FCC REPORT

Applicant:	Super BrightLEDs Inc
Address of Applicant:	4400 Earth City Expressway, Earth City, Missouri 63045, United States
Manufacturer/Factory:	Super BrightLEDs Inc
Address of Manufacturer/Factory:	4400 Earth City Expressway, Earth City, Missouri 63045, United States
Equipment Under Test (EUT)	
Product Name:	2.4G Wireless remote controller
Model No.:	LPD-TWWR
FCC ID:	2AO5Z-LPD-TWWR
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.247
Date of sample receipt:	July 16, 2018
Date of Test:	July 17-25, 2018
Date of report issued:	July 26, 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

Version No.	Date	Description
00	*July 26, 2018*	*Original*

Prepared By: ***Date:*** *July 26, 2018*

Project Engineer

Check By: ***Date:*** *July 26, 2018*

Reviewer

3 Contents

Page

1 COVER PAGE 1

2 VERSION 2

3 CONTENTS 3

4 TEST SUMMARY 4

4.1 MEASUREMENT UNCERTAINTY 4

5 GENERAL INFORMATION 5

5.1 GENERAL DESCRIPTION OF EUT 5
5.2 TEST MODE 7
5.3 DESCRIPTION OF SUPPORT UNITS 7
5.4 TEST FACILITY 7
5.5 TEST LOCATION 7

6 TEST INSTRUMENTS LIST 8

7 TEST RESULTS AND MEASUREMENT DATA 10

7.1 ANTENNA REQUIREMENT 10
7.2 CONDUCTED PEAK OUTPUT POWER 11
7.3 CHANNEL BANDWIDTH 13
7.4 POWER SPECTRAL DENSITY 15
7.5 BAND EDGES 17
7.5.1 Conducted Emission Method 17
7.5.2 Radiated Emission Method 19
7.6 SPURIOUS EMISSION 22
7.6.1 Conducted Emission Method 22
7.6.2 Radiated Emission Method 24

8 TEST SETUP PHOTO 32

9 EUT CONSTRUCTIONAL DETAILS 33

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)(3)	Pass
Channel Bandwidth	15.247 (a)(2)	Pass
Power Spectral Density	15.247 (e)	Pass
Band Edge	15.247(d)	Pass
Spurious Emission	15.205/15.209	Pass

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

Remark： Test according to ANSI C63.10:2013

N/A means not applicable.

4.1 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:	2.4G Wireless remote controller
Model No.:	LPD-TWWR
Serial No.:	70020180503
Test sample(s) ID:	GTS201803000256-1
Sample(s) Status	Engineer sample
Hardware Version:	V03
Software Version:	V2.0
Operation Frequency:	2405MHz~2480MHz
Channel numbers:	16
Channel separation:	5MHz
Modulation type:	FSK
Antenna Type:	Internal Antenna
Antenna gain:	1.5dBi(Declared by applicant)
Power supply:	DC3.0V (2 x 1.5V"AA" Size battery)

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2405MHz	5	2425MHz	9	2445MHz	13	2465MHz
2	2410MHz	6	2430MHz	10	2450MHz	14	2470MHz
3	2415MHz	7	2435MHz	11	2455MHz	15	2475MHz
4	2420MHz	8	2440MHz	12	2460MHz	16	2480 MHz

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	2405MHz
The middle channel	2440MHz
The Highest channel	2480MHz

5.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode.
Remark: During the test, 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 Description of Support Units

None.

5.4 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, January 08, 2018

● **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.

5.5 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
Tel: 0755-27798480
Fax: 0755-27798960

6 Test Instruments list

Radiated Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July. 03 2015	July. 02 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June. 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	9120D-829	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	8349B	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	GTS588	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

Conducted:						
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

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	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:

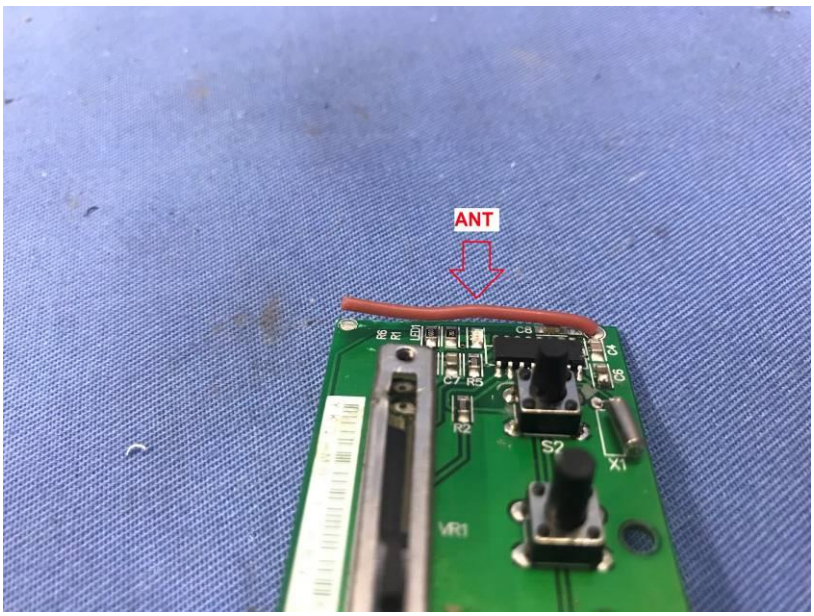
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit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

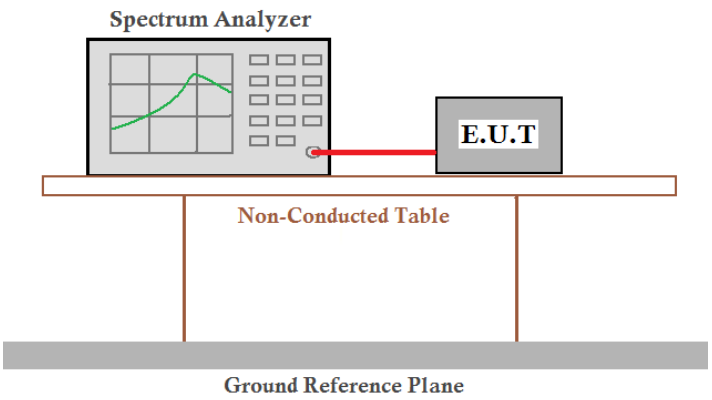
(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional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

EUT Antenna:

The antenna is Internal antenna, the best case gain of the antenna is 1.5dBi



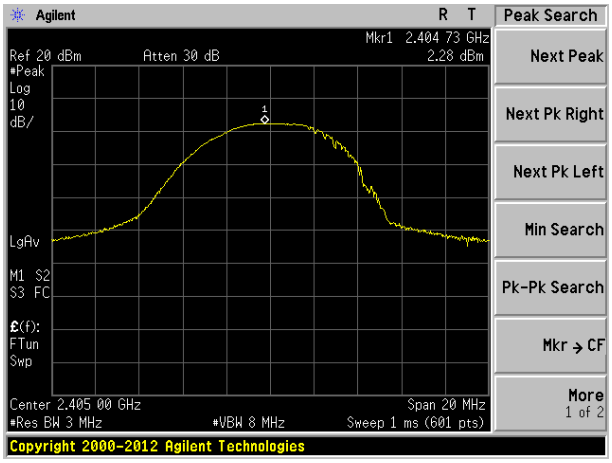
7.2 Conducted Peak Output Power

Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	ANSI C63.10:2013 and KDB558074 D01 DTS Meas Guidance V04
Limit:	30dBm
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2for details
Test results:	Pass

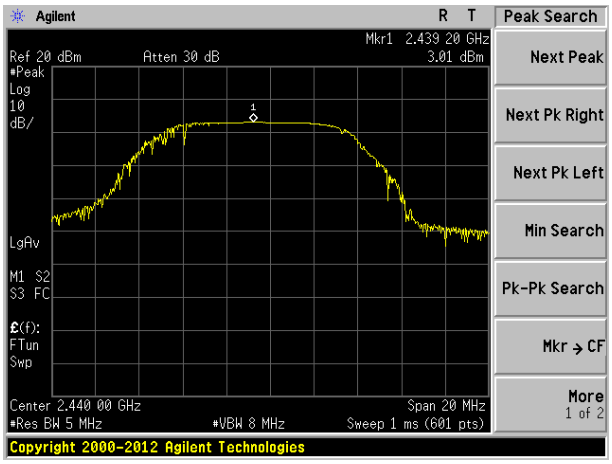
Measurement Data

Frequency (MHz)	Peak Output Power (dBm)	Limit(dBm)	Result
2405	2.28	30	PASS
2440	3.01		
2480	3.02		

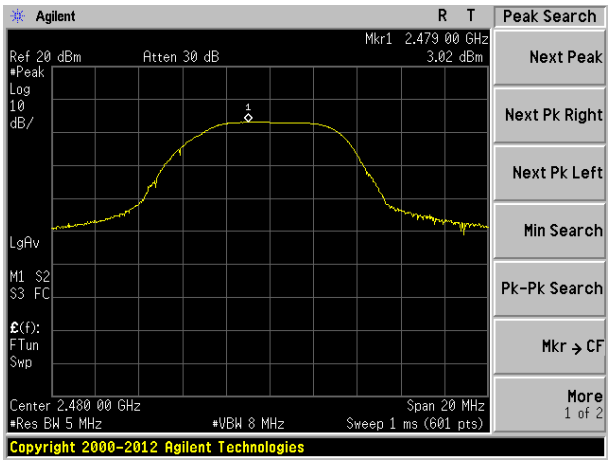
Test plot as follows:



2405MHz

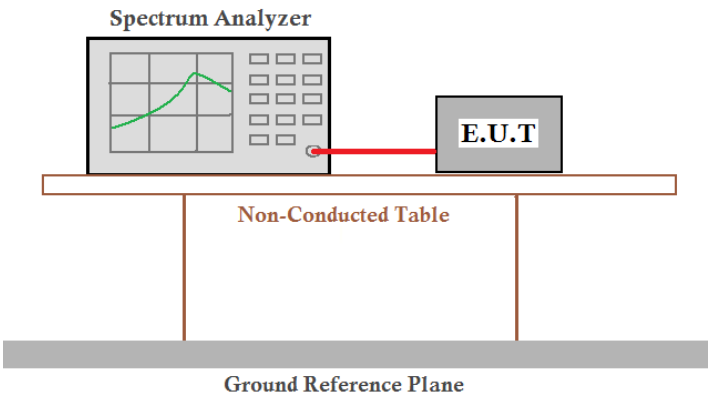


2440MHz



2480MHz

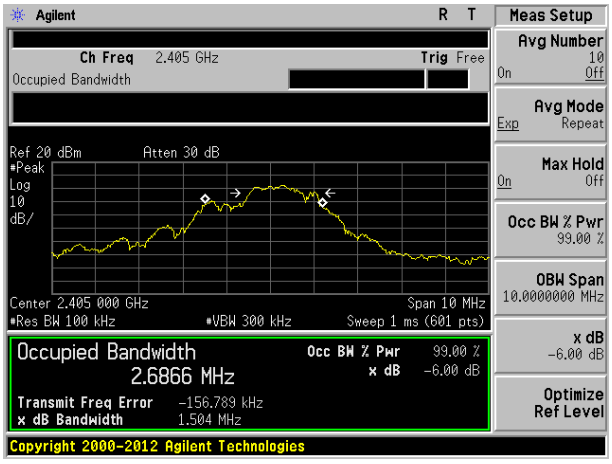
7.3 Channel Bandwidth

Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	ANSI C63.10:2013 and KDB558074 D01 DTS Meas Guidance V04
Limit:	>500KHz
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

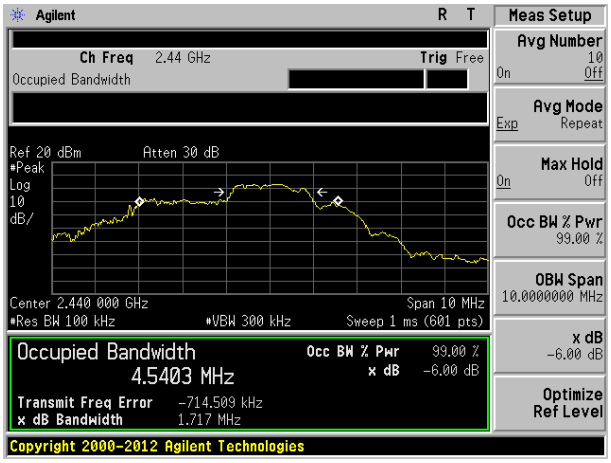
Measurement Data

Frequency (MHz)	Channel Bandwidth (MHz)	Limit(KHz)	Result
2405	1.504	>500	Pass
2440	1.717		
2480	0.784		

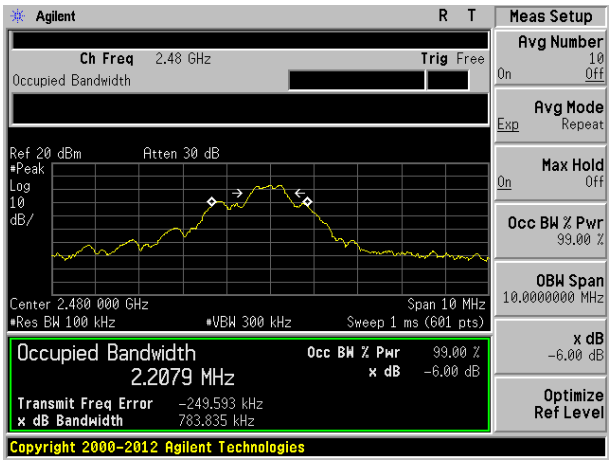
Test plot as follows:



2405MHz

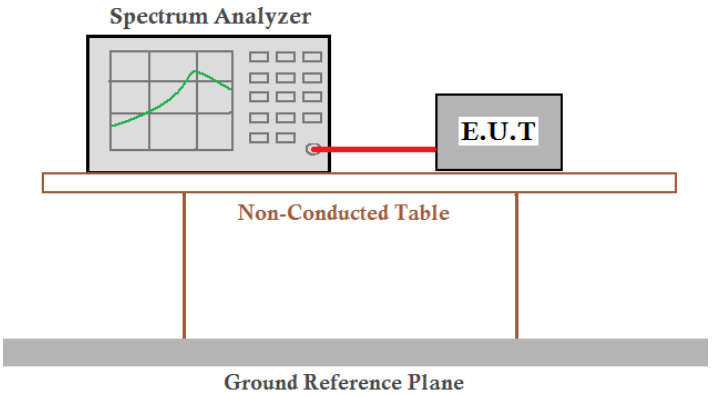


2440MHz



2480MHz

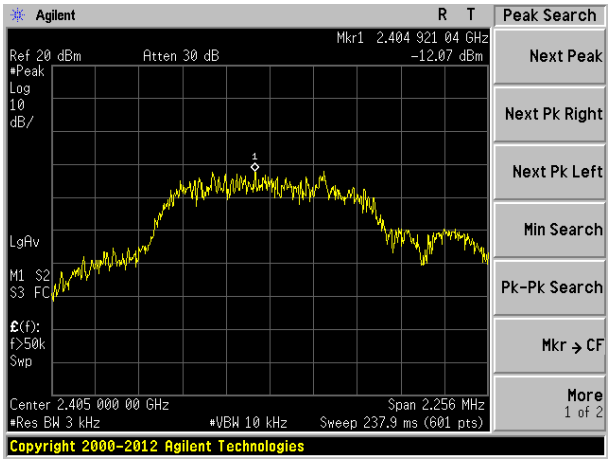
7.4 Power Spectral Density

Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	ANSI C63.10:2013 and KDB558074 D01 DTS Meas Guidance V04
Limit:	8dBm/3kHz
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

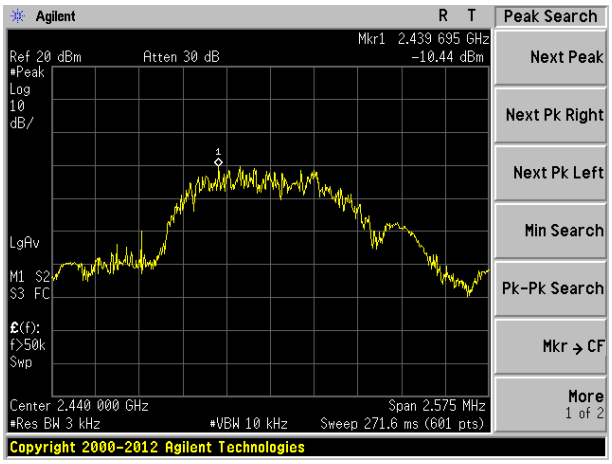
Measurement Data

Frequency (MHz)	Power Spectral Density (dBm)	Limit (dBm/3kHz)	Result
2405	-12.07	8.00	Pass
2440	-10.44		
2480	-9.23		

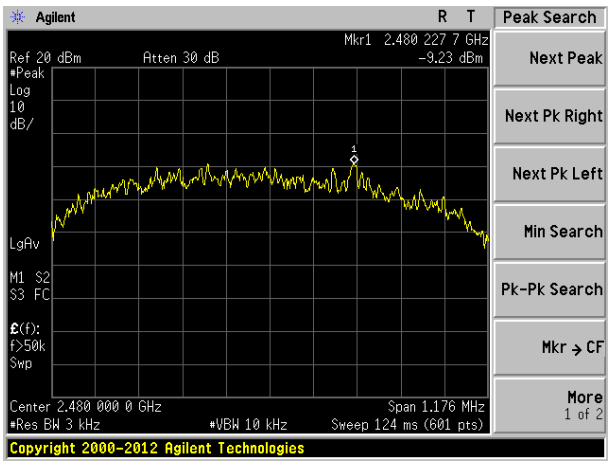
Test plot as follows:



2405MHz



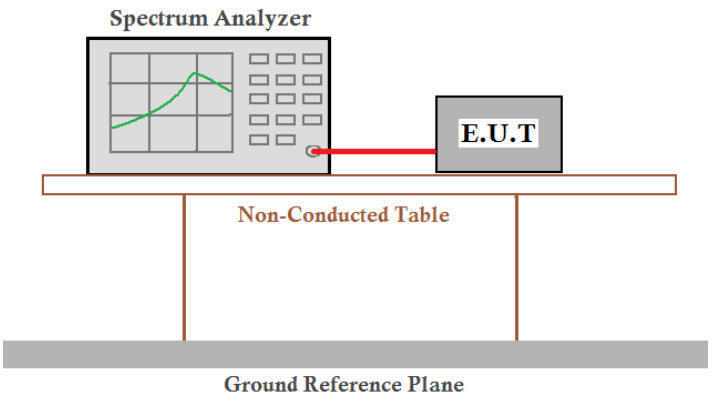
2440MHz



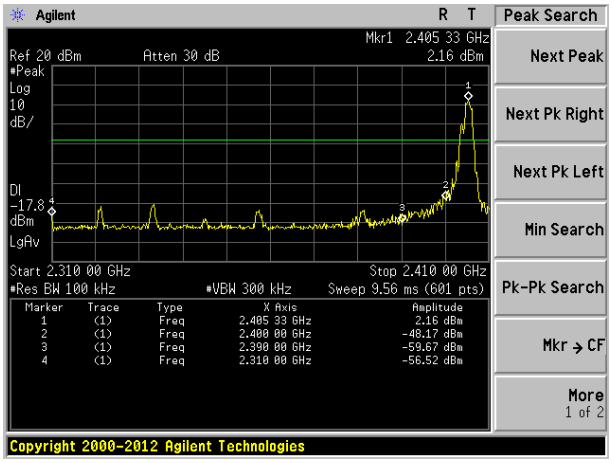
2480MHz

7.5 Band edges

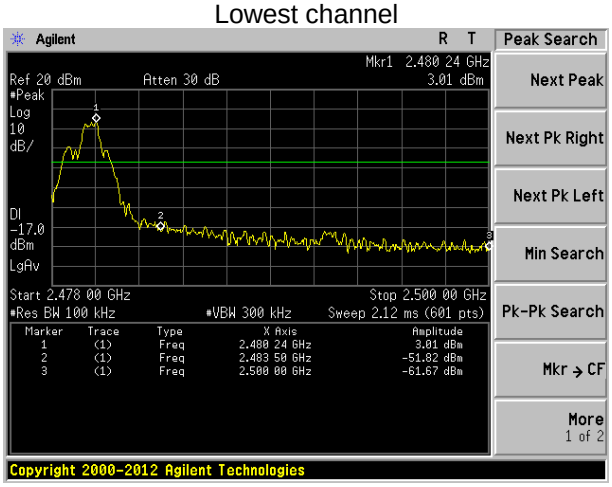
7.5.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.10:2013 and KDB558074 D01 DTS Meas Guidance V04
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:



Lowest channel



Highest channel

7.5.2 Radiated Emission Method

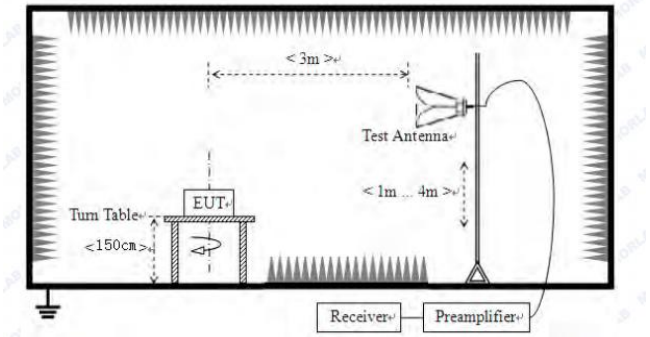
Test Requirement:	FCC Part15 C Section 15.209 and 15.205
Test Method:	ANSI C63.10:2013
Test Frequency Range:	All of the restrict bands were tested, only the worst band's (2310MHz to 2500MHz) data was showed.
Test site:	Measurement Distance: 3m
Receiver setup:	

Frequency	Detector	RBW	VBW	Value
Above 1GHz	Peak	1MHz	3MHz	Peak
	RMS	1MHz	3MHz	Average

Limit:

Frequency	Limit (dBuV/m @3m)	Value
Above 1GHz	54.00	Average
	74.00	Peak

Test setup:



Test Procedure:

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.
7. The radiation measurements are performed in X, Y, Z axis positioning. And found the Y axis positioning which it is worse case, only the test worst case mode is recorded in the report.

Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement data:

Remark: The pre-test were performed on lowest, middle and highest frequencies, only the worst case's (lowest and highest frequencies) data was showed.

Test channel:	Lowest channel

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
2310.00	39.41	27.91	5.30	24.64	47.98	74.00	-26.02	Vertical
2390.00	36.25	27.59	5.38	24.71	44.51	74.00	-29.49	Vertical
2400.00	40.13	27.58	5.39	24.72	48.38	74.00	-25.62	Vertical
2310.00	36.55	27.91	5.30	24.64	45.12	74.00	-28.88	Horizontal
2390.00	36.41	27.59	5.38	24.71	44.67	74.00	-29.33	Horizontal
2400.00	39.91	27.58	5.39	24.72	48.16	74.00	-25.84	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
2310.00	30.14	27.91	5.30	24.64	38.71	54.00	-15.29	Vertical
2390.00	27.50	27.59	5.38	24.71	35.76	54.00	-18.24	Vertical
2400.00	30.56	27.58	5.39	24.72	38.81	54.00	-15.19	Vertical
2310.00	29.85	27.91	5.30	24.64	38.42	54.00	-15.58	Horizontal
2390.00	26.59	27.59	5.38	24.71	34.85	54.00	-19.15	Horizontal
2400.00	27.65	27.58	5.39	24.72	35.90	54.00	-18.10	Horizontal

Test channel:	Highest channel

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	43.25	27.53	5.47	24.80	51.45	74.00	-22.55	Vertical
2500.00	35.67	27.55	5.49	24.86	43.85	74.00	-30.15	Vertical
2483.50	36.23	27.53	5.47	24.80	44.43	74.00	-29.57	Horizontal
2500.00	28.56	27.55	5.49	24.86	36.74	74.00	-37.26	Horizontal

Average value:

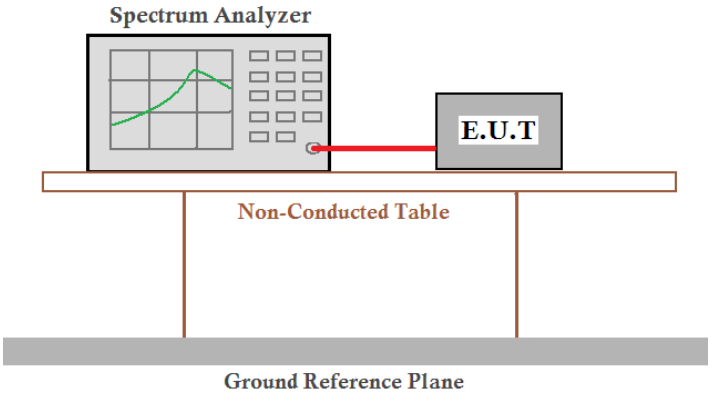
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	35.42	27.53	5.47	24.80	43.62	54.00	-10.38	Vertical
2500.00	25.74	27.55	5.49	24.86	33.92	54.00	-20.08	Vertical
2483.50	26.60	27.53	5.47	24.80	34.80	54.00	-19.20	Horizontal
2500.00	21.17	27.55	5.49	24.86	29.35	54.00	-24.65	Horizontal

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.*

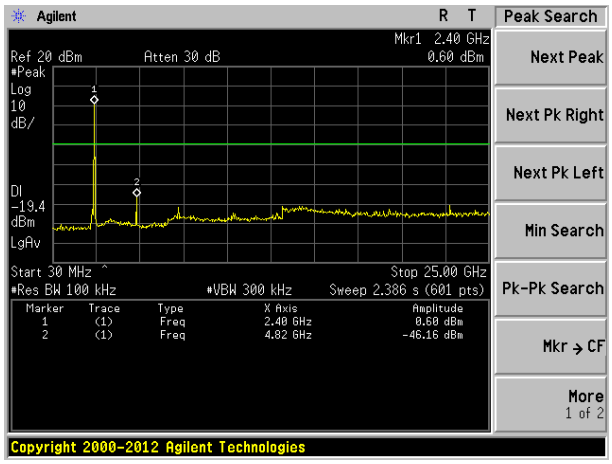
7.6 Spurious Emission

7.6.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.10:2013 and KDB558074 D01 DTS Meas Guidance V04
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

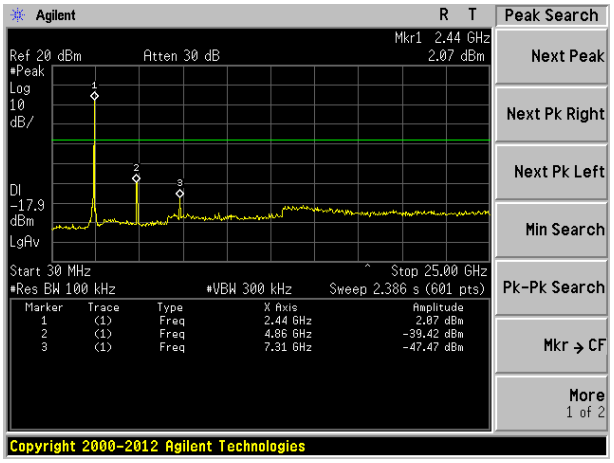
Test plot as follows:

Lowest channel



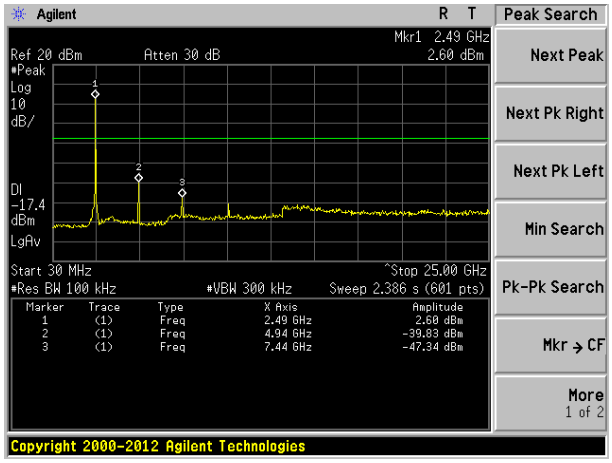
30MHz~25GHz

Middle channel



30MHz~25GHz

Highest channel



30MHz~25GHz

7.6.2 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209
Test Method:	ANSI C63.10:2013
Test Frequency Range:	9kHz to 25GHz
Test site:	Measurement Distance: 3m
Receiver setup:	

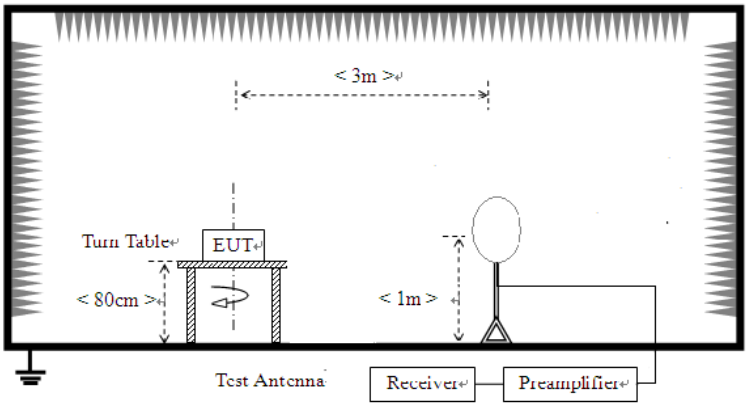
Frequency	Detector	RBW	VBW	Value
9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

Limit:
(Spurious Emissions)

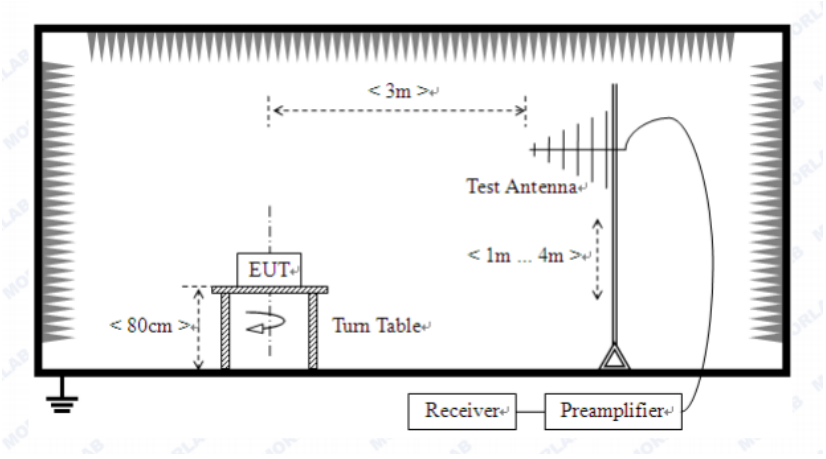
Frequency	Limit (uV/m)	Value	Measurement Distance
0.009MHz-0.490MHz	2400/F(KHz)	QP	300m
0.490MHz-1.705MHz	24000/F(KHz)	QP	300m
1.705MHz-30MHz	30	QP	30m
30MHz-88MHz	100	QP	3m
88MHz-216MHz	150	QP	
216MHz-960MHz	200	QP	
960MHz-1GHz	500	QP	
Above 1GHz	500	Average	
	5000	Peak	

Test setup:

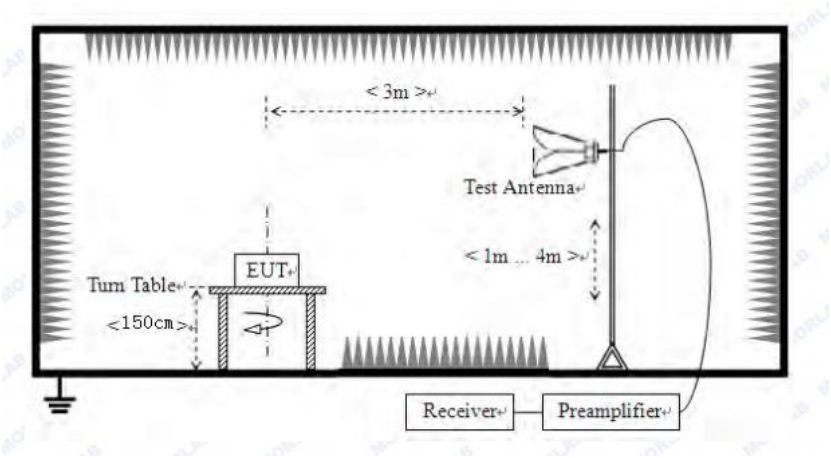
Below 30MHz



Below 1GHz



Above 1GHz



Test Procedure:

1. The EUT was placed on the top of a rotating table (0.8m for below 1G and 1.5m for 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

Measurement data:

9 kHz ~ 30 MHz

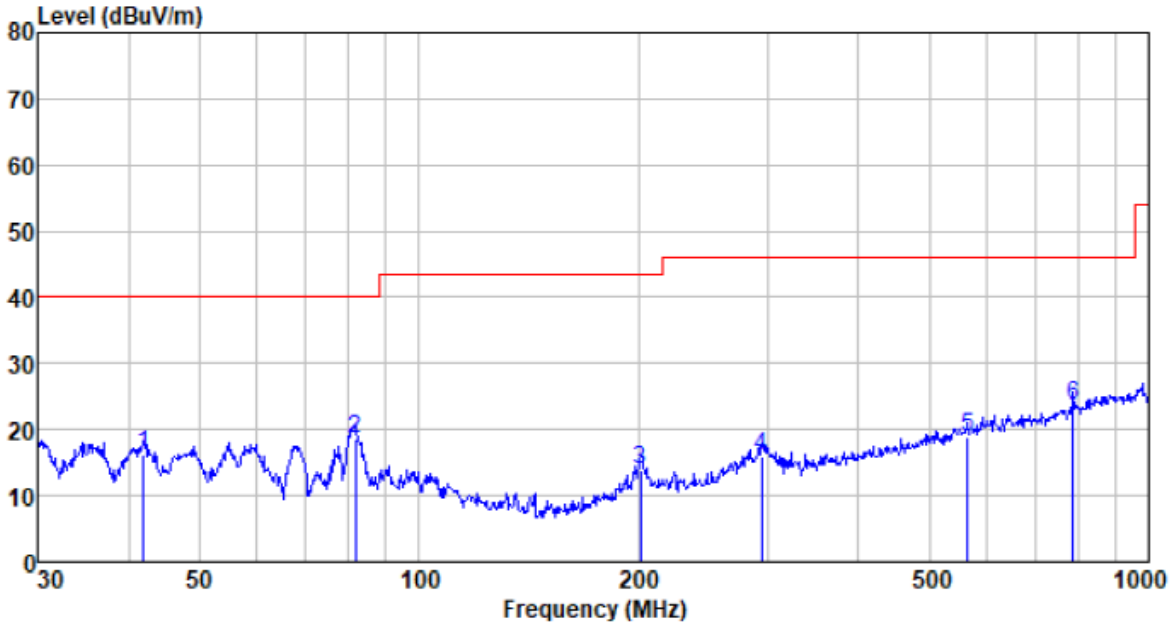
The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

Remark:

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

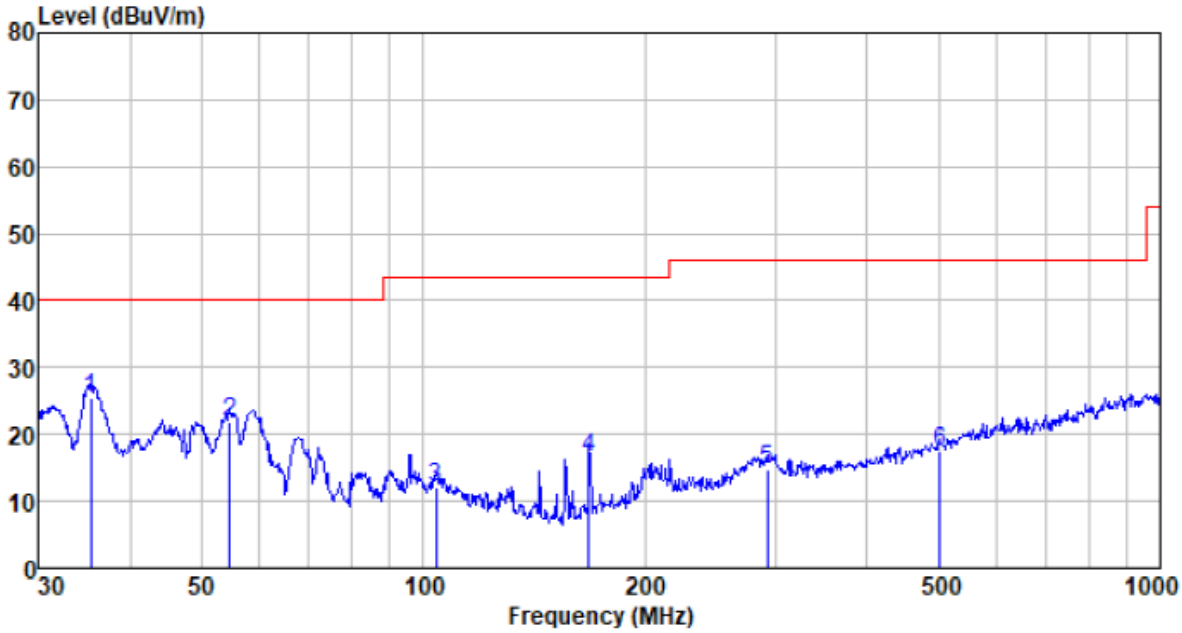
■ **Below 1GHz**

Mode:	**Transmitting mode**	**Test by:**	**Jason**
Temp./Hum.(%H):	**26℃/56%RH**	**Polarziation:**	**Horizontal**



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
41.860	39.10	12.22	0.68	35.77	16.23	40.00	-23.77	QP
81.783	46.15	8.03	1.04	36.56	18.66	40.00	-21.34	QP
201.393	38.93	10.44	1.85	37.33	13.89	43.50	-29.61	QP
295.147	37.64	13.45	2.34	37.42	16.01	46.00	-29.99	QP
564.639	34.19	18.73	3.58	37.53	18.97	46.00	-27.03	QP
787.851	35.70	21.21	4.41	37.62	23.70	46.00	-22.30	QP

Mode:	**Transmitting mode**	**Test by:**	**Jason**
Temp./Hum.(%H):	**26℃/56%RH**	**Polarziation:**	**Vertical**



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
35.375	48.83	11.39	0.61	35.38	25.45	40.00	-14.55	QP
54.643	45.49	11.82	0.81	36.25	21.87	40.00	-18.13	QP
104.170	35.89	11.73	1.23	36.76	12.09	43.50	-31.41	QP
167.824	43.65	8.46	1.67	37.18	16.60	43.50	-26.90	QP
293.084	36.37	13.42	2.32	37.41	14.70	46.00	-31.30	QP
502.940	34.13	17.35	3.32	37.51	17.29	46.00	-28.71	QP

■ **Above 1GHz**

Test channel:	Lowest channel

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
4810.00	50.35	31.17	8.60	37.66	52.46	74.00	-21.54	Vertical
7215.00	39.65	36.09	11.66	35.69	51.71	74.00	-22.29	Vertical
9620.00	30.57	37.84	14.14	34.91	47.64	74.00	-26.36	Vertical
12025.00	27.98	38.61	15.03	36.13	45.49	74.00	-28.51	Vertical
4810.00	48.87	31.17	8.60	37.66	50.98	74.00	-23.02	Horizontal
7215.00	42.03	36.09	11.66	35.69	54.09	74.00	-19.91	Horizontal
9620.00	29.32	37.84	14.14	34.91	46.39	74.00	-27.61	Horizontal
12025.00	27.96	38.61	15.03	36.13	45.47	74.00	-28.53	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
4810.00	44.27	31.17	8.60	37.66	46.38	54.00	-7.62	Vertical
7215.00	31.26	36.09	11.66	35.69	43.32	54.00	-10.68	Vertical
9620.00	20.87	37.84	14.14	34.91	37.94	54.00	-16.06	Vertical
12025.00	17.50	38.61	15.03	36.13	35.01	54.00	-18.99	Vertical
4810.00	43.10	31.17	8.60	37.66	45.21	54.00	-8.79	Horizontal
7215.00	31.20	36.09	11.66	35.69	43.26	54.00	-10.74	Horizontal
9620.00	19.67	37.84	14.14	34.91	36.74	54.00	-17.26	Horizontal
12025.00	17.86	38.61	15.03	36.13	35.37	54.00	-18.63	Horizontal

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.*
3. *"*", means this data is the too weak instrument of signal is unable to test.*

Test channel:	Middle channel

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
4880.00	50.26	31.26	8.66	37.68	52.50	74.00	-21.50	Vertical
7320.00	40.29	36.32	11.72	35.64	52.69	74.00	-21.31	Vertical
9760.00	29.65	38.01	14.25	34.98	46.93	74.00	-27.07	Vertical
12200.00	27.50	38.64	15.14	36.26	45.02	74.00	-28.98	Vertical
4880.00	47.98	31.26	8.66	37.68	50.22	74.00	-23.78	Horizontal
7320.00	38.67	36.32	11.72	35.64	51.07	74.00	-22.93	Horizontal
9760.00	28.66	38.01	14.25	34.98	45.94	74.00	-28.06	Horizontal
12200.00	27.94	38.64	15.14	36.26	45.46	74.00	-28.54	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
4880.00	42.10	31.26	8.66	37.68	44.34	54.00	-9.66	Vertical
7320.00	34.02	36.32	11.72	35.64	46.42	54.00	-7.58	Vertical
9760.00	22.15	38.01	14.25	34.98	39.43	54.00	-14.57	Vertical
12200.00	17.46	38.64	15.14	36.26	34.98	54.00	-19.02	Vertical
4880.00	41.03	31.26	8.66	37.68	43.27	54.00	-10.73	Horizontal
7320.00	21.92	36.32	11.72	35.64	34.32	54.00	-19.68	Horizontal
9760.00	21.63	38.01	14.25	34.98	38.91	54.00	-15.09	Horizontal
12200.00	18.09	38.64	15.14	36.26	35.61	54.00	-18.39	Horizontal

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.*
3. *"*", means this data is the too weak instrument of signal is unable to test.*

Test channel:	Highest channel

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	49.59	31.36	8.73	37.69	51.99	74.00	-22.01	Vertical
7440.00	40.21	36.59	11.79	35.58	53.01	74.00	-20.99	Vertical
9920.00	29.36	38.22	14.38	35.07	46.89	74.00	-27.11	Vertical
12400.00	26.88	38.68	15.27	36.43	44.40	74.00	-29.60	Vertical
4960.00	47.69	31.36	8.73	37.69	50.09	74.00	-23.91	Horizontal
7440.00	38.57	36.59	11.79	35.58	51.37	74.00	-22.63	Horizontal
9920.00	28.63	38.22	14.38	35.07	46.16	74.00	-27.84	Horizontal
12400.00	28.49	38.68	15.27	36.43	46.01	74.00	-27.99	Horizontal

Average value:

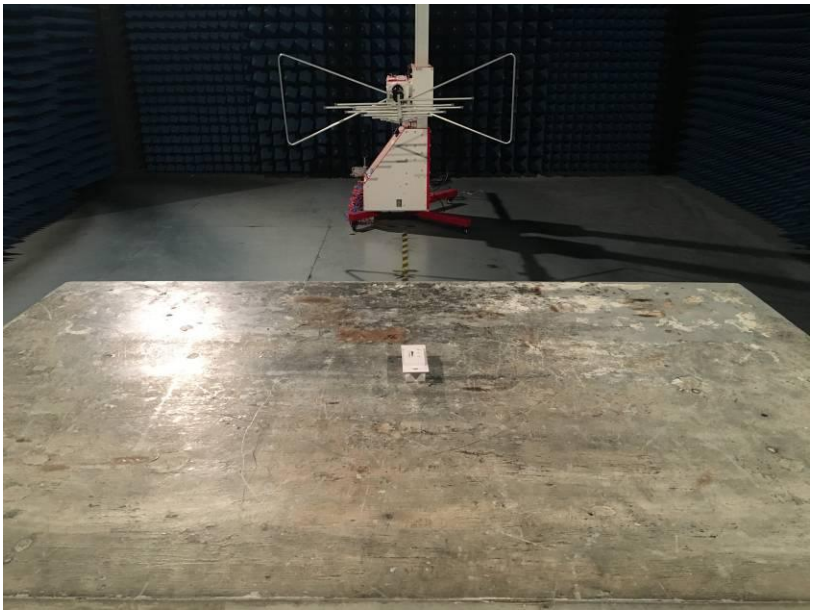
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4960.00	41.29	31.36	8.73	37.69	43.69	54.00	-10.31	Vertical
7440.00	32.09	36.59	11.79	35.58	44.89	54.00	-9.11	Vertical
9920.00	21.41	38.22	14.38	35.07	38.94	54.00	-15.06	Vertical
12400.00	17.92	38.68	15.27	36.43	35.44	54.00	-18.56	Vertical
4960.00	40.57	31.36	8.73	37.69	42.97	54.00	-11.03	Horizontal
7440.00	31.62	36.59	11.79	35.58	44.42	54.00	-9.58	Horizontal
9920.00	21.57	38.22	14.38	35.07	39.10	54.00	-14.90	Horizontal
12400.00	18.22	38.68	15.27	36.43	35.74	54.00	-18.26	Horizontal

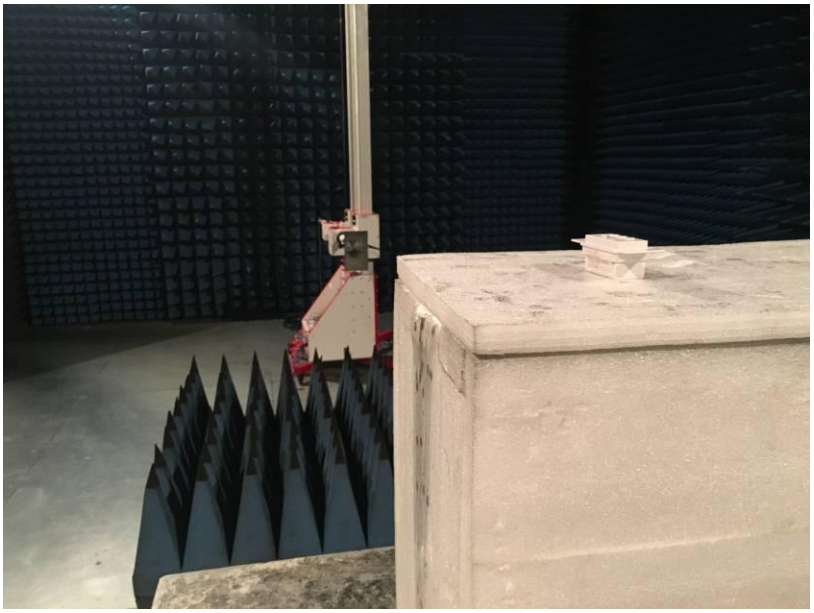
Remark:

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.*
3. *"*", means this data is the too weak instrument of signal is unable to test.*

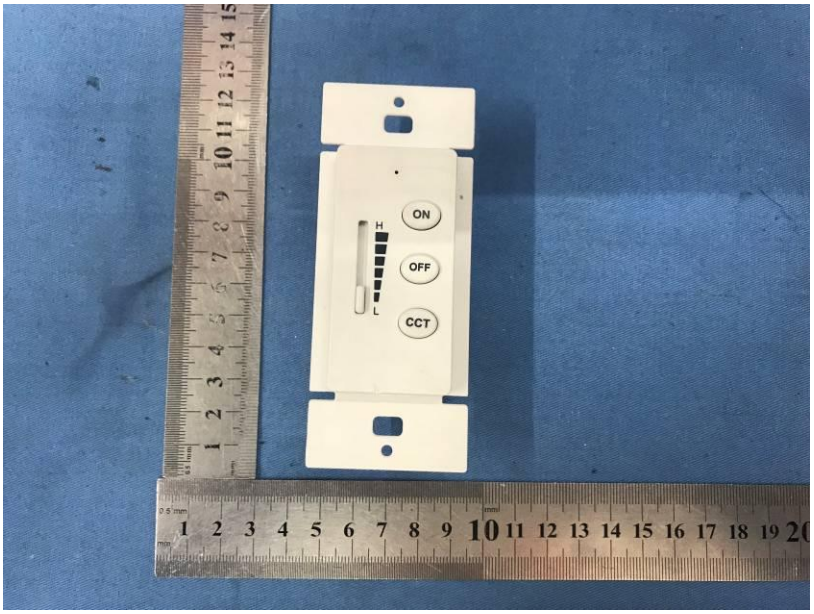
8 Test Setup Photo

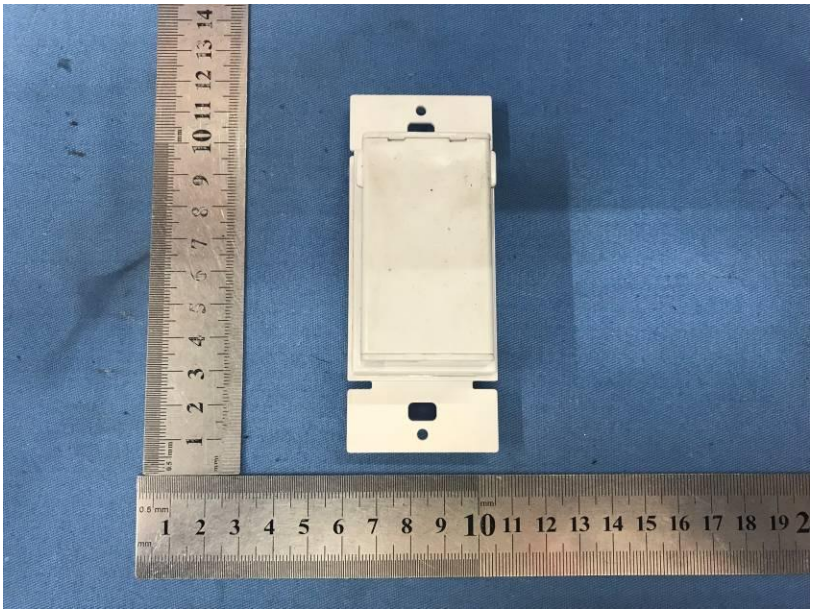
Radiated Emission

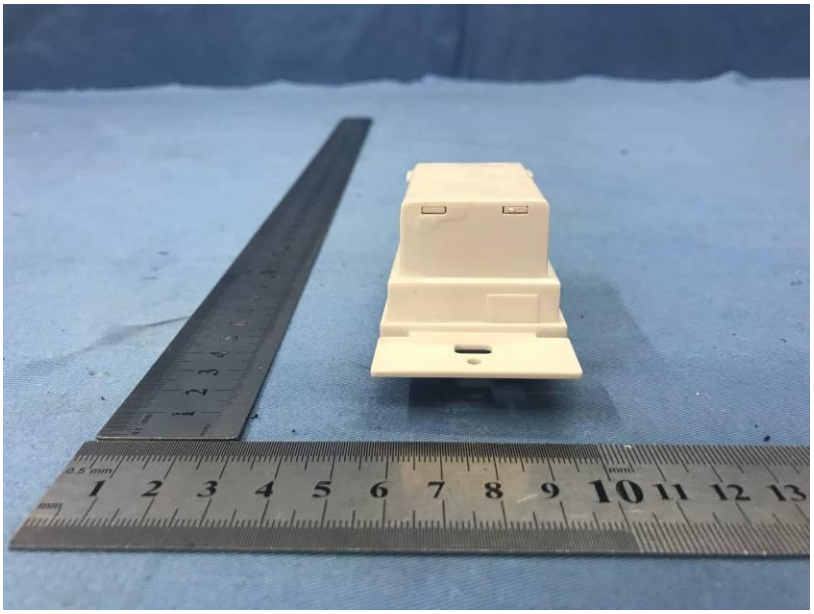


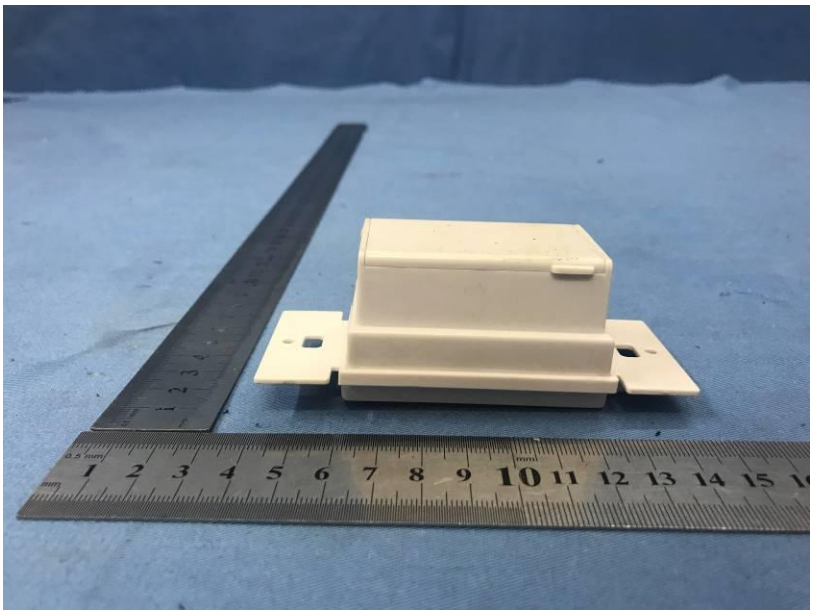


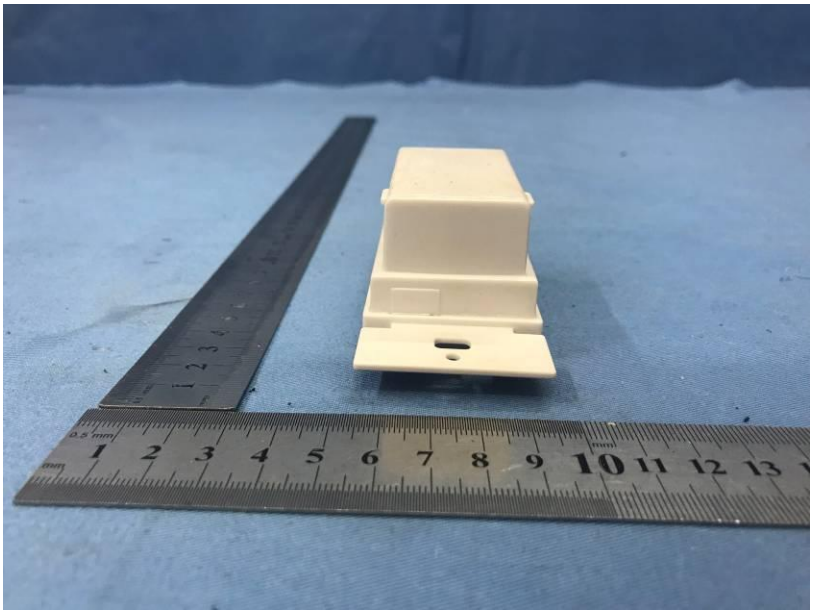
9 EUT Constructional Details

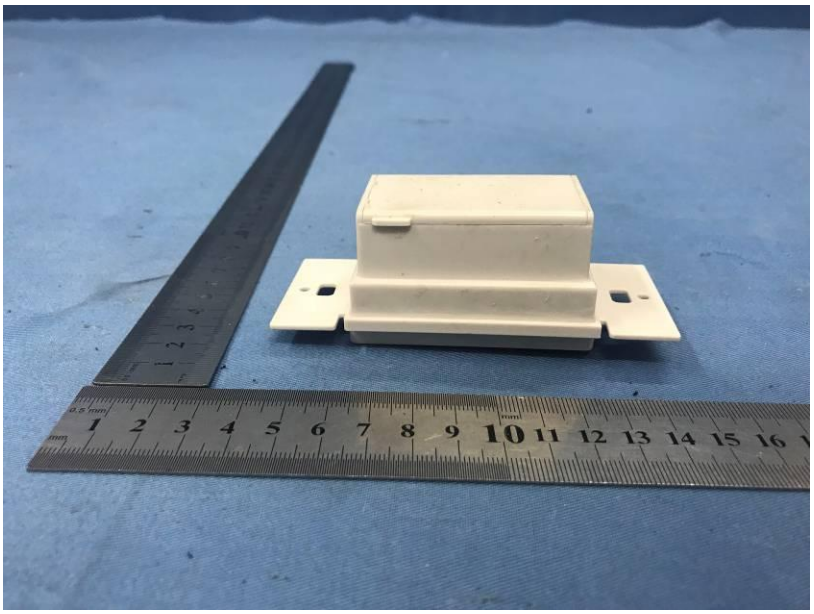


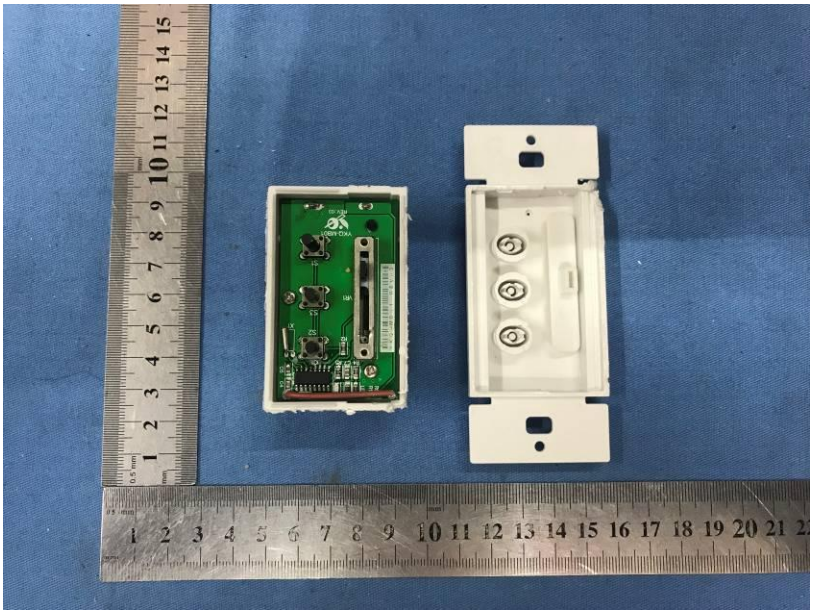


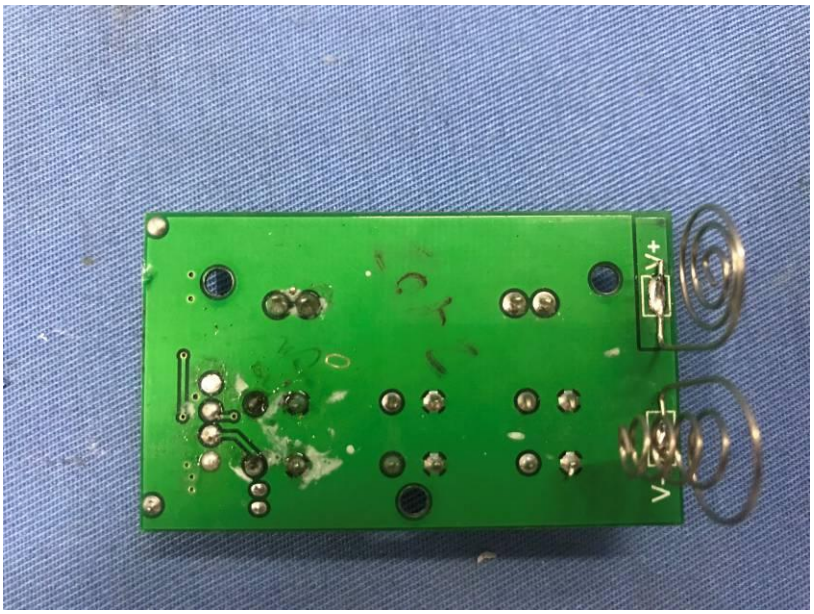


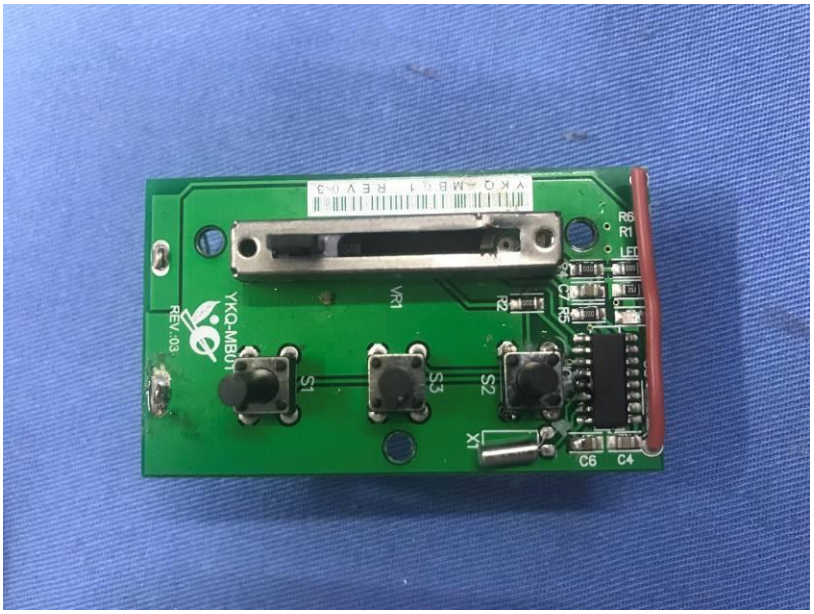


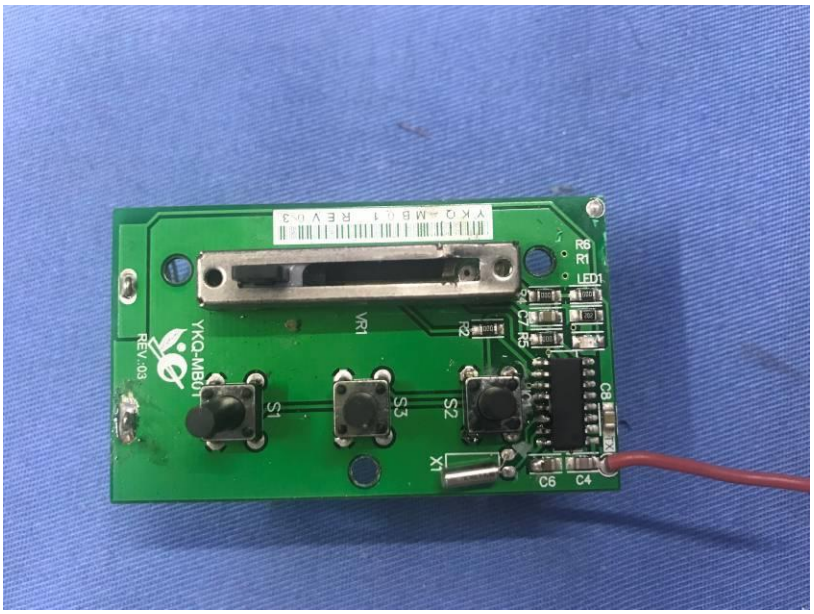


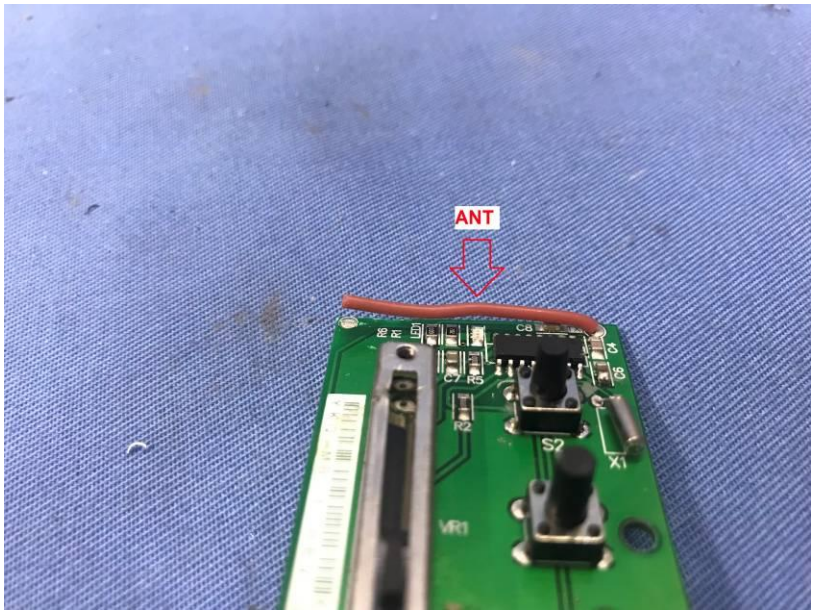





V+
V-


YKQ-MBUT
REV.:03
VR1
S1
S3
S2
X1
C6
C4
R6
R1
LED1
C7
R5
R2


YKQ-MBUT
REV.:03
VR1
S1
S3
S2
X1
C6
C4
R6
R1
LED1
C7
R5
R2
C8



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