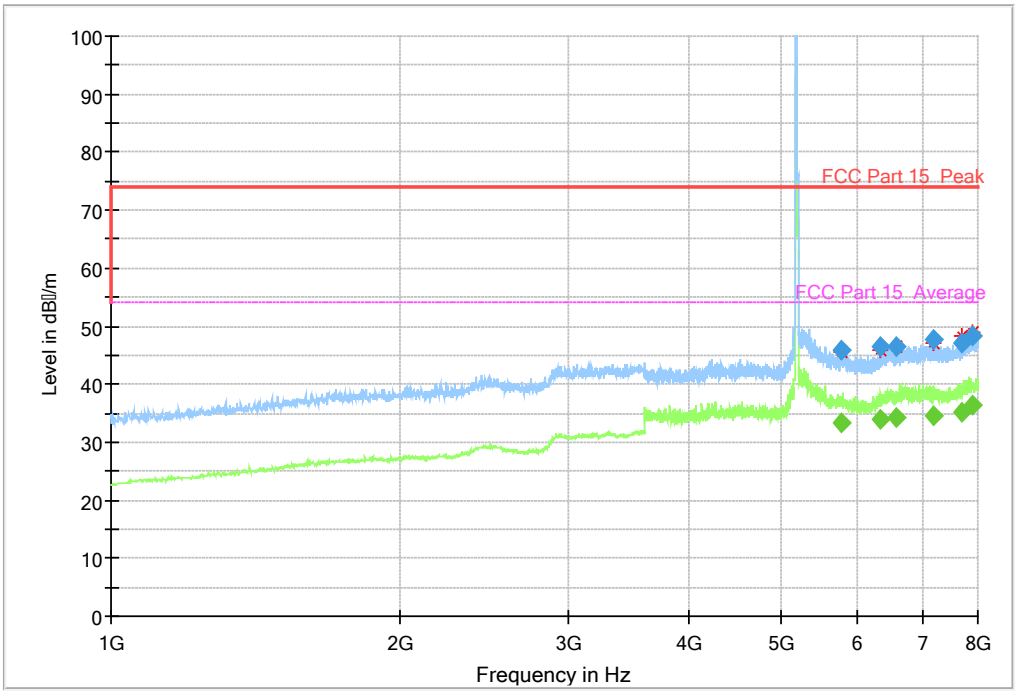


Fig. 180 Radiated Spurious Emission (802.11ac-HT20, ch36, 1 GHz-8 GHz)

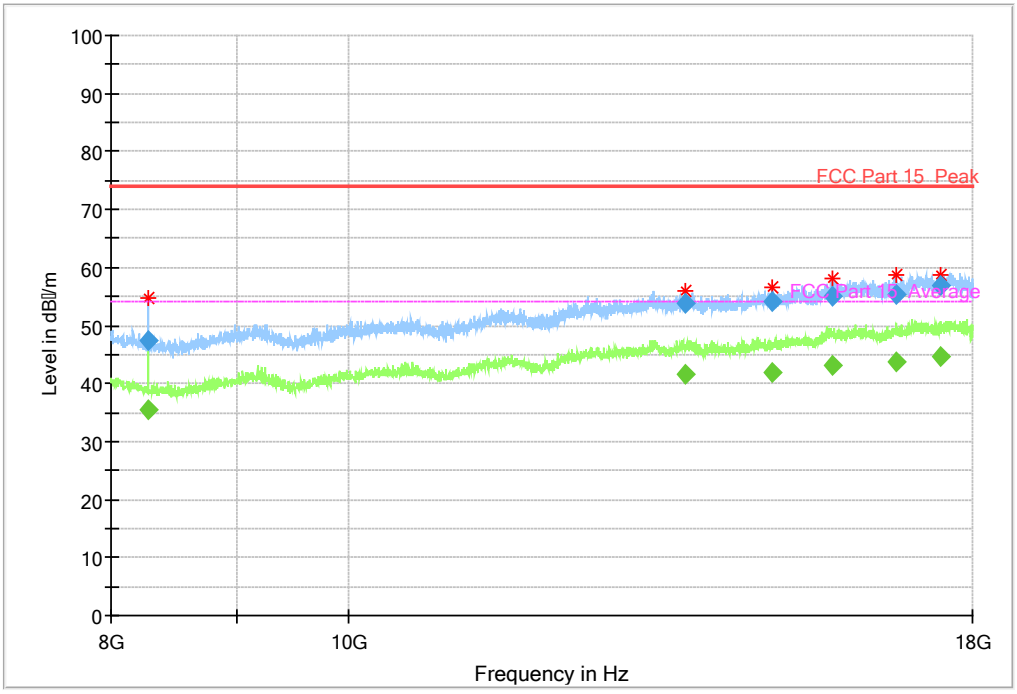


Fig. 181 Radiated Spurious Emission (802.11ac-HT20, ch36, 8 GHz-18 GHz)

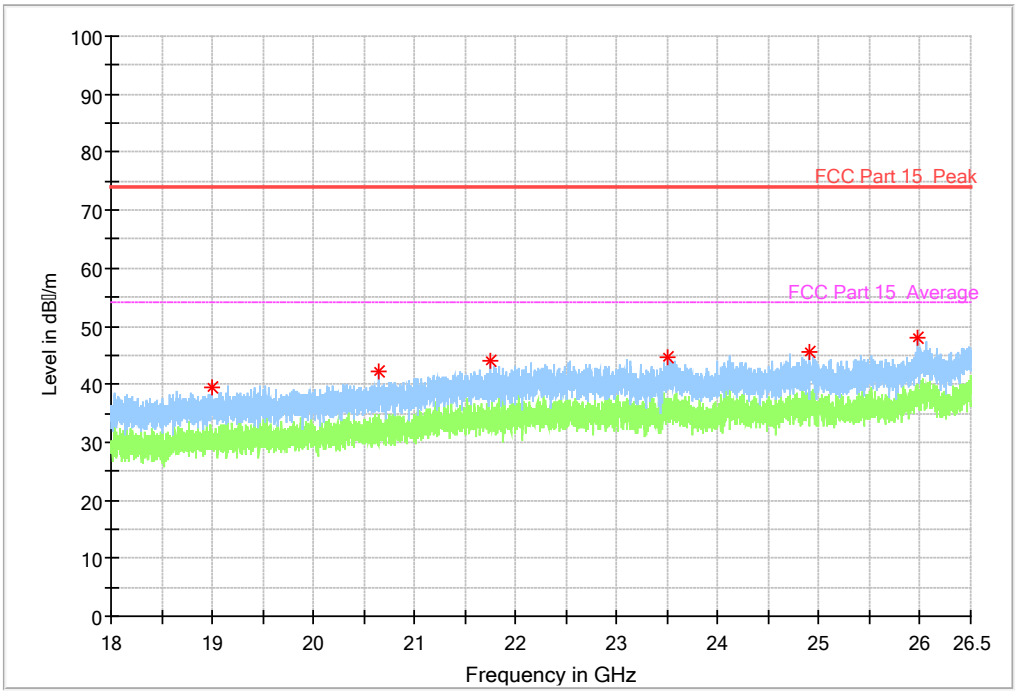


Fig. 182 Radiated Spurious Emission (802.11ac-HT20, ch36, 18 GHz-26.5 GHz)

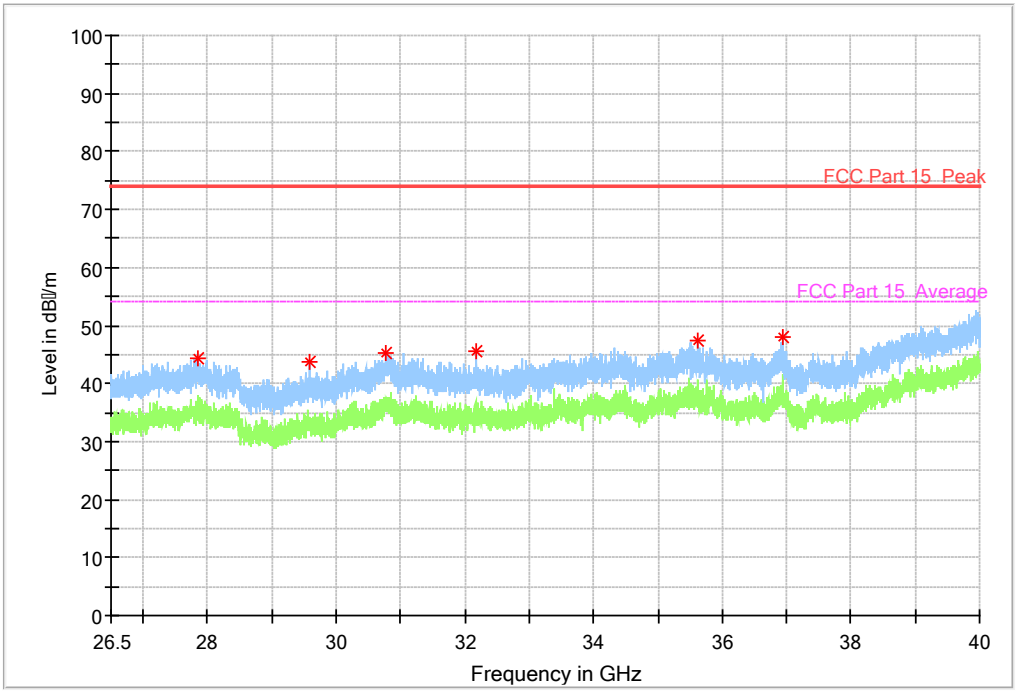


Fig. 183 Radiated Spurious Emission (802.11ac-HT20, ch36, 26.5 GHz-40 GHz)

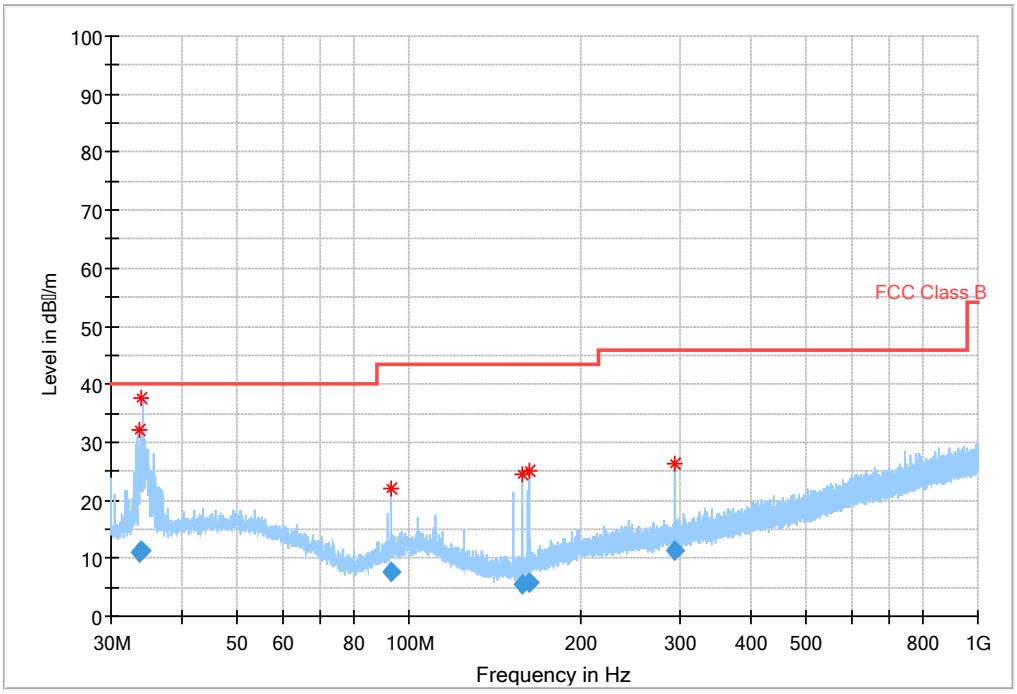


Fig. 184 Radiated Spurious Emission (802.11ac-HT40, ch38, 30 MHz-1 GHz)

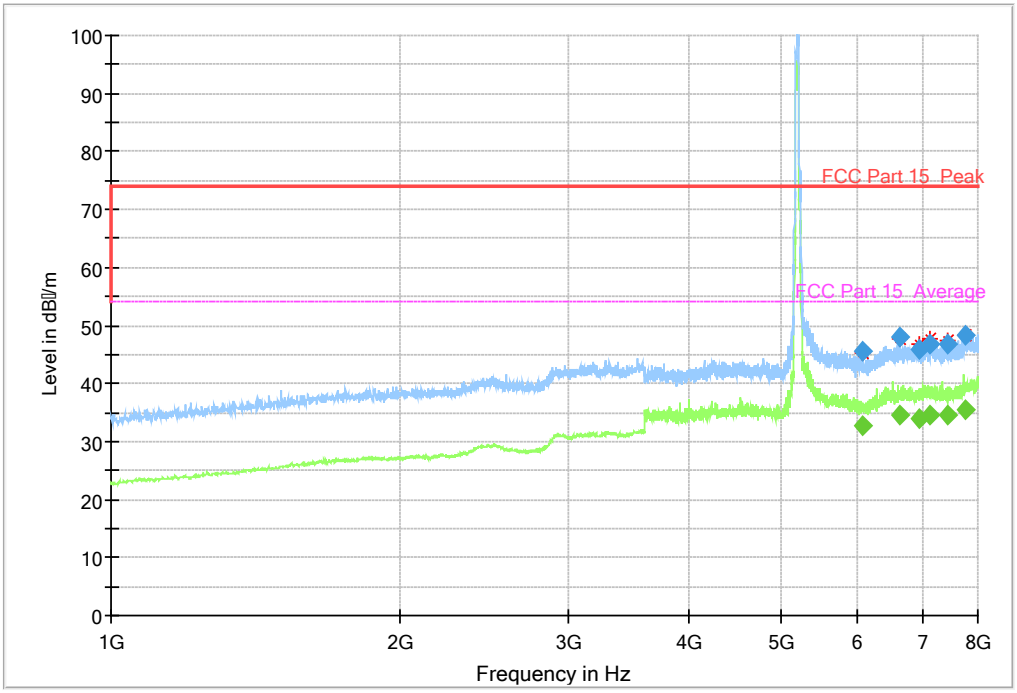


Fig. 185 Radiated Spurious Emission (802.11ac-HT40, ch38, 1 GHz-8 GHz)

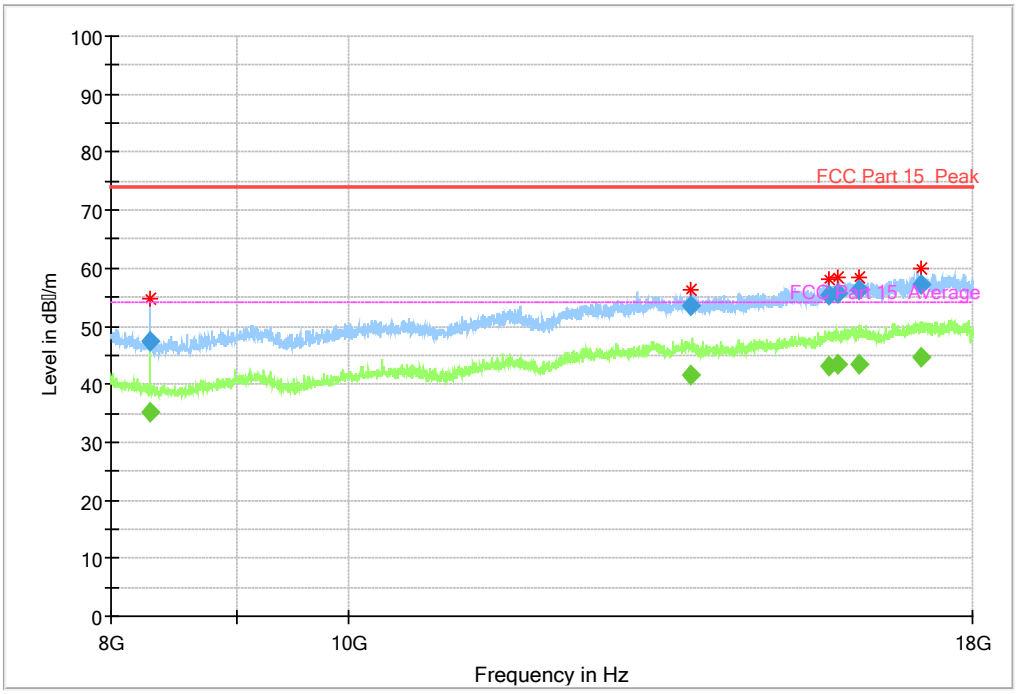


Fig. 186 Radiated Spurious Emission (802.11ac-HT40, ch38, 8 GHz-18 GHz)

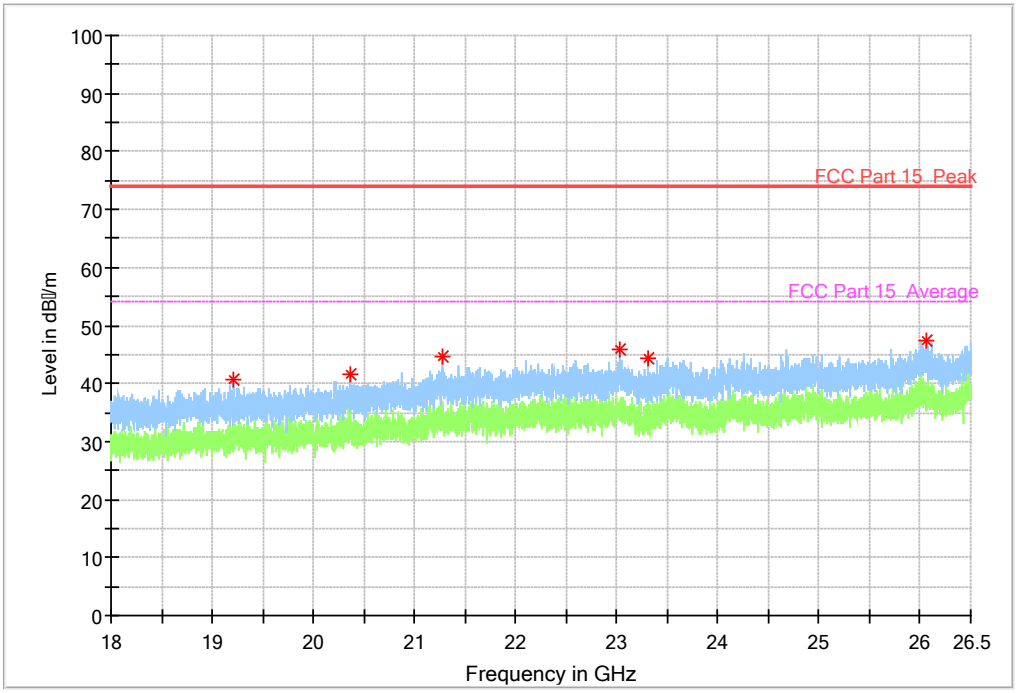


Fig. 187 Radiated Spurious Emission (802.11ac-HT40, ch38, 18 GHz-26.5 GHz)

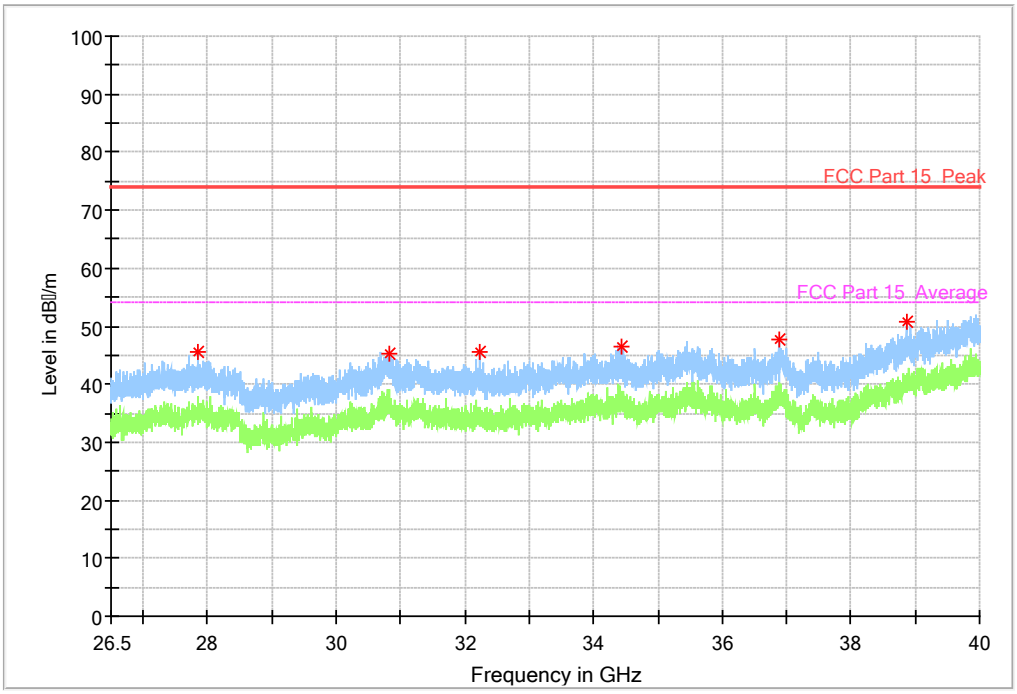


Fig. 188 Radiated Spurious Emission (802.11ac-HT40, ch38, 26.5 GHz-40 GHz)

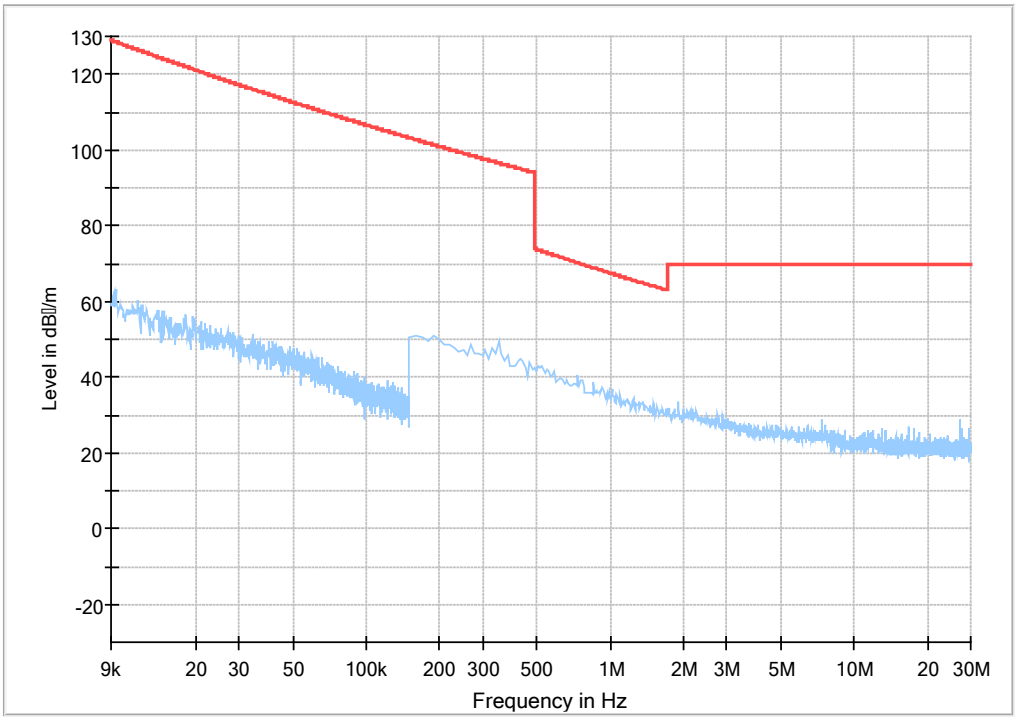


Fig. 189 Radiated Spurious Emission (9kHz-30MHz)

6.8. Conducted Emission (150kHz- 30MHz)

Test Condition:

Voltage（V）	Frequency（Hz）
120	60

Measurement Result and limit:

WLAN (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		With charger		
		11a mode	Idle	
0.15 to 0.5	66 to 56	Fig.190		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		
		11a mode	Idle	
0.15 to 0.5	56 to 46	Fig.190		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.				

Conclusion: PASS

Test graphs as below:

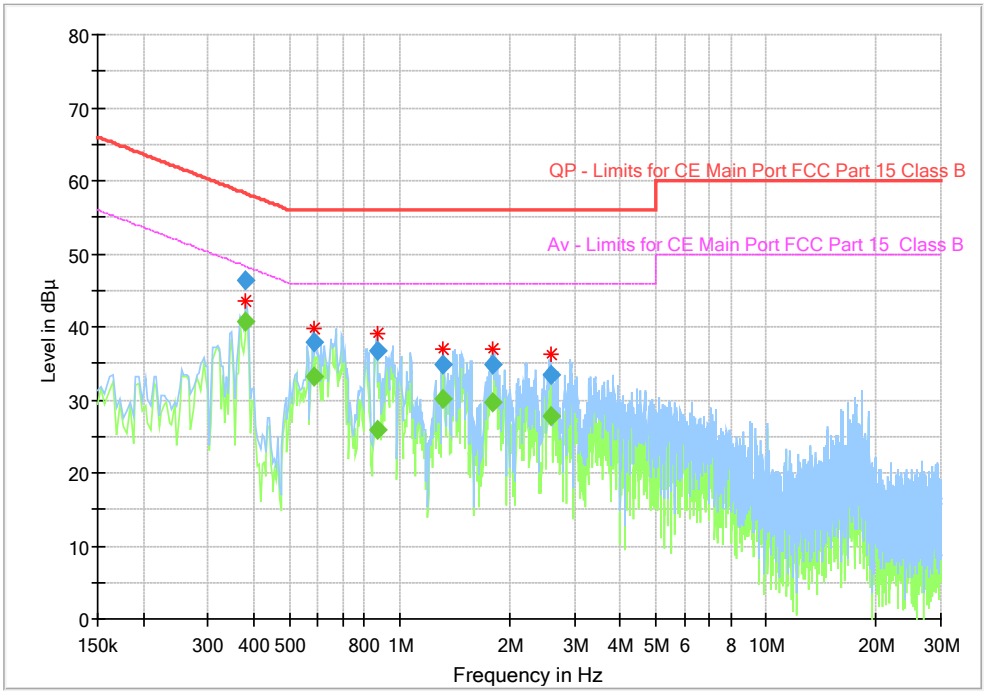


Fig. 190 Conducted Emission(802.11a, TX)

Measurement Result:

Frequency (MHz)	Quasi Peak (dBµV	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.381338	46.25	---	58.25	12.0	1000.0	9.000	N	ON	9.7
0.381338	---	40.74	48.25	7.51	1000.0	9.000	N	ON	9.7
0.582825	---	33.25	46.00	12.7	1000.0	9.000	N	ON	9.7
0.582825	37.81	---	56.00	18.1	1000.0	9.000	N	ON	9.7
0.866400	36.59	---	56.00	19.4	1000.0	9.000	L1	ON	9.7
0.866400	---	25.98	46.00	20.0	1000.0	9.000	L1	ON	9.7
1.317881	---	30.02	46.00	15.9	1000.0	9.000	N	ON	9.7
1.317881	34.88	---	56.00	21.1	1000.0	9.000	N	ON	9.7
1.799212	---	29.73	46.00	16.2	1000.0	9.000	N	ON	9.7
1.799212	34.73	---	56.00	21.2	1000.0	9.000	N	ON	9.7
2.579044	---	27.80	46.00	18.2	1000.0	9.000	N	ON	9.7
2.579044	33.30	---	56.00	22.7	1000.0	9.000	N	ON	9.7

6.9. Frequency Stability

Manufacturers ensured the EUT meet the requirement of frequency stability, such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

6.10. Power control

A Transmission Power Control mechanism is not required for systems with an e.i.r.p. of less than 27dBm (500 mW).

7. Test Equipment and Ancillaries Used For Tests

The test equipment and ancillaries used are as follows.

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration date	Cal.interval
1	Vector Signal Analyzer	FSQ40	200063	Rohde&Schwarz	2017-12-17	1 Year
2	DC Power Supply	ZUP60-14	LOC-220Z006	TDL-Lambda	2018-05-11	1 Year
3	Universal Radio Communication Tester	CMW50	104178	R&S	2018-05-11	1 Year

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration date	Cal.interval
1	Universal Radio Communication Tester	CMU200	123123	R&S	2018-05-11	1 Year
2	EMI Test Receiver	ESU40	100307	R&S	2018-05-11	1 Year
3	TRILOG Broadband Antenna	VULB9163	VULB9163-515	Schwarzbeck	2017-02-25	3 Year
4	Double-ridged Waveguide Antenna	ETS-3117	00135890	ETS	2017-01-11	3 Year
5	2-Line V-Network	ENV216	101380	R&S	2018-05-11	1 Year

6	Loop Antenna	AL-130R	121083	COM-POWER	2016-11-21	3 Year

Anechoic chamber

Fully anechoic chamber by Frankonia German.

8. Test Environment

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

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	> 100 dB
Ground system resistance	< 0.5 Ω

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

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. =25 %, Max. = 75 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω

Fully-anechoic chamber1 (6.9 meters×10.9 meters×5.4 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. = 25 %, Max. = 75 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
VSWR	Between 0 and 6 dB, from 1GHz to 18GHz
Site Attenuation Deviation	Between -4 and 4 dB,30MHz to 1GHz
Uniformity of field strength	Between 0 and 6 dB, from 80MHz to 3000 MHz

9. Measurement Uncertainty

Measurement uncertainty for all the testing in this report are within the limit specified in ECIT documents. The detailed measurement uncertainty to see the column, k=2

Measurement Items	Range	Confidence Level	Calculated Uncertainty
Maximum Peak Output Power	3600MHz-8000MHz	95%	±0.92db
EBW and VBW	3600MHz-8000MHz	95%	±0.031MHz
Transmitter Spurious Emission-Conducted	9KHz-10000MHz	95%	±4.56db
Transmitter Spurious Emission-Conducted	10000 MHz -40000MHz	95%	±5.34db
Transmitter Spurious Emission-Radiated	9KHz-30MHz	95%	±5.66db
Transmitter Spurious Emission-Radiated	30MHz-1000MHz	95%	±4.98db
Transmitter Spurious Emission-Radiated	1000MHz -18000MHz	95%	±5.06db
Transmitter Spurious Emission-Radiated	18000MHz -40000MHz	95%	±5.20db
AC Power line Conducted Emission	0.15MHz-30MHz	95%	±5.66 db
Peak Power Spectral Density	3600MHz-8000MHz	95%	±0.92db

ANNEX A. Accreditation Certificate

Accredited Laboratory

A2LA has accredited

EAST CHINA INSTITUTE OF TELECOMMUNICATIONS

Shanghai, People's Republic of China

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009*).

Presented this 15th day of March 2017.

President and CEO
For the Accreditation Council
Certificate Number 3682.01
Valid to February 28, 2019

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

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