

Test Report

Applicant: FLYSKY RC MODEL TECHNOLOGY CO., LTD

Address of Applicant: West building3, Huangjianyuan Ind, Park QIAOLI North Gate
Changping Town, Dongguan, China

Manufacturer: ShenZhen FLYSKY Technology Co.,Ltd

Address of Manufacturer: 16F, Huafeng Building, No. 6006 Shennan Road, Futian
District, Shenzhen, Guangdong, China

Factory: Dongguan Flysky RC Model technology Co.,Ltd

Address of Factory: West building 3, Huangjinyuan Ind Park, Qiaoli North Gate,
Changping Town, Dongguan ,China

Equipment Under Test (EUT)

Product Name: Digital propotional radio control system

Model No.: FS-i6X, LR6X

Trade Mark: FLYSKY

FCC ID: N4ZFLYSKYI6X

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247

Date of sample receipt: May 28, 2020

Date of Test: May 28-29, 2020

Date of report issued: May 29, 2020

Test Result : PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Robinson Lo
Laboratory Manager

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2 Version

Report No.	Version No.	Date	Description
GTS201605000060E01	00	May 25, 2016	Original
GTS202005000221F01	01	May 29, 2020	Change manufacturer, factory, product name, PCB board, appearance and software. Add model number

Prepared By:



Date:

May 29, 2020

Project Engineer

Check By:



Reviewer

Date:

May 29, 2020

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4 Test Summary

Test Item	Section	Result
Antenna Requirement	15.203/15.247 (c)	Pass
Radiated Emission	15.205/15.209	Pass

Pass: The EUT complies with the essential requirements in the standard.

Remark : Test according to ANSI C63.10:2013.

4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	30MHz-200MHz	3.8039dB	(1)
Radiated Emission	200MHz-1GHz	3.9679dB	(1)
Radiated Emission	1GHz-18GHz	4.29dB	(1)
Radiated Emission	18GHz-40GHz	3.30dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	3.44dB	(1)

Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.

5 General Information

5.1 General Description of EUT

Product Name:	Digital propotional radio control system
Model No.:	FS-i6X, LR6X
Test Model No:	FS-i6X
Remark:All above models are identical in the same PCB layout, interior structure and electrical circuits. The differences are appearance and model name for commercial purpose.	
Serial No.:	N/A
Test sample(s) ID:	GTS202005000221-1
Sample(s) Status	Engineer sample
Operation Frequency:	2408.0MHz~2475.0MHz
Channel numbers:	135
Modulation technology:	GFSK
Antenna Type:	Integral Antenna
Antenna gain:	2dBi
Power supply:	DC 6.0V(4*1.5V "AA" Battery)

Remark: The system works in the frequency range of 2408.0MHz to 2475MHz. This band has been divided to 135 independent channels. Each radio system uses 16 different channels, the minimum channel separation is ≥ 1 MHz. By using various switch-on times, hopping scheme and channel frequencies, the system can guarantee a jamming free radio transmission. The channel list is below.

Operation Frequency each of channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2408.00	36	2425.50	71	2443.00	106	2460.50
2	2408.50	37	2426.00	72	2443.50	107	2461.00
3	2409.00	38	2426.50	73	2444.00	108	2461.50
4	2409.50	39	2427.00	74	2444.50	109	2462.00
5	2410.00	40	2427.50	75	2445.00	110	2462.50
6	2410.50	41	2428.00	76	2445.50	111	2463.00
7	2411.00	42	2428.50	77	2446.00	112	2463.50
8	2411.50	43	2429.00	78	2446.50	113	2464.00
9	2412.00	44	2429.50	79	2447.00	114	2464.50
10	2412.50	45	2430.00	80	2447.50	115	2465.00
11	2413.00	46	2430.50	81	2448.00	116	2465.50
12	2413.50	47	2431.00	82	2448.50	117	2466.00
13	2414.00	48	2431.50	83	2449.00	118	2466.50
14	2414.50	49	2432.00	84	2449.50	119	2467.00
15	2415.00	50	2432.50	85	2450.00	120	2467.50
16	2415.50	51	2433.00	86	2450.50	121	2468.00
17	2416.00	52	2433.50	87	2451.00	122	2468.50
18	2416.50	53	2434.00	88	2451.50	123	2469.00
19	2417.00	54	2434.50	89	2452.00	124	2469.50
20	2417.50	55	2435.00	90	2452.50	125	2470.00
21	2418.00	56	2435.50	91	2453.00	126	2470.50
22	2418.50	57	2436.00	92	2453.50	127	2471.00
23	2419.00	58	2436.50	93	2454.00	128	2471.50
24	2419.50	59	2437.00	94	2454.50	129	2472.00
25	2420.00	60	2437.50	95	2455.00	130	2472.50
26	2420.50	61	2438.00	96	2455.50	131	2473.00
27	2421.00	62	2438.50	97	2456.00	132	2473.50
28	2421.50	63	2439.00	98	2456.50	133	2474.00
29	2422.00	64	2439.50	99	2457.00	134	2474.50
30	2422.50	65	2440.00	100	2457.50	135	2475.00
31	2423.00	66	2440.50	101	2458.00		
32	2423.50	67	2441.00	102	2458.50		
33	2424.00	68	2441.50	103	2459.00		
34	2424.50	69	2442.00	104	2459.50		
35	2425.00	70	2442.50	105	2460.00		

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The lowest channel	2408.0MHz
The middle channel	2440.0MHz
The Highest channel	2475.0MHz

5.2 Test mode

Transmitting mode	Keep the EUT in transmitting mode.
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5.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations: • FCC —Registration No.: 381383 Global United Technology Services Co., Ltd., Shenzhen 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 files. Registration 381383. • IC —Registration No.: 9079A The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A • NVLAP (LAB CODE:600179-0) Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). LAB CODE:600179-0

5.4 Test Location

All other tests were performed at:
Global United Technology Services Co., Ltd. Address: No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102 Tel: 0755-27798480 Fax: 0755-27798960

5.5 Description of Support Units

None.

5.6 Deviation from Standards

None.

5.7 Abnormalities from Standard Conditions

None.

5.8 Additional Instructions

Software (Used for test) from client
Built-in by manufacturer, power set default.

6 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July. 03 2015	July. 02 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June. 26 2019	June. 25 2020
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 26 2019	June. 25 2020
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 26 2019	June. 25 2020
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 26 2019	June. 25 2020
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 26 2019	June. 25 2020
9	Coaxial Cable	GTS	N/A	GTS211	June. 26 2019	June. 25 2020
10	Coaxial cable	GTS	N/A	GTS210	June. 26 2019	June. 25 2020
11	Coaxial Cable	GTS	N/A	GTS212	June. 26 2019	June. 25 2020
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 26 2019	June. 25 2020
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 26 2019	June. 25 2020
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 26 2019	June. 25 2020
15	Band filter	Amindeon	82346	GTS219	June. 26 2019	June. 25 2020
16	Power Meter	Anritsu	ML2495A	GTS540	June. 26 2019	June. 25 2020
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 26 2019	June. 25 2020
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 26 2019	June. 25 2020
19	Splitter	Agilent	11636B	GTS237	June. 26 2019	June. 25 2020
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 26 2019	June. 25 2020
21	Breitband hornantenne	SCHWARZBECK	BBHA 9170	GTS579	Oct. 19 2019	Oct. 18 2020
22	Amplifier	TDK	PA-02-02	GTS574	Oct. 19 2019	Oct. 18 2020
23	Amplifier	TDK	PA-02-03	GTS576	Oct. 19 2019	Oct. 18 2020
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	June. 26 2019	June. 25 2020

General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 26 2019	June. 25 2020
2	Barometer	ChangChun	DYM3	GTS255	June. 26 2019	June. 25 2020

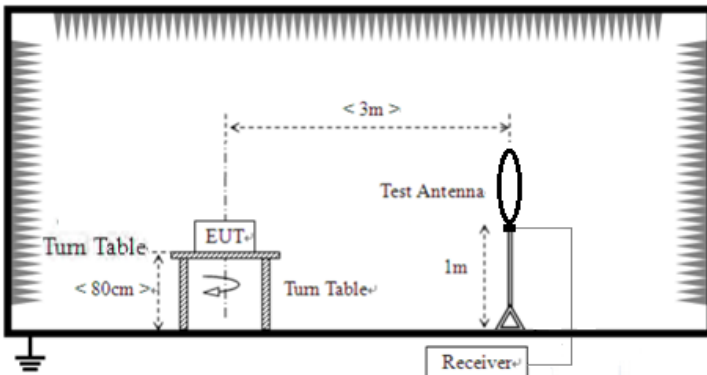
7 Test results and Measurement Data

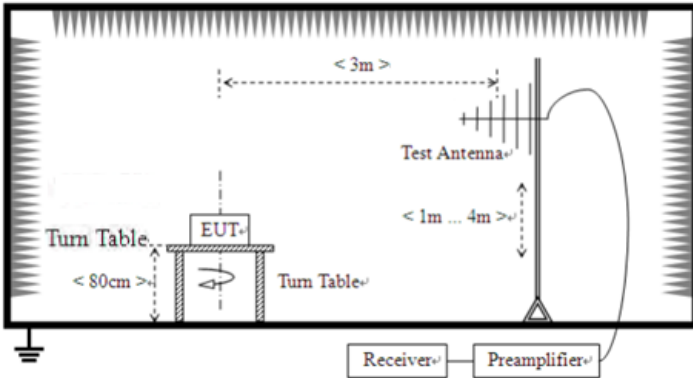
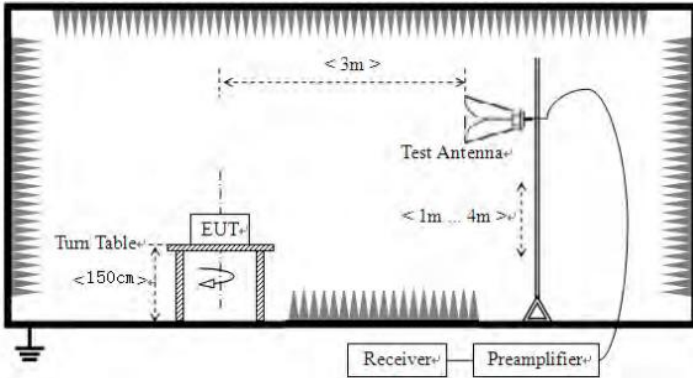
7.1 Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203 /247(c)
15.203 requirement: 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. 15.247(c) (1)(i) requirement: (i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.	
EUT Antenna:	
<i>The antenna is integral Antenna, the best case gain of the antenna is 2dBi,</i> <i>Two antenna can't transmit at the same time. While the ANT1 transmitting, the ANT2 act as a receiver antenna and vice versa, reference to the appendix II for details</i>	

7.2 Spurious Emission

7.2.1 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209				
Test Method:	ANSI C63.10:2013				
Test Frequency Range:	9kHz to 25GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Value
	9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
	150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average
Limit: (Spurious Emissions)	Frequency	Limit (uV/m)	Value	Measurement Distance	
	0.009MHz-0.490MHz	2400/F(KHz)	QP	300m	
	0.490MHz-1.705MHz	24000/F(KHz)	QP	30m	
	1.705MHz-30MHz	30	QP	30m	
	30MHz-88MHz	100	QP	3m	
	88MHz-216MHz	150	QP		
	216MHz-960MHz	200	QP		
	960MHz-1GHz	500	QP		
	Above 1GHz	500	Average		
		5000	Peak		
Test setup:	Below 30MHz				
					
	Below 1GHz				

	 Above 1GHz 
Test Procedure:	1. The EUT was placed on the top of a rotating table (0.8 meters for below 1GHz and 1.5meters for above 1GHz) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.2 for details
Temp. / Hum.	Temp.: 25 °C Humid.: 52% Press.: 1 012mbar

Test results:	Pass
Test voltage:	External power supply : DC28V Internal power supply : DC10V

Remark:

1. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.

Measurement data:

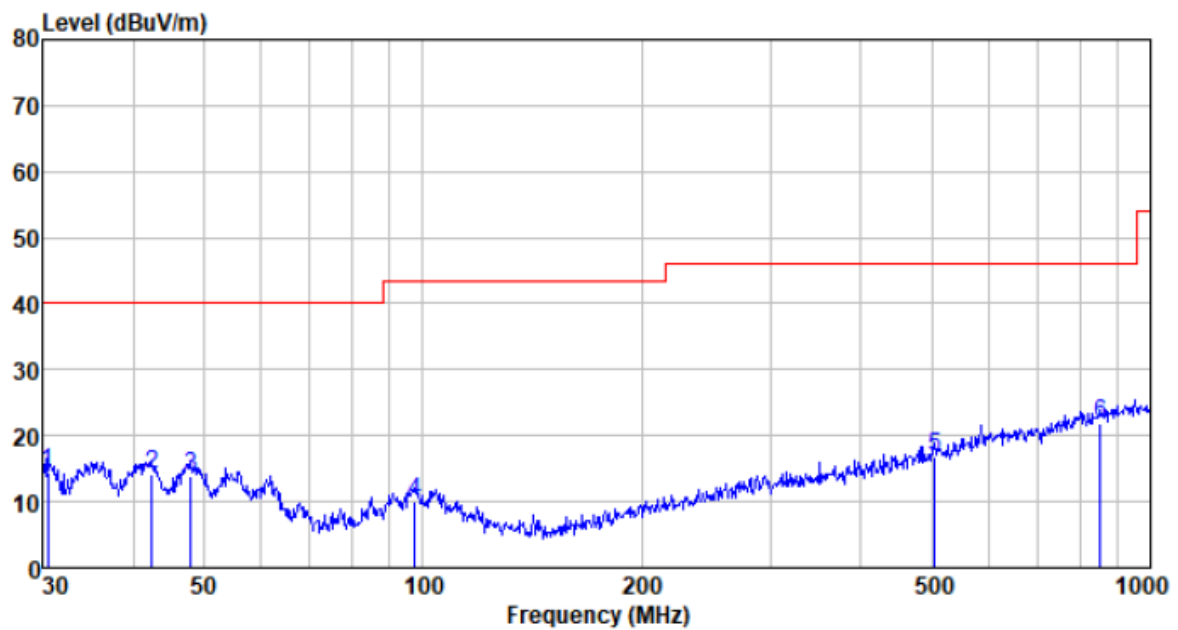
■ **Below 30MHz**

The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

■ 30MHz ~ 1GHz

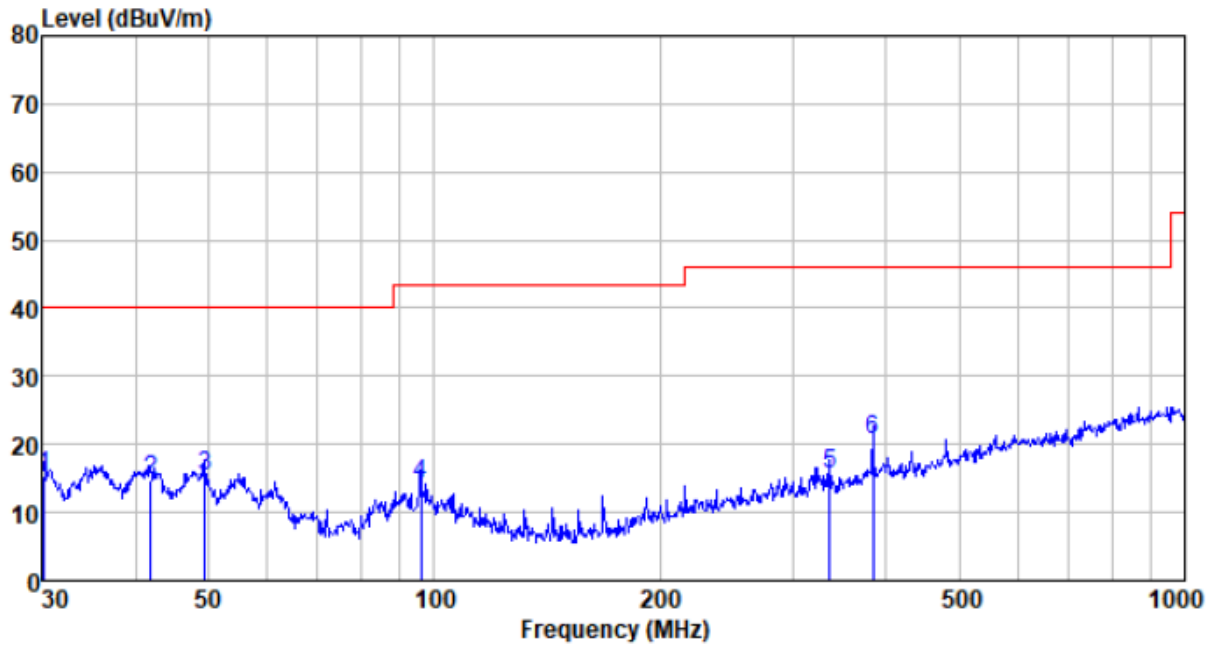
Pre-scan all test modes, found worst case at 2475.0MHz, and so only show the test result of 2475.0MHz.

Horizontal:



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
30.531	37.85	11.21	0.56	35.04	14.58	40.00	-25.42	QP
42.451	37.13	12.23	0.69	35.80	14.25	40.00	-25.75	QP
47.994	36.95	12.28	0.75	36.09	13.89	40.00	-26.11	QP
97.456	33.73	11.86	1.17	36.70	10.06	43.50	-33.44	QP
504.706	33.55	17.41	3.33	37.51	16.78	46.00	-29.22	QP
854.025	32.96	21.88	4.68	37.61	21.91	46.00	-24.09	QP

Vertical:



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
30.211	38.70	11.21	0.55	35.02	15.44	40.00	-24.56	QP
41.860	37.69	12.22	0.68	35.77	14.82	40.00	-25.18	QP
49.533	38.40	12.30	0.77	36.16	15.31	40.00	-24.69	QP
96.099	38.12	11.65	1.16	36.69	14.24	43.50	-29.26	QP
336.035	36.33	14.29	2.55	37.46	15.71	46.00	-30.29	QP
383.932	40.42	15.08	2.78	37.51	20.77	46.00	-25.23	QP

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. No emission found in frequency above 18GHz.

8 Test Setup Photo

Reference to the **appendix I** for details.

9 EUT Constructional Details

Reference to the **appendix II** for details.

---End---