intertek
Total Quality. Assured.

Sunway Products (Hong Kong) Company Limited

TEST REPORT

SCOPE OF WORK
EMC TESTING–SPM-228-PAD

REPORT NUMBER
200602166GZU-003

ISSUE DATE	**[REVISED DATE]**
26-January-2021	[----------]

PAGES
129

DOCUMENT CONTROL NUMBER
FCC WIFI 5G-d

Room 02, & 101/E201/E301/
E401/E501/E601/E701/E801 of
Room 01 1-8/F., No. 7-2. Caipin
Road, Science City, GETDD,
Guangzhou, Guangdong, China
Telephone: +86 20 8213 9688
Facsimile: +86 20 3205 7538
www.intertek.com.cn

TEST REPORT

Applicant Name & Address	:	Sunway Products (Hong Kong) Company Limited No. C, 16/F, Chinaweal Centre, 414-424 Jaffe Road, WANCHAI, Hong Kong SAR, China
Manufacturing Site	:	Sunway Electric Manufacturing (Guangzhou) Company Limited Jintian Industry Zone, Huadong Town, Huadu District, GUANGZHOU Guangdong 510890
Intertek Report No:		200602166GZU-003
FCC ID:		2ATAD-SPM228LPAD

Test standards

47 CFR PART 15 Subpart E: 2019 section 15.407

Sample Description

Product	:	Tablet PC
Model No.	:	SPM-228-PAD
Electrical Rating	:	Supplied by li-ion Battery (model name: U2968180PV, 5000mAh, 3.8V) for normal use, and charged by DC source: 5V2A. Class III
Serial No.	:	Not Labeled
Date Received	:	02 June 2020
Date Test Conducted	:	10 January 2021-23 January 2021

Prepared and Checked By

Oscar Gao

Project Engineer

Approved By:

Helen Ma

Team Leader

TEST REPORT

CONTENT

TEST REPORT **1**

CONTENT **3**

1.0 TEST RESULT SUMMARY **4**

2.0 GENERAL DESCRIPTION **5**

2.1 PRODUCT DESCRIPTION 5
2.2 RELATED SUBMITTAL(S) GRANTS 7
2.3 TEST METHODOLOGY 7
2.4 TEST FACILITY 7

3.0 SYSTEM TEST CONFIGURATION **7**

3.1 JUSTIFICATION 7
3.2 EUT EXERCISING SOFTWARE 8
3.3 SPECIAL ACCESSORIES 8
3.4 MEASUREMENT UNCERTAINTY 9
3.5 EQUIPMENT MODIFICATION 9
3.6 SUPPORT EQUIPMENT LIST AND DESCRIPTION 10

4.0 MEASUREMENT RESULTS **11**

4.1 ANTENNA REQUIREMENT 11
4.2 DUTY CYCLE 12
4.3 26 DB BANDWIDTH 17
4.4 6 DB BANDWIDTH 34
4.5 MAXIMUM AVERAGE CONDUCTED OUTPUT POWER 43
4.6 MAXIMUM PEAK POWER SPECTRAL DENSITY 46
4.7 RADIATED SPURIOUS EMISSIONS 77
4.8 BAND EDGES REQUIREMENT 100
4.9 CONDUCTED EMISSION TEST 126

5.0 TEST EQUIPMENT LIST **129**

TEST REPORT

1.0 TEST RESULT SUMMARY

Test Item	Test Requirement	Test Method	Result
Antenna Requirement	FCC PART 15 C clause 15.203	FCC PART 15 C clause 15.247 (c) and clause 15.203	PASS
26 dB Bandwidth / 99% Occupied Bandwidth	FCC PART 15 E clause 15.407(a)	FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01,Clause C&D	PASS
6 dB Bandwidth	FCC PART 15 E clause 15.407(e) Only for band IV	FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01,Clause C	PASS
Maximum Conducted Output Power	FCC PART 15 E clause 15.407(a)	FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01,Clause E	PASS
Maximum Peak Power Spectral Density	FCC PART 15 E clause 15.407(a)	FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01,Clause F	PASS
Radiated spurious emission	FCC PART 15 E clause 15.407(b)	FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01,Clause G	PASS
Band Edge	FCC PART 15 E clause 15.407(b)	FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01,Clause G	PASS
Conducted Emissions at Mains Terminals	FCC PART 15 E section 15.207	ANSI C63.10: Clause 6.2	PASS

Remark:
N/A: not applicable. Refer to the relative section for the details.
EUT: In this whole report EUT means Equipment Under Test.
Tx: In this whole report Tx (or tx) means Transmitter.
Rx: In this whole report Rx (or rx) means Receiver.
RF: In this whole report RF means Radio Frequency.
ANSI C63.10: the detail version is ANSI C63.10:2013 in the whole report

TEST REPORT

2.0 General Description

2.1 Product Description

Operating Frequency:	Band I 5150 MHz to 5250 MHz and Band IV 5725 MHz to 5850MHz for 802.11a/an(HT20,HT40)/ac(HT20,HT40,HT80)
Type of Modulation:	802.11a: OFDM (BPSK/QPSK/16QAM/64QAM) 802.11an: OFDM (BPSK/QPSK/16QAM/64QAM) 802.11ac: OFDM (BPSK/QPSK/16QAM/64QAM/256QAM)
Transmit Data Rate:	802.11an(HT20): MCS0: 7.2Mbps, MCS1:14.2Mbps, MCS2:21.7Mbps, MCS3:28.9Mbps, MCS4:43.3Mbps, MCS5:57.8Mbps, MCS6:65.0Mbps, MCS7:72.2Mbps 802.11an(HT40): MCS0:15Mbps, MCS1:30Mbps, MCS2:45Mbps, MCS3:60Mbps, MCS4:90Mbps, MCS5:120Mbps, MCS6:135Mbps, MCS7:150Mbps 802.11ac(HT20): MCS0: 7.2Mbps, MCS1:14.2Mbps, MCS2:21.7Mbps, MCS3:28.9Mbps, MCS4:43.3Mbps, MCS5:57.8Mbps, MCS6:65.0Mbps, MCS7:72.2Mbps, MCS8: 86.7MbPS 802.11ac(HT40): MCS0:15Mbps, MCS1:30Mbps, MCS2:45Mbps, MCS3:60Mbps, MCS4:90Mbps, MCS5:120Mbps,MCS6:135Mbps,MCS7:150Mbps,MCS8:180Mbps, MCS9:200Mbps 802.11ac(HT80): MCS0:32.5Mbps, MCS1:65Mbps, MCS2:97.5Mbps, MCS3:130Mbps, MCS4:195Mbps, MCS5:260Mbps,MCS6:292.5Mbps,MCS7:325Mbps,MCS8:390Mbps, MCS9:433.3Mbps
Number of Channels	Band I 5150MHz to 5250MHz 4 Channels for 802.11a/an(HT20)/ac(HT20) 2 Channels for 802.11an(HT40)/ac(HT40) 1 Channels for 802.11ac(HT80) Band IV 5725MHz to 5850MHz 5 Channels for 802.11a/an(HT20)/ac(HT20) 2 Channels for 802.11an(HT40)/ac(HT40) 1 Channels for 802.11ac(HT80)
Channel Separation:	20 MHz
Antenna Type	Dedicated antenna
Antenna gain:	1 dBi
Function:	Smart tablet with 5GHz WIFI
EUT Power Supply:	DC 3.8V, AC 120V 60 Hz for charging
Power cord:	N/A

TEST REPORT

channels and frequencies list:

Band I 5150 MHz to 5250 MHz

For 802.11a/an (HT20)/an (HT20): test frequencies are lowest channel 36: 5180 MHz, middle channel 44: 5220 MHz and highest channel 48: 5240.

For 802.11an(HT40)/ac(HT40): test frequencies are lowest channel 38: 5190 MHz and highest channel 46: 5230 MHz

For 802.11ac(HT80): test frequencies is channel 42: 5210 MHz

Band IV 5725 MHz to 5850 MHz

For 802.11a/an (HT20)/an (HT20): test frequencies are lowest channel 149: 5745 MHz, middle channel 157: 5785 MHz and highest channel 165: 5825 MHz

For 802.11an(HT40)/ac(HT40): test frequencies are lowest channel 151: 5755 MHz and highest channel 159: 5795 MHz

For 802.11ac(HT80): test frequencies is channel 155: 5775 MHz

For WIFI a(20)/WIFI an(HT 20)/WIFI ac(HT20):

Band I(5150MHz-5250MHz)		Band IV(5725MHz-5850MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	149	5745
40	5200	153	5765
44	5220	157	5785
48	5240	161	5805
		165	5825

For WIFI an(HT 40)/WIFI ac(HT40):

Band I(5150MHz-5250MHz)		Band IV(5725MHz-5850MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	151	5755
46	5230	159	5795

For WIFI ac(HT 80):

Band I(5150MHz-5250MHz)		Band IV(5725MHz-5850MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
42	5210	155	5775

TEST REPORT

2.2 Related Submittal(s) Grants

This is an application for certification of:
Unlicensed National Information Infrastructure Devices (WIFI transmitter portion).

Remaining portions are subject to the following procedures:
1. Receiver portion of WIFI: exempt from technical requirement of this Part.

2.3 Test Methodology

The EUT was performed according to the procedures in FCC Part 15 E, Section15.203, 15.207, 15.209, 15.407 and ANSI C63.4:2014, method of measurement: reference to FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10:2013. Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans and final tests were performed in the semi-anechoic chamber to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise.

2.4 Test Facility

All tests were performed at:
Intertek Testing Services Shenzhen Ltd. Guangzhou Branch
Room102/104, No 203, KeZhu Road, Science City, GETDD Guangzhou, China
Except Conducted Emissions was performed at:
Room 02, & 101/E201/E301/E401/E501/E601/E701/E801 of Room 01 1-8/F., No. 7-2. Caipin Road, Science City, GETDD, Guangzhou, Guangdong, China

A2LA Certificate Number 0078.10
Intertek Testing Services Shenzhen Ltd. Guangzhou Branch is accredited by A2LA and Listed in FCC website. FCC accredited test labs may perform both Certification testing under Parts 15 and 18 and Declaration of Conformity testing.

3.0 System Test Configuration

3.1 Justification

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. The pad can transmit during charging. Both battery powered and AC charging mode were tested, the worst case is 3.8V battery powered mode.

TEST REPORT

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. The spurious emissions more than 20 dB below the permissible value are not reported.

For an intentional radiator, the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to at least the frequency shown in the following table:

Frequency range of radiated emission measurements

Lowest frequency generated in the device	Upper frequency range of measurement
9 kHz to below 10 GHz	10th harmonic of highest fundamental frequency or to 40 GHz, whichever is lower
At or above 10 GHz to below 30 GHz	5th harmonic of highest fundamental frequency or to 100 GHz, whichever is lower
At or above 30 GHz	5th harmonic of highest fundamental frequency or to 200 GHz, whichever is lower, unless otherwise specified

Number of fundamental frequencies to be tested in EUT transmit band

Frequency range in which device operates	Number of frequencies	Location in frequency range of operation
1 MHz or less	1	Middle
1 MHz to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle and 1 near bottom

3.2 EUT Exercising Software

N/A

3.3 Special Accessories

No special accessories used.

TEST REPORT

3.4 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	20 dB Bandwidth	2.3%
	6dB Bandwidth	
	99% Bandwidth	
2	Carrier Frequencies Separated	2.3%
3	Dwell Time	1.2%
4	Maximum Peak Conducted Output Power	1.5dB
5	Peak Power Spectral Density	1.5dB
6	Out of Band Conducted Emissions	1.5dB
7	Band edges measurement	1.5dB
8	Radiated Emissions	4.7 dB (25 MHz-1 GHz)
		4.8 dB (1 GHz-18 GHz)
		5.21dB (18GZH-26GHz)
9	Conducted Emissions at Mains Terminals	2.58dB
10	Temperature	0.5 °C
11	Humidity	0.4 %
12	Time	1.2%

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT.
Measurement uncertainty is calculated in accordance with ETSI TR 100 028-2001.
The measurement uncertainty is given with a confidence of 95%, k=2.

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

Uncertainty and Compliance – Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value

3.5 Equipment Modification

Any modifications installed previous to testing by Sunway Products (Hong Kong) Company Limited will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Guangzhou Branch.

TEST REPORT

3.6 Support Equipment List and Description

The client made a continuous transmit sample for test.

This product was tested with corresponding support equipment as below:

Support Equipment

Description	Manufacturer	Model No.	SN/Version	Supplied by
NoteBook	HP	Compaq 6710b	SN:CNU8240LF9	Intertek

TEST REPORT

4.0 Measurement Results

4.1 Antenna Requirement

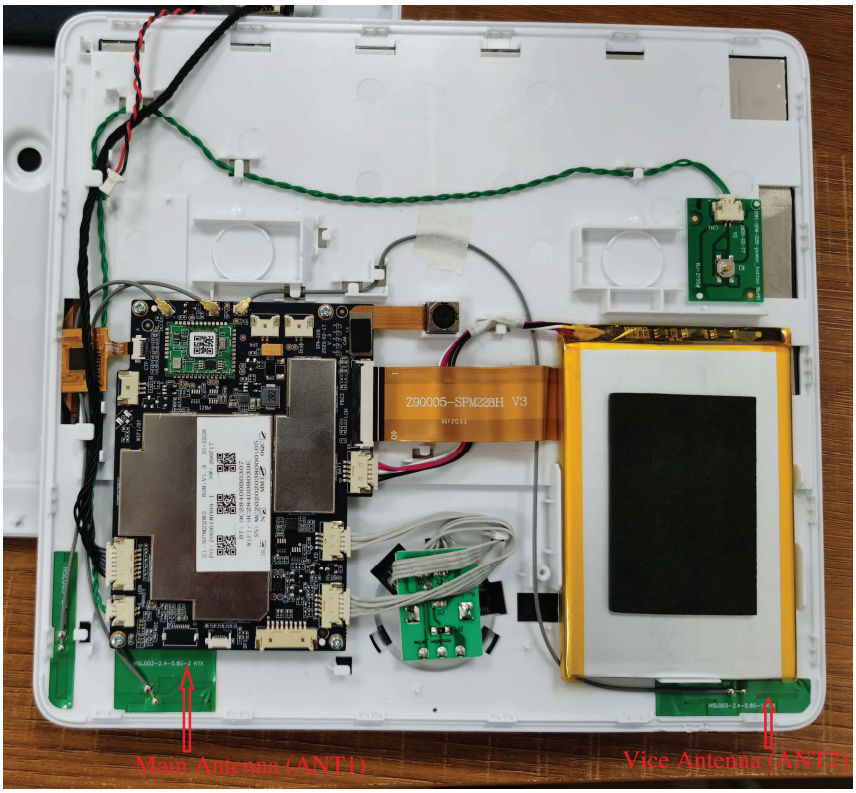
Standard requirement:

15.203 requirement:

For intentional device. According 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.

EUT Antenna

The antenna is a dedicated antenna and no consideration of replacement. The best case gain of the antenna is 1 dBi. Both antennas have the same antenna gain.

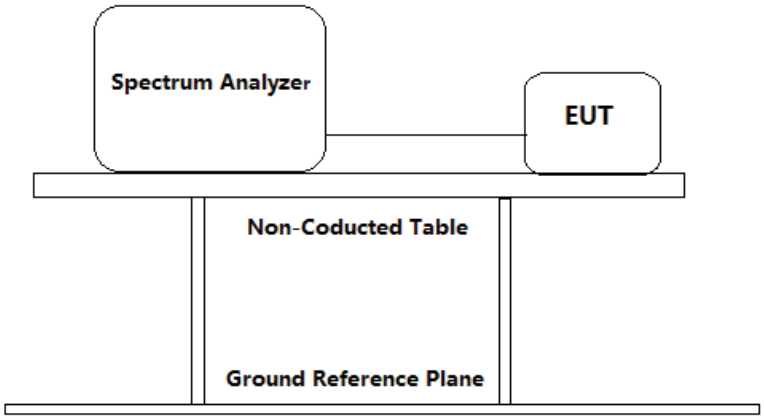


TEST REPORT

4.2 Duty Cycle

Test Requirement:	FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01, Clause B
Test Method:	FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01, Clause B
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

Test Configuration:



Test Procedure:

1. Remove the antenna from the EUT and then connect a low attention attenuation RF cable (cable loss =0.5 dB, with a 10dB attenuator) from the antenna port to the spectrum.
2. Set the spectrum analyser:
   a) Set RBW ≥ 1MHz
   b) Set the VBW ≥ [3 x RBW]
   c) Detector =peak
   d) Span = Zero span
   e) Sweep time = 100ms
   f) Trace mode = Free run
3. Repeat until all the test status is investigated.
4. Report the worst case.

Used Test Equipment List

Spectrum Analyzer. Refer to Clause 5 Test Equipment List for details.

TEST REPORT

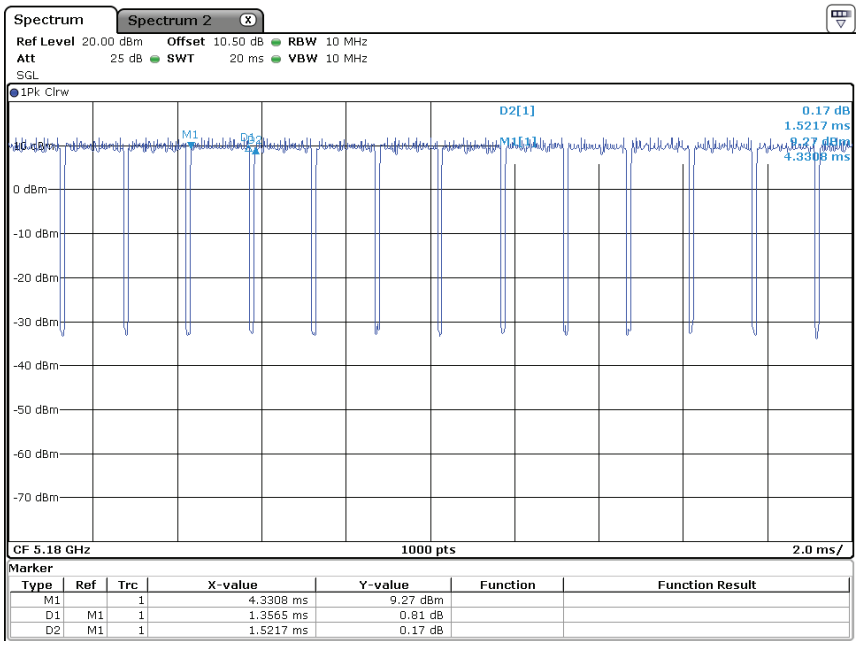
Test result:

Channel No.	Frequency (MHz)	Mode	On time (ms)	Period (ms)	Duty Cycle (%)
36	5180	802.11a (20)	1.3565	1.5217	89.1
36	5180	802.11n (HT20)	1.2548	1.4084	89.1
38	5190	802.11n (HT40)	1.2681	1.4079	90.1
36	5180	802.11ac (HT20)	0.5874	0.7472	78.6
38	5190	802.11ac (HT40)	0.5874	0.7672	76.6
42	5210	802.11ac (HT80)	0.2853x13	6.29	59.0

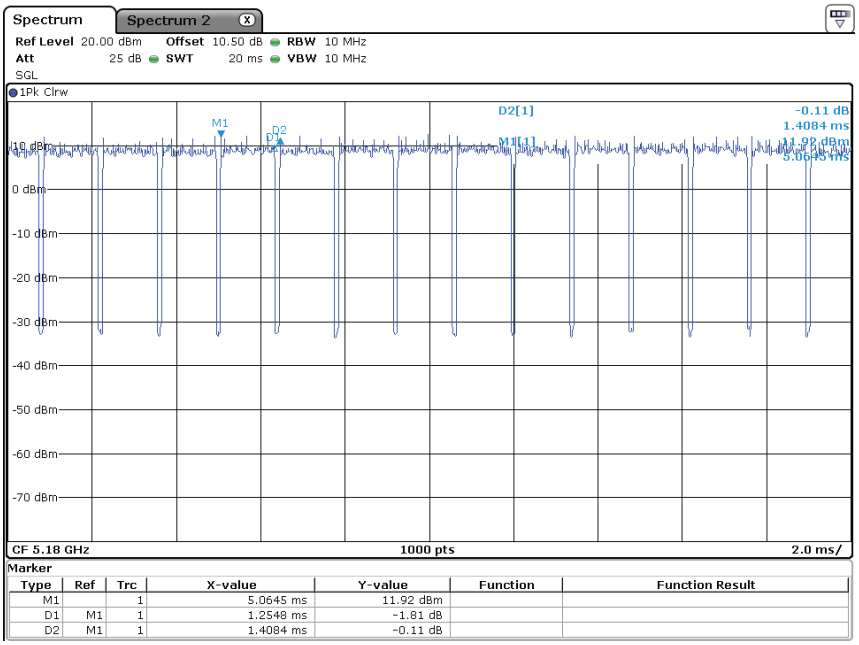
TEST REPORT

Result plot as follows:

802.11a(20) mode
Channel 36: 5180 MHz:



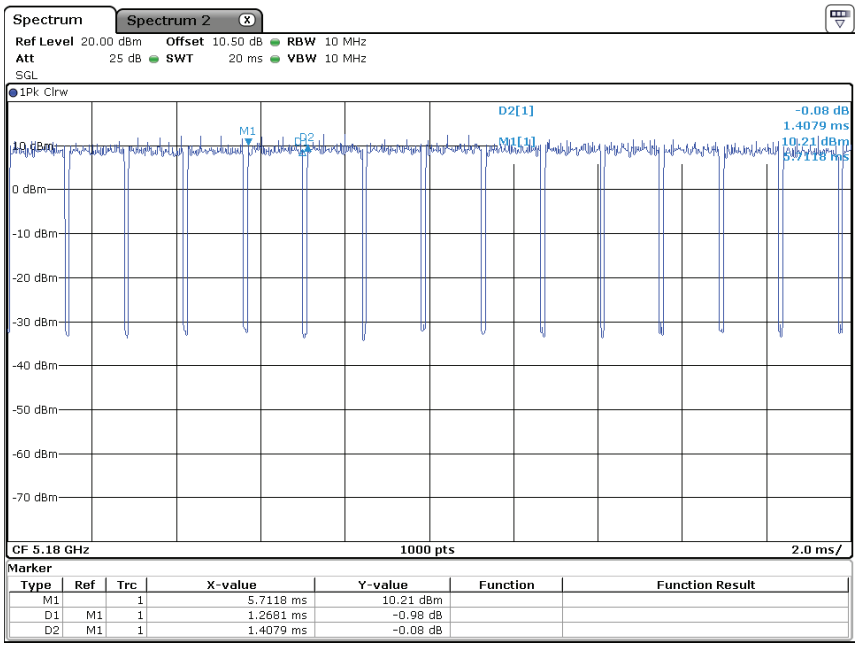
802.11an(HT 20)
Channel 36: 5180 MHz:



TEST REPORT

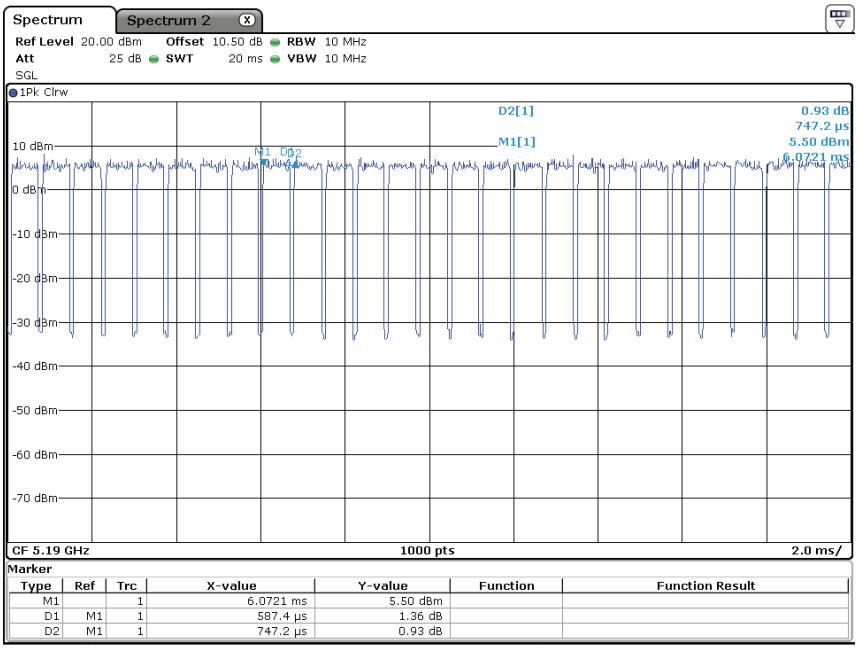
802.11ac(HT 20)

Channel 36: 5180 MHz:



802.11an(HT 40)

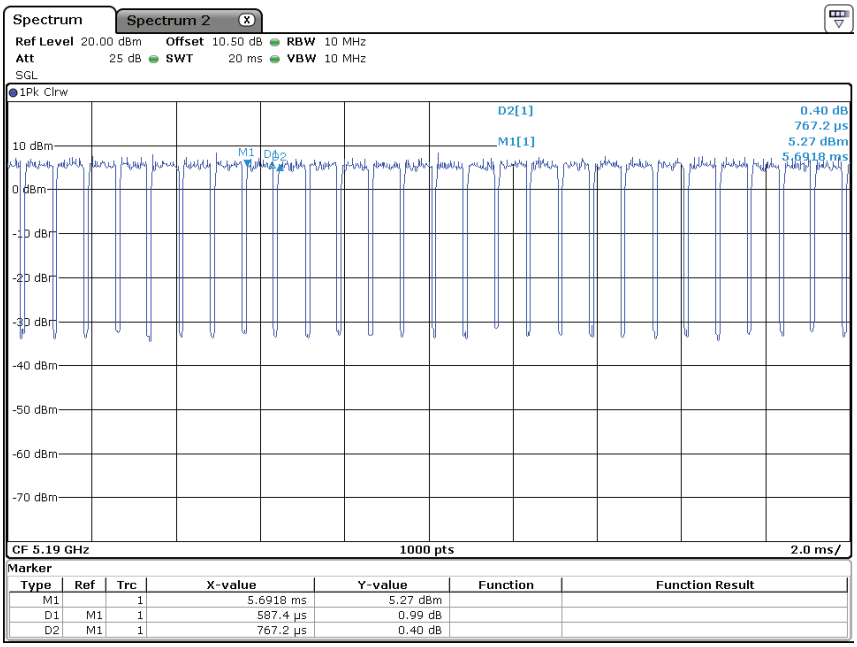
Channel 38: 5190 MHz:



TEST REPORT

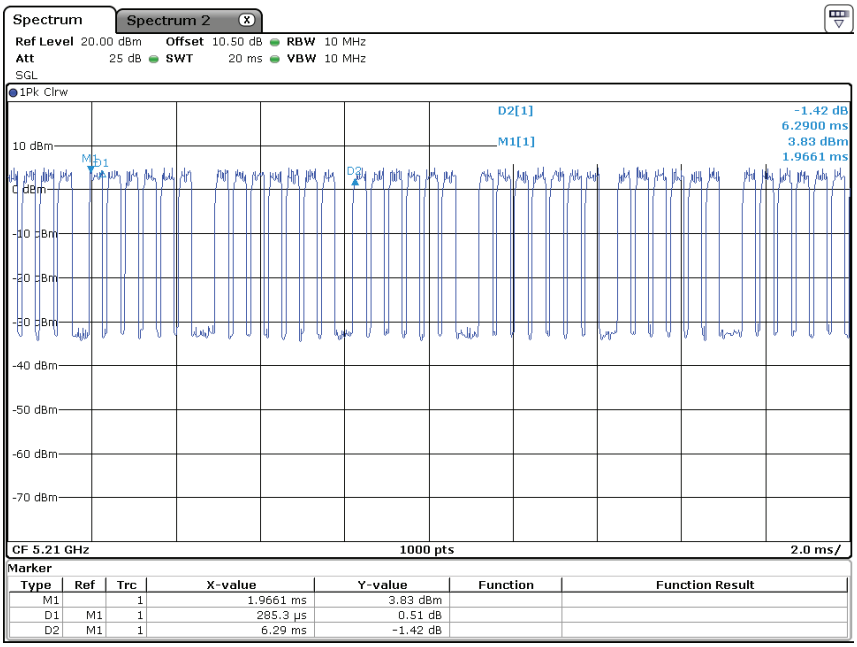
802.11ac(HT 40)

Channel 38: 5190 MHz:



802.11ac(HT 80)

Channel 42: 5210 MHz:

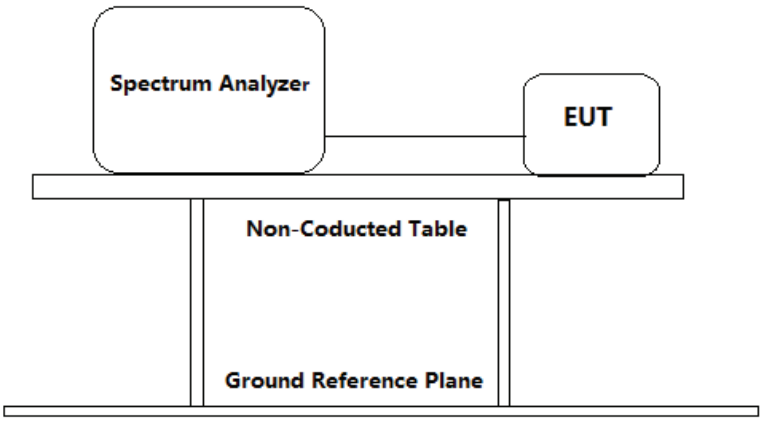


TEST REPORT

4.3 26 dB Bandwidth

Test Requirement:	FCC PART 15 E clause 15.407(a)
Test Method:	FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01, Clause C&D
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

Test Configuration:



Test Procedure:

1. Remove the antenna from the EUT and then connect a low attention attenuation RF cable (cable loss =0.5 dB, with a 10dB attenuator) from the antenna port to the spectrum.
2. Set the spectrum analyzer:

   a) Set the RBW = approximately 1% of the emission bandwidth.
   b) Set the VBW ≥ [3 × RBW].
   c) Detector = peak.
   d) Trace mode = max hold.
   e) Sweep = auto couple.
   f) Allow trace to fully 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 26 dB relative to the maximum level measured in the fundamental emission.
3. Repeat until all the test status is investigated.
4. Report the worst case.

Used Test Equipment List

Spectrum Analyzer. Refer to Clause 5 Test Equipment List for details.

TEST REPORT

Band I (5150MHz – 5250MHz)

Channel No.	Frequency (MHz)	Mode	Data Rate	26dB Bandwidth (MHz)
36	5180	802.11a(20)	6 Mbps	19.8
44	5220		6 Mbps	19.9
48	5240		6 Mbps	20.0
36	5180	802.11an (HT20)	7.2 Mbps	20.6
44	5220		7.2 Mbps	20.7
48	5240		7.2 Mbps	20.4
38	5190	802.11an (HT40)	15 Mbps	40.7
46	5230		15 Mbps	40.6
36	5180	802.11ac (HT20)	7.2 Mbps	19.9
44	5220		7.2 Mbps	19.9
48	5240		7.2 Mbps	20.0
38	5190	802.11ac (HT40)	15 Mbps	40.9
46	5230		15 Mbps	40.4
42	5210	802.11ac (HT80)	32.5 Mbps	80.7

TEST REPORT

Band IV (5725MHz – 5850MHz)

Channel No.	Frequency (MHz)	Mode	Data Rate	26dB Bandwidth (MHz)
149	5745	802.11a(20)	6 Mbps	20.6
157	5785		6 Mbps	20.4
165	5825		6 Mbps	20.6
149	5745	802.11an (HT20)	7.2 Mbps	20.4
157	5785		7.2 Mbps	20.7
165	5825		7.2 Mbps	20.7
151	5755	802.11an (HT40)	15 Mbps	40.4
159	5795		15 Mbps	40.2
149	5745	802.11ac (HT20)	7.2 Mbps	19.9
157	5785		7.2 Mbps	19.9
165	5825		7.2 Mbps	20.0
151	5755	802.11ac (HT40)	15 Mbps	40.4
159	5795		15 Mbps	40.5
155	5775	802.11ac (HT80)	32.5 Mbps	80.6

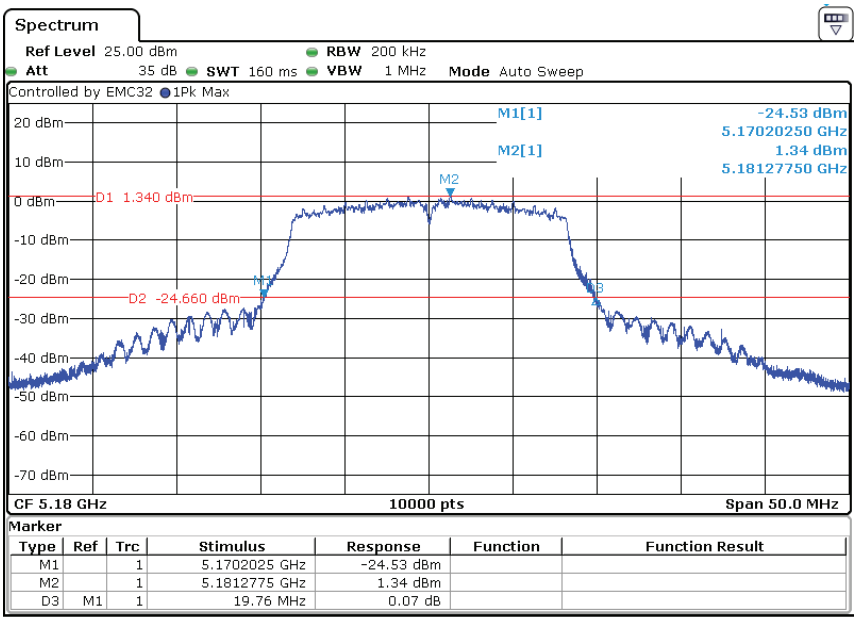
Test result: The unit does meet the FCC requirements.

TEST REPORT

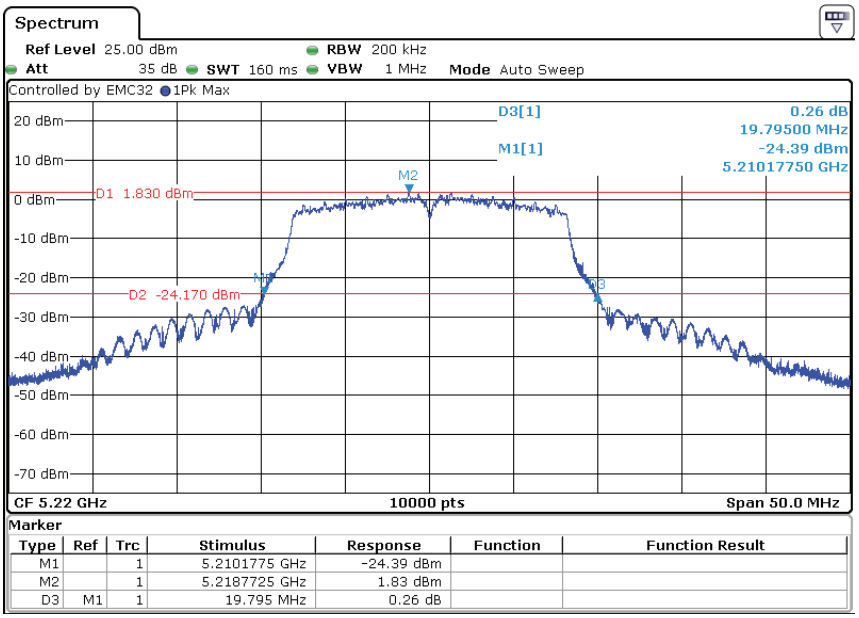
Result plot as follows:

Band I 5150 MHz to 5250 MHz

802.11a(20) mode
Channel 36: 5180 MHz:

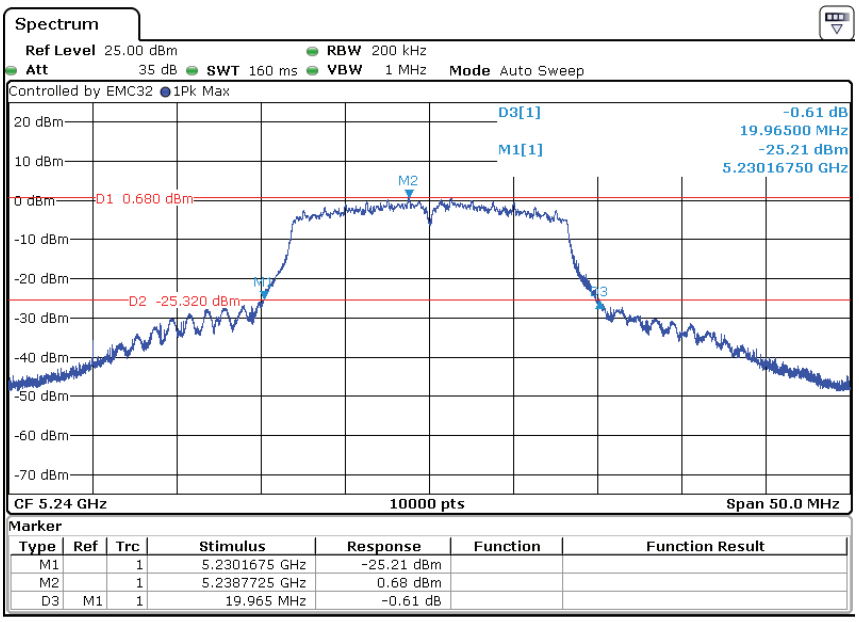


Channel 44: 5220 MHz:

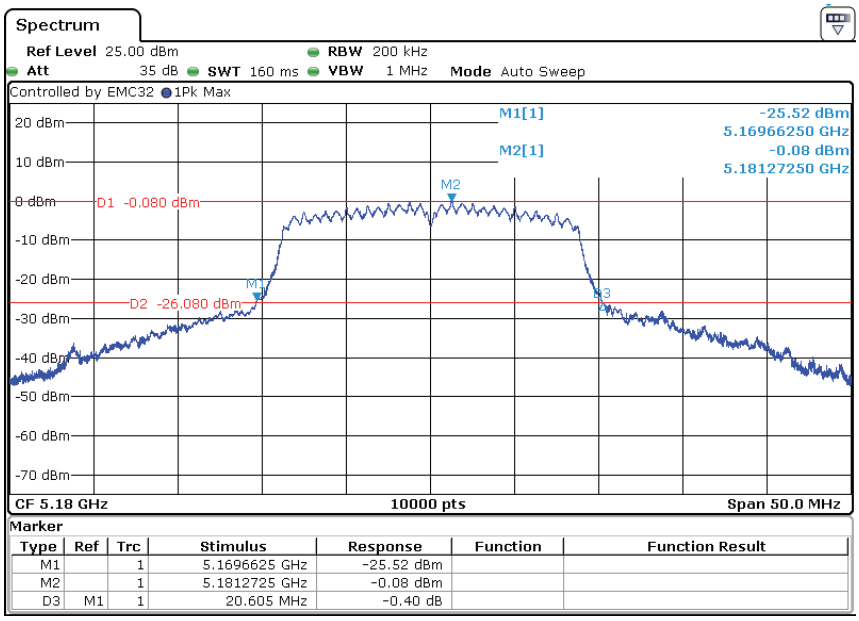


TEST REPORT

Channel 48: 5240 MHz:

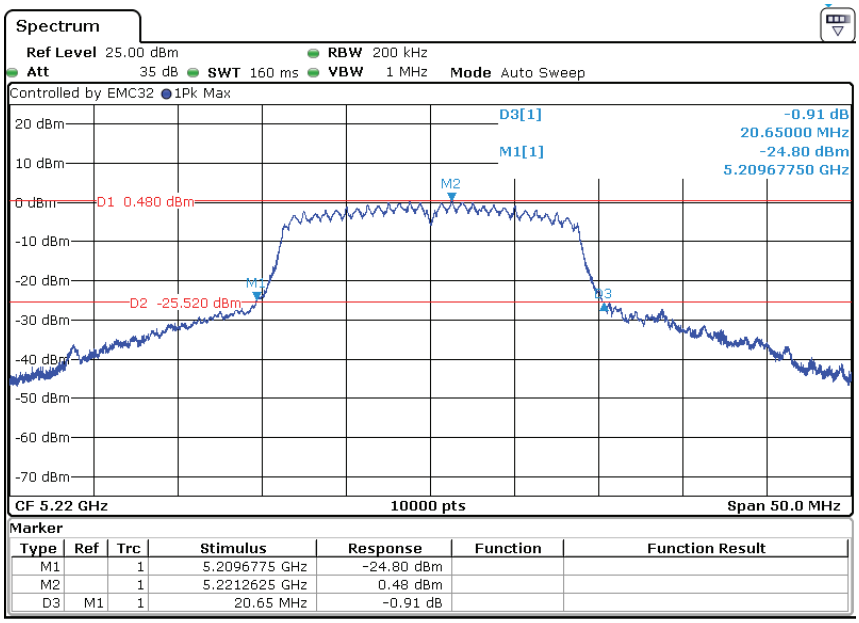


802.11an(HT 20)
Channel 36: 5180 MHz:

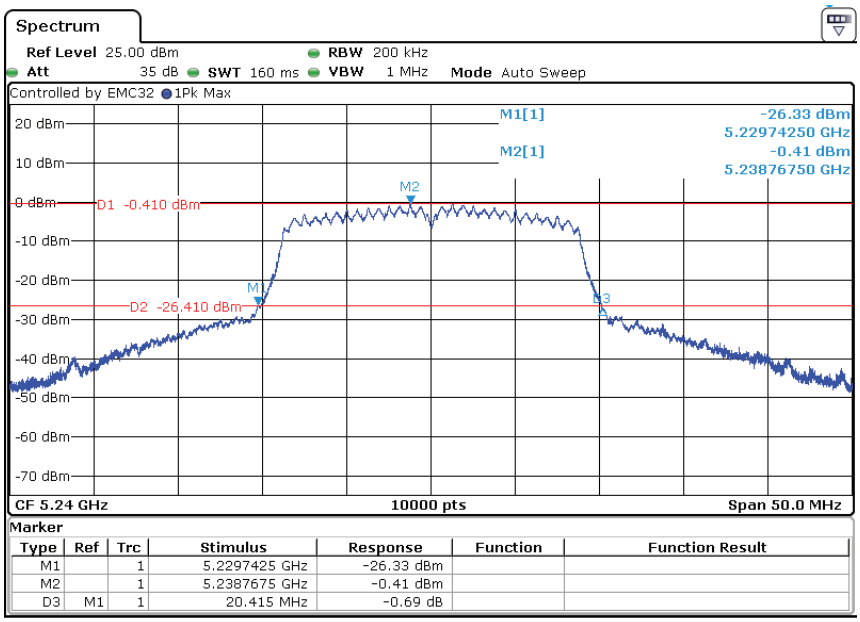


TEST REPORT

Channel 44: 5220 MHz:



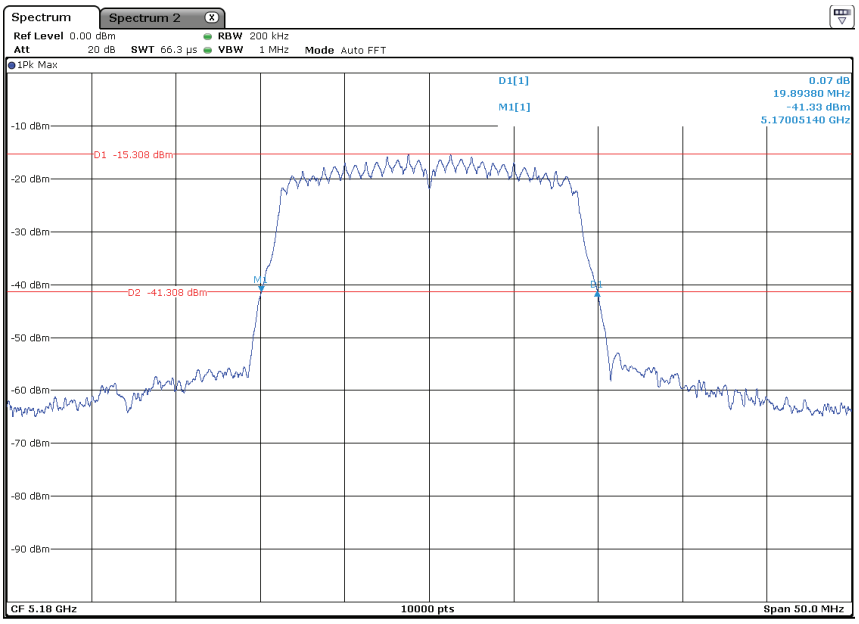
Channel 48: 5240 MHz:



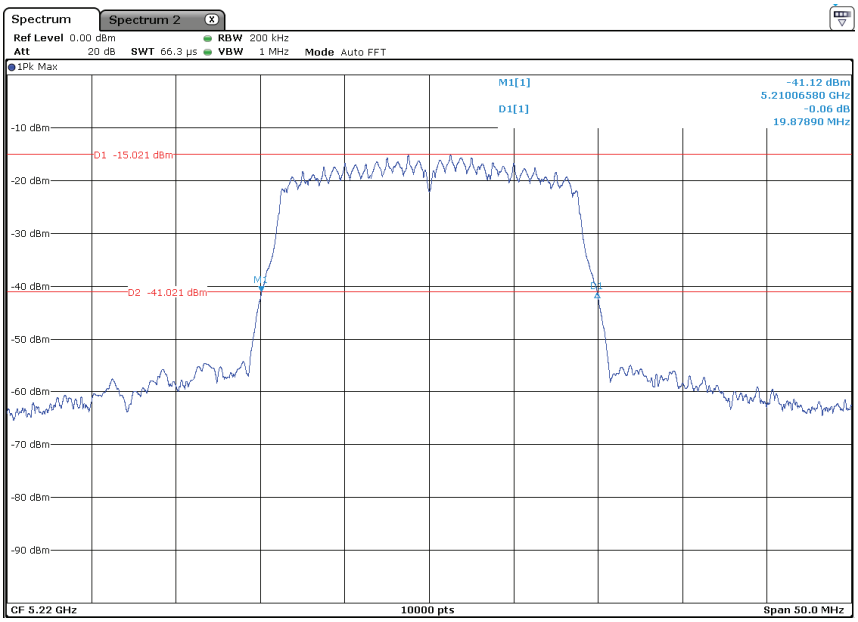
TEST REPORT

802.11ac(HT 20)

Channel 36: 5180 MHz:

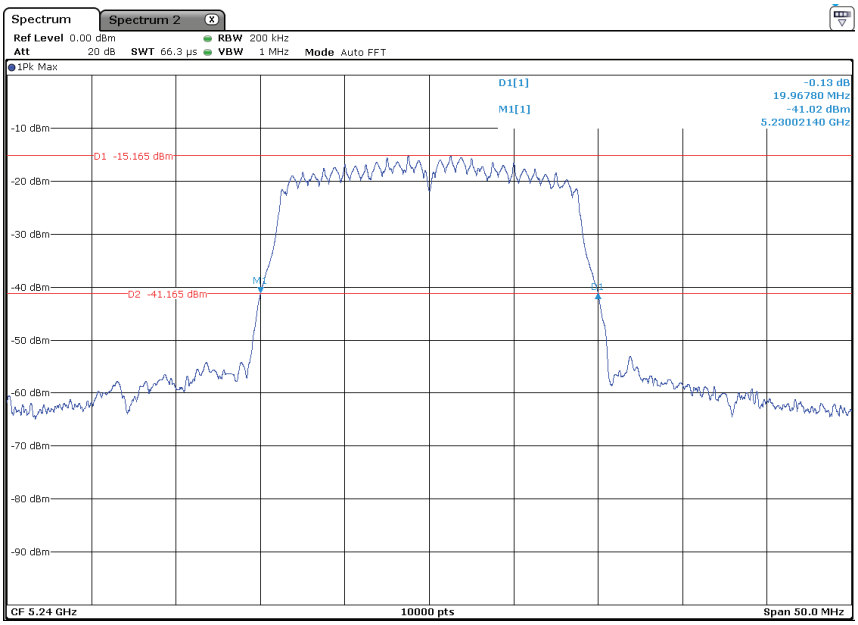


Channel 44: 5220 MHz:



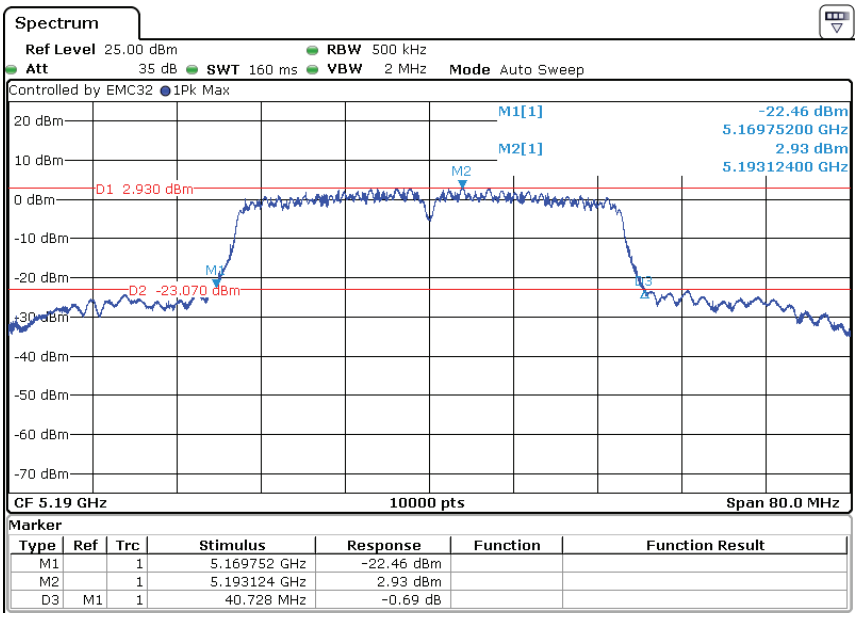
TEST REPORT

Channel 48: 5240 MHz:



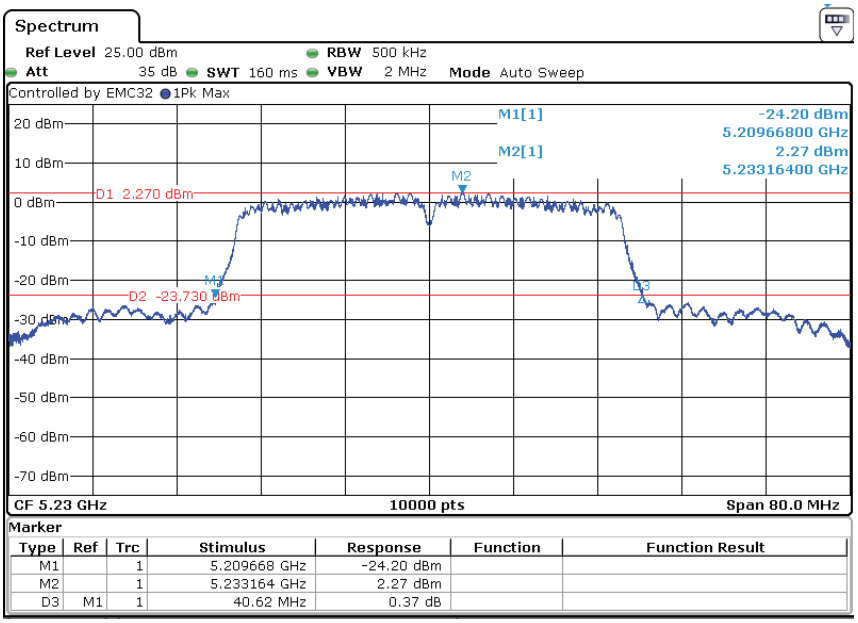
802.11an(HT 40)

Channel 38: 5190 MHz:



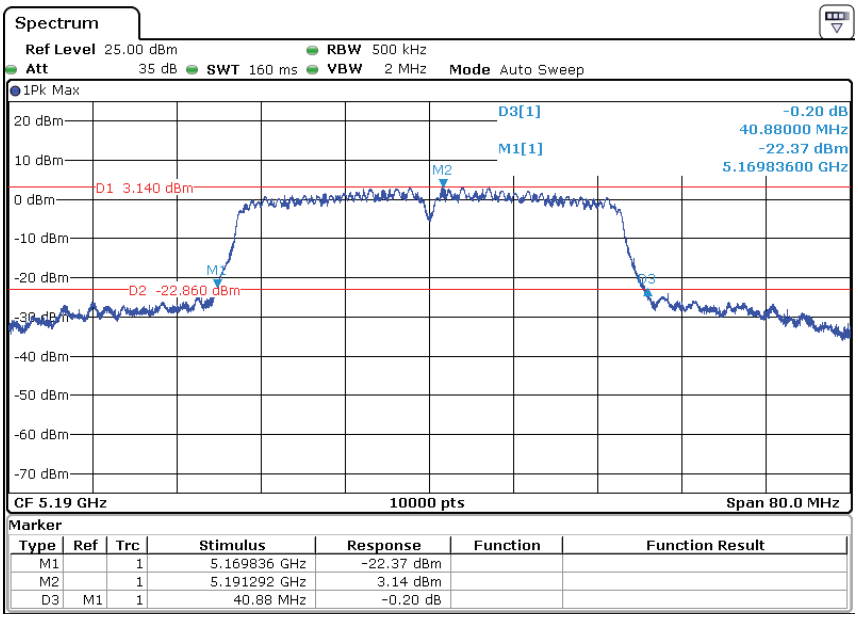
TEST REPORT

Channel 46: 5230 MHz:



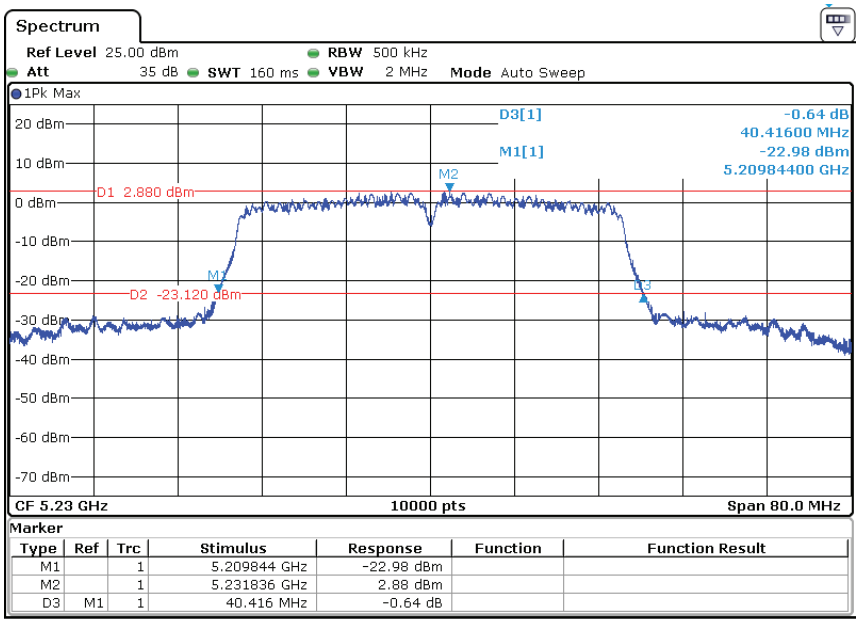
802.11ac(HT 40)

Channel 38: 5190 MHz:



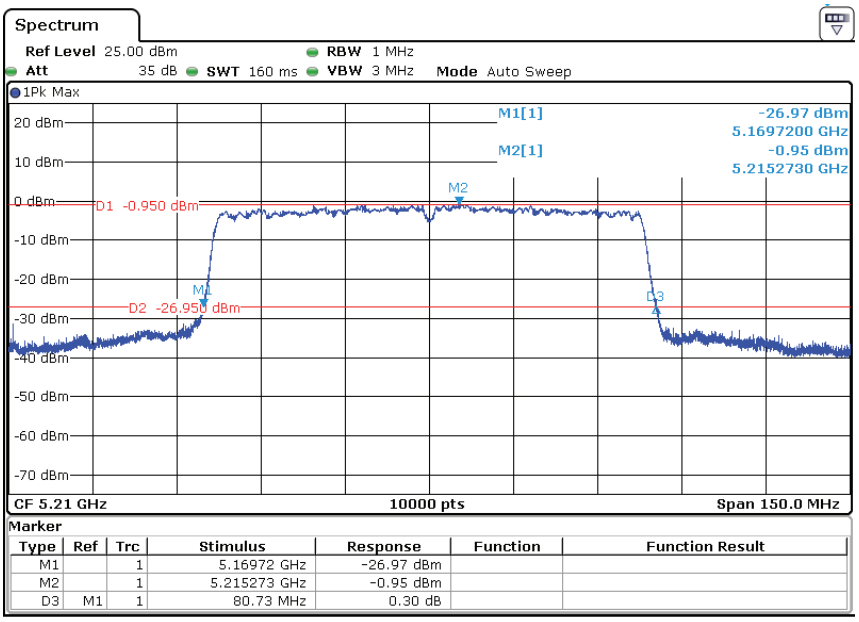
TEST REPORT

Channel 46: 5230 MHz:



802.11ac(HT 80)

Channel 42: 5210 MHz:

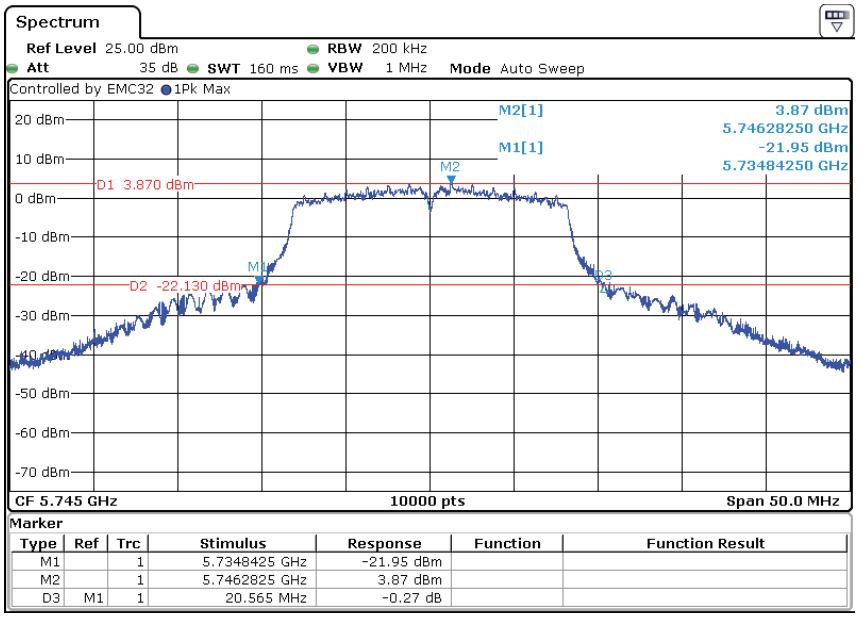


TEST REPORT

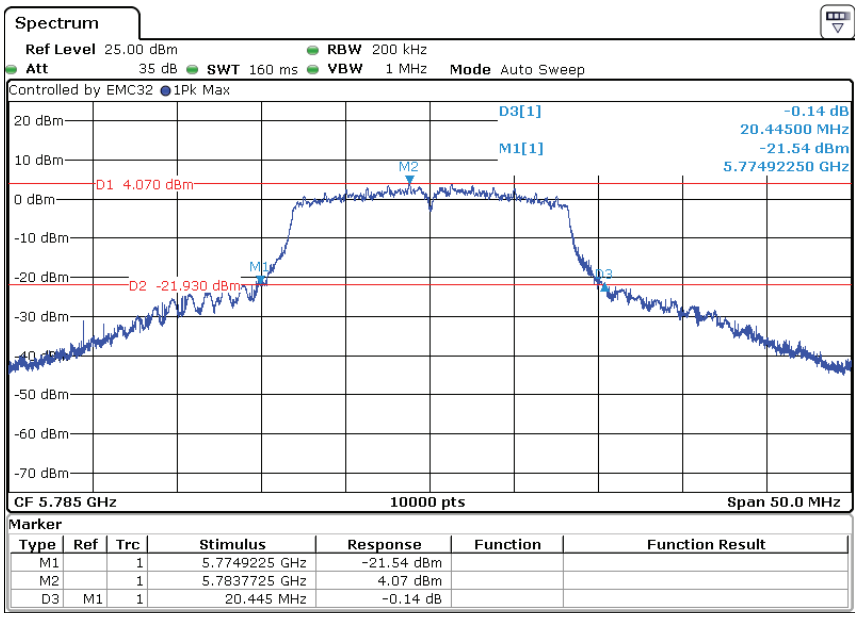
Result plot as follows:

Band IV 5725 MHz to 5850 MHz

802.11a(20) mode
Channel 149: 5745 MHz:

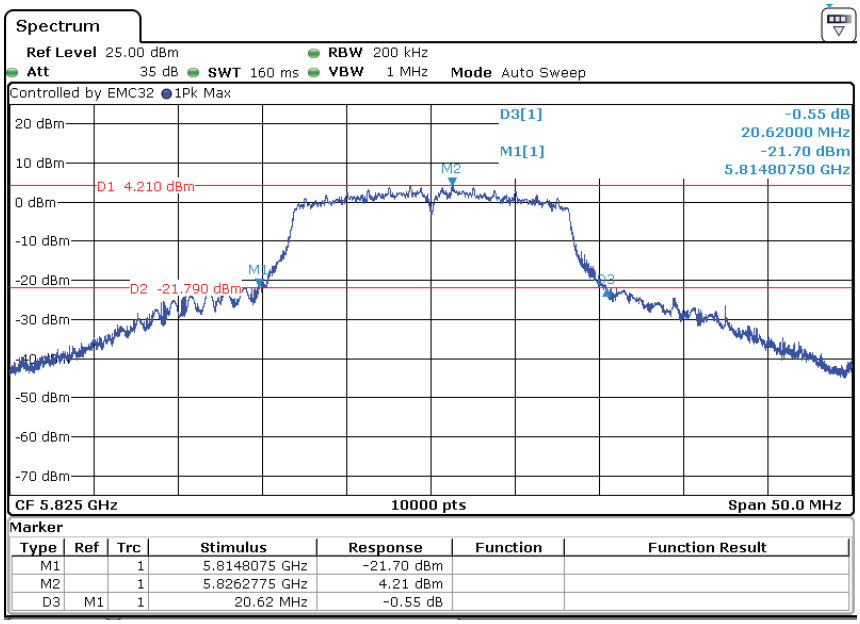


Channel 157: 5785 MHz:

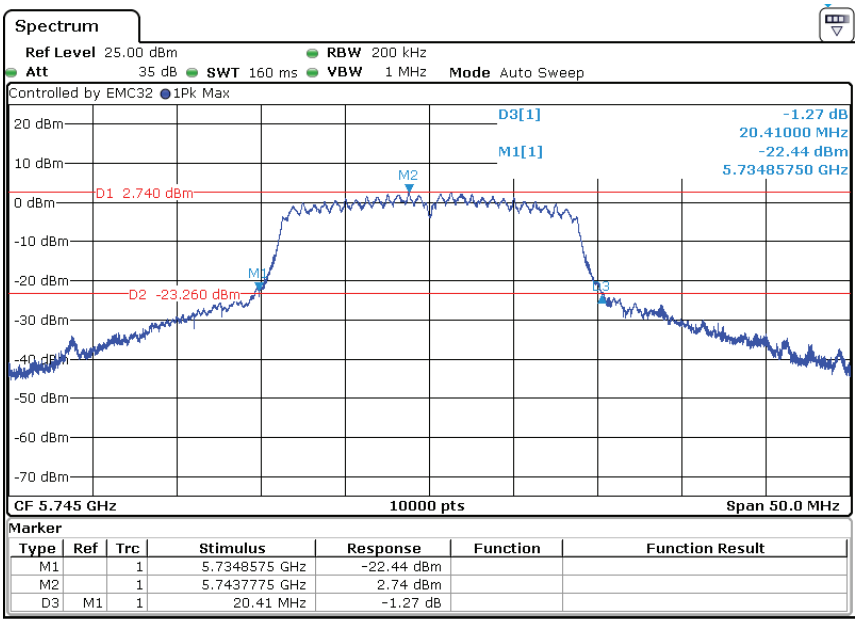


TEST REPORT

Channel 165: 5825 MHz:

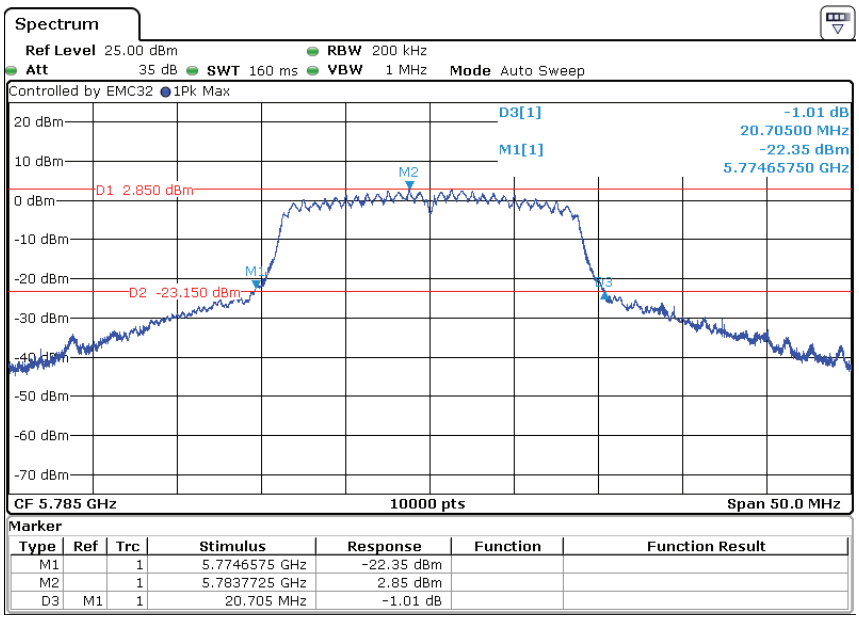


802.11an(HT 20)
Channel 149: 5745 MHz:

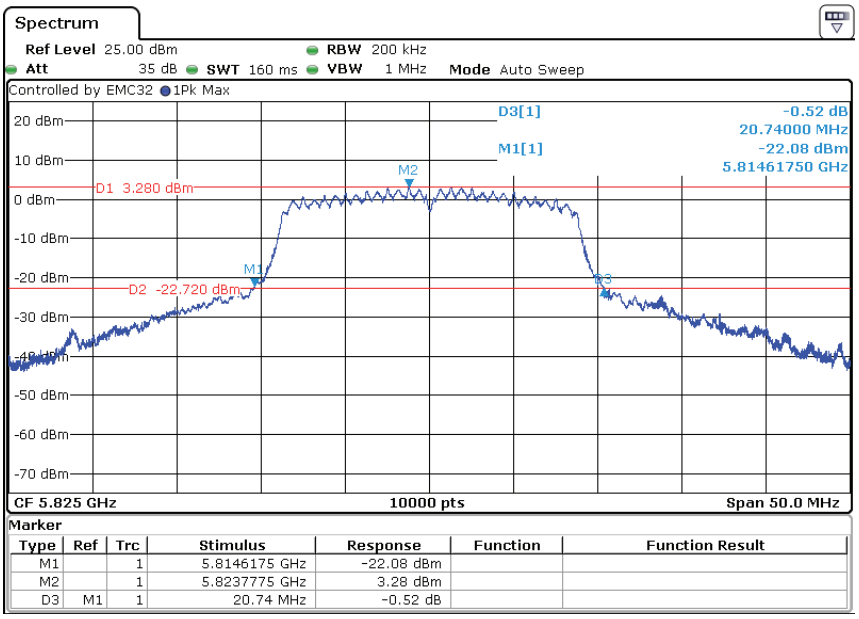


TEST REPORT

Channel 157: 5785 MHz:



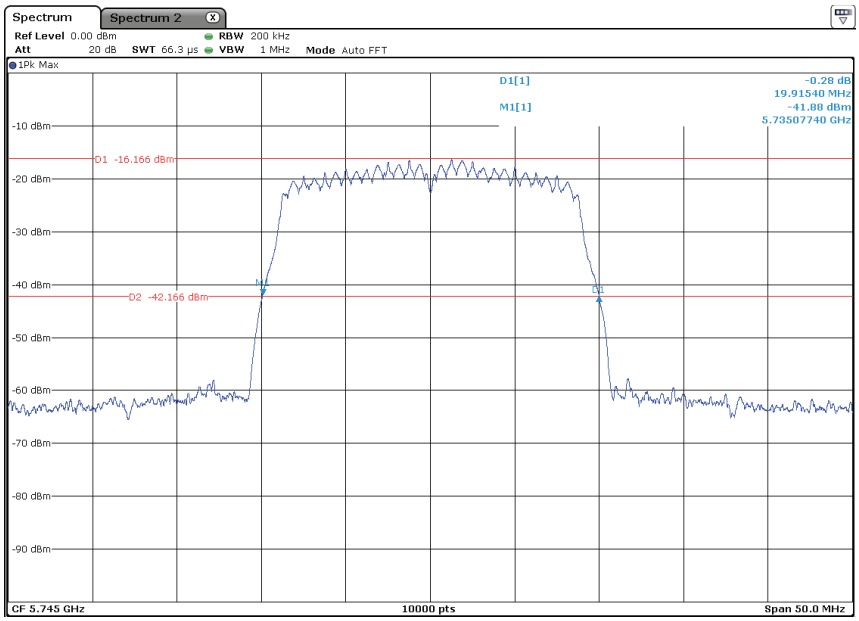
Channel 165: 5825 MHz:



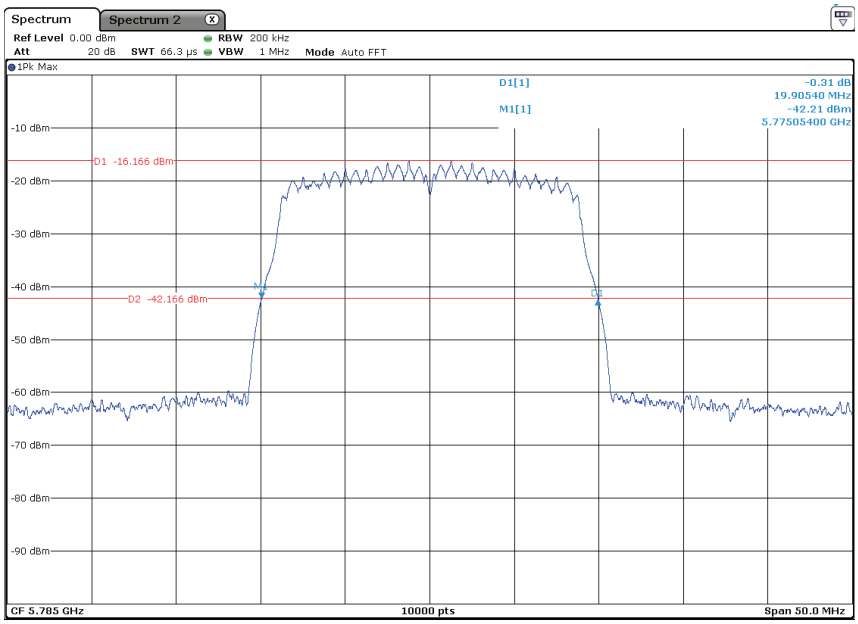
TEST REPORT

802.11ac(HT 20)

Channel 149: 5745 MHz:

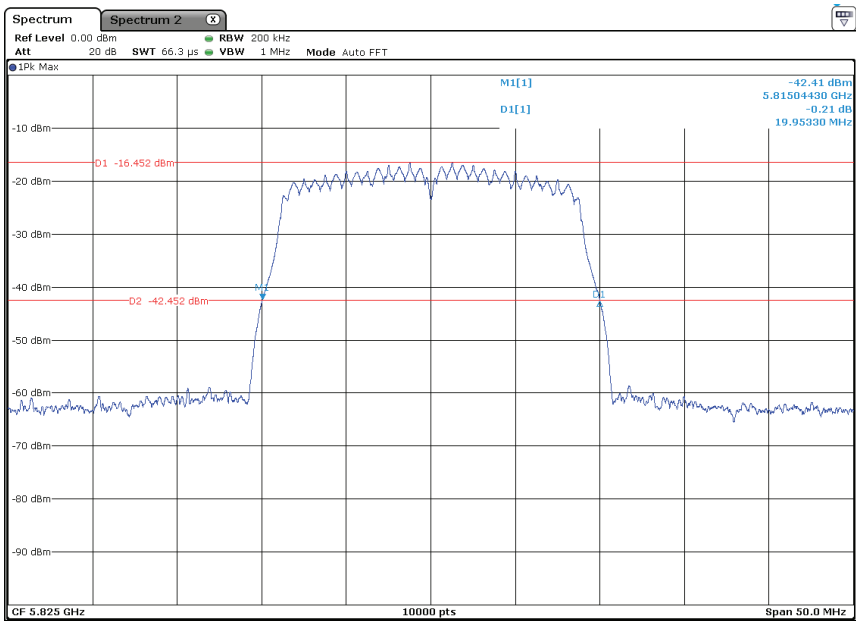


Channel 157: 5785 MHz:



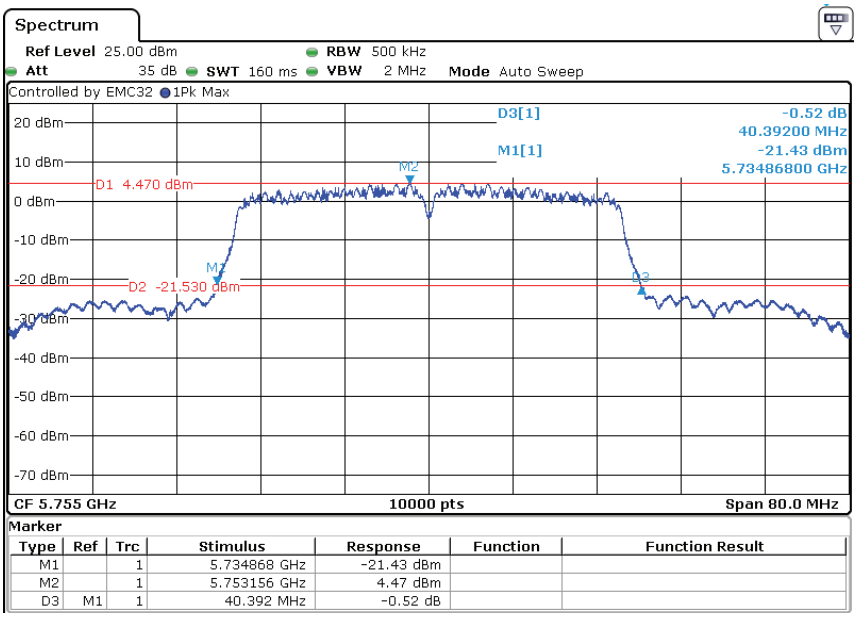
TEST REPORT

Channel 165: 5825 MHz:



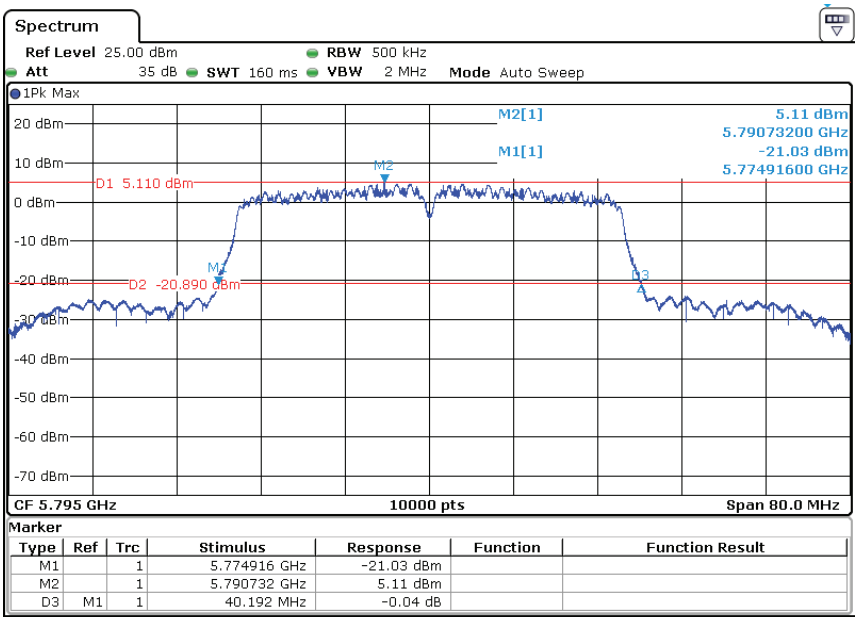
802.11an(HT 40)

Channel 151: 5755 MHz:



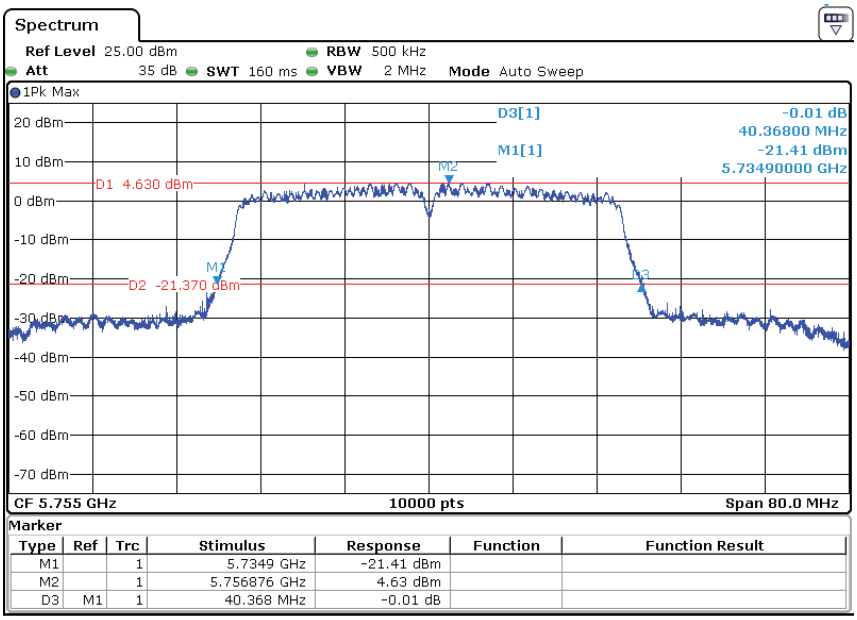
TEST REPORT

Channel 159: 5795 MHz:



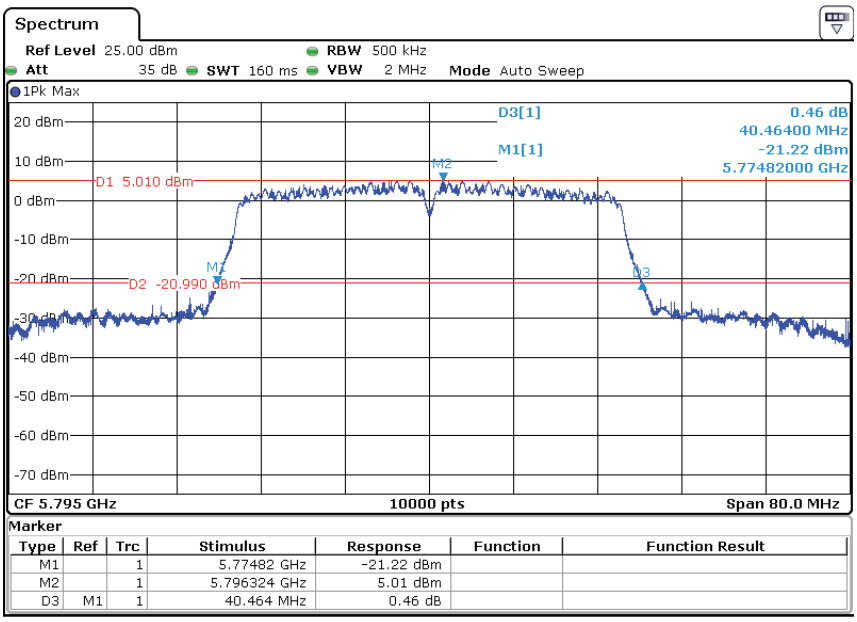
802.11ac(HT 40)

Channel 151: 5755 MHz:



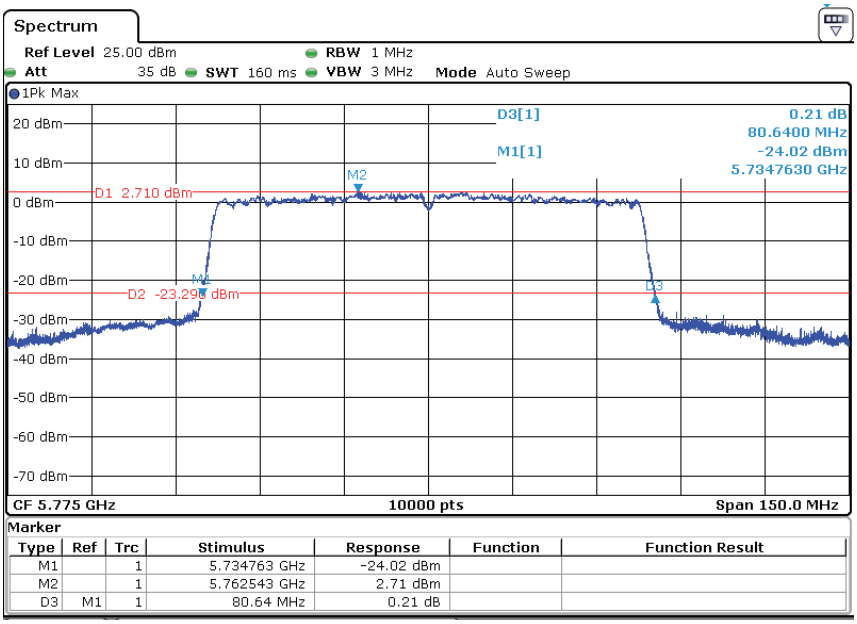
TEST REPORT

Channel 159: 5795 MHz:



802.11ac(HT 80)

Channel 155: 5775 MHz:

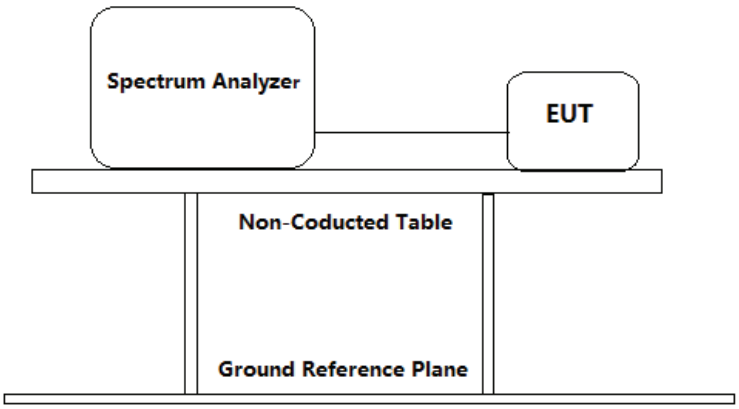


TEST REPORT

4.4 6 dB Bandwidth

Test Requirement:	FCC PART 15 E clause 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.
Test Method:	FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01, Clause C
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

Test Configuration:



Test Procedure:

1. Remove the antenna from the EUT and then connect a low attention attenuation RF cable(cable loss =0.5 dB, with a 10dB attenuator) from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer:
   a) Set RBW = 100 kHz.
   b) Set 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.
   h) Span=2*BW~5*BW.
3. Repeat until all the test status is investigated.
4. Report the worst case.

TEST REPORT

Used Test Equipment List
Spectrum Analyzer. Refer to Clause 5 Test Equipment List for details.

Test result:

Channel No.	Frequency (MHz)	Mode	Data Rate	6dB bandwidth (MHz)	Limit	Result
149	5745	802.11a(20)	6 Mbps	15.3	≥500kHz	Pass
157	5785		6 Mbps	15.1		Pass
165	5825		6 Mbps	15.1		Pass
149	5745	802.11an (HT20)	7.2 Mbps	16.3		Pass
157	5785		7.2 Mbps	16.3		Pass
165	5825		7.2 Mbps	16.3		Pass
151	5755	802.11an (HT40)	15 Mbps	35.3		Pass
159	5795		15 Mbps	35.3		Pass
149	5745	802.11ac (HT20)	7.2 Mbps	16.3		Pass
157	5785		7.2 Mbps	16.3		Pass
165	5825		7.2 Mbps	16.2		Pass
151	5755	802.11ac (HT40)	15 Mbps	35.1		Pass
159	5795		15 Mbps	35.4		Pass
155	5775	802.11ac (HT80)	32.5 Mbps	75.7		Pass

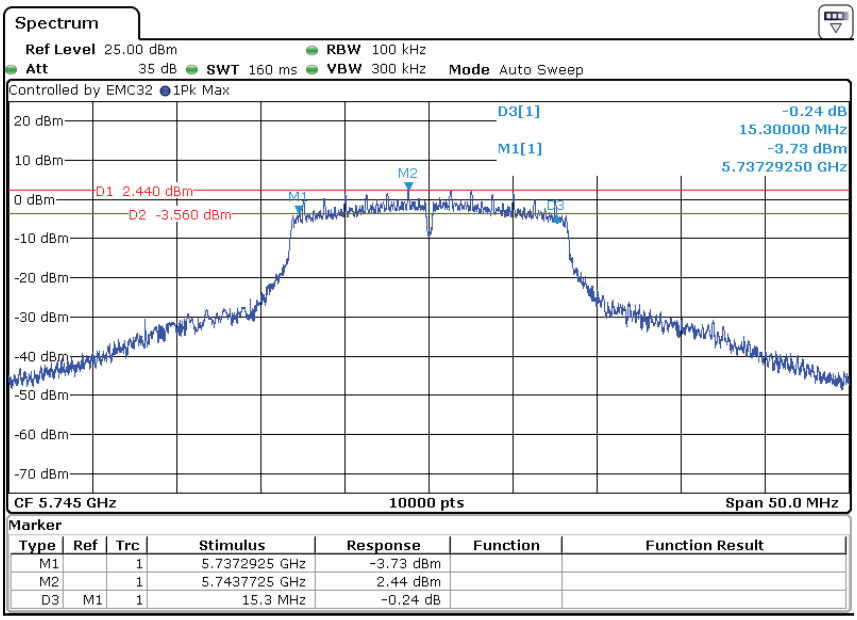
Test result: The unit does meet the FCC requirements

TEST REPORT

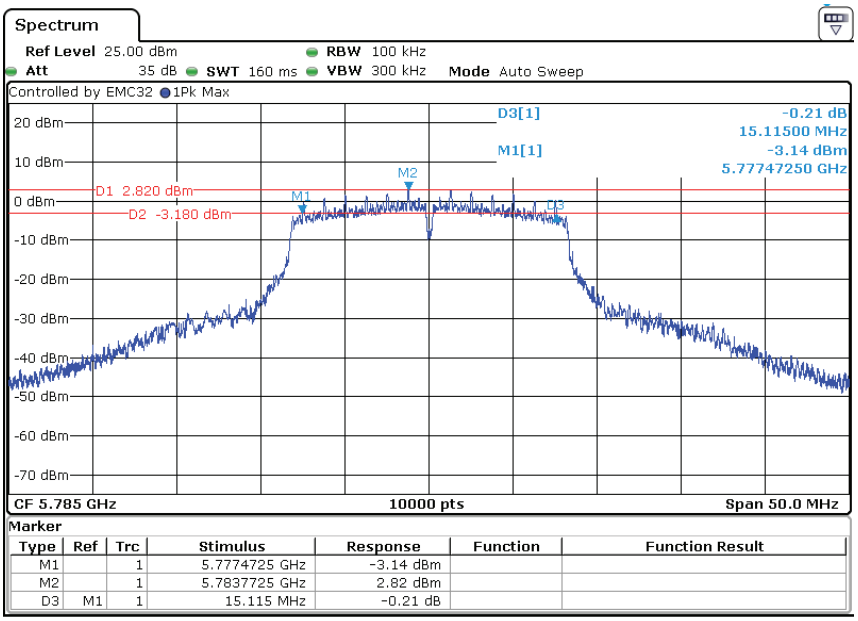
Result plot as follows:

Band IV 5725 MHz to 5850 MHz

802.11a(20) mode
Channel 149: 5745 MHz:

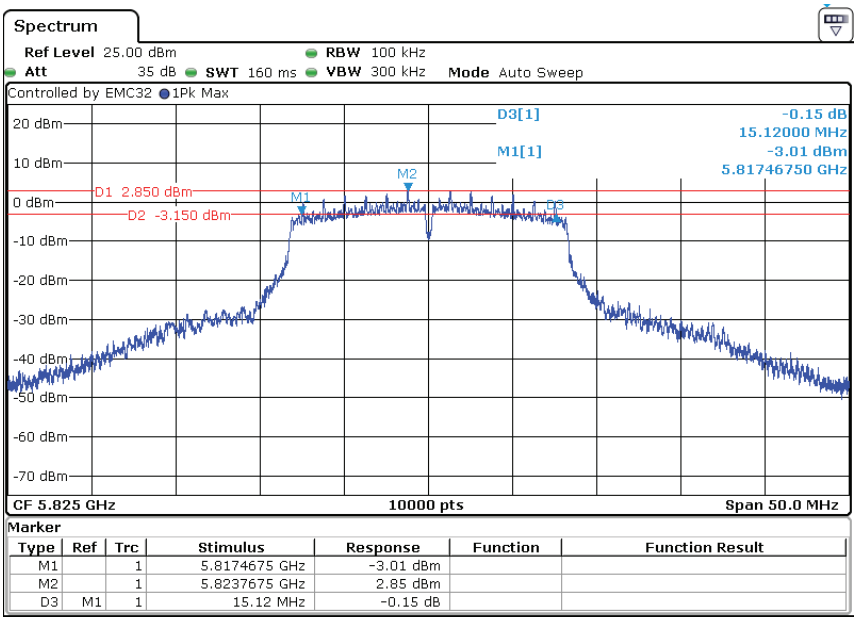


Channel 157: 5785 MHz:

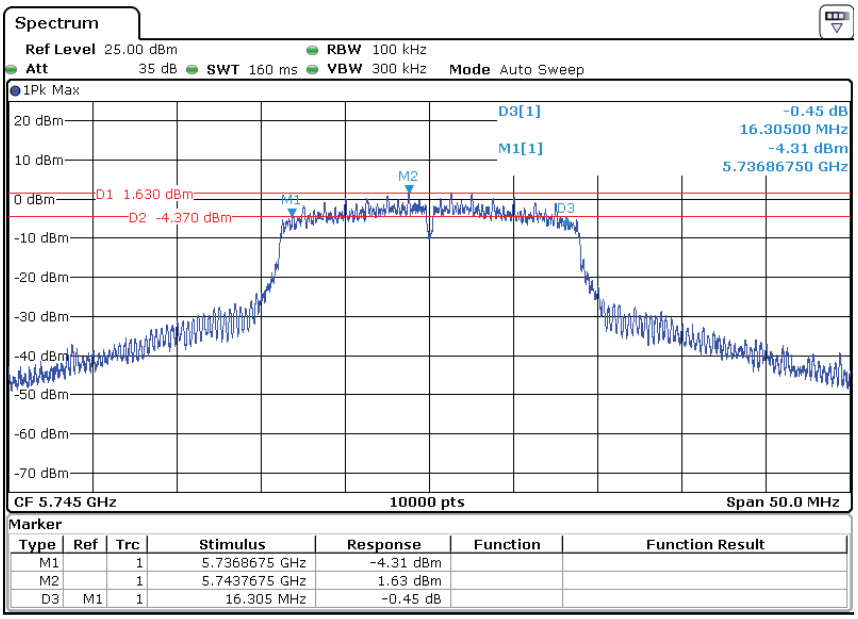


TEST REPORT

Channel 165: 5825 MHz:

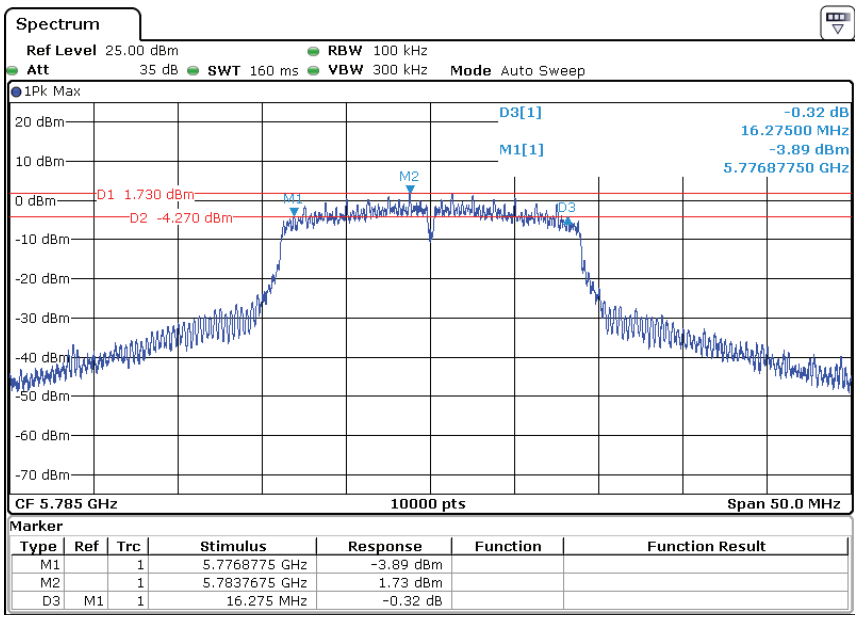


802.11an(HT 20)
Channel 149: 5745 MHz:

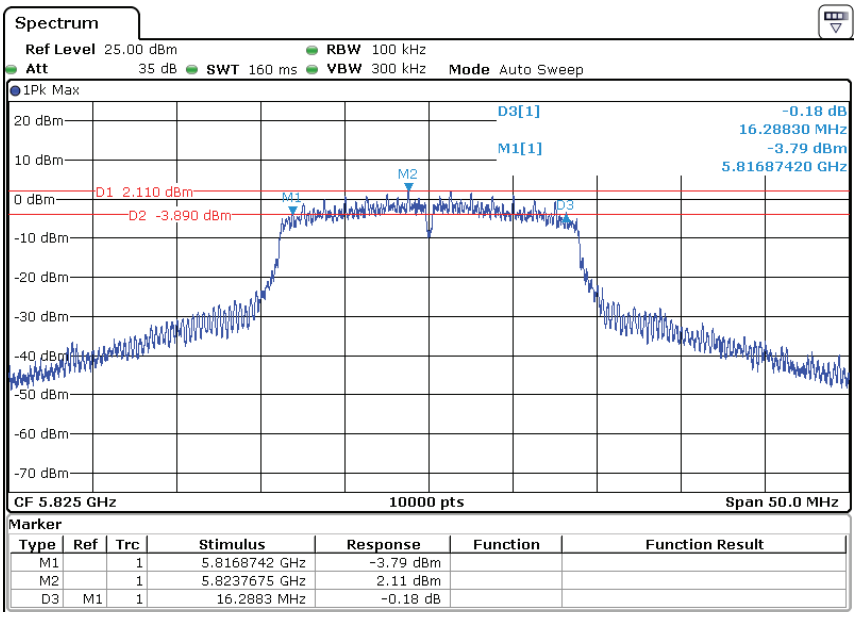


TEST REPORT

Channel 157: 5785 MHz:



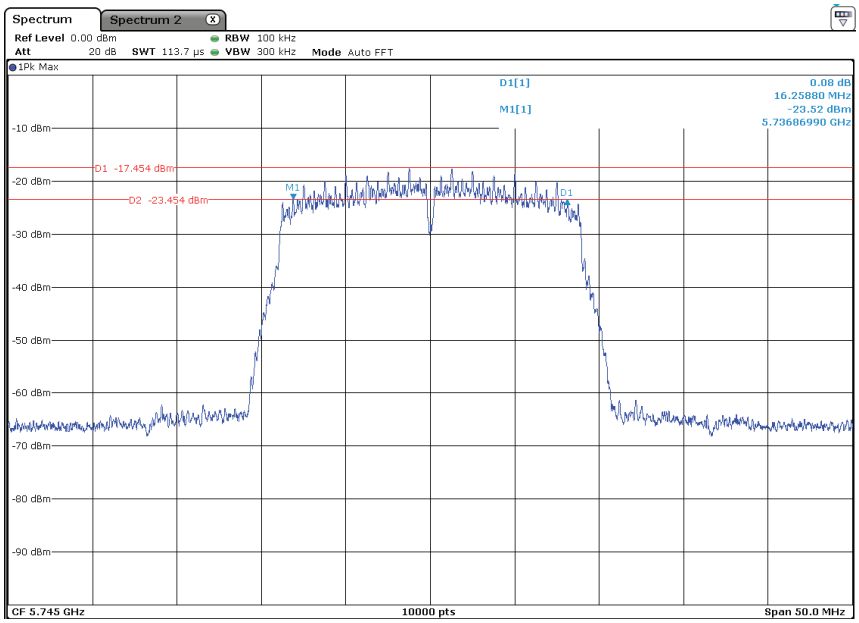
Channel 165: 5825 MHz:



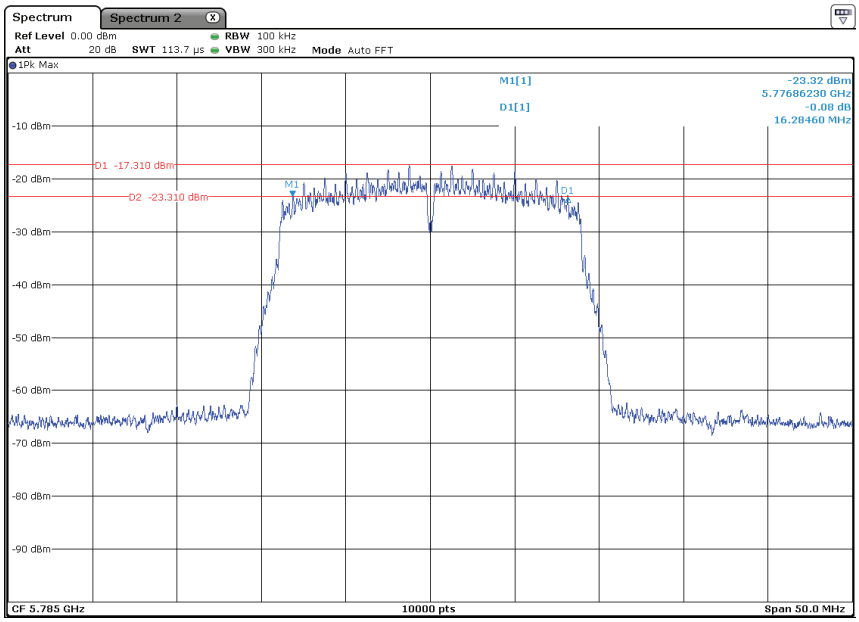
TEST REPORT

802.11ac(HT 20)

Channel 149: 5745 MHz:

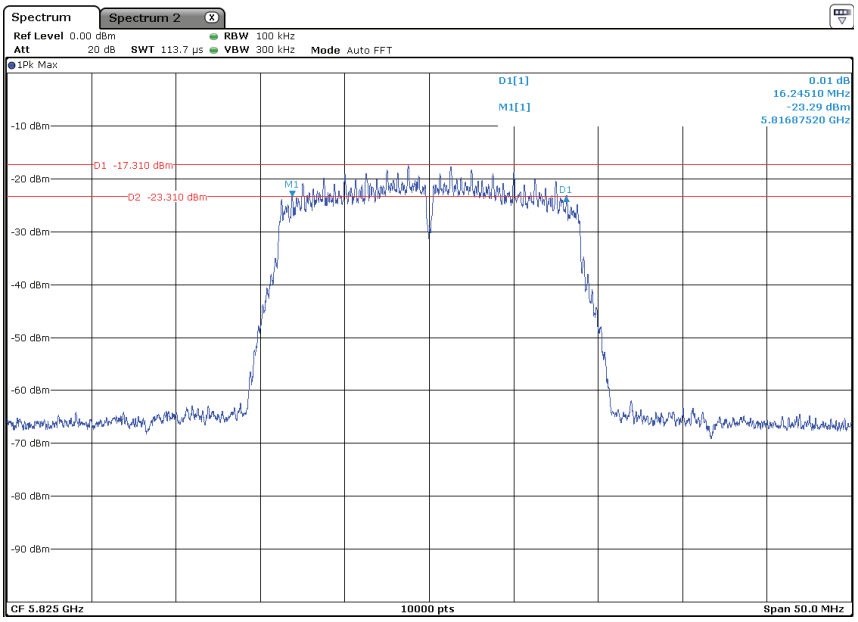


Channel 157: 5785 MHz:



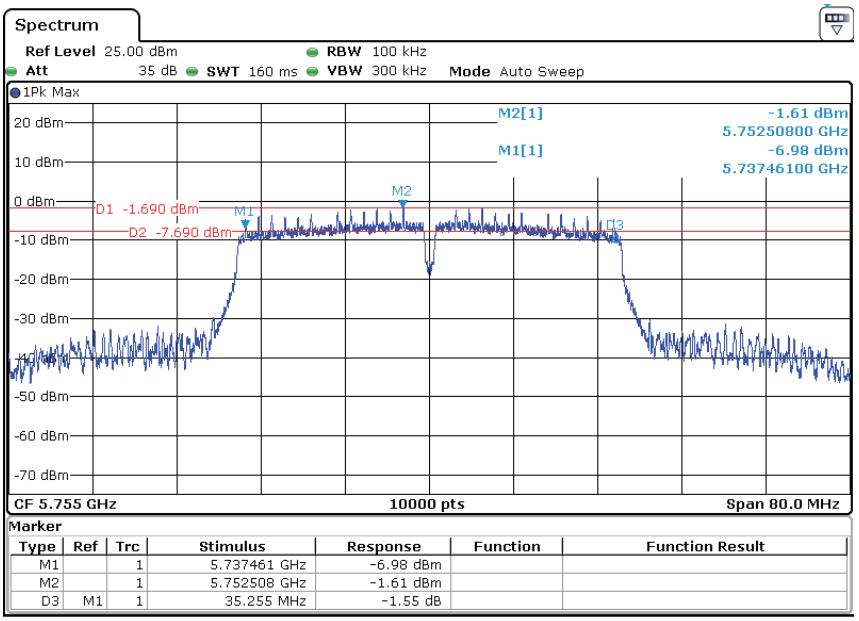
TEST REPORT

Channel 165: 5825 MHz:



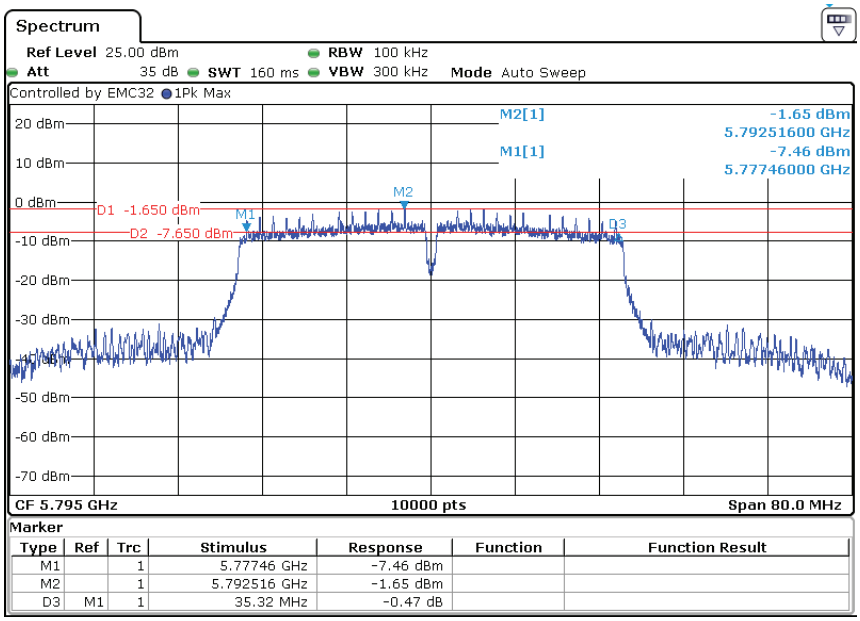
802.11an(HT 40)

Channel 151: 5755 MHz:



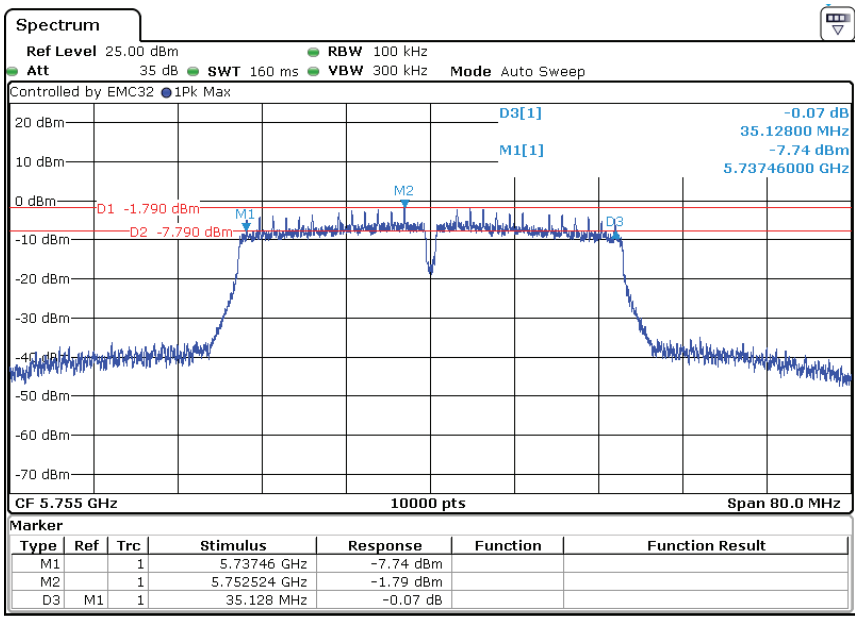
TEST REPORT

Channel 159: 5795 MHz:



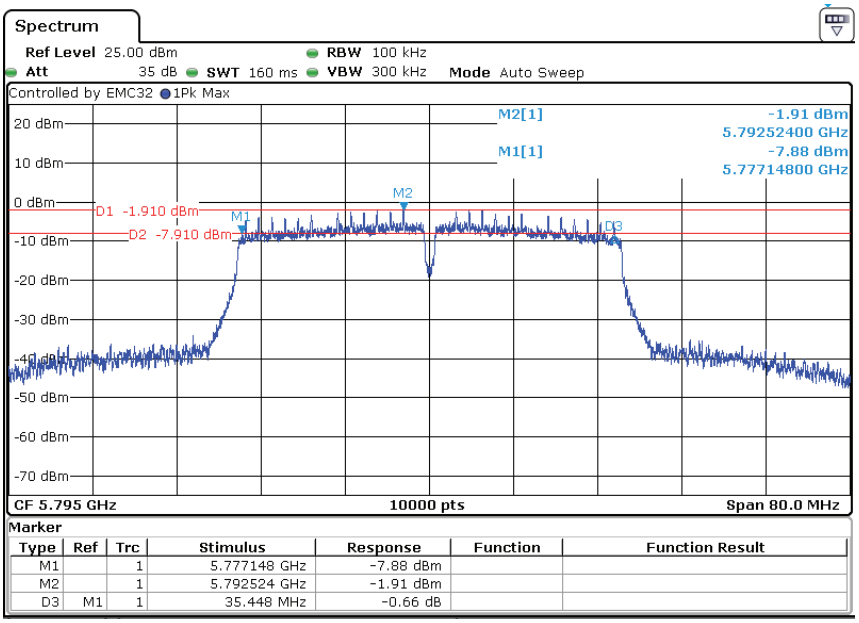
802.11ac(HT 40)

Channel 151: 5755 MHz:



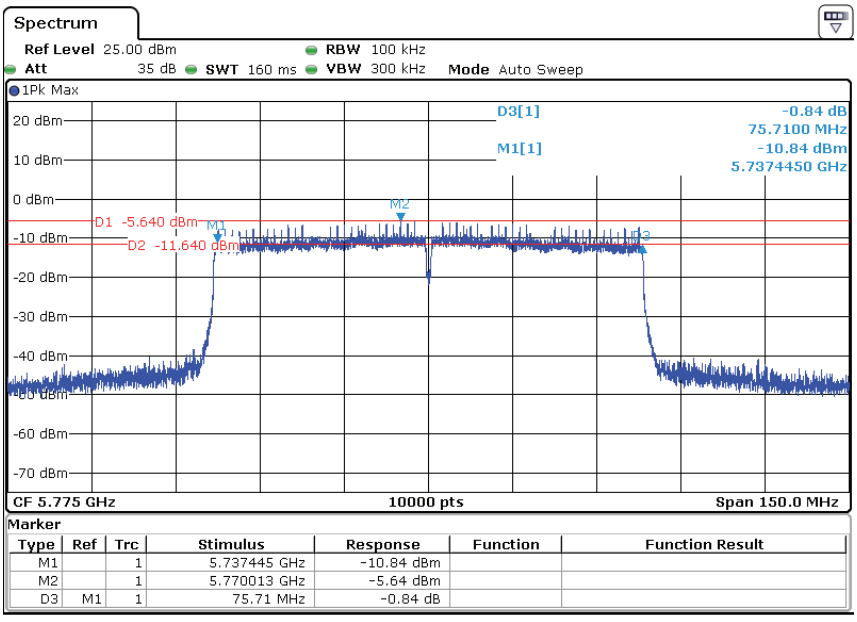
TEST REPORT

Channel 159: 5795 MHz:



802.11ac(HT 80)

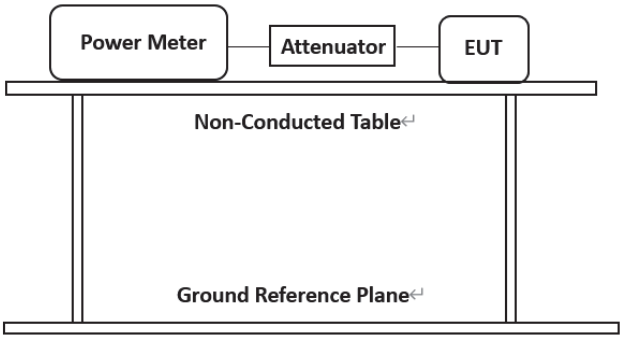
Channel 155: 5775 MHz:



TEST REPORT

4.5 Maximum Average Conducted Output Power

Test Requirement:	FCC Part 15 E clause 15.407(a)
Test Method:	FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01, Clause E
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.
Test Configuration:	



Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable (cable loss =0.5dB, with a 10dB attenuator) from the antenna port to the power meter.
2. The EUT is configured to transmit continuously or to transmit with a constant duty cycle.
3. If the EUT is transmitting at all times, it must be transmitting at its maximum power control level.
4. If the EUT does not transmit continuously, measure the duty cycle and adjust the measurement in dBm by adding 10log(1/x) where x is the duty cycle of transmitter output signal. This measurement is an average over both the ON and OFF periods of the transmitter.
5. Report the worst case.

Used Test Equipment List

Spectrum Analyzer. Refer to Clause 5 Test Equipment List for details.

TEST REPORT

Test result:
This is a client device.

Band I (5150MHz-5250MHz)

Channel No.	Frequency (MHz)	Mode	Measured Power(dBm) ANT1	Measured Power(dBm) ANT2	Sum of Power (dBm)	Limit	Result
36	5180	802.11a(20) 6Mbps	3.80	3.40	6.61	250mW (24dBm)	Pass
44	5220		4.34	3.75	7.07		Pass
48	5240		4.53	3.91	7.24		Pass
36	5180	802.11n (HT20) 7.2Mbps	4.37	2.11	6.40		Pass
44	5220		4.92	3.05	7.10		Pass
48	5240		5.18	3.41	7.39		Pass
36	5180	802.11ac (HT20) 7.2Mbps	4.41	2.57	6.60		Pass
44	5220		4.82	3.26	7.12		Pass
48	5240		5.09	3.57	7.41		Pass
38	5190	802.11n (HT40) 15Mbps	4.69	2.11	6.60		Pass
46	5230		5.12	2.80	7.12		Pass
38	5190	802.11ac (HT40) 15Mbps	4.51	2.36	6.58		Pass
46	5230		4.99	3.11	7.16		Pass
42	5210	802.11ac (HT80) 32.5Mbps	4.30	2.09	6.34		Pass

Remark: The measured power in the table has considered the compensation of duty cycle.

TEST REPORT

Band IV (5725MHz-5850MHz)

Channel No.	Frequency (MHz)	Mode	Measured Power(dBm) ANT1	Measured Power(dBm) ANT2	Sum of Power (dBm)	Limit	Result
149	5745	802.11a(20) 6Mbps	3.76	4.16	6.97	1W (30dBm)	Pass
157	5785		3.91	4.26	7.10		Pass
165	5825		5.17	3.95	7.61		Pass
149	5745	802.11n (HT20) 7.2Mbps	3.64	4.20	6.94		Pass
157	5785		3.76	4.43	7.12		Pass
165	5825		4.98	4.25	7.64		Pass
149	5745	802.11ac (HT20) 7.2Mbps	3.11	3.61	6.38		Pass
157	5785		3.22	4.01	6.64		Pass
165	5825		4.48	3.56	7.05		Pass
151	5755	802.11n (HT40) 15Mbps	2.58	2.98	5.79		Pass
159	5795		2.72	3.18	5.97		Pass
151	5755	802.11ac (HT40) 15Mbps	2.88	3.12	6.01		Pass
159	5795		3.01	3.5	6.27		Pass
155	5775	802.11ac (HT80) 32.5Mbps	3.38	3.69	6.55		Pass

Remark: The measured power in the table has considered the compensation of duty cycle.

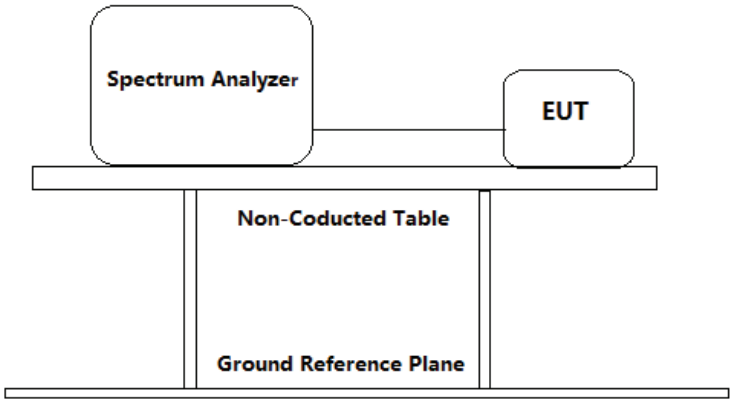
The unit does meet the FCC requirements.

TEST REPORT

4.6 Maximum Peak Power Spectral Density

Test Requirement:	FCC Part 15 E clause 15.407(a)
Test Method:	FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01,Clause F
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

Test Configuration:



Test Procedure:

1. Remove the antenna from the EUT and then connect a low attention attenuation RF cable (cable loss =0.5 dB, with a 10dB attenuator) from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer:

   For Band I (5150MHz-5250MHz)
   a) Set the RBW = 1MHz.
   b) Set the VBW ≥ [3 × RBW].
   c) Set the span ≥ 26 dB Bandwidth
   d) Detector = Peak average (RMS)
   e) Sweep time = auto couple.
   f) Trace mode = max hold.
   g) Allow trace to fully stabilize.
   i) Use the peak marker function to determine the maximum amplitude level within the RBW.

For Band IV (5725MHz-5850MHz)
   a) Set the RBW = 500kHz.
   b) Set the VBW ≥ [3 × RBW].
   c) Set the span ≥ 26 dB Bandwidth.
   d) Detector = Peak average (RMS)

TEST REPORT

e) Sweep time = auto couple.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum amplitude level within the RBW. Measure the Power Spectral Density of the test frequency with special test status.

3. Measure the Power Spectral Density of the test frequency with special test status.
4. Repeat until all the test status is investigated.
5. Report the worst case.

Used Test Equipment List
Spectrum Analyzer. Refer to Clause 5 Test Equipment List for details.

Band I (5150MHz-5250MHz)

Channel	Frequency (MHz)	Mode	Maximum PSD of ANT1 (dBm/MHz)	Maximum PSD of ANT2 (dBm/MHz)	Sum of PSD (dBm/ MHz)	Limit	Result
36	5180	802.11 a(20) 6Mbps	3.16	1.41	5.88	11 (dBm/ MHz)	Pass
44	5220		3.12	1.80	6.02		Pass
48	5240		3.01	1.88	5.99		Pass
36	5180	802.11n (HT20) 7.2Mbps	4.79	3.18	7.57		Pass
44	5220		3.82	3.65	7.25		Pass
48	5240		4.93	3.37	7.73		Pass
36	5180	802.11ac (HT20) 7.2Mbps	3.63	2.94	7.35		Pass
44	5220		3.89	3.29	7.66		Pass
48	5240		3.81	3.56	7.74		Pass
38	5190	802.11n (HT40) 15Mbps	0.17	-0.35	3.38		Pass
46	5230		0.16	-0.44	3.33		Pass
38	5190	802.11ac (HT40) 15Mbps	0.19	-0.60	3.98		Pass
46	5230		0.18	-0.44	4.05		Pass
42	5210	802.11ac (HT80) 32.5Mbps	-3.18	-4.32	1.59		Pass

TEST REPORT

Band IV (5725MHz-5850MHz)

Channel	Frequency (MHz)	Mode	Maximum PSD of ANT1 (dBm/500kHz)	Maximum PSD of ANT2 (dBm/500kHz)	Sum of PSD (dBm/500kHz)	Limit	Result
149	5745	802.11 a(20) 6Mbps	-12.35	-11.22	-8.24	30 (dBm/500kHz)	Pass
157	5785		-12.33	-10.82	-8.00		Pass
165	5825		-11.15	-11.26	-7.70		Pass
149	5745	802.11n (HT20) 7.2Mbps	-13.10	-9.68	-7.55		Pass
157	5785		-12.79	-9.61	-7.40		Pass
165	5825		-11.79	-9.83	-7.19		Pass
149	5745	802.11ac (HT20) 7.2Mbps	-13.52	-10.60	-7.76		Pass
157	5785		-13.31	-10.21	-7.43		Pass
165	5825		-12.30	-10.29	-7.12		Pass
151	5755	802.11n (HT40) 15Mbps	-17.54	-15.04	-12.65		Pass
159	5795		-17.26	-14.60	-12.26		Pass
151	5755	802.11ac (HT40) 15Mbps	-17.19	-14.67	-11.58		Pass
159	5795		-16.99	-14.53	-11.42		Pass
155	5775	802.11ac (HT80) 32.5Mbps	-19.91	-18.22	-13.68		Pass

The unit does meet the FCC requirements

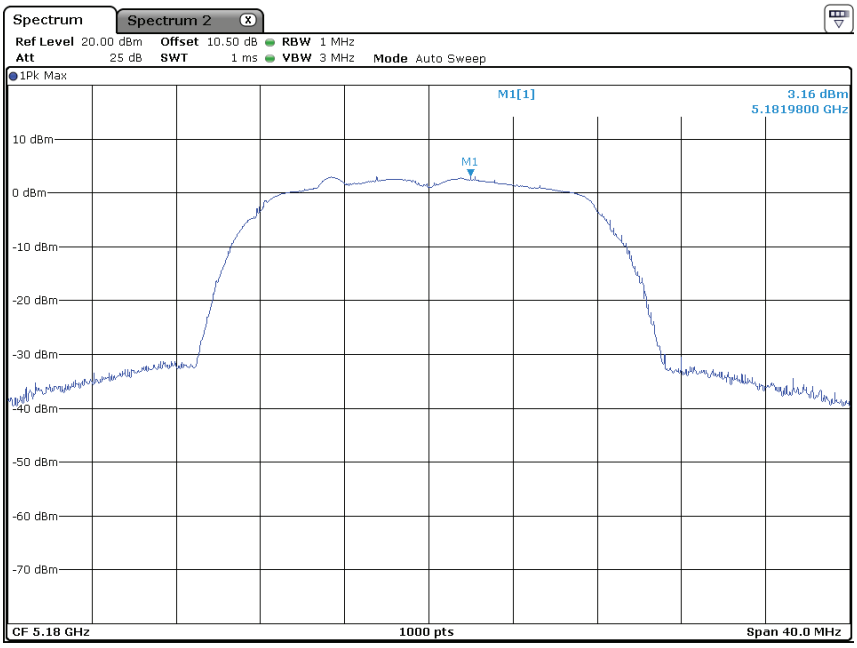
Remark: The sum of PSD in the table has considered the compensation of duty cycle.

TEST REPORT

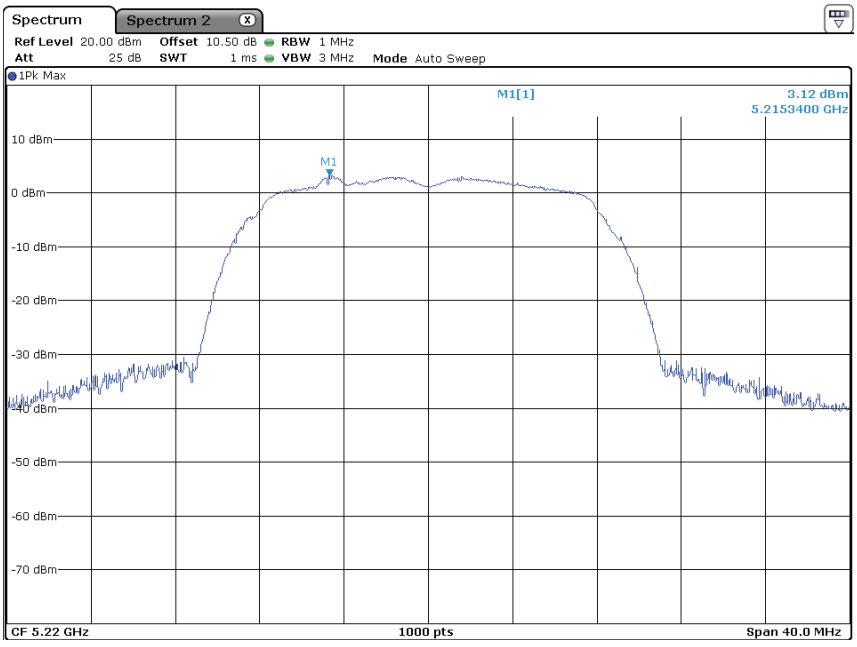
Result plot as follows:

Band I 5150 MHz to 5250 MHz

Main Antenna (ANT1)
802.11a(20) mode
Channel 36: 5180 MHz:

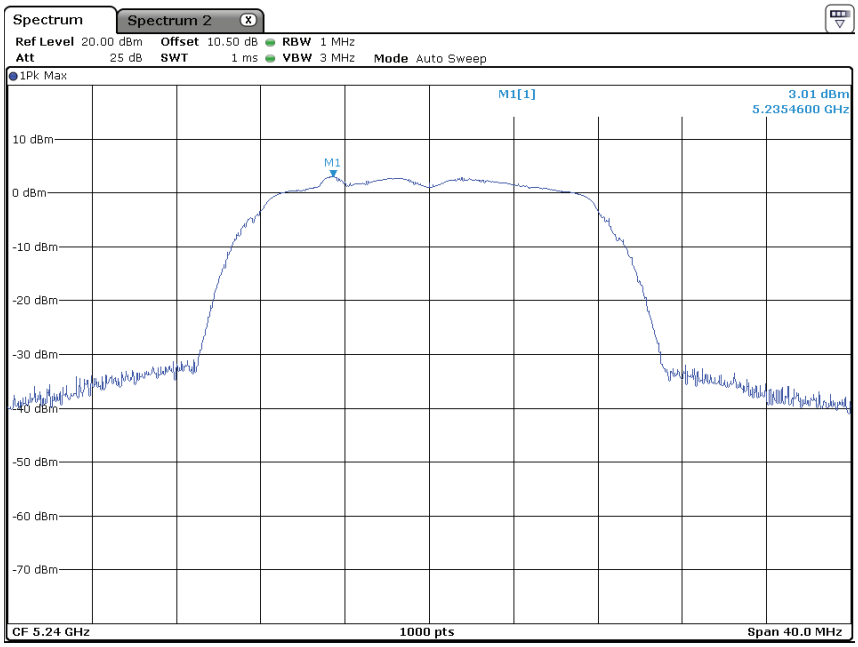


Channel 44: 5220 MHz:

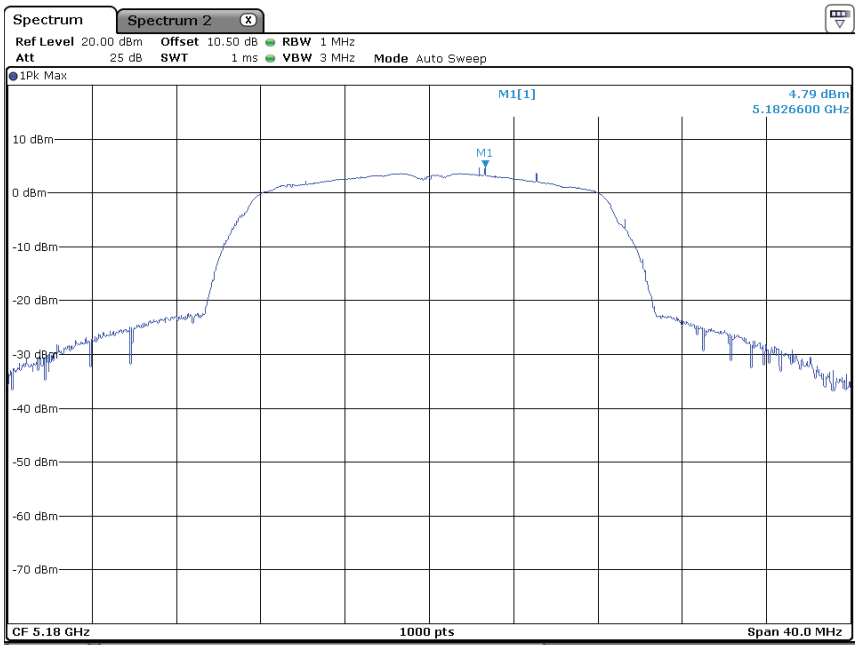


TEST REPORT

Channel 48: 5240 MHz:

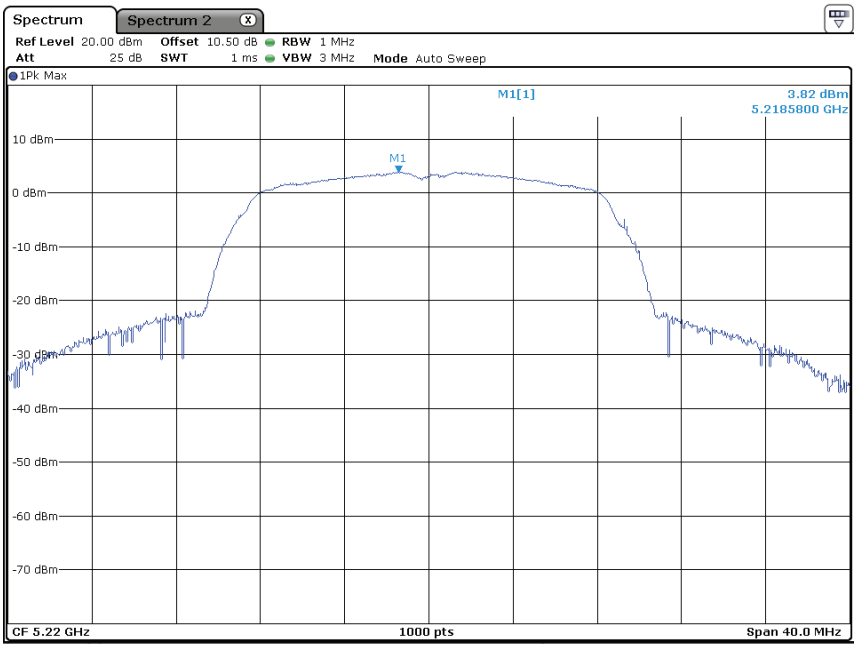


802.11an(HT 20)
Channel 36: 5180 MHz:

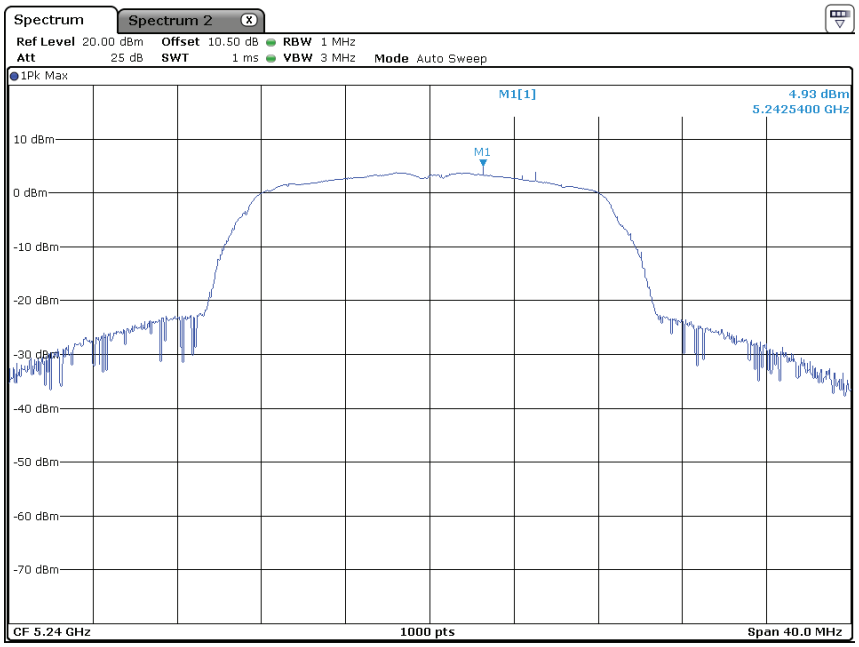


TEST REPORT

Channel 44: 5220 MHz:



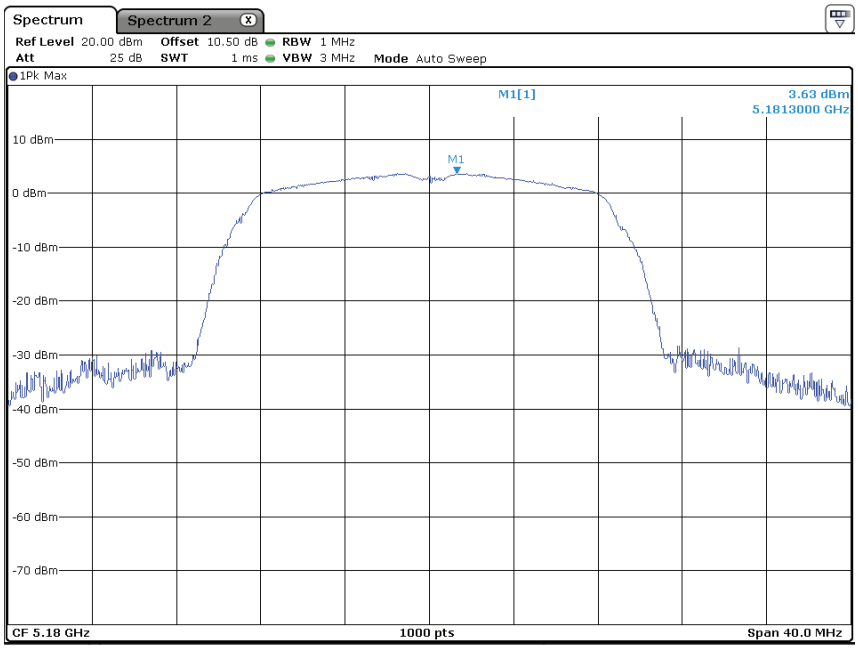
Channel 48: 5240 MHz:



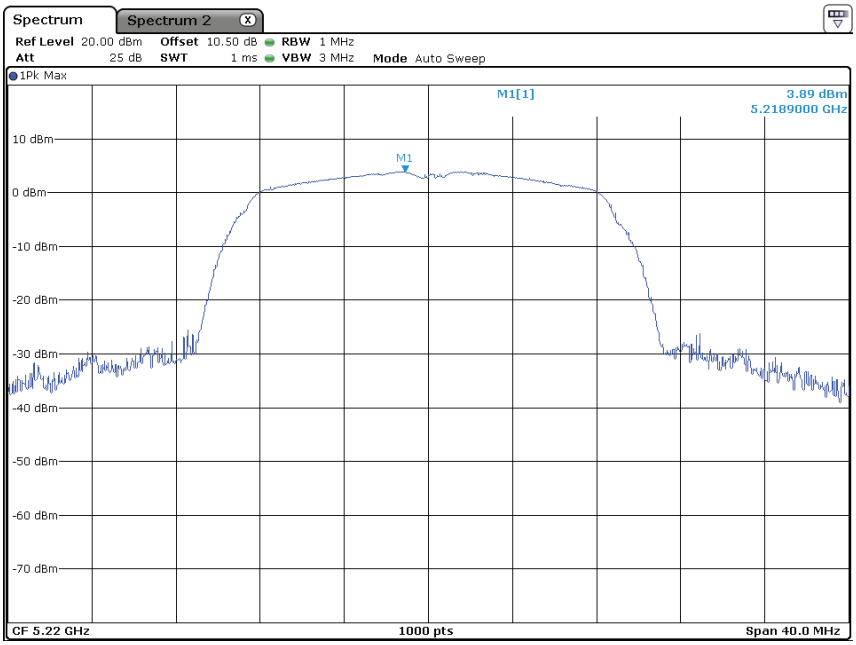
TEST REPORT

802.11ac(HT 20)

Channel 36: 5180 MHz:

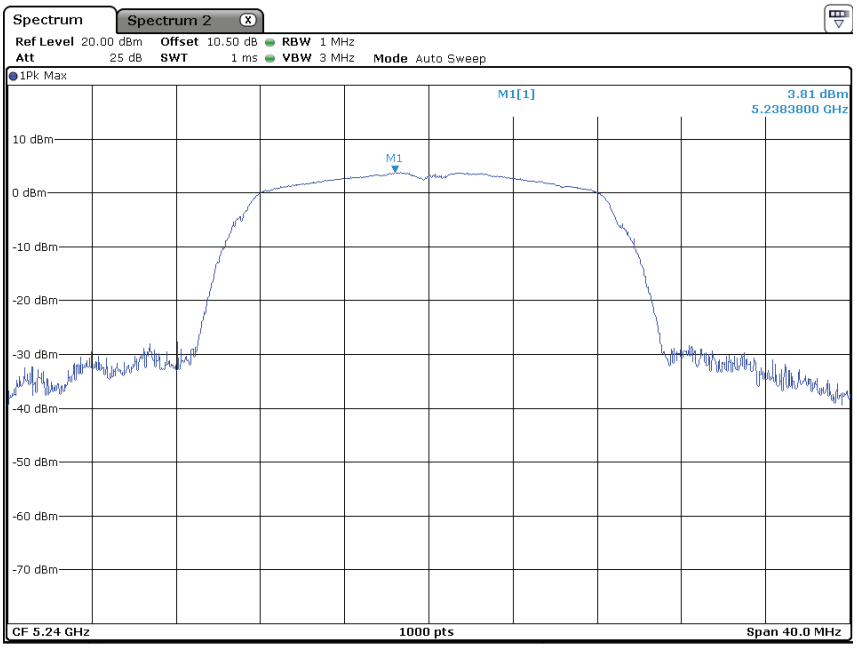


Channel 44: 5220 MHz:



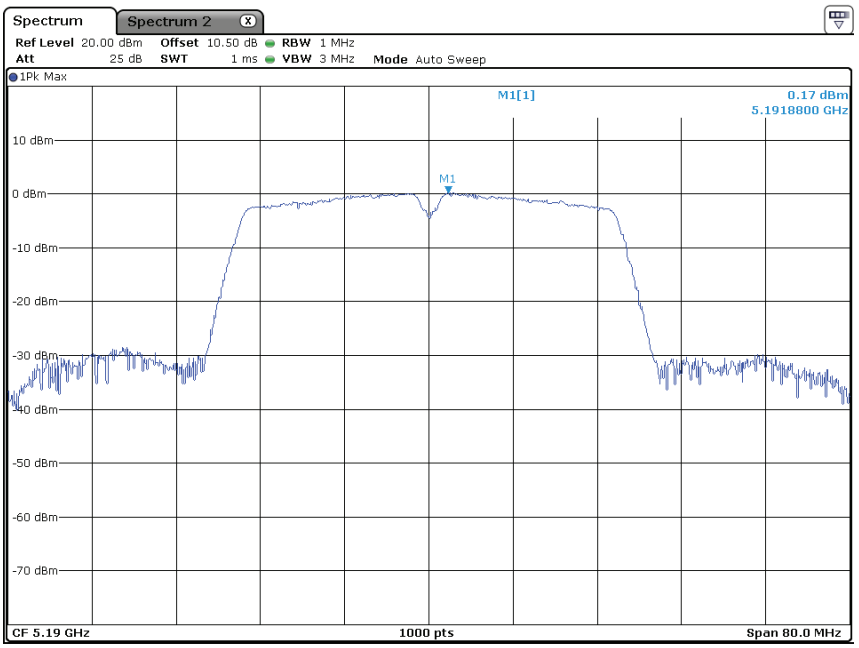
TEST REPORT

Channel 48: 5240 MHz:



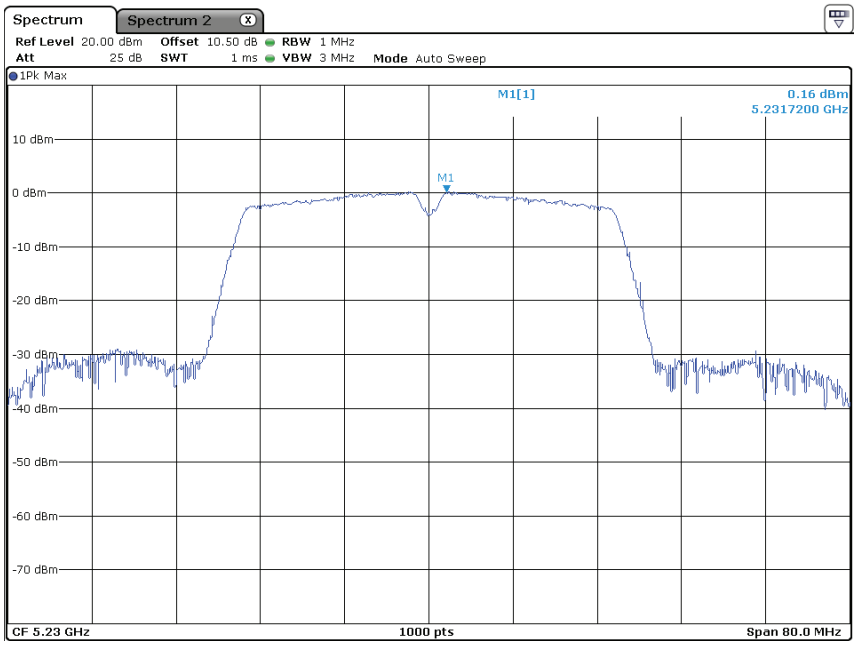
802.11an(HT 40)

Channel 38: 5190 MHz:



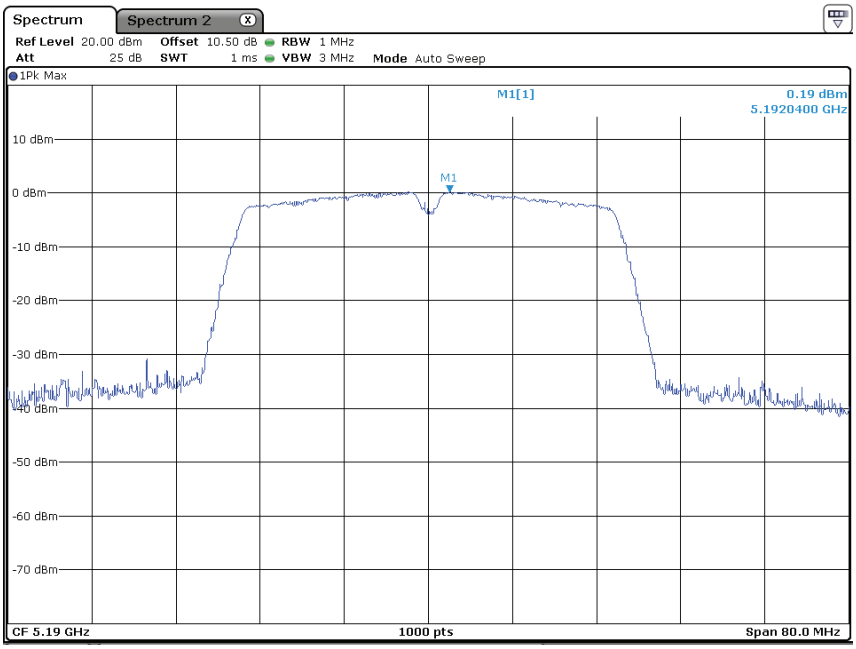
TEST REPORT

Channel 46: 5230 MHz:



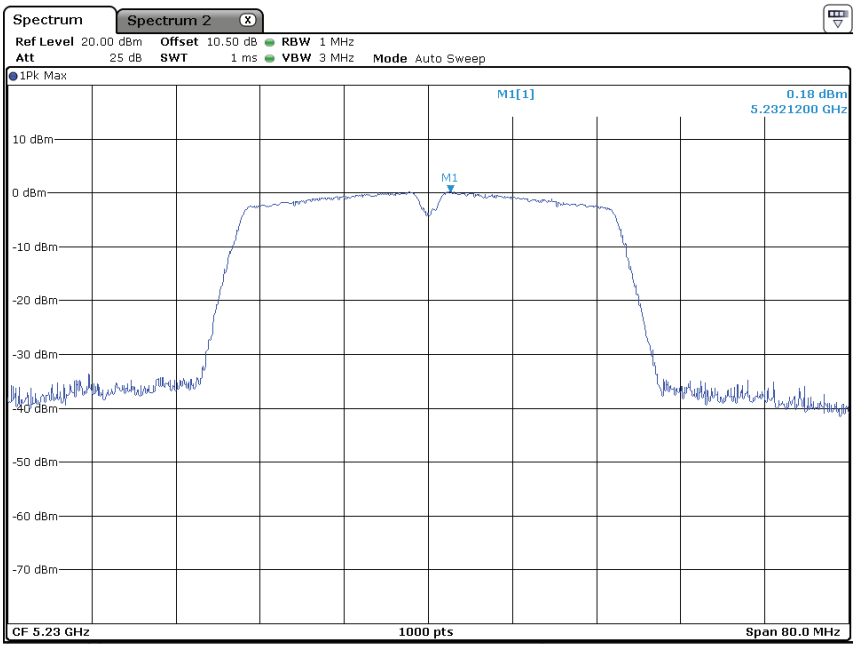
802.11ac(HT 40)

Channel 38: 5190 MHz:



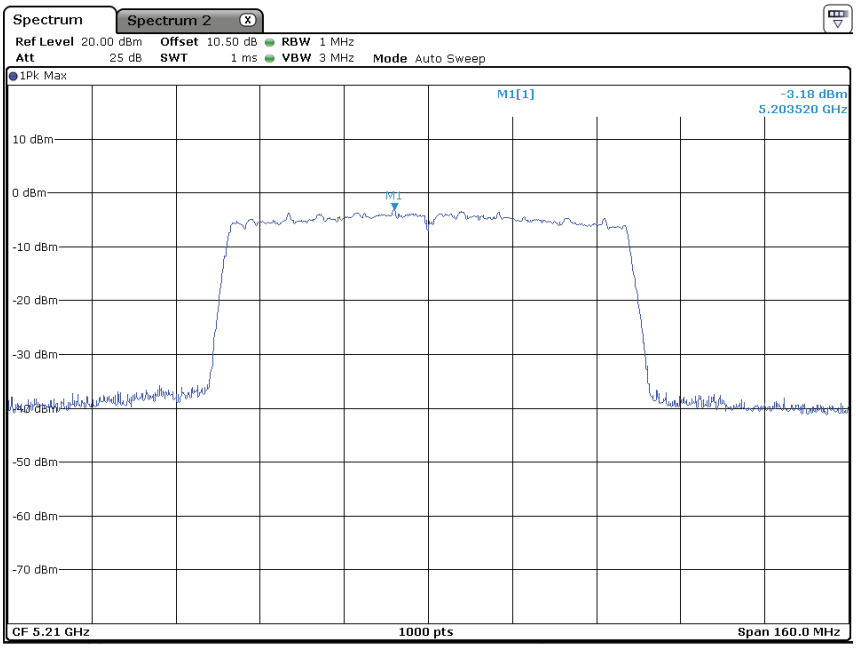
TEST REPORT

Channel 46: 5230 MHz:



802.11ac(HT 80)

Channel 42: 5210 MHz:

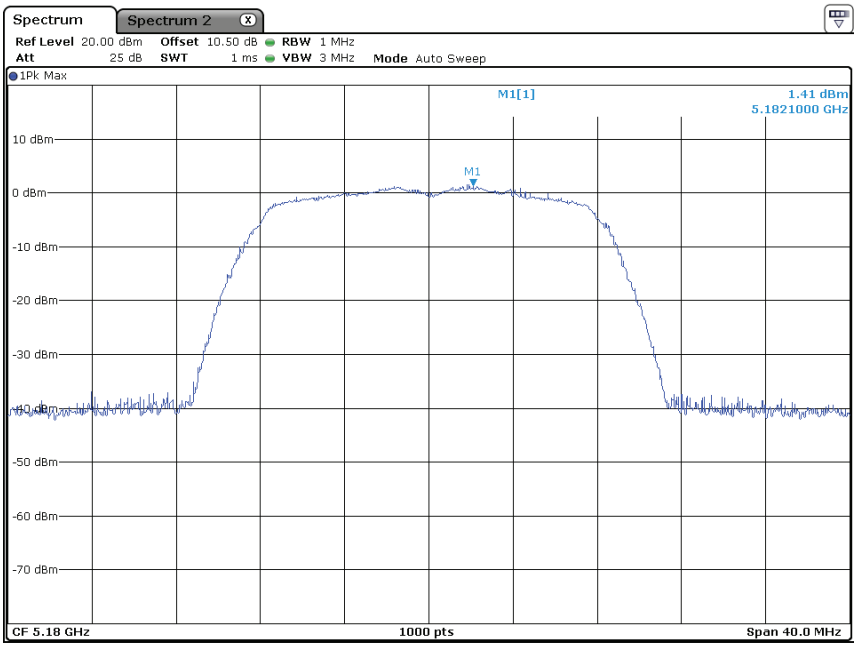


TEST REPORT

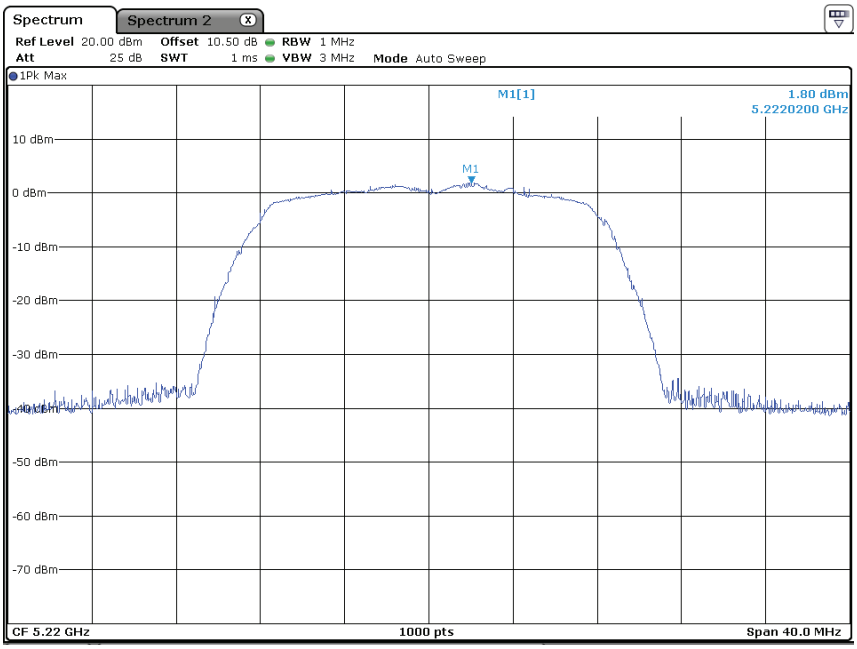
Vice Antenna (ANT2)

802.11a(20) mode

Channel 36: 5180 MHz:

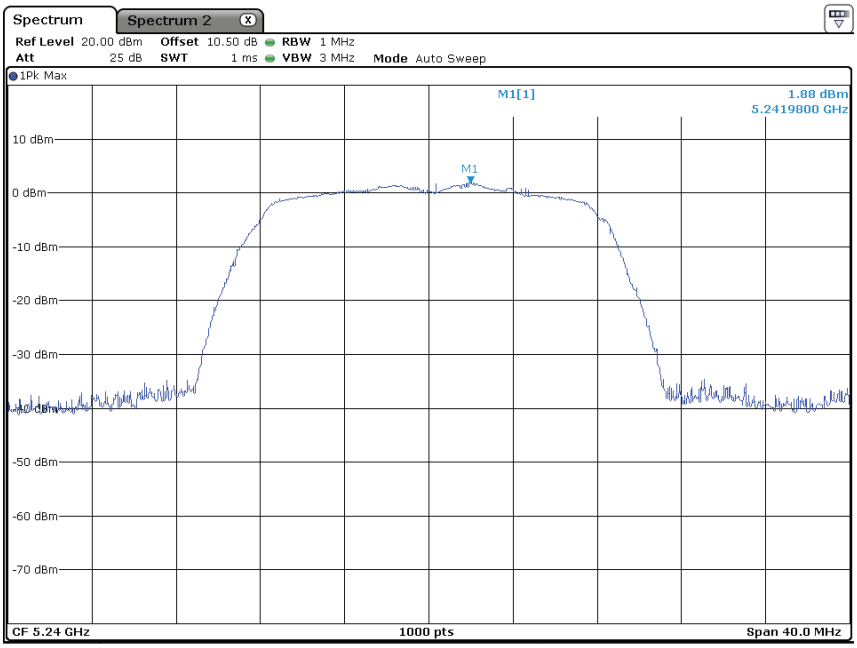


Channel 44: 5220 MHz:



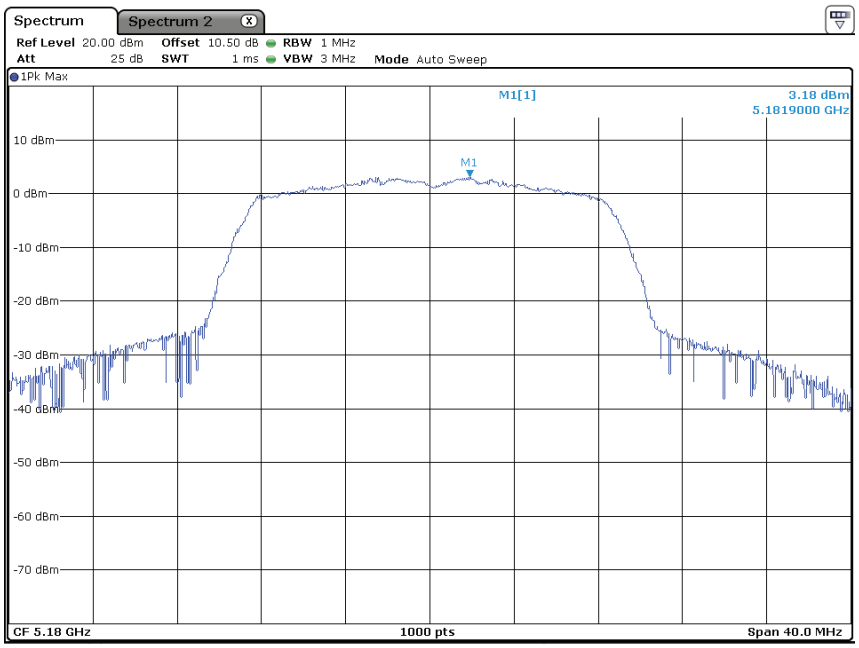
TEST REPORT

Channel 48: 5240 MHz:



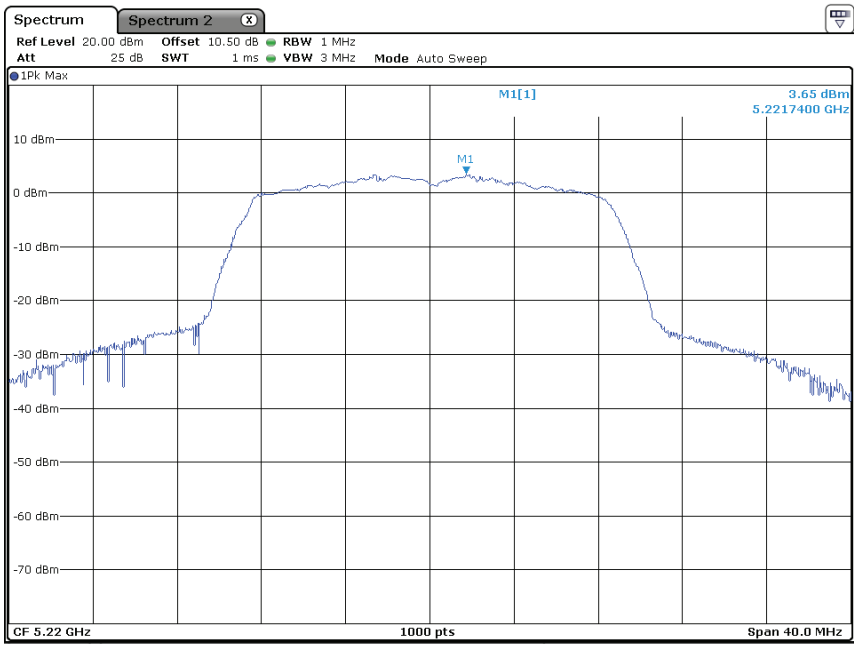
802.11an(HT 20)

Channel 36: 5180 MHz:

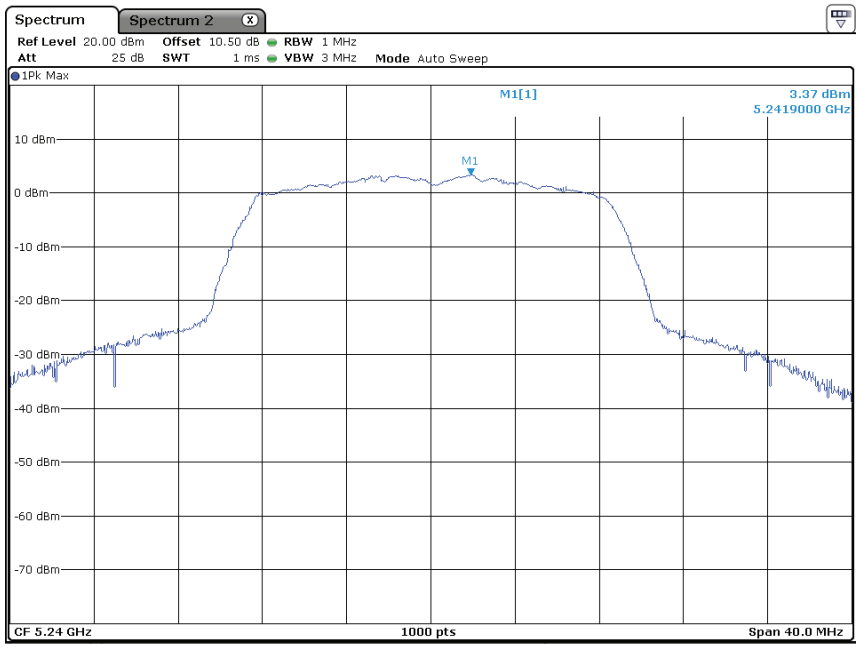


TEST REPORT

Channel 44: 5220 MHz:



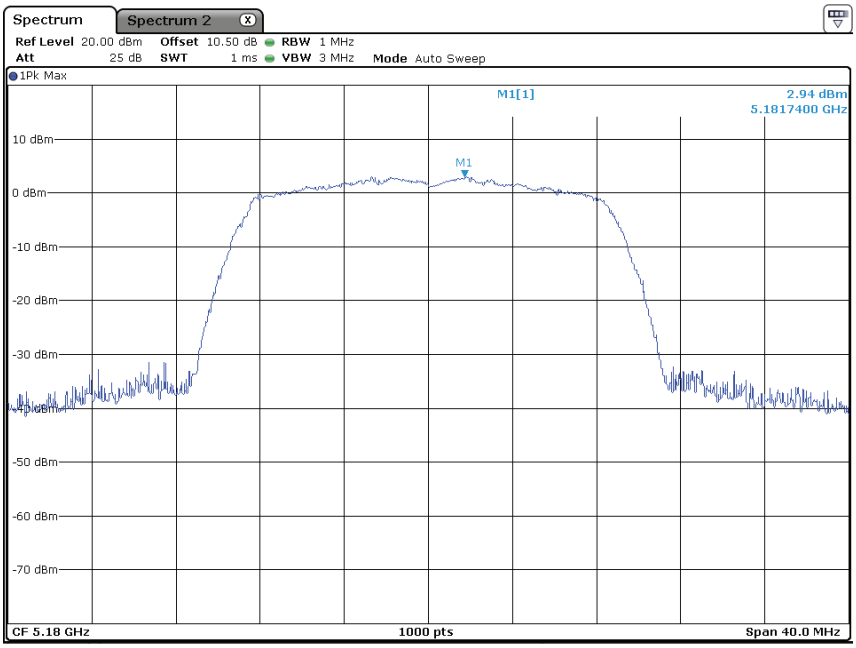
Channel 48: 5240 MHz:



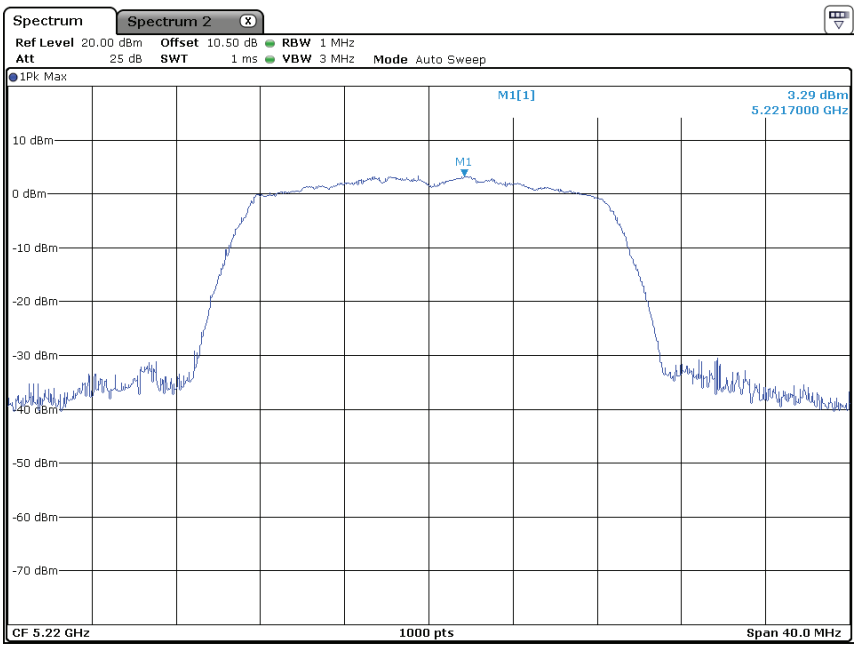
TEST REPORT

802.11ac(HT 20)

Channel 36: 5180 MHz:

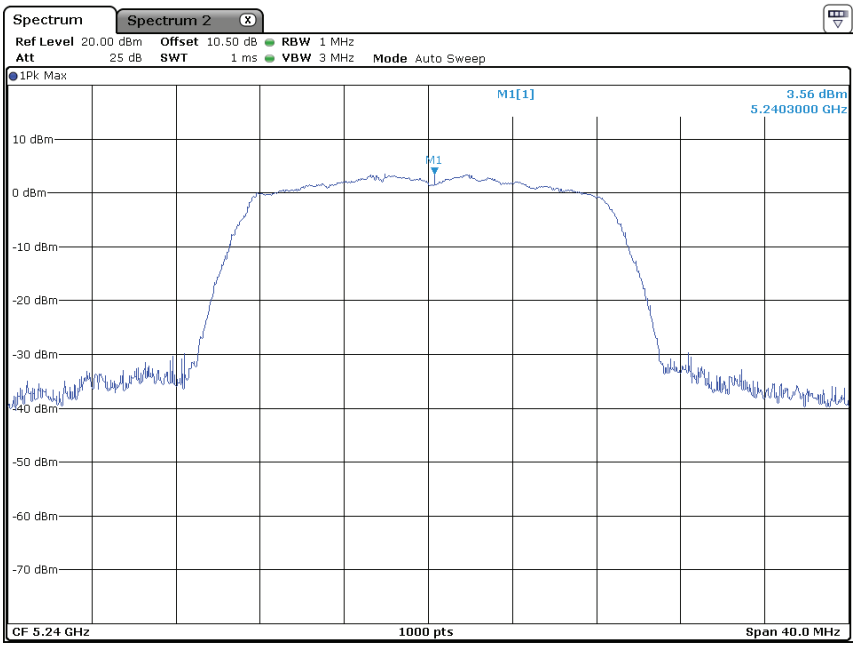


Channel 44: 5220 MHz:



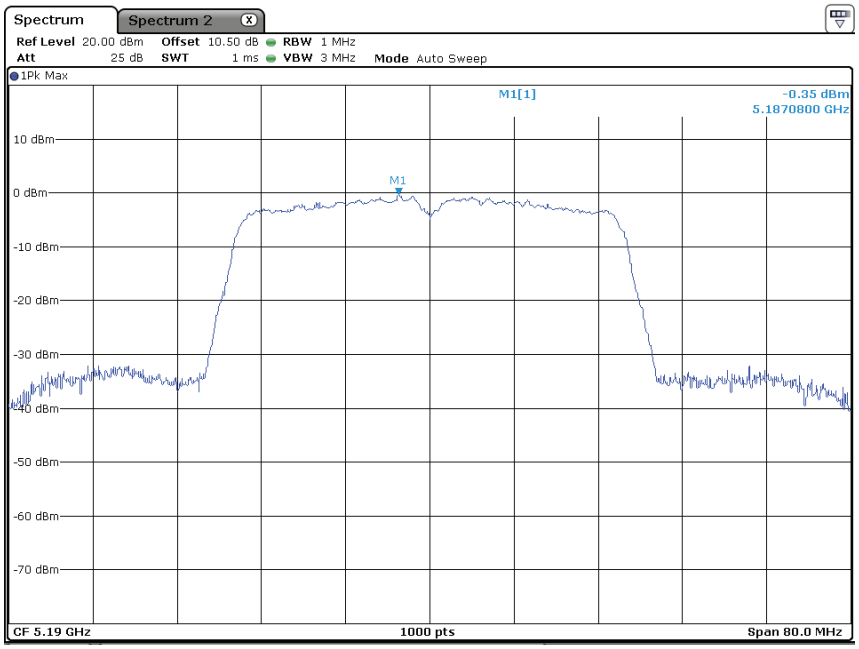
TEST REPORT

Channel 48: 5240 MHz:



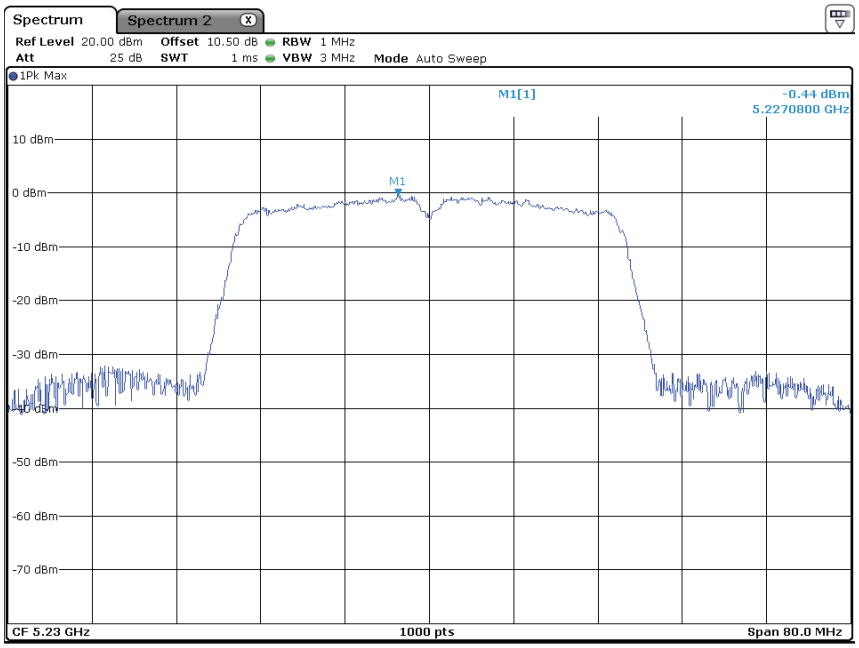
802.11an(HT 40)

Channel 38: 5190 MHz:



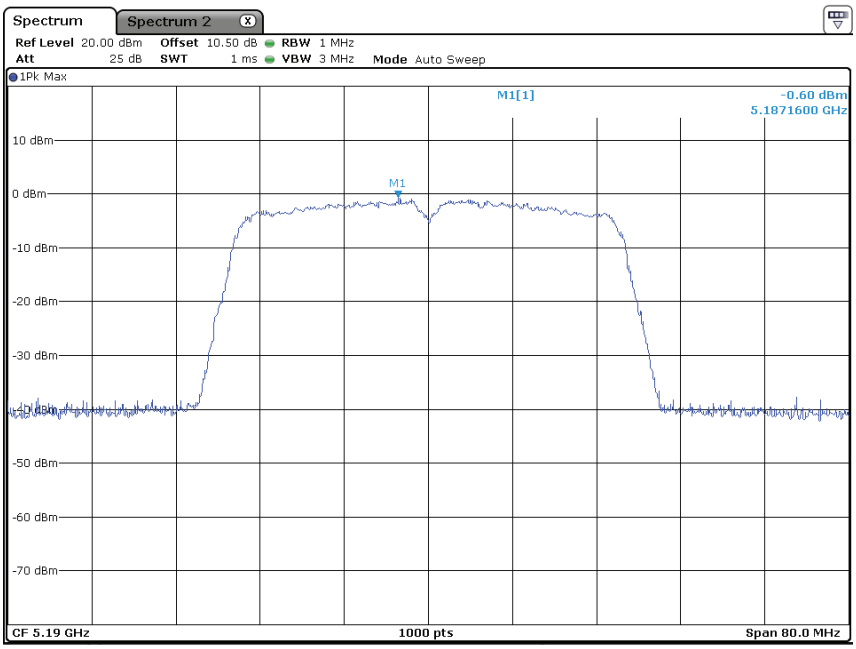
TEST REPORT

Channel 46: 5230 MHz:



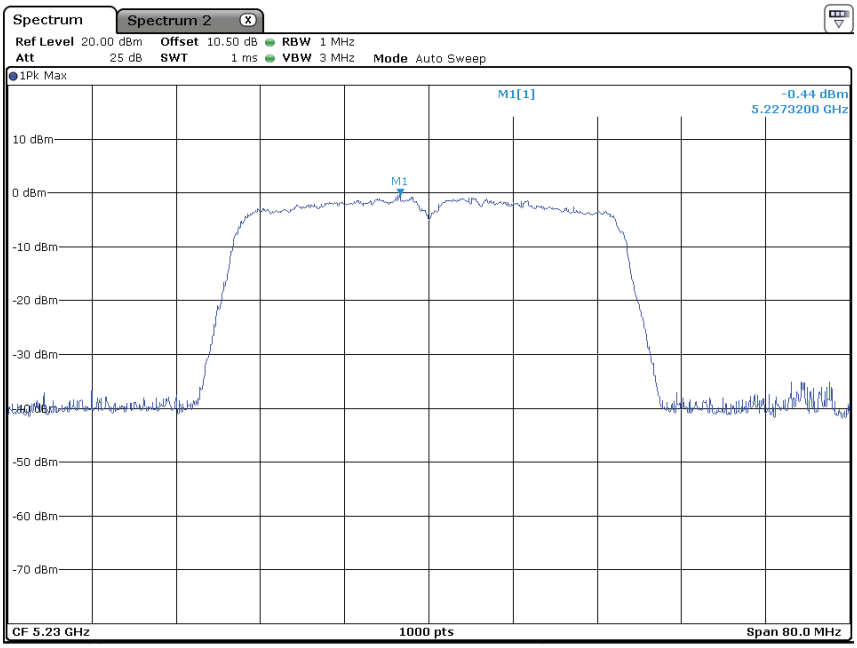
802.11ac(HT 40)

Channel 38: 5190 MHz:



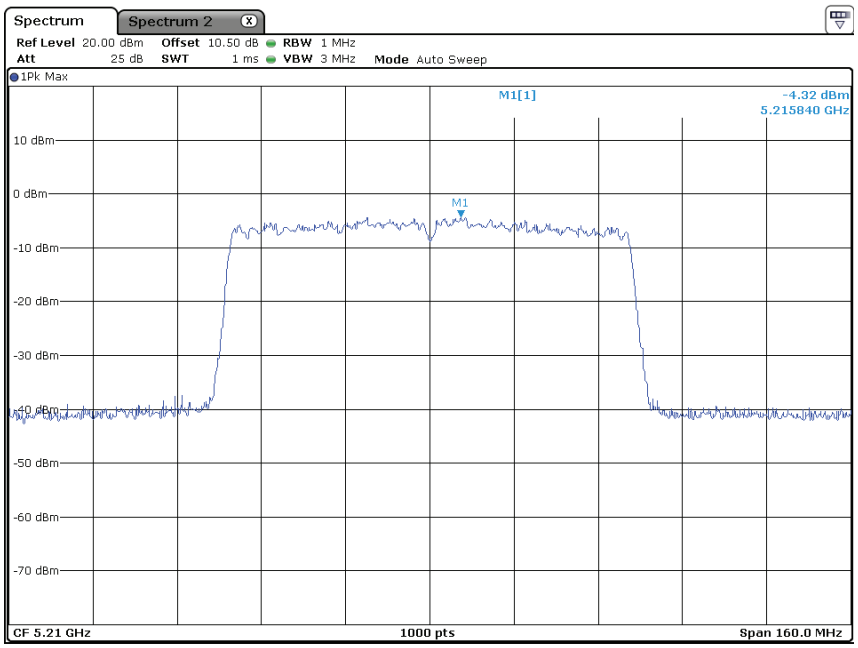
TEST REPORT

Channel 46: 5230 MHz:



802.11ac(HT 80)

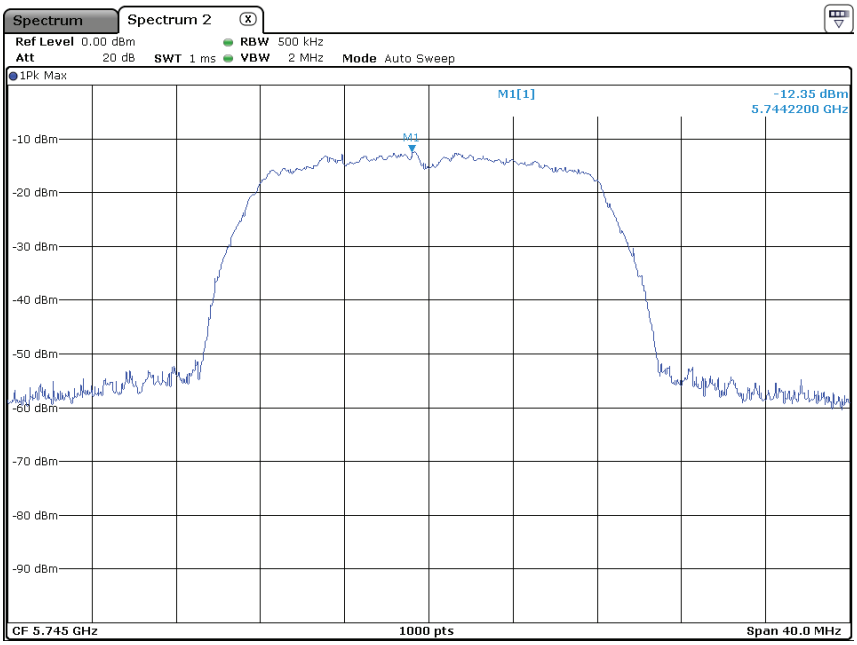
Channel 42: 5210 MHz:



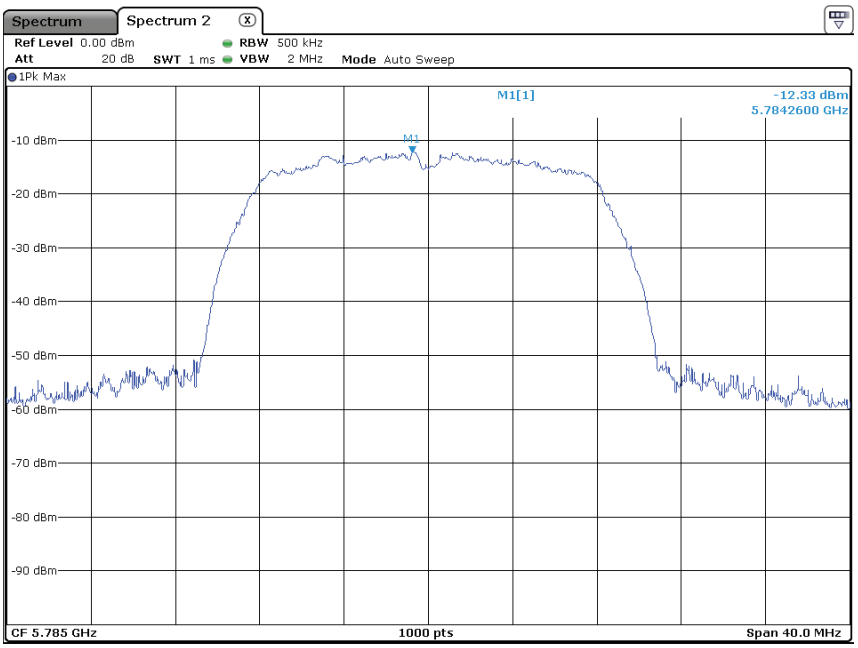
TEST REPORT

Band IV 5725 MHz to 5850 MHz

Main Antenna (ANT1)
802.11a(20) mode
Channel 149: 5745 MHz:

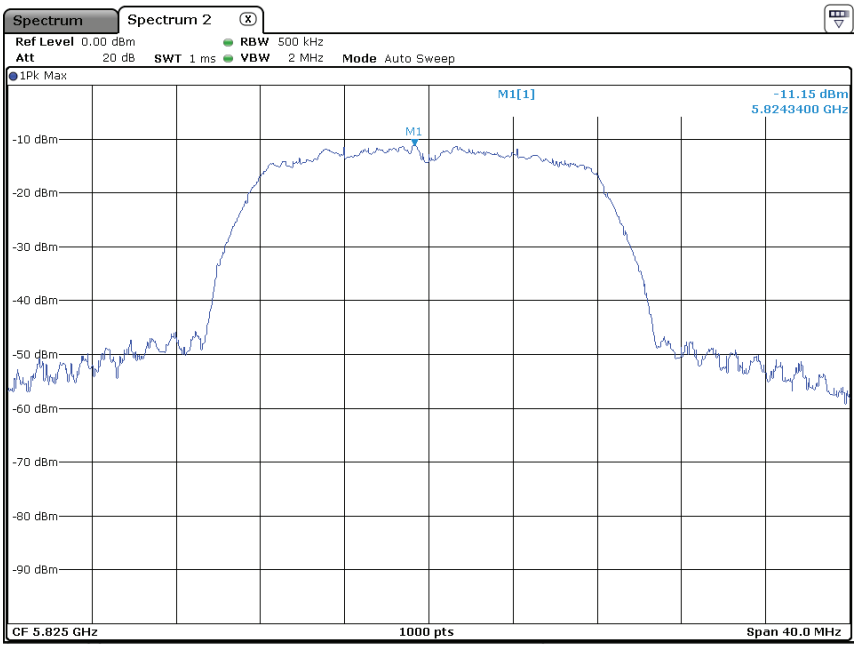


Channel 157: 5785 MHz:

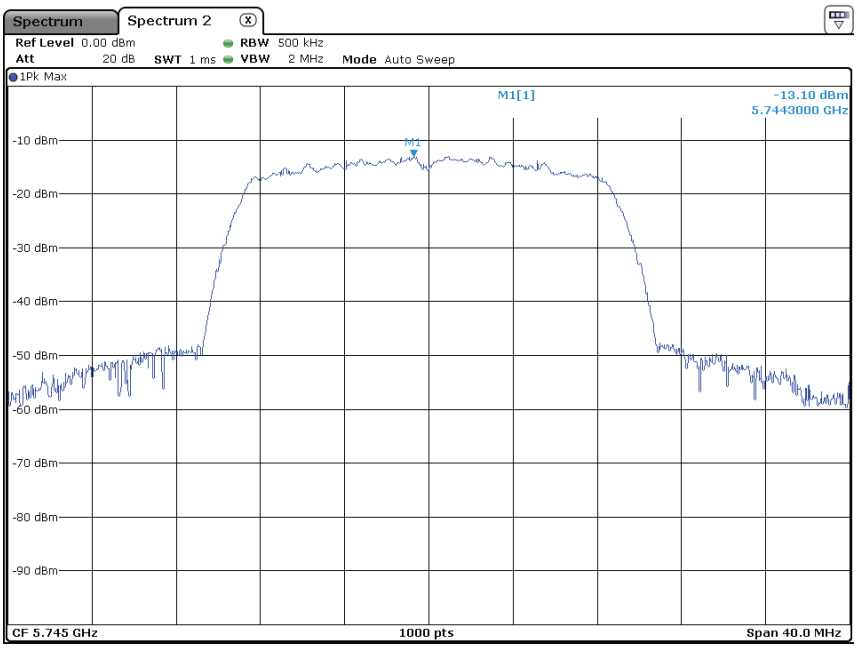


TEST REPORT

Channel 165: 5825 MHz:

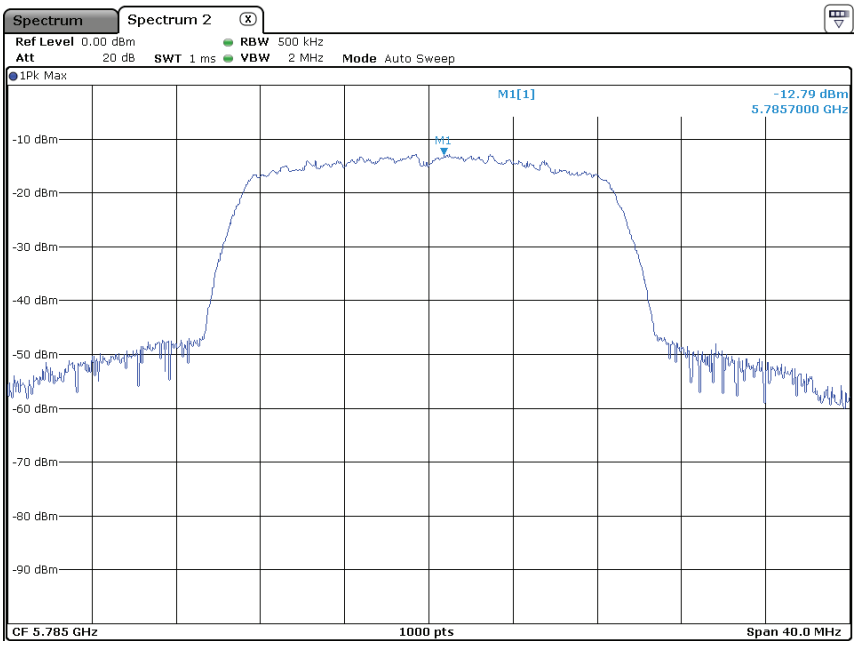


802.11an(HT 20)
Channel 149: 5745 MHz:

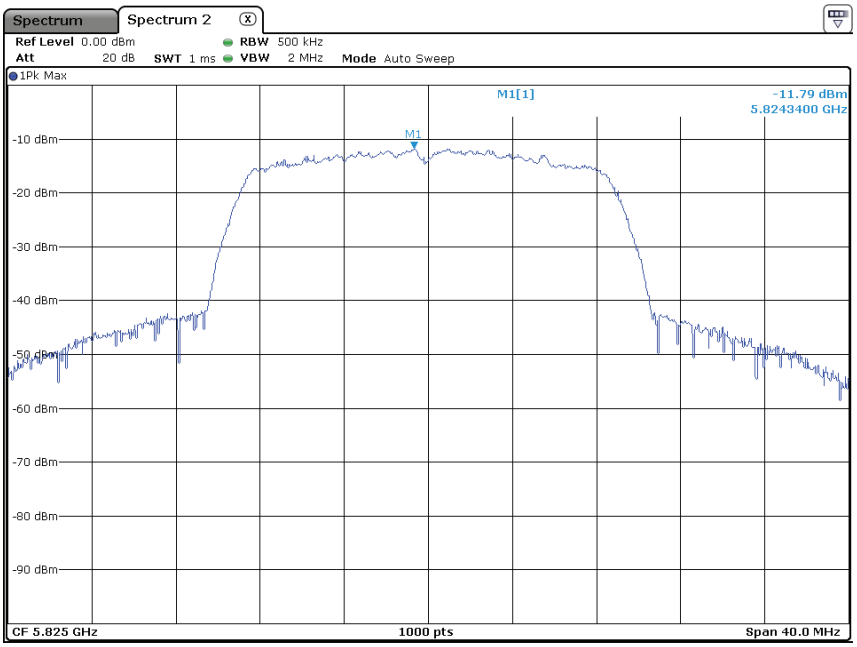


TEST REPORT

Channel 157: 5785 MHz:



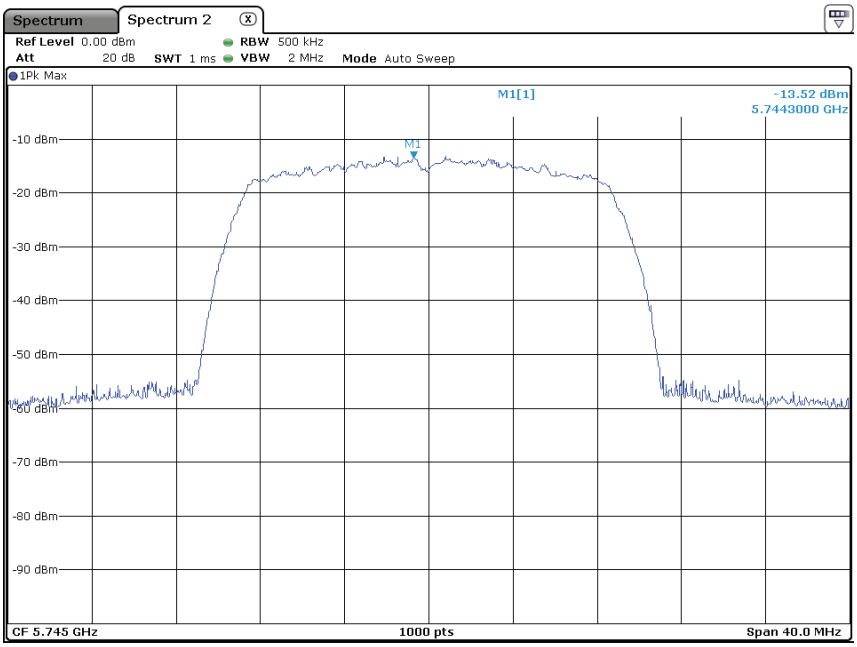
Channel 165: 5825 MHz:



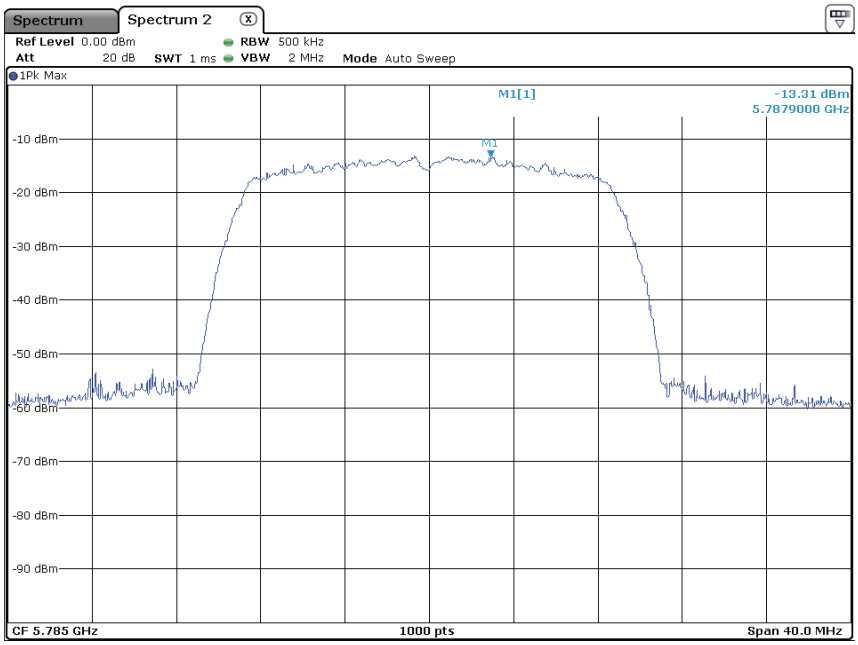
TEST REPORT

802.11ac(HT 20)

Channel 149: 5745 MHz:

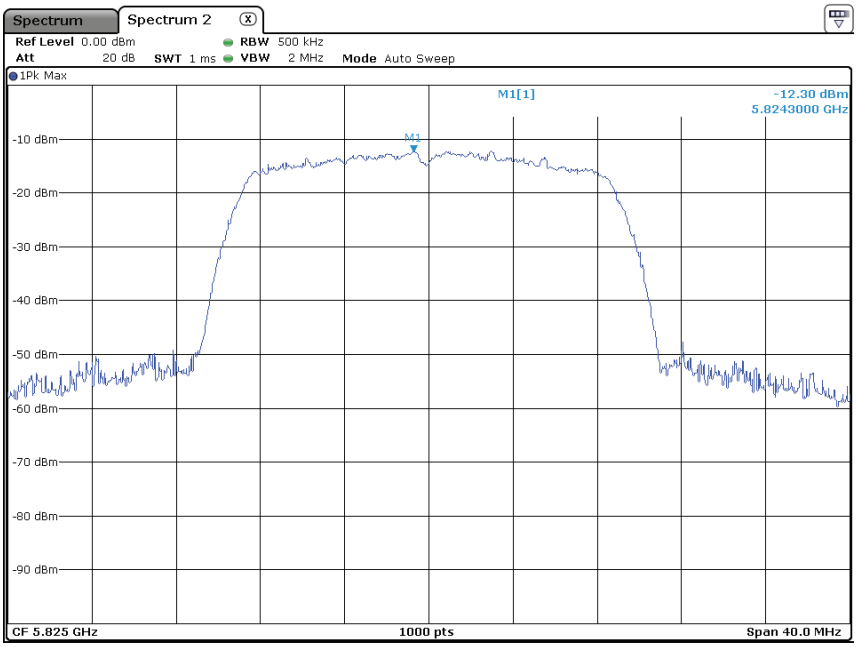


Channel 157: 5785 MHz:



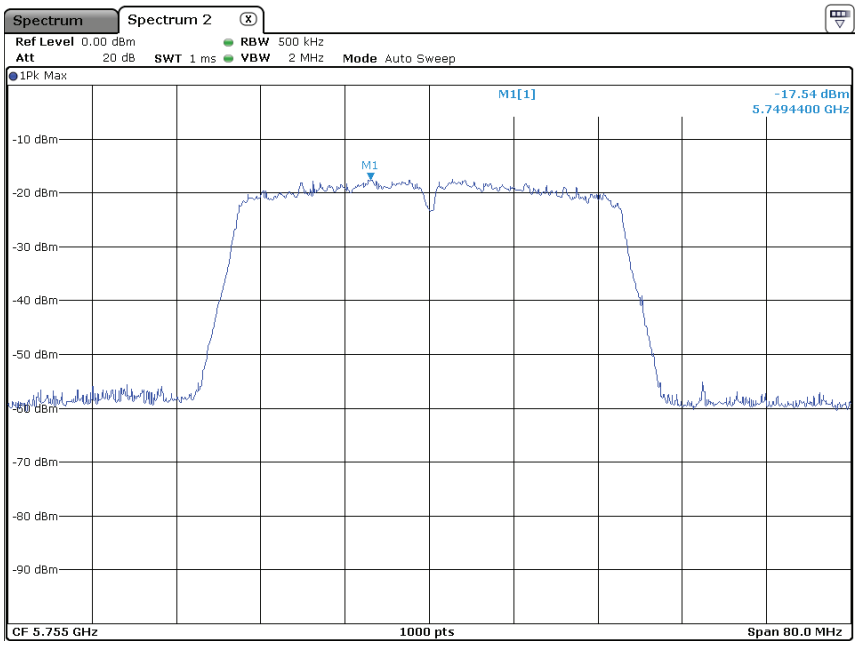
TEST REPORT

Channel 165: 5825 MHz:



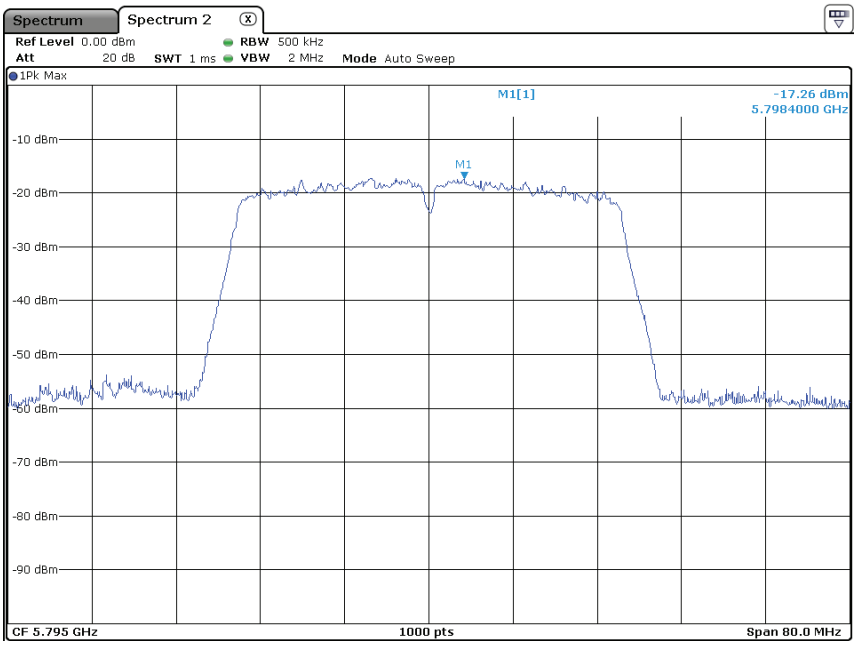
802.11an(HT 40)

Channel 151: 5755 MHz:



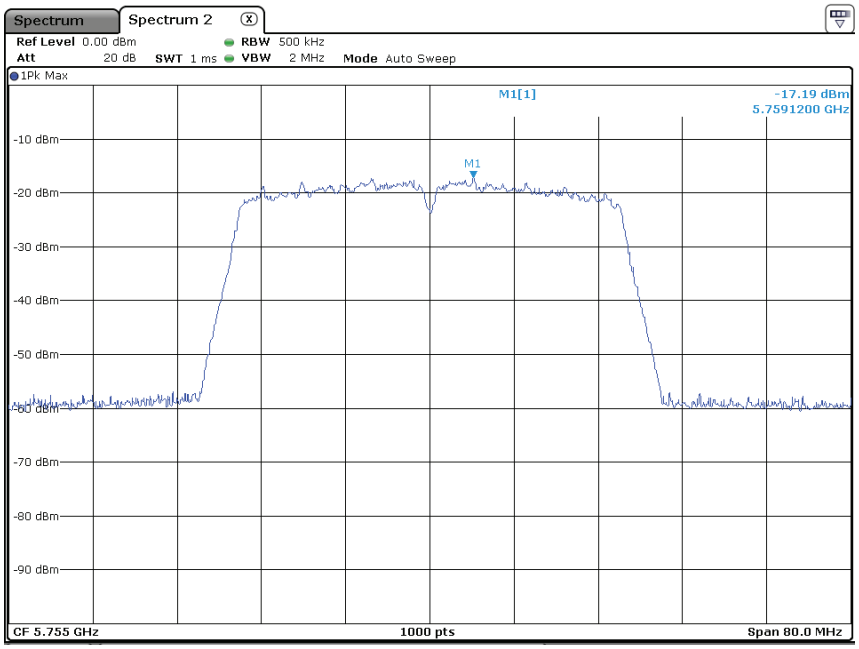
TEST REPORT

Channel 159: 5795 MHz:



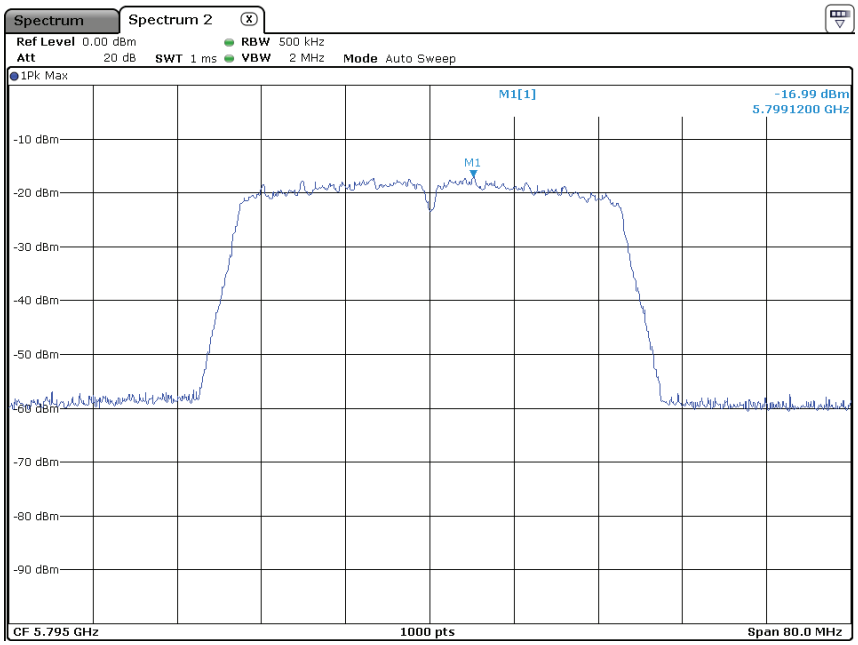
802.11ac(HT 40)

Channel 151: 5755 MHz:



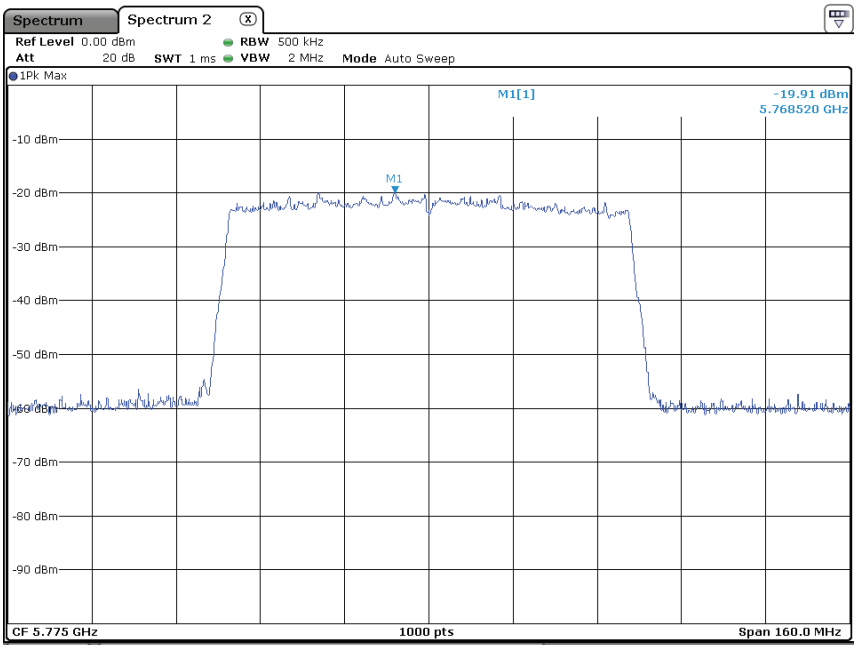
TEST REPORT

Channel 159: 5795 MHz:



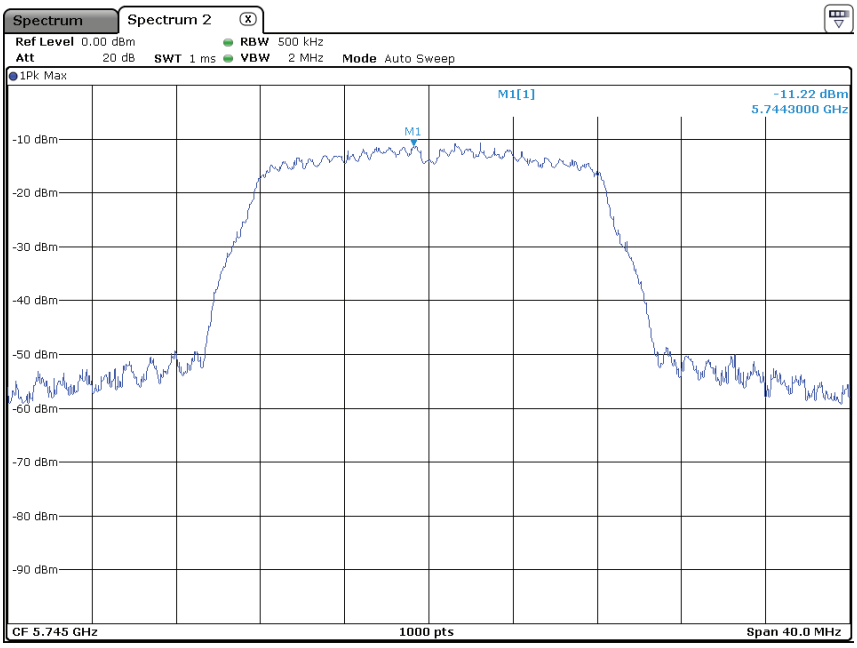
802.11ac(HT 80)

Channel 155: 5775 MHz:

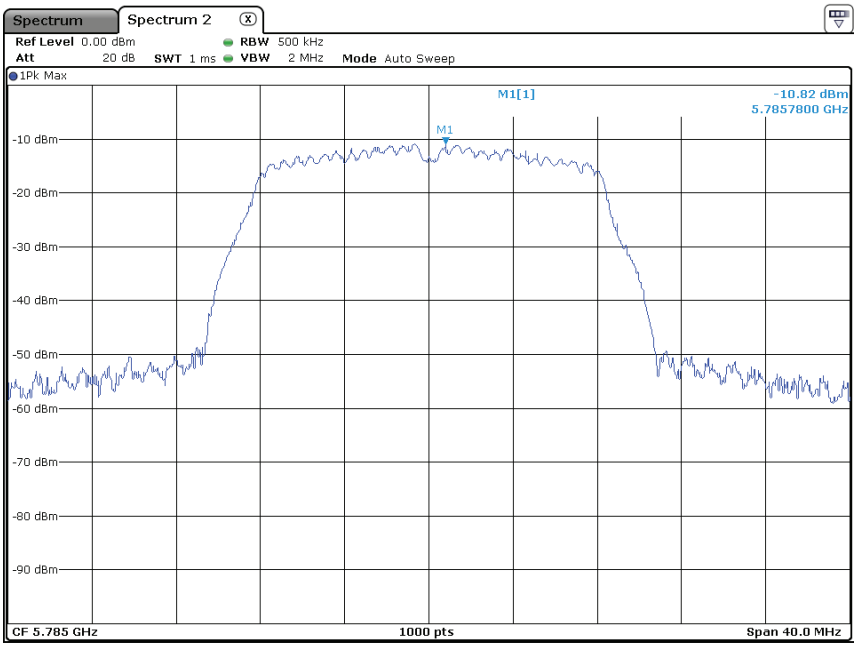


TEST REPORT

Vice Antenna (ANT2)
802.11a(20) mode
Channel 149: 5745 MHz:

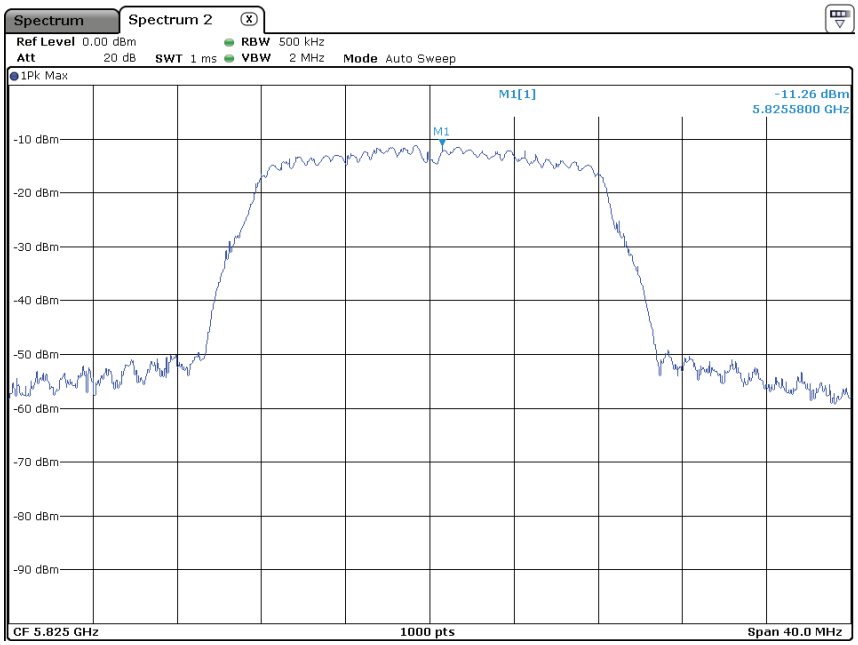


Channel 157: 5785 MHz:

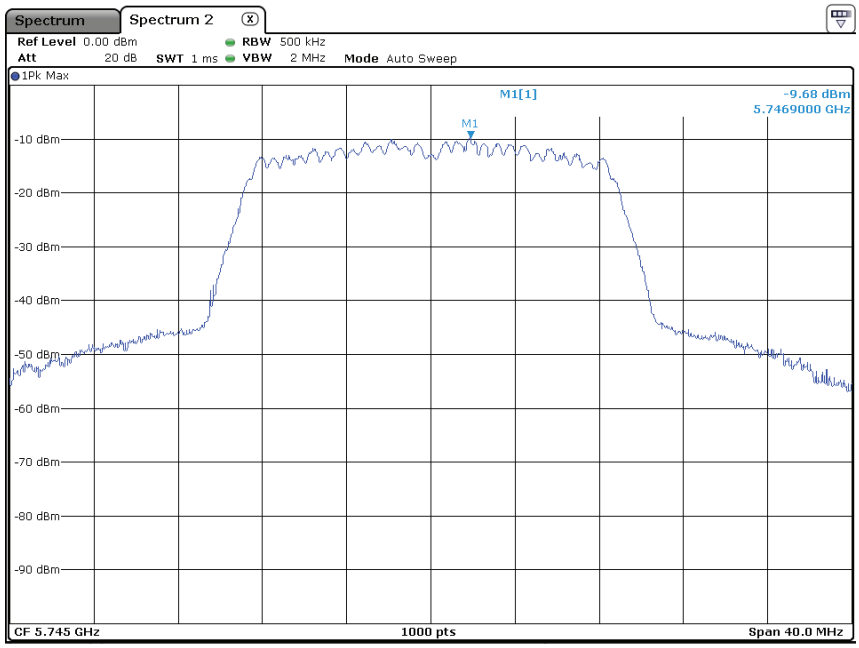


TEST REPORT

Channel 165: 5825 MHz:

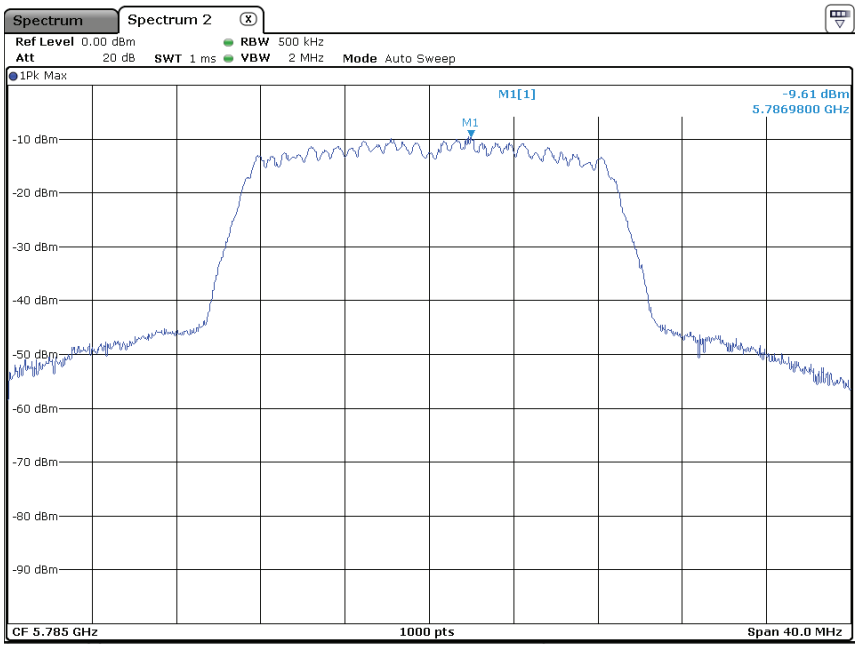


802.11an(HT 20)
Channel 149: 5745 MHz:

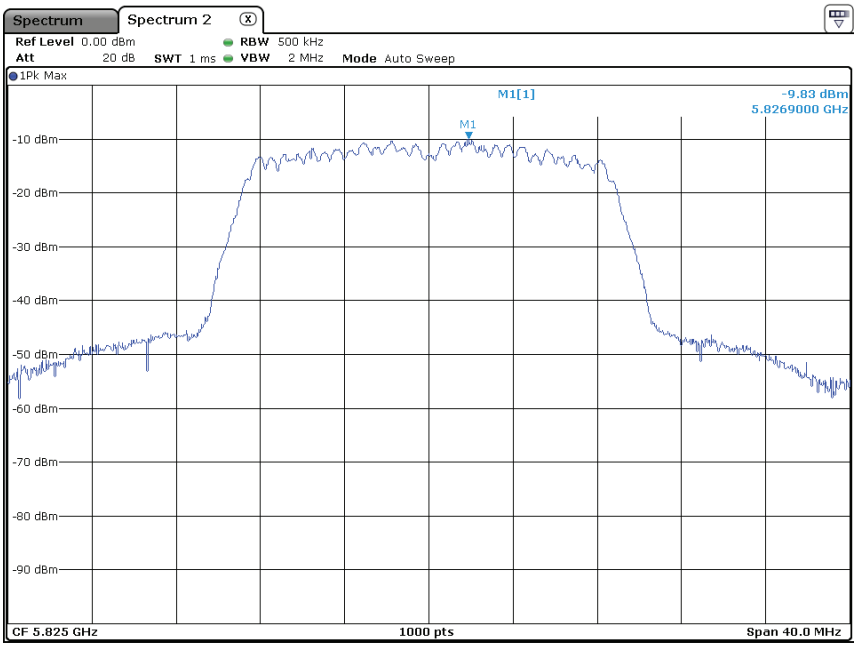


TEST REPORT

Channel 157: 5785 MHz:



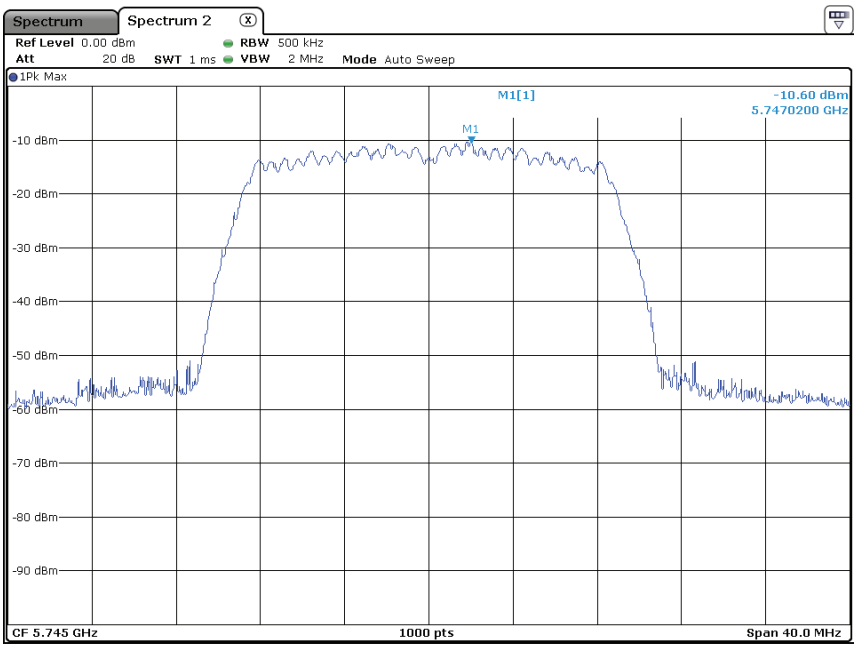
Channel 165: 5825 MHz:



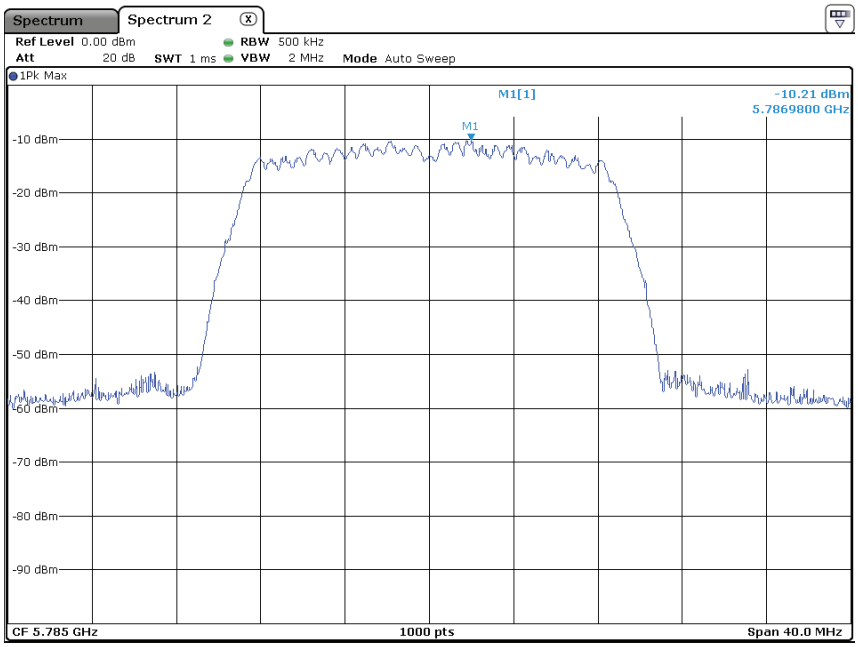
TEST REPORT

802.11ac(HT 20)

Channel 149: 5745 MHz:

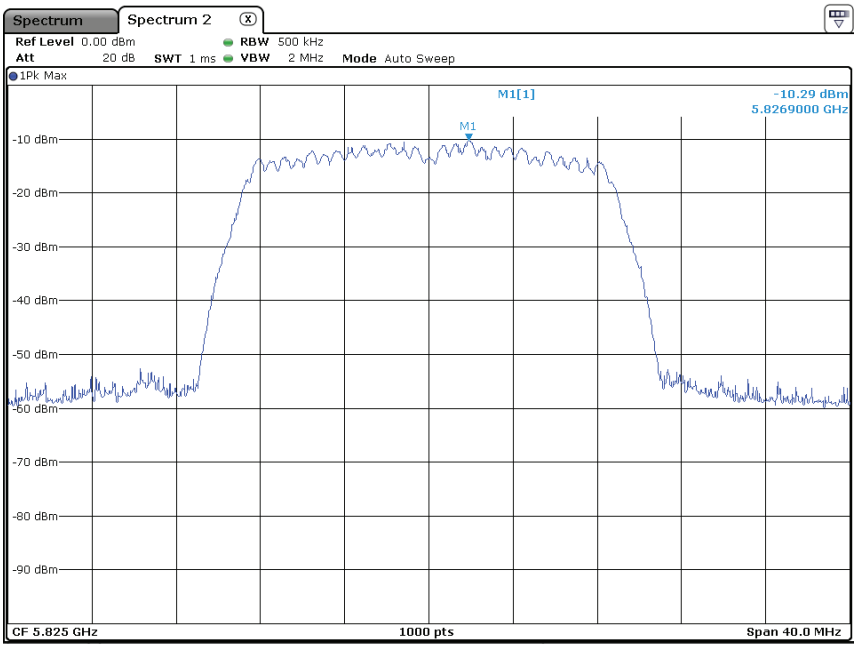


Channel 157: 5785 MHz:



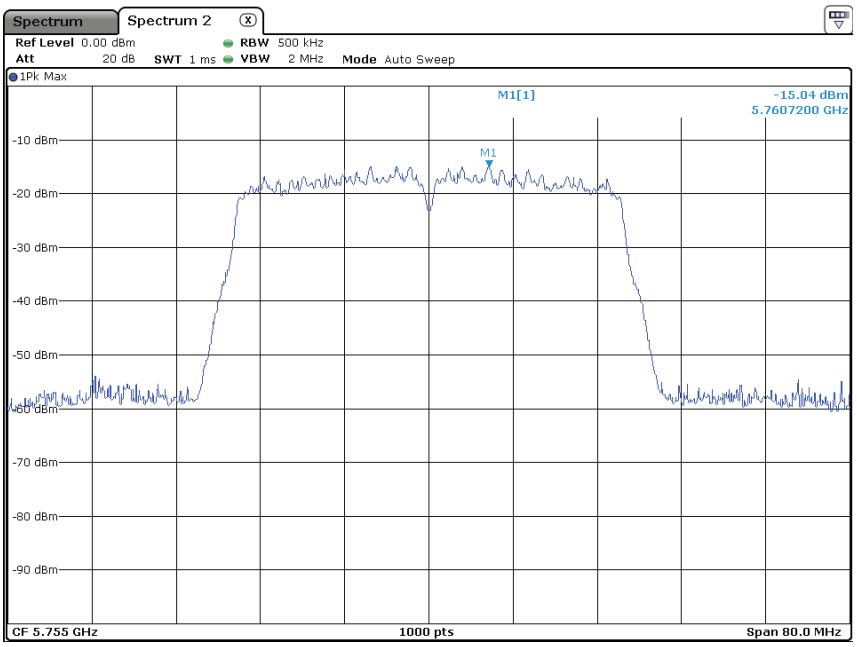
TEST REPORT

Channel 165: 5825 MHz:



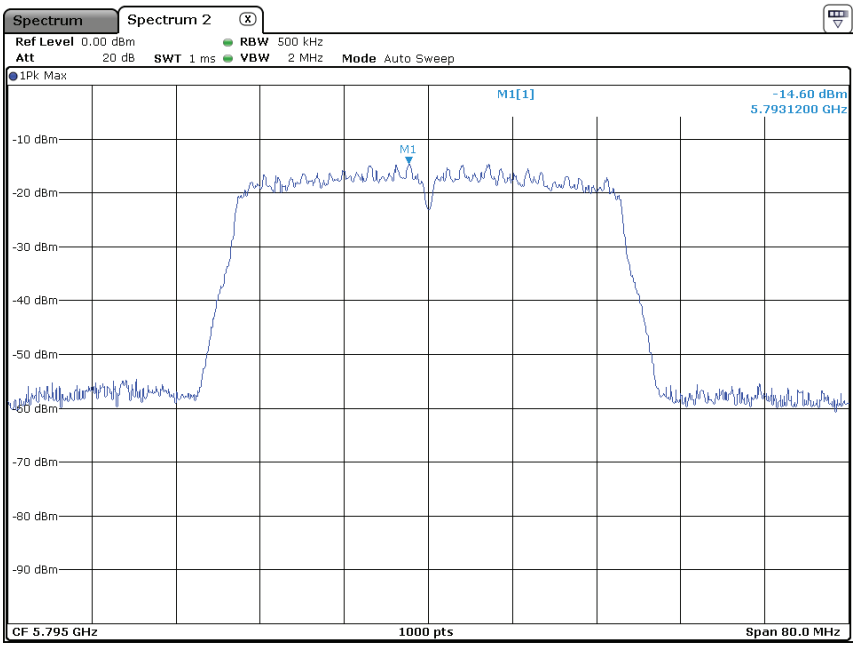
802.11an(HT 40)

Channel 151: 5755 MHz:



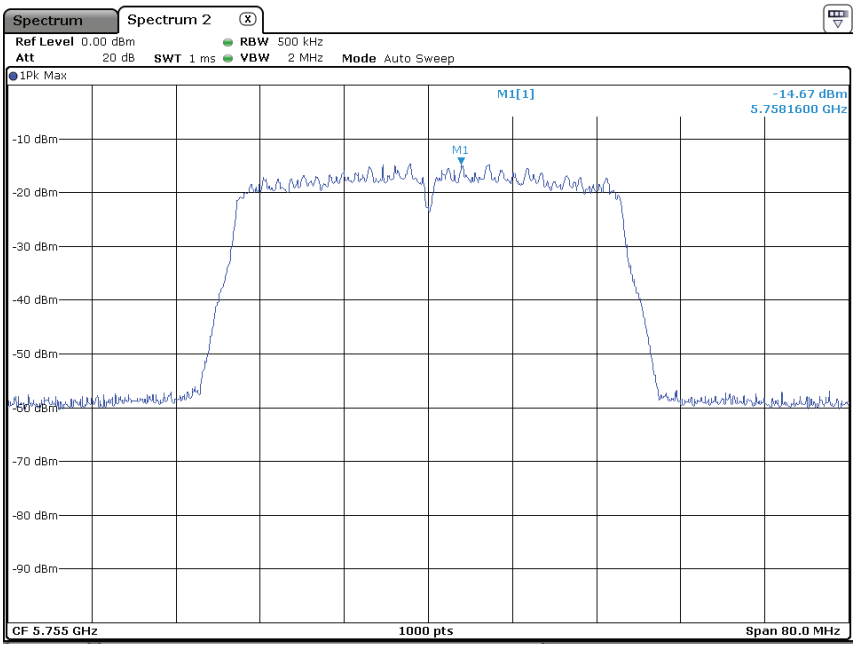
TEST REPORT

Channel 159: 5795 MHz:



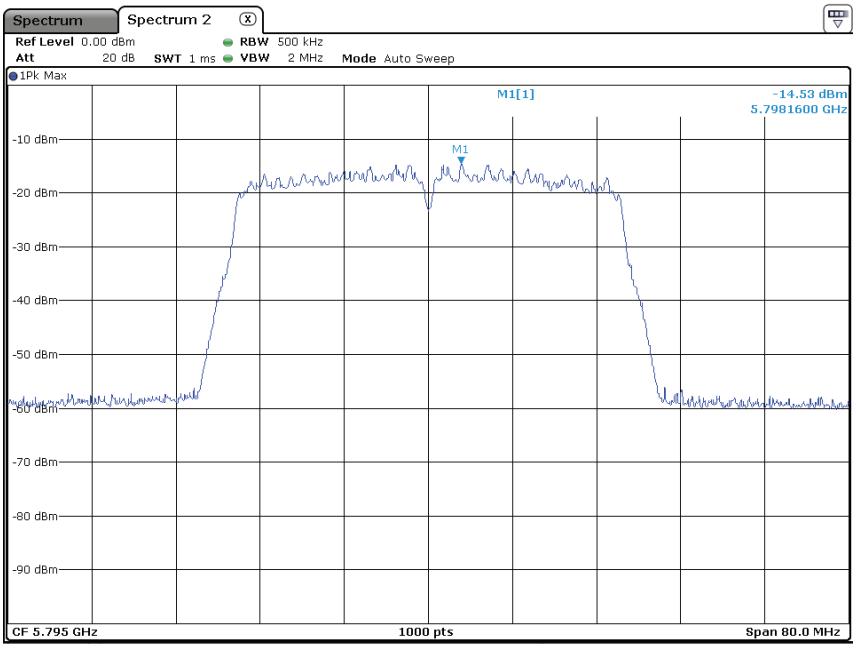
802.11ac(HT 40)

Channel 151: 5755 MHz:



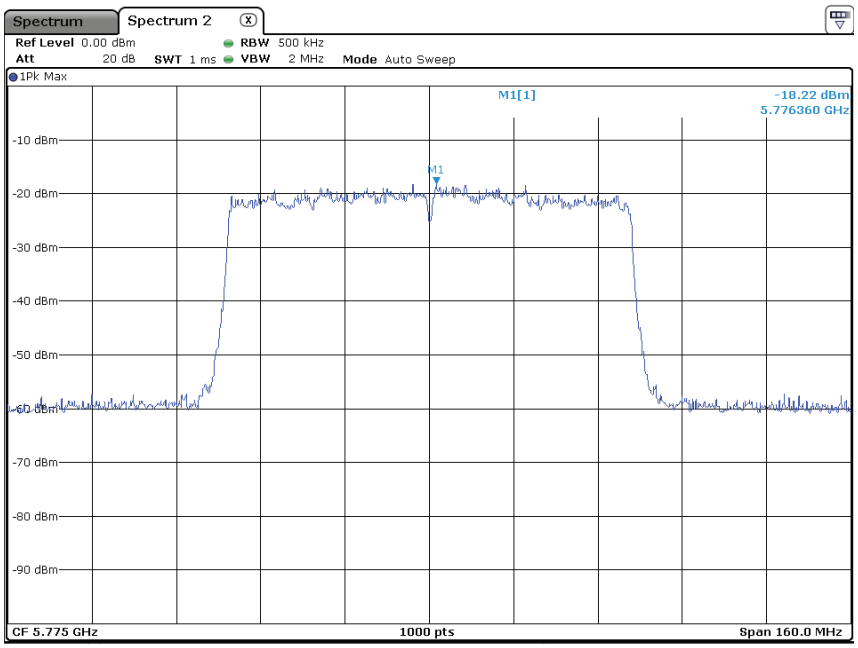
TEST REPORT

Channel 159: 5795 MHz:



802.11ac(HT 80)

Channel 155: 5775 MHz:



TEST REPORT

4.7 Radiated Spurious Emissions

Test Requirement:	FCC Part 15 E clause 15.407(b) In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Test Method:	FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01,Clause G
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)
Limit:	40.0 dBµV/m between 30MHz & 88MHz; 43.5 dBµV/m between 88MHz & 216MHz; 46.0 dBµV/m between 216MHz & 960MHz; 54.0 dBµV/m above 960MHz.
Detector:	For Peak and Quasi-Peak value: RBW = 1 MHz for f ≥ 1 GHz, 200 Hz for 9 kHz to 150 kHz 9 kHz for 150 kHz to 30 MHz 120 kHz for 30 MHz to 1GHz VBW ≥ RBW Sweep = auto Detector function = peak for f ≥ 1 GHz, QP for f < 1 GHz Trace = max hold For AV value: RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz VBW=10 Hz Sweep = auto Trace = max hold
Field Strength Calculation:	The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below: FS = RA + AF + CF - AG + PD + AV FS = RA + Correct Factor + AV
Where:	FS = Field Strength in dBµV/m RA = Receiver Amplitude (including preamplifier) in dBµV

TEST REPORT

AF = Antenna Factor in dB
CF = Cable Attenuation Factor in dB
AG = Amplifier Gain in dB
PD = Pulse Desensitization in dB
AV = Average Factor in –dB
Correct Factor = AF + CF – AG + PD

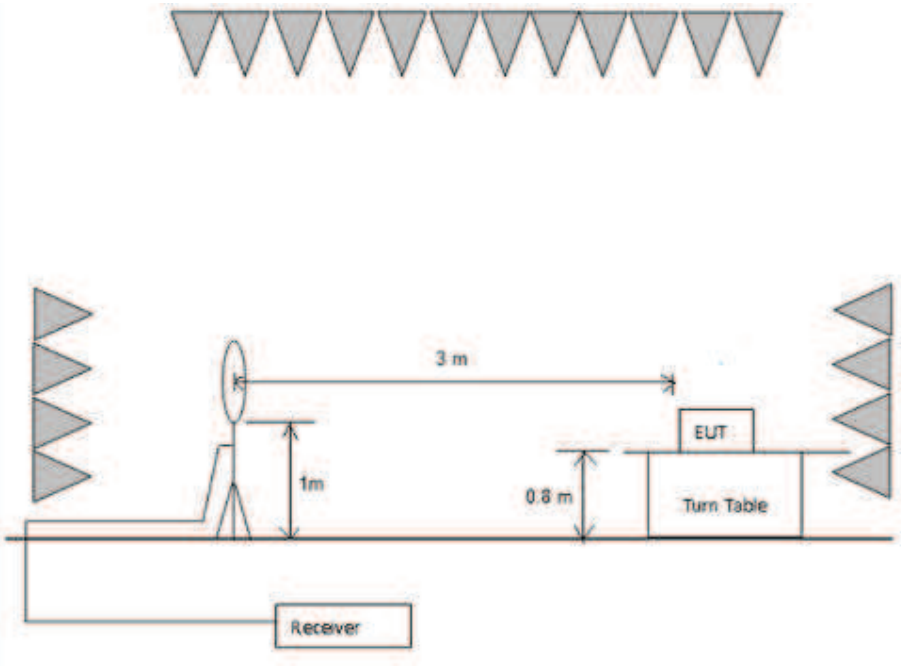
In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:
FS = RA + AF + CF - AG + PD + AV
Assume a receiver reading of 62.0 dBµV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB, and the resultant average factor was -10 dB. The net field strength for comparison to the appropriate emission limit is 32 dBµV/m.
RA = 62.0 dBµV
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
PD = 0 dB
AV = -10 dB
Correct Factor = 7.4 + 1.6 – 29.0 + 0 = -20 dB
FS = 62 + (-20) + (-10) = 32 dBµV/m

TEST REPORT

Section 15.205 Restricted bands of operation.
(a) Except as shown in paragraph (d) of this section. Only spurious emissions are permitted in any of the frequency bands listed below:

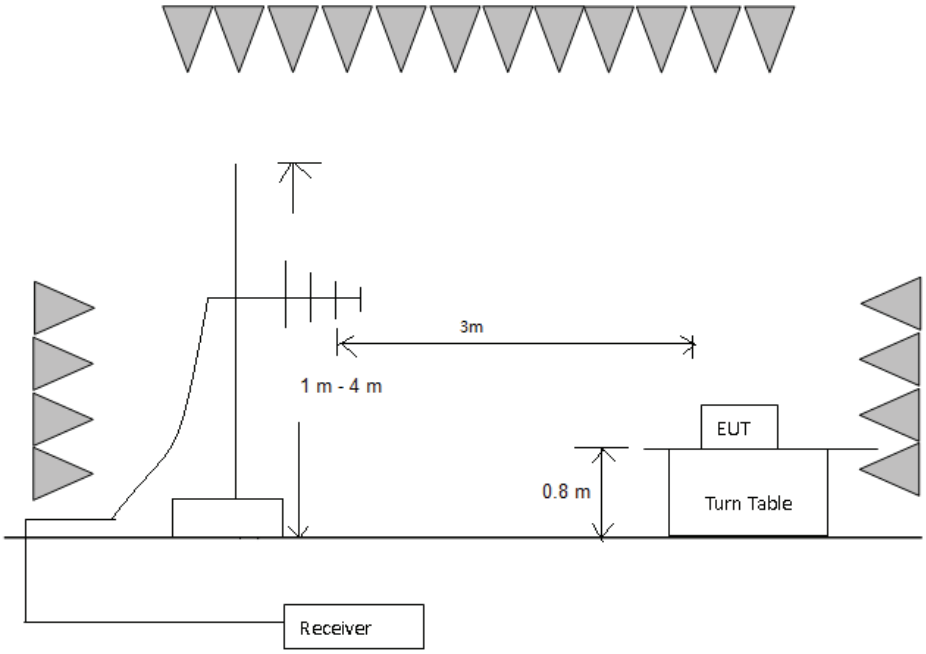
MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
10.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	
13.36 - 13.41	322 - 335.4		

Test Configuration:
1) 9 kHz to 30 MHz emissions:

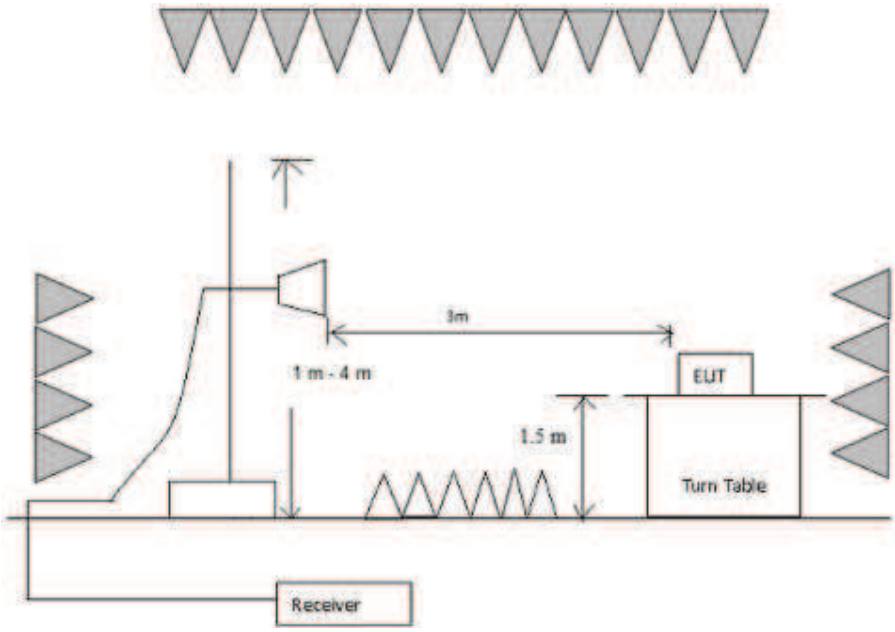


TEST REPORT

2) 30 MHz to 1 GHz emissions:



3) 1 GHz to 40 GHz emissions:



Test Procedure:

Test site with RF absorbing material covering the ground plane that met the site validation criterion called out in CISPR 16-1-4:2010 was used to perform radiated emission test above 1 GHz.

The receiver was scanned from 9 kHz to 25 GHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical

TEST REPORT

polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. The worst case emissions were reported.

Used Test Equipment List:
3m Semi-Anechoic Chamber, EMI Test Receiver (9 kHz~7 GHz), Signal and Spectrum Analyzer (10 Hz~40 GHz), Loop antenna (9 kHz-30 MHz). TRILOG Super Broadband test Antenna(30 MHz-3 GHz）(RX), Bouble-Ridged Waveguide Horn Antenna (800 MHz-18 GHz)(RX) and High Frequency Antenna & preamplifier(18 GHz~26.5 GHz) (RX). Refer to Clause 5 Test Equipment List for details.

9 kHz~30 MHz Field Strength of Unwanted Emissions for Quasi-Peak Measurement
The measurements with active loop antenna were greater than 20dB below the limit, so the test data were not recorded in the test report.

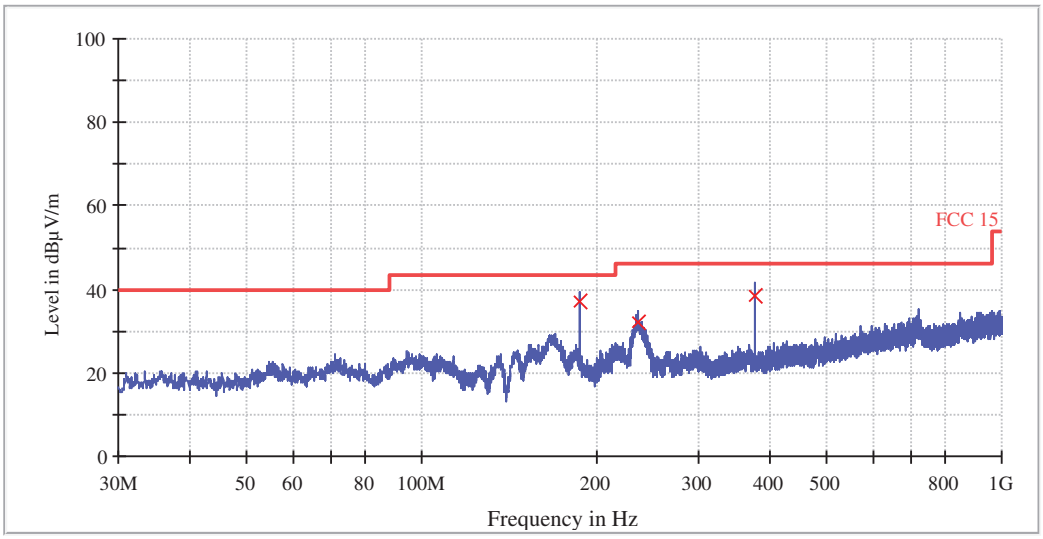
TEST REPORT

30 MHz~1 GHz Spurious Emissions .Quasi-Peak Measurement.

Pretest on the lowest channel, middle channel and highest channel for each mode of the band I and band IV.

The below data test on mode WIFI an (HT20) channel 44: 5220MHz was the worst case of all test record.

Horizontal:



QP

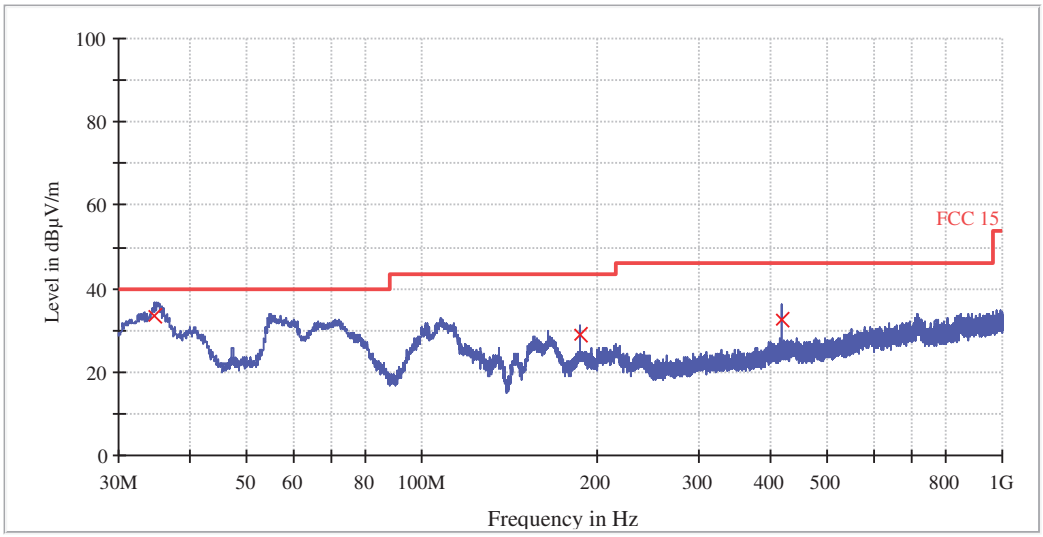
Frequency (MHz)	Quasi Peak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
187.640000	37.3	120.000	H	11.8	6.2	43.5
236.000000	32.3	120.000	H	14.0	13.7	46.0
375.360000	38.3	120.000	H	17.2	7.7	46.0

Remark:

1. Corr. (dB) = Antenna Factor (dB) + Cable Loss (dB)
2. Quasi Peak (dBµV/m) = Corr. (dB) + Read Level (dBµV)
3. Margin (dB) = Limit QPK (dBµV/m) –Quasi Peak (dBµV/m)

TEST REPORT

Vertical:



QP

Frequency (MHz)	Quasi Peak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
34.600000	33.6	120.000	V	11.4	6.4	40.0
187.680000	28.8	120.000	V	11.8	14.7	43.5
416.000000	32.5	120.000	V	17.9	13.5	46.0

Remark:
1. Corr. (dB) = Antenna Factor (dB) + Cable Loss (dB)
2. Quasi Peak (dBµV/m) = Corr. (dB) + Read Level (dBµV)
3. Margin (dB) = Limit QPK (dBµV/m) –Quasi Peak (dBµV/m)

TEST REPORT

1~40 GHz Radiated Emissions.

Result follows:

Band I 5150 MHz to 5250 MHz

802.11a(20) mode
Channel 36: 5180 MHz:

PK Measurement:

Frequency (MHz)	PK Reading Level (dBμV)	Correction factors (dB/m)	PK Emission Level (dBμV/m)	PK Limit (dBμV/m)	Antenna polarization
3977.7	46.6	-2.9	43.7	74	H
10474.3	41.1	6.9	48.0	68.2	H
1991.3	51.3	-9.7	41.6	68.2	V
3977.7	50.3	-2.9	47.4	74	V

AV Measurement:

Frequency (MHz)	AV Reading Level (dBμV)	Correction factors (dB/m)	AV Emission Level (dBμV/m)	AV Limit (dBμV/m)	Antenna polarization
3977.7	/	-2.9	/	54	H
3977.7	/	-2.9	/	54	V

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

TEST REPORT

Channel 44: 5220 MHz:

PK Measurement:

Frequency (MHz)	PK Reading Level (dBμV)	Correction factors (dB/m)	PK Emission Level (dBμV/m)	PK Limit (dBμV/m)	Antenna polarization
3977.7	46.8	-2.9	43.9	74	H
10438.2	41.7	6.9	48.6	68.2	H
3978.2	49.7	-2.9	46.8	74	V
7293.2	43.8	2.4	46.2	74	V

AV Measurement:

Frequency (MHz)	AV Reading Level (dBμV)	Correction factors (dB/m)	AV Emission Level (dBμV/m)	AV Limit (dBμV/m)	Antenna polarization
3977.7	/	-2.9	/	54	H
3978.2	/	-2.9	/	54	V
7293.2	/	2.4	/	54	V

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

Channel 48: 5240 MHz:

PK Measurement:

Frequency (MHz)	PK Reading Level (dBμV)	Correction factors (dB/m)	PK Emission Level (dBμV/m)	PK Limit (dBμV/m)	Antenna polarization
3978.2	47.1	-2.9	44.2	74	H
1660.9	51.3	-11.2	40.1	74	V
2159.7	50.2	-9.0	41.2	68.2	V
3978.2	50.4	-2.9	47.5	74	V

AV Measurement:

Frequency (MHz)	AV Reading Level (dBμV)	Correction factors (dB/m)	AV Emission Level (dBμV/m)	AV Limit (dBμV/m)	Antenna polarization
3978.2	/	-2.9	/	54	H
1660.9	/	-11.2	/	54	V
3978.2	/	-2.9	/	54	V

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

TEST REPORT

802.11an(HT 20)
Channel 36: 5180 MHz:

PK Measurement:

Frequency (MHz)	PK Reading Level (dBμV)	Correction factors (dB/m)	PK Emission Level (dBμV/m)	PK Limit (dBμV/m)	Antenna polarization
3978.2	47.0	-2.9	44.1	74	H
3978.2	50.2	-2.9	47.3	74	V

AV Measurement:

Frequency (MHz)	AV Reading Level (dBμV)	Correction factors (dB/m)	AV Emission Level (dBμV/m)	AV Limit (dBμV/m)	Antenna polarization
3978.2	/	-2.9	/	54	H
3978.2	/	-2.9	/	54	V

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

Channel 44: 5220 MHz:

PK Measurement:

Frequency (MHz)	PK Reading Level (dBμV)	Correction factors (dB/m)	PK Emission Level (dBμV/m)	PK Limit (dBμV/m)	Antenna polarization
3978.2	46.5	-2.9	43.6	74	H
1665.7	50.2	-11.2	39.0	74	V
3977.7	49.8	-2.9	46.9	74	V

AV Measurement:

Frequency (MHz)	AV Reading Level (dBμV)	Correction factors (dB/m)	AV Emission Level (dBμV/m)	AV Limit (dBμV/m)	Antenna polarization
3978.2	/	-2.9	/	54	H
1665.7	/	-11.2	/	54	V
3977.7	/	-2.9	/	54	V

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

TEST REPORT

Channel 48: 5240 MHz:

PK Measurement:

Frequency (MHz)	PK Reading Level (dBμV)	Correction factors (dB/m)	PK Emission Level (dBμV/m)	PK Limit (dBμV/m)	Antenna polarization
1833.0	46.6	-10.4	36.2	68.2	H
1327.3	52.9	-12.8	40.1	74.0	V
1992.4	49.5	-9.7	39.8	68.2	V
3978.2	50.6	-2.9	47.7	74.0	V

AV Measurement:

Frequency (MHz)	AV Reading Level (dBμV)	Correction factors (dB/m)	AV Emission Level (dBμV/m)	AV Limit (dBμV/m)	Antenna polarization
1327.3	/	-12.8	/	54	V
3978.2	/	-2.9	/	54	V

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

802.11ac(HT 20)

Channel 36: 5180 MHz:

PK Measurement:

Frequency (MHz)	PK Reading Level (dBμV)	Correction factors (dB/m)	PK Emission Level (dBμV/m)	PK Limit (dBμV/m)	Antenna polarization
7984.2	44.8	3.9	48.7	68.2	H
13078.5	43.1	7.7	50.8	68.2	H
7972.3	43.8	3.9	47.7	68.2	V
11875.5	43.0	6.6	49.6	74	V

AV Measurement:

Frequency (MHz)	AV Reading Level (dBμV)	Correction factors (dB/m)	AV Emission Level (dBμV/m)	AV Limit (dBμV/m)	Antenna polarization
11875.5	/	6.6	/	54	V

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

TEST REPORT

Channel 44: 5220 MHz:

PK Measurement:

Frequency (MHz)	PK Reading Level (dBμV)	Correction factors (dB/m)	PK Emission Level (dBμV/m)	PK Limit (dBμV/m)	Antenna polarization
8799.0	43.4	4.5	47.9	68.2	H
13201.5	42.9	7.9	50.8	68.2	H
3977.8	47.7	-2.9	44.8	74	V
11913.4	43.2	6.6	49.8	74	V

AV Measurement:

Frequency (MHz)	AV Reading Level (dBμV)	Correction factors (dB/m)	AV Emission Level (dBμV/m)	AV Limit (dBμV/m)	Antenna polarization
3977.8	/	-2.9	/	54	V
11913.4	/	6.6	/	54	V

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

Channel 48: 5240 MHz:

PK Measurement:

Frequency (MHz)	PK Reading Level (dBμV)	Correction factors (dB/m)	PK Emission Level (dBμV/m)	PK Limit (dBμV/m)	Antenna polarization
3977.8	45.5	-2.9	42.6	74	H
11299.2	43.5	6.5	50	74	H
3977.8	48.0	-2.9	45.1	74	V
13146.5	43.6	7.8	51.4	68.2	V

AV Measurement:

Frequency (MHz)	AV Reading Level (dBμV)	Correction factors (dB/m)	AV Emission Level (dBμV/m)	AV Limit (dBμV/m)	Antenna polarization
3977.8	/	-2.9	/	54	H
11299.2	/	6.5	/	54	H
3977.8	/	-2.9	/	54	V

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

TEST REPORT

802.11an(HT 40)

Channel 38: 5190 MHz:

PK Measurement:

Frequency (MHz)	PK Reading Level (dBμV)	Correction factors (dB/m)	PK Emission Level (dBμV/m)	PK Limit (dBμV/m)	Antenna polarization
3977.7	45.4	-2.9	42.5	74	H
1327.8	52.7	-12.8	39.9	74	V
3977.7	49.8	-2.9	46.9	74	V

AV Measurement:

Frequency (MHz)	AV Reading Level (dBμV)	Correction factors (dB/m)	AV Emission Level (dBμV/m)	AV Limit (dBμV/m)	Antenna polarization
3977.7	/	-2.9	/	54	H
1327.8	/	-12.8	/	54	V
3977.7	/	-2.9	/	54	V

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

Channel 46: 5230 MHz:

PK Measurement:

Frequency (MHz)	PK Reading Level (dBμV)	Correction factors (dB/m)	PK Emission Level (dBμV/m)	PK Limit (dBμV/m)	Antenna polarization
3978.2	47.1	-2.9	44.2	74	H
3977.7	49.8	-2.9	46.9	74	V

AV Measurement:

Frequency (MHz)	AV Reading Level (dBμV)	Correction factors (dB/m)	AV Emission Level (dBμV/m)	AV Limit (dBμV/m)	Antenna polarization
3978.2	/	-2.9	/	54	H
3977.7	/	-2.9	/	54	V

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

TEST REPORT

802.11ac(HT 40)

Channel 38: 5190 MHz:

PK Measurement:

Frequency (MHz)	PK Reading Level (dBμV)	Correction factors (dB/m)	PK Emission Level (dBμV/m)	PK Limit (dBμV/m)	Antenna polarization
1163.6	49.3	-13.6	35.7	74	H
3977.7	46.9	-2.9	44	74	H
3977.7	50.8	-2.9	47.9	74	V

AV Measurement:

Frequency (MHz)	AV Reading Level (dBμV)	Correction factors (dB/m)	AV Emission Level (dBμV/m)	AV Limit (dBμV/m)	Antenna polarization
1163.6	/	-13.6	/	54	H
3977.7	/	-2.9	/	54	H
3977.7	/	-2.9	/	54	V

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

Channel 46: 5230 MHz:

PK Measurement:

Frequency (MHz)	PK Reading Level (dBμV)	Correction factors (dB/m)	PK Emission Level (dBμV/m)	PK Limit (dBμV/m)	Antenna polarization
3977.7	45.4	-2.9	42.5	74	H
1332.6	48.0	-12.8	35.2	74	V
1659.3	50.6	-11.2	39.4	68.2	V
3978.2	49.9	-2.9	47	74	V

AV Measurement:

Frequency (MHz)	AV Reading Level (dBμV)	Correction factors (dB/m)	AV Emission Level (dBμV/m)	AV Limit (dBμV/m)	Antenna polarization
3977.7	/	-2.9	/	54	H
1332.6	/	-12.8	/	54	V
3978.2	/	-2.9	/	54	V

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

TEST REPORT

802.11ac(HT 80)

Channel 42: 5210 MHz:

PK Measurement:

Frequency (MHz)	PK Reading Level (dBμV)	Correction factors (dB/m)	PK Emission Level (dBμV/m)	PK Limit (dBμV/m)	Antenna polarization
3978.2	46.3	-2.9	43.4	74	H
3977.7	50.3	-2.9	47.4	74	V

AV Measurement:

Frequency (MHz)	AV Reading Level (dBμV)	Correction factors (dB/m)	AV Emission Level (dBμV/m)	AV Limit (dBμV/m)	Antenna polarization
3978.2	/	-2.9	/	54	H
3977.7	/	-2.9	/	54	V

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

TEST REPORT

Result as follows:

Band IV 5725 MHz to 5850 MHz

802.11a(20) mode
Channel 149: 5745 MHz:

PK Measurement:

Frequency (MHz)	PK Reading Level (dBμV)	Correction factors (dB/m)	PK Emission Level (dBμV/m)	PK Limit (dBμV/m)	Antenna polarization
3095.3	46.3	-5.6	40.7	68.2	H
3978.7	48.9	-2.9	46	74	H
1995.6	51.7	-9.7	42	68.2	V
3978.2	49.3	-2.9	46.4	74	V

AV Measurement:

Frequency (MHz)	AV Reading Level (dBμV)	Correction factors (dB/m)	AV Emission Level (dBμV/m)	AV Limit (dBμV/m)	Antenna polarization
3978.7	/	-2.9	/	54	H
3978.2	/	-2.9	/	54	V

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

TEST REPORT

Channel 157: 5785 MHz:

PK Measurement:

Frequency (MHz)	PK Reading Level (dBμV)	Correction factors (dB/m)	PK Emission Level (dBμV/m)	PK Limit (dBμV/m)	Antenna polarization
3978.2	46.7	-2.9	43.8	74	H
1665.1	56.7	-11.2	45.5	74	V
1999.3	53.3	-9.7	43.6	68.2	V
3977.7	49.8	-2.9	46.9	74	V

AV Measurement:

Frequency (MHz)	AV Reading Level (dBμV)	Correction factors (dB/m)	AV Emission Level (dBμV/m)	AV Limit (dBμV/m)	Antenna polarization
3978.2	/	-2.9	/	54	H
1665.1	/	-11.2	/	54	V
3977.7	/	-2.9	/	54	V

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

Channel 165: 5825 MHz:

PK Measurement:

Frequency (MHz)	PK Reading Level (dBμV)	Correction factors (dB/m)	PK Emission Level (dBμV/m)	PK Limit (dBμV/m)	Antenna polarization
3977.7	47.4	-2.9	44.5	74	H
3978.7	49.0	-2.9	46.1	74	V

AV Measurement:

Frequency (MHz)	AV Reading Level (dBμV)	Correction factors (dB/m)	AV Emission Level (dBμV/m)	AV Limit (dBμV/m)	Antenna polarization
3977.7	/	-2.9	/	54	H
3978.7	/	-2.9	/	54	V

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

TEST REPORT

802.11an(HT 20)
Channel 149: 5745 MHz:

PK Measurement:

Frequency (MHz)	PK Reading Level (dBμV)	Correction factors (dB/m)	PK Emission Level (dBμV/m)	PK Limit (dBμV/m)	Antenna polarization
3978.2	47.0	-2.9	44.1	74	H
1331.5	48.6	-12.8	35.8	74	V
2828.0	48.6	-6.5	42.1	74	V
3977.7	49.6	-2.9	46.7	74	V

AV Measurement:

Frequency (MHz)	AV Reading Level (dBμV)	Correction factors (dB/m)	AV Emission Level (dBμV/m)	AV Limit (dBμV/m)	Antenna polarization
3978.2	/	-2.9	/	54	H
1331.5	/	-12.8	/	54	V
2828.0	/	-6.5	/	54	V
3977.7	/	-2.9	/	54	V

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

Channel 157: 5785 MHz:

PK Measurement:

Frequency (MHz)	PK Reading Level (dBμV)	Correction factors (dB/m)	PK Emission Level (dBμV/m)	PK Limit (dBμV/m)	Antenna polarization
3977.7	46.2	-2.9	43.3	74	H
3977.7	49.6	-2.9	46.7	74	V

AV Measurement:

Frequency (MHz)	AV Reading Level (dBμV)	Correction factors (dB/m)	AV Emission Level (dBμV/m)	AV Limit (dBμV/m)	Antenna polarization
3977.7	/	-2.9	/	54	H
3977.7	/	-2.9	/	54	V

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

TEST REPORT

Channel 165: 5825 MHz:

PK Measurement:

Frequency (MHz)	PK Reading Level (dBμV)	Correction factors (dB/m)	PK Emission Level (dBμV/m)	PK Limit (dBμV/m)	Antenna polarization
1710.8	51.1	-10.9	40.2	68.2	H
3977.7	46.4	-2.9	43.5	74	H
1329.4	51.2	-12.8	38.4	74	V
3977.7	50.0	-2.9	47.1	74	V

AV Measurement:

Frequency (MHz)	AV Reading Level (dBμV)	Correction factors (dB/m)	AV Emission Level (dBμV/m)	AV Limit (dBμV/m)	Antenna polarization
3977.7	/	-2.9	/	54	H
1329.4	/	-12.8	/	54	V
3977.7	/	-2.9	/	54	V

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

802.11ac(HT 20)

Channel 149: 5745 MHz:

PK Measurement:

Frequency (MHz)	PK Reading Level (dBμV)	Correction factors (dB/m)	PK Emission Level (dBμV/m)	PK Limit (dBμV/m)	Antenna polarization
10083.7	41.8	6.7	48.5	68.2	H
13066.6	43.5	7.7	51.2	68.2	H
9345.9	44.2	4.6	48.8	74	V
11132.6	42.5	6.6	49.1	74	V

AV Measurement:

Frequency (MHz)	AV Reading Level (dBμV)	Correction factors (dB/m)	AV Emission Level (dBμV/m)	AV Limit (dBμV/m)	Antenna polarization
9345.9	/	4.6	/	54	V
11132.6	/	6.6	/	54	V

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

TEST REPORT

Channel 157: 5785 MHz:

PK Measurement:

Frequency (MHz)	PK Reading Level (dBμV)	Correction factors (dB/m)	PK Emission Level (dBμV/m)	PK Limit (dBμV/m)	Antenna polarization
9569.1	45.2	5.0	50.2	68.2	H
12267.0	42.3	6.8	49.1	74	H
3977.8	48.7	-2.9	45.8	74	V
11808.0	43.2	6.5	49.7	74	V

AV Measurement:

Frequency (MHz)	AV Reading Level (dBμV)	Correction factors (dB/m)	AV Emission Level (dBμV/m)	AV Limit (dBμV/m)	Antenna polarization
12267.0	/	6.8	/	54	H
3977.8	/	-2.9	/	54	V
11808.0	/	6.5	/	54	V

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

Channel 165: 5825 MHz:

PK Measurement:

Frequency (MHz)	PK Reading Level (dBμV)	Correction factors (dB/m)	PK Emission Level (dBμV/m)	PK Limit (dBμV/m)	Antenna polarization
8034.0	44.8	4.0	48.8	74	H
11901.5	43.7	6.6	50.3	74	H
9618.4	43.4	5.2	48.6	68.2	V
12939.1	43.0	7.5	50.5	68.2	V

AV Measurement:

Frequency (MHz)	AV Reading Level (dBμV)	Correction factors (dB/m)	AV Emission Level (dBμV/m)	AV Limit (dBμV/m)	Antenna polarization
8034.0	/	4.0	/	54	H
11901.5	/	6.6	/	54	H

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

TEST REPORT

802.11an(HT 40)

Channel 151: 5755 MHz:

PK Measurement:

Frequency (MHz)	PK Reading Level (dBμV)	Correction factors (dB/m)	PK Emission Level (dBμV/m)	PK Limit (dBμV/m)	Antenna polarization
3977.7	46.7	-2.9	43.8	74	H
1663.5	58.5	-11.2	47.3	74	V
3978.2	50.5	-2.9	47.6	74	V

AV Measurement:

Frequency (MHz)	AV Reading Level (dBμV)	Correction factors (dB/m)	AV Emission Level (dBμV/m)	AV Limit (dBμV/m)	Antenna polarization
3977.7	/	-2.9	/	54	H
1663.5	/	-11.2	/	54	V
3978.2	/	-2.9	/	54	V

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

Channel 159: 5795 MHz:

PK Measurement:

Frequency (MHz)	PK Reading Level (dBμV)	Correction factors (dB/m)	PK Emission Level (dBμV/m)	PK Limit (dBμV/m)	Antenna polarization
3978.2	47.8	-2.9	44.9	74	H
3978.2	50.1	-2.9	47.2	74	V
7292.7	44.6	2.4	47	74	V

AV Measurement:

Frequency (MHz)	AV Reading Level (dBμV)	Correction factors (dB/m)	AV Emission Level (dBμV/m)	AV Limit (dBμV/m)	Antenna polarization
3978.2	/	-2.9	/	54	H
3978.2	/	-2.9	/	54	V
7292.7	/	2.4	/	54	V

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

TEST REPORT

802.11ac(HT 40)

Channel 151: 5755 MHz:

PK Measurement:

Frequency (MHz)	PK Reading Level (dBμV)	Correction factors (dB/m)	PK Emission Level (dBμV/m)	PK Limit (dBμV/m)	Antenna polarization
3978.2	47.5	-2.9	44.6	74	H
1996.1	48.8	-9.7	39.1	68.2	V
3978.2	49.6	-2.9	46.7	74	V

AV Measurement:

Frequency (MHz)	AV Reading Level (dBμV)	Correction factors (dB/m)	AV Emission Level (dBμV/m)	AV Limit (dBμV/m)	Antenna polarization
3978.2	/	-2.9	/	54	H
3978.2	/	-2.9	/	54	V

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

Channel 159: 5795 MHz:

PK Measurement:

Frequency (MHz)	PK Reading Level (dBμV)	Correction factors (dB/m)	PK Emission Level (dBμV/m)	PK Limit (dBμV/m)	Antenna polarization
3978.2	47.8	-2.9	44.9	74	H
3978.2	50.1	-2.9	47.2	74	V
7292.7	44.6	2.4	47	74	V

AV Measurement:

Frequency (MHz)	AV Reading Level (dBμV)	Correction factors (dB/m)	AV Emission Level (dBμV/m)	AV Limit (dBμV/m)	Antenna polarization
3978.2	/	-2.9	/	54	H
3978.2	/	-2.9	/	54	V
7292.7	/	2.4	/	54	V

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

TEST REPORT

802.11ac(HT 80)

Channel 155: 5775 MHz:

PK Measurement:

Frequency (MHz)	PK Reading Level (dBμV)	Correction factors (dB/m)	PK Emission Level (dBμV/m)	PK Limit (dBμV/m)	Antenna polarization
3977.7	47.2	-2.9	44.3	74	H
1665.1	49.8	-11.2	38.6	74	V
3978.2	49.1	-2.9	46.2	74	V

AV Measurement:

Frequency (MHz)	AV Reading Level (dBμV)	Correction factors (dB/m)	AV Emission Level (dBμV/m)	AV Limit (dBμV/m)	Antenna polarization
3977.7	/	-2.9	/	54	H
1665.1	/	-11.2	/	54	V
3978.2	/	-2.9	/	54	V

Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Loss –Preamplifier Factor.