

Global United Technology Services Co., Ltd.

Report No.: GTS201811000132F01

FCC Report

Applicant: FLYSKY RC MODEL TECHNOLOGY CO., LTD

West building3, Huangjianyuan Ind, Park QIAOLI North Gate Address of Applicant:

Changping Town, Dongguan, China

ShenZhen FLYSKY Technology Co., Ltd Manufacturer:

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

Manufacturer: District, Shenzhen, Guangdong, China

FLYSKY RC MODEL TECHNOLOGY CO., LTD **Factory:**

Address of Factory: West building3, Huangjianyuan Ind, Park QIAOLI North Gate

Changping Town, Dongguan, China

Equipment Under Test (EUT)

Product Name: Nirvana

Model No.: NV14

Trade Mark: **FLYSKY**

FCC ID: N4ZNV1400

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

Date of sample receipt: November 20, 2018

November 21, 2018-December 27, 2018 **Date of Test:**

Date of report issued: December 28, 2018

Test Result: PASS *

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

Authorized Signature:

Robinson Lo 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.



2 Version

Report No.	Version No.	Date	Description
GTS201806000240F01	00	August 15, 2018	Original
GTS201811000132F01	01	December 28, 2018	Change power supply

Prepared By:	Jeger Chen	Date:	December 28, 2018
	Project Engineer		
Check By:	Johnson	Date:	December 28, 2018
	Reviewer		



3 Contents

			Page
1	1 COVER PAGE		1
2	2 VERSION		2
3	3 CONTENTS		3
4	4 TEST SUMMARY		4
	4.1 MEASUREMENT U	JNCERTAINTY	4
5	5 GENERAL INFORMA	ATION	5
		RIPTION OF EUT	
	5.5 OTHER INFORMATION	TION REQUESTED BY THE CUSTOMER	8
	5.6 DESCRIPTION OF	SUPPORT UNITS	8
	5.7 Additional Inst	RUCTIONS	8
6	6 TEST INSTRUMENT	'S LIST	9
7	7 TEST RESULTS ANI	D MEASUREMENT DATA	11
	7.1 ANTENNA REQUIR	REMENT	11
	7.2 CONDUCTED EMI	SSIONS	12
	7.3 SPURIOUS EMISS	SION	15
	7.3.1 Radiated Em	nission Method	15
8	8 TEST SETUP PHOTO	0	20
9	9 FUT CONSTRUCTIO	NAL DETAILS	20

Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102



4 Test Summary

Test Item	Section	Result
Antenna Requirement	15.203/15.247 (c)	Pass
AC Power Line Conducted Emission	15.207	Pass
Conducted Peak Output Power	15.247 (b)(1)	N/A
20dB Occupied Bandwidth	15.247 (a)(1)	N/A
Carrier Frequencies Separation	15.247 (a)(1)	N/A
Hopping Channel Number	15.247 (a)(1)	N/A
Dwell Time	15.247 (a)(1)	N/A
Pseudorandom Frequency Hopping Sequence	15.247(b)(4)	N/A
Radiated Emission	15.205/15.209	Pass
Band Edge	15.247(d)	N/A

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 ~ 30 MHz ± 4.34 dB ± 4.24 dB ± 4.24 dB		(1)		
Radiated Emission			(1)		
Radiated Emission	1GHz ~ 26.5GHz	± 4.68dB	(1)		
AC Power Line Conducted Emission	1 0.15MHz ~ 30MHz 1 + 3.45dB 1				
Note (1): The measurement u	ncertainty is for coverage factor of	of k=2 and a level of confidence	of 95%.		



5 General Information

5.1 General Description of EUT

Product Name:	Nirvana
Model No.:	NV14
Serial No.:	H1073061
Test sample(s) ID:	GTS201811000132-1
Sample(s) Status	Engineer sample
Operation Frequency:	2408MHz~2475.0MHz
Channel numbers:	135
Channel separation:	500kHz
Modulation technology:	GFSK
Antenna Type:	Integral Antenna
Antenna gain:	2dBi
Power supply:	DC 3.7V ~ 4.2V

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 ≥2.5MHz. 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.

Two antennas can't transmit at the same time. While the ANT 1 (Left ANT) transmitting, the ANT 2(Right ANT) act as a receiver antenna and vice versa.

Telephone: +86 (0) 755 2779 8480 Fax: +86 (0) 755 2779 8960 Page 5 of 20



-	Frequency eac Frequency		Frequency		Frequency		Frequency
Channel	(MHz)	Channel	(MHz)	Channel	(MHz)	Channel	(MHz)
1		36	2423.00	71	2440.50	106	2458.00
2		37	2423.50	72	2441.00	107	2458.50
3		38	2424.00	73	2441.50	108	2459.00
4		39	2424.50	74	2442.00	109	2459.50
5		40	2425.00	75	2442.50	110	2460.00
6	2408.00	41	2425.50	76	2443.00	111	2460.50
7	2408.50	42	2426.00	77	2443.50	112	2461.00
8	2409.00	43	2426.50	78	2444.00	113	2461.50
9	2409.50	44	2427.00	79	2444.50	114	2462.00
10	2410.00	45	2427.50	80	2445.00	115	2462.50
11	2410.50	46	2428.00	81	2445.50	116	2463.00
12	2411.00	47	2428.50	82	2446.00	117	2463.50
13	2411.50	48	2429.00	83	2446.50	118	2464.00
14	2412.00	49	2429.50	84	2447.00	119	2464.50
15	2412.50	50	2430.00	85	2447.50	120	2465.00
16	2413.00	51	2430.50	86	2448.00	121	2465.50
17	2413.50	52	2431.00	87	2448.50	122	2466.00
18	2414.00	53	2431.50	88	2449.00	123	2466.50
19	2414.50	54	2432.00	89	2449.50	124	2467.00
20	2415.00	55	2432.50	90	2450.00	125	2467.50
21	2415.50	56	2433.00	91	2450.50	126	2468.00
22	2416.00	57	2433.50	92	2451.00	127	2468.50
23	2416.50	58	2434.00	93	2451.50	128	2469.00
24	2417.00	59	2434.50	94	2452.00	129	2469.50
25	2417.50	60	2435.00	95	2452.50	130	2470.00
26	2418.00	61	2435.50	96	2453.00	131	2470.50
27	2418.50	62	2436.00	97	2453.50	132	2471.00
28	2419.00	63	2436.50	98	2454.00	133	2471.50
29	2419.50	64	2437.00	99	2454.50	134	2472.00
30	2420.00	65	2437.50	100	2455.00	135	2472.50
31	2420.50	66	2438.00	101	2455.50	136	2473.00
32	2421.00	67	2438.50	102	2456.00	137	2473.50
33	2421.50	68	2439.00	103	2456.50	138	2474.00
34	2422.00	69	2439.50	104	2457.00	139	2474.50
35	2422.50	70	2440.00	105	2457.50	140	2475.00

Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102



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/2409.5MHz
The middle channel	2440.0MHz
The Highest channel	2475.0MHz/2469.5MHz

Note: Comparing with original type, only DC power part is modified, so only 30MHz-1GHz Radiated emission and conducted emission is tested.



5.2 Test mode

Transmitting mode	Keep the EUT in transmitting mode.
-------------------	------------------------------------

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.

• Industry Canada (IC) —Registration No.: 9079A-2

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-2.

• 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

• CNAS (No. CNAS L5775)

CNAS has accredited Global United Technology Services Co., Ltd., to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

5.4 Test Location

All other tests were performed at:

Global United Technology Services Co., Ltd.

Address: No. 301-309, 3/F., Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

Tel: 0755-27798480 Fax: 0755-27798960

5.5 Other Information Requested by the Customer

None.

5.6 Description of Support Units

Manufacturer	Description	Model	Serial Number	FCC Approval	
DELTA	ADAPTER	ADP-60ADT	N/A	DELTA	

5.7 Additional Instructions

EUT Software Settings:

Mode Special test firmware was pre-built-in by manufacturer						
Mode	Channel Frequency (MHz) Level Set					
GFSK	CH01	2408				
	CH70	2440	TX level : default			
	CH140	2475				



6 Test Instruments list

Radi	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. 27 2018	June. 26 2019		
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 27 2018	June. 26 2019		
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 27 2018	June. 26 2019		
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 27 2018	June. 26 2019		
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A		
8	Coaxial Cable	GTS	N/A	GTS213	June. 27 2018	June. 26 2019		
9	Coaxial Cable	GTS	N/A	GTS211	June. 27 2018	June. 26 2019		
10	Coaxial cable	GTS	N/A	GTS210	June. 27 2018	June. 26 2019		
11	Coaxial Cable	GTS	N/A	GTS212	June. 27 2018	June. 26 2019		
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 27 2018	June. 26 2019		
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 27 2018	June. 26 2019		
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 27 2018	June. 26 2019		
15	Band filter	Amindeon	82346	GTS219	June. 27 2018	June. 26 2019		
16	Power Meter	Anritsu	ML2495A	GTS540	June. 27 2018	June. 26 2019		
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 27 2018	June. 26 2019		
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 27 2018	June. 26 2019		
19	Splitter	Agilent	11636B	GTS237	June. 27 2018	June. 26 2019		
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 27 2018	June. 26 2019		

Gene	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. 27 2018	June. 26 2019				
2	Barometer	ChangChun	DYM3	GTS255	June. 27 2018	June. 26 2019				



Conducted Emission										
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)				
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May.16 2014	May.15 2019				
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 27 2018	June. 26 2019				
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 27 2018	June. 26 2019				
4	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	June. 27 2018	June. 26 2019				
5	Coaxial Cable	GTS	N/A	GTS227	June. 27 2018	June. 26 2019				
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A				
7	Thermo meter	KTJ	TA328	GTS233	June. 27 2018	June. 26 2019				
8	Absorbing clamp	Elektronik- Feinmechanik	MDS21	GTS229	June. 27 2018	June. 26 2019				

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	June. 27 2018	June. 26 2019					
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 27 2018	June. 26 2019					
3	Spectrum Analyzer	Agilent	E4440A	GTS533	June. 27 2018	June. 26 2019					
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	June. 27 2018	June. 26 2019					
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	June. 27 2018	June. 26 2019					
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	June. 27 2018	June. 26 2019					
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	June. 27 2018	June. 26 2019					
8	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 27 2018	June. 26 2019					
9	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	June. 27 2018	June. 26 2019					



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 integral Antenna, the best case gain of the antenna is 2dBi

Two antenna can't transmit at the same time. While the ANT 1 (Left ANT) transmitting, the ANT 2(Right ANT) act as a receiver antenna and vice versa.





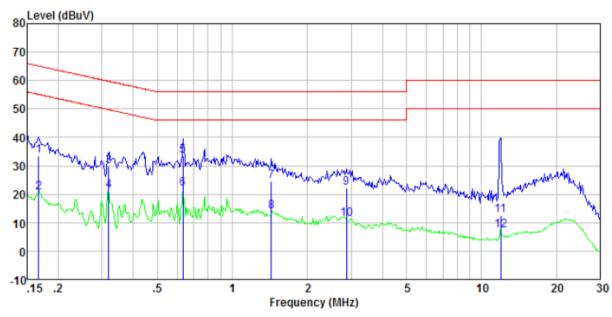
7.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.20	7						
Test Method:	ANSI C63.10:2013							
Test Frequency Range:	150KHz to 30MHz							
Class / Severity:	Class B							
Receiver setup:	RBW=9KHz, VBW=30KHz, S	Sweep time=auto						
Limit:	Frequency range (MHz) Limit (dBuV) Quasi-peak Average							
	0.15-0.5 66 to 56* 56 to 46							
	0.5-5	56	46					
	* Decreases with the logarith	m of the frequency	50					
Test setup:	Reference Plane							
Test presedure	LISN 40cm 80cm Filter AC power Equipment Test table/Insulation plane Remark. EUT = Quipment Under Test LISN: Line impedence Stabilization Network Test table height=0 8m							
Test procedure:	 The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement. 							
Test environment:	Temp.: 25 °C Hui	mid.: 52%	Press.: 1 012mbar					
Test Instruments:	Refer to section 6.0 for detail	S						
Test mode:	Refer to section 5.2 for details							
Test results:	Pass							



Measurement data:

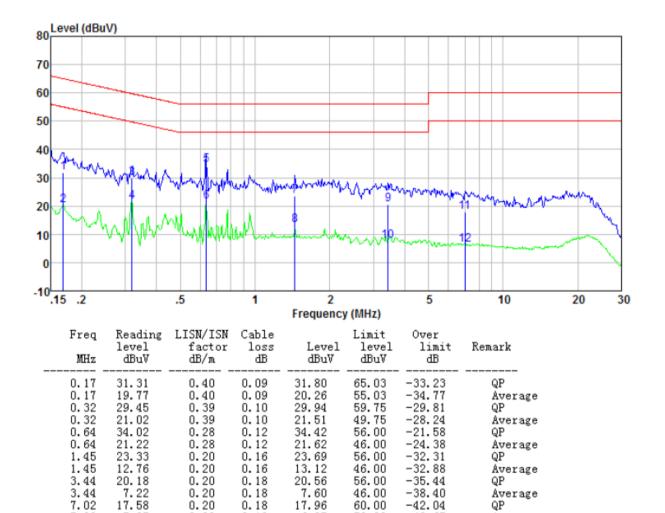
Test mode:	Transmitting mode	Phase Polarity:	Line
	1		



Freq MHz	Reading level dBuV	LISN/ISN factor dB/m	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.17	33.08	0.40	0.08	33.56	65.12	-31.56	QP
0.17	20.13	0.40	0.08	20.61	55.12	-34.51	Average
0.32	29.39	0.39	0.10	29.88	59.75	-29.87	QP
0.32	20.83	0.39	0.10	21.32	49.75	-28.43	Average
0.63	33.15	0.28	0.12	33.55	56.00	-22.45	QP
0.63	21.63	0.28	0.12	22.03	46.00	-23.97	Average
1.43	24.14	0.20	0.16	24.50	56.00	-31.50	QP
1.43	13.51	0.20	0.16	13.87	46.00	-32.13	Average
2.87	21.76	0.20	0.19	22.15	56.00	-33.85	QP
2.87	11.03	0.20	0.19	11.42	46.00	-34.58	Average
11.93	12.29	0.20	0.20	12.69	60.00	-47.31	QP
11.93	6.79	0.20	0.20	7.19	50.00	-42.81	Average

Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102 Telephone: +86 (0) 755 2779 8480 Fax: +86 (0) 755 2779 8960





Notes:

7.02

5.97

1. An initial pre-scan was performed on the line and neutral lines with peak detector.

0.18

0.20

2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.

6.35

50.00

-43.65

Average

3. Final Level =Receiver Read level + LISN Factor + Cable Loss



7.3 Spurious Emission

7.3.1 Radiated Emission Method

Test Requirement:	FCC Part15 C Section	on 15	5.209						
Test Method:	ANSI C63.10:2013								
Test Frequency Range:	30MHz to 1GHz								
Test site:	Measurement Distance: 3m								
Receiver setup:									
	Frequency	Frequency Detector RBW VBW Value							
	30MHz-1GHz	Qι	uasi-peak	120KH	Ηz	300KHz	Quasi-peak		
Limit: (Spurious Emissions)					<u> </u>		. ,		
	Frequency	Frequency Limit (uV/m) V			Value ^N		Measurement Distance		
	30MHz-88MHz 100		QP						
	88MHz-216MHz	<u>'</u>	150		(QP	3m		
	216MHz-960MH	Z	200		(QP			
	960MHz-1GHz		500		QP				
Test setup:	30MHz - 1GHz								



Report No.: GTS201811000132F01 < 1m ... 4m > EUT < 80cm Turn Table↔ Receiver_← Preamplifier+ Test Procedure: The EUT was placed on the top of a rotating table (0.8 meters for below 1GHz) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna 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. 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. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 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	average method as specified and then reported in a data sheet.					
Test Instruments:	Refer to se	Refer to section 5.8 for details Refer to section 5.2 for details					
Test mode:	Refer to se						
Temp. / Hum.	Temp.:	Temp.: 25 °C Humid.: 52% Press.: 1 012mbar					
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.
- 2. The measured filed strength at frequencies below 30MHz are lower than the limit over 30dB. So the data isn't reported.

Measurement data:

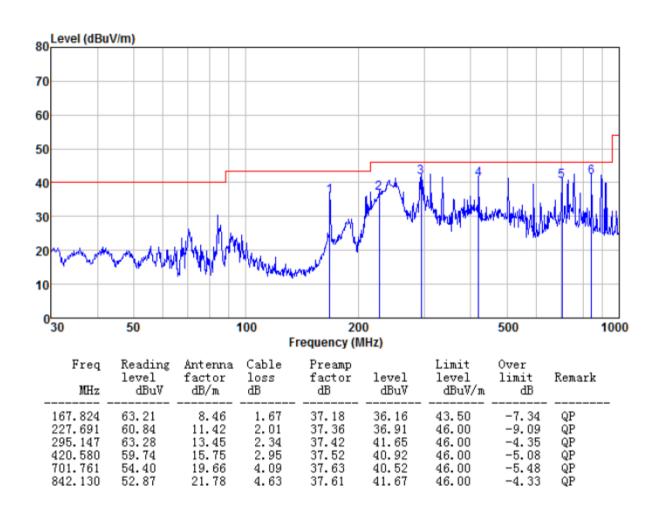
■ Below 30MHz

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.



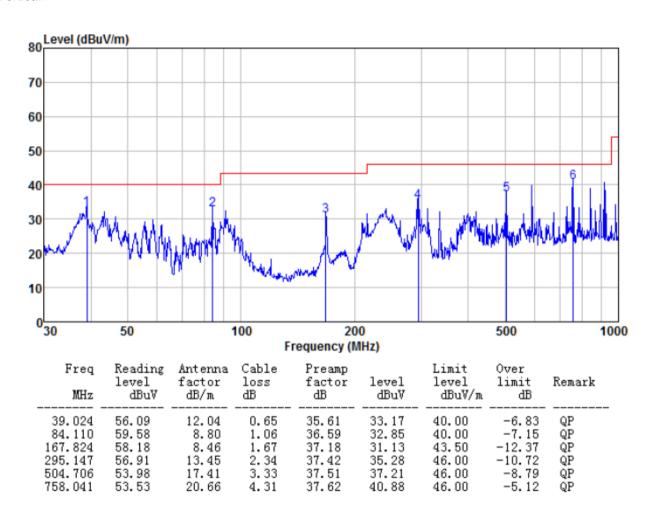
■ 30MHz ~ 1GHz

Horizontal:





Vertical:





8 Test Setup Photo

Reference to the appendix I for details.

9 EUT Constructional Details

Reference to the appendix II for details.

---End---