

TEST REPORT

Product : SAFE UNIT
Trade mark : N/A
Model/Type reference : PAU1(A)
Serial Number : N/A
Report Number : EED32R82399203
FCC ID : 2BTIZ-PAU1A
Date of Issue : May 15, 2026
Test Standards : 47 CFR Part 15 Subpart C
Test result : PASS

Prepared for:

HQE Systems Inc.

27348 Via Industria Temecula, CA 92590

Prepared by:

Centre Testing International Group Co., Ltd.

Hongwei Industrial Park, Zone 70, Bao'an District,

Shenzhen, Guangdong, China

TEL: +86-755-3368 3668

FAX: +86-755-3368 3385



Compiled by:

Lucas Lu

Lucas Lu

Approved by:

Aaron Ma

Aaron Ma

Reviewed by:

Keven Tan

Keven Tan

Date:

May 15, 2026

Check No.: 4224041225

1 Contents

	Page
1 CONTENTS	2
2 TEST SUMMARY	3
3 GENERAL INFORMATION	4
3.1 CLIENT INFORMATION	4
3.2 GENERAL DESCRIPTION OF EUT	4
3.3 TEST CONFIGURATION	6
3.4 TEST ENVIRONMENT	7
3.5 DESCRIPTION OF SUPPORT UNITS	7
3.6 TEST LOCATION	7
3.7 MEASUREMENT UNCERTAINTY (95% CONFIDENCE LEVELS, K=2)	8
3.8 EQUIPMENT LIST	9
4 TEST RESULTS AND MEASUREMENT DATA	13
4.1 ANTENNA REQUIREMENT	13
4.2 AC POWER LINE CONDUCTED EMISSIONS	14
4.3 MAXIMUM CONDUCTED OUTPUT POWER	18
4.4 20dB EMISSION BANDWIDTH	19
4.5 CARRIER FREQUENCY SEPARATION	20
4.6 NUMBER OF HOPPING CHANNEL	21
4.7 TIME OF OCCUPANCY	22
4.8 BAND EDGE MEASUREMENTS	23
4.9 CONDUCTED SPURIOUS EMISSIONS	24
4.10 RADIATED SPURIOUS EMISSION & RESTRICTED BANDS	25
5 APPENDIX A	42
6 PHOTOGRAPHS	43

2 Test Summary

Test Item	Test Requirement	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203/15.247 (c)	PASS
AC Power Line Conducted Emission	47 CFR Part 15, Subpart C Section 15.207	PASS
Maximum Conducted Output Power	47 CFR Part 15, Subpart C Section 15.247 (b)(2)	PASS
20dB Emission Bandwidth	47 CFR Part 15, Subpart C Section 15.247 (a)(1)	PASS
Carrier Frequency Separation	47 CFR Part 15, Subpart C Section 15.247 (a)(1)	PASS
Number of Hopping Channels	47 CFR Part 15, Subpart C Section 15.247 (a)(1)	PASS
Time of Occupancy	47 CFR Part 15, Subpart C Section 15.247 (a)(1)	PASS
Band Edge Measurements	47 CFR Part 15, Subpart C Section 15.247(d)	PASS
Conducted Spurious Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	PASS
Radiated Spurious emissions	47 CFR Part 15, Subpart C Section 15.205/15.209	PASS
Restricted bands around fundamental frequency	47 CFR Part 15, Subpart C Section 15.205/15.209	PASS

3 General Information

3.1 Client Information

Applicant:	HQE Systems Inc.
Address of Applicant:	27348 Via Industria Temecula, CA 92590
Manufacturer:	HQE Systems Inc.
Address of Manufacturer:	27348 Via Industria Temecula, CA 92590
Factory:	Shenzhen Xinxian Technology Co.,Limited.
Address of Factory:	5th Floor,102 first Floor,Building B17,HengfengIndustrial town No.739 Zhoushi Road,Hangcheng Street,Bao'an District,Shenzhen

3.2 General Description of EUT

Product Name:	SAFE UNIT		
Model No.:	PAU1(A)		
Test Model No.:	PAU1(A)		
Trade Mark:	N/A		
Product Type:	☐ Mobile ☒ Portable ☐ Fix Location		
Operation Frequency:	902.3MHz-914.9MHz		
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)		
Modulation Type:	LoRa		
Number of Channel:	64		
Hopping Channel Type:	Adaptive Frequency Hopping systems		
Antenna Type:	FPC Antenna		
Antenna Gain:	1.11 dBi		
Power Supply:	Adapter:	Input:100-240V~50/60Hz 0.4A Max, Output:5V 2A	
	Battery:	DC 3.7V	
Test Voltage:	DC 5V		
Sample Received Date:	Dec. 12, 2025		
Sample tested Date:	Dec. 12, 2025 to Apr. 23, 2026		

Operation Frequency each of channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	902.3	20	906.3	40	910.3	60	914.3
1	902.5	21	906.5	41	910.5	61	914.5
2	902.7	22	906.7	42	910.7	62	914.7
3	902.9	23	906.9	43	910.9	63	914.9
4	903.1	24	907.1	44	911.1		
5	903.3	25	907.3	45	911.3		
6	903.5	26	907.5	46	911.5		
7	903.7	27	907.7	47	911.7		
8	903.9	28	907.9	48	911.9		
9	904.1	29	908.1	49	912.1		
10	904.3	30	908.3	50	912.3		
11	904.5	31	908.5	51	912.5		
12	904.7	32	908.7	52	912.7		
13	904.9	33	908.9	53	912.9		
14	905.1	34	909.1	54	913.1		
15	905.3	35	909.3	55	913.3		
16	905.5	36	909.5	56	913.5		
17	905.7	37	909.7	57	913.7		
18	905.9	38	909.9	58	913.9		
19	906.1	39	910.1	59	914.1		

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:

Channel	Frequency(MHz)
The lowest channel (CH0)	902.3
The middle channel (CH31)	908.5
The highest channel (CH63)	914.9

3.3 Test Configuration

EUT Test Software Settings:		
Test Software:	sscom5.13.1	
EUT Power Grade:	Default (Power level is built-in set parameters and cannot be changed and selected)	
Use test software to set the lowest frequency, the middle frequency and the highest frequency keep transmitting of the EUT.		
Mode	Channel	Frequency(MHz)
LoRa	CH0	902.3
	CH31	908.5
	CH63	914.9

3.4 Test Environment

Operating Environment:	
Radiated Spurious Emissions:	
Temperature:	22~25.0 °C
Humidity:	50~55 % RH
Atmospheric Pressure:	1010mbar
Conducted Emissions:	
Temperature:	22~25.0 °C
Humidity:	50~55 % RH
Atmospheric Pressure:	1010mbar
RF Conducted:	
Temperature:	22~25.0 °C
Humidity:	50~55 % RH
Atmospheric Pressure:	1010mbar

3.5 Description of Support Units

The EUT has been tested independently.

3.6 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd
Hongwei Industrial Park, Zone 70, Bao'an District, Shenzhen, Guangdong, China
Telephone: +86 (0) 755 33683668 Fax: +86 (0) 755 33683385

No tests were sub-contracted.

FCC Designation No.: CN1164, Test Firm Registration No.: 260439

3.7 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.9×10^{-8}
2	RF power, conducted	0.46dB (30MHz-1GHz)
		0.55dB (1GHz-40GHz)
3	Radiated Spurious emission test	3.3dB (9kHz-30MHz)
		4.3dB (30MHz-1GHz)
		4.5dB (1GHz-18GHz)
		3.4dB (18GHz-40GHz)
4	Conduction emission	3.5dB (9kHz-150kHz)
		3.1dB (150kHz-30MHz)
5	Temperature test	0.64°C
6	Humidity test	3.8%
7	DC power voltages	0.026%

3.8 Equipment List

RF test system					
Equipment	Manufacturer	Model No.	Serial Number	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Spectrum Analyzer	Keysight	N9010A	MY54510339	11-25-2025	11-24-2026
Spectrum Analyzer	R&S	FSW43	102978	08-11-2025	08-10-2026
Signal Generator	Keysight	N5182B	MY53051549	11-13-2025	11-12-2026
Signal Generator	Agilent	N5181A	MY46240094	11-25-2025	11-24-2026
DC Power	Keysight	E3642A	MY56376072	11-13-2025	11-12-2026
Communication test set	R&S	CMW500	169004	03-03-2025 02-06-2026	03-02-2026 02-05-2027
RF control unit(power unit)	JS Tonscend	JS0806-2	24I80620925	07-21-2025	07-20-2026
Wi-Fi 7GHz Band Extender	JS Tonscend	TS-WF7U2	2206200002	05-12-2025	05-11-2026
high-low temperature test chamber	Dong Guang Qin Zhuo	LK-80GA	QZ20150611879	11-13-2025	11-12-2026
Temperature/ Humidity Indicator	biaozhi	HM10	1804186	05-26-2025	05-25-2026
BT&WI-FI Automatic test software	JS Tonscend	JS1120-3	V3.6.21	---	---
Digital multimeter	FLUKE	17B MAX	59545050WS	10-15-2025	10-14-2026

3M full-anechoic Chamber					
Equipment	Manufacturer	Model No.	Serial Number	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Fully Anechoic Chamber	TDK	FAC-3	---	01-29-2024	01-28-2027
Receiver	Keysight	N9038A	MY57290136	12-24-2024 12-22-2025	12-23-2025 12-21-2026
Spectrum Analyzer	Keysight	N9020B	MY57111112	12-24-2024 12-21-2025	12-23-2025 12-20-2026
Spectrum Analyzer	Keysight	N9030B	MY57140871	12-24-2024 12-21-2025	12-23-2025 12-20-2026
TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	9163-1148	04-12-2025 03-29-2026	04-11-2026 03-28-2027
Horn Antenna	Schwarzbeck	BBHA 9170	9170-832	04-12-2025 03-29-2026	04-11-2026 03-28-2027
Horn Antenna	ETS-LINDGREN	3117	57407	06-29-2025	06-28-2026
Preamplifier	EMCI	EMC001330	980563	03-03-2025 02-06-2026	03-02-2026 02-05-2027
Preamplifier	EMCI	EMC051845SE	980380	11-25-2025	11-24-2026
Preamplifier	Tonscend	TAP-011858	AP21B806112	07-07-2025	07-06-2026
Communication test set	R&S	CMW500	104466	11-25-2025	11-24-2026
Temperature/Humidity Indicator	biaozhi	GM1360	EE1186631	03-31-2025 03-24-2026	03-30-2026 03-23-2027
RSE Automatic test software	JS Tonscend	JS36-RSE	V5.0.0.1	---	---
Cable line	Times	SFT205-NMSM-2.50M	394812-0001	01-29-2024	01-28-2027
Cable line	Times	SFT205-NMSM-2.50M	394812-0002	01-29-2024	01-28-2027
Cable line	Times	SFT205-NMSM-2.50M	394812-0003	01-29-2024	01-28-2027
Cable line	Times	SFT205-NMSM-2.50M	393495-0001	01-29-2024	01-28-2027
Cable line	Times	EMC104-NMNM-1000	SN160710	01-29-2024	01-28-2027
Cable line	Times	SFT205-NMSM-3.00M	394813-0001	01-29-2024	01-28-2027
Cable line	Times	SFT205-NMNM-1.50M	381964-0001	01-29-2024	01-28-2027
Cable line	Times	SFT205-NMSM-7.00M	394815-0001	01-29-2024	01-28-2027
Cable line	Times	HF160-KMKM-3.00M	393493-0001	01-29-2024	01-28-2027

3M Semi-anechoic Chamber (2)- Radiated disturbance Test					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date	Cal. Due date
				(mm-dd-yyyy)	(mm-dd-yyyy)
3M Chamber & Accessory Equipment	TDK	SAC-3	---	01/13/2024	01/12/2027
Receiver	R&S	ESC17	100938-003	09/03/2025	09/02/2026
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	9163-618	05/14/2025	05/13/2026
Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-076	04/07/2025 03-29-2026	04/06/2026 03-28-2027
Microwave Preamplifier	Tonscend	EMC051845SE	980380	11/25/2025	11/24/2026
Horn Antenna	A.H.SYSTEMS	SAS-574	374	07/02/2023	07/01/2026
Horn Antenna	ETS-LINGREN	BBHA 9120D	9120D-1869	04/07/2025 03-31-2026	04/06/2026 03-30-2027
Preamplifier	Agilent	11909A	12-1	03/03/2025 02/06/2026	03/02/2026 02/07/2027
Preamplifier	CD	PAP-1840-60	6041.6042	05/26/2025	05/25/2026
Test software	Fara	EZ-EMC	EMEC-3A1-Pre	---	---
Cable line	Fulai(7M)	SF106	5219/6A	01/13/2024	01/12/2027
Cable line	Fulai(6M)	SF106	5220/6A	01/13/2024	01/12/2027
Cable line	Fulai(3M)	SF106	5216/6A	01/13/2024	01/12/2027
Cable line	Fulai(3M)	SF106	5217/6A	01/13/2024	01/12/2027

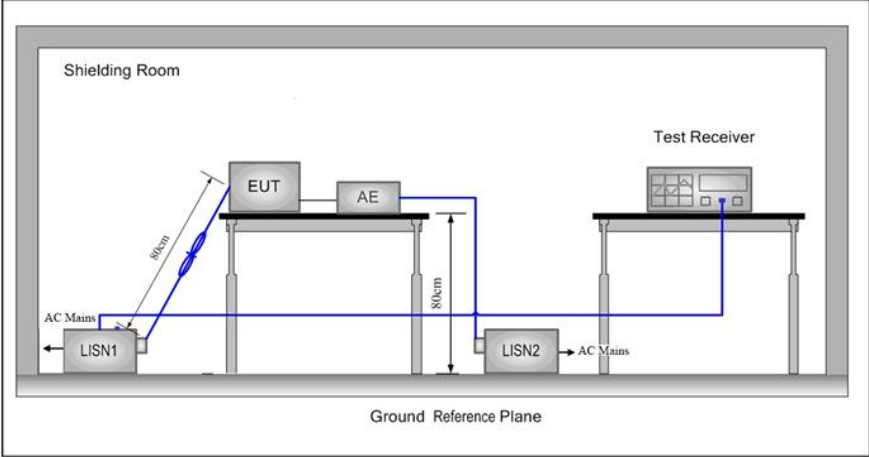
Conducted disturbance Test					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date	Cal. Due date
				(mm-dd-yyyy)	(mm-dd-yyyy)
Receiver	R&S	ESCI	100435	04-08-2025 04-06-2026	04-07-2026 04-05-2027
Temperature/ Humidity Indicator	Defu	TH128	/	03-31-2025 03-24-2026	03-30-2026 03-23-2027
LISN	R&S	ENV216	100098	09-13-2025	09-12-2026
Barometer	changchun	DYM3	1188	---	---
Test software	Fara	EZ-EMC	EMC-CON 3A1.1	---	---
Capacitive voltage probe	Schwarzbeck	CVP 9222C	00124	06-07-2025	06-06-2026
ISN	TESEQ	ISN T800	30297	11-24-2025	11-23-2026

4 Test results and Measurement Data

4.1 Antenna Requirement

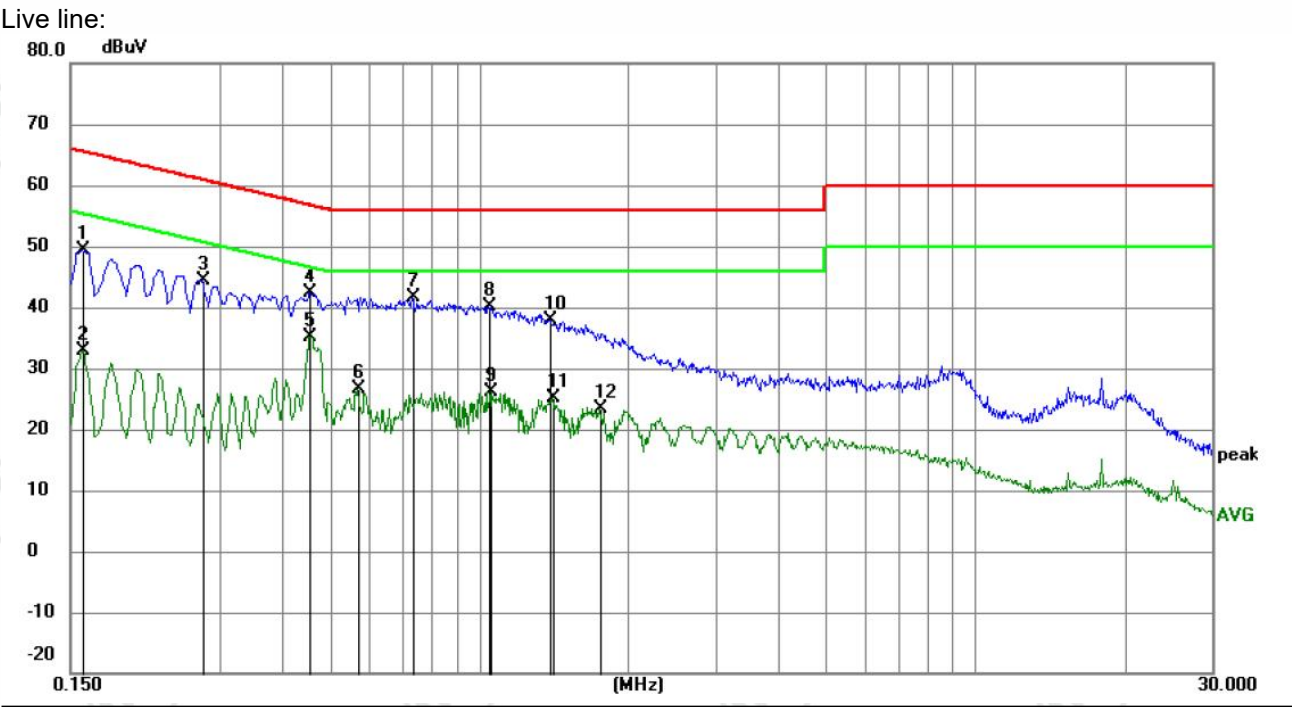
Standard requirement:	47 CFR Part 15C Section 15.203 /247(c)
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a 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:	Please see Internal photos
The antenna is FPC Antenna. The best case gain of the antenna is 1.11 dBi.	

4.2 AC Power Line Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207		
Test Method:	ANSI C63.10-2020		
Test Frequency Range:	150kHz to 30MHz		
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
* Decreases with the logarithm of the frequency.			
Test Setup:			
Test Procedure:	1) The mains terminal disturbance voltage test was conducted in a shielded room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a $50\Omega/50\mu\text{H} + 5\Omega$ linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.		

	5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10-2020 on conducted measurement.
Exploratory Test Mode:	Non-hopping transmitting mode with all kind of modulation and all kind of data type at the lowest, middle, high channel.
Final Test Mode:	Through Pre-scan, find the mode a is the worst case. Only the worst case is recorded in the report.
Test Results:	Pass

Measurement Data

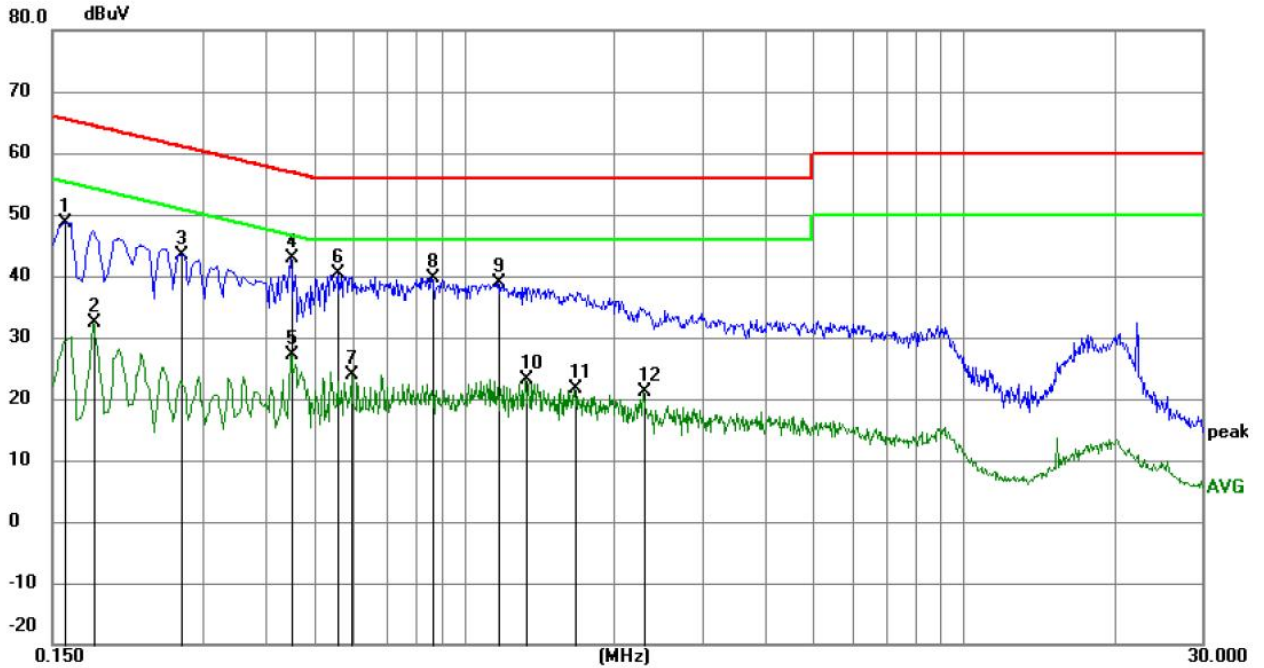


No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1590	39.02	10.27	49.29	65.52	-16.23	QP	
2	0.1590	22.70	10.27	32.97	55.52	-22.55	AVG	
3	0.2760	34.28	10.15	44.43	60.94	-16.51	QP	
4	0.4560	32.38	10.08	42.46	56.77	-14.31	QP	
5 *	0.4560	25.07	10.08	35.15	46.77	-11.62	AVG	
6	0.5685	16.53	10.09	26.62	46.00	-19.38	AVG	
7	0.7350	31.47	10.15	41.62	56.00	-14.38	QP	
8	1.0455	29.86	10.18	40.04	56.00	-15.96	QP	
9	1.0545	15.98	10.18	26.16	46.00	-19.84	AVG	
10	1.3920	27.78	10.18	37.96	56.00	-18.04	QP	
11	1.4100	14.84	10.18	25.02	46.00	-20.98	AVG	
12	1.7520	13.16	10.17	23.33	46.00	-22.67	AVG	

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. Margin=Measurement-Limit.
4. Measurement=Reading Level+Correct Factor.
5. In the test results, an asterisk (*) indicates Maximum Data, a cross (X) indicates over Limit.
6. If the Peak value under Average limit, the Average value is not recorded in the report.

Neutral line:

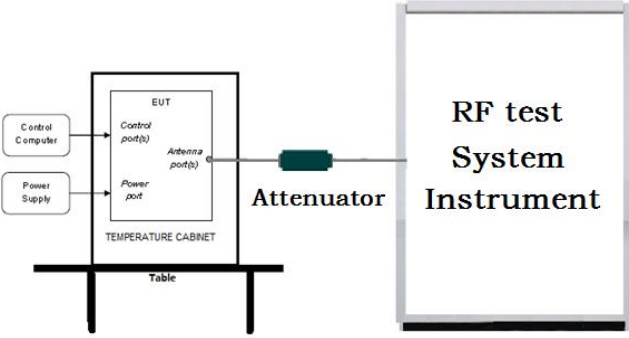


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1590	38.43	10.27	48.70	65.52	-16.82	QP	
2		0.1815	22.03	10.24	32.27	54.42	-22.15	AVG	
3		0.2714	33.33	10.15	43.48	61.07	-17.59	QP	
4	*	0.4515	32.73	10.08	42.81	56.85	-14.04	QP	
5		0.4515	17.01	10.08	27.09	46.85	-19.76	AVG	
6		0.5595	30.27	10.09	40.36	56.00	-15.64	QP	
7		0.5955	13.75	10.10	23.85	46.00	-22.15	AVG	
8		0.8655	29.42	10.17	39.59	56.00	-16.41	QP	
9		1.1670	28.74	10.18	38.92	56.00	-17.08	QP	
10		1.3290	13.05	10.18	23.23	46.00	-22.77	AVG	
11		1.6710	11.41	10.17	21.58	46.00	-24.42	AVG	
12		2.2875	11.09	10.16	21.25	46.00	-24.75	AVG	

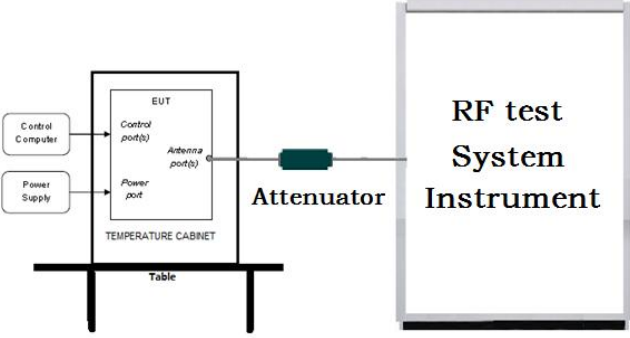
Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
3. Margin = Measurement - Limit.
4. Measurement = Reading Level + Correct Factor.
5. In the test results, an asterisk (*) indicates Maximum Data, a cross (X) indicates over Limit.
6. If the Peak value under Average limit, the Average value is not recorded in the report.

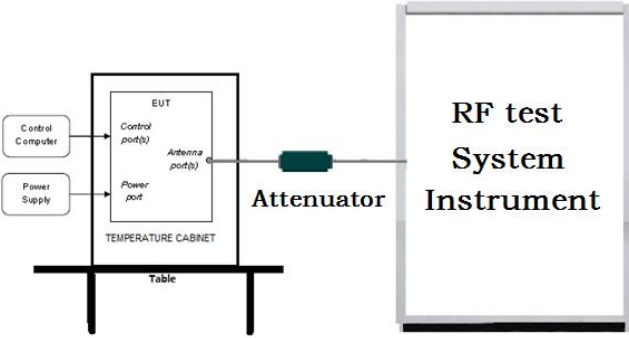
4.3 Maximum Conducted Output Power

Test Requirement:	47 CFR Part 15C Section 15.247 (b)(2)
Test Method:	ANSI C63.10-2020
Test Setup:	 Remark: Offset=Cable loss+ attenuation factor.
Test Procedure:	Use the following spectrum analyzer settings: Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel RBW > the 20 dB bandwidth of the emission being measured VBW ≥ RBW Sweep = auto Detector function = peak Trace = max hold Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission.
Limit:	1 watt (30 dBm) for systems employing at least 50 hopping channels; and, 0.25 watts (24 dBm) for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.
Exploratory Test Mode:	Non-hopping transmitting with all kind of modulation and all kind of data type
Final Test Mode:	Refer to clause 3.3
Test Results:	Refer to Appendix A

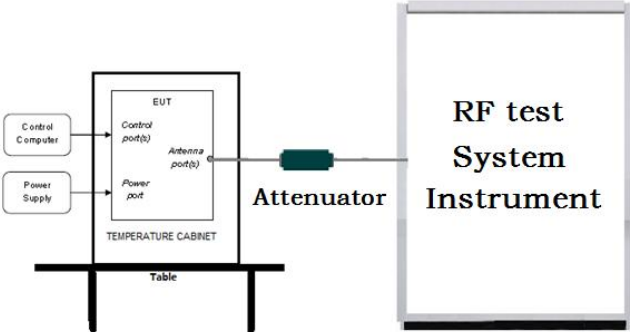
4.4 20dB Emission Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1)
Test Method:	ANSI C63.10-2020
Test Setup:	 Remark: Offset=Cable loss+ attenuation factor.
Test Procedure:	1. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Use the following spectrum analyzer settings for 20dB Bandwidth measurement. Span = approximately 2 to 5 times the 20 dB bandwidth, centered on a hopping channel; $1\% \leq RBW \leq 5\%$ of the 20 dB bandwidth; $VBW \geq 3RBW$; Sweep = auto; Detector function = peak; Trace = max hold. 4. Measure and record the results in the test report.
Limit:	The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.
Exploratory Test Mode:	Non-hopping transmitting with all kind of modulation and all kind of data type
Final Test Mode:	Refer to clause 3.3
Test Results:	Refer to Appendix A

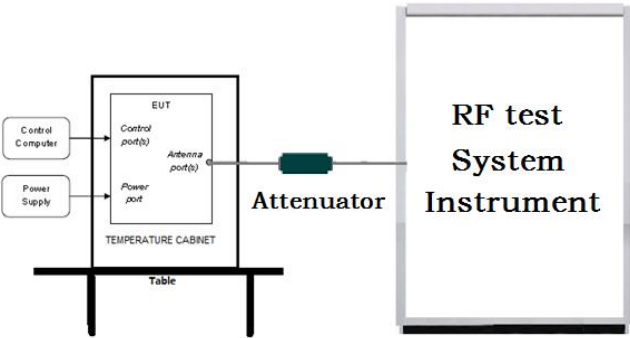
4.5 Carrier Frequency Separation

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1)
Test Method:	ANSI C63.10-2020
Test Setup:	 Remark: Offset=Cable loss+ attenuation factor.
Test Procedure:	1. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Enable the EUT hopping function. 4. Use the following spectrum analyzer settings: Span = wide enough to capture the peaks of two adjacent channels; RBW is set to approximately 30% of the channel spacing, adjust as necessary to best identify the center of each individual channel; VBW≥RBW; Sweep = auto; Detector function = peak; Trace = max hold. 5. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. Record the value in report.
Limit:	Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.
Test Mode:	Hopping transmitting with all kind of modulation
Test Results:	Refer to Appendix A

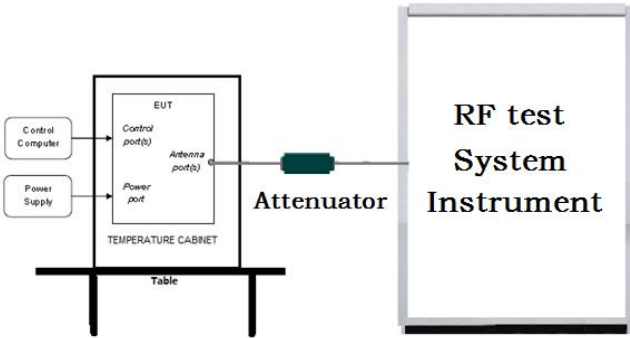
4.6 Number of Hopping Channel

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1)
Test Method:	ANSI C63.10-2020
Test Setup:	 Remark: Offset=Cable loss+ attenuation factor.
Test Procedure:	1. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Enable the EUT hopping function. 4. Use the following spectrum analyzer settings: Span = the frequency band of operation; set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller; VBW≥RBW; Sweep= auto; Detector function = peak; Trace = max hold. 5. The number of hopping frequency used is defined as the number of total channel. 6. Record the measurement data in report.
Limit:	At least 25 non overlapping hopping channels. If the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping channels.
Test Mode:	Hopping transmitting with all kind of modulation
Test Results:	Refer to Appendix A

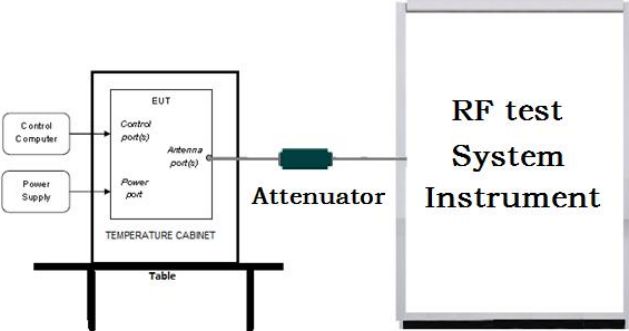
4.7 Time of Occupancy

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1)
Test Method:	ANSI C63.10-2020
Test Setup:	 Remark: Offset=Cable loss+ attenuation factor.
Test Procedure:	1. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Enable the EUT hopping function. 4. Use the following spectrum analyzer settings: Span = zero span, centered on a hopping channel; RBW shall be $\leq$ channel spacing and where possible RBW should be set $\gg 1/T$, where T is the expected dwell time per channel; VBW $\geq$ RBW; Sweep = as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = max hold. 5. Measure and record the results in the test report.
Limit:	If the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within 10 second period.
Test Mode:	Hopping transmitting with all kind of modulation and all kind of data type.
Test Results:	Refer to Appendix A

4.8 Band edge Measurements

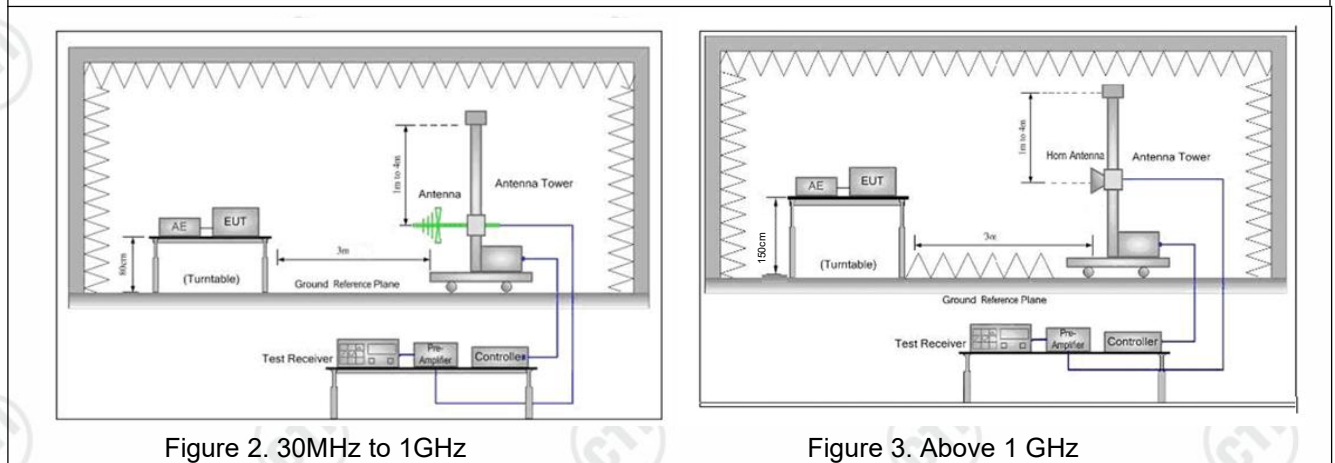
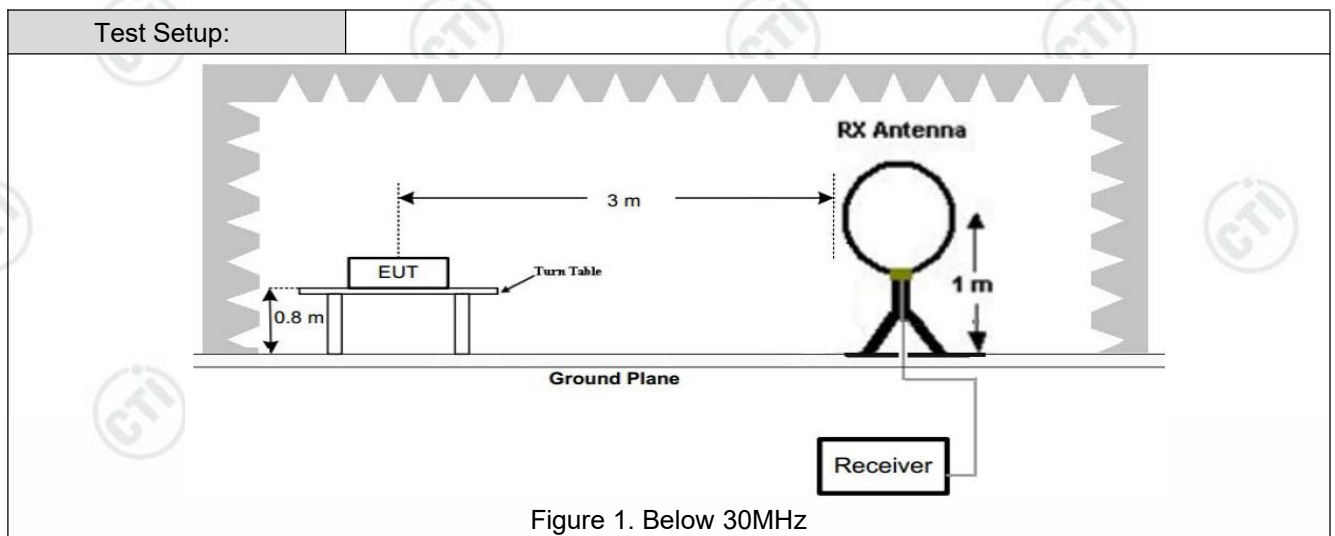
Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10-2020
Test Setup:	 Remark: Offset=Cable loss+ attenuation factor.
Test Procedure:	1. Set to the maximum power setting and enable the EUT transmit continuously. 2. Set RBW = 100 kHz, VBW = 300 kHz ($\geq$RBW). Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100kHz RBW. The attenuation shall be 30 dB instead of 20 dB when RMS conducted output power procedure is used. 3. Enable hopping function of the EUT and then repeat step 2 and 3. 4. Measure and record the results in the test report.
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Exploratory Test Mode:	Hopping and Non-hopping transmitting with all kind of modulation and all kind of data type
Final Test Mode:	Refer to clause 3.3
Test Results:	Refer to Appendix A

4.9 Conducted Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10-2020
Test Setup:	 Remark: Offset=Cable loss+ attenuation factor.
Test Procedure:	1. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Set RBW = 100 kHz, VBW = 300kHz, scan up through 10th harmonic. All harmonics / spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100kHz RBW. 4. Measure and record the results in the test report. 5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Exploratory Test Mode:	Non-hopping transmitting with all kind of modulation and all kind of data type
Final Test Mode:	Refer to clause 3.3
Test Results:	Refer to Appendix A

4.10 Radiated Spurious Emission & Restricted bands

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205				
Test Method:	ANSI C63.10-2020				
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	Peak	100 kHz	300kHz	Peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10kHz	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
	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.				



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 chamber. 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 chamber. 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

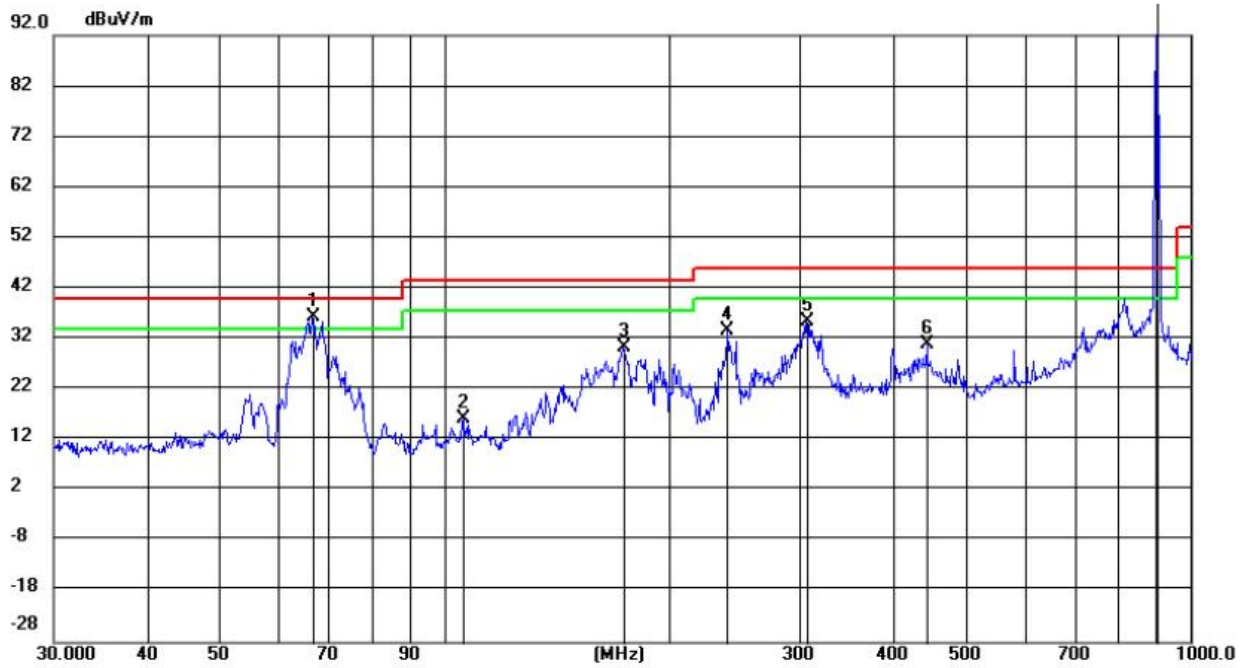
	horizontal and vertical polarizations of the antenna are set to make the measurement. d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) 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, quasi-peak or average method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel (2402MHz), the middle channel (2441MHz), the Highest channel (2480MHz) 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.
Exploratory Test Mode:	Non-hopping transmitting mode with all kind of modulation and all kind of data type
Final Test Mode:	Through Pre-scan, find the model a is the worst case. Pretest the EUT at Transmitting mode, For below 1GHz part, through pre-scan, the worst case is the lowest channel. Only the worst case is recorded in the report.
Test Results:	Pass

Radiated Spurious Emission below 1GHz:

During the test, the Radiates Emission from 30MHz to 1GHz was performed in all modes, only the worst case Model a was recorded in the report.

Test Graph

Horizontal:

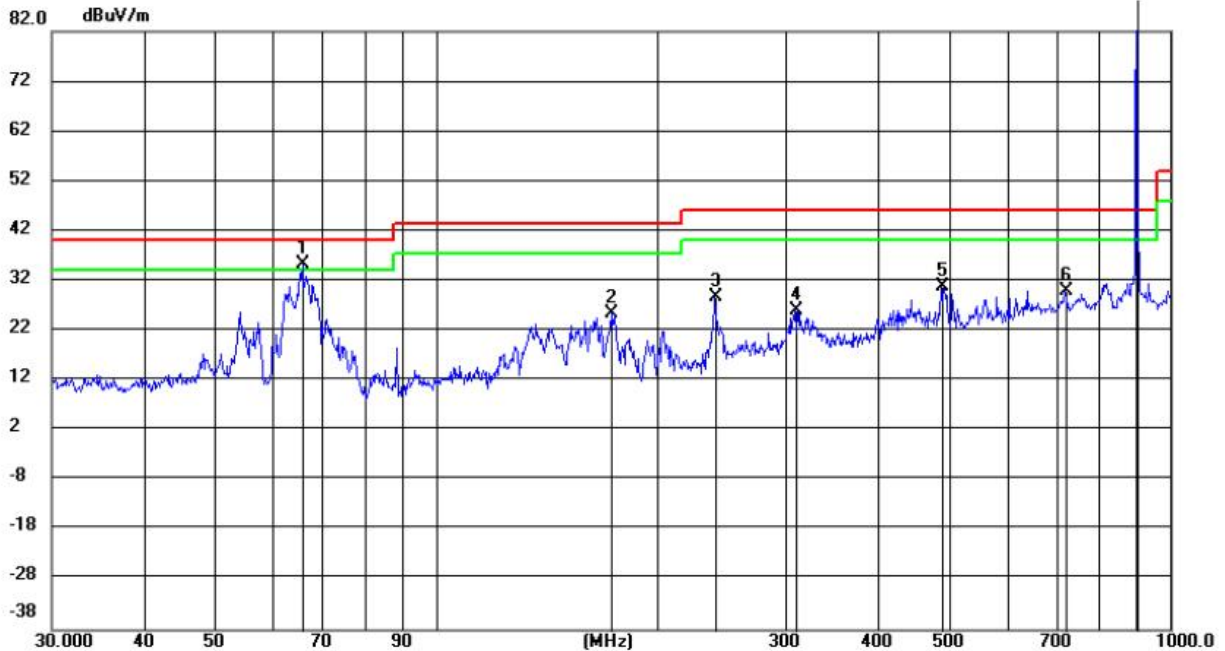


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Antenna Height cm	Table Degree degree	Comment
1	!	66.5455	24.35	11.88	36.23	40.00	-3.77	QP	100	152
2		106.0312	2.28	13.84	16.12	43.50	-27.38	QP	100	161
3		174.3323	19.37	11.02	30.39	43.50	-13.11	QP	100	126
4		239.9873	19.69	14.10	33.79	46.00	-12.21	QP	100	229
5		306.2163	18.87	16.53	35.40	46.00	-10.60	QP	100	360
6		444.0721	10.92	19.90	30.82	46.00	-15.18	QP	100	307
7	*	902.5178	78.89	26.98	105.87	46.00	59.87	peak	100	23

Remark:

1. $\text{Margin} = \text{Measurement}(\text{Level}) - \text{Limit}$.
2. $\text{Measurement}(\text{Level}) = \text{Reading Level} + \text{Correct Factor}$.
3. In the test results, an asterisk (*) indicates Maximum Data, a cross (X) indicates over Limit, an exclamation mark (!) indicates over -6dB margin Limit.
4. The part beyond the limit in the figure is Operation Frequency of the EUT. According to 47 CFR Part 15C Section 247(d), this test does not require an assessment.

Vertical:



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Antenna Height cm	Table Degree degree	Comment
1	!	65.8146	23.26	12.06	35.32	40.00	-4.68	QP	100	104
2		173.4178	14.42	11.02	25.44	43.50	-18.06	QP	100	62
3		239.9874	14.69	14.10	28.79	46.00	-17.21	QP	100	242
4		309.6175	9.56	16.64	26.20	46.00	-19.80	QP	100	345
5		488.0847	10.33	20.40	30.73	46.00	-15.27	QP	100	259
6		720.0827	5.87	24.20	30.07	46.00	-15.93	QP	100	165
7	*	902.3596	78.89	26.98	105.87	46.00	59.87	peak	100	139

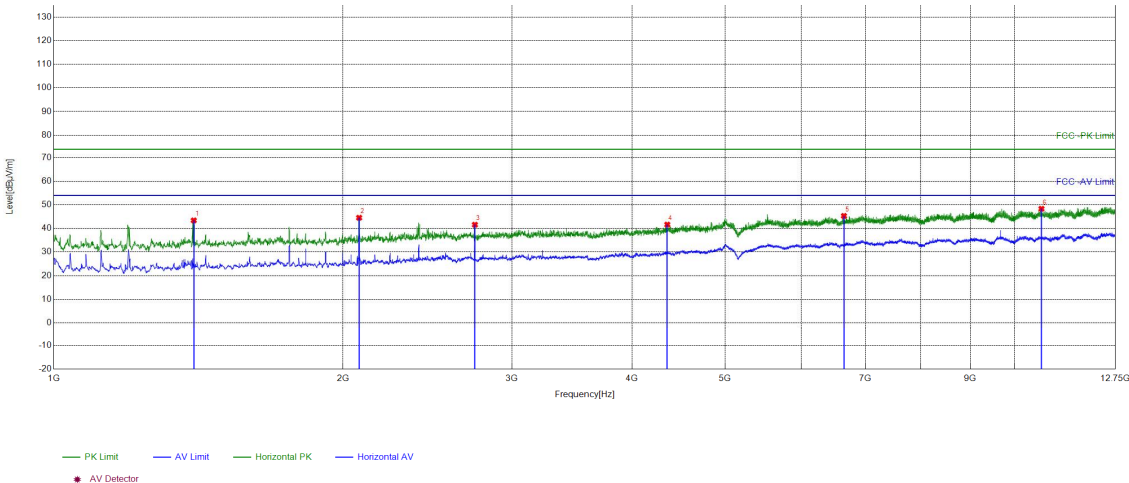
Remark:

1. $\text{Margin} = \text{Measurement}(\text{Level}) - \text{Limit}$.
2. $\text{Measurement}(\text{Level}) = \text{Reading Level} + \text{Correct Factor}$.
3. In the test results, an asterisk (*) indicates Maximum Data, a cross (X) indicates over Limit, an exclamation mark (!) indicates over -6dB margin Limit.
4. The part beyond the limit in the figure is Operation Frequency of the EUT. According to 47 CFR Part 15C Section 247(d), this test does not require an assessment.

Radiated Spurious Emission above 1GHz:

Test_Mode	Lora	Test_Frequency	902.3Mhz
Tset_Engineer	chenjun	Test_Date	2025/12/15
Remark	23.66°C60.82%/		

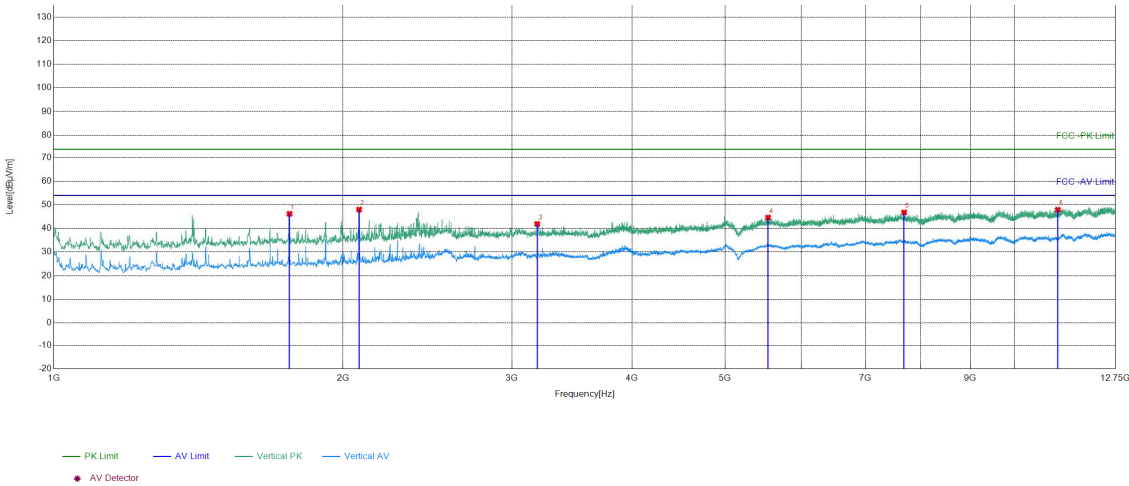
Test Graph



Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1398.7432	-21.69	65.10	43.41	74.00	30.59	PASS	Horizontal	PK
2	2079.5053	-19.17	63.71	44.54	74.00	29.46	PASS	Horizontal	PK
3	2744.5996	-16.36	57.94	41.58	74.00	32.42	PASS	Horizontal	PK
4	4353.6736	-9.89	51.53	41.64	74.00	32.36	PASS	Horizontal	PK
5	6649.7767	-3.98	49.29	45.31	74.00	28.69	PASS	Horizontal	PK
6	10677.9452	2.26	46.08	48.34	74.00	25.66	PASS	Horizontal	PK

Test_Mode	Lora	Test_Frequency	902.3Mhz
Tset_Engineer	chenjun	Test_Date	2025/12/15
Remark	23.66°C60.82%/		

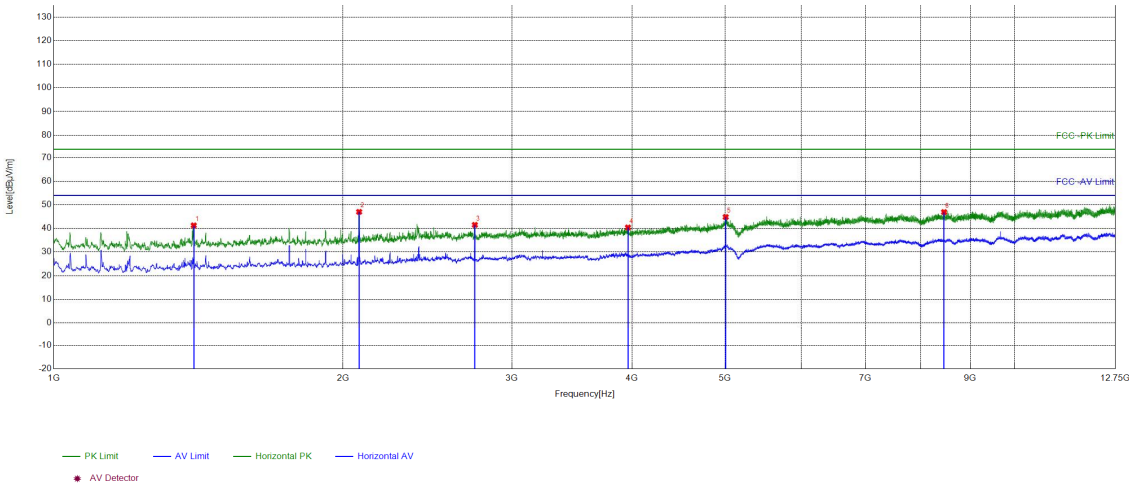
Test Graph



Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1759.884	-20.41	66.60	46.19	74.00	27.81	PASS	Vertical	PK
2	2079.5053	-19.17	67.19	48.02	74.00	25.98	PASS	Vertical	PK
3	3187.2125	-14.85	56.74	41.89	74.00	32.11	PASS	Vertical	PK
4	5544.4196	-6.29	50.94	44.65	74.00	29.35	PASS	Vertical	PK
5	7681.4954	-1.97	48.78	46.81	74.00	27.19	PASS	Vertical	PK
6	11104.1069	2.21	45.71	47.92	74.00	26.08	PASS	Vertical	PK

Test_Mode	Lora	Test_Frequency	908.5Mhz
Tset_Engineer	chenjun	Test_Date	2025/12/15
Remark	23.66°C60.82%/		

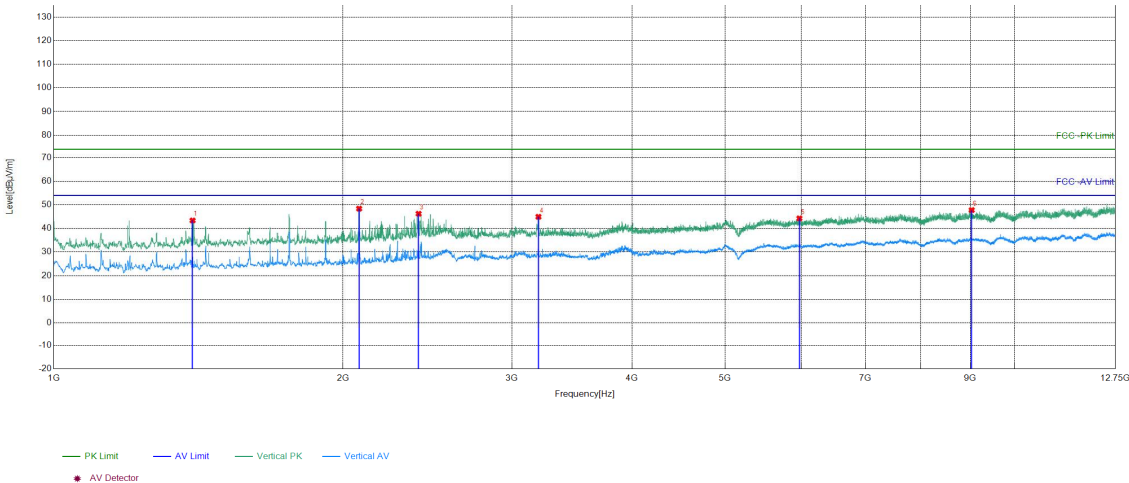
Test Graph



Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1398.7432	-21.69	62.98	41.29	74.00	32.71	PASS	Horizontal	PK
2	2079.5053	-19.17	66.20	47.03	74.00	26.97	PASS	Horizontal	PK
3	2744.5996	-16.36	57.87	41.51	74.00	32.49	PASS	Horizontal	PK
4	3961.9808	-11.98	52.40	40.42	74.00	33.58	PASS	Horizontal	PK
5	5007.8005	-8.25	53.10	44.85	74.00	29.15	PASS	Horizontal	PK
6	8454.697	-0.93	47.87	46.94	74.00	27.06	PASS	Horizontal	PK

Test_Mode	Lora	Test_Frequency	908.5Mhz
Tset_Engineer	chenjun	Test_Date	2025/12/15
Remark	23.66°C60.82%/		

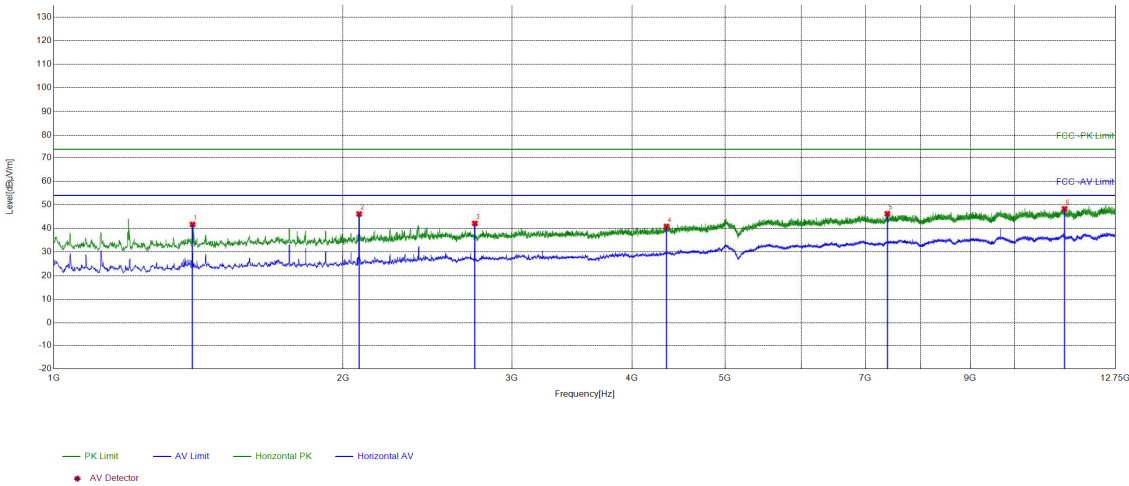
Test Graph



Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1394.8263	-21.73	65.11	43.38	74.00	30.62	PASS	Vertical	PK
2	2079.5053	-19.17	67.57	48.40	74.00	25.60	PASS	Vertical	PK
3	2398.3432	-17.88	64.12	46.24	74.00	27.76	PASS	Vertical	PK
4	3196.6131	-14.78	59.73	44.95	74.00	29.05	PASS	Vertical	PK
5	5976.0651	-5.55	49.82	44.27	74.00	29.73	PASS	Vertical	PK
6	9033.6189	0.42	47.37	47.79	74.00	26.21	PASS	Vertical	PK

Test_Mode	Lora	Test_Frequency	914.9Mhz
Tset_Engineer	chenjun	Test_Date	2025/12/15
Remark	23.66°C60.82%/		

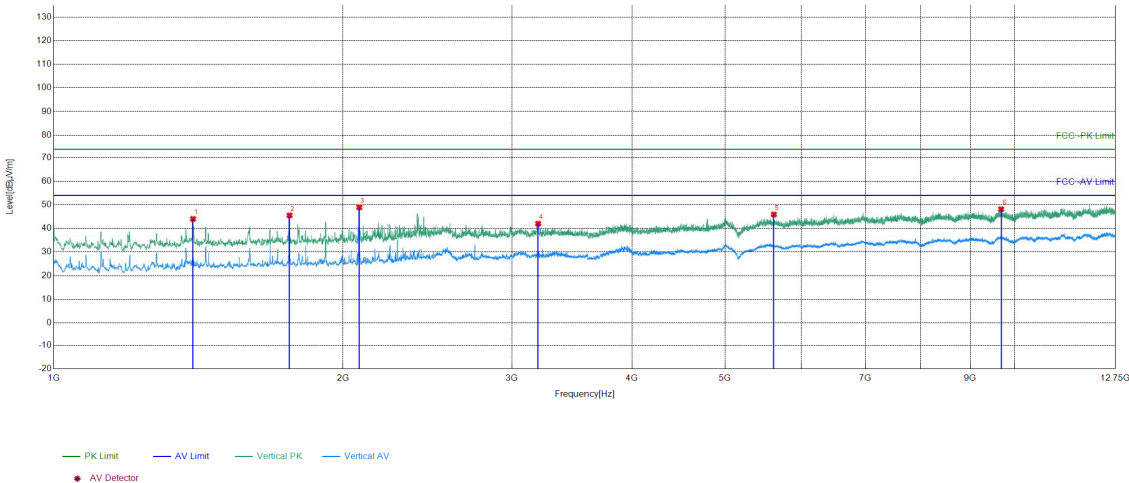
Test Graph



Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1394.8263	-21.73	63.43	41.70	74.00	32.30	PASS	Horizontal	PK
2	2079.5053	-19.17	65.32	46.15	74.00	27.85	PASS	Horizontal	PK
3	2744.5996	-16.36	58.50	42.14	74.00	31.86	PASS	Horizontal	PK
4	4345.8397	-9.92	50.77	40.85	74.00	33.15	PASS	Horizontal	PK
5	7379.892	-3.29	49.52	46.23	74.00	27.77	PASS	Horizontal	PK
6	11285.8524	2.48	45.84	48.32	74.00	25.68	PASS	Horizontal	PK

Test_Mode	Lora	Test_Frequency	914.9Mhz
Tset_Engineer	chenjun	Test_Date	2025/12/15
Remark	23.66°C60.82%/		

Test Graph



Suspected List

NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1396.3931	-21.71	65.77	44.06	74.00	29.94	PASS	Vertical	PK
2	1759.884	-20.41	65.97	45.56	74.00	28.44	PASS	Vertical	PK
3	2080.2887	-19.16	68.14	48.98	74.00	25.02	PASS	Vertical	PK
4	3194.263	-14.81	56.84	42.03	74.00	31.97	PASS	Vertical	PK
5	5621.1914	-6.06	52.00	45.94	74.00	28.06	PASS	Vertical	PK
6	9694.0129	1.14	47.01	48.15	74.00	25.85	PASS	Vertical	PK

Remark:

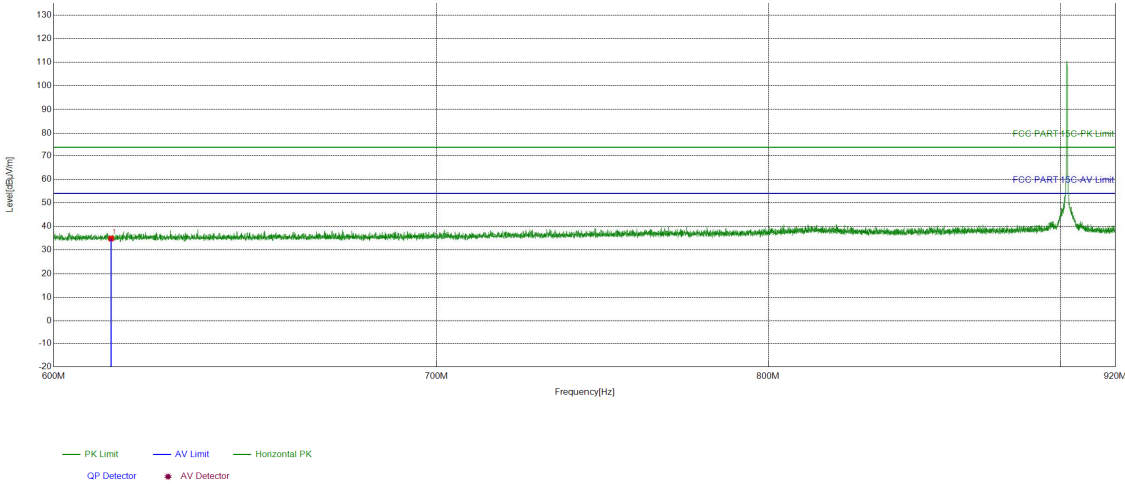
- 1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor
- 2) Scan from 9kHz to 25GHz, the disturbance above 10GHz and below 30MHz was very low. 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. As the PK values are all below 54dBμV/m. So, only the peak measurements were shown in the report.

Restricted bands:

Test plot as follows:

Test_Mode	Lora	Test_Frequency	902.3Mhz
Tset_Engineer	chenjun	Test_Date	2025/12/15
Remark	23.66°C60.82%/		

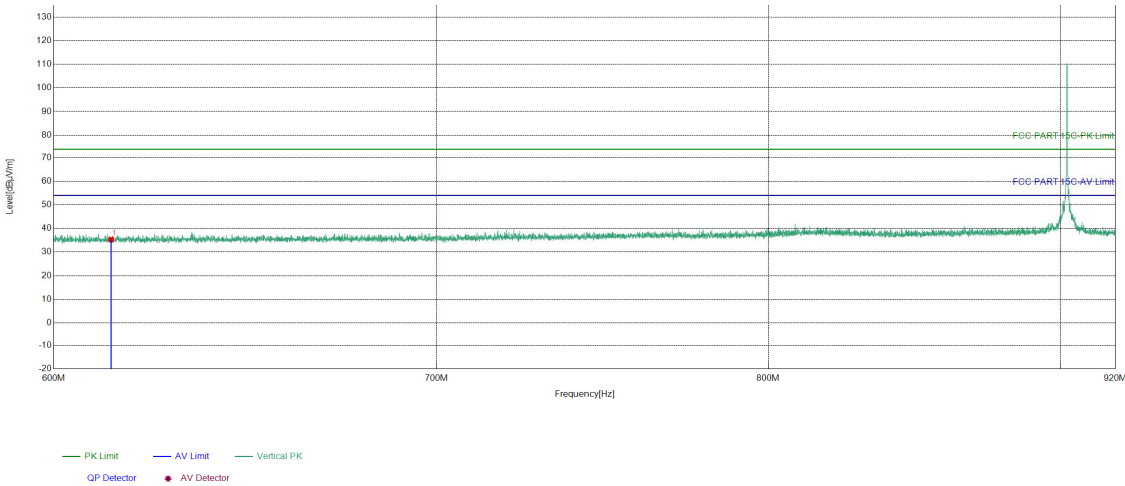
Test Graph



Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	614	-8.49	43.37	34.88	74.00	39.12	PASS	Horizontal	PK

Test_Mode	Lora	Test_Frequency	902.3Mhz
Tset_Engineer	chenjun	Test_Date	2025/12/15
Remark	23.66°C60.82%/		

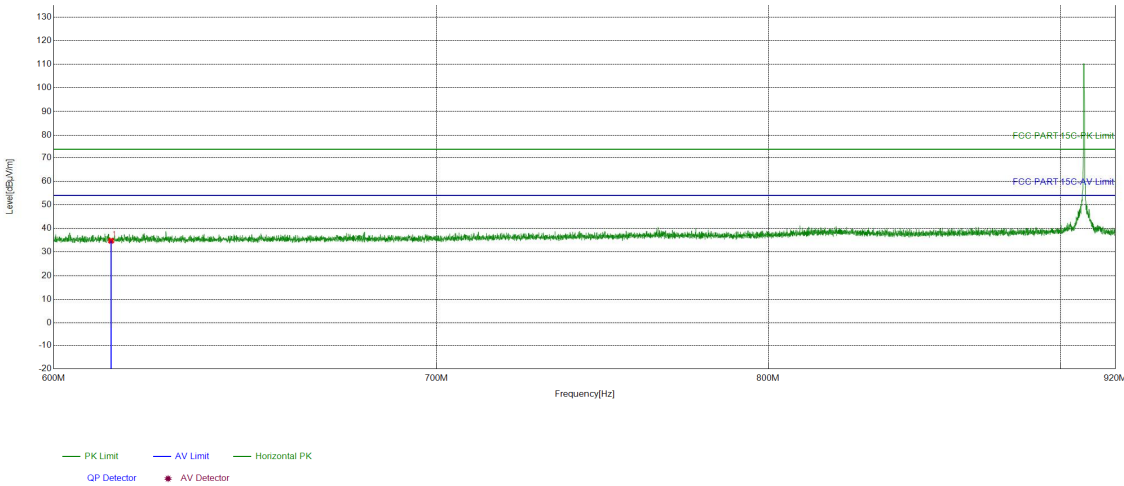
Test Graph



Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	614	-8.49	43.80	35.31	74.00	38.69	PASS	Vertical	PK

Test_Mode	Lora	Test_Frequency	908.5Mhz
Tset_Engineer	chenjun	Test_Date	2025/12/15
Remark	23.66°C60.82%/		

Test Graph

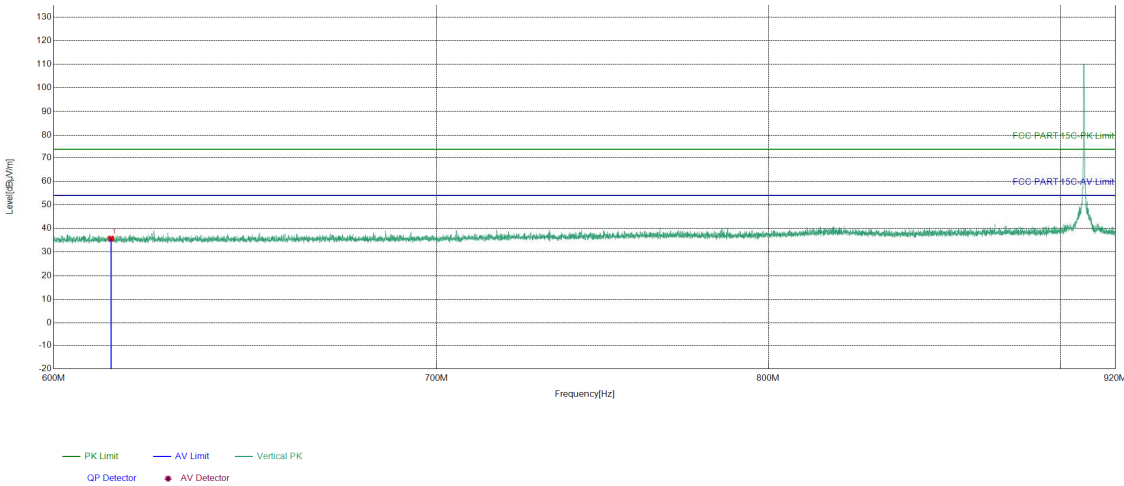


Suspected List

NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	614	-8.49	43.28	34.79	74.00	39.21	PASS	Horizontal	PK

Test_Mode	Lora	Test_Frequency	908.5Mhz
Tset_Engineer	chenjun	Test_Date	2025/12/15
Remark	23.66°C60.82%/		

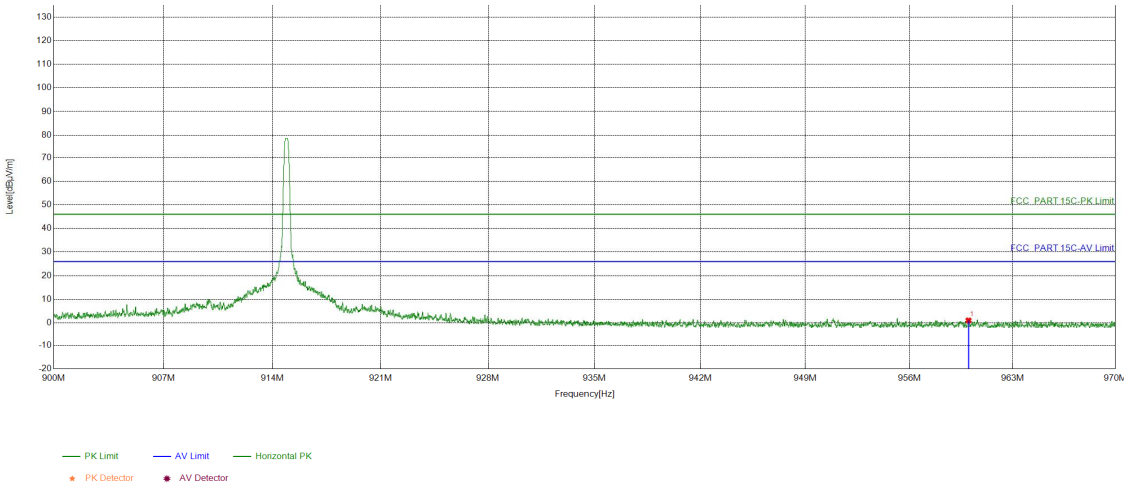
Test Graph



Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	614	-8.49	44.18	35.69	74.00	38.31	PASS	Vertical	PK

Test_Mode	Lora	Test_Frequency	914.9Mhz
Tset_Engineer	chenjun	Test_Date	2025/12/15
Remark	23.66°C60.82%/		

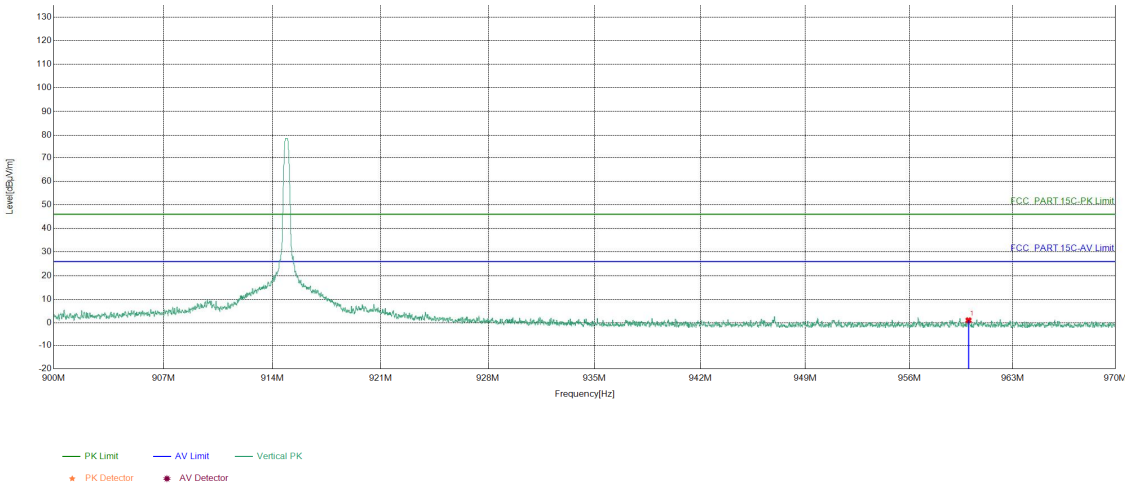
Test Graph



Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	960	-35.46	36.46	1.00	46.00	45.00	PASS	Horizontal	PK

Test_Mode	Lora	Test_Frequency	914.9Mhz
Tset_Engineer	chenjun	Test_Date	2025/12/15
Remark	23.66°C60.82%/		

Test Graph



Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	960	-35.46	36.54	1.08	46.00	44.92	PASS	Vertical	PK

Note:
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 - Correct Factor
Correct Factor = Preamplifier Factor– Antenna Factor–Cable Factor

5 Appendix A

Refer to Appendix: Bluetooth Classic of EED32R82399203

6 PHOTOGRAPHS

Refer to Appendix Photographs of Report No. EED32R82399203.

Statement

1. This report is considered invalid without approved signature, special seal and the seal on the perforation;
2. The Company Name shown on Report and Address, the sample(s) and sample information was/were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified;
3. The result(s) shown in this report refer(s) only to the sample(s) tested;
4. Unless otherwise stated, the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule stated in ILAC-G8:09/2019/CNAS-GL015:2022;
5. Without written approval of CTI, this report can't be reproduced except in full;

*** End of Report ***