RF TEST REPORT

Test Equipment	:	xPON ONT
Model Name	:	H660GM
FCC ID	:	PJZH660GM
IC	:	3691A-H660GM
Date of receipt	:	2020-05-25
Test duration	:	2020-07-07 ~ 2020-10-27
Date of issue	:	2020-10-28

Applicant(FCC)	:	DASAN Zhone Solutions, Inc. 1350 South Loop Rd. Suite 130, Alameda, California 94502 United States
Applicant(IC)	:	DASAN Zhone Solutions, Inc. 7195 Oakport Street Oakland CA 94621 United States Of America
Test Laboratory	:	Lab-T, Inc. 2182-42 Baegok-daero, Mohyeon-myeon, Cheoin-gu Yongin-si, Gyeonggi-do 17036, South Korea
Test specification	:	FCC Part 15 Subpart E 15.407 RSS-247 Issue 2 (2017-02), RSS-GEN Issue 5 (2019-03)
RF Output Power	:	18.09 dBm
Test result	:	Pass

The above equipment was tested by Lab-T Testing Laboratory for compliance with the requirements of FCC,IC Rules and Regulations.
The test results presented in this test report are limited only to the sample supplied by applicant and the use of this test report is inhibited other than its purpose.
This test report shall not be reproduced except in full, without the written approval of Lab-T, Inc

Tested by:

Engineer
SungSin Kim

Reviewed by:

Technical Manager
SangHoon Yu

CONTENTS

1. Applicant Information

Applicant(FCC)	:	DASAN Zhone Solutions, Inc.
Address	:	1350 South Loop Rd. Suite 130, Alameda, California, 94502 United States
Applicant(IC)	:	DASAN Zhone Solutions, Inc.
Address	:	7195 Oakport Street Oakland CA 94621 United States Of America
Telephone No.	:	+1 510-777-7000
Fax No.	:	+1 510-777-7001
Person in charge		Keith Nauman / KNauman@zhone.com
Manufacturer	:	DASAN Zhone Solutions, Inc.
Address	:	1350 South Loop Rd. Suite 130, Alameda, California, 94502 United States

2. Laboratory Information

Corporate name	Lab-T, Inc.
Representative	Jong-Young Kim
Address	2182-42 Baegok-daero, Mohyeon-myeon, Cheoin-gu, Yongin-si Gyeonggi-do 17036, South Korea
Telephone	+82-31-322-6767
Fax	+82-31-322-6768
E-mail	info@lab-t.net
FCC Designation No.	KR0159
FCC Registration No.	133186

Test Location

Test building	used	Address
Building T	☒	2182-42 Baegok-daero, Mohyeon-eup, Cheoin-gu, Yongin-si, Gyeonggi-do, 17036, Korea
Building L	☒	2182-40 Baegok-daero, Mohyeon-eup, Cheoin-gu, Yongin-si, Gyeonggi-do, 17036, Korea
Building A	☐	2182-44 Baegok-daero, Mohyeon-eup, Cheoin-gu, Yongin-si, Gyeonggi-do, 17036, Korea

3. Information About Test Equipment

3.1 Equipment Information

Equipment type	xPON ONT
Equipment model name	H660GM
Equipment add model name	H660GM-EU, H660GM-NA, H660GM-UK
Frequency range	5 180 MHz ~ 5 805 MHz / 5 190 MHz ~ 5 795 MHz 5 210 MHz ~ 5 775 MHz
Modulation	CCK, OFDM
Power supply	DC 12 V
H/W version	DS-K3-899-A1
S/W version	1.16-0115

Note:The above EUT information was declared by the manufacturer.

3.2 Antenna Information

		Antenna 1	Antenna 2
Type		Dipole Antenna	Dipole Antenna
Gain	5150 ~ 5250	4.88 dBi	4.88 dBi
	5250 ~ 5350	4.81 dBi	4.81 dBi
	5470 ~ 5725	5.03 dBi	5.03 dBi
	5725 ~ 5850	4.78 dBi	4.78 dBi

3.3 Test frequency

Test mode	Test frequency (MHz)			
	Band	Lowest Frequency	Middle Frequency	Highest Frequency
802.11a /802.11n_HT20 /802.11ac_VHT20	5150 ~ 5250	5180	5200	5240
	5250 ~ 5350	5260	5280	5320
	5470 ~ 5725	5500	5600	5700
	5725 ~ 5850	5745	5785	5805
802.11n_HT40/ 802.11ac_VHT40	5150 ~ 5250	5190	-	5230
	5250 ~ 5350	5270	-	5310
	5470 ~ 5725	5510	5590	5670
	5725 ~ 5850	5755	-	5795
802.11ac_VHT80	5150 ~ 5250	5210	-	-
	5250 ~ 5350	5290	-	-
	5470 ~ 5725	5530	5610	5690
	5725 ~ 5850	5775	-	-

3.4 Worst-case

802.11a	6 Mbps	802.11ac_VHT20 MIMO	MCS0
802.11n_HT20	MCS0	802.11ac_VHT40	MCS0
802.11n_HT20 MIMO	MCS16	802.11ac_VHT40 MIMO	MCS0
802.11n_HT40	MCS0	802.11ac_VHT80	MCS0
802.11n_HT40 MIMO	MCS16	802.11ac_VHT80 MIMO	MCS0
802.11ac_VHT20	MCS0	-	-

Note 1 : The power measurement has been conducted to determine the worst-case mode from all possible combi nations between available modulations, data rates.

Note 2 : The test was performed as follows. MIMO: ANT 1+2, Other mode(SISO): ANT 1

3.5 Tested Companion Device Information

Type	Manufacturer	Model	Note
AC/DC ADAPTER	DOKOCOM	LPL-P24120200Z	Used conducted emission Input : 100-240V~50/60Hz Output : 12V 2A
	-	-	-

3.6 Operating conditions for the EUT

Firmware state		1.16-0115
Test software name(version)		-
Test power setting		802.11a : 17.5 dBm 802.11n_HT20 : 17.5 dBm 802.11n_HT40 : 17.5 dBm 802.11ac_VHT20 : 17.5 dBm 802.11ac_VHT40 : 17.5 dBm 802.11ac_VHT80 : 17.5 dBm
Serial number (Setup mode)	EUT #1	#1 (Conducted / Radiated Emission)

4. Test Report

4.1 Summary

FCC Part 15E 407				
FCC Rule	IC Rule	Parameter	Clause	Status
Transmitter Requirements				
15.203 15.407(a)	RSS-247 5.4(f)	Antenna Requirement	4.4.1	C
15.407(a)	RSS-247 6.2.1.1 RSS-247 6.2.2.1	Maximum Conducted Output Power	4.4.2	C
15.407(a)	RSS-247 6.2.3.1 RSS-247 6.2.4.1	Maximum Power Spectral Density	4.4.3	C
15.403(i) 15.407(e)	-	Emission Bandwidth	4.4.4	C
-	RSS-GEN 6.7	Occupied Bandwidth	4.4.4	C
15.407(g)	RSS-GEN 6.11	Frequency Stability	4.4.5	C
15.407(b) 15.205(a) 15.209(a)	RSS-247 6.2.1.2 RSS-247 6.2.2.2 RSS-247 6.2.3.2 RSS-247 6.2.4.2	Radiated Emission, Band Edge and Restricted bands	4.4.6	C
15.207(a)	RSS-GEN 8.8	Conducted Emissions	4.4.7	C
NOTE 1 : C = Comply N/C = Not Comply N/T = Not Tested N/A = Not Applicable				

* The general test methods used to test this device is ANSI C63.10:2013

4.2 Measurement Uncertainty

Mesurement items	Expanded Uncertainty	
RF Output Power	1.16 dB	(The confidence level is about 95 %, *k*=2)
Power Spectral Density	1.44 dB	(The confidence level is about 95 %, *k*=2)
Occupied Channel Bandwidth	31.26 kHz	(The confidence level is about 95 %, *k*=2)
Conducted Spurious Emissions	0.50 dB	(The confidence level is about 95 %, *k*=2)
Radiated Spurious Emissions (1 GHz under)	4.80 dB	(The confidence level is about 95 %, *k*=2)
Radiated Spurious Emissions (Above 1 GHz)	5.96 dB	(The confidence level is about 95 %, *k*=2)
Conducted emission	2.36 dB	(The confidence level is about 95 %, *k*=2)

4.3 Test Report Version

Test Report No.	Date	Description
TRRFCC20-0014	2020-10-28	Initial issue

4.4 Transmitter Requirements

4.4.1 Antenna Requirement

4.4.1.1 Regulation

Accoding to §15.203 An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

And according to §15.407(a)(1)(2)(3), If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Accoding to §RSS-247 5.4(f)(ii) If the transmitter employs an antenna system that emits multiple directional beams, but does not emit multiple directional beams simultaneously, the total output power conducted to the array or arrays that comprise the device (i.e. the sum of the power supplied to all antennas, antenna elements, staves, etc., and summed across all carriers or frequency channels) shall not exceed the applicable output power limit specified in sections 5.4(b) and 5.4(d). However, the total conducted output power shall be reduced by 1 dB below the specified limits for each 3 dB that the directional gain of the antenna/antenna array exceeds 6 dBi. The directional antenna gain shall be computed as the sum of 10 log (number of array elements or staves) plus the directional gain of the element or stave having the highest gain.

		Antenna 1	Antenna 2
Type		Dipole Antenna	
Connector type		U.FL	
Gain	5150 ~ 5250	4.88 dBi	4.88 dBi
	5250 ~ 5350	4.81 dBi	4.81 dBi
	5470 ~ 5725	5.03 dBi	5.03 dBi
	5725 ~ 5850	4.78 dBi	4.78 dBi

Antenna	Directional Gain For Power(dBi)	Directional Gain For PSD(dBi)	Power Limit Reduction(dB)	PSD Limit Reduction(dB)
Band	5150 ~ 5250			
1	4.88	4.88	0	0
1+2	4.88	7.89	0	1.89
Band	5250 ~ 5350			
1	4.81	4.88	0	0
1+2	4.81	7.82	0	1.82
Band	5470 ~ 5725			
1	5.03	4.88	0	0
1+2	5.03	8.04	0	2.04
Band	5725 ~ 5850			
1	4.78	4.88	0	0
1+2	4.78	7.79	0	1.79

Note 1 : In case of siso, it works only antenna 1

4.4.2 Maximum Conducted Output Power

4.4.2.1 Regulation

According to §15.407(a)(1)(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to §RSS-247 6.2.1.1 For other devices, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10B, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

According to §15.407(a)(2) and RSS-247 6.2.2.1(a), RSS-247 6.2.3.1 For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to §15.407(a)(3) and RSS-247 6.2.4.1 For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

4.4.2.2 Measurement Procedure

These test measurement settings are specified in section E of 789033 D02 General UNII Test Procedures.

4.4.2.2.1 Measurement using a Power Meter (PM)

(i) Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied.

The EUT is configured to transmit continuously or to transmit with a constant duty cycle. .

At all times when the EUT is transmitting, it must be transmitting at its maximum power control

level.

The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.

(ii) If the transmitter does not transmit continuously, measure the duty cycle, x, of the transmitter output signal as described in section II.B.

(iii) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.

(iv) Adjust the measurement in dBm by adding 10 log (1/x) where x is the duty cycle (e.g., 10 log (1/0.25) if the duty cycle is 25%).

4.4.2.3 Result

Comply (measurement data : refer to the next page)

4.4.2.4 Measurement data

Test mode : 802.11a

Maximum Conducted Output Power								
Antenna	Freq. (MHz)	ANT1 (dBm)	ANT1 (mW)	ANT2 (dBm)	ANT2 (mW)	Result (dBm)	Result (mW)	Limit (dBm)
1	5180	16.23	41.98	-	-	17.15	51.90	30.00
1	5200	16.36	43.25	-	-	17.28	53.48	30.00
1	5240	16.41	43.75	-	-	17.33	54.10	30.00
1	5260	16.28	42.46	-	-	17.20	52.50	23.92
1	5280	16.59	45.60	-	-	17.51	56.39	23.89
1	5320	16.63	46.03	-	-	17.55	56.91	23.83
1	5500	16.72	46.99	-	-	17.64	58.10	23.91
1	5600	16.41	43.75	-	-	17.33	54.10	23.90
1	5700	16.46	44.26	-	-	17.38	54.72	23.94
1	5745	16.21	41.78	-	-	17.13	51.66	30.00
1	5785	16.69	46.67	-	-	17.61	57.70	30.00
1	5805	16.65	46.24	-	-	17.57	57.17	30.00

Note 1 : refer to 4.4.1 for information on limit reduction.
Note 2 : We took the insertion loss of the cable loss into consideration within the measuring instrument.
Note 3 : Result : Measured Value(ANT1 + ANT2) + Duty cycle Factor
Note 4 : Duty cycle Factor : 10*log(1/(on-time/Period)) refer to 4.4.6.6
Note 5 : IC Limit(Frequency band 5150-5250 MHz) : 200 mW

Test mode : 802.11n_HT20

Maximum Conducted Output Power								
Antenna	Freq. (MHz)	ANT1 (dBm)	ANT1 (mW)	ANT2 (dBm)	ANT2 (mW)	Result (dBm)	Result (mW)	Limit (dBm)
1	5180	16.46	44.26	-	-	17.60	57.53	30.00
1	5200	16.50	44.67	-	-	17.64	58.07	30.00
1	5240	16.62	45.92	-	-	17.76	59.69	30.00
1	5260	16.59	45.60	-	-	17.73	59.28	23.98
1	5280	16.77	47.53	-	-	17.91	61.79	23.98
1	5320	16.71	46.88	-	-	17.85	60.94	23.98
1	5500	16.55	45.19	-	-	17.69	58.74	23.98
1	5600	16.71	46.88	-	-	17.85	60.94	23.98
1	5700	16.72	46.99	-	-	17.86	61.08	23.98
1	5745	16.43	43.95	-	-	17.57	57.14	30.00
1	5785	16.58	45.50	-	-	17.72	59.15	30.00
1	5805	16.35	43.15	-	-	17.49	56.10	30.00
1+2	5180	12.29	16.94	12.63	18.32	17.36	54.44	30.00
1+2	5200	12.33	17.10	12.72	18.71	17.43	55.28	30.00
1+2	5240	12.34	17.14	13.41	21.93	17.80	60.31	30.00
1+2	5260	11.66	14.66	13.01	20.00	17.28	53.50	23.98
1+2	5280	12.02	15.92	12.82	19.14	17.33	54.13	23.98
1+2	5320	12.29	16.94	12.21	16.63	17.15	51.83	23.95
1+2	5500	11.94	15.63	12.77	18.92	17.27	53.34	23.98
1+2	5600	11.79	15.10	13.04	20.14	17.36	54.40	23.97
1+2	5700	12.68	18.54	13.11	20.46	17.80	60.21	23.97
1+2	5745	12.70	18.62	12.75	18.84	17.62	57.82	30.00
1+2	5785	13.12	20.51	12.88	19.41	17.90	61.63	30.00
1+2	5805	13.12	20.51	12.34	17.14	17.64	58.12	30.00

Note 1 : refer to 4.4.1 for information on limit reduction.
Note 2 : We took the insertion loss of the cable loss into consideration within the measuring instrument.
Note 3 : Result : Measured Value(ANT1 + ANT2) + Duty cycle Factor
Note 4 : Duty cycle Factor : 10*log(1/(on-time/Period)) refer to 4.4.6.6
Note 5 : IC Limit(Frequency band 5150-5250 MHz) : 200 mW

Test mode : 802.11n_HT40

Maximum Conducted Output Power								
Antenna	Freq. (MHz)	ANT1 (dBm)	ANT1 (mW)	ANT2 (dBm)	ANT2 (mW)	Result (dBm)	Result (mW)	Limit (dBm)
1	5190	15.15	32.73	-	-	17.25	53.08	30.00
1	5230	15.36	34.36	-	-	17.46	55.71	30.00
1	5270	15.48	35.32	-	-	17.58	57.27	23.98
1	5310	15.32	34.04	-	-	17.42	55.20	23.98
1	5510	15.63	36.56	-	-	17.73	59.29	23.98
1	5590	15.66	36.81	-	-	17.76	59.70	23.98
1	5670	15.37	34.43	-	-	17.47	55.84	23.98
1	5755	15.42	34.83	-	-	17.52	56.49	30.00
1	5795	15.76	37.67	-	-	17.86	61.09	30.00
1+2	5190	11.47	14.03	11.88	15.42	17.73	59.33	30.00
1+2	5230	11.12	12.94	12.67	18.49	18.02	63.34	30.00
1+2	5270	11.03	12.68	12.73	18.75	18.02	63.32	23.98
1+2	5310	11.58	14.39	12.22	16.67	17.96	62.59	23.98
1+2	5510	10.97	12.50	11.82	15.21	17.47	55.83	23.98
1+2	5590	10.83	12.11	11.63	14.55	17.30	53.72	23.98
1+2	5670	10.89	12.27	11.45	13.96	17.23	52.87	23.98
1+2	5755	11.07	12.79	11.29	13.46	17.23	52.90	30.00
1+2	5795	12.00	15.85	11.57	14.35	17.84	60.86	30.00

Note 1 : refer to 4.4.1 for information on limit reduction.
Note 2 : We took the insertion loss of the cable loss into consideration within the measuring instrument.
Note 3 : Result : Measured Value(ANT1 + ANT2) + Duty cycle Factor
Note 4 : Duty cycle Factor : 10*log(1/(on-time/Period)) refer to 4.4.6.6
Note 5 : IC Limit(Frequency band 5150-5250 MHz) : 200 mW

Test mode : 802.11ac_VHT20

Maximum Conducted Output Power								
Antenna	Freq. (MHz)	ANT1 (dBm)	ANT1 (mW)	ANT2 (dBm)	ANT2 (mW)	Result (dBm)	Result (mW)	Limit (dBm)
1	5180	16.15	41.21	-	-	17.32	53.90	30.00
1	5200	16.23	41.98	-	-	17.40	54.90	30.00
1	5240	16.63	46.03	-	-	17.80	60.19	30.00
1	5260	16.69	46.67	-	-	17.86	61.03	23.98
1	5280	16.24	42.07	-	-	17.41	55.02	23.98
1	5320	16.37	43.35	-	-	17.54	56.70	23.98
1	5500	16.44	44.06	-	-	17.61	57.62	23.98
1	5600	16.31	42.76	-	-	17.48	55.92	23.98
1	5700	16.71	46.88	-	-	17.88	61.31	23.98
1	5745	16.15	41.21	-	-	17.32	53.90	30.00
1	5785	16.36	43.25	-	-	17.53	56.57	30.00
1	5805	16.23	41.98	-	-	17.40	54.90	30.00
1+2	5180	12.22	16.67	12.47	17.66	17.12	51.56	30.00
1+2	5200	12.40	17.38	12.57	18.07	17.26	53.24	30.00
1+2	5240	12.35	17.18	13.38	21.78	17.67	58.51	30.00
1+2	5260	12.27	16.87	13.45	22.13	17.68	58.57	23.96
1+2	5280	11.86	15.35	13.48	22.28	17.52	56.52	23.98
1+2	5320	12.23	16.71	12.82	19.14	17.31	53.85	23.95
1+2	5500	12.16	16.44	13.13	20.56	17.45	55.57	23.97
1+2	5600	12.22	16.67	13.19	20.84	17.51	56.35	23.98
1+2	5700	12.34	17.14	12.59	18.16	17.24	53.01	23.98
1+2	5745	12.38	17.30	12.74	18.79	17.34	54.20	30.00
1+2	5785	12.51	17.82	12.30	16.98	17.18	52.27	30.00
1+2	5805	13.03	20.09	12.17	16.48	17.40	54.93	30.00

Note 1 : refer to 4.4.1 for information on limit reduction.
Note 2 : We took the insertion loss of the cable loss into consideration within the measuring instrument.
Note 3 : Result : Measured Value(ANT1 + ANT2) + Duty cycle Factor
Note 4 : Duty cycle Factor : 10*log(1/(on-time/Period)) refer to 4.4.6.6
Note 5 : IC Limit(Frequency band 5150-5250 MHz) : 200 mW

Test mode : 802.11ac_VHT40

Maximum Conducted Output Power								
Antenna	Freq. (MHz)	ANT1 (dBm)	ANT1 (mW)	ANT2 (dBm)	ANT2 (mW)	Result (dBm)	Result (mW)	Limit (dBm)
1	5190	15.48	35.32	-	-	17.31	53.80	30.00
1	5230	15.46	35.16	-	-	17.29	53.55	30.00
1	5270	15.48	35.32	-	-	17.31	53.80	23.98
1	5310	15.46	35.16	-	-	17.29	53.55	23.98
1	5510	15.95	39.36	-	-	17.78	59.95	23.98
1	5590	15.75	37.58	-	-	17.58	57.25	23.98
1	5670	15.27	33.65	-	-	17.10	51.26	23.98
1	5755	15.52	35.65	-	-	17.35	54.30	30.00
1	5795	16.03	40.09	-	-	17.86	61.06	30.00
1+2	5190	11.37	13.71	11.56	14.32	17.64	58.11	30.00
1+2	5230	10.88	12.25	12.54	17.95	17.97	62.60	30.00
1+2	5270	10.96	12.47	12.52	17.86	17.99	62.90	23.98
1+2	5310	11.33	13.58	12.22	16.67	17.97	62.73	23.98
1+2	5510	11.05	12.74	12.24	16.75	17.86	61.13	23.98
1+2	5590	11.28	13.43	12.43	17.50	18.07	64.12	23.98
1+2	5670	10.99	12.56	11.62	14.52	17.49	56.15	23.98
1+2	5755	11.92	15.56	11.65	14.62	17.96	62.57	30.00
1+2	5795	11.88	15.42	11.35	13.65	17.80	60.25	30.00

Note 1 : refer to 4.4.1 for information on limit reduction.
Note 2 : We took the insertion loss of the cable loss into consideration within the measuring instrument.
Note 3 : Result : Measured Value(ANT1 + ANT2) + Duty cycle Factor
Note 4 : Duty cycle Factor : 10*log(1/(on-time/Period)) refer to 4.4.6.6
Note 5 : IC Limit(Frequency band 5150-5250 MHz) : 200 mW

Test mode : 802.11ac_VHT80

Maximum Conducted Output Power								
Antenna	Freq. (MHz)	ANT1 (dBm)	ANT1 (mW)	ANT2 (dBm)	ANT2 (mW)	Result (dBm)	Result (mW)	Limit (dBm)
1	5210	14.30	26.92	-	-	17.49	56.06	30.00
1	5290	14.72	29.65	-	-	17.91	61.75	23.98
1	5530	14.23	26.49	-	-	17.42	55.16	23.98
1	5610	14.67	29.31	-	-	17.86	61.04	23.98
1	5690	14.53	28.38	-	-	17.72	59.11	23.98
1	5775	14.43	27.73	-	-	17.62	57.76	30.00
1+2	5210	9.22	8.36	10.53	11.30	17.79	60.08	30.00
1+2	5290	9.88	9.73	10.55	11.35	18.09	64.43	23.98
1+2	5530	8.98	7.91	10.12	10.28	17.45	55.59	23.98
1+2	5610	8.76	7.52	10.08	10.19	17.33	54.11	23.98
1+2	5690	10.09	10.21	10.29	10.69	18.05	63.89	23.98
1+2	5775	9.86	9.68	9.84	9.64	17.71	59.06	30.00

Note 1 : refer to 4.4.1 for information on limit reduction.
Note 2 : We took the insertion loss of the cable loss into consideration within the measuring instrument.
Note 3 : Result : Measured Value(ANT1 + ANT2) + Duty cycle Factor
Note 4 : Duty cycle Factor : 10*log(1/(on-time/Period)) refer to 4.4.6.6
Note 5 : IC Limit(Frequency band 5150-5250 MHz) : 200 mW

4.4.3 Maximum Power Spectral Density(PSD)

4.4.3.1 Regulation

According to §15.407(a)(1)(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to §RSS-247 6.2.1.1 For other devices, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10B, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

According to §15.407(a)(2) and RSS-247 6.2.2.1(a), RSS-247 6.2.3.1 For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to §15.407(a)(3) and RSS-247 6.2.4.1 For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

4.4.3.2 Measurement Procedure

These test measurement settings are specified in section F of 789033 D02 General UNII Test Procedures.

4.4.3.2.1 Maximum Power Spectral Density (PSD)

The rules requires “maximum power spectral density” measurements where the intent is to measure the maximum value of the time average of the power spectral density measured during a period of continuous transmission.

1. Create an average power spectrum for the EUT operating mode being tested by following the instructions in section II.E.2. for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, “Compute power….” (This procedure is required even if the maximum conducted output power measurement was performed using a power meter, method PM.)

2. Use the peak search function on the instrument to find the peak of the spectrum and record its value.
3. Make the following adjustments to the peak value of the spectrum, if applicable:

a) If Method SA-2 or SA-2 Alternative was used, add 10 log (1/x), where x is the duty cycle, to the peak of the spectrum.
b) If Method SA-3 Alternative was used and the linear mode was used in step II.E.2.g)(viii), add 1 dB to the final result to compensate for the difference between linear averaging and power averaging.

4. The result is the Maximum PSD over 1 MHz reference bandwidth.

5. For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 kHz bandwidth, the following adjustments to the procedures apply:

a) Set RBW ≥ 1/T, where T is defined in section II.B.I.a).
b) Set VBW ≥ 3 RBW.
c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10 log (500 kHz/RBW) to the measured result, whereas RBW (< 500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10 log (1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.
e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 kHz for the sections 5.c) and 5.d) above, since RBW=100 KHZ is available on nearly all spectrum analyzers.

4.4.3.3 Result

Comply (measurement data : refer to the next page)

4.4.3.4 Measurement data

Test mode : 802.11a

Maximum Power Spectral Density					
Antenna	Freq. (MHz)	ANT1 (dBm)	ANT2 (dBm)	Result (dBm)	Limit (dBm)
1	5180	4.92	-	5.84	17.00
1	5200	5.08	-	6.00	17.00
1	5240	5.25	-	6.17	17.00
1	5260	5.23	-	6.15	11.00
1	5280	5.50	-	6.42	11.00
1	5320	5.90	-	6.82	11.00
1	5500	5.61	-	6.53	11.00
1	5600	5.52	-	6.44	11.00
1	5700	5.29	-	6.21	11.00
1	5745	2.16	-	3.08	30.00
1	5785	3.05	-	3.97	30.00
1	5805	2.72	-	3.64	30.00

NOTE1 : refer to 4.1.1 for information on limit reduction.
NOTE2 : We took the insertion loss of the cable loss into consideration within the measuring instrument.
NOTE3 : Duty cycle Factor : 10*log(1/(on-time/Period)) refer to 4.4.6.6
NOTE4 : Result : Measured Value(ANT1 + ANT2) + Duty cycle Factor
NOTE5 : 5150MHz ~ 5725MHz : dBm/MHz
5725MHz ~ 5850MHz : dBm/500kHz
NOTE6 : IC Limit(Frequency band 5150-5250 MHz) : 10 dBm/MHz

Test mode : 802.11n_HT20

Maximum Power Spectral Density					
Antenna	Freq. (MHz)	ANT1 (dBm)	ANT2 (dBm)	Result (dBm)	Limit (dBm)
1	5180	5.07	-	6.21	17.00
1	5200	5.44	-	6.58	17.00
1	5240	5.14	-	6.28	17.00
1	5260	5.51	-	6.65	11.00
1	5280	5.52	-	6.66	11.00
1	5320	5.60	-	6.74	11.00
1	5500	5.50	-	6.64	11.00
1	5600	5.73	-	6.87	11.00
1	5700	5.58	-	6.72	11.00
1	5745	2.41	-	3.55	30.00
1	5785	2.55	-	3.69	30.00
1	5805	2.60	-	3.74	30.00
1+2	5180	1.10	1.73	6.32	17.00
1+2	5200	1.18	1.59	6.28	17.00
1+2	5240	0.96	2.27	6.56	17.00
1+2	5260	0.29	1.60	5.89	11.00
1+2	5280	0.74	1.94	6.27	11.00
1+2	5320	1.06	1.21	6.03	11.00
1+2	5500	0.72	1.64	6.10	11.00
1+2	5600	0.63	1.92	6.22	11.00
1+2	5700	1.65	2.08	6.77	11.00
1+2	5745	-1.22	-1.24	3.66	30.00
1+2	5785	-0.70	-1.36	3.88	30.00
1+2	5805	-0.83	-1.71	3.65	30.00

NOTE1 : refer to 4.1.1 for information on limit reduction.
NOTE2 : We took the insertion loss of the cable loss into consideration within the measuring instrument.
NOTE3 : Duty cycle Factor : 10*log(1/(on-time/Period)) refer to 4.4.6.6
NOTE4 : Result : Measured Value(ANT1 + ANT2) + Duty cycle Factor
NOTE5 : 5150MHz ~ 5725MHz : dBm/MHz
5725MHz ~ 5850MHz : dBm/500kHz
NOTE6 : IC Limit(Frequency band 5150-5250 MHz) : 10 dBm/MHz

Test mode : 802.11n_HT40

Maximum Power Spectral Density					
Antenna	Freq. (MHz)	ANT1 (dBm)	ANT2 (dBm)	Result (dBm)	Limit (dBm)
1	5190	1.41	-	3.50	17.00
1	5230	1.07	-	3.17	17.00
1	5270	1.48	-	3.58	11.00
1	5310	1.23	-	3.33	11.00
1	5510	1.77	-	3.87	11.00
1	5590	1.95	-	4.05	11.00
1	5670	1.24	-	3.34	11.00
1	5755	-1.62	-	0.48	30.00
1	5795	-6.97	-	-4.87	30.00
1+2	5190	-2.35	-2.08	3.84	17.00
1+2	5230	-2.74	-0.81	4.38	17.00
1+2	5270	-2.90	-1.09	4.15	11.00
1+2	5310	-2.54	-1.99	3.80	11.00
1+2	5510	-3.06	-1.63	3.77	11.00
1+2	5590	-3.53	-1.48	3.67	11.00
1+2	5670	-2.65	-2.10	3.69	11.00
1+2	5755	-5.40	-4.97	0.87	30.00
1+2	5795	-4.72	-5.39	1.01	30.00

NOTE1 : refer to 4.1.1 for information on limit reduction.
NOTE2 : We took the insertion loss of the cable loss into consideration within the measuring instrument.
NOTE3 : Duty cycle Factor : 10*log(1/(on-time/Period)) refer to 4.4.6.6
NOTE4 : Result : Measured Value(ANT1 + ANT2) + Duty cycle Factor
NOTE5 : 5150MHz ~ 5725MHz : dBm/MHz
5725MHz ~ 5850MHz : dBm/500kHz
NOTE6 : IC Limit(Frequency band 5150-5250 MHz) : 10 dBm/MHz

Test mode : 802.11ac_VHT20

Maximum Power Spectral Density					
Antenna	Freq. (MHz)	ANT1 (dBm)	ANT2 (dBm)	Result (dBm)	Limit (dBm)
1	5180	4.84	-	6.01	17.00
1	5200	5.06	-	6.22	17.00
1	5240	5.25	-	6.41	17.00
1	5260	5.42	-	6.59	11.00
1	5280	5.28	-	6.45	11.00
1	5320	4.86	-	6.03	11.00
1	5500	5.40	-	6.56	11.00
1	5600	5.17	-	6.33	11.00
1	5700	5.90	-	7.07	11.00
1	5745	2.10	-	3.26	30.00
1	5785	2.21	-	3.38	30.00
1	5805	2.05	-	3.22	30.00
1+2	5180	1.22	0.97	5.87	17.00
1+2	5200	1.30	1.22	6.04	17.00
1+2	5240	1.01	2.23	6.44	17.00
1+2	5260	0.43	1.74	5.91	11.00
1+2	5280	1.01	2.49	6.59	11.00
1+2	5320	1.41	1.81	6.39	11.00
1+2	5500	0.77	1.88	6.14	11.00
1+2	5600	1.07	2.33	6.52	11.00
1+2	5700	1.21	1.62	6.20	11.00
1+2	5745	-1.25	-0.93	3.69	30.00
1+2	5785	-1.09	-1.81	3.34	30.00
1+2	5805	-0.86	-1.54	3.59	30.00

NOTE1 : refer to 4.1.1 for information on limit reduction.
NOTE2 : We took the insertion loss of the cable loss into consideration within the measuring instrument.
NOTE3 : Duty cycle Factor : 10*log(1/(on-time/Period)) refer to 4.4.6.6
NOTE4 : Result : Measured Value(ANT1 + ANT2) + Duty cycle Factor
NOTE5 : 5150MHz ~ 5725MHz : dBm/MHz
5725MHz ~ 5850MHz : dBm/500kHz
NOTE6 : IC Limit(Frequency band 5150-5250 MHz) : 10 dBm/MHz

Test mode : 802.11ac_VHT40

Maximum Power Spectral Density					
Antenna	Freq. (MHz)	ANT1 (dBm)	ANT2 (dBm)	Result (dBm)	Limit (dBm)
1	5190	1.12	-	2.95	17.00
1	5230	1.46	-	3.29	17.00
1	5270	1.54	-	3.36	11.00
1	5310	1.21	-	3.04	11.00
1	5510	1.56	-	3.38	11.00
1	5590	1.72	-	3.54	11.00
1	5670	1.19	-	3.02	11.00
1	5755	-1.47	-	0.36	30.00
1	5795	-1.04	-	0.79	30.00
1+2	5190	-2.88	-2.77	3.35	17.00
1+2	5230	-3.19	-1.50	3.91	17.00
1+2	5270	-2.90	-1.58	3.99	11.00
1+2	5310	-2.44	-1.69	4.12	11.00
1+2	5510	-2.54	-1.61	4.13	11.00
1+2	5590	-2.74	-1.75	3.96	11.00
1+2	5670	-2.68	-2.34	3.67	11.00
1+2	5755	-4.90	-5.14	1.16	30.00
1+2	5795	-5.00	-5.21	1.07	30.00

NOTE1 : refer to 4.1.1 for information on limit reduction.
NOTE2 : We took the insertion loss of the cable loss into consideration within the measuring instrument.
NOTE3 : Duty cycle Factor : 10*log(1/(on-time/Period)) refer to 4.4.6.6
NOTE4 : Result : Measured Value(ANT1 + ANT2) + Duty cycle Factor
NOTE5 : 5150MHz ~ 5725MHz : dBm/MHz
5725MHz ~ 5850MHz : dBm/500kHz
NOTE6 : IC Limit(Frequency band 5150-5250 MHz) : 10 dBm/MHz

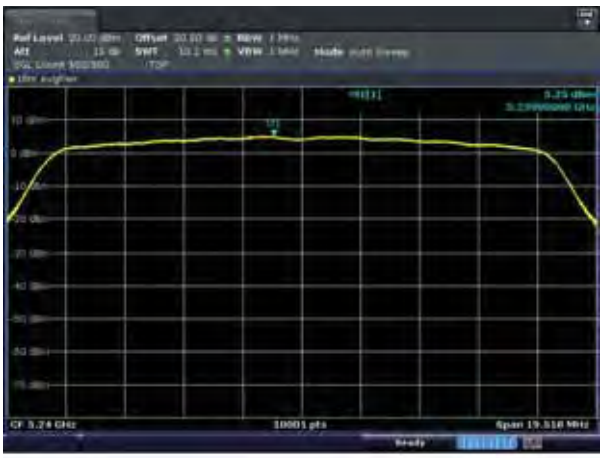
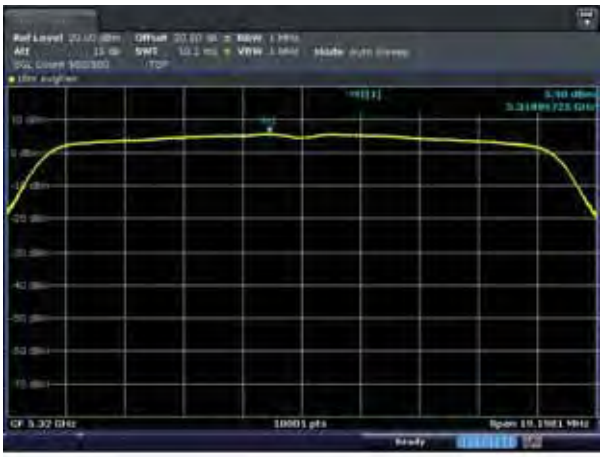
Test mode : 802.11ac_VHT80

Maximum Power Spectral Density					
Antenna	Freq. (MHz)	ANT1 (dBm)	ANT2 (dBm)	Result (dBm)	Limit (dBm)
1	5210	-2.19	-	1.00	17.00
1	5290	-8.36	-	-5.17	11.00
1	5530	-1.96	-	1.22	11.00
1	5610	-1.81	-	1.37	11.00
1	5690	-1.88	-	1.30	11.00
1	5775	-4.60	-	-1.41	30.00
1+2	5210	-11.51	-12.41	-4.07	17.00
1+2	5290	-12.41	-12.08	-4.38	11.00
1+2	5530	-10.84	-9.09	-2.01	11.00
1+2	5610	-11.37	-10.25	-2.91	11.00
1+2	5690	-10.45	-9.93	-2.32	11.00
1+2	5775	-11.47	-11.99	-3.86	30.00

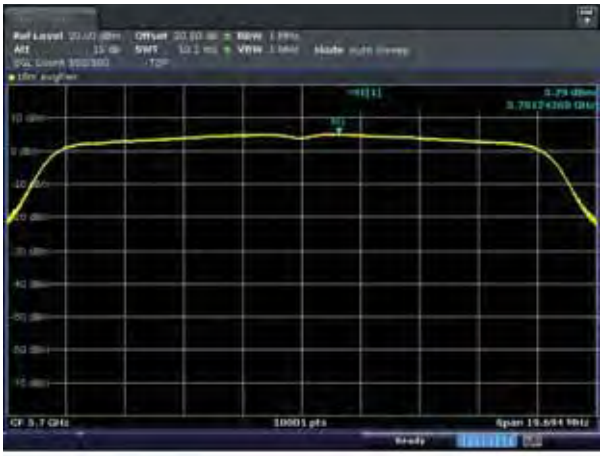
NOTE1 : refer to 4.1.1 for information on limit reduction.
NOTE2 : We took the insertion loss of the cable loss into consideration within the measuring instrument.
NOTE3 : Duty cycle Factor : 10*log(1/(on-time/Period)) refer to 4.4.6.6
NOTE4 : Result : Measured Value(ANT1 + ANT2) + Duty cycle Factor
NOTE5 : 5150MHz ~ 5725MHz : dBm/MHz
5725MHz ~ 5850MHz : dBm/500kHz
NOTE6 : IC Limit(Frequency band 5150-5250 MHz) : 10 dBm/MHz

4.4.3.5 Test Plot

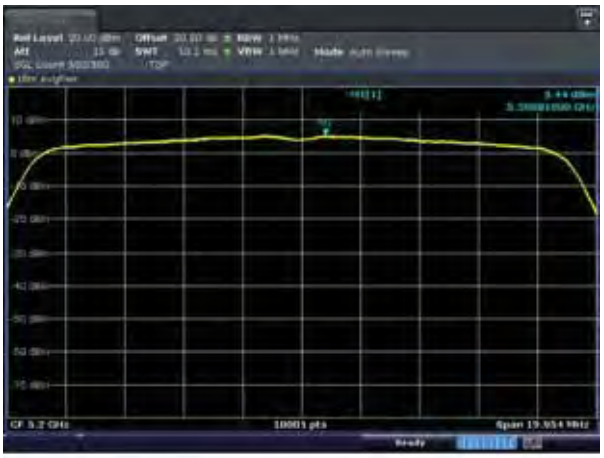
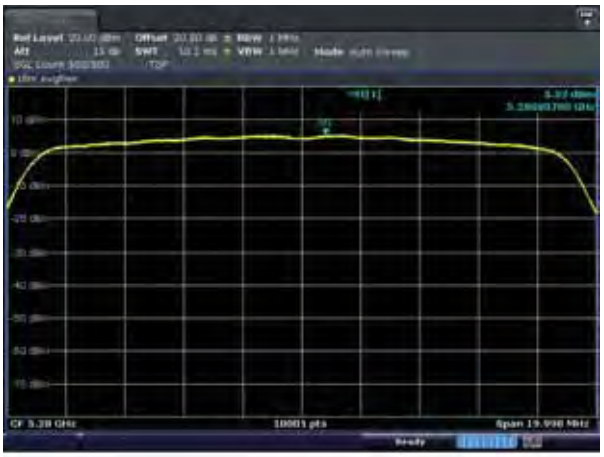
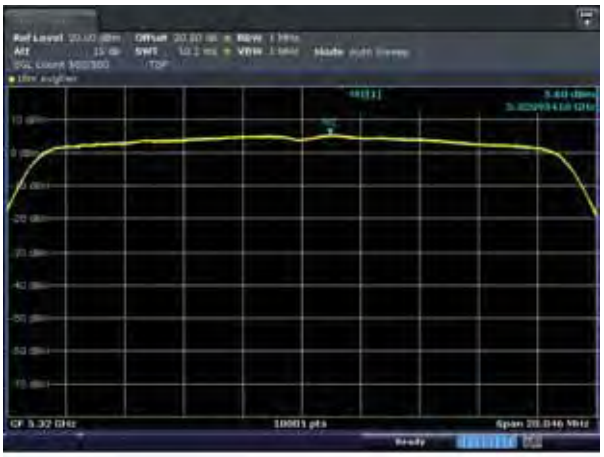
Test mode : 802.11a

5180MHz	5200MHz
	
5240MHz	5260MHz
	
5280MHz	5320MHz
	

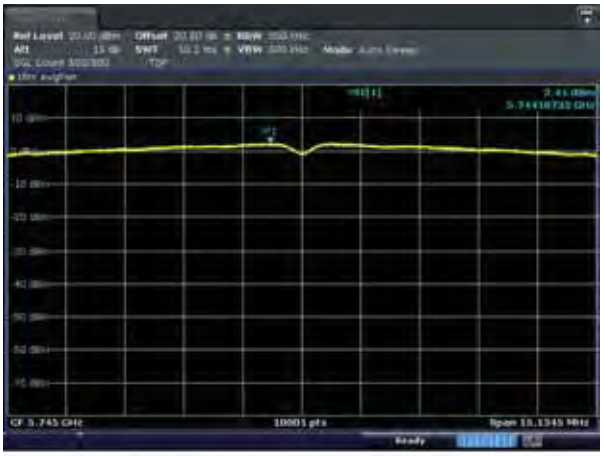
Test mode : 802.11a

5500MHz	5600MHz
	
5700MHz	5745MHz
	
5785MHz	5805MHz
	

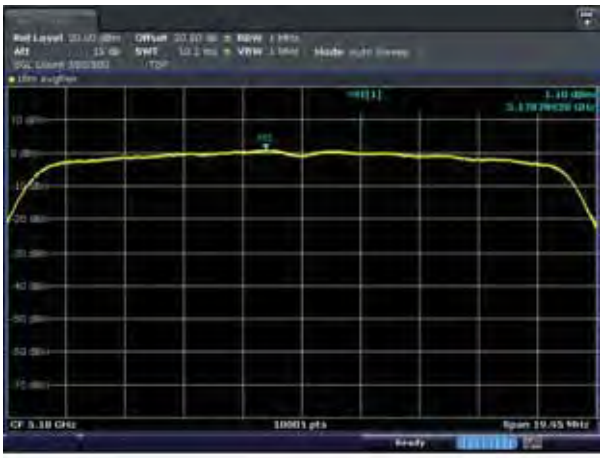
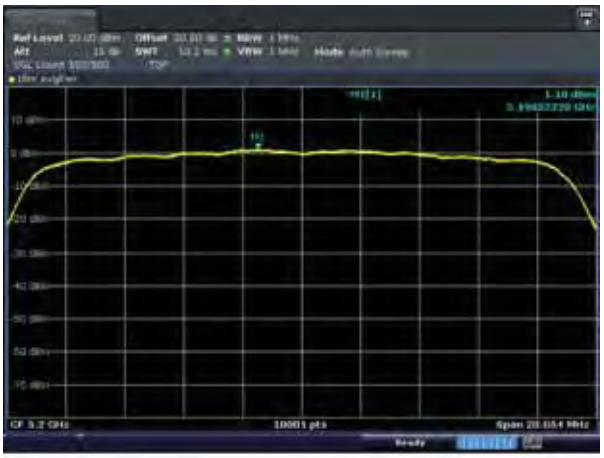
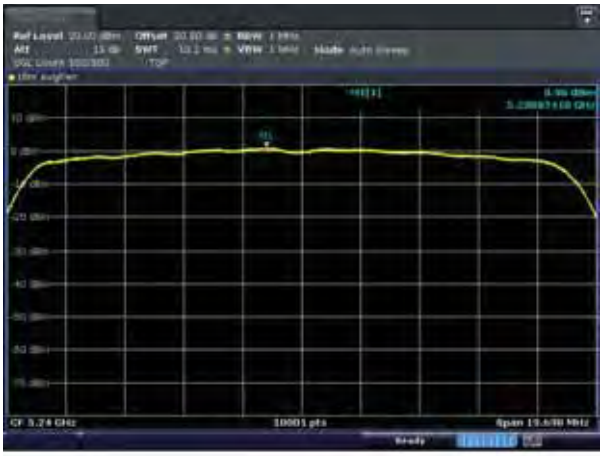
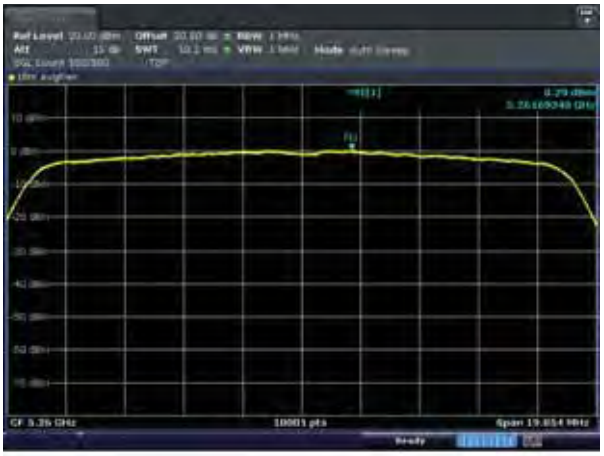
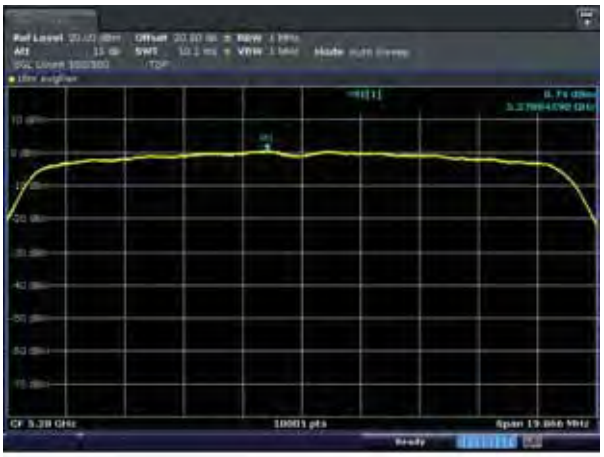
Test mode : 802.11n_HT20

5180MHz	5200MHz
	
5240MHz	5260MHz
	
5280MHz	5320MHz
	

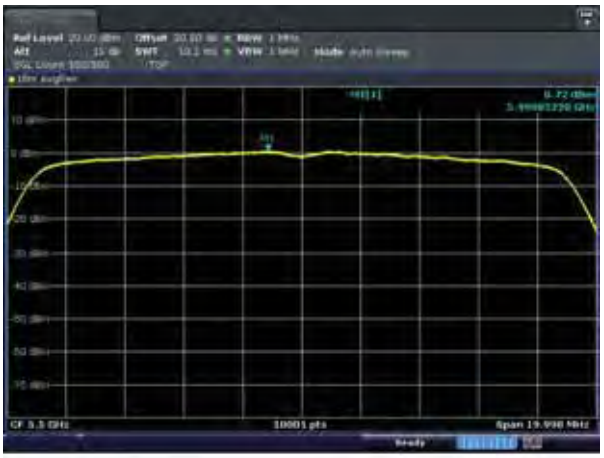
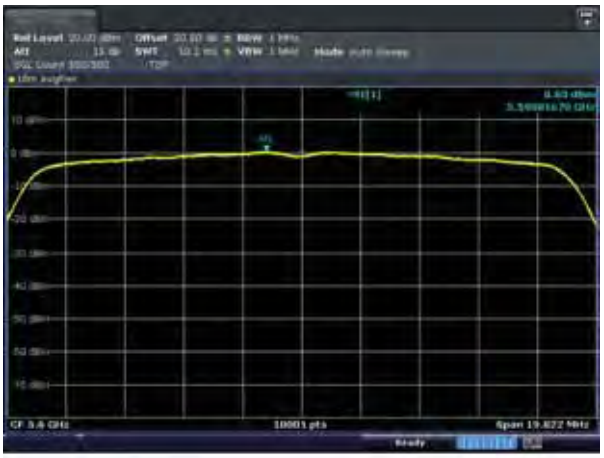
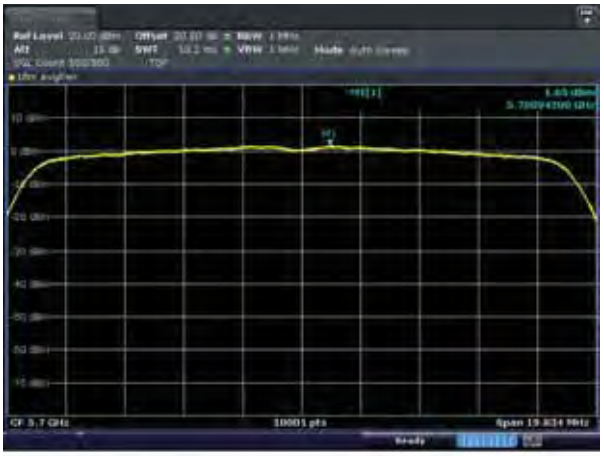
Test mode : 802.11n_HT20

5500MHz	5600MHz
	
5700MHz	5745MHz
	
5785MHz	5805MHz
	

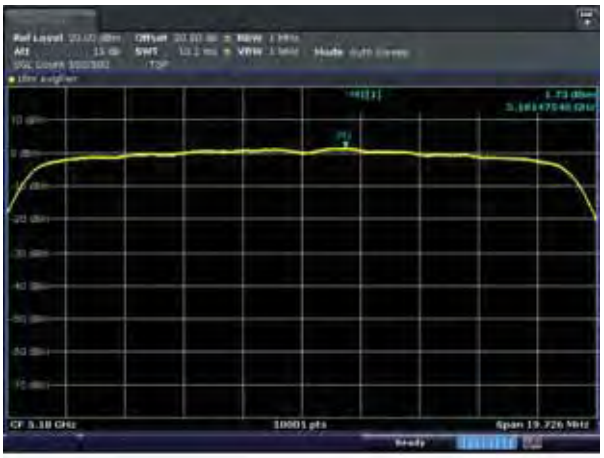
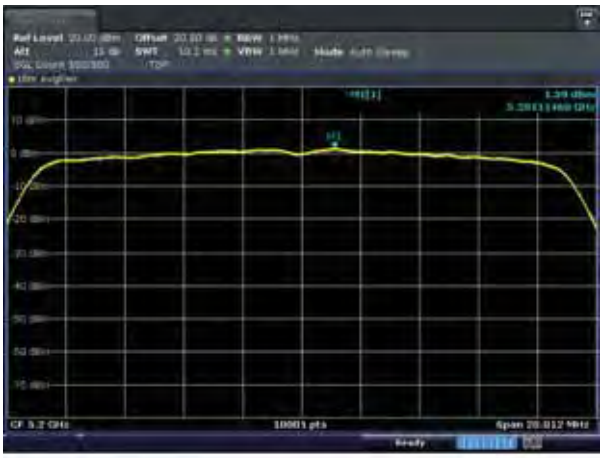
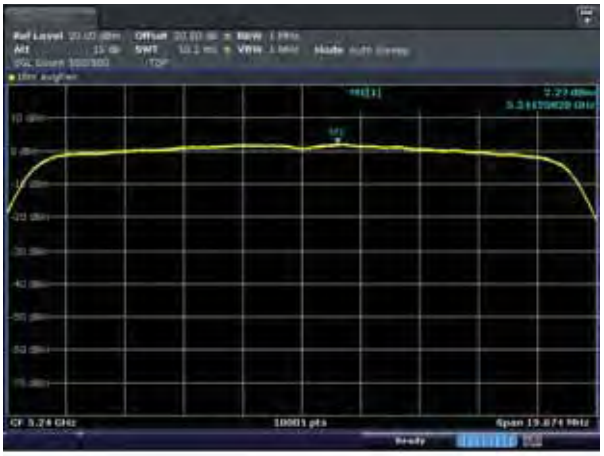
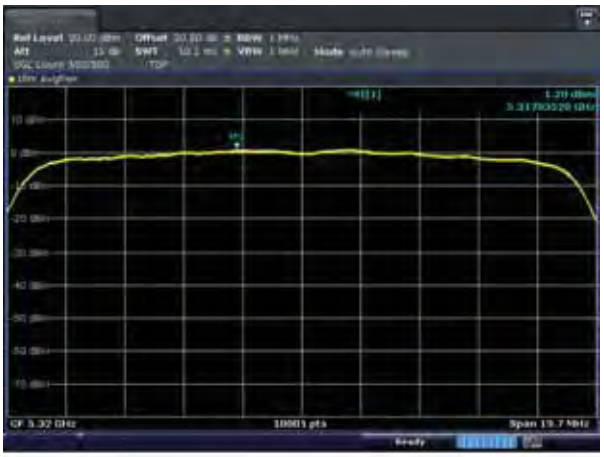
Test mode : 802.11n_HT20 MIMO ANT1

5180MHz	5200MHz
	
5240MHz	5260MHz
	
5280MHz	5320MHz
	

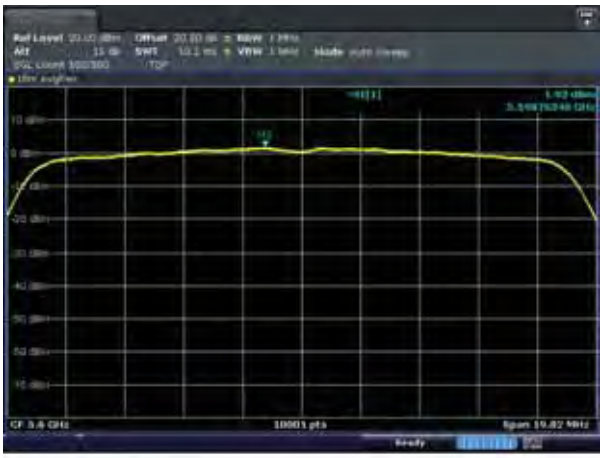
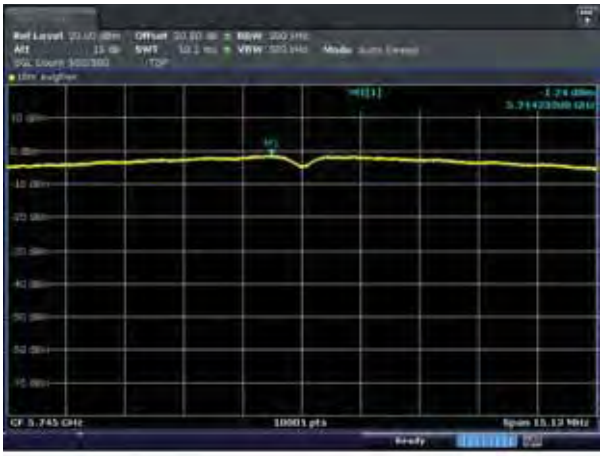
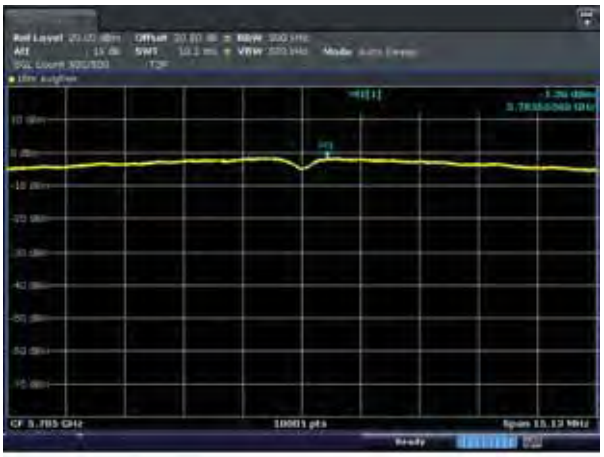
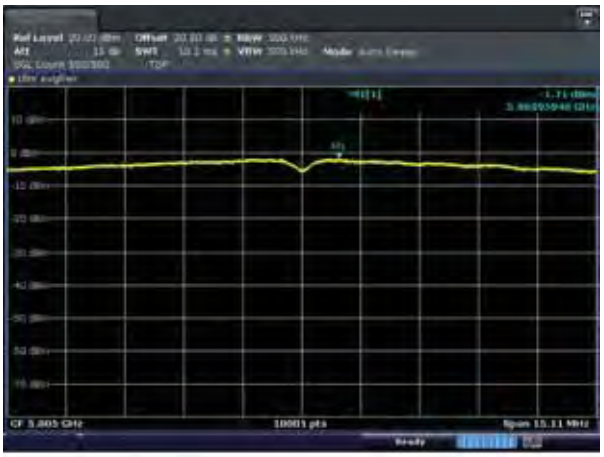
Test mode : 802.11n_HT20 MIMO ANT1

5500MHz	5600MHz
	
5700MHz	5745MHz
	
5785MHz	5805MHz
	

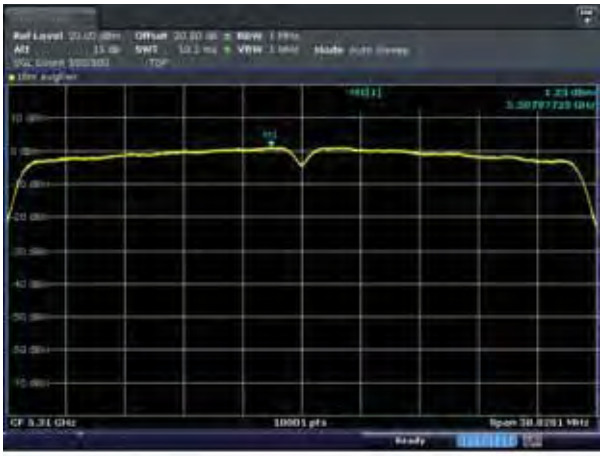
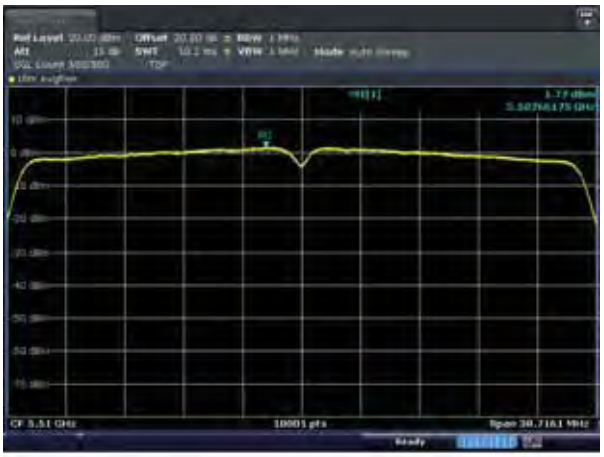
Test mode : 802.11n_HT20 MIMO ANT2

5180MHz	5200MHz
	
5240MHz	5260MHz
	
5280MHz	5320MHz
	

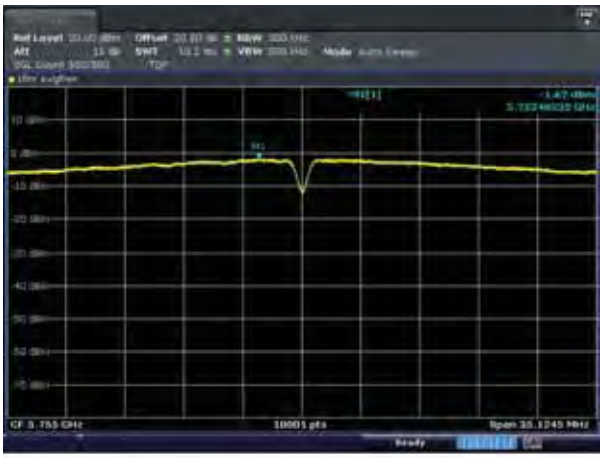
Test mode : 802.11n_HT20 MIMO ANT2

5500MHz	5600MHz
	
5700MHz	5745MHz
	
5785MHz	5805MHz
	

Test mode : 802.11n_HT40

5190MHz	5230MHz
	
5270MHz	5310MHz
	
5510MHz	5590MHz
	

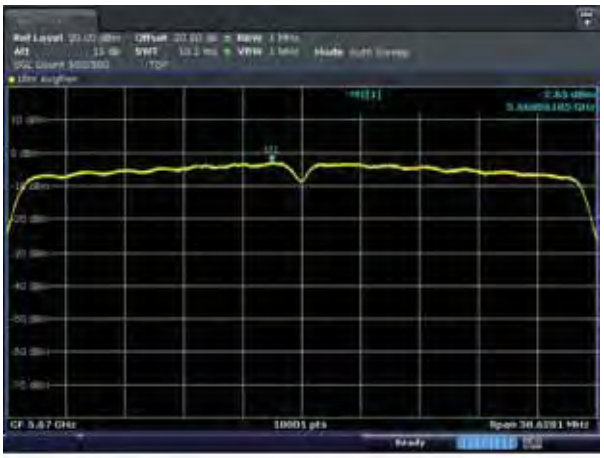
Test mode : 802.11n_HT40

5670MHz	5755MHz
	
5795MHz	
	

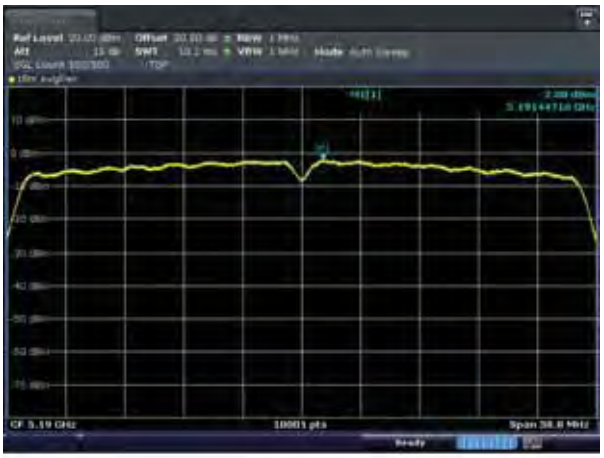
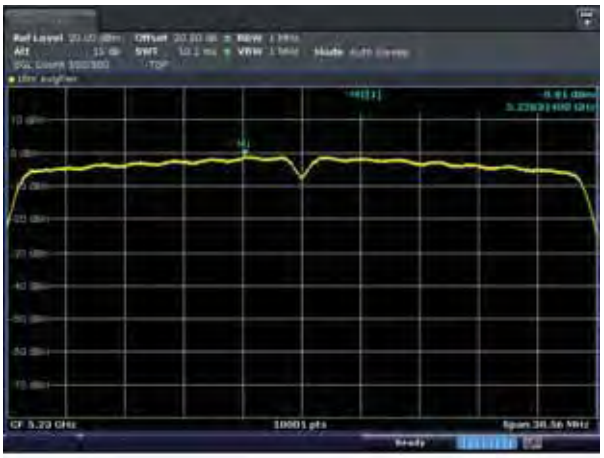
Test mode : 802.11n_HT40 MIMO ANT1

5190MHz	5230MHz
	
5270MHz	5310MHz
	
5510MHz	5590MHz
	

Test mode : 802.11n_HT40 MIMO ANT1

5670MHz	5755MHz
	
5795MHz	
	

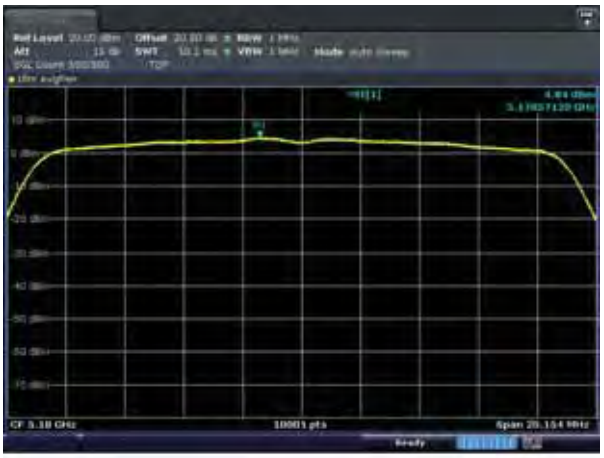
Test mode : 802.11n_HT40 MIMO ANT2

5190MHz	5230MHz
	
5270MHz	5310MHz
	
5510MHz	5590MHz
	

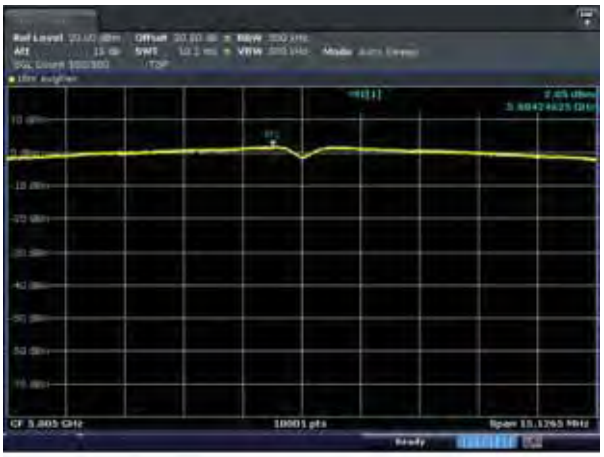
Test mode : 802.11n_HT40 MIMO ANT2

5670MHz	5755MHz
	
5795MHz	
	

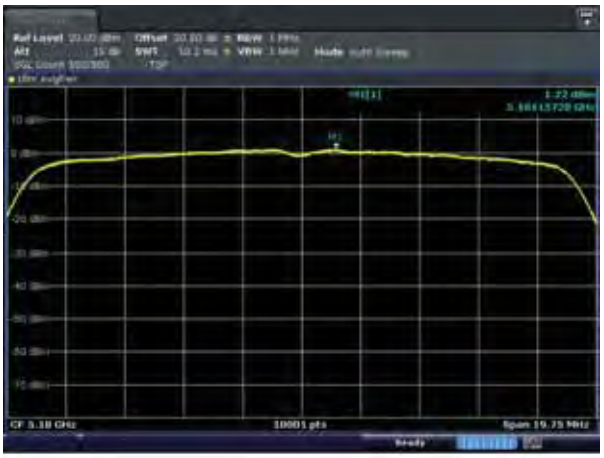
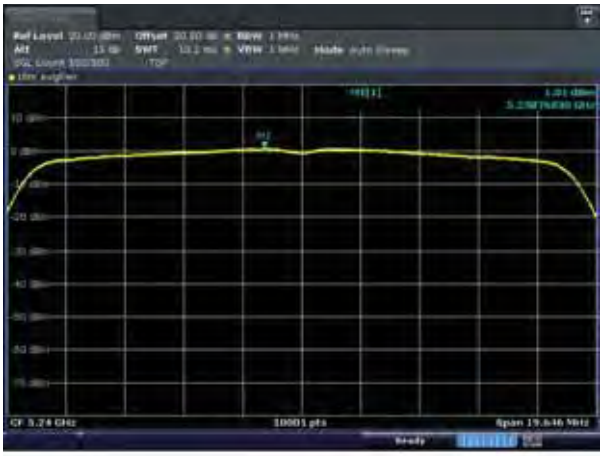
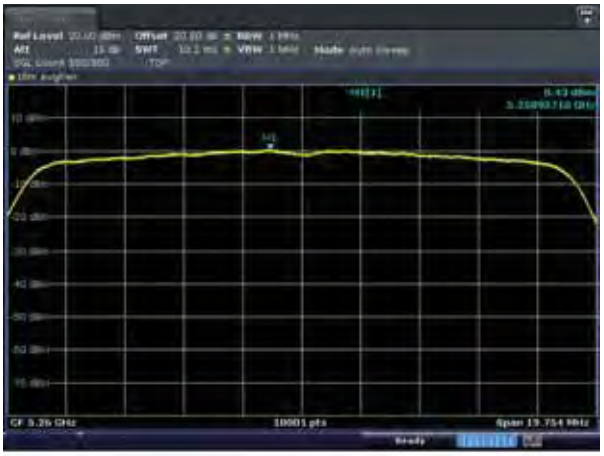
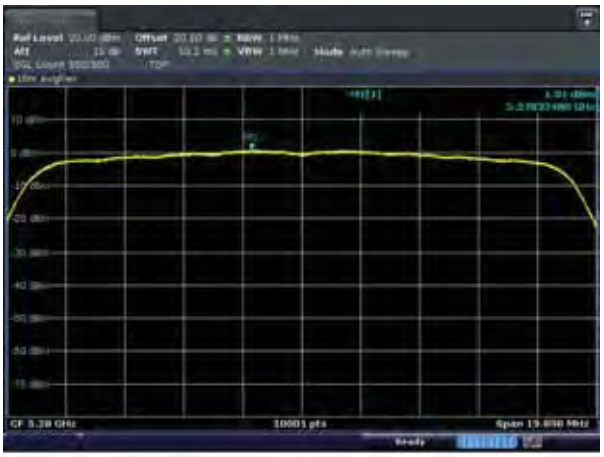
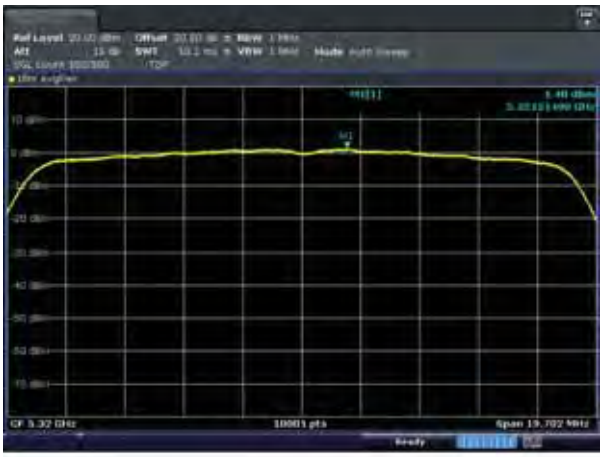
Test mode : 802.11ac_VHT20

5180MHz	5200MHz
	
5240MHz	5260MHz
	
5280MHz	5320MHz
	

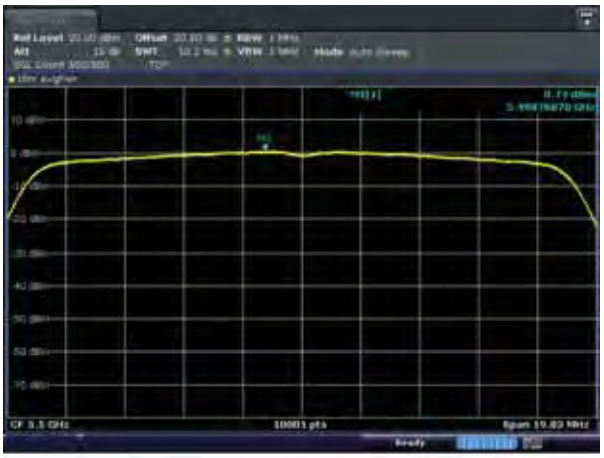
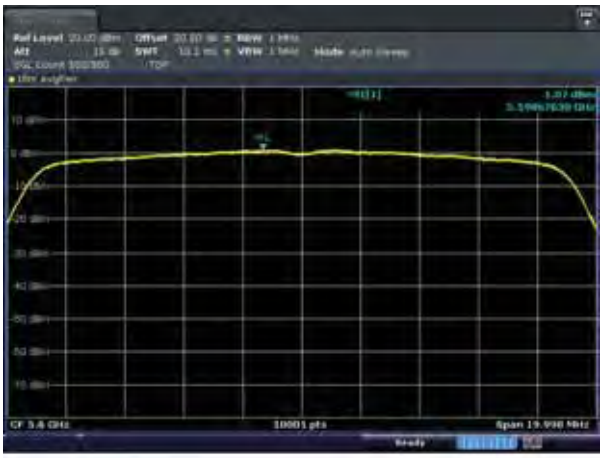
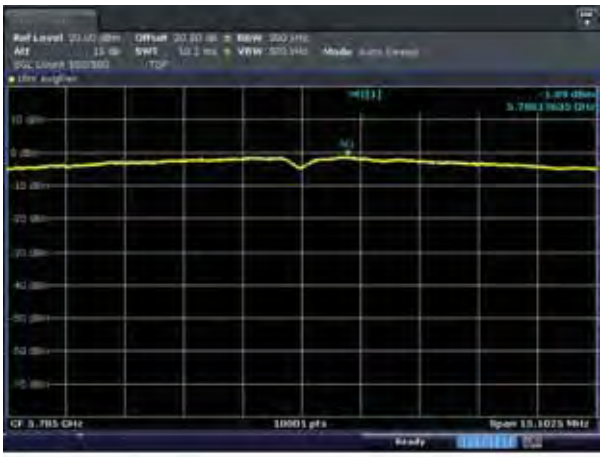
Test mode : 802.11ac_VHT20

5500MHz	5600MHz
	
5700MHz	5745MHz
	
5785MHz	5805MHz
	

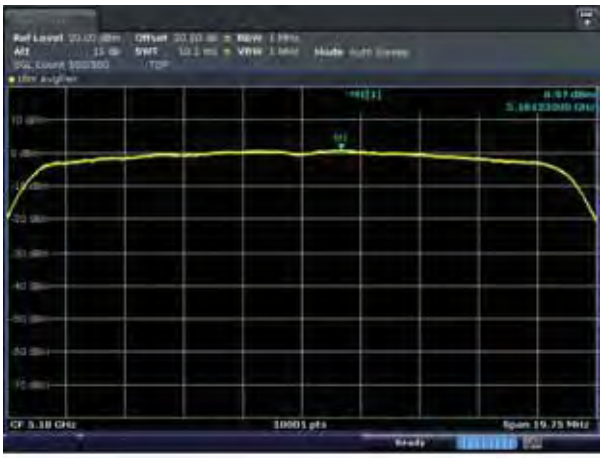
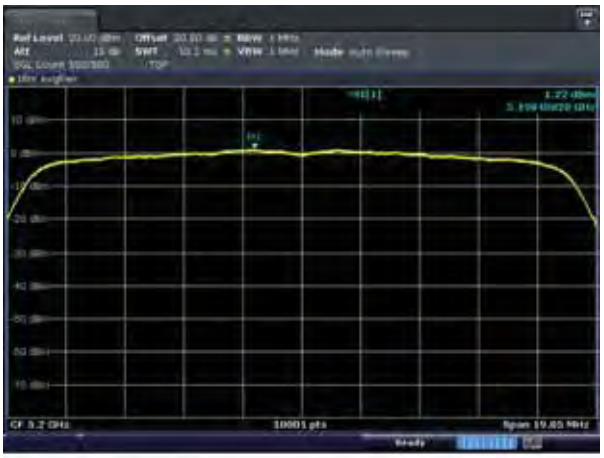
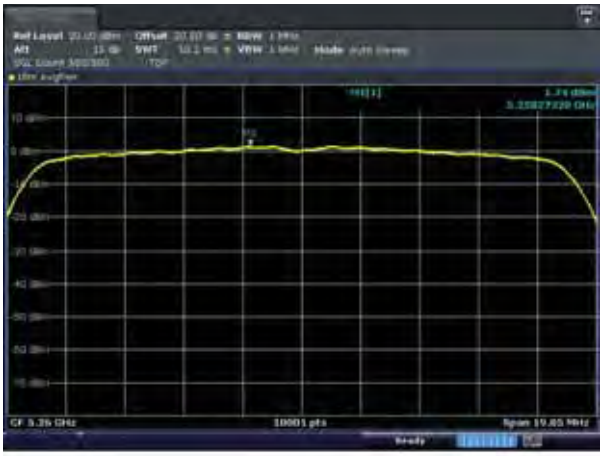
Test mode : 802.11ac_VHT20 MIMO ANT1

5180MHz	5200MHz
	
5240MHz	5260MHz
	
5280MHz	5320MHz
	

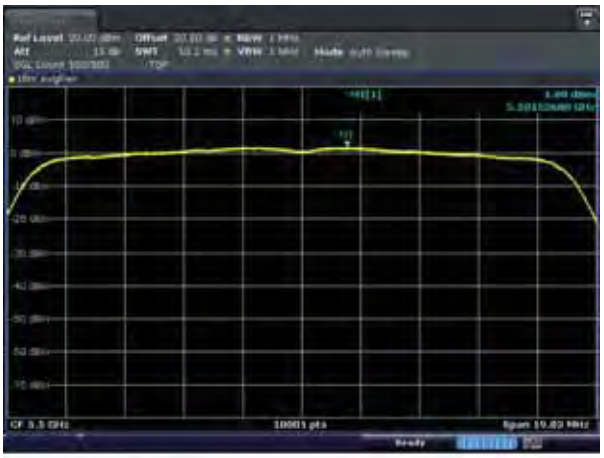
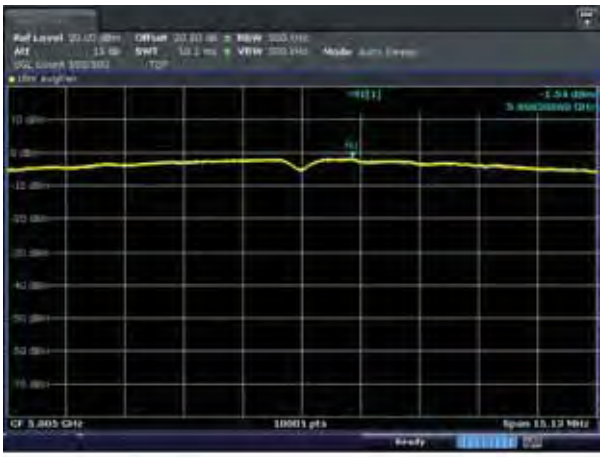
Test mode : 802.11ac_VHT20 MIMO ANT1

5500MHz	5600MHz
	
5700MHz	5745MHz
	
5785MHz	5805MHz
	

Test mode : 802.11ac_VHT20 MIMO ANT2

5180MHz	5200MHz
	
5240MHz	5260MHz
	
5280MHz	5320MHz
	

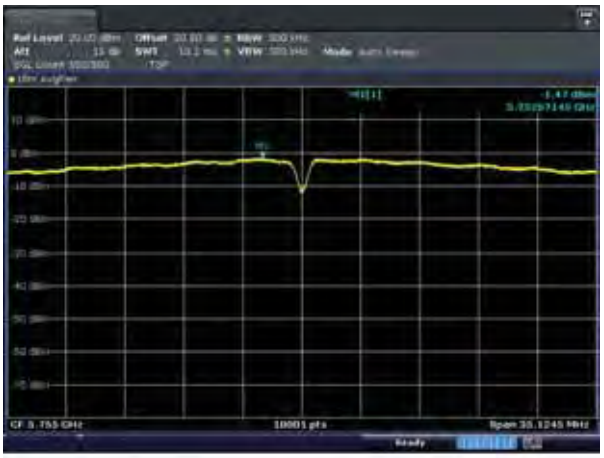
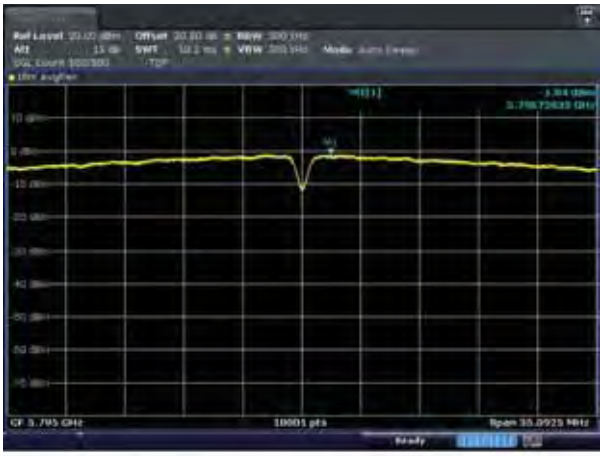
Test mode : 802.11ac_VHT20 MIMO ANT2

5500MHz	5600MHz
	
5700MHz	5745MHz
	
5785MHz	5805MHz
	

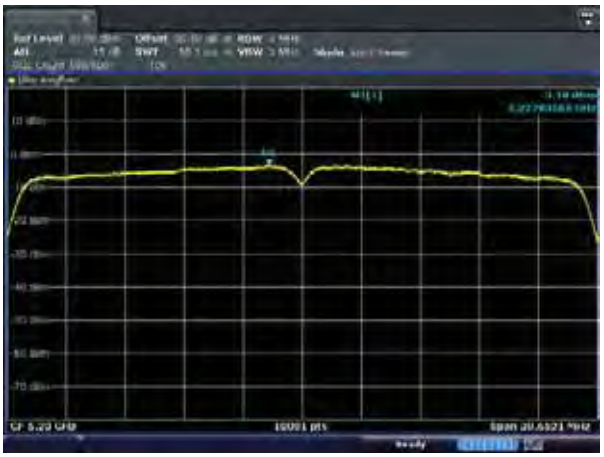
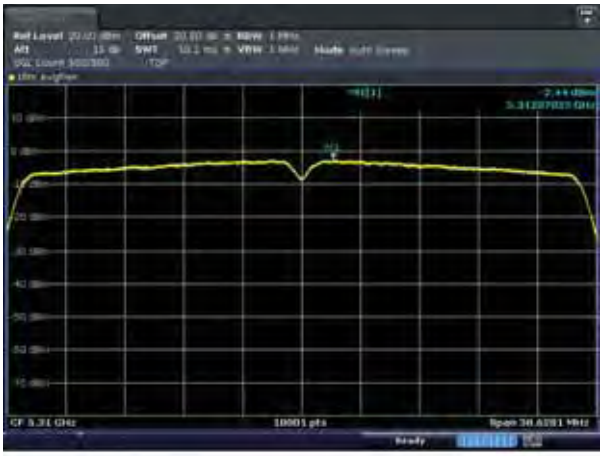
Test mode : 802.11ac_VHT40

5190MHz	5230MHz
	
5270MHz	5310MHz
	
5510MHz	5590MHz
	

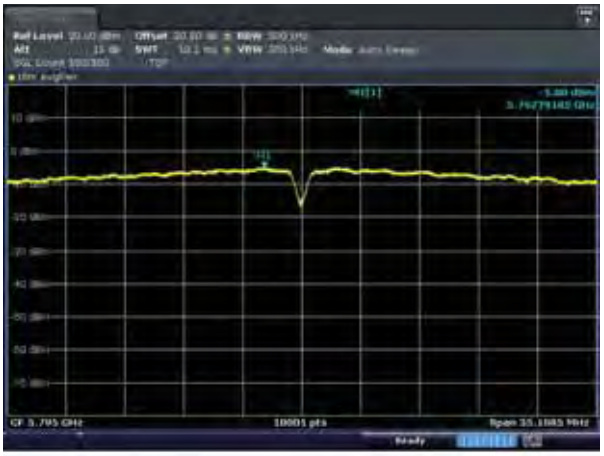
Test mode : 802.11ac_VHT40

5670MHz	5755MHz
	
5795MHz	
	

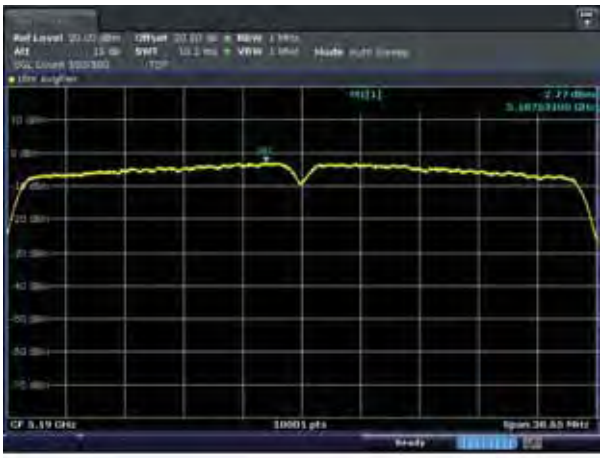
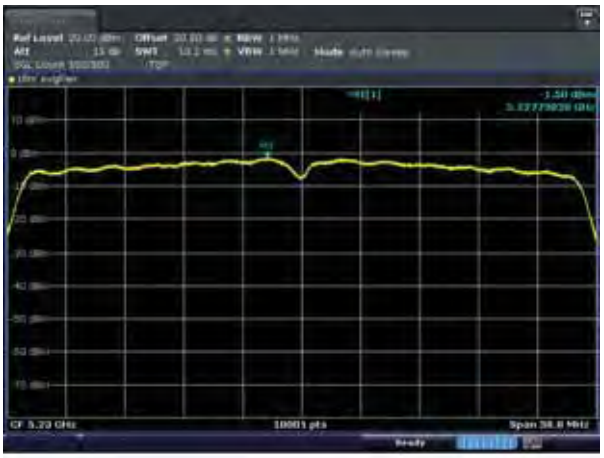
Test mode : 802.11ac_VHT40 MIMO ANT1

5190MHz	5230MHz
	
5270MHz	5310MHz
	
5510MHz	5590MHz
	

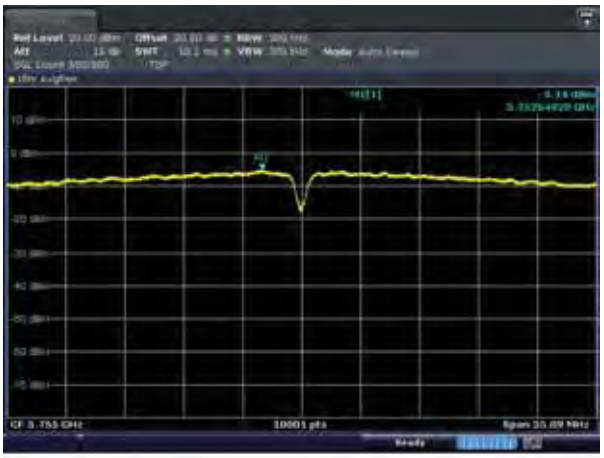
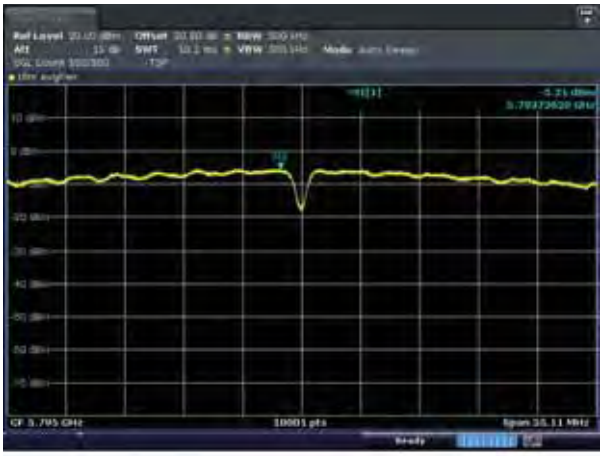
Test mode : 802.11ac_VHT40 MIMO ANT1

5670MHz	5755MHz
	
5795MHz	
	

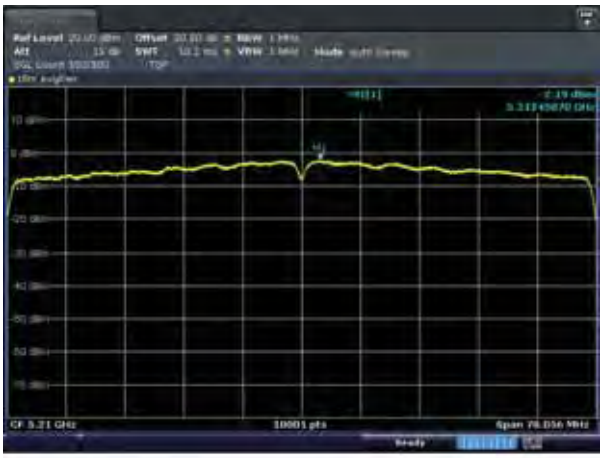
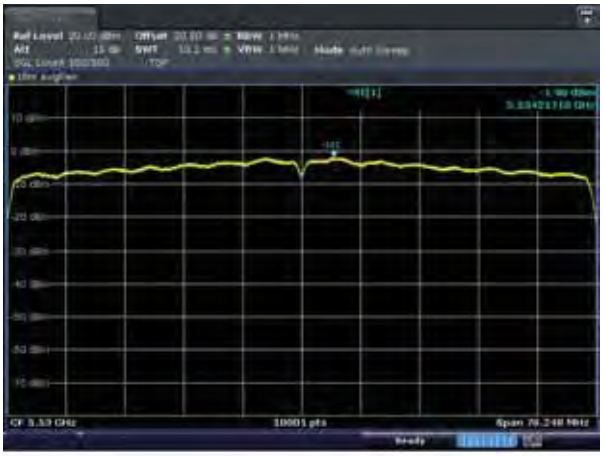
Test mode : 802.11ac_VHT40 MIMO ANT2

5190MHz	5230MHz
	
5270MHz	5310MHz
	
5510MHz	5590MHz
	

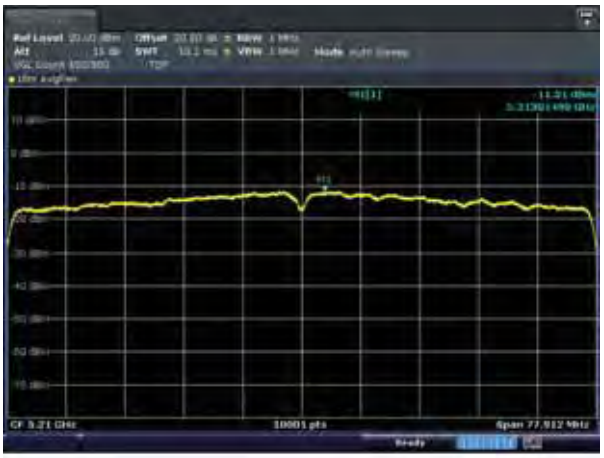
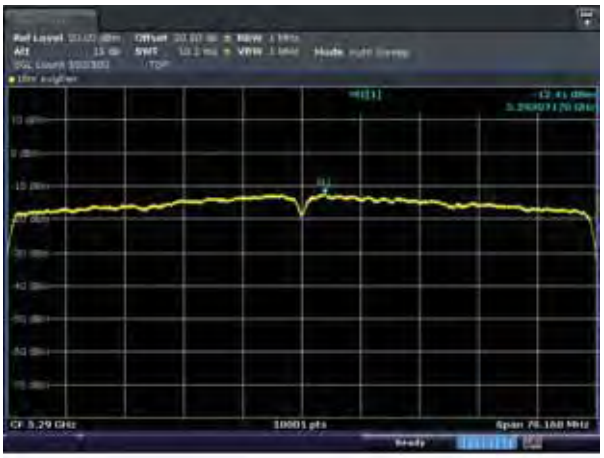
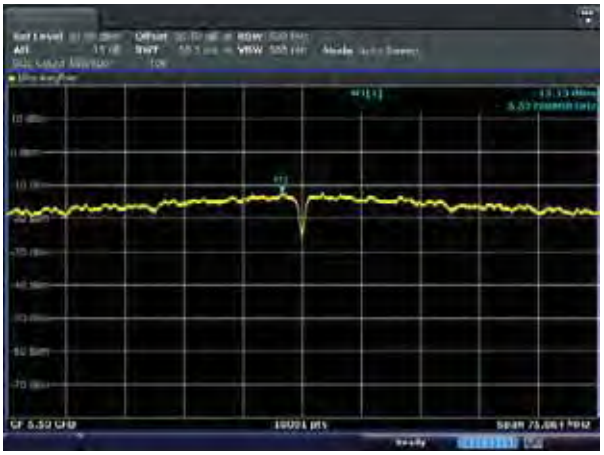
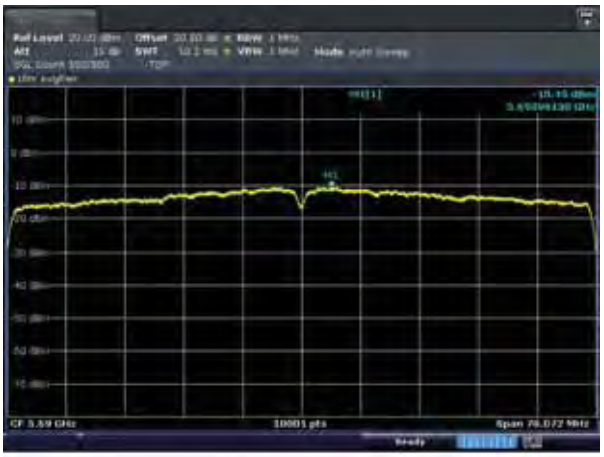
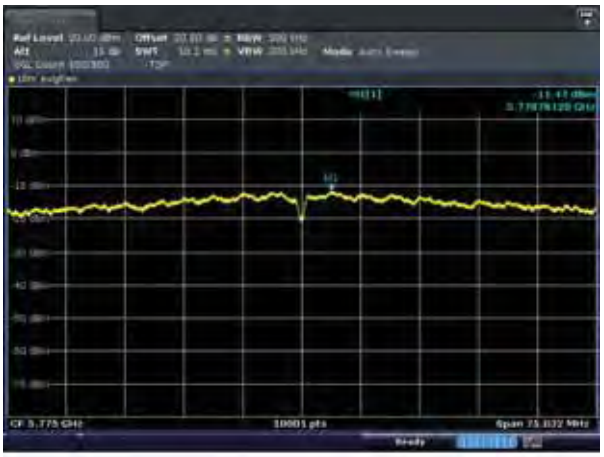
Test mode : 802.11ac_VHT40 MIMO ANT2

5670MHz	5755MHz
	
5795MHz	
	

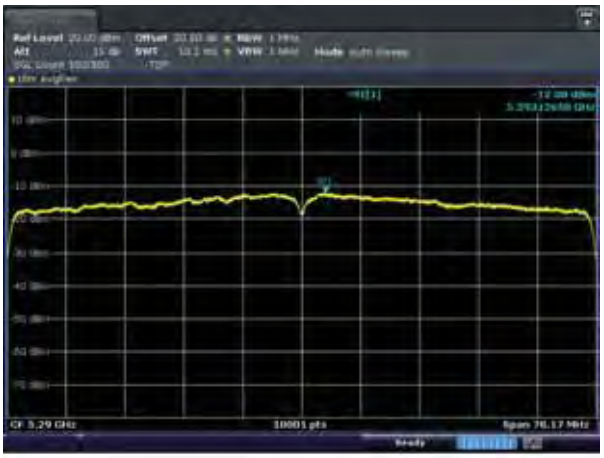
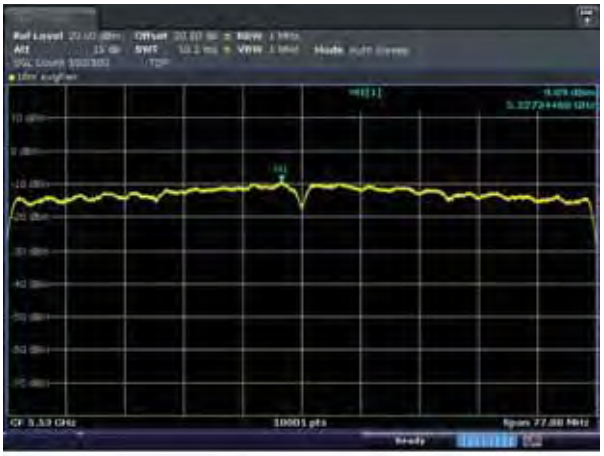
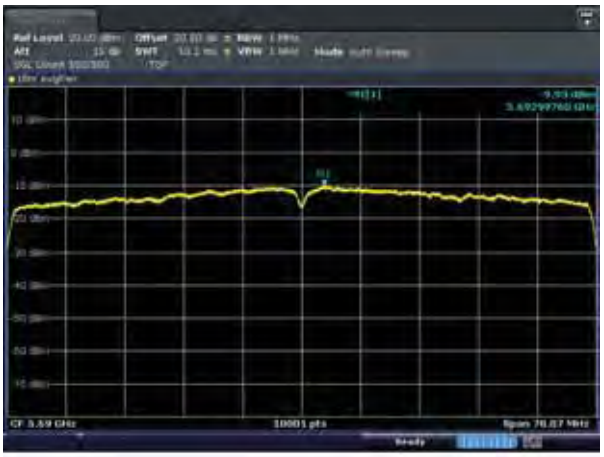
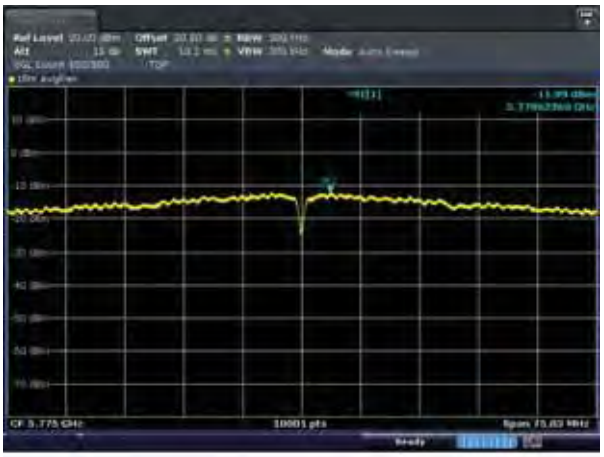
Test mode : 802.11ac_VHT80

5210MHz	5290MHz
	
5530MHz	**5610MHz**
	
5690MHz	**5775MHz**
	

Test mode : 802.11ac_VHT80 MIMO ANT1

5210MHz	5290MHz
	
5530MHz	5610MHz
	
5690MHz	5775MHz
	

Test mode : 802.11ac_VHT80 MIMO ANT2

5210MHz	5290MHz
	
5530MHz	5610MHz
	
5690MHz	5775MHz
	

4.4.4 Emission Bandwidth

4.4.4.1 Regulation

According to §15.407(i) Emission bandwidth. For purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Determination of the emissions bandwidth is based on the use of measurement instrumentation employing a peak detector function with an instrument resolution bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

According to §15.407(e) Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

According to §RSS-GEN 6.7 The occupied bandwidth or the “99% emission bandwidth” is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

In some cases, the “x dB bandwidth” is required, which is defined as the frequency range between two points, one at the lowest frequency below and one at the highest frequency above the carrier frequency, at which the maximum power level of the transmitted emission is attenuated x dB below the maximum in-band power level of the modulated signal, where the two points are on the outskirts of the in-band emission.

4.4.4.2 Measurement Procedure

These test measurement settings are specified in section C of 789033 D02 General UNII Test Procedures.

4.4.4.2.1 Emission Bandwidth (EBW)

a) Set RBW = approximately 1% of the emission bandwidth.
b) Set the VBW > RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

4.4.4.2.2 Minimum Emission Bandwidth for the band 5.725-5.85 GHz

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 kHz for the band 5.725-5.85 GHz. The following procedure shall be used for measuring this bandwidth:
a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3 > RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.
Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

4.4.4.3 Result

Comply (measurement data : refer to the next page)

4.4.4.4 Measurement data

Test mode : 802.11a

Emission Bandwidth(MHz)			
Band	Lowest Frequency	Middle Frequency	Highest Frequency
5150 ~ 5250	19.79	19.61	19.52
5250 ~ 5350	19.58	19.45	19.20
5470 ~ 5725	19.55	19.50	19.69
5725 ~ 5850	15.12	15.12	15.12

NOTE1 : 5 725 ~ 5 825 Band Limit : >500kHz
NOTE2 : Measured on antenna 1.
Measured the worst case. * Refer to 3.4

Test mode : 802.11n_HT20

Emission Bandwidth(MHz)			
Band	Lowest Frequency	Middle Frequency	Highest Frequency
5150 ~ 5250	19.97	19.95	19.93
5250 ~ 5350	20.28	20.00	20.05
5470 ~ 5725	20.09	19.96	19.93
5725 ~ 5850	15.14	15.05	15.12

NOTE1 : 5 725 ~ 5 825 Band Limit : >500kHz
NOTE2 : Measured on antenna 1.
Measured the worst case. * Refer to 3.4

Test mode : 802.11n_HT20 MIMO

Emission Bandwidth(MHz)			
Band	Lowest Frequency	Middle Frequency	Highest Frequency
5150 ~ 5250	19.95	20.05	19.70
5250 ~ 5350	19.85	19.87	19.73
5470 ~ 5725	20.00	19.82	19.83
5725 ~ 5850	15.13	15.13	15.11

NOTE1 : 5 725 ~ 5 825 Band Limit : >500kHz
NOTE2 : Measured on antenna 1.
Measured the worst case. * Refer to 3.4

Test mode : 802.11n_HT40

Emission Bandwidth(MHz)			
Band	Lowest Frequency	Middle Frequency	Highest Frequency
5150 ~ 5250	38.66	-	38.80
5250 ~ 5350	38.73	-	38.83
5470 ~ 5725	38.72	38.76	38.60
5725 ~ 5850	35.13	-	35.11

NOTE1 : 5 725 ~ 5 825 Band Limit : >500kHz
NOTE2 : Measured on antenna 1.
Measured the worst case. * Refer to 3.4

Test mode : 802.11n_HT40 MIMO

Emission Bandwidth(MHz)			
Band	Lowest Frequency	Middle Frequency	Highest Frequency
5150 ~ 5250	38.80	-	38.56
5250 ~ 5350	38.69	-	38.53
5470 ~ 5725	38.89	38.56	38.63
5725 ~ 5850	35.12	-	35.09

NOTE1 : 5 725 ~ 5 825 Band Limit : >500kHz
NOTE2 : Measured on antenna 1.
Measured the worst case. * Refer to 3.4

Test mode : 802.11ac_VHT20

Emission Bandwidth(MHz)			
Band	Lowest Frequency	Middle Frequency	Highest Frequency
5150 ~ 5250	20.15	19.93	19.97
5250 ~ 5350	19.98	19.99	20.10
5470 ~ 5725	20.00	20.21	20.01
5725 ~ 5850	15.12	15.10	15.13

NOTE1 : 5 725 ~ 5 825 Band Limit : >500kHz
NOTE2 : Measured on antenna 1.
Measured the worst case. * Refer to 3.4

Test mode : 802.11ac_VHT20 MIMO

Emission Bandwidth(MHz)			
Band	Lowest Frequency	Middle Frequency	Highest Frequency
5150 ~ 5250	19.75	19.85	19.65
5250 ~ 5350	19.75	19.90	19.70
5470 ~ 5725	19.83	20.00	19.90
5725 ~ 5850	15.09	15.10	15.13

NOTE1 : 5 725 ~ 5 825 Band Limit : >500kHz
NOTE2 : Measured on antenna 1.
Measured the worst case. * Refer to 3.4

Test mode : 802.11ac_VHT40

Emission Bandwidth(MHz)			
Band	Lowest Frequency	Middle Frequency	Highest Frequency
5150 ~ 5250	38.89	-	38.77
5250 ~ 5350	38.76	-	38.76
5470 ~ 5725	38.51	38.77	38.88
5725 ~ 5850	35.13	-	35.09

NOTE1 : 5 725 ~ 5 825 Band Limit : >500kHz
NOTE2 : Measured on antenna 1.
Measured the worst case. * Refer to 3.4

Test mode : 802.11ac_VHT40 MIMO

Emission Bandwidth(MHz)			
Band	Lowest Frequency	Middle Frequency	Highest Frequency
5150 ~ 5250	38.65	-	38.80
5250 ~ 5350	38.79	-	38.63
5470 ~ 5725	38.84	38.77	38.84
5725 ~ 5850	35.09	-	35.11

NOTE1 : 5 725 ~ 5 825 Band Limit : >500kHz
NOTE2 : Measured on antenna 1.
Measured the worst case. * Refer to 3.4

Test mode : 802.11ac_VHT80

Emission Bandwidth(MHz)			
Band	Lowest Frequency	Middle Frequency	Highest Frequency
5150 ~ 5250	78.06	-	-
5250 ~ 5350	78.04	-	-
5470 ~ 5725	78.25	78.87	78.33
5725 ~ 5850	75.03	-	-

NOTE1 : 5 725 ~ 5 825 Band Limit : >500kHz
NOTE2 : Measured on antenna 1.
Measured the worst case. * Refer to 3.4

Test mode : 802.11ac_VHT80 MIMO

Emission Bandwidth(MHz)			
Band	Lowest Frequency	Middle Frequency	Highest Frequency
5150 ~ 5250	77.91	-	-
5250 ~ 5350	78.17	-	-
5470 ~ 5725	77.88	78.06	78.07
5725 ~ 5850	75.03	-	-

NOTE1 : 5 725 ~ 5 825 Band Limit : >500kHz
NOTE2 : Measured on antenna 1.
Measured the worst case. * Refer to 3.4

Test mode : 802.11a

99% Occupied Bandwidth(MHz)			
Band	Lowest Frequency	Middle Frequency	Highest Frequency
5150 ~ 5250	16.43	16.45	16.49
5250 ~ 5350	16.44	16.35	16.52
5470 ~ 5725	16.41	16.51	16.49
5725 ~ 5850	16.35	16.33	16.34

Test mode : 802.11n_HT20

99% Occupied Bandwidth(MHz)			
Band	Lowest Frequency	Middle Frequency	Highest Frequency
5150 ~ 5250	17.55	17.55	17.56
5250 ~ 5350	17.52	17.53	17.54
5470 ~ 5725	17.55	17.52	17.55
5725 ~ 5850	17.52	17.51	17.52

Test mode : 802.11n_HT20 MIMO

99% Occupied Bandwidth(MHz)			
Band	Lowest Frequency	Middle Frequency	Highest Frequency
5150 ~ 5250	17.56	17.52	17.52
5250 ~ 5350	17.51	17.59	17.53
5470 ~ 5725	17.56	17.49	17.52
5725 ~ 5850	17.53	17.54	17.52

Test mode : 802.11n_HT40

99% Occupied Bandwidth(MHz)			
Band	Lowest Frequency	Middle Frequency	Highest Frequency
5150 ~ 5250	35.83	-	35.82
5250 ~ 5350	35.81	-	35.81
5470 ~ 5725	35.81	35.81	35.81
5725 ~ 5850	35.84	-	35.83

Test mode : 802.11n_HT40 MIMO

99% Occupied Bandwidth(MHz)			
Band	Lowest Frequency	Middle Frequency	Highest Frequency
5150 ~ 5250	35.84	-	35.84
5250 ~ 5350	35.85	-	35.84
5470 ~ 5725	35.84	35.84	35.84
5725 ~ 5850	35.84	-	35.84

Test mode : 802.11ac_VHT20

99% Occupied Bandwidth(MHz)			
Band	Lowest Frequency	Middle Frequency	Highest Frequency
5150 ~ 5250	17.53	17.57	17.57
5250 ~ 5350	17.54	17.56	17.57
5470 ~ 5725	17.55	17.57	17.54
5725 ~ 5850	17.51	17.51	17.50

Test mode : 802.11ac_VHT20 MIMO

99% Occupied Bandwidth(MHz)			
Band	Lowest Frequency	Middle Frequency	Highest Frequency
5150 ~ 5250	17.54	17.51	17.49
5250 ~ 5350	17.50	17.53	17.51
5470 ~ 5725	17.57	17.50	17.53
5725 ~ 5850	17.53	17.53	17.52

Test mode : 802.11ac_VHT40

99% Occupied Bandwidth(MHz)			
Band	Lowest Frequency	Middle Frequency	Highest Frequency
5150 ~ 5250	35.81	-	35.83
5250 ~ 5350	35.81	-	35.80
5470 ~ 5725	35.83	35.81	35.81
5725 ~ 5850	35.83	-	35.82

Test mode : 802.11ac_VHT40 MIMO

99% Occupied Bandwidth(MHz)			
Band	Lowest Frequency	Middle Frequency	Highest Frequency
5150 ~ 5250	35.84	-	35.84
5250 ~ 5350	35.82	-	35.82
5470 ~ 5725	35.83	35.84	35.84
5725 ~ 5850	35.81	-	35.81

Test mode : 802.11ac_VHT80

99% Occupied Bandwidth(MHz)			
Band	Lowest Frequency	Middle Frequency	Highest Frequency
5150 ~ 5250	-	75.06	-
5250 ~ 5350	-	74.99	-
5470 ~ 5725	75.05	75.06	75.13
5725 ~ 5850	-	74.89	-

Test mode : 802.11ac_VHT80 MIMO

99% Occupied Bandwidth(MHz)			
Band	Lowest Frequency	Middle Frequency	Highest Frequency
5150 ~ 5250	-	75.02	-
5250 ~ 5350	-	75.02	-
5470 ~ 5725	75.00	74.87	74.95
5725 ~ 5850	-	74.91	-

4.4.4.5 Test Plot_Emission Bandwidth

Test mode : 802.11a

5180MHz	5200MHz
	
5240MHz	5260MHz
	
5280MHz	5320MHz
	

Test mode : 802.11a

5500MHz	5600MHz
	
5700MHz	5745MHz
	
5785MHz	5805MHz
	

Test mode : 802.11n_HT20

5180MHz	5200MHz
	
5240MHz	5260MHz
	
5280MHz	5320MHz
	

Test mode : 802.11n_HT20

5500MHz	5600MHz
	
5700MHz	5745MHz
	
5785MHz	5805MHz
	

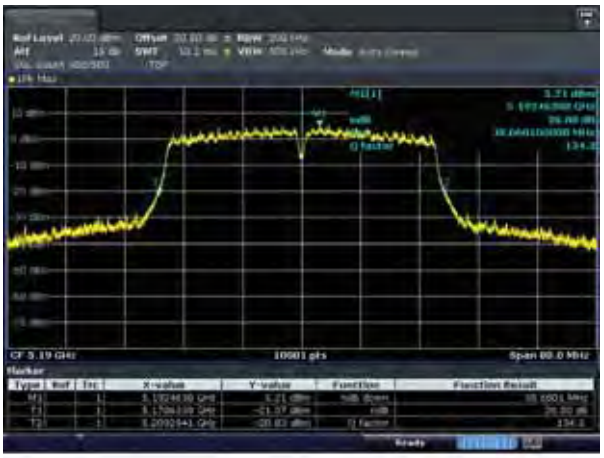
Test mode : 802.11n_HT20 MIMO

5180MHz	5200MHz
	
5240MHz	5260MHz
	
5280MHz	5320MHz
	

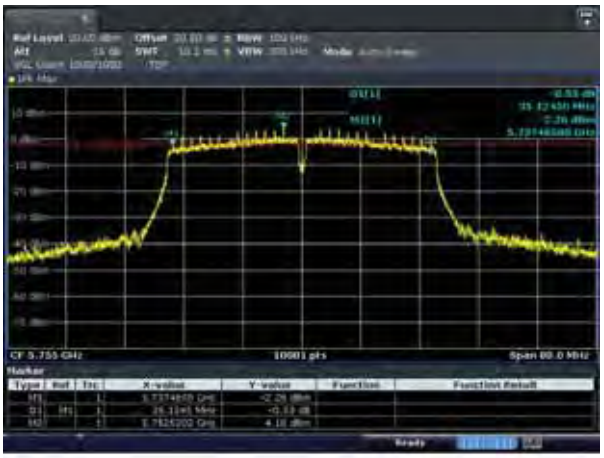
Test mode : 802.11n_HT20 MIMO ANT1

5500MHz	5600MHz
	
5700MHz	5745MHz
	
5785MHz	5805MHz
	

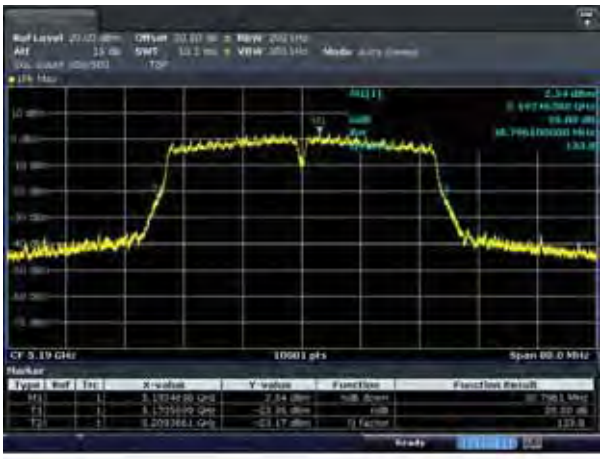
Test mode : 802.11n_HT40

5190MHz	5230MHz
	
5270MHz	5310MHz
	
5510MHz	5590MHz
	

Test mode : 802.11n_HT40

5670MHz	5755MHz
	
5795MHz	
	

Test mode : 802.11n_HT40 MIMO

5190MHz	5230MHz
	
5270MHz	5310MHz
	
5510MHz	5590MHz
	

Test mode : 802.11n_HT40 MIMO ANT1

5670MHz	5755MHz
	
5795MHz	
	

Test mode : 802.11ac_VHT20

5180MHz	5200MHz
	
5240MHz	5260MHz
	
5280MHz	5320MHz
	

Test mode : 802.11ac_VHT20

5500MHz	5600MHz
	
5700MHz	5745MHz
	
5785MHz	5805MHz
	

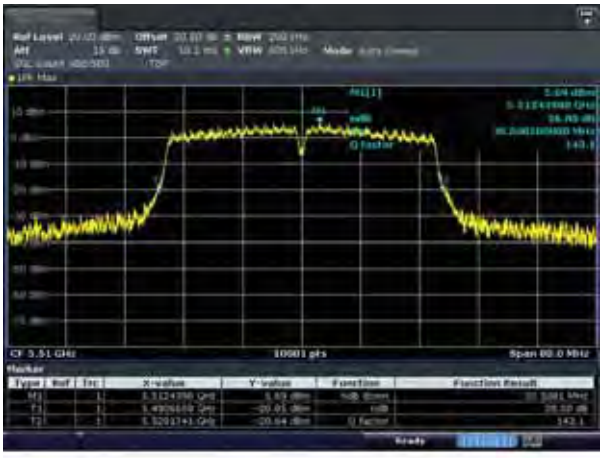
Test mode : 802.11ac_VHT20 MIMO

5180MHz	5200MHz
	
5240MHz	5260MHz
	
5280MHz	5320MHz
	

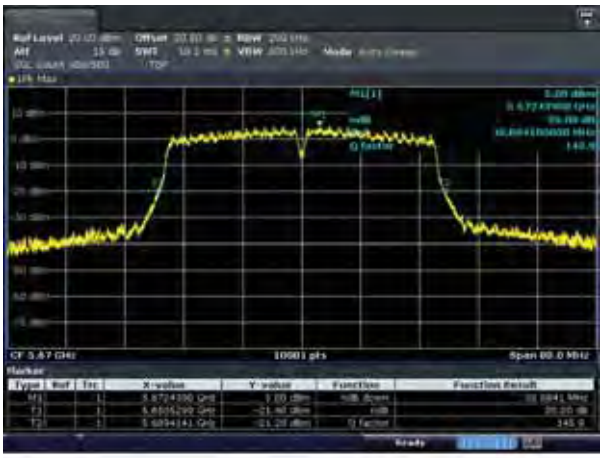
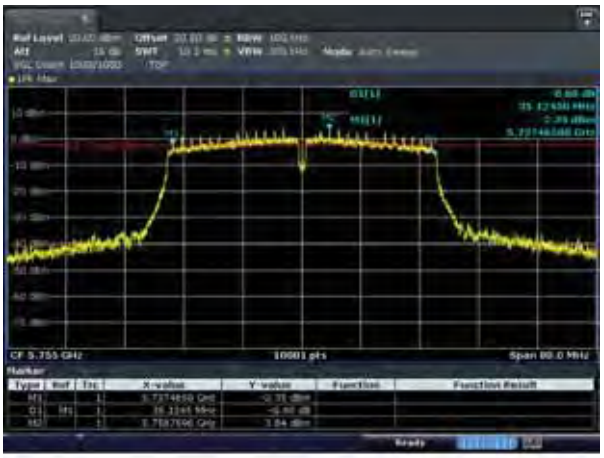
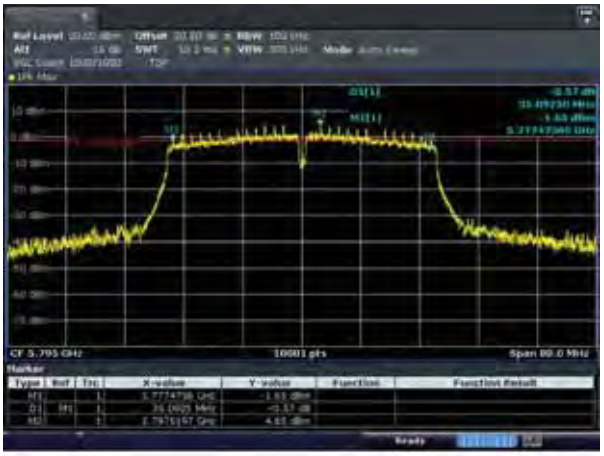
Test mode : 802.11ac_VHT20 MIMO ANT1

5500MHz	5600MHz
	
5700MHz	5745MHz
	
5785MHz	5805MHz
	

Test mode : 802.11ac_VHT40

5190MHz	5230MHz
	
5270MHz	5310MHz
	
5510MHz	5590MHz
	

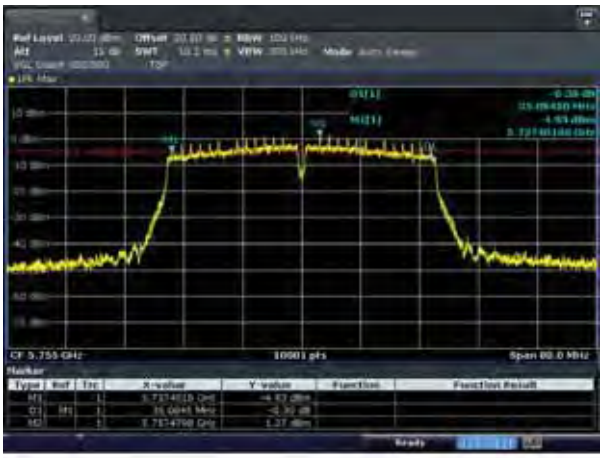
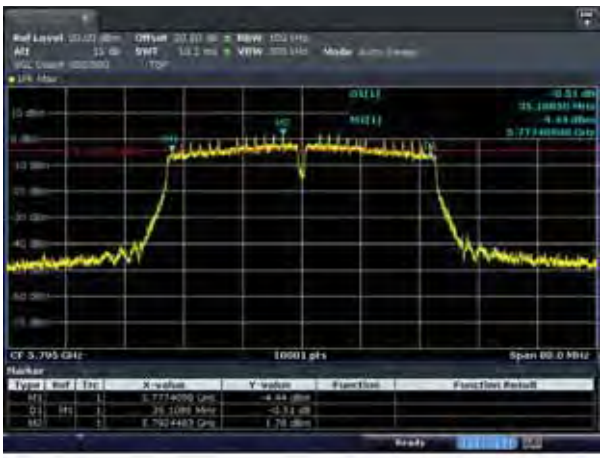
Test mode : 802.11ac_VHT40

5670MHz	5755MHz
	
5795MHz	
	

Test mode : 802.11ac_VHT40 MIMO

5190MHz	5230MHz
	
5270MHz	5310MHz
	
5510MHz	5590MHz
	

Test mode : 802.11ac_VHT40 MIMO ANT1

5670MHz	5755MHz
	
5795MHz	
	

Test mode : 802.11ac_VHT80

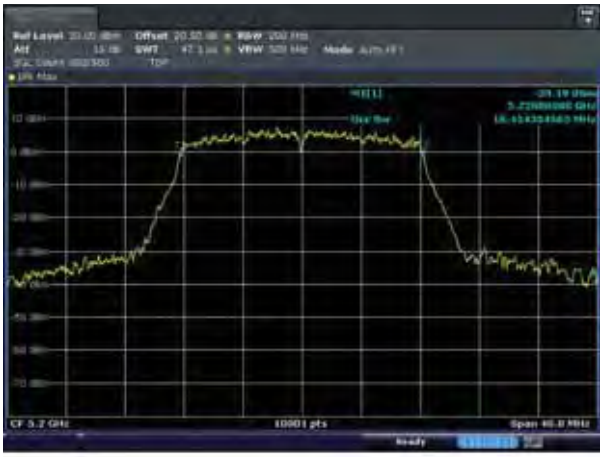
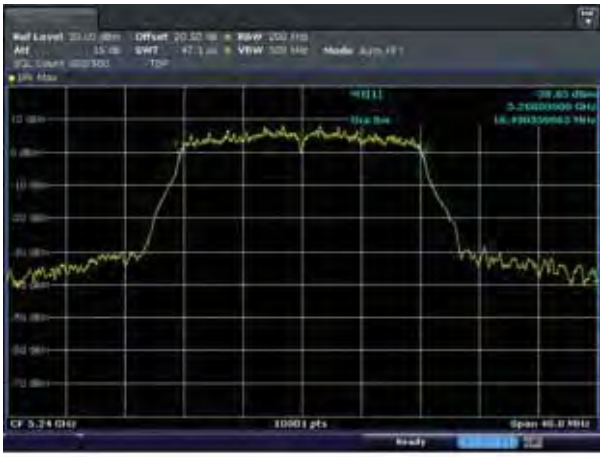
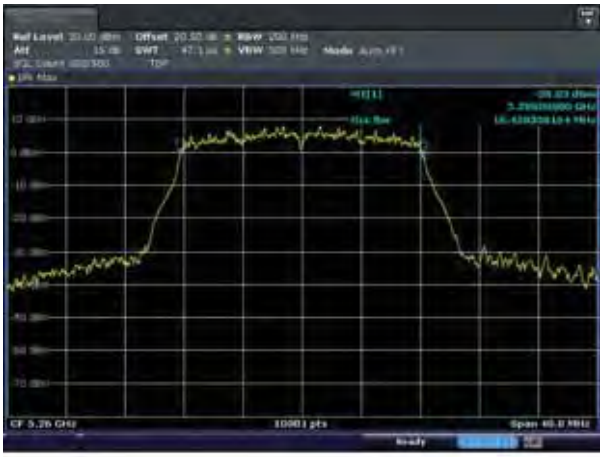
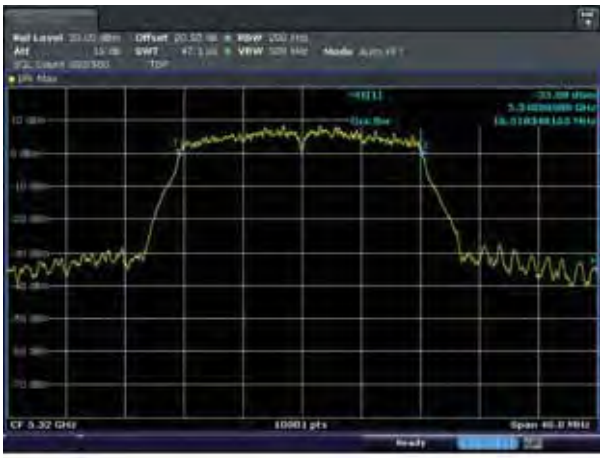
5210MHz	5290MHz
	
5530MHz	5610MHz
	
5690MHz	5775MHz
	

Test mode : 802.11ac_VHT80 MIMO ANT1

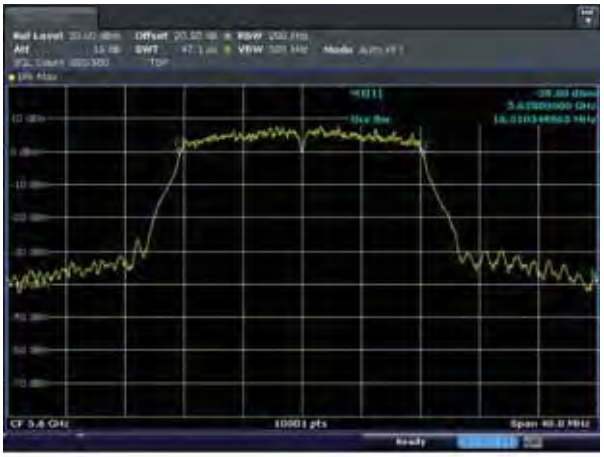
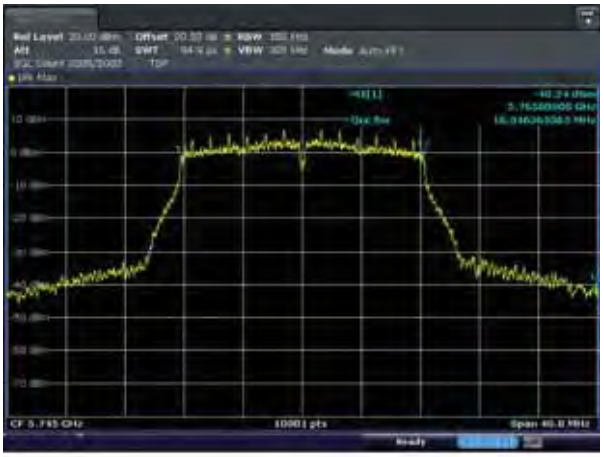
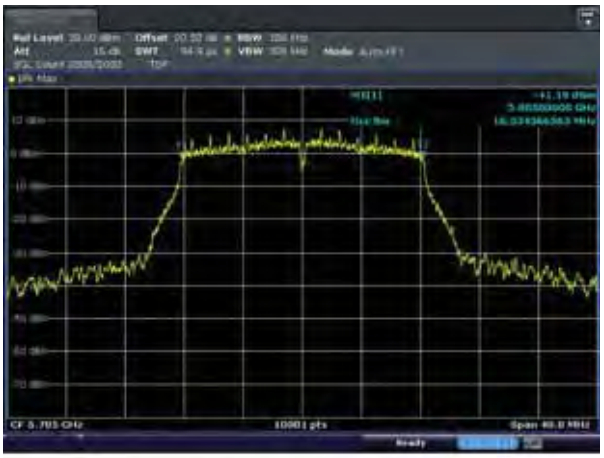
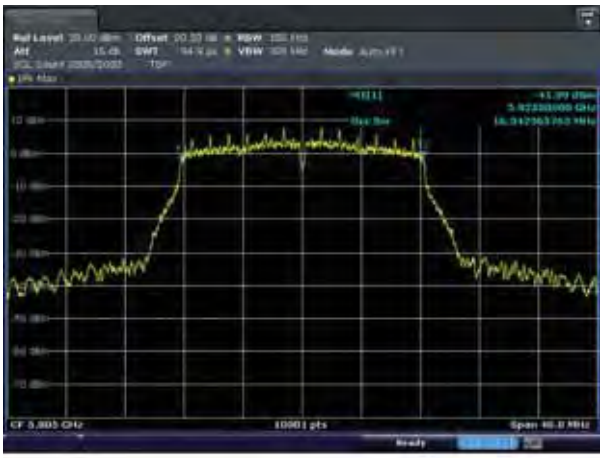
5210MHz	5290MHz
	
5530MHz	**5610MHz**
	
5690MHz	**5775MHz**
	

4.4.4.6 Test Plot_99% Occupied Bandwidth

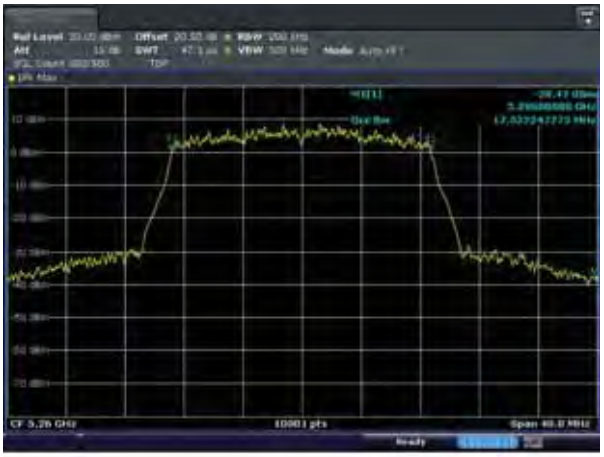
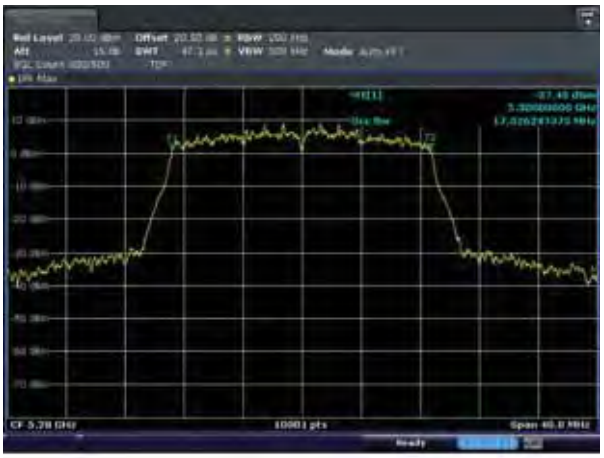
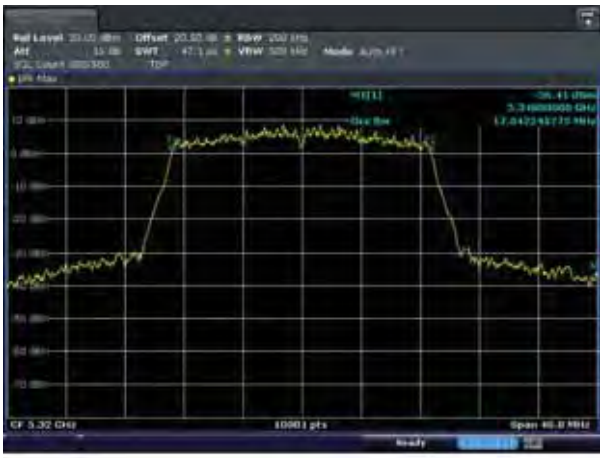
Test mode : 802.11a

5180MHz	5200MHz
	
5240MHz	5260MHz
	
5280MHz	5320MHz
	

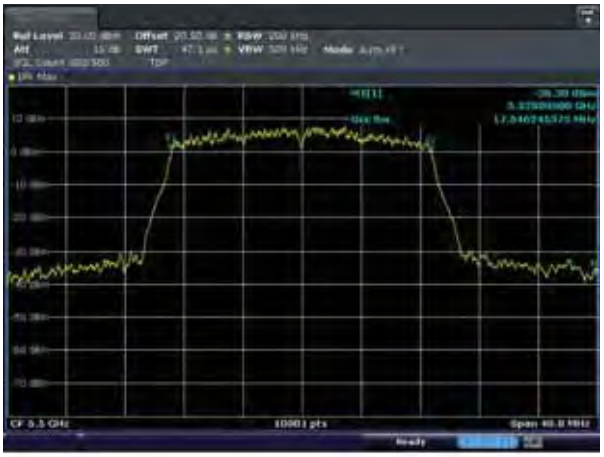
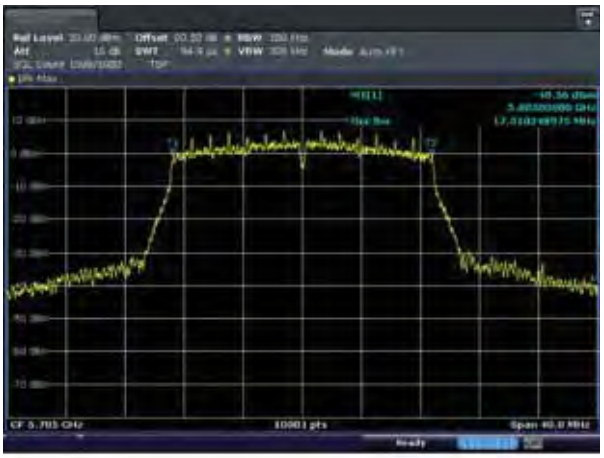
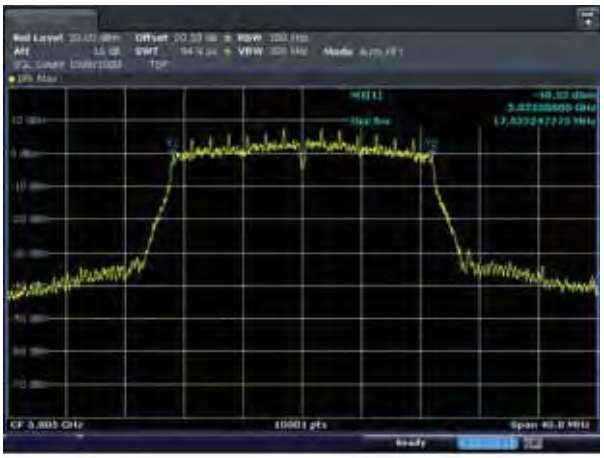
Test mode : 802.11a

5500MHz	5600MHz
	
5700MHz	5745MHz
	
5785MHz	5805MHz
	

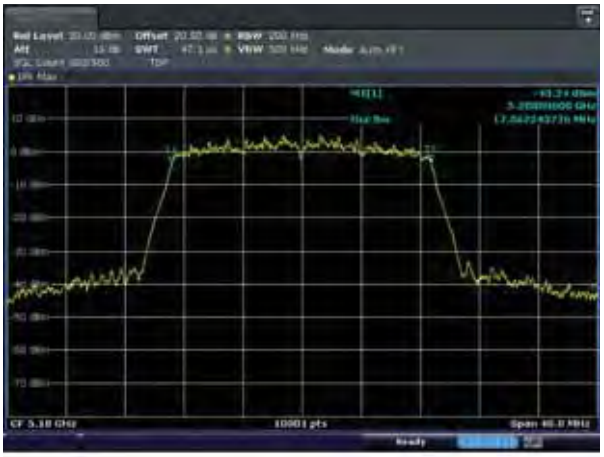
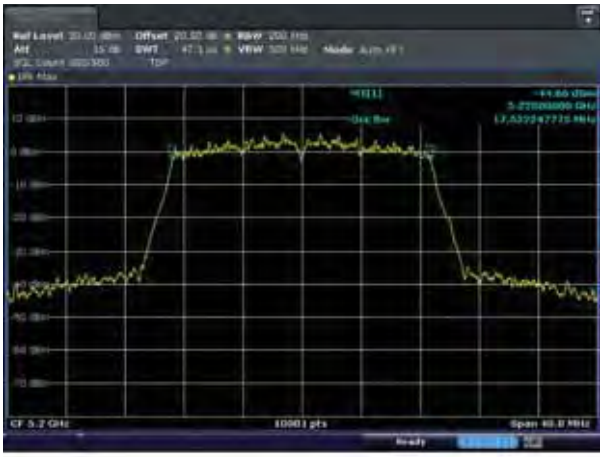
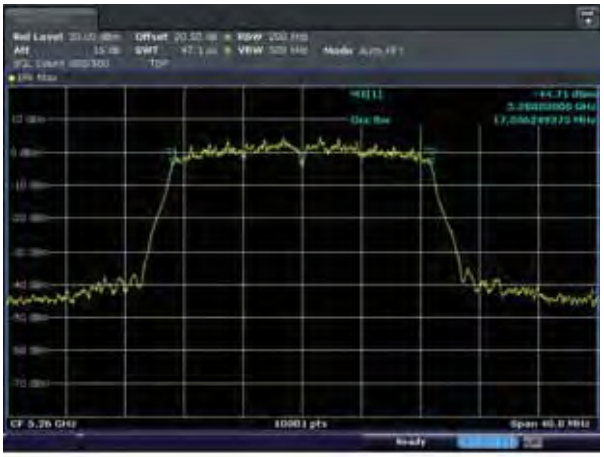
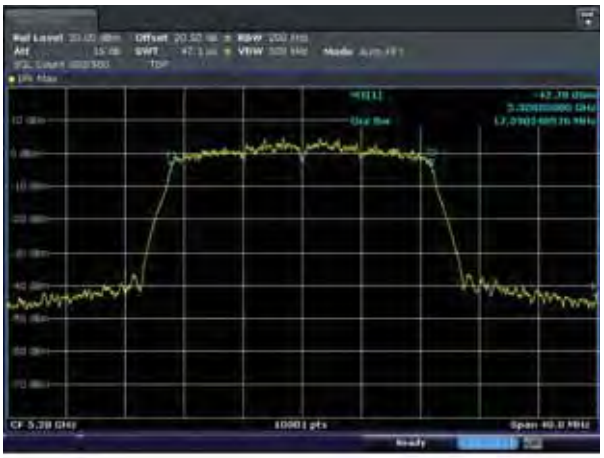
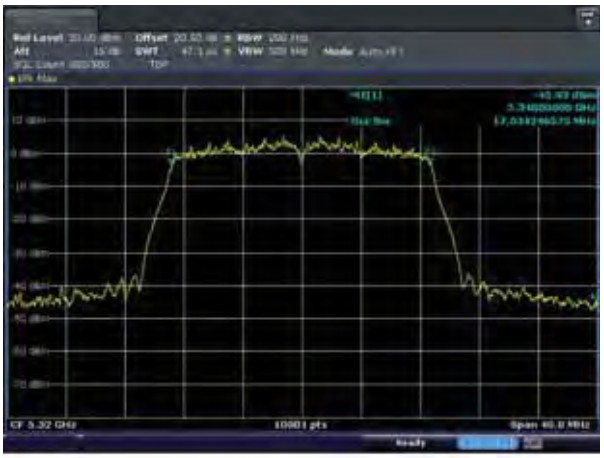
Test mode : 802.11n_HT20

5180MHz	5200MHz
	
5240MHz	5260MHz
	
5280MHz	5320MHz
	

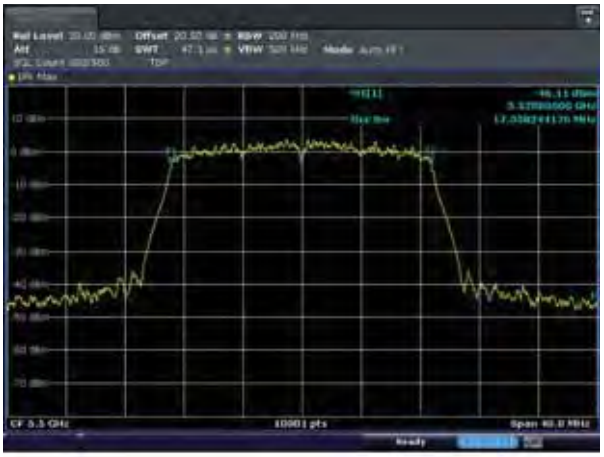
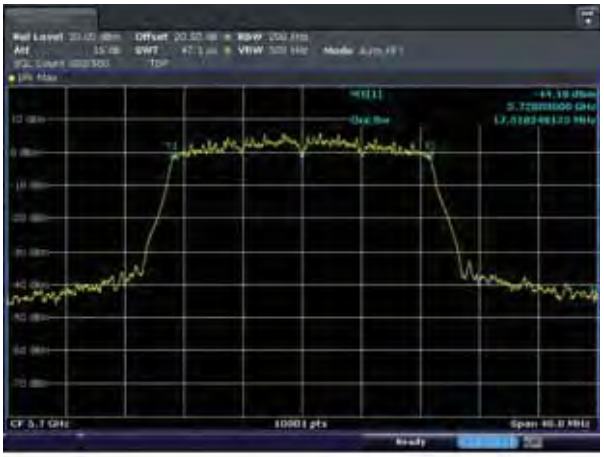
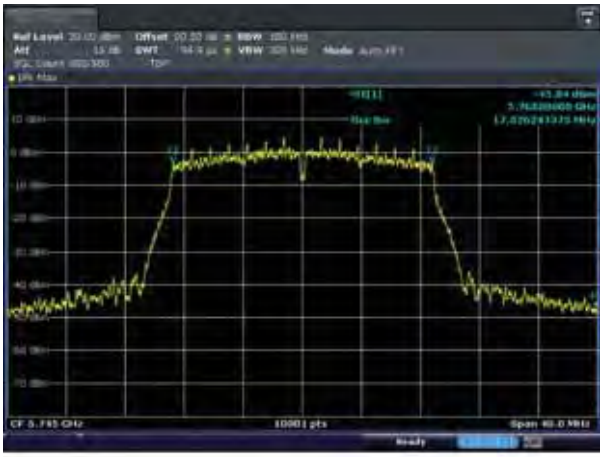
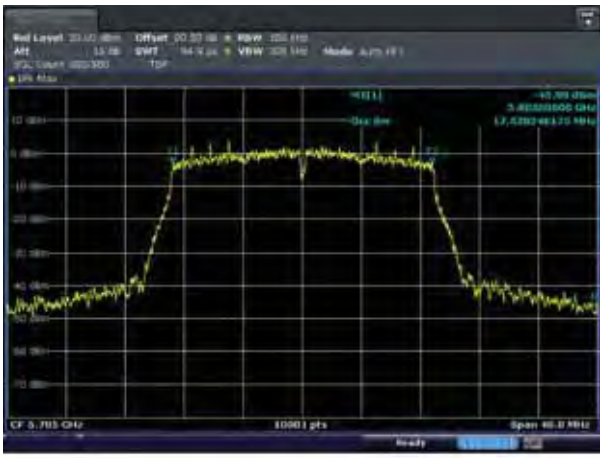
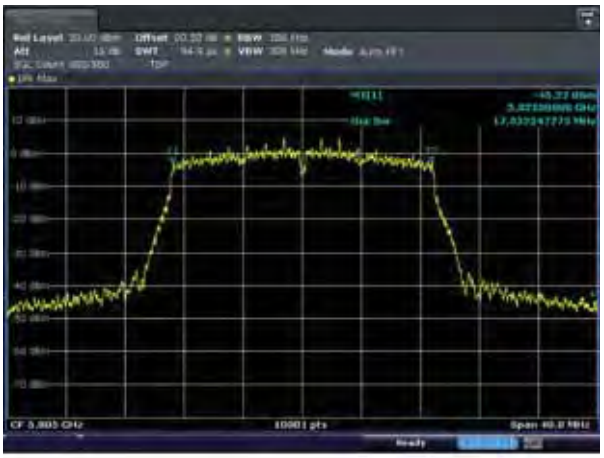
Test mode : 802.11n_HT20

5500MHz	5600MHz
	
5700MHz	5745MHz
	
5785MHz	5805MHz
	

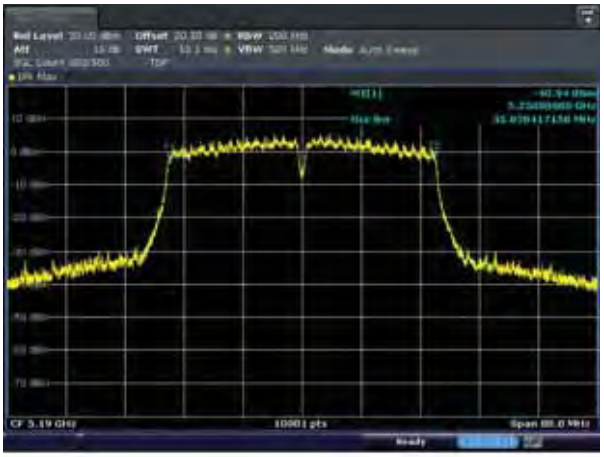
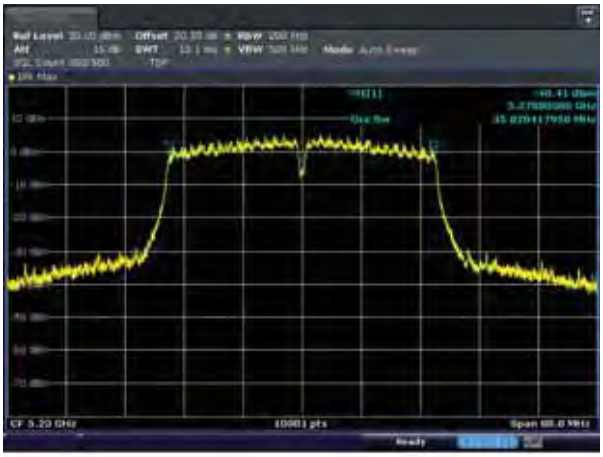
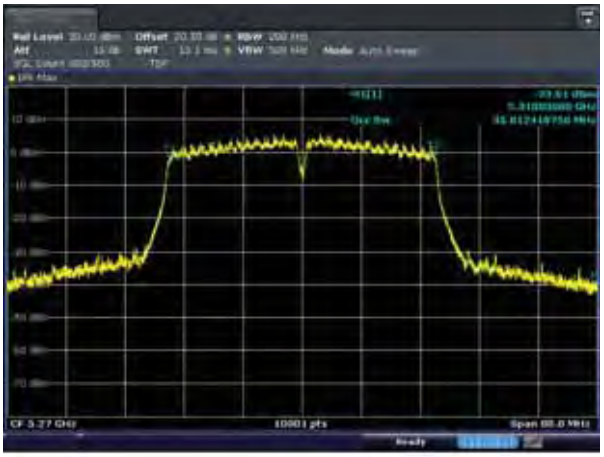
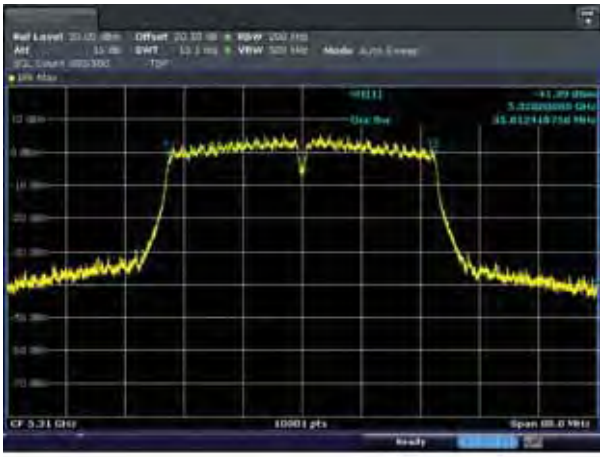
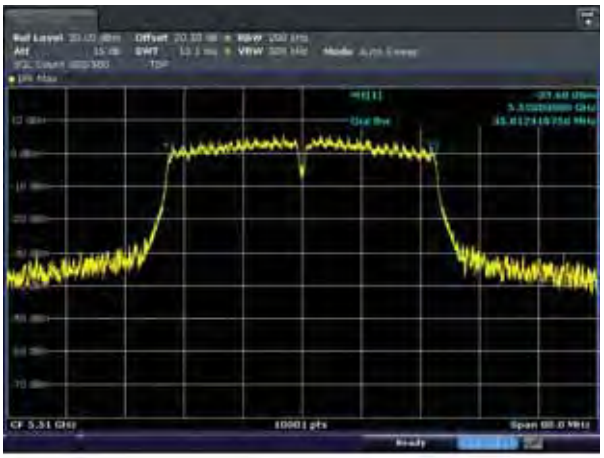
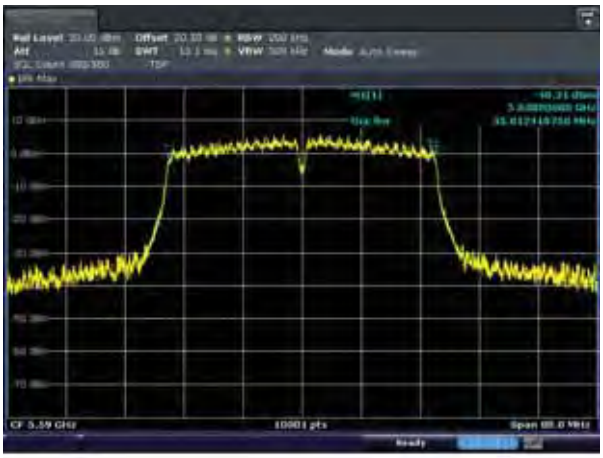
Test mode : 802.11n_HT20 MIMO

5180MHz	5200MHz
	
5240MHz	5260MHz
	
5280MHz	5320MHz
	

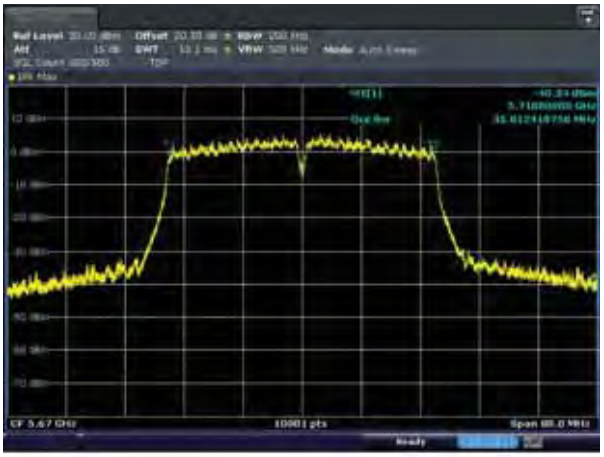
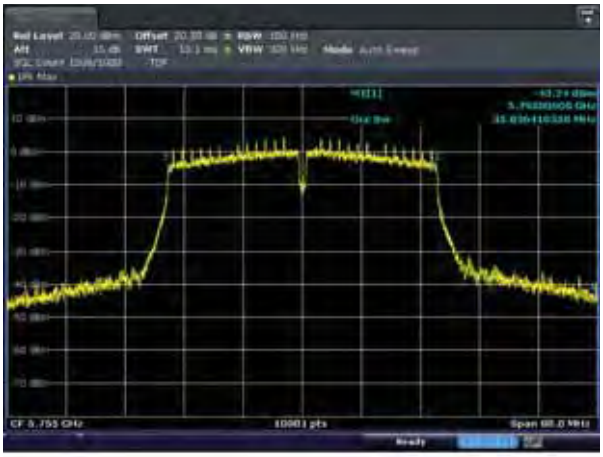
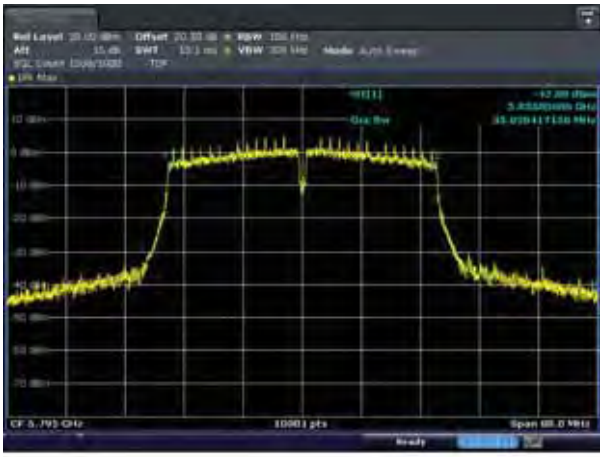
Test mode : 802.11n_HT20 MIMO ANT1

5500MHz	5600MHz
	
5700MHz	5745MHz
	
5785MHz	5805MHz
	

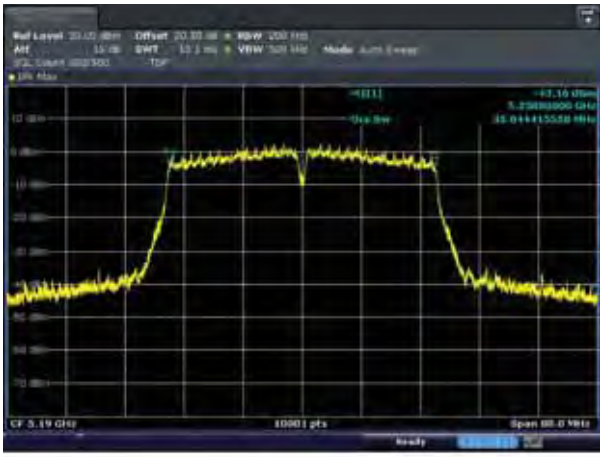
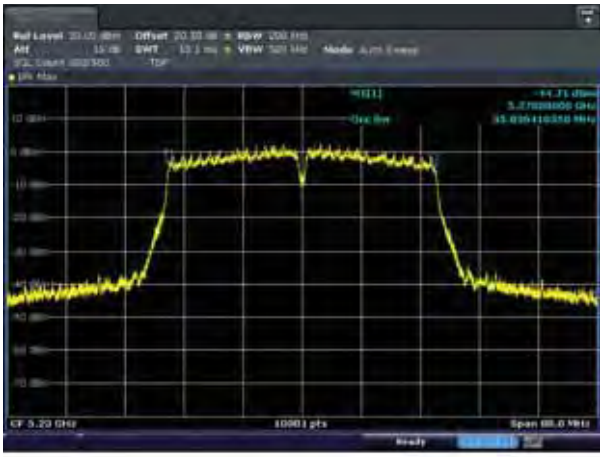
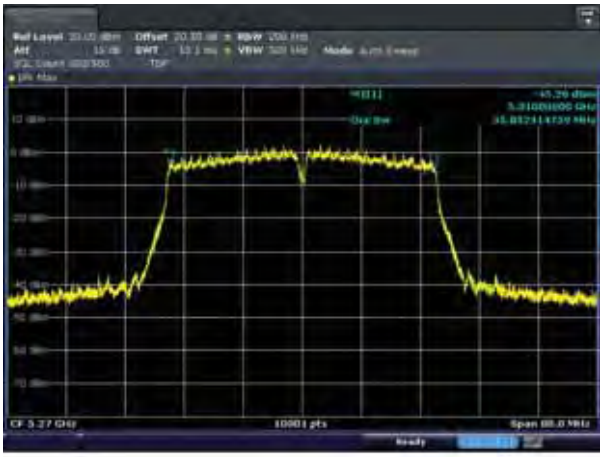
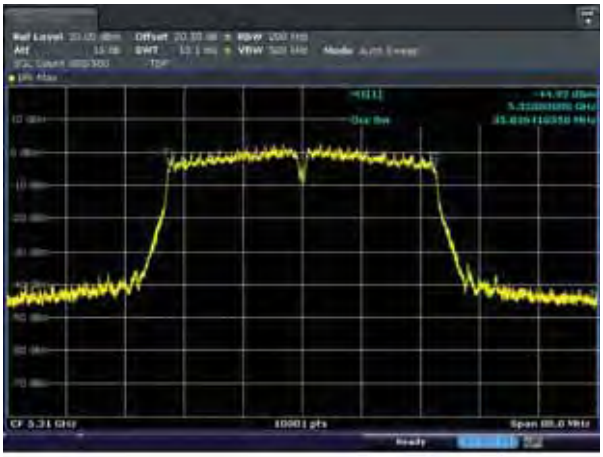
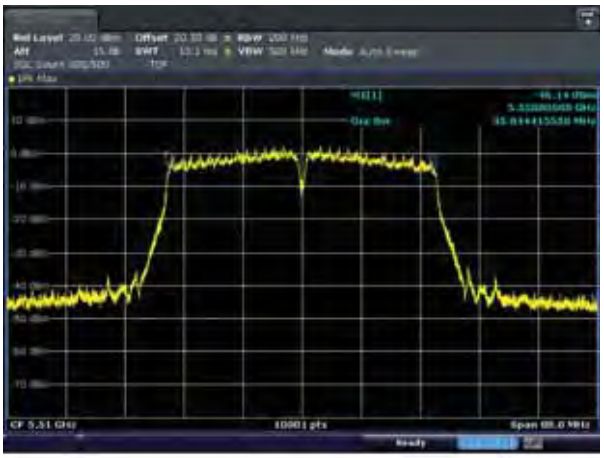
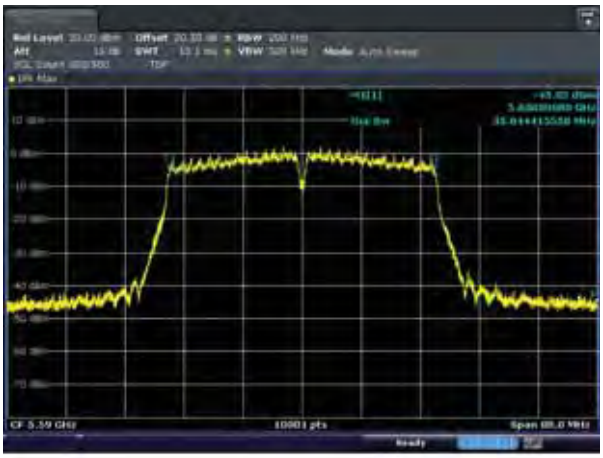
Test mode : 802.11n_HT40

5190MHz	5230MHz
	
5270MHz	5310MHz
	
5510MHz	5590MHz
	

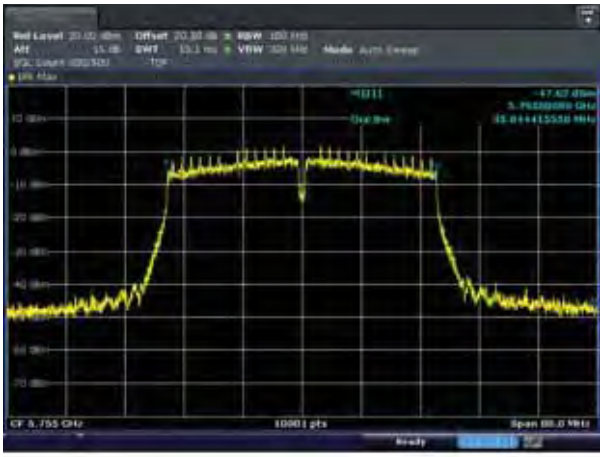
Test mode : 802.11n_HT40

5670MHz	5755MHz
	
5795MHz	
	

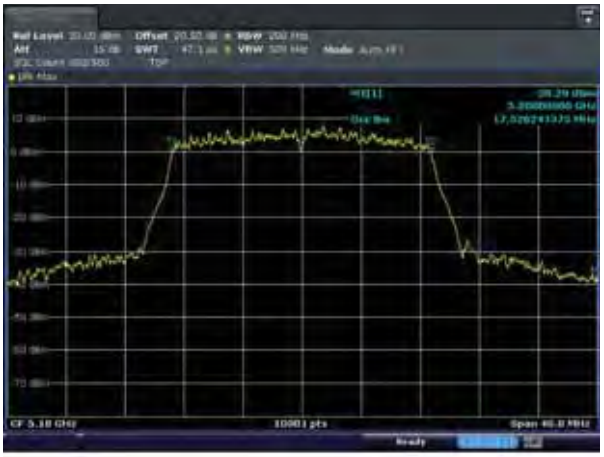
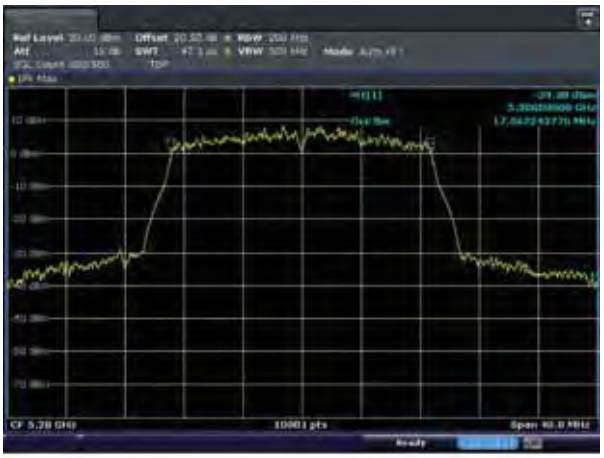
Test mode : 802.11n_HT40 MIMO

5190MHz	5230MHz
	
5270MHz	5310MHz
	
5510MHz	5590MHz
	

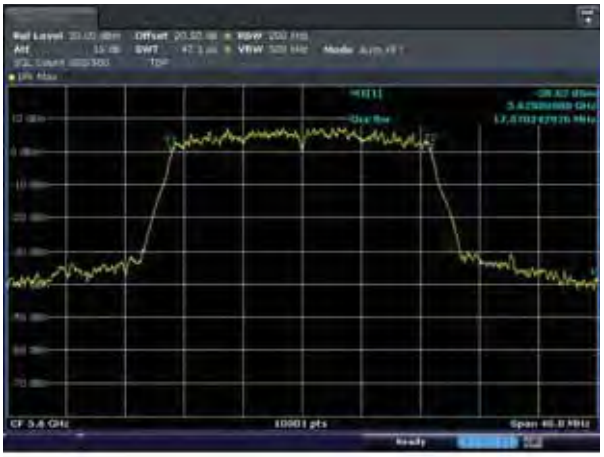
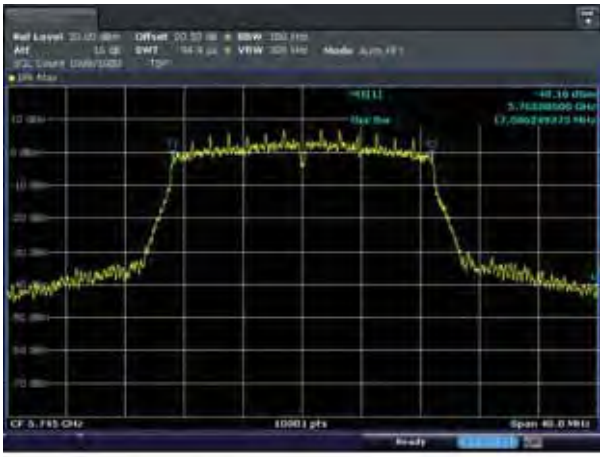
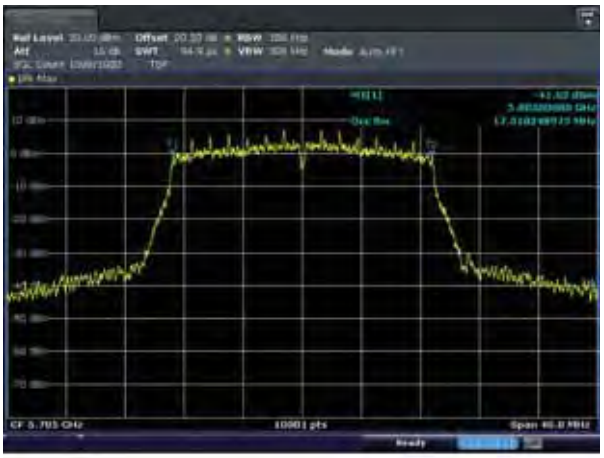
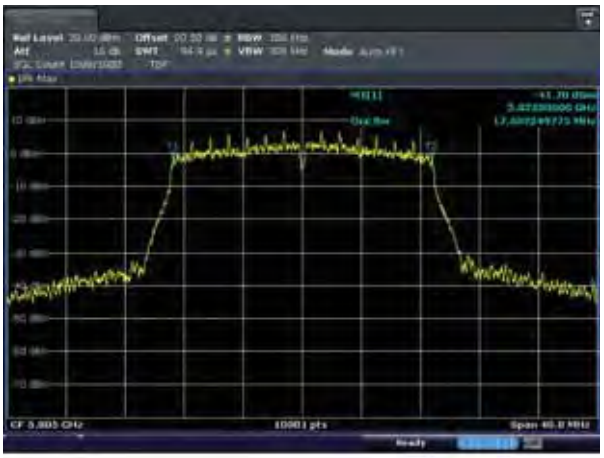
Test mode : 802.11n_HT40 MIMO ANT1

5670MHz	5755MHz
	
5795MHz	
	

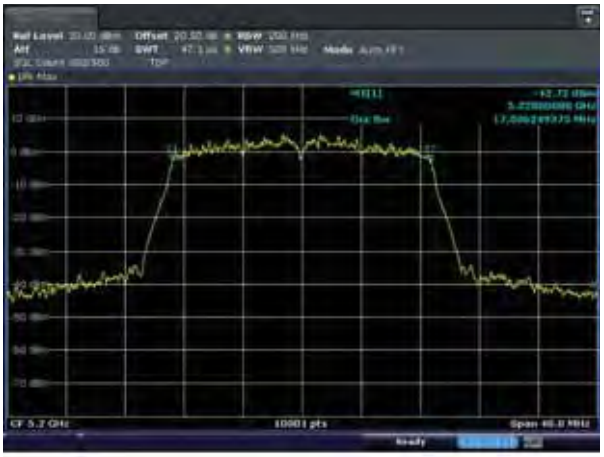
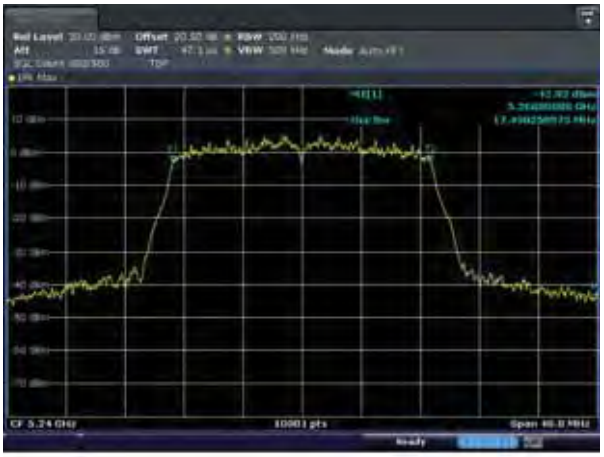
Test mode : 802.11ac_VHT20

5180MHz	5200MHz
	
5240MHz	**5260MHz**
	
5280MHz	**5320MHz**
	

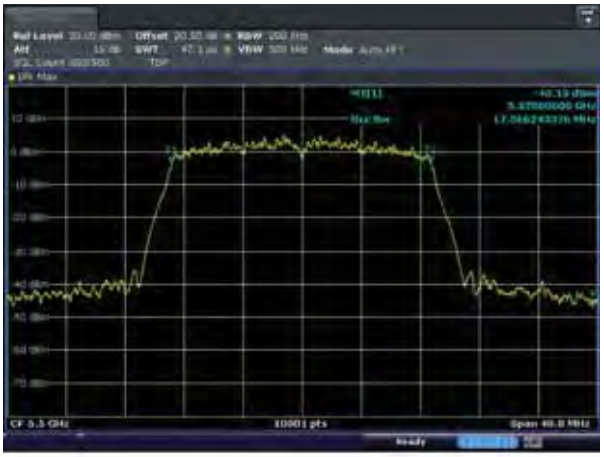
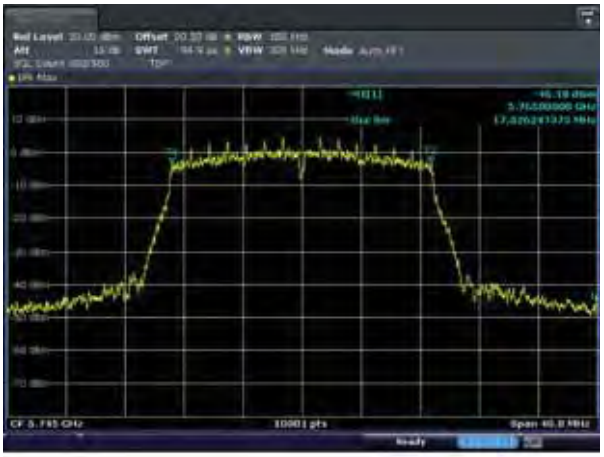
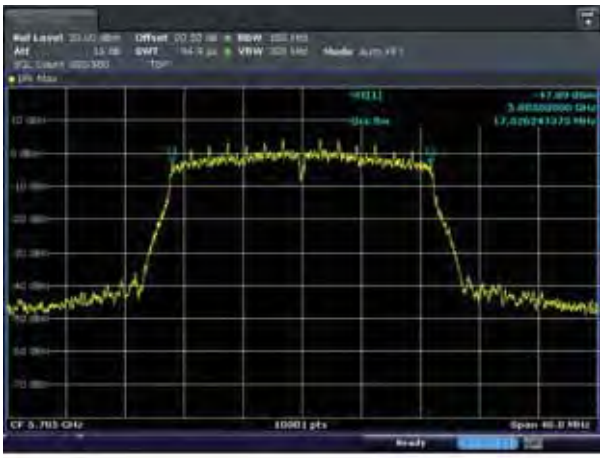
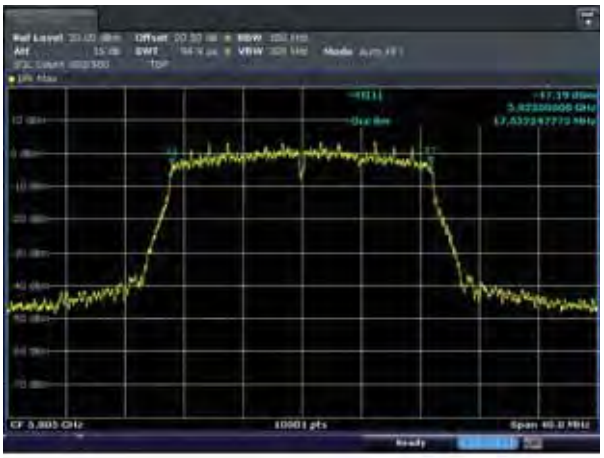
Test mode : 802.11ac_VHT20

5500MHz	5600MHz
	
5700MHz	**5745MHz**
	
5785MHz	**5805MHz**
	

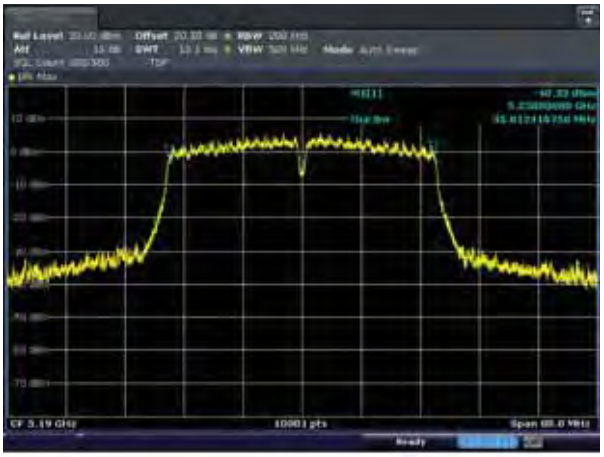
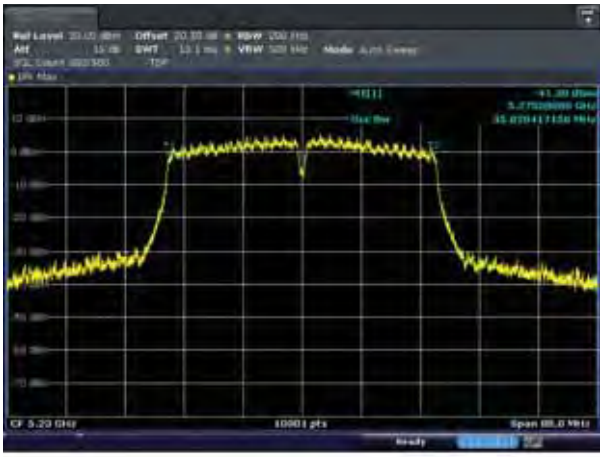
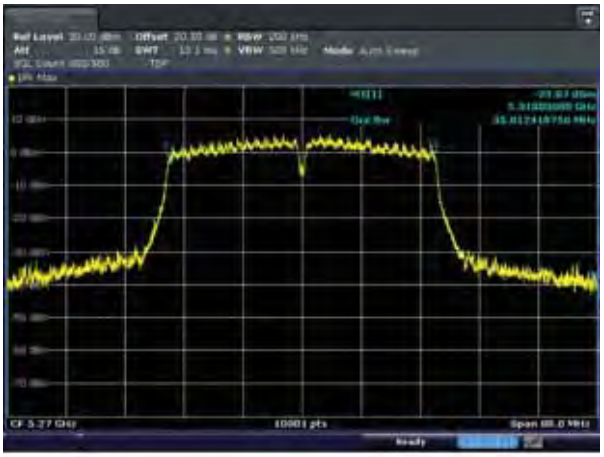
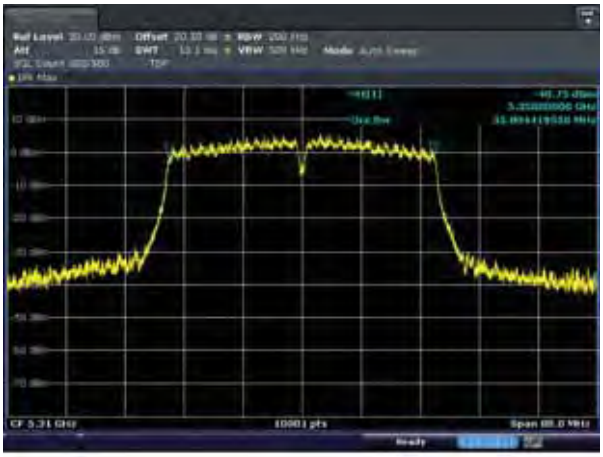
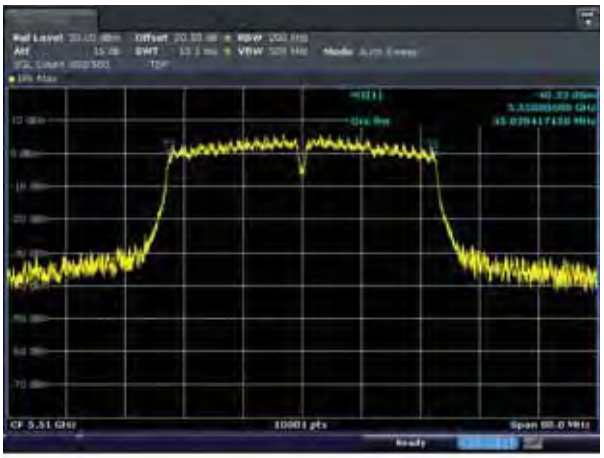
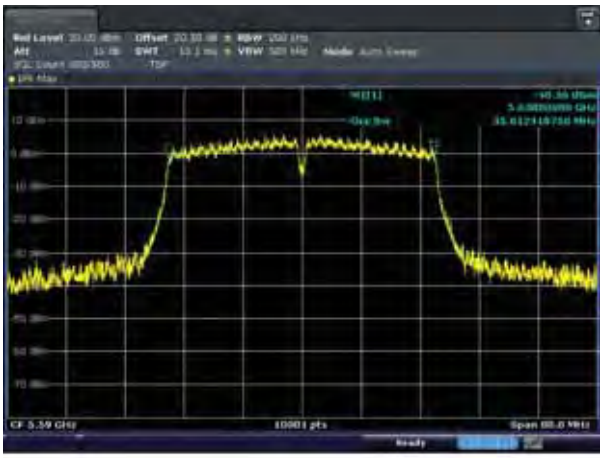
Test mode : 802.11ac_VHT20 MIMO

5180MHz	5200MHz
	
5240MHz	5260MHz
	
5280MHz	5320MHz
	

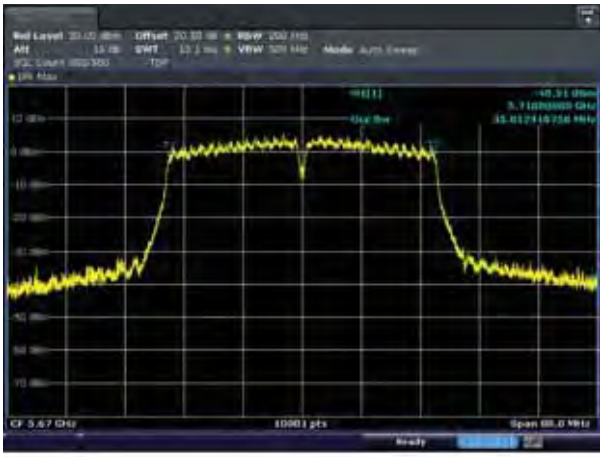
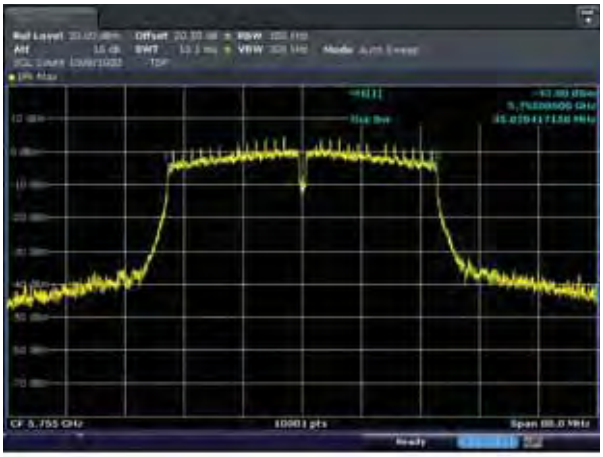
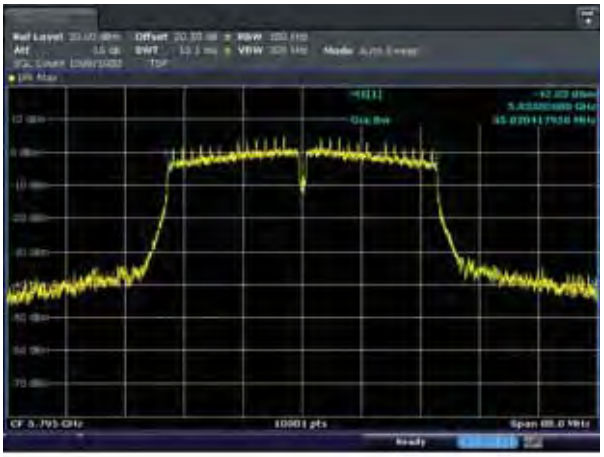
Test mode : 802.11ac_VHT20 MIMO ANT1

5500MHz	5600MHz
	
5700MHz	5745MHz
	
5785MHz	5805MHz
	

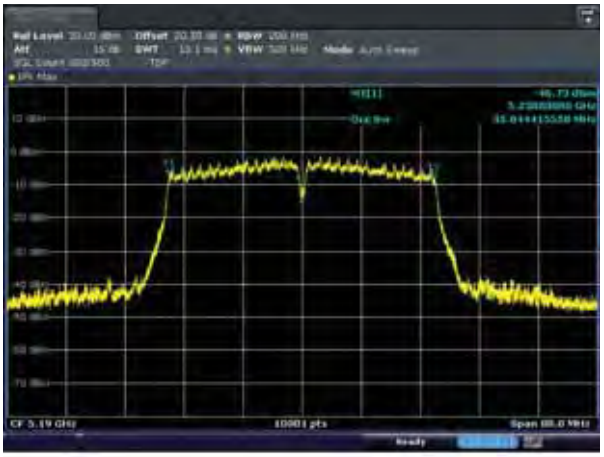
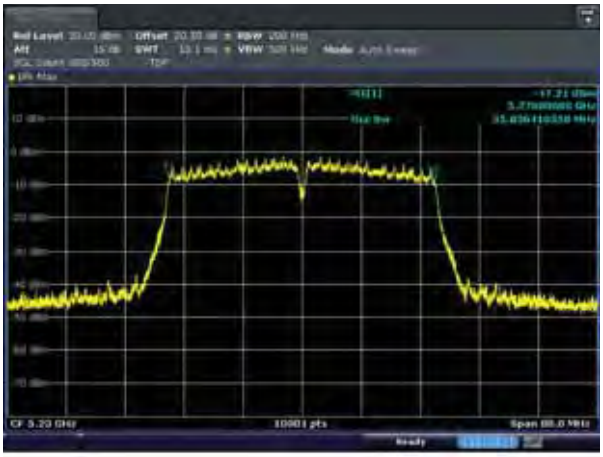
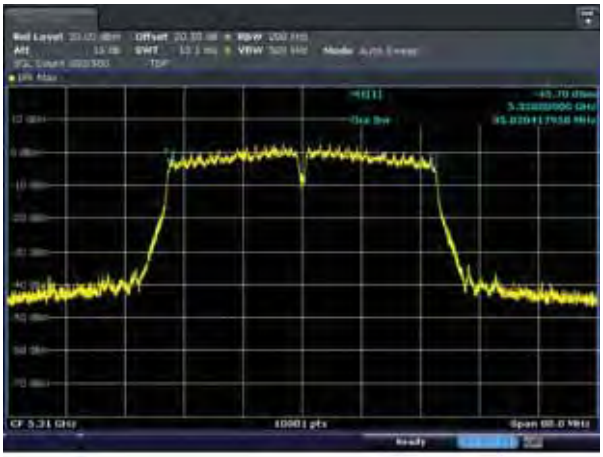
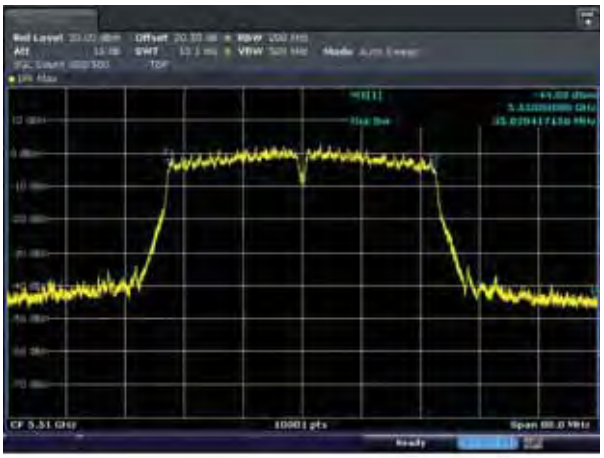
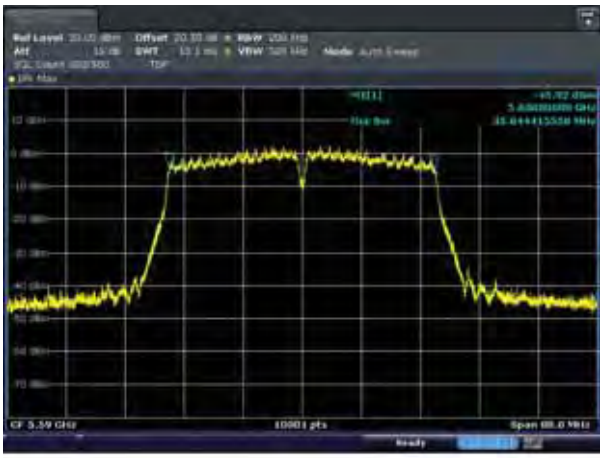
Test mode : 802.11ac_VHT40

5190MHz	5230MHz
	
5270MHz	5310MHz
	
5510MHz	5590MHz
	

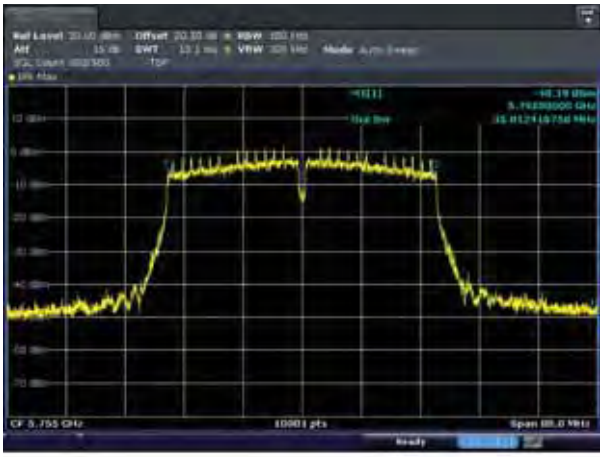
Test mode : 802.11ac_VHT40

5670MHz	5755MHz
	
5795MHz	
	

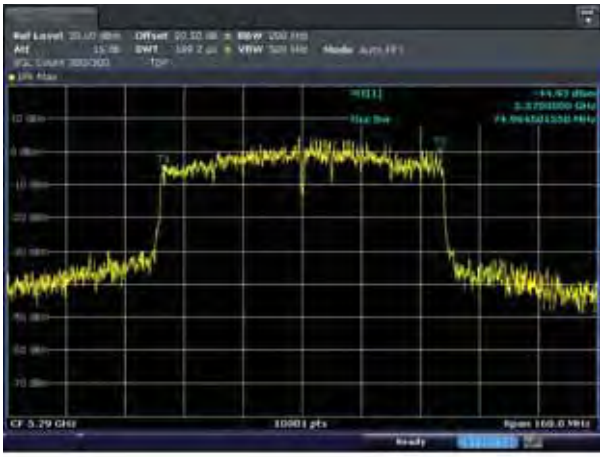
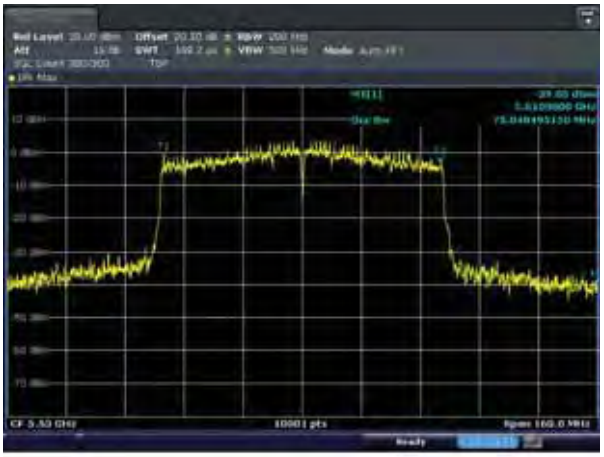
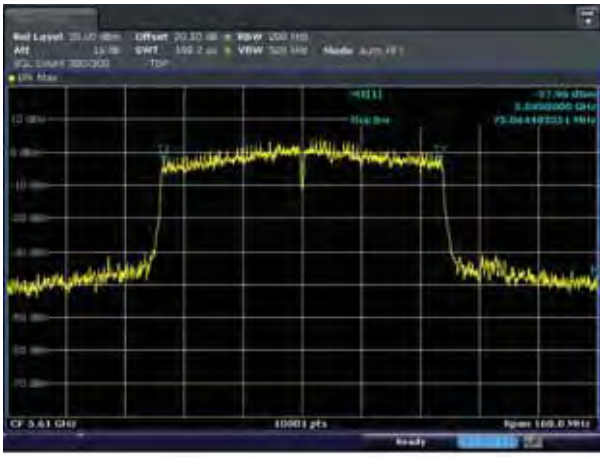
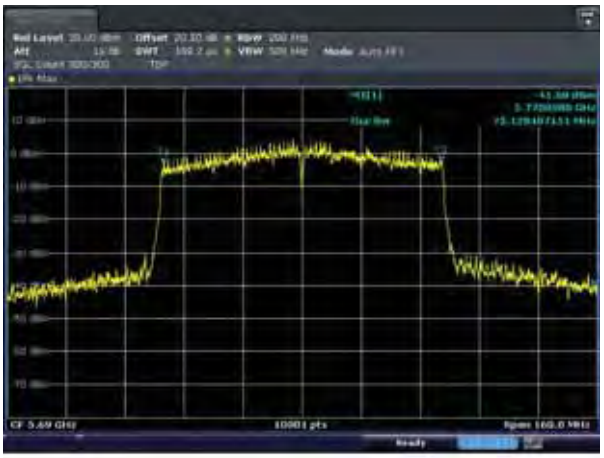
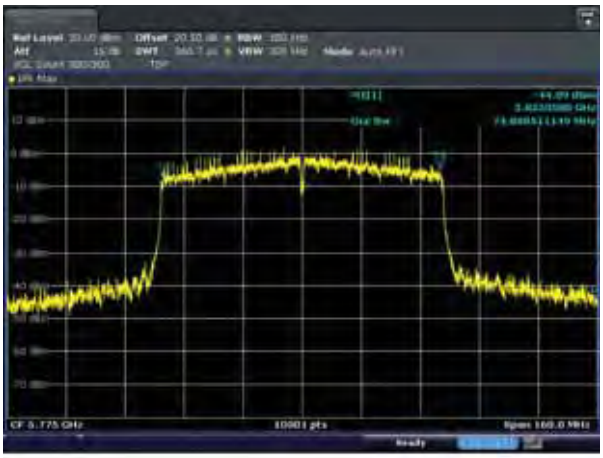
Test mode : 802.11ac_VHT40 MIMO

5190MHz	5230MHz
	
5270MHz	5310MHz
	
5510MHz	5590MHz
	

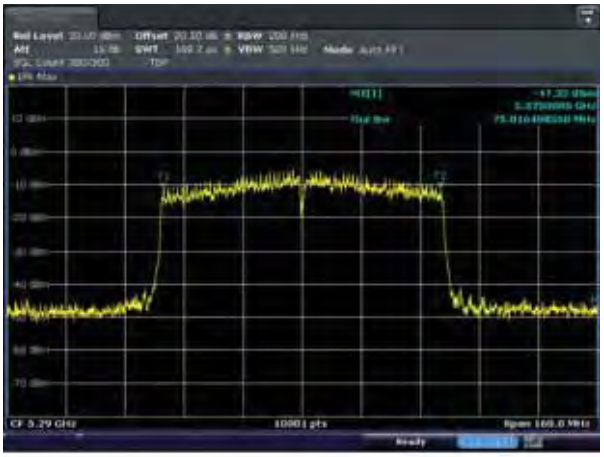
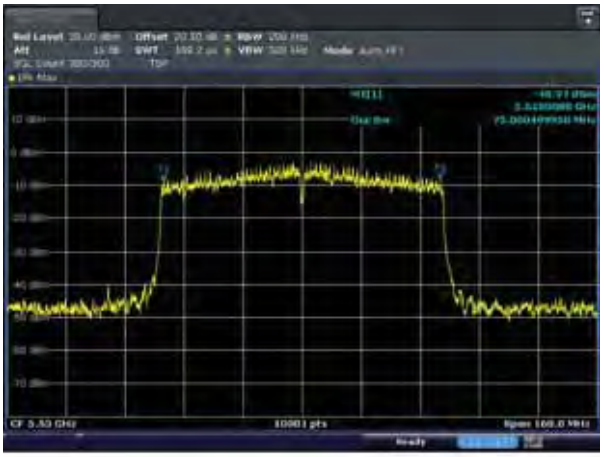
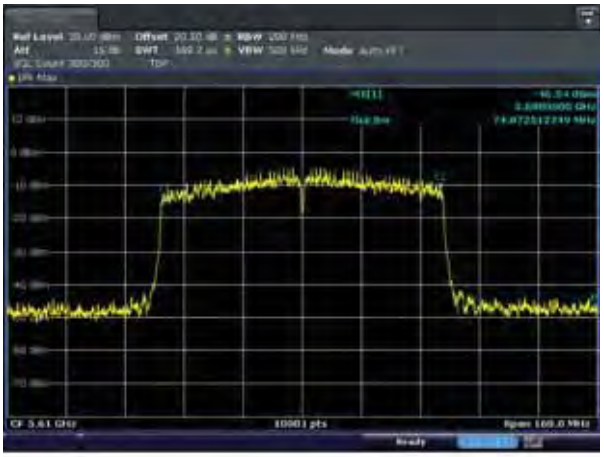
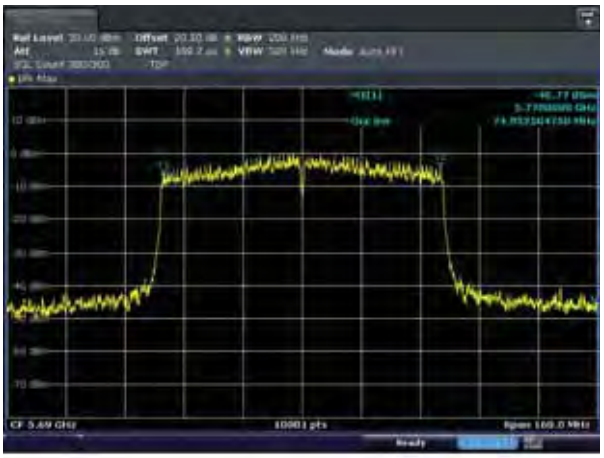
Test mode : 802.11ac_VHT40 MIMO ANT1

5670MHz	5755MHz
	
5795MHz	
	

Test mode : 802.11ac_VHT80

5210MHz	5290MHz
	
5530MHz	5610MHz
	
5690MHz	5775MHz
	

Test mode : 802.11ac_VHT80 MIMO ANT1

5210MHz	5290MHz
	
5530MHz	5610MHz
	
5690MHz	5775MHz
	

4.4.5 Frequency Stability

4.4.5.1 Regulation

According to §15.407(i) (g) Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

According to §RSS-GEN 6.11 Frequency stability is a measure of frequency drift due to temperature and supply voltage variations, with reference to the frequency measured at an appropriate reference temperature and the rated supply voltage.

When the measurement method of transmitter frequency stability is not stated in the applicable RSS or reference standards, the following conditions apply:

(a)The reference temperature for radio transmitters is +20°C (+68°F).

(b)A hand-held device that is only capable of operating using internal batteries shall be tested at the battery's nominal voltage, and again at the battery's operating end-point voltage, which shall be specified by the equipment manufacturer. For this test, either a battery or an external power supply can be used.

(c)The operating carrier frequency shall be set up in accordance with the manufacturer's published operation and instruction manual prior to the commencement of these tests. No adjustment of any frequency-determining circuit element shall be made subsequent to this initial set-up.

With the transmitter installed in an environmental test chamber, the unmodulated carrier frequency and frequency stability shall be measured under the conditions specified below for licensed and licence-exempt devices, unless specified otherwise in the applicable RSS. A sufficient stabilization period at each temperature shall be used prior to each frequency measurement.

4.4.5.2 Measurement Procedure

The frequency stability of the carrier frequency of the intentional radiator shall be maintained all conditions of normal operation as specified in the users manual. The frequency stability shall be maintained over a temperature variation of specified in the users manual at normal supply voltage, and over a variation in the primary supply voltage of specified in the users manual of the rated supply voltage at a temperature of 20 °C. For equipment that is capable only of operating from a battery, the frequency stability tests shall be performed using a new battery without any further requirement to vary supply voltage

1. The EUT was placed inside the environmental test chamber.
2. The temperature was incremented by 10 °C intervals from lowest temperature.
3. Each increase step of temperature measured the frequency.
4. The test temperature was set 20°C and the supply voltage was then adjusted on the EUT from 85 % to 115% and the frequency record.

4.4.5.3 Result

Comply (measurement data : refer to the next page)

4.4.5.4 Measurement data

Test mode : 20 MHz Bandwidth

Frequency (MHz)	Temp (℃)	Center Frequency (Hz)	Tolerance (%)
5180 MHz	-20	5179 960 000	-0.001
	-10	5179 880 000	-0.002
	0	5179 826 000	-0.003
	10	5180 068 000	0.001
	20	5179 882 000	-0.002
	30	5179 950 000	-0.001
	40	5180 128 000	0.002
	50	5179 858 000	-0.003
	Voltage(%)		
	85	5180 088 000	0.002
	115	5180 058 000	0.001

Test mode : 20 MHz Bandwidth

Frequency (MHz)	Temp (℃)	Center Frequency (Hz)	Tolerance (%)
5200 MHz	-20	5199 736 000	-0.005
	-10	5199 960 000	-0.001
	0	5199 950 000	-0.001
	10	5199 940 000	-0.001
	20	5200 004 000	0.000
	30	5199 854 000	-0.003
	40	5199 784 000	-0.004
	50	5199 776 000	-0.004
	Voltage(%)		
	85	5199 850 000	-0.003
	115	5199 778 000	-0.004

Test mode : 20 MHz Bandwidth

Frequency (MHz)	Temp (℃)	Center Frequency (Hz)	Tolerance (%)
5240 MHz	-20	5239 952 000	-0.001
	-10	5239 920 000	-0.002
	0	5239 806 000	-0.004
	10	5240 038 000	0.001
	20	5239 870 000	-0.002
	30	5239 904 000	-0.002
	40	5239 922 000	-0.001
	50	5239 956 000	-0.001
	Voltage(%)		
	85	5239 968 000	-0.001
	115	5239 996 000	0.000

Test mode : 20 MHz Bandwidth

Frequency (MHz)	Temp (℃)	Center Frequency (Hz)	Tolerance (%)
5260 MHz	-20	5260 102 000	0.002
	-10	5259 936 000	-0.001
	0	5260 034 000	0.001
	10	5260 032 000	0.001
	20	5259 798 000	-0.004
	30	5259 802 000	-0.004
	40	5259 830 000	-0.003
	50	5259 858 000	-0.003
	Voltage(%)		
	85	5259 838 000	-0.003
	115	5259 932 000	-0.001

Test mode : 20 MHz Bandwidth

Frequency (MHz)	Temp (℃)	Center Frequency (Hz)	Tolerance (%)
5280 MHz	-20	5280 156 000	0.003
	-10	5280 032 000	0.001
	0	5279 956 000	-0.001
	10	5279 796 000	-0.004
	20	5279 822 000	-0.003
	30	5279 922 000	-0.001
	40	5279 820 000	-0.003
	50	5280 002 000	0.000
	Voltage(%)		
	85	5280 008 000	0.000
	115	5279 998 000	0.000

Test mode : 20 MHz Bandwidth

Frequency (MHz)	Temp (℃)	Center Frequency (Hz)	Tolerance (%)
5320 MHz	-20	5320 050 000	0.001
	-10	5319 880 000	-0.002
	0	5319 846 000	-0.003
	10	5319 818 000	-0.003
	20	5319 940 000	-0.001
	30	5319 906 000	-0.002
	40	5319 822 000	-0.003
	50	5319 848 000	-0.003
	Voltage(%)		
	85	5319 886 000	-0.002
	115	5319 894 000	-0.002

Test mode : 20 MHz Bandwidth

Frequency (MHz)	Temp (℃)	Center Frequency (Hz)	Tolerance (%)
5500 MHz	-20	5499 944 000	-0.001
	-10	5499 894 000	-0.002
	0	5499 742 000	-0.005
	10	5499 694 000	-0.006
	20	5499 944 000	-0.001
	30	5499 778 000	-0.004
	40	5499 828 000	-0.003
	50	5499 934 000	-0.001
	Voltage(%)		
	85	5499 674 000	-0.006
	115	5500 088 000	0.002

Test mode : 20 MHz Bandwidth

Frequency (MHz)	Temp (℃)	Center Frequency (Hz)	Tolerance (%)
5600 MHz	-20	5600 036 000	0.001
	-10	5599 830 000	-0.003
	0	5599 870 000	-0.002
	10	5599 940 000	-0.001
	20	5599 836 000	-0.003
	30	5599 834 000	-0.003
	40	5599 858 000	-0.003
	50	5599 858 000	-0.003
	Voltage(%)		
	85	5599 880 000	-0.002
	115	5600 076 000	0.001

Test mode : 20 MHz Bandwidth

Frequency (MHz)	Temp (℃)	Center Frequency (Hz)	Tolerance (%)
5700 MHz	-20	5699 912 000	-0.002
	-10	5700 000 000	0.000
	0	5700 202 000	0.004
	10	5699 982 000	0.000
	20	5700 044 000	0.001
	30	5699 880 000	-0.002
	40	5699 922 000	-0.001
	50	5699 710 000	-0.005
	Voltage(%)		
	85	5699 962 000	-0.001
	115	5699 862 000	-0.002

Test mode : 20 MHz Bandwidth

Frequency (MHz)	Temp (℃)	Center Frequency (Hz)	Tolerance (%)
5745 MHz	-20	5745 172 000	0.003
	-10	5744 958 000	-0.001
	0	5745 160 000	0.003
	10	5744 968 000	-0.001
	20	5744 988 000	0.000
	30	5744 990 000	0.000
	40	5745 168 000	0.003
	50	5744 970 000	-0.001
	Voltage(%)		
	85	5745 162 000	0.003
	115	5745 086 000	0.001

Test mode : 20 MHz Bandwidth

Frequency (MHz)	Temp (℃)	Center Frequency (Hz)	Tolerance (%)
5785 MHz	-20	5785 024 000	0.000
	-10	5785 010 000	0.000
	0	5784 966 000	-0.001
	10	5785 060 000	0.001
	20	5784 914 000	-0.001
	30	5784 802 000	-0.003
	40	5785 050 000	0.001
	50	5784 952 000	-0.001
	Voltage(%)		
	85	5785 018 000	0.000
	115	5785 044 000	0.001

Test mode : 20 MHz Bandwidth

Frequency (MHz)	Temp (℃)	Center Frequency (Hz)	Tolerance (%)
5805 MHz	-20	5804 896 000	-0.002
	-10	5805 140 000	0.002
	0	5804 914 000	-0.001
	10	5805 012 000	0.000
	20	5805 128 000	0.002
	30	5804 998 000	0.000
	40	5804 876 000	-0.002
	50	5805 080 000	0.001
	Voltage(%)		
	85	5804 962 000	-0.001
	115	5804 922 000	-0.001

Test mode : 40 MHz Bandwidth

Frequency (MHz)	Temp (℃)	Center Frequency (Hz)	Tolerance (%)
5190 MHz	-20	5189 972 000	-0.001
	-10	5189 972 000	-0.001
	0	5189 980 000	0.000
	10	5189 920 000	-0.002
	20	5189 940 000	-0.001
	30	5189 912 000	-0.002
	40	5189 936 000	-0.001
	50	5190 008 000	0.000
	Voltage(%)		
	85	5190 004 000	0.000
	115	5189 940 000	-0.001

Test mode : 40 MHz Bandwidth

Frequency (MHz)	Temp (℃)	Center Frequency (Hz)	Tolerance (%)
5230 MHz	-20	5230 004 000	0.000
	-10	5230 040 000	0.001
	0	5229 952 000	-0.001
	10	5229 940 000	-0.001
	20	5229 936 000	-0.001
	30	5230 008 000	0.000
	40	5229 916 000	-0.002
	50	5229 976 000	0.000
	Voltage(%)		
	85	5229 944 000	-0.001
	115	5229 972 000	-0.001

Test mode : 40 MHz Bandwidth

Frequency (MHz)	Temp (℃)	Center Frequency (Hz)	Tolerance (%)
5270 MHz	-20	5269 940 000	-0.001
	-10	5269 928 000	-0.001
	0	5270 020 000	0.000
	10	5269 992 000	0.000
	20	5269 936 000	-0.001
	30	5269 932 000	-0.001
	40	5269 980 000	0.000
	50	5269 936 000	-0.001
	Voltage(%)		
	85	5270 000 000	0.000
	115	5269 976 000	0.000

Test mode : 40 MHz Bandwidth

Frequency (MHz)	Temp (℃)	Center Frequency (Hz)	Tolerance (%)
5310 MHz	-20	5310 004 000	0.000
	-10	5309 932 000	-0.001
	0	5309 960 000	-0.001
	10	5309 988 000	0.000
	20	5309 920 000	-0.002
	30	5309 996 000	0.000
	40	5309 964 000	-0.001
	50	5309 872 000	-0.002
	Voltage(%)		
	85	5309 952 000	-0.001
	115	5309 928 000	-0.001

Test mode : 40 MHz Bandwidth

Frequency (MHz)	Temp (℃)	Center Frequency (Hz)	Tolerance (%)
5510 MHz	-20	5509 960 000	-0.001
	-10	5510 016 000	0.000
	0	5510 008 000	0.000
	10	5509 920 000	-0.001
	20	5509 892 000	-0.002
	30	5509 908 000	-0.002
	40	5509 900 000	-0.002
	50	5509 956 000	-0.001
	Voltage(%)		
	85	5509 912 000	-0.002
	115	5509 948 000	-0.001

Test mode : 40 MHz Bandwidth

Frequency (MHz)	Temp (℃)	Center Frequency (Hz)	Tolerance (%)
5590 MHz	-20	5590 016 000	0.000
	-10	5590 052 000	0.001
	0	5590 016 000	0.000
	10	5589 944 000	-0.001
	20	5589 936 000	-0.001
	30	5590 004 000	0.000
	40	5589 976 000	0.000
	50	5589 956 000	-0.001
	Voltage(%)		
	85	5589 968 000	-0.001
	115	5589 992 000	0.000

Test mode : 40 MHz Bandwidth

Frequency (MHz)	Temp (℃)	Center Frequency (Hz)	Tolerance (%)
5630 MHz	-20	5670 016 000	0.000
	-10	5670 004 000	0.000
	0	5670 028 000	0.000
	10	5670 020 000	0.000
	20	5669 956 000	-0.001
	30	5669 964 000	-0.001
	40	5669 924 000	-0.001
	50	5669 960 000	-0.001
	Voltage(%)		
	85	5669 968 000	-0.001
	115	5669 996 000	0.000

Test mode : 40 MHz Bandwidth

Frequency (MHz)	Temp (℃)	Center Frequency (Hz)	Tolerance (%)
5755 MHz	-20	5755 032 000	0.001
	-10	5755 096 000	0.002
	0	5755 100 000	0.002
	10	5755 040 000	0.001
	20	5755 024 000	0.000
	30	5754 988 000	0.000
	40	5755 024 000	0.000
	50	5755 060 000	0.001
	Voltage(%)		
	85	5755 012 000	0.000
	115	5754 996 000	0.000

Test mode : 40 MHz Bandwidth

Frequency (MHz)	Temp (℃)	Center Frequency (Hz)	Tolerance (%)
5795 MHz	-20	5795 076 000	0.001
	-10	5795 024 000	0.000
	0	5795 072 000	0.001
	10	5795 032 000	0.001
	20	5794 976 000	0.000
	30	5795 080 000	0.001
	40	5795 024 000	0.000
	50	5795 084 000	0.001
	Voltage(%)		
	85	5795 012 000	0.000
	115	5795 052 000	0.001

Test mode : 80 MHz Bandwidth

Frequency (MHz)	Temp (℃)	Center Frequency (Hz)	Tolerance (%)
5210 MHz	-20	5209 960 000	-0.001
	-10	5210 008 000	0.000
	0	5210 056 000	0.001
	10	5210 024 000	0.000
	20	5209 936 000	-0.001
	30	5209 956 000	-0.001
	40	5209 960 000	-0.001
	50	5209 952 000	-0.001
	Voltage(%)		
	85	5209 928 000	-0.001
	115	5210 008 000	0.000

Test mode : 80 MHz Bandwidth

Frequency (MHz)	Temp (℃)	Center Frequency (Hz)	Tolerance (%)
5290 MHz	-20	5290 008 000	0.000
	-10	5289 968 000	-0.001
	0	5290 096 000	0.002
	10	5289 976 000	0.000
	20	5290 008 000	0.000
	30	5289 992 000	0.000
	40	5289 968 000	-0.001
	50	5289 928 000	-0.001
	Voltage(%)		
	85	5289 928 000	-0.001
	115	5290 032 000	0.001

Test mode : 80 MHz Bandwidth

Frequency (MHz)	Temp (℃)	Center Frequency (Hz)	Tolerance (%)
5530 MHz	-20	5529 976 000	0.000
	-10	5529 992 000	0.000
	0	5529 968 000	-0.001
	10	5530 008 000	0.000
	20	5529 968 000	-0.001
	30	5529 896 000	-0.002
	40	5530 016 000	0.000
	50	5529 856 000	-0.003
	Voltage(%)		
	85	5530 000 000	0.000
	115	5530 032 000	0.001

Test mode : 80 MHz Bandwidth

Frequency (MHz)	Temp (℃)	Center Frequency (Hz)	Tolerance (%)
5610 MHz	-20	5610 064 000	0.001
	-10	5609 984 000	0.000
	0	5609 976 000	0.000
	10	5610 112 000	0.002
	20	5609 912 000	-0.002
	30	5609 952 000	-0.001
	40	5610 016 000	0.000
	50	5609 976 000	0.000
	Voltage(%)		
	85	5609 936 000	-0.001
	115	5609 992 000	0.000

Test mode : 80 MHz Bandwidth

Frequency (MHz)	Temp (℃)	Center Frequency (Hz)	Tolerance (%)
5690 MHz	-20	5690 056 000	0.001
	-10	5690 040 000	0.001
	0	5690 048 000	0.001
	10	5689 944 000	-0.001
	20	5690 008 000	0.000
	30	5689 984 000	0.000
	40	5689 984 000	0.000
	50	5689 944 000	-0.001
	Voltage(%)		
	85	5689 992 000	0.000
	115	5689 912 000	-0.002

Test mode : 80 MHz Bandwidth

Frequency (MHz)	Temp (℃)	Center Frequency (Hz)	Tolerance (%)
5775 MHz	-20	5775 024 000	0.000
	-10	5774 984 000	0.000
	0	5774 984 000	0.000
	10	5775 048 000	0.001
	20	5775 008 000	0.000
	30	5775 040 000	0.001
	40	5774 976 000	0.000
	50	5774 976 000	0.000
	Voltage(%)		
	85	5774 896 000	-0.002
	115	5774 992 000	0.000

4.4.6 Spurious Emission, Band Edge, and Restricted bands

4.4.6.1 Regulation

According to §15.407(b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(4) For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

(5) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

(6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

(7) The provisions of §15.205 apply to intentional radiators operating under this section.

According to §RSS-247 6.2.1.2 For transmitters with operating frequencies in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. Any unwanted emissions that fall into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth (i.e. 99% bandwidth), above 5250 MHz. The 26 dB bandwidth may fall into the 5250-5350 MHz band; however, if the occupied bandwidth also falls within the 5250-5350 MHz band, the transmission is considered as intentional and the devices shall comply with all requirements in the band 5250-5350 MHz including implementing dynamic frequency selection (DFS) and TPC, on the portion of the emission that resides in the 5250-5350 MHz band.

According to §RSS-247 6.2.2.2 a) All emissions outside the band 5250-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p.; or
b) All emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. and its power shall comply with the spectral power density for operation within the band 5150-5250 MHz. The device, except devices installed in vehicles, shall be labelled or include in the user manual the following text “for indoor use only.”

According to §RSS-247 6.2.3.2 Emissions outside the band 5470-5725 MHz shall not exceed -27 dBm/MHz e.i.r.p. However, devices with bandwidth overlapping the band edge of 5725 MHz can meet the emission limit of -27 dBm/MHz e.i.r.p. at 5850 MHz instead of 5725 MHz.

According to §RSS-247 6.2.4.2 Devices operating in the band 5725-5850 MHz shall have e.i.r.p. of unwanted emissions comply with the following:

a) 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges;
b) 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;
c) 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and
d) -27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.

According to §15.209(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall notexceed the field strength levels specified in the following table:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009 - 0.490	2 400/F(kHz)	300
0.490 - 1.705	24 000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100**	3
88 - 216	150**	3
216 - 960	200**	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shallnot be located in the frequency bands 54–72 MHz, 76–88 MHz, 174–216 MHz or 470–806 MHz. However, operation within these frequency bands is permItted under other sections of this part, e.g., §§15.231 and 15.241.

According to §15.205(a) and (b), only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.009 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
0.495 - 0.505	16.694 75 - 16.695 25	608 - 614	5.35 - 5.46
2.173 5 - 2.190 5	16.804 25 - 16.804 75	960 – 1 240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1 300 – 1 427	8.025 - 8.5
4.177 25 - 4.177 75	37.5 - 38.25	1 435 – 1 626.5	9.0 - 9.2
4.207 25 - 4.207 75	73 - 74.6	1 645.5 – 1 646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1 660 – 1 710	10.6 - 12.7
6.267 75 - 6.268 25	108 - 121.94	1 718.8 – 1 722.2	13.25 - 13.4
6.311 75 - 6.312 25	123 - 138	2 200 – 2 300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2 310 – 2 390	15.35 - 16.2
8.362 - 8.366	156.524 75 - 156.525 25	2 483.5 – 2 500	17.7 - 21.4

8.376 25 - 8.386 75	156.7 - 156.9	2 690 – 2 900	22.01 - 23.12
8.414 25 - 8.414 75	162.012 5 - 167.17	3 260 – 3 267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3 332 – 3 339	31.2 - 31.8
12.519 75 - 12.520 25	240 - 285	3 345.8 – 3 358	36.43 - 36.5
12.576 75 - 12.577 25	322 - 335.4	3 600 – 4 400	Above 38.6
13.36 - 13.41			

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurement

According to RSS-GEN 8.10(c) Unwanted emissions that do not fall within the restricted frequency bands listed in table 7 shall comply either with the limits specified in the applicable RSS or with those specified in table 5 and table 6.

MHz	MHz	MHz	GHz
0.009 - 0.110	13.36 – 13.41	960 – 1427	9.0 – 9.2
0.495 - 0.505	16.42 – 16.423	1435 – 1626.5	9.3 – 9.5
2.173 5 - 2.190 5	16.69475 – 16.69525	1660 – 1710	10.6 – 12.7
3.020 – 3.026	16.80425 - 16.80475	1718.8 – 1722.2	13.25 – 13.4
4.125 – 4.128	25.5 – 25.67	2200 – 2300	14.47 – 14.5
4.17725 – 1.17775	37.5 – 38.25	2310 - 2390	15.35 – 16.2
4.20725 – 4.20775	73 – 74.6	2483.5 – 2500	17.7 – 21.4
5.677 – 5.683	74.8 – 75.2	2655 – 2900	22.01 – 23.12
6.215 – 6.218	108 – 138	3260 – 3267	23.6 – 24.0
6.266775 – 6.26825	149.9 – 150.05	3332 – 3339	31.2 – 31.8
6.31175 – 6.31225	156.52475 – 156.52525	3345.8 - 3358	36.43 – 36.5
8.291 – 8.294	156.7 – 156.9	3500 – 4400	Above 38.6
8.363 – 8.366	162.0125 – 167.17	4500 – 5150	-
8.37625 – 8.38675	167.75 – 173.2	5350 – 5460	-
8.41425 – 8.41475	240 – 285	7250 - 7750	-
12.29 – 12.293	322 – 335.4	8025 – 8500	-
12.51975 – 12.52025	399.9 – 410	-	-
12.57675 – 12.57725	608 – 614	-	-

4.4.6.2 Measurement Procedure

These test measurement settings are specified in section G of 789033 D02 General UNII Test Procedures
For all radiated emissions tests, measurements must correspond to the direction of maximum emission level for each measured emission (see ANSI C63.10 for guidance).

4.4.6.2.1 Unwanted Emissions in the Restricted Bands & Outside of the Restricted Bands

(1) For all measurements, follow the requirements in section II.G.3.,
"General Requirements for Unwanted Emissions Measurements".
(2) At frequencies below 1000 MHz, use the procedure described in section II.G.4.,
"Procedure for Unwanted Emissions Measurements Below 1000 ㎒".
(3) At frequencies above 1000 ㎒, measurements performed using the peak and average measurement procedures described in sections II.G.5. and II.G.6, respectively, must satisfy the respective peak and average limits. If all peak measurements satisfy the average limit, then average measurements are not required.

(4) Unwanted Emissions that fall Outside of the Restricted Bands
As specified in §15.407(b), emissions above 1000 MHz that are outside of the restricted bands are subject to a maximum emission limit of -27 dBm/MHz (or -17 dBm/MHz as specified in §15.407(b)(4)).
However, an out-of-band emission that complies with both the peak and average limits of §15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz maximum emission limit.

a) If radiated measurements are performed, field strength is then converted to EIRP as follows:

(i) EIRP = ((E*d)^2) / 30
where: • E is the field strength in V/m;
• d is the measurement distance in meters;
• EIRP is the equivalent isotropically radiated power in watts.

(ii) Working in dB units, the above equation is equivalent to:
EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77

(iii) or, if d is 3 meters:
EIRP[dBm] = E[dBμV/m] - 95.2

4.4.6.2.2 Radiated Spurious Emissions

1) The preliminary and final rdiated measurements were performed to determine the frequency producing the maximum emissions in at a 10m anechoic chamber. The EUT was tested at a distance 3 meters.
2) The EUT was placed on the top of the 0.8-meter height, 1 × 1.5 meter non-metallic table. To find the maximum emission levels, the height of a measuring antenna was changed and the turntable was rotated 360°.
3) The antenna polarization was also changed from vertical to horizontal. The spectrum was scanned from 9 kHz to 30 MHz using the loop antenna, and from 30 to 1 000 MHz using the TRILOG broadband antenna, and from 1 000 MHz to 40 000 MHz using the horn antenna.
4) Each frequency found during preliminary measurements was re-examined and investigated. The test-receiver system was set up to average, peak, and quasi-peak detector function with specified bandwidth.
5) For multiple antennas, the maximum simultaneous operating conditions were declared the worst case condition. The test was performed under the worst condition.

NOTE1 : The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1 GHz.
NOTE2 : The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection and frequency above 1 GHz.
The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 1 kHz(1/T) for Average detection (AV) at frequency above 1 GHz. (where T = pulse width)

4.4.6.3 Note

- Below 1GHz

Note 1 : Measured the worst case. * Refer to 3.4
Note 2 : Loss : Cable loss - Amp gain
Note 3 : Result : Reading + Ant Factor + Loss
Note 4 : Measured distance : 3 m

- Above 1GHz

Note 1 : Measured the worst case. * Refer to 3.4
Note 2 : Factor : Ant Factor + Cable loss - Amp gain + Distance Factor
Note 3 : Peak Result : Reading + Factor
Note 4 : Average Reasult : Average Reading + Factor + Average Factor
Note 5 : Average Factor : 10log(1/Dutycycle) * Refer to 4.4.6.6
Note 6 : Measured distance : 1 m, Distance Factor = 20log(1 / 3) = -9.54
Note 7 : Average measurement did not take place because the peak data did not exceed Average Limit.
Note 8 : Not Detected means that peak data does not exceed the average limit.

4.4.6.4 Result

Comply (measurement data : refer to the next page)

4.4.6.5 Measurement data

Test mode : Below 1 GHz (Worst case : 802.11ac_VHT80_MIMO_5290 MHz)

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBµV)	Ant Factor (dB)	Loss (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
36.06	QP	V	41.20	17.20	-29.30	29.10	40.00	10.90
58.25	QP	V	42.00	17.90	-28.90	31.00	40.00	9.00
134.03	QP	H	36.90	18.50	-27.80	27.60	43.50	15.90
374.95	QP	H	43.50	21.20	-26.60	38.10	46.00	7.90
833.34	QP	V	30.00	28.90	-25.40	33.50	46.00	12.50

Test mode : 802.11a_5180 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5139.66	PK	H	47.40	1.00	-	48.36	74.00	25.64
	AV	H	35.90	1.00	0.92	37.78	54.00	16.22
5139.66	PK	V	59.10	1.00	-	60.06	74.00	13.94
	AV	V	43.20	1.00	0.92	45.08	54.00	8.92

Test mode : 802.11a_5200 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5104.63	PK	H	45.00	0.90	-	45.86	74.00	28.14
	AV	H	35.20	0.90	0.92	36.98	54.00	17.02
5104.63	PK	V	60.30	0.90	-	61.16	74.00	12.84
	AV	V	44.90	0.90	0.92	46.68	54.00	7.32
5355.77	PK	H	41.90	1.60	-	43.46	74.00	30.54
	AV	H	35.30	1.60	0.92	37.78	54.00	16.22
5355.77	PK	V	54.40	1.60	-	55.96	74.00	18.04
	AV	V	42.10	1.60	0.92	44.58	54.00	9.42

Test mode : 802.11a_5240 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5146.62	PK	H	45.80	1.00	-	46.76	74.00	27.24
	AV	H	38.40	1.00	0.92	40.28	54.00	13.72
5146.62	PK	V	62.40	1.00	-	63.36	74.00	10.64
	AV	V	43.20	1.00	0.92	45.08	54.00	8.92
5351.73	PK	H	43.60	1.60	-	45.16	74.00	28.84
	AV	H	34.20	1.60	0.92	36.68	54.00	17.32
5351.73	PK	V	55.30	1.60	-	56.86	74.00	17.14
	AV	V	40.80	1.60	0.92	43.28	54.00	10.72

Test mode : 802.11a_5260 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5148.34	PK	H	46.00	1.00	-	46.96	74.00	27.04
	AV	H	36.20	1.00	0.92	38.08	54.00	15.92
5148.34	PK	V	58.30	1.00	-	59.26	74.00	14.74
	AV	V	41.80	1.00	0.92	43.68	54.00	10.32
5355.33	PK	H	46.70	1.60	-	48.26	74.00	25.74
	AV	H	33.80	1.60	0.92	36.28	54.00	17.72
5355.33	PK	V	56.60	1.60	-	58.16	74.00	15.84
	AV	V	42.40	1.60	0.92	44.88	54.00	9.12

Test mode : 802.11a_5280 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBµV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5147.65	PK	H	44.20	1.00	-	45.16	74.00	28.84
	AV	H	35.30	1.00	0.92	37.18	54.00	16.82
5147.65	PK	V	56.30	1.00	-	57.26	74.00	16.74
	AV	V	41.80	1.00	0.92	43.68	54.00	10.32
5352.24	PK	H	45.50	1.60	-	47.06	74.00	26.94
	AV	H	34.90	1.60	0.92	37.38	54.00	16.62
5352.24	PK	V	55.80	1.60	-	57.36	74.00	16.64
	AV	V	42.50	1.60	0.92	44.98	54.00	9.02

Test mode : 802.11a_5320 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBµV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5145.79	PK	H	42.40	1.00	-	43.36	74.00	30.64
	AV	H	33.90	1.00	0.92	35.78	54.00	18.22
5145.79	PK	V	55.30	1.00	-	56.26	74.00	17.74
	AV	V	43.20	1.00	0.92	45.08	54.00	8.92
5353.30	PK	H	45.60	1.60	-	47.16	74.00	26.84
	AV	H	35.10	1.60	0.92	37.58	54.00	16.42
5353.30	PK	V	57.50	1.60	-	59.06	74.00	14.94
	AV	V	43.30	1.60	0.92	45.78	54.00	8.22

Test mode : 802.11a_5500 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBµV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5392.32	PK	H	46.30	1.70	-	47.96	74.00	26.04
	AV	H	35.30	1.70	0.92	37.88	54.00	16.12
5392.32	PK	V	58.30	1.70	-	59.96	74.00	14.04
	AV	V	42.80	1.70	0.92	45.38	54.00	8.62

Test mode : 802.11a_5600 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBµV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5392.32	PK	H	46.30	1.70	-	47.96	74.00	26.04
	AV	H	35.30	1.70	0.92	37.88	54.00	16.12
5392.32	PK	V	58.30	1.70	-	59.96	74.00	14.04
	AV	V	42.80	1.70	0.92	45.38	54.00	8.62

Test mode : 802.11a_5700 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5851.25	PK	V	50.90	2.60	-	53.46	74.00	20.54
	AV	V	39.90	2.60	0.92	43.38	54.00	10.62

Test mode : 802.11a_5745 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
			Not Detected					

Test mode : 802.11a_5785 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
			Not Detected					

Test mode : 802.11a_5805 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
			Not Detected					

Test mode : 802.11n_HT20 MIMO_5180 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2659.89	PK	V	59.80	-3.80	-	55.96	74.00	18.04
	AV	V	49.20	-3.80	1.89	47.25	54.00	6.75
5144.93	PK	H	48.90	1.00	-	49.86	74.00	24.14
	AV	H	36.90	1.00	1.89	39.75	54.00	14.25
5144.93	PK	V	65.10	1.00	-	66.06	74.00	7.94
	AV	V	43.50	1.00	1.89	46.35	54.00	7.65
5365.40	PK	V	55.00	1.60	-	56.56	74.00	17.44
	AV	V	41.20	1.60	1.89	44.65	54.00	9.35

Test mode : 802.11n_HT20 MIMO_5200 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5136.98	PK	H	47.80	1.00	-	48.76	74.00	25.24
	AV	H	35.20	1.00	1.89	38.05	54.00	15.95
5136.98	PK	V	60.50	1.00	-	61.46	74.00	12.54
	AV	V	45.30	1.00	1.89	48.15	54.00	5.85
5352.26	PK	V	54.40	1.60	-	55.96	74.00	18.04
	AV	V	41.00	1.60	1.89	44.45	54.00	9.55

Test mode : 802.11n_HT20 MIMO_5240 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5148.71	PK	H	46.80	1.00	-	47.76	74.00	26.24
	AV	H	37.20	1.00	1.89	40.05	54.00	13.95
5148.71	PK	V	59.70	1.00	-	60.66	74.00	13.34
	AV	V	45.40	1.00	1.89	48.25	54.00	5.75
5353.09	PK	H	43.80	1.60	-	45.36	74.00	28.64
	AV	H	33.60	1.60	1.89	37.05	54.00	16.95
5353.99	PK	V	58.30	1.60	-	59.86	74.00	14.14
	AV	V	42.80	1.60	1.89	46.25	54.00	7.75

Test mode : 802.11n_HT20 MIMO_5260 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5149.96	PK	H	47.20	1.00	-	48.16	74.00	25.84
	AV	H	36.20	1.00	1.89	39.05	54.00	14.95
5149.96	PK	V	59.00	1.00	-	59.96	74.00	14.04
	AV	V	45.60	1.00	1.89	48.45	54.00	5.55
5351.39	PK	H	49.00	1.60	-	50.56	74.00	23.44
	AV	H	41.20	1.60	1.89	44.65	54.00	9.35
5351.39	PK	V	59.00	1.60	-	60.56	74.00	13.44
	AV	V	45.30	1.60	1.89	48.75	54.00	5.25

Test mode : 802.11n_HT20 MIMO_5280 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5149.22	PK	H	45.90	1.00	-	46.86	74.00	27.14
	AV	H	35.60	1.00	1.89	38.45	54.00	15.55
5149.22	PK	V	58.80	1.00	-	59.76	74.00	14.24
	AV	V	43.90	1.00	1.89	46.75	54.00	7.25
5354.95	PK	H	49.10	1.60	-	50.66	74.00	23.34
	AV	H	33.90	1.60	1.89	37.35	54.00	16.65
5354.95	PK	V	58.90	1.60	-	60.46	74.00	13.54
	AV	V	44.20	1.60	1.89	47.65	54.00	6.35

Test mode : 802.11n_HT20 MIMO_5320 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5137.03	PK	H	44.00	1.00	-	44.96	74.00	29.04
	AV	H	34.00	1.00	1.89	36.85	54.00	17.15
5137.03	PK	V	57.90	1.00	-	58.86	74.00	15.14
	AV	V	43.20	1.00	1.89	46.05	54.00	7.95
5352.34	PK	H	48.00	1.60	-	49.56	74.00	24.44
	AV	H	33.60	1.60	1.89	37.05	54.00	16.95
5352.34	PK	V	59.10	1.60	-	60.66	74.00	13.34
	AV	V	44.90	1.60	1.89	48.35	54.00	5.65

Test mode : 802.11n_HT20 MIMO_5500 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5415.24	PK	H	47.00	1.80	-	48.76	74.00	25.24
	AV	H	33.90	1.80	1.89	37.55	54.00	16.45
5415.24	PK	V	61.50	1.80	-	63.26	74.00	10.74
	AV	V	45.30	1.80	1.89	48.95	54.00	5.05

Test mode : 802.11n_HT20 MIMO_5600 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5452.37	PK	H	44.70	1.90	-	46.56	74.00	27.44
	AV	H	34.80	1.90	1.89	38.55	54.00	15.45
5452.37	PK	V	56.20	1.90	-	58.06	74.00	15.94
	AV	V	42.10	1.90	1.89	45.85	54.00	8.15

Test mode : 802.11n_HT20 MIMO_5700 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5453.75	PK	H	45.70	1.90	-	47.56	74.00	26.44
	AV	H	31.90	1.90	1.89	35.65	54.00	18.35
5453.75	PK	V	56.90	1.90	-	58.76	74.00	15.24
	AV	V	43.20	1.90	1.89	46.95	54.00	7.05

Test mode : 802.11n_HT20 MIMO_5745 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
			Not Detected					

Test mode : 802.11n_HT20 MIMO_5785 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
			Not Detected					

Test mode : 802.11n_HT20 MIMO_5805 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
			Not Detected					

Test mode : 802.11n_HT40 MIMO _5190 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5149.95	PK	H	47.20	1.00	-	48.16	74.00	25.84
	AV	H	33.50	1.00	3.04	37.50	54.00	16.50
5149.95	PK	V	62.30	1.00	-	63.26	74.00	10.74
	AV	V	45.10	1.00	3.04	49.10	54.00	4.90
5366.23	PK	H	42.60	1.60	-	44.16	74.00	29.84
	AV	H	33.60	1.60	3.04	38.20	54.00	15.80
5366.23	PK	V	56.00	1.60	-	57.56	74.00	16.44
	AV	V	41.50	1.60	3.04	46.10	54.00	7.90

Test mode : 802.11n_HT40 MIMO _5230 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5145.72	PK	H	45.80	1.00	-	46.76	74.00	27.24
	AV	H	35.30	1.00	3.04	39.30	54.00	14.70
5145.72	PK	V	58.80	1.00	-	59.76	74.00	14.24
	AV	V	42.20	1.00	3.04	46.20	54.00	7.80
5354.15	PK	H	44.80	1.60	-	46.36	74.00	27.64
	AV	H	33.80	1.60	3.04	38.40	54.00	15.60
5354.15	PK	V	56.30	1.60	-	57.86	74.00	16.14
	AV	V	41.00	1.60	3.04	45.60	54.00	8.40

Test mode : 802.11n_HT40 MIMO _5270 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5145.72	PK	H	44.90	1.00	-	45.86	74.00	28.14
	AV	H	31.20	1.00	3.04	35.20	54.00	18.80
5145.72	PK	V	59.60	1.00	-	60.56	74.00	13.44
	AV	V	42.10	1.00	3.04	46.10	54.00	7.90
5373.26	PK	H	47.90	1.60	-	49.46	74.00	24.54
	AV	H	33.40	1.60	3.04	38.00	54.00	16.00
5373.26	PK	V	60.40	1.60	-	61.96	74.00	12.04
	AV	V	44.20	1.60	3.04	48.80	54.00	5.20

Test mode : 802.11n_HT40 MIMO _5310 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5146.75	PK	H	43.30	1.00	-	44.26	74.00	29.74
	AV	H	33.30	1.00	3.04	37.30	54.00	16.70
5146.75	PK	V	56.80	1.00	-	57.76	74.00	16.24
	AV	V	41.20	1.00	3.04	45.20	54.00	8.80
5350.61	PK	H	49.10	1.60	-	50.66	74.00	23.34
	AV	H	35.10	1.60	3.04	39.70	54.00	14.30
5350.61	PK	V	63.90	1.60	-	65.46	74.00	8.54
	AV	V	45.10	1.60	3.04	49.70	54.00	4.30

Test mode : 802.11n_HT40 MIMO _5510 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5459.04	PK	H	46.60	1.90	-	48.46	74.00	25.54
	AV	H	31.20	1.90	3.04	36.10	54.00	17.90
5459.04	PK	V	58.10	1.90	-	59.96	74.00	14.04
	AV	V	43.10	1.90	3.04	48.00	54.00	6.00

Test mode : 802.11n_HT40 MIMO _5590 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5455.32	PK	H	44.30	1.90	-	46.16	74.00	27.84
	AV	H	33.30	1.90	3.04	38.20	54.00	15.80
5455.32	PK	V	54.90	1.90	-	56.76	74.00	17.24
	AV	V	42.50	1.90	3.04	47.40	54.00	6.60

Test mode : 802.11n_HT40 MIMO_5670 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
			Not Detected					

Test mode : 802.11n_HT40 MIMO_5755 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
			Not Detected					

Test mode : 802.11n_HT40 MIMO_5795 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
			Not Detected					

Test mode : 802.11ac_VHT20 MIMO_5180 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5140.56	PK	H	49.70	1.00	-	50.66	74.00	23.34
	AV	H	35.30	1.00	1.77	38.03	54.00	15.97
5140.56	PK	V	61.80	1.00	-	62.76	74.00	11.24
	AV	V	45.60	1.00	1.77	48.33	54.00	5.67
5360.05	PK	H	42.90	1.60	-	44.46	74.00	29.54
	AV	H	33.90	1.60	1.77	37.23	54.00	16.77
5360.05	PK	V	54.40	1.60	-	55.96	74.00	18.04
	AV	V	41.20	1.60	1.77	44.53	54.00	9.47

Test mode : 802.11ac_VHT20 MIMO_5200 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5133.46	PK	H	46.30	1.00	-	47.26	74.00	26.74
	AV	H	33.10	1.00	1.77	35.83	54.00	18.17
5133.46	PK	V	61.30	1.00	-	62.26	74.00	11.74
	AV	V	45.20	1.00	1.77	47.93	54.00	6.07
5353.02	PK	V	55.10	1.60	-	56.66	74.00	17.34
	AV	V	40.80	1.60	1.77	44.13	54.00	9.87

Test mode : 802.11ac_VHT20 MIMO_5240 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5146.57	PK	H	47.80	1.00	-	48.76	74.00	25.24
	AV	H	33.30	1.00	1.77	36.03	54.00	17.97
5146.57	PK	V	61.40	1.00	-	62.36	74.00	11.64
	AV	V	44.20	1.00	1.77	46.93	54.00	7.07
5350.80	PK	H	45.80	1.60	-	47.36	74.00	26.64
	AV	H	32.10	1.60	1.77	35.43	54.00	18.57
5350.80	PK	V	58.30	1.60	-	59.86	74.00	14.14
	AV	V	42.30	1.60	1.77	45.63	54.00	8.37

Test mode : 802.11ac_VHT20 MIMO_5260 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5144.59	PK	H	44.90	1.00	-	45.86	74.00	28.14
	AV	H	33.30	1.00	1.77	36.03	54.00	17.97
5144.59	PK	V	58.70	1.00	-	59.66	74.00	14.34
	AV	V	42.10	1.00	1.77	44.83	54.00	9.17
5353.99	PK	H	46.50	1.60	-	48.06	74.00	25.94
	AV	H	35.10	1.60	1.77	38.43	54.00	15.57
5353.99	PK	V	57.30	1.60	-	58.86	74.00	15.14
	AV	V	41.50	1.60	1.77	44.83	54.00	9.17

Test mode : 802.11ac_VHT20 MIMO_5280 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBµV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5144.87	PK	H	43.00	1.00	-	43.96	74.00	30.04
	AV	H	35.20	1.00	1.77	37.93	54.00	16.07
5144.87	PK	V	59.20	1.00	-	60.16	74.00	13.84
	AV	V	45.20	1.00	1.77	47.93	54.00	6.07
5353.08	PK	H	45.90	1.60	-	47.46	74.00	26.54
	AV	H	33.90	1.60	1.77	37.23	54.00	16.77
5353.08	PK	V	58.40	1.60	-	59.96	74.00	14.04
	AV	V	44.40	1.60	1.77	47.73	54.00	6.27

Test mode : 802.11ac_VHT20 MIMO_5320 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBµV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5148.36	PK	H	43.90	1.00	-	44.86	74.00	29.14
	AV	H	33.10	1.00	1.77	35.83	54.00	18.17
5148.36	PK	V	55.30	1.00	-	56.26	74.00	17.74
	AV	V	40.90	1.00	1.77	43.63	54.00	10.37
5354.17	PK	H	47.00	1.60	-	48.56	74.00	25.44
	AV	H	35.60	1.60	1.77	38.93	54.00	15.07
5354.17	PK	V	58.70	1.60	-	60.26	74.00	13.74
	AV	V	43.30	1.60	1.77	46.63	54.00	7.37

Test mode : 802.11ac_VHT20 MIMO_5500 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBµV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5459.80	PK	H	47.40	1.90	-	49.26	74.00	24.74
	AV	H	35.40	1.90	1.77	39.03	54.00	14.97
5459.80	PK	V	59.90	1.90	-	61.76	74.00	12.24
	AV	V	45.10	1.90	1.77	48.73	54.00	5.27

Test mode : 802.11ac_VHT20 MIMO_5600 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBµV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5459.87	PK	H	44.40	1.90	-	46.26	74.00	27.74
	AV	H	33.30	1.90	1.77	36.93	54.00	17.07
5459.87	PK	V	56.20	1.90	-	58.06	74.00	15.94
	AV	V	42.30	1.90	1.77	45.93	54.00	8.07

Test mode : 802.11ac_VHT20 MIMO_5700 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5455.46	PK	H	46.70	1.90	-	48.56	74.00	25.44
	AV	H	33.80	1.90	1.77	37.43	54.00	16.57
5455.46	PK	V	55.90	1.90	-	57.76	74.00	16.24
	AV	V	41.10	1.90	1.77	44.73	54.00	9.27

Test mode : 802.11ac_VHT20 MIMO_5745 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
			Not Detected					

Test mode : 802.11ac_VHT20 MIMO_5785 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
			Not Detected					

Test mode : 802.11ac_VHT20 MIMO_5805 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
			Not Detected					

Test mode : 802.11ac_VHT40 MIMO _5190 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBµV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5145.76	PK	H	49.10	1.00	-	50.06	74.00	23.94
	AV	H	33.30	1.00	3.17	37.43	54.00	16.57
5145.76	PK	V	59.50	1.00	-	60.46	74.00	13.54
	AV	V	45.20	1.00	3.17	49.33	54.00	4.67
5355.73	PK	H	44.50	1.60	-	46.06	74.00	27.94
	AV	H	31.20	1.60	3.17	35.93	54.00	18.07
5355.73	PK	V	54.80	1.60	-	56.36	74.00	17.64
	AV	V	41.20	1.60	3.17	45.93	54.00	8.07

Test mode : 802.11ac_VHT40 MIMO _5230 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBµV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5136.13	PK	H	46.20	1.00	-	47.16	74.00	26.84
	AV	H	31.20	1.00	3.17	35.33	54.00	18.67
5136.13	PK	V	60.90	1.00	-	61.86	74.00	12.14
	AV	V	45.10	1.00	3.17	49.23	54.00	4.77
5361.84	PK	H	44.00	1.60	-	45.56	74.00	28.44
	AV	H	33.30	1.60	3.17	38.03	54.00	15.97
5361.84	PK	V	57.30	1.60	-	58.86	74.00	15.14
	AV	V	40.80	1.60	3.17	45.53	54.00	8.47

Test mode : 802.11ac_VHT40 MIMO _5270 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBµV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5145.77	PK	H	45.70	1.00	-	46.66	74.00	27.34
	AV	H	35.10	1.00	3.17	39.23	54.00	14.77
5145.77	PK	V	59.10	1.00	-	60.06	74.00	13.94
	AV	V	43.30	1.00	3.17	47.43	54.00	6.57
5351.60	PK	H	48.00	1.60	-	49.56	74.00	24.44
	AV	H	36.20	1.60	3.17	40.93	54.00	13.07
5351.60	PK	V	57.80	1.60	-	59.36	74.00	14.64
	AV	V	42.20	1.60	3.17	46.93	54.00	7.07

Test mode : 802.11ac_VHT40 MIMO _5310 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5146.71	PK	H	43.90	1.00	-	44.86	74.00	29.14
	AV	H	33.10	1.00	3.17	37.23	54.00	16.77
5146.71	PK	V	58.70	1.00	-	59.66	74.00	14.34
	AV	V	44.10	1.00	3.17	48.23	54.00	5.77
5352.20	PK	H	47.30	1.60	-	48.86	74.00	25.14
	AV	H	31.30	1.60	3.17	36.03	54.00	17.97
5352.20	PK	V	66.40	1.60	-	67.96	74.00	6.04
	AV	V	46.50	1.60	3.17	51.23	54.00	2.77

Test mode : 802.11ac_VHT40 MIMO _5510 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5458.15	PK	H	45.90	1.90	-	47.76	74.00	26.24
	AV	H	33.80	1.90	3.17	38.83	54.00	15.17
5458.15	PK	V	61.00	1.90	-	62.86	74.00	11.14
	AV	V	44.90	1.90	3.17	49.93	54.00	4.07

Test mode : 802.11ac_VHT40 MIMO _5590 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5457.75	PK	H	47.10	1.90	-	48.96	74.00	25.04
	AV	H	32.80	1.90	3.17	37.83	54.00	16.17
5457.75	PK	V	56.30	1.90	-	58.16	74.00	15.84
	AV	V	43.80	1.90	3.17	48.83	54.00	5.17

Test mode : 802.11ac_VHT40 MIMO_5670 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5455.84	PK	H	46.50	1.90	-	48.36	74.00	25.64
	AV	H	31.80	1.90	3.17	36.83	54.00	17.17
5455.84	PK	V	57.20	1.90	-	59.06	74.00	14.94
	AV	V	41.60	1.90	3.17	46.63	54.00	7.37

Test mode : 802.11ac_VHT40 MIMO_5755 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
			Not Detected					

Test mode : 802.11ac_VHT40 MIMO_5795 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
			Not Detected					

Test mode : 802.11ac_VHT80 MIMO _5210 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBµV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5145.76	PK	H	47.00	1.00	-	47.96	74.00	26.04
	AV	H	31.00	1.00	4.85	36.81	54.00	17.19
5145.84	PK	V	59.00	1.00	-	59.96	74.00	14.04
	AV	V	41.20	1.00	4.85	47.01	54.00	6.99
5352.26	PK	H	41.80	1.60	-	43.36	74.00	30.64
	AV	H	30.80	1.60	4.85	37.21	54.00	16.79
5352.26	PK	V	53.30	1.60	-	54.86	74.00	19.14
	AV	V	39.90	1.60	4.85	46.31	54.00	7.69

Test mode : 802.11ac_VHT80 MIMO _5290 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBµV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5142.25	PK	H	41.60	1.00	-	42.56	74.00	31.44
	AV	H	28.70	1.00	4.85	34.51	54.00	19.49
5142.25	PK	V	54.20	1.00	-	55.16	74.00	18.84
	AV	V	41.00	1.00	4.85	46.81	54.00	7.19
5354.82	PK	H	42.80	1.60	-	44.36	74.00	29.64
	AV	H	32.10	1.60	4.85	38.51	54.00	15.49
5354.82	PK	V	57.50	1.60	-	59.06	74.00	14.94
	AV	V	41.90	1.60	4.85	48.31	54.00	5.69

Test mode : 802.11ac_VHT80 MIMO _5530 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBµV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5459.01	PK	H	46.40	1.90	-	48.26	74.00	25.74
	AV	H	32.50	1.90	4.85	39.21	54.00	14.79
5459.01	PK	V	60.00	1.90	-	61.86	74.00	12.14
	AV	V	44.70	1.90	4.85	51.41	54.00	2.59

Test mode : 802.11ac_VHT80 MIMO _5610 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBµV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5452.89	PK	H	41.40	1.90	-	43.26	74.00	30.74
	AV	H	33.30	1.90	4.85	40.01	54.00	13.99
5452.89	PK	V	53.70	1.90	-	55.56	74.00	18.44
	AV	V	41.60	1.90	4.85	48.31	54.00	5.69

Test mode : 802.11ac_VHT80 MIMO_5690 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
			Not Detected					

Test mode : 802.11ac_VHT80 MIMO_5775 MHz

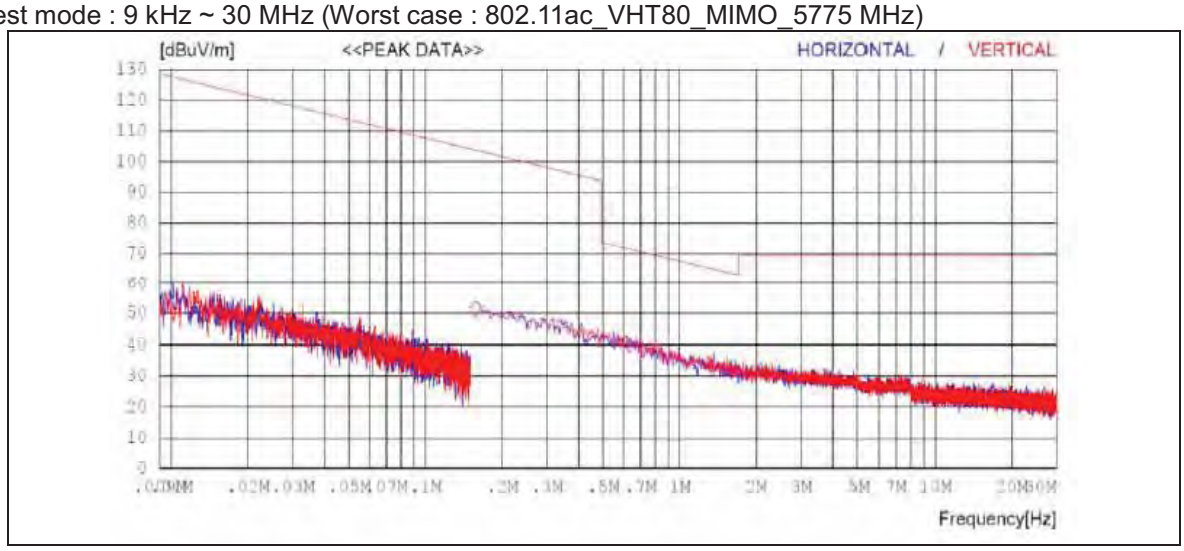
Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
			Not Detected					

Test mode : 802.11n_HT20_2412 MHz + 802.11a_5200 MHz

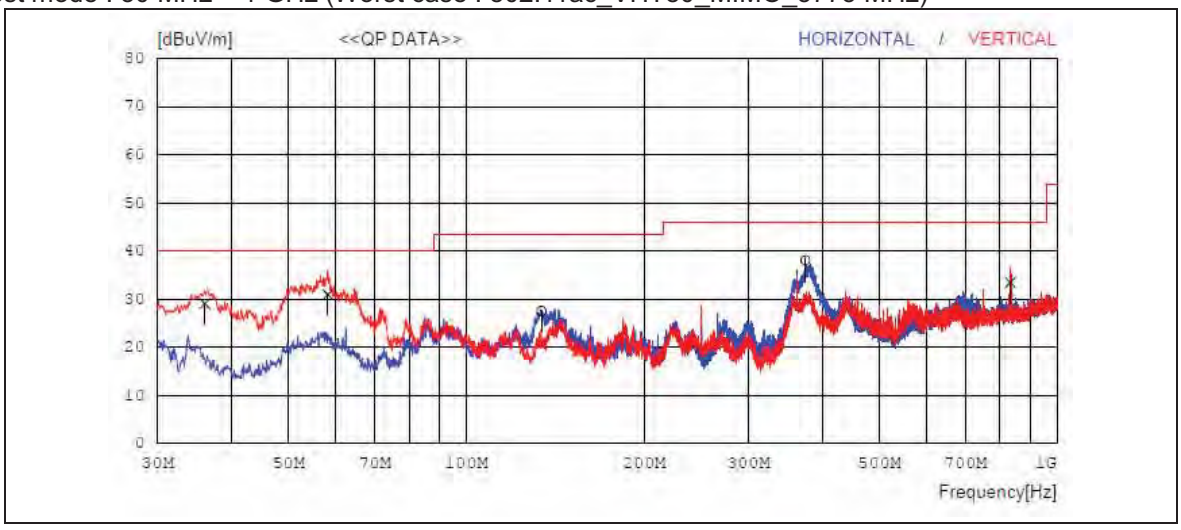
Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Average Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2389.99	PK	H	49.67	-4.70	-	44.93	74.00	29.07
	AV	H	38.36	-4.70	2.97	36.59	54.00	17.41
2389.99	PK	V	70.69	-4.70	-	65.95	74.00	8.05
	AV	V	50.92	-4.70	2.97	49.15	54.00	4.85
5142.25	PK	H	40.64	1.00	-	41.60	74.00	32.40
	AV	H	27.62	1.00	4.85	33.43	54.00	20.57
5142.25	PK	V	55.12	1.00	-	56.08	74.00	17.92
	AV	V	40.92	1.00	4.85	46.73	54.00	7.27
5354.82	PK	H	41.36	1.60	-	42.92	74.00	31.08
	AV	H	30.32	1.60	4.85	36.73	54.00	17.27
5354.82	PK	V	55.54	1.60	-	57.10	74.00	16.90
	AV	V	40.12	1.60	4.85	46.53	54.00	7.47

4.4.6.6 Measurement Plot

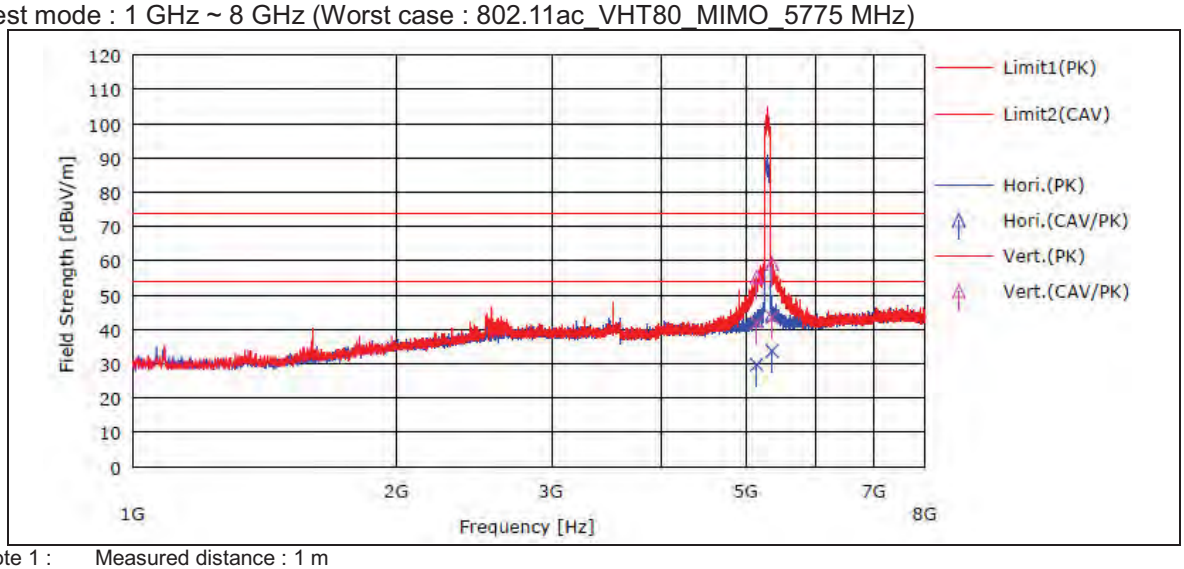
Test mode : 9 kHz ~ 30 MHz (Worst case : 802.11ac_VHT80_MIMO_5775 MHz)



Test mode : 30 MHz ~ 1 GHz (Worst case : 802.11ac_VHT80_MIMO_5775 MHz)

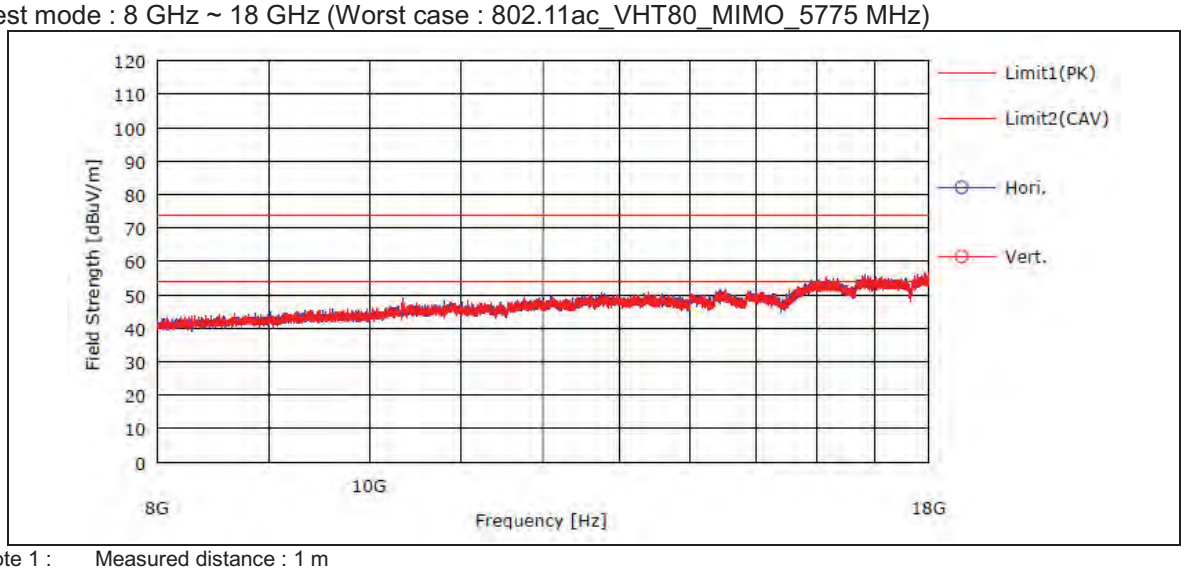


Test mode : 1 GHz ~ 8 GHz (Worst case : 802.11ac_VHT80_MIMO_5775 MHz)



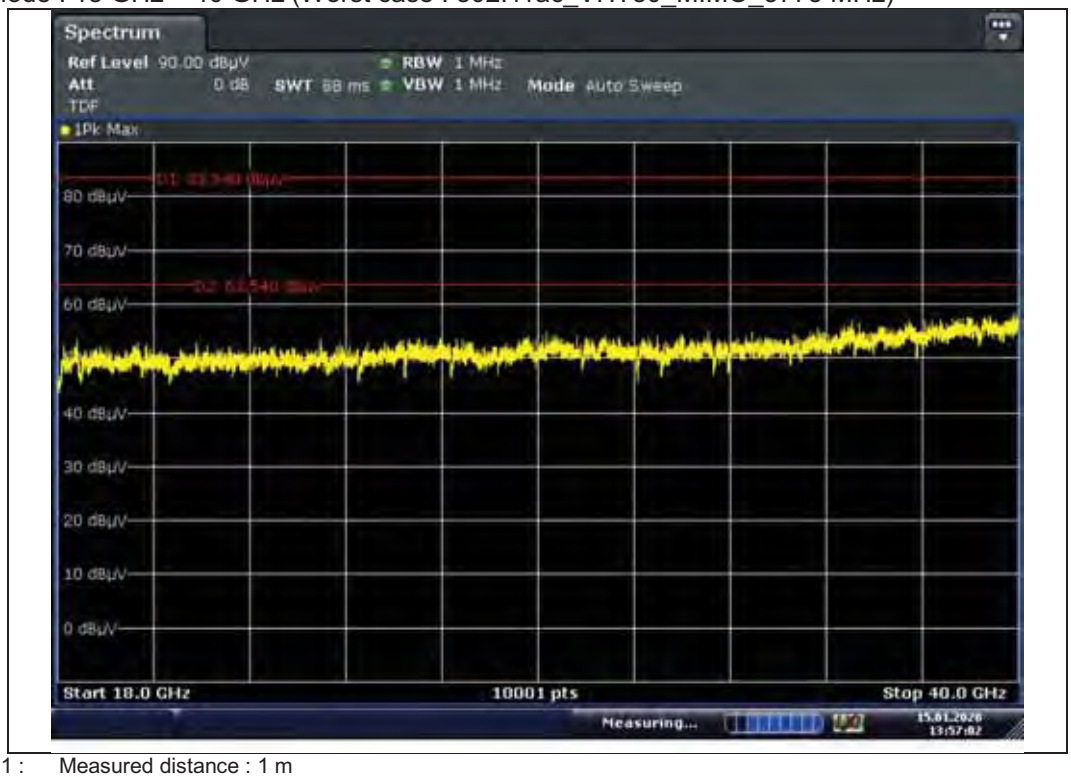
Note 1 : Measured distance : 1 m
Note 2 : Limit : Peak : 74 dBµV/m, Average : 54 dBµV/m

Test mode : 8 GHz ~ 18 GHz (Worst case : 802.11ac_VHT80_MIMO_5775 MHz)



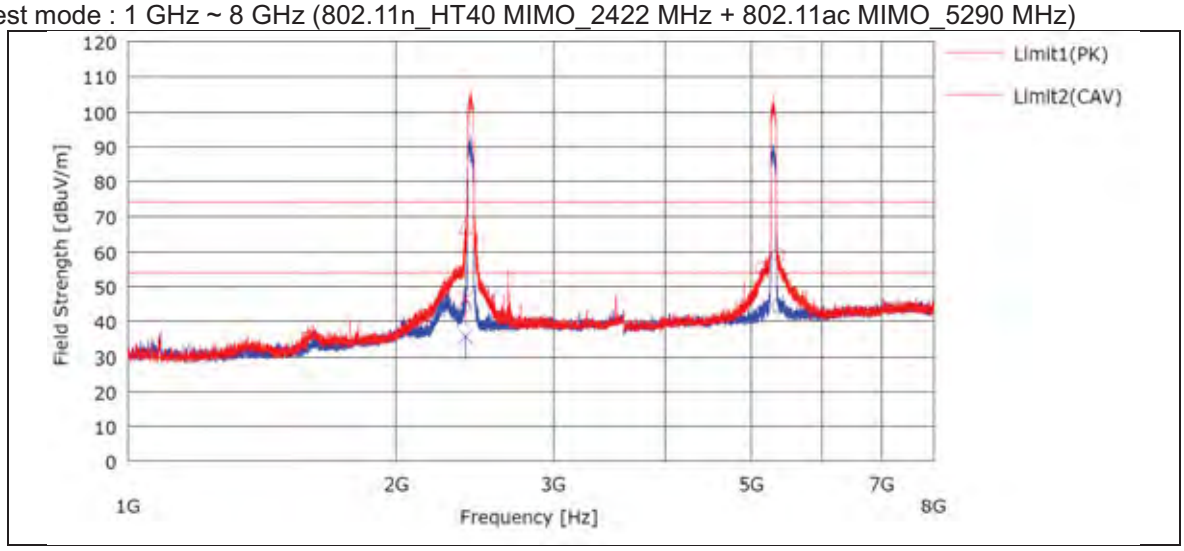
Note 1 : Measured distance : 1 m
Note 2 : Limit : Peak : 74 dBµV/m, Average : 54 dBµV/m

Test mode : 18 GHz ~ 40 GHz (Worst case : 802.11ac_VHT80_MIMO_5775 MHz)

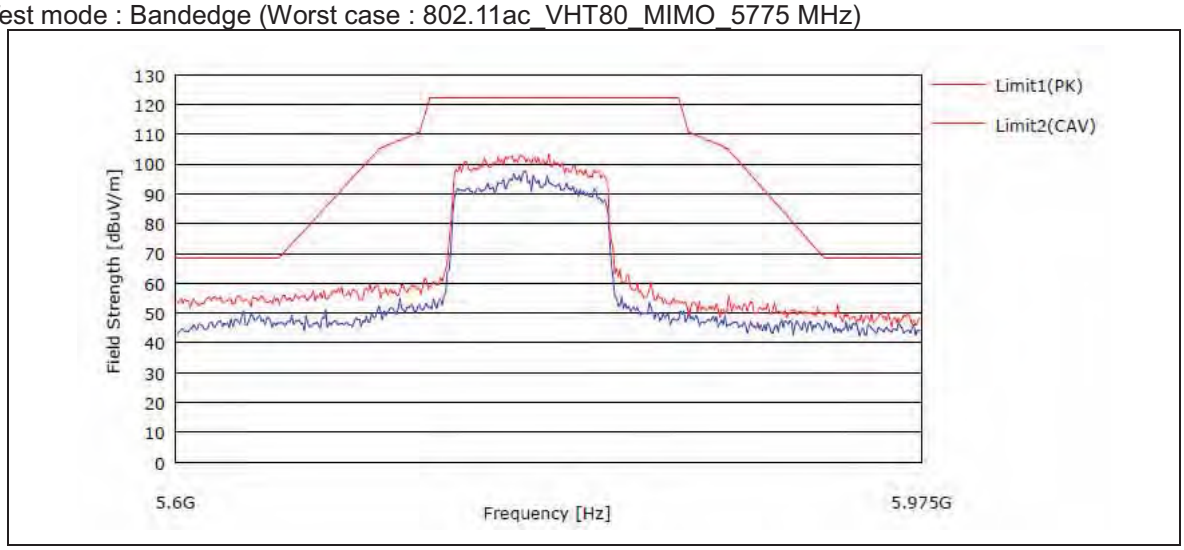


NOTE 1 : Measured distance : 1 m
NOTE 2 : Limit : Peak : 83.54 dBµV/m, Average : 63.54 dBµV/m

Test mode : 1 GHz ~ 8 GHz (802.11n_HT40 MIMO_2422 MHz + 802.11ac MIMO_5290 MHz)

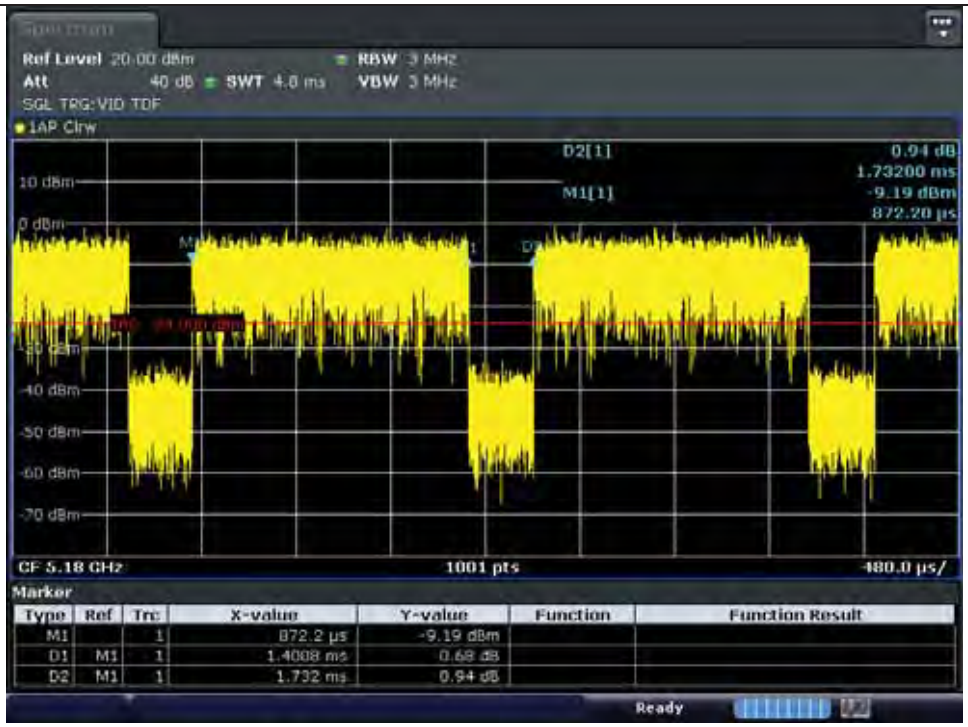


Test mode : Bandedge (Worst case : 802.11ac_VHT80_MIMO_5775 MHz)



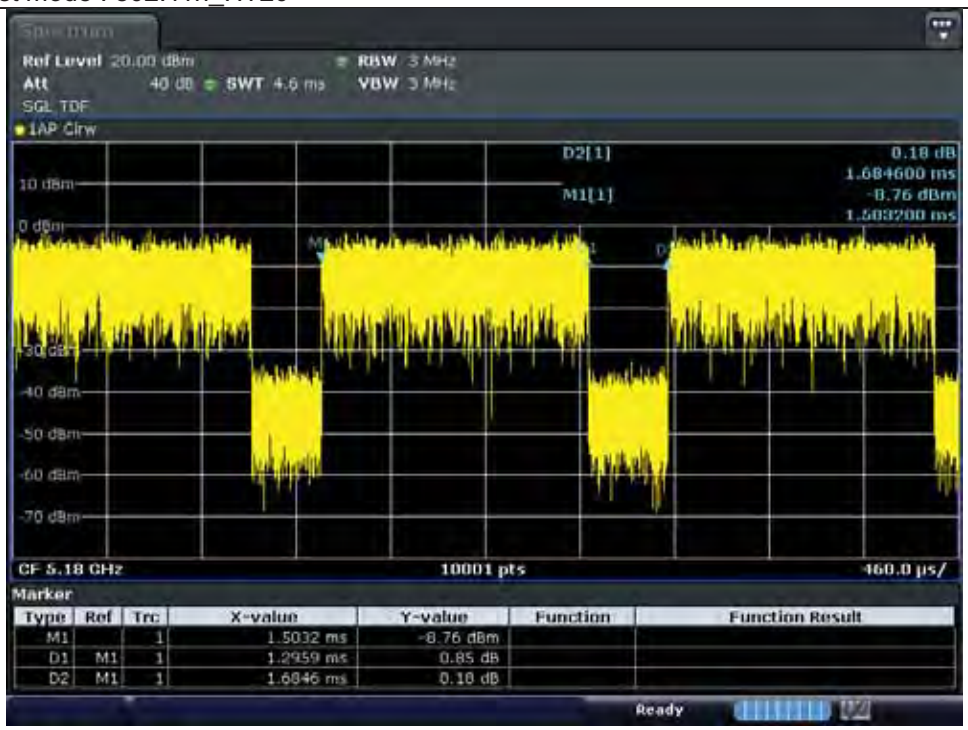
4.4.6.7 Measurement Plot_Dutycycle

Test mode : 802.11a



Average factor(dB) : 10log(ontime/period) = 0.92 dB

Test mode : 802.11n_HT20

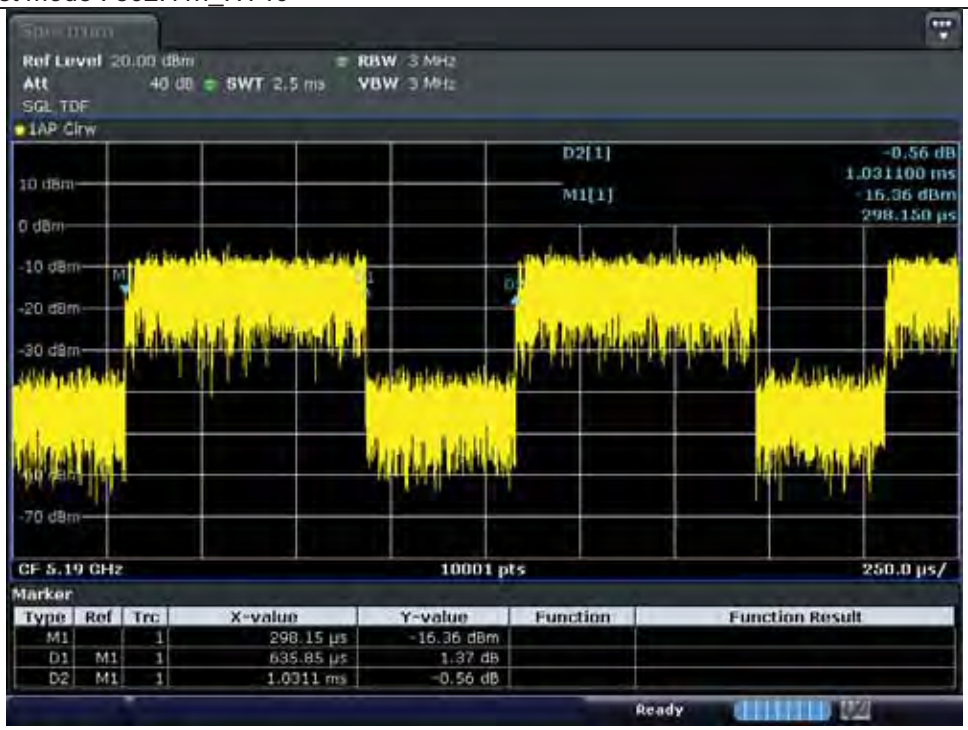


Average factor(dB) : 10log(ontime/period) = 1.14 dB

Test mode : 802.11n_HT20_MIMO

Average factor(dB) : 10log(ontime/period) = 1.89 dB

Test mode : 802.11n_HT40



Average factor(dB) : 10log(ontime/period) = 2.10 dB

Test mode : 802.11n_HT40 MIMO

Average factor(dB) : 10log(ontime/period) = 3.04 dB

Test mode : 802.11ac_VHT20

Average factor(dB) : 10log(ontime/period) = 1.17 dB

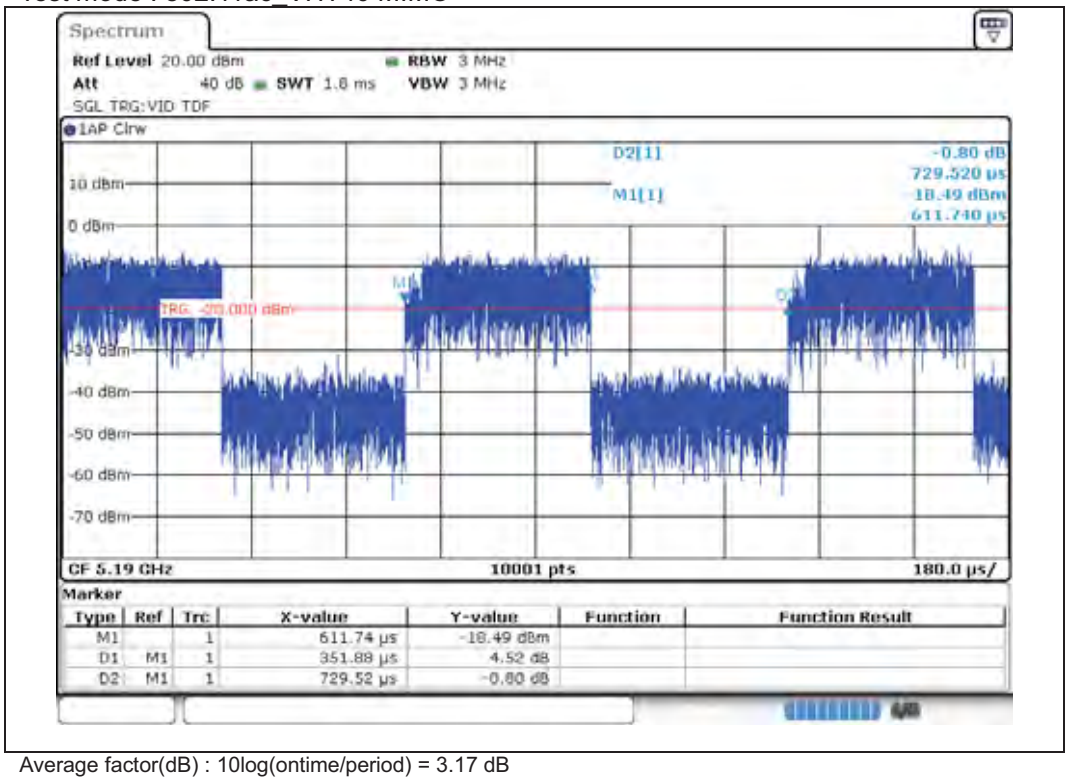
Test mode : 802.11ac_VHT20 MIMO

Average factor(dB) : 10log(ontime/period) = 1.77 dB

Test mode : 802.11ac_VHT40

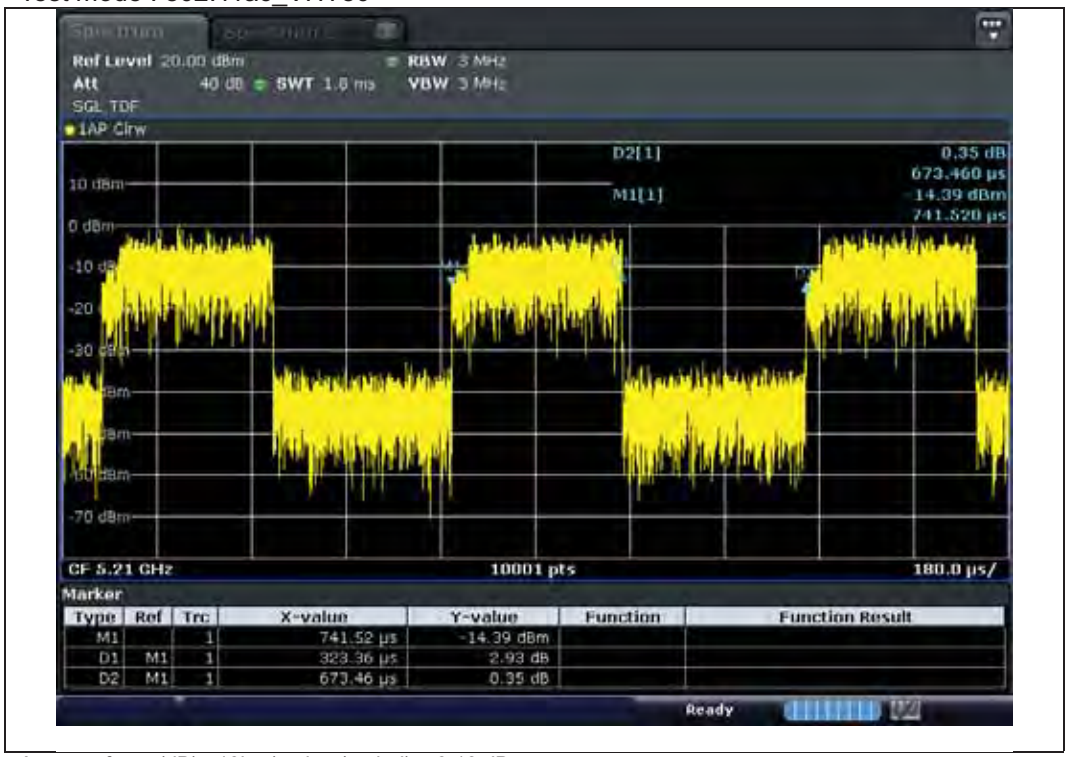
Average factor(dB) : 10log(ontime/period) = 1.83 dB

Test mode : 802.11ac_VHT40 MIMO



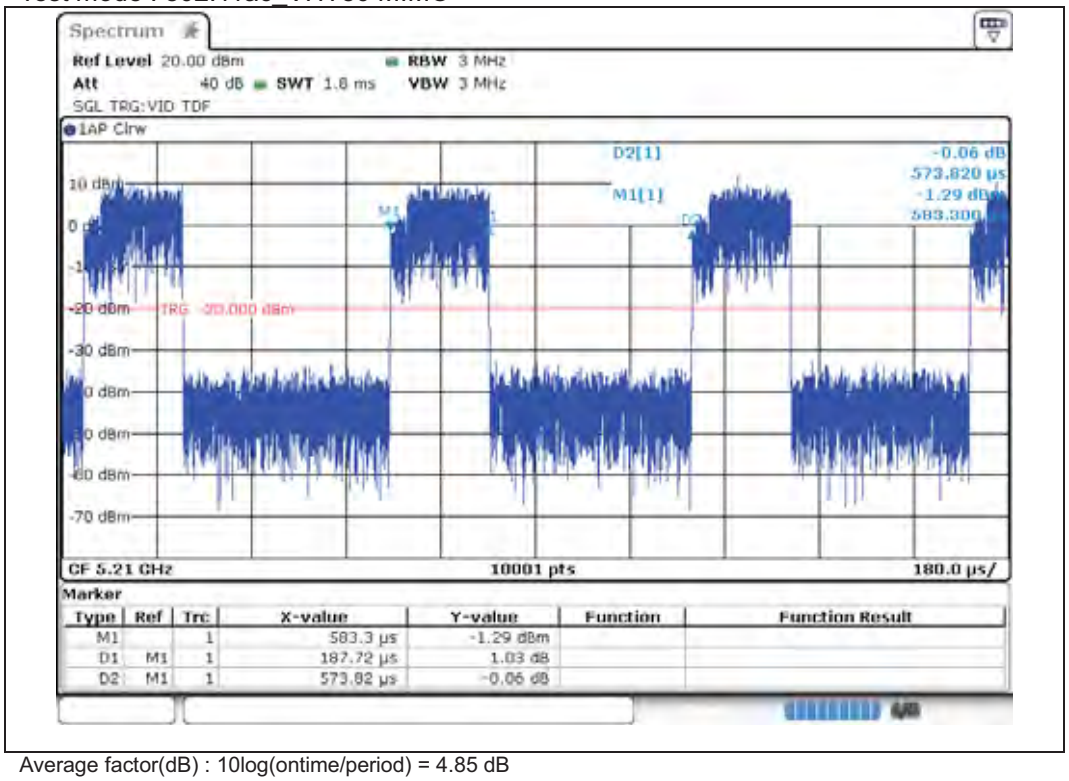
Average factor(dB) : 10log(ontime/period) = 3.17 dB

Test mode : 802.11ac_VHT80



Average factor(dB) : 10log(ontime/period) = 3.19 dB

Test mode : 802.11ac_VHT80 MIMO



Average factor(dB) : 10log(ontime/period) = 4.85 dB

4.4.7 Conducted Emission

4.4.7.1 Regulation

According to §15.207(a), and RSS-GEN 8.8 for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 Ω line impedance stabilization network (LISN).
Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Qausi-peak	Average
0.15 – 0.5	66 to 56 *	56 to 46 *
0.5 – 5	56	46
5 - 30	60	50

* Decreases with the logarithm of the frequency.

According to §15.107(a), for unintentional device, except for Class A digital devices, line conducted emission limits are the same as the above table.

4.4.7.2 Measurement Procedure

1) The EUT was placed on a wooden table of size, 1 m by 1.5 m, raised 80 cm in which is located 40 cm away from the vertical wall and 1.5 m away from the side wall of the shielded room.

2) Each current-carrying conductor of the EUT power cord was individually connected through a 50 Ω/50 μH LISN, which is an input transducer to a Spectrum Analyzer or an EMI/Field Intensity Meter, to the input power source.

3) Exploratory measurements were made to identify the frequency of the emission that had the highest amplitude relative to the limit by operating the EUT in a range of typical modes of operation, cable position, and with a typical system equipment configuration and arrangement. Based on the exploratory tests of the EUT, the one EUT cable configuration and arrangement and mode of operation that had produced the emission with the highest amplitude relative to the limit was selected for the final measurement.

4) The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment is the system) was then performed over the frequency range of 0.15 MHz to 30 MHz.

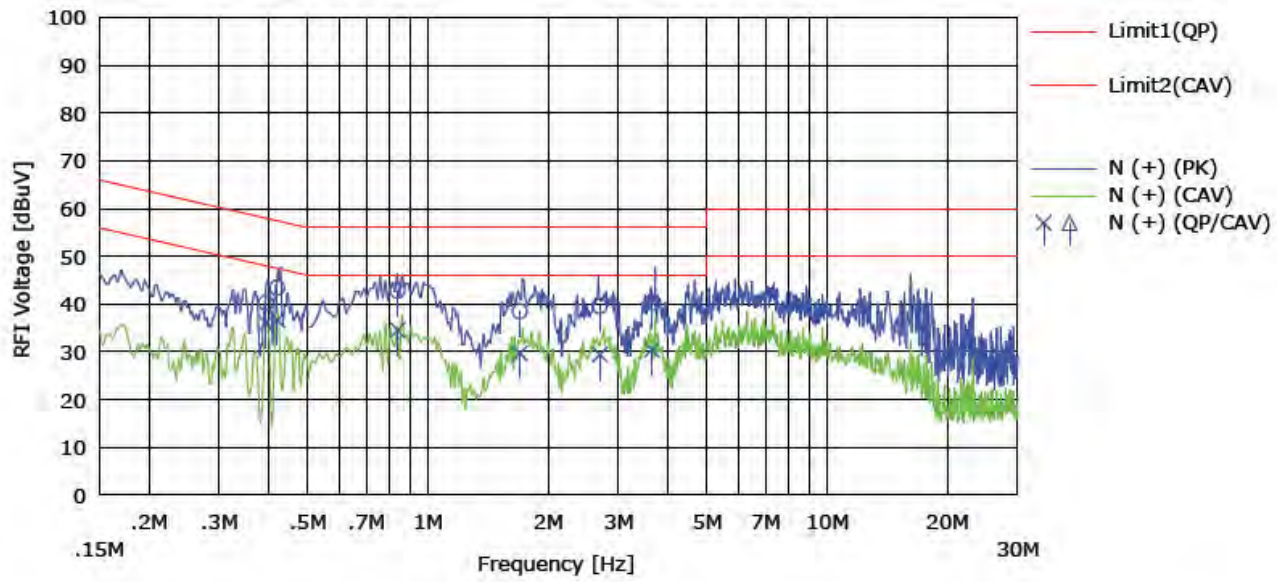
5) The measurements were made with the detector set to PEAK amplitude within a bandwidth of 10 kHz or to QUASIPEAK and AVERAGE within a bandwidth of 9 kHz. The EUT was in transmitting mode during the measurements.

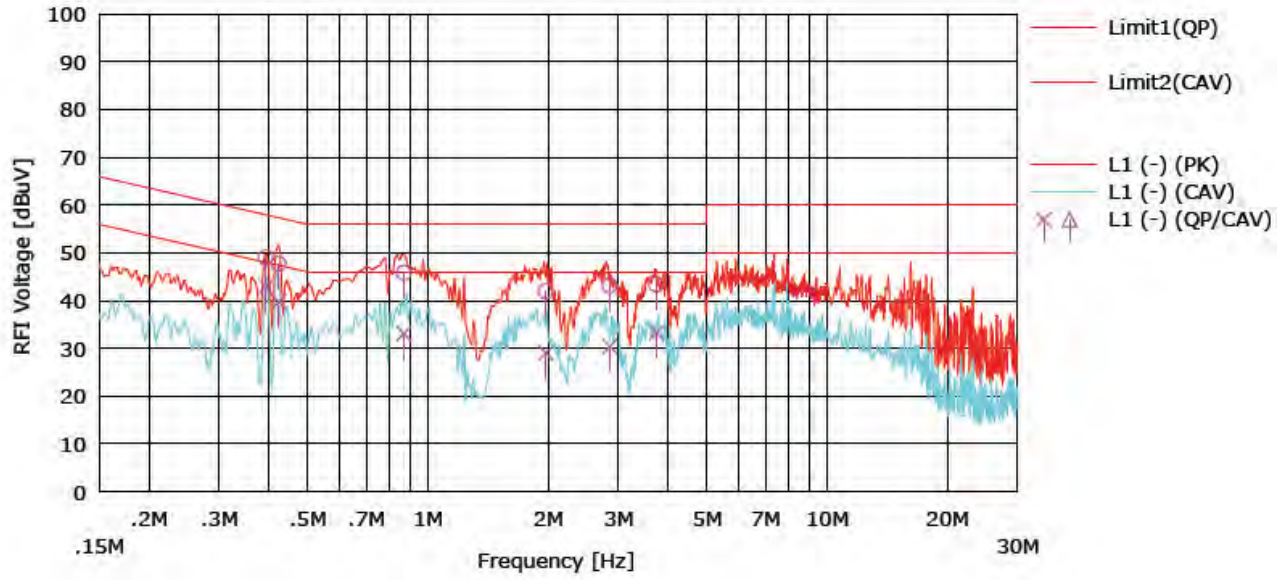
4.4.7.3 Result

Comply (measurement data : refer to the next page)

4.4.7.4 Measurement data

Test mode : 802.11n_HT40 MIMO_2422 MHz + 802.11ac MIMO_5290 MHz





NO	FREQ	READING QP	READING CAV	C.FACTOR	RESULT QP	RESULT CAV	LIMIT QP	LIMIT CAV	MARGIN QP	MARGIN CAV	PHASE
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.39301	20.0	15.7	20.2	40.2	35.9	58.0	48.0	17.8	12.1	N (+)
2	0.41959	23.1	16.4	20.3	43.4	36.7	57.5	47.5	14.1	10.8	N (+)
3	0.83937	22.7	14.5	20.1	42.8	34.6	56.0	46.0	13.2	11.4	N (+)
4	1.69957	18.4	9.7	20.0	38.5	29.7	56.0	46.0	17.5	16.3	N (+)
5	2.69494	19.5	9.4	20.0	39.5	29.4	56.0	46.0	16.5	16.6	N (+)
6	3.63218	20.2	10.4	20.1	40.3	30.5	56.0	46.0	15.7	15.5	N (+)
7	0.39264	28.8	22.6	20.3	49.1	42.9	58.0	48.0	8.9	5.1	L1 (-)
8	0.42292	27.4	19.4	20.3	47.7	39.7	57.4	47.4	9.7	7.7	L1 (-)
9	0.87093	25.7	13.0	20.1	45.8	33.1	56.0	46.0	10.2	12.9	L1 (-)
10	1.97444	21.9	9.0	20.1	41.9	29.1	56.0	46.0	14.1	16.9	L1 (-)
11	2.85585	23.0	10.4	20.1	43.1	30.5	56.0	46.0	12.9	15.5	L1 (-)
12	3.73393	23.2	13.2	20.1	43.3	33.3	56.0	46.0	12.7	12.7	L1 (-)

APPENDIX I

TEST EQUIPMENT USED FOR TESTS

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment.

Equipment	Manufacturer	Model	Serial No.	Cal. Date (yy.mm.dd)	Next Cal.Date (yy.mm.dd)
FSV Signal Analyzer	ROHDE&SCHWARZ	FSV30	103370	2019-10-15	2020-10-15
Power Sensor	KEYSIGHT	U2022XA	MY55320008	2020-08-21	2021-08-21
DC Power Supply	AGILENT	E3632A	MY51160055	2020-04-23	2021-04-23
Digital MultiMeter	HP	34401A	US36025428	2020-01-14	2021-01-14
ATTENUATOR	INMET	26A-20	TR010	2020-10-12	2021-10-12
Signal Generator	ROHDE&SCHWARZ	SMB100A	178384	2020-10-13	2021-10-13
EMI Test Receiver	ROHDE&SCHWARZ	ESU40	100445	2019-12-13	2020-12-13
BiLog Antenna	Schwarzbeck	VULB9160	9160-3381	2019-06-14	2021-06-14
Attenuator	JFW	50FPE-006N	-	2020-04-22	2021-04-22
Preamplifier	TSJ	MLA-10k01-b01-27	1870369	2020-04-22	2021-04-22
Antenna Mast(10 m)	TOKIN	5977	-	-	-
Antenna Mast(10 m)	Innco	MA4640-XPET-0800	578	-	-
Controller(10 m)	TOKIN	5909L	141909L-1	-	-
Controller(10 m)	Innco	CO3000	40040217	-	-
Turn Table(10 m)	TOKIN	5983-1.5	-	-	-
10 m Semi-Anechoic Chamber	SY CORPORATION	-	-	-	-
Active Loop H-Field	ETS	6502	00150598	2019-05-15	2021-05-15
Double Ridege Horn Antenna	ETS	3117	00168719	2019-08-29	2021-08-29
Double Ridege Horn Antenna	A.H Systems, Inc	SAS-574	465	2019-04-25	2021-04-25
PREAMPLIFIER	Agilent	8449B	3008A02110	2020-01-10	2021-01-10
PREAMPLIFIER	A.H Systems, Inc	PAM-1840VH	166	2020-01-10	2021-01-10
EMI Test Receiver	ROHDE&SCHWARZ	ESR7	101440	2019-12-13	2020-12-13
LISN	ROHDE&SCHWARZ	ENV216	101883	2020-04-22	2021-04-22
Pulse Limiter	Schwarzbeck	VTSD 9561-F	9561-F189	2020-04-22	2021-04-22
High pass filter	Wainwright Instruments GmbH	PAM-1840VH WHNX6-5840-8000-26500-60CC	4	2020-01-10	2021-01-10