

FCC Rule	TEST REPORT s and Regulations Part PART	15.249				
Report Reference No	GTS20201211003-1-1					
FCC ID	2ATEO-DT103					
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Date of issue	Dec.11, 2020					
Testing Laboratory Name	Shenzhen Global Test Service Co	)., Ltd.				
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Applicant's name	Dongguan Dogreat Electronic Teo	chnology Co., Ltd				
Address	2nd Floor, Building B, Chongji Industrial Park, No. 121, Fusheng Road, Dalang Town, Dongguan City, Guangdong Province, China					
Standard	FCC Rules and Regulations	Part PART 15.249				
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Test item description						
Trade Mark	/					
Manufacturer	Dongguan Dogreat Electronic Teo	chnology Co., Ltd				
Model/Type reference	DT103					
Listed Models	DT101,DT102,DT530,DT540,DT740	0,DT750,DT760,AT868,AT888				
Ratings	DC 3.7 V From Battery and DC 5V F	From external circuit				
Modulation	ASK					
Frequency	915MHz					
Result	PASS					

# TEST REPORT

Test Report No. :		GTS20201211003-1-1	Dec.11, 2020					
			Date of issue					
Equipment under Test	:	remote dog training collar						
Model /Type	:	DT103						
Listed Models	:	DT101,DT102,DT530,DT540,DT740,DT750,DT760,AT868,AT 88						
Applicant	:	Dongguan Dogreat Electron	ic Technology Co., Ltd					
Address	:	2nd Floor, Building B, Chongji Industrial Park, No. 121, Fusheng Road, Dalang Town, Dongguan City, Guangdong Province, China						
Manufacturer	:	Dongguan Dogreat Electron	ic Technology Co., Ltd					
Address	:	2nd Floor, Building B, Chongji Industrial Park, No. 121, Fusheng Road, Dalang Town, Dongguan City, Guangdong Province, 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. <u>TEST STANDARDS</u>

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

<u>ANSI C63.4: 2014:</u> –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 Range of 9 kHz to 40GHz

# 2. <u>SUMMARY</u>

### 2.1. General Remarks

Date of receipt of test sample	:	Nov. 27, 2020
Testing commenced on	:	Nov. 27, 2020
Testing concluded on	:	Dec. 11, 2020

# 2.2. Product Description

Name of EUT	remote dog training collar
Model Number	DT103
List Model:	DT101,DT102,DT530,DT540,DT740,DT750,DT760,AT868,AT888
Power Rating	DC 3.7 V From Battery and DC 5V From external circuit
Test Sample Number:	GTS20201211003-1#
Adapter information	Mode:EP-TA20CBC
(Auxiliary test equipment	Input:AC100-240V-50/60Hz, 0.5A
provided by the laboratory) :	Output:DC 5V,2A
Operation frequency:	915MHz
Modulation:	ASK
Antenna Type:	Internal antenna
Antenna Gain:	0dBi

# 2.3. Equipment Under Test

### Power supply system utilised

Power supply voltage	:	0	230V / 50 Hz	0	120V / 60Hz
		0	12 V DC	Ο	24 V DC
		•	Other (specified in blank bel	ow)	)

#### DC 3.7 V

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

This is a remote dog training collar

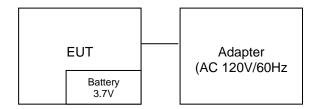
For more details, refer to the user's manual of the EUT.

# 2.5. EUT operation mode

The Applicant provides test software to control the EUT for staying in continuous transmitting and receiving mode for testing .There is 1 channels provided to the EUT. Channel 00 was selected to test.

Channel	Frequency(MHz)
00	915

# 2.6. Block Diagram of Test Setup



# 2.7. Modifications

No modifications were implemented to meet testing criteria.

# 3. <u>TEST ENVIRONMENT</u>

# 3.1. TEST FACILITY

Test Firm : Shenzhen Global Test Service Co., Ltd.

Address No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.4:2014 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.

# 3.2. Test Facility

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

### FCC-Registration No.: 165725

Shenzhen Global Test Service Co.,Ltd EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

### A2LA-Lab Cert. No.: 4758.01

Shenzhen Global Test Service Co.,Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

# CNAS-Lab Code: L8169

Shenzhen Global Test Service Co.,Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories. Date of Registration: Dec. 11, 2015. Valid time is until Dec. 10, 2024.

# 3.3. Environmental conditions

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

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	-	-									

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

Conducted testing:

Temperature:	25 ° C
Humidity:	44 %
Atmospheric pressure:	950-1050mbar

#### AC Power Conducted Emission

Temperature:	24 ° C
Humidity:	44 %
Atmospheric pressure:	950-1050mbar

FCC PART 15.249					
FCC Part 15.249(a)	Field Strength of Fundamental PA				
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	PASS			
FCC Part 15.203	Antenna Requirement	PASS			

# 3.5. Statement of the measurement uncertainty

Measurement Uncertainty		
Conducted Emission Expanded Uncertainty	=	2.23dB, k=2
Radiated emission expanded uncertainty(9kHz-30MHz)	=	3.08dB, k=2
Radiated emission expanded uncertainty(30MHz-1000MHz)	=	4.42dB, k=2
Radiated emission expanded uncertainty(Above 1GHz)	=	4.06dB, k=2

# 3.6. Equipments Used during the Test

Test Equipment			Serial No.	Calibration Date	Calibration Due Date
LISN	R&S	ENV216	3560.6550.08	2020/09/19	2021/09/18
LISN	LISN R&S		893606/008	2020/09/19	2021/09/18
EMI Test Receiver	R&S	ESPI3	101841-cd	2020/09/19	2021/09/18
EMI Test Receiver	R&S	ESCI7	101102	2020/09/19	2021/09/18
Spectrum Analyzer	Agilent	N9020A	MY48010425	2020/09/19	2021/09/18
Spectrum Analyzer	R&S	FSV40	100019	2020/09/19	2021/09/18
Vector Signal generator	Agilent	N5181A	MY49060502	2020/09/19	2021/09/18
Signal generator	Agilent	E4421B	3610AO1069	2020/09/19	2021/09/18
Climate Chamber	ESPEC	EL-10KA	A20120523	2020/09/19	2021/09/18
Controller	EM Electronics	Controller EM 1000	N/A	N/A	N/A
Horn Antenna	Schwarzbeck	BBHA 9120D	01622	2020/09/19	2021/09/18
Active Loop Antenna	Beijing Da Ze Technology Co.,Ltd.	ZN30900C	15006	2020/10/11	2021/10/10
Bilog Antenna	Schwarzbeck	VULB9163	000976	2020/05/26	2021/05/25
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	791	2020/09/19	2021/09/18
Amplifier	Schwarzbeck	BBV 9743	#202	2020/09/19	2021/09/18
Amplifier	Schwarzbeck	BBV9179	9719-025	2020/09/19	2021/09/18
Amplifier	EMCI	EMC051845B	980355	2020/09/19	2021/09/18
Temperature/Humidit y Meter	Gangxing	CTH-608	02	2020/09/19	2021/09/18
High-Pass Filter	K&L	9SH10- 2700/X12750- O/O	KL142031	2020/09/19	2021/09/18

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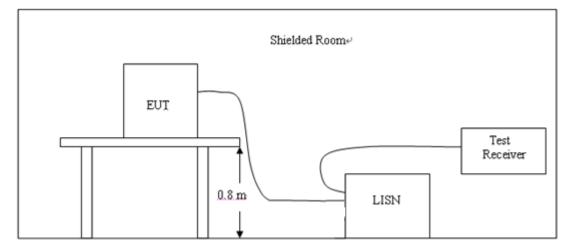
High-Pass Filter	K&L	41H10- 1375/U12750- O/O	KL142032	2020/09/19	2021/09/18
RF Cable(below 1GHz)	HUBER+SUHNE R	RG214	RE01	2020/09/19	2021/09/18
RF Cable(above 1GHz)	HUBER+SUHNE R	RG214	RE02	2020/09/19	2021/09/18
Data acquisition card	Agilent	U2531A	TW53323507	2020/09/19	2021/09/18
Power Sensor	Agilent	U2021XA	MY5365004	2020/09/19	2021/09/18
Test Control Unit	Tonscend	JS0806-1	178060067	2020/06/19	2021/06/18
Automated filter bank	Tonscend	JS0806-F	19F8060177	2020/06/19	2021/06/18
EMI Test Software	Tonscend	JS1120-1	Ver 2.6.8.0518	/	/
EMI Test Software	Tonscend	JS1120-3	Ver 2.5.77.0418	/	/
EMI Test Software	Tonscend	JS32-CE	Ver 2.5	/	/
EMI Test Software	Tonscend	JS32-RE	Ver 2.5.1.8	/	/

Note: The Cal.Interval was one year.

# 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

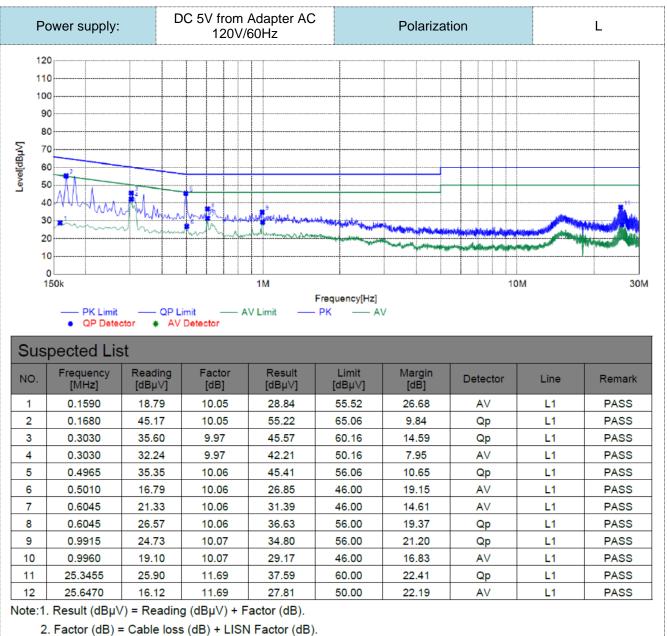
For intentional device, according to § 15.207(a) AC Power Conducted Emission Limits is as following :

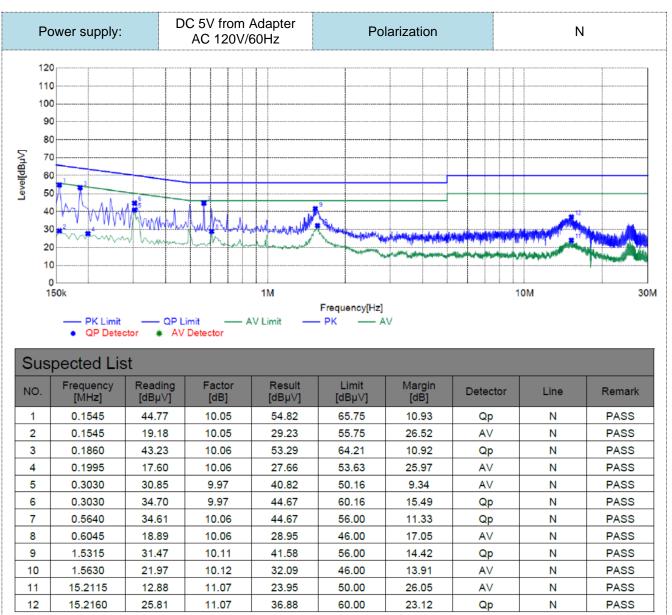
Frequency range (MHz)	Limit (	dBuV)
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50
* Decreases with the logarithm of the freque	ncy.	

TEST RESULTS

Remark : 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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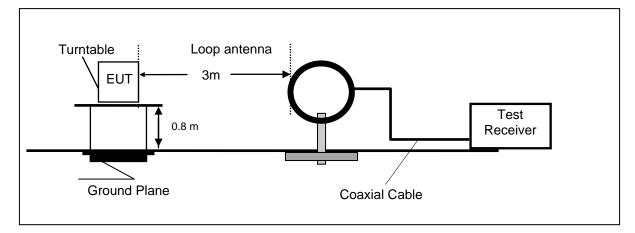
Note:1. Result  $(dB\mu V)$  = Reading  $(dB\mu V)$  + Factor (dB).

2. Factor (dB) = Cable loss (dB) + LISN Factor (dB).

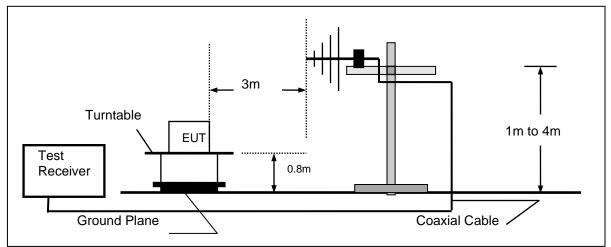
# 4.2. Radiated Emission and Band Edges

#### **TEST CONFIGURATION**

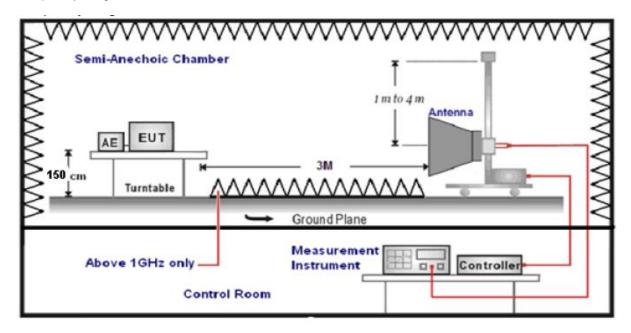
Frequency range 9 KHz – 30MHz



#### Frequency range 30MHz – 1000MHz



Frequency range above 1GHz-25GHz



#### TEST PROCEDURE

- 1. The EUT was placed on a turn table which is 0.8m above ground plane when testing frequency range 9 KHz –25GHz.
- 2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from  $0^{\circ}$  to  $360^{\circ}$  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.
- 4. Repeat above procedures until all frequency measurements have been completed.
- 5. The EUT minimum operation frequency was 26MHz and maximum operation frequency was 1910MHz.so radiated emission test frequency band from 9KHz to 25GHz.
- 6. 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

7. Setting test receiver/spectrum as following table states:

	Test Frequency range Test Receiver/Spectrum Setting		Detector			
ſ	9KHz-150KHz RBW=200Hz/VBW=3KHz,Sweep time=Auto		QP			
ſ	150KHz-30MHz RBW=9KHz/VBW=100KHz,Sweep time=Auto		QP			
Γ	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

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

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)

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

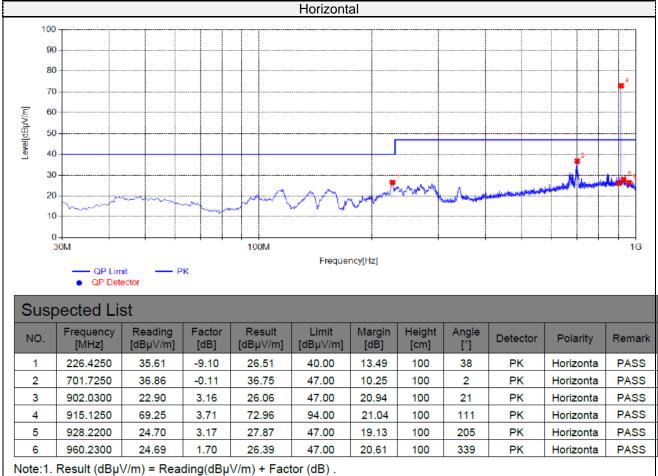
Radiated emission limits

#### TEST RESULTS

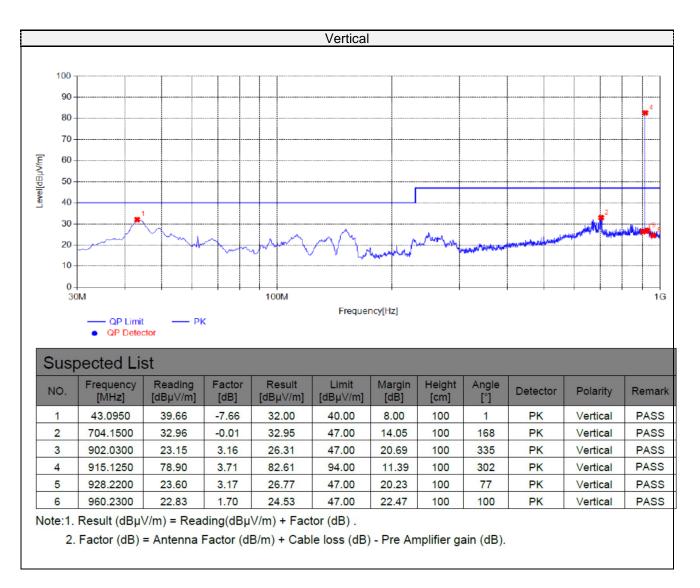
#### For 9 KHz-30MHz

Frequency (MHz)	Corrected Reading (dBuV/m)@3m	FCC Limit (dBuV/m) @3m	Margin (dB)	Detector	Result
0.38	47.47	96.01	48.54	QP	PASS
1.55	53.69	63.80	10.11	QP	PASS
19.68	57.52	69.54	12.02	QP	PASS
24.62	42.52	69.54	27.02	QP	PASS

#### For 30MHz-1GHz



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



#### For 1GHz to 25GHz

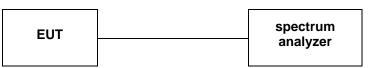
Horizontal:						
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
1240	57.48	-9.08	48.4	74	-25.6	peak
1240	42.96	-9.08	33.88	54	-20.12	AVG
1830	61.45	-8.79	52.66	74	-21.34	peak
1830	46.83	-8.79	38.04	54	-15.96	AVG
2745	57.79	-4.05	53.74	74	-20.26	peak
2745	43.18	-4.05	39.13	54	-14.87	AVG
Remark: Facto	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)	Detector Type
1240	58.29	-9.08	49.21	74	-24.79	peak
1240	44.71	-9.08	35.63	54	-18.37	AVG
1830	62.69	-8.79	53.9	74	-20.1	peak
1830	46.19	-8.79	37.4	54	-16.6	AVG
2745	56.72	-4.05	52.67	74	-21.33	peak
2745	44.73	-4.05	40.68	54	-13.32	AVG
Remark: Facto	or = Antenna Fa	ctor + Cable Lo	oss – Pre-amplifier			

### 4.3. 20dB bandwidth and Occupied 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 100KHz RBW and 300KHz VBW.

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

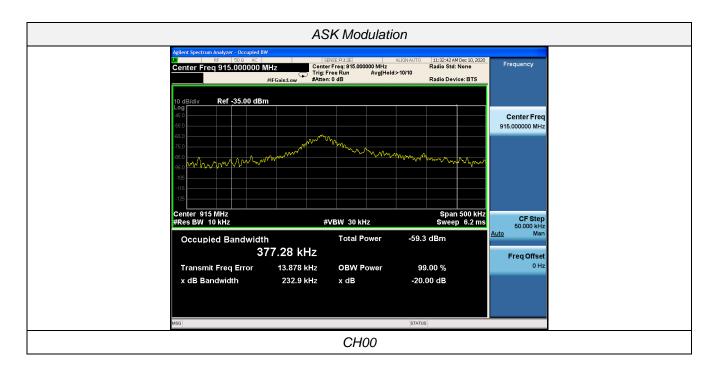
#### <u>LIMIT</u>

N/A

#### TEST RESULTS

Modulation	Channel	99% OBW (kHz)	20dB bandwidth (kHz)	Result
ASK	CH00	377.28	232.9	Pass

Note: 1.The test results including the cable lose.



#### 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.

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.

# 5. Test Setup Photos of the EUT



# 6. Photos of the EUT





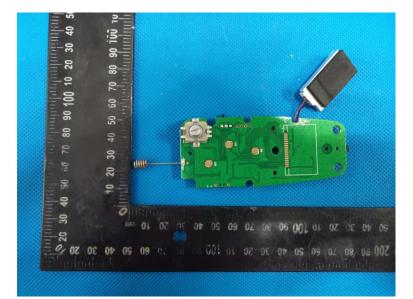


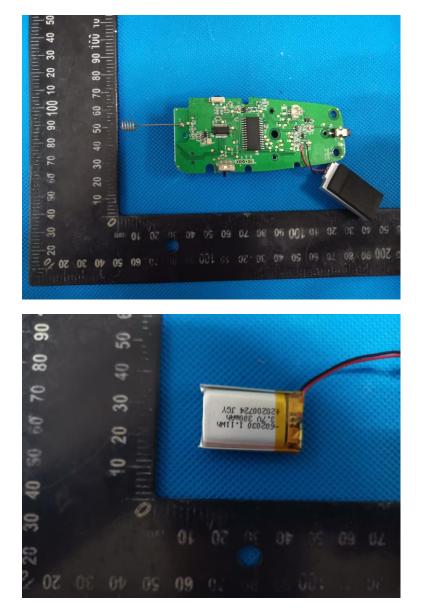


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.....End of Report.....