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Report Template Version: V05

Report Template Revision Date: 2021-11-03

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# Test Report

**Report No.:** CQASZ20220100086E-02

Applicant: Chengdu Vantron Technology Co., Ltd.

Address of Applicant: No.5 GaoPeng Road, Hi-Tech Zone, Chengdu, SiChuan, P.R. China 610045

**Equipment Under Test (EUT):** 

**Product:** Portable electronic tablet computer

All Model No.: IQRemote PG, V MPG

Test Model No.: IQRemote PG

Brand Name: N/A

FCC ID: 2AAGE-IQRTPGV4

Standards: 47 CFR Part 15, Subpart C

**Date of Receipt:** 2022-01-14

**Date of Test:** 2022-01-14 to 2022-06-25

**Date of Issue:** 2022-9-20

Test Result : PASS\*

Tested By:

(Lewis Zhou)

Reviewed By:

(Timo Lei)

Approved By: (Jack Ai)



The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.

<sup>\*</sup> In the configuration tested, the EUT complied with the standards specified above.



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# 1 Version

## **Revision History Of Report**

Report No.	Version	Description	Issue Date
CQASZ20220100086E-02	Rev.01	Initial report	2022-9-20

Note:

This test report (Ref. No.: CQASZ20220100086E-02)

All test data comes from source test reports (Ref. No.: CQASZ20220100087E-02).

Only on the basis of the original report Change Applicant, Address of Applicant.

The tested samples have not been changed.





# 2 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203/15.247 (c)	ANSI C63.10 2013	PASS
AC Power Line Conducted Emission	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 2013	PASS
Conducted Peak & Average Output Power	47 CFR Part 15, Subpart C Section 15.247 (b)(3)	ANSI C63.10 2013	PASS
6dB Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.247 (a)(2)	ANSI C63.10 2013	PASS
Power Spectral Density	47 CFR Part 15, Subpart C Section ANSI C63.10 2013		PASS
Band-edge for RF Conducted Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	ANSI C63.10 2013	PASS
RF Conducted Spurious Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	ANSI C63.10 2013	PASS
Radiated Spurious Emissions	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 2013	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 2013	PASS



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# 4 General Information

# 4.1 Client Information

Applicant:	Chengdu Vantron Technology Co., Ltd.
Address of Applicant:	No.5 GaoPeng Road, Hi-Tech Zone, Chengdu, SiChuan, P.R. China 610045
Manufacturer:	Chengdu Vantron Technology Co., Ltd.
Address of Manufacturer:	No.5 GaoPeng Road, Hi-Tech Zone, Chengdu, SiChuan, P.R. China 610045
Factory:	Chengdu Vantron Technology Co., Ltd.
Address of Factory:	No.5 GaoPeng Road, Hi-Tech Zone, Chengdu, SiChuan, P.R. China 610045

# 4.2 General Description of EUT

Product Name:	Portable electronic tablet computer
Model No.:	IQRemote PG, V MPG
Test Model No.:	IQRemote PG
Trade Mark:	N/A
Software Version:	1.0 FCC
Hardware Version:	Rev 5.1.1
Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz
Channel Numbers:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels
Channel Separation:	5MHz
Type of Modulation:	IEEE for 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE for 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n(HT20): OFDM (64QAM, 16QAM,QPSK,BPSK)
Transfer Rate:	IEEE for 802.11b: 1Mbps/2Mbps/5.5Mbps/11Mbps IEEE for 802.11g: 6Mbps/9Mbps/12Mbps/18Mbps/24Mbps/36Mbps/48Mbps/54Mbps IEEE for 802.11n(HT20): 6.5Mbps/13Mbps/19.5Mbps/26Mbps/39Mbps/52Mbps/58.5Mbps/65Mbps
Product Type:	☐ Mobile ☐ Portable ☒ Fix Location
Test Software of EUT:	Wi-Fi Continuous TX-Modulation
Antenna Type:	FPC antenna
Antenna Gain:	2.67 dBi
Power Supply:	lithium battery: DC 3.7V 2600mAh 9.62Wh, Charge by adapter
Adapter:	AC/DC Adapter:  Model: SW-120100  Input: 100-240V~ 50/60Hz 0.68A MAX  Output: 12V— 1000mA



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Operation Frequency each of channel(802.11b/g/n HT20)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz		

#### 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:

### For 802.11b/g/n (HT20):

= : :	
Channel	Frequency
The Lowest channel	2412MHz
The Middle channel	2437MHz
The Highest channel	2462MHz

### Note:

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.



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# 4.3 Test Environment and Mode

Temperature:	ironment:
•	25.5 °C
Humidity:	53 % RH
Atmospheric Pressure:	1009 mbar
Test mode:	
Transmitting	Keep the EUT in transmitting mode with all kind of modulation and all
mode:	kind of data rate.
Wi-Fi Continuous Tx - Mod	wi down
Wi-Fi Continuous Tx - Mod	widown wimpc0 wicountryALL
Wi-Fi Continuous Tx - Mod Mode 802.11n Bandwidth 20 MHz	wildown wingc D wilcountry ALL wiband a wilmine, by, csp 1 wilmine, by, csp 1 wilmine, by, csp 1 wilmine, by, csp 1
Mi-Fi Continuous Tx - Mode  Mode  802.11n  Bandwidth  20 MHz  Channel  1: 2412	wildown wimpc 0 wi mpc 0 wi country ALL wi band a wi mino, by c,sp 1 wi mino, by wi country 6 by 0 wi famino, by wi country 6 by 0 wi famino, by wi country 6 by 0 wi famino, by with famino, by wit
Wi-Fi Continuous Tx - Mod  Mode  802.11n  Bandwidth  20 MHz  Channel	wildown wingc D wilcountry ALL wilband a wilmino, by, csp 1 wilmino, by, csp 1 wilmino, by, csp 1 wilmino, by, csp 1 wildown csp
Wi-Fi Continuous Tx - Mode  802.11n  8andwidth 20 MHz  Channel 1:2412  Antenna	wildown withpe 0 withpe 10



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## 4.4 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	Remark	FCC certification
/	/	/	,	1

### 4.5 Test Location

All tests were performed at:

#### Shenzhen Huaxia Testing Technology Co., Ltd.,

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua New District, Shenzhen, Guangdong, China

## 4.6 Test Facility

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

### • CNAS (No. CNAS L5785)

CNAS has accredited Shenzhen Huaxia Testing Technology Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

#### • ISED Registration No.: 22984-1

The 3m Semi-anechoic chamber of Shenzhen Huaxia Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

#### • A2LA (Certificate No. 4742.01)

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4742.01.

#### • FCC Registration No.: 522263

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.:522263



# 4.7 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate.

The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities.

The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the **Shenzhen Huaxia Testing Technology Co., Ltd.** quality system acc. to DIN EN ISO/IEC 17025.

Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CQA laboratory is reported:

No.	Item	Uncertainty	Notes
1	Radiated Emission (Below 1GHz)	±5.12dB	(1)
2	Radiated Emission (Above 1GHz)	±4.60dB	(1)
3	Conducted Disturbance (0.15~30MHz)	±3.34dB	(1)
4	Radio Frequency	3×10 <sup>-8</sup>	(1)
5	Duty cycle	0.6 %.	(1)
6	Occupied Bandwidth	1.1%	(1)
7	RF conducted power	0.86dB	(1)
8	RF power density	0.74	(1)
9	Conducted Spurious emissions	0.86dB	(1)
10	Temperature test	0.8℃	(1)
11	Humidity test	2.0%	(1)
12	Supply voltages	0.5 %.	(1)
13	time	0.6 %.	(1)
14	Frequency Error	5.5 Hz	(1)

<sup>(1)</sup>This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

### 4.8 Deviation from Standards

None.

### 4.9 Abnormalities from Standard Conditions

None.

## 4.10 Other Information Requested by the Customer

None.





# 4.11 Equipment List

			Instrument	Calibration	Calibration
Test Equipment	Manufacturer	Model No.	No.	Date	Due Date
EMI Test Receiver	R&S	ESR7	CQA-005	2021/9/10	2022/9/9
Spectrum analyzer	R&S	FSU26	CQA-038	2021/9/10	2022/9/9
Preamplifier	MITEQ	AFS4-00010300-18- 10P-4	CQA-035	2021/9/10	2022/9/9
Preamplifier	MITEQ	AMF-6D-02001800- 29-20P	CQA-036	2021/9/10	2022/9/9
Loop antenna	Schwarzbeck	FMZB1516	CQA-087	2021/9/16	2024/9/15
Bilog Antenna	R&S	HL562	CQA-011	2021/9/16	2024/9/15
Horn Antenna	R&S	HF906	CQA-012	2021/9/16	2024/9/15
Horn Antenna	Schwarzbeck	BBHA 9170	CQA-088	2021/9/16	2024/9/15
Coaxial Cable (Above 1GHz)	CQA	N/A	C019	2021/9/10	2022/9/9
Coaxial Cable (Below 1GHz)	CQA	N/A	C020	2021/9/10	2022/9/9
Antenna Connector	CQA	RFC-01	CQA-080	2021/9/10	2022/9/9
RF cable(9KHz~40GHz)	CQA	RF-01	CQA-079	2021/9/10	2022/9/9
Power Sensor	KEYSIGHT	U2021XA	CQA-30	2021/9/10	2022/9/9
N1918A Power Analysis Manager Power Panel	Agilent	N1918A	CQA-074	2021/9/10	2022/9/9
Power divider	MIDWEST	PWD-2533-02-SMA- 79	CQA-067	2021/9/10	2022/9/9
EMI Test Receiver	R&S	ESPI3	CQA-013	2021/9/10	2022/9/9
LISN	R&S	ENV216	CQA-003	2021/9/10	2022/9/9
Coaxial cable	CQA	N/A	CQA-C009	2021/9/10	2022/9/9





### 5 Test results and Measurement Data

## 5.1 Antenna Requirement

Standard requirement:

47 CFR Part 15C Section 15.203 /247(c)

15.203 requirement:

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.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:



BT 2.4G and 5G wifi Ant

PowerG Ant

The 2.4G WIFI antenna is FPC antenna. The best case gain of the 2.4G WIFI antenna is 2.67dBi. The best case gain of the 5G WIFI antenna is 1.02dBi. The distance between the two antennas does not exceed 20CM.



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# 5.2 Conducted Emissions

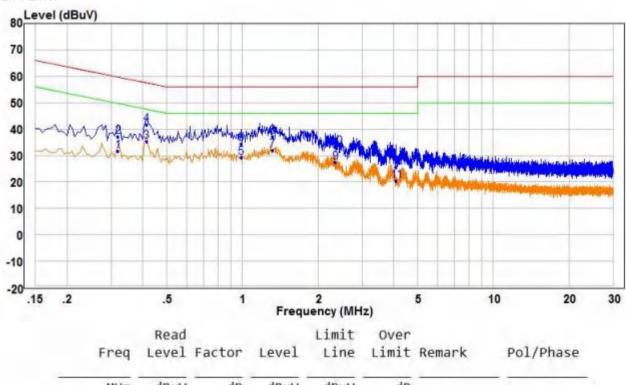
Test Requirement:	47 CFR Part 15C Section 15.2	207		
Test Method:	ANSI C63.10: 2013			
Test Frequency Range:	150kHz to 30MHz			
Limit:	TOOM IZ TO OUTVILIZ	Limit (d	IRuV)	
Littic	Frequency range (MHz)	Quasi-peak	•	
	0.15.0.5	66 to 56*	Average 56 to 46*	
	0.15-0.5			
	0.5-5	56	46	
	5-30	60	50	
Test Procedure:	* Decreases with the logarithm  1) The mains terminal disturb room.  2) The EUT was connected to Impedance Stabilization Not impedance. The power call connected to a second reference plane in the same way as the multiple socket outlet strip a single LISN provided the rate of the stabletop EUT was placed ground reference plane. An placed on the horizontal ground reference plane. An placed on the horizontal ground reference plane. The LISN unit under test and bonded mounted on top of the ground between the closest points the EUT and associated experience plane and all of the in ANSI C63.10: 2013 on control of the control of the control of the control of the in ANSI C63.10: 2013 on control of the control	pance voltage test was pance voltage test was pance voltage test was pance voltage test was pance voltage to AC power source through the LISN 2, which was the LISN 1 for the unit law was used to connect pating of the LISN was not panced upon a non-metallich of floor-standing and for floor-standing and the vertical ground reference plane, the vertical ground reference of the vertical ground reference und reference plane. The form the LISN 1 and the quipment was at least 0 am emission, the relative terface cables must be	bugh a LISN 1 (Line a 50Ω/50μH + 5Ω line the EUT were bonded to the grobeing measured. A multiple power cable to texceeded. The table 0.8m above the rangement, the EUT verence plane. The ehorizontal ground om the boundary of the plane for LISNs his distance was EUT. All other units of the positions of	near bund as to ne was ar e
Test Setup:	Shielding Room  EUT  AC Mains  LISN1	Ground Reference Plane	Test Receiver	



Exploratory Test Mode:	Transmitting with all kind of modulations, data rates at lowest, middle and highest channel.
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate of 802.11b at lowest channel is the worst case.  Only the worst case is recorded in the report.
Test Voltage:	AC120V/60Hz
Test Results:	Pass

#### **Measurement Data**

### Live Line:



	Freq	Level	Factor	Level	Line	Limit	Remark	Pol/Phase
-	MHz	dBuV	dB	dBuV	dBuV	dB		-
1	0.320	22.19	9.52	31.71	49.71	-18.00	Average	Line
2	0.320	27.71	9.52	37.23	59.71	-22.48	QP	Line
3 PP	0.415	25.77	9.62	35.39	47.55	-12.16	Average	Line
4 QP	0.415	32.10	9.62	41.72	57.55	-15.83	QP	Line
5	0.990	19.42	9.71	29.13	46.00	-16.87	Average	Line
6	0.990	24.78	9.71	34.49	56.00	-21.51	QP	Line
7	1.315	21.42	10.47	31.89	46.00	-14.11	Average	Line
8	1.315	26.66	10.47	37.13	56.00	-18.87	QP	Line
9	2.350	16.02	11.31	27.33	46.00	-18,67	Average	Line
10	2.350	21.97	11.31	33.28	56.00	-22.72	QP	Line
11	4.105	10.38	10.14	20.52	46.00	-25.48	Average	Line
12	4.105	15.57	10.14	25.71	56.00	-30.29	QP	Line

### Remark:

- 1. The following Quasi-Peak and Average measurements were performed on the EUT:
- 2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
- 3. If the Peak value under Average limit, the Average value is not recorded in the report.



Neutral

Neutral

Neutral

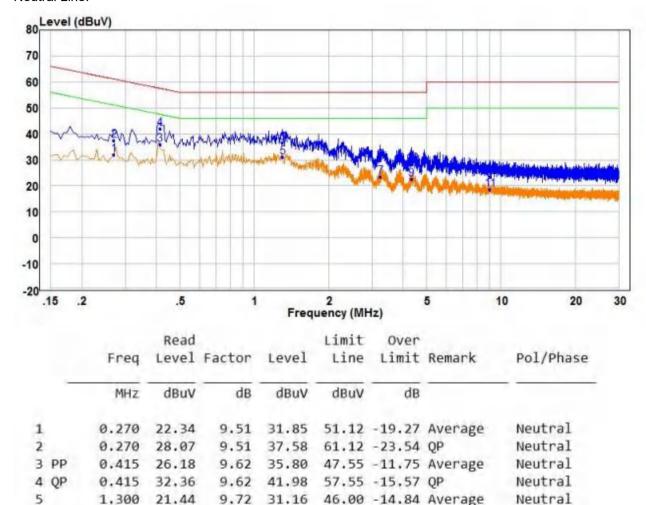
Neutral

Neutral

Neutral

Neutral

#### Neutral Line:



9.72 36.64 56.00 -19.36 QP

9.77 29.89 56.00 -26.11 QP

9.87 23.50 60.00 -36.50 QP

9.77 23.51 46.00 -22.49 Average

9.80 22.71 46.00 -23.29 Average

9.87 18.54 50.00 -31.46 Average

56.00 -27.59 QP

#### Remark:

6

7

8

9

10

11

12

1.300

3.240

3.240

9.005

9.005

4.330 12.91

4.330 18.61

26.92

13.74

20.12

8.67

13.63

1. The following Quasi-Peak and Average measurements were performed on the EUT:

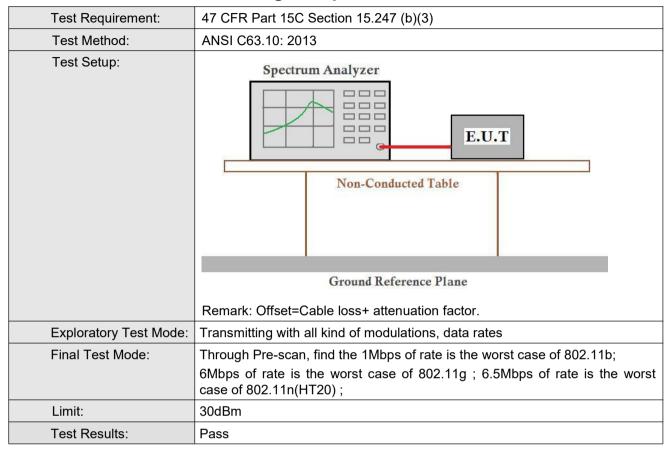
9.80 28.41

- 2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
- 3. If the Peak value under Average limit, the Average value is not recorded in the report.



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# 5.3 Conducted Peak & Average Output Power





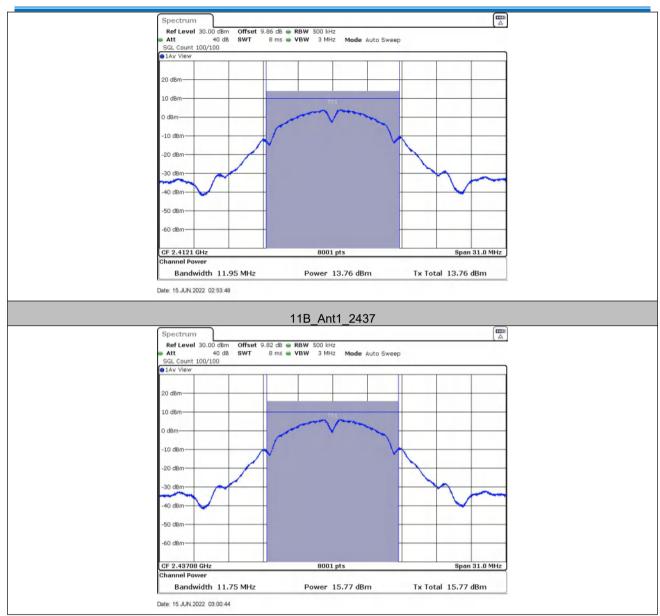
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### **Measurement Data**

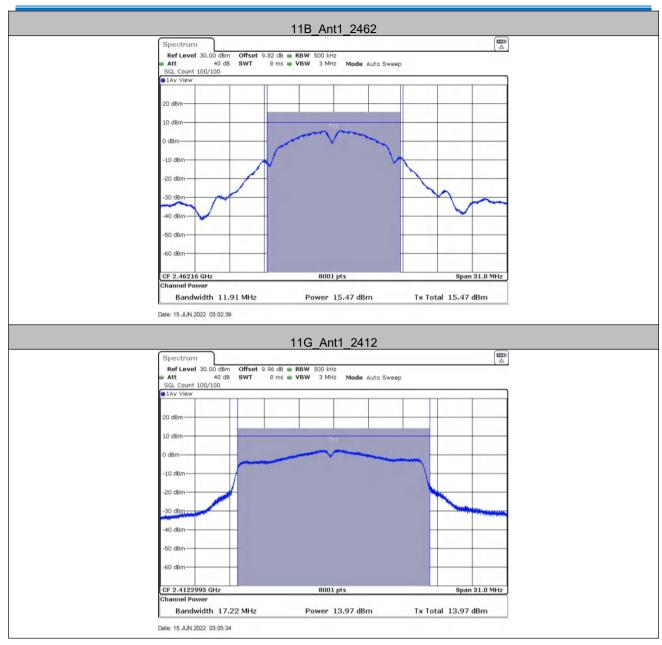
mode an official Bata							
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict		
		2412	13.76	≤30	PASS		
11B	Ant1	2437	15.77	≤30	PASS		
		2462	15.47	≤30	PASS		
	Ant1	2412	13.97	≤30	PASS		
11G		2437	15.71	≤30	PASS		
		2462	15.81	≤30	PASS		
11N20SISO	Ant1	2412	14.49	≤30	PASS		
		2437	16.28	≤30	PASS		
		2462	16.16	≤30	PASS		

The Result is averge output power.

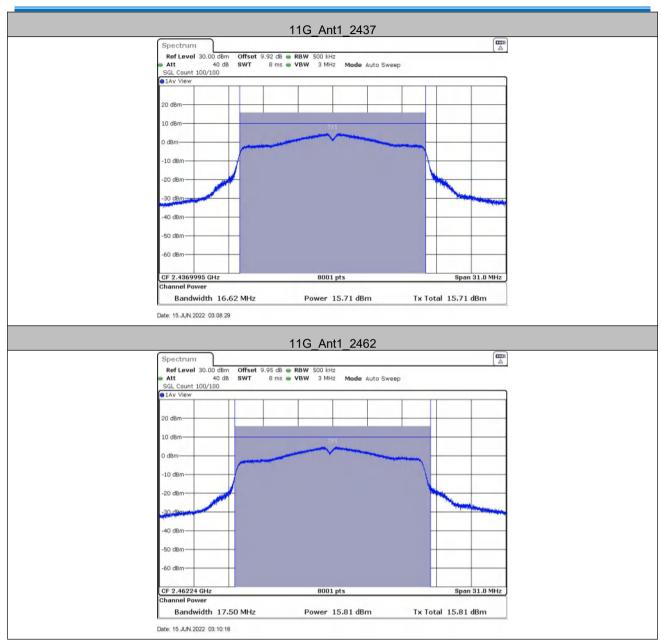




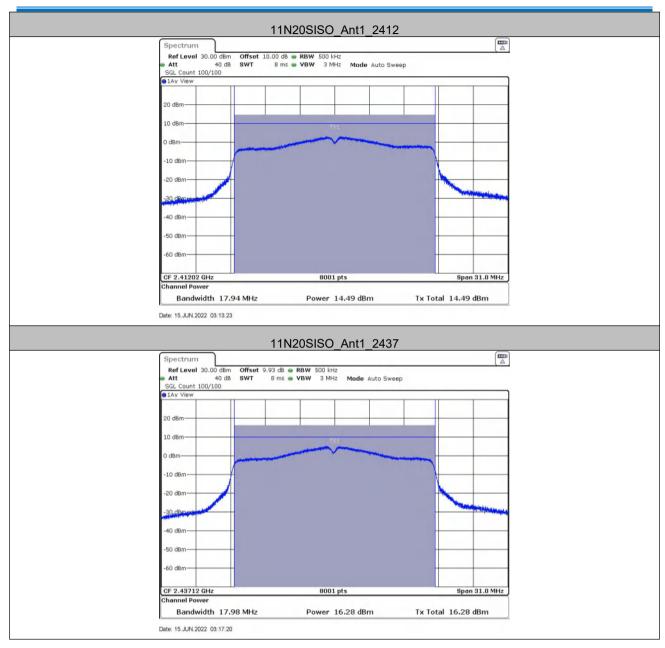




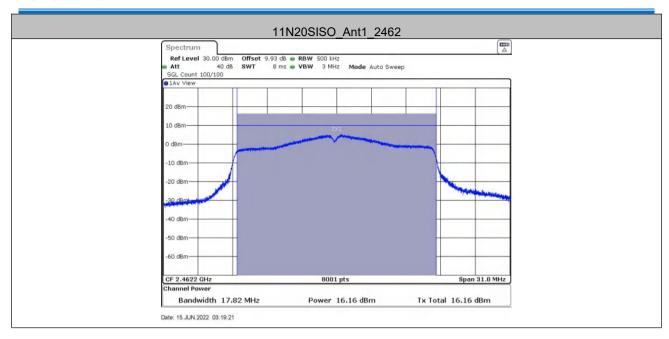








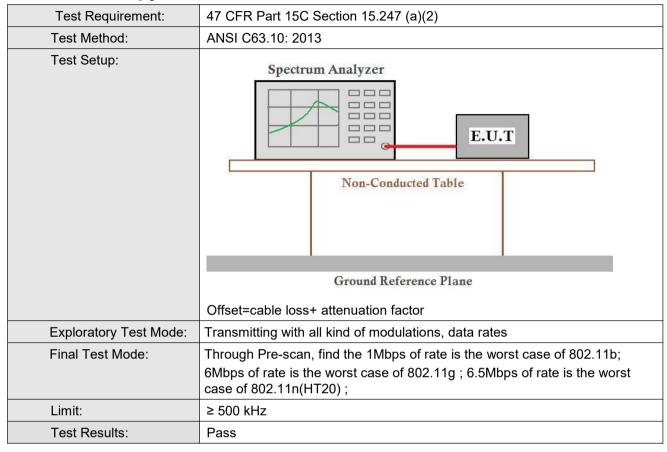








# 5.4 6dB Occupy Bandwidth





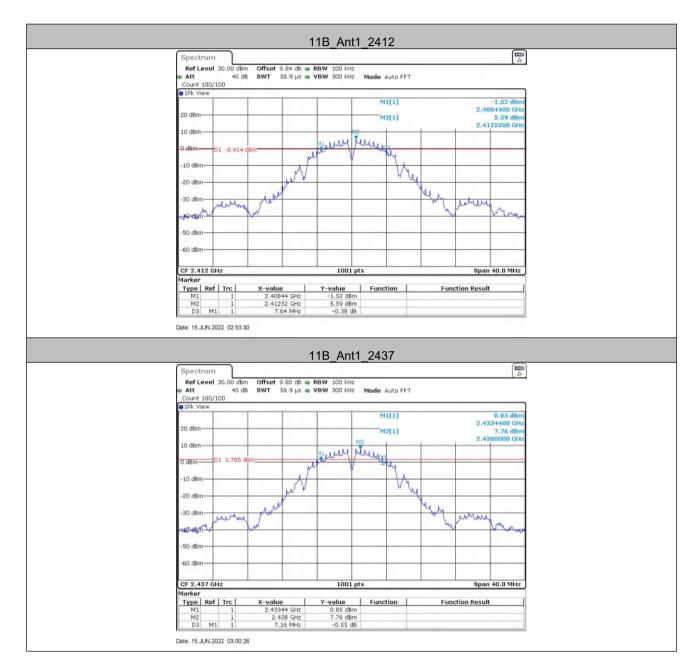
Report No.: CQASZ20220100086E-02

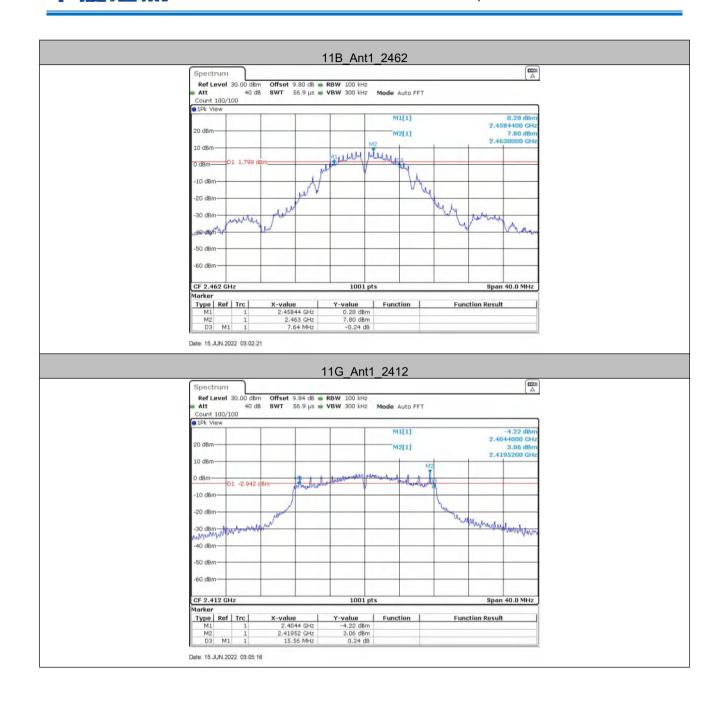
### **Measurement Data**

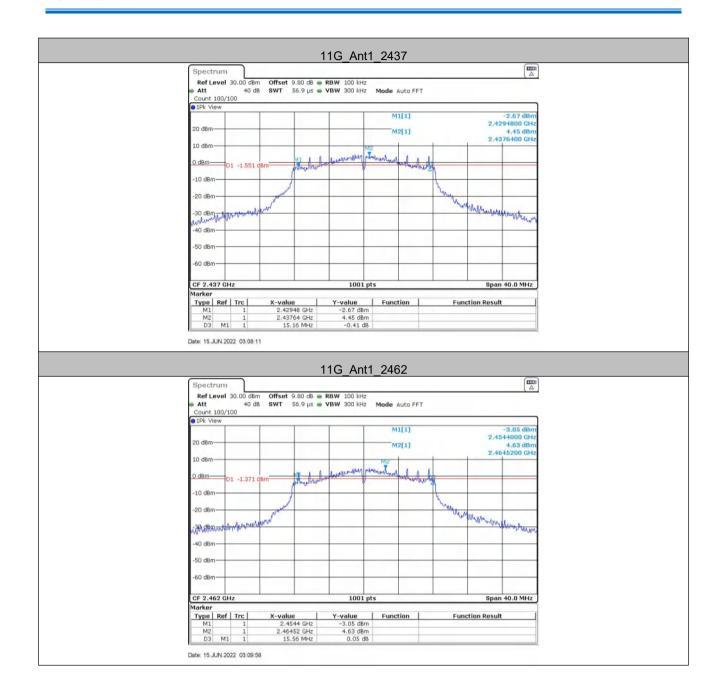
Measurement Data							
TestMode	Antenna	Channel	DTS BW	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
		2412	7.640	2408.440	2416.080	0.5	PASS
11B	Ant1	2437	7.160	2433.440	2440.600	0.5	PASS
		2462	7.640	2458.440	2466.080	0.5	PASS
		2412	15.560	2404.400	2419.960	0.5	PASS
11G	Ant1	2437	15.160	2429.480	2444.640	0.5	PASS
		2462	15.560	2454.400	2469.960	0.5	PASS
441100010		2412	15.800	2404.400	2420.200	0.5	PASS
11N20SIS	Ant1	2437	15.240	2429.400	2444.640	0.5	PASS
0		2462	15.240	2454.400	2469.640	0.5	PASS



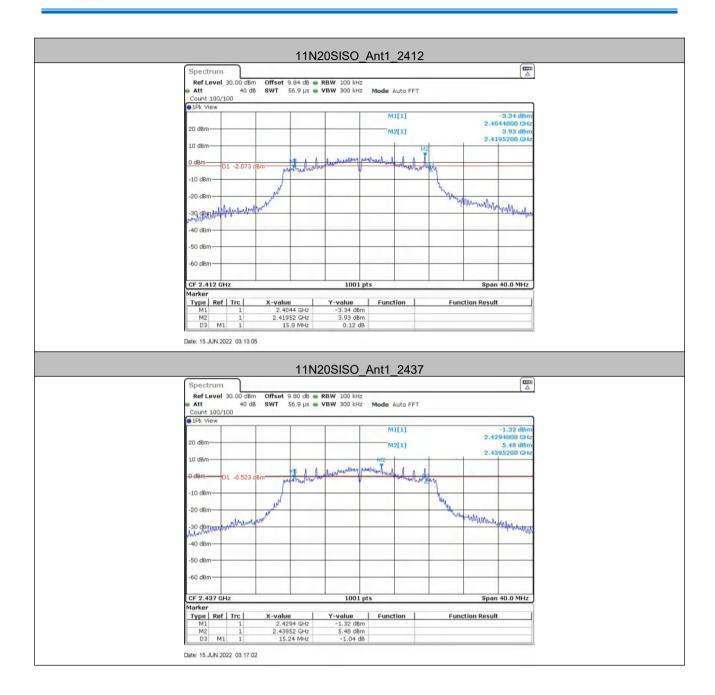
### Test plot as follows:











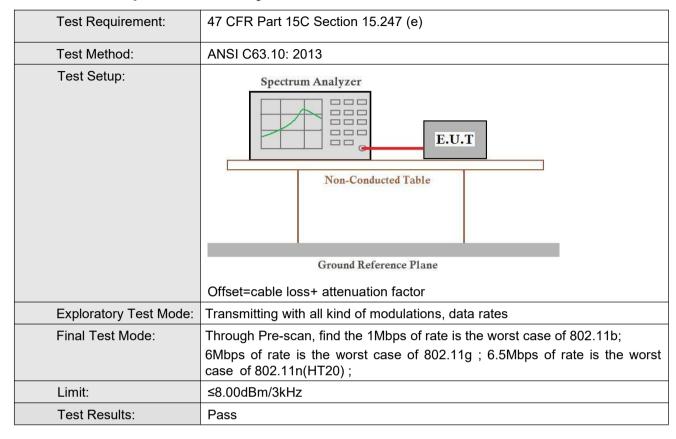






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# 5.5 Power Spectral Density





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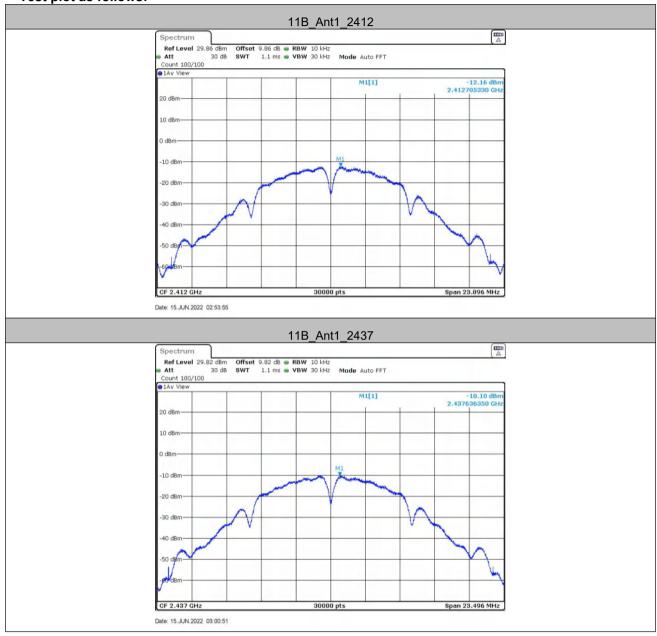
#### **Measurement Data**

Measurement Data	000 445			
	802.11b mode			
Test channel	Power Spectral Density	Limit (dBm/10kHz)	Result	
	(dBm/10kHz)			
Lowest	-12.16	≤13.23	Pass	
Middle	-10.1	≤13.23	Pass	
Highest	-10.53	≤13.23	Pass	
	802.11g mode			
Test channel	Power Spectral Density	Limit (dBm/10kHz)	Result	
	(dBm/10kHz)			
Lowest	-10.74	≤13.23	Pass	
Middle	-8.5	≤13.23	Pass	
Highest	-8.66	≤13.23	Pass	
	802.11n(HT20) mod	е		
Test channel	Power Spectral Density	Limit (dBm/10kHz)	Result	
	(dBm/10kHz)			
Lowest	-12.21	≤13.23	Pass	
Middle	-9.89	≤13.23	Pass	
Highest	-9.66	≤13.23	Pass	

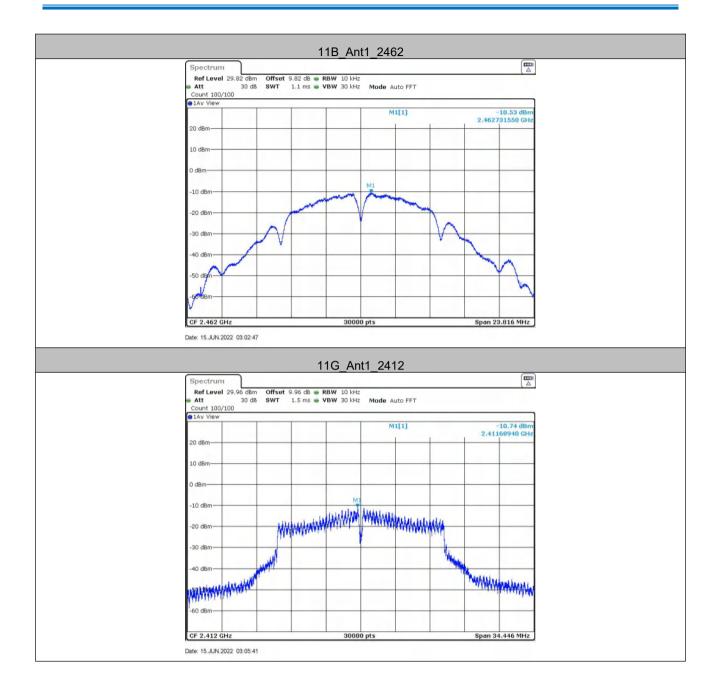
The Result is average PSD.



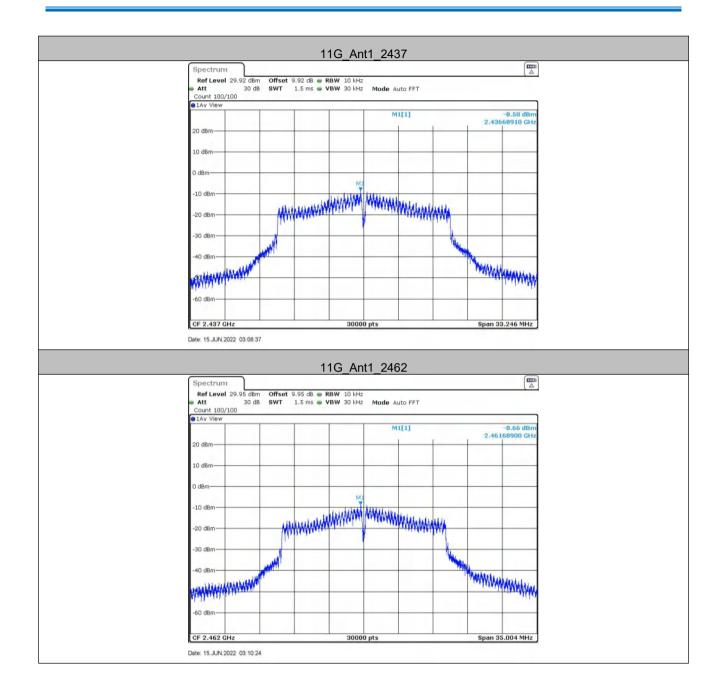
### Test plot as follows:



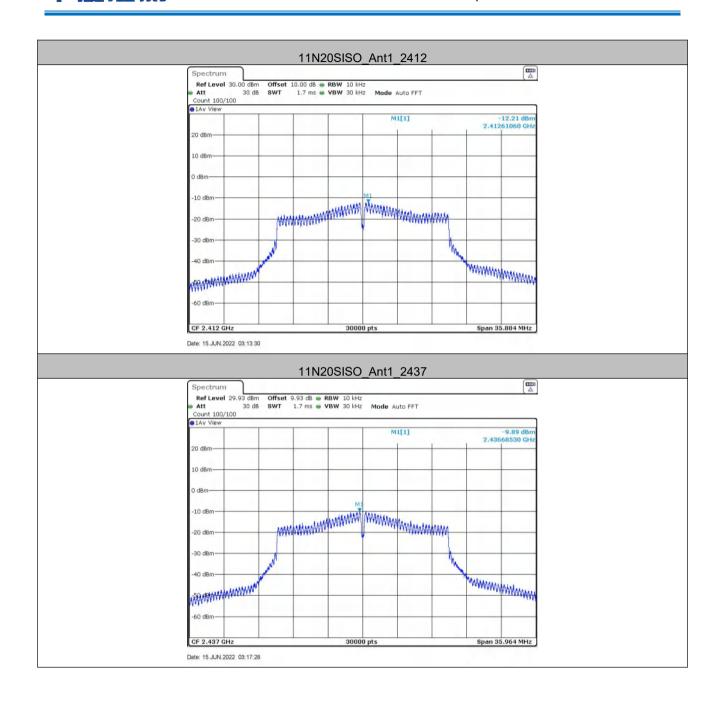




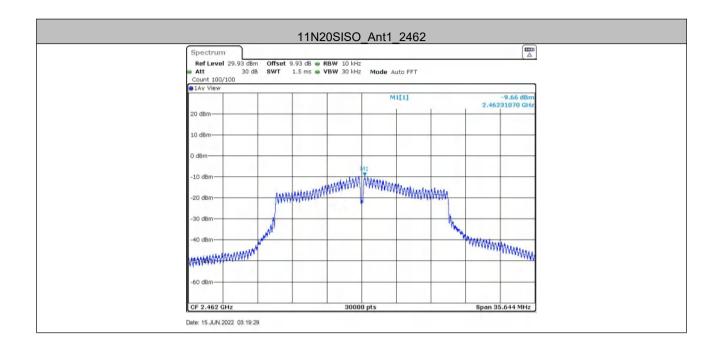








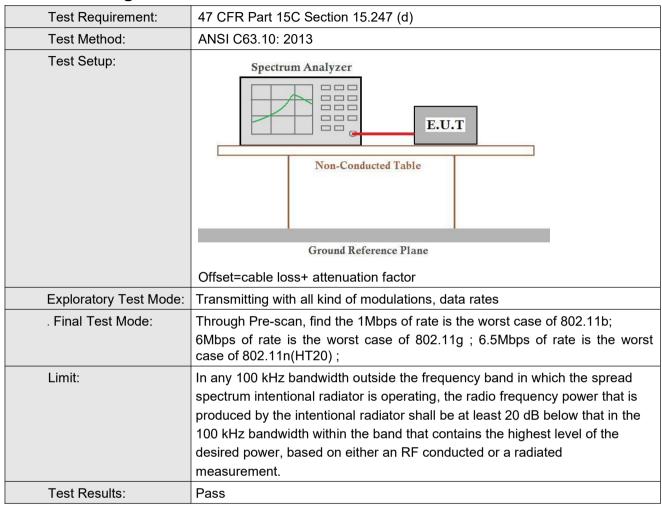






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## 5.6 Band-edge for RF Conducted Emissions





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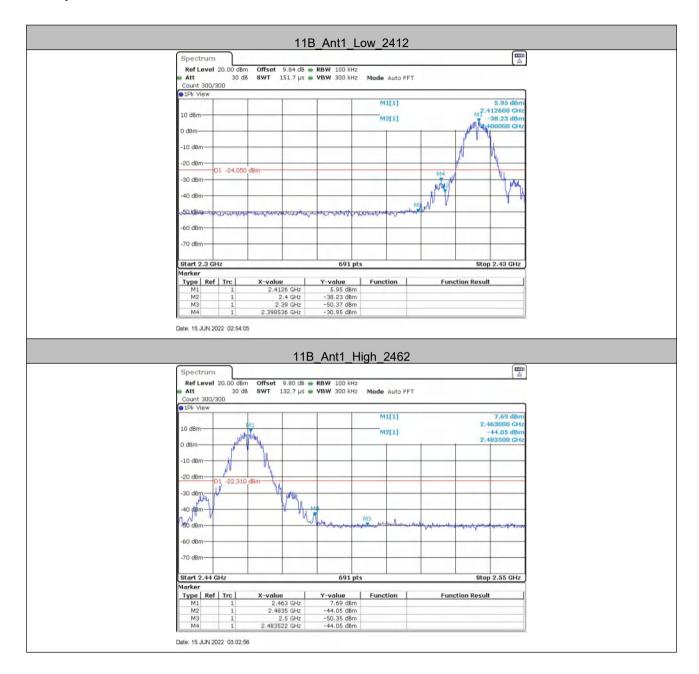
#### **Test Data:**

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
		Low	2412	5.95	-30.95	≤-24.05	PASS
11B	Ant1	High	2462	7.69	-44.05	≤-22.31	PASS
		Low	2412	2.45	-28.55	≤-27.55	PASS
11G	Ant1	High	2462	4.45	-33.76	≤-25.55	PASS
		Low	2412	0.01	-37.43	≤-29.99	PASS
11N20SISO	Ant1	High	2462	5.10	-33.84	≤-24.9	PASS



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#### Test plot as follows:







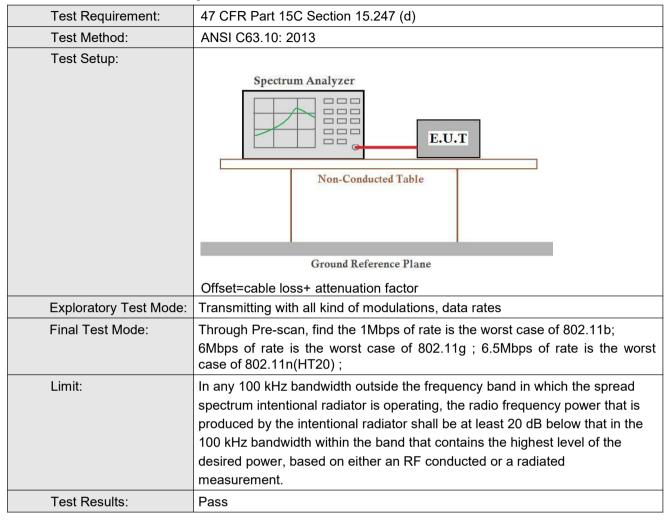




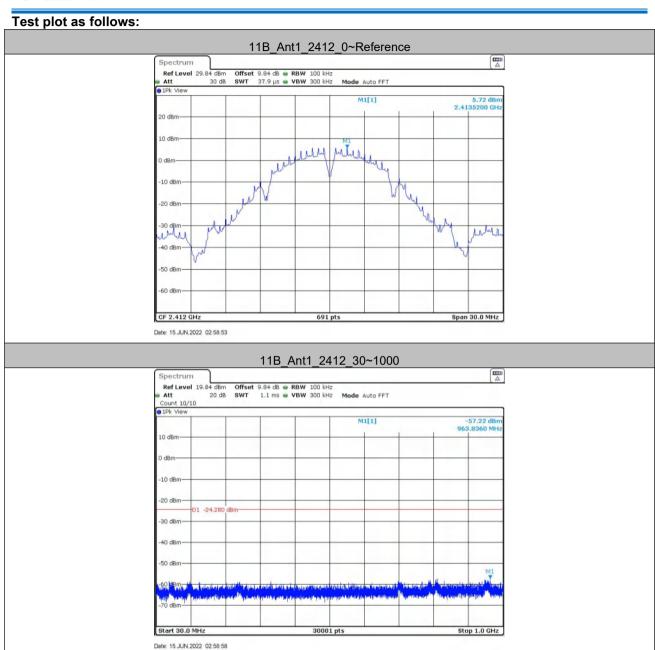


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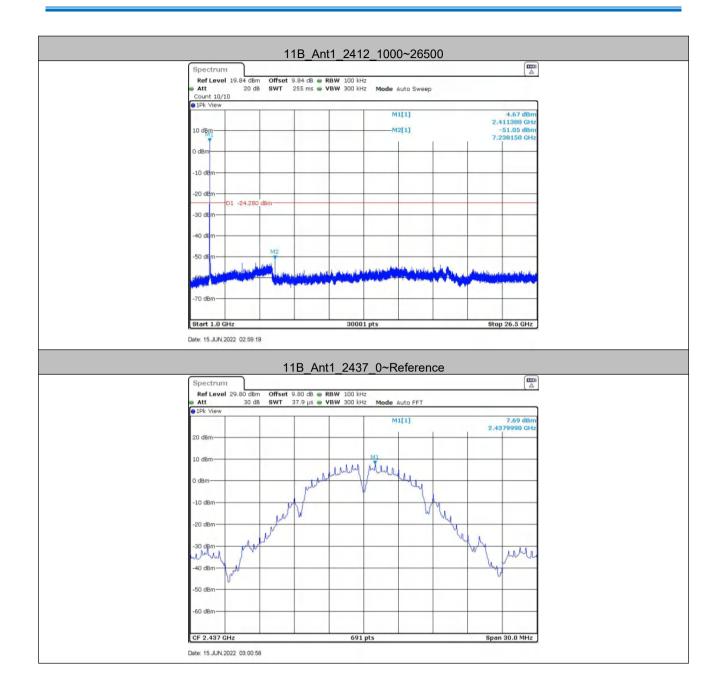
## 5.7 RF Conducted Spurious Emissions



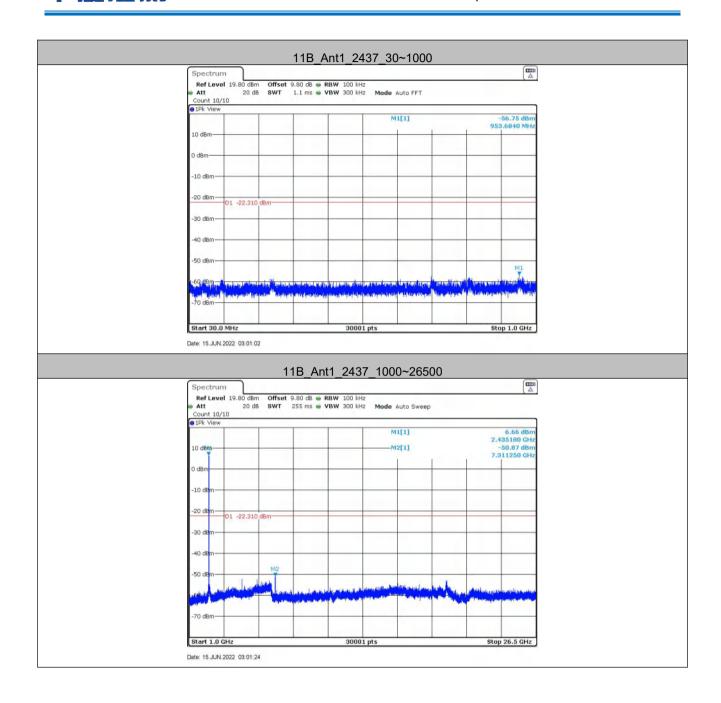




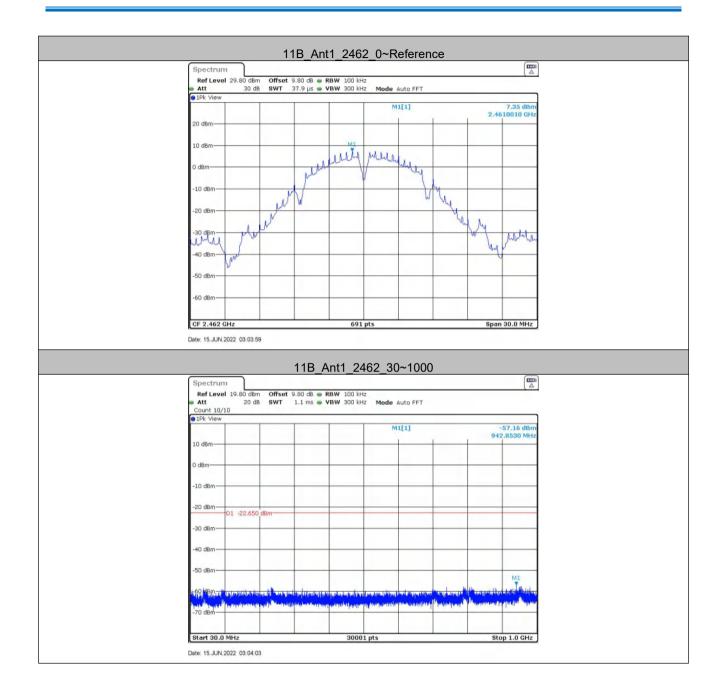




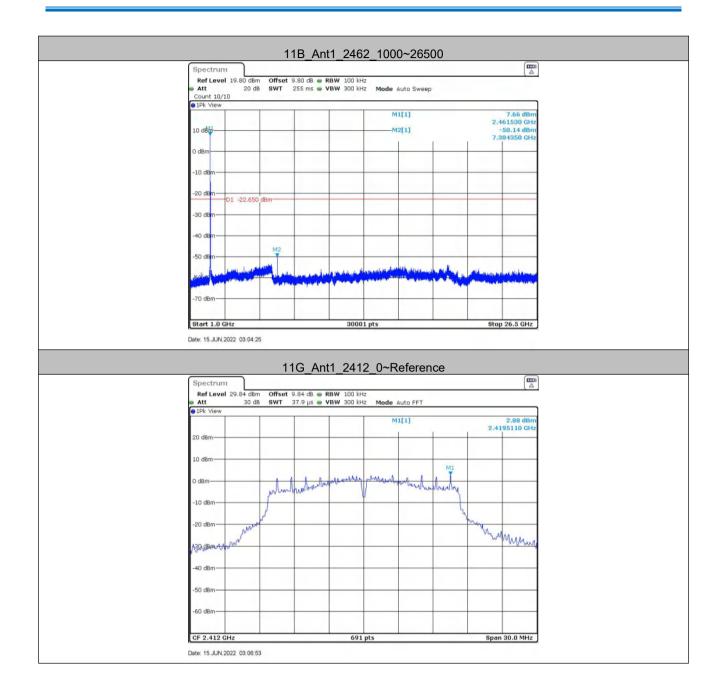




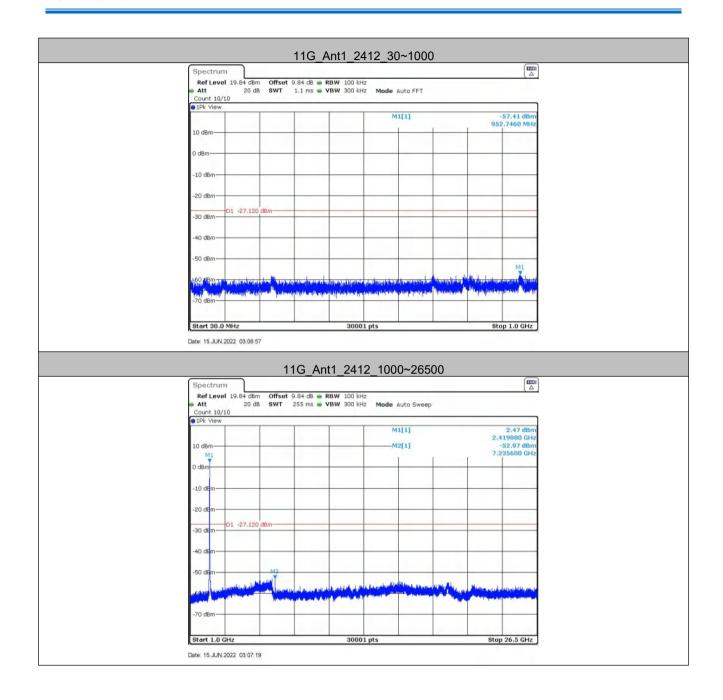




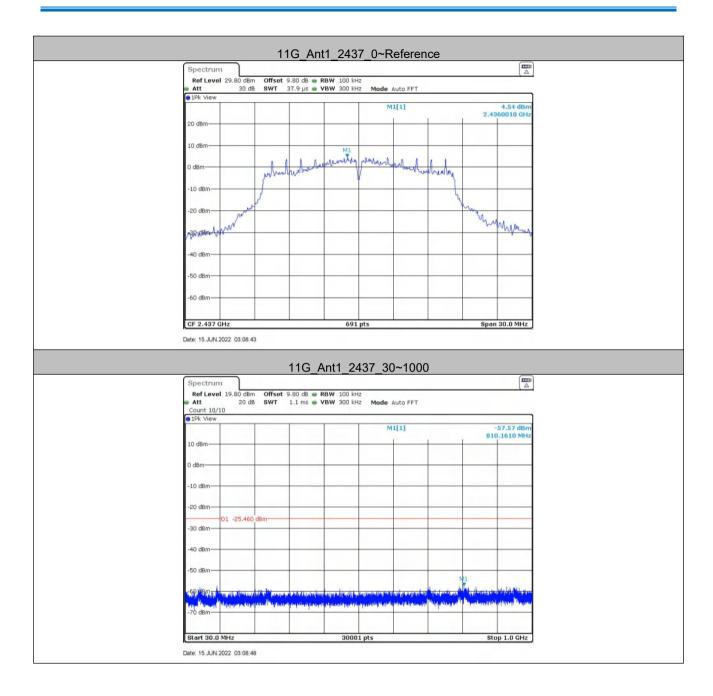




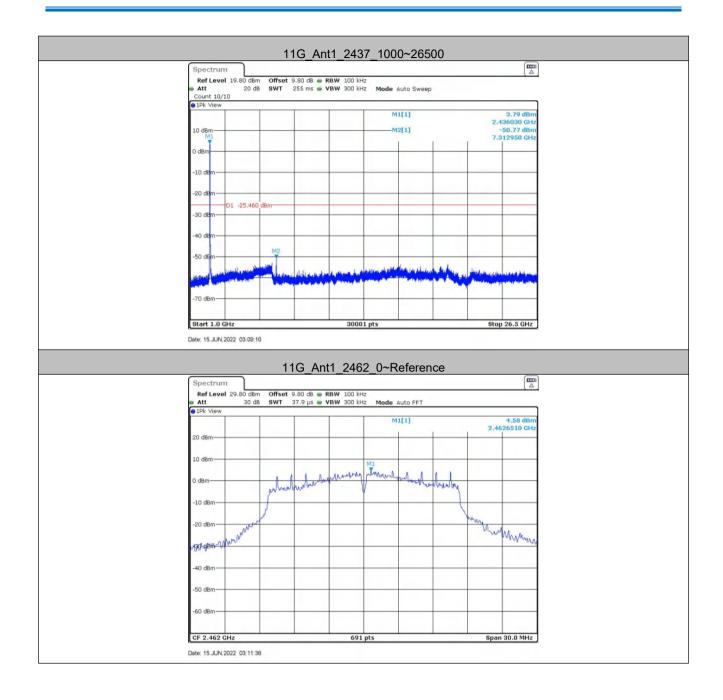




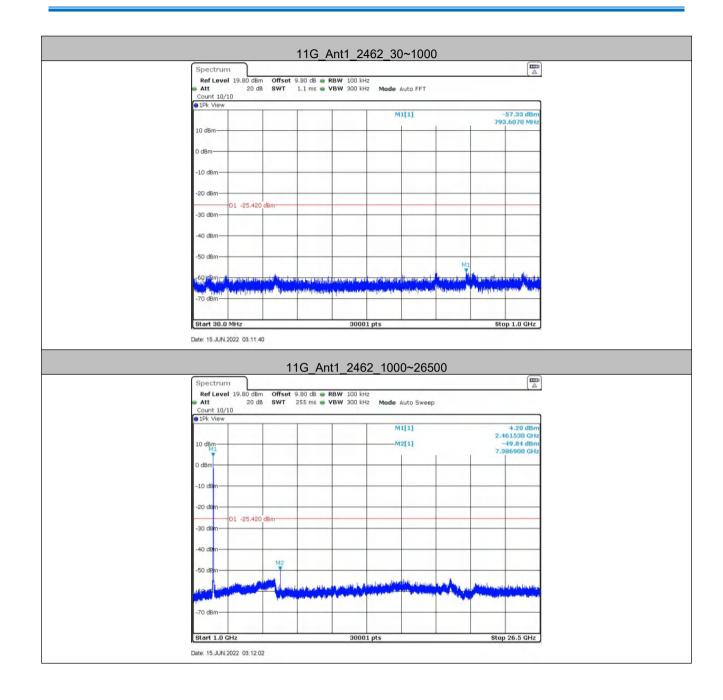




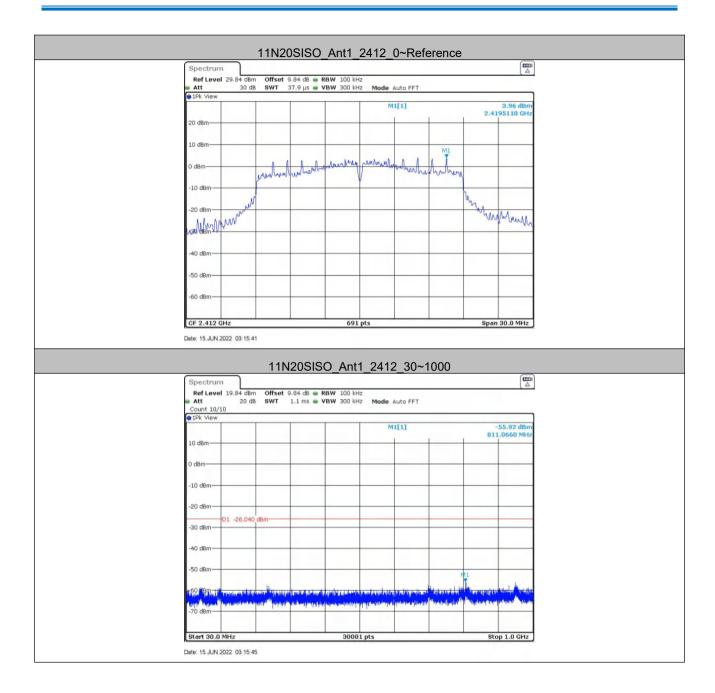




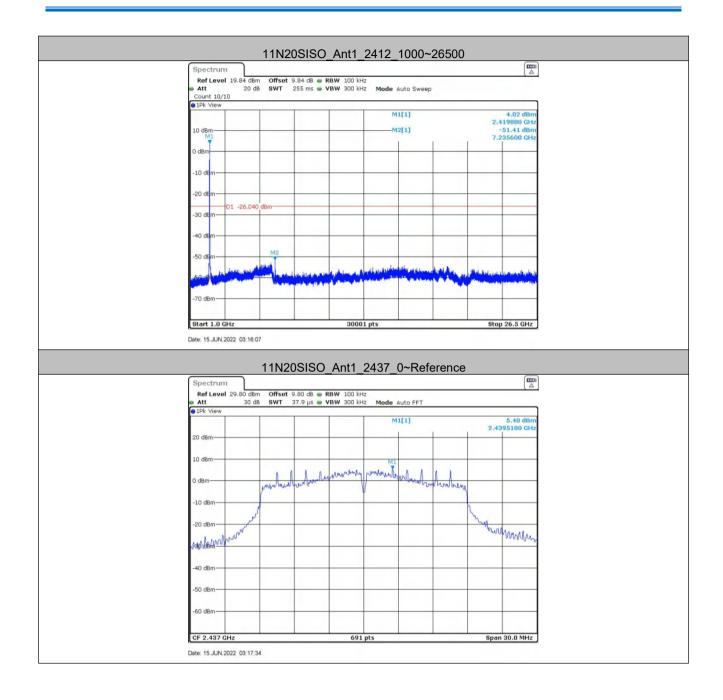




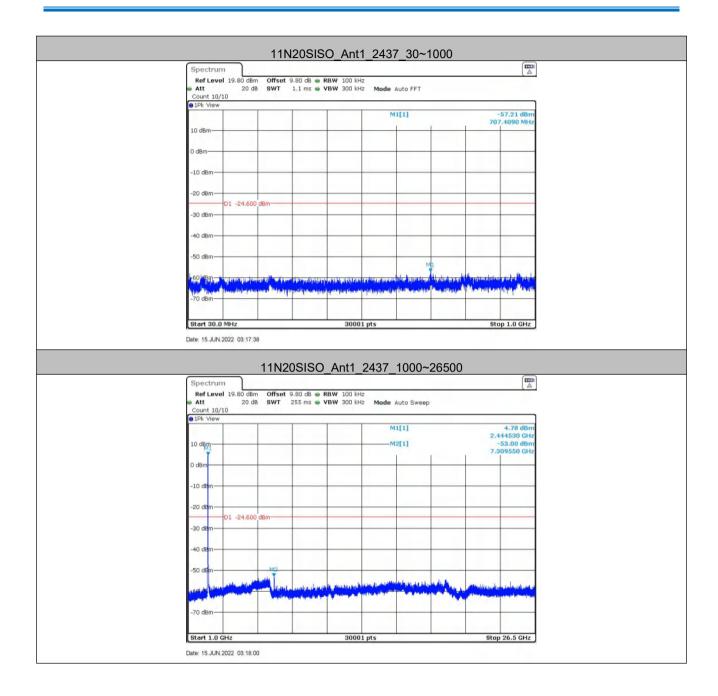




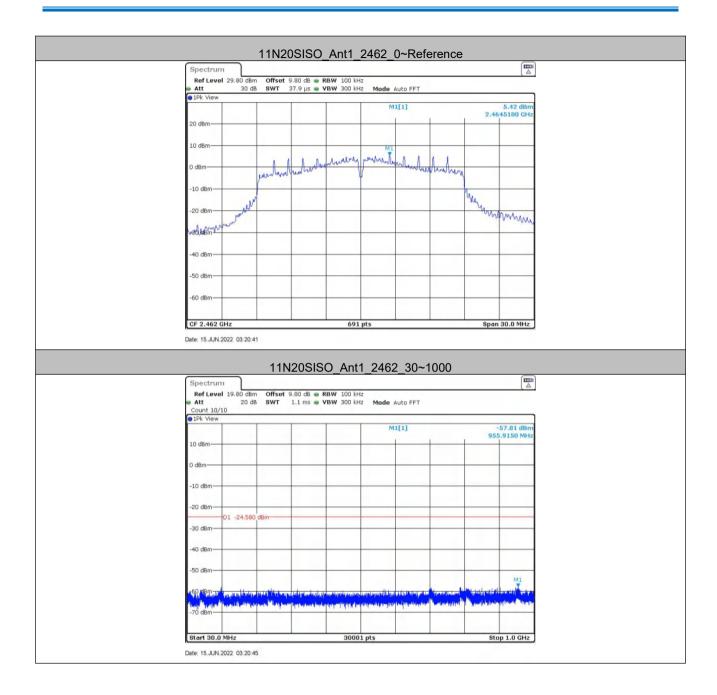






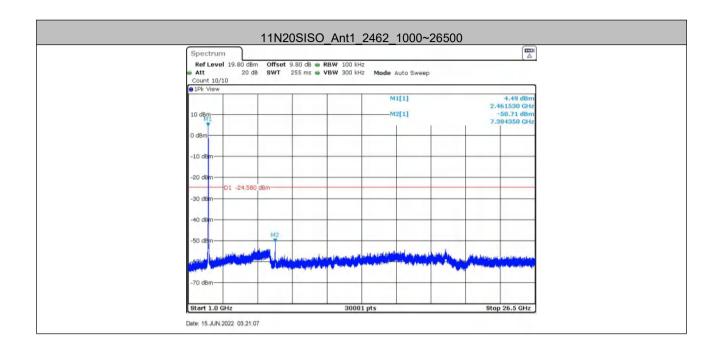








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#### Remark:

Pretest 9kHz to 25GHz, find the highest point when testing, so only the worst data were shown in the test report. Per FCC Part 15.33 (a) and 15.31 (o) ,The amplitude of spurious emissions from intentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this part.



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# 5.8 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205								
Test Method:	ANSI C63.10 2013								
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)								
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark				
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak				
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average				
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak				
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak				
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average				
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak				
	30MHz-1GHz	Quasi-peak	100 kHz	300kHz	Quasi-peak				
	Above 1GHz	Peak	1MHz	3MHz	Peak				
	Above IGHZ	Peak	1MHz	10Hz	Average				
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)				
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300				
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30				
	1.705MHz-30MHz	30	-	-	30				
	30MHz-88MHz	100	40.0	Quasi-peak	3				
	88MHz-216MHz	150	43.5	Quasi-peak	3				
	216MHz-960MHz	200	46.0	Quasi-peak	3				
	960MHz-1GHz	500	54.0	Quasi-peak	3				
	Above 1GHz	500	54.0	Average	3				
	emissions is 20dB applicable to the e	Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.							



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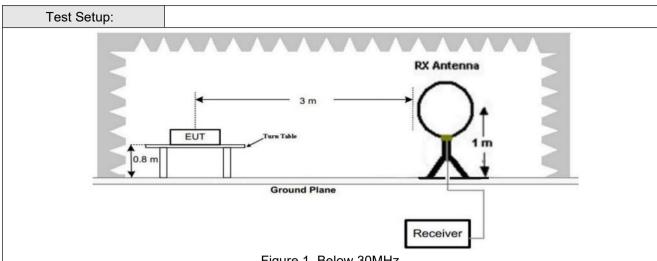


Figure 1. Below 30MHz

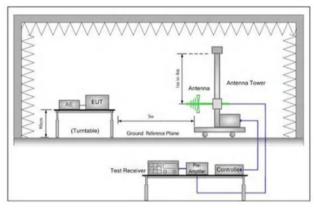


Figure 2. 30MHz to 1GHz

Figure 3. Above 1 GHz

#### Test Procedure:

- 1) Below 1G: The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
  - 2) Above 1G: The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.

Note: For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

- The EUT was set 3 meters away from the interference-receiving antenna. which was mounted on the top of a variable-height antenna tower.
- 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.



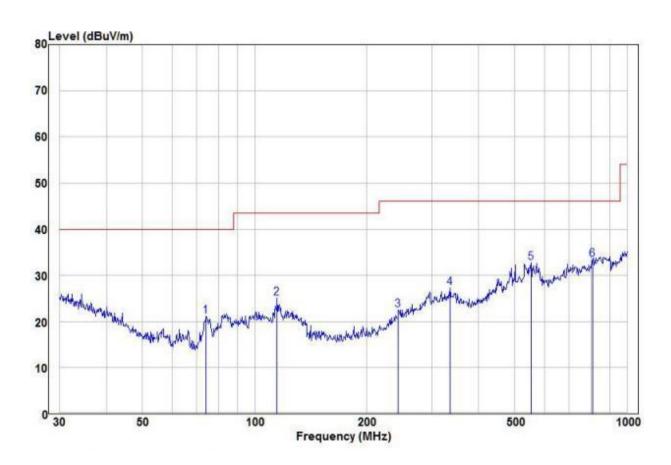
	d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters(for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
	e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
	<ul> <li>f. 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.</li> <li>g. Test the EUT in the lowest channel ,the middle channel ,the Highest channel</li> </ul>
	h. Repeat above procedures until all frequencies measured was complete.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates.
	Transmitting mode, Charge + Transmitting mode.
Final Test Mode:	Pretest the EUT at Transmitting mode and Charge +Transmitting mode, found the Charge +Transmitting mode which it is worse case
	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b;
	6Mbps of rate is the worst case of 802.11g; 6.5Mbps of rate is the worst case
	of 802.11n(HT20); For below 1GHz, through Pre-scan, find the 1Mbps of rate of 802.11b at lowest channel is the worst case.
	Only the worst case is recorded in the report.
Test Results:	Pass



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#### 5.8.1 Radiated emission below 1GHz

30MHz~1GHz		
Test mode:	Transmitting	Vertical



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	-	
1	74.14	20.81	0.37	21.18	40.00	-18.82	Peak	VERTICAL
2	114.92	24.67	0.49	25,16	43.50	-18.34	Peak	VERTICAL
3	243.38	19.79	2.66	22.45	46.00	-23.55	Peak	VERTICAL
4	334.86	24.49	2.88	27.37	46.00	-18.63	Peak	VERTICAL
5	552.88	30.50	2.25	32.75	46.00	-13.25	Peak	VERTICAL
6 pp	807.43	29.34	4.02	33,36	46.00	-12.64	Peak	VERTICAL

#### Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Factor = Antenna Factor + Cable Factor - Preamplifier Factor,

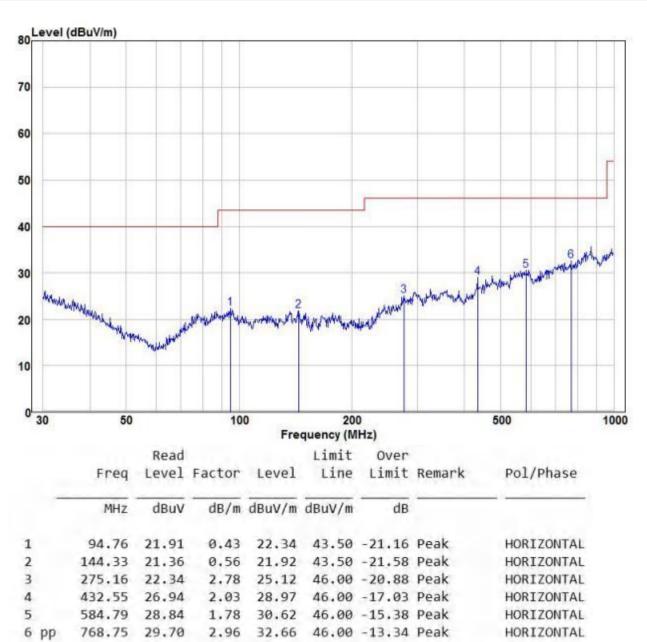
Level = Read Level + Factor,

Over Limit=Level-Limit Line.



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#### Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Factor = Antenna Factor + Cable Factor - Preamplifier Factor,

Level = Read Level + Factor,

Over Limit=Level-Limit Line.



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#### **5.8.2** Transmitter emission above 1GHz

2.4G WIFI can transmit at the same time with Power G, so the test data describes the test results of both transmission at the same time.

Test mode:	Test mode: 8		Mbps)	Test channel:		Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Type	H/V
1825.500	54.21	-9.32	44.89	74	-29.11	peak	Н
4824.000	52.66	-4.26	49.45	74	-24.55	peak	Н
4824.000	36.27	-4.26	32.39	54	-21.61	AVG	Н
7236.000	51.09	1.18	53.04	74	-20.96	peak	Н
7236.000	37.73	1.18	40.11	54	-13.89	AVG	Н
1825.500	53.02	-9.32	43.7	74	-30.3	peak	V
4824.000	55.27	-4.26	50.33	74	-23.67	peak	V
4824.000	38.83	-4.26	35.41	54	-18.59	AVG	V
7236.000	51.01	1.18	51.56	74	-22.44	peak	V
7236.000	35.74	1.18	36.27	54	-17.73	AVG	V

Test mode:		802.11b(1	Mbps)	Test chann	el:	Middle	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Type	H/V
4874.000	52.45	-4.12	47.52	74	-26.48	peak	Н
4874.000	36.72	-4.12	33.67	54	-20.33	AVG	Н
7311.000	49.86	1.46	51.13	74	-22.87	peak	Н
7311.000	35.02	1.46	37.01	54	-16.99	AVG	Н
4874.000	53.35	-4.12	48.27	74	-25.73	peak	V
4874.000	36.18	-4.12	33.68	54	-20.32	AVG	V
7311.000	48.86	1.46	51.03	74	-22.97	peak	V
7311.000	36.90	1.46	36.63	54	-17.37	AVG	V



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Test mode:		802.11b(1	Mbps)	Test chann	el:	Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Type	H/V
1838.212	53.21	-9.29	43.92	74	-30.08	peak	Н
4924.000	53.10	-4.03	48.34	74	-25.66	peak	Н
4924.000	37.78	-4.03	32.96	54	-21.04	AVG	Н
7386.000	50.67	1.66	52.90	74	-21.10	peak	Н
7386.000	37.32	1.66	37.97	54	-16.03	AVG	Н
1838.212	54.02	-9.29	44.73	74	-29.27	peak	V
4924.000	54.84	-4.03	50.66	74	-23.34	peak	V
4924.000	37.64	-4.03	34.81	54	-19.19	AVG	V
7386.000	49.52	1.66	52.18	74	-21.82	peak	V
7386.000	36.03	1.66	38.04	54	-15.96	AVG	V

#### Remark:

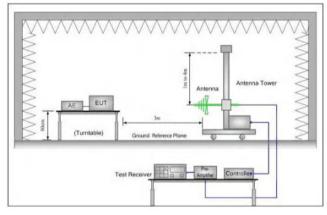
- 1) The 1Mbps of rate of 802.11b is the worst case.
- 2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
  - Final Test Level = Receiver Reading + Antenna Factor + Cable Factor Preamplifier Factor
- 3) Scan from 9kHz to 25GHz, The disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.



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### 5.9 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15C Section 1	47 CFR Part 15C Section 15.209 and 15.205								
Test Method:	ANSI C63.10 2013	ANSI C63.10 2013								
Test Site:	Measurement Distance: 3m	(Semi-Anechoic Chambe	r)							
Limit:	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							
	Above 1GHz	54.0	Average Value							
	Above IGHZ	74.0	Peak Value							
Test Setup:										



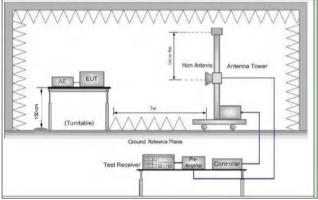


Figure 1. 30MHz to 1GHz

Figure 2. Above 1 GHz

#### Test Procedure:

a. 1) Below 1G: The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2) Above 1G: The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. Note: For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. 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.
- d. For each suspected emission, the EUT was arranged to its worst case and



	then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.  e. The test-receiver system was set to Peak Detect Function and Specified
	f. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel g. Test the EUT in the lowest channel, the Highest channel h. Repeat above procedures until all frequencies measured was complete.
•	Transmitting with all kind of modulations, data rates.
Mode:	Transmitting mode.
Final Test Mode:	Pretest the EUT at Transmitting mode, found the Transmitting mode which it is worse case
	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b;
	6Mbps of rate is the worst case of 802.11g; 6.5Mbps of rate is the worst case
	of 802.11n(HT20);
Test Results:	Pass



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#### Test data:

Worse case mode:		802.11b(1Mbps)		Test channel:		Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Type	H/V
2390.000	58.54	-9.2	49.42	74	-24.58	peak	Н
2390.000	44.08	-9.2	35.36	54	-18.64	AVG	Н
2400.000	59.63	-9.39	50.84	74	-23.16	peak	Н
2400.000	46.98	-9.39	37.05	54	-16.95	AVG	Н
2390.000	58.36	-9.2	49.53	74	-24.47	peak	V
2390.000	44.49	-9.2	35.40	54	-18.60	AVG	V
2400.000	59.56	-9.39	50.14	74	-23.86	peak	V
2400.000	46.02	-9.39	36.63	54	-17.37	AVG	V

Worse case	mode:	802.11b(1N	Mbps)	Test chann	el:	Highest	
	Meter		Emission				Ant. Pol.
Frequency	Reading	Factor	Level	Limits	Over	Detector	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре	H/V
2483.500	57.53	-9.29	48.47	74	-25.53	peak	Н
2483.500	43.68	-9.29	34.19	54	-19.81	AVG	Н
2483.500	57.78	-9.29	48.68	74	-25.32	peak	V
2483.500	45.73	-9.29	36.19	54	-17.81	AVG	V



Worse case mode:		802.11g(6Mbps)		Test channel:		Lowest	
	Meter		Emission				Ant. Pol.
Frequency	Reading	Factor	Level	Limits	Over	Detector	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре	H/V
2390.000	59.15	-9.2	50.00	74	-24.00	peak	Н
2390.000	44.86	-9.2	34.81	54	-19.19	AVG	Н
2400.000	60.08	-9.39	50.75	74	-23.25	peak	Н
2400.000	46.44	-9.39	36.94	54	-17.06	AVG	Н
2390.000	58.47	-9.2	49.08	74	-24.92	peak	V
2390.000	44.62	-9.2	34.87	54	-19.13	AVG	V
2400.000	60.14	-9.39	50.23	74	-23.77	peak	V
2400.000	46.82	-9.39	37.51	54	-16.49	AVG	V

Worse case mode:		802.11g(6Mbps)		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Type	H/V
2483.500	57.82	-9.29	48.77	74	-25.23	peak	Н
2483.500	43.73	-9.29	34.72	54	-19.28	AVG	Н
2483.500	58.29	-9.29	48.81	74	-25.19	peak	V
2483.500	45.77	-9.29	36.54	54	-17.46	AVG	V



Worse case mode:		802.11n(HT20)(6.5Mbps)		Test channel:		Lowest	
	Meter		Emission				Ant. Pol.
Frequency	Reading	Factor	Level	Limits	Over	Detector	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре	H/V
2390.000	59.20	-9.2	49.79	74	-24.21	peak	Н
2390.000	44.21	-9.2	35.72	54	-18.28	AVG	Н
2400.000	60.06	-9.39	50.55	74	-23.45	peak	Н
2400.000	46.00	-9.39	36.60	54	-17.40	AVG	Н
2390.000	59.16	-9.2	49.65	74	-24.35	peak	V
2390.000	44.50	-9.2	35.25	54	-18.75	AVG	V
2400.000	60.03	-9.39	50.29	74	-23.71	peak	V
2400.000	46.07	-9.39	37.26	54	-16.74	AVG	V

Worse case mode:		802.11n(HT20)(6.5Mbps)		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Type	H/V
2483.500	57.73	-9.29	49.03	74	-24.97	peak	Н
2483.500	43.70	-9.29	34.32	54	-19.68	AVG	Н
2483.500	57.87	-9.29	48.30	74	-25.70	peak	V
2483.500	45.46	-9.29	36.23	54	-17.77	AVG	V

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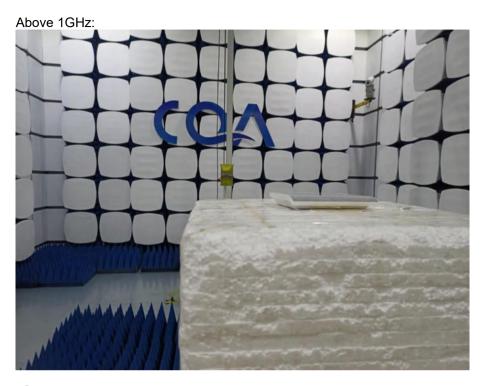
# 6 Photographs - EUT Test Setup

# 6.1 Radiated Spurious Emission

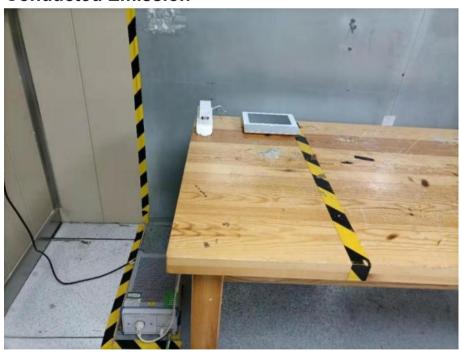




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# **6.2 Conducted Emission**





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### **PHOTOGRAPHS OF EUT Constructional Details**

Refer to APPENDIX 2 PHOTOGRAPHS OF EUT for CQASZ20220100086E-01.

\*\*\* END OF REPORT\*\*\*