FCC RADIO TEST REPORT

The device described below is tested by Dongguan Nore Testing Center Co., Ltd. to determine the maximum emission levels emanating from the device, the severe levels which the device can endure and E.U.T.'s performance criterion. The test results, data evaluation, test procedures, and equipment of configurations shown in this report were made in accordance with the procedures in ANSI C63.10(2013).

Applicant /Manufacturer	:	BESTOM TECHNOLOGY(HK) CO., LIMITED
Address	:	R718 BuildingB1, Huayuan S&TP, No.168 BY Road Xixiang Street, Shenzhen City, China
Factory	:	Guangzhou Jinghua Precision Optics Co., Ltd.
Address	:	12 Kangda Rd., Dongcheng Zone, Yunpu Industrial District, Huangpu, Guangzhou, China
E.U.T.	:	Bestable
Brand Name	:	N/A
Model No.	:	ET1030
FCC ID	:	2ALBPET1030
Measurement Standard	:	47 CFR FCC PART 15 Subpart E (section 407)
Date of Receiver	:	November 08, 2019
Date of Test	:	November 08, 2019 to December 09, 2019
Date of Report	:	Decenber 09, 2019

This Test Report is Issued Under the Authority of :

Prepared by	Approved & Authorized Signer
Rose Hu / Engineer	Iori Fan / Authorized Signatory

This test report is for the customer shown above and their specific product only. This report applies to above tested sample only and shall not be reproduced in part without written approval of Dongguan Nore Testing Center Co., Ltd.

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Revision History of This Test Report

Report Number	Description	Issued Date
NTC1912108FV00	Initial Issue	2019-12-09

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test

E.U.T.	:	Bestable
Main Model Name	:	ET1030
Brand Name	:	N/A
Power Supply	:	DC 5V From Type-C USB Port
Test Voltage	:	AC 120V 60Hz Adapter Input, AC 240V 60Hz Adapter Input Only the worst case was recorded in the test report.
Adapter	:	N/A
Cable	:	N/A
Hardware version	:	V1.0
Software version	:	V1.0
Note	:	This report only applies to 5G WIFI function.

Technical parameters
For 5G Band

Frequency Range	:	U-NII-1: 5180-5240MHz U-NII-3: 5745-5825MHz
Modulation type	:	IEEE 802.11a: OFDM IEEE 802.11n/ac: see the below table
Data Modulation	:	EEE 802.11a: OFDM (BPSK/QPSK/16QAM/64-QAM) IEEE 802.11n/ac: OFDM (BPSK/QPSK/16QAM/ 64-QAM/256-QAM)
Modulation Technology	:	OFDM
Number of Channel	:	802.11a/n(HT20)/ac(VHT20): 9 802.11n(HT40)/ac (VHT40): 4 802.11ac (VHT80): 2
Data rate	:	802.11a: 6~54Mbps 802.11n(HT20): MCS 0~8 802.11n(HT40): MCS 0~9 802.11ac(VHT20): MCS 0~8, Nss=1-2 802.11ac(VHT40): MCS 0~9, Nss=1-2 802.11ac(VHT80): MCS 0~9, Nss=1-2
Beamforming Mode	:	Does not support
Antenna Type	:	Integral antenna
Antenna Gain	:	2dBi

Channel list for 5GHz Band

U-NII-1 5180~5240MHz			
802.11a/n(HT20)/ac(VHT20)		802.11n(HT40)/ac(VHT40)	
Channel	Frequency MHz	Channel	Frequency MHz
36	5180	38	5190
40	5200	46	5230
44	5220	802.11 ac (VHT80)	
48	5240	42	5210

U-NII-3 5745~5825MHz			
802.11a/n(HT20)/ac(VHT20)		802.11n(HT40)/ac(VHT40)	
Channel	Frequency MHz	Channel	Frequency MHz
149	5745	151	5755
153	5765	159	5795
157	5785	802.11 ac (VHT80)	
161	5805	155	155
165	5825		

Note: According to section 15.31(m), regards to the operating frequency range over 10MHz, the Lowest, middle, and the Highest frequency of channel were selected to perform the test. The selected frequency see below:

U-NII-1 5180~5240MHz		U-NII-3 5745~5825MHz	
802.11a/n(HT20)/ac (VHT20)		802.11a/n(HT20)/ac(VHT20)	
Channel	Frequency MHz	Channel	Frequency MHz
36	5180	149	5745
40	5200	157	5785
48	5240	165	5825
802.11n(HT40)/ac(VHT40)		802.11n(HT40)/ac(VHT40)	
38	5190	151	5755
46	5230	159	5795
802.11ac (VHT80)		802.11ac (VHT80)	
42	5210	155	5775

Test SW version	EngineerMode.apk

1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **2ALBPET1030** filing to comply with Section 15.407 of the FCC Part 15 subpart E Rule.

1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013). Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters. All other measurements were made in accordance with the procedures in 47 CFR part 2.

1.4 Equipment Modifications

Not available for this EUT intended for grant.

1.5 Support Device

Adapter	:	Manufacturer: HUWEI Model No.: HW-050200C01 Input: AC100-240V 50/60Hz, 0.5A Output: DC5V 2A
Notebook	:	Manufacturer: Lenovo Model: TP00067A P/N: SL10G10768 S/N: PF-0DS3YC 15/12
Adapter (For Notebook)	:	Manufacturer: Lenovo Model: ADLX65NLC3A I/P: AC 100-240V 50-60Hz, 1.8A O/P: DC 20V 3.25A

1.6 Test Facility and Location

Site Description

EMC Lab : Listed by CNAS, August 13, 2018
The certificate is valid until August 13, 2024
The Laboratory has been assessed and proved to be in compliance with CNAS/CL01
The Certificate Registration Number is L5795.

Listed by A2LA, November 01, 2017
The certificate is valid until December 31, 2021
The Laboratory has been assessed and proved to be in compliance with ISO17025
The Certificate Registration Number is 4429.01

Listed by FCC, November 06, 2017
The Designation Number is CN1214
Test Firm Registration Number: 907417

Listed by Industry Canada, June 08, 2017
The Certificate Registration Number. Is 46405-9743

Name of Firm : Dongguan Nore Testing Center Co., Ltd.
(Dongguan NTC Co., Ltd.)

Site Location : Building D, Gaosheng Science and Technology Park, Hongtu Road, Nancheng District, Dongguan City, Guangdong Province, China

1.7 Deviations and Abnormalities from Standard Conditions

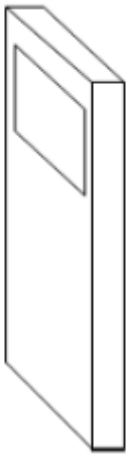
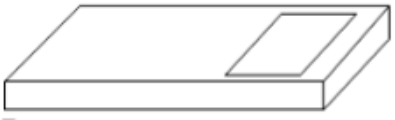
No additions, deviations and exclusions from the standard.

1.8 Summary of Test Results

FCC Rules	Description Of Test	Uncertainty	Result
§15.207 (a)	AC Power Conducted Emission	±1.06dB	PASS
§15.407(a)	Max. Conducted Output Power	±1.06dB	PASS
§15.407(a)	26dB Spectrum Bandwidth and 99% Occupied Bandwidth	±1.42 x10^{-4}%	PASS
§15.407(e)	6dB Bandwidth	±1.42 x10^{-4}%	PASS
§15.407(a)	Power Spectral Density	±1.70dB	PASS
§15.407(b) §15.209 §15.205	Radiated Emissions	±3.70dB	PASS
§15.407(b)	Band Edge Emissions	±1.06dB	PASS
§15.407(g)	Frequency Stability	±8.42 x10^{-8}	PASS
§15.203	Antenna Requirement	---	PASS

Note: The EUT operating multiple positions, therefore the EUT shall be performed three orthogonal planes. The worst plane is X.

Example:

X Plane	Y Plane	Z Plane
		

2. System Test Configuration

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 Special Accessories

Not available for this EUT intended for grant.

2.3 Description of test modes

The EUT has been tested under continuous operating condition. Test program used to control the EUT staying in continuous transmitting mode. The Lowest, middle and highest channel were chosen for testing, and modulation type CCK, DQPSK, DBPSK, OFDM, OFDM-BPSK, QPSK, 16QAM, 256QAM and all data rate were tested. But only the worst case data is shown in this report.

2.4 EUT Exercise

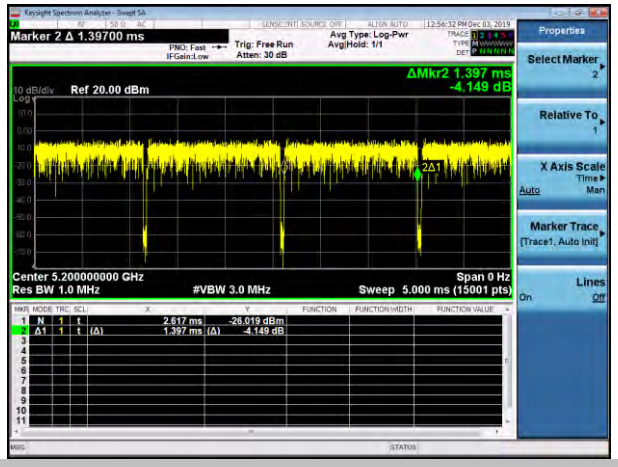
The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements.

2.5 Duty cycle

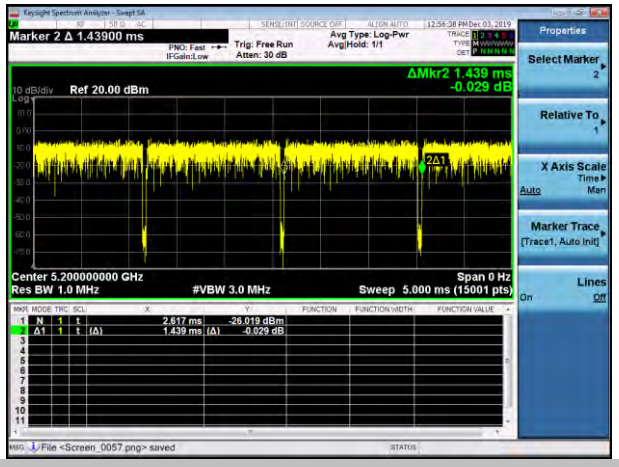
Operation Band (MHz)	Mode	Ton (ms)	Ton+off (ms)	Duty Cycle (%)	1/T minimum VBW (kHz)
U-NII-1 5180~5240	802.11a	1.397	1.439	97.08%	0.042
	802.11ac(VHT20)	1.315	1.356	96.98%	0.041
	802.11ac(VHT40)	0.657	0.697	94.26%	0.040
	802.11ac(VHT80)	0.326	0.356	91.57%	0.030
	802.11n(HT20)	1.308	1.348	97.03%	0.040
	802.11n(HT40)	0.651	0.695	93.67%	0.044
U-NII-3 5745~5825	802.11a	1.391	1.433	97.07%	0.042
	802.11ac(VHT20)	1.316	1.357	96.98%	0.041
	802.11ac(VHT40)	0.658	0.697	94.40%	0.039
	802.11ac(VHT80)	0.328	0.366	89.62%	0.038
	802.11n(HT20)	1.304	1.345	96.95%	0.041
	802.11n(HT40)	0.652	0.689	94.93%	0.037

U-NII-1 5180-5240MHz
IEEE 802.11a

Ton

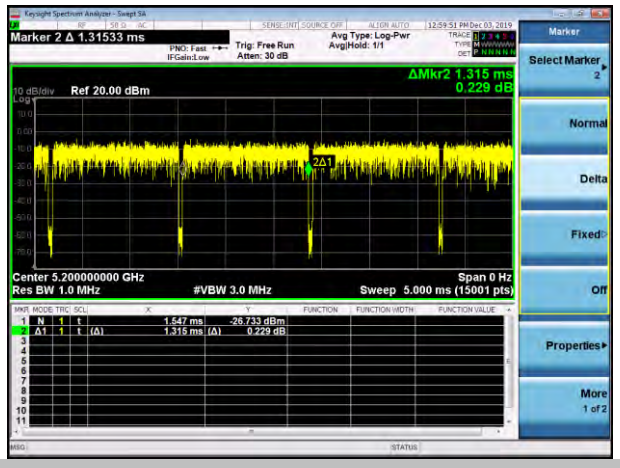


Ton+off



IEEE 802.11ac(VHT20)

Ton



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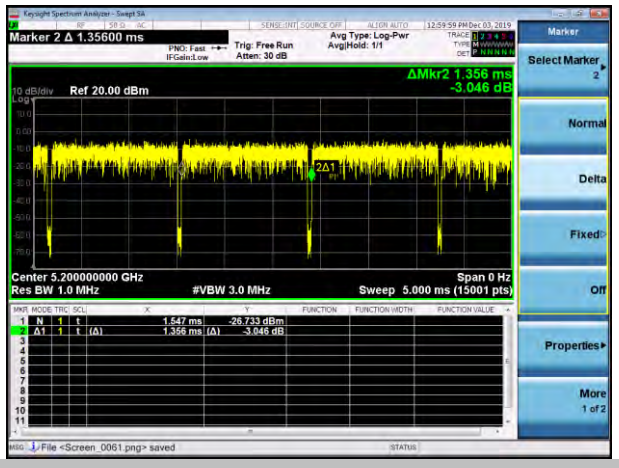

IEEE 802.11ac(VHT40)

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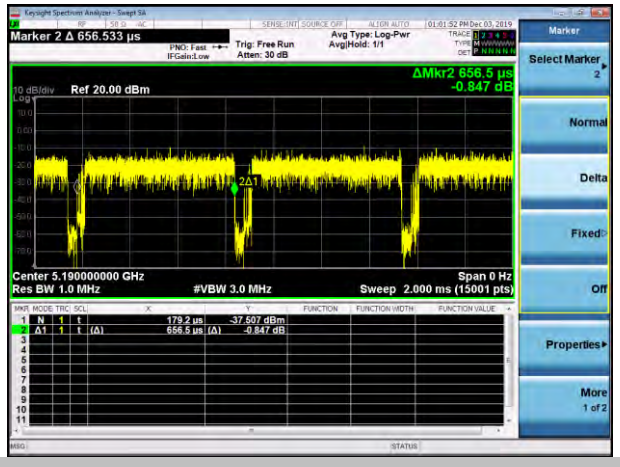

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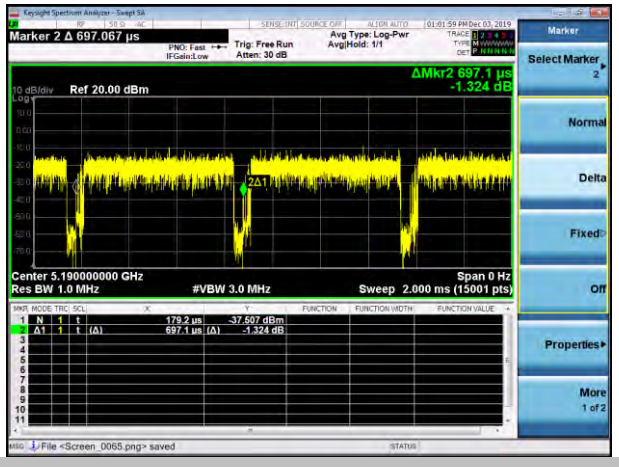

IEEE 802.11ac(VHT80)

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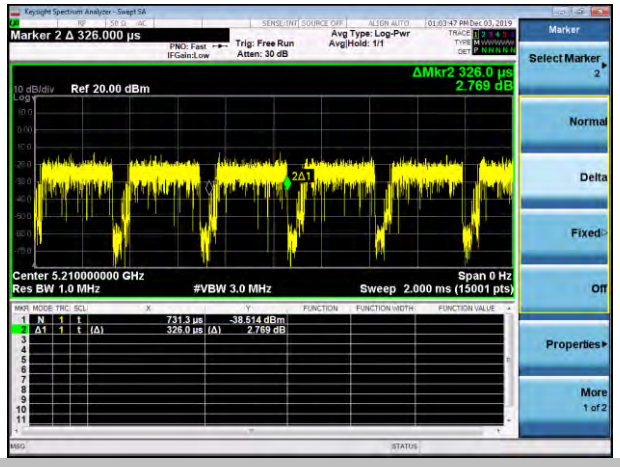

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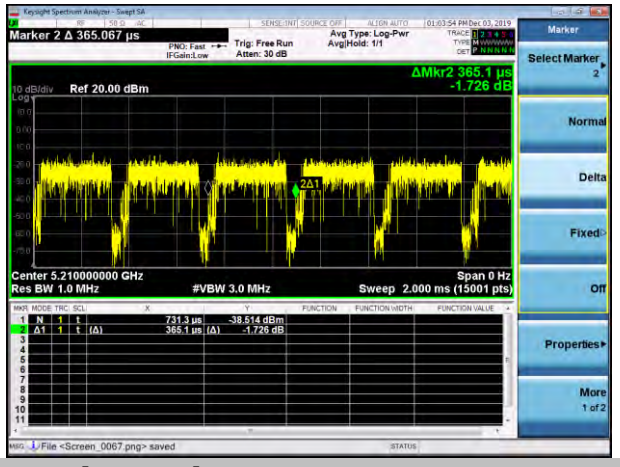
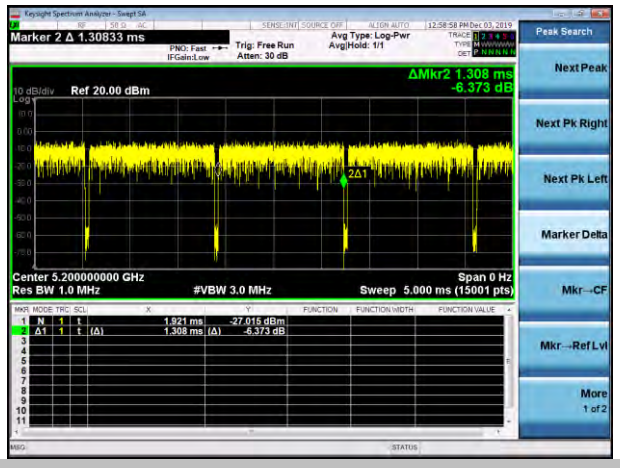


IEEE 802.11n(HT20)

Ton



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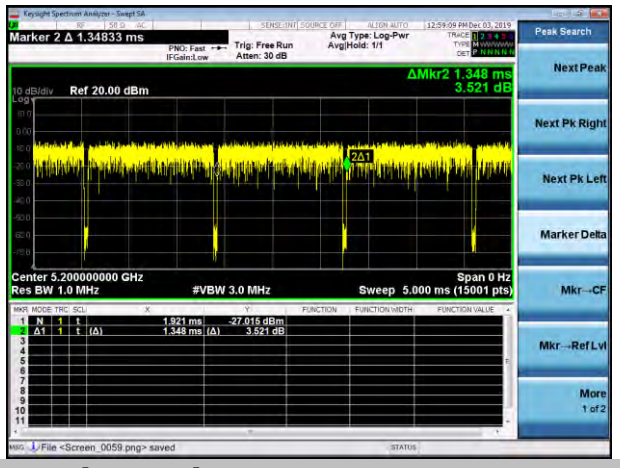
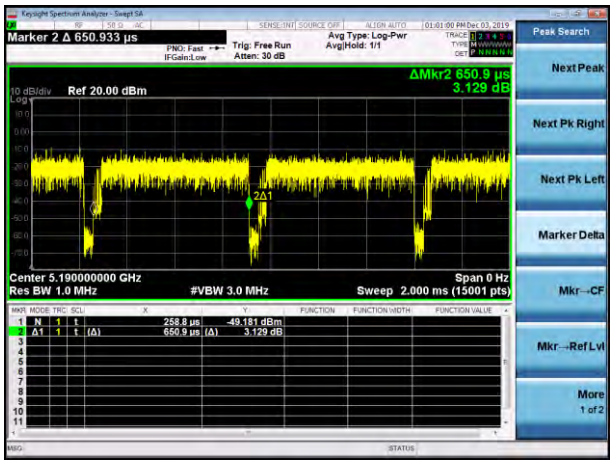


IEEE 802.11n(HT40)

Ton



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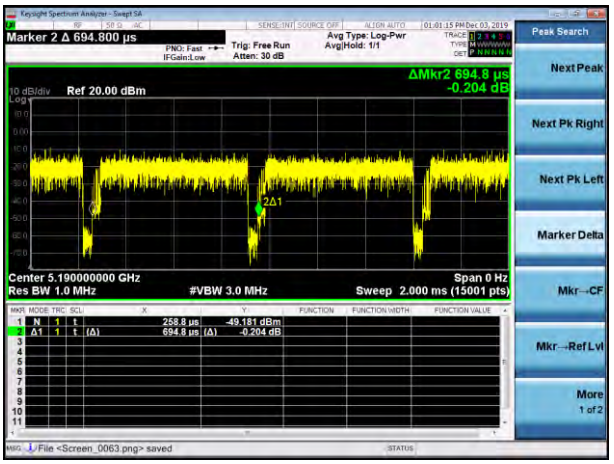
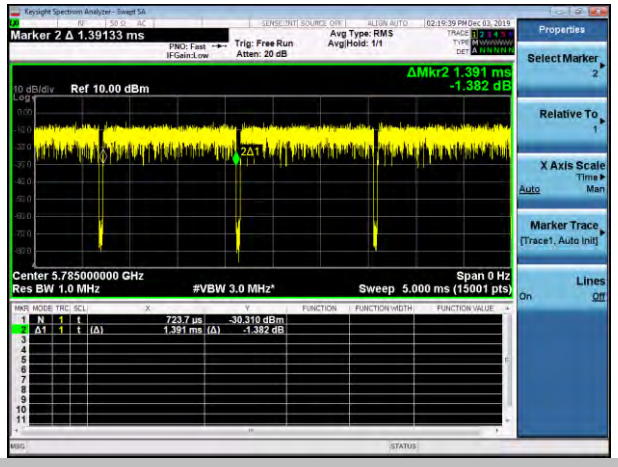


U-NII-3 5725-5850MHz
IEEE 802.11a

Ton



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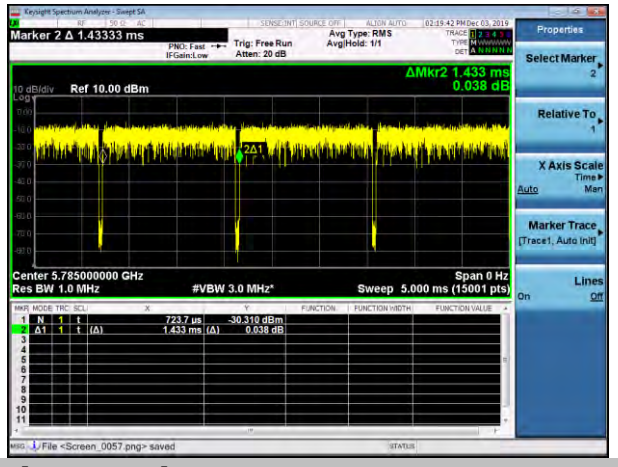

IEEE 802.11ac(VHT20)

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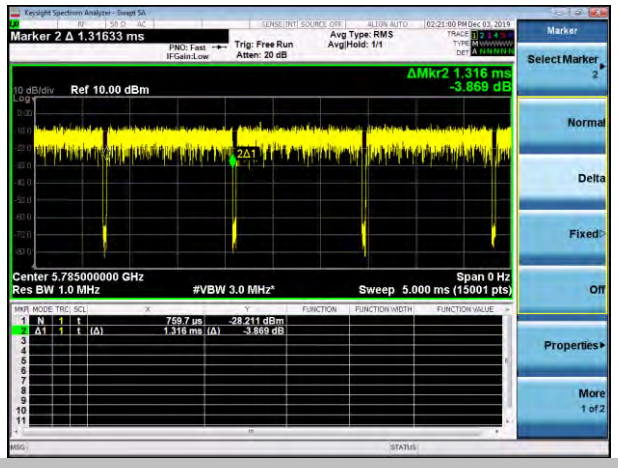

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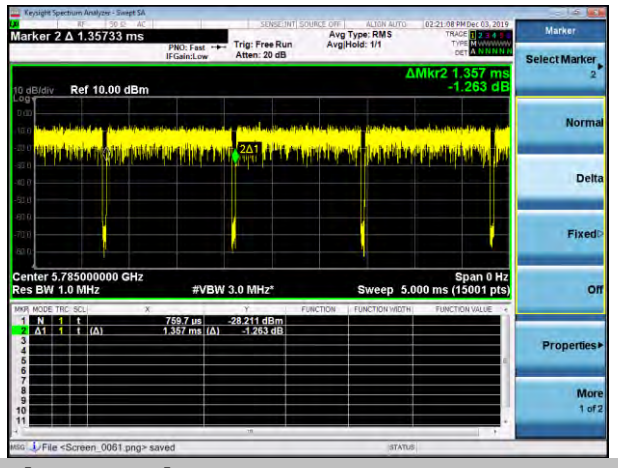

IEEE 802.11ac(VHT40)

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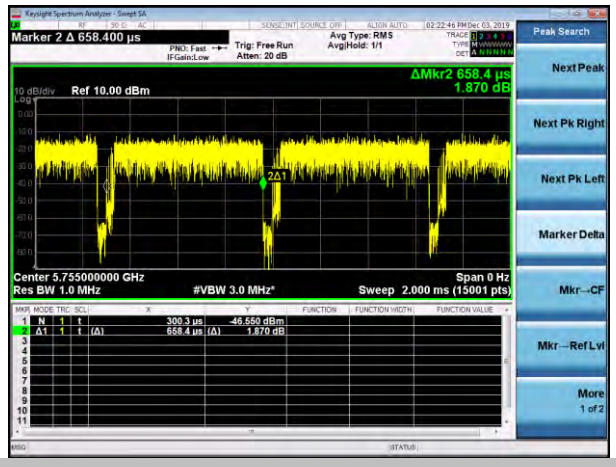

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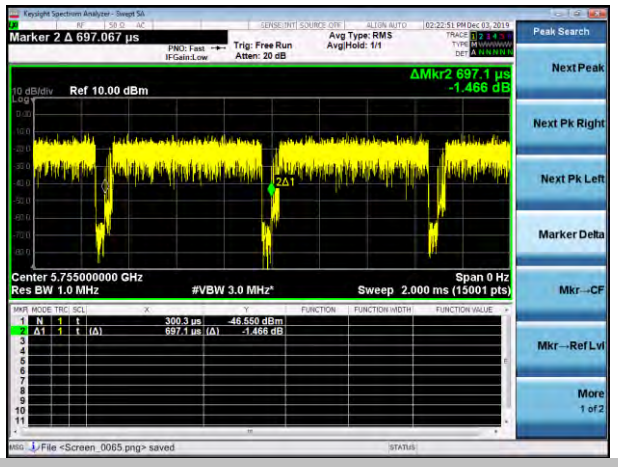

IEEE 802.11ac(VHT80)

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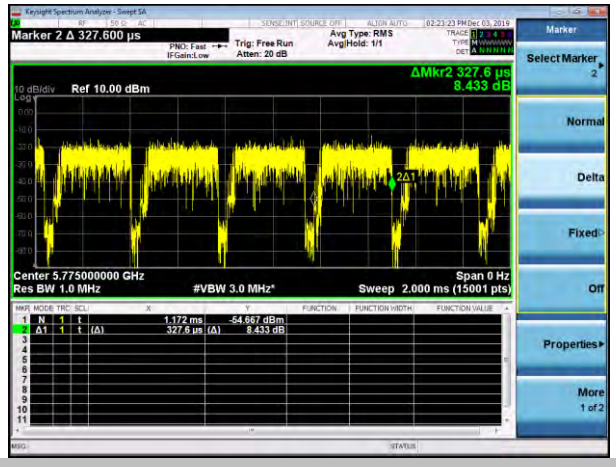

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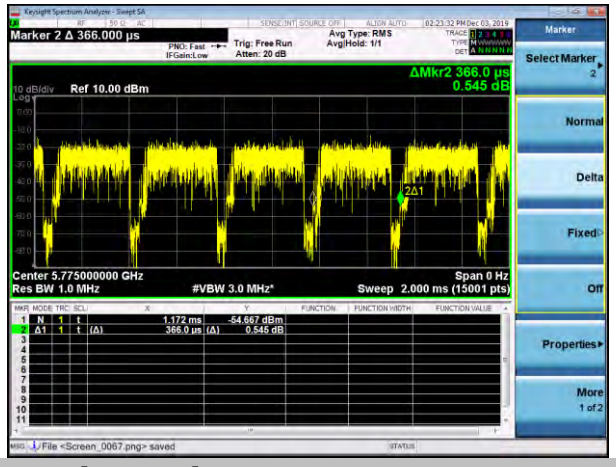

IEEE 802.11n(HT20)

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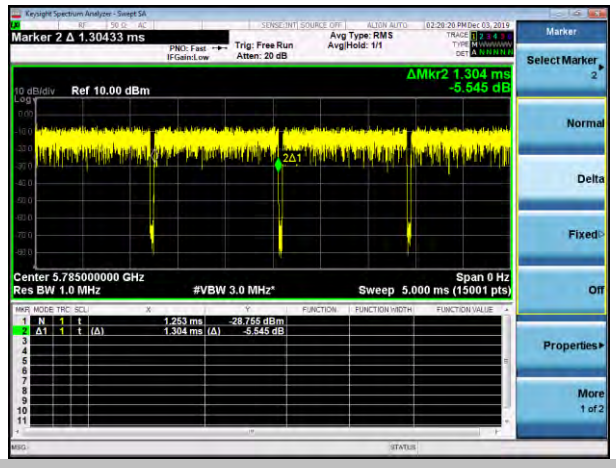

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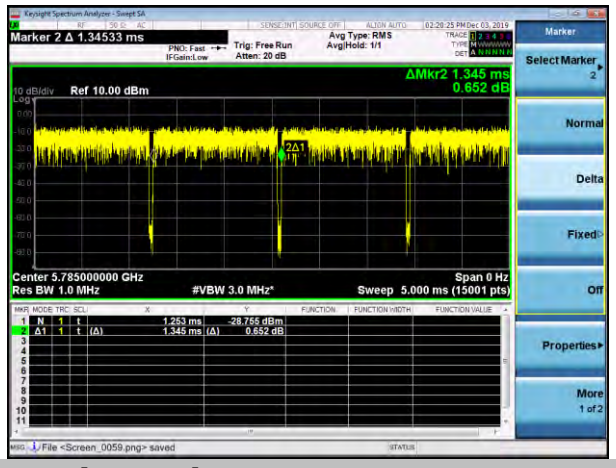

IEEE 802.11n(HT40)

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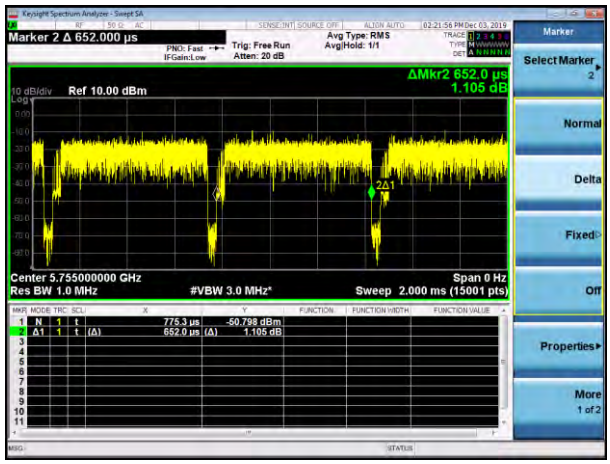

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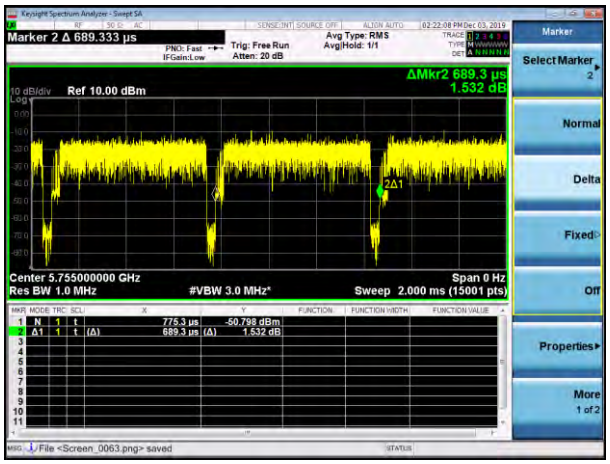
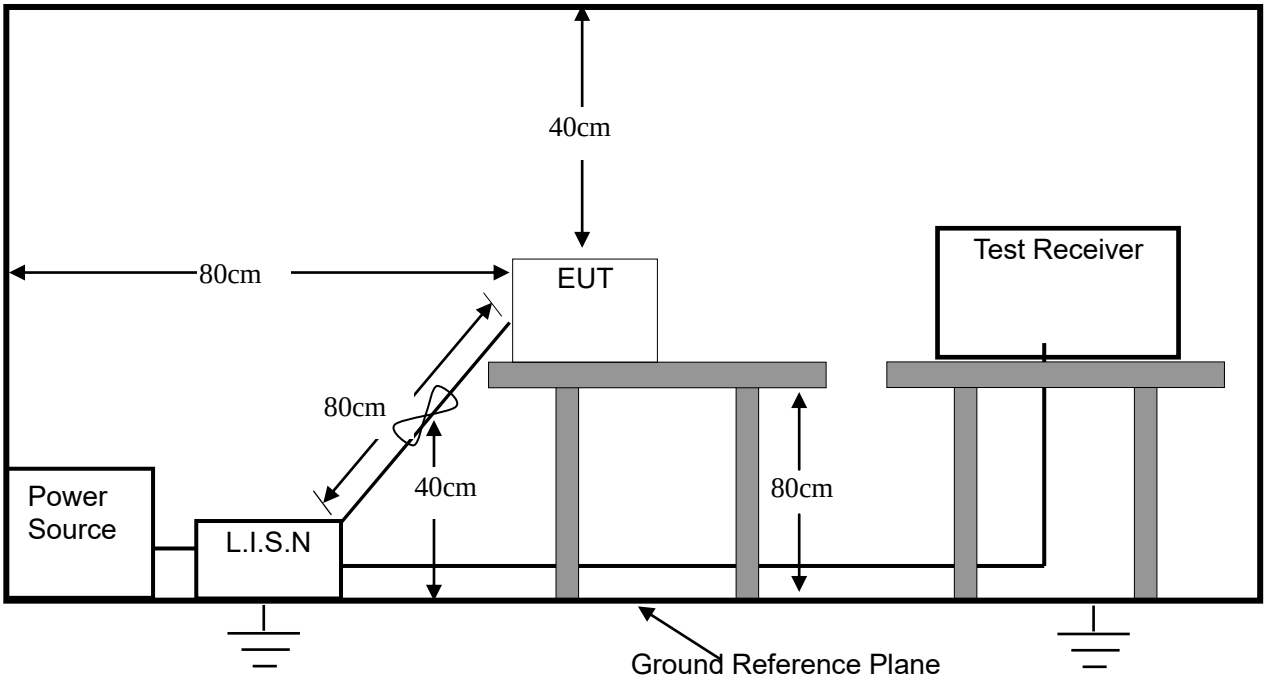


3. Conducted Emissions Test

3.1 Test SET-UP (Block Diagram of Configuration)



3.2 Test Condition

Test Requirement: FCC Part 15.207

Frequency Range: 150KHz ~ 30MHz

Detector: RBW 9KHz, VBW 30KHz

Operation Mode: TX, TX+Charging

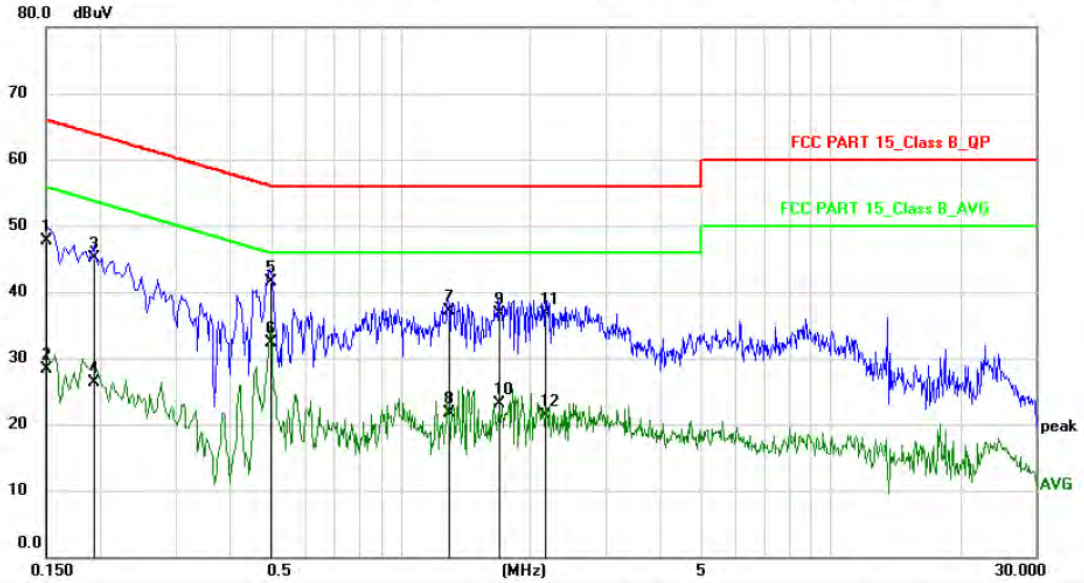
3.3 Measurement Results

Please refer to following plots of the worst case: 802.11a Low channel (U-NII-1) and 802.11a Low channel (U-NII-3).
The worst test voltage: AC 120V 60Hz

Dongguan NTC Co., Ltd.
Tel: +86-769-22022444 Fax: +86-769-22022799
Web: Http://www.ntc-c.com

Conducted Emission Measurement

File :ET1030 Data :#8 Date: 2019/12/5 Time: 10:12:08



Site
Limit: FCC PART 15_Class B_QP
EUT: Bestable
M/N: ET1030
Mode: TX-5G Band 1
Note:

Phase: *L1*
Power: AC120V/60Hz

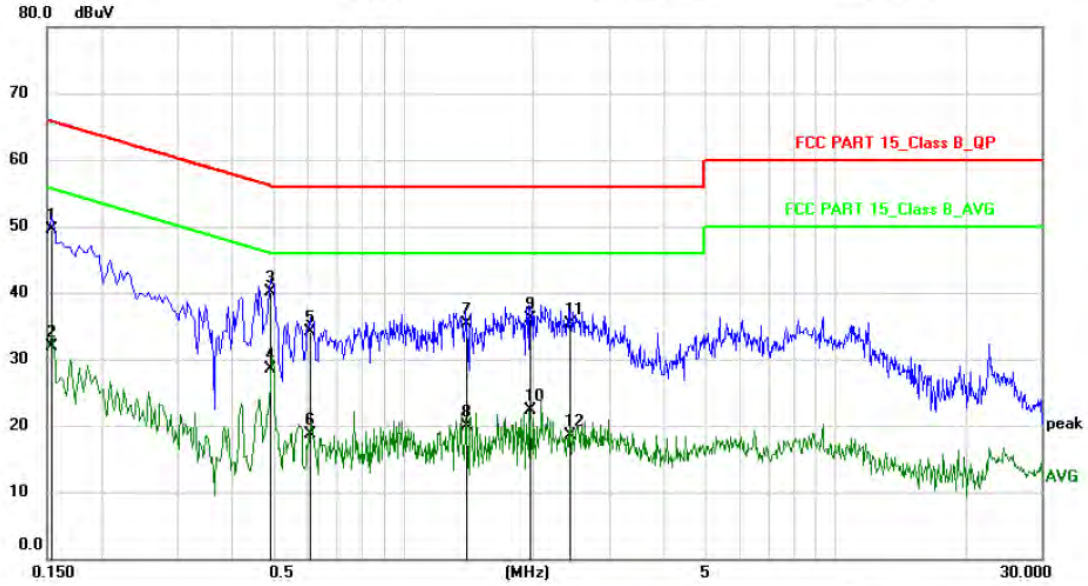
Temperature: 26
Humidity: 50 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	37.20	10.60	47.80	66.00	-18.20	QP	
2		0.1500	17.80	10.60	28.40	56.00	-27.60	AVG	
3		0.1940	34.60	10.60	45.20	63.86	-18.66	QP	
4		0.1940	15.80	10.60	26.40	53.86	-27.46	AVG	
5		0.4979	30.97	10.63	41.60	56.03	-14.43	QP	
6	*	0.4979	21.77	10.63	32.40	46.03	-13.63	AVG	
7		1.2900	26.40	10.70	37.10	56.00	-18.90	QP	
8		1.2900	11.10	10.70	21.80	46.00	-24.20	AVG	
9		1.6900	26.10	10.70	36.80	56.00	-19.20	QP	
10		1.6900	12.50	10.70	23.20	46.00	-22.80	AVG	
11		2.1779	26.10	10.70	36.80	56.00	-19.20	QP	
12		2.1779	10.70	10.70	21.40	46.00	-24.60	AVG	

Dongguan NTC Co., Ltd.
Tel: +86-769-22022444 Fax: +86-769-22022799
Web: Http://www.ntc-c.com

Conducted Emission Measurement

File :ET1030 Data :#7 Date: 2019/12/5 Time: 9:56:39



Site
Limit: FCC PART 15_Class B_QP
EUT: Bestable
M/N: ET1030
Mode: TX-5G Band 1
Note:

Phase: N
Power: AC120V/60Hz

Temperature: 26
Humidity: 50 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1539	38.90	10.60	49.50	65.79	-16.29	QP	
2		0.1539	21.30	10.60	31.90	55.79	-23.89	AVG	
3	*	0.4940	29.47	10.63	40.10	56.10	-16.00	QP	
4		0.4940	17.87	10.63	28.50	46.10	-17.60	AVG	
5		0.6100	23.56	10.64	34.20	56.00	-21.80	QP	
6		0.6100	8.06	10.64	18.70	46.00	-27.30	AVG	
7		1.4020	24.60	10.70	35.30	56.00	-20.70	QP	
8		1.4020	9.20	10.70	19.90	46.00	-26.10	AVG	
9		1.9660	25.40	10.70	36.10	56.00	-19.90	QP	
10		1.9660	11.70	10.70	22.40	46.00	-23.60	AVG	
11		2.4260	24.70	10.70	35.40	56.00	-20.60	QP	
12		2.4260	7.90	10.70	18.60	46.00	-27.40	AVG	

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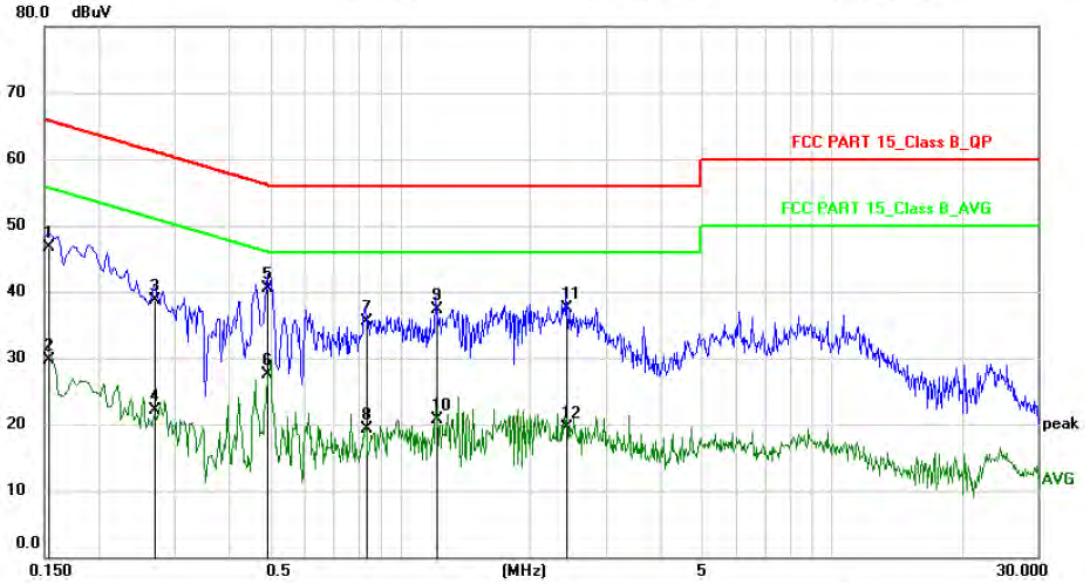
Web: Http://www.ntc-c.com

Conducted Emission Measurement

File :ET1030 Data :#10 Date: 2019/12/5 Time: 10:31:53



Site
Limit: FCC PART 15_Class B_QP
EUT: Bestable
M/N: ET1030
Mode: TX-5G Band 3
Note:

Phase: L1
Power: AC120V/60Hz

Temperature: 26
Humidity: 50 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1539	36.20	10.60	46.80	65.79	-18.99	QP	
2		0.1539	19.10	10.60	29.70	55.79	-26.09	AVG	
3		0.2700	28.20	10.60	38.80	61.12	-22.32	QP	
4		0.2700	11.50	10.60	22.10	51.12	-29.02	AVG	
5	*	0.4940	29.97	10.63	40.60	56.10	-15.50	QP	
6		0.4940	16.97	10.63	27.60	46.10	-18.50	AVG	
7		0.8340	24.82	10.68	35.50	56.00	-20.50	QP	
8		0.8340	8.72	10.68	19.40	46.00	-26.60	AVG	
9		1.2100	26.60	10.70	37.30	56.00	-18.70	QP	
10		1.2100	10.10	10.70	20.80	46.00	-25.20	AVG	
11		2.4300	26.90	10.70	37.60	56.00	-18.40	QP	
12		2.4300	8.90	10.70	19.60	46.00	-26.40	AVG	

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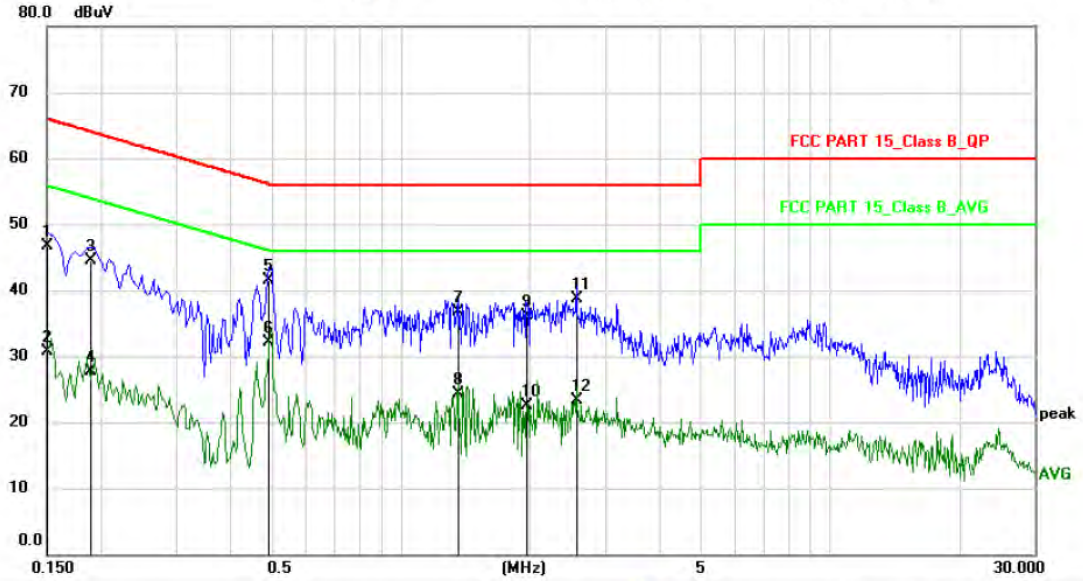
Conducted Emission Measurement

File :ET1030 Data :#9 Date: 2019/12/5 Time: 10:23:16



Site
Limit: FCC PART 15_Class B_QP
EUT: Bestable
M/N: ET1030
Mode: TX-5G Band 3
Note:

Phase: N
Power: AC120V/60Hz

Temperature: 26
Humidity: 50 %

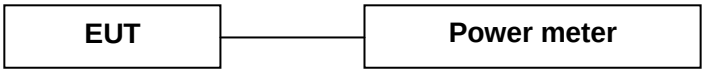
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	36.20	10.60	46.80	66.00	-19.20	QP	
2		0.1500	20.20	10.60	30.80	56.00	-25.20	AVG	
3		0.1900	33.90	10.60	44.50	64.04	-19.54	QP	
4		0.1900	17.10	10.60	27.70	54.04	-26.34	AVG	
5		0.4940	30.97	10.63	41.60	56.10	-14.50	QP	
6	*	0.4940	21.47	10.63	32.10	46.10	-14.00	AVG	
7		1.3619	26.00	10.70	36.70	56.00	-19.30	QP	
8		1.3619	13.60	10.70	24.30	46.00	-21.70	AVG	
9		1.9660	25.50	10.70	36.20	56.00	-19.80	QP	
10		1.9660	11.90	10.70	22.60	46.00	-23.40	AVG	
11		2.5780	28.00	10.70	38.70	56.00	-17.30	QP	
12		2.5780	12.60	10.70	23.30	46.00	-22.70	AVG	

4. Max. Conducted Output Power

4.1 Limits

Operation Band	EUT category	Limit
■5180~5240MHz	□Outdoor Access Point	1 Watt (30dBm) (Max. e.i.r.p ≤ 125mW(21dBm) at any elevation angle above 30 degrees as measured from the horizon)
	□Fixed point-to-point Access Point	1 Watt (30dBm)
	■Indoor Access Point	1 Watt (30dBm)
	□Mobile and Portable client device	250mW (24dBm)
■5745~5825MHz	-	1 Watt (30dBm)

4.2 Test SET-UP (Block Diagram of Configuration)



4.3 Test Procedure

1. The transmitter output (antenna port) was connected to the power meter.
2. Test was performed in accordance with KDB789033 v01r03 for compliance testing of Unlicensed National Information Infrastructure (U-NII) Device -section (E) Maximum conducted output power. =3. Measurement using a power meter (PM) =b Method PM-G (Measurement using a gated RF average power meter).

4.4 Measurement Results

Pass

Please refer to following table.

U-NII-1: 5180~5240MHz

Temperature :	23 ℃	Humidity :	52%
Test By:	Sance	Test Date :	December 03, 2019
Test Result:	PASS		

Frequency MHz	Data Rate Mbps	Peak Output Power dBm	Limit dBm
IEEE 802.11a Mode (OFDM, Antenna Gain=2dBi)			
Low Channel: 5180	6	6.06	30
Middle Channel: 5200	6	5.28	30
High Channel: 5240	6	5.63	30
IEEE 802.11n(HT20)Mode (OFDM, Antenna Gain=2dBi)			
Low Channel: 5180	MCS0	5.07	30
Middle Channel: 5200	MCS0	4.46	30
High Channel: 5240	MCS0	5.02	30
IEEE 802.11n(HT40) Mode (OFDM, Antenna Gain=2dBi)			
Low Channel: 5190	MCS0	3.86	30
High Channel: 5230	MCS0	3.70	30
IEEE 802.11ac (VHT20) Mode (OFDM, Antenna Gain=2dBi)			
Low Channel: 5180	MCS0	4.83	30
Middle Channel: 5200	MCS0	4.78	30
High Channel: 5240	MCS0	5.03	30
IEEE 802.11ac (VHT40) Mode (OFDM, Antenna Gain=2dBi)			
Low Channel: 5190	MCS0	3.79	30
High Channel: 5230	MCS0	3.88	30
IEEE 802.11ac (VHT80) Mode (OFDM, Antenna Gain=2dBi)			
Channel: 5210	MCS0	3.56	30

U-NII-3: 5745~5825MHz

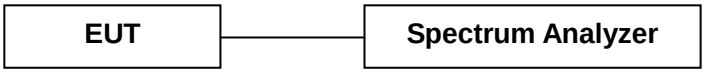
Temperature :	22 ℃	Humidity :	54%	
Test By:	Sance	Test Date :	December 03, 2019	
Test Result:	PASS			
Frequency MHz	Data Rate Mbps	Peak Output Power dBm		Limit dBm
IEEE 802.11a Mode (OFDM, Antenna Gain=2dBi)				
Low Channel: 5745	6	5.88		30
Middle Channel: 5785	6	4.44		30
High Channel: 5825	6	4.03		30
IEEE 802.11n(HT20)Mode (OFDM, Antenna Gain=2dBi)				
Low Channel: 5745	MCS0	4.73		30
Middle Channel: 5785	MCS0	4.16		30
High Channel: 5825	MCS0	3.60		30
IEEE 802.11n(HT40) Mode (OFDM, Antenna Gain=2dBi)				
Low Channel: 5755	MCS0	3.73		30
High Channel: 5795	MCS0	2.99		30
IEEE 802.11ac (VHT20) Mode (OFDM, Antenna Gain=2dBi)				
Low Channel: 5745	MCS0	5.14		30
Middle Channel: 5785	MCS0	4.41		30
High Channel: 5825	MCS0	3.63		30
IEEE 802.11ac (VHT40) Mode (OFDM, Antenna Gain=2dBi)				
Low Channel: 5755	MCS0	3.68		30
High Channel: 5795	MCS0	2.81		30
IEEE 802.11ac (VHT80) Mode (OFDM, Antenna Gain=2dBi)				
Channel: 5775	MCS0	3.49		30

5. 6dB Bandwidth

5.1 Limits

For digital modulation systems, the minimum 6dB bandwidth shall be at least 500 kHz.

5.2 Test SET-UP (Block Diagram of Configuration)



5.3 Test Procedure

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer was set as below according to FCC KDB789033(v01r03):

1. For 6dB bandwidth, Set the RBW = 100KHz.
2. Set the VBW ≥ 3 x RBW
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

5.4 Measurement Results

Pass

Please refer to following table and plots.

U-NII-1: 5180~5240MHz

Temperature :	21 ℃	Humidity : 54 %	
Test By:	Sance	Test Date : December 03, 2019	
Test Result:	PASS		
Frequency MHz	Data Rate Mbps	6dB Bandwidth MHz	Limit
IEEE 802.11a Mode (OFDM)			
Low Channel: 5180	6	16.34	>500KHz
Middle Channel: 5200	6	16.37	>500KHz
High Channel: 5240	6	16.32	>500KHz
IEEE 802.11n(HT20) Mode (OFDM)			
Low Channel: 5180	MCS0	17.55	>500KHz
Middle Channel: 5200	MCS0	17.55	>500KHz
High Channel: 5240	MCS0	17.58	>500KHz
IEEE 802.11n(HT40) Mode (OFDM)			
Low Channel: 5190	MCS0	35.67	>500KHz
High Channel: 5230	MCS0	36.32	>500KHz
IEEE 802.11ac (VHT20) Mode (OFDM)			
Low Channel: 5180	MCS0	17.57	>500KHz
Middle Channel: 5200	MCS0	17.29	>500KHz
High Channel: 5240	MCS0	17.55	>500KHz
IEEE 802.11ac (VHT40) Mode (OFDM)			
Low Channel: 5190	MCS0	35.71	>500KHz
High Channel: 5230	MCS0	36.36	>500KHz
IEEE 802.11ac (VHT80) Mode (OFDM)			
Channel: 5210	MCS0	76.03	>500KHz

U-NII-3: 5745~5825MHz

Temperature :	23 ℃	Humidity : 53 %	
Test By:	Sance	Test Date : December 03, 2019	
Test Result:	PASS		
Frequency MHz	Data Rate Mbps	6dB Bandwidth MHz	Limit
IEEE 802.11a Mode (OFDM)			
Low Channel: 5745	6	16.34	>500KHz
Middle Channel: 5785	6	16.35	>500KHz
High Channel: 5825	6	16.33	>500KHz
IEEE 802.11n(HT20) Mode (OFDM)			
Low Channel: 5745	MCS0	17.54	>500KHz
Middle Channel: 5785	MCS0	17.58	>500KHz
High Channel: 5825	MCS0	17.55	>500KHz
IEEE 802.11n(HT40) Mode (OFDM)			
Low Channel: 5755	MCS0	35.74	>500KHz
High Channel: 5795	MCS0	36.03	>500KHz
IEEE 802.11ac (VHT20) Mode (OFDM)			
Low Channel: 5745	MCS0	17.54	>500KHz
Middle Channel: 5785	MCS0	17.56	>500KHz
High Channel: 5825	MCS0	17.56	>500KHz
IEEE 802.11ac (VHT40) Mode (OFDM)			
Low Channel: 5755	MCS0	36.04	>500KHz
High Channel: 5795	MCS0	36.35	>500KHz
IEEE 802.11ac (VHT80) Mode (OFDM)			
Channel: 5775	MCS0	76.08	>500KHz

U-NII-1 5180-5240MHz
IEEE 802.11a

Low Channel

Middle Channel

High Channel

IEEE 802.11n(HT20)

Low Channel

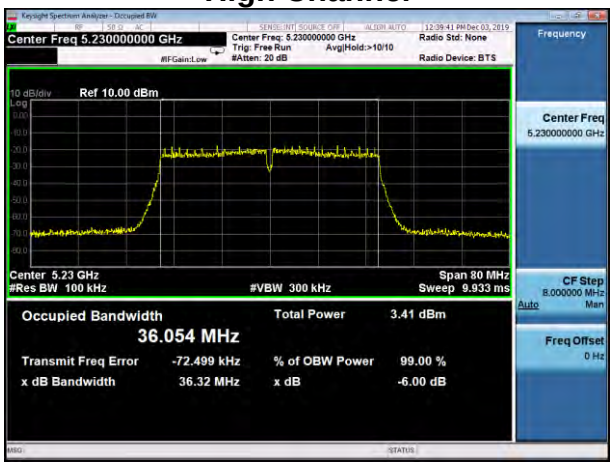
Middle Channel

High Channel

IEEE 802.11n(HT40)

Low Channel

High Channel



IEEE 802.11ac VHT20

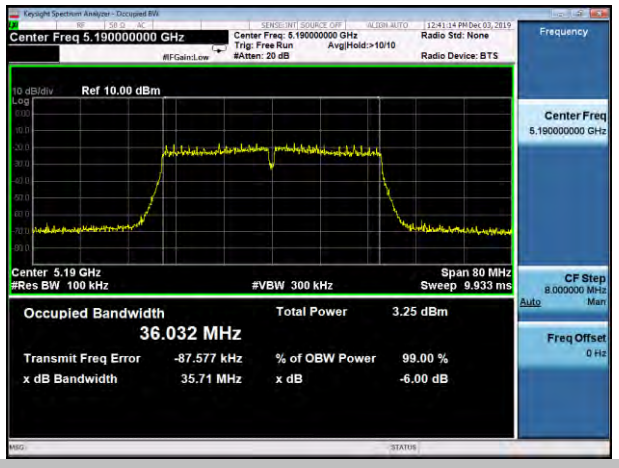
Low Channel

Middle Channel

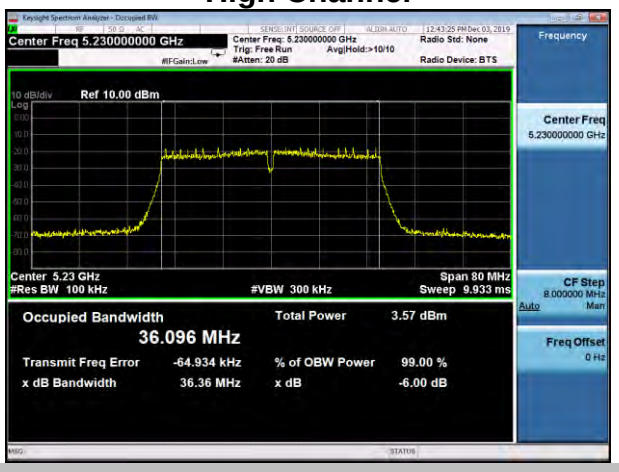
High Channel

IEEE 802.11ac VHT40

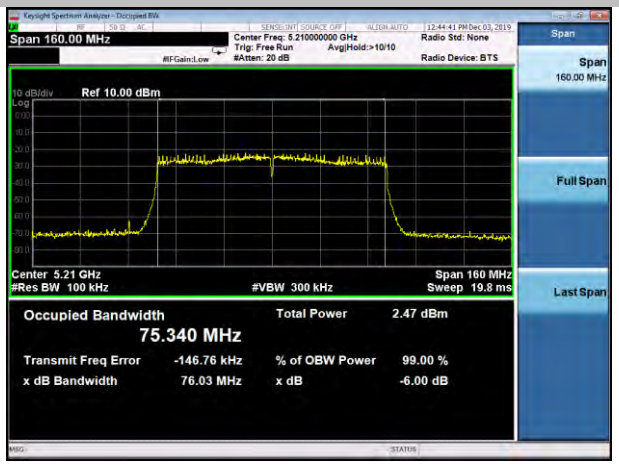
Low Channel



High Channel



IEEE 802.11ac VHT80

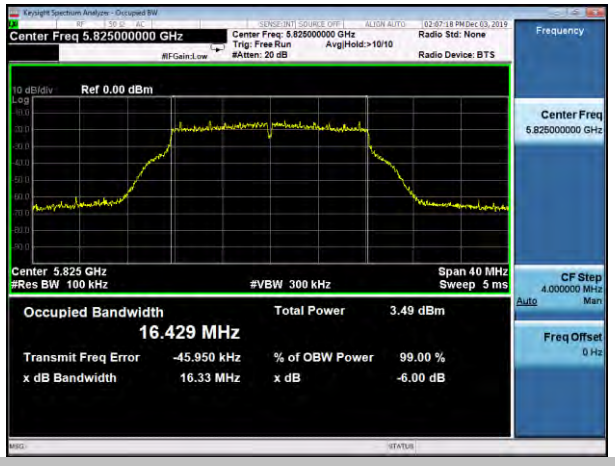


U-NII-3 5745-5825MHz
IEEE 802.11a

Low Channel

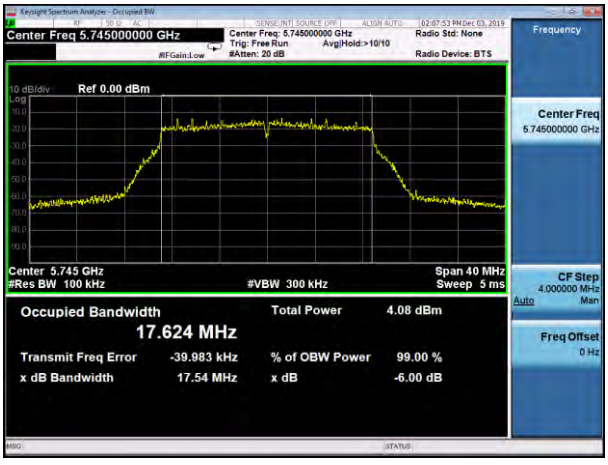
Middle Channel

High Channel



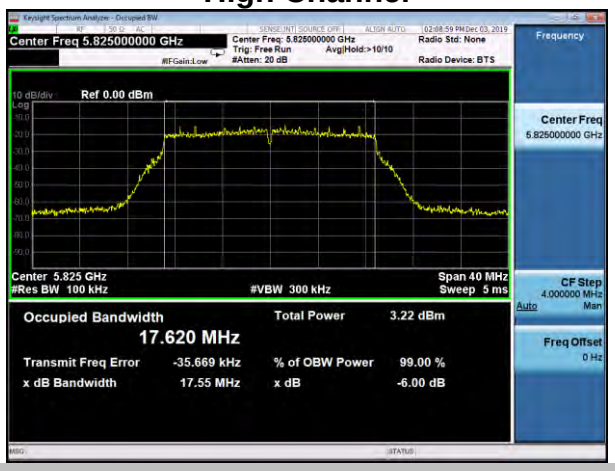
IEEE 802.11n(HT20)

Low Channel



Middle Channel

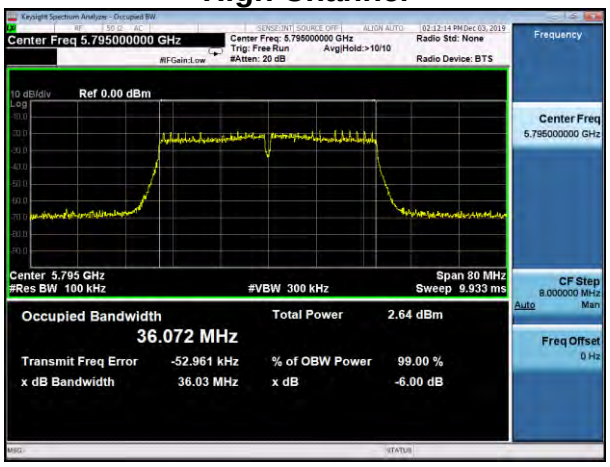
High Channel



IEEE 802.11n(HT40)

Low Channel

High Channel

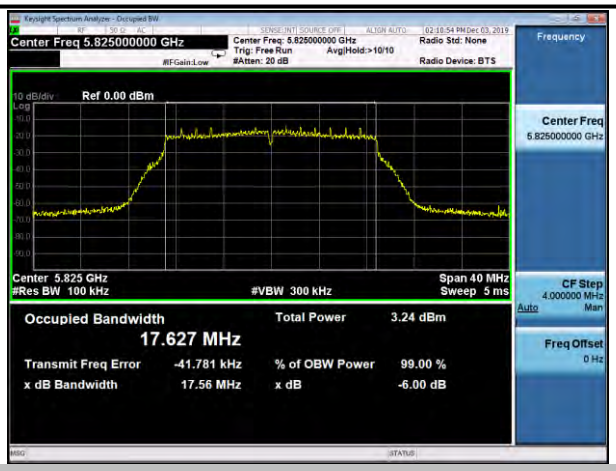


IEEE 802.11ac VHT20

Low Channel

Middle Channel

High Channel



IEEE 802.11ac VHT40

Low Channel

High Channel

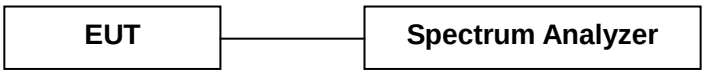
IEEE 802.11ac VHT80

6. 26dB Bandwidth & 99% Occupied Bandwidth

6.1 Limits

No restriction limits.

6.2 Test SET-UP (Block Diagram of Configuration)



6.3 Test Procedure

The antenna port of the EUT was connected to the input of a spectrum analyzer.
Analyzer was set as below according to FCC KDB789033(v01r03):

1. For 26dB bandwidth, Set the RBW = Approximately 1% of the emission bandwidth
2. Set the VBW ＞ RBW
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 26 dB relative to the maximum level measured in the fundamental emission.

1. For 99% occupied bandwidth, Set the RBW = 1% to 5% of the OBW
2. Set the VBW ≥ 3 x RBW
3. Detector = peak.
4. Span = 1.5 times to 5.0 times the OBW
5. Sweep time = auto couple.
6. Trace mode = max hold. Allow trace to fully stabilize.
7. Use the 99% power bandwidth function of the spectrum analyzer measure the occupied bandwidth.

6.4 Measurement Results

Pass

Please refer to following table and plots.

U-NII-1: 5180~5240MHz

Temperature :	21 ℃	Humidity : 54 %	
Test By:	Sance	Test Date : December 03, 2019	
Test Result:	PASS		
Frequency MHz	Data Rate Mbps	26dB Bandwidth MHz	99% Occupied Bandwidth MHz
IEEE 802.11a Mode (OFDM)			
Low Channel: 5180	6	21.43	16.831
Middle Channel: 5200	6	21.08	16.732
High Channel: 5240	6	21.50	16.784
IEEE 802.11n(HT20) Mode (OFDM)			
Low Channel: 5180	MCS0	21.31	17.869
Middle Channel: 5200	MCS0	21.43	17.879
High Channel: 5240	MCS0	21.46	17.833
IEEE 802.11n(HT40) Mode (OFDM)			
Low Channel: 5190	MCS0	40.25	36.408
High Channel: 5230	MCS0	40.34	36.508
IEEE 802.11ac (VHT20) Mode (OFDM)			
Low Channel: 5180	MCS0	21.48	17.901
Middle Channel: 5200	MCS0	21.45	17.892
High Channel: 5240	MCS0	21.27	17.875
IEEE 802.11ac (VHT40) Mode (OFDM)			
Low Channel: 5190	MCS0	40.08	36.452
High Channel: 5230	MCS0	40.31	36.470
IEEE 802.11ac (VHT80) Mode (OFDM)			
Channel: 5210	MCS0	80.83	75.599

U-NII-3: 5745~5825MHz

Temperature :	23 ℃	Humidity : 53 %	
Test By:	Sance	Test Date : December 03, 2019	
Test Result:	PASS		
Frequency MHz	Data Rate Mbps	26dB Bandwidth MHz	99% Occupied Bandwidth MHz
IEEE 802.11a Mode (OFDM)			
Low Channel: 5745	6	21.42	16.782
Middle Channel: 5785	6	21.17	16.779
High Channel: 5825	6	21.10	16.747
IEEE 802.11n(HT20) Mode (OFDM)			
Low Channel: 5745	MCS0	21.29	17.886
Middle Channel: 5785	MCS0	21.66	17.896
High Channel: 5825	MCS0	21.50	17.847
IEEE 802.11n(HT40) Mode (OFDM)			
Low Channel: 5755	MCS0	40.30	36.479
High Channel: 5795	MCS0	40.36	36.456
IEEE 802.11ac (VHT20) Mode (OFDM)			
Low Channel: 5745	MCS0	21.39	17.852
Middle Channel: 5785	MCS0	21.34	7.890
High Channel: 5825	MCS0	21.28	17.832
IEEE 802.11ac (VHT40) Mode (OFDM)			
Low Channel: 5755	MCS0	40.32	36.334
High Channel: 5795	MCS0	40.51	36.455
IEEE 802.11ac (VHT80) Mode (OFDM)			
Channel: 5775	MCS0	81.22	75.636

U-NII-1 5180-5240MHz
IEEE 802.11a

Low Channel

Middle Channel

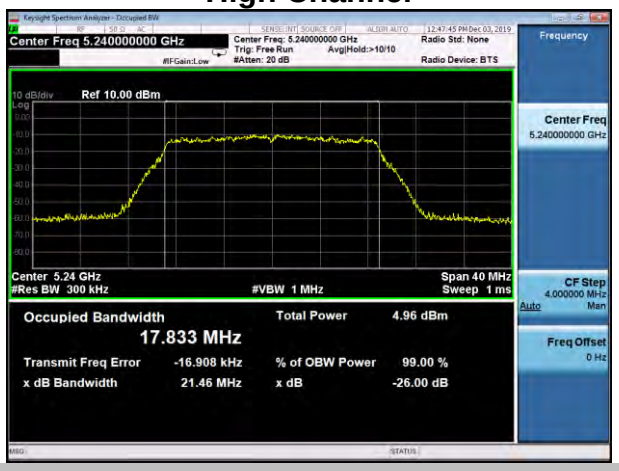
High Channel

IEEE 802.11n(HT20)

Low Channel

Middle Channel

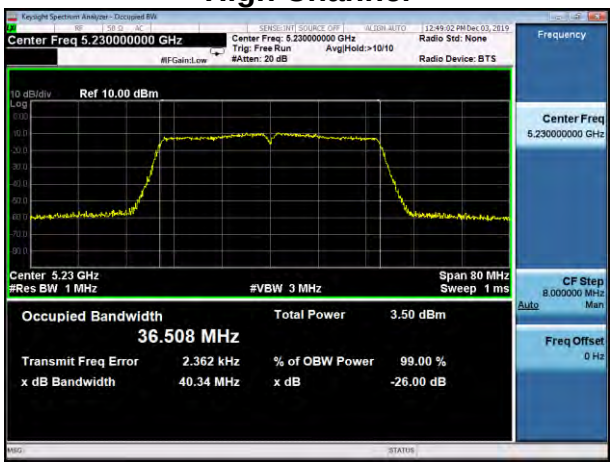
High Channel



IEEE 802.11n(HT40)

Low Channel

High Channel

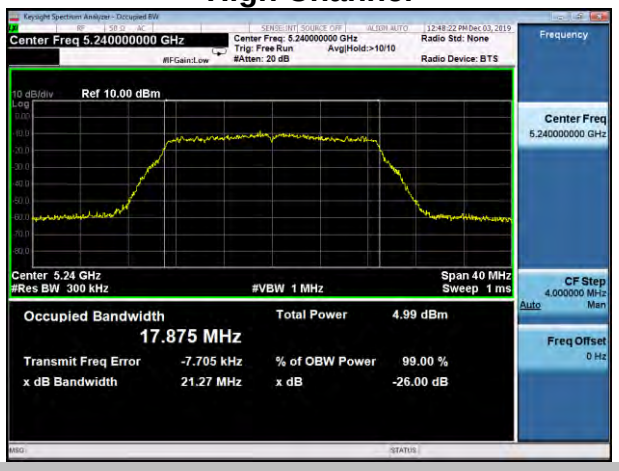


IEEE 802.11ac VHT20

Low Channel

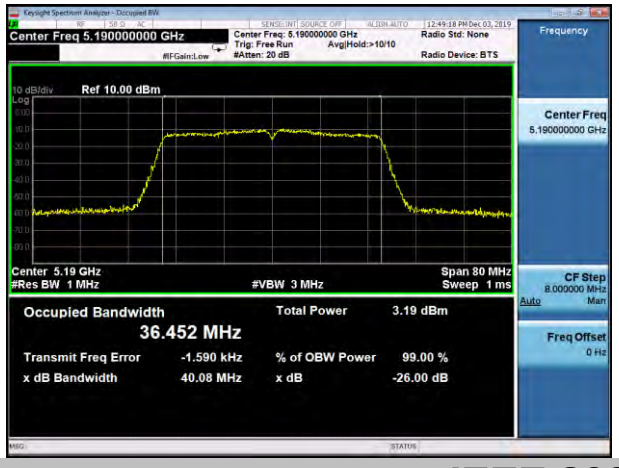
Middle Channel

High Channel

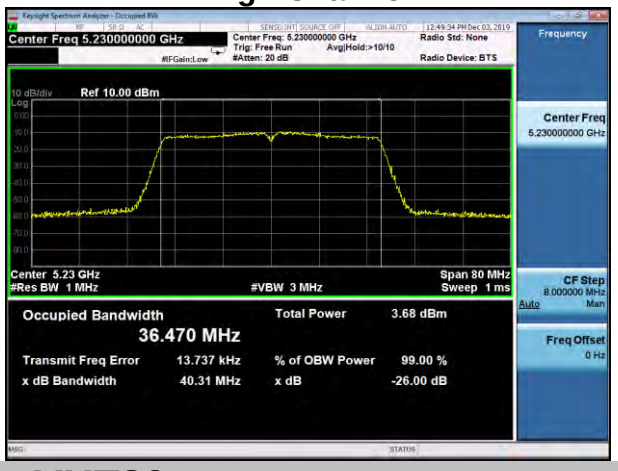


IEEE 802.11ac VHT40

Low Channel



High Channel



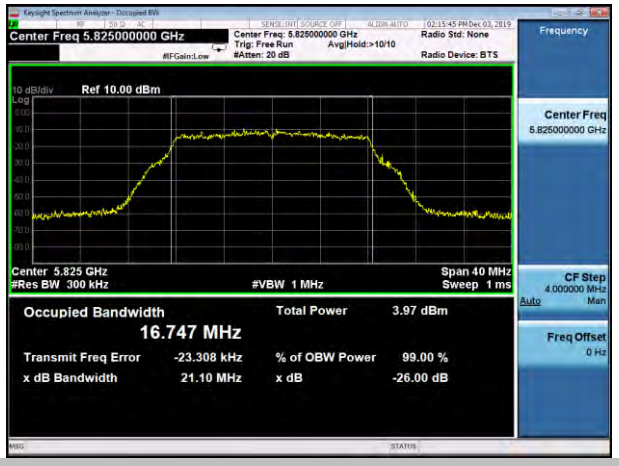
IEEE 802.11ac VHT80

U-NII-3 5745-5825MHz
IEEE 802.11a

Low Channel

Middle Channel

High Channel

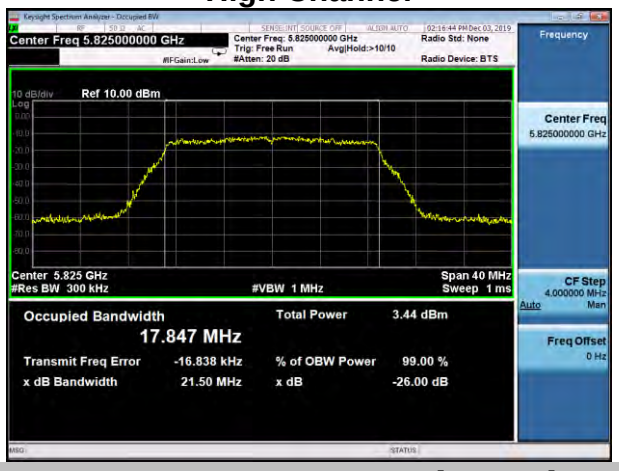


IEEE 802.11n(HT20)

Low Channel

Middle Channel

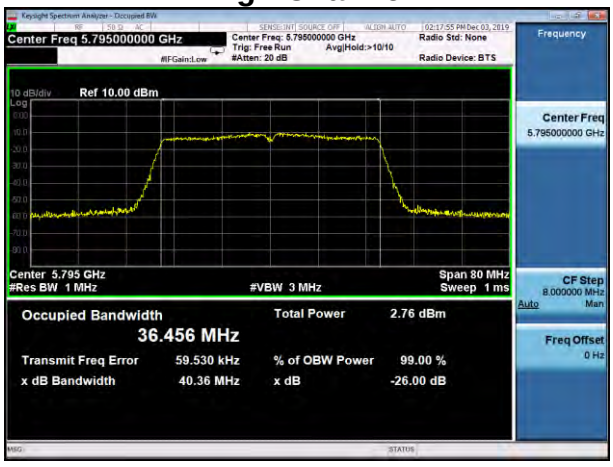
High Channel



IEEE 802.11n(HT40)

Low Channel

High Channel



IEEE 802.11ac VHT20

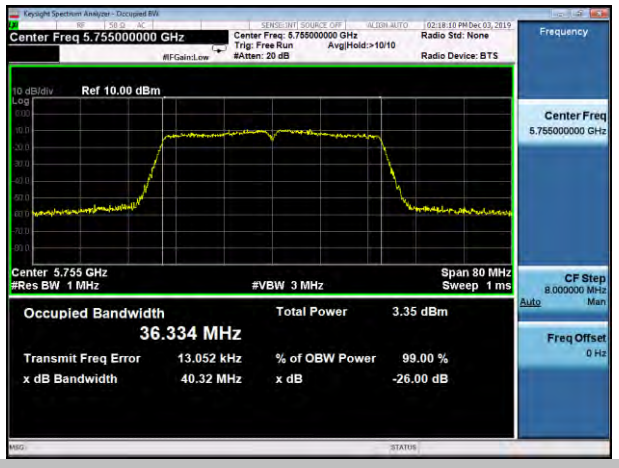
Low Channel

Middle Channel

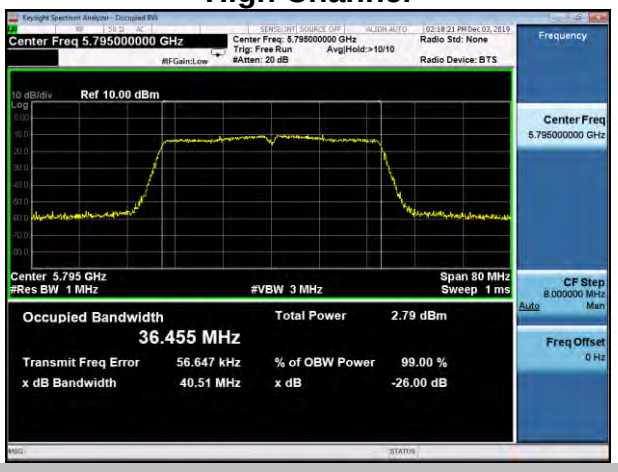
High Channel

IEEE 802.11ac VHT40

Low Channel



High Channel



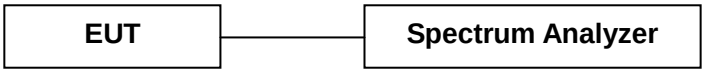
IEEE 802.11ac VHT80

7. Power Spectral Density

7.1 Limits

Operation Band		Limit
■5180~5240MHz	□Outdoor access point	17 dBm/MHz
	■Indoor access point	11 dBm/MHz
	□Fixed point-to-point access points	17 dBm/MHz
	□Client devices	11 dBm/MHz
■5745~5825MHz		30 dBm/500kHz

7.2 Test SET-UP (Block Diagram of Configuration)

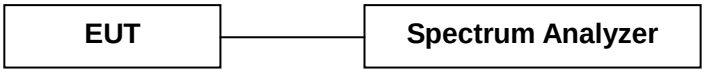


7.3 Test Procedure

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer was set as below according to FCC KDB789033 (v01r03):

1. Set analyzer center frequency to center frequency
2. Set the RBW to: 1MHz
3. Set the VBW to: 3MHz
4. Detector = RMS
5. Sweep time = auto couple
6. Trace Average = 100 times
7. If measured bandwidth of Maximum PSD is specified in 500kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (<500kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.

7.4 Test SET-UP (Block Diagram of Configuration)



7.5 Measurement Results

Pass

Please refer to following table and plots.

U-NII-1: 5180~5240MHz

Temperature :	21 ℃	Humidity :	51 %
Test By:	Sance	Test Date :	December 03, 2019
Test Result:	PASS		
Frequency MHz	Data Rate Mbps	PSD dBm/MHz	Limit dBm/ MHz
IEEE 802.11a Mode (OFDM)			
Low Channel: 5180	6	-9.703	11
Middle Channel: 5200	6	-9.946	11
High Channel: 5240	6	-9.464	11
IEEE 802.11n(HT20) Mode (OFDM)			
Low Channel: 5180	MCS0	-10.639	11
Middle Channel: 5200	MCS0	-10.364	11
High Channel: 5240	MCS0	-10.002	11
IEEE 802.11n(HT40) Mode (OFDM)			
Low Channel: 5190	MCS0	-13.983	11
High Channel: 5230	MCS0	-13.871	11
IEEE 802.11ac (VHT20) Mode (OFDM)			
Low Channel: 5180	MCS0	-10.389	11
Middle Channel: 5200	MCS0	-10.621	11
High Channel: 5240	MCS0	-10.097	11
IEEE 802.11ac (VHT40) (OFDM)			
Low Channel: 5190	MCS0	-13.758	11
High Channel: 5230	MCS0	-13.628	11
IEEE 802.11ac (VHT80) Mode (OFDM)			
Channel: 5210	MCS0	-16.563	11

Note: 10log(500kHz/RNW) Factor = -3.01dB

U-NII-3: 5745~5825MHz

Temperature :	23 ℃	Humidity :	53 %
Test By:	Sance	Test Date :	December 03, 2019
Test Result:	PASS		
Frequency MHz	Data Rate Mbps	PSD dBm/ 500kHz	Limit dBm/ 500kHz
IEEE 802.11a Mode (OFDM)			
Low Channel: 5745	6	-12.044	11
Middle Channel: 5785	6	-12.843	11
High Channel: 5825	6	-13.443	11
IEEE 802.11n(HT20) Mode (OFDM)			
Low Channel: 5745	MCS0	-12.671	11
Middle Channel: 5785	MCS0	-12.986	11
High Channel: 5825	MCS0	-13.608	11
IEEE 802.11n(HT40) Mode (OFDM)			
Low Channel: 5755	MCS0	-15.671	11
High Channel: 5795	MCS0	-16.542	11
IEEE 802.11ac (VHT20) Mode (OFDM)			
Low Channel: 5745	MCS0	-12.359	11
Middle Channel: 5785	MCS0	-12.754	11
High Channel: 5825	MCS0	-13.213	11
IEEE 802.11ac (VHT40) (OFDM)			
Low Channel: 5755	MCS0	-15.543	11
High Channel: 5795	MCS0	-16.726	11
IEEE 802.11ac (VHT80) Mode (OFDM)			
Channel: 5775	MCS0	-19.470	11

Note: 10log(500kHz/RNW) Factor = -3.01dB

U-NII-1 5180-5240MHz
IEEE 802.11a

Low Channel

Middle Channel

High Channel

IEEE 802.11n(HT20)

Low Channel

Middle Channel

High Channel

IEEE 802.11n(HT40)

Low Channel

High Channel

IEEE 802.11ac VHT20

Low Channel

Middle Channel

High Channel

IEEE 802.11ac VHT40

Low Channel

High Channel

IEEE 802.11ac VHT80

U-NII-3 5745-5825MHz
IEEE 802.11a

Low Channel

Middle Channel

High Channel

IEEE 802.11n(HT20)

Low Channel

Middle Channel

High Channel

IEEE 802.11n(HT40)

Low Channel

High Channel

IEEE 802.11ac VHT20

Low Channel

Middle Channel

High Channel

IEEE 802.11ac VHT40

Low Channel

High Channel

IEEE 802.11ac VHT80

8. Band Edge

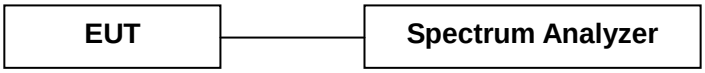
8.1 Limits

For transmitters operating in the 5.15-5.25GHz band: all emissions outside of the 5.15-5.35GHz band shall not exceed an EIRP of -27dBm

For transmitter operating in the 5.25-5.35GHz band: all emissions outside of the 5.15-5.35GHz band shall not exceed an EIRP of -27dBm/MHz. Devices operating in the 5.25-5.35GHz band generate emissions in the 5.15-5.25GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27dBm/MHz in the 5.15-5.25GHz band.

For transmitters operating in the 5.725-5.850GHz band: all emissions shall be limited to a level of -27dBm/MHz at 75MHz or more above or below the band edge increasing linearly to 10dBm/MHz at 25MHz above or below the band edge, and from 25MHz above or below the band edge increasing linearly to a level of 15.6dBm/MHz at 5MHz above or below the band edge, and from 5MHz above or below the band increasing linearly to a level of 27dBm/MHz at the band edge.

8.2 Test SET-UP (Block Diagram of Configuration)



8.3 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibration or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 1MHz and VBW to 3MHz of spectrum analyzer.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

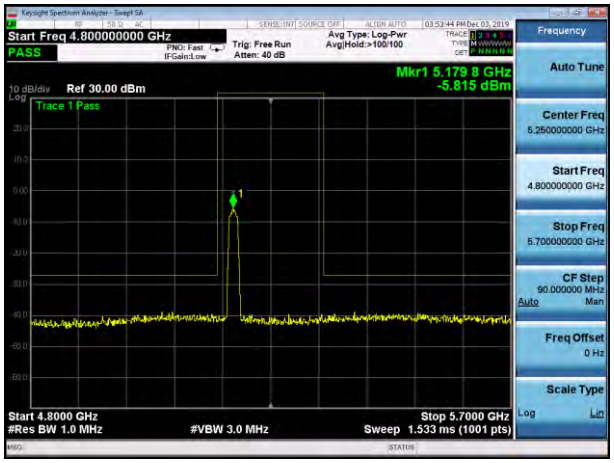
8.4 Measurement Results

Pass

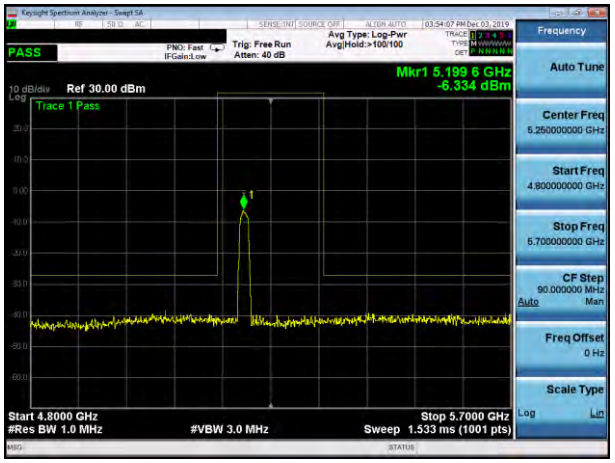
Please refer to following plots.

U-NII-1 5180-5240MHz
IEEE 802.11a

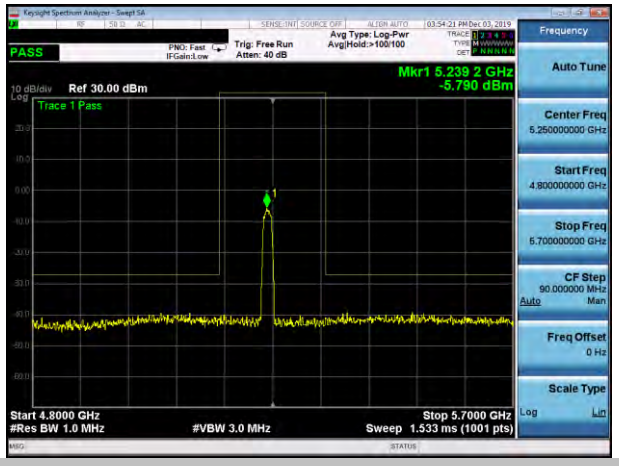
Low Channel



Middle Channel

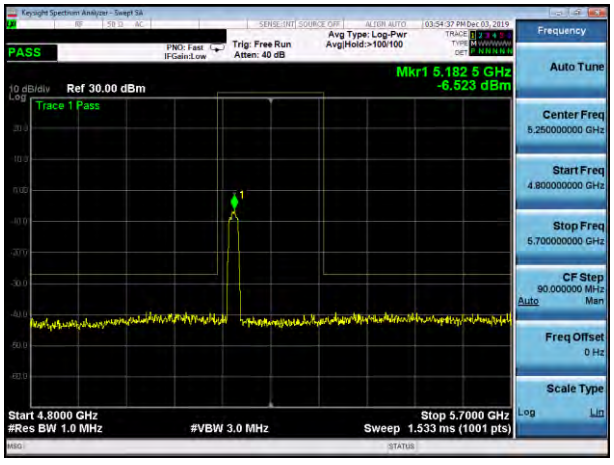


High Channel

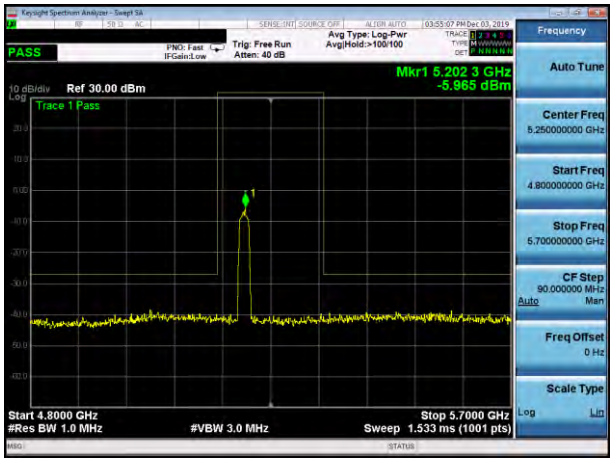


IEEE 802.11n(HT20)

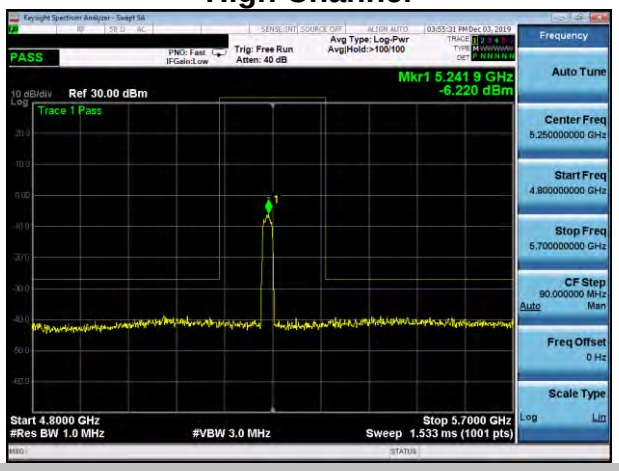
Low Channel



Middle Channel

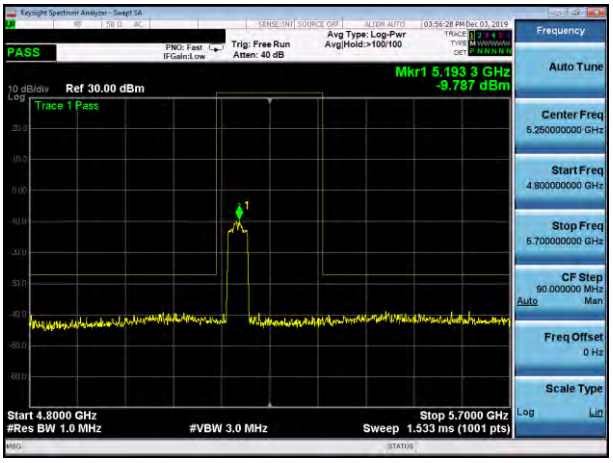


High Channel

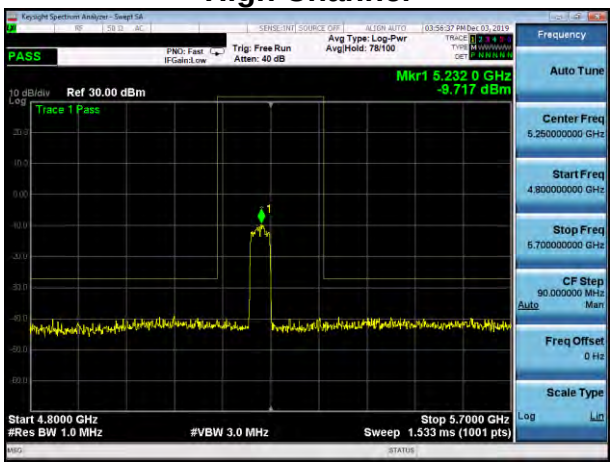


IEEE 802.11n(HT40)

Low Channel

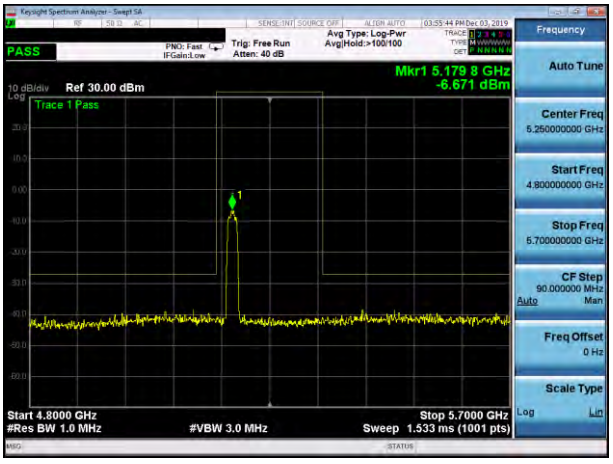


High Channel

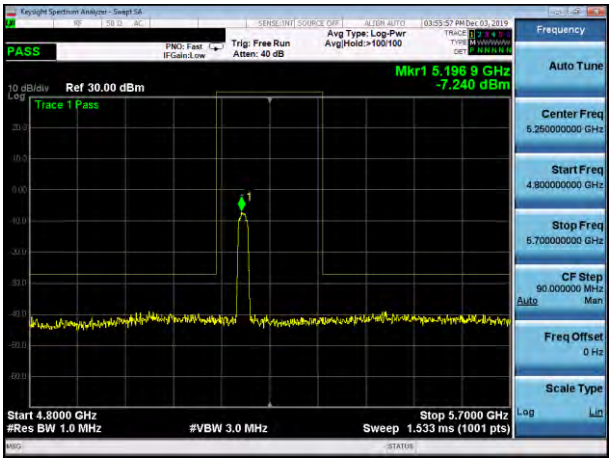


IEEE 802.11ac VHT20

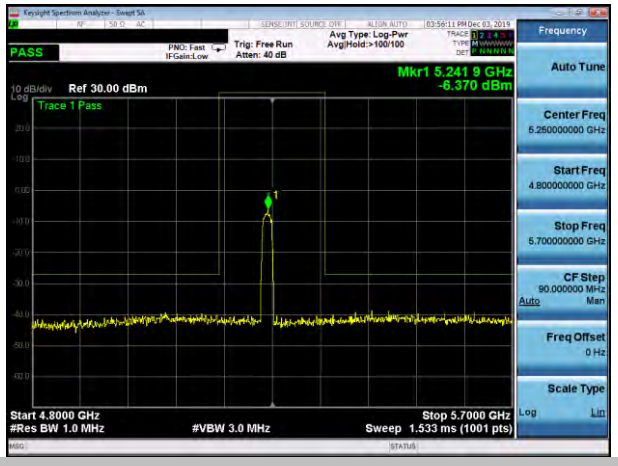
Low Channel



Middle Channel

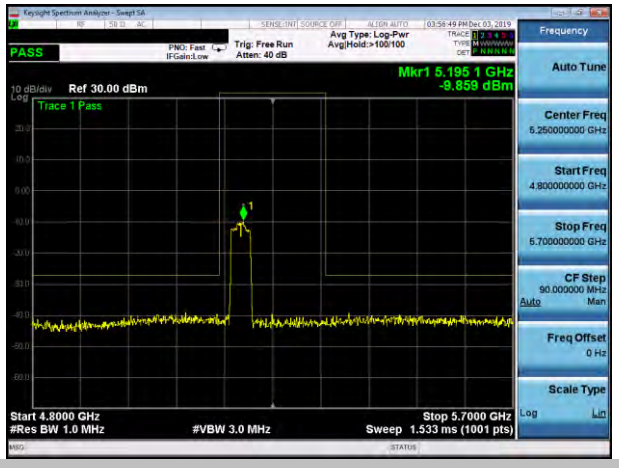


High Channel

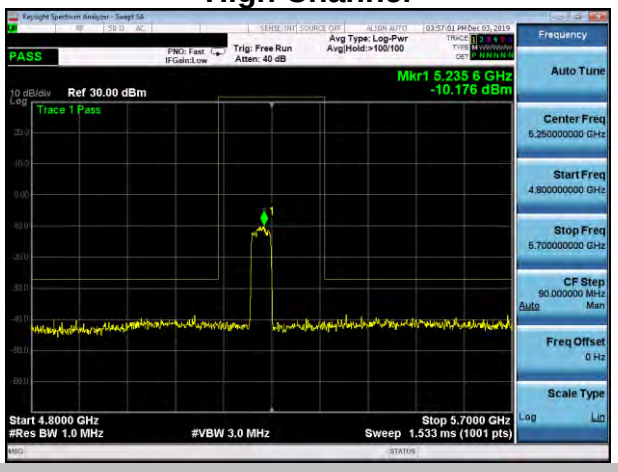


IEEE 802.11ac VHT40

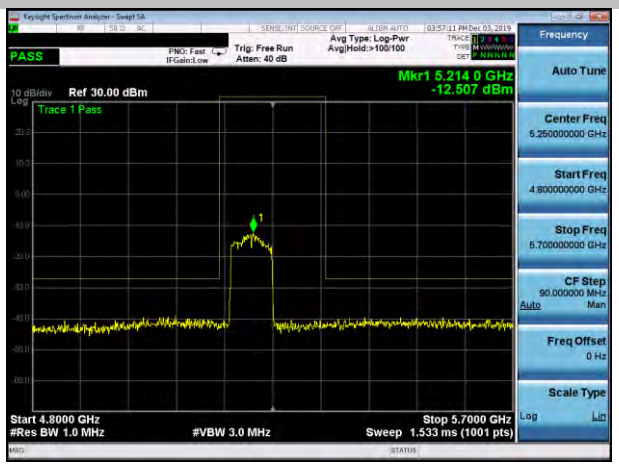
Low Channel



High Channel

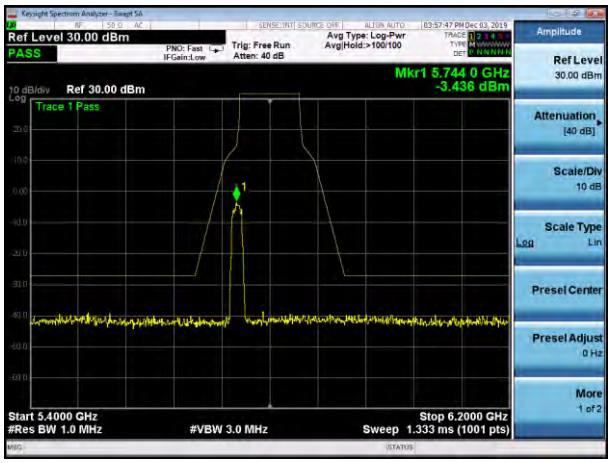


IEEE 802.11ac VHT80

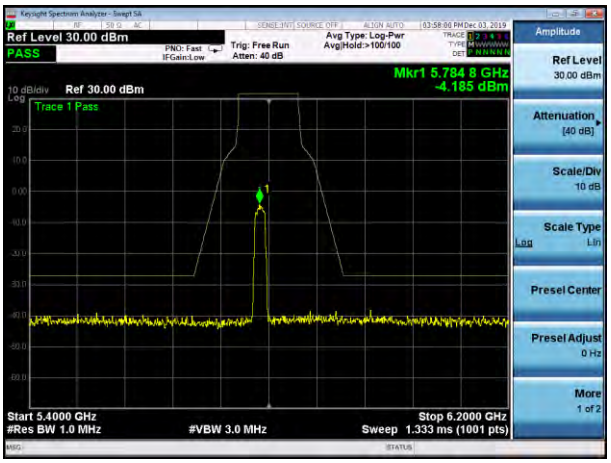


U-NII-3 5745-5825MHz
IEEE 802.11a

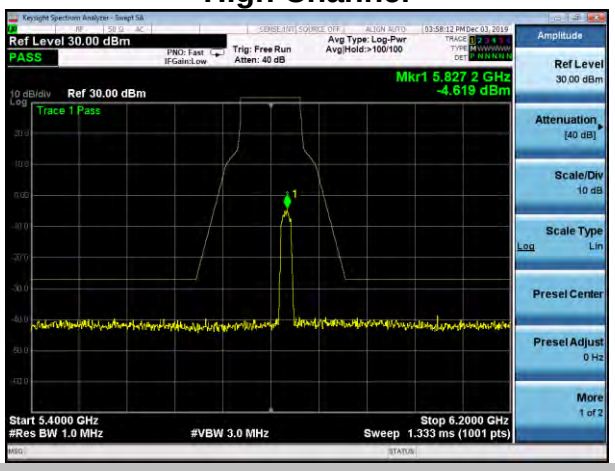
Low Channel



Middle Channel

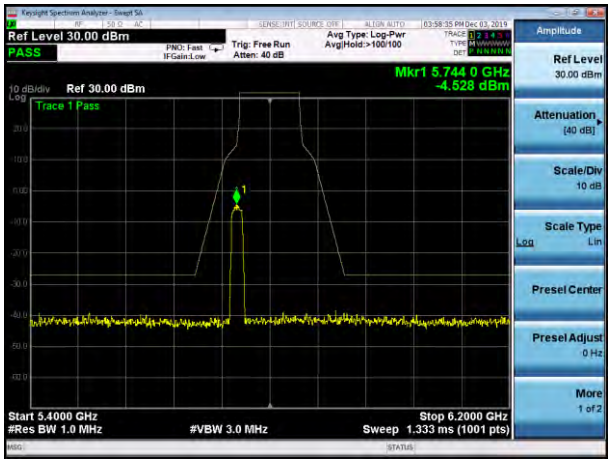


High Channel

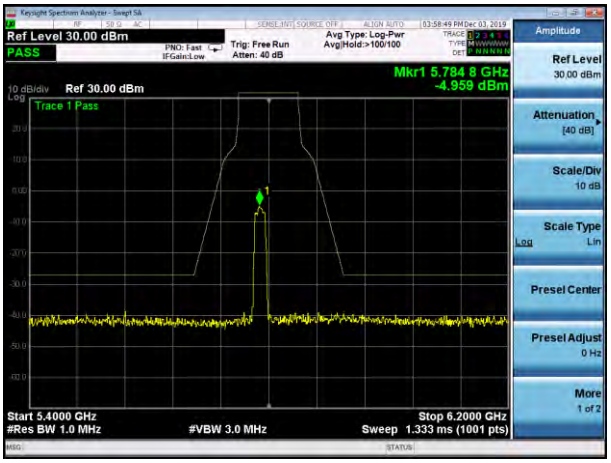


IEEE 802.11n(HT20)

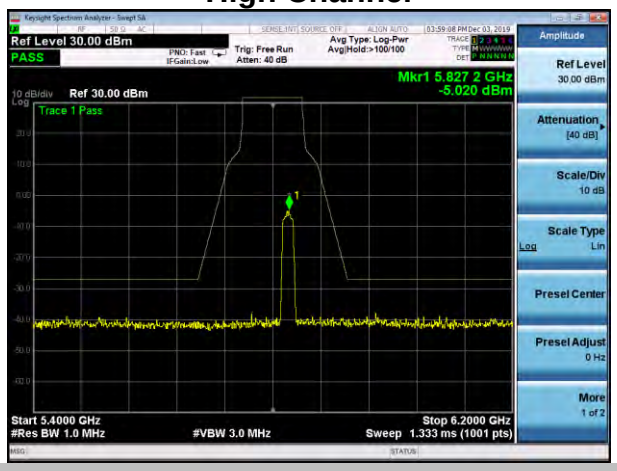
Low Channel



Middle Channel

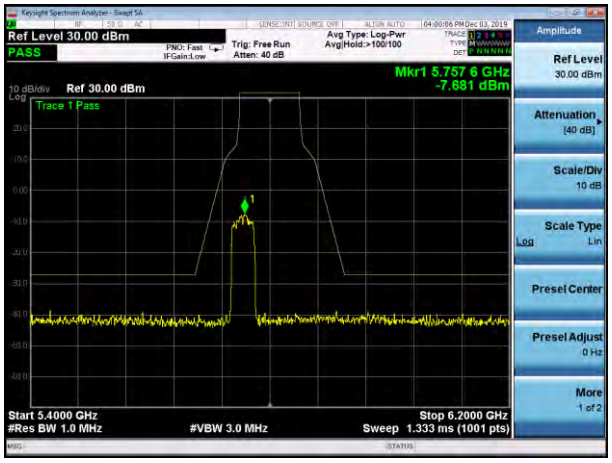


High Channel

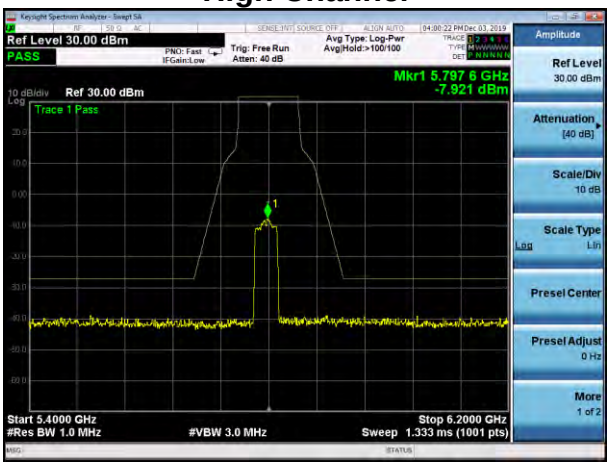


IEEE 802.11n(HT40)

Low Channel

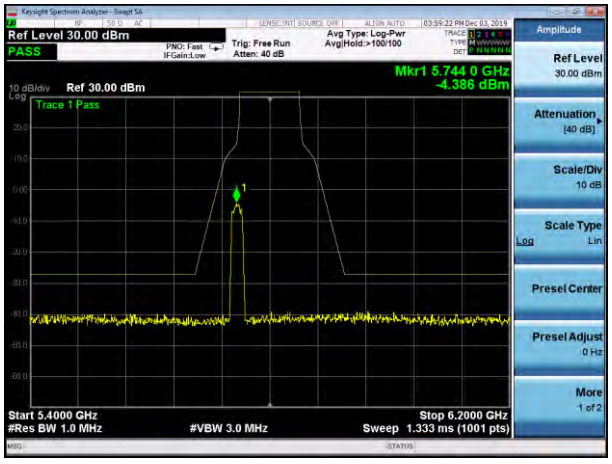


High Channel

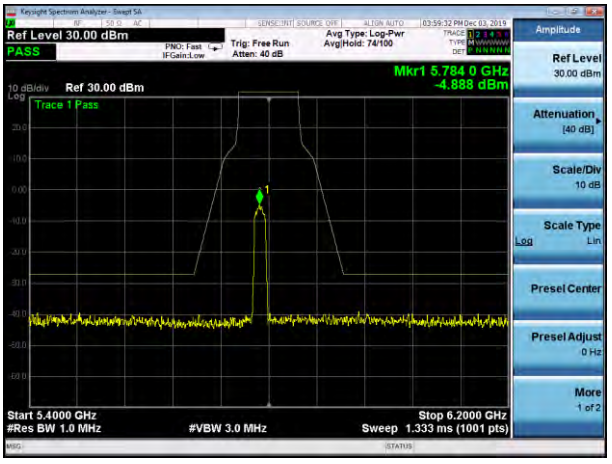


IEEE 802.11ac VHT20

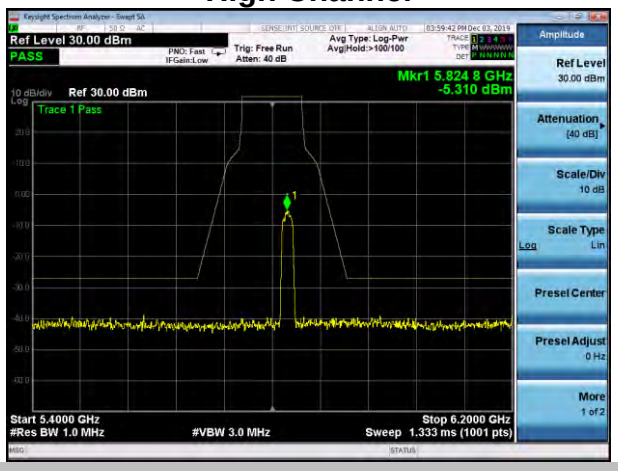
Low Channel



Middle Channel

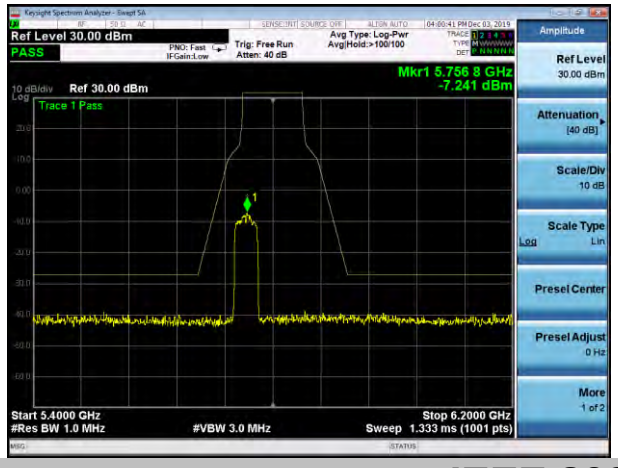


High Channel

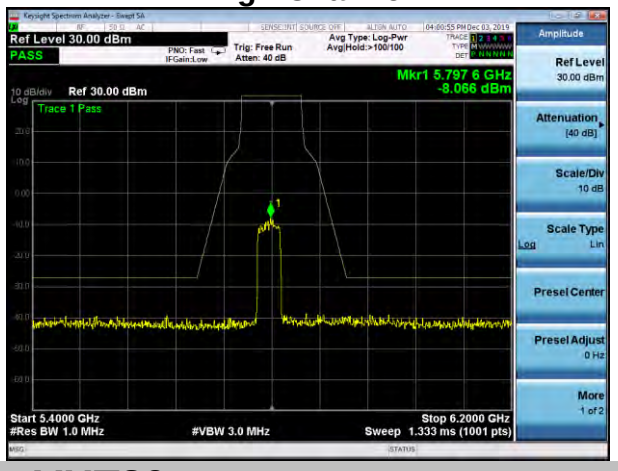


IEEE 802.11ac VHT40

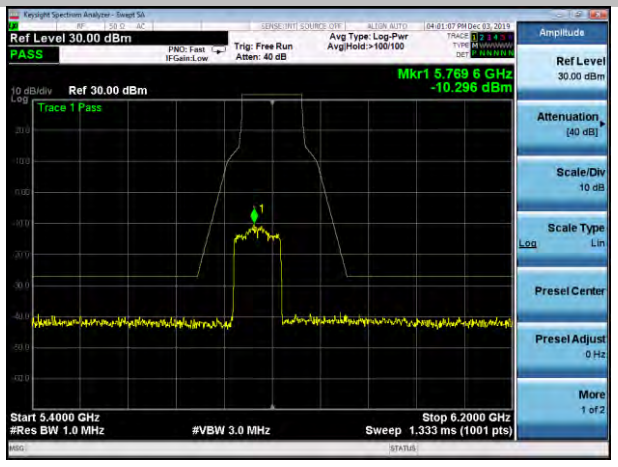
Low Channel



High Channel



IEEE 802.11ac VHT80

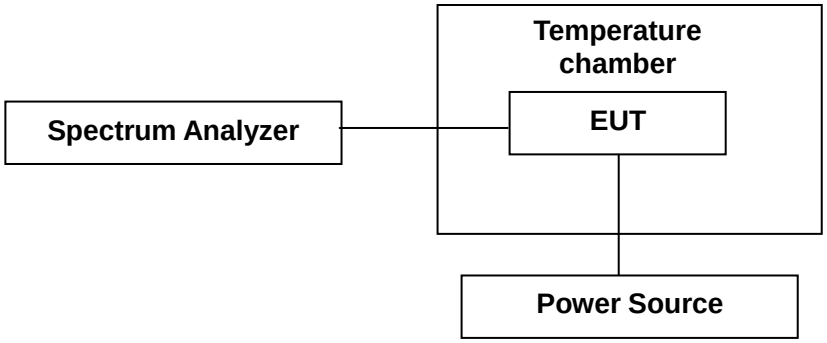


9. Frequency Stability

9.1 Limits

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

9.2 Test SET-UP (Block Diagram of Configuration)



9.3 Test Procedure

1. The EUT was placed inside the environmental test chamber and powered by Power source.
2. Turn the EUT on and couple its output to a spectrum analyzer.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
5. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
6. The chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.
   Note: The EUT set at un-modulation mode during frequency stability test.

9.4 Measurement Results

Pass

Please refer to following tables.

Temperature :	21 ℃	Humidity :	51 %
Test By:	Sance	Test Date :	December 03, 2019

5180~5240MHz Band

Lowest channel
5180MHz

Temperature (℃)	Power Supplied (Vdc)	Measured Frequency (MHz)				Test Result
		0 Minute	2 Minute	5 Minute	10 Minute	
25	5	5180.0214	5180.0256	5180.0142	5180.0304	Pass
-5		5180.0310	5180.0234	5180.0207	5180.0237	Pass
5		5180.0203	5180.0312	5180.0214	5180.0257	Pass
15		5180.0120	5180.0320	5180.0384	5180.0224	Pass
40		5180.0225	5180.0402	5180.0430	5180.0181	Pass
20	4.25	5180.0213	5180.0316	5180.0277	5180.0254	Pass
	5.75	5180.0247	5180.0403	5180.0256	5180.0128	Pass

Note: EUT temperature working range is 0 to 40.

Temperature :	21 ℃	Humidity :	51 %
Test By:	Sance	Test Date :	December 03, 2019

5180~5240MHz Band

Highest channel
5240MHz

Temperature (℃)	Power Supplied (Vdc)	Measured Frequency (MHz)				Test Result
		0 Minute	2 Minute	5 Minute	10 Minute	
25	5	5240.0114	5240.0274	5240.0277	5240.0227	Pass
-5		5240.0143	5240.0256	5240.0248	5240.0234	Pass
5		5240.0124	5240.0128	5240.0255	5240.0259	Pass
15		5240.0226	5240.0247	5240.0247	5240.0306	Pass
40		5240.0333	5240.0203	5240.0232	5240.0240	Pass
20	4.25	5240.0216	5240.0425	5240.0247	5240.0223	Pass
	5.75	5240.0404	5240.0418	5240.0253	5240.0275	Pass

Note: EUT temperature working range is 0 to 40.

Temperature :	21 ℃	Humidity :	51 %
Test By:	Sance	Test Date :	December 03, 2019

5745~5825MHz Band

Lowest channel
5745MHz

Temperature (℃)	Power Supplied (Vdc)	Measured Frequency (MHz)				Test Result
		0 Minute	2 Minute	5 Minute	10 Minute	
25	5	5745.0224	5745.0156	5745.0145	5745.0222	Pass
-5		5745.0108	5745.0153	5745.0165	5745.0327	Pass
5		5745.0173	5745.0224	5745.0137	5745.0423	Pass
15		5745.0157	5745.0312	5745.0177	5745.0519	Pass
40		5745.0146	5745.0124	5745.0222	5745.0642	Pass
20	4.25	5745.0124	5745.0242	5745.0453	5745.0557	Pass
	5.75	5745.0141	5745.0453	5745.0272	5745.0239	Pass

Note: EUT temperature working range is 0 to 40.

Temperature :	21 ℃	Humidity :	51 %
Test By:	Sance	Test Date :	December 03, 2019

5745~5825MHz Band

Highest channel
5825MHz

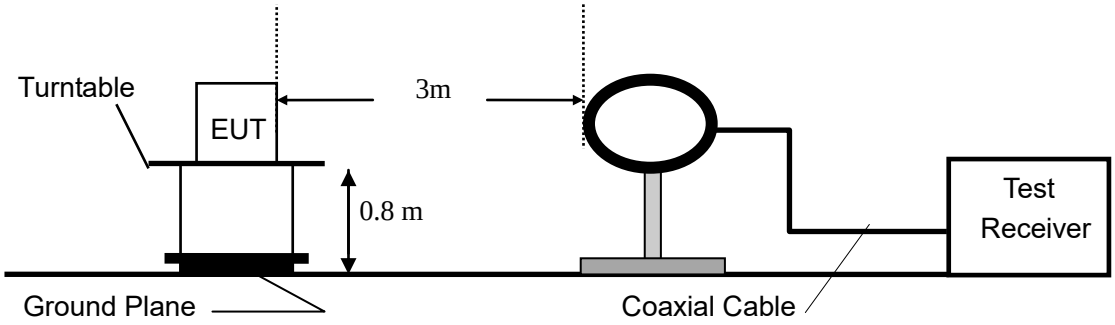
Temperature (℃)	Power Supplied (Vdc)	Measured Frequency (MHz)				Test Result
		0 Minute	2 Minute	5 Minute	10 Minute	
25	5	5825.0135	5825.0162	5825.0357	5825.0257	Pass
-5		5825.0157	5825.0248	5825.0234	5825.0260	Pass
5		5825.0244	5825.0377	5825.0257	5825.0463	Pass
15		5825.0439	5825.0369	5825.0352	5825.0378	Pass
40		5825.0323	5825.0347	5825.0340	5825.0285	Pass
20	4.25	5825.0123	5825.0163	5825.0175	5825.0312	Pass
	5.75	5825.0371	5825.0337	5825.0389	5825.0163	Pass

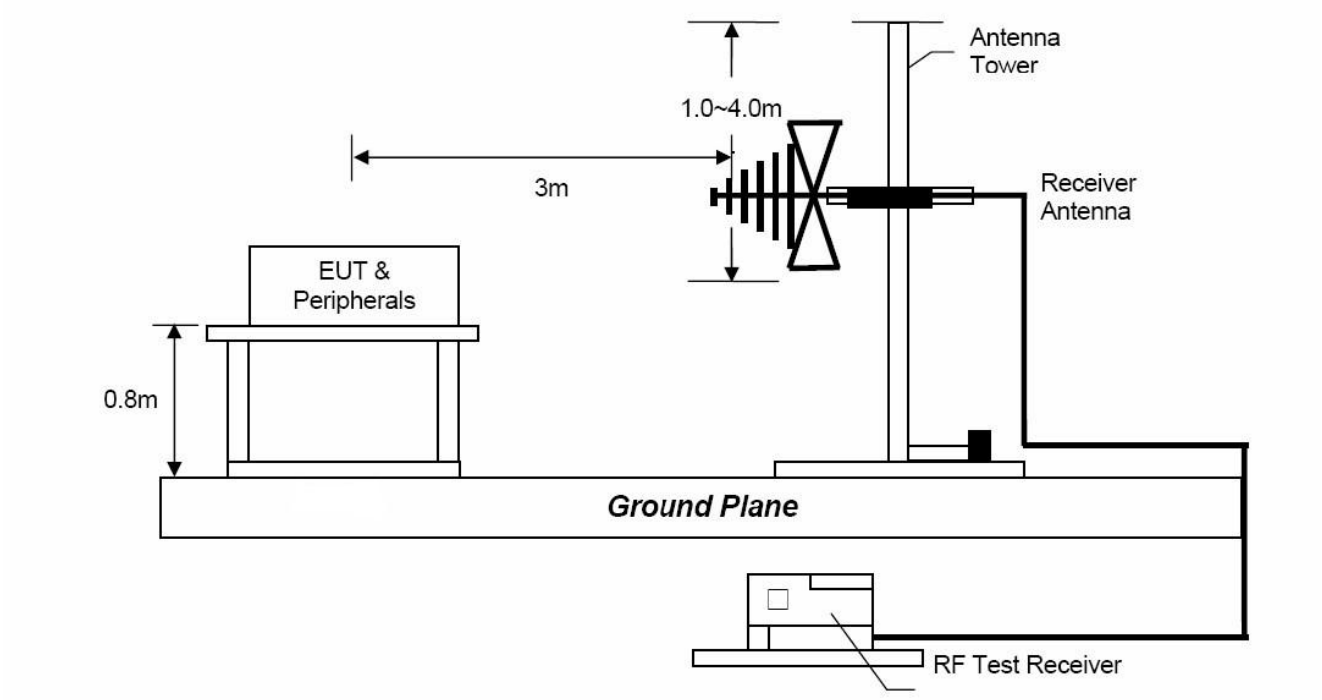
Note: EUT temperature working range is 0 to 40.

10. Radiated Spurious Emissions and Restricted Bands

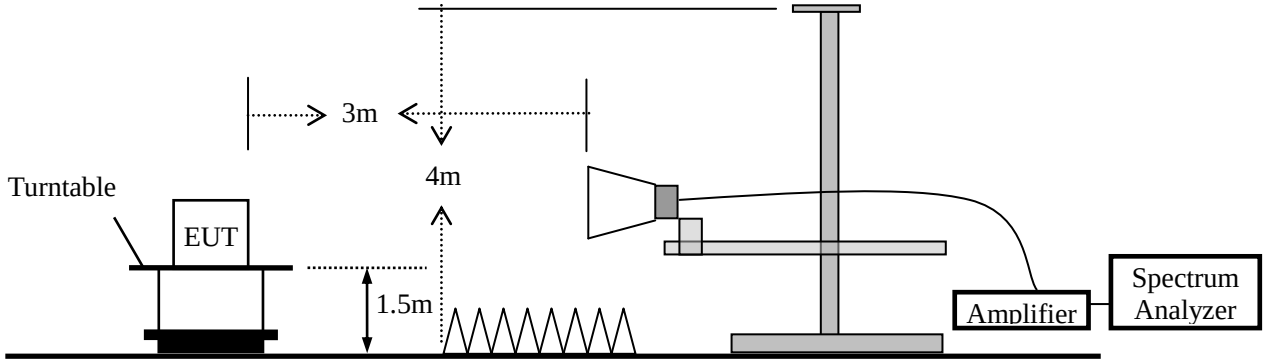
10.1 Test SET-UP (Block Diagram of Configuration)

10.1.1 Radiated Emission Test Set-Up, Frequency Below 30MHz





10.1.2 Radiated Emission Test Set-Up, Frequency above 1GHz



10.2 Measurement Procedure

a. Blow 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi- anechoic chamber room.
b. For the radiated emission test above 1GHz:
The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter full anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
c. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
d. 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.
e. 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. The test-receiver system was set to peak detect function and specified bandwidth with maximum hold mode.
f. A Quasi-peak measurement was then made for that frequency point for below 1GHz test. PK and AV for above 1GHz emission test.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

Frequency Band (MHz)	Level	Resolution Bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	3 MHz
	Average	1 MHz	1/T

10.3 Limit

Frequency range MHz	Distance Meters	Field Strengths Limit (15.209) μV/m
0.009 ~ 0.490	300	2400/F(kHz)
0.490 ~ 1.705	30	24000/F(kHz)
1.705 ~ 30	30	30
30 ~ 88	3	100
88 ~ 216	3	150
216 ~ 960	3	200
Above 960	3	500

Remark：(1) Emission level (dB)μV = 20 log Emission level μV/m
(2) The smaller limit shall apply at the cross point between two frequency bands.
(3) As shown in 15.35(b), 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.
(4) The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower.
(5) §15.247(d) specifies that emissions which fall in the restricted bands, as defined in §15.205 comply with radiated emission limits specified in §15.209.

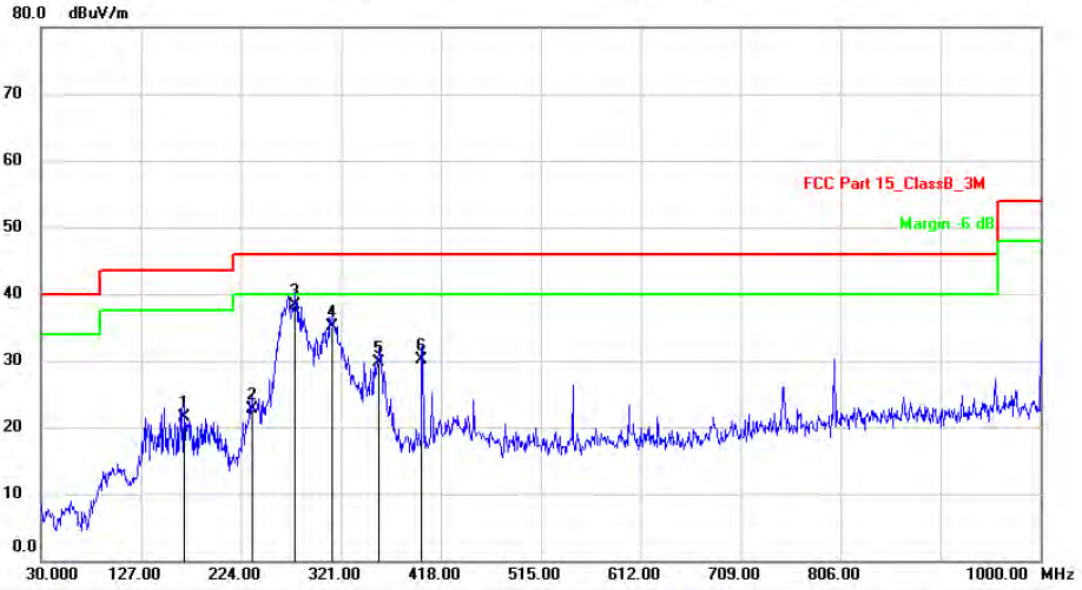
10.4 Measurement Results

Please refer to following plots of the worst case: **802.11a Low channel (U-NII-1) and 802.11a Low channel (U-NII-4)**
The worst test voltage: AC 120V 60Hz

Dongguan NTC Co., Ltd.
Tel:+86-769-22022444 Fax:+86-769-22022799
Web: Http://www.ntc-c.com

Radiated Emission Measurement

File :ET1030 Data :#58 Date: 2019/12/6 Time: 9:17:09



Site
Limit: FCC Part 15_ClassB_3M
EUT: Bestable
M/N: ET1030
Mode: TX-5G Band 1
Note:

Polarization: *Horizontal*
Power: AC120V/60Hz
Distance: 3m

Temperature: 26
Humidity: 47 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		168.7100	36.45	-14.85	21.60	43.50	-21.90	QP			
2		234.6700	34.96	-12.26	22.70	46.00	-23.30	QP			
3	*	276.3800	49.36	-11.06	38.30	46.00	-7.70	QP			
4		312.2700	45.23	-10.13	35.10	46.00	-10.90	QP			
5		357.8599	38.93	-9.13	29.80	46.00	-16.20	QP			
6		399.5700	39.31	-9.11	30.20	46.00	-15.80	QP			

Note: Below 30MHz, the emissions are lower than 20dB below the allowable limit.

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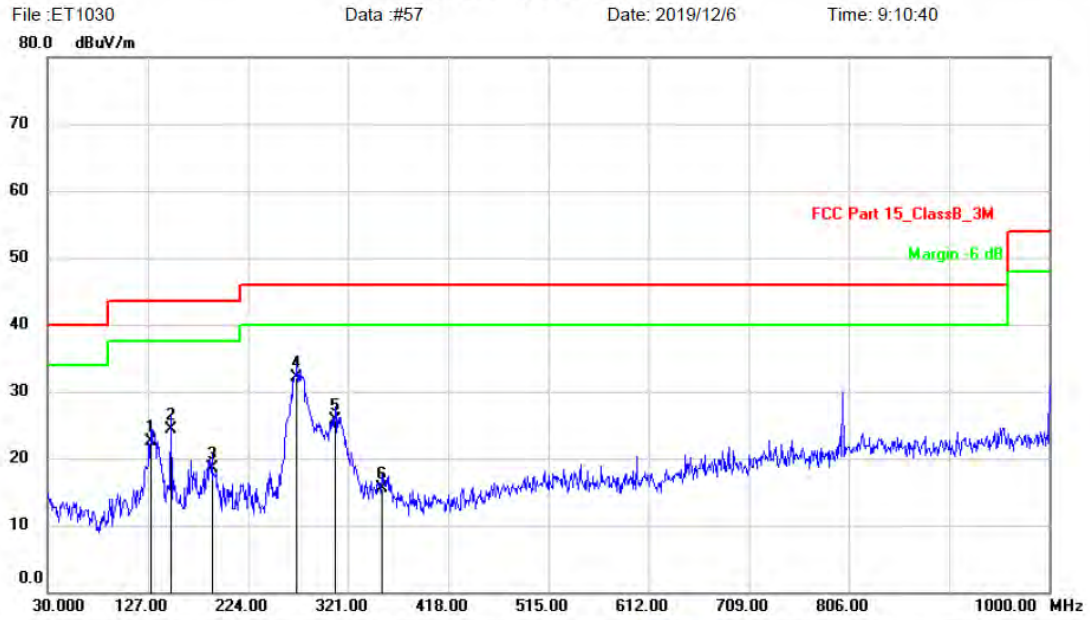
Radiated Emission Measurement



Site
Limit: FCC Part 15_ClassB_3M
EUT: Bestable
M/N: ET1030
Mode: TX-5G Band 1
Note:

Polarization: *Vertical*
Power: AC120V/60Hz
Distance: 3m

Temperature: 26
Humidity: 47 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		129.9100	40.75	-18.15	22.60	43.50	-20.90	QP			
2		149.3100	42.92	-18.52	24.40	43.50	-19.10	QP			
3		189.0800	35.23	-16.63	18.60	43.50	-24.90	QP			
4	*	271.5300	45.35	-13.15	32.20	46.00	-13.80	QP			
5		308.3900	37.94	-12.24	25.70	46.00	-20.30	QP			
6		353.9800	26.72	-11.12	15.60	46.00	-30.40	QP			

Note: Below 30MHz, the emissions are lower than 20dB below the allowable limit.

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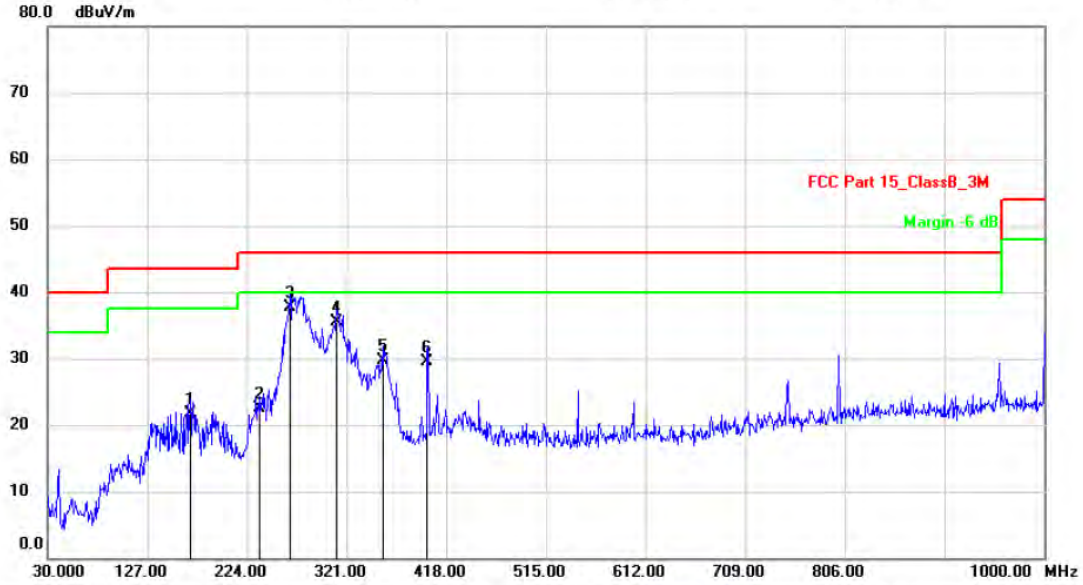
Radiated Emission Measurement

File :ET1030 Data :#59 Date: 2019/12/6 Time: 9:24:47



Site
Limit: FCC Part 15_ClassB_3M
EUT: Bestable
M/N: ET1030
Mode: TX-5G Band 4
Note:

Polarization: *Horizontal*
Power: AC120V/60Hz
Distance: 3m

Temperature: 26
Humidity: 47 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		168.7100	36.65	-14.85	21.80	43.50	-21.70	QP			
2		236.6100	34.68	-12.18	22.50	46.00	-23.50	QP			
3	*	265.7100	49.09	-11.29	37.80	46.00	-8.20	QP			
4		311.3000	45.66	-10.16	35.50	46.00	-10.50	QP			
5		355.9200	38.94	-9.14	29.80	46.00	-16.20	QP			
6		399.5700	38.61	-9.11	29.50	46.00	-16.50	QP			

Note: Below 30MHz, the emissions are lower than 20dB below the allowable limit.

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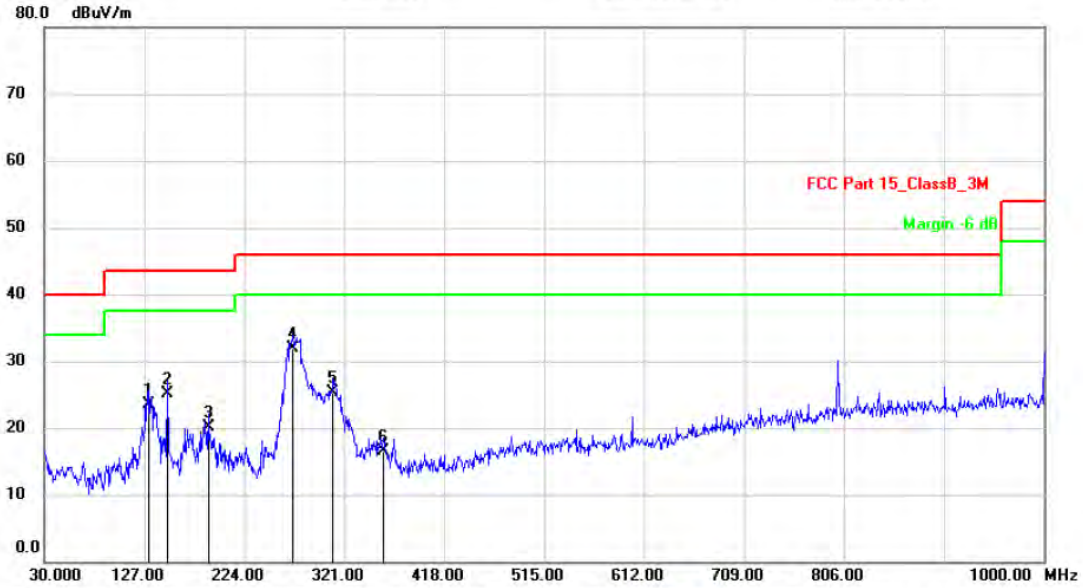
Web: Http://www.ntc-c.com

Radiated Emission Measurement

File :ET1030 Data :#60 Date: 2019/12/6 Time: 9:32:17



Site
Limit: FCC Part 15_ClassB_3M
EUT: Bestable
M/N: ET1030
Mode: TX-5G Band 4
Note:

Polarization: *Vertical*
Power: AC120V/60Hz
Distance: 3m

Temperature: 26
Humidity: 47 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		131.8500	41.74	-18.24	23.50	43.50	-20.00	QP			
2		149.3100	43.62	-18.52	25.10	43.50	-18.40	QP			
3		189.0800	36.73	-16.63	20.10	43.50	-23.40	QP			
4	*	271.5300	45.05	-13.15	31.90	46.00	-14.10	QP			
5		310.3299	37.60	-12.20	25.40	46.00	-20.60	QP			
6		358.8299	27.64	-11.14	16.50	46.00	-29.50	QP			

Note: Below 30MHz, the emissions are lower than 20dB below the allowable limit.

Test Mode:	The worst case: 802.11a	Test Date :	December 07, 2019
Frequency Range:	Above 1GHz	Temperature :	24℃
Test Result:	PASS	Humidity :	47 %
Measured Distance:	3m	Test By:	Lee

U-NII-1 5140-5240 MHz

Freq. (MHz)	Ant.Pol. (H/V)	Reading Level(dBuV)		Factor (dB/m)	Emission Level (dBuV)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
Operation Mode: TX Mode (Low)										
10360	V	47.18	31.98	14.04	61.22	46.02	74.00	54.00	-12.78	-7.98
15540	V	42.11	27.53	19.00	61.11	46.53	74.00	54.00	-12.89	-7.47

10360	H	47.16	32.09	14.04	61.20	46.13	74.00	54.00	-12.8	-7.87
15540	H	44.45	30	19.00	63.45	49.00	74.00	54.00	-10.55	-5

Operation Mode: TX Mode (Mid)										
10400	V	46.73	31.99	14.12	60.85	46.11	74.00	54.00	-13.15	-7.89
15600	V	41.59	26.86	20.20	61.79	47.06	74.00	54.00	-12.21	-6.94

10400	H	47.07	31.97	14.12	61.19	46.09	74.00	54.00	-12.81	-7.91
15600	H	42.91	28.88	20.20	63.11	49.08	74.00	54.00	-10.89	-4.92

Operation Mode: TX Mode (High)										
10480	V	46.81	31.66	14.29	61.10	45.95	74.00	54.00	-12.9	-8.05
15720	V	42.17	26.89	20.82	62.99	47.71	74.00	54.00	-11.01	-6.29

10480	H	47.9	31.69	14.29	62.19	45.98	74.00	54.00	-11.81	-8.02
15720	H	38.74	27.97	20.82	59.56	48.79	74.00	54.00	-14.44	-5.21

Note: (1) All Readings are Peak Value and AV.
(2) Emission Level= Reading Level + Factor
(3) Factor= Antenna Gain + Cable Loss – Amplifier Gain
(4) Data of measurement within this frequency range shown " ---" in the table above means the reading of emissions are attenuated more than 10dB below the permissible limits.
(5) Measurement uncertainty : ±3.7dB.
(6) Horn antenna used for the emission over 1000MHz.

Test Mode: The worst case: 802.11a
Frequency Range: Above 1GHz
Test Result: PASS
Measured Distance: 3m

Test Date : December 07, 2019
Temperature : 24℃
Humidity : 47 %
Test By: Lee

U-NII-3 5745-5825 MHz

Freq. (MHz)	Ant.Pol. (H/V)	Reading Level(dBuV)		Factor (dB/m)	Emission Level (dBuV)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
Operation Mode: TX Mode (Low)										
11490	V	46.99	31.51	16.86	63.85	48.37	74.00	54.00	-10.15	-5.63
17235	V	40.18	25.94	22.23	62.41	48.17	74.00	54.00	-11.59	-5.83

11490	H	46.72	31.53	16.86	63.58	48.39	74.00	54.00	-10.42	-5.61
17235	H	40.58	25.93	22.23	62.81	48.16	74.00	54.00	-11.19	-5.84

Operation Mode: TX Mode (Mid)										
11570	V	45.85	30.96	17.01	62.86	47.97	74.00	54.00	-11.14	-6.03
17355	V	39.69	25.27	22.62	62.31	47.89	74.00	54.00	-11.69	-6.11

11570	H	45.44	30.97	17.01	62.45	47.98	74.00	54.00	-11.55	-6.02
17355	H	40.19	25.27	22.62	62.81	47.89	74.00	54.00	-11.19	-6.11

Operation Mode: TX Mode (High)										
11650	V	45.28	30.61	17.16	62.44	47.77	74.00	54.00	-11.56	-6.23
17475	V	38.96	24.75	23.01	61.97	47.76	74.00	54.00	-12.03	-6.24

11650	H	45.9	30.6	17.16	63.06	47.76	74.00	54.00	-10.94	-6.24
17475	H	38.92	24.75	23.01	61.93	47.76	74.00	54.00	-12.07	-6.24

Note: (1) All Readings are Peak Value and AV.
(2) Emission Level= Reading Level + Factor
(3) Factor= Antenna Gain + Cable Loss – Amplifier Gain
(4) Data of measurement within this frequency range shown " ---" in the table above means the reading of emissions are attenuated more than 10dB below the permissible limits.
(5) Measurement uncertainty : ±3.7dB.
(6) Horn antenna used for the emission over 1000MHz.

11. Antenna Application

11.1 Antenna requirement

According to of FCC part 15C section 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section 15.203 of the rules.

And according to 47 CFR section 15.407(a), if the transmitting antennas of directional gain greater than 6dBi are used, the transmit power and power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

11.2 Measurement Results

The antenna is integral antenna that no antenna other than furnished by the responsible party shall be used with the device, and the best case gain of the antenna is 2dBi, So, the antenna is consider meet the requirement.

12. Test Equipment List

Description	Manufacturer	Model Number	Serial Number	Characteristics	Calibration Date	Calibration Due Date
Test Receiver	Rohde & Schwarz	ESCI7	100837	9KHz~7GHz	Mar. 13, 2019	1 Year
Antenna	Schwarzbeck	VULB9162	9162-010	30MHz~7GHz	Mar. 22, 2019	1 Year
Spectrum Analyzer	Rohde & Schwarz	FSU26	200409/026	20Hz~26.5GHz	Mar. 13, 2019	1 Year
Spectrum Analyzer	Keysight	N9020A	MY54200831	20Hz~26.5GHz	Apr. 23, 2019	1 Year
Spectrum Analyzer	Rohde & Schwarz	FSV40	101003	10Hz~40GHz	Apr. 23, 2019	1 Year
Horn Antenna	Schwarzbeck	BBHA9170	9170-372	15GHz~40GHz	Mar. 22, 2019	1 Year
Pre-Amplifier	EMCI	EMC 184045	980102	18GHz~40GHz	Apr. 23, 2019	1 Year
Power Sensor	DARE	RPR3006W	15I00041SNO64	100MHz~6GHz	Mar. 13, 2019	1 Year
Communication Tester	Rohde & Schwarz	CMW500	149004	70MHz~6GHz	Mar. 13, 2019	1 Year
Horn Antenna	COM-Power	AH-118	071078	500MHz~18GHz	Mar. 22, 2019	1 Year
Pre-Amplifier	HP	HP 8449B	3008A00964	1GHz~26.5GHz	Mar. 13, 2019	1 Year
Pre-Amplifier	HP	HP 8447D	1145A00203	100KHz~1.3GHz	Mar. 13, 2019	1 Year
Loop Antenna	Schwarzbeck	FMZB 1513	1513-272	9KHz~30MHz	Apr. 23, 2019	1 Year
Temperature & Humidity Chamber	REMAFEE	SYHR225L	N/A	-40~150℃	Apr. 23, 2019	1 Year
DC Source	MY	MY8811	N/A	0~30V	N/A	N/A
Temporary antenna connector	TESCOM	SS402	N/A	9KHz~25GHz	N/A	N/A
Power Meter	Anritsu	ML2495A	1139001	100k-65GHz	Apr. 23, 2019	1 Year
Power Sensor	Anritsu	MA2411B	100345	300M-40GHz	Apr. 23, 2019	1 Year
Test Software	EZ	EZ_EMC	N/A	N/A	N/A	N/A
Test Receiver	Rohde & Schwarz	ESCI	101152	9KHz-3GHz	Mar. 14, 2019	1 Year
L.I.S.N	Rohde & Schwarz	ENV 216	101317	9KHz-30MHz	Mar. 14, 2019	1 Year
RF Switching Unit	Compliance Direction Systems Inc.	RSU-M2	38311	9KHz-3GHz	Mar.14, 2019	1 Year

Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

---End---