

# Global United Technology Services Co., Ltd.

Report No.: GTS2023060193F01

# **TEST REPORT**

Applicant: ShenZhen FLYSKY Technology Co.,Ltd

Address of Applicant: 16F, Huafeng Building, No. 6006 Shennan Road, Futian

District, Shenzhen, Guangdong, China

Manufacturer: ShenZhen FLYSKY Technology Co.,Ltd

Address of 16F, Huafeng Building, No. 6006 Shennan Road, Futian

Manufacturer: District, Shenzhen, Guangdong, China

Factory: Dongguan Flysky RC Model technology Co.,Ltd

Address of Factory: West building 3, HuangjinyuanInd Park, Qiaoli North Gate,

Changping Town, Dongguan, China

**Equipment Under Test (EUT)** 

Product Name: Digital Proprotional Radio Control System

Model No.: RTX-4C

Trade Mark: FLYSKY

FCC ID: 2A2UNRTX4C00

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

Date of sample receipt: June 08, 2023

**Date of Test:** June 09-27, 2023

Date of report issued: June 27, 2023

Test Result : PASS \*

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

Authorized Signature:

Robinson Luo Laboratory Manager

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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## 2 Version

Version No.	Date	Description
00	June 27, 2023	Original

Prepared By:	Trankly	Date:	June 27, 2023	
	Project Engineer			
Check By:	Johnson Lun	Date:	June 27, 2023	
	Reviewer			



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4 Test Summary

Test Item	Section	Result
Antenna Requirement	15.203/15.247 (c)	Pass
AC Power Line Conducted Emission	15.207	N/A
Conducted Peak Output Power	15.247 (b)(1)	Pass
20dB Occupied Bandwidth	15.247 (a)(1)	Pass
Carrier Frequencies Separation	15.247 (a)(1)	Pass
Hopping Channel Number	15.247 (a)(1)(iii)	Pass
Dwell Time	15.247 (a)(1)(iii)	Pass
Radiated Emission	15.205/15.209	Pass
Band Edge	15.247(d)	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	9kHz-30MHz	3.1dB	(1)
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 unce	ertainty is for coverage factor of k	=2 and a level of confidence of 9	95%.



## 5 General Information

## 5.1 General Description of EUT

Product Name:	Digital Proprotional Radio Control System
Model No.:	RTX-4C
Serial No.:	3C05076
Test sample(s) ID:	GTS2023060193-1
Sample(s) Status	Engineer sample
Operation Frequency:	2408MHz~2475MHz
Channel numbers:	135
Modulation method:	FHSS
Modulation technology:	GFSK
Antenna Type:	2.4G On-board antenna
Antenna gain:	0.76dBi
Power supply:	DC 6V(4*1.5V Size"AA" Battery)

Remark: The system works in the frequency range of 2408MHz to 2475MHz. This band has been divided to 135 independent channels. Each radio system uses 16 different channels; the minimum channel separation is ≥2MHz. By using various switch-on times, hopping scheme and channel frequencies, the system can guarantee a jamming free radio transmission. Pre-testing all radio systems, this radio system recorded in the report is the worst mode. The channel list is below.

### The test frequencies are below:

Channel	Frequency
The lowest channel	2408MHz
The middle channel	2440MHz
The Highest channel	2475MHz



Operation F	Operation Frequency each of channel						
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2408	36	2425.5	71	2443	106	2460.5
2	2408.5	37	2426	72	2443.5	107	2461
3	2409	38	2426.5	73	2444	108	2461.5
4	2409.5	39	2427	74	2444.5	109	2462
5	2410	40	2427.5	75	2445	110	2462.5
6	2410.5	41	2428	76	2445.5	111	2463
7	2411	42	2428.5	77	2446	112	2463.5
8	2411.5	43	2429	78	2446.5	113	2464
9	2412	44	2429.5	79	2447	114	2464.5
10	2412.5	45	2430	80	2447.5	115	2465
11	2413	46	2430.5	81	2448	116	2465.5
12	2413.5	47	2431	82	2448.5	117	2466
13	2414	48	2431.5	83	2449	118	2466.5
14	2414.5	49	2432	84	2449.5	119	2467
15	2415	50	2432.5	85	2450	120	2467.5
16	2415.5	51	2433	86	2450.5	121	2468
17	2416	52	2433.5	87	2451	122	2468.5
18	2416.5	53	2434	88	2451.5	123	2469
19	2417	54	2434.5	89	2452	124	2469.5
20	2417.5	55	2435	90	2452.5	125	2470
21	2418	56	2435.5	91	2453	126	2470.5
22	2418.5	57	2436	92	2453.5	127	2471
23	2419	58	2436.5	93	2454	128	2471.5
24	2419.5	59	2437	94	2454.5	129	2472
25	2420	60	2437.5	95	2455	130	2472.5
26	2420.5	61	2438	96	2455.5	131	2473
27	2421	62	2438.5	97	2456	132	2473.5
28	2421.5	63	2439	98	2456.5	133	2474
29	2422	64	2439.5	99	2457	134	2474.5
30	2422.5	65	2440	100	2457.5	135	2475
31	2423	66	2440.5	101	2458		
32	2423.5	67	2441	102	2458.5		
33	2424	68	2441.5	103	2459		
34	2424.5	69	2442	104	2459.5		
35	2425	70	2442.5	105	2460		



#### 5.2 Test mode

Transmitting mode Keep the EUT in transmitting mode.

Remark: New battery is used during all test.

## 5.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

## • FCC —Registration No.: 381383

Designation Number: CN5029

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.

## • IC —Registration No.: 9079A

CAB identifier: CN0091

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.

#### NVLAP (LAB CODE:600179-0)

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

#### 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

Rad	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	June 23, 2021	June 22, 2024	
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	April 14, 2023	April 13, 2024	
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9168	GTS640	March 19, 2023	March 18, 2025	
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	April 17, 2023	April 16, 2025	
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A	
7	Coaxial Cable	GTS	N/A	GTS213	April 21, 2023	April 20, 2024	
8	Coaxial Cable	GTS	N/A	GTS211	April 21, 2023	April 20, 2024	
9	Coaxial cable	GTS	N/A	GTS210	April 21, 2023	April 20, 2024	
10	Coaxial Cable	GTS	N/A	GTS212	April 21, 2023	April 20, 2024	
11	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	April 14, 2023	April 13, 2024	
12	Loop Antenna	ZHINAN	ZN30900A	GTS534	Nov. 29, 2022	Nov. 28, 2023	
13	Broadband Preamplifier	SCHWARZBECK	BBV9718	GTS535	April 14, 2023	April 13, 2024	
14	Amplifier(1GHz-26.5GHz)	HP	8449B	GTS601	April 14, 2023	April 13, 2024	
15	Horn Antenna (18- 26.5GHz)	1	UG-598A/U	GTS664	Oct. 30, 2022	Oct. 29, 2023	
16	Horn Antenna (26.5-40GHz)	A.H Systems	SAS-573	GTS665	Oct. 30, 2022	Oct. 29, 2023	
17	FSV-Signal Analyzer (10Hz- 40GHz)	Keysight	FSV-40-N	GTS666	March 13, 2023	March 12, 2024	
18	Amplifier	1	LNA-1000-30S	GTS650	April 14, 2023	April 13, 2024	
19	CDNE M2+M3-16A	HCT	30MHz-300MHz	GTS668	Dec. 20,2022	Dec.19,2023	



RF C	RF Conducted Test:						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)	
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	April 14, 2023	April 13, 2024	
2	EMI Test Receiver	R&S	ESCI 7	GTS552	April 14, 2023	April 13, 2024	
3	PSA Series Spectrum Analyzer	Agilent	E4440A	GTS536	April 14, 2023	April 13, 2024	
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	April 14, 2023	April 13, 2024	
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	April 14, 2023	April 13, 2024	
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	April 14, 2023	April 13, 2024	
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	April 14, 2023	April 13, 2024	
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	April 14, 2023	April 13, 2024	
9	EXA Signal Analyzer	Keysight	N9010B	MY60241168	Nov. 04, 2022	Nov. 03, 2023	

Ge	eral 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	April 18, 2023	April 17, 2024
2	Barometer	KUMAO	SF132	GTS647	April 19, 2023	April 18, 2024



## 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:

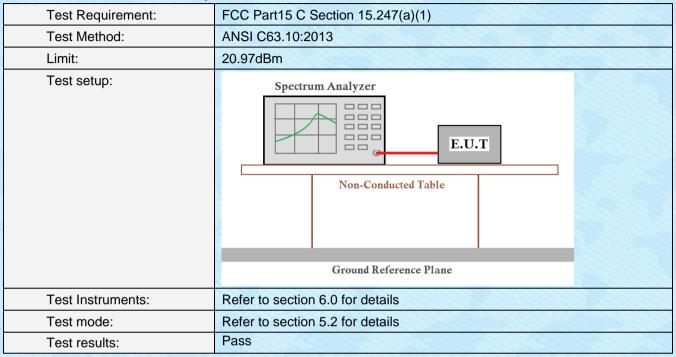
(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

#### **EUT Antenna:**

The antenna is 2.4G On-board antenna, reference to the appendix II for details.



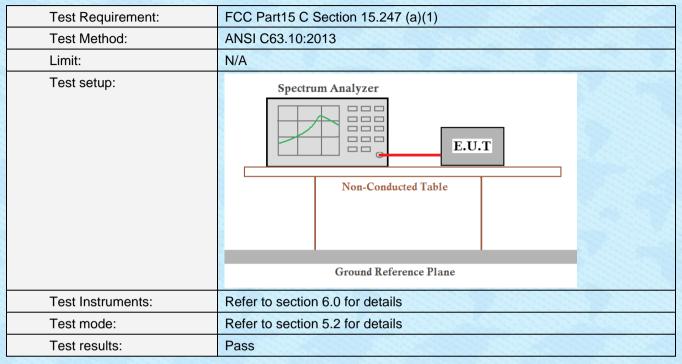
## 7.2 Conducted Peak Output Power



**Measurement Data:** The detailed test data see Appendix for 2.4G.



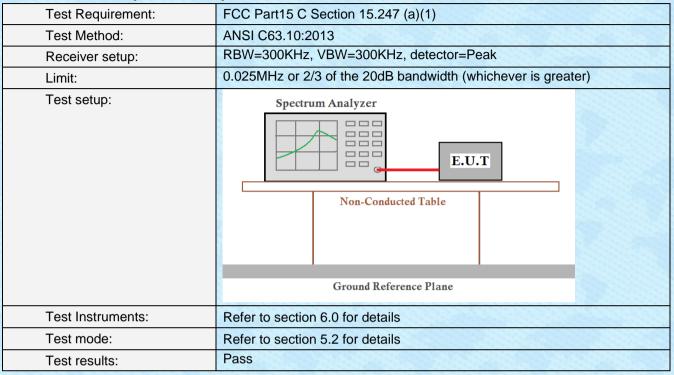
## 7.3 20dB Emission Bandwidth



Measurement Data: The detailed test data see Appendix for 2.4G.



## 7.4 Carrier Frequencies Separation



Measurement Data: The detailed test data see Appendix for 2.4G.



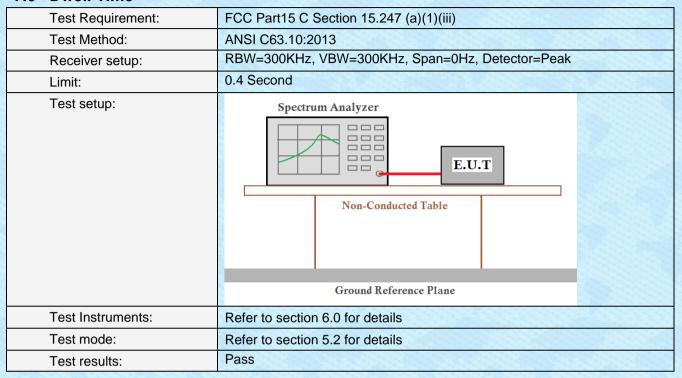
## 7.5 Hopping Channel Number

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)(iii)		
Test Method:	ANSI C63.10:2013		
Receiver setup:	RBW=300kHz, VBW=300kHz, Frequency range=2400MHz-2483.5MHz, Detector=Peak		
Limit:	15 channels		
Test setup:	Spectrum Analyzer  E.U.T  Non-Conducted Table  Ground Reference Plane		
Test Instruments:	Refer to section 6.0 for details		
Test mode:	Refer to section 5.2 for details		
Test results:	Pass		

Measurement Data: The detailed test data see Appendix for 2.4G.



## 7.6 Dwell Time



Measurement Data: The detailed test data see Appendix for 2.4G.



## 7.7 Spurious Emission in Non-restricted & restricted Bands

## 7.7.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)		
Test Method:	ANSI C63.10:2013		
Receiver setup:	RBW=100kHz, VBW=300kHz, Detector=Peak		
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.		
Test setup:	Spectrum Analyzer  E.U.T  Non-Conducted Table  Ground Reference Plane		
Test Instruments:	Refer to section6.0 for details		
Test mode:	Refer to section 5.2 for details		
Test results:	Pass		

Measurement Data: The detailed test data see Appendix for 2.4G.



## 7.7.2 Radiated Emission Method

1.1.2 Radiated Emission Me	tillou					
Test Requirement:	FCC Part15 C Section	on 15.209	and 18	5.205		
Test Method:	ANSI C63.10:2013					
Test Frequency Range:	9kHz to 25GHz					
Test site:	Measurement Distance: 3m					
Receiver setup:	Frequency	Detec	tor	RBW	VBW	Value
	9KHz-150KHz	Quasi-p	eak	200Hz	600H	z Quasi-peak
	150KHz-30MHz	Quasi-p	eak	9KHz	30KH	z Quasi-peak
	30MHz-1GHz	Quasi-p	eak	120KH	z 300KH	Iz Quasi-peak
	Above 1GHz	Peal	k	1MHz	3MHz	z Peak
		Peal		1MHz		
	Note: For Duty cy cycle < 98%					
Limit: (Spurious Emissions)	Frequency	Lir	mit (uV	/m)	Value	Measurement Distance
(	0.009MHz-0.490M	IHz 24	00/F(K	Hz)	QP	300m
	0.490MHz-1.705M	IHz 240	000/F(k	(Hz)	QP	300m
	1.705MHz-30MH	lz	30		QP	30m
	30MHz-88MHz		100		QP	
	88MHz-216MHz	7	150		QP	
	216MHz-960MH	Z	200		QP	3m
	960MHz-1GHz		500		QP	Oill
	Above 1GHz		500		Average	
	5000 South			Peak		
Test setup:	Below 30MHz					
	Turn Table   Turn Table   Im   Receiver   Receiver   Below 1GHz					



Report No.: GTS2023060193F01 Test Antenna EUT Turn Table < 80cm Turn Tables Receiver-Preamplifier. Above 1GHz Test Antenna+ < 1m ... 4m > FUT. Tum Table <150cm> Receiver-Preamplifier+ Test Procedure: 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 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



à		Report No.: GTS2023060193F01
	Test results:	Pass

#### Remark:

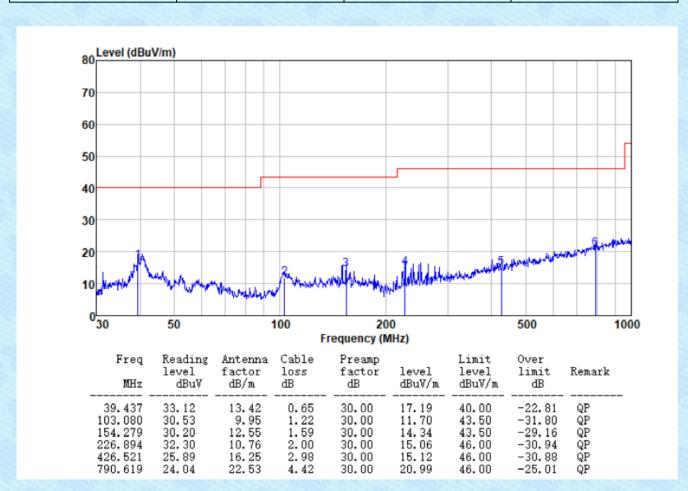
1. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.

#### Measurement data:

#### ■ Below 30MHz

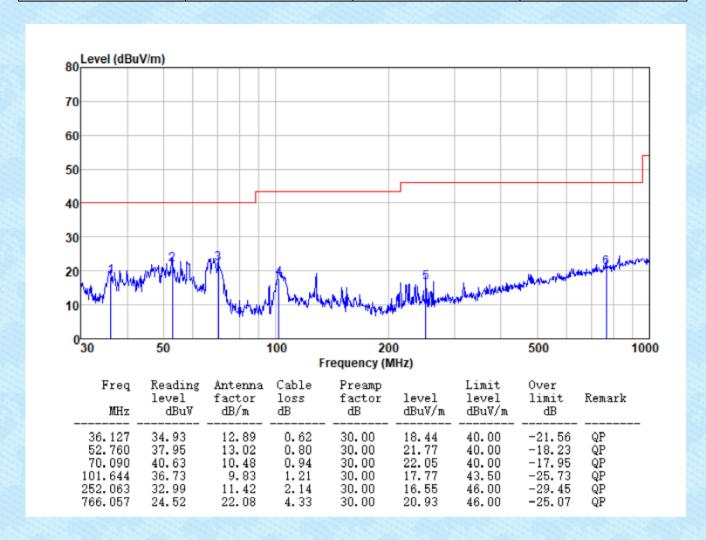
The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

30MHz ~ 1GHz



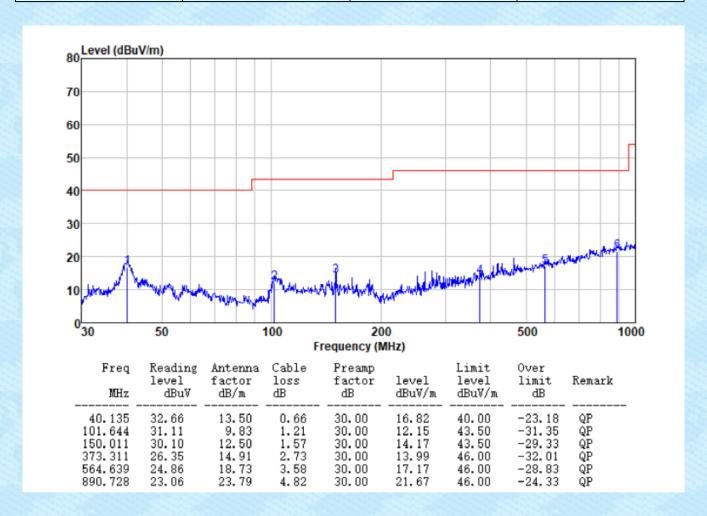


Test channel:	Lowest	Polarization:	Vertical
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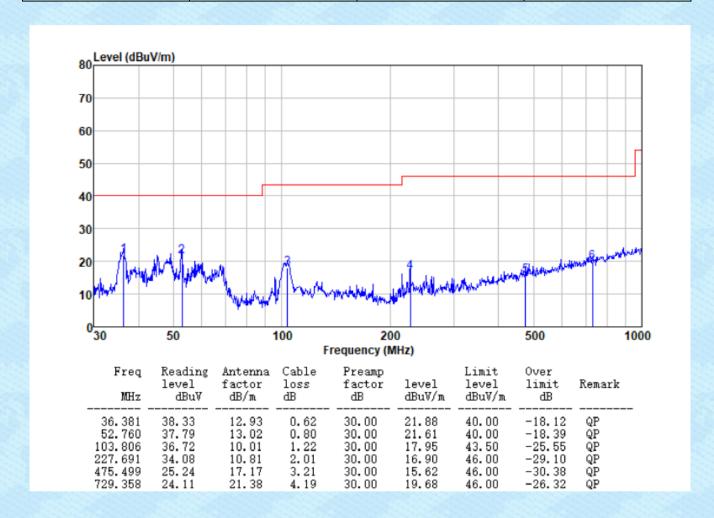


est channel:	Middle	Polarization:	Horizontal
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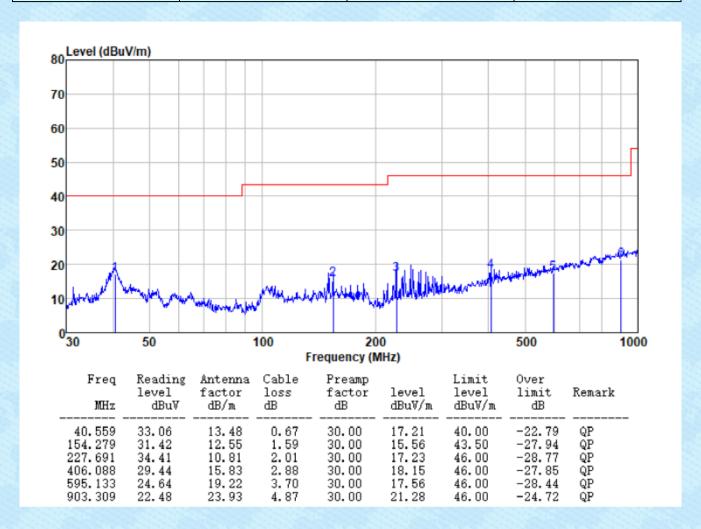


Test channel:	Middle	Polarization:	Vertical
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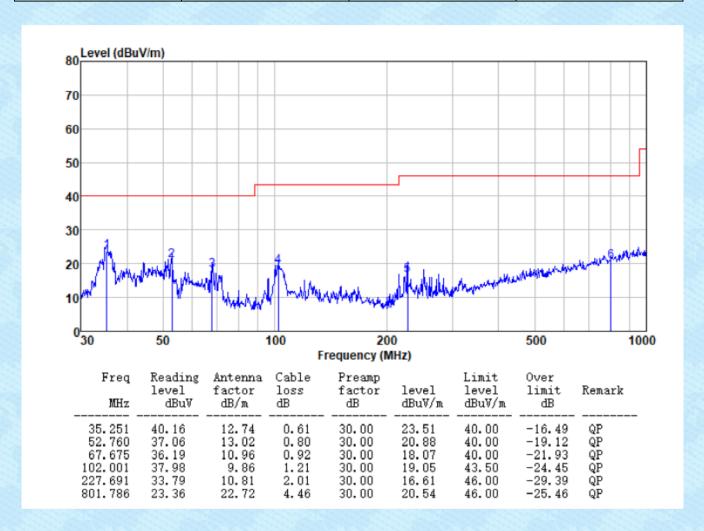


Test channel:	Highest	Polarization:	Horizontal
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Test channel: Highest Polarization: Vertical

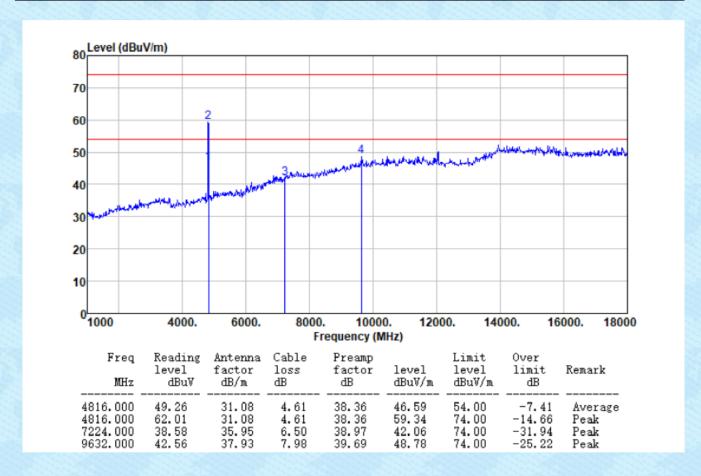




#### ■ Above 1GHz

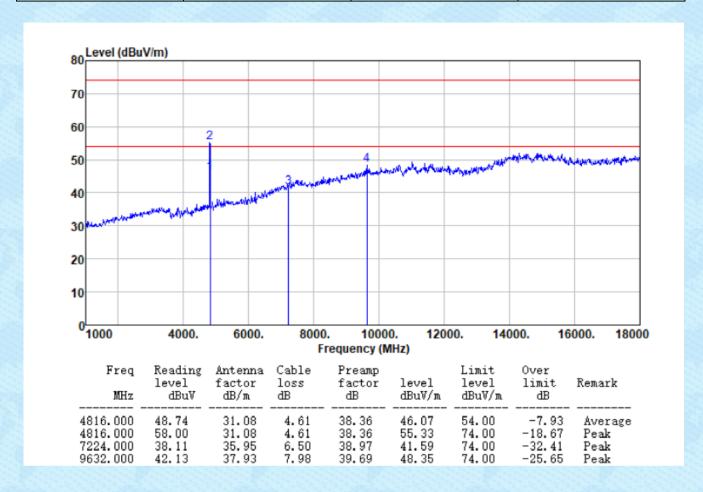
### Unwanted Emissions in Non-restricted Frequency Bands

Test channel:	Lowest	Polarization:	Horizontal
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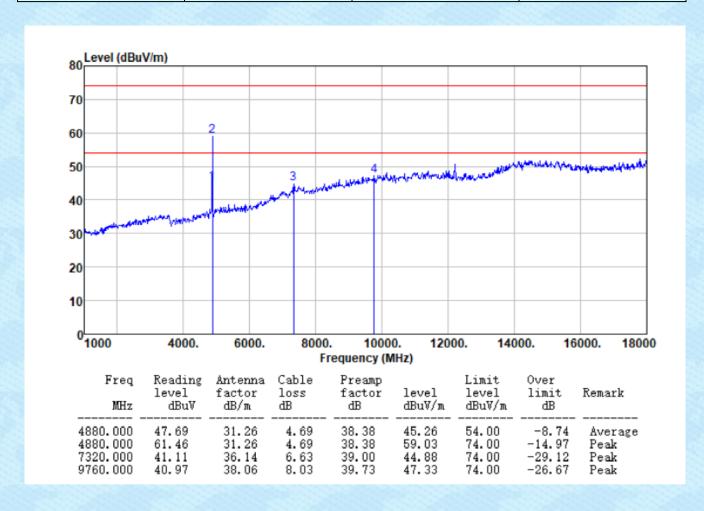


Test channel:	Lowest	Polarization:	Vertical
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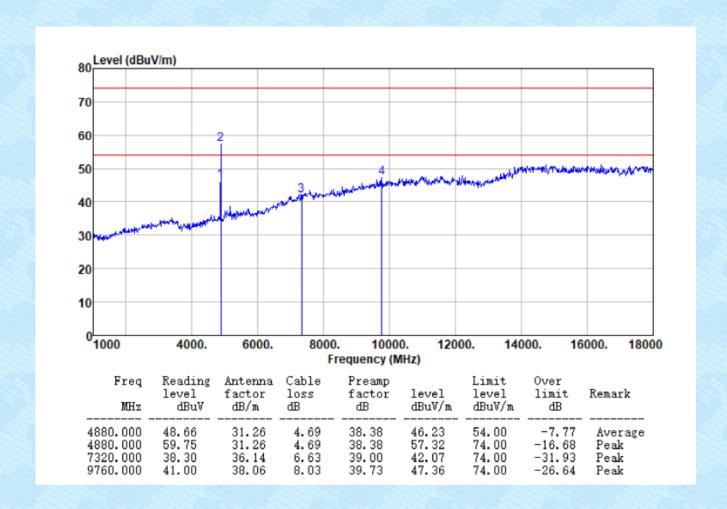




	Test channel:	Middle	Polarization:	Horizontal	
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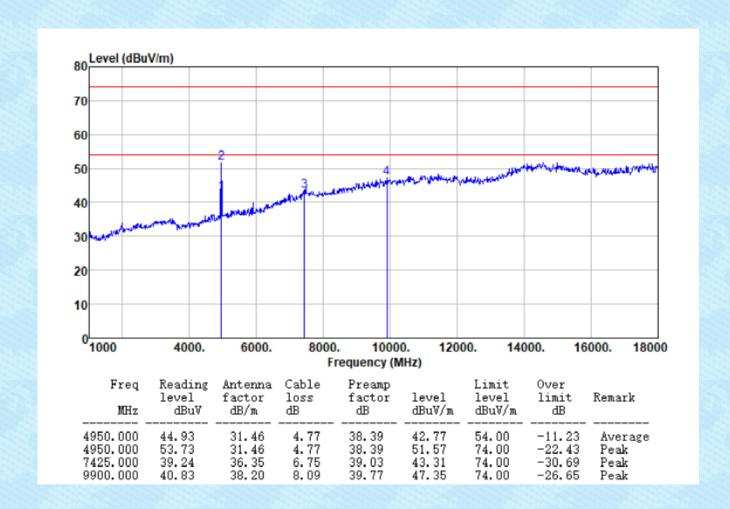






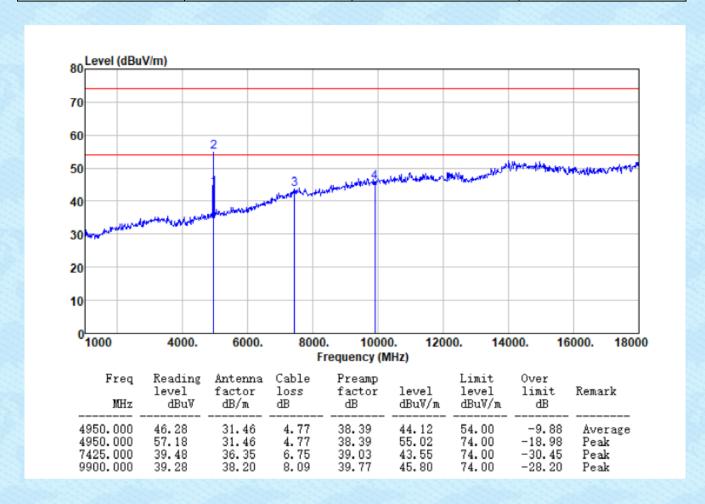


Test channel:	Highest	Polarization:	Horizontal
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Test channel:	Highest	Polarization:	Vertical
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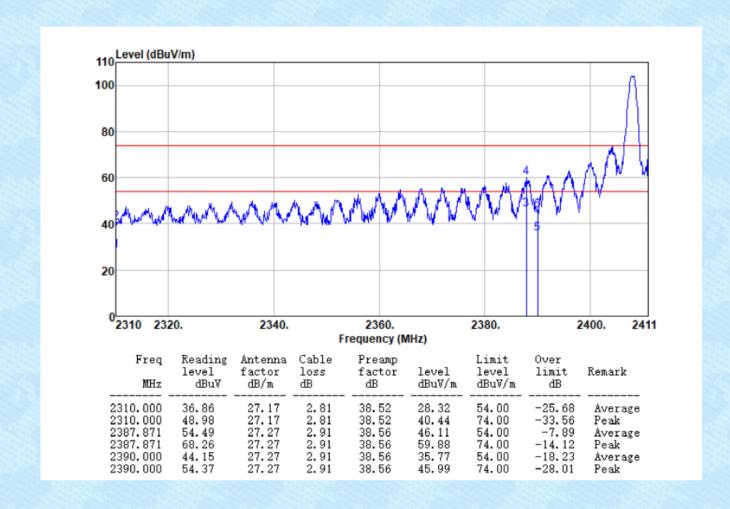
#### Remark:

- 1. Final Level =Receiver Read level + Antenna Factor + Cable Loss Preamplifier Factor
- 2. "\*", means this data is the too weak instrument of signal is unable to test.
- 3. The emission levels of other frequencies are very lower than the limit and not show in test report.
- 4. For above 18GHz, no emission found.

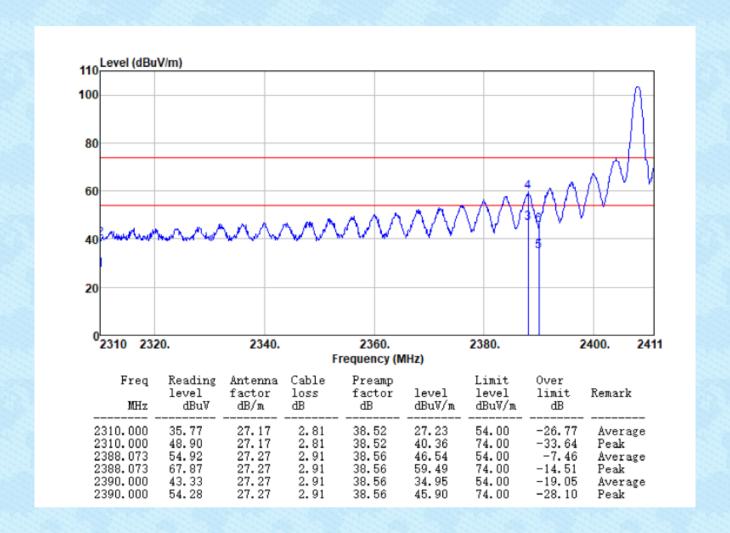


## Unwanted Emissions in Restricted Frequency Bands

Test channel:	Lowest	Polarization:	Horizontal
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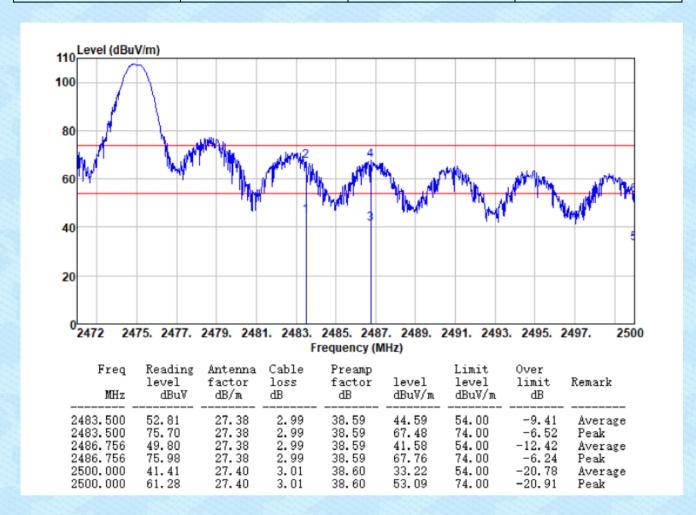






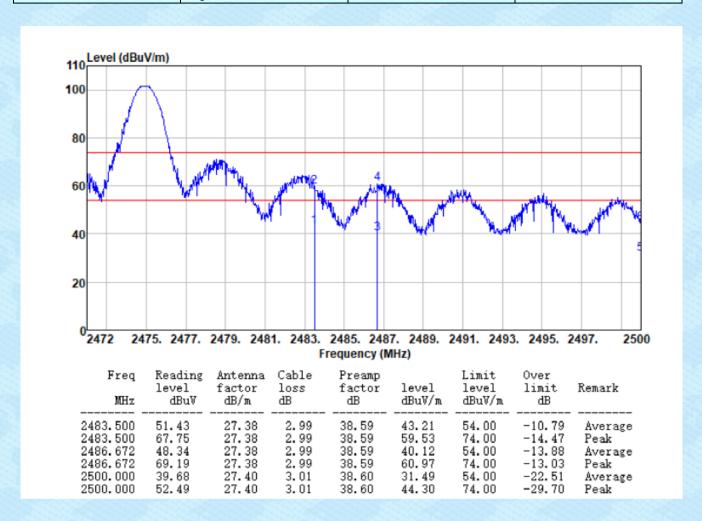


Test channel:	Highest	Polarization:	Horizontal
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Test channel: Highest	Polarziation:	Vertical
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### Remarks:

- 1. Final Level =Receiver Read level + Antenna Factor + Cable Loss Preamplifier Factor
- 2. The emission levels of other frequencies are very lower than the limit and not show in test report.



## 8 Test Setup Photo

Reference to the appendix I for details.

## 9 EUT Constructional Details

Reference to the appendix II for details.

---End---