

Shenzhen Certification Technologh Service Co., Ltd 3F, Bldg27,Area A, Tanglang Industrial Zone, Xili Town, Nanshan District, ShenZhen, Guang dong, P.R. China.

# TEST REPORT

FCC ID: YDXQX-169A

**Applicant** 

: Goeasily Int'l Co., Ltd

**Address** 

: 2F A Bldg., WenTao Tech-Park, ShiYan Town, BaoAn Zone, ShenZhen,

**GuangDong Province,** 

#### **Equipment under Test (EUT):**

Name

: 2.4Ghz wireless multimedia game mouse Dongle

Model

: QX-169

**Standards** 

: FCC PART 15, SUBPART C : 2008 (Section 15.247)

Report No.

: STE100505319

**Date of Test** 

: May 4-6, 2010

**Date of Issue** 

: May 7, 2010

Test Result:

PASS \*

**Authorized Signature** 

(Mark Zhu) General Manager

The manufacture should ensure that all the products in series production are in conformity with the product sample detailed in this report.

If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of Shenzhen Certification Technology Service Co., Ltd. Or test done by Shenzhen Certification Technology Service Co., Ltd. Approvals in connection with, distribution or use of the product described in this report must be approved by Shenzhen Certification Technology Service Co., Ltd. Approvals in writing.

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<sup>\*</sup> In the configuration tested, the EUT complied with the standards specified above

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# 1 General Information

# 1.1 Description of Device (EUT)

Trade Name : N/A

EUT : 2.4Ghz wireless multimedia game mouse Dongle

Model No. : QX-169

Type of Antenna : Integral Antenna

Antenna Specification: 0 dBi

Operation Frequency : 2402~2480MHZ

Channel number : 79

Modulation type : GFSK

Power Supply : DC 5V supply by PC

Rated PF

output Power -1.47 dBm

Applicant : Goeasily Int'l Co., Ltd

Address : 2F A Bldg., WenTao Tech-Park, ShiYan Town,

BaoAn Zone, ShenZhen, GuangDong Province,

Manufacturer : Goeasily Int'l Co., Ltd

Address : 2F A Bldg., WenTao Tech-Park, ShiYan Town,

BaoAn Zone, ShenZhen, GuangDong Province,

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# 1.2 Description of Test Facility

Shenzhen Certification Technology Service Co.,Ltd. 3F, Bldg.27, Area A, Tanglang Industrial Zone, Xili Town, Nanshan District, Shenzhen 518055, Guangdong, P.R. China FCC Registered No.:305283

# 2 EMC Equipment List

| Equipment           | Manufacture  | Model No.                   | Serial No.       | Last cal.  | Cal<br>Interval |
|---------------------|--------------|-----------------------------|------------------|------------|-----------------|
| 3m Semi-Anechoic    | ETS-LINDGREN | N/A                         | SEL0017          | 16/06/2009 | 1Year           |
| Spectrum analyzer   | Agilent      | E4443A                      | MY46185649       | 06/06/2009 | 1Year           |
| Receiver            | R&S          | ESCI                        | 100492           | 04/06/2009 | 1Year           |
| Receiver            | R&S          | ESCI                        | 101202           | 07/01/2010 | 1Year           |
| Bilog Antenna       | Sunol        | JB3                         | A121206          | 04/06/2009 | 1Year           |
| Horn Antenna        | EMCO         | 3115                        | 640201028-0<br>6 | 04/06/2009 | 1Year           |
| Power Meter         | Anritsu      | ML2487A                     | 6K00001491       | 23/02/2010 | 1Year           |
| ETS Horn Antenna    | ETS          | 3160                        | SEL0076          | 12/08/2009 | 1Year           |
| Active Loop Antenna | Beijing Daze | ZN30900A                    | SEL0097          | 15/06/2009 | 1Year           |
| Cable               | Resenberger  | N/A                         | No.1             | 04/06/2009 | 1Year           |
| Cable               | SCHWARZBECK  | N/A                         | No.2             | 04/06/2009 | 1Year           |
| Cable               | SCHWARZBECK  | N/A                         | No.3             | 04/06/2009 | 1Year           |
| Pre-amplifier       | R&S          | AFS42-00101<br>800-25-S-42  | SEL0081          | 18/06/2009 | 1Year           |
| Pre-amplifier       | R&S          | AFS33-18002650<br>-30-8P-44 | SEL0080          | 18/06/2009 | 1Year           |

# 3 Test Procedure

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**POWER LINE CONDUCTED INTERFERENCE**: The test procedure used was ANSI Standard C63.4-2003 using a 50 u H LISN. Both Lines were observed. The bandwidth of the receiver was 10kHz with an appropriate sweep speed. The ambient temperature of the EUT was 25°C with a humidity of 58%.

**RADIATION INTERFERENCE:** The test procedure used was ANSI Standard C63.4-2003 using a ANRITSU spectrum analyzer with a pre-selector. The analyzer was calibrated in dB above a micro volt at the output of the antenna. The resolution bandwidth was 100kHz and the video bandwidth was 300 kHz up to 1 GHz and 1 MHz with a video BW of 3MHz above 1 GHz. The ambient temperature of the EUT was 25°C with a humidity of 58%.

**FORMULA OF CONVERSION FACTORS:** The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer and cable loss. The antenna correction factors and cable loss are stated in terms of dB. The gain of the Pre-selector was accounted for in the Spectrum Analyzer Meter Reading.

Example:

Freq (MHz) METER READING + ACF + CABLE = FS 33.20 dBuV + 10.36 dB + 0.9 dB= 44.46 dBuV/m @ 3m

ANSI STANDARD C63.4-2003 10.1.7 MEASUREMENT PROCEDURES: The EUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The EUT was placed in the center of the table (1.5m side). The table used for radiated measurements is capable of continuous rotation. When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes. The situation was similar for the conducted measurement except that the table did not rotate. The EUT was setup as described in ANSI Standard C63.4-2003 10.1.7 with the EUT 40 cm from the vertical ground wall.

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# 4 Summary of Measurement

| Test Item            | Test Requirement   | Stanadard<br>Paragraph   | Result         |
|----------------------|--------------------|--------------------------|----------------|
| Spurious Emission    | FCC PART 15 : 2008 | Section<br>15.247&15.209 | Compliance     |
| Conduction Emission  | FCC PART 15: 2008  | Section 15.207           | Not applicable |
| Frequency Separation | FCC PART 15:2008   | Section 15.247           | Compliance     |
| Peak Power           | FCC PART 15:2008   | Section 15.247           | Compliance     |
| Power Density        | FCC PART 15:2008   | Section 15.247           | Compliance     |
| Number Channel       | FCC PART 15:2008   | Section 15.247           | Not applicable |
| Band Edge            | FCC PART 15:2008   | Section 15.247           | Compliance     |
| Antenna Requirement  | FCC PART 15 : 2008 | Section 15.203           | Compliance     |

Note: The EUT has been tested as an independent unit. And Continual Transmitting in maximum power (The new battery be used during Test)

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# 5 Spurious Emission

### 5.1 Conducted Spurious Emission

#### 5.1.1 Test limit

Please refer section 15.247.

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

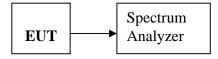
#### 5.1.2 Method of measurement

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 KHz. The video bandwidth is set to 100 KHz.

Measurements are made over the 30MHz to 26GHzrange with the transmitter set to the lowest, middle, and highest channels.

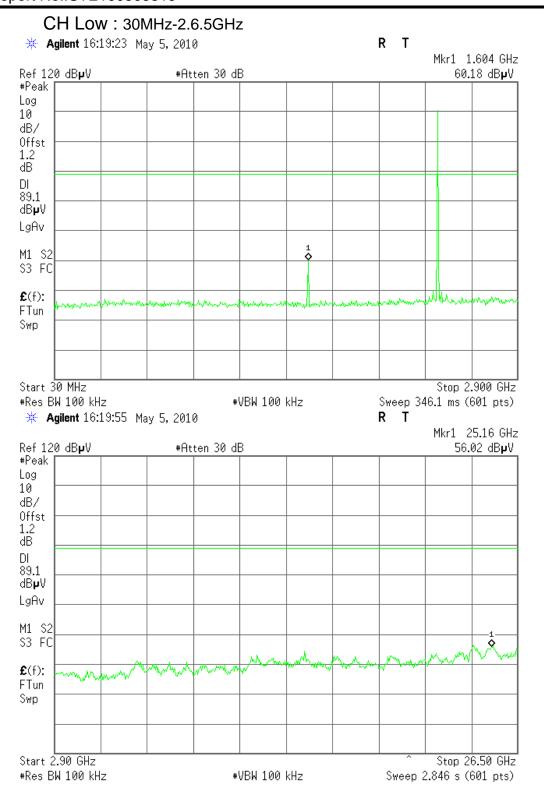
## 5.1.3 Test Setup

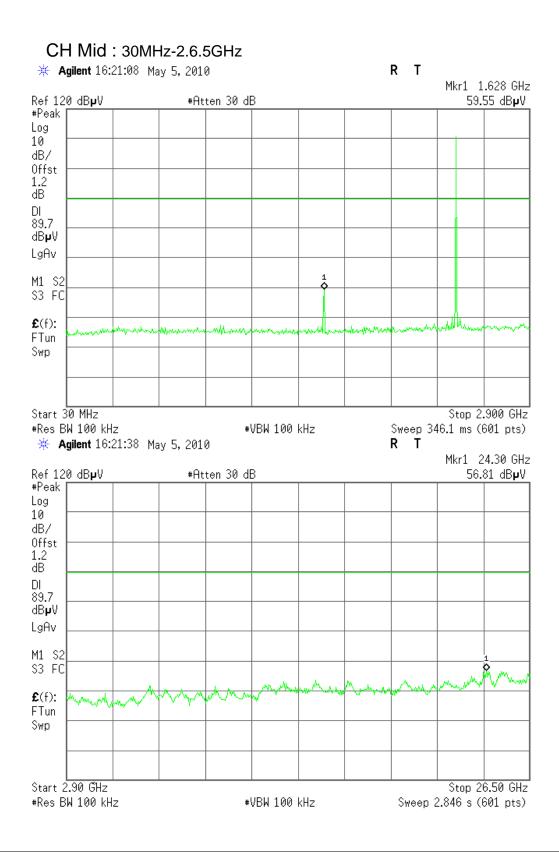


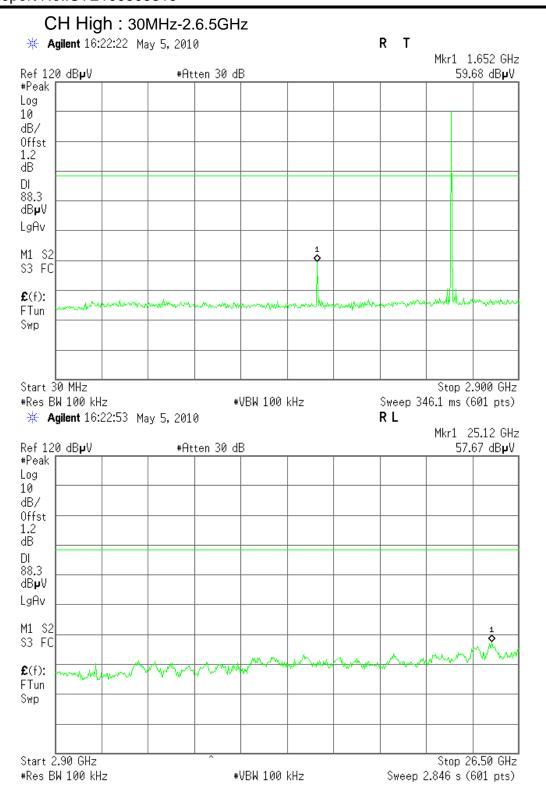
# 5.1.4 Test Results PASS.

Detailed information please see the following page.

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#### 5.2 Radiation Emission

# 5.2.1 Radiation Emission Limits(15.209)

| Frequencies<br>(MHz) | Field Strength<br>(micorvolts/meter) | Measurement Distance<br>(meters) |
|----------------------|--------------------------------------|----------------------------------|
| 0.009~0.490          | 2400/F(KHz)                          | 300                              |
| 0.490~1.705          | 24000/F(KHz)                         | 30                               |
| 1.705~30.0           | 30                                   | 30                               |
| 30~88                | 100                                  | 3                                |
| 88~216               | 150                                  | 3                                |
| 216~960              | 200                                  | 3                                |
| Above 960            | 500                                  | 3                                |

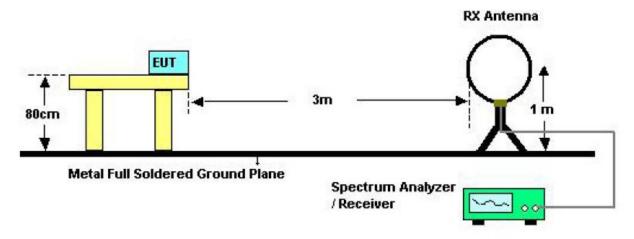
Harmonic emissions limits comply with below 54 dBuV/m at 3m. Other emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or comply with the radiated emissions limits specified in section 15.209(a) limit in the table below has to be followed.

#### NOTE:

- a) The tighter limit applies at the band edges.
- b) Emission Level(dB uV/m)=20log Emission Level(Uv/m)

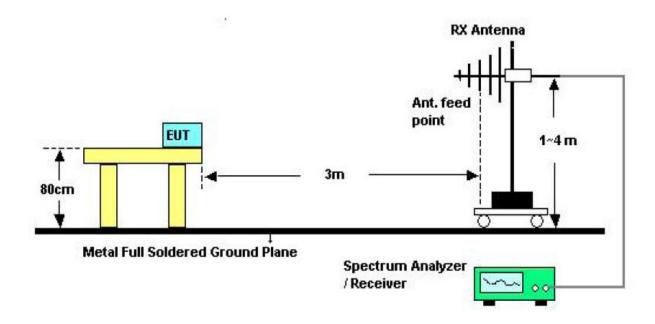
# 5.2.2 Test Setup

# See the next page

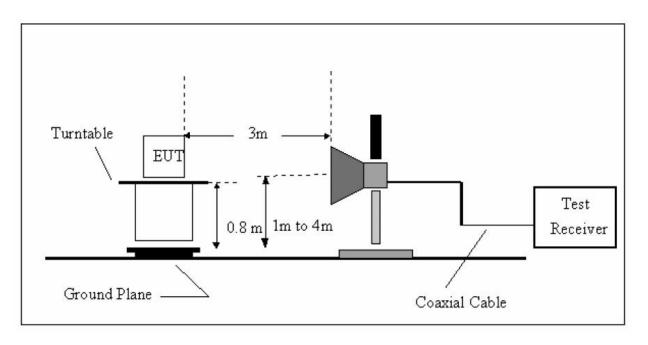


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# Below 30MHZ Test Setup



Above 30MHZ Test Setup



Above 1GHZ Test Setup

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#### 5.2.3 Test Procedure

- a) The measureing distance of 3m shall be used for measurements at frequency up to 1GHZ and above 1GHZ, The EUT was placed on a rotating 0.8 m high above ground, The table was rotated 360 degrees to determine the position of the highest radiation
- b) The Test antenna shall vary between 1m and 4m,Both Horizontal and Vertical antenna are set of make measurement.
- c) The initial step in collecting conducted emission data is a spectrum analyzer Peak detector mode pre-scanning the measurement frequency range. Significent Peaks are then marked and then Qusia Peak Detector mode remeasured
- d) If Peak value comply with QP limit Below 1GHZ. The EUT deemed to comply with QP limit. But the Peak value and average value both need to comply with applicable limit above 1GHZ.
- e) For the actual test configuration, please see the test setup photo.

## 5.2.4 Test Equipment Setting For emission test.est Result

| 9KHZ~150KHZ  | RBW 200HZ  | VBW1KHZ    |
|--------------|------------|------------|
| 150KHZ~30MHZ | RBW 9KHZ   | VBW 30KHZ  |
| 30MHZ~1GHZ   | RBW 120KHZ | VBW 300KHZ |
| Above 1GHZ   | RBW 1MHZ   | VBW 3MHZ   |

#### 5.2.5 Test Condition

Continual Transmitting in maximum power(The new battery be used during Test)

## 5.2.6 Test Result

Detailed information please see the following page.

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| EUT         | 2.4Ghz wireless<br>multimedia game<br>mouse Dongle | Model Name        | QX-169 |
|-------------|--|-------------------|--------|
| Temperature | 26°C   | Relative Humidity | 58%    |
| Pressure    | 960hPa   | Test voltage      | DC 5V  |
| Test Mode   | TX   |                   |        |

| Freq. (MHz) | Ant.Pol.<br>H/V | Detector<br>Mode<br>(PK/OP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limits 3m (dBuV/m) | Margin<br>(dBuV/m) |
|-------------|-----------------|-----------------------------|----------------|-------------|--------------------|--------------------|--------------------|
| 75.590      | V               | Peak                        | 46.01          | -18.38      | 27.63              | 40.00              | -12.37             |
| 165.800     | V               | Peak                        | 40.03          | -12.80      | 27.23              | 43.50              | -16.27             |
| 276.380     | V               | Peak                        | 41.29          | -10.74      | 30.55              | 46.00              | -15.45             |
| 544.100     | V               | Peak                        | 37.62          | -7.72       | 29.90              | 46.00              | -16.10             |
| 649.830     | V               | Peak                        | 35.46          | -5.90       | 29.56              | 46.00              | -16.44             |
| 971.870     | V               | Peak                        | 30.67          | -1.84       | 28.83              | 46.00              | -17.17             |

| EUT         | 2.4Ghz wireless<br>multimedia game<br>mouse Dongle | Model Name        | QX-169 |
|-------------|--|-------------------|--------|
| Temperature | 26°C   | Relative Humidity | 58%    |
| Pressure    | 960hPa   | Test voltage      | DC 5V  |
| Test Mode   | TX   |                   |        |

| Freq. (MHz) | Ant.Pol.<br>H/V | Detector<br>Mode<br>(PK/OP) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limits 3m (dBuV/m) | Margin<br>(dBuV/m) |
|-------------|-----------------|-----------------------------|----------------|-------------|--------------------|--------------------|--------------------|
| 72.680      | Н               | Peak                        | 44.22          | -18.33      | 25.89              | 40.00              | -14.11             |
| 167.740     | Н               | Peak                        | 41.85          | -12.80      | 29.05              | 43.50              | -14.45             |
| 480.080     | Н               | Peak                        | 41.97          | -8.30       | 33.67              | 46.00              | -12.33             |
| 525.670     | Н               | Peak                        | 41.10          | -7.94       | 33.16              | 46.00              | -12.84             |
| 745.860     | Н               | Peak                        | 35.01          | -4.20       | 30.81              | 46.00              | -15.19             |
| 920.460     | Н               | Peak                        | 34.46          | -2.33       | 32.13              | 46.00              | -13.87             |

Notes: Above is Below 1GHZ test data

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| EUT         | 2.4Ghz wireless<br>multimedia game<br>mouse Dongle | Model Name        | QX-169 |
|-------------|--|-------------------|--------|
| Temperature | 26°C   | Relative Humidity | 58%    |
| Pressure    | 960hPa   | Test voltage      | DC 5V  |
| Test Mode   | TX Low   |                   |        |

| Freq. (MHz) | Ant. Pol<br>H/V | Peak<br>Reading | AV<br>Reading | Ant. / CL<br>CF | Actu             | al Fs          | Peak<br>Limit | AV<br>Limit | Margin (dB) | Remark  |
|-------------|-----------------|-----------------|---------------|-----------------|------------------|----------------|---------------|-------------|-------------|---------|
|             |                 | (dBuV)          | (dBuV)        | (dB)            | Peak<br>(dBuV/m) | AV<br>(dBuV/m) | ` ′           | (dBuV/m)    |             | TCHAH K |
| 1375.42     | V               | 57.09           |               | -10.43          | 46.66            |                | 74.00         | 54.00       | -7.34       | Peak    |
| 1604.33     | V               | 56.98           |               | -9.84           | 47.14            |                | 74.00         | 54.00       | -6.86       | Peak    |
| 2893.48     | V               | 50.74           |               | -5.95           | 44.79            |                | 74.00         | 54.00       | -9.21       | Peak    |
| 4802.00     | V               | 44.63           |               | 0.64            | 45.27            |                | 74.00         | 54.00       | -8.73       | Peak    |
| N/A         |                 | _               |               |                 |                  |                |               |             |             |         |

| EUT         | 2.4Ghz wireless<br>multimedia game<br>mouse Dongle | Model Name        | QX-169 |
|-------------|--|-------------------|--------|
| Temperature | 26°C   | Relative Humidity | 58%    |
| Pressure    | 960hPa   | Test voltage      | DC 5V  |
| Test Mode   | TX Low   |                   |        |

| Freq. (MHz) | Ant. Pol<br>H/V | Peak<br>Reading | AV<br>Reading | Ant. / CL<br>CF | Actual Fs |          | Peak<br>Limit | AV<br>Limit | Margin (dB) | Remark  |
|-------------|-----------------|-----------------|---------------|-----------------|-----------|----------|---------------|-------------|-------------|---------|
|             |                 | (dBuV)          | (dBuV)        | (dB)            | Peak      | AV       | , ,           | (dBuV/m)    |             | Killark |
|             |                 |                 |               |                 | (dBuV/m)  | (dBuV/m) |               |             |             |         |
| 1317.88     | Н               | 55.09           |               | -10.84          | 44.25     |          | 74.00         | 54.00       | -9.75       | Peak    |
| 1604.33     | Н               | 56.36           |               | -9.84           | 46.52     |          | 74.00         | 54.00       | -7.48       | Peak    |
| 2968.44     | Н               | 49.45           |               | -5.86           | 43.59     |          | 74.00         | 54.00       | -10.41      | Peak    |
| 4802.00     | Н               | 43.71           |               | 0.64            | 44.35     |          | 74.00         | 54.00       | -9.65       | Peak    |
| N/A         |                 |                 |               |                 |           |          |               |             |             |         |

**Notes:**AV Means AV detector test data, Peak Means Peak detector test data. Emissions attenuated more than 20 dB below the permissible value are not reported.

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| EUT         | 2.4Ghz wireless<br>multimedia game<br>mouse Dongle | Model Name        | QX-169 |
|-------------|--|-------------------|--------|
| Temperature | 26°C   | Relative Humidity | 58%    |
| Pressure    | 960hPa   | Test voltage      | DC 5V  |
| Test Mode   | TX Mid   |                   |        |

| Freq. (MHz) | Ant. Pol<br>H/V | Peak<br>Reading | AV<br>Reading | Ant. / CL<br>CF | Actual Fs        |                | Peak<br>Limit | AV<br>Limit | Margin (dB) | Remark |
|-------------|-----------------|-----------------|---------------|-----------------|------------------|----------------|---------------|-------------|-------------|--------|
|             |                 | (dBuV)          | (dBuV)        | (dB)            | Peak<br>(dBuV/m) | AV<br>(dBuV/m) | ` ′           | (dBuV/m)    |             | Remark |
| 1145.88     | V               | 55.81           |               | -11.24          | 44.57            |                | 74.00         | 54.00       | -9.43       | Peak   |
| 1628.33     | V               | 55.16           |               | -9.84           | 45.32            |                | 74.00         | 54.00       | -8.68       | Peak   |
| 3135.44     | V               | 48.14           |               | -5.63           | 42.51            |                | 74.00         | 54.00       | -11.49      | Peak   |
| 4884.00     | V               | 42.93           |               | 0.76            | 43.69            |                | 74.00         | 54.00       | -10.31      | Peak   |

| EUT         | 2.4Ghz wireless<br>multimedia game<br>mouse Dongle | Model Name        | QX-169 |
|-------------|--|-------------------|--------|
| Temperature | 26°C   | Relative Humidity | 58%    |
| Pressure    | 960hPa   | Test voltage      | DC 5V  |
| Test Mode   | TX Mid   |                   |        |

| Freq. (MHz) | Ant. Pol<br>H/V | Peak<br>Reading | AV<br>Reading | Ant. / CL<br>CF | Actual Fs        |                | Peak<br>Limit | AV<br>Limit | Margin (dB) | Remark |
|-------------|-----------------|-----------------|---------------|-----------------|------------------|----------------|---------------|-------------|-------------|--------|
|             |                 | (dBuV)          | (dBuV)        | (dB)            | Peak<br>(dBuV/m) | AV<br>(dBuV/m) | , ,           | (dBuV/m)    |             | Kemark |
| 1265.97     | Н               | 56.78           |               | -10.96          | 45.82            |                | 74.00         | 54.00       | -8.18       | Peak   |
| 1628.33     | Н               | 56.48           |               | -9.84           | 46.64            |                | 74.00         | 54.00       | -7.36       | Peak   |
| 3384.96     | Н               | 48.34           |               | -5.18           | 43.16            |                | 74.00         | 54.00       | -10.84      | Peak   |
| 4884.00     | Н               | 43.53           |               | 0.76            | 44.29            |                | 74.00         | 54.00       | -9.71       | Peak   |

**Notes:**AV Means AV detector test data, Peak Means Peak detector test data. Emissions attenuated more than 20 dB below the permissible value are not reported.

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| EUT         | 2.4Ghz wireless<br>multimedia game<br>mouse Dongle | Model Name        | QX-169 |
|-------------|--|-------------------|--------|
| Temperature | 26°C   | Relative Humidity | 58%    |
| Pressure    | 960hPa   | Test voltage      | DC 5V  |
| Test Mode   | TX High  |                   |        |

| Freq. (MHz) | Ant. Pol<br>H/V | Peak<br>Reading | AV<br>Reading | Ant. / CL<br>CF | Actual Fs        |                | Peak<br>Limit | AV<br>Limit | Margin (dB) | Remark |
|-------------|-----------------|-----------------|---------------|-----------------|------------------|----------------|---------------|-------------|-------------|--------|
|             |                 | (dBuV)          | (dBuV)        | (dB)            | Peak<br>(dBuV/m) | AV<br>(dBuV/m) | ` ′           | (dBuV/m)    |             | Kemark |
| 1489.73     | V               | 54.64           |               | -10.27          | 44.37            |                | 74.00         | 54.00       | -9.63       | Peak   |
| 1652.66     | V               | 53.20           |               | -9.65           | 43.55            |                | 74.00         | 54.00       | -10.45      | Peak   |
| 3468.75     | V               | 50.71           |               | -4.95           | 45.76            |                | 74.00         | 54.00       | -8.24       | Peak   |
| 4958.00     | V               | 41.71           |               | 0.98            | 42.69            |                | 74.00         | 54.00       | -11.31      | Peak   |

| EUT         | 2.4Ghz wireless<br>multimedia game<br>mouse Dongle | Model Name        | QX-169 |
|-------------|--|-------------------|--------|
| Temperature | 26°C   | Relative Humidity | 58%    |
| Pressure    | 960hPa   | Test voltage      | DC 5V  |
| Test Mode   | TX High  |                   |        |

| Freq. (MHz) | Ant. Pol<br>H/V | Peak<br>Reading | AV<br>Reading | Ant. / CL<br>CF | Actual Fs        |                | Peak<br>Limit | AV<br>Limit | Margin (dB) | Remark  |
|-------------|-----------------|-----------------|---------------|-----------------|------------------|----------------|---------------|-------------|-------------|---------|
|             |                 | (dBuV)          | (dBuV)        | (dB)            | Peak<br>(dBuV/m) | AV<br>(dBuV/m) | ` /           | (dBuV/m)    |             | Killalk |
| 1284.96     | Н               | 54.67           |               | -10.96          | 43.71            |                | 74.00         | 54.00       | -10.29      | Peak    |
| 1652.66     | Н               | 55.08           |               | -9.65           | 45.43            |                | 74.00         | 54.00       | -8.57       | Peak    |
| 3152.66     | Н               | 47.88           |               | -5.52           | 42.36            |                | 74.00         | 54.00       | -11.64      | Peak    |
| 4958.00     | Н               | 43.79           |               | 0.98            | 44.77            |                | 74.00         | 54.00       | -9.23       | Peak    |

**Notes:**AV Means AV detector test data, Peak Means Peak detector test data. Emissions attenuated more than 20 dB below the permissible value are not reported.

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# 6 Peak Power

## 6.1 Test limit

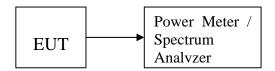
Please refer section15.247.

Regulation 15.247(b) The limit of Maximum Peak OutputPower Measurement is 1W(30dBm)

## 6.2 Test Procedure

The transmitter output is connected to the RF Power Meter. The RF Power Meter is set to the peak power detection.

# 6.3 Test Setup



## 6.4 Test Results

| Channel | Frequency<br>(MHz) | Reading<br>Power<br>(dBm) | Factor<br>(dB) | Out put<br>Power<br>(dBm) | Out put<br>Power<br>(W) | Limit<br>(W) | Result |
|---------|--------------------|---------------------------|----------------|---------------------------|-------------------------|--------------|--------|
| Low     | 2402               | -2.67                     | 1.2            | -1.47                     | 0.000713                |              | PASS   |
| Mid     | 2441               | -2.72                     | 1.2            | -1.52                     | 0.000705                | 1            | PASS   |
| High    | 2480               | -2.69                     | 1.2            | -1.49                     | 0.000710                |              | PASS   |

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# 7 PEAK POWER SPECTRAL DENSITY

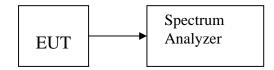
#### 7.1 Test limit

- 7.1.1 Please refer section15.247.
- 7.1.2 For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.
- 7.1.3 The direct sequence operating of the hybrid system, with the frequency hopping operation turned off, shall comply with the power density requirements of paragraph (d) of this section.

#### 7.2 Method of measurement

- 7.2.1 Place the EUT on the table and set it in transmitting mode.
- 7.2.2 Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 7.2.3 Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, Span = 300kHz, Sweep=100s.
- 7.2.4 Record the max. reading.
- 7.2.5 Repeat the above procedure until the measurements for all frequencies are completed.

# 7.3 Test Setup



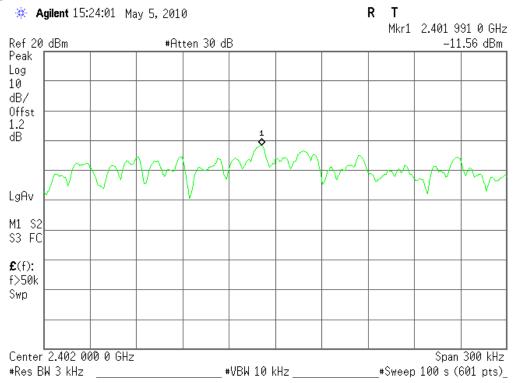
#### 7.4 Test Results

#### PASS.

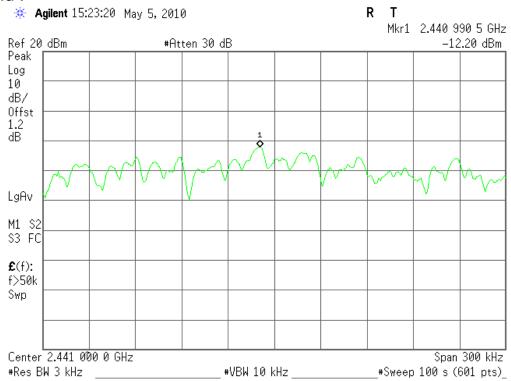
Detailed information please see the following page.

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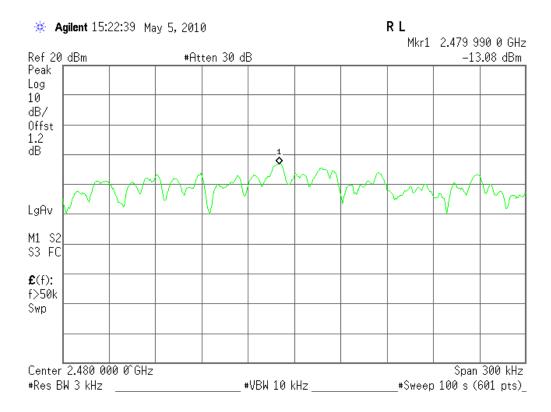
# CH Low:



#### CH Mid:



# CH High:



# 8 FREQUENCY SEPARATION

#### 8.1 Test limit

Please refer section 15.247

According to § 15.247(a)(2), Systems using digital modulation techniques may operate in the902-928MHz, 2400-2483.5MHz, and 5725-5850MHz. bands. The minimum 6DB bandwidth shall be at least 500kHz.

No requirements for Frequency Hopping Systems.

#### 8.2 Method of measurement

- a)The bandwidth is measured at an amplitude level reduced 20dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.
- b)The test receiver RBW set 100KHZ,VBW set 300KHZ,Sweep time set auto.

## 8.3 Test Setup

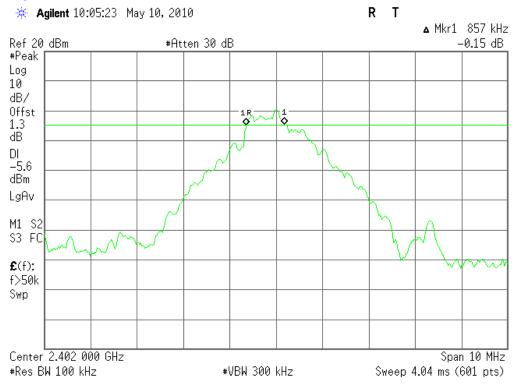
Same as 7.3

# 8.4 Test Results PASS.

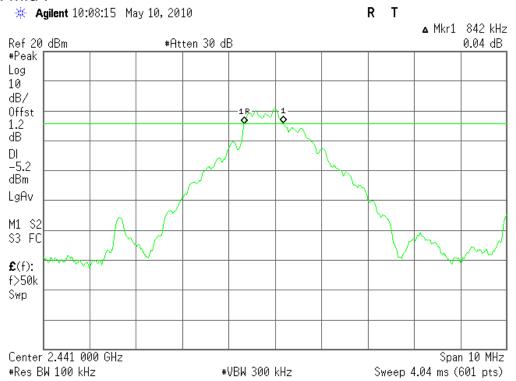
Detailed information please see the following page.

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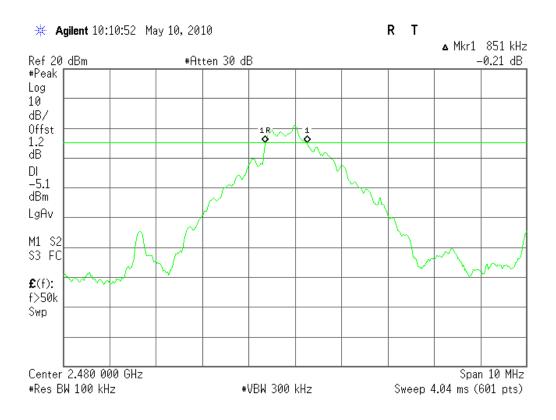
#### CH Low:



## CH Mid:



# CH High:



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# 9 NUMBER OF HOPPING FREQUENCY

#### 9.1 Test limit

Please refer section15.247

According to § 15.247(a)(1)(ii), Frequency hopping systems operating in the 2400MHz-2483.5 MHz bands shall use at least 15 hopping frequencies.

#### 9.2 Method of measurement

- 9.2.1. Place the EUT on the table and set it in transmitting mode.
- 9.2.2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 9.2.3. Set spectrum analyzer Start=2400MHz, Stop = 2441.5MHz, Sweep = 1ms and Start=2441.5MHz, Stop = 2483.5MHz, Sweep = 1ms.
- 9.2.4. Set the spectrum analyzer as RBW, VBW=510kHz,
- 9.2.5. Max hold, view and count how many channel in the band.

## 9.3 Test Setup Same as 7.3

#### 9.4 Test Results

The test is not applicable.

No requirements for Frequency Hopping Systems.

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# 10 Band Edge Check

## 10.1 Test limit

Please refer section15.247

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.

#### 10.2 Test Procedure

- 11.2.1 Put the EUT on a 0.8m high table, power on the EUT. Emissions were scanned and measured rotating the EUT to 360 degrees, Find the maximum Emission
- 11.2.2 Turning to Low and High frequency, then reduced 50dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency.
- 11.2.3 Check the spurious emissions out of band.
- 11.2.4 RBW,VBW Setting, please see the following test plot.
- 10.3 Test Setup

Same as 5.2.2.

# 10.4 Test Result PASS.

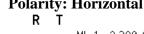
Detailed information please see the following page.

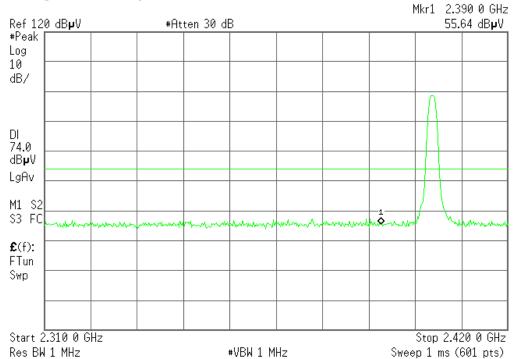
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#### CH LOW:

#### **Detector mode: Peak Polarity: Horizontal**



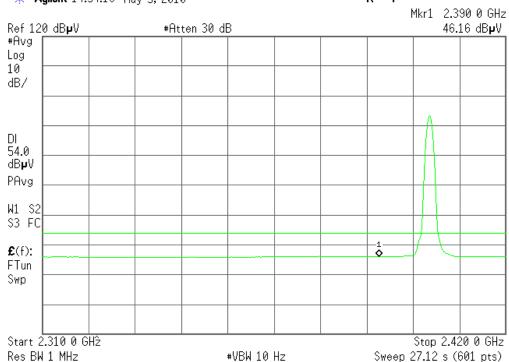




**Detector mode: Average** 

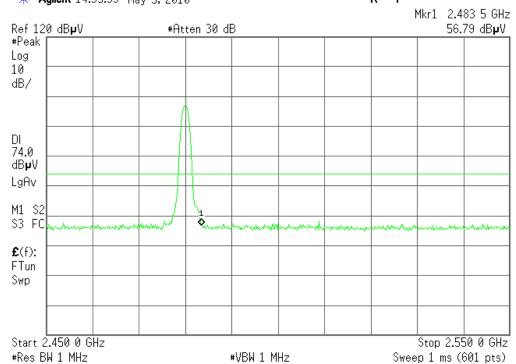
\* Agilent 14:54:19 May 5, 2010

# **Polarity: Horizontal**



# CH High:

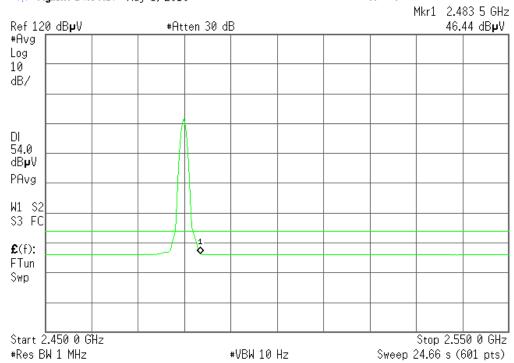
# Detector mode: Peak \*\* Agilent 14:35:33 May 5, 2010 R T



#### **Detector mode: Average**

\* Agilent 14:38:17 May 5, 2010

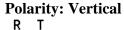
## **Polarity: Horizontal**



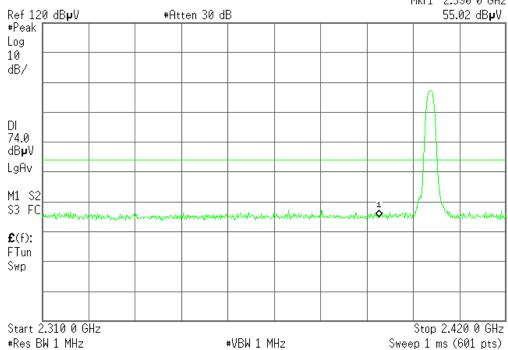
#### CH LOW:

### Detector mode: Peak

\* Agilent 14:48:29 May 5, 2010



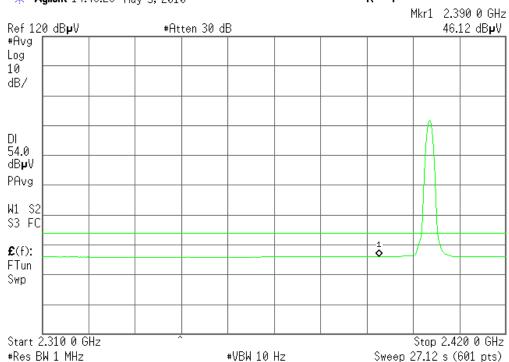
Mkr1 2.390 0 GHz



#### **Detector mode: Average**

\* Agilent 14:49:28 May 5, 2010

# **Polarity: Vertical**



# CH High:

Ref 120 dBµV

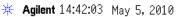
#Peak | Log 10 dB/

DI 74.0 dB**µ**V

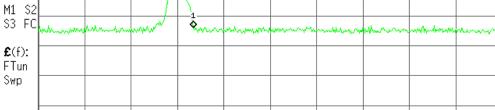
LgAv

# Detector mode: Peak Polarity: Vertical

#Atten 30 dB







Start 2.450 0 GHz #Res BW 1 MHz

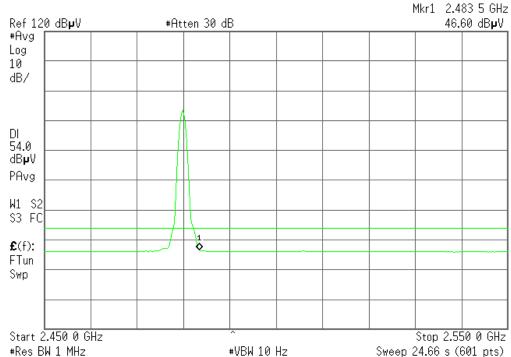
#VBW 1 MHz

Stop 2.550 0 GHz Sweep 1 ms (601 pts)

#### **Detector mode: Average**

Agilent 14:43:01 May 5, 2010

# **Polarity: Vertical**



# 11 Antenna Requirement

## 11.1 Standard 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 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.

#### 11.2 Antenna Connected Construction

The directional gains of antenna used for transmitting is 0 dBi, and the antenna connector is de-signed with permanent attachment and no consideration of replacement. Please see EUT photo for details.

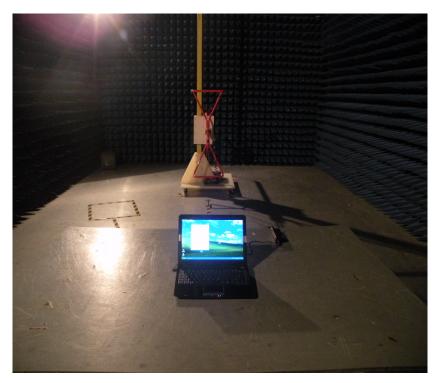
#### 11.3 Result

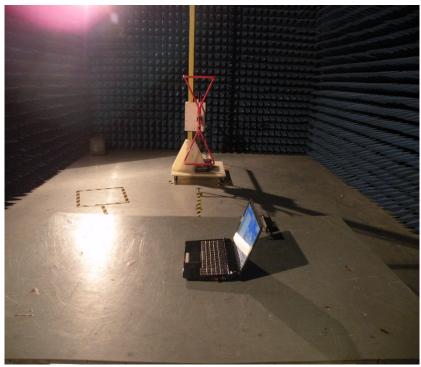
The EUT antenna is integral Antenna. It comply with the standard requirement.

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# 12 Photographs of Test Setup

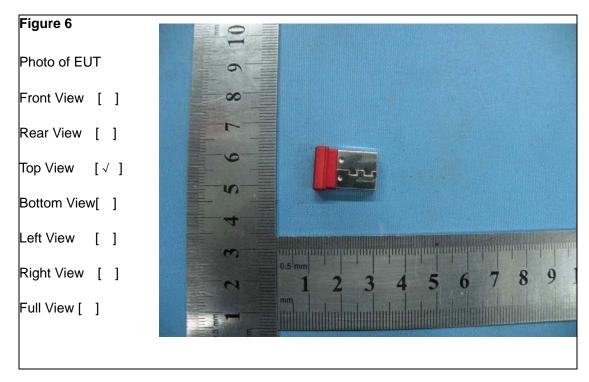
Photographs-Radiated Emission Test Setup in Chamber

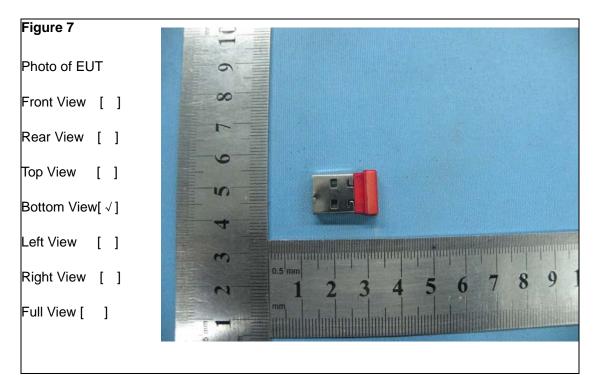




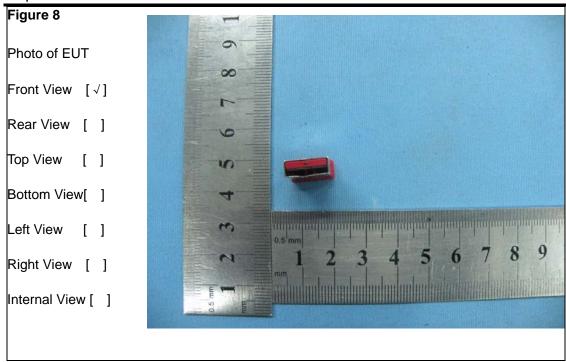
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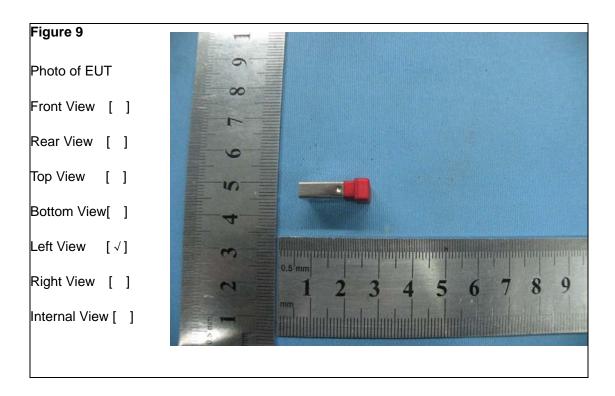
# 13 Photographs of EUT

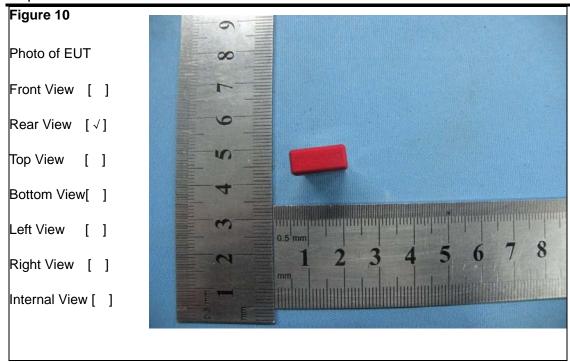


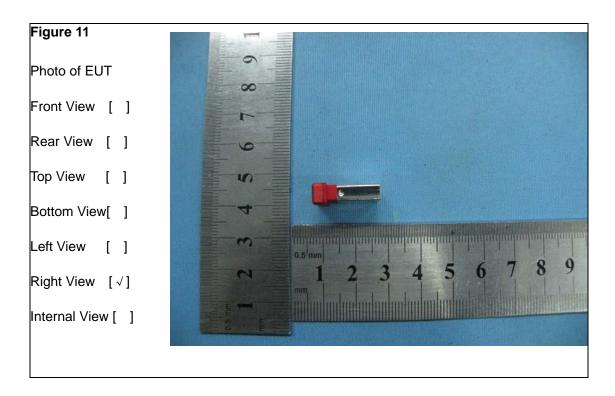


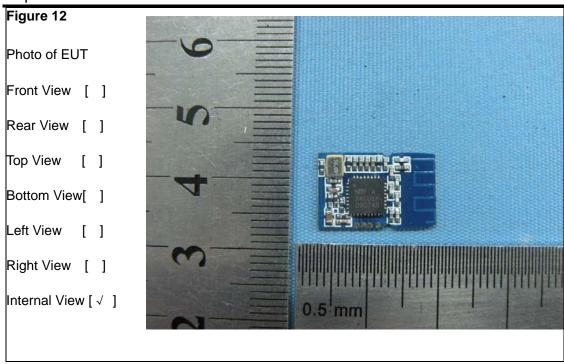
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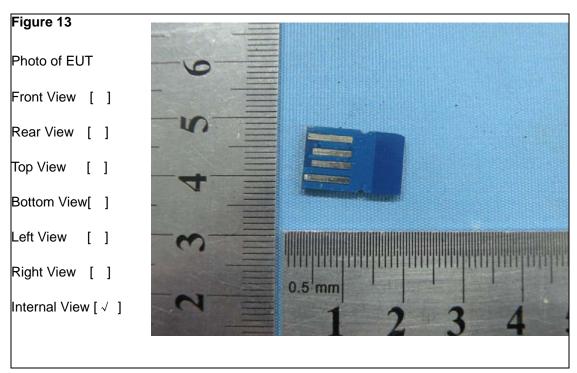












# -----END OF THE REPORT-----