



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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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

Nicol Lee

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
(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 M/N: OPTIRLEX 760 S/N: N/A CE, FCC: DOC
LCD Monitor	Manufacturer: DELL M/N: E1909WF S/N: N/A CE , FCC:DOC
Keyboard	: Manufacturer: DELL M/N: L30U S/N: 0N277F CE, FCC: DOC
Printer	: Manufacturer: HEWLETT PACKARD M/N: Q5911A S/N: CNCK512065 CE, FCC: DOC

1.3 Test Facility

Site Description	
EMC Lab	: Accredited by CNAS, 2007.07.27 The certificate is valid until 2012.07.26 The Laboratory has been assessed and proved to be in compliance with CNAS/CL01:2006 The Certificate Registration Number is L3150
	Accredited by TUV Rheinland Shenzhen 2009.09.16 The certificate is valid until 2011.03.16 The Laboratory has been assessed according to the requirements ISO/IEC 17025: 2005
	Accredited by FCC, Nov. 05, 2008 The Certificate Number is 247565.
	Accredited by Industry Canada, March 05, 2010 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

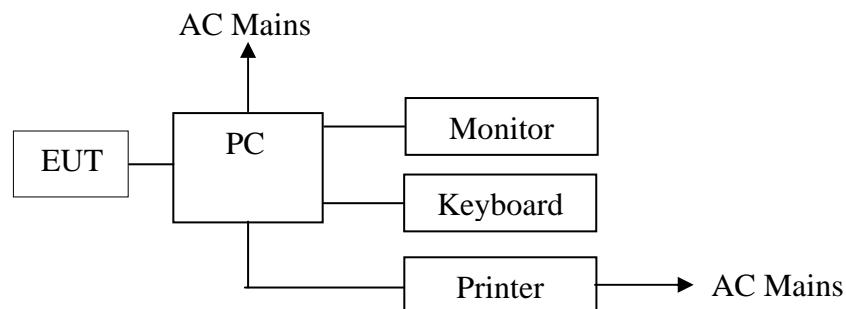
2.1 Test Equipment

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	1 Year
3	Conical Housing	EMTEK	N/A	N/A	May 29, 2010	N/A
4	Voltage Probe	SCHWARZBECK	EZ-17	100213	May 29, 2010	1 Year
5	50Ω Coaxial Switch	ANRITSU CORP	MP59B	6100175589	May 29, 2010	1 Year

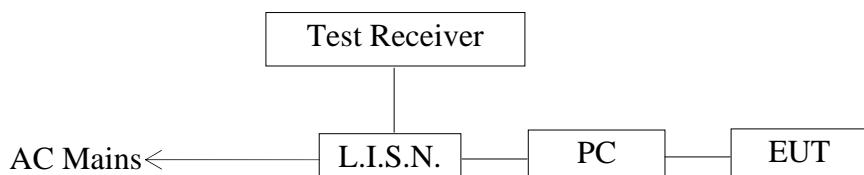
2.2 Block Diagram of Test Setup

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 MHz	Limits dB(μ 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.	Reading	Correct	Measure-	Limit	Over	Detector	Comment
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV	dBuV	dB		
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.	Reading	Correct	Measure-	Limit	Over	Detector	Comment
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV	dBuV	dB		
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

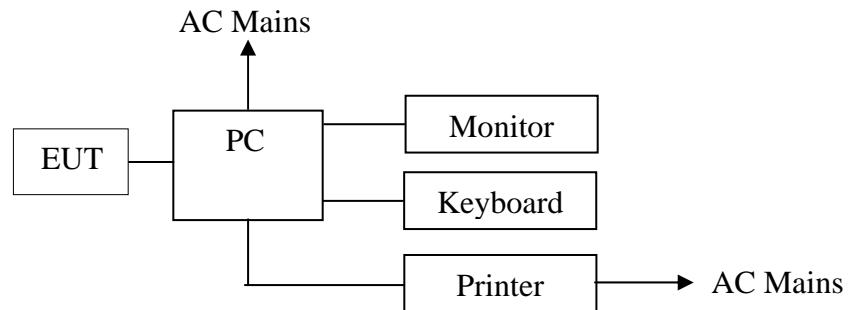
The following test equipments are used during the radiated emission measurement:

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

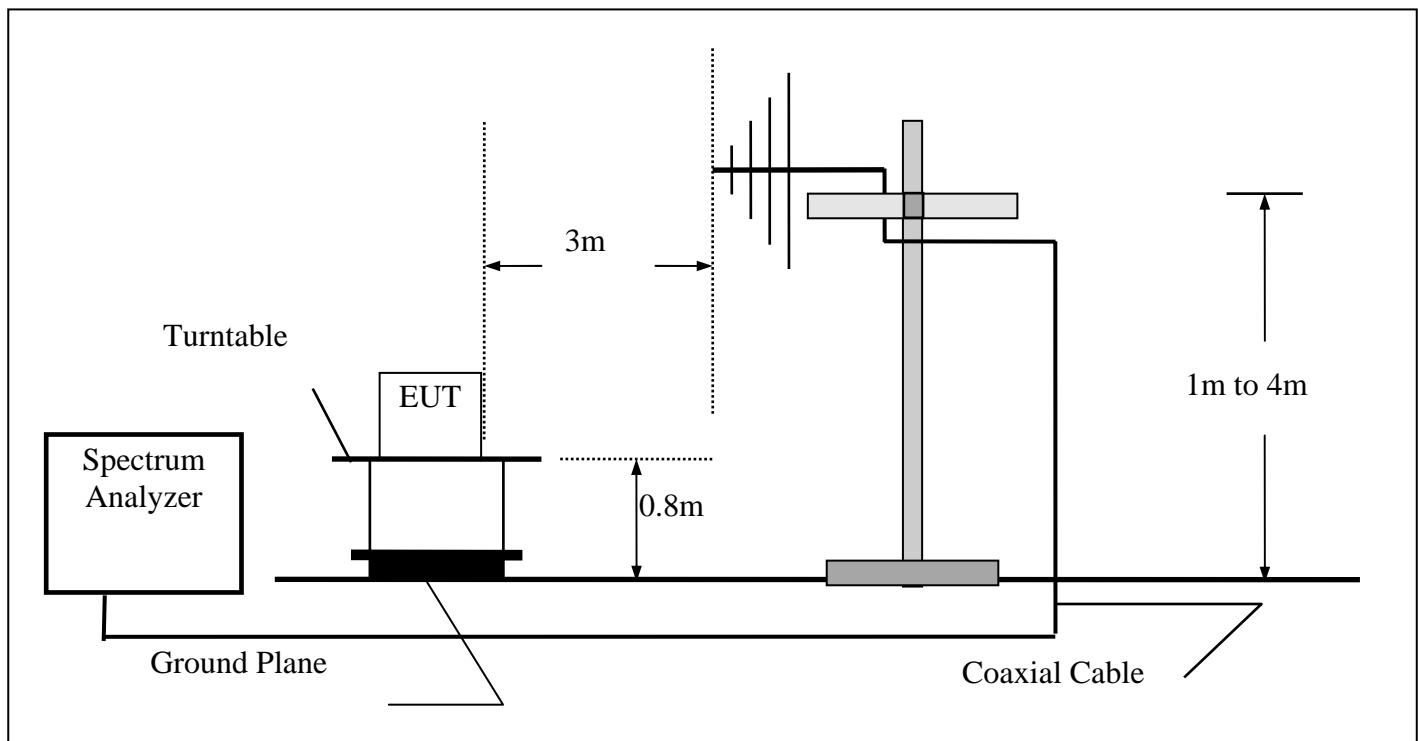
3.2 Block Diagram of Test Setup

3.2.1 Block diagram of connection between the EUT and simulators



(EUT: WIRED OPTICAL MOUSE)

3.2.1 Anechoic Chamber Test Setup Diagram



(EUT: WIRED OPTICAL MOUSE)

3.3 Radiated Emission Limit

Radiated Emission Limits is as following.

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT
		dB(μ 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(μ V)/m (peak) 54.0 dB(μ V)/m (Average)

Remark : (1) Emission level (dB) μ V = 20 log Emission level μ 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:

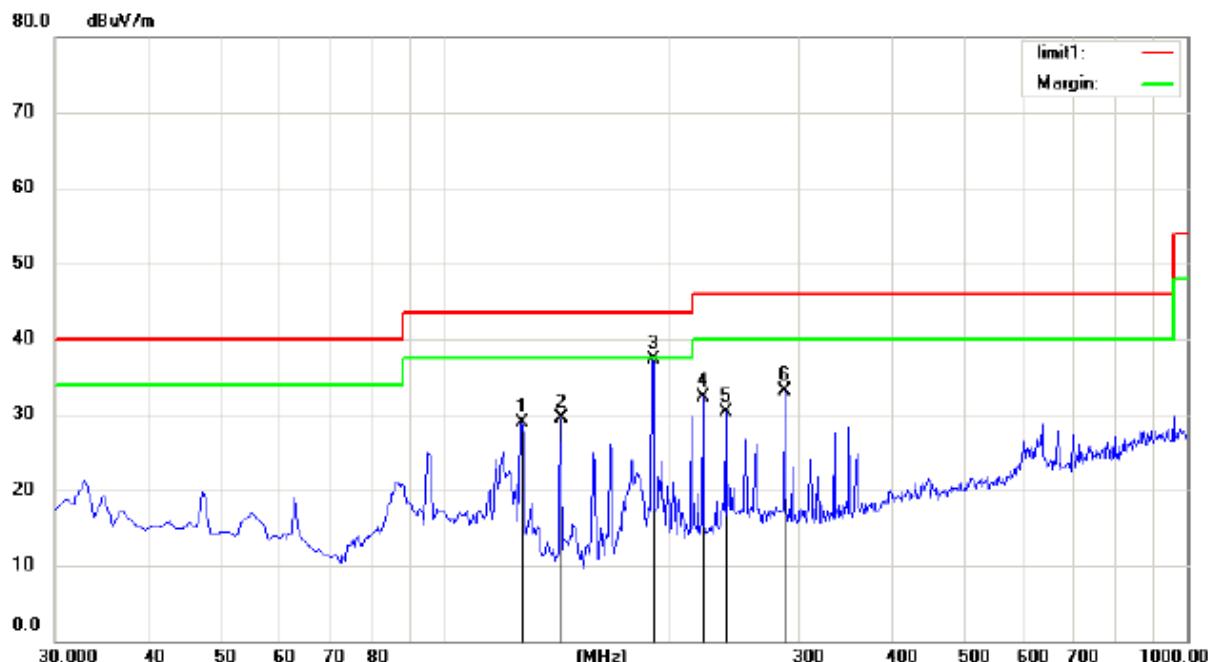
Radiated Emission Measurement

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. MHz	Reading Level	Correct Factor	Measure- ment	Limit	Over	Antenna Height	Table Degree	Comment
		dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	
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

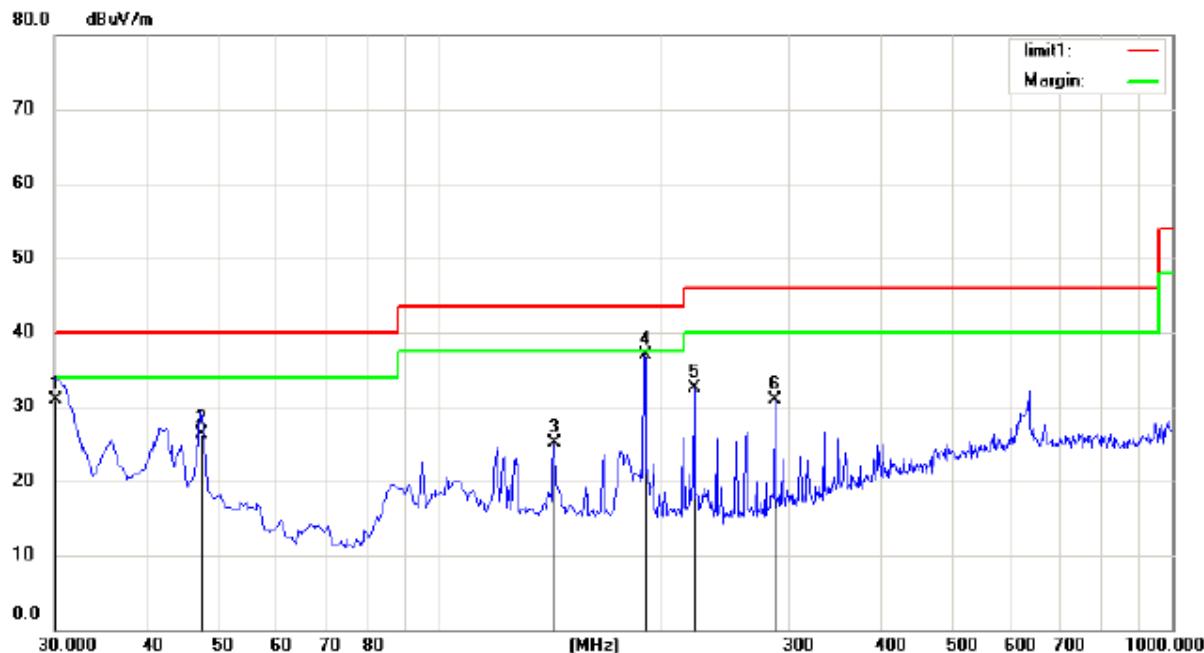
Radiated Emission Measurement

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. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Antenna Height cm	Table 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

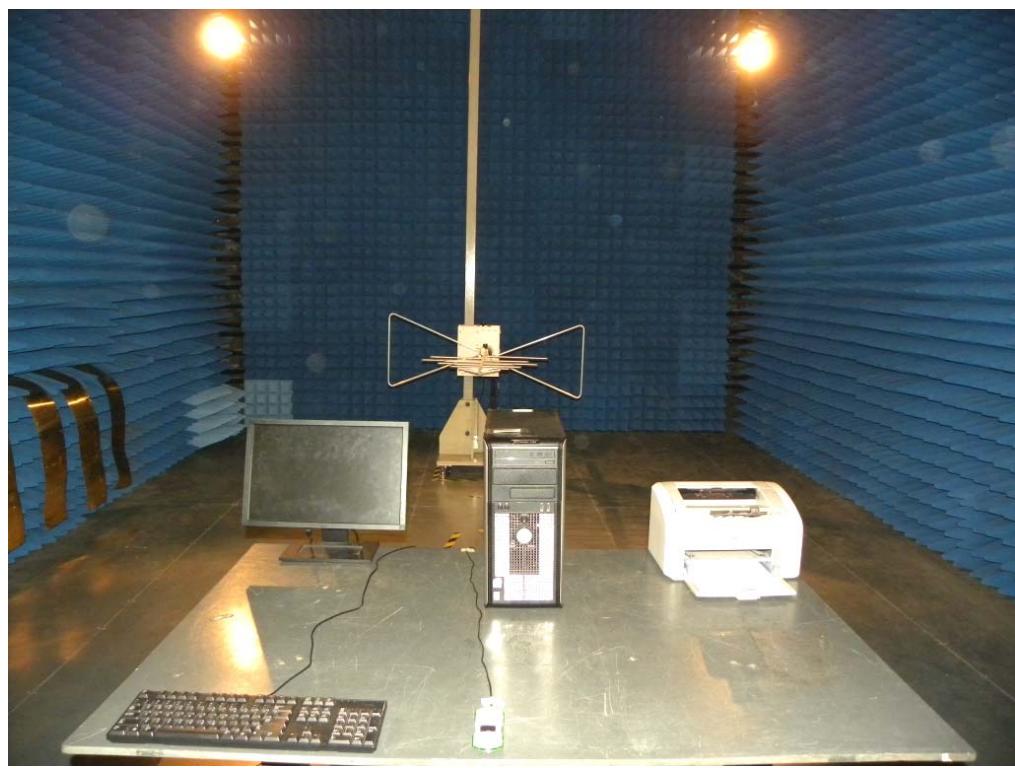
Page: 1

4. PHOTOGRAPHS

4.1 Photo of Power Line Conducted Emission Measurement

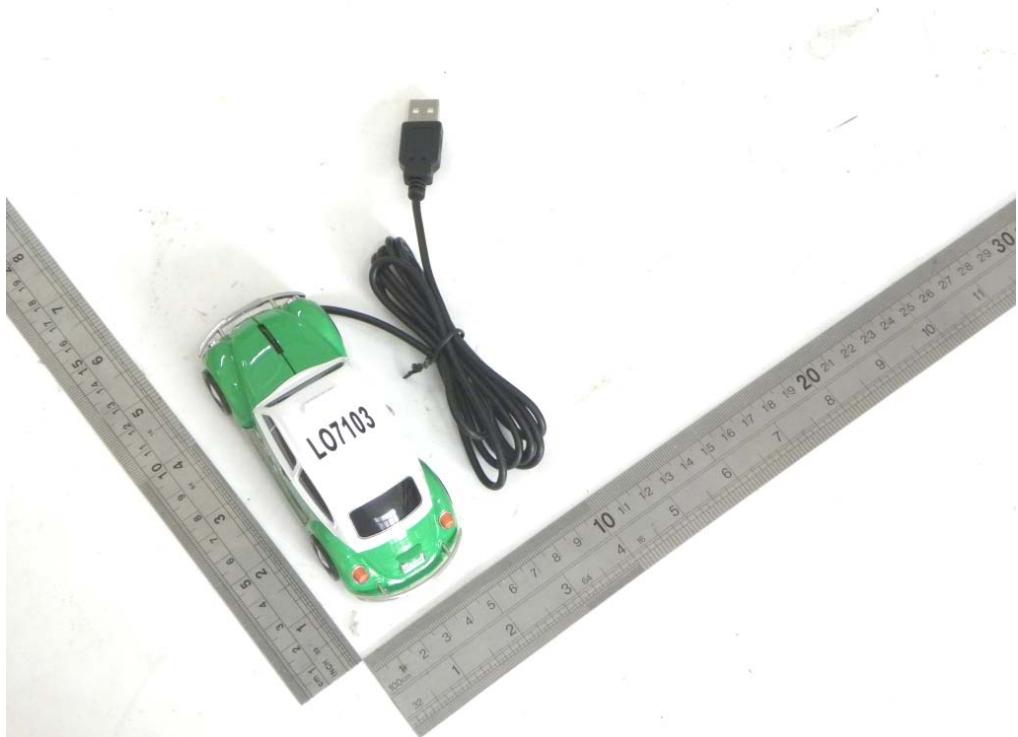


4.2 Photo of Radiated Emission Measurement



4.3 Photos of EUT

General Appearance of EUT



General Appearance of EUT



General Appearance of EUT



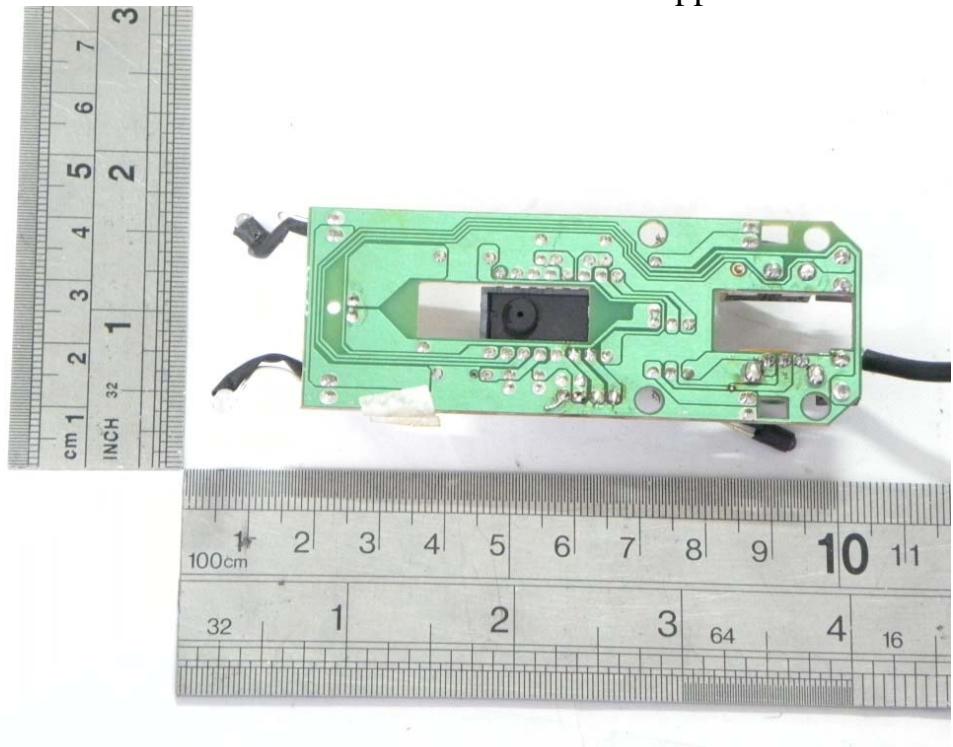
General Appearance of EUT



General Internal of EUT



General Appearance of PCB



General Appearance of PCB

