FCC RADIO TEST REPORT
FCC ID: V6KX-6

Product：	Radio controller
Trade Name：	FMS / HISKY /XINYI
Model Name：	X-6
Serial Model：	X-4
Report No.：	NTEK- 2013DG0523451F

Prepared for

Guangzhou Chiyuan Electronic Co., Ltd

2/F., No.1 Bulding,Boyi Industrial Park, 4th Gongye Rd,Zhicun, Dashi Street, Panyu Dis., Guangzhou, China

Prepared by

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TEST RESULT CERTIFICATION

Applicant's name	:	Guangzhou Chiyuan Electronic Co., Ltd
Address	:	2/F., No.1 Bulding,Boyi Industrial Park, 4th Gongye Rd,Zhicun, Dashi Street, Panyu Dis., Guangzhou, China
Manufacture's Name	:	Guangzhou Chiyuan Electronic Co., Ltd
Address	:	2/F., No.1 Bulding,Boyi Industrial Park, 4th Gongye Rd,Zhicun, Dashi Street, Panyu Dis., Guangzhou, China

Product description

Product name	:	Radio controller
Model and/or type reference	:	X-6
Serial Model：		X-4
Standards	:	FCC Part15.247
Test procedure		ANSI C63.4-2003

This device described above has been tested by NTEK, 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.

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Date of Test	:	
Date (s) of performance of tests	:	17 May. 2013 ~23 May. 2013
Date of Issue	:	24 May. 2013
Test Result	:	**Pass**

Testing Engineer : Apple Huang

(Apple Huang)

Technical Manager : Tom Zhang

(Tom Zhang)

Authorized Signatory : Bovey Yang

(Bovey Yang)

Table of Contents

Table of Contents

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.247) , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.247(a)(1)	Hopping Channel Separation	PASS	
15.247(b)(1)	Peak Output Power	PASS	
15.247(c)	Radiated Spurious Emission	PASS	
15.247(a)(iii)	Number of Hopping Frequency	PASS	
15.247(a)(iii)	Dwell Time	PASS	
15.247(a)(1)	Bandwidth	PASS	
15.205	Band Edge Emission	PASS	
15.203	Antenna Requirement	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

1.1 TEST FACILITY

NTEK Testing Technology Co., Ltd
Add. : 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.
FCC Registration Number:238937; IC Registration Number:9270A-1
CNAS Registration Number:L5516

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **U**，where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**，providing a level of confidence of approximately **95** %。

No.	Item	Uncertainty
1	Conducted Emission Test	±1.38dB
2	RF power,conducted	±0.16dB
3	Spurious emissions,conducted	±0.21dB
4	All emissions,radiated(<1G)	±4.68dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Radio controller
Model Name	X-6
Serial Model	X-4
Model Difference	All model are the same circuit and RF module, except the appearance colour. All test base on X-6
Product Description	The EUT is a Radio controller Operation Frequency: 2402~2477 MHz Modulation Type: FHSS Bit Rate of Transmitter GFSK(1Mbps) Number Of Channel 76 CH Antenna Designation: Please see Note 3. Antenna Gain(Peak) 0dBi Output Power(Conducted): 1.011 dBm (Max.) EIRP： 1.011dBm(Max.)
Channel List	Please refer to the Note 2.
Adapter	N/A
Battery	1.5V*5 AAA battery
Connecting I/O Port(s)	Please refer to the User's Manual

Note:

1. For a more detailed features description, please refer to the manufacturer’s specifications or the User's Manual.

2.

Channel List					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	27	2429	54	2456
01	2403	28	2430	55	2457
02	2404	29	2431	56	2458
03	2405	30	2432	57	2459
04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451		
23	2425	50	2452		
24	2426	51	2453		
25	2427	52	2454		
26	2428	53	2455		

3.

Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	N/A	N/A	Not Remove Antenna	N/A	0	BT Antenna

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	CH00
Mode 2	CH39
Mode 3	CH75

For Conducted Emission	
Final Test Mode	Description
N/A	N/A

For Radiated Emission	
Final Test Mode	Description
Mode 1	CH00
Mode 2	CH39
Mode 3	CH75

Note:

(1) The measurements are performed at the highest, middle, lowest available channels.

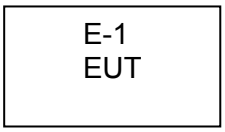
(2) The EUT use new battery.

2.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of FHSS

Test software Version	Test program: N/A		
Frequency	2402 MHz	2441 MHz	2477 MHz
Parameters(1Mbps)	DEF	DEF	DEF

2.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



2.5 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	Radio controller	FMS / HISKY /XINYI	X-6	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in『Length』column.
(3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Agilent	E4407B	160400005	2012.07.05	2013.07.06	1 year
2	Test Receiver	R&S	ESPI	101318	2012.07.05	2013.07.06	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2012.07.05	2013.07.06	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2012.07.05	2013.07.06	1 year
5	Spectrum Analyzer	ADVANTEST	R3132	150900201	2012.07.05	2013.07.06	1 year
6	Horn Antenna	EM	EM-AH-20180	2011071402	2012.07.05	2013.07.06	1 year
7	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2012.07.05	2013.07.06	1 year
8	Amplifier	EM	EM-30180	060538	2012.07.05	2013.07.06	1 year
9	Loop Antenna	ARA	PLA-2030/B	1029	2012.07.05	2013.07.06	1 year
10	Power Meter	R&S	NRVS	100696	2012.07.05	2013.07.06	1 year
11	Signal Generator	R&S	SMT 06	832080/007	2012.07.05	2013.07.06	1 year
12	Temperature & Humitidy Chamber	GIANT FORCE	GTH-056P	GF-94454-1	2012.07.05	2013.07.06	1 year
13	Power Sensor	R&S	URV5-Z4	0395.1619.05	2012.07.05	2013.07.06	1 year

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

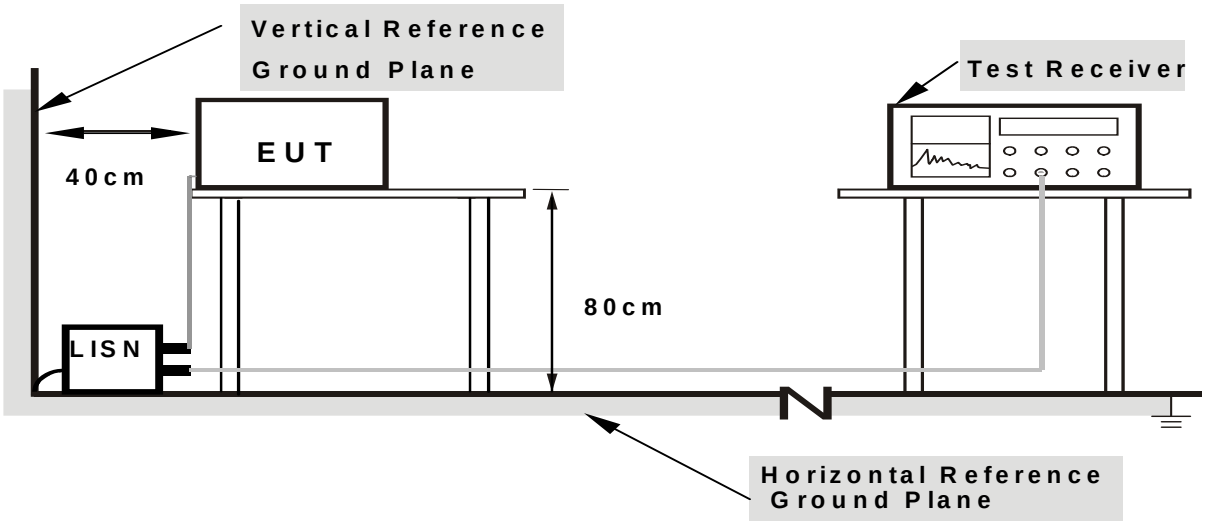
3.1.2 TEST PROCEDURE

a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.1.6 TEST RESULTS

EUT：	Radio controller	Model Name ：	X-6
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	N/A
Test Voltage ：	N/A	Test Mode：	N/A

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class A (dBuV/m) (at 3M)		Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80	60	74	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

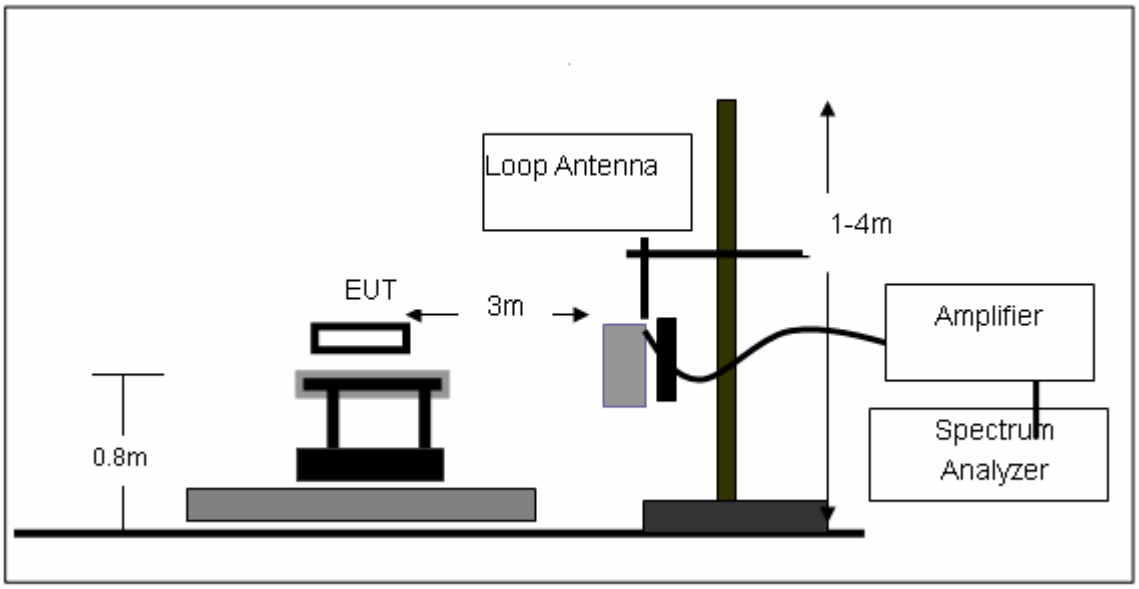
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

3.2.3 DEVIATION FROM TEST STANDARD

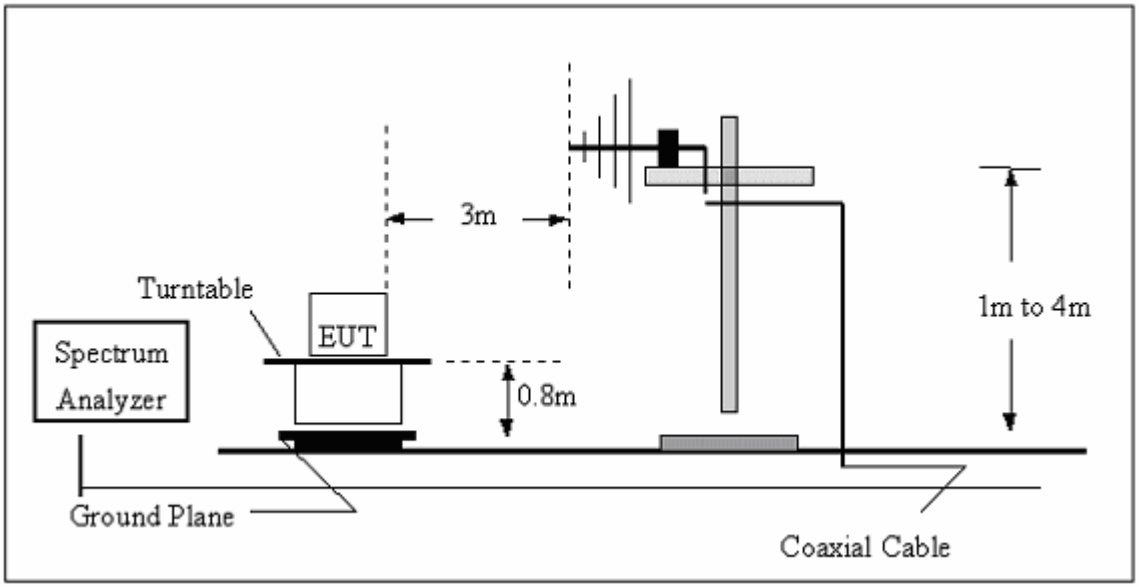
No deviation

3.2.4 TEST SETUP

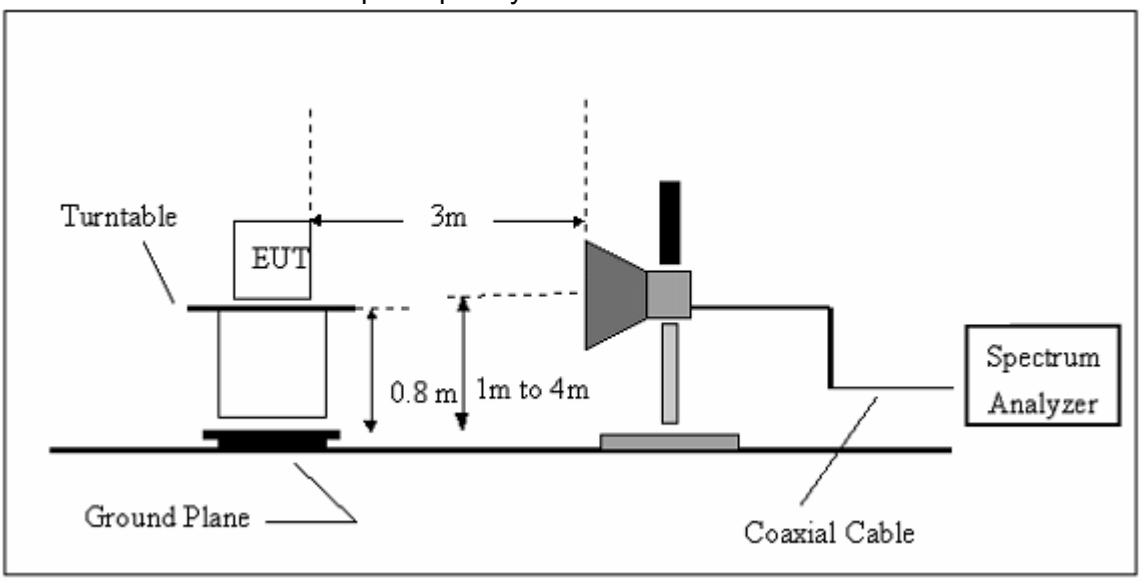
（A）Radiated Emission Test-Up Frequency Below 30MHz



（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



（C）Radiated Emission Test-Up Frequency Above 1GHz



3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.6 TEST RESULTS (BELOW 30 MHZ)

EUT：	Radio controller	Model Name ：	X-6
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Polarization：	---
Test Voltage ：	DC 7.5V by battery		
Test Mode ：	TX		

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

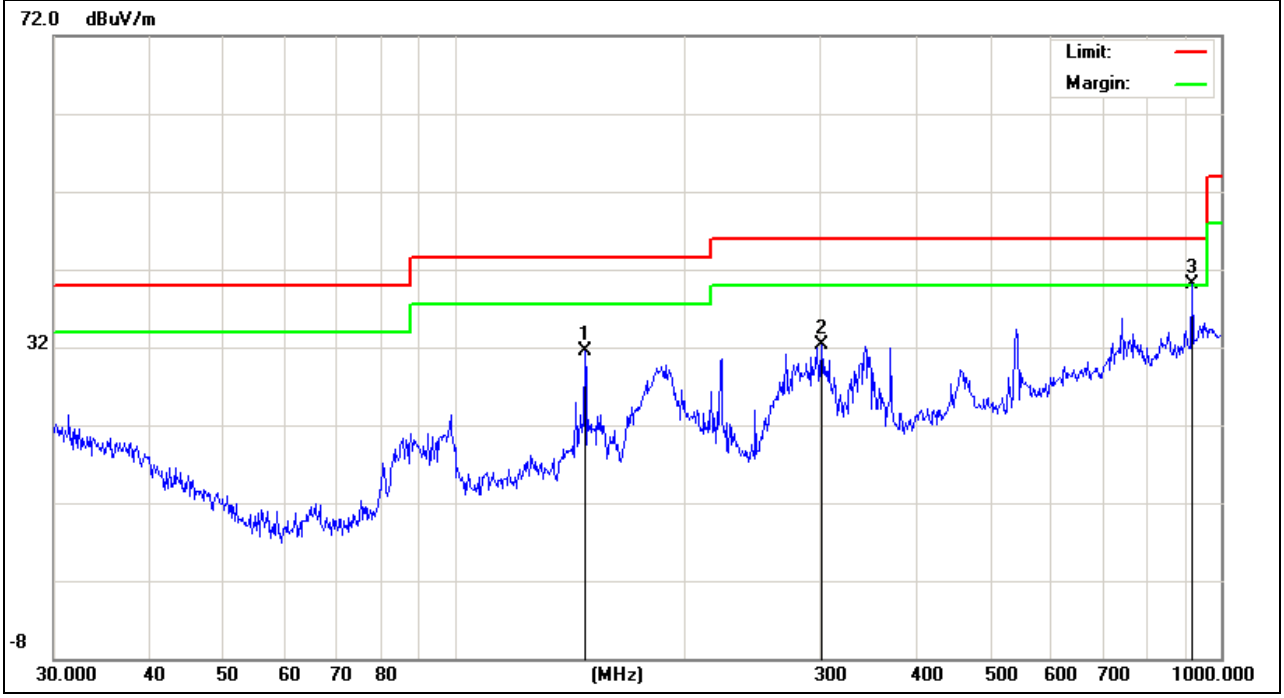
NOTE:
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =20 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

3.2.7 TEST RESULTS (BETWEEN 30M – 1000 MHZ)

EUT：	Radio controller	Model Name ：	X-6
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX	Polarization：	Horizontal

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
147.9214	19.58	11.86	31.44	43.50	-12.06	QP
301.4223	17.44	14.79	32.23	46.00	-13.77	QP
916.0687	11.65	28.48	40.13	46.00	-5.87	QP

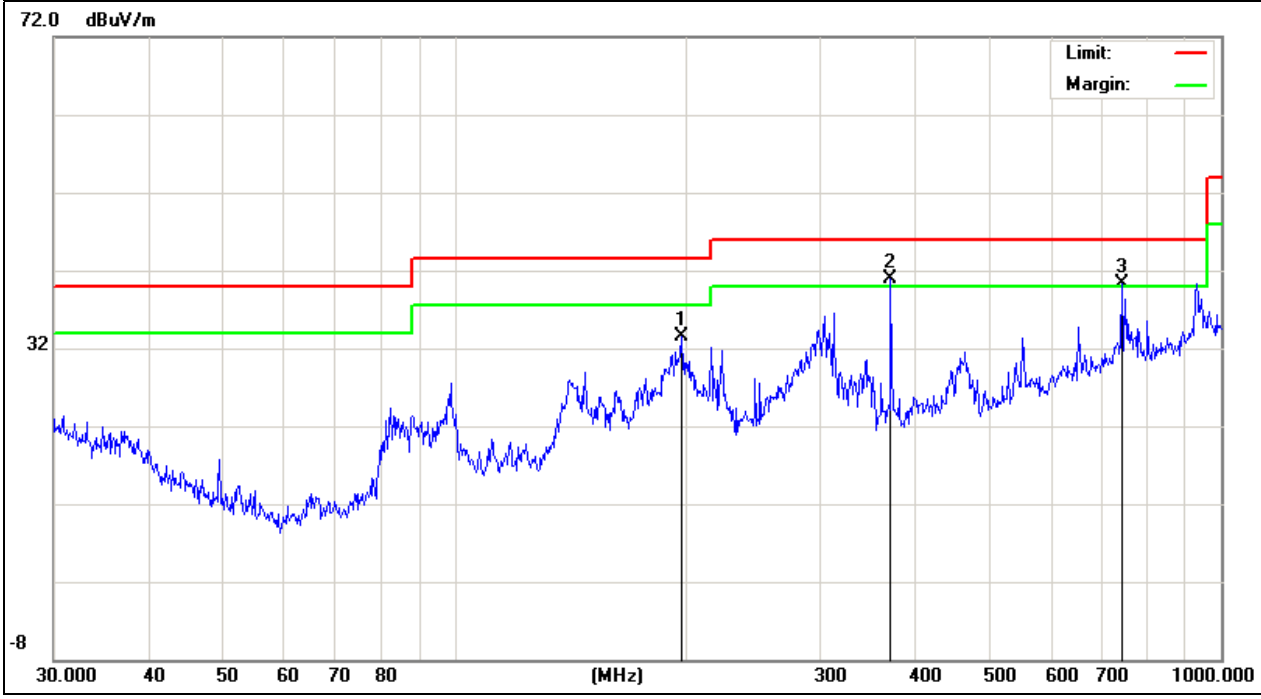
Remark:
Factor = Antenna Factor + Cable Loss.



EUT：	Radio controller	Model Name ：	X-6
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX 2402MHz	Polarization：	Vertical

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
197.8926	24.57	8.99	33.56	43.50	-9.94	QP
370.7022	24.13	16.73	40.86	46.00	-5.14	QP
742.2586	13.94	26.46	40.40	46.00	-5.60	QP

Remark:
Factor = Antenna Factor + Cable Loss.

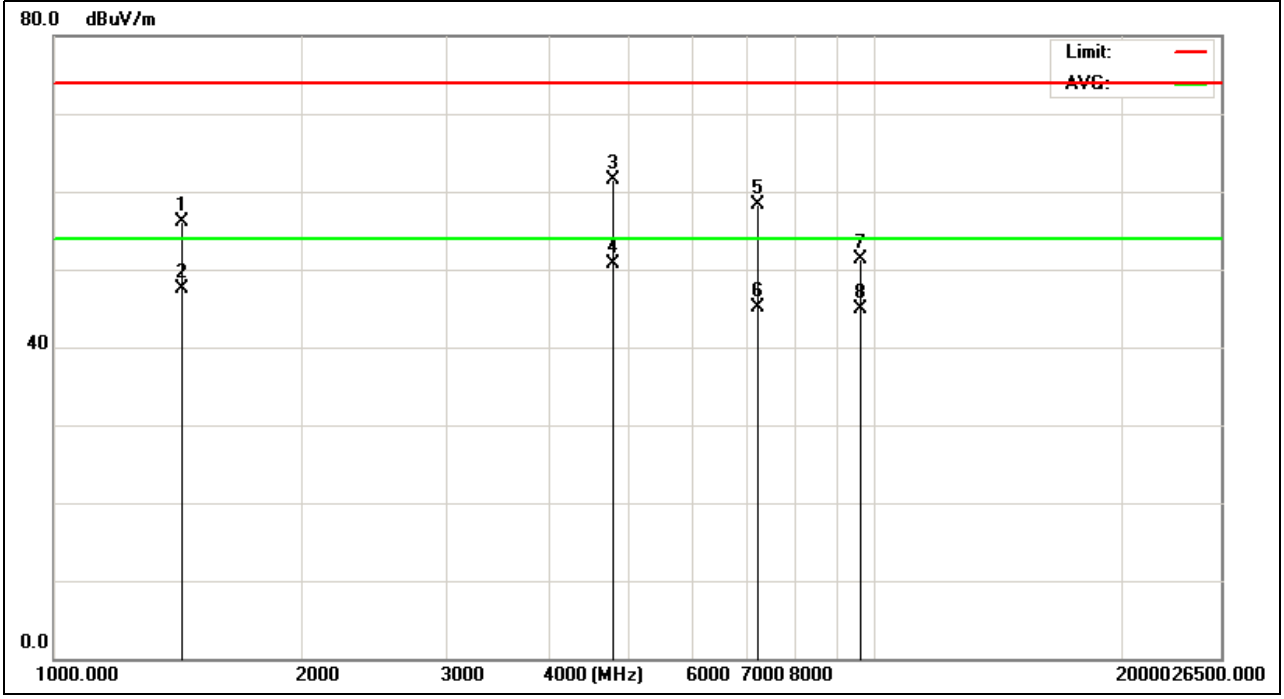


3.2.8 TEST RESULTS (ABOVE 1000 MHZ)

EUT：	Radio controller	Model Name ：	X-6
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX 2402MHz	Polarization：	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
1431.21	30.61	25.44	56.05	74	-17.95	peak
1431.21	22.04	25.44	47.48	54	-6.52	AVG
4804.14	25.87	35.6	61.47	74	-12.53	peak
4804.14	15.11	35.6	50.71	54	-3.29	AVG
7206.51	22.12	36.26	58.38	74	-15.62	peak
7206.51	8.87	36.26	45.13	54	-8.87	AVG
9608.15	13.45	37.95	51.4	74	-22.6	peak
9608.15	6.87	37.95	44.82	54	-9.18	AVG

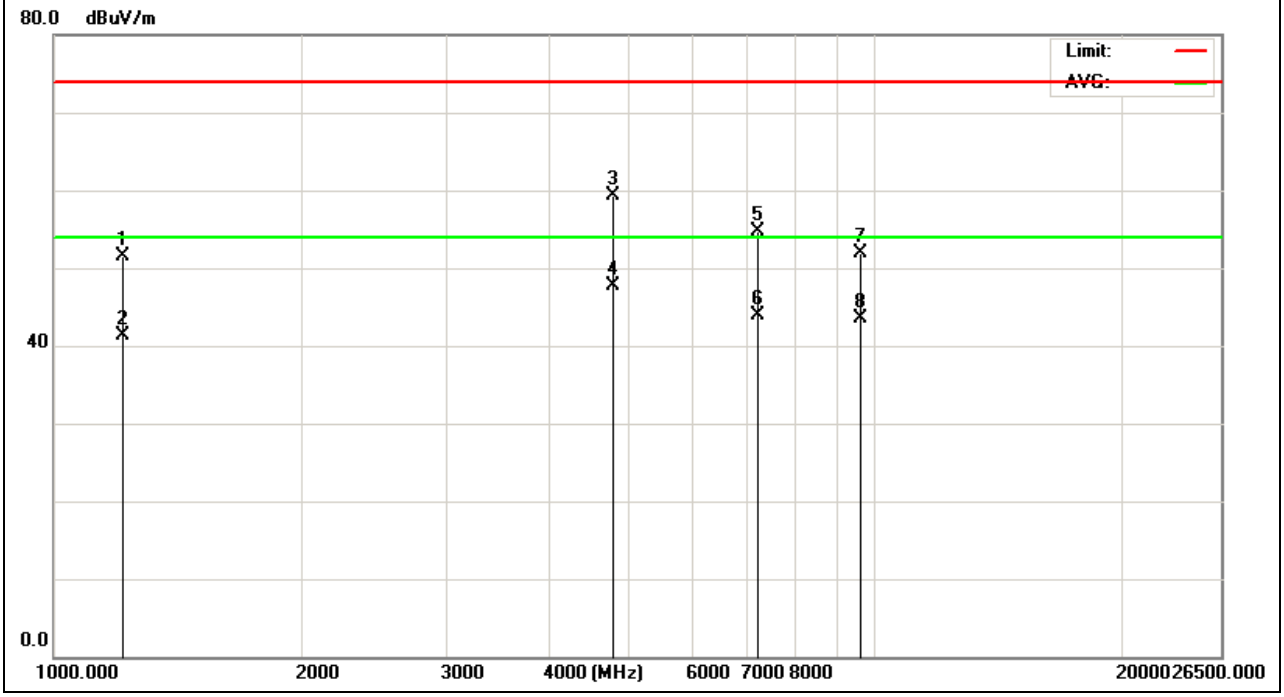
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Radio controller	Model Name ：	X-6
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX 2402MHz	Polarization：	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
1211.32	26.15	25.43	51.58	74	-22.42	peak
1211.32	15.87	25.43	41.3	54	-12.7	AVG
4804.54	23.74	35.6	59.34	74	-14.66	peak
4804.54	12.14	35.6	47.74	54	-6.26	AVG
7206.554	18.35	36.26	54.61	74	-19.39	peak
7206.554	7.74	36.26	44	54	-10	AVG
9608.15	13.87	37.95	51.82	74	-22.18	peak
9608.15	5.54	37.95	43.49	54	-10.51	AVG

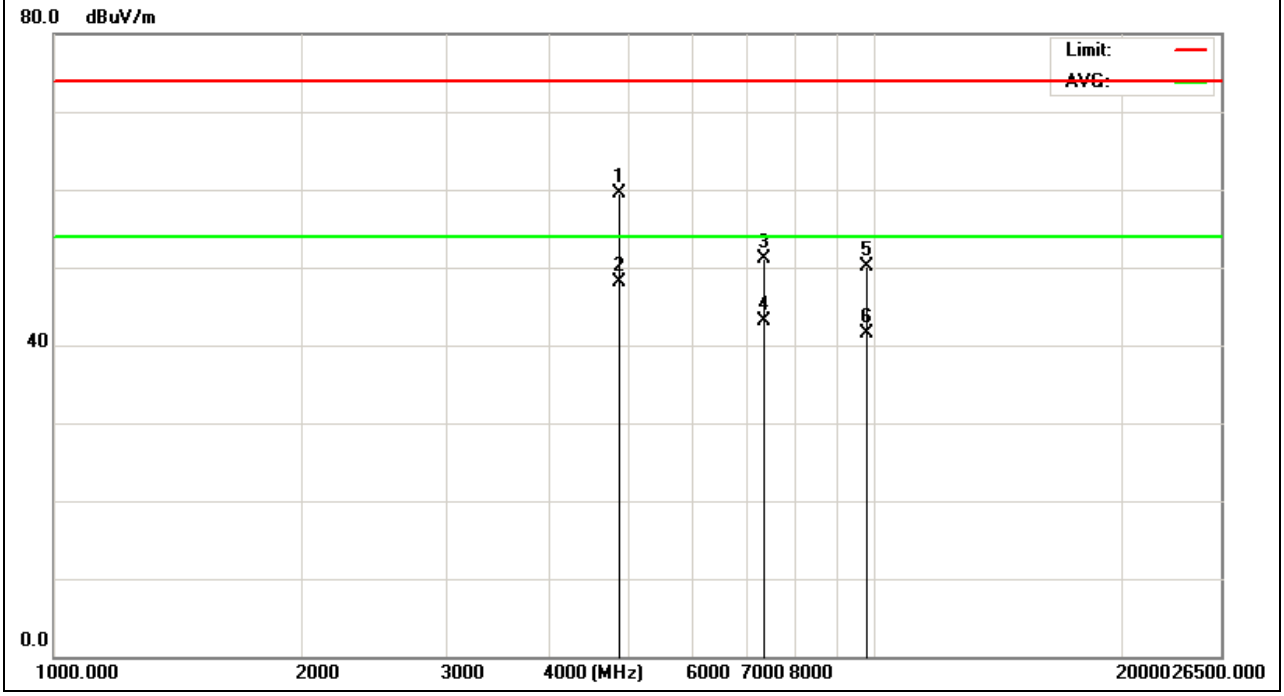
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Radio controller	Model Name ：	X-6
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX 2441MHz	Polarization：	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4882.11	24.12	35.46	59.58	74	-14.42	peak
4882.11	12.57	35.46	48.03	54	-5.97	AVG
7323.35	14.68	36.51	51.19	74	-22.81	peak
7323.35	6.67	36.51	43.18	54	-10.82	AVG
9764.85	13.11	37.02	50.13	74	-23.87	peak
9764.85	4.47	37.02	41.49	54	-12.51	AVG

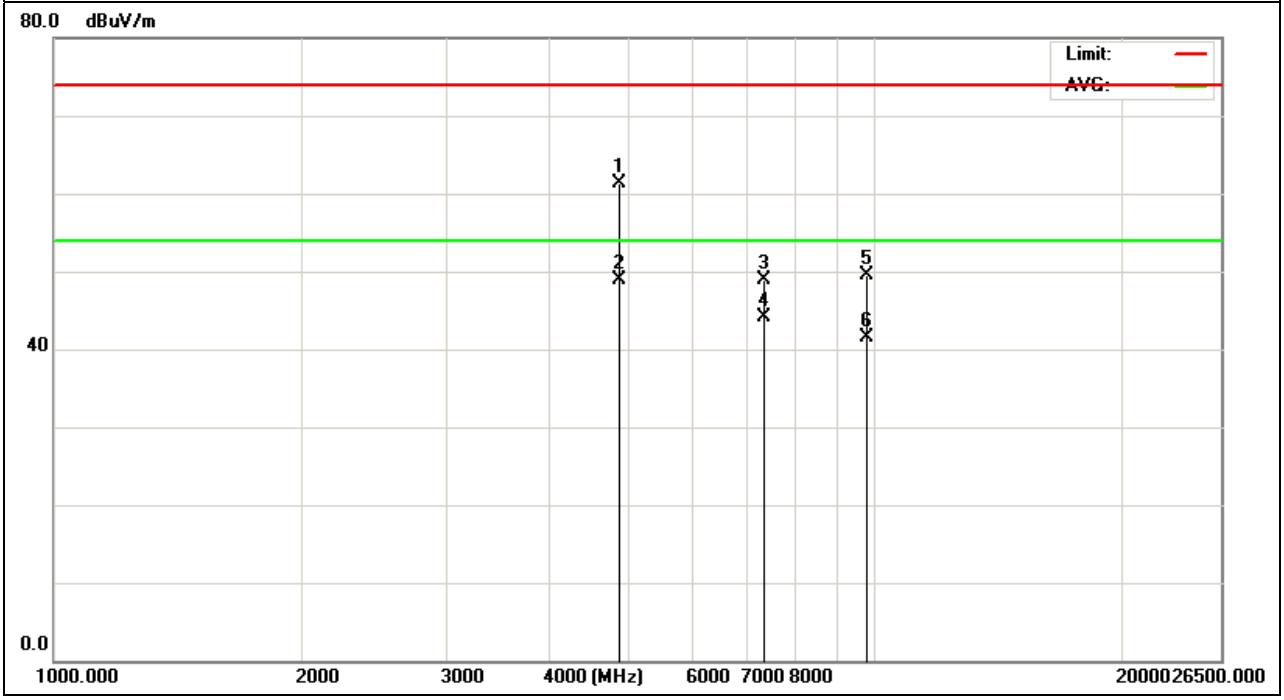
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Radio controller	Model Name ：	X-6
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX 2441MHz	Polarization：	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4882.64	25.78	35.46	61.24	74	-12.76	peak
4882.64	13.54	35.46	49	54	-5	AVG
7323.87	12.44	36.51	48.95	74	-25.05	peak
7323.87	7.65	36.51	44.16	54	-9.84	AVG
9764.1	12.55	37.01	49.56	74	-24.44	peak
9764.1	4.46	37.01	41.47	54	-12.53	AVG

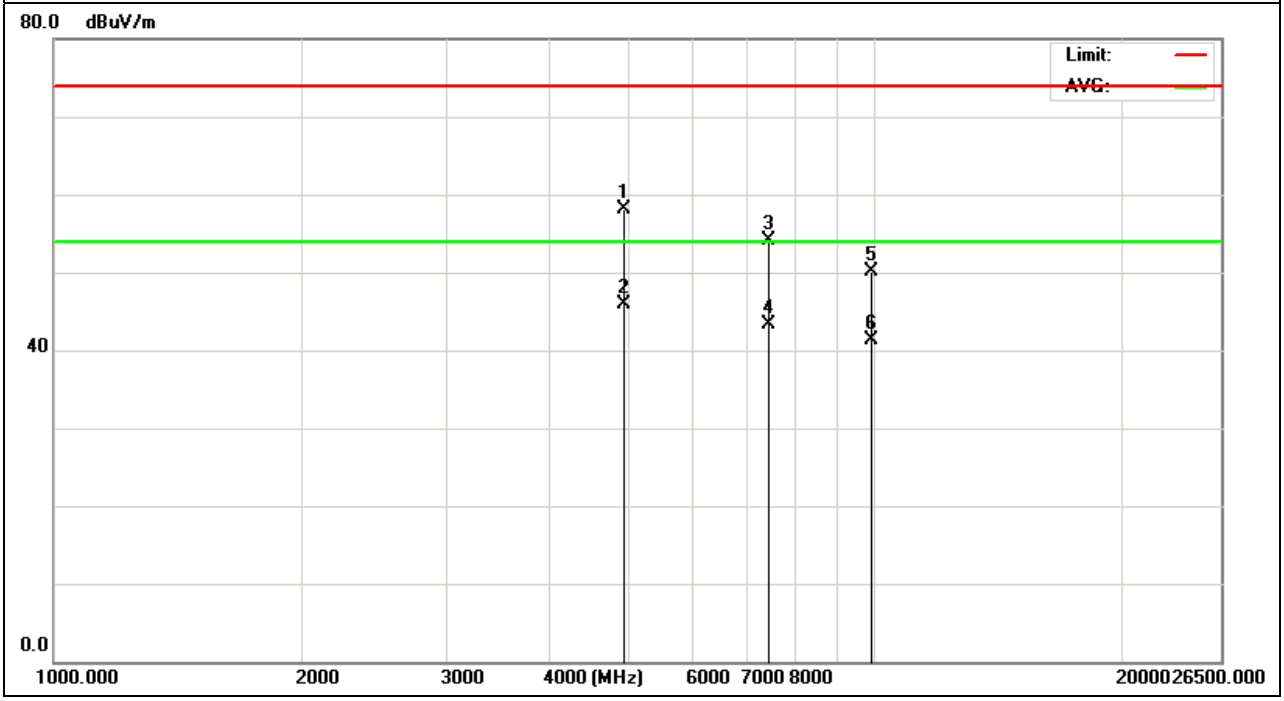
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Radio controller	Model Name ：	X-6
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX 2477MHz	Polarization：	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4954.88	22.56	35.48	58.04	74	-15.96	peak
4954.88	10.39	35.48	45.87	54	-8.13	AVG
7431.62	17.48	36.66	54.14	74	-19.86	peak
7431.62	6.58	36.66	43.24	54	-10.76	AVG
9908.72	12.66	37.53	50.19	74	-23.81	peak
9908.72	3.75	37.53	41.28	54	-12.72	AVG

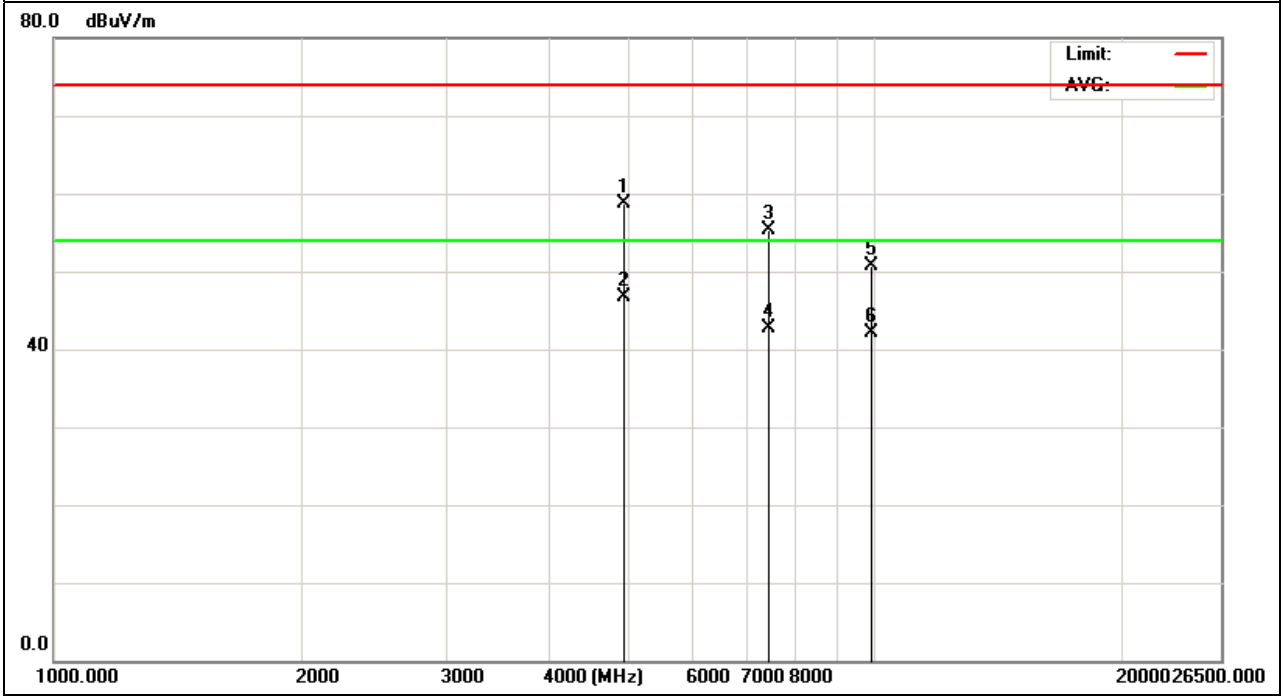
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Radio controller	Model Name ：	X-6
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX 2477MHz	Polarization：	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4954.8	23.25	35.49	58.74	74	-15.26	peak
4954.8	11.23	35.49	46.72	54	-7.28	AVG
7431.25	18.75	36.65	55.4	74	-18.6	peak
7431.25	6.15	36.65	42.8	54	-11.2	AVG
9908.41	13.22	37.53	50.75	74	-23.25	peak
9908.41	4.52	37.53	42.05	54	-11.95	AVG

Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

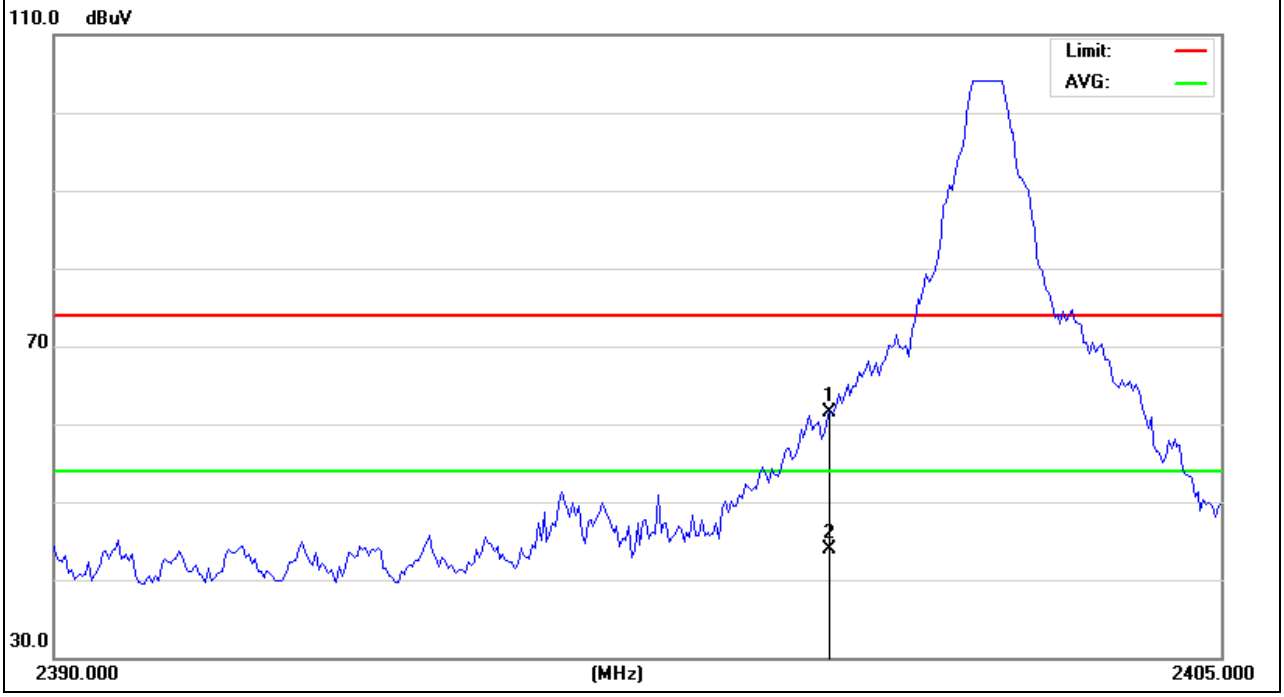


3.2.9 TEST RESULTS (RESTRICTED BANDS REQUIREMENTS)

EUT：	Radio controller	Model Name ：	X-6
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX /2402MHz	Polarization：	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2400	73.68	-12.99	60.69	74	-13.31	peak
2400	55.72	-12.99	42.73	54	-11.27	AVG

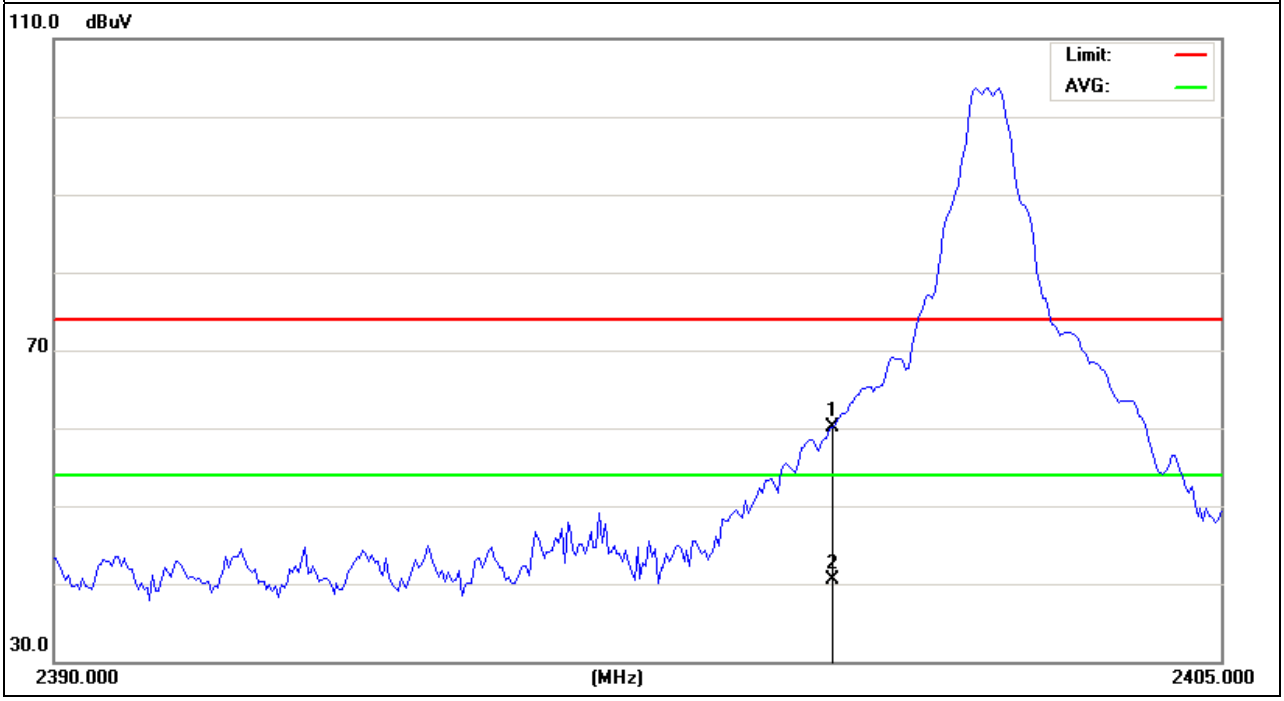
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Radio controller	Model Name ：	X-6
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX /2402MHz	Polarization：	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2400	74.21	-12.99	61.22	74	-12.78	peak
2400	53.67	-12.99	40.68	54	-13.32	AVG

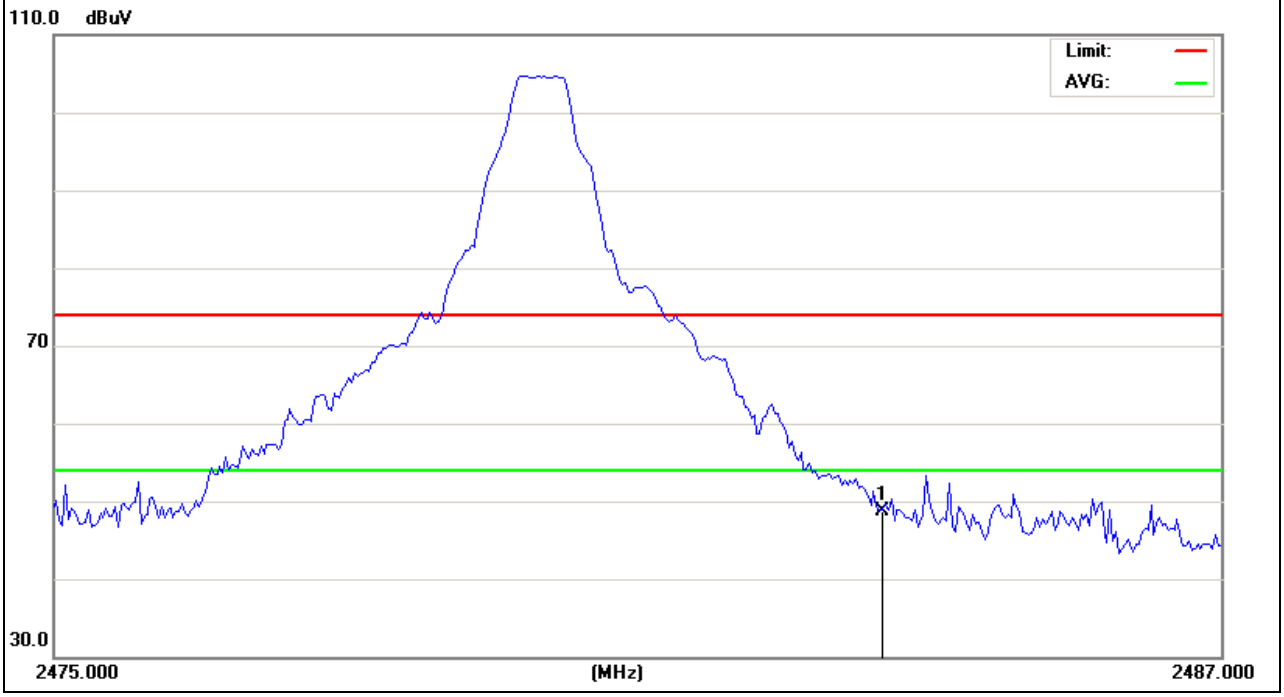
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Radio controller	Model Name ：	X-6
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX /2477MHz	Polarization：	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	60.64	-12.78	47.86	74	-26.14	peak

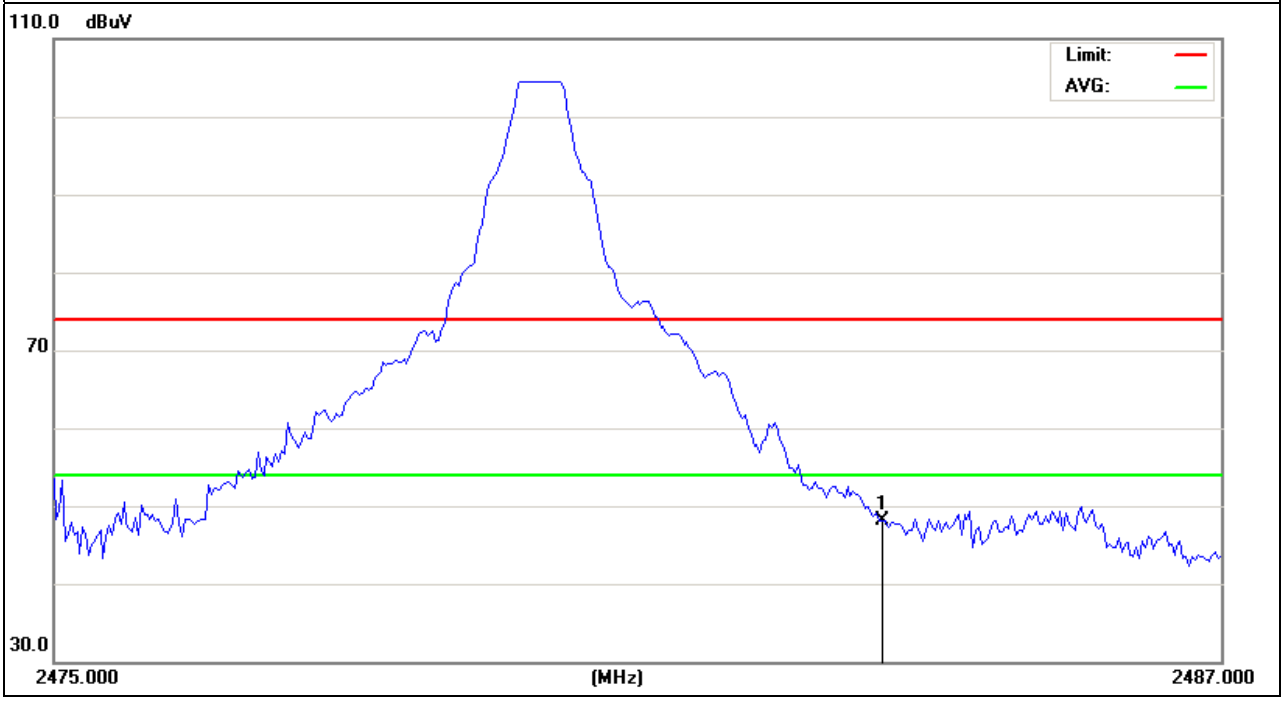
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Radio controller	Model Name ：	X-6
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX /2477MHz	Polarization：	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	61	-12.78	48.22	74	-25.78	peak

Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



4. NUMBER OF HOPPING CHANNEL

4.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (a)(1)(iii)	Number of Hopping Channel	≥15	2400-2483.5	PASS

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> Operating Frequency Range
RB	100 kHz
VB	100 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

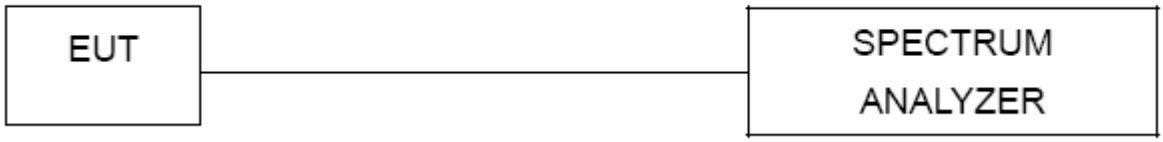
4.1.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 100KHz, VBW=100KHz, Sweep time = Auto.

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



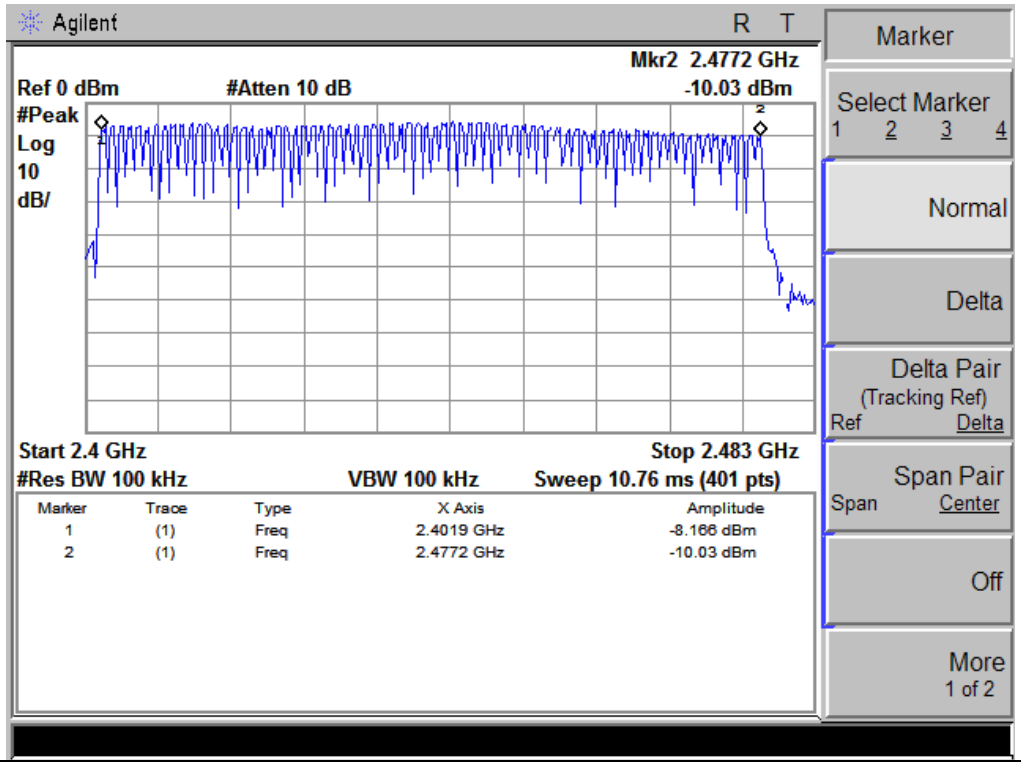
4.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

4.1.5 TEST RESULTS

EUT：	Radio controller	Model Name ：	X-6
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1015 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Hopping Mode		

Number of Hopping Channel	76



5. AVERAGE TIME OF OCCUPANCY

5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (a)(1)(iii)	Average Time of Occupancy	0.4sec	2400-2483.5	PASS

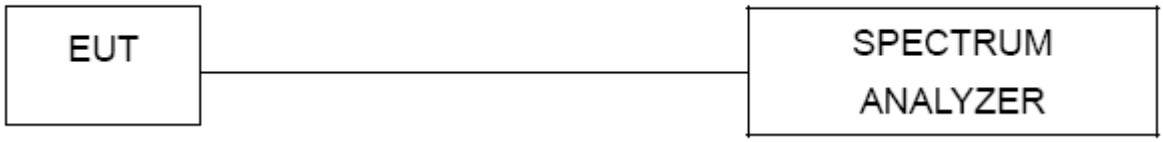
5.1.1 TEST PROCEDURE

a. The transmitter output (antenna port) was connected to the spectrum analyzer
b. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
c. Use a video trigger with the trigger level set to enable triggering only on full pulses.
d. Sweep Time is more than once pulse time.
e. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
f. Measure the maximum time duration of one single pulse.
g. Measure the maximum time duration of one single pulse.
h. A Period Time = (channel number)*0.4
Time Slot: Reading * (240/2)*30.4/(channel number)

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP



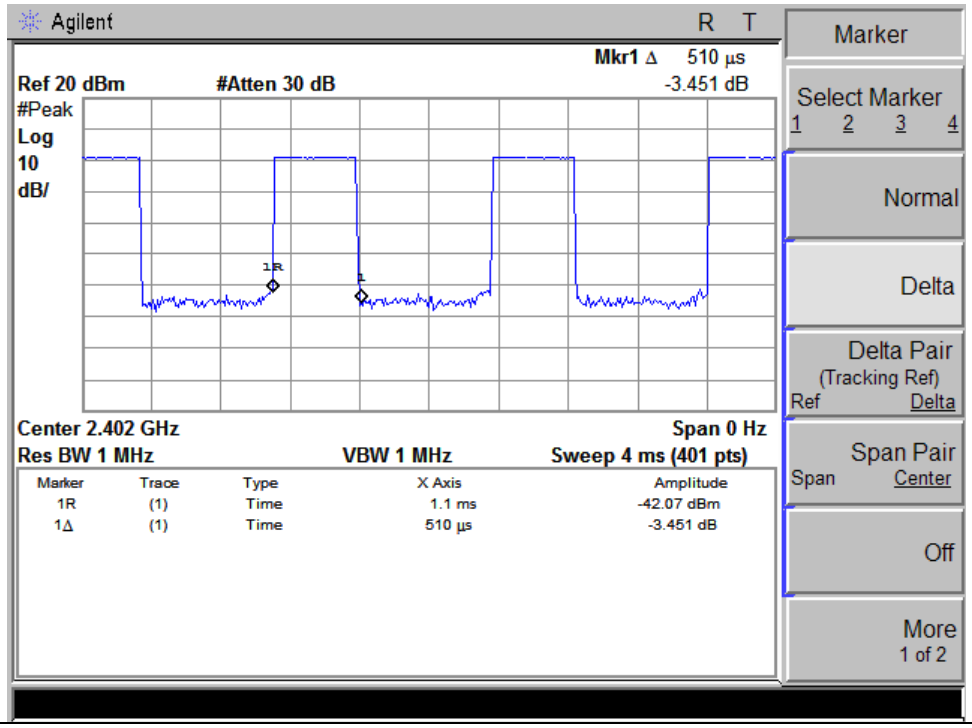
5.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.1.5 TEST RESULTS

EUT：	Radio controller	Model Name ：	X-6
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	2402MHz		

Frequency(MHz)	Pulse Duration (ms)	Dwell Time (s)	Limits (s)
2402	0.51	0.0245	0.4000



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6. HOPPING CHANNEL SEPARATION MEASUREMENT

6.1 APPLIED PROCEDURES / LIMIT

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	100 kHz (Channel Separation)
VB	300 kHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

6.1.1 TEST PROCEDURE

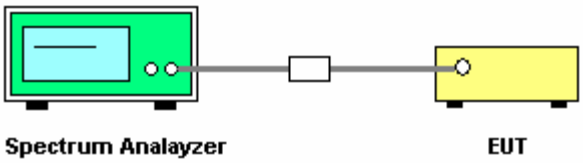
a. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.

b. The resolution bandwidth of 100 kHz and the video bandwidth of 300 kHz were utilised for channel separation measurement.

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP



6.1.4 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

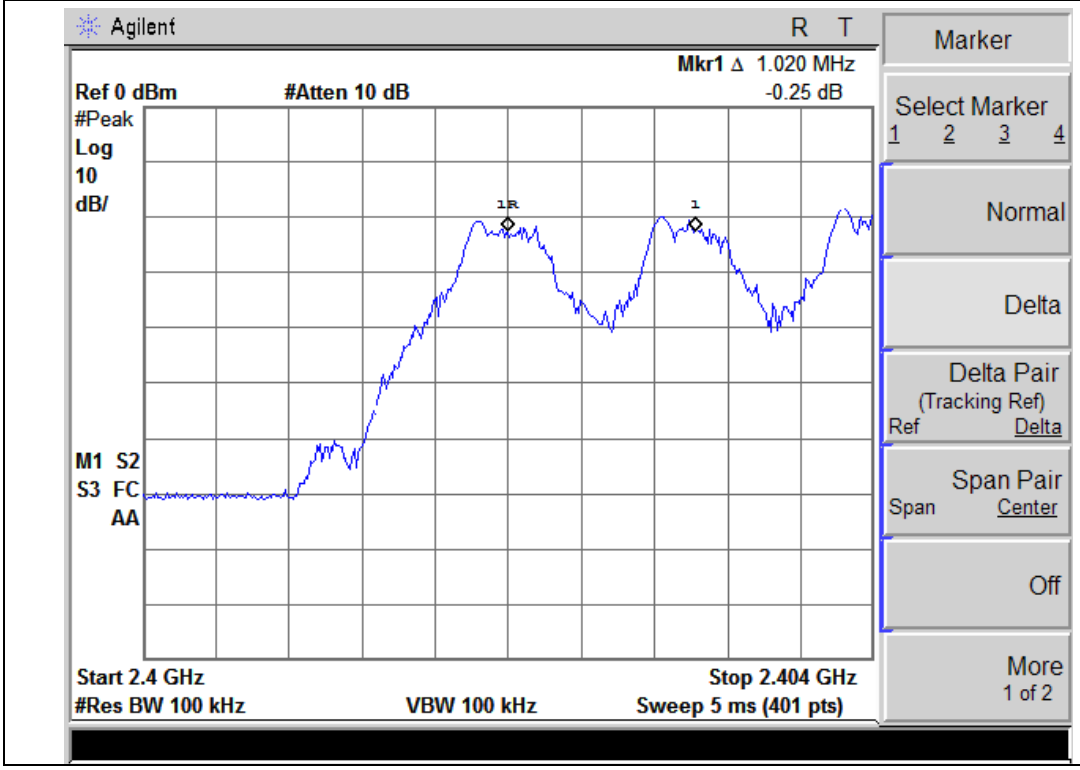
6.1.5 TEST RESULTS

EUT：	Radio controller	Model Name ：	X-6
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	CH00 / CH39 /CH75 (1Mbps Mode)		

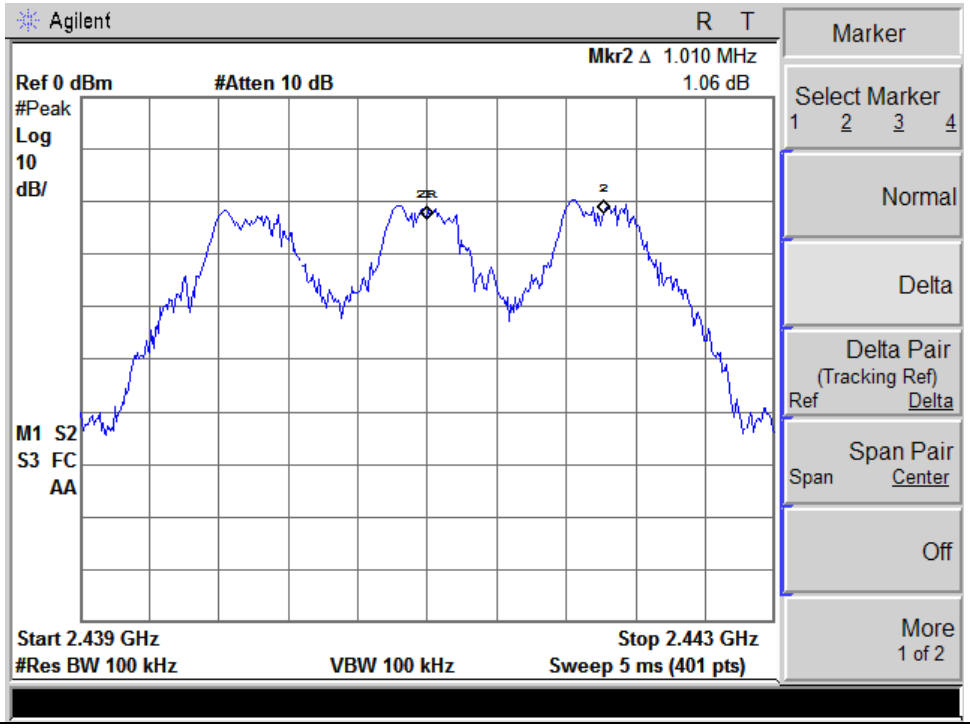
Frequency	Ch. Separation (MHz)	Result
2402 MHz	1.020	**Complies**
2441 MHz	1.010	**Complies**
2477 MHz	1.070	**Complies**

Ch. Separation Limits: >20dB bandwidth or >2/3 of 20dB bandwidth

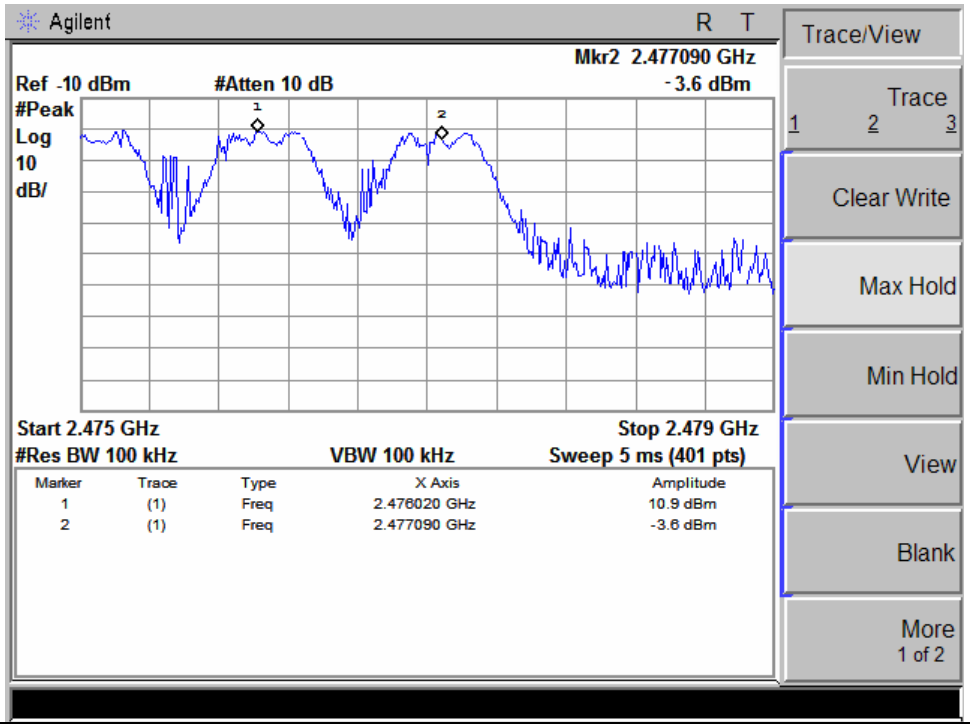
CH00



CH39 -1Mbps



CH75 -1Mbps



7. BANDWIDTH TEST

7.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (a)(1)	Bandwidth	(20dB bandwidth)	2400-2483.5	PASS

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	30 kHz
VB	100 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

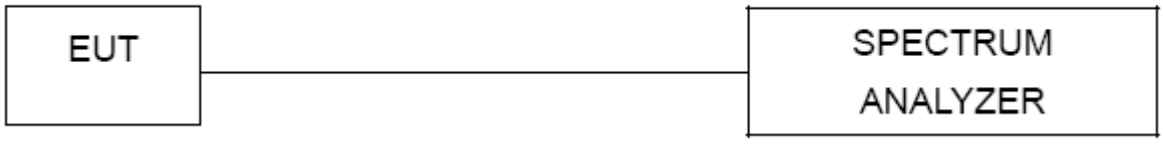
7.1.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 30KHz, VBW=100KHz, Sweep time = Auto.

7.1.2 DEVIATION FROM STANDARD

No deviation.

7.1.3 TEST SETUP



7.1.4 EUT OPERATION CONDITIONS

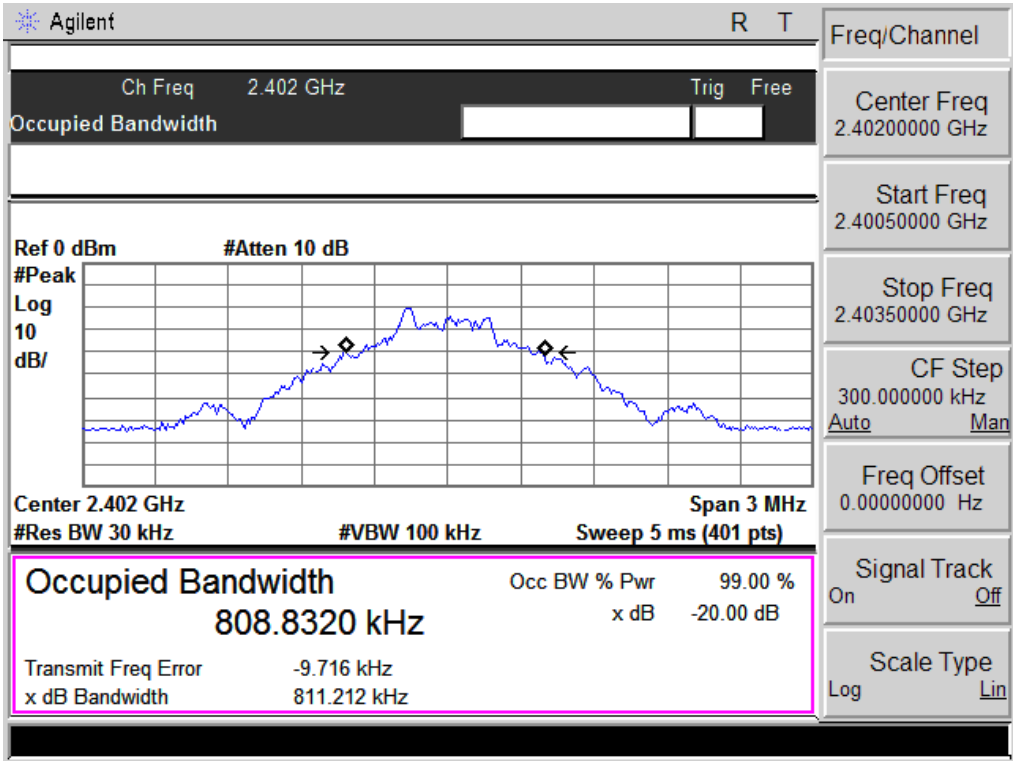
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

7.1.5 TEST RESULTS

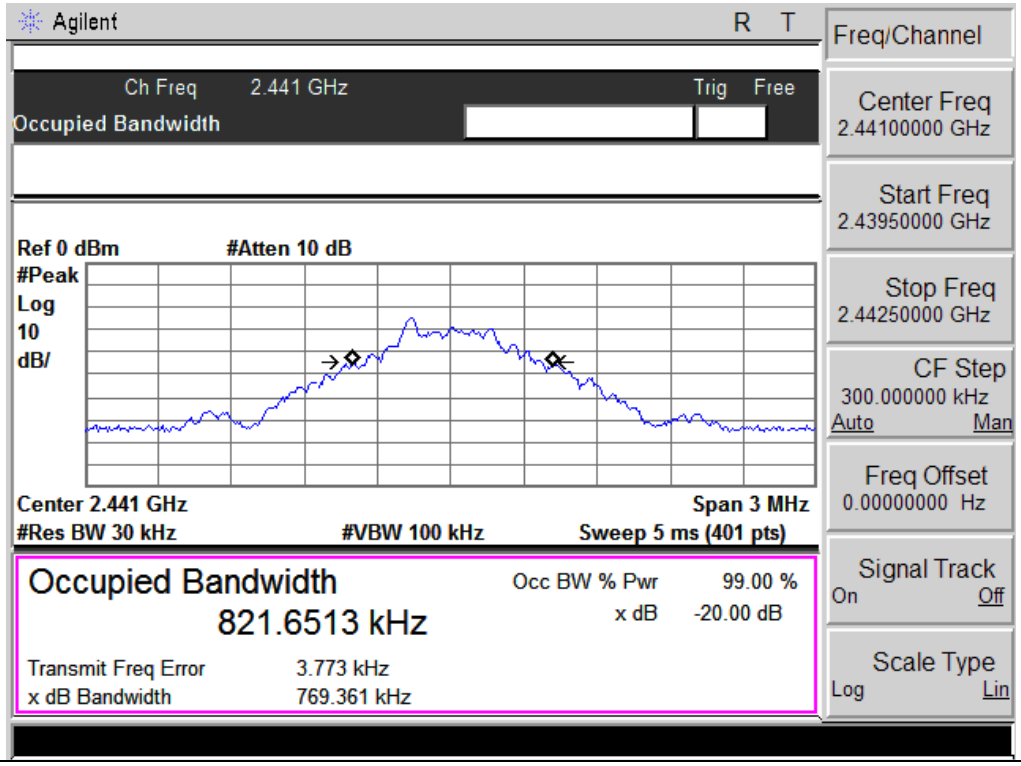
EUT：	Radio controller	Model Name ：	X-6
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	CH00 / CH39 /C78		

Frequency	20dB Bandwidth (kHz)	Result
2402 MHz	811.212	**PASS**
2441 MHz	769.361	**PASS**
2477 MHz	826.153	**PASS**

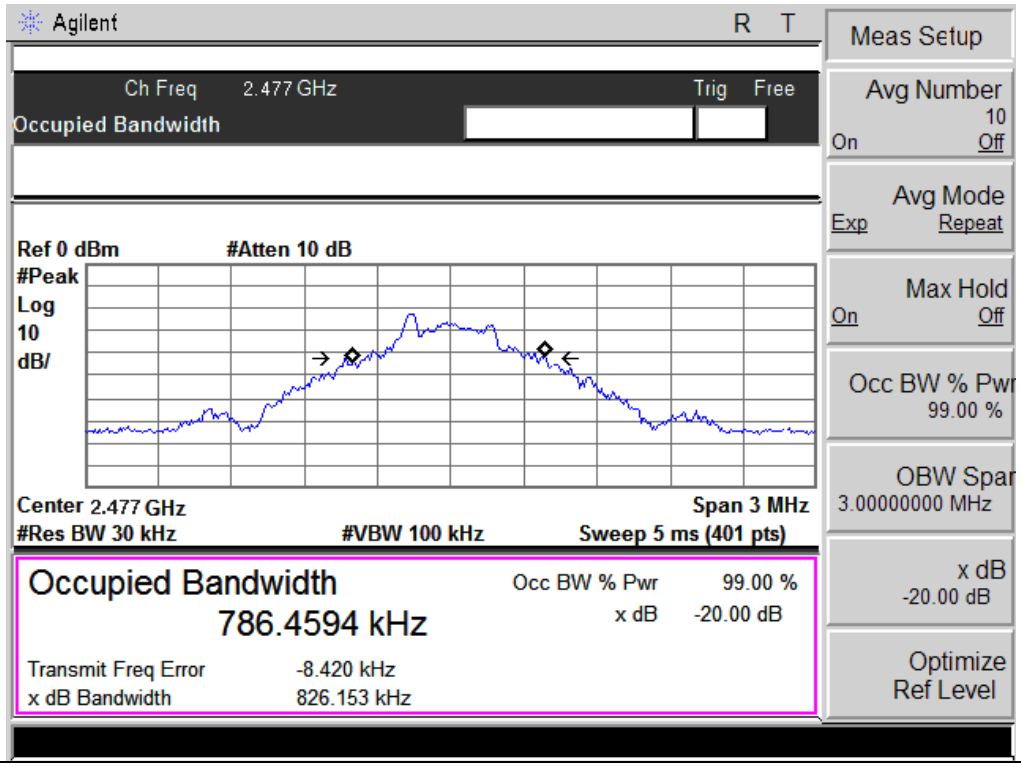
CH00



CH39


Agilent
R T
Ch Freq 2.441 GHz
Trig Free
Occupied Bandwidth
Ref 0 dBm
#Atten 10 dB
#Peak
Log
10
dB/
Center 2.441 GHz
Span 3 MHz
#Res BW 30 kHz
#VBW 100 kHz
Sweep 5 ms (401 pts)
Occupied Bandwidth
821.6513 kHz
Occ BW % Pwr 99.00 %
x dB -20.00 dB
Transmit Freq Error 3.773 kHz
x dB Bandwidth 769.361 kHz
Freq/Channel
Center Freq
2.44100000 GHz
Start Freq
2.43950000 GHz
Stop Freq
2.44250000 GHz
CF Step
300.000000 kHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Scale Type
Log Lin

CH75


Agilent
R T
Ch Freq 2.477 GHz
Trig Free
Occupied Bandwidth
Ref 0 dBm
#Atten 10 dB
#Peak
Log
10
dB/
Center 2.477 GHz
Span 3 MHz
#Res BW 30 kHz
#VBW 100 kHz
Sweep 5 ms (401 pts)
Occupied Bandwidth
786.4594 kHz
Occ BW % Pwr 99.00 %
x dB -20.00 dB
Transmit Freq Error -8.420 kHz
x dB Bandwidth 826.153 kHz
Meas Setup
Avg Number
10
On Off
Avg Mode
Exp Repeat
Max Hold
On Off
Occ BW % Pwr
99.00 %
OBW Span
3.00000000 MHz
x dB
-20.00 dB
Optimize
Ref Level

8. PEAK OUTPUT POWER TEST

8.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (b)(i)	Peak Output Power	0.125 w or 20.96dBm	2400-2483.5	PASS

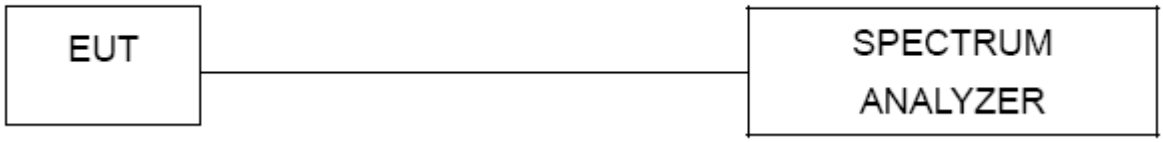
8.1.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 1MHz, VBW= 1MHz, Sweep time = Auto.

8.1.2 DEVIATION FROM STANDARD

No deviation.

8.1.3 TEST SETUP



8.1.4 EUT OPERATION CONDITIONS

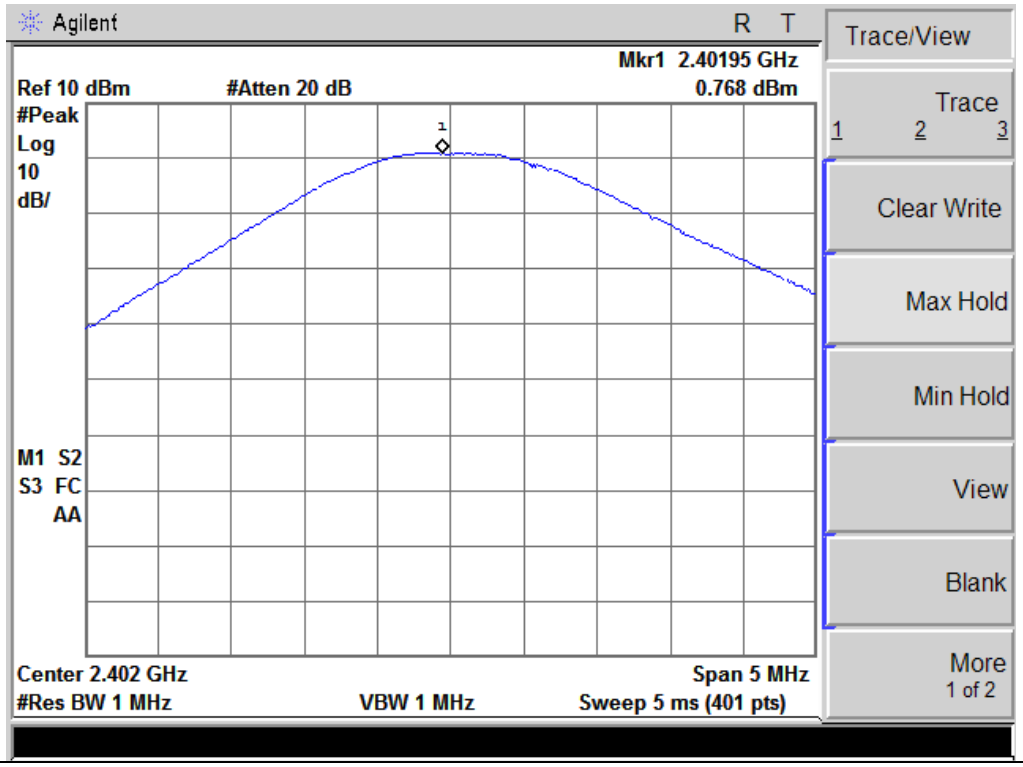
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

8.1.5 TEST RESULTS

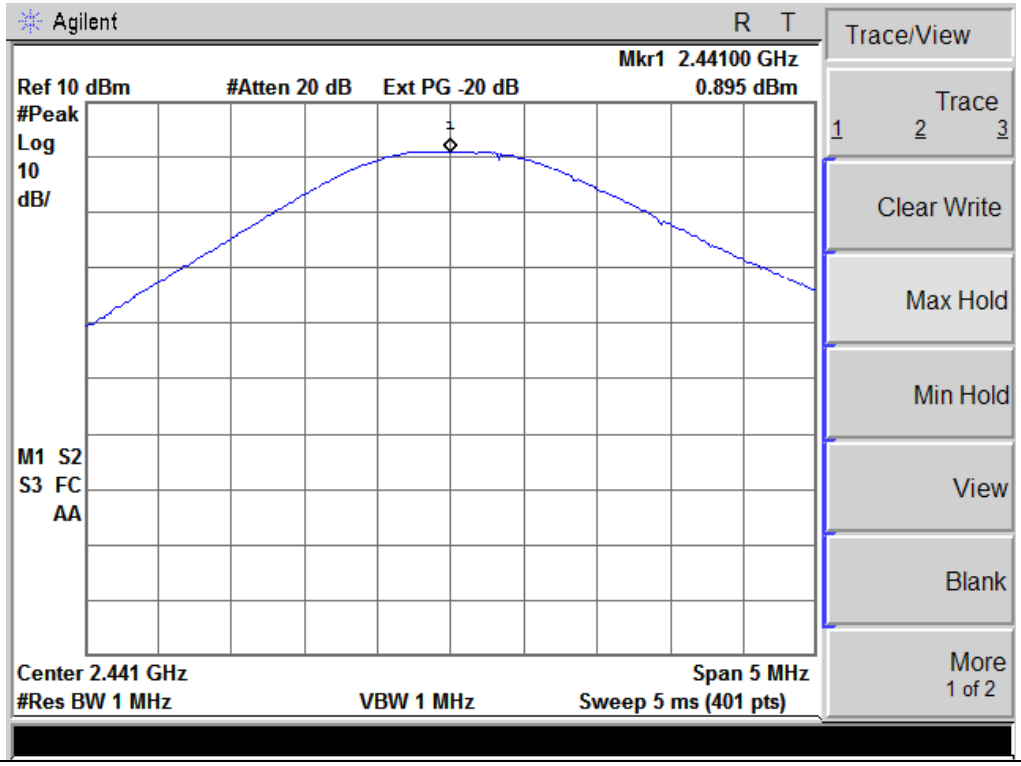
EUT：	Radio controller	Model Name ：	X-6
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	CH00/ CH39 /CH75		

Test Channel	Frequency (MHz)	Peak Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
CH00	2402	0.768	20.96	1
CH39	2441	0.895	20.96	1
CH75	2477	1.011	20.96	1

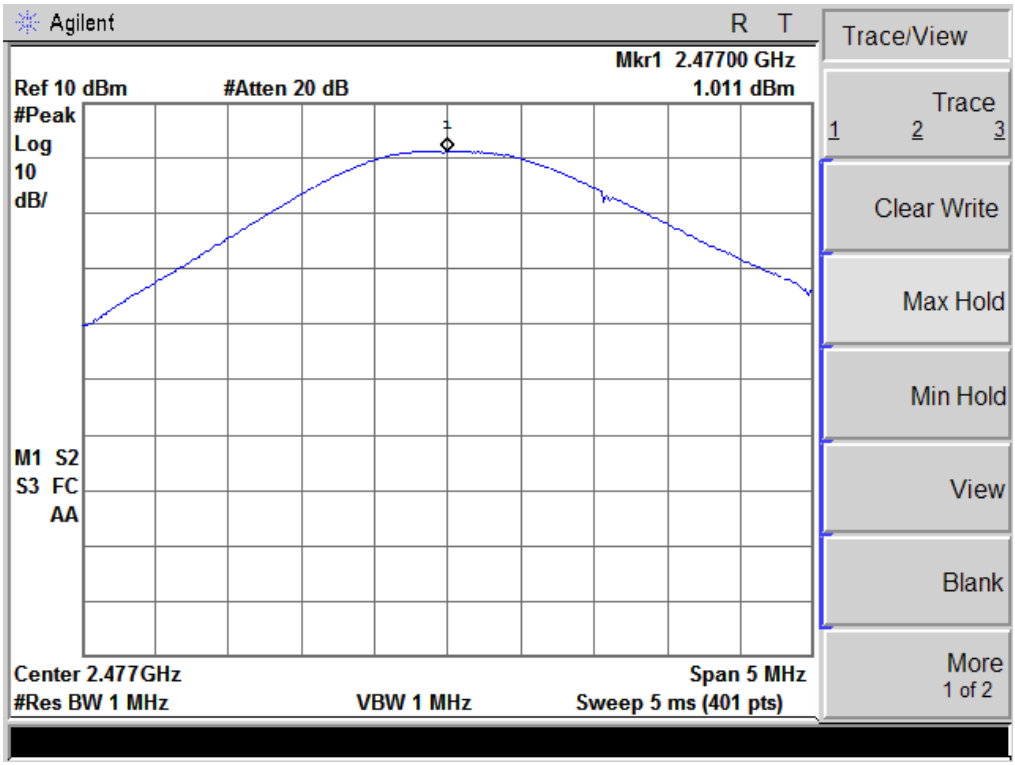
CH00



CH39


Agilent
R T
Mkr1 2.44100 GHz
Ref 10 dBm
#Atten 20 dB
Ext PG -20 dB
0.895 dBm
#Peak
Log
10
dB/
M1 S2
S3 FC
AA
Center 2.441 GHz
#Res BW 1 MHz
VBW 1 MHz
Span 5 MHz
Sweep 5 ms (401 pts)
Trace/View
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2

CH75


Agilent
R T
Mkr1 2.47700 GHz
Ref 10 dBm
#Atten 20 dB
1.011 dBm
#Peak
Log
10
dB/
M1 S2
S3 FC
AA
Center 2.477GHz
#Res BW 1 MHz
VBW 1 MHz
Span 5 MHz
Sweep 5 ms (401 pts)
Trace/View
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2

9. ANTENNA REQUIREMENT

9.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 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.

9.2 EUT ANTENNA

The EUT antenna is integral Antenna. It comply with the standard requirement.

10. EUT TEST PHOTO

Radiated Measurement Photos