PRECISE TESTING

TEST REPORT

FCC ID: 2AOXY-PC209A

Product Name	:	Wireless Keyboard
Model Name	:	PC209A, KF-001, KF-002, KF-003, KF-004, KF-005, KF-07, KF-08, KF-09, KF-10, KF-11, KF-12, KF-13, KF-14, KF-15, KF-16, KF-17, KF-18, KF-19, KF-20, KF-21, KF-22, KF-23, KF-24, KF-25, KF-26, KF-27, KF-28, KF-29, KF-30
Brand Name	:	N/A
Report No.	:	PTC18091812101E-FC01
Prepared for		
Shenzhen Qianhai Patuoxun Network & Technology co.,ltd		
201# Building A, No.1, qianwan #1 Road, Qianhai ShenGang Co-work district, Shenzhen, Guangdong, China		
Prepared by		
DongGuan Precise testing &Certification Corp. Ltd		
Building D, Baoding Technology Park, Guangming Road 2, Guangming Community, Dongcheng District, Dongguan, Guangdong, China		

1 TEST RESULT CERTIFICATION

Applicant's name	:	Shenzhen QianhaiPatuoxun Network & Technology co.,ltd
Address	:	201# Building A, No.1, qianwan #1 Road, Qianhai ShenGang Co-work district, Shenzhen, Guangdong, China
Manufacture's name	:	Shenzhen Torich Electronic Technology Co., Ltd.
Address	:	3F, Unit Al, FengHuangGang 3rd Industiral Area, Baotian 1st Road, No.213, Bao'An District, Shenzhen
Product name	:	Wireless Keyboard
Model name	:	PC209A, KF-001, KF-002, KF-003, KF-004, KF-005, KF-07, KF-08, KF-09, KF-10, KF-11, KF-12, KF-13, KF-14, KF-15, KF-16, KF-17, KF-18, KF-19, KF-20, KF-21, KF-22, KF-23, KF-24, KF-25, KF-26, KF-27, KF-28, KF-29, KF-30
Standards	:	FCC CFR47 Part 15 Section 15.249
Test procedure	:	ANSI C63.10: 2013
Test Date	:	September 13, 2018 to September 19, 2018
Date of Issue	:	September 19, 2018
Test Result	:	Pass

This device described above has been tested by PTC, and the test results show that the equipment under test (EUT) is in compliance with the requirements. And it is applicable only to the tested sample identified in the report.
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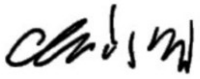
Test Engineer:

Leo Yang / Engineer

Technical Manager:



Chris Du / Manager

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2 Test Summary

Test Items	Test Requirement	Result
AC Power Conducted Emission	15.207	N/A (Note 1)
20dB Bandwidth	15.215(c)	PASS
Band edge	15.249(d) 15.205 15.209	PASS
Field Strength of Fundamental Emissions	15.249(a) 15.249(c) 15.205(a) 15.209	PASS
Radiated Spurious Emissions		PASS
Antenna Requirement	15.203	PASS

Note:

1. The EUT only powered by battery, no need to evaluate AC Power Conducted Emission.

2. The EUT is powered by new batteries during the test.

3 TEST FACILITY

DongGuan Precise testing &Certification Corp. Ltd

Building D,Baoding Technology Park,Guangming Road2, Dongcheng District, Dongguan, Guangdong, China, Dongguan, 523129

FCC Registration Number: 790290

A2LA Certificate No.: 4408.01

IC Registration Number: 12191A-1

Test Lab: Shenzhen BCTC Testing Co., Ltd.

Address: BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China

FCC Registered No.: 712850

Test items: Radiated Spurious Emission(18GHz to 25GHz)

4 General Information

4.1 General Description of E.U.T.

Product Name	:	Wireless Keyboard
Model Name	:	PC209A, KF-001, KF-002, KF-003, KF-004, KF-005, KF-07, KF-08, KF-09, KF-10, KF-11, KF-12, KF-13, KF-14, KF-15, KF-16, KF-17, KF-18, KF-19, KF-20, KF-21, KF-22, KF-23, KF-24, KF-25, KF-26, KF-27, KF-28, KF-29, KF-30 (Note: The samples are the same except different color and tooling. So PC209A was selected for full tested.)
Operating frequency	:	2408-2474MHz
Numbers of Channel	:	34
Channel Space	:	2MHz
Antenna Type	:	Internal PCB Antenna
Antenna Gain	:	-0.61dBi
Type of Modulation	:	FSK
Power supply	:	DC 2*1.5V Battery
Hardware Version	:	N/A
Software Version	:	N/A

4.2 Test Mode

The EUT has been tested under its typical operating condition. Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting. Only the worst case data were reported.
For Radiated: The EUT's antenna was pre-tested under the following modes:

Test Mode	Description
Mode A	X-Y axis
Mode B	Y-Z axis
Mode C	X-Z axis

From the above modes, the worst case was found in Mode A, Therefore only the test data of the mode was recorded in this report.

Channel List:

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
01	**2408**	11	2428	21	2448	31	2468
02	2410	12	2430	22	2450	32	2470
03	2412	13	2432	23	2452	33	2472
04	2414	14	2434	24	2454	**34**	**2474**
05	2416	15	2436	25	2456		
06	2418	16	2438	26	2458		
07	2420	**17**	**2440**	27	2460		
08	2422	18	2442	28	2462		
09	2424	19	2444	29	2464		
10	2426	20	2446	30	2466		

The 3 channels of lower, middle and higher were chosen for test.

Channel	**Frequency(MHz)**
1	2408
17	2440
34	2474

5 Equipment During Test

5.1 Equipments List

RF Conducted Test

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Calibration Due
MXG Signal Analyzer	Agilent	N9020A	MY56070279	10Hz-30GHz	Apr 07, 2019
Coaxial Cable	CDS	79254	46107086	10Hz-30GHz	Oct 09, 2018

Remark: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

Radiated Emissions(9KHz-18GHz)

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Calibration Due
EMI Test Receiver	Rohde&Schwarz	ESCI	101417	9KHz-3GHz	Sep. 03, 2019
Loop Antenna	Schwarzbeck	FMZB 1519	012	9 KHz -30MHz	Aug 31, 2019
Bilog Antenna	SCHWARZBECK	VULB9160	9160-3355	25MHz-2GHz	Aug 31, 2019
Preamplifier (low frequency)	SCHWARZBECK	BBV 9475	9745-0013	1MHz-1GHz	Sep. 03, 2019
Cable	Schwarzbeck	PLF-100	549489	9KHz-3GHz	Sep. 03, 2019
Spectrum Analyzer	Agilent	E4407B	MY45109572	9KHz-40GHz	Oct. 13, 2018
Horn Antenna	SCHWARZBECK	9120D	9120D-1246	1GHz-18GHz	Aug. 31, 2019
Power Amplifier	LUNAR EM	LNA1G18-40	J10100000081	1GHz-26.5GHz	Aug. 31, 2019
Cable	H+S	CBL-26	N/A	1GHz-26.5GHz	Sep. 03, 2019

5.2 Measurement Uncertainty

Parameter	Uncertainty
RF output power, conducted	±1.0dB
Power Spectral Density, conducted	±2.2dB
Radio Frequency	± 1 x 10^{-6}
Bandwidth	± 1.5 x 10^{-6}
Time	±2%
Duty Cycle	±2%
Temperature	±1°C
Humidity	±5%
DC and low frequency voltages	±3%
Conducted Emissions (150kHz~30MHz)	±3.64dB
Radiated Emission(30MHz~1GHz)	±5.03dB
Radiated Emission(1GHz~25GHz)	±4.74dB
Remark: The coverage Factor (k=2), and measurement Uncertainty for a level of Confidence of 95%	

5.3 Description of Support Units

Equipment	Model No.	Series No.
N/A	N/A	N/A

6 Conducted Emission

Test Requirement:	:	FCC CFR 47 Part 15 Section 15.207
Test Method:	:	ANSI C63.10:2013
Test Result:	:	PASS
Frequency Range:	:	150kHz to 30MHz
Class/Severity:	:	Class B
Detector:	:	Peak for pre-scan (9kHz Resolution Bandwidth)

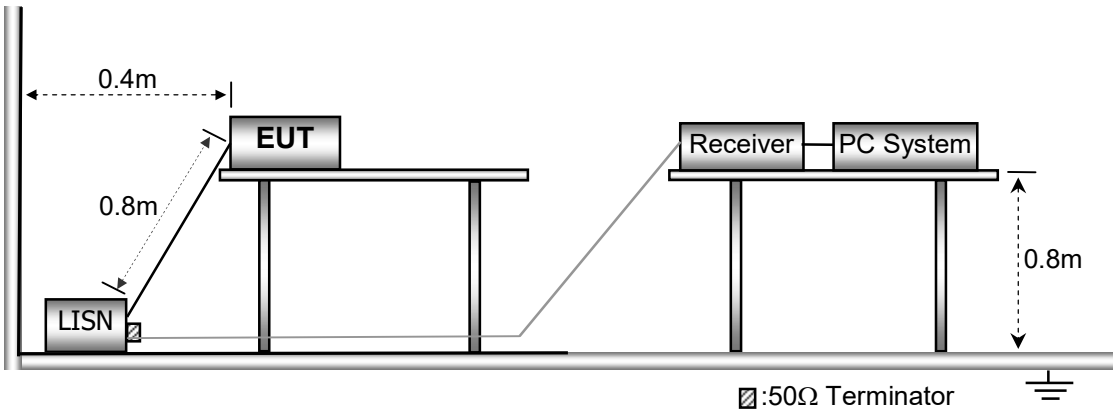
6.1 E.U.T. Operation

Operating Environment **:**

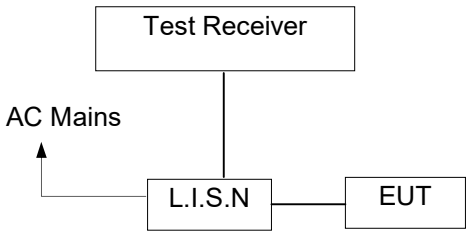
Temperature:	:	25.5 °C
Humidity:	:	51 % RH
Atmospheric Pressure:	:	101.2kPa

6.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10: 2013.



6.3 Test SET-UP (Block Diagram of Configuration)



6.4 Measurement Procedure:

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured was complete.

6.5 Conducted Emission Limit

Conducted Emission

Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

Note:
1. The lower limit shall apply at the transition frequencies
2.The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

6.6 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

6.7 Conducted Emission Test Result

N/A.

The EUT only powered by battery, no need to evaluate AC Power Conducted Emission.

7 Field Strength of Fundamental Emission and Radiated Spurious Emissions

Test Requirement: : FCC Part C section 15.205 & 15.209 & 15.249

Test Method: : ANSI C63.10: 2013

Test Result: : PASS

Measurement Distance: : 3m

Limit: : See the follow table

15.209 limit:

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))}$ + 80
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))}$ + 40
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)}$ + 40
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

Note: 1. Emission level in dBuV/m=20 log (uV/m)

2. Measurement was performed at an antenna to the closed point of EUT distance of meters.

The field strength of emission from intentional radiators operated within these frequency bands shall comply with the following:

15.249(a) Limit:

Fundamental Frequency	Field strength of fundamental		Field strength of harmonics	
(MHz)	mV/m	dBuV/m	uV/m	dBuV/m
902-928	50	94	500	54
2400-2483.5	50	94	500	54
5725-5875	50	94	500	54
24000-24250	250	108	2500	68

7.1 EUT Operation

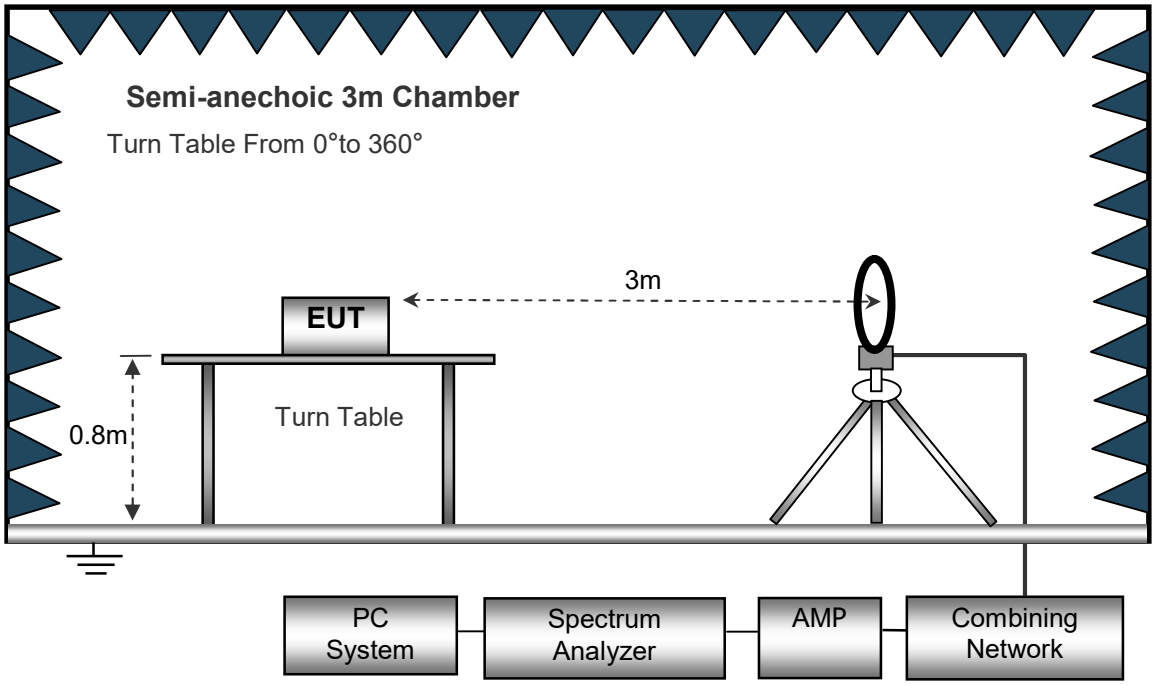
Operating Environment :

Temperature:	:	23.5 °C
Humidity:	:	51.1 % RH
Atmospheric Pressure:	:	101.2kPa
Test Voltage	:	DC 2*1.5V Battery

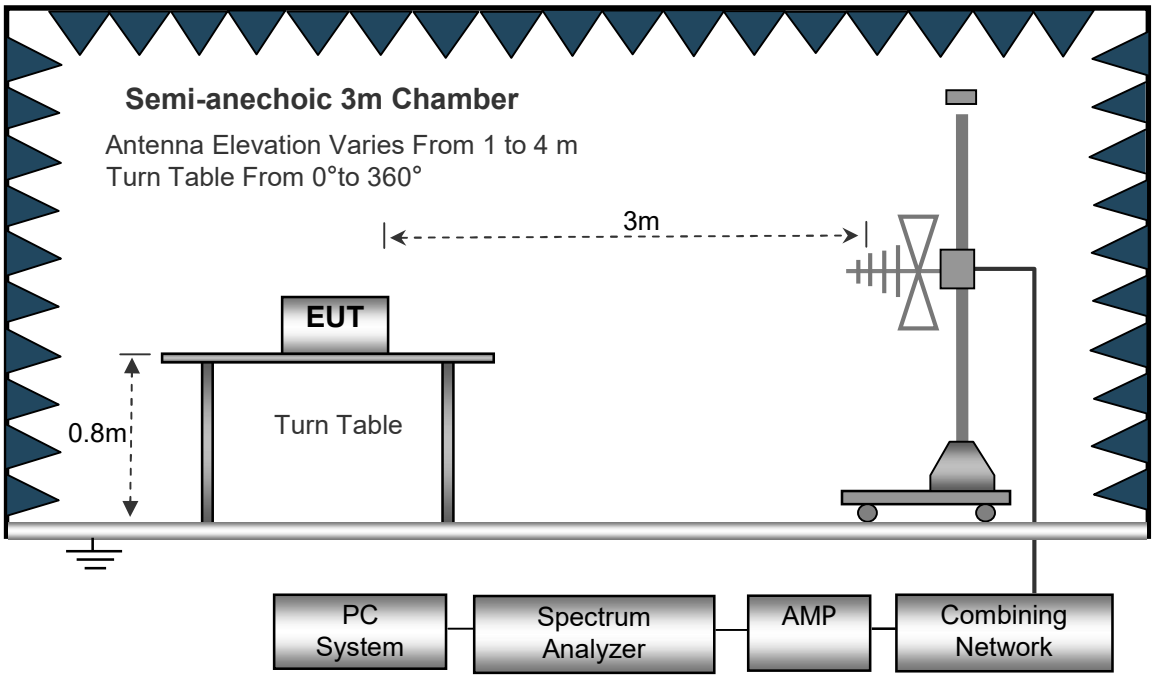
7.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site

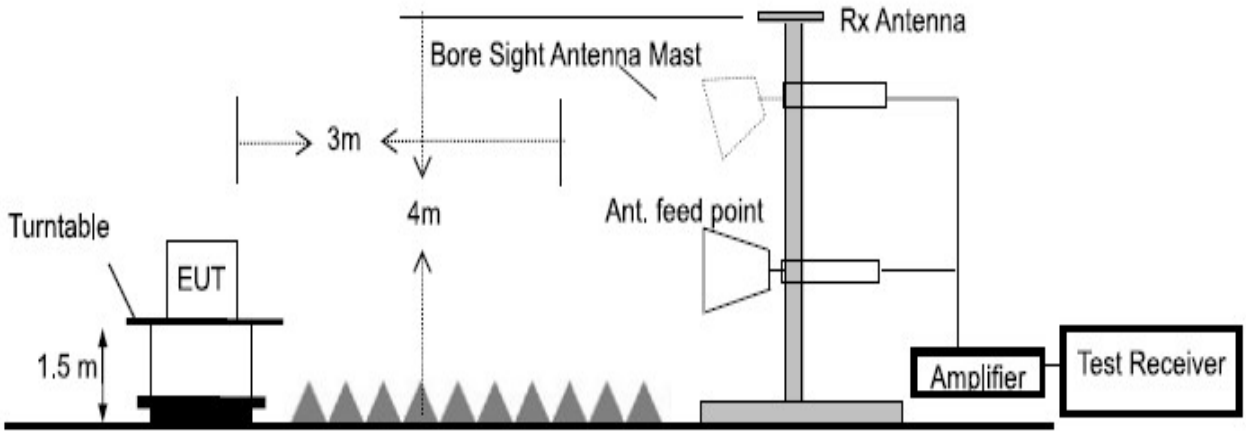
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



7.3 Spectrum Analyzer Setup

	Frequency	Detector	RBW	VBW	Remark
Receiver Setup	Below 30MHz	--	10kHz	10kHz	--
	30MHz ~ 1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		RMS	1MHz	3MHz	Average Value

7.4 Test Procedure

1. The testing follows the guidelines in Spurious Radiated Emissions of ANSI C63.10-2013.

2. Below 1000MHz, The EUT was placed on a turn table which is 0.8m above ground plane. And above 1000MHz, The EUT was placed on a styrofoam table which is 1.5m above ground plane.

3. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (From 1m to 4m) and turntable (from 0 degree to 360 degree) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.

5. Set to the maximum power setting and enable the EUT transmit continuously.

6. Final measurement (Above 1GHz): The frequency range will be divided into different sub ranges depending of the frequency range of the used horn antenna. The EMI Receiver set to peak and average mode and a resolution bandwidth of 1MHz. The measurement will be performed in horizontal and vertical polarization of the measuring antenna and while rotating the EUT in its vertical axis in the range of 0 degree to 360 degree in order to have the antenna inside the cone of radiation.

7. Test Procedure of measurement (For Above 1GHz):

1) Monitor the frequency range at horizontal polarization and move the antenna over all sides of the EUT(if necessary move the EUT to another orthogonal axis).

2) Change the antenna polarization and repeat 1) with vertical polarization.

3) Make a hardcopy of the spectrum.

4) Measure the frequency of the detected emissions with a lower span and resolution bandwidth to increase the accuracy and note the frequency value.

5) Change the analyser mode to Clear/ Write and found the cone of emission.

6) Rotate and move the EUT, so that the measuring distance can be enlarged to 3m and the antenna will be still inside the cone of emission.

7) Measure the level of the detected frequency with the correct resolution bandwidth, with the antenna polarization and azimuth and the peak and average detector, which causes the maximum emission.

8) Repeat steps 1) to 7) for the next antenna spot if the EUT is larger than the antenna beamwidth.

8. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

7.5 Summary of Test Results

Test Frequency: 9KHz-30MHz

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Over (dB)
--	--	--	--	>20

Note:

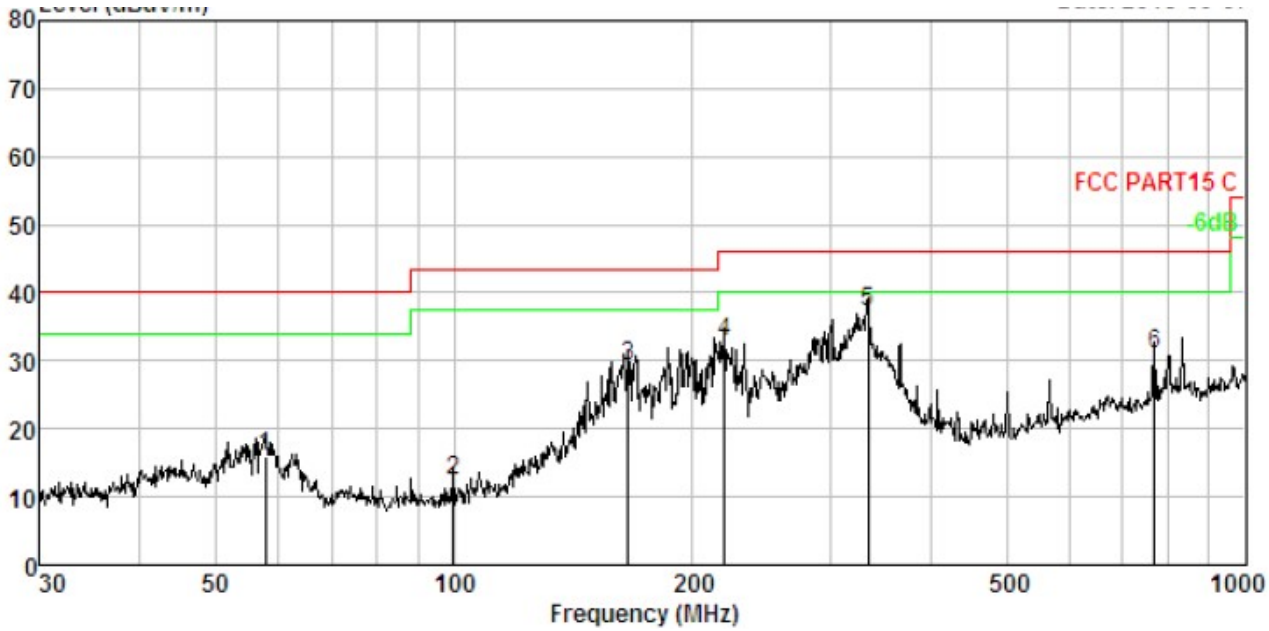
The amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

Distance extrapolation factor =40log(Specific distance/ test distance)(dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor.

Test Frequency: 30MHz ~ 1GHz

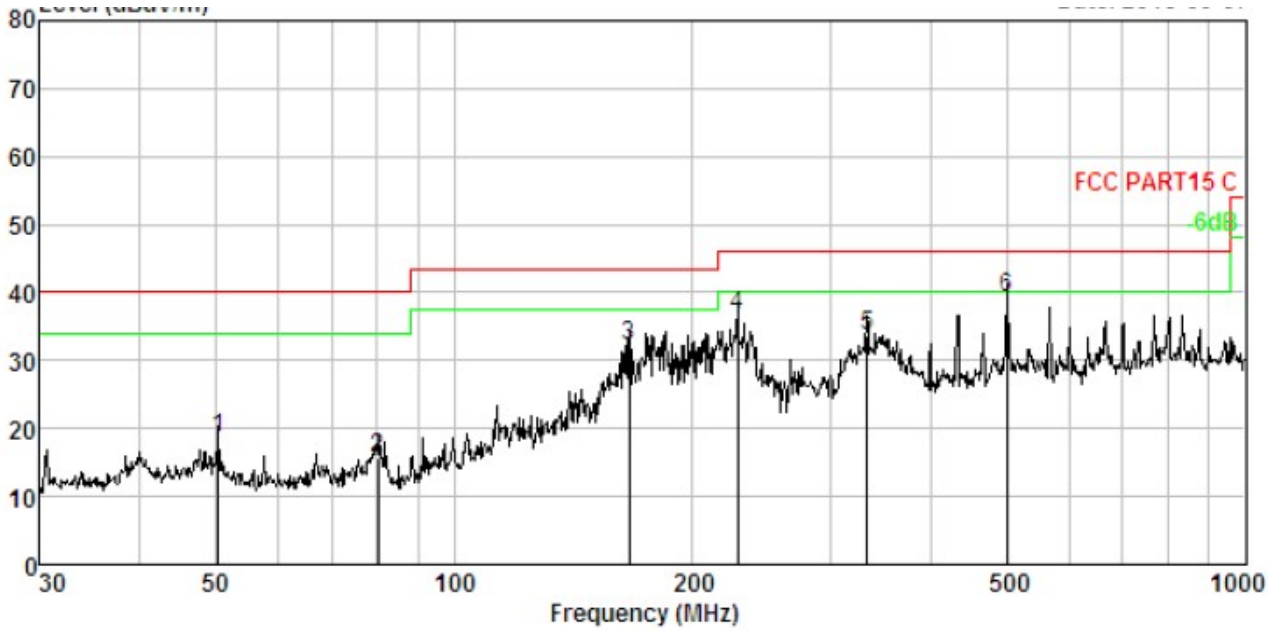
Remark: only the worst data were reported.

Test plot for Horizontal: 2408MHz is worse case of low mid high channels



No.	Freq MHz	Cable Loss dB	ANT Factor dB/m	Receiver Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark
1.	57.796	1.65	12.05	32.34	30.20	15.84	40.00	-24.16	QP
2.	99.878	2.14	10.23	30.31	30.39	12.29	43.50	-31.21	QP
3.	166.068	2.60	13.54	43.72	30.57	29.29	43.50	-14.21	QP
4.	219.845	2.86	10.76	49.73	30.66	32.69	46.00	-13.31	QP
5.	333.687	3.24	13.95	50.84	30.81	37.22	46.00	-8.78	QP
6.	768.748	3.99	21.40	36.57	31.10	30.86	46.00	-15.14	QP

Test plot for Vertical: 2408MHz is worse case of low mid high channels



No.	Freq MHz	Cable Loss dB	ANT Factor dB/m	Receiver Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark
1.	50.409	1.52	12.24	34.88	30.15	18.49	40.00	-21.51	QP
2.	80.081	1.94	8.77	35.36	30.31	15.76	40.00	-24.24	QP
3.	166.651	2.61	13.51	46.75	30.57	32.30	43.50	-11.20	QP
4.	228.490	2.89	11.17	53.29	30.68	36.67	46.00	-9.33	QP
5.	332.519	3.23	13.93	47.31	30.81	33.66	46.00	-12.34	QP
6.	499.425	3.60	17.06	49.54	30.95	39.25	46.00	-6.75	QP

Test Frequency 1GHz-25GHz:

Frequency (MHz)	Reading (dBuV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2408	95.33	PK	V	30.22	2.12	35.23	92.44	114	-21.56
2408	85.04	AV	V	30.22	2.12	35.23	82.15	94	-11.85
4816	48.12	PK	V	36.24	2.36	34.26	52.46	74	-21.54
4816	46.55	AV	V	36.24	2.36	34.26	50.89	54	-3.11
7224	45.98	PK	V	35.71	2.79	36.07	48.41	74	-25.59
7224	38.41	AV	V	35.71	2.79	36.07	40.84	54	-13.16
9632	*	*	*	*	*	*	*	*	*
12040	*	*	*	*	*	*	*	*	*
2408	97.35	PK	H	30.22	2.12	35.23	94.46	114	-19.54
2408	86.04	AV	H	30.22	2.12	35.23	83.15	94	-10.85
4816	48.25	PK	H	36.24	2.36	34.26	52.59	74	-21.41
4816	46.18	AV	H	36.24	2.36	34.26	50.52	54	-3.48
7224	45.28	PK	H	35.71	2.79	36.07	47.71	74	-26.29
7224	37.56	AV	H	35.71	2.79	36.07	39.99	54	-14.01
9632	*	*	*	*	*	*	*	*	*
12040	*	*	*	*	*	*	*	*	*

Frequency (MHz)	Reading (dBuV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2440	94.32	PK	V	31.24	2.19	36.22	91.53	114	-22.47
2440	85.12	AV	V	31.24	2.19	36.22	82.33	94	-11.67
4880	47.2	PK	V	33.19	2.35	35.15	47.59	74	-26.41
4880	44.51	AV	V	33.19	2.35	35.15	44.9	54	-9.1
7320	48.19	PK	V	34.52	2.67	36.18	49.2	74	-24.8
7320	42.48	AV	V	34.52	2.67	36.18	43.49	54	-10.51
9760	*	*	*	*	*	*	*	*	*
12200	*	*	*	*	*	*	*	*	*
2440	96.22	PK	H	31.24	2.19	36.22	93.43	114	-20.57
2440	87.43	AV	H	31.24	2.19	36.22	84.64	94	-9.36
4880	47.26	PK	H	33.19	2.35	35.15	47.65	74	-26.35
4880	44.13	AV	H	33.19	2.35	35.15	44.52	54	-9.48
7320	48.03	PK	H	34.52	2.67	36.18	49.04	74	-24.96
7320	42.84	AV	H	34.52	2.67	36.18	43.85	54	-10.15
9760	*	*	*	*	*	*	*	*	*
12200	*	*	*	*	*	*	*	*	*

Frequency (MHz)	Reading (dBuV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2474	95.13	PK	V	30.18	2.07	35.16	92.22	114	-21.78
2474	85.7	AV	V	30.18	2.07	35.16	82.79	94	-11.21
4948	48.02	PK	V	32.42	2.23	34.27	48.4	74	-25.6
4948	46.13	AV	V	32.42	2.23	34.27	46.51	54	-7.49
7422	48.27	PK	V	35.91	2.68	36.29	50.57	74	-23.43
7422	44.57	AV	V	35.91	2.68	36.29	46.87	54	-7.13
9896	*	*	*	*	*	*	*	*	*
12370	*	*	*	*	*	*	*	*	*
2474	96.24	PK	H	30.18	2.07	35.16	93.33	114	-20.67
2474	88.07	AV	H	30.18	2.07	35.16	85.16	94	-8.84
4948	48.27	PK	H	32.42	2.23	34.27	48.65	74	-25.35
4948	46.31	AV	H	32.42	2.23	34.27	46.69	54	-7.31
7422	47.05	PK	H	35.91	2.68	36.29	49.35	74	-24.65
7422	46.29	AV	H	35.91	2.68	36.29	48.59	54	-5.41
9896	*	*	*	*	*	*	*	*	*
12370	*	*	*	*	*	*	*	*	*

Remark:

1. Emission Level= Reading+ Antenna Factor+ Cable Loss-Preamplifier Gain
2. Margin=Emission Level - Limit
3. “*” means the test results were attenuated more than 20dB below the permissible limits, so the results don’t record in the report.
4. For fundamental frequency test， RBW 3MHz VBW 10MHz peak detector is for PK value， RMS detector is for AV value .

Radiated Band Edge:

Lowest Channel								
Peak Value								
Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol.
2390.00	55.32	29.15	3.41	34.01	53.87	74	-20.13	V
2400.00	57.16	29.16	3.43	34.01	55.74	74	-18.26	V
2390.00	55.09	29.15	3.41	34.01	53.64	74	-20.36	H
2400.00	56.42	29.16	3.43	34.01	55	74	-19	H
Average Value								
2390.00	44.32	29.15	3.41	34.01	42.87	54	-11.13	V
2400.00	45.05	29.16	3.43	34.01	43.63	54	-10.37	V
2390.00	44.19	29.15	3.41	34.01	42.74	54	-11.26	H
2400.00	43.68	29.16	3.43	34.01	42.26	54	-11.74	H

Highest Channel								
Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
2483.50	56.32	29.28	3.53	34.03	55.1	74	-18.9	V
2500.00	57.04	29.3	3.56	34.01	55.89	74	-18.11	V
2483.50	55.29	29.28	3.53	34.03	54.07	74	-19.93	H
2500.00	57.19	29.3	3.56	34.01	56.04	74	-17.96	H
Average Value								
2483.50	45.22	29.28	3.53	34.03	44.93	54	-9.07	V
2500.00	44.13	29.3	3.56	34.01	44.84	54	-9.16	V
2483.50	46.29	29.28	3.53	34.03	46	54	-8	H
2500.00	45.08	29.3	3.56	34.01	45.79	54	-8.21	H

Remark:

1. Emission Level= Reading+ Antenna Factor+ Cable Loss-Preamplifier Gain
2. Margin=Emission Level - Limit

8 BAND EDGE EMISSION

8.1 TEST PROCEDURE

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz, Sweep = auto
Detector function = peak, Trace = max hold

8.2 TEST RESULTS


Marker 1 2.474400000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Mkr1 2.474 40 GHz
-3.426 dBm
10 dB/div
Log
Ref 10.00 dBm
Start 2.47000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.50000 GHz
Sweep 2.880 ms (601 pts)
1 N 1 f 2.474 40 GHz -3.426 dBm
2 N 1 f 2.475 90 GHz -30.100 dBm
3 N 1 f 2.478 95 GHz -31.778 dBm
4 N 1 f 2.480 90 GHz -32.527 dBm

9 20 dB Bandwidth Measurement

Test Method : ANSI C63.10: 2013

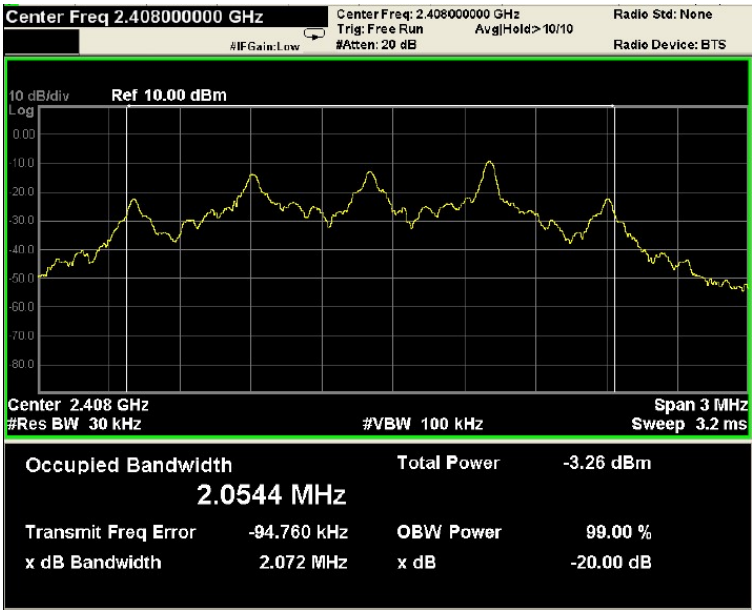
9.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;

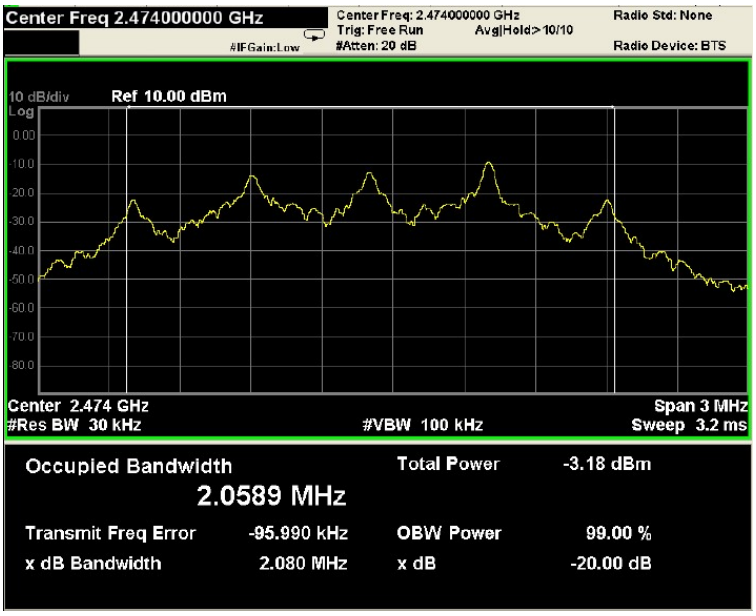
2. Set the spectrum analyzer: RBW = 30kHz, VBW = 100kHz

9.2 Test Result

Channel number	Channel frequency (MHz)	20dB Down BW(KHz)
01	2408	2072.0
17	2440	2078.0
34	2474	2080.0


Center Freq 2.408000000 GHz
Center Freq: 2.408000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
10 dB/div
Log
Ref 10.00 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 2.408 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 3 MHz
Sweep 3.2 ms
Occupied Bandwidth
2.0544 MHz
Total Power -3.26 dBm
Transmit Freq Error -94.760 kHz
OBW Power 99.00 %
x dB Bandwidth 2.072 MHz
x dB -20.00 dB


Center Freq 2.440000000 GHz
Center Freq: 2.440000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
10 dB/div
Log
Ref 10.00 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 2.44 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 3 MHz
Sweep 3.2 ms
Occupied Bandwidth
2.0545 MHz
Total Power -3.47 dBm
Transmit Freq Error -95.700 kHz
OBW Power 99.00 %
x dB Bandwidth 2.078 MHz
x dB -20.00 dB


Center Freq 2.474000000 GHz
Center Freq: 2.474000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
#IFGain:Low
10 dB/div
Log
Ref 10.00 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Center 2.474 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 3 MHz
Sweep 3.2 ms
Occupied Bandwidth
2.0589 MHz
Total Power
-3.18 dBm
Transmit Freq Error
-95.990 kHz
OBW Power
99.00 %
x dB Bandwidth
2.080 MHz
x dB
-20.00 dB

10 Antenna Requirement

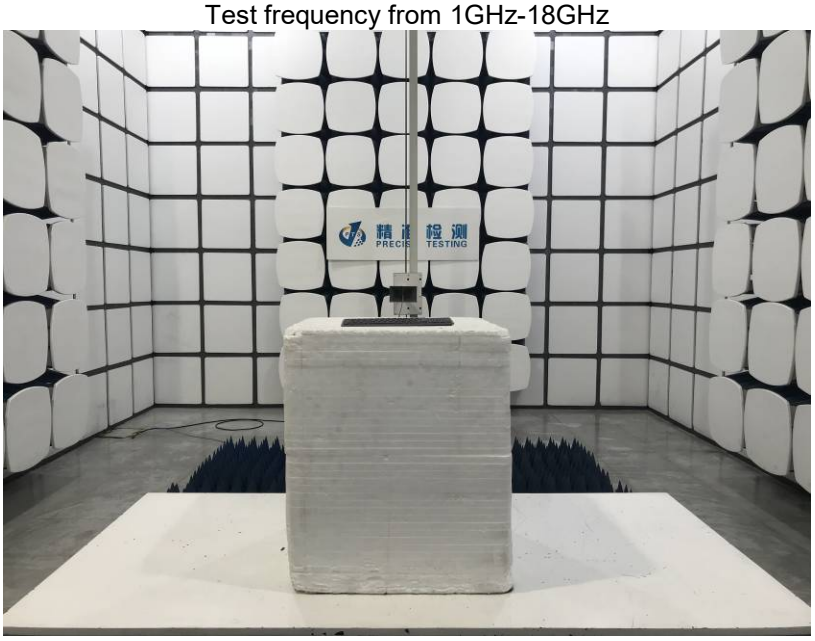
The antenna is permanently attached on PCB, no consideration of replacement. Please refer to internal Photos for details.

11 TEST PHOTOS

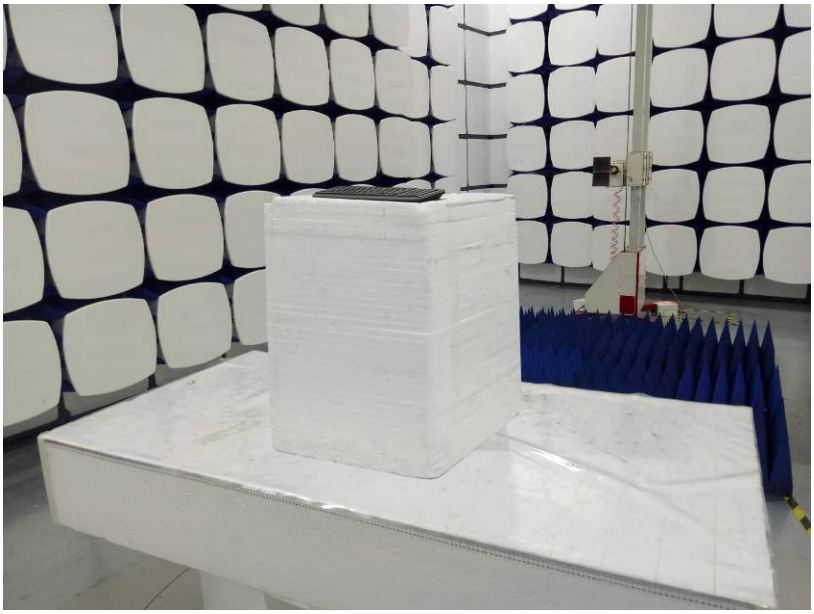
Radiated Spurious Emissions

Test Frequency From 30MHz-1000MHz

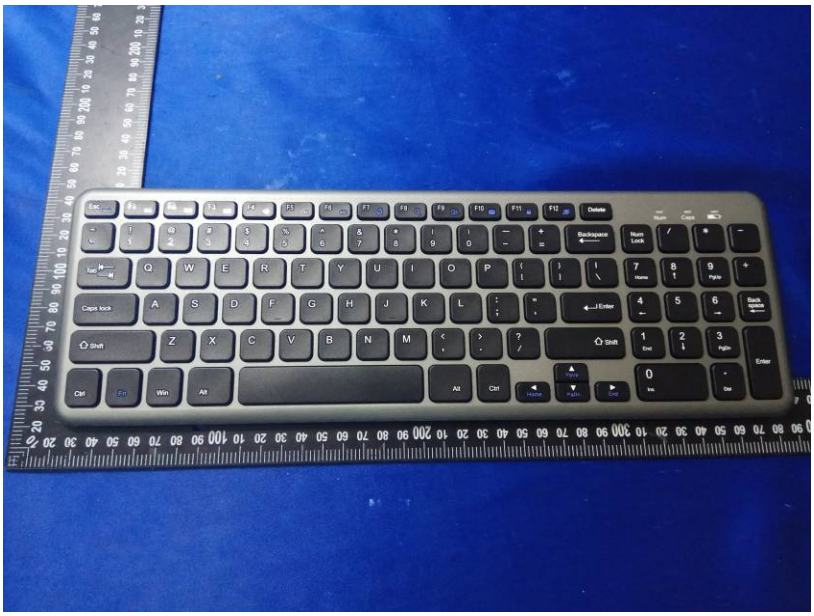
Test frequency from 1GHz-18GHz

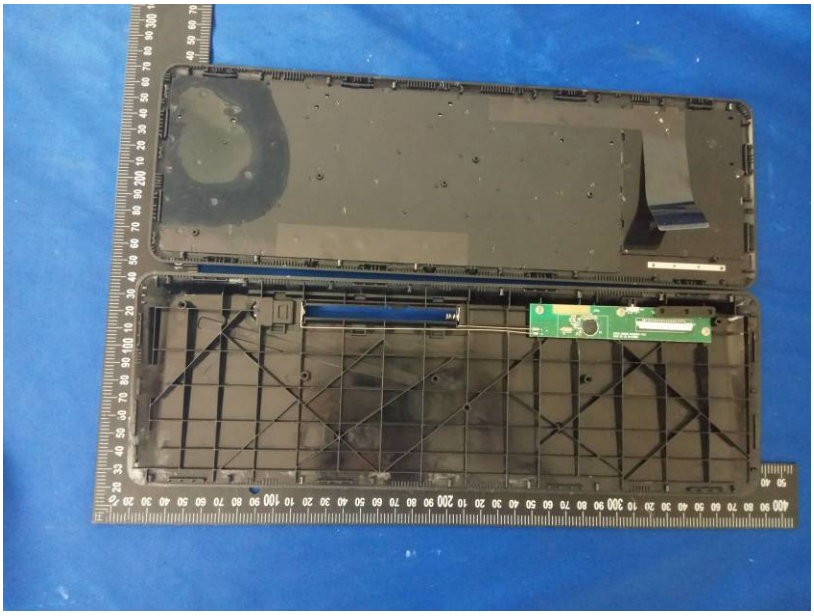


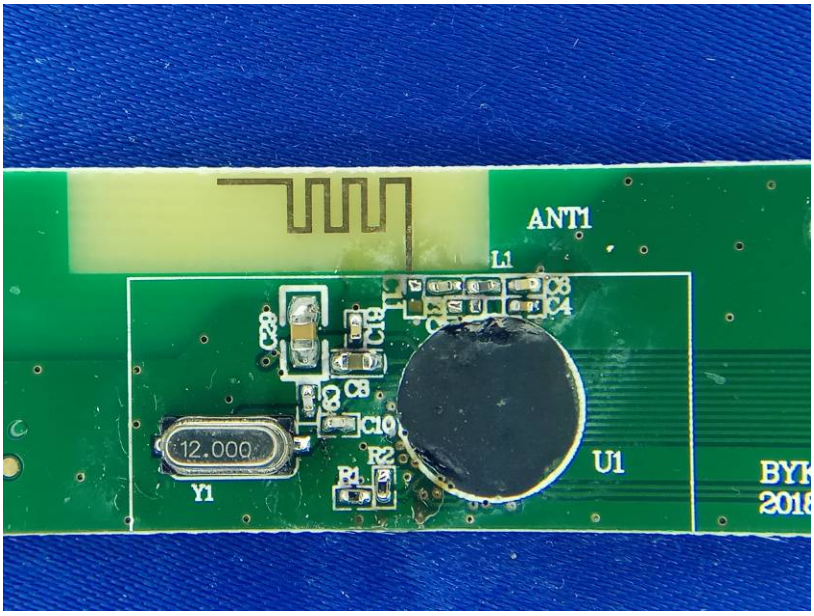
Test frequency from 18GHz-25GHz

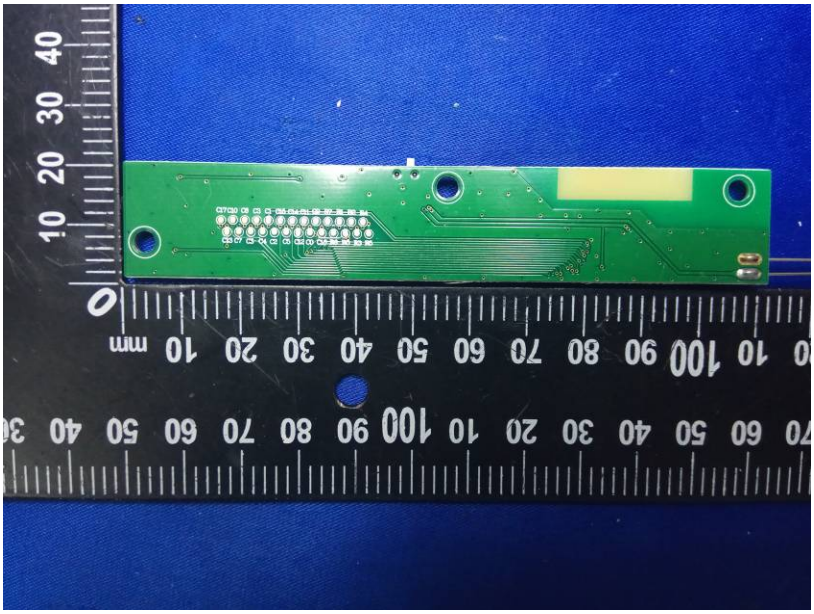


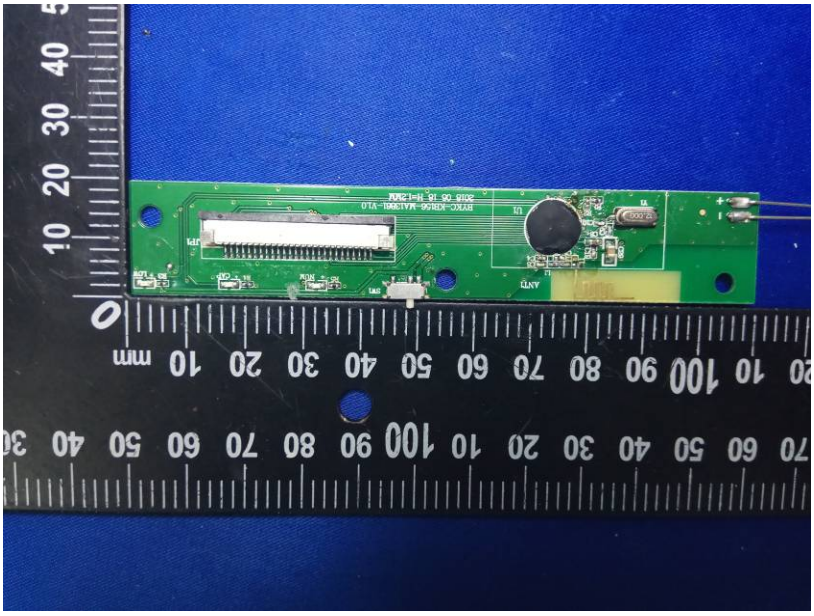
12 EUT PHOTOS






ANT1
L1
C8
C4
C18
C9
C3
C10
12.000
Y1
R2
R1
U1





******THE END REPORT******