FCC 47 CFR PART 15 SUBPART E

for

Wireless Router

Model: AC40, AC50, AC60, AC70, A655W

Brand: UTT

Test Report Number:

C160415Z12-RP1-2

Issued Date: May 31, 2016

Issued for

SHANGHAI UTT TECHNOLOGIES CO., LTD.

Room 301, No.9 Building, No.518, Xinzhuan Rd., Songjiang District, Shanghai, China

Issued by:

Compliance Certification Services (Shenzhen) Inc.

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TESTING CERT #2861.01

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	May 31, 2016	Initial Issue	ALL	Sabrina Wang

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1. TEST CERTIFICATION

Product	Wireless Router
Model	AC40, AC50, AC60, AC70, A655W
Brand	UTT
Tested	April 15~May 30, 2016
Applicant	**SHANGHAI UTT TECHNOLOGIES CO., LTD.** Room 301, No.9 Building, No.518, Xinzhuan Rd., Songjiang District, Shanghai, China
Manufacturer	**SHANGHAI UTT TECHNOLOGIES CO., LTD.** Room 301, No.9 Building, No.518, Xinzhuan Rd., Songjiang District, Shanghai, China

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
FCC 47 CFR Part 15 Subpart E	No non-compliance noted

We hereby certify that:

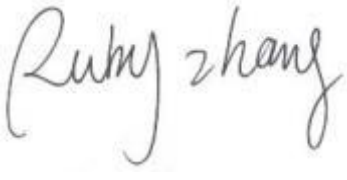
Compliance Certification Services (Shenzhen) Inc. tested the above equipment. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in **ANSI C63.10: 2013** and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.407、FCC 14-30.

The TEST RESULTS of this report relate only to the tested sample identified in this report.

Approved by:

Sunday Hu
Supervisor of EMC Dept.
Compliance Certification Services (Shenzhen) Inc.

Reviewed by:



Ruby Zhang
Supervisor of Report Dept.
Compliance Certification Services (Shenzhen) Inc.

2. EUT DESCRIPTION

Product	Wireless Router
Model Number	AC40, AC50, AC60, AC70, A655W
Brand	UTT
Model Discrepancy	All models are identical to each other except the different model name.
Serial Number	C160415Z12-RP1-2
Received Date	April 15, 2016
Power Supply	DC12V supplied by the Adapter
Adapter Manufacturer /Model No.	SHENZHEN FUJIA APPLIANCE CO., LTD. / FJ-SW1202000N I/P: 100-240Vac, 50/60Hz, 0.6A max O/P: 12Vdc, 2000mA DC Output Cable: Unshielded 1.50m
Frequency Range	UNII Band IV: IEEE 802.11a, 802.11n HT20 : 5745MHz ~ 5825MHz IEEE 802.11n HT40: 5755MHz ~ 5795MHz IEEE 802.11ac 80: 5775MHz
Transmit Power	UNII Band IV: IEEE 802.11a: 17.26dBm (Antenna 1) 15.55dBm (Antenna 2) IEEE 802.11n HT 20 MHz mode: 18.61dBm (Combine with Antenna 1 and Antenna 2) IEEE 802.11n HT 40 MHz mode: 18.95dBm (Combine with Antenna 1 and Antenna 2) IEEE 802.11ac 80: 19.02dBm (Combine with Antenna 1 and Antenna 2)
Modulation Technique	OFDM (QPSK, BPSK, 16-QAM, 64-QAM)
Transmit Data Rate	IEEE 802.11a mode: 48, 36, 24, 18, 12, 9, 6Mbps IEEE802.11n HT20MHz mode: 13,26,39,52,78,104,117,130Mbps IEEE802.11n HT40MHz mode: 27,54,81,108,162,216,243,270Mbps IEEE802.11ac VHT80MHz mode: 58.6,117,175.6,234,351,468,526.6, 585,702,780Mbps
Number of Channels	UNII Band IV IEEE 802.11a, 802.11n HT20 : 5 Channels IEEE 802.11n HT 40 MHz mode: 2 Channels IEEE 802.11ac 80: 1 Channel
Antenna Specification	External Antenna with 5dBi gain (Max)
Channels Spacing	IEEE 802.11a, 802.11n HT20 : 20MHz IEEE 802.11n HT40: 40MHz IEEE 802.11ac 80: 80MHz
Temperature Range	-10°C ~ +50°C
Hardware Version	MT7620-K
Software Version	nvAC60v1.8.11-160330.bin

Note: *1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.*

Operation Frequency:

UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE (U-NII)	
CHANNEL	**MHz**
149	5745
151	5755
153	5765
155	5775
157	5785
159	5795
161	5805
165	5825

Remark:

1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for FCC ID: **XPF-REG10-UTT** filing to comply with Section 15.407 of the FCC Part 15, Subpart E Rules and FCC 14-30.

3. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10 Radiated testing was performed at an antenna to EUT distance 3 meters. The tests documented in this report were performed in accordance with ANSI C63.10: 2013 and FCC CFR 47 Part 15.207, 15.209, 15.407 and FCC 14-30.
Radio testing was performed according to KDB DA 02-2138、KDB 789033 D02、KDB 905462 D06；

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed for RF field strength measurement to meet the Commissions requirement, and is operated in a manner intended to generate the maximum emission in a continuous normal application.

3.2 EUT EXERCISE

The EUT is operated in the engineering mode to fix the TX frequency for the purposes of measurement.
According to its specifications, the EUT must comply with the requirements of Section 15.407 under the FCC Rules Part 15 Subpart E.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is positioned at 0.8 m above the ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.10, the conducted emission from the EUT is measured in the frequency range between 0.15 MHz and 30MHz, using the CISPR Quasi-Peak detector mode.

Radiated Emissions

The EUT is placed on the turntable, which is 0.8 m above the ground plane. The turntable is then rotated for 360 degrees to determine the proper orientation for the maximum emission level. The EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission level. And, each emission is to be maximized by changing the horizontal and vertical polarization of the receiving antenna. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.10.

3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

(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
[1]0.495 - 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	([2])
13.36 - 13.41	322 - 335.4		

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

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

3.5 DESCRIPTION OF TEST MODES

The EUT is a 2x2 configuration spatial MIMO (2TX & 2RX) without beam forming function.

Software used to control the EUT for staying in continuous transmitting mode was programmed.

Test Item	Test mode	Worse mode
Conducted Emission	**Mode 1:** TX	☒
Radiated Emission	**Mode 1:** TX	☒

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz, which worst case was in normal link mode only.

The field strength of spurious emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X axis). The worst emission was found in lie-down position (Z axis) and the worst case was recorded.

UNII Band IV:

IEEE 802.11a for 5745 ~ 5825MHz:
Channel Low (5745MHz), Channel Mid (5785MHz) and Channel High (5825MHz) with 6Mbps data rate were chosen for full testing.

IEEE 802.11n HT 20 MHz for 5745 ~ 5825MHz:
Channel Low (5745MHz), Channel Mid (5785MHz) and Channel High (5825MHz) with 27Mbps data rate were chosen for full testing.

IEEE 802.11n HT 40 MHz Channel for 5755~ 5795MHz:
Channel Low (5755MHz) and Channel High (5795MHz) with 27Mbps data rate were chosen for full testing.

IEEE 802.11ac 80 Channel for 5775MHz:
Channel Low (5775MHz) with 27Mbps data rate were chosen for full testing.

4. SETUP OF EQUIPMENT UNDER TEST

4.1 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Equipment	Model No.	Serial No.	FCC ID	Brand	Data Cable	Power Cord
1	Notebook	E335	N/A	DOC	Thinkpad	Shielded 1.50m	Unshielded 2.00m

Note:

Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.2 CONFIGURATION OF SYSTEM UNDER TEST

See test photographs attached in Appendix II for the actual connections between EUT and support equipment.

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at **No.10-1 Mingkeda Logistics park, No.18, Huanguan South Rd., Guan Lan Town, Baoan District, Shenzhen, China**

The sites are constructed in conformance with the requirements of ANSI C63.10, ANSI C63.7 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

5.3 ACCREDITATIONS

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

USA	**A2LA**
China	**CNAS**

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

USA	**FCC**
Japan	**VCCI (C-4815,R-4320,T-2317, G-10624)**
Canada	**INDUSTRY CANADA**

Copies of granted accreditation certificates are available for downloading from our web site, http://www.ccssz.com

5.4 MEASUREMENT UNCERTAINTY

Parameter	Uncertainty
RF frequency	+/-1 * 10-5
RF power conducted	+/- 1,5 dB
RF power radiated	+/- 6 dB
Spurious emissions, conducted	+/- 3 dB
Spurious emissions, radiated	+/- 6 dB
Humidity	+/- 5 %
Temperature	+/- 1°C
Time	+/-10 %

Remark: *This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.*

6. FCC PART 15 REQUIREMENTS

6.1 26dB EMISSION BANDWIDTH

6.1.1LIMIT

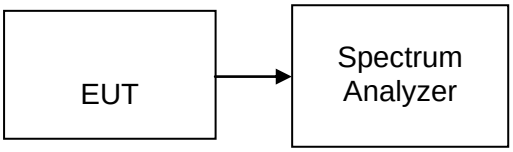
According to §15.303(c), for purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Compliance with the emissions limits is based on the use of measurement instrumentation employing a peak detector function with an instrument resolutions bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

6.1.2MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	N9010A	MY52221469	02/21/2016	02/20/2017

Remark: *Each piece of equipment is scheduled for calibration once a year.*

6.1.3TEST CONFIGURATION



6.1.4TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low-loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW > 1%EBW, VBW > RBW, Span >26dB bandwidth, Detector = Peak, and Sweep = auto.
4. Mark the peak frequency and –26dB (upper and lower) frequency.
5. Repeat until all the rest channels were investigated.

6.1.5TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11a mode / 5745 ~ 5825MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)	
		Antenna 1	Antenna 2
Low	5745	20.11	19.90
Mid	5785	19.93	19.65
High	5825	19.85	19.79

Test mode: IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)	
		Antenna 1	Antenna 2
Low	5745	20.23	20.13
Mid	5785	19.87	20.13
High	5825	20.13	19.95

Test mode: IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)	
		Antenna 1	Antenna 2
Low	5755	40.16	39.65
High	5795	39.88	39.65

Test mode: IEEE 802.11ac 80 mode / 5775MHz

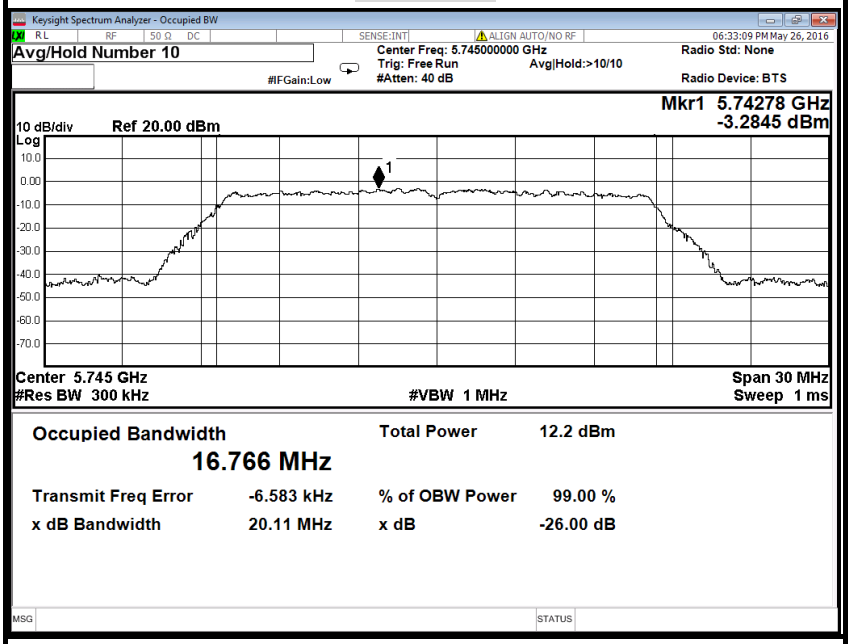
Channel	Frequency (MHz)	Bandwidth(B) (MHz)	
		Antenna 1	Antenna 2
	5775	79.73	79.85

Test Plot

IEEE 802.11a mode / 5745 ~ 5825MHz

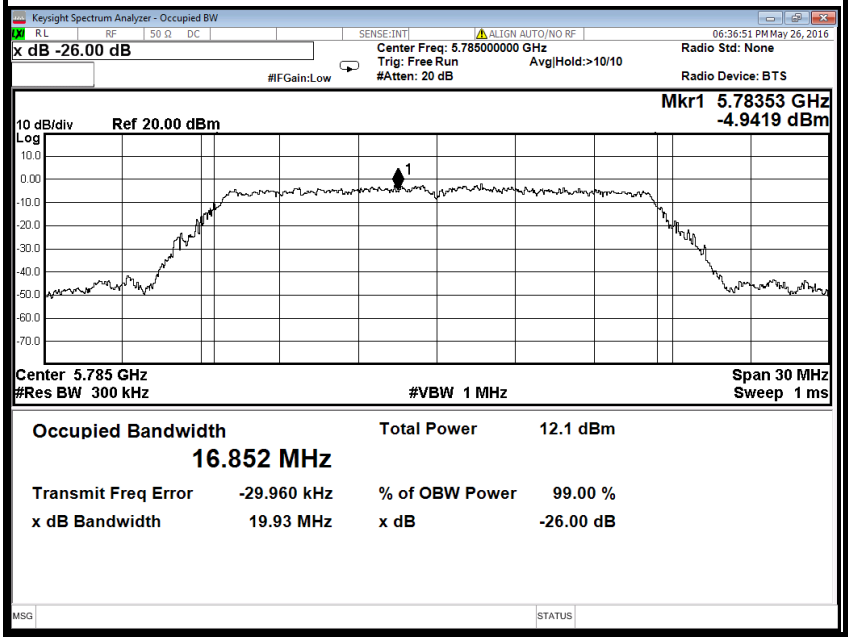
26dB Bandwidth (CH Low)

Antenna 1



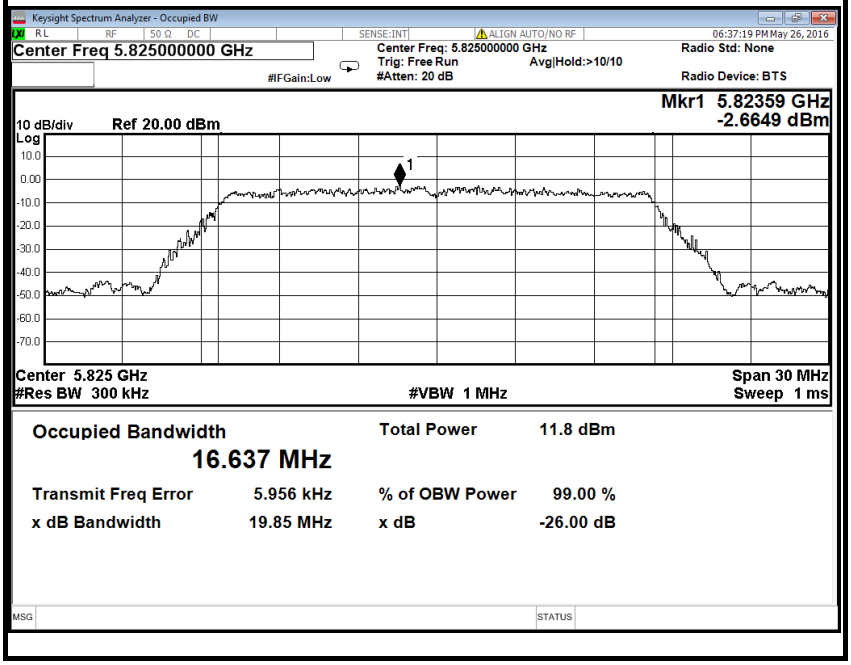
26dB Bandwidth (CH Mid)

Antenna 1



26dB Bandwidth (CH High)

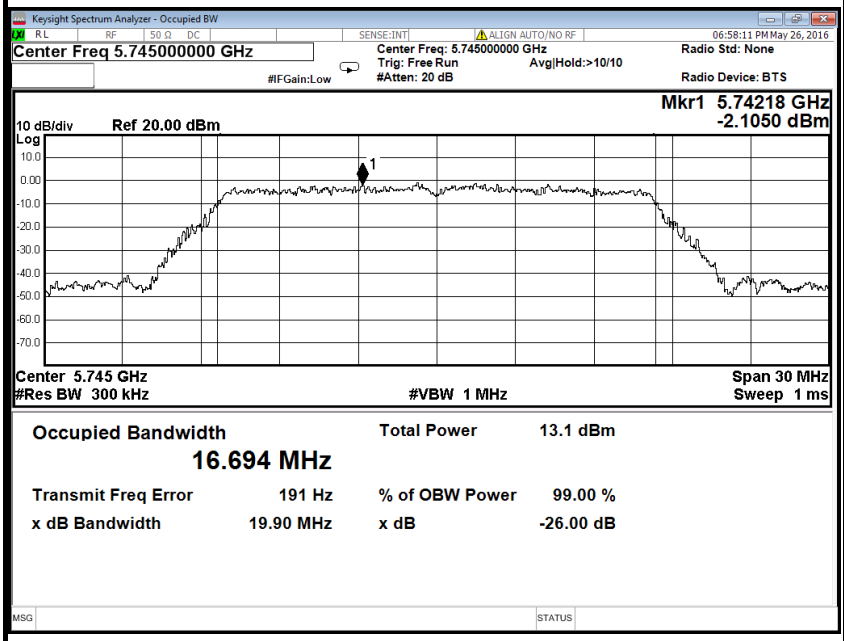
Antenna 1



IEEE 802.11a mode / 5745 ~ 5825MHz

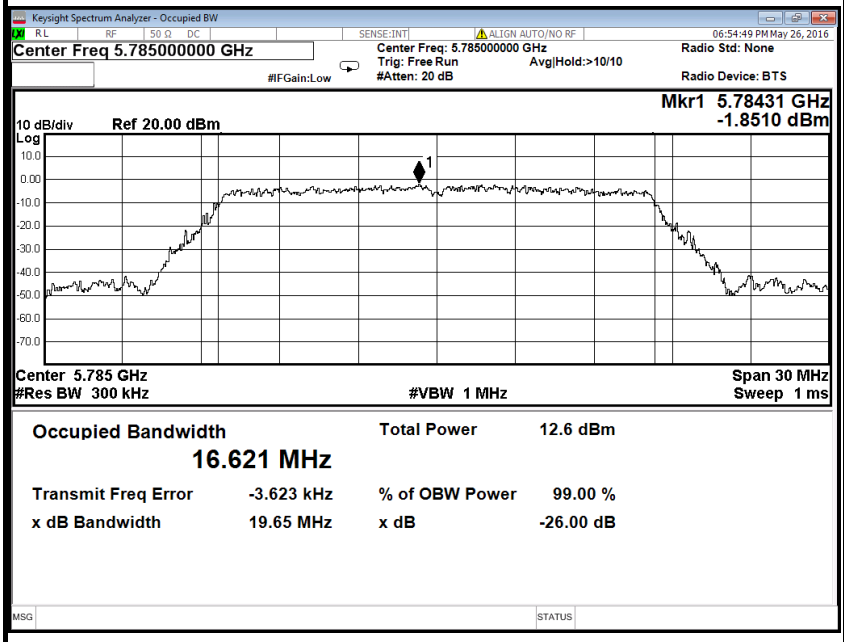
26dB Bandwidth (CH Low)

Antenna 2



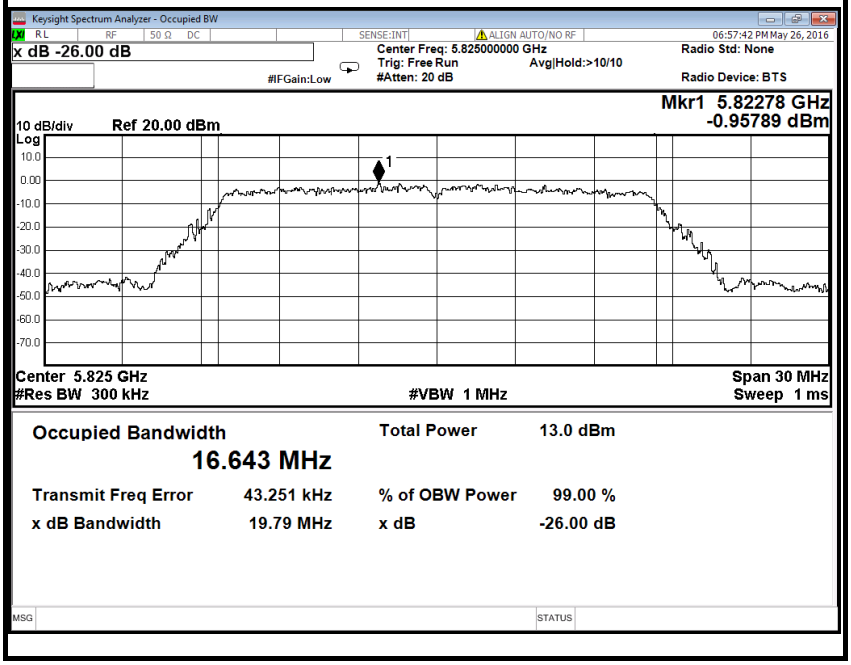
26dB Bandwidth (CH Mid)

Antenna 2



26dB Bandwidth (CH High)

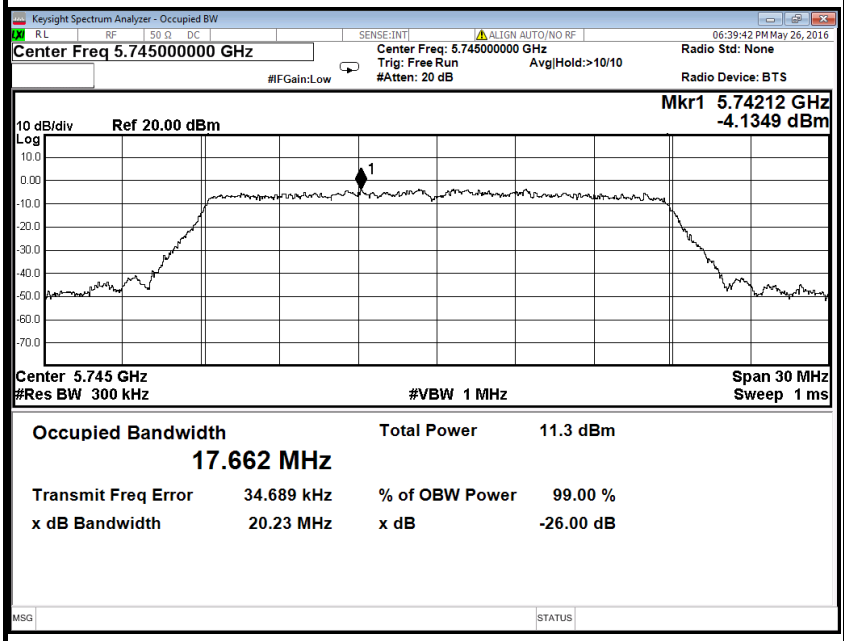
Antenna 2



IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz

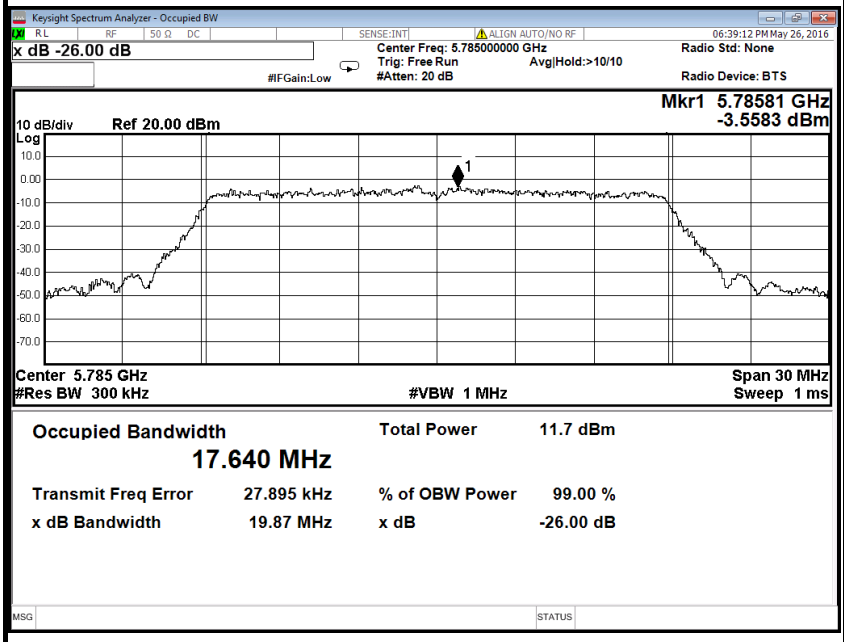
26dB Bandwidth (CH Low)

Antenna 1



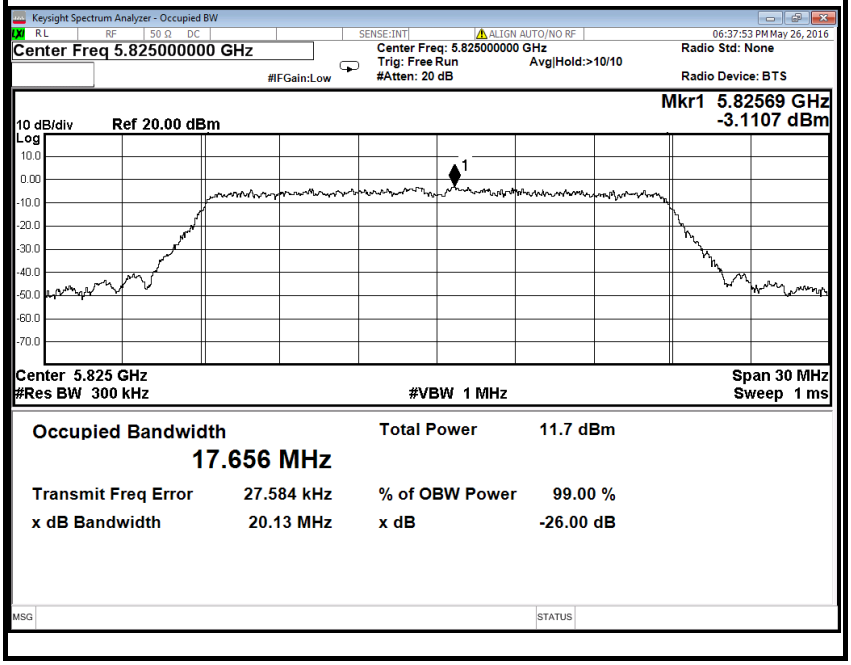
26dB Bandwidth (CH Mid)

Antenna 1



26dB Bandwidth (CH High)

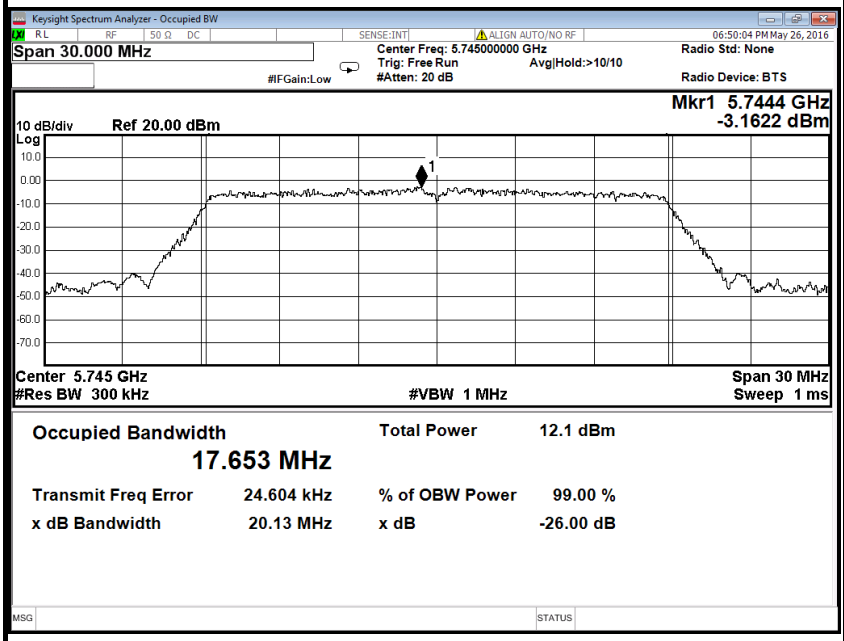
Antenna 1



IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz

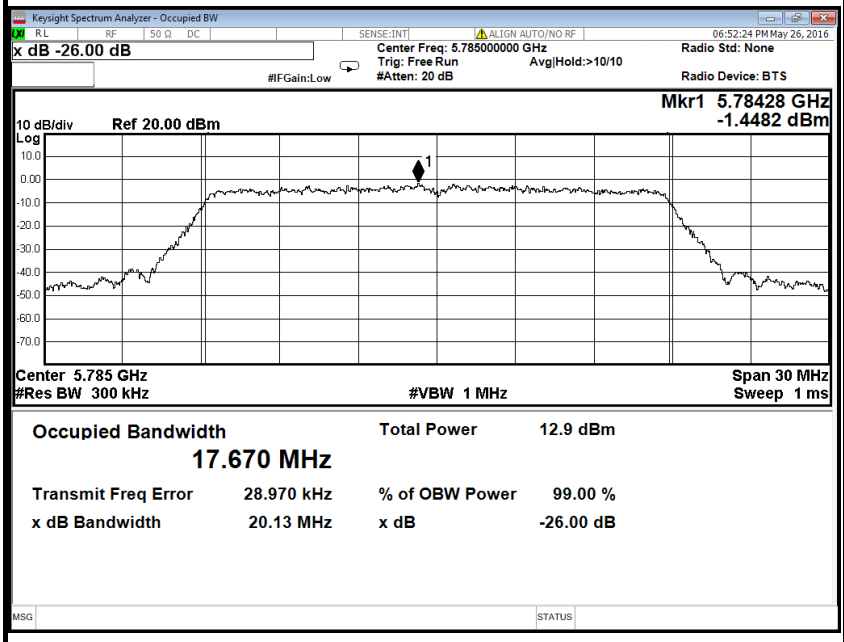
26dB Bandwidth (CH Low)

Antenna 2



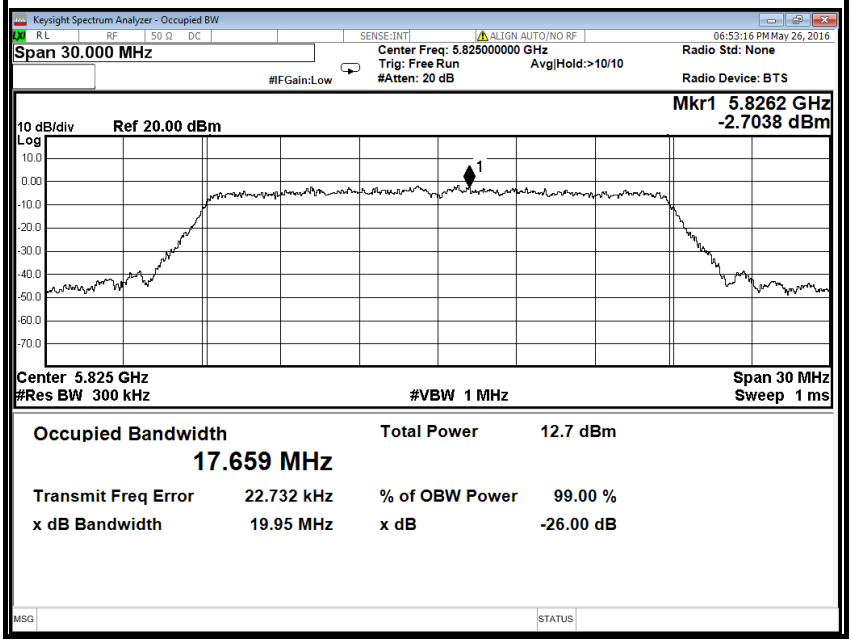
26dB Bandwidth (CH Mid)

Antenna 2



26dB Bandwidth (CH High)

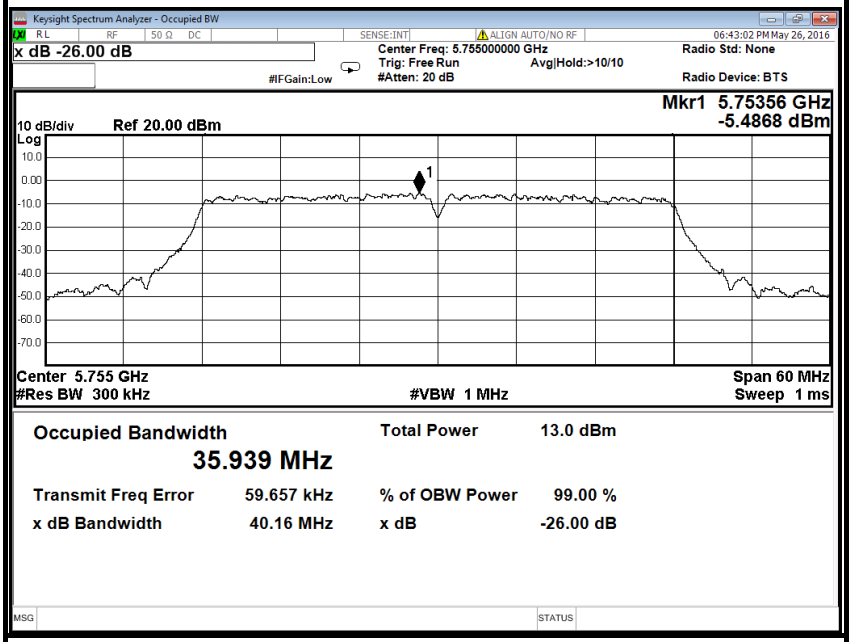
Antenna 2



IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz

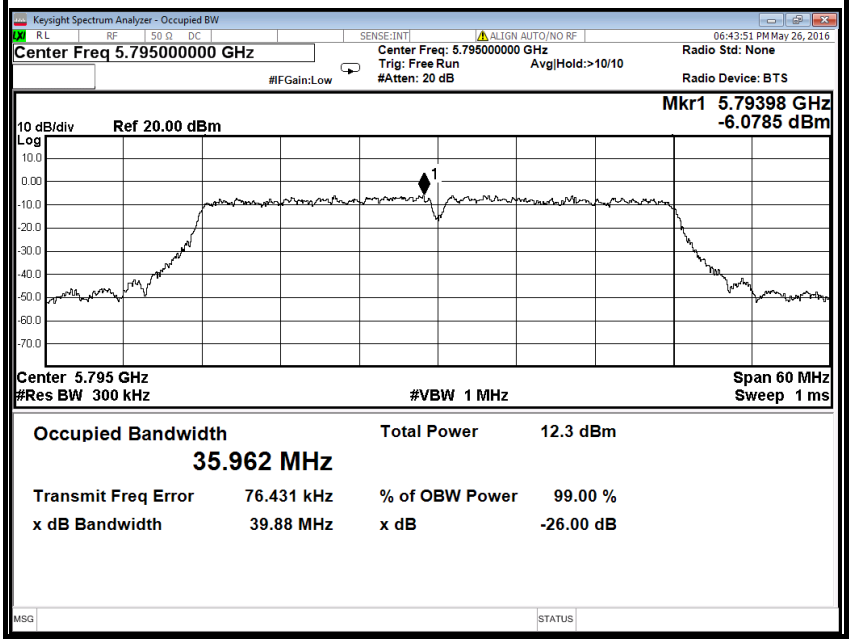
26dB Bandwidth (CH Low)

Antenna 1



26dB Bandwidth (CH High)

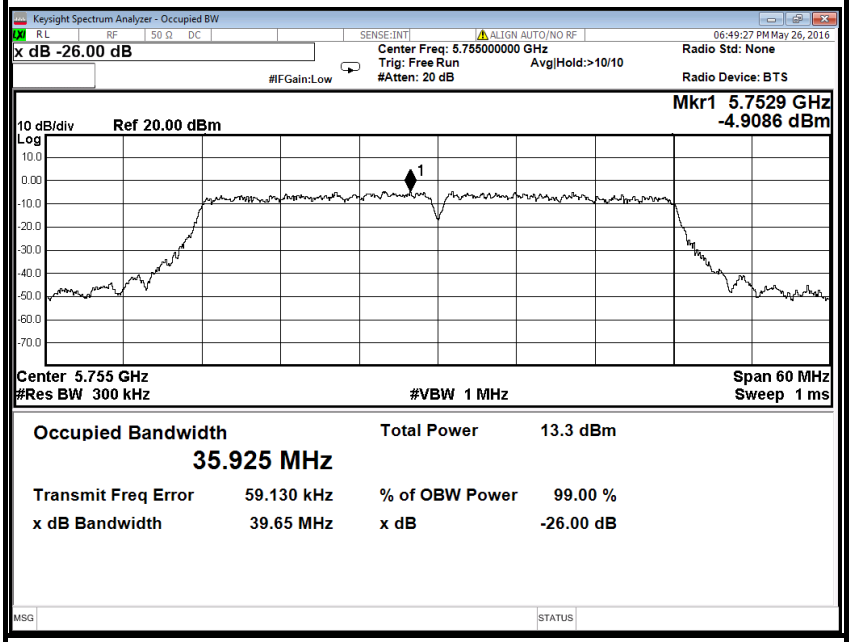
Antenna 1



IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz

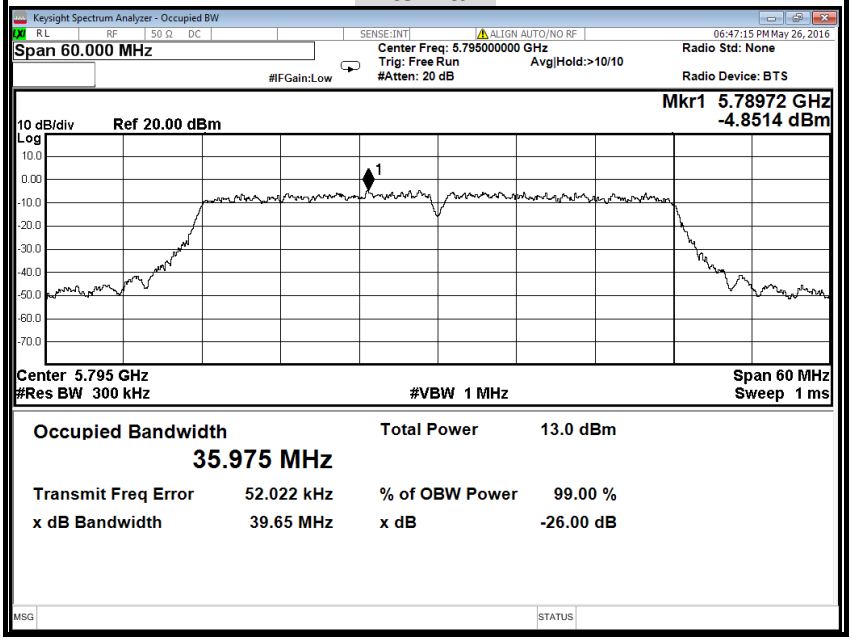
26dB Bandwidth (CH Low)

Antenna 2



26dB Bandwidth (CH High)

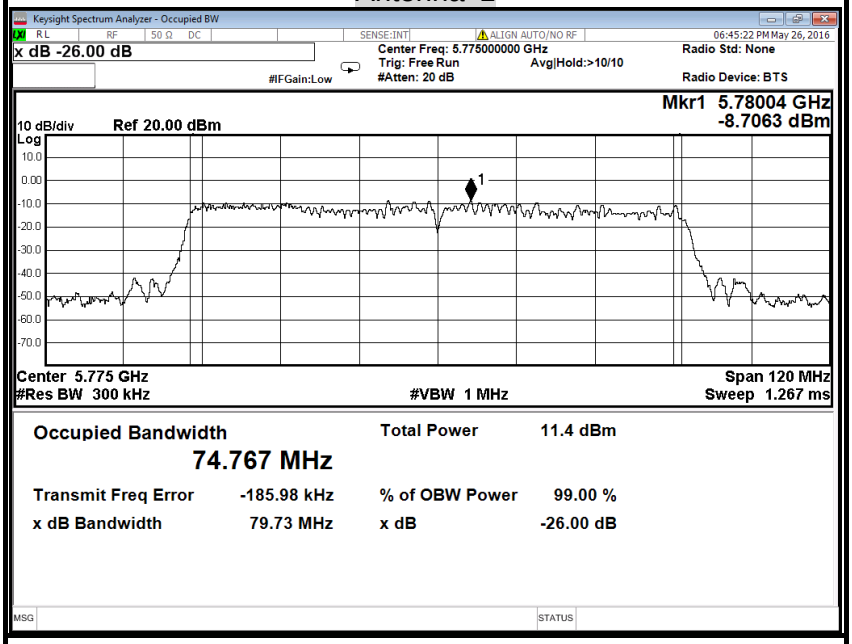
Antenna 2



IEEE 802.11ac 80 mode / 5775MHz

26dB Bandwidth

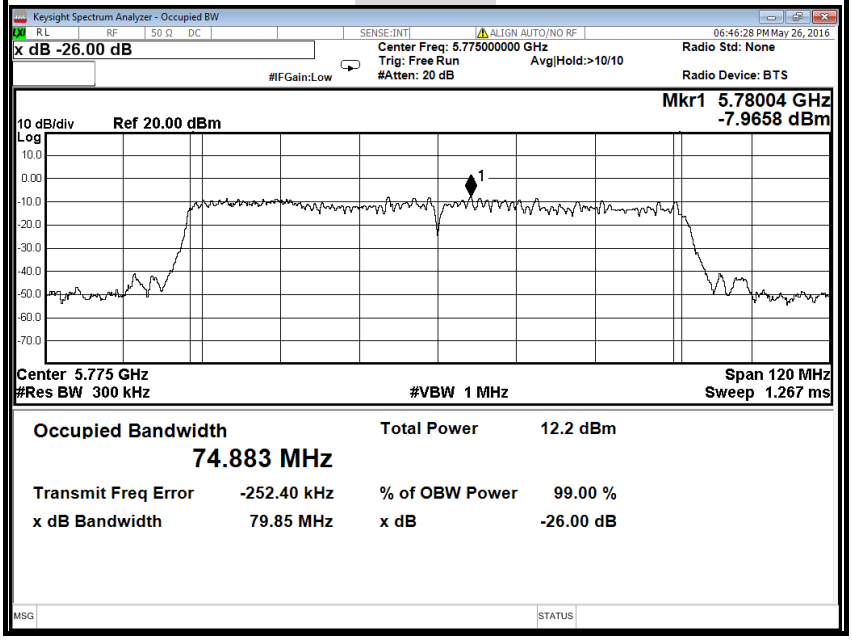
Antenna 1



IEEE 802.11ac 80 mode / 5775MHz

26dB Bandwidth

Antenna 2



6.2 6dB BANDWIDTH MEASUREMENT

6.2.1 LIMITS

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

6.2.2 TEST INSTRUMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Calibration Due
Spectrum Analyzer	Agilent	N9010A	MY52221469	02/21/2016	02/20/2017

6.2.3 TEST PROCEDURES (please refer to measurement standard)

8.1 Option 1:

a) Set RBW = 100 kHz.

b) Set the video bandwidth (VBW) ≥ 3 x RBW.

c) Detector = Peak.

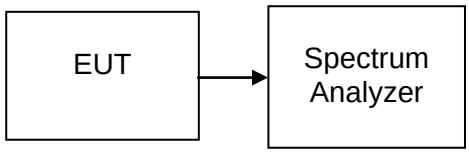
d) Trace mode = max hold.

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.

6.2.4 TEST SETUP



6.2.5 TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11a mode / 5745 ~ 5825MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)	
		Antenna 1	Antenna 2
Low	5745	16.39	16.33
Mid	5785	16.29	16.37
High	5825	16.34	16.33

Test mode: IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)	
		Antenna 1	Antenna 2
Low	5745	17.54	17.48
Mid	5785	17.60	17.52
High	5825	17.51	17.52

Test mode: IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)	
		Antenna 1	Antenna 2
Low	5755	36.13	36.15
High	5795	35.85	36.02

Test mode: IEEE 802.11ac 80 mode / 5775MHz

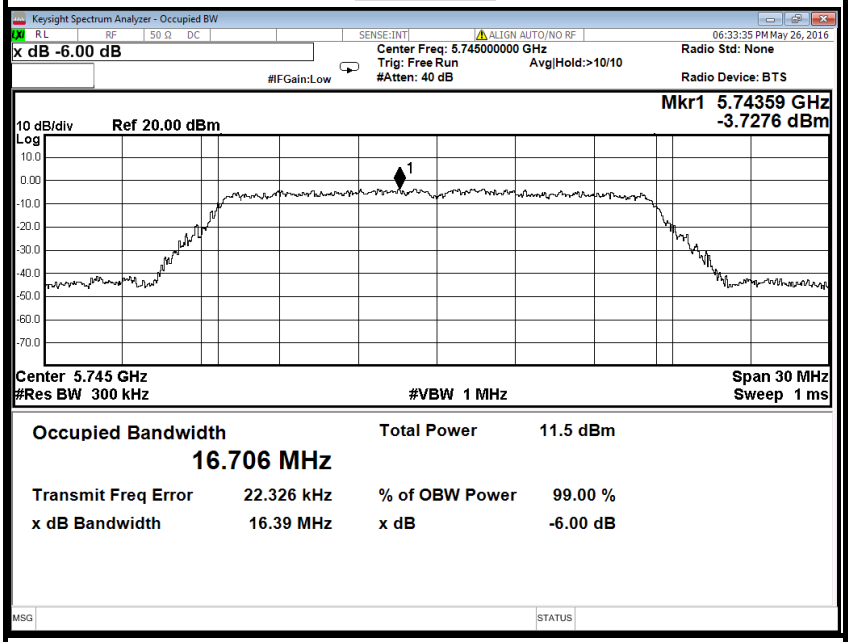
Channel	Frequency (MHz)	Bandwidth(B) (MHz)	
		Antenna 1	Antenna 2
	5775	74.69	74.33

Test Plot

IEEE 802.11a mode / 5745 ~ 5825MHz

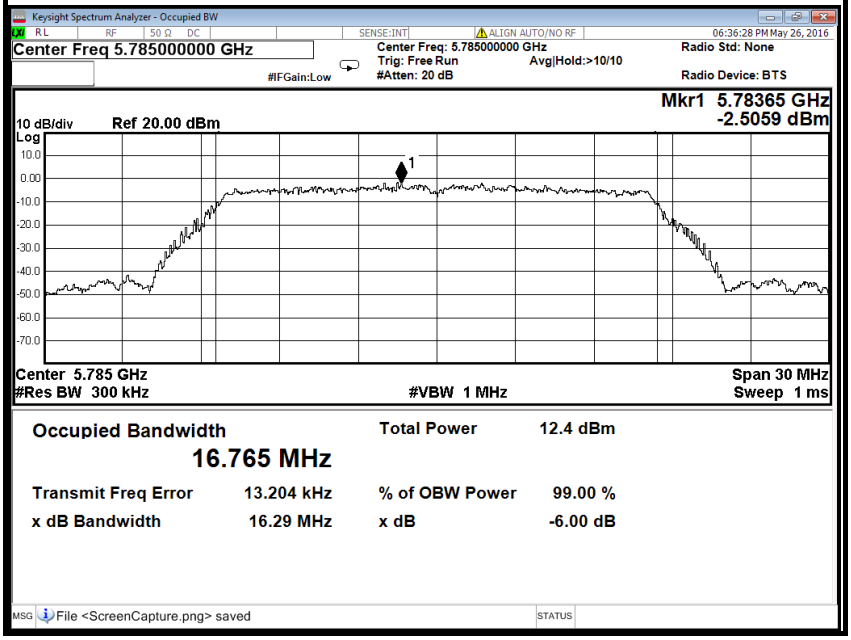
6dB Bandwidth (CH Low)

Antenna 1



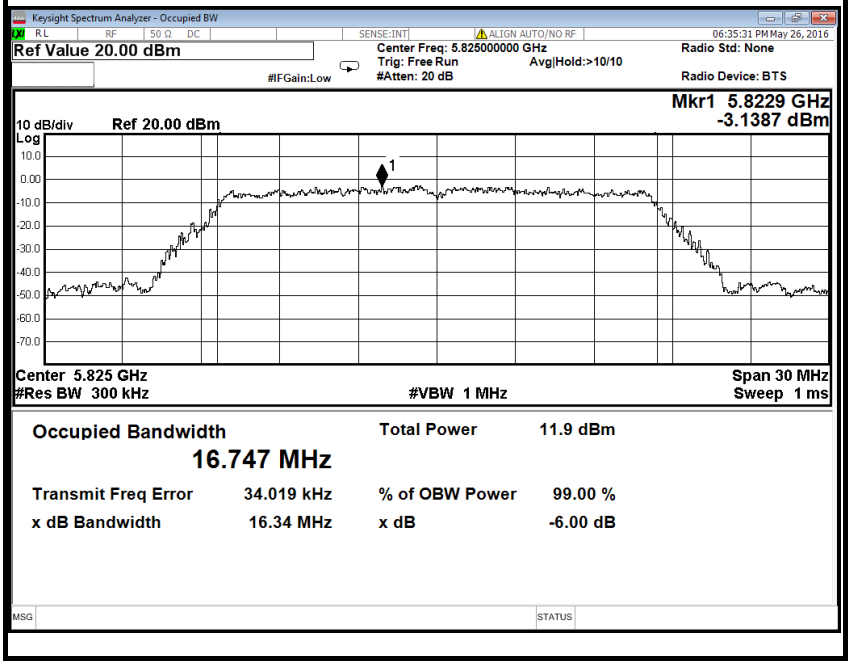
6dB Bandwidth (CH Mid)

Antenna 1



6dB Bandwidth (CH High)

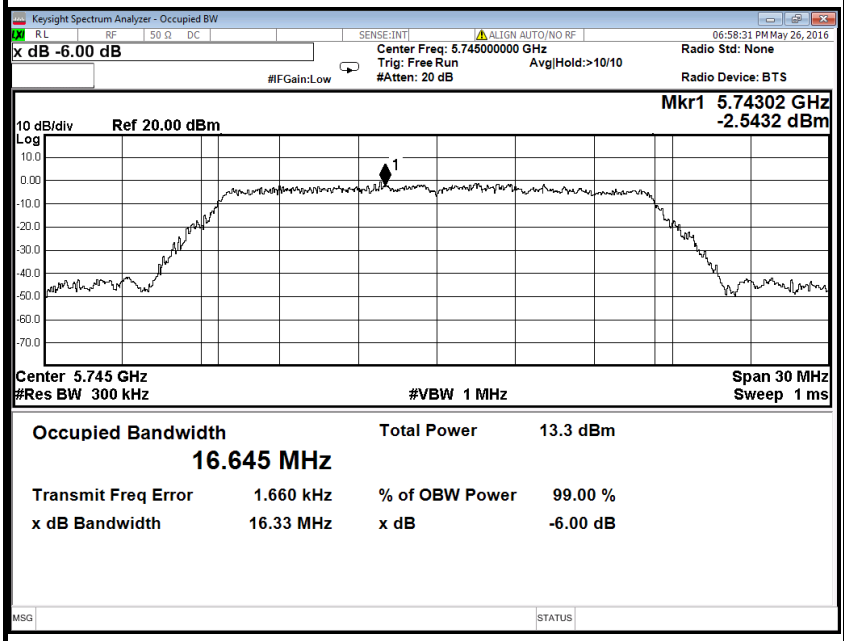
Antenna 1



IEEE 802.11a mode / 5745 ~ 5825MHz

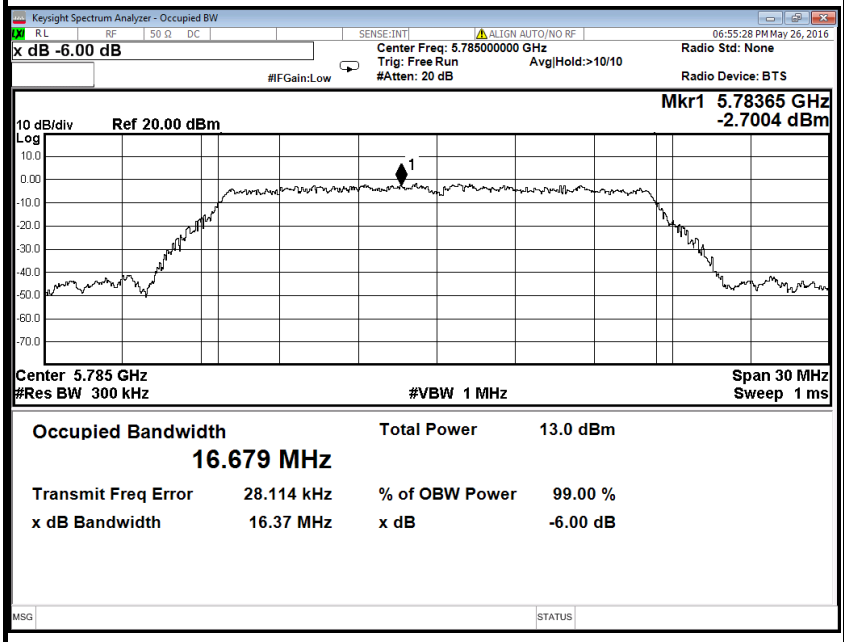
6dB Bandwidth (CH Low)

Antenna 2



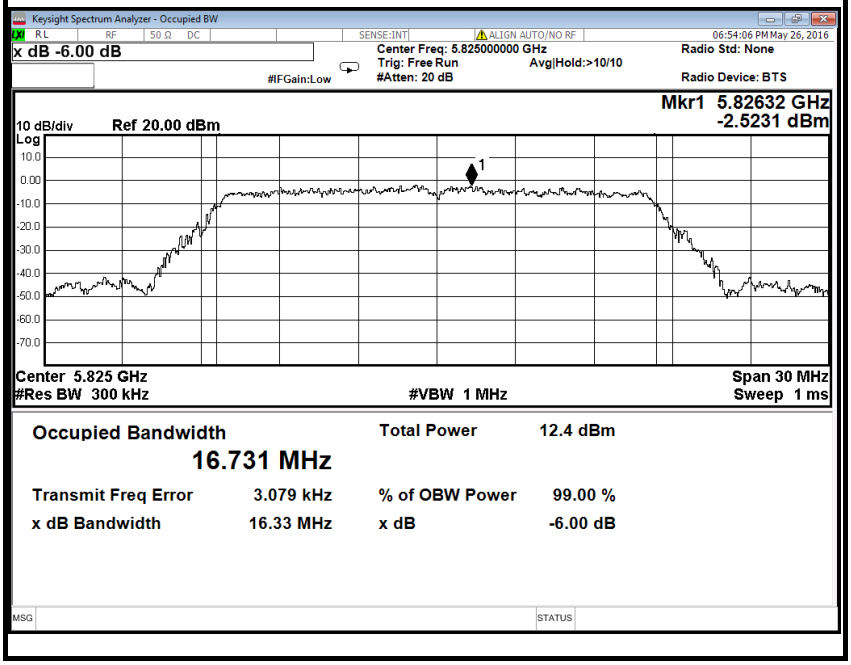
6dB Bandwidth (CH Mid)

Antenna 2



6dB Bandwidth (CH High)

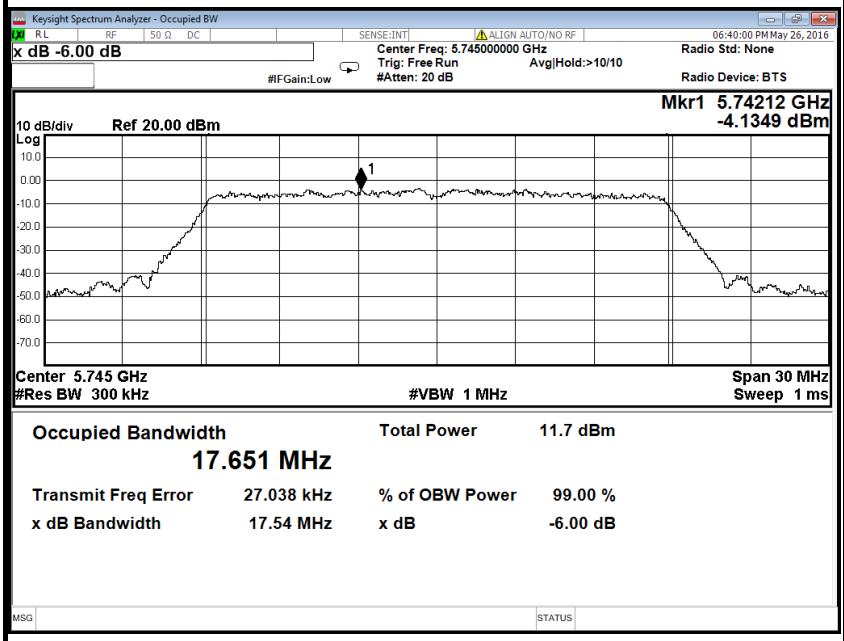
Antenna 2



IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz

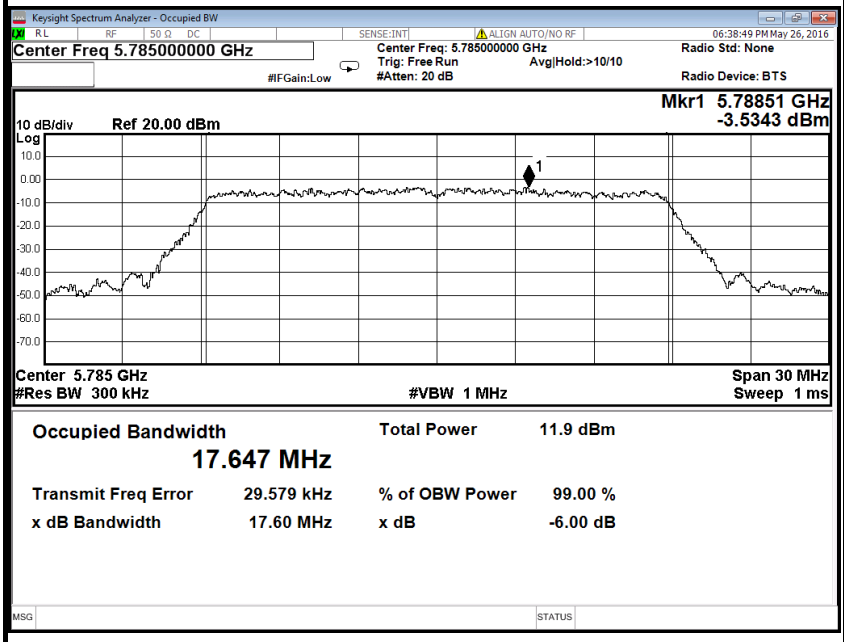
6dB Bandwidth (CH Low)

Antenna 1



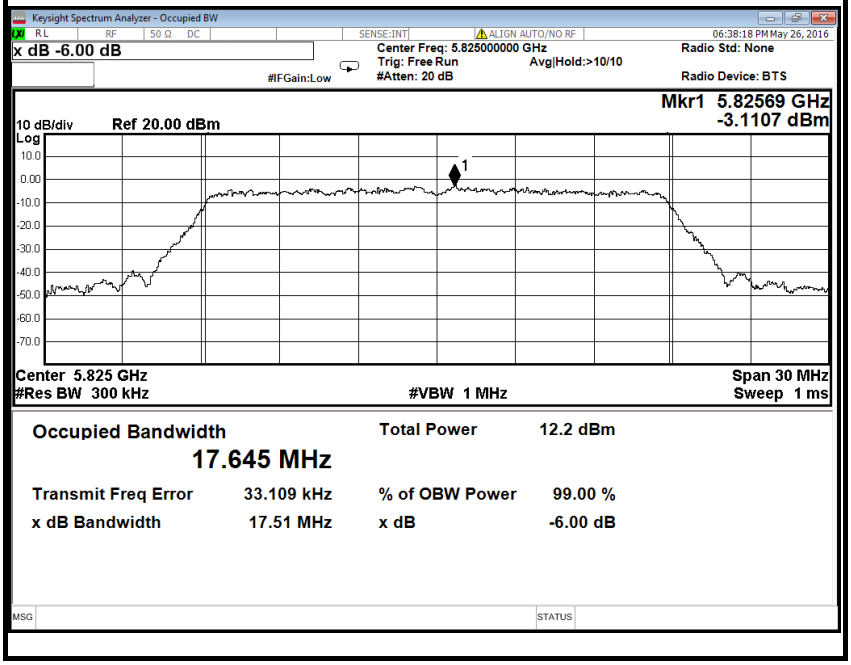
6dB Bandwidth (CH Mid)

Antenna 1



6dB Bandwidth (CH High)

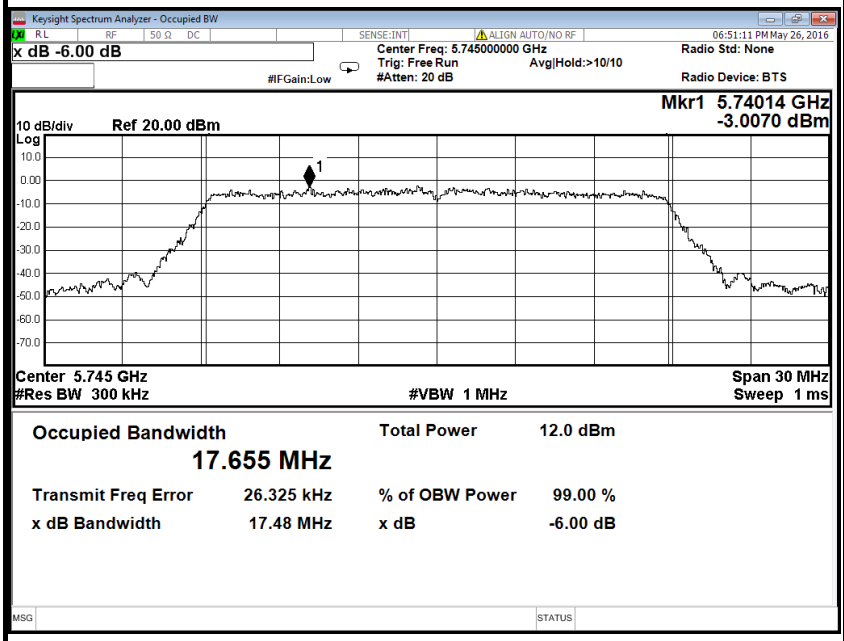
Antenna 1



IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz

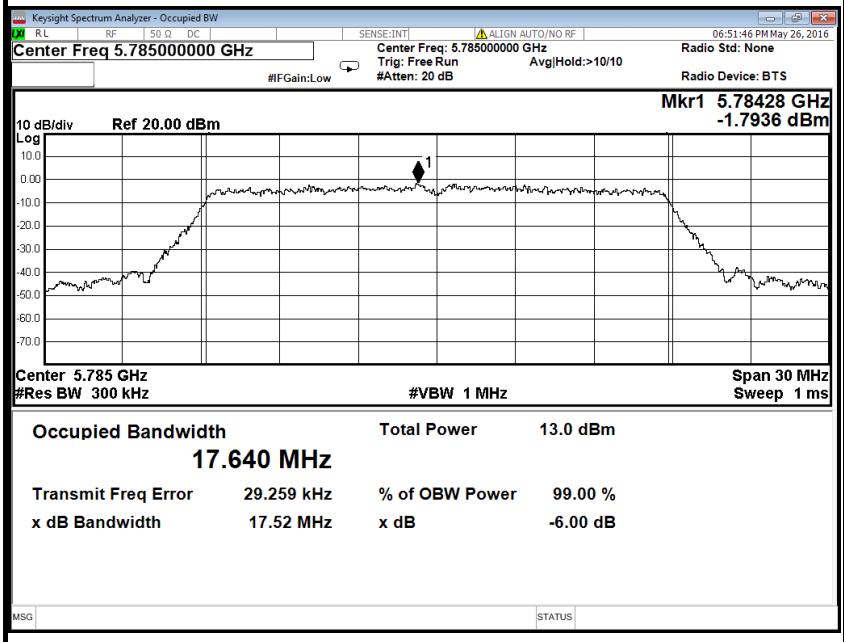
6dB Bandwidth (CH Low)

Antenna 2



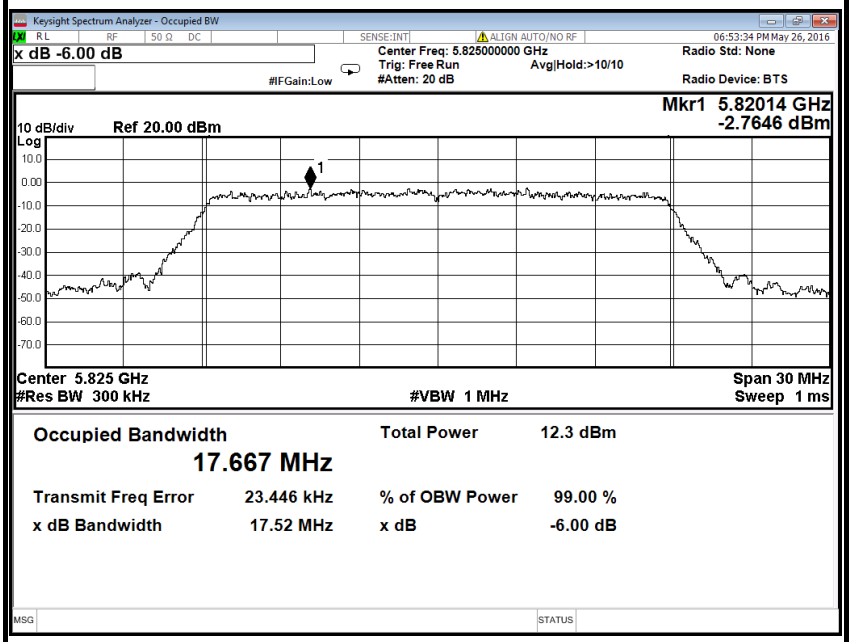
6dB Bandwidth (CH Mid)

Antenna 2



6dB Bandwidth (CH High)

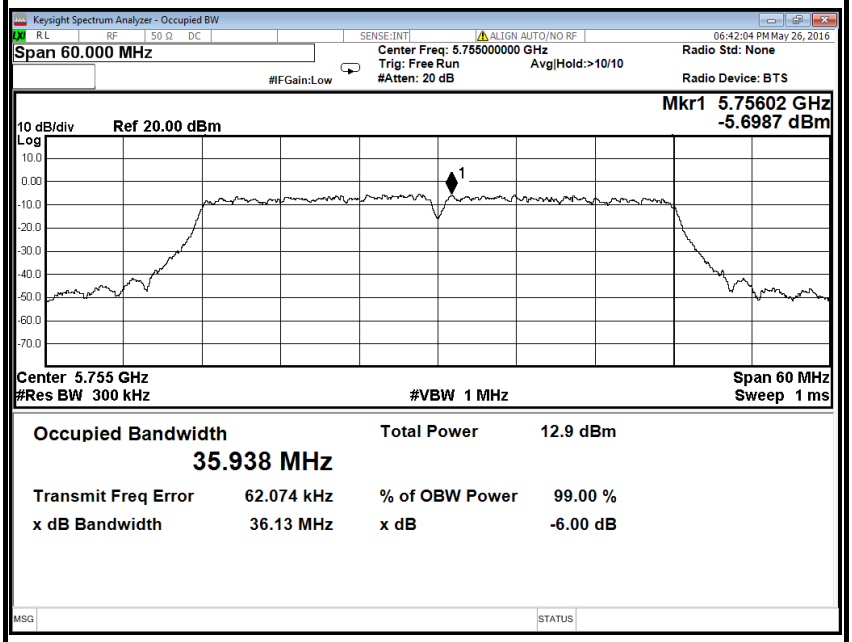
Antenna 2



IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz

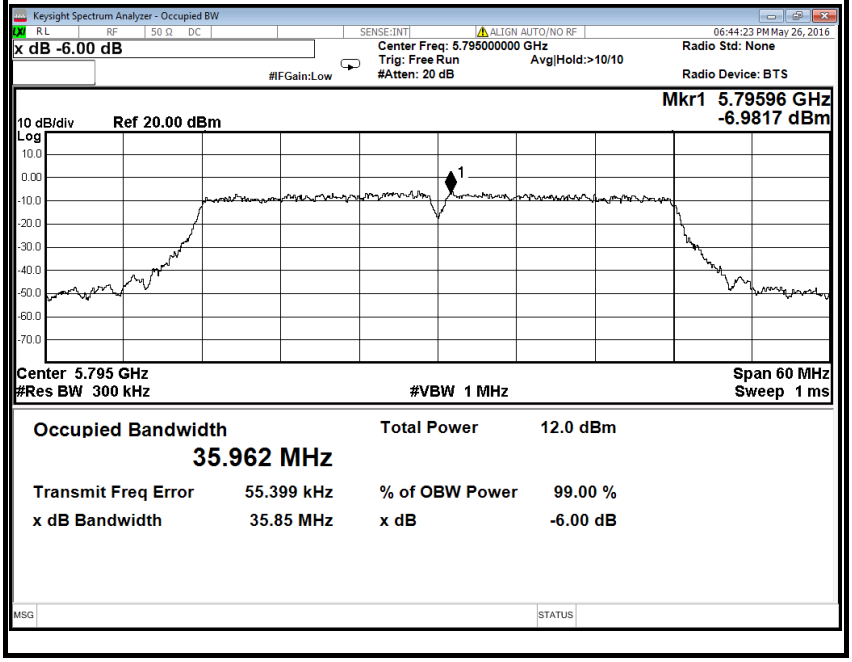
6dB Bandwidth (CH Low)

Antenna 1



6dB Bandwidth (CH High)

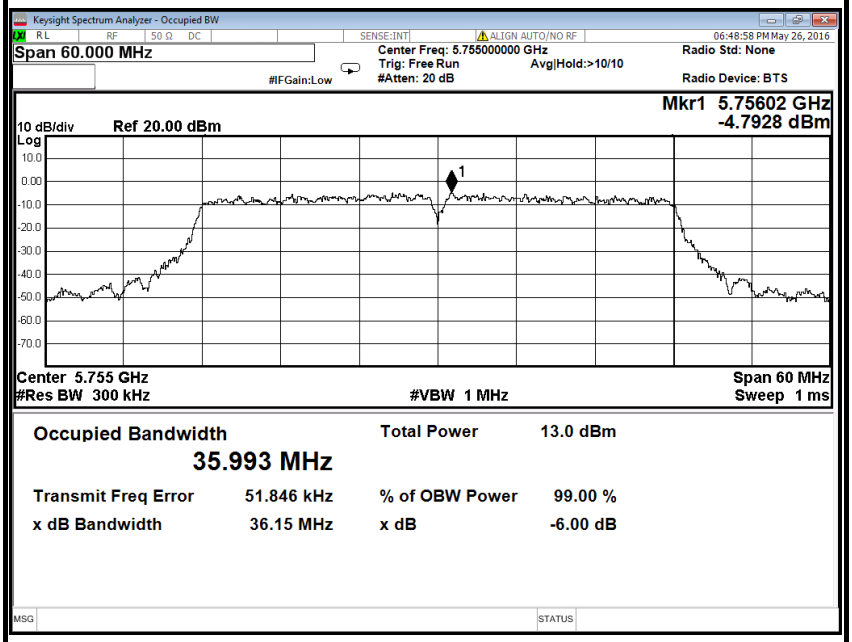
Antenna 1



IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz

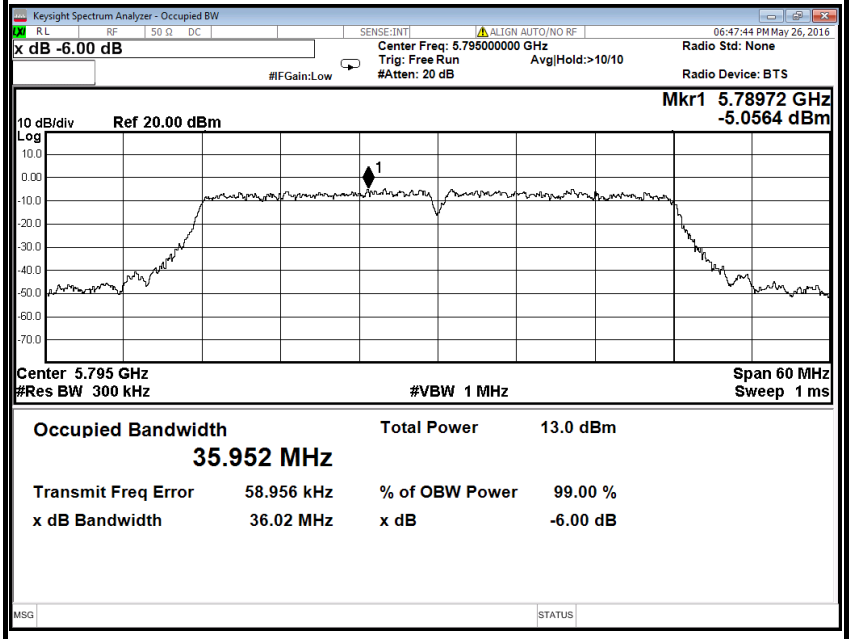
6dB Bandwidth (CH Low)

Antenna 2



6dB Bandwidth (CH High)

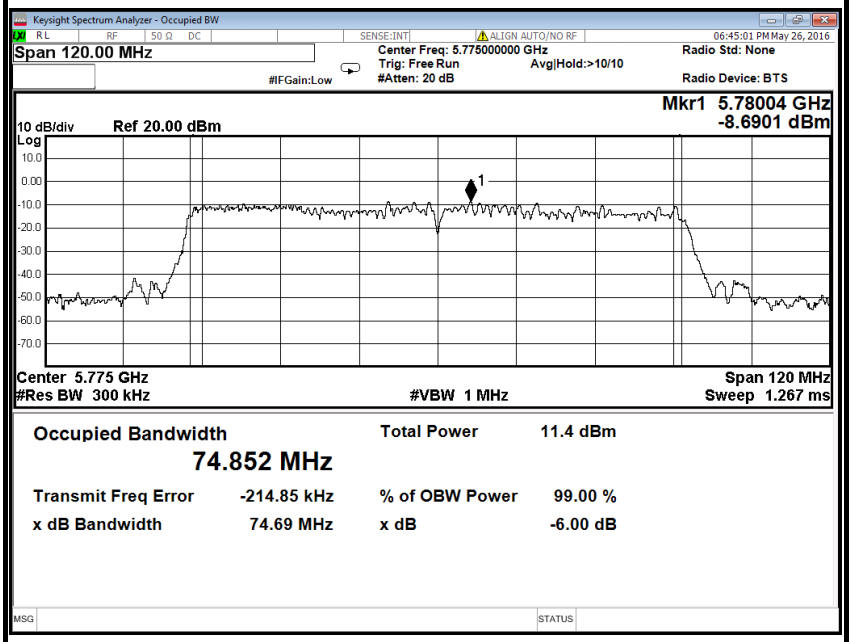
Antenna 2



IEEE 802.11ac 80 mode / 5775MHz

6dB Bandwidth

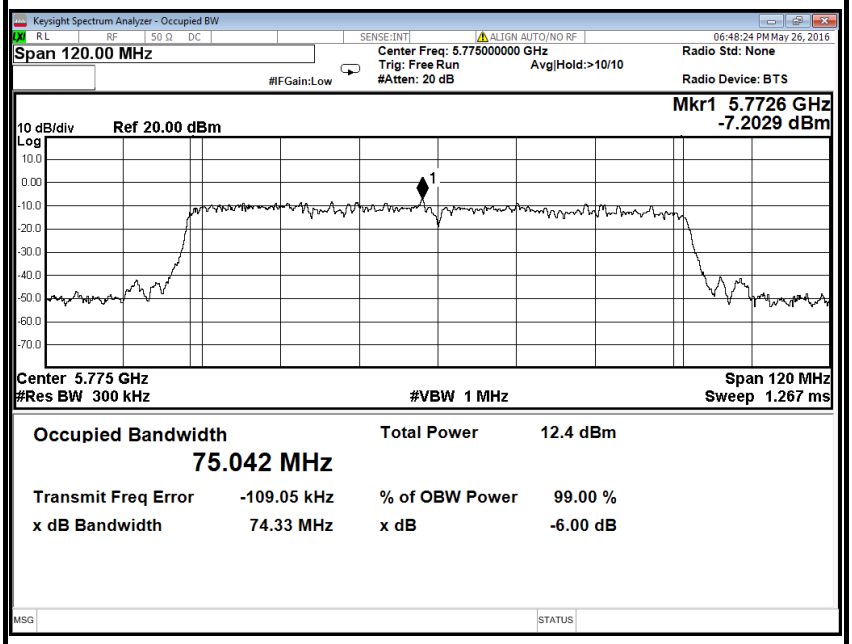
Antenna 1



IEEE 802.11ac 80 mode / 5775MHz

6dB Bandwidth

Antenna 2



6.3 ANTENNA GAIN

MEASUREMENT

The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module. For normal WLAN devices, the OFDM mode is used.

MEASUREMENT PARAMETERS

Measurement parameter	
Detector	Peak
Sweep time	Auto
Resolution bandwidth	3 MHz
Video bandwidth	3 MHz
Trace-Mode	Max hold

LIMITS

FCC	IC
Antenna Gain	
6 dBi	

TEST RESULTS

IEEE 802.11a mode (Antenna 1)

T_{nom}	V_{nom}	Lowest channel 5745MHz	Highest channel 5825MHz
Conducted power [dBm] Measured with OFDM modulation		5.02	4.37
Radiated power [dBm] Measured with OFDM modulation		8.31	8.65
Gain [dBi] Calculated		3.29	4.28
Measurement uncertainty		± 1.5 dB (cond.) / ± 3 dB (rad.)	

IEEE 802.11a mode (Antenna 2)

T_{nom}	V_{nom}	Lowest channel 5745MHz	Highest channel 5825MHz
Conducted power [dBm] Measured with OFDM modulation		3.32	1.20
Radiated power [dBm] Measured with OFDM modulation		7.65	5.83
Gain [dBi] Calculated		4.33	4.63
Measurement uncertainty		± 1.5 dB (cond.) / ± 3 dB (rad.)	

6.4 OUTPUT POWER

6.4.1 LIMIT

According to §15.407(a)& FCC R&O FCC 14 - 30,

(1) For the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10log B, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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

(3) For the band 5.725-5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W or 17 dBm + 10log B, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 17 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain up to 23 dBi without any corresponding reduction in the transmitter peak output power or peak power spectral density. For fixed, point-to-point U-NII transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in peak transmitter power and peak power spectral density for each 1 dB of antenna gain in excess of 23 dBi would be required. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

NOTE: The Commission strongly recommends that parties employing U-NII devices to provide critical communications services should determine if there are any nearby Government radar systems that could affect their operation.

Specified Limit of the Peak Power

Not applicable, since the EUT only used band IV.

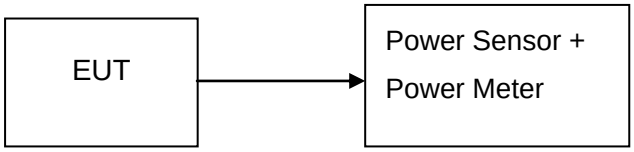
6.4.2 MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Calibration Due
Power Meter	Anritsu	ML2495A	1204003	02/21/2016	02/20/2017
Power Sensor	Anritsu	MA2411B	1126150	02/21/2016	02/20/2017

Remark: *Each piece of equipment is scheduled for calibration once a year.*

6.4.3 TEST CONFIGURATIONS

The EUT was connected to a spectrum analyzer through a 50Ω RF cable.



6.4.4 TEST PROCEDURE

Set span to encompass the entire emission bandwidth (EBW) of the signal.

Set RBW = 1 MHz / Set VBW = 3 MHz.

Use sample detector mode if bin width (i.e., span/number of points in spectrum display) < 0.5 RBW. Otherwise use peak detector mode. Use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at full control power for entire sweep of every sweep. If the device transmits continuously, with no off intervals or reduced power intervals, the trigger may be set to “free run”.·Trace average 100 traces in power averaging mode. Compute power by integrating the spectrum across the 26 dB EBW of the signal. The integration can be performed using the spectrum analyzer’s band power measurement function with band limits set equal to the EBW band edges or by summing power levels in each 1 MHz band in linear power terms. The 1 MHz band power levels to be summed can be obtained by averaging, in linear power terms, power levels in each frequency bin across the 1 MHz.

6.4.5 TEST RESULTS

No non-compliance noted

6.4.6 TEST DATA

IEEE 802.11a mode / 5745 ~ 5825MHz

Channel	Frequency (MHz)	Output Power (dBm)		Output Power (W)		Limit (dBm)	Result
		Antenna 1	Antenna 2	Antenna 1	Antenna 2		
Low	5745	17.26	15.55	0.05321	0.03589	30.00	PASS
Mid	5785	16.94	13.98	0.04943	0.02500		PASS
High	5825	16.58	13.41	0.04550	0.02193		PASS

IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz

Channel	Frequency (MHz)	Output Power (dBm)			Output Power (W)	Limit (dBm)	Result
		Antenna 1	Antenna 2	Total			
Low	5745	16.09	14.37	18.32	0.06800	30.00	PASS
Mid	5785	16.87	13.80	18.61	0.07263		PASS
High	5825	16.41	13.31	18.14	0.06518		PASS

IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHzs

Channel	Frequency (MHz)	Output Power (dBm)			Output Power (W)	Limit (dBm)	Result
		Antenna 1	Antenna 2	Total			
Low	5755	17.15	14.26	18.95	0.07855	30.00	PASS
High	5795	16.82	13.71	18.55	0.07158		PASS

IEEE 802.11ac 80 mode / 5775MHz

Channel	Frequency (MHz)	Output Power (dBm)			Output Power (W)	Limit (dBm)	Result
		Antenna 1	Antenna 2	Total			
	5775	17.20	14.37	19.02	0.07983	30.00	PASS

6.5 BAND EDGES MEASUREMENT

6.5.1LIMIT

According to §15.407(b)

(1) The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.

(2) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency block edges as the design of the equipment permits.

6.5.2MEASUREMENT EQUIPMENT USED

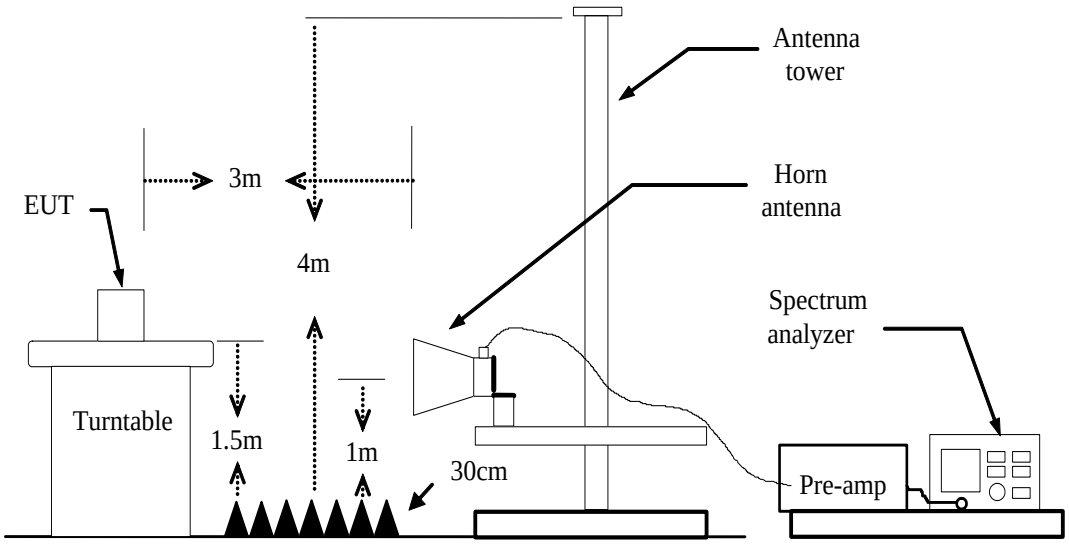
Radiated Emission Test Site 966(2)					
Name of Equipment	**Manufacturer**	**Model Number**	**Serial Number**	**Last Calibration**	**Due Calibration**
PSA Series Spectrum Analyzer	Agilent	E4446A	US44300399	02/21/2016	02/20/2017
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	02/21/2016	02/20/2017
Amplifier	EMEC	EM330	060661	03/18/2016	03/17/2017
High Noise Amplifier	Agilent	8449B	3008A01838	02/21/2016	02/20/2017
Loop Antenna	COM-POWER	AL-130	121044	09/25/2015	09/24/2016
Bilog Antenna	SCHAFFNER	CBL6143	5082	02/21/2016	02/20/2017
Horn Antenna	SCHWARZBECK	BBHA9120	D286	02/28/2016	02/27/2017
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170-497	02/28/2016	02/27/2017
Turn Table	N/A	N/A	N/A	N.C.R	N.C.R
Antenna Tower	SUNOL	TLT2	N/A	N.C.R	N.C.R
Controller	Sunol Sciences	SC104V	022310-1	N.C.R	N.C.R
Controller	CT	N/A	N/A	N.C.R	N.C.R
Temp. / Humidity Meter	Anymetre	JR913	N/A	02/21/2016	02/20/2017
Test S/W	FARAD	LZ-RF / CCS-SZ-3A2			

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The FCC Site Registration number is 101879.

3. N.C.R = No Calibration Required.

6.5.3TEST CONFIGURATION



6.5.4TEST PROCEDURE

1. The EUT is placed on a turntable, which is 1.5m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
   (a) PEAK: RBW=1 / VBW=3MHz / Sweep=AUTO
   (b) AVERAGE: RBW=1MHz / VBW=3MHz / Sweep=AUTO / Detector=RMS
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

6.5.5TEST RESULT

IEEE 802.11a mode / 5745 ~ 5825MHz

Antenna 1:

1. Operating Frequency: 5745-5825MHz
2. CH Low: 5745MHz, CH High: 5825MHz
3. 26dB bandwidth: CH Low: 20.11MHz, CH High: 19.85MHz
4. Frequency Range: 5734.945MHz, 5834.925MHz

Antenna 2:

1. Operating Frequency: 5745-5825MHz
2. CH Low: 5745MHz, CH High: 5825MHz
3. 26dB bandwidth: CH Low: 19.90MHz, CH High: 19.79MHz
4. Frequency Range: 5735.050MHz, 5834.895MHz

IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz

Antenna 1:

1. Operating Frequency: 5745-5825MHz
2. CH Low: 5745MHz, CH High: 5825MHz
3. 26dB bandwidth: CH Low: 20.23MHz, CH High: 20.13MHz
4. Frequency Range: 5734.885MHz, 5835.065MHz

Antenna 2:

1. Operating Frequency: 5745-5825MHz
2. CH Low: 5745MHz, CH High: 5825MHz
3. 26dB bandwidth: CH Low: 20.13MHz, CH High: 19.95MHz
4. Frequency Range: 5734.935MHz, 5834.975MHz

IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz

Antenna 1:

1. Operating Frequency: 5755-5795MHz
2. CH Low: 5755MHz, CH High: 5795MHz
3. 26dB bandwidth: CH Low: 40.16MHz, CH High: 39.88MHz
4. Frequency Range: 5734.920MHz, 5814.940MHz

Antenna 2:

1. Operating Frequency: 5755-5795MHz
2. CH Low: 5755MHz, CH High: 5795MHz
3. 26dB bandwidth: CH Low: 39.65MHz, CH High: 39.65MHz
4. Frequency Range: 5735.175MHz, 5814.825MHz

IEEE 802.11ac 80 mode / 5755 ~ 5795MHz

Antenna 1:

1. Operating Frequency: 5775MHz
2. CH: 5775MHz
3. 26dB bandwidth: CH: 79.73MHz
4. Frequency Range: 5735.135MHz, 5814.865MHz

Antenna 2:

1. Operating Frequency: 5775MHz
2. CH: 5775MHz
3. 26dB bandwidth: CH: 79.85MHz
4. Frequency Range: 5735.075MHz, 5184.925MHz

Because the mentioned conditions, the test is not applicable.

6.6 PEAK POWER SPECTAL DENSITY

6.6.1 LIMIT

According to §15.407(a) & FCC R&O FCC 14-30

(1) For the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10log B, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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

(3) For the band 5.725-5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W or 17 dBm + 10log B, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 17 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain up to 23 dBi without any corresponding reduction in the transmitter peak output power or peak power spectral density. For fixed, point-to-point U-NII transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in peak transmitter power and peak power spectral density for each 1 dB of antenna gain in excess of 23 dBi would be required. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

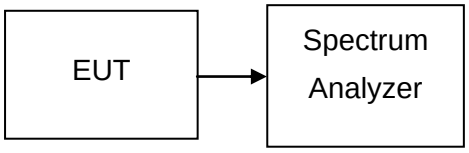
NOTE: The Commission strongly recommends that parties employing U-NII devices to provide critical communications services should determine if there are any nearby Government radar systems that could affect their operation.

6.6.2 MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	N9010A	MY52221469	02/21/2016	02/20/2017

Remark: *Each piece of equipment is scheduled for calibration once a year.*

6.6.3 TEST CONFIGURATION



6.6.4 TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
   Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. For devices operating in the bands 5.15-5.25 GHz,Set the spectrum analyzer as RBW = 1MHz, VBW = 3MHz, Span = 30MHz, Sweep=1.2ms
3. For devices operating in the bands 5.725-5.85 GHz,Set the spectrum analyzer as RBW = 500kHz, VBW = 1.5MHz, Span = 30MHz, Sweep=1.2ms
4. Record the max. reading.
5. Repeat the above procedure until the measurements for all frequencies are completed

6.6.5 TEST RESULTS

Test Data

IEEE 802.11a mode / 5745 ~ 5825MHz

Channel	Frequency (MHz)	PPSD (dBm)		factor	Limit (dBm)	Margain		Result
		Antenna 1	Antenna 2			Antenna 1	Antenna 2	
Low	5745	3.356	3.227	-3.01	30	-29.654	-29.783	PASS
Mid	5785	2.358	3.269	-3.01		-30.652	-29.741	PASS
High	5825	2.590	2.626	-3.01		-30.420	-27.374	PASS

Test mode: IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz

Channel	Frequency (MHz)	PPSD (dBm)		factor	Total (dBm)	Limit (dBm)	Margain	Result
		Antenna 1	Antenna 2					
Low	5745	1.852	1.159	-3.01	1.520	30	-28.480	PASS
Mid	5785	3.000	2.599	-3.01	2.804		-27.196	PASS
High	5825	2.232	1.858	-3.01	2.049		-27.951	PASS

IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz

Channel	Frequency (MHz)	PPSD (dBm)		factor	Total (dBm)	Limit (dBm)	Margain	Result
		Antenna 1	Antenna 2					
Low	5755	0.310	-1.134	-3.01	-0.352	30	-30.352	PASS
High	5795	-0.521	0.256	-3.01	-0.115		-30.115	PASS

IEEE 802.11ac 80 mode / 5775MHz

Channel	Frequency (MHz)	PPSD (dBm)		factor	Total (dBm)	Limit (dBm)	Margain	Result
		Antenna 1	Antenna 2					
	5775	-1.193	-1.196	-3.01	-1.194	30	-31.194	PASS

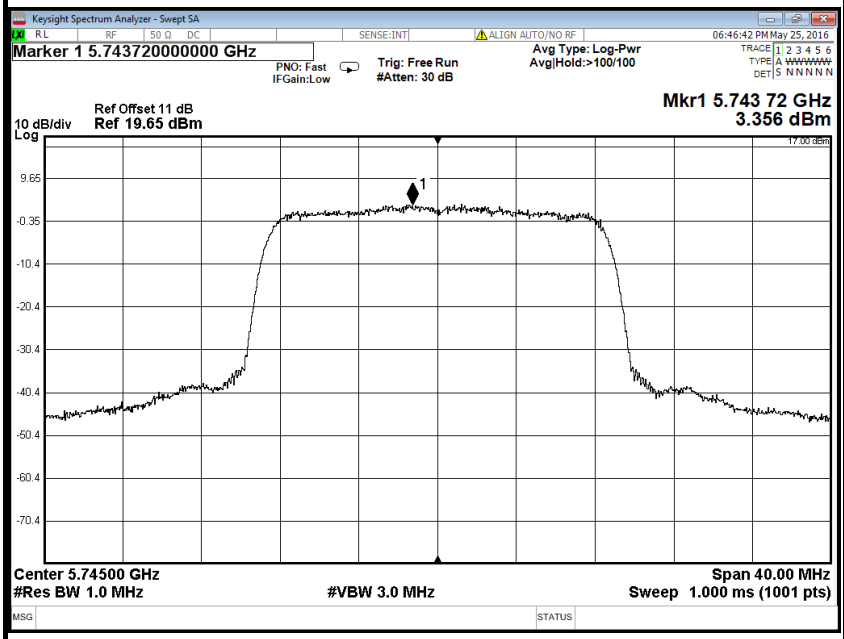
Remark: factor =10*log10(500/RBW)

Test Plot

IEEE 802.11a mode / 5745 ~ 5825MHz

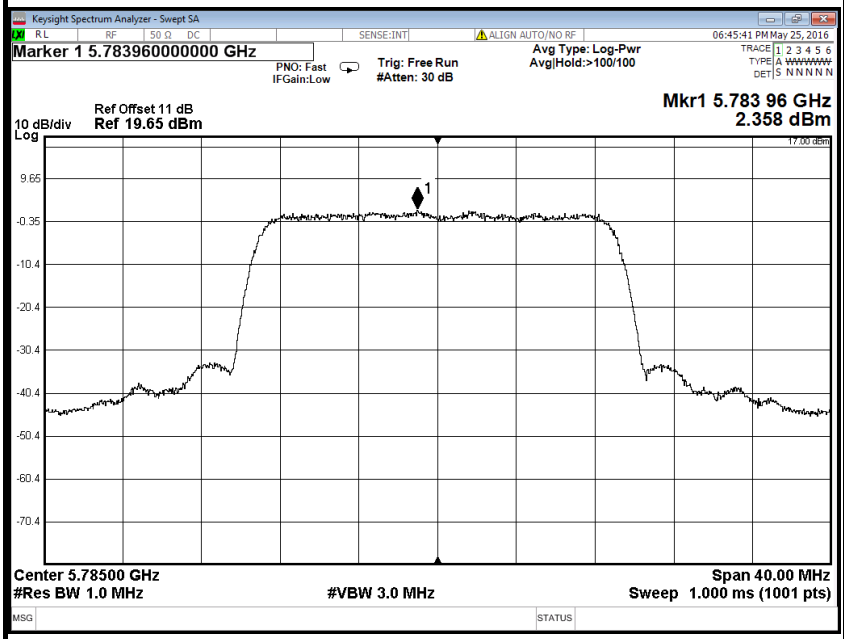
PPSD (CH Low)

Antenna 1



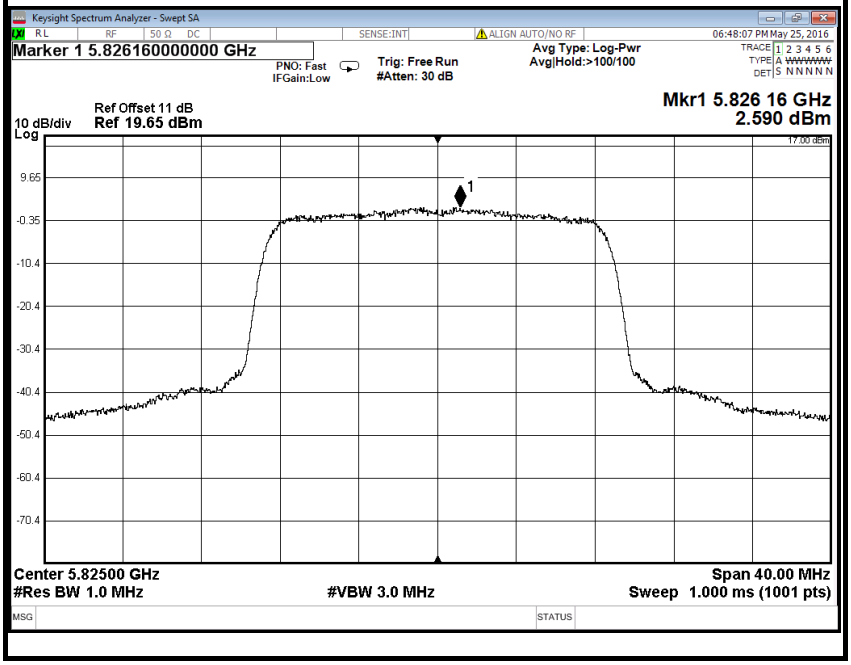
PPSD (CH Mid)

Antenna 1



PPSD (CH High)

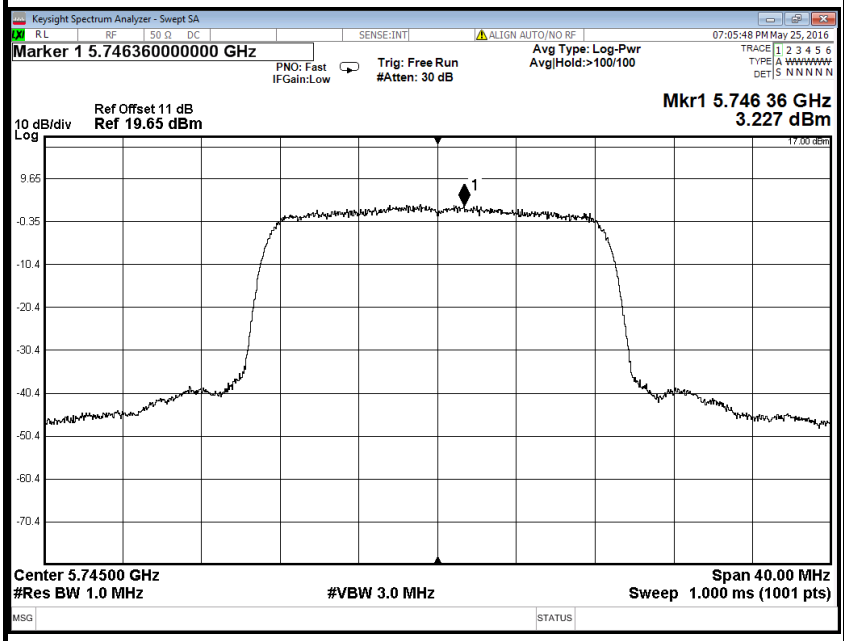
Antenna 1



IEEE 802.11a mode / 5745 ~ 5825MHz

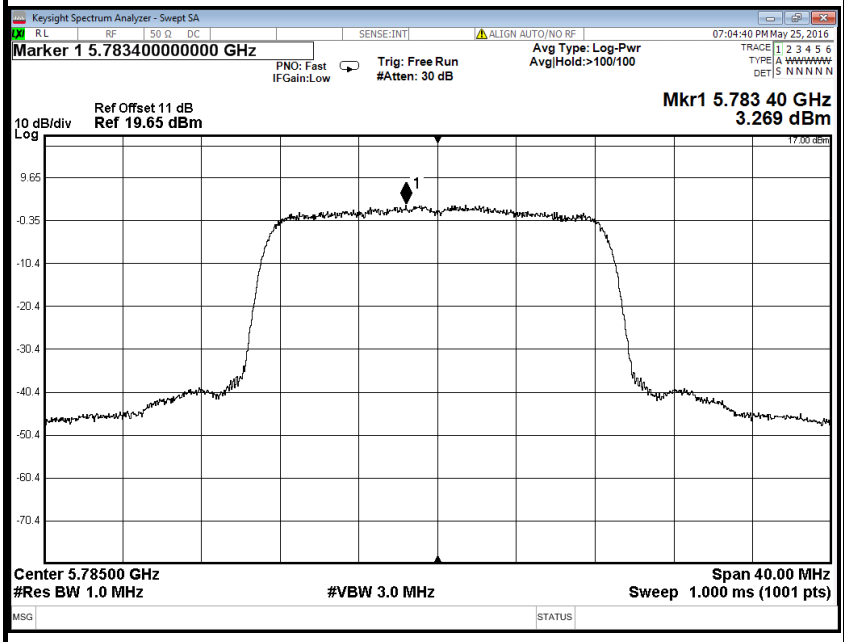
PPSD (CH Low)

Antenna 2



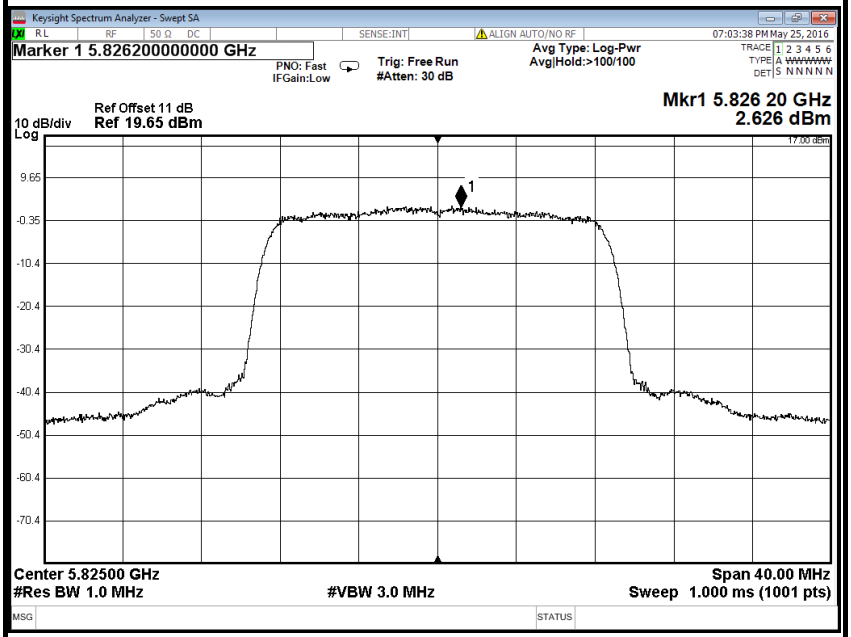
PPSD (CH Mid)

Antenna 2



PPSD (CH High)

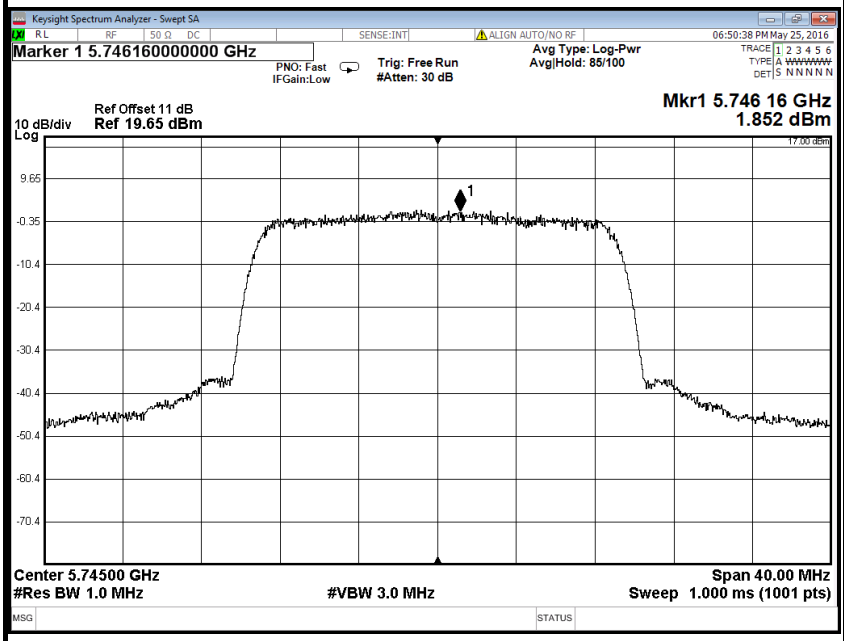
Antenna 2



IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz

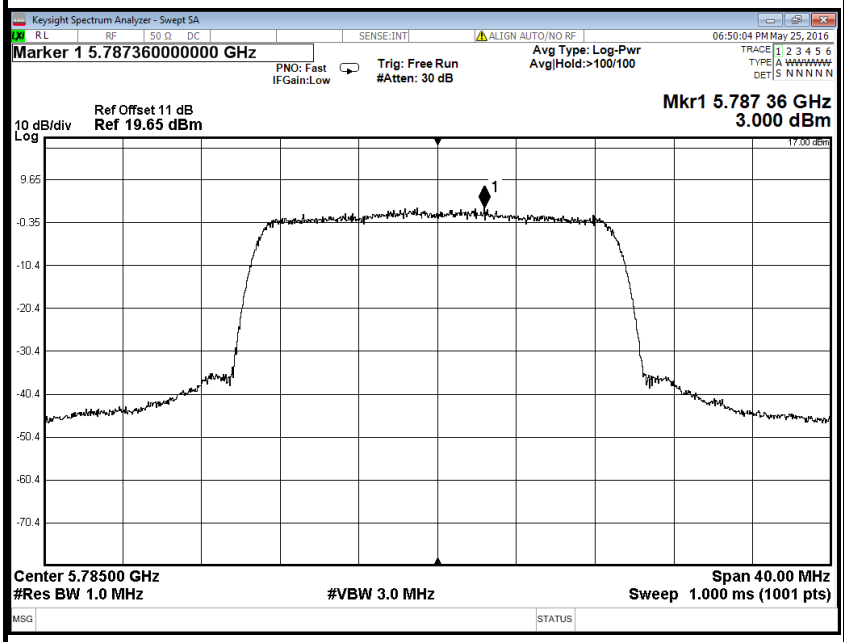
PPSD (CH Low)

Antenna 1



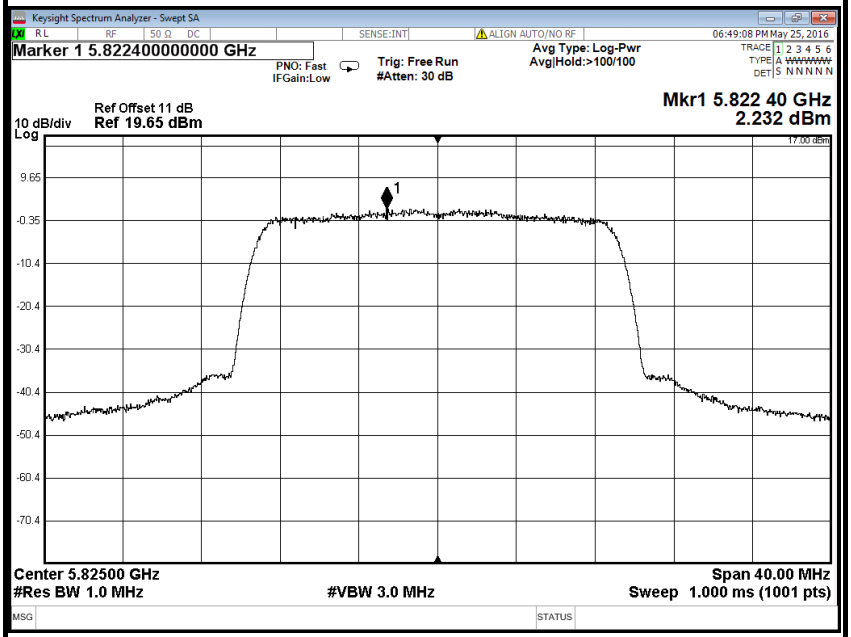
PPSD (CH Mid)

Antenna 1



PPSD (CH High)

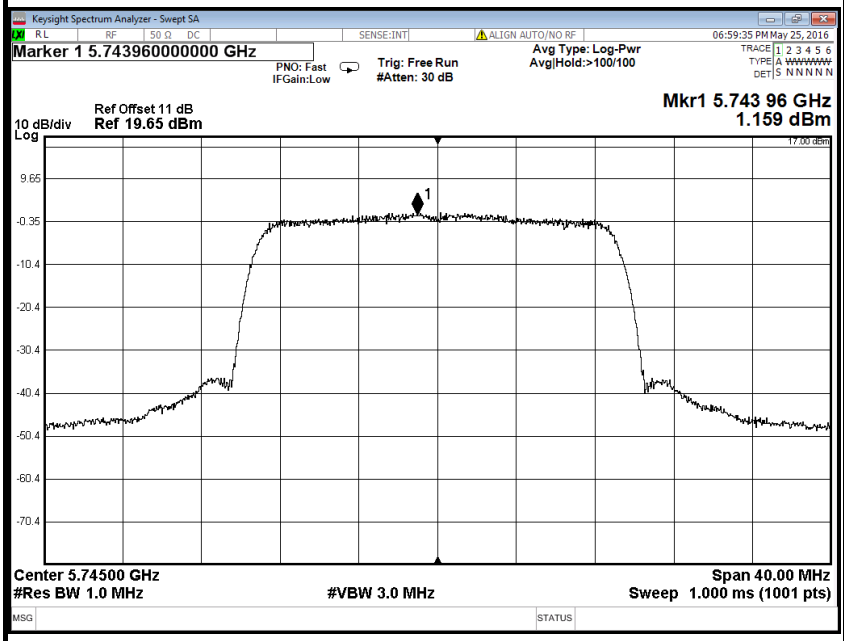
Antenna 1



IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz

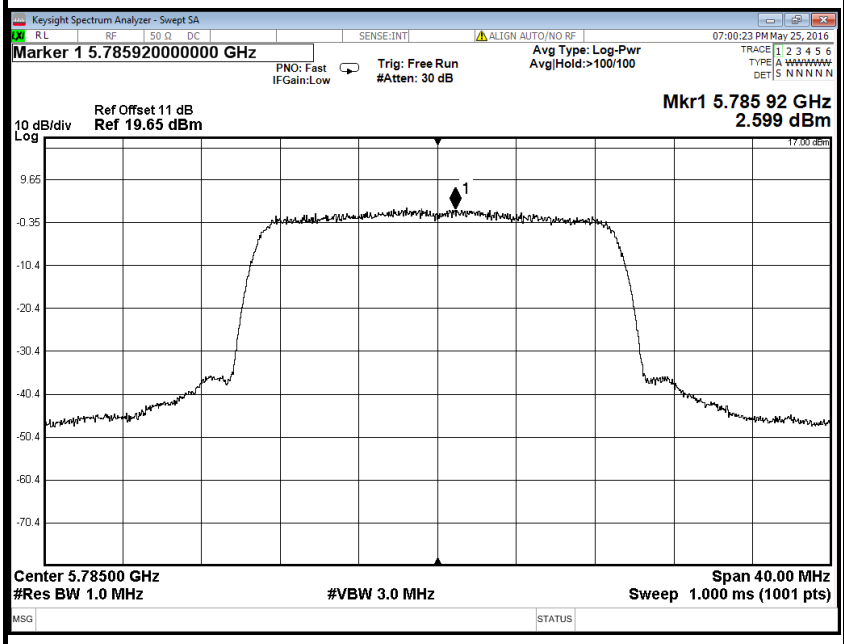
PPSD (CH Low)

Antenna 2



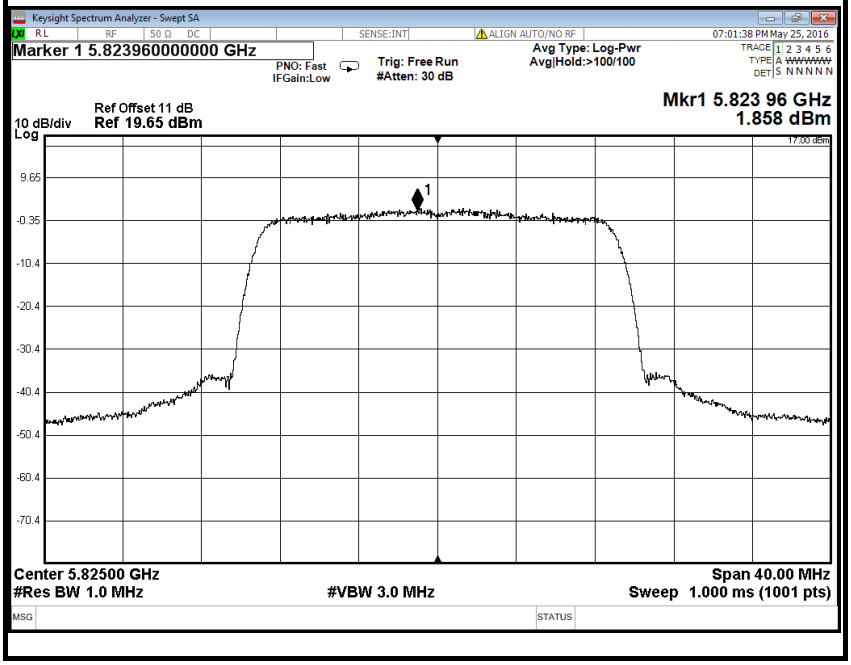
PPSD (CH Mid)

Antenna 2



PPSD (CH High)

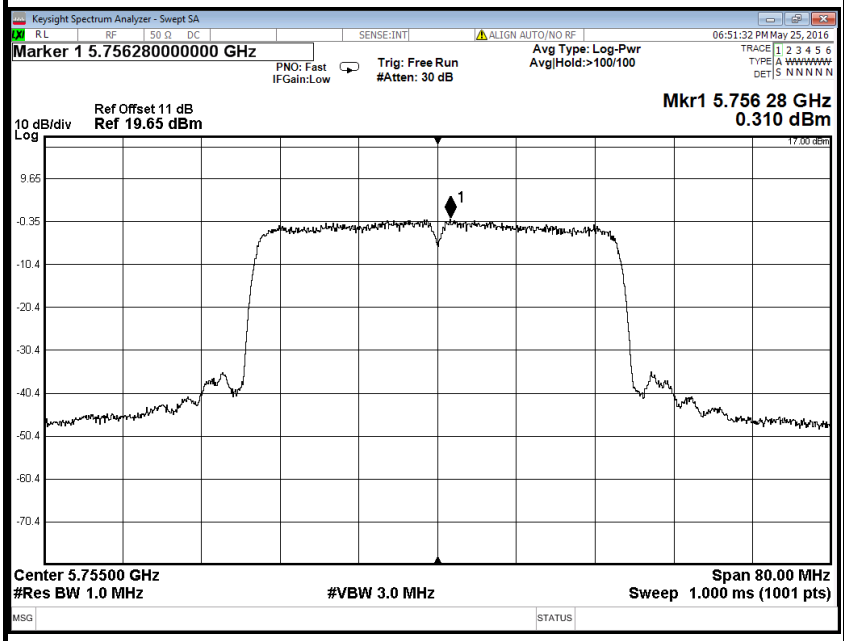
Antenna 2



IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz

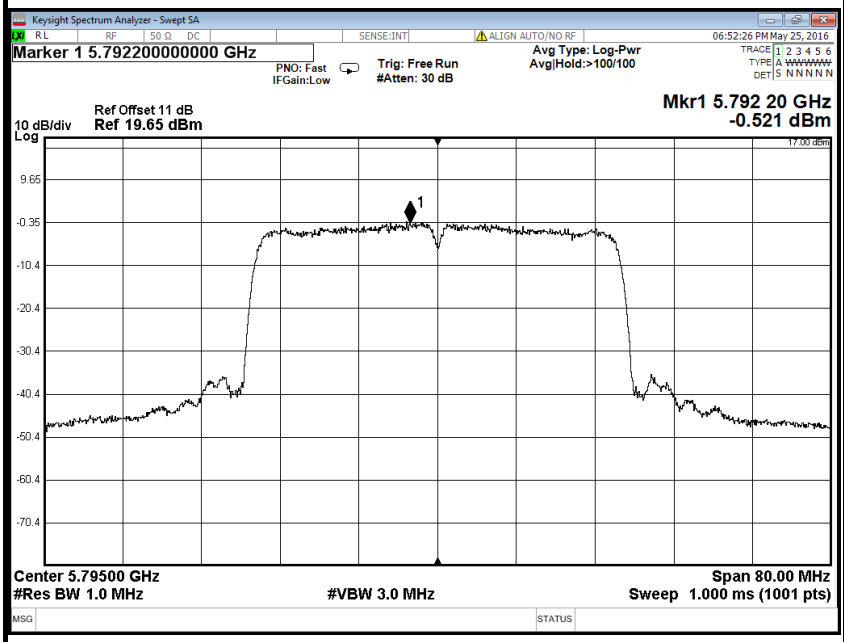
PPSD (CH Low)

Antenna 1



PPSD (CH High)

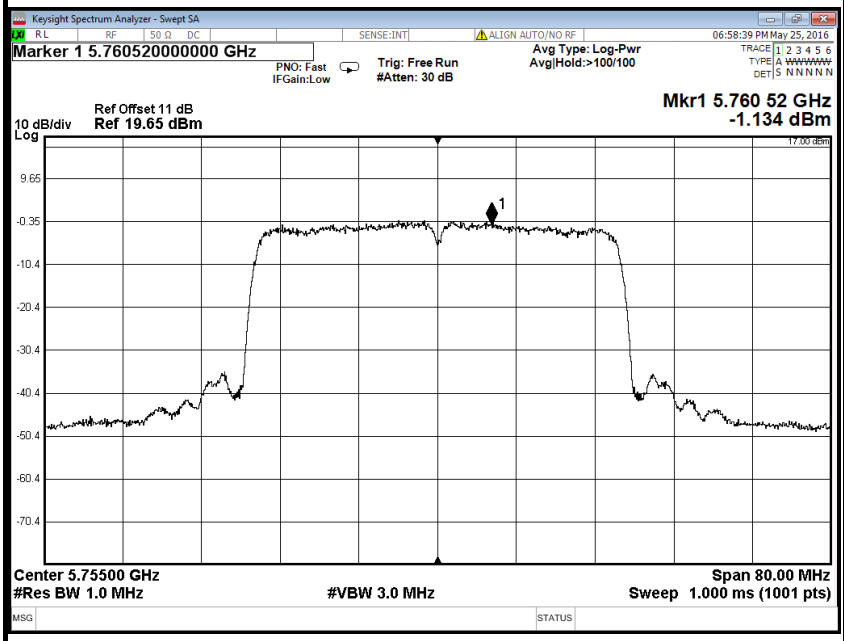
Antenna 1



IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz

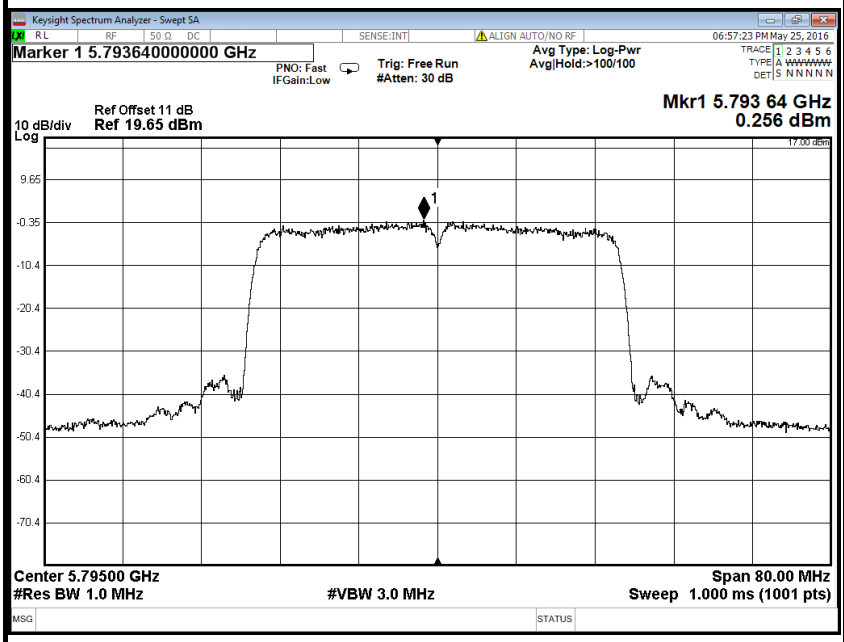
PPSD (CH Low)

Antenna 2



26dB Bandwidth (CH High)

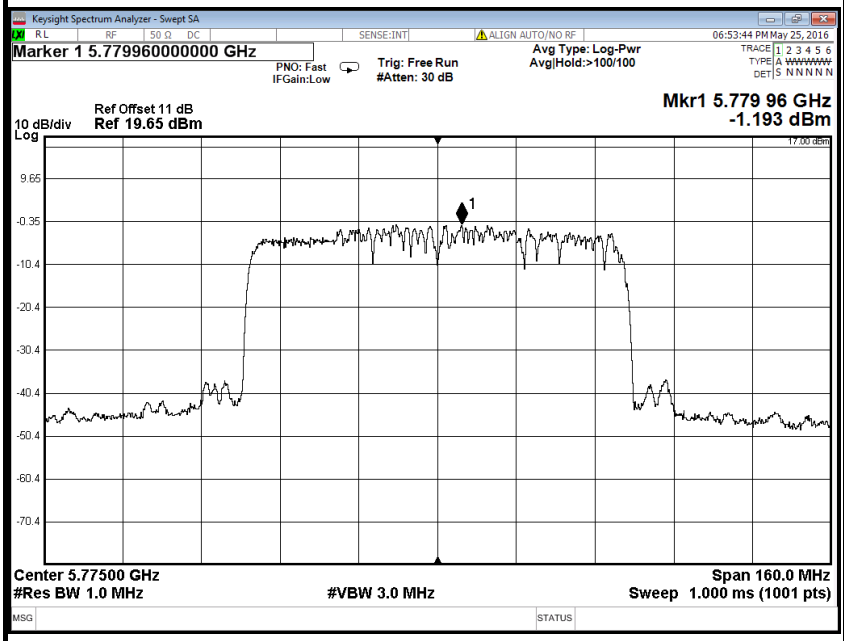
Antenna 2



IEEE 802.11ac 80 mode / 5775MHz

PPSD

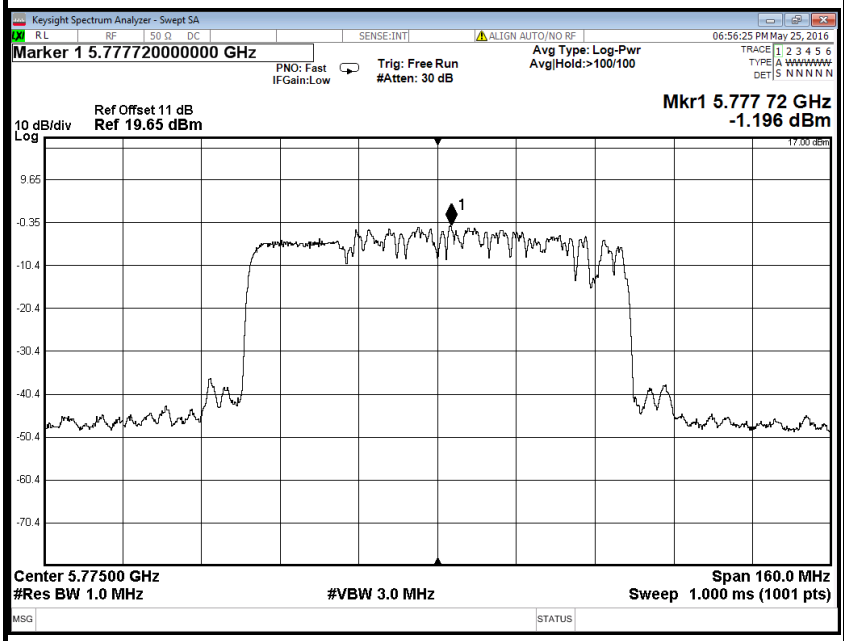
Antenna 1



IEEE 802.11ac 80 mode / 5775MHz

PPSD

Antenna 2



6.7 RADIATED UNDESIABLE EMISSION

6.7.1 LIMIT

1. According to §15.209(a), except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

Remark: *Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.*

2. In the emission table above, the tighter limit applies at the band edges.

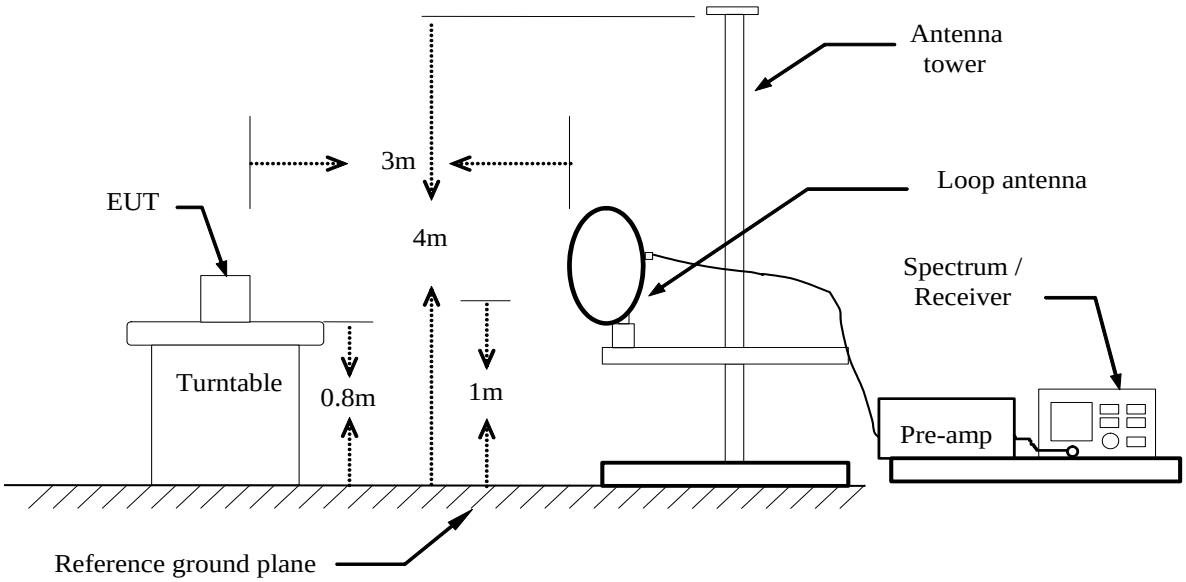
Frequency (MHz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

6.7.2 TEST INSTRUMENTS

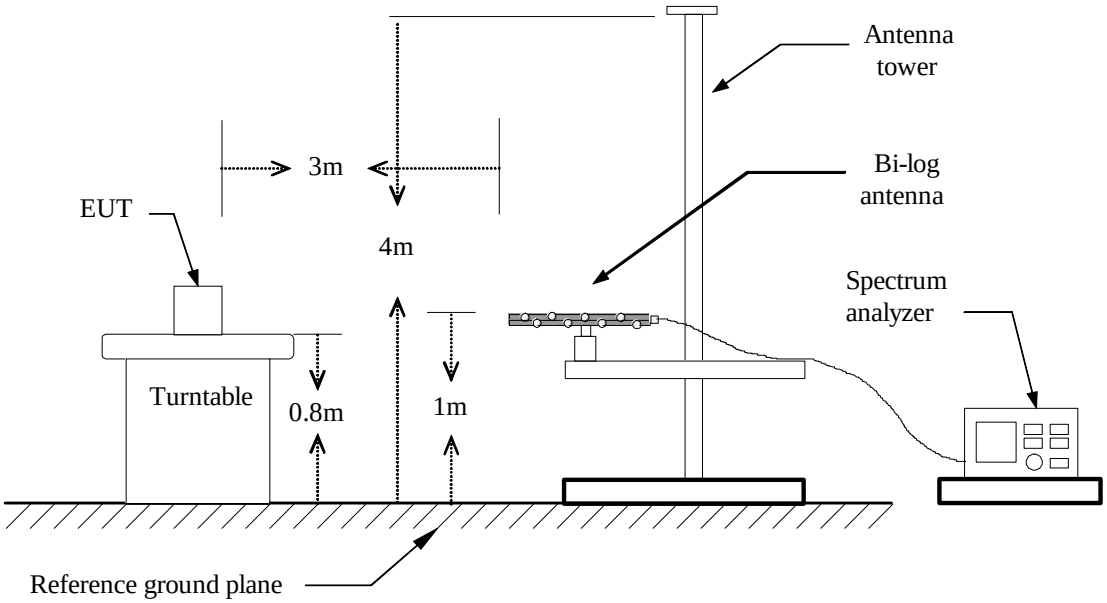
Radiated Emission Test Site 966(2)					
Name of Equipment	**Manufacturer**	**Model Number**	**Serial Number**	**Last Calibration**	**Due Calibration**
PSA Series Spectrum Analyzer	Agilent	E4446A	US44300399	02/21/2016	02/20/2017
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	02/21/2016	02/20/2017
Amplifier	EMEC	EM330	060661	03/18/2016	03/17/2017
High Noise Amplifier	Agilent	8449B	3008A01838	02/21/2016	02/20/2017
Loop Antenna	COM-POWER	AL-130	121044	09/25/2015	09/24/2016
Bilog Antenna	SCHAFFNER	CBL6143	5082	02/21/2016	02/20/2017
Horn Antenna	SCHWARZBECK	BBHA9120	D286	02/28/2016	02/27/2017
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170-497	02/28/2016	02/27/2017
Turn Table	N/A	N/A	N/A	N.C.R	N.C.R
Antenna Tower	SUNOL	TLT2	N/A	N.C.R	N.C.R
Controller	Sunol Sciences	SC104V	022310-1	N.C.R	N.C.R
Controller	CT	N/A	N/A	N.C.R	N.C.R
Temp. / Humidity Meter	Anymetre	JR913	N/A	02/21/2016	02/20/2017
Test S/W	FARAD	LZ-RF / CCS-SZ-3A2			

6.7.3 TEST CONFIGURATION

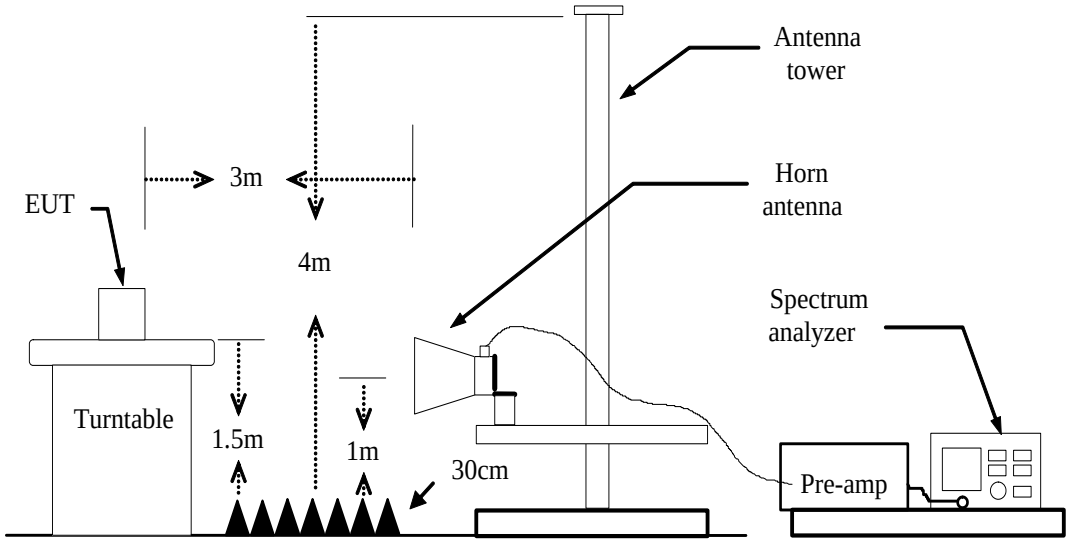
Below 30MHz



Below 1 GHz



Above 1 GHz



For the actual test configuration, please refer to the related item – Photographs of the TEST CONFIGURATION.

6.7.4 TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m or 1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:

   Below 1GHz:

   RBW=100kHz / VBW=300kHz / Sweep=AUTO

   Above 1GHz:

   (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO

   (b) AVERAGE: RBW=1MHz / VBW=3MHz / Sweep=AUTO / Detector=RMS
7. Repeat above procedures until the measurements for all frequencies are complete.

6.7.5 DATA SAPLE

Below 1GHz

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
XXX.XXXX	36.37	-12.20	24.17	40.00	-15.83	V	QP

Frequency (MHz) = Emission frequency in MHz
Reading (dBuV) = Uncorrected Analyzer / Receiver reading
Correct Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain
Result (dBuV/m) = Reading (dBuV) + Corr. Factor (dB/m)
Limit (dBuV/m) = Limit stated in standard
Margin (dB) = Result (dBuV/m) – Limit (dBuV/m)
Q.P. = Quasi-peak Reading

Above 1GHz

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
XXXX.XXXX	62.09	-11.42	50.67	74.00	-23.33	V	Peak
XXXX.XXXX	49.78	-11.42	38.36	54.00	-15.64	V	AVG

Frequency (MHz) = Emission frequency in MHz
Reading (dBuV) = Uncorrected Analyzer / Receiver reading
Correction Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain
Result (dBuV/m) = Reading (dBuV) + Corr. Factor (dB/m)
Limit (dBuV/m) = Limit stated in standard
Margin (dB) = Result (dBuV/m) – Limit (dBuV/m)
Peak = Peak Reading
AVG = Average Reading

Calculation Formula

Margin (dB) = Result (dBuV/m) – Limits (dBuV/m)
Result (dBuV/m) = Reading (dBuV) + Correction Factor

6.7.6 TEST RESULTS

Below 1 GHz

Test Mode: TX **Tested by:** Jack Chen

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** May 18, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
100.8100	55.13	-23.53	31.60	43.50	-11.90	V	QP
326.8200	50.88	-18.57	32.31	46.00	-13.69	V	QP
344.2800	53.73	-17.94	35.79	46.00	-10.21	V	QP
377.2600	51.16	-16.67	34.49	46.00	-11.51	V	QP
600.3600	49.55	-12.86	36.69	46.00	-9.31	V	QP
903.0000	44.49	-9.76	34.73	46.00	-11.27	V	QP
75.5900	61.51	-26.25	35.26	40.00	-4.74	H	QP
312.2700	50.97	-19.12	31.85	46.00	-14.15	H	QP
398.6000	50.46	-16.14	34.32	46.00	-11.68	H	QP
429.6400	50.85	-15.58	35.27	46.00	-10.73	H	QP
647.8900	42.24	-12.51	29.73	46.00	-16.27	H	QP
696.3900	44.41	-12.03	32.38	46.00	-13.62	H	QP

Remark:

1. *No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz)*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.*
3. *Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).*

Above 1 GHz

1GHz~6GHz

Test Mode: TX / IEEE 802.11a / 5745MHz /(CH Low) **Tested by:** Jack Chen

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** May 18, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
2885.000	45.13	-1.57	43.56	74.00	-30.44	V	peak
3260.000	44.24	-0.92	43.32	74.00	-30.68	V	peak
4145.000	43.91	2.10	46.01	74.00	-27.99	V	peak
4750.000	42.27	4.17	46.44	74.00	-27.56	V	peak
5225.000	41.77	5.38	47.15	74.00	-26.85	V	peak
5440.000	41.45	5.76	47.21	74.00	-26.79	V	peak
9804.000	30.55	11.42	41.97	74.00	-32.03	H	Peak
10620.000	30.56	13.90	44.46	74.00	-29.54	H	Peak
11316.000	30.16	14.94	45.10	74.00	-28.90	H	Peak
12492.000	29.64	16.27	45.91	74.00	-28.09	H	peak
14244.000	28.76	20.72	49.48	74.00	-24.52	H	peak
14988.000	29.14	21.15	50.29	74.00	-23.71	H	peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Antenna 1

Test Mode: TX / IEEE 802.11a / 5745MHz /(CH Low) **Tested by:** Jack Chen

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** May 18, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
9960.000	30.77	11.86	42.63	74.00	-31.37	V	peak
10824.000	29.76	14.53	44.29	74.00	-29.71	V	peak
12360.000	30.16	15.83	45.99	74.00	-28.01	V	peak
13548.000	28.18	19.39	47.57	74.00	-26.43	V	peak
14316.000	28.71	20.76	49.47	74.00	-24.53	V	peak
15000.000	28.73	21.16	49.89	74.00	-24.11	V	peak
1765.000	49.33	-6.35	42.98	74.00	-31.02	H	Peak
2885.000	45.77	-1.57	44.20	74.00	-29.80	H	Peak
3925.000	43.36	1.27	44.63	74.00	-29.37	H	Peak
4135.000	42.93	2.07	45.00	74.00	-29.00	H	peak
4795.000	42.49	4.31	46.80	74.00	-27.20	H	peak
5610.000	42.41	5.92	48.33	74.00	-25.67	H	peak

Remark:

7. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
8. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
9. *Average test would be performed if the peak result were greater than the average limit.*
10. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
11. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
12. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11a / 5785MHz /(CH Mid) **Tested by:** Jack Chen

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** May 18, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
10104.000	31.13	12.30	43.43	74.00	-30.57	V	peak
10620.000	29.95	13.90	43.85	74.00	-30.15	V	peak
12276.000	30.04	15.55	45.59	74.00	-28.41	V	peak
12768.000	29.92	17.18	47.10	74.00	-26.90	V	peak
14352.000	28.63	20.78	49.41	74.00	-24.59	V	peak
14952.000	29.04	21.13	50.17	74.00	-23.83	V	peak
11016.000	29.85	15.07	44.92	74.00	-29.08	H	Peak
11820.000	30.69	14.72	45.41	74.00	-28.59	H	Peak
12348.000	29.92	15.79	45.71	74.00	-28.29	H	Peak
13596.000	28.35	19.52	47.87	74.00	-26.13	H	peak
14244.000	28.62	20.72	49.34	74.00	-24.66	H	peak
14952.000	28.94	21.13	50.07	74.00	-23.93	H	peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11a / 5825MHz /(CH High) **Tested by:** Jack Chen

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** May 18, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
10296.000	30.78	12.90	43.68	74.00	-30.32	V	peak
11292.000	30.18	14.95	45.13	74.00	-28.87	V	peak
12228.000	30.48	15.39	45.87	74.00	-28.13	V	peak
12984.000	29.33	17.90	47.23	74.00	-26.77	V	peak
14256.000	28.67	20.73	49.40	74.00	-24.60	V	peak
14928.000	28.86	21.12	49.98	74.00	-24.02	V	peak
10152.000	30.76	12.45	43.21	74.00	-30.79	H	Peak
11220.000	29.98	14.98	44.96	74.00	-29.04	H	Peak
12912.000	29.19	17.66	46.85	74.00	-27.15	H	Peak
14052.000	27.75	20.61	48.36	74.00	-25.64	H	peak
14940.000	29.20	21.13	50.33	74.00	-23.67	H	peak
16980.000	27.47	23.25	50.72	74.00	-23.28	H	peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Antenna 2

Test Mode: TX / IEEE 802.11a / 5745MHz /(CH Low) **Tested by:** Jack Chen

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** May 18, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
7752.000	32.11	9.17	41.28	74.00	-32.72	V	peak
8424.000	32.51	9.42	41.93	74.00	-32.07	V	peak
9612.000	31.13	10.86	41.99	74.00	-32.01	V	peak
11196.000	30.10	14.99	45.09	74.00	-28.91	V	peak
12912.000	29.33	17.66	46.99	74.00	-27.01	V	peak
14436.000	28.73	20.83	49.56	74.00	-24.44	V	peak
8376.000	32.06	9.44	41.50	74.00	-32.50	H	Peak
10032.000	30.91	12.08	42.99	74.00	-31.01	H	Peak
11040.000	30.22	15.06	45.28	74.00	-28.72	H	Peak
11844.000	30.53	14.71	45.24	74.00	-28.76	H	peak
12672.000	29.16	16.86	46.02	74.00	-27.98	H	peak
14964.000	29.03	21.14	50.17	74.00	-23.83	H	peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11a / 5785MHz /(CH Mid) **Tested by:** Jack Chen

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** May 18, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
6948.000	32.16	7.62	39.78	74.00	-34.22	V	peak
7752.000	32.04	9.17	41.21	74.00	-32.79	V	peak
8364.000	31.88	9.45	41.33	74.00	-32.67	V	peak
10392.000	30.13	13.20	43.33	74.00	-30.67	V	peak
11340.000	29.78	14.93	44.71	74.00	-29.29	V	peak
15024.000	28.84	21.05	49.89	74.00	-24.11	V	peak
6924.000	32.14	7.58	39.72	74.00	-34.28	H	Peak
7752.000	31.85	9.17	41.02	74.00	-32.98	H	Peak
8376.000	31.81	9.44	41.25	74.00	-32.75	H	Peak
10620.000	30.13	13.90	44.03	74.00	-29.97	H	peak
11316.000	29.78	14.94	44.72	74.00	-29.28	H	peak
14964.000	28.92	21.14	50.06	74.00	-23.94	H	peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11a / 5825MHz /(CH High) **Tested by:** Jack Chen

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** May 18, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
6924.000	32.41	7.58	39.99	74.00	-34.01	V	peak
7608.000	31.26	8.89	40.15	74.00	-33.85	V	peak
8352.000	32.12	9.46	41.58	74.00	-32.42	V	peak
10068.000	30.94	12.19	43.13	74.00	-30.87	V	peak
13008.000	28.75	17.97	46.72	74.00	-27.28	V	peak
14880.000	28.72	21.09	49.81	74.00	-24.19	V	peak
6948.000	32.66	7.62	40.28	74.00	-33.72	H	Peak
7752.000	31.96	9.17	41.13	74.00	-32.87	H	Peak
8352.000	31.82	9.46	41.28	74.00	-32.72	H	Peak
11196.000	29.94	14.99	44.93	74.00	-29.07	H	peak
12984.000	29.29	17.90	47.19	74.00	-26.81	H	peak
15036.000	28.96	21.00	49.96	74.00	-24.04	H	peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Combine with Antenna 1 and Antenna 2

Test Mode: TX / IEEE 802.11n HT 20 MHz / 5745MHz /(CH Low) **Tested by:** Jack Chen

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** May 18, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
9876.000	30.73	11.62	42.35	74.00	-31.65	V	peak
11040.000	29.83	15.06	44.89	74.00	-29.11	V	peak
12792.000	29.09	17.26	46.35	74.00	-27.65	V	peak
13548.000	28.19	19.39	47.58	74.00	-26.42	V	peak
14244.000	28.40	20.72	49.12	74.00	-24.88	V	peak
14928.000	28.90	21.12	50.02	74.00	-23.98	V	peak
10248.000	30.85	12.75	43.60	74.00	-30.40	H	Peak
10848.000	29.87	14.61	44.48	74.00	-29.52	H	Peak
12960.000	29.01	17.82	46.83	74.00	-27.17	H	Peak
13512.000	27.94	19.30	47.24	74.00	-26.76	H	peak
14244.000	28.68	20.72	49.40	74.00	-24.60	H	peak
15000.000	28.96	21.16	50.12	74.00	-23.88	H	peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11n HT 20 MHz / 5785MHz /(CH Mid) **Tested by:** Jack Chen

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** May 18, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
10680.000	29.65	14.09	43.74	74.00	-30.26	V	peak
11040.000	30.39	15.06	45.45	74.00	-28.55	V	peak
12936.000	29.23	17.74	46.97	74.00	-27.03	V	peak
13896.000	27.75	20.31	48.06	74.00	-25.94	V	peak
14388.000	28.59	20.81	49.40	74.00	-24.60	V	peak
15096.000	29.10	20.72	49.82	74.00	-24.18	V	peak
8328.000	32.00	9.47	41.47	74.00	-32.53	H	Peak
10140.000	31.30	12.41	43.71	74.00	-30.29	H	Peak
11364.000	30.29	14.92	45.21	74.00	-28.79	H	Peak
12228.000	30.42	15.39	45.81	74.00	-28.19	H	peak
14316.000	29.05	20.76	49.81	74.00	-24.19	H	peak
15024.000	28.90	21.05	49.95	74.00	-24.05	H	peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11n HT 20 MHz / 5825MHz /(CH High) **Tested by:** Jack Chen

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** May 18, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
8328.000	32.00	9.47	41.47	74.00	-32.53	V	peak
9288.000	31.36	9.93	41.29	74.00	-32.71	V	peak
10512.000	30.26	13.57	43.83	74.00	-30.17	V	peak
11844.000	30.53	14.71	45.24	74.00	-28.76	V	peak
14016.000	27.73	20.59	48.32	74.00	-25.68	V	peak
14316.000	29.05	20.76	49.81	74.00	-24.19	V	peak
10800.000	29.52	14.46	43.98	74.00	-30.02	H	Peak
10980.000	29.88	15.02	44.90	74.00	-29.10	H	Peak
11832.000	30.75	14.71	45.46	74.00	-28.54	H	Peak
12612.000	29.34	16.67	46.01	74.00	-27.99	H	peak
14124.000	27.95	20.65	48.60	74.00	-25.40	H	peak
15000.000	28.78	21.16	49.94	74.00	-24.06	H	peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Combine with Antenna 1 and Antenna 2

Test Mode: TX / IEEE 802.11n HT 40 MHz / 5755MHz /(CH Low) **Tested by:** Jack Chen

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** May 18, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
7752.000	32.51	9.17	41.68	74.00	-32.32	V	peak
10032.000	31.15	12.08	43.23	74.00	-30.77	V	peak
11040.000	29.93	15.06	44.99	74.00	-29.01	V	peak
12972.000	29.26	17.86	47.12	74.00	-26.88	V	peak
14388.000	28.80	20.81	49.61	74.00	-24.39	V	peak
14880.000	29.11	21.09	50.20	74.00	-23.80	V	peak
10104.000	30.90	12.30	43.20	74.00	-30.80	H	Peak
11340.000	29.94	14.93	44.87	74.00	-29.13	H	Peak
12984.000	29.24	17.90	47.14	74.00	-26.86	H	Peak
14244.000	28.93	20.72	49.65	74.00	-24.35	H	peak
14988.000	28.59	21.15	49.74	74.00	-24.26	H	peak
17376.000	28.48	23.32	51.80	74.00	-22.20	H	peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Test Mode: TX / IEEE 802.11n HT 40 MHz / 5795MHz /(CH High) **Tested by:** Jack Chen

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** May 18, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
10080.000	31.06	12.23	43.29	74.00	-30.71	V	peak
11016.000	29.92	15.07	44.99	74.00	-29.01	V	peak
12348.000	30.27	15.79	46.06	74.00	-27.94	V	peak
12684.000	29.17	16.90	46.07	74.00	-27.93	V	peak
14244.000	28.66	20.72	49.38	74.00	-24.62	V	peak
15000.000	29.19	21.16	50.35	74.00	-23.65	V	peak
10884.000	29.79	14.72	44.51	74.00	-29.49	H	Peak
11208.000	30.16	14.99	45.15	74.00	-28.85	H	Peak
12444.000	29.80	16.11	45.91	74.00	-28.09	H	Peak
12636.000	29.48	16.75	46.23	74.00	-27.77	H	peak
14244.000	28.70	20.72	49.42	74.00	-24.58	H	peak
15012.000	28.69	21.11	49.80	74.00	-24.20	H	peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Combine with antenna 1 and antenna 2

Test Mode: TX / IEEE 802.11ac 80 / 5775MHz **Tested by:** Jack Chen

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** May 18, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
9936.000	30.64	11.80	42.44	74.00	-31.56	V	peak
10800.000	29.78	14.46	44.24	74.00	-29.76	V	peak
11844.000	30.51	14.71	45.22	74.00	-28.78	V	peak
12396.000	29.93	15.95	45.88	74.00	-28.12	V	peak
13008.000	29.39	17.97	47.36	74.00	-26.64	V	peak
14940.000	28.79	21.13	49.92	74.00	-24.08	V	peak
9744.000	30.67	11.24	41.91	74.00	-32.09	H	Peak
10296.000	30.55	12.90	43.45	74.00	-30.55	H	Peak
10932.000	30.35	14.87	45.22	74.00	-28.78	H	Peak
12648.000	29.24	16.78	46.02	74.00	-27.98	H	peak
14196.000	28.76	20.69	49.45	74.00	-24.55	H	peak
14856.000	28.49	21.08	49.57	74.00	-24.43	H	peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

6.8 CONDUCTED UNDESIRABLE EMISSION

6.8.1 LIMIT

According to 15.407(b) ,

(1) For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.

(2) For transmitters operating in the 5.725–5.850 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of –17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of –27 dBm/MHz.

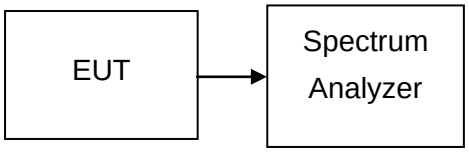
(3) The provisions of §15.205 apply to intentional radiators operating under this section.

6.8.2 MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	E4446A	US44300399	02/21/2016	02/20/2017

Remark: *Each piece of equipment is scheduled for calibration once a year.*

6.8.3 TEST CONFIGURATION



6.8.4 TEST PROCEDURE

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 1 MHz. The video bandwidth is set to 1 MHz. Peak detection measurements are compared to the average EIRP limit, adjusted for the maximum antenna gain. If necessary, additional average detection measurements are made.

Measurements are made over the 30 MHz to 40 GHz range with the transmitter set to the lowest, middle, and highest channels.

6.8.5 TEST RESULTS

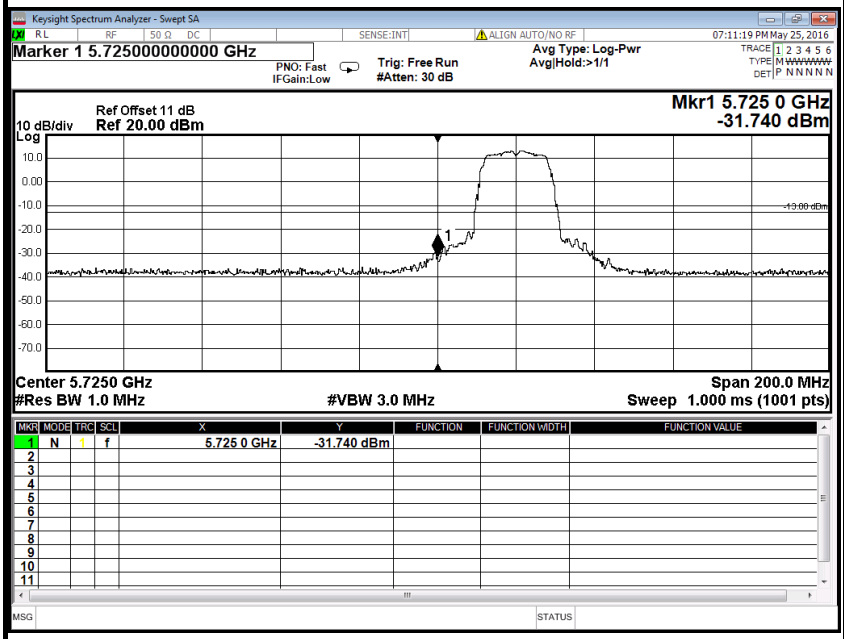
No non-compliance noted

Test Plot

IEEE 802.11a mode / 5745 ~ 5825MHz

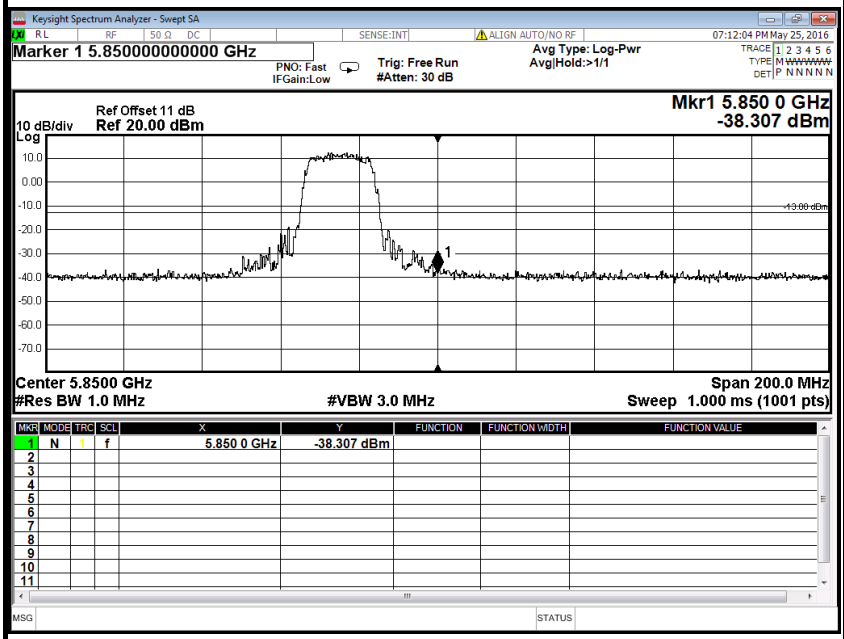
CH Low

Antenna 1



CH High

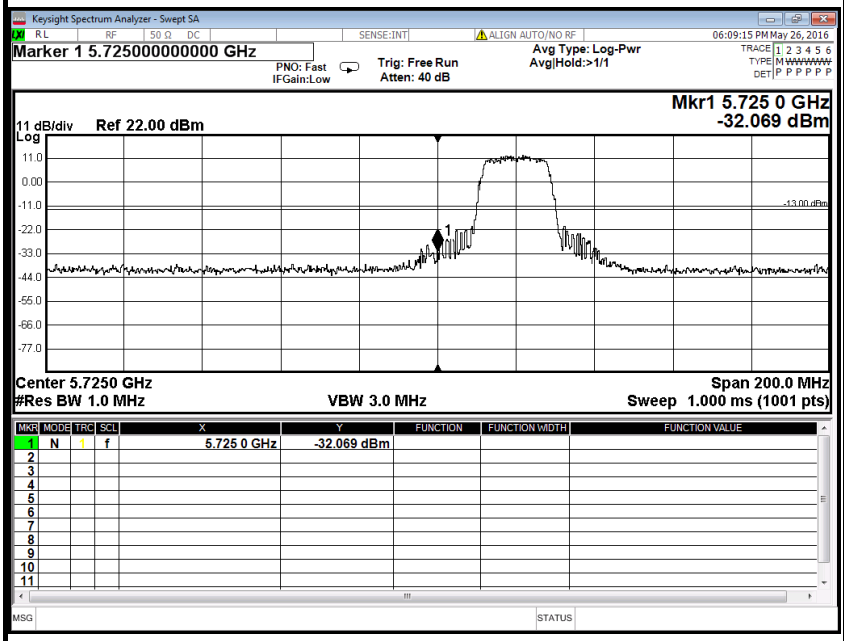
Antenna 1



IEEE 802.11a mode / 5745 ~ 5825MHz

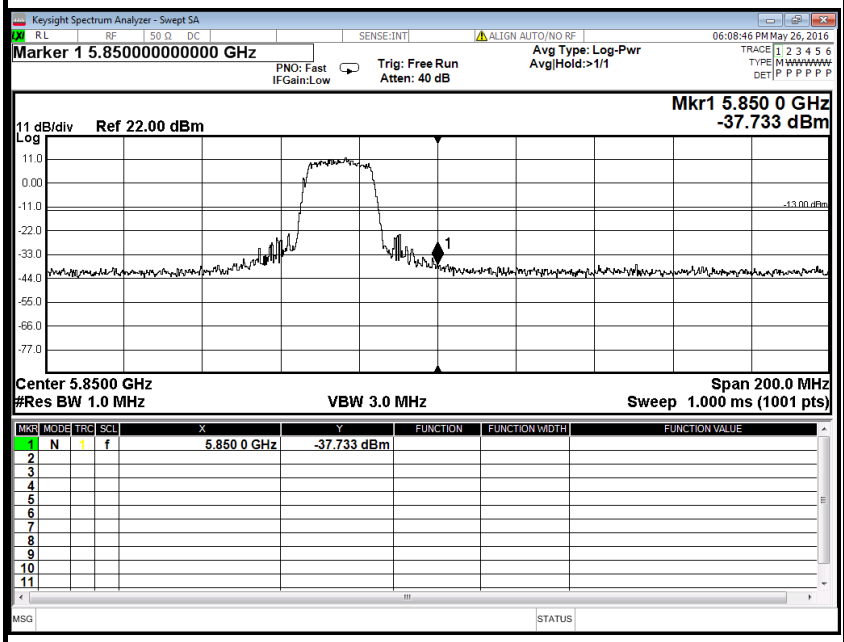
CH Low

Antenna 2



CH High

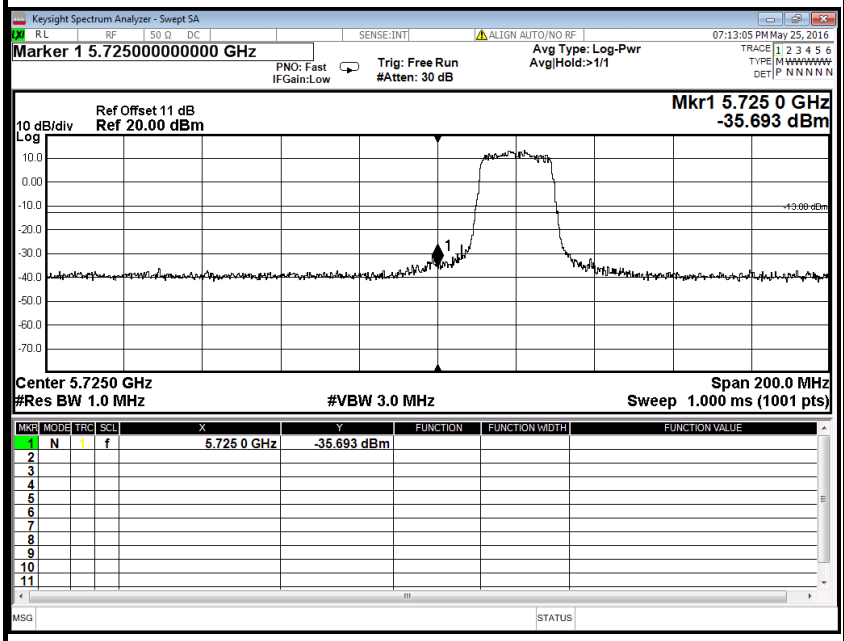
Antenna 2



IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz

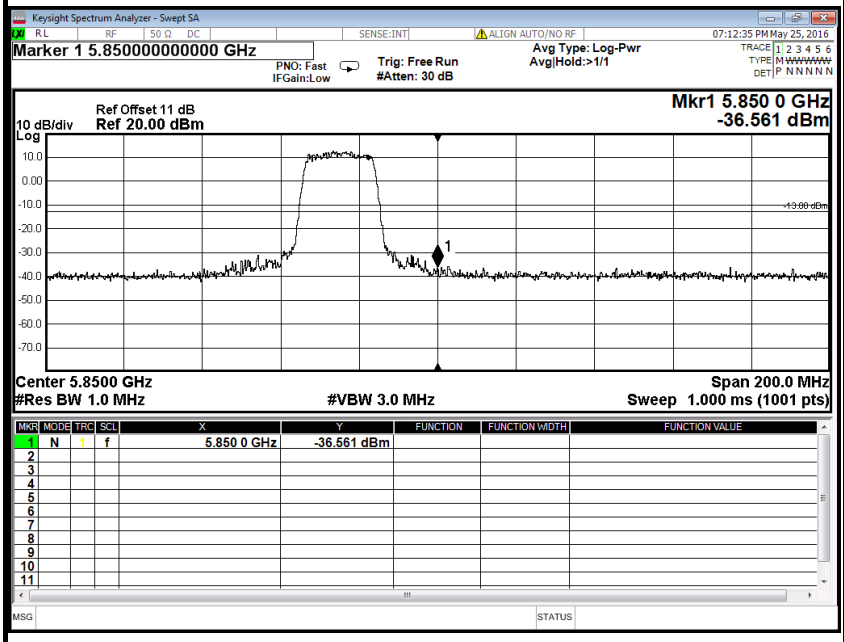
CH Low

Antenna 1



CH High

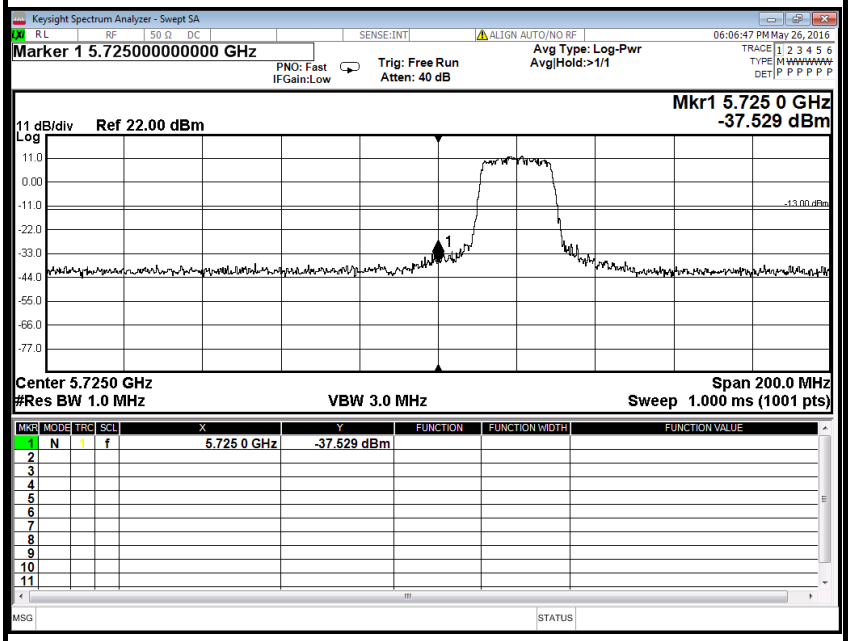
Antenna 1



IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz

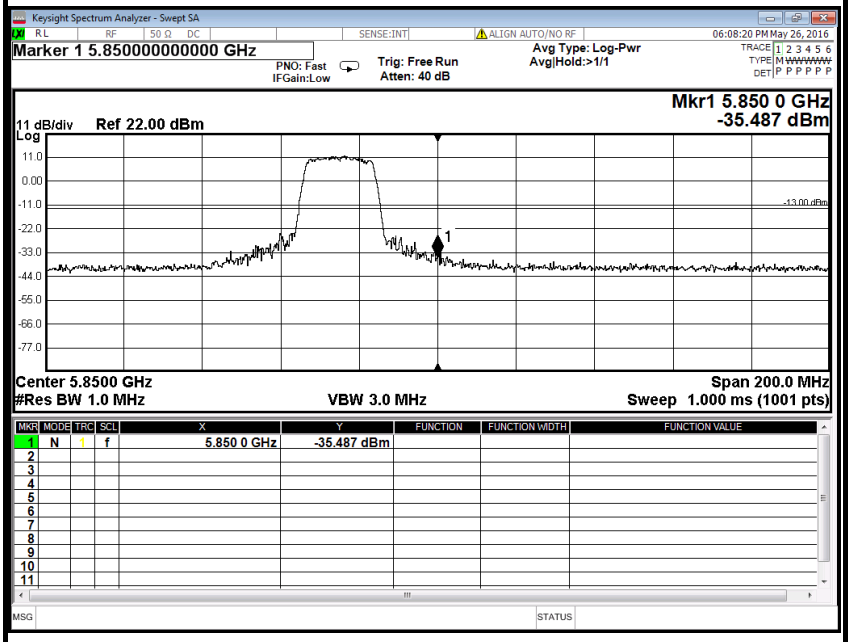
CH Low

Antenna 2



CH High

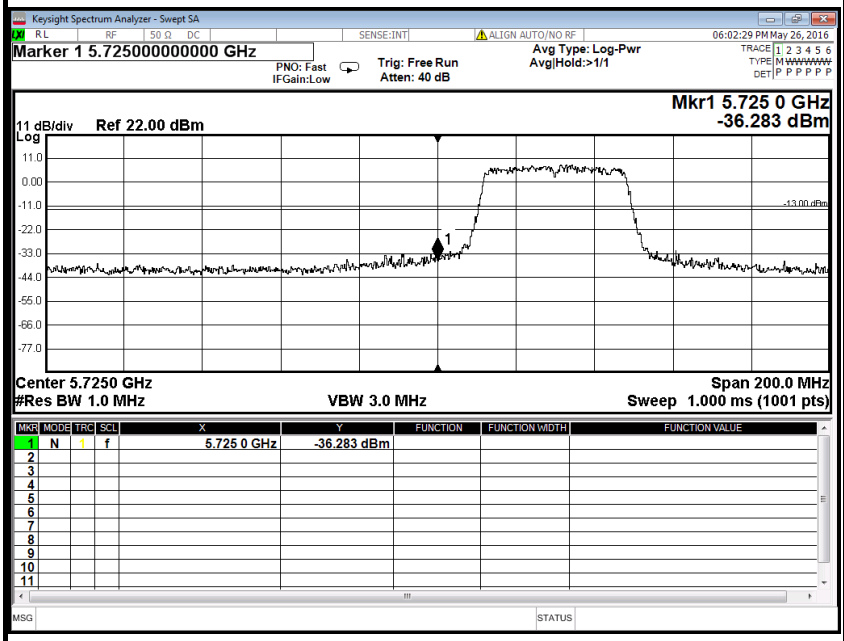
Antenna 2



IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz

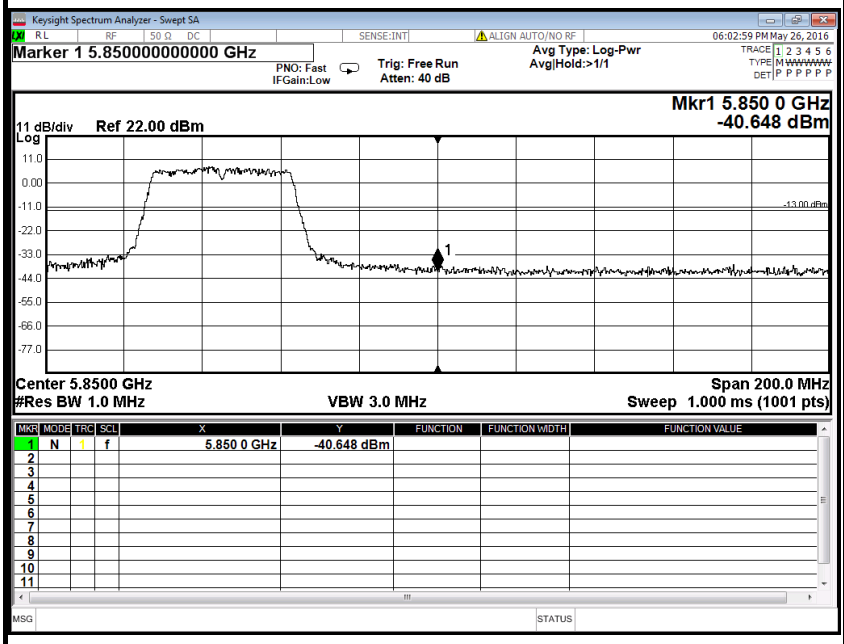
CH Low

Antenna 1



CH High

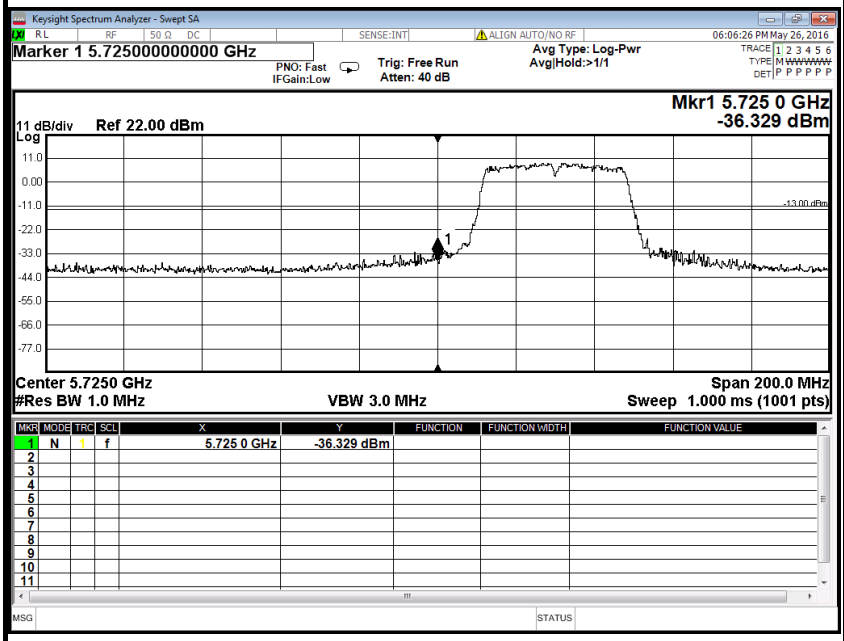
Antenna 1



IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz

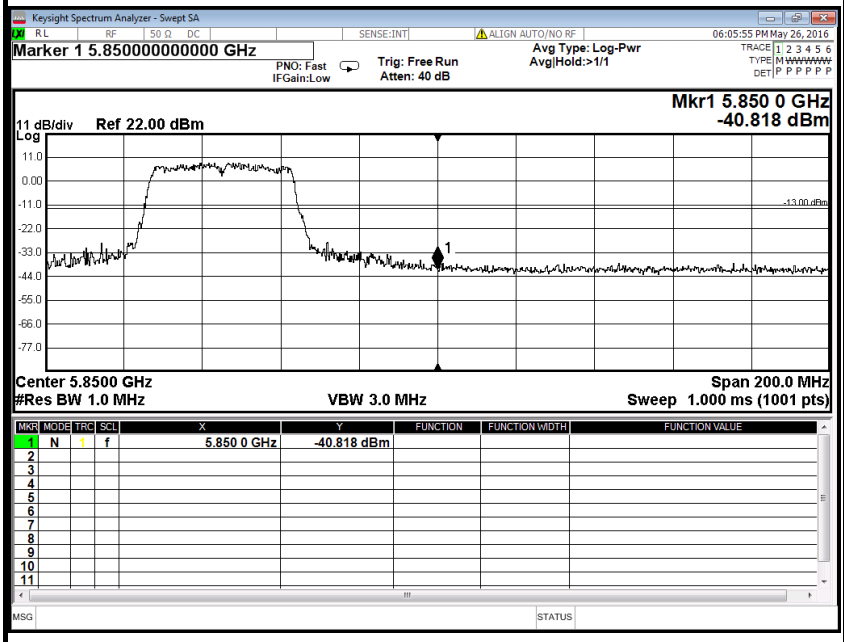
CH Low

Antenna 2



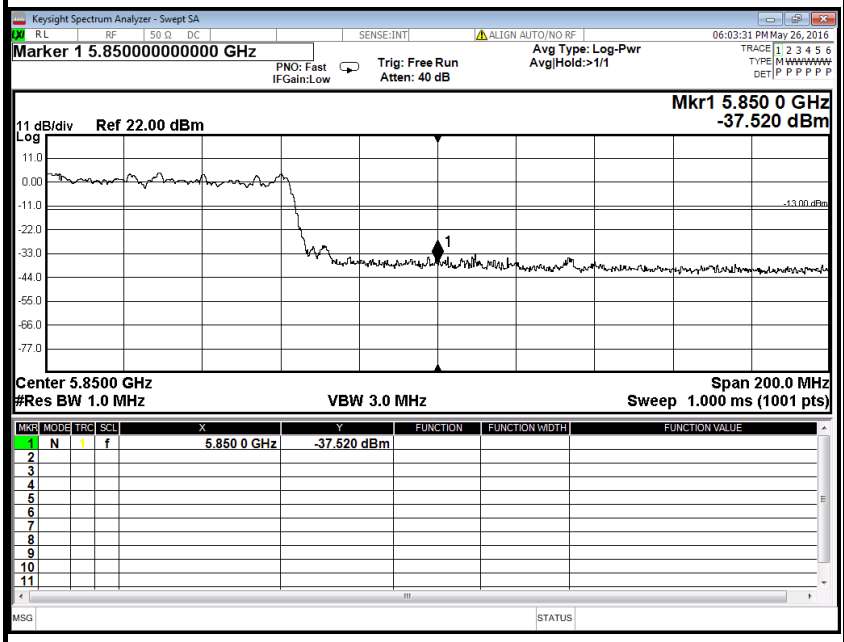
CH High

Antenna 2



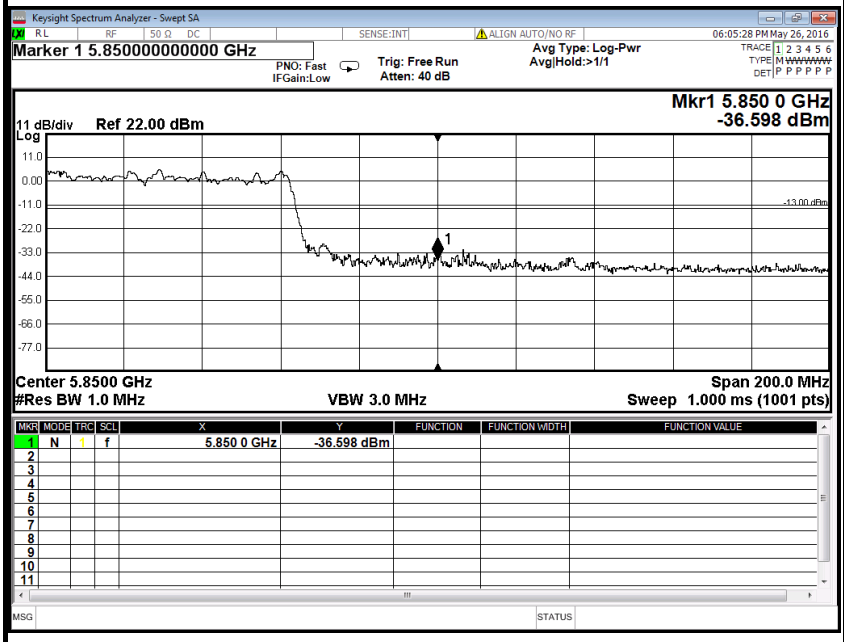
IEEE 802.11ac 80 mode / 5775MHz

Antenna 1



IEEE 802.11ac 80 mode / 5775MHz

Antenna 2



6.9 POWERLINE CONDUCTED EMISSIONS

6.9.1 LIMIT

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

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

** Decreases with the logarithm of the frequency.*

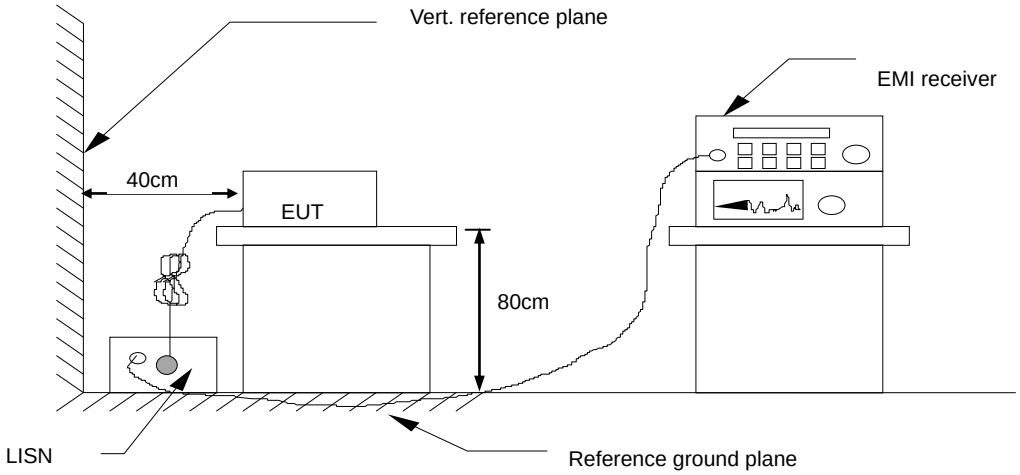
6.9.2 TEST INSTRUMENTS

Conducted Emission Test Site					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	02/21/2016	02/20/2017
LISN(EUT)	ROHDE&SCHWARZ	ENV216	101543-WX	02/21/2016	02/20/2017
LISN	EMCO	3825/2	8901-1459	02/21/2016	02/20/2017
Temp. / Humidity Meter	VICTOR	HTC-1	N/A	02/21/2016	02/20/2017
Test S/W	FARAD	EZ-EMC/ CCS-3A1-CE			

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. N.C.R = No Calibration Request.

6.9.3 TEST CONFIGURATION



6.9.4 TEST PROCEDURE

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

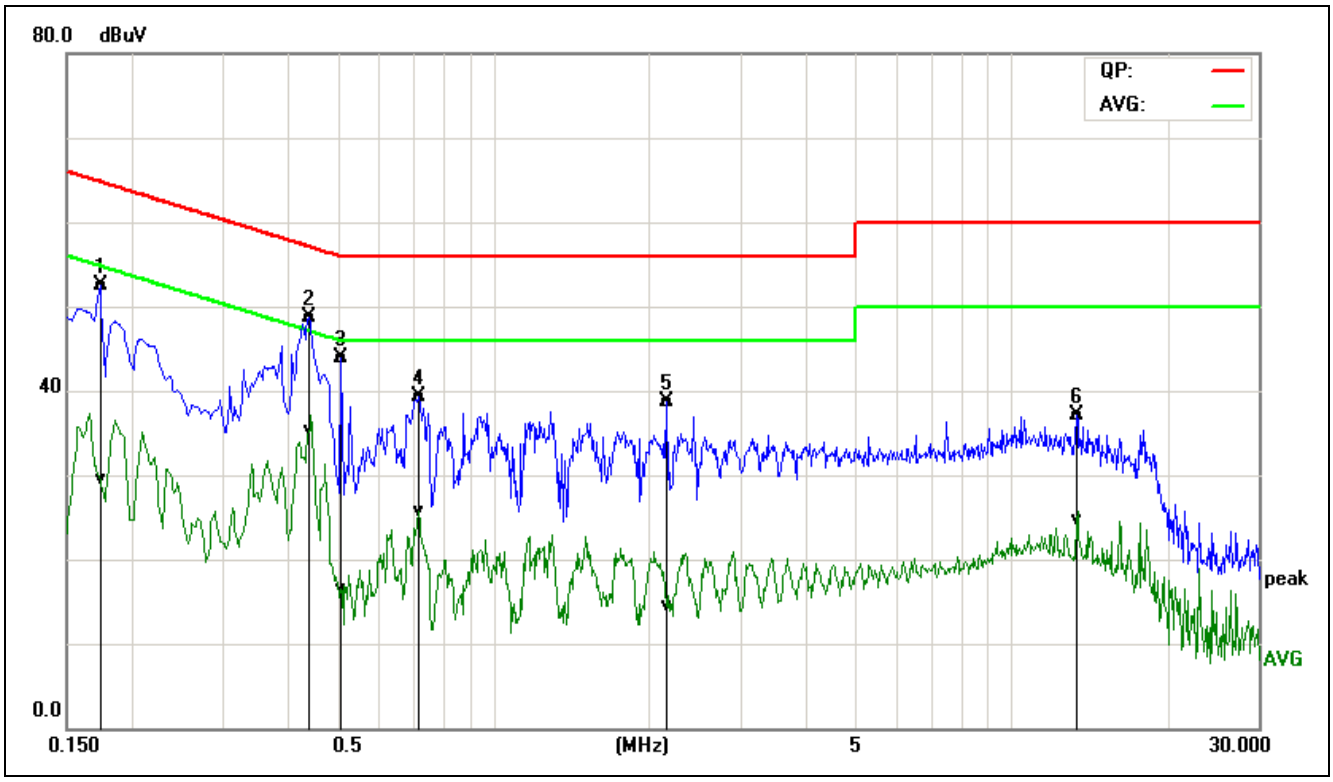
6.9.5 DATA SAMPLE

Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XXXX	32.69	25.65	11.52	44.21	37.17	65.78	55.79	-21.57	-18.62	Pass

Factor = Insertion loss of LISN + Cable Loss
Result = Quasi-peak Reading/ Average Reading + Factor
Limit = Limit stated in standard
Margin = Result (dBuV) – Limit (dBuV)

6.9.6 TEST RESULTS

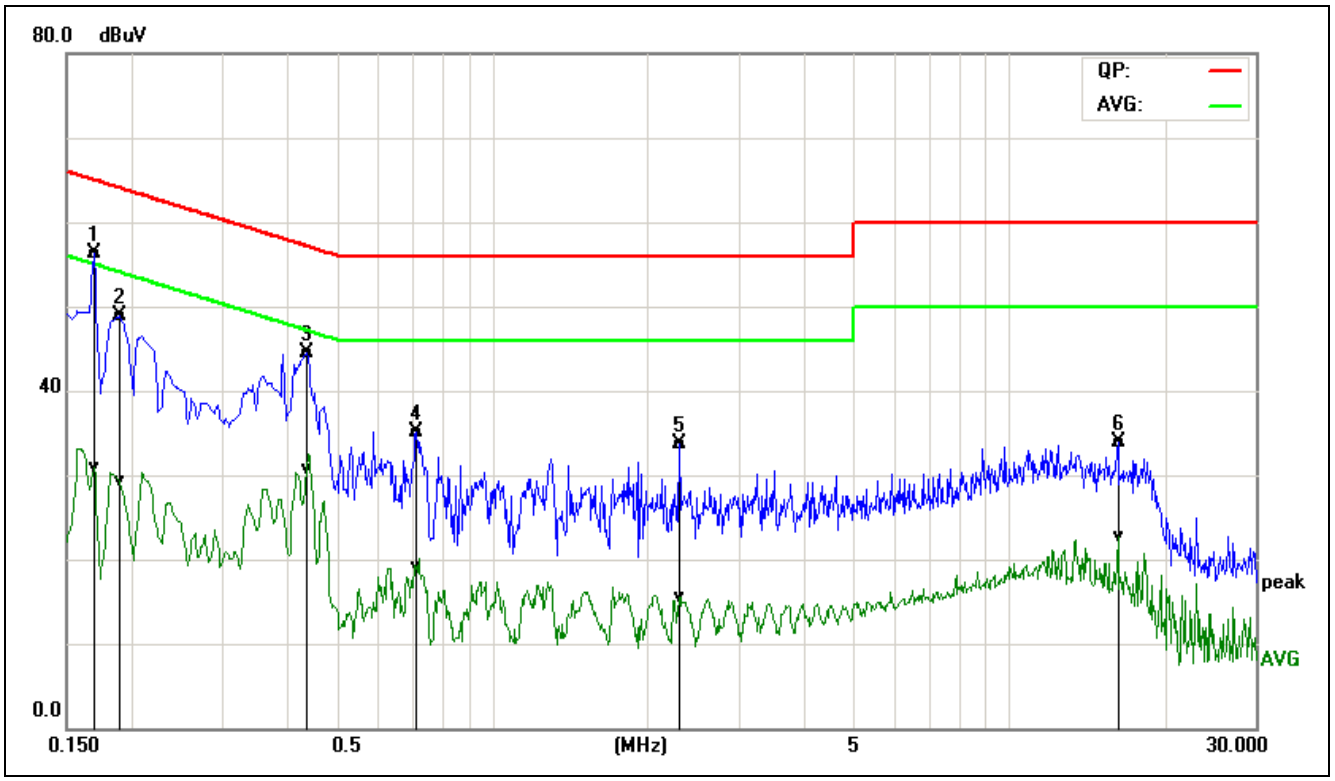
Model No.	AC60	**RBW,VBW**	9 kHz
Environmental Conditions	22°C, 45% RH	**Test Mode**	Mode 1
Tested by	Jack Chen	**Line**	L1
Test Date	April 20, 2016		



Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)	**Line (L1/L2)**
0.1740	42.70	19.75	9.78	52.48	29.53	64.76	54.77	-12.28	-25.24	Pass	L1
0.4420	38.82	25.46	9.86	48.68	35.32	57.02	47.02	-8.34	-11.70	Pass	L1
0.5100	34.05	6.59	9.88	43.93	16.47	56.00	46.00	-12.07	-29.53	Pass	L1
0.7180	29.46	15.85	9.89	39.35	25.74	56.00	46.00	-16.65	-20.26	Pass	L1
2.1660	28.76	4.54	9.94	38.70	14.48	56.00	46.00	-17.30	-31.52	Pass	L1
13.3580	26.97	14.52	10.10	37.07	24.62	60.00	50.00	-22.93	-25.38	Pass	L1

REMARKS: L1 = Line One (Live Line)

Model No.	AC60	**RBW,VBW**	9 kHz
Environmental Conditions	22°C, 45% RH	**Test Mode**	Mode 1
Tested by	Jack Chen	**Line**	L2
Test Date	April 20, 2016		



Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)	**Line (L1/L2)**
0.1700	46.36	21.06	9.88	56.24	30.94	64.96	54.96	-8.72	-24.02	Pass	L2
0.1900	39.00	19.37	9.89	48.89	29.26	64.03	54.04	-15.14	-24.78	Pass	L2
0.4380	34.58	20.86	9.88	44.46	30.74	57.10	47.10	-12.64	-16.36	Pass	L2
0.7140	25.26	9.17	9.89	35.15	19.06	56.00	46.00	-20.85	-26.94	Pass	L2
2.3020	23.71	5.47	9.95	33.66	15.42	56.00	46.00	-22.34	-30.58	Pass	L2
16.2260	23.85	12.54	10.13	33.98	22.67	60.00	50.00	-26.02	-27.33	Pass	L2

REMARKS: L2 = Line Two (Neutral Line)

6.10 FREQUENCY STABILITY

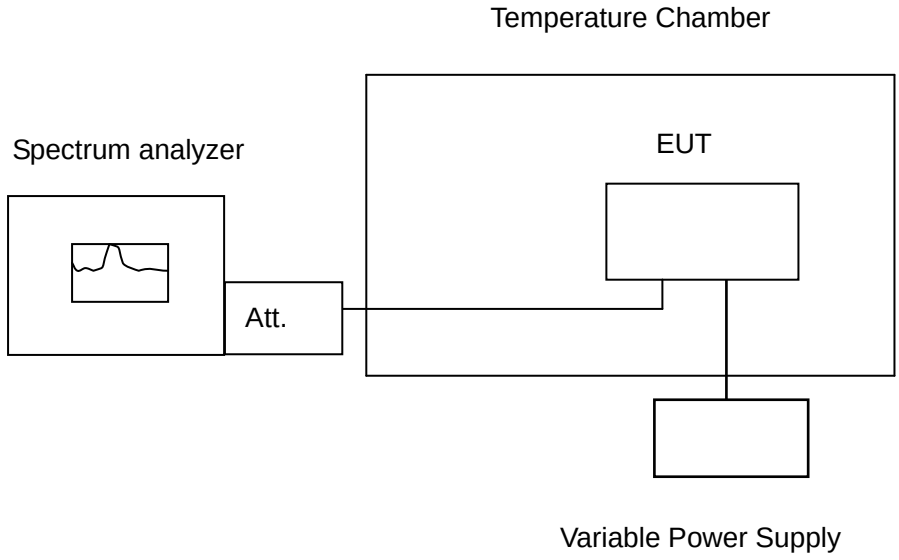
6.10.1 LIMIT

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

6.10.2 TEST INSTRUMENTS

Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	N9010A	MY52221469	02/21/2016	02/20/2017
DC Power Supply	DAZHENG	PS-605D	20018978	N.C.R	N.C.R
AC POWER SOUCE	UMART	HPA1010	N/A	N.C.R	N.C.R
Power Meter	Anritsu	ML2495A	1204003	02/21/2016	02/20/2017
Power Sensor	Anritsu	MA2411B	1126150	02/21/2016	02/20/2017
Temperature Chamber	TERCHY	MHG-800N	E21104	11/18/2015	11/17/2016
Temp. / Humidity Meter	Anymetre	JR913	N/A	02/21/2016	02/20/2017

6.10.3 TEST CONFIGURATION



Remark: *Measurement setup for testing on Antenna connector*

6.10.4 TEST PROCEDURE

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20^{o}C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to –20^{o}C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10^{o}C increased per stage until the highest temperature of +50^{o}C reached.

6.10.5 TEST RESULTS

No non-compliance noted.

Test Data
Antenna 1

IEEE 802.11a mode / 5745 ~ 5825MHz (Low)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5744.989396	5725-5850	PASS
40	120	5744.958932	5725-5850	PASS
30	120	5744.992946	5725-5850	PASS
20	120	5745.046500	5725-5850	PASS
10	120	5744.983821	5725-5850	PASS
0	120	5744.992575	5725-5850	PASS
-10	120	5744.954193	5725-5850	PASS
-20	120	5744.965642	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5744.986059	5725-5850	PASS
	120	5745.046500	5725-5850	PASS
	132	5744.965630	5725-5850	PASS

IEEE 802.11a mode / 5745 ~ 5825MHz (High)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5824.957410	5725-5850	PASS
40	120	5824.991564	5725-5850	PASS
30	120	5824.953195	5725-5850	PASS
20	120	5825.016500	5725-5850	PASS
10	120	5824.981881	5725-5850	PASS
0	120	5824.957977	5725-5850	PASS
-10	120	5824.978433	5725-5850	PASS
-20	120	5824.982298	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5824.999478	5725-5850	PASS
	120	5825.016500	5725-5850	PASS
	132	5824.984305	5725-5850	PASS

Antenna 2

IEEE 802.11a mode / 5745 ~ 5825MHz (Low)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5744.955513	5725-5850	PASS
40	120	5744.966041	5725-5850	PASS
30	120	5744.961645	5725-5850	PASS
20	120	5745.017000	5725-5850	PASS
10	120	5744.990997	5725-5850	PASS
0	120	5744.964883	5725-5850	PASS
-10	120	5744.990977	5725-5850	PASS
-20	120	5744.961728	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5744.970550	5725-5850	PASS
	120	5745.017000	5725-5850	PASS
	132	5744.991713	5725-5850	PASS

IEEE 802.11a mode / 5745 ~ 5825MHz (High)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5824.973279	5725-5850	PASS
40	120	5824.963506	5725-5850	PASS
30	120	5824.967354	5725-5850	PASS
20	120	5825.017000	5725-5850	PASS
10	120	5824.957152	5725-5850	PASS
0	120	5824.951842	5725-5850	PASS
-10	120	5824.960506	5725-5850	PASS
-20	120	5824.987006	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5824.994259	5725-5850	PASS
	120	5825.017000	5725-5850	PASS
	132	5824.968607	5725-5850	PASS

Antenna 1

IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz (Low)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5744.990608	5725-5850	PASS
40	120	5744.997828	5725-5850	PASS
30	120	5744.993015	5725-5850	PASS
20	120	5745.016000	5725-5850	PASS
10	120	5744.999721	5725-5850	PASS
0	120	5744.957647	5725-5850	PASS
-10	120	5744.981450	5725-5850	PASS
-20	120	5744.983218	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5744.999436	5725-5850	PASS
	120	5745.016000	5725-5850	PASS
	132	5744.963186	5725-5850	PASS

IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz (High)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5824.977988	5725-5850	PASS
40	120	5824.979818	5725-5850	PASS
30	120	5824.951485	5725-5850	PASS
20	120	5824.997830	5725-5850	PASS
10	120	5824.997600	5725-5850	PASS
0	120	5824.970390	5725-5850	PASS
-10	120	5824.974025	5725-5850	PASS
-20	120	5824.952096	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5824.995765	5725-5850	PASS
	120	5825.016000	5725-5850	PASS
	132	5824.987564	5725-5850	PASS

Antenna 2

IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz (Low)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5744.952998	5725-5850	PASS
40	120	5744.973392	5725-5850	PASS
30	120	5744.977707	5725-5850	PASS
20	120	5745.017000	5725-5850	PASS
10	120	5744.989491	5725-5850	PASS
0	120	5744.987114	5725-5850	PASS
-10	120	5744.983671	5725-5850	PASS
-20	120	5744.957818	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5744.980673	5725-5850	PASS
	120	5745.017000	5725-5850	PASS
	132	5744.987372	5725-5850	PASS

IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz (High)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5824.995887	5725-5850	PASS
40	120	5824.956206	5725-5850	PASS
30	120	5824.997688	5725-5850	PASS
20	120	5825.017000	5725-5850	PASS
10	120	5824.971406	5725-5850	PASS
0	120	5824.953357	5725-5850	PASS
-10	120	5824.970686	5725-5850	PASS
-20	120	5824.957658	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5824.973564	5725-5850	PASS
	120	5825.017000	5725-5850	PASS
	132	5824.951977	5725-5850	PASS

Antenna 1

IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz (Low)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5754.989876	5725-5850	PASS
40	120	5754.987040	5725-5850	PASS
30	120	5754.974761	5725-5850	PASS
20	120	5755.016000	5725-5850	PASS
10	120	5754.963339	5725-5850	PASS
0	120	5754.972887	5725-5850	PASS
-10	120	5754.964932	5725-5850	PASS
-20	120	5754.972265	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5754.960451	5725-5850	PASS
	120	5755.016000	5725-5850	PASS
	132	5754.961469	5725-5850	PASS

IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz (High)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5794.993126	5725-5850	PASS
40	120	5794.988357	5725-5850	PASS
30	120	5794.954822	5725-5850	PASS
20	120	5795.016500	5725-5850	PASS
10	120	5794.978741	5725-5850	PASS
0	120	5794.964729	5725-5850	PASS
-10	120	5794.954911	5725-5850	PASS
-20	120	5794.958346	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5794.985940	5725-5850	PASS
	120	5795.016500	5725-5850	PASS
	132	5794.986350	5725-5850	PASS

Antenna 2

IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz (Low)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5754.957925	5725-5850	PASS
40	120	5754.968268	5725-5850	PASS
30	120	5754.954263	5725-5850	PASS
20	120	5755.017500	5725-5850	PASS
10	120	5754.959007	5725-5850	PASS
0	120	5754.984021	5725-5850	PASS
-10	120	5754.986712	5725-5850	PASS
-20	120	5754.994760	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5754.980187	5725-5850	PASS
	120	5755.017500	5725-5850	PASS
	132	5754.969518	5725-5850	PASS

IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz (High)

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5794.985067	5725-5850	PASS
40	120	5794.983775	5725-5850	PASS
30	120	5794.968560	5725-5850	PASS
20	120	5795.017000	5725-5850	PASS
10	120	5794.960149	5725-5850	PASS
0	120	5794.961706	5725-5850	PASS
-10	120	5794.986231	5725-5850	PASS
-20	120	5794.954433	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5794.973527	5725-5850	PASS
	120	5795.017000	5725-5850	PASS
	132	5794.955880	5725-5850	PASS

Antenna 1

IEEE 802.11ac 80 mode / 5775MHz

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5774.967401	5725-5850	PASS
40	120	5774.990109	5725-5850	PASS
30	120	5774.965118	5725-5850	PASS
20	120	5775.018000	5725-5850	PASS
10	120	5774.980493	5725-5850	PASS
0	120	5774.967862	5725-5850	PASS
-10	120	5774.993643	5725-5850	PASS
-20	120	5774.966678	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5774.984222	5725-5850	PASS
	120	5775.018000	5725-5850	PASS
	132	5774.973396	5725-5850	PASS

Antenna 2

IEEE 802.11ac 80 mode / 5775MHz

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5774.995084	5725-5850	PASS
40	120	5774.976485	5725-5850	PASS
30	120	5774.953557	5725-5850	PASS
20	120	5775.018000	5725-5850	PASS
10	120	5774.964791	5725-5850	PASS
0	120	5774.965510	5725-5850	PASS
-10	120	5774.972526	5725-5850	PASS
-20	120	5774.972264	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	108	5774.997253	5725-5850	PASS
	120	5775.018000	5725-5850	PASS
	132	5774.949792	5725-5850	PASS