TEST REPORT

No. I20N02496-RLAN

TCL Communication Ltd.

Tablet PC

Model Name: 8094X

with

Hardware Version: PIO

Software Version: 2C51

FCC ID: 2ACCJB140

Issued Date: 2020-09-30

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.

Test Laboratory:

Shenzhen Academy of Information and Communications Technology

Building G, Shenzhen International Innovation Center, No.1006 Shennan Road, Futian District, Shenzhen, Guangdong, P. R. China 518026.

Tel: +86(0)755-33322000, Fax: +86(0)755-33322001

Email: yewu@caict.ac.cn, website: www.cszit.com

CONTENTS

1. SUMMARY OF TEST REPORT 3
1.1. TEST ITEMS 3
1.2. TEST STANDARDS 3
1.3. TEST RESULT 3
1.4. TESTING LOCATION 3
1.5. PROJECT DATA 3
1.6. SIGNATURE 3
2. CLIENT INFORMATION 4
2.1. APPLICANT INFORMATION 4
2.2. MANUFACTURER INFORMATION 4
3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE) 5
3.1. ABOUT EUT 5
3.2. INTERNAL IDENTIFICATION OF EUT 5
3.3. INTERNAL IDENTIFICATION OF AE 5
3.4. GENERAL DESCRIPTION 6
4. REFERENCE DOCUMENTS 7
4.1. DOCUMENTS SUPPLIED BY APPLICANT 7
4.2. REFERENCE DOCUMENTS FOR TESTING 7
5. TEST RESULTS 8
5.1. TESTING ENVIRONMENT 8
5.2. TEST RESULTS 8
5.3. STATEMENTS 8
6. TEST EQUIPMENTS UTILIZED 9
7. LABORATORY ENVIRONMENT 10
8. MEASUREMENT UNCERTAINTY 11
ANNEX A: MEASUREMENT RESULTS 12
A.0. MEASUREMENT METHOD 12
A.1. MAXIMUM OUTPUT POWER 13
A.2. PEAK POWER SPECTRAL DENSITY 15
A.3. OCCUPIED 26DB BANDWIDTH 16
A.4. 99% OCCUPIED BANDWIDTH 23
A.5. BAND EDGES COMPLIANCE 30
A.6. TRANSMITTER SPURIOUS EMISSION 34
A.7. RADIATED SPURIOUS EMISSIONS < 30MHZ 48
A.8. AC POWER LINE CONDUCTED EMISSION 49
A.9. FREQUENCY STABILITY 52
A.10. POWER CONTROL 52
ANNEX B: DETAIL SPOT CHECK VERIFICATION DATA 53

1. Summary of Test Report

1.1. Test Items

Description	Tablet PC
Model Name	8094X
Applicant's name	TCL Communication Ltd.
Manufacturer's Name	TCL Communication Ltd.

1.2. Test Standards

FCC Part15-2019; ANSI C63.10-2013; 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:	2020-09-27
Testing End Date:	2020-09-29

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:	TCL Communication Ltd.
Address:	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
Contact Person	Gong Zhizhou
E-Mail	zhizhou.gong@tcl.com
Telephone:	0086-755-36611722
Fax:	0086-755-36612000-81722

2.2. Manufacturer Information

Company Name:	TCL Communication Ltd.
Address:	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
Contact Person	Gong Zhizhou
E-Mail	zhizhou.gong@tcl.com
Telephone:	0086-755-36611722
Fax:	0086-755-36612000-81722

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

3.1. About EUT

Description	Tablet PC
Model Name	8094X
Brand Name	/
RLAN Frequency Range	ISM Bands: -5150MHz~5250MHz -5250MHz~5350MHz
RLAN Protocol	IEEE 802.11a, 802.11n-HT20/40, 802.11ac-VHT20/40/80
Type of modulation	OFDM
Antenna Type	Integrated
Antenna Gain	1.03dBi
Power Supply	3.9V DC by Battery
FCC ID	2ACCJB140
Condition of EUT as received	No abnormality in appearance

Note: The EUT model 8094X (FCC ID: 2ACCJB140) is a variant product of 8094M (FCC ID: 2ACCJB131), according to the declaration of changes provided by applicant and FCC KDB publication 484596 D01, spot check measurement were performed on this device, all the test results are derived from test report I20N01660-RLAN. Please refer ANNEX A for reference data, and ANNEX B for detail spot check verification data, the spot check test results are consistent with basic model.

3.2. Internal Identification of EUT

EUT ID*	IMEI	HW Version	SW Version	Receive Date
EUT1	358496890001132	PIO	2C51	2020-07-22
EUT2	358496890001116	PIO	2C51	2020-07-22

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

3.3. Internal Identification of AE

AE ID*	Description	SN
AE1	Battery	CAC5360006C1
AE2	Charger	CBA0059AGAC5

AE1

Model	TLp053C1
Manufacturer	BYD
Capacity	5500mAh
Nominal Voltage	3.85v

AE2

Model	UC13US
Manufacturer	PUAN

*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 Tablet PC with integrated antenna and battery.
It consists of normal options: Lithium Battery and Charger.
Manual and specifications of the EUT were provided to fulfil the test.
Samples undergoing test were selected by the client.

4. REFERENCE DOCUMENTS

4.1. Documents supplied by applicant

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

4.2. Reference Documents for testing

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

Reference	Title	Version
FCC Part15	FCC CFR 47,Part 15,Subpart C FCC CFR 47,Part 15,Subpart E	2019
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℃

Relative Humidity: 20~75%

5.2. Test Results

No.	Test cases	Sub-clause of Part15E	Verdict
1	Maximum Output Power	15.407	**P**
2	Power Spectral Density	15.407	**P**
3	Occupied 26dB Bandwidth	15.403	**/**
4	99% Occupied Bandwidth	15.403	**/**
5	Band edge compliance	15.209	**P**
6	Transmitter Spurious Emissions	15.407, 15.205	**P**
7	AC Power line Conducted	15.107, 15.207	**P**
8	Frequency Stability	15.407	**P**
9	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	2021-08-05	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	2021-07-17	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 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
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

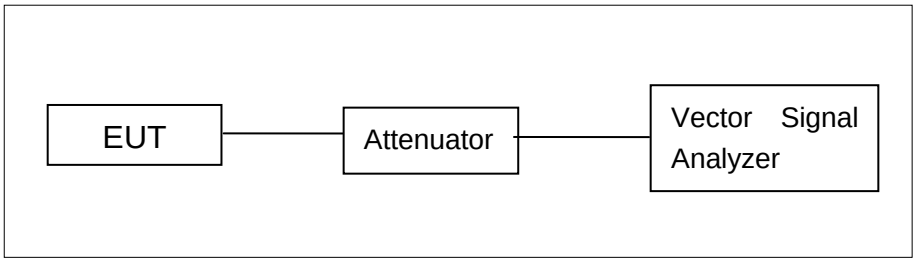
Test Name	Uncertainty (*k=2*)	
1. RF Output Power - Conducted	1.32dB	
2. Power Spectral Density - Conducted	2.32dB	
3. Occupied channel bandwidth - Conducted	66Hz	
4. Transmitter Spurious Emission - Conducted	30MHz≤f≤1GHz	1.41dB
	1GHz≤f≤7GHz	1.92dB
	7GHz≤f≤13GHz	2.31dB
	13GHz≤f≤26GHz	2.61dB
5. Transmitter 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.0. Measurement Method

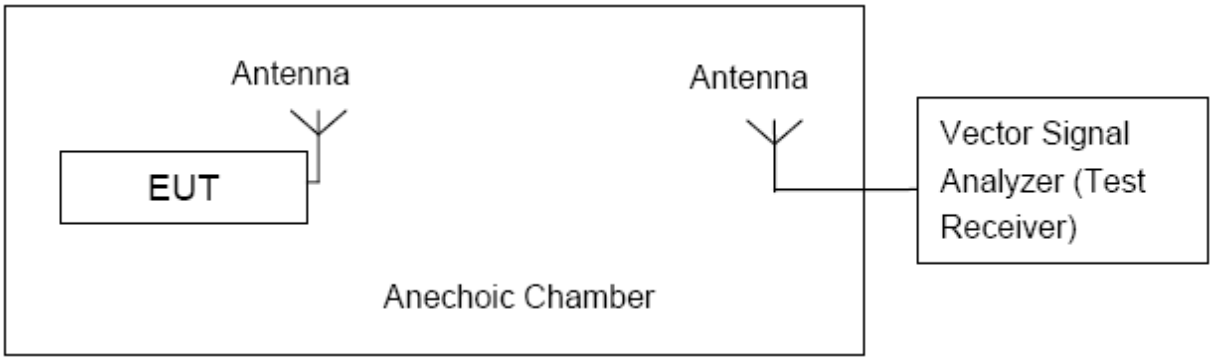
Conducted Measurements

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.1. 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

Limit use the less value, and B is the 26dB 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:

802.11a mode

Mode	Channel	Test Result (dBm)							
		Data Rate (Mbps)							
		6	9	12	18	24	36	48	54
802.11a	5180MHz(Ch36)	7.04	7.01	6.97	6.95	6.92	6.92	6.90	6.87
	5200MHz(Ch40)	7.01	/	/	/	/	/	/	/
	5240MHz(Ch48)	7.15	/	/	/	/	/	/	/
	5260MHz(Ch52)	7.17	/	/	/	/	/	/	/
	5280MHz(Ch56)	7.22	/	/	/	/	/	/	/
	5320MHz(Ch64)	7.25	/	/	/	/	/	/	/

802.11n-HT20 mode

Mode	Channel	Test Result (dBm)							
		Data Rate (Index)							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n (HT20)	5180MHz(Ch36)	6.96	6.94	6.89	6.91	6.90	6.86	6.83	6.82
	5200MHz(Ch40)	6.98	/	/	/	/	/	/	/
	5240MHz(Ch48)	7.08	/	/	/	/	/	/	/
	5260MHz(Ch52)	7.12	/	/	/	/	/	/	/
	5280MHz(Ch56)	7.13	/	/	/	/	/	/	/
	5320MHz(Ch64)	7.15	/	/	/	/	/	/	/

802.11ac-VHT20 mode

Mode	Channel	Test Result (dBm)							
		Data Rate (Index)							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7

802.11ac (VHT20)	5180MHz(Ch36)	6.89	6.83	6.81	6.78	6.80	6.75	6.72	6.73
	5200MHz(Ch40)	6.94	/	/	/	/	/	/	/
	5240MHz(Ch48)	7.07	/	/	/	/	/	/	/
	5260MHz(Ch52)	7.11	/	/	/	/	/	/	/
	5280MHz(Ch56)	7.10	/	/	/	/	/	/	/
	5320MHz(Ch64)	7.19	/	/	/	/	/	/	/

802.11n-HT40 mode

Mode	Channel	Test Result (dBm)							
		Data Rate (Index)							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n (HT40)	5190MHz(Ch38)	6.80	6.77	6.73	6.75	6.73	6.70	6.68	6.64
	5230MHz(Ch46)	6.93	/	/	/	/	/	/	/
	5270MHz(Ch54)	7.01	/	/	/	/	/	/	/
	5310MHz(Ch62)	7.06	/	/	/	/	/	/	/

802.11ac-VHT40 mode

Mode	Channel	Test Result (dBm)							
		Data Rate (Index)							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11ac (VHT40)	5190MHz(Ch38)	6.71	6.68	6.66	6.62	6.61	6.63	6.59	6.56
	5230MHz(Ch46)	6.83	/	/	/	/	/	/	/
	5270MHz(Ch54)	6.90	/	/	/	/	/	/	/
	5310MHz(Ch62)	6.92	/	/	/	/	/	/	/

802.11ac-VHT80 mode

Mode	Channel	Test Result (dBm)							
		Data Rate (Index)							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11ac (VHT80)	5210MHz(Ch42)	6.94	6.92	6.88	6.86	6.85	6.81	6.77	6.76
	5290MHz(Ch58)	7.07	/	/	/	/	/	/	/

Note: The data rate 6Mbps (11a mode), MCS0 (11n mode) and MCS0 (11ac mode) are selected as the worst case. 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.2. Peak Power Spectral Density

Measurement Limit:

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

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)	Conclusion
802.11a	5180MHz(Ch36)	0.54	**P**
	5200MHz(Ch40)	0.69	**P**
	5240MHz(Ch48)	1.35	**P**
802.11n HT40	5190MHz(Ch38)	-2.25	**P**
	5230MHz(Ch46)	-2.54	**P**
802.11ac VHT80	5210MHz(Ch42)	-5.37	**P**

5.3GHz Band (UNII-2A)

Mode	Channel	Power Spectral Density (dBm/MHz)	Conclusion
802.11a	5260MHz(Ch52)	0.52	**P**
	5280MHz(Ch56)	0.70	**P**
	5320MHz(Ch64)	0.77	**P**
802.11n HT40	5270MHz(Ch54)	-2.15	**P**
	5310MHz(Ch62)	-2.70	**P**
802.11ac VHT80	5290MHz(Ch58)	-5.73	**P**

Conclusion: PASS

A.3. Occupied 26dB Bandwidth

Measurement Limit:

Standard	Limit (MHz)
FCC 47 CFR Part 15.403	/

The measurement is made according to KDB 789033.

Measurement Result:

Mode	Channel	Occupied 26dB Bandwidth (MHz)		Conclusion
802.11a	5180MHz(Ch36)	Fig.1	20.60	**P**
	5200MHz(Ch40)	Fig.2	20.45	**P**
	5240MHz(Ch48)	Fig.3	20.50	**P**
	5260MHz(Ch52)	Fig.4	20.45	**P**
	5280MHz(Ch56)	Fig.5	20.50	**P**
	5320MHz(Ch64)	Fig.6	20.50	**P**
802.11n HT40	5190MHz(Ch38)	Fig.7	40.64	**P**
	5230MHz(Ch46)	Fig.8	41.04	**P**
	5270MHz(Ch54)	Fig.9	40.64	**P**
	5310MHz(Ch62)	Fig.10	40.32	**P**
802.11ac VHT80	5210MHz(Ch42)	Fig.11	81.28	**P**
	5290MHz(Ch58)	Fig.12	81.12	**P**

Conclusion: PASS

Test graphs as below:

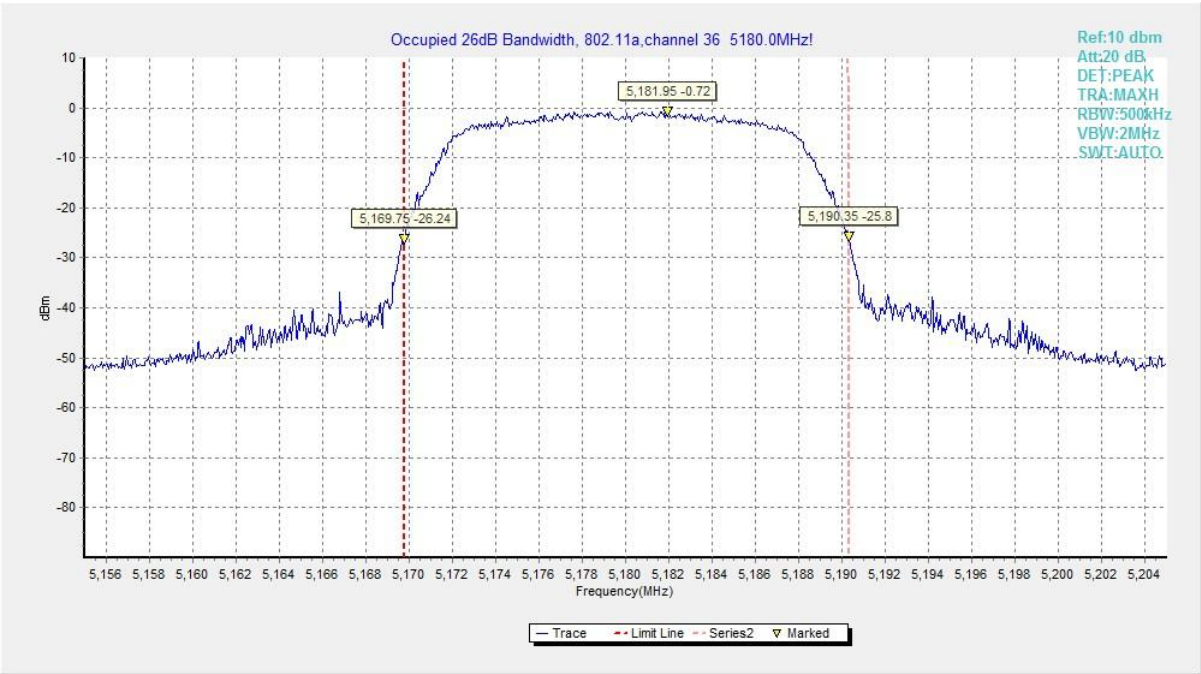


Fig. 1 Occupied 26dB Bandwidth (802.11a, 5180MHz)

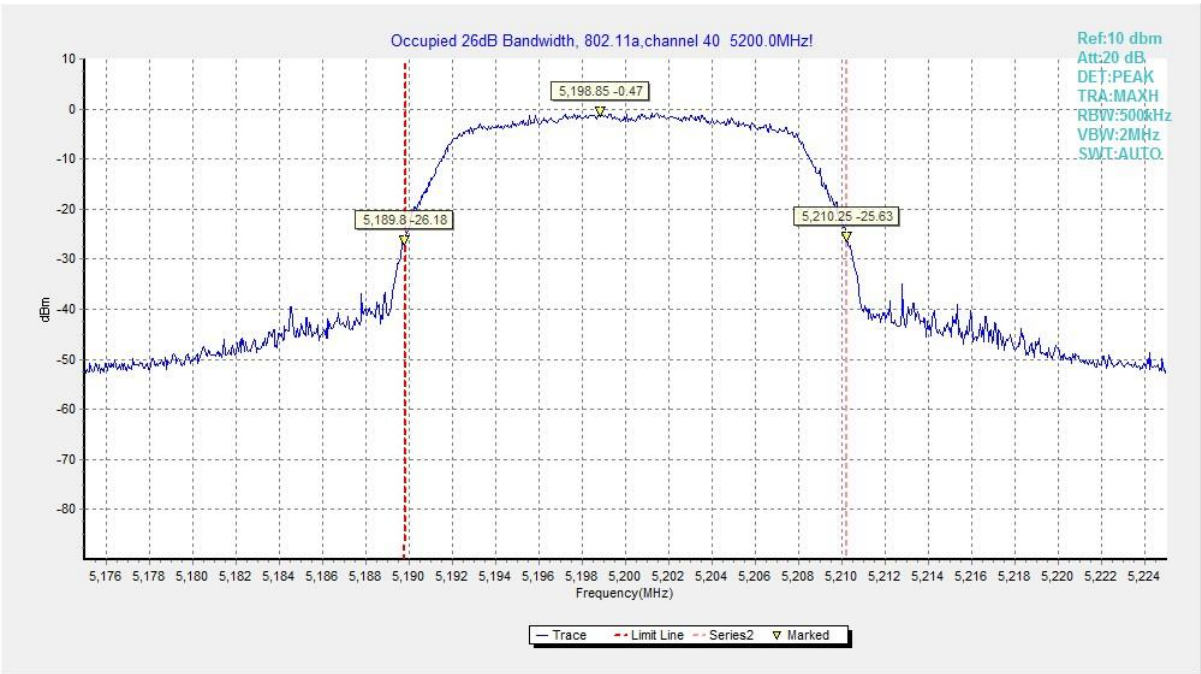


Fig. 2 Occupied 26dB Bandwidth (802.11a, 5200MHz)

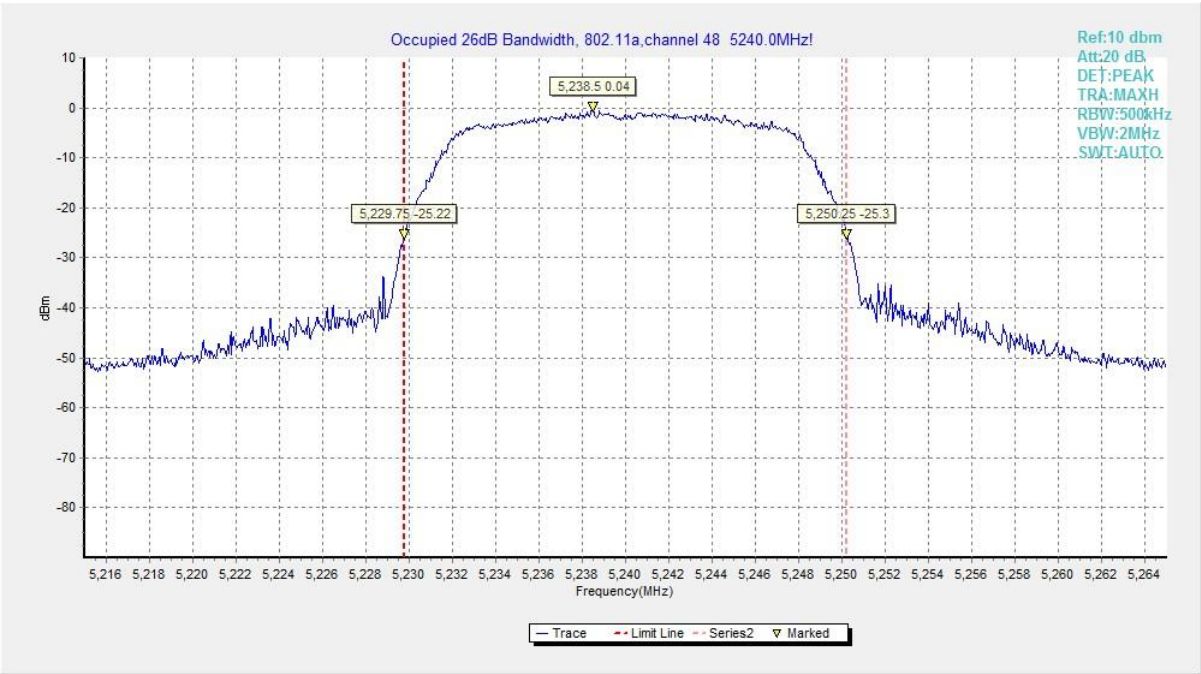


Fig. 3 Occupied 26dB Bandwidth (802.11a, 5240MHz)

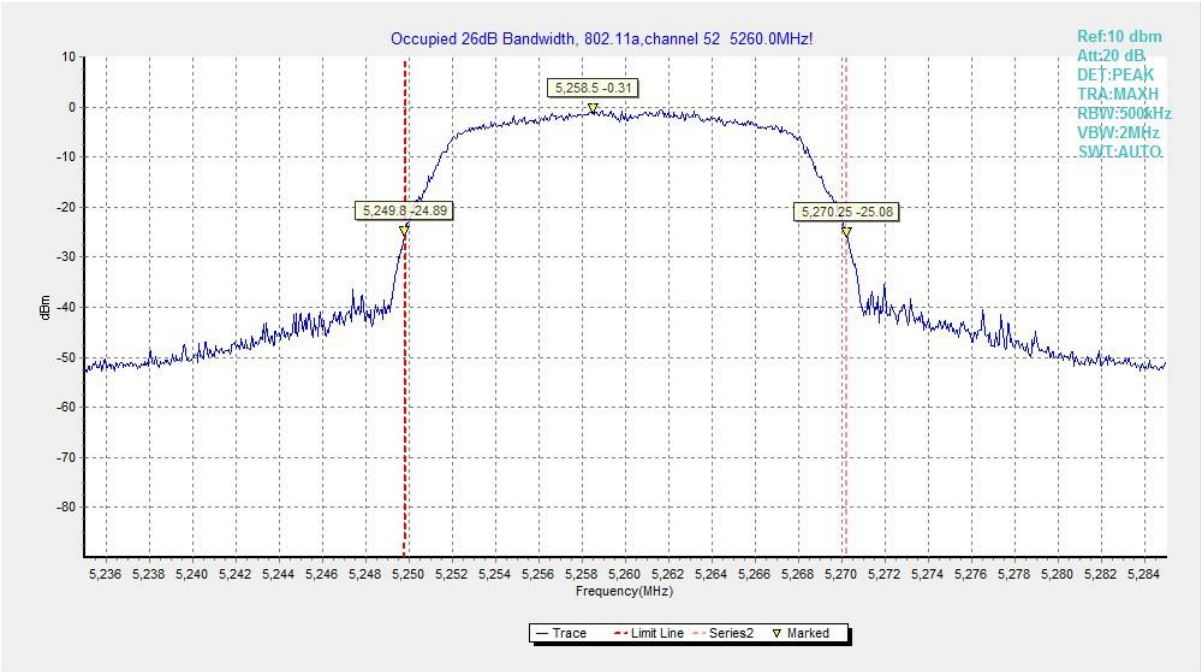


Fig. 4 Occupied 26dB Bandwidth (802.11a, 5260MHz)

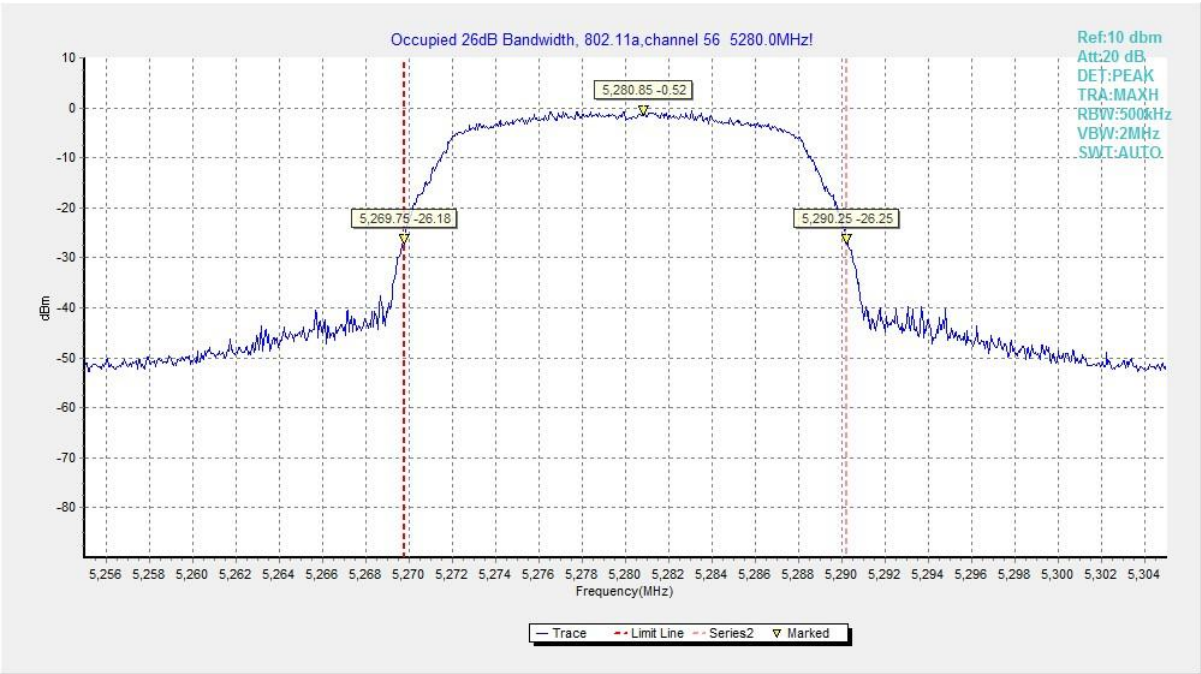


Fig. 5 Occupied 26dB Bandwidth (802.11a, 5280MHz)

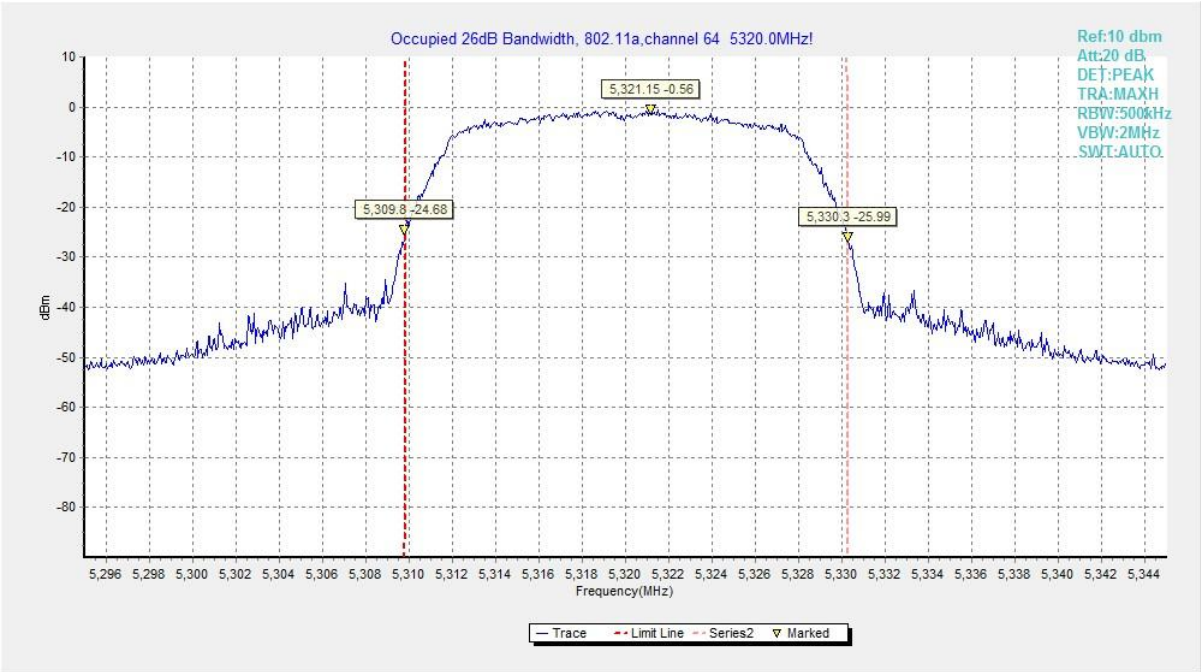


Fig. 6 Occupied 26dB Bandwidth (802.11a, 5320MHz)

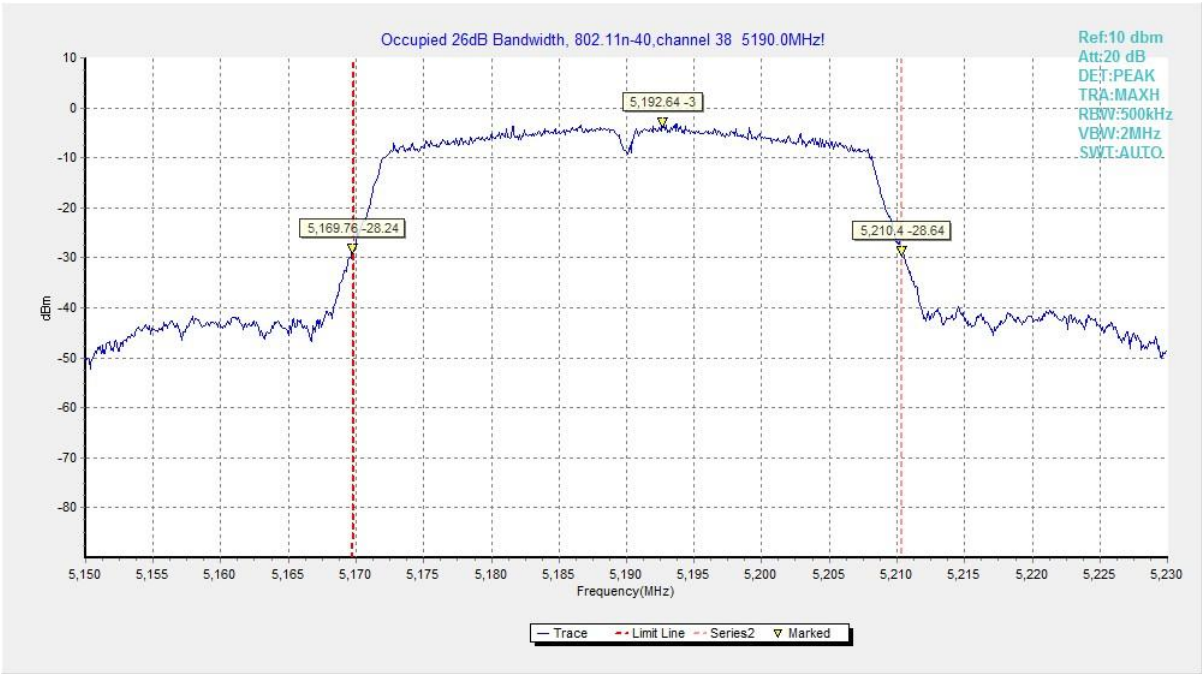


Fig. 7 Occupied 26dB Bandwidth (802.11n-HT40, 5190MHz)

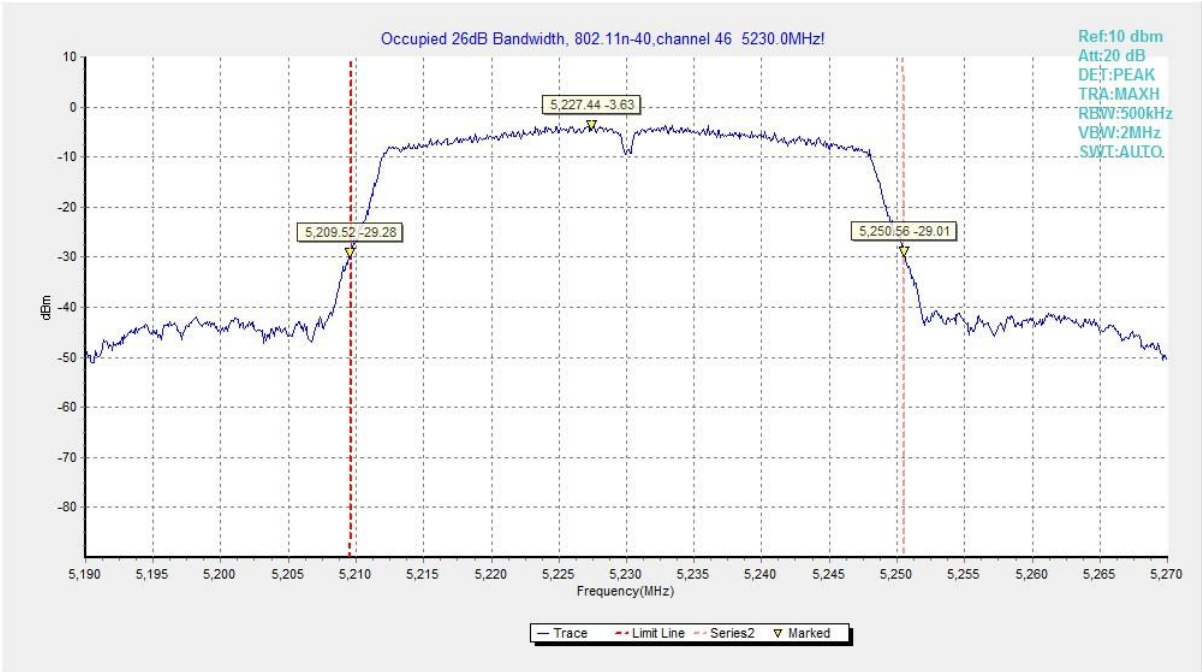


Fig. 8 Occupied 26dB Bandwidth (802.11n-HT40, 5230MHz)

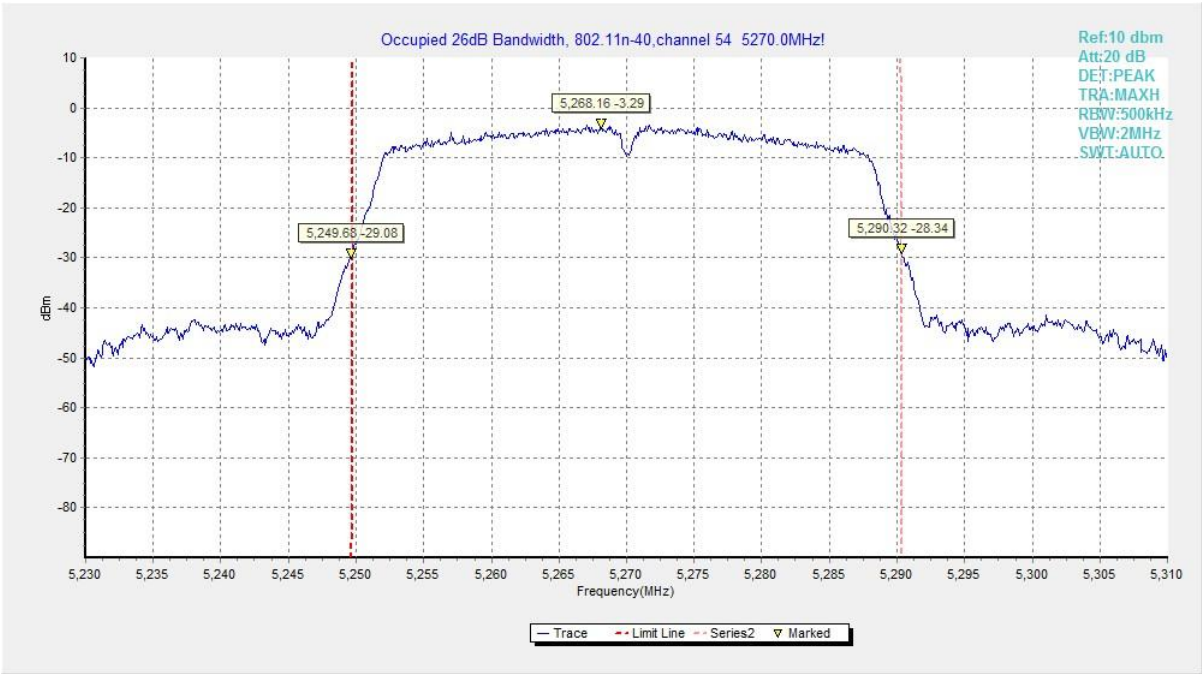


Fig. 9 Occupied 26dB Bandwidth (802.11n-HT40, 5270MHz)

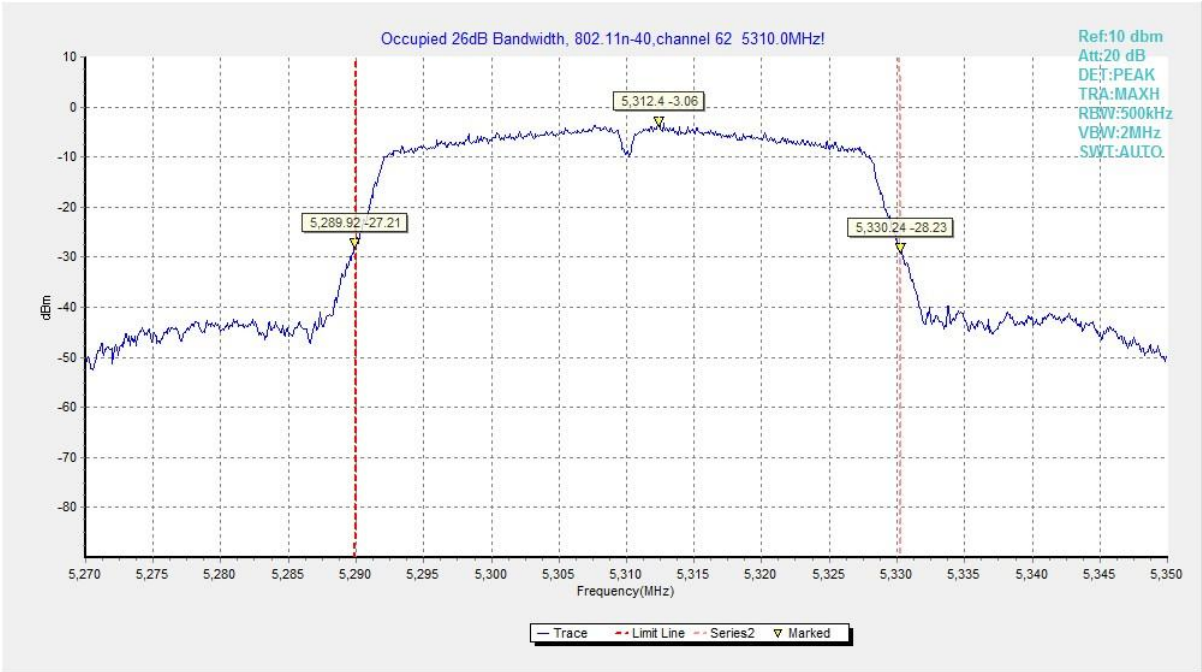


Fig. 10 Occupied 26dB Bandwidth (802.11n-HT40, 5310MHz)

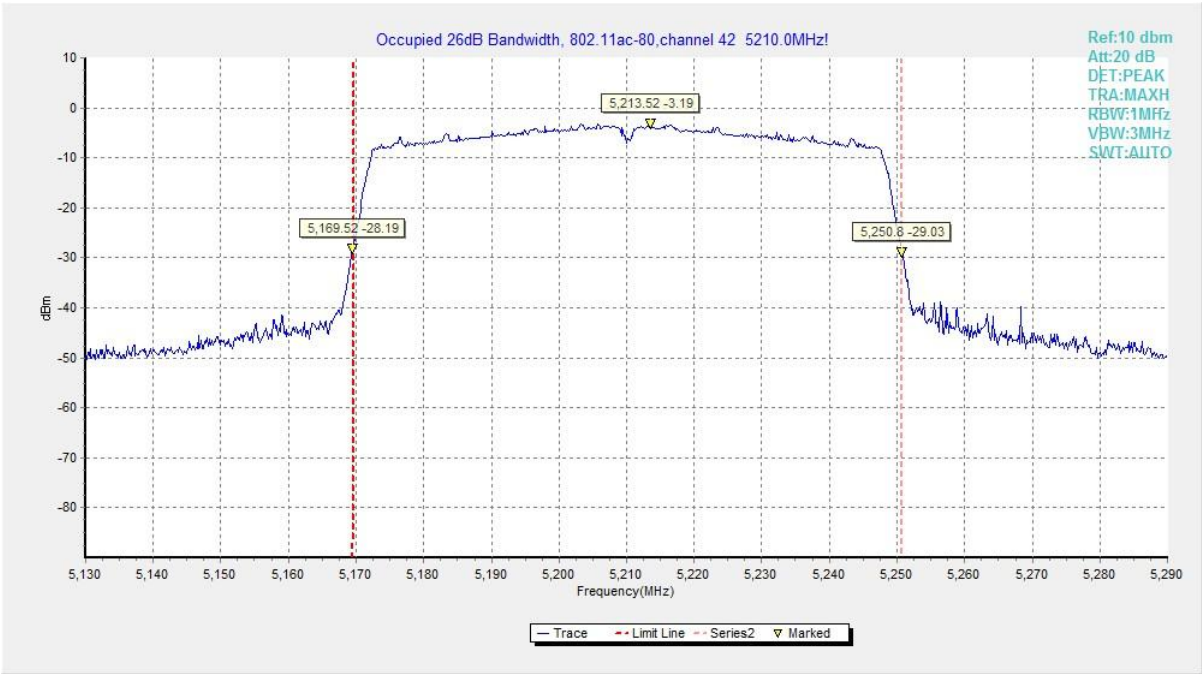


Fig. 11 Occupied 26dB Bandwidth (802. 11ac-VHT80, 5210MHz)

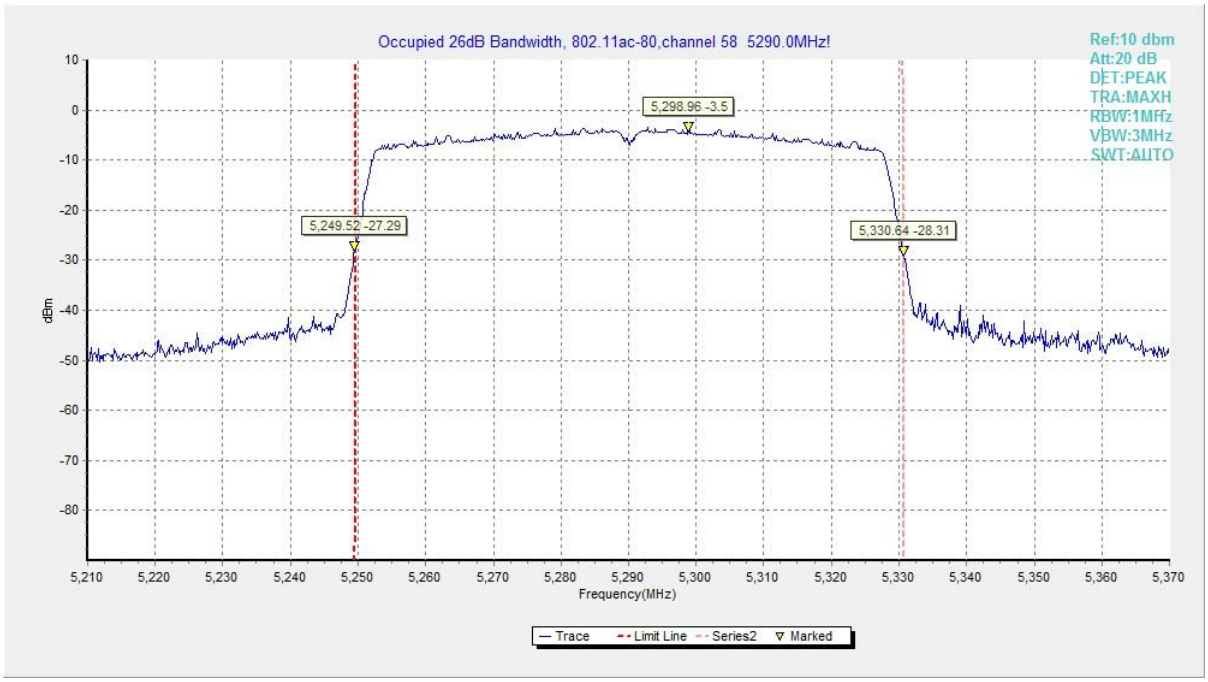


Fig. 12 Occupied 26dB Bandwidth (802. 11ac-VHT80, 5290MHz)

A.4. 99% Occupied Bandwidth

Measurement Limit:

Standard	Limit (MHz)
FCC 47 CFR Part 15.403	/

The measurement is made according to KDB 789033.

Measurement Result:

Mode	Channel	99% Occupied Bandwidth (MHz)		Conclusion
802.11a	5180MHz(Ch36)	Fig.13	17.14	**P**
	5200MHz(Ch40)	Fig.14	17.18	**P**
	5240MHz(Ch48)	Fig.15	17.22	**P**
	5260MHz(Ch52)	Fig.16	17.18	**P**
	5280MHz(Ch56)	Fig.17	17.18	**P**
	5320MHz(Ch64)	Fig.18	17.18	**P**
802.11n HT40	5190MHz(Ch38)	Fig.19	36.12	**P**
	5230MHz(Ch46)	Fig.20	36.12	**P**
	5270MHz(Ch54)	Fig.21	36.12	**P**
	5310MHz(Ch62)	Fig.22	36.04	**P**
802.11ac VHT80	5210MHz(Ch42)	Fig.23	74.97	**P**
	5290MHz(Ch58)	Fig.24	75.28	**P**

Conclusion: PASS

Test graphs as below:

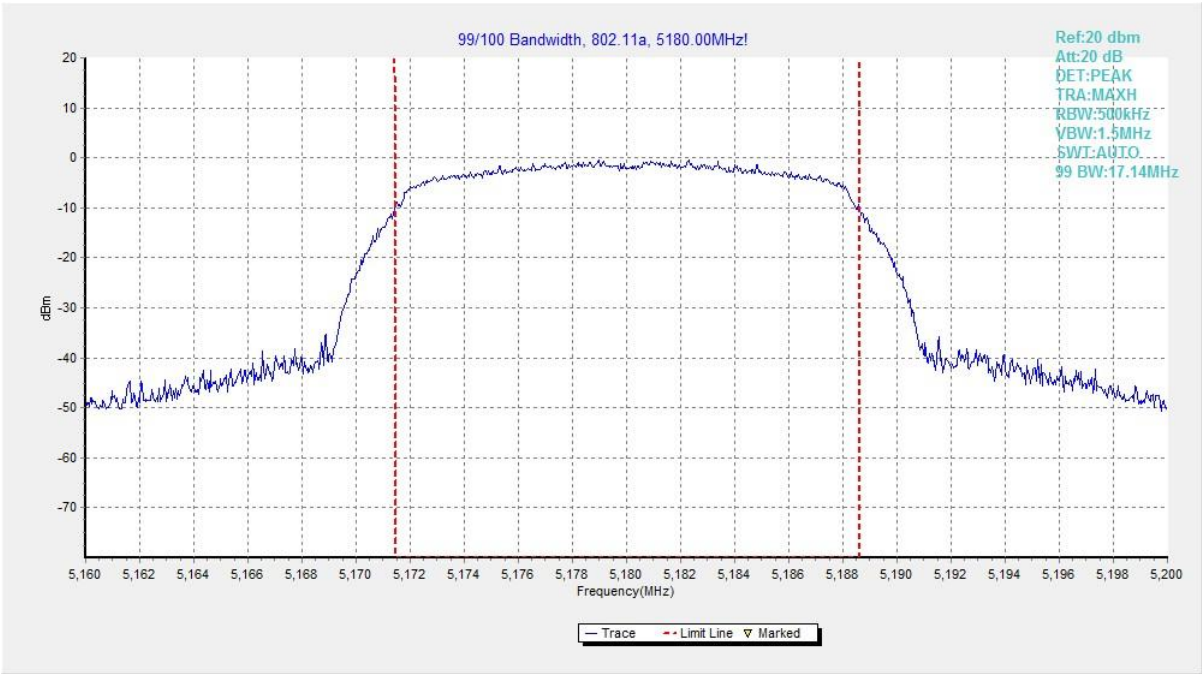


Fig. 13 99% Occupied Bandwidth (802.11a, 5180MHz)

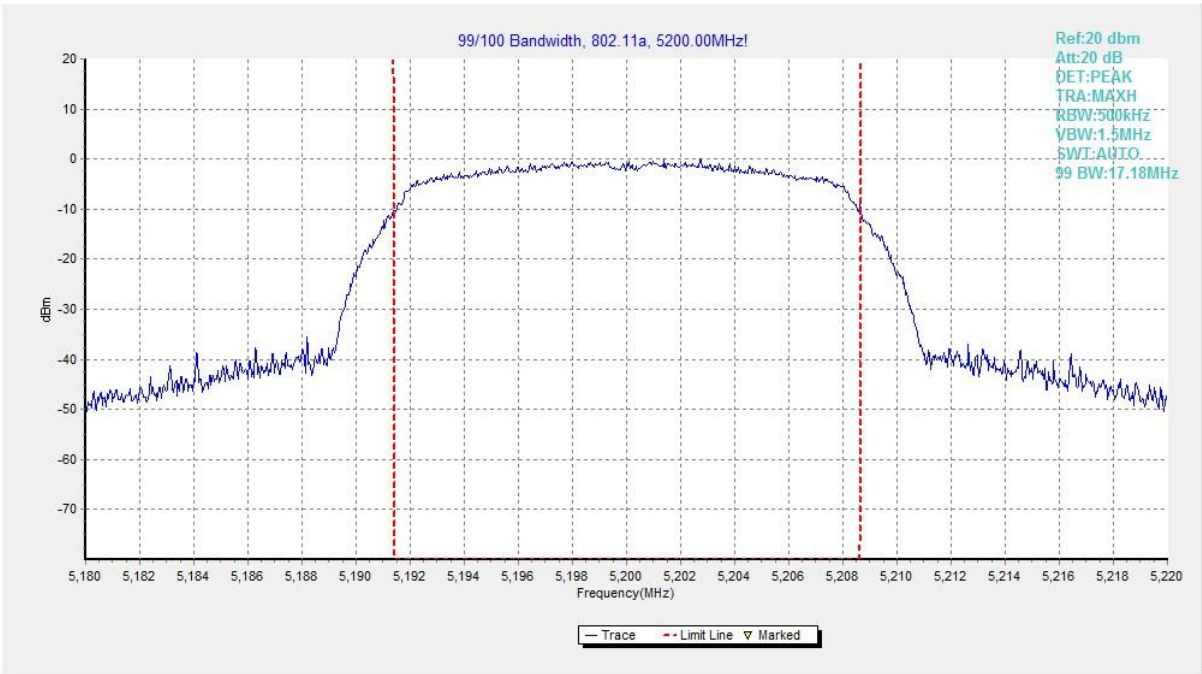


Fig. 14 99% Occupied Bandwidth (802.11a, 5200MHz)

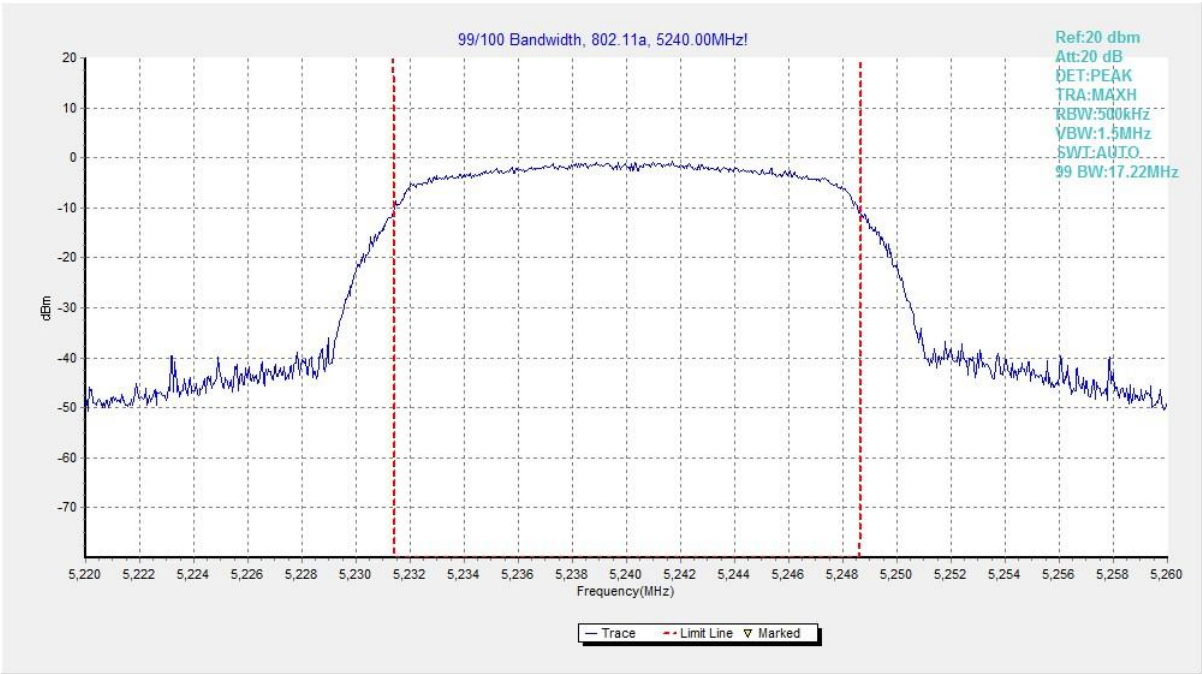


Fig. 15 99% Occupied Bandwidth (802.11a, 5240MHz)

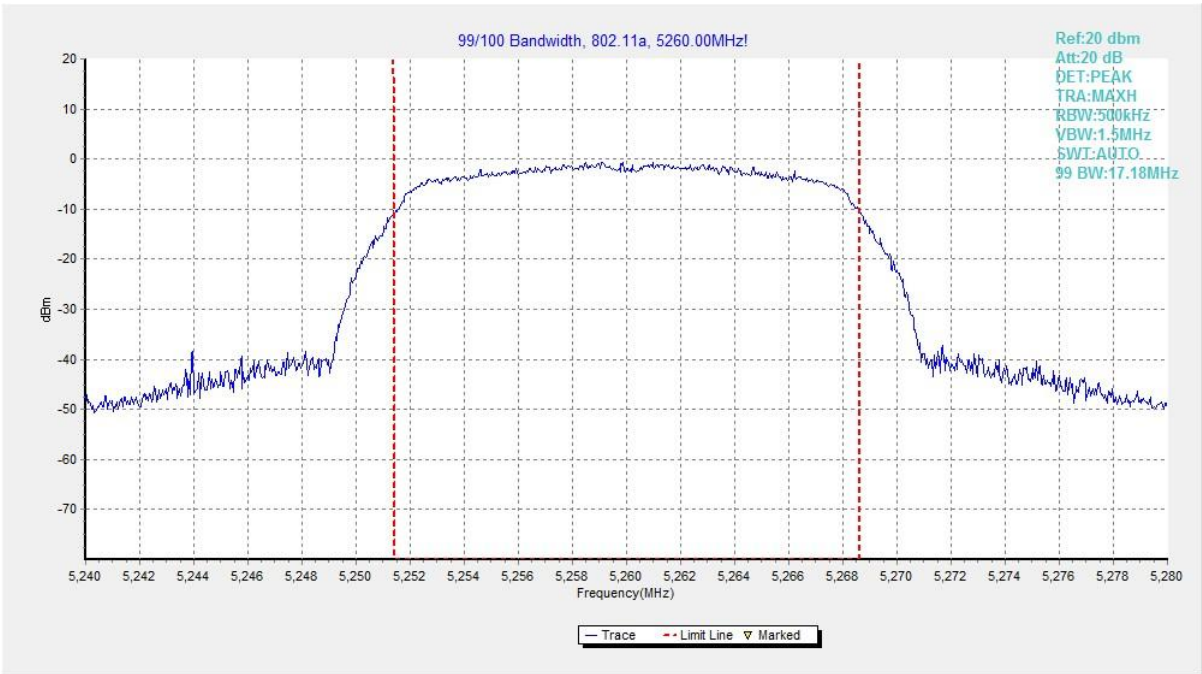


Fig. 16 99% Occupied Bandwidth (802.11a, 5260MHz)

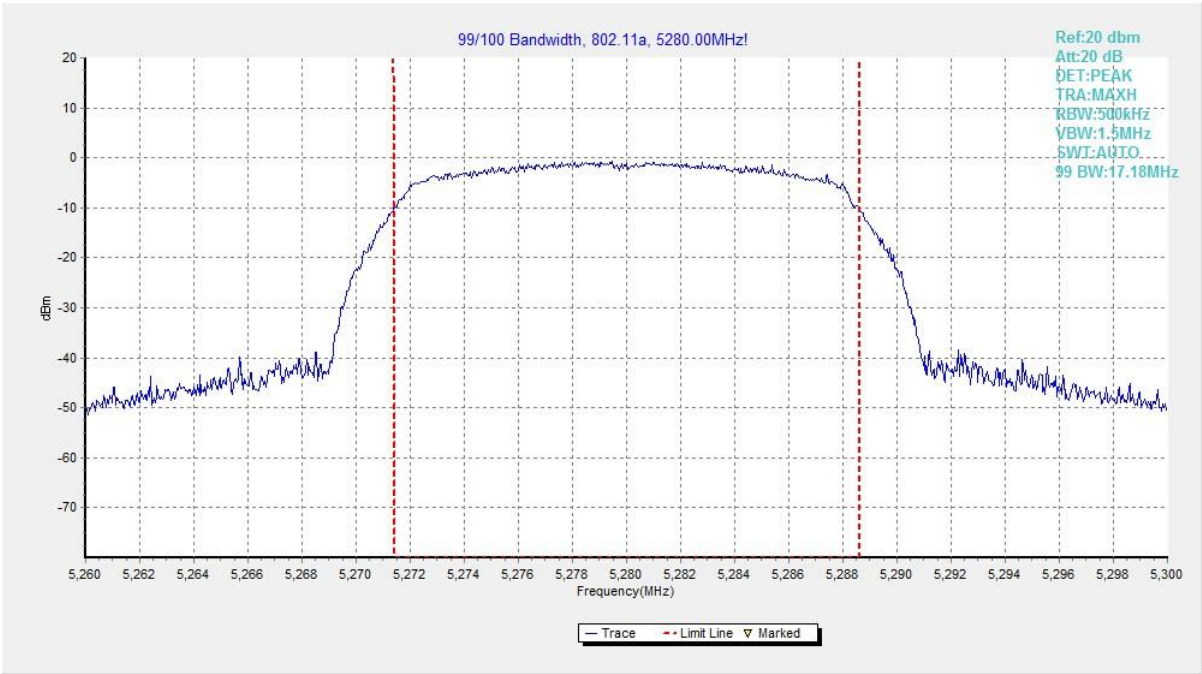


Fig. 17 99% Occupied Bandwidth (802.11a, 5280MHz)

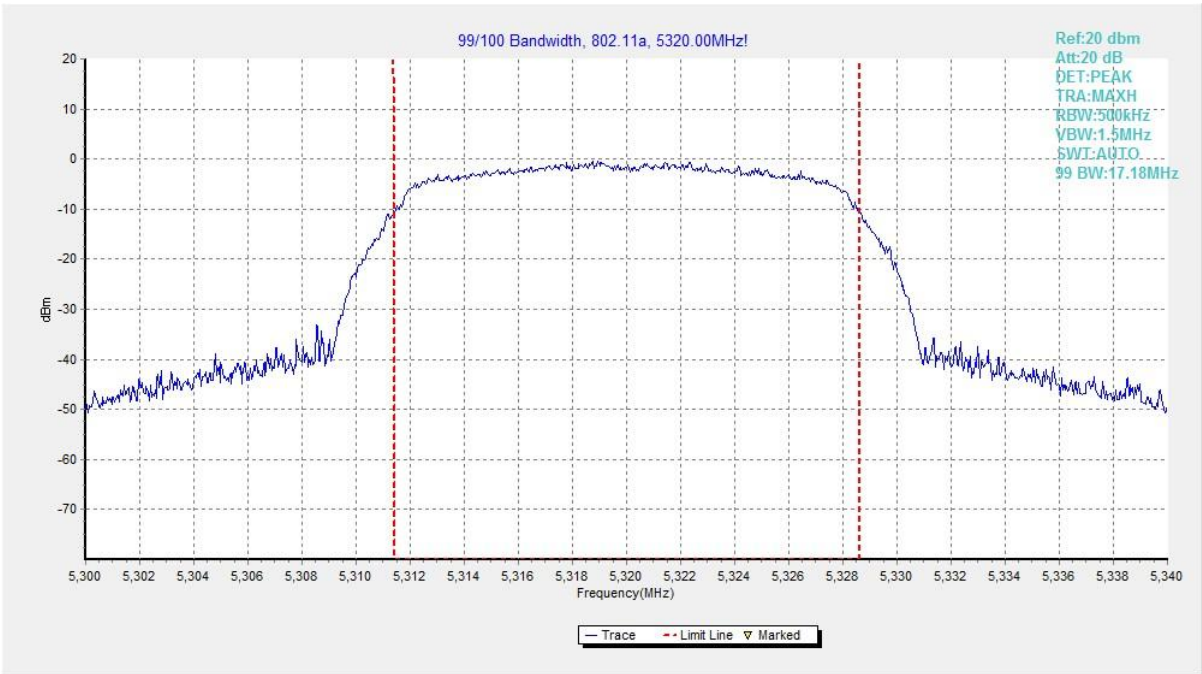


Fig. 18 99% Occupied Bandwidth (802.11a, 5320MHz)

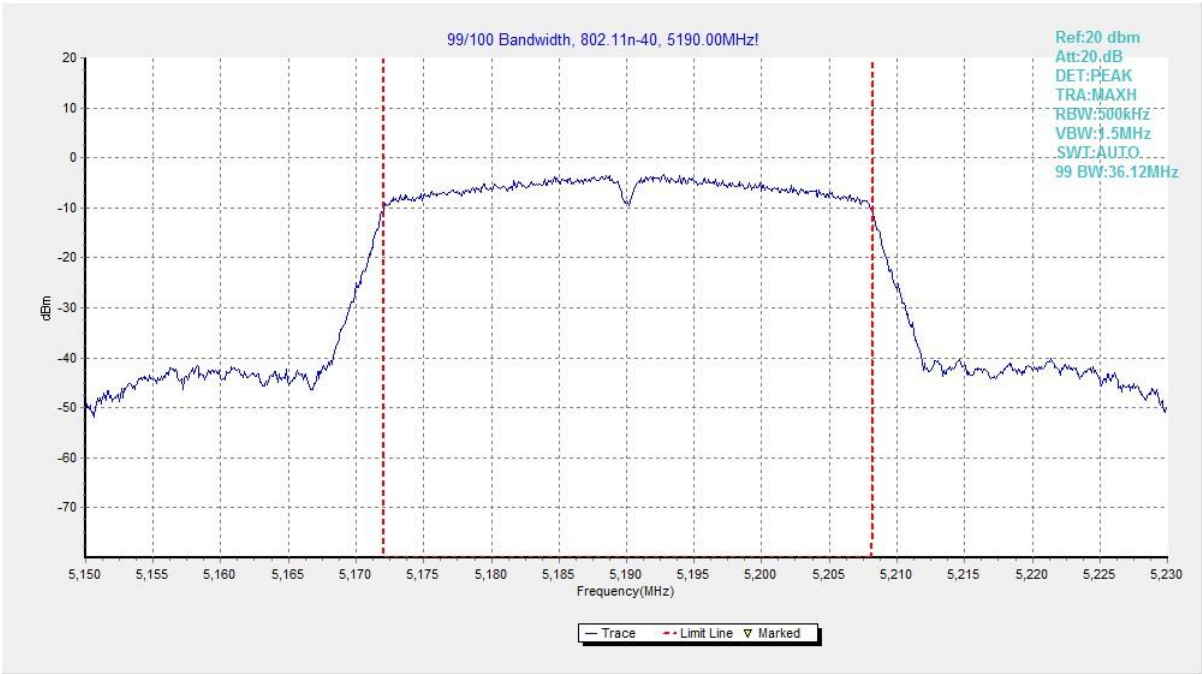


Fig. 19 99% Occupied Bandwidth (802.11n-HT40, 5190MHz)

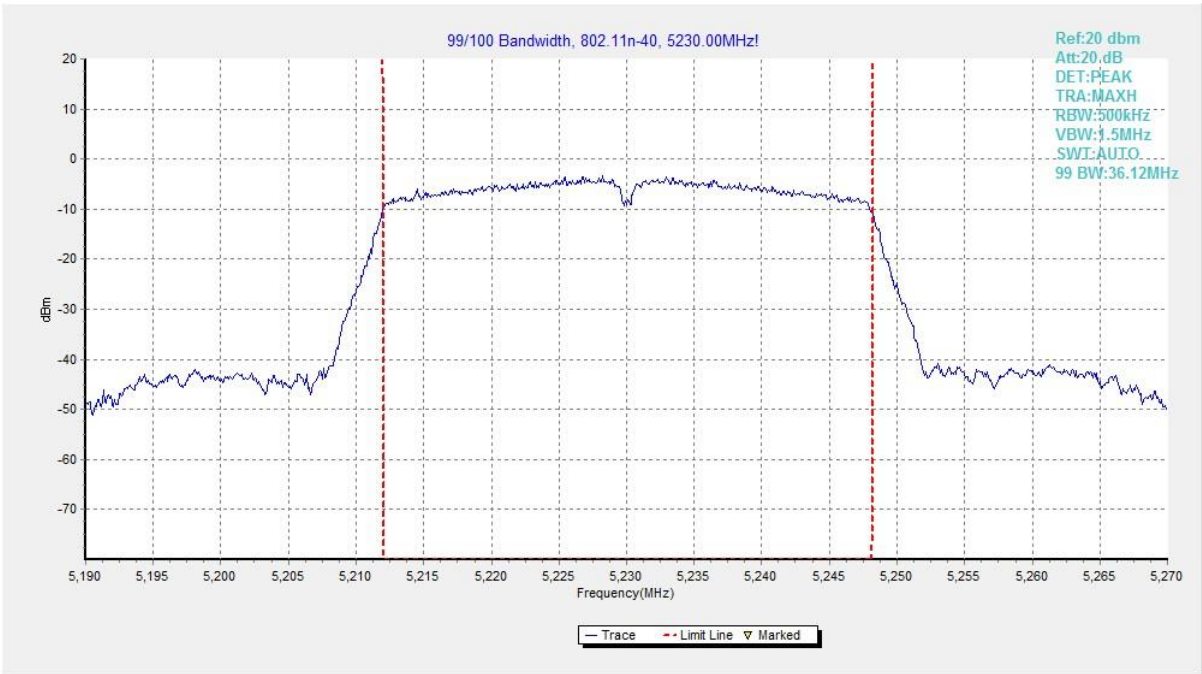


Fig. 20 99% Occupied Bandwidth (802.11n-HT40, 5230MHz)

Fig. 21 99% Occupied Bandwidth (802.11n-HT40, 5270MHz)

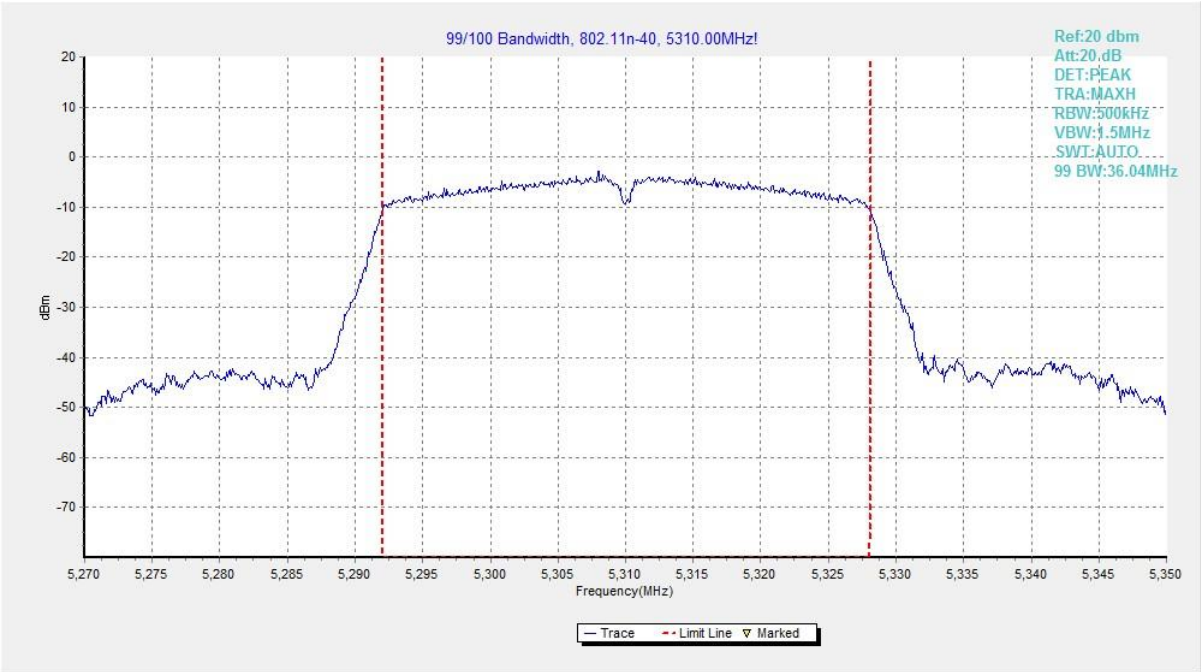


Fig. 22 99% Occupied Bandwidth (802.11n-HT40, 5310MHz)

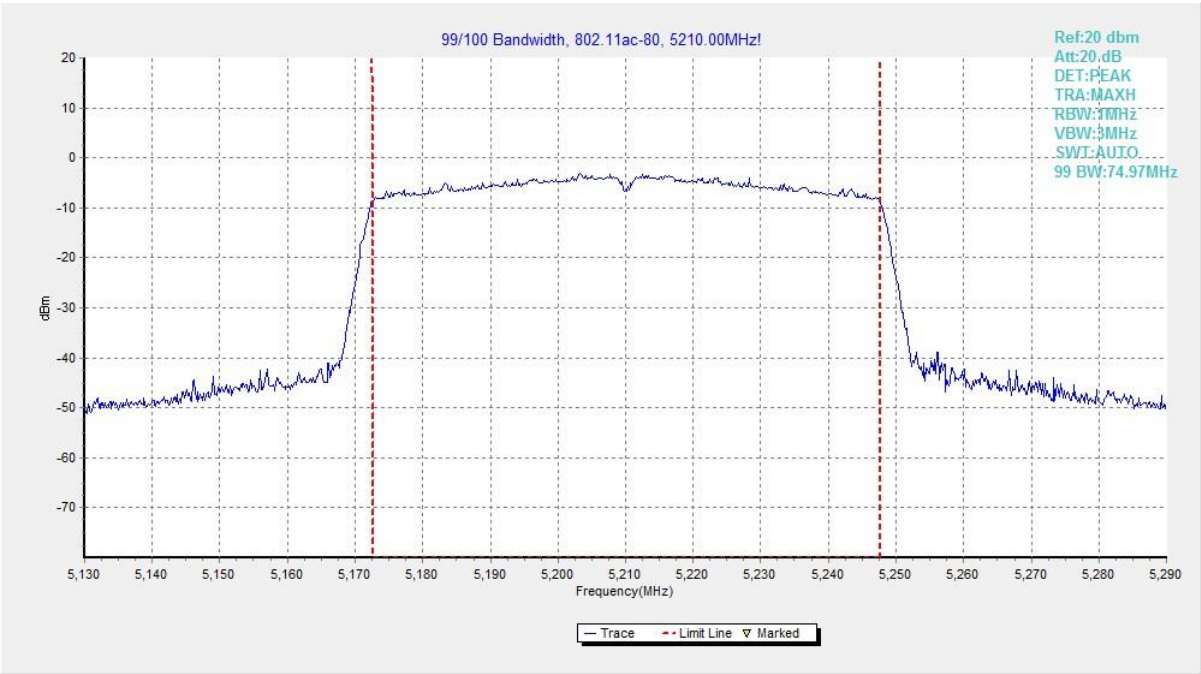


Fig. 23 99% Occupied Bandwidth (802. 11ac-VHT80, 5210MHz)

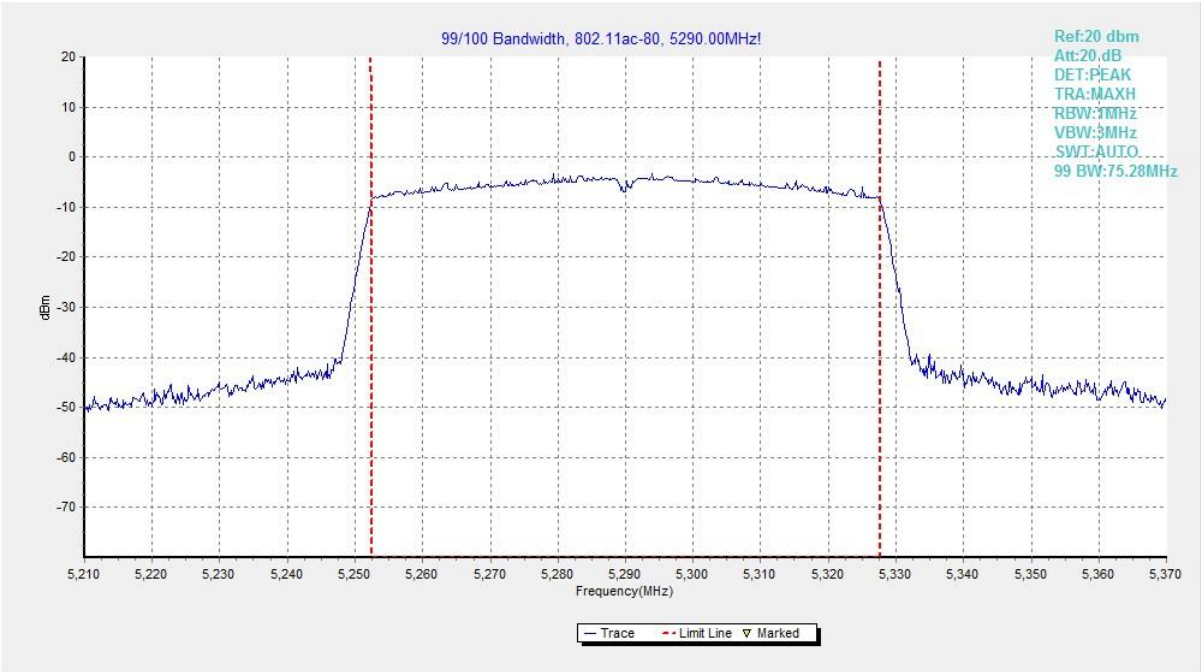


Fig. 24 99% Occupied Bandwidth (802. 11ac-VHT80, 5290MHz)

A.5. Band Edges Compliance

Measurement Limit:

Standard	Limit (dBuV/m)	
FCC 47 CFR Part 15.209	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.25	**P**
	5320 MHz (CH64)	Fig.26	**P**
802.11n HT40	5190 MHz (CH38)	Fig.27	**P**
	5310 MHz (CH62)	Fig.28	**P**
802.11ac VHT80	5210 MHz (CH42)	Fig.29	**P**
	5290 MHz (CH58)	Fig.30	**P**

Conclusion: PASS

Test graphs as below:

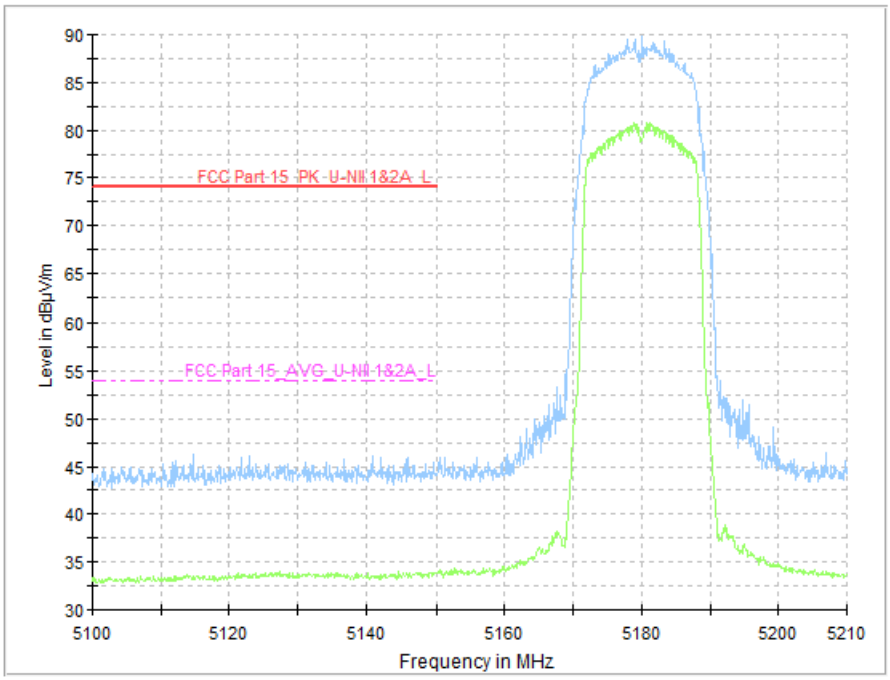


Fig. 25 Band Edges (802.11a, CH36 5180MHz)

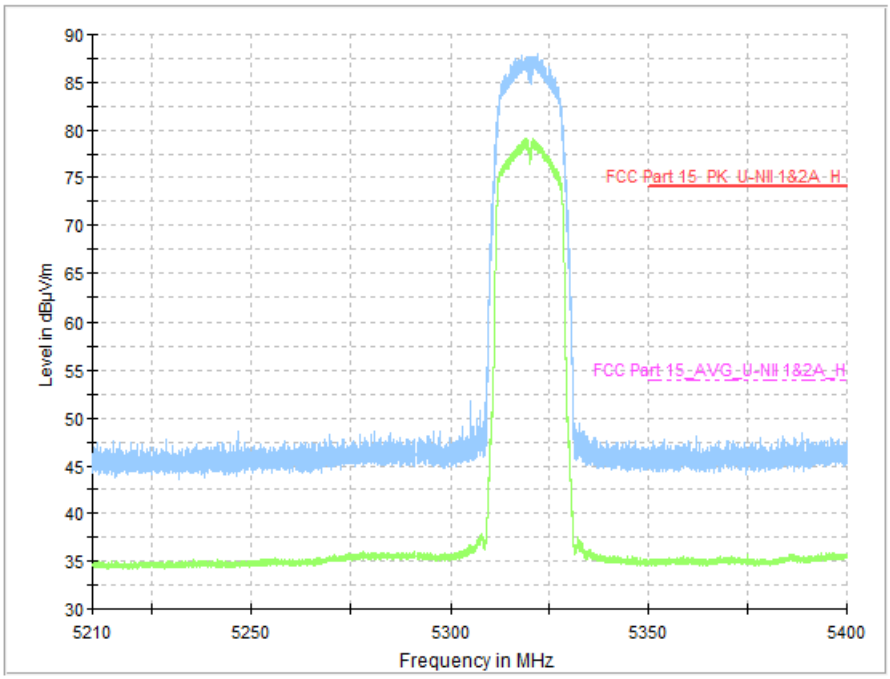


Fig. 26 Band Edges (802.11a, CH64 5320MHz)

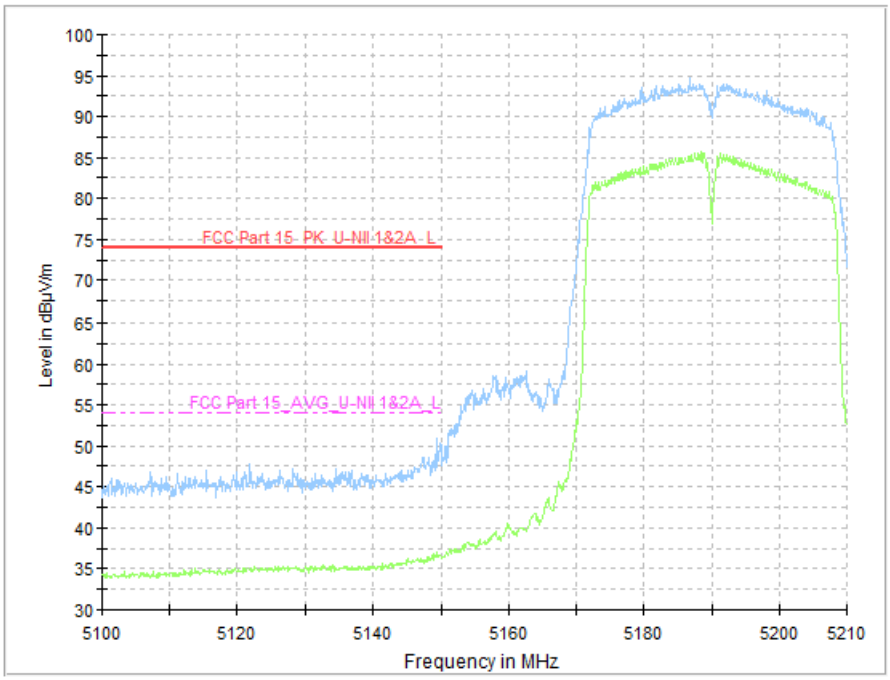


Fig. 27 Band Edges (802.11n-HT40, CH38 5190MHz)

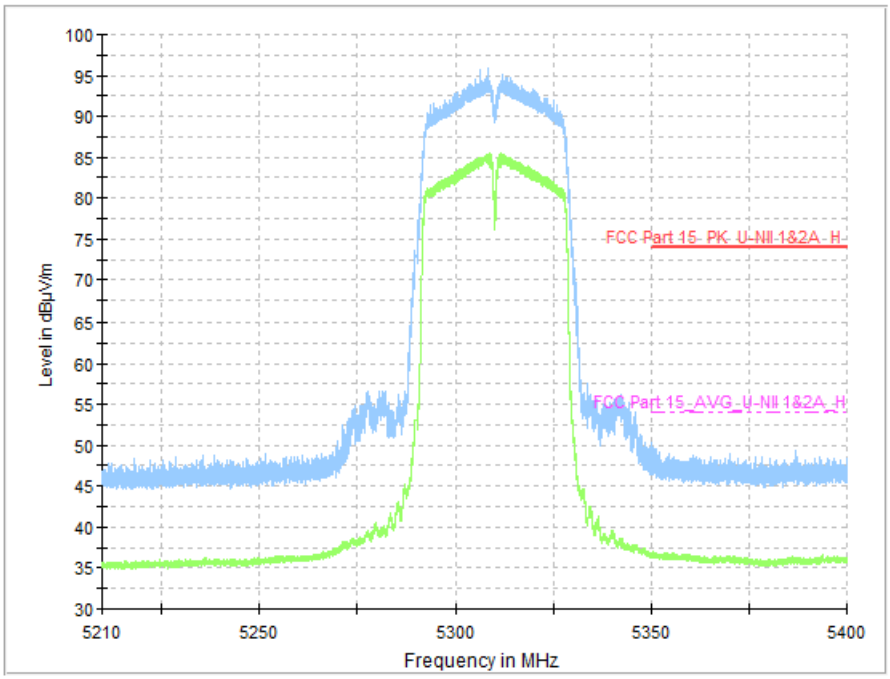


Fig. 28 Band Edges (802.11n-HT40, CH62 5310MHz)

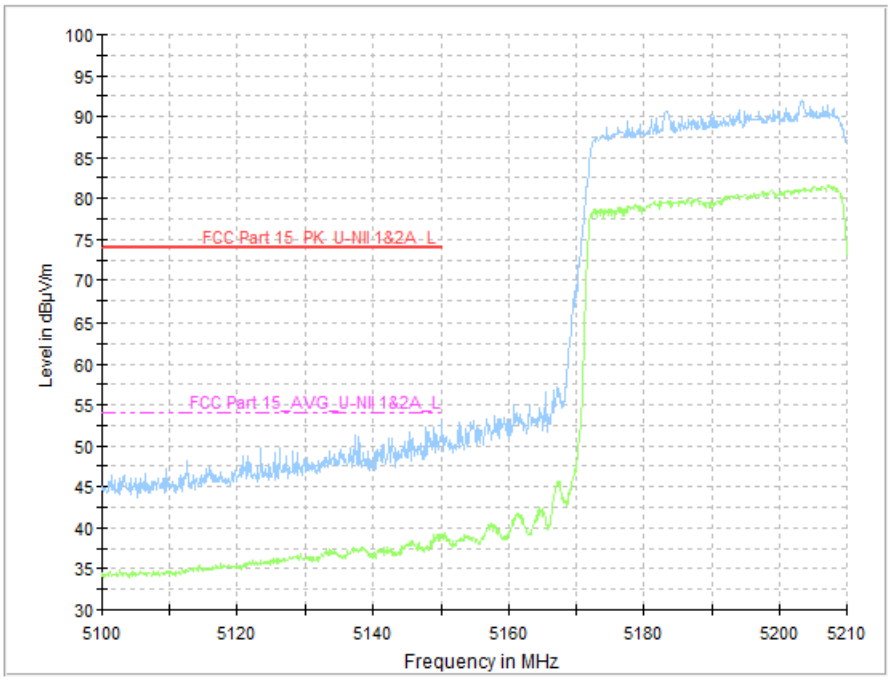


Fig. 29 Band Edges (802.11ac-VHT80, CH42 5210MHz)

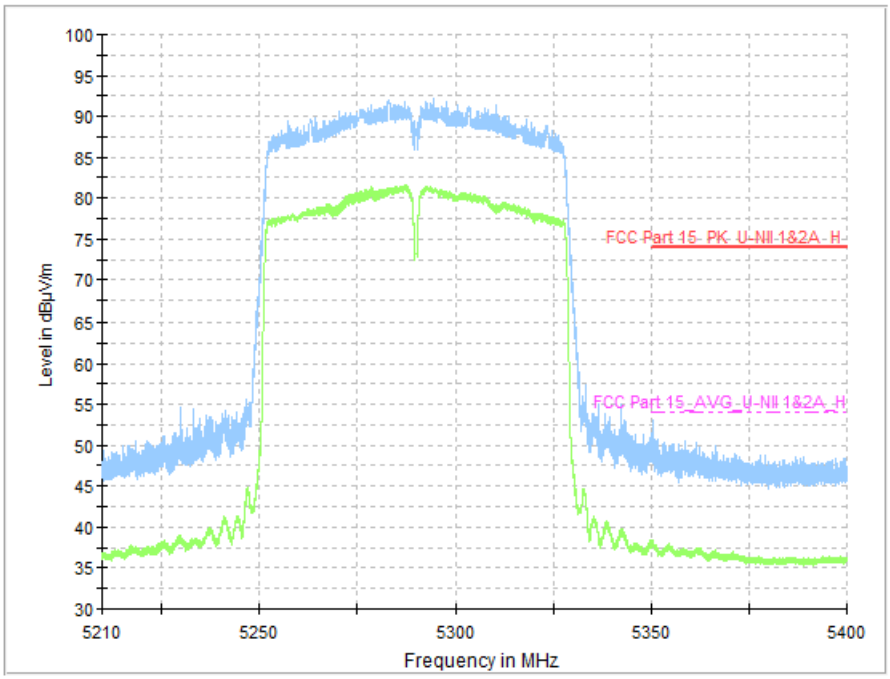


Fig. 30 Band Edges (802.11ac-VHT80, CH58 5290MHz)

A.6. Transmitter Spurious Emission

Measurement Limit:

Standard	Limit (dBm/MHz)
FCC 47 CFR Part 15.407, 15.205	< -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)	1 GHz ~ 18 GHz	Fig.31	**P**
	5200MHz (Ch40)	1 GHz ~ 18 GHz	Fig.32	**P**
	5240MHz (Ch48)	1 GHz ~ 18 GHz	Fig.33	**P**
	5260MHz (Ch52)	1 GHz ~ 18 GHz	Fig.34	**P**
	5280MHz (Ch56)	1 GHz ~ 18 GHz	Fig.35	**P**
	5320MHz (Ch64)	1 GHz ~ 18 GHz	Fig.36	**P**
802.11n HT40	5190MHz (Ch38)	1 GHz ~ 18 GHz	Fig.37	**P**
	5230MHz (Ch46)	1 GHz ~ 18 GHz	Fig.38	**P**
	5270MHz (Ch54)	1 GHz ~ 18 GHz	Fig.39	**P**
	5310MHz (Ch62)	1 GHz ~ 18 GHz	Fig.40	**P**
802.11ac VHT80	5210MHz (Ch42)	1 GHz ~ 18 GHz	Fig.41	**P**
	5290MHz (Ch58)	1 GHz ~ 18 GHz	Fig.42	**P**
All channels		30 MHz ~ 1 GHz	Fig.43	**P**
		18 GHz ~ 26.5 GHz	Fig.44	**P**
		26.5 GHz ~ 40 GHz	Fig.45	**P**

Conclusion: PASS

Test graphs as below:

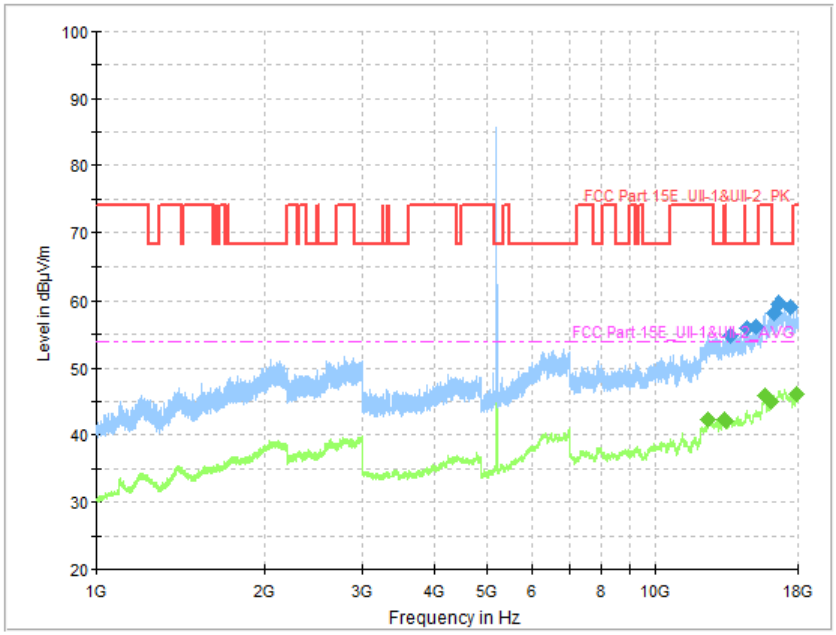


Fig. 31 Transmitter Spurious Emission (802.11a, CH36 5180MHz)

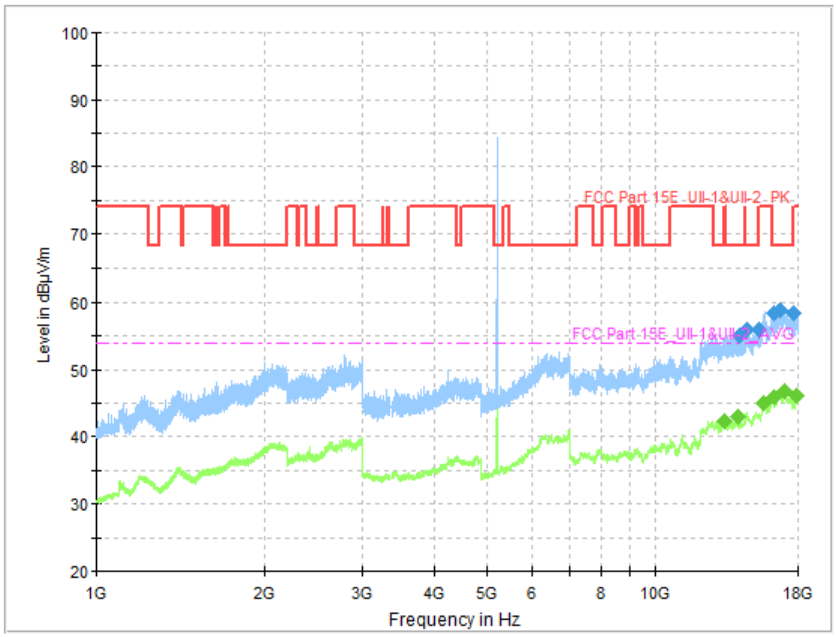


Fig. 32 Transmitter Spurious Emission (802.11a, CH40 5200MHz)

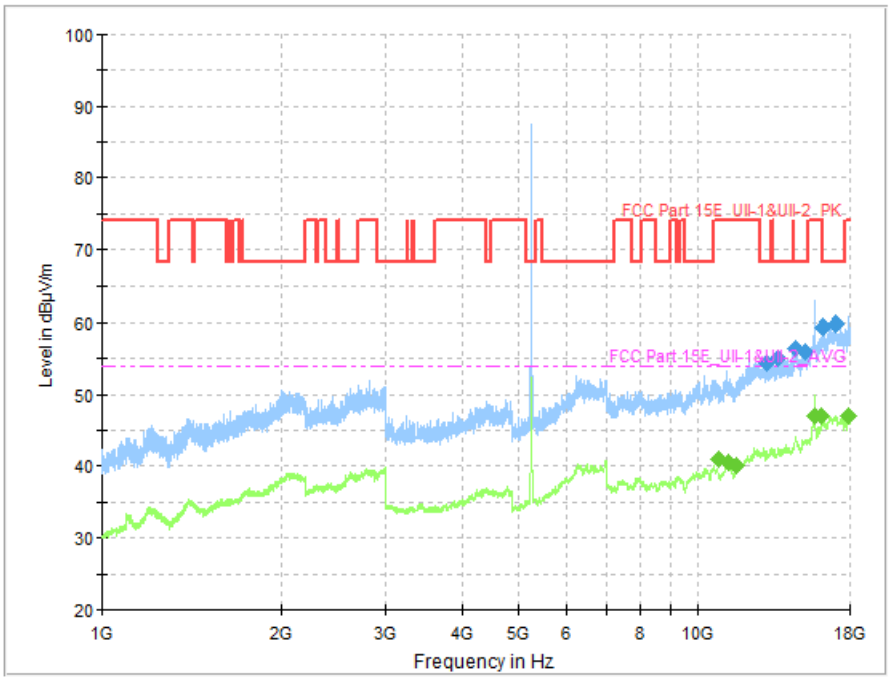


Fig. 33 Transmitter Spurious Emission (802.11a, CH48 5240MHz)

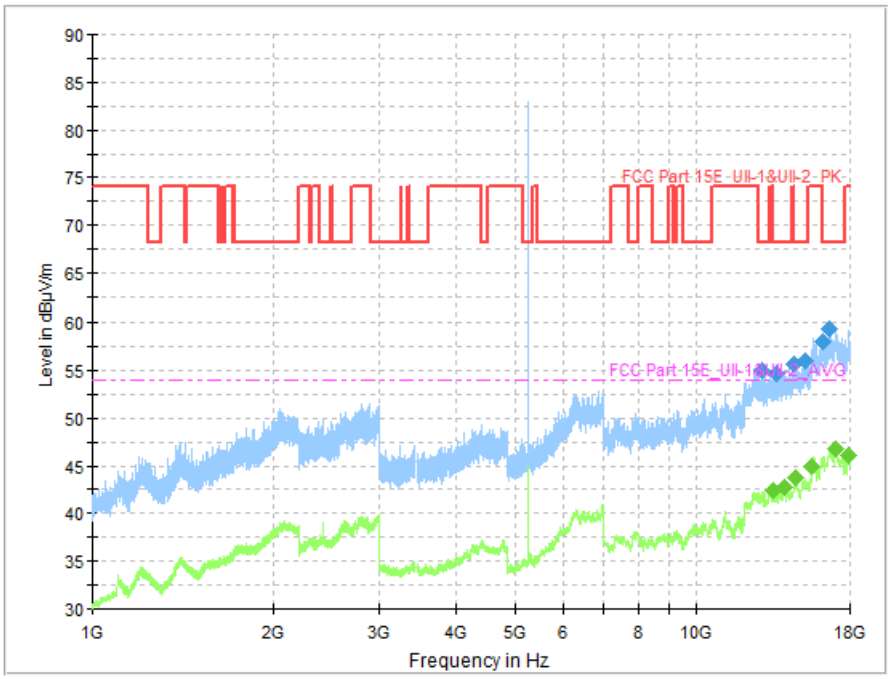


Fig. 34 Transmitter Spurious Emission (802.11a, CH52 5260MHz)

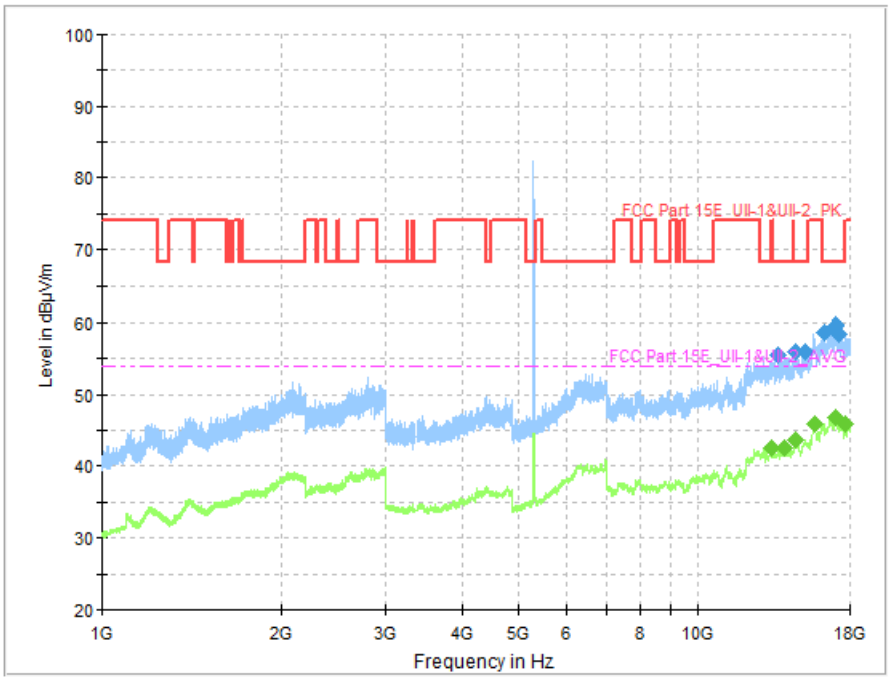


Fig. 35 Transmitter Spurious Emission (802.11a, CH56 5280MHz)

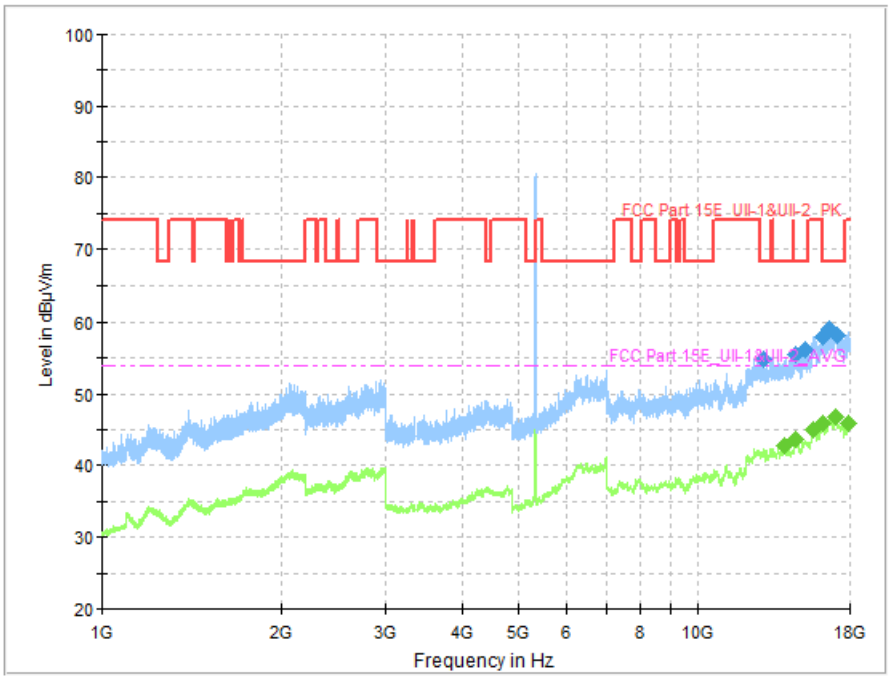


Fig. 36 Transmitter Spurious Emission (802.11a, CH64 5320MHz)

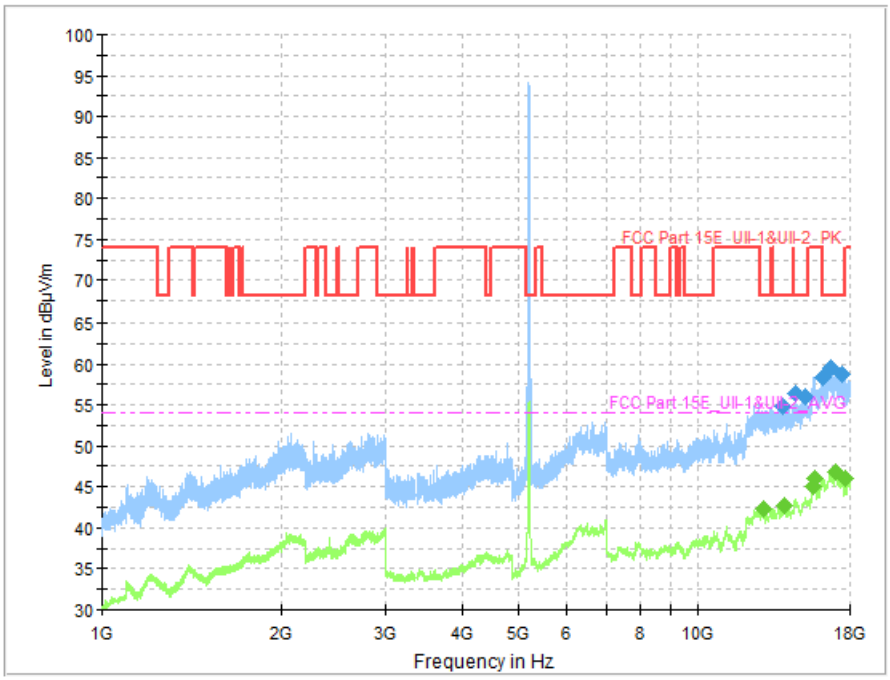


Fig. 37 Transmitter Spurious Emission (802.11n-HT40, CH38 5190MHz)

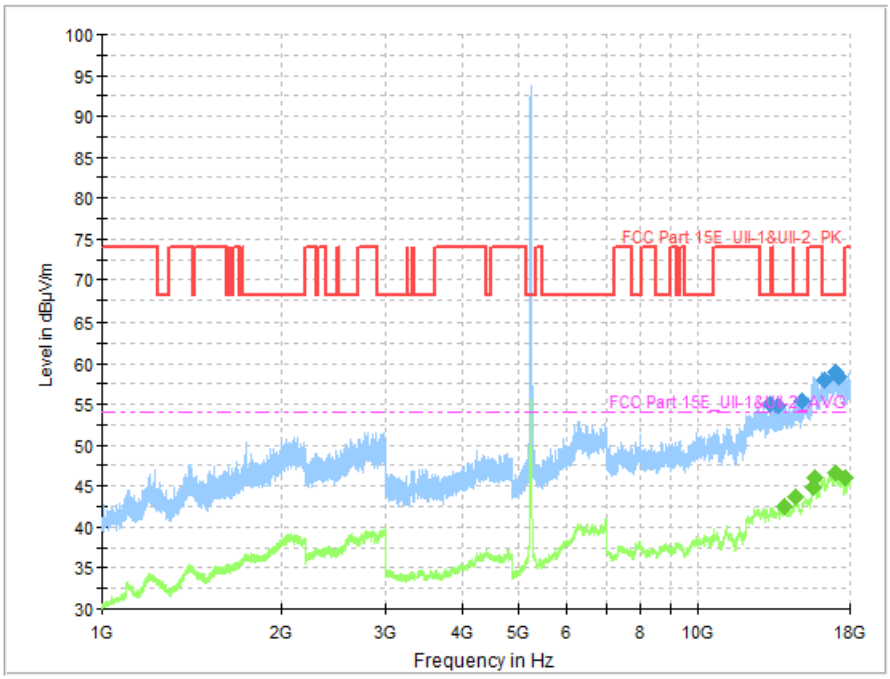


Fig. 38 Transmitter Spurious Emission (802.11n-HT40, CH46 5230MHz)

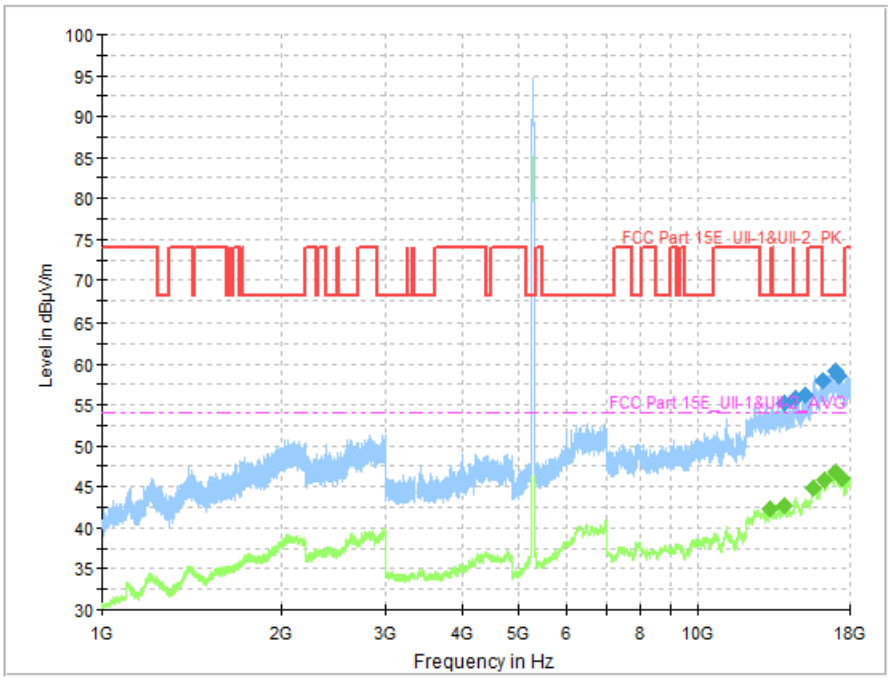


Fig. 39 Transmitter Spurious Emission (802.11n-HT40, CH54 5270MHz)

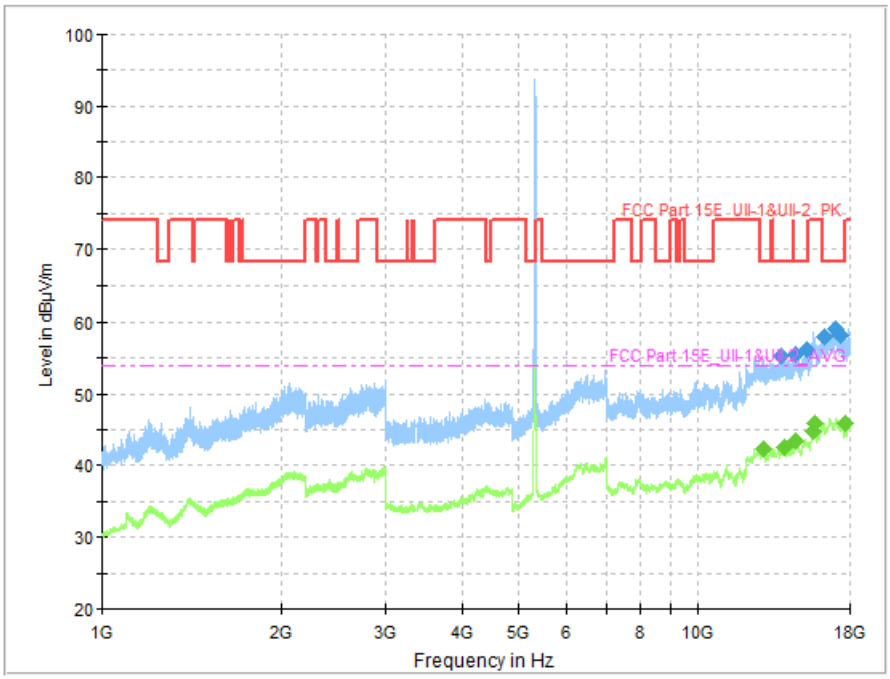


Fig. 40 Transmitter Spurious Emission (802.11n-HT40, CH62 5310MHz)

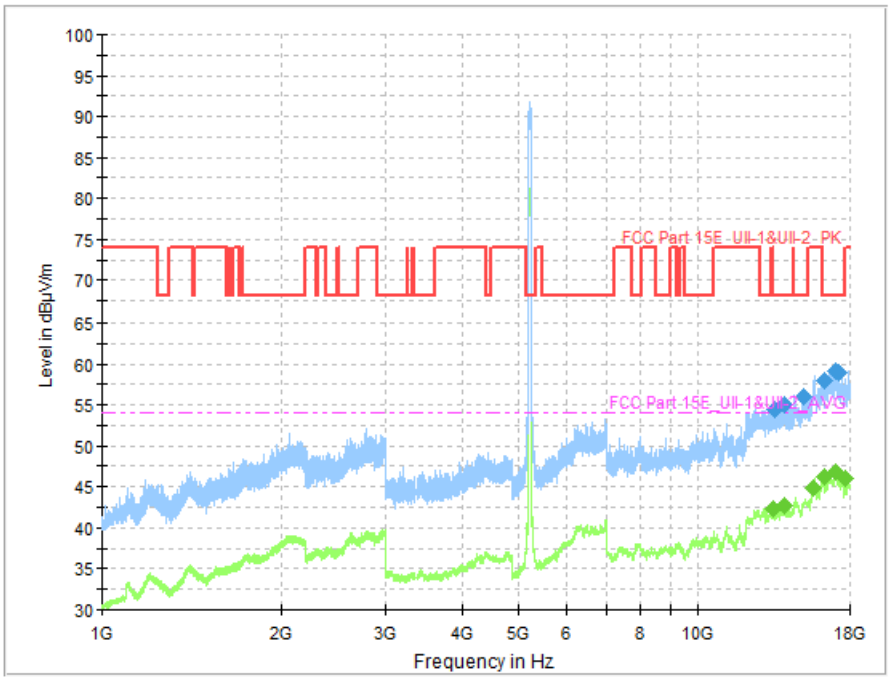


Fig. 41 Transmitter Spurious Emission (802. 11ac-VHT80, CH42 5210MHz)

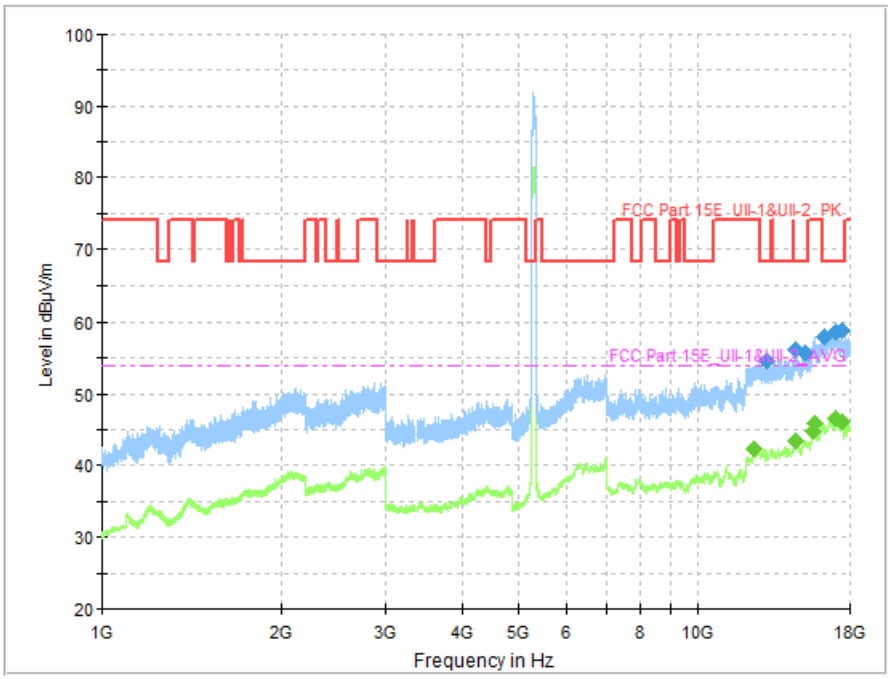


Fig. 42 Transmitter Spurious Emission (802. 11ac-VHT80, CH58 5290MHz)

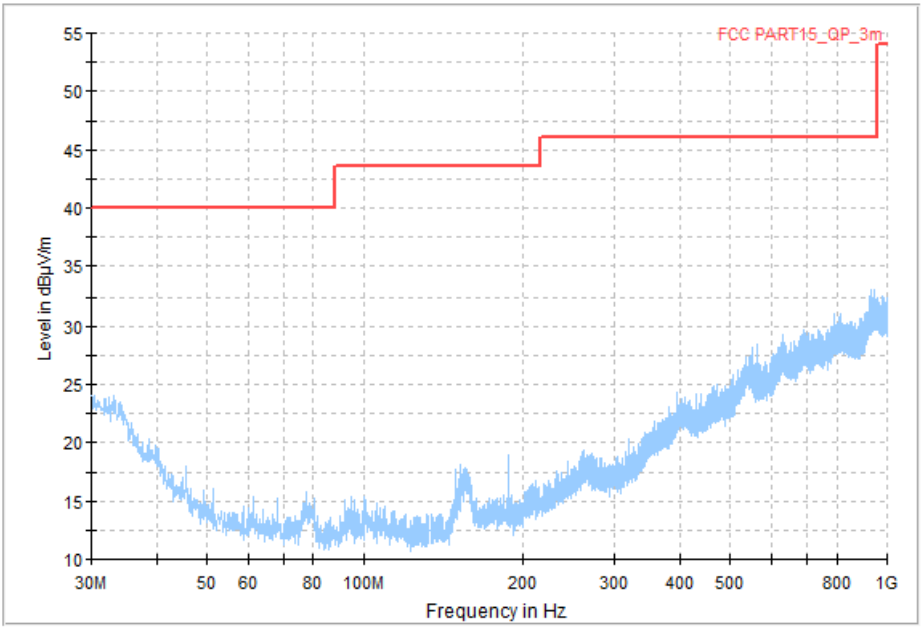


Fig. 43 Transmitter Spurious Emission (All channel, 30MHz~1GHz)

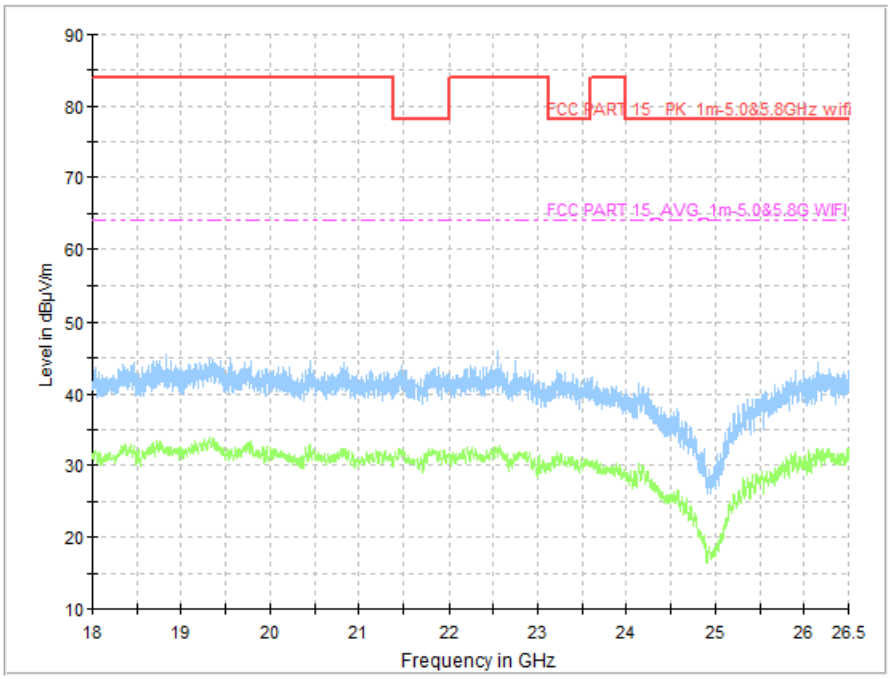


Fig. 44 Transmitter Spurious Emission (All channel, 18GHz~26.5GHz)

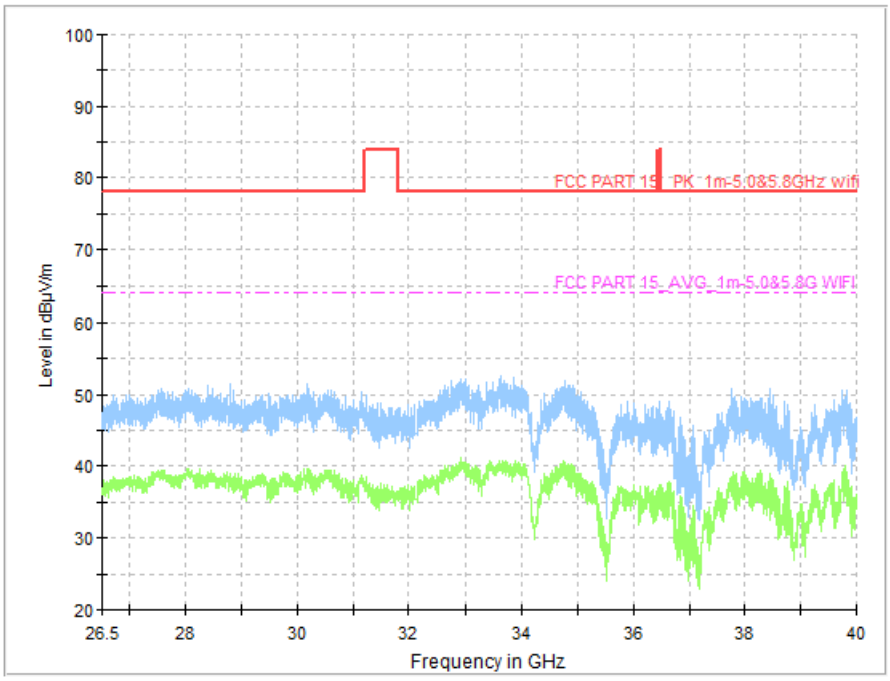


Fig. 45 Transmitter Spurious Emission (All channel, 26.5GHz~40GHz)

Worst Case Result

802.11a CH48

Frequency (MHz)	Max Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
13014.750000	54.47	68.20	13.73	V	17
13651.750000	55.11	68.20	13.09	V	17
14575.500000	56.40	68.20	11.80	V	18
15136.000000	55.97	68.20	12.23	V	18
16237.500000	59.26	68.20	8.94	V	21
17002.500000	59.68	68.20	8.52	V	23

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
10815.250000	40.98	54.00	13.02	V	17
11250.250000	40.56	54.00	13.44	V	17
11562.250000	40.04	54.00	13.96	V	18
15719.250000	50.06	54.00	3.94	V	20
16097.000000	47.00	54.00	7.00	V	23
17900.250000	47.06	54.00	6.94	V	24

802.11a CH64

Frequency (MHz)	Max Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
12904.000000	54.75	68.20	13.45	H	17
14539.500000	55.62	68.20	12.58	V	18
15161.000000	56.22	68.20	11.98	H	18
16226.500000	58.06	68.20	10.14	H	21
16648.500000	59.15	68.20	9.05	H	22
17158.000000	58.28	68.20	9.92	V	21

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
13959.250000	42.85	54.00	11.15	H	17
14558.250000	43.66	54.00	10.34	V	18
15576.500000	44.96	54.00	9.04	H	20
16248.750000	45.93	54.00	8.07	H	21
17047.000000	46.86	54.00	7.14	H	22
17892.250000	46.00	54.00	8.00	V	24

802.11a CH149

Frequency (MHz)	Max Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
13227.250000	54.72	68.20	13.48	V	17
13607.250000	55.28	68.20	12.92	V	17
14601.250000	55.74	68.20	12.46	V	18
15301.750000	56.06	68.20	12.14	V	19
16282.000000	58.94	68.20	9.26	V	21
16643.500000	59.32	68.20	8.88	V	22

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
10889.000000	40.62	54.00	13.38	V	17
11012.250000	40.81	54.00	13.19	V	17
12576.500000	41.07	54.00	12.93	V	18
15566.000000	45.71	54.00	8.29	V	20
16179.250000	46.74	54.00	7.26	V	21
17731.500000	47.11	54.00	6.89	V	22

802.11n HT40 CH46

Frequency (MHz)	Max Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
13226.750000	55.01	68.20	13.19	V	17
13603.000000	54.81	68.20	13.39	V	17
14967.000000	55.50	68.20	12.70	V	18
16260.500000	57.92	68.20	10.28	H	21
17059.750000	58.91	68.20	9.29	V	22
17233.250000	58.33	68.20	9.87	V	22

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
13955.750000	42.61	54.00	11.39	V	17
14576.000000	43.63	54.00	10.37	H	18
15577.250000	44.95	54.00	9.05	V	20
15670.750000	46.00	54.00	8.00	H	20
17017.500000	46.70	54.00	7.30	H	23
17700.750000	46.08	54.00	7.92	H	23

802.11n HT40 CH62

Frequency (MHz)	Max Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
13755.500000	55.25	68.20	12.95	V	17
14533.000000	55.53	68.20	12.67	V	18
15225.750000	56.12	68.20	12.08	H	19
16263.000000	58.02	68.20	10.18	V	21
17035.000000	59.04	68.20	9.16	V	22
17307.000000	58.26	68.20	9.94	H	22

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
12902.000000	42.45	54.00	11.55	H	17
13954.500000	42.63	54.00	11.37	H	17
14562.250000	43.57	54.00	10.43	V	18
15576.500000	44.84	54.00	9.16	H	20
15661.500000	45.95	54.00	8.05	V	20
17690.000000	45.99	54.00	8.01	V	23

802.11n HT40 CH159

Frequency (MHz)	Max Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
14003.000000	54.63	68.20	13.57	V	17
14539.000000	56.09	68.20	12.11	V	18
15115.000000	56.28	68.20	11.92	V	18
16286.000000	59.07	68.20	9.13	V	21
16738.250000	59.43	68.20	8.77	V	21
17782.500000	58.89	68.20	9.31	V	22

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
10902.750000	39.58	54.00	14.42	V	17
11410.250000	39.98	54.00	14.02	V	17
12165.000000	41.05	54.00	12.95	V	18
15565.750000	45.80	54.00	8.20	V	20
16282.500000	46.69	54.00	7.31	V	21
17737.250000	47.15	54.00	6.85	V	22

802.11ac VHT80 CH42

Frequency (MHz)	Max Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
13412.000000	54.39	68.20	13.81	V	17
13986.750000	55.05	68.20	13.15	V	17
15071.250000	56.04	68.20	12.16	H	18
16266.750000	57.90	68.20	10.30	V	21
17056.500000	59.20	68.20	9.00	H	22
17223.250000	58.94	68.20	9.26	H	22

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
13384.500000	42.31	54.00	11.69	V	17
13958.750000	42.70	54.00	11.30	V	17
15576.000000	44.81	54.00	9.19	H	20
16262.250000	46.17	54.00	7.83	V	21
17020.750000	46.79	54.00	7.21	V	23
17700.500000	46.00	54.00	8.00	V	23

802.11ac VHT80 CH58

Frequency (MHz)	Max Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
13017.250000	54.68	68.20	13.52	V	17
14547.250000	56.17	68.20	12.03	H	18
15125.000000	55.86	68.20	12.34	H	18
16317.000000	57.89	68.20	10.31	V	21
17044.500000	58.73	68.20	9.47	H	22
17426.250000	58.95	68.20	9.25	V	22

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
12425.500000	42.29	54.00	11.71	V	17
14579.000000	43.49	54.00	10.51	H	18
15572.750000	44.86	54.00	9.14	H	20
15658.000000	45.92	54.00	8.08	H	20
17020.750000	46.69	54.00	7.31	V	23
17484.500000	46.04	54.00	7.96	H	22

802.11ac VHT80 CH155

Frequency (MHz)	Max Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
13022.500000	54.58	68.20	13.62	V	17
13764.000000	54.93	68.20	13.27	V	17
14630.750000	55.80	68.20	12.40	V	18
15280.500000	56.23	68.20	11.97	V	19
16251.000000	58.98	68.20	9.22	V	21
17692.000000	60.24	68.20	7.96	V	23

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB)
10890.750000	42.64	54.00	11.36	V	17
11015.000000	42.93	54.00	11.07	V	17
12572.750000	44.02	54.00	9.98	V	18
15563.250000	45.82	54.00	8.18	V	19
16163.250000	46.68	54.00	7.32	V	21
17905.500000	47.10	54.00	6.90	V	24

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.7. 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.46	**P**

Conclusion: PASS

Test graphs as below:

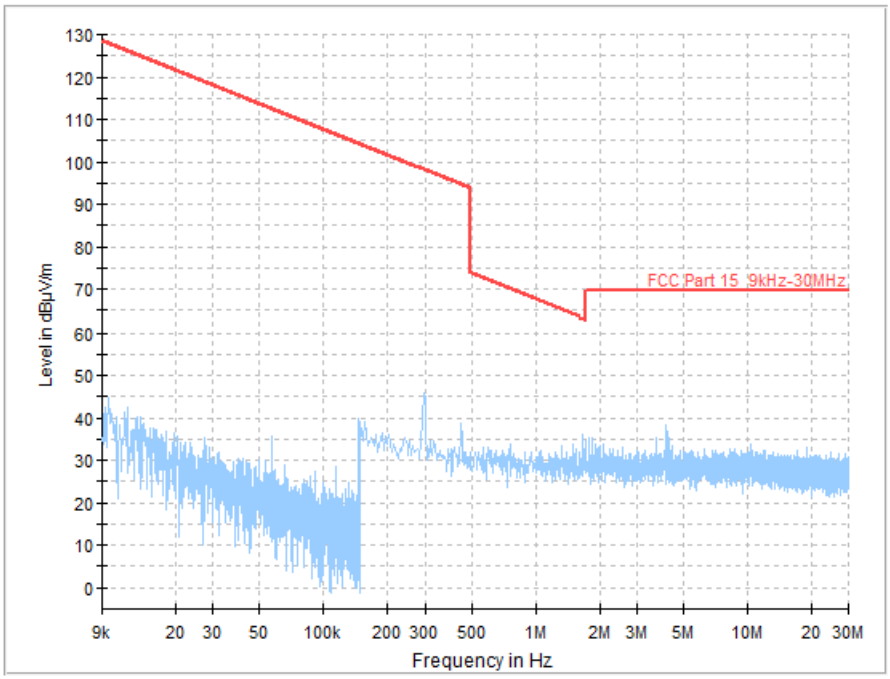


Fig. 46 Radiated Spurious Emission (All Channel, 9 kHz ~30 MHz)

A.8. AC Power Line Conducted Emission

Test Condition:

Voltage(V)	Frequency(Hz)
120	60

Measurement Result and limit:

RLAN (Quasi-peak Limit) - AE2

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	66 to 56	Fig.47	Fig.48	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) - AE2

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	56 to 46	Fig.47	Fig.48	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:

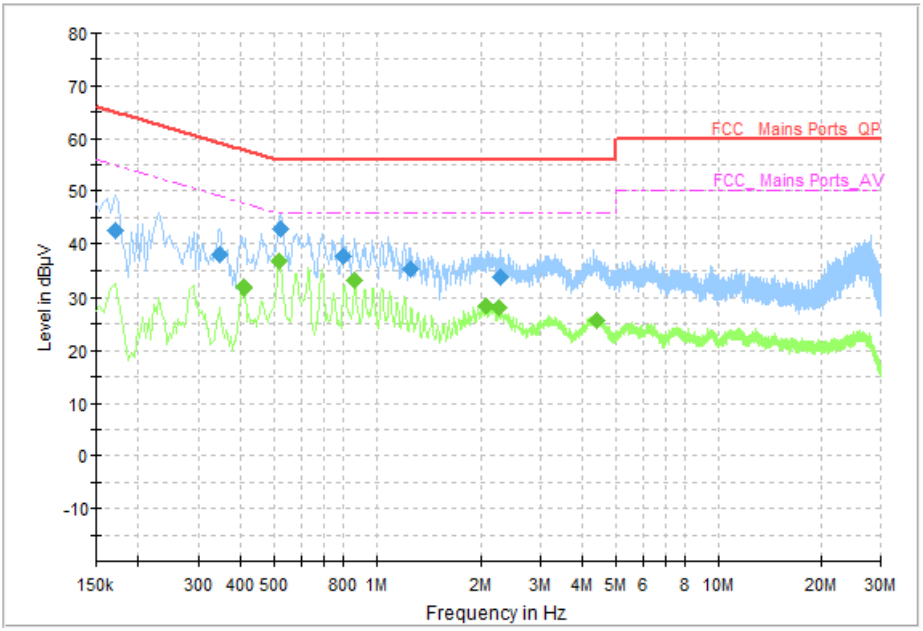


Fig. 47 AC Power line Conducted Emission (Traffic)

Measurement Result: Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.170000	42.57	64.96	22.39	L1	ON	10
0.346000	37.85	59.06	21.21	L1	ON	10
0.522000	42.71	56.00	13.29	L1	ON	10
0.798000	37.52	56.00	18.48	L1	ON	10
1.254000	35.08	56.00	20.92	L1	ON	10
2.278000	33.53	56.00	22.47	L1	ON	10

Measurement Result: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.406000	31.71	47.73	16.02	L1	ON	10
0.518000	36.83	46.00	9.17	L1	ON	10
0.862000	32.96	46.00	13.04	L1	ON	10
2.078000	28.36	46.00	17.64	L1	ON	10
2.254000	28.11	46.00	17.89	L1	ON	10
4.378000	25.86	46.00	20.14	L1	ON	10

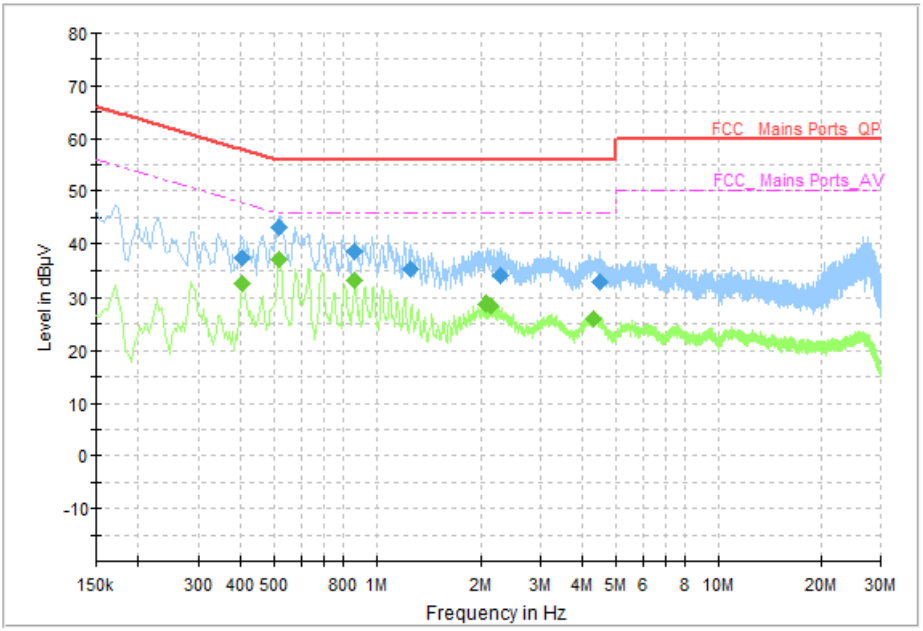


Fig. 48 AC Power line Conducted Emission (Idle)

Measurement Result: Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.402000	37.45	57.81	20.36	L1	ON	10
0.518000	43.03	56.00	12.97	L1	ON	10
0.866000	38.57	56.00	17.43	L1	ON	10
1.254000	35.28	56.00	20.72	L1	ON	10
2.278000	33.98	56.00	22.02	L1	ON	10
4.494000	32.65	56.00	23.35	L1	ON	10

Measurement Result: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.402000	32.34	47.81	15.47	L1	ON	10
0.518000	37.10	46.00	8.90	L1	ON	10
0.862000	33.16	46.00	12.84	L1	ON	10
2.082000	28.64	46.00	17.36	L1	ON	10
2.142000	28.60	46.00	17.40	L1	ON	10
4.274000	26.17	46.00	19.83	L1	ON	10

A.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.

Measurement Condition:

T min = 0˚C T nom = 25˚C T max = 45˚C

V min = 3.6V V nom = 3.9V V max = 4.3V

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.10. Power control

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

ANNEX B: Detail Spot Check Verification Data

8094X

U–NII Band	Mode	Channel	Data Rate	Average power (dBm)	Conclusion
5.2GHz Band (UNII-1)	802.11a	CH 36	6 Mbps	7.07	P
		CH 40		7.04	P
		CH 48		7.13	P
	802.11n-HT20	CH 36	MCS0	6.99	P
		CH 40		6.96	P
		CH 48		7.01	P
	802.11n-HT40	CH 38	MCS0	6.86	P
		CH 46		6.90	P
	802.11ac-VHT20	CH 36	MCS0	6.93	P
		CH 40		6.97	P
		CH 48		7.04	P
	802.11ac-VHT40	CH 38	MCS0	6.73	P
		CH 46		6.79	P
	802.11ac-VHT80	CH 42	MCS0	6.98	P

U–NII Band	Mode	Channel	Data Rate	Average power (dBm)	Conclusion
5.3GHz Band (UNII-2A)	802.11a	CH 52	6 Mbps	7.18	P
		CH 56		7.23	P
		CH 64		7.26	P
	802.11n-HT20	CH 52	MCS0	7.08	P
		CH 56		7.12	P
		CH 64		7.15	P
	802.11n-HT40	CH 54	MCS0	6.89	P
		CH 62		7.02	P
	802.11ac-VHT20	CH 52	MCS0	7.10	P
		CH 56		7.12	P
		CH 64		7.16	P
	802.11ac-VHT40	CH 54	MCS0	6.84	P
		CH 62		6.90	P
	802.11ac-VHT80	CH 58	MCS0	7.03	P

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