



**ETSI EN 300 440-1 V1.5.1**  
**ETSI EN 300 440-2 V1.3.1**  
**ETSI EN 301 489-1 V1.8.1**  
**ETSI EN 301 489-3 V1.4.1**

**TEST REPORT**  
**For**

**Wireless Mouse**

**M/N: CNL-MBMSOW02 / WS-740**

**Trade Name: Not Applicable**

**Report No.: EESZE03070009-1**

**Issue Date: Mar. 16, 2012**

Prepared for

**Juchin Electronic CO., LTD.**

**HongJi street JiuTan HeBei Zone YuanZhou Town  
Bolou county HuiZhou City, Guangdong Province**

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*(Note: N/A means not applicable)*

## 1. GENERAL INFORMATION

<b>Applicant:</b>	Juchin Electronic CO., LTD. HongJi street JiuTan HeBei Zone YuanZhou Town Bolou county HuiZhou City, GuangDong Province
<b>Manufacturer:</b>	Juchin Electronic CO., LTD. HongJi street JiuTan HeBei Zone YuanZhou Town Bolou county HuiZhou City, GuangDong Province
<b>Sample Description:</b>	Wireless mouse
<b>Technical Date:</b>	USB Dongle: DC 5V by USB port Wireless Mouse: DC 3V
<b>Model Name:</b>	CNL-MBMSOW02 / WS-740
<b>Model Difference:</b>	The tow models are identical except the model number
<b>Trade Name:</b>	Not Applicable
<b>Serial Number:</b>	Not Applicable
<b>Report Number:</b>	EESZE03070009-1
<b>Date of Test:</b>	Mar. 15, 2012 to Mar. 16, 2012

## 2. TEST METHODOLOGY

### 2.1 Test Facilities

Centre Testing International (Shenzhen) Co., Ltd.

Building C, Hongwei Industrial Zone, Baoan 70 District, Shenzhen, Guangdong, China

### 2.2 Test Standard

ETSI EN 300 440-1 V1.5.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); Short range devices; Radio equipment to be used in the 1 GHz to 40 GHz frequency range; Part 1: Technical characteristics and test methods

ETSI EN 300 440-2 V1.3.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); Short range devices; Radio equipment to be used in the 1 GHz to 40 GHz frequency range; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive

ETSI EN 301 489-1V1.8.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements

ETSI EN 301 489-3 V1.4.1 – Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 40 GHz

## 2.3 List of Test and Measurement Instruments

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC/EN 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories

3M Semi-anechoic Chamber - Radiated disturbance Test				
Equipment	Manufacturer	Model	Serial No.	Due Date
3M Chamber & Accessory Equipment	ETS-LINDGREN	FACT-3	3510	07/09/2012
Spectrum Analyzer	Agilent	E4440A	MY46185649	07/06/2012
Biconilog Antenna	ETS-LINGREN	3142C	00044562	07/06/2012
Multi device Controller	ETS-LINGREN	2090	00057230	N/A
Horn Antenna	ETS-LINGREN	3117	00057407	07/06/2012
Microwave Preamplifier	Agilent	8449B	3008A02425	07/06/2012

Shielding Room No. 3 - ESD Test (IEC 61000-4-2)				
Equipment	Manufacturer	Model	Serial No.	Due Date
ESD Simulator	TESEQ	NSG437	478	08/22/2012

3M Full-anechoic Chamber - Radio-frequency electromagnetic field Immunity Test (IEC 61000-4-3)				
Equipment	Manufacturer	Model	Serial No.	Due Date
3M Chamber & Accessory Equipment	ETS-LINDGREN	FACT-3	3510	07/09/2012
ESG Vector signal generators	Agilent	E4438C	MY45095744	03/29/2012
Power Amplifier	AR	150W1000	0322288	07/06/2012
Power Amplifier	AR	25S1G4A	0321112	07/06/2012
Biconilog Antenna	ETS-LINGREN	3142C	00044562	07/06/2012
Horn Antenna	ETS-LINGREN	3117	00057407	07/06/2012

Shielding Room No. 2 - RF Test				
Equipment	Manufacturer	Model	Serial No.	Due Date
Spectrum Analyzer	Agilent	E4440A	MY46185649	07/06/2012
Temperature & Humidity Chamber	ESPEC	EL-04KA	N/A	01/29/2013

## 2.4 Uncertainty of Measurement

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

Test item	Value (dB)
Radiated disturbance	4.5

## 3. RATINGS AND SYSTEM DETAILS

Items	Description
Frequency Range	2403 ~ 2477 MHz
Channel Number	16
Channel Frequency	2403MHz, 2407MHz, 2412MHz, 2417MHz, 2422MHz, 2427MHz, 2432MHz, 2437MHz, 2442MHz, 2447MHz, 2452MHz, 2457MHz, 2462MHz, 2467MHz, 2472MHz, 2477 MHz
Modulation type	GFSK

## 4. TEST SETUP AND OPERATION MODES

### 4.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum power level. The test modes were adapted accordingly in reference to the instructions for use.

### 4.2 Auxiliary Equipment

No.	Device Type	Brand	Model	Series No.	Data Cable	Power Cord
1.	Notebook PC	DELL	V3400D-326	GYQTVP1	N/A	N/A

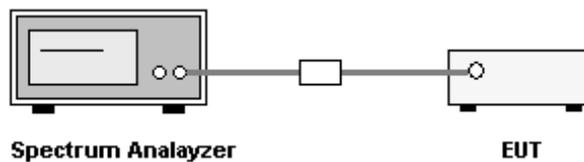
## 5. TRANSMITTER REQUIREMENT & TEST SUITES

### 5.1 Equivalent isotropically radiated power

#### Test Limits

The equivalent isotropic radiated power (e.i.r.p.) shall be equal to or less than 10 dBmW.

#### Test Setup



#### Test Procedure

##### Step 1:

- using a suitable means, the output of the transmitter shall be coupled to a matched diode detector;
- the output of the diode detector shall be connected to the vertical channel of an oscilloscope;
- the combination of the diode detector and the oscilloscope shall be capable of faithfully reproducing the envelope peaks and the duty cycle of the transmitter output signal;
- the observed duty cycle of the transmitter (Tx on/(Tx on + Tx off)) shall be noted as x, ( $0 < x < 1$ ) and recorded.

##### Step 2:

- the average output power of the transmitter shall be determined using a wideband, calibrated RF power meter with a matched thermocouple detector or an equivalent thereof and, where applicable, with an integration period that exceeds the repetition period of the transmitter by a factor 5 or more. The observed value shall be recorded as "A" (in dBm);
- the e.i.r.p. shall be calculated from the above measured power output A, the observed duty cycle x, and the applicable antenna assembly gain "G" in dBi, according to the formula:  
-  $P = A + G + 10 \log (1/x)$

#### Test Results

For Wireless Mouse:

Temperature (°C)	Voltage (V)	Equivalent isotropic radiated power			Limit
		Low CH.	Middle CH.	High CH.	
		dBm	dBm	dBm	
Tnor = 25	3.0	-10.6	-9.3	-7.7	10mW(10dBm)
Tmin = -20	3.0	-10.3	-8.9	-7.4	
	2.7	-10.5	-9.2	-7.6	
Tmax = 55	3.0	-10.9	-9.5	-7.8	
	2.7	-11.0	-9.7	-8.0	

For USB Dongle:

Temperature (°C)	Voltage (V)	Equivalent isotropic radiated power			Limit
		Low CH.	Middle CH.	High CH.	
		dBm	dBm	dBm	
Tnor = 25	5	-14.6	-16.7	-19.1	10mW(10dBm)
Tmin = -20	5	-14.2	-16.3	-18.7	
Tmax = 55	5	-14.8	-16.9	-19.2	

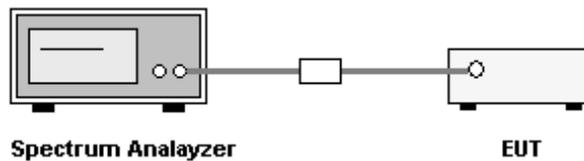
## 5.2 Permitted range of operating frequencies

### Test Limits

The width of the power spectrum envelope is  $f_H - f_L$  for a given operating frequency. In equipment that allows adjustment or selection of different operating frequencies, the power envelope takes up different positions in the allowed band. The frequency range is determined by the lowest value of  $f_L$  and the highest value of  $f_H$  resulting from the adjustment of the equipment to the lowest and highest operating frequencies.

For all equipment the frequency range shall lie within the band 2.4 GHz to 2.4835 GHz ( $f_L > 2.4$  GHz and  $f_H < 2.4835$  GHz).

### Test Setup



### Test Procedure

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Set spectrum analyzer's RBW and VBW to applicable value with AV in Max Hold. RBW=30 kHz, VBW=30 kHz, sweep time= 60s.

### Test Results

For Wireless Mouse:

TEST CONDITIONS		FREQUENCY (GHz)			
		Lowest Frequency		Highest Frequency	
Temperature (°C)	Voltage(V)	Measure result	Limit	Measure result	Limit
Tnor = 25	3.0	2.402770	>2.4 GHz	2.477620	<2.4835 GHz
Tmin = -20	3.0	2.402773		2.477624	
	2.7	2.402769		2.477622	
Tmax = 55	3.0	2.402769		2.477620	
	2.7	2.402767		2.477618	

For USB Dongle:

TEST CONDITIONS		FREQUENCY (GHz)			
		Lowest Frequency		Highest Frequency	
Temperature (°C)	Voltage(V)	Measure result	Limit	Measure result	Limit
Tnor = 25	5	2.402767	>2.4 GHz	2.477417	<2.4835 GHz
Tmin = -20	5	2.402770		2.477419	
Tmax = 55	5	2.402765		2.477415	

### 5.3 Unwanted emissions in the spurious domain

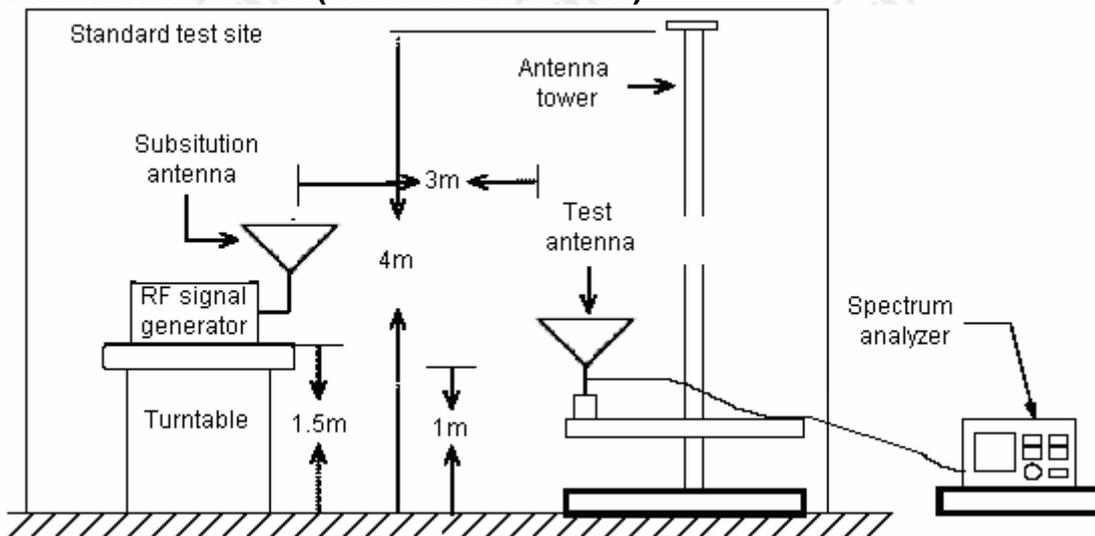
#### Test Limits (ERP)

The power of any radiated emission shall not exceed the values given in below.

Frequency range	Limit when operating	Limit when in standby
47 MHz to 74 MHz 87.5 MHz to 108 MHz 174 MHz to 230 MHz 470 MHz to 862 MHz	-54 dBm	-57 dBm
Other frequencies ≤ 1 000 MHz	-36 dBm	-57 dBm
Frequencies > 1 000 MHz	-30 dBm	-47 dBm

#### Test Setup

##### SUBSTITUTION METHOD: (Radiated Emissions)



#### Test Procedure

- 1) On a test site, the EUT shall be placed on a turntable and in the position closest to the normal use as declared by the user.
- 2) The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the transmitter.
- 3) The output of the antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
- 4) The transmitter shall be switched on; if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
- 5) The test antenna shall be raised and lowered through the specified range of height until the measuring receiver detects a maximum signal level.

- 6) The transmitter shall than be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- 7) The test antenna shall be raised and lowered again through the specified range of height until the measuring receiver detects a maximum signal level.
- 8) The maximum signal level detected by the measuring receiver shall be noted.
- 9) The measurement shall be repeated with the test antenna set to horizontal polarization.
- 10) Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter.
- 11) The substitution antenna shall be oriented for vertical polarization and, if necessary, the length of the substitution antenna shall be adjusted to correspond to the frequency of transmitting.
- 12) The substitution antenna shall be connected to a calibrated signal generator.
- 13) If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- 14) The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.
- 15) The input signal to substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
- 16) The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
- 17) The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.

### **Test Results**

Pass.

The EUT has no standby mode.

**For Wireless Mouse:**

Frequency (MHz)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization
Low Channel_2403MHz				
511.767	-66.6	-54.0	-12.6	H
3258.333	-44.1	-30.0	-14.1	H
4600.000	-38.2	-30.0	-8.2	H
794.683	-62.3	-54.0	-8.3	V
3983.333	-39.4	-30.0	-9.4	V
4466.667	-43.7	-30.0	-13.7	V
Middle Channel_2442MHz				
424.466	-66.4	-36.0	-30.4	H
3216.667	-44.0	-30.0	-14.0	H
4900.000	-42.5	-30.0	-12.5	H
597.450	-66.2	-54.0	-12.2	V
4308.333	-43.9	-30.0	-13.9	V
4883.333	-43.3	-30.0	-13.3	V
High Channel_2477MHz				
687.938	-63.4	-54.0	-9.4	H
2151.000	-45.6	-30.0	-15.6	H
4158.333	-42.7	-30.0	-12.7	H
424.467	-66.8	-36.0	-30.8	V
3116.667	-43.6	-30.0	-13.6	V
5358.333	-44.2	-30.0	-14.2	V

**For USB Dongle:**

Frequency (MHz)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization
Low Channel_2403MHz				
120.533	-76.6	-54.0	-22.6	H
3158.333	-43.9	-30.0	-13.9	H
5366.667	-43.9	-30.0	-13.9	H
138.317	-67.7	-36.0	-31.7	V
3058.333	-42.8	-30.0	-12.8	V
5316.667	-44.6	-30.0	-14.6	V
Middle Channel_2442MHz				
180.350	-69.2	-54.0	-15.2	H
3425.000	-44.7	-30.0	-14.7	H
4500.000	-43.3	-30.0	-13.3	H
299.983	-71.5	-36.0	-35.5	V
3650.000	-44.7	-30.0	-14.7	V
4916.667	-43.1	-30.0	-13.1	V
High Channel_2477MHz				
304.833	-61.9	-36.0	-25.9	H
3075.000	-44.3	-30.0	-14.3	H
4008.333	-43.4	-30.0	-13.4	H
733.533	-65.9	-54.0	-11.9	V
4191.667	-44.2	-30.0	-14.2	V
5216.667	-43.6	-30.0	-13.6	V

**Remark:**

1. The test frequency from 25MHz up to 25GHz.
2. If the emission level is too low to be measured, it is not reported.
3. The result basic equation calculation is as follows:

Margin = Emission Level - Limit

## 6. RECEIVER REQUIREMENT & TEST SUITES

### 6.1 Spurious radiations

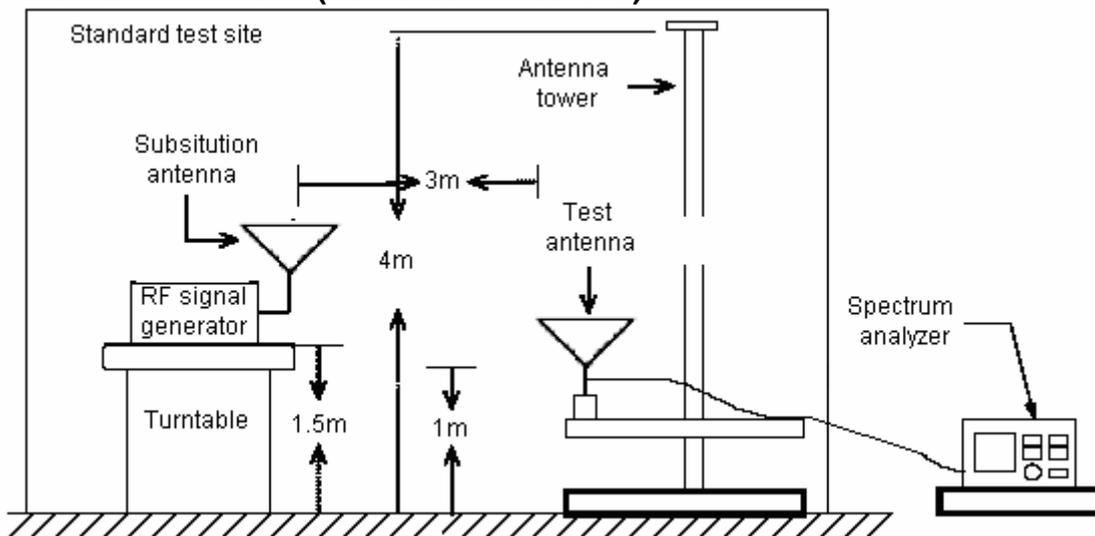
#### Test Limits(ERP)

The spurious emissions of the receiver shall not exceed the values in below tables in the indicated bands.

Frequency Range	Limit
25MHz to 1 GHz	-57 dBm
above 1 GHz	-47 dBm

#### Test Setup

##### **SUBSTITUTION METHOD: (Radiated Emissions)**



#### Test Procedure

- 1) On a test site, the EUT shall be placed on a turntable and in the position closest to the normal use as declared by the user.
- 2) The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the transmitter.
- 3) The output of the antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report.  
The detector selection is based on how close the emission level was approaching the limit.
- 4) The transmitter shall be switched on; if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
- 5) The test antenna shall be raised and lowered through the specified range of height until the measuring receiver detects a maximum signal level.
- 6) The transmitter shall than be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.

- 7) The test antenna shall be raised and lowered again through the specified range of height until the measuring receiver detects a maximum signal level.
- 8) The maximum signal level detected by the measuring receiver shall be noted.
- 9) The measurement shall be repeated with the test antenna set to horizontal polarization.
- 10) Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter.
- 11) The substitution antenna shall be oriented for vertical polarization and, if necessary, the length of the substitution antenna shall be adjusted to correspond to the frequency of transmitting.
- 12) The substitution antenna shall be connected to a calibrated signal generator.
- 13) If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- 14) The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.
- 15) The input signal to substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
- 16) The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
- 17) The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.

## **Test Results**

Pass.

**For Wireless Mouse:**

Frequency (MHz)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization
114.066	-84.3	-57.0	-27.3	H
324.233	-78.8	-57.0	-21.8	H
2075.000	-56.8	-47.0	-9.8	H
3008.333	-55.4	-47.0	-8.4	H
30.000	-69.7	-57.0	-12.7	V
707.383	-63.0	-57.0	-6.0	V
2066.667	-55.5	-47.0	-8.5	V
4883.333	-55.3	-47.0	-8.3	V

**For USB Dongle:**

Frequency (MHz)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization
120.533	-78.2	-57.0	-21.2	H
180.358	-71.5	-57.0	-14.5	H
2191.667	-50.7	-47.0	-3.7	H
4841.667	-55.9	-47.0	-8.9	H
133.467	-71.1	-57.0	-14.1	V
594.216	-71.9	-57.0	-14.9	V
2133.333	-55.8	-47.0	-8.8	V
3341.667	-57.2	-47.0	-10.2	V

**Remark:**

1. The test frequency from 25MHz up to 25GHz.
2. If the emission level is too low to be measured, it is not reported. All the emissions for RX mode are less than the limit 20dB, so they are not recorded.
3. According to technical experiences, all spurious emissions at the low, middle and high channel are almost the same, so that the test data of middle channel are chosen as representative for the test.
3. The result basic equation calculation is as follows:  

$$\text{Margin} = \text{Emission Level} - \text{Limit}$$

## 7. EMC REQUIREMENT & TEST SUITES

### 7.1 Immunity test results

According to the clause 6.4 of ETSI EN 301 489-3 V1.4.1:2002, the description of performance criteria is below:

#### **Continuous phenomena applied to Transmitters (CT):**

For equipment of type I or II including ancillary equipment tested on a stand alone basis, the performance criteria A of the applicable class as given in clause 6.3 shall apply.

For equipment of type II or type III that requires a communication link that is maintained during the test, it shall be verified by appropriate means supplied by the manufacturer that the communication link is maintained during each individual exposure in the test sequence.

Where the EUT is a transmitter, tests shall be repeated with the EUT in standby mode to ensure that any unintentional transmission does not occur.

#### **Transient phenomena applied to Transmitters (TT):**

For equipment of type I or II, including ancillary equipment tested on a stand alone basis, the performance criteria B of the applicable class as given in clause 6.3 shall apply, except for power interruptions exceeding a certain time the performance criteria deviations are specified in clause 7.2.2.

For equipment of type II or type III that requires a communication link that is maintained during the test, this shall be verified by appropriate means supplied by the manufacturer during each individual exposure in the test sequence.

Where the EUT is a transmitter, tests shall be repeated with the EUT in standby mode to ensure that any unintentional transmission does not occur.

#### **Continuous phenomena applied to Receivers (CR):**

For equipment of type I or II, including ancillary equipment tested on a stand alone basis, the performance criteria A of the applicable class as given in clause 6.3 shall apply.

For equipment of type II or III that requires a communication link that is maintained during the test, it shall be verified by appropriate means supplied by the manufacturer that the communication link is maintained during each individual exposure in the test sequence.

Where the EUT is a transceiver, under no circumstances shall the transmitter operate unintentionally during the test.

#### **Transient phenomena applied to Receivers (TR):**

For equipment of type I or II, including ancillary equipment tested on a stand alone basis, the performance criteria B of the applicable class as given in clause 6.3 shall apply, except for power interruptions exceeding a certain time the performance criteria deviations are specified in clause 7.2.2.

For equipment of type II or type III that requires a communication link that is maintained during the test, this shall be verified by appropriate means supplied by the manufacturer during each individual exposure in the test sequence.

Where the EUT is a transceiver, under no circumstances shall the transmitter operate unintentionally during the test.

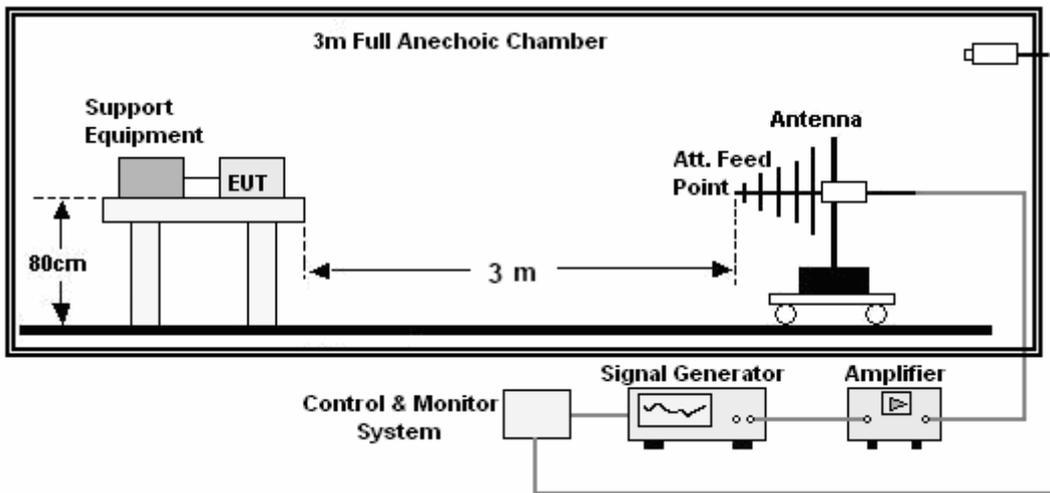
## 7.1.1 RF electromagnetic field (RS)

### Test Specification

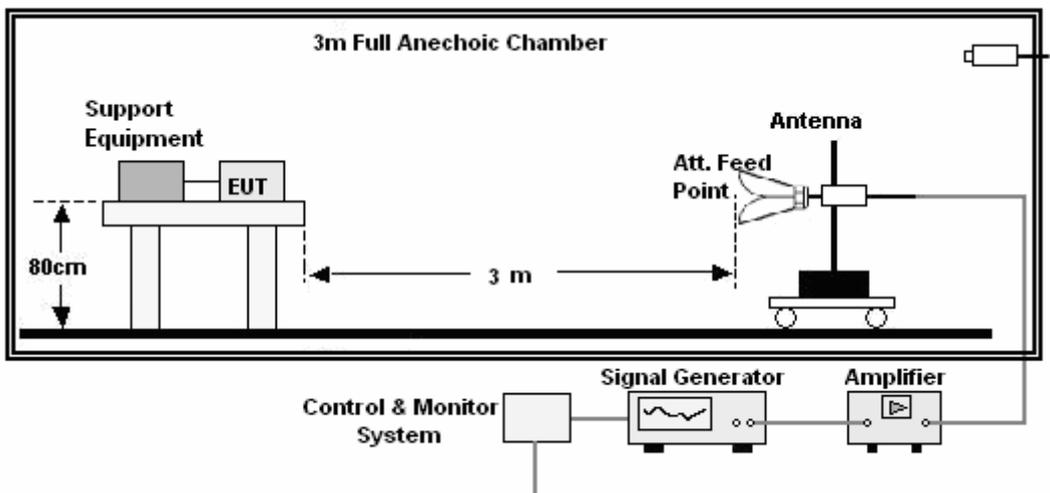
<b>Basic Standard</b>	: ETSI EN 301 489-3 & EN 61000-4-3
<b>Step Size</b>	: 10%
<b>Modulation</b>	: 80% AM
<b>Dwell Time</b>	: 1 second
<b>Polarization</b>	: Horizontal & Vertical
<b>Test Mode</b>	: TX & RX

### Test Setup

a. Below 1GHz:



b. Above 1GHz



### Test Procedure

- a. The testing was performed in a fully-anechoic chamber. The transmit antenna was located at a distance of 3m and 1m from the EUT.
- b. The frequency range is swept from 80MHz to 1GHz and 1.4GHz to 2.7GHz, with the signal 80% amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed  $1.5 \times 10^{-3}$  decade/s. Where the frequency range is swept incrementally, the step size was 10%.
- c. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond, and not exceed 5s at each of the frequencies during the scan.
- d. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

### Test Results

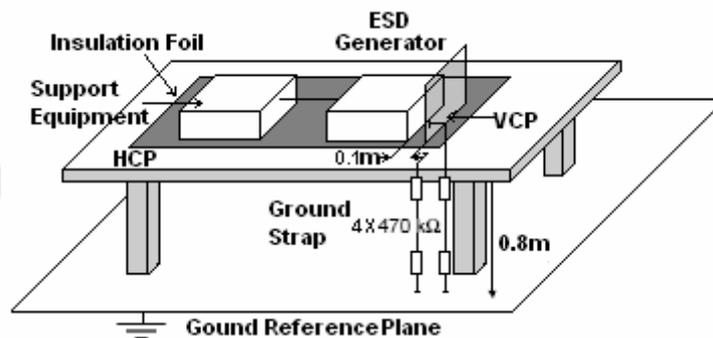
Position	Frequency (MHz)	Field Strength (V/m)	RF Signal (Modulation)	Polarity (H/V)	Result (Pursuant to EN301489-3 Criterion CT & CR)	Remark
Front	80MHz-1GHz & 1.4GHz-2.7GHz	3	AM	H/V	Complied	EUT operated as intended.
Left	80MHz-1GHz & 1.4GHz-2.7GHz	3	AM	H/V	Complied	
Back	80MHz-1GHz & 1.4GHz-2.7GHz	3	AM	H/V	Complied	
Right	80MHz-1GHz & 1.4GHz-2.7GHz	3	AM	H/V	Complied	

## 7.1.2 Electrostatic discharge (ESD)

### Test Specification

<b>Basic Standard</b>	: ETSI EN 301 489-3 & EN 61000-4-2
<b>Discharge Impedance</b>	: 330 ohm / 150 pF
<b>Discharge Mode</b>	: Single Discharge
<b>Discharge Period</b>	: 1 discharge per second
<b>Test Mode</b>	: TX & RX

### Test Setup



### Test Procedure

- Electrostatic discharges were applied only to those points and surfaces of the EUT that are accessible to users during normal operation.
- The test was performed with at least ten single discharges on the pre-selected points in the most sensitive polarity.
- The time interval between two successive single discharges was at least 1 second.
- The ESD generator was held perpendicularly to the surface to which the discharge was applied and the return cable was at least 0.2 meters from the EUT.
- Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.
- Air discharges were applied with the round discharge tip of the discharge electrode approaching the EUT as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator was removed from the EUT and re-triggered for a new single discharge. The test was repeated until all discharges were complete.
- At least ten single discharges (in the most sensitive polarity) were applied to the Horizontal Coupling Plane at points on each side of the EUT. The ESD generator was positioned vertically at a distance of 0.1 meters from the EUT with the discharge electrode touching the HCP.
- At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical edge of the Vertical Coupling Plane in sufficiently different positions that the four

faces of the EUT were completely illuminated. The VCP (dimensions 0.5m x 0.5m) was placed vertically to and 0.1 meters from the EUT.

### Test Results

Amount of Discharges	Voltage	Coupling	Result (Pursuant to EN301489-3 Criterion TT & TR)	Remark
Mini 10 /Point	± 2; ±4; ±8 kV	Air Discharge	Complied	EUT operated as intended.
Mini 10 /Point	± 2; ±4 kV	Contact Discharge	Complied	
Mini 10 /Point	± 2; ±4 kV	Indirect Discharge HCP	Complied	
Mini 10 /Point	± 2; ±4 kV	Indirect Discharge VCP	Complied	

## APPENDIX 1 PHOTOGRAPHS OF TEST SETUP



**RS Test Setup**



**ESD Test Setup**

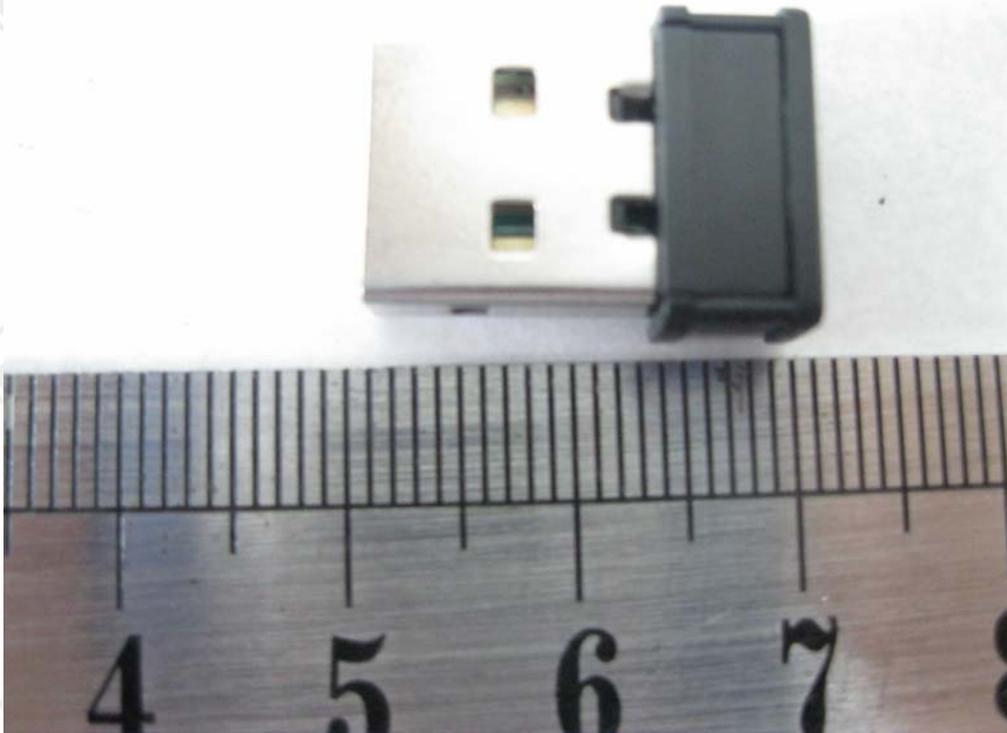
**APPENDIX 2 EXTERNAL PHOTOGRAPHS OF EUT**



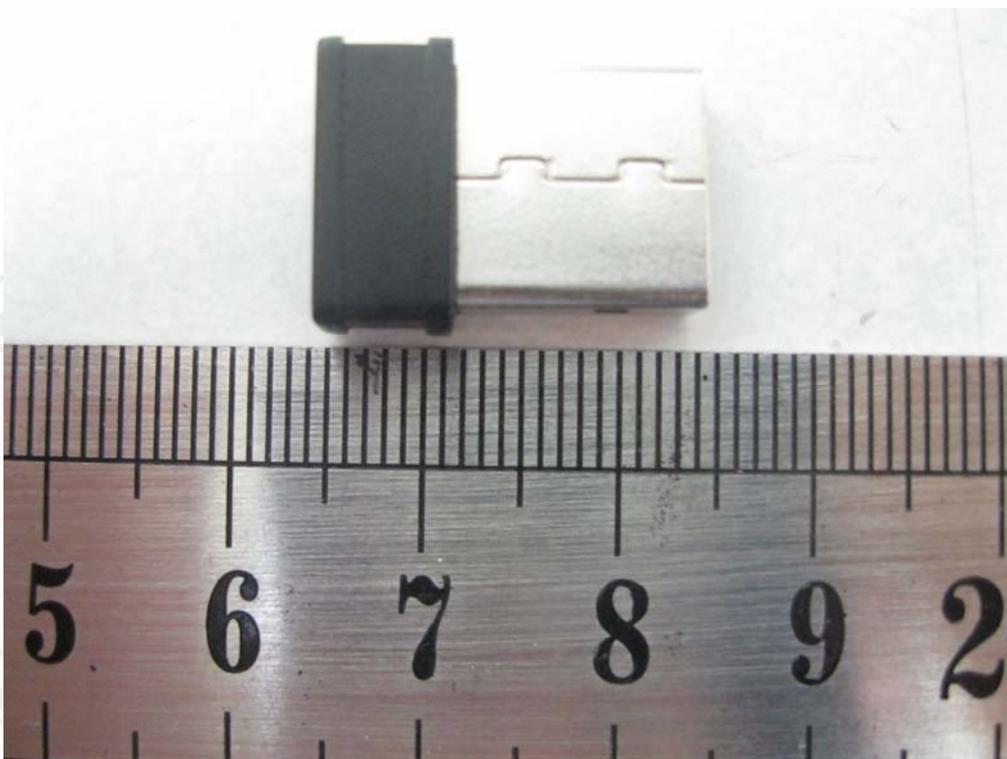
Front View of Wireless Mouse



Rear View of Wireless Mouse



Front View of USB Dongle

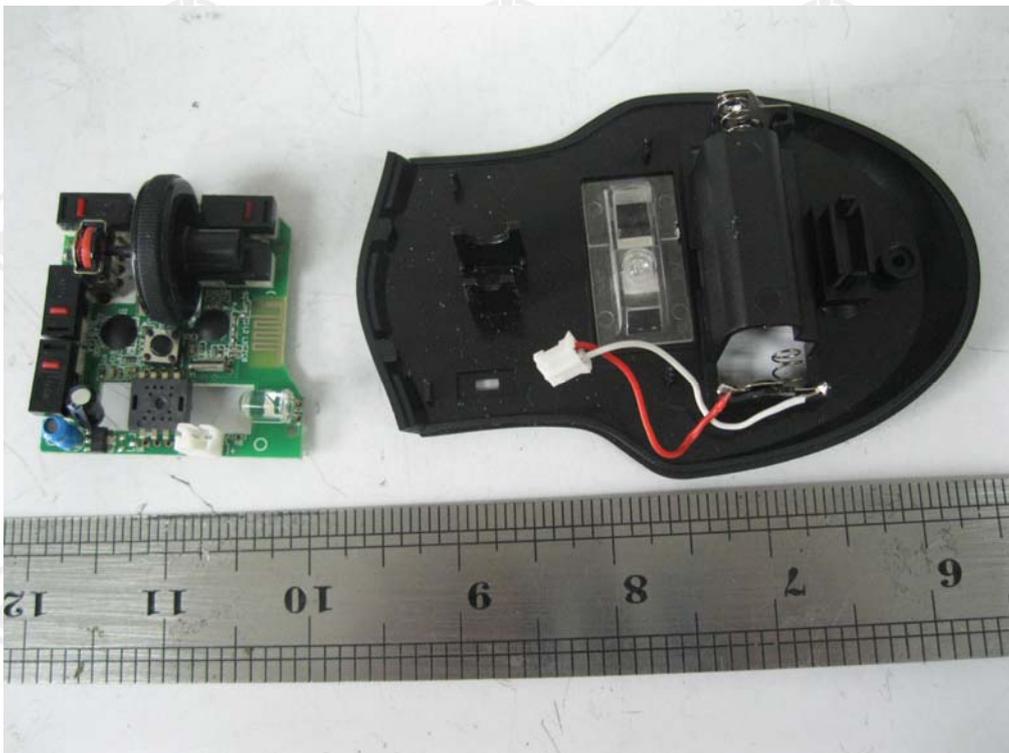


Rear View of USB Dongle

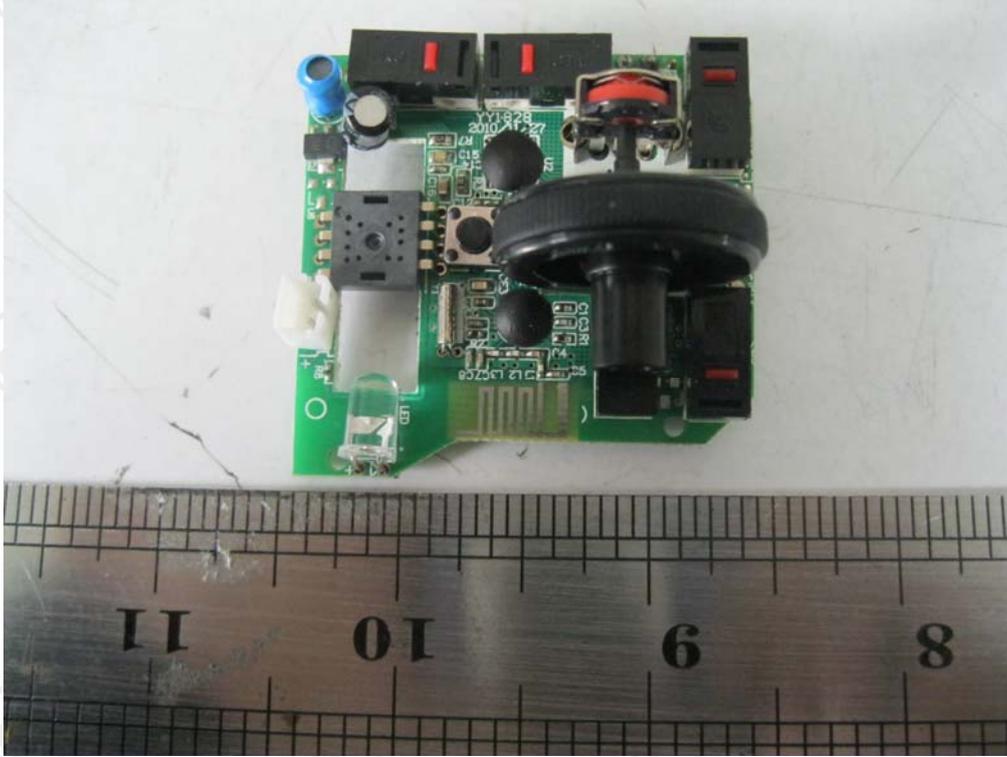
**APPENDIX 3 INTERNAL PHOTOGRAPHS OF EUT**



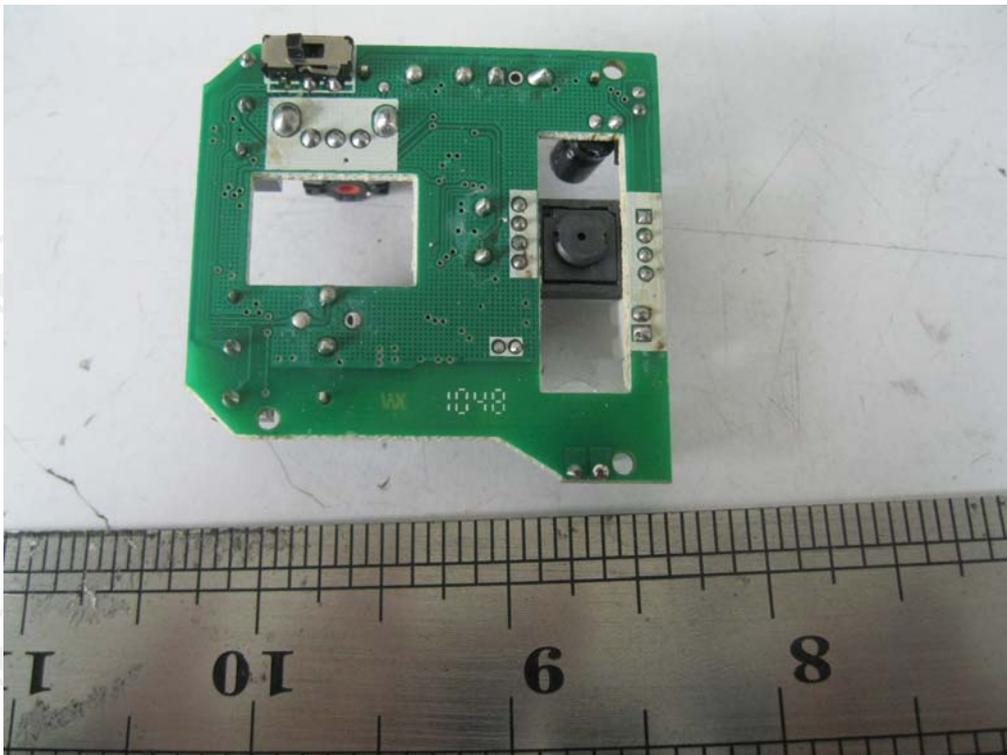
Wireless Mouse-1



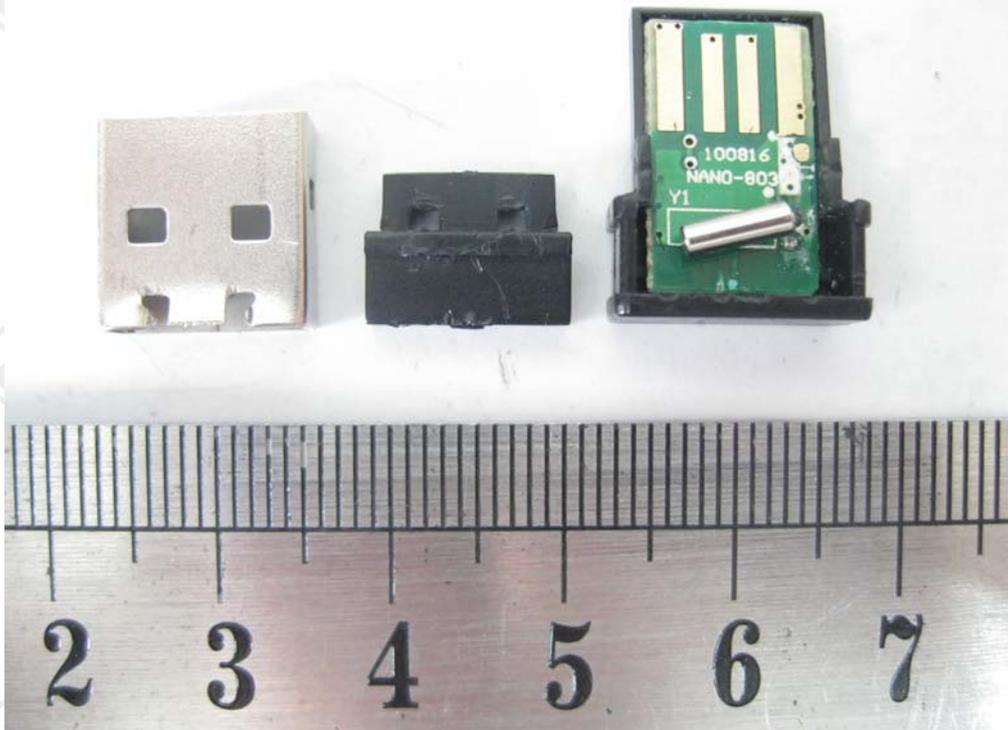
Wireless Mouse-2



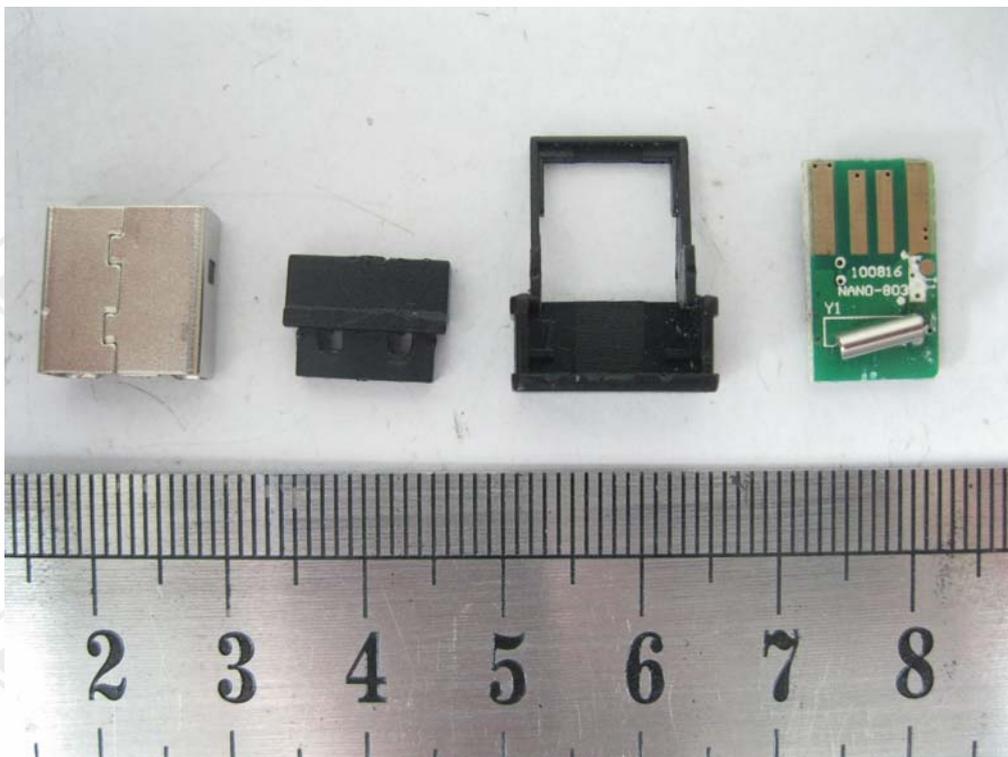
Wireless Mouse-3



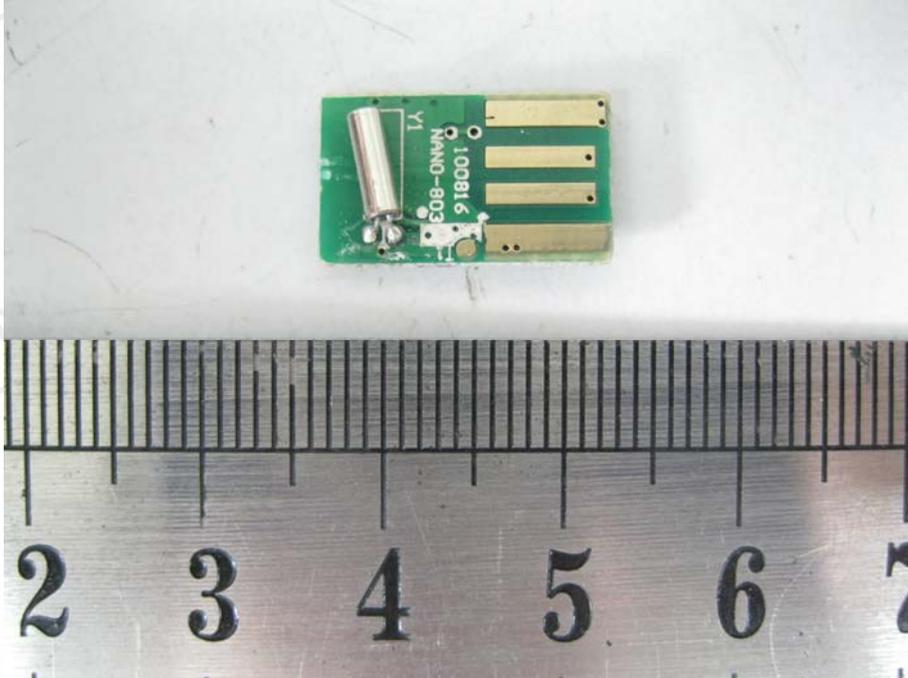
Wireless Mouse-4



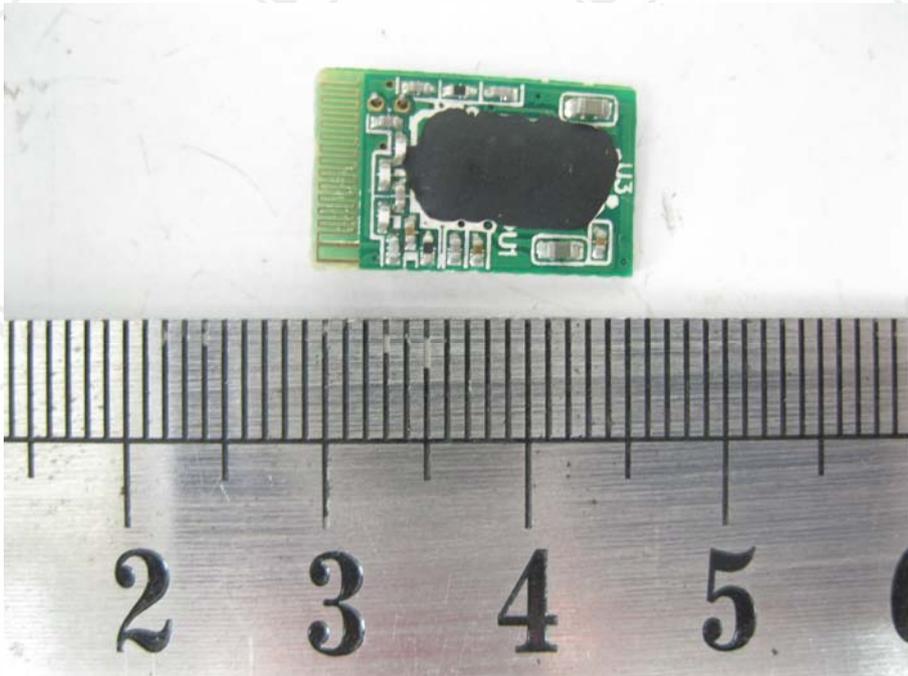
USB Dongle-1



USB Dongle-2



USB Dongle-3



USB Dongle-4

\*\*\* End of report \*\*\*

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