FCC Test Report

Part 15 subpart C

Client Information:

Applicant: Fujian New Times Digital Technology Co., Ltd.

Applicant add.: New Times Ind Park,Hanjiang Dis.,Putian,Fujian,China

Product Information:

Product Name: Wireless Optic Mouse

Model No.: M-127

Derivative model No.: MX96XX, MXX-96XN

Brand Name: N/A

FCC ID: UGKNTDWOMM127

Standards: CFR 47 FCC PART 15 SUBPART C:2017 section 15.249

Prepared By:

Dongguan Yaxu (AiT) Technology Limited

Add. : No.22, Jinqianling Third Street, Jitigang, Huangjiang, Dongguan, Guangdong, China

Date of Receipt:	Mar. 20, 2016	Date of Test:	Mar. 20~Apr. 05, 2017
Date of Issue:	Apr. 06, 2017	Test Result:	Pass

This device described above has been tested by Dongguan Yaxu (AiT) Technology Limited., and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

*This test report must not be used by the client to claim product endorsement by any agency of the U.S. government.

Reviewed by: Seal-Chen

Approved by:

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2 Test Summary

2.1 Compliance with FCC Part 15 subpart C

Test	Test Requirement	Standard Paragraph	Result
Field Strength of Fundamental	FCC PART 15 C section 15.249 (a)	ANSI C63.10: Clause 6.6	PASS
Field Strength of Unwanted Emissions	FCC PART 15 C section 15.249 (a) section 15.249 (d)	ANSI C63.10: Clause 6.4, 6.6 and 6.7	PASS
Band Edges	FCC PART 15 C section 15.249 (d)	ANSI C63.10: Clause 6.9.2	PASS
Occupied Bandwidth	FCC PART 15 C section 15.215(c)	ANSI C63.10: Clause 6.9.1	PASS
Conducted Emissions at Mains Terminals	FCC PART 15 C section 15.207	ANSI C63.10: Clause 6.2	N/A

Remark:
EUT: In this whole report EUT means Equipment Under Test. Tx: In this whole report Tx (or tx) means Transmitter. Rx: In this whole report Rx (or rx) means Receiver. RF: In this whole report RF means Radio Frequency.
ANSI C63.10: the detail version is ANSI C63.10:2013 in the whole report.

2.2 Measurement Uncertainty

All measurements involve certain levels of uncertainties, the maximum value of the uncertainty as below:

No.	Item	Uncertainty
1	Conducted Emission Test	1.20dB
2	Radiated Emission Test	3.30dB
3	RF power,conducted	0.16dB
4	RF power density,conducted	0.24dB
5	Spurious emissions,conducted	0.21dB
6	All emissions,radiated(<1G)	4.68dB
7	All emissions,radiated(>1G)	4.89dB

3 General Information

3.1 General Description of EUT

Manufacturer:	Fujian New Times Digital Technology Co., Ltd.
Manufacturer Address:	New Times Ind Park,Hanjiang Dis.,Putian,Fujian,China
EUT Name:	Wireless Optic Mouse
Model No.:	M-127
Operation frequency:	2402 MHz to 2480 MHz
Number of channel:	40 channels
Modulation Type and Antenna Type:	GFSK Printed Antenna
Data rate:	2Mbps
H/W No.:	V1.3
S/W No.:	00
Antenna Gain:	-1.52 dBi
Brand Name:	N/A
Derivative model No.:	MX96XX, MXX-96XN
Power Supply Range:	DC 3V(2*1.5V AA battery)
Power Supply:	DC 3V from battery
Power Cord:	N/A
Signal Cable:	N/A
Model description:	According to the declaration from the applicant, the electrical circuit design, layout, components used and internal wiring were identical for all models, with only difference being the model name. Therefore only one model M-127 was tested in this report.

3.2 Test Location

All tests were performed at:
Dongguan Yaxu (AiT) Technology Limited
No.22, Jinqianling Third Street, Jitigang, Huangjiang, Dongguan, Guangdong, China.
Tel.: +86.769.82020499 Fax.: +86.769.82020495
The FCC Registration No. of Dongguan Yaxu (AiT) Technology Limited is 248337.

Description of Channel:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	20	2442
01	2404	21	2444
02	2406	22	2446
03	2408	23	2448
04	2410	24	2450
05	2412	25	2452
06	2414	26	2454
07	2416	27	2456
08	2418	28	2458
09	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	39	2480

4 Description of Test conditions

4.1 E.U.T. Operation

Test Voltage:	DC 3V from battery(Using a new battery)
Temperature:	20.0 -25.0 °C
Humidity:	38-50 % RH
Atmospheric Pressure:	1000 -1010 mbar
Test frequencies and frequency range:	According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and, if required, reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table: According to the 15.33 (a) For an intentional radiator, the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to at least the frequency shown in the following table:

Number of fundamental frequencies to be tested in EUT transmit band

Frequency range in which device operates	Number of frequencies	Location in frequency range of operation
1 MHz or less	1	Middle
1 MHz to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle and 1 near bottom

Frequency range of radiated emission measurements

Lowest frequency generated in the device	Upper frequency range of measurement
9 kHz to below 10 GHz	10th harmonic of highest fundamental frequency or to 40 GHz, whichever is lower
At or above 10 GHz to below 30 GHz	5th harmonic of highest fundamental frequency or to 100 GHz, whichever is lower
At or above 30 GHz	5th harmonic of highest fundamental frequency or to 200 GHz, whichever is lower, unless otherwise specified

4.2 EUT Peripheral List

No.	Equipment	Manufacturer	Model No.	Serial No.	Power cord	signal cable
1	N/A	N/A	N/A	N/A	N/A	N/A

4.3 Test Peripheral List

No.	Equipment	Manufacturer	EMC Compliance	Model No.	Serial No.	Power cord	signal cable
1	N/A	N/A	N/A	N/A	N/A	N/A	N/A

5 Equipments List for All Test Items

No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	Spectrum Analyzer	ADVANTEST	R3182	150900201	2016.06.29	2017.06.28
2	EMI Measuring Receiver	R&S	ESR	101660	2016.06.29	2017.06.28
3	Low Noise Pre Amplifier	Tsj	MLA-10K01-B01-27	1205323	2016.06.29	2017.06.28
4	Low Noise Pre Amplifier	Tsj	MLA-0120-A02-34	2648A04738	2016.06.29	2017.06.28
5	TRILOG Super Broadband test Antenna	SCHWARZBECK	VULB9160	9160-3206	2016.06.29	2017.06.28
6	Broadband Horn Antenna	SCHWARZBECK	BBHA9120D	452	2016.06.29	2017.06.28
7	SHF-EHF Horn	SCHWARZBECK	BBHA9170	BBHA9170367	2016.06.29	2017.06.28
8	Loop Antenna	ARA	PLA-1030/B	1029	2016.06.29	2017.06.28
9	Radiated Cable 1#（30MHz-1GHz）	FUJIKURA	5D-2W	01	2016.06.29	2017.06.28
10	Radiated Cable 2#（1GHz -25GHz）	FUJIKURA	10D2W	02	2016.06.29	2017.06.28
11	Conducted Cable 1#(9KHz-30MHz)	FUJIKURA	1D-2W	01	2016.06.29	2017.06.28
12	SMA Antenna connector	Dosin	Dosin-SMA	N/A	N/A	N/A
Note: The SMA antenna connector is soldered on the PCB board in order to perform conducted tests and this SMA antenna connector is listed in the equipment list.						

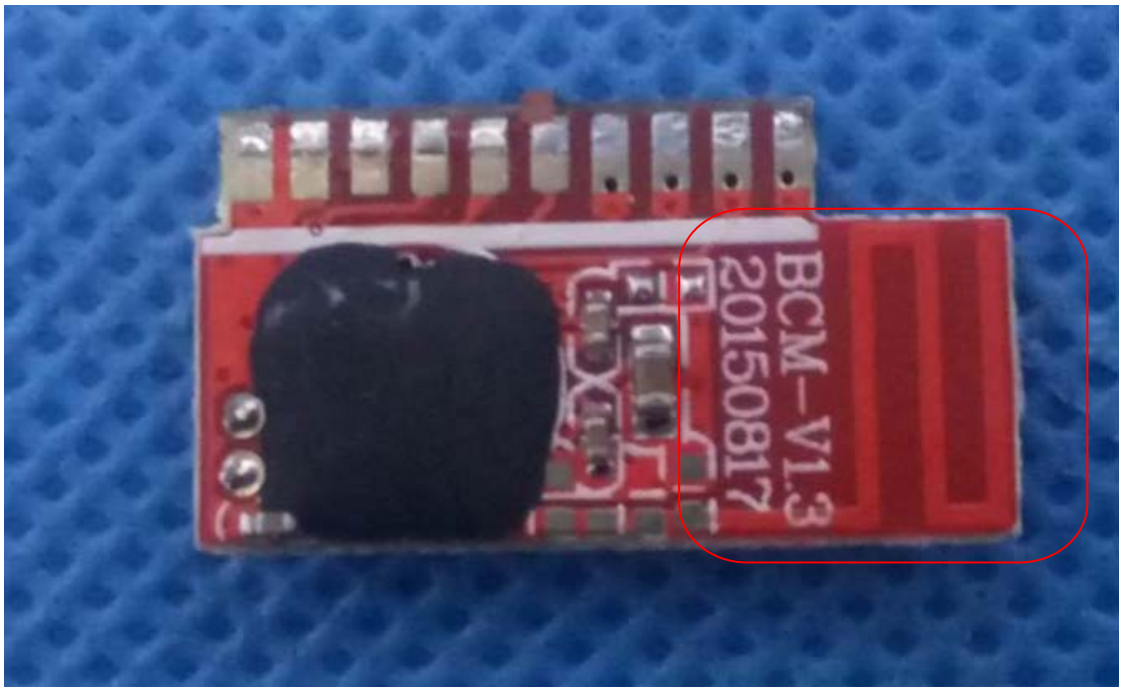
6 Test Result

6.1 Antenna Requirement

Standard requirement

EUT Antenna

The antenna is Printed Antenna and no consideration of replacement. The maximum gain of the antenna is -1.52 dBi.



Test result: The unit does meet the FCC requirements.

6.2 Field Strength of Fundamental& Field Strength of Unwanted Emissions& Band Edge

Test Requirement: FCC Part15 C section 15.249

(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (dBμV/m @ 3m)	Field Strength of Harmonics (dBμV/m @ 3m)
902 to 928	94.0	54.0
2400 to 2483.5	94.0	54.0
5725 to 5875	94.0	54.0
24000 to 24250	108.0	68.0

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Limits: The fundamental frequency rang is in the frequency band of the EUT is 2402 MHz ~ 2480 MHz

The limit for AVG field strength dBμV/m for the fundamental frequency = 94.0 dBμV/m.

The limit for Peak field strength dBμV/m for the fundamental frequency = 114.0 dBμV/m.

No fundamental is allowed in the restricted bands.

The limit for AVG field strength dBμV/m for the harmonics and other above 1G frequencies = 54.0 dBμV/m.

The limit for Peak field strength dBμV/m for the harmonics and other above 1G frequencies = 74.0 dBμV/m.

Test Method: ANSI C63.10: Clause 6.4, 6.6 and 6.7 for Field Strength of Fundamental& Field Strength of Unwanted Emissions

ANSI C63.10: Clause 6.9.2 for Band Edge

Status: Pre-test the EUT in continuous transmitting mode with setup as stand-alone in X, Y, Z threes axes, found the worst case is X axes and report the data.

Measurement Distance: 3m (Semi-Anechoic Chamber)

Frequency range: 9 kHz – 25 GHz for transmitting mode.

Test instrumentation resolution bandwidth
9 kHz (9 kHz - 30 MHz), 120 kHz (30 MHz - 1000 MHz), 1 MHz (1000 MHz – 25 GHz)

Detector: For PK and QP value:

RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz

VBW ≥ RBW

Sweep = auto

Detector function = peak

Trace = max hold

For AV value:

RBW = 1 MHz for f ≥ 1 GHz,

VBW =10 Hz

Sweep = auto

Detector function = peak

Trace = max hold

Test Procedure:

1)9 kHz to 30 MHz emissions:

For testing performed with the loop antenna, testing was performed in accordance to ANSI C63.10. The centre of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT, During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane.

2)30 MHz to 1 GHz emissions:

For testing performed with the bi-log type antenna, testing was performed in accordance to ANSI C63.10. The measurement is performed with the EUT rotated 360º, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.

3)1 GHz to 25 GHz emissions:

Test site with RF absorbing material covering the ground plane that met the site validation criterion called out in CISPR 16-1-4:2007 was used to perform radiated emission test above 1 GHz.

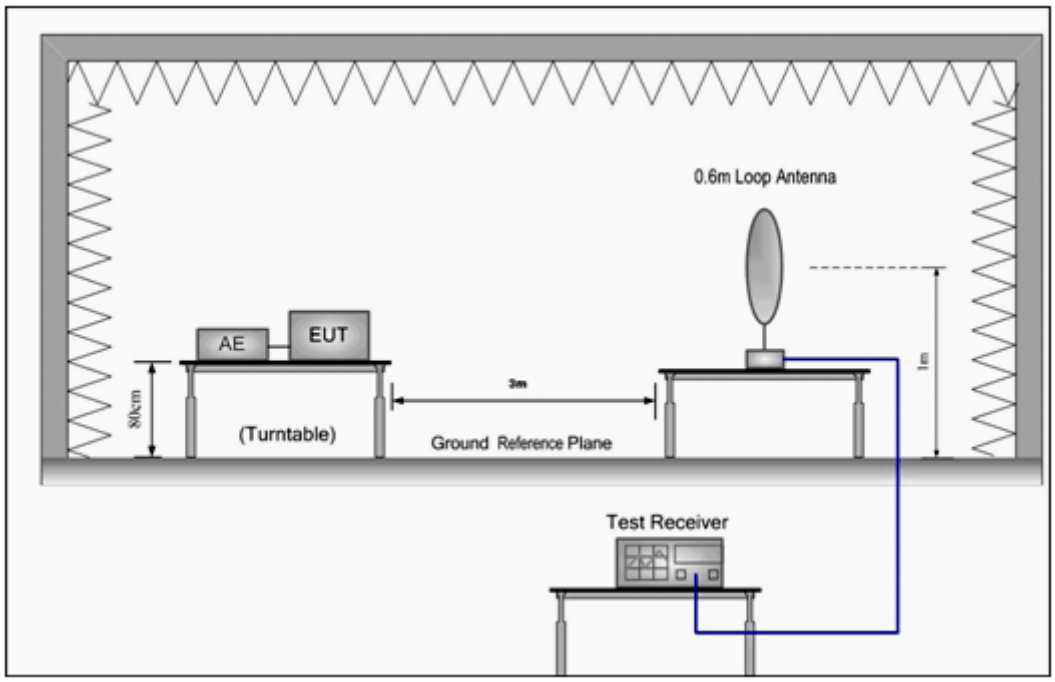
For testing performed with the horn antenna, testing was performed in accordance to ANSI C63.10. The measurement is performed with the EUT rotated 360º, the antenna height scan between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.

For the radiated emission test above 1GHz:

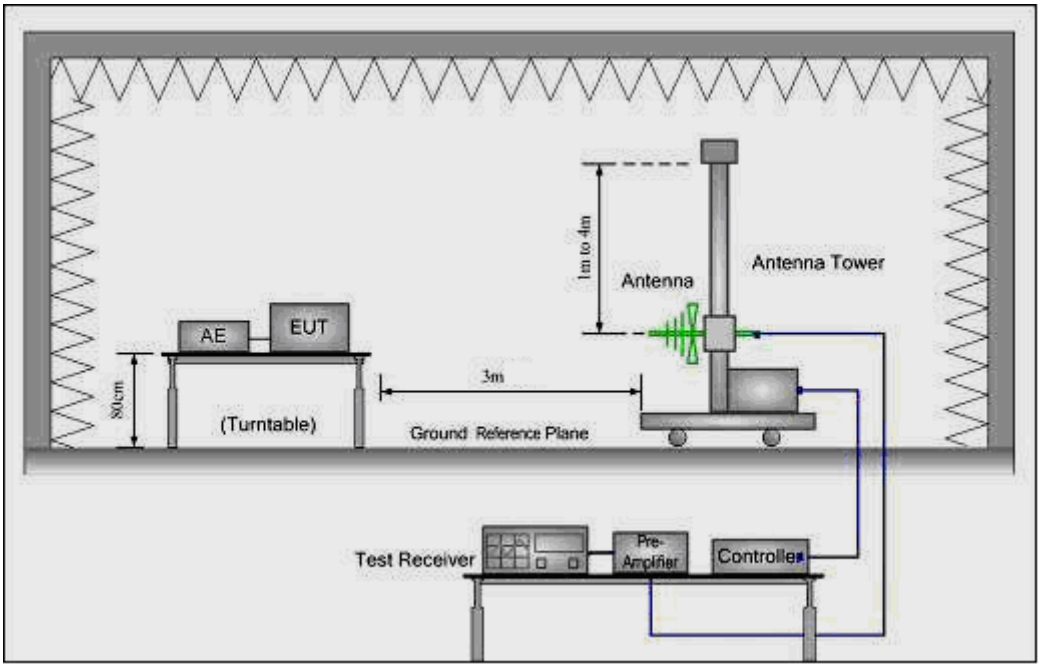
Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

Test Configuration:

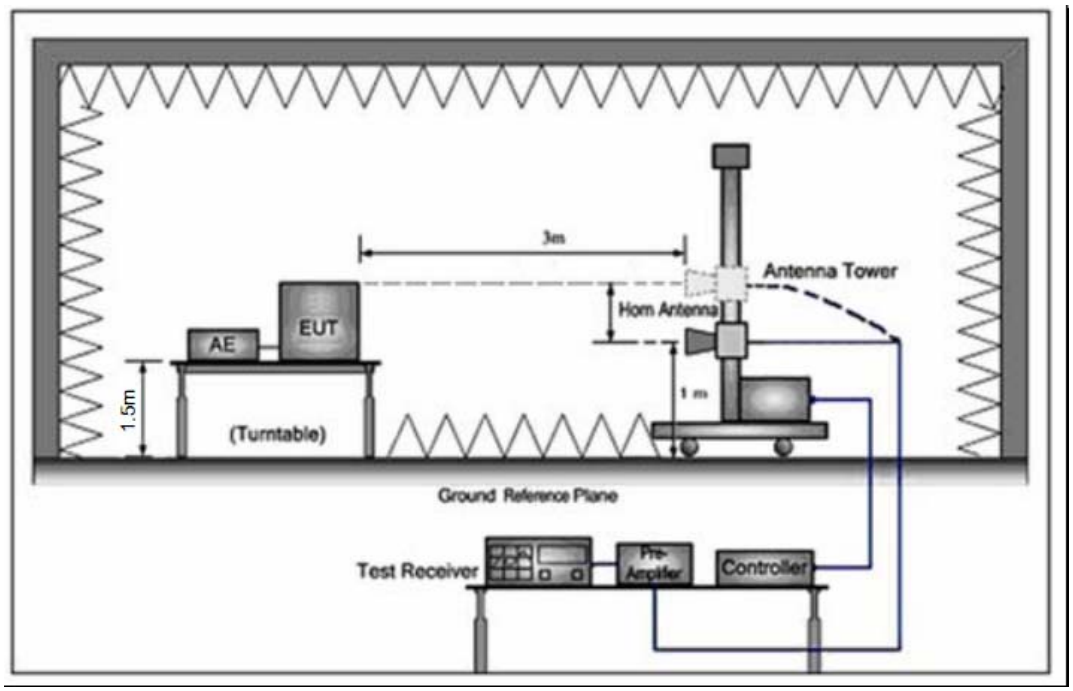
1) 9 kHz to 30 MHz emissions:



2) 30 MHz to 1 GHz emissions:



3) 1 GHz to 25 GHz emissions:



The field strength is calculated by adding the Antenna Factor, Cable Loss & Per-amplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna, Factor + Cable Loss – Preamplifier Factor

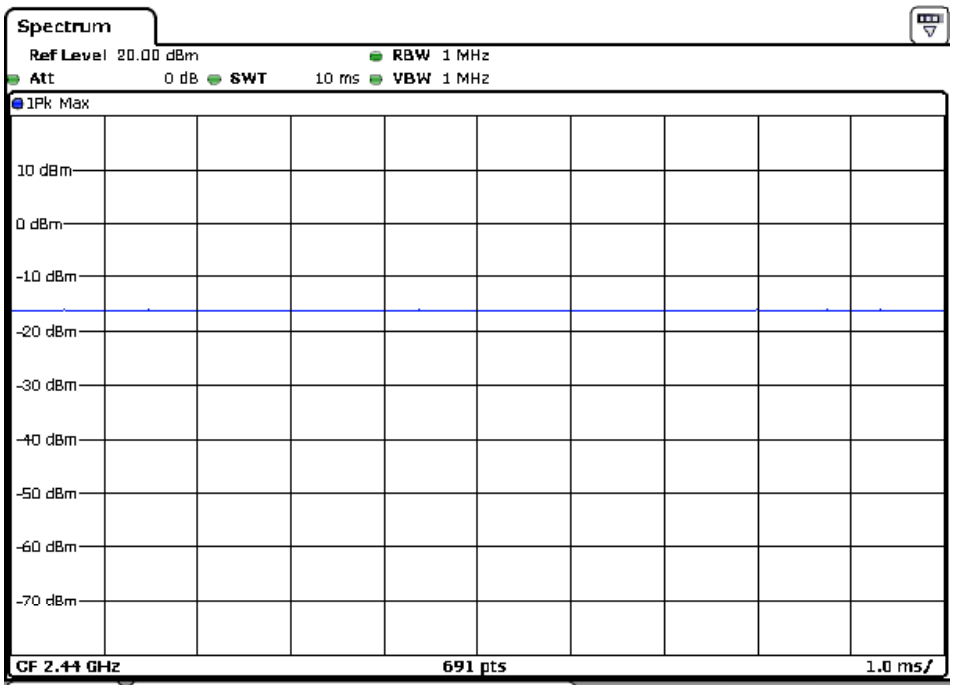
And according 15.35(a)

15.35(a) On any frequency or frequencies below or equal to 1000 MHz, the limits shown are based on measuring equipment employing a CISPR quasi-peak detector function and related measurement bandwidths, unless otherwise specified. The specifications for the measuring instrument using the CISPR quasi-peak detector can be found in Publication 16 of the International Special Committee on Radio Interference (CISPR) of the International Electrotechnical Commission. As an alternative to CISPR quasi-peak measurements, the responsible party, at its option, may demonstrate compliance with the emission limits using measuring equipment employing a peak detector function, properly adjusted for such factors as pulse desensitization, as long as the same bandwidths as indicated for CISPR quasi-peak measurements are employed.

Note: For pulse modulated devices with a pulse-repetition frequency of 20 Hz or less and for which CISPR quasi-peak measurements are specified, compliance with the regulations shall be demonstrated using measuring equipment employing a peak detector function, properly adjusted for such factors as pulse desensitization, using the same measurement bandwidths that are indicated for CISPR quasi-peak measurements.

According to 15.35 (b) Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1 MHz. When average radiated emission measurements are specified in this part, including average emission measurements below 1000 MHz, there also is a limit on the peak level of the radio frequency emissions. Unless otherwise specified, e.g., see §§ 15.250, 15.252, 15.255, and 15.509-15.519 of this part, the limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device, e.g., the total peak power level. Note that the use of a pulse desensitization correction factor may be needed to determine the total peak emission level. The instruction manual or application note for the measurement instrument should be consulted for determining pulse desensitization factors, as necessary.

7.2.1 Duty cycle measurement:



7.2.2 Radiated Emissions Test Data

9 kHz~30 MHz Field Strength of Unwanted Emissions. Quasi-Peak Measurement

The measurements with active loop antenna were greater than 20dB below the limit, so the test data were not recorded in the test report.

30 MHz~1 GHz Field Strength of Unwanted Emissions. Quasi-Peak Measurement

EUT:	Wireless Optic Mouse	Model Name :	M-127
Temperature:	25 ℃	Test Data	2017-03-28
Pressure:	1010 hPa	Relative Humidity:	50%
Test Mode :	TX mode(worse-case: 2402MHz)	Test Voltage :	DC 3V from battery
Measurement Distance	3 m	Frenqucy Range	30MHz to 1GHz
RBW/VBW	100KHz / 300KHz for spectrum, RBW=120KHz for receiver.		

(a) Antenna polarization: Horizontal

Frequency (MHz)	Reading Level (dBuV)	Correct Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Type
38.6160	31.69	-14.49	17.20	40.00	-22.80	QUASIPEAK
109.4116	31.38	-15.42	15.96	43.50	-27.54	QUASIPEAK
184.4898	30.48	-12.12	18.36	43.50	-25.14	QUASIPEAK
286.9823	30.93	-10.60	20.33	46.00	-25.67	QUASIPEAK
576.6443	30.96	-2.76	28.20	46.00	-17.80	QUASIPEAK
724.2611	31.87	-0.46	31.41	46.00	-14.59	QUASIPEAK

(b) Antenna polarization: Vertical

Frequency (MHz)	Reading Level (dBuV)	Correct Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Type
42.4508	33.82	-17.18	16.64	40.00	-23.36	QUASIPEAK
103.0800	30.78	-13.72	17.06	43.50	-26.44	QUASIPEAK
290.0172	30.93	-10.18	20.75	46.00	-25.25	QUASIPEAK
389.3549	30.92	-7.34	23.58	46.00	-22.42	QUASIPEAK
601.4265	30.47	-0.89	29.58	46.00	-16.42	QUASIPEAK
726.8052	31.22	-0.51	30.71	46.00	-15.29	QUASIPEAK

Note:

Measurement Level = Reading Level + Factor, Factor=Ant Factor + Cable Loss– Pre-amplifier.

1~25 GHz Field Strength of Fundamental & Field Strength of Unwanted Emissions.
Peak & Average Measurement.

EUT：	Wireless Optic Mouse	Model Name ：	M-127
Temperature：	25 ℃	Test Data	2017-03-28
Pressure：	1010 hPa	Relative Humidity：	50%
Test Mode ：	TX mode	Test Voltage ：	DC 3V from battery
Measurement Distance	3 m	Frenqucy Range	1GHz to 25GHz
RBW/VBW	1MHz/1MHz for Peak, 1MHz/10Hz for Average. non-restricted band: 100KHz/300KHz for Peak.		

Test at Low Channel in transmitting status						
Peak Measurement:						
Frequency (MHz)	**Reading Level (dBμV)**	**Factor (dB)**	**Emission Level (dBμV/m)**	**Limits (dBμV/m)**	**Margin (dB)**	**Antenna polarization**
2402.000	91.18	-5.68	85.50	114.00	-28.50	V
4804.000	52.47	5.06	57.53	74.00	-16.47	V
7206.000	44.87	7.03	51.90	74.00	-22.10	V
2402.000	96.40	-5.68	90.72	114.00	-23.28	H
4804.000	52.49	5.06	57.55	74.00	-16.45	H
7206.000	45.21	7.03	52.24	74.00	-21.76	H
Average Measurement:						
2402.000	76.28	-5.68	70.60	94.00	-23.40	V
4804.000	39.45	5.06	44.51	54.00	-9.49	V
7206.000	27.89	7.03	34.92	54.00	-19.08	V
2402.000	77.93	-5.68	72.25	94.00	-21.75	H
4804.000	34.70	5.06	39.76	54.00	-14.24	H
7206.000	27.43	7.03	34.46	54.00	-19.54	H

Band Edge:

Peak Measurement:

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Antenna polarization
2400.000	63.20	-5.70	57.50	74.00	-16.50	V
2483.500	42.08	-4.98	37.10	74.00	-36.90	V
2400.000	66.42	-5.70	60.72	74.00	-13.28	H
2483.500	45.97	-4.98	40.99	74.00	-33.01	H

Average Measurement:

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Antenna polarization
2400.000	38.85	-5.70	33.15	54.00	-20.85	V
2483.500	28.17	-4.98	23.19	54.00	-30.81	V
2400.000	40.03	-5.70	34.33	54.00	-19.67	H
2483.500	30.00	-4.98	25.02	54.00	-28.98	H

Test at Middle Channel in transmitting status						
Peak Measurement:						
Frequency (MHz)	**Reading Level (dBμV)**	**Factor (dB)**	**Emission Level (dBμV/m)**	**Limits (dBμV/m)**	**Margin (dB)**	**Antenna polarization**
2440.000	92.40	-5.36	87.04	114.00	-26.96	V
4880.000	52.95	5.14	58.09	74.00	-15.91	V
7320.000	45.70	7.52	53.22	74.00	-20.78	V
2440.000	97.30	-5.36	91.94	114.00	-22.06	H
4880.000	49.66	5.14	54.80	74.00	-19.20	H
7320.000	44.37	7.52	51.89	74.00	-22.11	H
Average Measurement:						
2440.000	77.68	-5.36	72.32	94.00	-21.68	V
4880.000	39.12	5.14	44.26	54.00	-9.74	V
7320.000	27.81	7.52	35.33	54.00	-18.67	V
2440.000	78.87	-5.36	73.51	94.00	-20.49	H
4880.000	34.15	5.14	39.29	54.00	-14.71	H
7320.000	28.80	7.52	36.32	54.00	-17.68	H

Band Edge:

Peak Measurement:

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Antenna polarization
2400.000	46.39	-5.70	40.69	74.00	-33.31	V
2483.500	44.72	-4.98	39.74	74.00	-34.26	V
2400.000	51.67	-5.70	45.97	74.00	-28.03	H
2483.500	52.11	-4.98	47.13	74.00	-26.87	H

Average Measurement:

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Antenna polarization
2400.000	28.03	-5.70	22.33	54.00	-31.67	V
2483.500	28.11	-4.98	23.13	54.00	-30.87	V
2400.000	30.23	-5.70	24.53	54.00	-29.47	H
2483.500	37.14	-4.98	32.16	54.00	-21.84	H

Test at High Channel in transmitting status						
Peak Measurement:						
Frequency (MHz)	**Reading Level (dBμV)**	**Factor (dB)**	**Emission Level (dBμV/m)**	**Limits (dBμV/m)**	**Margin (dB)**	**Antenna polarization**
2480.000	91.25	-5.01	86.24	114.00	-27.76	V
4960.000	54.59	5.22	59.81	74.00	-14.19	V
7440.000	47.22	8.06	55.28	74.00	-18.72	V
2480.000	97.49	-5.01	92.48	114.00	-21.52	H
4960.000	51.30	5.22	56.52	74.00	-17.48	H
7440.000	46.98	8.06	55.04	74.00	-18.96	H
Average Measurement:						
2480.000	79.88	-5.01	74.87	94.00	-19.13	V
4960.000	39.63	5.22	44.85	54.00	-9.15	V
7440.000	28.08	8.06	36.14	54.00	-17.86	V
2480.000	80.33	-5.01	75.32	94.00	-18.68	H
4960.000	33.20	5.22	38.42	54.00	-15.58	H
7440.000	29.06	8.06	37.12	54.00	-16.88	H

Band Edge:

Peak Measurement:

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Antenna polarization
2400.000	41.25	-5.70	35.55	74.00	-38.45	V
2483.500	60.14	-4.98	55.16	74.00	-18.84	V
2400.000	44.89	-5.70	39.19	74.00	-34.81	H
2483.500	60.54	-4.98	55.56	74.00	-18.44	H

Average Measurement:

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Antenna polarization
2400.000	27.91	-5.70	22.21	54.00	-31.79	V
2483.500	37.07	-4.98	32.09	54.00	-21.91	V
2400.000	28.22	-5.70	22.52	54.00	-31.48	H
2483.500	38.78	-4.98	33.80	54.00	-20.20	H

Remark:

1). The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Loss –Preamplifier Factor.

2). As shown in Section, for frequencies above 1000 MHz. the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

3). The test only perform the EUT in transmitting status since the test frequencies were over 1GHz only required transmitting status.

4). For Radiated Emissions fall in the restricted bands (2400MHz is worse case than 2390MHz and report it as above), which set out in Section 15.205 Restricted bands.

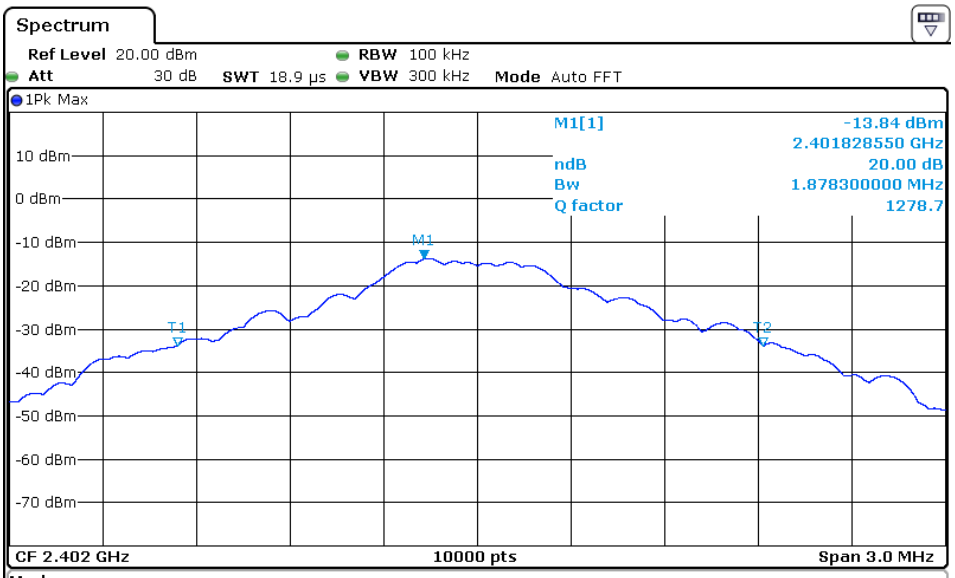
Also there is not any other emission which falls in restricted bands can be detected and reported.

Test result: The unit does meet the FCC requirements.

6.3 Occupied Bandwidth

Test Requirement:	FCC Part 15 C section 15.215 (c)Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.
Test Method:	ANSI C63.10: Clause 6.9.1 Operation within the band 2402 MHz to 2480 MHz
Method of measurement:	A small sample of the transmitter output was fed into the Spectrum Analyzer and the attached plot was taken.

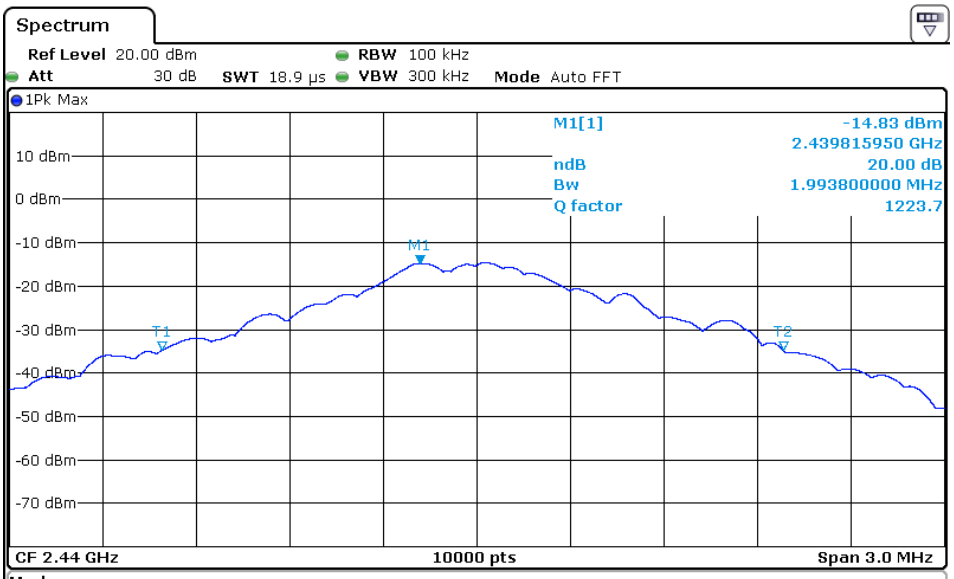
Test in the frequency 2402MHz (20 dB bandwidth)



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.40182855 GHz	-13.84 dBm	ndB down	1.8783 MHz
T1		1	2.40103775 GHz	-33.83 dBm	ndB	20.00 dB
T2		1	2.40291605 GHz	-33.85 dBm	Q factor	1278.7

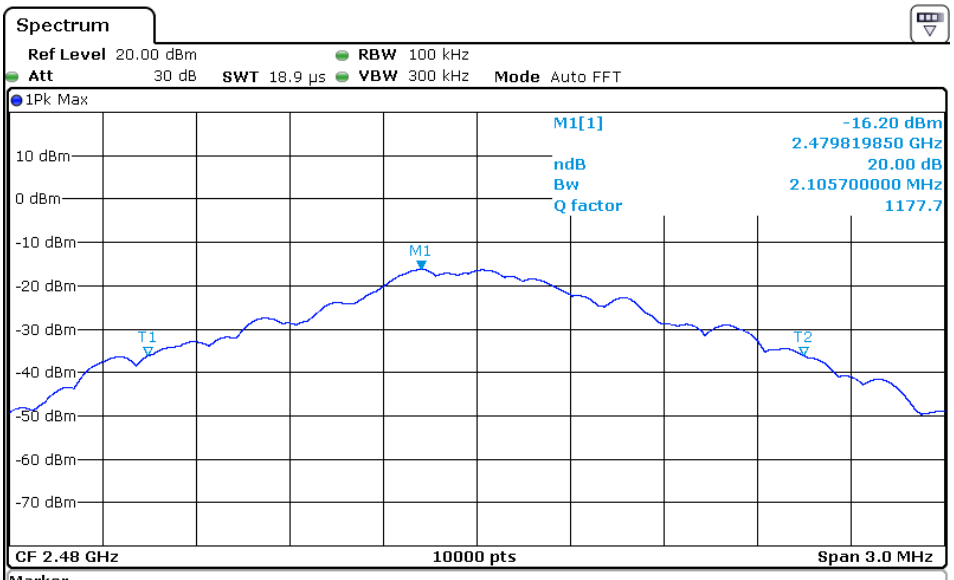
Test in the frequency 2440MHz (20 dB bandwidth)



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.43981595 GHz	-14.83 dBm	ndB down	1.9938 MHz
T1		1	2.43898855 GHz	-34.83 dBm	ndB	20.00 dB
T2		1	2.44098235 GHz	-34.83 dBm	Q factor	1223.7

Test in the frequency 2480MHz (20 dB bandwidth)



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.47981985 GHz	-16.20 dBm	ndB down	2.1057 MHz
T1		1	2.47894415 GHz	-36.19 dBm	ndB	20.00 dB
T2		1	2.48104985 GHz	-36.20 dBm	Q factor	1177.7

6.4 Conducted Emissions at Mains Terminals 150 kHz to 30 MHz

Test Requirement: FCC Part 15 C section 15.207

Test Method: ANSI C63.10: Clause 6.2

Frequency Range: 150 kHz to 30 MHz

Detector: Peak for pre-scan (9 kHz Resolution Bandwidth)

Test Limit

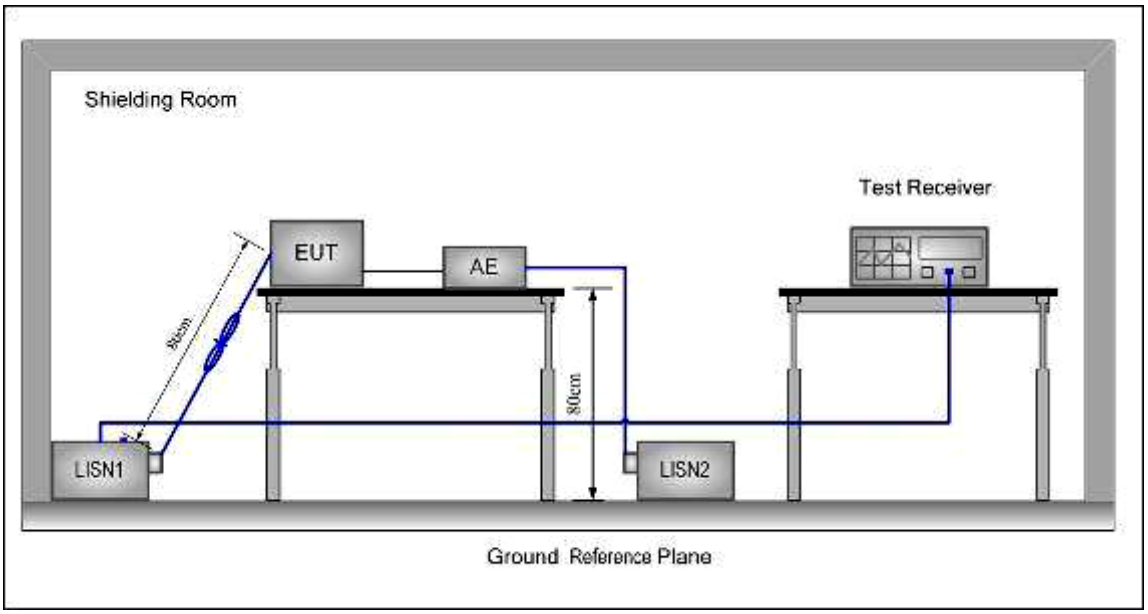
Limits for conducted disturbance at the mains ports of class B

Frequency Range (MHz)	**Class B Limit dB(μV)**	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
NOTE 1 The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.		

EUT Operation: Test in normal operating mode. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Test Configuration:



Test procedure:

1. The mains terminal disturbance voltage test was conducted in a shielded room.

2. The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.

3. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.

4. The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0,4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0,8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0,8 m from the LISN 2.

7.2.3 Measurement Data

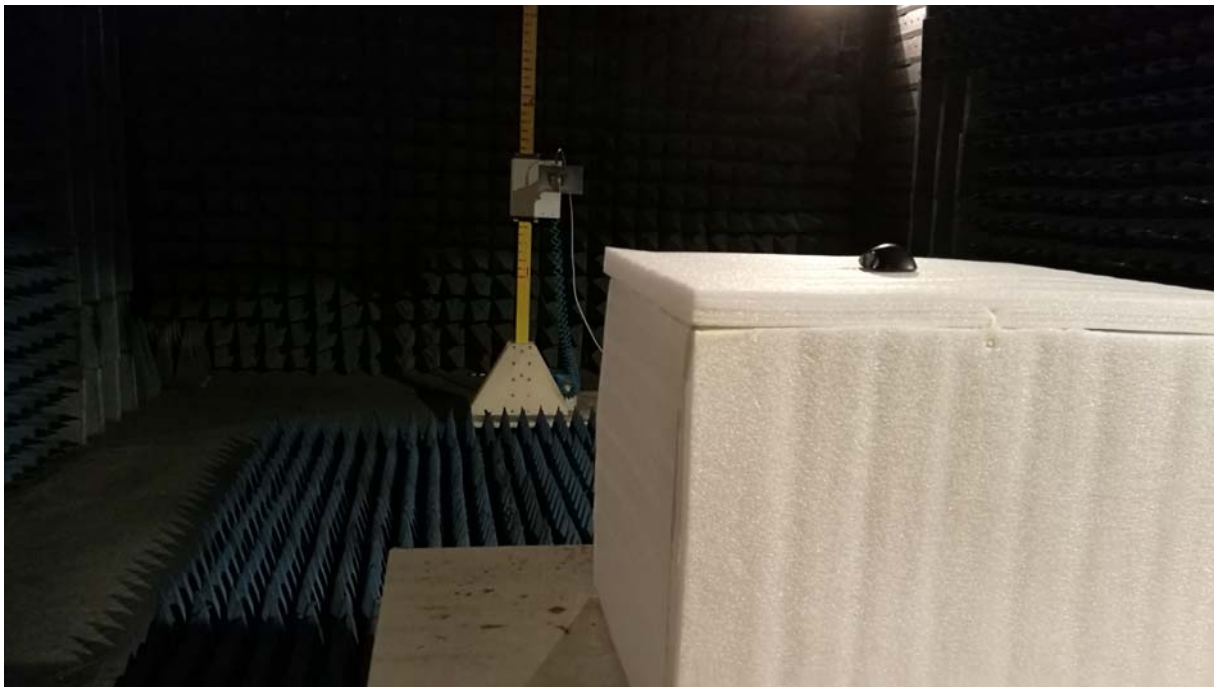
Remark: Because the EUT employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Measurements to demonstrate compliance with the conducted limits are not required for devices.

7 Photographs

7.1 Radiated Emission Test Setup

Below 1G

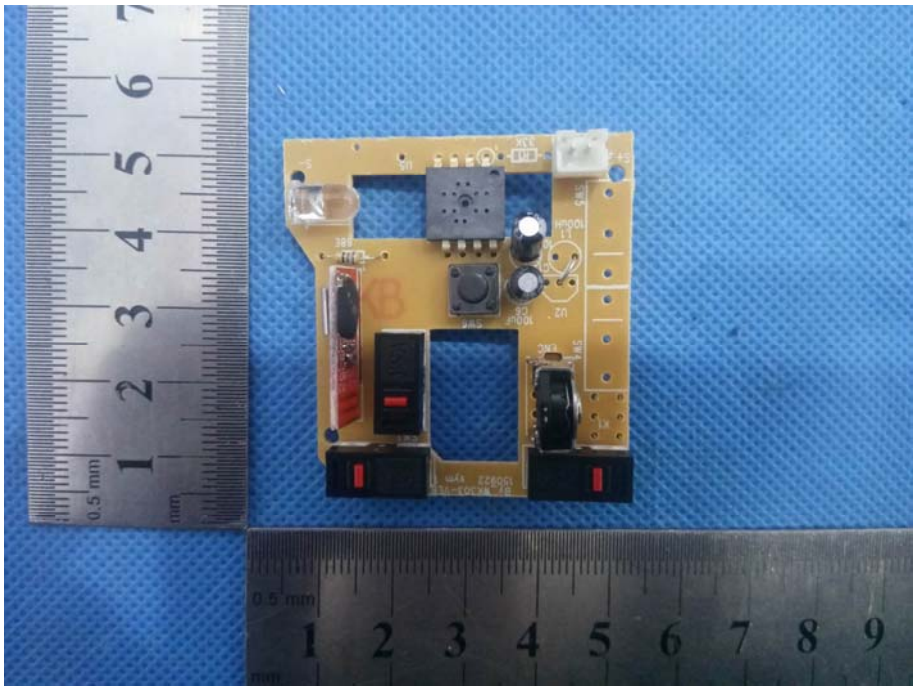
Above 1G

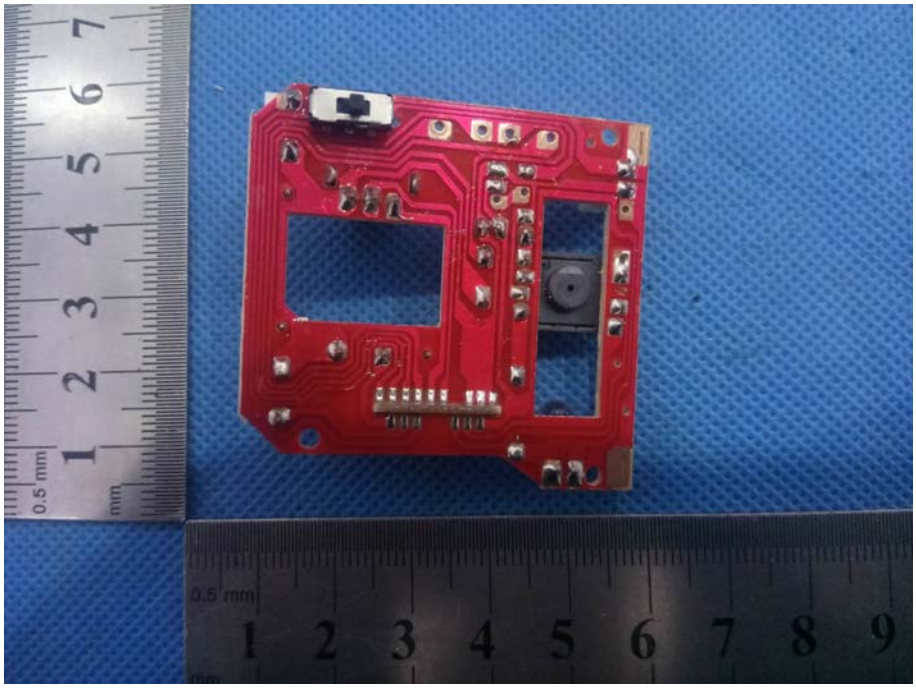


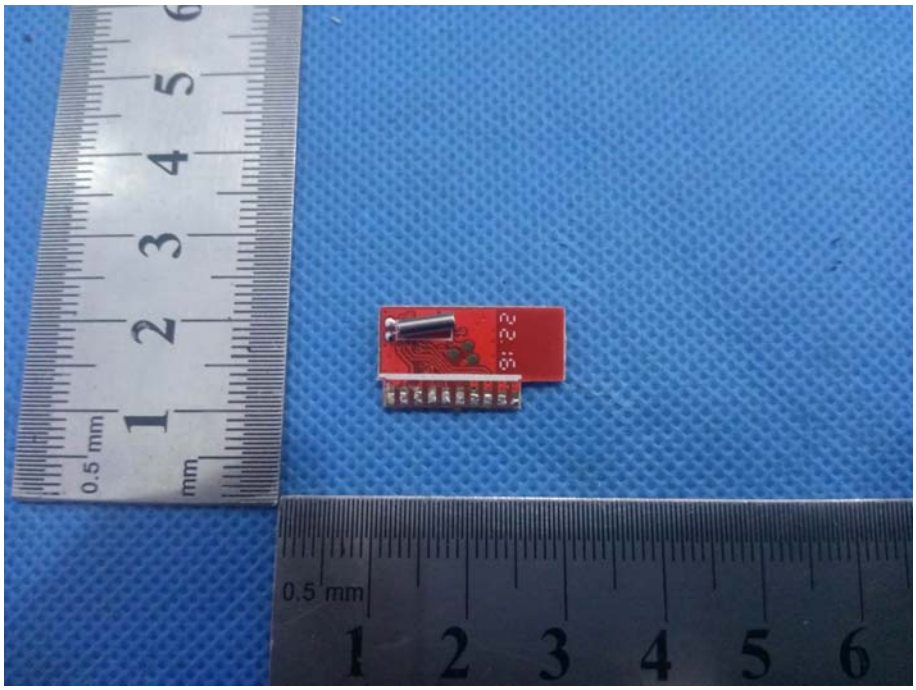
7.2 EUT Constructional Details

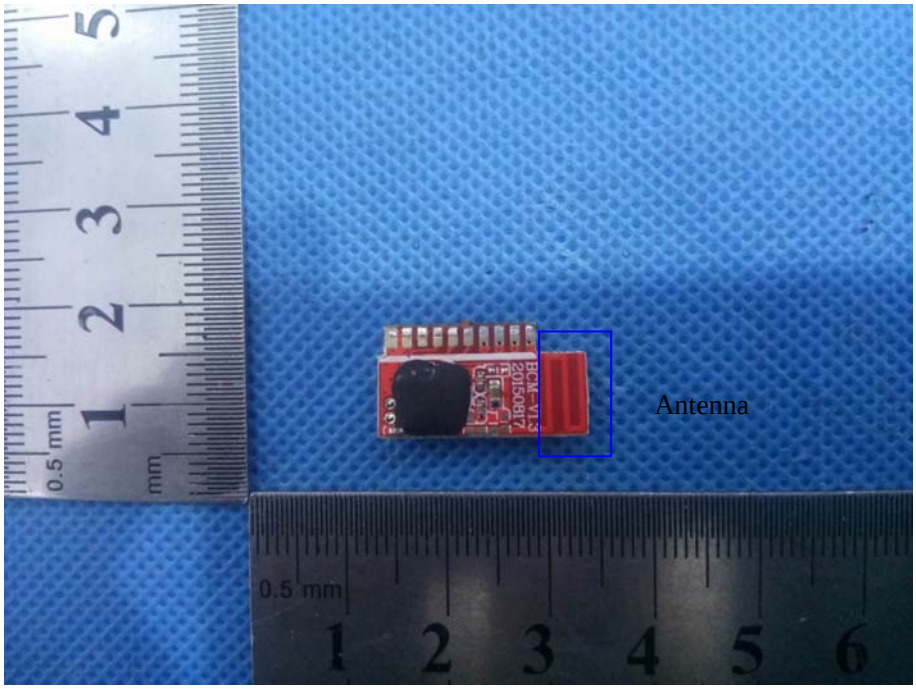
ON OFF
OPEN

ON OFF









End of report