



FCC TEST REPORT

Test report
On Behalf of
Things on Edge
For
Cricket

Model List : REV 1.0

FCC ID: 2AW7I-VEV

Prepared for : Things on Edge
1 Cammell Walk, CB259LT, Cambridge, United Kingdom

Prepared By : Shenzhen HUAKE Testing Technology Co., Ltd.
1F, B2 Building, Junfeng Zhongcheng Zhizao Innovation Park, Fuhai
Street, Bao'an District, Shenzhen City, China

Date of Test: Jul. 31, 2020 ~ Aug. 11, 2020

Date of Report: Aug. 11, 2020

Report Number: HK2008072126-E



TEST RESULT CERTIFICATION

Applicant's name: Things on Edge

Address.....: 1 Cammell Walk, CB259LT, Cambridge, United Kingdom

Manufacture's Name.....: Things on Edge

Address.....: 1 Cammell Walk, CB259LT, Cambridge, United Kingdom

Product description

Trade Mark : N/A

Product name.....: Cricket

Model and/or type reference : REV 1.0

Standards: FCC Part 15 Subpart C Section 15.247

This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen HUAK Testing Technology Co., Ltd. is acknowledged as copyright owner and source of the material. Shenzhen HUAK Testing Technology Co., Ltd. takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

Date of Test:

Date (s) of performance of tests: Jul. 31, 2020 ~ Aug. 11, 2020

Date of Issue.....: Aug. 11, 2020

Test Result: **Pass**

Testing Engineer :

(Gary Qian)

Technical Manager :

(Eden Hu)

Authorized Signatory :

(Jason Zhou)



TABLE OF CONTENTS

1. Test Result Summary	4
1.1. TEST PROCEDURES AND RESULTS	4
1.2. TEST FACILITY	4
1.3. Measurement Uncertainty.....	5
2. EUT Description	6
2.1. GENERAL DESCRIPTION OF EUT	6
2.2. Carrier Frequency of Channels.....	6
2.3. Operation of EUT during testing	6
2.4. DESCRIPTION OF TEST SETUP	7
3. General Information	8
3.1. Test environment and mode	8
3.2. Description of Support Units	9
4. Test Results and Measurement Data.....	10
4.1. Conducted Emission.....	10
4.2. Maximum Conducted Output Power	14
4.3. Emission Bandwidth	16
4.4. Power Spectral Density	21
4.5. Conducted Band Edge and Spurious Emission Measurement	26
4.6. Radiated Spurious Emission Measurement	40
4.7. ANTENNA REQUIREMENT	61
4.8. PHOTOGRAPH OF TEST	62
5. PHOTOS OF THE EUT	64



1. Test Result Summary

1.1. TEST PROCEDURES AND RESULTS

Requirement	CFR 47 Section	Result
Antenna requirement	§15.203/§15.247 (c)	PASS
AC Power Line Conducted Emission	§15.207	PASS
Conducted Peak Output Power	§15.247 (b)(3)	PASS
6dB Emission Bandwidth	§15.247 (a)(2)	PASS
Power Spectral Density	§15.247 (e)	PASS
Band Edge	§15.247(d)	PASS
Spurious Emission	§15.205/§15.209	PASS

Note:

1. PASS: Test item meets the requirement.
2. Fail: Test item does not meet the requirement.
3. N/A: Test case does not apply to the test object.
4. The test result judgment is decided by the limit of test standard.

1.2. TEST FACILITY

Test Firm : Shenzhen HUAKE Testing Technology Co., Ltd.

Address 1F, B2 Building, Junfeng Zhongcheng Zhizao Innovation Park, Fuhai Street, Bao'an District, Shenzhen City, China



1.3. Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	$\pm 2.56\text{dB}$
2	RF power, conducted	$\pm 0.12\text{dB}$
3	Spurious emissions, conducted	$\pm 0.11\text{dB}$
4	All emissions, radiated(<1G)	$\pm 3.92\text{dB}$
5	All emissions, radiated(>1G)	$\pm 4.28\text{dB}$
6	Temperature	$\pm 0.1^{\circ}\text{C}$
7	Humidity	$\pm 1.0\%$



2. EUT Description

2.1. GENERAL DESCRIPTION OF EUT

Equipment	Cricket
Model Name	REV 1.0
Serial No.	N/A
Trade Mark	N/A
FCC ID	2AW7I-VEV
Hardware Version:	V1.0
Software Version:	V2.58
Operation frequency	802.11b/g/n 20: 2412~2462 MHz
Number of Channels	802.11b/g/n20: 11CH
Antenna Type	PCB Antenna
Antenna Gain	0dBi
Modulation Type	CCK/DSSS/OFDM
Power Source	DC 5.0V from PC/others

2.2. Carrier Frequency of Channels

Channel List for 802.11b/802.11g/802.11n (HT20)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	04	2427	07	2442	10	2457
02	2417	05	2432	08	2447	11	2462
03	2422	06	2437	09	2452		

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.

2.3. Operation of EUT during testing

Operating Mode

The mode is used: **Transmitting mode for 802.11b/802.11g/802.11n (HT20)**

Low Channel: 2412MHz

Middle Channel: 2437MHz

High Channel: 2462MHz

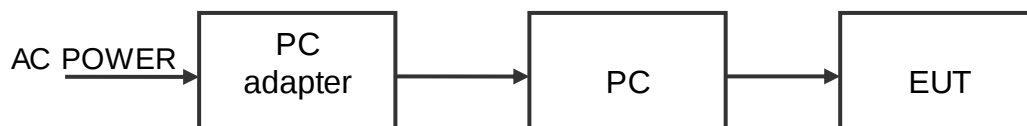


2.4. DESCRIPTION OF TEST SETUP

Operation of EUT during conducted testing:



Operation of EUT during Radiation and Above1GHz Radiation testing:





3. General Information

3.1. Test environment and mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	56 % RH
Atmospheric Pressure:	1010 mbar
Test Mode:	
Engineering mode:	Keep the EUT in continuous transmitting by select channel and modulations(The value of duty cycle is 98.37%)
The sample was placed (0.8m below 1GHz, 1.5m above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. For the full battery state and The output power to the maximum state.	

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
802.11b	1Mbps
802.11g	6Mbps
802.11n(H20)	MCS0

Final Test Mode:

Operation mode:	Keep the EUT in continuous transmitting with modulation
1. For WIFI function, the engineering test program was provided and enabled to make EUT continuous transmit/receive. 2. According to ANSI C63.10 standards, the test results are both the “worst case” and “worst setup” 1Mbps for 802.11b, 6Mbps for 802.11g, MCS0 for 802.11n(H20). Duty cycle setting during the transmission is 98.37% with maximum power setting for all modulations.	



3.2. Description of Support Units

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

Description	Model No.	Manufacturer	Remark	Certificate
PC Adapter	MODEL:PW25T12A1 INPUT:100-240V AC 50/60Hz OUTPUT:12V 6A	DELL	Provide by lab	sdoc
PC	Model: TP00067A	DELL	Provide by lab	id

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.
3. For conducted measurements (Output Power, 6dB Emission Bandwidth, Power Spectral Density, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.



4. Test Results and Measurement Data

4.1. Conducted Emission

Test Specification

Test Requirement:	FCC Part15 C Section 15.207														
Test Method:	ANSI C63.10:2013														
Frequency Range:	150 kHz to 30 MHz														
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto														
Limits:	<table><tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBuV)</th></tr><tr><th>Quasi-peak</th><th>Average</th></tr><tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr><tr><td>0.5-5</td><td>56</td><td>46</td></tr><tr><td>5-30</td><td>60</td><td>50</td></tr></table>	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
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													
Test Setup:	Reference Plane 40cm 80cm E.U.T AC power Test table/Insulation plane LISN Filter AC power EMI Receiver Remark E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m														
Test Mode:	Charging + transmitting with modulation														
Test Procedure:	1. The E.U.T is connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.														
Test Result:	PASS														

Test Instruments



Conducted Emission Shielding Room Test Site (843)				
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Receiver	R&S	ESCI 7	HKE-010	Dec. 26, 2020
LISN	R&S	ENV216	HKE-002	Dec. 26, 2020
Conducted test software	Tonscend	TS+ Rev 2.5.0.0	HKE-081	N/A

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

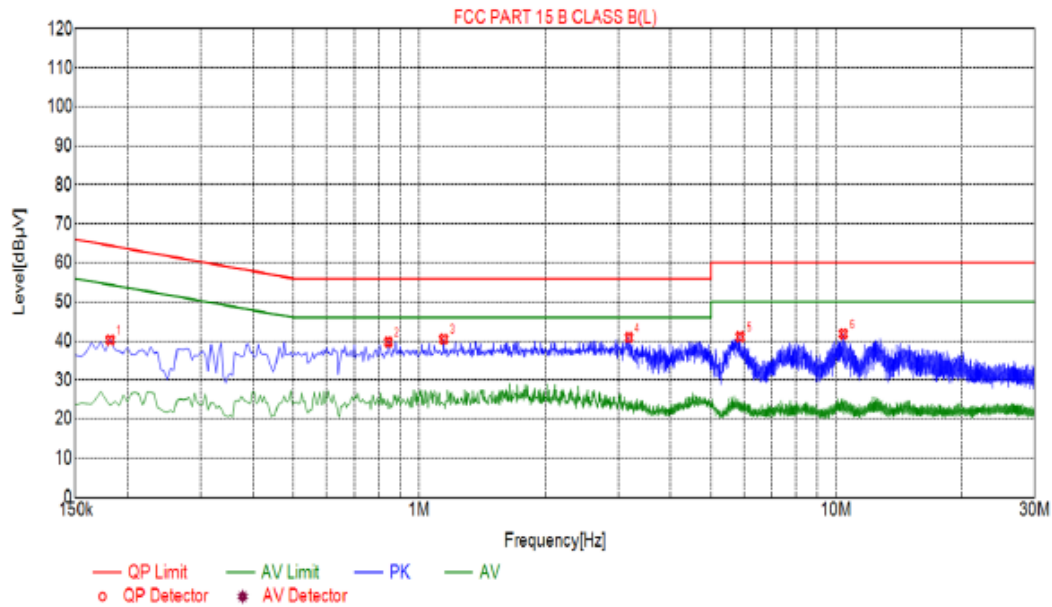


Test data

Note :

All the test modes completed for test. only the worst result of AC 120V/60Hz(802.11b at 2412MHz) was reported as below:

Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



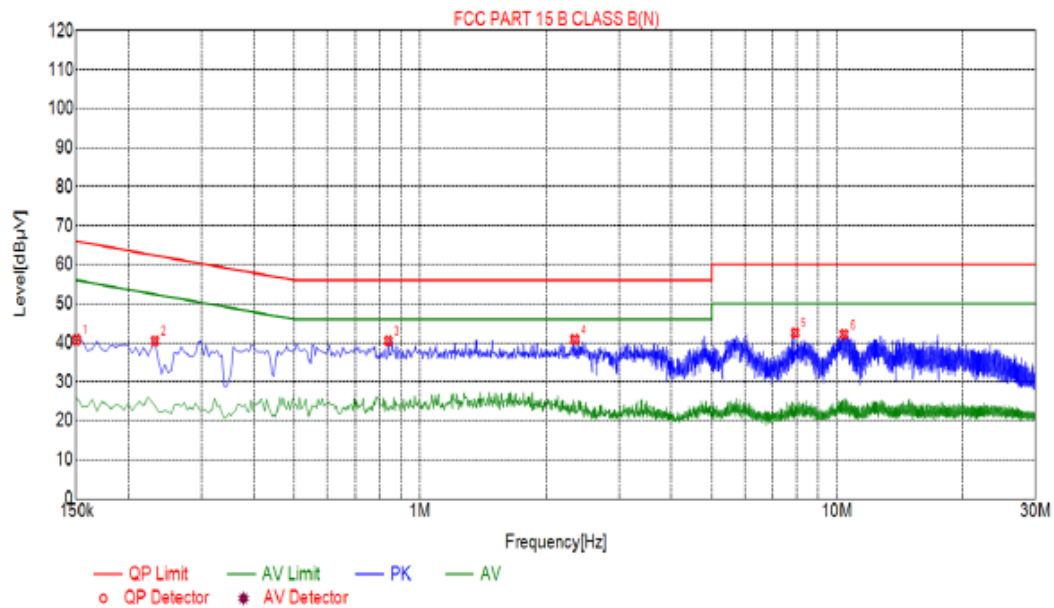
Suspected List

NO.	Freq. [MHz]	Level [dBμV]	Factor [dB]	Limit [dBμV]	Margin [dB]	Reading [dBμV]	Detector	Type
1	0.1815	40.24	10.06	64.42	24.18	30.18	PK	L
2	0.8430	39.74	10.06	56.00	16.26	29.68	PK	L
3	1.1445	40.45	10.09	56.00	15.55	30.36	PK	L
4	3.1875	40.87	10.23	56.00	15.13	30.64	PK	L
5	5.8875	41.04	10.23	60.00	18.96	30.81	PK	L
6	10.3965	41.83	10.04	60.00	18.17	31.79	PK	L

Remark: Margin = Limit – Level

Correction factor = Cable lose + LISN insertion loss

Level=Test receiver reading + correction factor

**Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)**

Suspected List								
NO.	Freq. [MHz]	Level [dBμV]	Factor [dB]	Limit [dBμV]	Margin [dB]	Reading [dBμV]	Detector	Type
1	0.1500	40.71	10.03	66.00	25.29	30.68	PK	N
2	0.2310	40.47	10.03	62.41	21.94	30.44	PK	N
3	0.8385	40.49	10.06	56.00	15.51	30.43	PK	N
4	2.3505	40.82	10.18	56.00	15.18	30.64	PK	N
5	7.9395	42.54	10.15	60.00	17.46	32.39	PK	N
6	10.3920	42.18	10.04	60.00	17.82	32.14	PK	N

Remark: Margin = Limit – Level

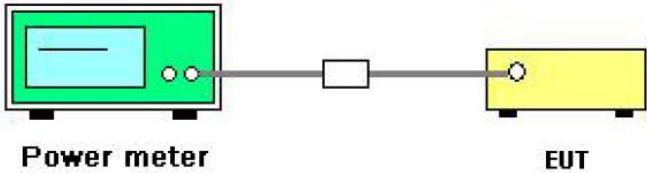
Correction factor = Cable lose + LISN insertion loss

Level=Test receiver reading + correction factor



4.2. Maximum Conducted Output Power

Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	KDB 558074
Limit:	30dBm
Test Setup:	 The diagram illustrates the test setup. On the left is a green box labeled 'Power meter'. A cable connects it to a small white box labeled 'Attenuator'. Another cable connects the attenuator to a yellow box labeled 'EUT' (Equipment Under Test).
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. The testing follows the Measurement Procedure of FCC KDB 558074 D01 guidance V05r02 2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement. 3. Set to the maximum power setting and enable the EUT transmit continuously. 4. Measure the Peak output power and record the results in the test report.
Test Result:	PASS

Test Instruments

RF Test Room				
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Power meter	Agilent	E4417B	HKE-107	Dec. 26, 2020
Power Sensor	Agilent	U2021X	HKE-113	Dec. 26, 2020
RF cable	Times	1-40G	HKE-034	Dec. 26, 2020
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Dec. 26, 2020

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

Test Data



TX 802.11b Mode			
Test Channe	Frequency	Maximum Peak Conducted Output Power	LIMIT
	(MHz)	(dBm)	dBm
CH01	2412	13.94	30
CH06	2437	11.73	30
CH11	2462	12.48	30
TX 802.11g Mode			
CH01	2412	12.71	30
CH06	2437	11.14	30
CH11	2462	12.01	30
TX 802.11n20 Mode			
CH01	2412	12.48	30
CH06	2437	11.90	30
CH11	2462	11.83	30



4.3. Emission Bandwidth

Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	KDB 558074
Limit:	>500kHz
Test Setup:	 Spectrum Analyzer EUT
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v05r02. 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6dB bandwidth must be greater than 500 kHz. 4. Measure and record the results in the test report.
Test Result:	PASS

Test Instruments

RF Test Room				
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum analyzer	Agilent	N9020A	HKE-048	Dec. 26, 2020
RF Cable (9KHz-26.5GHz)	Tonscend	170660	N/A	Dec. 26, 2020
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Dec. 26, 2020

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

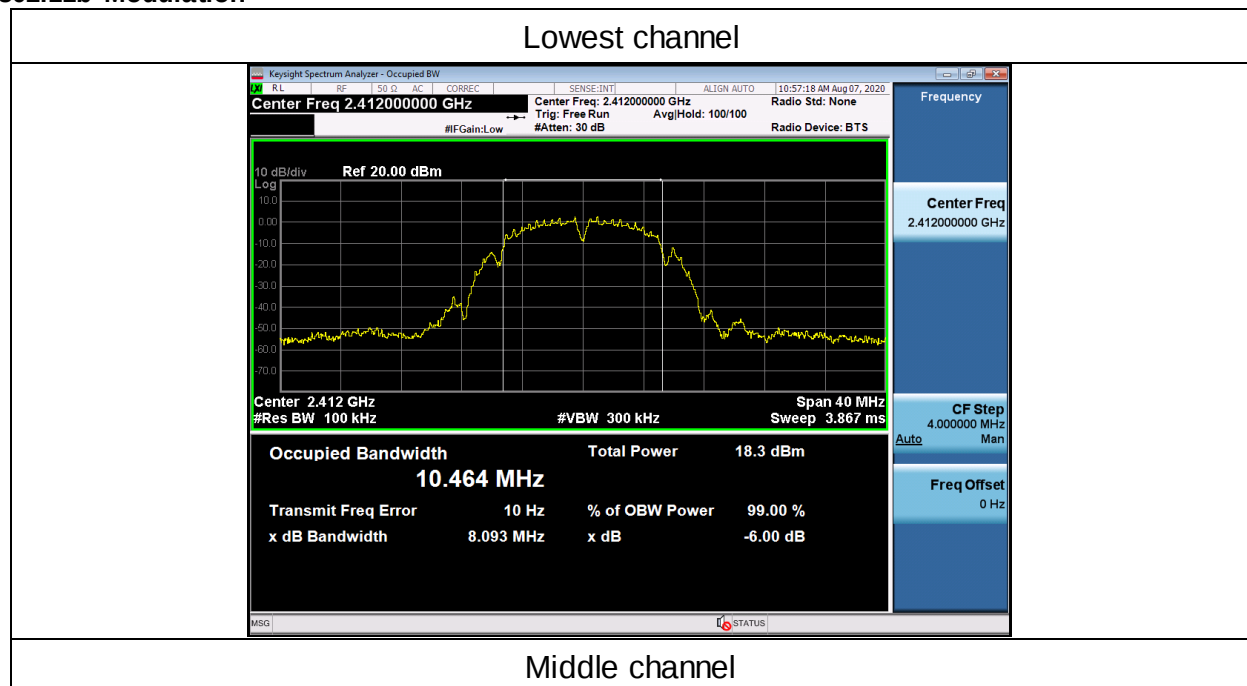


Test data

Test channel	6dB Emission Bandwidth (MHz)			
	802.11b	802.11g	802.11n(H20)	/
Lowest	8.093	15.868	15.812	/
Middle	9.050	16.124	16.151	/
Highest	8.085	16.297	15.933	/
Limit:	>500kHz			
Test Result:	PASS			

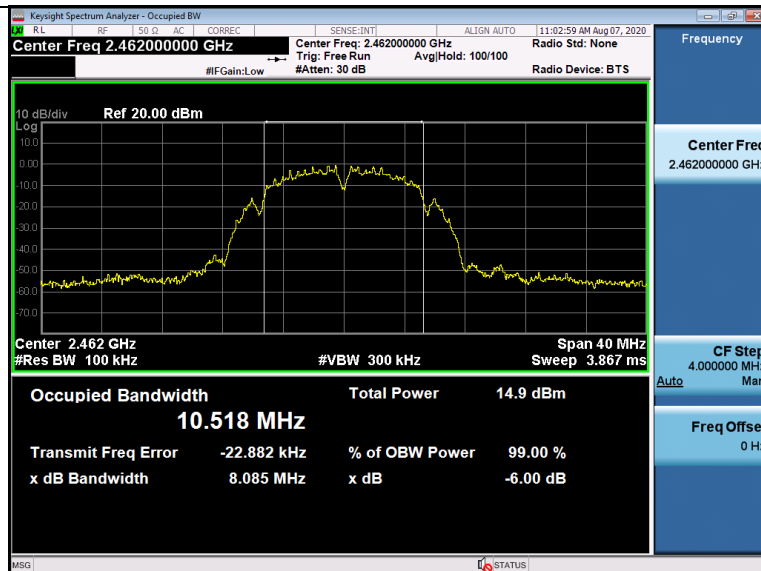
Test plots as follows:

802.11b Modulation





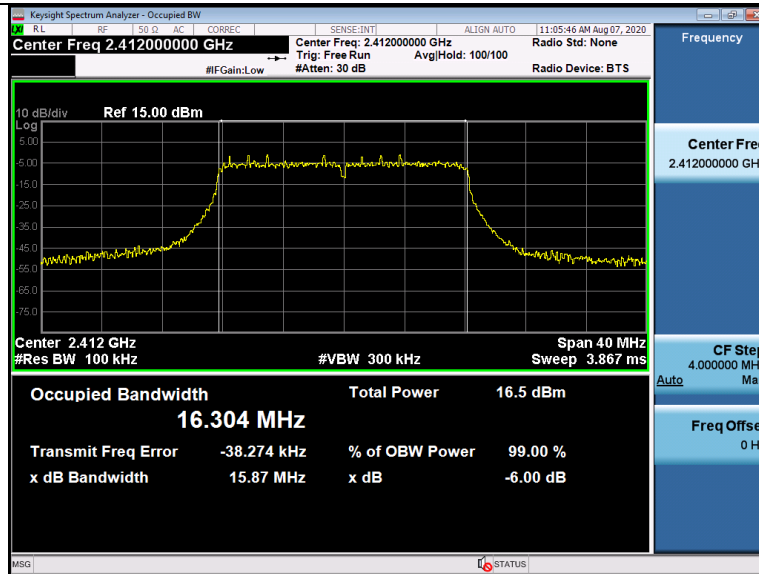
Highest channel



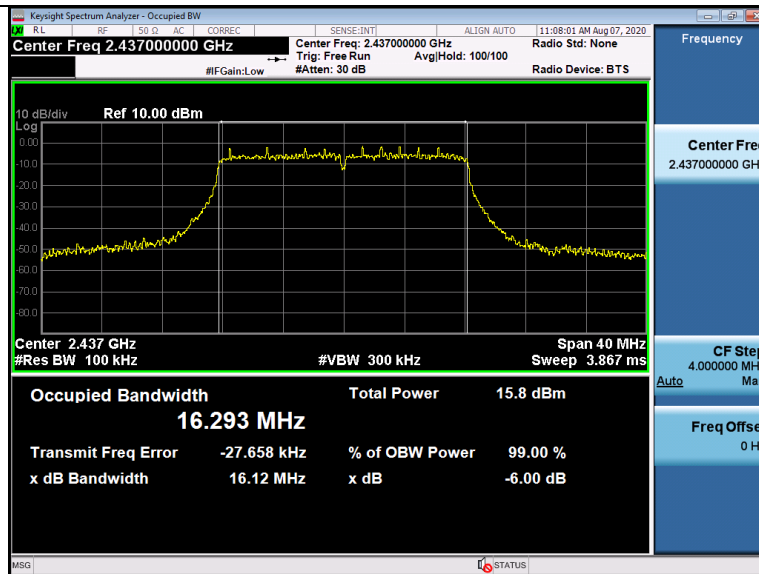


802.11g Modulation

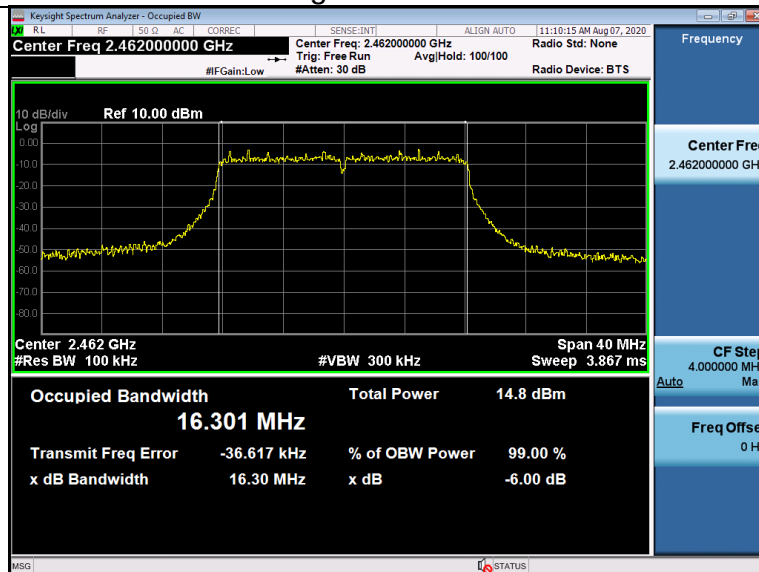
Lowest channel



Middle channel



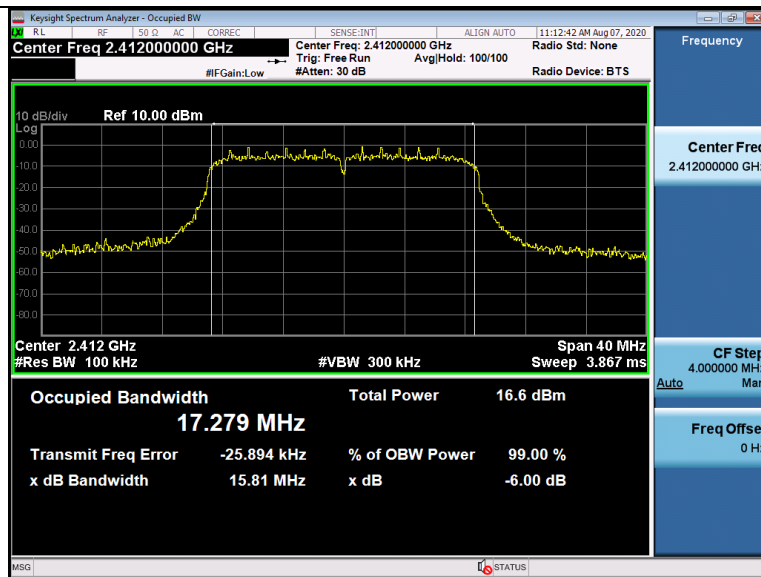
Highest channel



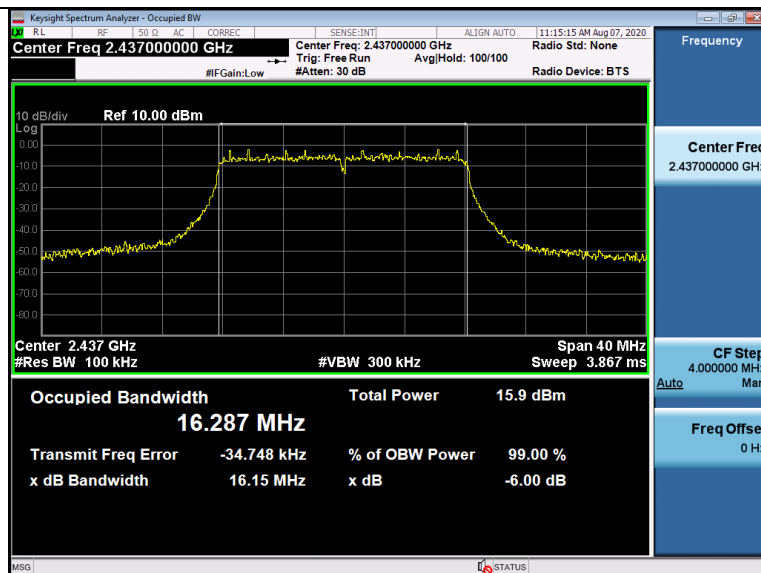


802.11n (HT20) Modulation

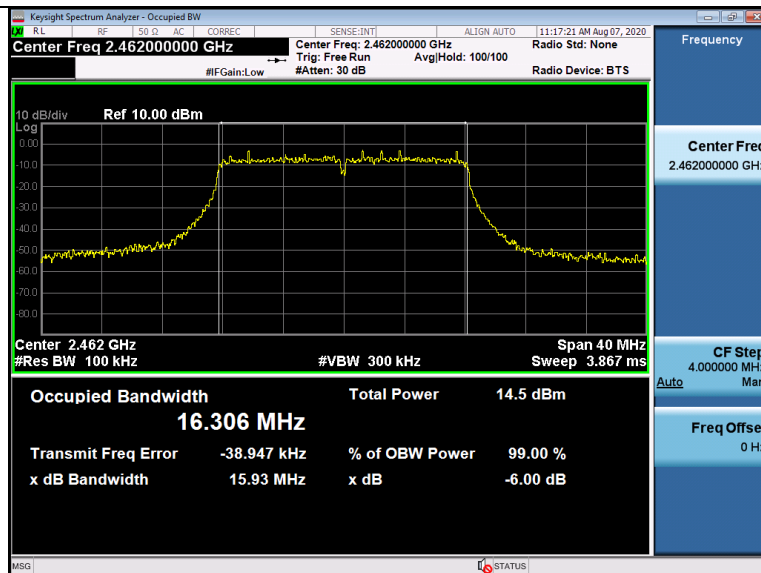
Lowest channel



Middle channel



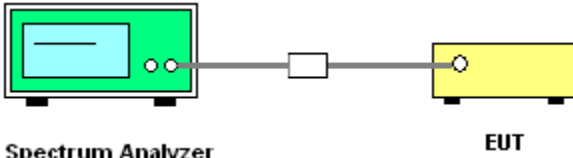
Highest channel





4.4. Power Spectral Density

Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	KDB 558074
Limit:	The average power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.
Test Setup:	 Spectrum Analyzer EUT
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. The testing follows Measurement procedure 10.2 method PKPSD of FCC KDB Publication No.558074 D01 DTS Meas. Guidance v05r02 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. 3. Set to the maximum power setting and enable the EUT transmit continuously. 4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW): $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$. Video bandwidth VBW $\geq 3 \times \text{RBW}$. Set the span to at least 1.5 times the OBW. 5. Detector = Peak, Sweep time = auto couple. 6. Employ trace averaging (Peak) mode over a minimum of 100 traces. Use the peak marker function to determine the maximum power level. 6. Measure and record the results in the test report.
Test Result:	PASS

Test Instruments

RF Test Room				
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum analyzer	Agilent	N9020A	HKE-048	Dec. 27, 2019
RF Cable (9KHz-26.5GHz)	Tonscend	170660	N/A	Dec. 27, 2019
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Dec. 27, 2019

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

**Test data**

EUT Set Mode	Channel	Result (dBm/3kHz)
802.11b	Lowest	-12.133
	Middle	-14.095
	Highest	-15.991
802.11g	Lowest	-15.31
	Middle	-15.997
	Highest	-16.871
802.11n(H20)	Lowest	-15.839
	Middle	-15.883
	Highest	-17.115
Limit:		8dBm/3kHz
Test Result:	PASS	

Test plots as follows:



802.11b Modulation

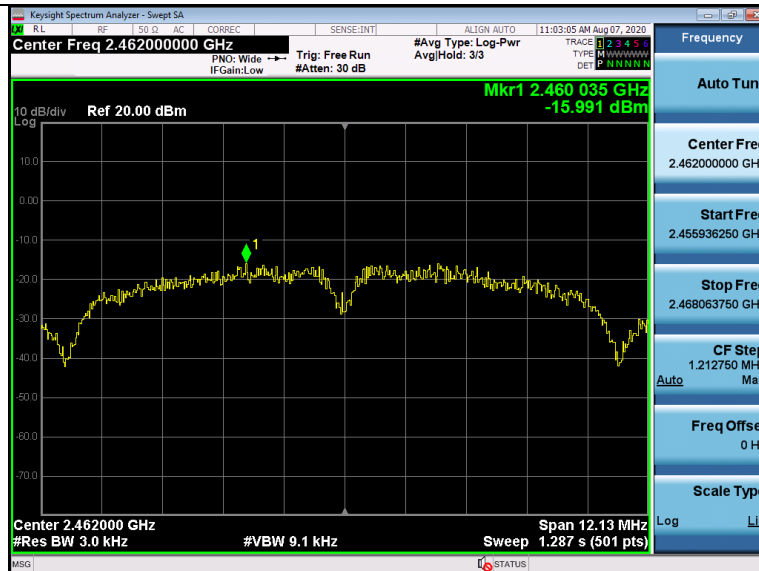
Lowest channel



Middle channel



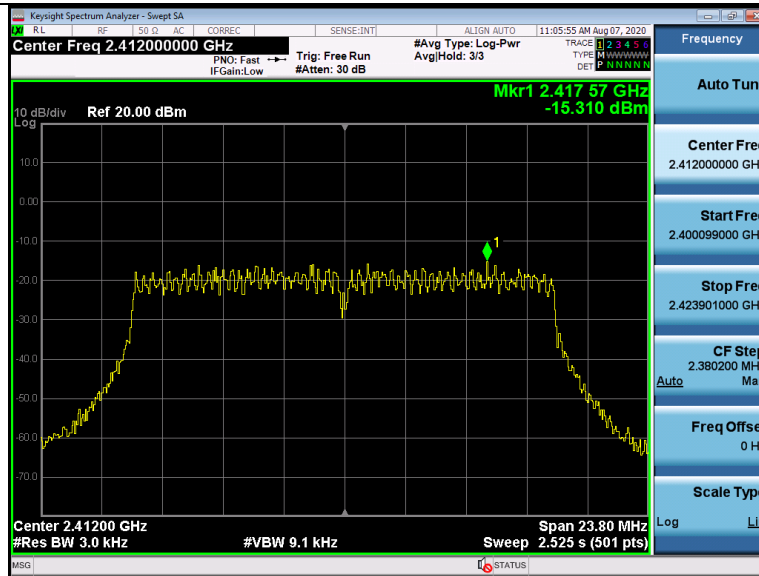
Highest channel



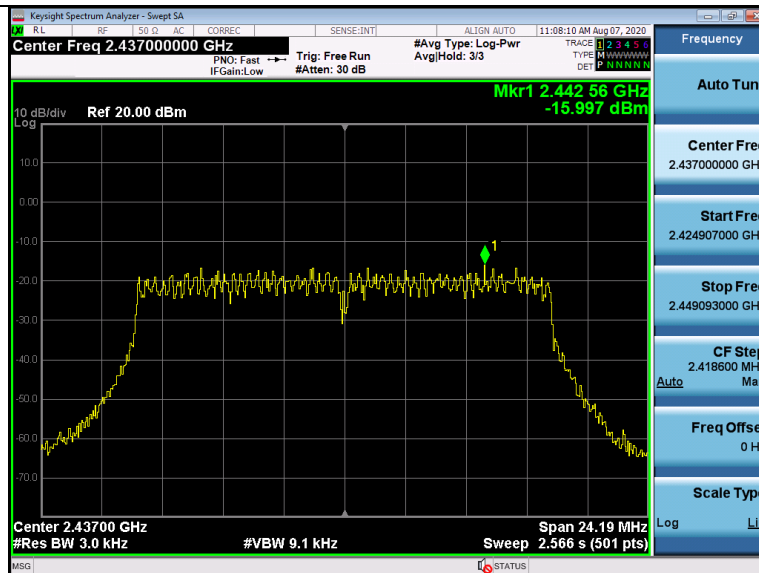


802.11g Modulation

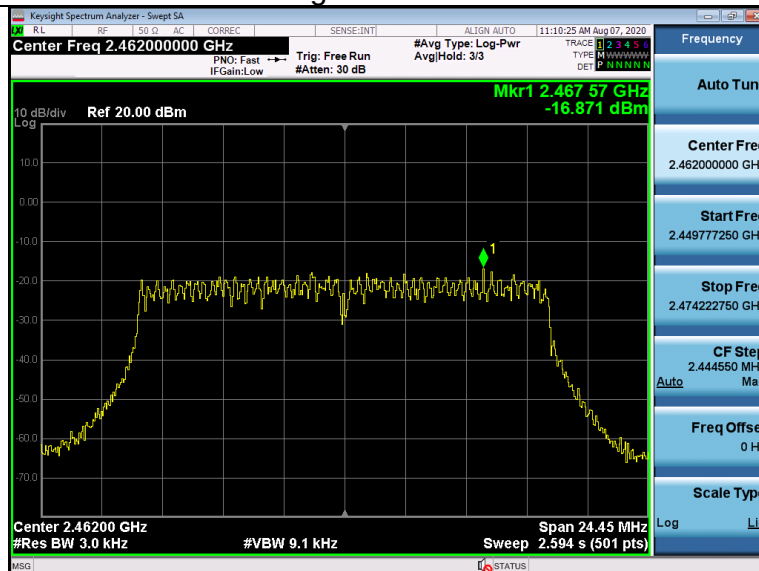
Lowest channel



Middle channel



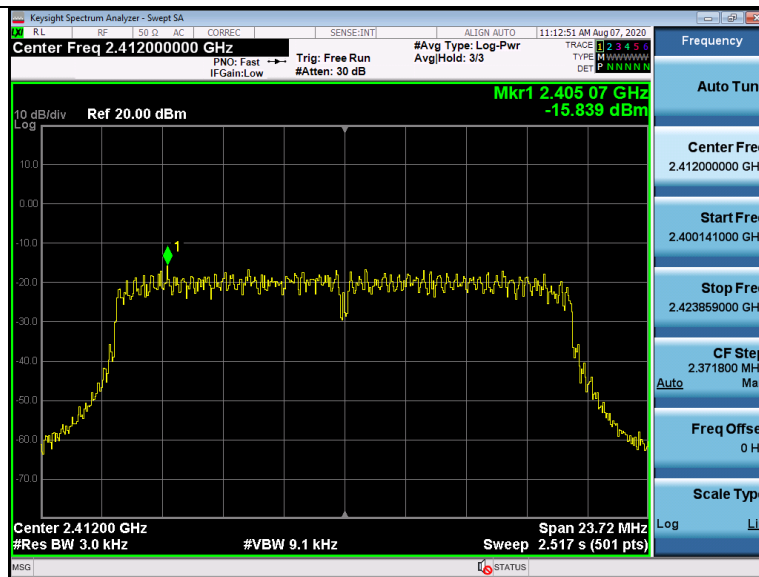
Highest channel



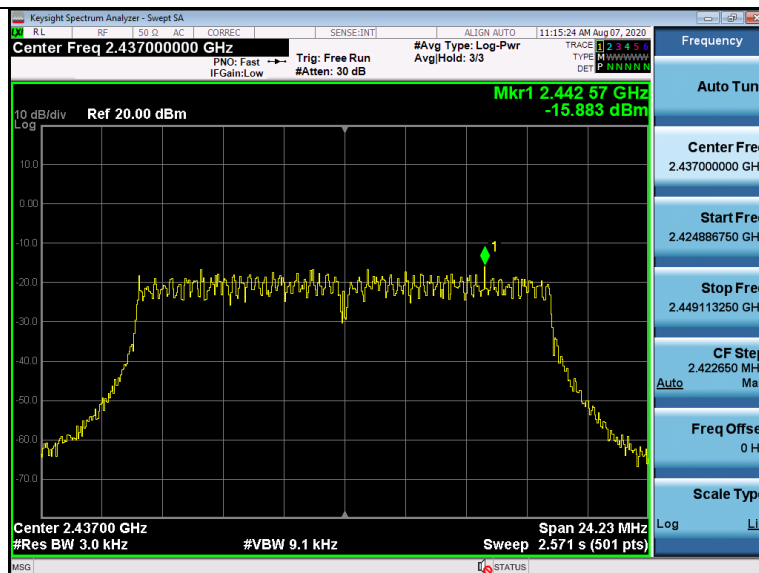


802.11n (HT20) Modulation

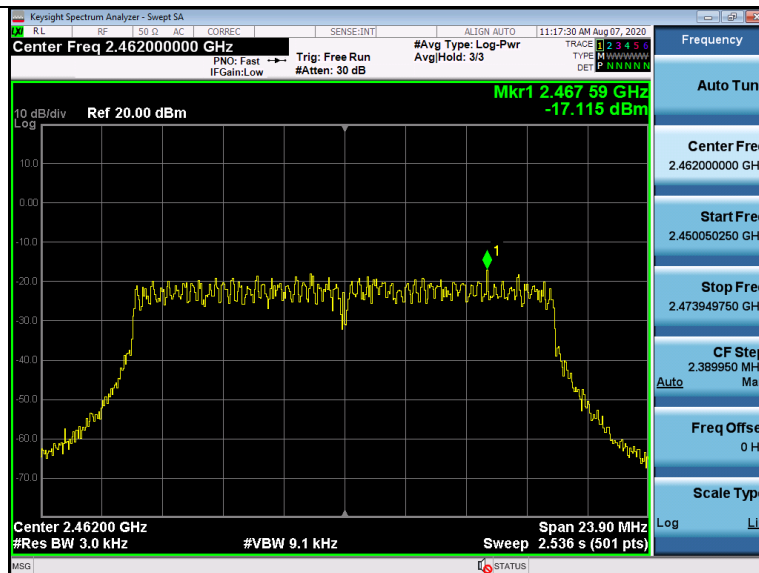
Lowest channel



Middle channel



Highest channel





4.5. Conducted Band Edge and Spurious Emission Measurement

Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	KDB558074
Limit:	In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement and radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).
Test Setup:	 Spectrum Analyzer EUT
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v05r02. 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. 3. Set to the maximum power setting and enable the EUT transmit continuously. 4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d). 5. Measure and record the results in the test report. 6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
Test Result:	PASS

**Test Instruments**

RF Test Room				
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum analyzer	Agilent	N9020A	HKE-048	Dec. 26, 2020
Signal generator	Agilent	N5183A	HKE-071	Dec. 26, 2020
RF Cable (9KHz-26.5GHz)	Tonscend	170660	N/A	Dec. 26, 2020
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Dec. 26, 2020

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

Test Data



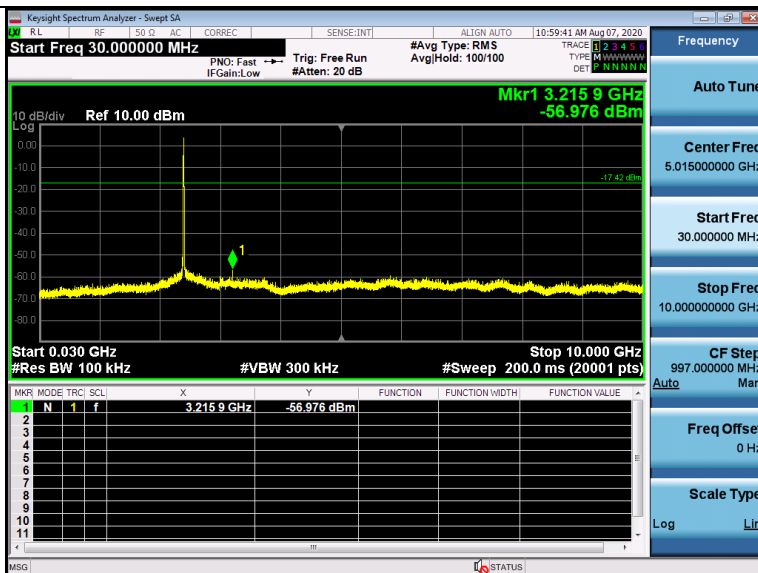
802.11b Modulation

Low Channel

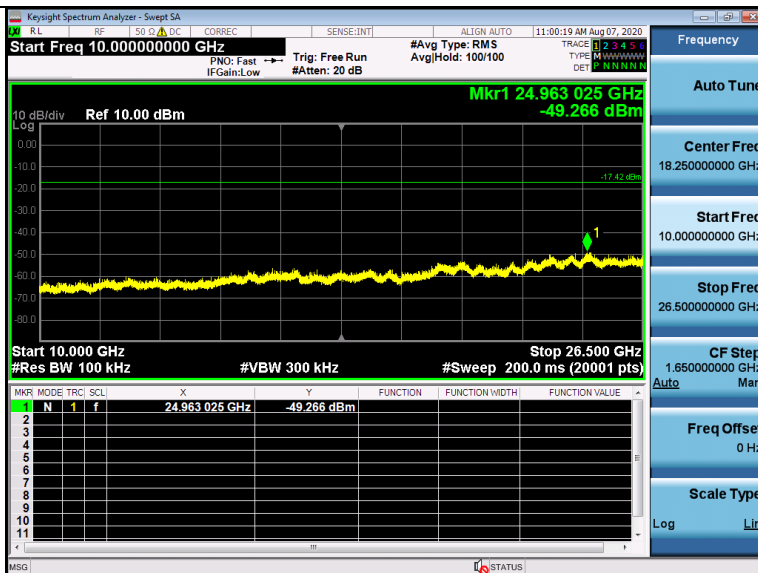
Reference



30MHz-10GHz



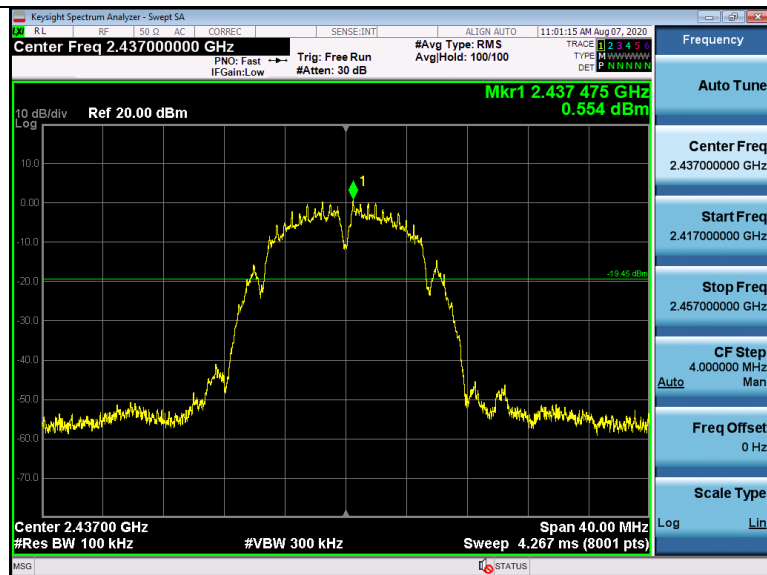
Above 10GHz



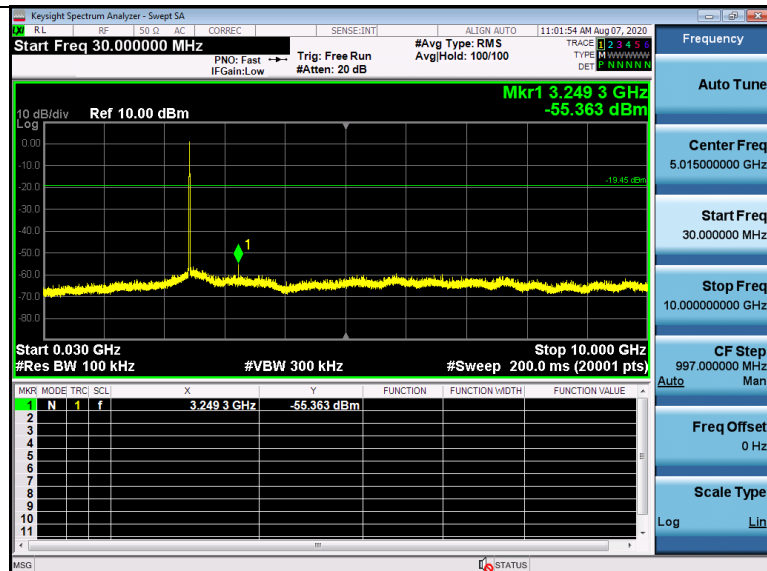


Middle Channel

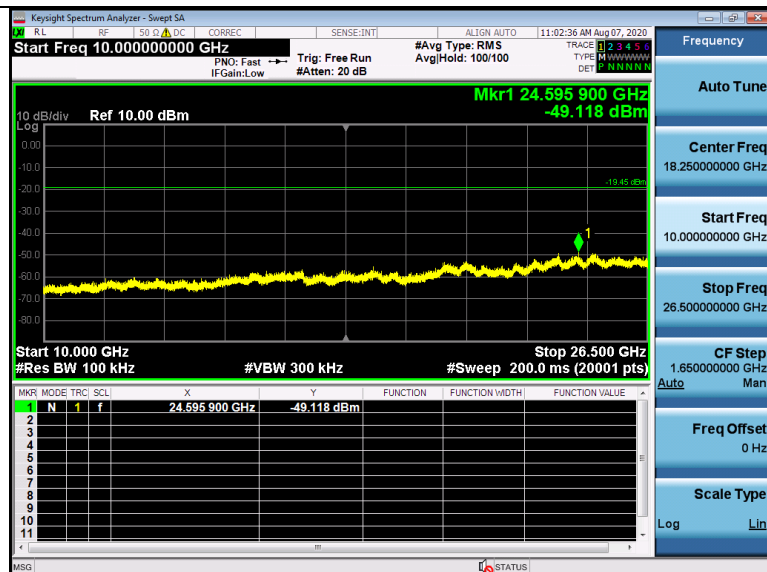
Reference



30MHz-10GHz

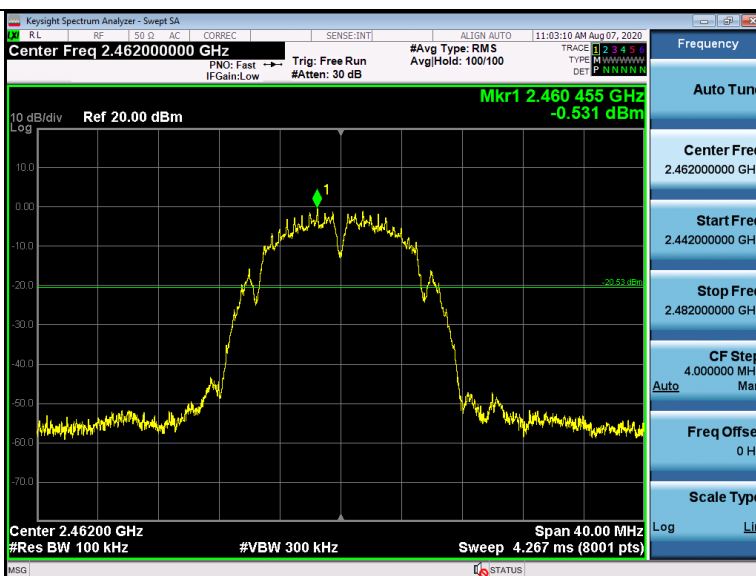


Above 10GHz

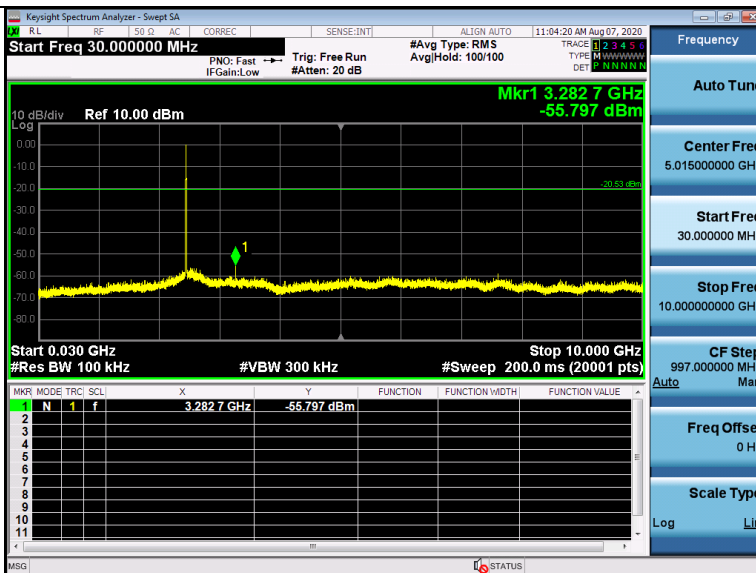




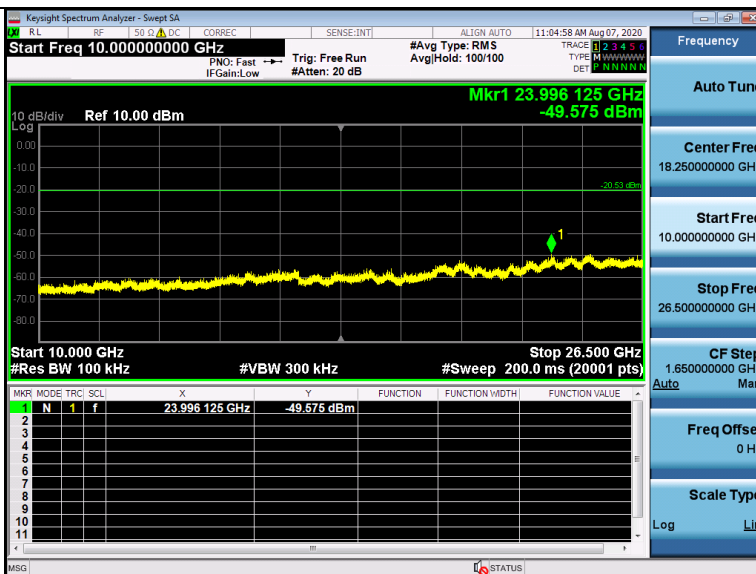
Reference



30MHz-10GHz



Above 10GHz



High Channel

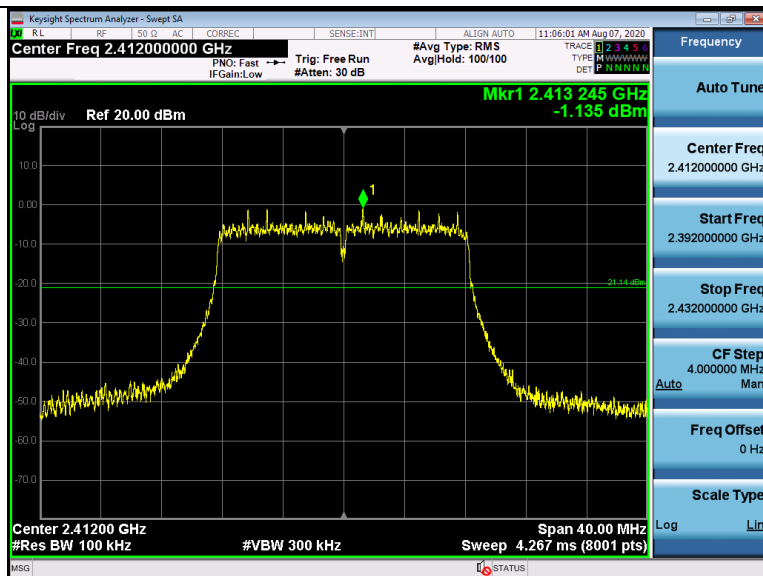




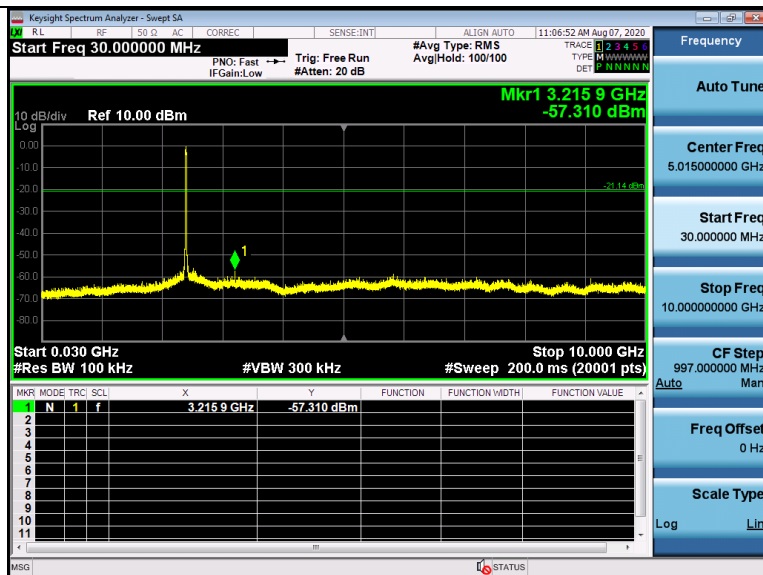
802.11g Modulation

Low Channel

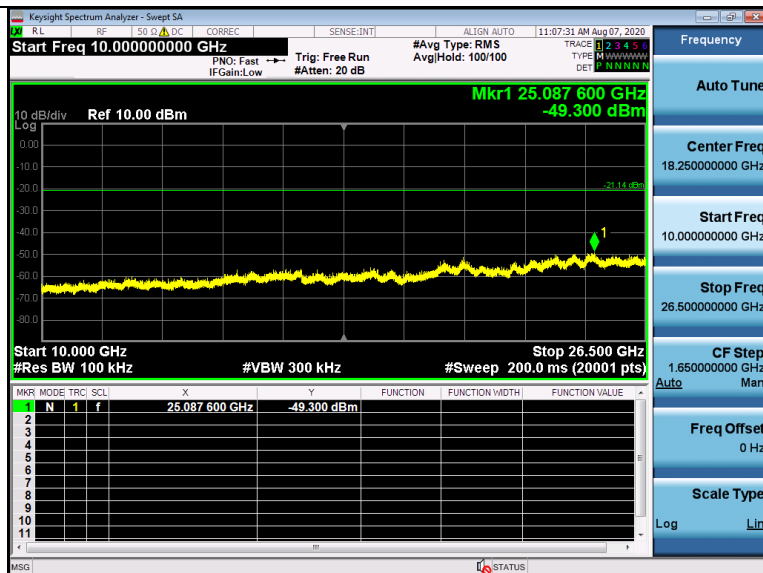
Reference



30MHz-10GHz



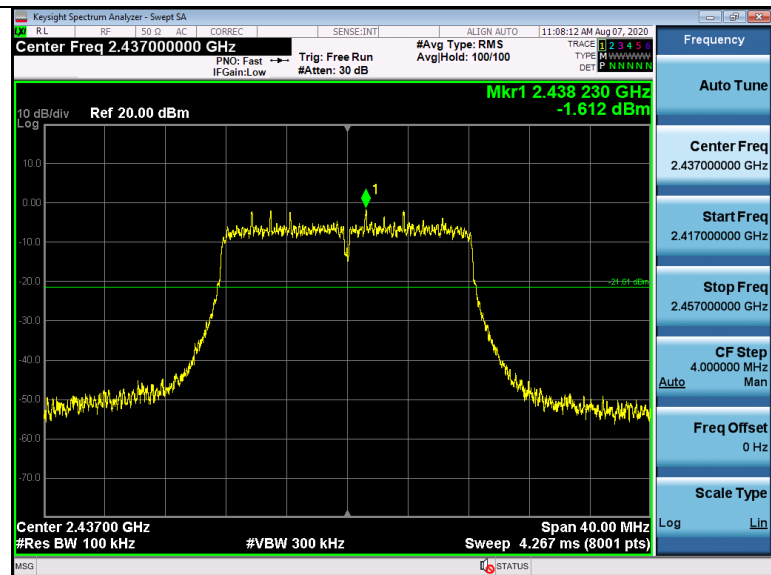
Above 10GHz



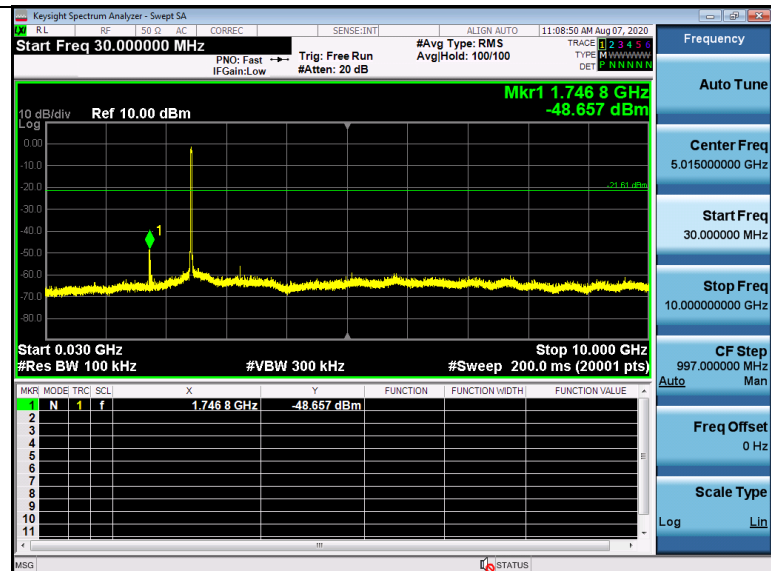


Middle Channel

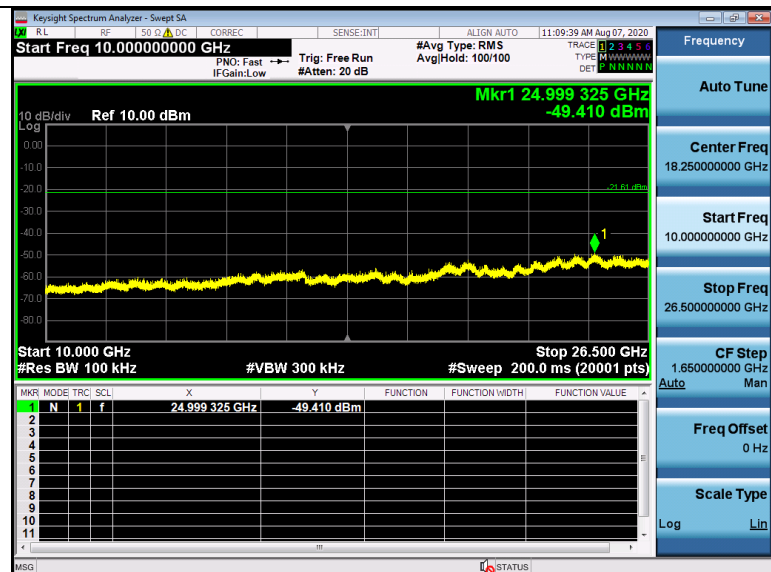
Reference



30MHz-10GHz



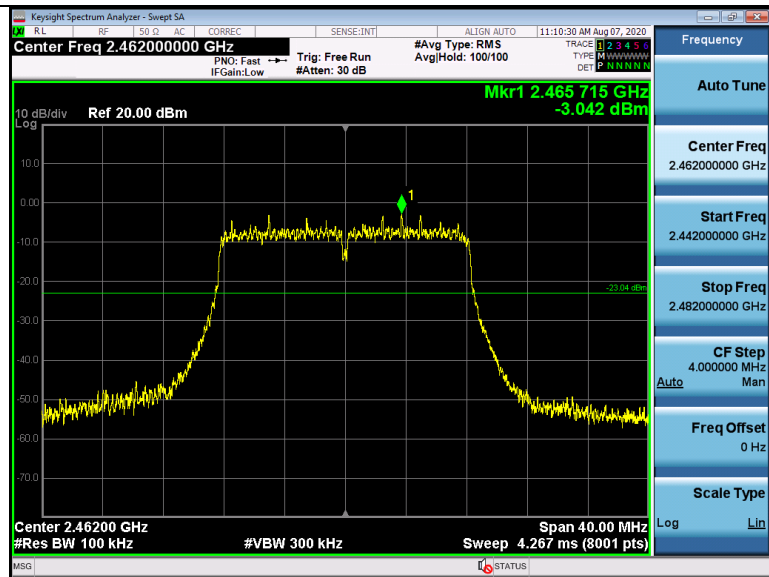
Above 10GHz



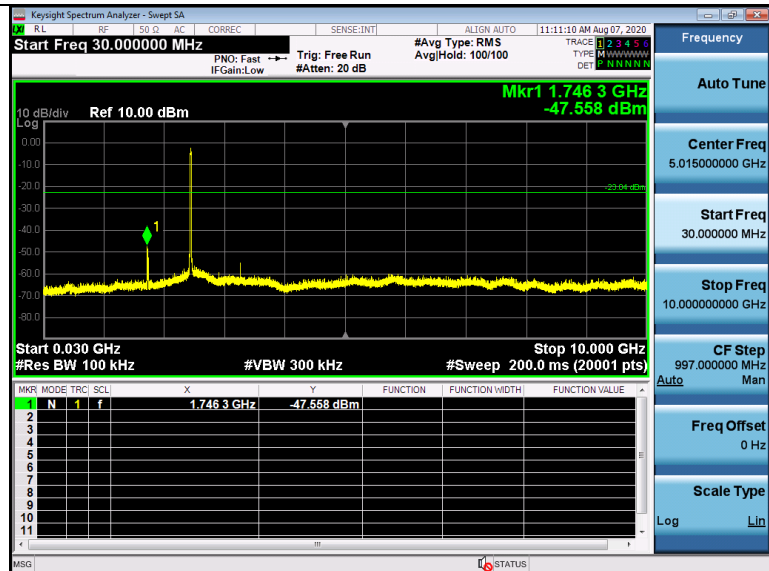


High Channel

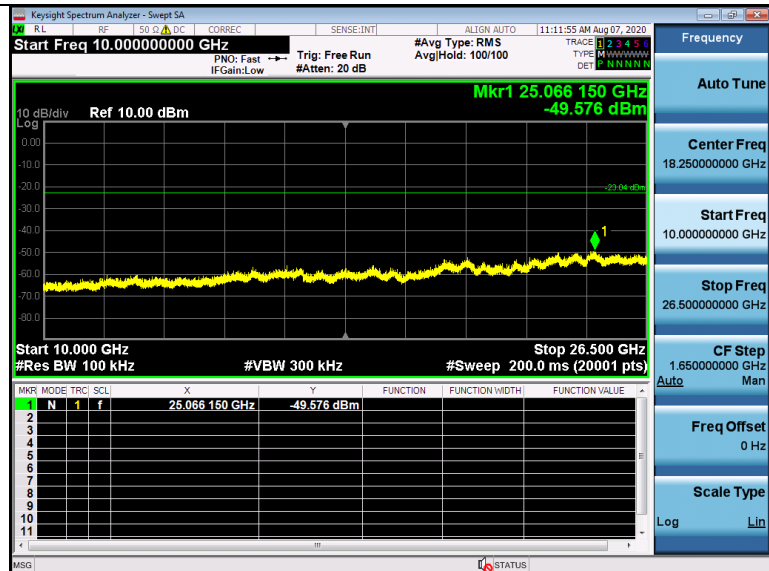
Reference

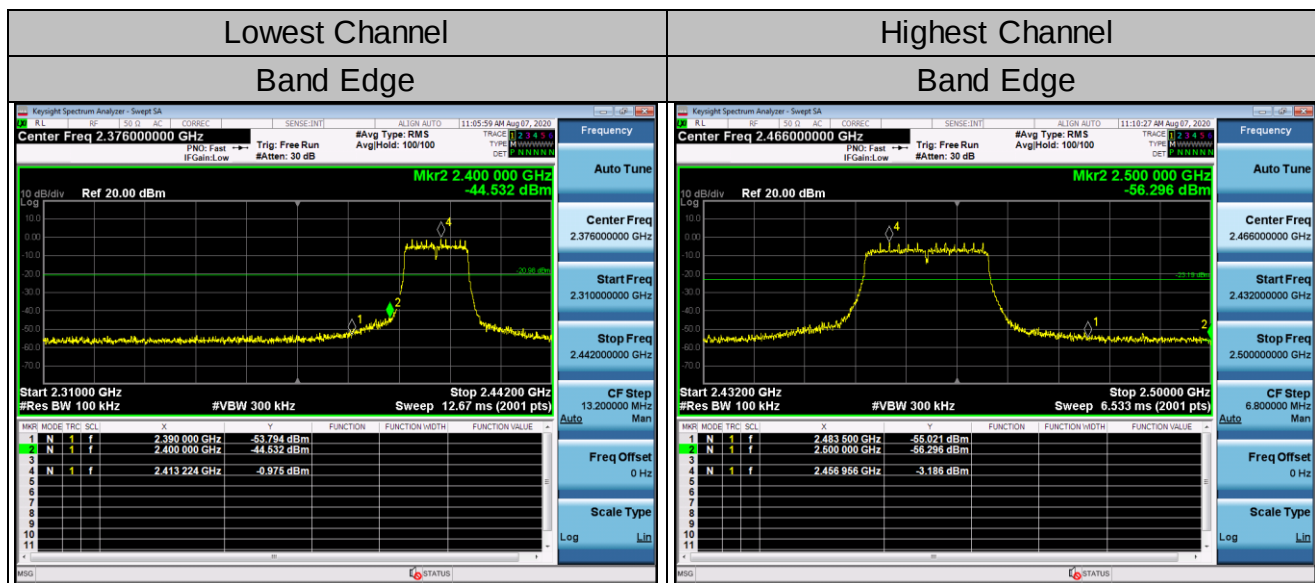


30MHz-10GHz



Above 10GHz



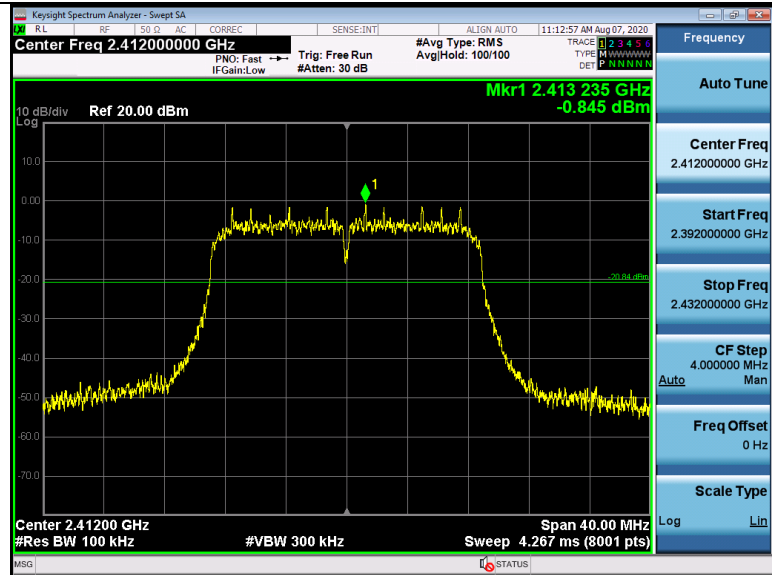




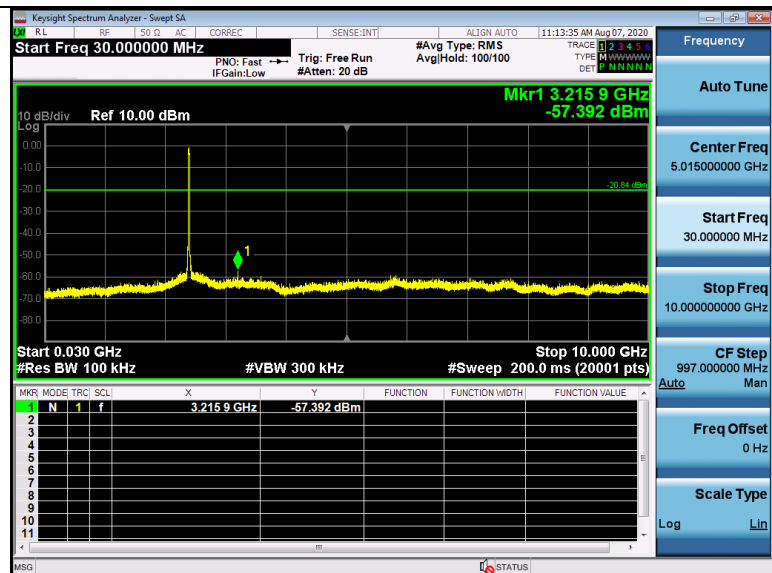
802.11n (HT20) Modulation

Low Channel

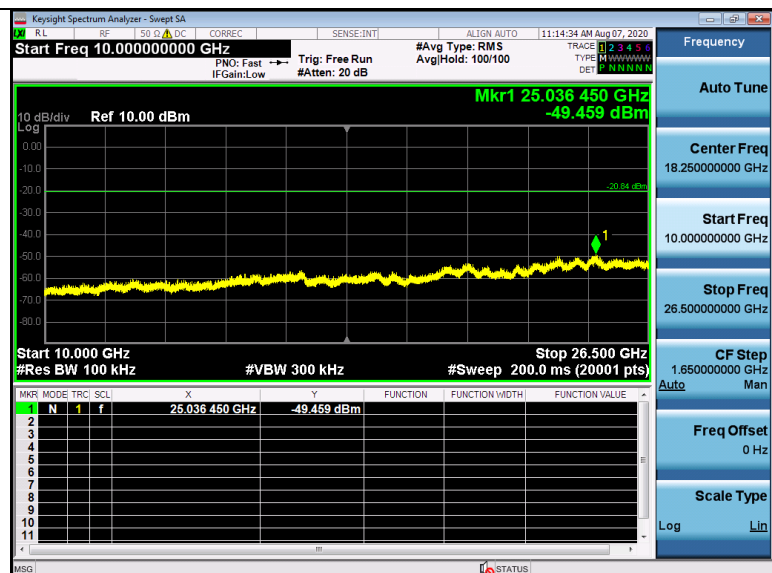
Reference



30MHz-10GHz



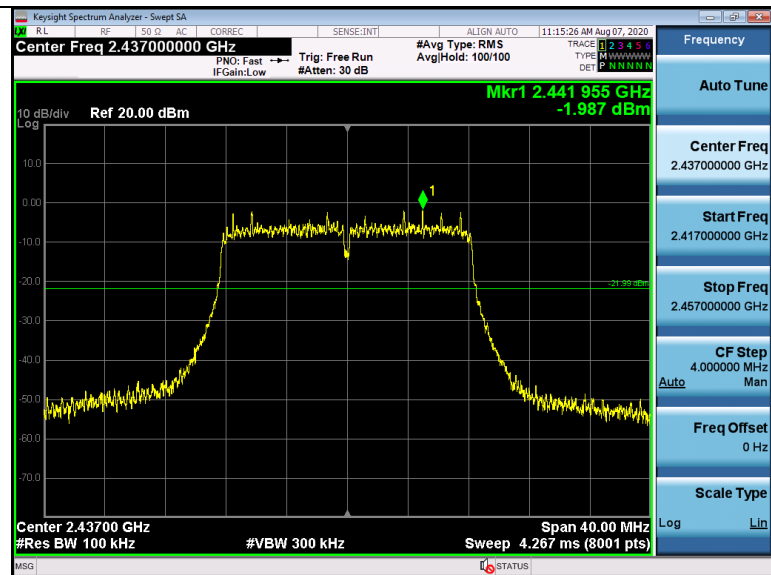
Above 10GHz



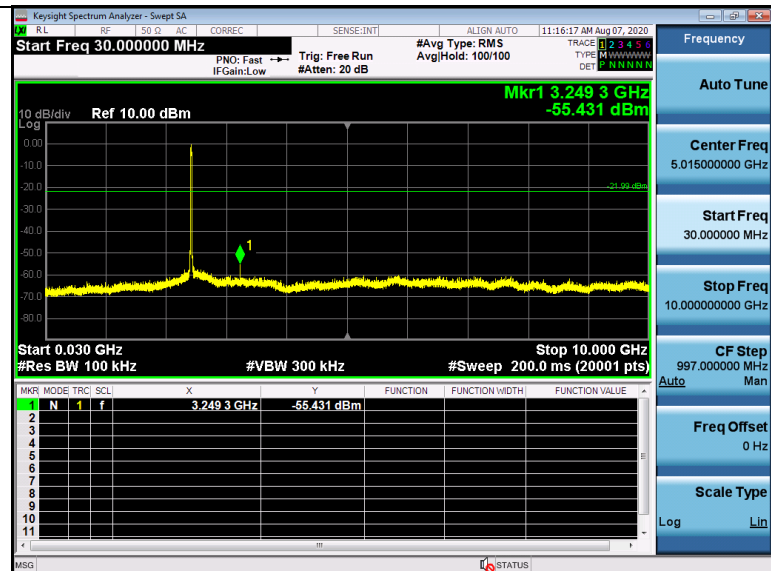


Middle Channel

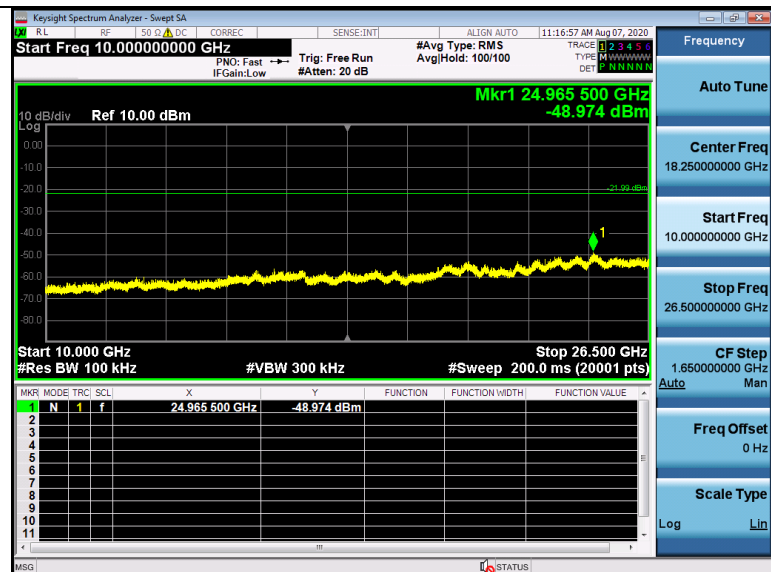
Reference



30MHz-10GHz



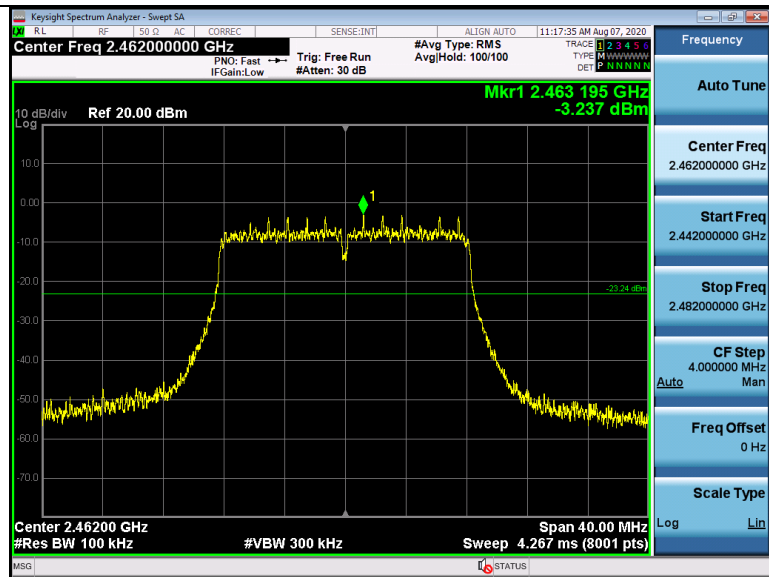
Above 10GHz



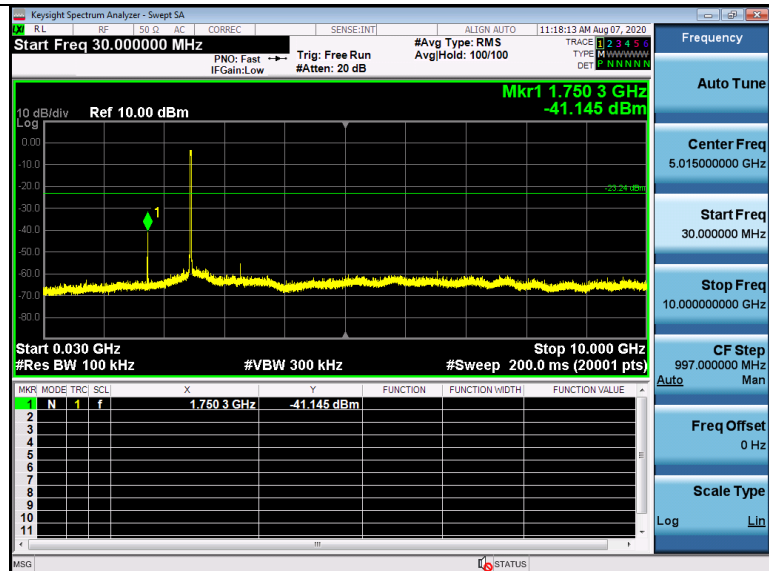


High Channel

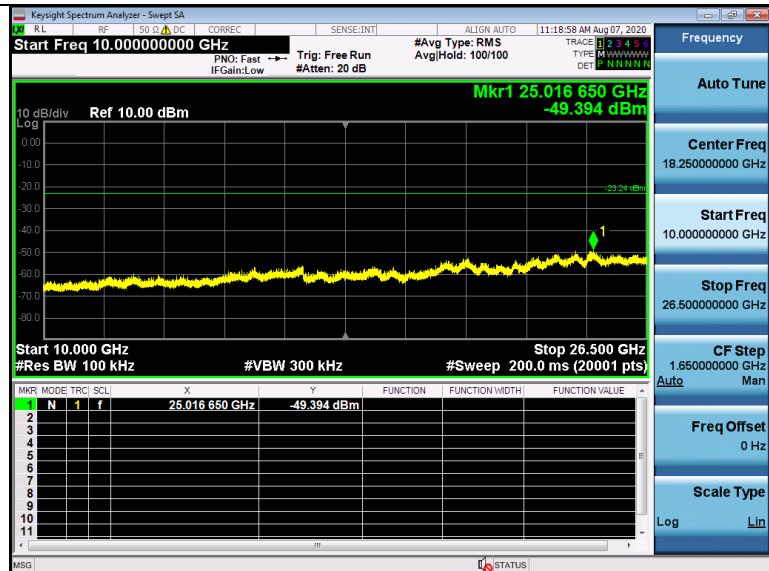
Reference



30MHz-10GHz



Above 10GHz



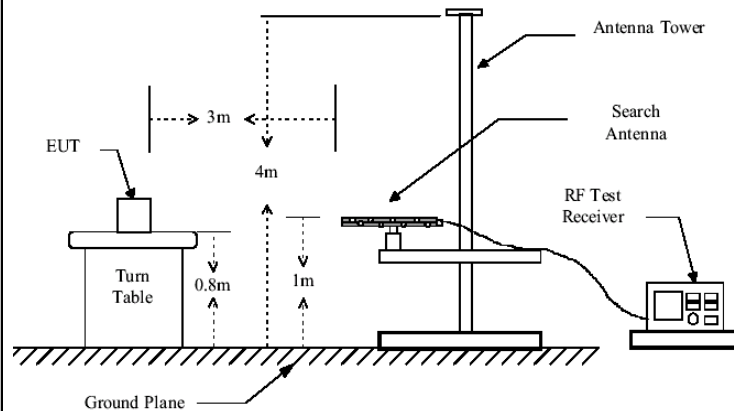




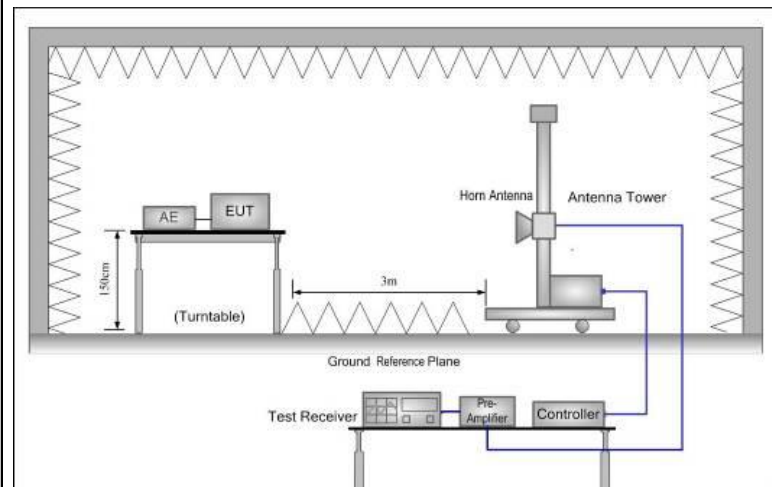
4.6. Radiated Spurious Emission Measurement

Test Specification

Test Requirement:	FCC Part15 C Section 15.209				
Test Method:	ANSI C63.10: 2013				
Frequency Range:	9 kHz to 25 GHz				
Measurement Distance:	3 m				
Antenna Polarization:	Horizontal & Vertical				
Operation mode:	Transmitting mode with modulation				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	9kHz- 150kHz	Quasi-peak	200Hz	1kHz	Quasi-peak Value
	150kHz- 30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak Value
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
Peak		1MHz	10Hz	Average Value	
Limit:	Frequency		Field Strength (microvolts/meter)		Measurement Distance (meters)
	0.009-0.490		2400/F(KHz)		300
	0.490-1.705		24000/F(KHz)		30
	1.705-30		30		30
	30-88		100		3
	88-216		150		3
	216-960		200		3
	Above 960		500		3
	Frequency		Field Strength (microvolts/meter)	Measurement Distance (meters)	Detector
	Above 1GHz		500	3	Average
		5000	3	Peak	
Test setup:	For radiated emissions below 30MHz				
	Distance = 3m 0.8m Turn table 1m Ground Plane Computer Pre -Amplifier Receiver				
	30MHz to 1GHz				



Above 1GHz



Test Procedure:

- For the radiated emission test below 1GHz:
The EUT was placed on a turntable with 0.8 meter above ground. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high PASS filter are used for the test in order to get better signal level.
- For the radiated emission test above 1GHz:
Place the measurement antenna on a turntable with 1.5 meter above ground, which is away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement



	antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane. 3. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level 4. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported. 5. Use the following spectrum analyzer settings: (1) Span shall wide enough to fully capture the emission being measured; (2) Set RBW=100 kHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold; (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement. For average measurement: VBW = 10 Hz, when duty cycle is no less than 98 percent. VBW $\geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
Test results:	PASS

**Test Instruments**

Radiated Emission Test Site (966)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Receiver	R&S	ESCI-7	HKE-010	Dec. 26, 2020
Spectrum analyzer	Agilent	N9020A	HKE-048	Dec. 26, 2020
Preamplifier	EMCI	EMC051845S E	HKE-015	Dec. 26, 2020
Preamplifier	Agilent	83051A	HKE-016	Dec. 26, 2020
Loop antenna	Schwarzbeck	FMZB 1519 B	HKE-014	Dec. 26, 2020
Broadband antenna	Schwarzbeck	VULB 9163	HKE-012	Dec. 26, 2020
Horn antenna	Schwarzbeck	9120D	HKE-013	Dec. 26, 2020
Antenna Mast	Keleto	CC-A-4M	N/A	N/A
Position controller	Taiwan MF	MF7802	HKE-011	Dec. 26, 2020
Radiated test software	Tonscend	TS+ Rev 2.5.0.0	HKE-082	N/A
RF cable (9KHz-1GHz)	Times	381806-001	N/A	N/A
RF cable	Times	1-40G	HKE-034	Dec. 26, 2020
High Gain Antenna	Schwarzbeck	LB-180400KF	HKE-054	Dec. 26, 2020

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).



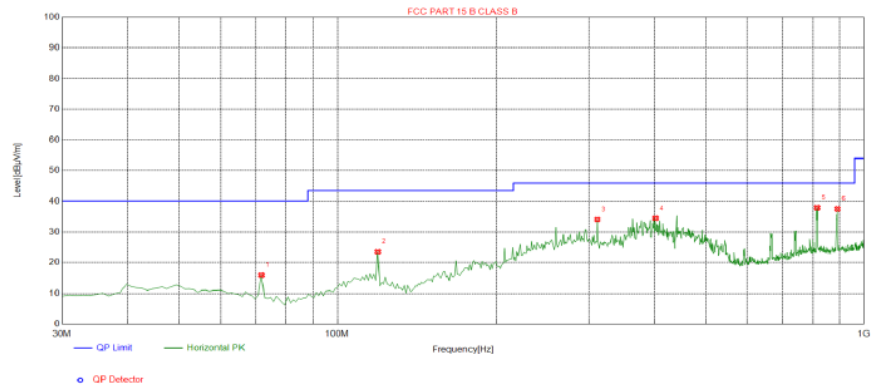
Test Data

All the test modes completed for test. only the worst result of AC 120V/60Hz(802.11b at 2412MHz) was reported as below:

Below 1GHz

Horizontal

Test Graph



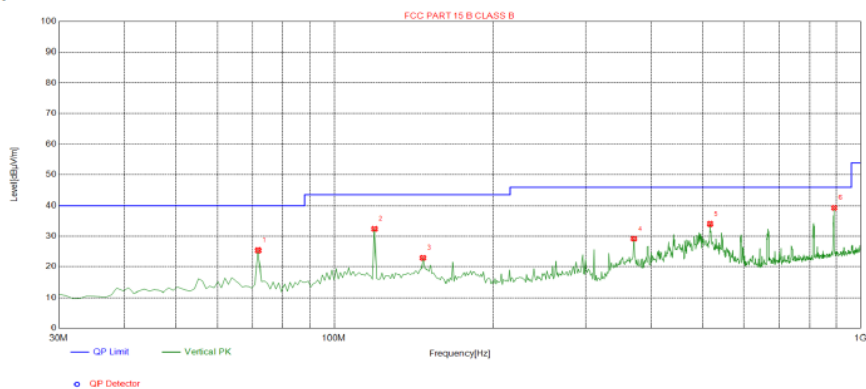
Suspected List

Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	71.7518	-17.99	33.98	15.99	40.00	24.01	100	271	Horizontal
2	119.3293	-16.99	40.58	23.59	43.50	19.91	100	168	Horizontal
3	311.5816	-12.53	46.57	34.04	46.00	11.96	100	213	Horizontal
4	401.8819	-10.37	44.80	34.43	46.00	11.57	100	360	Horizontal
5	814.5445	-2.84	40.78	37.94	46.00	8.06	100	79	Horizontal
6	891.2513	-1.87	39.43	37.56	46.00	8.44	100	245	Horizontal

Remark: Margin = Limit – Level

Correction Factor= Antenna Factor + Cable loss – Pre-amplifier

Level=Test receiver reading + correction factor

**Vertical****Test Graph****Suspected List**

Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	71.7518	-17.99	43.39	25.40	40.00	14.60	100	213	Vertical
2	119.3293	-16.99	49.45	32.46	43.50	11.04	100	116	Vertical
3	147.4875	-19.00	41.95	22.95	43.50	20.55	100	75	Vertical
4	370.8108	-10.99	40.18	29.19	46.00	16.81	100	174	Vertical
5	517.4274	-7.80	41.83	34.03	46.00	11.97	100	200	Vertical
6	891.2513	-1.87	41.18	39.31	46.00	6.69	100	316	Vertical

Remark: Margin = Limit – Level

Correction Factor= Antenna Factor + Cable loss – Pre-amplifier

Level=Test receiver reading + correction factor

Harmonics and Spurious Emissions**Frequency Range (9 kHz-30MHz)**

Frequency (MHz)	Level@3m (dBμV/m)	Limit@3m (dBμV/m)
--	--	--
--	--	--
--	--	--
--	--	--

Note: 1. Emission Level=Reading+ Cable loss-Antenna factor-Amp factor

2. The emission levels are 20 dB below the limit value, which are not reported. It is deemed to comply with the requirement

**For 1GHz to 25GHz**

LOW CH1 (802.11b Mode)/2412MHz

Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4824.00	57.76	-3.64	54.12	74	-19.88	Peak
4824.00	45.44	-3.64	41.80	54	-12.20	AVG
7236.00	55.53	-0.95	54.58	74	-19.42	Peak
7236.00	43.52	-0.95	42.57	54	-11.43	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4824.00	57.36	-3.64	53.72	74	-20.28	Peak
4824.00	45.37	-3.64	41.73	54	-12.27	AVG
7236.00	55.76	-0.95	54.81	74	-19.19	Peak
7236.00	44.68	-0.95	43.73	54	-10.27	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						



MID CH6 (802.11b Mode)/2437

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4874.00	59.13	-3.51	55.62	74	-18.38	Peak
4874.00	45.16	-3.51	41.65	54	-12.35	AVG
7311.00	55.35	-0.82	54.53	74	-19.47	Peak
7311.00	43.19	-0.82	42.37	54	-11.63	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4874.00	57.86	-3.51	54.35	74	-19.65	Peak
4874.00	44.51	-3.51	41.00	54	-13.00	AVG
7311.00	57.28	-0.82	56.46	74	-17.54	Peak
7311.00	43.91	-0.82	43.09	54	-10.91	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						



HIGH CH11 (802.11b Mode)/2462

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4924.00	59.12	-3.43	55.69	74	-18.31	Peak
4924.00	45.53	-3.43	42.10	54	-11.90	AVG
7386.00	55.83	-0.75	55.08	74	-18.92	Peak
7386.00	44.45	-0.75	43.70	54	-10.30	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4924.00	57.90	-3.43	54.47	74	-19.53	Peak
4924.00	43.90	-3.43	40.47	54	-13.53	AVG
7386.00	55.36	-0.75	54.61	74	-19.39	Peak
7386.00	42.97	-0.75	42.22	54	-11.78	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						

Remark:

(1) Measuring frequencies from 1 GHz to the 25 GHz .

(2) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.

(3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.

(4) Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.

(6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.



LOW CH1 (802.11g Mode)/2412

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4824.00	56.97	-3.43	53.54	74	-20.46	Peak
4824.00	45.28	-3.43	41.85	54	-12.15	AVG
7236.00	57.48	-0.75	56.73	74	-17.27	Peak
7236.00	43.65	-0.75	42.90	54	-11.10	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4824.00	59.55	-3.43	56.12	74	-17.88	Peak
4824.00	45.61	-3.43	42.18	54	-11.82	AVG
7236.00	55.36	-0.75	54.61	74	-19.39	Peak
7236.00	44.50	-0.75	43.75	54	-10.25	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						



MID CH6 (802.11g Mode)/2437

Horizontal:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
4874.00	57.03	-3.51	53.52	74	-20.48	Peak
4874.00	45.05	-3.51	41.54	54	-12.46	AVG
7311.00	56.73	-0.82	55.91	74	-18.09	Peak
7311.00	43.05	-0.82	42.23	54	-11.77	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						

Vertical:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
4874.00	58.15	-3.51	54.64	74	-19.36	Peak
4874.00	44.02	-3.51	40.51	54	-13.49	AVG
7311.00	55.91	-0.82	55.09	74	-18.91	Peak
7311.00	43.41	-0.82	42.59	54	-11.41	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						



HIGH CH11 (802.11g Mode)/2462

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB μ V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)	
4924.00	56.66	-3.43	53.23	74	-20.77	Peak
4924.00	44.34	-3.43	40.91	54	-13.09	AVG
7386.00	56.80	-0.75	56.05	74	-17.95	Peak
7386.00	43.20	-0.75	42.45	54	-11.55	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB μ V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)	
4924.00	57.58	-3.43	54.15	74	-19.85	Peak
4924.00	44.18	-3.43	40.75	54	-13.25	AVG
7386.00	57.44	-0.75	56.69	74	-17.31	Peak
7386.00	44.54	-0.75	43.79	54	-10.21	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						

Remark:

(1) Measuring frequencies from 1 GHz to the 25 GHz.

(2) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.

(3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.

(4) Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.

(6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.



LOW CH1 (802.11n/H20 Mode)/2412

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4824.00	56.89	-3.64	53.25	74	-20.75	Peak
4824.00	44.54	-3.64	40.90	54	-13.10	AVG
7236.00	56.15	-0.95	55.20	74	-18.80	Peak
7236.00	43.38	-0.95	42.43	54	-11.57	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4824.00	57.70	-3.64	54.06	74	-19.94	Peak
4824.00	45.14	-3.64	41.50	54	-12.50	AVG
7236.00	55.15	-0.95	54.20	74	-19.80	Peak
7236.00	43.98	-0.95	43.03	54	-10.97	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						



MID CH6 (802.11n/H20 Mode)/2437

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4874.00	58.41	-3.51	54.90	74	-19.10	Peak
4874.00	44.27	-3.51	40.76	54	-13.24	AVG
7311.00	56.68	-0.82	55.86	74	-18.14	Peak
7311.00	43.16	-0.82	42.34	54	-11.66	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4874.00	57.48	-3.51	53.97	74	-20.03	Peak
4874.00	43.84	-3.51	40.33	54	-13.67	AVG
7311.00	56.70	-0.82	55.88	74	-18.12	Peak
7311.00	44.05	-0.82	43.23	54	-10.77	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						



HIGH CH11 (802.11n/H20 Mode)/2462

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4924.00	58.25	-3.43	54.82	74	-19.18	Peak
4924.00	45.21	-3.43	41.78	54	-12.22	AVG
7386.00	56.63	-0.75	55.88	74	-18.12	Peak
7386.00	44.20	-0.75	43.45	54	-10.55	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4924.00	57.20	-3.43	53.77	74	-20.23	Peak
4924.00	43.77	-3.43	40.34	54	-13.66	AVG
7386.00	57.62	-0.75	56.87	74	-17.13	Peak
7386.00	44.75	-0.75	44.00	54	-10.00	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						

Remark:

(1) Measuring frequencies from 1 GHz to the 25 GHz.

(2) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.

(3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.

(4) Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.

(6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.

**Test Result of Radiated Spurious at Band edges**

Operation Mode:

802.11b Mode TX CH Low (2412MHz)

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2310	58.63	-5.81	52.82	74	-21.18	Peak
2310	44.39	-5.81	38.58	54	-15.42	AVG
2390	59.71	-5.84	53.87	74	-20.13	Peak
2390	48.56	-5.84	42.72	54	-11.28	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2310	61.41	-5.81	55.60	74	-18.40	Peak
2310	43.77	-5.81	37.96	54	-16.04	AVG
2390	58.15	-5.84	52.31	74	-21.69	Peak
2390	47.44	-5.84	41.60	54	-12.40	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						



Operation Mode: TX CH High (2462MHz)

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	59.63	-6.04	53.59	74	-20.41	Peak
2483.5	43.58	-6.04	37.54	54	-16.46	AVG
2500	59.00	-6.06	52.94	74	-21.06	Peak
2500	47.84	-6.06	41.78	54	-12.22	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	59.14	-6.04	53.10	74	-20.90	Peak
2483.5	45.22	-6.04	39.18	54	-14.82	AVG
2500	58.59	-6.06	52.53	74	-21.47	Peak
2500	47.56	-6.06	41.50	54	-12.50	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						



Operation Mode: 802.11g Mode TX CH Low (2412MHz)

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2310	60.46	-5.81	54.65	74	-19.35	Peak
2310	44.45	-5.81	38.64	54	-15.36	AVG
2390	59.37	-5.84	53.53	74	-20.47	Peak
2390	47.67	-5.84	41.83	54	-12.17	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2310	58.77	-5.81	52.96	74	-21.04	Peak
2310	43.54	-5.81	37.73	54	-16.27	AVG
2390	59.35	-5.84	53.51	74	-20.49	Peak
2390	47.05	-5.84	41.21	54	-12.79	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						



Operation Mode: TX CH High (2462MHz)

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	61.66	-6.04	55.62	74	-18.38	Peak
2483.5	44.23	-6.04	38.19	54	-15.81	AVG
2500	58.95	-6.06	52.89	74	-21.11	Peak
2500	47.56	-6.06	41.50	54	-12.50	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	61.43	-6.04	55.39	74	-18.61	Peak
2483.5	45.11	-6.04	39.07	54	-14.93	AVG
2500	58.31	-6.06	52.25	74	-21.75	Peak
2500	48.59	-6.06	42.53	54	-11.47	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						



Operation Mode: 802.11n/H20 Mode TX CH Low (2412MHz)

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2310	58.36	-5.81	52.55	74	-21.45	Peak
2310	43.48	-5.81	37.67	54	-16.33	AVG
2390	58.68	-5.84	52.84	74	-21.16	Peak
2390	47.18	-5.84	41.34	54	-12.66	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2310	61.27	-5.81	55.46	74	-18.54	Peak
2310	42.99	-5.81	37.18	54	-16.82	AVG
2390	59.90	-5.84	54.06	74	-19.94	Peak
2390	47.79	-5.84	41.95	54	-12.05	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						



Operation Mode: TX CH High (2462MHz)

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	58.40	-6.04	52.36	74	-21.64	Peak
2483.5	45.35	-6.04	39.31	54	-14.69	AVG
2500	59.18	-6.06	53.12	74	-20.88	Peak
2500	47.11	-6.06	41.05	54	-12.95	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	61.28	-6.04	55.24	74	-18.76	Peak
2483.5	44.01	-6.04	37.97	54	-16.03	AVG
2500	58.87	-6.06	52.81	74	-21.19	Peak
2500	47.09	-6.06	41.03	54	-12.97	AVG
Remark :Factor= Antenna Factor + Cable Loss - Pre-amplifier						



4.7. ANTENNA REQUIREMENT

Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247, if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

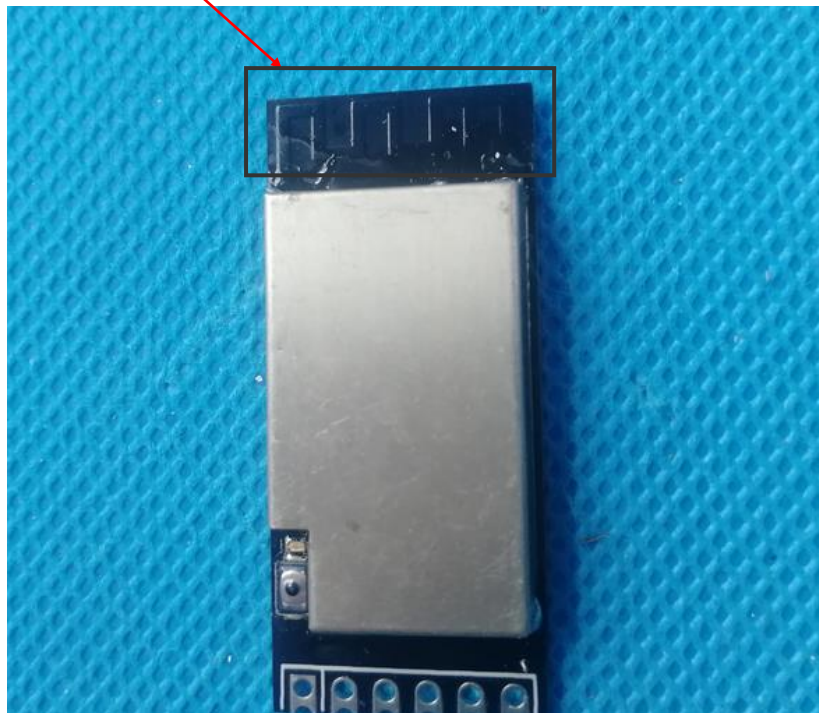
Refer to statement below for compliance.

The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

Antenna Connected Construction

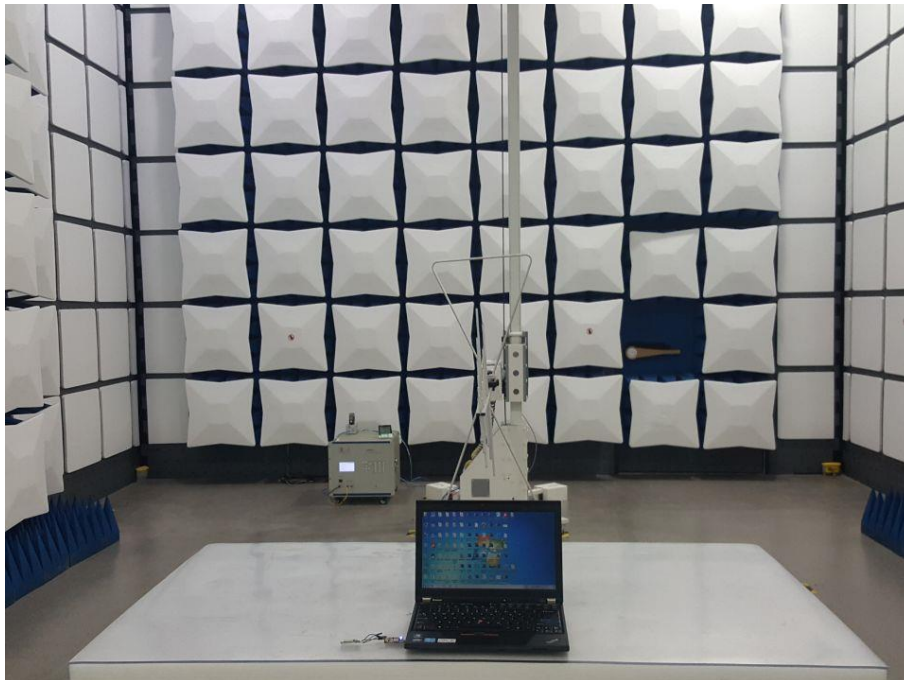
The PCB antenna used in the product is a permanently connected antenna that complies with the provisions of part 15.203 requirement in this section. The antenna used in this product is a PCB Antenna, The directional gains of antenna used for transmitting is 0 dBi.

WIFI ANTENNA

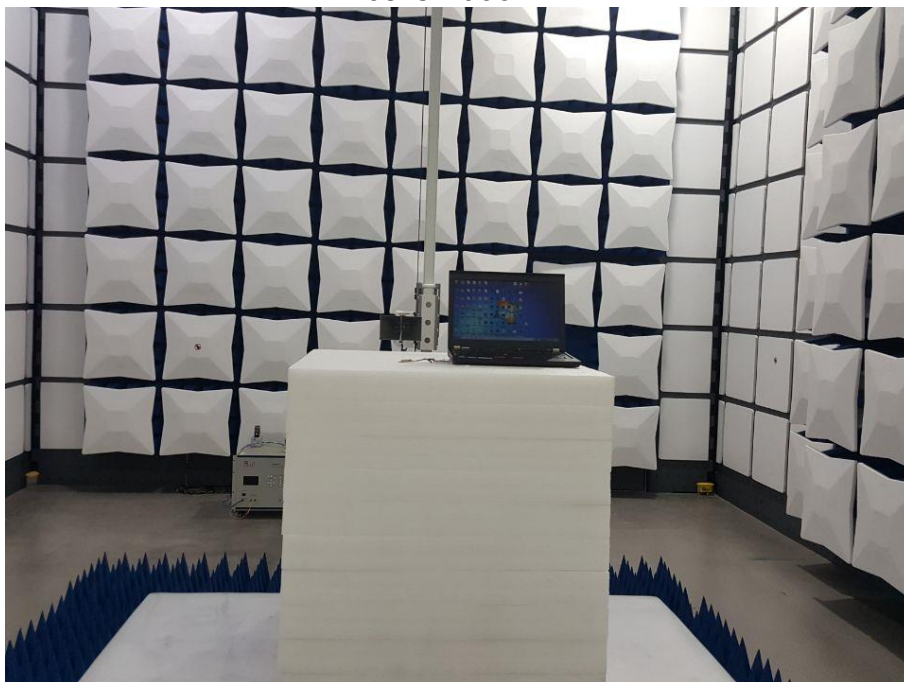


4.8. PHOTOGRAPH OF TEST

30MHz-1000MHz



Above 1000MHz





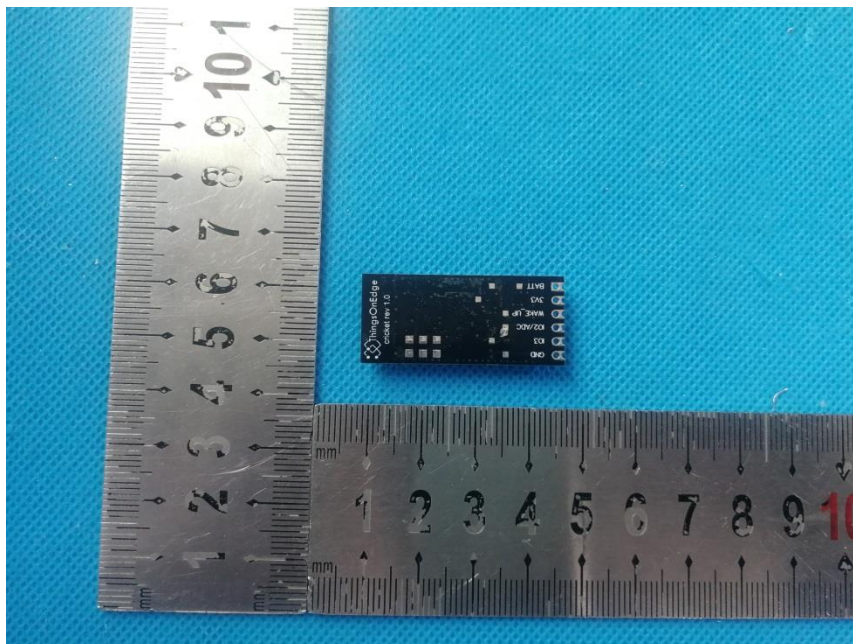
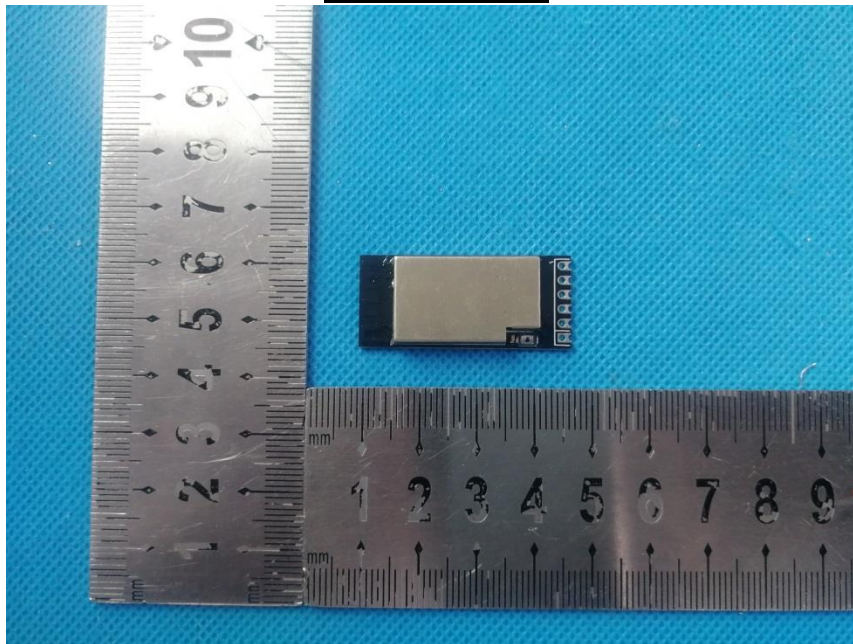
Conducted Emission



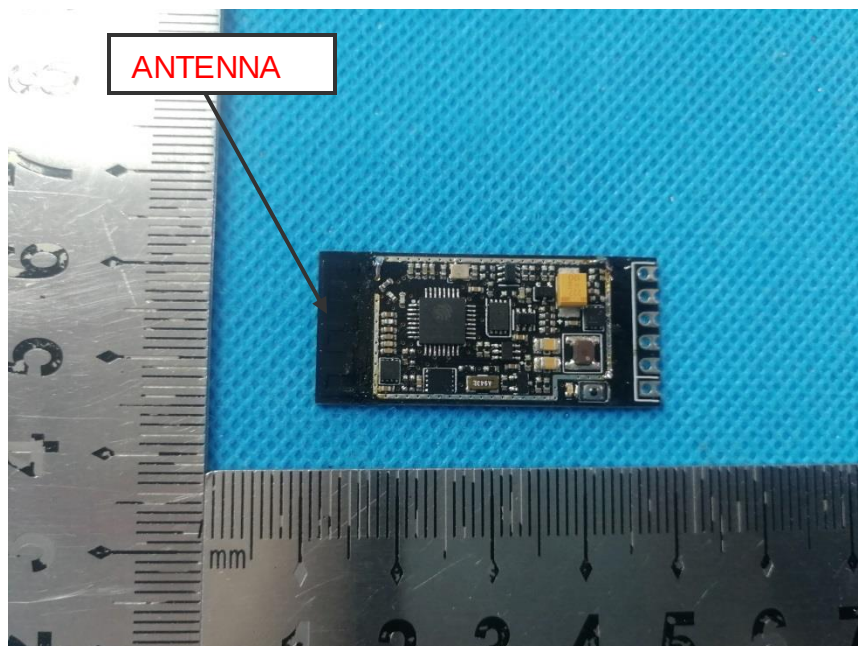
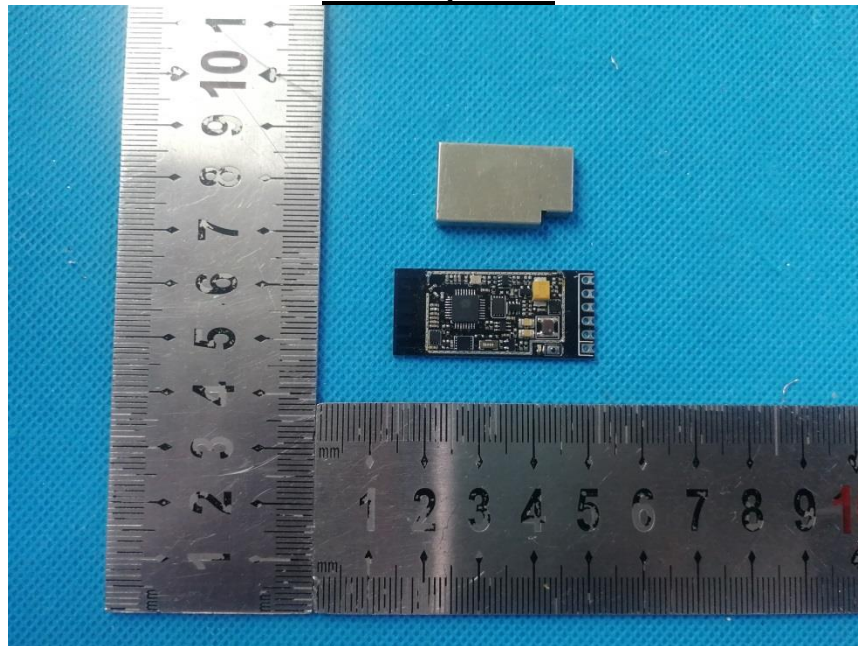


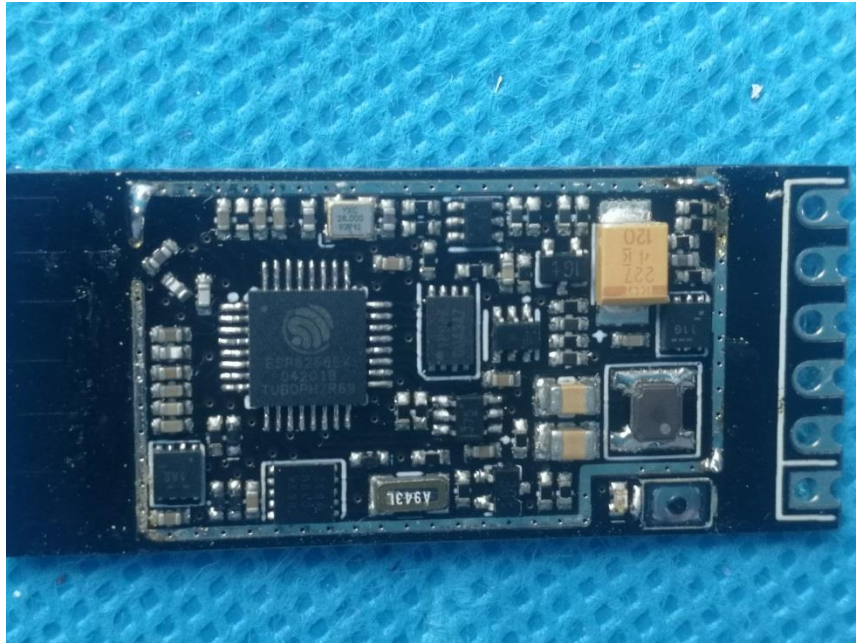
5. PHOTOS OF THE EUT

External photos



Internal photos





END