TEST REPORT

No. B20N00421-RLAN

i.safe MOBILE GmbH

LTE SMARTPHONE

Model Name: M53A01

with

Hardware Version: V1.00

Software Version: IS530_EEA_1.0.0.0.0_1_20200331

FCC ID: 2AACZ-M53A01

IC: 11122A-M53A01

Issued Date: 2020-06-09

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 SAICT.

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1. Summary of Test Report

1.1. Test Items

Description	LTE SMARTPHONE
Model Name	M53A01
Applicant's name	i.safe MOBILE GmbH
Manufacturer's Name	i.safe MOBILE GmbH

1.2. Test Standards

FCC Part15-2018; ANSI C63.10-2013; RSS-247 Issue 2; RSS-Gen Issue 5; KDB789033-V02r01

1.3. Test Result

Pass

1.4. Testing Location

Address: Building G, Shenzhen International Innovation Center, No.1006 Shennan Road, Futian District, Shenzhen, Guangdong, P. R. China

1.5. Project data

Testing Start Date:	2020-03-30
Testing End Date:	2020-04-10

1.6. Signature

Lin Kanfeng

(Prepared this test report)

Tang Weisheng

(Reviewed this test report)

Zhang Bojun

(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	i.safe MOBILE GmbH
Address:	i_Park Tauberfranken 10 97922 Lauda-Koenigshofen Germany
Contact Person	Dirk Amann
E-Mail	dirk.amann@isafe-mobile.com
Telephone:	+491703719004
Fax:	/

2.2. Manufacturer Information

Company Name:	i.safe MOBILE GmbH
Address:	i_Park Tauberfranken 10 97922 Lauda-Koenigshofen Germany
Contact Person	Dirk Amann
E-Mail	dirk.amann@isafe-mobile.com
Telephone:	+491703719004
Fax:	/

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

3.1. About EUT

Description	LTE SMARTPHONE
Model Name	M53A01
Brand Name	i.safe MOBILE
RLAN Frequency Range	ISM Bands: -5150MHz~5250MHz -5250MHz~5350MHz -5470MHz~5725MHz -5725MHz~5850MHz
RLAN Protocol	IEEE 802.11a,802.11n-HT20/40,802.11ac-VHT20/40/80
Type of modulation	OFDM
Antenna Type	Integrated
Antenna Gain	-0.5dBi
Power Supply	3.8V DC by Battery
FCC ID	2AACZ-M53A01
IC	11122A-M53A01
Condition of EUT as received	No abnormality in appearance

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of Shenzhen Academy of Information and Communications Technology.

3.2. Internal Identification of EUT

EUT ID*	IMEI	HW Version	SW Version	Receive Date
EUT1	/	V1.0.0	IS530_EEA_1.0.0.0.0_1_2020 0331	2020-03-09

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

3.3. Internal Identification of AE

AE ID*	Description	SN
AE1	Charger	/
AE2	Battery	/

AE1

Model	ICP12-050-2000B
Manufacturer	SHENZHEN SHI YINGYUAN POWER SUPPLY TECHNOLOGY CO., LTD.

AE2

Model	MBP53A01
Manufacturer	FPR Connectivity Technology Inc.
Capacitance	3600mAh
Nominal Voltage	3.8V

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

3.4. General Description

The Equipment under Test (EUT) is a model of LTE SMARTPHONE with integrated antenna and battery.

It consists of normal options: Lithium Battery, Charger and Headset.

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

Samples undergoing test were selected by the client.

4. REFERENCE DOCUMENTS

4.1. Documents supplied by applicant

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

4.2. Reference Documents for testing

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

Reference	Title	Version
FCC Part15	FCC CFR 47,Part 15,Subpart C FCC CFR 47,Part 15,Subpart E	2019
RSS-247	Spectrum Management and Telecommunications Radio Standards Specification Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and License-Exempt Local Area Network (LE-LAN) Devices	Issue 2 February, 2017
RSS-Gen	Spectrum Management and Telecommunications Radio Standards Specification General Requirements for Compliance of Radio Apparatus	Issue 5 April, 2018
ANSI C63.10	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices	2013
KDB789033	GUIDELINES FOR COMPLIANCE TESTING OF UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE (U-NII) DEVICES PART 15, SUBPART E	V02r01

5. Test Results

5.1. Testing Environment

Normal Temperature: 15~35˚C

Relative Humidity: 20~75%

5.2. Test Results

No.	Test cases	Sub-clause of Part15E	Sub-clause of IC	Verdict
1	Maximum Output Power	15.407	RSS-247 section 5.4	**P**
2	Power Spectral Density	15.407	RSS-247 section 5.2	**P**
3	Occupied 26dB Bandwidth	15.403	RSS-247 section 5.2	**P**
4	Occupied 6dB Bandwidth	15.407	RSS-247 section 5.2	**P**
5	99% Occupied Bandwidth	/	RSS-Gen section 6.7	**P**
6	Band edge compliance	15.209	RSS-247 section 5.5	**P**
7	Transmitter Spurious Emissions	15.407, 15.205	RSS-247 section 5.5/ RSS-Gen section 6.13	**P**
8	AC Power line Conducted	15.107, 15.207	RSS-Gen section 8.8	**P**
9	Frequency Stability	15.407	/	**P**
10	Transmit Power Control	15.407	/	**NA**

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

Note: According to the definition of the application description, the device will automatically discontinue transmission in case of either absence of information to transmit or operational failure.

5.3. Statements

SAICT has evaluated the test cases requested by the applicant/manufacturer as listed in section 5.2 of this report, for the EUT specified in section 3, according to the standards or reference documents listed in section 4.2.

6. Test Equipments Utilized

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Date	Calibration Period
1	Vector Signal Analyzer	FSV40	100903	Rohde & Schwarz	2021-01-15	1 year
2	Power Sensor	U2021XA	MY55430013	Agilent	2021-01-15	1 year
3	Data Acquisiton	U2531A	TW55443507	Agilent	/	/
4	Climate chamber	SU-242	93008165	ESPEC	2021-03-25	1 year
5	DC Power Supply	ZUP60-14	6MY-847Z13-0001	TDK-Lambda	2021-02-26	1 year

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Date	Calibration Period
1	LISN	ESH2-Z5	100196	R&S	2021-01-02	1 year
2	Test Receiver	ESCI	100701	R&S	2020-08-06	1 year
3	Loop Antenna	HLA6120	35779	TESEQ	2022-05-01	3 year
4	BiLog Antenna	VULB9163	9163 329	Schwarzbeck	2021-02-16	3 year
5	Horn Antenna	3117	00066585	ETS-Lindgren	2022-03-04	3 year
6	Test Receiver	ESR7	101675	R&S	2020-07-18	1 year
7	Spectrum Analyzer	FSP 40	100378	R&S	2020-12-12	1 year
8	Chamber	FACT5-2.0	4166	ETS-Lindgren	2021-05-12	3 year
9	Antenna	QSH-SL-18-26-S-20	17013	Q-par	2021-01-14	3 year
10	Antenna	QSH-SL-26-40-K-20	17014	Q-par	2021-01-10	3 year

Test software

No.	Equipment	Manufacturer	Version
1	TechMgr Software	CAICT	2.1.1
2	EMC32	Rohde & Schwarz	8.53.0
3	EMC32	Rohde & Schwarz	10.01.00

EUT is engineering software provided by the customer to control the transmitting signal.
The EUT was programmed to be in continuously transmitting mode.

Anechoic chamber

Fully anechoic chamber by ETS-Lindgren

7. Laboratory Environment

Semi-anechoic chambe

Temperature	Min. = 15 ˚C, Max. = 35 ˚C
Relative humidity	Min. = 15 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz> 60 dB; 1MHz-18000MHz>90 dB
Electrical insulation	> 2MΩ
Ground system resistance	< 4 Ω
Normalised site attenuation (NSA)	< ±4 dB, 3 m distance, from 30 to 1000 MHz

Shielded room

Temperature	Min. = 15 ˚C, Max. = 35 ˚C
Relative humidity	Min. =20 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz> 60 dB; 1MHz-1000MHz>90 dB
Electrical insulation	> 2MΩ
Ground system resistance	< 4 Ω

Fully-anechoic chamber

Temperature	Min. = 15 ˚C, Max. = 35 ˚C
Relative humidity	Min. = 15 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz> 60 dB; 1MHz-18000MHz>90 dB
Electrical insulation	> 2MΩ
Ground system resistance	< 4 Ω
Voltage Standing Wave Ratio （VSWR）	≤ 6 dB, from 1 to 18 GHz， 3 m distance
Uniformity of field strength	Between 0 and 6 dB, from 80 to 6000 MHz

8. Measurement Uncertainty

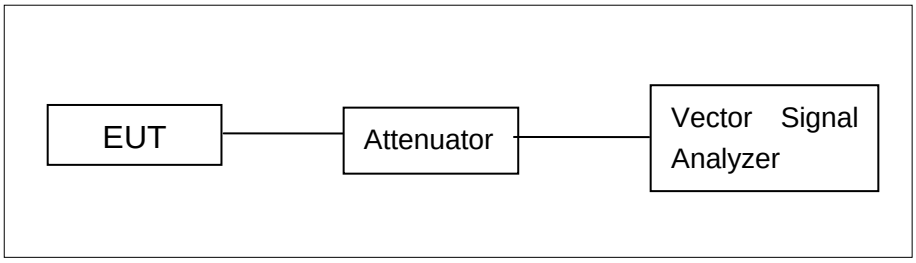
Test Name	Uncertainty (*k=2*)	
1. RF Output Power - Conducted	1.32dB	
2. Power Spectral Density - Conducted	2.32dB	
3. Occupied channel bandwidth - Conducted	66Hz	
4. Transmitter Spurious Emission - Conducted	30MHz≤f≤1GHz	1.41dB
	1GHz≤f≤7GHz	1.92dB
	7GHz≤f≤13GHz	2.31dB
	13GHz≤f≤26GHz	2.61dB
5. Transmitter Spurious Emission - Radiated	9kHz≤f≤30MHz	1.70dB
	30MHz≤f≤1GHz	4.90dB
	1GHz≤f≤18GHz	4.60dB
	18GHz≤f≤40GHz	4.10dB
6. AC Power line Conducted Emission	150kHz≤f≤30MHz	3.00dB

ANNEX A: MEASUREMENT RESULTS

A.1. Measurement Method

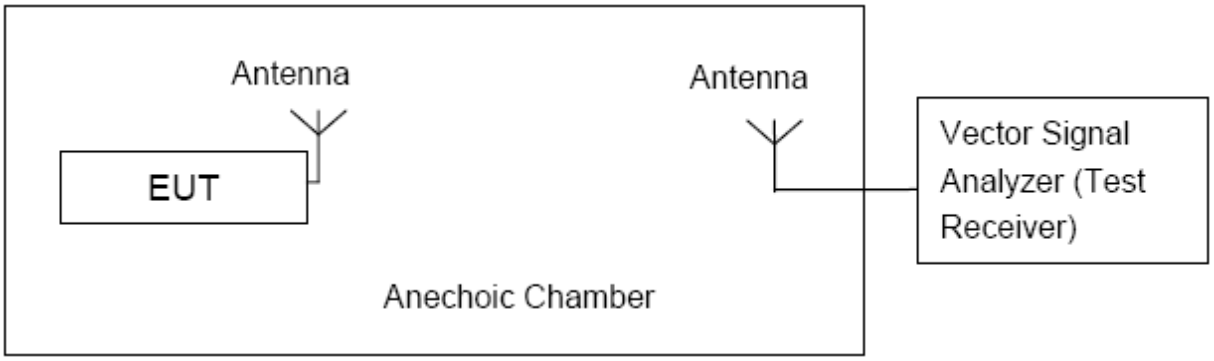
Conducted Measurements

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.



Radiated Emission Measurements

In the case of radiated emission, the used settings are as follows:
Sweep frequency from 30 MHz to 1 GHz, RBW = 100 KHz, VBW = 300 KHz;
Sweep frequency from 1 GHz to 26 GHz, RBW = 1 MHz, VBW = 10 Hz;



The measurement is made according to KDB 789033.
The radiated emission test is performed in semi-anechoic chamber. The distance from the EUT to the reference point of measurement antenna is 3m. The test is carried out on both vertical and horizontal polarization and only maximization result of both polarizations is kept. During the test, the turntable is rotated 360° and the measurement antenna is moved from 1m to 4m to get the maximization result.

A.2. Maximum output Power

Measurement Limit and Method:

Standard	Frequency (MHz)	Limit (dBm)
FCC CRF Part 15.407	5150MHz~5250MHz	24
	5250MHz~5350MHz	24 or 11+10logB
	5470MHz~5725MHz	24 or 11+10logB
	5725MHz~5850MHz	30

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

Standard	Frequency (MHz)	Limit (dBm)
RSS-247 section 5.4	5150MHz~5250MHz	23 (EIRP) or 10+10logB(EIRP)
	5250MHz~5350MHz	24 or 11+10logB
	5470MHz~5600MHz	24 or 11+10logB
	5650MHz~5725MHz	24 or 11+10logB
	5725MHz~5850MHz	30

Limit use the less value, and B is the 99% bandwidth.

Measurement of method: See ANSI C63.10-2013-Clause 12.3.3.2

Method PM-G is a measurement using a gated RF average power meter.

Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Because the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

Measurement Results:

U–NII Band	Mode	Frequency (MHz)	Average power (dBm)	E.I.R.P (dBm)	Conclusion
5.2GHz Band (UNII-1)	802.11a	5180 (CH 36)	15.60	15.10	**P**
		5200 (CH 40)	15.40	14.90	**P**
		5240 (CH 48)	14.88	14.38	**P**
	802.11n-HT20	5180 (CH 36)	15.48	14.98	**P**
		5200 (CH 40)	15.32	14.82	**P**
		5240 (CH 48)	14.80	14.30	**P**
	802.11n-HT40	5190 (CH 38)	15.39	14.89	**P**
		5230 (CH 46)	14.79	14.29	**P**
	802.11ac-VHT20	5180 (CH 36)	13.57	13.07	**P**
		5200 (CH 40)	13.45	12.95	**P**
		5240 (CH 48)	12.89	12.39	**P**
	802.11ac-VHT40	5190 (CH 38)	13.36	12.86	**P**
		5230 (CH 46)	12.82	12.32	**P**
	802.11ac-VHT80	5210 (CH 42)	13.38	12.88	**P**

Note: E.I.R.P value= Conducted values (with conducted samples) + Antenna Gain.

U–NII Band	Mode	Channel	Frequency (MHz)	Average power (dBm)	Conclusion
5.3GHz Band (UNII-2A)	802.11a	CH 52	5260	14.47	**P**
		CH 56	5280	14.33	**P**
		CH 64	5320	14.33	**P**
	802.11n-HT20	CH 52	5260	14.44	**P**
		CH 56	5280	14.27	**P**
		CH 64	5320	14.21	**P**
	802.11n-HT40	CH 54	5270	14.31	**P**
		CH 62	5310	13.93	**P**
	802.11ac-VHT20	CH 52	5260	12.77	**P**
		CH 56	5280	12.48	**P**
		CH 64	5320	12.50	**P**
	802.11ac-VHT40	CH 54	5270	12.37	**P**
		CH 62	5310	11.85	**P**
	802.11ac-VHT80	CH 58	5290	12.28	**P**

U–NII Band	Mode	Channel	Frequency (MHz)	Average power (dBm)	Conclusion
5.5GHz Band (UNII-2C)	802.11a	CH 100	5500	15.39	**P**
		CH 116	5580	15.17	**P**
		CH 140	5700	14.56	**P**
	802.11n-HT20	CH 100	5500	15.37	**P**
		CH 116	5580	15.08	**P**
		CH 140	5700	14.52	**P**
	802.11n-HT40	CH 102	5510	15.22	**P**
		CH 110	5550	15.16	**P**
		CH 134	5670	14.52	**P**
	802.11ac-VHT20	CH 100	5500	13.42	**P**
		CH 116	5580	13.13	**P**
		CH 140	5700	12.49	**P**
	802.11ac-VHT40	CH 102	5510	13.12	**P**
		CH 110	5550	13.16	**P**
		CH 134	5670	12.51	**P**
	802.11ac-VHT80	CH 106	5530	13.37	**P**
		CH 122	5610	12.71	**P**

U–NII Band	Mode	Channel	Frequency (MHz)	Average power (dBm)	Conclusion
5.8GHz Band (UNII-3)	802.11a	CH 149	5745	14.76	**P**
		CH 157	5785	14.36	**P**
		CH 165	5825	14.08	**P**
	802.11n-HT20	CH 149	5745	14.73	**P**
		CH 157	5785	14.23	**P**
		CH 165	5825	14.01	**P**
	802.11n-HT40	CH 151	5755	14.50	**P**
		CH 159	5795	14.02	**P**
	802.11ac-VHT20	CH 149	5745	12.73	**P**
		CH 157	5785	12.38	**P**
		CH 165	5825	12.09	**P**
	802.11ac-VHT40	CH 151	5755	12.46	**P**
		CH 159	5795	12.03	**P**
	802.11ac-VHT80	CH 155	5775	12.25	**P**

Note:

Worst-case data rates as provided by the client were: 6Mbps (802.11a), MCS0 (802.11n), MCS0 (802.11ac). 802.11a, 802.11n-HT40 and 802.11ac-VHT80 modes are selected as the worst case. The following cases and test graphs are performed with this condition.

The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

A.3. Peak Power Spectral Density

Measurement Limit:

Standard	Frequency (MHz)	Limit
FCC CRF Part 15.407 & RSS-247 section 5.2	5150MHz~5250MHz	11dBm/MHz (FCC)
		10dBm/MHz EIRP (IC)
	5250MHz~5350MHz	11dBm/MHz
	5470MHz~5725MHz	11dBm/MHz
	5725MHz~5850MHz	30dBm/500KHz

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

Measurement Results:

5.2GHz Band (UNII-1)

Mode	Channel	Power Spectral Density (dBm/MHz)	E.I.R.P Spectral Density (dBm)	Conclusion
802.11a	5180MHz(Ch36)	7.94	7.44	**P**
	5200MHz(Ch40)	7.24	6.74	**P**
	5240MHz(Ch48)	6.53	6.03	**P**
802.11n HT40	5190MHz(Ch38)	4.53	4.03	**P**
	5230MHz(Ch46)	3.46	2.96	**P**
802.11ac VHT80	5210MHz(Ch42)	-0.85	-1.35	**P**

Note: E.I.R.P value= Conducted values (with conducted samples) + Antenna Gain.

5.3GHz Band (UNII-2A)

Mode	Channel	Power Spectral Density (dBm/MHz)	Conclusion
802.11a	5260MHz(Ch52)	6.40	**P**
	5280MHz(Ch56)	5.64	**P**
	5320MHz(Ch64)	6.36	**P**
802.11n HT40	5270MHz(Ch54)	3.40	**P**
	5310MHz(Ch62)	3.48	**P**
802.11ac VHT80	5290MHz(Ch58)	-1.35	**P**

5.5GHz Band (UNII-2C)

Mode	Channel	Power Spectral Density (dBm/MHz)	Conclusion
802.11a	5500MHz(Ch100)	7.98	**P**
	5580MHz(Ch116)	7.10	**P**
	5700MHz(Ch140)	6.57	**P**
802.11n HT40	5510MHz(Ch102)	4.75	**P**
	5550MHz(Ch110)	4.38	**P**

	5670MHz(Ch134)	3.93	**P**
802.11ac VHT80	5530MHz(Ch106)	-0.23	**P**
	5610MHz(Ch122)	-0.79	**P**

5.8GHz Band (UNII-3)

Mode	Channel	Power Spectral Density (dBm/500kHz)	Conclusion
802.11a	5745MHz(CH149)	5.28	**P**
	5785MHz(CH157)	4.45	**P**
	5825MHz(CH165)	4.16	**P**
802.11n HT40	5755MHz(CH151)	2.74	**P**
	5795MHz(CH159)	2.42	**P**
802.11ac VHT80	5775MHz(CH155)	-2.84	**P**

Conclusion: PASS

A.4. Occupied 26dB Bandwidth

Measurement Limit:

Standard	Limit (MHz)
FCC 47 CFR Part 15.403 & RSS-247 section 5.2	/

The measurement is made according to KDB 789033.

Measurement Result:

Mode	Channel	Occupied 26dB Bandwidth (MHz)		Conclusion
802.11a	5180MHz(Ch36)	Fig.1	26.35	**P**
	5200MHz(Ch40)	Fig.2	26.25	**P**
	5240MHz(Ch48)	Fig.3	26.45	**P**
	5260MHz(Ch52)	Fig.4	26.10	**P**
	5280MHz(Ch56)	Fig.5	26.35	**P**
	5320MHz(Ch64)	Fig.6	26.25	**P**
	5500MHz(Ch100)	Fig.7	26.10	**P**
	5580MHz(Ch116)	Fig.8	26.15	**P**
	5700MHz(Ch140)	Fig.9	24.95	**P**
802.11n HT40	5190MHz(Ch38)	Fig.10	42.08	**P**
	5230MHz(Ch46)	Fig.11	42.40	**P**
	5270MHz(Ch54)	Fig.12	41.52	**P**
	5310MHz(Ch62)	Fig.13	41.12	**P**
	5510MHz(Ch102)	Fig.14	41.76	**P**
	5550MHz(Ch110)	Fig.15	41.52	**P**
	5670MHz(Ch134)	Fig.16	42.00	**P**
802.11ac VHT80	5210MHz(Ch42)	Fig.17	84.48	**P**
	5290MHz(Ch58)	Fig.18	84.64	**P**
	5530MHz(Ch106)	Fig.19	84.16	**P**
	5610MHz(Ch122)	Fig.20	84.48	**P**

Conclusion: PASS

Test graphs as below:

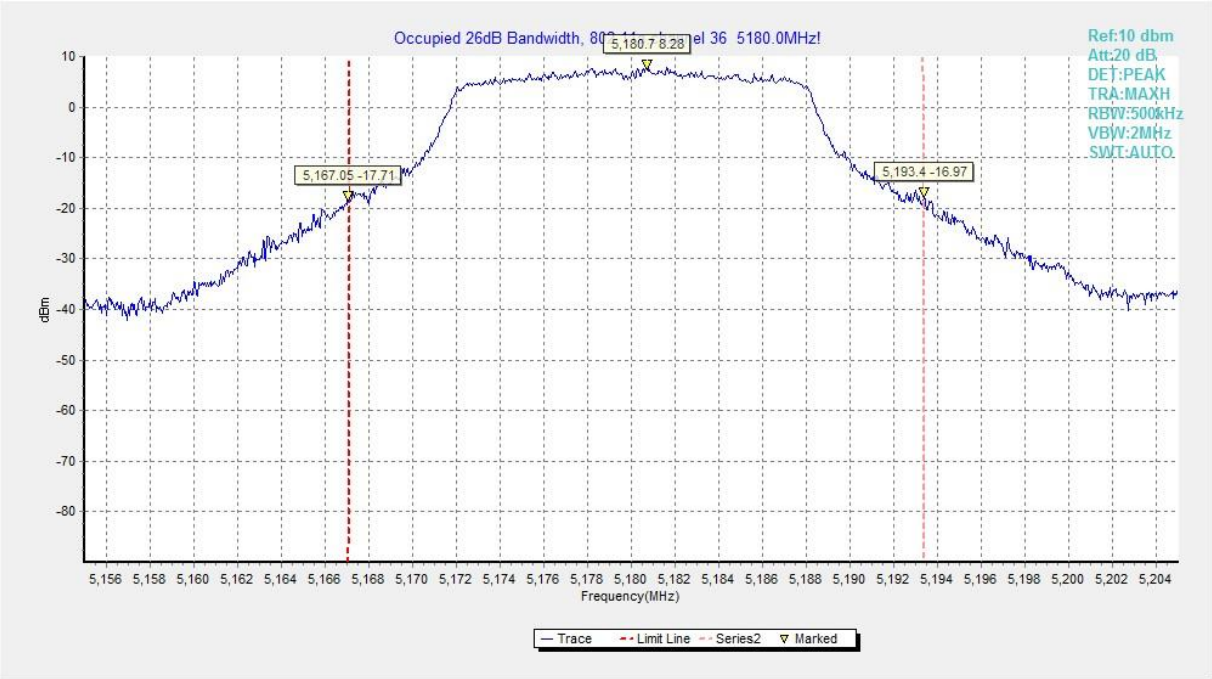


Fig. 1 Occupied 26dB Bandwidth (802.11a, 5180MHz)

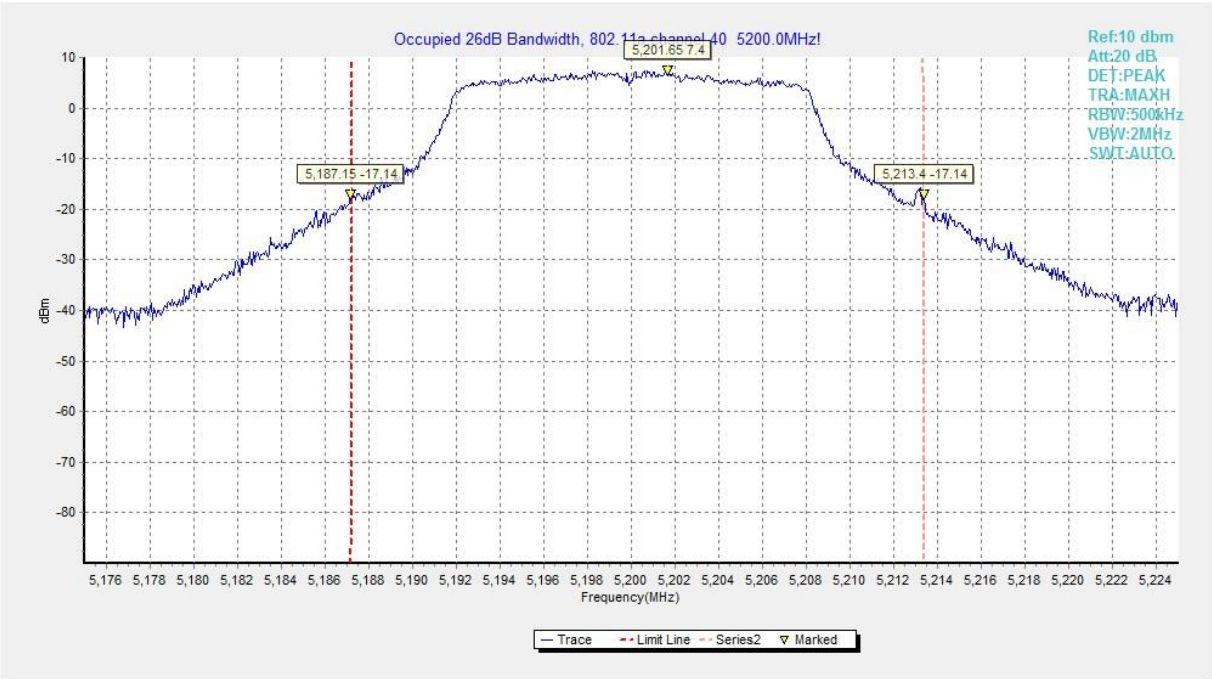


Fig. 2 Occupied 26dB Bandwidth (802.11a, 5200MHz)

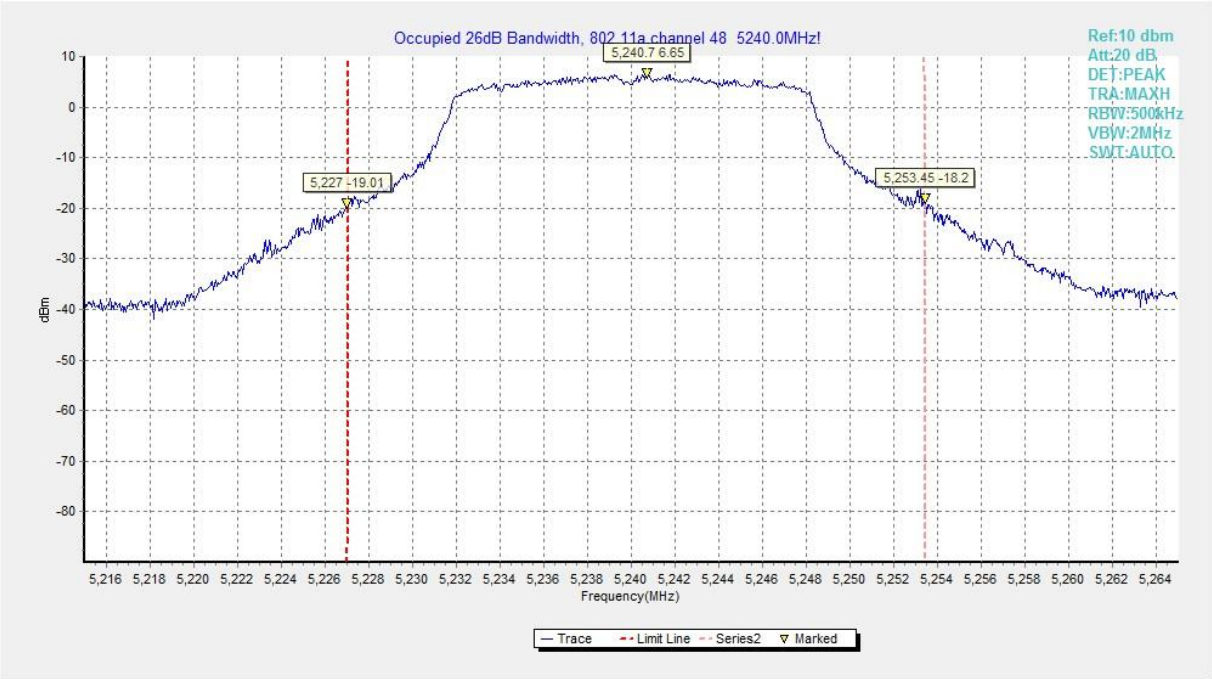


Fig. 3 Occupied 26dB Bandwidth (802.11a, 5240MHz)

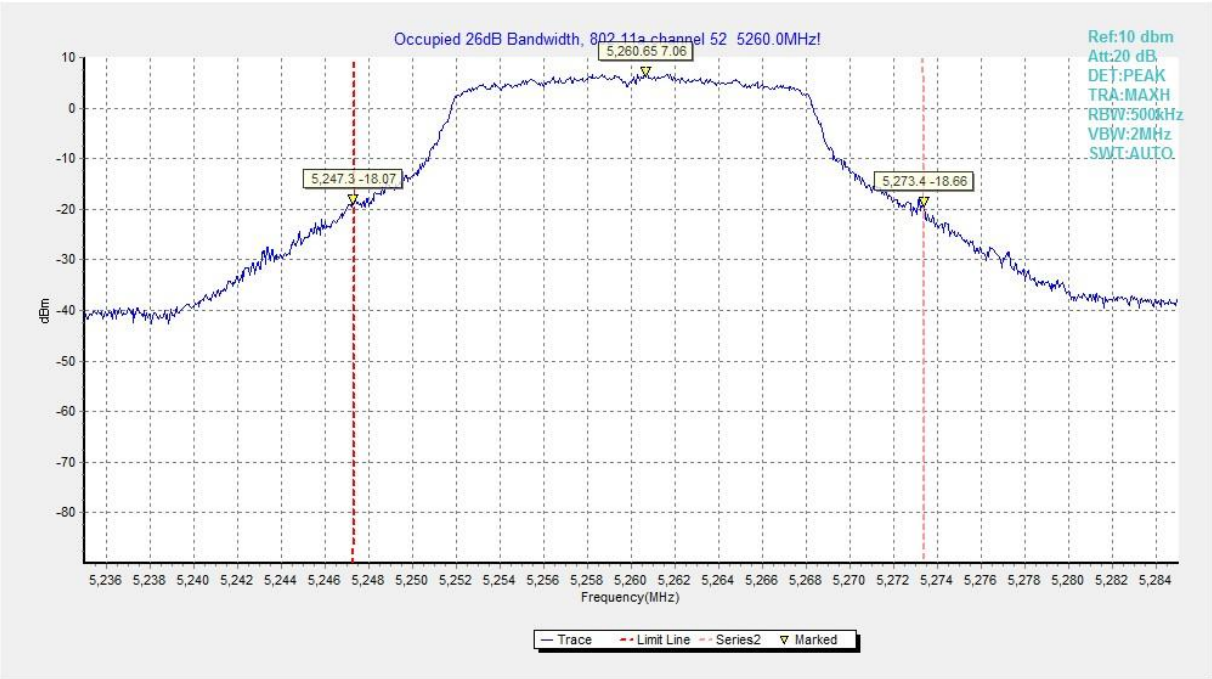


Fig. 4 Occupied 26dB Bandwidth (802.11a, 5260MHz)

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

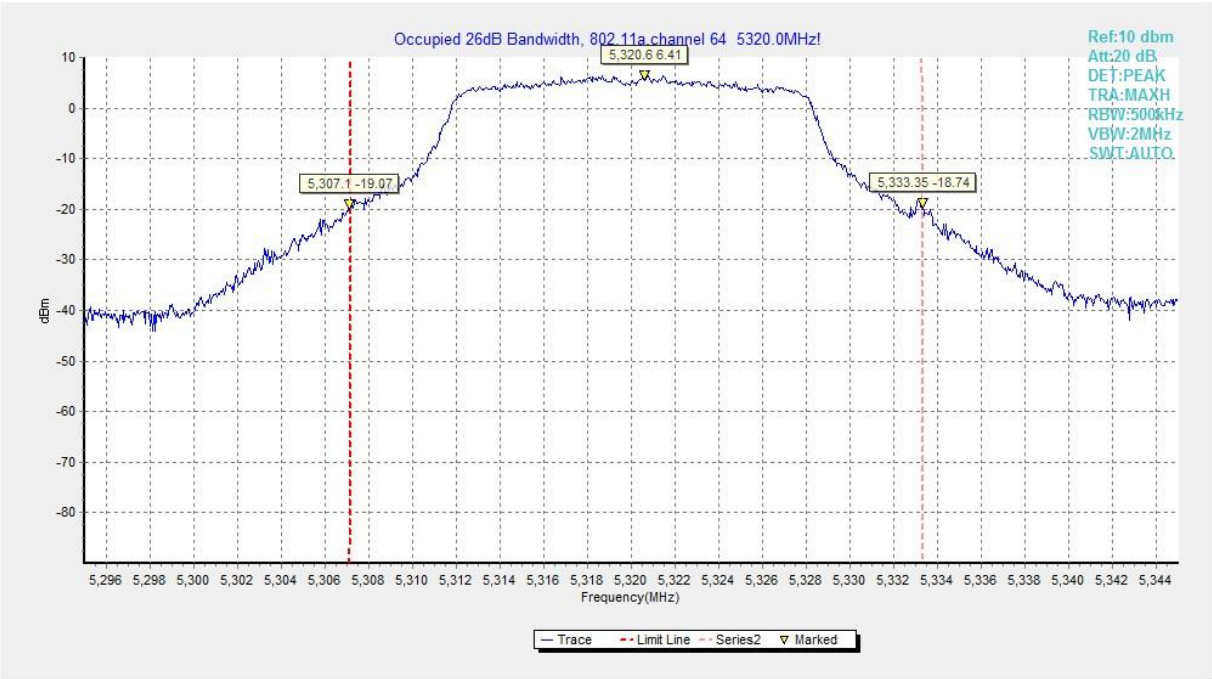


Fig. 6 Occupied 26dB Bandwidth (802.11a, 5320MHz)

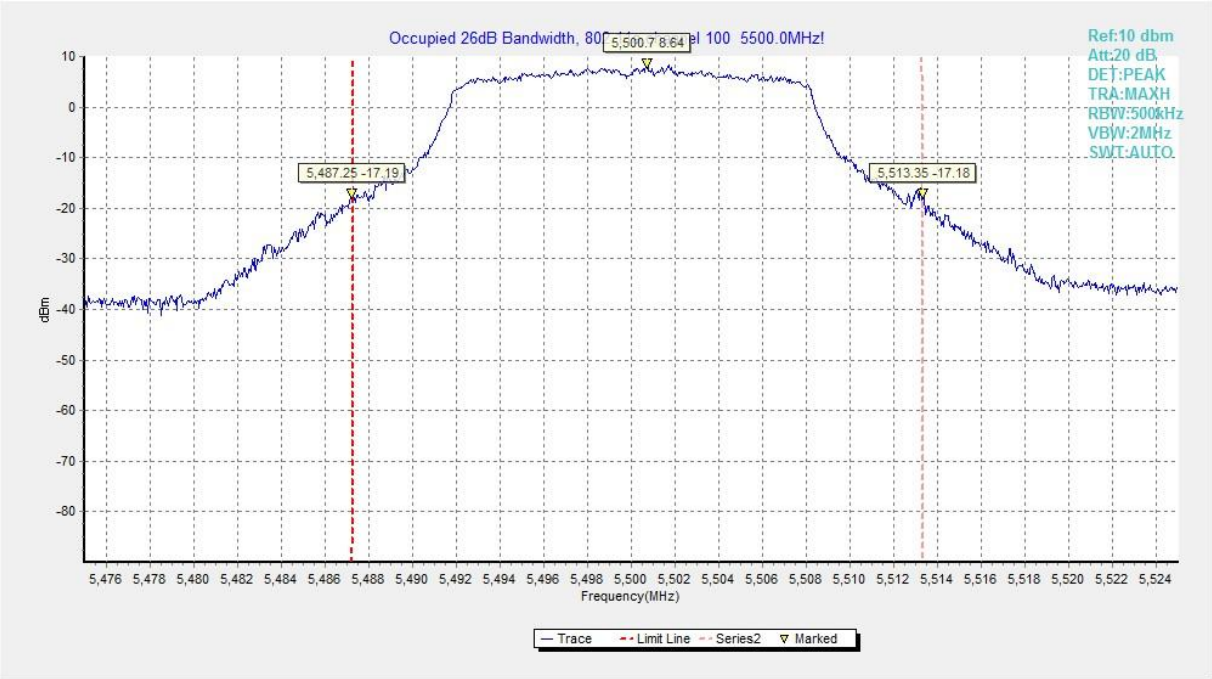


Fig. 7 Occupied 26dB Bandwidth (802. 11a, 5500MHz)

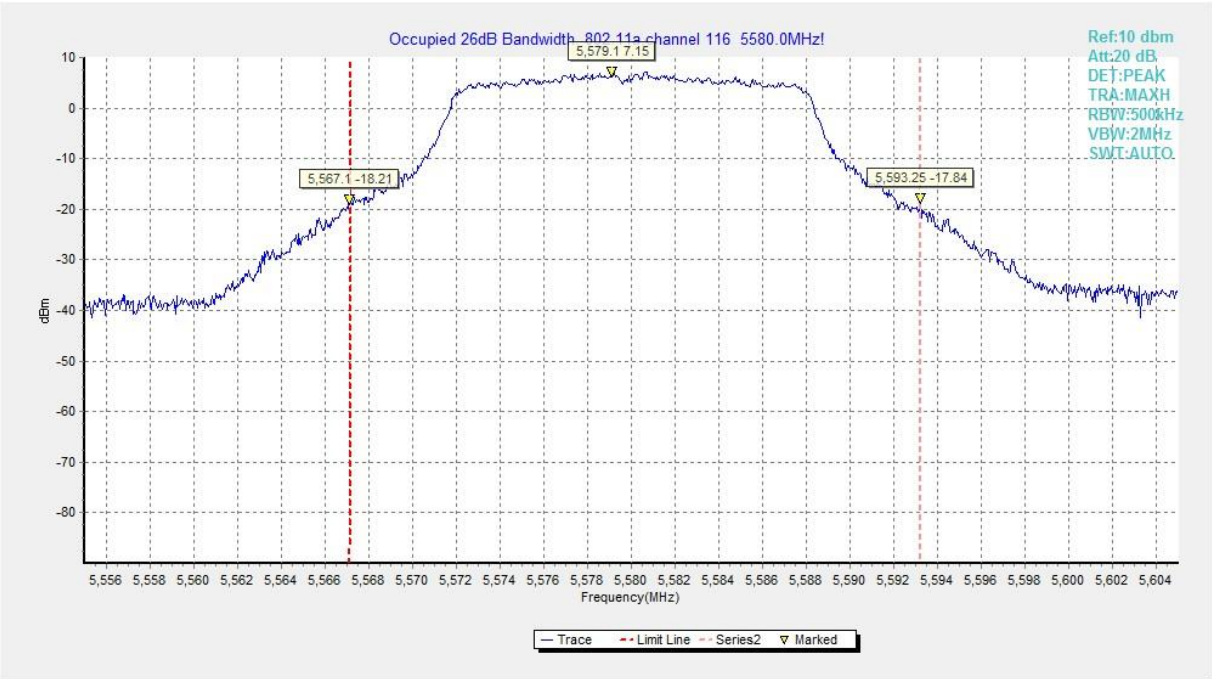


Fig. 8 Occupied 26dB Bandwidth (802. 11a, 5580MHz)

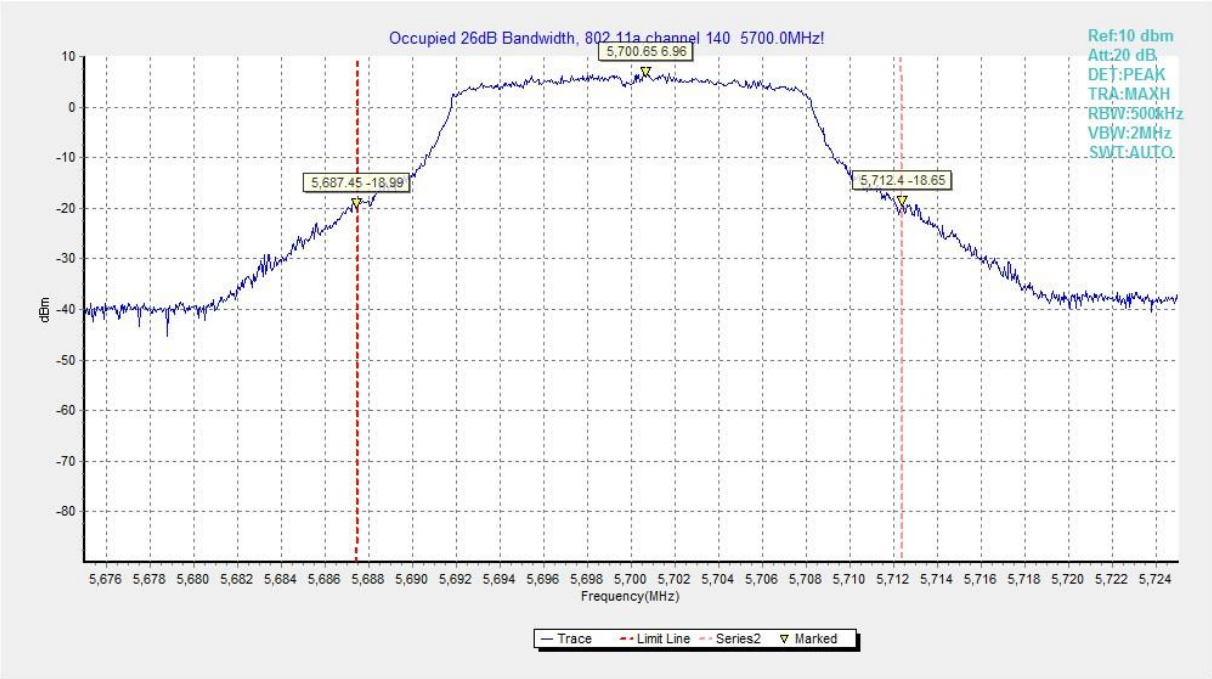


Fig. 9 Occupied 26dB Bandwidth (802. 11a, 5700MHz)

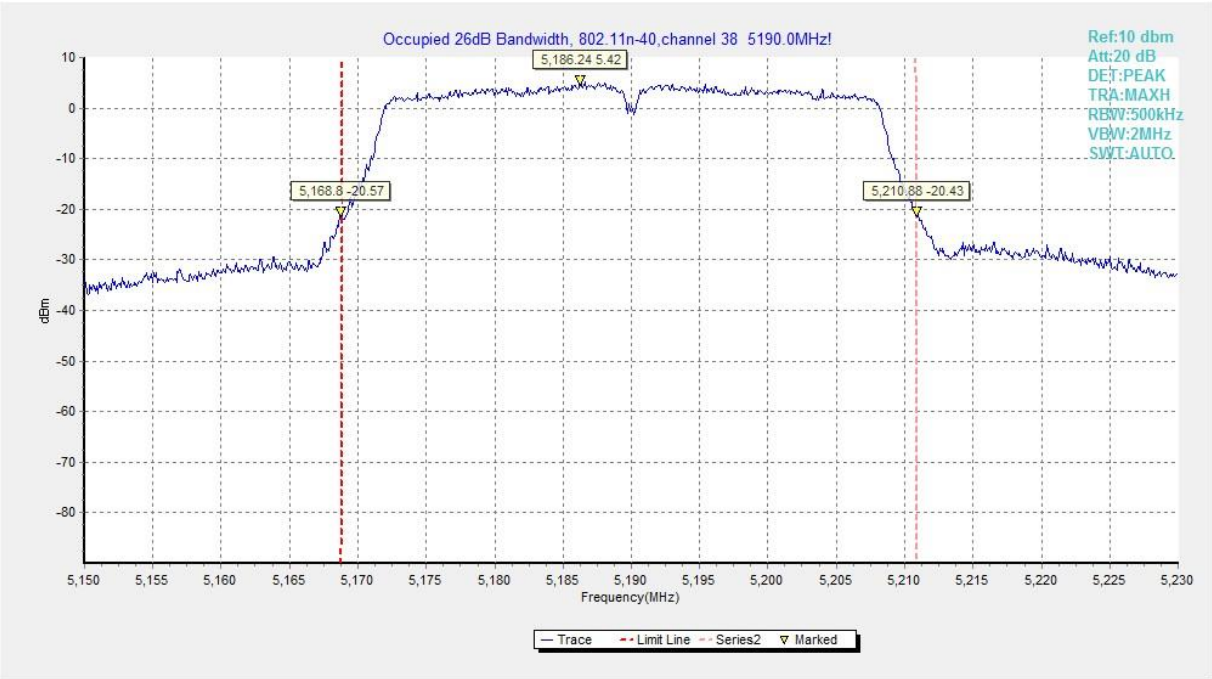


Fig. 10 Occupied 26dB Bandwidth (802.11n-HT40, 5190MHz)

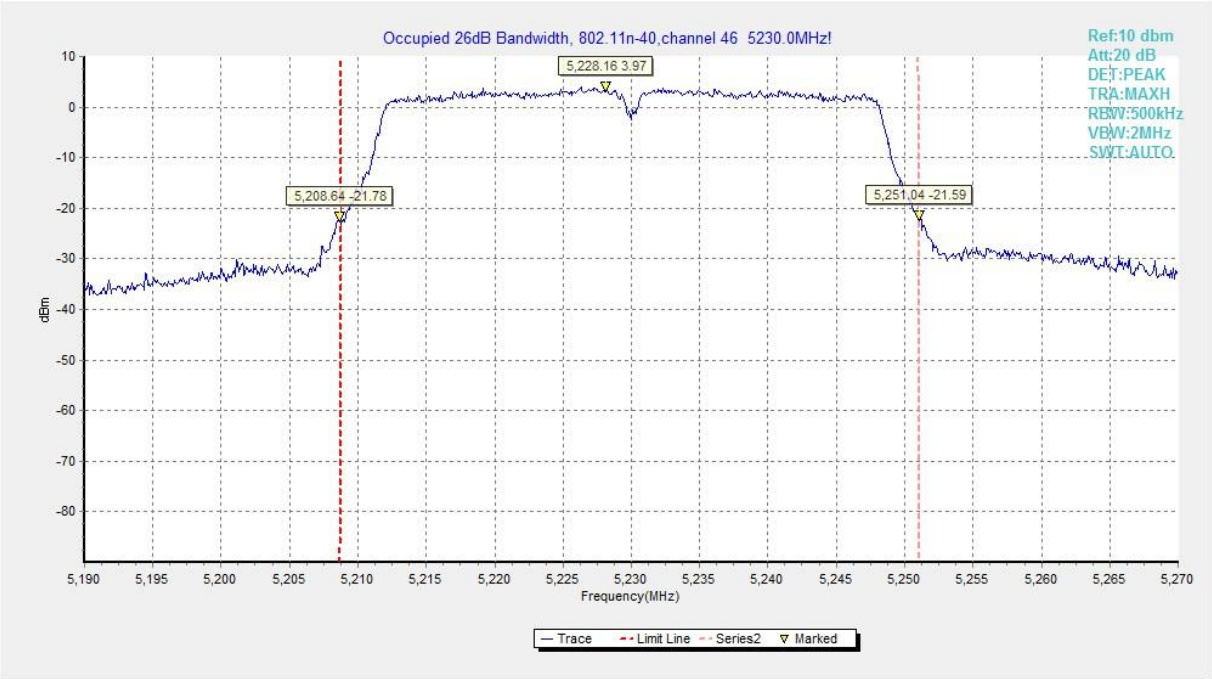


Fig. 11 Occupied 26dB Bandwidth (802.11n-HT40, 5230MHz)

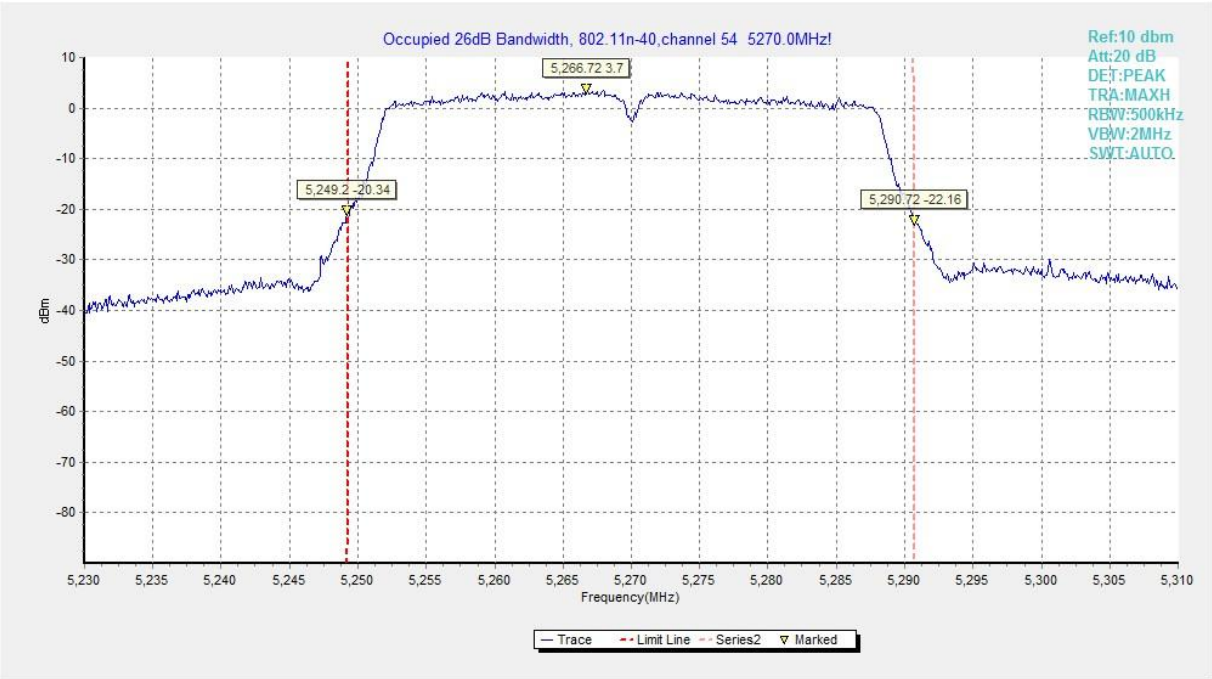


Fig. 12 Occupied 26dB Bandwidth (802.11n-HT40, 5270MHz)

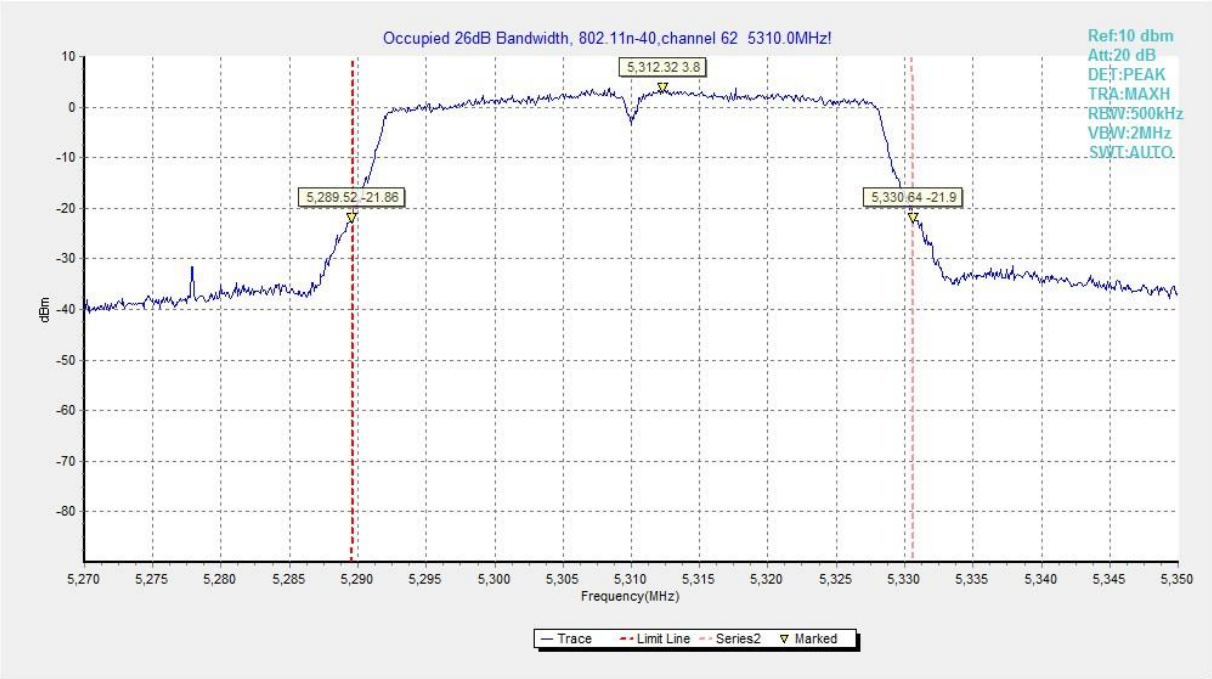


Fig. 13 Occupied 26dB Bandwidth (802.11n-HT40, 5310MHz)

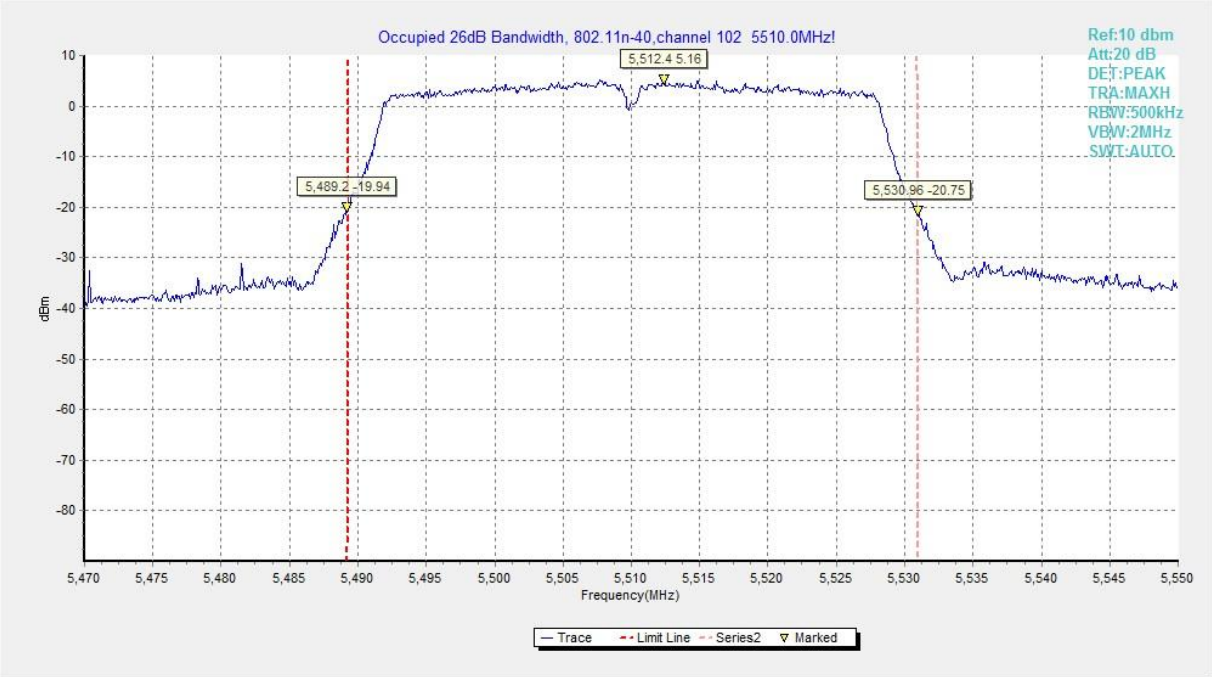


Fig. 14 Occupied 26dB Bandwidth (802. 11n-HT40, 5510MHz)

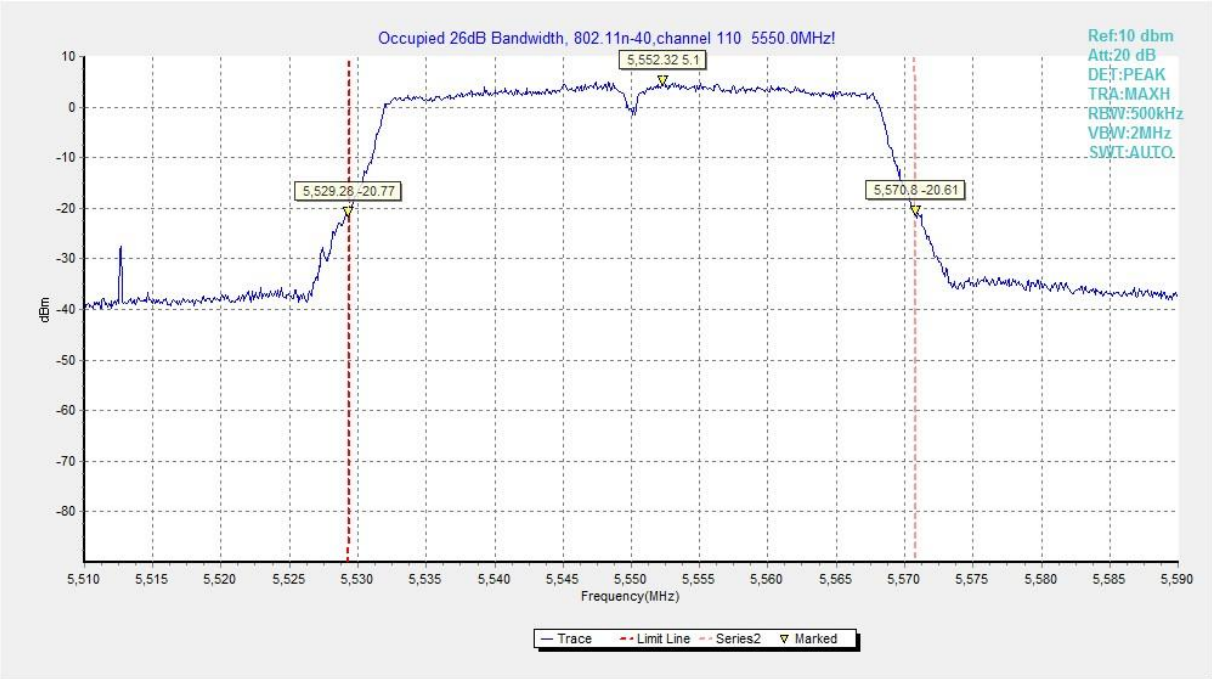


Fig. 15 Occupied 26dB Bandwidth (802. 11n-HT40, 5550MHz)

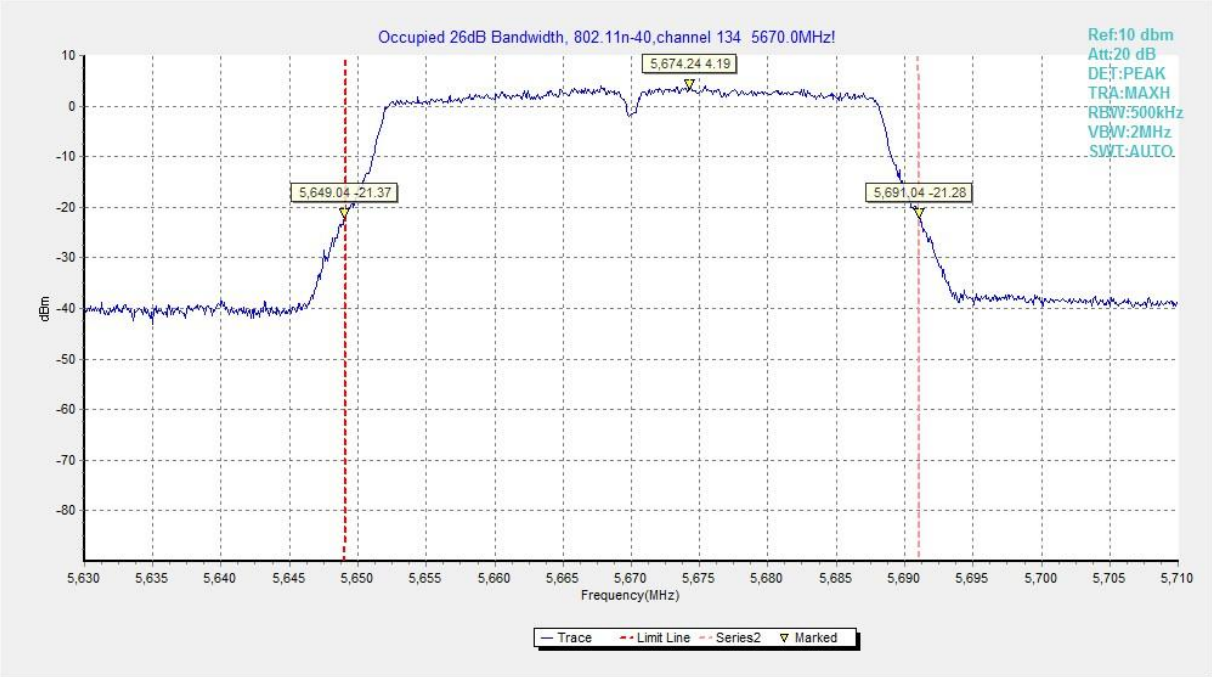


Fig. 16 Occupied 26dB Bandwidth (802. 11n-HT40, 5670MHz)

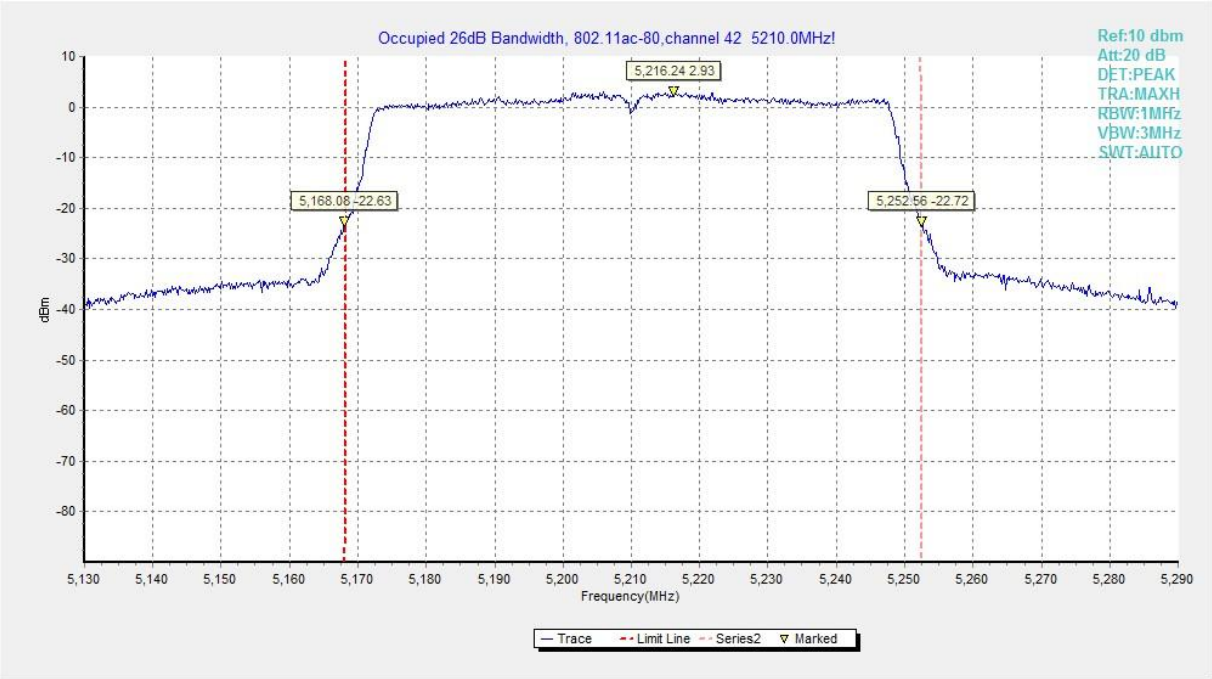


Fig. 17 Occupied 26dB Bandwidth (802. 11ac-VHT80, 5210MHz)

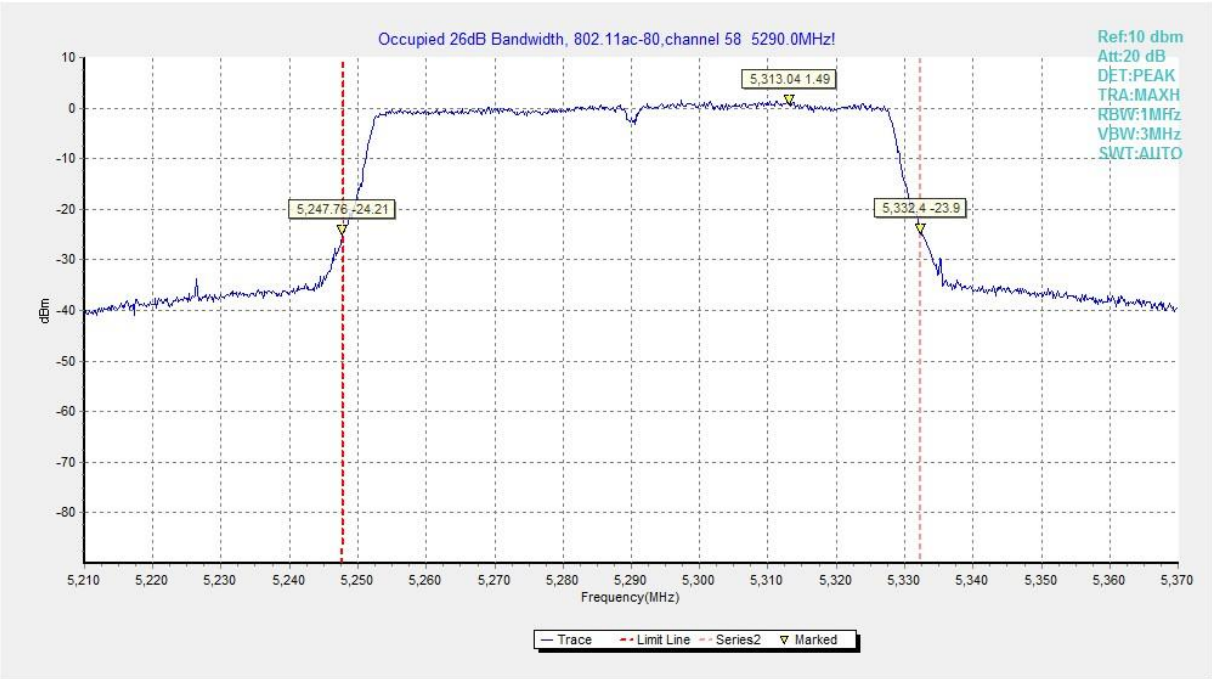


Fig. 18 Occupied 26dB Bandwidth (802. 11ac-VHT80, 5290MHz)

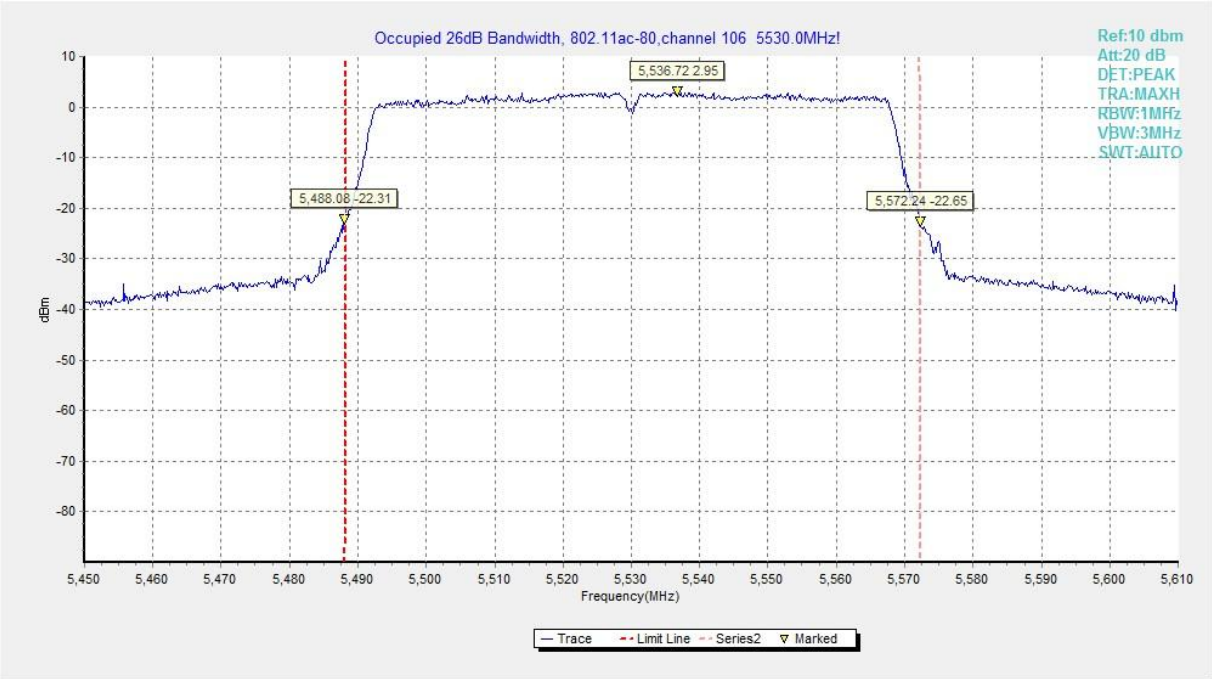


Fig. 19 Occupied 26dB Bandwidth (802. 11ac-VHT80, 5530MHz)

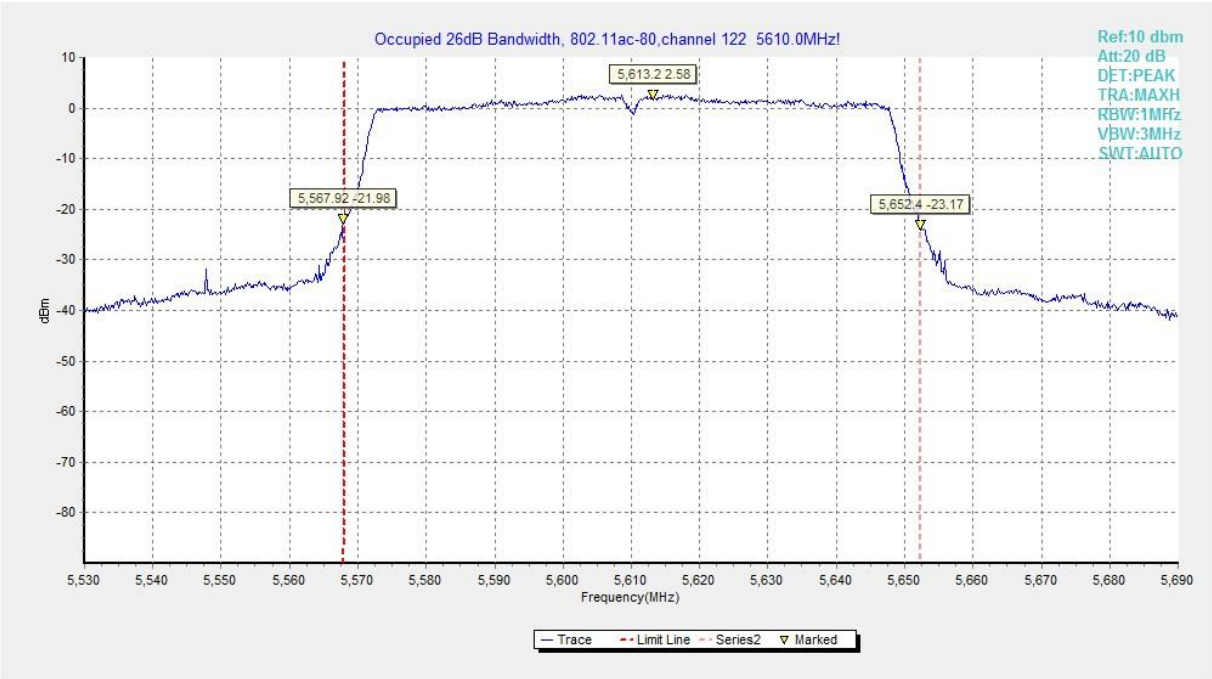


Fig. 20 Occupied 26dB Bandwidth (802. 11ac-VHT80, 5610MHz)

A.5. Occupied 6dB Bandwidth

Measurement Limit:

Standard	Limit (MHz)
FCC 47 CFR Part 15.407 & RSS-247 section 5.2	⩾0.5

The measurement is made according to KDB 789033.

Measurement Result:

Mode	Channel	Occupied 6dB Bandwidth (MHz)		Conclusion
802.11a	5745MHz(Ch149)	Fig.21	15.45	**P**
	5785MHz(Ch157)	Fig.22	15.90	**P**
	5825MHz(Ch165)	Fig.23	16.05	**P**
802.11n HT40	5755MHz(Ch151)	Fig.24	35.36	**P**
	5795MHz(Ch159)	Fig.25	35.68	**P**
802.11ac VHT80	5775MHz(Ch155)	Fig.26	75.20	**P**

Conclusion: PASS

Test graphs as below:

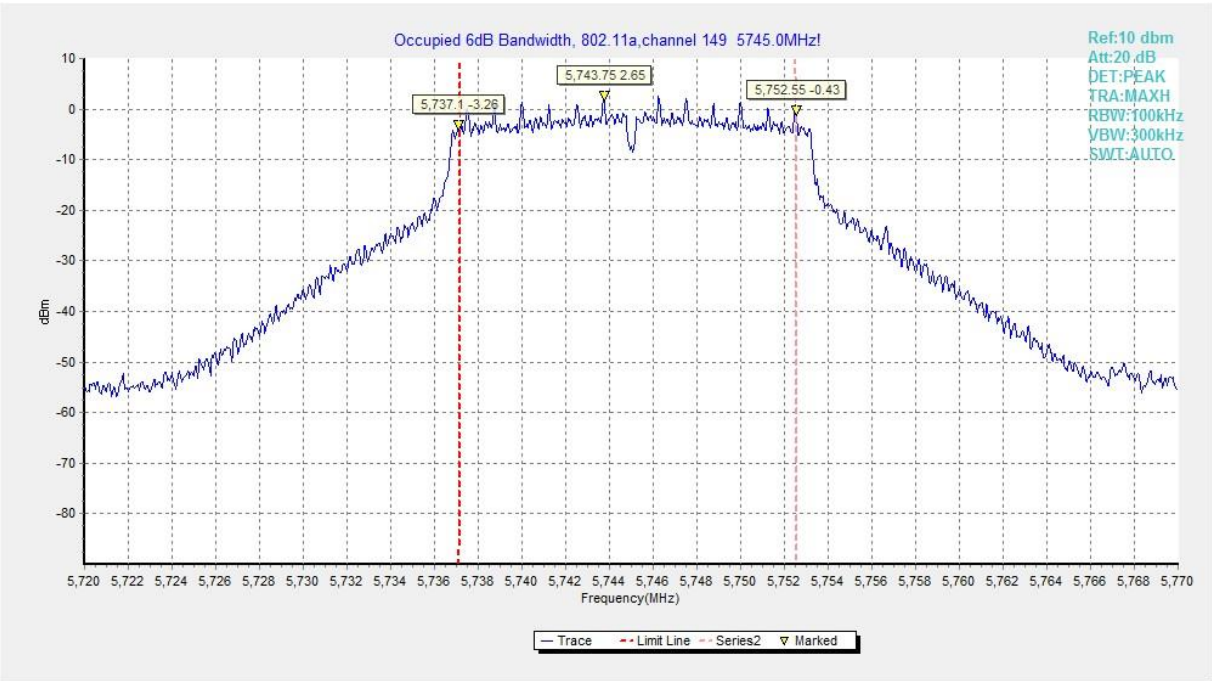


Fig. 21 Occupied 6dB Bandwidth (802.11a, 5745MHz)

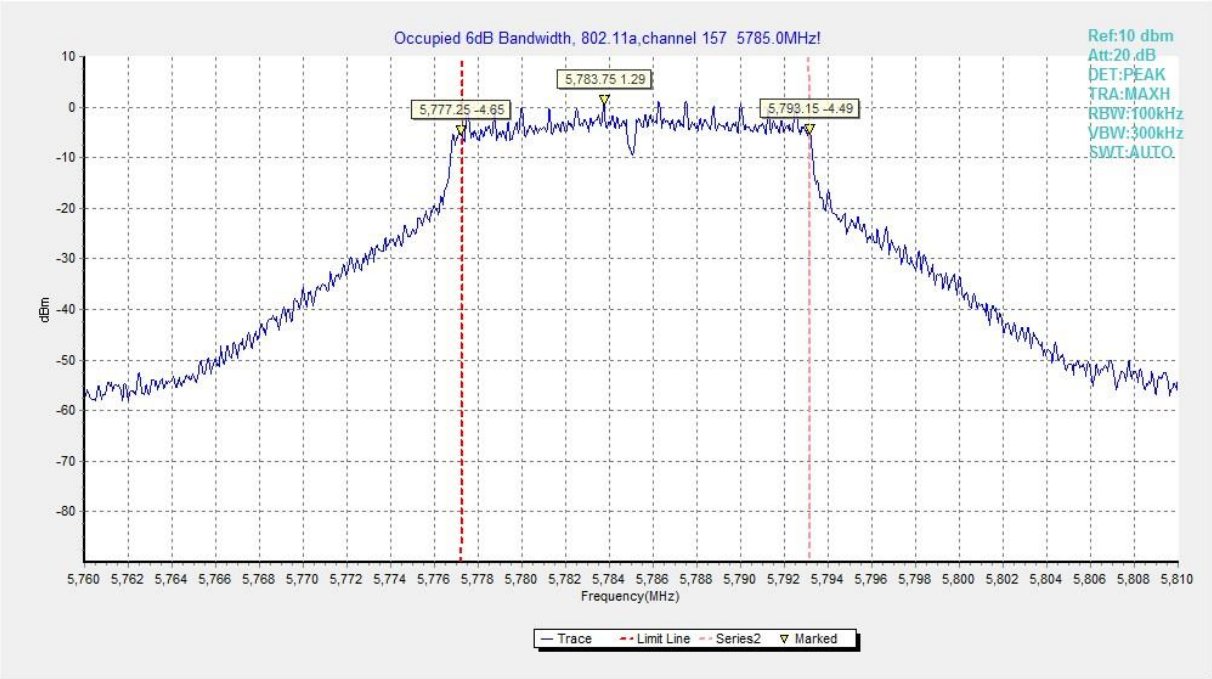


Fig. 22 Occupied 6dB Bandwidth (802.11a, 5785MHz)

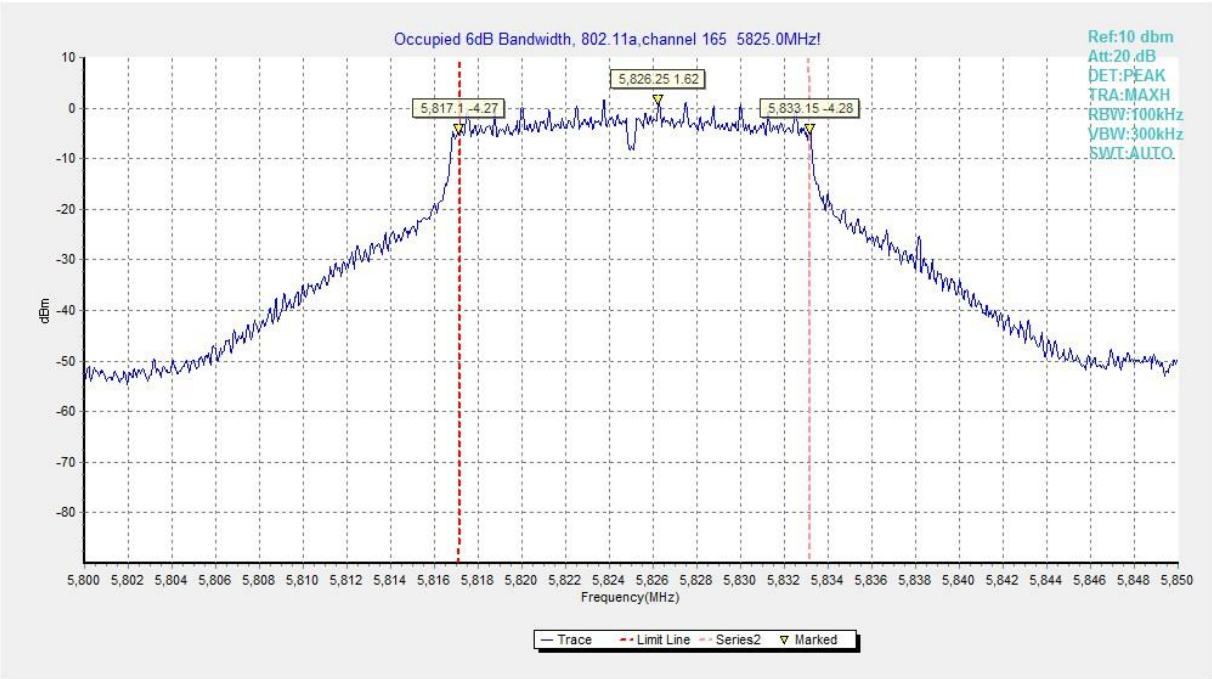


Fig. 23 Occupied 6dB Bandwidth (802.11a, 5825MHz)

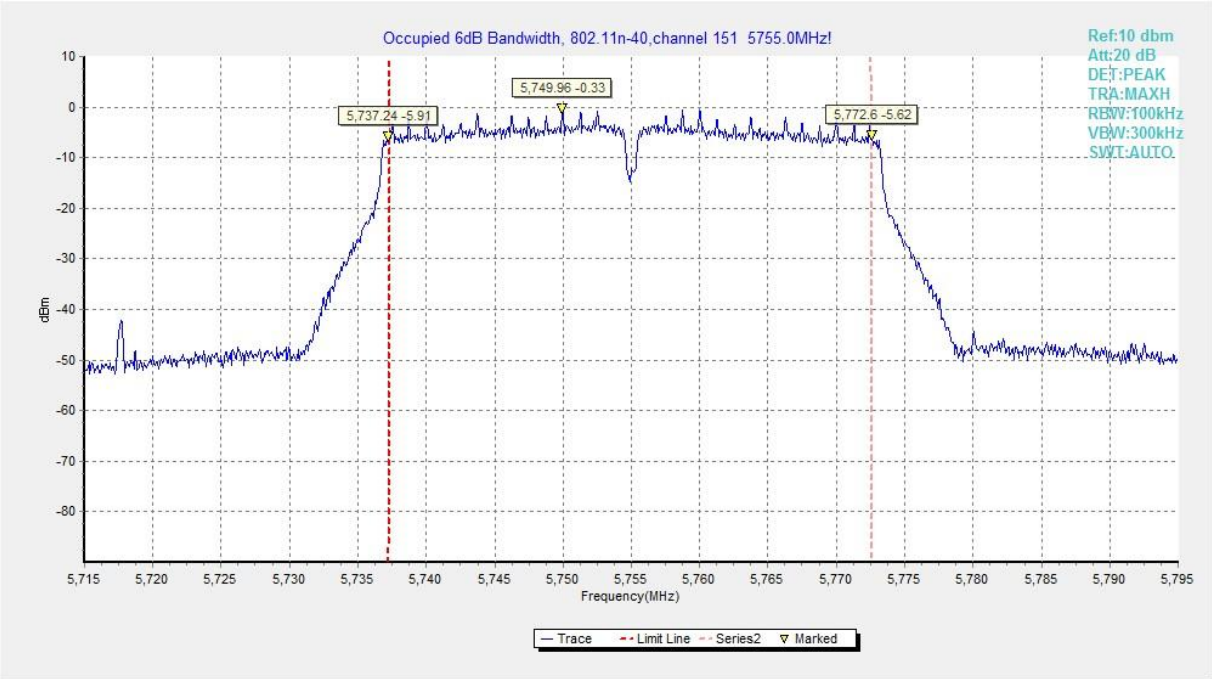


Fig. 24 Occupied 6dB Bandwidth (802.11n-HT40, 5755MHz)

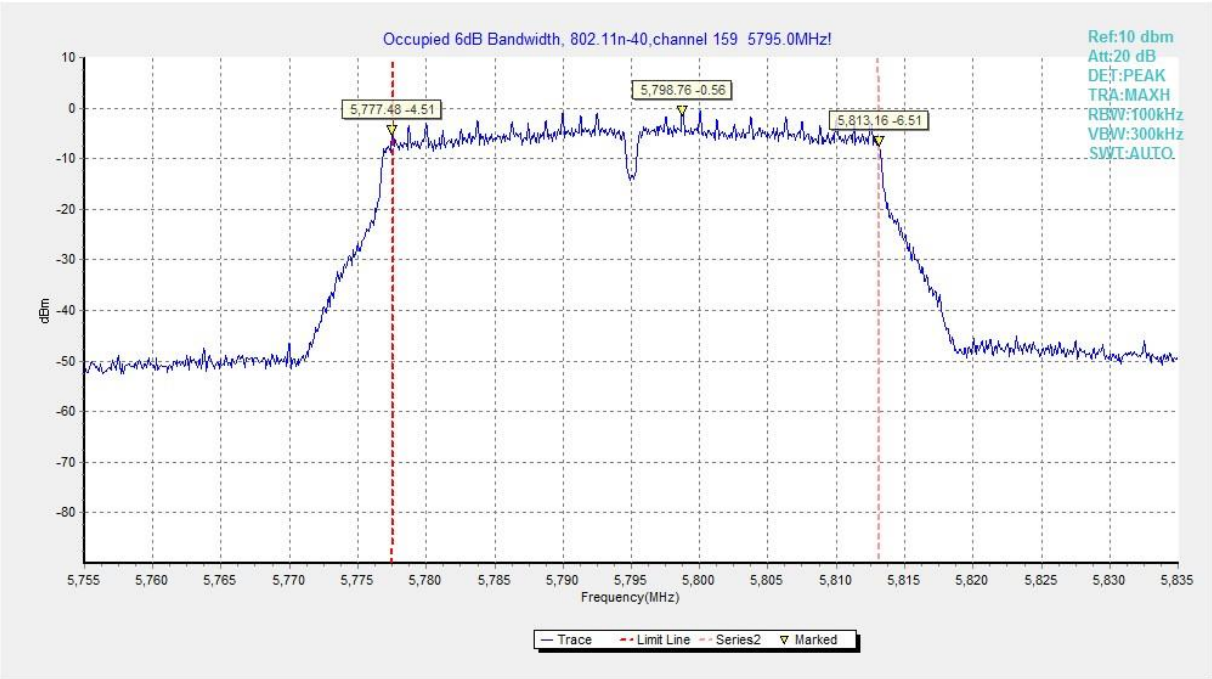


Fig. 25 Occupied 6dB Bandwidth (802.11n-HT40, 5795MHz)

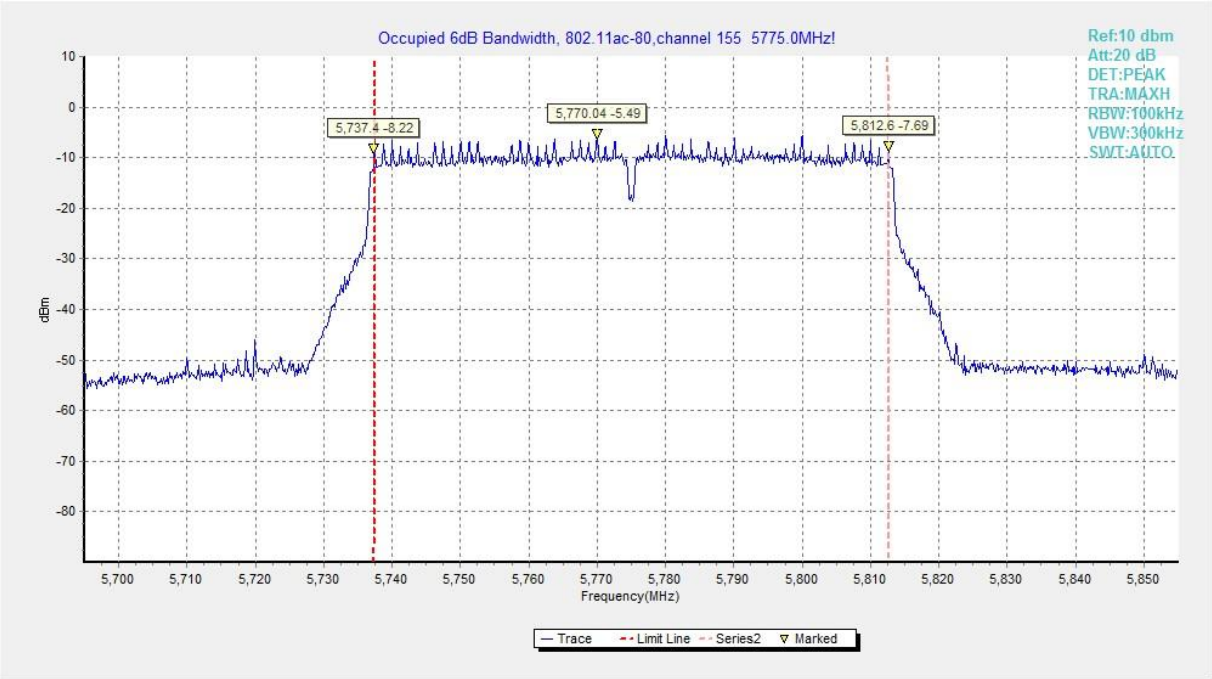


Fig. 26 Occupied 6dB Bandwidth (802.11ac-VHT80, 5775MHz)

A.6. 99% Occupied Bandwidth

Measurement Limit:

Standard	Limit (MHz)
RSS-Gen section 6.7	/

The measurement is made according to KDB 789033.

Measurement Result:

Mode	Channel	99% Occupied Bandwidth (MHz)		Conclusion
802.11a	5180MHz(Ch36)	Fig.27	17.42	**P**
	5200MHz(Ch40)	Fig.28	17.50	**P**
	5240MHz(Ch48)	Fig.29	17.54	**P**
	5260MHz(Ch52)	Fig.30	17.30	**P**
	5280MHz(Ch56)	Fig.31	17.50	**P**
	5320MHz(Ch64)	Fig.32	17.34	**P**
	5500MHz(Ch100)	Fig.33	17.30	**P**
	5580MHz(Ch116)	Fig.34	17.38	**P**
	5700MHz(Ch140)	Fig.35	17.34	**P**
802.11n HT40	5190MHz(Ch38)	Fig.36	36.36	**P**
	5230MHz(Ch46)	Fig.37	36.44	**P**
	5270MHz(Ch54)	Fig.38	36.36	**P**
	5310MHz(Ch62)	Fig.39	36.28	**P**
	5510MHz(Ch102)	Fig.40	36.36	**P**
	5550MHz(Ch110)	Fig.41	36.36	**P**
	5670MHz(Ch134)	Fig.42	36.36	**P**
802.11ac VHT80	5210MHz(Ch42)	Fig.43	75.76	**P**
	5290MHz(Ch58)	Fig.44	75.76	**P**
	5530MHz(Ch106)	Fig.45	75.76	**P**
	5610MHz(Ch122)	Fig.46	75.76	**P**

Conclusion: PASS

Test graphs as below:

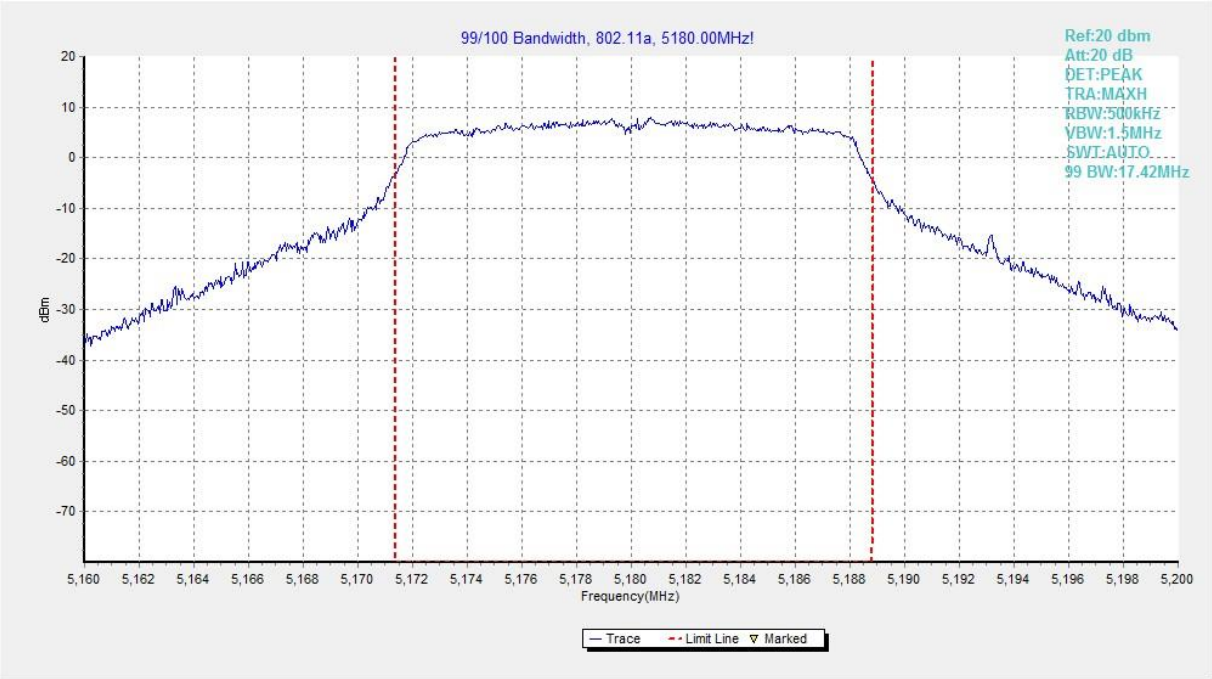


Fig. 27 99% Occupied Bandwidth (802.11a, 5180MHz)

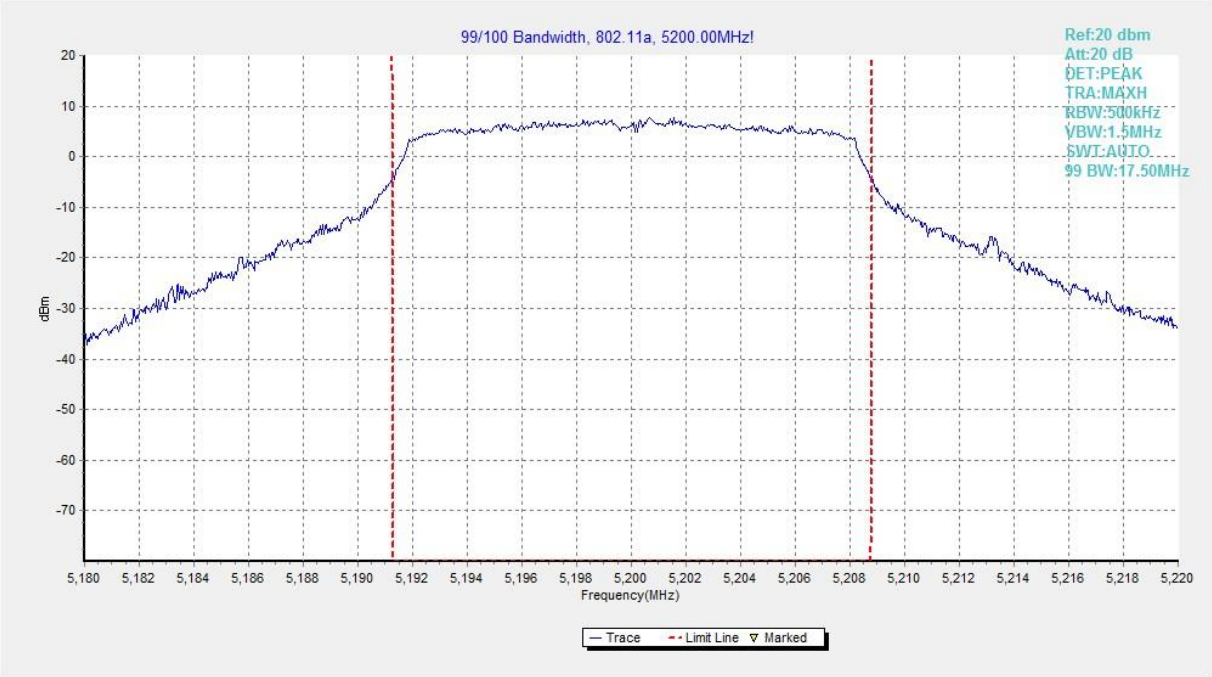


Fig. 28 99% Occupied Bandwidth (802.11a, 5200MHz)

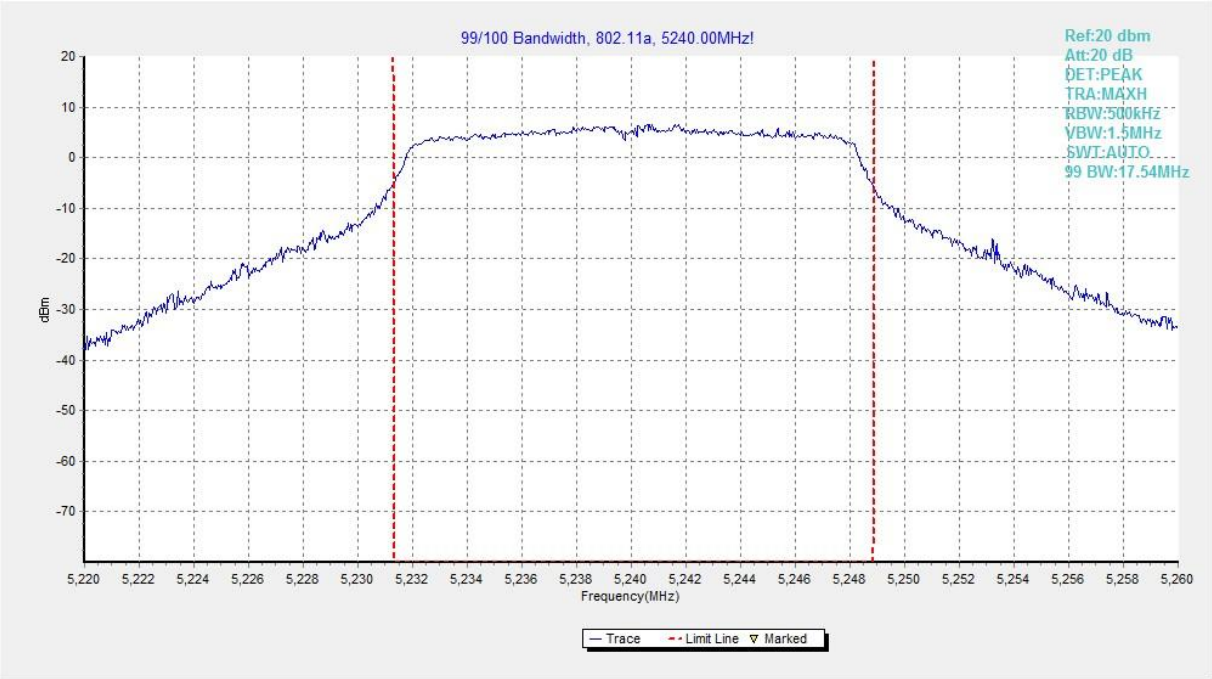


Fig. 29 99% Occupied Bandwidth (802.11a, 5240MHz)

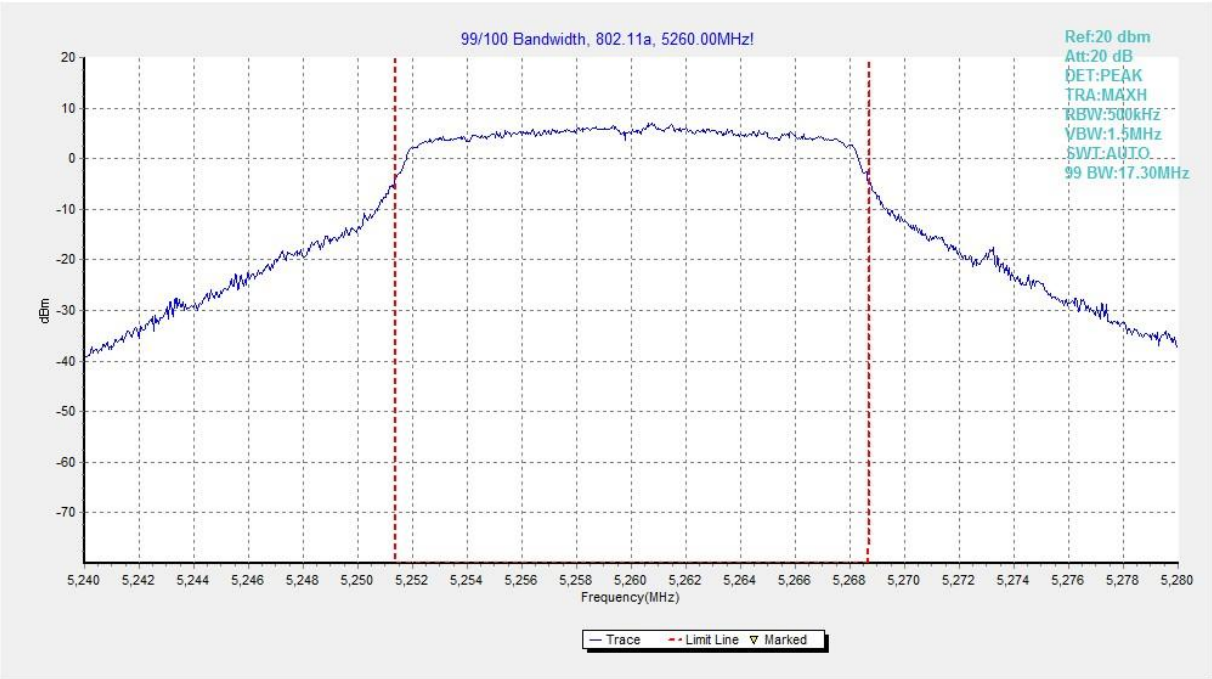


Fig. 30 99% Occupied Bandwidth (802.11a, 5260MHz)

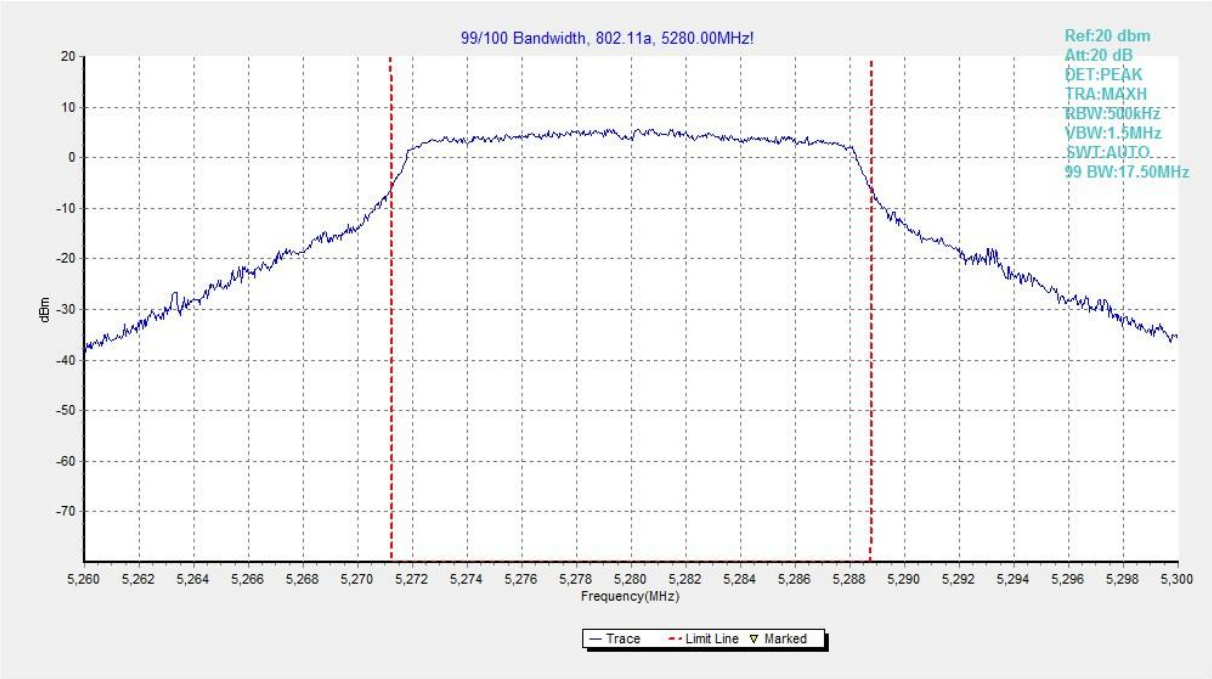


Fig. 31 99% Occupied Bandwidth (802.11a, 5280MHz)

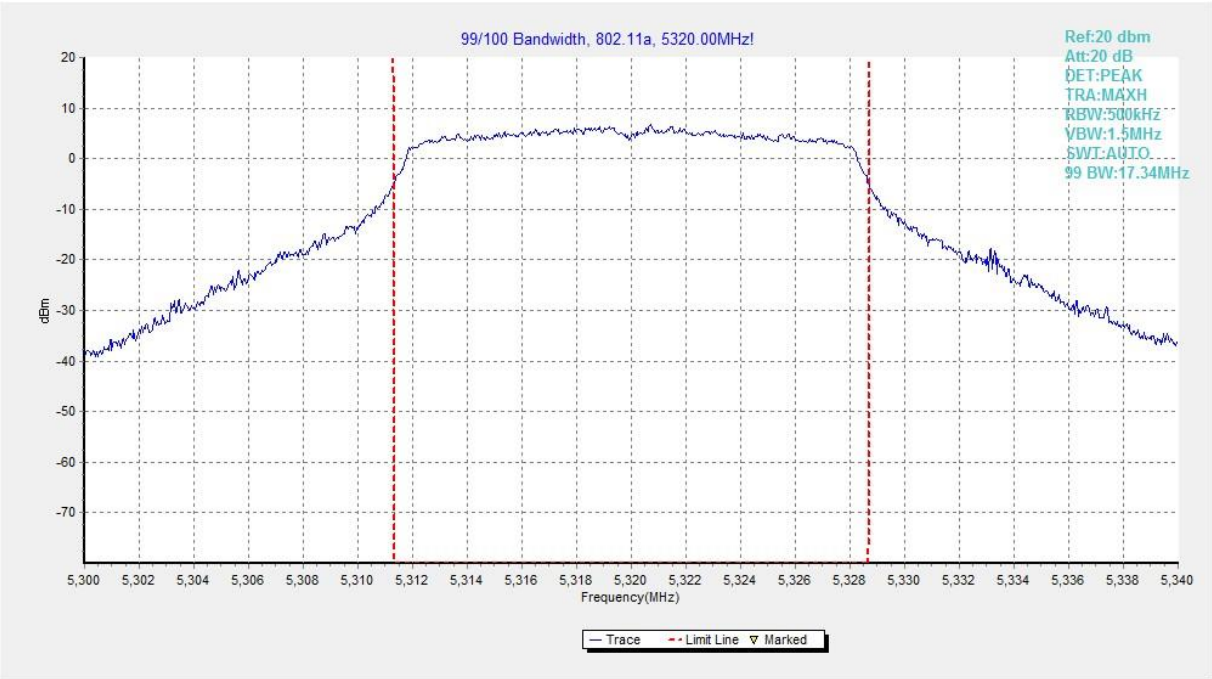


Fig. 32 99% Occupied Bandwidth (802.11a, 5320MHz)

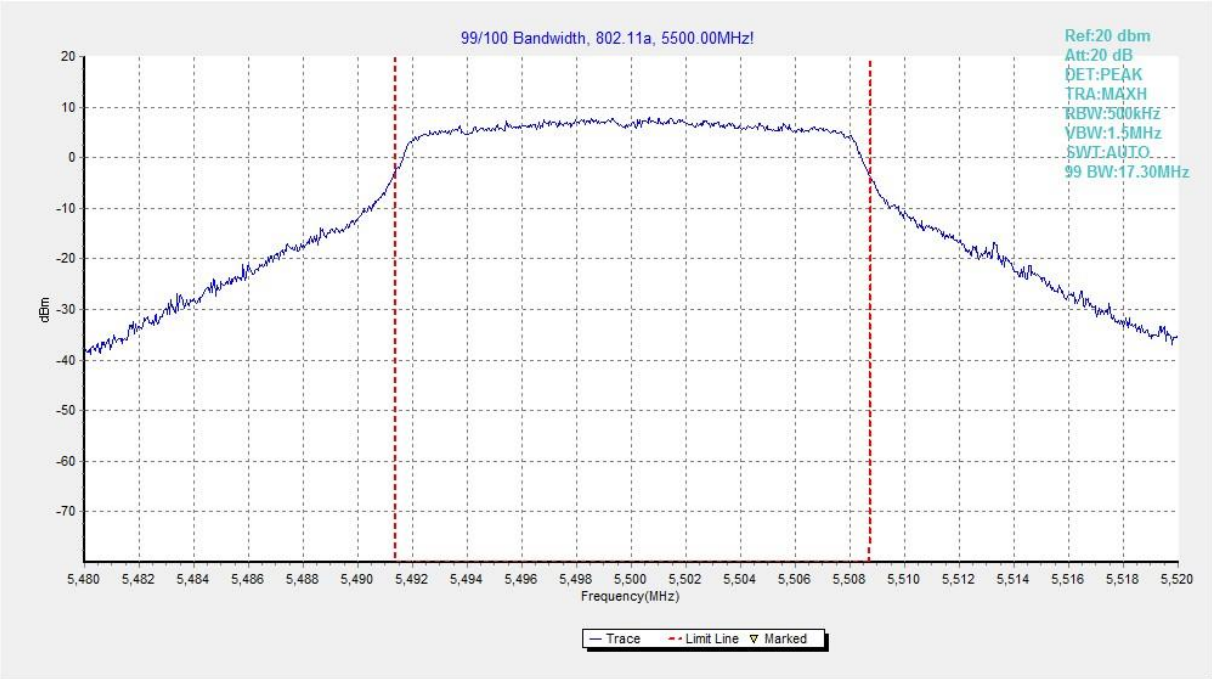


Fig. 33 99% Occupied Bandwidth (802. 11a, 5500MHz)

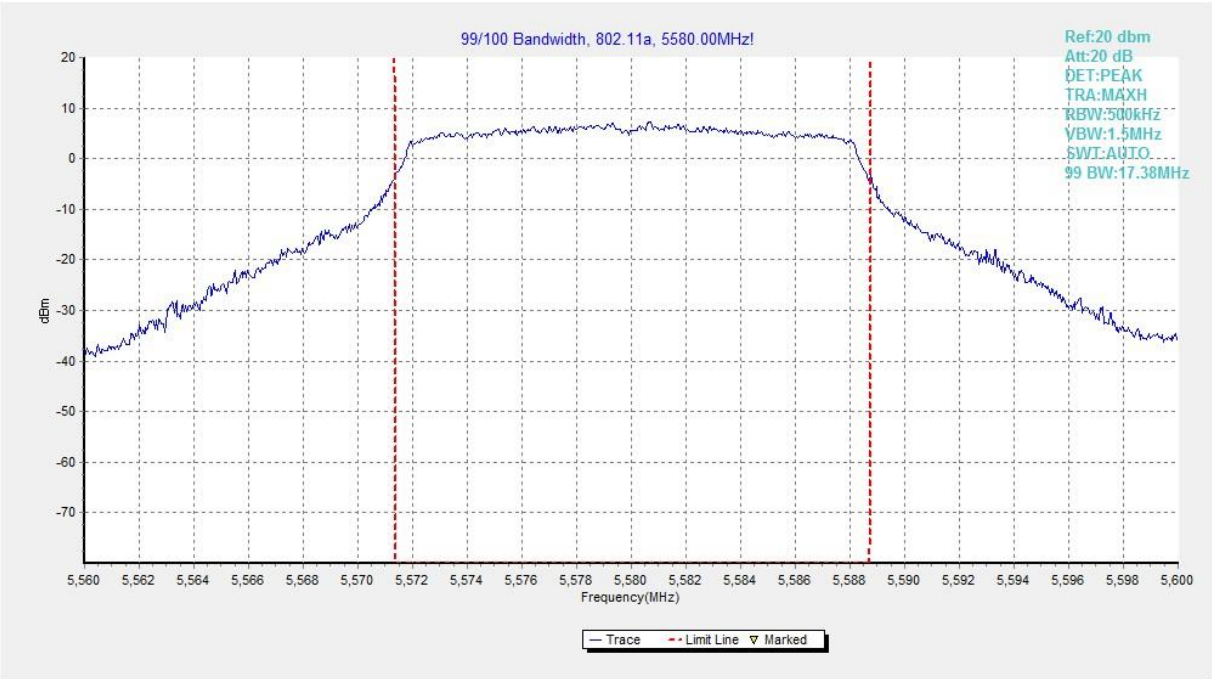


Fig. 34 99% Occupied Bandwidth (802. 11a, 5580MHz)

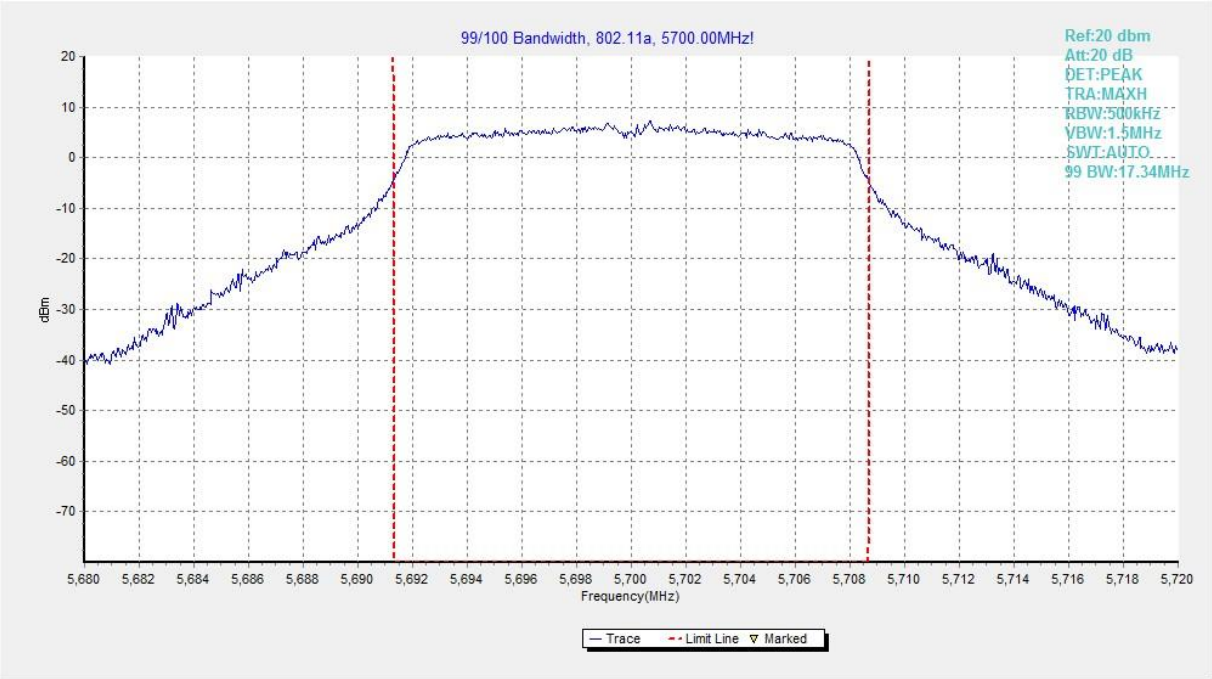


Fig. 35 99% Occupied Bandwidth (802. 11a, 5700MHz)

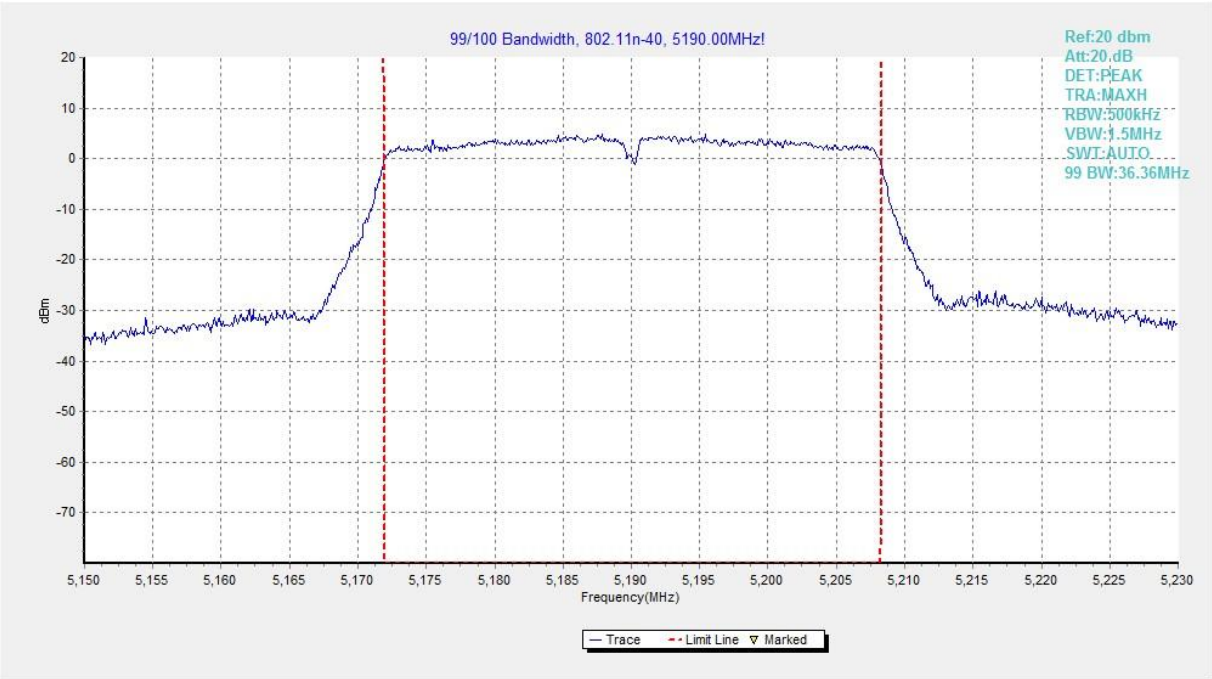


Fig. 36 99% Occupied Bandwidth (802.11n-HT40, 5190MHz)

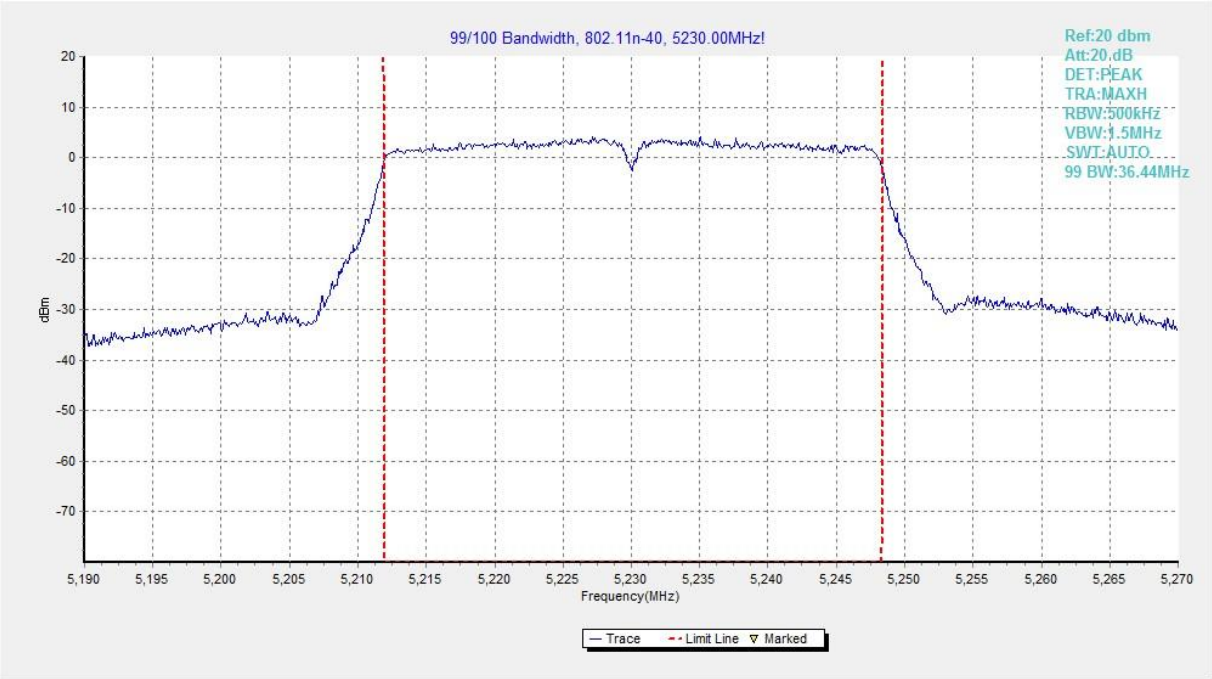


Fig. 37 99% Occupied Bandwidth (802.11n-HT40, 5230MHz)

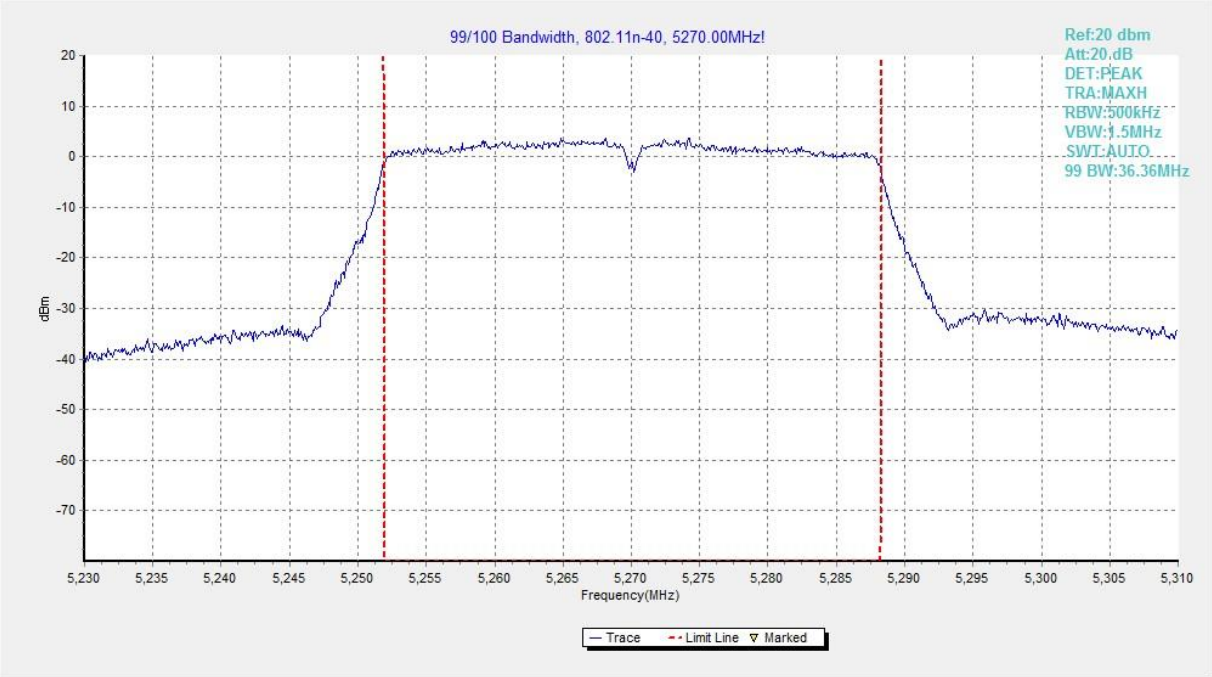


Fig. 38 99% Occupied Bandwidth (802.11n-HT40, 5270MHz)

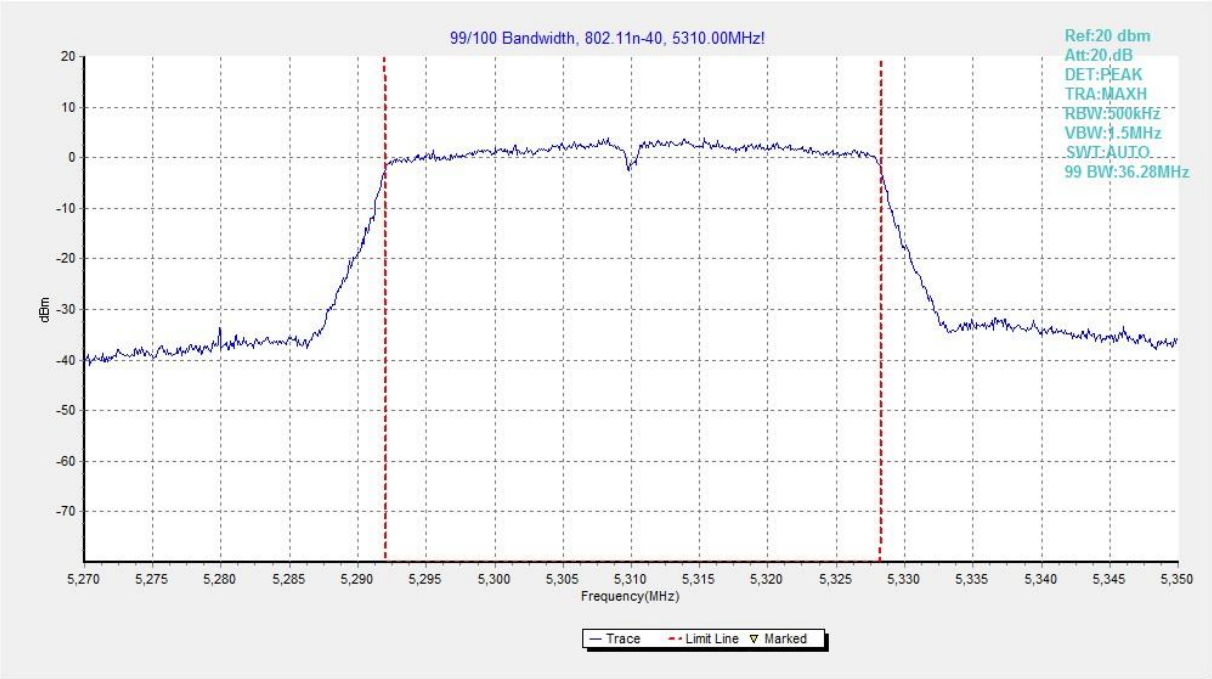


Fig. 39 99% Occupied Bandwidth (802.11n-HT40, 5310MHz)

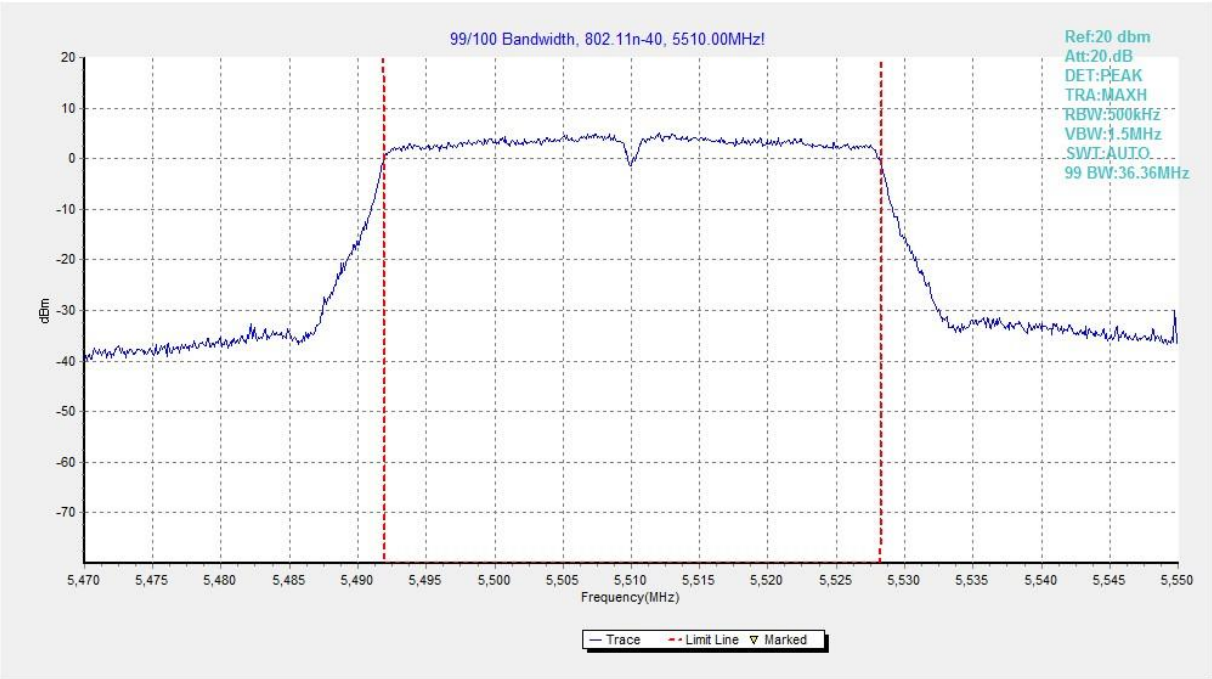


Fig. 40 99% Occupied Bandwidth (802. 11n-HT40, 5510MHz)

Fig. 41 99% Occupied Bandwidth (802. 11n-HT40, 5550MHz)

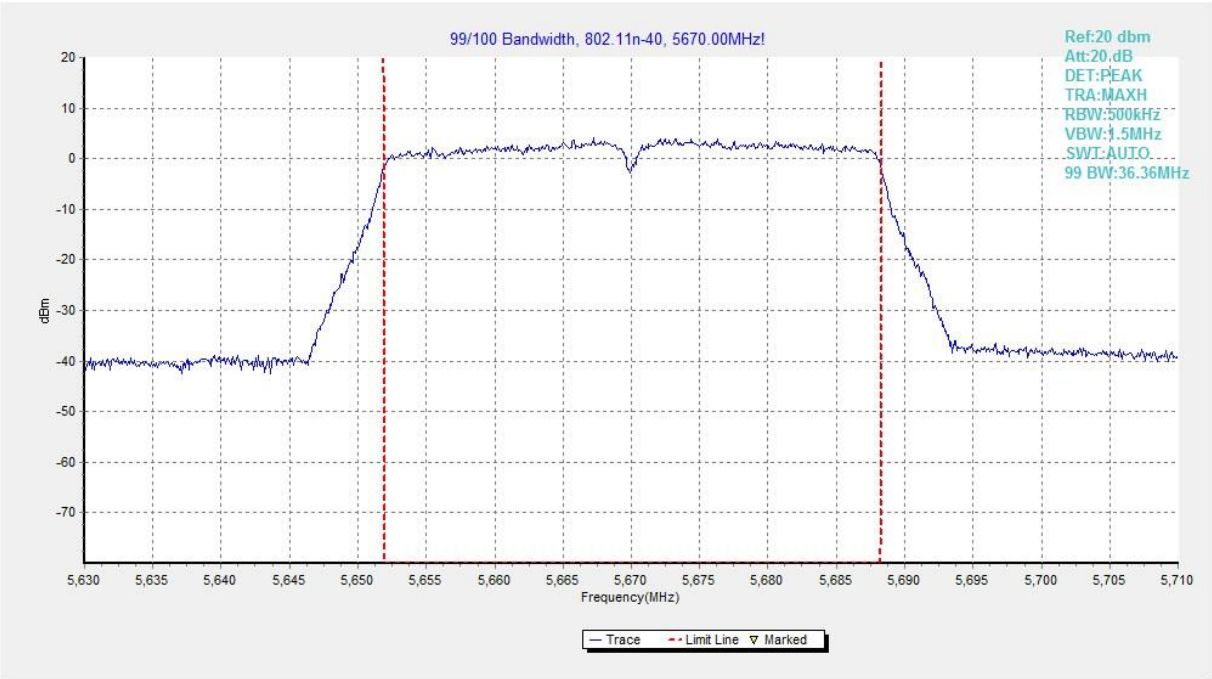


Fig. 42 99% Occupied Bandwidth (802. 11n-HT40, 5670MHz)

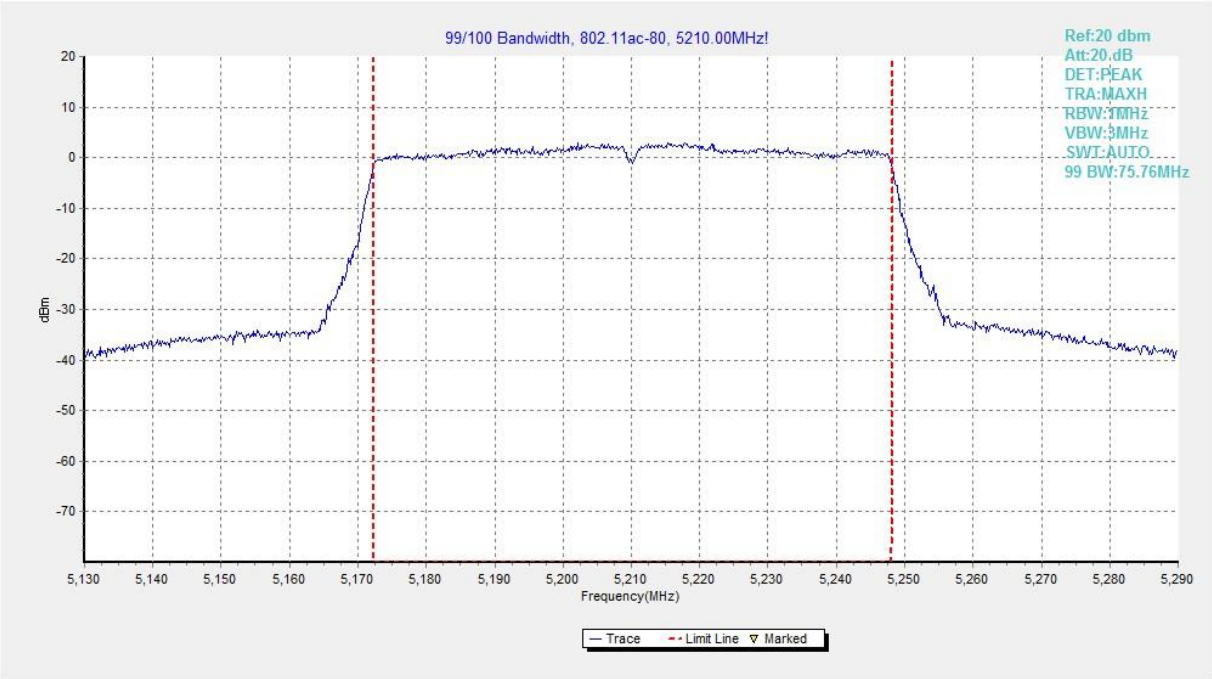


Fig. 43 99% Occupied Bandwidth (802. 11ac-VHT80, 5210MHz)

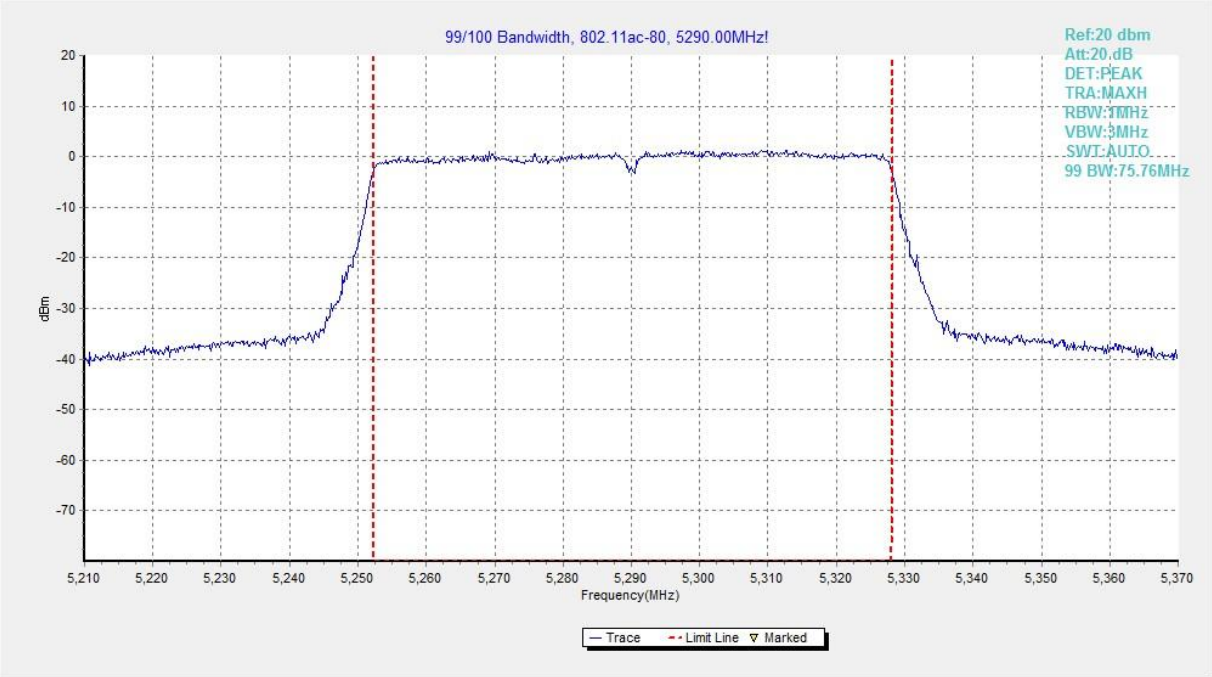


Fig. 44 99% Occupied Bandwidth (802. 11ac-VHT80, 5290MHz)

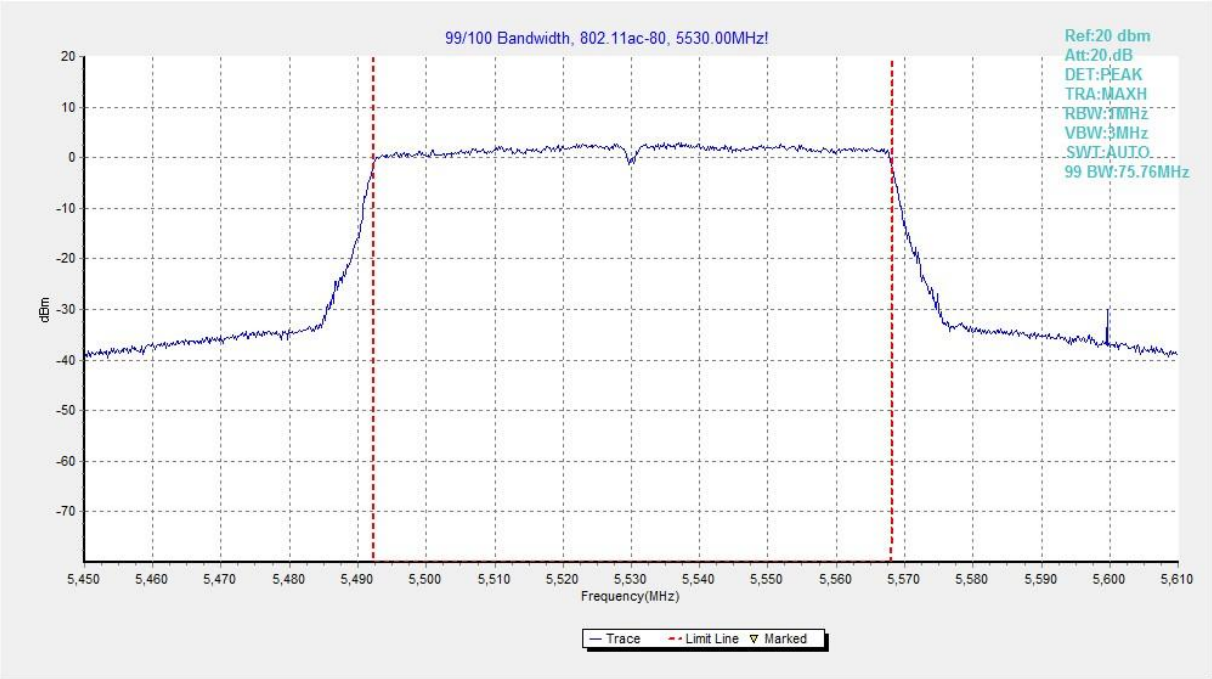


Fig. 45 99% Occupied Bandwidth (802. 11ac-VHT80, 5530MHz)

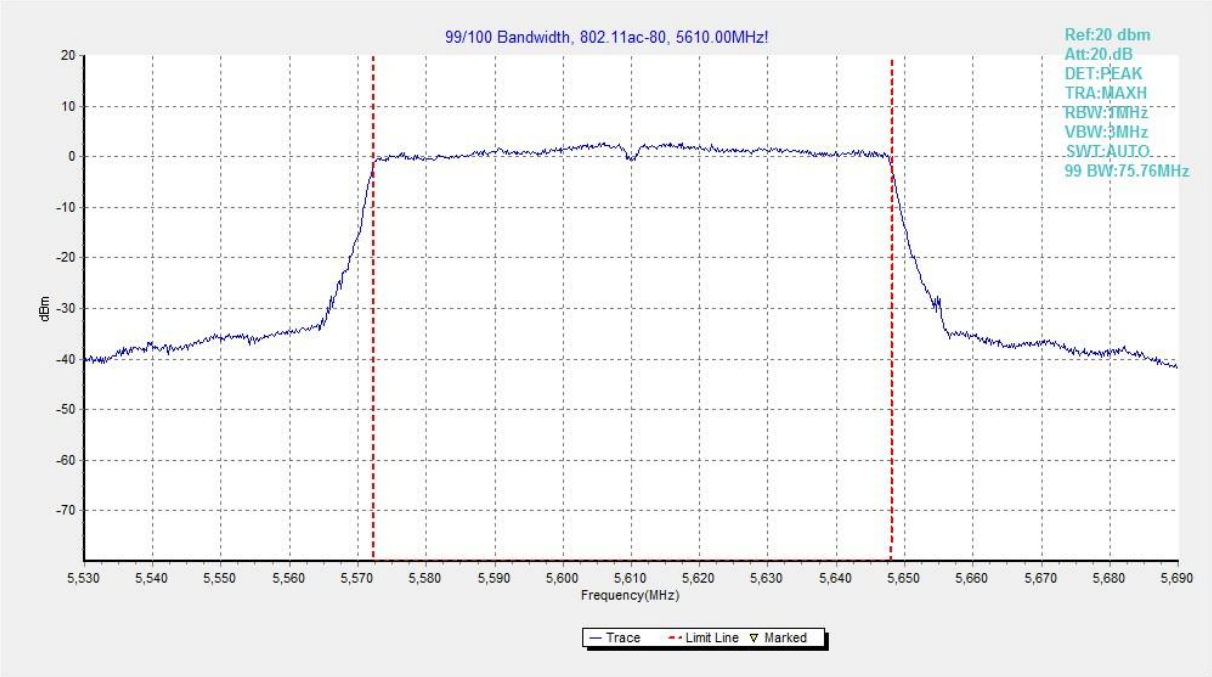


Fig. 46 99% Occupied Bandwidth (802. 11ac-VHT80, 5610MHz)

A.7. Band Edges Compliance

Measurement Limit:

Standard	Limit (dBuV/m)	
FCC 47 CFR Part 15.209 & RSS-247 section 5.5	Peak	74
	Average	54

The measurement is made according to KDB 789033.

Measurement Result:

Mode	Channel	Test Results	Conclusion
802.11a	5180 MHz (CH36)	Fig.47	**P**
	5320 MHz (CH64)	Fig.48	**P**
	5500 MHz (CH100)	Fig.49	**P**
	5700 MHz (CH140)	Fig.50	**P**
	5745 MHz (CH149)	Fig.51	**P**
	5825 MHz (CH165)	Fig.52	**P**
802.11n HT40	5190 MHz (CH38)	Fig.53	**P**
	5310 MHz (CH62)	Fig.54	**P**
	5510 MHz (CH102)	Fig.55	**P**
	5670 MHz (CH134)	Fig.56	**P**
	5755 MHz (CH151)	Fig.57	**P**
	5795 MHz (CH159)	Fig.58	**P**
802.11ac VHT80	5210 MHz (CH42)	Fig.59	**P**
	5290 MHz (CH58)	Fig.60	**P**
	5530 MHz (CH106)	Fig.61	**P**
	5610MHz (Ch122)	Fig.62	**P**
	5775 MHz (CH155)	Fig.63	**P**

Conclusion: PASS

Test graphs as below:

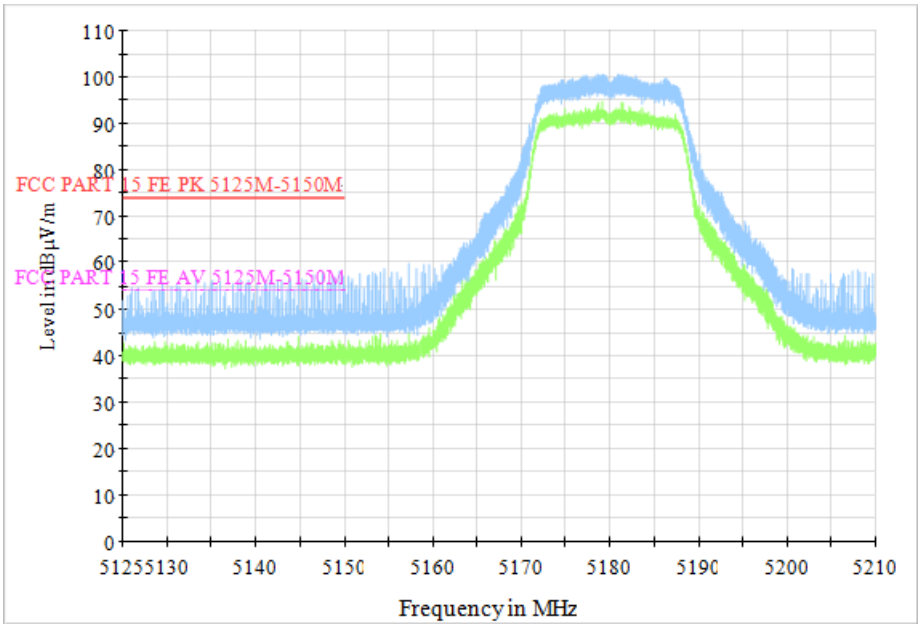


Fig. 47 Band Edges (802.11a, CH36 5180MHz)

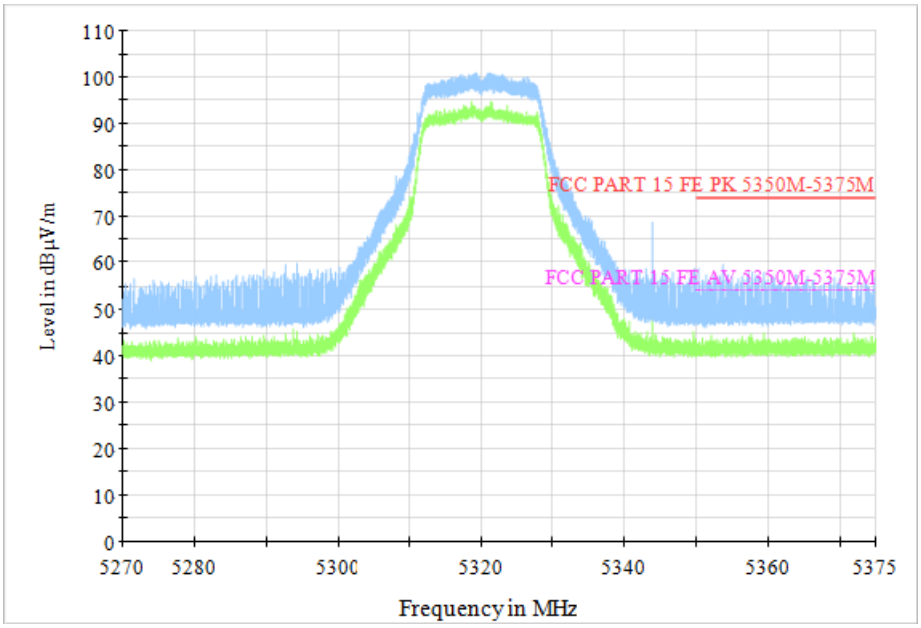


Fig. 48 Band Edges (802.11a, CH64 5320MHz)

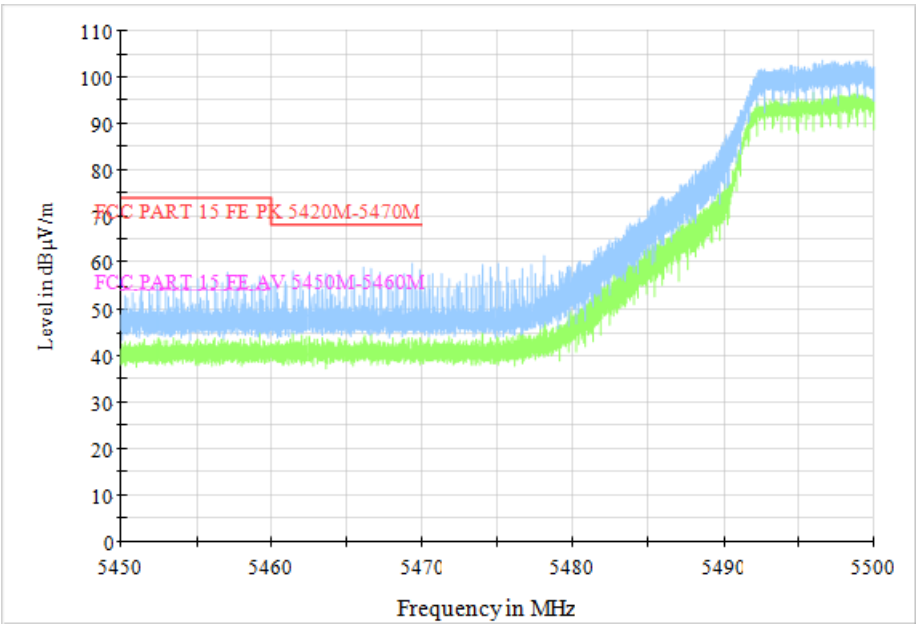


Fig. 49 Band Edges (802.11a, CH100 5500MHz)

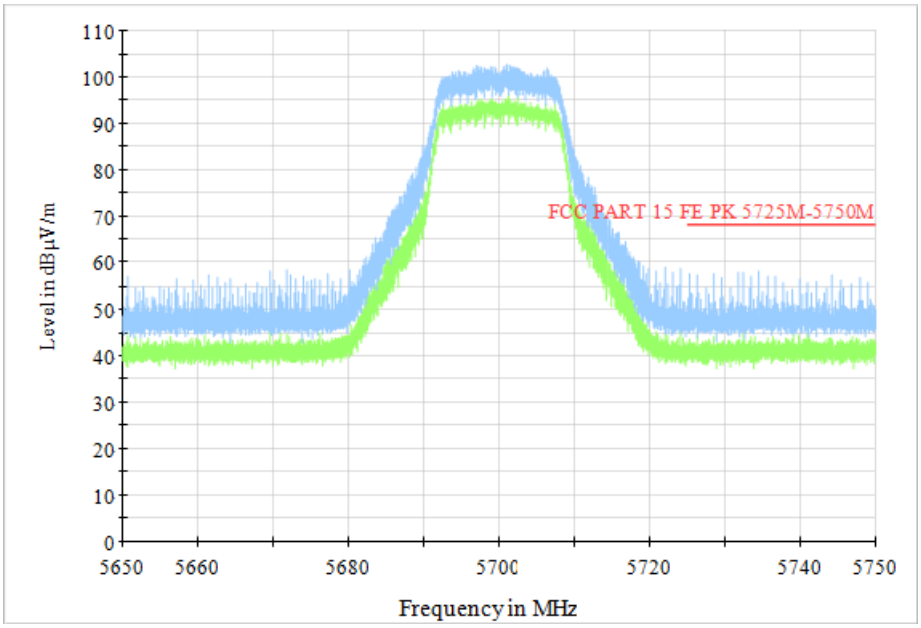


Fig. 50 Band Edges (802.11a, CH140 5700MHz)

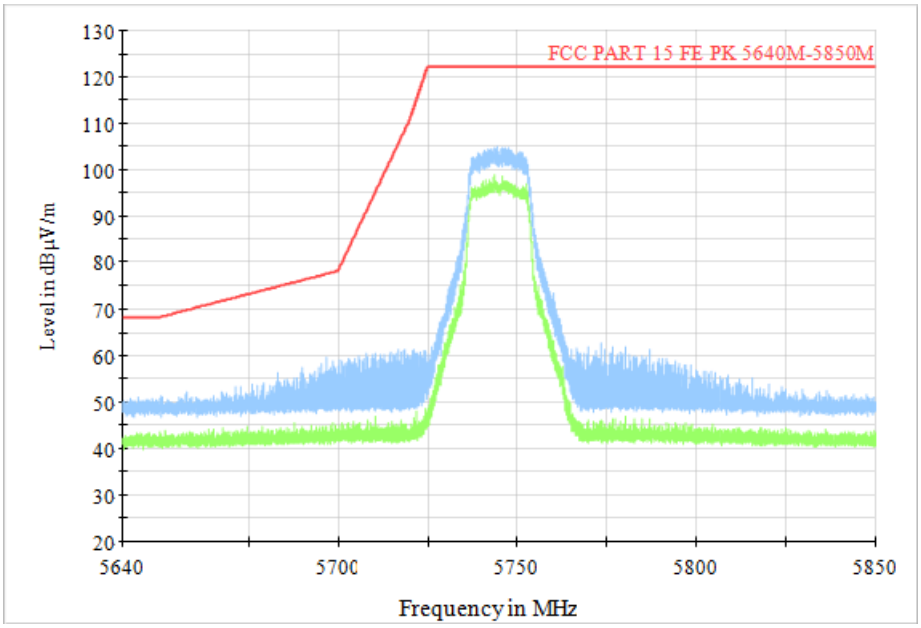


Fig. 51 Band Edges (802.11a, CH149 5745MHz)

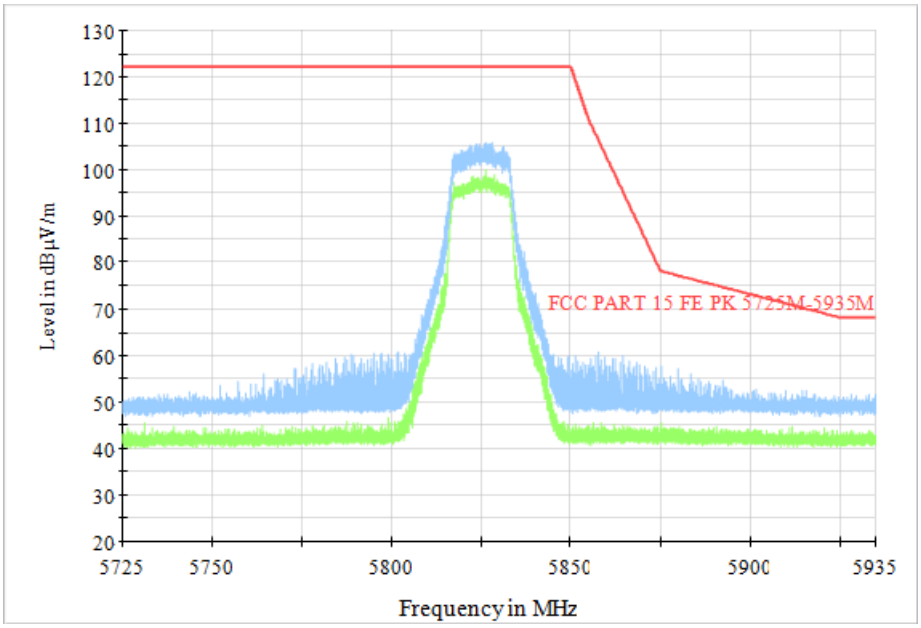


Fig. 52 Band Edges (802.11a, CH165 5825MHz)

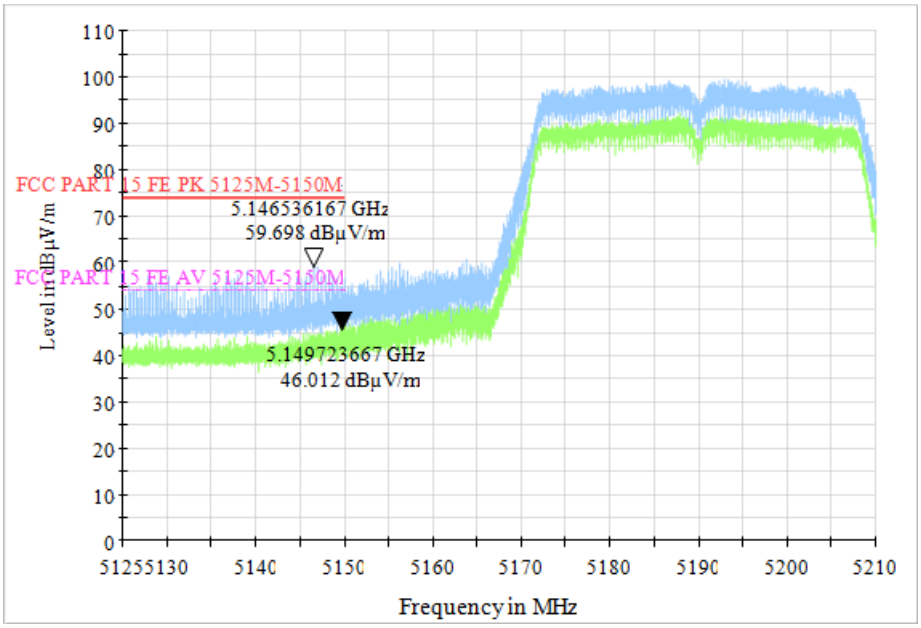


Fig. 53 Band Edges (802.11n-HT40, CH38 5190MHz)

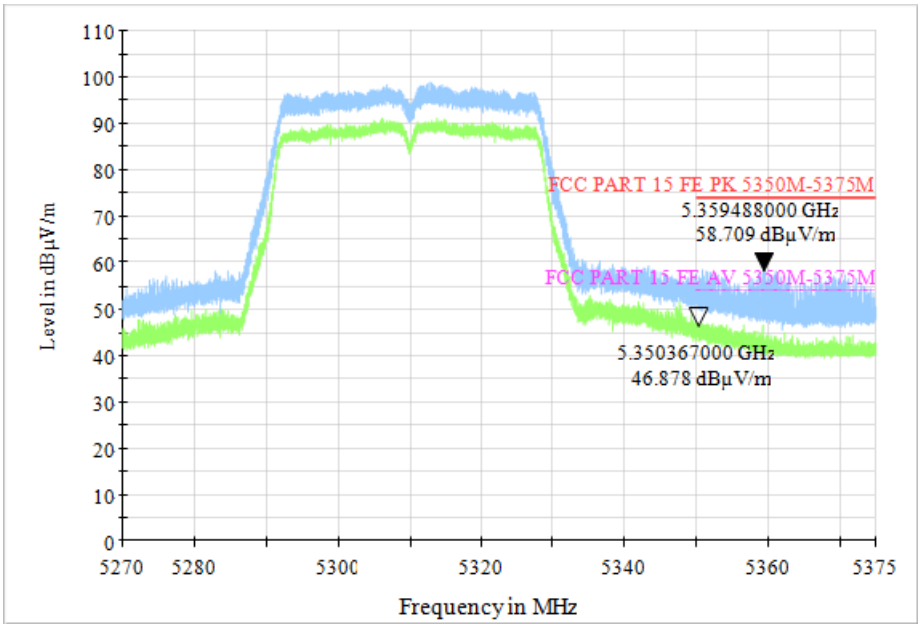


Fig. 54 Band Edges (802.11n-HT40, CH62 5310MHz)

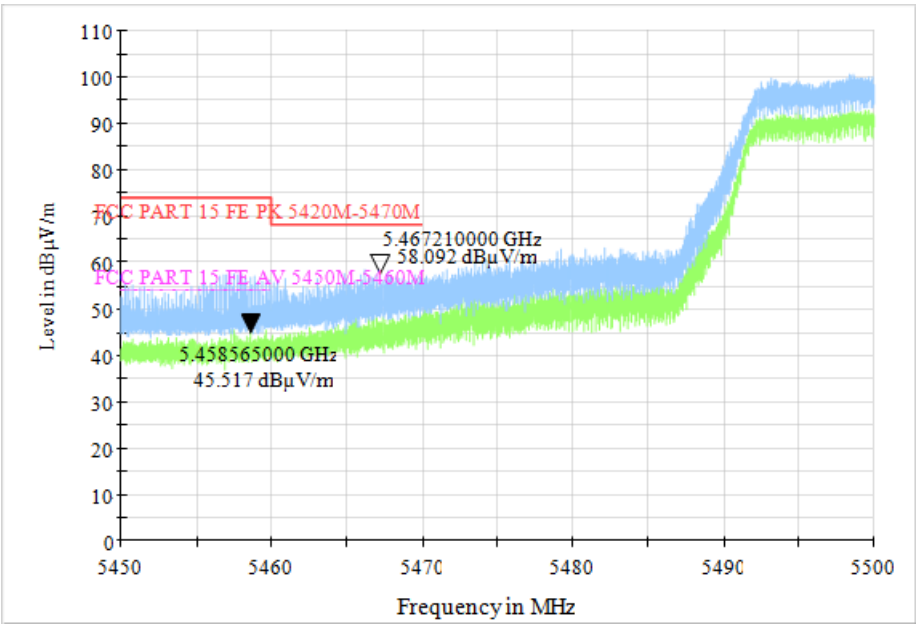


Fig. 55 Band Edges (802.11n-HT40, CH102 5510MHz)

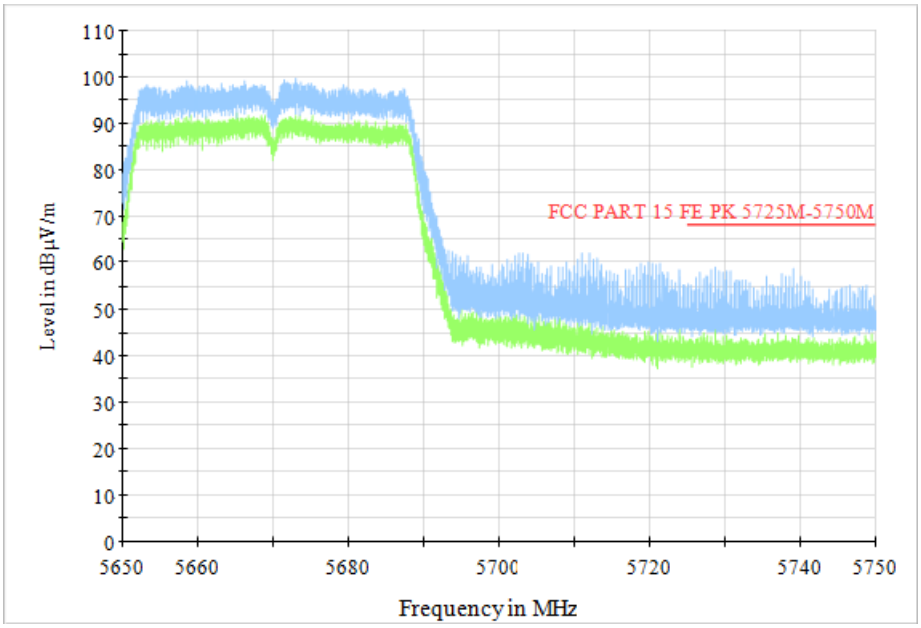


Fig. 56 Band Edges (802.11n-HT40, CH134 5670MHz)

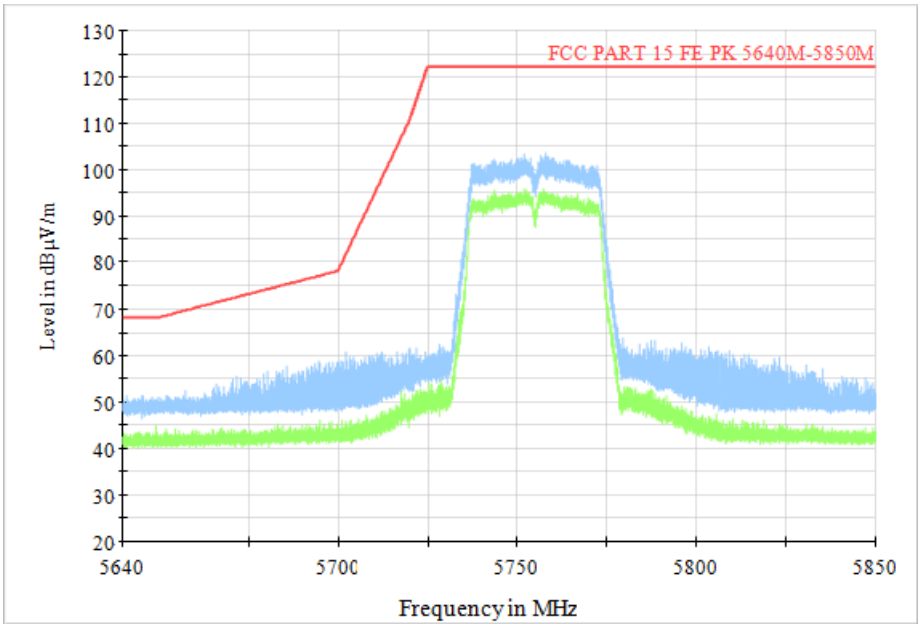


Fig. 57 Band Edges (802.11n-HT40, CH151 5755MHz)

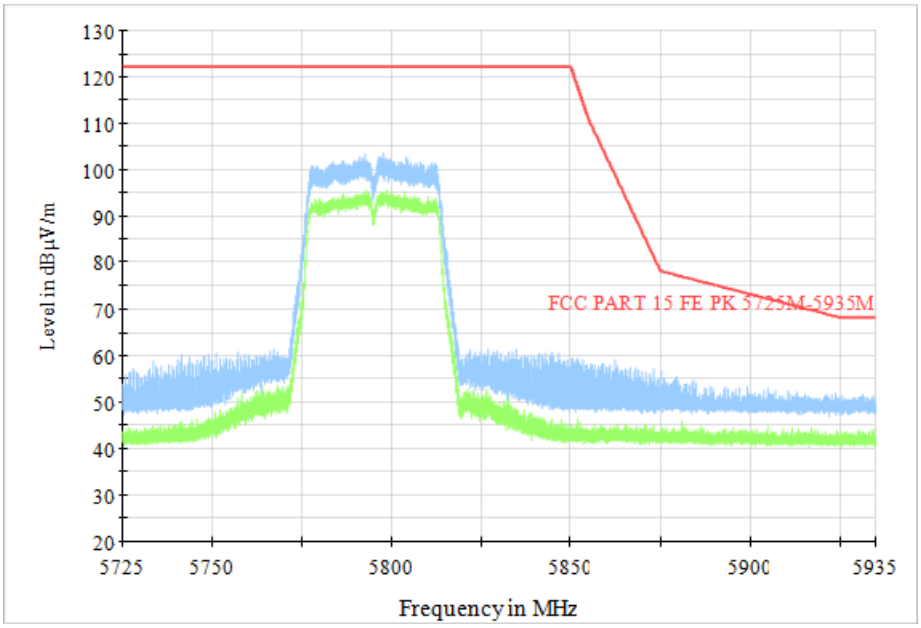


Fig. 58 Band Edges (802.11n-HT40, CH159 5795MHz)

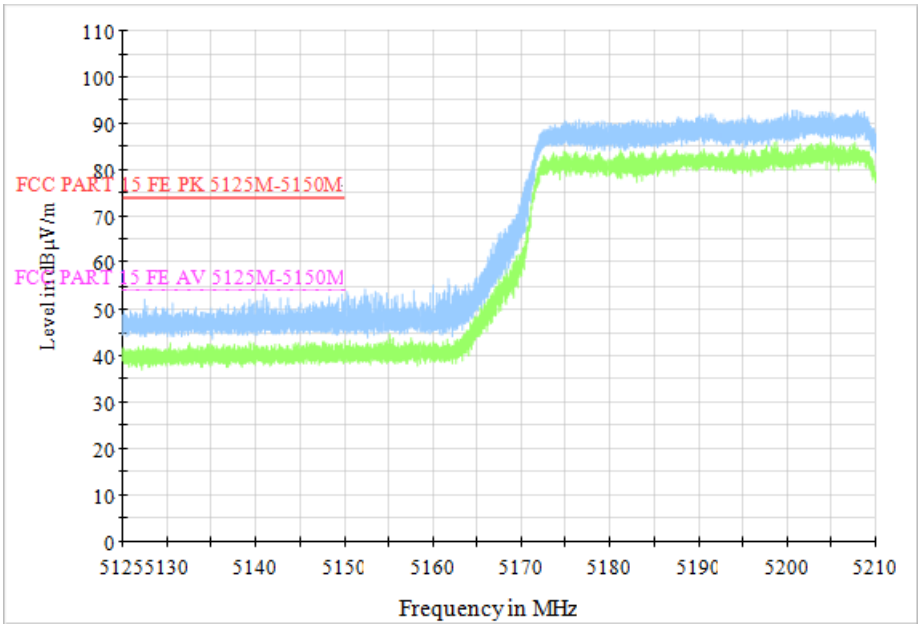


Fig. 59 Band Edges (802.11ac-VHT80, CH42 5210MHz)

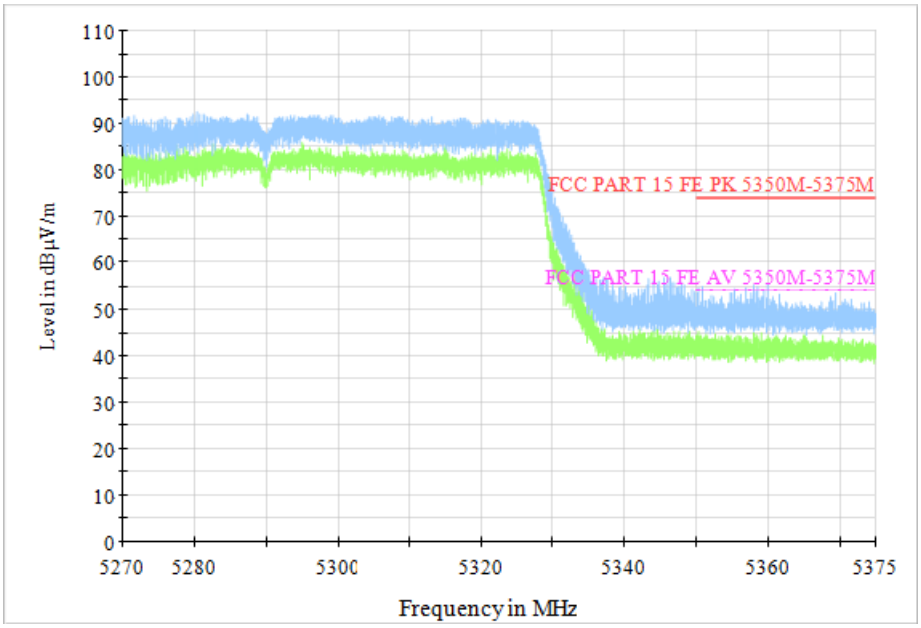


Fig. 60 Band Edges (802.11ac-VHT80, CH58 5290MHz)

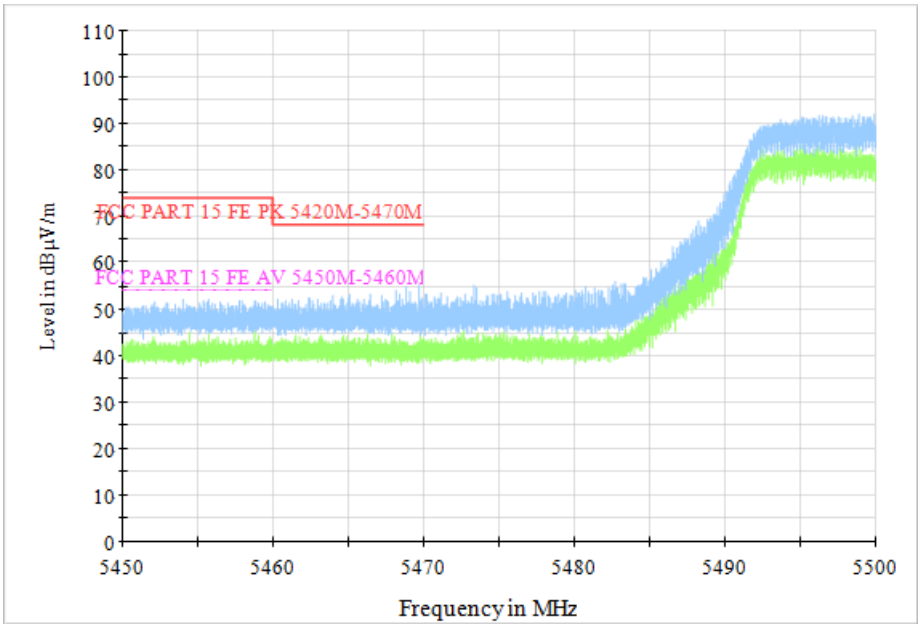


Fig. 61 Band Edges (802.11ac-VHT80, CH106 5530MHz)

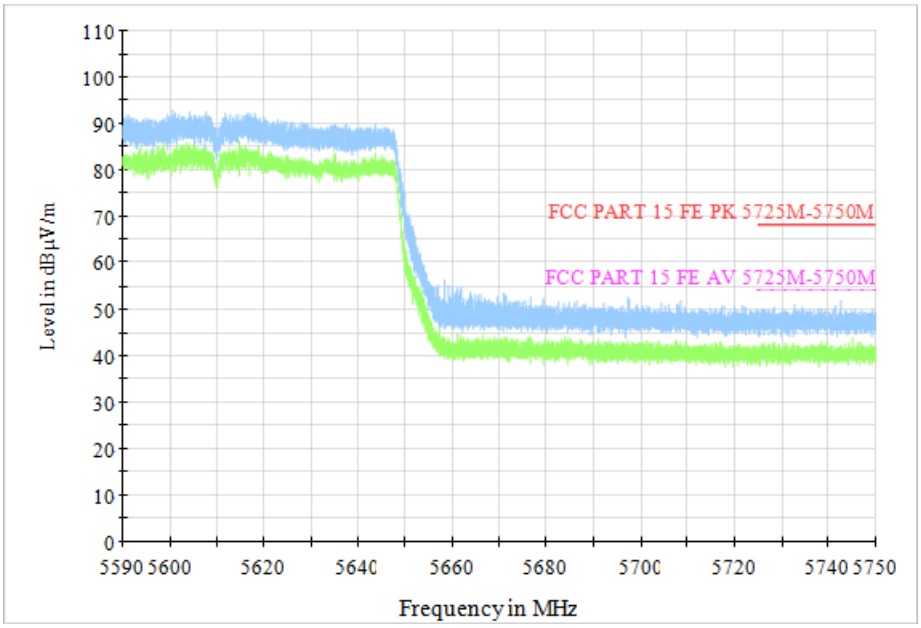


Fig. 62 Band Edges (802.11ac-VHT80, CH122 5610MHz)

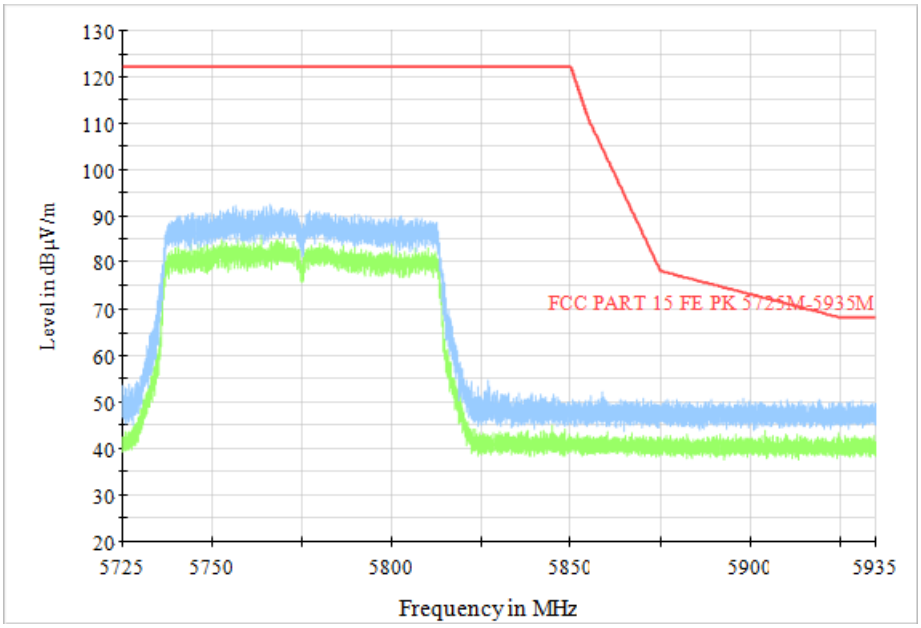


Fig. 63 Band Edges (802.11ac-VHT80, CH155 5775MHz)

A.8. Transmitter Spurious Emission

Measurement Limit:

Standard	Limit (dBm/MHz)
FCC 47 CFR Part 15.407, 15.205 & RSS-247 section 5.5/RSS-Gen section 6.13	< -27

The measurement is made according to KDB 789033.

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

Limit in restricted band:

Frequency of emission (MHz)	Field strength (dBμV/m)	Measurement distance (m)
30-88	40.0	3
88-216	43.5	3
216-960	46.0	3
Above 960	54.0	3

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

Measurement Result:

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11a	5180MHz (Ch36)	3 GHz ~7 GHz	Fig.64	**P**
		7 GHz ~18 GHz	Fig.65	**P**
	5200MHz (Ch40)	3 GHz ~7 GHz	Fig.66	**P**
		7 GHz ~18 GHz	Fig.67	**P**
	5240MHz (Ch48)	3 GHz ~7 GHz	Fig.68	**P**
		7 GHz ~18 GHz	Fig.69	**P**
	5260MHz (Ch52)	3 GHz ~7 GHz	Fig.70	**P**
		7 GHz ~18 GHz	Fig.71	**P**
	5280MHz (Ch56)	3 GHz ~7 GHz	Fig.72	**P**
		7 GHz ~18 GHz	Fig.73	**P**
	5320MHz (Ch64)	3 GHz ~7 GHz	Fig.74	**P**
		7 GHz ~18 GHz	Fig.75	**P**
	5500MHz (Ch100)	3 GHz ~7 GHz	Fig.76	**P**
		7 GHz ~18 GHz	Fig.77	**P**
	5600MHz (Ch120)	3 GHz ~7 GHz	Fig.78	**P**
		7 GHz ~18 GHz	Fig.79	**P**
	5700MHz (Ch140)	3 GHz ~7 GHz	Fig.80	**P**
		7 GHz ~18 GHz	Fig.81	**P**
	5745MHz (Ch149)	3 GHz ~7 GHz	Fig.82	**P**
		7 GHz ~18 GHz	Fig.83	**P**

	5785MHz (Ch157)	3 GHz ~7 GHz	Fig.84	**P**
		7 GHz ~18 GHz	Fig.85	**P**
	5825MHz (Ch165)	3 GHz ~7 GHz	Fig.86	**P**
		7 GHz ~18 GHz	Fig.87	**P**
802.11n HT40	5190MHz (Ch38)	3 GHz ~7 GHz	Fig.88	**P**
		7 GHz ~18 GHz	Fig.89	**P**
	5230MHz (Ch46)	3 GHz ~7 GHz	Fig.90	**P**
		7 GHz ~18 GHz	Fig.91	**P**
	5270MHz (Ch54)	3 GHz ~7 GHz	Fig.92	**P**
		7 GHz ~18 GHz	Fig.93	**P**
	5310MHz (Ch62)	3 GHz ~7 GHz	Fig.94	**P**
		7 GHz ~18 GHz	Fig.95	**P**
	5510MHz (Ch102)	3 GHz ~7 GHz	Fig.96	**P**
		7 GHz ~18 GHz	Fig.97	**P**
	5550MHz (Ch110)	3 GHz ~7 GHz	Fig.98	**P**
		7 GHz ~18 GHz	Fig.99	**P**
	5670MHz (Ch134)	3 GHz ~7 GHz	Fig.100	**P**
		7 GHz ~18 GHz	Fig.101	**P**
	5755MHz (Ch151)	3 GHz ~7 GHz	Fig.102	**P**
		7 GHz ~18 GHz	Fig.103	**P**
	5795MHz (Ch159)	3 GHz ~7 GHz	Fig.104	**P**
		7 GHz ~18 GHz	Fig.105	**P**
802.11ac VHT80	5210MHz (Ch42)	3 GHz ~7 GHz	Fig.106	**P**
		7 GHz ~18 GHz	Fig.107	**P**
	5290MHz (Ch58)	3 GHz ~7 GHz	Fig.108	**P**
		7 GHz ~18 GHz	Fig.109	**P**
	5530MHz (Ch106)	3 GHz ~7 GHz	Fig.110	**P**
		7 GHz ~18 GHz	Fig.111	**P**
	5610MHz (Ch122)	3 GHz ~7 GHz	Fig.112	**P**
		7 GHz ~18 GHz	Fig.113	**P**
	5775MHz (Ch155)	3 GHz ~7 GHz	Fig.114	**P**
		7 GHz ~18 GHz	Fig.115	**P**
All channels		30 MHz ~1 GHz	Fig.116	**P**
		1 GHz ~3 GHz	Fig.117	**P**
		18 GHz ~26.5 GHz	Fig.118	**P**
		26.5GHz~40GHz	Fig.119	**P**

Conclusion: PASS

Test graphs as below:

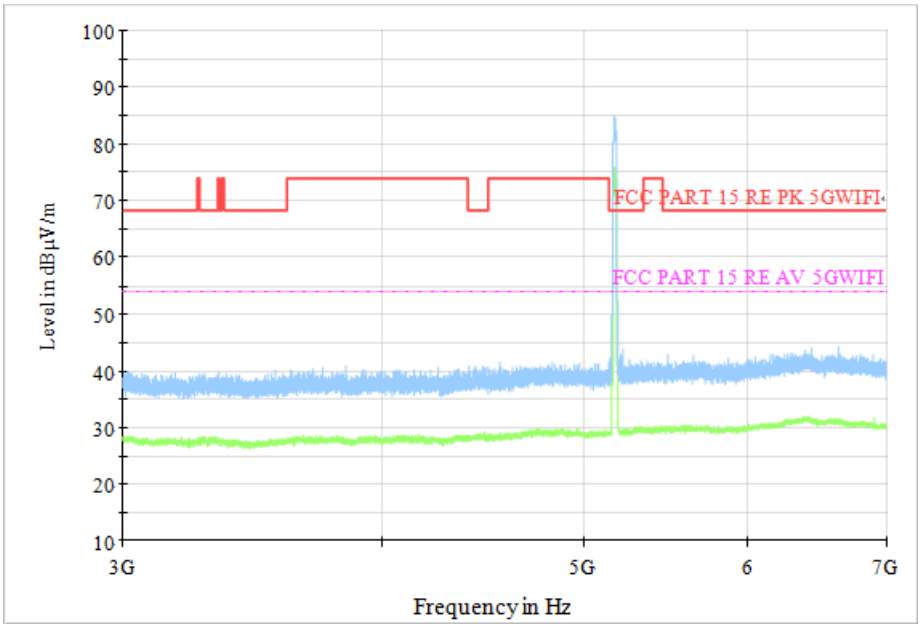


Fig. 64 Transmitter Spurious Emission (802.11a, CH36 5180MHz)

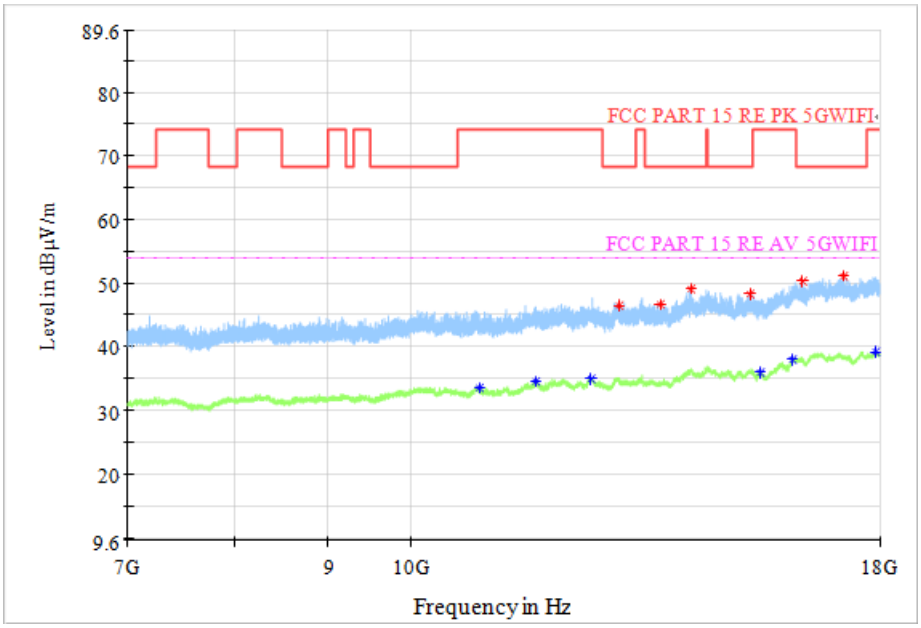


Fig. 65 Transmitter Spurious Emission (802.11a, CH36 5180MHz)

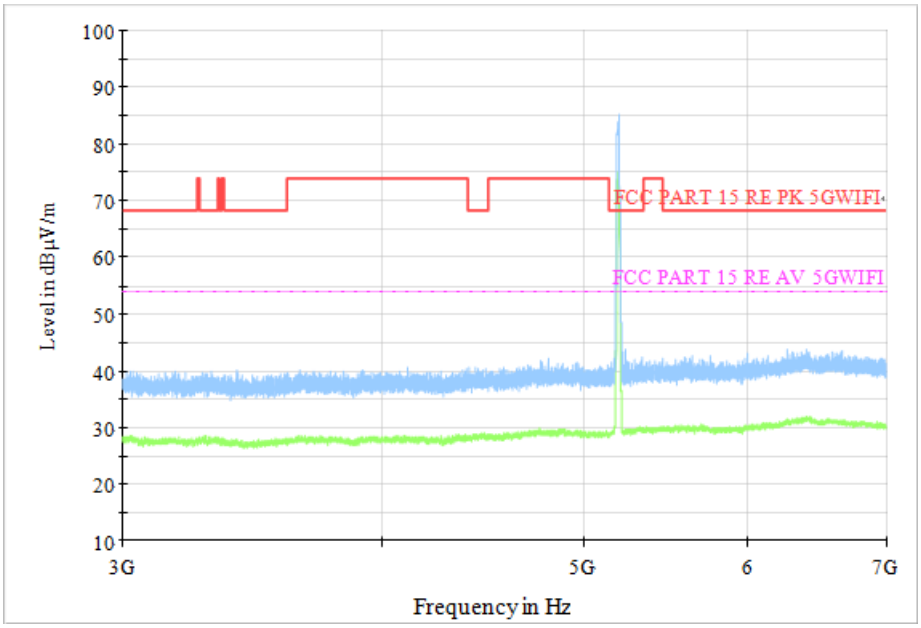


Fig. 66 Transmitter Spurious Emission (802.11a, CH40 5200MHz)

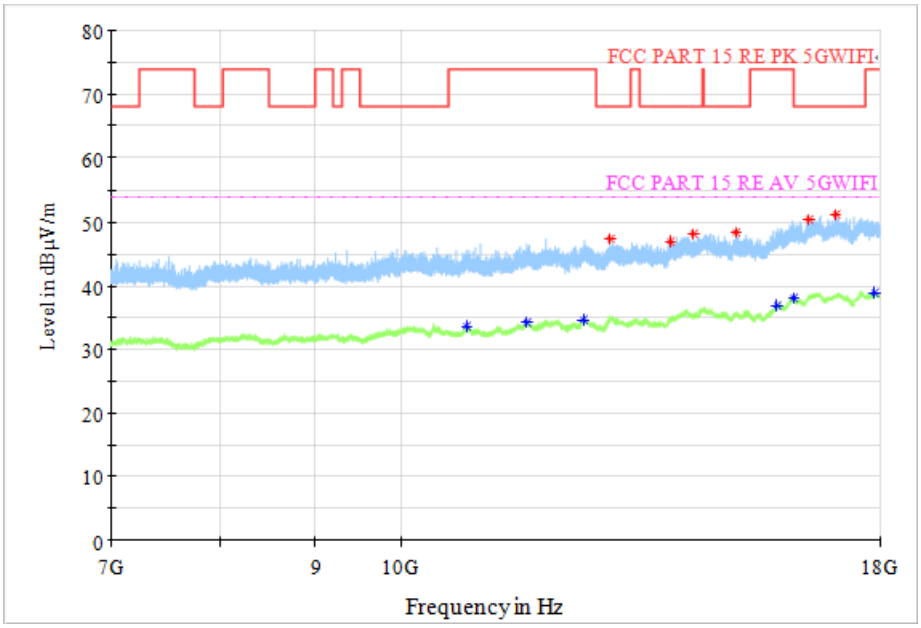


Fig. 67 Transmitter Spurious Emission (802.11a, CH40 5200MHz)

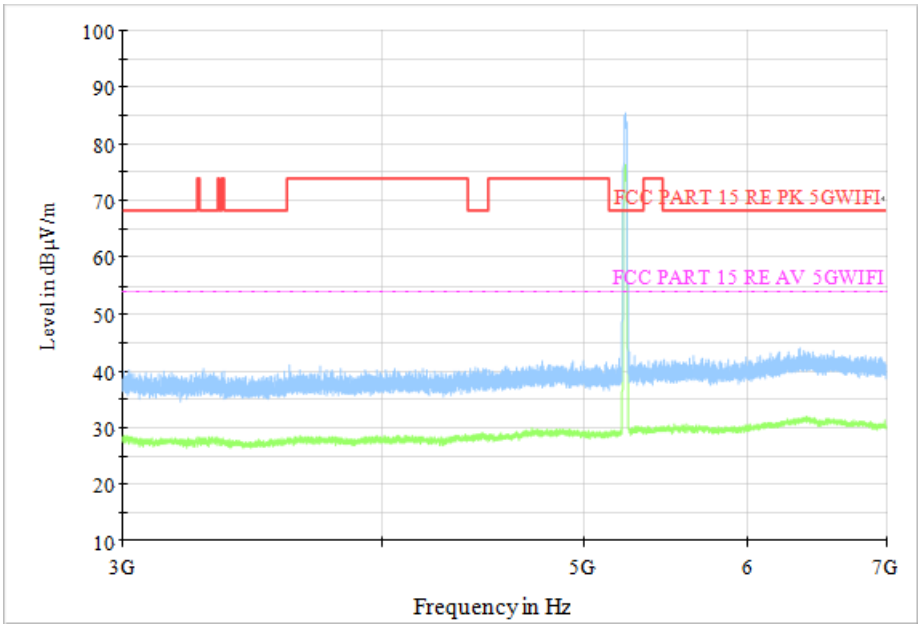


Fig. 68 Transmitter Spurious Emission (802.11a, CH48 5240MHz)

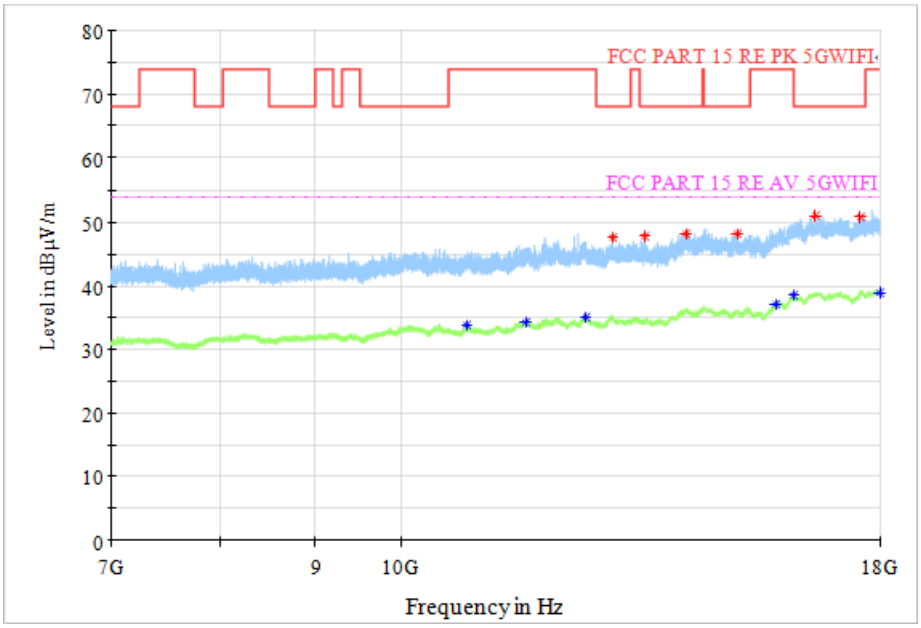


Fig. 69 Transmitter Spurious Emission (802.11a, CH48 5240MHz)

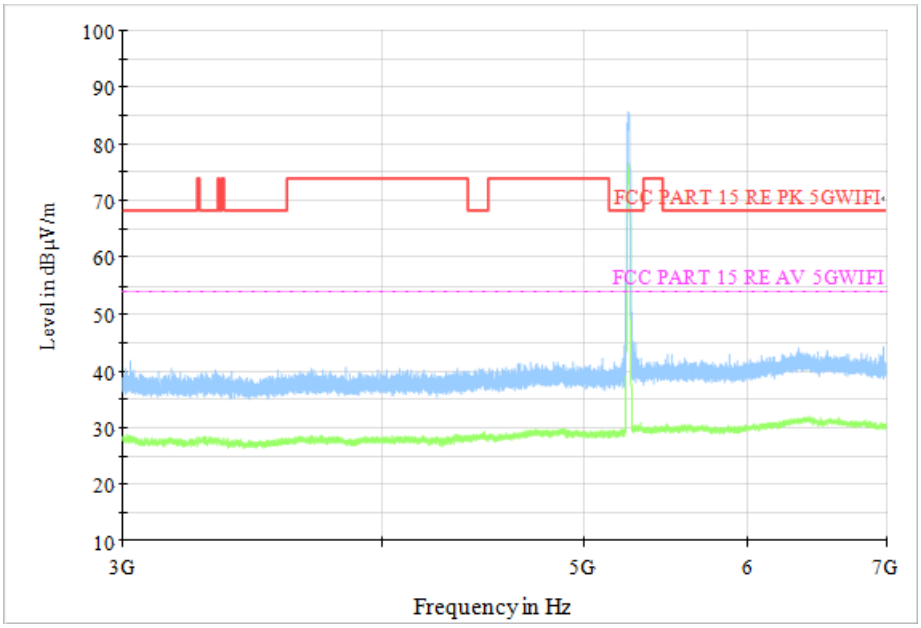


Fig. 70 Transmitter Spurious Emission (802.11a, CH52 5260MHz)

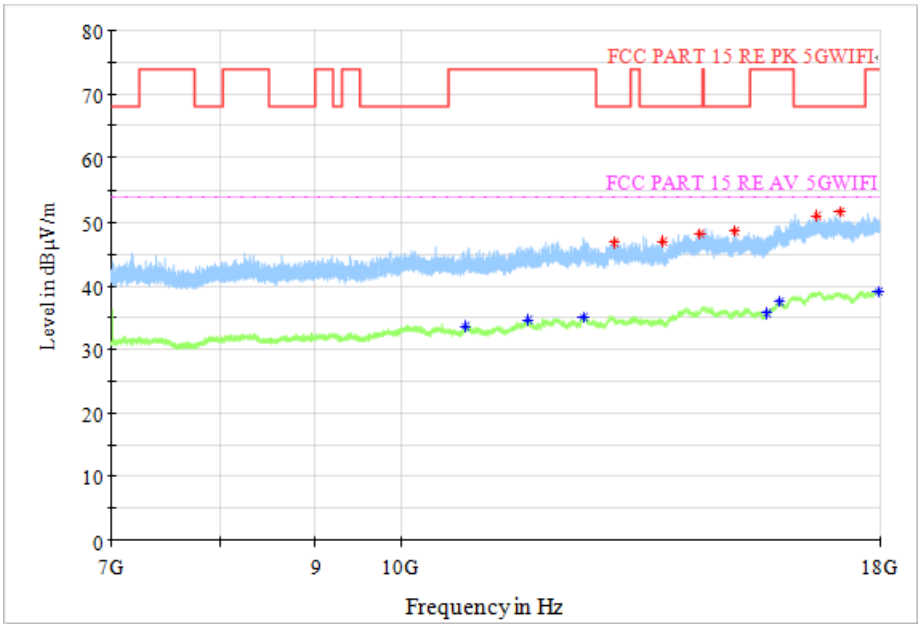


Fig. 71 Transmitter Spurious Emission (802.11a, CH52 5260MHz)

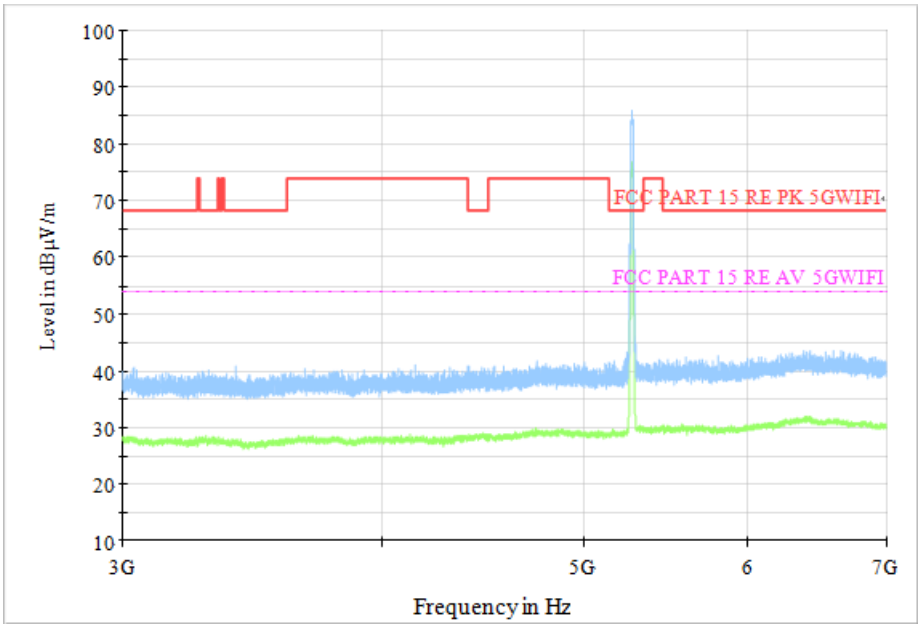


Fig. 72 Transmitter Spurious Emission (802.11a, CH56 5280MHz)

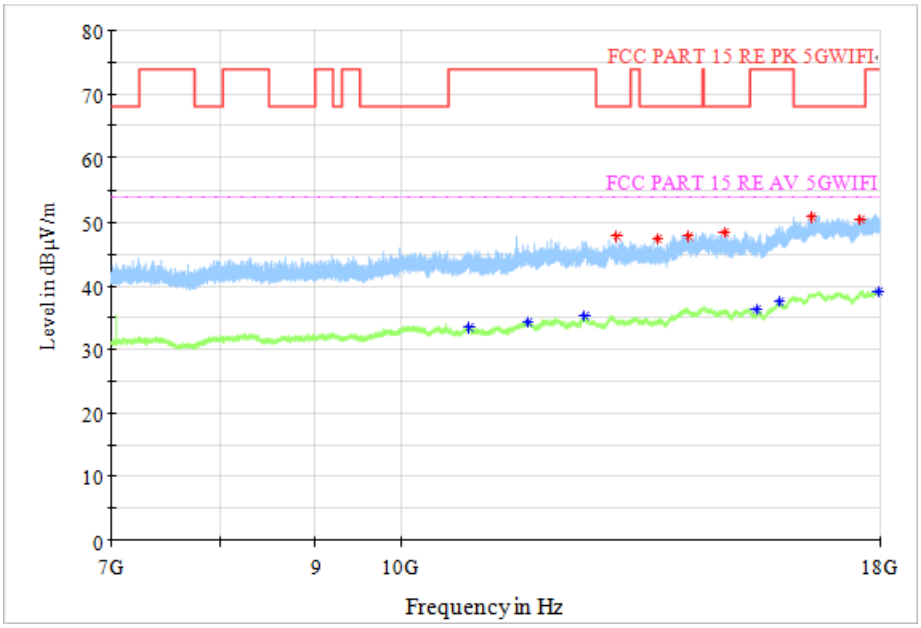


Fig. 73 Transmitter Spurious Emission (802.11a, CH56 5280MHz)

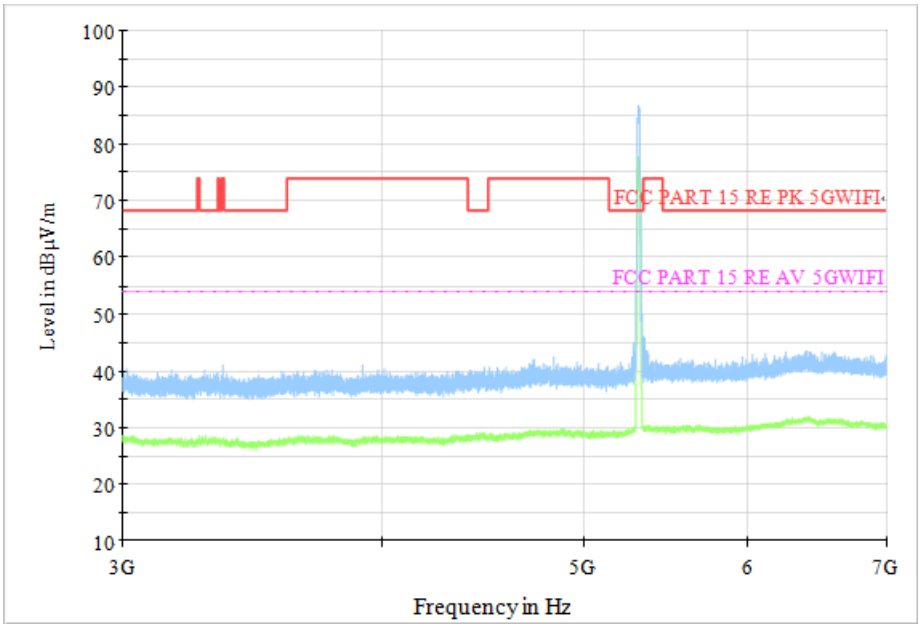


Fig. 74 Transmitter Spurious Emission (802.11a, CH64 5320MHz)

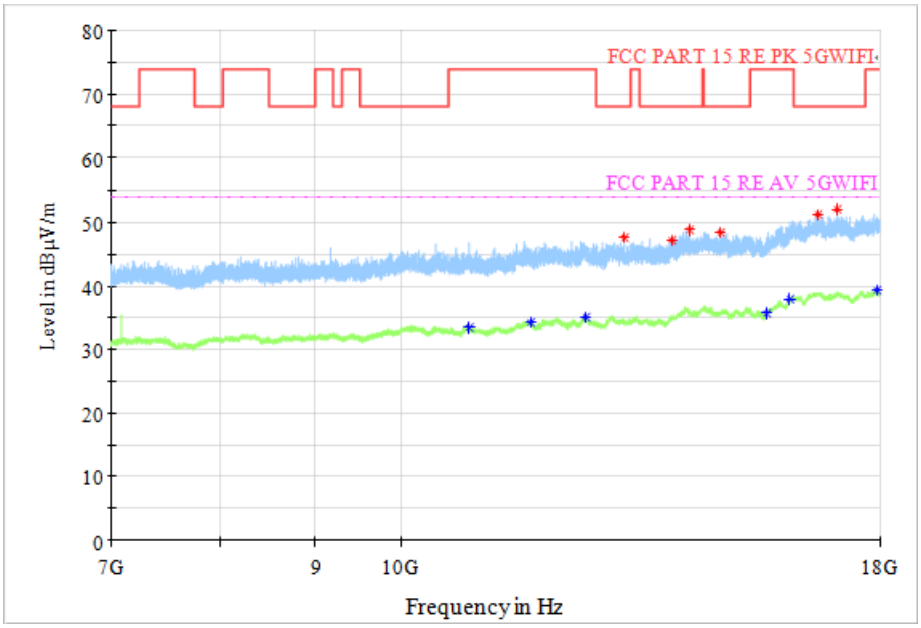


Fig. 75 Transmitter Spurious Emission (802.11a, CH64 5320MHz)

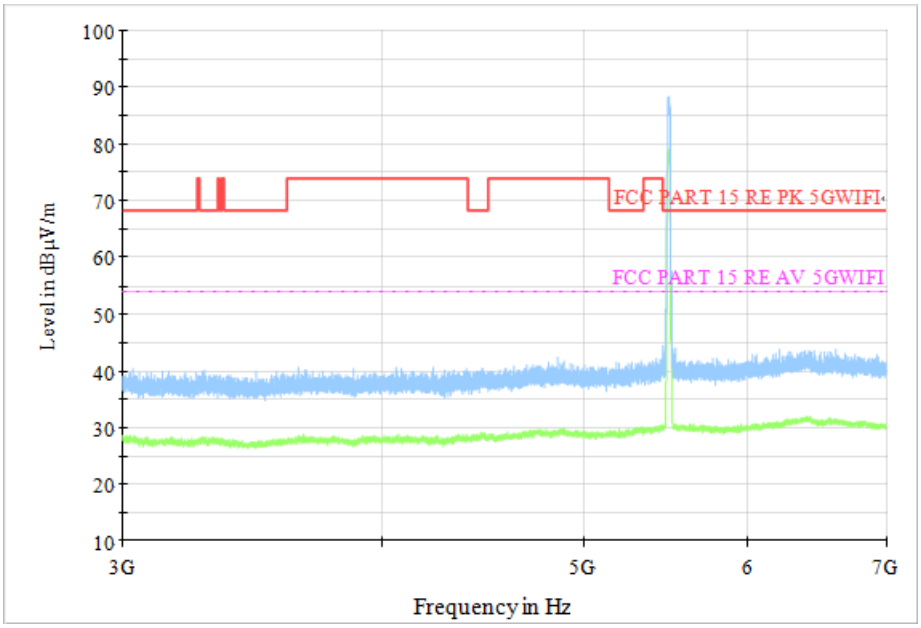


Fig. 76 Transmitter Spurious Emission (802. 11a, CH100 5500MHz)

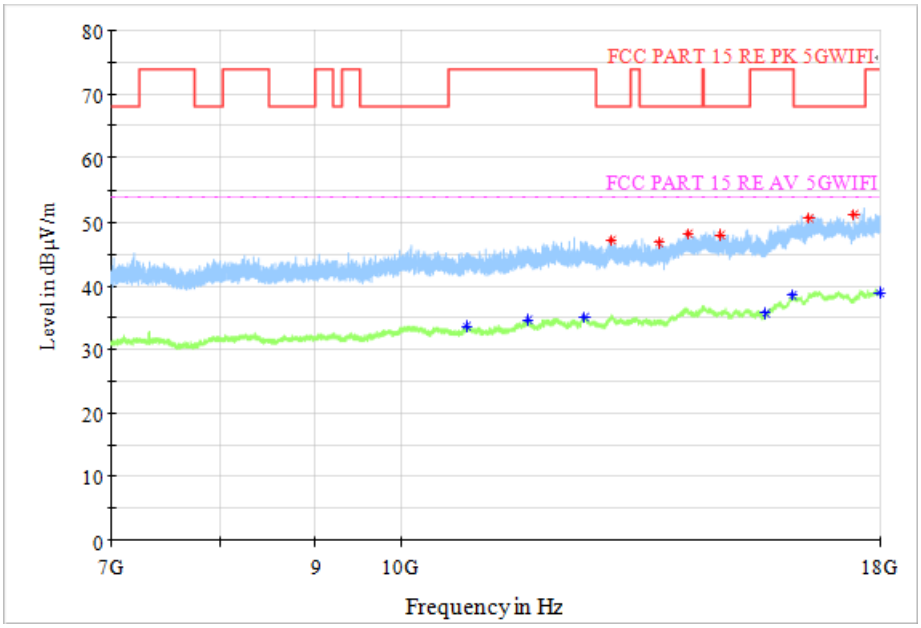


Fig. 77 Transmitter Spurious Emission (802. 11a, CH100 5500MHz)

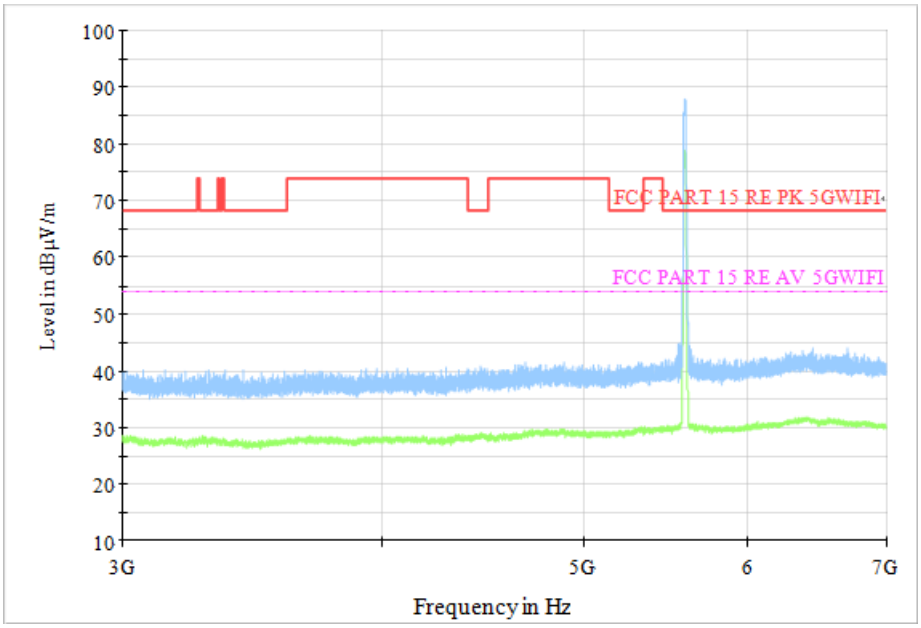


Fig. 78 Transmitter Spurious Emission (802. 11a, CH120 5600MHz)

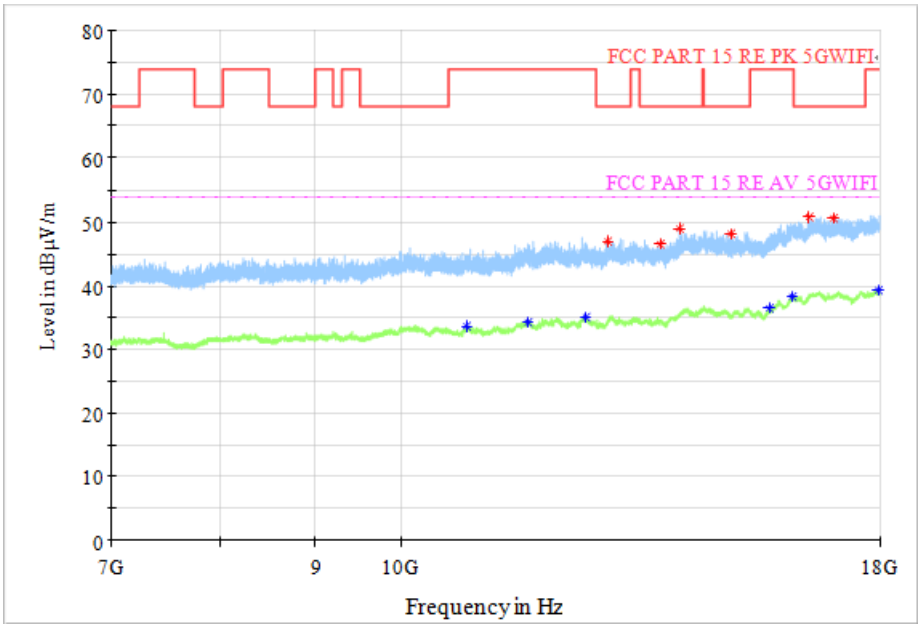


Fig. 79 Transmitter Spurious Emission (802. 11a, CH120 5600MHz)

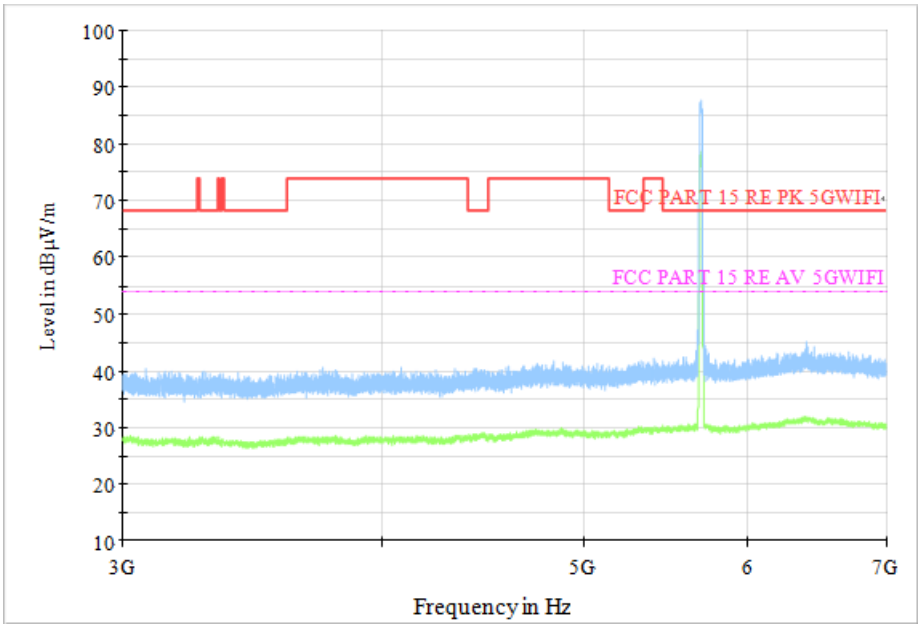


Fig. 80 Transmitter Spurious Emission (802. 11a, CH140 5700MHz)

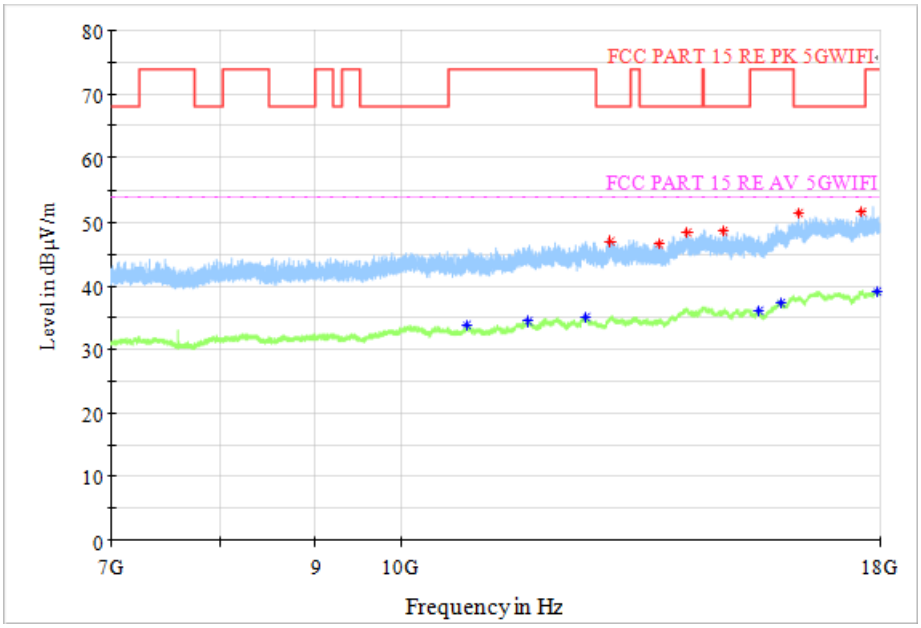


Fig. 81 Transmitter Spurious Emission (802. 11a, CH140 5700MHz)

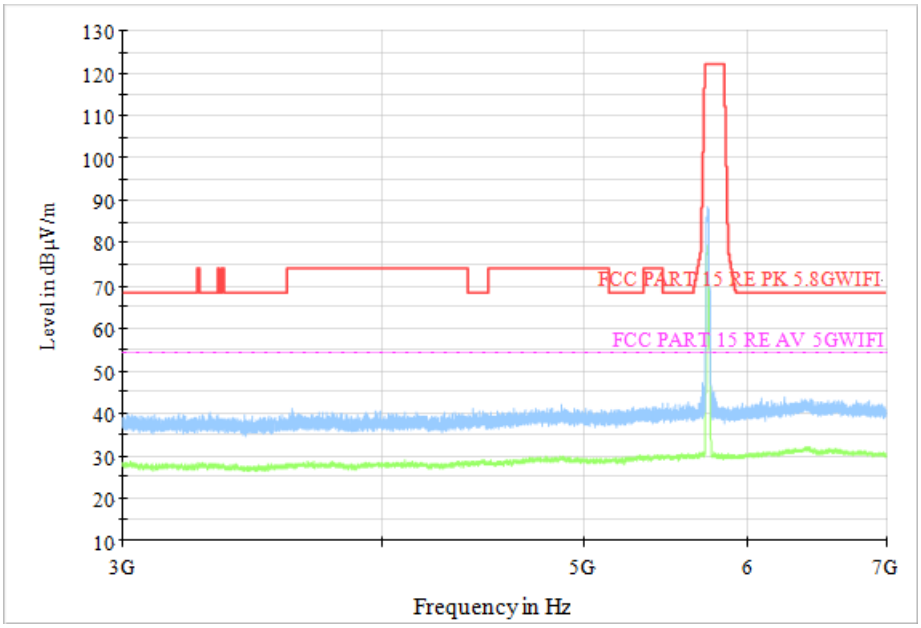


Fig. 82 Transmitter Spurious Emission (802. 11a, CH149 5745MHz)

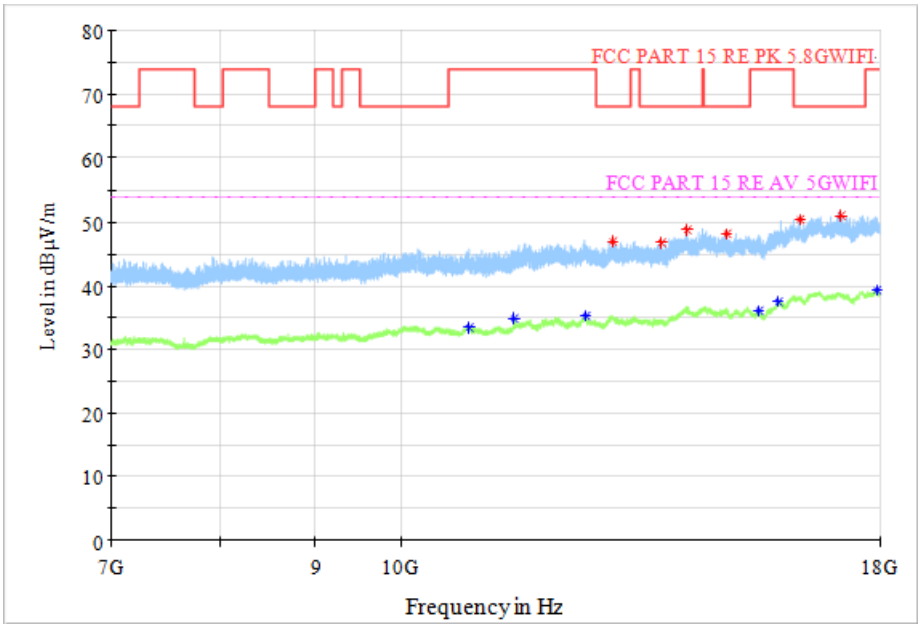


Fig. 83 Transmitter Spurious Emission (802. 11a, CH149 5745MHz)

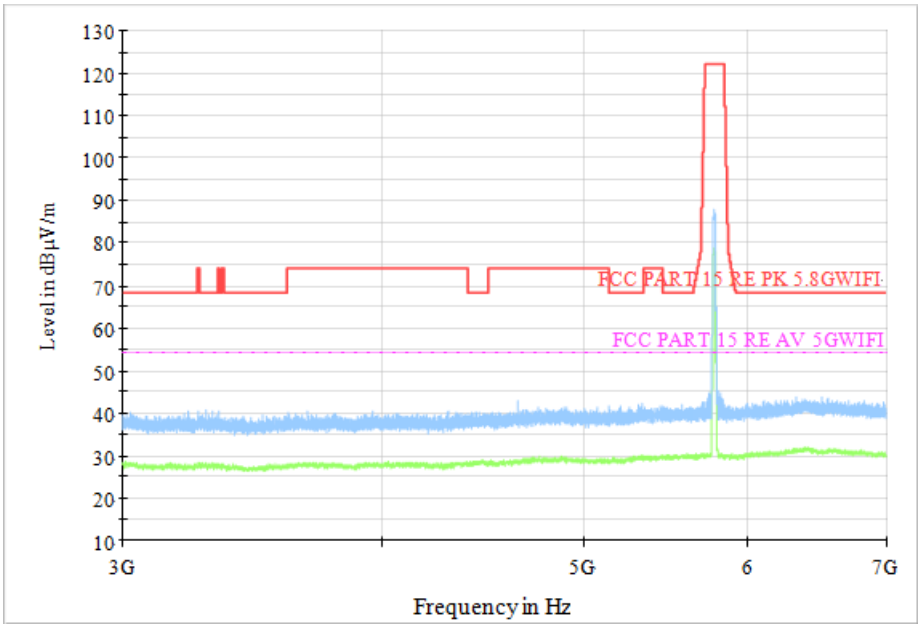


Fig. 84 Transmitter Spurious Emission (802. 11a, CH157 5785MHz)

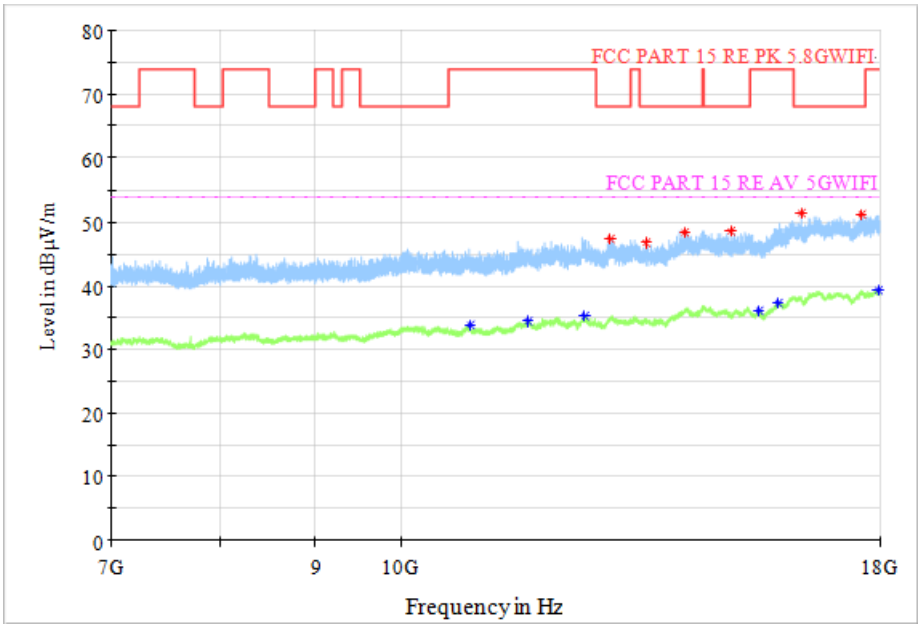


Fig. 85 Transmitter Spurious Emission (802. 11a, CH157 5785MHz)

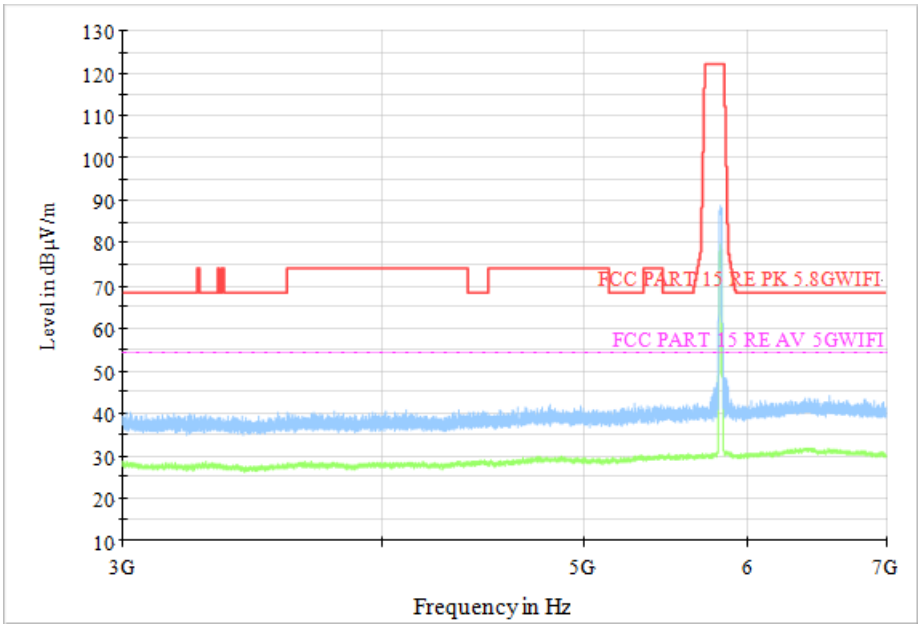


Fig. 86 Transmitter Spurious Emission (802. 11a, CH165 5825MHz)

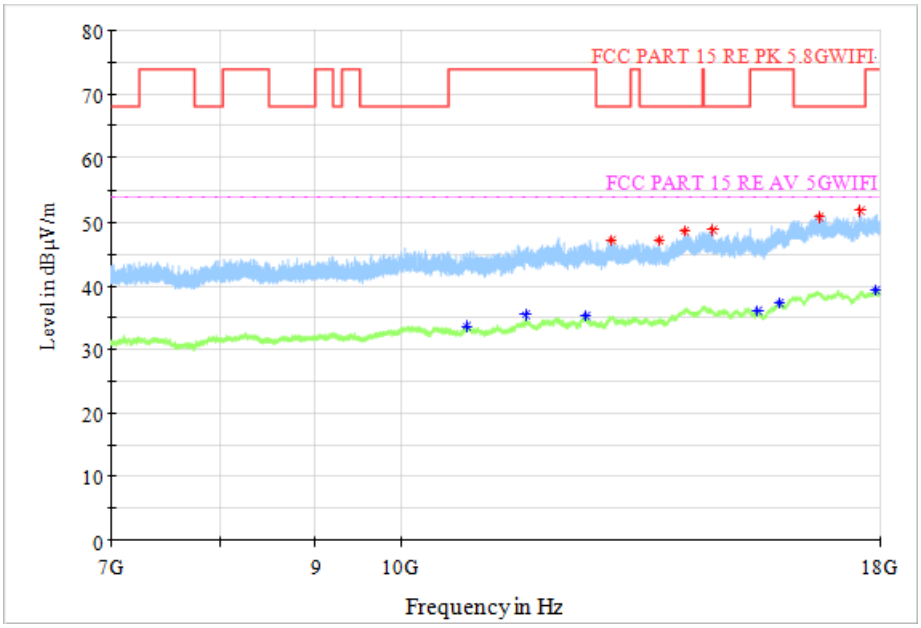


Fig. 87 Transmitter Spurious Emission (802. 11a, CH165 5825MHz)

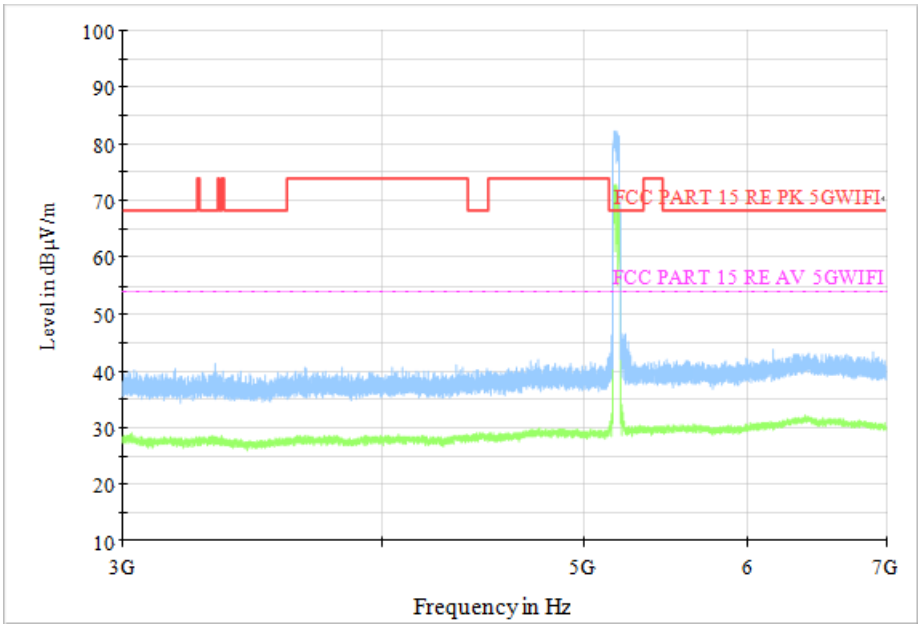


Fig. 88 Transmitter Spurious Emission (802.11n-HT40, CH38 5190MHz)

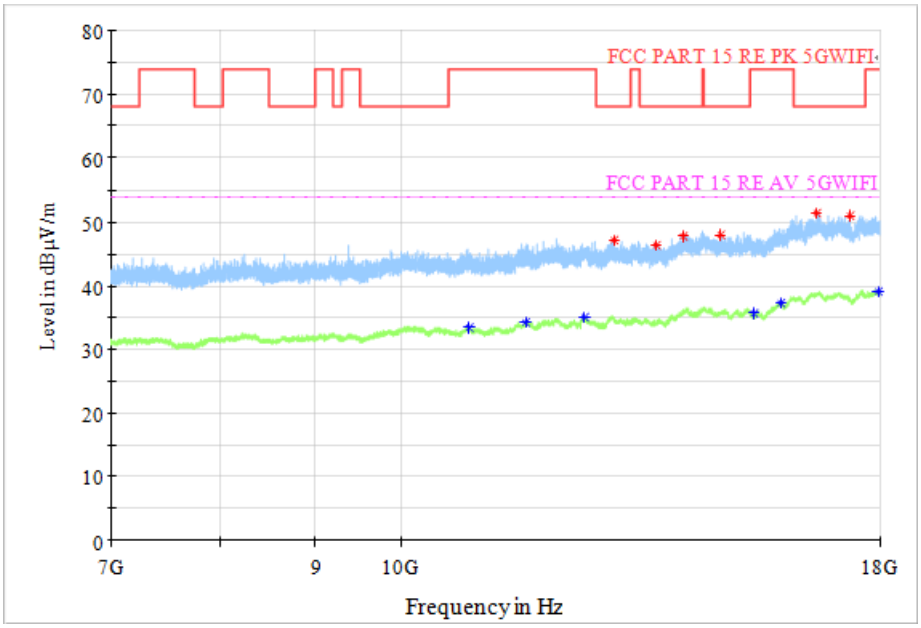


Fig. 89 Transmitter Spurious Emission (802.11n-HT40, CH38 5190MHz)

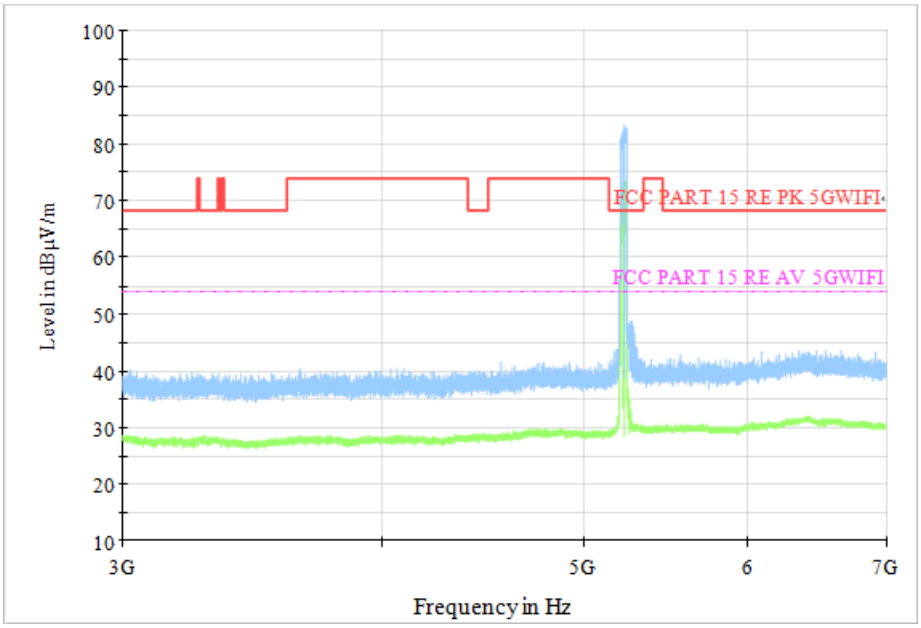


Fig. 90 Transmitter Spurious Emission (802.11n-HT40, CH46 5230MHz)

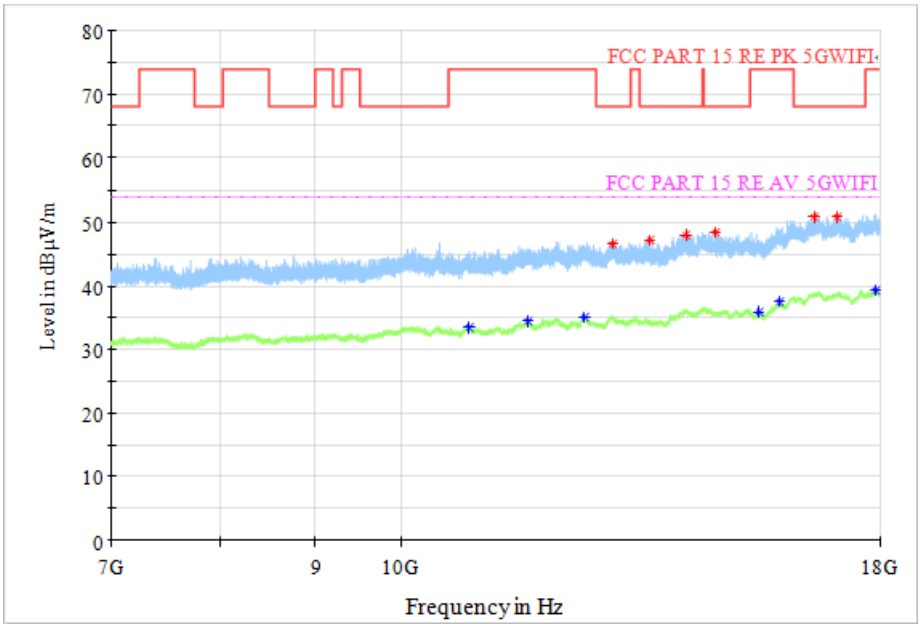


Fig. 91 Transmitter Spurious Emission (802.11n-HT40, CH46 5230MHz)

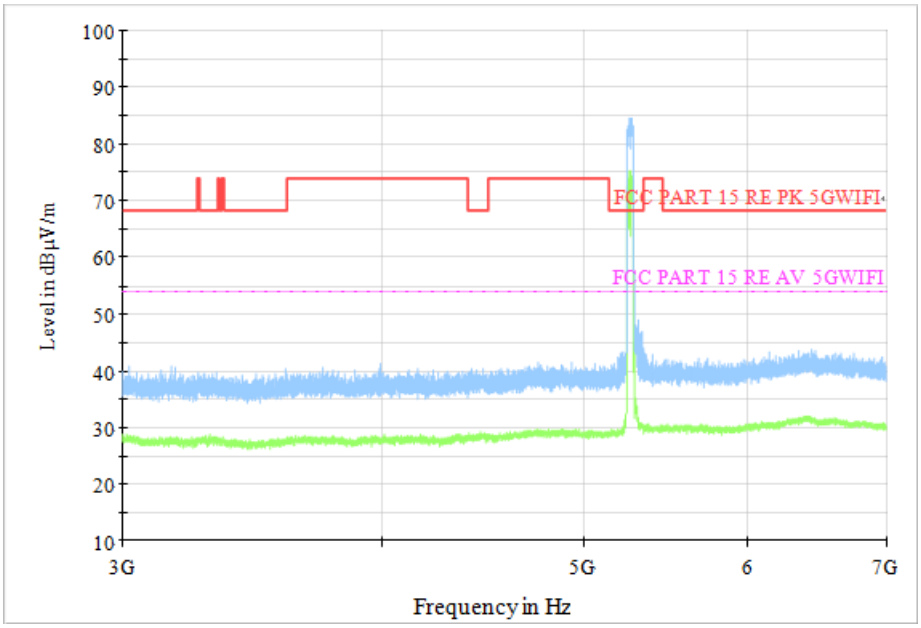


Fig. 92 Transmitter Spurious Emission (802.11n-HT40, CH54 5270MHz)

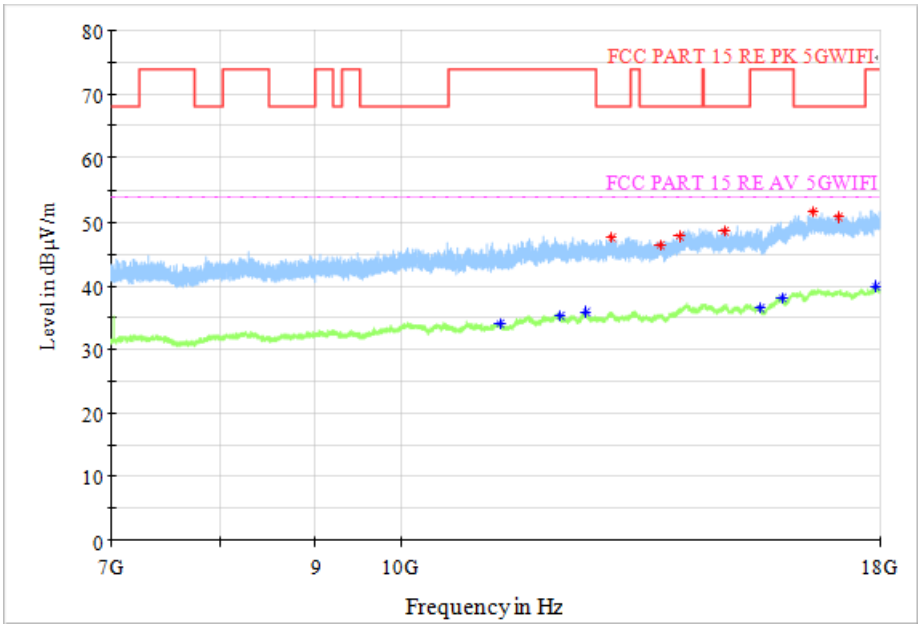


Fig. 93 Transmitter Spurious Emission (802.11n-HT40, CH54 5270MHz)

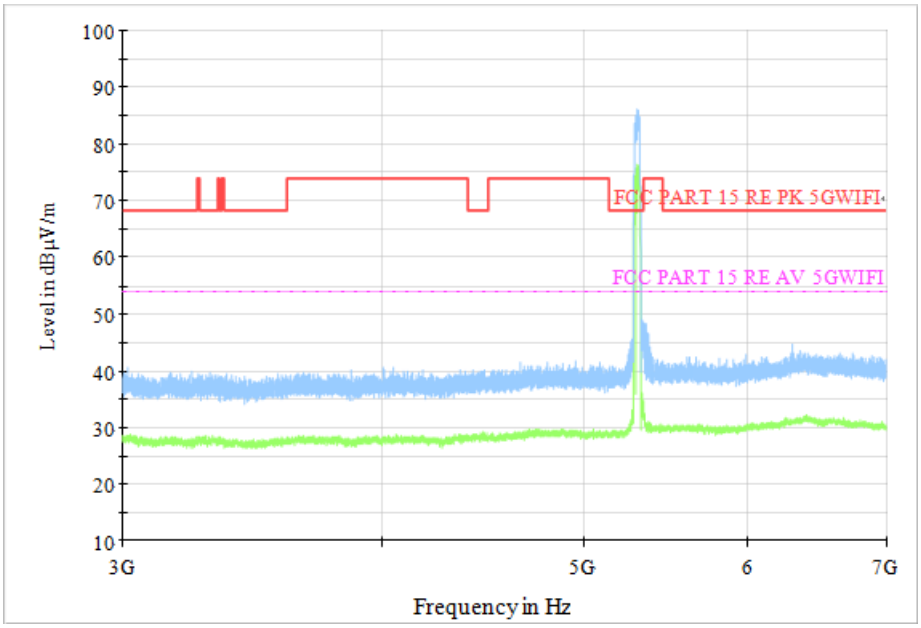


Fig. 94 Transmitter Spurious Emission (802.11n-HT40, CH62 5310MHz)

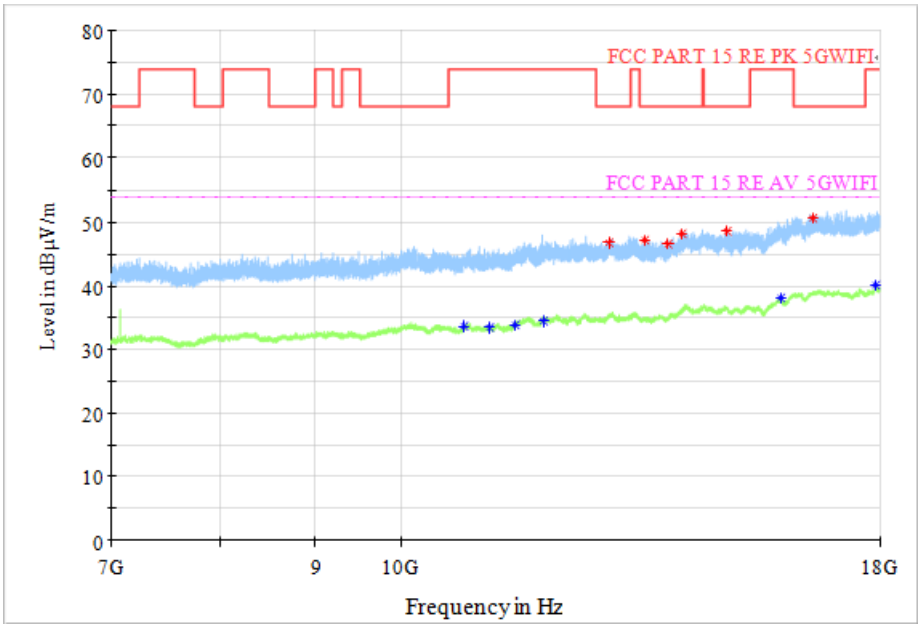


Fig. 95 Transmitter Spurious Emission (802.11n-HT40, CH62 5310MHz)

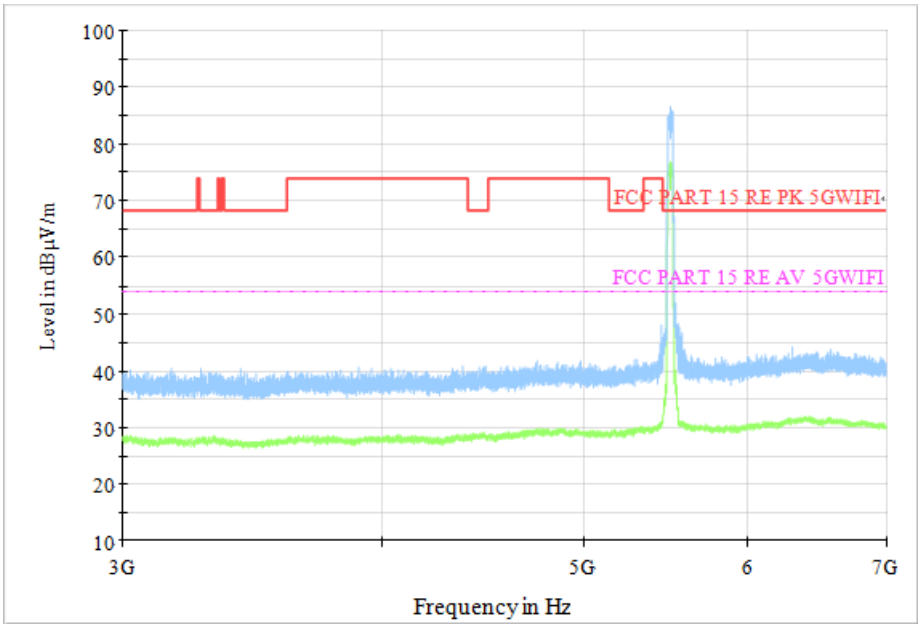


Fig. 96 Transmitter Spurious Emission (802. 11n-HT40, CH102 5510MHz)

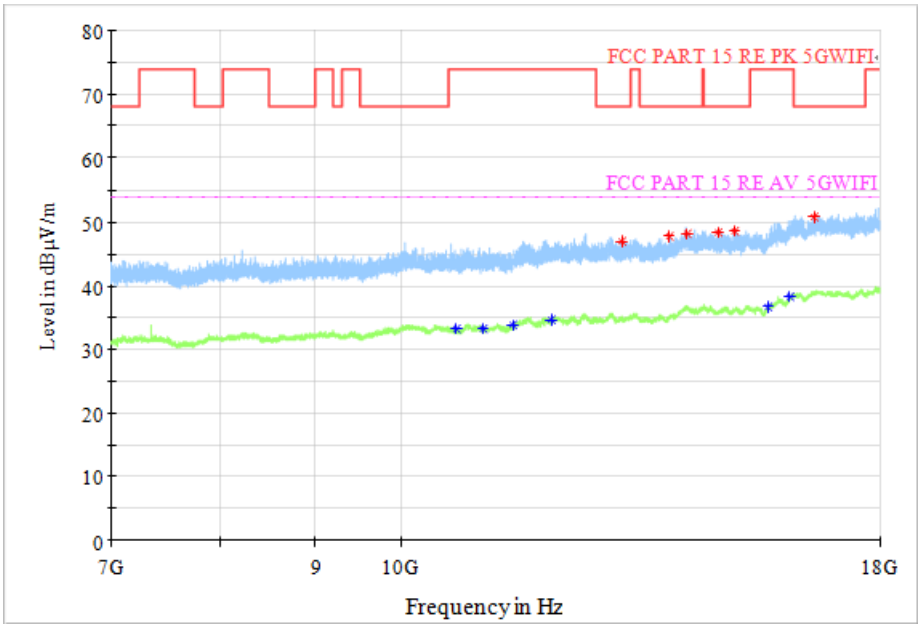


Fig. 97 Transmitter Spurious Emission (802. 11n-HT40, CH102 5510MHz)

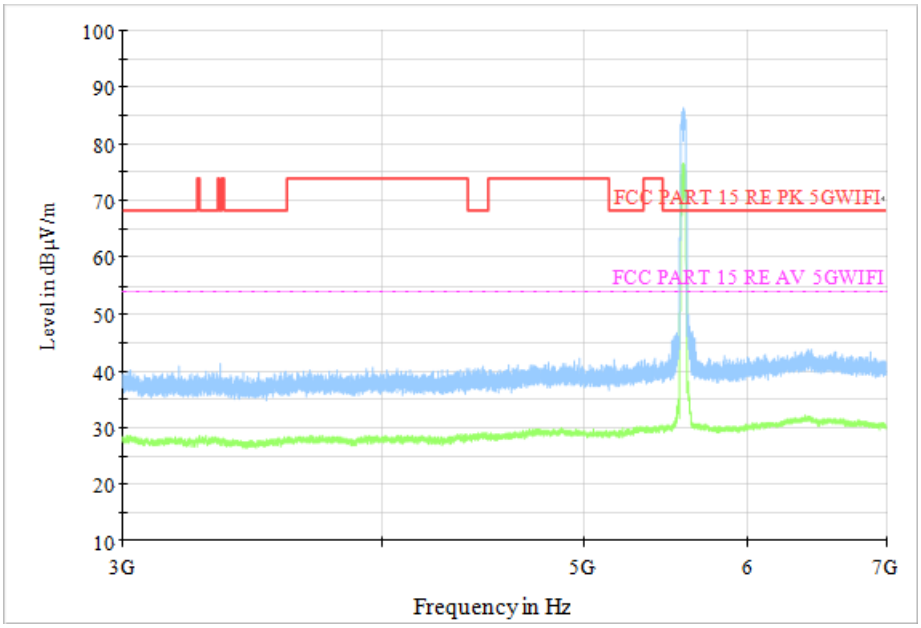


Fig. 98 Transmitter Spurious Emission (802. 11n-HT40, CH118 5590MHz)

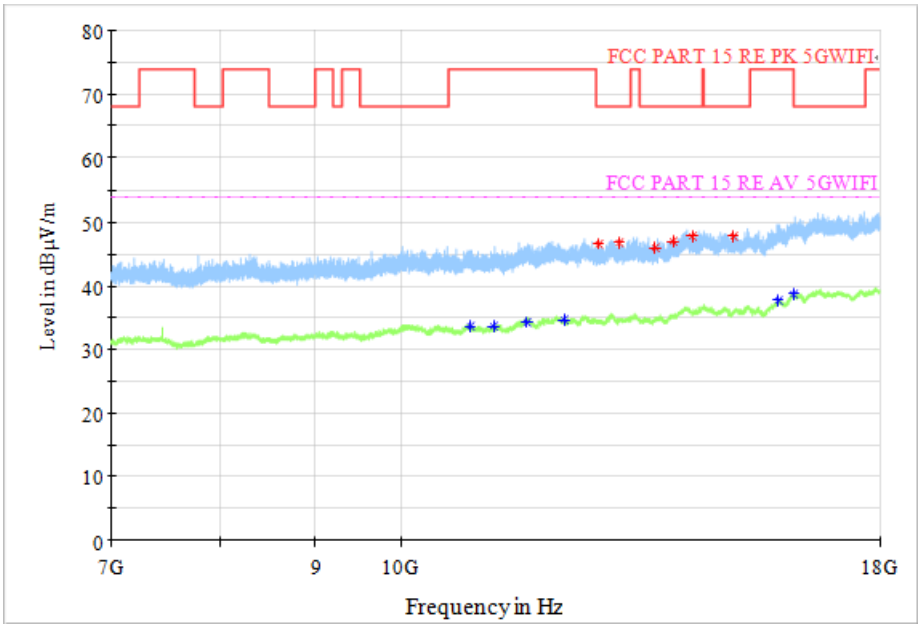


Fig. 99 Transmitter Spurious Emission (802. 11n-HT40, CH118 5590MHz)

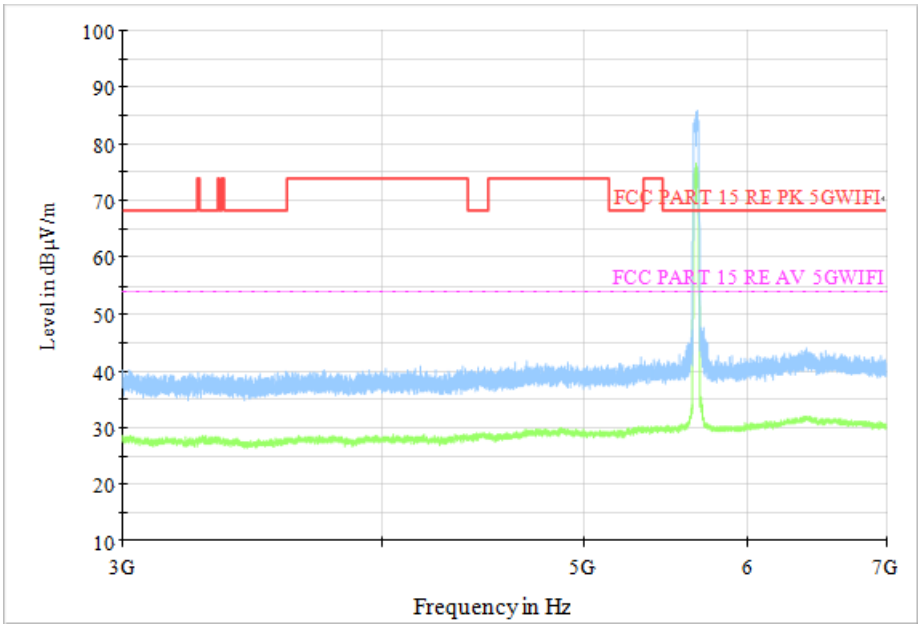


Fig. 100 Transmitter Spurious Emission (802. 11n-HT40, CH134 5670MHz)

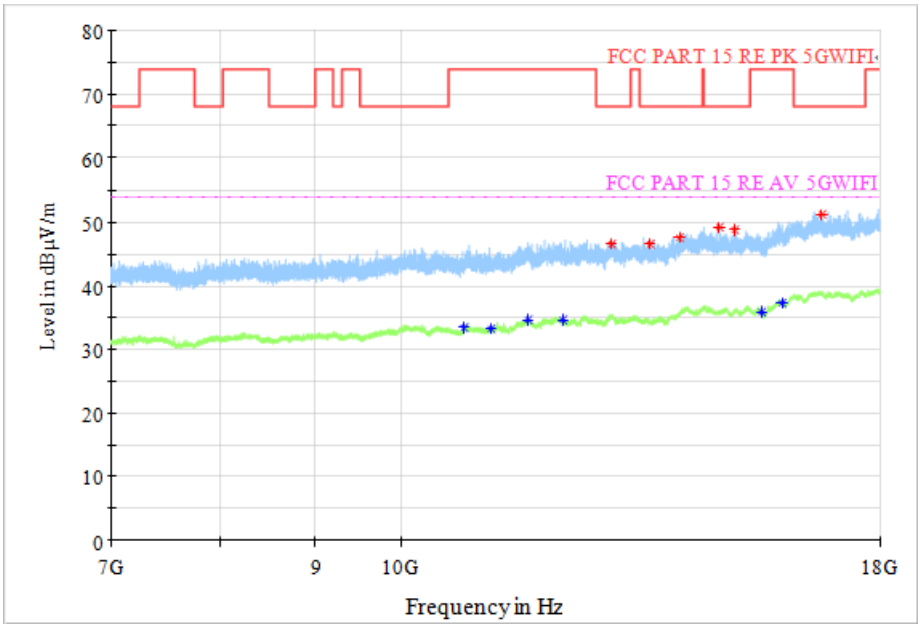


Fig. 101 Transmitter Spurious Emission (802. 11n-HT40, CH134 5670MHz)

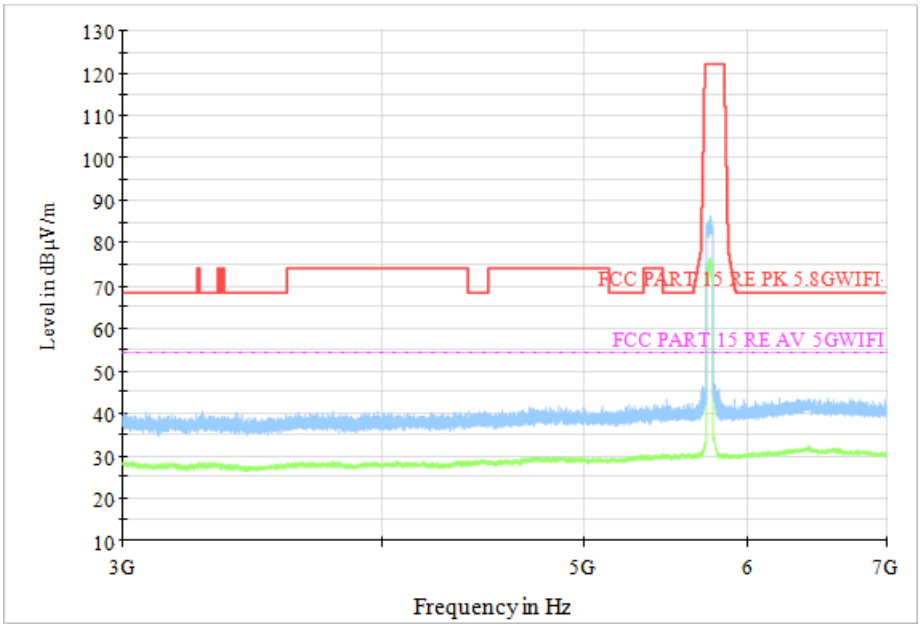


Fig. 102 Transmitter Spurious Emission (802. 11n-HT40, CH151 5755MHz)

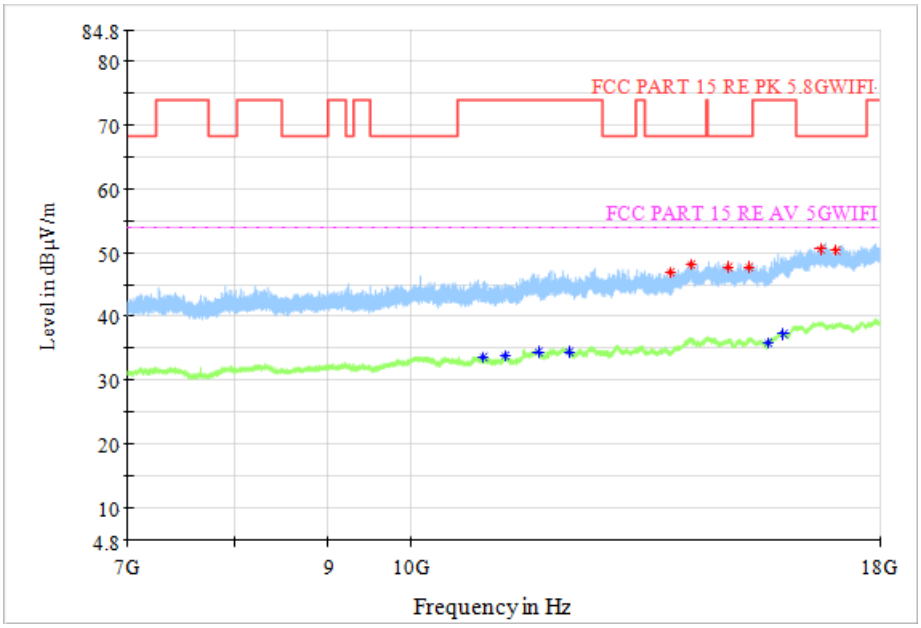


Fig. 103 Transmitter Spurious Emission (802. 11n-HT40, CH151 5755MHz)

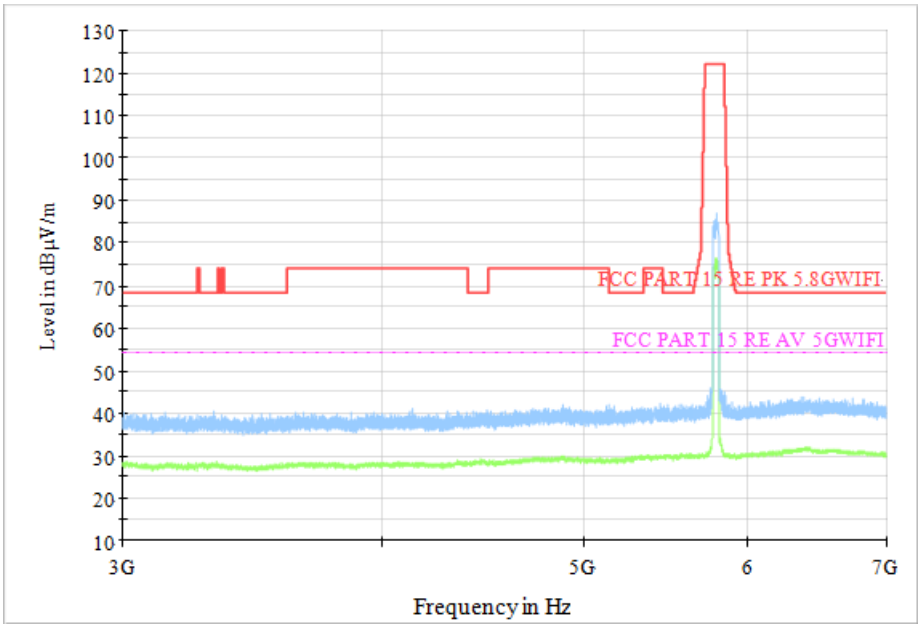


Fig. 104 Transmitter Spurious Emission (802. 11n-HT40, CH159 5795MHz)

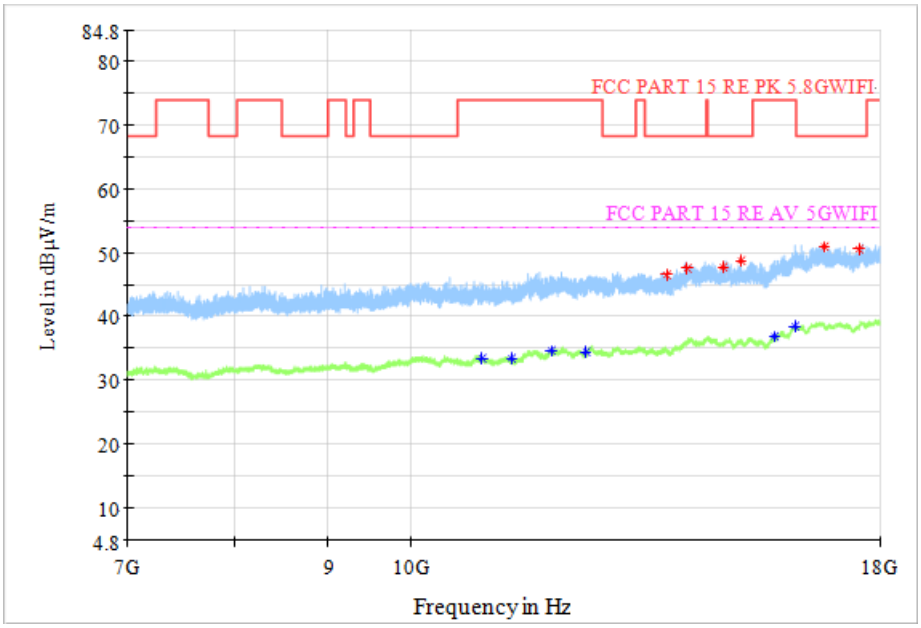


Fig. 105 Transmitter Spurious Emission (802. 11n-HT40, CH159 5795MHz)

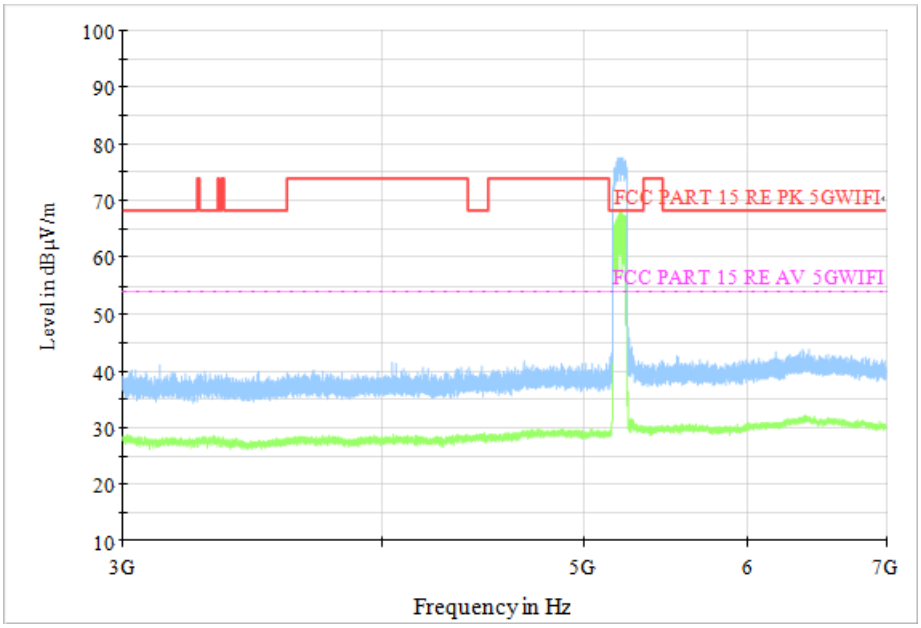


Fig. 106 Transmitter Spurious Emission (802. 11ac-VHT80, CH42 5210MHz)

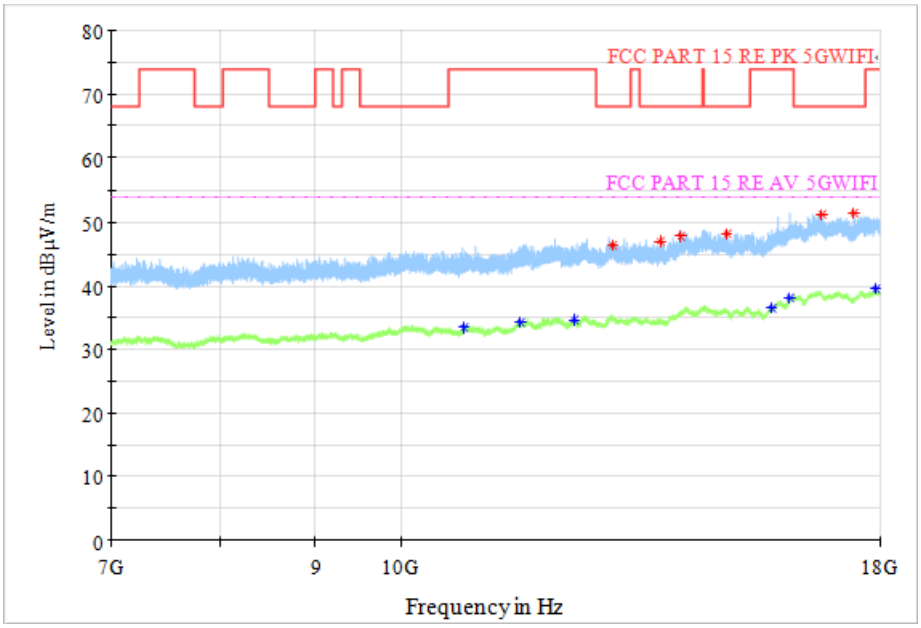


Fig. 107 Transmitter Spurious Emission (802. 11ac-VHT80, CH42 5210MHz)

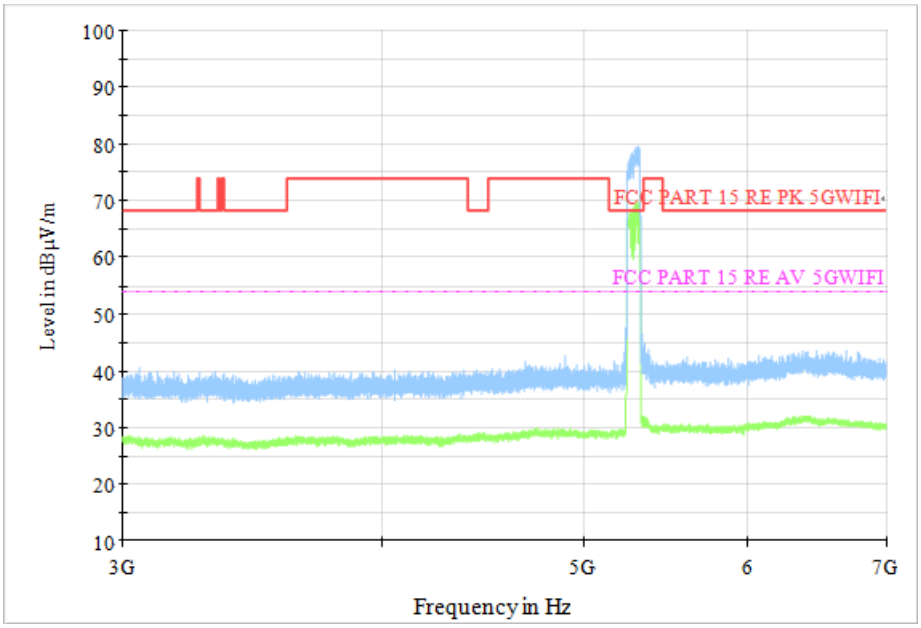


Fig. 108 Transmitter Spurious Emission (802. 11ac-VHT80, CH58 5290MHz)

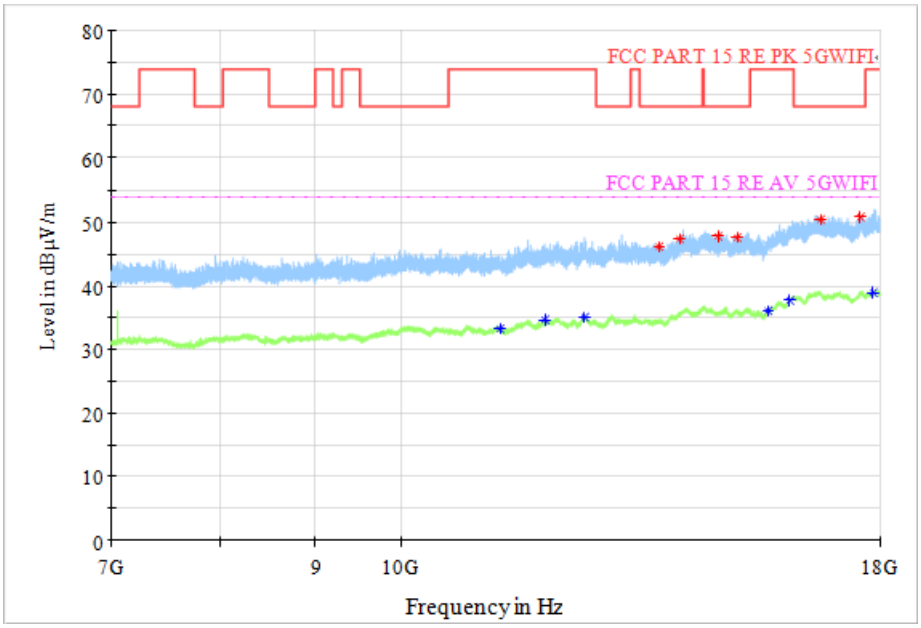


Fig. 109 Transmitter Spurious Emission (802. 11ac-VHT80, CH58 5290MHz)

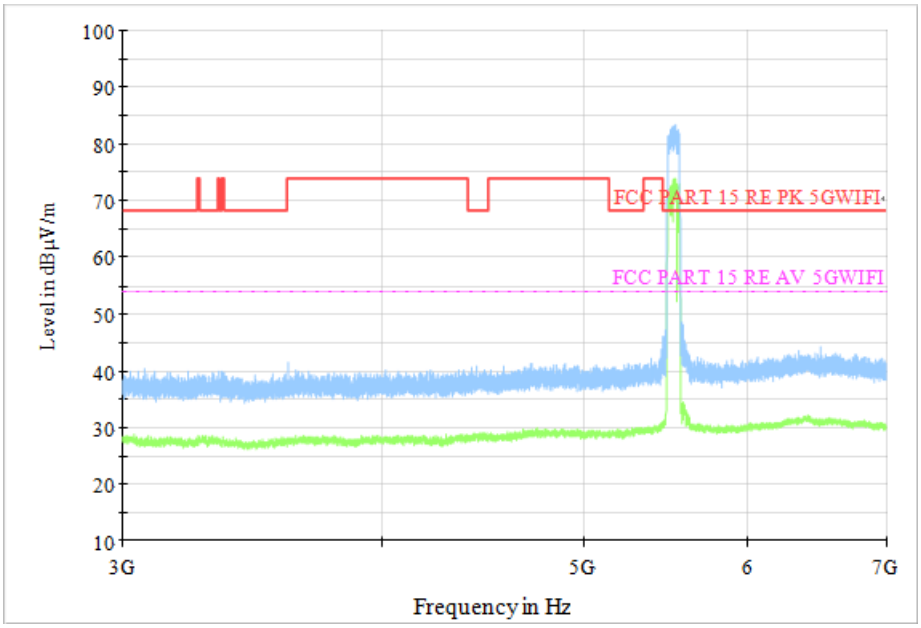


Fig. 110 Transmitter Spurious Emission (802. 11ac-VHT80, CH106 5530MHz)

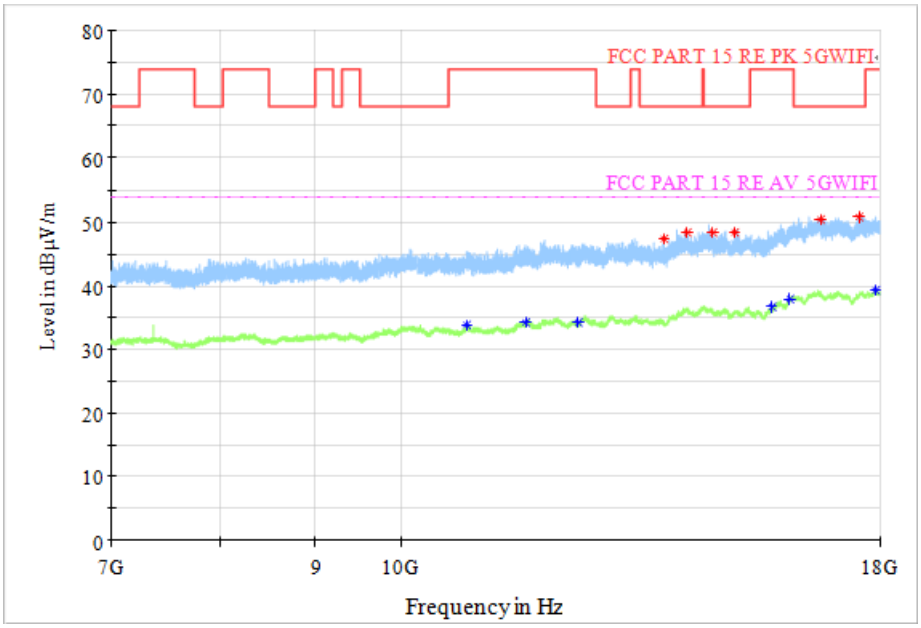


Fig. 111 Transmitter Spurious Emission (802. 11ac-VHT80, CH106 5530MHz)

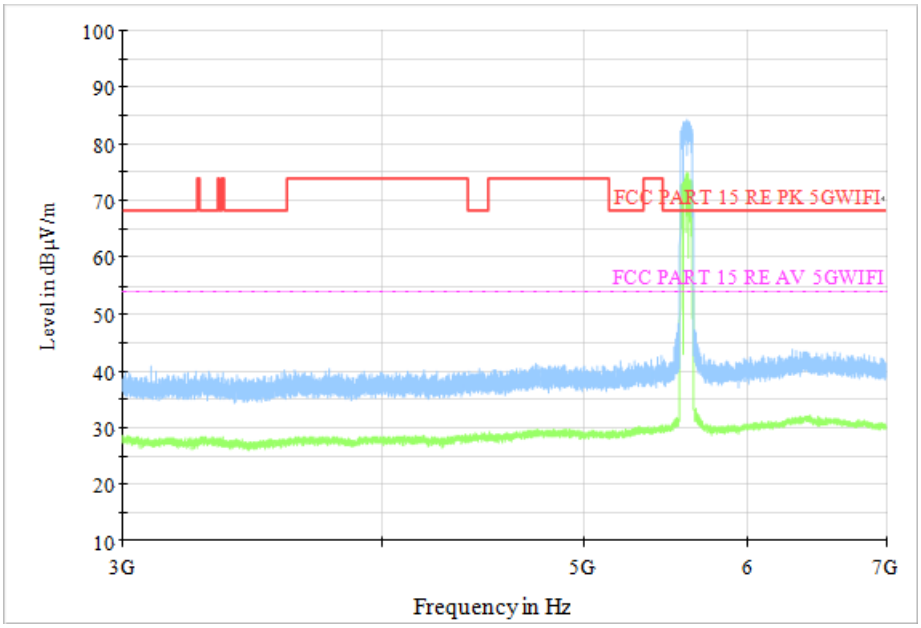


Fig. 112 Transmitter Spurious Emission (802. 11ac-VHT80, CH122 5610MHz)

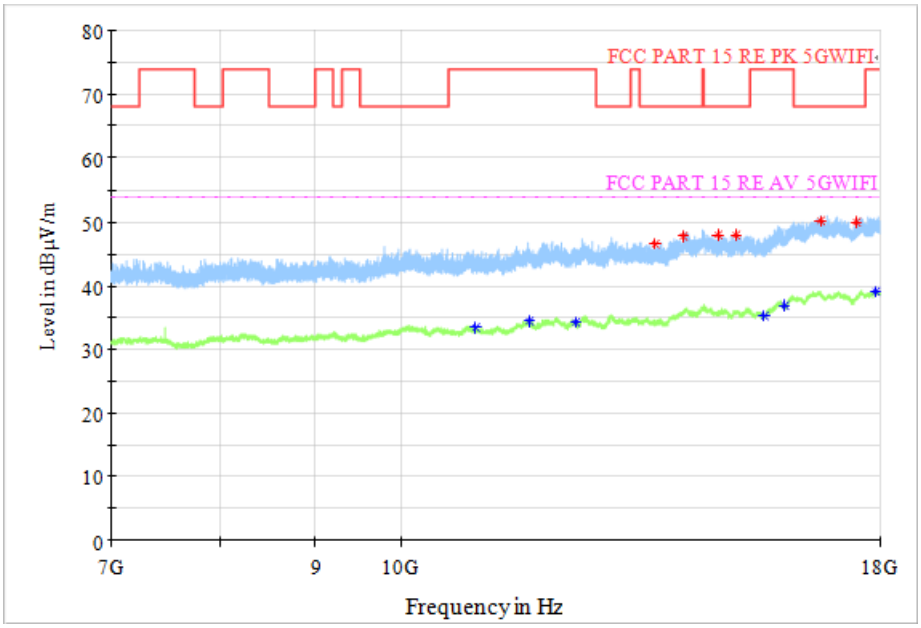


Fig. 113 Transmitter Spurious Emission (802. 11ac-VHT80, CH122 5610MHz)

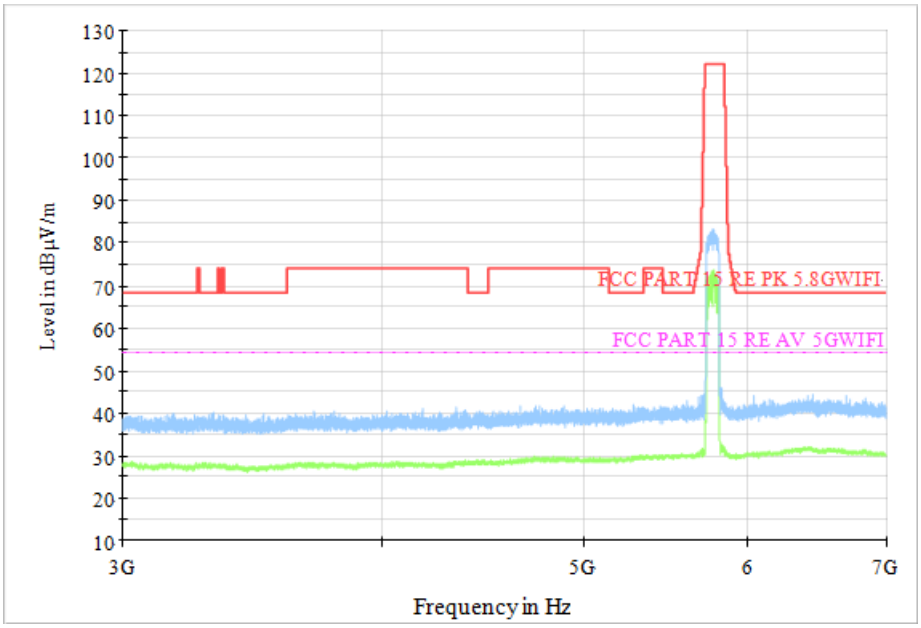


Fig. 114 Transmitter Spurious Emission (802. 11ac-VHT80, CH155 5775MHz)

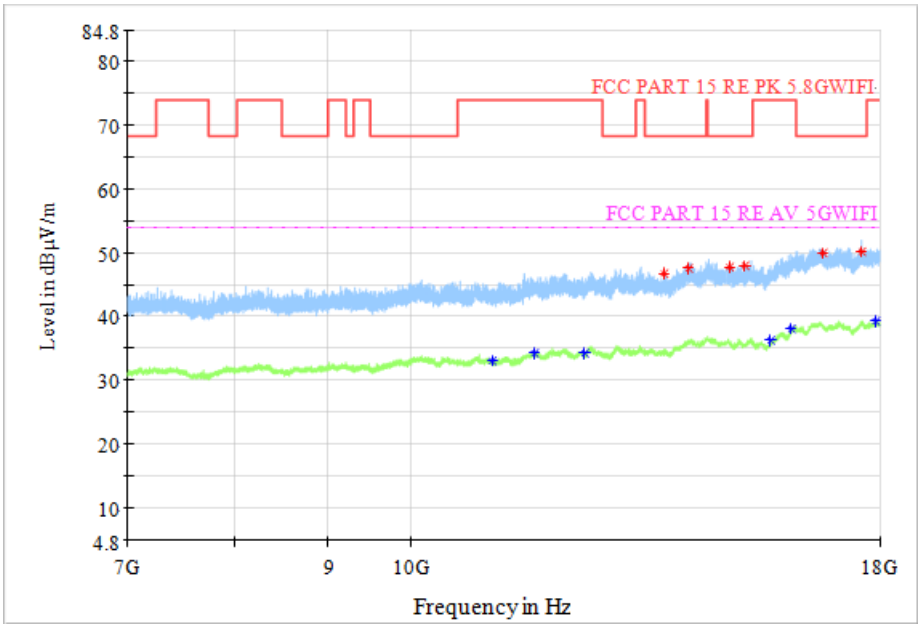


Fig. 115 Transmitter Spurious Emission (802. 11ac-VHT80, CH155 5775MHz)

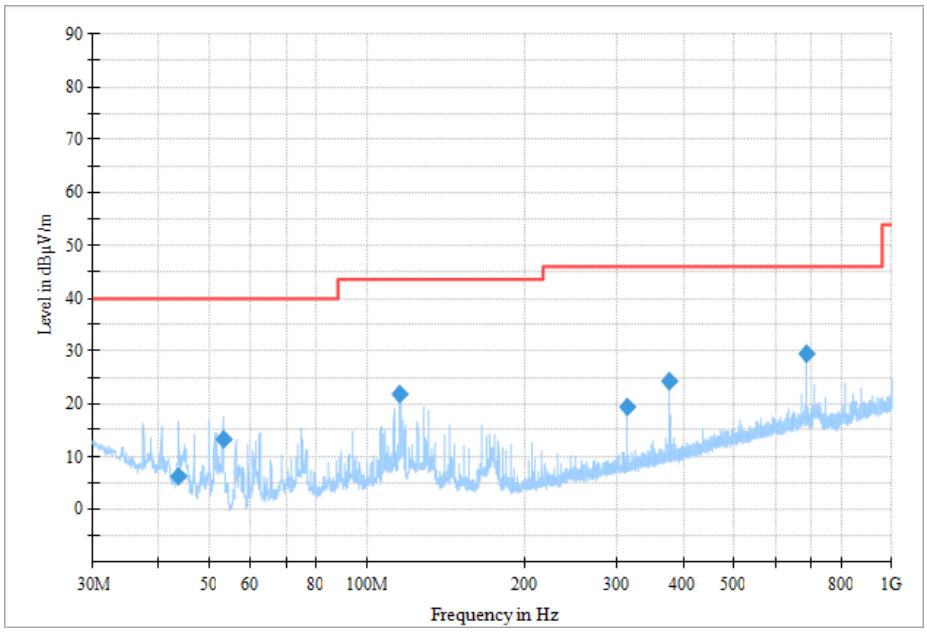


Fig. 116 Transmitter Spurious Emission (All channel, 30MHz~1GHz)

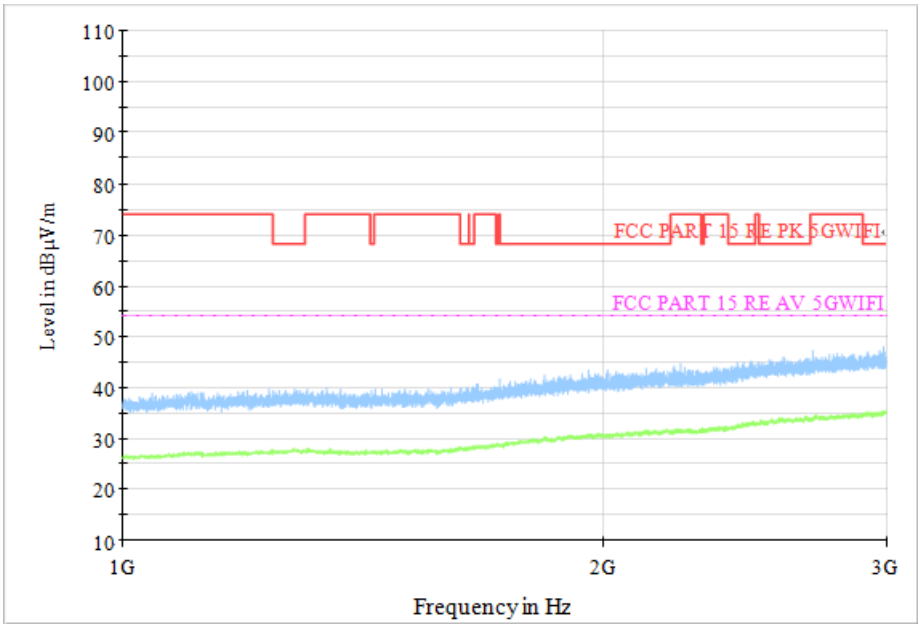


Fig. 117 Transmitter Spurious Emission (All channel, 1GHz~3GHz)

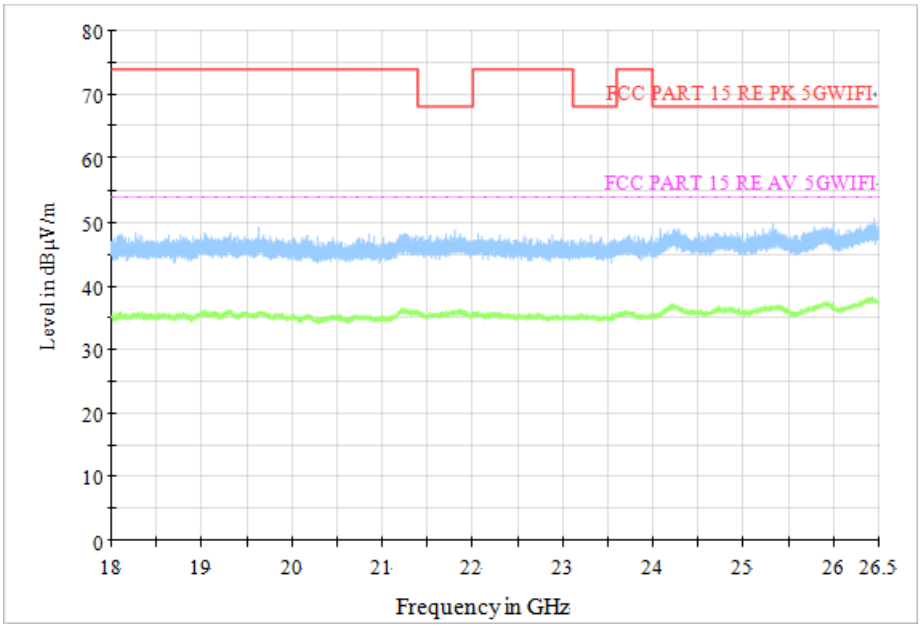


Fig. 118 Transmitter Spurious Emission (All channel, 18GHz~26.5GHz)

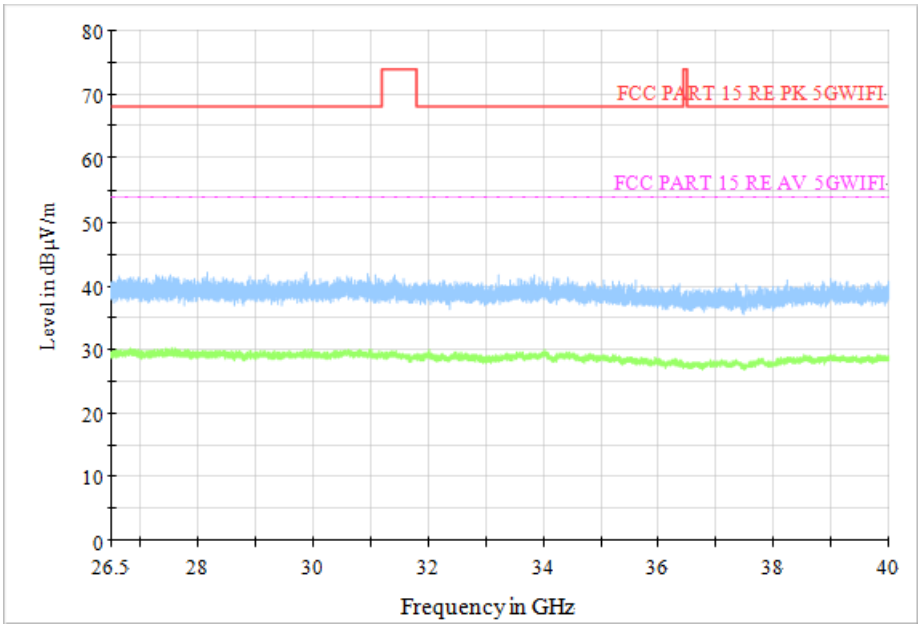


Fig. 119 Transmitter Spurious Emission (All channel, 26.5GHz~40GHz)

Worst Case Result

802.11a CH36

Frequency (MHz)	Max Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
12985.47	46.56	68.20	21.64	V	8.3
13669.30	46.71	68.20	21.49	V	8.5
14198.40	49.00	68.20	19.20	V	10.9
15284.47	48.26	68.20	19.94	H	11.3
16342.67	50.35	68.20	17.85	V	14.3
17209.10	51.09	68.20	17.11	H	14.8

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
10878.60	33.63	54.00	20.37	H	5.2
11689.67	34.57	54.00	19.43	H	7.1
12530.80	35.02	54.00	18.98	H	8.0
15502.27	35.94	54.00	18.06	H	12.0
16121.20	38.09	54.00	15.91	H	14.1
17917.87	39.23	54.00	14.77	H	16.2

802.11a CH52

Frequency (MHz)	Max Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
12988.77	46.84	68.20	21.36	V	8.3
13781.87	47.03	68.20	21.17	H	8.7
14441.87	48.24	68.20	19.96	H	11.0
15063.73	48.58	68.20	19.62	H	11.1
16663.87	51.00	68.20	17.20	H	14.9
17138.70	51.53	68.20	16.67	H	15.0

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
10822.13	33.62	54.00	20.38	V	5.2
11684.17	34.62	54.00	19.38	H	7.1
12495.97	35.15	54.00	18.85	V	8.0
15657.73	35.76	54.00	18.24	V	12.1
15905.23	37.50	54.00	16.50	H	13.2
17958.20	39.09	54.00	14.91	H	16.1

802.11a CH100

Frequency (MHz)	Max Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
12950.63	47.21	68.20	20.99	H	8.6
13734.57	46.80	68.20	21.40	H	8.7
14233.97	48.24	68.20	19.96	H	11.0
14813.67	48.04	68.20	20.16	H	10.7
16515.37	50.51	68.20	17.69	H	14.8
17449.63	51.24	68.20	16.96	H	14.8

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
10834.97	33.63	54.00	20.37	H	5.3
11678.30	34.60	54.00	19.40	H	7.1
12532.63	35.10	54.00	18.90	V	8.0
15650.03	35.66	54.00	18.34	H	12.0
16161.17	38.52	54.00	15.48	H	14.2
17993.77	38.89	54.00	15.11	V	15.9

802.11a CH149

Frequency (MHz)	Max Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
12967.50	46.88	68.20	21.32	V	8.5
13759.50	46.78	68.20	21.42	H	8.6
14218.20	48.72	68.20	19.48	V	10.9
14911.93	48.26	68.20	19.94	H	11.1
16336.07	50.40	68.20	17.80	V	14.3
17163.63	50.96	68.20	17.24	H	14.9

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
10876.03	33.50	54.00	20.50	V	5.2
11489.83	34.91	54.00	19.09	H	6.0
12538.13	35.29	54.00	18.71	V	8.0
15513.63	36.12	54.00	17.88	V	12.0
15899.73	37.47	54.00	16.53	H	13.2
17956.00	39.25	54.00	14.75	H	16.1

802.11n HT40 CH38

Frequency (MHz)	Max Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
12982.53	47.17	68.20	21.03	H	8.30
13671.87	46.29	68.20	21.91	V	8.50
14134.60	47.84	68.20	20.36	H	10.50
14799.00	48.04	68.20	20.17	V	10.70
16655.80	51.46	68.20	16.74	V	14.90
17352.83	50.91	68.20	17.29	V	14.70

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
10874.20	33.48	54.00	20.52	V	5.20
11653.00	34.35	54.00	19.65	H	6.90
12523.83	35.10	54.00	18.90	V	8.00
15415.73	35.71	54.00	18.29	V	11.60
15941.53	37.26	54.00	16.74	V	13.30
17959.67	39.16	54.00	14.84	H	16.10

802.11n HT40 CH54

Frequency (MHz)	Max Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
12955.40	47.62	68.20	20.58	H	8.50
13737.87	46.29	68.20	21.91	V	8.70
14065.67	47.78	68.20	20.42	H	9.90
14878.57	48.50	68.20	19.70	H	11.00
16581.73	51.55	68.20	16.65	H	14.80
17116.33	50.79	68.20	17.41	H	15.00

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
11285.97	33.96	54.00	20.04	H	5.40
12147.27	35.18	54.00	18.82	H	7.30
12541.43	35.95	54.00	18.05	V	8.10
15548.10	36.41	54.00	17.59	H	11.80
15965.73	38.03	54.00	15.97	H	13.30
17918.97	39.83	54.00	14.17	H	16.20

802.11n HT40 CH102

Frequency (MHz)	Max Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
13110.87	47.02	68.20	21.18	H	8.60
13908.00	47.68	68.20	20.52	H	9.40
14218.93	48.17	68.20	20.03	H	10.90
14752.80	48.38	68.20	19.82	V	10.80
15071.43	48.60	68.20	19.60	V	11.10
16606.30	50.87	68.20	17.33	H	14.80

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
10694.53	33.28	54.00	20.72	H	4.90
11065.60	33.19	54.00	20.81	V	4.90
11468.57	33.78	54.00	20.22	H	5.80
12012.70	34.70	54.00	19.30	H	7.20
15686.33	36.64	54.00	17.36	H	12.20
16112.77	38.36	54.00	15.64	V	14.00

802.11n HT40 CH151

Frequency (MHz)	Max Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
13848.23	46.99	68.20	21.21	V	8.80
14198.77	48.14	68.20	20.06	H	10.90
14891.03	47.78	68.20	20.42	H	11.10
15269.43	47.82	68.20	20.38	V	11.20
16703.47	50.61	68.20	17.59	H	14.90
17049.97	50.42	68.20	17.78	H	15.00

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
10932.50	33.55	54.00	20.45	H	5.10
11251.13	33.73	54.00	20.27	V	5.50
11730.00	34.52	54.00	19.48	H	6.80
12185.03	34.49	54.00	19.51	H	7.10
15651.87	35.78	54.00	18.22	H	12.00
15958.40	37.19	54.00	16.81	H	13.30

802.11ac VHT80 CH42

Frequency (MHz)	Max Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
12974.10	46.25	68.20	21.95	V	8.40
13744.47	46.97	68.20	21.23	V	8.70
14106.73	47.68	68.20	20.52	V	10.30
14916.33	48.16	68.20	20.04	H	11.20
16765.80	51.16	68.20	17.04	H	14.80
17448.53	51.43	68.20	16.77	H	14.80

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
10798.67	33.41	54.00	20.59	V	5.20
11568.67	34.17	54.00	19.83	V	6.50
12367.63	34.71	54.00	19.29	V	7.40
15765.17	36.52	54.00	17.48	H	12.60
16117.90	38.11	54.00	15.89	H	14.10
17907.60	39.42	54.00	14.58	V	16.30

802.11ac VHT80 CH58

Frequency (MHz)	Max Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
13717.33	46.21	68.20	21.99	V	8.60
14072.63	47.34	68.20	20.86	H	10.00
14747.30	47.83	68.20	20.37	H	10.70
15098.20	47.58	68.20	20.62	H	11.10
16747.83	50.36	68.20	17.84	V	14.90
17571.00	50.74	68.20	17.46	H	15.40

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
11292.20	33.33	54.00	20.67	H	5.40
11934.97	34.63	54.00	19.37	V	7.10
12522.37	35.10	54.00	18.90	V	8.00
15686.33	36.08	54.00	17.92	H	12.20
16106.90	37.65	54.00	16.35	V	14.00
17871.30	38.99	54.00	15.01	V	16.20

802.11ac VHT80 CH106

Frequency (MHz)	Max Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
13801.30	47.41	68.20	20.79	V	8.60
14205.73	48.32	68.20	19.88	V	10.90
14658.57	48.30	68.20	19.90	H	11.00
15061.90	48.32	68.20	19.88	H	11.10
16749.67	50.28	68.20	17.92	H	14.90
17552.67	50.80	68.20	17.40	V	15.10

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
10841.93	33.82	54.00	20.18	V	5.30
11653.73	34.26	54.00	19.74	H	6.90
12427.40	34.22	54.00	19.78	V	7.40
15771.77	36.75	54.00	17.25	V	12.70
16118.63	37.98	54.00	16.02	H	14.10
17908.70	39.34	54.00	14.66	H	16.30

802.11ac VHT80 CH155

Frequency (MHz)	Max Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
13737.50	46.67	68.20	21.53	V	8.70
14151.47	47.48	68.20	20.72	V	10.50
14900.20	47.73	68.20	20.47	V	11.10
15192.43	48.00	68.20	20.20	H	11.00
16780.47	49.85	68.20	18.35	V	14.80
17590.43	50.17	68.20	18.03	H	15.50

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
11069.27	32.93	54.00	21.07	V	4.90
11668.03	34.19	54.00	19.81	V	7.00
12425.57	34.17	54.00	19.83	H	7.40
15696.97	36.16	54.00	17.84	V	12.30
16109.47	38.00	54.00	16.00	V	14.00
17903.20	39.31	54.00	14.69	H	16.30

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

A.9. Radiated Spurious Emissions < 30MHz

Measurement Limit (15.209, 9kHz-30MHz):

Frequency (MHz)	Field strength (μV/m)	Measurement distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30

The measurement is made according to KDB 789033.

Note: The measurement distance during the test is 3m. The limit used in plots recalculated based on the extrapolation factor of 40 dB/decade.

Measurement Result:

Channel	Frequency Range	Test Results	Conclusion
All Channel	9 kHz ~30 MHz	Fig.120	**P**

Conclusion: PASS

Test graphs as below:

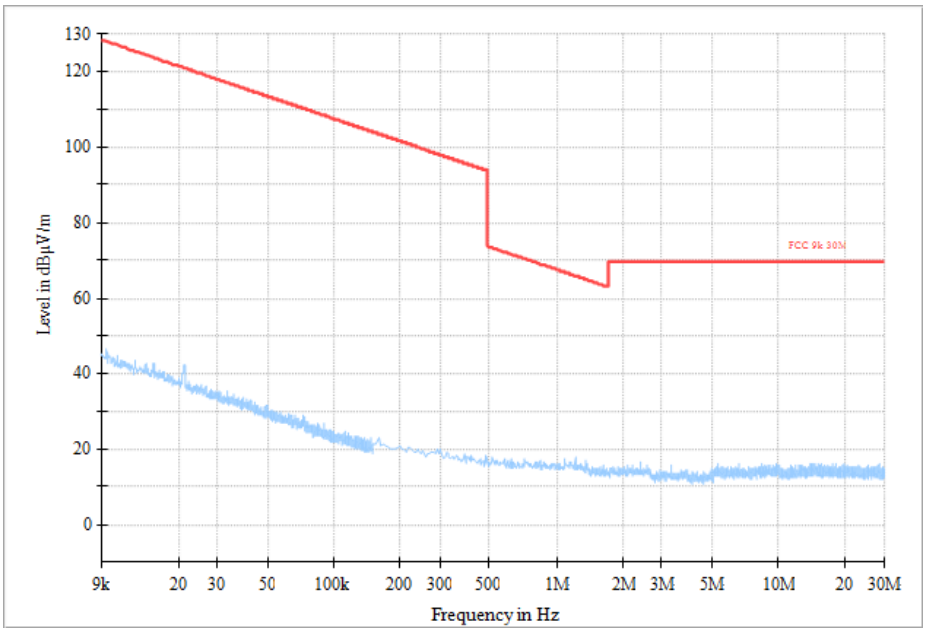


Fig. 120 Radiated Spurious Emission (All Channel, 9 kHz ~30 MHz)

A.10. AC Power Line Conducted Emission

Test Condition:

Voltage(V)	Frequency(Hz)
120	60

Measurement Result and limit:

RLAN (Quasi-peak Limit)-AE1

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	66 to 56	Fig.121	Fig.122	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.				

RLAN (Average Limit)-AE1

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	56 to 46	Fig.121	Fig.122	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.				

Note: The measurement results include the L1 and N measurements.

Conclusion: PASS

Test graphs as below:

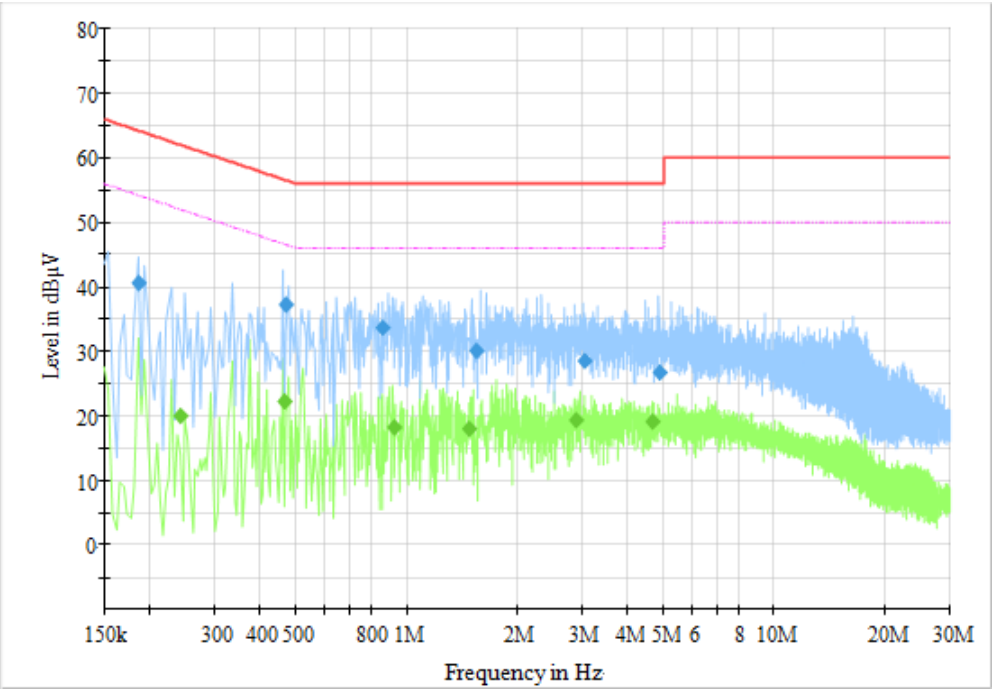


Fig. 121 AC Power line Conducted Emission (Traffic)

Measurement Result: Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.186	40.63	64.21	23.58	L1	ON	9.6
0.468	37.26	56.55	19.29	L1	ON	9.6
0.856	33.75	56.00	22.25	L1	ON	9.7
1.540	30.09	56.00	25.91	L1	ON	9.7
3.040	28.56	56.00	27.44	L1	ON	9.7
4.868	26.69	56.00	29.31	L1	ON	9.7

Measurement Result: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.242	19.94	52.03	32.08	L1	ON	9.6
0.464	22.26	46.62	24.36	N	ON	9.6
0.920	18.14	46.00	27.86	N	ON	9.7
1.476	18.09	46.00	27.92	N	ON	9.7
2.884	19.42	46.00	26.58	N	ON	9.7
4.676	19.00	46.00	27.00	N	ON	9.7

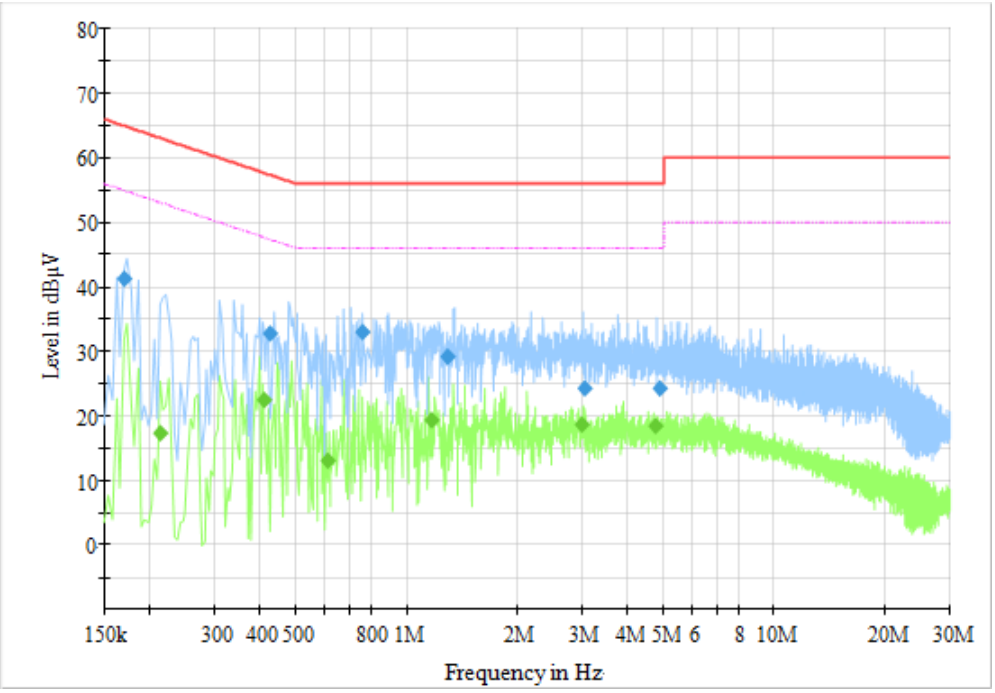


Fig. 122 AC Power line Conducted Emission (Idle)

Measurement Result: Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.170	41.38	64.96	23.58	L1	ON	9.6
0.424	32.85	57.37	24.52	L1	ON	9.6
0.760	33.04	56.00	22.96	L1	ON	9.6
1.288	29.14	56.00	26.86	L1	ON	9.7
3.052	24.33	56.00	31.67	L1	ON	9.7
4.880	24.30	56.00	31.70	L1	ON	9.7

Measurement Result: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.214	17.42	53.05	35.63	L1	ON	9.6
0.408	22.39	47.69	25.30	N	ON	9.7
0.608	13.00	46.00	33.00	L1	ON	9.6
1.172	19.29	46.00	26.71	N	ON	9.7
2.980	18.55	46.00	27.45	N	ON	9.7
4.764	18.44	46.00	27.56	N	ON	9.7

A.11. 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.

Measurement Condition:

T min = -10˚C T nom = 25˚C T max = 50˚C

V min = 3.5V V nom = 3.8V V max = 4.35V

Measurement Result:

Mode	Channel	Condition		Frequency	Conclusion
802.11a	5180 MHz (CH36)	T nom	V nom	5179.9831	**P**
		T max	V nom	5179.9853	**P**
		T min	V nom	5179.9845	**P**
		T nom	V max	5179.9831	**P**
		T nom	V min	5179.9773	**P**
802.11n HT40	5190 MHz (CH38)	T nom	V nom	5189.9131	**P**
		T max	V nom	5189.9638	**P**
		T min	V nom	5189.9684	**P**
		T nom	V max	5189.9658	**P**
		T nom	V min	5189.9652	**P**
802.11ac VHT80	5210 MHz (CH42)	T nom	V nom	5209.9831	**P**
		T max	V nom	5209.9752	**P**
		T min	V nom	5209.9754	**P**
		T nom	V max	5209.9842	**P**
		T nom	V min	5209.9753	**P**

A.12. Power control

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

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