RF Test Report

For

Applicant name:	**VL Wireless Inc**
Address:	2970 E La Palma Ave Suite L, Anaheim, CALIFORNIA 92806 United States
EUT name:	Tablet PC
Brand name:	VL
Model number:	VL10
Series model number:	N/A
FCC ID:	2BS4HVL10

Issued By

Company name:	**BTF Testing Lab (Shenzhen) Co., Ltd.**
Address:	Plant 101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, Guangdong, China
Report number:	BTF251114R00504
Test standards:	FCC CFR Title 47 Part 15 Subpart E (§ 15.407)
Test conclusion:	Pass
Date of sample receipt:	2025-11-14
Test date:	2025-11-15 to 2026-01-19
Date of issue:	2026-01-27

Prepared by: Chris Liu / Project engineer

Approved by: Ryan.C / EMC manager

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Revision History		
Version	Issue date	Revisions content
R_V0	2026-01-27	Original

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1 Introduction

1.1 Laboratory Location

Test location:	BTF Testing Lab (Shenzhen) Co., Ltd.
Address:	Plant 101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, Guangdong, China
Description:	All measurement facilities used to collect the measurement data are located at Plant 101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, Guangdong, China
Phone number:	+86-0755-23146130
Fax number:	+86-0755-23146130

1.2 Laboratory Facility

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

- **FCC - Designation No.: CN1409**
  BTF Testing Lab (Shenzhen) Co., Ltd. has been accredited as a testing laboratory by FCC (Federal Communications Commission). The test firm Registration No. is 695374.
- **CNAS - Registration No.: CNAS L17568**
  BTF Testing Lab (Shenzhen) Co., Ltd. is accredited to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L17568.
- **A2LA - Registration No.: 6660.01**
  BTF Testing Lab (Shenzhen) Co., Ltd. is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories.

1.3 Announcement

(1) The test report reference to the report template version v0.
(2) The test report is invalid if not marked with the signatures of the persons responsible for preparing, reviewing and approving the test report.
(3) The test report is invalid if there is any evidence and/or falsification.
(4) This document may not be altered or revised in any way unless done so by BTF and all revisions are duly noted in the revisions section.
(5) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
(6) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.
(7) All entrusted information in this report is provided by the client and has been confirmed through consultation with the client; The testing items for this report have been discussed and confirmed with the client, and our company is only responsible for the content reflected in the report.

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2 Product Information

2.1 Application Information

Company name:	VL Wireless Inc
Address:	2970 E La Palma Ave Suite L, Anaheim, CALIFORNIA 92806 United States

2.2 Manufacturer Information

Company name:	VL Wireless Inc
Address:	2970 E La Palma Ave Suite L, Anaheim, CALIFORNIA 92806 United States

2.3 Factory Information

Company name:	ZTECH COMMNICATION(SZ) CO LTD
Address:	FL 7 BLOCK D BAO'AN ZHIGU INNOVATION PARK YIN'TIAN ROAD NO.4 XI'XIANG STR'BAO'AN DISTRICT SZ CHINA

2.4 General Description of Equipment under Test (EUT)

EUT name	Tablet PC
Under test model name	VL10
Series model name	N/A
Description of model name differentiation	N/A
Hardware Version	N/A
Software Version	N/A
Rating:	Adapter Model: VL10 Input: 100-240V, 50/60Hz 0.3A Output: 5.0V⎓2.0A 10.0W Battery:4000mAh 14.8Wh 3.70V

2.5 Technical Information

Operation frequency:	Band 1: 5150MHz ~ 5250MHz Band 2A: 5250MHz ~ 5350MHz Band 2C: 5470MHz ~ 5725MHz Band 3: 5725MHz ~ 5850MHz
Channel number:	Band 1/2: 4, Band 3: 11, Band 4: 5 (for 802.11a/n-HT20/ac-VHT20) Band 1/2/4: 2, Band 3: 5 (for 802.11n-HT40/ac-VHT40) Band 1/2/4: 1, Band 3: 2 (for 802.11ac-VHT80)
Modulation technology: (IEEE 802.11a/n)	OFDM-BPSK, QPSK, 16QAM, 64QAM
Modulation technology: (IEEE 802.11ac)	OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM
Data rate:	802.11a: 6Mbps, 9Mbps etc., and up to 54Mbps 802.11n-HT20: 6.5Mbps, 13Mbps etc., and up to 72.2Mbps

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	802.11n-HT40: 13.5Mbps, 27Mbps etc., and up to 150Mbps 802.11ac-VHT20: 6.5Mbps, 13Mbps etc., and up to 86.7Mbps 802.11ac-VHT40: 13.5Mbps, 27Mbps etc., and up to 200Mbps 802.11ac-VHT80: 29.3Mbps, 58.5Mbps etc., and up to 433.3Mbps
Equipment type:	Adaptive equipment
Max. Conducted Power:	13.89 dBm
Antenna type:	Internal Antenna
Antenna gain:	0.45 dBi (declare by Applicant)
Antenna transmit mode:	SISO (1TX, 1RX)

2.6 Channel List

Band 1: 5150MHz ~ 5250MHz							
20MHz		40MHz		80MHz		160MHz	
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180	38	5190	42	5210	50	5250
40	5200	46	5230	--	--	--	--
48	5240	--	--	--	--	--	--

Band 2A: 5250MHz ~ 5350MHz							
20MHz		40MHz		80MHz		160MHz	
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
52	5260	54	5270	58	5290	50	5250
60	5300	62	5310	--	--	--	--
64	5320	--	--	--	--	--	--

Band 2C: 5470MHz ~ 5725MHz							
20MHz		40MHz		80MHz		160MHz	
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
100	5500	102	5510	106	5530	114	5570
120	5600	118	5590	122	5610	--	--
140	5700	134	5670	--	--	--	--

Band 3: 5725MHz ~ 5850MHz					
20MHz		40MHz		80MHz	
Channel	Frequency	Channel	Frequency	Channel	Frequency
149	5745	151	5755	155	5775
157	5785	159	5795	--	--
165	5825	--	--	--	--

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3 Test Information

3.1 Test Standards

Identity	Document Title
FCC CFR Title 47 Part 15 Subpart E (§15.407)	Unlicensed National Information Infrastructure Devices
ANSI C63.10-2020	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
KDB 789033 D02 General U-NII Test Procedures New Rules v02r01	Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E

3.2 Summary of Test

Clauses	Test Items	Result
Part 15.203	Antenna requirement	PASS
47 CFR 15.207(a)	Conducted Emission at AC power line	PASS
47 CFR 15.407(a)(1)(iv)-(B1), (a)(2)-(B2/3), (a)(3)(i)-(B4)	Duty Cycle	PASS
47 CFR 15.407(a)(12)	26dB Emission Bandwidth 99% Occupied Bandwidth	PASS
47 CFR 15.407(a)(1)(iv)-(B1), (a)(2)-(B2/3), (a)(3)(i)-(B4)	Maximum Conducted Output Power	PASS
47 CFR 15.407(a)(1)(iv)-(B1), (a)(2)-(B2/3), (a)(3)(i)-(B4)	Power Spectral Density	PASS
47 CFR 15.407(e)	6dB Emission Bandwidth	PASS
47 CFR 15.205 47 CFR 15.209 47 CFR 15.407(b)(1) -(B1), (2) -(B2), (3) -(B3), (4) -(B4), (9), (10)	Unwanted Emissions	PASS
47 CFR 15.407(g)	Frequency Stability	PASS

Remark:

1. Pass: met the requirements.

2. N/A: not applicable.

3.3 Uncertainty of Test

Measurement	Value
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±1.5 dB
Power Spectral Density, conducted	±3.0 dB
Unwanted Emissions, conducted	±3.0 dB

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Supply voltages	±3 %
Time	±5 %
Conducted Emission for LISN (9kHz ~ 150kHz)	±2.97 dB
Conducted Emission for LISN (150kHz ~ 30MHz)	±2.45 dB
Radiated Emission (30MHz ~ 1000MHz)	±4.80 dB
Radiated Emission (1GHz ~ 18GHz)	±4.82 dB
The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

3.4 Additions to, deviations, or exclusions from the method

None

3.5 Test Auxiliary Equipment

No.	Description	Manufacturer	Model	Serial Number	Certification
1	N/A	N/A	N/A	N/A	N/A

3.6 Test Equipment List

Radiated Emission Test					
Test Equipment	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
EMI Receiver	Rohde & Schwarz	ESCI7	101032	2025/10/17	2026/10/16
Signal Analyzer	Rohde & Schwarz	FSQ40	100010	2025/10/17	2026/10/16
Log periodic antenna	Schwarzbeck	VULB 9168	01328	2025/10/18	2026/10/17
Preamplifier (30MHz ~ 1GHz)	Schwarzbeck	BBV9744	00246	2025/5/26	2026/5/25
BELOW-Cable	REBES Talent	9K1G	21101576	2025/8/23	2026/8/22
Horn Antenna	Schwarzbeck	BBHA9120D	2597	2025/10/18	2026/10/17
Preamplifier (1GHz ~ 18GHz)	Schwarzbeck	BBV9718D	00008	2025/5/26	2026/5/25
Preamplifier	TSTPASS	LNA10180G45	TS2215007	2025/5/26	2026/5/25
ABOVE-Cable	REBES Talent	1~18G	21101558	2025/8/23	2026/8/22
Horn Antenna	SCHWARZBECK	BBHA9170	1157	2025/10/18	2026/10/17
Low Noise Pre-amplifier	Sket	LNPA_1840G-50	SK2022032902	2025/10/17	2026/10/16
ABOVE-Cable2	REBES Talent	18~40G	21101686	2025/8/23	2026/8/22
ABOVE-Cable1	REBES Talent	18~40G	21101687	2025/8/23	2026/8/22
Test Software	Frad	EZ_EMC	Version: FA-03A2 RE+		

Conducted Emission Test					
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
EMI Receiver	Rohde & Schwarz	ESCI3	101422	2025/10/17	2026/10/16

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V-LISN	Schwarzbeck	NSLK 8127	01073	2025/8/23	2026/8/22
Coaxial Switcher	Schwarzbeck	CX210	CX210	/	/
Pulse Limiter	Schwarzbeck	VTSD 9561-F	00953	/	/
LISN-Cable	REBES Talent	LISN9K30M	21101580	2025/8/23	2026/8/22
Test Software	Frad	EZ_EMC	Version: EMC-CON 3A1.1+		

Conducted test method					
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Cell Site Test Set	HP	8921A	US35010158	2025/10/17	2026/10/16
Spectrum Analyzer	Keysight	N9020A	MY50410020	2025/10/17	2026/10/16
ESG Vector Signal Generator	Agilent	E4438C	MY45094854	2025/10/17	2026/10/16
MXG Vector Signal Generator	Agilent	N5182A	MY46240163	2025/10/17	2026/10/16
Wideband Radio Communication Tester	Rohde&Schwarz	CMW500	161997	2025/10/17	2026/10/16
Programmable Constant Temperature And Humidity Test Chamber	ZZCKONG	ZZ-K02A	20210928007	2025/10/17	2026/10/16
DC Power Supply	Tongmen	etm-6050c	20211026123	2025/10/17	2026/10/16
RF Control Unit	Techy	TR1029-1	/	2025/10/17	2026/10/16
RF Sensor Unit	Techy	TR1029-2	/	2025/10/17	2026/10/16
RF shielding box	Yinuoxin Electronics	50*50*50 cm	N/A	2025/5/26	2026/5/25
Test Software	TST Pass	/	Version: 2.0		

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4 Test Configuration

4.1 Environment Condition

Selected Values During Tests		
Temperature	Relative Humidity	Ambient Pressure
Normal: +15°C to +35°C Extreme: -30°C to +50°C	20% to 75%	86 kPa to 106 kPa

4.2 Test mode

(TM1)Transmitting mode:	Keep the EUT in continuously transmitting mode with modulation	
We have verified the construction and function in typical operation. All the test items were carried out with the EUT in above test modes.		
Clauses	Test Items	Test mode
47 CFR 15.207(a)	Conducted Emission at AC power line	TM1
47 CFR 15.407(a)(1)(iv)-(B1), (a)(2)-(B2/3), (a)(3)(i)-(B4)	Duty Cycle	TM1
47 CFR 15.407(a)(12)	26dB Emission Bandwidth 99% Occupied Bandwidth	TM1
47 CFR 15.407(a)(1)(iv)-(B1), (a)(2)-(B2/3), (a)(3)(i)-(B4)	Maximum Conducted Output Power	TM1
47 CFR 15.407(a)(1)(iv)-(B1), (a)(2)-(B2/3), (a)(3)(i)-(B4)	Power Spectral Density	TM1
47 CFR 15.407(e)	6dB Emission Bandwidth	TM1
47 CFR 15.205 47 CFR 15.209 47 CFR 15.407(b)(1) -(B1), (2) -(B2), (3) -(B3), (4) -(B4), (9), (10)	Unwanted Emissions	TM1
47 CFR 15.407(g)	Frequency Stability	TM1

4.3 Test Channel of EUT

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:

Operation frequency: 5150 MHz – 5250 MHz **802.11b/g/n-HT20/ac-VHT20**					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
36	5180	40	5200	48	5240

802.11n-HT40/ac-VHT40					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
38	5190	/	/	46	5230
802.11ac-VHT80					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
/	/	42	5210	/	/

Operation frequency: 5250 MHz – 5350 MHz					
802.11b/g/n-HT20/ac-VHT20					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
52	5260	56	5280	64	5320
802.11n-HT40/ac-VHT40					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
54	5270	/	/	62	5310
802.11ac-VHT80					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
/	/	58	5290	/	/

Operation frequency: 5470 MHz – 5725 MHz					
802.11b/g/n-HT20/ac-VHT20					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
100	5500	112	5560	140	5700

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802.11n-HT40/ac-VHT40					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
102	5510	118	5590	134	5670
802.11ac-VHT80					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
106	5530	/	/	122	5610

Operation frequency: 5725 MHz – 5850 MHz					
802.11b/g/n-HT20/ac-VHT20					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
149	5745	157	5785	165	5825
802.11n-HT40/ac-VHT40					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
151	5755	/	/	159	5795
802.11ac-VHT80					
Lowest channel		Middle channel		Highest channel	
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
/	/	155	5775	/	/

4.4 Test software

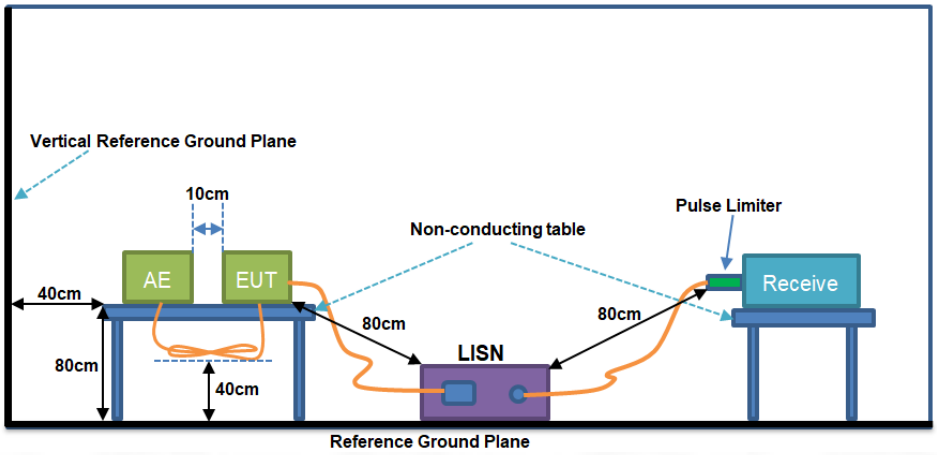
Test software:	Version:	Power Class:
Engineering Mode	*#*#3646633#*#*	13

4.5 Test procedure

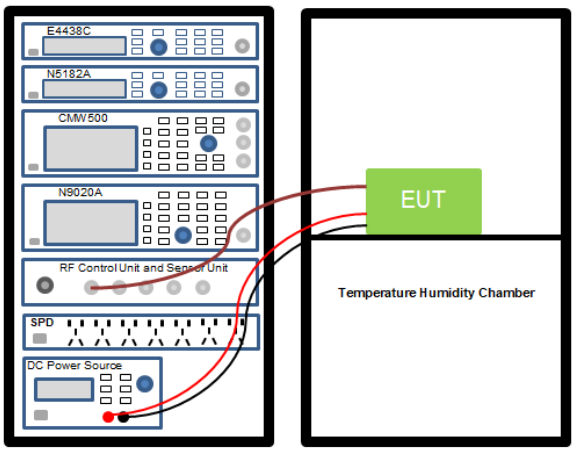
AC Power Line Conducted Emission
The EUT is connected to the power mains through a LISN which provides 50 Ω/50 μH of coupling impedance for the measuring instrument. The test frequency range is from 150 kHz to 30 MHz. The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels that are more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed.
1. Level= Read Level+ Cable Loss+ LISN Factor 2. Margin=Level-Limit=Reading+factor-Limit
Radiated test method
1. The EUT was placed on the tabletop of a rotating table 1.5 m the ground at a 3 m semi anechoic chamber. The measurement distance from the EUT to the receiving antenna is 3 m. 2. EUT works in each mode of operation that needs to be tested，and having the EUT continuously working, respectively on 3 axis (X, Y & Z) and considered typical configuration to obtain worst position. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations. 3. Open the test software to control the test antenna and test turntable. Perform the test, recorded the test results. 4. The substitution antenna shall be used to replace the equipment under test. 5. The reference point of the substitution antenna shall coincide with the volume centre of the UUT when its antenna is internal. 6. Set the required test frequency for the signal generator, adjust the emission level, until the spectrum analyzer reading on the receiving link is consistent with the recorded value in step 3, and the recorded signal generator emission level. 7. Final results = S.G. output (dBm) + Antenna Gain(dB/dBi) – Cable Loss (dB). This report only reflects the final results.
1. Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor 2. Margin=Level-Limit=Reading+factor-Limit
Conducted test method
1. The WiFi antenna port of EUT was connected to the test port of the test system through an RF cable. 2. The EUT is keeping in continuous transmission mode and tested in all modulation modes. 3. Open the test software, prepare a test plan, and control the system through the software. After the test is completed, the test report is exported through the test software.

4.6 Test Setup Block

1) Conducted emission measurement:

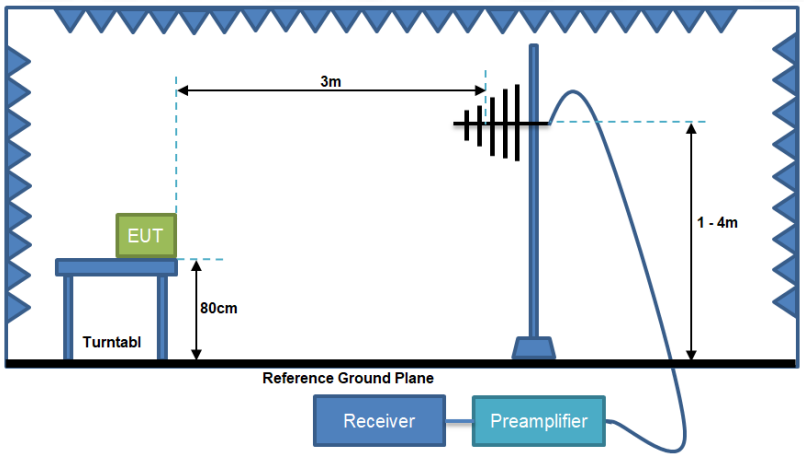


2) Conducted test method:

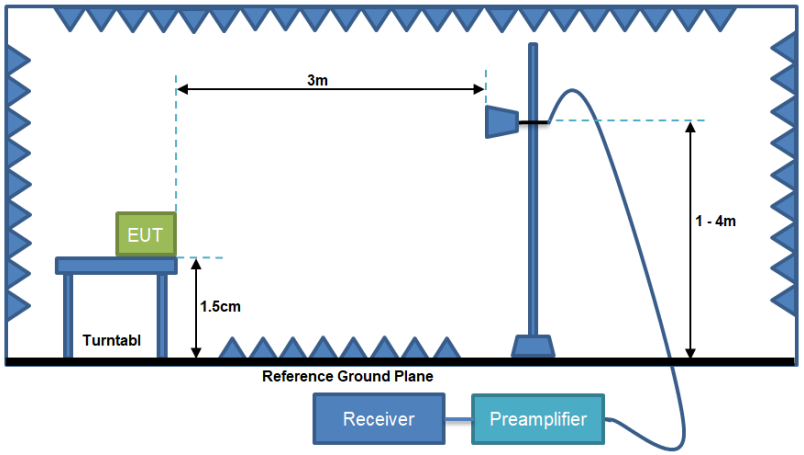


3) Radiated test method:

Below 1GHz



Above 1GHz



5 Technical requirements specification

5.1 Antenna Requirement

§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:** (4) 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.	
E.U.T Antenna:	The 5GWifi antenna is an Internal antenna which permanently attached, and the best case gain of the antenna is 0.45 dBi. See product internal photos for details.

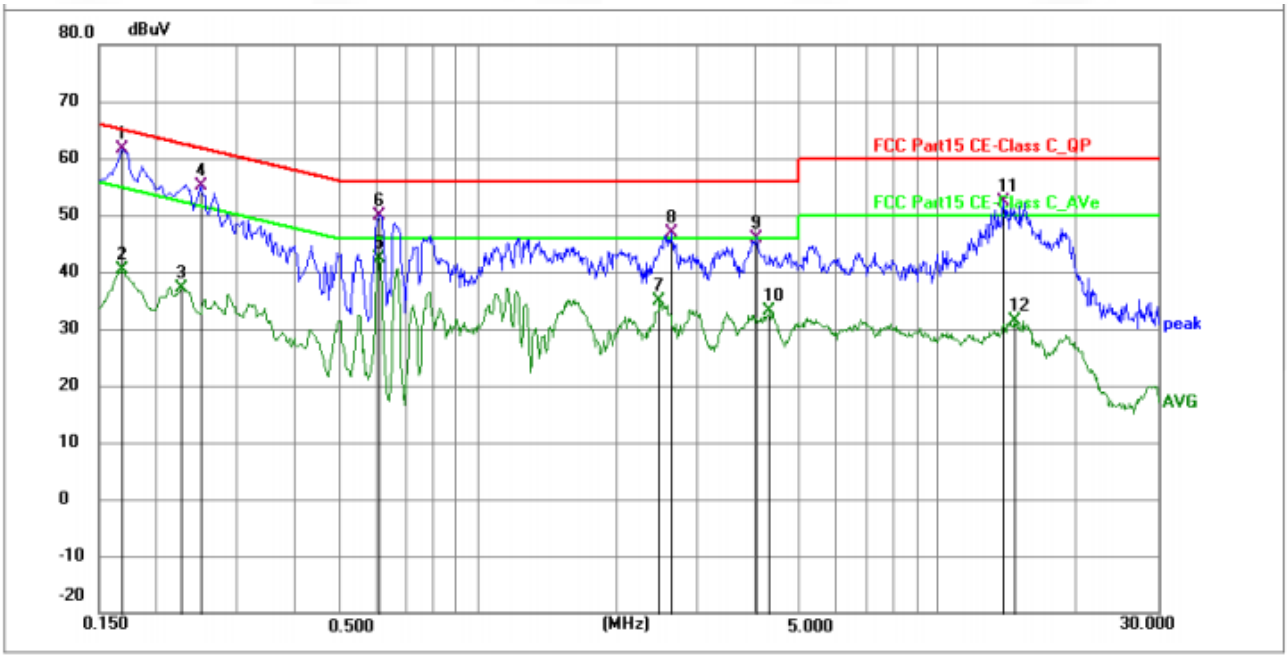
5.2 Conducted Emission at AC power line

Test Requirement:	Except as shown in paragraphs (b)and (c)of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN).
Test Method:	Refer to ANSI C63.10-2020 section 6.2, standard test method for ac power-line conducted emissions from unlicensed wireless devices
Test Limit:	Frequency of emission (MHz) / Conducted limit (dBμV): Quasi-peak / Average 0.15-0.5: 66 to 56* / 56 to 46* 0.5-5: 56 / 46 5-30: 60 / 50 *Decreases with the logarithm of the frequency.
Test Setup:	See section 4.6 for test setup description. The photo of test setup please refer to Appendix I Test Setup Photos
Operating Environment:	
Temperature:	22.5℃
Humidity:	46%RH
Atmospheric Pressure:	1010 hpa
Test voltage:	AC 120V 60Hz

5.2.1 Test Data:

Remark: The report only reflects the test data of worst mode.

Test phase: L phase



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1 *	0.1680	51.52	10.21	61.73	65.06	-3.33	QP	P	
2	0.1680	30.09	10.21	40.30	55.06	-14.76	AVG	P	
3	0.2265	27.10	10.09	37.19	52.58	-15.39	AVG	P	
4	0.2490	44.99	10.06	55.05	61.79	-6.74	QP	P	
5	0.6090	32.34	10.15	42.49	46.00	-3.51	AVG	P	
6	0.6134	39.74	10.15	49.89	56.00	-6.11	QP	P	
7	2.4810	24.56	10.22	34.78	46.00	-11.22	AVG	P	
8	2.6474	36.61	10.23	46.84	56.00	-9.16	QP	P	
9	4.0290	35.75	10.25	46.00	56.00	-10.00	QP	P	
10	4.2990	22.80	10.26	33.06	46.00	-12.94	AVG	P	
11	13.8975	41.70	10.70	52.40	60.00	-7.60	QP	P	
12	14.6714	20.72	10.74	31.46	50.00	-18.54	AVG	P	

Note:Margin=Level-Limit=Reading+factor-Limit

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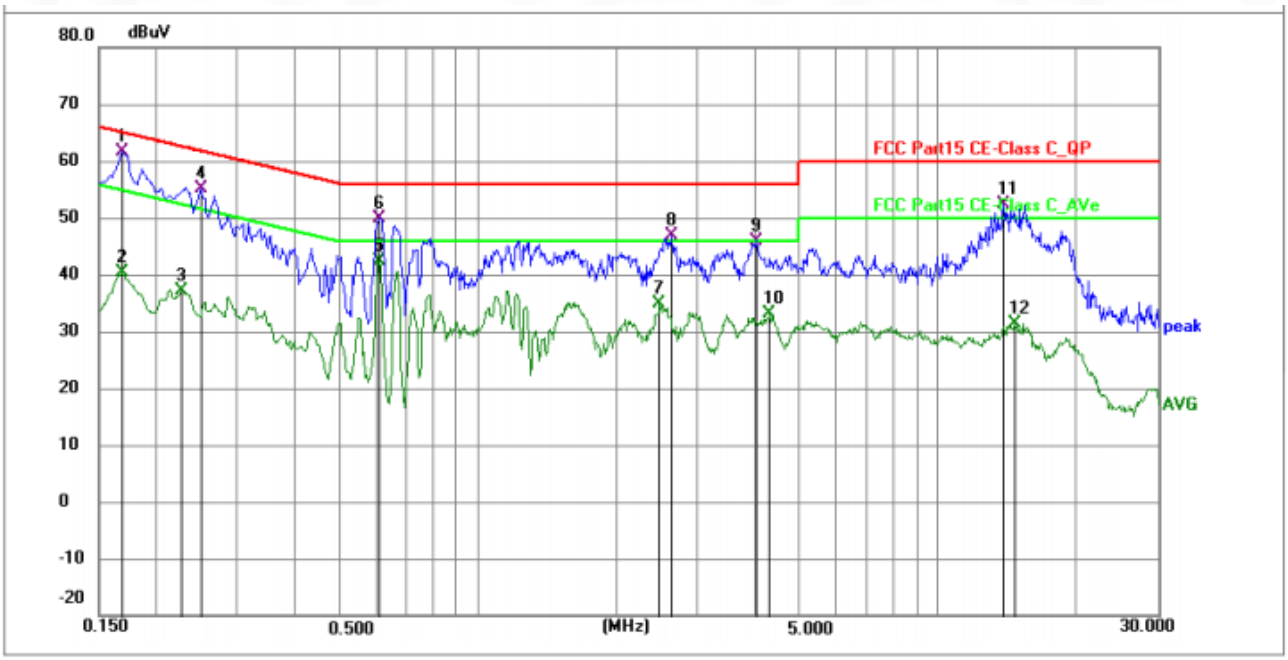
Test phase: N phase



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1 *	0.1680	51.52	10.21	61.73	65.06	-3.33	QP	P	
2	0.1680	30.09	10.21	40.30	55.06	-14.76	AVG	P	
3	0.2265	27.10	10.09	37.19	52.58	-15.39	AVG	P	
4	0.2490	44.99	10.06	55.05	61.79	-6.74	QP	P	
5	0.6090	32.34	10.15	42.49	46.00	-3.51	AVG	P	
6	0.6134	39.74	10.15	49.89	56.00	-6.11	QP	P	
7	2.4810	24.56	10.22	34.78	46.00	-11.22	AVG	P	
8	2.6474	36.61	10.23	46.84	56.00	-9.16	QP	P	
9	4.0290	35.75	10.25	46.00	56.00	-10.00	QP	P	
10	4.2990	22.80	10.26	33.06	46.00	-12.94	AVG	P	
11	13.8975	41.70	10.70	52.40	60.00	-7.60	QP	P	
12	14.6714	20.72	10.74	31.46	50.00	-18.54	AVG	P	

Note:Margin=Level-Limit=Reading+factor-Limit

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5.3 Emissions in Restricted Frequency Bands

Test Requirement:	47 CFR Part 15.407(b)(1) 47 CFR Part 15.407(b)(2) 47 CFR Part 15.407(b)(4) 47 CFR Part 15.407(b)(10)
Test Method:	ANSI C63.10-2013, section 12.7.4, 12.7.5, 12.7.6
Test Limit:	For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz. For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz. For transmitters operating solely in the 5.725-5.850 GHz band: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1]0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	([2])
13.36-13.41			

[1]Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2]Above 38.6

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in § 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in § 15.209shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in § 15.209shall be demonstrated based on the average value of the measured emissions. The provisions in § 15.35apply to these measurements.

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	Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table: Frequency (MHz) / Field strength (microvolts/meter) / Measurement distance (meters) 0.009-0.490 / 2400/F(kHz) / 300 0.490-1.705 / 24000/F(kHz) / 30 1.705-30.0 / 30 / 30 30-88 / 100 ** / 3 88-216 / 150 ** / 3 216-960 / 200 ** / 3 Above 960 / 500 / 3
Procedure:	Above 1GHz: a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. 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 (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. 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 or average method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel, the middle channel, the Highest channel. h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case. i. Repeat above procedures until all frequencies measured was complete. Remark: 1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor 2. Scan from 18GHz to 40GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. 3. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report. 4. The disturbance above 18GHz were very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.
Test Setup:	See section 4.6 for test setup description. The photo of test setup please refer to Appendix I Test Setup Photos
Operating Environment:	

Temperature:	22.5℃
Humidity:	46%RH
Atmospheric Pressure:	1010 hpa
Test voltage:	DC 3.7V From Battery

5.3.1 Test Data:

Remark: The report only reflects the test data of worst mode.

Band 1&2A: 5180 MHz - 5320 MHz Test Channel: Lowest channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
5097.679	43.11	5.35	48.46	74.00	-25.54	Peak	Pass
5097.679	31.85	5.35	37.20	54.00	-16.80	AV	Pass
5150.000	45.78	5.33	51.11	74.00	-22.89	Peak	Pass
5150.000	34.84	5.33	40.17	54.00	-13.83	AV	Pass
Test Channel: Lowest channel, Test Polarization: Horizontal							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
5097.679	42.36	5.28	47.64	74.00	-26.36	Peak	Pass
5097.679	33.29	5.28	38.57	54.00	-15.43	AV	Pass
5150.000	45.30	5.33	50.63	74.00	-23.37	Peak	Pass
5150.000	35.25	5.33	40.58	54.00	-13.42	AV	Pass
Test Channel: Highest channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
5350.000	43.22	5.45	48.67	74.00	-25.33	Peak	Pass
5350.000	33.74	5.45	39.19	54.00	-14.81	AV	Pass
5460.000	47.85	5.52	53.37	74.00	-20.63	Peak	Pass
5460.000	37.22	5.52	42.74	54.00	-11.26	AV	Pass
Test Channel: Highest channel, Test Polarization: Horizontal							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
5350.000	44.11	5.45	49.56	74.00	-24.44	Peak	Pass
5350.000	35.06	5.45	40.51	54.00	-13.49	AV	Pass
5460.000	46.73	5.52	52.25	74.00	-21.75	Peak	Pass
5460.000	34.70	5.52	40.22	54.00	-13.78	AV	Pass

Note:Margin=Level-Limit=Reading+factor-Limit

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Band 2C: 5500 MHz -5720 MHz Test Channel: Lowest channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
5350.000	42.50	5.49	47.99	74.00	-26.01	Peak	Pass
5350.000	33.91	5.49	39.40	54.00	-14.60	AV	Pass
5460.000	46.61	5.56	52.17	74.00	-21.83	Peak	Pass
5460.000	34.98	5.56	40.54	54.00	-13.46	AV	Pass
Test Channel: Lowest channel, Test Polarization: Horizontal							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
5350.000	41.65	5.49	47.14	74.00	-26.86	Peak	Pass
5350.000	32.43	5.49	37.92	54.00	-16.08	AV	Pass
5460.000	45.82	5.56	51.38	74.00	-22.62	Peak	Pass
5460.000	34.86	5.56	40.42	54.00	-13.58	AV	Pass
Test Channel: Highest channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
5725.000	45.54	5.53	51.07	68.20	-17.13	Peak	Pass
5725.000	35.20	5.53	40.73	48.20	-7.47	AV	Pass
5730.000	42.37	5.59	47.96	68.20	-20.24	Peak	Pass
5730.000	33.51	5.59	39.10	48.20	-9.10	AV	Pass
Test Channel: Highest channel, Test Polarization: Horizontal							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
5725.000	45.66	5.53	51.19	68.20	-17.01	Peak	Pass
5725.000	35.21	5.53	40.74	48.20	-7.46	AV	Pass
5730.000	42.32	5.59	47.91	68.20	-20.29	Peak	Pass
5730.000	32.99	5.59	38.58	48.20	-9.62	AV	Pass

Note:Margin=Level-Limit=Reading+factor-Limit

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Band 3: 5745 MHz - 5825 MHz Test Channel: Lowest channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
5650.000	42.84	5.63	48.47	68.20	-19.73	Peak	Pass
5700.000	45.87	5.70	51.57	105.20	-53.63	Peak	Pass
5720.000	47.40	5.66	53.06	110.80	-57.74	Peak	Pass
5725.000	49.40	5.66	55.06	122.20	-67.14	Peak	Pass
Test Channel: Lowest channel, Test Polarization: Horizontal							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
5650.000	43.62	5.63	49.25	68.20	-18.95	Peak	Pass
5700.000	46.32	5.70	52.02	105.20	-53.18	Peak	Pass
5720.000	46.92	5.66	52.58	110.80	-58.22	Peak	Pass
5725.000	48.92	5.66	54.58	122.20	-67.62	Peak	Pass
Test Channel: Highest channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
5850.000	42.76	5.73	48.49	122.20	-73.71	Peak	Pass
5855.000	40.76	5.72	46.48	110.80	-64.32	Peak	Pass
5875.000	40.61	5.70	46.31	105.20	-58.89	Peak	Pass
5925.000	36.21	5.66	41.87	68.20	-26.33	Peak	Pass
Test Channel: Highest channel, Test Polarization: Horizontal							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
5850.000	42.48	5.73	48.21	122.20	-73.99	Peak	Pass
5855.000	40.48	5.72	46.20	110.80	-64.60	Peak	Pass
5875.000	39.72	5.70	45.42	105.20	-59.78	Peak	Pass
5925.000	36.17	5.66	41.83	68.20	-26.37	Peak	Pass

Note:Margin=Level-Limit=Reading+factor-Limit

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5.4 Undesirable emission limits (below 1GHz)

Test Requirement:	47 CFR Part 15.407(b)(9)
Test Method:	ANSI C63.10-2013, section 12.7.4, 12.7.5, 12.7.6
Test Limit:	Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209. Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table: Frequency (MHz) / Field strength (microvolts/meter) / Measurement distance (meters) 0.009-0.490 / 2400/F(kHz) / 300 0.490-1.705 / 24000/F(kHz) / 30 1.705-30.0 / 30 / 30 30-88 / 100 ** / 3 88-216 / 150 ** / 3 216-960 / 200 ** / 3 Above 960 / 500 / 3
Procedure:	Below 1GHz: a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 or 10 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 (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. 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 quasi-peak method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel, the middle channel, the Highest channel. h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case. i. Repeat above procedures until all frequencies measured was complete. Remark: 1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor 2. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. 3. The disturbance below 1GHz was very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

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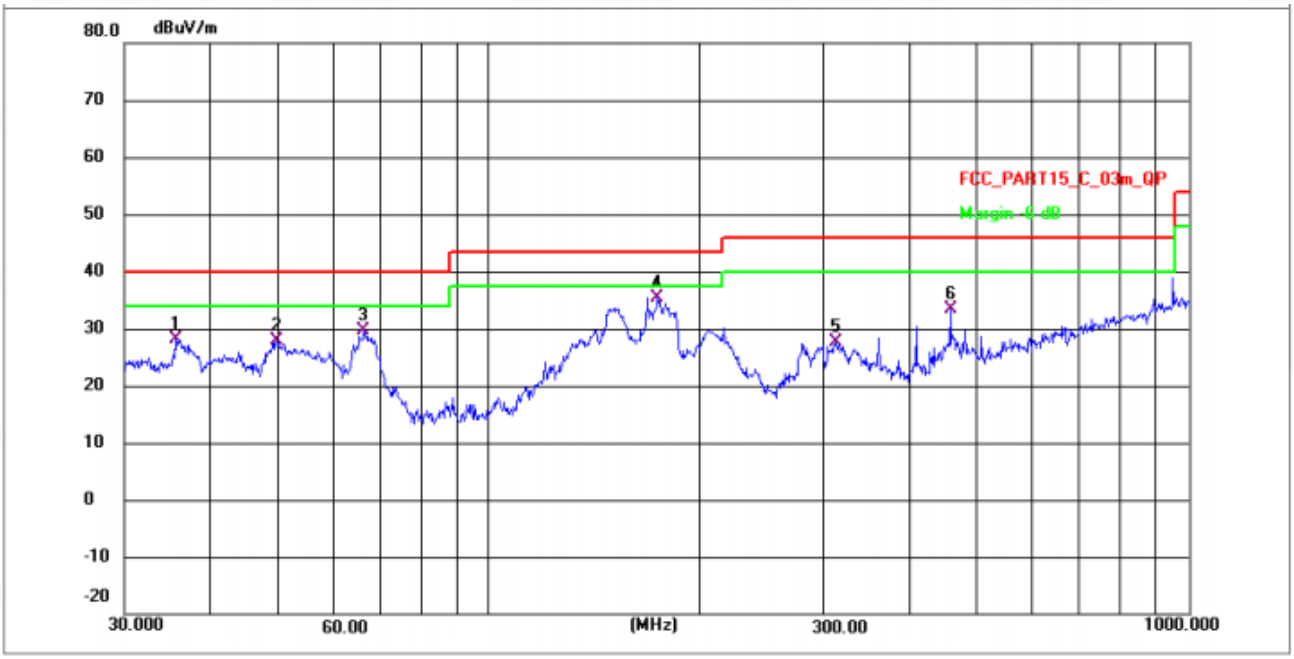
	Above 1GHz: a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, 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 (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. 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 or average method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel, the middle channel, the Highest channel. h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case. i. Repeat above procedures until all frequencies measured was complete. Remark: 1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor 2. Scan from 18GHz to 40GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. 3. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report. 4. The disturbance above 18GHz were very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.
Test Setup:	See section 4.6 for test setup description. The photo of test setup please refer to Appendix I Test Setup Photos
Operating Environment:	
Temperature:	22.5℃
Humidity:	46%RH
Atmospheric Pressure:	1010 hpa
Test voltage:	DC 3.7V From Battery

5.4.1 Test Data:

Remark: The report only reflects the test data of worst mode.

Test antenna polarization: Horizontal(30 MHz to 1 GHz)



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	35.5615	38.20	-10.18	28.02	40.00	-11.98	QP	P
2	49.5328	37.59	-9.60	27.99	40.00	-12.01	QP	P
3	66.1501	39.11	-9.42	29.69	40.00	-10.31	QP	P
4 *	174.1184	62.53	-27.05	35.48	43.50	-8.02	QP	P
5	313.2760	53.33	-25.66	27.67	46.00	-18.33	QP	P
6	455.9058	57.82	-24.45	33.37	46.00	-12.63	QP	P

Note:Margin=Level-Limit=Reading+factor-Limit

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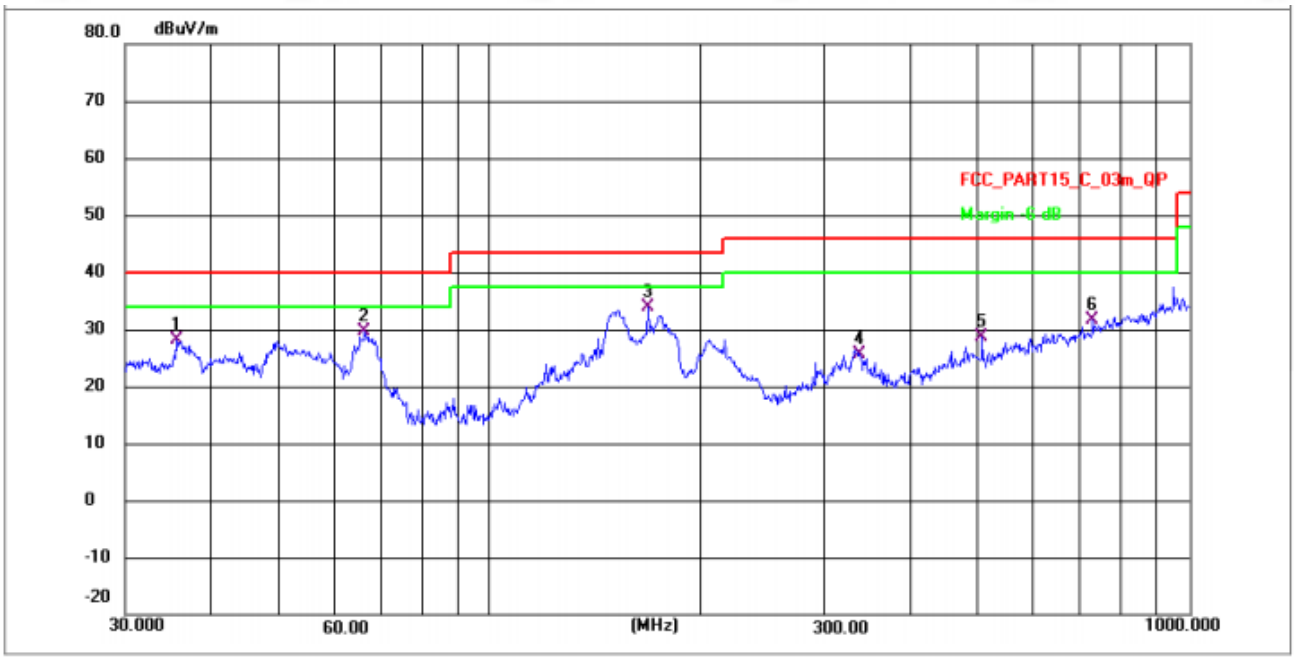
Test antenna polarization: Vertical (30 MHz to 1 GHz)



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	35.5615	38.20	-10.18	28.02	40.00	-11.98	QP	P
2	66.1501	39.11	-9.42	29.69	40.00	-10.31	QP	P
3 *	168.1188	60.89	-27.11	33.78	43.50	-9.72	QP	P
4	337.8073	51.08	-25.44	25.64	46.00	-20.36	QP	P
5	504.7062	52.57	-24.05	28.52	46.00	-17.48	QP	P
6	728.0806	53.81	-22.24	31.57	46.00	-14.43	QP	P

Note:Margin=Level-Limit=Reading+factor-Limit

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5.5 Undesirable emission limits (Above 1GHz)

Test Requirement:	47 CFR Part 15.407(b)(1) 47 CFR Part 15.407(b)(2) 47 CFR Part 15.407(b)(4) 47 CFR Part 15.407(b)(10)
Test Method:	ANSI C63.10-2013, section 12.7.4, 12.7.5, 12.7.6
Test Limit:	For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz. For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz. For transmitters operating solely in the 5.725-5.850 GHz band: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1]0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	([2])
13.36-13.41			

[1]Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2]Above 38.6

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in § 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in § 15.209shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in § 15.209shall be demonstrated based on the average value of the measured emissions. The provisions in § 15.35apply to these measurements.

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

	Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
	0.009-0.490	2400/F(kHz)	300
	0.490-1.705	24000/F(kHz)	30
	1.705-30.0	30	30
	30-88	100 **	3
	88-216	150 **	3
	216-960	200 **	3
	Above 960	500	3
Procedure:	Above 1GHz: a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. 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 (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. 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 or average method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel, the middle channel, the Highest channel. h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case. i. Repeat above procedures until all frequencies measured was complete. Remark: 1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor 2. Scan from 18GHz to 40GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. 3. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report. 4. The disturbance above 18GHz were very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.		
Test Setup:	See section 4.6 for test setup description. The photo of test setup please refer to Appendix I Test Setup Photos		
Operating Environment:			
Temperature:	22.5℃		
Humidity:	46%RH		
Atmospheric Pressure:	1010 hpa		
Test voltage:	DC 3.7V From Battery		

5.5.1 Test Data:

Remark: The report only reflects the test data of worst mode.

Band 1: 5150 MHz - 5250 MHz Test Channel: Lowest channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
10360.00	93.40	-45.18	48.22	68.20	-19.98	Peak	Pass
10360.00	82.11	-45.18	36.93	48.20	-11.27	AVG	Pass
15540.00	90.01	-42.94	47.07	74.00	-26.93	Peak	Pass
15540.00	81.37	-42.94	38.43	54.00	-15.57	AVG	Pass
Test Channel: Lowest channel, Test Polarization: Horizontal							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
10360.00	92.91	-45.12	47.79	68.20	-20.41	Peak	Pass
10360.00	81.62	-45.18	36.44	48.20	-11.76	AVG	Pass
15540.00	89.52	-42.88	46.64	74.00	-27.36	Peak	Pass
15540.00	80.88	-42.94	37.94	54.00	-16.06	AVG	Pass
Test Channel: Middle channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
10400.00	94.48	-45.18	49.30	74.00	-24.70	Peak	Pass
10400.00	83.19	-45.18	38.01	54.00	-15.99	AVG	Pass
15600.00	91.09	-42.94	48.15	74.00	-25.85	Peak	Pass
15600.00	82.45	-42.94	39.51	54.00	-14.49	AVG	Pass
Test Channel: Middle channel, Test Polarization: Horizontal							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
10400.00	94.03	-45.18	48.85	74.00	-25.15	Peak	Pass
10400.00	82.74	-45.18	37.56	54.00	-16.44	AVG	Pass
15600.00	90.64	-42.94	47.70	74.00	-26.30	Peak	Pass
15600.00	82.00	-42.94	39.06	54.00	-14.94	AVG	Pass
Test Channel: Highest channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
10480.00	92.19	-45.07	47.12	68.20	-21.08	Peak	Pass
10480.00	80.90	-45.18	35.72	48.20	-12.48	AVG	Pass
15720.00	88.80	-42.83	45.97	74.00	-28.03	Peak	Pass
15720.00	80.16	-42.94	37.22	54.00	-16.78	AVG	Pass

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Test Channel: Highest channel, Test Polarization: Horizontal							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
10480.00	91.80	-45.07	46.73	68.20	-21.47	Peak	Pass
10480.00	80.51	-45.18	35.33	48.20	-12.87	AVG	Pass
15720.00	88.41	-42.83	45.58	74.00	-28.42	Peak	Pass
15720.00	79.77	-42.94	36.83	54.00	-17.17	AVG	Pass

Remark: Test frequency up to 40GHz and the emission levels of other frequencies are lower than the limit 20dB, not show in test report.
Note:Margin=Level-Limit=Reading+factor-Limit

Band 2A: 5250 MHz - 5350 MHz Test Channel: Lowest channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
10500.00	94.58	-45.08	49.50	74.00	-24.50	Peak	Pass
10500.00	94.58	-45.08	49.50	54.00	-4.50	AVG	Pass
15750.00	90.89	-42.74	48.15	74.00	-25.85	Peak	Pass
15750.00	82.25	-42.74	39.51	54.00	-14.49	AVG	Pass
Test Channel: Lowest channel, Test Polarization: Horizontal							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
10500.00	94.10	-45.02	49.08	74.00	-24.92	Peak	Pass
10500.00	94.10	-45.08	49.02	54.00	-4.98	AVG	Pass
15750.00	90.41	-42.68	47.73	74.00	-26.27	Peak	Pass
15750.00	81.77	-42.74	39.03	54.00	-14.97	AVG	Pass
Test Channel: Middle channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
10560.00	91.24	-45.08	46.16	74.00	-27.84	Peak	Pass
10560.00	91.24	-45.08	46.16	54.00	-7.84	AVG	Pass
15840.00	87.55	-42.74	44.81	74.00	-29.19	Peak	Pass
15840.00	78.91	-42.74	36.17	54.00	-17.83	AVG	Pass
Test Channel: Middle channel, Test Polarization: Horizontal							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
10560.00	90.79	-45.08	45.71	74.00	-28.29	Peak	Pass
10560.00	90.79	-45.08	45.71	54.00	-8.29	AVG	Pass
15840.00	87.10	-42.74	44.36	74.00	-29.64	Peak	Pass
15840.00	78.46	-42.74	35.72	54.00	-18.28	AVG	Pass

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Test Channel: Highest channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
10640.00	93.15	-44.97	48.18	74.00	-25.82	Peak	Pass
10640.00	93.15	-45.08	48.07	74.00	-25.93	AVG	Pass
15960.00	89.46	-42.63	46.83	74.00	-27.17	Peak	Pass
15960.00	80.82	-42.74	38.08	74.00	-35.92	AVG	Pass
Test Channel: Highest channel, Test Polarization: Horizontal							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
10640.00	92.76	-44.97	47.79	74.00	-26.21	Peak	Pass
10640.00	92.76	-45.08	47.68	74.00	-26.32	AVG	Pass
15960.00	89.07	-42.63	46.44	74.00	-27.56	Peak	Pass
15960.00	80.43	-42.74	37.69	74.00	-36.31	AVG	Pass

Remark: Test frequency up to 40GHz and the emission levels of other frequencies are lower than the limit 20dB, not show in test report.
Note:Margin=Level-Limit=Reading+factor-Limit

Band 2C: 5470 MHz - 5725 MHz Test Channel: Lowest channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
11000.00	91.43	-44.77	46.66	74.00	-27.34	Peak	Pass
11000.00	80.36	-44.77	35.59	54.00	-18.41	AVG	Pass
16500.00	87.10	-41.49	45.61	68.20	-22.59	Peak	Pass
16500.00	78.06	-41.49	36.57	48.20	-11.63	AVG	Pass
Test Channel: Lowest channel, Test Polarization: Horizontal							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
11000.00	90.98	-44.77	46.21	74.00	-27.79	Peak	Pass
11000.00	79.91	-44.77	35.14	54.00	-18.86	AVG	Pass
16500.00	86.65	-41.49	45.16	68.20	-23.04	Peak	Pass
16500.00	77.61	-41.49	36.12	48.20	-12.08	AVG	Pass
Test Channel: Middle channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
11120.00	89.32	-44.71	44.61	74.00	-29.39	Peak	Pass
11120.00	78.25	-44.77	33.48	54.00	-20.52	AVG	Pass
16800.00	84.99	-41.43	43.56	68.20	-24.64	Peak	Pass
16800.00	75.95	-41.49	34.46	48.20	-13.74	AVG	Pass

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Test Channel: Middle channel, Test Polarization: Horizontal							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
11120.00	88.43	-44.71	43.72	74.00	-30.28	Peak	Pass
11120.00	77.36	-44.77	32.59	54.00	-21.41	AVG	Pass
16800.00	84.10	-41.43	42.67	68.20	-25.53	Peak	Pass
16800.00	71.32	-41.49	29.83	48.20	-18.37	AVG	Pass
Test Channel: Highest channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
11400.00	86.59	-44.66	41.93	74.00	-32.07	Peak	Pass
11400.00	77.59	-44.77	32.82	54.00	-21.18	AVG	Pass
17100.00	82.26	-41.38	40.88	68.20	-27.32	Peak	Pass
17100.00	75.29	-41.49	33.80	48.20	-14.40	AVG	Pass
Test Channel: Highest channel, Test Polarization: Horizontal							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
11400.00	86.24	-44.66	41.58	74.00	-32.42	Peak	Pass
11400.00	78.21	-44.77	33.44	54.00	-20.56	AVG	Pass
17100.00	81.91	-41.38	40.53	68.20	-27.67	Peak	Pass
17100.00	75.91	-41.49	34.42	48.20	-13.78	AVG	Pass

Remark: Test frequency up to 40GHz and the emission levels of other frequencies are lower than the limit 20dB, not show in test report.
Note:Margin=Level-Limit=Reading+factor-Limit

Band 3: 5725 MHz - 5825 MHz Test Channel: Lowest channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
11490.00	94.18	-44.70	49.48	74.00	-24.52	Peak	Pass
11490.00	83.48	-44.70	38.78	54.00	-15.22	AVG	Pass
17235.00	87.85	-40.61	47.24	68.20	-20.96	Peak	Pass
17235.00	77.22	-40.61	36.61	48.20	-11.59	AVG	Pass
Test Channel: Lowest channel, Test Polarization: Horizontal							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
11490.00	94.46	-44.70	49.76	74.00	-24.24	Peak	Pass
11490.00	83.76	-44.70	39.06	54.00	-14.94	AVG	Pass
17235.00	88.13	-40.61	47.52	68.20	-20.68	Peak	Pass
17235.00	77.50	-40.61	36.89	48.20	-11.31	AVG	Pass

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Test Channel: Middle channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
11570.00	94.06	-44.64	49.42	74.00	-24.58	Peak	Pass
11570.00	83.36	-44.70	38.66	54.00	-15.34	AVG	Pass
17355.00	87.73	-40.55	47.18	68.20	-21.02	Peak	Pass
17355.00	77.10	-40.61	36.49	48.20	-11.71	AVG	Pass
Test Channel: Middle channel, Test Polarization: Horizontal							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
11570.00	93.60	-44.64	48.96	74.00	-25.04	Peak	Pass
11570.00	82.90	-44.70	38.20	54.00	-15.80	AVG	Pass
17355.00	87.27	-40.55	46.72	68.20	-21.48	Peak	Pass
17355.00	76.64	-40.61	36.03	48.20	-12.17	AVG	Pass
Test Channel: Highest channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
11650.00	93.10	-44.59	48.51	74.00	-25.49	Peak	Pass
11650.00	82.40	-44.70	37.70	54.00	-16.30	AVG	Pass
17475.00	86.77	-40.50	46.27	68.20	-21.93	Peak	Pass
17475.00	76.14	-40.61	35.53	48.20	-12.67	AVG	Pass
Test Channel: Highest channel, Test Polarization: Horizontal							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
11650.00	92.75	-44.59	48.16	74.00	-25.84	Peak	Pass
11650.00	82.05	-44.70	37.35	54.00	-16.65	AVG	Pass
17475.00	86.42	-40.50	45.92	68.20	-22.28	Peak	Pass
17475.00	75.79	-40.61	35.18	48.20	-13.02	AVG	Pass

Remark: Test frequency up to 40GHz and the emission levels of other frequencies are lower than the limit 20dB, not show in test report.
Note:Margin=Level-Limit=Reading+factor-Limit

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5.6 Duty Cycle

Test Requirement:	All measurements are to be performed with the EUT transmitting at 100% duty cycle at its maximum power control level; however, if 100% duty cycle cannot be achieved, measurements of duty cycle, x, and maximum-power transmission duration, T, are required for each tested mode of operation.
Test Method:	ANSI C63.10-2020
Test Limit:	No limits, only for report use.
Procedure:	i) Set the center frequency of the instrument to the center frequency of the transmission. ii) Set RBW >= EBW if possible; otherwise, set RBW to the largest available value. iii) Set VBW >= RBW. iv) Set detector = peak. v) The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T, where T is defined in item a1) of 12.2, and the number of sweep points across duration T exceeds 100.
Test Setup:	See section 4.6 for test setup description. The photo of test setup please refer to Appendix I Test Setup Photos
Operating Environment:	
Temperature:	22.5℃
Humidity:	46%RH
Atmospheric Pressure:	1010 hpa
Test voltage:	DC 3.7V From Battery

5.6.1 Test Data:

Please Refer to Appendix-5G WIFI for Details

5.7 Emission bandwidth and Occupied bandwidth

Test Requirement:	U-NII 1, U-NII 2A, U-NII 2C: No limits, only for report use. U-NII 3, U-NII 4: 47 CFR Part 15.407(e)
Test Method:	ANSI C63.10-2013, section 6.9.3 & 12.4 KDB 789033 D02, Clause C.2
Test Limit:	U-NII 1, U-NII 2A, U-NII 2C: No limits, only for report use. U-NII 3, U-NII 4: Within the 5.725-5.850 GHz and 5.850-5.895 GHz bands, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.
Procedure:	Emission bandwidth: a) Set RBW = approximately 1% of the emission bandwidth. b) Set the VBW > RBW. c) Detector = peak. d) Trace mode = max hold. e) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the instrument. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%. Occupied bandwidth: a) The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW. b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW, unless otherwise specified by the applicable requirement. c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2. d) Step a) through step c) might require iteration to adjust within the specified range. e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used. f) Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth. g) If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the

	total is reached; that frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies. h) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s). 6 dB emission bandwidth: a) Set RBW = 100 kHz. b) Set the video bandwidth (VBW) ≥ 3 >= RBW. c) Detector = Peak. d) Trace mode = max hold. e) Sweep = auto couple. f) Allow the trace to stabilize. g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.
Test Setup:	See section 4.6 for test setup description. The photo of test setup please refer to Appendix I Test Setup Photos
Operating Environment:	
Temperature:	22.5℃
Humidity:	46%RH
Atmospheric Pressure:	1010 hpa
Test voltage:	DC 3.7V From Battery

5.7.1 Test Data:

Please Refer to Appendix-5G WIFI for Details

5.8 Maximum Conducted Output Power

Test Requirement:	47 CFR Part 15.407(a)(1)(i) 47 CFR Part 15.407(a)(1)(ii) 47 CFR Part 15.407(a)(1)(iii) 47 CFR Part 15.407(a)(1)(iv) 47 CFR Part 15.407(a)(2) 47 CFR Part 15.407(a)(3)(i)
Test Method:	ANSI C63.10-2013, section 12.3
Test Limit:	For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm). For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations. For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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	For the band 5.725-5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.
Procedure:	Method SA-1 a) Set span to encompass the entire 26 dB EBW or 99% OBW of the signal. b) Set RBW = 1 MHz. c) Set VBW >= 3 MHz. d) Number of points in sweep >= [2 × span / RBW]. (This gives bin-to-bin spacing <= RBW / 2, so that narrowband signals are not lost between frequency bins.) e) Sweep time = auto. f) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode. g) If transmit duty cycle < 98%, use a video trigger with the trigger level set to enable triggering only on full power pulses. The transmitter shall operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no OFF intervals) or at duty cycle >= 98%, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run.” h) Trace average at least 100 traces in power averaging (rms) mode. i) Compute power by integrating the spectrum across the 26 dB EBW or 99% OBW of the signal using the instrument’s band power measurement function, with band limits set equal to the EBW or OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in power units) at 1 MHz intervals extending across the 26 dB EBW or 99% OBW of the spectrum.
Test Setup:	See section 4.6 for test setup description. The photo of test setup please refer to Appendix I Test Setup Photos
Operating Environment:	
Temperature:	22.5℃
Humidity:	46%RH
Atmospheric Pressure:	1010 hpa
Test voltage:	DC 3.7V From Battery

5.8.1 Test Data:

Please Refer to Appendix-5G WIFI for Details

5.9 Power Spectral Density

Test Requirement:	47 CFR Part 15.407(a)(1)(i) 47 CFR Part 15.407(a)(1)(ii) 47 CFR Part 15.407(a)(1)(iii) 47 CFR Part 15.407(a)(1)(iv) 47 CFR Part 15.407(a)(2) 47 CFR Part 15.407(a)(3)(i)
Test Method:	ANSI C63.10-2013, section 12.5
Test Limit:	For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations. For client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. For the band 5.725-5.850 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power.

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	Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.
Procedure:	a) Create an average power spectrum for the EUT operating mode being tested by following the instructions in 12.3.2 for measuring maximum conducted output power using a spectrum analyzer or EMI receiver; that is, select the appropriate test method (SA-1, SA-2, SA-3, or their respective alternatives) and apply it up to, but not including, the step labeled, “Compute power….” (This procedure is required even if the maximum conducted output power measurement was performed using the power meter method PM.) b) Use the peak search function on the instrument to find the peak of the spectrum. c) Make the following adjustments to the peak value of the spectrum, if applicable: 1) If method SA-2 or SA-2A was used, then add [10 log (1 / D)], where D is the duty cycle, to the peak of the spectrum. 2) If method SA-3A was used and the linear mode was used in step h) of 12.3.2.7, add 1 dB to the final result to compensate for the difference between linear averaging and power averaging. d) The result is the PPSD. e) The procedure in item a) through item c) requires the use of 1 MHz resolution bandwidth to satisfy the 1 MHz measurement bandwidth specified by some regulatory authorities.This requirement also permits use of resolution bandwidths less than 1 MHz “provided that the measured power is integrated to show the total power over the measurement bandwidth” (i.e., 1 MHz). If measurements are performed using a reduced resolution bandwidth and integrated over 1 MHz bandwidth, the following adjustments to the procedures apply: 1) Set RBW >= 1 / T, where T is defined in 12.2 a). 2) Set VBW >= [3 × RBW]. 3) Care shall be taken such that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.
Test Setup:	See section 4.6 for test setup description. The photo of test setup please refer to Appendix I Test Setup Photos
Operating Environment:	
Temperature:	22.5℃
Humidity:	46%RH
Atmospheric Pressure:	1010 hpa
Test voltage:	DC 3.7V From Battery

5.9.1 Test Data:

Please Refer to Appendix-5G WIFI for Details

5.10 Frequency Stability Measurement

Test Requirement:	FCC Part15 Section 15.407(g) &Part2 J Section 2.1055
Test Method:	ANSI C63.10: 2020
Test Limit:	The frequency tolerance shall be maintained within the band of operation frequency over a temperature variation of 0 degrees to 45 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.
Procedure:	The EUT was placed inside the environmental test chamber and powered by nominal AC/DC voltage. b. Turn the EUT on and couple its output to a spectrum analyzer. c. Turn the EUT off and set the chamber to the highest temperature specified. d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize. e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature. f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.
Test Setup:	See section 4.6 for test setup description. The photo of test setup please refer to Appendix I Test Setup Photos
Operating Environment:	
Temperature:	22.5℃
Humidity:	46%RH
Atmospheric Pressure:	1010 hpa
Test voltage:	DC 3.7V From Battery

5.10.1 Test Data:

Please Refer to Appendix-5G WIFI for Details

6 Test Setup Photos

Please refer to the Appendix I Test Setup Photos

7 EUT Constructional Details (EUT Photos)

Please refer to the Appendix II External Photos &Appendix III External Photos

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--END OF REPORT--