

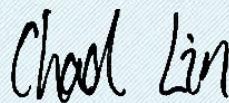
# TEST REPORT

Report No..... : KS2406S2147E04  
FCC ID..... : 2BGU2-ZENC50  
Applicant..... : Shenzhen Zentron Technology Co.,Ltd.  
Address..... : 12F Sinotrans Building, 46 Futian South Road, Futian District, Guangdong, 518045  
Manufacturer..... : Shenzhen Zentron Technology Co.,Ltd.  
Address..... : 12F Sinotrans Building, 46 Futian South Road, Futian District, Guangdong, 518045  
Product Name..... : Thermal imaging device  
Trademark..... : ZENTRON  
Model/Type reference..... : C50, Q635, Q50  
Standard..... : 47 CFR Part 15E  
Date of Receipt..... : June 06, 2024  
Date of Test Date..... : June 06, 2024 to August 14, 2024  
Date of issue..... : August 14, 2024  
**Test result..... : Pass**

Conclusion..... : The submitted sample was found to COMPLY with the standards above.

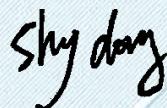
Prepared by:  
( Printed name + Signature)

Chad Lin



Approved by:  
( Printed name + Signature)

Sky Dong



**Testing Laboratory Name...: KSIGN(Guangdong) Testing Co., Ltd.**

Address..... : West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

TRF No. RF\_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

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## 1. TEST SUMMARY

### 1.1. Test Standards

The tests were performed according to following standards:

**47 CFR Part 15E:** Unlicensed National Information Infrastructure Devices

**ANSI C63.10-2013:** 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.

### 1.2. Report Version

Revised No.	Date of issue	Description
01	August 14, 2024	Original

TRF No. RF\_R1

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### 1.3. Test Description

Test Item	Standard	Requirement	Result
Antenna requirement	47 CFR Part 15E	Part 15.203	Pass
Conducted Emission at AC power line	47 CFR Part 15E	47 CFR Part 15.207(a)	Pass
Emission bandwidth and occupied bandwidth	47 CFR Part 15E	U-NII 1, U-NII 2A, U-NII 2C: No limits, only for report use.	Pass
Duty Cycle	47 CFR Part 15E	ANSI C63.10-2013 section 12.2 (b)	Pass
Maximum conducted output power	47 CFR Part 15E	47 CFR Part 15.407(a)(1)(iv)	Pass
Power spectral density	47 CFR Part 15E	47 CFR Part 15.407(a)(1)(iv)	Pass
Band edge emissions (Conducted)	47 CFR Part 15E	47 CFR Part 15.407(b)(1) 47 CFR Part 15.407(b)(10)	Pass
Band edge emissions (Radiated)	47 CFR Part 15E	47 CFR Part 15.407(b)(1) 47 CFR Part 15.407(b)(10)	Pass
Undesirable emission limits (below 1GHz)	47 CFR Part 15E	47 CFR Part 15.407(b)(9)	Pass
Undesirable emission limits (above 1GHz)	47 CFR Part 15E	47 CFR Part 15.407(b)(1) 47 CFR Part 15.407(b)(10)	Pass

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## 1.4. Test Facility

### KSIGN(Guangdong) Testing Co., Ltd .

West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

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

#### CNAS-Lab Code: L 13261

KSIGN(Guangdong) Testing Co., Ltd. has been assessed and proved to be in Compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

#### A2LA-Lab Cert. No.: 5457.01

KSIGN(Guangdong) Testing Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing

#### ISED# : 25693 CAB identifier.: CN0096

KSIGN(Guangdong) Testing Co., Ltd. has been listed by Innovation, Science and Economic Development Canada to perform electromagnetic emission measurement.

#### FCC-Registration No.: 294912 Designation Number: CN1328

KSIGN(Guangdong) Testing Co., Ltd. EMC Laboratory has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

## 1.5. Measurement Uncertainty

Test Items	Measurement Uncertainty
Conducted Emission (150k-30MHz)	± 3.34dB
Output Power, Conducted	± 1.4dB
PSD, Conducted	± 1.0dB
Spurious Emissions, Conducted	± 3.3dB
RSE (1-18GHz)	± 4.68dB
RSE (30-1000MHz)	± 5.7dB
RSE (18-40GHz)	± 5.18dB

The reported uncertainty of measurement  $y \pm U$ , where expended uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 %. Otherwise required by the applicant or Product Regulations. Decision Rule in this report did not consider the uncertainty.

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## 2. GENERAL INFORMATION

### 2.1. General Description Of EUT

Test Sample Number:	1-1(Normal Sample), 1-2(Engineering Sample)
Product Name:	Thermal imaging device
Trademark:	ZENTRON
Model / Type reference:	C50, Q635,Q50
Model Difference:	The only difference product models is models name. Different model names are available to meet market demands. Other power supply methods, appearance, internal structures, circuits and key components are the same, and do not affect safety and electromagnetic compatibility performance. According to the above information, all tests were performed on C50.
Power Supply:	DC 3.7V from battery
Operation Frequency:	802.11a/n(HT20)/ac(HT20): U-NII Band 1: 5180MHz to 5240MHz;  802.11n(HT40)/ac(HT40): U-NII Band 1: 5190MHz to 5230MHz;  802.11ac(HT80): U-NII Band 1: 5210MHz;
Number of Channels:	802.11a/n(HT20)/ac(HT20): U-NII Band 1: 4;  802.11n(HT40)/ac(HT40): U-NII Band 1: 2;  802.11ac(HT80): U-NII Band 1: 1;
Modulation Type:	802.11a: OFDM(BPSK, QPSK, 16QAM, 64QAM); 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM); 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM);
Antenna Type:	Interanl
Antenna Gain:	1.0dBi
Max TX Power:	5.38dBm
Hardware Version:	V1.0
Software Version:	V1.0.0

**Note:**Antenna gain provided by the applicant Can affect the validity of results

### 2.2. Accessory Equipment Information

Title	Manufacturer	Model No.	Technical Parameters	Provided by
Adapter	MCDODO	CH-810 Pro	Input: AC 100-240V~, 50/60Hz Output: DC 5V, 9V, 12V	laboratory
Computer	HP	15-cd028AX	/	Laboratory

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## 2.3. Description of Test Modes

No.	Title	Description of Mode
Test Mode1	802.11a mode	Keep the EUT in continuously transmitting mode with 802.11a modulation type. All data rates has been tested and found the data rate @ 6Mbps is the worst case. Only the data of worst case is recorded in the report.
Test Mode2	802.11n mode	Keep the EUT in continuously transmitting mode with 802.11n modulation type. All bandwidth and data rates has been tested and found the data rate @ MCS0 is the worst case. Only the data of worst case is recorded in the report.
Test Mode3	802.11ac mode	Keep the EUT in continuously transmitting mode with 802.11ac modulation type. All bandwidth and data rates has been tested and found the data rate @ MCS0 is the worst case. Only the data of worst case is recorded in the report.

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## 2.4. Operation channel list

### U-NII Band 1

Bandwidth:	20MHz	Bandwidth:	40MHz	Bandwidth:	80MHz
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	38	5190	42	5210
40	5200	46	5230	/	/
44	5220	/	/	/	/
48	5240	/	/	/	/

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## 2.5. Measurement Instruments List

Conducted Emission at AC power line				
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
LISN	R&S	ENV432	1326.6105.02	2025-01-21
EMI Test Receiver	R&S	ESR	102524	2025-01-21
Manual RF Switch	JS TOYO	/	MSW-01/002	2025-01-21
ISN CAT6	Schwarzbeck	CAT5 8158	227	2025-01-21
Color Signal Generator	Philips	PM5418	672926	2025-01-21
Power Absorbing Clamp	R&S	MDS-21	100925	2025-01-22
TV Tuner	SUNLIGHT	ST5075	/	2024-12-12
Artificial power network	EVERFINE	LS-5	G657431CD14311 12	2025-01-21

Band edge emissions (Conducted) Emission bandwidth and occupied bandwidth Duty Cycle Maximum conducted output power Power spectral density				
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
Wideband Radio Communication Tester	R&S	CMU200	115297	2025-01-19
Audio Analyzer	R&S	UPL16	100001	2025-01-19
Shielding box	Gxiong	GX-5915A	2201113	2025-01-19
High Pass Filter	COM-MW Technology Co., Ltd	ZHPF-M1.2-9G-1 87	09203403	2025-01-19
Band Stop Filter	COM-MW Technology Co., Ltd	ZBSF6-C820-920 -188	09203401	2025-01-19
Splitter	COM-MW Technology Co., Ltd	ZPD-M1-8-2103	09203407	2025-01-19
Coaxial Cable	BEBES	A40-2.92M2.92F- 4.5M	1907021	2025-01-19
Hygrothermograph	Anymetre	JB913	/	2025-01-19
Climate Chamber	Angul	AGNH80L	1903042120	2025-01-19
Spectrum Analyzer	HP	8593E	3831U02087	2025-01-19
Dual Output DC Power Supply	Agilent	E3646A	MY40009992	2025-01-19
RF Control Unit	Tonscend	JS0806-2	/	2025-01-19
Analog Signal Generator	HP	83752A	3344A00337	2025-01-19
Vector Signal Generator	Agilent	N5182A	MY50142520	2025-01-19
Wideband Radio Communication Tester	R&S	CMW500	157282	2025-01-19
Spectrum Analyzer	R&S	FSV40-N	101798	2025-01-19

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<b>Band edge emissions (Radiated) Undesirable emission limits (below 1GHz) Undesirable emission limits (above 1GHz)</b>				
<b>Test Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Cal. Until</b>
Color Signal Generator	Philips	PM5418	672926	2025-01-21
Log Periodic Antenna	Schwarzbeck	VULB 9163	1230	2025-01-29
Pre-Amplifier	Schwarzbeck	BBV 9745	9745#129	2025-01-21
Broadcast Television Signal Generator	R&S	SFE100	141038	2025-01-21
Analog Signal Generator	Agilent	8648A	3847M00445	2025-01-21
EMI Test Receiver	R&S	ESR	102525	2025-01-21
Loop Antenna	Beijin ZHINAN	ZN30900C	18050	2025-01-29
Horn Antenna	Schwarzbeck	BBHA 9120 D	2023	2025-01-22
Pre-Amplifier	EMCI	EMC051835SE	980662	2025-01-21
Spectrum Analyzer	Keysight	N9020A	MY46471971	2025-01-21

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### 3. Evaluation Results (Evaluation)

#### 3.1. Antenna requirement

Test Requirement:	Refer to 47 CFR Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.
Conclusion:	The directional gain of the antenna less than 6dBi, please refer to the EUT internal photographs antenna photo.

### 4. Radio Spectrum Matter Test Results (RF)

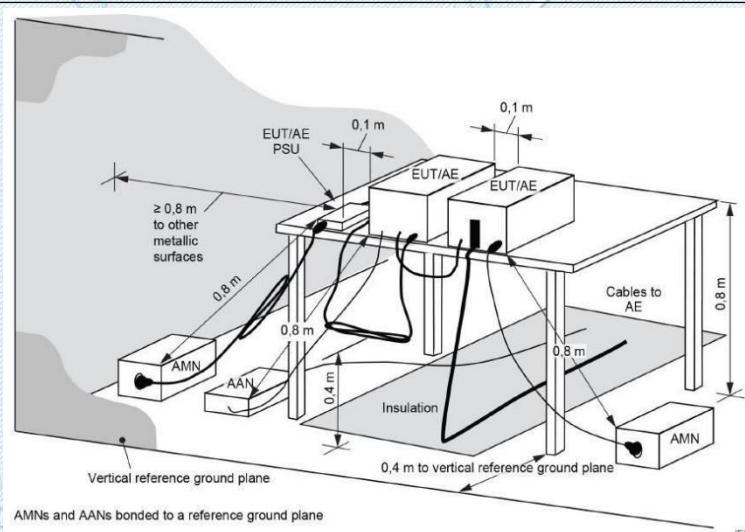
#### 4.1. Conducted Emission at AC power line

Test Requirement:	47 CFR Part 15.207(a)		
Test Limit:	Frequency of emission (MHz)	Conducted limit (dB $\mu$ V)	
	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 Method:	ANSI C63.10-2013 section 6.2		

##### 4.1.1. E.U.T. Operation:

Operating Environment:	
Temperature:	25.6 °C
Humidity:	45.6 %
Atmospheric Pressure:	101 kPa
Final test mode:	Test Mode1, Test Mode2, Test Mode3

##### 4.1.2. Test Setup Diagram:



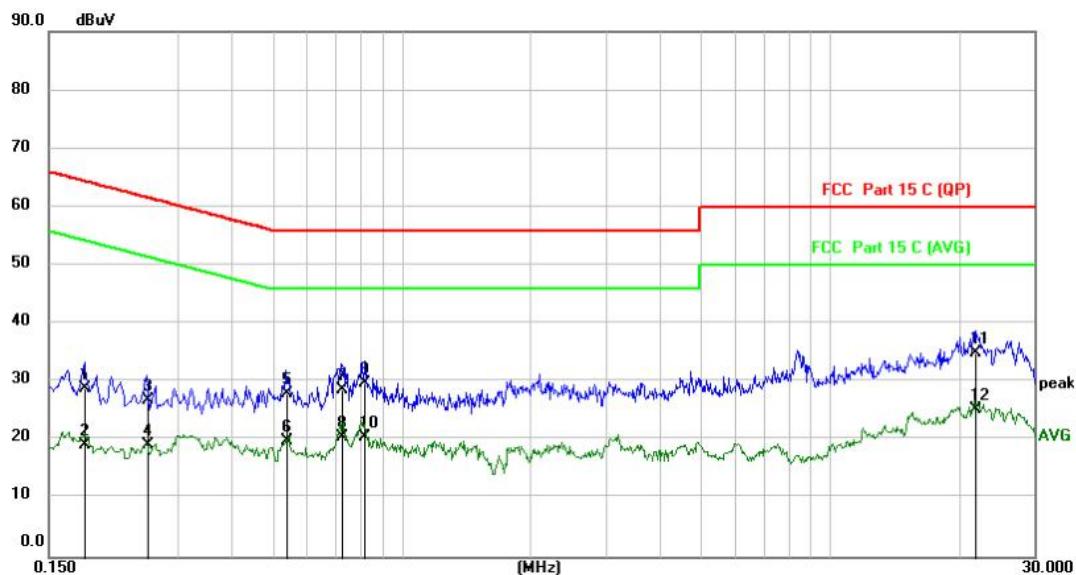
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### 4.1.3. Test Data:

#### Test Mode1 / Line: Line



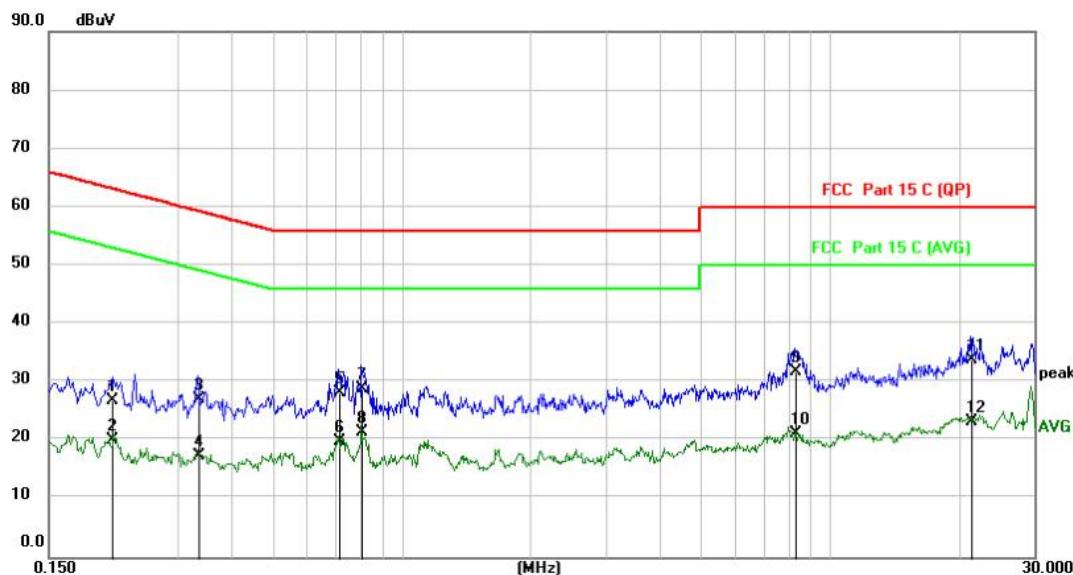
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dB	Detector	Comment
1		0.1819	7.61	21.40	29.01	64.40	-35.39	QP
2		0.1819	-2.08	21.40	19.32	54.40	-35.08	AVG
3		0.2540	5.51	21.36	26.87	61.63	-34.76	QP
4		0.2540	-2.15	21.36	19.21	51.63	-32.42	AVG
5		0.5380	6.61	21.32	27.93	56.00	-28.07	QP
6		0.5380	-1.43	21.32	19.89	46.00	-26.11	AVG
7		0.7258	7.32	21.37	28.69	56.00	-27.31	QP
8		0.7258	-0.79	21.37	20.58	46.00	-25.42	AVG
9		0.8215	8.37	21.39	29.76	56.00	-26.24	QP
10		0.8215	-0.83	21.39	20.56	46.00	-25.44	AVG
11		21.9375	8.93	26.08	35.01	60.00	-24.99	QP
12	*	21.9375	-0.66	26.08	25.42	50.00	-24.58	AVG

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## Test Mode1 / Line: Neutral



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Detector	Comment
			Level	Factor	ment				
1		0.2116	5.53	21.37	26.90	63.14	-36.24	QP	
2		0.2116	-1.24	21.37	20.13	53.14	-33.01	AVG	
3		0.3339	5.73	21.34	27.07	59.35	-32.28	QP	
4		0.3339	-3.84	21.34	17.50	49.35	-31.85	AVG	
5		0.7137	6.86	21.38	28.24	56.00	-27.76	QP	
6		0.7137	-1.53	21.38	19.85	46.00	-26.15	AVG	
7		0.8059	7.46	21.41	28.87	56.00	-27.13	QP	
8	*	0.8059	0.11	21.41	21.52	46.00	-24.48	AVG	
9		8.3215	9.25	22.55	31.80	60.00	-28.20	QP	
10		8.3215	-1.24	22.55	21.31	50.00	-28.69	AVG	
11		21.2620	7.89	25.95	33.84	60.00	-26.16	QP	
12		21.2620	-2.56	25.95	23.39	50.00	-26.61	AVG	

## Note:

1. Measurement = Reading level + Correct Factor

2. Correct Factor=Antenna Factor + Cable Loss -Preamplifier Factor

3. Pre-scan all modulation, and found the 802.11a modulation which it is 5180 MHz channel which it is worse case for below 1GHz, so only show the test data for worse case

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## 4.2. Emission bandwidth and occupied bandwidth

Test Requirement:	U-NII 1, U-NII 2A, U-NII 2C: No limits, only for report use.
Test Limit:	U-NII 1, U-NII 2A, U-NII 2C: No limits, only for report use.
Test Method:	ANSI C63.10-2013, section 6.9 & 12.4
Procedure:	<p>Emission bandwidth:</p> <ul style="list-style-type: none"><li>a) Set RBW = approximately 1% of the emission bandwidth.</li><li>b) Set the VBW &gt; RBW.</li><li>c) Detector = peak.</li><li>d) Trace mode = max hold.</li><li>e) Measure the maximum width of the emission that is 26 dB down from the peak of the emission.</li></ul> <p>Compare this with the RBW setting of the instrument. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.</p> <p>99% Occupied bandwidth:</p> <ul style="list-style-type: none"><li>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.</li><li>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.</li><li>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 <math>[10 \log (OBW/RBW)]</math> below the reference level. Specific guidance is given in 4.1.5.2.</li><li>d) Step a) through step c) might require iteration to adjust within the specified range.</li><li>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.</li><li>f) Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.</li><li>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.</li><li>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.</li></ul>

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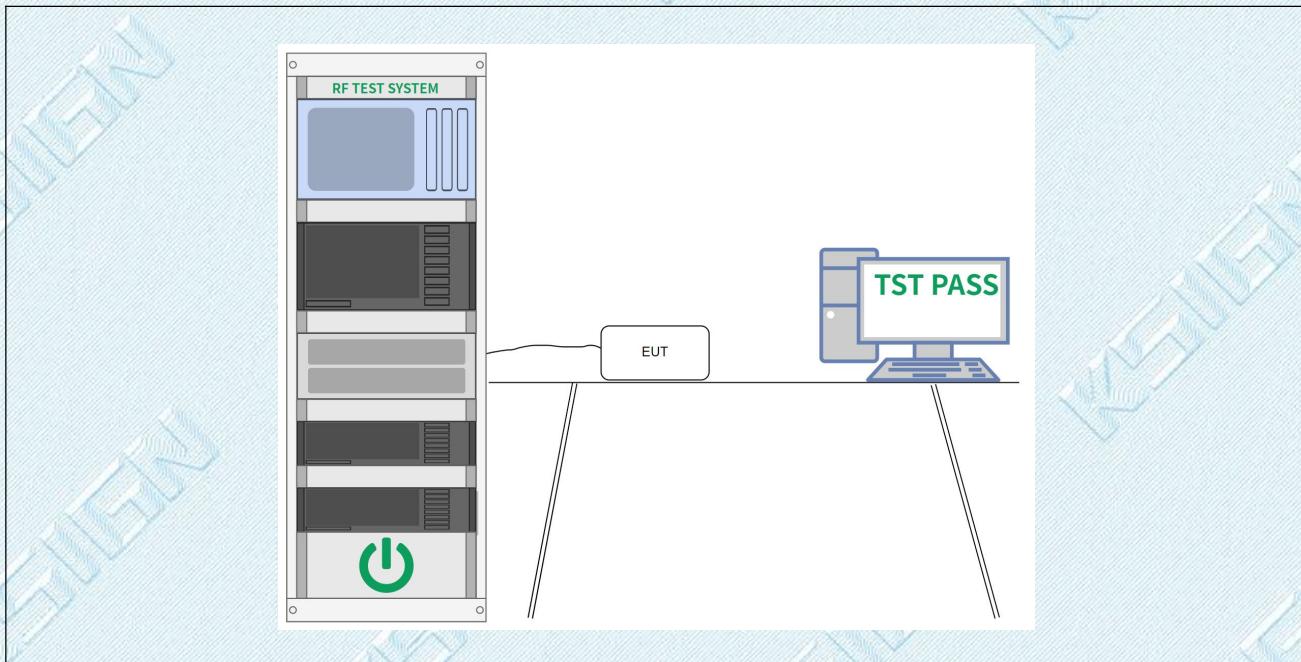
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	Tabular data may be reported in addition to the plot(s).
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#### 4.2.1. E.U.T. Operation:

Operating Environment:	
Temperature:	25.6 °C
Humidity:	45.6 %
Atmospheric Pressure:	101 kPa
Final test mode:	Test Mode1, Test Mode2, Test Mode3

#### 4.2.2. Test Setup Diagram:



#### 4.2.3. Test Data:

Please Refer to Appendix for Details.

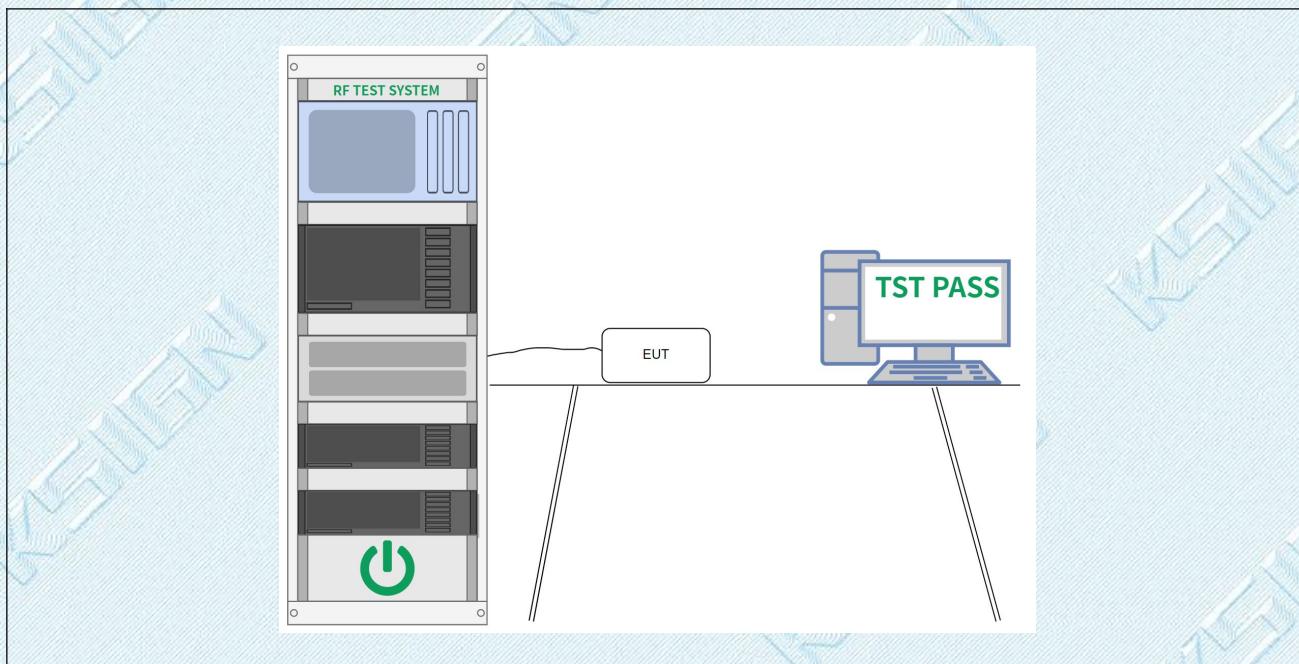
### 4.3. Duty Cycle

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 Limit:	No limits, only for report use.
Test Method:	ANSI C63.10-2013 section 12.2 (b)
Procedure:	<ul style="list-style-type: none"> <li>i) Set the center frequency of the instrument to the center frequency of the transmission.</li> <li>ii) Set RBW <math>\geq</math> EBW if possible; otherwise, set RBW to the largest available value.</li> <li>iii) Set VBW <math>\geq</math> RBW.</li> <li>iv) Set detector = peak.</li> <li>v) The zero-span measurement method shall not be used unless both RBW and VBW are <math>&gt; 50/T</math>, where T is defined in item a1) of 12.2, and the number of sweep points across duration T exceeds 100.</li> </ul>

#### 4.3.1. E.U.T. Operation:

Operating Environment:	
Temperature:	25.6 °C
Humidity:	45.6 %
Atmospheric Pressure:	101 kPa
Final test mode:	Test Mode1, Test Mode2, Test Mode3

#### 4.3.2. Test Setup Diagram:



#### 4.3.3. Test Data:

Please Refer to Appendix for Details.

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#### 4.4. Maximum conducted output power

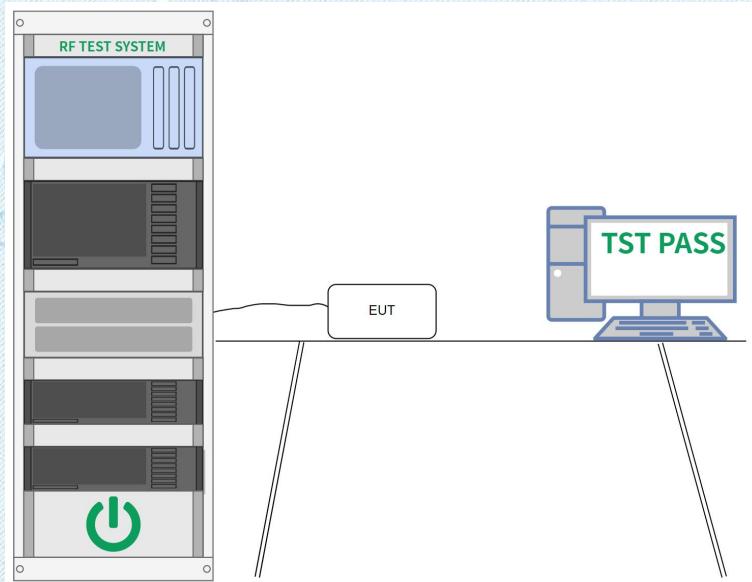
Test Requirement:	47 CFR Part 15.407(a)(1)(iv)
Test Limit:	<p>For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas 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).</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>
Test Method:	ANSI C63.10-2013, section 12.3
Procedure:	Refer to ANSI C63.10-2013 section 12.3

##### 4.4.1. E.U.T. Operation:

Operating Environment:	
Temperature:	25.6 °C
Humidity:	45.6 %
Atmospheric Pressure:	101 kPa
Final test mode:	Test Mode1, Test Mode2, Test Mode3

TRF No. RF\_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China  
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**4.4.2. Test Setup Diagram:****4.4.3. Test Data:**

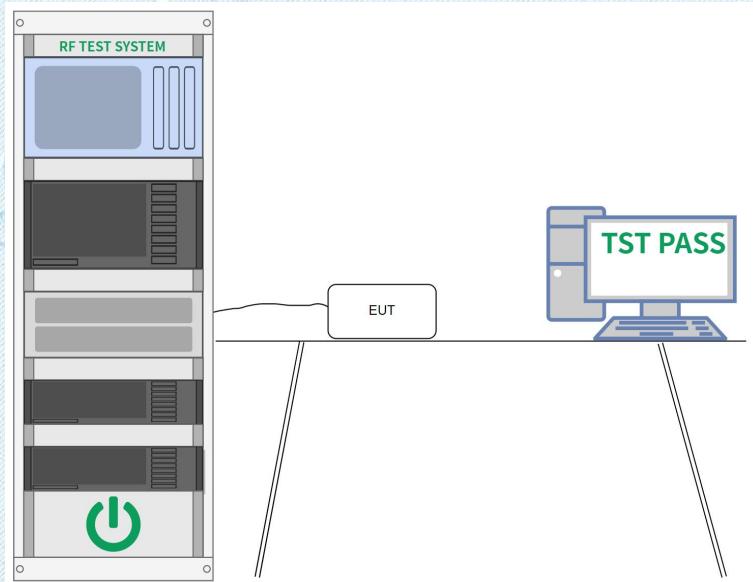
Please Refer to Appendix for Details.

## 4.5. Power spectral density

Test Requirement:	47 CFR Part 15.407(a)(1)(iv)
Test Limit:	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>
Test Method:	ANSI C63.10-2013, section 12.5
Procedure:	Refer to ANSI C63.10-2013, section 12.5

### 4.5.1. E.U.T. Operation:

Operating Environment:	
Temperature:	25.6 °C
Humidity:	45.6 %
Atmospheric Pressure:	101 kPa
Final test mode:	Test Mode1, Test Mode2, Test Mode3

**4.5.2. Test Setup Diagram:****4.5.3. Test Data:**

Please Refer to Appendix for Details.

#### 4.6. Band edge emissions (Conducted)

Test Requirement:	47 CFR Part 15.407(b)(1) 47 CFR Part 15.407(b)(10)																											
	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.																											
	MHz	MHz	MHz	GHz																								
	0.090-0.110	16.42-16.423	399.9-410	4.5-5.15																								
	<sup>1</sup> 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	156.52475-156.525	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	( <sup>2</sup> )																								
	13.36-13.41																											
Test Limit:	<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.																											
	<sup>2</sup> 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 § 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in § 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in § 15.35 apply 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:																											
	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th><th>Field strength (microvolts/meter)</th><th>Measurement distance (meters)</th></tr> </thead> <tbody> <tr> <td>0.009-0.490</td><td>2400/F(kHz)</td><td>300</td></tr> <tr> <td>0.490-1.705</td><td>24000/F(kHz)</td><td>30</td></tr> <tr> <td>1.705-30.0</td><td>30</td><td>30</td></tr> <tr> <td>30-88</td><td>100 **</td><td>3</td></tr> <tr> <td>88-216</td><td>150 **</td><td>3</td></tr> <tr> <td>216-960</td><td>200 **</td><td>3</td></tr> <tr> <td>Above 960</td><td>500</td><td>3</td></tr> </tbody> </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
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																										
	** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However,																											

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	<p>operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.</p> <p>In the emission table above, the tighter limit applies at the band edges. The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.</p>
Test Method:	ANSI C63.10-2013, section 12.7.4, 12.7.6, 12.7.7
Procedure:	<p>Above 1GHz:</p> <ol style="list-style-type: none"> <li>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.</li> <li>The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>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.</li> <li>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.</li> <li>The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>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.</li> <li>Test the EUT in the lowest channel, the middle channel, the Highest channel.</li> <li>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.</li> <li>Repeat above procedures until all frequencies measured was complete.</li> </ol> <p>Remark:</p> <ol style="list-style-type: none"> <li>Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor</li> <li>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.</li> <li>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.</li> <li>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.</li> </ol>

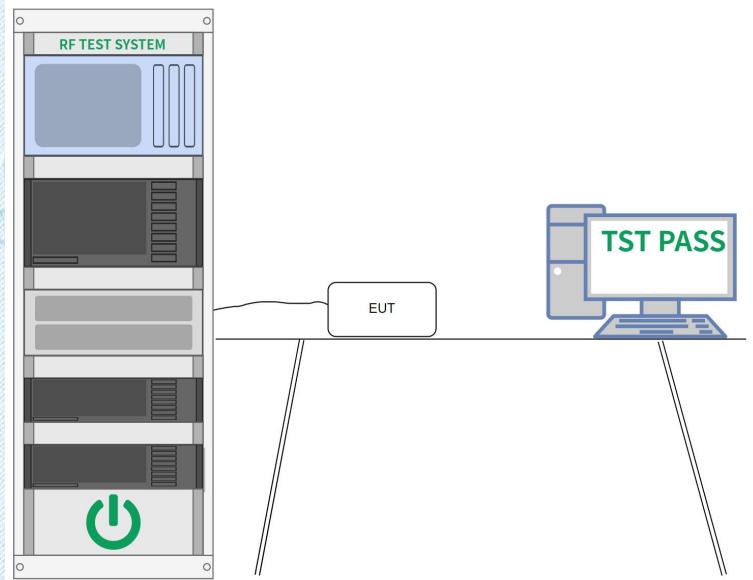
#### 4.6.1. E.U.T. Operation:

Operating Environment:	
Temperature:	25.6 °C
Humidity:	45.6 %
Atmospheric Pressure:	101 kPa
Final test mode:	Test Mode1, Test Mode2, Test Mode3

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**4.6.2. Test Setup Diagram:****4.6.3. Test Data:**

Please Refer to Appendix for Details.

## 4.7. Band edge emissions (Radiated)

Test Requirement:	47 CFR Part 15.407(b)(1) 47 CFR Part 15.407(b)(10)																											
	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.																											
	MHz	MHz	MHz	GHz																								
	0.090-0.110	16.42-16.423	399.9-410	4.5-5.15																								
	<sup>1</sup> 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46																								
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Test Limit:	<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.																											
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	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 § 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in § 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in § 15.35 apply 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:																											
	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th><th>Field strength (microvolts/meter)</th><th>Measurement distance (meters)</th></tr> </thead> <tbody> <tr> <td>0.009-0.490</td><td>2400/F(kHz)</td><td>300</td></tr> <tr> <td>0.490-1.705</td><td>24000/F(kHz)</td><td>30</td></tr> <tr> <td>1.705-30.0</td><td>30</td><td>30</td></tr> <tr> <td>30-88</td><td>100 **</td><td>3</td></tr> <tr> <td>88-216</td><td>150 **</td><td>3</td></tr> <tr> <td>216-960</td><td>200 **</td><td>3</td></tr> <tr> <td>Above 960</td><td>500</td><td>3</td></tr> </tbody> </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
Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)																										
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	<p>operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.</p> <p>In the emission table above, the tighter limit applies at the band edges. The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.</p>
Test Method:	ANSI C63.10-2013, section 12.7.4, 12.7.6, 12.7.7
Procedure:	<p>Above 1GHz:</p> <ol style="list-style-type: none"> <li>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.</li> <li>The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>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.</li> <li>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.</li> <li>The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>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.</li> <li>Test the EUT in the lowest channel, the middle channel, the Highest channel.</li> <li>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.</li> <li>Repeat above procedures until all frequencies measured was complete.</li> </ol> <p>Remark:</p> <ol style="list-style-type: none"> <li>Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor</li> <li>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.</li> <li>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.</li> <li>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.</li> </ol>

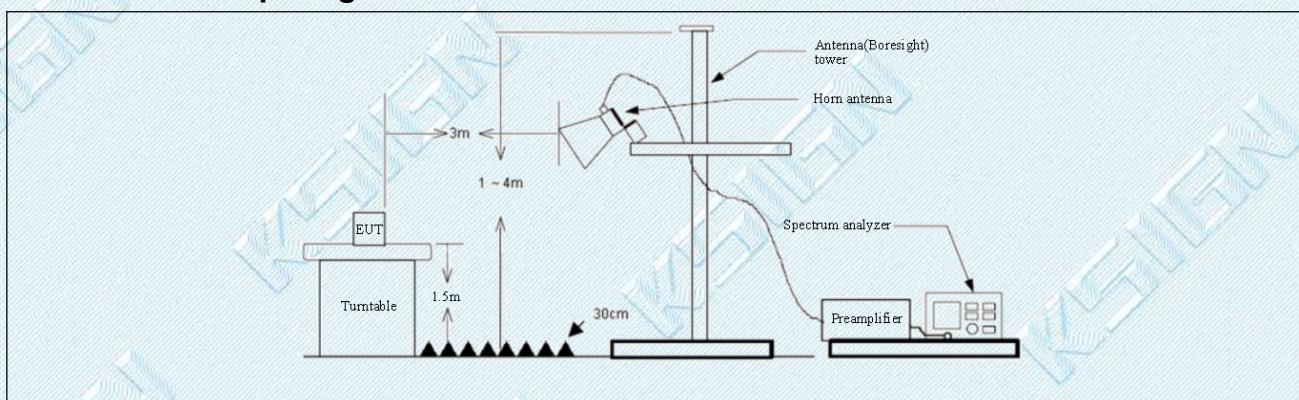
#### 4.7.1. E.U.T. Operation:

Operating Environment:	
Temperature:	25.6 °C
Humidity:	45.6 %
Atmospheric Pressure:	101 kPa
Final test mode:	Test Mode1, Test Mode2, Test Mode3

TRF No. RF\_R1

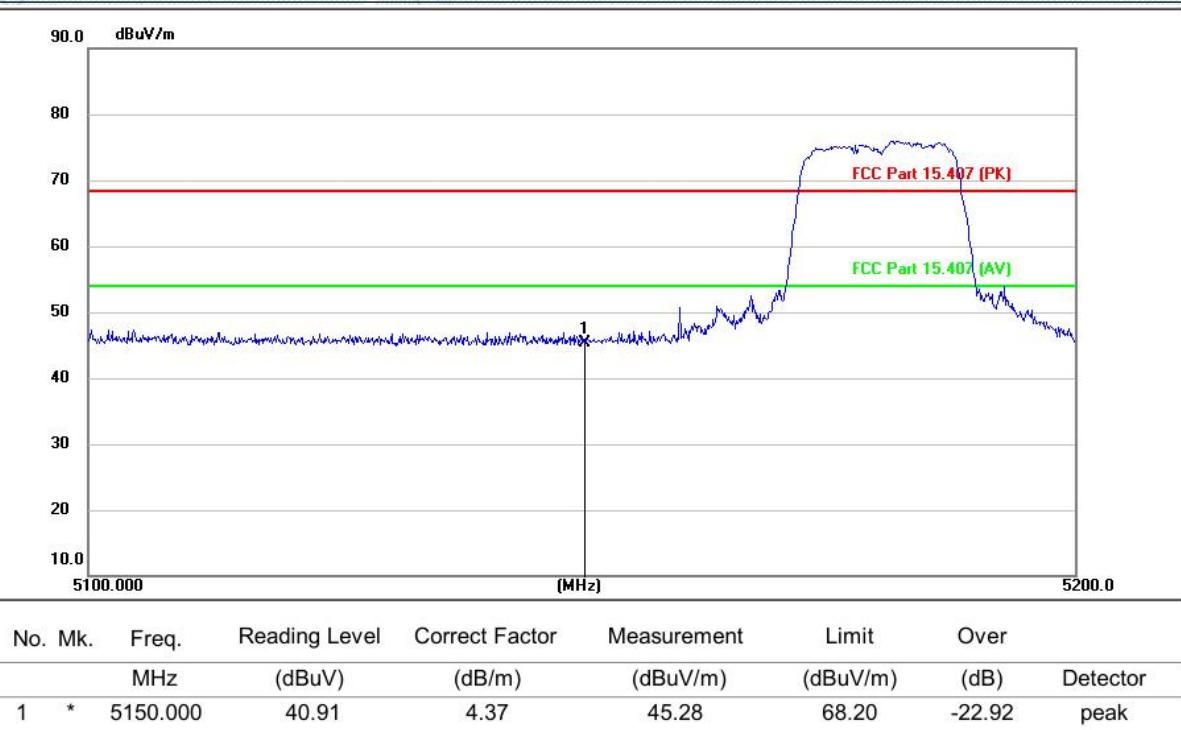
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**4.7.2. Test Setup Diagram:**

#### 4.7.3. Test Data:

##### Test Mode1 / Polarization: Horizontal / CH: L

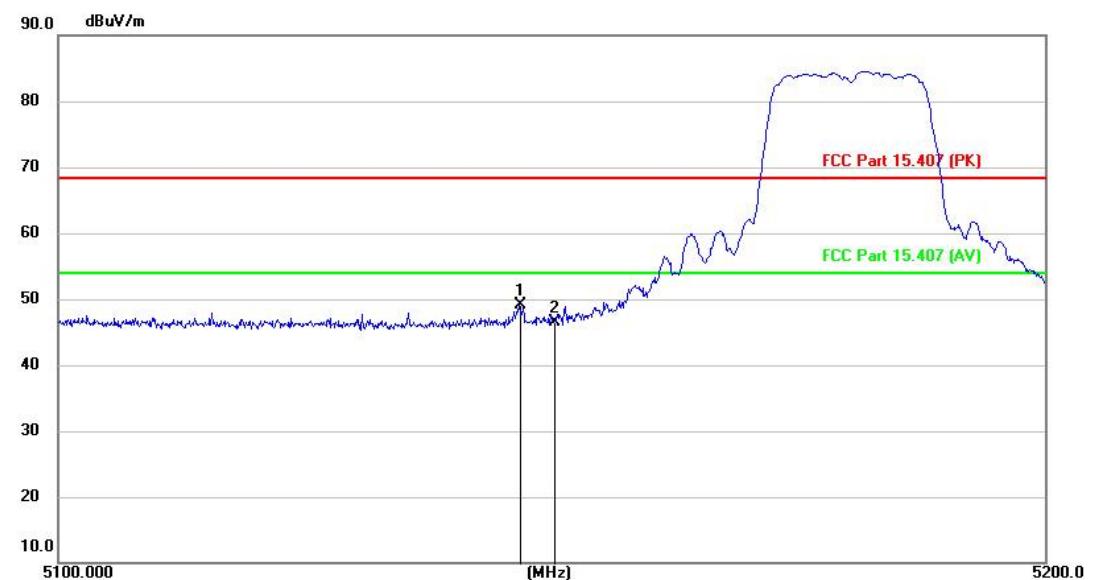


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## Test Mode1 / Polarization: Vertical / CH: L



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Detector
1	*	5146.470	44.75	4.40	49.15	68.20	-19.05	peak
2		5150.000	42.16	4.37	46.53	68.20	-21.67	peak

TRF No. RF\_R1

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## Test Mode1 / Polarization: Horizontal / CH: H



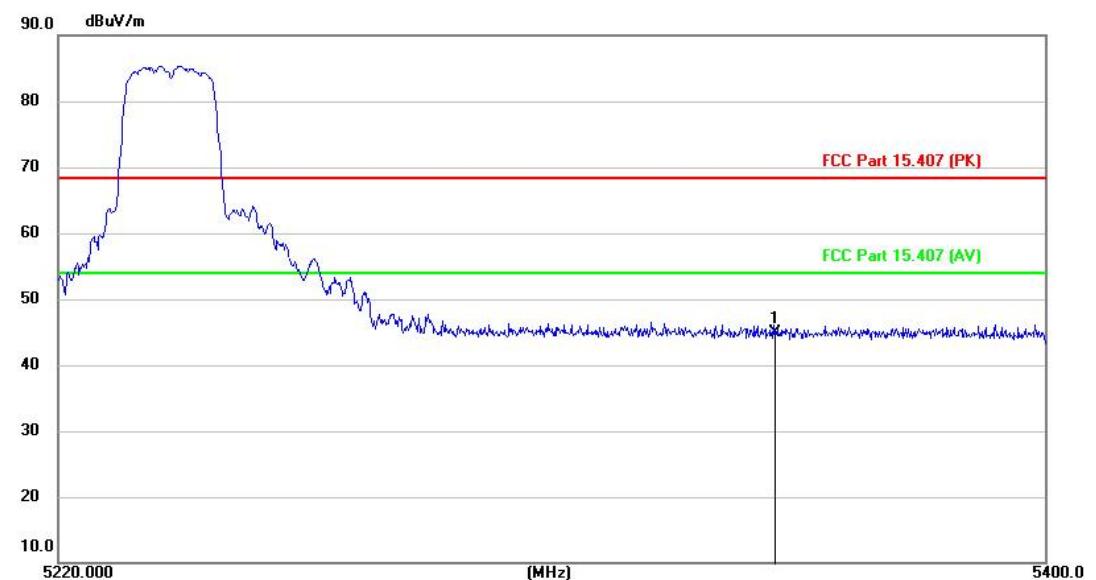
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Detector
1	*	5350.000	40.72	3.90	44.62	68.20	-23.58	peak

TRF No. RF\_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

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## Test Mode1 / Polarization: Vertical / CH: H



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Detector
1	*	5350.000	41.09	3.90	44.99	68.20	-23.21	peak

## Note:

1. Measurement = Reading level + Correct Factor
2. Correct Factor=Antenna Factor + Cable Loss -Preamplifier Factor
3. Since the peak value is less than the limit of the AVG value, there is no AVG data
4. Pre-scan all mode, and found the A mode which it is worse case, so only show the test data for worse case.

TRF No. RF\_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

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## 4.8. Undesirable emission limits (below 1GHz)

Test Requirement:	47 CFR Part 15.407(b)(9)		
	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:		
Test Limit:	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
	<p>** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.</p> <p>In the emission table above, the tighter limit applies at the band edges. The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.</p>		
Test Method:	ANSI C63.10-2013, section 12.7.4, 12.7.5		
Procedure:	<p>Below 1GHz:</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>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.</p> <p>g. Test the EUT in the lowest channel, the middle channel, the Highest channel.</p> <p>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.</p> <p>i. Repeat above procedures until all frequencies measured was complete.</p> <p>Remark:</p> <p>1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor</p>		

TRF No. RF\_R1

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	<p>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.</p> <p>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.</p> <p>Above 1GHz:</p> <ol style="list-style-type: none"> <li>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.</li> <li>The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>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.</li> <li>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.</li> <li>The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>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.</li> <li>Test the EUT in the lowest channel, the middle channel, the Highest channel.</li> <li>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.</li> <li>Repeat above procedures until all frequencies measured was complete.</li> </ol> <p>Remark:</p> <ol style="list-style-type: none"> <li>Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor</li> <li>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.</li> <li>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.</li> <li>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.</li> </ol>
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#### 4.8.1. E.U.T. Operation:

Operating Environment:	
Temperature:	25.6 °C
Humidity:	45.6 %
Atmospheric Pressure:	101 kPa

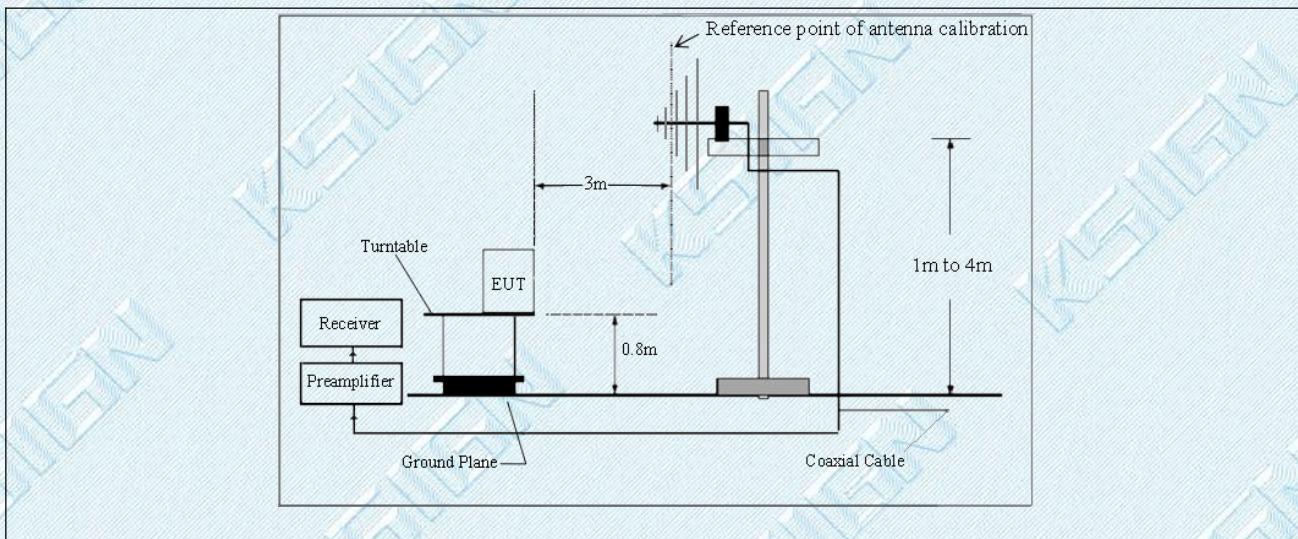
TRF No. RF\_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

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Final test mode:	Test Mode1, Test Mode2, Test Mode3
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#### 4.8.2. Test Setup Diagram:



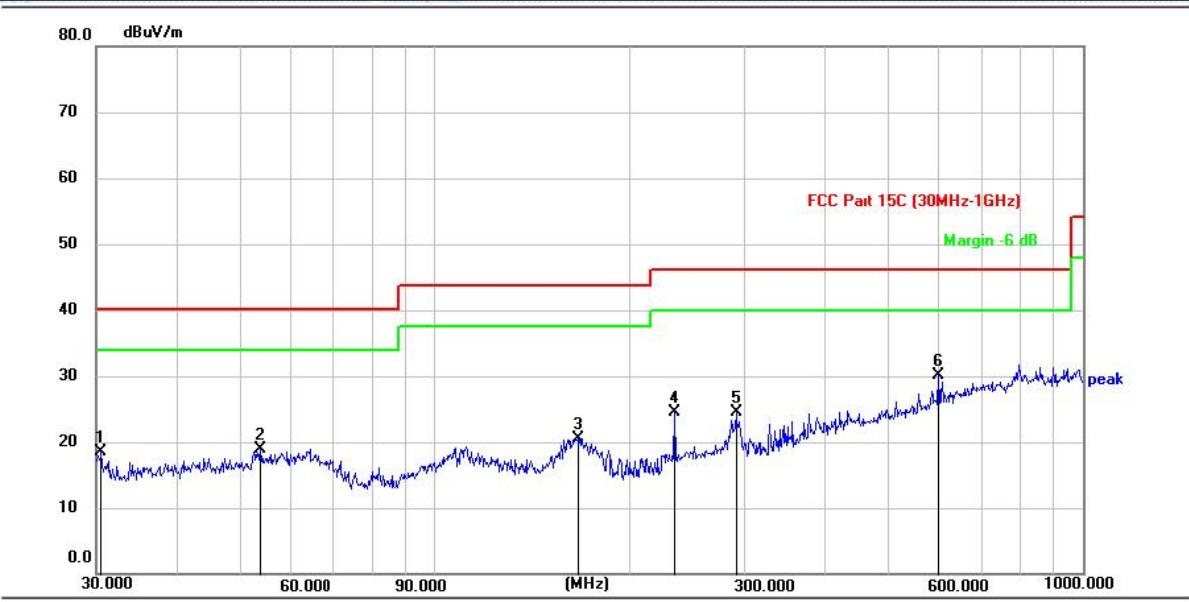
TRF No. RF\_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

Tel: +(86) 0755-2985 2678 Fax: +(86) 0755-2985 2397 E-mail: [info@gdksign.cn](mailto:info@gdksign.cn) Web: [www.gdksign.com](http://www.gdksign.com)

#### 4.8.3. Test Data:

##### Test Mode1 / Polarization: Horizontal



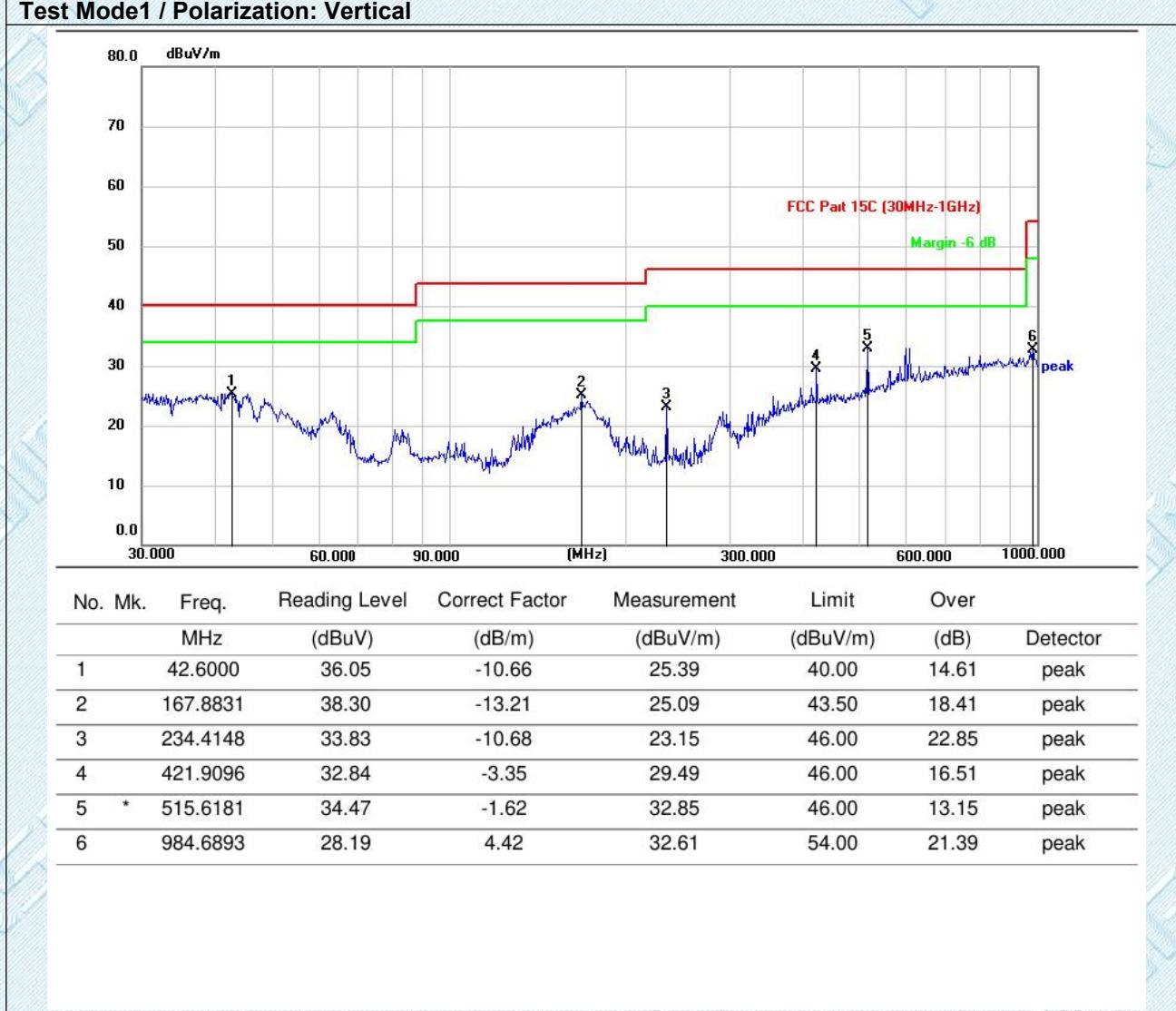
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1		30.5411	30.44	-11.96	18.48	40.00	21.52	peak
2		53.7873	29.16	-10.18	18.98	40.00	21.02	peak
3		166.1262	33.79	-13.31	20.48	43.50	23.02	peak
4		234.4148	35.20	-10.68	24.52	46.00	21.48	peak
5		291.2400	33.09	-8.67	24.42	46.00	21.58	peak
6	*	600.1624	29.19	0.83	30.02	46.00	15.98	peak

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## Test Mode1 / Polarization: Vertical



## Note:

1. Measurement = Reading level + Correct Factor
2. Correct Factor = Antenna Factor + Cable Loss - Preamplifier Factor
3. Over = Measurement - Limit
4. Pre-scan all modulation, and found the 802.11a modulation which it is low channel which it is worse case for below 1GHz, so only show the test data for worse case.

TRF No. RF\_R1

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#### 4.9. Undesirable emission limits (above 1GHz)

Test Requirement:	47 CFR Part 15.407(b)(1) 47 CFR Part 15.407(b)(10)																											
	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.																											
	MHz	MHz	MHz	GHz																								
	0.090-0.110	16.42-16.423	399.9-410	4.5-5.15																								
	<sup>1</sup> 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	156.52475-156.525	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	( <sup>2</sup> )																								
	13.36-13.41																											
Test Limit:	<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.																											
	<sup>2</sup> 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 § 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in § 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in § 15.35 apply 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:																											
	<table border="1"> <thead> <tr> <th>Frequency (MHz)</th><th>Field strength (microvolts/meter)</th><th>Measurement distance (meters)</th></tr> </thead> <tbody> <tr> <td>0.009-0.490</td><td>2400/F(kHz)</td><td>300</td></tr> <tr> <td>0.490-1.705</td><td>24000/F(kHz)</td><td>30</td></tr> <tr> <td>1.705-30.0</td><td>30</td><td>30</td></tr> <tr> <td>30-88</td><td>100 **</td><td>3</td></tr> <tr> <td>88-216</td><td>150 **</td><td>3</td></tr> <tr> <td>216-960</td><td>200 **</td><td>3</td></tr> <tr> <td>Above 960</td><td>500</td><td>3</td></tr> </tbody> </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
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																										
	** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However,																											

TRF No. RF\_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

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	<p>operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.</p> <p>In the emission table above, the tighter limit applies at the band edges. The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.</p>
Test Method:	ANSI C63.10-2013, section 12.7.4, 12.7.6, 12.7.7
Procedure:	<p>Above 1GHz:</p> <ol style="list-style-type: none"> <li>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.</li> <li>The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>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.</li> <li>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.</li> <li>The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>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.</li> <li>Test the EUT in the lowest channel, the middle channel, the Highest channel.</li> <li>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.</li> <li>Repeat above procedures until all frequencies measured was complete.</li> </ol> <p>Remark:</p> <ol style="list-style-type: none"> <li>Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor</li> <li>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.</li> <li>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.</li> <li>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.</li> </ol>

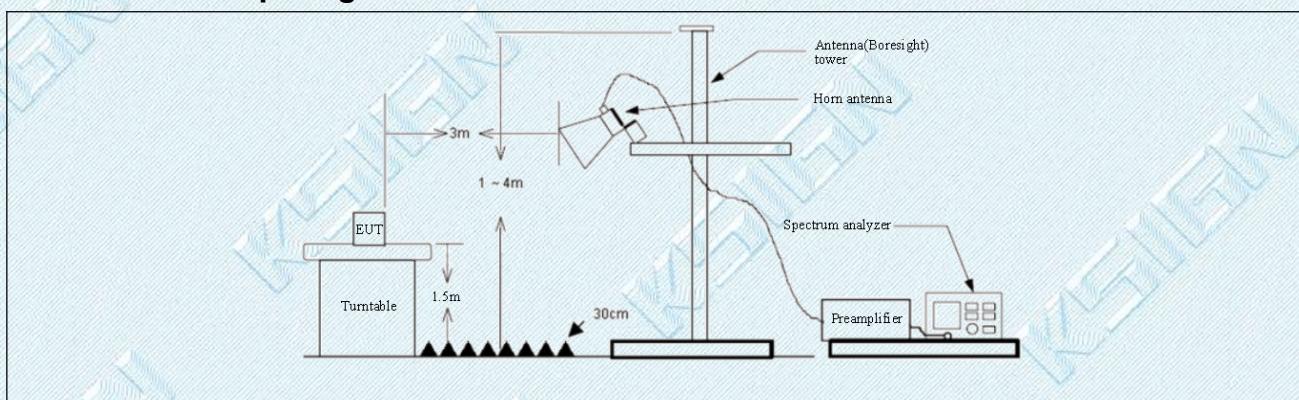
#### 4.9.1. E.U.T. Operation:

Operating Environment:	
Temperature:	25.6 °C
Humidity:	45.6 %
Atmospheric Pressure:	101 kPa
Final test mode:	Test Mode1, Test Mode2, Test Mode3

TRF No. RF\_R1

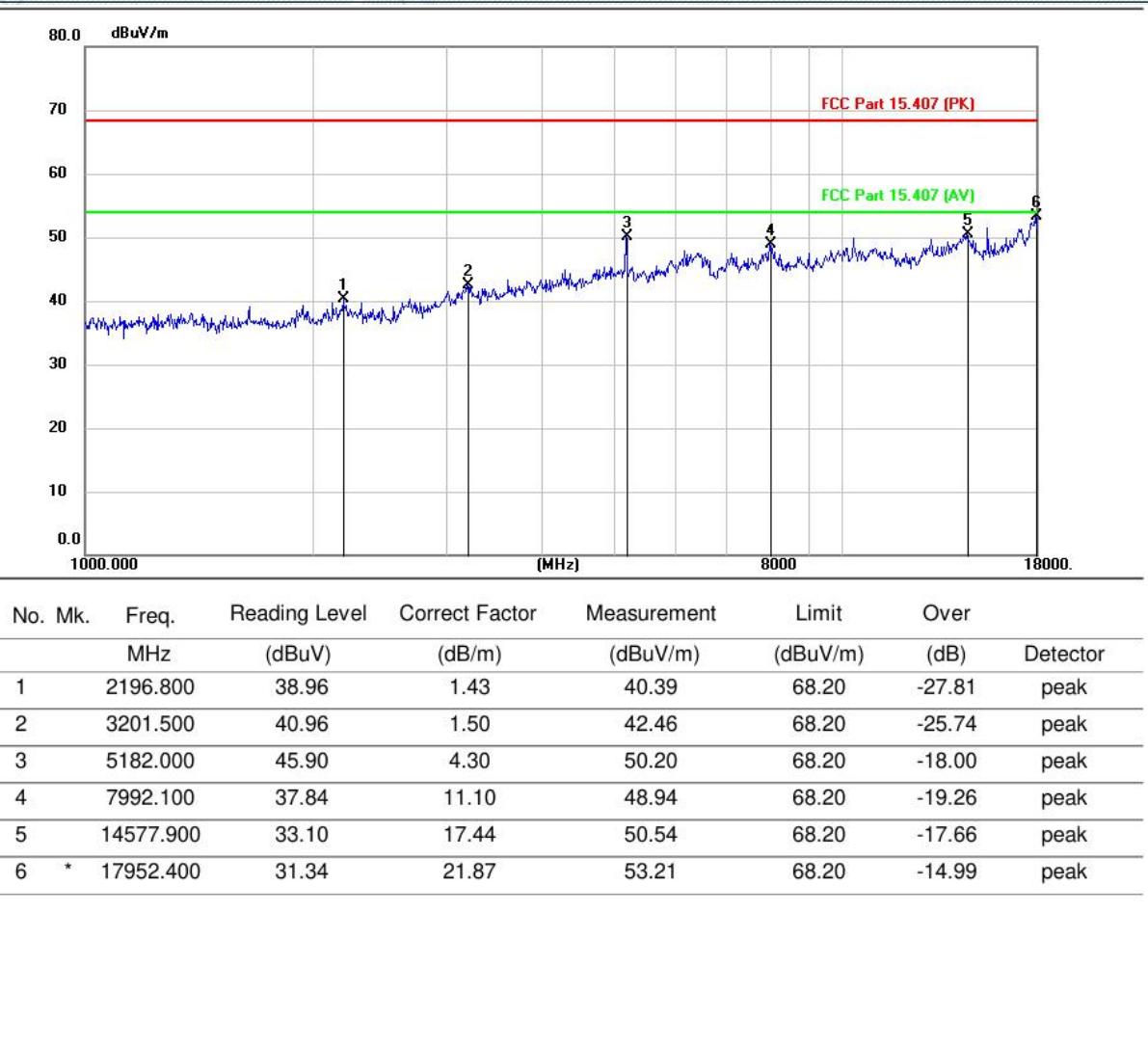
Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

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**4.9.2. Test Setup Diagram:**

#### 4.9.3. Test Data:

##### Test Mode1 / Polarization: Horizontal / CH: L

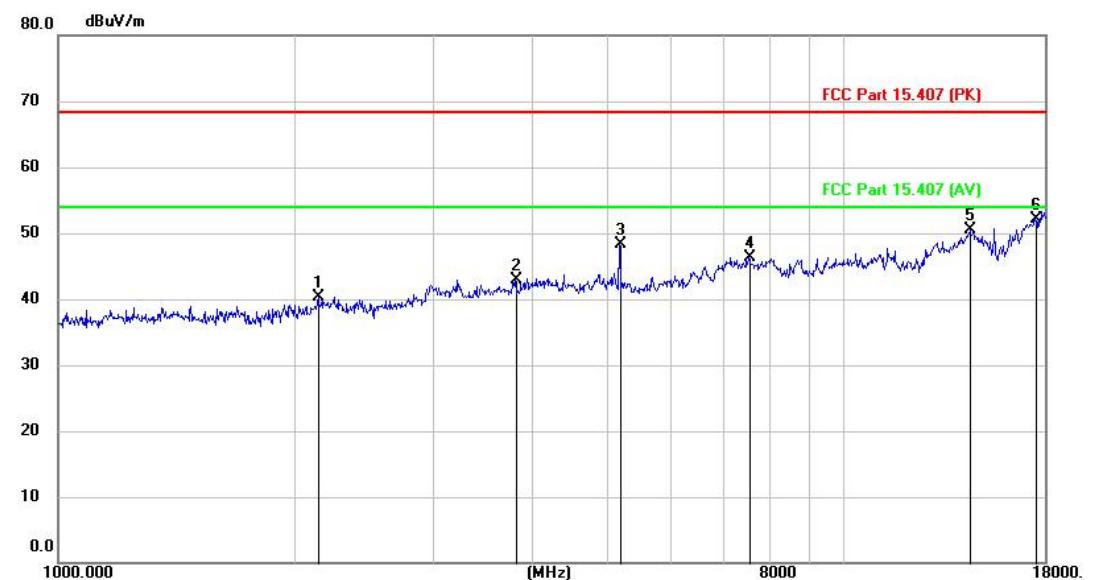


TRF No. RF\_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

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## Test Mode1 / Polarization: Vertical CH: L



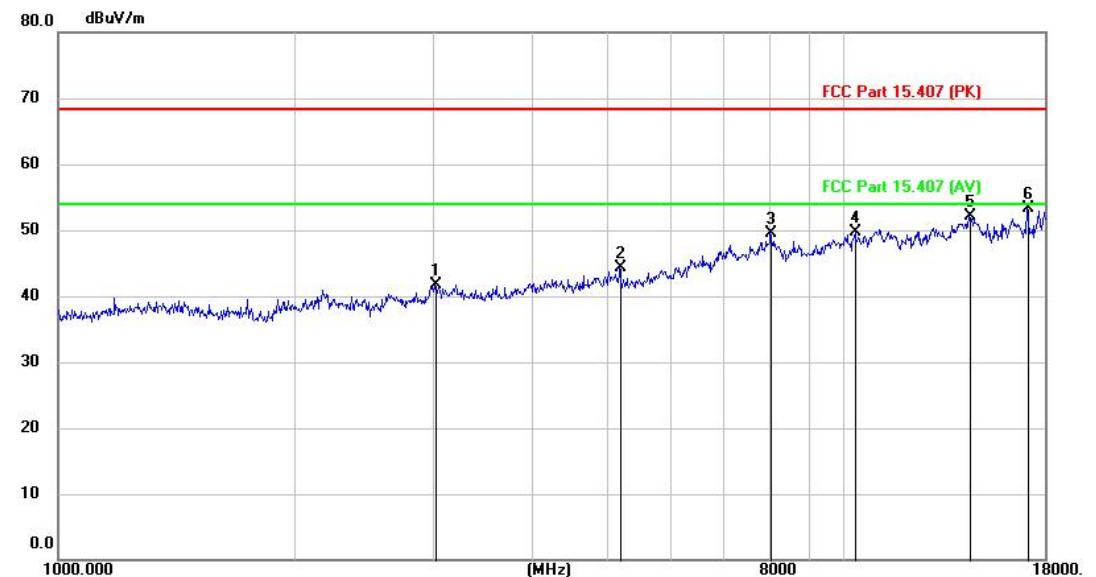
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1		2147.500	39.58	0.77	40.35	68.20	-27.85	peak
2		3815.200	40.88	1.95	42.83	68.20	-25.37	peak
3		5182.000	43.94	4.30	48.24	68.20	-19.96	peak
4		7543.300	36.54	9.85	46.39	68.20	-21.81	peak
5		14481.000	33.09	17.49	50.58	68.20	-17.62	peak
6	*	17515.500	32.62	19.58	52.20	68.20	-16.00	peak

TRF No. RF\_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

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## Test Mode1 / Polarization: Horizontal / CH: M



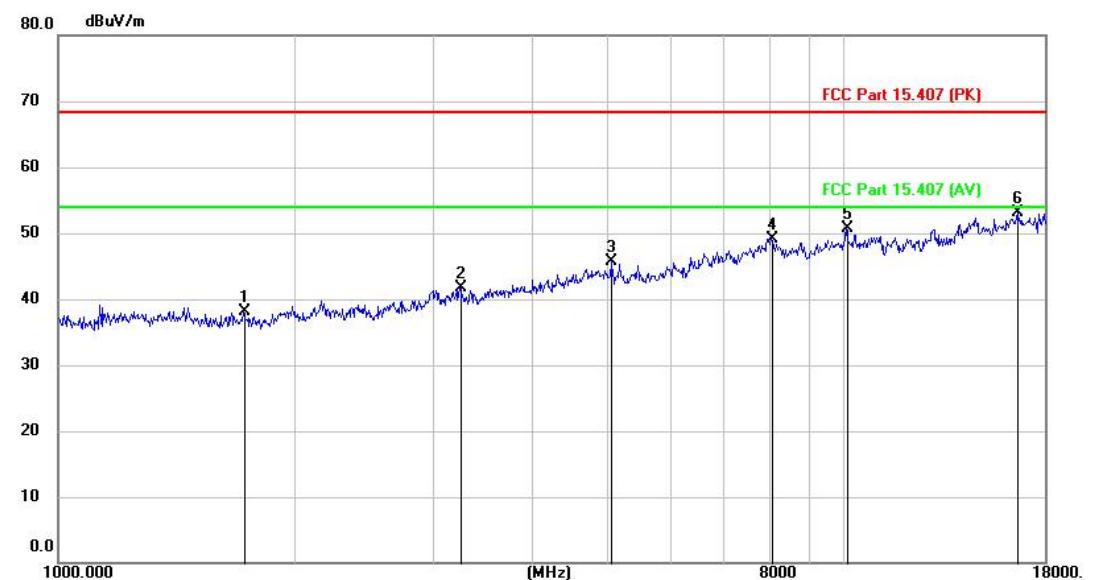
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Detector
1		3024.700	40.36	1.37	41.73	68.20	-26.47	peak
2		5185.400	39.98	4.29	44.27	68.20	-23.93	peak
3		8053.300	38.34	11.13	49.47	68.20	-18.73	peak
4		10361.900	37.06	12.65	49.71	68.20	-18.49	peak
5		14440.200	34.64	17.53	52.17	68.20	-16.03	peak
6	*	17095.600	35.06	18.32	53.38	68.20	-14.82	peak

TRF No. RF\_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

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## Test Mode1 / Polarization: Vertical / CH: M



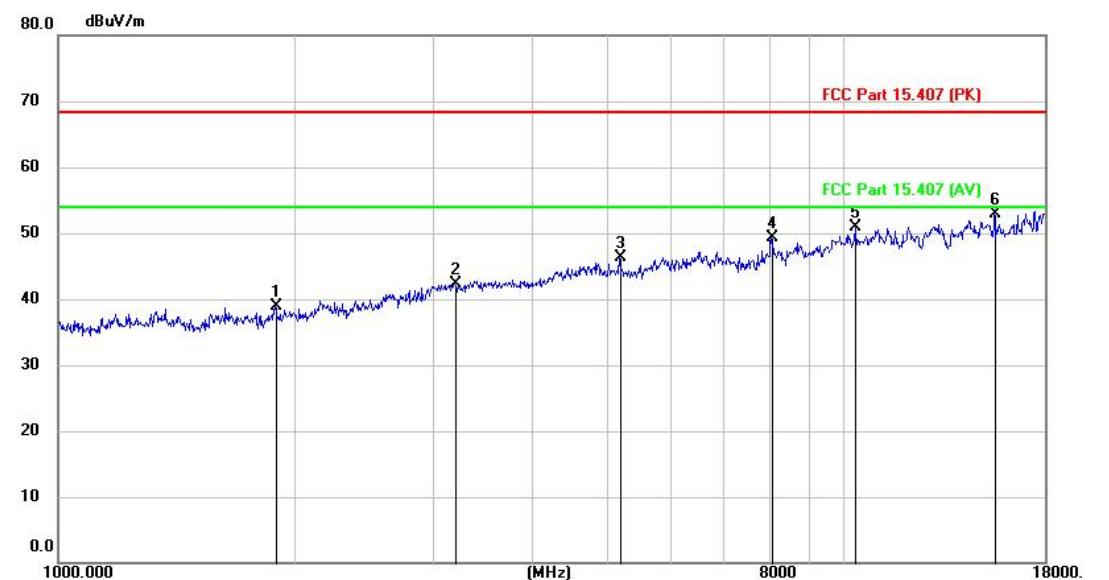
No.	Mk.	Freq. MHz	Reading Level (dBuV)	Correct Factor (dB/m)	Measurement (dBuV/m)	Limit (dBuV/m)	Over (dB)	Over Detector
1		1719.100	39.69	-1.58	38.11	68.20	-30.09	peak
2		3261.000	40.41	1.26	41.67	68.20	-26.53	peak
3		5054.500	41.16	4.53	45.69	68.20	-22.51	peak
4		8061.800	38.07	11.08	49.15	68.20	-19.05	peak
5		10089.900	38.62	12.09	50.71	68.20	-17.49	peak
6	*	16646.800	36.69	16.48	53.17	68.20	-15.03	peak

TRF No. RF\_R1

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## Test Mode1 / Polarization: Horizontal / CH: H



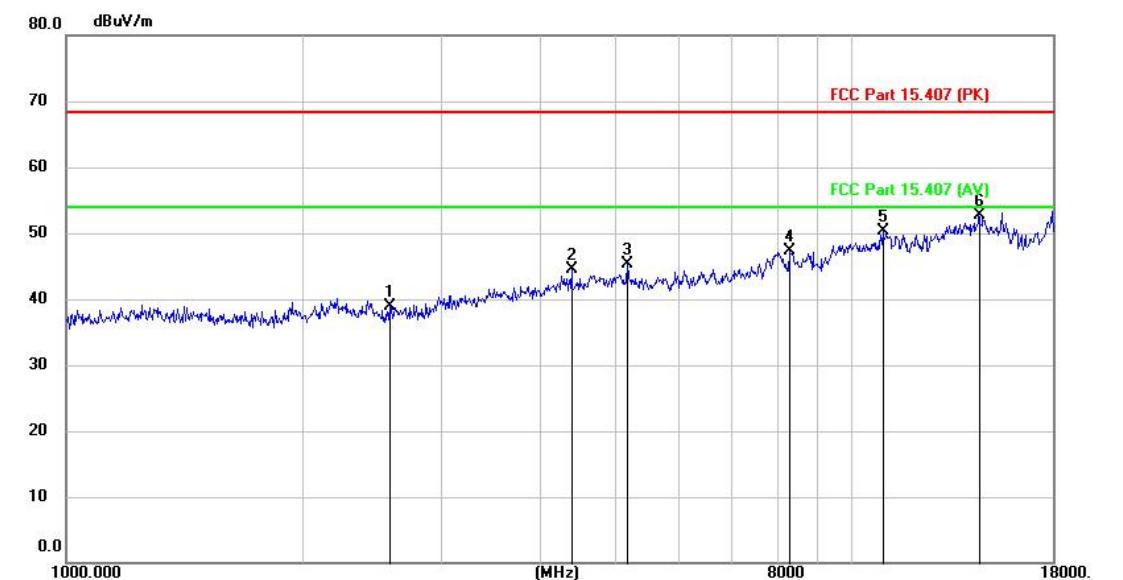
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1		1884.000	39.66	-0.85	38.81	68.20	-29.39	peak
2		3198.100	40.90	1.50	42.40	68.20	-25.80	peak
3		5182.000	42.10	4.30	46.40	68.20	-21.80	peak
4		8068.600	38.30	11.05	49.35	68.20	-18.85	peak
5		10361.900	38.31	12.65	50.96	68.20	-17.24	peak
6	*	15546.900	38.67	14.14	52.81	68.20	-15.39	peak

TRF No. RF\_R1

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

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## Test Mode1 / Polarization: Vertical / CH: H



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1		2581.000	37.97	0.86	38.83	68.20	-29.37	peak
2		4398.300	41.70	2.76	44.46	68.20	-23.74	peak
3		5178.600	41.04	4.30	45.34	68.20	-22.86	peak
4		8303.200	37.03	10.30	47.33	68.20	-20.87	peak
5		10960.300	36.53	13.83	50.36	68.20	-17.84	peak
6	*	14526.900	35.21	17.46	52.67	68.20	-15.53	peak

## Note:

1. Measurement = Reading level + Correct Factor

Correct Factor=Antenna Factor + Cable Loss - Preamplifier Factor

Over = Measurement - Limit

2. Pre-scan all mode, and found the A mode which it is worse case, so only show the test data for worse case.

3. Since the peak value is less than the limit of the AVG value, there is no AVG data.

4. From 18GHz to 26.5GHz, the amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

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## 5. EUT TEST PHOTOS

Conducted Emission at AC power line



Undesirable emission limits (below 1GHz)



TRF No. RF\_R1

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**Undesirable emission limits (above 1GHz)****RF Conducted****TRF No. RF\_R1**

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## 6. PHOTOGRAPHS OF EUT CONSTRUCTIONAL

Refer to Appendix - EUT Photos for KS2406S2147E.

--THE END--

TRF No. RF\_R1

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## Important Notice

1. The results are valid only for the samples submitted.
2. The report is invalid without the "APPROVED Seal" and the "Riding Seam Seal".
3. This report is invalid without the signature of the main inspector, reviewer, or approver.
4. The testing report cannot be partially copied without the written consent of our laboratory.
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