Shenzhen Global Test Service Co.,Ltd.
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

TEST REPORT
FCC Rules and Regulations Part PART 15.249

Report Reference No.....:	**GTS20210315018-1-1**
FCC ID..... .::	**2AZCN-8001**
Compiled by (position+printed name+signature)..:	File administrators Jimmy Wang
Supervised by (position+printed name+signature)..:	Test Engineer Aaron Tan
Approved by (position+printed name+signature)..:	Manager Jason Hu
Date of issue.....:	Mar. 15, 2020
Testing Laboratory Name .....:	**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, China
Applicant's name.....:	**QUANSHENG TOYS FACTORY**
Address .....:	WAIBU INDUSTRIAL AREA,CHENGHAI SHANTOU CHINA
Standard .....:	**FCC Rules and Regulations Part PART 15.249**

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Test item description .....:	**R/C CAR**
Trade Mark .....:	N/A
Manufacturer.....:	**QUANSHENG TOYS FACTORY**
Model/Type reference.....:	8001
Listed Models .....:	8002, 8003, 8004,8005, 8006, 8007, 8008, 8009, 80010,80011, 80012, 80013, 80014, 80015, 80016, 80017, 80018, 80019, 80020
Modulation .....:	GFSK
Frequency.....	2465.5MHz
Ratings .....:	DC 3.0 V From Battery
Result.....:	**PASS**

T E S T R E P O R T

Test Report No. :	GTS20210315018-1-1	Mar. 15, 2021 Date of issue

Equipment under Test	:	R/C CAR
Model /Type	:	8001
Listed Models	:	8002, 8003, 8004,8005, 8006, 8007, 8008, 8009, 80010,80011, 80012, 80013, 80014, 80015, 80016, 80017, 80018, 80019, 80020
Applicant	:	**QUANSHENG TOYS FACTORY**
Address	:	WAIBU INDUSTRIAL AREA,CHENGHAI SHANTOU CHINA
Manufacturer	:	**QUANSHENG TOYS FACTORY**
Address	:	WAIBU INDUSTRIAL AREA,CHENGHAI SHANTOU CHINA

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:

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 Range of 9 kHz to 40GHz

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	Mar. 01, 2021
Testing commenced on	:	Mar. 01, 2021
Testing concluded on	:	Mar. 15, 2021

2.2. Product Description

Name of EUT	R/C CAR
Model Number	8001
List Model:	8002, 8003, 8004,8005, 8006, 8007, 8008, 8009, 80010,80011, 80012, 80013, 80014, 80015, 80016, 80017, 80018, 80019, 80020
Power Rating	DC 3.0V From Battery
Sample ID:	GTS20210315018-1-1 -1#(Engineer sample) GTS20210315018-1-1 -2#(Normal sample)
Operation frequency	2465.5MHz
Modulation	GFSK
Antenna Type	PCB antenna
Antenna Gain	0dB(Max)

2.3. Equipment Under Test

Power supply system utilised

Power supply voltage	:	○	230V / 50 Hz	○	120V / 60Hz
		○	12 V DC	○	24 V DC
		●	Other (specified in blank below)		

DC 3.0 V

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

This is a R/C CAR

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

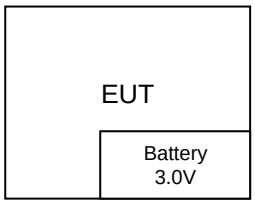
2.5. EUT operation mode

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	2465.5

Test frequency:

2.6. Block Diagram of Test Setup



2.7. Modifications

No modifications were implemented to meet testing criteria.

3. TEST ENVIRONMENT

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

3.2. Environmental conditions

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

Radiated Emission:

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

Conducted testing：

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

3.3. 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

3.4. 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

3.5. Equipments Used during the Test

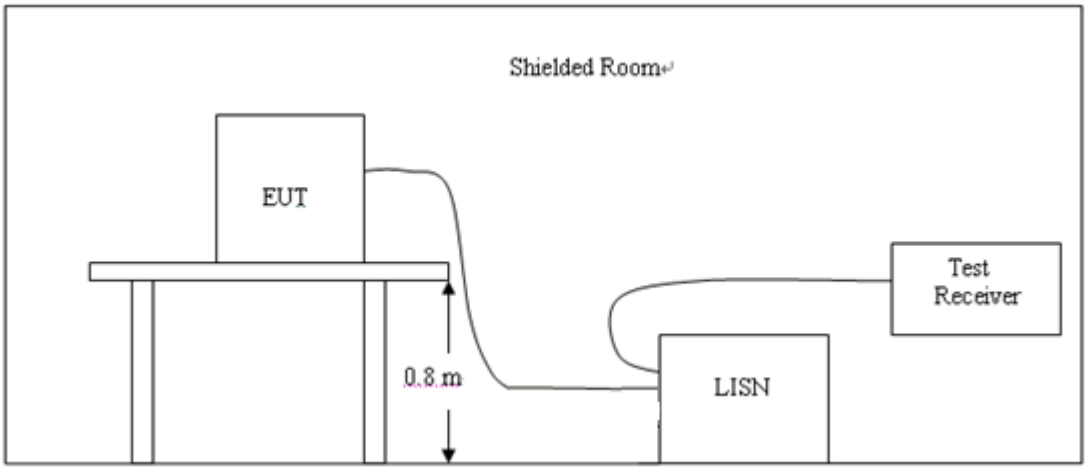
Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
LISN	R&S	ENV216	3560.6550.08	2020/09/19	2021/09/18
LISN	R&S	ESH2-Z5	893606/008	2020/09/19	2021/09/18
EMI Test Receiver	R&S	ESPI3	101841-cd	2020/09/19	2021/09/18
EMI Test Receiver	R&S	ESCI7	101102	2020/09/19	2021/09/18
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/Humidity 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
High-Pass Filter	K&L	41H10-1375/U12750-O/O	KL142032	2020/09/19	2021/09/18
RF Cable(below 1GHz)	HUBER+SUHNER	RG214	RE01	2020/09/19	2021/09/18
RF Cable(above 1GHz)	HUBER+SUHNER	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 frequency.		

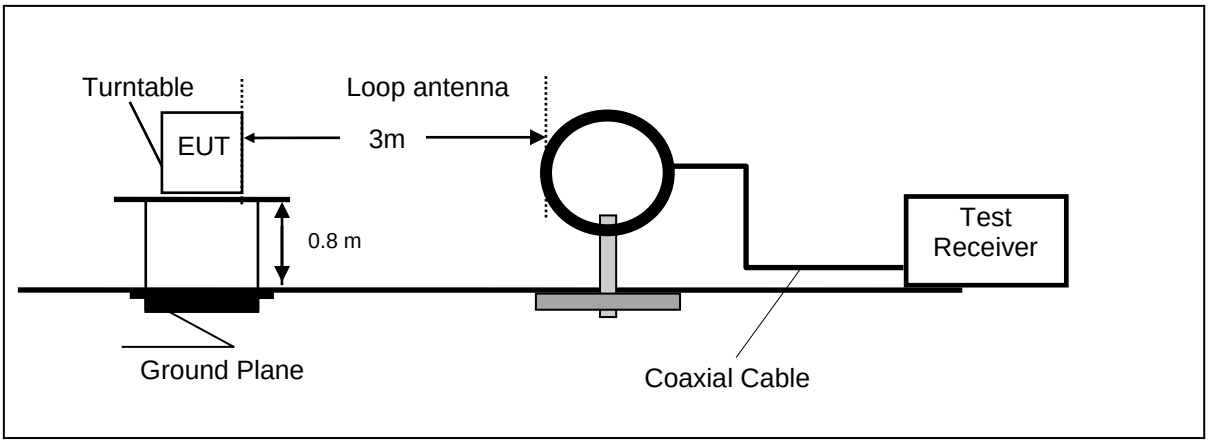
TEST RESULTS

The EUT is powered by Battery,So this test item is not applicable for the EUT.

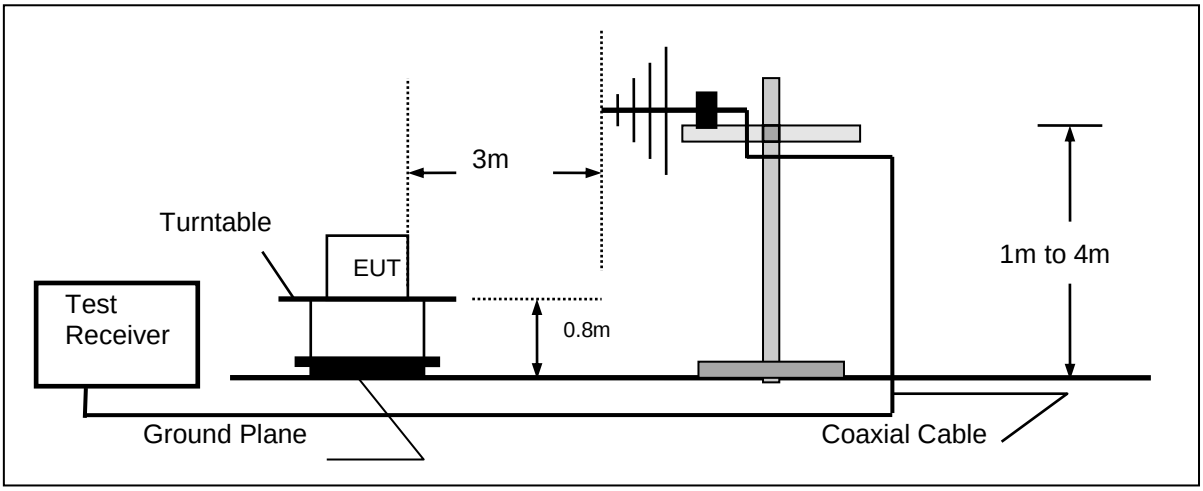
4.2. Radiated Emission and Band Edges

TEST CONFIGURATION

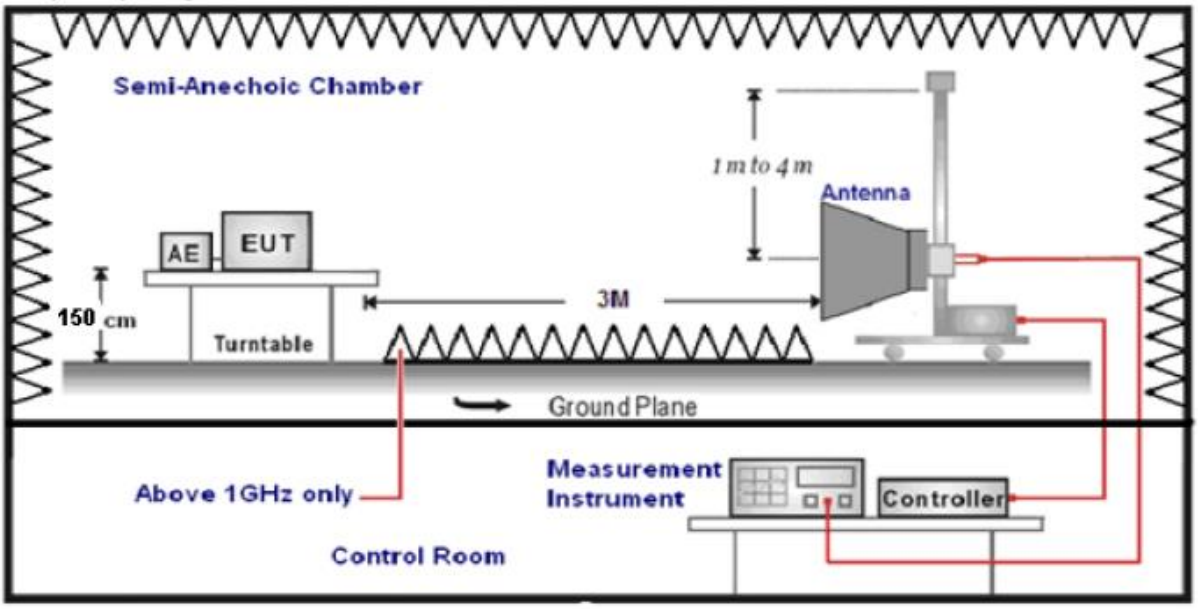
Frequency range 9 KHz – 30MHz



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℃ to 360℃ 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
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

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)

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

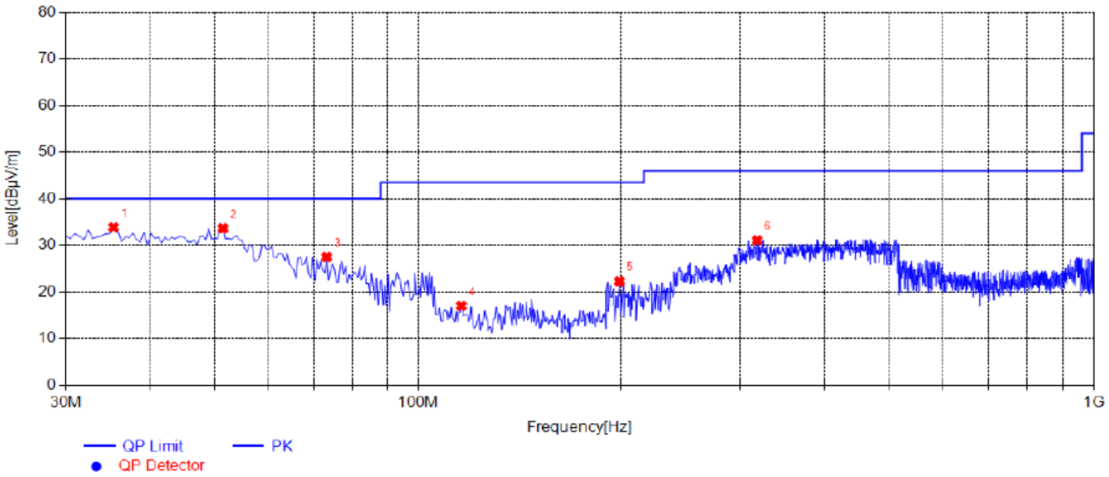
TEST RESULTS

Remark:

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

For 30MHz-1GHz

Horizontal



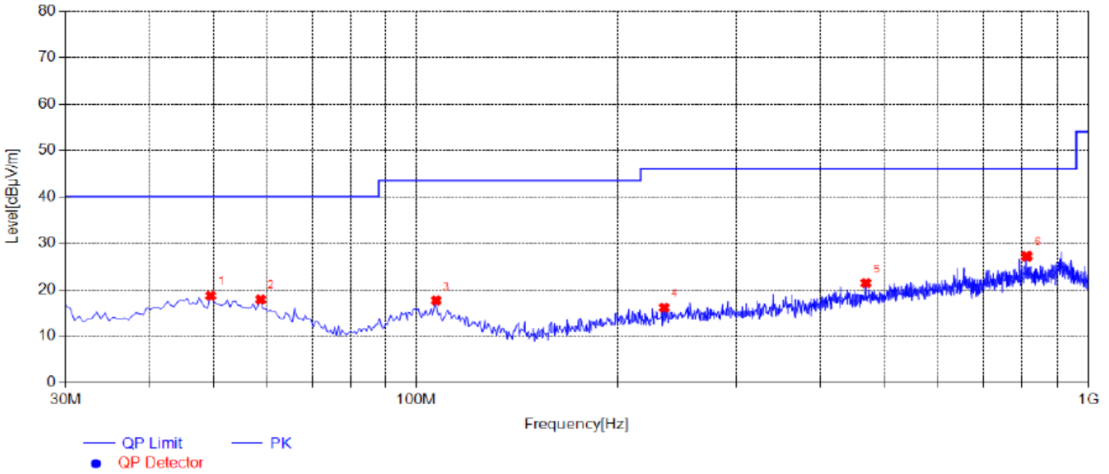
Suspected List

NO.	Frequency [MHz]	Reading [dBµV/m]	Factor [dB]	Result [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity	Remark
1	35.3350	43.70	-9.83	33.87	40.00	6.13	100	358	PK	Horizonta	PASS
2	51.3400	40.28	-6.63	33.65	40.00	6.35	100	358	PK	Horizonta	PASS
3	73.1650	39.05	-11.55	27.50	40.00	12.50	100	358	PK	Horizonta	PASS
4	115.8450	26.46	-9.43	17.03	43.50	26.47	100	358	PK	Horizonta	PASS
5	198.7800	31.37	-9.12	22.25	43.50	21.25	100	358	PK	Horizonta	PASS
6	318.0900	38.14	-7.04	31.10	46.00	14.90	100	358	PK	Horizonta	PASS

Note:1. Result (dBµV/m) = Reading(dBµV/m) + Factor (dB) .

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

Vertical



Suspected List

NO.	Frequency [MHz]	Reading [dBµV/m]	Factor [dB]	Result [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity	Remark
1	49.4000	25.32	-6.63	18.69	40.00	21.31	100	349	PK	Vertical	PASS
2	58.6150	25.79	-7.91	17.88	40.00	22.12	100	358	PK	Vertical	PASS
3	107.1150	25.39	-7.73	17.66	43.50	25.84	100	342	PK	Vertical	PASS
4	234.1850	25.00	-8.87	16.13	46.00	29.87	100	356	PK	Vertical	PASS
5	468.4400	25.51	-4.08	21.43	46.00	24.57	100	352	PK	Vertical	PASS
6	811.8200	25.51	1.70	27.21	46.00	18.79	100	358	PK	Vertical	PASS

Note:1. Result (dBµV/m) = Reading(dBµV/m) + Factor (dB) .

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

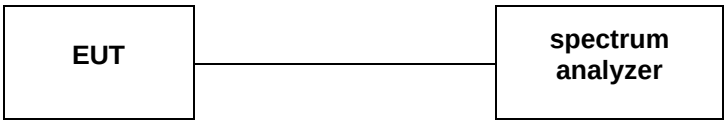
For 1GHz to 25GHz

Frequency(MHz):				**2465.50**		**Polarity:**			**HORIZONTAL**	
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	2390.00	47.20	PK	74	26.80	13.88	28.72	4.6	0.00	33.32
1	2390.00	--	AV	54	--	--	--	--	--	--
2	2465.50	90.41	PK	114	23.59	56.83	28.9	4.68	0.00	33.58
2	2465.50	81.25	AV	94	12.75	47.67	28.9	4.68	0.00	33.58
3	2483.50	51.39	PK	74	22.61	17.76	28.93	4.7	0.00	33.63
3	2483.50	--	AV	54	--	--	--	--	--	--
4	2500.00	46.85	PK	74	27.15	13.17	28.96	4.72	0.00	33.68
4	2500.00	--	AV	54	--	--	--	--	0.00	--
5	4931.00	54.96	PK	74	19.04	50.12	33.77	6.99	35.92	4.84
5	4931.00	45.60	AV	54	8.40	40.76	33.77	6.99	35.92	4.84

Frequency(MHz):				**2465.50**		**Polarity:**			**VERTICAL**	
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	2390.00	47.64	PK	74	26.36	14.32	28.72	4.6	0.00	33.32
1	2390.00	--	AV	54	--	--	--	--	--	--
2	2465.50	91.79	PK	114	22.21	58.21	28.9	4.68	0.00	33.58
2	2465.50	82.92	AV	94	11.08	49.34	28.9	4.68	0.00	33.58
3	2483.50	51.95	PK	74	22.05	18.32	28.93	4.7	0.00	33.63
3	2483.50	--	AV	54	--	--	--	--	--	--
4	2500.00	47.97	PK	74	26.03	14.29	28.96	4.72	0.00	33.68
4	2500.00	--	AV	54	--	--	--	--	0.00	--
5	4931.00	56.27	PK	74	17.73	51.43	33.77	6.99	35.92	4.84
5	4931.00	46.92	AV	54	7.08	42.08	33.77	6.99	35.92	4.84

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 20dB.

LIMIT

N/A

TEST RESULTS

Modulation	Channel	20dB bandwidth (MHz)	Result
GFSK	CH01	1.095	Pass

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

20dB Bandwidth Measurement

CH01

4.4. Antenna Requirement

Standard Applicable

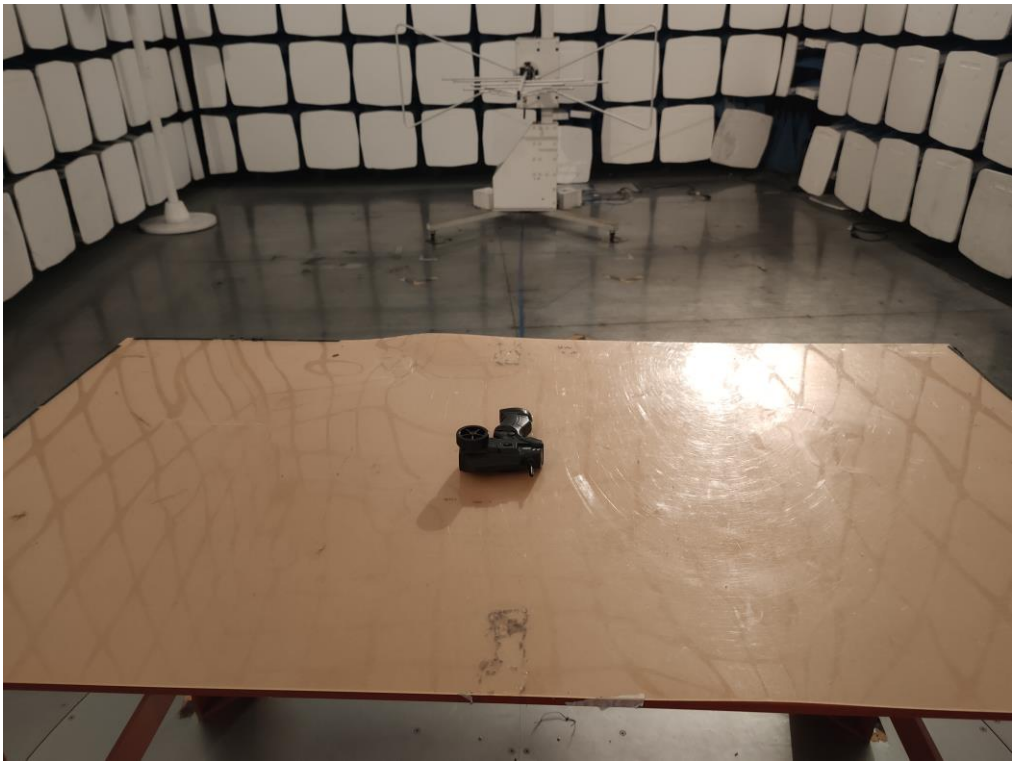
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

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

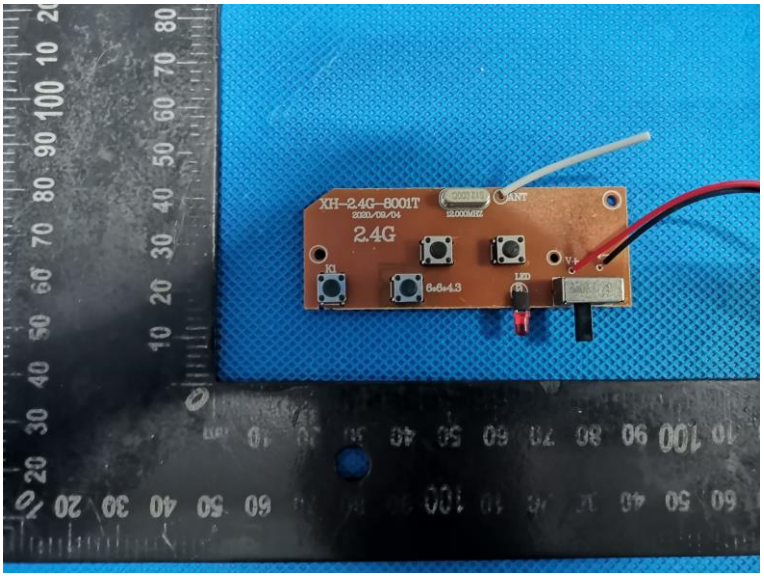


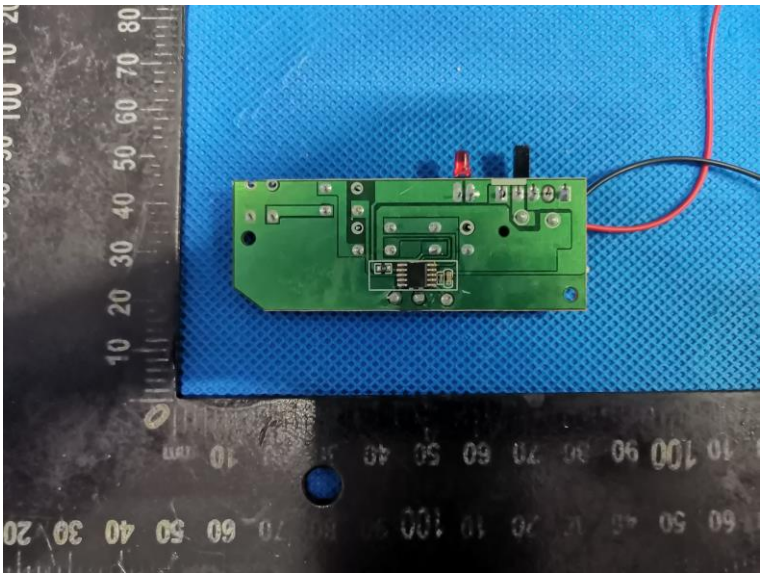
6. Test Photos of the EUT

2.4 GHz

2.4 GHz

2.4 GHZ





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