



Shenzhen CTA Testing Technology Co., Ltd.

Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China

TEST REPORT

FCC PART 15 SUBPART C 15.249

Report Reference No.....: CTA22030300701

FCC ID.....: 2A4JU-Z2107

Compiled by

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Date of issue.....: Mar. 03, 2022

Testing Laboratory Name: Shenzhen CTA Testing Technology Co., Ltd.

Address: Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China

Applicant's name: Shenzhen ShunXinDa Trading Co., Ltd.

Address: Room 308, 3rd Floor, Building B, Donghaiwang Building, Bantian Street, Longgang District, Shenzhen, Guangdong, China

Test specification

Standard: 47 CFR FCC Part 15 Subpart C 15.249

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Test item description: Wireless Reversing Kit

Trade Mark: N/A

Manufacturer: Shenzhen ShunXinDa Trading Co., Ltd.

Model/Type reference.....: Z2107

List Model: See next page

Modulation: GFSK

Ratings: DC 12V

Result.....: PASS

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TEST REPORT

Equipment under Test : Wireless Reversing Kit

Model /Type : Z2107

Listed Models : M2013, C0063, K0232, Z2065, K0082, Z2099, Z2092, Z2091, Z2090, Z2083, K0192, K0163, F0502, K0079, K0084, M2005, C0054, K0081, R0009, Z2114, R0026, R0027, K0203, K0129

Applicant : **ShenZhen litian technology Co.,Ltd**

Address : Rm209, #2 Zonghe Bldg, Bao yun da center, Xixiang St, Bao an District, Shenzhen, China

Manufacturer : **ShenZhen litian technology Co.,Ltd**

Address : Rm209, #2 Zonghe Bldg, Bao yun da center, Xixiang St, Bao an District, Shenzhen, China

Test Result:	PASS
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The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1 TEST STANDARDS

The tests were performed according to following standards:

[FCC Rules Part 15.249](#): Operation within the bands 902 - 928 MHz, 2400 - 2483.5 MHz, 5725 - 5875 MHz, and 24.0 - 24.25 GHz.

[ANSI C63.10-2013](#): American National Standard for Testing Unlicensed Wireless Devices

2 SUMMARY

2.1 General Remarks

Date of receipt of test sample	:	Feb. 17, 2022
Testing commenced on	:	Feb. 18, 2022
Testing concluded on	:	Feb. 23, 2022

2.2 Product Description

Product Name:	Wireless Reversing Kit
Model/Type reference:	Z2107
Power supply:	DC 12V
Hardware Version:	TX-2458(V1.9)
Software Version:	V1.0
Testing sample ID:	CTA220303007-1# (Engineer sample) CTA220303007-2# (Normal sample)
2.4GHz wireless	
Modulation:	GFSK
Operation frequency:	2406MHz to 2475MHz
Channel number:	70
Channel separation:	1 MHz
Antenna type:	Integral antenna
Antenna gain:	1.0dBi

Note: Antenna gain is provided by the manufacturer.

2.3 Equipment Under Test

Power supply system utilised

Power supply voltage	:	☐ 230V / 50 Hz	☐ 120V / 60Hz
		☐ 12 V DC	☐ 24 V DC
		☒ Other (specified in blank below)	

DC 12V

2.4 Short description of the Equipment under Test (EUT)

This is a Wireless Reversing Kit.

For more details, refer to the user's manual of the EUT.

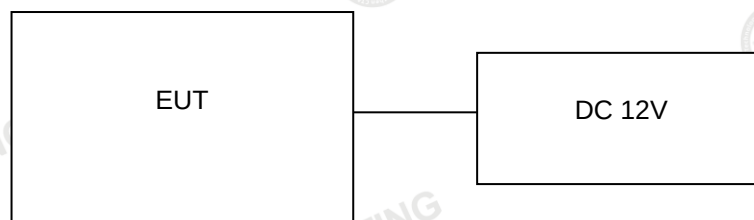
2.5 EUT operation mode

The Applicant provides communication tools software(CMD command) to control the EUT for staying in continuous transmitting (Duty Cycle more than 98%) and receiving mode for testing . There are 31 channels provided to the EUT and Channel 01/15/31 were selected to test.

Operation Frequency:

Channel	Frequency (MHz)
01	2406
02	2407
03	2408
⋮	⋮
35	2440
⋮	⋮
68	2473
69	2474
70	2475

2.6 Block Diagram of Test Setup



2.7 Special Accessories

Follow auxiliary equipment(s) test with EUT that provided by the manufacturer or laboratory is listed as follow:

Description	Manufacturer	Model	Technical Parameters	Certificate	Provided by
/	/	/	/	/	/
/	/	/	/	/	/
/	/	/	/	/	/
/	/	/	/	/	/

2.8 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for the device filing to comply with Section 15.249 of the FCC Part 15, Subpart C Rules.

2.9 Modifications

No modifications were implemented to meet testing criteria.

3 TEST ENVIRONMENT

3.1 Address of the test laboratory

Shenzhen CTA Testing Technology Co., Ltd.

Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China

3.2 Test Facility

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

FCC-Registration No.: 517856 Designation Number: CN1318

Shenzhen CTA Testing Technology Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

A2LA-Lab Cert. No.: 6534.01

Shenzhen CTA Testing Technology Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10 and CISPR 16-1-4:2010.

3.3 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Radiated Emission:

Temperature:	24 ° C
Humidity:	46 %
Atmospheric pressure:	950-1050mbar

AC Power Conducted Emission:

Temperature:	25 ° C
Humidity:	47 %
Atmospheric pressure:	950-1050mbar

Conducted testing:

Temperature:	24 ° C
Humidity:	46 %
Atmospheric pressure:	950-1050mbar

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3.4 Summary of measurement results

FCC PART 15.249		
FCC Part 15.249(a)	Field Strength of Fundamental	PASS
FCC Part 15.209	Spurious Emission	PASS
FCC Part 15.215(c)	20dB bandwidth	PASS
FCC Part 15.207	Conducted Emission	N/A
FCC Part 15.203	Antenna Requirement	PASS

Remark:

1. The measurement uncertainty is not included in the test result.
2. NA = Not Applicable; NP = Not Performed

3.5 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2" and is documented in the Shenzhen CTA Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen CTA Testing Technology Co., Ltd. :

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.06 dB	(1)
Radiated Emission	1~18GHz	5.14 dB	(1)
Radiated Emission	18-40GHz	5.38 dB	(1)
Conducted Disturbance	0.15~30MHz	2.14 dB	(1)

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

3.6 Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Equipment No.	Calibration Date	Calibration Due Date
LISN	R&S	ENV216	CTA-308	2021/08/06	2022/08/05
LISN	R&S	ENV216	CTA-314	2021/08/06	2022/08/05
EMI Test Receiver	R&S	ESPI	CTA-307	2021/08/06	2022/08/05
EMI Test Receiver	R&S	ESCI	CTA-306	2021/08/06	2022/08/05
Spectrum Analyzer	Agilent	N9020A	CTA-301	2021/08/06	2022/08/05
Spectrum Analyzer	R&S	FSP	CTA-337	2021/08/06	2022/08/05
Vector Signal generator	Agilent	N5182A	CTA-305	2021/08/06	2022/08/05
Analog Signal Generator	R&S	SML03	CTA-304	2021/08/06	2022/08/05
Universal Radio Communication	CMW500	R&S	CTA-302	2021/08/06	2022/08/05
Temperature and humidity meter	Chigo	ZG-7020	CTA-326	2021/08/06	2022/08/05
Ultra-Broadband Antenna	Schwarzbeck	VULB9163	CTA-310	2021/08/07	2022/08/06
Horn Antenna	Schwarzbeck	BBHA 9120D	CTA-309	2021/08/07	2022/08/06

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Loop Antenna	Zhinan	ZN30900C	CTA-311	2021/08/07	2022/08/06
Horn Antenna	Beijing Hangwei Dayang	OBH100400	CTA-336	2021/08/06	2022/08/05
Amplifier	Schwarzbeck	BBV 9745	CTA-312	2021/08/06	2022/08/05
Amplifier	Taiwan chengyi	EMC051845B	CTA-313	2021/08/06	2022/08/05
Directional coupler	NARDA	4226-10	CTA-303	2021/08/06	2022/08/05
High-Pass Filter	XingBo	XBLBQ-GTA18	CTA-402	2021/08/06	2022/08/05
High-Pass Filter	XingBo	XBLBQ-GTA27	CTA-403	2021/08/06	2022/08/05
Automated filter bank	Tonscend	JS0806-F	CTA-404	2021/08/06	2022/08/05
Power Sensor	Agilent	U2021XA	CTA-405	2021/08/06	2022/08/05
Amplifier	Schwarzbeck	BBV9719	CTA-406	2021/08/06	2022/08/05

4 TEST CONDITIONS AND RESULTS

4.1 Conducted Emissions Test

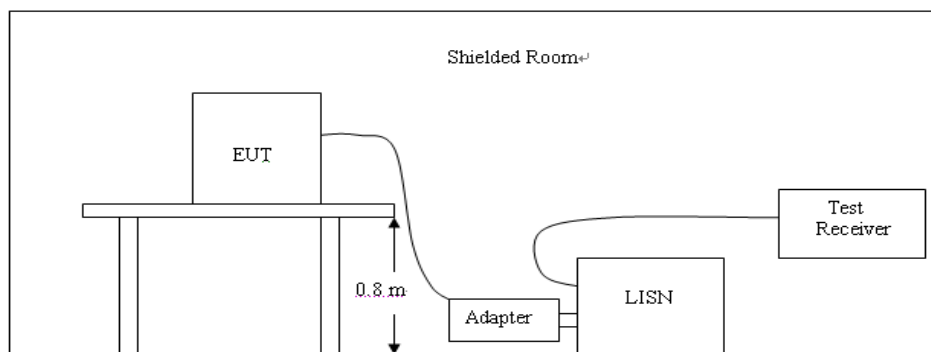
LIMIT

According to FCC CFR Title 47 Part 15 Subpart C Section 15.207, AC Power Line Conducted Emissions Limits for Licence-Exempt Radio Apparatus as below:

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST CONFIGURATION



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 C63.10:2013.
2. Support equipment, if needed, was placed as per ANSI C63.10:2013.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10:2013.
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.
8. During the above scans, the emissions were maximized by cable manipulation.

TEST RESULTS

Not applicable to this device.

4.2 Radiated Emissions and Band Edge

Limit

According 15.249, the field strength of emissions from intentional radiators operated within 2400MHz-2483.5 MHz shall not exceed 94dB μ V/m (50mV/m):

FCC PART 15.249(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits list as below, whichever is the lesser attenuation.

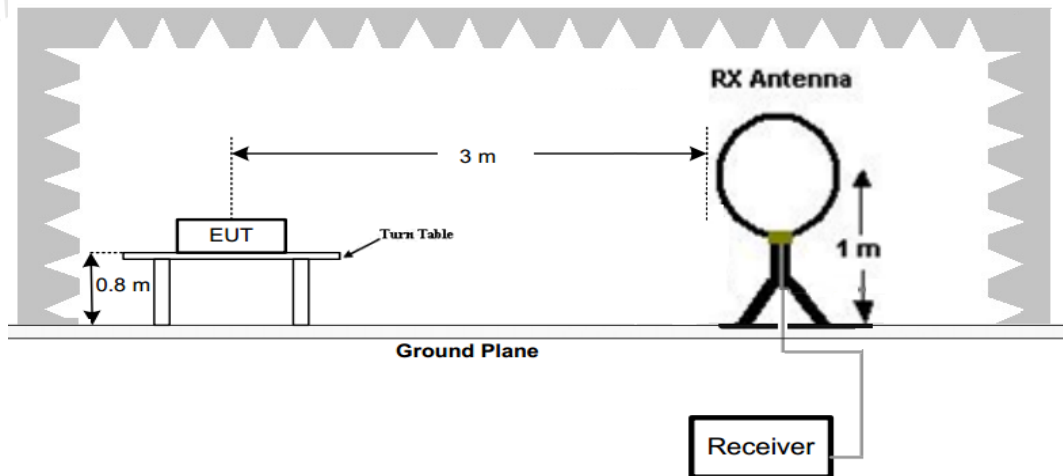
In addition, radiated emissions which fall in the restricted bands, must also comply with the radiated emission limits specified list as below.

Radiated emission limits

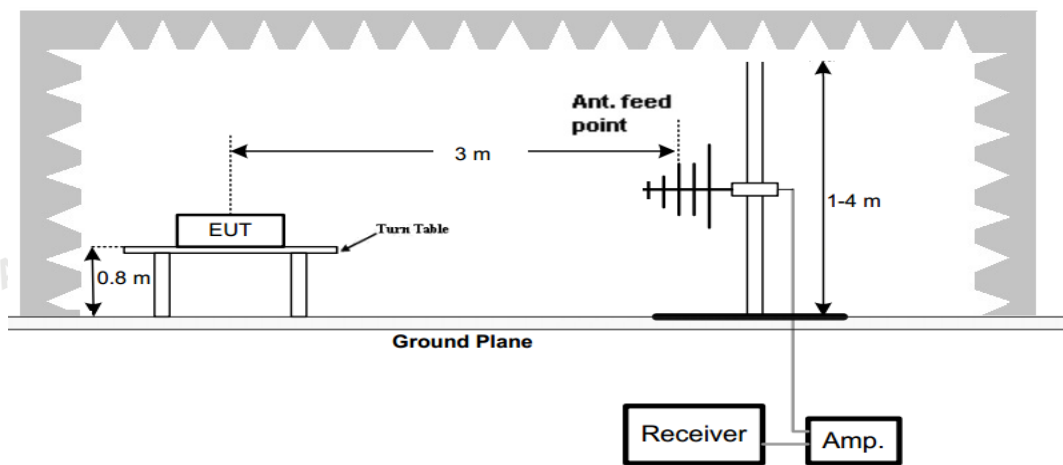
Frequency (MHz)	Distance (Meters)	Radiated (dB μ V/m)	Radiated (μ V/m)
0.009-0.49	3	$20\log(2400/F(\text{KHz}))+40\log(300/3)$	$2400/F(\text{KHz})$
0.49-1.705	3	$20\log(24000/F(\text{KHz}))+40\log(30/3)$	$24000/F(\text{KHz})$
1.705-30	3	$20\log(30)+40\log(30/3)$	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

TEST CONFIGURATION

(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



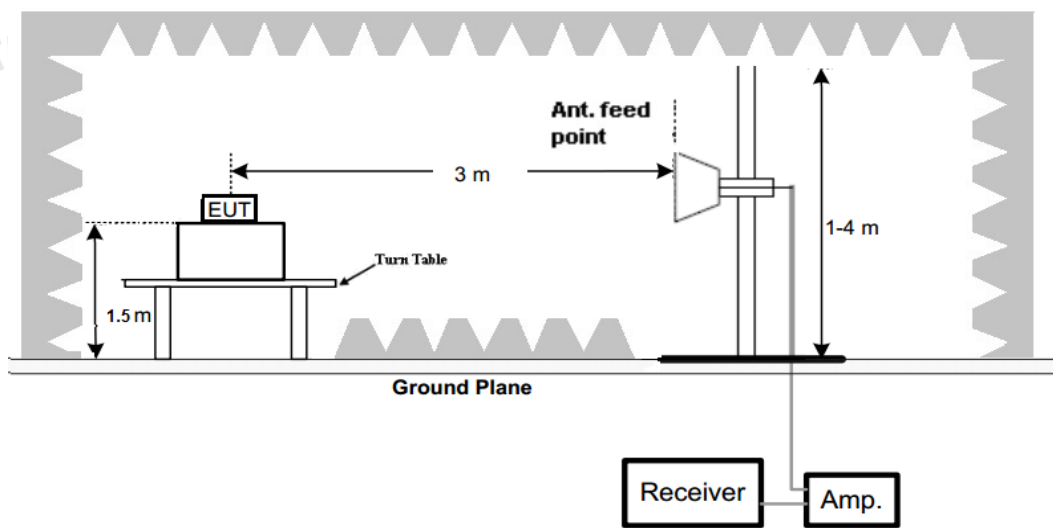
(B) Radiated Emission Test Set-Up, Frequency below 1000MHz



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(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



Test Procedure

- Below 1GHz measurement the EUT is placed on a turntable which is 0.8m above ground plane, and above 1GHz measurement EUT was placed on a low permittivity and low loss tangent turn table which is 1.5m above ground plane.
- Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0° to 360° to acquire the highest emissions from EUT
- And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- Repeat above procedures until all frequency measurements have been completed.
- Radiated emission test frequency band from 9KHz to 25GHz.
- The distance between test antenna and EUT as following table states:

Test Frequency range	Test Antenna Type	Test Distance
9KHz-30MHz	Active Loop Antenna	3
30MHz-1GHz	Bilog Antenna	3
1GHz-18GHz	Horn Antenna	3
18GHz-25GHz	Horn Antenna	1

- Setting test receiver/spectrum as following table states:

Test Frequency range	Test Receiver/Spectrum Setting	Detector
9KHz-150KHz	RBW=200Hz/VBW=3KHz, Sweep time=Auto	QP
150KHz-30MHz	RBW=9KHz/VBW=100KHz, Sweep time=Auto	QP
30MHz-1GHz	RBW=120KHz/VBW=1000KHz, Sweep time=Auto	QP
1GHz-40GHz	Peak Value: RBW=1MHz/VBW=3MHz, Sweep time=Auto Average Value: RBW=1MHz/VBW=10Hz, Sweep time=Auto	Peak

TEST RESULTS

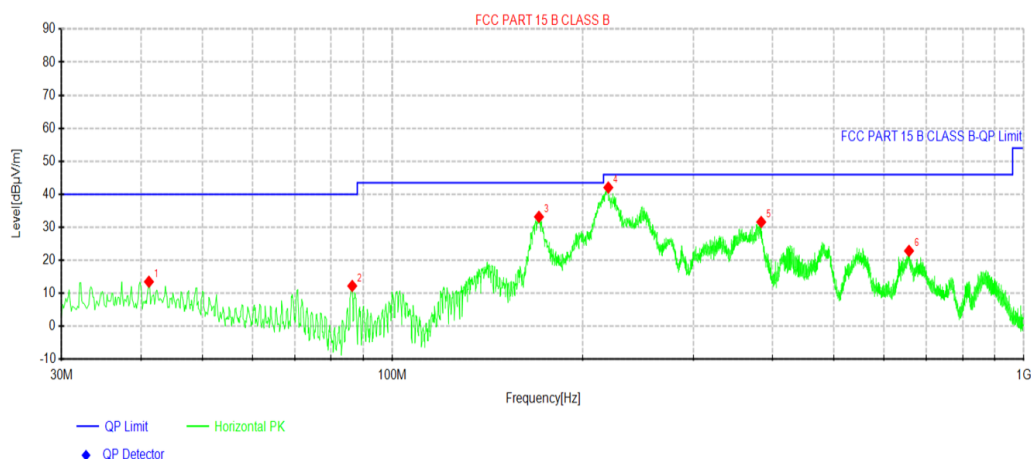
Remark:

- We measured Radiated Emission at GFSK mode from 9 KHz to 25GHz and recorded worst case.
- For below 1GHz testing recorded worst at GFSK low channel.
- Radiated emission test from 9 KHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9 KHz to 30MHz and not recorded in this report.

For 30MHz-1GHz

Horizontal

Test Graph



Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	41.155	30.52	13.53	-16.99	40.00	26.47	100	4	Horizontal
2	86.3812	32.69	12.25	-20.44	40.00	27.75	100	99	Horizontal
3	170.65	54.19	33.18	-21.01	43.50	10.32	100	350	Horizontal
4	219.756	60.88	42.06	-18.82	46.00	3.94	100	350	Horizontal
5	383.807	47.29	31.62	-15.67	46.00	14.38	100	309	Horizontal
6	657.953	34.85	22.87	-11.98	46.00	23.13	100	91	Horizontal

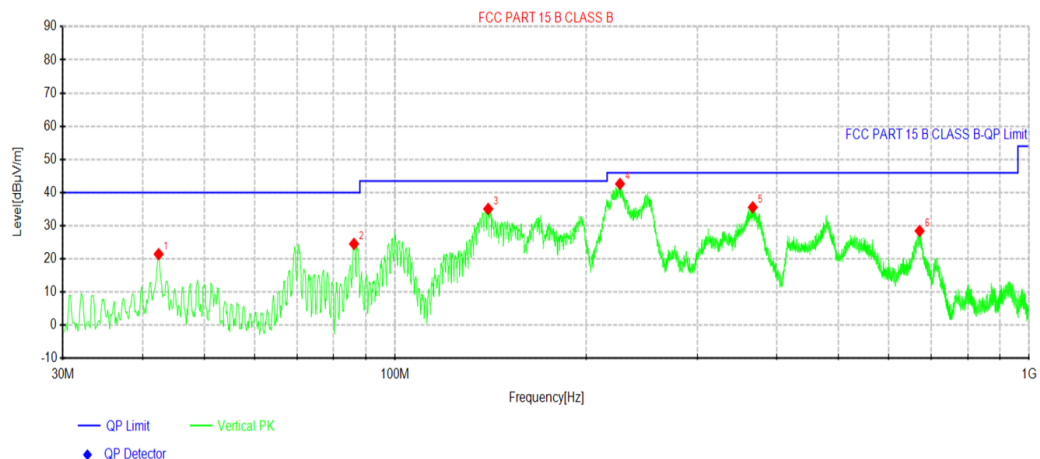
Note:1). Level (dBμV/m) = Reading (dBμV/m) + Factor (dB/m)

2). Factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)

3). Margin (dB) = Limit (dBμV/m) - Level (dBμV/m)

Vertical

Test Graph



Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	42.3675	38.28	21.46	-16.82	40.00	18.54	100	82	Vertical
2	86.1388	45.02	24.55	-20.47	40.00	15.45	100	98	Vertical
3	140.216	56.88	35.09	-21.79	43.50	8.41	100	3	Vertical
4	226.303	61.24	42.64	-18.60	46.00	3.36	100	139	Vertical
5	366.59	51.49	35.59	-15.90	46.00	10.41	100	359	Vertical
6	671.776	40.39	28.44	-11.95	46.00	17.56	100	195	Vertical

Note:1). Level (dBμV/m) = Reading (dBμV/m) + Factor (dB/m)

2). Factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)

3). Margin (dB) = Limit (dBμV/m) - Level (dBμV/m)

For 1GHz to 25GHz

GFSK Mode (above 1GHz)

Frequency(MHz):				2406		Polarity:			HORIZONTAL	
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	2406.00	90.34	PK	114	23.66	56.93	28.79	4.62	0.00	33.41
1	2406.00	82.01	AV	94	11.99	48.60	28.79	4.62	0.00	33.41
2	2390.00	46.02	PK	74	27.98	12.70	28.72	4.60	0.00	33.32
2	2390.00	--	AV	54	--	--	--	--	--	--
3	2400.00	47.68	PK	74	26.32	14.29	28.78	4.61	0.00	33.39
3	2400.00	--	AV	54	--	--	--	--	--	--
4	4812.00	58.11	PK	74	15.89	60.90	33.50	5.92	42.20	-2.79
4	4812.00	49.10	AV	54	4.90	51.89	33.50	5.92	42.20	-2.79
5	5675.75	49.40	PK	74	24.60	52.19	34.79	5.41	42.99	-2.79
5	5675.75	--	AV	54	--	--	--	--	--	--
6	7218.00	50.53	PK	74	23.47	50.51	37.01	6.19	43.18	0.02
6	7218.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):				2406		Polarity:			VERTICAL	
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	2406.00	90.94	PK	114	23.06	57.53	28.79	4.62	0.00	33.41
1	2406.00	82.55	AV	94	11.45	49.14	28.79	4.62	0.00	33.41
2	2390.00	46.85	PK	74	27.15	13.53	28.72	4.60	0.00	33.32
2	2390.00	--	AV	54	--	--	--	--	--	--
3	2400.00	48.45	PK	74	25.55	15.06	28.78	4.61	0.00	33.39
3	2400.00	--	AV	54	--	--	--	--	--	--
4	4812.00	58.56	PK	74	15.44	61.35	33.50	5.92	42.20	-2.79
4	4812.00	49.51	AV	54	4.49	52.30	33.50	5.92	42.20	-2.79
5	5675.75	49.92	PK	74	24.08	52.71	34.79	5.41	42.99	-2.79
5	5675.75	--	AV	54	--	--	--	--	--	--
6	7218.00	51.21	PK	74	22.79	51.19	37.01	6.19	43.18	0.02
6	7218.00	--	AV	54	--	--	--	--	--	--

REMARKS:

1. Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
3. Margin value = Limit value- Emission level.
4. -- Mean the PK detector measured value is below average limit.
5. The other emission levels were very low against the limit.
6. RBW1MHz VBW3MHz Peak detector is for PK value; RBW 1MHz VBW10Hz Peak detector is for AV value.
7. For fundamental frequency, RBW 3MHz VBW 3MHz Peak detector is for PK Value ; RMS detector is for AV value.

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Frequency(MHz):				2440		Polarity:			HORIZONTAL	
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	2440.00	90.62	PK	114	23.38	57.11	28.85	4.65	0.00	33.51
1	2440.00	82.52	AV	94	11.48	49.01	28.85	4.65	0.00	33.51
2	4125.50	45.78	PK	74	28.22	49.58	32.81	5.48	42.09	-3.80
2	4125.50	--	AV	54	--	--	--	--	--	--
3	4880.00	47.42	PK	74	26.58	50.08	33.60	5.95	42.21	-2.66
3	4880.00	--	AV	54	--	--	--	--	--	--
4	5575.25	57.80	PK	74	16.20	60.55	34.77	5.36	42.87	-2.75
4	5575.25	48.75	AV	54	5.25	51.50	34.77	5.36	42.87	-2.75
5	7320.00	48.58	PK	74	25.42	48.08	37.46	6.23	43.19	0.50
5	7320.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):				2440		Polarity:			VERTICAL	
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	2440.00	90.98	PK	114	23.02	57.47	28.85	4.65	0.00	33.51
1	2440.00	83.21	AV	94	10.79	49.70	28.85	4.65	0.00	33.51
2	4125.50	46.46	PK	74	27.54	50.26	32.81	5.48	42.09	-3.80
2	4125.50	--	AV	54	--	--	--	--	--	--
3	4880.00	48.01	PK	74	25.99	50.67	33.60	5.95	42.21	-2.66
3	4880.00	--	AV	54	--	--	--	--	--	--
4	5575.25	58.36	PK	74	15.64	61.11	34.77	5.36	42.87	-2.75
4	5575.25	49.33	AV	54	4.67	52.08	34.77	5.36	42.87	-2.75
5	7320.00	49.05	PK	74	24.95	48.55	37.46	6.23	43.19	0.50
5	7320.00	--	AV	54	--	--	--	--	--	--

REMARKS:

1. Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
3. Margin value = Limit value- Emission level.
4. -- Mean the PK detector measured value is below average limit.
5. The other emission levels were very low against the limit.
6. RBW1MHz VBW3MHz Peak detector is for PK value; RBW 1MHz VBW10Hz Peak detector is for AV value.
7. For fundamental frequency, RBW 3MHz VBW 3MHz Peak detector is for PK Value; RMS detector is for AV value.

Frequency(MHz):				2475		Polarity:			HORIZONTAL	
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	2475.00	90.44	PK	114	23.56	56.83	28.92	4.69	0.00	33.61
1	2475.00	81.58	AV	94	12.42	47.97	28.92	4.69	0.00	33.61
2	2483.50	50.28	PK	74	23.72	16.65	28.93	4.70	0.00	33.63
2	2483.50	--	AV	54	--	--	--	--	--	--
3	2500.00	46.71	PK	74	27.29	13.03	28.96	4.72	0.00	33.68
3	2500.00	--	AV	54	--	--	--	--	--	--
4	4950.00	58.47	PK	74	15.53	61.39	33.81	5.50	42.22	-2.92
4	4950.00	49.55	AV	54	4.45	52.47	33.81	5.50	42.22	-2.92
5	5225.50	50.27	PK	74	23.73	53.03	34.57	5.16	42.48	-2.76
5	5225.50	--	AV	54	--	--	--	--	--	--
6	7425.00	50.83	PK	74	23.17	50.12	37.64	6.27	43.20	0.71
6	7425.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):				2475		Polarity:			VERTICAL	
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	2475.00	91.19	PK	114	22.81	57.58	28.92	4.69	0.00	33.61
1	2475.00	82.02	AV	94	11.98	48.41	28.92	4.69	0.00	33.61
2	2483.50	50.87	PK	74	23.13	17.24	28.93	4.70	0.00	33.63
2	2483.50	--	AV	54	--	--	--	--	--	--
3	2500.00	47.32	PK	74	26.68	13.64	28.96	4.72	0.00	33.68
3	2500.00	--	AV	54	--	--	--	--	--	--
4	4950.00	59.19	PK	74	14.81	62.11	33.81	5.50	42.22	-2.92
4	4950.00	50.09	AV	54	3.91	53.01	33.81	5.50	42.22	-2.92
5	5225.50	50.72	PK	74	23.28	53.48	34.57	5.16	42.48	-2.76
5	5225.50	51.40	PK	74	22.60	50.69	37.64	6.27	43.20	0.71
6	7425.00	51.40	PK	74	22.60	50.69	37.64	6.27	43.20	0.71
6	7425.00	--	AV	54	--	--	--	--	--	--

REMARKS:

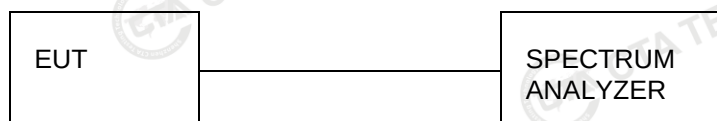
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) - Pre-amplifier Factor
3. Margin value = Limit value - Emission level.
4. -- Mean the PK detector measured value is below average limit.
5. The other emission levels were very low against the limit.
6. RBW1MHz VBW3MHz Peak detector is for PK value; RBW 1MHz VBW10Hz Peak detector is for AV value.
7. For fundamental frequency, RBW 3MHz VBW 3MHz Peak detector is for PK Value; RMS detector is for AV value.

4.3 Occupied Bandwidth Measurement

Limit

N/A

Test Configuration



Test Procedure

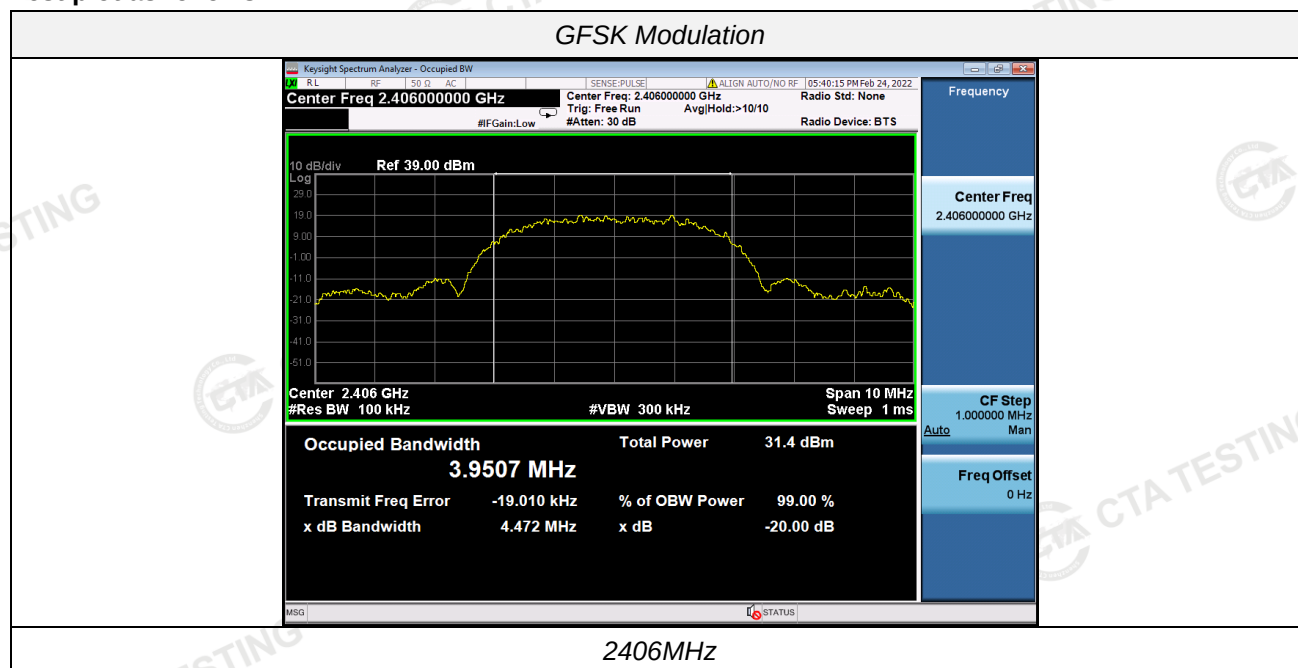
The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 KHz RBW and 300 KHz VBW.

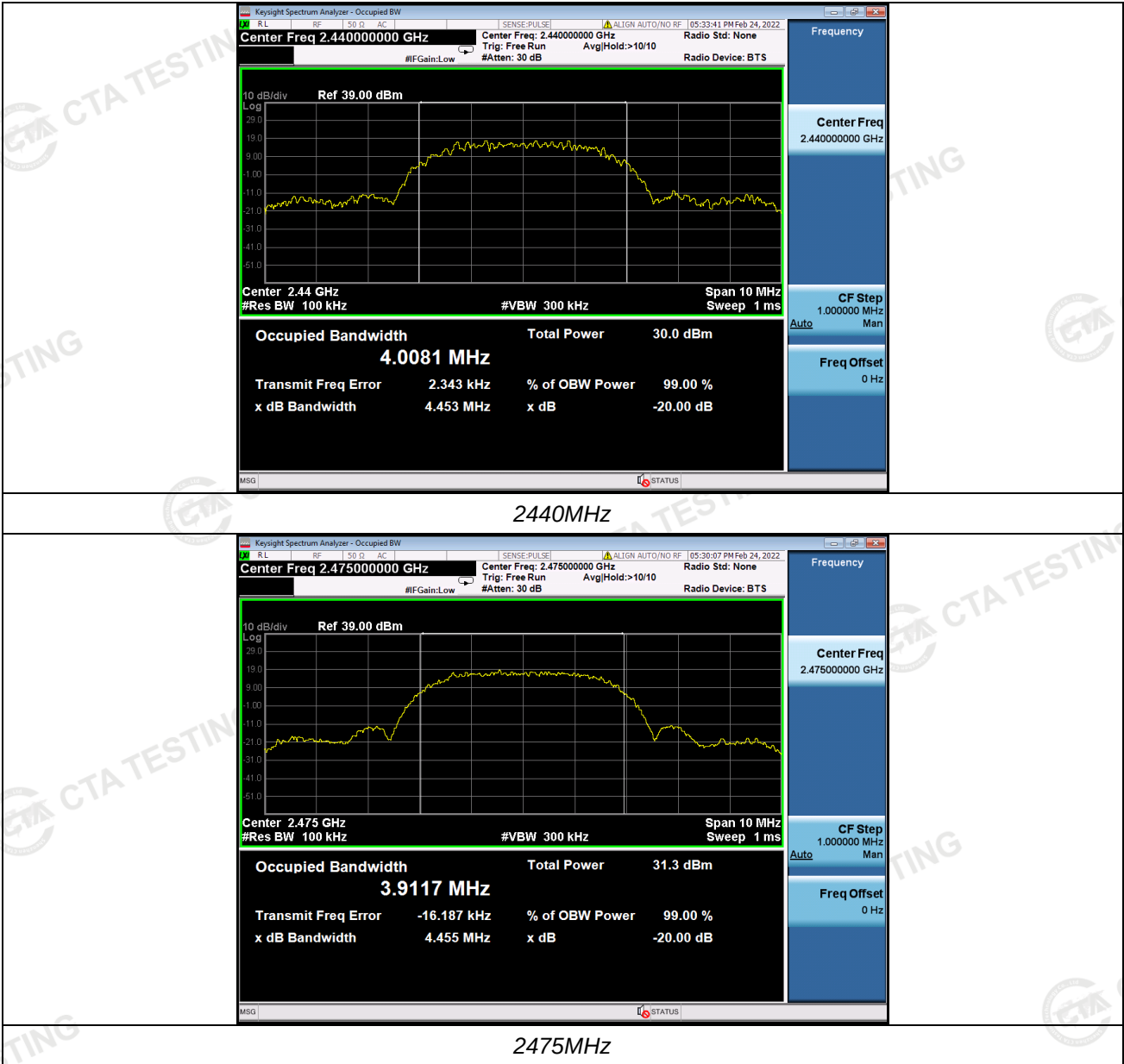
The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

Test Results

Modulation	Channel	99% OBW (MHz)	20dB bandwidth (MHz)	Result
GFSK	CH01	3.9507	4.472	Pass
	CH35	4.0081	4.453	
	CH70	3.9117	4.455	

Test plot as follows:





2440MHz

KeySight Spectrum Analyzer - Occupied BW

RLRF50 D AC

SENSE:PULSE

ALIGN AUTO/NO RF

05:30:07 PM Feb 24, 2022

Center Freq 2.475000000 GHz

Center Freq: 2.475000000 GHz

Trig: Free Run

Avg/Hold:>10/10

Radio Std: None

#FGain:Low

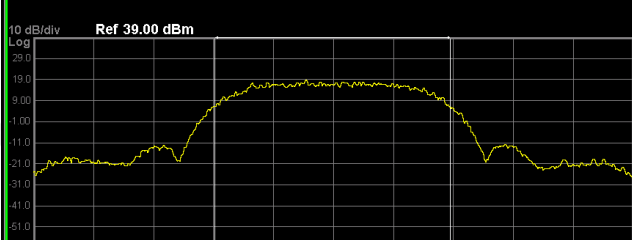
#Atten: 30 dB

Radio Device: BTS

10 dB/div

Log

Ref 39.00 dBm



Center 2.475 GHz

#Res BW 100 kHz

#VBW 300 kHz

Span 10 MHz

Sweep 1 ms

Occupied Bandwidth

3.9117 MHz

Total Power

31.3 dBm

Transmit Freq Error

-16.187 kHz

% of OBW Power

99.00 %

x dB Bandwidth

4.455 MHz

x dB

-20.00 dB

Frequency

Center Freq

2.475000000 GHz

CF Step

1.000000 MHz

Auto

Man

Freq Offset

0 Hz

MSGSTATUS

2475MHz

4.4 Antenna Requirement

Standard Applicable

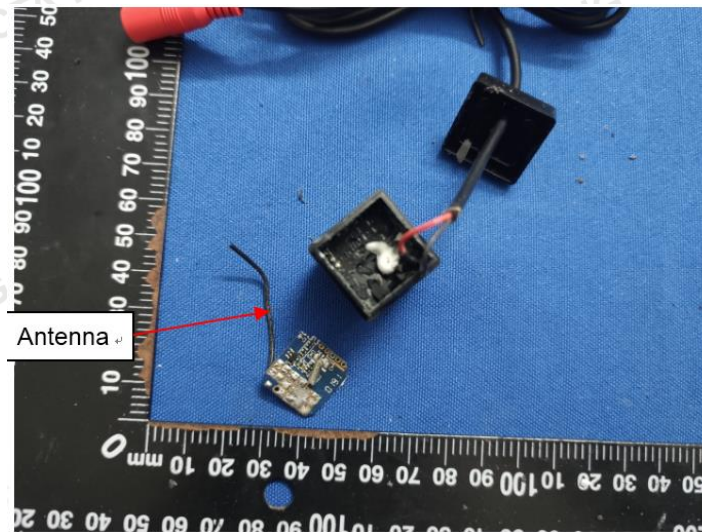
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Refer to statement below for compliance.

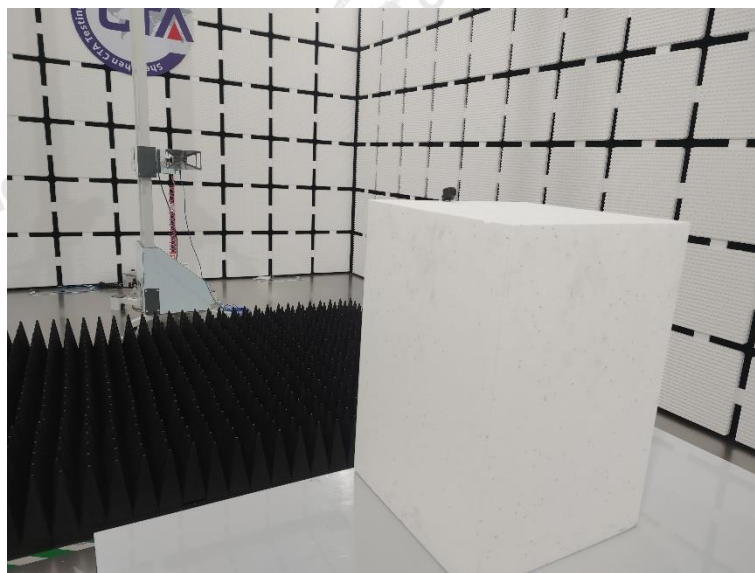
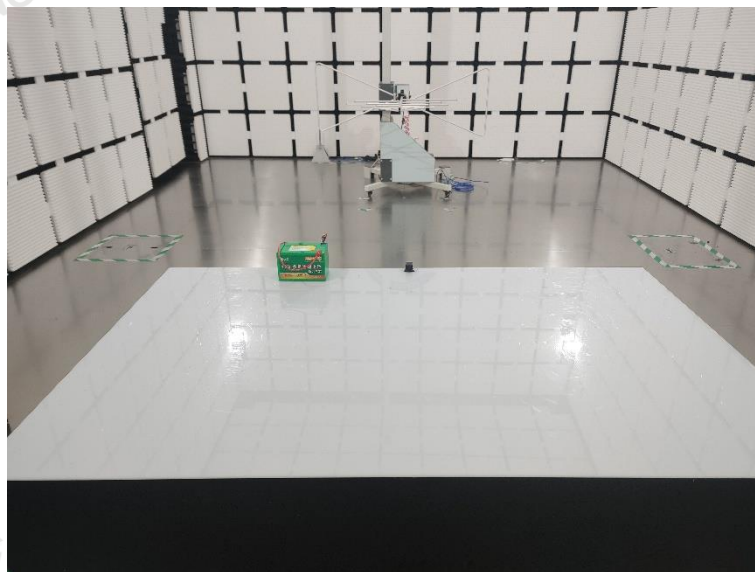
The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

Antenna Connected Construction

The antenna used in this product is an integral Antenna, The directional gains of antenna used for transmitting is 1dBi.



5 Test Setup Photos of the EUT



6 Photos of the EUT

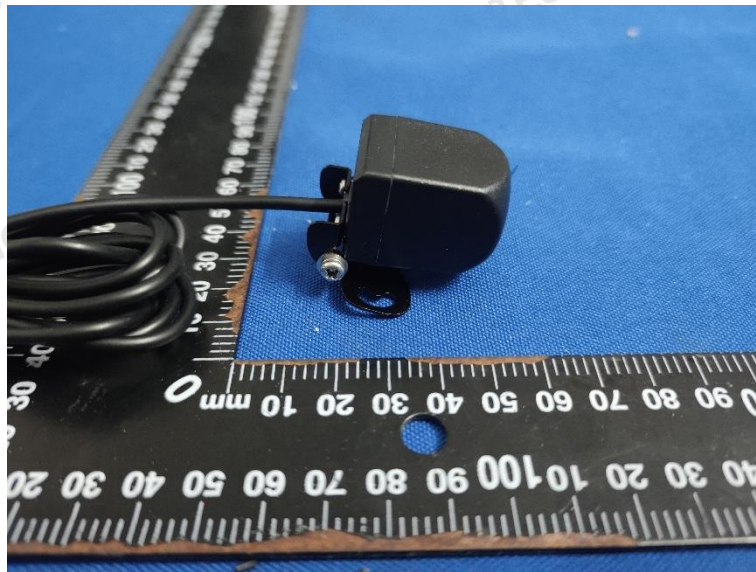
External photos



Shenzhen CTA Testing Technology Co., Ltd.

Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China

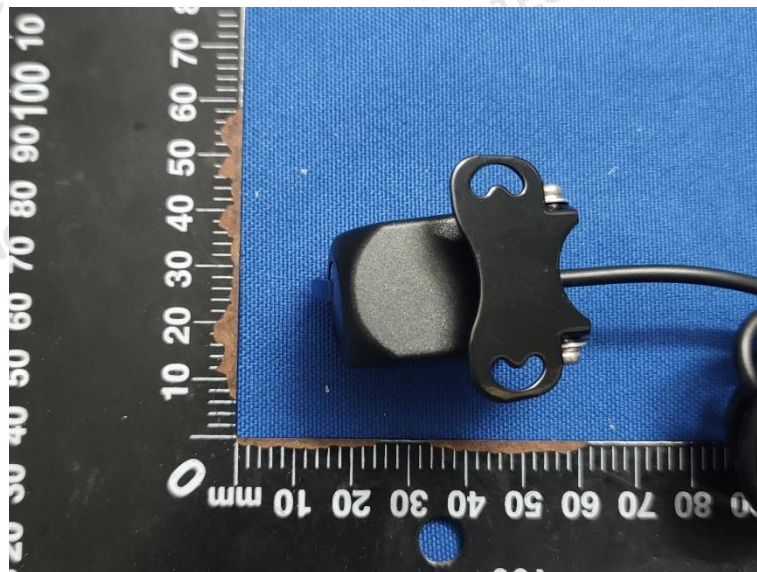
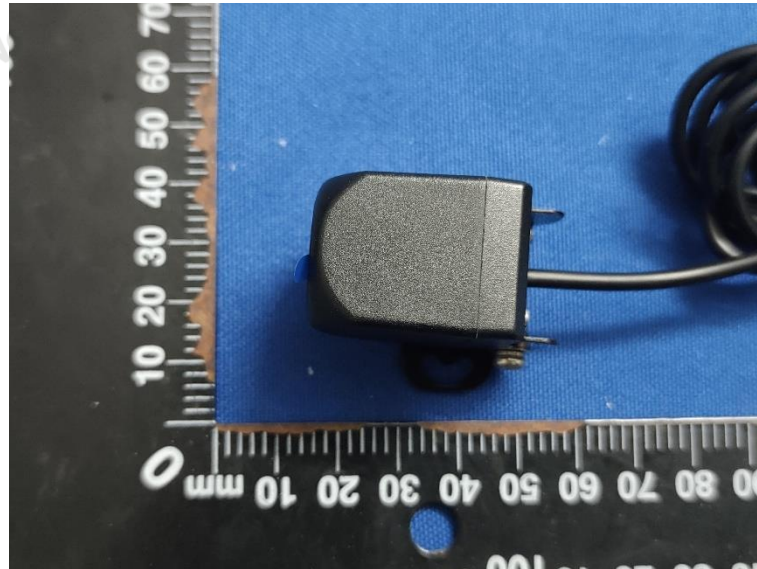
Tel:+86-755 2322 5875 E-mail:cta@cta-test.cn Web:http://www.cta-test.cn

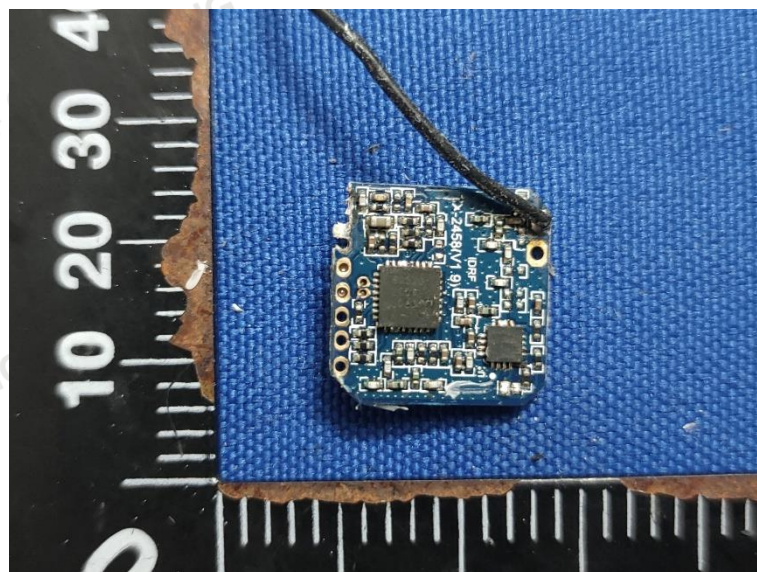
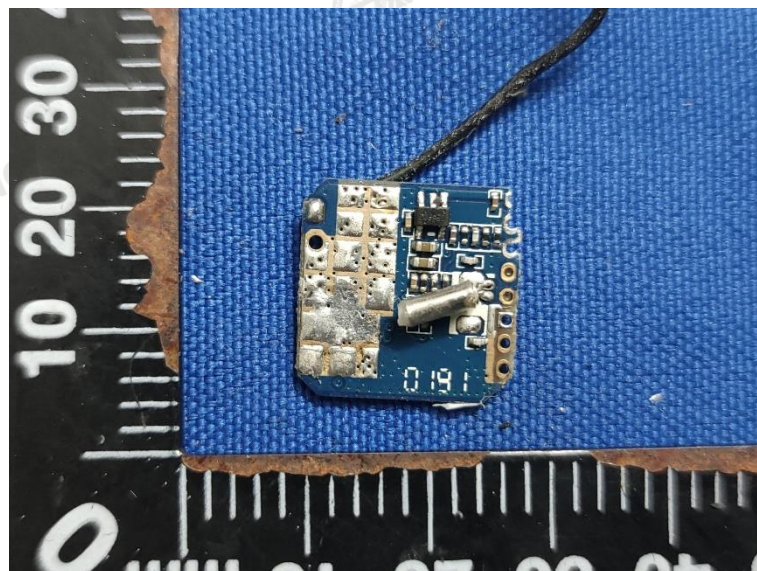
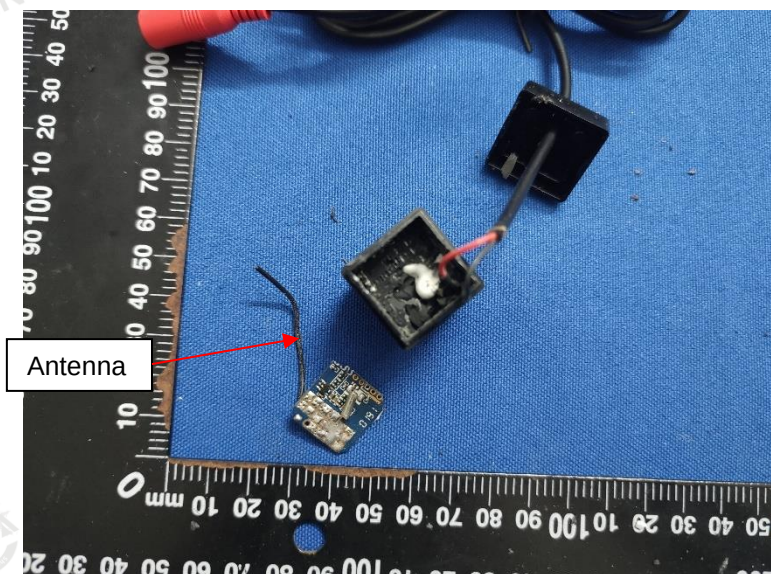


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Internal Photos

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

Shenzhen CTA Testing Technology Co., Ltd.

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