

FCC TEST REPORT

FCC ID: W2MXQ3708TX2GBYH

Product : R/C TOYS

Model Name : 3708

Brand : N/A

Report No. : PTC801011160613E-FC01

Prepared for

GuangDong XinYu Technology Industrial Co.,Ltd
Laimei Industrial zone,Chenghai District,
Shantou, Guangdong, China

Prepared by

DongGuan Precise Testing Service Co.,Ltd.
Building D, Baoding Technology Park, Guangming Road 2, Guangming Community
Dongcheng District, Dongguan, Guangdong, China



TEST RESULT CERTIFICATION

Applicant's name : GuangDong XinYu Technology Industrial Co.,Ltd
Address : Laimei Industrial zone,Chenghai District, Shantou, Guangdong, China
Manufacture's name : GuangDong XinYu Technology Industrial Co.,Ltd
Address : Laimei Industrial zone,Chenghai District, Shantou, Guangdong, China
Product name : R/C TOYS
Model name : 3708
Standards : FCC CFR47 Part 15 Section 15.249
Test procedure : ANSI C63.10:2013
Test Date : Jul. 19, 2016 - Aug. 03, 2016
Date of Issue : Aug. 04, 2016
Test Result : Pass

This device described above has been tested by PTC, 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 PTC, this document may be altered or revised by PTC, personal only, and shall be noted in the revision of the document.

Testing Engineer

August Qiu

Authorized Signatory

Chris Du



Contents

	Page
2 TEST SUMMARY.....	4
3 GENERAL INFORMATION.....	5
3.1 GENERAL DESCRIPTION OF E.U.T.....	5
3.2 TEST MODE	6
4 EQUIPMENT DURING TEST	7
4.1 EQUIPMENTS LIST.....	7
4.2 MEASUREMENT UNCERTAINTY.....	7
5 RADIATED EMISSIONS.....	8
5.1 EUT OPERATION	8
5.2 TEST SETUP.....	9
5.3 SPECTRUM ANALYZER SETUP.....	10
5.4 TEST PROCEDURE.....	11
5.5 SUMMARY OF TEST RESULTS.....	12
6 BAND EDGE EMISSION	16
6.1 TEST PROCEDURE.....	16
6.2 SUMMARY OF TEST RESULTS.....	17
6.3 LIMITS FOR FUNDAMENTAL AND HARMONICS EMISSION[FCC PART 15B 15.249]:.....	18
6.4 20 dB BANDWIDTH MEASUREMENT	21
6.5 TEST PROCEDURE.....	21
6.6 TEST RESULT.....	21
7 ANTENNA REQUIREMENT	23
8 TEST SETUP.....	24
9 EUT PHOTOS.....	25



2 Test Summary

Test Items	Test Requirement	Result
Conducted Emission	FCC Part 15B 15.207	PASS
Radiated Emission	FCC Part 15B 15.209	PASS
Band Edge Emission	FCC Part 15B 15.249	PASS
Fundamental and Harmonics Emission	FCC Part 15B 15.249	PASS
20dB Bandwidth	15:215(c)	PASS
Antenna Requirement	N/A	PASS

Remark:

N/A: Not Applicable



3 General Information

3.1 General Description of E.U.T.

Product Name : R/C TOYS
Model Name : 3708
Model Description : N/A
Operation Frequency: : 2407MHz, 2443MHz, 2477MHz
Antenna installation: : internal permanent antenna
Antenna Gain: : 0dBi
Type of Modulation : FSK
The lowest oscillator : 16MHz
Power supply : DC 3V power by batteries



3.2 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

Modulation	Test mode	Low channel	Middle channel	High channel
FSK	continuously Transmitting	2407MHz	2443MHz	2477MHz
Tests Carried Out Under FCC Part 15B				
Test Item		Test Mode		
Conduction Emission, 0.15MHz to 30MHz		TX mode		
Radiated Emission, 30M-25GHz		TX mode		

Dongguan Precise Testing Service Co., Ltd.

Building D, Baoding Technology Park, Guangming Road2, Dongcheng District, Dongguan,

Guangdong, China, Dongguan, 523129, China

IC Registration Number: 12191A-1



4 Equipment During Test

4.1 Equipments List

Radiated Emissions							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	EMI Test Receiver	Rohde & Schwarz	ESCI	101417	July 15, 2015	July 14, 2016	1 year
2	EMC Analyzer (9k~26.5GHz)	Agilent	E4407B	MY45109572	Aug.04, 2015	Aug.03, 2016	1 year
3	Trilog Broadband Antenna	SCHWARZECK	VULB9160	9160-3355	July 15, 2015	July 14, 2016	1 year
4	Amplifier	EM	EM-30180	060538	July 15, 2015	July 14, 2016	1 year
5	Horn Antenna	SCHWARZECK	BBHA9120D	9120D-1246	July 15, 2015	July 14, 2016	1 year
6	Coaxial Cable(below 1GHz)	LARGE	CALB1	-	July 15, 2015	July 14, 2016	1 year
7	Coaxial Cable(above 1GHz)	LARGE	CALB2	-	July 15, 2015	July 14, 2016	1 year

4.2 Measurement Uncertainty

Parameter	Uncertainty
RF output power, conducted	±1.0dB
Power Spectral Density, conducted	±2.2dB
Radio Frequency	± 1 x 10 ⁻⁶
Bandwidth	± 1.5 x 10 ⁻⁶
Time	±2%
Duty Cycle	±2%
Temperature	±1°C
Humidity	±5%
DC and low frequency voltages	±3%
Conducted Emissions (150kHz~30MHz)	±3.64dB
Radiated Emission(30MHz~1GHz)	±5.03dB
Radiated Emission(1GHz~25GHz)	±4.74dB



5 Radiated Emissions

Test Requirement: : FCC Part 15B 15.209
 Test Method: : ANSI C63.10:2013
 Test Result: : PASS
 Measurement Distance: : 3m
 Limit: : See the follow table

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	$2400/F(\text{kHz})$	300	$10000 * 2400/F(\text{kHz})$	$20\log^{(2400/F(\text{kHz}))} + 80$
0.490 ~ 1.705	$24000/F(\text{kHz})$	30	$100 * 24000/F(\text{kHz})$	$20\log^{(24000/F(\text{kHz}))} + 40$
1.705 ~ 30	30	30	$100 * 30$	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

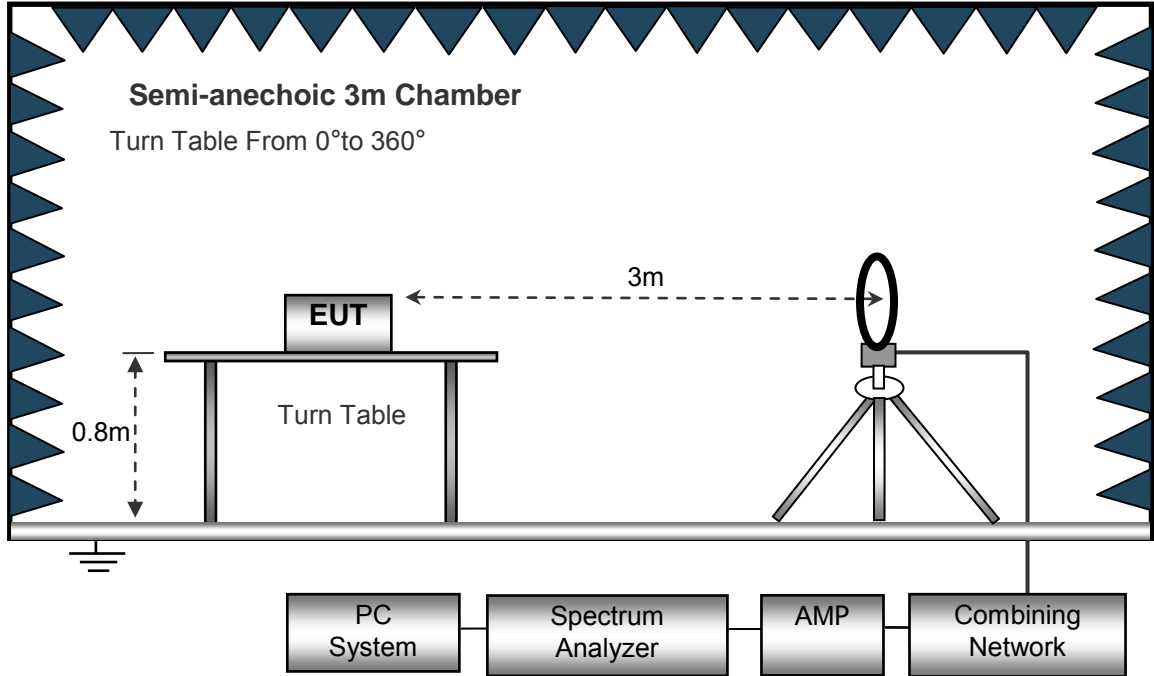
5.1 EUT Operation

Operating Environment :
 Temperature: : 23.5 °C
 Humidity: : 51.1 % RH
 Atmospheric Pressure: : 101.2kPa
 EUT Operation : : Refer to section 3.3

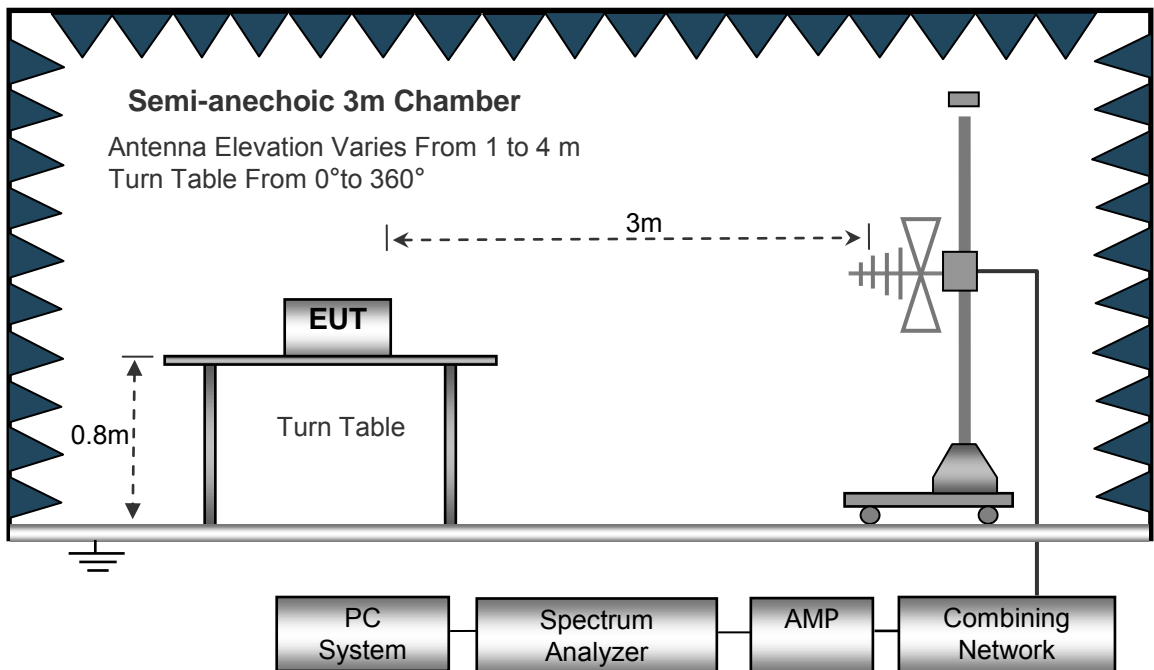
5.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site

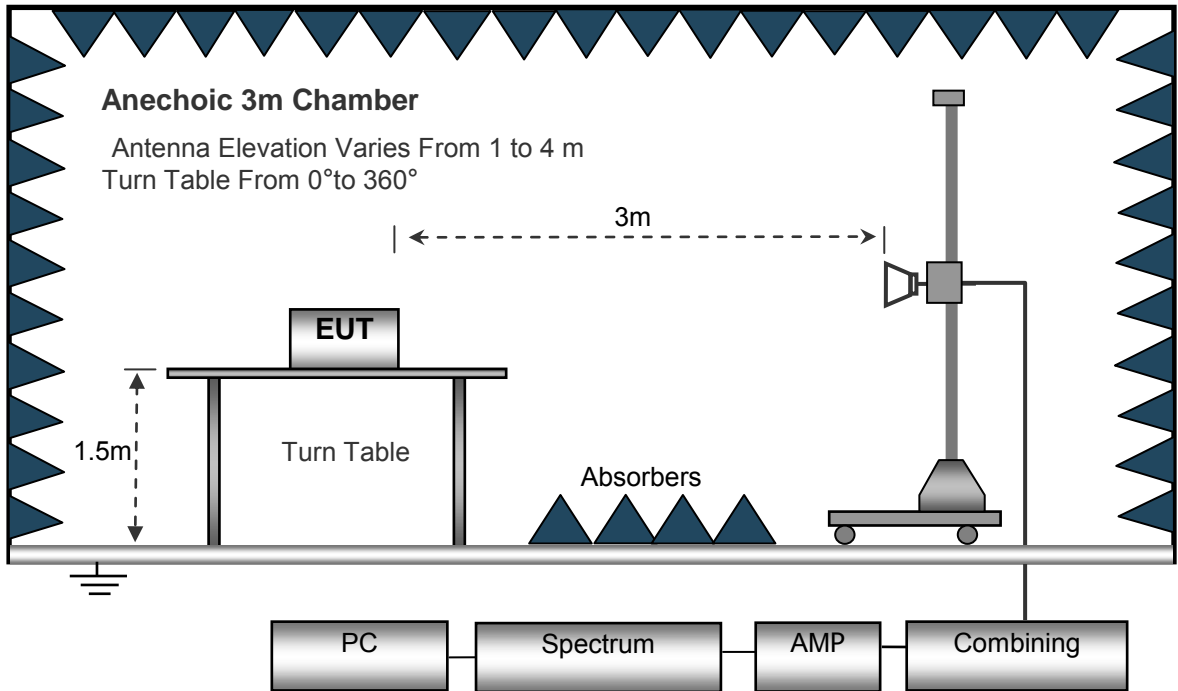
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



5.3 Spectrum Analyzer Setup

Below 30MHz

IF Bandwidth	10kHz
Resolution Bandwidth	10kHz
Video Bandwidth	10kHz

30MHz ~ 1GHz

Detector	: PK
Resolution Bandwidth	: 100kHz
Video Bandwidth	: 300kHz
Detector	: QP
Resolution Bandwidth	: 120kHz
Video Bandwidth	: 300kHz

Above 1GHz

Detector	: PK
Resolution Bandwidth	: 1MHz
Video Bandwidth	: 3MHz
Detector	: AV
Resolution Bandwidth	: 1MHz
Video Bandwidth	: 10Hz



5.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m or 1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.



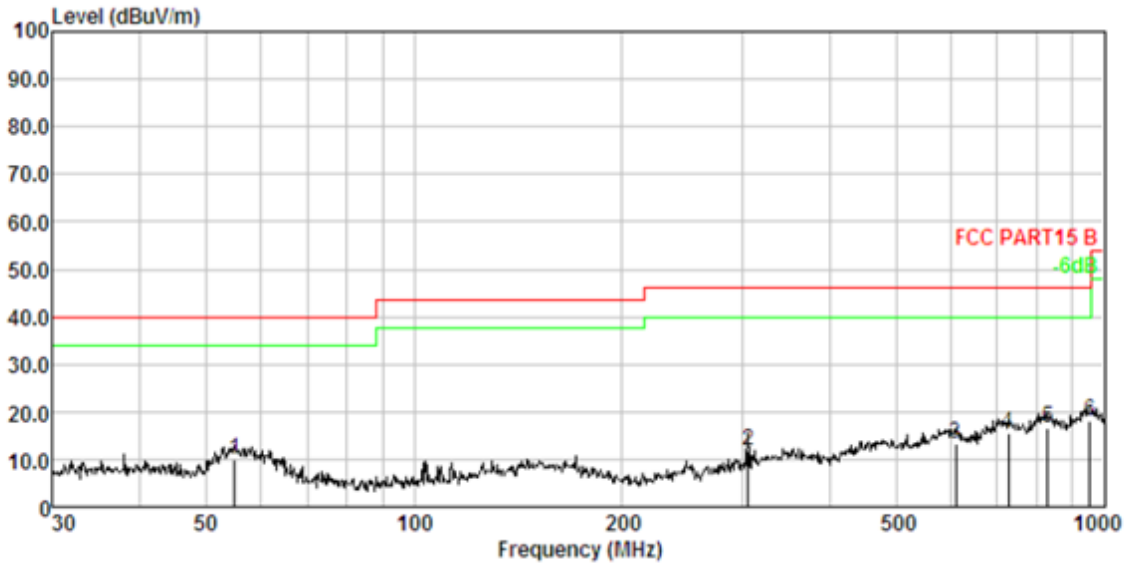
5.5 Summary of Test Results

Test Frequency: Below 30MHz

The measurements were more than 30 dB below the limit and not reported.

Test Frequency: 30MHz ~ 1GHz

Antenna Polarization: Horizontal

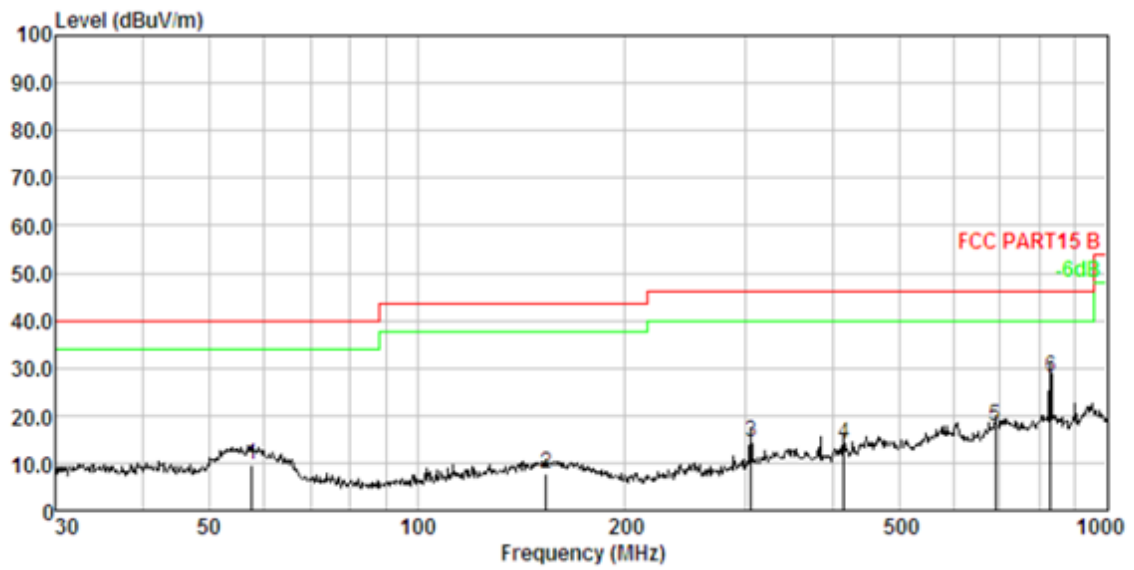


No.	Freq MHz	Cable Loss dB	ANT Factor dB/m	Receiver Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark
1.	55.027	1.60	11.90	26.58	30.18	9.90	40.00	-30.10	QP
2.	304.610	3.15	13.30	25.96	30.78	11.63	46.00	-34.37	QP
3.	609.922	3.78	19.18	21.50	31.02	13.44	46.00	-32.56	QP
4.	726.805	3.94	20.66	22.07	31.08	15.59	46.00	-30.41	QP
5.	827.493	4.06	21.94	21.66	31.12	16.54	46.00	-29.46	QP
6.	952.094	4.19	23.43	21.79	31.17	18.24	46.00	-27.76	QP

Emission Level=Cable Loss+ANT Factor+Receiver Reading-Pre Factor



Antenna Polarization: Vertical



No.	Freq MHz	Cable Loss dB	ANT Factor dB/m	Receiver Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark
1.	57.594	1.65	12.04	26.24	30.20	9.73	40.00	-30.27	QP
2.	153.739	2.53	13.89	21.82	30.54	7.70	43.50	-35.80	QP
3.	304.610	3.15	13.30	28.70	30.78	14.37	46.00	-31.63	QP
4.	416.179	3.44	15.63	25.69	30.89	13.87	46.00	-32.13	QP
5.	689.565	3.89	20.01	24.91	31.06	17.75	46.00	-28.25	QP
6.	827.493	4.06	21.94	33.06	31.12	27.94	46.00	-18.06	QP

Emission Level=Cable Loss+ANT Factor+Receiver Reading-Pre Factor



Test Frequency: 1GHz ~ 18GHz

Remark: only the worst data(GFSK modulation mode) were reported.

Frequency	Receiver Reading	Detector	Corrected Factor	Corrected Amplitude	Limit	Margin
(MHz)	(dBµV)	(PK/Ave)	(dB)	(dBµV/m)	(dBµV/m)	(dB)
GFSK Low Channel						
1105.33	55.86	PK	-18.67	37.19	74	-36.81
1105.33	45.01	Ave	-18.67	26.34	54	-27.66
2455.75	56.34	PK	-13.08	43.26	74	-30.74
2455.75	43.35	Ave	-13.08	30.27	54	-23.73
3658.50	55.51	PK	-8.25	47.26	74	-26.74
3658.50	42.4	Ave	-8.25	34.15	54	-19.85

Frequency	Receiver Reading	Detector	Corrected Factor	Corrected Amplitude	Limit	Margin
(MHz)	(dBµV)	(PK/Ave)	(dB)	(dBµV/m)	(dBµV/m)	(dB)
GFSK Middle Channel						
1134.31	56.71	PK	-18.67	38.04	74	-35.96
1134.31	44.35	Ave	-18.67	25.68	54	-28.32
2494.75	52.36	PK	-13.08	39.28	74	-34.72
2494.75	42.89	Ave	-13.08	29.81	54	-24.19
3584.11	55.11	PK	-8.25	46.86	74	-27.14
3584.11	43.05	Ave	-8.25	34.8	54	-19.2

Corrected Factor=ANT Factor + Cable Loss – Amp Gain



Frequency	Receiver Reading	Detector	Corrected Factor	Corrected Amplitude	Limit	Margin
(MHz)	(dBμV)	(PK/Ave)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
GFSK High Channel						
1192.37	56.53	PK	-18.67	37.86	74	-36.14
1192.37	44.38	Ave	-18.67	25.71	54	-28.29
2521.30	54.66	PK	-13.08	41.58	74	-32.42
2521.30	43.79	Ave	-13.08	30.71	54	-23.29
3715.25	55.16	PK	-8.25	46.91	74	-27.09
3715.25	42.97	Ave	-8.25	34.72	54	-19.28

Corrected Factor=ANT Factor + Cable Loss – Amp Gain

Test Frequency :Above 18GHz

The measurements were more than 20 dB below the limit and not reported



6 Band Edge Emission

Test Requirement	:	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.
Test Method	:	ANSI C63.10:2013
Test Limit	:	50 dB below the level of the fundamental or to the general radiated emission limits
	:	Refer to section 3.3

6.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;

2. Set the spectrum analyzer: RBW = 1000kHz, VBW = 3000kHz, Sweep = auto

Detector function = peak, Trace = max hold



6.2 Summary of Test Results

Frequency	Receiver Reading	Detector	Corrected Factor	Corrected Amplitude	Limit	Margin
(MHz)	(dBμV)	(PK/Ave)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
GFSK Low Channel 2408MHz						
2380.11	45.85	PK	-13.19	32.66	74	-41.34
2380.11	39.69	Ave	-13.19	26.5	54	-27.5
2400.00	54.11	PK	-13.08	41.03	74	-32.97
2400.00	44.3	Ave	-13.08	31.22	54	-22.78
GFSK High Channel 2478MHz						
2483.50	50.08	PK	-13.19	36.89	74	-37.11
2483.50	42.7	Ave	-13.19	29.51	54	-24.49
2557.58	46.21	PK	-13.08	33.13	74	-40.87
2457.58	41.4	Ave	-13.08	28.32	54	-25.68
Remark:						
1. Corrected Factor=ANT Factor + Cable Loss – Amp Gain						
3. All other emissions more than 30dB below the limit						



6.3 Limits for Fundamental and Harmonics Emission[FCC Part 15B 15.249]:

Frequency Range [MHz]	Field Strength (millivolts/m)	
	Fundamental	Harmonics
902-928	50	0.5
2400-2483.5	50	0.5
5725-5875	50	0.5

Note: The limits shown in the above table are based on measurements using an average detector, except for the fundamental emission in the frequency band 902-928 MHz, which is based on measurements using a CISPR quasi-peak detector.

(b) 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

The provisions of 15.249 regarding pulsed operation do not apply to CISPR measurement for the band 902-928 MHz.

Frequency (MHz)	Receiver Reading (dBµV)	Detector (PK/Ave)	Corrected Factor (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
GFSK Low Channel 2407MHz						
2407.00	86.35	PK	-13.19	73.16	114	-40.84
2407.00	79.21	Ave	-13.19	66.02	94	-27.98
4814.00	53.69	PK	-7.68	46.01	74	-27.99
4814.00	40.11	Ave	-7.68	32.43	54	-21.57
7221.00	54.37	PK	-4.52	49.85	74	-24.15
7221.00	40.2	Ave	-4.52	35.68	54	-18.32
9628.00	54.58	PK	-2.33	52.25	74	-21.75
9628.00	39.67	Ave	-2.33	37.34	54	-16.66



GFSK Middle Channel 2443MHz						
2443.00	85.11	PK	-13.19	71.92	114	-42.08
2443.00	76.38	Ave	-13.19	63.19	94	-30.81
4886.00	54.26	PK	-7.68	46.58	74	-27.42
4886.00	40.08	Ave	-7.68	32.4	54	-21.6
7329.00	54.17	PK	-4.52	49.65	74	-24.35
7329.00	41.02	Ave	-4.52	36.5	54	-17.5
9772.00	54.69	PK	-2.33	52.36	74	-21.64
9772.00	39.87	Ave	-2.33	37.54	54	-16.46



GFSK High Channel 2477MHz						
2477.00	86.01	PK	-13.19	72.82	114	-41.18
2477.00	75.98	Ave	-13.19	62.79	94	-31.21
4954.00	54.86	PK	-7.68	47.18	74	-26.82
4954.00	40.15	Ave	-7.68	32.47	54	-21.53
7431.00	54.91	PK	-4.52	50.39	74	-23.61
7431.00	40.48	Ave	-4.52	35.96	54	-18.04
9908.00	54.75	PK	-2.33	52.42	74	-21.58
9908.00	39.58	Ave	-2.33	37.25	54	-16.75
Remark:						
1. Corrected Factor=ANT Factor + Cable Loss – Amp Gain						
3. All other emissions more than 30dB below the limit						



6.4 20 dB Bandwidth Measurement

- Test Requirement : FCC Part 15 B 15.205
- Test Method : ANSI C63.10:2013
- Test Mode : Refer to section 3.3

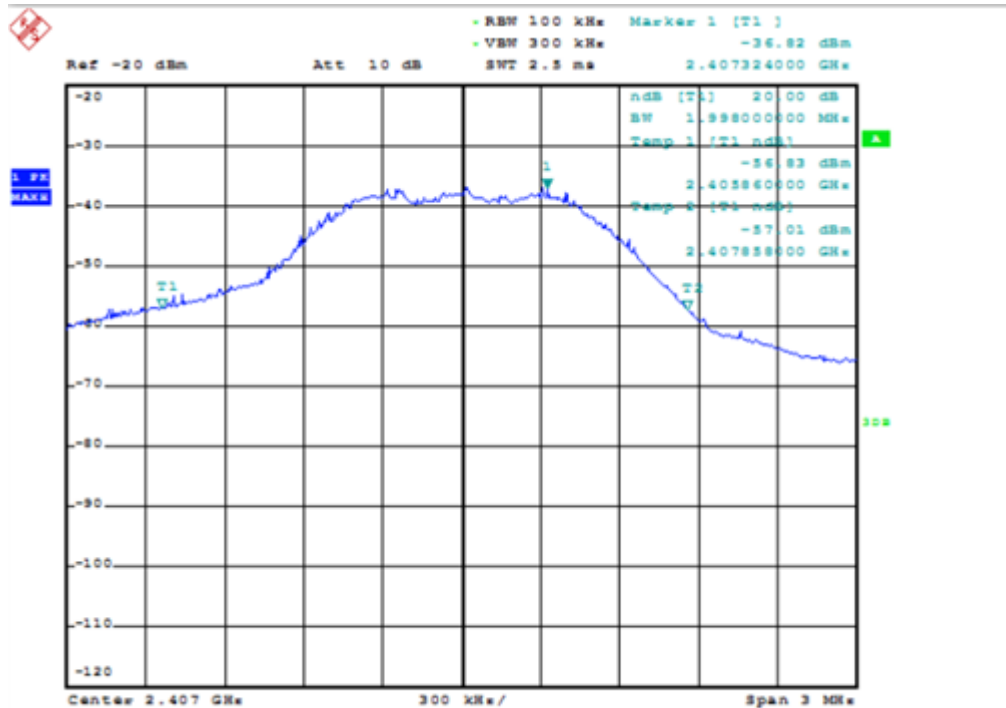
6.5 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: For BLE, RBW = 100kHz, VBW = 300kHz,

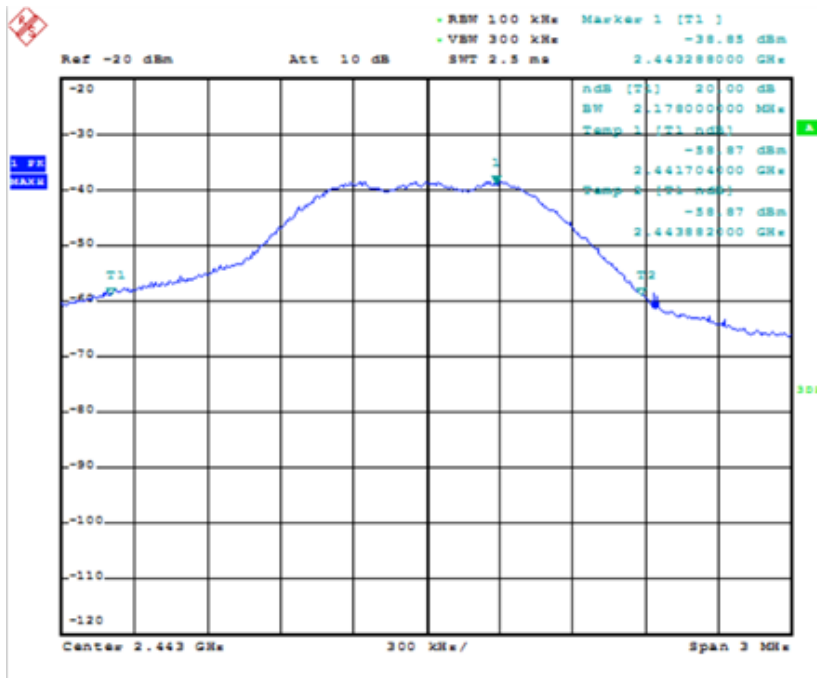
6.6 Test Result

Test Frequency	Bandwidth
2407MHz	1.998MHz
2443MHz	2.178MHz
2477MHz	2.124MHz

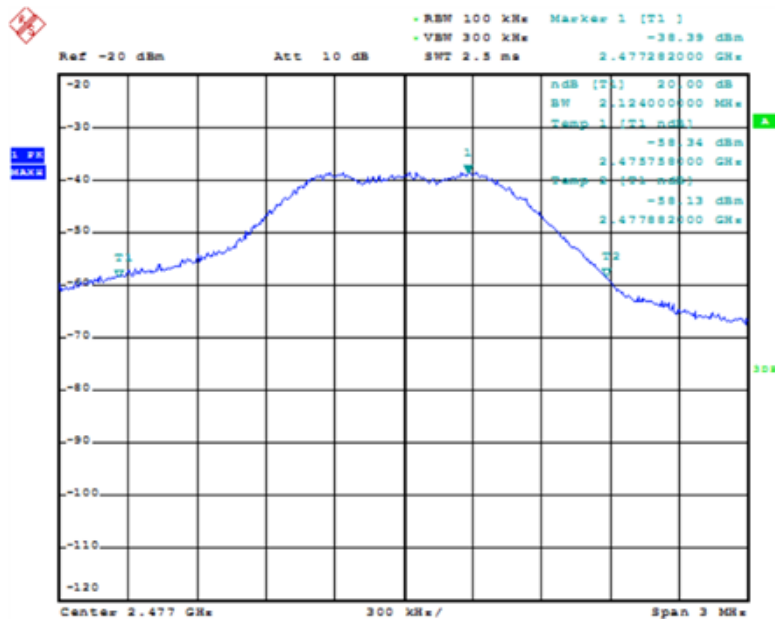
Test plots 2407



Test plots 2443



Test plots 2477





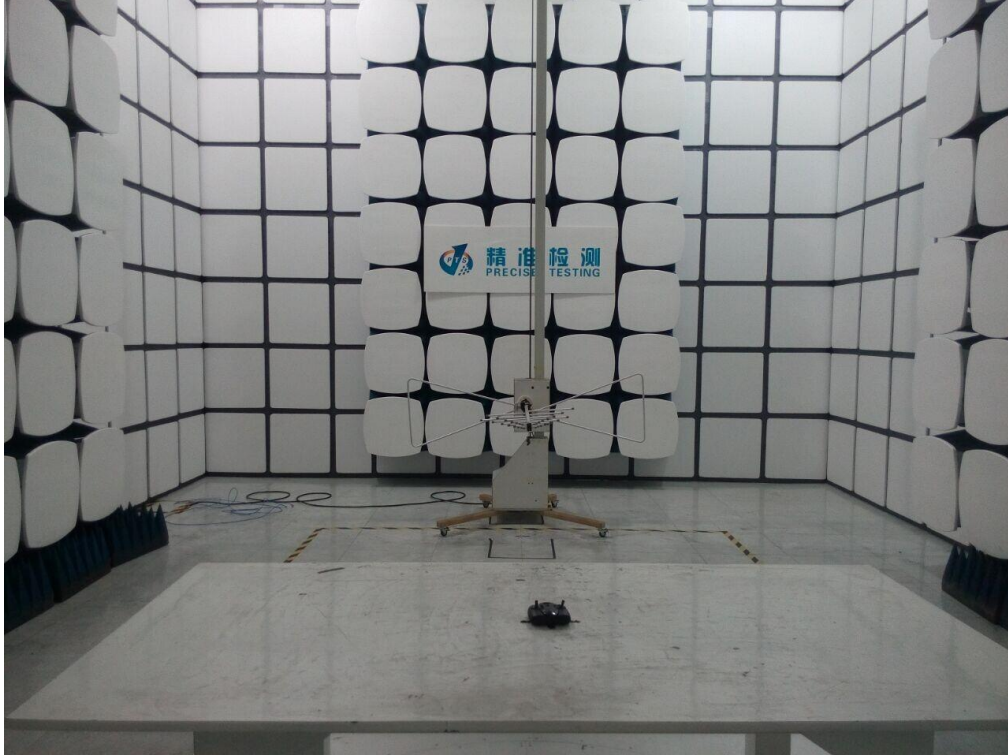
7 Antenna Requirement

According to the FCC part15.203 A transmitter can only be sold or operated with antennas with which it was approved. This product has an internal permanent antenna which meet the requirement of this section.

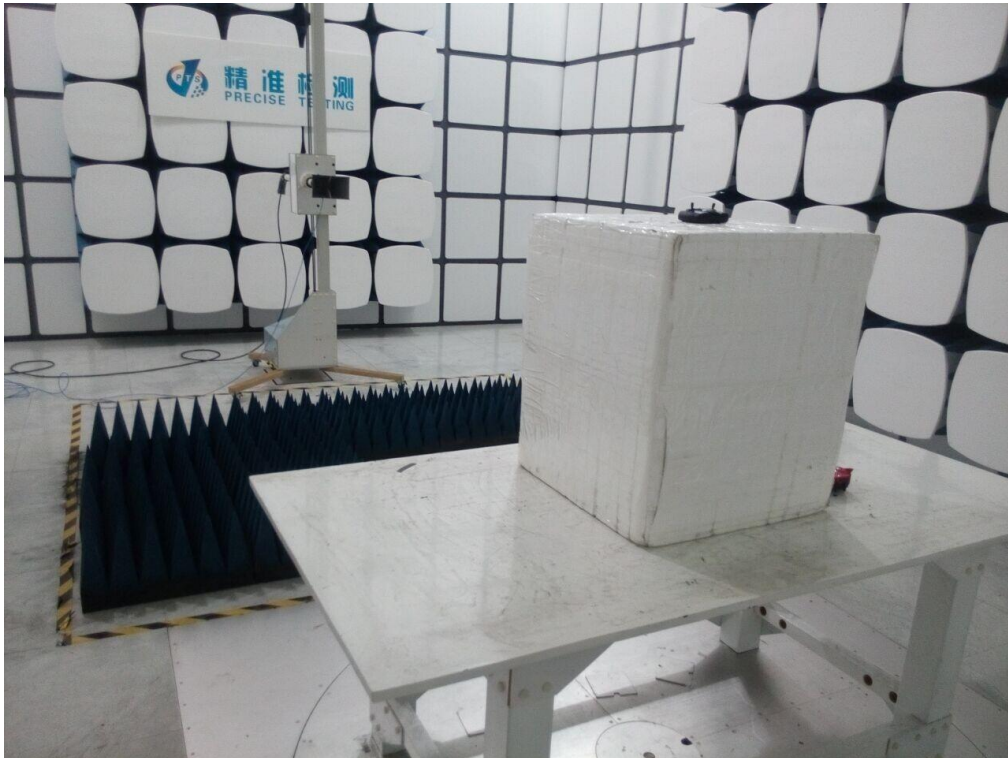


8 Test Setup

Radiated Spurious Emissions
From 30MHz-1000MHz



Above 1GHz





9 EUT Photos

External Photos



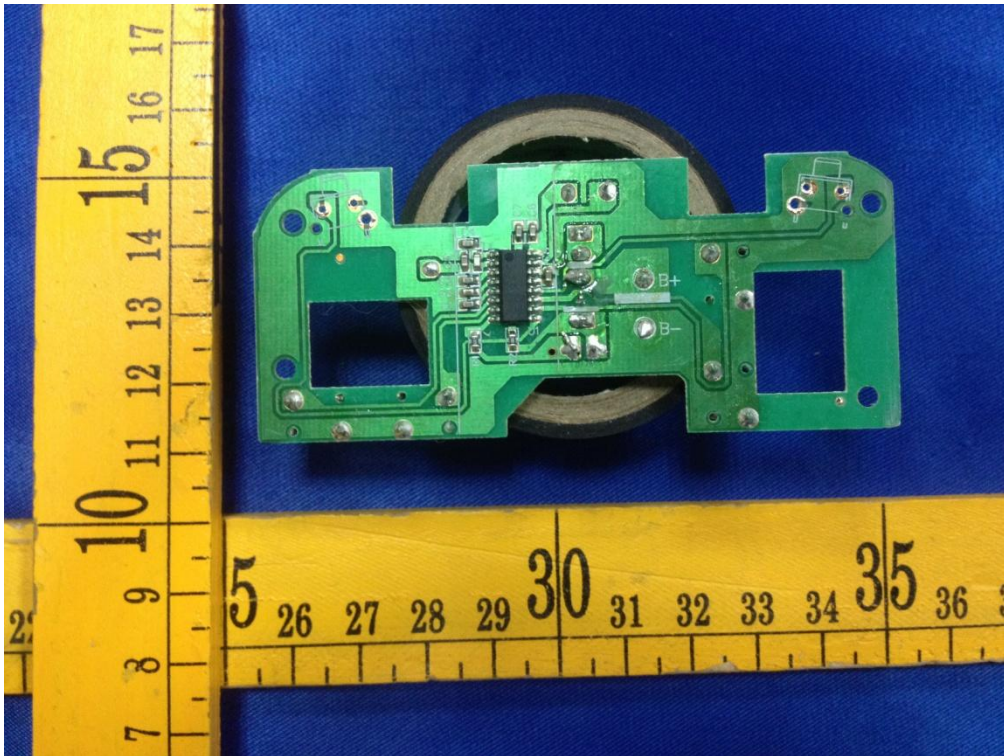
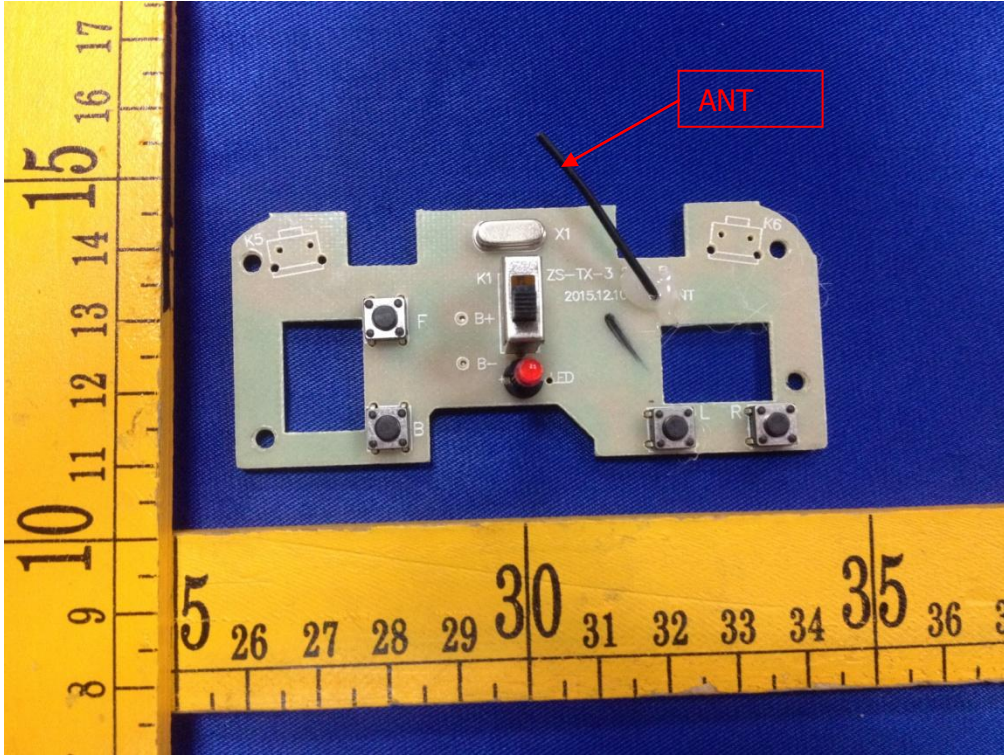






Internal Photos





*****THE END REPORT*****