

FCC Part 15C

Measurement And Test Report For

JIANGXI TONGGU JIANGQIAO TIMBER&BAMBOO INDUSTRY COMPANY. LTD

XIA YAOPU INDUSTRIAL ZONE, TONGGU COUNTY,
JIANGXI PROVINCE, CHINA

Model: WQ-93 WQ-100,WQ-110,WQ-N-YZ
(N can be 00-999,Y can be A~Z,Z can be A~Z)

Mar.18 ,2011

| | |
|---|--|
| This Report Concerns: <input checked="" type="checkbox"/> Original Report | Equipment Type: wireless mouse |
| Report Number: | MTI110302002RF |
| Test Engineer: | Bill Chen |
| Reviewed By: | Jason zheng |
| Approved & Authorized By: | Hebe lee |
| Test Date: | Mar.9-15 ,2011 |
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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior written consent of MTI Technology Laboratory Ltd.

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

| | |
|--------------------------|--|
| Applicant: | JIANGXI TONGGU JIANGQIAO TIMBER&BAMBOO INDUSTRY COMPANY. LTD |
| Address of applicant: | XIA YAOPU INDUSTRIAL ZONE, TONGGU COUNTY, JIANGXI PROVINCE, CHINA |
| Manufacturer: | JIANGXI TONGGU JIANGQIAO TIMBER&BAMBOO INDUSTRY COMPANY. LTD |
| Address of manufacturer: | XIA YAOPU INDUSTRIAL ZONE, TONGGU COUNTY, JIANGXI PROVINCE, CHINA |
| Equipment Under Test: | wireless mouse |
| Tested Model No.: | WQ-93 |
| Supplementary Models No: | WQ-100,WQ-110,WQ-N-YZ (N can be 00-999,Y can be A~Z,Z can be A~Z) Remark: supplementary models are only different in exterior with tested Model and with the same circuit construction |
| FCC ID: | |
| Type of Modulation: | GFSK |
| Antenna Type: | Integral Antenna |
| Frequency Band: | 2402~2480 MHz |
| Rated Power: | <10mW |
| Power Supply: | DC 3V (Tx); USB 5V (Rx) |

Remark: * The test data gathered are from the production sample provided by the manufacturer.

1.2 Related Submittal(s) / Grant (s)

This submittal(s) is a test report based on the Electromagnetic Interference (EMI) tests performed on the EUT. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4 - 2003.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.209, and 15.249 rules.

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 - 2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4 Test Facility

All measurement required was performed at laboratory of MTI Technology Laboratory Ltd. at 10F, Yinxing Business Building, Xixiang Road, Bao'an District, Shenzhen, P.R.China.

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

FCC – Registration No.: 167003

MTI Technology Laboratory Ltd. 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 our files. Registration 167003, May 04, 2009.

2. SYSTEM TEST CONFIGURATION

The tests documented in this report were performed in accordance with ANSI C63.4-2003 and FCC CFR 47 Part 15 Subpart C.

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The calibrated antennas used to sample the radiated field strength are mounted on a non-conductive, motorized antenna mast 3 or 10 meters from the leading edge of the turntable.

2.3 General Test Procedures

Conducted Emissions The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 7.1 of ANSI C63.4-2003. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak detector mode.

Radiated Emissions The EUT is placed on a turntable, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4-2003.

2.4 List of Measuring Equipments Used

| Items | Equipment | Manufacturer | Model No. | Serial No. | Last Cal | Calibration Period |
|-------|------------------------------|-----------------|-----------|--------------|----------|--------------------|
| 1 | EMI Test Receiver | ROHDE & SCHWARZ | ESI 26 | 100079 | 2010/11 | 1 year |
| 2 | Horn Antenna | R/S | CH14-H052 | 1091698 | 2010/11 | 1 year |
| 3 | 3m Semi- Anechoic Chamber | ETS | N/A | N/A | 2010/11 | 1 year |
| 1 | EMI Test Receiver | ROHDE & SCHWARZ | ESCS30 | 100038 | 2010/11 | 1 year |
| 2 | EMI Test Receiver | ROHDE & SCHWARZ | ESI 26 | 100009 | 2010/11 | 1 year |
| 3 | Receiver/ Spectrum Analyzer | ROHDE & SCHWARZ | ESCI | 100106 | 2010/11 | 1 year |
| 4 | Spectrum Analyzer | Agilent | E7405A | US41160415 | 2010/11 | 1 year |
| 5 | Artificial Mains | ROHDE & SCHWARZ | ESH2-Z5 | 100028 | 2010/11 | 1 year |
| 6 | Pulse Limiter | ROHDE & SCHWARZ | ESHSZ2 | 100044 | 2010/11 | 1 year |
| 7 | LISN | COM Power | LI-200 | 12212 | 2010/11 | 1 year |
| 8 | LISN | COM Power | LI-200 | 12019 | 2010/11 | 1 year |
| 9 | 3m/5m Semi- Anechoic Chamber | ETS | N/A | N/A | 2010/11 | 1 year |
| 10 | Ultra-Broadband Antenna | R/S | HL562 | 100015 | 2010/11 | 1 year |
| 11 | Horn Antenna | R/S | HF906 | 100039 | 2010/11 | 1 year |
| 12 | RF Test Panel | R/S | TS / RSP | 335015/ 0017 | N/A | N/A |
| 13 | Turntable | ETS | 2088 | 2149 | N/A | N/A |
| 14 | Antenna Mast | ETS | 2075 | 2346 | N/A | N/A |

3. SUMMARY OF TEST RESULTS

| FCC Rules | Description of Test | Result |
|-----------|------------------------------|--------|
| 15.203 | Antenna Requirement | Pass |
| 15.205 | Restricted Band of Operation | Pass |
| 15.209 | Radiated Emission | Pass |
| 15.249(a) | Field Strength | Pass |
| 15.249(d) | Out of Band Emission | Pass |

4. ANTENNA REQUIREMENT

4.1 Standard Applicable

Section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. 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.

4.2 Antenna Connected Construction

This product has a permanent antenna, fulfill the requirement of this section.

5. §15.205, §15.209, §15.249 (a)- RADIATED EMISSION

5.1 Standard Applicable

According to §15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

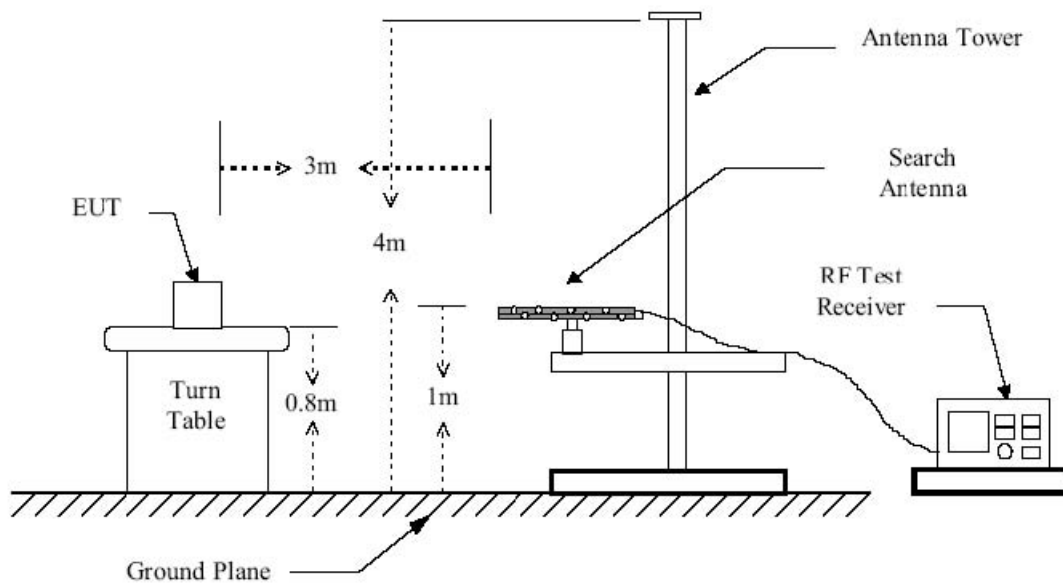
| Fundamental Frequency | Field strength of fundamental (milli-volts/meter) | Field strength of fundamental (micro-volts/meter) |
|-----------------------|---|---|
| 902-928 MHz | 50 | 500 |
| 2400-2483.5 MHz | 50 | 500 |
| 5725-5875 MHz | 50 | 500 |
| 24.0-24.25 GHz | 250 | 2500 |

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

EMISSIONS RADIATED OUTSIDE OF THE SPECIFIED FREQUENCY BANDS, EXCEPT FOR HARMONICS, SHALL BE ATTENUATED BY AT LEAST 20 dB BELOW THE LEVEL OF THE FUNDAMENTAL OR TO THE GENERAL RADIATED EMISSION LIMITS IN 15.209,WHICHEVER IS THE LESSER ATTENUATION.

Emissions that fall in the restricted bands (15.205) must be less than 54dBuV/m otherwise the spurious and harmonics must be attenuated by at least 20dB.

5.2 EUT Setup



5.3 Test Equipment List and Details

See section 2.4.

5.4 Test Procedure

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. 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 is a broadband antenna, and its 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 rotatable 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 10 dB 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 10 dB margin would be re-tested one by one using the quasi-peak method or average method as specified and then reported in Data sheet peak mode and QP mode.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.

5.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain}$$

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB μ V means the emission is 6dB μ V below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15 Limit}$$

5.6 Test Result

According to the data below, the FCC Part 15.205, 15.209 and 15.249 standards, and had the worst margin of:

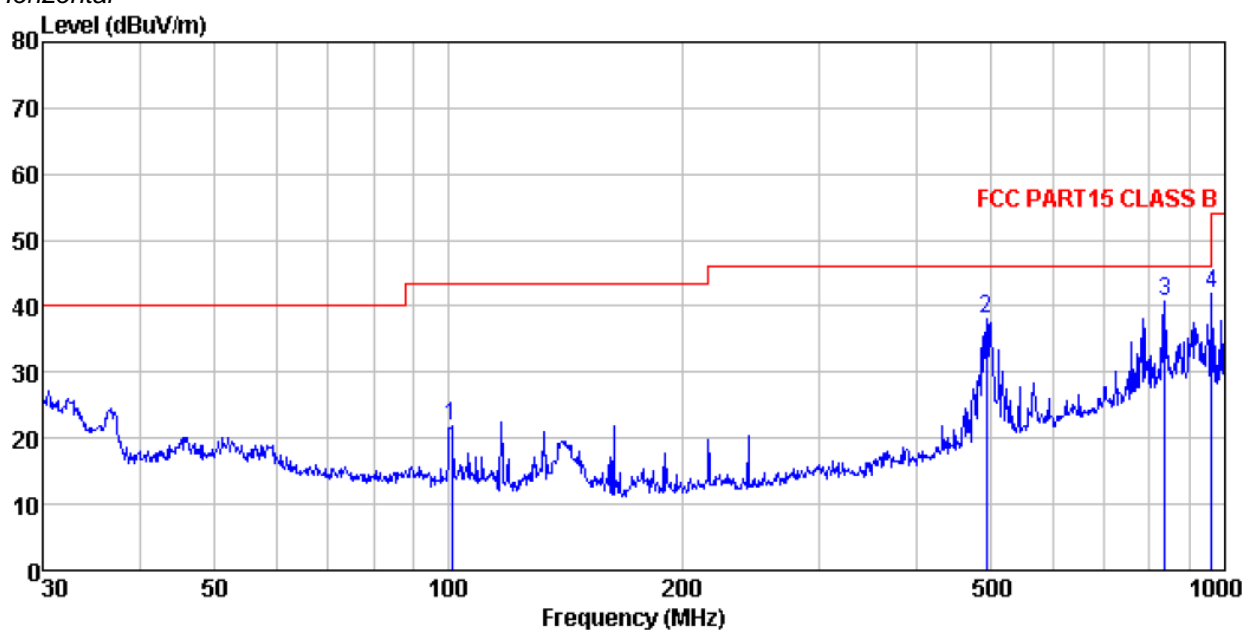
-4.30 dB μ V at 2402 MHz in the Horizontal polarization, 30 MHz to 25 GHz, 3Meters

Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

Plot of Radiation Emissions Test

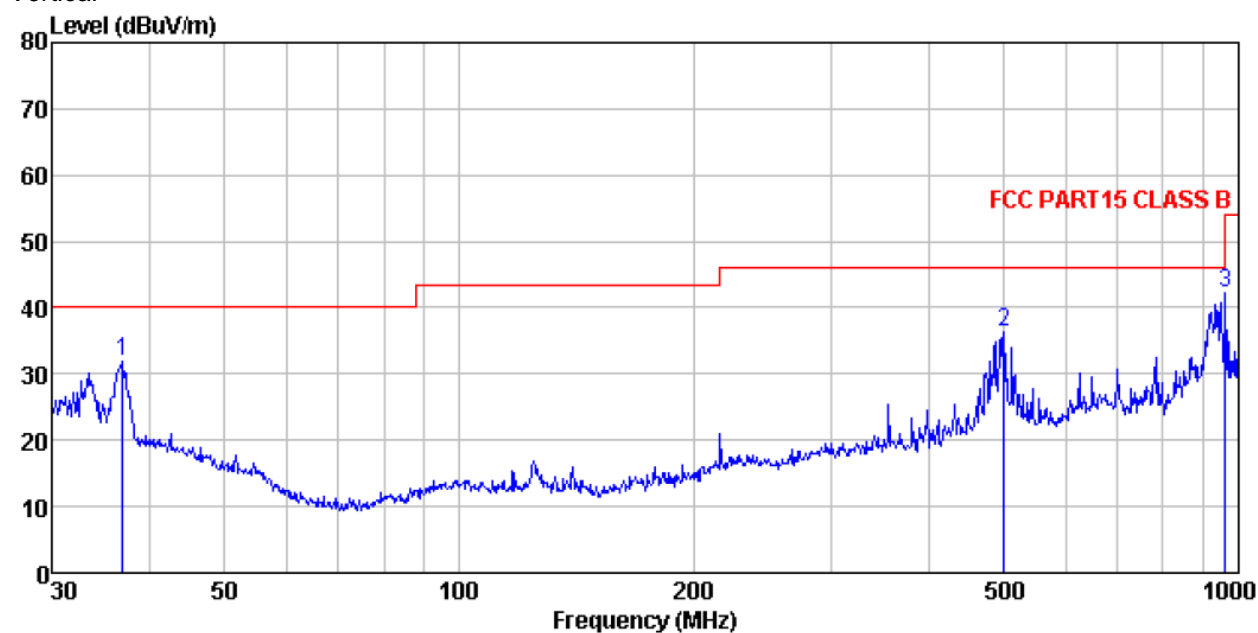
Transmitting below 1GHz- Low CH

Horizontal



| | ReadAntenna | Cable | Preamp | | | Limit | Over | |
|-------|-------------|--------|--------|--------|-------|-------|-------|-------------|
| Freq | Level | Factor | Loss | Factor | Level | Line | Limit | Remark |
| ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| MHz | dBm | dB/m | dB | dB | dBm/m | dBm/m | dB | |
| 1 | 100.93 | 34.93 | 12.71 | 1.16 | 26.86 | 21.94 | 43.50 | -21.56 Peak |
| 2 | 492.47 | 45.45 | 17.14 | 2.39 | 26.92 | 38.06 | 46.00 | -7.94 Peak |
| 3 | 836.24 | 39.69 | 24.08 | 3.21 | 26.17 | 40.81 | 46.00 | -5.19 Peak |
| 4 | 962.16 | 39.90 | 24.96 | 3.43 | 26.35 | 41.94 | 54.00 | -12.06 Peak |

Vertical



| | Freq | ReadAntenna Level | Cable Factor | Preamp Loss | Factor | Level | Limit Line | Over Limit | Remark |
|---|--------|----------------------|-----------------|----------------|--------|-------|---------------|---------------|--------|
| | MHz | dBm | dB/m | dB | dB | dBm/m | dBm/m | dB | |
| 1 | 37.02 | 39.69 | 18.64 | 0.63 | 27.04 | 31.92 | 40.00 | -8.08 | Peak |
| 2 | 499.42 | 39.47 | 21.19 | 2.40 | 26.90 | 36.16 | 47.00 | -10.84 | Peak |
| 3 | 962.16 | 39.18 | 26.04 | 3.43 | 26.35 | 42.30 | 47.00 | -4.70 | Peak |

Spurious Emission Above 1GHz

| Frequency MHz | Detector | Meter Reading dBuV | Direction Degree | Polar H / V | Antenna Loss dB | Cable loss dB | Amplifier dB | Correction Amplitude dBuV/m | Limit dBuV/m | Margin dB |
|---------------|----------|--------------------|------------------|-------------|-----------------|---------------|--------------|-----------------------------|--------------|-----------|
| Low CH | | | | | | | | | | |
| 4804.0 | AV | 30.6 | 240 | V | 34.1 | 5.2 | 33.0 | 36.9 | 54 | -17.1 |
| 4804.0 | AV | 33.5 | 341 | H | 34.1 | 5.2 | 33.0 | 39.8 | 54 | -14.2 |
| 4804.0 | PK | 42.9 | 177 | V | 34.1 | 5.2 | 33.0 | 49.2 | 74 | -24.8 |
| 4804.0 | PK | 45.7 | 28 | H | 34.1 | 5.2 | 33.0 | 52.0 | 74 | -22.0 |
| 7287.0 | AV | 28.2 | 325 | V | 37.4 | 6.1 | 33.5 | 38.2 | 54 | -15.8 |
| 7287.0 | AV | 32.3 | 159 | H | 37.4 | 6.1 | 33.5 | 42.3 | 54 | -11.7 |
| 7287.0 | PK | 39.8 | 77 | V | 37.4 | 6.1 | 33.5 | 49.8 | 74 | -24.2 |
| 7287.0 | PK | 43.6 | 267 | H | 37.4 | 6.1 | 33.5 | 53.6 | 74 | -20.4 |
| 2402.0 | AV | 88.5 | 122 | V | 29.1 | 3.7 | 34.0 | 87.3 | 94 | -6.7 |
| 2402.0 | AV | 90.9 | 32 | H | 29.1 | 3.7 | 34.0 | 89.7 | 94 | -4.3 |
| 2402.0 | PK | 99.9 | 45 | V | 29.1 | 3.7 | 34.0 | 98.7 | 114 | -15.3 |
| 2402.0 | PK | 102.5 | 115 | H | 29.1 | 3.7 | 34.0 | 101.3 | 114 | -12.7 |
| Middle CH | | | | | | | | | | |
| 4882.0 | AV | 31.1 | 90 | V | 34.1 | 5.2 | 33.0 | 37.4 | 54 | -16.6 |
| 4882.0 | AV | 32.8 | 8 | H | 34.1 | 5.2 | 33.0 | 39.1 | 54 | -14.9 |
| 4882.0 | PK | 42.9 | 134 | V | 34.1 | 5.2 | 33.0 | 49.2 | 74 | -24.8 |
| 4882.0 | PK | 46.7 | 45 | H | 34.1 | 5.2 | 33.0 | 53.0 | 74 | -21.0 |
| 7323.0 | AV | 29.4 | 78 | V | 37.4 | 6.1 | 33.5 | 39.4 | 54 | -14.6 |
| 7323.0 | AV | 31.7 | 315 | H | 37.4 | 6.1 | 33.5 | 41.7 | 54 | -12.3 |
| 7323.0 | PK | 41.0 | 43 | V | 37.4 | 6.1 | 33.5 | 51.0 | 74 | -23.0 |
| 7323.0 | PK | 43.7 | 67 | H | 37.4 | 6.1 | 33.5 | 53.7 | 74 | -20.3 |
| 2441.0 | AV | 88.2 | 133 | V | 29.1 | 3.7 | 34.0 | 87.0 | 94 | -7.0 |
| 2441.0 | AV | 90.1 | 78 | H | 29.1 | 3.7 | 34.0 | 88.9 | 94 | -5.1 |
| 2441.0 | PK | 99.6 | 23 | V | 29.1 | 3.7 | 34.0 | 98.4 | 114 | -15.6 |
| 2441.0 | PK | 101.0 | 110 | H | 29.1 | 3.7 | 34.0 | 99.8 | 114 | -14.2 |
| High CH | | | | | | | | | | |
| 4960.0 | AV | 31.9 | 67 | V | 34.1 | 5.2 | 33.0 | 38.2 | 54 | -15.8 |
| 4960.0 | AV | 35.1 | 331 | H | 34.1 | 5.2 | 33.0 | 41.4 | 54 | -12.6 |
| 4960.0 | PK | 43.5 | 90 | V | 34.1 | 5.2 | 33.0 | 49.8 | 74 | -24.2 |
| 4960.0 | PK | 47.6 | 61 | H | 34.1 | 5.2 | 33.0 | 53.9 | 74 | -20.1 |
| 7440.0 | AV | 31.6 | 44 | V | 37.4 | 6.1 | 33.5 | 41.6 | 54 | -12.4 |
| 7440.0 | AV | 32.9 | 67 | H | 37.4 | 6.1 | 33.5 | 42.9 | 54 | -11.1 |
| 7440.0 | PK | 43.4 | 68 | V | 37.4 | 6.1 | 33.5 | 53.4 | 74 | -20.6 |
| 7440.0 | PK | 45.1 | 10 | H | 37.4 | 6.1 | 33.5 | 55.1 | 74 | -18.9 |
| 2480.0 | AV | 86.8 | 23 | V | 29.1 | 3.7 | 34.0 | 85.6 | 94 | -8.4 |
| 2480.0 | AV | 89.2 | 321 | H | 29.1 | 3.7 | 34.0 | 88.0 | 94 | -6.0 |
| 2480.0 | PK | 98.5 | 67 | V | 29.1 | 3.7 | 34.0 | 97.3 | 114 | -16.7 |
| 2480.0 | PK | 99.8 | 94 | H | 29.1 | 3.7 | 34.0 | 98.6 | 114 | -15.4 |

Note: Testing is carried out with frequency rang 30MHz to the tenth harmonics, which above 4th Harmonics is close to the noise base even antenna close up to 1meter distance according the measurement of ANSI C63.4. Emissions 20dB lower than the limit are not reported.

6. §15.249(b) OUT OF BAND EMISSIONS

6.1 Limits of bandedge Measurement

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 §15.209, whichever is the lesser attenuation.

6.2 Test Equipment List and Details

See section 2.4.

6.3 Test Procedure

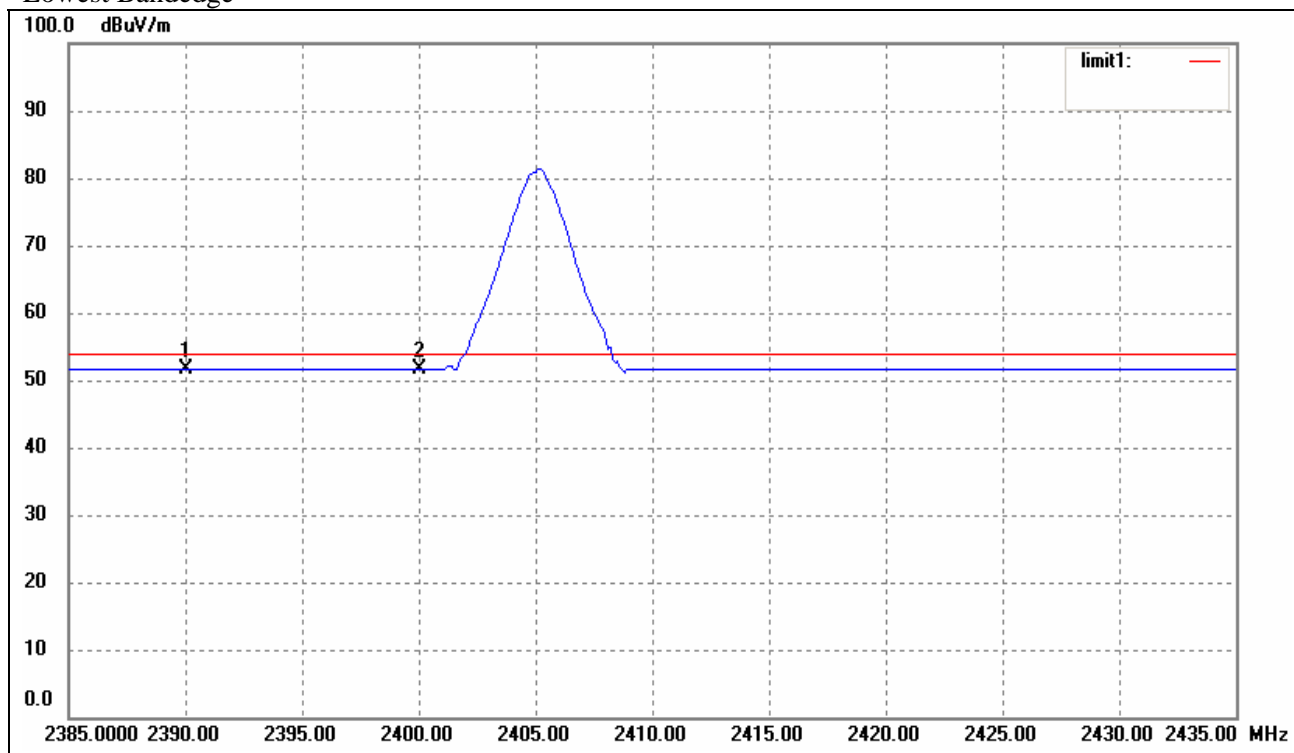
As the radiation test, set the Lowest and Highest Transmitting Channel, observed the outside band of 2400MHz to 2483.5MHz, than mark the higher-level emission for comparing with the FCC rules.

6.4 Test Result /Plots

| Frequency MHz | Limit dBuv | Result |
|------------------|---------------|--------|
| Low Edge | <54 | Pass |
| High Edge | <54 | Pass |

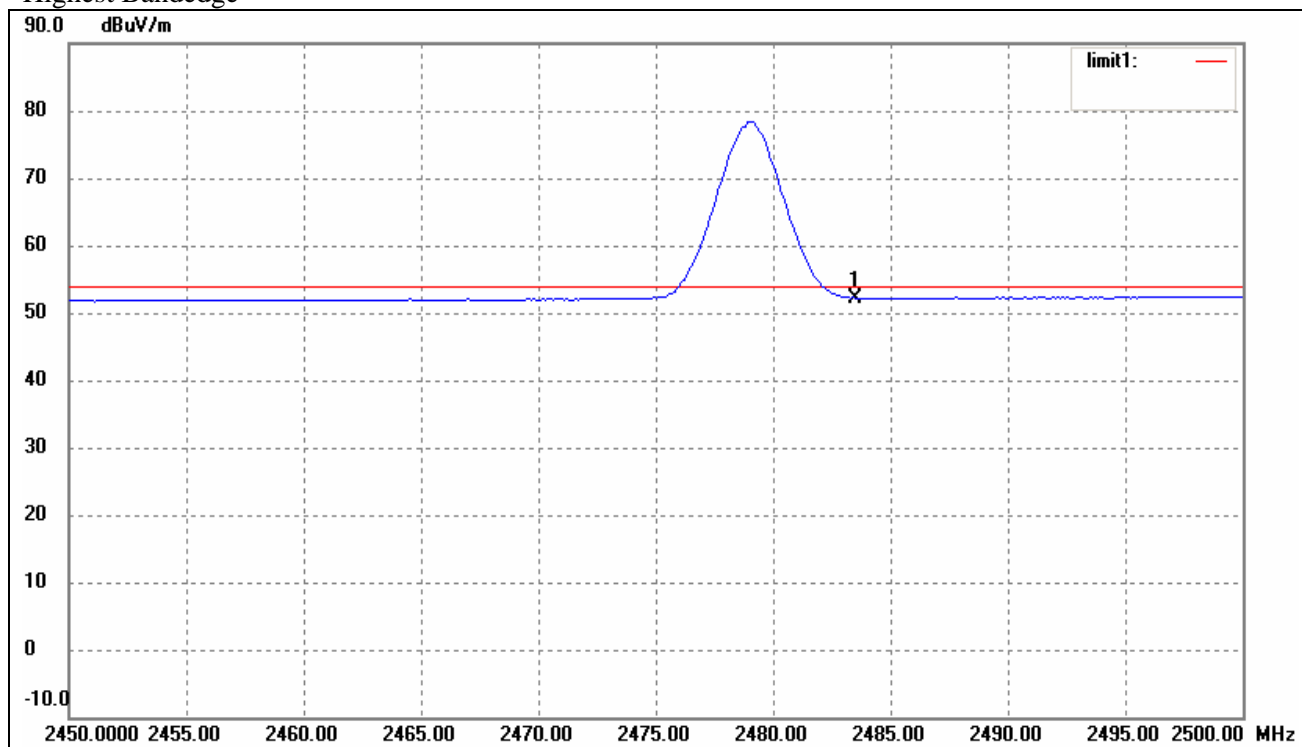
The edge emissions are below the FCC 15.209 Limits. Please refer to the test plots below.

Lowest Bandedge



| No. | Frequency (MHz) | Reading (dBuV/m) | Correct dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|------------------|
| 1 | 2390.000 | 11.98 | 39.66 | 51.64 | 54.00 | -2.36 | Average Detector |
| | 2390.000 | 22.09 | 39.66 | 61.75 | 74.00 | -12.25 | Peak Detector |
| 2 | 2400.000 | 11.82 | 39.76 | 51.58 | / | / | Average Detector |

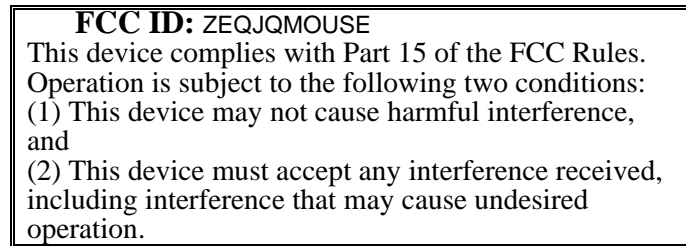
Highest Bandedge



| No. | Frequency (MHz) | Reading (dBuV/m) | Correct dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|------------------|
| 1 | 2483.500 | 12.07 | 40.18 | 52.25 | 54.00 | -1.75 | Average Detector |
| | 2483.500 | 22.86 | 40.18 | 63.04 | 74.00 | -10.96 | Peak Detector |

APPENDIX A - PRODUCT LABELING

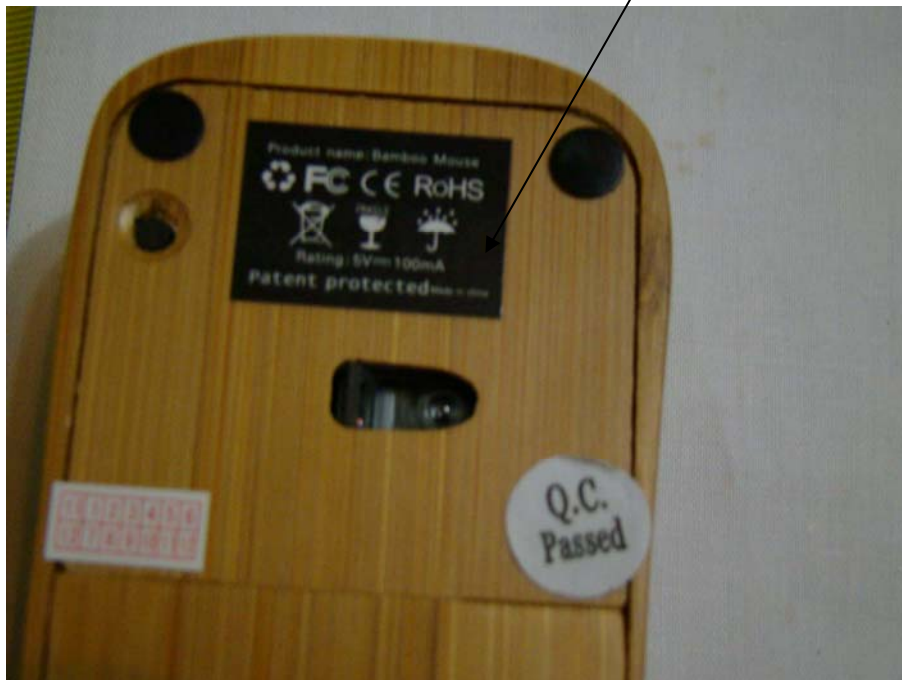
Proposed FCC ID Label Format



Specifications: Text is Black in color and justified. Labels are printed in indelible ink on permanent adhesive silk-screened onto the EUT or shall be affixed at a conspicuous location on the EUT.

Proposed Label Location on EUT

FCC ID Label Location



EUT - Front View

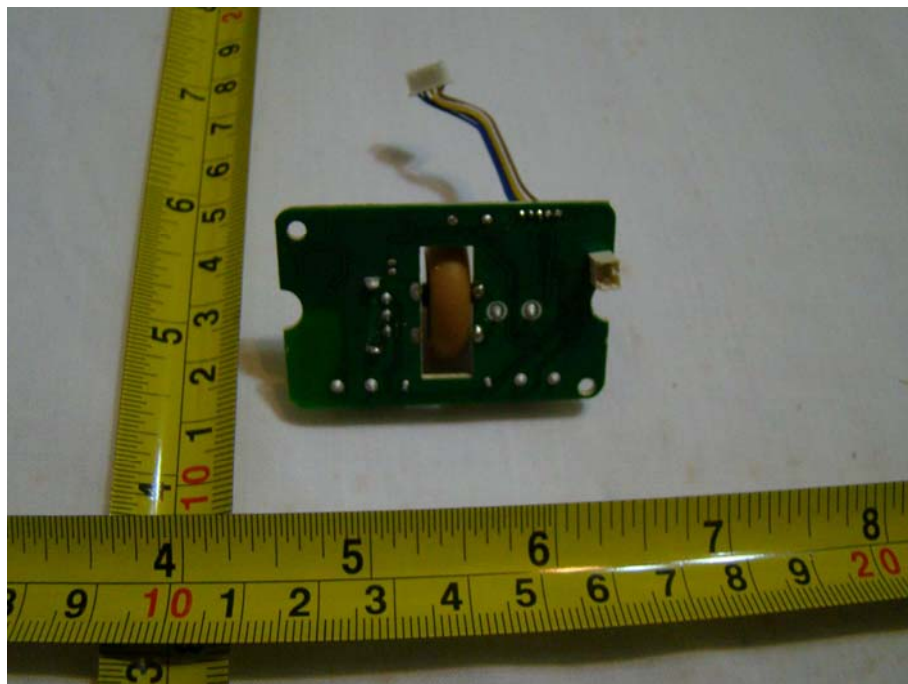


APPENDIX C - EUT INTERNAL PHOTOGRAPHS

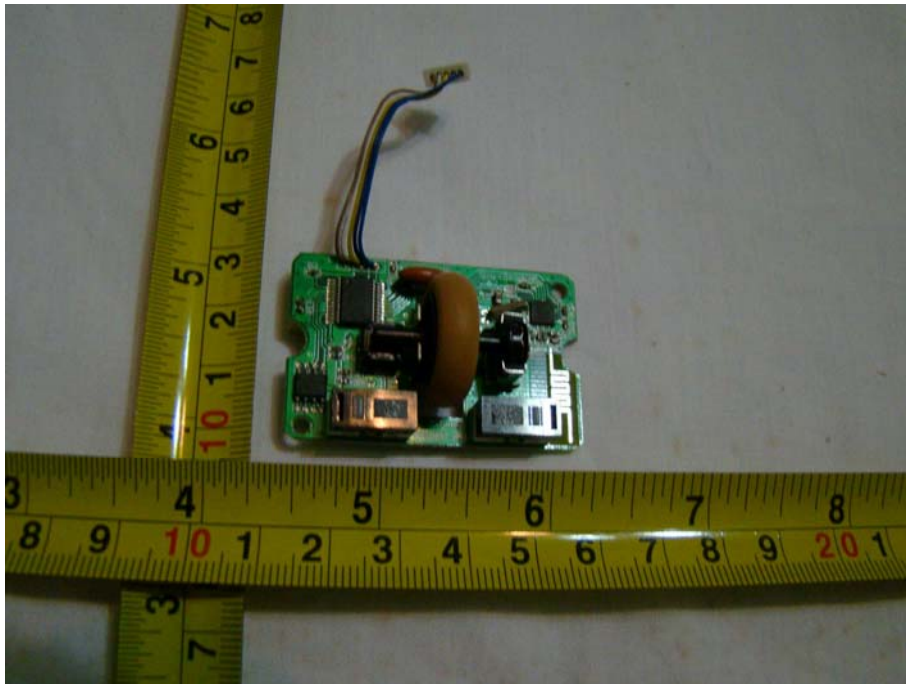
EUT – Open View



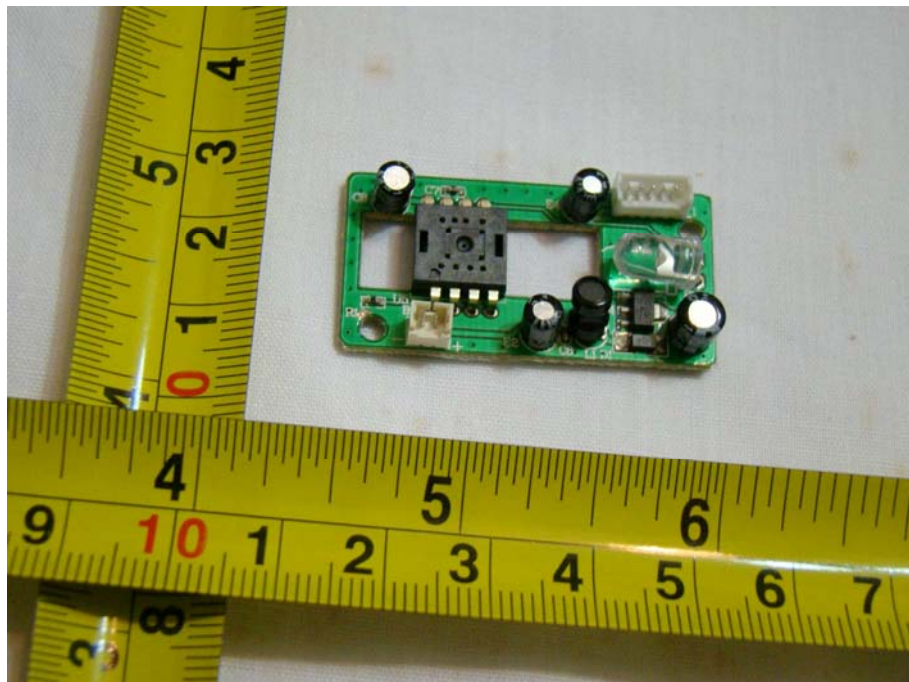
EUT – PCB View 1



EUT – PCB View 2



EUT – PCB View 3



EUT – PCB View 4

