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 Rules and Regulations Part PART 15.249

Report Reference No...... CTA21111200302

FCC ID...... 2AIXF-MK280

Compiled by

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Date of issue.....: Nov.12, 2021

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

Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community,

Fuhai Street, Bao'an District, Shenzhen, China

Applicant's name...... ENPING RUOCA ELECTRONICS CO.,LTD

ENPING GARDEN, ENPING CITY, GUANGDONG, CHINA

Test specification:

Standard FCC Part 15.249

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Test item description: WIRELESS MICROPHONE

Trade Mark N/A

Manufacturer ENPING RUOCA ELECTRONICS CO.,LTD

Model/Type reference.....: MK280

RC-U8019,RC-U8021,RC-U8090,RC-U6003,RC-U9500,MK240-1,

Listed Models: MK240-2,MK202,RC-U8018,RC-U6011,RC-U8090,RC-U8022,RC-

U8023, RC-U8024, RC-U8025, RC-U8026

Modulation: FM

Ratings DC 3.0V From Battery

Result.....: PASS

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TEST REPORT

Equipment under Test WIRELESS MICROPHONE

MK280 Model /Type

Listed Models

PCB board, structure and internal of these model(s) are the same, Model Declaration

So no additional models were tested.

RC-U8019,RC-U8021,RC-U8090,RC-U6003,RC-U9500,MK240-

1, MK240-2, MK202, RC-U8018, RC-U6011, RC-U8090, RC-U8022,

RC-U8023, RC-U8024, RC-U8025, RC-U8026

Applicant : ENPING RUOCA ELECTRONICS CO.,LTD

: NO.A3 DISTRICT JIANGMEN INDUSTRIAL TRANSFER PARK Address

ENPING GARDEN, ENPING CITY, GUANGDONG, CHINA

Manufacturer : ENPING RUOCA ELECTRONICS CO.,LTD

: NO.A3 DISTRICT JIANGMEN INDUSTRIAL TRANSFER PARK Address

ENPING GARDEN, ENPING CITY, GUANGDONG, CHINA

-71	NG	
CTATES	Test Result:	PASS

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:

CTATESTING CTATE 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

ANSI C63.4: 2014: - American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40GHz CTATESTING Range of 9 kHz to 40GHz

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2. SUMMARY

2.1. General Remarks

2.1. General Remarks		CTATESTING	
Date of receipt of test sample		Nov. 01, 2021	TESI
		<u></u>	CTA
Testing commenced on	:	Nov. 01, 2021	
G		N. 40.0004	
Testing concluded on	:	Nov. 12, 2021	

2.2. Product Description

Name of EUT	WIRELESS MICROPHONE
Model Number	MK280
Power Rating	DC 3V from battery
Hardware version:	V1.0
Software version:	V1.0
Sample ID:	CTA21111200302-1#(Engineer sample)
Cample ID.	CTA21111200302-2#(Normal sample)
WIRELESS MICROPHONE	
Operation frequency	904.3-919.7MHz
Modulation	FMA
Antenna Type	Internal Antenna
Antenna Gain	0.00 dBi
2.3. Equipment Under Test	CON C.
Power supply system utilised	

2.3. Equipment Under Test

Power supply system utilised

Power supply voltage		0	230V / 50 Hz	0	120V / 60Hz
-67	1	0	12 V DC	0	24 V DC
TATES		•	Other (specified in blank bel	ow))

DC 3.0V from battery

2.4. Short description of the Equipment under Test (EUT)

This is a WIRELESS MICROPHONE

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

2.5. EUT operation mode

The Applicant use Key to control the EUT for staying in continuous transmitting and receiving mode for testing .There is 100 channels provided to the EUT. Channel Low, Mid and High was selected to test.

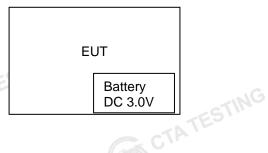
Channel	Frequency (MHz)	
01	904.30	
02	911.30	
03	914.90	
04	919.70	

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Test frequency:

Channel	Frequency (MHz)
01	904.30
02	911.30
04	919.70

2.6. Block Diagram of Test Setup



2.7. **Modifications**

No modifications were implemented to meet testing criteria.

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3. TEST ENVIRONMENT

Shenzhen CTA Testing Technology Co., Ltd.
Room 106, Building 1, Yibaolai Industria 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:		25 ° C
	75-110	-TA
Humidity:		45 %
	The same of the sa	
Atmospheric pressure:		950-1050mbar

Conducted testing:

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

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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 15.209	Band edge	PASS
FCC Part 15.215(c)	20dB bandwidth	PASS
FCC Part 15.207	Conducted Emission	N/A
FCC Part 15.203	Antenna Requirement	PASS

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	4.10 dB	(1)
Radiated Emission	1~18GHz	4.32 dB	(1)
Radiated Emission	18-40GHz	5.54 dB	(1)
Conducted Disturbance	0.15~30MHz	3.12 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	Chigo	ZG-7020	CTA-326	2021/08/06	2022/08/05

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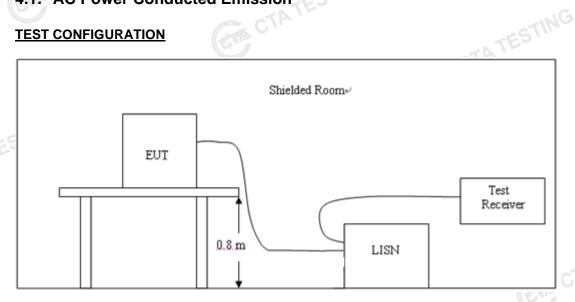
humidity meter	C				
Ultra-Broadband Antenna	Schwarzbeck	VULB9163	CTA-310	2021/08/07	2022/08/06
Horn Antenna	Schwarzbeck	BBHA 9120D	CTA-309	2021/08/07	2022/08/06
Loop Antenna	Zhinan	ZN30900C	CTA-311	2021/08/07	2022/08/06
Horn Antenna	Beijing Hangwei Dayang	OBH100400	CTA-336	2021/08/06	2022/08/05
Amplifier	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
Note: The Cal.Interval	was one year.	CIP.		2021/06/06	ATEST

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4. 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.
- 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 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.

AC Power Conducted Emission Limit

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

Frequency range (MHz)	Limit (dBuV)				
Frequency range (MHz)	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	uency.				

TEST RESULTS

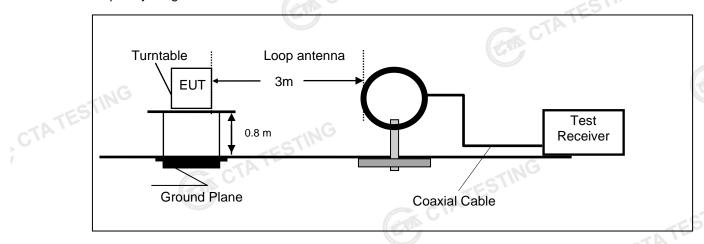
Not applicable.

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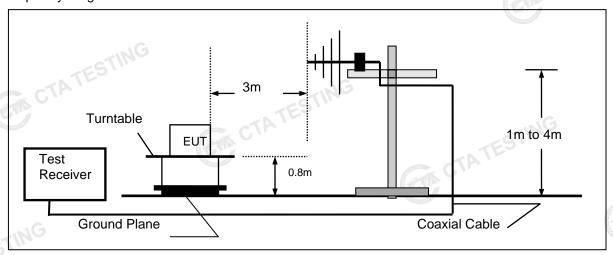
4.2. Radiated Emission and Band Edges

TEST CONFIGURATION

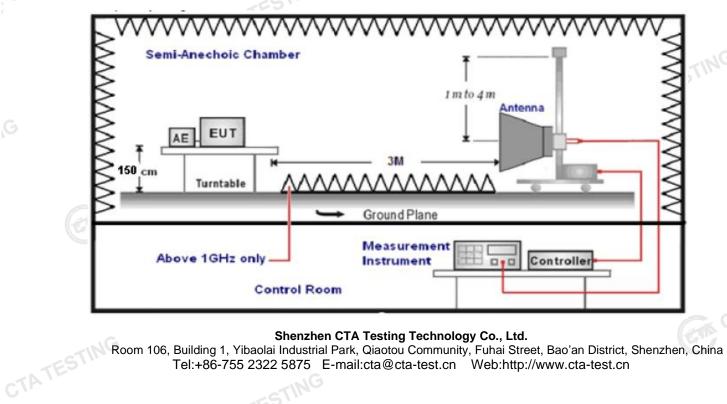
Frequency range 9 KHz - 30MHz



Frequency range 30MHz - 1000MHz



Frequency range above 1GHz-25GHz



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TEST PROCEDURE

- The EUT was placed on a turn table which is 0.8m above ground plane when testing frequency range 9 KHz -25GHz.
- 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.
- 3. 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.
- The EUT minimum operation frequency was 26MHz and maximum operation frequency was 1910MHz.so 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	Ultra-Broadband Antenna	3
1GHz-18GHz	Double Ridged Horn Antenna	3
18GHz-25GHz	Horn Anternna	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

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

١	Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	C

Transd=AF +CL-AG

RADIATION LIMIT

According 15.249, the field strength of emissions from intentional radiators operated within 902MHz-928 MHz shall not exceed 94dBµV/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 in §15.209, whichever is the lesser attenuation.

In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

Radiated emission limits

	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				
	216-960	3	46.0	200				
	Above 960	3	54.0	500				
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								
CALL		ESTING						

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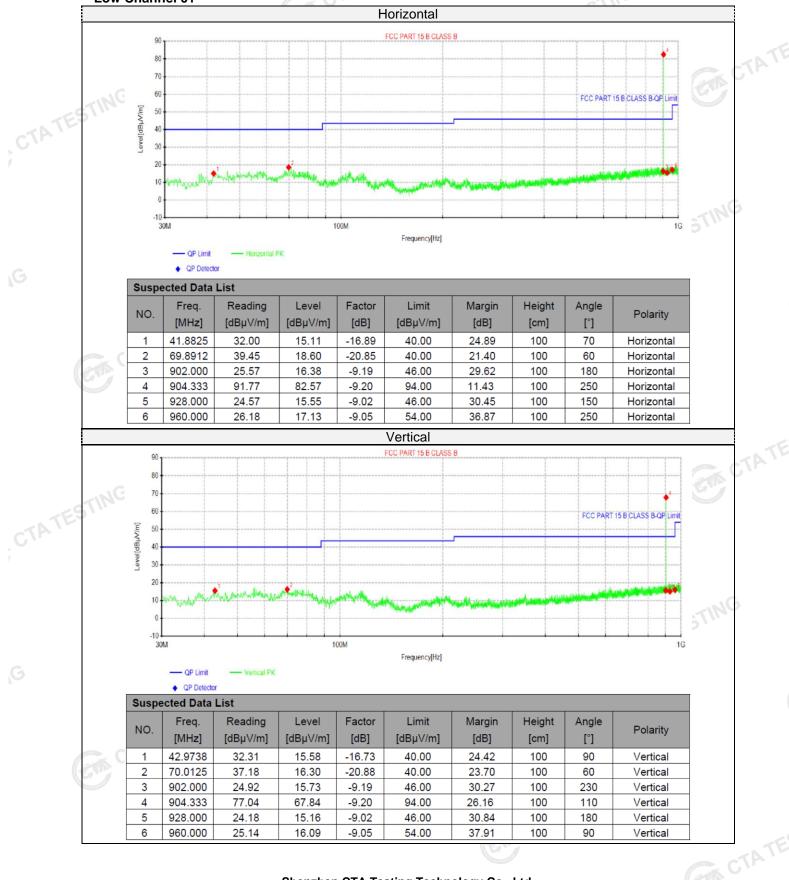
TEST RESULTS

Remark:

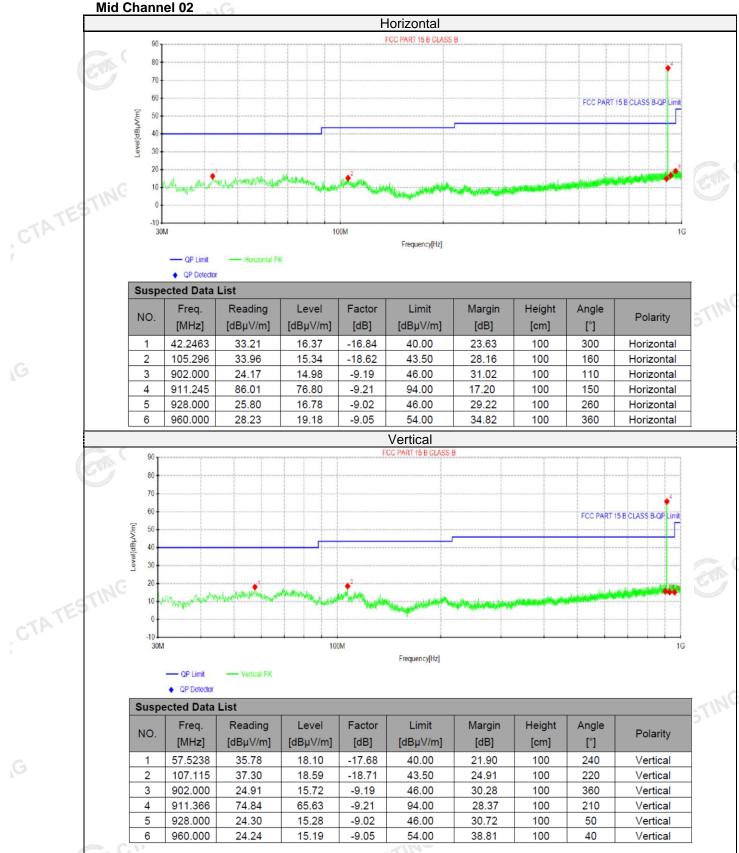
Radiated emission test from 9 KHz to 10th harmonic of fundamental was verified, and no emission found 1. except system noise floor in 9 KHz to 30MHz and not recorded in this report.

For 30MHz-1GHz

Low Channel 01



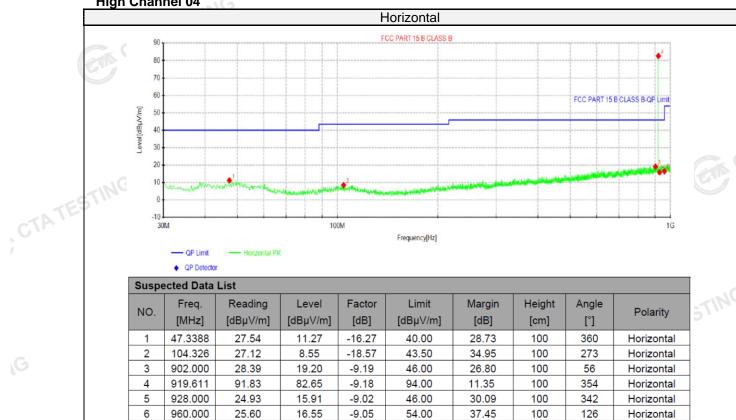
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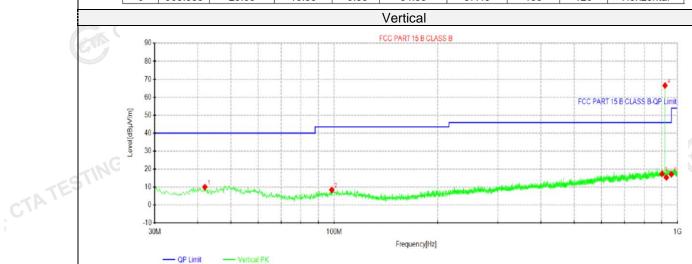


CTA TESTING

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High Channel 04





Suspe	Suspected Data List										
NO.	Freq.	Reading	Level	Factor	Limit	Margin	Height	Angle	Dalavitu		
	[MHz]	[dBµV/m]	[dBµV/m]	[dB]	[dBµV/m]	[dB]	[cm]	[°]	Polarity		
1	42.0037	26.91	10.04	-16.87	40.00	29.96	100	220	Vertical		
2	98.385	27.06	8.45	-18.61	43.50	35.05	100	210	Vertical		
3	902.000	26.56	17.37	-9.19	46.00	28.63	100	220	Vertical		
4	919.611	75.72	66.54	-9.18	94.00	27.46	100	190	Vertical		
5	928.000	24.41	15.39	-9.02	46.00	30.61	100	250	Vertical		
6	960.000	26.24	17.19	-9.05	54.00	36.81	100	320	Vertical		

Note:1).Level $(dB\mu V/m)$ = Reading $(dB\mu V/m)$ + Factor (dB/m)

- 2). Factor(dB/m)=Antenna Factor (dB/m) + Cable loss (dB) Pre Amplifier gain (dB)
- 3). Margin(dB) = Limit (dB μ V/m) Level (dB μ V/m)

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For 1GHz to 25GHz Low Channel 01

Horizontal:

	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	
	(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
	1808.6	58.85	-4.48	54.37	74	-19.63	peak
	1808.6	42.79	-4.48	38.31	54	-15.69	AVG
	2712.9	51.64	-0.97	50.67	74	-23.33	peak
	2712.9	38.25	-0.97	37.28	54	-16.72	AVG
CTATESTIN							
CIA		- <s< td=""><td>ING</td><td></td><td></td><td></td><td></td></s<>	ING				
1		r = Antenna Fa	ctor + Cable L	oss – Pre-amplifier	JAG	1	ļ.

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Type
1808.6	59.53	-4.48	55.05	74	-18.95	peak
1808.6	42.89	-4.48	38.41	54	-15.59	AVG
2712.9	52.75	-0.97	51.78	74	-22.22	peak
2712.9	38.91	-0.97	37.94	54	-16.06	AVG
		CTAT			TING	
		TIN		-17	£5 \	
emark: Facto	or = Antenna Fa	ctor + Cable L	.oss – Pre-amplifier.	CAN CAN	· <u>I</u>	<u> </u>
			·	To something		(GIV)
annel 02						

Mid Channel 02

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin]
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
1822.6	58.11	-4.39	53.72	S ⁷ 74	-20.28	peak
1822.6	41.64	-3.39	38.25	54	-15.75	AVG
2733.9	52.48	-0.89	51.59	74	-22.41	peak
2733.9	38.16	-0.89	37.27	54	-16.73	AVG
	. C.				123 mail	
	NO					

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

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Vertical:

	STATE			NG			
(EVA	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	_
	(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
	1822.6	59.29	-4.39	54.9	74	-19.1	peak
	1822.6	42.05	-3.39	38.66	54	-15.34	AVG
	2733.9	53.65	-0.89	52.76	74	-21.24	peak
ESTIN	2733.9	39.32	-0.89	38.43	54	-15.57	AVG
CTATESTIN			CING				
* 1		TATES			G		
	Remark: Facto	r = Antenna Fa	ctor + Cable I (nee _ Pre-amplifier			

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

High Channel 04

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
1839.4	59.32	-4.29	55.03	74	-18.97	peak
1839.4	43.08	-4.29	38.79	54	-15.21	AVG
2759.1	52.83	-0.81	52.02	74	-21.98	peak
2759.1	37.74	-0.81	36.93	54	-17.07	AVG
				CTAT		
		_		CTA.		
		•		A CO COMPANY		-C6-11d

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

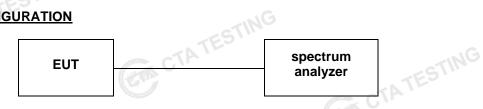
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detecto Type
1839.4	58.32	-4.29	54.03	74	-19.97	peak
1839.4	43.76	-4.29	39.47	54	-14.53	AVG
2759.1	52.17	-0.81	51.36	74	-22.64	peak
2759.1	37.68	-0.81	36.87	54	-17.13	AVG
	1.Ca					
-61	NG					

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

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4.3. 20dB Bandwidth Measurement

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 30KHz RBW and 300KHz VBW.

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

LIMIT

TEST RESULTS

Modulation Channel 20dB bandwid (kHz) CH01 30.01 FM CH02 30.24 CH04 30.37	TATESTIN
Modulation Channel (kHz) CH01 30.01 FM CH02 30.24	
FM CH02 30.24	dth Result
CH04 30.37	Pass
- CTA	
Note: 1.The test results including the cable lose.	CTATESTING
	C. C.

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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.

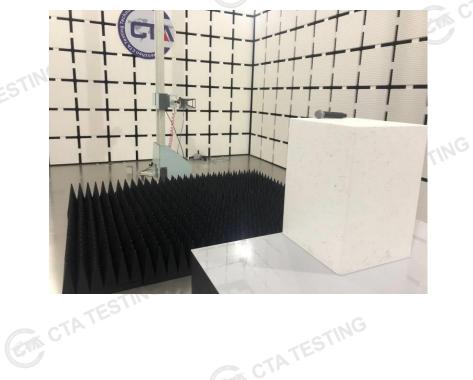
CTATE And according to FCC 47 CFR Section 15.247 (c), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

Antenna Information

The directional gains of antenna used for transmitting is 0.00 dBi. CTATES CTATESTING Report No.: CTA21111200302 Page 21 of 25

5. Test Setup Photos of the EUT





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6. Test Photos of the EUT







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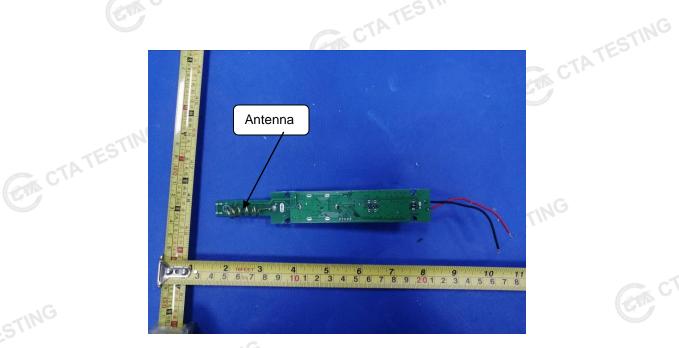


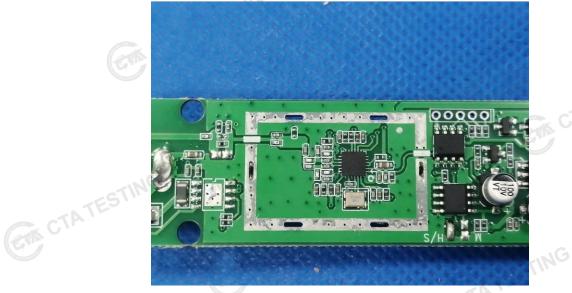




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.....End of Report.....