



ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CLASS B CERTIFICATION

Test report file number : E03NR-006

Applicant : Pentel Co., Ltd.

Address : 4-1-8, Yoshi-cho, Soka-shi, Saitama-ken, Japan

Manufacturer : Pentel Co., Ltd.

Address : 4-1-8, Yoshi-cho, Soka-shi, Saitama-ken, Japan

Type of Equipment : Touch Screen

FCC ID. : EU6PTD-1800D

Model / Type No. : PTD-1800-D

Serial number : N/A

Total page of Report : 13 pages (including this page)

Date of Incoming : October 25, 2003

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SUMMARY

The equipment complies with the regulation; **FCC PART 15 CFR 47 SUBPART B, Class B**.

This test report contains only the result of a single test of the sample supplied for the examination.

It is not a general valid assessment of the features of the respective products of the mass-production.

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**1. VERIFICATION OF COMPLIANCE**

APPLICANT : Pentel Co., Ltd.
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CONTACT PERSON : Mr. Mitsuo Kazama / Manager
TELEPHONE NO. : +81-048-922-1111
FCC ID : EU6PTD-1800D
MODEL NO/NAME : PTD-1800-D
SERIAL NUMBER : N/A
DATE : November 03, 2003

DEVICE TYPE	Peripheral Device for Class B Computing Device -UNINTENTIONAL RADIATOR
E.U.T. DESCRIPTION	Touch Screen
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	ANSI C63.4/1992
TYPE OF EQUIPMENT TESTED	PRE-PRODUCTION
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	CERTIFICATION
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART 15 SUBPART B SECTION 15.101(CLASS B)
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	NO
FINAL TEST WAS CONDUCTED ON	3 METER OPEN AREA TEST SITE

- This device has shown compliance with the conducted emissions limits in 15.107 adopted under FCC 02-107 (ET Docket 98-80). The device may be marketed after July 11, 2005 and is not affected by the 15.37(j) transition provisions.
- The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.



2. GENERAL INFORMATION

2.1 Product Description

The Pentel Co., Ltd., Model PTD-1800-D (referred to as the EUT in this report) is a Touch Screen for LCD or CRT monitor. The EUT consist of touch panel and main board, which shall be inserted into the monitor. The touch panel detects contact of a finger, and changes it into the coordinate's data of X and Y and then the data are sent to a host. The EUT operates by supplying +5V dc. The EUT and the host systems are connected by the RS-232C serial communication interface. The Product specification described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	Glass – Non metal
LIST OF EACH OSC. OR CRY. FREQ.(FREQ >=1MHz)	12.8MHz on the main board
POWER REQUIREMENT	DC +5V from the LCD Monitor
SPEED	More than 100 Points/sec
OPERATION ENVIRONMENT	Temperature 0°C~+40°C, Humidity 30%~85% RH(Without dew condensation)
NUMBER OF LAYERS	Main board: 4Layers
EXTERNAL CONNECTORS	RS232C(Signal compatible)

2.2 Model Differences:

- The following list consists of added model name and their difference. The basic and added models for main board are identical except for following difference.

Model Name		Difference
Basic Model Name	PTD-1800-D	Screen size: 18"
Added Mode Name	PTD-1100-D	Screen size: 11"
	PTD-1200-D	Screen size: 12"
	PTD-1500-D	Screen size: 15"
	PTD-1700-D	Screen size: 17"
	PTD-2200-D	Screen size: 22"

2.3 Related Submittal(s) / Grant(s)

- Original submittal only



2.4 Test System Details

The model numbers for all the equipments, which were used in the tested system, is:

Model	Manufacturer	Description	FCC ID	Connected to
PTD-1800-D	Pentel Co., Ltd.	Touch Screen	EU6PTD-1800-D	Host and Monitor
GX240	Dell Computer Corp.	PC (Host)	DoC	-
DAVI-1810A	DATA VIEW Co., Ltd.	LCD Monitor	PRXDAVI-1810A	PC
LSE9901B1260	Li Shin International Enterprise Corp.	AC/DC ADAPTER	N/A	LCD Monitor
SKT-910	Emachines	KEYBOARD	DoC	Host
X06-08477	Microsoft Corp.	MOUSE	DoC	Host
2225C	HP	PRINTER	DSI6XU2225	Host

2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4/1992.

Radiated testing was performed at a distance of 3 meters from EUT to the antenna.

2.6 Test Facility

The open area test site and conducted measurement facilities are located on at 426-1 Daessangryung-Ri, Chowol-Myun, Kwangju-Kun, Kyunggi-Do 464-080 Korea. Description details of test facilities were submitted to the Commission on October 02, 2002. (Registration Number: 529838)

3. SYSTEM TEST CONFIGURATION

3.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
Main Board	Pentel Co., Ltd.	PTD-1800-D	N/A



3.2 EUT exercise Software

The windows program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. This program was included into HOST. Once loaded, this program sequentially exercises each system component in turn. The sequence used is: (1) series of "H" characters are printed on the monitor until the screen is completely full, (2) copy series of "H" characters to mass storage device (if one is used), (3) print series of "H" characters to printer. The complete cycle is repeated continuously.

Also, the tests were performed about stand-by and communication mode for getting maximum noise level and the investigated maximum of the EUT was communication mode.

3.3 Cable Description

	Power Cord Shielded (Y/N)	I/O cable Shielded (Y/N)	Length (M)
Touch Screen (EUT)	N/A	Y	1.2(D)
PERSONAL COMPUTER	N	Y	1.0(P), 1.2(D)
18.1" LCD Monitor	N	Y	1.5(P), 1.2(D)
AC/DC ADAPTER	N	N/A	1.2(P)
KEYBOARD	N/A	Y	1.5(D)
MOUSE	N/A	Y	1.5(D)
PRINTER	N	Y	1.5(P), 1.2(D)

* The marked "(D)" means the Data Cable and "(P)" means the Power Cable.

3.4 Noise Suppression Parts on Cable

	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
Touch Screen (EUT)	N	N/A	Y	BOTH END
PERSONAL COMPUTER	-	-	-	-
18.1" LCD Monitor	Y	BOTH END	Y	BOTH END
AC/DC ADAPTER	Y	LCD Monitor END	Y	Monitor END
KEYBOARD	N	N/A	Y	PC END
MOUSE	N	N/A	Y	PC END
PRINTER	N	N/A	Y	BOTH END



3.5 Equipment Modifications

- . None

3.6 Configuration of Test System

Line Conducted Test: The power of the EUT was supplied by 18" LCD Monitor, the power of the 18" LCD Monitor was supplied by used AC/DC adaptor and the adapter was connected to LISN. All supporting equipments were connected to another LISN. Preliminary Power line Conducted Emission test was performed by using the procedure in ANSI C63.4/1992 7.2.3 to determine the worse operating conditions.

Radiated Emission Test: Preliminary radiated emissions test were conducted using the procedure in ANSI C63.4/1992 8.3.1.1 and 13.1.4.1 to determine the worse operating conditions. Final radiated emission tests were conducted at 3meter open area test site.

The turntable was rotated through 360 degrees and the EUT was tested by positioned three orthogonal planes to obtain the highest reading on the field strength meter. Once maximum reading was determined, the search antenna was raised and lowered in both vertical and horizontal polarization.

4. PRELIMINARY TEST

4.1 AC Power line Conducted Emission Test

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
Standby-by Mode	
Communication Mode	X

4.2 Radiated Emission Test

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
Standby-by Mode	
Communication Mode	X



5. FINAL RESULT OF MEASURMENT

Preliminary test was done in normal operation mode. And the final measurement was selected for the maximized emission level.

5.1 Conducted Emission Test

Humidity Level : 37% Temperature : 20°C
Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.107(a)
Type of Test : CLASS B
Result : PASSED BY -6.18 dB at 2.70 MHz when used Average detector mode

EUT : Touch Screen Date : October 25, 2003
Operating Condition : Continuously Communication Mode to PC
Detector : CISPR Quasi-Peak and Average(6 dB Bandwidth: 9 kHz)

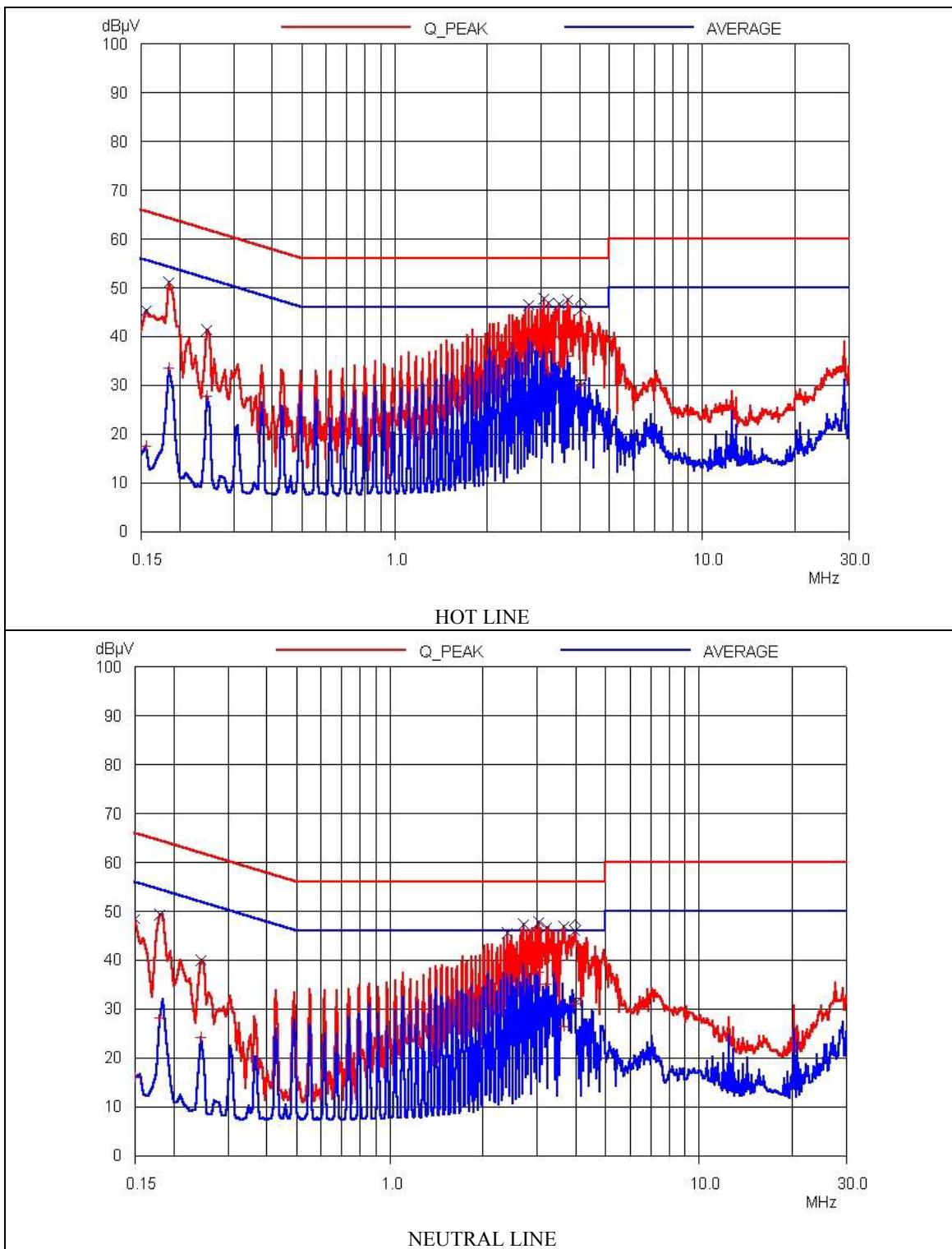
Frequency (MHz)	Line	Quasi-Peak (dBuV)			Margin (dB)	Average (dBuV)		Margin (dB)
		Emission Level	Detector Mode	Limits		Emission level	Limits	
0.15	N	48.55	P	66.00	-17.45	15.85	56.00	-40.15
0.19	H	51.01	P	64.26	-13.25	33.43	54.26	-20.83
2.40	N	45.49	P	56.00	-10.51	37.46	46.00	-8.54
2.70	N	47.33	P	56.00	-8.67	39.82	46.00	-6.18
3.01	N	47.82	P	56.00	-8.18	37.59	46.00	-8.41
3.19	N	46.62	P	56.00	-9.38	35.14	46.00	-10.86
3.65	H	47.62	P	56.00	-8.38	35.92	46.00	-10.08
3.93	N	45.99	P	56.00	-10.01	31.15	46.00	-14.85

Tabulated test data for Mains Terminal Continuous Disturbance Voltage

Remark : "H": Hot Line, "N": Neutral line, "P": Peak detector, "Q.P.": Quasi-Peak Detector Mode

See Appendix I for an overview sweep performed with peak detector and average.

Tested by: Hyun-Suck, Lee / Test Engineer





5.2 Radiated Emission Test

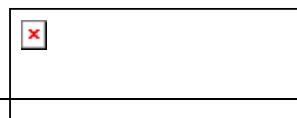
The following table shows the highest levels of radiated emission on both polarizations of horizontal and vertical.

Humidity Level	: <u>38 %</u>	Temperature : <u>21°C</u>
Limits apply to	: <u>FCC CFR 47, PART 15, SUBPART B, SECTION 15.109(a)</u>	
Type of Test	: <u>CLASS B</u>	
Result	: <u>PASSED BY -3.80 dB at 816.00 MHz when used Peak detector mode</u>	

EUT	: Touch Screen	Date : October 25, 2003
Operating Condition	: Continuously Communication Mode to PC	
Detector	: CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)	
Distance	: 3 Meter	

Radiated Emission		Ant	Correction Factors		Total	FCC CLASS B	
Frequency (MHz)	Amplitude (dBuV)		Pol.	Antenna (dBuV/m)		Amplitude (dBuV/m)	Limit (dBuV/m)
73.83	19.80	V	7.20	1.00	28.00	40.00	-12.00
78.05	13.50	V	6.74	1.00	21.24	40.00	-18.76
86.01	21.60	V	7.71	1.10	30.41	40.00	-9.59
249.80	18.30	H	12.07	1.83	32.20	46.00	-13.80
288.80	21.20	H	14.12	1.95	37.27	46.00	-8.73
431.80	17.60	H	15.89	2.50	35.99	46.00	-10.01
816.00	16.80	H	21.66	3.74	42.20	46.00	-3.80

Radiated Emission Tabulated Data



Tested by: Hyun-Suck, Lee / Test Engineer



6. FIELD STRENGTH CALCULATION

Meter readings are compared to the specification limit correcting for antenna and cable losses

+ Meter reading (dBuV)

+ Cable Loss (dB)

+ Antenna Factor (Loss) (dB/meter)

= Corrected Reading (dBuV/meter)

- Specification Limit (dBuV/meter)

= dB Relative to Spec (+/- dB)



7. LIST OF TEST EQUIPMENT

No.	EQUIPMENTS	MFR.	MODEL	SER. NO.	LAST CAL	DUE CAL	USE
1.	Test receiver	R/S	ESVS 10	827864/005	NOV/03	12MONTH	■
2.	Test receiver	R/S	ESHS 10	834467/007	APR/03	12MONTH	■
3.	Spectrum analyzer	HP	8566B	3407A08547	MAY/03	12MONTH	■
4.	Spectrum analyzer	HP	8568B	3109A05456	MAY/03	12MONTH	■
5.	RF preselector	HP	85685A	3107A01264	MAY/03	12MONTH	■
6.	Quasi-Peak Adapter	HP	85650A	3107A01542	MAY/03	12MONTH	■
7.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	VULB9163 166	FEB/03	12MONTH	
8.	Biconical antenna	EMCO	3104C	9109-4443	MAY/03	12MONTH	
		Schwarzbeck	VHA9103	9109-4444	JUL/03		■
				91031852	AUG/03		
9.	Log Periodic antenna	EMCO	3146	9109-3213	AUG/03	12MONTH	
		Schwarzbeck	9108-A(494)	9109-3214	JUL/03		■
				9109-3217	MAY/03		
				62281001	AUG/03		
10.	Horn Antenna	Schwarzbeck	BBHA9170	BBHA9170178	JUNE/02	24MONTH	
			BBHA9170	BBHA9170179	JUNE/02		
			BBHA9120D	BBHA9120D294	JUNE/02		
			BBHA9120D	BBHA9120D295	JUNE/02		
11.	Microwave System Preamplifier	Agilent	83051A	3950M00201	JUNE/03	12MONTH	
12.	RF Amplifier	Hewlett Packard	8347A	3307A01354	JUNE/03	12MONTH	
13.	LISN	EMCO	3825/2	9109-1867	AUG/03	12MONTH	■
				9109-1869	OCT/03		
14.	Position Controller	EMCO	1090	9107-1038	N/A	N/A	■
15.	Turn Table	EMCO	1080-1.21	9109-1576	N/A	N/A	■
16.	Antenna Master	EMCO	1070-1	9109-1624	N/A	N/A	■