# Shenzhen CTA Testing Technology Co., Ltd.

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

#### FCC PART 15 SUBPART C TEST REPORT

**FCC PART 15.231** 

Report Reference No. ....: CTA24122402301 FCC ID. .....: **2AILYC88HM102** 

Compiled by

( position+printed name+signature) . : File administrators Xudong Zhang

Supervised by

( position+printed name+signature) . : Project Engineer Zoey Cao

Approved by

( position+printed name+signature) . RF Manager Eric Wang

Date of issue .....: Jan. 06, 2025

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

Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Address .....:

Fuhai Street, Bao'an District, Shenzhen, China

Applicant's name .....: JM Sunflower Limited

Rm 109-10, 1st Floor, Stag Building, 148-150 Queen's Road Address .....:

Central, Hong Kong, China

Test specification ....:

FCC Part 15.231 Standard....:

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Test item description....: Rechargeable remote

Trade Mark....: VeDO

Manufacturer .....: JM Sunflower Limited TATESTING

Model/Type reference .....: C88-HM102

Listed Models ....:: N/A Modulation ....:: **ASK** 

433.92MHz Frequency .....

DC 3.7V From battery and DC 5.0V From external circuit Ratings .....:

**PASS** CTATESTIN'

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#### TEST REPORT

CTATESTING **Equipment under Test** Rechargeable remote

Model /Type C88-HM102

N/A **Listed Models** 

CTATESTIN JM Sunflower Limited **Applicant** 

Rm 109-10, 1st Floor, Stag Building, 148-150 Queen's Road Address

Central, Hong Kong, China

JM Sunflower Limited Manufacturer

Address	: Rm 109-10, 1st Floor, Central, Hong Kong, C	Stag Building, 148-150 Queen's Road China
CTATE	:51	NG.
	Test Result:	PASS

The test report merely corresponds to the test sample.

یند re it is not pelaboratory. It is not permitted to copy extracts of these test result without the written permission of the test

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			C/P	



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### 1 TEST STANDARDS

The tests were performed according to following standards:

FCC Rules Part 15.231: Periodic operation in the band 40.66-40.70 MHz and above 70 MHz. ANSI C63.10:2013: American National Standard for Testing Unlicensed Wireless Devices

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### SUMMARY

#### 2.1 General Remarks

2.1 General Remarks		
Date of receipt of test sample	:	Dec. 24, 2024
Testing commenced on		Dec. 24, 2024
	) manage	
Testing concluded on	:	Jan. 06, 2025

#### 2.2 Product Description

	Testing concluded on	: Jan. 06, 2025
	2.2 Product Description	CIA CIA
	Product Name:	Rechargeable remote
CTATE	Model/Type reference:	C88-HM102
	Power supply:	DC 3.7V From battery and DC 5.0V From external circuit
	Testing sample ID:	CTA241224023-1# (Engineer sample), CTA241224023-2#(Normal sample)
	Modulation:	ASK
	Operation frequency:	433.92MHz
	Channel number:	1
	Antenna type:	PCB antenna
	Antenna gain:	0 dBi

2.3 Equipment Under	Test		
Power supply system ut	tilised	TESTING	
Power supply voltage	: O 230V / 50 Hz	○ 120V / 60Hz	7
	○ 12 V DC	O 24 V DC	7
		in blank below)	

# CTATESTING Short description of the Equipment under Test (EUT)

This is a Rechargeable remote.

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

#### 2.5 EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

supplied by the manufacturer

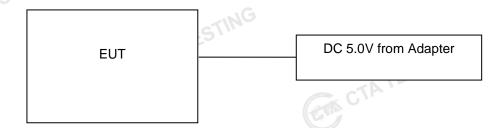
O - supplied by the lab

O Adapter	TING	Model: EP-TA20CBC Input: AC 100-240V 50/60Hz Output: DC 5V 2A
CIP.	CTATES	CTATESTING



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#### 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	on Manufacturer	Model	Technical Parameters	Certificate	Provided by
	/	TES	G	/	
	Marita C		ESTING		

#### 2.8 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for the device filing to comply with Section 15.231 of the FCC Part 15, Subpart C Rules.

#### 2.9 Modifications

No modifications were implemented to meet testing criteria.

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#### 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.

#### Industry Canada Registration Number. Is: 27890 CAB identifier: CN0127

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

#### 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.

#### **Environmental conditions**

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

#### Radiated Emission:

Temperature:	25 ° C
Humidity:	45 %
Atmospheric pressure:	950-1050mbar

#### Conducted testing:

	Atmospheric pressure:	950-1050mbar	
TATE	Conducted testing:		
	Temperature:	25 ° C	
	TATE		NG
	Humidity:	44 %	ESTIN
			CATE
	Atmospheric pressure:	950-1050mbar	,
		1.07 31 2	

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#### Summary of measurement results

FCC and IC Requirements			
FCC Part 15.207	Conducted Emission	PASS	
FCC Part 15.231(a)(2)	Automatically Deactivate	PASS	
FCC Part 15.231(b)	Electric Field Strength of Fundamental Emission	PASS	
FCC Part 15.205 &15.209& 15.231(b)	Electric Field Strength of Spurious Emission	PASS	
FCC Part 15.231(c)	-20dB bandwidth	PASS	

Remark: The measurement uncertainty is not included in the test result.

#### 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	9KHz~30MHz	3.02 dB	(1)	
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)	
Output Peak power	30MHz~18GHz	0.55 dB	(1)	
Power spectral density	/	0.57 dB	(1)	
Spectrum bandwidth	1	1.1%	(1)	
Radiated spurious emission (30MHz-1GHz)	30~1000MHz	4.10 dB	(1)	
Radiated spurious emission (1GHz-18GHz)	1~18GHz	4.32 dB	(1)	
Radiated spurious emission (18GHz-40GHz)	18-40GHz	5.54 dB	(1)	

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

#### **Equipments Used during the Test**

TATESTING

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	2024/08/03	2025/08/02
LISN	R&S	ENV216	CTA-314	2024/08/03	2025/08/02
EMI Test Receiver	R&S	ESPI	CTA-307	2024/08/03	2025/08/02
EMI Test Receiver	R&S	ESCI	CTA-306	2024/08/03	2025/08/02
Spectrum Analyzer	Agilent	N9020A	CTA-301	2024/08/03	2025/08/02

					-4	ATES !!
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	Spectrum Analyzer	R&S	FSU	CTA-337	2024/08/03	2025/08/02
	Vector Signal generator	Agilent	N5182A	CTA-305	2024/08/03	2025/08/02
	Analog Signal Generator	R&S	SML03	CTA-304	2024/08/03	2025/08/02
	WIDEBAND RADIO COMMUNICATION TESTER	CMW500	R&S	CTA-302	2024/08/03	2025/08/02
	Temperature and humidity meter	Chigo	ZG-7020	CTA-326	2024/08/03	2025/08/02
	Ultra-Broadband Antenna	Schwarzbeck	VULB9163	CTA-310	2023/10/17	2026/10/16
	Horn Antenna	Schwarzbeck	BBHA 9120D	CTA-309	2023/10/13	2026/10/12
CTATE	Loop Antenna	Zhinan	ZN30900C	CTA-311	2023/10/17	2026/10/16
,	Horn Antenna	Beijing Hangwei Dayang	OBH100400	CTA-336	2023/10/17	2026/10/16
	Amplifier	Schwarzbeck	BBV 9745	CTA-312	2024/08/03	2025/08/02
	Amplifier	Taiwan chengyi	EMC051845B	CTA-313	2024/08/03	2025/08/02
	Directional coupler	NARDA	4226-10	CTA-303	2024/08/03	2025/08/02
	High-Pass Filter	XingBo	XBLBQ-GTA18	CTA-402	2024/08/03	2025/08/02
	High-Pass Filter	XingBo	XBLBQ-GTA27	CTA-403	2024/08/03	2025/08/02
	Automated filter bank	Tonscend	JS0806-F	CTA-404	2024/08/03	2025/08/02
	Power Sensor	Agilent	U2021XA	CTA-405	2024/08/03	2025/08/02
	Amplifier	Schwarzbeck	BBV9719	CTA-406	2024/08/03	2025/08/02
		T		Town trains		-
	Test Equipment	Manufacturer	Model No.	Version number	Calibration Date	Calibration Due Date
	FMI Took Coffus	Tanasand	TC@ IC22 DE	5000	NI/A	NI/A

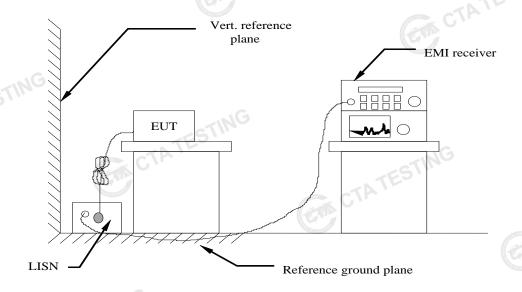
	Test Equipment	Manufacturer	Model No.	Version number	Calibration Date	Calibration Due Date
CTATE	EMI Test Software	Tonscend	TS®JS32-RE	5.0.0.2	N/A	N/A
;	EMI Test Software	Tonscend	TS®JS32-CE	5.0.0.1	N/A	N/A
	RF Test Software	Tonscend	TS®JS1120-3	3.1.65	N/A	N/A
	RF Test Software	Tonscend	TS®JS1120	3.1.46	N/A	N/A

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### TEST CONDITIONS AND RESULTS

#### 4.1 AC Power Conducted Emission

#### **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 The EUT received DC 12V power from adapter, the adapter received AC120V/60Hz and AC 240V/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.

#### **AC Power Conducted Emission Limit**

For intentional device, according to § 15.207(a) AC Power Conducted Emission Limits is as following:

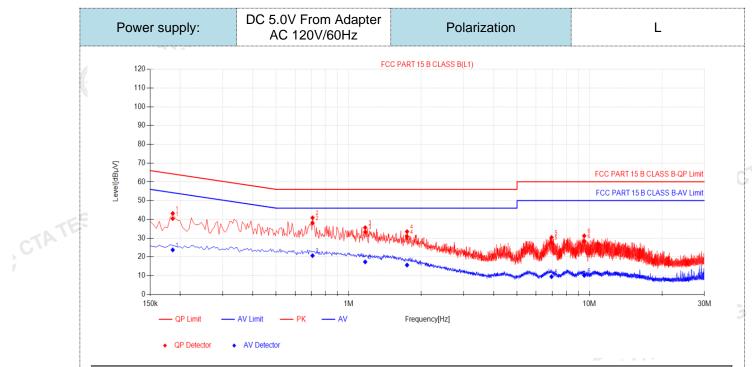
Eroguanav rand	70 (MHz)	Limit	(dBuV)
Frequency rang	je (IVII 12)	Quasi-peak	Average
0.15-0.	5	66 to 56*	56 to 46*
0.5-5		56	46
5-30		G 60	50
* Decreases with the loga	arithm of the frequency	ESTIN	
TEST RESULTS	CTA CTA		TESTING
Remark:			

#### **TEST RESULTS**

#### Remark:

1. Both 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz power supply have been tested, only the worst result of 120 VAC, 60 Hz was reported as below:

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Fina	l Data Lis	st										
NO.	Freq. [MHz]	Factor [dB]	QP Reading[dB μV]	QP Value [dBµV]	QP Limit [dΒμV]	QP Margin [dB]	AV Reading [dBμV]	ΑV Value [dBμV]	AV Limit [dΒμV]	AV Margin [dB]	Verdict	
1	0.186	10.03	30.39	40.42	64.21	23.79	13.69	23.72	54.21	30.49	PASS	
2	0.708	9.91	28.17	38.08	56.00	17.92	10.76	20.67	46.00	25.33	PASS	
3	1.1715	9.90	23.35	33.25	56.00	22.75	7.43	17.33	46.00	28.67	PASS	
4	1.7475	9.91	20.91	30.82	56.00	25.18	5.75	15.66	46.00	30.34	PASS	
5	6.9585	10.29	17.52	27.81	60.00	32.19	-0.81	9.48	50.00	40.52	PASS	
6	9.51	10.26	18.16	28.42	60.00	31.58	-0.10	10.16	50.00	39.84	PASS	
Note:1).QP Value (dBμV)= QP Reading (dBμV)+ Factor (dB)  2). Factor (dB)=insertion loss of LISN (dB) + Cable loss (dB)  3). QPMargin(dB) = QP Limit (dBμV) - QP Value (dBμV)  4). AVMargin(dB) = AV Limit (dBμV) - AV Value (dBμV)										C/TA		

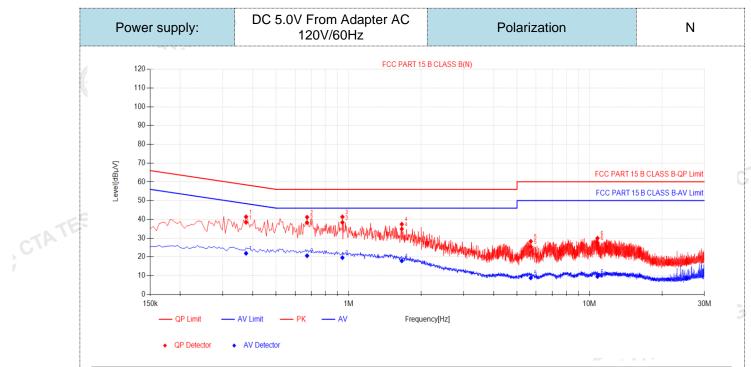
- 2). Factor (dB)=insertion loss of LISN (dB) + Cable loss (dB)
- 3). QPMargin(dB) = QP Limit (dB $\mu$ V) QP Value (dB $\mu$ V)

CTATE

4). AVMargin(dB) = AV Limit (dBμV) - AV Value (dBμV) CTA TESTING



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NO.	Freq. [MHz]	Factor [dB]	QP Reading[dB μV]	QP Value [dBµV]	QP Limit [dΒμV]	QP Margin [dB]	AV Reading [dBμV]	ΑV Value [dBμV]	ΑV Limit [dBμV]	AV Margin [dB]	Verdict
1	0.375	9.90	28.50	38.40	58.39	19.99	12.00	21.90	48.39	26.49	PASS
2	0.672	10.08	28.12	38.20	56.00	17.80	10.53	20.61	46.00	25.39	PASS
3	0.942	10.12	28.26	38.38	56.00	17.62	9.46	19.58	46.00	26.42	PASS
4	1.662	10.15	24.74	34.89	56.00	21.11	7.76	17.91	46.00	28.09	PASS
5	5.703	10.20	15.22	25.42	60.00	34.58	-1.41	8.79	50.00	41.21	PASS
6	10.7925	10.40	17.17	27.57	60.00	32.43	-0.84	9.56	50.00	40.44	PASS
Note:1).QP Value (dBμV)= QP Reading (dBμV)+ Factor (dB)  2). Factor (dB)=insertion loss of LISN (dB) + Cable loss (dB)  3). QPMargin(dB) = QP Limit (dBμV) - QP Value (dBμV)  4). AVMargin(dB) = AV Limit (dBμV) - AV Value (dBμV)											

- 2). Factor (dB)=insertion loss of LISN (dB) + Cable loss (dB)
- 3). QPMargin(dB) = QP Limit (dB $\mu$ V) QP Value (dB $\mu$ V)

CTATE

4). AVMargin(dB) = AV Limit (dBμV) - AV Value (dBμV) CTATESTING

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#### 4.2 Radiated Emission

#### Limit

For intentional device, according to 15.209(a) the general requirement of field strength of radiated emission from intentional radiators at a distance of 3 meters shall not exceed the following table.

	Frequency (MHz)	Distance (Meters)	Radiated (dBµV/m)	Radiated (µV/m)
	0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)	2400/F(KHz)
	0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)	24000/F(KHz)
	1.705-30	3	20log(30)+ 40log(30/3)	30
	30-88	3	40.0	100
	88-216	3	43.5	150
CTATE	216-960	3	46.0	200
	Above 960	3	54.0	500
,	la addition to the provi	siana of 45 004/b) that	ald atvanath of aminaiana from intentional r	

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

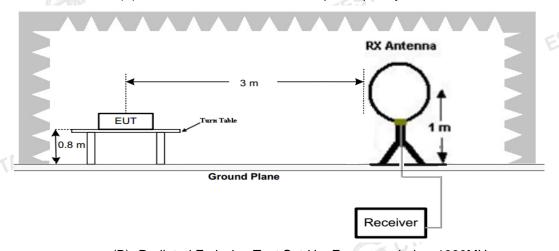
Funda- mental fre- quency (MHz)	Field strength of funda- mental (microvolts/ meter)	Field strength of spurious emissions (microvolts/meter)
40.66– 40.70.	2,250	225
70-130	1,250	125
130-174	<sup>1</sup> 1,250 to 3,750	<sup>1</sup> 125 to 375
174-260	3,750	375
260-470	<sup>1</sup> 3,750 to 12,500	<sup>1</sup> 375 to 1,250
Above 470	12,500	1,250

<sup>&</sup>lt;sup>1</sup> Linear interpolations.

[Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 260-470 MHz, 20\*log(41.6667\*433.920-7083.3333)=80.83dBuV/m The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]

#### **TEST CONFIGURATION**

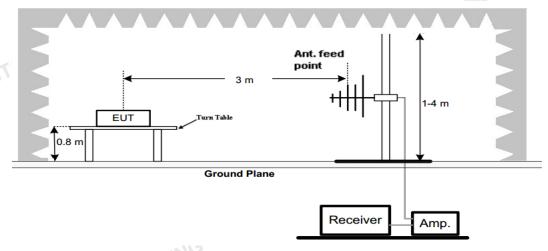
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



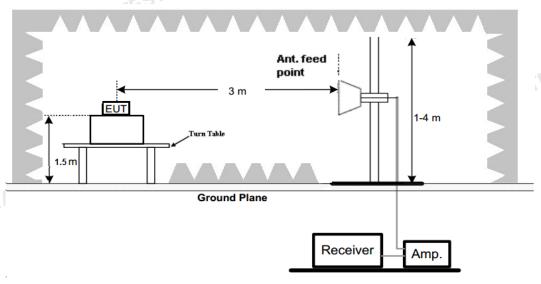
(B) Radiated Emission Test Set-Up, Frequency below 1000MHz

TESTING

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



#### **Test Procedure**

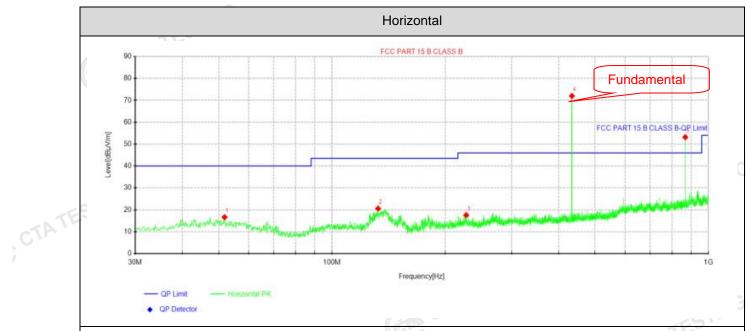
- Below 1GHz measurement the EUT is placed on a turntable which is 0.8m above ground plane, and above 1GHz measurement EUT was placed on a low permittivity and low loss tangent turn table which is 1.5m above ground plane.
- 2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0°C to 360°C to acquire the highest emissions from EUT
- And also, each emission was to be maximized by changing the polarization of receiving antenna both CTATESTING 3. horizontal and vertical.
- Repeat above procedures until all frequency measurements have been completed. 4.
- There were no emissions found below 30MHz within 20dB of the limit. 5.

#### **TEST RESULTS**

The emissions from 30MHz to 5GHz are measured peak and average level, below 1 GHz measured QP level, detailed test data please see below. Besides, we tested 3 directions and recorded the worst data.

Note: We tested all Modes and recorded the worst case as follow. CTATES

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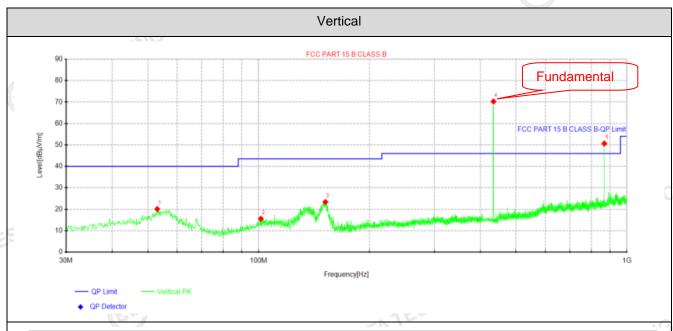


						H.Achan				
Su	ıspe	ected Data	List							
N	Ο.	Freq. [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
•	1	51.825	27.92	16.63	-11.29	40.00	23.37	100	115	Horizontal
2	2	132.577	36.84	20.56	-16.28	43.50	22.94	100	185	Horizontal
	3	227.273	30.03	17.58	-12.45	46.00	28.42	100	360	Horizontal
4	4	433.92	82.15	71.96	-10.19	46.00	-25.96	100	290	Horizontal
	5	867.84	56.31	53.11	-3.20	46.00	-7.11	100	208	Horizontal

	Emission Styles	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	PK Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Direction (H)
TES	Fundamental	433.92	82.15	-10.19	71.96	100.83	28.87	PK	Н
CTA	Harmonics	867.84	56.31	<sup>-3.20</sup>	53.11	80.83	27.72	PK	Н
1	Harmonics	1301.76	63.77	-20.17	43.6	74.00	30.40	PK	Н
		C				ESTIN	1		

Emission Styles	Frequency (MHz)	PK Level (dBuV/m)	AV Factor (dB/m)	AV Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Direction (H)
Fundamental	433.92	71.96	-4.18	67.78	80.83	13.05	Н
Harmonics	867.84	53.11	-4.18	48.93	60.83	11.90	Н
Harmonics	1301.76	43.60	-4.18	39.42	54.00	14.58	Н
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211									
Suspe	ected Data	List							
NO.	Freq. [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	53.0375	31.48	20.09	-11.39	40.00	19.91	100	24	Vertical
2	101.416	28.54	15.57	-12.97	43.50	27.93	100	327	Vertical
3	151.735	38.88	23.38	-15.50	43.50	20.12	100	291	Vertical
4	433.92	80.43	70.24	-10.19	46.00	-24.24	100	357	Vertical
5	867.84	53.86	50.66	-3.20	46.00	-4.66	100	82	Vertical

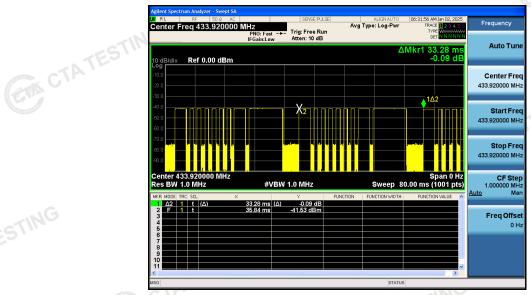
	Emission Styles	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	PK Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Direction (V)
	Fundamental	433.920	80.43	-10.19	70.24	100.83	30.59	PK	V
TES	Harmonics	867.84	53.86	-3.2	50.66	80.83	30.17	PK	V
CTATE	Harmonics	1301.76	64.65	-20.17	44.48	74.00	29.52	PK	V
Ĩ			TES						

Harmonics	1301.76	04.03	-20.17	14.40	74.00	29.52	FIX	V
CTATES								
Emission Styles	Frequency (MHz)	PK Level (dBuV/m)	AV Factor (dB/m)	AV Level (dBuV/m	(dE	Limit BuV/m)	Margin (dB)	Direction (V)
Fundamental	433.92	70.24	-4.18	66.06	8	80.83	14.77	V
Harmonics	867.84	50.66	-4.18	46.48	6	80.83	14.35	V
Harmonics	1301.76	44.48	-4.18	40.3	5	54.00	13.70	٧

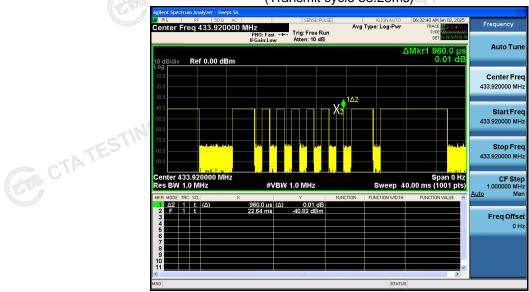
#### Note:

- --: The other emission levels were very low against the limit.
- 1. Level (dBuV/m)= Reading (dBuV)+Factor(dB/m)
- 2. AV Level (dBuV/m)= PK Level (dBuV/m)+ AV Factor(dB)
- 3. In a transmit cycle 100ms period found burst 35pcs, the Duty Cycle can calculate as below: Duty Cycle= (0.960\*6+2.960\*2+8.880\*1)/33.28=20.56/33.28=0.6178 AV Factor=20\*log(Duty Cycle)=20\*log(0.6178)=-4.18

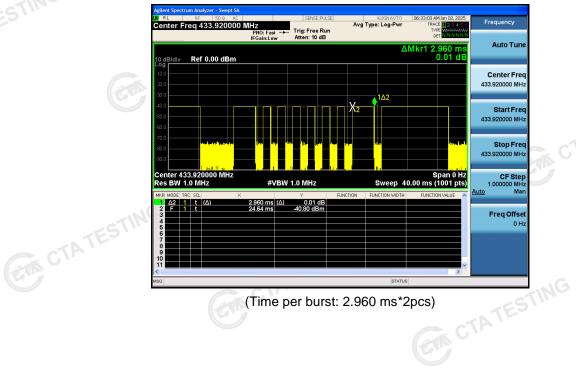
(The plot of Duty Cycle See the follow page)



(Transmit cycle 33.28ms)

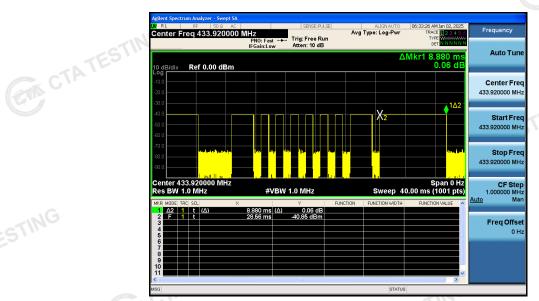


(Time per burst: 0.960ms\*6pcs)



(Time per burst: 2.960 ms\*2pcs)

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(Time per burst: 8.880 ms\*1pcs)

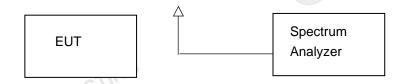
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#### 4.3 20dB Bandwidth

#### **Limit**

According to 47 CFR 15.231(c) The bandwidth of the emission shall be no wider than 0.25% of the centre frequency for devices operating above 70MHz and below 900MHz. Bandwidth is determined at the points 20dB down from the modulated carrier.

#### **Test Configuration**



# CTATESTING **Test Procedure**

The 20dB bandwidth and 99% bandwidth is measured with a spectrum analyzer connected via a receive antenna placed near the EUT while the EUT is operating in transmission mode.

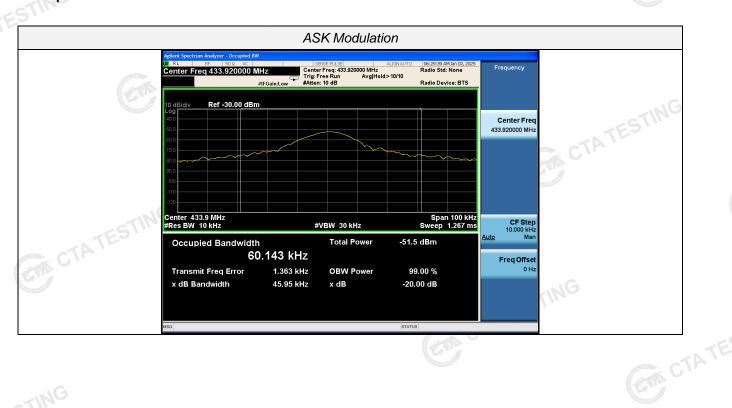
The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

The occupied bandwidth (OBW), that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.

#### **Test Results**

est Results		-4A	LES,	-16		_
Modulation	Channel Frequency (MHz)	99% OBW (KHz)	20dB bandwidth (KHz)	Limit (KHz)	Result	
ASK	433.92	60.143	45.95	0.25%*433.92*1000=1084.8	Pass	TP.

#### Test plot as follows:



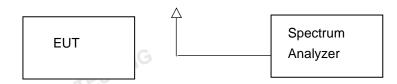
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#### **Deactivation Time** 4.4

#### Limit

According to FCC §15.231(a)(2), A transmitter activated automatically shall cease transmission within 5 CTATEST seconds after activation.

#### **Test Configuration**



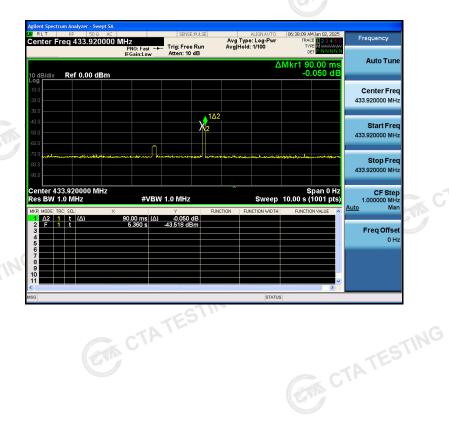
#### **Test Procedure**

- The EUT was placed on a wooded table which is 0.8m height and close to receiver antenna of spectrum analyzer.
- 2. The spectrum analyzer resolution bandwidth was set to 1 MHz and video bandwidth was set to 1 MHz to encompass all significant spectral components during the test. The spectrum analyzer was operated in linear scale and zero span mode after tuning to the transmitter carrier frequency.

#### **TEST RESULTS**

Note: The transmitter was automatically activated, and the carrier frequency 433.92MHz:

One transmission time (S)	Limit(S)	Result	
0.090	5	Pass	
	CAN.		
RLT RF 50.Ω AC SENSE:PULSE	Aug Type: Log-Pwr TRACE 1 2 3 4 5 7 Avg Hold: 1/100 Tree 1  Avg Hold: 1/100 Tr	ncy	
	glient Spectrum Analyzer - Swept SA  RRT RF SO AC  Center Freq 433,920000 MHz  PNO: Fast Trig: Free Run	(S)  0.090  5  RET RF SO AC MHZ SENSERUSE AUGNANTO 06:38:09 AM Jin 02, 2025 PRO; Freque PRO; Fast	(S)  O.090  5  Pass  Result  O.090  Frequency  Program Analyzer - Swept SA  RRIT RF 500 AC  Center Freq 4333.920000 MHz  PROgram Arg Type: Log-Pwr React  Avg Type: Log-Pwr







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#### 4.5 Antenna Requirement

#### **Standard Applicable**

According to FCC Part 15C 15.203

- a) An intentional radiator shall be de-signed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.
- b) The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

#### 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 a PCB Antenna, The directional gains of antenna used for transmitting is 0 dBi

Remark: The antenna gain is provided by the customer, if the data provided by the customer is not accurate, Shenzhen CTA Testing Technology Co., Ltd. does not assume any responsibility.

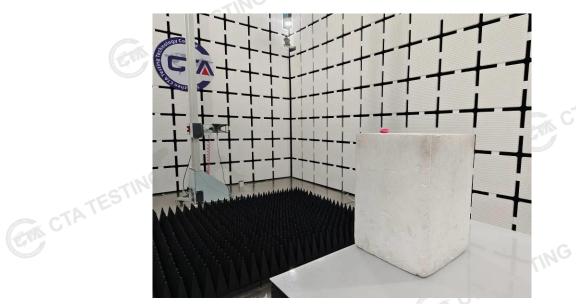


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# 5 Test Setup Photos of the EUT







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# 6 Photos of the EUT





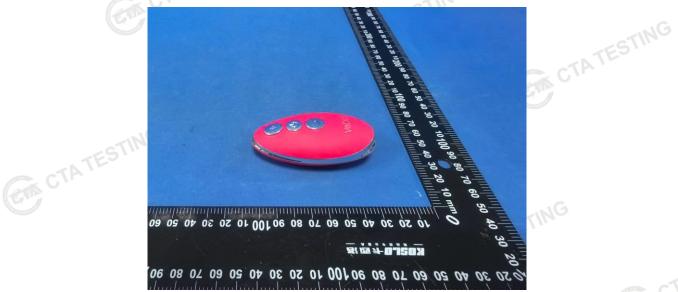
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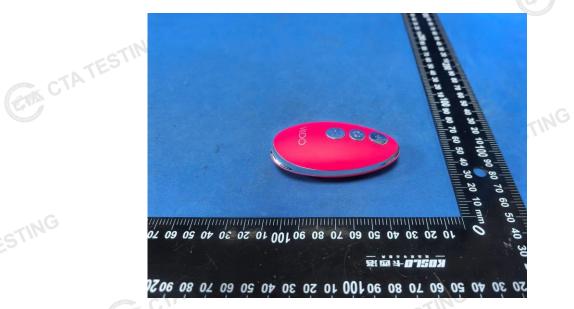






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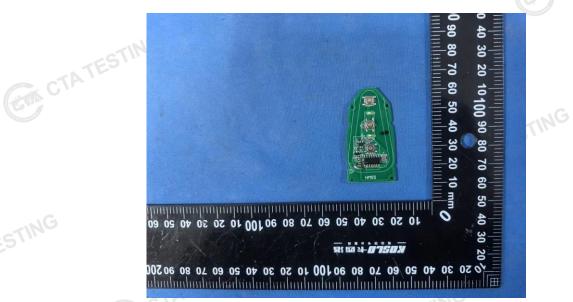




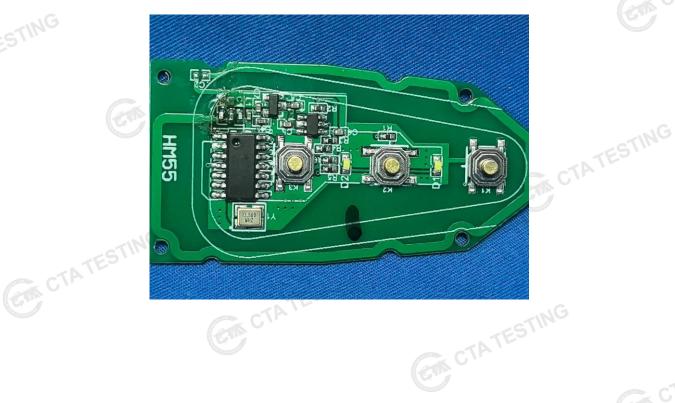


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