

FCC REPORT

Product Name : WiFi Module
Trade mark : ofeixin
Model No. : F11AUUM13
FCC ID : 2AT5W-F11AUUM13
Report Number : BLA-EMC-201906-A38-02
Date of sample receipt : June 28, 2019
Date of Test : June 28 , 2019 –July 23, 2019
Date of Issue : July 24, 2019
Test standard : FCC CFR Title 47 Part 15 Subpart E
Section 15.407
Test result : PASS

Prepared for:

SHENZHEN OFEIXIN TECHNOLOGY LIMITED
1505, shifeng building, no.1, villa road, xinzhuang community, matan
street, guangming new district, shenzhen city, guangdong province,
China

Prepared by:

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Compiled by:

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Review by:

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Approved by:

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Date: July 24, 2019



2 Version

Version No.	Date	Description
00	July 24, 2019	Original

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203/15.407 (g)	Pass
AC Power Line Conducted Emission	15.207	Pass
Conducted Peak Output Power	15.407 (a)	Pass
26dB Occupied Bandwidth	15.407 (a)	Pass
6dB Emission Bandwidth	15.407(e)	Pass
Power Spectral Density	15.407 (a)	Pass
Band Edge	15.407(b)	Pass
Spurious Emission	15.205/15.209	Pass
Frequency Stability	15.407(g)	Pass

Pass: The EUT complies with the essential requirements in the standard.

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5 General Information

5.1 Client Information

Applicant:	SHENZHEN OFEIXIN TECHNOLOGY LIMITED
Address of Applicant:	1505, shifeng building, no.1, villa road, xinzhuang community, matan street, guangming new district, shenzhen city, guangdong province, China
Manufacturer:	HUNAN FN-LINK TECHNOLOGY LIMITED
Address of Manufacturer:	No.8, Litong Road, Liuyan Economic & Technical Development Zone, Changsha, Hunan, CHINA

5.2 General Description of E.U.T.

Product Name:	WiFi Module
Model No.:	F11AUUM13
Test Model No.:	F11AUUM13
Operation Frequency:	Band 1 : 5180MHz-5240MHz Band 4 : 5745MHz-5825MHz
Operation mode:	Indoor used
Channel numbers:	Band 1: 802.11a/802.11n(HT20)/802.11ac(HT20): 4, 802.11n(HT40)/802.11ac(HT40):2, 802.11ac(HT80): 1 Band 4: 802.11a/802.11(HT20)/802.11ac(HT20): 5, 802.11n(HT40)/802.11ac(HT40): 2, 802.11ac(HT80): 1
Channel separation:	802.11a/n/ac(HT2): 20MHz, 802.11n/ac(HT40): 40MHz, 802.11ac(HT80): 80MHz
Modulation technology: (IEEE 802.11a/n/ac)	BPSK, QPSK,16-QAM, 64-QAM, 256-QAM
Data speed(IEEE 802.11a)	6Mbps, 9Mbps,12Mbps,18Mbps, 24Mbps,36Mbps,48Mbps, 54Mbps
Data speed (IEEE 802.11n/ac):	Up to 433Mbps
Antenna Type:	Internal antenna
Antenna gain:	2.0dBi
Power supply:	DC3.3V
Remark:	All above models are identical in the same PCB layout, interior structure and electrical circuits. The differences are model name for commercial purpose.

Operation Frequency each of channel

Band 1					
802.11a/802.11n20		802.11n40		802.11ac	
Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180MHz	39	5190MHz	42	5210MHz
40	5200MHz	45	5230MHz		
44	5220MHz				
48	5240MHz				
Band 4					
802.11a/802.11n20		802.11n40		802.11ac	
Channel	Frequency	Channel	Frequency	Channel	Frequency
149	5745MHz	151	5755MHz	155	5775MHz
153	5765MHz	159	5795MHz		
157	5785MHz				
161	5805MHz				
165	5825MHz				

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Band 1					
802.11a/802.11n20		802.11n40		802.11ac	
Channel	Frequency	Channel	Frequency	Channel	Frequency
The lowest channel	5180MHz	The lowest channel	5190MHz	The middle channel	5210MHz
The middle channel	5200MHz	The highest channel	5230MHz		
The highest channel	5240MHz				
Band 4					
802.11a/802.11n20		802.11n40		802.11ac	
Channel	Frequency	Channel	Frequency	Channel	Frequency
The lowest channel	5745MHz	The lowest channel	5755MHz	The middle channel	5775MHz
The middle channel	5785MHz	The highest channel	5795MHz		
The highest channel	5825MHz				

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5.3 Test environment and mode

Operating Environment:	
Temperature:	24.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010 mbar
Test mode:	
Continuously transmitting mode	Keep the EUT in 100% duty cycle transmitting with modulation.

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

Per-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.

Mode	Data rate
802.11a	6Mbps
802.11n(HT20)	6.5Mbps
802.11n(HT40)	13Mbps
802.11ac(HT20)	6.5Mbps
802.11ac(HT40)	13.5Mbps
802.11ac(HT80)	29.3Mbps

Final Test Mode:

According to ANSI C63.4 standards, the test results are both the “worst case” and “worst setup” 6 Mbps for 802.11a, 6.5 Mbps for 802.11n20 and 13 Mbps for 802.11n40. All test items for 802.11a and 802.11n were performed with duty cycle above 98%, meet the requirements of KDB789033.

5.4 Description of Support Units

Manufacturer	Description	Model	Serial Number
Lenovo	Notebook computer	E470C	PF-10FB5C

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5.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- FCC — Designation No.: CN1252

Qianhai BlueAsia of Technical Services(Shenzhen) Co., Ltd has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Designation CN1252.

- ISED — CAB identifier No.: CN0028

Qianhai BlueAsia of Technical Services(Shenzhen) Co., Ltd has been registered by Certification and Engineering Bureau of ISED for radio equipment testing with CAB identifier CN0028

5.6 Laboratory Location

All tests were performed at:

Qianhai BlueAsia of Technical Services(Shenzhen) Co., Ltd.

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No tests were sub-contracted.

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5.7 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
1	3m SAC	SKET	9m*6m*6m	966	06-10-2018	06-09-2023
2	Broadband Antenna	SCHWARZBECK	VULB9168	00836 P:00227	07-14-2018	07-13-2019
					07-14-2019	07-13-2020
3	Horn Antenna	SCHWARZBECK	9120D	01892 P:00331	07-14-2018	07-13-2019
					07-14-2019	07-13-2020
4	EMI Test Software	EZ	EZ	N/A	N/A	N/A
5	Pre-amplifier	SKET	N/A	N/A	07-14-2018	07-13-2019
					07-14-2019	07-13-2020
6	Spectrum analyzer	Rohde & Schwarz	FSP40	100817	05-24-2019	05-23-2020
7	EMI Test Receiver	Rohde & Schwarz	ESR7	101199	03-21-2019	03-20-2020
8	Controller	SKET	N/A	N/A	N/A	N/A
9	Vector Signal Generator	Agilent	E4438C	MY45092582	05-24-2019	05-23-2020
10	Signal Generator	Agilent	E8257D	MY44320250	05-24-2019	05-23-2020

Conducted Emission:						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
1	EMI Test Receiver	Rohde & Schwarz	ESPI3	101082	06-10-2019	06-09-2020
2	LISN	CHASE	MN2050D	1447	12-18-2018	12-17-2019
3	LISN	Rohde & Schwarz	ENV216	3560.6550.15	07-14-2018	07-13-2019
					07-14-2019	07-13-2020
4	EMI Test Software	EZ	EZ	N/A	N/A	N/A
5	Temperature Humidity Chamber	Mingle	TH101B	N/A	07-14-2018	07-13-2019
					07-14-2019	07-13-2020

RF Conducted Test:						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Spectrum Analyzer	Agilent	N9030A	MY50510123	05-24-2019	05-23-2020
2	Spectrum analyzer	Rohde & Schwarz	FSP40	100817	05-24-2019	05-23-2020
3	Vector Signal Generator	Agilent	E4438C	MY45092582	05-24-2019	05-23-2020

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4	Signal Generator	Agilent	E8257D	MY44320250	05-24-2019	05-23-2020
5	Power Sensor	D.A.R.E	RPR3006W	17I00015SNO27	05-24-2019	05-23-2020
6	DC Power Supply	LODESTAR	LP305DE	N/A	07-14-2018	07-13-2019
					07-14-2019	07-13-2020
7	Temperature Humidity Chamber	Mingle	TH101B	N/A	07-14-2018	07-13-2019
					07-14-2019	07-13-2020

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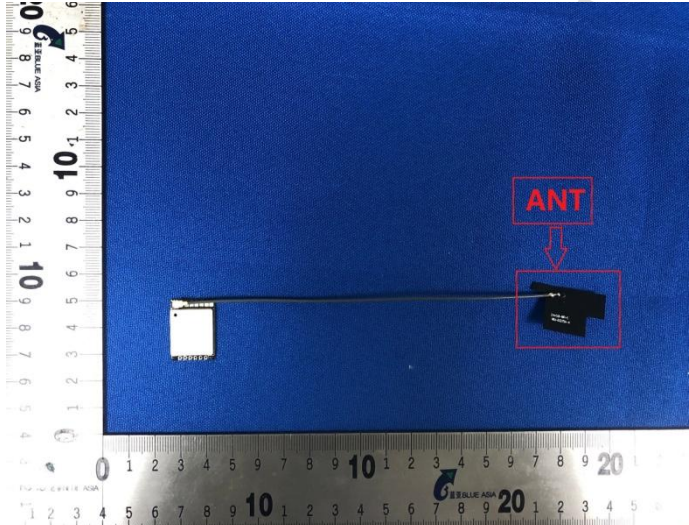
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6 Test results and Measurement Data

6.1 Antenna requirement

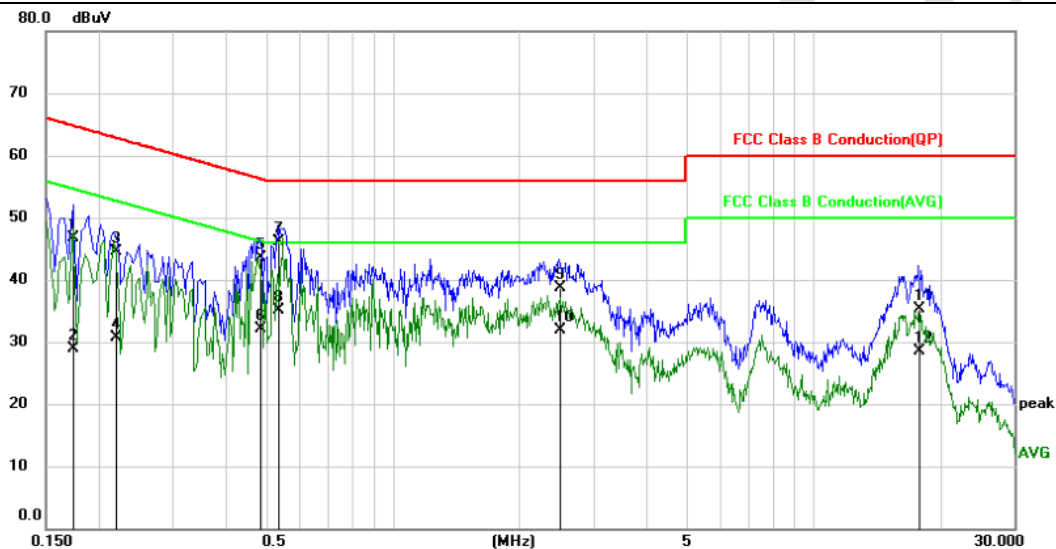
Standard requirement:	FCC Part15 E Section 15.203 /407(a)
15.203 requirement: <i>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a 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.</i> <i>This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, § 15.213, § 15.217, § 15.219, or § 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.</i>	
E.U.T Antenna:	
The antenna is Internal Antenna, the best case gain of the antenna is 2.0dBi 	

6.2 Conducted Emission

Test Requirement:	FCC Part15 C Section 15.207		
Test Method:	ANSI C63.10: 2013		
Test Frequency Range:	150 kHz to 30 MHz		
Class / Severity:	Class B		
Receiver setup:	RBW=9 kHz, VBW=30 kHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
* Decreases with the logarithm of the frequency.			
Test procedure			

Measurement Data:

EUT:	WiFi Module	Model:	F11AUUM13
Test By:	Eason	Test mode:	Wifi mode
Power Source:	AC120V/60Hz	Temp./Hum.(%H):	26°C/60%RH
Test Frequency:	150kHz to 30MHz	Phase:	Line



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.1740	36.72	9.90	46.62	64.77	-18.15	QP
2		0.1740	19.08	9.90	28.98	54.77	-25.79	AVG
3		0.2208	34.61	9.90	44.51	62.79	-18.28	QP
4		0.2208	20.71	9.90	30.61	52.79	-22.18	AVG
5		0.4860	33.78	9.72	43.50	56.24	-12.74	QP
6		0.4860	22.38	9.72	32.10	46.24	-14.14	AVG
7	*	0.5340	36.47	9.73	46.20	56.00	-9.80	QP
8		0.5340	25.39	9.73	35.12	46.00	-10.88	AVG
9		2.4900	28.89	9.81	38.70	56.00	-17.30	QP
10		2.4900	22.16	9.81	31.97	46.00	-14.03	AVG
11		17.8300	25.26	10.01	35.27	60.00	-24.73	QP
12		17.8300	18.58	10.01	28.59	50.00	-21.41	AVG

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

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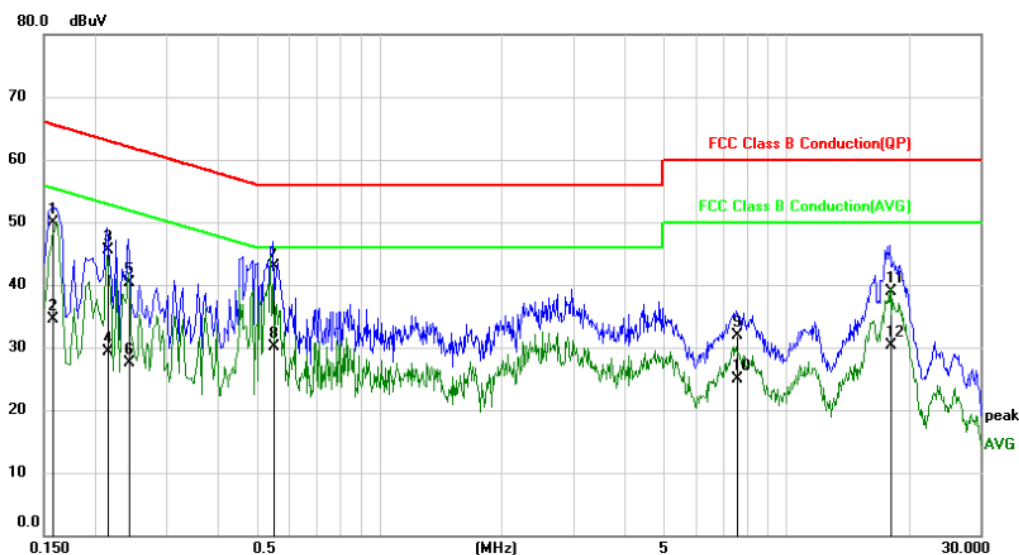
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EUT:	WiFi Module	Model:	F11AUUM13
Test By:	Eason	Test mode:	Wifi mode
Power Source:	AC120V/60Hz	Temp./Hum.(%H):	26°C/60%RH
Test Frequency:	150kHz to 30MHz	Phase:	Neutral



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.1580	39.95	9.88	49.83	65.57	-15.74	QP
2		0.1580	24.68	9.88	34.56	55.57	-21.01	AVG
3		0.2140	35.67	9.88	45.55	63.05	-17.50	QP
4		0.2140	19.50	9.88	29.38	53.05	-23.67	AVG
5		0.2420	30.37	9.85	40.22	62.03	-21.81	QP
6		0.2420	17.69	9.85	27.54	52.03	-24.49	AVG
7	*	0.5500	33.16	9.73	42.89	56.00	-13.11	QP
8		0.5500	20.38	9.73	30.11	46.00	-15.89	AVG
9		7.5340	22.10	9.85	31.95	60.00	-28.05	QP
10		7.5340	15.14	9.85	24.99	50.00	-25.01	AVG
11		18.0020	28.88	10.06	38.94	60.00	-21.06	QP
12		18.0020	20.26	10.06	30.32	50.00	-19.68	AVG

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

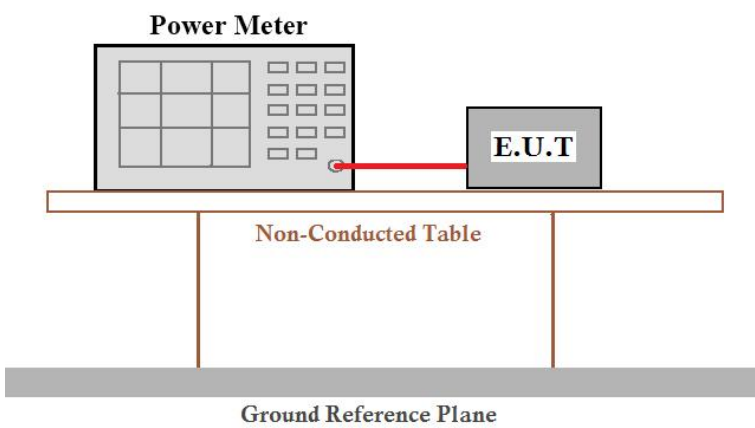
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6.3 Conducted Output Power

Test Requirement:	FCC Part15 E Section 15.407 (a) (1) (ii) & (a) (3)
Test Method:	ANSI C63.10: 2013, KDB 789033
Limit:	Band 1: 1 W (For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.); Band 4: 1W.
Test setup:	
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data

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Band 1

Mode	Test CH	Conducted Output power(dBm)	Limit (dBm)	Result
802.11a	Lowest	15.27	30.00	Pass
	Middle	15.43	30.00	Pass
	Highest	15.62	30.00	Pass
802.11n(HT20)	Lowest	15.14	30.00	Pass
	Middle	15.27	30.00	Pass
	Highest	15.46	30.00	Pass
802.11n(HT40)	Lowest	15.31	30.00	Pass
	Highest	15.69	30.00	Pass
802.11ac(HT20)	Lowest	15.07	30.00	Pass
	Middle	15.31	30.00	Pass
	Highest	15.26	30.00	Pass
802.11ac(HT40)	Lowest	14.72	30.00	Pass
	Highest	15.03	30.00	Pass
802.11ac(HT80)	Lowest	15.26	30.00	Pass

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Band 4

Mode	Test CH	Conducted Output power(dBm)	Limit (dBm)	Result
802.11a	Lowest	15.03	30.00	Pass
	Middle	14.87	30.00	Pass
	Highest	15.34	30.00	Pass
802.11n(HT20)	Lowest	15.63	30.00	Pass
	Middle	15.41	30.00	Pass
	Highest	15.74	30.00	Pass
802.11n(HT40)	Lowest	15.45	30.00	Pass
	Highest	15.71	30.00	Pass
802.11ac(HT20)	Lowest	15.24	30.00	Pass
	Middle	15.11	30.00	Pass
	Highest	15.42	30.00	Pass
802.11ac(HT40)	Lowest	15.81	30.00	Pass
	Highest	15.34	30.00	Pass
802.11ac(HT80)	Lowest	16.03	30.00	Pass

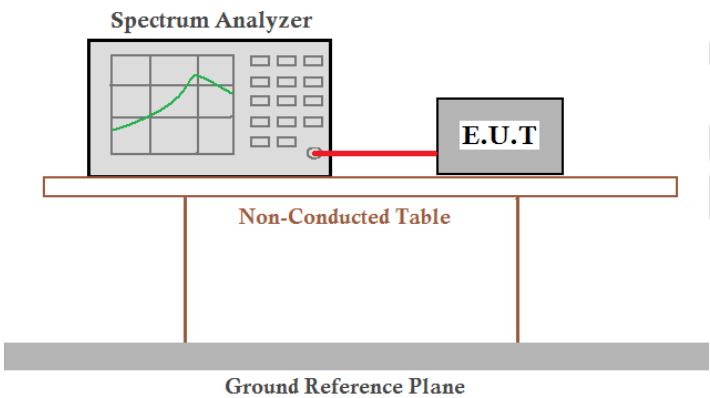
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6.4 Occupy Bandwidth

Test Requirement:	FCC Part15 E Section 15.407 (a) (5) and Section 15.407 (e)
Test Method:	ANSI C63.10:2013 and KDB 789033
Limit:	Band 1: N/A(26dB Emission Bandwidth and 99% Occupy Bandwidth) Band 4: >500kHz(6dB Bandwidth)
Test setup:	
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data

Band 1:

CH. No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)			26dB Emission Bandwidth (MHz)		
		802.11a	802.11n(HT 20)	802.11ac(H T20)	802.11a	802.11n(HT 20)	802.11ac(H T20)
36	5180.00	17.20	18.16	18.16	22.32	21.84	22.08
40	5200.00	17.28	18.16	18.16	22.16	21.84	22.08
48	5240.00	17.28	18.16	18.16	22.16	21.92	21.92

CH. No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)		26dB Emission Bandwidth (MHz)	
		802.11n(HT40)	802.11ac(HT40)	802.11n(HT40)	802.11ac(HT40)
38	5190.00	36.48	36.48	42.88	42.56
46	5230.00	36.48	36.64	42.08	42.56

CH. No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26dB Emission Bandwidth (MHz)
		802.11ac(HT80)	802.11ac(HT80)
42	5210.00	75.84	81.60

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Band 4:

Test CH	6dB Emission Bandwidth (MHz)						Limit (KHz)	Result
	802.11a	802.11n(H T20)	802.11ac(HT20)	802.11n(H T40)	802.11ac(HT40)	802.11ac(HT80)		
Lowest	16.48	17.84	17.84	36.80	36.80	---	>500	Pass
Middle	16.48	17.84	17.84	---	---	76.48		
Highest	16.48	17.92	17.84	36.80	36.80	---		

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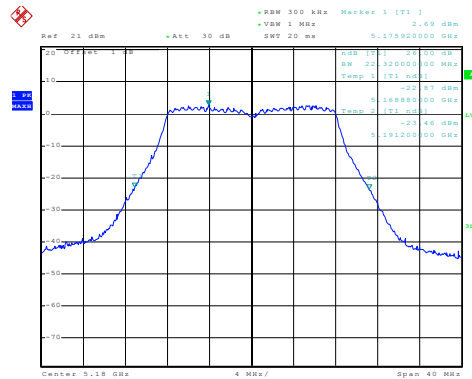
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No. 448 Bulong Road, Bantian Street, Longgang District, Shenzhen, China

Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

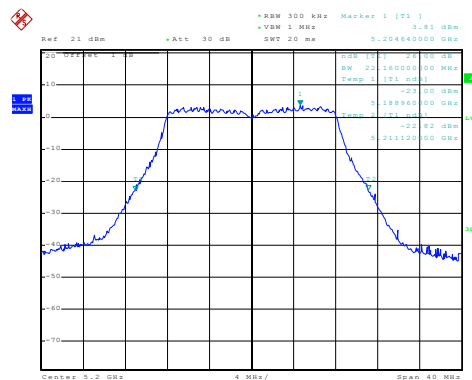
Band 1:

26 dB EBW - 802.11a



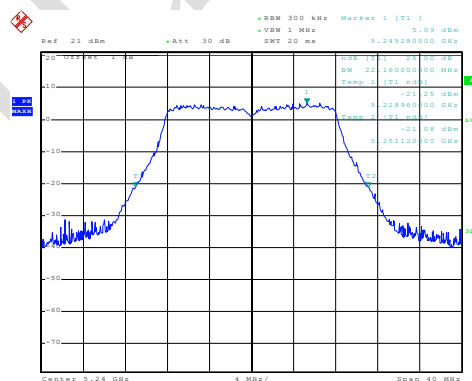
Date: 16.JUL.2019 12:03:49

Lowest channel



Date: 16.JUL.2019 12:06:15

Middle channel



Date: 16.JUL.2019 12:08:59

Highest channel

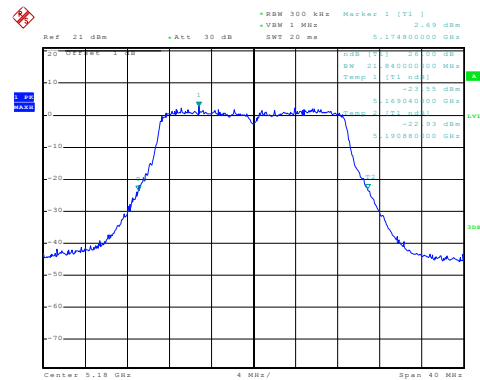
Qianhai BlueAsia of Technical Services(Shenzhen) Co., Ltd.

IOT Test Centre of BlueAsia,

No. 448 Bulong Road, Bantian Street, Longgang District, Shenzhen, China

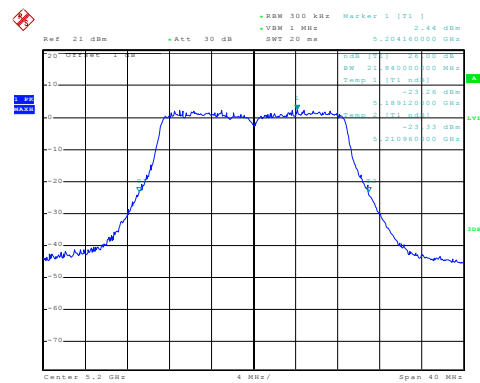
Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

802.11n(HT20)



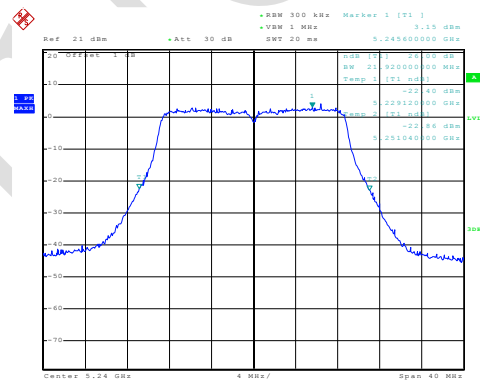
Date: 17.JUL.2019 12:43:08

Lowest channel



Date: 17.JUL.2019 12:45:08

Middle channel



Date: 17.JUL.2019 12:47:31

Highest channel

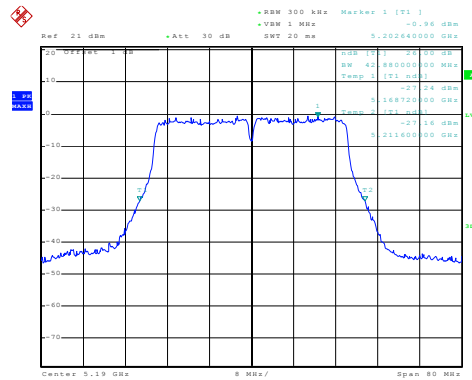
Qianhai BlueAsia of Technical Services(Shenzhen) Co., Ltd.

IOT Test Centre of BlueAsia,

No. 448 Bulong Road, Bantian Street, Longgang District, Shenzhen, China

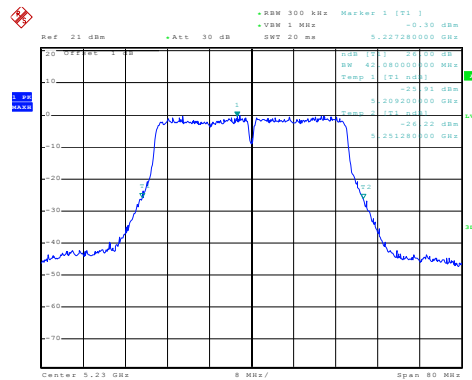
Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

802.11n(HT40)



Date: 17.JUL.2019 12:49:59

Lowest channel



Date: 17.JUL.2019 12:51:35

Highest channel

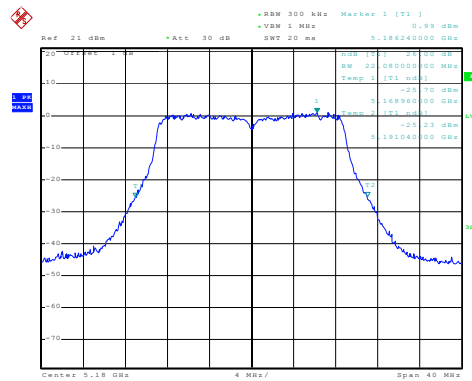
Qianhai BlueAsia of Technical Services(Shenzhen) Co., Ltd.

IOT Test Centre of BlueAsia,

No. 448 Bulong Road, Bantian Street, Longgang District, Shenzhen, China

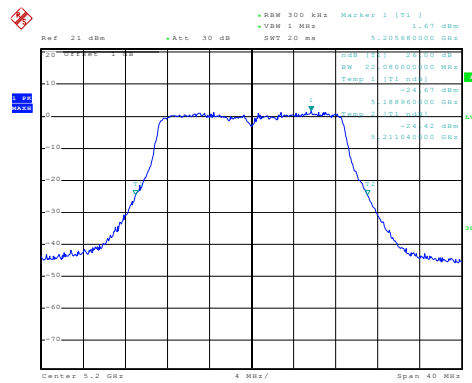
Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

802.11ac(HT20)



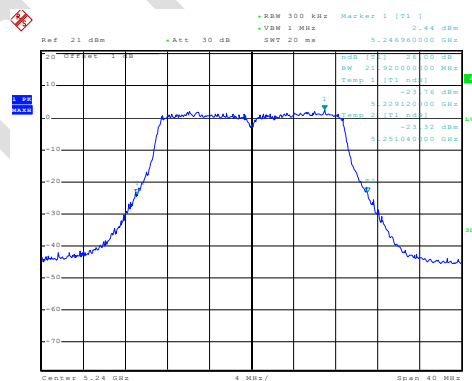
Date: 16_JUL.2019 12:11:07

Lowest channel



Date: 16_JUL.2019 12:14:02

Middle channel



Date: 16_JUL.2019 12:15:26

Highest channel

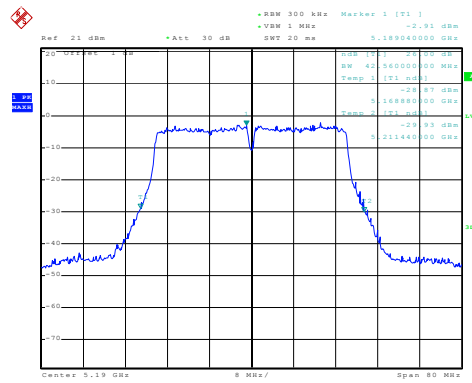
Qianhai BlueAsia of Technical Services(Shenzhen) Co., Ltd.

IOT Test Centre of BlueAsia,

No. 448 Bulong Road, Bantian Street, Longgang District, Shenzhen, China

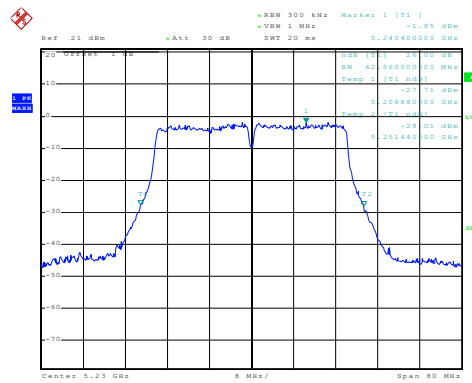
Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

802.11ac(HT40)



Date: 17_JUL_2019 12:35:44

Lowest channel



Date: 17_JUL_2019 12:38:29

Highest channel

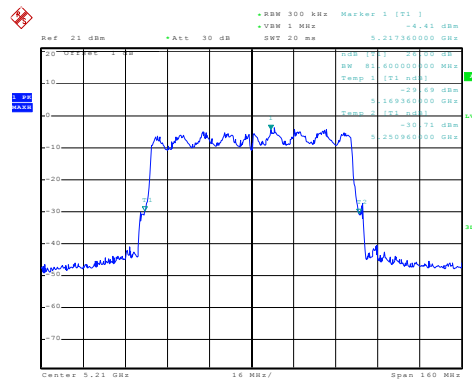
Qianhai BlueAsia of Technical Services(Shenzhen) Co., Ltd.

IOT Test Centre of BlueAsia,

No. 448 Bulong Road, Bantian Street, Longgang District, Shenzhen, China

Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

802.11ac(HT80)



Date: 17.JUL.2019 12:40:52

Middle channel

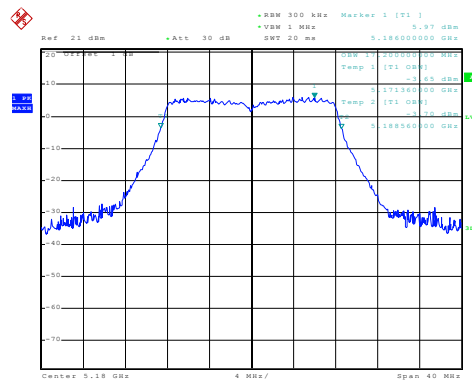
Qianhai BlueAsia of Technical Services(Shenzhen) Co., Ltd.

IOT Test Centre of BlueAsia,

No. 448 Bulong Road, Bantian Street, Longgang District, Shenzhen, China

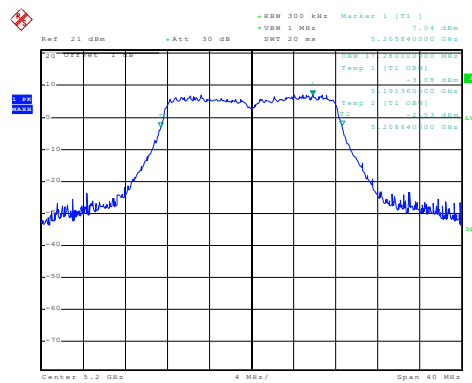
Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

99% OBW - 802.11a



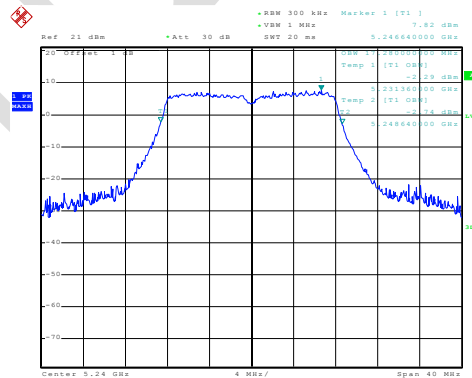
Date: 18.JUL.2019 11:31:41

Lowest channel



Date: 18.JUL.2019 11:32:55

Middle channel



Date: 18.JUL.2019 11:33:44

Highest channel

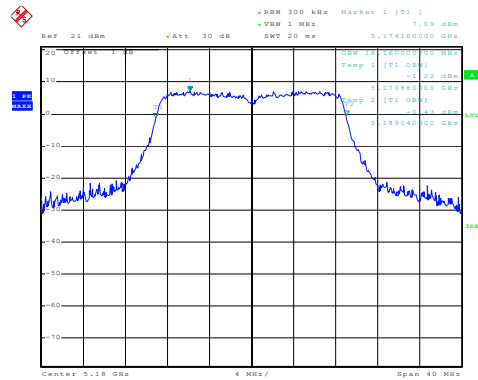
Qianhai BlueAsia of Technical Services(Shenzhen) Co., Ltd.

IOT Test Centre of BlueAsia,

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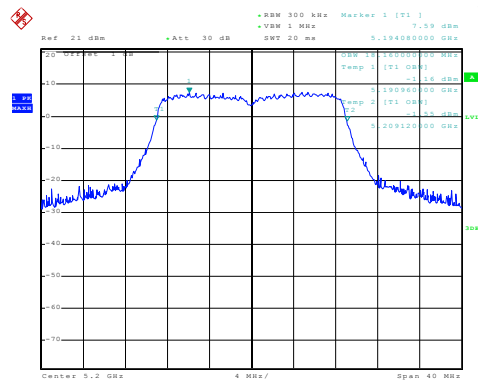
Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

802.11n(HT20)



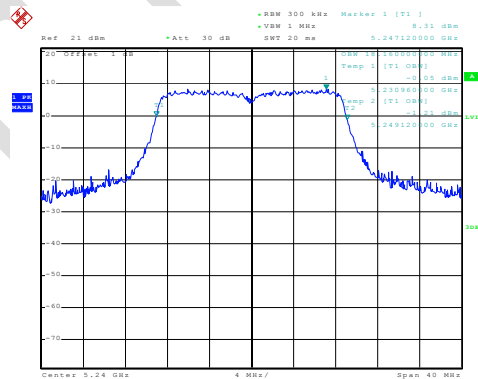
Date: 18.JUL.2019 11:41:14

Lowest channel



Date: 18.JUL.2019 11:42:01

Middle channel



Date: 18.JUL.2019 11:42:46

Highest channel

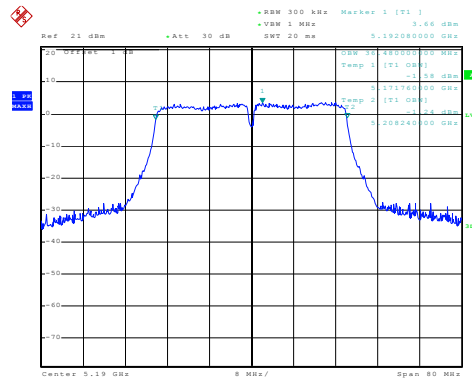
Qianhai BlueAsia of Technical Services(Shenzhen) Co., Ltd.

IOT Test Centre of BlueAsia,

No. 448 Bulong Road, Bantian Street, Longgang District, Shenzhen, China

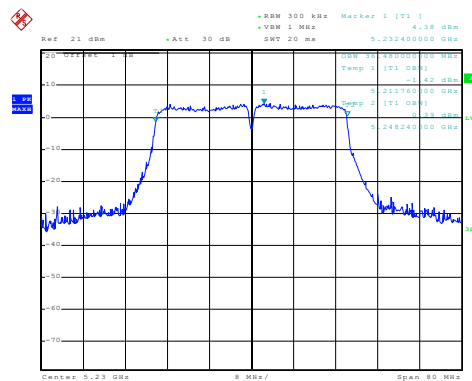
Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

802.11n(HT40)



Date: 18.JUL.2019 11:45:17

Lowest channel



Date: 18.JUL.2019 11:45:48

Highest channel

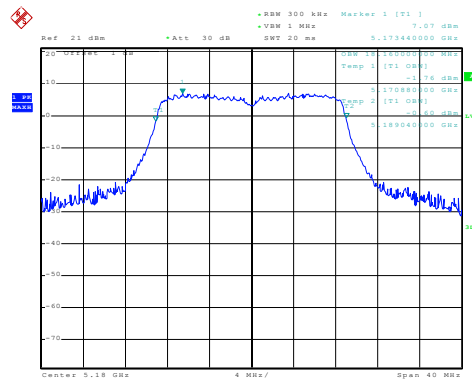
Qianhai BlueAsia of Technical Services(Shenzhen) Co., Ltd.

IOT Test Centre of BlueAsia,

No. 448 Bulong Road, Bantian Street, Longgang District, Shenzhen, China

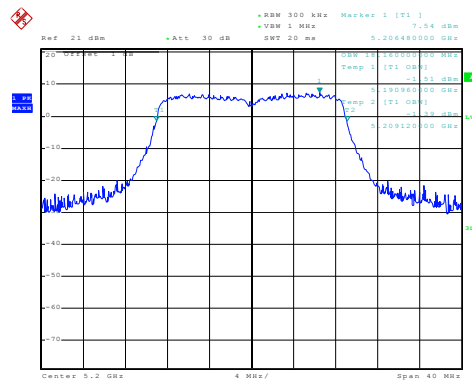
Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

802.11ac(HT20)



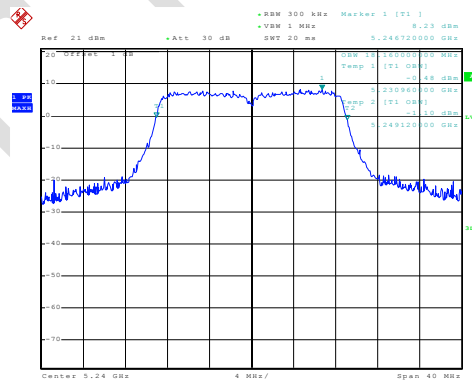
Date: 18_JUL.2019 11:47:43

Lowest channel



Date: 18_JUL.2019 11:48:09

Middle channel



Date: 18_JUL.2019 11:48:29

Highest channel

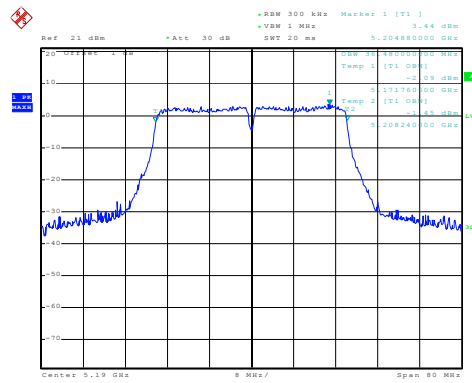
Qianhai BlueAsia of Technical Services(Shenzhen) Co., Ltd.

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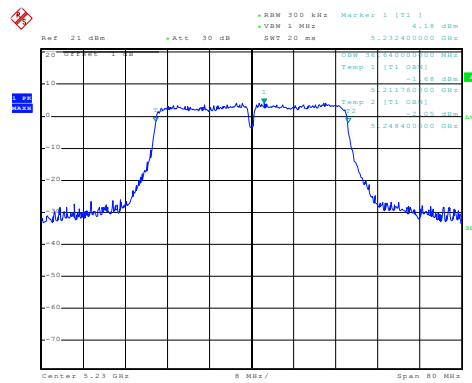
Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

802.11ac(HT40)



Date: 18_JUL_2019 11:49:07

Lowest channel



Date: 18_JUL_2019 11:49:40

Highest channel

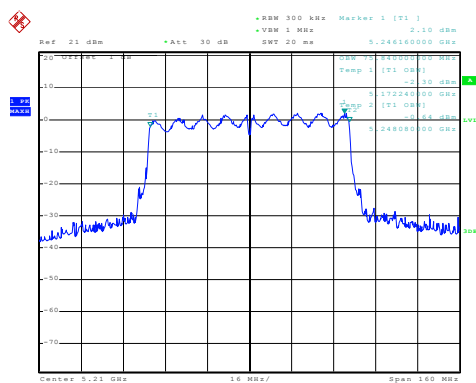
Qianhai BlueAsia of Technical Services(Shenzhen) Co., Ltd.

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Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

802.11ac(HT80)



Date: 18.JUL.2019 11:50:38

Middle channel

Qianhai BlueAsia of Technical Services(Shenzhen) Co., Ltd.

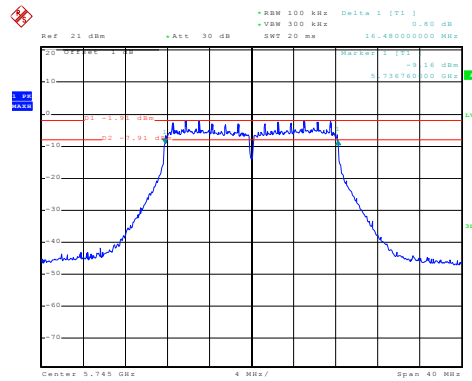
IOT Test Centre of BlueAsia,

No. 448 Bulong Road, Bantian Street, Longgang District, Shenzhen, China

Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

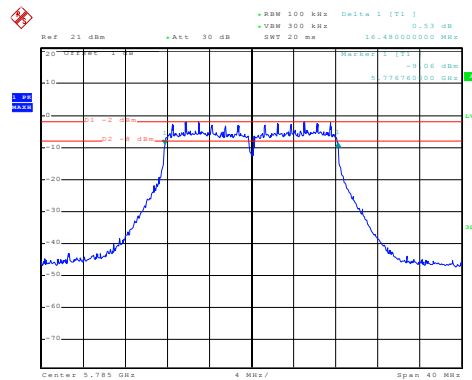
Band 4:

6 dB EBW - 802.11a



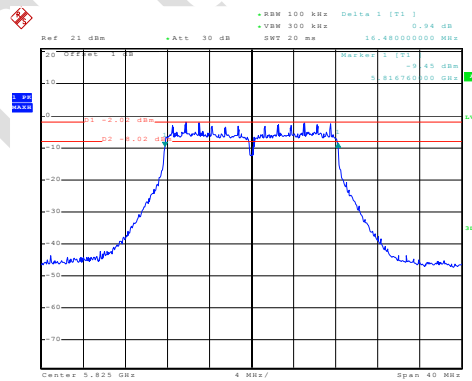
Date: 16.JUL.2019 10:34:13

Lowest channel



Date: 16.JUL.2019 10:36:22

Middle channel



Date: 16.JUL.2019 10:38:22

Highest channel

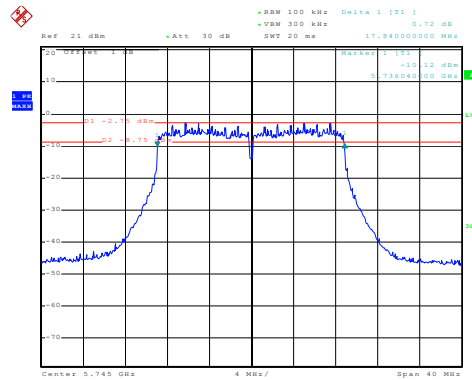
Qianhai BlueAsia of Technical Services(Shenzhen) Co., Ltd.

IOT Test Centre of BlueAsia,

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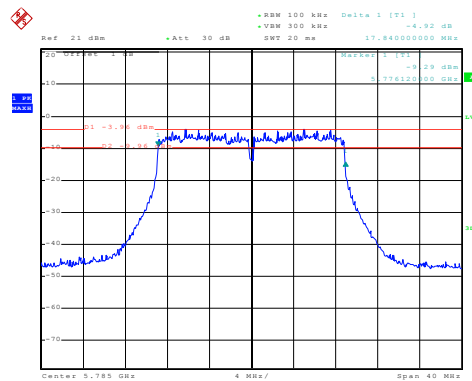
Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

802.11n(HT20)



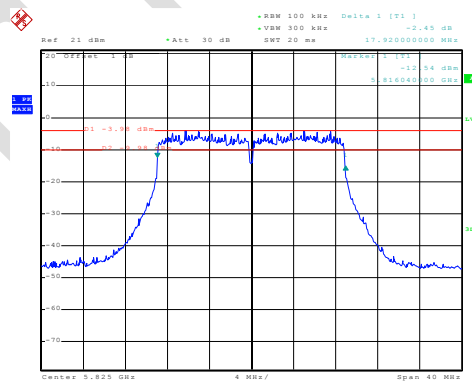
Date: 16.JUL.2019 11:30:32

Lowest channel



Date: 16.JUL.2019 11:33:08

Middle channel



Date: 16.JUL.2019 11:36:04

Highest channel

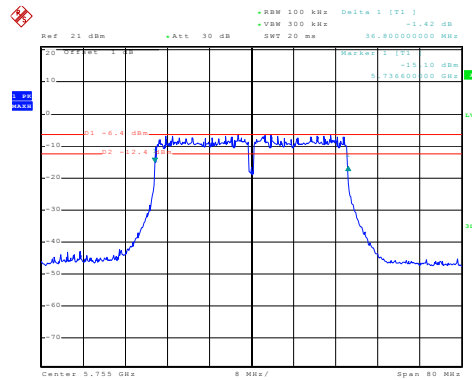
Qianhai BlueAsia of Technical Services(Shenzhen) Co., Ltd.

IOT Test Centre of BlueAsia,

No. 448 Bulong Road, Bantian Street, Longgang District, Shenzhen, China

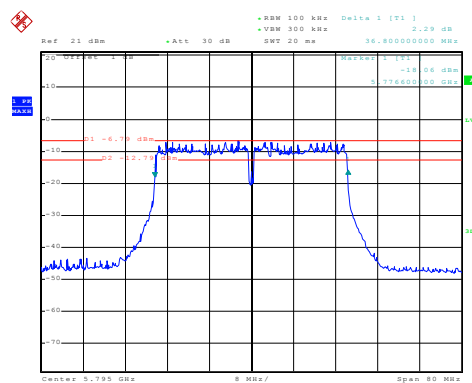
Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

802.11n(HT40)



Date: 16.JUL.2019 11:42:24

Lowest channel



Date: 16.JUL.2019 11:44:31

Highest channel

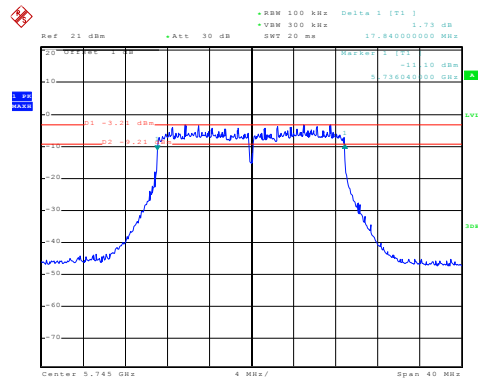
Qianhai BlueAsia of Technical Services(Shenzhen) Co., Ltd.

IOT Test Centre of BlueAsia,

No. 448 Bulong Road, Bantian Street, Longgang District, Shenzhen, China

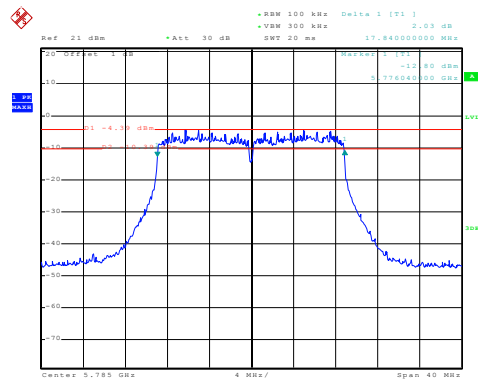
Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

802.11ac(HT20)



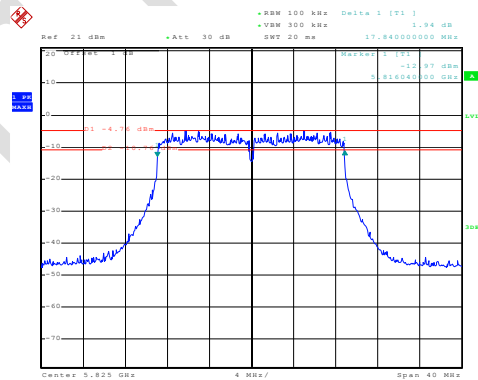
Date: 16.JUL.2019 11:06:45

Lowest channel



Date: 16.JUL.2019 11:09:10

Middle channel



Date: 16.JUL.2019 11:11:10

Highest channel

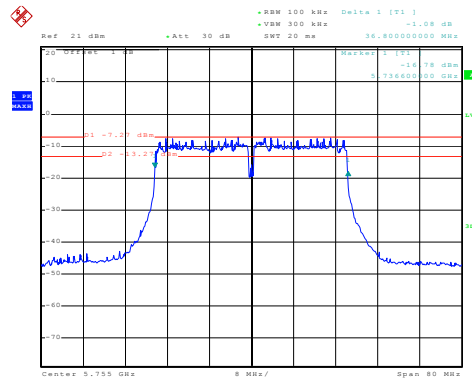
Qianhai BlueAsia of Technical Services(Shenzhen) Co., Ltd.

IOT Test Centre of BlueAsia,

No. 448 Bulong Road, Bantian Street, Longgang District, Shenzhen, China

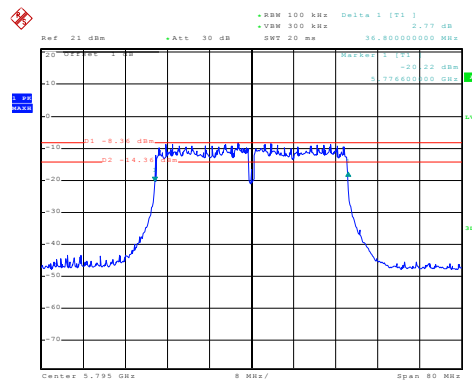
Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

802.11ac(HT40)



Date: 16.JUL.2019 11:16:44

Lowest channel



Date: 16.JUL.2019 11:18:52

Highest channel

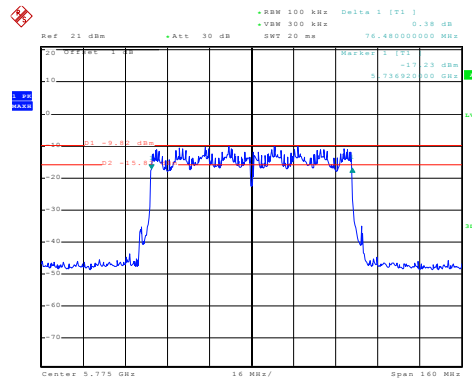
Qianhai BlueAsia of Technical Services(Shenzhen) Co., Ltd.

IOT Test Centre of BlueAsia,

No. 448 Bulong Road, Bantian Street, Longgang District, Shenzhen, China

Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

802.11ac(HT80)



Date: 16.JUL.2019 11:21:43

Middle channel

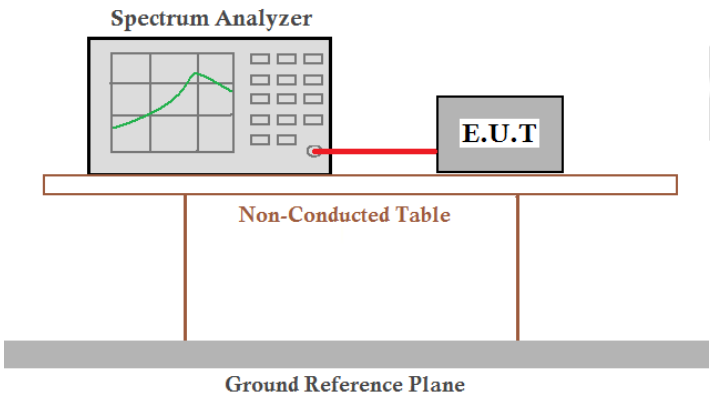
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6.5 Power Spectral Density

Test Requirement:	FCC Part15 E Section 15.407 (a) (1) (ii) & (a) (3)
Test Method:	ANSI C63.10:2013, KDB 789033
Limit:	Band 1: 17 dBm/MHz (The maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.); Band 4: 30dBm/500kHz
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data

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Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

Band 1

Mode	Test CH	PSD(dBm)		Total (dBm)	Limit (dBm)	Result
		ANT1	ANT2			
802.11a	Lowest	-0.64	/	/	17.00	Pass
	Middle	-0.05	/	/	17.00	Pass
	Highest	0.97	/	/	17.00	Pass
802.11n(HT20)	Lowest	-1.41	/	/	17.00	Pass
	Middle	-1.70	/	/	17.00	Pass
	Highest	-0.41	/	/	17.00	Pass
802.11n(HT40)	Lowest	-4.98	/	/	17.00	Pass
	Highest	-3.79	/	/	17.00	Pass
802.11ac(HT20)	Lowest	0.52	/	/	17.00	Pass
	Middle	0.40	/	/	17.00	Pass
	Highest	1.47	/	/	17.00	Pass
802.11ac(HT40)	Lowest	-4.87	/	/	17.00	Pass
	Highest	-4.27	/	/	17.00	Pass
802.11ac(HT80)	Middle	-6.77	/	/	17.00	Pass

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Band 4

Mode	Test CH	PSD(dBm)		Total (dBm)	Limit (dBm)	Result
		ANT1	ANT2			
802.11a	Lowest	2.69	/	/	30.00	Pass
	Middle	0.96	/	/	30.00	Pass
	Highest	0.82	/	/	3.000	Pass
802.11n(HT20)	Lowest	2.36	/	/	30.00	Pass
	Middle	1.12	/	/	30.00	Pass
	Highest	1.93	/	/	30.00	Pass
802.11n(HT40)	Lowest	-0.73	/	/	30.00	Pass
	Highest	-1.24	/	/	30.00	Pass
802.11ac(HT20)	Lowest	0.02	/	/	3.000	Pass
	Middle	-0.20	/	/	30.00	Pass
	Highest	-0.62	/	/	30.00	Pass
802.11ac(HT40)	Lowest	-2.69	/	/	30.00	Pass
	Highest	-3.80	/	/	30.00	Pass
802.11ac(HT80)	Middle	-5.08	/	/	30.00	Pass

Qianhai BlueAsia of Technical Services(Shenzhen) Co., Ltd.

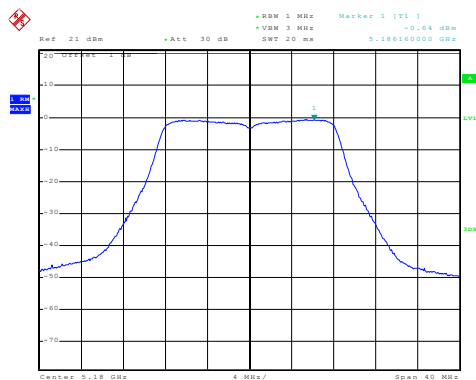
IOT Test Centre of BlueAsia,

No. 448 Bulong Road, Bantian Street, Longgang District, Shenzhen, China

Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

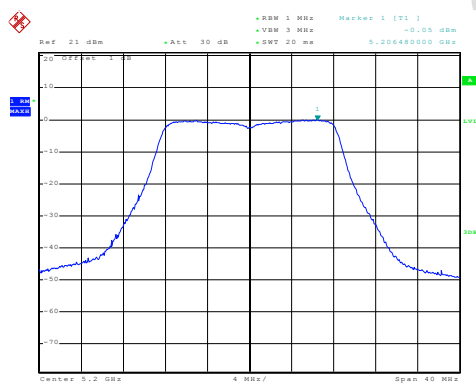
Band 1: ANT1

Test mode: 802.11a



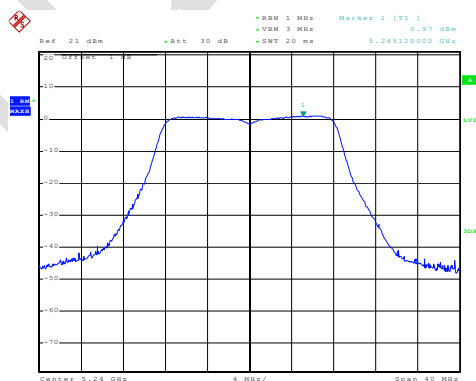
Date: 15.JUL.2019 15:56:24

Lowest channel



Date: 15.JUL.2019 15:59:20

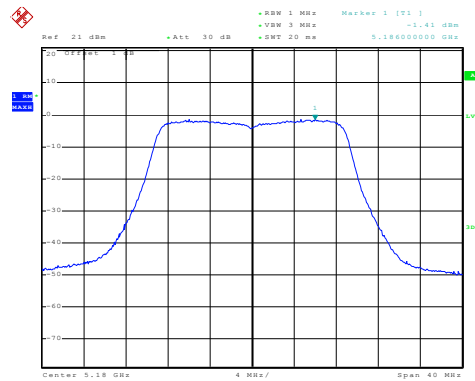
Middle channel



Date: 15.JUL.2019 16:00:59

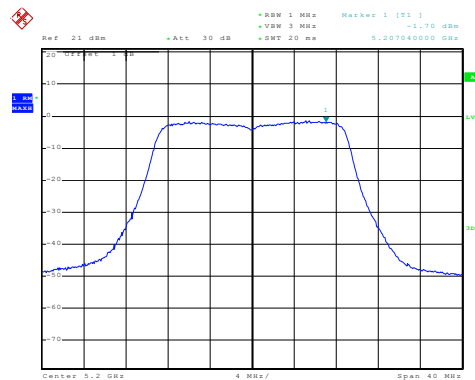
Highest channel

Test mode: 802.11n(HT20)



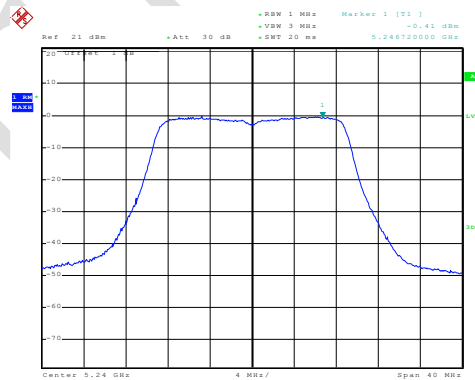
Date: 15.JUL.2019 16:18:27

Lowest channel



Date: 15.JUL.2019 16:19:32

Middle channel



Date: 15.JUL.2019 16:21:01

Highest channel

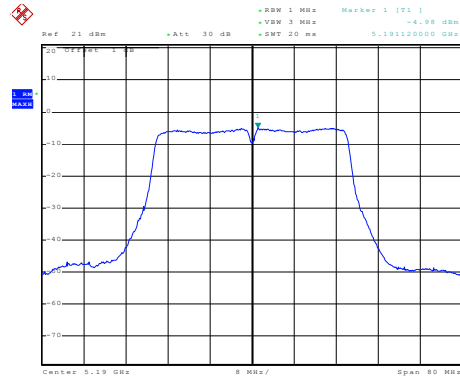
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IOT Test Centre of BlueAsia,

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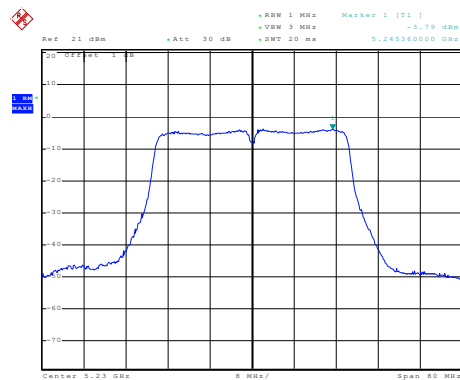
Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

Test mode: 802.11n(HT40)



Date: 15.JUL.2019 16:23:34

Lowest channel



Date: 15.JUL.2019 16:25:35

Highest channel

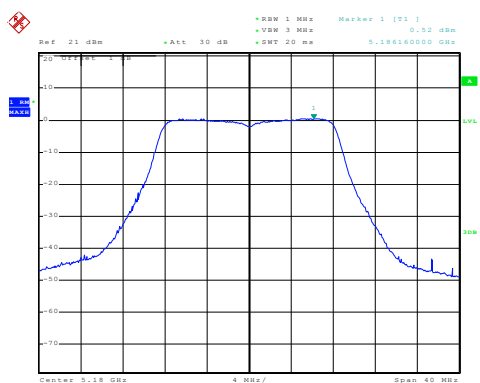
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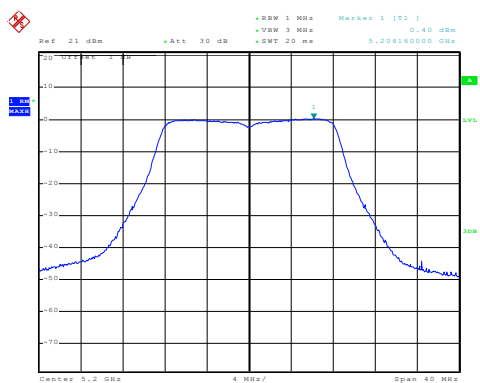
Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

Test mode: 802.11ac(HT20)



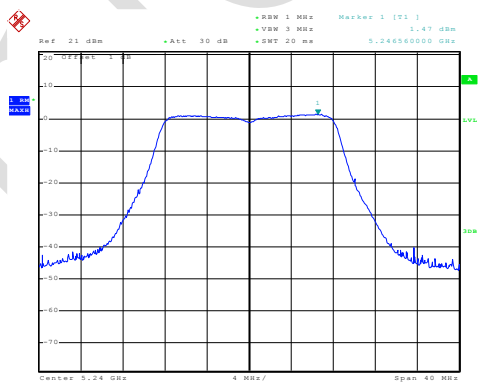
Date: 15.JUL.2019 16:03:47

Lowest channel



Date: 15.JUL.2019 16:05:35

Middle channel



Date: 15.JUL.2019 16:07:08

Highest channel

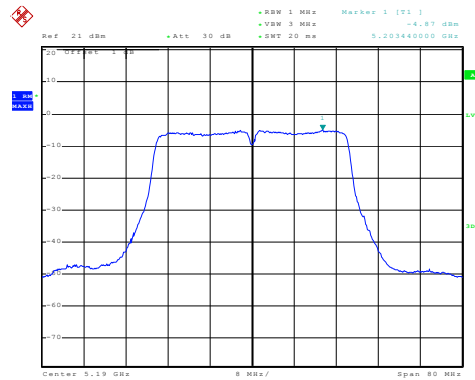
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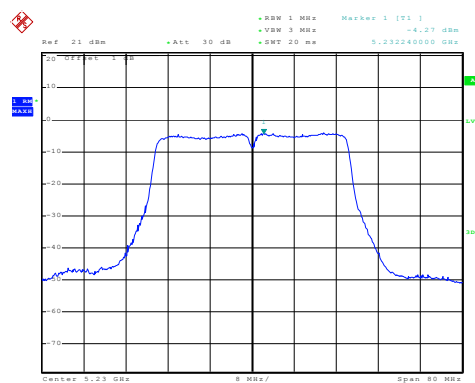
Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

Test mode: 802.11ac(HT40)



Date: 15.JUL.2019 16:10:28

Lowest channel



Date: 15.JUL.2019 16:12:07

Highest channel

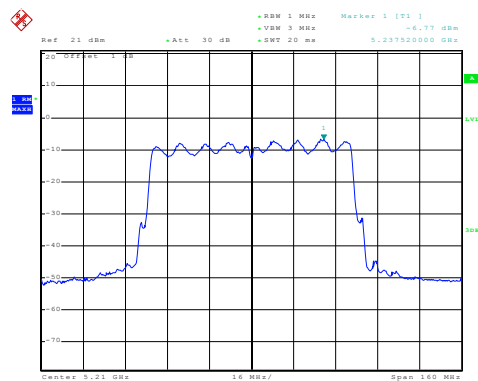
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Test mode: 802.11ac(HT80)



Date: 15_Mar_2019 16:15:03

Middle channel

Qianhai BlueAsia of Technical Services(Shenzhen) Co., Ltd.

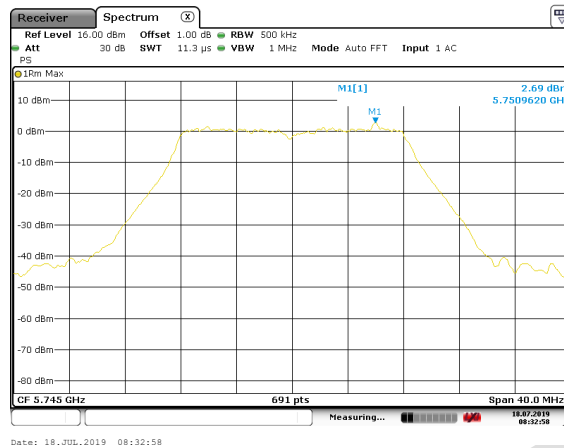
IOT Test Centre of BlueAsia,

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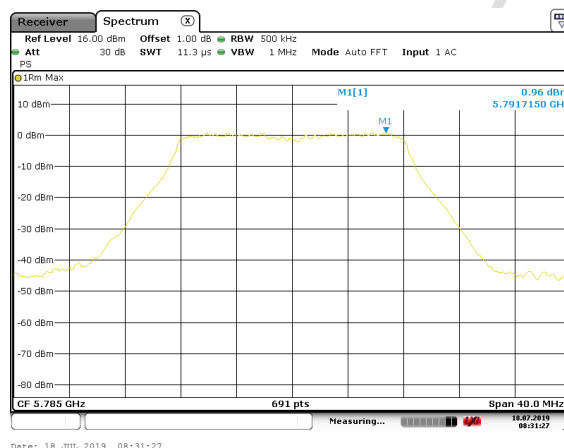
Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

Band 4 ANT1:

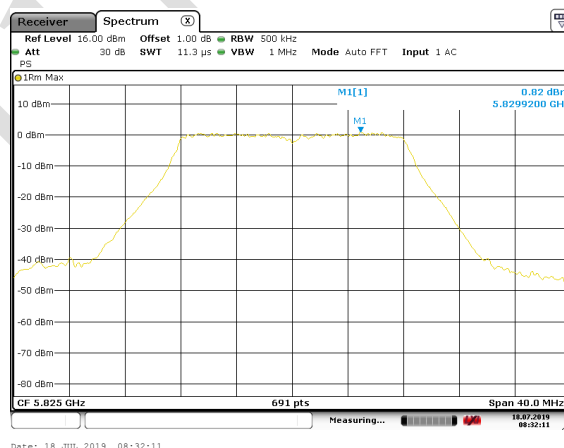
Test mode: 802.11a



Lowest channel



Middle channel



Highest channel

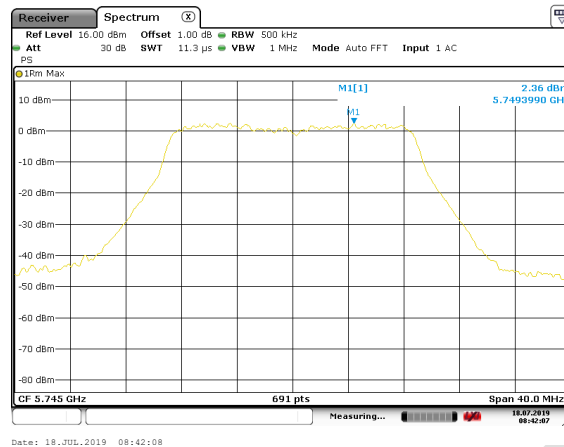
Qianhai BlueAsia of Technical Services(Shenzhen) Co., Ltd.

IOT Test Centre of BlueAsia,

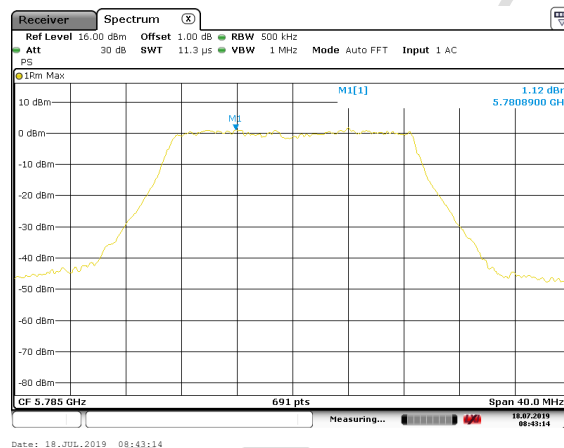
No. 448 Bulong Road, Bantian Street, Longgang District, Shenzhen, China

Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

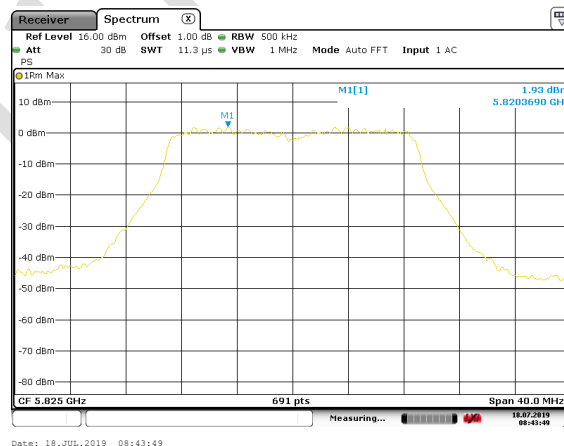
Test mode: 802.11n(HT20)



Lowest channel



Middle channel



Highest channel

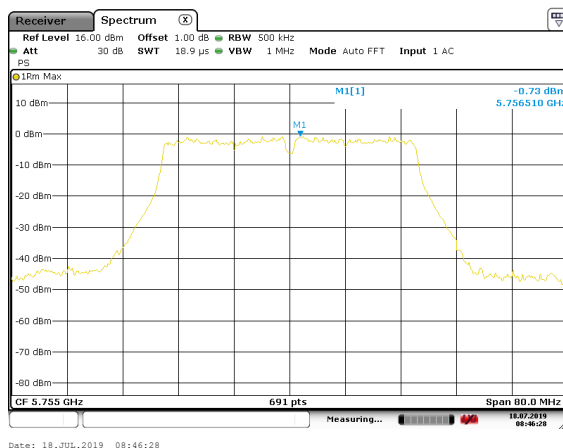
Qianhai BlueAsia of Technical Services(Shenzhen) Co., Ltd.

IOT Test Centre of BlueAsia,

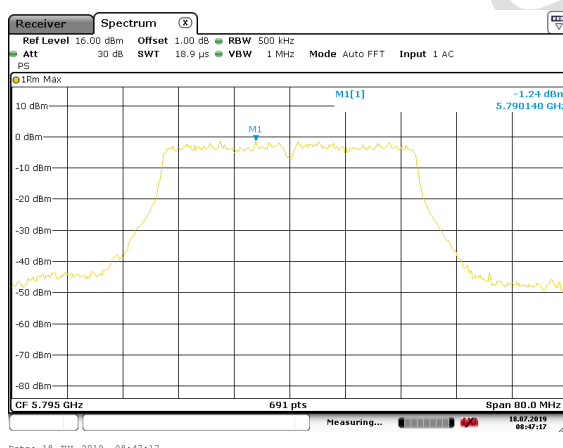
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Test mode: 802.11n(HT40)



Lowest channel



Highest channel

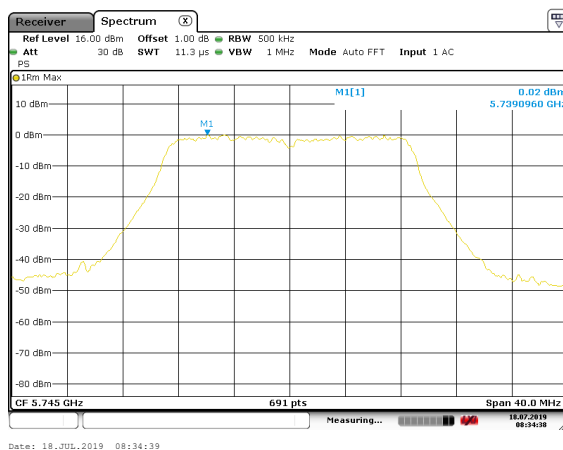
Qianhai BlueAsia of Technical Services(Shenzhen) Co., Ltd.

IOT Test Centre of BlueAsia,

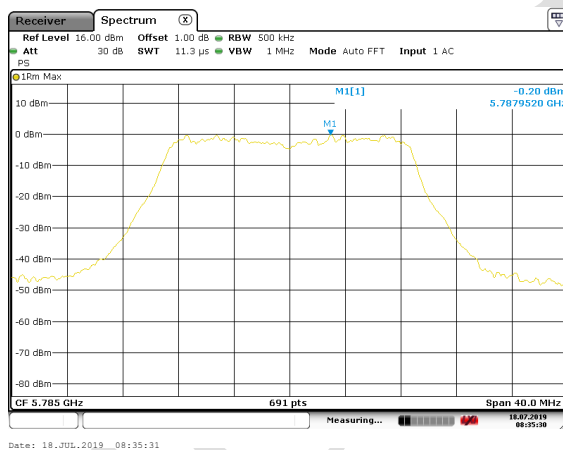
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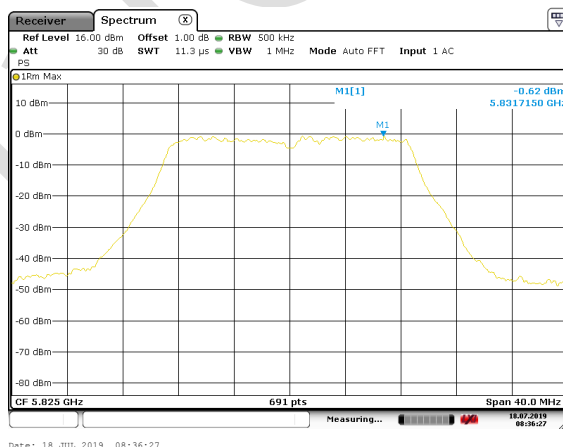
Test mode: 802.11ac(HT20)



Lowest channel



Middle channel



Highest channel

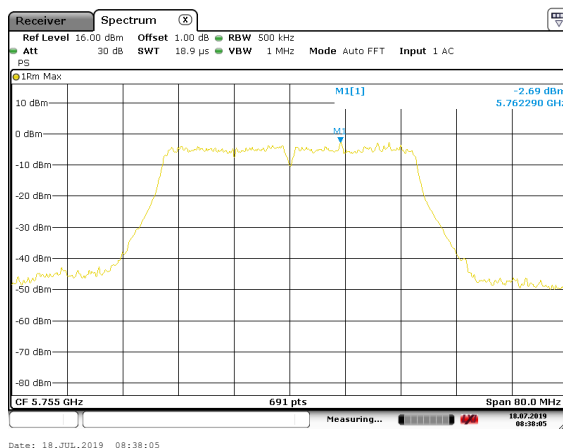
Qianhai BlueAsia of Technical Services(Shenzhen) Co., Ltd.

IOT Test Centre of BlueAsia,

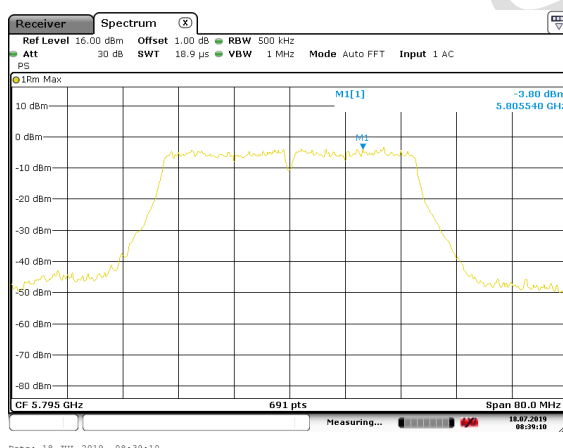
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Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

Test mode: 802.11ac(HT40)



Lowest channel



Highest channel

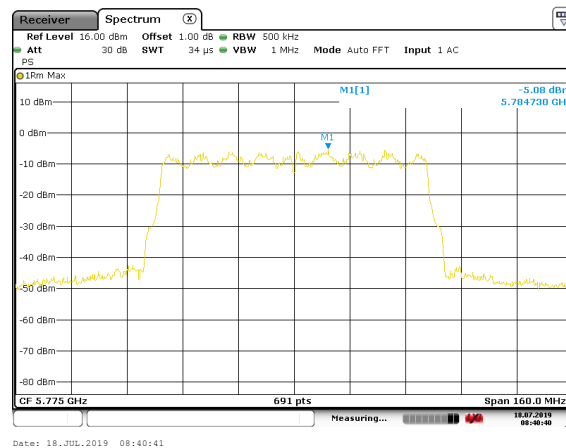
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Test mode: 802.11ac(HT80)



Middle channel

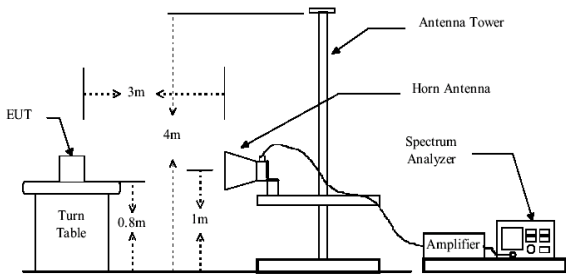
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6.6 Band Edge

Test Requirement:	FCC Part15 E Section 15.407 (b)													
Test Method:	ANSI C63.10:2013 , KDB 789033													
Receiver setup:	<table><tr><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr><tr><td>Quasi-peak</td><td>120kHz</td><td>300kHz</td><td>Quasi-peak Value</td></tr><tr><td>RMS</td><td>1MHz</td><td>3MHz</td><td>Average Value</td></tr></table>	Detector	RBW	VBW	Remark	Quasi-peak	120kHz	300kHz	Quasi-peak Value	RMS	1MHz	3MHz	Average Value	
Detector	RBW	VBW	Remark											
Quasi-peak	120kHz	300kHz	Quasi-peak Value											
RMS	1MHz	3MHz	Average Value											
Limit:	<table><tr><td></td><td>Limit (dBuV/m @3m)</td><td>Remark</td></tr><tr><td rowspan="2">Band 1</td><td>68.20</td><td>Peak Value</td></tr><tr><td>54.00</td><td>Average Value</td></tr><tr><td rowspan="2">Band 4</td><td>78.20</td><td>Peak Value</td></tr><tr><td>54.00</td><td>Average Value</td></tr></table> Remark: 1. Band 1 limit: E[dBμV/m] = EIRP[dBm] + 95.2=68.2 dBuV/m, for EIPR[dBm]= -27dBm. 2. Band 4 limit: E[dBμV/m] = EIRP[dBm] + 95.2=78.2 dBuV/m, for EIPR[dBm]= -17dBm.		Limit (dBuV/m @3m)	Remark	Band 1	68.20	Peak Value	54.00	Average Value	Band 4	78.20	Peak Value	54.00	Average Value
	Limit (dBuV/m @3m)	Remark												
Band 1	68.20	Peak Value												
	54.00	Average Value												
Band 4	78.20	Peak Value												
	54.00	Average Value												
Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.													
Test setup:														
Test Instruments:	Refer to section 5.7 for details													
Test mode:	Refer to section 5.3 for details													
Test results:	Passed													

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Band 1:

802.11a						
Test channel		Lowest	Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	51.23	-6.86	44.37	68.20	-23.33	Horizontal
5150.00	53.27	-6.86	46.41	68.20	-21.79	Vertical
802.11a						
Test channel		Lowest	Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	39.68	-6.86	32.82	54.00	-21.18	Horizontal
5150.00	41.25	-6.86	34.39	54.00	-19.61	Vertical
802.11a						
Test channel		Highest	Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	52.06	-6.35	45.71	68.20	-22.49	Horizontal
5350.00	51.57	-6.35	45.22	68.20	-22.98	Vertical
802.11a						
Test channel		Highest	Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	41.03	-6.35	34.68	54.00	-19.32	Horizontal
5350.00	39.54	-6.35	33.19	54.00	-20.81	Vertical

802.11n-HT20						
Test channel		Lowest	Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	52.03	-6.86	45.17	68.20	-23.03	Horizontal
5150.00	51.74	-6.86	44.88	68.20	-23.32	Vertical
802.11n-HT20						
Test channel		Lowest	Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	41.23	-6.86	34.37	54.00	-19.63	Horizontal
5150.00	39.54	-6.86	32.68	54.00	-21.32	Vertical
802.11n-HT20						
Test channel		Highest	Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	52.24	-6.35	45.89	68.20	-22.31	Horizontal
5350.00	53.65	-6.35	47.30	68.20	-20.90	Vertical
802.11n-HT20						
Test channel		Highest	Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	40.84	-6.35	34.49	54.00	-19.51	Horizontal
5350.00	42.61	-6.35	36.26	54.00	-17.74	Vertical

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802.11n-HT40						
Test channel		Lowest	Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	52.03	-6.86	45.17	68.20	-23.03	Horizontal
5150.00	53.69	-6.86	46.38	68.20	-21.37	Vertical
802.11n-HT40						
Test channel		Lowest	Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	41.02	-6.86	34.16	54.00	-19.84	Horizontal
5150.00	39.56	-6.86	32.70	54.00	-21.30	Vertical
802.11n-HT40						
Test channel		Highest	Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	53.24	-6.35	46.89	68.20	-21.31	Horizontal
5350.00	51.57	-6.35	45.22	68.20	-22.98	Vertical
802.11n-HT40						
Test channel		Highest	Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	39.36	-6.35	33.01	54.00	-20.99	Horizontal
5350.00	40.04	-6.35	33.69	54.00	-20.31	Vertical

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802.11ac-HT80						
Test channel		Lowest	Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	52.26	-6.86	45.40	68.20	-22.80	Horizontal
5150.00	53.09	-6.86	46.23	68.20	-21.97	Vertical
802.11n-HT80						
Test channel		Lowest	Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	40.17	-6.86	33.31	54.00	-20.69	Horizontal
5150.00	42.03	-6.86	35.17	54.00	-18.83	Vertical
802.11n-HT80						
Test channel		Highest	Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	51.39	-6.35	45.04	68.20	-23.16	Horizontal
5350.00	52.25	-6.35	45.90	68.20	-22.30	Vertical
802.11n-HT80						
Test channel		Highest	Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	42.28	-6.35	35.93	54.00	-18.07	Horizontal
5350.00	41.18	-6.35	34.83	54.00	-19.17	Vertical

Remark:

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
3. *Correct factor= Antenna Factor + Cable Loss – Preamplifier Factor*

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Band 4:

802.11a						
Test channel		Lowest	Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5725.00	54.23	-4.93	49.30	78.20	-28.90	Horizontal
5725.00	53.74	-4.93	48.81	78.20	-29.39	Vertical
802.11a						
Test channel		Lowest	Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5725.00	41.36	-4.93	36.43	54.00	-17.57	Horizontal
5725.00	39.27	-4.93	34.34	54.00	-19.66	Vertical
802.11a						
Test channel		Highest	Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5850.00	52.87	-4.35	48.52	78.20	-29.68	Horizontal
5850.00	54.45	-4.35	50.01	78.20	-28.10	Vertical
802.11a						
Test channel		Highest	Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5850.00	41.13	-4.35	36.78	54.00	-17.22	Horizontal
5850.00	42.06	-4.35	37.74	54.00	-16.29	Vertical

802.11n-HT20						
Test channel		Lowest	Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5725.00	53.36	-4.93	48.43	78.20	-29.77	Horizontal
5725.00	54.18	-4.93	49.25	78.20	-28.95	Vertical
802.11n-HT20						
Test channel		Lowest	Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5725.00	42.03	-4.93	37.10	54.00	-16.90	Horizontal
5725.00	43.17	-4.93	38.24	54.00	-15.76	Vertical
802.11n-HT20						
Test channel		Highest	Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5850.00	54.69	-4.35	50.34	78.20	-27.86	Horizontal
5850.00	53.26	-4.35	48.91	78.20	-29.29	Vertical
802.11n-HT20						
Test channel		Highest	Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5850.00	39.06	-4.35	34.71	54.00	-19.29	Horizontal
5850.00	41.15	-4.35	36.80	54.00	-17.20	Vertical

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802.11n-HT40						
Test channel		Lowest	Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5725.00	53.06	-4.93	48.13	78.20	-30.07	Horizontal
5725.00	54.41	-4.93	49.48	78.20	-28.72	Vertical
802.11n-HT40						
Test channel		Lowest	Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5725.00	41.23	-4.93	36.30	54.00	-17.70	Horizontal
5725.00	42.07	-4.93	37.14	54.00	-16.86	Vertical
802.11n-HT40						
Test channel		Highest	Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5850.00	55.36	-4.35	51.01	78.20	-27.19	Horizontal
5850.00	52.54	-4.35	48.19	78.20	-30.01	Vertical
802.11n-HT40						
Test channel		Highest	Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5850.00	40.03	-4.35	35.68	54.00	-18.32	Horizontal
5850.00	39.74	-4.35	35.39	54.00	-18.61	Vertical

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802.11ac-HT80						
Test channel		Lowest	Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5725.00	54.36	-4.93	49.43	78.20	-28.77	Horizontal
5725.00	53.03	-4.93	48.10	78.20	-30.01	Vertical
802.11ac-HT80						
Test channel		Lowest	Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5725.00	39.47	-4.93	34.54	54.00	-19.46	Horizontal
5725.00	41.25	-4.93	36.32	54.00	-17.68	Vertical
802.11ac-HT80						
Test channel		Highest	Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5850.00	52.69	-4.35	48.34	78.20	-29.66	Horizontal
5850.00	53.86	-4.35	49.51	78.20	-28.69	Vertical
802.11ac-HT80						
Test channel		Highest	Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5850.00	42.14	-4.35	37.79	54.00	-16.21	Horizontal
5850.00	40.27	-4.35	35.92	54.00	-18.08	Vertical

Remark:

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
3. *Correct factor = Antenna Factor + Cable Loss – Preamplifier Factor*

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6.7 Spurious Emission

6.7.1 Restricted Band

Test Requirement:	FCC Part15 E Section 15.407(b)																		
Test Method:	ANSI C63.10: 2013																		
Test Frequency Range:	Band 1: 4.5 GHz to 5.15 GHz and 5.35GHz to 5.46GHz Band 4: 5.35 GHz to 5.46 GHz																		
Test site:	Measurement Distance: 3m																		
Receiver setup:	<table><tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr><tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr><tr><td>RMS</td><td>1MHz</td><td>3MHz</td><td>Average Value</td></tr></table>					Frequency	Detector	RBW	VBW	Remark	Above 1GHz	Peak	1MHz	3MHz	Peak Value	RMS	1MHz	3MHz	Average Value
Frequency	Detector	RBW	VBW	Remark															
Above 1GHz	Peak	1MHz	3MHz	Peak Value															
	RMS	1MHz	3MHz	Average Value															
Limit:	<table><tr><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Remark</td></tr><tr><td rowspan="2">Above 1GHz</td><td>74.00</td><td>Peak Value</td></tr><tr><td>54.00</td><td>Average Value</td></tr></table>					Frequency	Limit (dBuV/m @3m)	Remark	Above 1GHz	74.00	Peak Value	54.00	Average Value						
Frequency	Limit (dBuV/m @3m)	Remark																	
Above 1GHz	74.00	Peak Value																	
	54.00	Average Value																	
Test Procedure:	<																		

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Band 1:

802.11a						
Test channel		Lowest	Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	52.48	-8.71	43.77	74.00	-30.23	Horizontal
4500.00	53.48	-8.71	44.77	74.00	-29.23	Vertical
802.11a						
Test channel		Lowest	Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	41.36	-8.71	32.65	54.00	-21.35	Horizontal
4500.00	39.65	-8.71	30.94	54.00	-23.06	Vertical
802.11a						
Test channel		Highest	Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	52.70	-5.36	47.34	74.00	-26.66	Horizontal
5460.00	53.57	-5.36	48.21	74.00	-25.79	Vertical
802.11a						
Test channel		Highest	Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	38.78	-5.36	33.42	54.00	-20.58	Horizontal
5460.00	39.36	-5.36	34.00	54.00	-20.00	Vertical

802.11n-HT20						
Test channel		Lowest	Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	52.36	-8.71	43.65	74.00	-30.35	Horizontal
4500.00	53.69	-8.71	44.98	74.00	-29.02	Vertical
802.11n-HT20						
Test channel		Lowest	Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	38.23	-8.71	29.52	54.00	-24.48	Horizontal
4500.00	39.69	-8.71	30.98	54.00	-23.02	Vertical
802.11n-HT20						
Test channel		Highest	Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	53.25	-5.36	47.89	74.00	-26.11	Horizontal
5460.00	52.03	-5.36	46.67	74.00	-27.33	Vertical
802.11n-HT20						
Test channel		Highest	Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	39.69	-5.36	34.33	54.00	-19.67	Horizontal
5460.00	40.05	-5.36	34.69	54.00	-19.31	Vertical

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802.11n-HT40						
Test channel		Lowest	Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	51.26	-8.71	42.55	74.00	-31.45	Horizontal
4500.00	53.35	-8.71	44.64	74.00	-29.36	Vertical
802.11n-HT40						
Test channel		Lowest	Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	40.58	-8.71	31.87	54.00	-22.13	Horizontal
4500.00	39.63	-8.71	30.92	54.00	-23.08	Vertical
802.11n-HT40						
Test channel		Highest	Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	53.48	-5.36	48.12	74.00	-5.88	Horizontal
5460.00	52.29	-5.36	46.93	74.00	-7.07	Vertical
802.11n-HT40						
Test channel		Highest	Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	38.52	-5.36	33.16	54.00	-20.84	Horizontal
5460.00	38.15	-5.36	32.79	54.00	-21.21	Vertical

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802.11ac-HT80						
Test channel		Lowest	Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	53.39	-8.71	44.68	74.00	-29.32	Horizontal
4500.00	52.48	-8.71	43.77	74.00	-30.23	Vertical
802.11n-HT80						
Test channel		Lowest	Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	39.69	-8.71	30.98	54.00	-23.02	Horizontal
4500.00	40.27	-8.71	31.56	54.00	-22.44	Vertical
802.11n-HT80						
Test channel		Highest	Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	54.69	-5.36	49.33	74.00	-24.67	Horizontal
5460.00	53.16	-5.36	47.80	74.00	-26.20	Vertical
802.11n-HT80						
Test channel		Highest	Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	42.23	-5.36	36.87	54.00	-17.13	Horizontal
5460.00	41.17	-5.36	35.81	54.00	-18.19	Vertical

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.
3. Correct factor = Antenna Factor + Cable Loss – Preamplifier Factor

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Band 4:
802.11a

Test channel		Lowest	Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Correct factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	53.21	-6.35	46.86	74.00	-27.14	Horizontal
5460.00	52.29	-5.36	46.93	74.00	-27.07	Horizontal
5350.00	52.24	-6.35	45.89	74.00	-28.11	Vertical
5460.00	51.36	-5.36	46.00	74.00	-28.00	Vertical
Test channel		Lowest	Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Correct factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	37.96	-6.35	31.61	54.00	-22.39	Horizontal
5460.00	39.34	-5.36	33.98	54.00	-20.02	Horizontal
5350.00	38.87	-6.35	32.52	54.00	-21.48	Vertical
5460.00	39.01	-5.36	33.65	54.00	-20.35	Vertical

802.11n-HT20

Test channel		Lowest	Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Correct factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	52.23	-6.35	45.88	74.00	-28.12	Horizontal
5460.00	51.87	-5.36	46.51	74.00	-27.49	Horizontal
5350.00	52.26	-6.35	45.91	74.00	-28.09	Vertical
5460.00	53.69	-5.36	48.33	74.00	-25.67	Vertical
Test channel		Lowest	Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Correct factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	39.36	-6.35	33.01	54.00	-20.99	Horizontal
5460.00	40.17	-5.36	34.81	54.00	-19.19	Horizontal
5350.00	41.28	-6.35	34.93	54.00	-19.07	Vertical
5460.00	42.39	-5.36	37.03	54.00	-16.97	Vertical

802.11n-HT40

Test channel		Lowest	Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Correct factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	52.37	-6.35	46.02	74.00	-27.98	Horizontal
5460.00	53.16	-5.36	47.80	74.00	-26.20	Horizontal
5350.00	51.25	-6.35	44.90	74.00	-29.10	Vertical
5460.00	54.28	-5.36	48.92	74.00	-25.08	Vertical
Test channel		Lowest	Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Correct factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	38.03	-6.35	31.68	54.00	-22.32	Horizontal
5460.00	37.45	-5.36	32.09	54.00	-21.91	Horizontal

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5350.00	35.36	-6.35	29.01	54.00	-24.99	Vertical
5460.00	36.03	-5.36	30.67	54.00	-23.33	Vertical

802.11ac-HT80

Test channel		Lowest	Level		Peak	
Frequency (MHz)	Read Level (dBuV/m)	Correct factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	53.14	-6.35	46.79	74.00	-27.21	Horizontal
5460.00	52.28	-5.36	46.92	74.00	-27.08	Horizontal
5350.00	52.47	-6.35	46.12	74.00	-27.88	Vertical
5460.00	53.05	-5.36	47.69	74.00	-26.31	Vertical
Test channel		Lowest	Level		Average	
Frequency (MHz)	Read Level (dBuV/m)	Correct factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	38.81	-6.35	32.46	54.00	-21.54	Horizontal
5460.00	39.36	-5.36	34.00	54.00	-20.00	Horizontal
5350.00	40.04	-6.35	33.69	54.00	-20.31	Vertical
5460.00	41.58	-5.36	36.22	54.00	-17.78	Vertical

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.
3. Correct factor = Antenna Factor + Cable Loss – Preamplifier Factor

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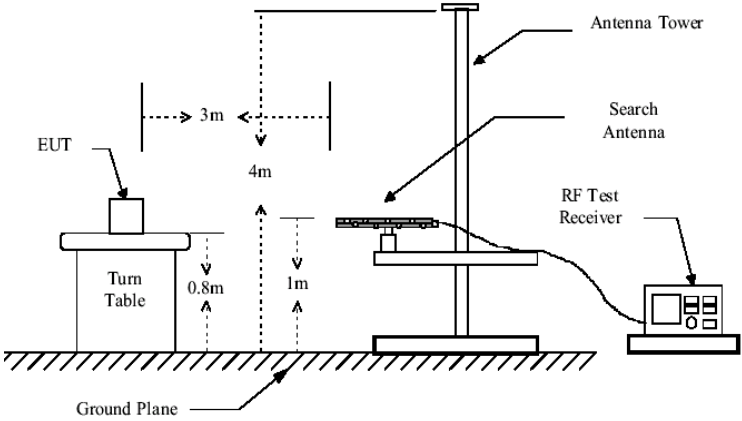
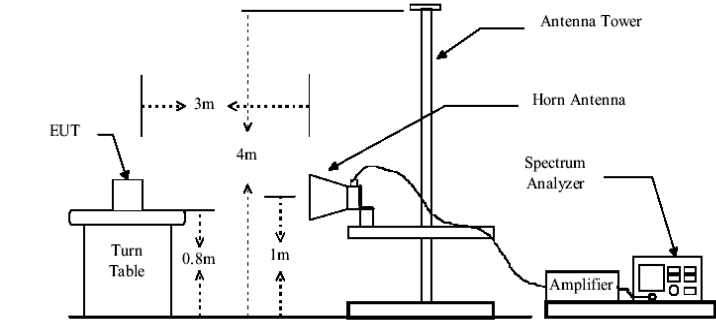
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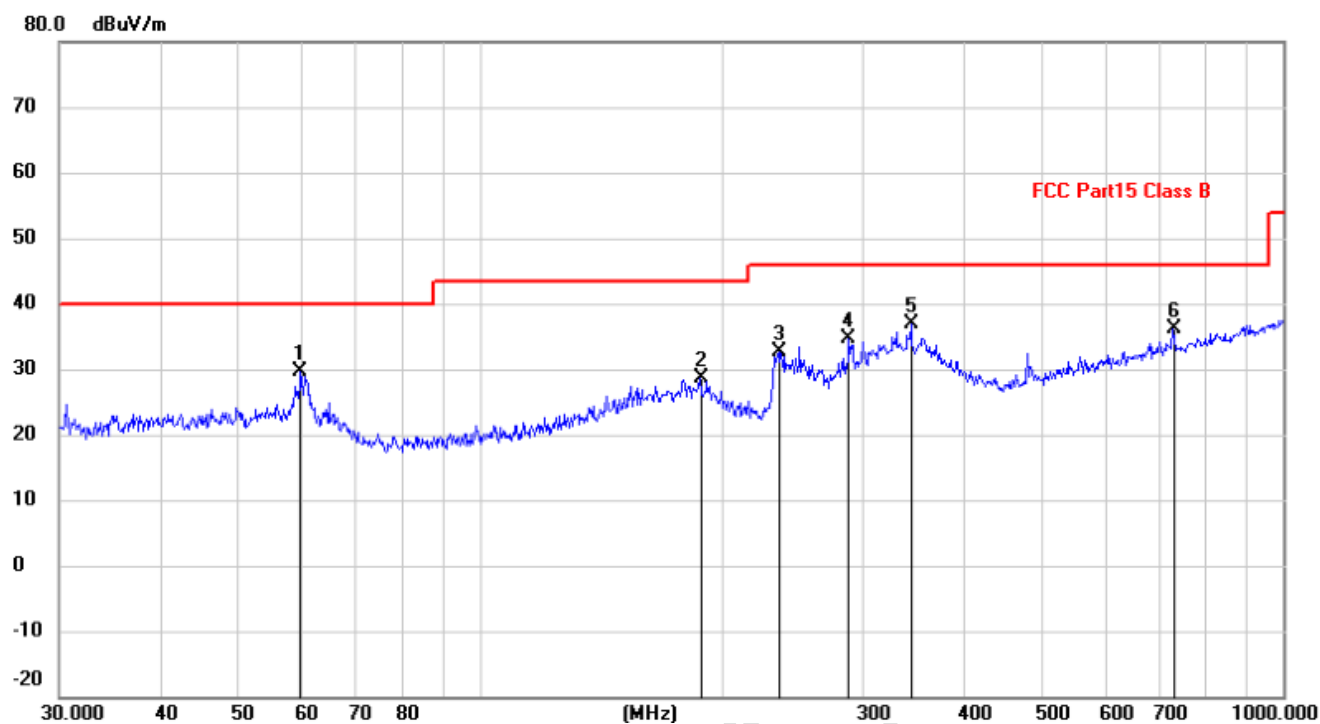
6.7.2 Unwanted Emissions in the Restricted Bands

Test Requirement:	FCC Part15 C Section 15.209 and 15.205																											
Test Method:	ANSI C63.10:2013																											
Test Frequency Range:	30MHz to 40GHz																											
Test site:	Measurement Distance: 3m																											
Receiver setup:	<table><tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr><tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>100kHz</td><td>300kHz</td><td>Quasi-peak Value</td></tr><tr><td>Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr></table>					Frequency	Detector	RBW	VBW	Remark	30MHz-1GHz	Quasi-peak	100kHz	300kHz	Quasi-peak Value	Above 1GHz	Peak	1MHz	3MHz	Peak Value								
Frequency	Detector	RBW	VBW	Remark																								
30MHz-1GHz	Quasi-peak	100kHz	300kHz	Quasi-peak Value																								
Above 1GHz	Peak	1MHz	3MHz	Peak Value																								
Limit:	<table><tr><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Remark</td></tr><tr><td>30MHz-88MHz</td><td>40.0</td><td>Quasi-peak Value</td></tr><tr><td>88MHz-216MHz</td><td>43.5</td><td>Quasi-peak Value</td></tr><tr><td>216MHz-960MHz</td><td>46.0</td><td>Quasi-peak Value</td></tr><tr><td>960MHz-1GHz</td><td>54.0</td><td>Quasi-peak Value</td></tr></table> <table><tr><td>Frequency</td><td>Limit (dBm/MHz)</td><td>Remark</td></tr><tr><td rowspan="2">Above 1GHz</td><td>68.20</td><td>Peak Value</td></tr><tr><td>54.00</td><td>Average Value</td></tr></table> Remark: 1. Above 1GHz limit: $E[dBuV/m] = EIRP[dBm] + 95.2=68.2 \text{ dBuV/m}$, for $EIPR[dBm]=-27dBm$.					Frequency	Limit (dBuV/m @3m)	Remark	30MHz-88MHz	40.0	Quasi-peak Value	88MHz-216MHz	43.5	Quasi-peak Value	216MHz-960MHz	46.0	Quasi-peak Value	960MHz-1GHz	54.0	Quasi-peak Value	Frequency	Limit (dBm/MHz)	Remark	Above 1GHz	68.20	Peak Value	54.00	Average Value
Frequency	Limit (dBuV/m @3m)	Remark																										
30MHz-88MHz	40.0	Quasi-peak Value																										
88MHz-216MHz	43.5	Quasi-peak Value																										
216MHz-960MHz	46.0	Quasi-peak Value																										
960MHz-1GHz	54.0	Quasi-peak Value																										
Frequency	Limit (dBm/MHz)	Remark																										
Above 1GHz	68.20	Peak Value																										
	54.00	Average Value																										
Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.																											

Test setup:	Below 1GHz  Above 1GHz 
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Below 1GHz

Horizontal:



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		59.8588	16.62	12.96	29.58	40.00	-10.42	QP
2		187.7530	18.27	10.41	28.68	43.50	-14.82	QP
3		235.8164	20.30	12.42	32.72	46.00	-13.28	QP
4		287.9904	21.47	13.18	34.65	46.00	-11.35	QP
5	*	344.3855	21.94	14.82	36.76	46.00	-9.24	QP
6		729.3583	13.20	22.87	36.07	46.00	-9.93	QP

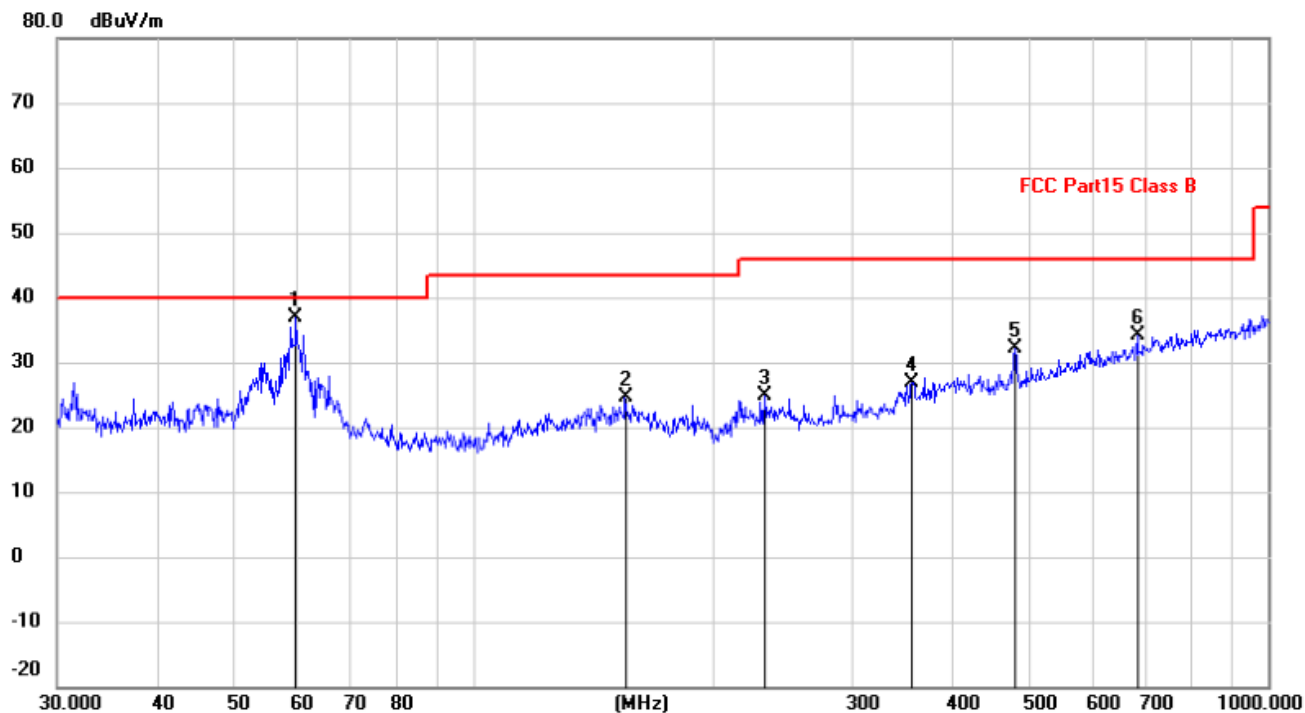
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Vertical:



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
		MHz	Level	Factor	ment			Detector
			dBuV	dB	dBuV/m	dBuV/m	dB	
1	*	59.8588	23.83	12.96	36.79	40.00	-3.21	QP
2		155.3644	11.49	13.03	24.52	43.50	-18.98	QP
3		232.5318	12.78	12.19	24.97	46.00	-21.03	QP
4		356.6758	11.73	15.19	26.92	46.00	-19.08	QP
5		480.5276	13.84	18.41	32.25	46.00	-13.75	QP
6		684.7454	11.87	22.16	34.03	46.00	-11.97	QP

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Above 1GHz:
Band 1:

802.11a mode Lowest channel (Peak Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.00	50.03	2.56	52.59	68.20	-15.61	Vertical
10360.00	48.48	2.56	51.04	68.20	-17.16	Horizontal
802.11a mode Lowest channel (Average Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.00	35.03	2.56	37.59	54.00	-16.41	Vertical
10360.00	34.12	2.56	36.68	54.00	-17.32	Horizontal

802.11a mode Middle channel (Peak Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400.00	49.36	2.71	52.07	68.20	-16.13	Vertical
10400.00	48.47	2.71	51.18	68.20	-17.02	Horizontal
802.11a mode Middle channel (Average Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400.00	35.54	2.71	38.25	54.00	-15.75	Vertical
10400.00	33.23	2.71	35.94	54.00	-18.06	Horizontal

802.11a mode Highest channel (Peak Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480.00	48.81	3.04	51.85	68.20	-16.35	Vertical
10480.00	47.75	3.04	50.79	68.20	-17.41	Horizontal
802.11a mode Highest channel (Average Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480.00	34.14	3.04	37.18	54.00	-16.82	Vertical
10480.00	33.37	3.04	36.41	54.00	-17.59	Horizontal

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802.11n20 mode Lowest channel (Peak Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.00	48.43	2.56	50.99	68.20	-17.21	Vertical
10360.00	48.16	2.56	50.72	68.20	-17.48	Horizontal
802.11n20 mode Lowest channel (Average Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.00	34.34	2.56	36.90	54.00	-17.10	Vertical
10360.00	33.68	2.56	36.24	54.00	-17.76	Horizontal

802.11n20 mode Middle channel (Peak Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400.00	49.36	2.71	52.07	68.20	-16.13	Vertical
10400.00	48.17	2.71	50.88	68.20	-17.32	Horizontal
802.11n20 mode Middle channel (Average Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400.00	35.11	2.71	37.82	54.00	-16.18	Vertical
10400.00	36.03	2.71	38.74	54.00	-17.32	Horizontal

802.11n20 mode Highest channel (Peak Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480.00	50.07	3.04	53.11	68.20	-15.09	Vertical
10480.00	47.63	3.04	50.67	68.20	-17.53	Horizontal
802.11n20 mode Highest channel (Average Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480.00	33.74	3.04	36.78	54.00	-17.22	Vertical
10480.00	35.55	3.04	38.59	54.00	-15.41	Horizontal

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802.11n40 mode Lowest channel (Peak Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10380.00	48.36	2.65	51.01	68.20	-17.19	Vertical
10380.00	49.21	2.65	51.86	68.20	-16.34	Horizontal
802.11n40 mode Lowest channel (Average Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10380.00	32.74	2.65	35.39	54.00	-18.61	Vertical
10380.00	33.23	2.65	35.88	54.00	-18.12	Horizontal

802.11n40 mode Highest channel (Peak Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10460.00	49.69	2.87	52.56	68.20	-15.64	Vertical
10460.00	48.74	2.87	51.61	68.20	-16.59	Horizontal
802.11n40 mode Highest channel (Average Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10460.00	35.53	2.87	38.40	54.00	-15.60	Vertical
10460.00	34.07	2.87	36.94	54.00	-17.06	Horizontal

802.11ac20 mode Lowest channel (Peak Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.00	48.51	2.56	51.07	68.20	-17.13	Vertical
10360.00	48.07	2.56	50.63	68.20	-17.57	Horizontal
802.11ac20 mode Lowest channel (Average Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.00	33.67	2.56	36.23	54.00	-17.77	Vertical
10360.00	34.72	2.56	37.28	54.00	-16.72	Horizontal

802.11ac20 mode Middle channel (Peak Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400.00	49.77	2.71	52.48	68.20	-15.72	Vertical
10400.00	49.23	2.71	51.94	68.20	-16.26	Horizontal

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802.11ac20 mode Middle channel (Average Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400.00	33.36	2.71	36.07	54.00	-17.98	Vertical
10400.00	34.51	2.71	37.22	54.00	-16.78	Horizontal

802.11ac20 mode Highest channel (Peak Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480.00	49.67	3.04	52.71	68.20	-15.49	Vertical
10480.00	48.85	3.04	51.89	68.20	-16.31	Horizontal

802.11ac20 mode Highest channel (Average Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480.00	34.46	3.04	37.50	54.00	-16.50	Vertical
10480.00	35.05	3.04	38.09	54.00	-15.91	Horizontal

802.11ac40 mode Lowest channel (Peak Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10380.00	47.74	2.65	50.39	68.20	-17.81	Vertical
10380.00	49.63	2.65	52.28	68.20	-15.92	Horizontal

802.11ac40 mode Lowest channel (Average Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10380.00	36.36	2.65	39.01	54.00	-14.99	Vertical
10380.00	34.41	2.65	37.05	54.00	-16.94	Horizontal

802.11ac40 mode Highest channel (Peak Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10460.00	50.11	2.87	52.98	68.20	-15.22	Vertical
10460.00	48.47	2.87	51.34	68.20	-16.86	Horizontal

802.11ac40 mode Highest channel (Average Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10460.00	35.22	2.87	38.09	54.00	-15.91	Vertical
10460.00	33.75	2.87	36.62	54.00	-17.38	Horizontal

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802.11ac80 mode Middle channel (Peak Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10420.00	48.68	2.79	51.47	68.20	-16.73	Vertical
10420.00	49.71	2.79	52.50	68.20	-15.70	Horizontal
802.11ac80 mode Middle channel (Average Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10420.00	34.04	2.79	36.83	54.00	-17.17	Vertical
10420.00	33.13	2.79	35.92	54.00	-18.08	Horizontal

Remark:

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
3. *Correct factor = Antenna Factor + Cable Loss – Preamplifier Factor*

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Band 4:

802.11a mode Lowest channel (Peak Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11490.00	46.35	3.84	50.19	68.20	-18.01	Vertical
11490.00	45.14	3.84	48.98	68.20	-19.22	Horizontal

802.11a mode Lowest channel (Average Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11490.00	31.47	3.84	35.31	54.00	-18.69	Vertical
11490.00	33.69	3.84	37.53	54.00	-16.47	Horizontal

802.11a mode Middle channel (Peak Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11570.00	47.74	3.91	51.65	68.20	-16.55	Vertical
11570.00	46.63	3.91	50.54	68.20	-17.66	Horizontal

802.11a mode Middle channel (Average Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11570.00	31.17	3.91	35.08	54.00	-18.92	Vertical
11570.00	32.26	3.91	36.17	54.00	-17.83	Horizontal

802.11a mode Highest channel (Peak Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11650.00	46.69	4.23	50.92	68.20	-17.28	Vertical
11650.00	47.73	4.23	51.96	68.20	-16.24	Horizontal

802.11a mode Highest channel (Average Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11650.00	32.02	4.23	36.25	54.00	-17.75	Vertical
11650.00	31.77	4.23	36.00	54.00	-18.00	Horizontal

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802.11n20 mode Lowest channel (Peak Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11490.00	46.63	3.84	50.47	68.20	-17.73	Vertical
11490.00	45.59	3.84	49.43	68.20	-18.77	Horizontal
802.11n20 mode Lowest channel (Average Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11490.00	32.06	3.84	35.90	54.00	-18.10	Vertical
11490.00	33.17	3.84	37.01	54.00	-16.99	Horizontal

802.11n20 mode Middle channel (Peak Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11570.00	47.71	3.91	51.62	68.20	-16.58	Vertical
11570.00	46.36	3.91	50.27	68.20	-17.93	Horizontal
802.11n20 mode Middle channel (Average Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11570.00	32.03	3.91	35.94	54.00	-18.06	Vertical
11570.00	33.69	3.91	37.60	54.00	-16.40	Horizontal

802.11n20 mode Highest channel (Peak Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11650.00	45.69	4.23	49.92	68.20	-18.28	Vertical
11650.00	45.41	4.23	49.64	68.20	-18.56	Horizontal
802.11n20 mode Highest channel (Average Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11650.00	30.01	4.23	34.24	54.00	-19.76	Vertical
11650.00	31.11	4.23	35.34	54.00	-18.66	Horizontal

802.11n40 mode Lowest channel (Peak Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11510.00	47.69	3.88	51.57	68.20	-16.63	Vertical
11510.00	46.03	3.88	49.91	68.20	-18.29	Horizontal
802.11n40 mode Lowest channel (Average Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11510.00	33.03	3.88	36.91	54.00	-17.09	Vertical
11510.00	31.17	3.88	35.05	54.00	-18.95	Horizontal

802.11n40 mode Highest channel (Peak Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11590.00	46.63	4.02	50.65	68.20	-17.55	Vertical
11590.00	45.57	4.02	49.59	68.20	-18.61	Horizontal
802.11n40 mode Highest channel (Average Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11590.00	32.03	4.02	36.05	54.00	-17.95	Vertical
11590.00	33.19	4.02	37.21	54.00	-16.79	Horizontal

802.11ac20 mode Lowest channel (Peak Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11490.00	47.71	3.84	51.55	68.20	-16.65	Vertical
11490.00	46.03	3.84	49.87	68.20	-18.33	Horizontal
802.11ac20 mode Lowest channel (Average Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11490.00	31.33	3.84	35.17	54.00	-18.83	Vertical
11490.00	32.28	3.84	36.12	54.00	-17.88	Horizontal

802.11ac20 mode Middle channel (Peak Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11570.00	47.63	3.91	51.54	68.20	-16.66	Vertical
11570.00	46.34	3.91	50.25	68.20	-17.95	Horizontal
802.11ac20 mode Middle channel (Average Value)						

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Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11570.00	31.25	3.91	35.16	54.00	-18.84	Vertical
11570.00	32.69	3.91	36.60	54.00	-17.40	Horizontal

802.11ac20 mode Highest channel (Peak Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11650.00	46.69	4.23	50.92	68.20	-17.28	Vertical
11650.00	45.37	4.23	49.60	68.20	-18.60	Horizontal
802.11ac20 mode Highest channel (Average Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11650.00	31.11	4.23	35.34	54.00	-18.66	Vertical
11650.00	32.69	4.23	36.92	54.00	-17.08	Horizontal

802.11ac40 mode Lowest channel (Peak Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11510.00	46.37	3.88	50.25	68.20	-17.95	Vertical
11510.00	45.59	3.88	49.47	68.20	-18.73	Horizontal
802.11ac40 mode Lowest channel (Average Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11510.00	32.03	3.88	35.91	54.00	-18.09	Vertical
11510.00	33.17	3.88	37.05	54.00	-16.95	Horizontal

802.11ac40 mode Highest channel (Peak Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11590.00	47.06	4.02	51.08	68.20	-17.12	Vertical
11590.00	46.69	4.02	50.71	68.20	-17.49	Horizontal
802.11ac40 mode Highest channel (Average Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11590.00	33.66	4.02	37.68	54.00	-16.32	Vertical
11590.00	31.24	4.02	35.26	54.00	-18.74	Horizontal

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802.11ac80 mode Middle channel (Peak Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11550.00	46.36	3.89	50.25	68.20	-17.95	Vertical
11550.00	45.57	3.89	49.46	68.20	-18.74	Horizontal
802.11ac80 mode Middle channel (Average Value)						
Frequency (MHz)	Read Level (dBuV)	Correct factor(dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11550.00	31.17	3.89	35.06	54.00	-18.94	Vertical
11550.00	32.52	3.89	36.41	54.00	-17.59	Horizontal

Remark:

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
3. *Correct factor = Antenna Factor + Cable Loss – Preamplifier Factor*

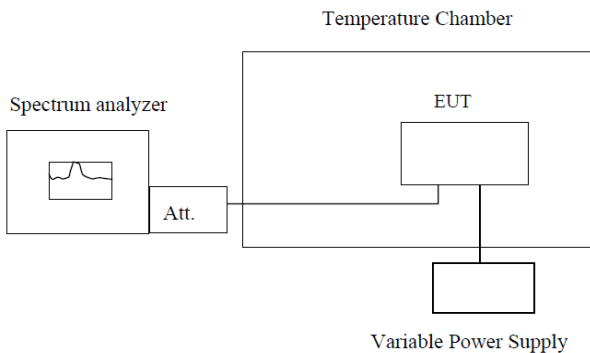
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6.8 Frequency stability

Test Requirement:	FCC Part15 E Section 15.407 (g)
Limit:	Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.
Test setup:	 Temperature Chamber Spectrum analyzer Att. EUT Variable Power Supply Note : Measurement setup for testing on Antenna connector
Test procedure:	1. The EUT is installed in an environment test chamber with external power source. 2. Set the chamber to operate at 50 centigrade and external power source to output at nominal voltage of EUT. 3. A sufficient stabilization period at each temperature is used prior to each frequency measurement. 4. When temperature is stabled, measure the frequency stability. 5. The test shall be performed under -30 to 50 centigrade and 85 to 115 percent of the nominal voltage. Change setting of chamber and external power source to complete all conditions.
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details, and all channels have been tested, only shows the worst channel data in this report.
Test results:	Passed

Measurement Data (the worst channel):

Band 1:

Voltage vs. Frequency Stability (Lowest channel=5180MHz)

Test conditions		Frequency(MHz)	Max. Deviation (ppm)
Temp(°C)	Voltage(AC /60Hz)		
20	138	5179.995414	0.88
	120	5179.991475	1.65
	102	5179.993654	1.23

Temperature vs. Frequency Stability (Lowest channel=5180MHz)

Test conditions		Frequency(MHz)	Max. Deviation (ppm)
Voltage(AC /60Hz)	Temp(°C)		
120	-20	5179.972512	5.31
	-10	5179.976471	4.54
	0	5179.988512	2.22
	10	5179.985123	2.87
	20	5179.988745	2.17
	30	5179.982568	3.37
	40	5179.987419	2.43
	50	5179.985245	2.85

Band 4:

Voltage vs. Frequency Stability (Lowest channel=5745MHz)

Test conditions		Frequency(MHz)	Max. Deviation (ppm)
Temp(°C)	Voltage(AC /60Hz)		
20	138	5744.987485	2.18
	120	5744.987415	2.16
	102	5744.986981	2.27

Temperature vs. Frequency Stability (Lowest channel=5745MHz)

Test conditions		Frequency(MHz)	Max. Deviation (ppm)
Voltage(AC /60Hz)	Temp(°C)		
120	-20	5744.992525	1.30
	-10	5744.994571	0.94
	0	5744.987415	2.19
	10	5744.995236	0.83
	20	5744.991478	1.48
	30	5744.994578	0.94
	40	5744.982654	3.02
	50	5744.994742	0.92

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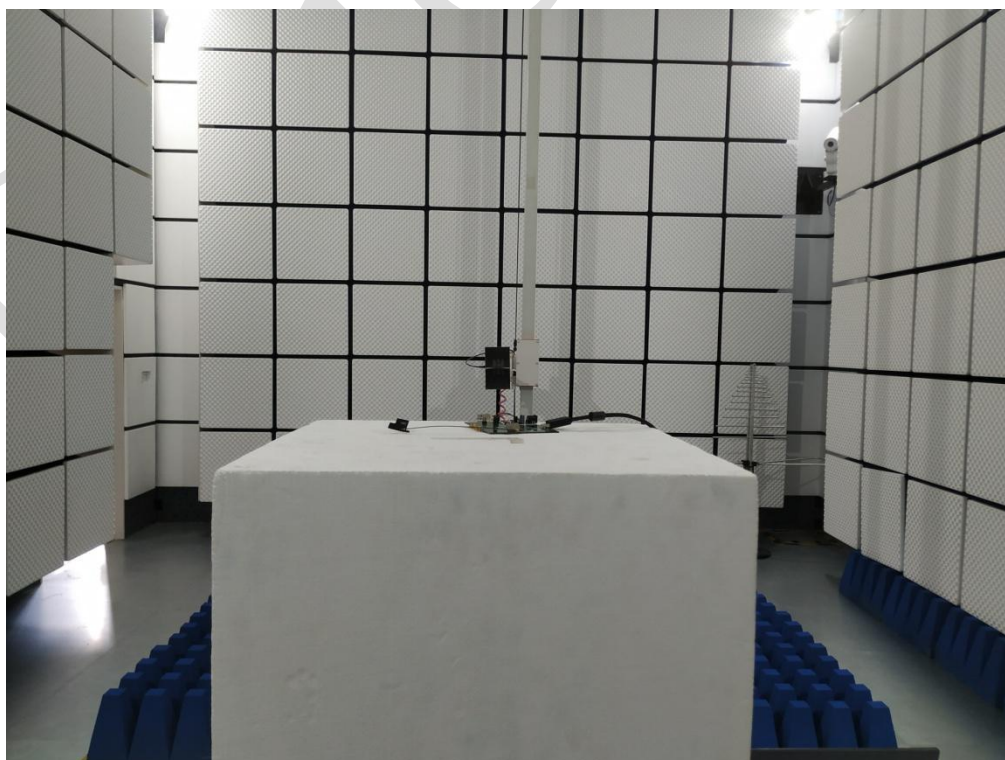
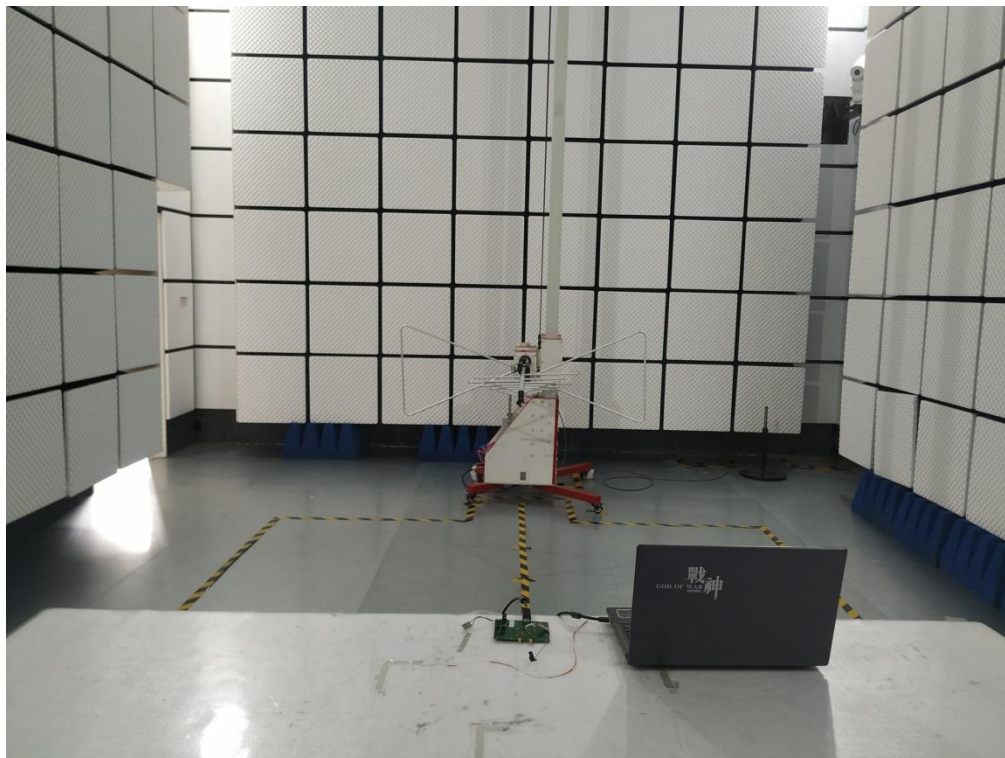
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7 Test Setup Photo

Radiated emission



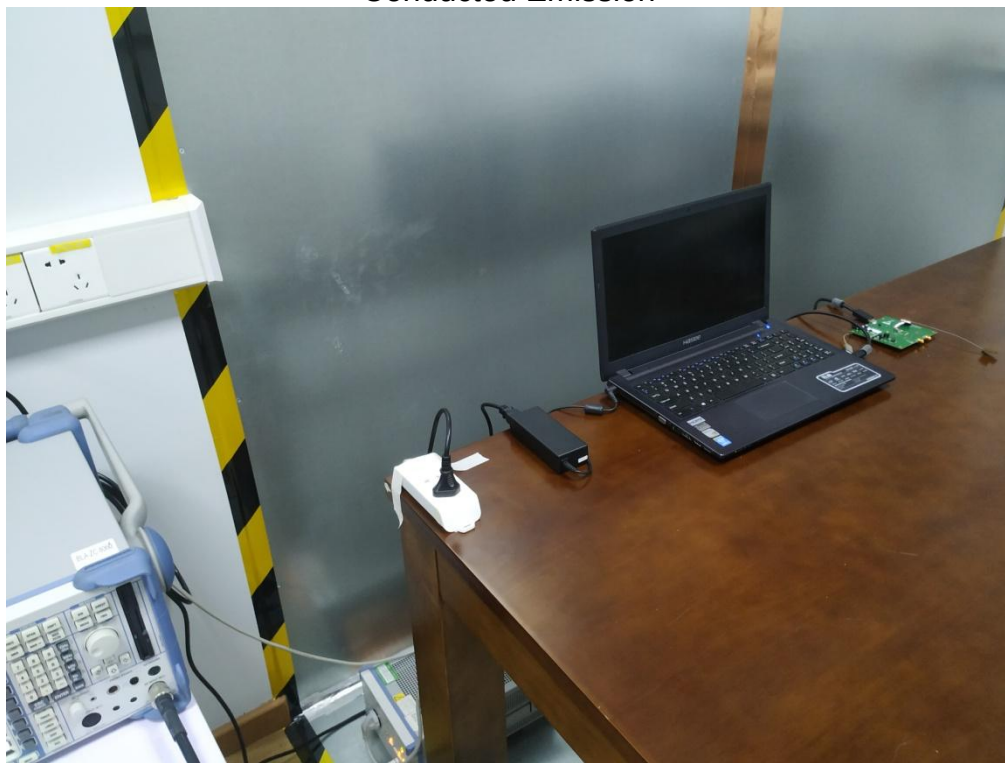
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Conducted Emission



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8 EUT Constructional Details

Reference to the test report No. BLA-EMC-201906-A38-01

-----End of report-----

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