



ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CLASS B CERTIFICATION

Test Report No. : E04NR-104

Applicant : ITM INC.

Address : 880-3, Kwanyang-Dong, Dongan-Ku, Anyang-City, Kyunggi-Do, 431-060, Korea

Manufacturer : ITM INC.

Address : 880-3, Kwanyang-Dong, Dongan-Ku, Anyang-City, Kyunggi-Do, 431-060, Korea

Type of Equipment : 4 Wires Analog Resistive Touch Screen

FCC ID : P9ATPMA330

Model Name : MA-330

Serial number : N/A

Total page of Report : 11 pages (including this page)


Date of Incoming : October 02, 2004


Date of Issuing : November 30, 2004

SUMMARY

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

This test report contains only the results 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.

Reviewed by: 
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ONETECH Corp.

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ONETECH Corp.



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**1. VERIFICATION OF COMPLIANCE**

- APPLICANT : ITM INC.
- ADDRESS : 880-3, Kwanyang-Dong, Dongan-Ku, Anyang-City, Kyunggi-Do, 431-060, Korea
- CONTACT PERSON : Mr. Heui-Seob, Jeong / Senior Researcher
- TELEPHONE NO : +82-31-421-6117
- FCC ID : P9ATPMA330
- MODEL NAME : MA-330
- SERIAL NUMBER : N/A
- DATE : November 30, 2004

| | |
|---|--|
| DEVICE TYPE | Peripheral Device for Class B Computing Device - Unintentional Radiator |
| E.U.T. DESCRIPTION | 4 Wires Analog Resistive Touch Screen |
| THIS REPORT CONCERNS | ORIGINAL GRANT |
| MEASUREMENT PROCEDURES | ANSI C63.4: 2001 |
| TYPE OF EQUIPMENT TESTED | PRE-PRODUCTION |
| KIND OF EQUIPMENT AUTHORIZATION REQUESTED | CERTIFICATION |
| EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S) | FCC PART 15, SECTION 15.101 |
| 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 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 ITM INC., Model MA-330 (referred to as the EUT in this report) is a 4 Wires Analog Resistive Touch Screen that is a personal computer peripheral with USB standard port and installed in the monitor. Product specification described herein was obtained from product data sheet or user's manual.

| | |
|---|---|
| CHASSIS TYPE | Open Type |
| LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>=1MHz) | 6 MHz |
| ELECTRICAL RATING | DC 5V, Max. 100mA from the USB hub standard of PC |
| NUMBER OF LAYERS | 4 Layers |
| EXTERNAL CONNECTOR | USB In/Out |

2.2 Model Differences:

-. None

2.3 Related Submittal(s) / Grant(s)

Original submittal only

2.4 Test System Details

Defined as equipment needed for correct operation of the EUT, but not considered as tested:

| Model | Manufacturer | FCC ID | Description | Connected to |
|--------|---------------------|------------|---|--------------|
| MA-330 | ITM INC. | P9ATPMA330 | 4 Wires Analog Resistive Touch Screen (EUT) | Notebook PC |
| PP01L | DELL Computer Corp. | DoC | Notebook PC | - |
| N/A | N/A | N/A | Monitor | EUT |
| MO56UO | N/A | DoC | Mouse | Notebook PC |
| 2225C | HP | DSI6XU2225 | Printer | Notebook PC |

2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4: 2001. 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-City, Kyunggi-Do 464-080 Korea. Description details of test facilities were submitted to the Commission on January 18, 2002. (Registration Number: 92819)

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FCC-003 (Rev.0)

HEAD OFFICE : #505 SK APT. Factory 223-28, Sangdaewon 1 Dong, Jungwon-Gu, Seongnam-City, Kyunggi-Do, 462-121, Korea
(TEL: +82-31-746-8500, FAX: +82-31-746-8700)

EMC Testing Dept : 426-1 Daessangryung-Ri, Chowol-Myun, Kwangju-City, Kyunggi-Do 464-860 Korea. (TEL: +82-31-765-8289, FAX: +82-31-766-2904)



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 | ITM INC. | MA-330-21-B | N/A |

3.2 Mode of operation during the test

- After connecting the EUT to USB port of a notebook PC, the “H” characters are printed on the monitor until the screen is completely full.

3.3 Cable Description

| | Power Cord Shielded (Y/N) | I/O cable Shielded (Y/N) | Length (M) |
|---|------------------------------|-----------------------------|----------------|
| 4 Wires Analog Resistive Touch Screen (EUT) | N/A | Y | 1.2 (D) |
| NOTEBOOK PC | N | - | 1.5 (P) |
| MONITOR | N | Y | 1.5(P), 1.5(D) |
| PRINTER | N | Y | 1.5(P), 1.5(D) |
| MOUSE | N/A | N | 1.2 (D) |

* The marked “(P)” means the Power Cable and “D” means the I/O Cable.

3.4 Noise Suppression Parts on Cable

| | Ferrite Bead (Y/N) | Location | Metal Hood (Y/N) | Location |
|---|-----------------------|----------|---------------------|-----------------|
| 4 Wires Analog Resistive Touch Screen (EUT) | N | N/A | Y | Notebook PC END |
| NOTEBOOK PC | - | - | - | - |
| MONITOR | Y | BOTH END | Y | BOTH END |
| PRINTER | N | N/A | Y | BOTH END |
| MOUSE | N | N/A | Y | Notebook PC END |



3.5 Equipment Modifications

To achieve compliance to CLASS B levels, the following change(s) was made by ONETECH Corp. during compliance testing:

“There were no Modified items during EMI test”

3.6 Configuration of Test System

Line Conducted Test : The EUT was connected to USB port of PC and the power line of PC 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: 2001 7.2.3 to determine the worse operating conditions.

Radiated Emission Test : Preliminary radiated emission test was conducted using the procedure in ANSI C63.4: 2001 8.3.1.1 to determine the worse operating conditions. Final radiated emission test was conducted at 3 meters open area test site.

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) |
|---|---|
| The “H” characters are printed on the monitor until the screen is completely full | 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) |
|---|---|
| The “H” characters are printed on the monitor until the screen is completely full | X |

**5. FINAL RESULT OF MEASUREMENT**

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

5.1 Conducted Emissions TestsHumidity Level : 43 %Temperature: 22 °CLimits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.107 (a)Type of Test : Class BResult : PASSED BY -15.92 dB at 0.17 MHz

EUT : 4 Wires Analog Resistive Touch Screen

Date: November 04, 2004

Operating Condition : The "H" characters are printed on the monitor until the screen is completely full.

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

| Frequency (MHz) | Line | Peak (dBuV) | | Margin (dB) |
|--------------------|------|----------------|------------|----------------|
| | | Emission level | Q.P Limits | |
| 0.16 | H | 49.38 | 65.46 | -16.08 |
| 0.17 | N | 49.04 | 64.96 | -15.92 |
| 0.26 | H | 41.76 | 61.43 | -19.67 |
| 0.28 | N | 44.04 | 60.82 | -16.78 |
| 0.39 | H | 36.27 | 57.96 | -21.69 |
| 4.89 | N | 35.03 | 56.00 | -20.97 |
| Frequency (MHz) | Line | Average (dBuV) | | Margin (dB) |
| | | Emission level | Limits | |
| - | | | | |
| - | | | | |

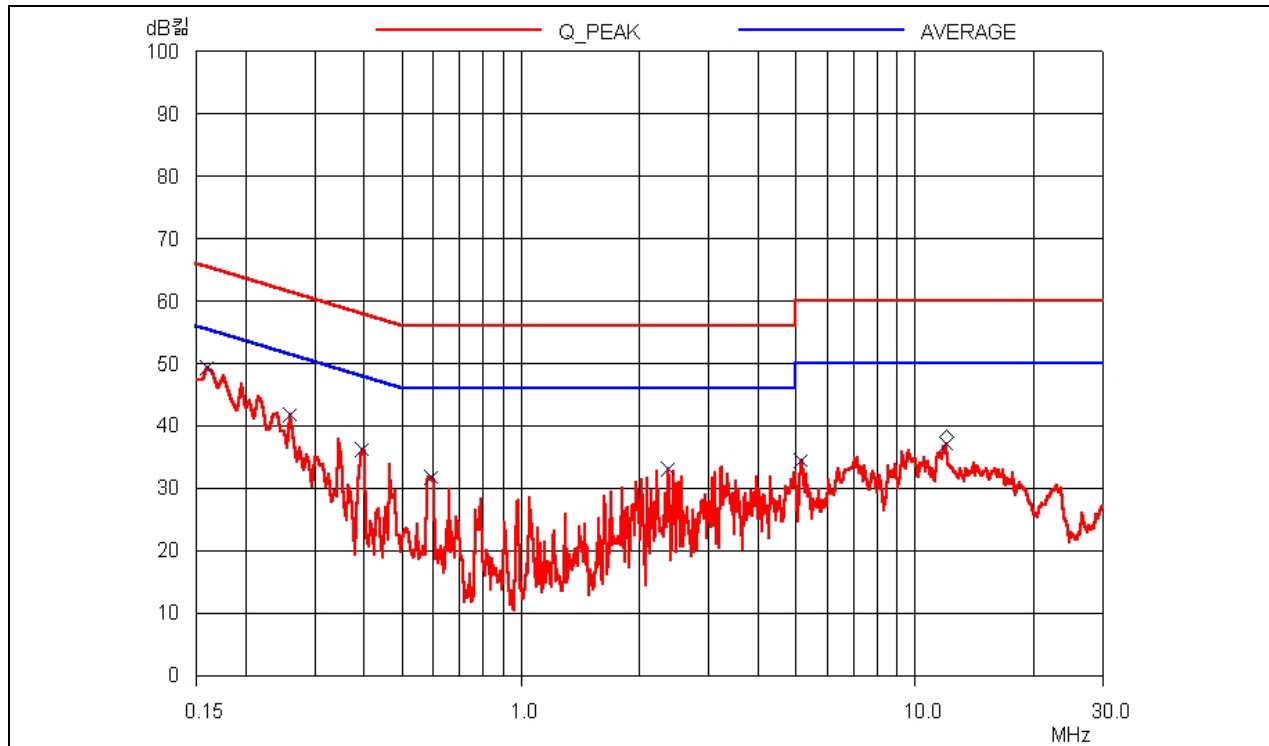
Line Conducted Emissions Tabulated Data

Remark : "H": Hot Line, "N": Neutral line

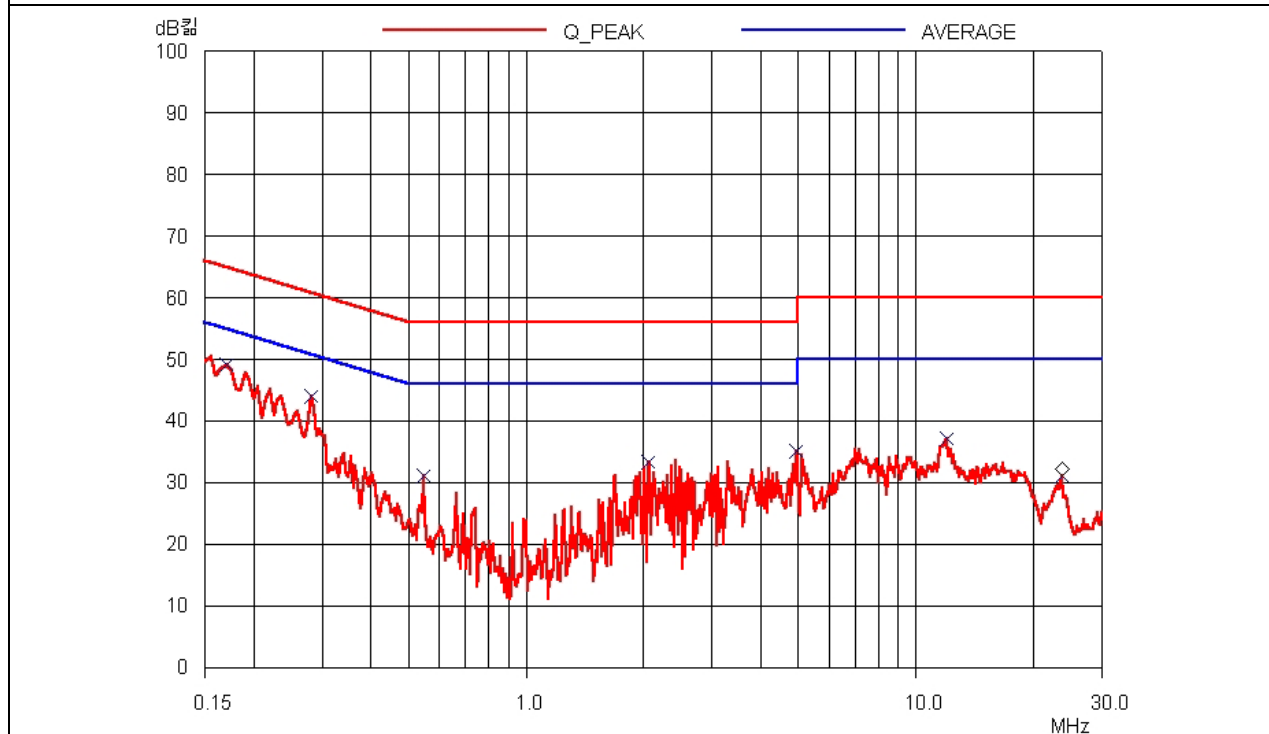
Average mode was not measured, because peak measurement values were under the Average limit.

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

Tested by: In-Sub, Youn / Test Engineer



HOT LINE



NEUTRAL LINE

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**5.2 Radiated Emission Test**

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

Humidity Level : 38 % Temperature: 19 °C
 Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109 (a)
 Type of Test : CLASS B
 Result : PASSED BY -9.78 dB at 664.70 MHz

EUT : 4 Wires Analog Resistive Touch Screen Date: October 08, 2004
 Operating Condition : The "H" characters are printed on the monitor until the screen is completely full.
 Frequency range : 30MHz ~ 1000MHz
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)
 Distance : 3 Meter

| Radiated Emissions | | Ant | Correction Factors | | Total | FCC CLASS B | |
|--------------------|----------------|------|--------------------|---------------|------------------|-------------------|----------------|
| Freq. (MHz) | Amp. (dBuV) | Pol. | Ant. (dBuV/m) | Cable (dB) | Amp. (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
| 66.00 | 21.40 | H | 5.70 | 1.42 | 28.52 | 40.00 | -11.48 |
| 83.30 | 19.10 | V | 6.74 | 1.67 | 27.51 | 40.00 | -12.49 |
| 165.60 | 14.50 | V | 14.65 | 2.10 | 31.25 | 43.52 | -12.27 |
| 194.70 | 11.60 | V | 15.78 | 2.25 | 29.63 | 43.52 | -13.89 |
| 240.00 | 15.30 | H | 17.09 | 2.56 | 34.95 | 46.02 | -11.07 |
| 264.50 | 13.60 | H | 17.39 | 2.66 | 33.65 | 46.02 | -12.37 |
| 541.60 | 11.20 | H | 18.76 | 3.87 | 33.83 | 46.02 | -12.19 |
| 565.80 | 13.10 | H | 18.73 | 3.96 | 35.79 | 46.02 | -10.23 |
| 664.70 | 12.10 | H | 19.91 | 4.23 | 36.24 | 46.02 | -9.78 |

Radiated Emissions Tabulated Data

Tested by: In-Sub, Youn / 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 | DEC/03 | 12MONTH | ■ |
| 2. | Test receiver | R/S | ESHS 10 | 834467/007 | MAY/04 | 12MONTH | ■ |
| 3. | Spectrum analyzer | HP | 8566B | 3407A08547 | JUL/04 | 12MONTH | |
| 4. | Spectrum analyzer | HP | 8568B | 3109A05456 | JUL/04 | 12MONTH | ■ |
| 5. | RF preselector | HP | 85685A | 3107A01264 | APR/04 | 12MONTH | ■ |
| 6. | Quasi-Peak Adapter | HP | 85650A | 3107A01542 | JUL/04 | 12MONTH | ■ |
| 7. | TRILOG Broadband Antenna | Schwarzbeck | VULB9163 | VULB9163 166 | FEB/04 | 12MONTH | |
| 8. | Biconical antenna | EMCO | 3104C | 9109-4443 | MAY/04 | 12MONTH | |
| | | Schwarzbeck | VHA9103 | 91031852 | JAN/04 | | ■ |
| 9. | Log Periodic antenna | EMCO | 3146 | 9109-3213 | FEB/04 | 12MONTH | |
| | | | | 9109-3217 | MAY/04 | | |
| | | Schwarzbeck | 9108-A(494) | 62281001 | JAN/04 | | ■ |
| 10. | LISN | EMCO | 3825/2 | 9109-1867 | JUL/04 | 12MONTH | ■ |
| | | | | 9109-1869 | OCT/04 | | ■ |
| 11. | Position Controller | HD GmbH | HD100 | N/A | N/A | N/A | ■ |
| 12. | Turn Table | HD GmbH | DS420S | N/A | N/A | N/A | ■ |
| 13. | Antenna Master | HD GmbH | MA240 | N/A | N/A | N/A | ■ |