



FCC Test Report

**Test Report
On Behalf of
Shenzhen Raypole Technology Co.,Ltd.
For
LED POOL LIGHT
Model No.: PL07-CKN65W, PL07-CKN35W
FCC ID: 2A5W9-PL07-CKN65W**

Prepared For: Shenzhen Raypole Technology Co.,Ltd.
6 Lou, A6 Dong C Qu, Bao Ying Gong Ye Qu, Long Xi She Qu, Long Cheng Jie
Dao, Long Gang Qu, Shenzhen, Guang dong, China

Prepared By: Shenzhen HUAKE Testing Technology Co., Ltd.
1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai
Street, Bao'an District, Shenzhen, Guangdong, China

Date of Test: Jan. 15, 2025 ~ Mar. 19, 2025

Date of Report: Mar. 19, 2025

Report Number: HK2501150328-E



Test Result Certification

Applicant's Name.....: Shenzhen Raypole Technology Co.,Ltd.

Address: 6 Lou, A6 Dong C Qu, Bao Ying Gong Ye Qu, Long Xi She Qu,
Long Cheng Jie Dao, Long Gang Qu, Shenzhen, Guang dong,
China

Manufacturer's Name: Shenzhen Raypole Technology Co.,Ltd.

Address: 6 Lou, A6 Dong C Qu, Bao Ying Gong Ye Qu, Long Xi She Qu,
Long Cheng Jie Dao, Long Gang Qu, Shenzhen, Guang dong,
China

Product Description

Trade Mark: N/A

Product Name.....: LED POOL LIGHT

Model and/or Type Reference : PL07-CKN65W, PL07-CKN35W

Standards: FCC Part15 Subpart C 2017, Section 15.231
ANSI C63.10: 2013

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

Date of Test.....:

Date (s) of Performance of Tests.....: Jan. 15, 2025 ~ Mar. 19, 2025

Date of Issue.....: Mar. 19, 2025

Test Result: Pass

Testing Engineer

Len Liao

Technical Manager

Sliver Wan

Authorized Signatory

Jason Zhou



Contents

1 . Test Summary.....	5
1.1 Test Facility	5
1.2 Information of the Test Laboratory.....	5
1.3 Measurement Uncertainty.....	5
2. General Information.....	6
2.1 Description of Device (EUT).....	6
2.2 Description of Test Setup.....	7
2.3 Description of Support Units.....	8
2.4 List of Channels.....	8
2.5 Test Equipment List	9
3. Conducted Emission Test	11
3.1 Conducted Power Line Emission Limit	11
3.2 Test Setup	11
3.3 Test Procedure	11
3.4 Test Data	12
4. Radiated Emissions	13
4.1 Standard Applicable.....	13
4.2 Test Procedure	13
4.3 Corrected Amplitude & Margin Calculation	15
4.4 Environmental Conditions.....	15
4.5 Test Data	15
5. 20dB Occupy Bandwidth Test	19
5.1 Standard Applicable.....	19
5.2 Test Procedure	19
5.3 Test Data	19
6. Transmission Time	20
6.1 Standard Applicable.....	20
6.2 Test Procedure	20
6.3 Environmental Conditions.....	20
6.4 Test Data	21
7. Duty Cycle.....	22
7.1 Standard Applicable.....	22
7.2 Test Procedure	22
7.3 Introduction to PDCF Reference:	22
7.4 Test Data	23
8. Antenna Connected Construction.....	26
9. Photographs of Test.....	27
10. Photos of the EUT.....	28



**** Modified History ****

Revision	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	Mar. 19, 2025	Jason Zhou



1. Test Summary

1.1 Test Facility

Standard Section	Test Item	Result
15.203	Antenna Requirement	PASS
15.207	Conducted Emission	N/A
15.205/15.209/15.231(b)	Spurious Emission	PASS
15.231(c)	20dB Occupied Bandwidth	PASS
15.231(a)	Deactivation Testing	PASS
Remark: "N/A" is an abbreviation for Not Applicable.		

1.2 Information of the Test Laboratory

Shenzhen HUAKE Testing Technology Co., Ltd.

Add.: 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Testing Laboratory Authorization:

A2LA Accreditation Code is 4781.01.

FCC Designation Number is CN1229.

Canada IC CAB identifier is CN0045.

CNAS Registration Number is L9589.

1.3 Measurement Uncertainty

Measurement Uncertainty		
Parameter	Conditions	Uncertainty
Occupied Bandwidth	Conducted	$\pm 1.5\%$
Conducted Spurious Emission	Conducted	$\pm 2.17\text{dB}$
Transmission Time	Conducted	$\pm 5\%$
Conducted Emissions	Conducted	$\pm 2.88\text{dB}$
Transmitter Spurious Emissions	Radiated	$\pm 5.1\text{dB}$



2. General Information

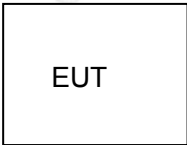
2.1 Description of Device (EUT)

Product Name	:	LED POOL LIGHT	
Model No.	:	PL07-CKN65W	
Series Models	:	PL07-CKN35W	
Model Difference	:	All model's the function, software and electric circuit are the same, only with product accessories and model named different. Test sample model: PL07-CKN65W.	
Trade Mark	:	N/A	
Test Power Supply	:	DC12V from battery	
Product Description	:	Operation Frequency:	434.08MHz
	:	Number of Channel:	1 Channels
	:	Modulation Type:	ASK
	:	Antenna Type:	External Antenna
	:	Antenna Gain(Peak):	2dBi
Remark: 1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual. 2) Antenna gain Refer to the antenna specifications. 3) The cable loss data is obtained from the supplier. 4) The test results in the report only apply to the tested sample.			



2.2 Description of Test Setup

Operation of EUT during Radiation Testing:



EUT

The sample was placed (0.8m below 1GHz, 1.5m above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. The worst case is X position



2.3 Description of Support Units

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

Item	Equipment	Trade Mark	Model/Type No.	Specification	Note
1	LED POOL LIGHT	N/A	PL07-CKN65W	N/A	EUT

Note:

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

2.4 List of Channels

Channel	Freq. (MHz)	Note (Modulation Type)
01	434.08	ASK



2.5 Test Equipment List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	L.I.S.N.	R&S	ENV216	HKE-002	2024/02/20	1 Year
2	L.I.S.N.	R&S	ENV216	HKE-059	2024/02/20	1 Year
3	EMI Test Receiver	R&S	ESR	HKE-005	2024/02/20	1 Year
4	Spectrum analyzer	Agilent	N9020A	HKE-025	2024/02/20	1 Year
5	Spectrum analyzer	R&S	FSV3044	HKE-126	2024/02/20	1 Year
6	Preamplifier	EMCI	EMC051845S	HKE-006	2024/02/20	1 Year
7	Preamplifier	Schwarzbeck	BBV 9743	HKE-016	2024/02/20	1 Year
8	Preamplifier	A.H. Systems	SAS-574	HKE-182	2024/02/20	1 Year
9	6dB Attenuator	Pasternack	6db	HKE-184	2024/02/20	1 Year
10	EMI Test Receiver	Rohde & Schwarz	ESR-7	HKE-010	2024/02/20	1 Year
11	Broadband Antenna	Schwarzbeck	VULB9168	HKE-167	2024/02/21	2 Year
12	Loop Antenna	COM-POWER	AL-130R	HKE-014	2024/02/21	2 Year
13	Horn Antenna	Schwarzbeck	9120D	HKE-013	2024/02/21	2 Year
14	EMI Test Software	Tonscend	JS32-CE 2.5.0.6	HKE-081	/	/
15	EMI Test Software	Tonscend	JS32-RE 5.0.0	HKE-082	/	/
16	RF Automatic control unit	Tonscend	JS0806-2	HKE-060	2024/02/20	1 Year
17	High pass filter unit	Tonscend	JS0806-F	HKE-055	2024/02/20	1 Year
18	Wireless Communication Test Set	R&S	CMU200	HKE-026	2024/02/20	1 Year
19	Wireless Communication Test Set	R&S	CMW500	HKE-027	2024/02/20	1 Year
20	High-low temperature chamber	Guangke	HT-80L	HKE-118	2024/06/11	1 Year
21	Temperature and humidity meter	Boyang	HTC-1	HKE-075	2024/06/11	1 Year
22	RF Test Software	Tonscend	JS1120-3 Version 3.5.39	HKE-083	/	/
23	10dB Attenuator	Schwarzbeck	VTSD9561F	HKE-153	2024/02/20	1 Year
24	RSE Test Software	Tonscend	JS36-RSE 5.0.0	HKE-184	/	/

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAKE, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.cer-mark.com>.

TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com

Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China



Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	L.I.S.N.	R&S	ENV216	HKE-002	2025/02/19	1 Year
2	L.I.S.N.	R&S	ENV216	HKE-059	2025/02/19	1 Year
3	EMI Test Receiver	R&S	ESR	HKE-005	2025/02/19	1 Year
4	Spectrum analyzer	Agilent	N9020A	HKE-025	2025/02/19	1 Year
5	Spectrum analyzer	R&S	FSV3044	HKE-126	2025/02/19	1 Year
6	Preamplifier	EMCI	EMC051845S	HKE-006	2025/02/19	1 Year
7	Preamplifier	Schwarzbeck	BBV 9743	HKE-016	2025/02/19	1 Year
8	Preamplifier	A.H. Systems	SAS-574	HKE-182	2025/02/19	1 Year
9	6dB Attenuator	Pasternack	6db	HKE-184	2025/02/19	1 Year
10	EMI Test Receiver	Rohde & Schwarz	ESR-7	HKE-010	2025/02/19	1 Year
11	Broadband Antenna	Schwarzbeck	VULB9168	HKE-167	2024/02/21	2 Year
12	Loop Antenna	COM-POWER	AL-130R	HKE-014	2024/02/21	2 Year
13	Horn Antenna	Schwarzbeck	9120D	HKE-013	2024/02/21	2 Year
14	EMI Test Software	Tonscend	JS32-CE 2.5.0.6	HKE-081	/	/
15	EMI Test Software	Tonscend	JS32-RE 5.0.0	HKE-082	/	/
16	RF Automatic control unit	Tonscend	JS0806-2	HKE-060	2025/02/19	1 Year
17	High pass filter unit	Tonscend	JS0806-F	HKE-055	2025/02/19	1 Year
18	Wireless Communication Test Set	R&S	CMU200	HKE-026	2025/02/19	1 Year
19	Wireless Communication Test Set	R&S	CMW500	HKE-027	2025/02/19	1 Year
20	High-low temperature chamber	Guangke	HT-80L	HKE-118	2024/06/11	1 Year
21	Temperature and humidity meter	Boyang	HTC-1	HKE-075	2024/06/11	1 Year
22	RF Test Software	Tonscend	JS1120-3 Version 3.5.39	HKE-083	/	/
23	10dB Attenuator	Schwarzbeck	VTSD9561F	HKE-153	2025/02/19	1 Year
24	RSE Test Software	Tonscend	JS36-RSE 5.0.0	HKE-184	/	/

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAKE, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.cer-mark.com>.

TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com

Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China



3. Conducted Emission Test

3.1 Conducted Power Line Emission Limit

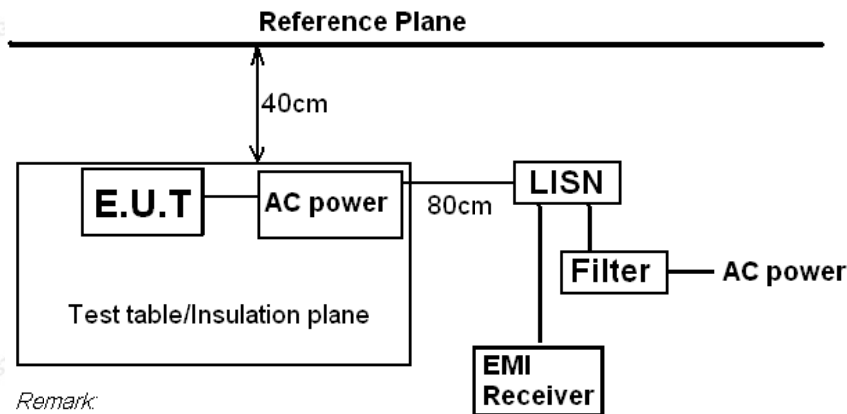
For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following

Frequency (MHz)	Maximum RF Line Voltage (dBμV)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

* Decreasing linearly with the logarithm of the frequency

For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

3.2 Test Setup



Remark:

E.U.T: Equipment Under Test

LISN: Line Impedance Stabilization Network

Test table height=0.8m

3.3 Test Procedure

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
2. Support equipment, if needed, was placed as per ANSI C63.10.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4. If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.



3.4 Test Data

Not applicable.

Note: EUT Power Supply by Battery Powered, so this test item not applicable.



4. Radiated Emissions

4.1 Standard Applicable

According to §15.231(b), the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (microvolts/meter)	Field Strength of Spurious Emissions (microvolts/meter)
40.66 - 40.70	2,250	225
70 - 130	1,250	125
130 - 174	1,250 to 3,750 **	125 to 375 **
174 - 260	3,750	375
260 - 470	3,750 to 12,500 **	375 to 1,250 **
Above 470	12,500	1,250

** linear interpolations

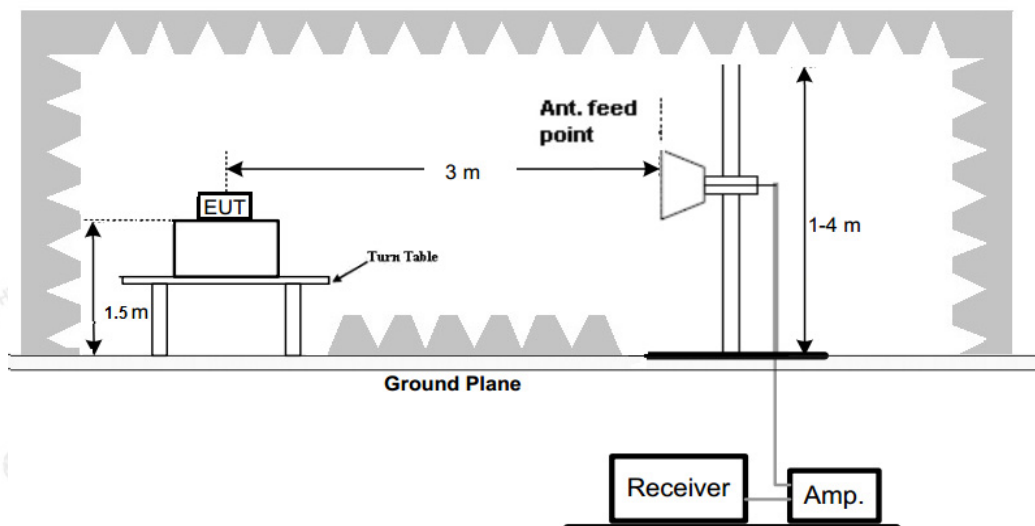
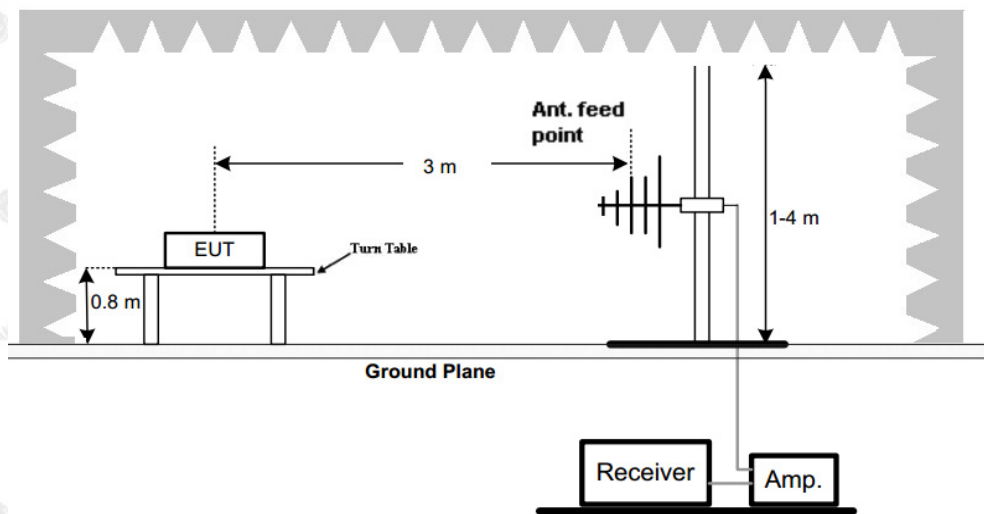
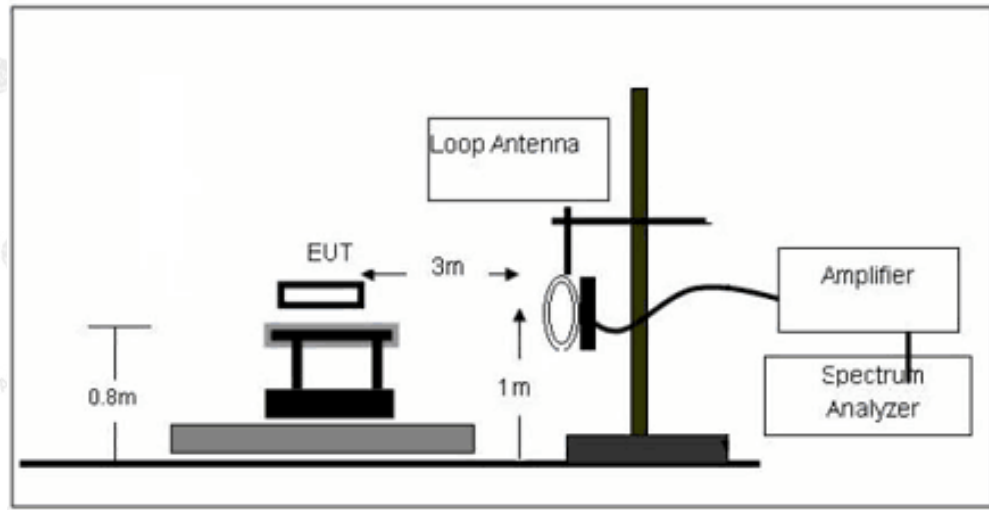
The limits on the field strength of the spurious emissions in the above table are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in §15.209, whichever limit permits a higher field strength.

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

Compliance with the provisions of §15.205 shall be demonstrated using the measurement instrumentation specified in that section.

4.2 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.205 15.231(b) and FCC Part 15.209 Limit.





4.3 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Ant. Loss} + \text{Cab. Loss} - \text{Ampl. Gain}$$

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB μ V means the emission is 6dB μ V below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part15C Limit}$$

4.4 Environmental Conditions

Temperature:	21°C
Relative Humidity:	50%
ATM Pressure:	1011 mbar

4.5 Test Data

According to the data below, the FCC Part 15.205, 15.209 and 15.231 standards, and had the worst margin of:

Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

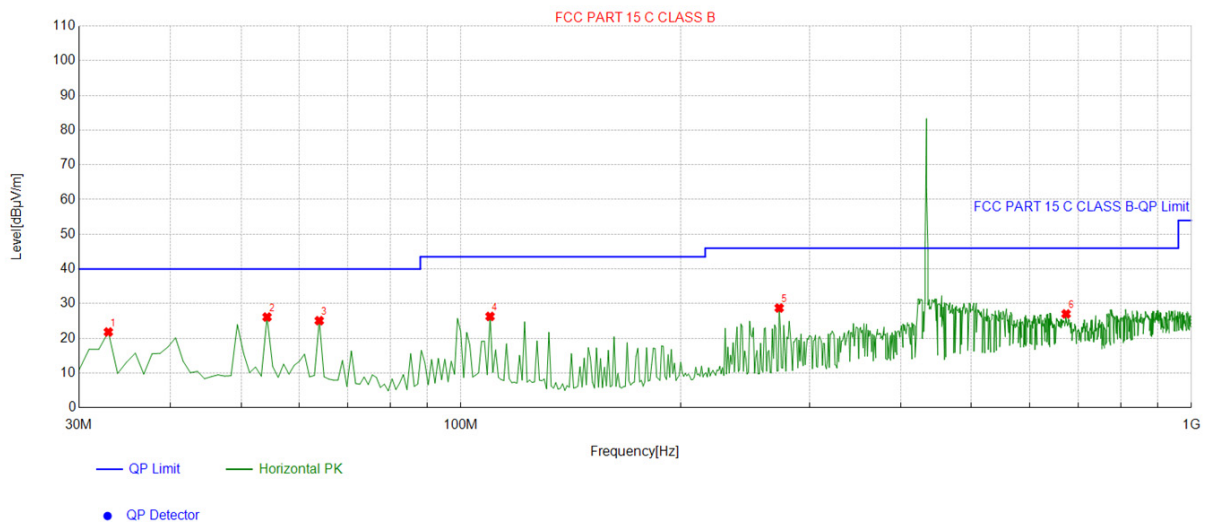
(Fundamental 434.08MHz)

No.	Frequency	Reading	Corr.	Duty cycle	Result	Limit	Margin	Deg.	Height	Polarity	Remark
	MHz	dBuV/m	Factor (dB)	Factor (dB)	dBuV/m	dBuV/m	dB	(°)	(cm)		
1	434.0800	72.08	12.33	N/A	84.41	100.8	16.39	177	100	H	Peak
2	434.0800	N/A	N/A	-8.86	75.55	80.83	5.28	177	100	H	AV
3	434.0800	71.56	12.33	N/A	83.89	100.8	16.91	177	100	V	Peak
4	434.0800	N/A	N/A	-8.86	75.03	80.83	5.80	117	100	V	AV



Radiated Emission

Antenna polarity: H



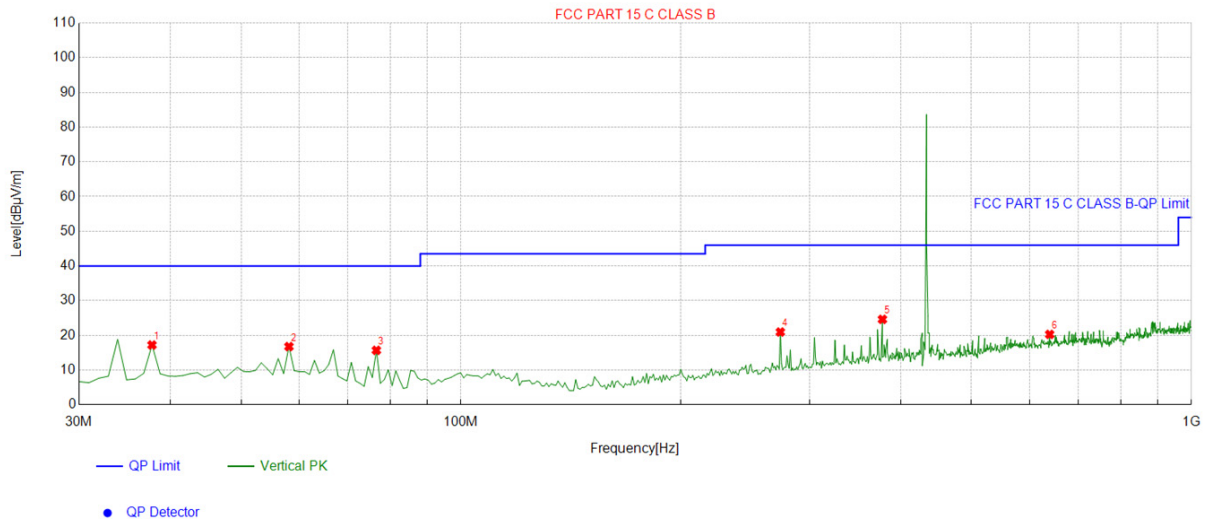
Suspected List

NO.	Freq. [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	32.912913	-15.12	36.95	21.83	40.00	18.17	100	14	Horizontal
2	54.274274	-13.50	39.65	26.15	40.00	13.85	100	160	Horizontal
3	63.983984	-14.38	39.48	25.10	40.00	14.90	100	160	Horizontal
4	109.61962	-14.22	40.54	26.32	43.50	17.18	100	8	Horizontal
5	272.74274	-12.61	41.36	28.75	46.00	17.25	100	26	Horizontal
6	673.75375	-4.64	31.67	27.03	46.00	18.97	100	90	Horizontal

Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Limit – Level;



Antenna polarity: V



Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	37.767768	-14.98	32.21	17.23	40.00	22.77	100	326	Vertical
2	58.158158	-14.00	30.77	16.77	40.00	23.23	100	308	Vertical
3	76.606607	-17.96	33.65	15.69	40.00	24.31	100	308	Vertical
4	273.71371	-12.65	33.61	20.96	46.00	25.04	100	326	Vertical
5	377.60760	-9.58	34.20	24.62	46.00	21.38	100	308	Vertical
6	639.76977	-5.26	25.54	20.28	46.00	25.72	100	291	Vertical

Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Limit – Level;



Above 1GHz

Horizontal:

No.	Frequency	Reading	Corr.	Duty cycle	Result	Limit	Margin	Deg.	Height	Remark
	MHz	dBuV/m	Factor (dB)	Factor (dB)	dBuV/m	dBuV/m	dB	(°)	(cm)	
1	1302.24	24.86	25.83	N/A	50.69	74	23.31	41	100	Peak
	1302.24	/	/	-8.86	41.83	54	12.17	306	100	Ave
2	1736.32	22.07	27.25	N/A	49.32	74	24.68	204	100	Peak
	1736.32	/	/	-8.86	40.46	54	13.54	87	100	Ave

Vertical:

No.	Frequency	Reading	Corr.	Duty cycle	Result	Limit	Margin	Deg.	Height	Remark
	MHz	dBuV/m	Factor (dB)	Factor (dB)	dBuV/m	dBuV/m	dB	(°)	(cm)	
1	1302.24	23.12	25.83	N/A	48.95	74	25.05	151	100	Peak
	1302.24	/	/	-8.86	40.09	54	13.91	74	100	Ave
2	1736.32	24.39	27.25	N/A	51.64	74	22.36	332	100	Peak
	1736.32	/	/	-8.86	42.78	54	11.22	51	100	Ave

Note: Testing is carried out with frequency rang 30MHz to the tenth harmonics, which above 5th Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

The fundamental frequency is 434.08MHz, so the fundamental and spurious emissions radiated limit base on the operating frequency 434.08MHz.

Frequency Range (9 kHz-30MHz)

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

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

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



5. 20dB Occupy Bandwidth Test

5.1 Standard Applicable

According to FCC Part 15.231(c), The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

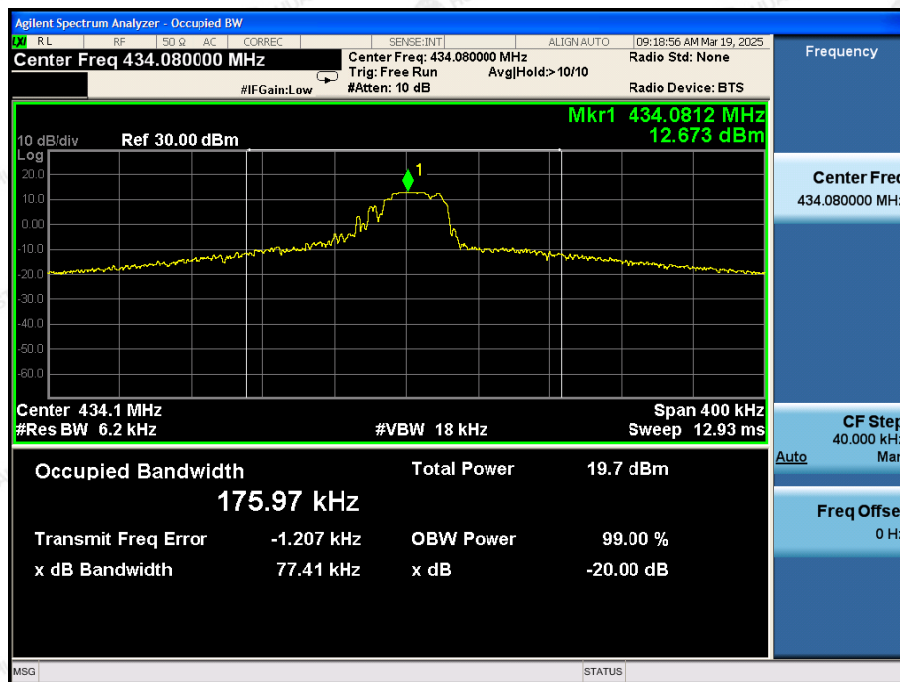
5.2 Test Procedure

With the EUT's antenna attached, the EUT's 20dB Bandwidth power was received by the test antenna, which was connected to the spectrum analyzer with the START, and STOP frequencies set to the EUT's operation band.

Temperature:	21°C
Relative Humidity:	52%
ATM Pressure:	1011 mbar

5.3 Test Data

Freq. (MHz)	Modulation Type	Bandwidth (kHz)	Limit (kHz)	Results
434.08	ASK	77.41	<1085.2	PASS





6. Transmission Time

6.1 Standard Applicable

According to FCC Part 15.231(a), the transmitter shall be complied the following requirements:

- (1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.
- (2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.
- (3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.

6.2 Test Procedure

With the EUT's antenna attached, the EUT's output signal was received by the test antenna, which was connected to the spectrum analyzer. Set the center frequency to 434.08MHz, than set the spectrum analyzer to Zero Span for the release time reading. During the testing, the switch was released then the EUT automatically deactivated.

6.3 Environmental Conditions

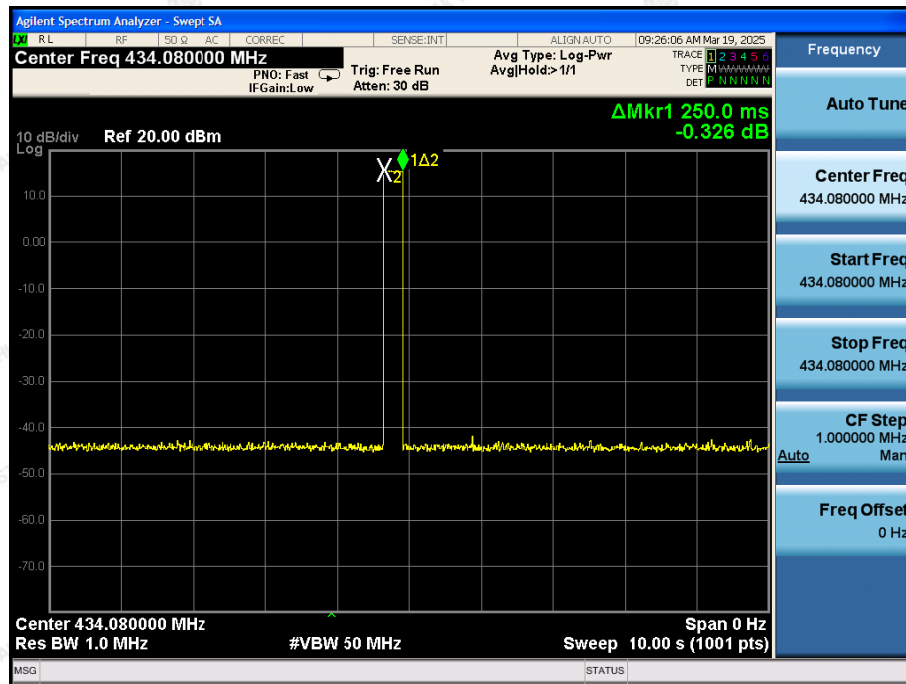
Temperature:	20℃
Relative Humidity:	52%
ATM Pressure:	1011 mbar



6.4 Test Data

Transmission Type	Test Frequency MHz	Transmission Time seconds	Limit s	Result
Manually	434.08	0.25	5	PASS

Please refer the following plot.





7. Duty Cycle

7.1 Standard Applicable

According to FCC Part 15.231(b)(2) and 15.35 (c), For pulse operation transmitter, the averaging pulsed emissions are calculated by peak value of measured emission plus duty cycle factor.

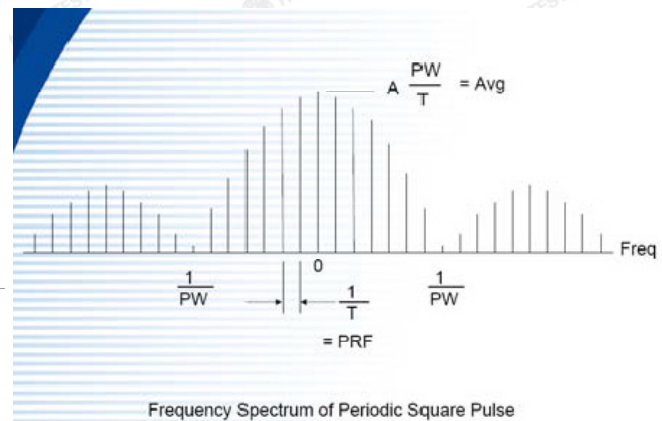
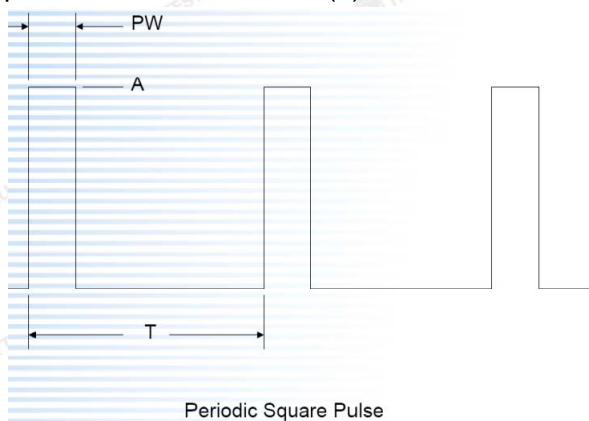
7.2 Test Procedure

- 1) The EUT was placed on a turntable which is 0.8m above ground plane.
- 2) Set EUT operating in continuous transmitting mode
- 3) Set Test Receiver into spectrum analyzer mode, Tune the spectrum analyzer to the transmitter carrier frequency, and set the spectrum analyzer resolution bandwidth(RBW) to 1000kHz and video bandwidth(VBW) to 1000kHz, Span was set to 0Hz.
- 4) The Duty Cycle was measured and recorded.

7.3 Introduction to PDCF Reference:

(§15.35 Measurement detector functions and bandwidths.)

1) Part 15 of the FCC Rules provides for the operation of low power communication devices without an individual license (e.g., intrusion detectors, pulsed water tank level gauges, etc.), subject to certain requirements. Some of these devices use extremely narrow pulses to generate wideband emissions, which are measured to determine compliance with the rules. These measurements are typically performed with a receiver or spectrum analyzer. Depending on a number of factors (e.g., resolution bandwidth, pulse width, etc.), the spectrum analyzer may not always display the true peak value of the measured emission. This effect, called “pulse desensitization,” relates to the capabilities of the measuring instrument. For the measurement and reporting of the true peak of pulsed emissions, it may be necessary to apply a “pulse desensitization correction factor” (PDCF) to the measured value, pursuant to 47 CFR 15.35(a).





If using spectrum analyzer to measure pulse signal, it have to make sure the RBW use is at least $2/PW$.
•When RBW is less than $2/PW$, you are able to measure the true peak level of the pulse signal. If this is the case.

PDCF is required to compensate to determine true peak value.

Pulse desensitization:

$PW = 29250\mu\text{sec}$ ($0.6 \times 13 + 1.65 \times 13$), Period= $67500\mu\text{sec}$, Level=A

$RBW > 2/PW = 0.068\text{K}$, $1/T = 0.15\text{K}$

NOTE: $2 / PW < RBW$, first don't need

2). For the actual test, please refer to the ANSI C63.10, Annex C refer to section 5 for more detail

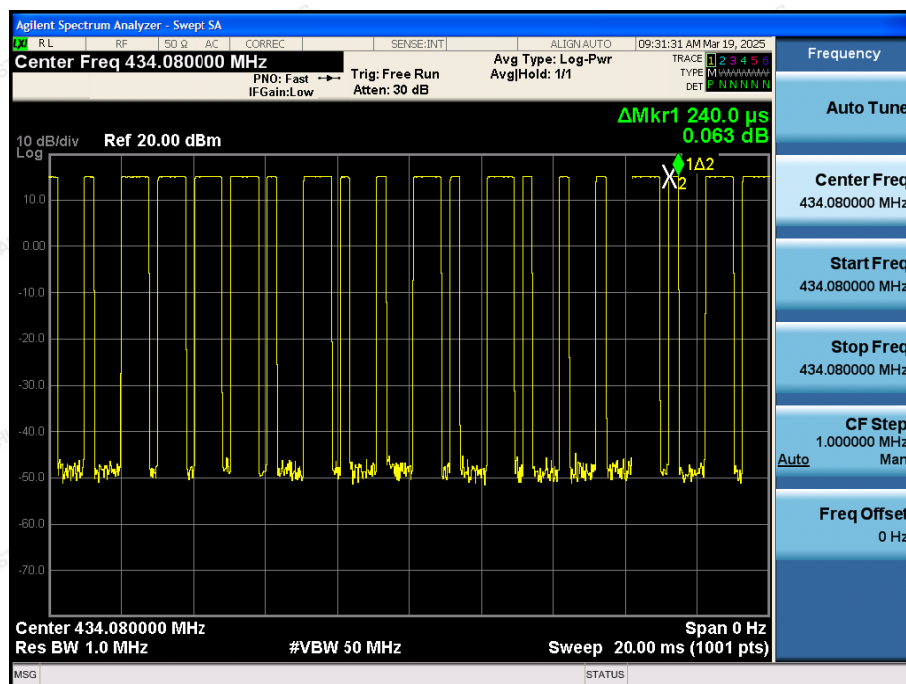
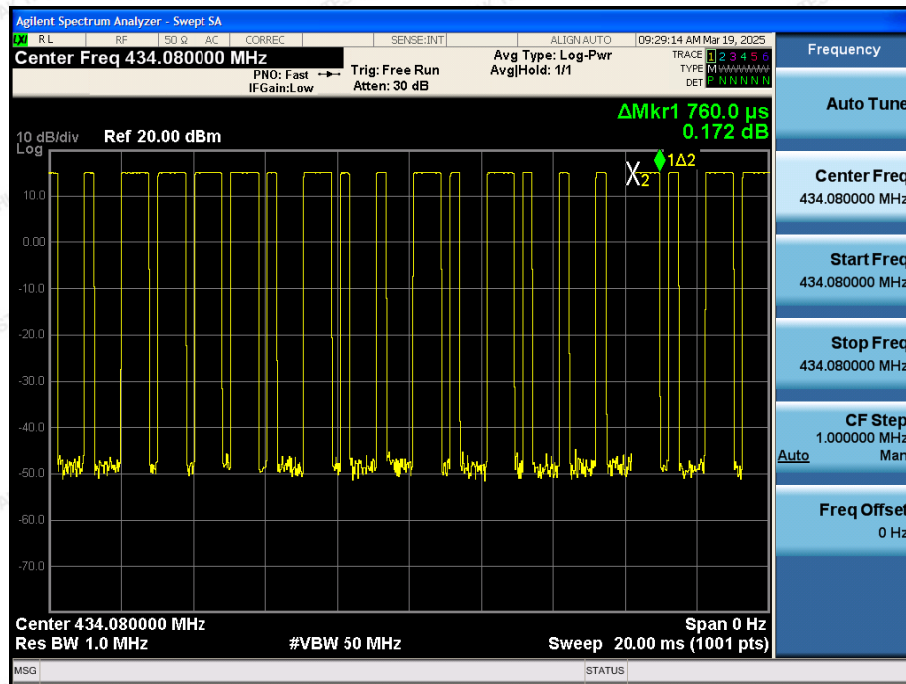
7.4 Test Data

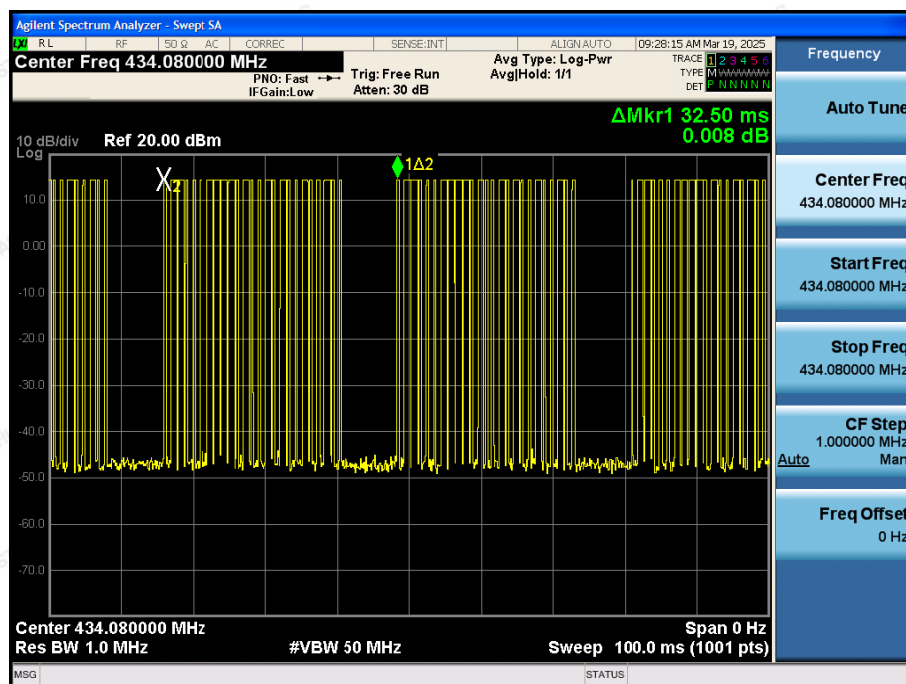
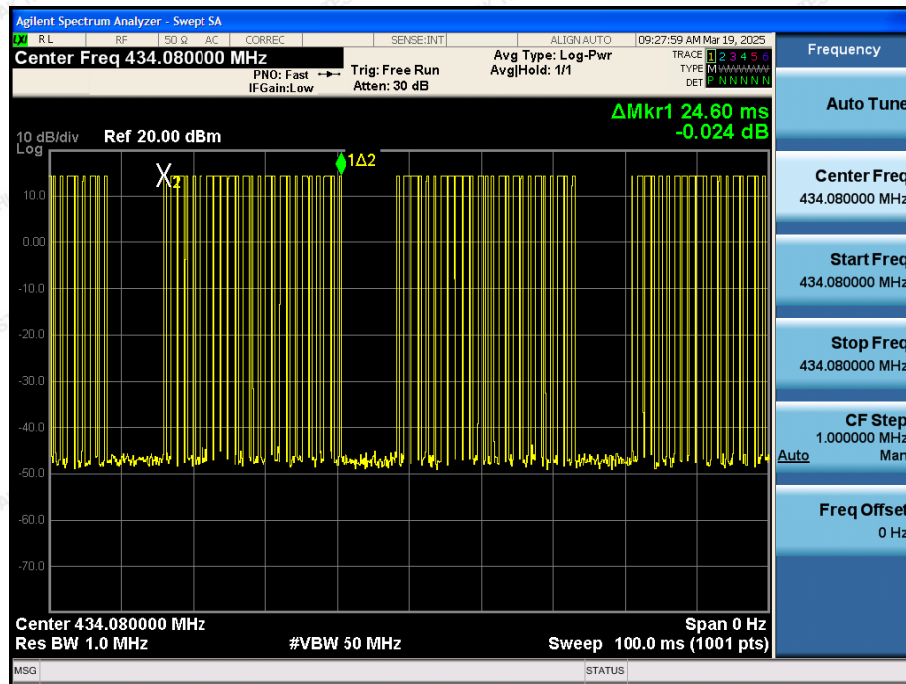
Type of Pulse	Width of Pulse ms	Quantity of Pulse	Transmission Time ms	Total Time (T_{on}) ms
Pulse 1	0.76	11	8.36	11.72
Pulse 2	0.24	14	3.36	

Test Period (T_p) ms	Total Time (T_{on}) ms	Duty Cycle %	Duty Cycle Factor dB
32.50	11.72	36.06	-8.86

Remark: Duty Cycle Factor= $20 \times \log(\text{Duty Cycle})$

Please refer to the attached test plots







8. Antenna Connected Construction

The antenna used in this product is an External Antenna, need professional installation, not easy to remove. It conforms to the standard requirements. The directional gains of antenna used for transmitting is 2dBi.

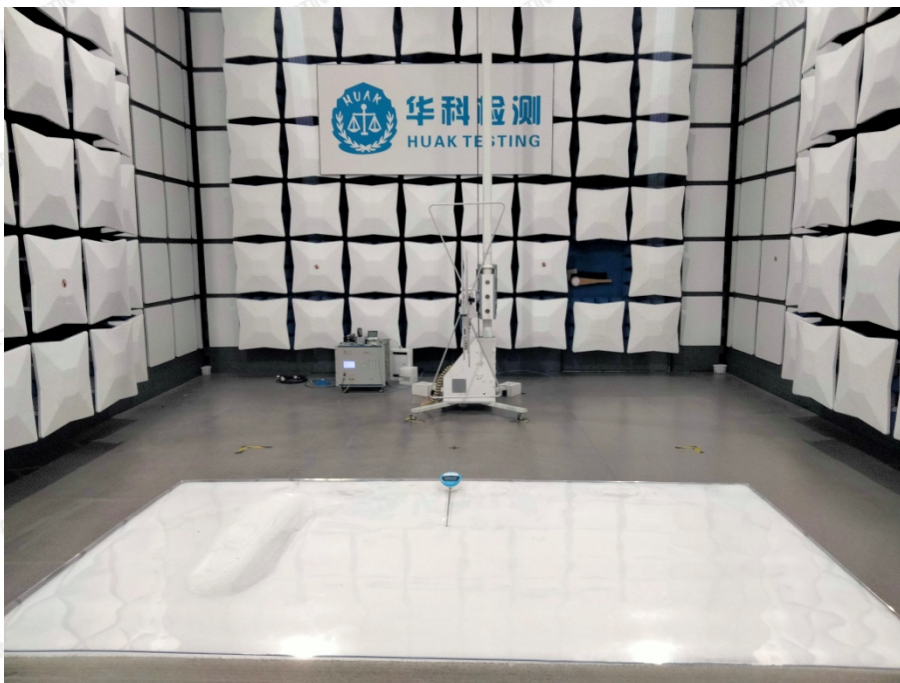
Antenna





9. Photographs of Test

Radiated Emission



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAKE, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.cer-mark.com>.

TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com

Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China



10. Photos of the EUT

Reference to the report: ANNEX A of External photos and ANNEX B of Internal photos

*****End of Report*****

