

MEASUREMENT/TECHNICAL REPORT**APPLICANT:** Tremon Enterprises Co., Ltd**MODEL NO.:** MMS-10**FCC ID:** JKGMUO3S

This report concerns (check one) : **Original Grant** **Class II Change**

Equipment type: **MOUSE**

Deferred grant requested per 47CFR 0.457(d)(1)(ii)?

Yes No If yes, defer until: _____ (date)

We, the undersigned, agree to notify the Commission by (date) _____ / _____ / _____ of the intended date of announcement of the product so that the grant can be issued on that date.

Transiyion Rules Request per 15.37?

Yes No

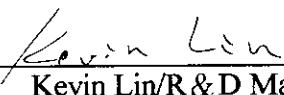
If no, assumed Part 15, Subpart B for unintentional radiator the new 47 CFR (10-1-90 Edition) provision.

Report Prepared**by Testing House :** **Neutron Engineering Inc.****for Company :**

Name Tremon Enterprises Co., Ltd.

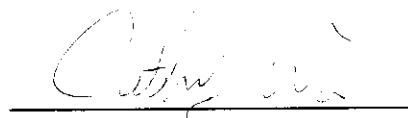
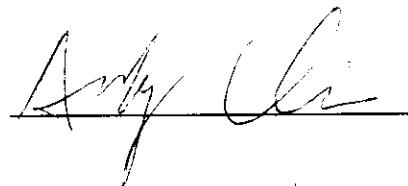
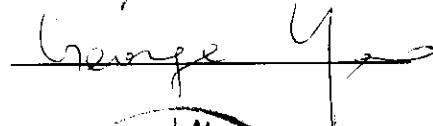
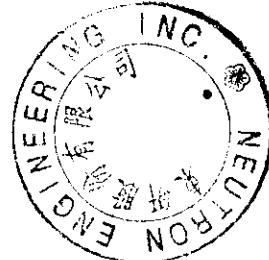
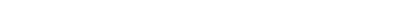
Address 15F, No. 116 Sec. 1, Shin-Tai 5th. Rd. Hsichih Taipei County Taiwan,

R. O. C.

Applicant Signature :
Kevin Lin/R&D Manager

CERTIFICATION**We hereby certify that:**

The test data , data evaluation , test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (1992)/CISPR 22(1996) and the energy emitted by the sample EUT tested as described in this report is in compliance with CLASS B conducted and radiated emission limits of FCC Rules Part 15 , Subpart B/CISPR 22(1996).

Prepared by : Cathy Wu**Reviewed by :** Andy Chiu**Approved by :** George Yao**Issued Date :** June 09, 1998**Report No. :** NEI-FCCB-98057**Company Stamp :** 

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1. GENERAL INFORMATION

1-1. Product Description

The Tremon Enterprises Co., Ltd. Model: MMS-10(referred to as the EUT in the report) is a two keys serial mouse. It is designed as an “Input Device” for IBM PC AT or compatible.

The summarized feature of EUT are described as following:

1). Oscillator Frequency: 32.768 KHz

2). Interface Port: RS232

It provides a permanently, shielded, D-Sub 9pin, cable connector without ferrite core attached to interconnect with PC.

3). Power Consumption: 42.35mW, 8.47mA at 5 Vdc Supply, in average.

1-2. Related Submittal(s) / Grant (s)

1-2-1. Models Covered

Only the EUT model MMS-10 is submitted for FCC ID filing.

1-2-2. Models Difference

N/A

1-3. Tested System Details

The FCC IDs for all equipments, plus descriptions of all cables used in the tested system (including inserted cards, which have grants) are:

| Model No. | FCC ID | Equipment | Cable |
|-----------|----------------|-----------------------|--|
| MMS-10 | JKGMUO3S | Mouse | Shielded Data Cable |
| 93V | ANO6282 | PC | Shielded Power Cord |
| NE64 | KFBNE64 | Monitor | Shielded Data Cable ⁽²⁾ Un-Shielded Power Cord |
| HP2225C+ | DSI6XU2225 | Printer, Parallel I/F | Shielded Parallel Data Cable Un-Shielded Power Cord |
| AT-1200CK | E2O5OV1200CK | Modem, Serial I/F | Shielded Serial Data Cable Un-Shielded Power Cord |
| FDA-102A | F4Z4K3FDA-102A | Keyboard | Shielded Data Cable |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Notes:

- (1) EUT submitted for grant.
- (2) Monitor's attached video cable without ferrite core.

1-4. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (1992)/CISPR 22(1996). Radiated testing was performed at an antenna to EUT distance 10 meters.

1-5. Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the address of No. 5, All 2, Lane 220, Kang Lo St., Nei Hwu, Taipei, Taiwan, R.O.C. of NEUTRON ENGINEERING INC. This site has been fully described in report dated Feb.4,1998 Submitted to your office, and accepted in a letter dated March 28, 1998 (31040/SIT-1300F2).

3.5 Configuration of Tested System

The configuration of tested system is described as the block diagram shown in next page Figure 3.1 and details information of I/O cable and power cord connection are tabulated as Table A and B. The monitor is powered from a floor mounted receptacle (referred to as the wall outlet in the previous described) was tested.

TABLE A - Test Equipment

| Item | Equipment | Mfr. | Model/Type No. | I/O Port | FCC ID | Remark |
|------|-----------|-------------|----------------|----------------|----------------|--------|
| E-1 | Monitor | Chern Yin | NE64 | VGA Port | KFBNE64 | |
| E-2 | PC | IBM | 93V | N/A | ANO6282 | |
| E-3 | Mouse | Tremon | MMS-10 | COM 1 Port | JKGMU03S | EUT |
| E-4 | Printer | HP | HP2225C+ | Centronic Port | DSI6XU2225 | |
| E-5 | Modem | Datatronics | AT-1200CK | Com 2 Port | E2O5OV1200CK | |
| E-6 | Keyboard | Forward | FDA-102A | KB DIN Port | F4Z4K3FDA-102A | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Remark:

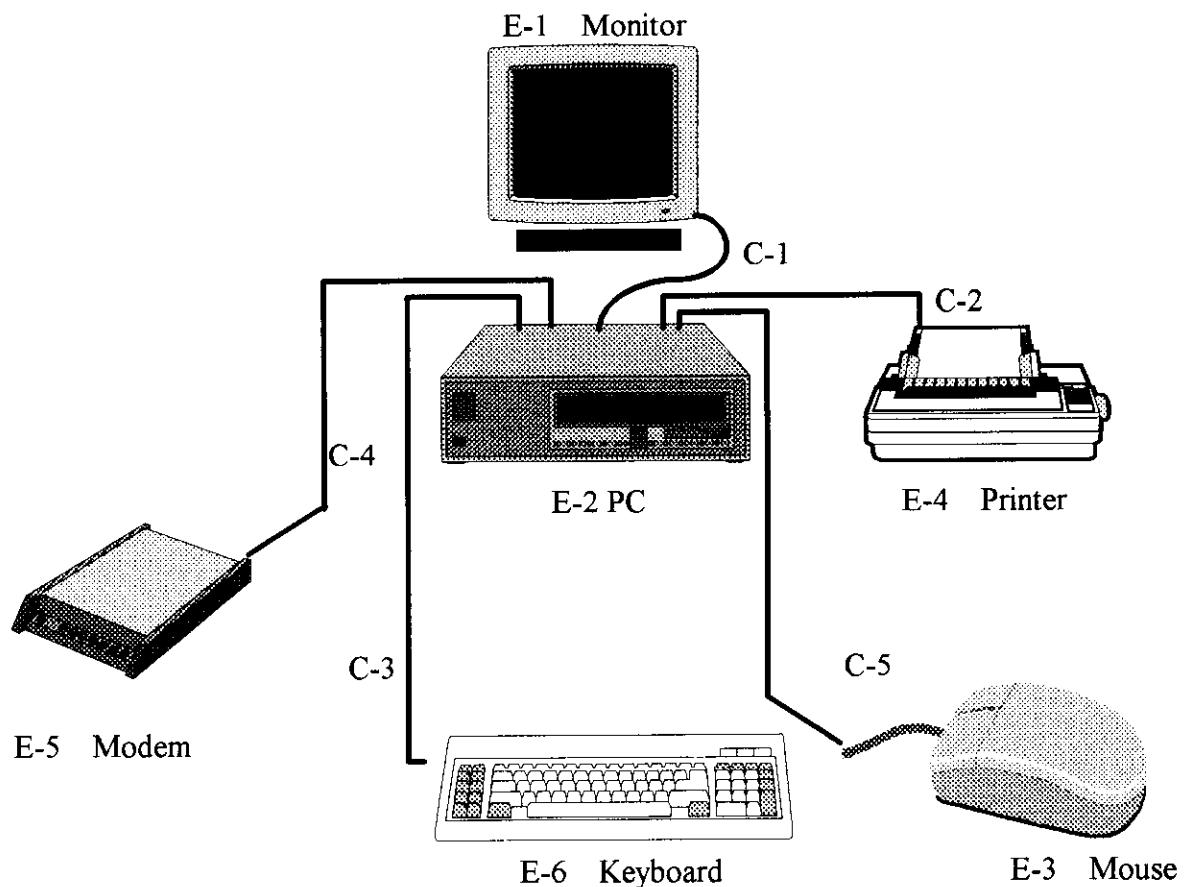
- (1) Unless otherwise denoted as EUT in 「Remark」 column, device(s) used in tested system is a support equipment.
- (2) Unless otherwise marked as * in 「Remark」 column, Neutron consigns the supporting equipment(s) to the tested system.

Table B. - Informations Cable Information

| Item | I/O Cable | Device Connected | Shielded | Ferrite Core | Detachable/Permanently | Length | Note |
|------|------------------|------------------|----------|--------------|------------------------|--------|------|
| C-1 | Video Cable | PC-Monitor | Yes | No | Permanently attached | 150cm | |
| C-2 | Centronics Cable | PC-Printer | Yes | No | Detachable type | 200cm | |
| C-3 | Keyboard Cable | PC-Keyboard | Yes | No | Permanently attached | 200cm | |
| C-4 | RS-232 Cable | PC-Modem | Yes | No | Detachable type | 120cm | |
| C-5 | Mouse Cable | PC-Mouse | Yes | No | Permanently attached | 150cm | ※ |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Note:

(1) Unless otherwise marked as **※** in **『Remark』** colum, Neutron consigns the supporting equipment(s) to the tested system.

Figure 3.1 Configuration of Tested System

3. System Test Configuration

3-1. Justification

The system was configured for testing in a typical fashion (as a customer would normally use it). The mouse was connected to support equipment-personal computer. Peripherals of PC, such as monitor, keyboard, modem and printer were contained in this system in order to comply with the ANSI C63.4/CISPR 22(1996) Rules requirement. The PC operated in the default 640x480/31.5KHz VGA Graphic mode. This operating condition was tested and used to collect the included data.

3-2. EUT Exercise Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The software, contained on a 3-1/2 inch disk, was inserted into driver A and is auto-starting on power-up. Once loaded, the program sequentially exercises each system component in turn. The sequence used is:

1. Read(write) from(to) mass storage device(Disk).
2. Send "H" pattern to video port device(Monitor).
3. Send " H " pattern to parallel port device(Printer).
4. Send " H " pattern to COM port device (Modem).
5. Repeated from 1 to 4 continuously.

As the Keyboard and mouse are strictly input devices, no data is transmitted to (from) them during test. They are, however, continuously scanned for data input activity.

3-3. Special Accessories

Not available for this EUT intended for grant.

3-4. Equipment Modifications

Not available for this EUT intended for grant.

| | | | |
|-----------------------|------------------|------------|---------------|
| Applicant Signature : | <u>Kevin Lin</u> | Date : | June 09, 1998 |
| Type/Printed Name : | Kevin Lin | Position : | R & D Manager |

4. Block Diagram(s)

Figure 4.1 Block diagram of system, Page 13.A

6. Conducted Emission Datas

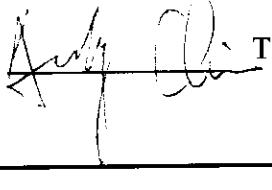
6.1 The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Judgement: Passed by **-16.93 dB** in mode of Neutral terminal **1.49 MHz**

| Freq. (MHz) | Terminal | Measured(dBuV) | | Limits(dBuV) | | Safe Margins | |
|----------------|----------|----------------|---------|--------------|---------|--------------|-------------|
| | | L/N | QP-Mode | AV-Mode | QP-Mode | AV-Mode | (dBuV) |
| 0.23 | Line | | 37.01 | * | 62.45 | 52.45 | -25.44 (QP) |
| 0.52 | Line | | 34.73 | * | 56.00 | 46.00 | -21.27 (QP) |
| 1.55 | Line | | 35.82 | * | 56.00 | 46.00 | -20.18 (QP) |
| 1.84 | Line | | 35.36 | * | 56.00 | 46.00 | -20.64 (QP) |
| 8.37 | Line | | 36.57 | * | 60.00 | 50.00 | -23.43 (QP) |
| 0.23 | Neutral | | 36.87 | * | 62.45 | 52.45 | -25.58 (QP) |
| 0.52 | Neutral | | 36.06 | * | 56.00 | 46.00 | -19.94 (QP) |
| 0.86 | Neutral | | 37.35 | * | 56.00 | 46.00 | -18.65 (QP) |
| 1.49 | Neutral | | 39.07 | * | 56.00 | 46.00 | -16.93 (QP) |
| 14.36 | Neutral | | 37.27 | * | 60.00 | 50.00 | -22.73 (QP) |

Remark :

- (1) Reading inwhich marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz ; SPA setting in RBW=100KHz, VBW =100KHz, Swp. Time = 0.3 sec./MHz. Reading inwhich marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz,VBW=10Hz, Swp. Time =0.3 sec./MHz .
- (2) All readings are QP Mode value unless otherwise stated AVG in colum of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemd to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform . In this case, a " * " marked in AVG Mode colum of Interference Voltage Measured .
- (3) Measuring frequency range from 150KHz to 30MHz .

Review :  Test Personnel : R.ken Hsy Date: May 29, 1998

7. Radiated Emission Data

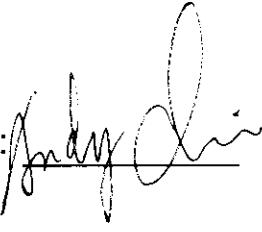
7.1 The following data lists the significant emission frequencies, measured levels, correction factor (includes cable and antenna corrections), the corrected reading, as well as the limit. Explanation of the Correction Factor is given in paragraph 7.2.

Judgement: Passed by **-3.75 dB** in polarity of **Horizontal 651.20 MHz**

| Freq. (MHz) | Ant. H/V | Reading(RA) (dBuV) | Corr.Factor(CF) (dB) | Measured(FS) (dBuV/m) | Limits(QP) (dBuV/m) | Safe Margins (dBuV/m) | Note |
|----------------|-------------|-----------------------|-------------------------|--------------------------|------------------------|--------------------------|------|
| 81.30 | V | 19.20 | 6.62 | 25.82 | 30.00 | - | 4.18 |
| 125.20 | V | 11.80 | 13.34 | 25.14 | 30.00 | - | 4.86 |
| 140.70 | H | 13.20 | 12.24 | 25.44 | 30.00 | - | 4.56 |
| 148.30 | H | 12.70 | 12.83 | 25.53 | 30.00 | - | 4.47 |
| 151.20 | H | 12.60 | 13.14 | 25.74 | 30.00 | - | 4.26 |
| 164.00 | V | 10.20 | 15.28 | 25.48 | 30.00 | - | 4.52 |
| 420.00 | H | 13.50 | 18.32 | 31.82 | 37.00 | - | 5.18 |
| 428.00 | V | 13.70 | 18.56 | 32.26 | 37.00 | - | 4.74 |
| 485.60 | V | 11.90 | 20.75 | 32.65 | 37.00 | - | 4.35 |
| 506.40 | H | 11.10 | 21.35 | 32.45 | 37.00 | - | 4.55 |
| 651.20 | H | 9.70 | 23.55 | 33.25 | 37.00 | - | 3.75 |
| 658.40 | V | 9.00 | 23.85 | 32.85 | 37.00 | - | 4.15 |

Remark :

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=1MHz, VBW =1MHz, Swp. Time = 0.3 sec./MHz .
- (2) All readings are Peak unless otherwise stated QP in column of "Note". Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (3) Measuring frequency range from 30MHz to 1000MHz .
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table .

Review :  Test Personnel : Riker Hsu Date: May 26, 1998

7-2. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$\mathbf{FS = RA + AF + CF - AG}$$

Where **FS** = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor (1)

CF = Cable Attenuation Factor (1)

AG = Amplifier Gain (1) (2)

Remark :

(1) The Correction Factor = AF + CF - AG, as shown in the data tables' Correction Factor column.

(2) AG is not available for Neutron's Open Site Facility

Example of Calculation:

Assume a Receiver Reading of 23.7 dBuV is obtained with an Antenna Factor of 7.2 dBuV and a Cable Factor of 1.1 dBuV. Then:

1. The Correction Factor will be calculated by

$$\mathbf{Correction\ Factor = AF + CF - AG = 7.2 + 1.1 - 0 = 8.3\ (dBuV)}$$

as shown in the data tables' Correction Factor column.

2. The Field Strength will be calculated by

$$\mathbf{FS = RA + Correction\ Factor = 23.7 + 8.3 = 32\ (dBuV).}$$

FS is the value shown in the data tables' Corrected Reading column and RA is the value shown in the data tables' Receiver Reading column. The 32 dBuV/m value was mathematically converted to its corresponding level in uV/m as:

$$\mathbf{Log^{-1} [(32.0\ dBuV/m)/20] = 39.8\ (uV/m)}$$

7-3. Correction Factor VS Frequency

| Frequency (MHz) | Antenna Factor (dB) | Cable Loss (dB) |
|-----------------|---------------------|-----------------|
| 30.00 | 11.10 | 0.20 |
| 35.00 | 10.80 | 0.00 |
| 40.00 | 11.20 | 0.40 |
| 45.00 | 11.50 | 0.40 |
| 50.00 | 11.30 | 0.90 |
| 55.00 | 10.50 | 0.00 |
| 60.00 | 9.90 | 0.00 |
| 65.00 | 8.70 | 0.20 |
| 70.00 | 7.60 | 0.00 |
| 75.00 | 6.40 | 0.50 |
| 80.00 | 6.10 | 0.10 |
| 85.00 | 7.00 | 0.80 |
| 90.00 | 8.00 | 0.30 |
| 95.00 | 10.00 | 0.40 |
| 100.00 | 11.20 | 0.60 |
| 110.00 | 12.60 | 0.60 |
| 120.00 | 13.00 | 0.60 |
| 130.00 | 12.50 | 0.50 |
| 140.00 | 12.00 | 0.20 |
| 150.00 | 12.00 | 1.00 |
| 160.00 | 13.20 | 1.20 |
| 170.00 | 14.80 | 1.60 |
| 180.00 | 16.30 | 1.90 |
| 190.00 | 17.00 | 1.90 |
| 200.00 | 17.30 | 1.40 |
| 225.00 | 10.50 | 1.10 |
| 250.00 | 11.70 | 2.00 |
| 275.00 | 12.80 | 2.40 |
| 300.00 | 14.50 | 2.40 |
| 325.00 | 14.00 | 1.90 |
| 350.00 | 14.20 | 2.40 |
| 375.00 | 14.60 | 2.90 |
| 400.00 | 15.10 | 2.70 |
| 450.00 | 16.20 | 3.20 |
| 500.00 | 17.60 | 3.70 |
| 550.00 | 17.80 | 3.90 |
| 600.00 | 18.40 | 4.30 |
| 650.00 | 19.50 | 4.00 |
| 700.00 | 20.80 | 4.10 |
| 750.00 | 20.50 | 5.30 |
| 800.00 | 21.10 | 5.90 |
| 850.00 | 22.40 | 5.80 |
| 900.00 | 23.50 | 5.50 |
| 950.00 | 24.00 | 6.30 |
| 1000.00 | 24.80 | 5.20 |

8. Photos of Tested EUT:

1. Photo # 1. Front View
2. Photo # 2. Rear View
3. Photo # 3. Unit Partially Disassembled
4. Photo # 4. Unit Partially Disassembled
5. Photo # 5. Unit Partially Disassembled
6. Photo # 6. Unit Partially Disassembled