
FCC Test Report

Report No.: AGC10295170803FE03

FCC ID : 2AANZRCMNTR

APPLICATION PURPOSE : Original Equipment

PRODUCT DESIGNATION : Remote Control

BRAND NAME : N/A

MODEL NAME : NFL-RC-MNTR
NFL-RC-MNTR-GBY, NFL-RC-MNTR-DAL,
NFL-RC-MNTR-DEN, NFL-RC-MNTR-NE,

SERIAL MODELS : NFL-RC-MNTR-OAK, NFL-RC-MNTR-NYG,
NFL-RC-MNTR-PIT, NFL-RC-MNTR-SEA
NFL-CAR-PIT, NFL-CAR-SEA

CLIENT : DGL Group LTD.

DATE OF ISSUE : July 06, 2017

STANDARD(S) : FCC Part 15 Rules

TEST PROCEDURE(S) :

REPORT VERSION : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

CAUTION:

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Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	July 06, 2017	Valid	Original Report

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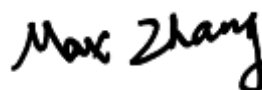
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1. VERIFICATION OF CONFORMITY

Applicant	DGL Group LTD.
Address	195 Raritan Center Parkway Edison, New Jersey United States 08837
Manufacturer	DGL Group LTD.
Address	195 Raritan Center Parkway Edison, New Jersey United States 08837
Product Designation	Remote Control
Brand Name	N/A
Test Model	NFL-RC-MNTR
Series model	NFL-RC-MNTR-GBY, NFL-RC-MNTR-DAL, NFL-RC-MNTR-DEN, NFL-RC-MNTR-NE, NFL-RC-MNTR-OAK, NFL-RC-MNTR-NYG, NFL-RC-MNTR-PIT, NFL-RC-MNTR-SEA , NFL-CAR-PIT, NFL-CAR-SEA
Difference Description	All are the same except the appearance.
Date of test	July 05, 2017 to July 06, 2017
Deviation	None
Condition of Test Sample	Normal
Report Template	AGCRT-US-BR/RF

We hereby certify that: The above equipment was tested by Dongguan Precise Testing Service Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC Rules Part 15.227.

Tested by



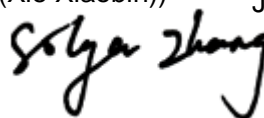
Max Zhang(Zhang Yi) July 06, 2017

Reviewed by



Bart Xie(Xie Xiaobin) July 06, 2017

Approved by



Solger Zhang(Zhang Hongyi)
Authorized Officer July 06, 2017

2. GENERAL INFORMATION

A major technical description of EUT is described as following

Operation Frequency	27.145MHz
Maximum field strength	71.80 dB μ V/m@3m(AV)
Modulation	AM
Number of channels	1
Antenna Gain	3dBi
Antenna Designation	Integral Antenna (Met 15.203 Antenna requirement)
Hardware Version	YED1705T-01
Software Version	V1.0
Power Supply	DC3V by battery

3. MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded 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	$\pm 3.18\text{dB}$
2	All emissions, radiated	$\pm 3.91\text{Db}$
3	Temperature	$\pm 0.5^\circ\text{C}$
4	Humidity	$\pm 2\%$

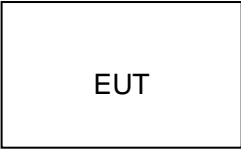
4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Transmitting mode
Note: 1. All the test modes can be supply by battery, only the result of the worst case was recorded in the report, if no other cases. 2. For Radiated Emission, 3axis were chosen for testing for each applicable mode.	

5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Configure :



5.2. EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	Remote control	NFL-RC-MNTR	2AANZRCMNTR	EUT

5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.227	Radiated Emission	Compliant
§15.215	20dB bandwidth	Compliant

6. TEST FACILITY

Site	Dongguan Precise Testing Service Co., Ltd.
Location	Building D, Baoding Technology Park, Guangming Road2, Dongcheng District, Dongguan, Guangdong, China.
FCC Registration No.	371540
Description	The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.4:2014.

ALL TEST EQUIPMENT LIST

Radiated Emission Test Site					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
EMI Test Receiver	Rohde & Schwarz	ESCI	101417	July 4, 2017	July 3, 2018
Trilog Broadband Antenna (25M-1GHz)	SCHWARZBECK	VULB9160	9160-3355	July 4, 2017	July 3, 2018
Signal Amplifier	SCHWARZBECK	BBV 9475	9745-0013	July 4, 2017	July 3, 2018
RF Cable	SCHWARZBECK	AK9515E	96221	July 4, 2017	July 3, 2018
3m Anechoic Chamber	CHENGYU	966	PTS-001	July 4, 2017	July 3, 2018
MULTI-DEVICE Positioning Controller	Max-Full	MF-7802	MF780208339	N/A	N/A
Active loop antenna (9K-30MHz)	Schwarzbeck	FMZB1519	1519-038	June 6, 2017	June 5, 2018
Spectrum analyzer	Agilent	E4407B	MY46185649	June 6, 2017	June 5, 2018

7. RADIATED EMISSION

7.1 TEST LIMIT

Standard FCC15.227

Fundamental Frequency	Field Strength of Fundamental (micro volts/meter) AV Detector	Field Strength of Fundamental (micro volts/meter) PK Detector
26.96-27.28MHz	10000(80 dB μ V/m)	100000(100 dB μ V/m)

Standard FCC 15.209

Frequency (MHz)	Distance Meters	Field Strengths Limit	
		μ V/m	dB(μ V)/m
0.009 ~ 0.490	300	2400/F(kHz)	---
0.490 ~ 1.705	30	24000/F(kHz)	---
1.705 ~ 30	30	30	---
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	Other:74.0 dB(μ V)/m (Peak) 54.0 dB(μ V)/m (Average)	

Remark: (1) Emission level dB μ V = 20 log Emission level μ V/m
 (2) The smaller limit shall apply at the cross point between two frequency bands.
 (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

7.2. MEASUREMENT PROCEDURE

1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
7. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

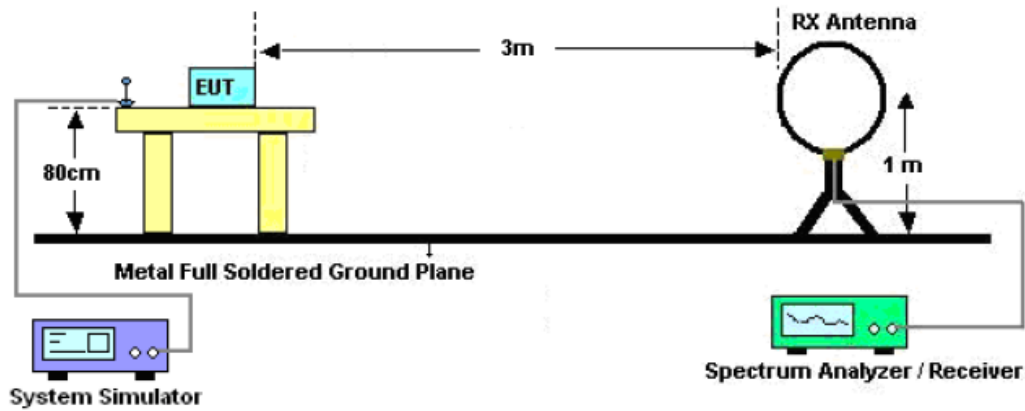
The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
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

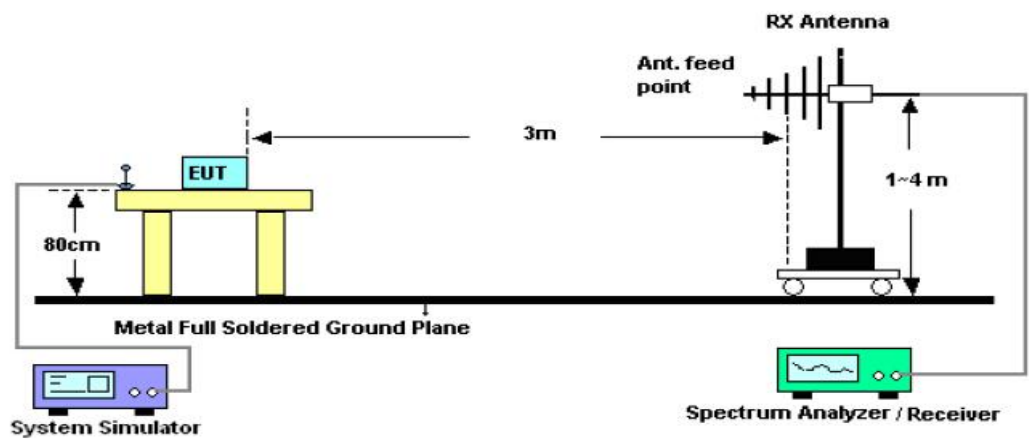
Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

7.3. TEST SETUP

Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



7.4. TEST RESULT

RADIATED EMISSION BELOW 30MHZ

EUT :	Remote Control	Model Name. :	NFL-RC-MNTR
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC3V
Test Mode :	Mode 1	Polarization :	--

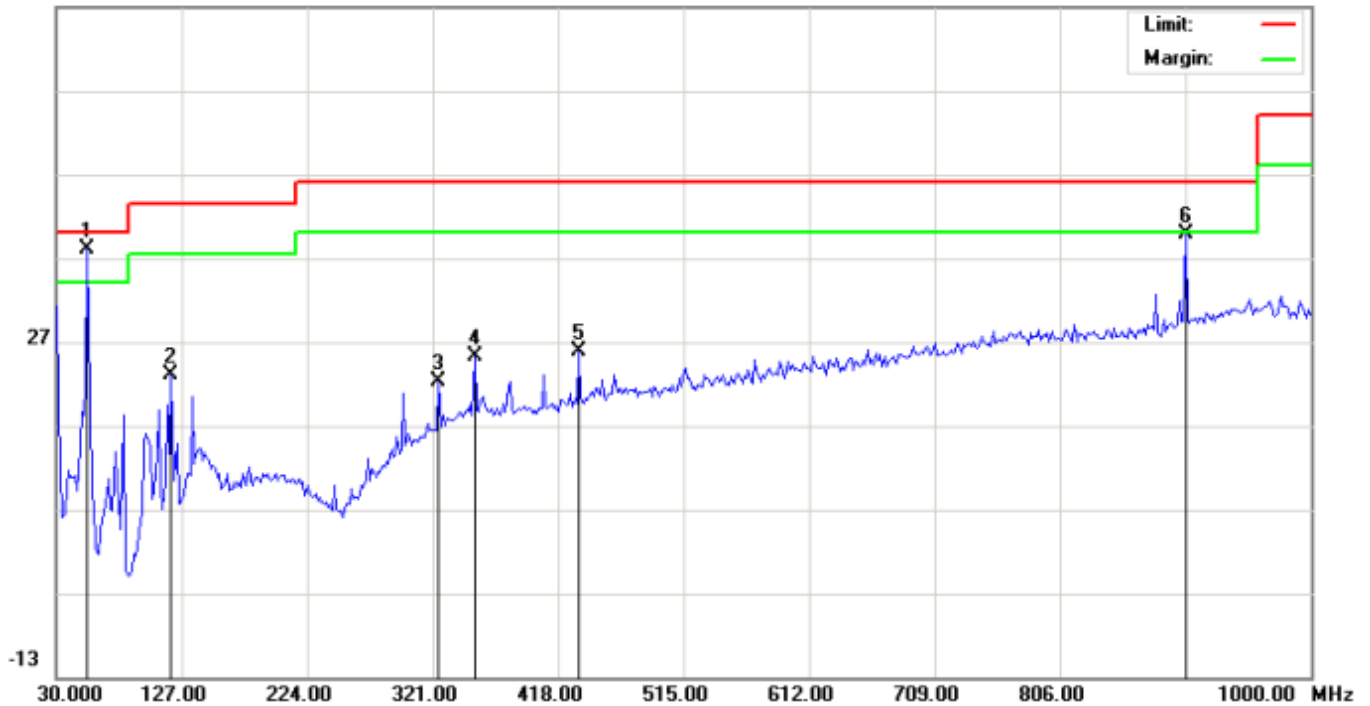
Frequency MHz	Polarization	Reading dB(uV) PK	Factor dB (1/m)	Level dB(uV/m) PK	Limit dB(uV/m) PK	Margin dB	Pass/Fail
27.145	Face	58.33	14.5	72.83	100	27.17	Pass
27.145	Side	50.45	14.5	64.95	100	35.05	Pass
Frequency MHz	Polarization	Reading dB(uV) PK	Factor dB (1/m)	Level dB(uV/m) AVG	Limit dB(uV/m) AVG	Margin dB	Pass/Fail
27.145	Face	57.30	14.5	71.80	80	8.20	Pass
27.145	Side	49.07	14.5	63.57	80	16.43	Pass

Note: Other emissions from 9 kHz to 30 MHz are considered as ambient noise. No recording in the test report.

RADIATED EMISSION 30MHz- 1GHZ

EUT :	Remote Control	Model Name. :	NFL-RC-MNTR
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC3V
Test Mode :	Mode 1	Polarization :	Horizontal

66.9 dBuV/m

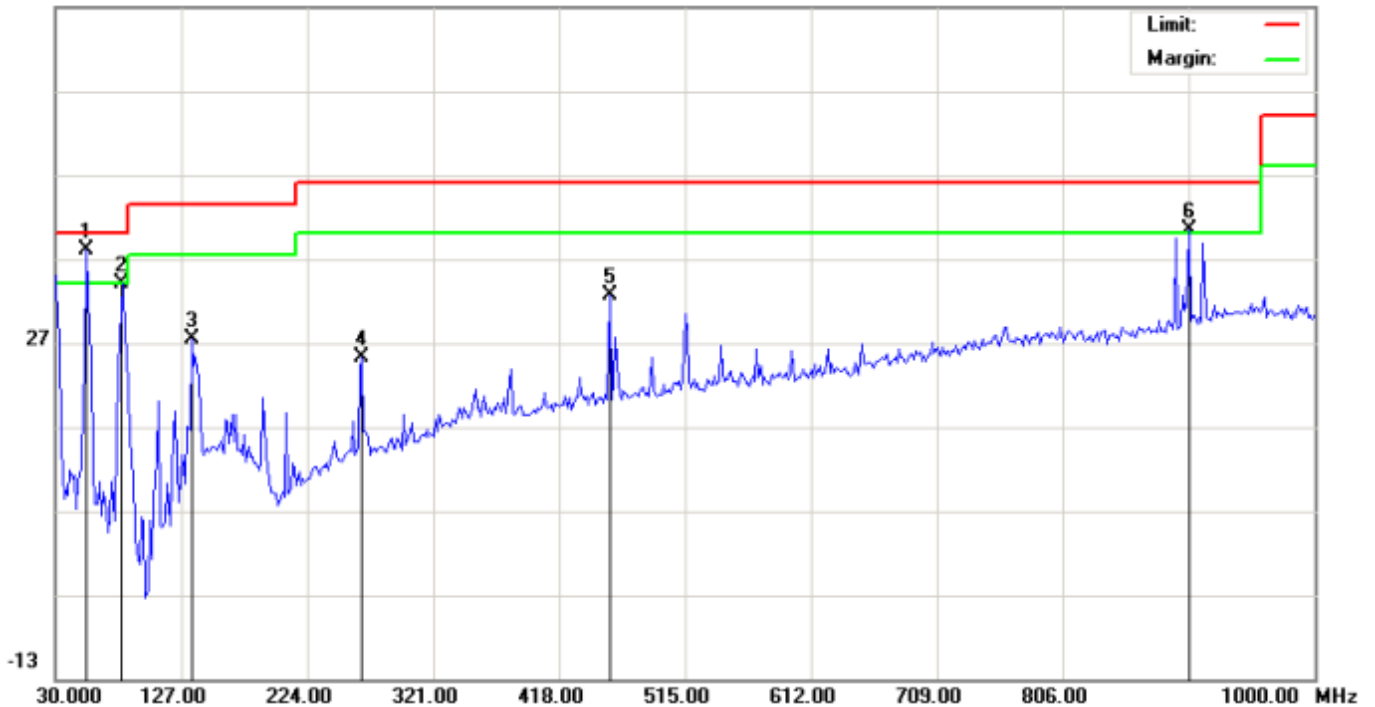


No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	54.2500	31.30	6.68	37.98	40.00	-2.02	peak			
2		118.9167	16.87	6.11	22.98	43.50	-20.52	peak			
3		325.8500	5.13	17.13	22.26	46.00	-23.74	peak			
4		353.3333	6.49	18.76	25.25	46.00	-20.75	peak			
5		434.1666	5.61	20.11	25.72	46.00	-20.28	peak			
6		903.0000	11.04	28.69	39.73	46.00	-6.27	peak			

RESULT: PASS

EUT :	Remote Control	Model Name. :	NFL-RC-MNTR
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010 hPa	Test Voltage :	DC3V
Test Mode :	Mode 1	Polarization :	Vertical

66.9 dBuV/m



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	54.2500	29.90	8.20	38.10	40.00	-1.90	peak			
2	!	81.7332	31.66	2.42	34.08	40.00	-5.92	peak			
3		135.0833	14.18	13.15	27.33	43.50	-16.17	peak			
4		266.0332	10.87	14.38	25.25	46.00	-20.75	peak			
5		456.8000	12.04	20.66	32.70	46.00	-13.30	peak			
6	!	903.0000	11.75	28.69	40.44	46.00	-5.56	peak			

RESULT: PASS

Note:

Factor=Antenna Factor + Cable loss, Margin=Result-Limit.

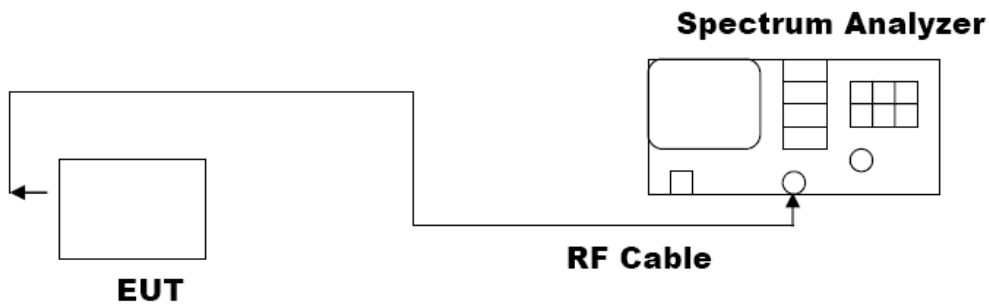
The "Factor" value can be calculated automatically by software of measurement system.

8. 20DB BANDWIDTH

8.1. MEASUREMENT PROCEDURE

1. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the EMI receiver or spectrum analyzer shall be between two times and five times the OBW.
2. The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW, unless otherwise specified by the applicable requirement.
3. Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than $[10 \log (OBW/RBW)]$ below the reference level.
4. Steps 1 through 3 might require iteration to adjust within the specified tolerances.

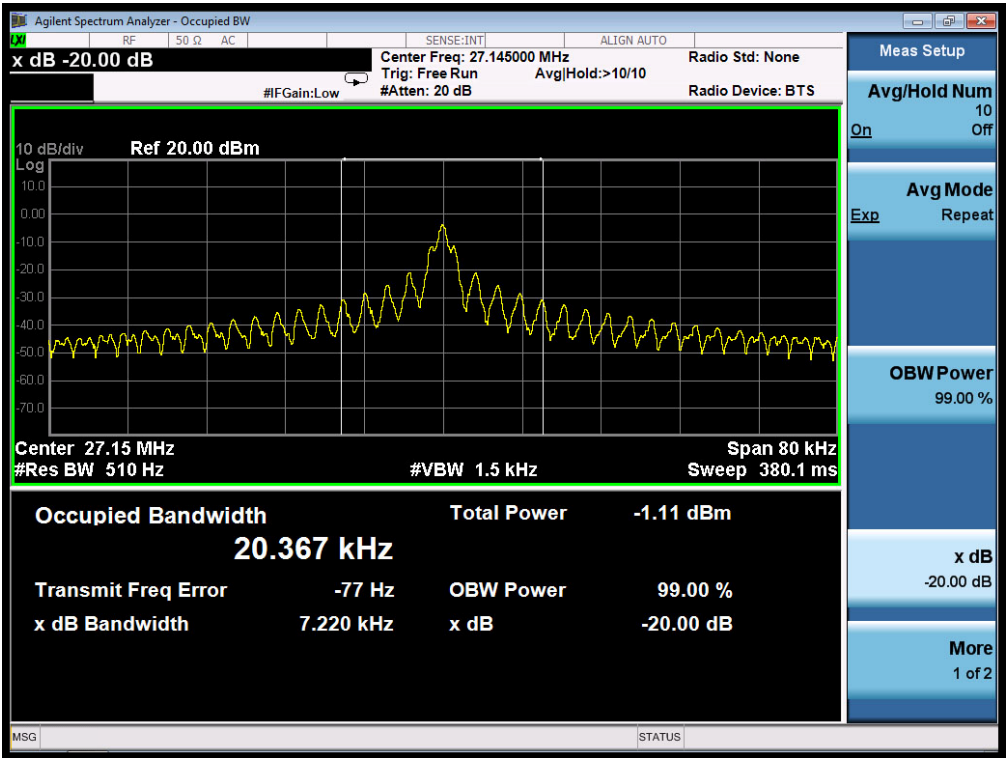
8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



8.3. MEASUREMENT RESULTS

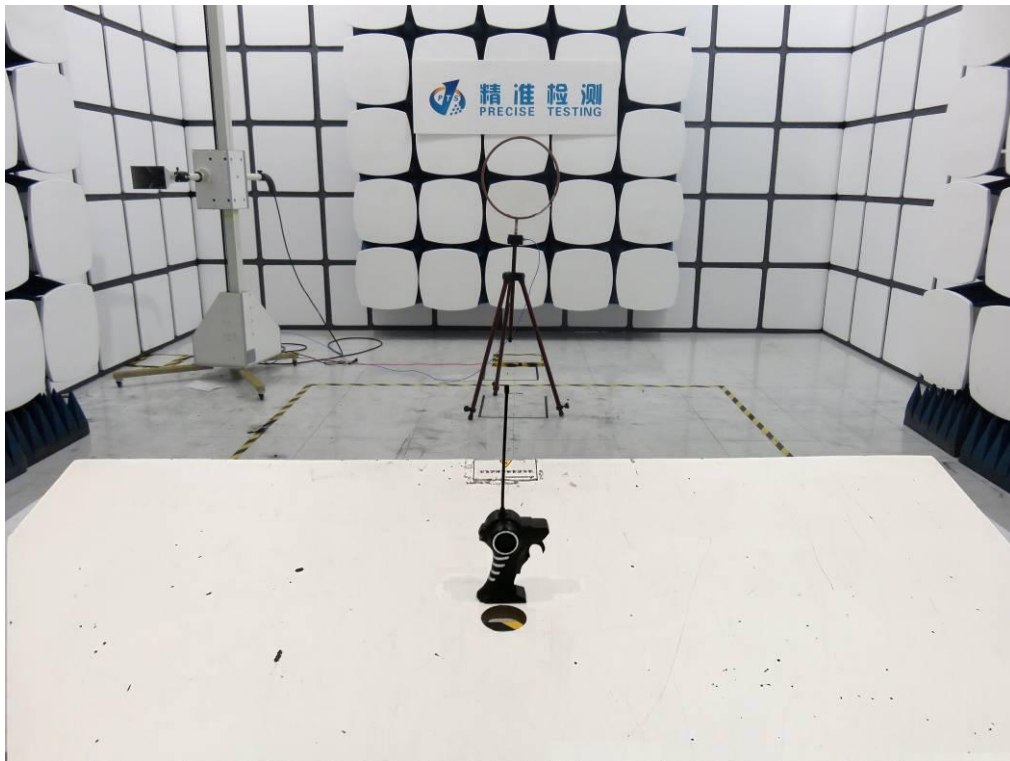
TEST ITEM	20DB BANDWIDTH
TEST MODE	Mode1

Test Data (kHz)		Criteria
Operate channel	7.220	PASS

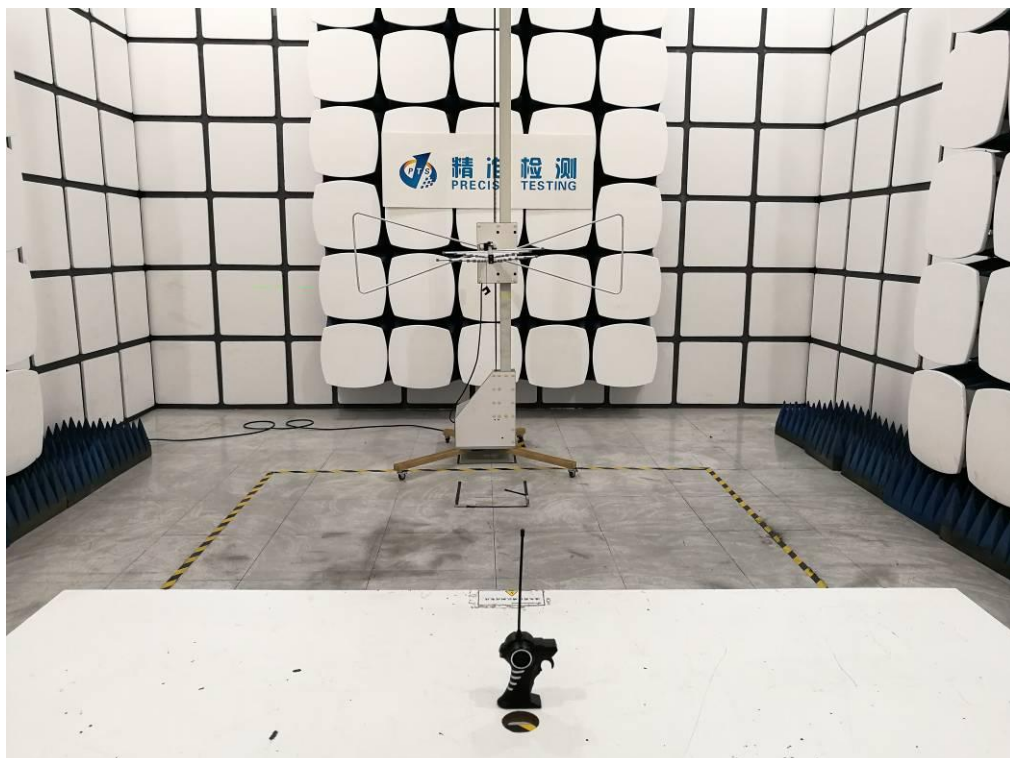


APPENDIX A: PHOTOGRAPHS OF TEST SETUP

RADIATED EMISSION TEST SETUP BELOW 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



APPENDIX B: PHOTOGRAPHS OF EUT

ALL VIEW OF EUT



TOP VIEW OF EUT



BOTTOM VIEW OF EUT



FRONT VIEW OF EUT



BACK VIEW OF EUT



LEFT VIEW OF EUT



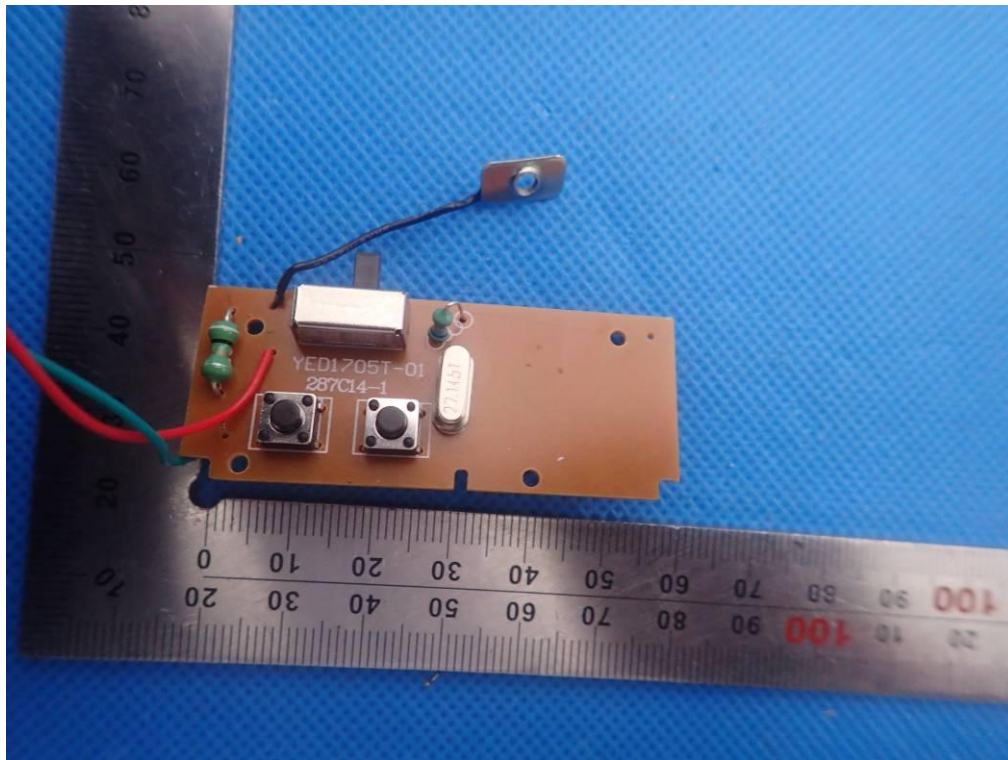
RIGHT VIEW OF EUT



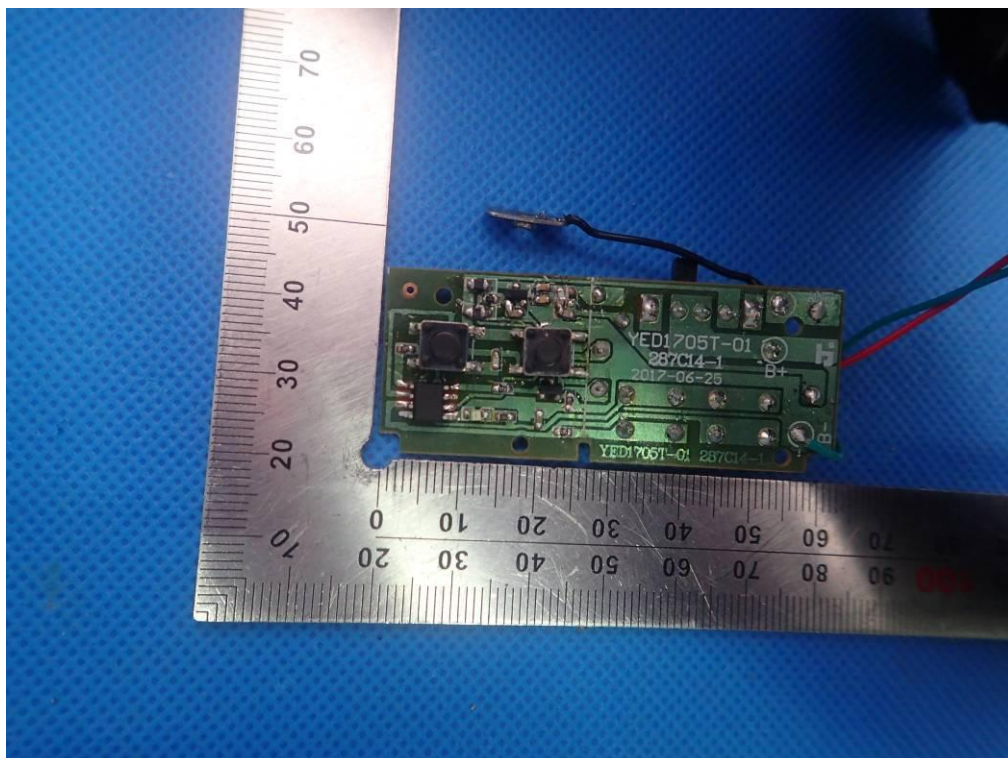
OPEN VIEW OF EUT



INTERNAL VIEW OF EUT-1



INTERNAL VIEW OF EUT-2



----END OF REPORT----