



## **FCC TEST REPORT**

**For**

**WIRED OPTICAL MOUSE**

**MODEL No.: KM1033C, CCM660165, CCM660196**

**BRAND NAME: N/A**

**FCC ID: WUACCM660165-196**

**REPORT NO: KAD101109014E**

**ISSUE DATE: November 25, 2010**

*Prepared for*

**PAWAS Trading Gmbh  
Nordstrasse 223, CH-8037 Zurich, Switzerland**

*Prepared by*

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## TABLE OF CONTENTS

|                                                              |           |
|--------------------------------------------------------------|-----------|
| <b>1. GENERAL INFORMATION .....</b>                          | <b>4</b>  |
| 1.1 Description of Device (EUT).....                         | 4         |
| 1.2 Description of Support Device .....                      | 5         |
| 1.3 Test Facility .....                                      | 5         |
| 1.4 Measurement Uncertainty .....                            | 6         |
| <b>2. POWER LINE CONDUCTED MEASUREMENT .....</b>             | <b>7</b>  |
| 2.1 Test Equipment .....                                     | 7         |
| 2.2 Block Diagram of Test Setup.....                         | 7         |
| 2.3 Power Line Conducted Emission Measurement Limits.....    | 8         |
| 2.4 Configuration of EUT on Measurement .....                | 8         |
| 2.5 Operating Condition of EUT .....                         | 8         |
| 2.6 Test Procedure .....                                     | 8         |
| 2.7 Power Line Conducted Emission Measurement Results .....  | 8         |
| <b>3. RADIATED EMISSION MEASUREMENT .....</b>                | <b>11</b> |
| 3.1 Test Equipment .....                                     | 11        |
| 3.2 Block Diagram of Test Setup.....                         | 12        |
| 3.3 Radiated Emission Limit .....                            | 13        |
| 3.4 EUT Configuration on Measurement .....                   | 13        |
| 3.5 Operating Condition of EUT .....                         | 13        |
| 3.6 Test Procedure .....                                     | 13        |
| 3.7 Radiated Emission Measurement Results .....              | 14        |
| <b>4. PHOTOGRAPHS .....</b>                                  | <b>17</b> |
| 4.1 Photo of Power Line Conducted Emission Measurement ..... | 17        |
| 4.2 Photo of Radiated Emission Measurement .....             | 17        |
| 4.3 Photos of EUT .....                                      | 18        |

## TEST REPORT DESCRIPTION

Applicant : PAWAS TRADING GMBH  
Manufacturer : PAWAS TRADING GMBH  
EUT : WIRED OPTICAL MOUSE  
FCC ID No. : WUACCM660165-196  
Test Voltage : DC 5V (PC Input: AC 120V 60Hz)  
File Number : KAD101109014E  
Date of Test : November 09, 2010 to November 25, 2010

### Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart B Class B October 2009 & FCC / ANSI C63.4-2009

The device described above is tested by Dongguan EMTEK Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart Class B limits both radiated and conducted emissions. The measurement results are contained in this test report and Dongguan EMTEK Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Dongguan EMTEK Co., Ltd.

*Approved By*



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**Nicol Lee / Q.A. Manager**  
**DONGGUAN EMTEK CO., LTD.**

# 1. GENERAL INFORMATION

## 1.1 Description of Device (EUT)

|                         |                                                                                                                                                                      |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EUT                     | : WIRED OPTICAL MOUSE                                                                                                                                                |
| Model Number            | : KM1033C, CCM660165, CCM660196<br>(Note: These models are the same except model number, all models use the same FCC ID Number. So we prepare KM1033C for EMC test.) |
| FCC ID Number           | : WUACCM660165-196                                                                                                                                                   |
| Trade Mark              | : N/A                                                                                                                                                                |
| Power Supply            | : DC 5V (PC Input: AC 120V 60Hz)                                                                                                                                     |
| Applicant               | : PAWAS TRADING GMBH                                                                                                                                                 |
| Address                 | : Nordstrasse 223, CH-8037 Zurich, Switzerland                                                                                                                       |
| Manufacturer            | : PAWAS TRADING GMBH                                                                                                                                                 |
| Address                 | : Nordstrasse 223, CH-8037 Zurich, Switzerland                                                                                                                       |
| Date of sample receiver | : November 09, 2010                                                                                                                                                  |
| Date of Test            | : November 09, 2010 to November 25, 2010                                                                                                                             |

## 1.2 Description of Support Device

|             |                                                                                   |
|-------------|-----------------------------------------------------------------------------------|
| PC          | : Manufacturer: DELL<br>M/N: OPTIRLEX 760<br>S/N: N/A<br>CE, FCC: DOC             |
| LCD Monitor | Manufacturer: DELL<br>M/N: E1909WF<br>S/N: N/A<br>CE , FCC:DOC                    |
| Keyboard    | : Manufacturer: DELL<br>M/N: L30U<br>S/N: 0N277F<br>CE, FCC: DOC                  |
| Printer     | : Manufacturer: HEWLETT PACKARD<br>M/N: Q5911A<br>S/N: CNCK512065<br>CE, FCC: DOC |

## 1.3 Test Facility

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Site Description |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| EMC Lab          | : Accredited by CNAS, 2007.07.27<br>The certificate is valid until 2012.07.26<br>The Laboratory has been assessed and proved to be in compliance with CNAS/CL01:2006<br>The Certificate Registration Number is L3150<br><br>Accredited by TUV Rheinland Shenzhen 2009.09.16<br>The certificate is valid until 2011.03.16<br>The Laboratory has been assessed according to the requirements ISO/IEC 17025: 2005<br><br>Accredited by FCC, Nov. 05, 2008<br>The Certificate Number is 247565.<br><br>Accredited by Industry Canada, March 05, 2010<br>The Certificate Registration Number. is 46405-4480 |
| Name of Firm     | : Dongguan EMTEK Co., Ltd.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Site Location    | : No.281, Guantai Road, Nancheng District, Dongguan, Guangdong, China.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

## 1.4 Measurement Uncertainty

Conducted Emission Uncertainty :  $U_r = 3.3$

Radiated Emission Uncertainty :  $U_c = 2.8$

Disturbance Power Uncertainty :  $U_c = 2.6$

## 2. POWER LINE CONDUCTED MEASUREMENT

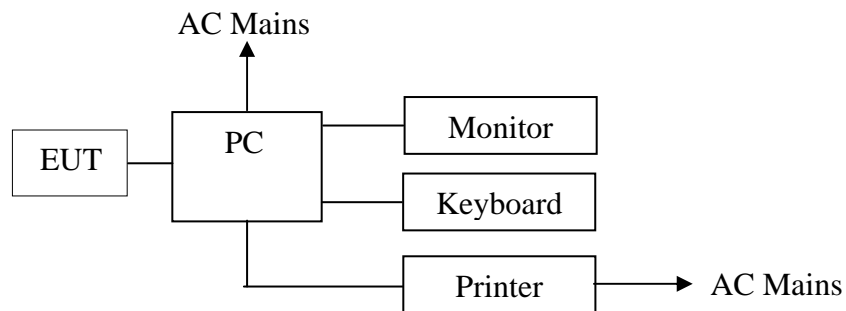
### 2.1 Test Equipment

The following test equipments are used during the power line conducted measurement:

| Item | Equipment                  | Manufacturer  | Model No. | Serial No. | Last Cal.    | Cal. Interval |
|------|----------------------------|---------------|-----------|------------|--------------|---------------|
| 1    | EMI Test Receiver          | ROHDE&SCHWARZ | ESCS30    | 828985/018 | May 29, 2010 | 1 Year        |
| 2    | LISN                       | ROHDE&SCHWARZ | ENV216    | 100017     | May 29, 2010 | 1Year         |
| 3    | Conical Housing            | EMTEK         | N/A       | N/A        | May 29, 2010 | N/A           |
| 4    | Voltage Probe              | SCHWARZBECK   | EZ-17     | 100213     | May 29, 2010 | 1Year         |
| 5    | 50 $\Omega$ Coaxial Switch | ANRITSU CORP  | MP59B     | 6100175589 | May 29, 2010 | 1Year         |

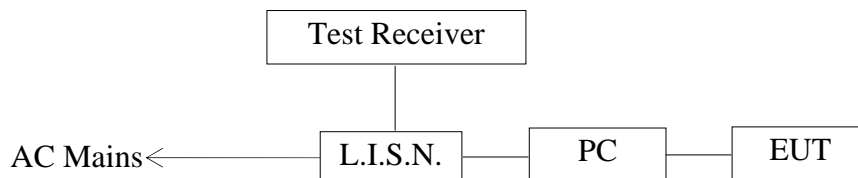
### 2.2 Block Diagram of Test Setup

#### 2.1.1. Block diagram of connection between the EUT and simulators



(EUT: WIRED OPTICAL MOUSE)

#### 2.1.2 Block diagram of test setup



(EUT: WIRED OPTICAL MOUSE)

## 2.3 Power Line Conducted Emission Measurement Limits

Conducted Emission Limits is as following.

| Frequency<br>MHz | Limits dB( $\mu$ V) |               |
|------------------|---------------------|---------------|
|                  | Quasi-peak Level    | Average Level |
| 0.15 ~ 0.50      | 66 ~ 56*            | 56 ~ 46*      |
| 0.50 ~ 5.00      | 56                  | 46            |
| 5.00 ~ 30.00     | 60                  | 50            |

Notes: 1. \*Decreasing linearly with logarithm of frequency.  
2. The lower limit shall apply at the transition frequencies.

## 2.4 Configuration of EUT on Measurement

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

EUT : WIRED OPTICAL MOUSE  
Model Number : KM1033C  
Manufacturer : PAWAS TRADING GMBH

## 2.5 Operating Condition of EUT

- 2.5.1 Setup the EUT and simulator as shown as Section 2.2.
- 2.5.2 Turn on the power of all equipment.
- 2.5.3 Let the EUT work in test model (Connect to PC) and measure it.

## 2.6 Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.4-2009 on Conducted Emission Measurement.

The bandwidth of test receiver (R&S ESCS30) is set at 9KHz.  
The frequency range from 150KHz to 30MHz is checked.

## 2.7 Power Line Conducted Emission Measurement Results

**PASS**

The scanning waveforms refer to the following pages.

## Conducted Emission Measurement

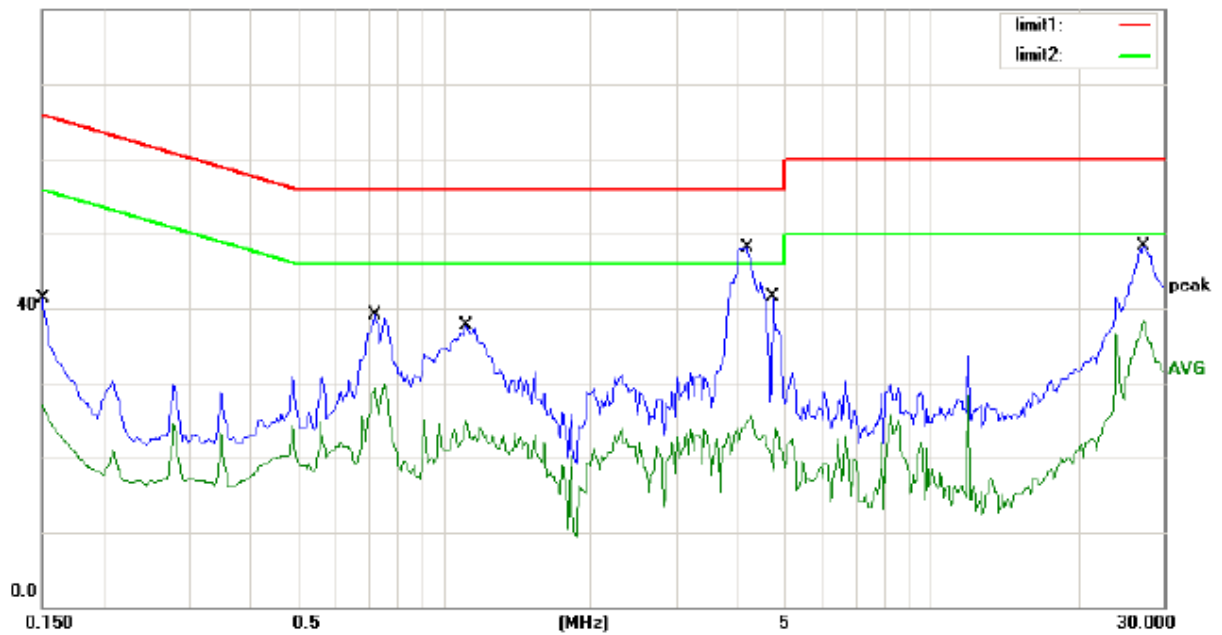
File :KM1033C

Data :#1

Date: 2010/11/11

Time: 19:43:45

80.0 dBuV



Site site #1

Phase: L1

Temperature: 25

Limit: (CE)FCC PART 15 Class B\_QP

Power: DC 5V (PC Input  
120/60Hz)

Humidity: 50 %

EUT: WIRED OPTICAL MOUSE

M/N: KM1033C

Mode: Connect to PC

Note:

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV | Limit<br>dBuV | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|---------|
| 1   |     | 0.1500       | 38.65                    | 0.00                    | 38.65                    | 66.00         | -27.35     | QP       |         |
| 2   |     | 0.1500       | 27.20                    | 0.00                    | 27.20                    | 56.00         | -28.80     | AVG      |         |
| 3   |     | 0.7200       | 37.06                    | 0.00                    | 37.06                    | 56.00         | -18.94     | QP       |         |
| 4   |     | 0.7200       | 29.83                    | 0.00                    | 29.83                    | 46.00         | -16.17     | AVG      |         |
| 5   |     | 1.1150       | 32.86                    | 0.00                    | 32.86                    | 56.00         | -23.14     | QP       |         |
| 6   |     | 1.1150       | 24.91                    | 0.00                    | 24.91                    | 46.00         | -21.09     | AVG      |         |
| 7   | *   | 4.1800       | 46.19                    | 0.00                    | 46.19                    | 56.00         | -9.81      | QP       |         |
| 8   |     | 4.1800       | 25.71                    | 0.00                    | 25.71                    | 46.00         | -20.29     | AVG      |         |
| 9   |     | 4.7400       | 37.45                    | 0.00                    | 37.45                    | 56.00         | -18.55     | QP       |         |
| 10  |     | 4.7400       | 23.98                    | 0.00                    | 23.98                    | 46.00         | -22.02     | AVG      |         |
| 11  |     | 27.3750      | 46.27                    | 0.00                    | 46.27                    | 60.00         | -13.73     | QP       |         |
| 12  |     | 27.3750      | 38.38                    | 0.00                    | 38.38                    | 50.00         | -11.62     | AVG      |         |

\*:Maximum data    x:Over limit    !:over margin    Comment: Factor build in receiver.    Operator: Andy

File :KM1033C\Data :#1

Page: 1

## Conducted Emission Measurement

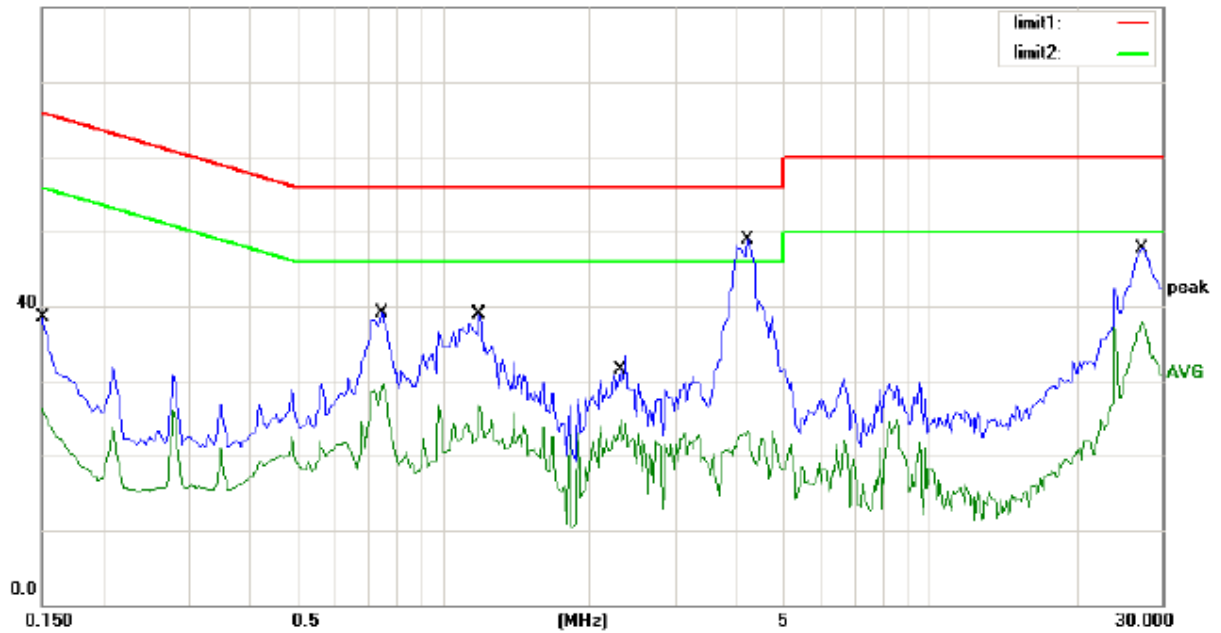
File :KM1033C

Data :#2

Date: 2010/11/11

Time: 19:46:06

80.0 dBuV



Site site #1

Phase: N

Temperature: 25

Limit: (CE)FCC PART 15 Class B\_QP

Power: DC 5V (PC Input  
120/60Hz)

Humidity: 50 %

EUT: WIRED OPTICAL MOUSE

M/N: KM1033C

Mode: Connect to PC

Note:

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV | Limit<br>dBuV | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|---------|
| 1   |     | 0.1500       | 35.58                    | 0.00                    | 35.58                    | 66.00         | -30.42     | QP       |         |
| 2   |     | 0.1500       | 26.32                    | 0.00                    | 26.32                    | 56.00         | -29.68     | AVG      |         |
| 3   |     | 0.7500       | 37.14                    | 0.00                    | 37.14                    | 56.00         | -18.86     | QP       |         |
| 4   |     | 0.7500       | 29.57                    | 0.00                    | 29.57                    | 46.00         | -16.43     | AVG      |         |
| 5   |     | 1.1900       | 35.88                    | 0.00                    | 35.88                    | 56.00         | -20.12     | QP       |         |
| 6   |     | 1.1900       | 26.71                    | 0.00                    | 26.71                    | 46.00         | -19.29     | AVG      |         |
| 7   |     | 2.3100       | 28.67                    | 0.00                    | 28.67                    | 56.00         | -27.33     | QP       |         |
| 8   |     | 2.3100       | 24.60                    | 0.00                    | 24.60                    | 46.00         | -21.40     | AVG      |         |
| 9   | *   | 4.2400       | 46.95                    | 0.00                    | 46.95                    | 56.00         | -9.05      | QP       |         |
| 10  |     | 4.2400       | 23.33                    | 0.00                    | 23.33                    | 46.00         | -22.67     | AVG      |         |
| 11  |     | 27.3750      | 45.80                    | 0.00                    | 45.80                    | 60.00         | -14.20     | QP       |         |
| 12  |     | 27.3750      | 37.82                    | 0.00                    | 37.82                    | 50.00         | -12.18     | AVG      |         |

\*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Andy

File :KM1033C\Data :#2

Page: 1

### 3. RADIATED EMISSION MEASUREMENT

#### 3.1 Test Equipment

The following test equipments are used during the radiated emission measurement:

##### 3.1.1 For Anechoic Chamber

| Item | Equipment                      | Manufacturer    | Model No. | Serial No. | Last Cal.    | Cal. Interval |
|------|--------------------------------|-----------------|-----------|------------|--------------|---------------|
| 1.   | Spectrum Analyzer              | Rohde & Schwarz | ESCI      | 100137     | May 29, 2010 | 1 Year        |
| 2.   | Test Receiver                  | Rohde & Schwarz | ESCI      | 100137     | May 29, 2010 | 1 Year        |
| 3.   | Bilog Antenna                  | Schwarzbeck     | VULB9163  | 143        | May 29, 2010 | 1 Year        |
| 4.   | Power Amplifier                | HP              | 8447F     | OPT H64    | May 29, 2010 | 1 Year        |
| 5.   | Positioning Controller         | C&C LAB         | CC-C-IF   | N/A        | May 29, 2010 | 1 Year        |
| 6.   | Color Monitor                  | SUNSPO          | SP-140A   | N/A        | May 29, 2010 | 1 Year        |
| 7.   | Single Line Filter             | JIANLI          | XL-3      | N/A        | May 29, 2010 | 1 Year        |
| 8.   | Single Phase Power Line Filter | JIANLI          | DL-2X100B | N/A        | May 29, 2010 | 1 Year        |
| 9.   | 3 Phase Power Line Filter      | JIANLI          | DL-4X100B | N/A        | May 29, 2010 | 1 Year        |
| 10.  | DC Power Filter                | JIANLI          | DL-2X50B  | N/A        | May 29, 2010 | 1 Year        |
| 11.  | Cable                          | Schwarzbeck     | PLF-100   | N/A        | May 29, 2010 | 1 Year        |
| 12.  | Cable                          | Rosenberger     | CIL02     | A0783566   | May 29, 2010 | 1 Year        |
| 13.  | Cable                          | Rosenberger     | AK9513    | AC RX1     | May 29, 2010 | 1 Year        |



### 3.3 Radiated Emission Limit

Radiated Emission Limits is as following.

| FREQUENCY<br>MHz | DISTANCE<br>Meters | FIELD STRENGTHS LIMIT                                       |
|------------------|--------------------|-------------------------------------------------------------|
|                  |                    | dB( $\mu$ V)/m                                              |
| 30 ~ 88          | 3                  | 40.0                                                        |
| 88 ~ 216         | 3                  | 43.5                                                        |
| 216 ~ 960        | 3                  | 46.0                                                        |
| 960 ~ 1000       | 3                  | 54.0                                                        |
| > 1000           | 3                  | 74.0 dB( $\mu$ V)/m (peak)<br>54.0 dB( $\mu$ V)/m (Average) |

- Remark :
- (1) Emission level (dB) $\mu$ V = 20 log Emission level  $\mu$ V/m
  - (2) The smaller limit shall apply at the cross point between two frequency bands.
  - (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

### 3.4 EUT Configuration on Measurement

The following equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

WIRED OPTICAL MOUSE (EUT)  
Model Number : KM1033C

### 3.5 Operating Condition of EUT

- 3.5.1 Setup the EUT as shown in Section 3.2.
- 3.5.2 Turn on the power of all equipment.
- 3.5.3 Let the EUT work in test mode (Connect to PC) and measure it.

### 3.6 Test Procedure

EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarization of the antenna is set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4-2009 on radiated emission measurement.

The bandwidth of the EMI test receiver (R&S ESCI) set at 120KHz in 30MHz to 1000MHz, set at 1MHz above 1000MHz.

### 3.7 Radiated Emission Measurement Results

**PASS.**

The scanning waveforms refer to the following pages:

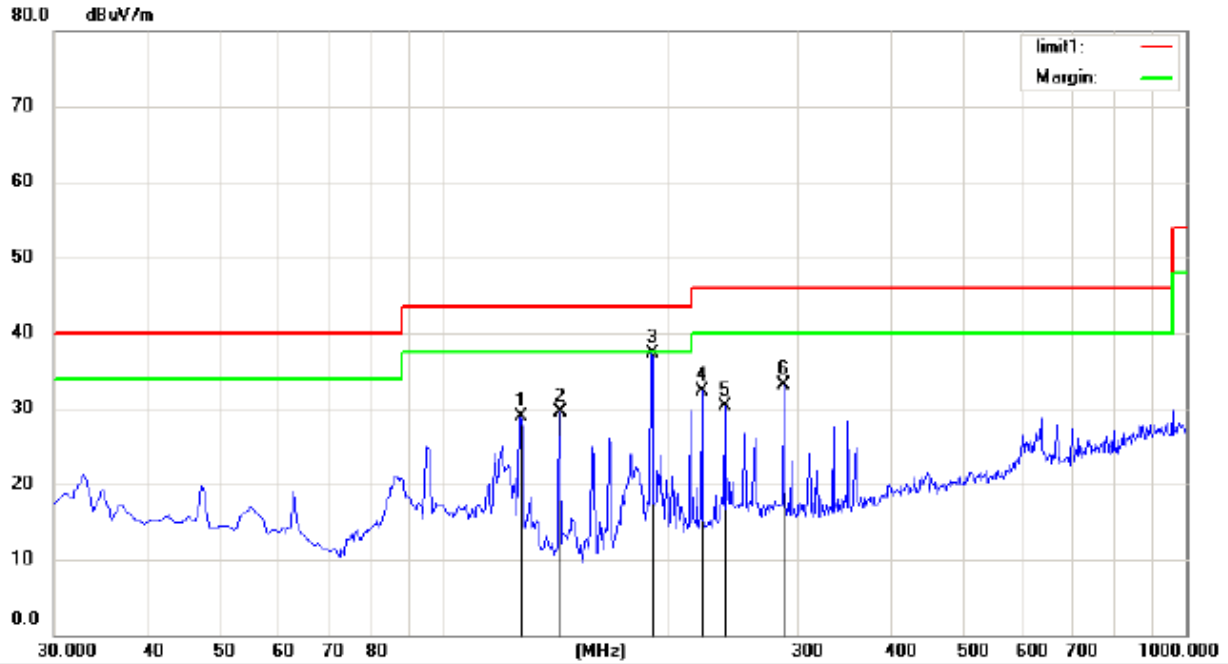
## Radiated Emission Measurement

File :KM1033C

Data :#3

Date: 2010-11-22

Time: 16:35:27



Site Chamber #1

Polarization: **Horizontal**

Temperature: 26

Limit: (RE)FCC PART 15 class B 3m

Power: DC 5V(PC Input  
120V/60Hz)

Humidity: 55 %

EUT: WIRED OPTICAL MOUSE

M/N: KM1033C

Mode: Connect to PC

Note:

| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |         |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz      | dBuV          | dB             | dBuV/m      | dBuV/m | dB     | cm             | degree       | Comment |
| 1   |     | 127.0000 | 48.86         | -19.93         | 28.93       | 43.50  | -14.57 | QP             |              |         |
| 2   |     | 143.4900 | 50.38         | -20.85         | 29.53       | 43.50  | -13.97 | QP             |              |         |
| 3   | *   | 191.0200 | 52.89         | -15.52         | 37.37       | 43.50  | -6.13  | QP             |              |         |
| 4   |     | 223.0300 | 46.32         | -13.93         | 32.39       | 46.00  | -13.61 | QP             |              |         |
| 5   |     | 239.5200 | 43.37         | -13.08         | 30.29       | 46.00  | -15.71 | QP             |              |         |
| 6   |     | 287.0500 | 45.00         | -11.99         | 33.01       | 46.00  | -12.99 | QP             |              |         |

\*:Maximum data    x:Over limit    !:over margin

Operator: Alan

File :KM1033C\Data :#3

Page: 1

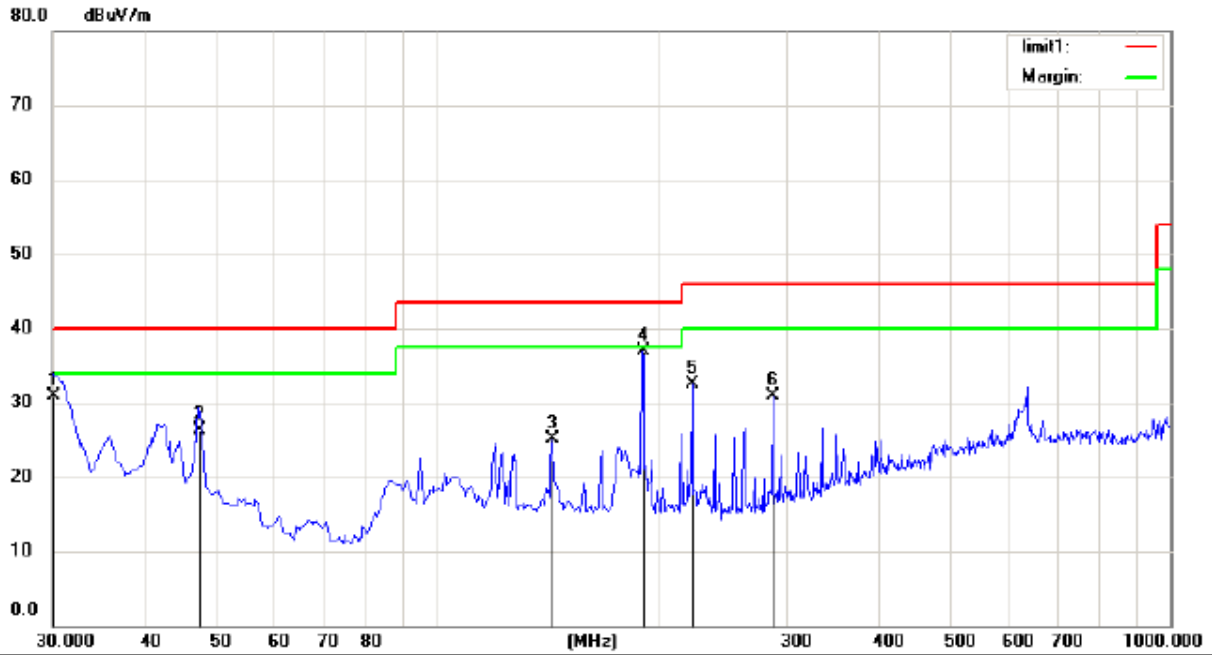
## Radiated Emission Measurement

File :KM1033C

Data :#4

Date: 2010-11-11

Time: 16:42:03



Site Chamber #1

Polarization: **Vertical**

Temperature: 26

Limit: (RE)FCC PART 15 class B 3m

Power: DC 5V(PC Input  
120V/60Hz)

Humidity: 55 %

EUT: WIRED OPTICAL MOUSE

M/N: KM1033C

Mode: Connect to PC

Note:

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Antenna<br>Height<br>cm | Table<br>Degree<br>degree | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|-------------------------|---------------------------|---------|
| 1   |     | 30.0000      | 47.99                    | -17.15                  | 30.84                      | 40.00           | -9.16      | QP                      |                           |         |
| 2   |     | 47.4600      | 42.60                    | -16.26                  | 26.34                      | 40.00           | -13.66     | QP                      |                           |         |
| 3   |     | 143.4900     | 45.92                    | -20.85                  | 25.07                      | 43.50           | -18.43     | QP                      |                           |         |
| 4   | *   | 191.0200     | 52.43                    | -15.52                  | 36.91                      | 43.50           | -6.59      | QP                      |                           |         |
| 5   |     | 223.0300     | 46.34                    | -13.93                  | 32.41                      | 46.00           | -13.59     | QP                      |                           |         |
| 6   |     | 287.0500     | 42.97                    | -11.99                  | 30.98                      | 46.00           | -15.02     | QP                      |                           |         |

\*:Maximum data    x:Over limit    !:over margin

Operator: Alan

File :KM1033C\Data :#4

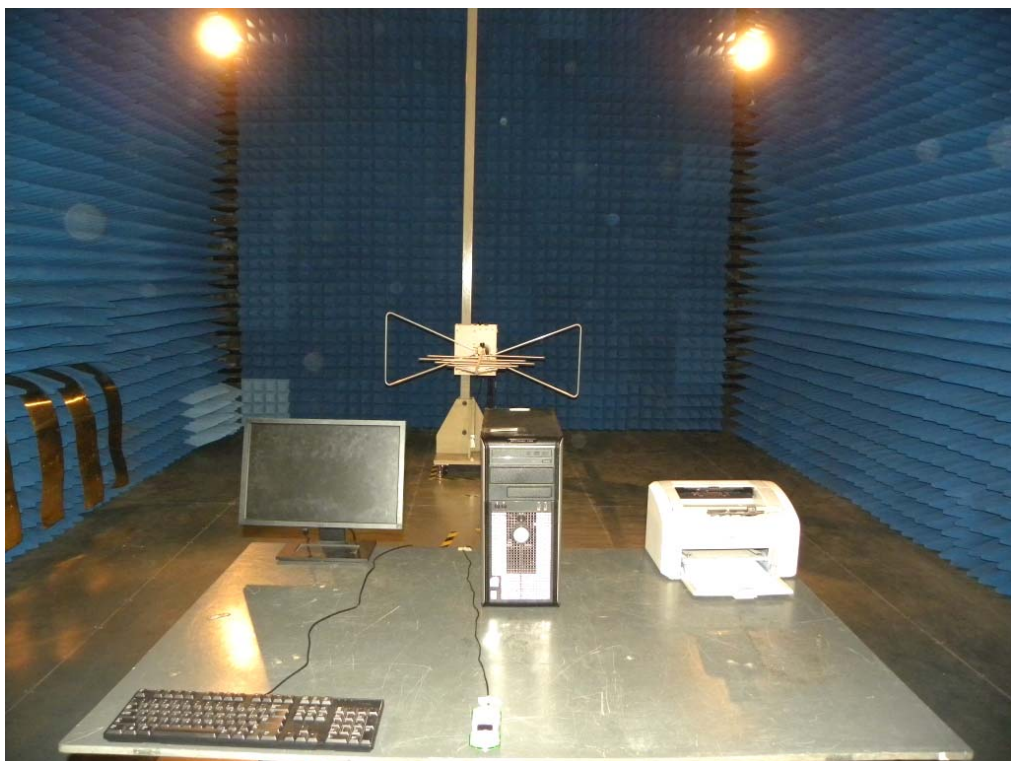
Page: 1

## 4. PHOTOGRAPHS

### 4.1 Photo of Power Line Conducted Emission Measurement



### 4.2 Photo of Radiated Emission Measurement



#### 4.3 Photos of EUT

##### General Appearance of EUT



##### General Appearance of EUT



## General Appearance of EUT



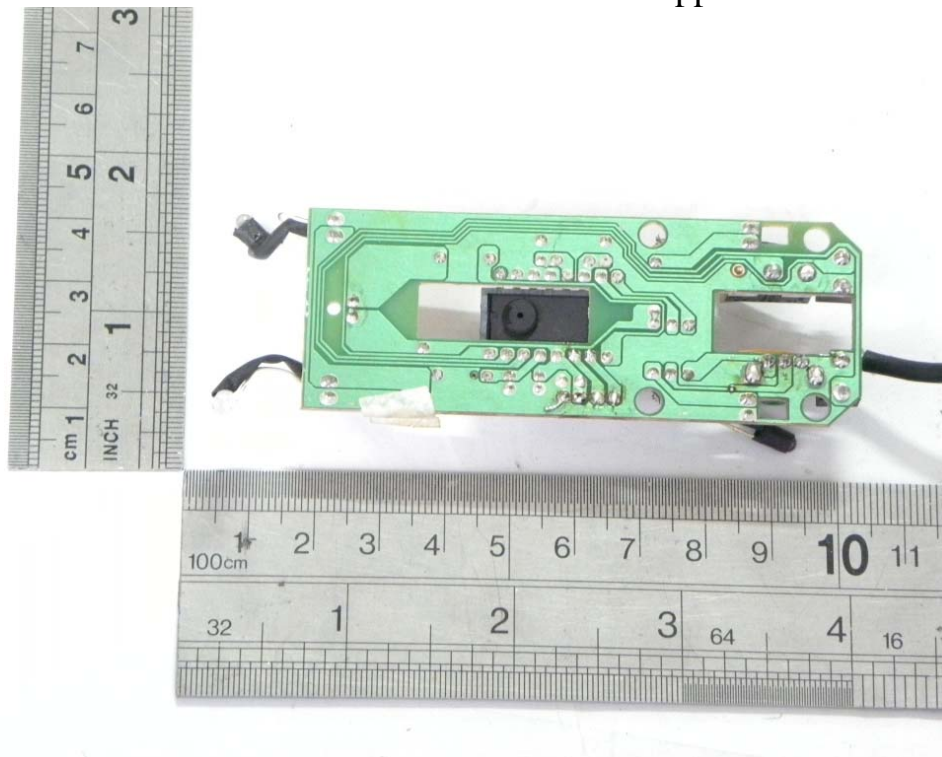
## General Appearance of EUT



## General Internal of EUT



## General Appearance of PCB



## General Appearance of PCB

