



RF TEST REPORT

Report No.: SET2018-12008

Product Name: PoE Router

FCC ID: 2AG32EP3011

IC: 20982-EP3011

Model No. : EP3011

Applicant: Baicells Technologies Co., Ltd.

Address: 3F, Hui Yuan Development Building, No.1 Shangdi
Information Industry Base, Haidian Dist., Beijing, China

Dates of Testing: 09/12/2018 — 10/19/2018

Issued by: CCIC Southern Electronic Product Testing (Shenzhen)
Co., Ltd.

Lab Location: Building 28/29, East of Shigu Xili Industrial Zone, Nanshan
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Test Report

Product Name : PoE Router

Brand Name : BaiCells

Trade Name : BaiCells

Applicant : Baicells Technologies Co., Ltd.

Applicant Address : 3F, Hui Yuan Development Building, No.1 Shangdi
Information Industry Base, Haidian Dist., Beijing, China

Manufacturer : Baicells Technologies Co., Ltd.

Manufacturer Address : 3F, Hui Yuan Development Building, No.1 Shangdi
Information Industry Base, Haidian Dist., Beijing, China

Test Standards : 47 CFR Part 15 Subpart E
IC RSS-Gen(Issue 5, April 2018)
IC RSS-247(Issue 2, Feb. 2017)

Test Result : PASS

Tested by :

2018.10.19

Shallwe Yang, Test Engineer

Reviewed by :

2018.10.19

Chris You, Senior Engineer

Approved by :

2018.10.19

Zhu Qi, Manager

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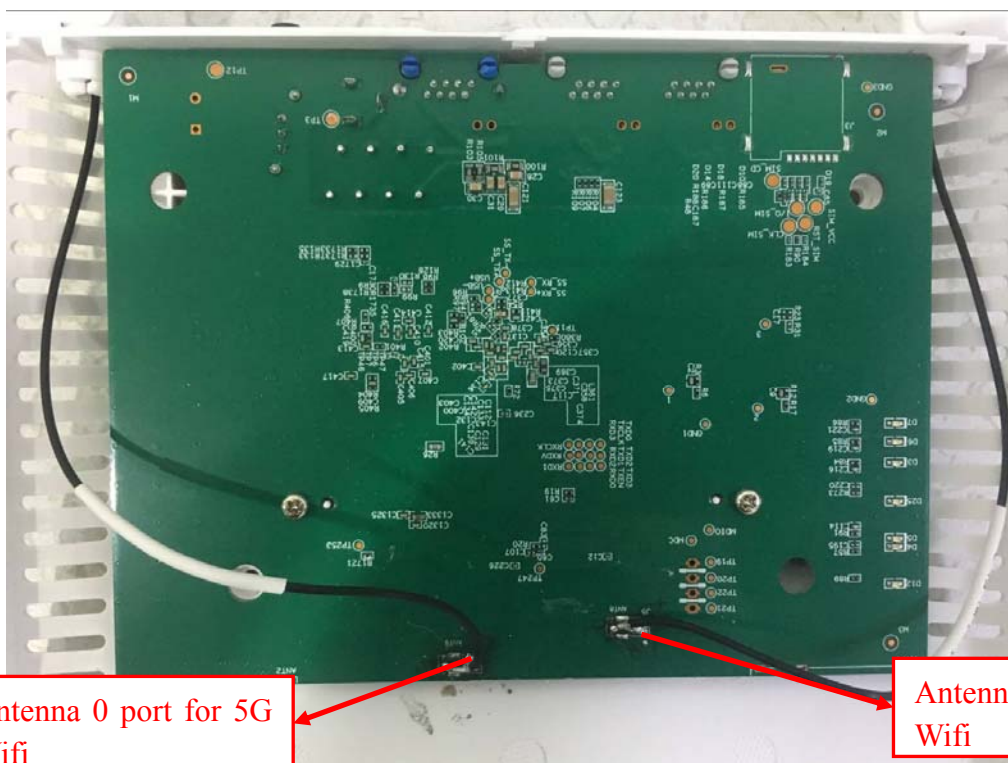
Change History		
Issue	Date	Reason for change
1.0	2018.10.19	First edition

1. General Information

1.1. EUT Description

EUT Type	PoE Router
Hardware Version	V1
Software Version	BCE-AP-2.3C
EUT supports Radios application	WLAN2.4GHz 802.11b/g/n (HT20/HT40) WLAN5.0GHz 802.11a/n (HT20/40)/ac(VHT20/40/80)
Product Type	Indoor
Modulation Type	CCK, DQPSK, DBPSK for DSSS 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only
Transfer Rate	802.11a: 65/54/48/36/24/18/12/9/6 Mbps 802.11n : up to 300 Mbps 802.11ac: up to 866Mbps
Frequency Range	Band UNII-1: 5150 ~ 5250MHz Band UNII-3: 5725 ~ 5850MHz
Channel Bandwidth	802.11a: 20MHz 802.11n: 20MHz/40MHz 802.11ac: 20MHz/40MHz/80MHz
Channel Number	5150 MHz ~ 5250MHz: 4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80) 5725 MHz ~ 5850MHz: 5 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80)
Antenna Type	External Antenna
Antenna Gain	Antenna 0: 5.0dBi Antenna 1: 5.0dBi ;
Product Type	Refer to note
Output Power (Max.)	Band UNII-1: 14.34dBm Band UNII-3: 16.26dBm

Frequency	Modulation Mode	TX / RX Function
5.0GHz	802.11a	1TX / 1RX
	802.11n (HT20)	1TX / 1RX or 2TX / 2RX
	802.11n (HT40)	1TX / 1RX or 2TX / 2RX
	802.11ac (VHT20)	1TX / 1RX or 2TX / 2RX
	802.11ac (VHT40)	1TX / 1RX or 2TX / 2RX
	802.11ac (VHT80)	1TX / 1RX or 2TX / 2RX



1.2. Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart E for the EUT FCC Certification:

No.	Identity	Document Title
1	47 CFR Part 15 Subpart E § 15.407	Radio Frequency Devices
2	KDB Publication 789033D02v02r01	Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E
3	KDB Publication 662911 D01v02r01	Emissions Testing of Transmitters with Multiple Outputs in the Same Band (e.g., MIMO, Smart Antenna, etc)
4	IC RSS-Gen (Issue 5, April. 2018)	General Requirements for Compliance of Radio Apparatus
5	IC RSS-247 (Issue 2, Feb. 2017)	Digital Transmission Systems (DTSSs), Frequency Hopping Systems(FHSs) and Licence-Exemp Local Area Network (LE-LAN) Devices
6	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

Test detailed items/section required by FCC rules, IC rules and results are as below:

No.	FCC Rule	IC Rule	Description	Result
1	15.203	-	Antenna Requirement	PASS
2	15.407(a)	RSS-247, 6.2	Maximum Conducted Output Power	PASS
3	15.407(a)	-	Emission Bandwidth(26 dB Bandwidth)	PASS
	15.407(e)	RSS-247, 6.2	Emission Bandwidth(6 dB Bandwidth)	PASS
	-	RSS GEN (6.7)	Emission Bandwidth(99%)	PASS
4	15.407(a)	RSS-247, 6.2	Power spectral density (PSD)	PASS
5	15.207	RSS-Gen, 8.8	AC Power Line Conducted Emission	PASS
6	15.209 15.407(b)	RSS-247, 6.2	Radiated Band Edges and Spurious Emission	PASS
7	15.407(g)	-	Frequency Stability	PASS

1.3. Channel List

Operated band in 5150 MHz ~ 5250MHz

4 channels are provided for 802.11a, 802.11n-HT20, and 802.11ac-VHT20

Channel	Frequency	Channel	Frequency
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

2 channels are provided for 802.11n-HT40 and 802.11ac-VHT40

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel are provided for 802.11ac-VHT80

Channel	Frequency	Channel	Frequency
42	5210 MHz	/	/

1 channel are provided for 802.11ac-VHT80

Channel	Frequency	Channel	Frequency
106	5530 MHz	/	/

Operated band in 5725 MHz ~ 5850MHz

5 channels are provided for 802.11a, 802.11n-HT20 and 802.11ac-VHT20

Channel	Frequency	Channel	Frequency
149	5745 MHz	161	5805 MHz
153	5765 MHz	165	5825 MHz
157	5785 MHz	/	/

2 channels are provided for 802.11n-HT40 and 802.11ac-VHT40

Channel	Frequency	Channel	Frequency
151	5755 MHz	159	5795 MHz

1 channel are provided for 802.11ac-VHT80

Channel	Frequency	Channel	Frequency
155	5775 MHz	/	/

1.4. Test environment and mode

Operating Environment	
Temperature	24 °C
Humidity	57 % RH
Atmospheric Pressure	1010 mbar
Test mode:	
Continuously transmitting mode	Keeps the EUT in 100% duty cycle transmitting with modulation in SISO and MIMO mode, duty cycle factor is not required.

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

For Frequency band 5150 ~ 5250 MHz			
Mode	Modulation scheme / bandwidth		
	5180 MHz	5220 MHz	5240 MHz
802.11a	6 Mbps	6 Mbps	6 Mbps
802.11n/ac – HT20	MCS 0	MCS 0	MCS 0
Frequency	5190 MHz		5230 MHz
802.11n/ac – HT40	MCS 0		MCS 0
Frequency	5210 MHz		
802.11ac – VHT80	MCS 0		
For Frequency band 5725 ~ 5850 MHz			
Mode	Modulation scheme / bandwidth		
	5745 MHz	5785 MHz	5825 MHz
802.11a	6 Mbps	6 Mbps	6 Mbps
802.11n/ac – HT20	MCS 0	MCS 0	MCS 0
Frequency	5755 MHz		5795 MHz
802.11n/ac – HT40	MCS 0		MCS 0
Frequency	5775 MHz		
802.11ac – VHT80	MCS 0		

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation modes or test configuration modes mentioned above was evaluated respectively.

Pretest Test Mode	Description
Mode 1	TX A Mode / CH36, CH44, CH48 (UNII-1)
Mode 2	TX N20 Mode / CH36, CH44, CH48 (UNII-1)
Mode 3	TX N40 Mode / CH38, CH46 (UNII-1)
Mode 4	TX AC20 Mode / CH36, CH44, CH48 (UNII-1)
Mode 5	TX AC40 Mode / CH38, CH46 (UNII-1)
Mode 6	TX AC80 Mode / CH42 (UNII-1)
Mode 7	TX A Mode / CH149, CH157, CH165 (UNII-3)
Mode 8	TX N20 Mode / CH149, CH157, CH165 (UNII-3)
Mode 9	TX N40 Mode / CH151, CH159 (UNII-3)
Mode 10	TX AC20 Mode / CH149, CH157, CH165 (UNII-3)
Mode 11	TX AC40 Mode / CH151, CH159 (UNII-3)
Mode 12	TX AC80 Mode / CH155 (UNII-3)
Mode 13	TX Mode

The EUT system operated these modes were found to be the worst case during the pre-scanning test as following:

For Conducted Test	
Final Test Mode	Description
Mode 13	TX Mode

For Radiated Test	
Final Test Mode	Description
Mode 1	TX A Mode / CH36, CH44, CH48 (UNII-1)
Mode 2	TX N20 Mode / CH36, CH44, CH48 (UNII-1)
Mode 3	TX N40 Mode / CH38, CH46 (UNII-1)
Mode 4	TX AC20 Mode / CH36, CH44, CH48 (UNII-1)
Mode 5	TX AC40 Mode / CH38, CH46 (UNII-1)
Mode 6	TX AC80 Mode / CH42 (UNII-1)
Mode 7	TX A Mode / CH149, CH157, CH165 (UNII-3)
Mode 8	TX N20 Mode / CH149, CH157, CH165 (UNII-3)
Mode 9	TX N40 Mode / CH151, CH159 (UNII-3)
Mode 10	TX AC20 Mode / CH149, CH157, CH165 (UNII-3)
Mode 11	TX AC40 Mode / CH151, CH159 (UNII-3)
Mode 12	TX AC80 Mode / CH155 (UNII-3)

1.5. Power level setup in software

Power level setup in software for 5G wifi			
UNII-1 (Antenna 0)			
Frequency (MHz)	5180	5220	5240
A mode	19	19	19
Frequency (MHz)	5180	5220	5240
N20 mode	1A	1A	1A
Frequency (MHz)	5190	5230	\
N40 mode	19	19	\
Frequency (MHz)	5180	5220	5240
AC20 mode	1D	1D	1D
Frequency (MHz)	5190	5230	\
AC40 mode	19	19	\
Frequency (MHz)	5210	\	\
AC80 mode	18	\	\

Power level setup in software for 5G wifi			
UNII-1 (Antenna 1)			
Frequency (MHz)	5180	5220	5240
A mode	1C	1C	1C
Frequency (MHz)	5180	5220	5240
N20 mode	18	18	18
Frequency (MHz)	5190	5230	\
N40 mode	19	19	\
Frequency (MHz)	5180	5220	5240
AC20 mode	1A	1A	1A
Frequency (MHz)	5190	5230	\
AC40 mode	19	19	\
Frequency (MHz)	5210	\	\
AC80 mode	1D	\	\

Power level setup in software for 5G wifi			
UNII-3 (Antenna 0)			
Frequency (MHz)	5745	5785	5825
A mode	1B	1B	1B
Frequency (MHz)	5745	5785	5825
N20 mode	1E	1E	1E
Frequency (MHz)	5755	5795	\
N40 mode	23	23	\
Frequency (MHz)	5745	5785	5825
AC20 mode	23	23	23
Frequency (MHz)	5755	5795	\
AC40 mode	23	23	\
Frequency (MHz)	5775	\	\
AC80 mode	20	\	\

Power level setup in software for 5G wifi			
UNII-3 (Antenna 1)			
Frequency (MHz)	5745	5785	5825
A mode	1B	1B	1B
Frequency (MHz)	5745	5785	5825
N20 mode	1E	1E	1E
Frequency (MHz)	5755	5795	\
N40 mode	23	23	\
Frequency (MHz)	5745	5785	5825
AC20 mode	23	23	23
Frequency (MHz)	5755	5795	\
AC40 mode	23	23	\
Frequency (MHz)	5775	\	\
AC80 mode	20	\	\

1.6. Laboratory Facilities

CNAS-Lab Code: L1659

CCIC-SET is a third party testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L1659.

FCC-Registration No.: CN5031

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Designation Number: CN5031, valid time is until December 31, 2018.

ISED Registration: 11185A-1

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11185A-1 on Aug. 04, 2016, valid time is until Aug. 03, 2019.

NVLAP Lab Code: 201008-0

CCIC-SET is a third party testing organization accredited by NVLAP according to ISO/IEC 17025. The accreditation certificate number is 201008-0.

1.6.1. Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15°C - 35°C
Relative Humidity (%):	30% -60%
Atmospheric Pressure (kPa):	86KPa-106KPa

2. 47 CFR Part 15C Requirements

2.1. Antenna requirement

2.1.1. Applicable Standard

According to FCC 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

And according to FCC 47 CFR Section 15.407(c), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

2.1.2. Antenna Information

Antenna Type	External
--------------	----------

2.1.3. Antenna Gain

Antenna	Gain(dBi)
0	5
1	5
0+1	8.01

Note: 1. for 802.11n/ac mode, antenna 0, 1 can transmit/receive simultaneously (MIMO mode), for 802.11a, both antennas 0, 1 can transmit/receive at single mode (SISO mode)

$$2. \text{ Directional gain} = G_{\text{ANT}} + 10\log(N_{\text{ANT}}) \text{ dBi}$$

2.1.4. Result: comply

The EUT has a permanently and irreplaceable attached antenna. Please refer to the EUT internal photos.

2.2. Output Power

2.2.1. Limit of Output Power

FCC 15.407(a)

The maximum conducted output power should not exceed:

Band	EUT Category	Limit
U-NII-1	☐ Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p. $\leq$ 125mW(21dBm) at any elevation angle above 30 degrees as measured from the horizon)
	☐ Fixed point-to-point Access device	1 Watt (30 dBm)
	☒ Indoor Access Point	1 Watt (30 dBm)
	☐ Mobile and portable client device	250mW (24 dBm)
U-NII-2A	☐	250mW (24 dBm) or 11dBm+10logB* Whichever is less.
U-NII-2C	☐	250mW (24 dBm) or 11dBm+10logB* Whichever is less.
U-NII-3	☒	1 Watt (30 dBm)

Note: B* is the 26 dB emission bandwidth in MHz.

RSS-247, 6.2

The maximum conducted output power shall not exceed:

Band	EUT Category	Limit
U-NII-1	☒	N/A
U-NII-2A	☐	250mW (24 dBm) or 11dBm+10logB* Whichever is less.
U-NII-2C	☐	250mW (24 dBm) or 11dBm+10logB* Whichever is less.
U-NII-3	☒	1 Watt (30 dBm)

Note: B* is the 99% emission bandwidth in MHz.

The maximum e.i.r.p. shall not exceed:

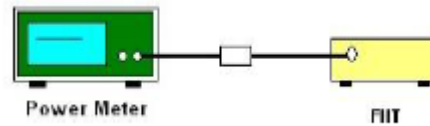
Band	EUT Category	Limit
U-NII-1	☒	200mW(23dBm) or 10dBm+10log B* Whichever is less.
U-NII-2A	☐	1W (30 dBm) or 17dBm+10logB* Whichever is less.
U-NII-2C	☐	1W (30 dBm) or 17dBm+10logB* Whichever is less.
U-NII-3	☒	N/A

Note: B* is the 99% emission bandwidth in MHz.

2.2.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.2.3. Test Setup



2.2.4. Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

3. Set to the maximum power setting and enable the EUT transmit continuously.

4. Measure the conducted output power and record the results in the test report.

2.2.5. Test Result

Conducted Power Test results of band U-NII-1 (5150 ~ 5250 MHz)

802.11a mode						
Frequency (MHz)	Conducted Output Power (dBm)		FCC Limit (dBm)	IC Limit (dBm)	Result	
	Antenna 0	Antenna 1				
5180	13.30	13.90	30	/	PASS	
5220	12.27	13.11	30	/	PASS	
5240	12.00	13.06	30	/	PASS	
802.11n-HT20 mode						
Test Frequency (MHz)	Conducted Output Power (dBm)			FCC Limit (dBm)	IC Limit (dBm)	Result
	Antenna 0	Antenna 1	Total			
5180	11.27	10.99	14.14	27.99	/	PASS
5220	11.81	10.17	14.08	27.99	/	PASS
5240	11.25	10.91	14.09	27.99	/	PASS
802.11n-HT40 mode						
Test Frequency (MHz)	Conducted Output Power (dBm)			FCC Limit (dBm)	IC Limit (dBm)	Result
	Antenna 0	Antenna 1	Total			
5190	11.67	10.81	14.27	27.99	/	PASS
5230	11.54	10.70	14.15	27.99	/	PASS
802.11ac-VHT20 mode						
Test Frequency (MHz)	Conducted Output Power (dBm)			FCC Limit (dBm)	IC Limit (dBm)	Result
	Antenna 0	Antenna 1	Total			
5180	11.53	10.68	14.14	27.99	/	PASS
5220	11.74	10.88	14.34	27.99	/	PASS
5240	11.65	10.88	14.29	27.99	/	PASS
802.11ac-VHT40 mode						
Test Frequency (MHz)	Conducted Output Power (dBm)			FCC Limit (dBm)	IC Limit (dBm)	Result
	Antenna 0	Antenna 1	Total			
5190	11.06	10.84	13.96	27.99	/	PASS
5230	11.70	10.28	14.06	27.99	/	PASS



802.11ac-VHT80 mode						
Test Frequency (MHz)	Conducted Output Power (dBm)			FCC Limit (dBm)	IC Limit (dBm)	Result
	Antenna 0	Antenna 1	Total			
5210	11.56	10.49	14.07	27.99	/	PASS

Note: For 802.11n/ac, antenna 0, 1 can transmit/receive simultaneously (MIMO mode), The MIMO antenna directional gain is 8.01dBi, the applicable output power limit shall be calculated as follows:

$$P_{\text{out}} = P_{\text{limit}} - (G_{\text{TX}} - 6) = 30 - (8.01 - 6) = 27.99 \text{ dBm}$$

Conducted Power Test results of band U-NII-3 (5725 ~ 5850 MHz)

802.11a mode						
Frequency (MHz)	Conducted Output Power (dBm)		FCC Limit (dBm)	IC Limit (dBm)	Result	
	Antenna 0	Antenna 1				
5745	13.05	11.61	30	30	PASS	
5785	12.37	13.50	30	30	PASS	
5825	11.51	12.64	30	30	PASS	
802.11n-HT20 mode						
Test Frequency (MHz)	Conducted Output Power (dBm)			FCC Limit (dBm)	IC Limit (dBm)	Result
	Antenna 0	Antenna 1	Total			
5745	13.30	12.69	16.02	27.99	27.99	PASS
5785	12.24	13.07	15.69	27.99	27.99	PASS
5825	12.93	12.17	15.58	27.99	27.99	PASS
802.11n-HT40 mode						
Test Frequency (MHz)	Conducted Output Power (dBm)			FCC Limit (dBm)	IC Limit (dBm)	Result
	Antenna 0	Antenna 1	Total			
5755	13.51	11.06	15.47	27.99	27.99	PASS
5795	13.73	11.30	15.69	27.99	27.99	PASS
802.11ac-VHT20 mode						
Test Frequency (MHz)	Conducted Output Power (dBm)			FCC Limit (dBm)	IC Limit (dBm)	Result
	Antenna 0	Antenna 1	Total			
5745	13.58	11.24	15.58	27.99	27.99	PASS
5785	12.13	13.39	15.82	27.99	27.99	PASS
5825	11.32	12.50	14.96	27.99	27.99	PASS
802.11ac-VHT40 mode						
Test Frequency (MHz)	Conducted Output Power (dBm)			FCC Limit (dBm)	IC Limit (dBm)	Result
	Antenna 0	Antenna 1	Total			
5755	13.65	11.18	15.60	27.99	27.99	PASS
5795	13.32	11.72	15.60	27.99	27.99	PASS



802.11ac-VHT80 mode						
Test Frequency (MHz)	Conducted Output Power (dBm)			FCC Limit (dBm)	IC Limit (dBm)	Result
	Antenna 0	Antenna 1	Total			
5775	13.26	13.24	16.26	27.99	27.99	PASS

Note: For 802.11n/ac, antenna 0, 1 can transmit/receive simultaneously (MIMO mode), The MIMO antenna directional gain is 8.01dBi, the applicable output power limit shall be calculated as follows:
 $P_{out} = P_{limit} - (GTX - 6) = 30 - (8.01 - 6) = 27.99\text{dBm}$

EIRP Power Test results of band U-NII-1 (5150 ~ 5250 MHz)

802.11a mode							
Frequency (MHz)	Max. Conducted Power (dBm)		Antenna Gain(dBi)	EIRP Total (dBm)		IC Limit (dBm)	Result
	Antenna 0	Antenna 1		Antenna 0	Antenna 1		
5180	13.30	13.90	5	18.30	18.90	22.28	PASS
5220	12.27	13.11	5	17.27	18.11	22.28	PASS
5240	12.00	13.06	5	17.00	18.06	22.28	PASS
802.11n-HT20 mode							
Test Frequency (MHz)	Conducted Power Total (dBm)		Antenna Gain(dBi)	EIRP Total (dBm)		IC Limit (dBm)	Result
5180	14.14		8.01	22.15		22.43	PASS
5220	14.08		8.01	22.09		22.43	PASS
5240	14.09		8.01	22.10		22.43	PASS
802.11n-HT40 mode							
Test Frequency (MHz)	Conducted Power Total (dBm)		Antenna Gain(dBi)	EIRP Total (dBm)		IC Limit (dBm)	Result
5190	14.27		8.01	22.28		23	PASS
5230	14.15		8.01	22.16		23	PASS
802.11ac-VHT20 mode							
Test Frequency (MHz)	Conducted Power Total (dBm)		Antenna Gain(dBi)	EIRP Total (dBm)		IC Limit (dBm)	Result
5180	14.14		8.01	22.15		22.46	PASS
5220	14.34		8.01	22.35		22.46	PASS
5240	14.29		8.01	22.30		22.46	PASS
802.11ac-VHT40 mode							
Test Frequency (MHz)	Conducted Power Total (dBm)		Antenna Gain(dBi)	EIRP Total (dBm)		IC Limit (dBm)	Result
5190	13.96		8.01	21.97		23	PASS
5230	14.06		8.01	22.07		23	PASS



802.11ac-VHT80 mode					
Test Frequency (MHz)	Conducted Power Total (dBm)	Antenna Gain(dBi)	EIRP Total (dBm)	IC Limit (dBm)	Result
5210	14.07	8.01	22.08	23	PASS

Note: In IC Standard, For other devices, the maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz

2.3. Emission Bandwidth

2.3.1. Limit of Bandwidth

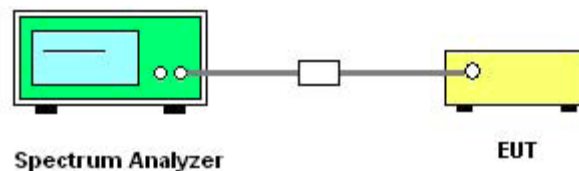
There is no limit bandwidth for band U-NII-1, U-NII-2A and U-NII-2C.

The minimum of 6dB bandwidth measurement is 0.5 MHz for U-NII-3.

2.3.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.3.3. Test Setup



2.3.4. Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.

3. Set to the maximum power setting and enable the EUT transmit continuously.

4. For 26dB bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) = approximately 1%EBW, VBW $\geq$ 3RBW, Detector = Peak, Trace mode = max hold

Span > 26 dB bandwidth and Sweep time = auto

5. Mark the peak frequency and -26dB (upper and lower) frequency.

6. For 6 Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) = 100kHz
VBW = 300 kHz, Detector = Peak, Trace mode = max hold

7. Mark the peak frequency and -6dB (upper and lower) frequency.

8. For 99% Occupied Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) = 1% to 5% of the OBW, VBW $\geq$ 3RBW, Detector = Peak, Trace mode = max hold, Span = 1.5 times to 5 times the OBW.

8. Measure and record the worst results in the test report.

2.3.5. Test Results Bandwidth

Test results of band U-NII-1 (5150 ~ 5250 MHz)

U-NII-1 99% Occupied Bandwidth				
Mode	Test Frequency (MHz)	Ant	99% Occupied Bandwidth (MHz)	Result
802.11n (20MHz)	5180	Ant0	17.641	Pass
802.11n (20MHz)	5180	Ant1	17.501	Pass
802.11n (20MHz)	5220	Ant0	17.737	Pass
802.11n (20MHz)	5220	Ant1	17.828	Pass
802.11n (20MHz)	5240	Ant0	17.646	Pass
802.11n (20MHz)	5240	Ant1	17.714	Pass
802.11n (40MHz)	5190	Ant0	36.061	Pass
802.11n (40MHz)	5190	Ant1	36.058	Pass
802.11n (40MHz)	5230	Ant0	36.073	Pass
802.11n (40MHz)	5230	Ant1	36.325	Pass
802.11ac (20MHz)	5180	Ant0	17.638	Pass
802.11ac (20MHz)	5180	Ant1	17.665	Pass
802.11ac (20MHz)	5220	Ant0	17.750	Pass
802.11ac (20MHz)	5220	Ant1	17.729	Pass
802.11ac (20MHz)	5240	Ant0	17.668	Pass
802.11ac (20MHz)	5240	Ant1	17.769	Pass
802.11ac (40MHz)	5190	Ant0	36.042	Pass
802.11ac (40MHz)	5190	Ant1	36.062	Pass
802.11ac (40MHz)	5230	Ant0	36.275	Pass
802.11ac (40MHz)	5230	Ant1	36.158	Pass
802.11ac (80MHz)	5210	Ant0	75.056	Pass
802.11ac (80MHz)	5210	Ant1	75.011	Pass
802.11a (20MHz)	5180	Ant0	16.904	Pass
802.11a (20MHz)	5180	Ant1	17.558	Pass
802.11a (20MHz)	5220	Ant0	16.692	Pass
802.11a (20MHz)	5220	Ant1	17.586	Pass
802.11a (20MHz)	5240	Ant0	17.737	Pass
802.11a (20MHz)	5240	Ant1	16.971	Pass

Test results of band U-NII-3 (5725 ~ 5850 MHz)

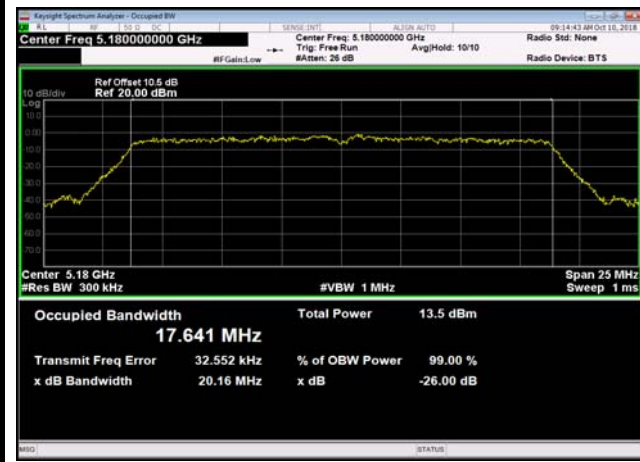
U-NII-3 99% Occupied Bandwidth				
Mode	Test Frequency (MHz)	Ant	99% Occupied Bandwidth (MHz)	Result
802.11n (20MHz)	5745	Ant0	17.683	Pass
802.11n (20MHz)	5745	Ant1	20.105	Pass
802.11n (20MHz)	5785	Ant0	17.654	Pass
802.11n (20MHz)	5785	Ant1	17.701	Pass
802.11n (20MHz)	5825	Ant0	17.654	Pass
802.11n (20MHz)	5825	Ant1	18.334	Pass
802.11n (40MHz)	5755	Ant0	36.324	Pass
802.11n (40MHz)	5755	Ant1	36.380	Pass
802.11n (40MHz)	5795	Ant0	36.423	Pass
802.11n (40MHz)	5795	Ant1	36.613	Pass
802.11ac (20MHz)	5745	Ant0	17.698	Pass
802.11ac (20MHz)	5745	Ant1	18.293	Pass
802.11ac (20MHz)	5785	Ant0	17.696	Pass
802.11ac (20MHz)	5785	Ant1	18.211	Pass
802.11ac (20MHz)	5825	Ant0	17.675	Pass
802.11ac (20MHz)	5825	Ant1	18.607	Pass
802.11ac (40MHz)	5755	Ant0	36.088	Pass
802.11ac (40MHz)	5755	Ant1	36.486	Pass
802.11ac (40MHz)	5795	Ant0	36.414	Pass
802.11ac (40MHz)	5795	Ant1	36.619	Pass
802.11ac (80MHz)	5775	Ant0	75.390	Pass
802.11ac (80MHz)	5775	Ant1	76.344	Pass
802.11a (20MHz)	5745	Ant0	16.718	Pass
802.11a (20MHz)	5745	Ant1	16.932	Pass
802.11a (20MHz)	5785	Ant0	16.741	Pass
802.11a (20MHz)	5785	Ant1	16.991	Pass
802.11a (20MHz)	5825	Ant0	16.841	Pass
802.11a (20MHz)	5825	Ant1	17.527	Pass

U-NII-3 Occupied 6 dB Bandwidth				
Mode	Test Frequency (MHz)	Ant	6dB Occupied Bandwidth (MHz)	Result
802.11n (20MHz)	5745	Ant0	16.40	Pass
802.11n (20MHz)	5745	Ant1	17.64	Pass
802.11n (20MHz)	5785	Ant0	16.52	Pass
802.11n (20MHz)	5785	Ant1	17.63	Pass
802.11n (20MHz)	5825	Ant0	16.46	Pass
802.11n (20MHz)	5825	Ant1	17.63	Pass
802.11n (40MHz)	5755	Ant0	36.40	Pass
802.11n (40MHz)	5755	Ant1	36.40	Pass
802.11n (40MHz)	5795	Ant0	36.41	Pass
802.11n (40MHz)	5795	Ant1	36.38	Pass
802.11ac (20MHz)	5745	Ant0	17.64	Pass
802.11ac (20MHz)	5745	Ant1	17.63	Pass
802.11ac (20MHz)	5785	Ant0	17.63	Pass
802.11ac (20MHz)	5785	Ant1	17.65	Pass
802.11ac (20MHz)	5825	Ant0	17.62	Pass
802.11ac (20MHz)	5825	Ant1	17.64	Pass
802.11ac (40MHz)	5755	Ant0	36.41	Pass
802.11ac (40MHz)	5755	Ant1	36.39	Pass
802.11ac (40MHz)	5795	Ant0	36.40	Pass
802.11ac (40MHz)	5795	Ant1	36.41	Pass
802.11ac (80MHz)	5775	Ant0	75.23	Pass
802.11ac (80MHz)	5775	Ant1	75.35	Pass
802.11a (20MHz)	5745	Ant0	16.42	Pass
802.11a (20MHz)	5745	Ant1	16.42	Pass
802.11a (20MHz)	5785	Ant0	16.42	Pass
802.11a (20MHz)	5785	Ant1	16.40	Pass
802.11a (20MHz)	5825	Ant0	16.49	Pass
802.11a (20MHz)	5825	Ant1	16.40	Pass

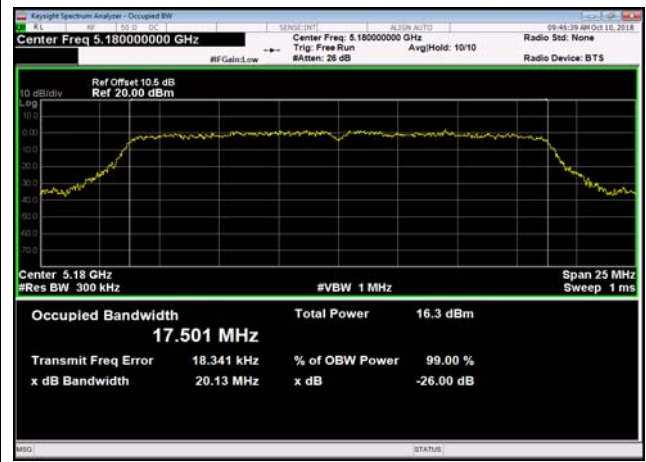
2.3.6. Test Results (plots) of Bandwidth

U-NII-1 (5150 ~ 5250 MHz)

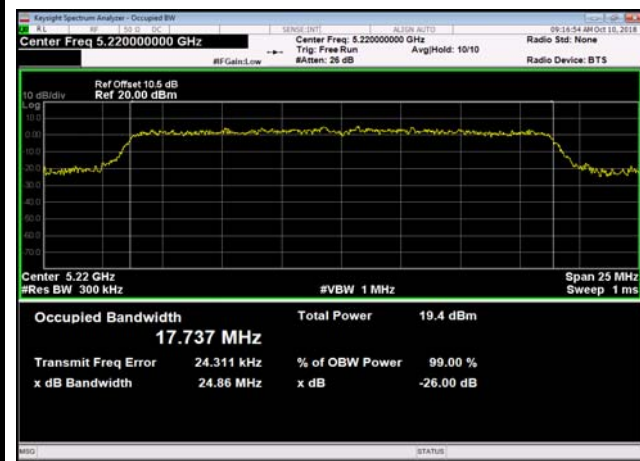
U-NII-1 99% Bandwidth-802.11n(20MHz)
,5180MHz,Ant0



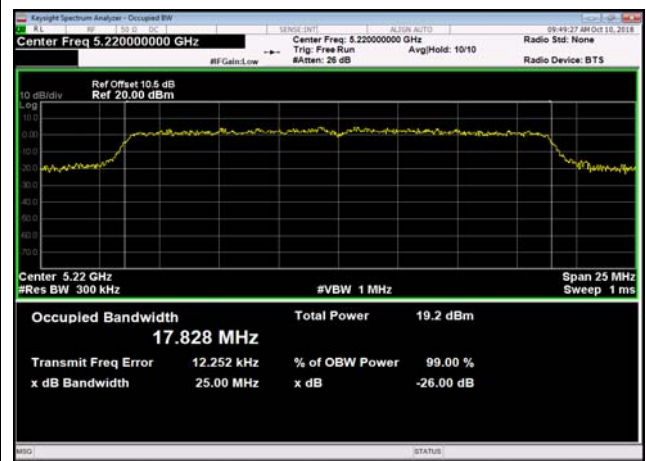
U-NII-1 99% Bandwidth-802.11n(20MHz)
,5180MHz,Ant1



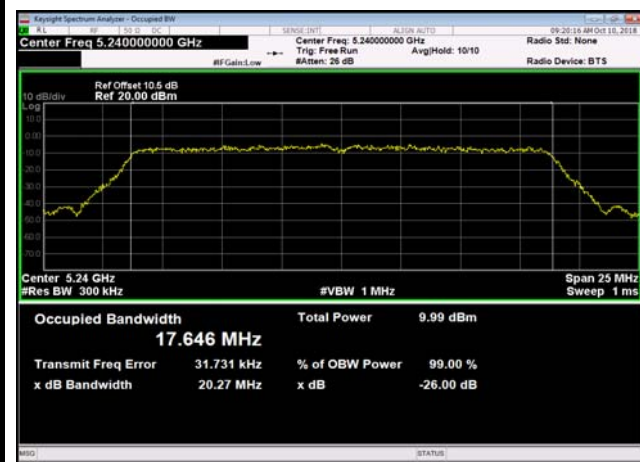
U-NII-1 99% Bandwidth-802.11n(20MHz)
,5220MHz,Ant0



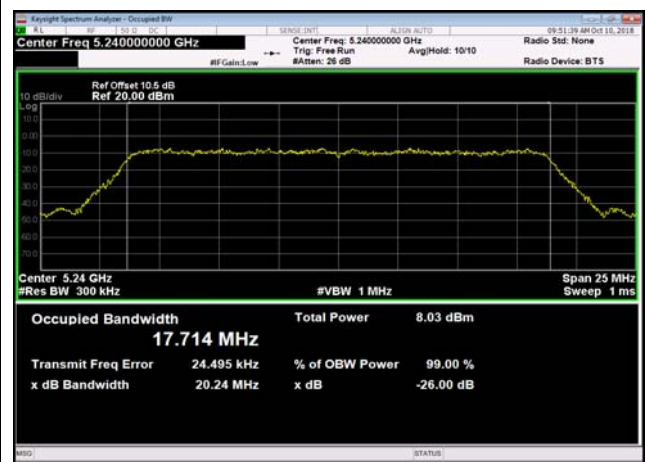
U-NII-1 99% Bandwidth-802.11n(20MHz)
,5220MHz,Ant1



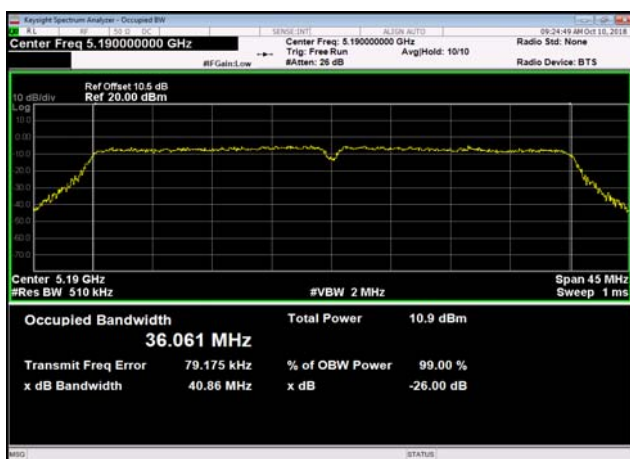
U-NII-1 99% Bandwidth-802.11n(20MHz)
,5240MHz,Ant0



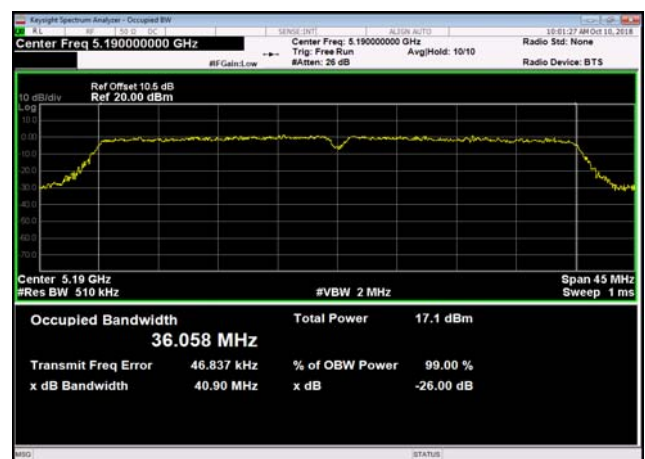
U-NII-1 99% Bandwidth-802.11n(20MHz)
,5240MHz,Ant1



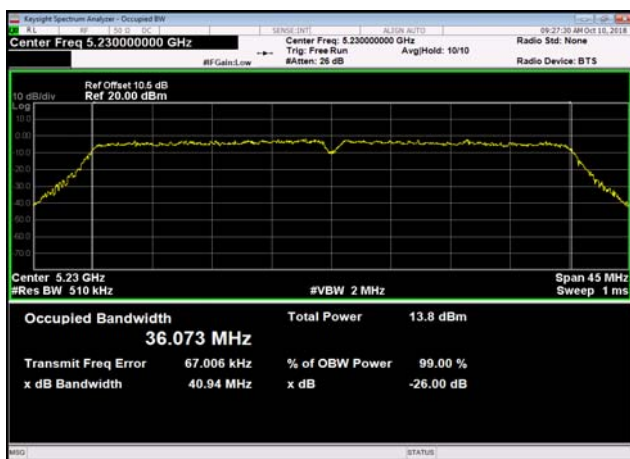
U-NII-1 99% Bandwidth-802.11n(40MHz)
,5190MHz,Ant0



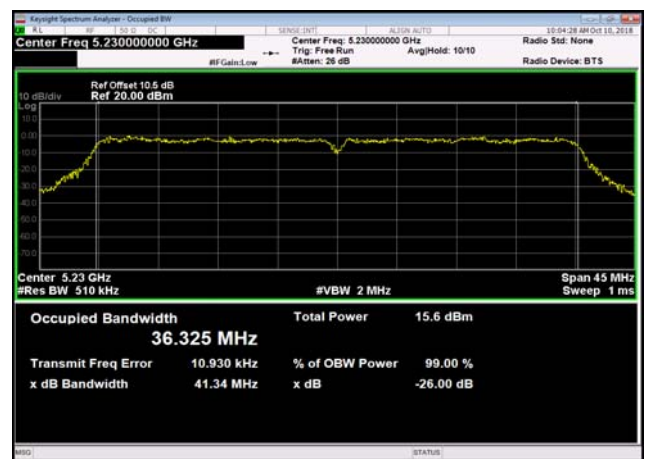
U-NII-1 99% Bandwidth-802.11n(40MHz)
,5190MHz,Ant1



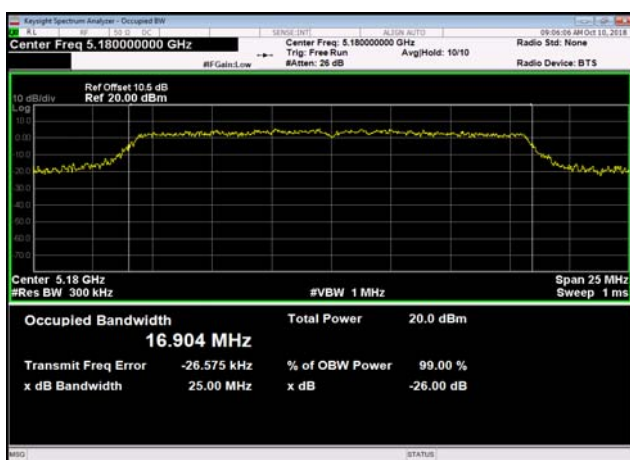
U-NII-1 99% Bandwidth-802.11n(40MHz)
,5230MHz,Ant0



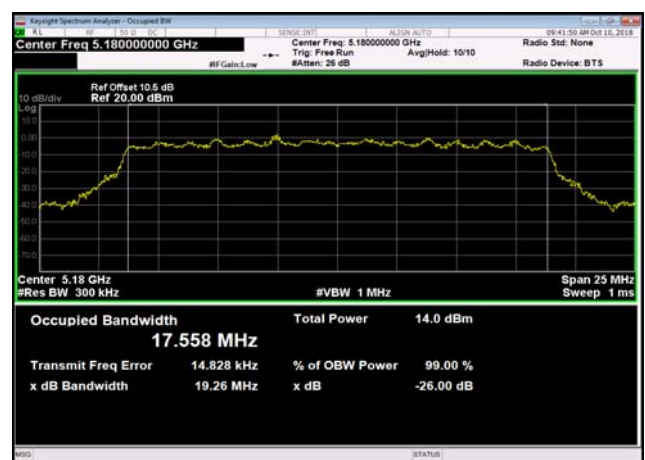
U-NII-1 99% Bandwidth-802.11n(40MHz)
,5230MHz,Ant1



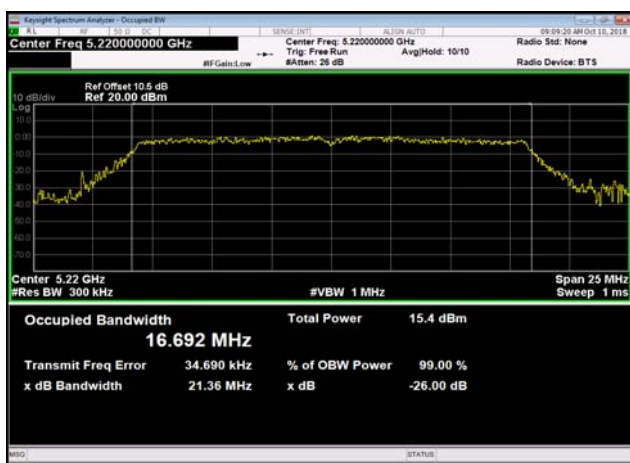
U-NII-1 99% Bandwidth-802.11a(20MHz)
,5180MHz,Ant0



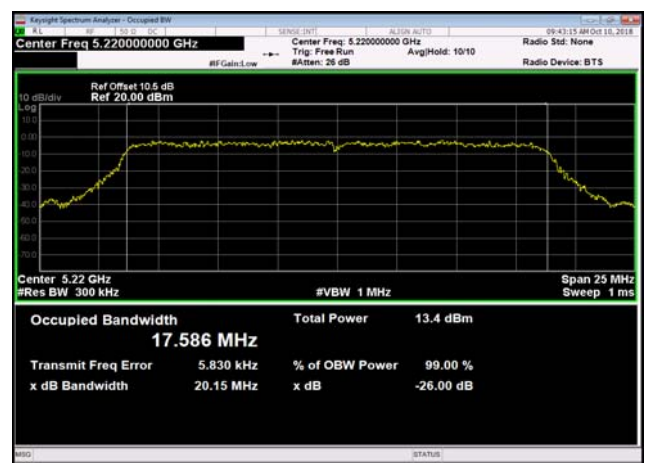
U-NII-1 99% Bandwidth-802.11a(20MHz)
,5180MHz,Ant1



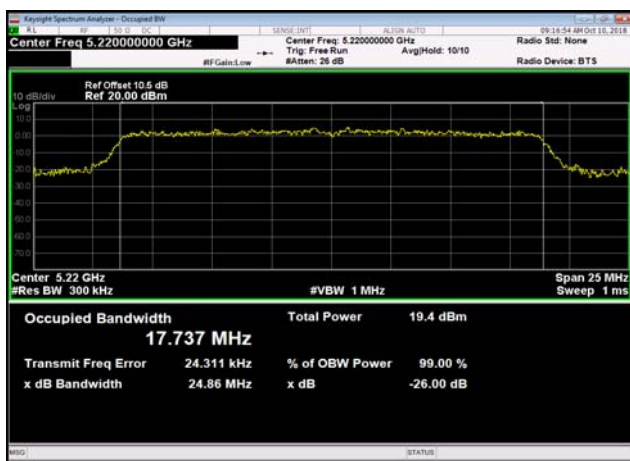
U-NII-1 99% Bandwidth-802.11a(20MHz)
,5220MHz,Ant0



U-NII-1 99% Bandwidth-802.11a(20MHz)
,5220MHz,Ant1



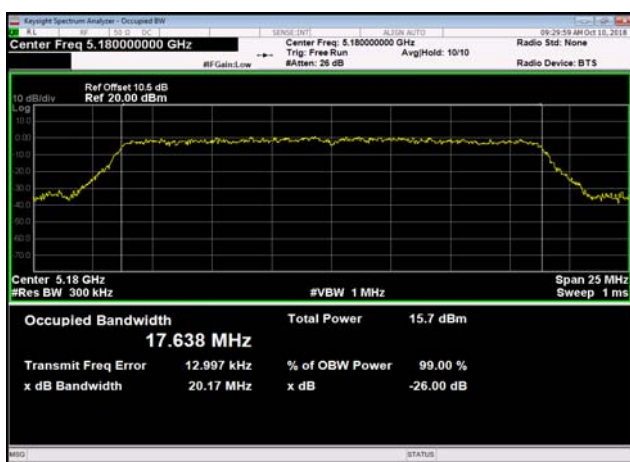
U-NII-1 99% Bandwidth-802.11a(20MHz)
,5240MHz,Ant0



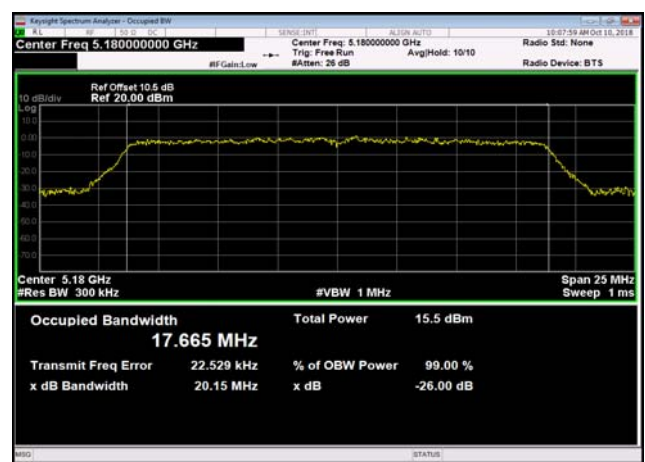
U-NII-1 99% Bandwidth-802.11a(20MHz)
,5240MHz,Ant1



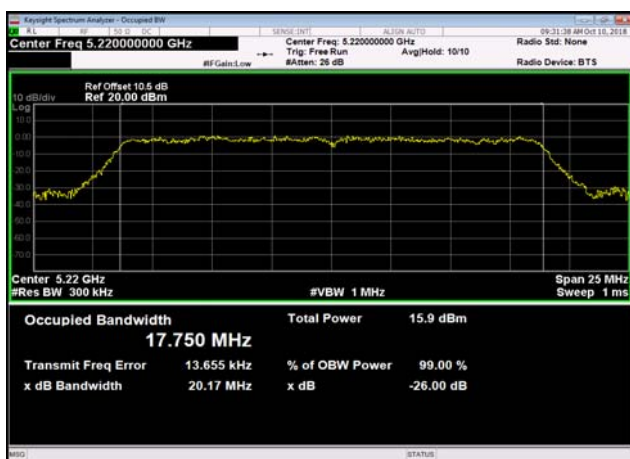
U-NII-1 99% Bandwidth-802.11ac(20MHz)
,5180MHz,Ant0



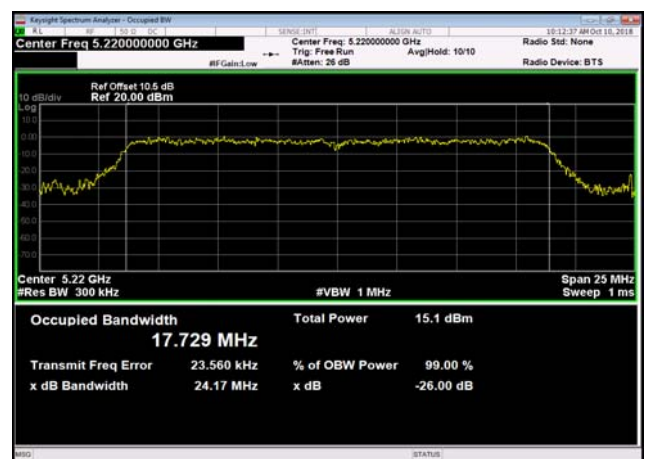
U-NII-1 99% Bandwidth-802.11ac(20MHz)
,5180MHz,Ant1



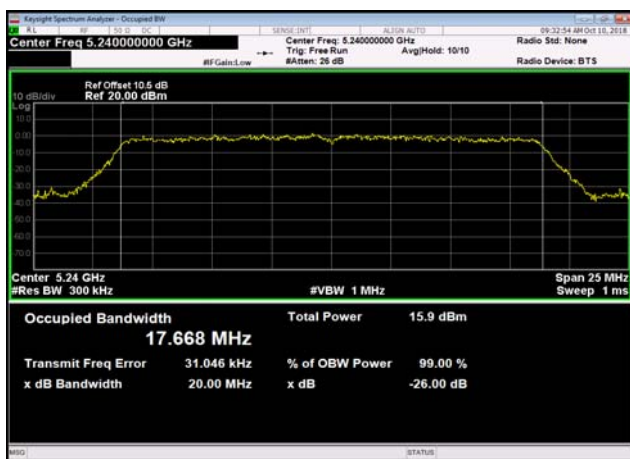
U-NII-1 99% Bandwidth-802.11ac(20MHz)
,5220MHz,Ant0



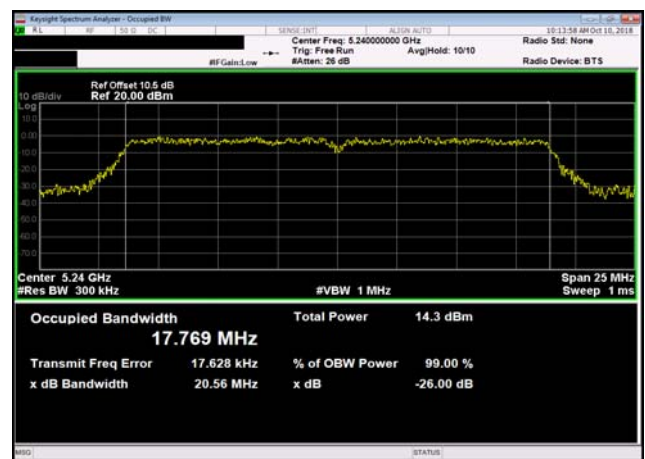
U-NII-1 99% Bandwidth-802.11ac(20MHz)
,5220MHz,Ant1



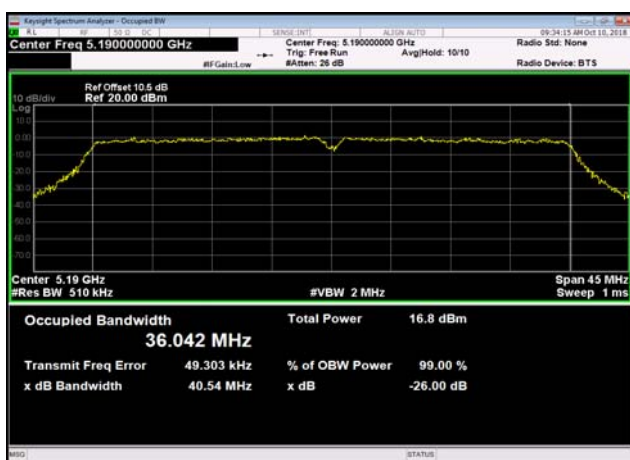
U-NII-1 99% Bandwidth-802.11ac(20MHz)
,5240MHz,Ant0



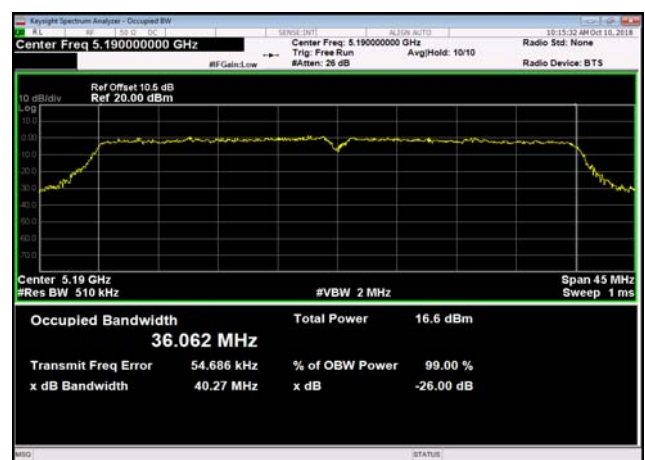
U-NII-1 99% Bandwidth-802.11ac(20MHz)
,5240MHz,Ant1



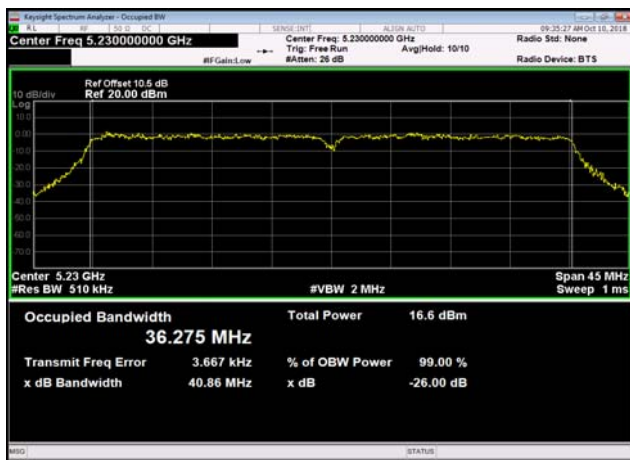
U-NII-1 99% Bandwidth-802.11ac(40MHz)
,5190MHz,Ant0



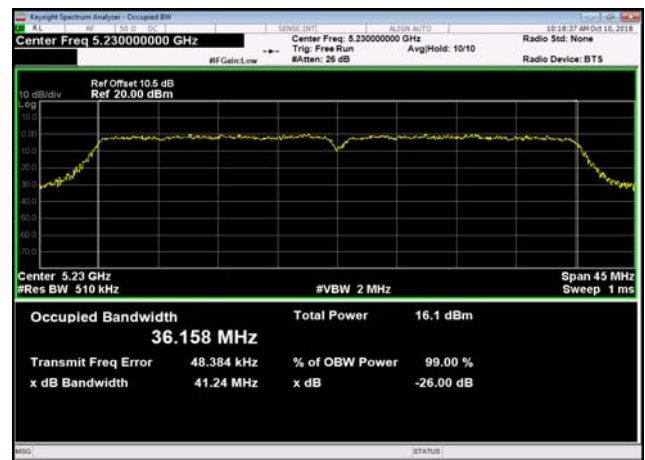
U-NII-1 99% Bandwidth-802.11ac(40MHz)
,5190MHz,Ant1



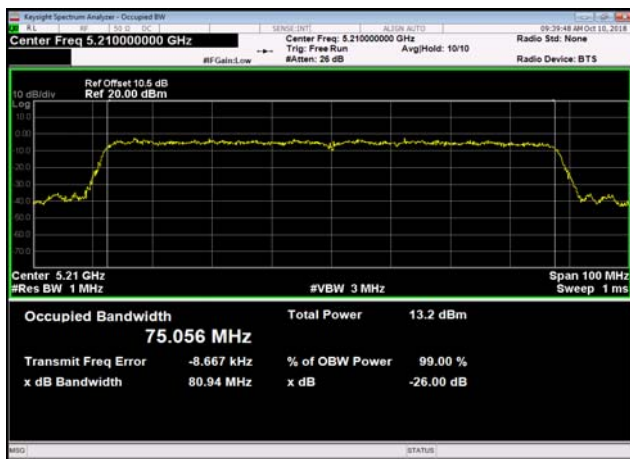
U-NII-1 99% Bandwidth-802.11ac(40MHz)
,5230MHz,Ant0



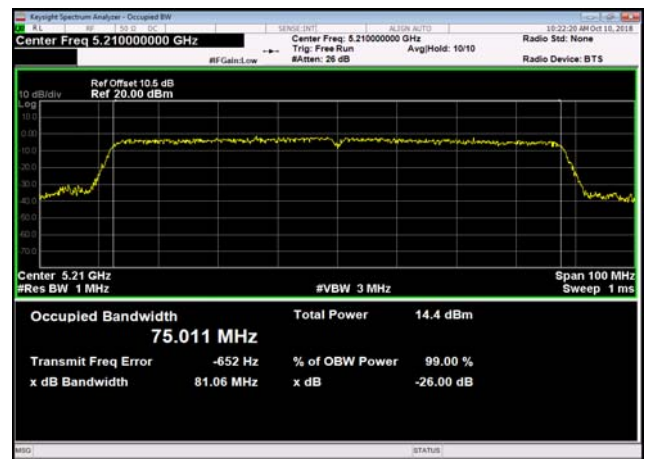
U-NII-1 99% Bandwidth-802.11ac(40MHz)
,5230MHz,Ant1



U-NII-1 99% Bandwidth-802.11ac(80MHz)
,5210MHz,Ant0

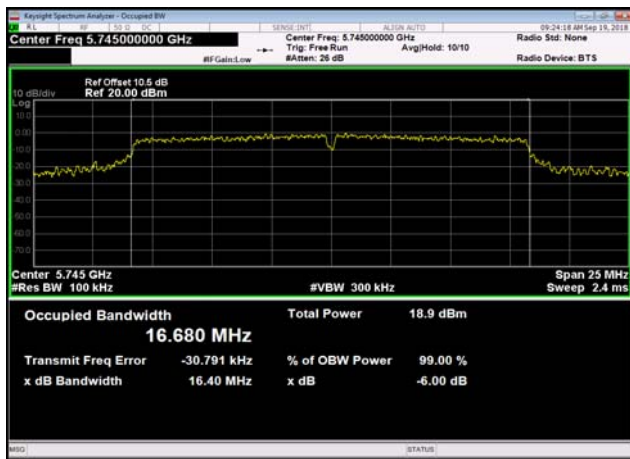


U-NII-1 99% Bandwidth-802.11ac(80MHz)
,5210MHz,Ant1

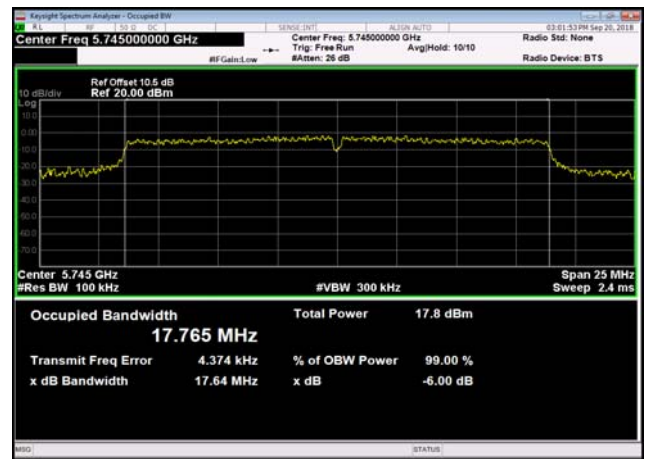


U-NII-3 (5725 ~ 5850 MHz)

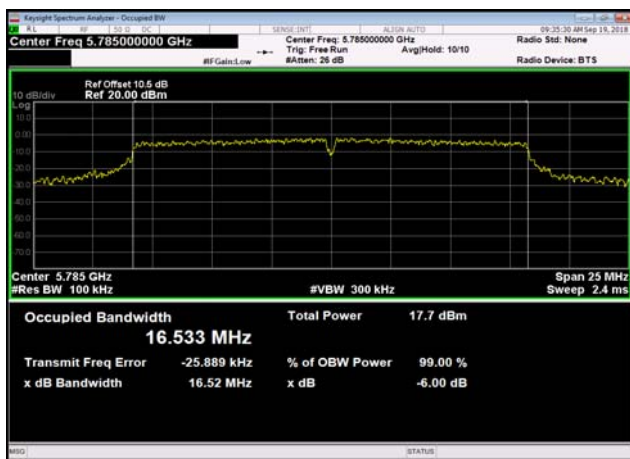
U-NII-3 6dB Bandwidth-802.11n(20MHz)
,5745MHz,Ant0



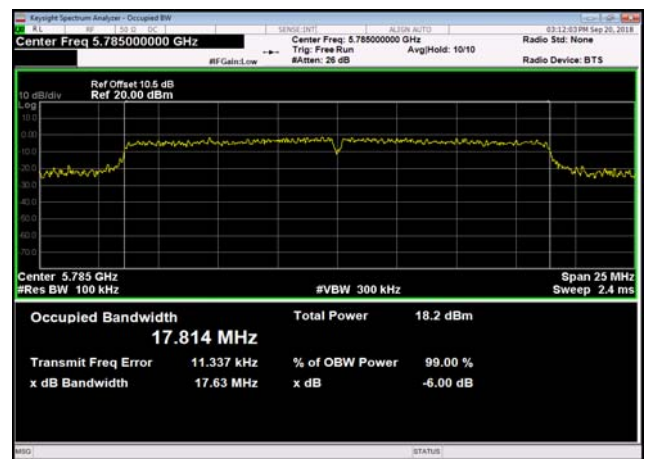
U-NII-3 6dB Bandwidth-802.11n(20MHz)
,5745MHz,Ant1



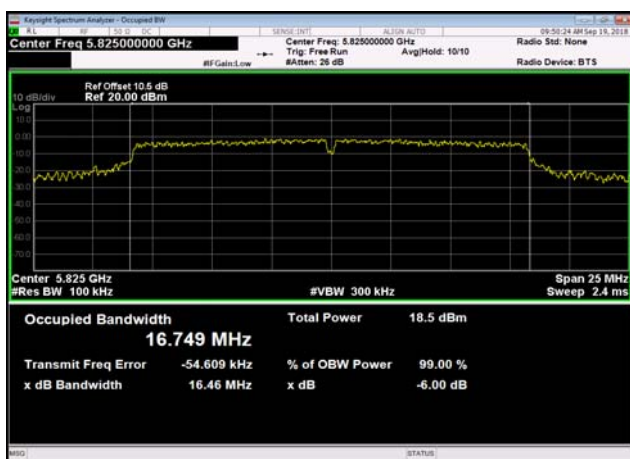
U-NII-3 6dB Bandwidth-802.11n(20MHz)
,5785MHz,Ant0



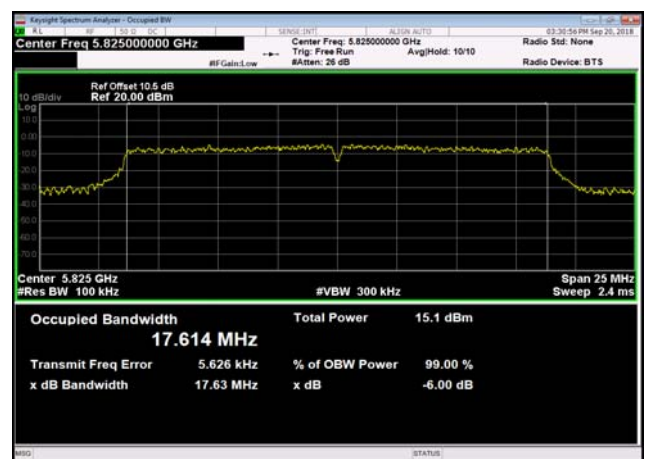
U-NII-3 6dB Bandwidth-802.11n(20MHz)
,5785MHz,Ant1

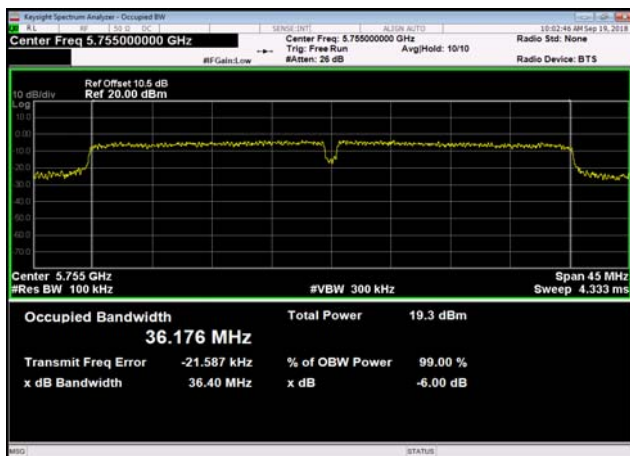
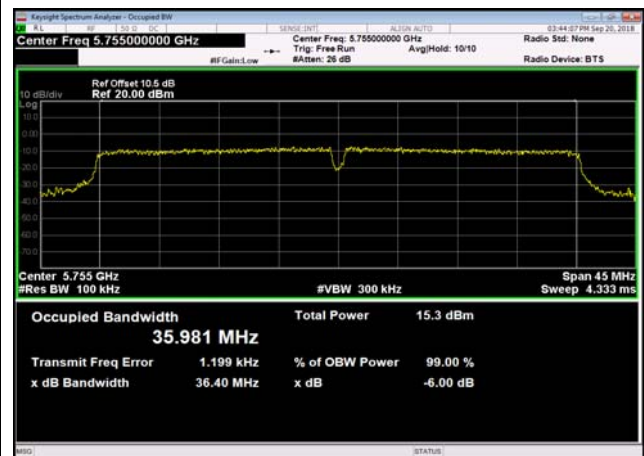
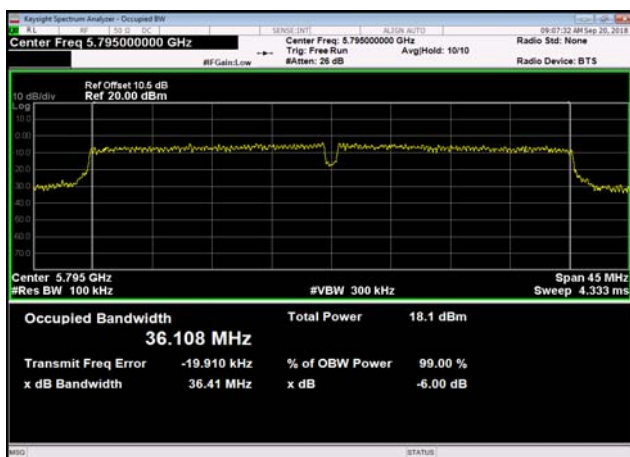
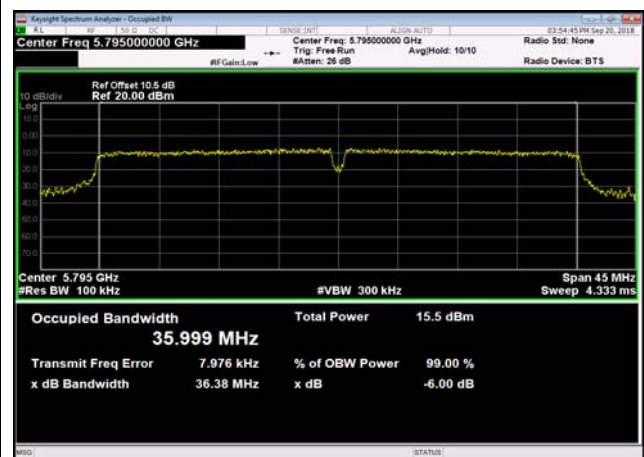
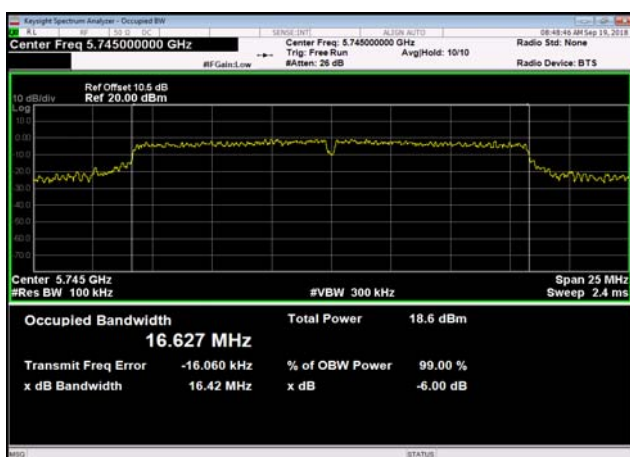
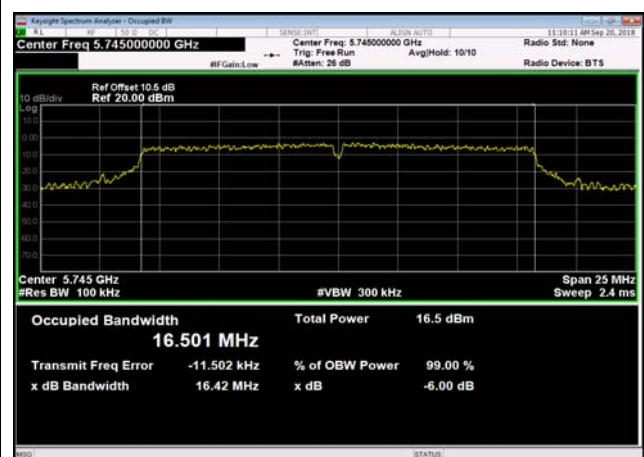


U-NII-3 6dB Bandwidth-802.11n(20MHz)
,5825MHz,Ant0



U-NII-3 6dB Bandwidth-802.11n(20MHz)
,5825MHz,Ant1



U-NII-3 6dB Bandwidth-802.11n(40MHz)
,5755MHz,Ant0U-NII-3 6dB Bandwidth-802.11n(40MHz)
,5755MHz,Ant1U-NII-3 6dB Bandwidth-802.11n(40MHz)
,5795MHz,Ant0U-NII-3 6dB Bandwidth-802.11n(40MHz)
,5795MHz,Ant1U-NII-3 6dB Bandwidth-802.11a(20MHz)
,5745MHz,Ant0U-NII-3 6dB Bandwidth-802.11a(20MHz)
,5745MHz,Ant1

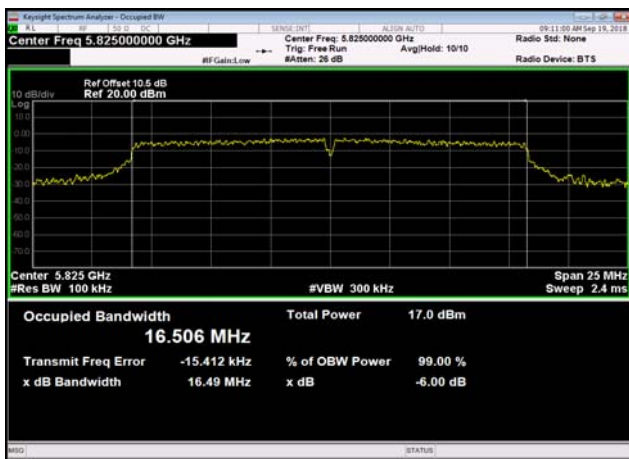
U-NII-3 6dB Bandwidth-802.11a(20MHz)
,5785MHz,Ant0



U-NII-3 6dB Bandwidth-802.11a(20MHz)
,5785MHz,Ant1



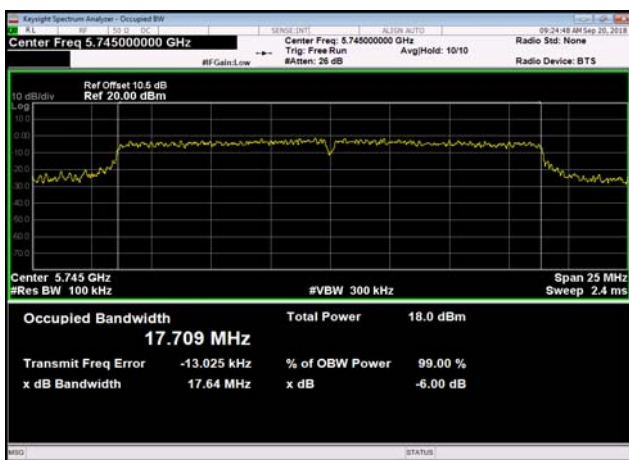
U-NII-3 6dB Bandwidth-802.11a(20MHz)
,5825MHz,Ant0



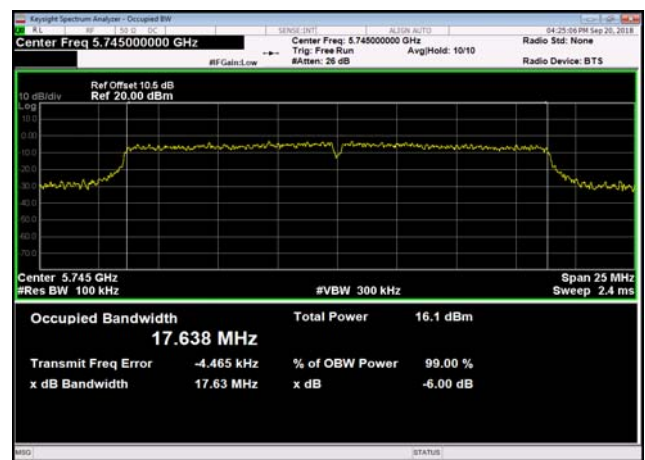
U-NII-3 6dB Bandwidth-802.11a(20MHz)
,5825MHz,Ant1



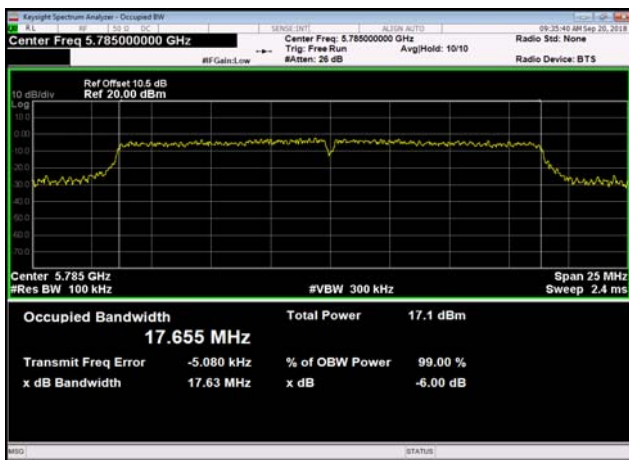
U-NII-3 6dB Bandwidth-802.11ac(20MHz)
,5745MHz,Ant0



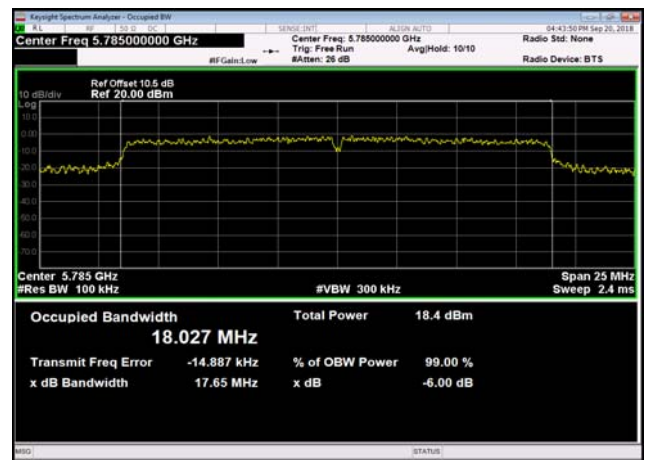
U-NII-3 6dB Bandwidth-802.11ac(20MHz)
,5745MHz,Ant1



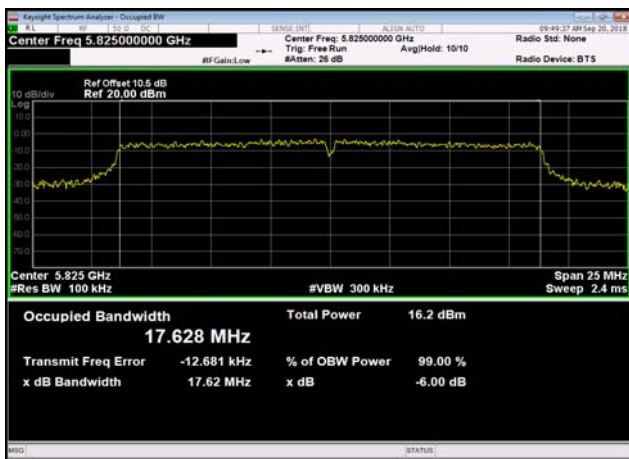
U-NII-3 6dB Bandwidth-802.11ac(20MHz)
,5785MHz,Ant0



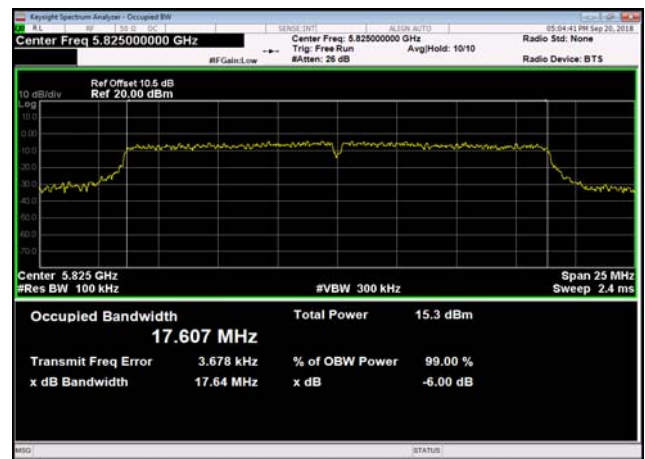
U-NII-3 6dB Bandwidth-802.11ac(20MHz)
,5785MHz,Ant1



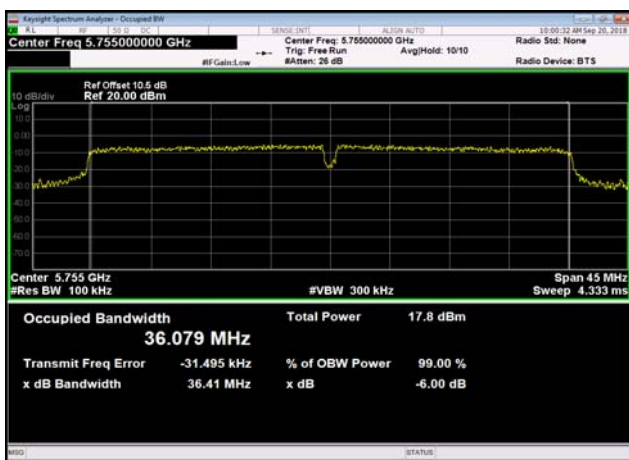
U-NII-3 6dB Bandwidth-802.11ac(20MHz)
,5825MHz,Ant0



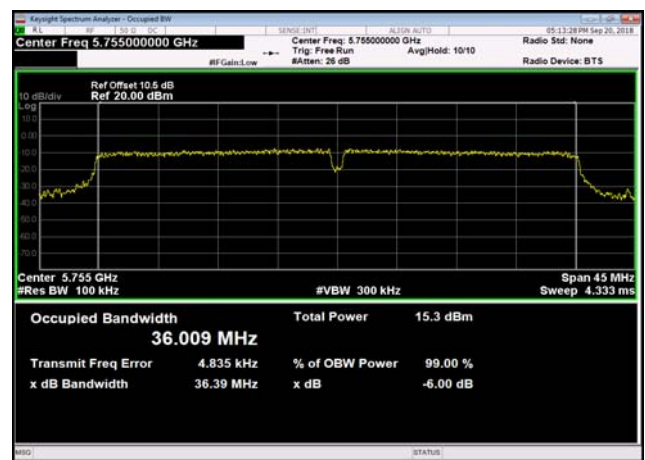
U-NII-3 6dB Bandwidth-802.11ac(20MHz)
,5825MHz,Ant1

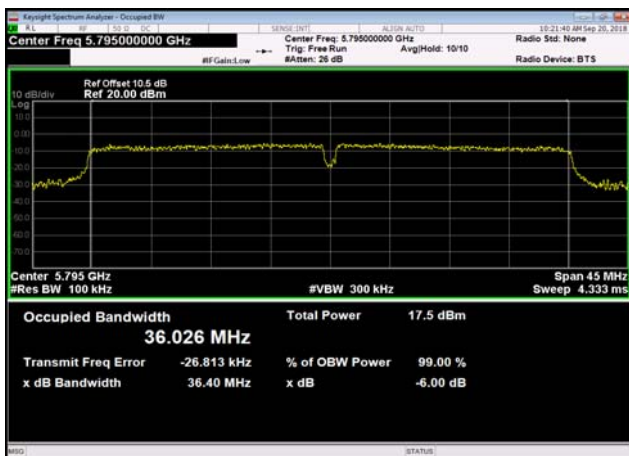
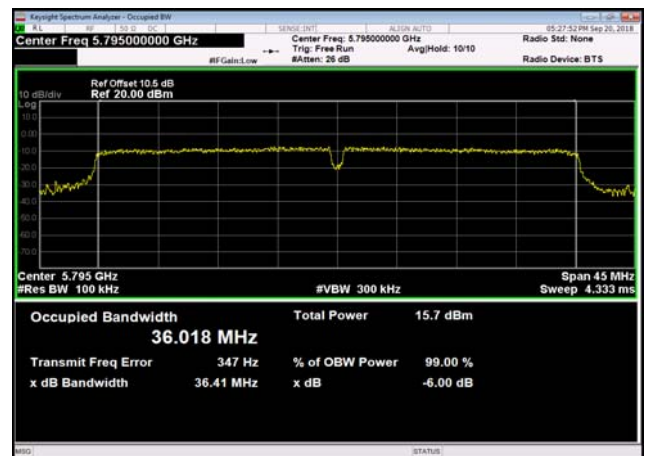
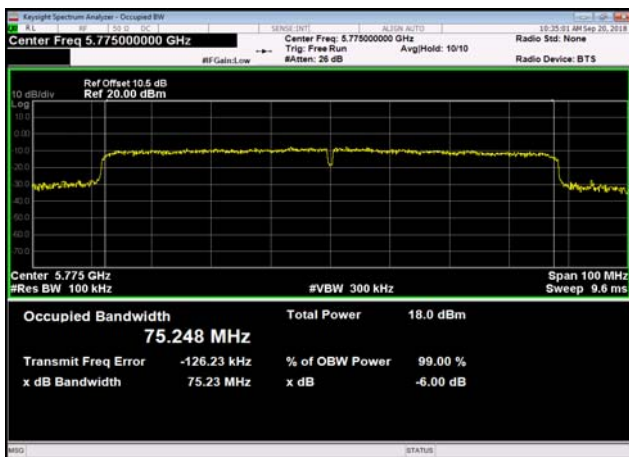
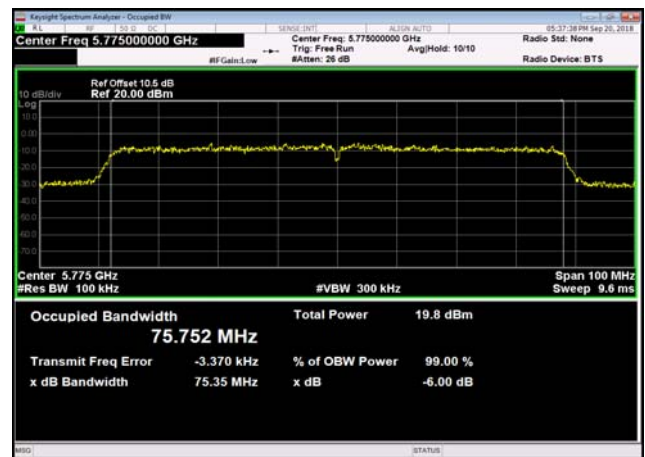


U-NII-3 6dB Bandwidth-802.11ac(40MHz)
,5755MHz,Ant0

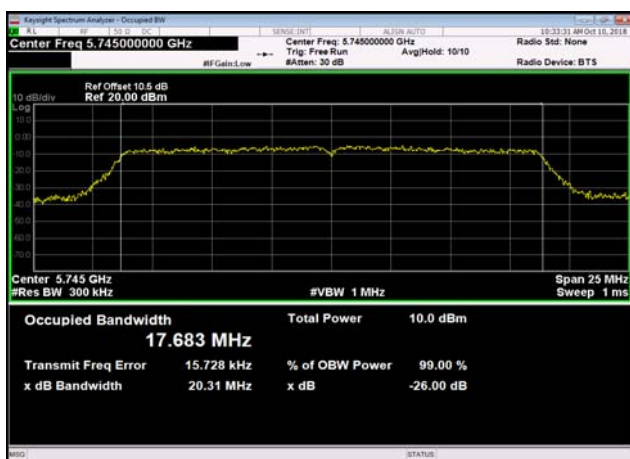


U-NII-3 6dB Bandwidth-802.11ac(40MHz)
,5755MHz,Ant1

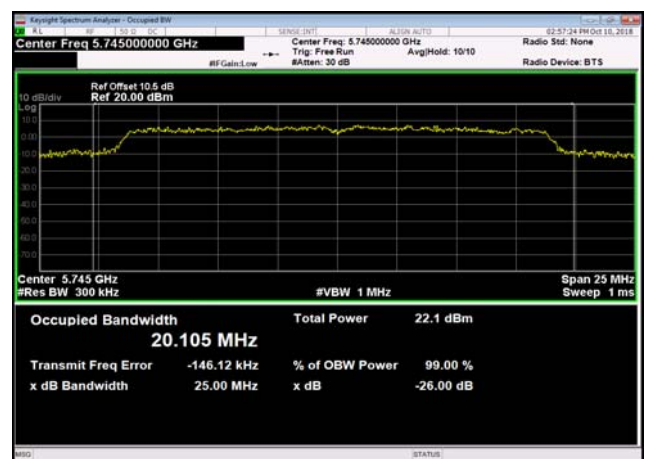


U-NII-3 6dB Bandwidth-802.11ac(40MHz)
,5795MHz,Ant0U-NII-3 6dB Bandwidth-802.11ac(40MHz)
,5795MHz,Ant1U-NII-3 6dB Bandwidth-802.11ac(80MHz)
,5775MHz,Ant0U-NII-3 6dB Bandwidth-802.11ac(80MHz)
,5775MHz,Ant1

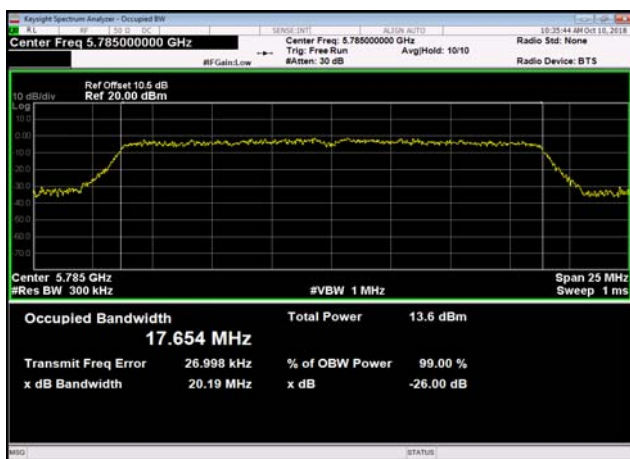
U-NII-3 99% Bandwidth-802.11n(20MHz)
,5745MHz,Ant0



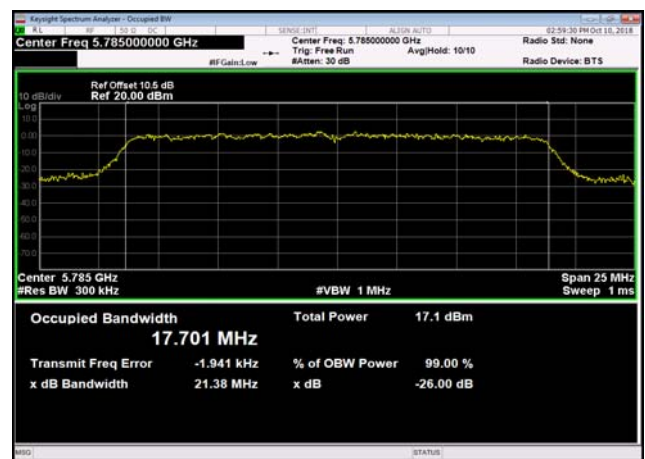
U-NII-3 99% Bandwidth-802.11n(20MHz)
,5745MHz,Ant1



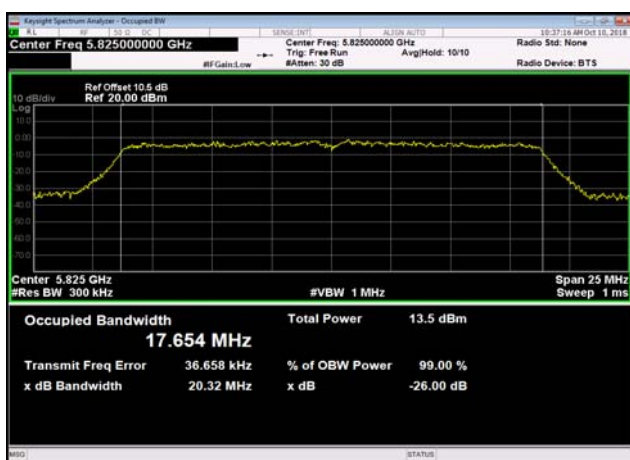
U-NII-3 99% Bandwidth-802.11n(20MHz)
,5785MHz,Ant0



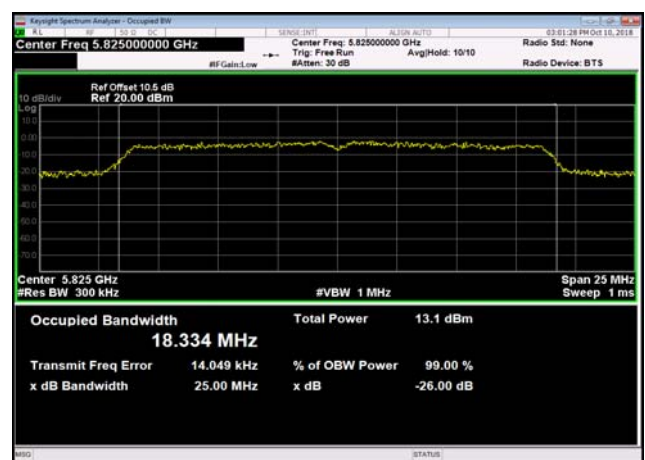
U-NII-3 99% Bandwidth-802.11n(20MHz)
,5785MHz,Ant1



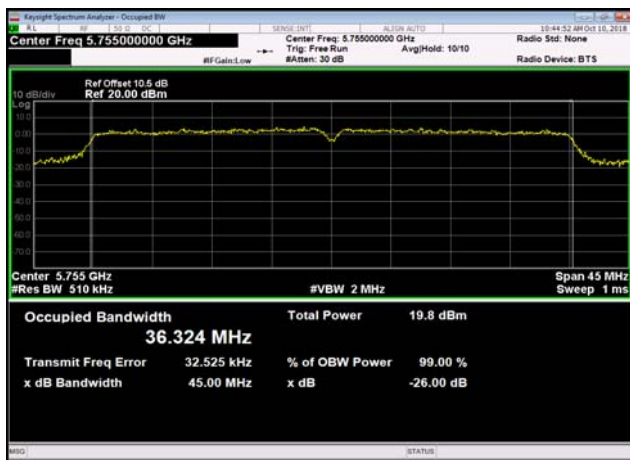
U-NII-3 99% Bandwidth-802.11n(20MHz)
,5825MHz,Ant0



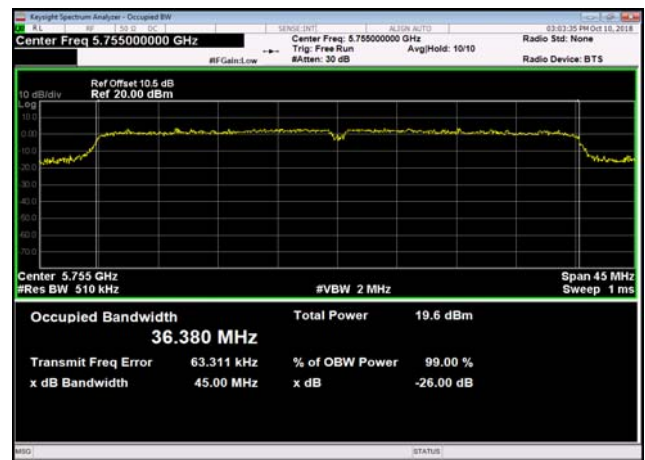
U-NII-3 99% Bandwidth-802.11n(20MHz)
,5825MHz,Ant1



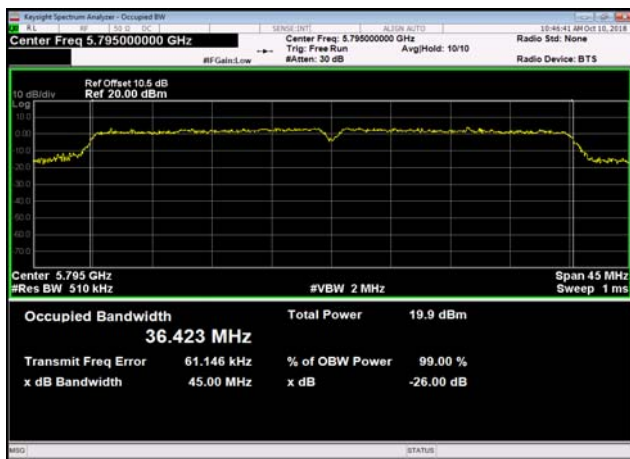
U-NII-3 99% Bandwidth-802.11n(40MHz)
,5755MHz,Ant0



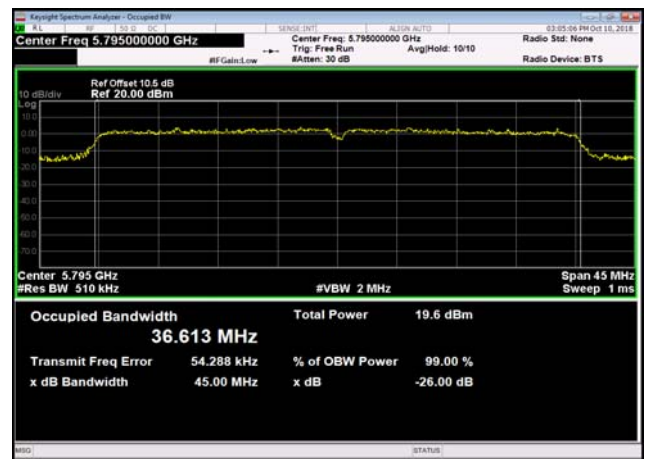
U-NII-3 99% Bandwidth-802.11n(40MHz)
,5755MHz,Ant1



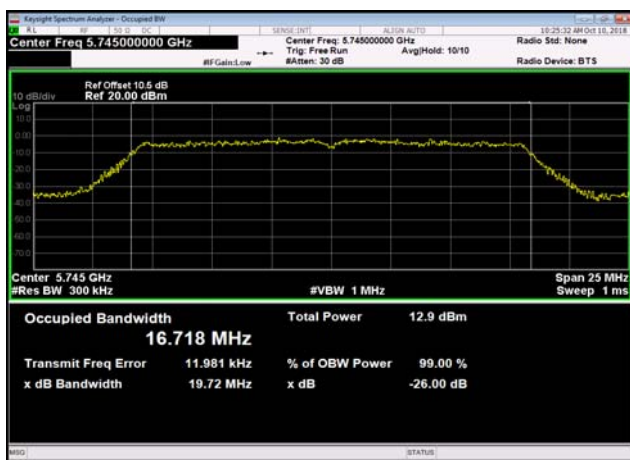
U-NII-3 99% Bandwidth-802.11n(40MHz)
,5795MHz,Ant0



U-NII-3 99% Bandwidth-802.11n(40MHz)
,5795MHz,Ant1



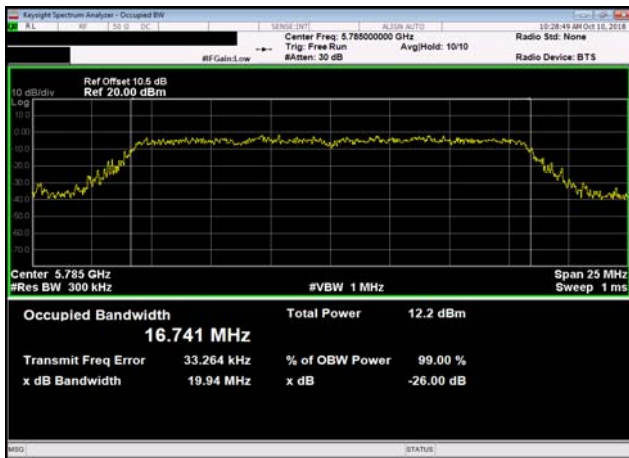
U-NII-3 99% Bandwidth-802.11a(20MHz)
,5745MHz,Ant0



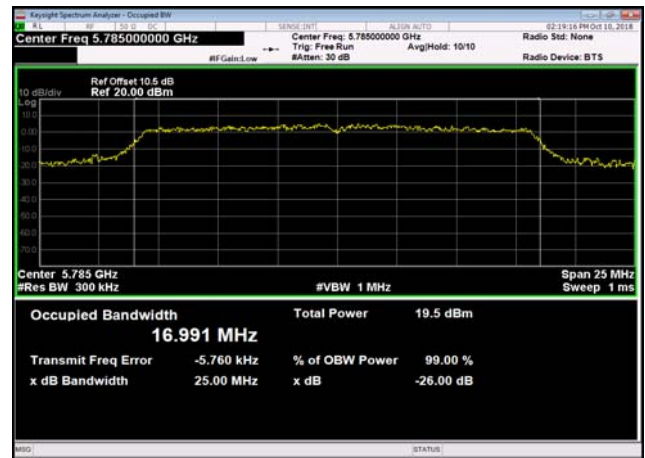
U-NII-3 99% Bandwidth-802.11a(20MHz)
,5745MHz,Ant1



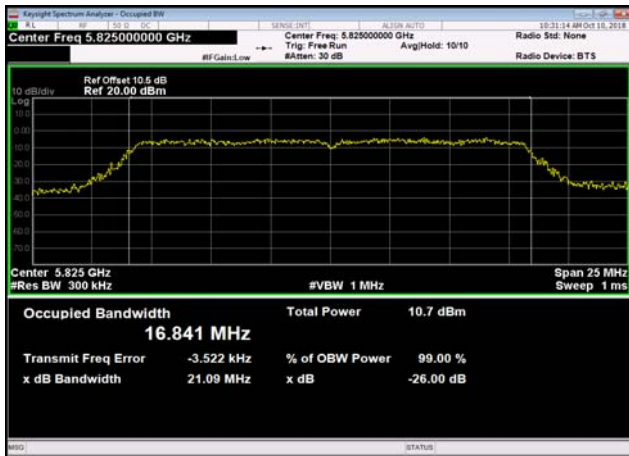
U-NII-3 99% Bandwidth-802.11a(20MHz)
,5785MHz,Ant0



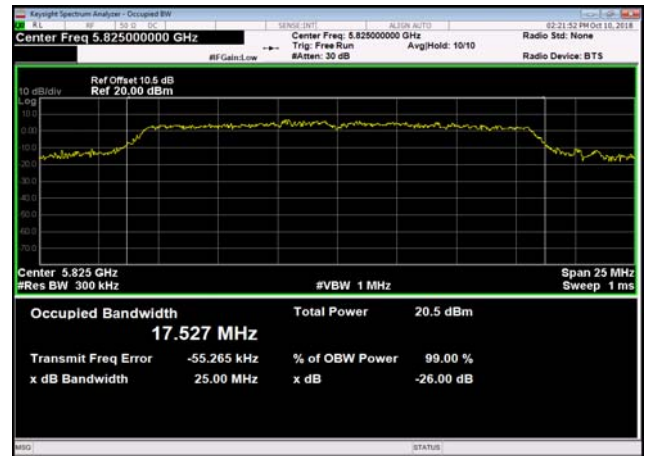
U-NII-3 99% Bandwidth-802.11a(20MHz)
,5785MHz,Ant1



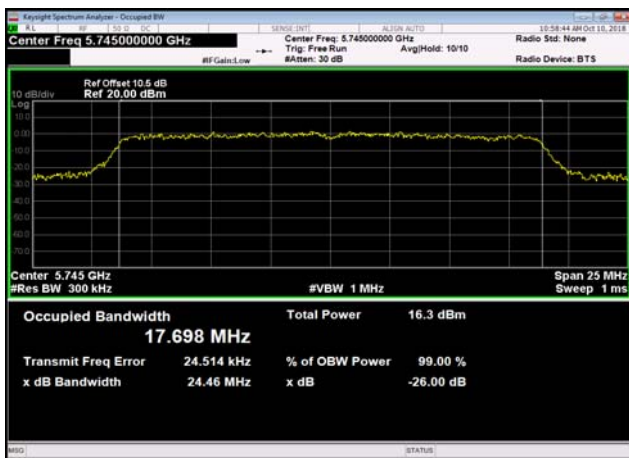
U-NII-3 99% Bandwidth-802.11a(20MHz)
,5825MHz,Ant0



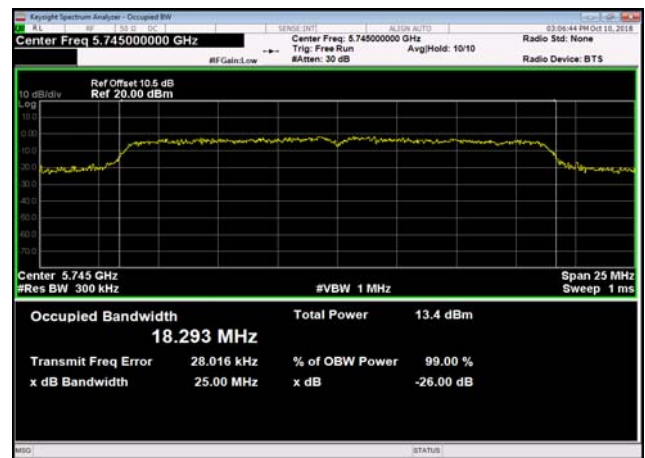
U-NII-3 99% Bandwidth-802.11a(20MHz)
,5825MHz,Ant1



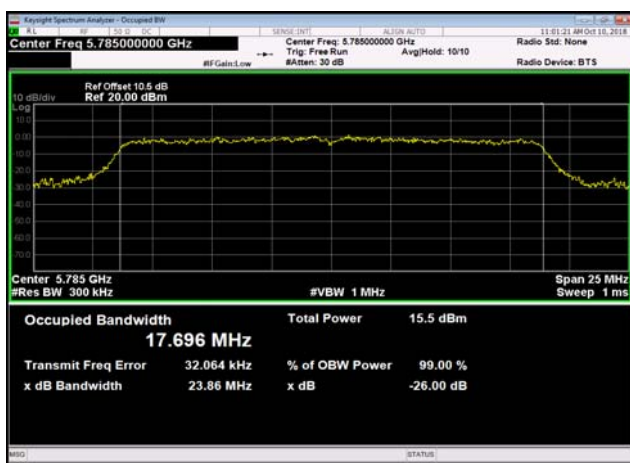
U-NII-3 99% Bandwidth-802.11ac(20MHz)
,5745MHz,Ant0



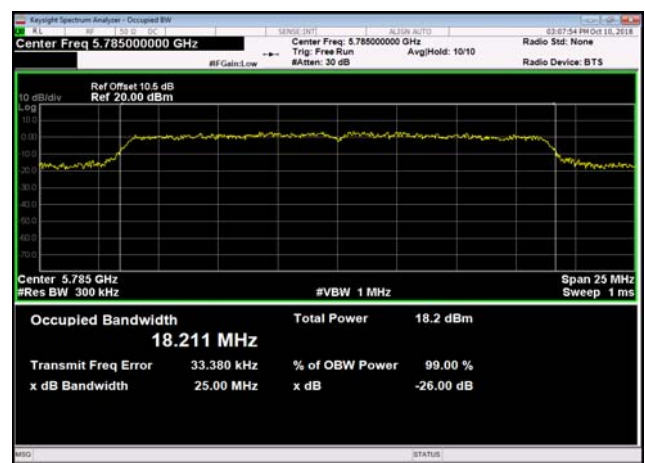
U-NII-3 99% Bandwidth-802.11ac(20MHz)
,5745MHz,Ant1



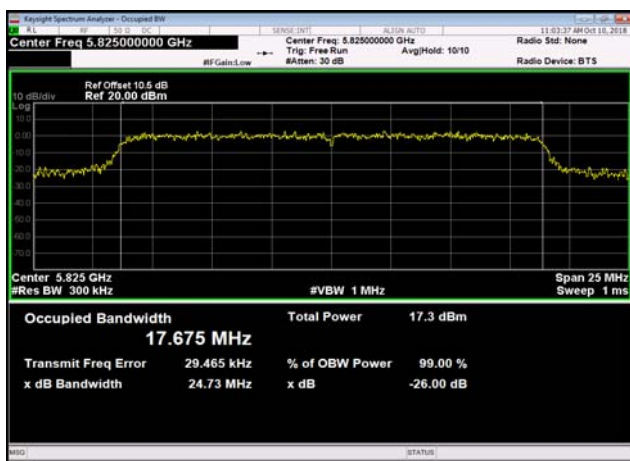
U-NII-3 99% Bandwidth-802.11ac(20MHz)
,5785MHz,Ant0



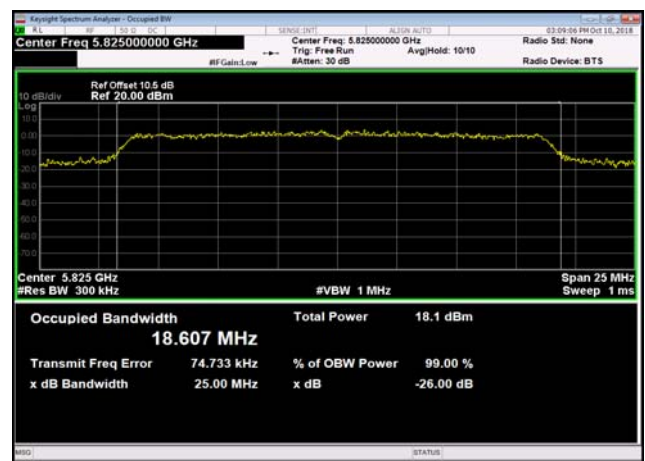
U-NII-3 99% Bandwidth-802.11ac(20MHz)
,5785MHz,Ant1



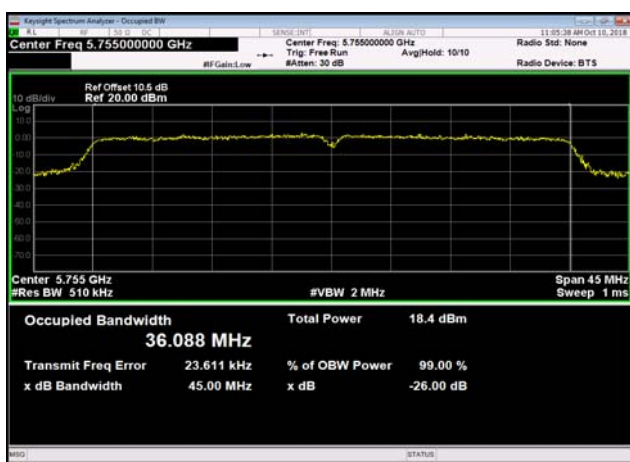
U-NII-3 99% Bandwidth-802.11ac(20MHz)
,5825MHz,Ant0



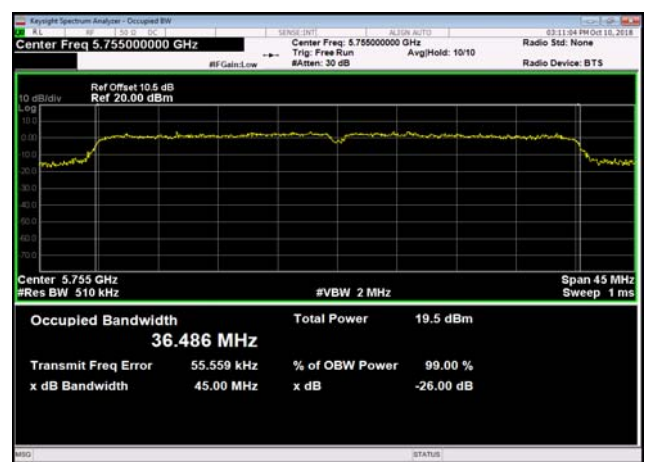
U-NII-3 99% Bandwidth-802.11ac(20MHz)
,5825MHz,Ant1

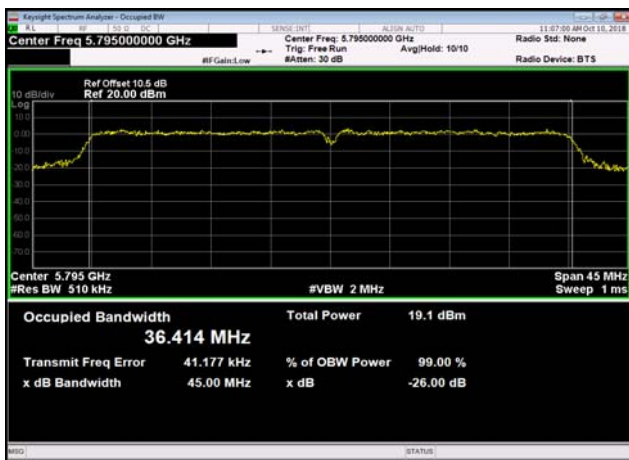
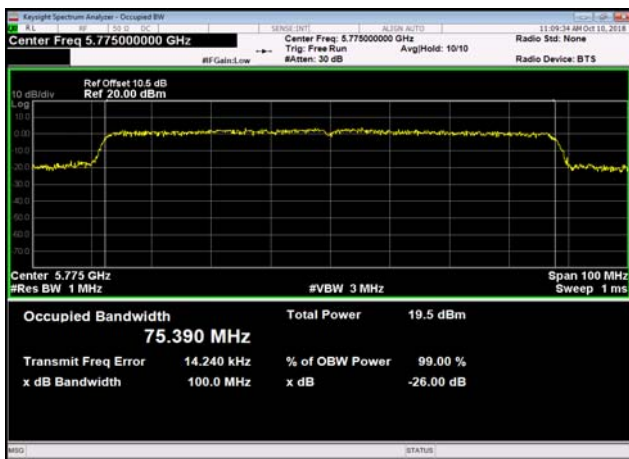
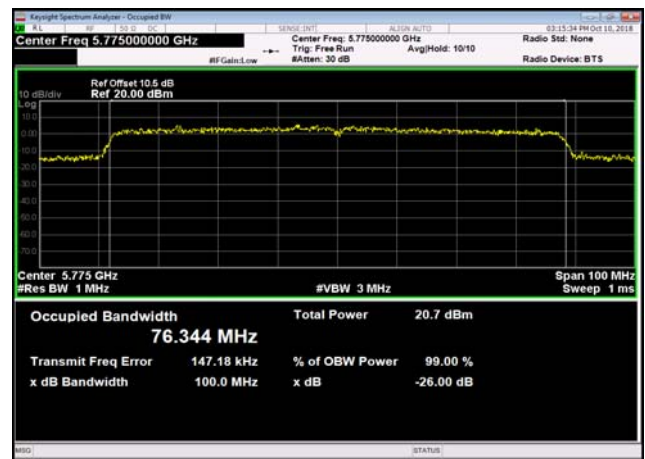


U-NII-3 99% Bandwidth-802.11ac(40MHz)
,5755MHz,Ant0



U-NII-3 99% Bandwidth-802.11ac(40MHz)
,5755MHz,Ant1



U-NII-3 99% Bandwidth-802.11ac(40MHz)
,5795MHz,Ant0U-NII-3 99% Bandwidth-802.11ac(40MHz)
,5795MHz,Ant1U-NII-3 99% Bandwidth-802.11ac(80MHz)
,5775MHz,Ant0U-NII-3 99% Bandwidth-802.11ac(80MHz)
,5775MHz,Ant1

2.4. Power spectral density (PSD)

2.4.1. Limit of Power Spectral Density

FCC 15.407(a)

The maximum power spectral density should not exceed:

Band	EUT Category	Limit
U-NII-1	☒ Access Point (Master device)	17 dBm/MHz
	☐ Fixed point-to-point Access device	
	☐ Mobile and portable client device	11 dBm/MHz
U-NII-2A	☐	11 dBm/MHz
U-NII-2C	☐	11 dBm/MHz
U-NII-3	☒	30dBm/500kHz

RSS-247, 6.2

The maximum power spectral density should not exceed:

Band	EUT Category	Limit
U-NII-1	☒	N/A
U-NII-2A	☐	11 dBm/MHz
U-NII-2C	☐	11 dBm/MHz
U-NII-3	☒	30 dBm/500kHz

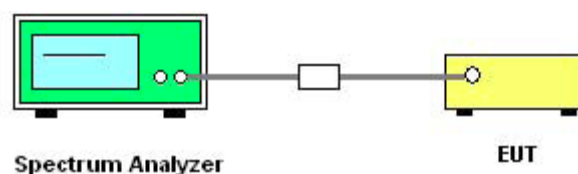
The e.i.r.p. spectral density should not exceed:

Band	EUT Category	Limit
U-NII-1	☒	10 dBm/MHz
U-NII-2A	☐	N/A
U-NII-2C	☐	N/A
U-NII-3	☒	N/A

2.4.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.4.3. Test Setup



2.4.4. Test Procedures

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to Spectrum.

4. For U-NII-1, U-NII-2A, U-NII-2C Band:

Using method SA-2

Set RBW=1MHz, VBW=3MHz, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)

For U-NII-3 Band:

Set RBW=500 kHz, $VBW \geq 3RBW$, where span is enough to capture the entire bandwidth, Sweep time = Auto, detector = sample, traces 100 sweeps of averaging mode.

5. Use peak search function on the instrument to find the peak of the spectrum and record its value
6. Repeat above procedures until all default test channel (low, middle, and high) was complete.

2.4.5. Test Results of Power spectral density

Conducted PSD Test results of band U-NII-1 (5150~5250MHz)

802.11a mode					
Test Frequency (MHz)	Power Spectral Density (dBm/MHz)		FCC Limit (dBm/MHz)	Result	
	Antenna 0	Antenna 1			
5180	2.179	3.196	17	PASS	
5220	0.497	3.561	17	PASS	
5240	0.915	3.468	17	PASS	
802.11n-HT20 mode					
Test Frequency (MHz)	Power Spectral Density (dBm/MHz)			FCC Limit (dBm/MHz)	Result
	Antenna 0	Antenna 1	Total		
5180	-1.814	-1.273	1.48	14.99	PASS
5220	-1.371	-2.429	1.14	14.99	PASS
5240	-1.663	-1.724	1.32	14.99	PASS
802.11n-HT40 mode					
Test Frequency (MHz)	Power Spectral Density (dBm/MHz)			FCC Limit (dBm/MHz)	Result
	Antenna 0	Antenna 1	Total		
5190	-1.991	-1.561	1.24	14.99	PASS
5230	-0.458	-4.729	0.92	14.99	PASS
802.11ac-VHT20 mode					
Test Frequency (MHz)	Power Spectral Density (dBm/MHz)			FCC Limit (dBm/MHz)	Result
	Antenna 0	Antenna 1	Total		
5180	-3.233	-2.559	0.13	14.99	PASS
5220	-1.546	-2.371	1.07	14.99	PASS
5240	-3.570	-3.293	-0.42	14.99	PASS
802.11ac-VHT40 mode					
Test Frequency (MHz)	Power Spectral Density (dBm/MHz)			FCC Limit (dBm/MHz)	Result
	Antenna 0	Antenna 1	Total		
5190	-4.334	-1.477	0.34	14.99	PASS
5230	-1.661	-0.935	1.73	14.99	PASS
802.11n-VHT80 mode					
Test Frequency (MHz)	Power Spectral Density (dBm/MHz)			FCC Limit (dBm/MHz)	Result
	Antenna 0	Antenna 1	Total		
5210	-4.391	-2.780	-0.50	14.99	PASS

Note: For 802.11n/ac, antenna 0, 1 can transmit/receive simultaneously (MIMO mode), The MIMO antenna directional gain is 8.01dBi, the applicable Power Spectral Density limit shall be calculated as follows:
 $PSD_{limit}-(G_{TX}-6)=17-(8.01-6)=14.99dBm$

Conducted PSD Test results of band U-NII-3 (5725 ~ 5850 MHz)

802.11a mode					
Test Frequency (MHz)	Power Spectral Density (dBm/500kHz)		FCC/IC Limit (dBm/500kHz)	Result	
	Antenna 0	Antenna 1			
5745	-0.070	-2.298	30	PASS	
5785	-1.277	0.135	30	PASS	
5825	-1.377	-0.812	30	PASS	
802.11n-HT20 mode					
Test Frequency (MHz)	Power Spectral Density (dBm/500kHz)			FCC/IC Limit (dBm/500kHz)	Result
	Antenna 0	Antenna 1	Total		
5745	0.184	-1.182	2.56	27.99	PASS
5785	-0.943	-0.744	2.17	27.99	PASS
5825	0.227	-3.421	1.79	27.99	PASS
802.11n-HT40 mode					
Test Frequency (MHz)	Power Spectral Density (dBm/500kHz)			FCC/IC Limit (dBm/500kHz)	Result
	Antenna 0	Antenna 1	Total		
5755	-1.500	-6.129	-0.21	27.99	PASS
5795	-3.529	-5.799	-1.51	27.99	PASS
802.11ac-VHT20 mode					
Test Frequency (MHz)	Power Spectral Density (dBm/500kHz)			FCC/IC Limit (dBm/500kHz)	Result
	Antenna 0	Antenna 1	Total		
5745	-0.465	-2.908	1.49	27.99	PASS
5785	-1.917	-0.671	1.76	27.99	PASS
5825	-2.486	-3.419	0.08	27.99	PASS
802.11ac-VHT40 mode					
Test Frequency (MHz)	Power Spectral Density (dBm/500kHz)			FCC/IC Limit (dBm/500kHz)	Result
	Antenna 0	Antenna 1	Total		
5755	-3.282	-5.807	-1.35	27.99	PASS
5795	-3.992	-5.288	-1.58	27.99	PASS
802.11n-VHT80 mode					
Test Frequency (MHz)	Power Spectral Density (dBm/500kHz)			FCC/IC Limit (dBm/500kHz)	Result
	Antenna 0	Antenna 1	Total		
5775	-6.428	-6.797	-3.60	27.99	PASS

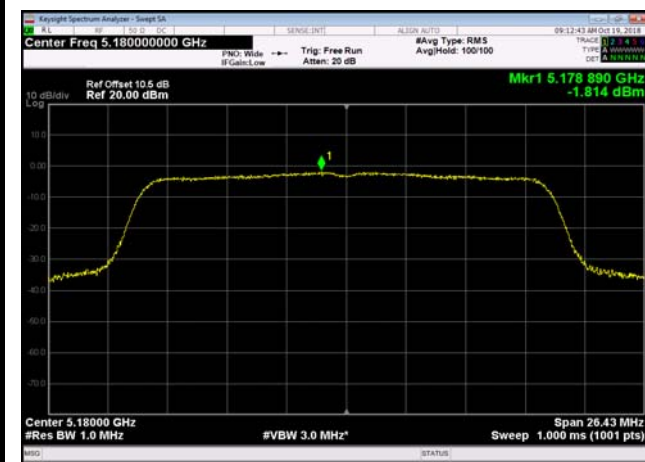
Note: For 802.11n/ac, antenna 0, 1 can transmit/receive simultaneously (MIMO mode), The MIMO antenna directional gain is 8.01dBi, the applicable Power Spectral Density limit shall be calculated as follows:
 $PSD_{limit}-(G_{TX}-6)=30-(8.01-6)=27.99\text{dBm}/500\text{KHz}$

EIRP PSD Test results of band U-NII-1 (5150~5250MHz)

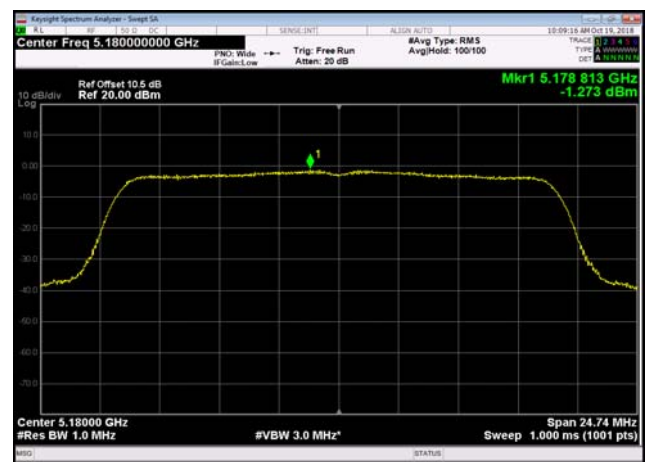
802.11a mode				
Test Frequency (MHz)	Power Spectral Density (dBm/MHz)		IC Limit (dBm/MHz)	Result
	Antenna 0	Antenna 1		
5180	7.179	8.196	10	PASS
5220	5.497	8.561	10	PASS
5240	5.915	8.468	10	PASS
802.11n-HT20 mode				
Test Frequency (MHz)	Power Spectral Density (dBm/MHz)		IC Limit (dBm/MHz)	Result
5180	9.49		10	PASS
5220	9.15		10	PASS
5240	9.33		10	PASS
802.11n-HT40 mode				
Test Frequency (MHz)	Power Spectral Density (dBm/MHz)		IC Limit (dBm/MHz)	Result
5190	9.25		10	PASS
5230	8.93		10	PASS
802.11ac-VHT20 mode				
Test Frequency (MHz)	Power Spectral Density (dBm/MHz)		IC Limit (dBm/MHz)	Result
5180	8.14		10	PASS
5220	9.08		10	PASS
5240	7.59		10	PASS
802.11ac-VHT40 mode				
Test Frequency (MHz)	Power Spectral Density (dBm/MHz)		IC Limit (dBm/MHz)	Result
5190	8.35		10	PASS
5230	9.74		10	PASS
802.11n-VHT80 mode				
Test Frequency (MHz)	Power Spectral Density (dBm/MHz)		IC Limit (dBm/MHz)	Result
5210	7.51		10	PASS

2.4.6. Test Results (plots) of Power spectral density

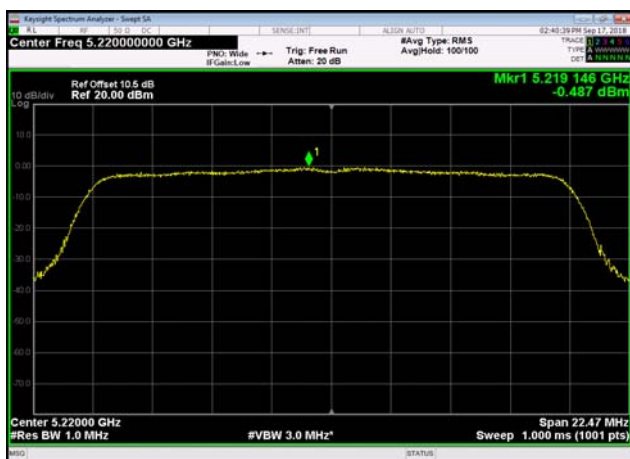
U-NII-1 Power spectral density-802.11
n(20MHz),5180MHz,Ant0



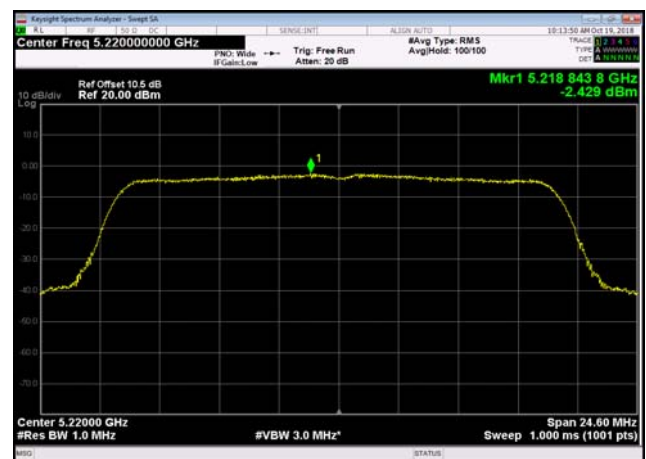
U-NII-1 Power spectral density-802.11
n(20MHz),5180MHz,Ant1



U-NII-1 Power spectral density-802.11
n(20MHz),5220MHz,Ant0



U-NII-1 Power spectral density-802.11
n(20MHz),5220MHz,Ant1



U-NII-1 Power spectral density-802.11
n(20MHz),5240MHz,Ant0



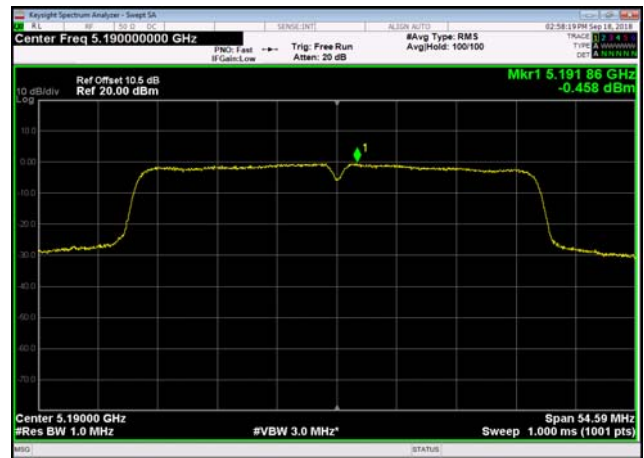
U-NII-1 Power spectral density-802.11
n(20MHz),5240MHz,Ant1



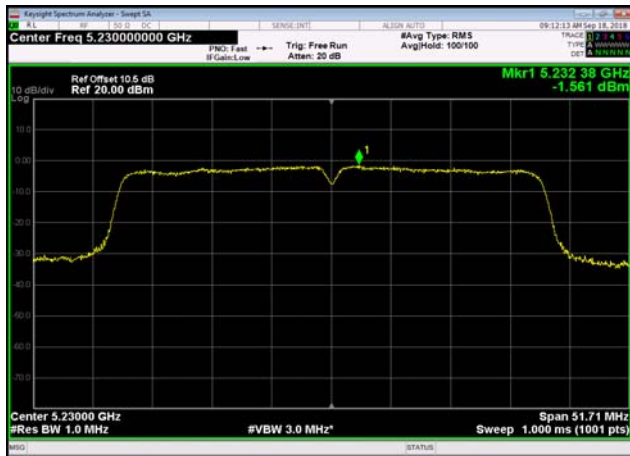
U-NII-1 Power spectral density-802.11
n(40MHz),5190MHz,Ant0



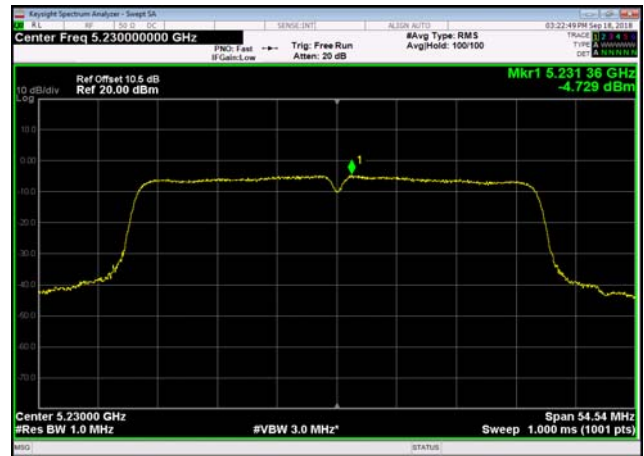
U-NII-1 Power spectral density-802.11
n(40MHz),5190MHz,Ant1



U-NII-1 Power spectral density-802.11
n(40MHz),5230MHz,Ant0



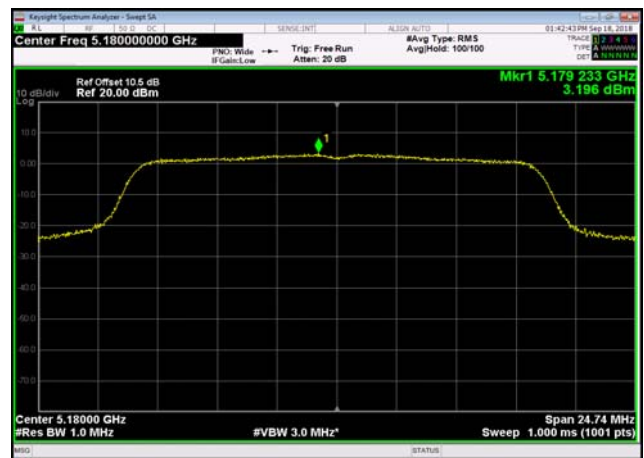
U-NII-1 Power spectral density-802.11
n(40MHz),5230MHz,Ant1



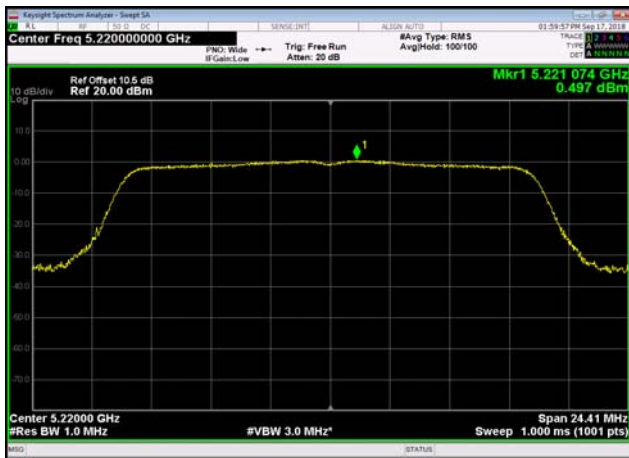
U-NII-1 Power spectral density-802.11
a(20MHz),5180MHz,Ant0



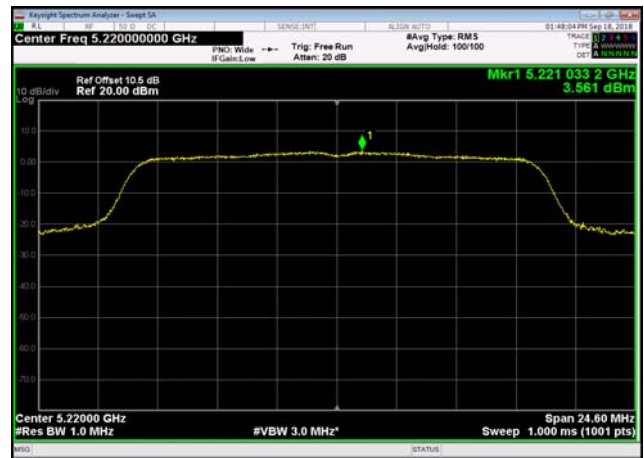
U-NII-1 Power spectral density-802.11
a(20MHz),5180MHz,Ant1



U-NII-1 Power spectral density-802.11
a(20MHz),5220MHz,Ant0



U-NII-1 Power spectral density-802.11
a(20MHz),5220MHz,Ant1



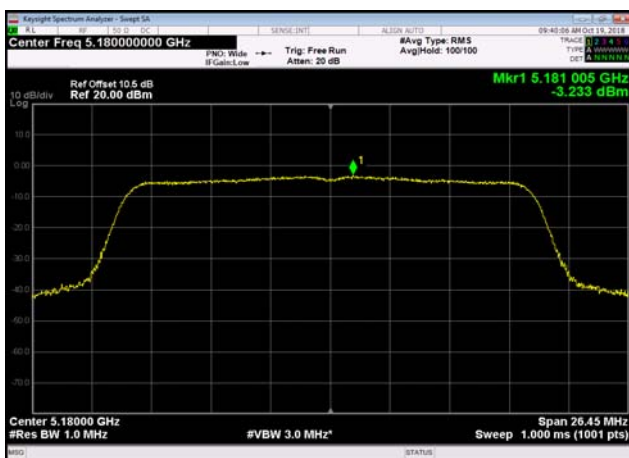
U-NII-1 Power spectral density-802.11
a(20MHz),5240MHz,Ant0



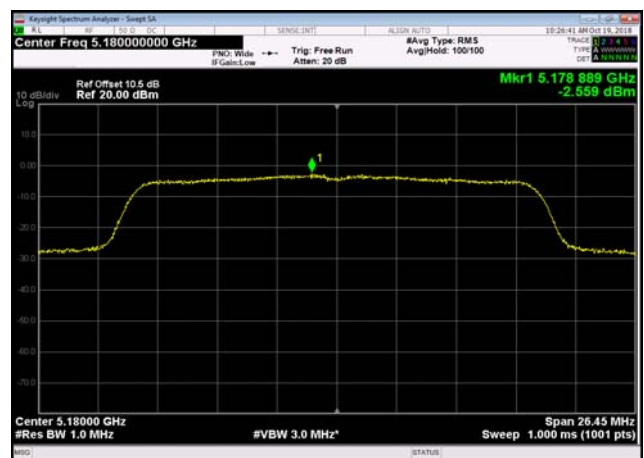
U-NII-1 Power spectral density-802.11
a(20MHz),5240MHz,Ant1



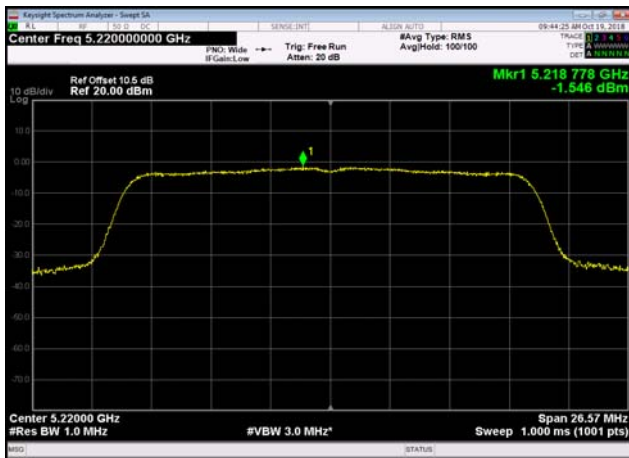
U-NII-1 Power spectral density-802.11
ac(20MHz),5180MHz,Ant0



U-NII-1 Power spectral density-802.11
ac(20MHz),5180MHz,Ant1



U-NII-1 Power spectral density-802.11
ac(20MHz),5220MHz,Ant0



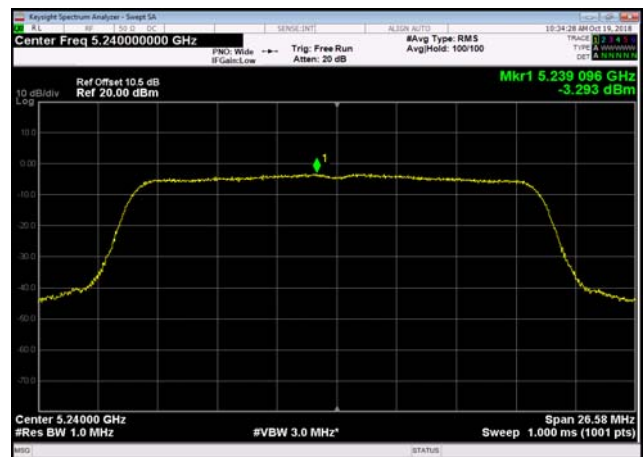
U-NII-1 Power spectral density-802.11
ac(20MHz),5220MHz,Ant1



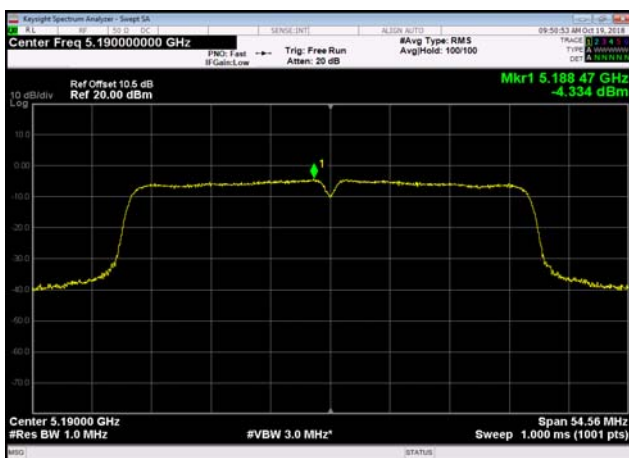
U-NII-1 Power spectral density-802.11
ac(20MHz),5240MHz,Ant0



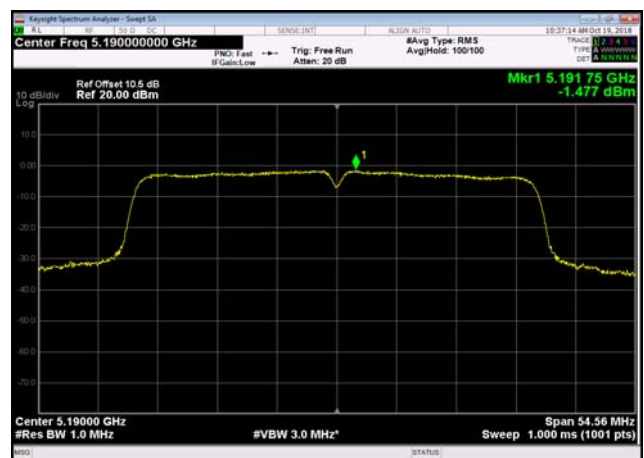
U-NII-1 Power spectral density-802.11
ac(20MHz),5240MHz,Ant1



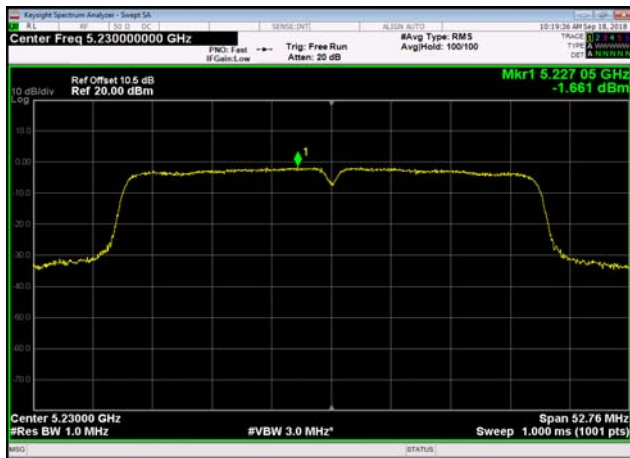
U-NII-1 Power spectral density-802.11
ac(40MHz),5190MHz,Ant0



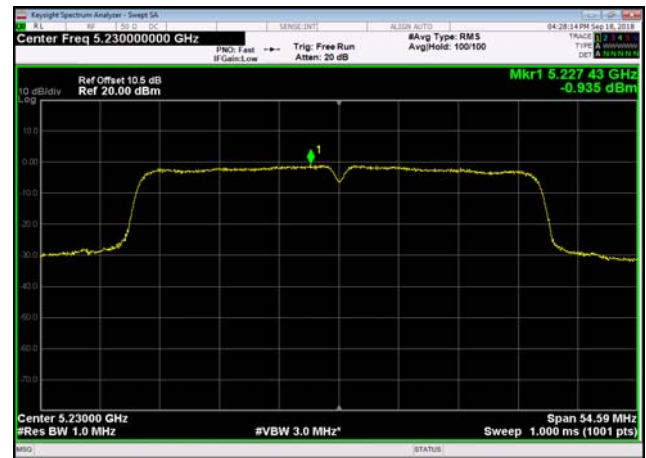
U-NII-1 Power spectral density-802.11
ac(40MHz),5190MHz,Ant1



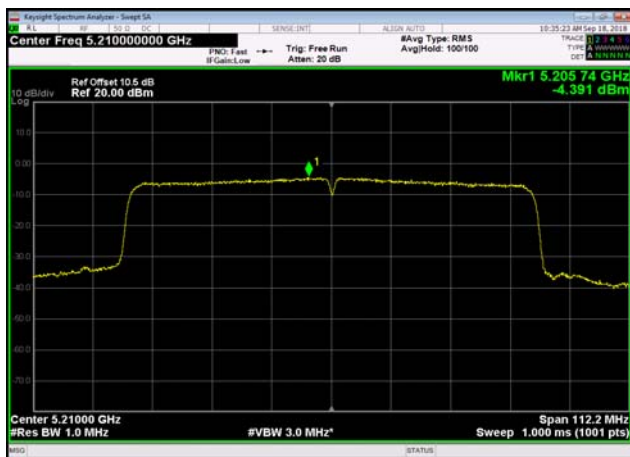
U-NII-1 Power spectral density-802.11
ac(40MHz),5230MHz,Ant0



U-NII-1 Power spectral density-802.11
ac(40MHz),5230MHz,Ant1



U-NII-1 Power spectral density-802.11
ac(80MHz),5210MHz,Ant0



U-NII-1 Power spectral density-802.11
ac(80MHz),5210MHz,Ant1



2.5. Frequency Stability

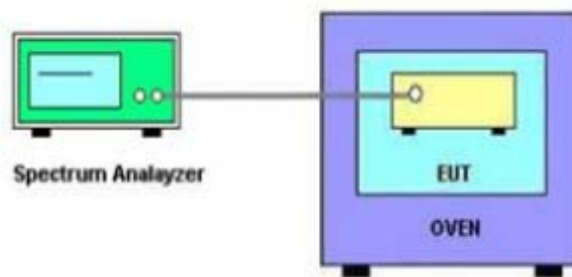
2.5.1. Limit

FCC 15.407(b)/RSS-247 Frequency Stability	
Frequency Band(MHz)	Limit
5150~5250	Specified in the user's manual
5250~5350	
5470~5725	
5725~5850	

2.5.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.5.3. Test Setup



2.5.4. Test Procedures

1. The EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. The EUT is installed in an environment test chamber with external power source.
4. Set the chamber to operate at 50 centigrade and external power source to output at nominal voltage of EUT.
5. A sufficient stabilization period at each temperatures in used prior to each frequency measurement.
6. The test shall be performed under -10 to 55 centigrade and 85 to 115 percent of the nominal voltage. Change setting of chamber and external power source to complete all conditions.
7. Measure and record the worst results in the test report.

2.5.5. Test Results of Frequency Stability

Ant 0	Band UNII-1
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Voltage vs. Frequency Stability (11a ch44)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Temperature(°C)	Voltage(Vdc)			
20	20.4	5220	5220.013812	2.65
	24.0	5220	5220.015681	3.00
	27.6	5220	5220.011562	2.21

Temperature vs. Frequency Stability (11a ch44)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Voltage (Vdc)	Temperature(°C)			
24.0	-10	5220	5220.019254	3.69
	0	5220	5220.012546	2.40
	10	5220	5220.011562	2.21
	20	5220	5220.018145	3.48
	30	5220	5220.008451	1.62
	40	5220	5220.011478	2.20
	55	5220	5220.018579	3.56

Voltage vs. Frequency Stability (11n-HT20 ch44)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Temperature(°C)	Voltage(Vdc)			
20	20.4	5220	5220.018569	3.56
	24.0	5220	5220.017596	3.37
	27.6	5220	5220.016557	3.17

Temperature vs. Frequency Stability (11n-HT20 ch44)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Voltage (Vdc)	Temperature(°C)			
24.0	-10	5220	5220.014587	2.79
	0	5220	5220.009686	1.86
	10	5220	5220.012587	2.41
	20	5220	5220.015897	3.05
	30	5220	5220.01579	3.02
	40	5220	5220.012675	2.43
	55	5220	5220.016578	3.18

Voltage vs. Frequency Stability (11n-HT40 ch38)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Temperature(°C)	Voltage(Vdc)			
20	20.4	5190	5190.000000	0.00
	24.0	5190	5190.012682	2.44
	27.6	5190	5190.016475	3.17

Temperature vs. Frequency Stability (11n-HT40 ch38)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Voltage (Vdc)	Temperature(°C)			
24.0	-10	5190	5190.017482	3.37
	0	5190	5190.009225	1.78
	10	5190	5190.002583	0.50
	20	5190	5190.012805	2.47
	30	5190	5190.014378	2.77
	40	5190	5190.013589	2.62
	55	5190	5190.012589	2.43

Voltage vs. Frequency Stability (11ac-HT20 ch44)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Temperature(°C)	Voltage(Vdc)			
20	20.4	5220	5190.002578	0.50
	24.0	5220	5190.012368	2.38
	27.6	5220	5190.015743	3.03

Temperature vs. Frequency Stability (11ac-HT20 ch44)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Voltage (Vdc)	Temperature(°C)			
24.0	-10	5220	5190.014590	2.81
	0	5220	5190.011257	2.17
	10	5220	5190.012748	2.46
	20	5220	5190.013685	2.64
	30	5220	5190.015428	2.97
	40	5220	5190.016258	3.13
	55	5220	5190.017485	3.37

Voltage vs. Frequency Stability (11ac-HT40 ch38)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Temperature(°C)	Voltage(Vdc)			
20	20.4	5190	5190.015892	3.06
	24.0	5190	5190.012368	2.38
	27.6	5190	5190.015743	3.03

Temperature vs. Frequency Stability (11ac-HT40 ch38)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Voltage (Vdc)	Temperature(°C)			
24.0	-10	5190	5190.013456	2.59
	0	5190	5190.011568	2.23
	10	5190	5190.01346	2.59
	20	5190	5190.016743	3.23
	30	5190	5190.014438	2.78
	40	5190	5190.013658	2.63
	55	5190	5190.016358	3.15

Voltage vs. Frequency Stability (11ac-HT80 ch42)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Temperature(°C)	Voltage(Vdc)			
20	20.4	5210	5210.022725	4.36
	24.0	5210	5210.012594	2.42
	27.6	5210	5210.019245	3.69

Temperature vs. Frequency Stability (11ac-HT80 ch42)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Voltage (Vdc)	Temperature(°C)			
24.0	-10	5210	5210.018528	3.56
	0	5210	5210.023315	4.48
	10	5210	5210.020645	3.96
	20	5210	5210.023652	4.54
	30	5210	5210.012548	2.41
	40	5210	5210.013562	2.60
	55	5210	5210.019587	3.76

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Voltage vs. Frequency Stability (11a ch157)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Temperature(°C)	Voltage(Vdc)			
20	20.4	5785	5785.013598	2.35
	24.0	5785	5785.015741	2.72
	27.6	5785	5785.014987	2.59

Temperature vs. Frequency Stability (11a ch157)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Voltage (Vdc)	Temperature(°C)			
24.0	-10	5785	5785.012584	2.18
	0	5785	5785.015748	2.72
	10	5785	5785.012587	2.18
	20	5785	5785.015236	2.63
	30	5785	5785.014587	2.52
	40	5785	5785.014695	2.54
	55	5785	5785.015485	2.68

Voltage vs. Frequency Stability (11n-HT20 ch157)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Temperature(°C)	Voltage(Vdc)			
20	20.4	5785	5785.017458	3.02
	24.0	5785	5785.014578	2.52
	27.6	5785	5785.014957	2.59

Temperature vs. Frequency Stability (11n-HT20 ch157)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Voltage (Vdc)	Temperature(°C)			
24.0	-10	5785	5785.013658	2.36
	0	5785	5785.016528	2.86
	10	5785	5785.01742	3.01
	20	5785	5785.012657	2.19
	30	5785	5785.013658	2.36
	40	5785	5785.013587	2.35
	55	5785	5785.014653	2.53

Voltage vs. Frequency Stability (11n-HT40 ch151)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Temperature(°C)	Voltage(Vdc)			
20	20.4	5755	5755.020235	3.52
	24.0	5755	5755.015782	2.74
	27.6	5755	5755.013692	2.38

Temperature vs. Frequency Stability (11n-HT40 ch151)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Voltage (Vdc)	Temperature(°C)			
24.0	-10	5755	5755.023562	4.09
	0	5755	5755.018725	3.25
	10	5755	5755.014262	2.47
	20	5755	5755.017465	3.03
	30	5755	5755.013568	2.36
	40	5755	5755.015625	2.72
	55	5755	5755.023624	4.10

Voltage vs. Frequency Stability (11ac-HT20 ch157)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Temperature(°C)	Voltage(Vdc)			
20	20.4	5785	5785.015274	2.64
	24.0	5785	5785.019685	3.40
	27.6	5785	5785.024152	4.17

Temperature vs. Frequency Stability (11ac-HT20 ch157)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Voltage (Vdc)	Temperature(°C)			
24.0	-10	5785	5785.021542	3.72
	0	5785	5785.016584	2.87
	10	5785	5785.017815	3.08
	20	5785	5785.023512	4.06
	30	5785	5785.014256	2.46
	40	5785	5785.012524	2.16
	55	5785	5785.020145	3.48

Voltage vs. Frequency Stability (11ac-HT40 ch151)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Temperature(°C)	Voltage(Vdc)			
20	20.4	5755	5755.028742	4.99
	24.0	5755	5755.016574	2.88
	27.6	5755	5755.021457	3.73

Temperature vs. Frequency Stability (11ac-HT40 ch151)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Voltage (Vdc)	Temperature(°C)			
24.0	-10	5755	5755.013685	2.38
	0	5755	5755.018236	3.17
	10	5755	5755.024147	4.20
	20	5755	5755.020154	3.50
	30	5755	5755.016782	2.92
	40	5755	5755.014528	2.52
	55	5755	5755.019367	3.37

Voltage vs. Frequency Stability (11ac-HT80 ch155)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Temperature(°C)	Voltage(Vdc)			
20	20.4	5775	5775.025412	4.40
	24.0	5775	5775.027165	4.70
	27.6	5775	5775.018635	3.23

Temperature vs. Frequency Stability (11ac-HT80 ch155)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Voltage (Vdc)	Temperature(°C)			
24.0	-10	5775	5775.022357	3.87
	0	5775	5775.016842	2.92
	10	5775	5775.021571	3.74
	20	5775	5775.018417	3.19
	30	5775	5775.019256	3.33
	40	5775	5775.013428	2.33
	55	5775	5775.017125	2.97

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Voltage vs. Frequency Stability (11a ch44)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Temperature(°C)	Voltage(Vdc)			
20	20.4	5220	5220.017625	3.38
	24.0	5220	5220.012754	2.44
	27.6	5220	5220.016571	3.17

Temperature vs. Frequency Stability (11a ch44)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Voltage (Vdc)	Temperature(°C)			
24.0	-10	5220	5220.020325	3.89
	0	5220	5220.012541	2.40
	10	5220	5220.016575	3.18
	20	5220	5220.011567	2.21
	30	5220	5220.013625	2.61
	40	5220	5220.014658	2.81
	55	5220	5220.017562	3.36

Voltage vs. Frequency Stability (11n-HT20 ch44)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Temperature(°C)	Voltage(Vdc)			
20	20.4	5220	5220.016257	3.11
	24.0	5220	5220.013652	2.62
	27.6	5220	5220.019572	3.75

Temperature vs. Frequency Stability (11n-HT20 ch44)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Voltage (Vdc)	Temperature(°C)			
24.0	-10	5220	5220.015625	2.99
	0	5220	5220.021625	4.14
	10	5220	5220.022624	4.33
	20	5220	5220.014625	2.80
	30	5220	5220.013625	2.61
	40	5220	5220.014514	2.78
	55	5220	5220.019251	3.69

Voltage vs. Frequency Stability (11n-HT40 ch38)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Temperature(°C)	Voltage(Vdc)			
20	20.4	5190	5190.012415	2.39
	24.0	5190	5190.018542	3.57
	27.6	5190	5190.022361	4.31

Temperature vs. Frequency Stability (11n-HT40 ch38)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Voltage (Vdc)	Temperature(°C)			
24.0	-10	5190	5190.019574	3.77
	0	5190	5190.013567	2.61
	10	5190	5190.012457	2.40
	20	5190	5190.013054	2.52
	30	5190	5190.022541	4.34
	40	5190	5190.011675	2.25
	55	5190	5190.019257	3.71

Voltage vs. Frequency Stability (11ac-HT20 ch44)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Temperature(°C)	Voltage(Vdc)			
20	20.4	5220	5220.015254	2.92
	24.0	5220	5220.017851	3.42
	27.6	5220	5220.013625	2.61

Temperature vs. Frequency Stability (11ac-HT20 ch44)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Voltage (Vdc)	Temperature(°C)			
24.0	-10	5220	5220.018254	3.50
	0	5220	5220.013542	2.59
	10	5220	5220.016254	3.11
	20	5220	5220.017825	3.41
	30	5220	5220.021036	4.03
	40	5220	5220.019364	3.71
	55	5220	5220.013625	2.61

Voltage vs. Frequency Stability (11ac-HT40 ch38)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Temperature(°C)	Voltage(Vdc)			
20	20.4	5190	5190.015427	2.97
	24.0	5190	5190.019362	3.73
	27.6	5190	5190.017824	3.43

Temperature vs. Frequency Stability (11ac-HT40 ch38)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Voltage (Vdc)	Temperature(°C)			
24.0	-10	5190	5190.016825	3.24
	0	5190	5190.017542	3.38
	10	5190	5190.012457	2.40
	20	5190	5190.016234	3.13
	30	5190	5190.013524	2.61
	40	5190	5190.014572	2.81
	55	5190	5190.016254	3.13

Voltage vs. Frequency Stability (11ac-HT80 ch42)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Temperature(°C)	Voltage(Vdc)			
20	20.4	5210	5210.017451	3.35
	24.0	5210	5210.016225	3.11
	27.6	5210	5210.018524	3.56

Temperature vs. Frequency Stability (11ac-HT80 ch42)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Voltage (Vdc)	Temperature(°C)			
24.0	-10	5210	5210.016254	3.12
	0	5210	5210.021574	4.14
	10	5210	5210.022362	4.29
	20	5210	5210.018622	3.57
	30	5210	5210.017256	3.31
	40	5210	5210.022467	4.31
	55	5210	5210.017562	3.37

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Voltage vs. Frequency Stability (11a ch157)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Temperature(°C)	Voltage(Vdc)			
20	20.4	5785	5785.026552	4.59
	24.0	5785	5785.023657	4.09
	27.6	5785	5785.017524	3.03

Temperature vs. Frequency Stability (11a ch157)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Voltage (Vdc)	Temperature(°C)			
24.0	-10	5785	5785.025471	4.40
	0	5785	5785.017256	2.98
	10	5785	5785.013251	2.29
	20	5785	5785.017544	3.03
	30	5785	5785.016257	2.81
	40	5785	5785.017814	3.08
	55	5785	5785.022567	3.90

Voltage vs. Frequency Stability (11n-HT20 ch157)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Temperature(°C)	Voltage(Vdc)			
20	20.4	5785	5785.022478	3.89
	24.0	5785	5785.015625	2.70
	27.6	5785	5785.019257	3.33

Temperature vs. Frequency Stability (11n-HT20 ch157)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Voltage (Vdc)	Temperature(°C)			
24.0	-10	5785	5785.026254	4.54
	0	5785	5785.011475	1.98
	10	5785	5785.024625	4.26
	20	5785	5785.015784	2.73
	30	5785	5785.014625	2.53
	40	5785	5785.018781	3.25
	55	5785	5785.020625	3.57

Voltage vs. Frequency Stability (11n-HT40 ch151)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Temperature(°C)	Voltage(Vdc)			
20	20.4	5755	5755.022623	3.93
	24.0	5755	5755.017654	3.07
	27.6	5755	5755.019274	3.35

Temperature vs. Frequency Stability (11n-HT40 ch151)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Voltage (Vdc)	Temperature(°C)			
24.0	-10	5755	5755.021524	3.74
	0	5755	5755.017625	3.06
	10	5755	5755.014625	2.54
	20	5755	5755.018541	3.22
	30	5755	5755.021574	3.75
	40	5755	5755.016237	2.82
	55	5755	5755.024658	4.28

Voltage vs. Frequency Stability (11ac-HT20 ch157)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Temperature(°C)	Voltage(Vdc)			
20	20.4	5785	5785.025624	4.43
	24.0	5785	5785.016782	2.90
	27.6	5785	5785.024547	4.24

Temperature vs. Frequency Stability (11ac-HT20 ch157)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Voltage (Vdc)	Temperature(°C)			
24.0	-10	5785	5785.022545	3.90
	0	5785	5785.019254	3.33
	10	5785	5785.014257	2.46
	20	5785	5785.024562	4.25
	30	5785	5785.018254	3.16
	40	5785	5785.015245	2.64
	55	5785	5785.024578	4.25

Voltage vs. Frequency Stability (11ac-HT40 ch151)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Temperature(°C)	Voltage(Vdc)			
20	20.4	5755	5775.016582	2.87
	24.0	5755	5775.015987	2.77
	27.6	5755	5775.014879	2.58

Temperature vs. Frequency Stability (11ac-HT40 ch151)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Voltage (Vdc)	Temperature(°C)			
24.0	-10	5755	5775.012587	2.18
	0	5755	5775.015548	2.69
	10	5755	5775.013659	2.37
	20	5755	5775.015471	2.68
	30	5755	5775.019925	3.45
	40	5755	5775.018476	3.20
	55	5755	5775.018655	3.23

Voltage vs. Frequency Stability (11ac-HT80 ch155)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Temperature(°C)	Voltage(Vdc)			
20	20.4	5775	5775.017759	3.08
	24.0	5775	5775.016258	2.82
	27.6	5775	5775.015471	2.68

Temperature vs. Frequency Stability (11ac-HT80 ch155)

Test Conditions		Test Frequency (MHz)	Measurement Frequency(MHz)	Max. Deviation(ppm)
Voltage (Vdc)	Temperature(°C)			
24.0	-10	5775	5775.014259	2.47
	0	5775	5775.015215	2.63
	10	5775	5775.016355	2.83
	20	5775	5775.015874	2.75
	30	5775	5775.018592	3.22
	40	5775	5775.018655	3.23
	55	5775	5775.018746	3.25

2.6. Radiated Band Edge and Spurious Emission

2.6.1. Limit of Radiated Band Edges and Spurious Emission

Radiated emission which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level ($\mu\text{V/m}$).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

Limits of unwanted emission out of the restricted bands

Applicable To	Limit	
789033 D02 General UNII Test Procedures New Rules v02r01	Field Strength at 3m	
	PK:74(dB $\mu\text{V/m}$)	AV:54 (dB $\mu\text{V/m}$)

Frequency Band (MHz)	Frequency (MHz)	EIRP Limit (dBm)	Equivalent Field Strength (3m) (dB $\mu\text{V/m}$)
5150 - 5250	Outside of the 5.15~5.35 GHz	-27	68.2
5250 - 5350	Outside of the 5.15~5.35 GHz		
5470 -5725	Outside of the 5.47~5.725 GHz		

FCC 15.407			
Frequency Band (MHz)	Frequency (MHz)	EIRP Limit (dBm)	Equivalent Field Strength (3m) (dBμV/m)
5725 - 5850	<5650	-27	68.2
	5650~5700	-27~10	68.2~105.2
	5700~5720	10~15.6	105.2~110.8
	5720~5725	15.6~27	110.8~122.2
	5850~5855	27~15.6	122.2~110.8
	5855~5875	15.6~10	110.8~105.2
	5875~5925	10~-27	105.2~68.2
	>5925	-27	68.2

RSS - 247			
Frequency Band (MHz)	Frequency (MHz)	EIRP Limit (dBm)	Equivalent Field Strength (3m) (dBμV/m)
5725 - 5850	5715~5725	-17	78.2
	5850~5860	-17	78.2
	Other un-restricted band: e.i.r.p.	-27	68.2

Note:

1. The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

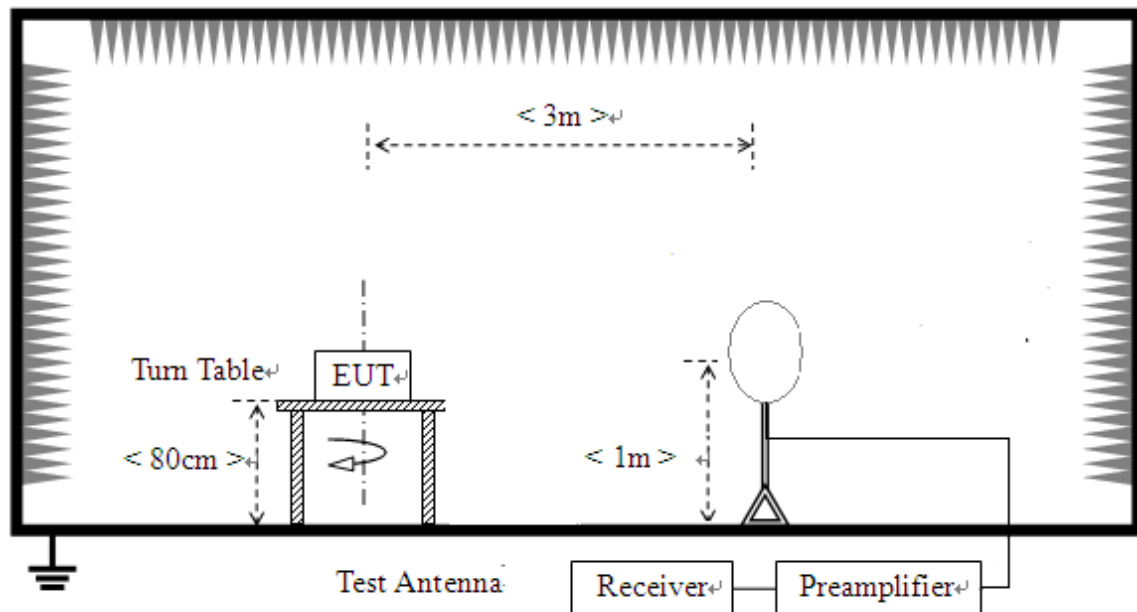
$$E = \frac{1000000 \sqrt{30P}}{3} \mu\text{V/m, where } P \text{ is the eirp (Watts).}$$

2.6.2. Measuring Instruments

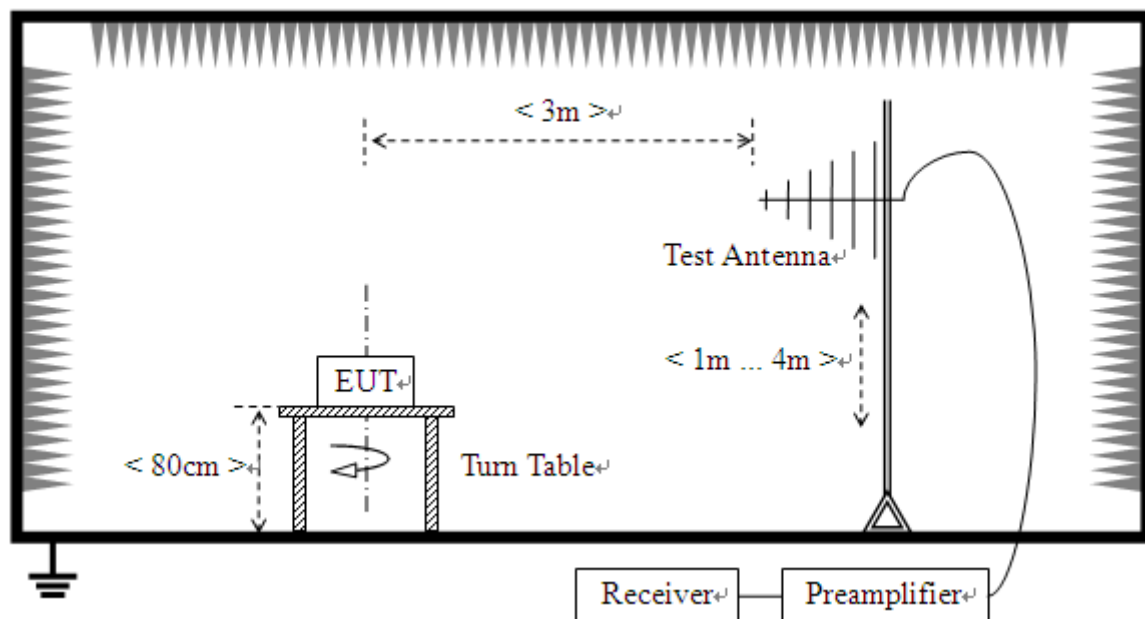
The measuring equipment is listed in the section 3 of this test report.

2.6.3. Test Setup

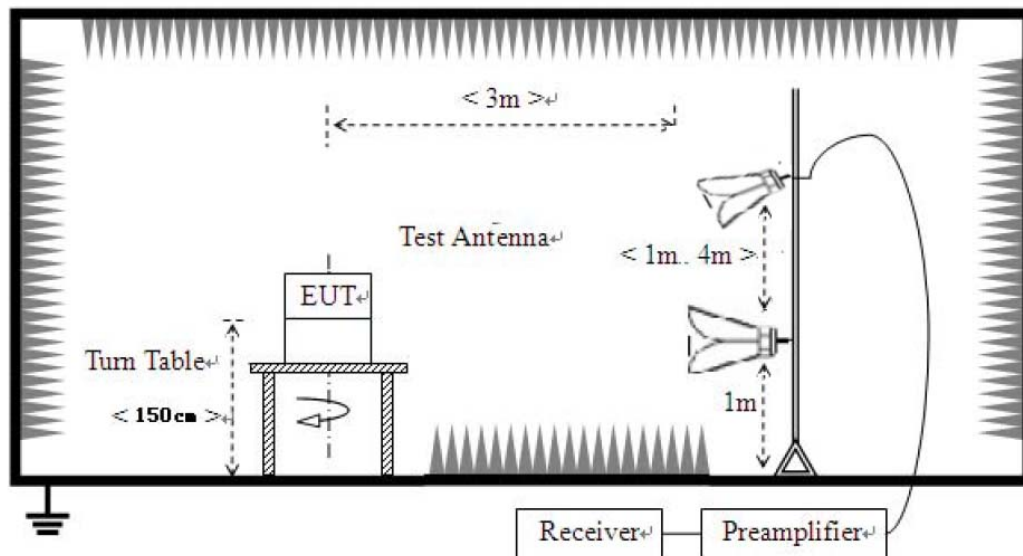
For radiated emissions from 9 KHz to 30 MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



2.6.4. Test Procedures

1. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
6. The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

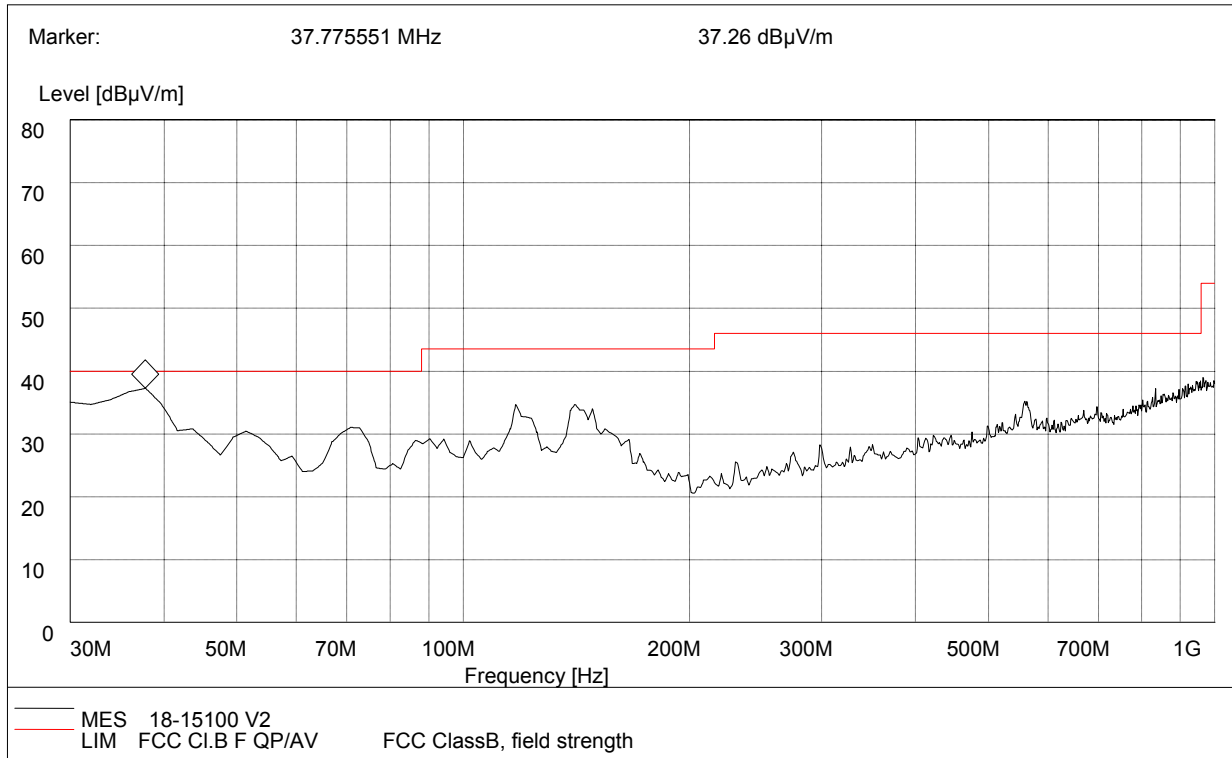
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor ($10 \log(1/\text{duty cycle})$).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.
- 6.

2.6.5. Test Results of Radiated Band Edge and Spurious Emission

For 9 KHz to 30MHz

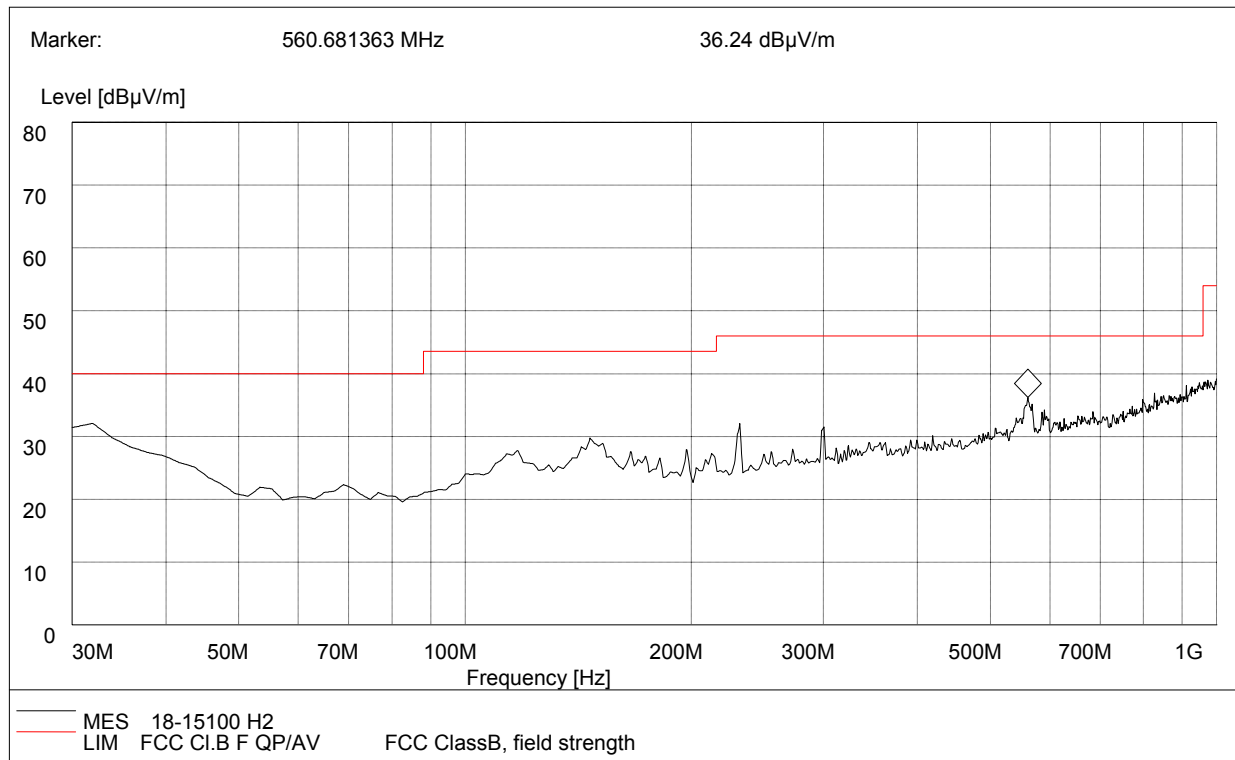
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

For 30MHz to 1000 MHz



30MHz to 1GHz, Antenna Vertical

Frequency (MHz)	QuasiPeak (dB μ V/m)	Bandwidth (kHz)	Antenna height (cm)	Limit (dB μ V/m)	Antenna	Verdict
30.00	31.83	120.000	100.0	40.00	Vertical	Pass
70.820000	31.03	120.000	100.0	40.00	Vertical	Pass
117.470000	32.88	120.000	100.0	43.50	Vertical	Pass
141.270000	32.51	120.000	100.0	43.50	Vertical	Pass
558.740000	35.22	120.000	100.0	46.00	Vertical	Pass
834.770000	37.24	120.000	100.0	46.00	Vertical	Pass



30MHz to 1GHz, Antenna Horizontal

Frequency (MHz)	QuasiPeak (dB μ V/m)	Bandwidth (kHz)	Antenna height (cm)	Limit (dB μ V/m)	Antenna	Verdict
31.940000	32.08	120.000	100.0	40.00	Horizontal	Pass
117.470000	27.79	120.000	100.0	43.5	Horizontal	Pass
146.630000	29.76	120.000	100.0	43.5	Horizontal	Pass
232.160000	32.02	120.000	100.0	46.0	Horizontal	Pass
300.200000	31.55	120.000	100.0	46.0	Horizontal	Pass
560.680000	36.24	120.000	100.0	46.0	Horizontal	Pass

For 1GHz to 40 GHz
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11a_5180MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5150.00	61.64	PK	74.00	-12.36	1.50	360	54.14	7.50
2	5150.00	51.34	AV	54.00	-2.66	1.50	360	43.84	7.50
3	10360.00	61.21	PK	68.20	-6.99	1.50	360	41.41	19.80

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11a_5180MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5150.00	60.26	PK	74.00	-13.74	1.50	240	52.76	7.50
2	5150.00	50.28	AV	54.00	-3.72	1.50	240	42.78	7.50
3	10360.00	60.95	PK	68.20	-7.25	1.50	250	41.15	19.80

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11a_5220MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	10400.00	58.47	PK	68.20	-9.73	1.50	180	38.57	19.90

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11a_5220MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	10400.00	59.26	PK	68.20	-8.94	1.00	360	39.36	19.90

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11a_5240MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5350.00	60.35	PK	74.00	-13.65	2.00	90	52.35	8.00
2	5350.00	50.00	AV	54.00	-4	2.00	90	42.00	8.00
3	10480.00	61.24	PK	68.20	-6.96	2.00	360	41.34	19.90

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11a_5240MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5350.00	61.24	PK	74.00	-12.76	1.00	180	53.24	8.00
2	5350.00	50.10	AV	54.00	-3.9	1.00	180	43.10	8.00
3	10480.00	60.18	PK	68.20	-8.02	2.00	360	40.28	19.90

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11a_5745MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5725.00	59.87	PK	74.00	-14.13	2.00	100	50.22	9.65
2	11490.00	58.41	PK	74.00	-15.59	1.50	360	36.71	21.70
3	11490.00	47.89	AV	54.00	-6.11	1.50	360	30.19	21.70

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11a_5745MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5725.00	60.24	PK	74.00	-13.76	1.00	360	50.59	9.65
2	11490.00	58.74	PK	74.00	-15.26	1.50	180	37.04	21.70
3	11490.00	48.20	AV	54.00	-5.8	1.50	180	30.50	21.70

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11a_5785MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	11570.00	59.87	PK	74.00	-14.13	1.00	250	38.17	21.70
2	11570.00	50.19	AV	54.00	-3.81	1.00	250	28.49	21.70

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11a_5785MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	11570.00	58.88	PK	74.00	-15.12	1.00	260	37.18	21.70
2	11570.00	50.30	AV	54.00	-3.7	1.00	260	28.60	21.70

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11a_5825MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5850.00	61.25	PK	68.20	-6.95	1.50	0	51.47	9.78
2	11650.00	57.14	PK	74.00	-16.86	1.50	360	35.24	21.90
3	11650.00	47.79	AV	54.00	-6.21	1.50	360	25.89	21.90

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11a_5825MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5850.00	60.78	PK	68.20	-7.42	2.00	180	51.00	9.78
2	11650.00	56.65	PK	74.00	-17.35	1.80	360	34.75	21.90
3	11650.00	47.11	AV	54.00	-6.89	1.80	360	25.21	21.90

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11n20_5180MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5150.00	58.14	PK	74.00	-15.86	1.50	0	50.64	7.50
2	5150.00	47.84	AV	54.00	-6.16	1.50	0	40.34	7.50
3	10360.00	60.35	PK	68.20	-7.85	1.50	360	40.55	19.80

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11n20_5180MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5150.00	57.71	PK	74.00	-16.29	1.50	240	50.21	7.50
2	5150.00	47.73	AV	54.00	-6.27	1.50	240	40.23	7.50
3	10360.00	59.78	PK	68.20	-8.42	1.50	150	39.98	19.80

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11n20_5220MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	10400.00	61.14	PK	68.20	-7.06	1.50	360	41.24	19.90

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11n20_5220MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	10400.00	61.47	PK	68.20	-6.73	1.50	360	41.57	19.90

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11n20_5240MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5350.00	60.08	PK	74.00	-13.92	2.00	180	52.08	8.00
2	5350.00	49.73	AV	54.00	-4.27	2.00	180	41.73	8.00
3	10480.00	61.78	PK	68.20	-6.42	2.00	180	41.88	19.90

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11n20_5240MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5350.00	59.41	PK	74.00	-14.59	1.00	360	51.41	8.00
2	5350.00	49.27	AV	54.00	-4.73	1.00	360	41.27	8.00
3	10480.00	62.09	PK	68.20	-6.11	2.00	360	42.19	19.90

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11n20_5745MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5725.00	61.28	PK	68.20	-6.92	1.50	10	51.63	9.65
2	11490.00	58.78	PK	74.00	-15.22	1.20	360	37.28	21.50
3	11490.00	50.04	AV	54.00	-3.96	1.20	360	28.54	21.50

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11n20_5745MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5725.00	60.99	PK	68.20	-7.21	1.50	100	51.34	9.65
2	11490.00	59.19	PK	74.00	-14.81	1.50	180	37.69	21.50
3	11490.00	50.61	AV	54.00	-3.39	1.50	180	29.11	21.50

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11n20_5785MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	11570.00	58.78	PK	74.00	-15.22	1.00	250	37.08	21.70
2	11570.00	49.10	AV	54.00	-4.9	1.00	250	27.40	21.70

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11n20_5785MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	11570.00	59.36	PK	74.00	-14.64	1.00	260	37.66	21.70
2	11570.00	50.78	AV	54.00	-3.22	1.00	260	29.08	21.70

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11n20_5825MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5850.00	60.74	PK	68.20	-7.46	2.00	0	50.96	9.78
2	11650.00	59.67	PK	74.00	-14.33	1.50	0	37.77	21.90
3	11650.00	50.32	AV	54.00	-3.68	1.50	0	28.42	21.90

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11n20_5825MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5850.00	61.27	PK	68.20	-6.93	2.00	180	51.49	9.78
2	11650.00	59.97	PK	74.00	-14.03	1.80	360	38.07	21.90
3	11650.00	50.43	AV	54.00	-3.57	1.80	360	28.53	21.90

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11n40_5190MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5150.00	61.08	PK	74.00	-12.92	2.00	100.00	53.58	7.50
2	5150.00	50.30	AV	54.00	-3.7	2.00	100.00	42.80	7.50
3	10380.00	59.82	PK	68.20	-8.38	1.80	360.00	40.02	19.80

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11n40_5190MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5150.00	59.78	PK	74.00	-14.22	1.50	0.00	52.28	7.50
2	5150.00	49.80	AV	54.00	-4.2	1.50	0.00	42.30	7.50
3	10380.00	61.24	PK	68.20	-6.96	1.80	250.00	41.44	19.80

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11n40_5230MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5350.00	58.95	PK	74.00	-15.05	2.00	180.00	50.95	8.00
2	5350.00	48.60	AV	54.00	-5.4	2.00	180.00	40.60	8.00
3	10460.00	59.97	PK	68.20	-8.23	2.00	150.00	40.07	19.90

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11n40_5230MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5350.00	58.97	PK	74.00	-15.03	2.00	180.00	50.97	8.00
2	5350.00	48.83	AV	54.00	-5.17	2.00	180.00	40.83	8.00
3	10460.00	59.99	PK	68.20	-21.54	1.50	150.00	40.09	19.90

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11n40_5755MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5725.00	59.97	PK	74.00	-14.03	1.50	220.00	50.32	9.65
2	5725.00	49.23	AV	54.00	-4.77	1.50	220.00	39.58	9.65
3	11510.00	58.74	PK	68.20	-9.46	1.80	360.00	37.04	21.70

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11n40_5755MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5725.00	60.71	PK	74.00	-13.29	2.00	180.00	51.06	9.65
2	5725.00	50.06	AV	54.00	-3.94	2.00	180.00	40.41	9.65
3	11510.00	59.78	PK	68.20	-8.42	1.50	200.00	38.08	21.70

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11n40_5795MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5850.00	60.07	PK	74.00	-13.93	1.50	360.00	50.29	9.78
2	5850.00	49.33	AV	54.00	-4.67	1.50	360.00	39.55	9.78
3	11590.00	59.78	PK	68.20	-8.42	2.00	180.00	37.98	21.80

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11n40_5795MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5850.00	61.48	PK	74.00	-12.52	1.20	360.00	51.70	9.78
2	5850.00	50.83	AV	54.00	-3.17	1.20	360.00	41.05	9.78
3	11590.00	59.97	PK	68.20	-8.23	1.50	360.00	38.17	21.80

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11ac20_5180MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5150.00	61.17	PK	74.00	-12.83	1.50	0	53.67	7.50
2	5150.00	50.87	AV	54.00	-3.13	1.50	0	43.37	7.50
3	10360.00	59.87	PK	68.20	-8.33	1.50	180	40.07	19.80

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11ac20_5180MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5150.00	61.11	PK	74.00	-12.89	1.50	360	53.61	7.50
2	5150.00	51.13	AV	54.00	-2.87	1.50	360	43.63	7.50
3	10360.00	59.87	PK	68.20	-8.33	1.50	150	40.07	19.80

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11ac20_5220MHz)**

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	10400.00	62.47	PK	68.20	-5.73	1.50	360	42.57	19.90

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11ac20_5220MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	10400.00	61.19	PK	68.20	-7.01	1.50	360	41.29	19.90

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11ac20_5240MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5350.00	59.87	PK	74.00	-14.13	2.00	180	51.87	8.00
2	5350.00	49.52	AV	54.00	-4.48	2.00	180	41.52	8.00
3	10480.00	61.17	PK	68.20	-7.03	2.00	180	41.27	19.90

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11ac20_5240MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5350.00	59.99	PK	74.00	-14.01	1.00	360	51.99	8.00
2	5350.00	49.85	AV	54.00	-4.15	1.00	360	41.85	8.00
3	10480.00	61.28	PK	68.20	-6.92	2.00	360	41.38	19.90

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11ac20_5745MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5725.00	59.97	PK	68.20	-8.23	1.00	360	50.32	9.65
2	11490.00	58.87	PK	74.00	-15.13	2.00	180	37.17	21.70
3	11490.00	49.35	AV	54.00	-4.65	2.00	180	27.65	21.70

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11ac20_5745MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5725.00	60.78	PK	68.20	-7.42	1.00	360	51.13	9.65
2	11490.00	59.66	PK	74.00	-14.34	1.50	0	37.96	21.70
3	11490.00	50.12	AV	54.00	-3.88	1.50	0	28.42	21.70

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11ac20_5785MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	11570.00	61.25	PK	74.00	-12.75	1.50	100	39.55	21.70
2	11570.00	51.57	AV	54.00	-2.43	1.50	100	29.87	21.70

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11ac20_5785MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	11570.00	60.68	PK	74.00	-13.32	1.00	360	38.98	21.70
2	11570.00	52.10	AV	54.00	-1.9	1.00	360	30.40	21.70

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11ac20_5825MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5850.00	61.54	PK	68.20	-6.66	1.50	150	51.76	9.78
2	11650.00	60.00	PK	74.00	-14	1.50	360	38.10	21.90
3	11650.00	50.65	AV	54.00	-3.35	1.50	360	28.75	21.90

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11ac20_5825MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5850.00	60.15	PK	68.20	-8.05	2.00	180	50.37	9.78
2	11650.00	58.98	PK	74.00	-15.02	1.80	360	37.08	21.90
3	11650.00	49.44	AV	54.00	-4.56	1.80	360	27.54	21.90

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11ac40_5190MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5150.00	60.28	PK	74.00	-13.72	1.50	360.00	52.78	7.50
2	5150.00	49.50	AV	54.00	-4.5	1.50	360.00	42.00	7.50
3	10380.00	58.78	PK	68.20	-9.42	1.80	360.00	38.98	19.80

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11ac40_5190MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5150.00	60.74	PK	74.00	-13.26	1.50	0.00	53.24	7.50
2	5150.00	50.76	AV	54.00	-3.24	1.50	0.00	43.26	7.50
3	10380.00	60.33	PK	68.20	-7.87	1.80	250.00	40.53	19.80

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11ac40_5230MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5350.00	60.35	PK	74.00	-13.65	1.50	360.00	52.35	8.00
2	5350.00	50.00	AV	54.00	-4	1.50	360.00	42.00	8.00
3	10460.00	58.84	PK	68.20	-9.36	2.00	150.00	38.94	19.90

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11ac40_5230MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5350.00	60.28	PK	74.00	-13.72	1.50	180.00	52.28	8.00
2	5350.00	50.14	AV	54.00	-3.86	1.50	180.00	42.14	8.00
3	10460.00	59.99	PK	68.20	-21.54	1.50	150.00	40.09	19.90

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11ac40_5755MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5725.00	60.58	PK	74.00	-13.42	1.50	100.00	50.93	9.65
2	5725.00	49.84	AV	54.00	-4.16	1.50	100.00	40.19	9.65
3	11510.00	59.78	PK	68.20	-8.42	2.00	150.00	38.08	21.70

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11ac40_5755MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5725.00	60.05	PK	74.00	-13.95	2.00	180.00	50.40	9.65
2	5725.00	49.40	AV	54.00	-4.6	2.00	180.00	39.75	9.65
3	11510.00	58.98	PK	68.20	-9.22	1.50	200.00	37.28	21.70

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11ac40_5795MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5850.00	61.58	PK	74.00	-12.42	1.50	0.00	51.80	9.78
2	5850.00	50.84	AV	54.00	-3.16	1.50	0.00	41.06	9.78
3	11590.00	60.74	PK	68.20	-7.46	2.00	360.00	38.94	21.80

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11ac40_5795MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5850.00	61.11	PK	74.00	-12.89	1.80	180.00	51.33	9.78
2	5850.00	50.46	AV	54.00	-3.54	1.80	180.00	40.68	9.78
3	11590.00	60.25	PK	68.20	-7.95	1.50	360.00	38.45	21.80

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11ac-VHT80_5210MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5150.00	59.87	PK	74.00	-14.13	1.00	360.00	52.37	7.50
2	5150.00	49.21	AV	54.00	-4.79	1.00	360.00	41.71	7.50
3	10420.00	58.87	PK	68.20	-9.33	1.60	180.00	38.97	19.90

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11ac-VHT80_5210MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5150.00	60.45	PK	74.00	-13.55	2.00	360.00	52.95	7.50
2	5150.00	50.47	AV	54.00	-3.53	2.00	360.00	42.97	7.50
3	10420.00	61.25	PK	68.20	-6.95	1.60	180.00	41.35	19.90

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11ac-VHT80_5775MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5460.00	59.98	PK	74.00	-14.02	2.00	100.00	50.20	9.78
2	5460.00	52.24	AV	54.00	-1.76	2.00	100.00	42.46	9.78
3	11550.00	56.74	PK	74.00	-17.26	1.50	360.00	34.94	21.80
4	11550.00	49.00	AV	54.00	-5.00	1.50	360.00	27.20	21.80

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11ac-VHT80_5775MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	5460.00	58.87	PK	74.00	-15.13	1.50	360.00	49.09	9.78
2	5460.00	50.22	AV	54.00	-3.78	1.50	360.00	40.44	9.78
3	11550.00	55.15	PK	74.00	-18.85	2.00	360.00	33.35	21.80
4	11550.00	47.57	AV	54.00	-6.43	2.00	360.00	25.77	21.80

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

2.7. Conducted Emission

2.7.1. Limit of Conducted Emission

FCC 15.207, RSS-Gen, 8.8

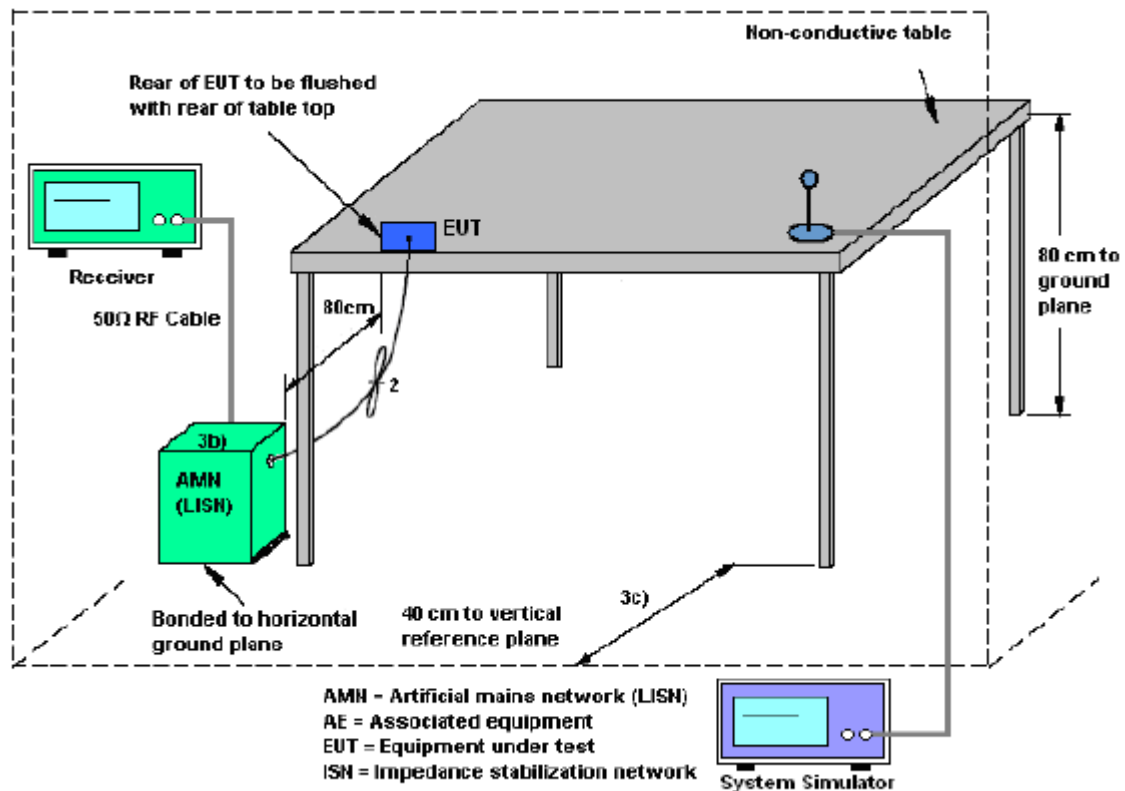
For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency range (MHz)	Conducted Limit (dB μ V)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

2.7.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.7.3. Test Setup

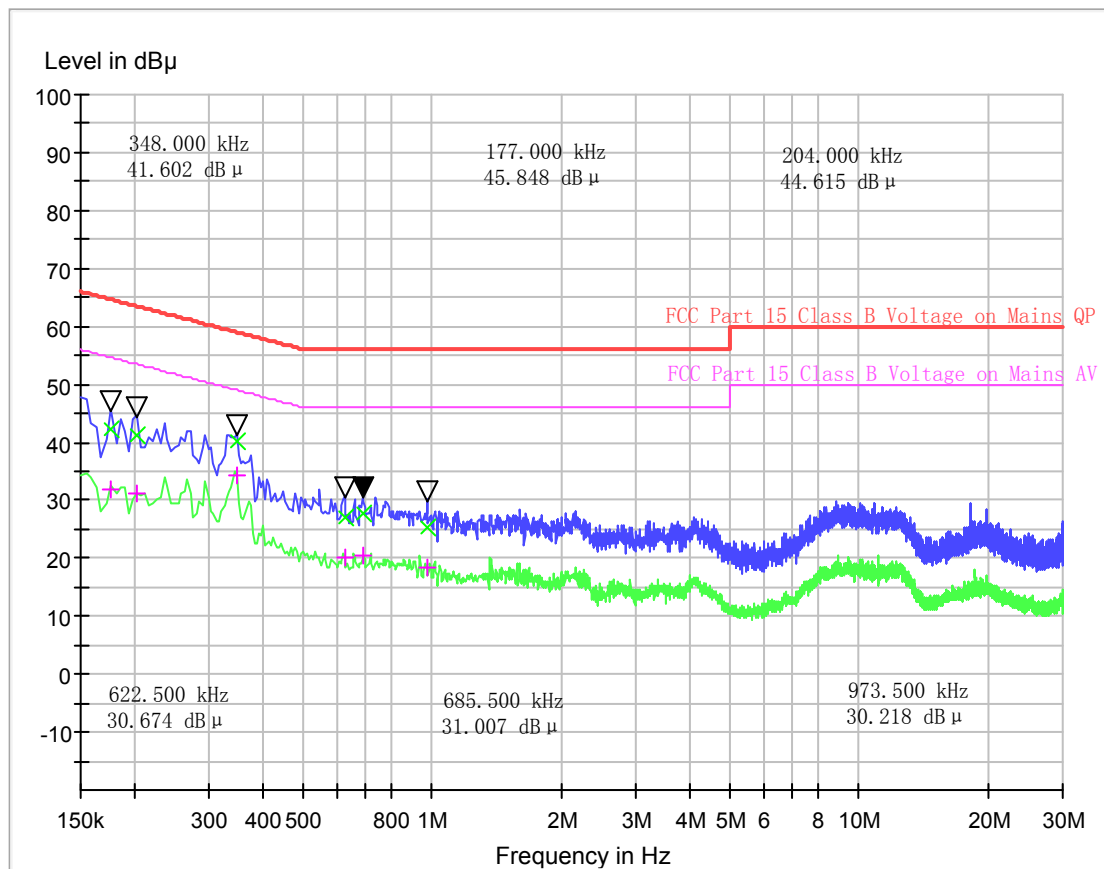


2.7.4. Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

2.7.5. Test Results of Conducted Emission

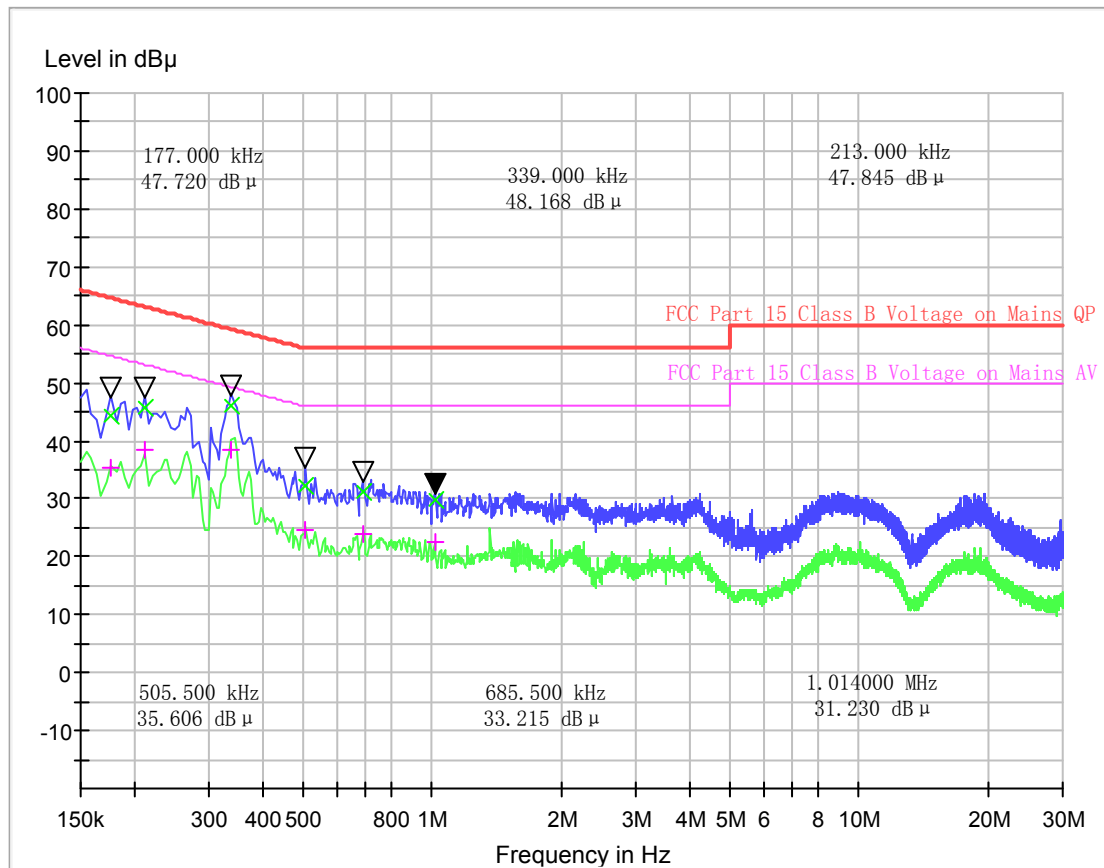
The EUT configuration of the emission tests is 5G WLAN Link + Adapter



(Plot B: N Phase)

Conducted Disturbance at Mains Terminals					
N Test Data					
QP			AV		
Frequency (MHz)	Limits (dBμV)	Measurement Value (dBμV)	Frequency (MHz)	Limits (dBμV)	Measurement Value (dBμV)
0.177000	64.6	42.08	0.177000	54.6	31.75
0.204000	63.4	41.25	0.204000	53.4	31.34
0.348000	59.0	40.10	0.348000	49.0	34.16
0.622500	56.0	27.08	0.622500	46.0	20.02
0.685500	56.0	27.79	0.685500	46.0	20.46
0.973500	56.0	25.33	0.973500	46.0	18.26

Test Result: PASS



(Plot A: L Phase)

Conducted Disturbance at Mains Terminals					
L Test Data					
QP			AV		
Frequency (MHz)	Limits (dBμV)	Measurement Value (dBμV)	Frequency (MHz)	Limits (dBμV)	Measurement Value (dBμV)
0.177000	64.6	44.29	0.177000	54.6	35.35
0.213000	63.1	45.77	0.213000	53.1	38.53
0.339000	59.2	46.04	0.339000	49.2	38.44
0.505500	56.0	32.34	0.505500	46.0	24.64
0.685500	56.0	31.12	0.685500	46.0	23.79
1.014000	56.0	29.73	1.014000	46.0	22.67

Test Result: PASS

3. List of measuring equipment

Radiated Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal
1	Ultra-Broadband Antenna	ShwarzBeck	VULB9163	538	11/12/2017
2	EMI TEST RECEIVER	Rohde&Schwarz	ESI 26	100009	11/12/2017
3	EMI TEST Software	Audix	E3	N/A	N/A
4	TURNTABLE	ETS	2088	2149	N/A
5	ANTENNA MAST	ETS	2075	2346	N/A
6	EMI TEST Software	Rohde&Schwarz	ESK1	N/A	N/A
7	HORNANTENNA	ShwarzBeck	9120D	1011	11/12/2017
8	Amplifer	Sonoma	310N	E009-13	11/12/2017
9	JS amplifer	Rohde&Schwarz	JS4-00101800-28 -5A	F201504	11/12/2017
10	High pass filter	Compliance Direction systems	BSU-6	34202	11/12/2017
11	HORNANTENNA	ShwarzBeck	9120D	1012	11/12/2017
12	Amplifer	Compliance Direction systems	PAP1-4060	120	11/12/2017
13	Loop Antenna	Rohde&Schwarz	HFH2-Z2	100020	11/12/2017
14	TURNTABLE	MATURO	TT2.0	----	N/A
15	ANTENNA MAST	MATURO	TAM-4.0-P	----	N/A
16	Horn Antenna	SCHWARZBECK	BBHA9170	25841	11/12/2017
17	ULTRA-BROADBAND ANTENNA	Rohde&Schwarz	HL562	100015	11/12/2017
18	Power Meter	Anritsu	ML2480B	100798	11/12/2017

**** END OF REPORT ****