FCC Part 15C Test Report

FCC ID: 2AFIOUSA-TNK-PZR

Product Name:	RC Tank
Trademark:	AWW
Model Name :	USA-TNK-PZR, USA-TNK-LRM
Prepared For : Address :	**HUAJIA TECHNOLOGY INDUSTRY CO.,LTD.** Fl.12. Jiafa Mansion, NO.9 Guangyi Road Chenghai Dist. Shantou, China
Prepared By : Address :	**Shenzhen BCTC Technology Co., Ltd.** No.101,Yousong Road,Longhua New District, Shenzhen,China
Test Date:	**Jul. 25 - Jul. 28, 2015**
Date of Report :	**Jun. 30, 2015**
Report No.:	BCTC-15070147

VERIFICATION OF COMPLIANCE

Applicant's name	:	**HUAJIA TECHNOLOGY INDUSTRY CO.,LTD.**
Address	:	Fl.12. Jiafa Mansion, NO.9 Guangyi Road Chenghai Dist. Shantou, China
Manufacture's Name	:	**Hype Wireless c/o DGL Group, Ltd.**
Address	:	195 Raritan Center Parkway，Edison, NJ 08837, USA

Product description

Product name	:	RC Tank
Trademark:		AWW
Model Name:		USA-TNK-PZR, USA-TNK-LRM
Test procedure		FCC Part15.227
Standards		ANSI C63.10-2013

This device described above has been tested by BCTC, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

This report shall not be reproduced except in full, without the written approval of BCTC, this document may be altered or revised by BCTC, personal only, and shall be noted in the revision of the document.

Test Result.....: **Pass**

Testing Engineer **:** Eric Yang

(Eric Yang)

Technical Manager **:** Sophie Lu

(Sophia Lee)

Authorized Signatory **:** Carson. Zhang

SHENZHEN BCTC TECHNOLOGY CO., LTD. APPROVED

(Carson. Zhang)

Table of Contents Page

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.227) , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	N/A	
15.209,15.227	Radiated Emission Test	PASS	
15.203	Antenna Requirement	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

1.1 TEST FACILITY

Shenzhen BCTC Technology Co., Ltd.
Add.:No.101,Yousong Road,Longhua New District, Shenzhen,China
FCC Registration No.:187086

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **U**，where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**，providing a level of confidence of approximately **95** %。

No.	Item	Uncertainty
1	Conducted Emission Test	±1.38dB
2	RF power,conducted	±0.16dB
3	Spurious emissions,conducted	±0.21dB
4	All emissions,radiated(<1G)	±4.68dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

<table>
<tr><td>Equipment</td><td>RC Tank</td></tr>
<tr><td>Trade Name</td><td>AWW</td></tr>
<tr><td>Model Name</td><td>USA-TNK-PZR</td></tr>
<tr><td>Serial Model</td><td>USA-TNK-LRM</td></tr>
<tr><td>Model Difference</td><td>All the same, is different for model and appearance color.</td></tr>
<tr><td>Product Description</td><td>The EUT is a RC Tank
<table>
<tr><td>Operation Frequency:</td><td>27.145MHz</td></tr>
<tr><td>Modulation Type:</td><td>FSK</td></tr>
<tr><td>Antenna Designation:</td><td>External</td></tr>
<tr><td>Antenna Gain</td><td>2dBi</td></tr>
</table>
Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.</td></tr>
<tr><td>Adapter</td><td>N/A</td></tr>
<tr><td>Battery</td><td>DC 3V</td></tr>
<tr><td>Connecting I/O Port(s)</td><td>Please refer to the User's Manual</td></tr>
<tr><td>Hardware Version</td><td>V1.1</td></tr>
<tr><td>Software Version</td><td>V0.1</td></tr>
</table>

Note:

1. For a more detailed features description, please refer to the manufacturer’s specifications or the User's Manual.

2.2 DESCRIPTION OF TEST MODES

For All Emission	
Final Test Mode	Description
Mode 1	TX Mode

Note:

(1) New battery is used during the test

(2) The antenna is telescopic antenna, The worst mode is on max length(7cm).

(3) For this device equipped with 4 buttons, all 4 buttons was pre-tested and the worst button was Increase the speed button and the data was recrding the report.

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious Emission Test

2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

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

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note

Note:

(1) The support equipment was authorized by Declaration of Confirmation.

(2) For detachable type I/O cable should be specified the length in cm in『Length』column.

(3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation, 20db bandwith,dwell time test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Agilent	E4407B	MY45108040	2014.07.06	2015.07.05	1 year
2	Test Receiver	R&S	ESCI	1166.5950K03-101165-ha	2015.06.06	2016.06.05	1 year
3	Bilog Antenna	R&S	VULB 9168	VULB9168-438	2014.07.06	2015.07.05	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2015.06.06	2016.06.05	1 year
5	Spectrum Analyzer	ADVANTEST	R3132	150900201	2015.06.06	2016.06.05	1 year
6	Horn Antenna	R&S	HF906	10027	2014.07.06	2015.07.05	1 year
7	RF cables (1GHz~25GHz)	Florida RFLabs	Lab-Fle	966 cable 2#	2015.06.06	2016.06.05	1 year
8	Amplifier	R&S	BBV9743	9743-019	2014.12.22	2015.12.21	1 year
9	Loop Antenna	ARA	PLA-1030/B	1029	2015.06.06	2016.06.05	1 year
10	RF cables (9kHz~1GHz)	R&S	R203	R20X	2015.06.06	2016.06.05	1 year

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FRE U NCY (MHz)	Class B (dBuV)		Standard
	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	CISPR
0. 0 -5.0	56.00	46.00	CISPR
5.0 -30.0	60.00	50.00	CISPR

0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

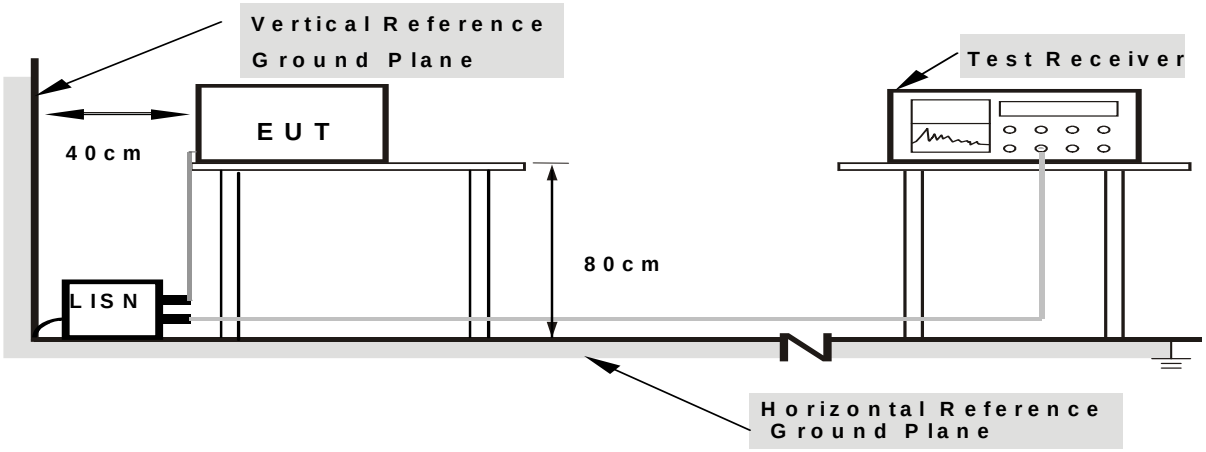
3.1.2 TEST PROCEDURE

a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.1.6 TEST RESULTS

The product's power provide by battery, no requriment for conduct test.

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.231(b) limit in the table below has to be followed.

Frequencies(MHz)	Field Strength(micorvolts/meter)	Measurement Distance(meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

FUNDAMENTAL AND HARMONICS EMISSION LIMITS

The field strength of any emission within this band shall not exceed 10,000 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in § 15.35 for limiting peak emissions apply.

FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5^{th} harmonic of the highest frequency or 40 GHz, whichever is lower

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW setting	1 MHz / 1 MHz for Peak

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

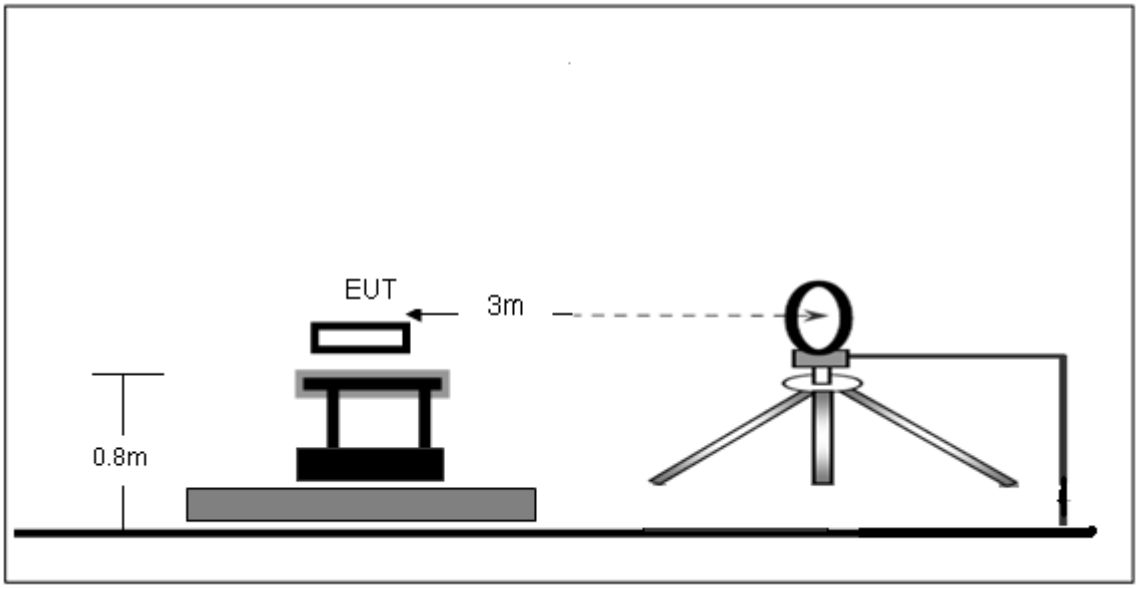
a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

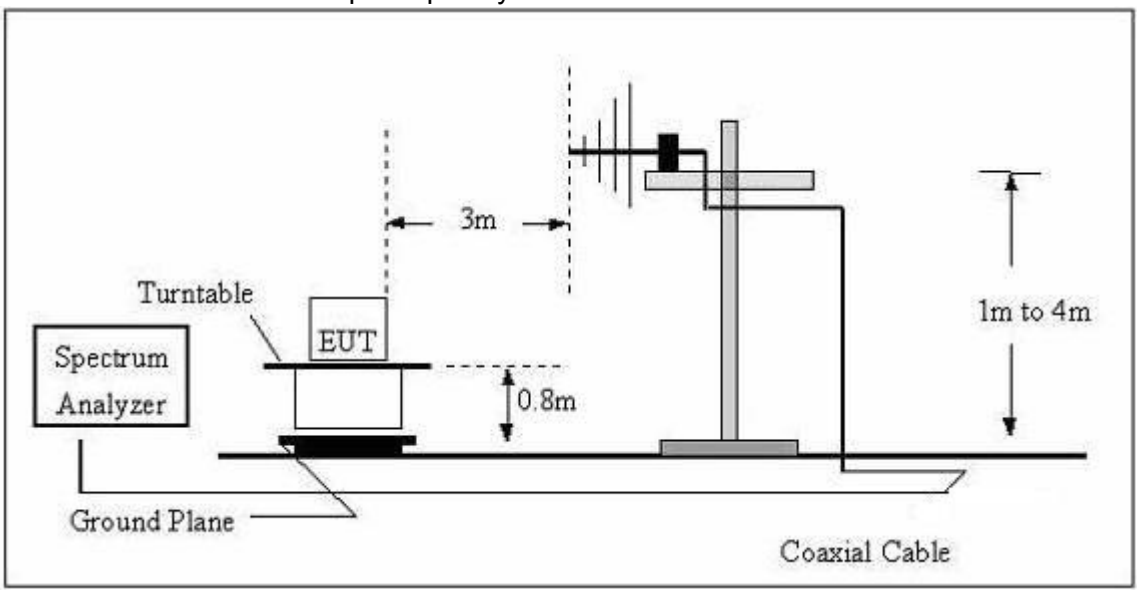
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case was X axis and the emissions were reported

3.2.3 TEST SETUP

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



（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



3.2.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.5 TEST RESULTS

Radiated Spurious Emission (Below 30MHz)

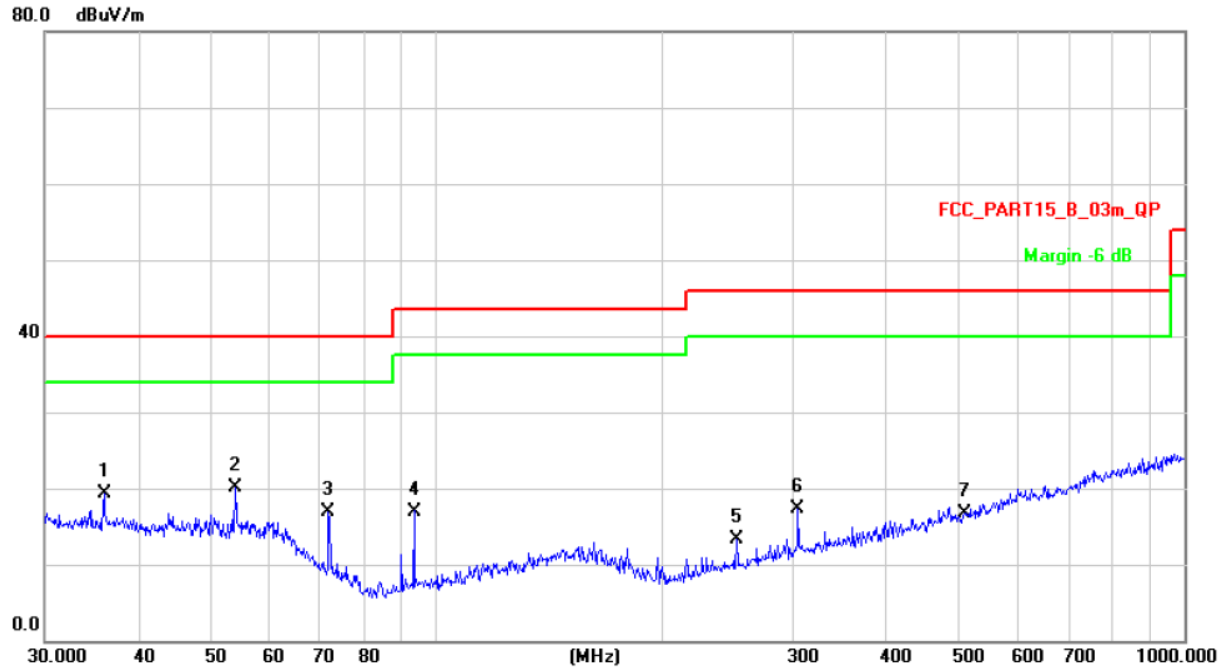
EUT：	RC Tank	Model Name ：	USA-TNK-PZR
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Polarization :	---
Test Voltage ：	DC 3V		
Test Mode ：	TX Mode		

Freq.	Reading	Correct Factor	Measurement	Limit	Margin	Antenna Polarization
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V
27.145	38.68	-7.96	30.72	40.00	-9.28	H
27.145	41.59	-7.96	33.63	40.00	-6.37	V

NOTE:
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Radiated Spurious Emission (Between 30MHz – 1GHz)

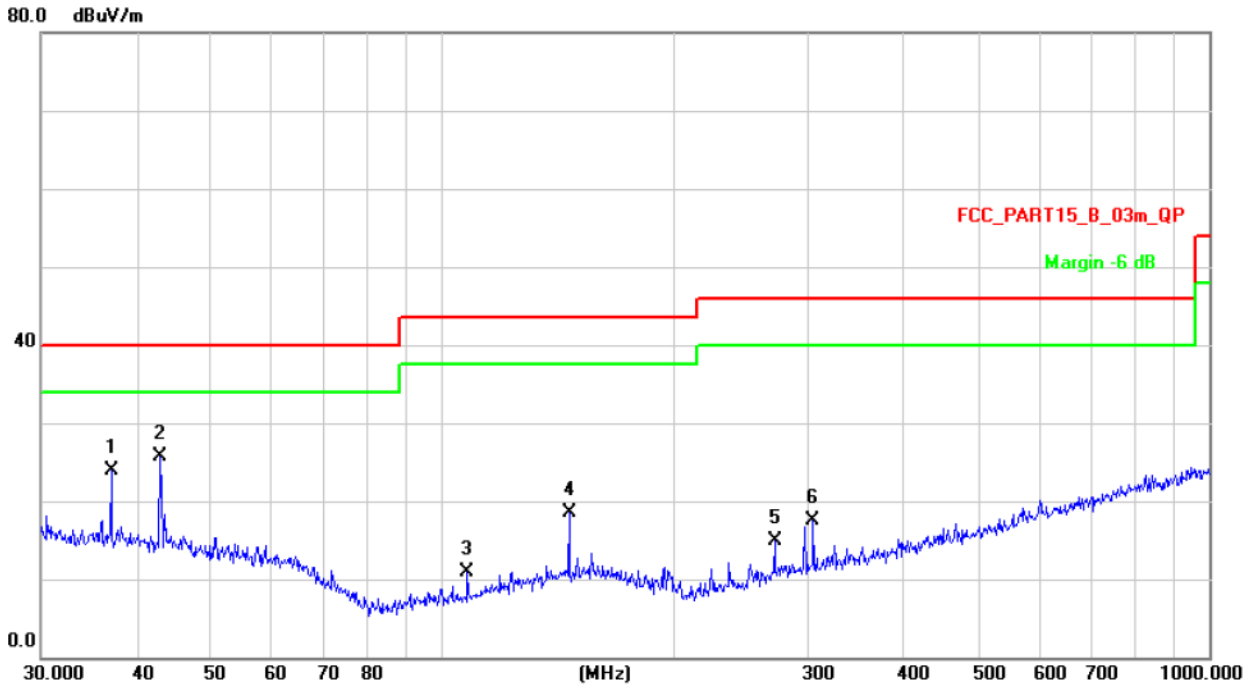
EUT：	RC Tank	Model Name ：	USA-TNK-PZR
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Polarization：	Horizontal
Test Voltage ：	DC 3V		
Test Mode ：	TX Mode		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		36.0007	27.84	-8.59	19.25	40.00	-20.75	QP			
2	*	53.8818	31.03	-10.93	20.10	40.00	-19.90	QP			
3		71.8320	32.08	-15.19	16.89	40.00	-23.11	QP			
4		93.4402	34.18	-17.18	17.00	43.50	-26.50	QP			
5		252.0627	27.53	-14.14	13.39	46.00	-32.61	QP			
6		304.6099	29.69	-12.47	17.22	46.00	-28.78	QP			
7		508.2582	24.69	-8.05	16.64	46.00	-29.36	QP			

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

EUT：	RC Tank	Model Name ：	USA-TNK-PZR
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Polarization：	Vertical
Test Voltage ：	DC 3V		
Test Mode ：	TX Mode		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		37.0248	32.51	-8.68	23.83	40.00	-16.17	QP			
2	*	42.8997	34.89	-9.21	25.68	40.00	-14.32	QP			
3		107.8876	26.67	-15.83	10.84	43.50	-32.66	QP			
4		146.3735	31.55	-13.05	18.50	43.50	-25.00	QP			
5		271.3245	28.26	-13.45	14.81	46.00	-31.19	QP			
6		304.6099	29.95	-12.47	17.48	46.00	-28.52	QP			

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

4. BANDWIDTH TEST

4.1 APPLIED PROCEDURES / LIMIT

According to FCC 15.227

Operation within the band 26.96-27.28 MHz

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	10kHz
VB	≥RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

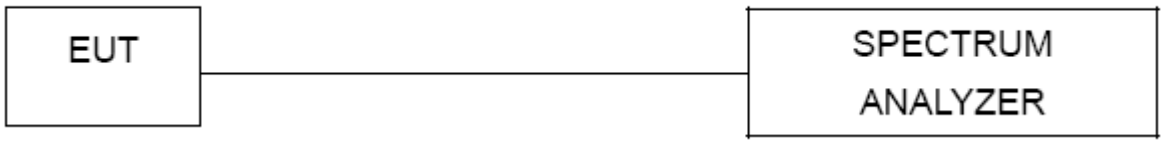
4.1.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 10kHz, VBW≥ RBW, Sweep time = Auto.

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



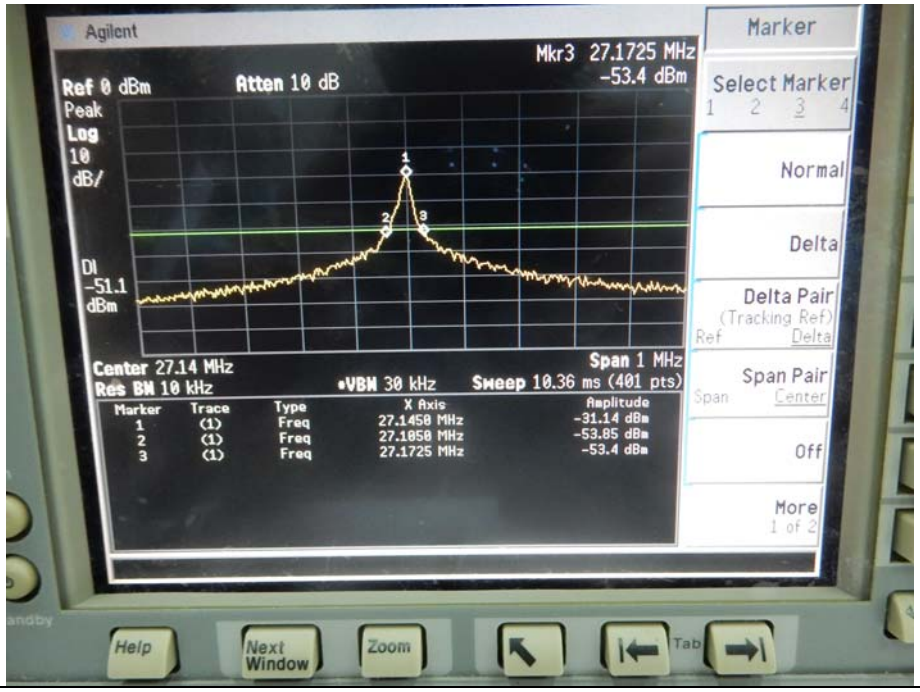
4.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

4.1.5 TEST RESULTS

EUT：	RC Tank	Model Name ：	USA-TNK-PZR
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	By Battery
Test Mode ：	TX Mode		

Frequency	20dB Bandwidth (kHz)	Result
27.145MHz	67.5	**PASS**



5. ANTENNA REQUIREMENT

5.1 STANDARD REQUIREMENT

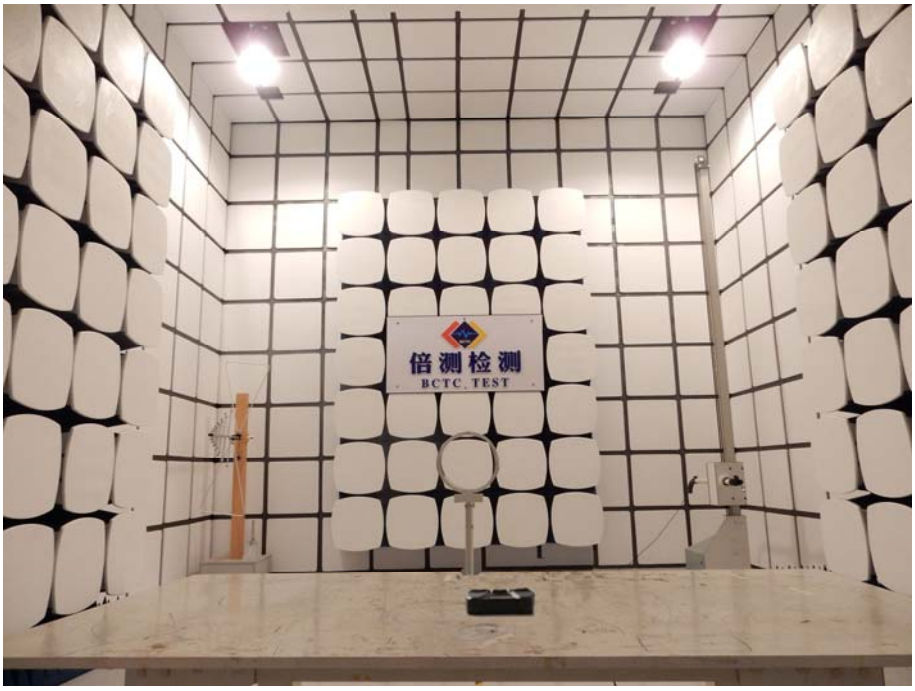
15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

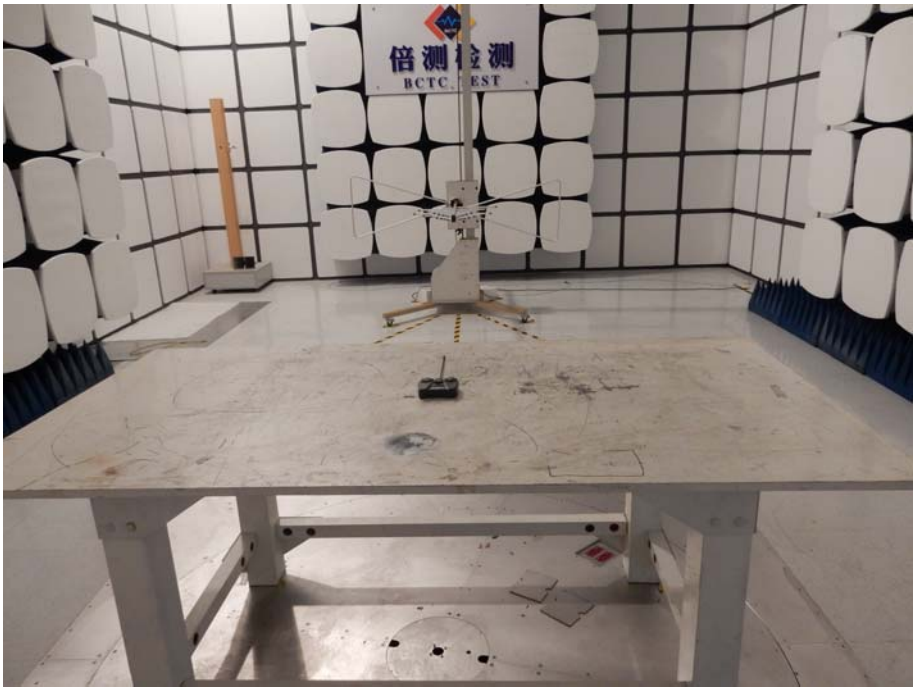
5.2 EUT ANTENNA

The EUT antenna is the permanent attached antenna. It comply with the standard requirement.

6. EUT TEST PHOTO

Radiated Measurement Photos





7. EUT TEST PHOTO