FCC Report

Applicant:	Radiolink Electronic Limited
Address of Applicant:	3/F, BLD2, FuGuo industrial park, KaiFeng North Road, MeiLin Shenzhen China
Manufacturer/ Factory:	Radiolink Electronic Limited
Address of Manufacturer/ Factory:	3/F, BLD2, FuGuo industrial park, KaiFeng North Road, MeiLin Shenzhen China

Equipment Under Test (EUT)

Product Name:	Radio Control
Model No.:	T8FB
Trade Mark:	RadioLink
FCC ID:	U2BRL039T8FB
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.247:2016
Date of sample receipt:	February 23, 2017
Date of Test:	February 24-March 03, 2017
Date of report issued:	March 03, 2017
Test Result :	PASS *

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

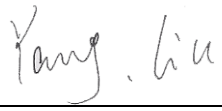
Authorized Signature:

Robinson Lo
Laboratory Manager

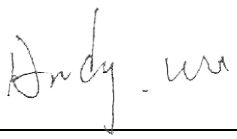
This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

2 Version

Version No.	Date	Description
00	*March 03, 2017*	*Original*

Prepared By:  ***Date:*** *March 03, 2017*

Project Engineer

Check By:  ***Date:*** *March 03, 2017*

Reviewer

3 Contents

Page

4 Test Summary

Test Item	Section in CFR 47	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)	Pass
Dwell Time	15.247 (a)(1)	Pass
Pseudorandom Frequency Hopping Sequence	15.247(b)(4)&TCB Exclusion List (7 July 2002)	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.

N/A: Not applicable

Remark: Test according to ANSI C63.4:2014 and ANSI C63.10:2013

Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	9kHz ~ 30MHz	± 4.34dB	(1)
Radiated Emission	30MHz ~ 1000MHz	± 4.24dB	(1)
Radiated Emission	1GHz ~ 26.5GHz	± 4.68dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	± 3.45dB	(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:	Radio Control
Model No.:	T8FB
Operation Frequency:	2402MHz ~2480MHz
Channel numbers:	66
Channel separation:	1.2MHz
Modulation technology:	FHSS
Antenna Type:	Integral Antenna
Antenna gain:	3.0dBi (declare by Applicant)
Power supply:	DC 6V (4*"AA" battery)

Remark: The system works in the frequency range of 2402.0MHz to 2480.0MHz. This band has been divided to 66 independent channels. Each radio system uses 16 different channels, the minimum channel separation is ≥1.2MHz. 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	2402.0MHz	18	2422.4MHz	35	2442.8MHz	52	2463.2MHz
2	2403.2MHz	19	2423.6MHz	36	2444.0MHz	53	2464.4MHz
3	2404.4MHz	20	2424.8MHz	37	2445.2MHz	54	2465.6MHz
4	2405.6MHz	21	2426.0MHz	38	2446.4MHz	55	2466.8MHz
5	2406.8MHz	22	2427.2MHz	39	2447.6MHz	56	2468.0MHz
6	2408.0MHz	23	2428.4MHz	40	2448.8MHz	57	2469.2MHz
7	2409.2MHz	24	2429.6MHz	41	2450.0MHz	58	2470.4MHz
8	2410.4MHz	25	2430.8MHz	42	2451.2MHz	59	2471.6MHz
9	2411.6MHz	26	2432.0MHz	43	2452.4MHz	60	2472.8MHz
10	2412.8MHz	27	2433.2MHz	44	2453.6MHz	61	2474.0MHz
11	2414.0MHz	28	2434.4MHz	45	2454.8MHz	62	2475.2MHz
12	2415.2MHz	29	2435.6MHz	46	2456.0MHz	63	2476.4MHz
13	2416.4MHZ	30	2436.8MHz	47	2457.2MHz	64	2477.6MHz
14	2417.6MHz	31	2438.0MHz	48	2458.4MHz	65	2478.8MHz
15	2418.8MHz	32	2439.2MHz	49	2459.6MHz	66	2480.0MHz
16	2420.0MHz	33	2440.4MHz	50	2460.8MHz		
17	2421.2MHz	34	2441.6MHz	51	2462.0MHz		

Note:

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	2402.0MHz
The middle channel	2441.6MHz
The Highest channel	2480.0MHz

5.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting status
Remark: During the test,the dutycycle >98%, *the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.*	

5.3 Test Facility

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

● **FCC —Registration No.: 600491**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fuly described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 600491, June 22, 2016.

● **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, August 15, 2016.

5.4 Test Location

All 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

None.

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	Spectrum Analyzer	Agilent	E4440A	GTS536	June. 29 2016	June. 28 2017
4	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June. 29 2016	June. 28 2017
5	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 29 2016	June. 28 2017
6	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 29 2016	June. 28 2017
7	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	June. 29 2016	June. 28 2017
8	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 29 2016	June. 28 2017
9	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
10	Coaxial Cable	GTS	N/A	GTS213	June. 29 2016	June. 28 2017
11	Coaxial Cable	GTS	N/A	GTS211	June. 29 2016	June. 28 2017
12	Coaxial cable	GTS	N/A	GTS210	June. 29 2016	June. 28 2017
13	Coaxial Cable	GTS	N/A	GTS212	June. 29 2016	June. 28 2017
14	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 29 2016	June. 28 2017
15	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	June. 29 2016	June. 28 2017
16	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 29 2016	June. 28 2017
17	Band filter	Amindeon	82346	GTS219	June. 29 2016	June. 28 2017
18	Power Meter	Anritsu	ML2495A	GTS540	June 29 2016	June 28 2017
19	Power Sensor	Anritsu	MA2411B	GTS541	June 29 2016	June 28 2017

General used equipment:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Barometer	ChangChun	DYM3	GTS257	July 06 2016	July 05 2017

7 Test results and Measurement Data

7.1 Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203 /247(c)

15.203 requirement:

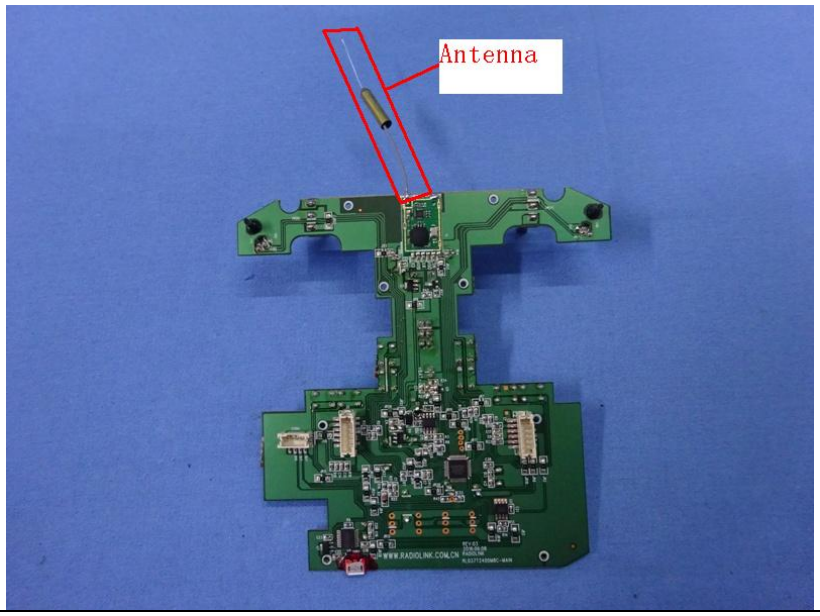
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit 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:

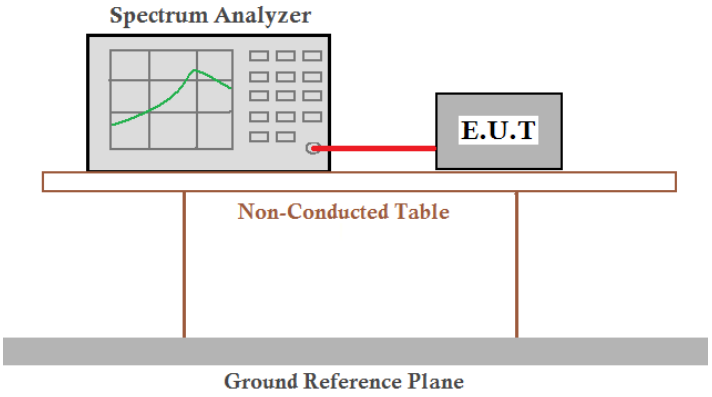
(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional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

E.U.T Antenna:

The antenna is integral antenna, the best case gain of the antenna is 3dBi



7.2 Conducted Peak Output Power

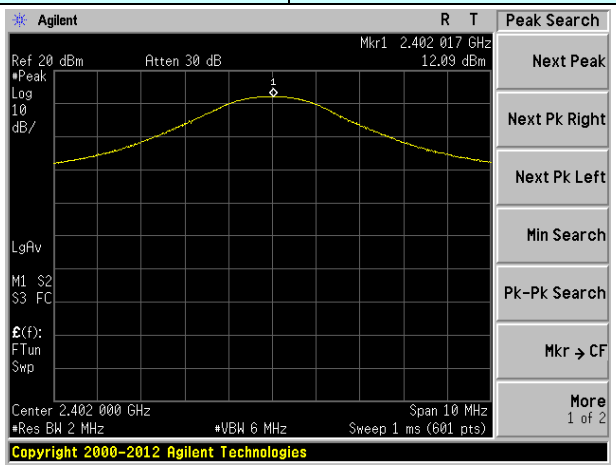
Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	ANSI C63.10:2013
Limit:	21dBm
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

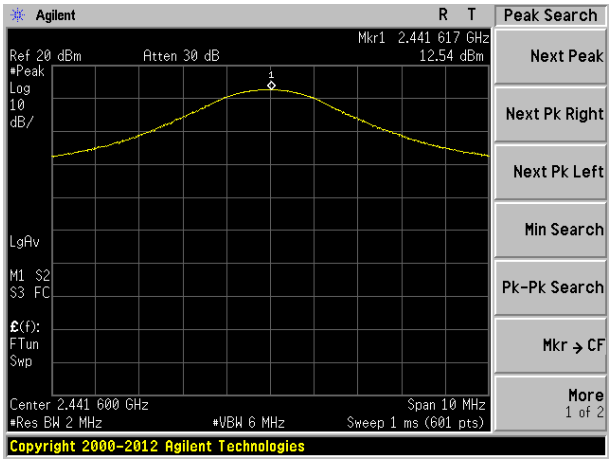
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	12.09	21.00	Pass
Middle	12.54		
Highest	12.89		

Test plot as follows:

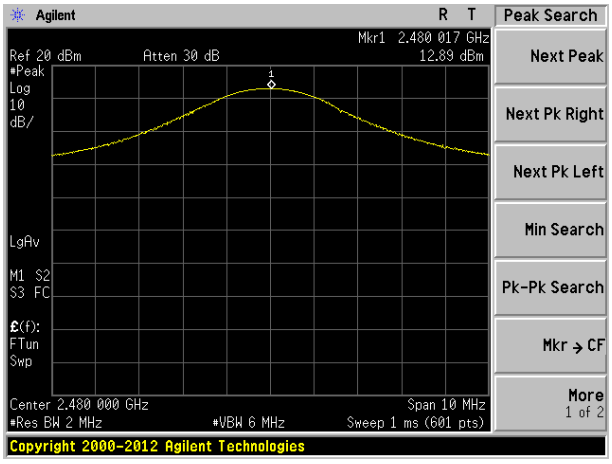
Test mode:	GFSK mode



Lowest channel

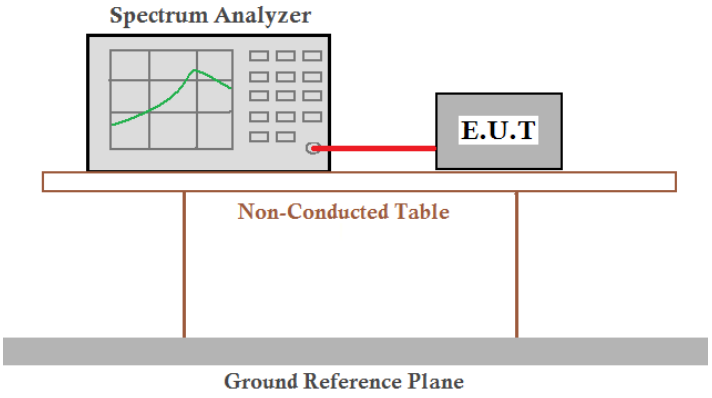


Middle channel



Highest channel

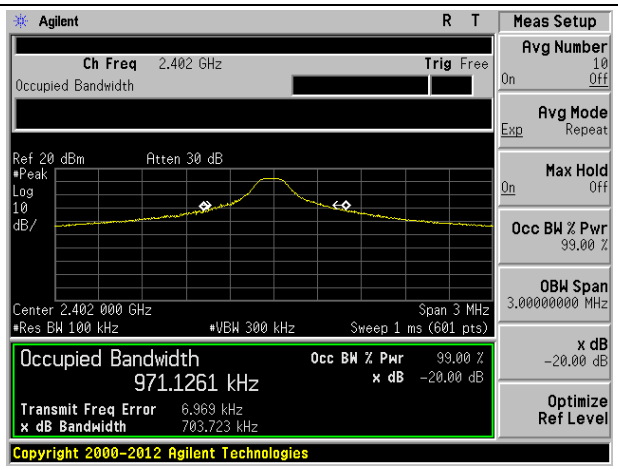
7.3 20dB Emission Bandwidth

Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	ANSI C63.10:2013
Limit:	N/A
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

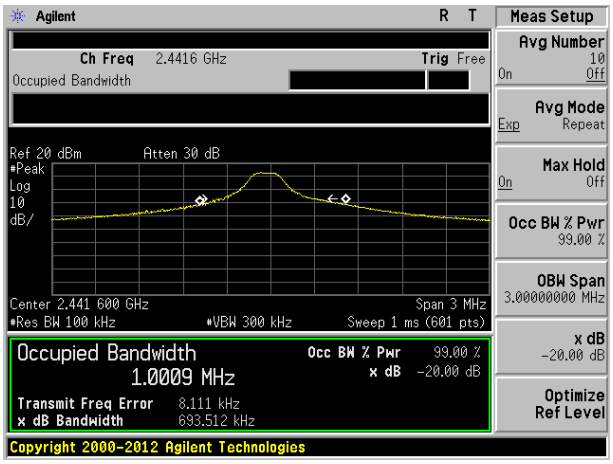
Measurement Data

Test channel	Channel Bandwidth (MHz)	Limit(KHz)	Result
Lowest	0.704	N/A	Pass
Middle	0.694		
Highest	0.751		

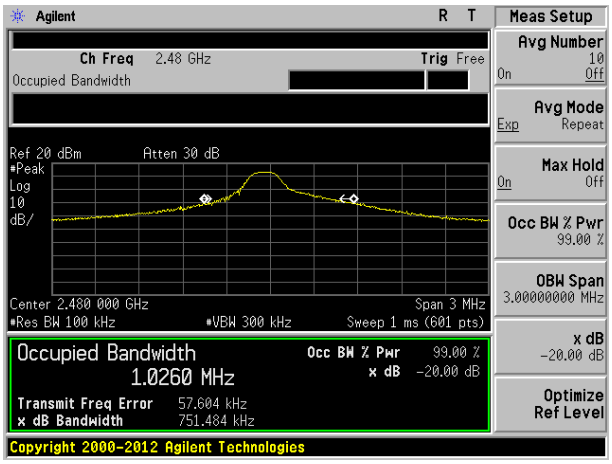
Test plot as follows:



Lowest channel

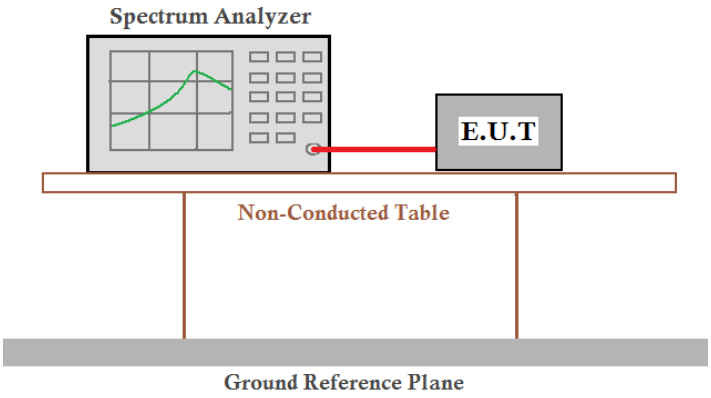


Middle channel



Highest channel

7.4 Carrier Frequencies Separation

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=100KHz, VBW=300KHz, detector=Peak
Limit:	0.025MHz or 2/3 of the 20dB bandwidth (whichever is greater)
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

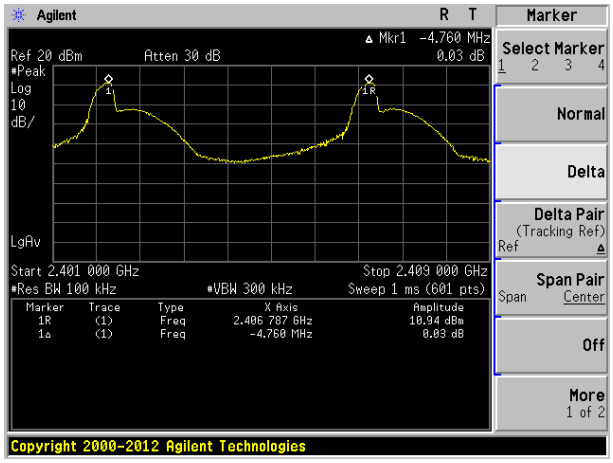
Measurement Data

Test channel	Carrier Frequencies Separation (kHz)	Limit (kHz)	Result
Lowest	4760	501	Pass
Middle	4813	501	Pass
Highest	4773	501	Pass

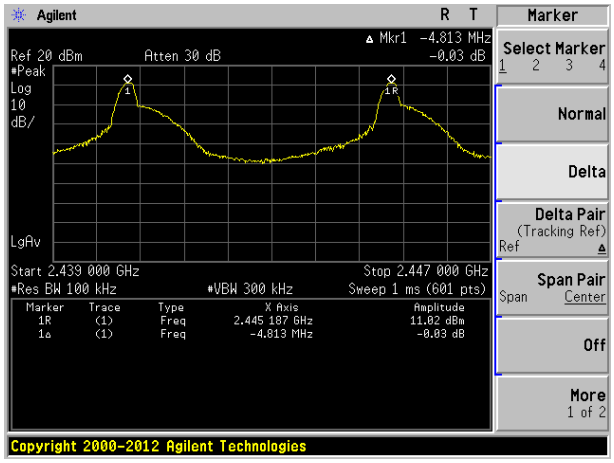
Note: According to section 7.4

Mode	20dB bandwidth (kHz) (worse case)	Limit (kHz) (Carrier Frequencies Separation)
GFSK	751	501

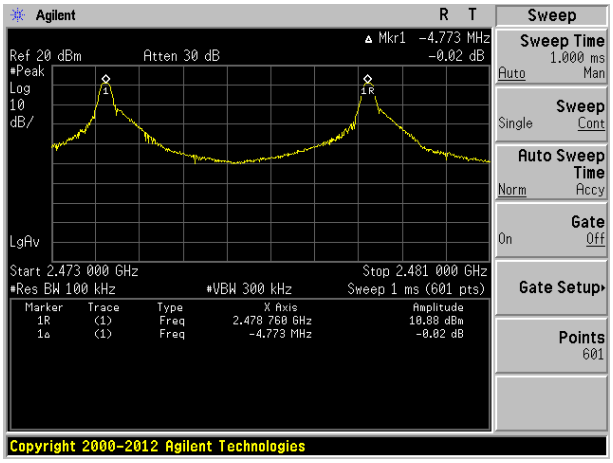
Test plot as follows:



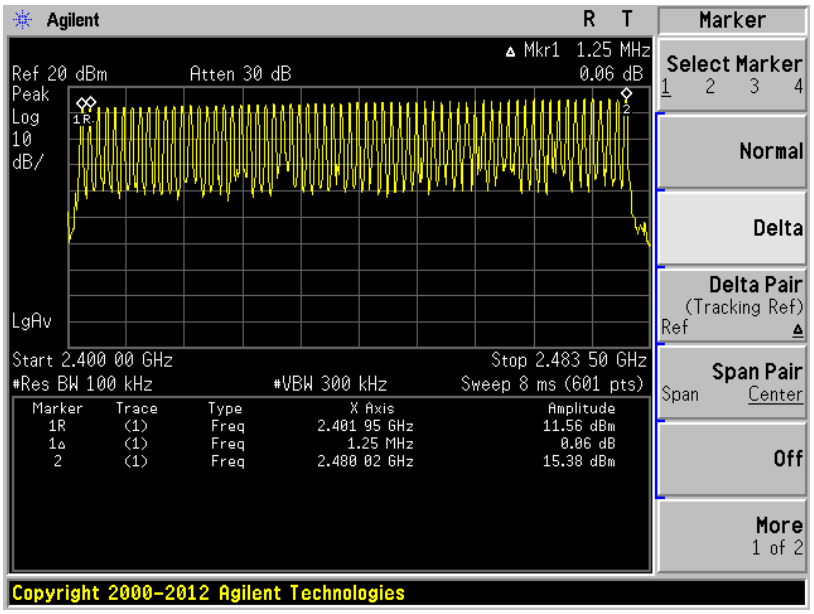
Lowest channel



Middle channel

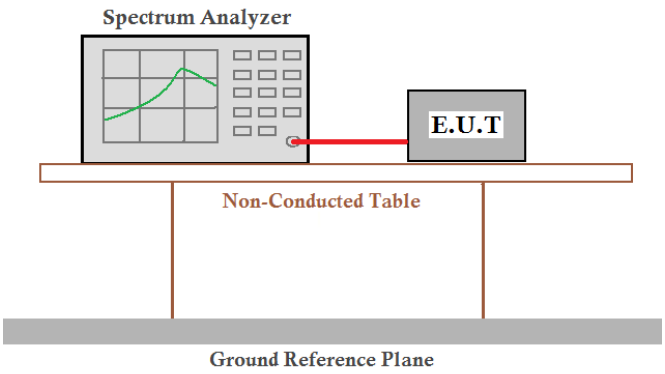


Highest channel



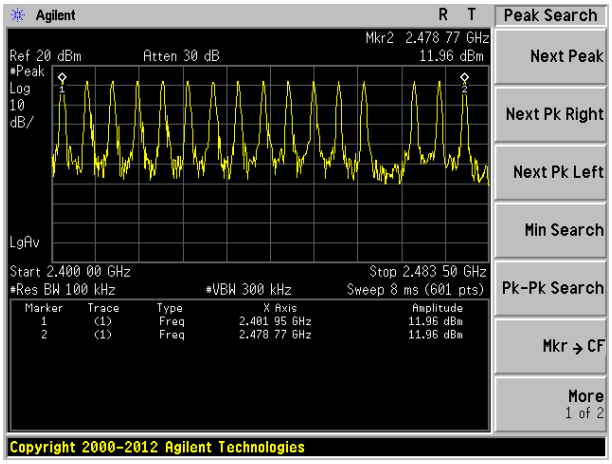
The minimum separation is 1.25MHz

7.5 Hopping Channel Number

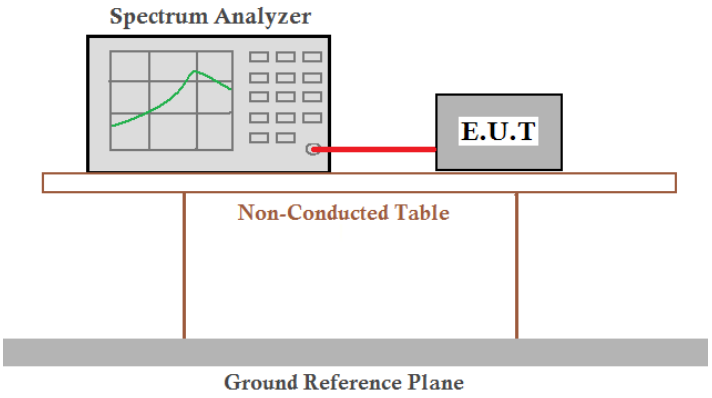
Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=100kHz, VBW=300kHz, Frequency range=2400MHz-2483.5MHz, Detector=Peak
Limit:	15 channels
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data:

Mode	Hopping channel numbers	Limit	Result
GFSK	16	15	Pass



7.6 Dwell Time

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=1MHz, VBW=1MHz, Span=0Hz, Detector=Peak
Limit:	0.4 Second
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

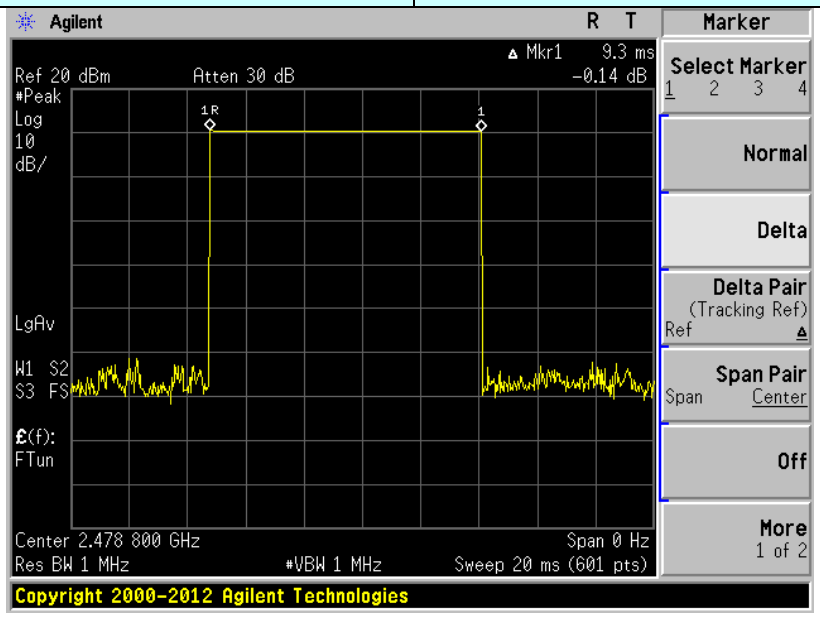
Measurement Data

Frequency	One pulse	Dwell time(ms)	Limit(ms)	Result
2478.8MHz	9.3ms	9.3*40=372ms	400	Pass

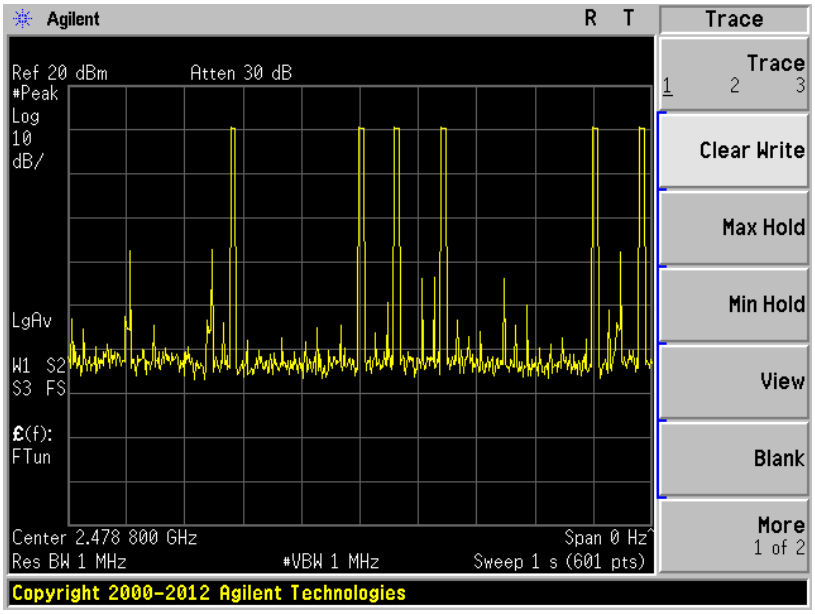
```
16 hopping channels shall be used, the evaluation period is 16x0.4=6.4s
According to the plots below, maximum hopping number is 6x6=36, and in 0.4s,
maximum hopping is 4 times, total hopping shall be 36+4 =40.
```

Test plot as follows:

Frequency:	2478.8MHz



Ton



Ton times in 1s

Note: All 3 channels have been tested , only worse case is reported

7.7 Pseudorandom Frequency Hopping Sequence

Test Requirement:	FCC Part15 C Section 15.247 (a)(1) requirement:

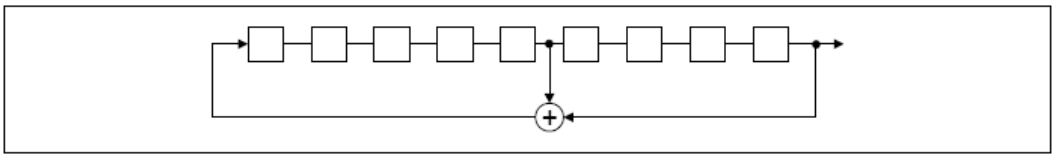
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

Alternatively. 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, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a Pseudorandom ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

EUT Pseudorandom Frequency Hopping Sequence

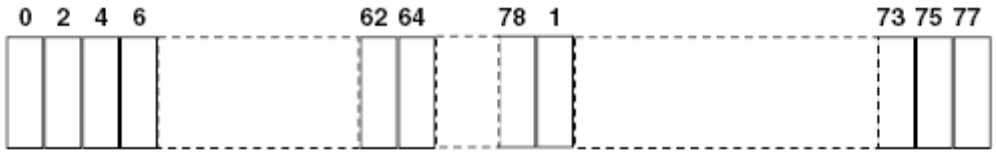
The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONEs; i.e. the shift register is initialized with nine ones.

- *Number of shift register stages: 9*
- *Length of pseudo-random sequence: 2^9 -1 = 511 bits*
- *Longest sequence of zeros: 8 (non-inverted signal)*



Linear Feedback Shift Register for Generation of the PRBS sequence

An example of Pseudorandom Frequency Hopping Sequence as follow:

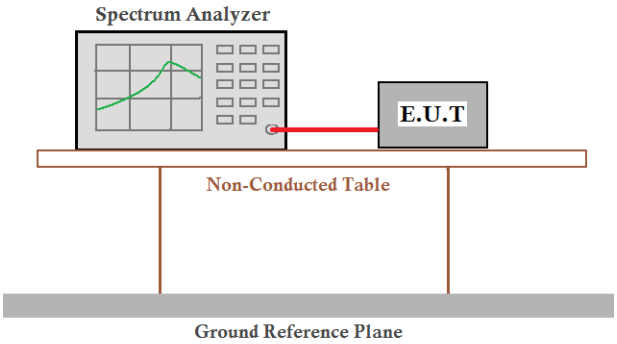


Each frequency used equally on the average by each transmitter.

The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.

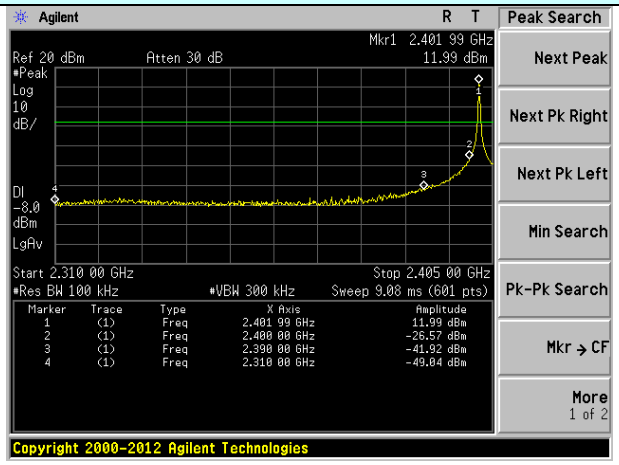
7.8 Band Edge

7.8.1 Conducted Emission Method

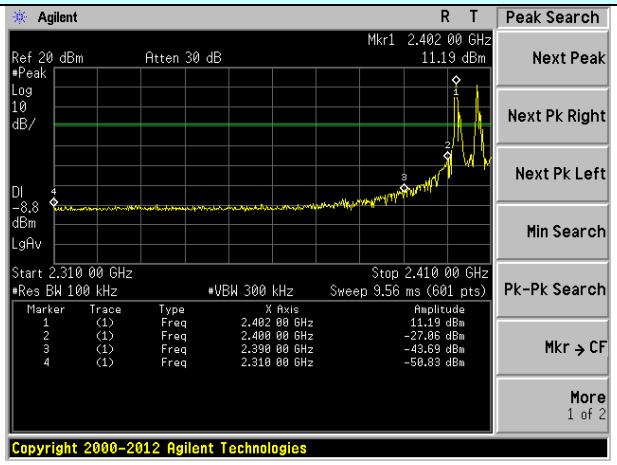
Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=100kHz, VBW=300kHz, Detector=Peak
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by 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:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Test plot as follows:

Test channel:	Lowest channel

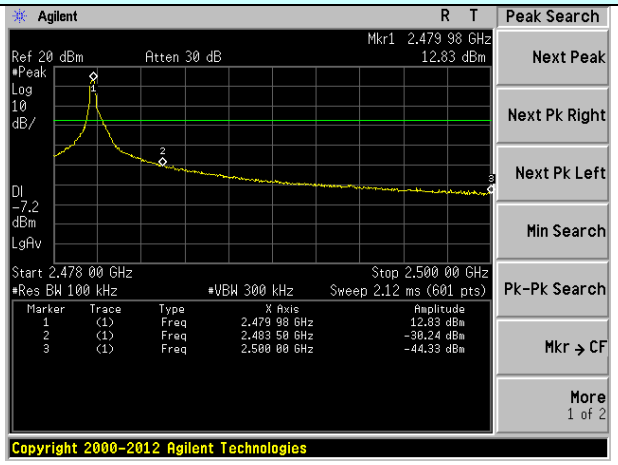


No-hopping mode

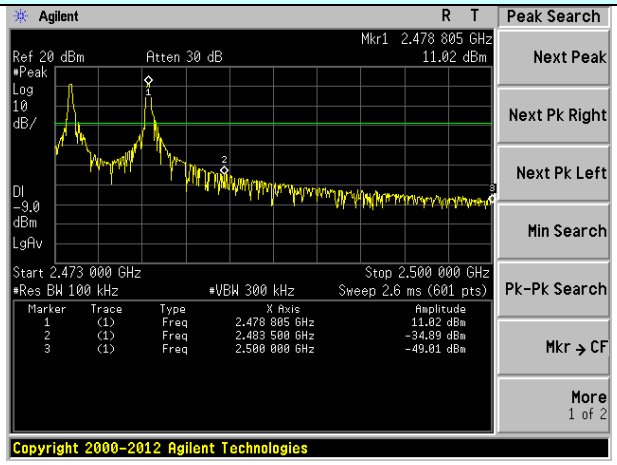


Hopping mode

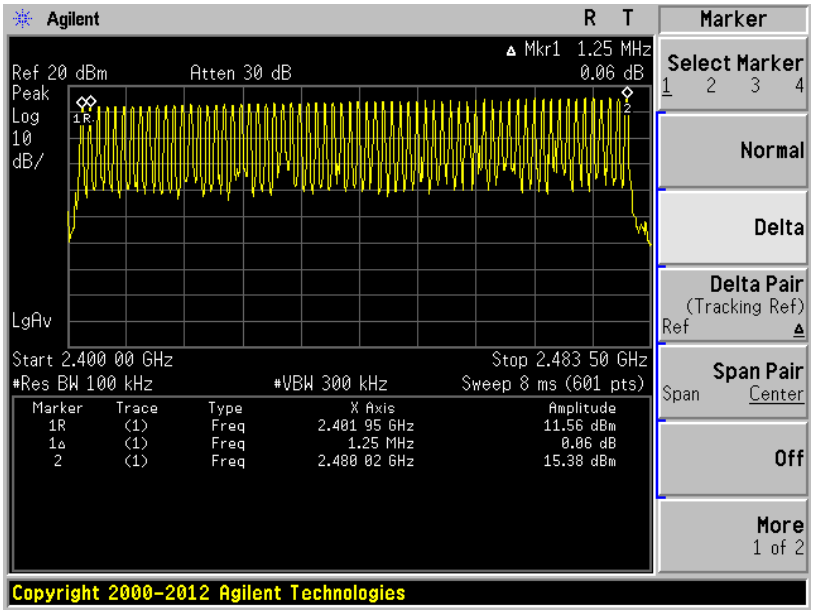
Test channel:	Highest channel



No-hopping mode

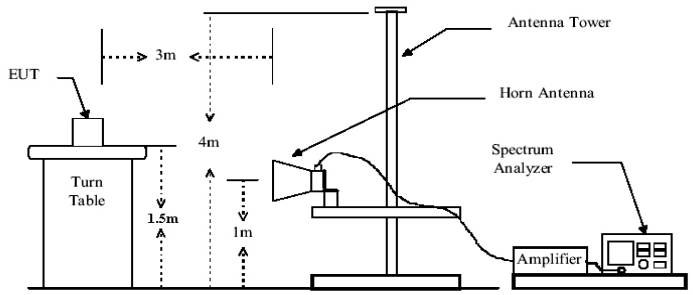


Hopping mode



Hopping mode :2483.5MHz is lower than 2480MHz more than 20dBc

7.8.2 Radiated Emission Method

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.209 and 15.205</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013</td></tr>
<tr><td>Test Frequency Range:</td><td>All restriction band have been tested, and 2.3GHz to 2.5GHz band is the worse case</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Remark</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>54.00</td><td>Average Value</td></tr>
<tr><td>74.00</td><td>Peak Value</td></tr>
</table>
</td></tr>
<tr><td>Test setup:</td><td> 
</td></tr>
<tr><td>Test Procedure:</td><td>1. The EUT was placed on the top of a rotating table 1.5 meters 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.</td></tr>
<tr><td>Test Instruments:</td><td>Refer to section 6.0 for details</td></tr>
<tr><td>Test mode:</td><td>Refer to section 5.2 for details</td></tr>
<tr><td>Test results:</td><td>Pass</td></tr>
</table>

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.

Test channel:	Lowest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	37.29	27.59	5.38	30.18	40.08	74.00	-33.92	Horizontal
2400.00	53.28	27.58	5.39	30.18	56.07	74.00	-17.93	Horizontal
2390.00	37.30	27.59	5.38	30.18	40.09	74.00	-33.91	Vertical
2400.00	54.71	27.58	5.39	30.18	57.50	74.00	-16.50	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	29.10	27.59	5.38	30.18	31.89	54.00	-22.11	Horizontal
2400.00	40.01	27.58	5.39	30.18	42.80	54.00	-11.20	Horizontal
2390.00	28.65	27.59	5.38	30.18	31.44	54.00	-22.56	Vertical
2400.00	41.12	27.58	5.39	30.18	43.91	54.00	-10.09	Vertical

Test channel:	Highest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	38.73	27.53	5.47	29.93	41.80	74.00	-32.20	Horizontal
2500.00	38.96	27.55	5.49	29.93	42.07	74.00	-31.93	Horizontal
2483.50	38.64	27.53	5.47	29.93	41.71	74.00	-32.29	Vertical
2500.00	39.43	27.55	5.49	29.93	42.54	74.00	-31.46	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	31.86	27.53	5.47	29.93	34.93	54.00	-19.07	Horizontal
2500.00	30.66	27.55	5.49	29.93	33.77	54.00	-20.23	Horizontal
2483.50	32.61	27.53	5.47	29.93	35.68	54.00	-18.32	Vertical
2500.00	30.12	27.55	5.49	29.93	33.23	54.00	-20.77	Vertical

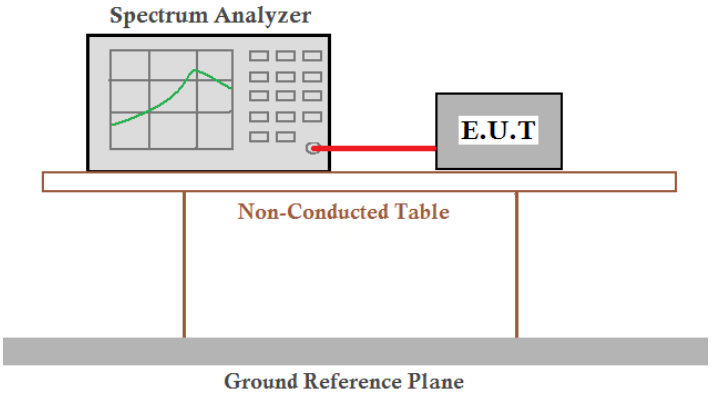
Remark:

1. Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

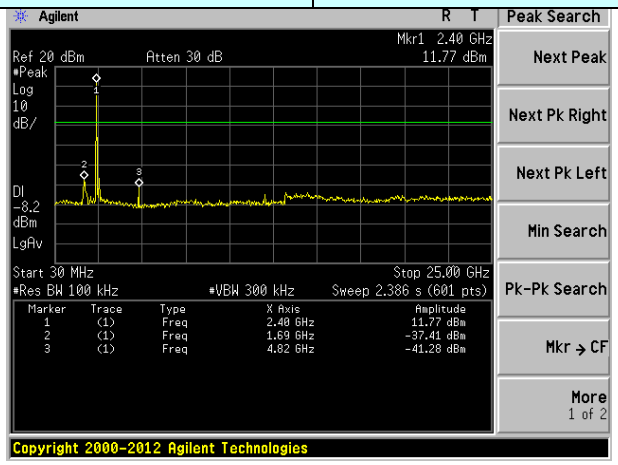
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

7.9 Spurious Emission

7.9.1 Conducted Emission Method

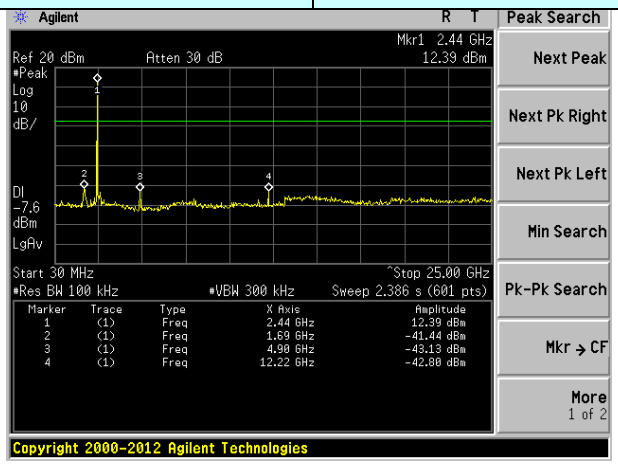
Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.10:2013 and KDB558074 D01 Meas Guidance
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator 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:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Test channel:	Lowest channel



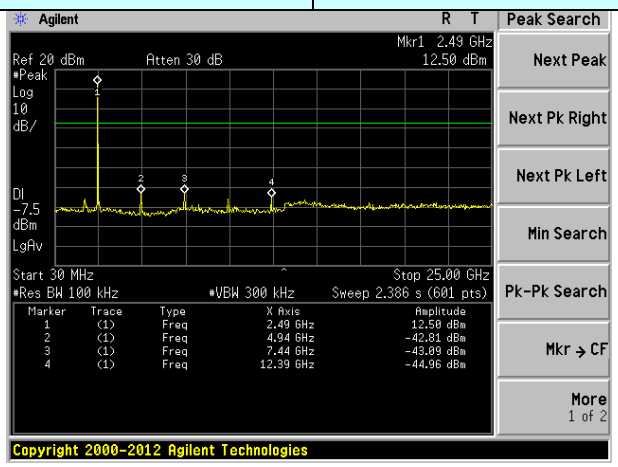
30MHz~25GHz

Test channel:	Middle channel



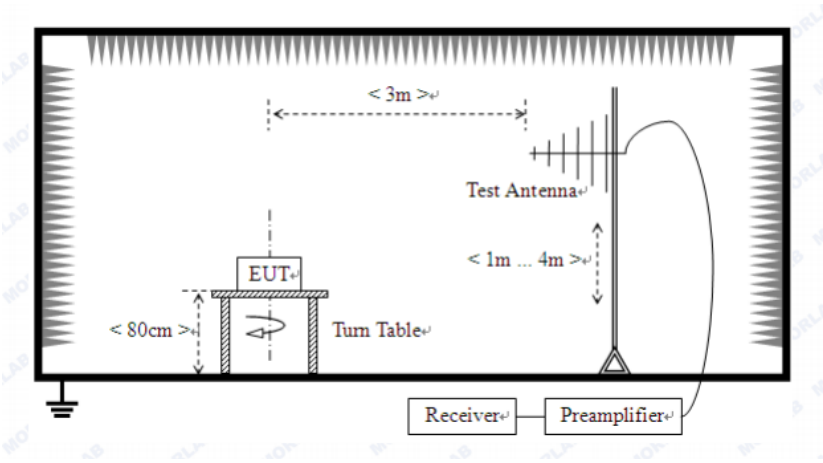
30MHz~25GHz

Test channel:	Highest channel

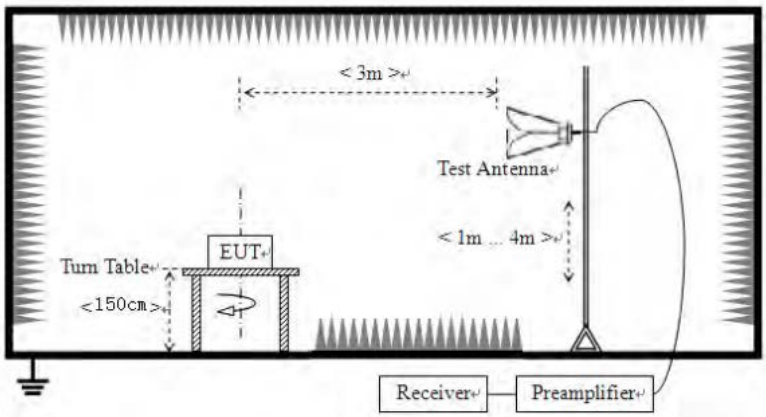


30MHz~25GHz

7.9.2 Radiated Emission Method

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.209</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013</td></tr>
<tr><td>Test Frequency Range:</td><td>30MHz to 25GHz</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><th>Frequency</th><th>Detector</th><th>RBW</th><th>VBW</th><th>Remark</th></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>120KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><th>Frequency</th><th>Limit (dBuV/m @3m)</th><th>Remark</th></tr>
<tr><td>30MHz-88MHz</td><td>40.0</td><td>Quasi-peak Value</td></tr>
<tr><td>88MHz-216MHz</td><td>43.5</td><td>Quasi-peak Value</td></tr>
<tr><td>216MHz-960MHz</td><td>46.0</td><td>Quasi-peak Value</td></tr>
<tr><td>960MHz-1GHz</td><td>54.0</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>54.0</td><td>Average Value</td></tr>
<tr><td>74.0</td><td>Peak Value</td></tr>
</table>
</td></tr>
<tr><td>Test setup:</td><td>Below 1GHz
 

Above 1GHz</td></tr>
</table>

	
Test Procedure:	1. The EUT was placed on the top of a rotating table (0.8 meters below 1G and 1.5 meters above 1G) 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 6.0 for details
Test mode:	Refer to section 5.2 for details
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 1GHz**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
38.08	32.38	12.30	0.64	30.05	15.27	40.00	-24.73	Vertical
85.60	34.55	9.50	1.07	29.77	15.35	40.00	-24.65	Vertical
110.18	37.53	11.20	1.28	29.63	20.38	43.50	-23.12	Vertical
159.23	43.59	8.20	1.62	29.37	24.04	43.50	-19.46	Vertical
216.02	35.51	10.78	1.93	29.36	18.86	46.00	-27.14	Vertical
364.26	36.59	14.79	2.69	29.67	24.40	46.00	-21.60	Vertical
71.83	39.44	7.38	0.96	29.84	17.94	40.00	-22.06	Horizontal
102.00	39.69	12.10	1.21	29.69	23.31	43.50	-20.19	Horizontal
167.24	42.18	8.33	1.67	29.33	22.85	43.50	-20.65	Horizontal
312.18	41.31	13.74	2.42	29.93	27.54	46.00	-18.46	Horizontal
364.26	41.98	14.79	2.69	29.67	29.79	46.00	-16.21	Horizontal
793.40	33.47	21.21	4.43	29.20	29.91	46.00	-16.09	Horizontal

■ **Above 1GHz**

Test channel:	Lowest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4804.00	38.19	31.78	8.60	32.09	46.48	74.00	-27.52	Vertical
7206.00	32.42	36.15	11.65	32.00	48.22	74.00	-25.78	Vertical
9608.00	31.99	37.95	14.14	31.62	52.46	74.00	-21.54	Vertical
12010.00	*					74.00		Vertical
14412.00	*					74.00		Vertical
4804.00	42.66	31.78	8.60	32.09	50.95	74.00	-23.05	Horizontal
7206.00	34.25	36.15	11.65	32.00	50.05	74.00	-23.95	Horizontal
9608.00	31.50	37.95	14.14	31.62	51.97	74.00	-22.03	Horizontal
12010.00	*					74.00		Horizontal
14412.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4804.00	26.84	31.78	8.60	32.09	35.13	54.00	-18.87	Vertical
7206.00	21.00	36.15	11.65	32.00	36.80	54.00	-17.20	Vertical
9608.00	20.03	37.95	14.14	31.62	40.50	54.00	-13.50	Vertical
12010.00	*					54.00		Vertical
14412.00	*					54.00		Vertical
4804.00	31.16	31.78	8.60	32.09	39.45	54.00	-14.55	Horizontal
7206.00	23.24	36.15	11.65	32.00	39.04	54.00	-14.96	Horizontal
9608.00	19.83	37.95	14.14	31.62	40.30	54.00	-13.70	Horizontal
12010.00	*					54.00		Horizontal
14412.00	*					54.00		Horizontal

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.*

Test channel:	Middle

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4883.20	37.86	31.85	8.67	32.12	46.26	74.00	-27.74	Vertical
7324.80	32.20	36.37	11.72	31.89	48.40	74.00	-25.60	Vertical
9766.40	31.80	38.35	14.25	31.62	52.78	74.00	-21.22	Vertical
12208.00	*					74.00		Vertical
14649.60	*					74.00		Vertical
4883.20	42.26	31.85	8.67	32.12	50.66	74.00	-23.34	Horizontal
7324.80	34.00	36.37	11.72	31.89	50.20	74.00	-23.80	Horizontal
9766.40	31.27	38.35	14.25	31.62	52.25	74.00	-21.75	Horizontal
12208.00	*					74.00		Horizontal
14649.60	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4883.20	26.59	31.85	8.67	32.12	34.99	54.00	-19.01	Vertical
7324.80	20.83	36.37	11.72	31.89	37.03	54.00	-16.97	Vertical
9766.40	19.87	38.35	14.25	31.62	40.85	54.00	-13.15	Vertical
12208.00	*					54.00		Vertical
14649.60	*					54.00		Vertical
4883.20	30.88	31.85	8.67	32.12	39.28	54.00	-14.72	Horizontal
7324.80	23.04	36.37	11.72	31.89	39.24	54.00	-14.76	Horizontal
9766.40	19.65	38.35	14.25	31.62	40.63	54.00	-13.37	Horizontal
12208.00	*					54.00		Horizontal
14649.60	*					54.00		Horizontal

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.*

Test channel:	Highest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4960.00	36.76	31.93	8.73	32.16	45.26	74.00	-28.74	Vertical
7440.00	31.47	36.59	11.79	31.78	48.07	74.00	-25.93	Vertical
9920.00	31.14	38.81	14.38	31.88	52.45	74.00	-21.55	Vertical
12400.00	*					74.00		Vertical
14880.00	*					74.00		Vertical
4960.00	40.93	31.93	8.73	32.16	49.43	74.00	-24.57	Horizontal
7440.00	33.17	36.59	11.79	31.78	49.77	74.00	-24.23	Horizontal
9920.00	30.52	38.81	14.38	31.88	51.83	74.00	-22.17	Horizontal
12400.00	*					74.00		Horizontal
14880.00	*					74.00		Horizontal

Average value:

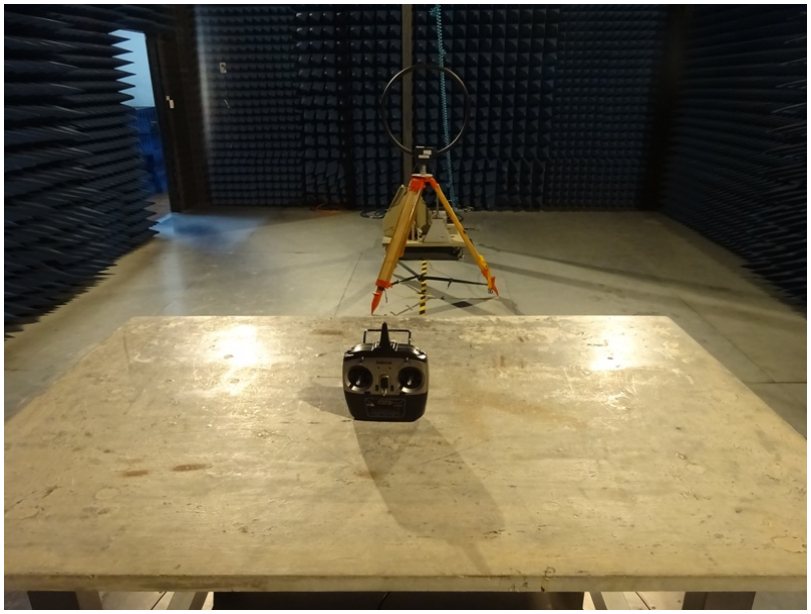
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4960.00	25.75	31.93	8.73	32.16	34.25	54.00	-19.75	Vertical
7440.00	20.26	36.59	11.79	31.78	36.86	54.00	-17.14	Vertical
9920.00	19.37	38.81	14.38	31.88	40.68	54.00	-13.32	Vertical
12400.00	*					54.00		Vertical
14880.00	*					54.00		Vertical
4960.00	29.92	31.93	8.73	32.16	38.42	54.00	-15.58	Horizontal
7440.00	22.41	36.59	11.79	31.78	39.01	54.00	-14.99	Horizontal
9920.00	19.06	38.81	14.38	31.88	40.37	54.00	-13.63	Horizontal
12400.00	*					54.00		Horizontal
14880.00	*					54.00		Horizontal

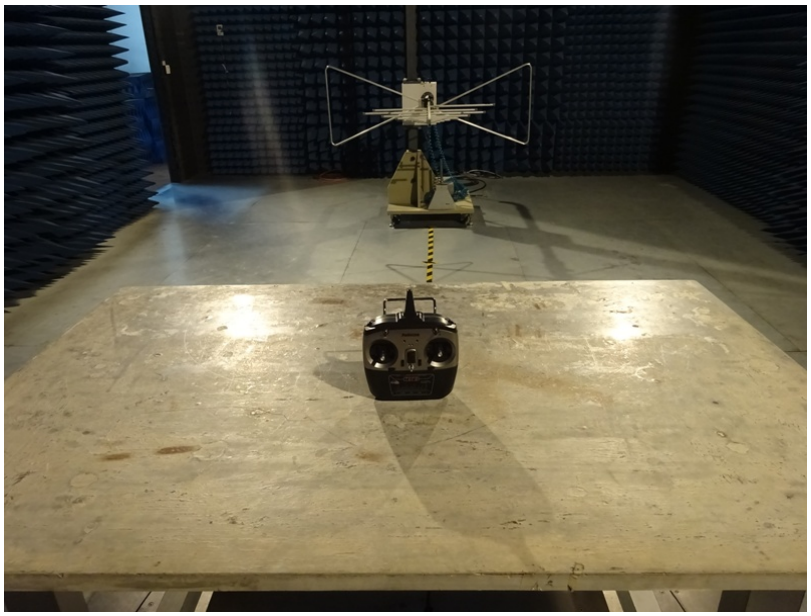
Remark:

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.*

8 Test Setup Photo

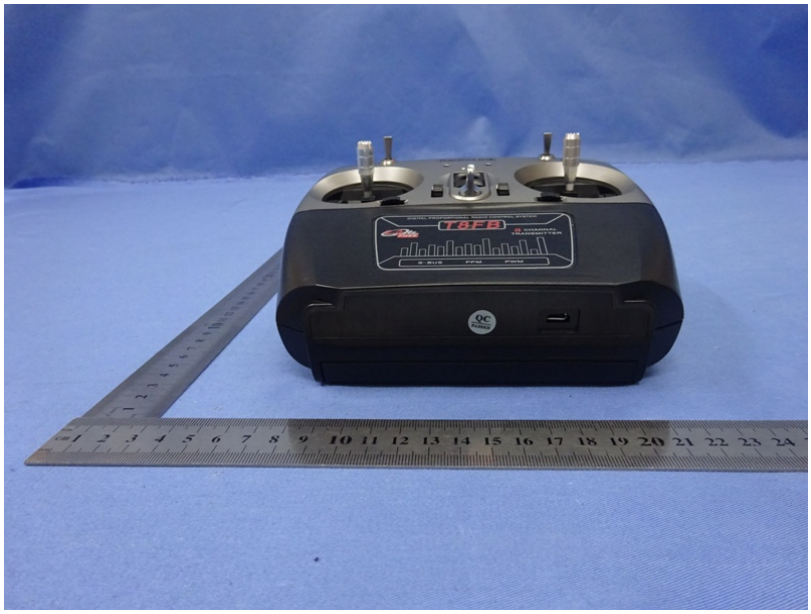
Radiated Emission

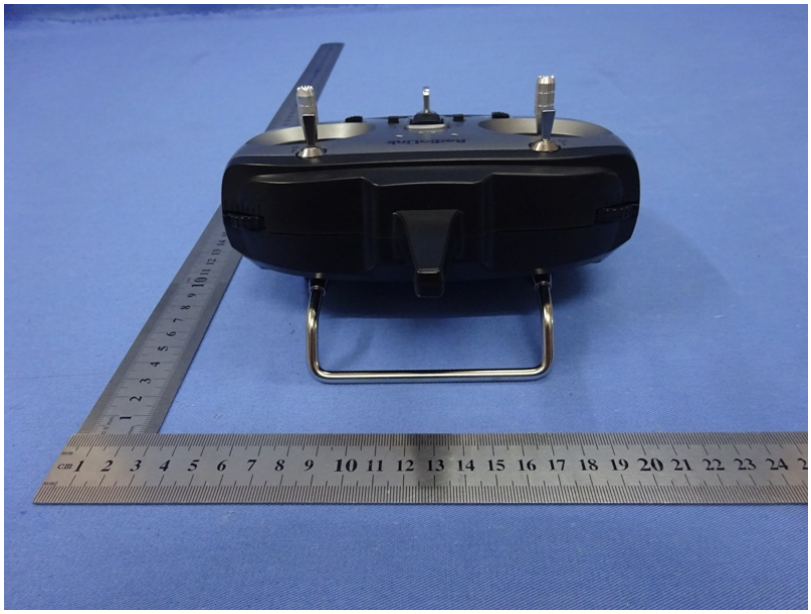


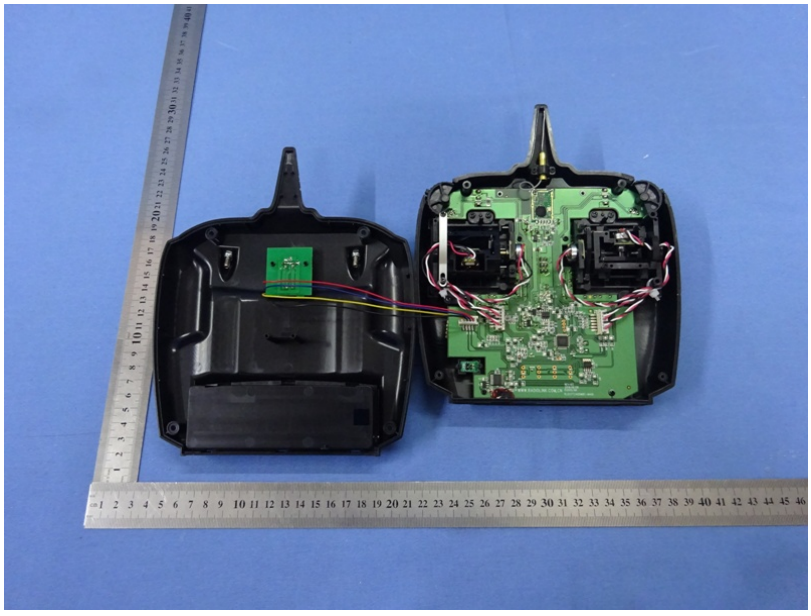


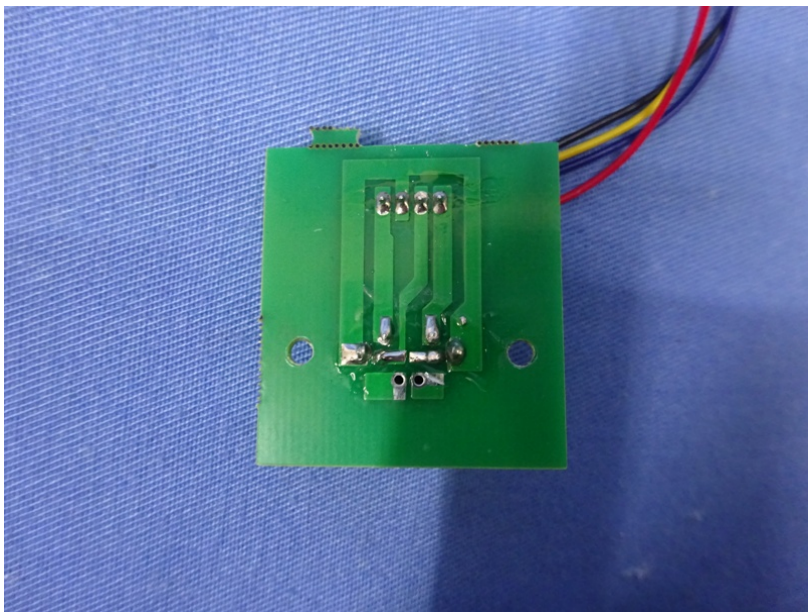

RadioLink

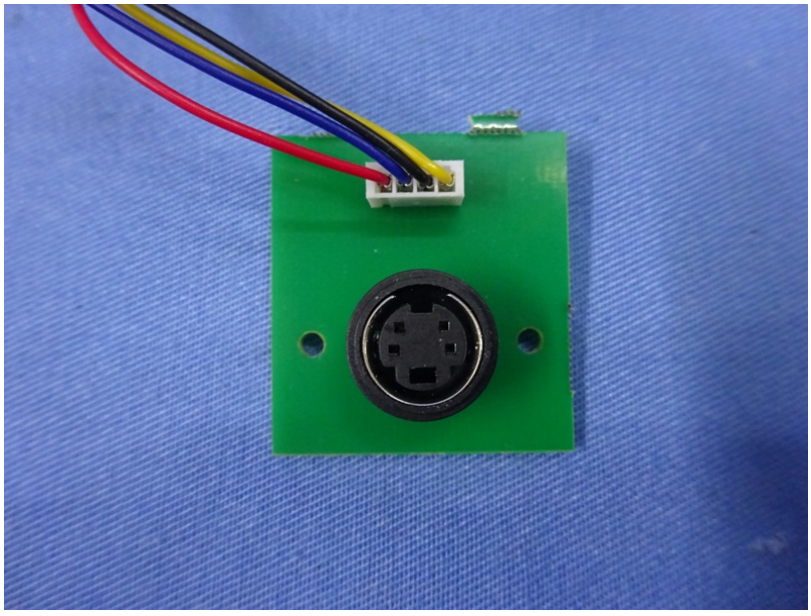
9 EUT Constructional Details

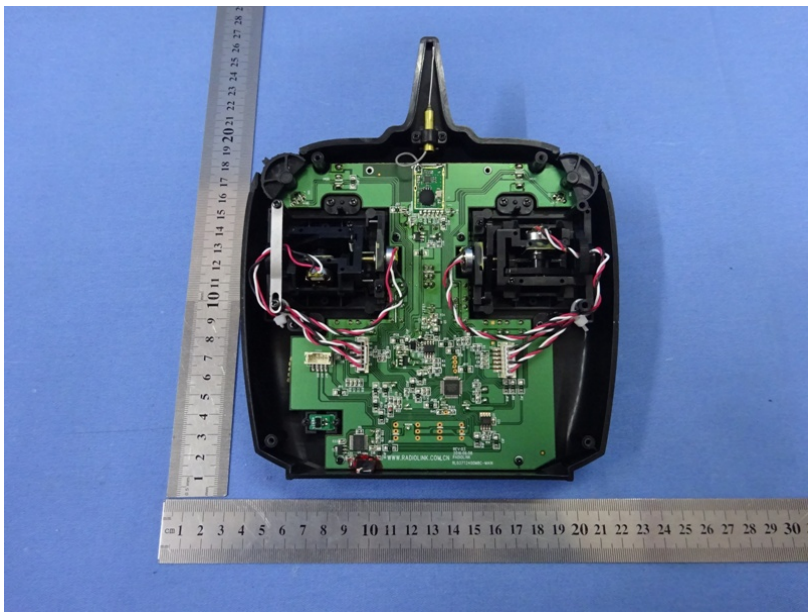


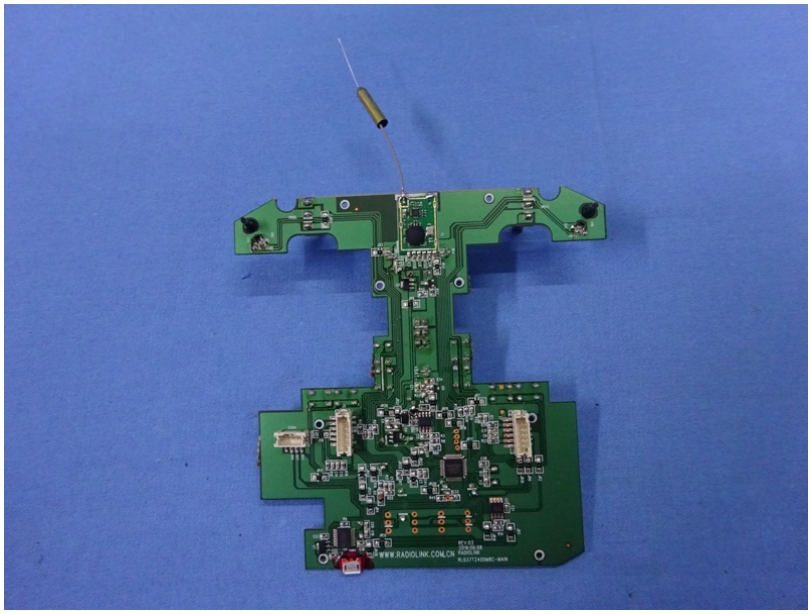


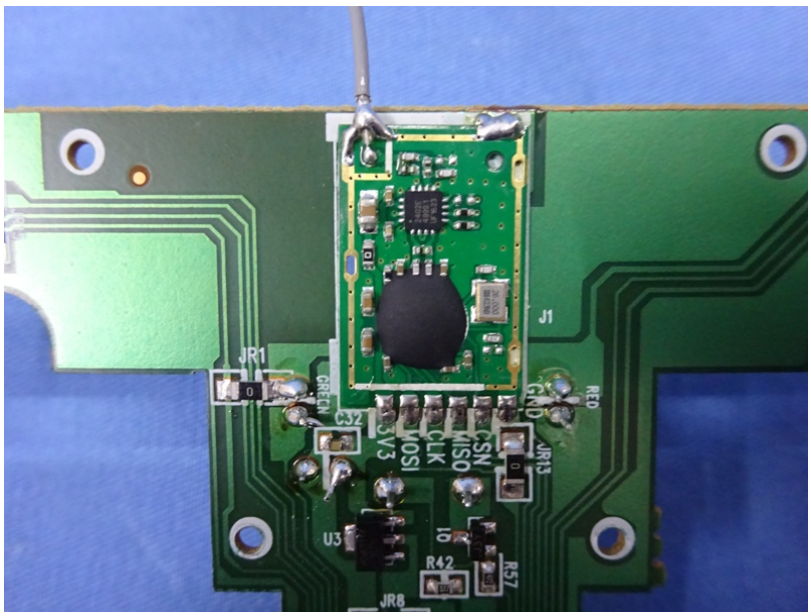


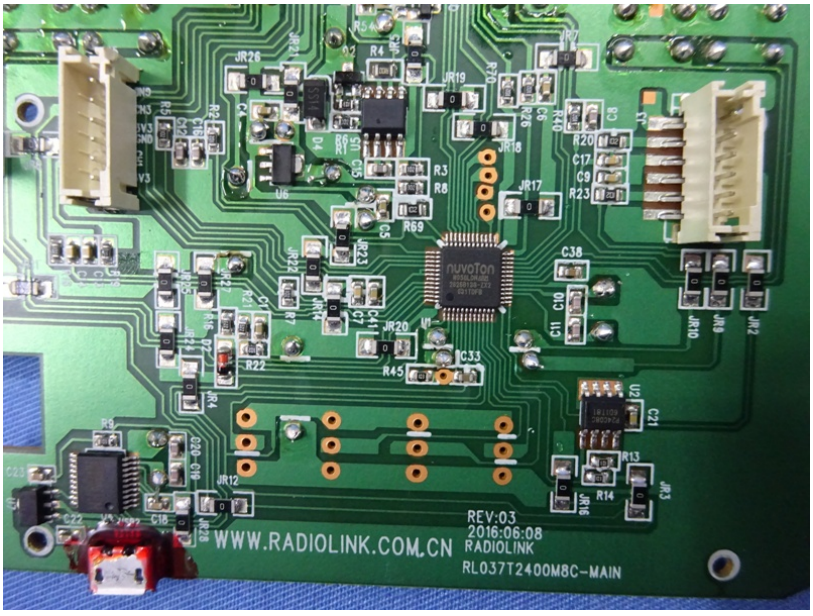


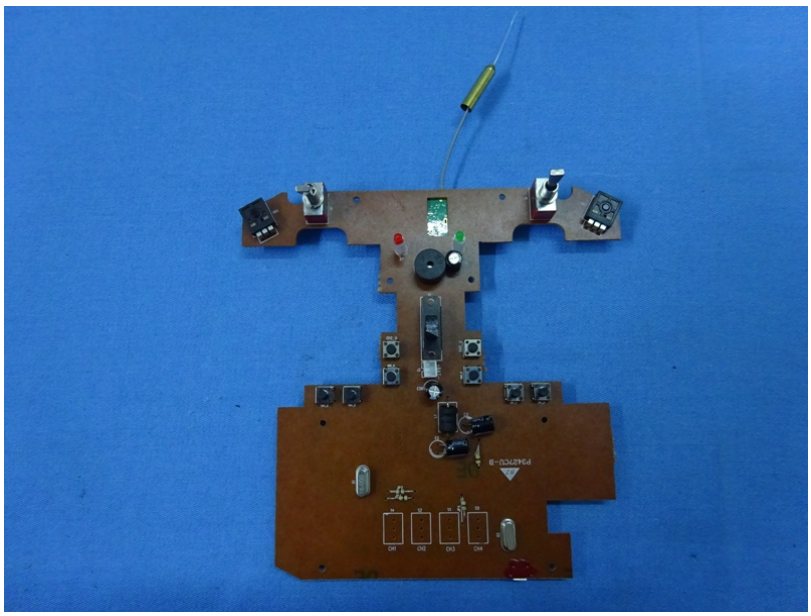


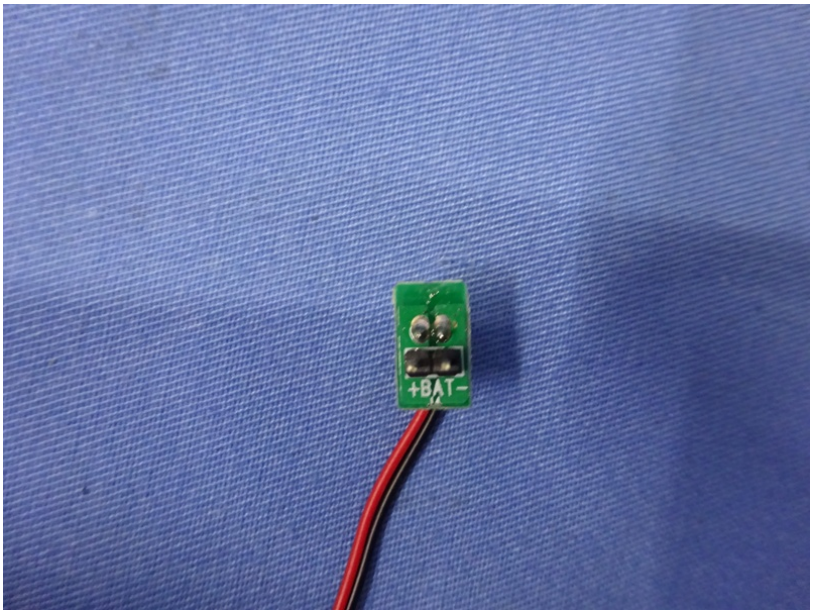





JR1
J1
GREEN
RED
C32
3V3
MOSI
CLK
MISO
CSN
JR13
U3
Q1
R42
R57
JR8


nuvoTon
WWW.RADIOLINK.COM.CN
REV:03
2016:06:08
RADIOLINK
RL037T2400M8C-MAIN





------End------