

TEST REPORT

Applicant: Emdoor digital technology Co.,Ltd

Address of Applicant: Meigu bld, Wonderful life wisdom Valley technology Park, No.83 Dabao road, Baoan district, Shenzhen, China

Manufacturer/Factory: Visiontech Dominicana, srl

Address of Manufacturer/Factory: Franco bido no 205, nibaje, Dominican republic, zip code 5100

Equipment Under Test (EUT)

Product Name: Tablet

Model No.: tablet

Trade Mark: greatwall

FCC ID: 2A2CZW1027VGTW

Applicable standards: FCC CFR Title 47 Part 15 Subpart E Section 15.407

Date of sample receipt: Jun. 18, 2021

Date of Test: Jun. 18, 2021~Jun. 25, 2021

Date of report issued: Jun. 26, 2021

Test Result : PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Robinson Luo

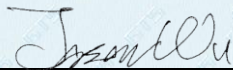
Laboratory Manager

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

2 Version

Version No.	Date	Description
00	Jun. 26, 2021	Original

Prepared By:




Tested/Project Engineer

Date:

Jun. 26, 2021

Check By:



Reviewer

Date:

Jun. 26, 2021

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
AC Power Line Conducted Emission	15.207	Pass
Conducted Peak Output Power	15.407(a)(3)	Pass
Channel Bandwidth	15.407(e)	Pass
Power Spectral Density	15.407(a)(3)	Pass
Band Edge	15.407(b)(4)	Pass
Spurious Emission	15.205/15.209/15.407(b)(4)	Pass
Frequency Stability	15.407(g)	Pass

Remarks:

1. Pass: The EUT complies with the essential requirements in the standard.
2. Test according to ANSI C63.10:2013.

4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	30MHz-200MHz	3.8039dB	(1)
Radiated Emission	200MHz-1GHz	3.9679dB	(1)
Radiated Emission	1GHz-18GHz	4.29dB	(1)
Radiated Emission	18GHz-40GHz	3.30dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	3.44dB	(1)

Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.

5 General Information

5.1 General Description of EUT

Product Name:	Tablet
Model No.:	tablet
Serial No.:	N/A
Hardware Version:	EM_T6818D_V1_1_L20
Software Version:	100011886_GTW_20210625
Test sample(s) ID:	GTSL202106000300-1
Sample(s) Status:	Engineer sample
Operation Frequency:	802.11a/802.11n(HT20)/802.11ac(HT20): 5745MHz ~ 5825MHz 802.11n(HT40)/ 802.11ac(HT40): 5755MHz ~ 5795MHz 802.11ac(HT80): 5775MHz
Channel numbers:	802.11a/802.11n(HT20)/802.11ac(HT20): 5 802.11n(HT40)/ 802.11ac(HT40): 2 802.11ac(HT80): 1
Channel bandwidth:	802.11a/802.11n(HT20)/802.11ac(HT20) : 20MHz 802.11n(HT40)/802.11ac(HT40) : 40MHz 802.11ac(HT80): 80MHz
Modulation technology:	802.11a/802.11n(H20)/802.11n(H40)/802.11ac(HT20)/802.11ac(HT40) /802.11ac(HT80): Orthogonal Frequency Division Multiplexing (OFDM)
Antenna Type:	FPCB antenna
Antenna gain:	2.55dBi
Power supply:	Adapter:BSY01J3050200U U INPUT: 100-240V~ 50/60Hz 0.3A OUTPUT: DC 5V 2A

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
149	5745MHz	151	5755MHz	153	5765MHz	155	5775MHz
157	5785MHz	159	5795MHz	161	5805MHz	163	5815MHz
165	5825MHz						

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Test channel	Frequency (MHz)		
	802.11 a/n/ac(HT20)	802.11 n/ac(HT40)	802.11ac(HT80)
Lowest channel	5745	5755	5765
Middle channel	5785	5795	5775
Highest channel	5825	5795	5805

5.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode
<p><i>Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.</i></p>	

<p>We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:</p>	
<p>Per-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.</p>	
Mode	Data rate
802.11a	6Mbps
802.11n(HT20)	6.5Mbps
802.11n(HT40)	13Mbps
802.11ac(HT20)	6.5Mbps
802.11ac(HT40)	13.5Mbps
802.11ac(HT80)	29.3Mbps

5.3 Description of Support Units

None.

5.4 Deviation from Standards

None.

5.5 Abnormalities from Standard Conditions

None.

5.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

● **FCC—Registration No.: 381383**

Designation Number: CN5029

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files.

● **IC —Registration No.: 9079A**

CAB identifier: CN0091

The 3m Semi-

anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

● **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

5.7 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone,

Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

Tel: 0755-27798480

Fax: 0755-27798960

6 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July. 02 2020	July. 01 2025
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June. 24 2021	June. 23 2022
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 24 2021	June. 23 2022
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 24 2021	June. 23 2022
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 24 2021	June. 23 2022
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 24 2021	June. 23 2022
9	Coaxial Cable	GTS	N/A	GTS211	June. 24 2021	June. 23 2022
10	Coaxial cable	GTS	N/A	GTS210	June. 24 2021	June. 23 2022
11	Coaxial Cable	GTS	N/A	GTS212	June. 24 2021	June. 23 2022
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 24 2021	June. 23 2022
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 24 2021	June. 23 2022
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 24 2021	June. 23 2022
15	Band filter	Amindeon	82346	GTS219	June. 24 2021	June. 23 2022
16	Power Meter	Anritsu	ML2495A	GTS540	June. 24 2021	June. 23 2022
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 24 2021	June. 23 2022
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 24 2021	June. 23 2022
19	Splitter	Agilent	11636B	GTS237	June. 24 2021	June. 23 2022
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 24 2021	June. 23 2022
21	Breitband hornantenne	SCHWARZBECK	BBHA 9170	GTS579	Oct. 18 2020	Oct. 17 2021
22	Amplifier	TDK	PA-02-02	GTS574	Oct. 18 2020	Oct. 17 2021
23	Amplifier	TDK	PA-02-03	GTS576	Oct. 18 2020	Oct. 17 2021
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	June. 24 2021	June. 23 2022

Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May.15 2019	May.14 2022
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 24 2021	June. 23 2022
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 24 2021	June. 23 2022
4	ENV216 2-L-V-NETZNACHB.DE	ROHDE&SCHWARZ	ENV216	GTS226	June. 24 2021	June. 23 2022
5	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	KTJ	TA328	GTS233	June. 24 2021	June. 23 2022
8	Absorbing clamp	Elektronik-Feinmechanik	MDS21	GTS229	June. 24 2021	June. 23 2022
9	ISN	SCHWARZBECK	NTFM 8158	GTS565	June. 24 2021	June. 23 2022
10	High voltage probe	SCHWARZBECK	TK9420	GTS537	July. 10 2020	July. 09 2021

RF Conducted Test:						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	June. 24 2021	June. 23 2022
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 24 2021	June. 23 2022
3	Spectrum Analyzer	Agilent	E4440A	GTS533	June. 24 2021	June. 23 2022
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	June. 24 2021	June. 23 2022
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	June. 24 2021	June. 23 2022
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	June. 24 2021	June. 23 2022
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	June. 24 2021	June. 23 2022
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	June. 24 2021	June. 23 2022
9	Spectrum Analyzer	R&S	FSV40	GTS559	June. 24 2021	June. 23 2022

General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 24 2021	June. 23 2022
2	Barometer	ChangChun	DYM3	GTS255	June. 24 2021	June. 23 2022

7 Test results and Measurement Data

7.1 Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203
<i>15.203 requirement: 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, 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.</i>	
E.U.T Antenna:	
<i>The antennas are FPCB antenna, the best case gain of the antennas are 2.55dBi, reference to the appendix II for details</i>	

7.2 Conducted Emissions

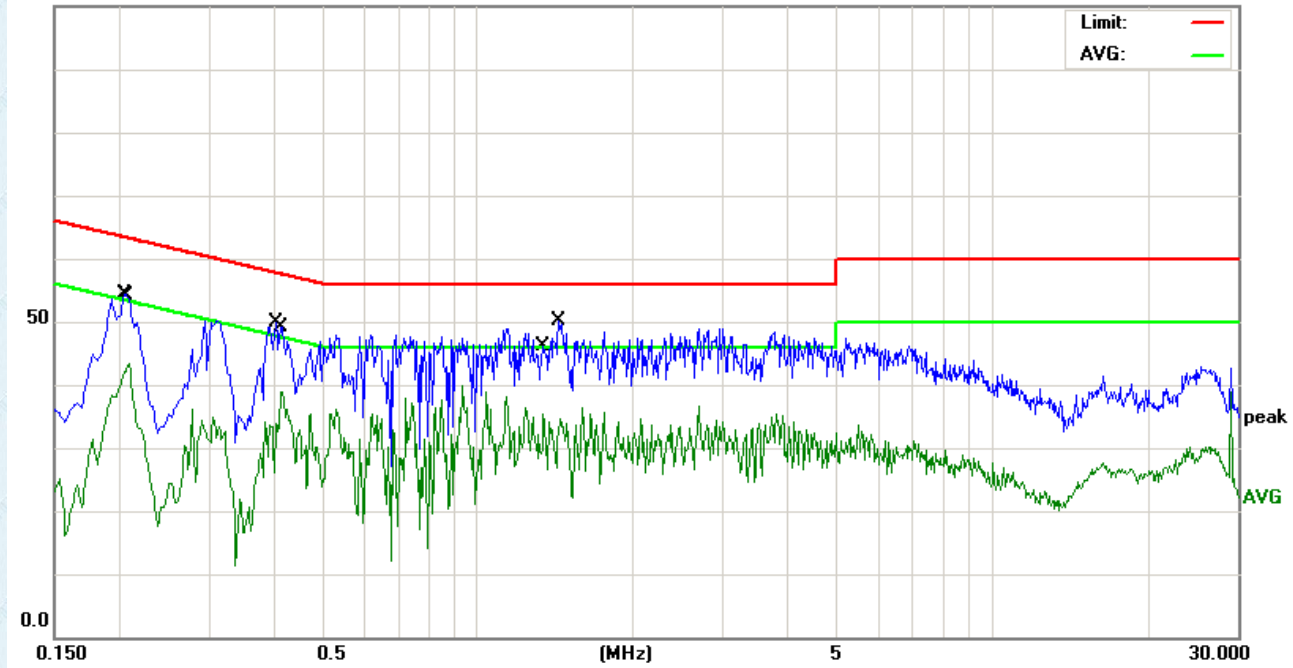
Test Requirement:	FCC Part15 C Section 15.207					
Test Method:	ANSI C63.10:2013					
Test Frequency Range:	150KHz to 30MHz					
Class / Severity:	Class B					
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto					
Limit:	Frequency range (MHz)		Limit (dBuV)			
			Quasi-peak		Average	
	0.15-0.5		66 to 56*		56 to 46*	
	0.5-5		56		46	
	5-30		60		50	
* Decreases with the logarithm of the frequency.						
Test setup:	<p>Remark E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p>					
Test procedure:	<ol style="list-style-type: none"> 1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement. 					
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Test voltage:	AC 120V, 60Hz					
Test results:	Pass					

Remark: Both high and low voltages have been tested to show only the worst low voltage test data.

Measurement data

Line:

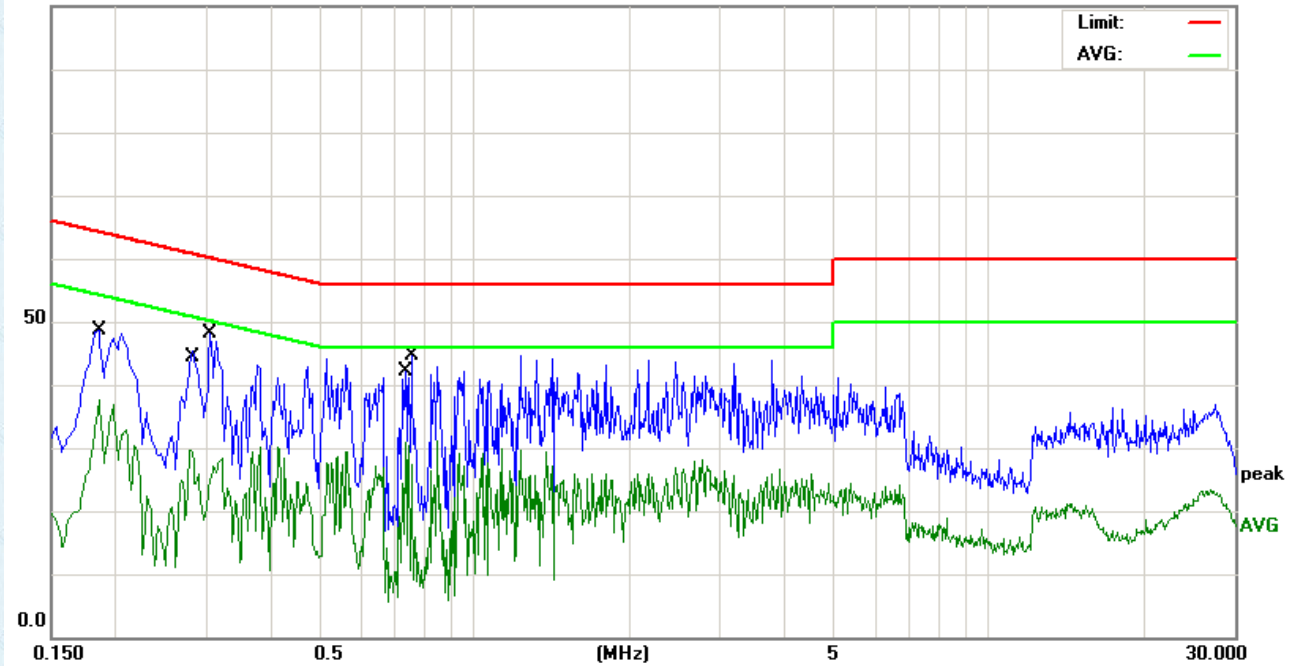
100.0 dBuV



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.2060	43.39	11.09	54.48	63.36	-8.88	QP
2		0.2100	32.32	11.06	43.38	53.20	-9.82	AVG
3		0.4060	39.72	10.12	49.84	57.73	-7.89	QP
4		0.4180	28.68	10.11	38.79	47.49	-8.70	AVG
5		1.3420	25.29	9.96	35.25	46.00	-10.75	AVG
6	*	1.4340	40.07	9.96	50.03	56.00	-5.97	QP

Neutral:

100.0 dBuV

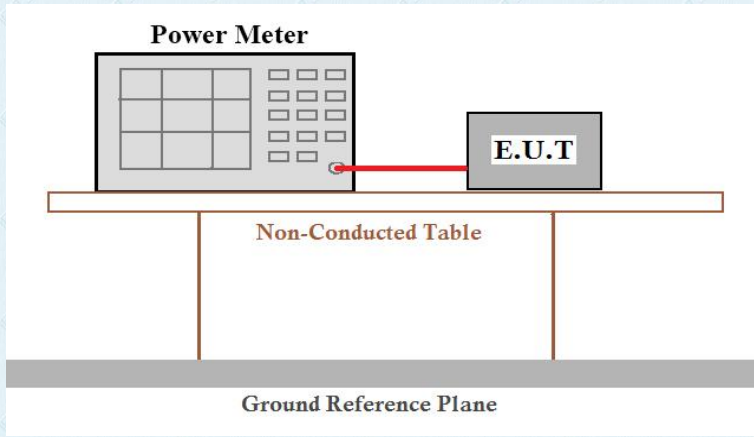


No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Detector
		MHz	Level	Factor	ment			
			dBuV	dB	dBuV	dBuV	dB	
1		0.1860	37.42	11.31	48.73	64.21	-15.48	QP
2		0.1860	26.29	11.31	37.60	54.21	-16.61	AVG
3		0.2779	18.90	10.80	29.70	50.88	-21.18	AVG
4		0.3060	37.88	10.20	48.08	60.08	-12.00	QP
5		0.7340	21.00	9.97	30.97	46.00	-15.03	AVG
6	*	0.7539	34.58	9.97	44.55	56.00	-11.45	QP

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss
4. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both *limits and measurement with the average detector receiver is unnecessary.*

7.3 Conducted Peak Output Power

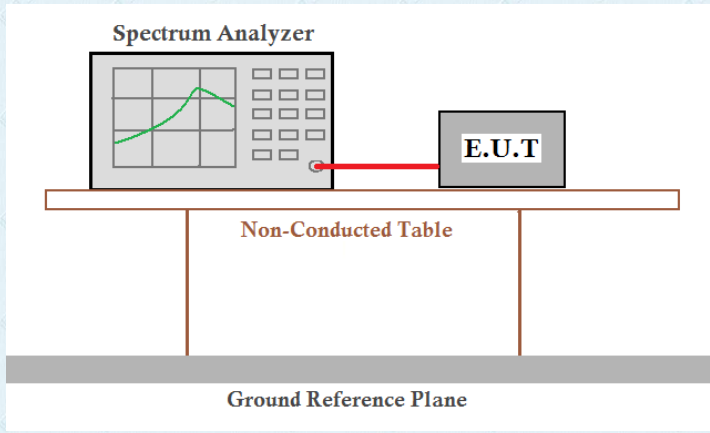
Test Requirement:	FCC Part15 E Section 15.407(a)(3)
Test Method:	ANSI C63.10:2013 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01
Limit:	30dBm
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

Test CH	Output Power (dBm)						Limit(dBm)	Result
	802.11a	802.11n (HT20)	802.11ac (HT20)	802.11n (HT40)	802.11ac (HT40)	802.11ac (HT80)		
Lowest	10.48	10.25	10.45	9.81	9.99	9.13	30.00	Pass
Middle	10.86	10.91	10.84	--	--	--		
Highest	9.45	9.27	9.17	9.34	9.43	--		

Remark: "--" is not applicable

7.4 Channel Bandwidth

Test Requirement:	FCC Part15 E Section 15.407(e)
Test Method:	ANSI C63.10:2013 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01
Limit:	>500KHz
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

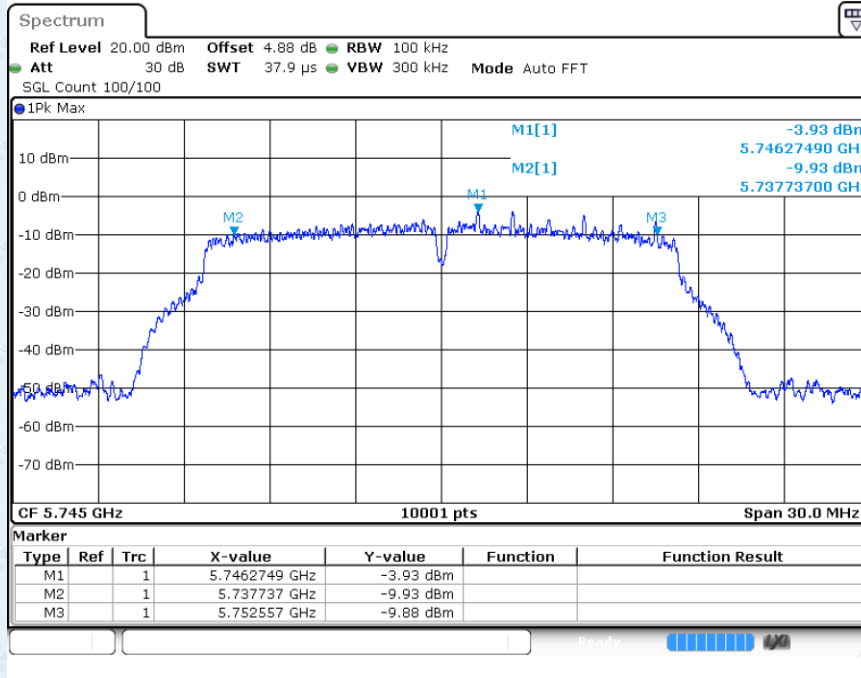
Test CH	Channel Bandwidth (MHz)						Limit (KHz)	Result
	802.11a	802.11n (HT20)	802.11ac (VHT20)	802.11n (HT40)	802.11ac (VHT40)	802.11ac (VHT80)		
Lowest	14.82	16.911	17.559	35.07	35.112	73.824	>500	Pass
Middle	14.793	15.075	16.422	--	--	--		
Highest	15.108	15.42	16.899	35.088	35.064	--		

Test CH	99%Channel Bandwidth (MHz)						Limit (KHz)	Result
	802.11a	802.11n (HT20)	802.11ac (VHT20)	802.11n (HT40)	802.11ac (VHT40)	802.11ac (VHT80)		
Lowest	16.414	17.542	17.572	36.002	35.912	74.945	>500	Pass
Middle	16.381	17.476	17.506	--	--	--		
Highest	16.375	17.596	17.68	35.984	35.774	--		

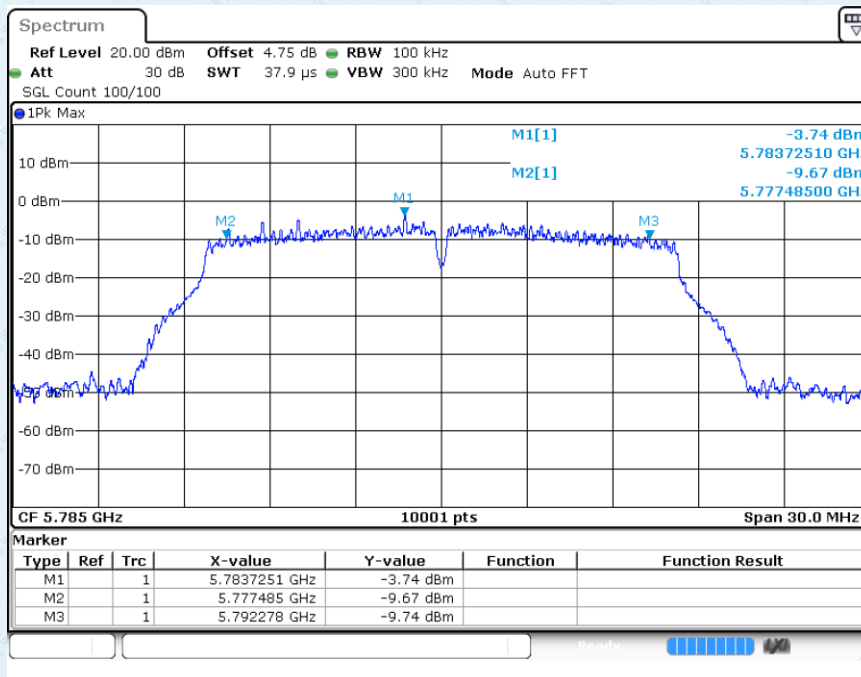
Remark: "---"is not applicable

Test plot as follows:
6dB Occupied Bandwidth

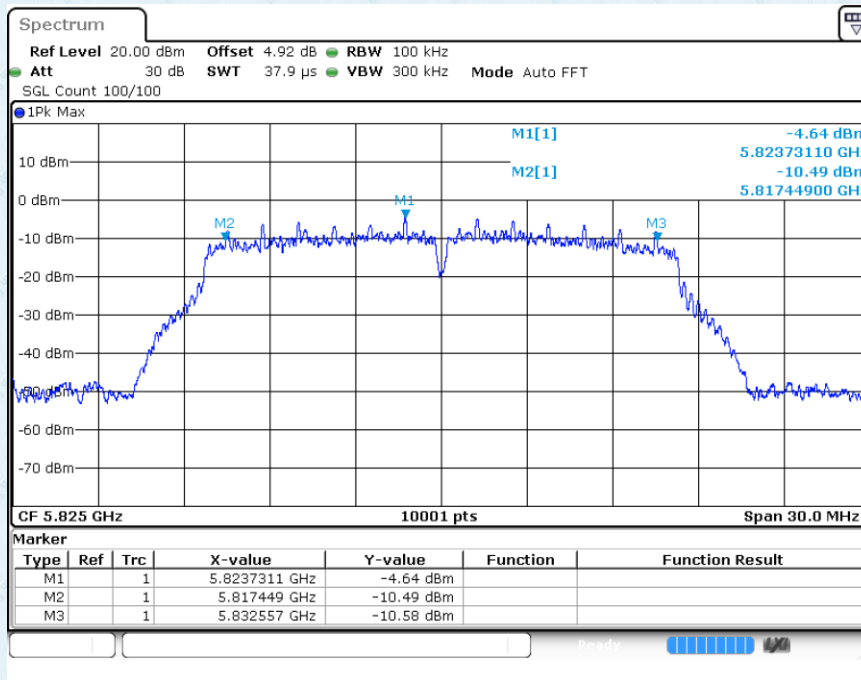
Test mode: 802.11a



Lowest channel

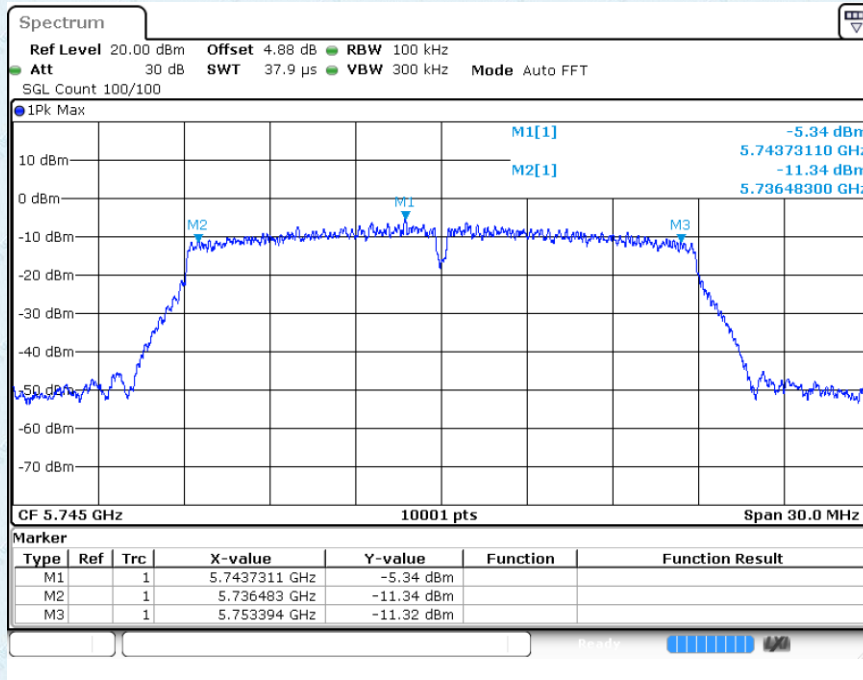


Middle channel

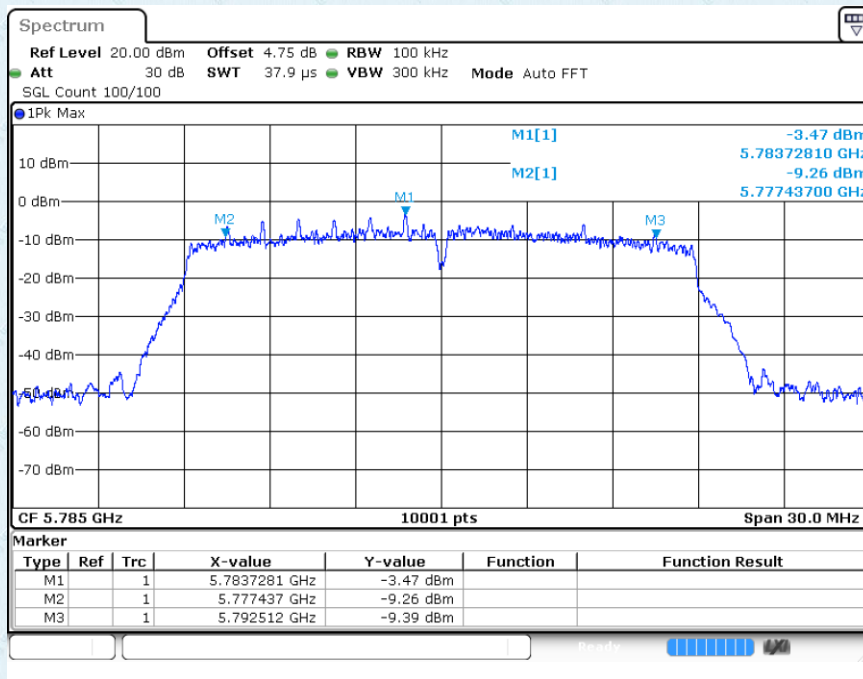


Highest channel

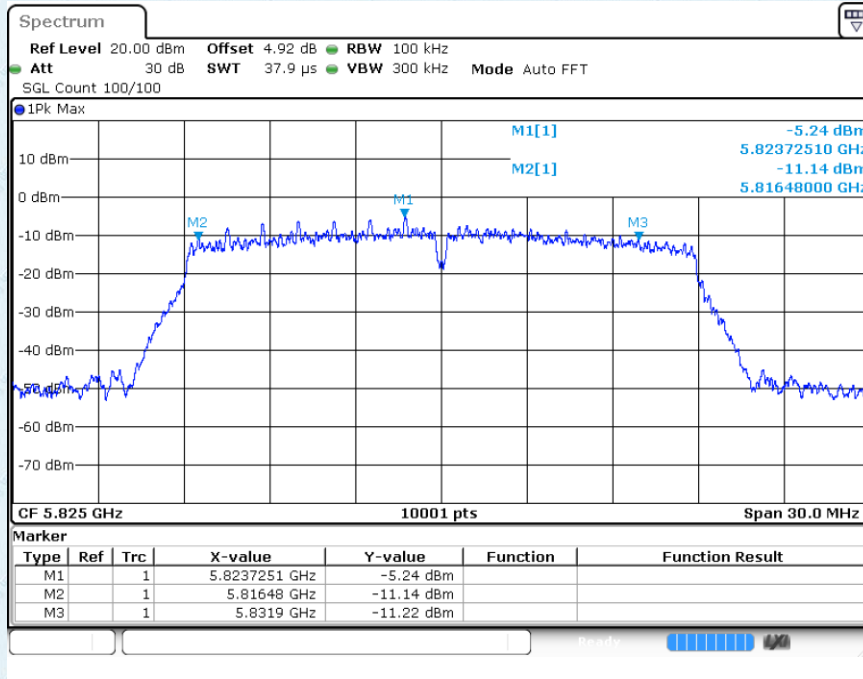
Test mode: 802.11n(HT20)



Lowest channel

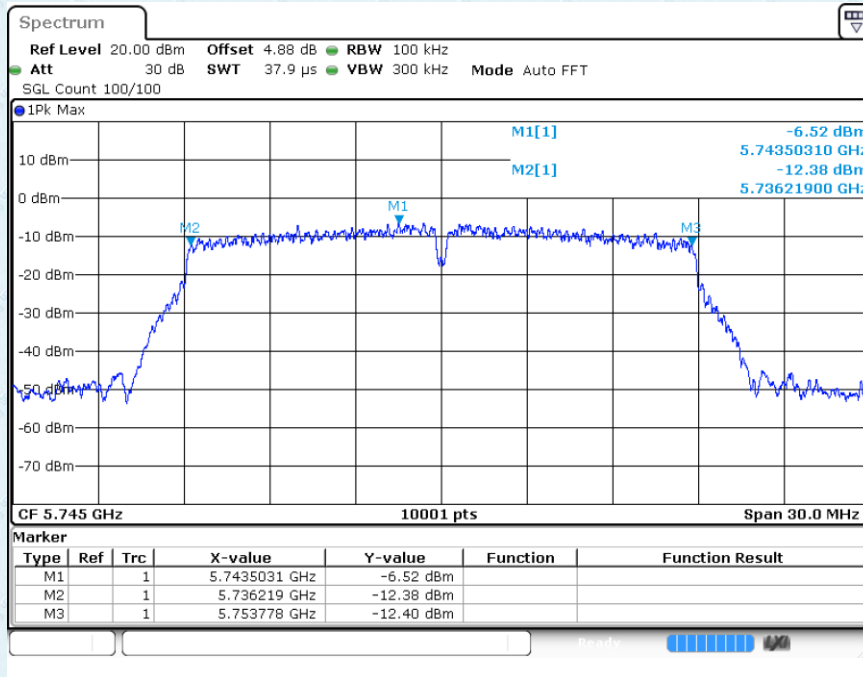


Middle channel

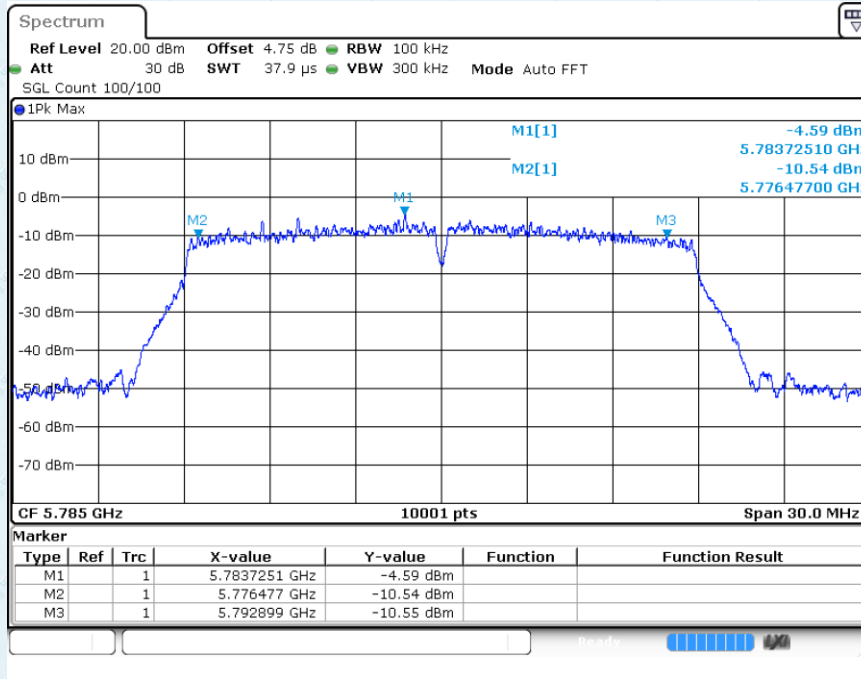


Highest channel

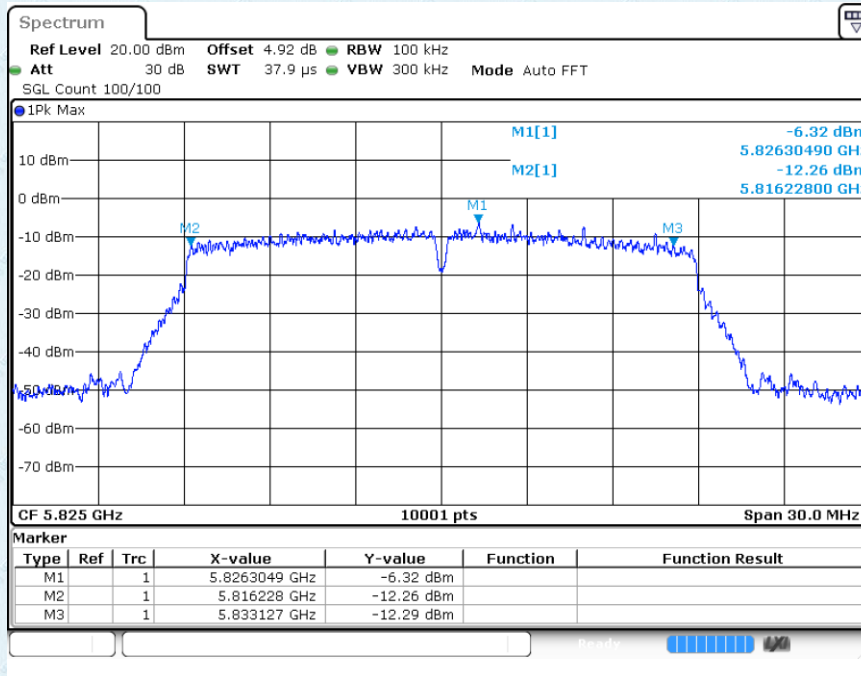
Test mode: 802.11ac(VHT20)



Lowest channel

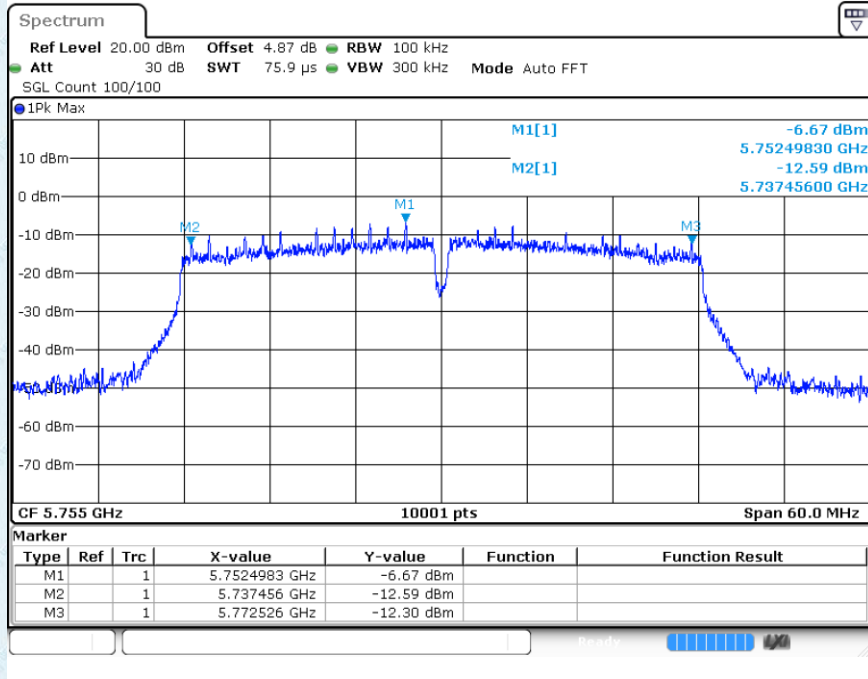


Middle channel

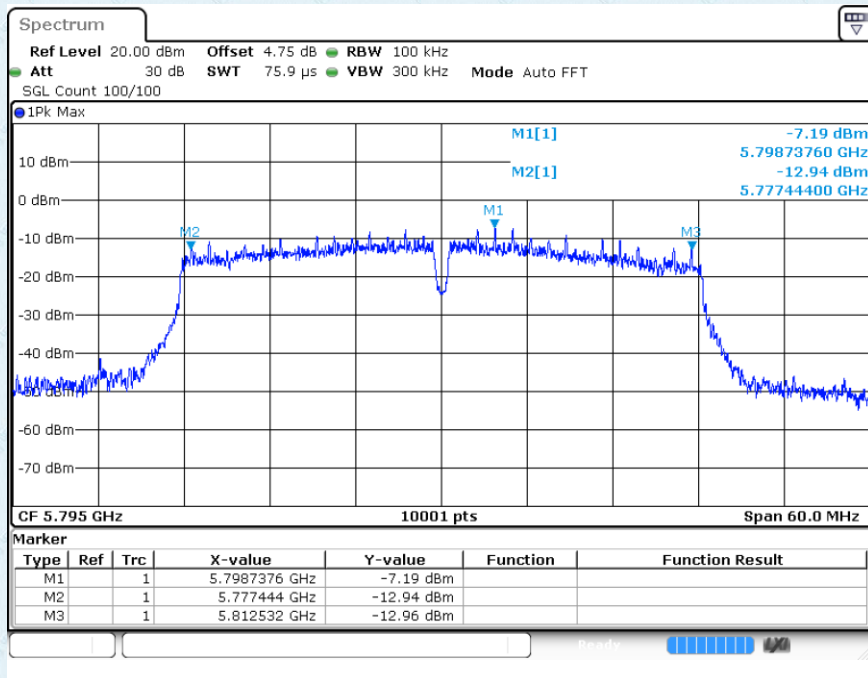


Highest channel

Test mode: 802.11n(HT40)

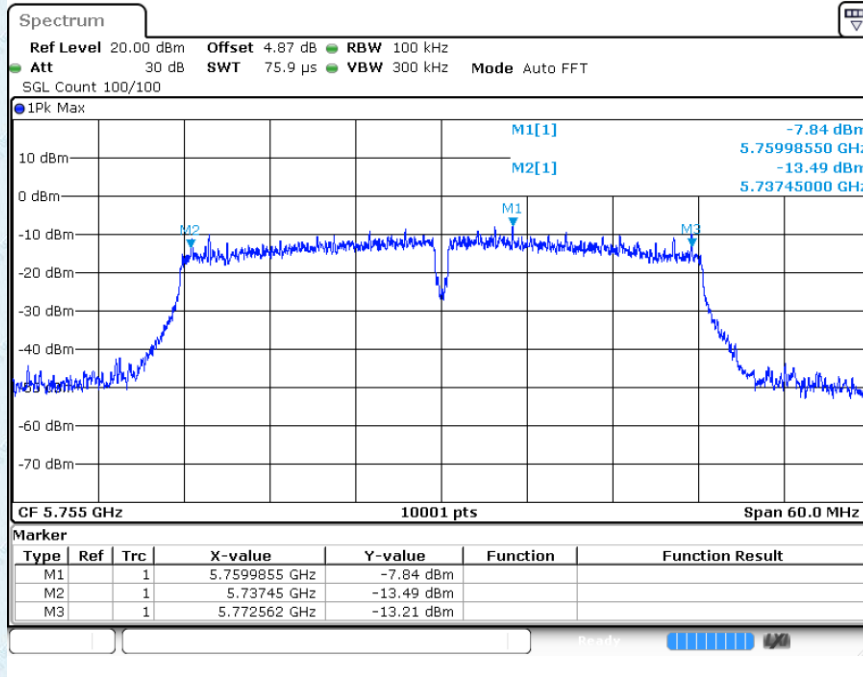


Lowest channel

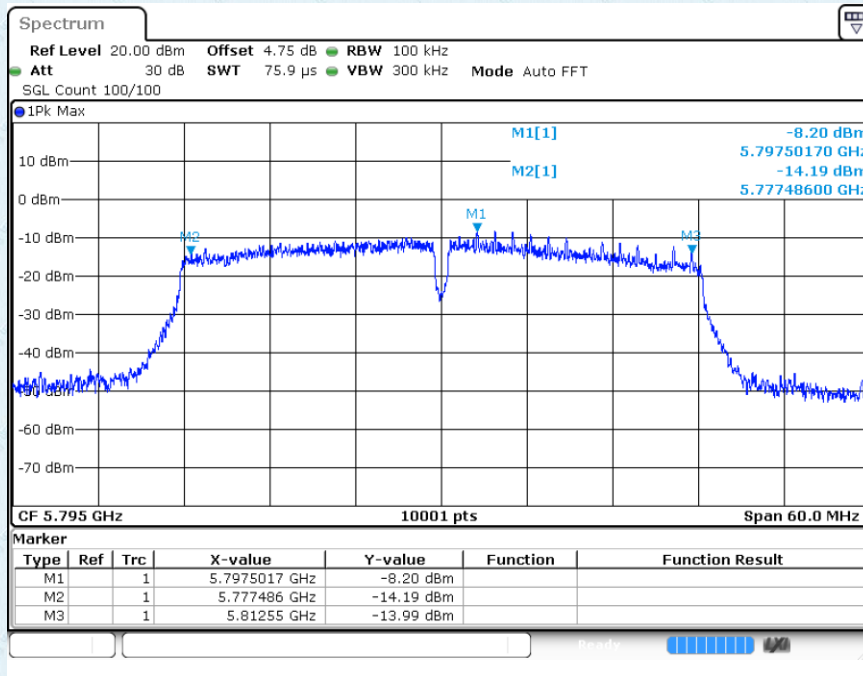


Highest channel

Test mode: 802.11ac(VHT40)

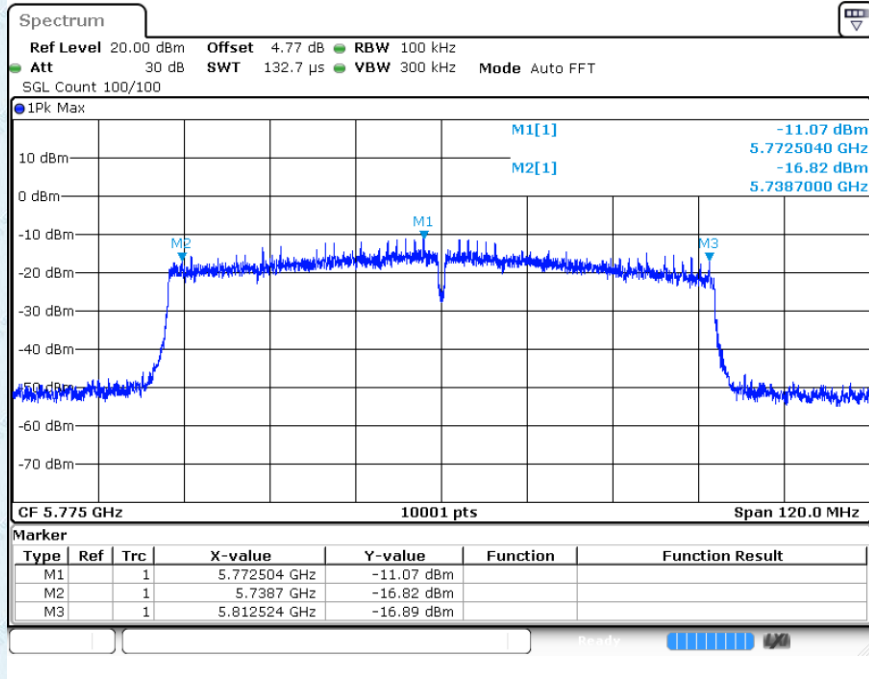


Lowest channel



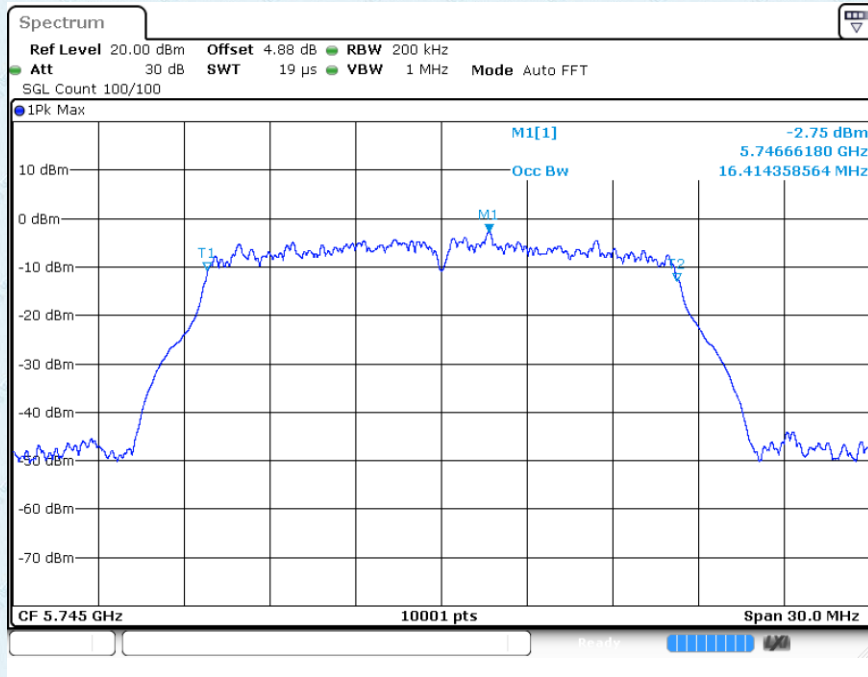
Highest channel

Test mode: 802.11ac(VHT80)

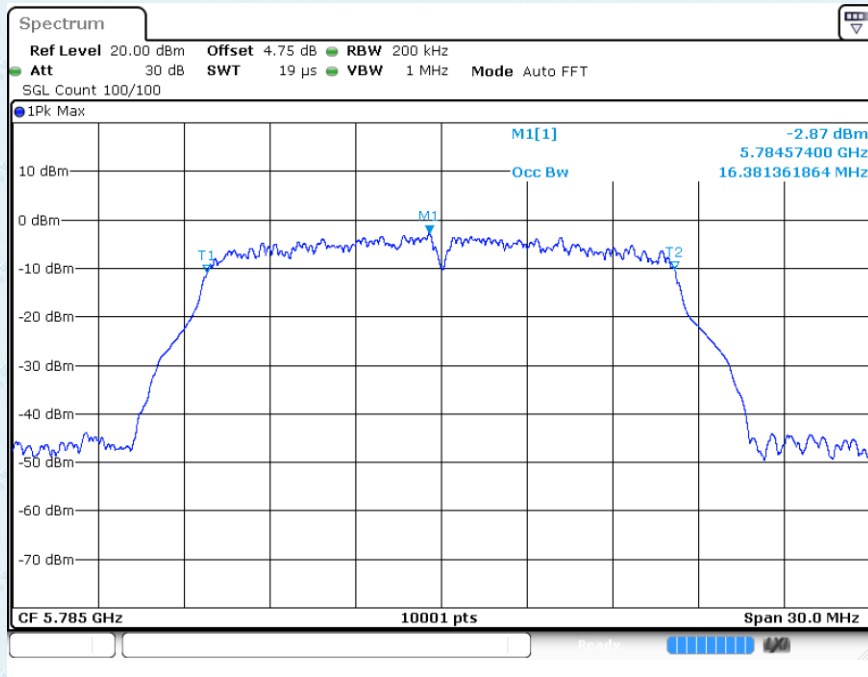


99% Occupied Bandwidth

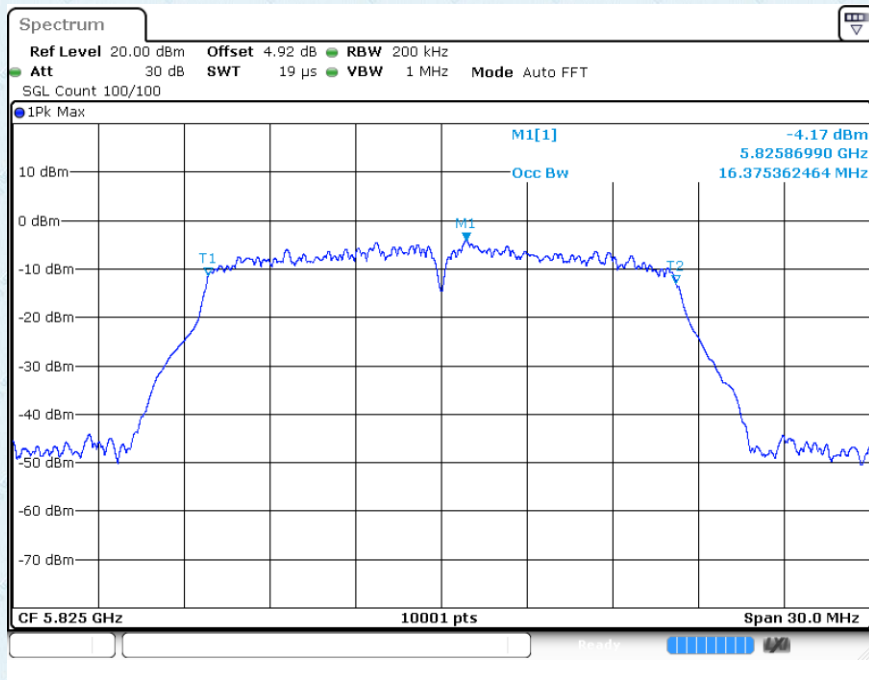
Test mode: 802.11a



Lowest channel

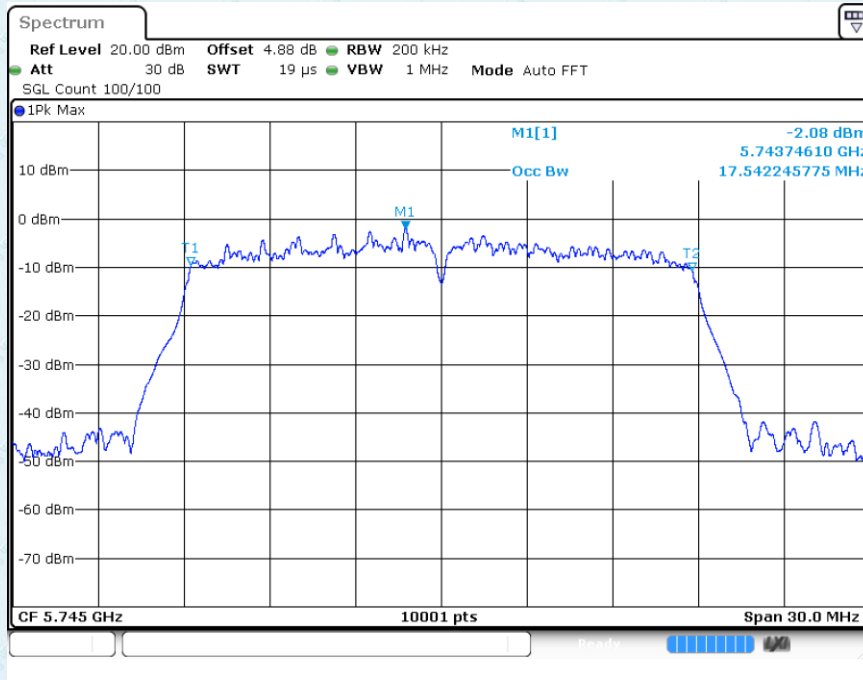


Middle channel

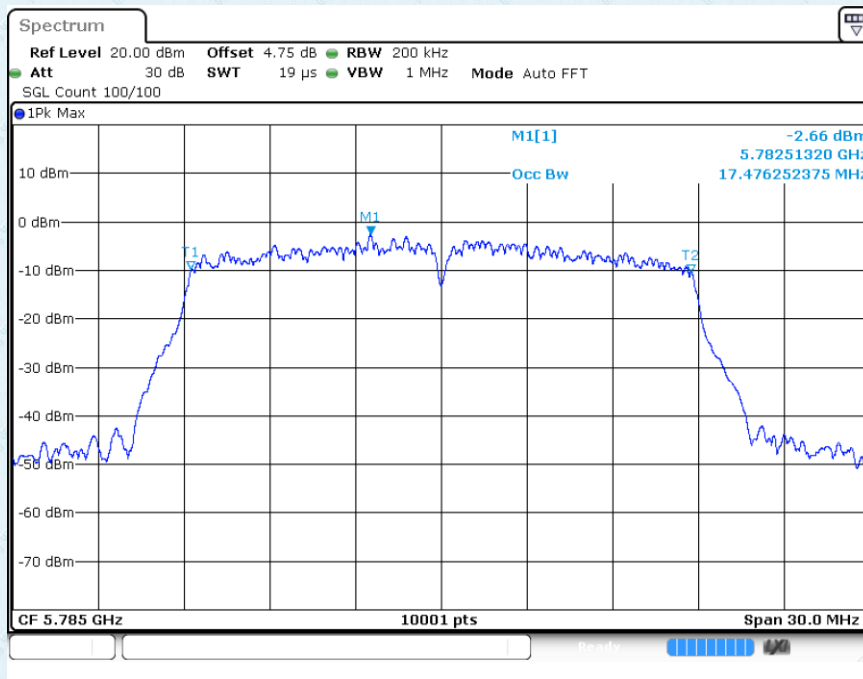


Highest channel

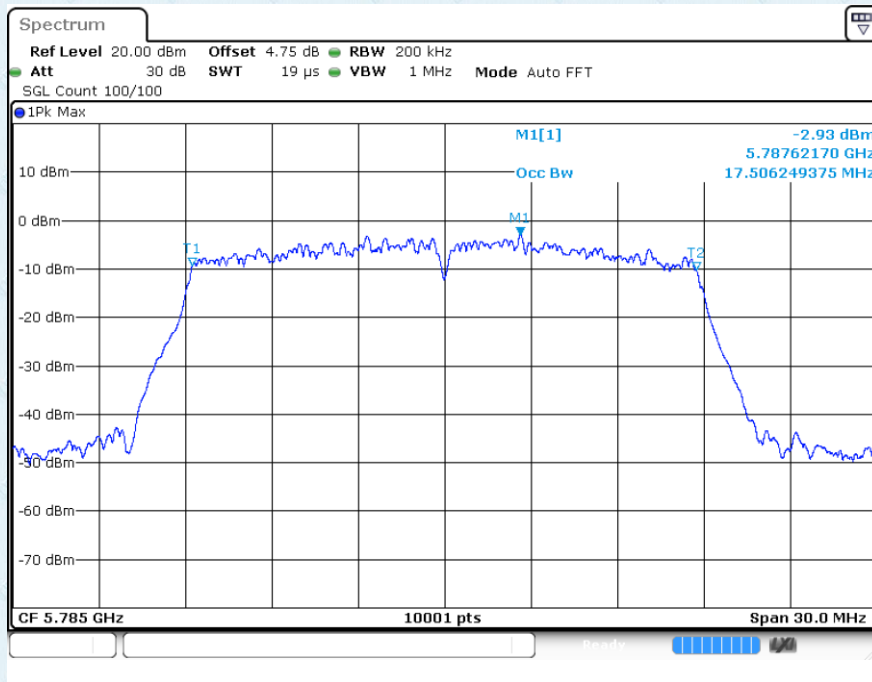
Test mode: 802.11n(HT20)



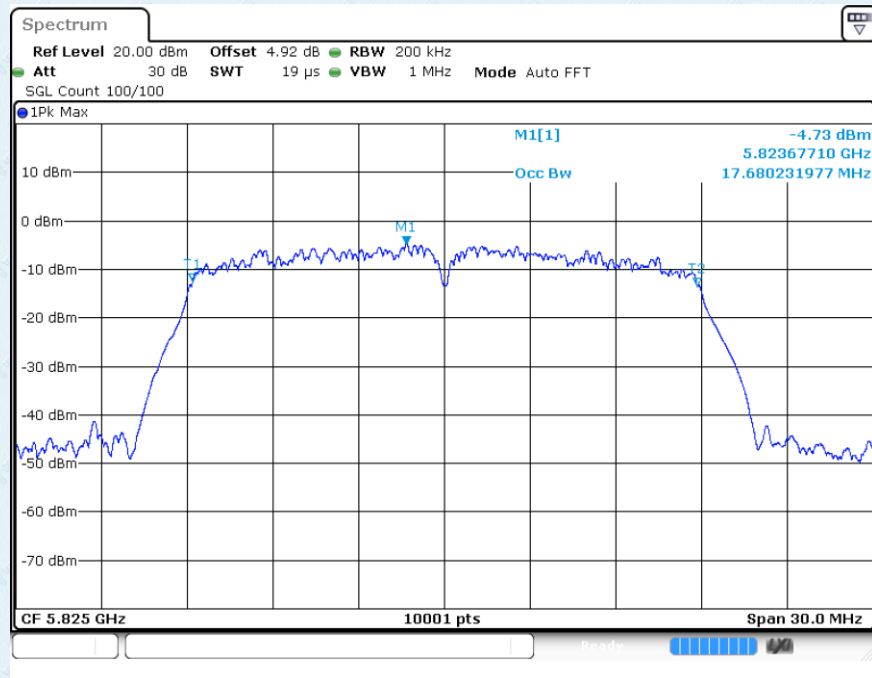
Lowest channel



Middle channel

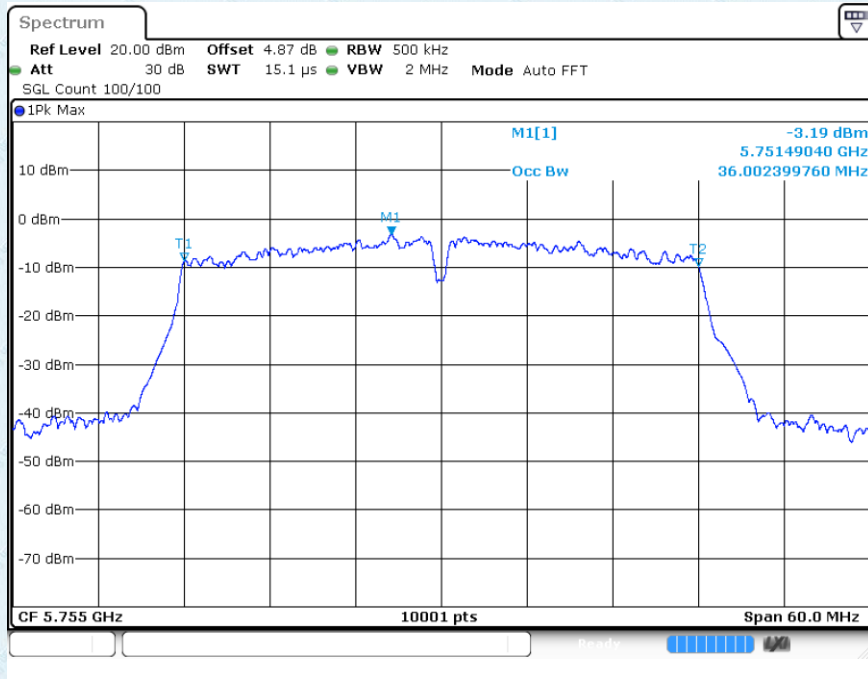


Middle channel

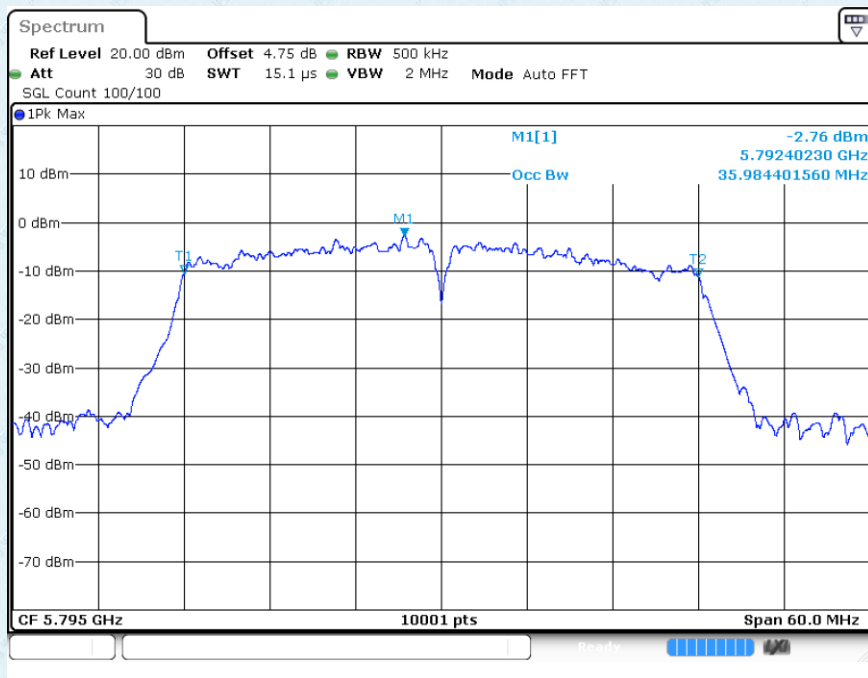


Highest channel

Test mode: 802.11n(VHT40)

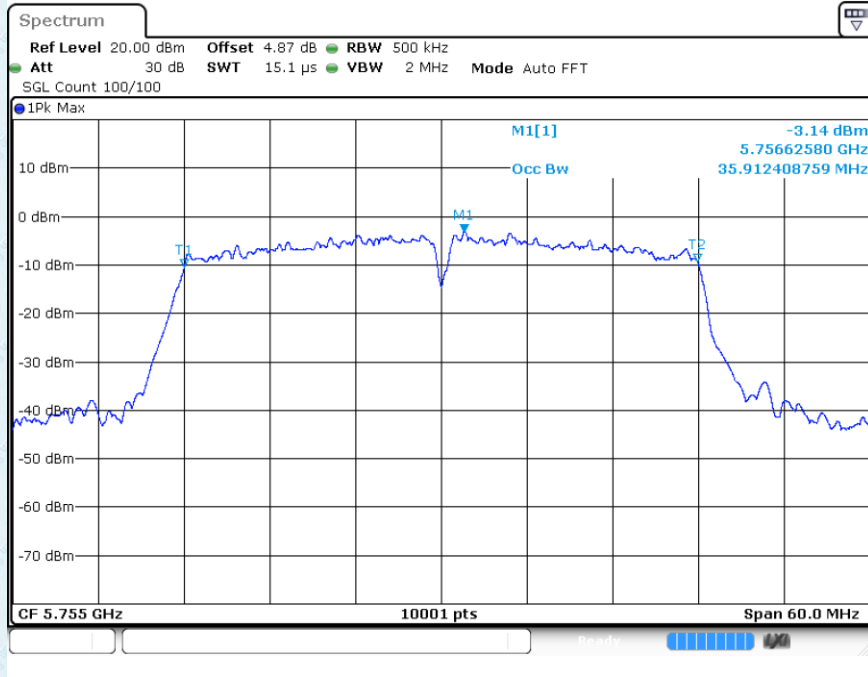


Lowest channel

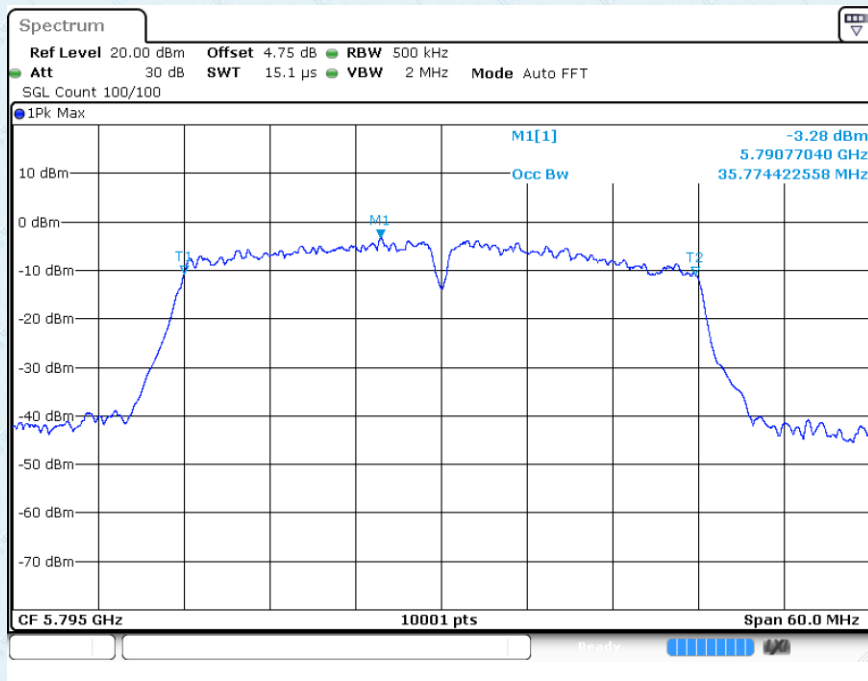


Highest channel

Test mode: 802.11ac(VHT40)

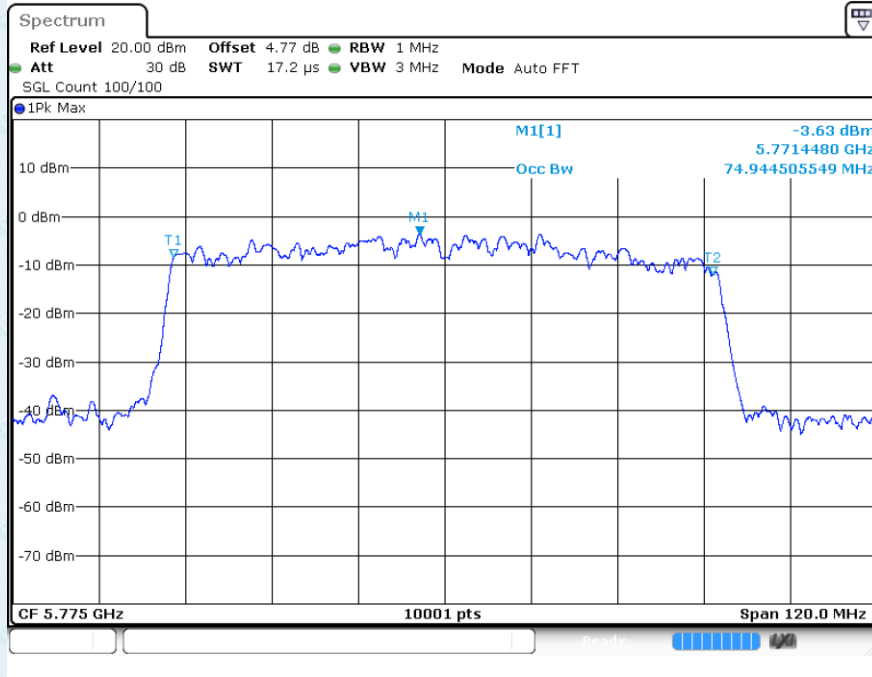


Lowest channel

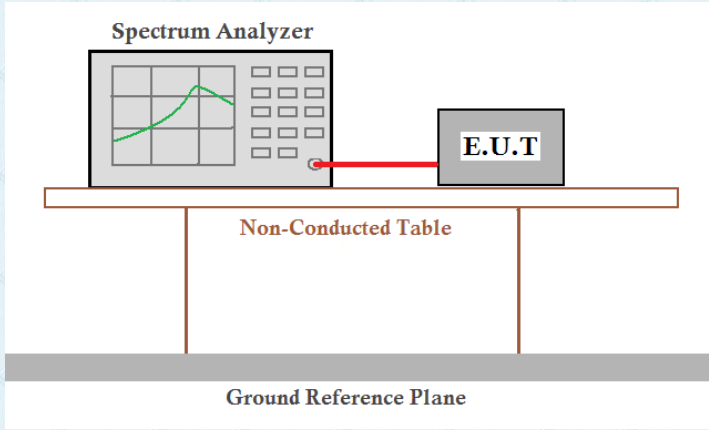


Highest channel

Test mode: 802.11ac(VHT80)



7.5 Power Spectral Density

Test Requirement:	FCC Part15 E Section 15.407(a)(3)
Test Method:	ANSI C63.10:2013 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01
Limit:	30dBm/500kHz
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

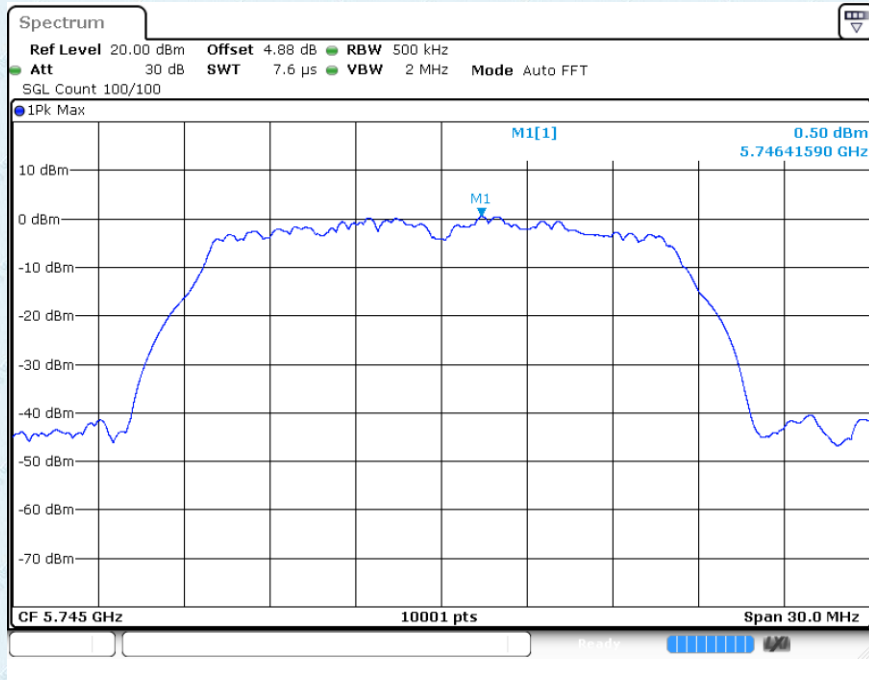
Measurement Data

Test CH	Power Spectral Density (dBm)						Limit (dBm/500k Hz)	Result
	802.11a	802.11n (HT20)	802.11ac (VHT20)	802.11n (HT40)	802.11ac (VHT40)	802.11ac (VHT80)		
Lowest	0.5	-0.32	0.75	-3.41	-3.38	-6.48	30.00	Pass
Middle	0.69	0.45	0.49	--	--	--		
Highest	-1.4	-0.09	-1.45	-3.26	-3.05	--		

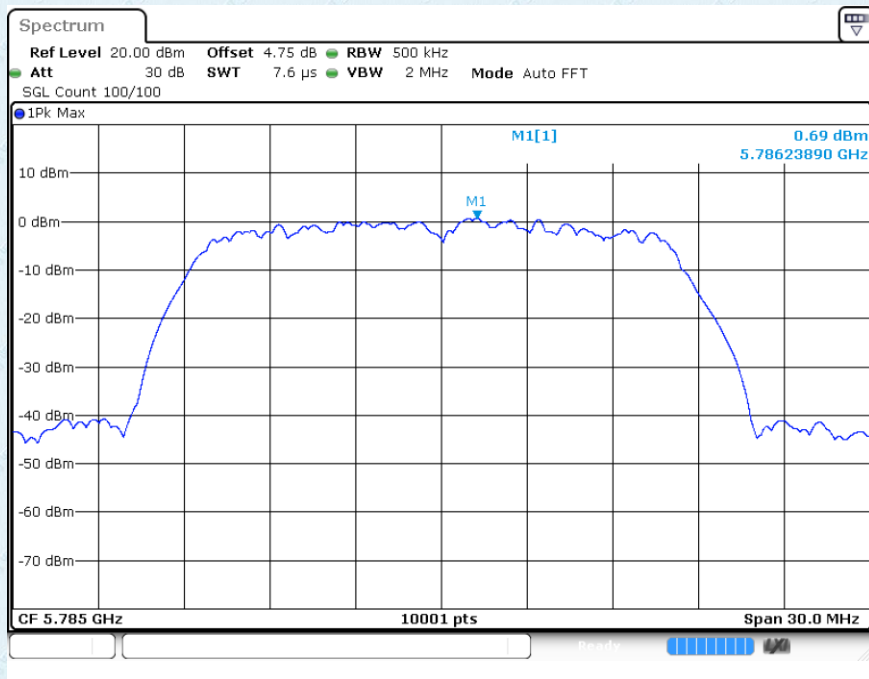
Remark: “---“is not applicable

Test plot as follows:

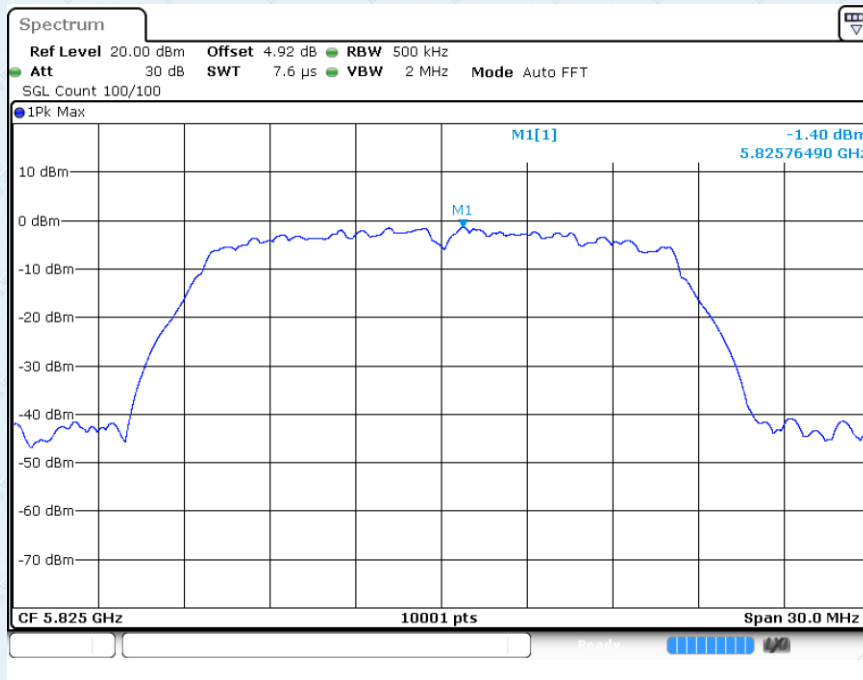
Test mode: 802.11a



Lowest channel

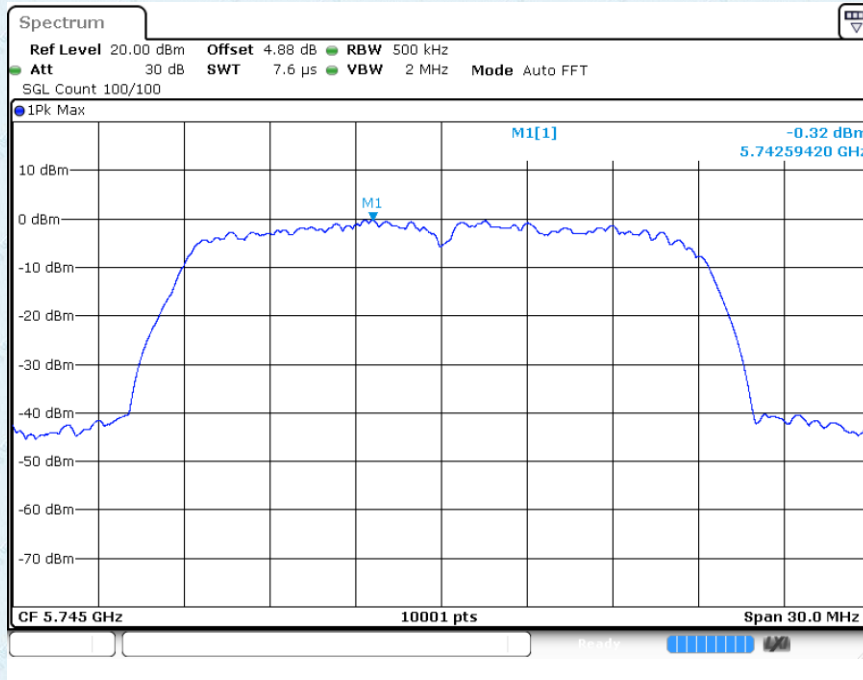


Middle channel

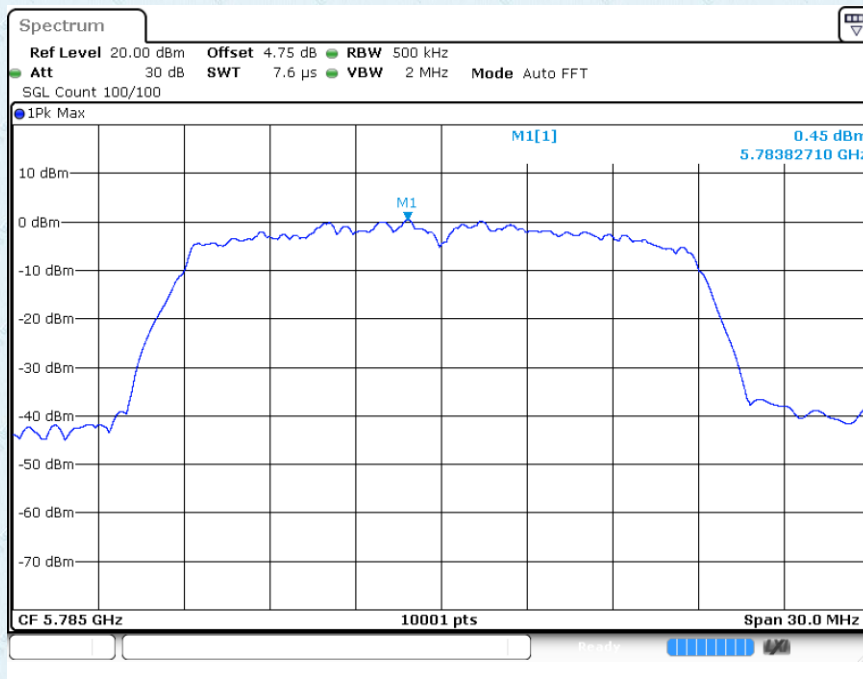


Highest channel

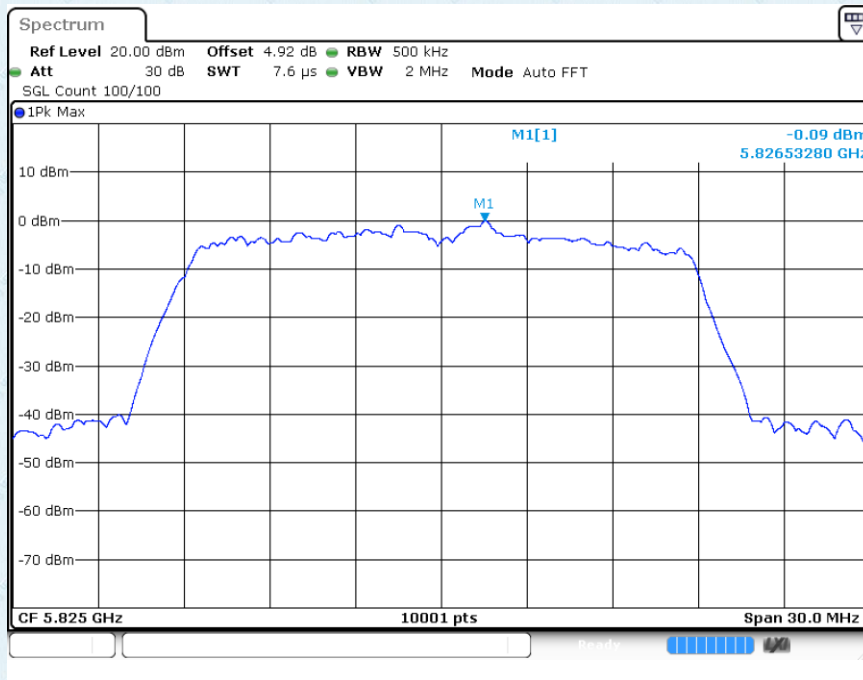
Test mode: 802.11n(HT20)



Lowest channel

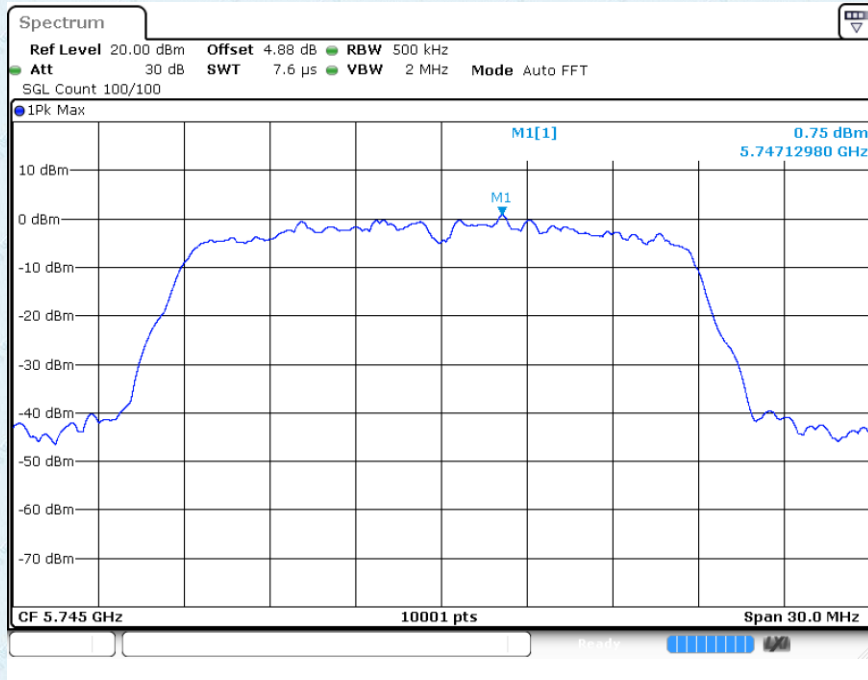


Middle channel

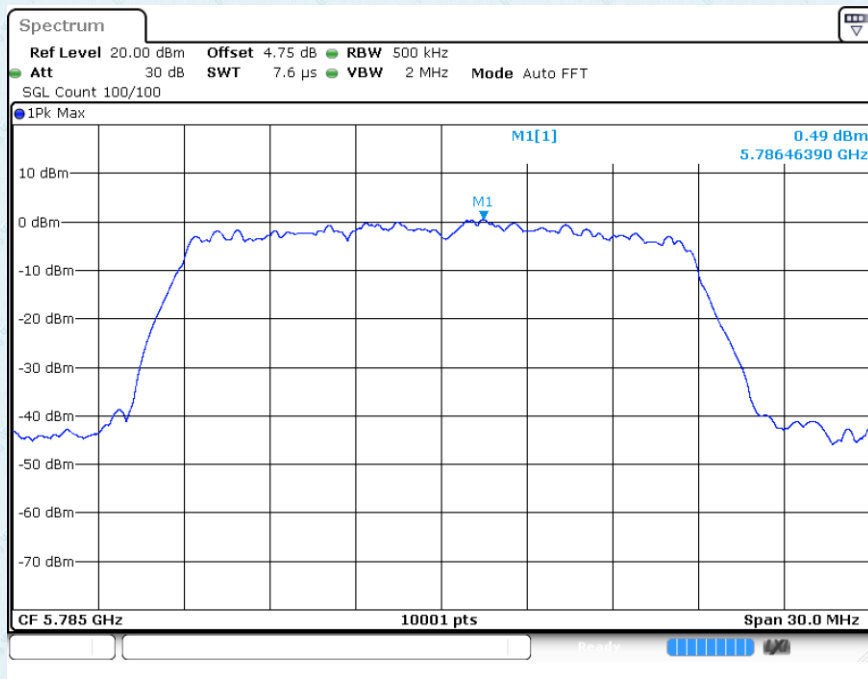


Highest channel

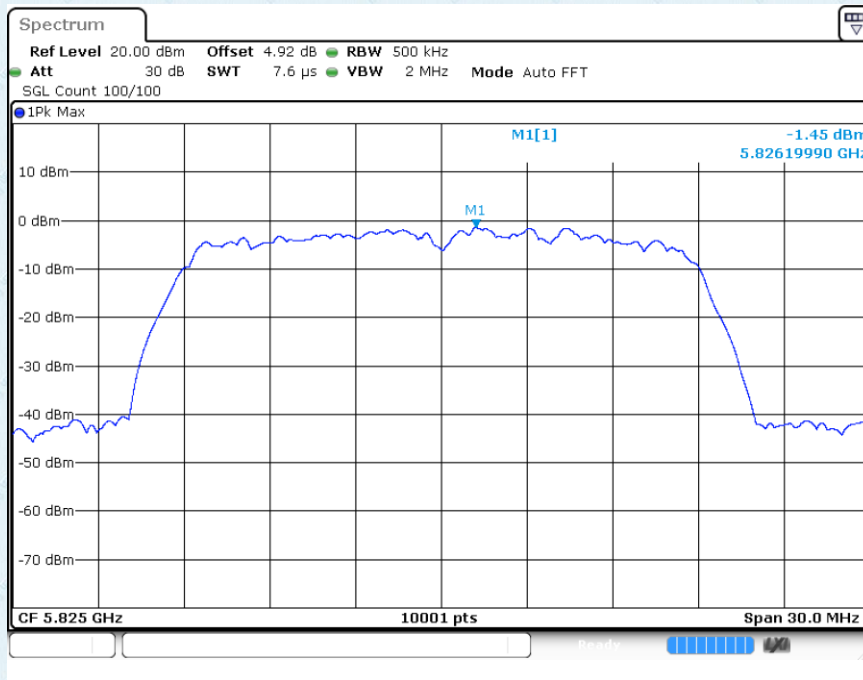
Test mode: 802.11ac(HT20)



Lowest channel

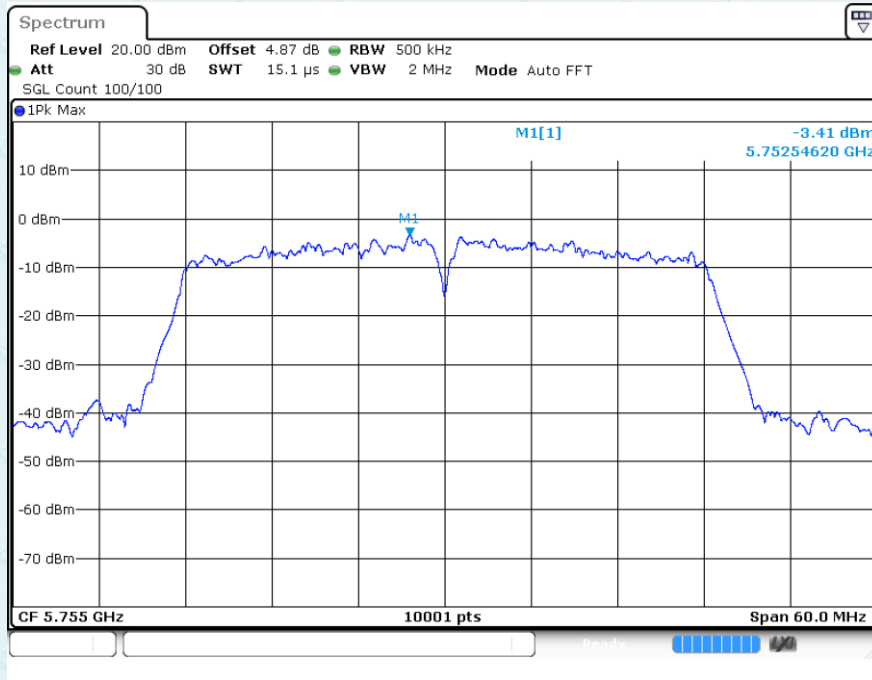


Middle channel

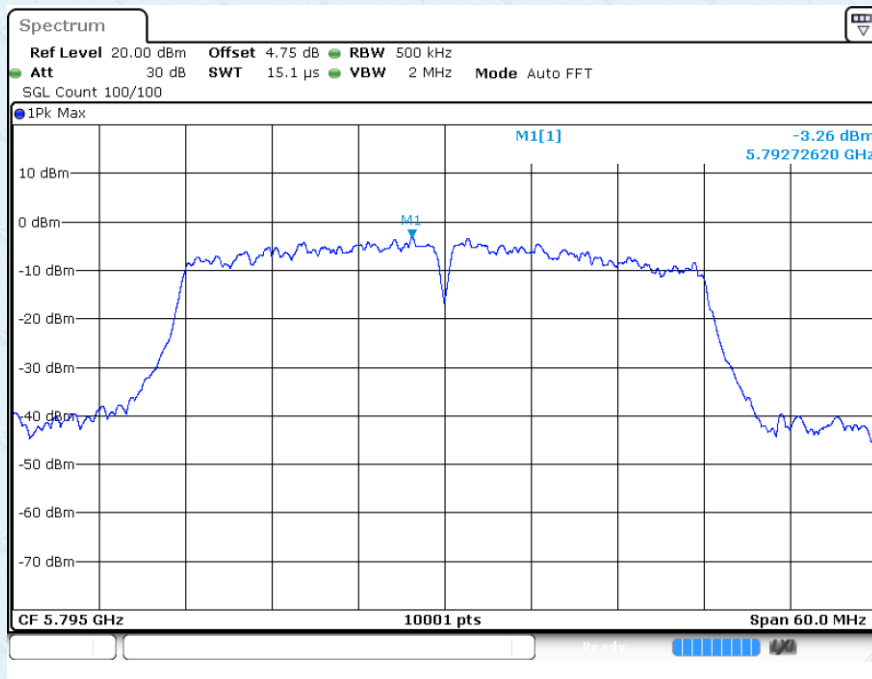


Highest channel

Test mode: 802.11n(HT40)

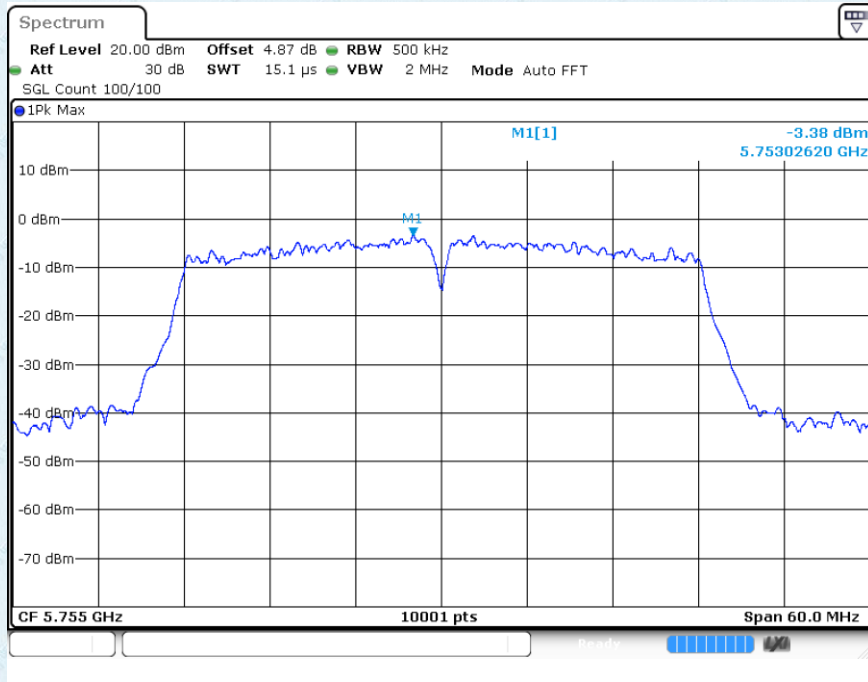


Lowest channel

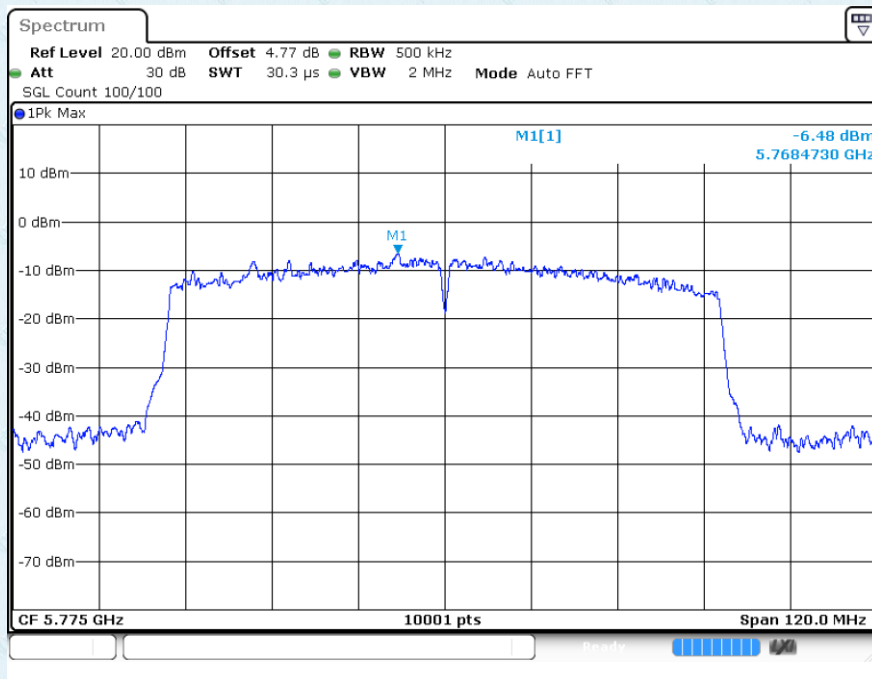


Highest channel

Test mode: 802.11ac(HT40)

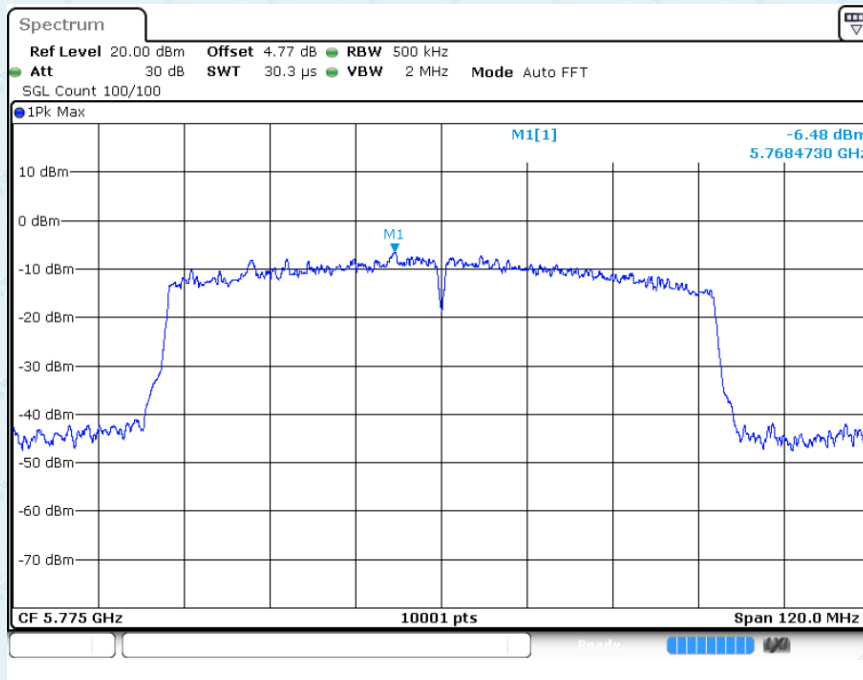


Lowest channel



Highest channel

Test mode: 802.11ac(HT80)



Middle channel

7.6 Band edge

7.6.1 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209 and 15.205				
Test Method:	ANSI C63.10: 2013				
Test Frequency Range:	9kHz to 40GHz, only worse case is reported				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Value
	Above 1GHz	Peak RMS	1MHz 1MHz	3MHz 3MHz	Peak RMS
Limit:	All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.				
Test setup:					
Test Procedure:	<ol style="list-style-type: none"> 1. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. 7. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report. 				

Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Remarks:

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
3. *The pre-test were performed on lowest, middle and highest frequencies, only the worst case's (lowest and highest frequencies) data was showed.*
4. *According to KDB 789033 D02v02r01 section G) 1) d), for measurements above 1000 MHz @3m distance, the limit of field strength is computed as follows:*

$$E[\text{dBuV/m}] = \text{EIRP}[\text{dBm}] + 95.2;$$

$$E[\text{dBuV/m}] = -27 + 95.2 = 68.2\text{dBuV/m}.$$

$$E[\text{dBuV/m}] = 10 + 95.2 = 105.2\text{dBuV/m}.$$

$$E[\text{dBuV/m}] = 15.6 + 95.2 = 110.8\text{dBuV/m}.$$

$$E[\text{dBuV/m}] = 27 + 95.2 = 122.2\text{dBuV/m}$$

Measurement data:

IEEE 802.11a

Freq. (MHz)	Ant.Pol. H/V	Reading (dBuv)	Ant/CF (dB)	Act (dBuv/m)	Limit (dBuv/m)	Note
5725.000	V	57.19	3.95	61.14	122.2	CH 149
5725.000	H	58.28	3.95	62.23	122.2	CH 149
5850.000	V	49.83	3.96	53.79	122.2	CH 165
5850.000	H	50.10	3.96	54.06	122.2	CH 165

IEEE 802.11n HT20

Freq. (MHz)	Ant.Pol. H/V	Reading (dBuv)	Ant/CF (dB)	Act (dBuv/m)	Limit (dBuv/m)	Note
5725.000	V	55.95	3.95	59.90	122.2	CH 149
5725.000	H	56.76	3.95	60.71	122.2	CH 149
5850.000	V	54.22	3.96	58.18	122.2	CH 165
5850.000	H	55.95	3.95	59.90	122.2	CH 165

IEEE 802.11ac HT20

Freq. (MHz)	Ant.Pol. H/V	Reading (dBuv)	Ant/CF (dB)	Act (dBuv/m)	Limit (dBuv/m)	Note
5725.000	V	55.73	3.95	59.68	122.2	CH 149
5725.000	H	56.87	3.95	60.82	122.2	CH 149
5850.000	V	52.34	3.96	56.30	122.2	CH 165
5850.000	H	50.90	3.96	54.86	122.2	CH 165

IEEE 802.11n HT40

Freq. (MHz)	Ant.Pol. H/V	Reading (dBuv)	Ant/CF (dB)	Act (dBuv/m)	Limit (dBuv/m)	Note
5725.000	V	55.52	3.95	59.47	122.2	CH 151
5725.000	H	57.60	3.95	61.55	122.2	CH 151
5850.000	V	48.65	3.96	52.61	122.2	CH 159
5850.000	H	47.79	3.96	51.75	122.2	CH 159

IEEE 802.11ac HT40

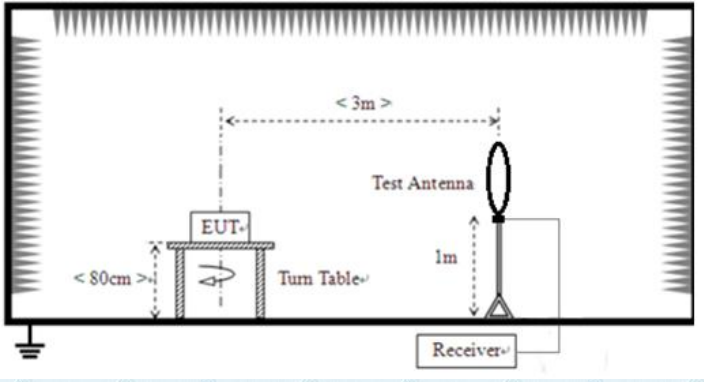
Freq. (MHz)	Ant.Pol. H/V	Reading (dBuv)	Ant/CF (dB)	Act (dBuv/m)	Limit (dBuv/m)	Note
5725.000	V	56.52	3.95	60.47	122.2	CH 151
5725.000	H	56.28	3.95	60.23	122.2	CH 151
5850.000	V	45.16	3.96	49.12	122.2	CH 159
5850.000	H	48.77	3.96	52.73	122.2	CH 159

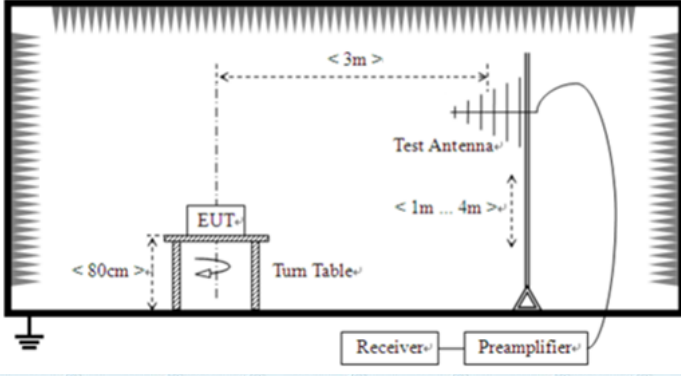
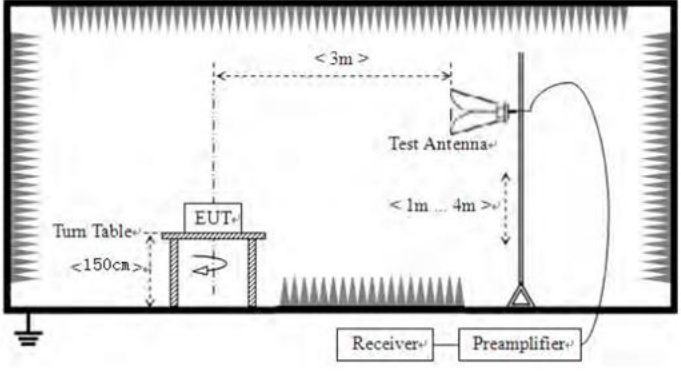
IEEE 802.11ac HT80

Freq. (MHz)	Ant.Pol. H/V	Reading (dBuv)	Ant/CF (dB)	Act (dBuv/m)	Limit (dBuv/m)	Note
5725.000	V	58.68	3.95	62.63	122.2	CH 155
5850.000	V	55.48	3.96	59.44	122.2	CH 155
5725.000	H	60.13	3.95	64.08	122.2	CH 155
5850.000	H	53.20	3.96	57.16	122.2	CH 155

7.7 Spurious Emission

7.7.1 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209, Part 15E Section 15.407(b)(4)				
Test Method:	ANSI C63.10:2013				
Test Frequency Range:	9kHz to 40GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Value
	9kHz-150kHz	Quasi-peak	200Hz	1kHz	Quasi-peak Value
	150kHz-30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak Value
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
AV		1MHz	3MHz	Average Value	
Limit:	Frequency	Limit (uV/m)	Value	Measurement Distance	
	0.009MHz-0.490MHz	2400/F(KHz)	QP	300m	
	0.490MHz-1.705MHz	24000/F(KHz)	QP	300m	
	1.705MHz-30MHz	30	QP	30m	
	30MHz-88MHz	100	QP	3m	
	88MHz-216MHz	150	QP		
	216MHz-960MHz	200	QP		
	960MHz-1GHz	500	QP		
		Frequency	Limit (dBm/MHz)	Remark	
	Above 1GHz	-27.0	Peak Value		
Test setup:	For radiated emissions from 9kHz to 30MHz				
					
	For radiated emissions from 30MHz to 1GHz				

	 <p>For radiated emissions above 1GHz</p> 
<p>Test Procedure:</p>	<ol style="list-style-type: none"> 1. The EUT was placed on the top of a rotating table (0.8m for below 1GHz and 1.5 meters for above 1GHz) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. 7. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test

	worst case mode is recorded in the report.					
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Test voltage:	AC 120V, 60Hz					
Test results:	Pass					

Remarks:

1. *Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.*

Measurement Data:

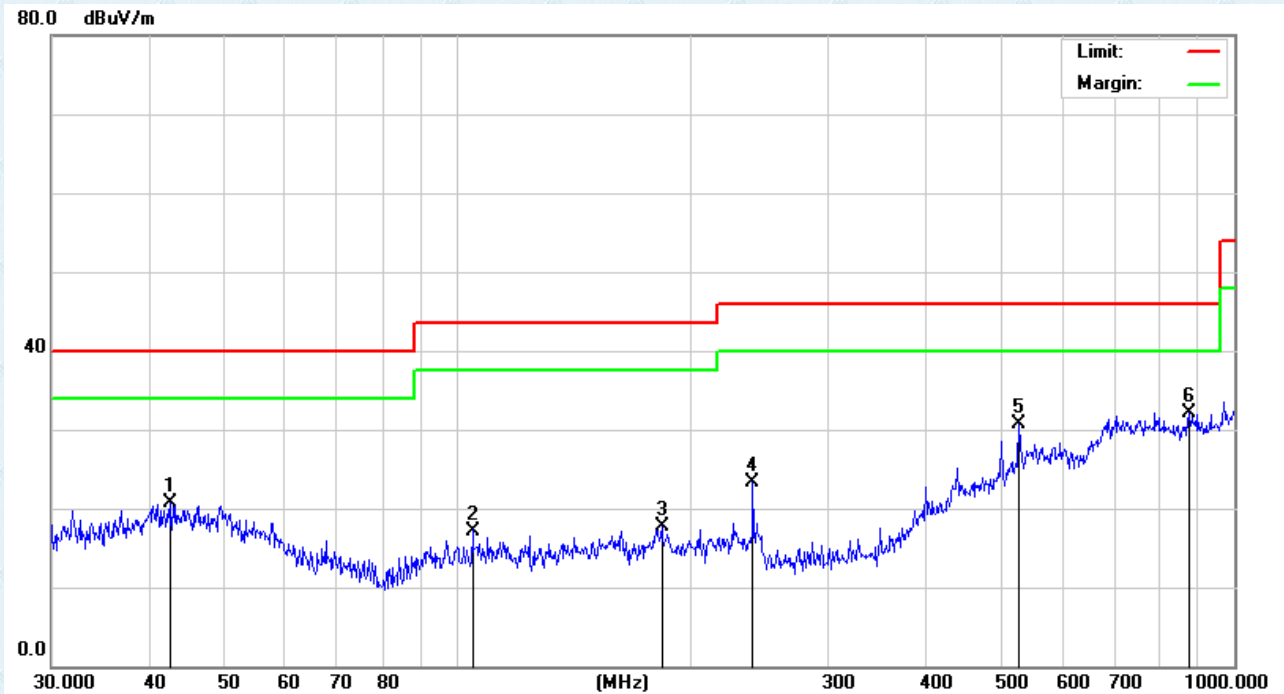
9 kHz ~ 30 MHz

The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

Below 1GHz

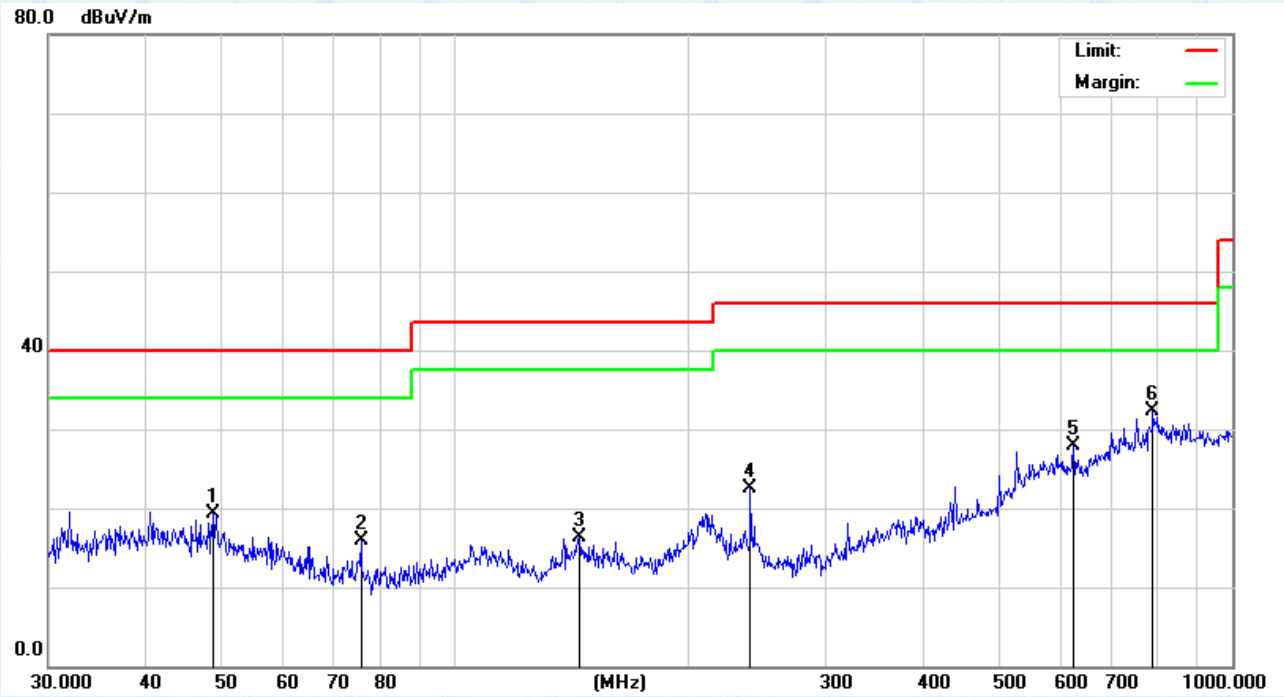
Pre-scan all test modes, found worst case at 802.11ac(HT80), and so only show the test result of 802.11ac(HT80)

Horizontal:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1		42.7496	22.76	-1.97	20.79	40.00	-19.21	QP
2		104.5361	24.48	-7.28	17.20	43.50	-26.30	QP
3		183.2005	22.94	-5.24	17.70	43.50	-25.80	QP
4		239.9874	29.83	-6.52	23.31	46.00	-22.69	QP
5		528.2458	26.83	3.83	30.66	46.00	-15.34	QP
6	*	875.2470	24.98	7.20	32.18	46.00	-13.82	QP

Vertical:



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		48.8429	24.97	-5.70	19.27	40.00	-20.73	QP
2		75.7114	26.36	-10.43	15.93	40.00	-24.07	QP
3		144.8418	23.55	-7.18	16.37	43.50	-27.13	QP
4		239.9874	28.95	-6.52	22.43	46.00	-23.57	QP
5		625.0780	25.86	1.95	27.81	46.00	-18.19	QP
6	*	790.6188	24.65	7.69	32.34	46.00	-13.66	QP

Above 1GHz:

802.11a,11n(HT20),11ac(HT20),11n(HT40),11ac(HT40),11ac(HT80) all have been tested,
Only the data of worst case at each channel plan (nominal bandwidth =20MHz, 40MHz, 80MHz) is reported.

Test mode:		802.11a		Test channel:		lowest	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dBuV/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
V	11490	33.09	16.82	49.91	68.2	-18.29	PK
V	17235	29.42	22.93	52.35	68.2	-15.85	PK
H	11490	30.91	16.82	47.73	68.2	-20.47	PK
H	17235	29.31	22.93	52.24	68.2	-15.96	PK

Test mode:		802.11a		Test channel:		Middle	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dBuV/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
V	11570	32.02	16.71	48.73	68.2	-19.47	PK
V	17355	27.57	24.37	51.94	68.2	-16.26	PK
H	11570	29.85	16.71	46.56	68.2	-21.64	PK
H	17355	28.61	24.37	52.98	68.2	-15.22	PK

Test mode:		802.11a		Test channel:		Highest	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dBuV/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
V	11650	34.15	16.61	50.76	68.2	-17.44	PK
V	17475	27.16	25.01	52.17	68.2	-16.03	PK
H	11650	32.97	16.61	49.58	68.2	-18.62	PK
H	17475	28.68	25.01	53.69	68.2	-14.51	PK

Test mode:		802.11ac(HT40)		Test channel:		Lowest	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dBuV/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
V	11510	32.35	16.78	49.13	68.2	-19.07	PK
V	17265	28.06	23.29	51.35	68.2	-16.85	PK
H	11510	33.58	16.78	50.36	68.2	-17.84	PK
H	17265	28.55	23.29	51.84	68.2	-16.36	PK

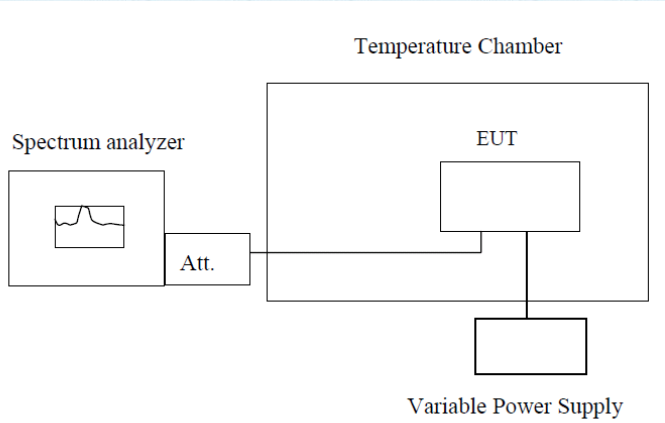
Test mode:		802.11ac(HT40)		Test channel:		Highest	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dBuV/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
V	11590	32.28	16.69	48.97	68.2	-19.23	PK
V	17385	26.65	24.73	51.38	68.2	-16.82	PK
H	11590	30.39	16.69	47.08	68.2	-21.12	PK
H	17385	27.34	24.73	52.07	68.2	-16.13	PK

Test mode:		802.11ac(HT80)		Test channel:		Middle	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dBuV/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
V	11550	32.49	16.73	49.22	68.2	-18.98	PK
V	17325	26.34	24.01	50.35	68.2	-17.85	PK
H	11550	30.04	16.73	46.77	68.2	-21.43	PK
H	17325	25.33	24.01	49.34	68.2	-18.86	PK

Notes:

1. Measure Level = Reading Level + Factor.
2. The test trace is same as the ambient noise (the test frequency range: 18GHz~40GHz), therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

7.8 Frequency stability

Test Requirement:	FCC Part15 C Section 15.407(g)
Test Method:	ANSI C63.10:2013, FCC Part 2.1055
Limit:	Manufactures 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
Test Procedure:	The EUT was setup to ANSI C63.4, 2003; tested to 2.1055 for compliance to FCC Part 15.407(g) requirements.
Test setup:	 <p>Note : Measurement setup for testing on Antenna connector</p>
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement data:

HT 20MHz					
Frequency stability versus Temp.					
Power Supply: AC 120V					
Temp. (°C)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
-30	5745	5744.9290	5745.0652	5745.0377	5745.1616
	5785	5785.1825	5784.9260	5785.1245	5784.9166
	5825	5825.2398	5825.2116	5825.0232	5825.0024
-20	5745	5745.0533	5745.1205	5745.0350	5745.1264
	5785	5785.1871	5785.0365	5784.8908	5784.9829
	5825	5824.9735	5824.7874	5825.0324	5824.9647
-10	5745	5745.1635	5745.0944	5745.1288	5745.1065
	5785	5785.1645	5785.0639	5784.9982	5785.2196
	5825	5825.1296	5825.0100	5825.1091	5824.9610
0	5745	5745.1345	5745.0446	5745.0132	5744.7882
	5785	5784.9791	5785.1223	5784.9850	5784.9480
	5825	5825.0636	5825.1119	5824.8553	5824.9916
10	5745	5744.9981	5745.0016	5744.7955	5745.0528
	5785	5784.9474	5785.0813	5784.8243	5784.9524
	5825	5824.9917	5824.8784	5824.9232	5824.9915
20	5745	5744.8234	5745.1261	5745.0808	5745.0828
	5785	5784.7879	5785.1331	5785.1500	5785.2830
	5825	5824.9861	5824.9242	5824.8884	5825.0065
30	5745	5745.1453	5745.0565	5745.1320	5744.9598
	5785	5785.0942	5785.1383	5784.9117	5784.9478
	5825	5824.9660	5824.8266	5825.1506	5824.9997
40	5745	5744.9985	5744.9708	5744.9447	5745.0801
	5785	5785.0373	5785.1628	5785.1218	5785.1558
	5825	5825.2048	5825.2420	5825.1102	5824.8664
50	5745	5745.1176	5744.9202	5744.9554	5744.8641
	5785	5785.1376	5785.1772	5785.0553	5784.8978
	5825	5824.9689	5824.9078	5824.8262	5825.1274

Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (VAC)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
108	5745	5745.0666	5745.1069	5745.1826	5745.2570
	5785	5785.0972	5784.8596	5785.0579	5785.0550
	5825	5825.1264	5825.3444	5825.0869	5825.1690
120	5745	5744.8691	5745.0740	5744.9875	5745.0387
	5785	5785.1407	5784.9514	5785.1660	5785.0413
	5825	5824.9810	5825.1505	5825.0558	5824.7445
132	5745	5745.0882	5745.1410	5745.0725	5744.8223
	5785	5785.1625	5784.9272	5785.1450	5785.0272
	5825	5825.1635	5825.1431	5824.9678	5825.1520

HT40 MHz					
Frequency stability versus Temp.					
Power Supply: AC 120V					
Temp. (°C)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
-30	5745	5745.3038	5745.0729	5745.2172	5745.0751
	5785	5785.0585	5785.1428	5785.1560	5784.8290
-20	5825	5825.0191	5825.3921	5825.1530	5825.0969
	5745	5745.0949	5744.9254	5744.8837	5745.1036
-10	5785	5785.0341	5785.1835	5785.1977	5784.9621
	5825	5824.9101	5824.8686	5824.9789	5825.0347
0	5745	5745.0101	5744.8246	5745.1591	5744.9197
	5785	5785.0287	5785.1584	5784.8950	5784.8692
10	5825	5824.9411	5825.0005	5824.9235	5825.2147
	5745	5744.9923	5745.1877	5744.9720	5744.8711
20	5785	5785.1551	5784.8744	5784.8533	5784.8141
	5825	5824.8276	5824.9228	5825.0220	5824.8486
30	5745	5744.9016	5744.8232	5744.7513	5744.8510
	5785	5784.9665	5784.9176	5784.8372	5784.8692
40	5825	5744.9448	5745.0266	5745.0163	5745.1550
	5745	5785.0747	5784.9490	5785.1720	5785.0474
50	5785	5825.2927	5825.0731	5824.9811	5824.9780
	5825	5744.7499	5744.9653	5744.9575	5744.9332

Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (VAC)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
108	5745	5745.2206	5745.0291	5745.0046	5745.0064
	5785	5785.1896	5785.0502	5785.0988	5784.9953
120	5825	5825.2498	5825.0618	5824.9854	5824.8027
	5745	5744.9815	5744.9506	5744.8728	5744.9699
132	5785	5785.1466	5785.2250	5785.1867	5785.3257
	5825	5825.2799	5824.8168	5825.0894	5824.8162

HT80 MHz					
Frequency stability versus Temp.					
Power Supply: AC 120V					
Temp. (°C)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
-30	5745	5745.0475	5745.1477	5744.9437	5745.1042
-20	5785	5785.0176	5785.0108	5785.2754	5785.0061
-10	5825	5825.1574	5825.0166	5825.0150	5825.0965
0	5745	5745.0871	5744.8184	5745.1991	5744.8890
10	5785	5784.9659	5784.9693	5785.1019	5784.8563
20	5825	5825.0593	5824.9375	5824.7742	5824.9582
30	5745	5745.1600	5745.0201	5744.9709	5745.0377
40	5785	5784.8800	5785.0517	5785.1203	5784.8671
50	5825	5825.0314	5825.1411	5824.9004	5825.0479

Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (VAC)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
108	5745	5745.1905	5745.0900	5744.9056	5745.0381
120	5785	5785.1302	5784.9900	5785.0668	5784.9150
132	5825	5825.0694	5825.0060	5825.1325	5824.9664

8 Test Setup Photo

Reference to the **appendix I** for details.

9 EUT Constructional Details

Reference to the **appendix II** for details.

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