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	:	Shenzhen Smart Device Technology Co., LTD
Address	:	SSMEC Building, Gao Xin Nan First Avenue Hi-Tech Park South, Nanshan, Shenzhen, China
Manufacturer /Factory	:	Shenzhen Smart Device Technology Co., LTD
Address	:	SSMEC Building, Gao Xin Nan First Avenue Hi-Tech Park South, Nanshan, Shenzhen, China
E.U.T.	:	IoT-3399E
Brand Name	:	N/A
Model No.	:	IoT-3399E
FCC ID	:	2AITM-IOT-3399E
Measurement Standard	:	47 CFR FCC PART 15 Subpart E (section 407)
Date of Receiver	:	June 31, 2018
Date of Test	:	June 31, 2018 to November 21, 2018
Date of Report	:	November 21, 2018

This Test Report is Issued Under the Authority of :

Prepared by	Approved & Authorized Signer
Sundiy jiang / 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.

Table of Contents

Revision History of This Test Report

Report Number	Description	Issued Date
NTC1807423FV00	Initial Issue	2018-11-21

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test

Product Name	:	IoT-3399E
Main Model Name	:	IoT-3399E
Additional Model Name	:	N/A
Brand Name	:	N/A
Power Supply	:	DC 12V(from external adapter or terminal product)
Test voltage	:	AC 120V/60Hz (adapter input)
Hardware version	:	IoT-3399E-V2.0
Software version	:	Android7.1
Serial number	:	N/A
Note	:	This report only applies to 5G WIFI(Band1+Band4) function.

Technical parameters
For 5G Band

Frequency Range	:	5180-5240MHz 5745-5825MHz
Modulation type	:	CCK, DQPSK, DBPSK for 802.11a 64-QAM,16-QAM, QPSK, BPSK for 802.11n 256-QAM,64-QAM,16-QAM, QPSK BPSK for 802.11ac
Modulation Technology	:	DSSS, 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 0~7 802.11n(HT40): MCS 0~7 802.11ac(VHT20): MCS 0~8, Nss=1 802.11ac(VHT40): MCS 0~9, Nss=1 802.11ac(VHT80): MCS 0~9, Nss=1
Antenna Type	:	External plastic rod antenna *2
Antenna Gain	:	3.5dBi

Channel list for 5GHz Band

Band 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

Band 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	5775
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:

Band 5180~5240MHz		Band 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	RFTestTool-user-5.6_sign

1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **2AITM-IOT-3399E** filing to comply with Section 15.407 of the FCC Part 15 subpart E(2016) 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

Notebook	:	Manufacturer: Lenovo Model: TP00067A P/N: SL10G10768 S/N: PF-0DS3YC 15/12 CE, FCC: DOC
Adapter (For notebook)	:	Manufacturer: Lenovo Model: ADLX65NLC3A I/P: AC 100-240V 50-60Hz, 1.8A O/P: DC 20V 3.25A
Antenna	:	Provided by the Manufacturer Manufacturer: BGS M/N: SMT-006 Antenna Gain: 3.5dBi
Adapter	:	Provided by the Manufacturer Manufacturer: BSY M/N: BSY018B120150V U I/P:AC100-240V ~50/60Hz, 0.4A O/P:12V1.5A

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, 2019
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 & Technology Park, Zhouxi Longxi Road, Nancheng District, Dongguan City, Guangdong Province, China

1.7 Summary of Test Results

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

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

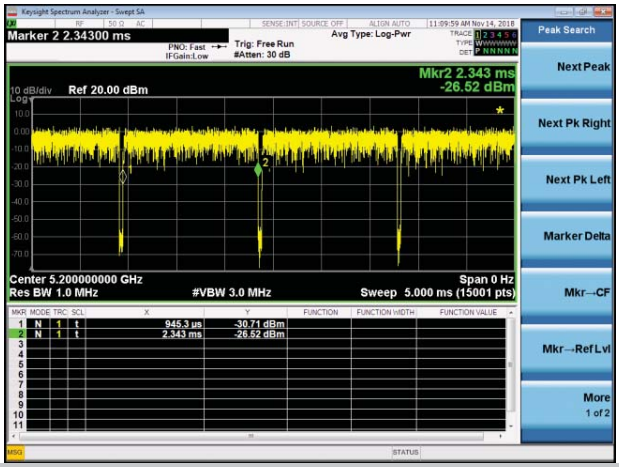
The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements.

2.5 Duty cycle

Operation Band (MHz)	Mode	Ton (ms)	Ton+off (ms)	Duty Cycle (%)	1/T minimum VBW (kHz)
5180~5240	802.11a	1.3977	1.4357	97.35	0.038
	802.11n(HT20)	1.3100	1.3480	97.18	0.038
	802.11n(HT40)	0.6589	0.6949	94.82	0.036
	802.11ac(VHT20)	1.3180	1.3560	97.20	0.038
	802.11ac(VHT40)	0.6591	0.6951	94.82	0.036
	802.11ac(VHT80)	0.3270	0.3640	89.84	0.037
5745~5825	802.11a	1.3980	1.4360	97.35	0.038
	802.11n(HT20)	1.3110	1.3490	97.18	0.038
	802.11n(HT40)	0.6511	0.6871	94.76	0.036
	802.11ac(VHT20)	1.3190	1.3560	97.27	0.037
	802.11ac(VHT40)	0.6591	0.6951	94.82	0.036
	802.11ac(VHT80)	0.3274	0.3634	90.09	0.036

Band 5180-5240MHz
IEEE 802.11a

Ton



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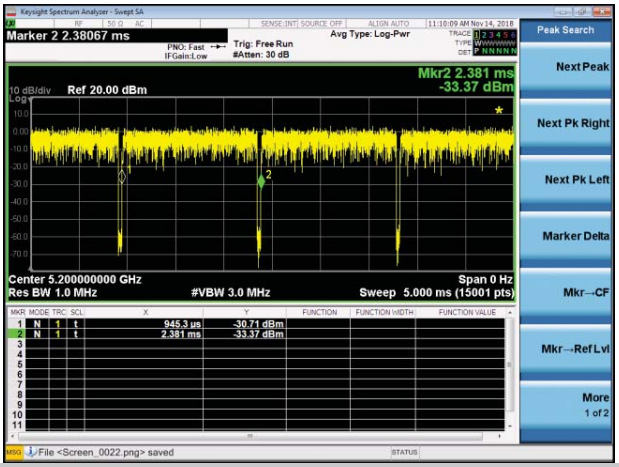
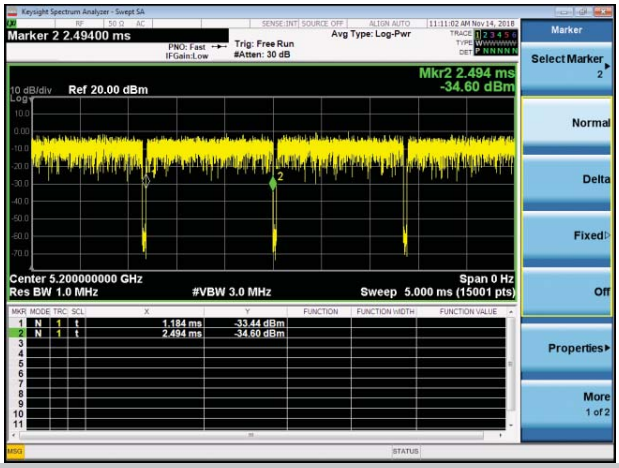


IEEE 802.11n(HT20)

Ton



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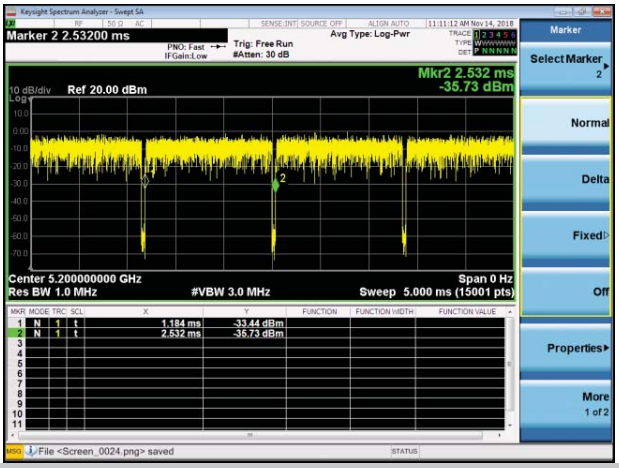

802.11n(HT40)

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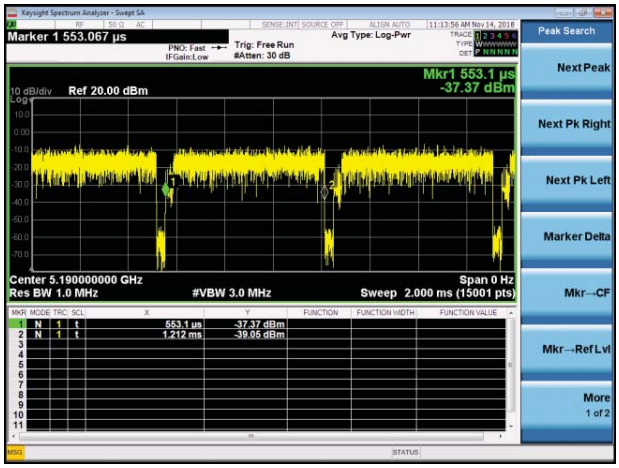

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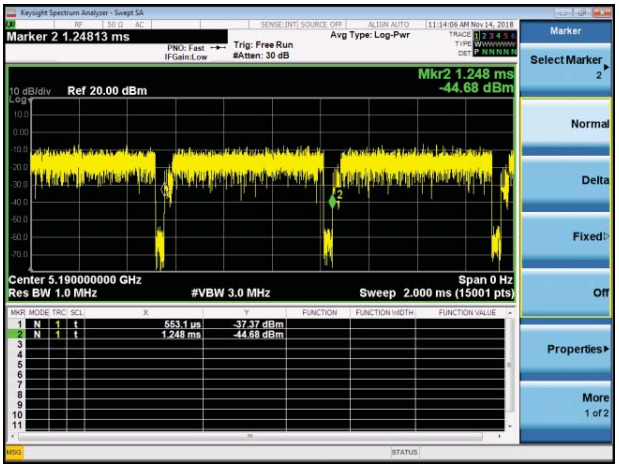

IEEE 802.11ac(VHT20)

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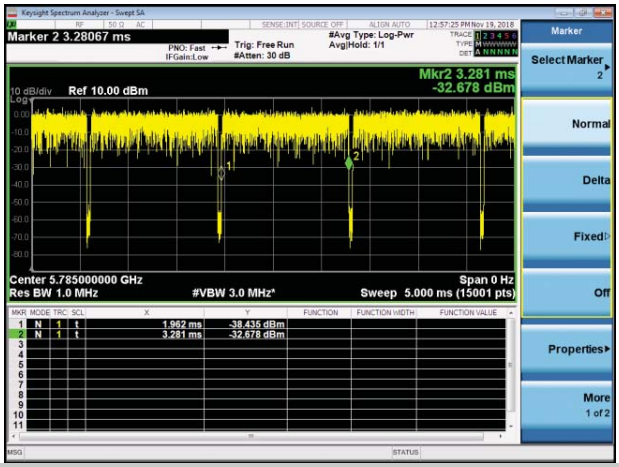

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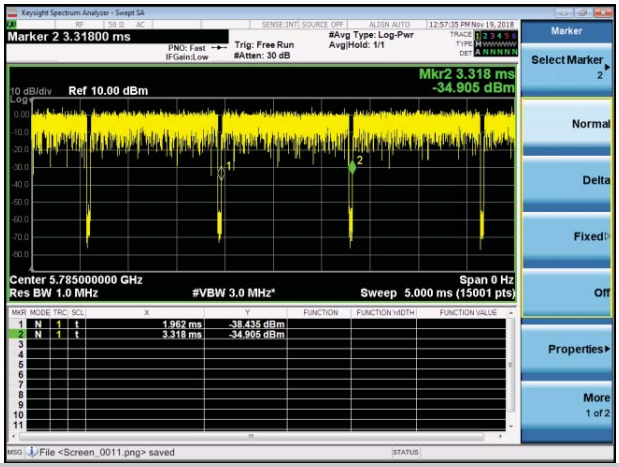

IEEE 802.11ac(VHT40)

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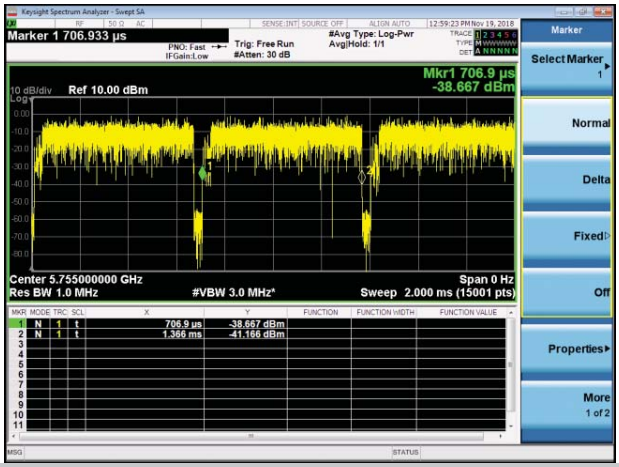

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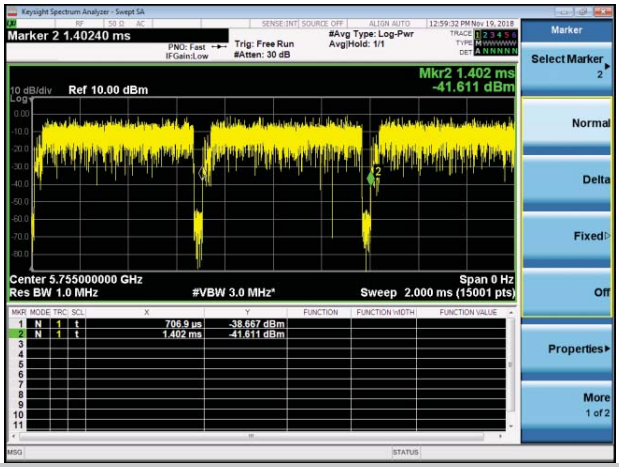

IEEE 802.11ac(VHT80)

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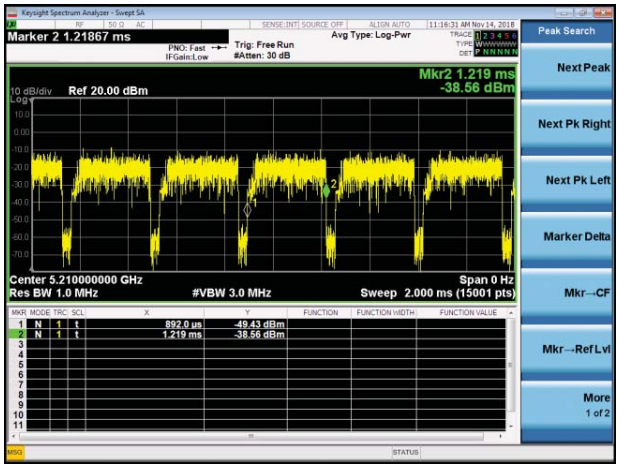

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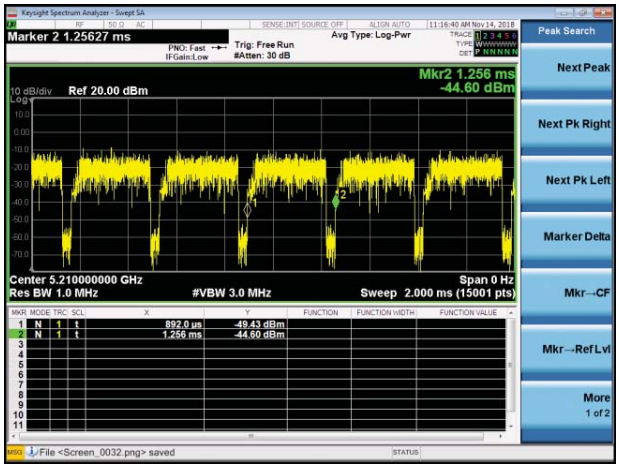
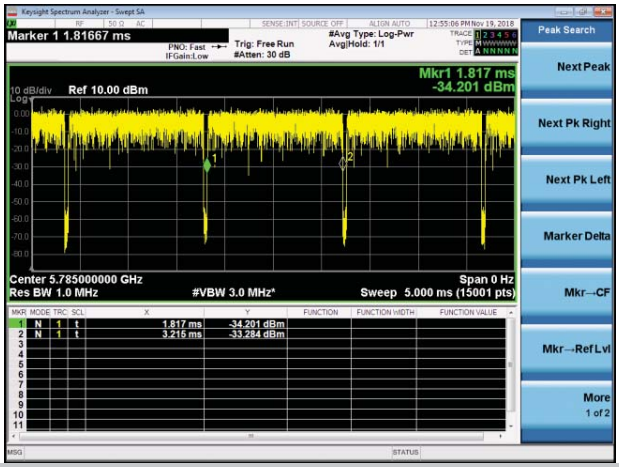


Band 4 5745-5825MHz
IEEE 802.11a

Ton



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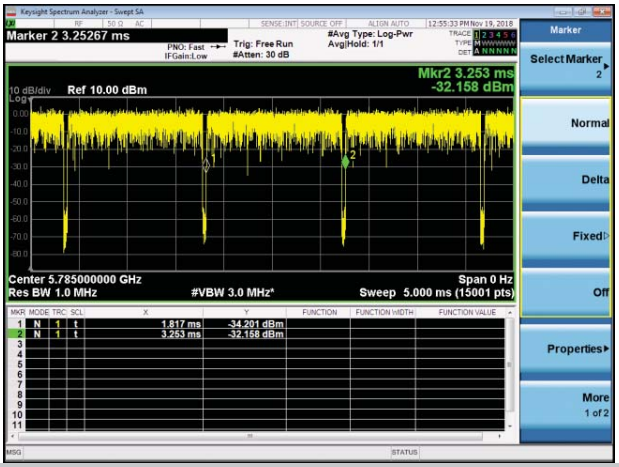

IEEE 802.11n(HT20)

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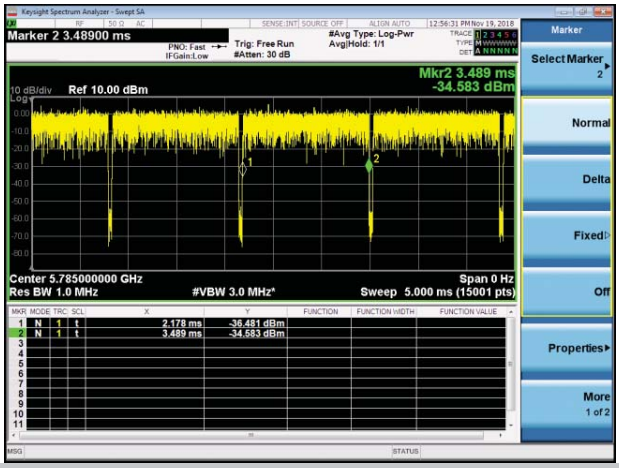

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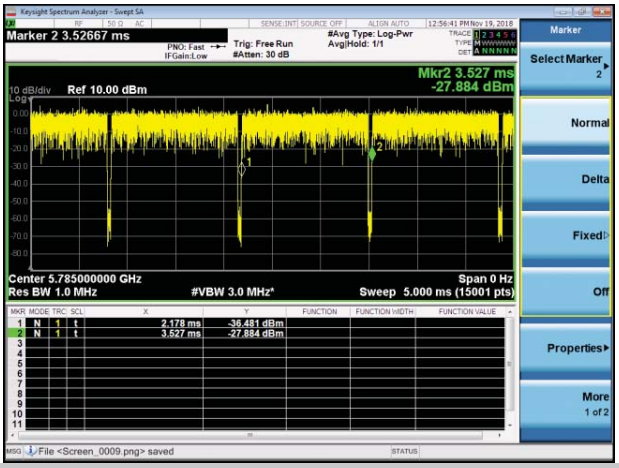

802.11n(HT40)

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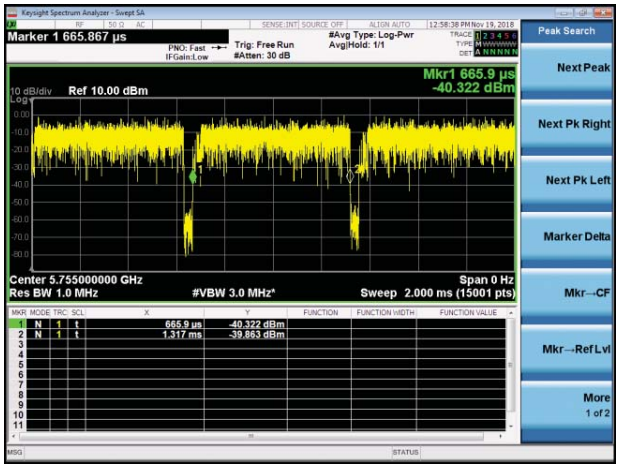

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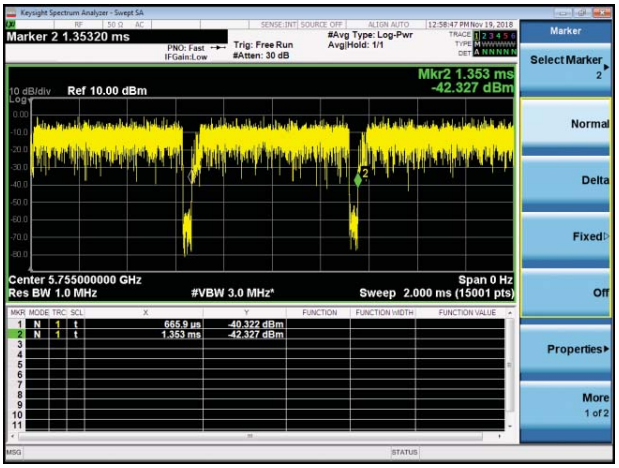

IEEE 802.11ac(VHT20)

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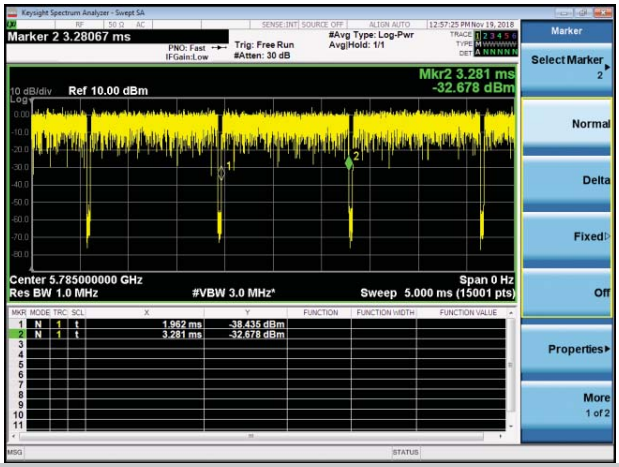

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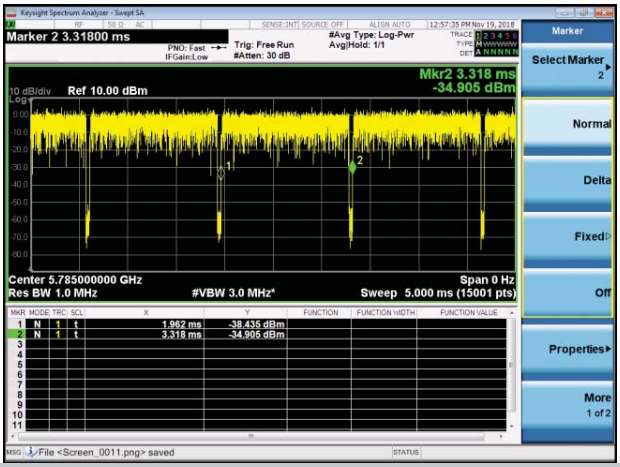

IEEE 802.11ac(VHT40)

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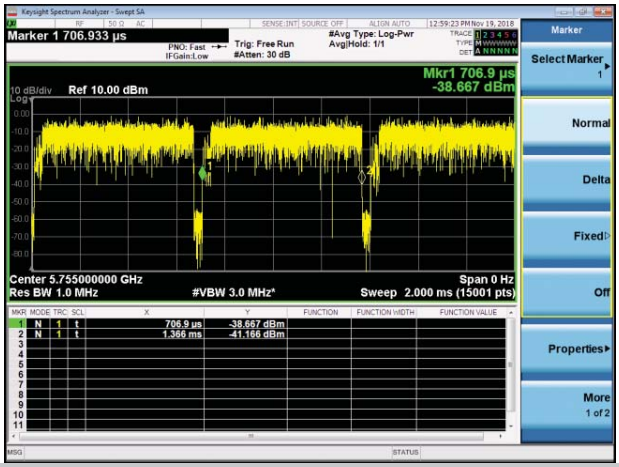

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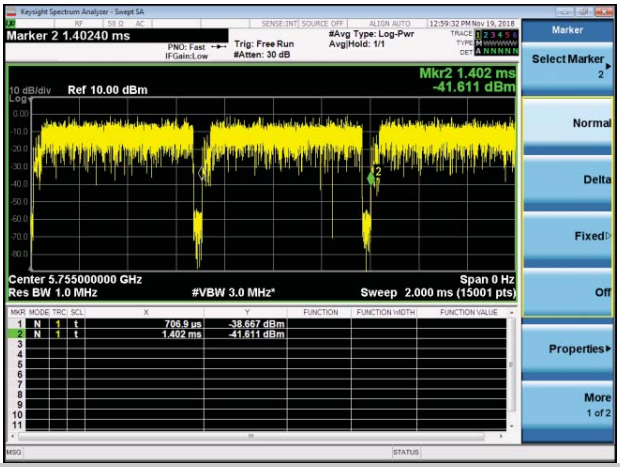

IEEE 802.11ac(VHT80)

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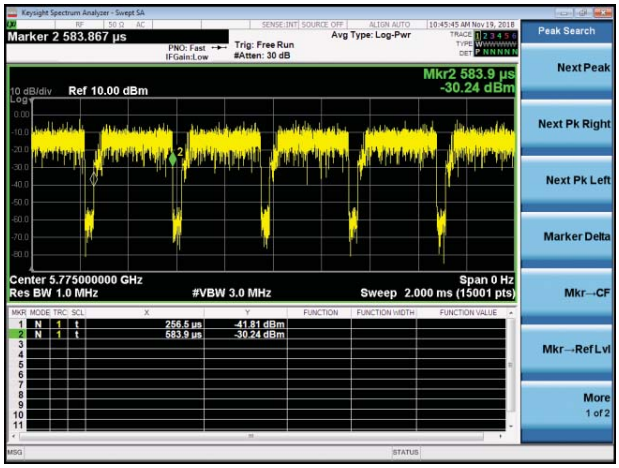

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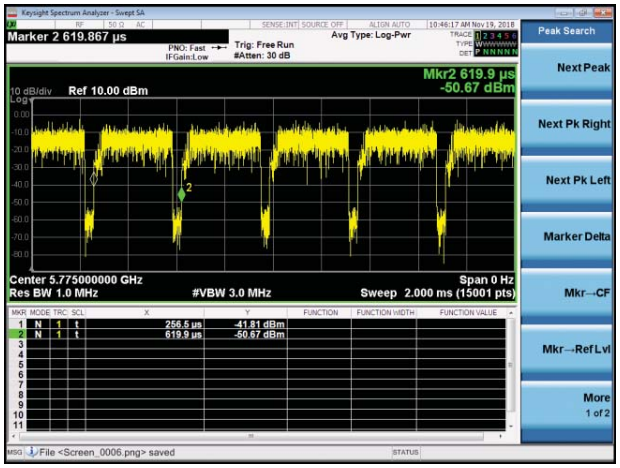
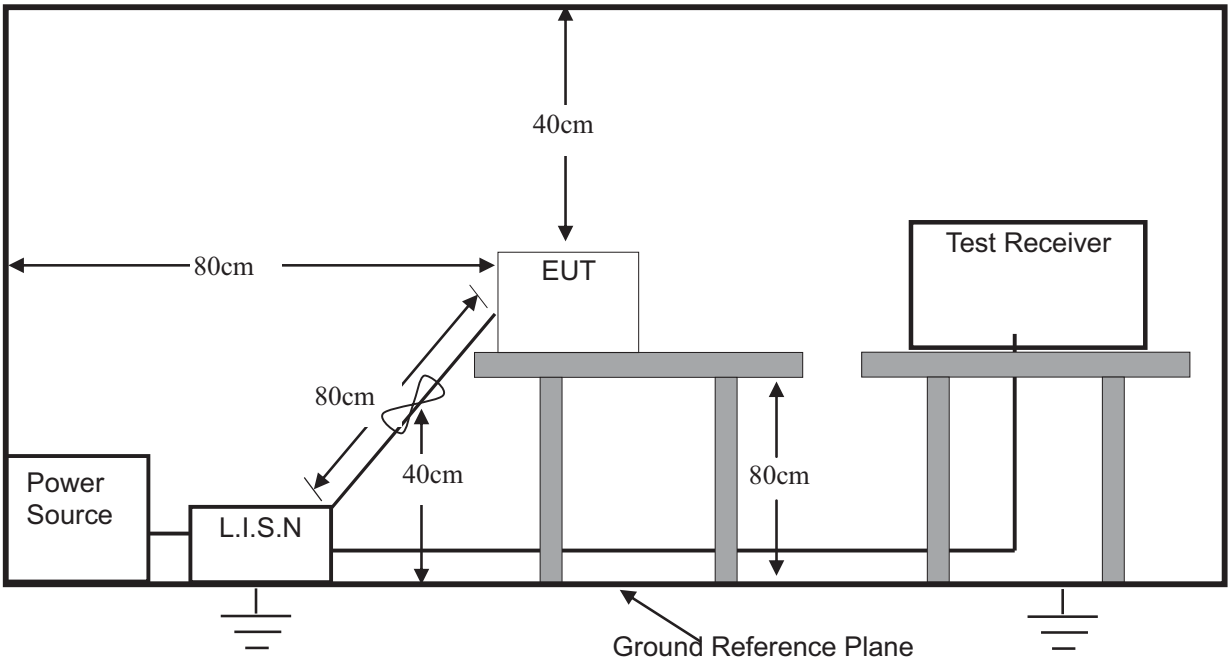


3. Conducted Emissions Test

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 (5G WIFI Band1), TX (5G WIFI Band4)

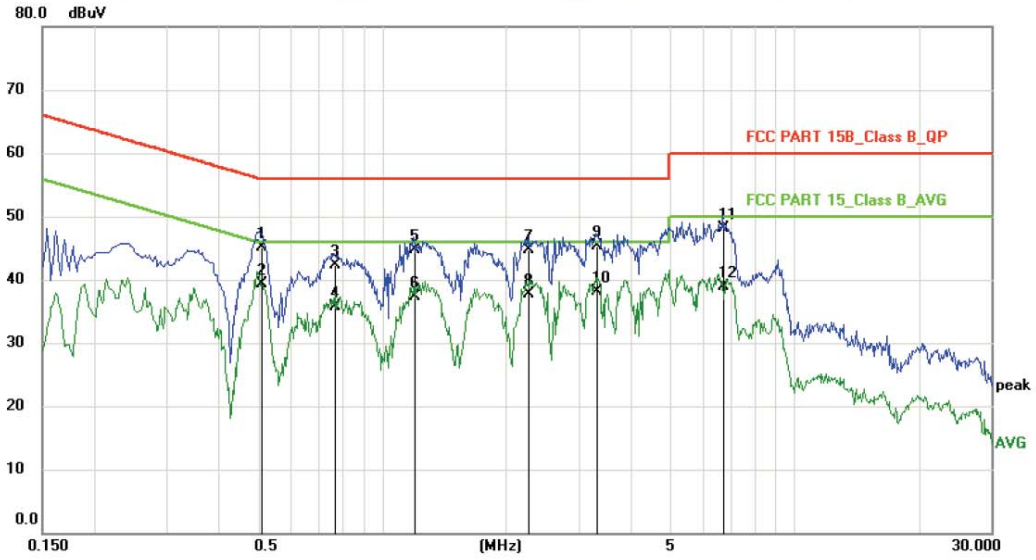
3.3 Measurement Results

For 5G WIFI Band 1
Please refer to following plots of the worst case: 802.11a high channel.
For 5G WIFI Band 4
Please refer to following plots of the worst case : 802.11n(HT20) middle channel.

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

Conducted Emission Measurement

File :IoT-3399E Data :#16 Date: 2018-8-4 Time: 11:22:05



Site
Limit: FCC PART 15B_Class B_QP
EUT: IoT-3399E
M/N: IoT-3399E
Mode: TX(5G Band 1)
Note:

Phase: L1
Power: AC 120V/60Hz

Temperature: 26
Humidity: 50 %

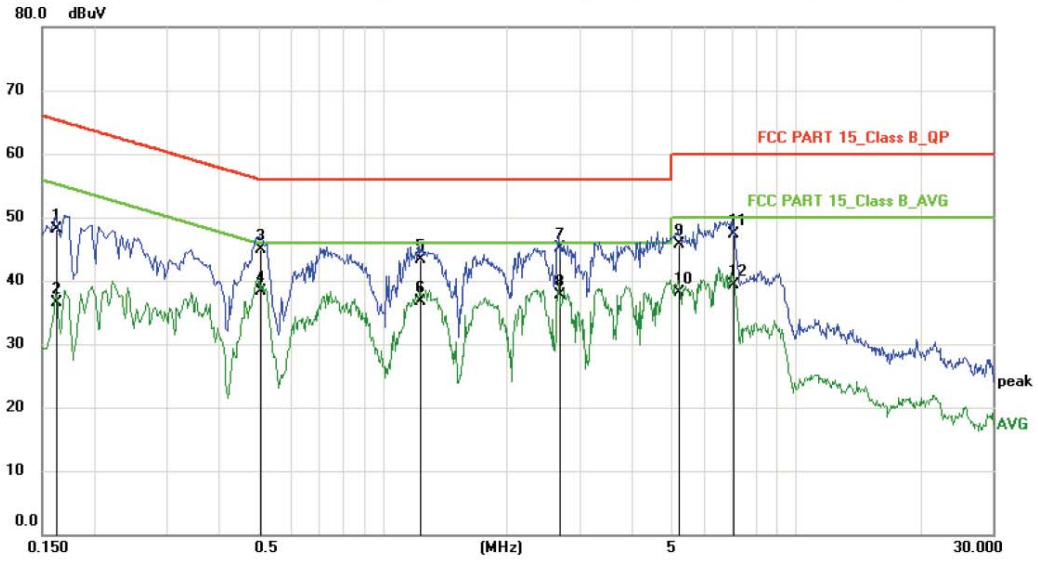
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.5100	34.57	10.63	45.20	56.00	-10.80	QP	
2	*	0.5100	28.77	10.63	39.40	46.00	-6.60	AVG	
3		0.7660	31.63	10.67	42.30	56.00	-13.70	QP	
4		0.7660	25.03	10.67	35.70	46.00	-10.30	AVG	
5		1.1935	34.00	10.70	44.70	56.00	-11.30	QP	
6		1.1935	26.70	10.70	37.40	46.00	-8.60	AVG	
7		2.2700	34.10	10.70	44.80	56.00	-11.20	QP	
8		2.2700	27.10	10.70	37.80	46.00	-8.20	AVG	
9		3.2980	34.69	10.71	45.40	56.00	-10.60	QP	
10		3.2980	27.49	10.71	38.20	46.00	-7.80	AVG	
11		6.7259	37.38	10.72	48.10	60.00	-11.90	QP	
12		6.7259	28.18	10.72	38.90	50.00	-11.10	AVG	

*:Maximum data x:Over limit !:over margin 〈Reference Only

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

Conducted Emission Measurement

File :IoT-3399E Data :#15 Date: 2018-8-4 Time: 11:15:42



Site
Limit: FCC PART 15_Class B_QP
EUT: IoT-3399E
M/N: IoT-3399E
Mode: TX(5G Band 1)
Note:

Phase: *N*
Power: AC 120V/60Hz

Temperature: 26
Humidity: 50 %

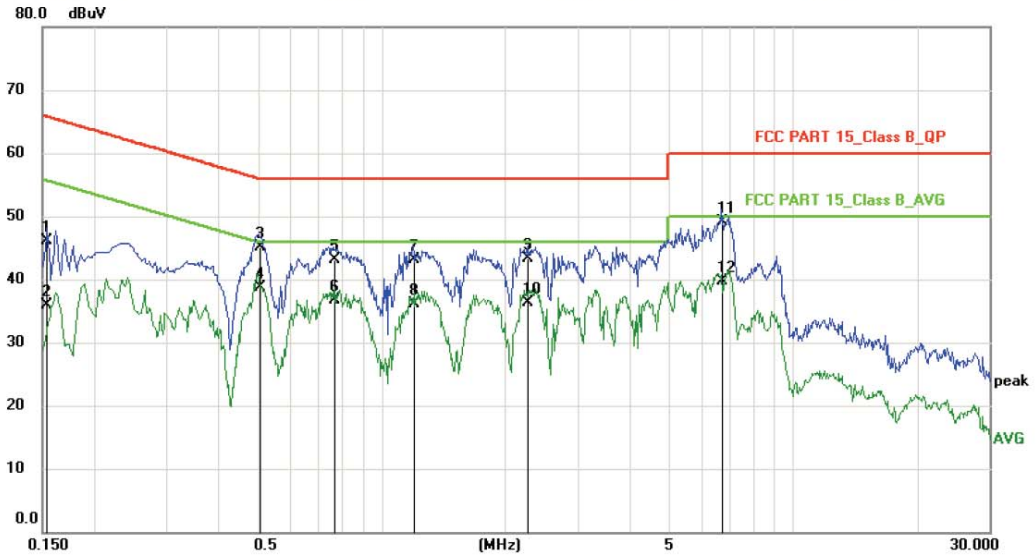
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1620	37.60	10.60	48.20	65.36	-17.16	QP	
2		0.1620	25.90	10.60	36.50	55.36	-18.86	AVG	
3		0.5060	34.27	10.63	44.90	56.00	-11.10	QP	
4	*	0.5060	27.67	10.63	38.30	46.00	-7.70	AVG	
5		1.2338	32.70	10.70	43.40	56.00	-12.60	QP	
6		1.2338	26.10	10.70	36.80	46.00	-9.20	AVG	
7		2.6739	34.49	10.71	45.20	56.00	-10.80	QP	
8		2.6739	26.99	10.71	37.70	46.00	-8.30	AVG	
9		5.1977	35.09	10.71	45.80	60.00	-14.20	QP	
10		5.1977	27.49	10.71	38.20	50.00	-11.80	AVG	
11		7.0537	36.68	10.72	47.40	60.00	-12.60	QP	
12		7.0537	28.58	10.72	39.30	50.00	-10.70	AVG	

*:Maximum data x:Over limit !:over margin 〈Reference Only

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

Conducted Emission Measurement

File :IoT-3399E Data :#18 Date: 2018-8-4 Time: 11:35:37



Site
Limit: FCC PART 15_Class B_QP
EUT: IoT-3399E
M/N: IoT-3399E
Mode: TX(5G Band 4)
Note:

Phase: *L1*
Power: AC 120V/60Hz

Temperature: 26
Humidity: 50 %

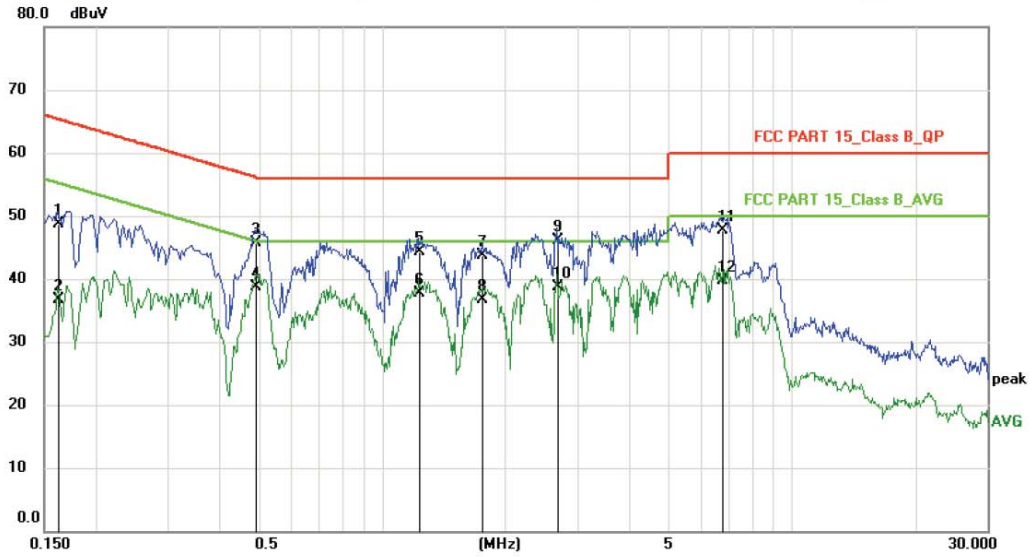
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1539	35.60	10.60	46.20	65.79	-19.59	QP	
2		0.1539	25.30	10.60	35.90	55.79	-19.89	AVG	
3		0.5060	34.57	10.63	45.20	56.00	-10.80	QP	
4	*	0.5060	28.17	10.63	38.80	46.00	-7.20	AVG	
5		0.7660	32.43	10.67	43.10	56.00	-12.90	QP	
6		0.7660	26.03	10.67	36.70	46.00	-9.30	AVG	
7		1.1935	32.50	10.70	43.20	56.00	-12.80	QP	
8		1.1935	25.50	10.70	36.20	46.00	-9.80	AVG	
9		2.2700	32.60	10.70	43.30	56.00	-12.70	QP	
10		2.2700	25.70	10.70	36.40	46.00	-9.60	AVG	
11		6.7259	38.38	10.72	49.10	60.00	-10.90	QP	
12		6.7259	28.98	10.72	39.70	50.00	-10.30	AVG	

*:Maximum data x:Over limit !:over margin 〈Reference Only

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

Conducted Emission Measurement

File :IoT-3399E Data :#17 Date: 2018-8-4 Time: 11:28:52



Site
Limit: FCC PART 15_Class B_QP
EUT: IoT-3399E
M/N: IoT-3399E
Mode: TX(5G Band 4)
Note:

Phase: N
Power: AC 120V/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		0.1620	38.10	10.60	48.70	65.36	-16.66	QP	
2		0.1620	26.10	10.60	36.70	55.36	-18.66	AVG	
3		0.4939	35.07	10.63	45.70	56.10	-10.40	QP	
4		0.4939	28.17	10.63	38.80	46.10	-7.30	AVG	
5		1.2338	33.70	10.70	44.40	56.00	-11.60	QP	
6		1.2338	27.10	10.70	37.80	46.00	-8.20	AVG	
7		1.7620	33.00	10.70	43.70	56.00	-12.30	QP	
8		1.7620	26.10	10.70	36.80	46.00	-9.20	AVG	
9		2.6739	35.49	10.71	46.20	56.00	-9.80	QP	
10	*	2.6739	27.99	10.71	38.70	46.00	-7.30	AVG	
11		6.7378	36.98	10.72	47.70	60.00	-12.30	QP	
12		6.7378	29.08	10.72	39.80	50.00	-10.20	AVG	

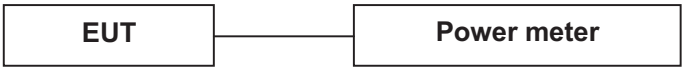
*:Maximum data x:Over limit !:over margin 〈Reference Only

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.

Temperature :	23 ℃	Humidity :	52%
Test By:	Lee	Test Date :	November 14, 2018
Test Result:	PASS		

Frequency MHz	Data Rate Mbps	Peak Output Power dBm	Limit dBm
IEEE 802.11a Mode (OFDM, Antenna Gain=3.5dBi)			
Low Channel: 5180	6	8.36	30
Middle Channel: 5200	6	8.94	30
High Channel: 5240	6	9.08	30

Note: Both of antennas have considered during pre-test, but only the worst case (ANT_0) was recorded.

Frequency MHz	Data Rate Mbps	Peak Output Power dBm			Limit dBm
IEEE 802.11n(HT20)Mode (OFDM, Antenna Gain=3.5dBi)					
Low Channel: 5180	MCS0	ANT_0	ANT_1	Total	30
		4.35	4.15	7.26	
Middle Channel: 5200	MCS0	5.02	4.94	7.99	30
High Channel: 5240	MCS0	5.52	5.12	8.33	30
IEEE 802.11n(HT40) Mode (OFDM, Antenna Gain=3.5dBi)					
Low Channel: 5190	MCS0	4.67	4.47	7.58	30
High Channel: 5230	MCS0	6.04	5.95	9.01	30
IEEE 802.11ac (VHT20) Mode (OFDM, Antenna Gain=3.5dBi)					
Low Channel: 5180	MCS0	5.63	5.38	8.52	30
Middle Channel: 5200	MCS0	5.33	5.15	8.25	30
High Channel: 5240	MCS0	5.73	5.63	8.69	30
IEEE 802.11ac (VHT40) Mode (OFDM, Antenna Gain=3.5dBi)					
Low Channel: 5190	MCS0	5.88	5.47	8.69	30
High Channel: 5230	MCS0	5.87	5.48	8.69	30
IEEE 802.11ac (VHT80) Mode (OFDM, Antenna Gain=3.5dBi)					
Channel: 5210	MCS0	5.60	5.30	8.46	30

Note : The working on MIMO mode.

Temperature :	22 ℃	Humidity :	54%
Test By:	Lee	Test Date :	November 14, 2018
Test Result:	PASS		

Frequency MHz	Data Rate Mbps	Peak Output Power dBm	Limit dBm
IEEE 802.11a Mode (OFDM, Antenna Gain=3.5dBi)			
Low Channel: 5745	6	5.98	30
Middle Channel: 5785	6	5.76	30
High Channel: 5825	6	6.39	30

Note: Both of antennas have considered during pre-test, but only the worst case (ANT_0) was recorded.

Frequency MHz	Data Rate Mbps	Peak Output Power dBm			Limit dBm
IEEE 802.11n(HT20)Mode (OFDM, Antenna Gain=3.5dBi)					
Low Channel: 5745	MCS0	ANT_0	ANT_1	Total	30
		6.55	6.06	9.32	
Middle Channel: 5785	MCS0	6.96	6.72	9.85	30
High Channel: 5825	MCS0	6.31	6.17	9.25	30
IEEE 802.11n(HT40) Mode (OFDM, Antenna Gain=3.5dBi)					
Low Channel: 5755	MCS0	6.63	6.44	9.55	30
High Channel: 5795	MCS0	6.07	5.91	9.00	30
IEEE 802.11ac (VHT20) Mode (OFDM, Antenna Gain=3.5dBi)					
Low Channel: 5745	MCS0	6.52	6.17	9.36	30
Middle Channel: 5785	MCS0	5.98	5.86	8.93	30
High Channel: 5825	MCS0	5.79	5.76	8.79	30
IEEE 802.11ac (VHT40) Mode (OFDM, Antenna Gain=3.5dBi)					
Low Channel: 5755	MCS0	5.97	5.87	8.93	30
High Channel: 5795	MCS0	6.33	6.15	9.25	30
IEEE 802.11ac (VHT80) Mode (OFDM, Antenna Gain=3.5dBi)					
Channel: 5775	MCS0	6.37	6.26	9.33	30

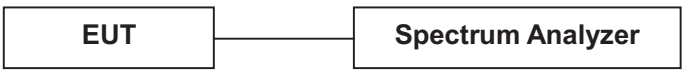
Note : The working on MIMO mode.

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.

Temperature :	21 ℃	Humidity : 54 %	
Test By:	Lee	Test Date : November 14, 2018	
Test Result:	PASS		
Frequency MHz	Data Rate Mbps	6dB Bandwidth MHz	Limit
IEEE 802.11a Mode (CCK)			
Low Channel: 5180	6	16.39	>500KHz
Middle Channel: 5200	6	16.38	>500KHz
High Channel: 5240	6	16.36	>500KHz
IEEE 802.11n(HT20) Mode (OFDM)			
Low Channel: 5180	MCS0	17.63	>500KHz
Middle Channel: 5200	MCS0	17.61	>500KHz
High Channel: 5240	MCS0	17.61	>500KHz
IEEE 802.11n(HT40) Mode (OFDM)			
Low Channel: 5190	MCS0	36.36	>500KHz
High Channel: 5230	MCS0	36.41	>500KHz
IEEE 802.11ac (VHT20) Mode (OFDM)			
Low Channel: 5180	MCS0	17.61	>500KHz
Middle Channel: 5200	MCS0	17.61	>500KHz
High Channel: 5240	MCS0	17.61	>500KHz
IEEE 802.11ac (VHT40) Mode (OFDM)			
Low Channel: 5190	MCS0	36.42	>500KHz
High Channel: 5230	MCS0	36.39	>500KHz
IEEE 802.11ac (VHT80) Mode (OFDM)			
Channel: 5210	MCS0	76.15	>500KHz

Note: Both of antennas have considered during pre-test, but only the worst case (ANT_0) was recorded.

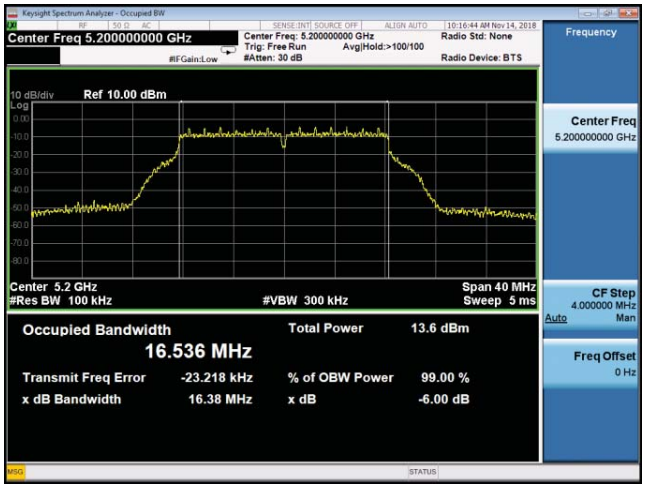
Temperature :	23 ℃	Humidity : 53 %	
Test By:	Lee	Test Date : November 14, 2018	
Test Result:	PASS		
Frequency MHz	Data Rate Mbps	6dB Bandwidth MHz	Limit
IEEE 802.11a Mode (CCK)			
Low Channel: 5745	6	16.41	>500KHz
Middle Channel: 5785	6	16.42	>500KHz
High Channel: 5825	6	16.41	>500KHz
IEEE 802.11n(HT20) Mode (OFDM)			
Low Channel: 5745	MCS0	17.71	>500KHz
Middle Channel: 5785	MCS0	17.73	>500KHz
High Channel: 5825	MCS0	17.72	>500KHz
IEEE 802.11n(HT40) Mode (OFDM)			
Low Channel: 5755	MCS0	36.45	>500KHz
High Channel: 5795	MCS0	36.43	>500KHz
IEEE 802.11ac (VHT20) Mode (OFDM)			
Low Channel: 5745	MCS0	17.71	>500KHz
Middle Channel: 5785	MCS0	17.72	>500KHz
High Channel: 5825	MCS0	17.72	>500KHz
IEEE 802.11ac (VHT40) Mode (OFDM)			
Low Channel: 5755	MCS0	36.46	>500KHz
High Channel: 5795	MCS0	36.43	>500KHz
IEEE 802.11ac (VHT80) Mode (OFDM)			
Channel: 5775	MCS0	76.38	>500KHz

Note: Both of antennas have considered during pre-test, but only the worst case (ANT_0) was recorded.

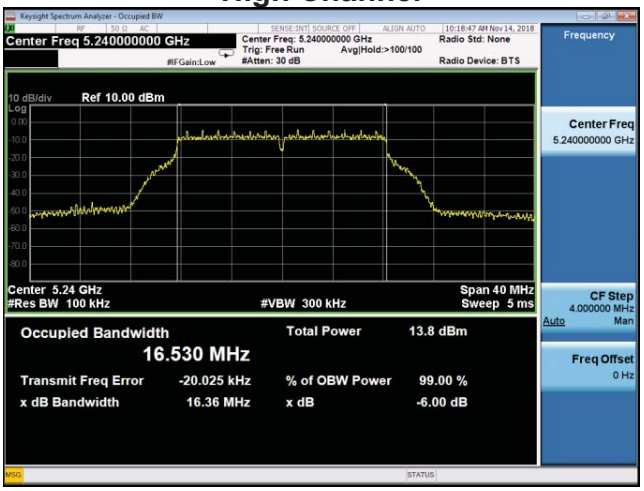
Band 5180-5240MHz
IEEE 802.11a

Low Channel

Middle Channel

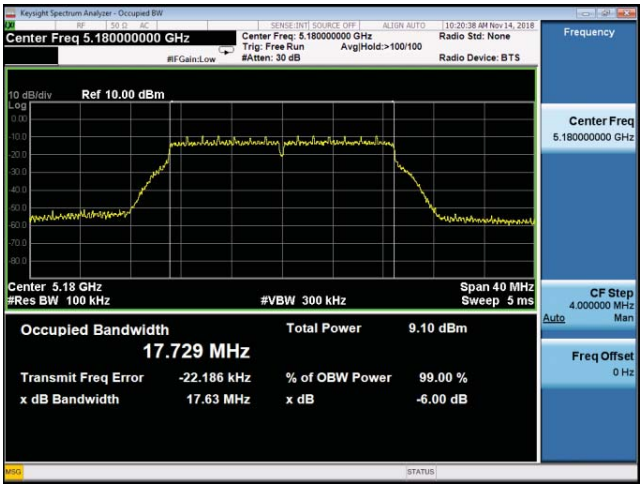


High Channel

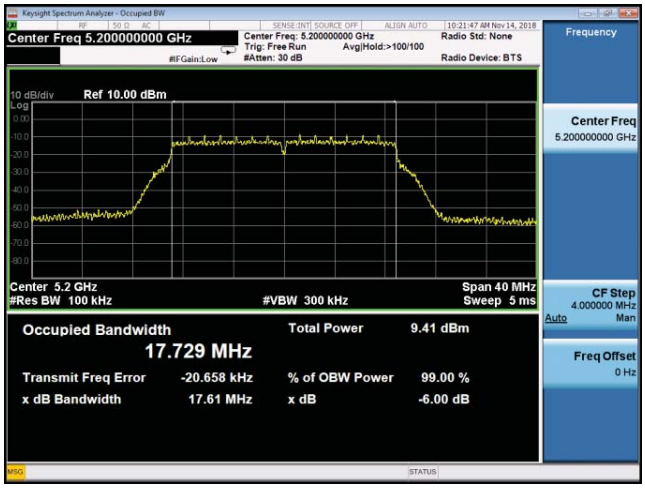


802.11n(HT20)

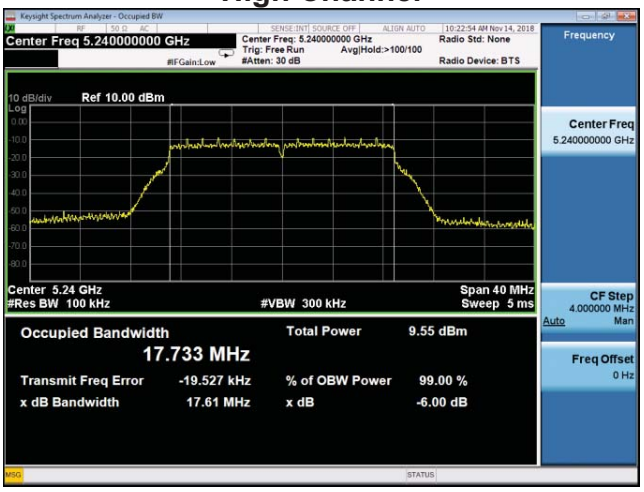
Low Channel



Middle Channel

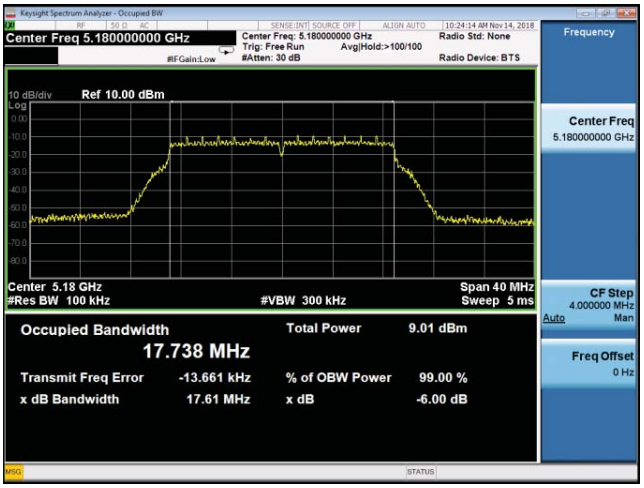


High Channel

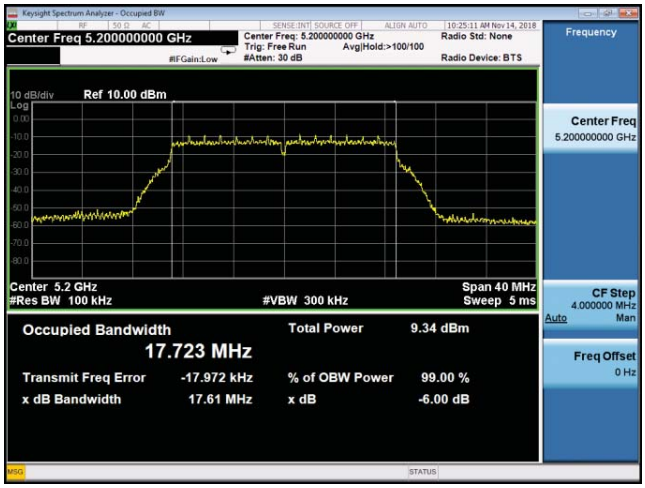


802.11ac(VHT20)

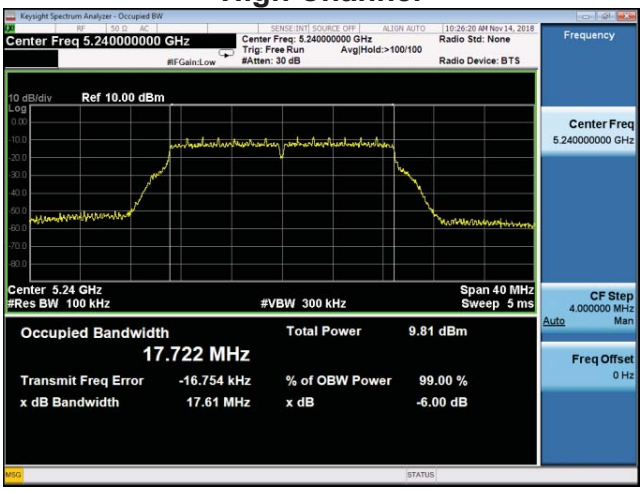
Low Channel



Middle Channel

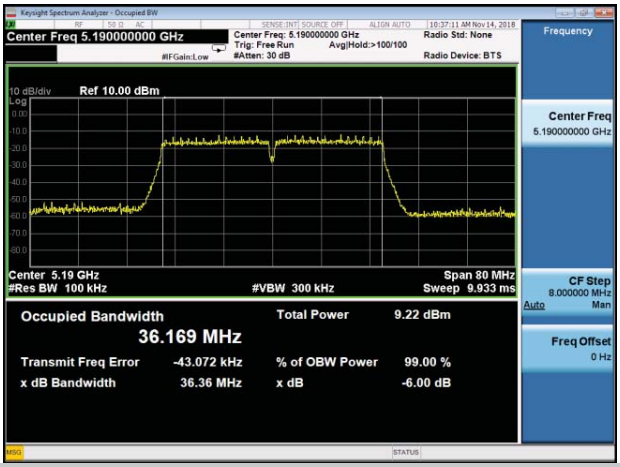


High Channel

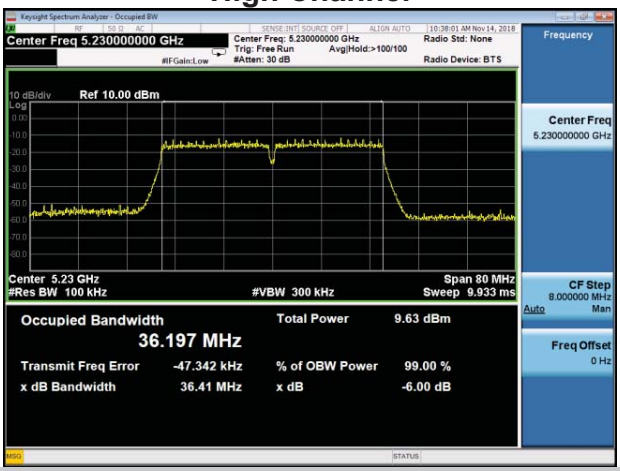


802.11n(HT40)

Low Channel

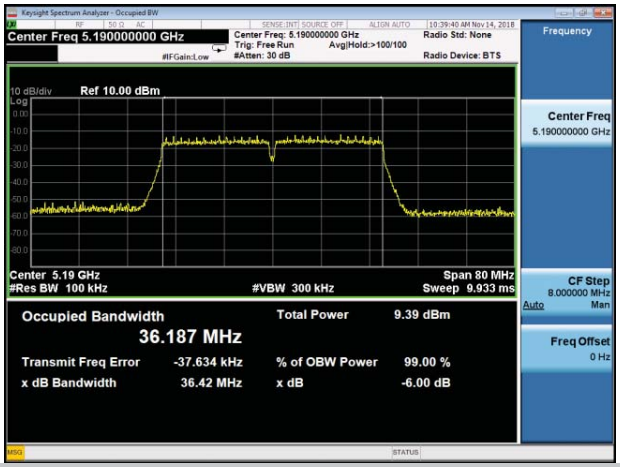


High Channel

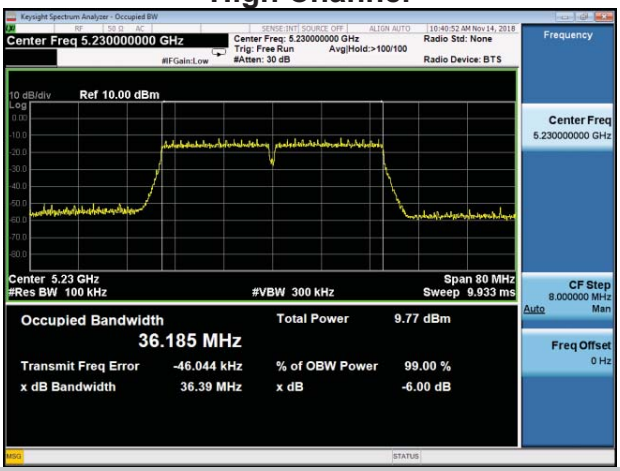


802.11ac(VHT40)

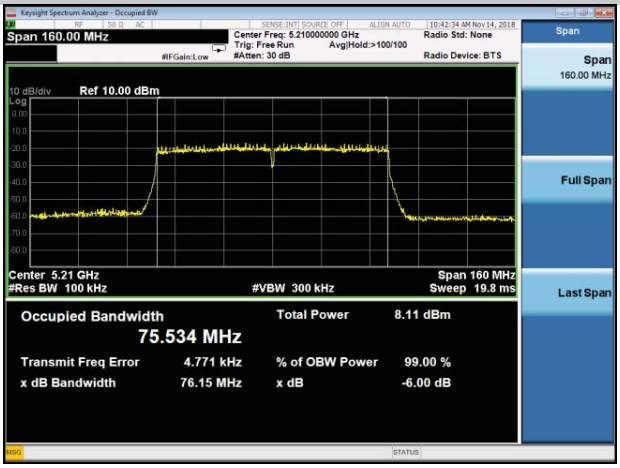
Low Channel



High Channel

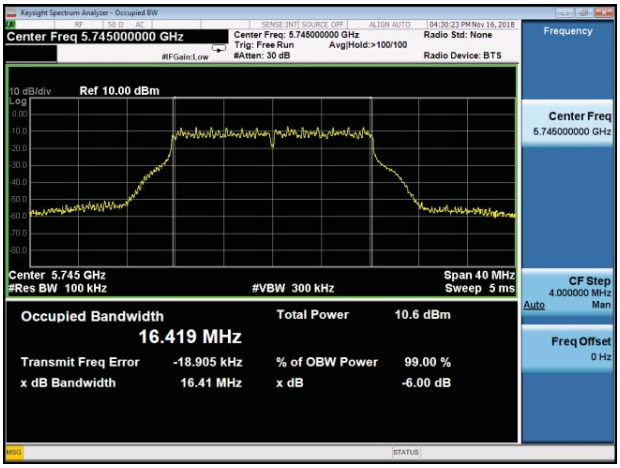


802.11ac(VHT80)

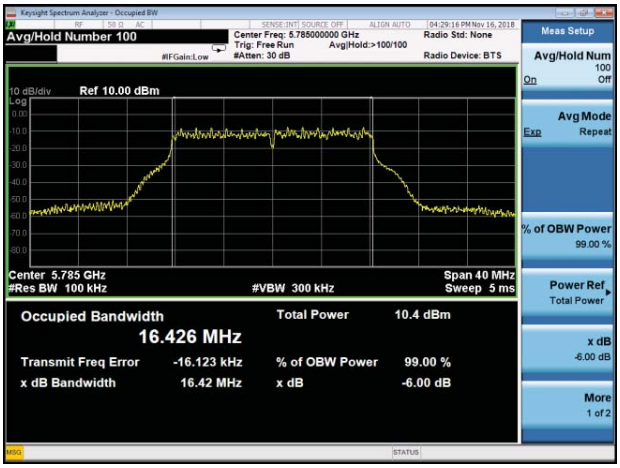


Band 5745-5825MHz
IEEE 802.11a

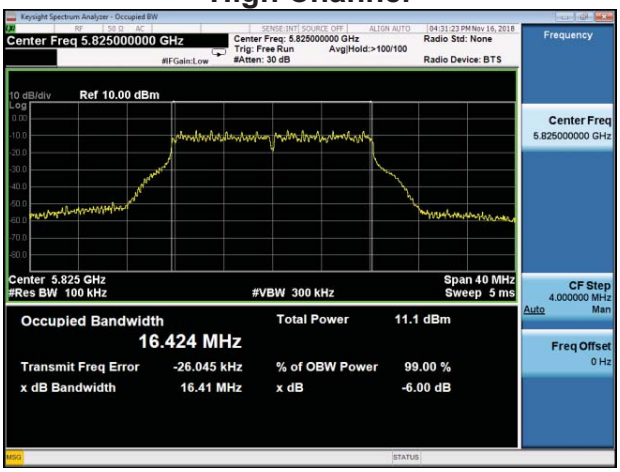
Low Channel



Middle Channel

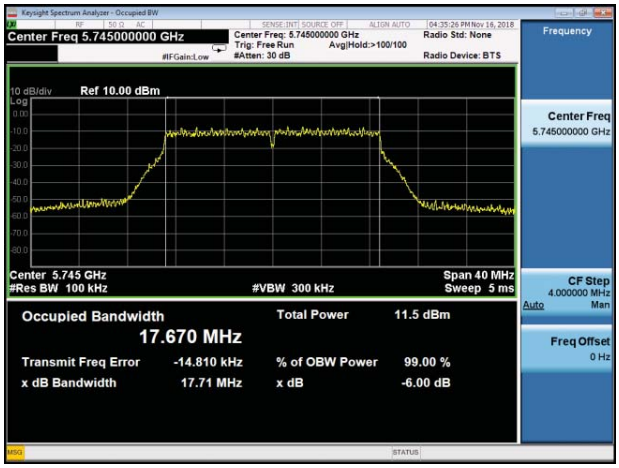


High Channel

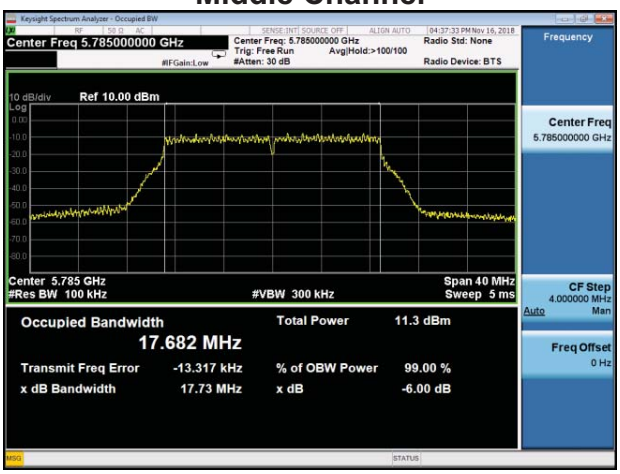


802.11n(HT20)

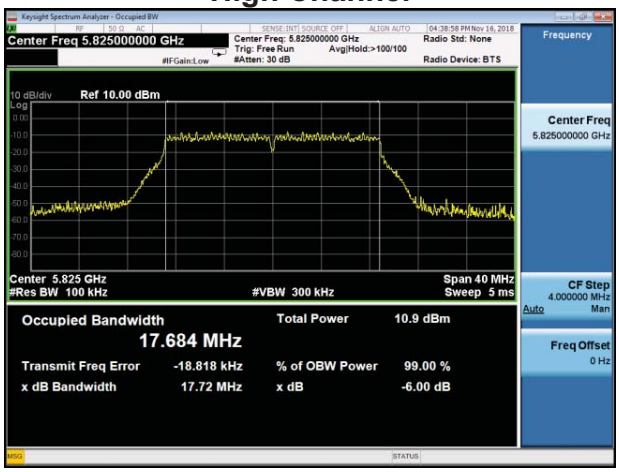
Low Channel



Middle Channel

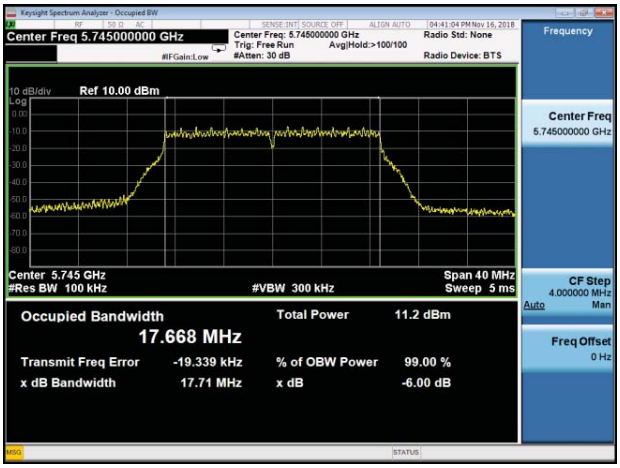


High Channel

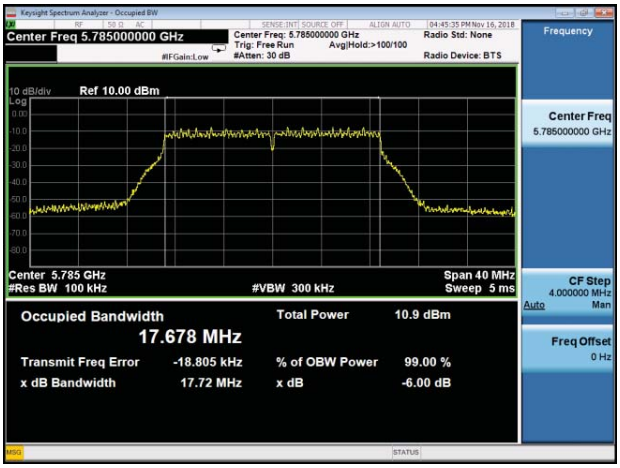


802.11ac(VHT20)

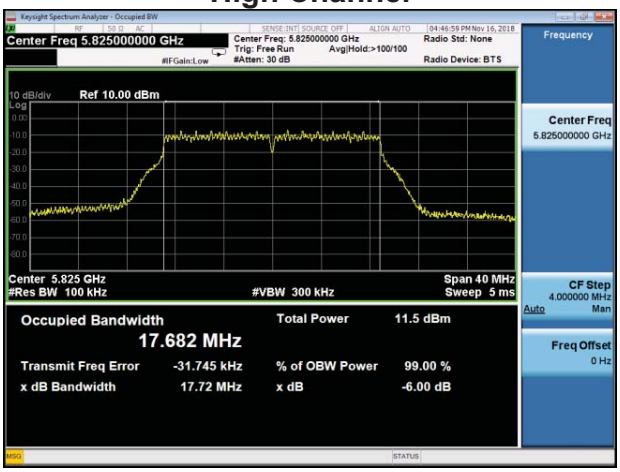
Low Channel



Middle Channel

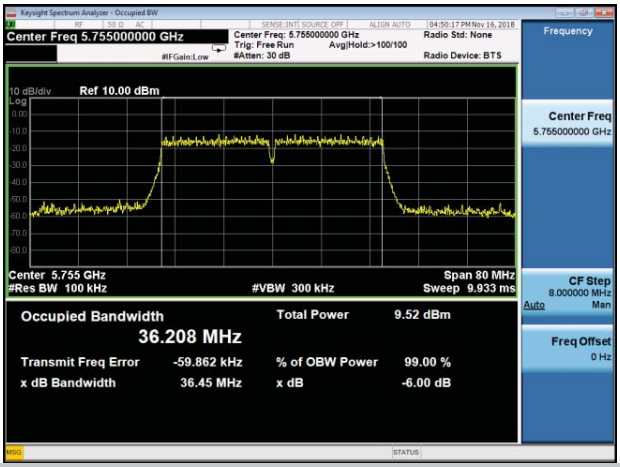


High Channel

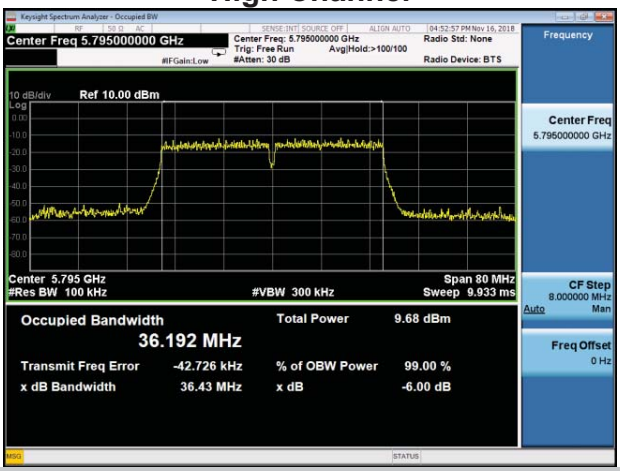


802.11n(HT40)

Low Channel

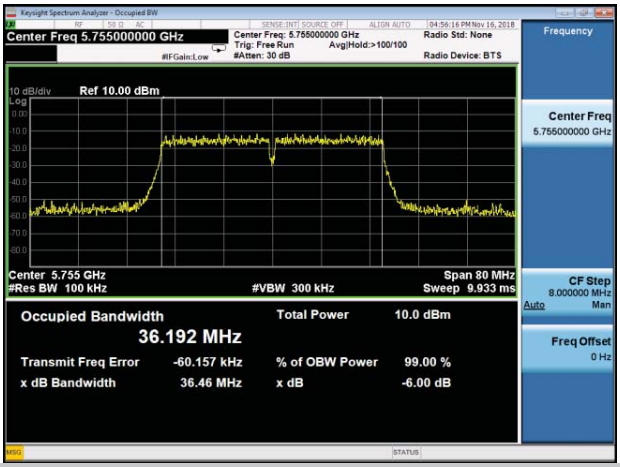


High Channel

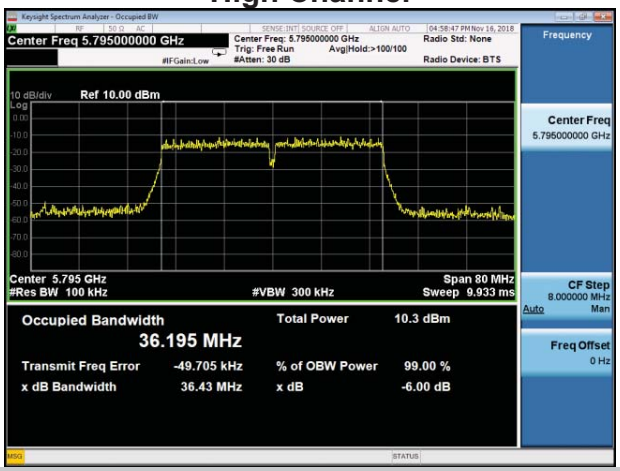


802.11ac(VHT40)

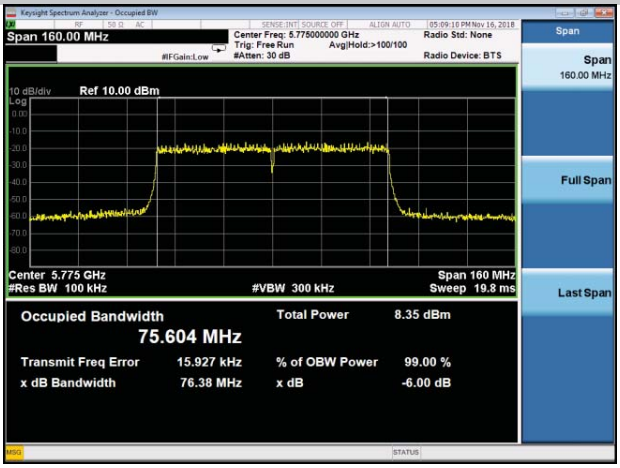
Low Channel



High Channel



802.11ac(VHT80)

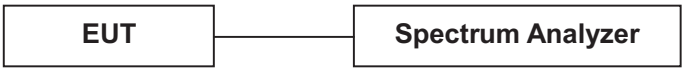


6. 26dB Bandwidth & 99% Occupied Bandwidth

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

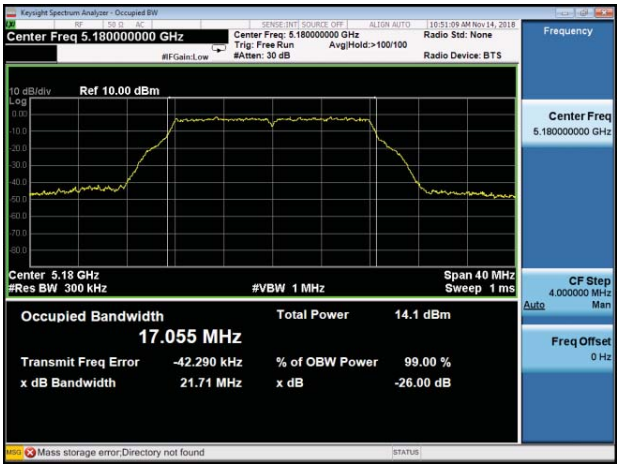
Please refer to following table and plots.

Temperature :	23 ℃	Humidity : 53 %	
Test By:	Lee	Test Date : November 14, 2018	
Test Result:	PASS		
Frequency MHz	Data Rate Mbps	26dB Bandwidth MHz	99% Occupied Bandwidth MHz
IEEE 802.11a Mode (CCK)			
Low Channel: 5180	6	21.71	17.055
Middle Channel: 5200	6	21.60	17.022
High Channel: 5240	6	21.68	17.023
IEEE 802.11n(HT20) Mode (OFDM)			
Low Channel: 5180	MCS0	21.94	18.087
Middle Channel: 5200	MCS0	22.04	18.066
High Channel: 5240	MCS0	22.00	18.117
IEEE 802.11n(HT40) Mode (OFDM)			
Low Channel: 5190	MCS0	40.82	36.681
High Channel: 5230	MCS0	41.00	36.786
IEEE 802.11ac (VHT20) Mode (OFDM)			
Low Channel: 5180	MCS0	21.97	18.082
Middle Channel: 5200	MCS0	21.91	18.115
High Channel: 5240	MCS0	21.87	18.107
IEEE 802.11ac (VHT40) Mode (OFDM)			
Low Channel: 5190	MCS0	40.76	36.782
High Channel: 5230	MCS0	41.01	36.749
IEEE 802.11ac (VHT80) Mode (OFDM)			
Channel: 5210	MCS0	81.72	75.871

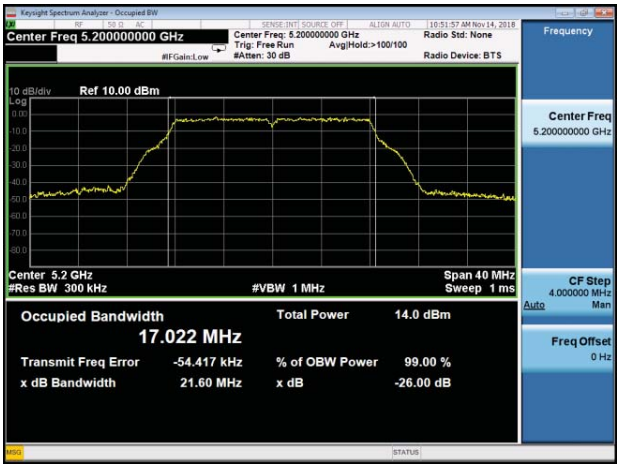
Temperature :	23 ℃	Humidity : 53 %	
Test By:	Lee	Test Date : November 14, 2018	
Test Result:	PASS		
Frequency MHz	Data Rate Mbps	26dB Bandwidth MHz	99% Occupied Bandwidth MHz
IEEE 802.11a Mode (CCK)			
Low Channel: 5745	6	21.13	16.640
Middle Channel: 5785	6	21.07	16.648
High Channel: 5825	6	21.16	16.646
IEEE 802.11n(HT20) Mode (OFDM)			
Low Channel: 5745	MCS0	21.50	17.920
Middle Channel: 5785	MCS0	21.48	17.933
High Channel: 5825	MCS0	21.42	17.946
IEEE 802.11n(HT40) Mode (OFDM)			
Low Channel: 5755	MCS0	40.52	36.728
High Channel: 5795	MCS0	40.23	36.733
IEEE 802.11ac (VHT20) Mode (OFDM)			
Low Channel: 5745	MCS0	21.38	17.998
Middle Channel: 5785	MCS0	21.52	17.993
High Channel: 5825	MCS0	21.58	17.982
IEEE 802.11ac (VHT40) Mode (OFDM)			
Low Channel: 5755	MCS0	40.98	37.006
High Channel: 5795	MCS0	40.95	36.884
IEEE 802.11ac (VHT80) Mode (OFDM)			
Channel: 5775	MCS0	81.49	75.773

Band 5180-5240MHz
IEEE 802.11a

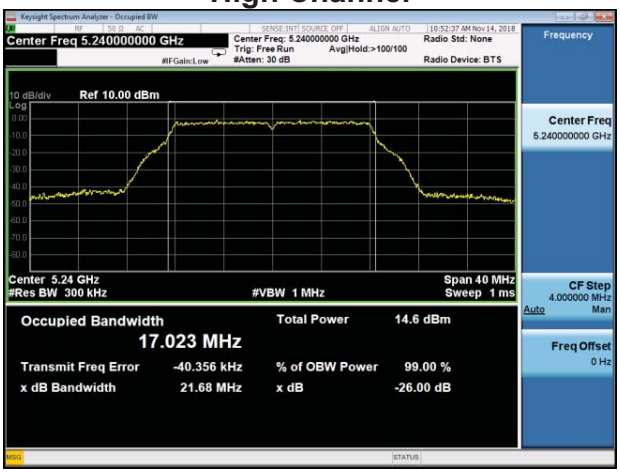
Low Channel



Middle Channel

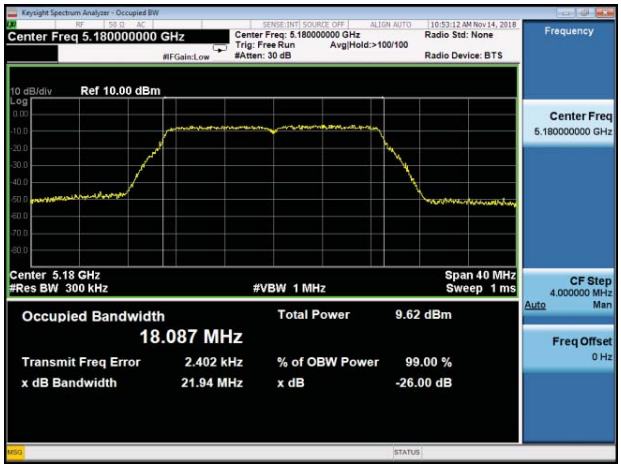


High Channel

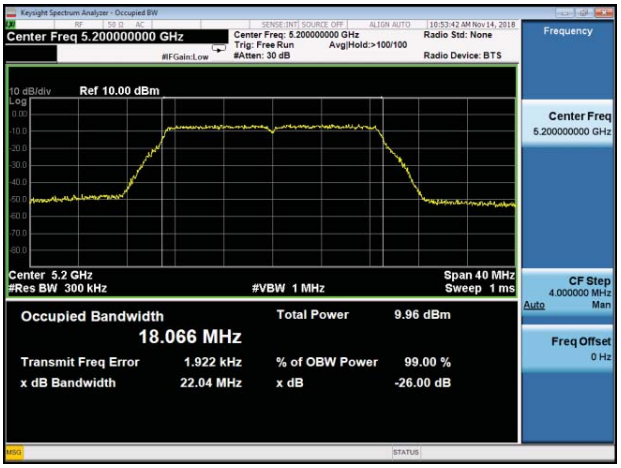


802.11n(HT20)

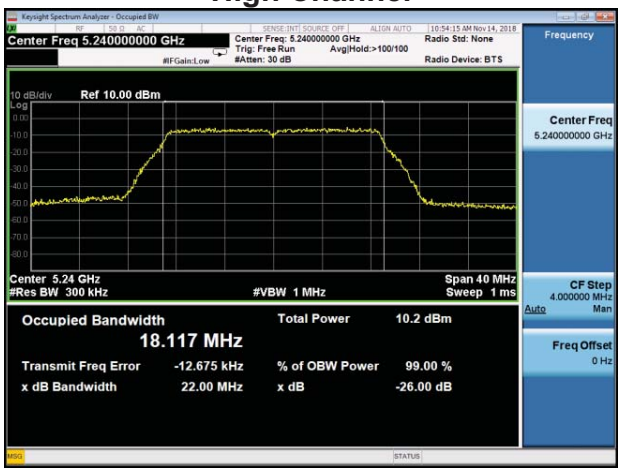
Low Channel



Middle Channel

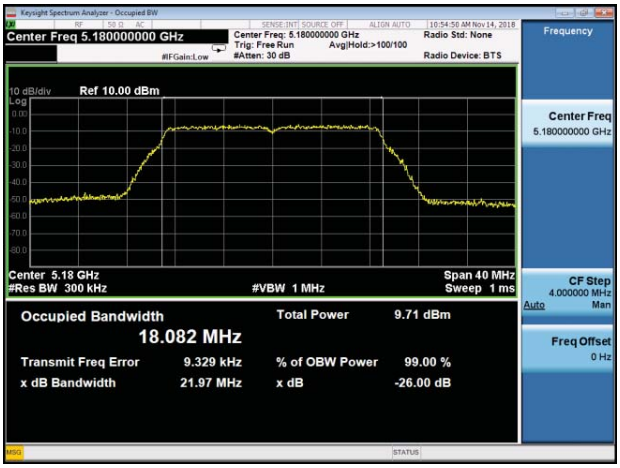


High Channel

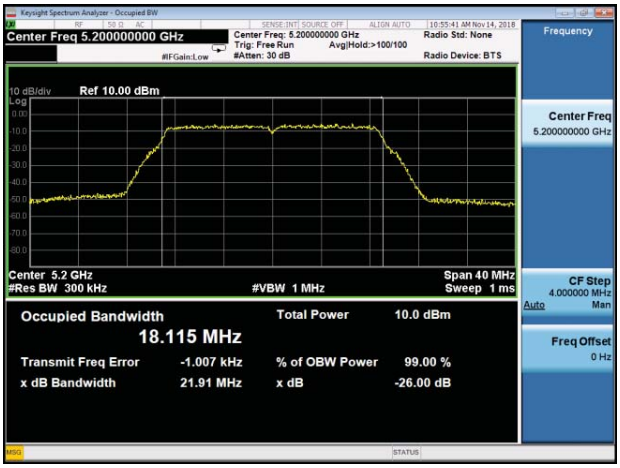


802.11ac(VHT20)

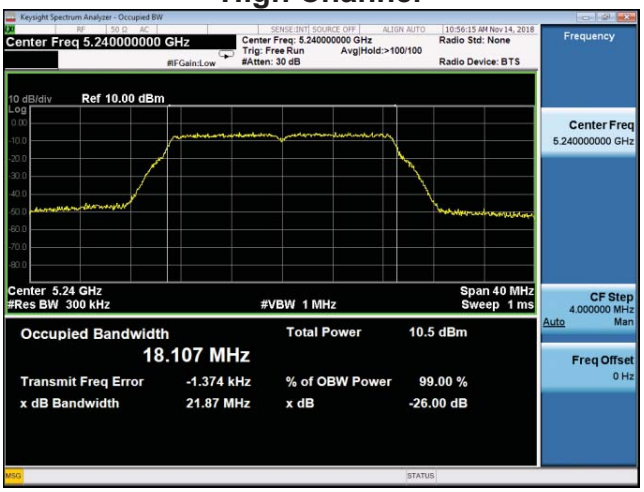
Low Channel



Middle Channel

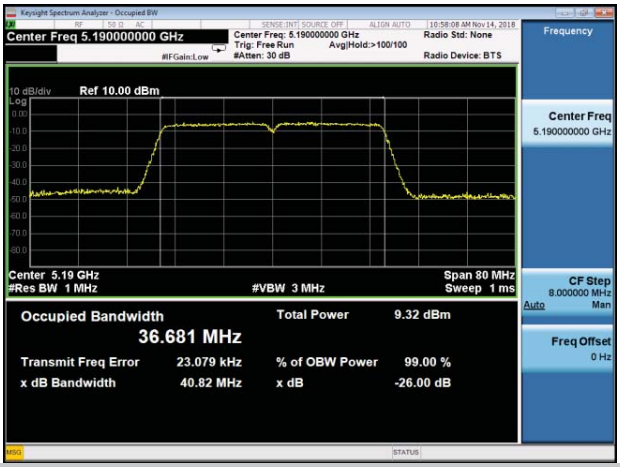


High Channel



802.11n(HT40)

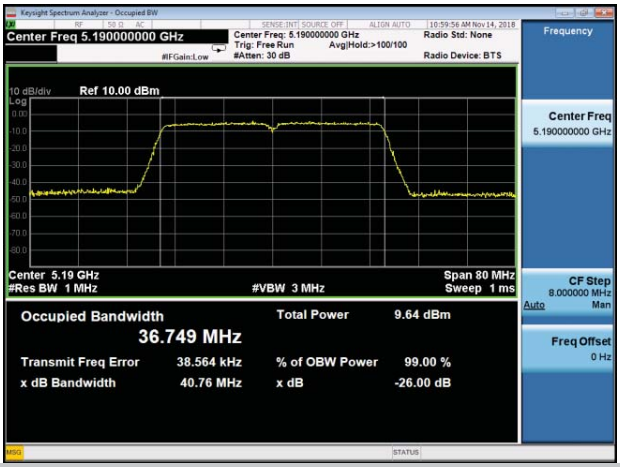
Low Channel



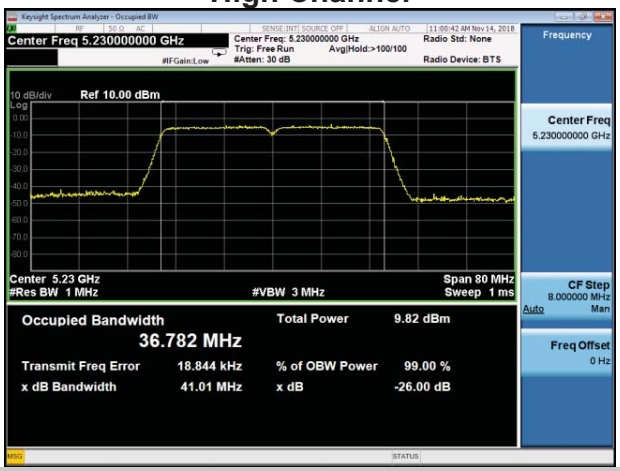
High Channel

802.11ac(VHT40)

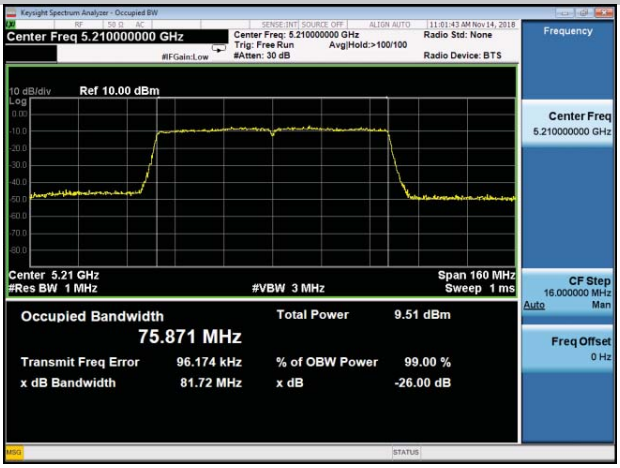
Low Channel



High Channel

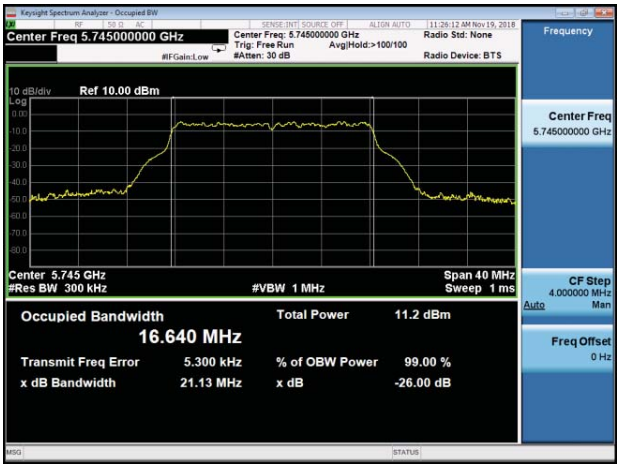


802.11ac(VHT80)

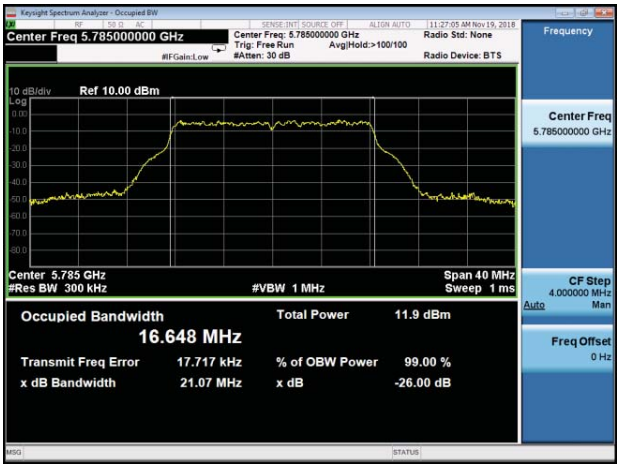


Band 5745-5825MHz
IEEE 802.11a

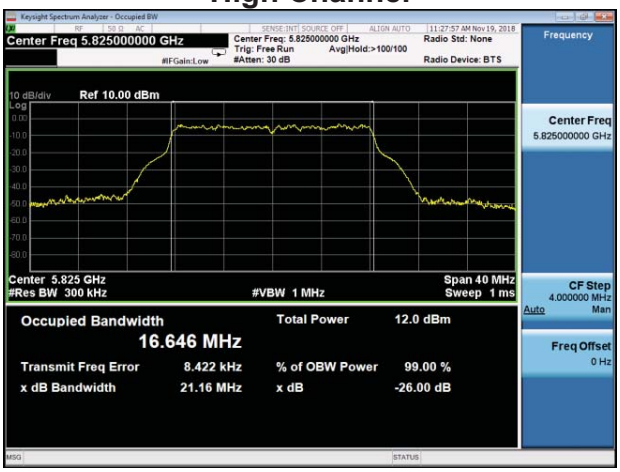
Low Channel



Middle Channel

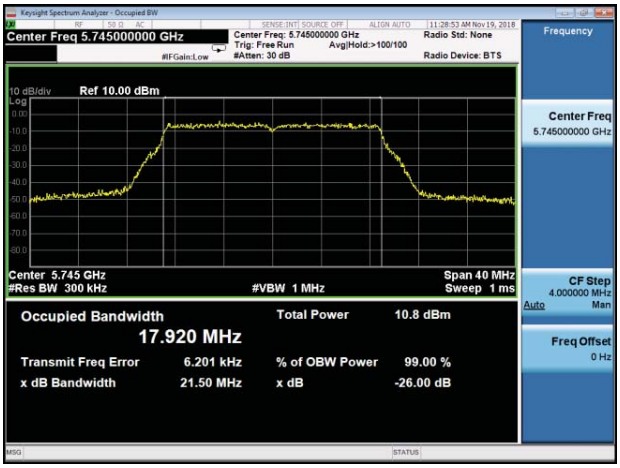


High Channel

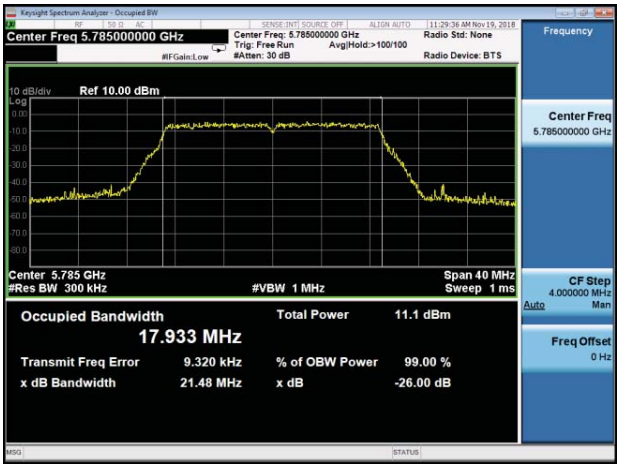


802.11n(HT20)

Low Channel



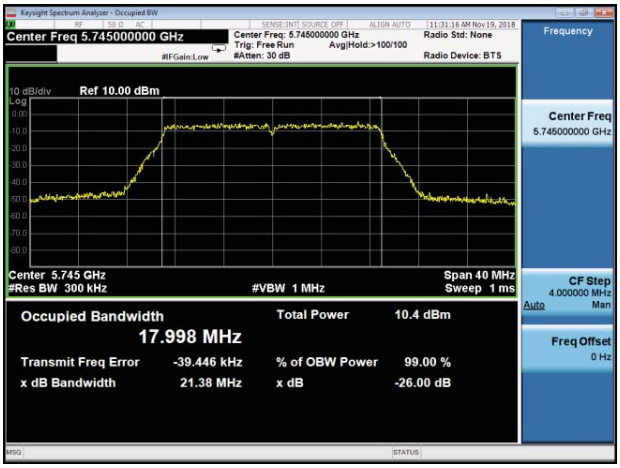
Middle Channel



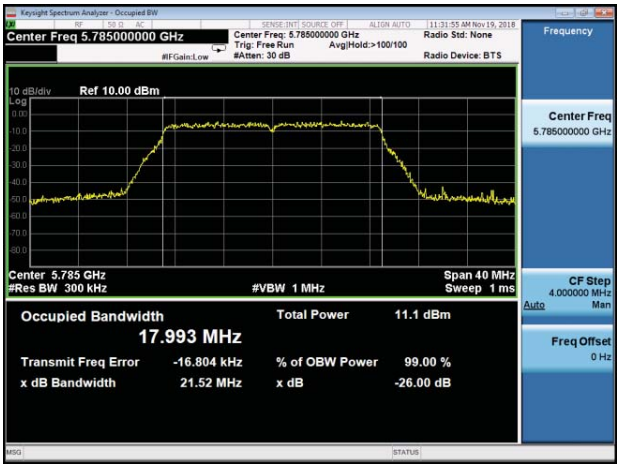
High Channel

802.11ac(VHT20)

Low Channel



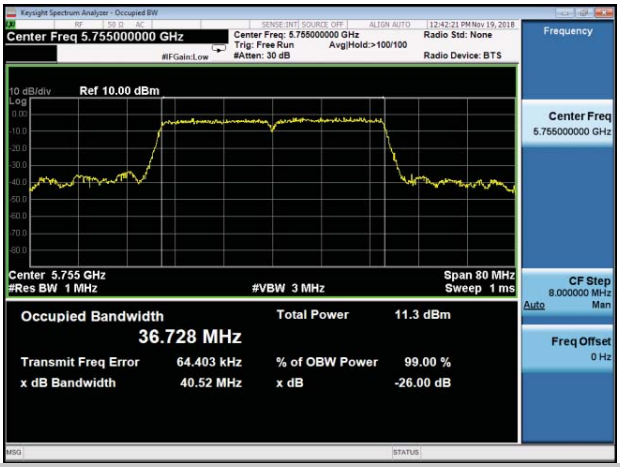
Middle Channel



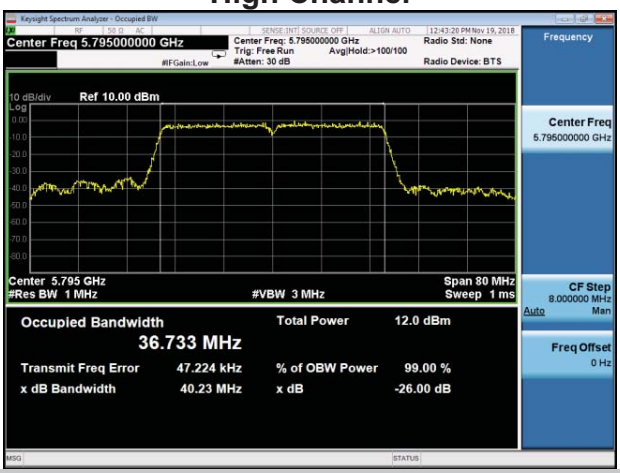
High Channel

802.11n(HT40)

Low Channel

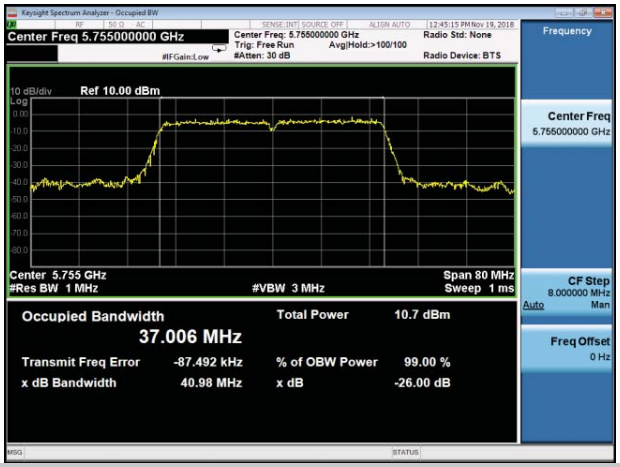


High Channel

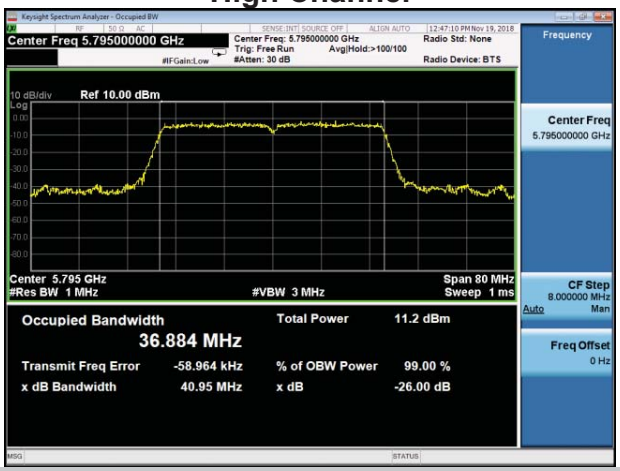


802.11ac(VHT40)

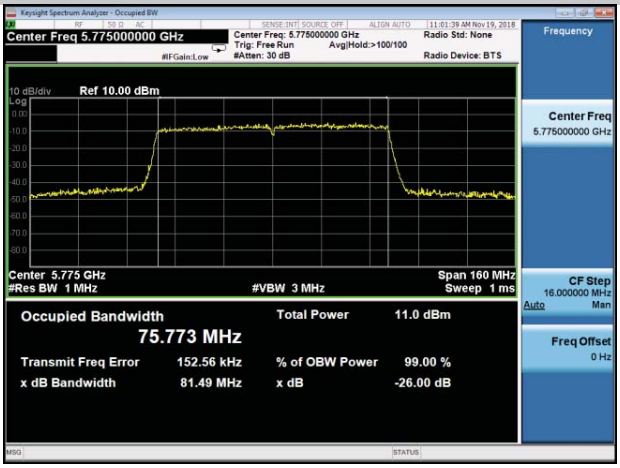
Low Channel



High Channel



802.11ac(VHT80)

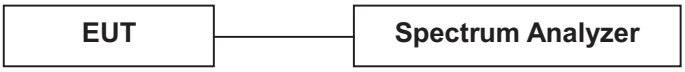


7. Power Spectral Density

7.1 Limits

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

7.2 Test SET-UP (Block Diagram of Configuration)

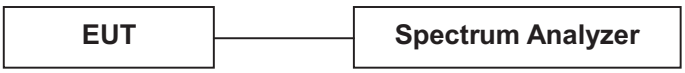


7.3 Test Procedure

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.

Temperature :	21 ℃	Humidity :	51 %
Test By:	Lee	Test Date :	November 14, 2018
Test Result:	PASS		
Frequency MHz	Data Rate Mbps	PSD dBm/MHz	Limit dBm/ MHz
IEEE 802.11a Mode (OFDM)			
Low Channel: 5180	6	-2.508	17
Middle Channel: 5200	6	-2.156	17
High Channel: 5240	6	-2.077	17

Note: Both of antennas have been tested, but only the worst case (ANT_0) was recorded.

Frequency MHz	Data Rate Mbps	PSD dBm/MHz			Limit dBm/ MHz
IEEE 802.11n(HT20) Mode (OFDM)					
Low Channel: 5180	MCS0	ANT_0	ANT_1	Total	17
		-6.993	-7.025	-4.00	
Middle Channel: 5200	MCS0	-6.463	-6.838	-3.64	17
High Channel: 5240	MCS0	-6.539	-6.723	-3.62	17
IEEE 802.11n(HT40) Mode (OFDM)					
Low Channel: 5190	MCS0	-9.325	-9.863	-6.58	17
High Channel: 5230	MCS0	-8.974	-9.041	-6.00	17
IEEE 802.11ac (VHT20) Mode (OFDM)					
Low Channel: 5180	MCS0	-6.861	-7.031	-3.93	17
Middle Channel: 5200	MCS0	-6.494	-6.505	-3.49	17
High Channel: 5240	MCS0	-6.160	-6.214	-3.18	17
IEEE 802.11ac (VHT40) (OFDM)					
Low Channel: 5190	MCS0	-9.303	-9.527	-6.40	17
High Channel: 5230	MCS0	-9.221	-9.528	-6.36	17
IEEE 802.11ac (VHT80) Mode (OFDM)					
Channel: 5210	MCS0	-12.425	-12.555	-9.48	17

Note: 1. Both of antennas have been tested, but only the worst case (ANT_0) was recorded.
2. The working on MIMO mode.

Temperature :	23 ℃	Humidity :	53 %	
Test By:	Lee	Test Date :	November 14, 2018	
Test Result:	PASS			
Frequency MHz	Data Rate Mbps	PSD dBm/MHz	PSD dBm/ 500kHz	Limit dBm/ 500kHz
IEEE 802.11a Mode (OFDM)				
Low Channel: 5745	6	-4.005	-7.015	30
Middle Channel: 5785	6	-3.180	-6.190	30
High Channel: 5825	6	-3.084	-6.094	30

Note: 1. Both of antennas have considered during pre-test, but only the worst case (ANT_0) was recorded.
2. 10log(500kHz/RNW) Factor = -3.01dB

Frequency MHz	Data Rate Mbps	PSD dBm/MHz			PSD dBm/ 500kHz	Limit dBm/ 500kHz
IEEE 802.11n(HT20) Mode (OFDM)						
Low Channel: 5745	MCS0	ANT_0	ANT_1	Total	-4.61	30
		-4.568	-4.663	-1.60	-3.87	
Middle Channel: 5785	MCS0	-3.813	-3.925	-0.86	-3.57	30
High Channel: 5825	MCS0	-3.510	-3.625	-0.56	-4.61	30
IEEE 802.11n(HT40) Mode (OFDM)						
Low Channel: 5755	MCS0	-6.121	-6.254	-3.18	-6.19	30
High Channel: 5795	MCS0	-5.532	-5.625	-2.57	-5.58	30
IEEE 802.11ac (VHT20) Mode (OFDM)						
Low Channel: 5745	MCS0	-4.456	-4.502	-1.47	-4.48	30
Middle Channel: 5785	MCS0	-3.951	-4.021	-0.98	-3.99	30
High Channel: 5825	MCS0	-3.622	-3.714	-0.66	-3.67	30
IEEE 802.11ac (VHT40) (OFDM)						
Low Channel: 5755	MCS0	-6.607	-6.714	-3.65	-6.66	30
High Channel: 5795	MCS0	-5.714	-5.805	-2.75	-5.76	30
IEEE 802.11ac (VHT80) Mode (OFDM)						
Channel: 5775	MCS0	-10.651	-10.999	-7.81	-10.82	30

Note: 1. Both of antennas have been tested, but only the worst case (ANT_0) was recorded.
2. The working on MIMO mode.
3. 10log(500kHz/RNW) Factor = -3.01dB