

# Electromagnetic Emission

## FCC MEASUREMENT REPORT

### Certification OF COMPLIANCE

#### FCC Part 15 Verification Measurement

**PRODUCT** : USB optical mouse with smart card reader & token  
**MODEL/TYPE NO** : OMS-100  
**FCC ID** : QGUOMS-100  
**APPLICANT** : Smart System, Inc.  
365-1, GunHee Bldg, 2F. Yangjae-Dong  
Seocho-Gu,, Seoul, Korea  
Attn. : Su Hyun, Kim / General Manager of Sales Team 3  
**FCC CLASSIFICATION** : FCC Part 15 Subpart B  
**FCC RULE PART(S)** : Part 15 Class B Computing Device Peripheral (JBP)  
**FCC PROCEDURE** : Certification  
**TRADE NAME** : Smart System, Inc.  
**TEST REPORT No.** : E02.1118.FCC.777N  
**DATES OF TEST** : November 12~13, 2002  
**DATES OF ISSUE** : November 18, 2002  
**TEST LABORATORY** : ETL Inc ( FCC Registration Number : 95422)  
#584 Sangwhal-ri, Kanam-myun, Youju-kun, 469-885  
Kyeonggi-do, Korea  
Tel : (031) 885-0072 Fax : (031) 885-0074

This USB optical mouse with smart card reader & token, Model OMS-100 has been tested in accordance with the measurement procedures specified in ANSI C63.4-1992 at the ETL/EMC Test Laboratory and has been shown to be complied with the electromagnetic radiated emission limits specified in FCC Rule Part 15, Computer peripheral Devices.

I attest to the accuracy of data. All measurement herein are performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

The results of testing in this report apply to the product / system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

*Yo Han, Park*

Name : Yo Han, Park

Title : Chief Engineer Of EMC Team



**E-RAE Testing Laboratory Inc.**

**#584 Sangwhal-ri, Kanam-myun, Youju-kun, 469-885 Kyeonggi-do, Korea**

*This report only responds to the tested sample and may not be reproduced, except in full, without written approval of the ETL, Inc.*

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## FCC MEASUREMENT REPORT

**Scope** – Measurement and determination of electromagnetic emission (EME) of radio frequency devices including intentional radiators and/or unintentional radiators for compliance with the technical rules and regulations of the U.S Federal Communications Commission (FCC)

### General Information

**Applicant Name** : Smart System, Inc.

**Address** : 365-1. GunHee Bldg, 2F. Yangjae-Dong,  
Seocho-Gu, Seoul, Korea

**Attention** : Su Hyun, Kim / General Manager of Sales Team 3

- **EUT Type** : USB optical mouse with smart card reader & token
- **Model Number** : OMS-100
- **FCC Identifier** : QGUOMS-100
- **S/N** : NONE
- **Modulation** : NONE
- **FCC Rule Part(s)** : FCC Part 15 Subpart B
- **Test Procedure** : ANSI C63.4-1992
- **FCC Classification** : Part 15 Class B Computing Device Peripheral (JBP)
- **Dates of Tests** : November 18, 2002
- **Place of Tests** : ETL Inc
- EMC Testing Lab (FCC Registration Number : 95422)
- 584, Sangwhal-Ri, Kanam-Myun, Yoju-Kun, 469-885
- Kyounggi-Do, Korea
- Tel : (031) 885-0072 Fax : (031) 885-0074
- **Test Report No.** : E02.1118.FCC.777N

## 1. INTRODUCTION

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The measurement test for radiated and conducted emission test were conducted at the open area test site of E-RAE Testing Laboratory Inc. facility located at 584, Sangwhal-ri, Ganam-myun, Youju-kun, Kyounggi-do, Korea. The site is constructed in conformance with the requirements of the ANSI C63.4-1992 and CISPR Publication 22. The ETL has site descriptions on file with the FCC for 3 and 10 meters site configurations. Detailed description of test facility was found to be in compliance with the requirements of Section 2.948 FCC Rules according to the ANSI C63.4-1992 and registered to the Federal Communications Commission (Registration Number : 95422 ).

The measurement procedure described in American National Standard for Method of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz (ANSI C.63.4-1992) was used in determining radiated and conducted emissions from the Model : OMS-100

## 2. PRODUCT INFORMATION

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### 2.1 Equipment Description

The Equipment Under Test(EUT) is the Smart System, Inc.OMS-100

Please refer to Users manual

### 2.2 General Specification

- USB Smart Card Rader : supports all ISO 7816-1/2/3/4 smart cards
  - : supports memory card
  - : PC/SC compliant
  - : supports T=0, T=1 protocol
  - : Indicator with red LED(card power on)
  - : guaranteed for 100,000 insertion cycles
- USB Optical Mouse : provides movement resolution 800 dpi optical sens
  - : Long life expectancy
  - : provides 3 buttons and wheel scroll
- USB Token : supports Triple DES ciphered algorithm
  - : supports 8 Kbytes EEPROM(options 16/32/64 Kbytes)
- Host Interface : USB Type A cable
  - : Bus powered device
  - : supports hot plug and play
  - : Hubless
- Power Supply : 5V from the USB port
- Operating Temperature : 0 / 55
- Storage Temperature : -40 / 85
- Dimension : LWH 124\*64\*40 (mm) / 180cm
- Operating system : Windows 98 / Me / 2000 / XP

### 3. DESCRIPTION OF TESTS

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#### 3.1 Conducted Emission Measurement

Conducted emissions measurements were made in accordance with § 12.2 in ANSI C63.4-1992 "Measurement of Information Technology Equipment ". The measurement were performed over the frequency range of 0.15MHz to 30MHz using a 50Ω/50uH LISN as the input transducer to a Spectrum Analyzer or a Field Intensity Meter. The measurements were made with the detector set for "Peak" amplitude within a bandwidth of 10KHz or for "quasi-peak" within a bandwidth of 9KHz.

- Procedure of Test

The line-conducted facility is located inside a shielded room 1m X 1.5m wooden table 80cm high is placed 40cm away from the vertical wall and 1.5m away from the side wall of the shielded room. Two EMCO 3825/2 LISN are bonded to the shielded room. The EUT is powered from the EMCO LISN and the support equipment is powered from another EMCO LISN. Power to the LISN is filtered by a noise cut power line filters. All electrical cables are shielded by braided tinned steel tubing with inner  $\phi$  1.2cm. If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and these supply lines will be connected to the EMCO LISN. Non-inductive bundling to a 1m length shortened all interconnecting cables more than 1m. Sufficient time for the EUT support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the R3261A Spectrum Analyzer to determine the frequency producing the max. emission from the EUT. The frequency producing the max. level was reexamined using to set Quasi-Peak mode by manual, after scanned by automatic Peak mode from 0.15 to 30MHz. The bandwidth of the Spectrum Analyzer was set to 9kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission.

### 3. DESCRIPTION OF TESTS

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#### 3.2 Radiated Emission Measurement

Radiated emission measurements were in accordance with ANSI C63.4-1992. The measurements were performed over the frequency range of 30MHz to 1GHz using antenna as the input transducer to a Spectrum analyzer or a Field Intensity Meter. The measurements were made with the detector set for "Quasi-peak" within a bandwidth of 120KHz.

- **Procedure of Test**

Preliminary measurements were made at 3 meter using broadband antennas, and spectrum analyzer to determined the frequency producing the max. emission in shielded room. Appropriate precaution was taken to ensure that all emission from the EUT were maximized and investigated. The system configuration, mode of operation, turntable azimuth and height with respect to the antenna were noted for each frequency found. The spectrum was scanned from 30 to 1000MHz using SchwarzBeck Log-Bicon antenna. Above 1GHz, linearly polarized double ridge horn antennas were used. Final measurements were made open site at 10-meters. The test equipment was placed on a wooden turn-table. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined by manual. The detector function was set to CISPR Quasi-peak mode and the bandwidth of the receiver was set to 120kHz or 1MHz depending on the frequency of type of signal. The EUT, support equipment and interconnecting cables were re-configured to the set-up producing the max. emission for the frequency and were placed on top of a 0.8-meter high nonmetallic 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each emission. The turntable containing the system was rotated; the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the max. emission. Each emission was maximized by: varying the mode of operation to the EUT and/or support equipment and changing the polarity of the antenna, whichever determined the worst-case emission. Photographs of the worst-case emission can be seen in Test Setup photos.

## 4. TEST CONDITION

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### 4.1 Test Configuration

The device was configured for testing in a typical fashion (as a customer would normally use it). During the tests, the following conditions and configurations were used.

### 4.2 EUT operation

| Operating Mode     | The worst operating condition |
|--------------------|-------------------------------|
| Smart card Mode    | O                             |
| Mouse Mode         | O                             |
| Communication Mode | X                             |

O : Worst case investigated during the Test

### 4.3 Support Equipment Used

Following peripheral devices and interface cables were connected during the measurement:

#### EUT – USB optical mouse with smart card reader & token

FCC ID : QGUOMS-100  
Model Name : OMS-100  
Serial No. : N/A  
Manufacturer : Smart System, Inc.  
Power Supply Type : 5Vd.c from the USB port  
Power Cord : N/A  
Data Cable : Shielded, 1m

#### Support Unit 1-Persnal computer (DELL)

FCC ID : N/A (DOC)  
Model Name : MMP  
Serial No. : SK1W31S  
Manufacturer : DELL  
Power Supply Type : Switching  
Power Cord : Non-shielded, Detachable: 1.2m  
Port : Parallel: 1, USB: 2, Keyboard: 1, Mouse: 1, RS-232: 2, RGB: 1  
RJ-45:1, Audio in: 1, Audio out: 1, MIC in: 1

#### Support Unit 2-Keybaord (DELL)

FCC ID : N/A (DOC)  
Model Name : SK-8000  
Serial No. : 2965  
Manufacturer : DELL  
Power Supply Type : N/A  
Power Cord : N/A  
Data Cable : Shielded, 1.5m

**Support Unit 3- Serial Mouse (PETRA)**

FCC ID : JKGMUS5S01  
Model Name : MUS5S  
Serial No. : E183027  
Manufacturer : PETRA  
Power Supply Type : N/A  
Power Cord : shielded, 1.2m

**Support Unit 4-Mouse (LOGITECH)**

FCC ID : DZL211029  
Model Name : M-S34  
Serial No. : LZC01002314  
Manufacturer : LOGITECH  
Power Supply Type : N/A  
Power Cord : N/A  
Data Cable : Non-Shielded, 1.2m

**Support Unit 5- Monitor (E-RAE)**

FCC ID : OIOELM-150  
Model Name : ELM-150B  
Serial No. : N/A  
Manufacturer : E-RAE Electronics Industry Co., Ltd.  
Power Supply Type : DC12V From Adaptor, Switching  
Power Cord : Non-shielded, Detachable: 1.2m  
Data Cable : Shielded 15pin D-sub, 1.5m

**Support Unit 6- Printer (EPSON)**

FCC ID : N/A  
Model Name : STYLUS PHOTO 750  
Serial No. : BRL0005620  
Manufacturer : EPSON  
Power Supply Type : Switching  
Power Cord : Non-Shield, 1.5m  
Data Cable : Shielded, 1.5m

**Support Unit 7- EAR MIC (JETECH)**

FCC ID : N/A  
Model Name : JE101  
Serial No. : N/A  
Manufacturer : JETECH  
Power Supply Type : N/A  
Power Cord : N/A  
Data Cable : Shielded, 1.5m

## 5. TEST RESULTS

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### 5.1 Summary of Test Results

The measurement results were obtained with the EUT tested in the conditions described in this report. Detailed measurement data and plots showing the maximum emission of the EUT are reported.

| FCC Rule Parts | Measurement Required           | Result             |
|----------------|--------------------------------|--------------------|
| 15.107(e)      | Conducted Emission Measurement | Passed by -10.10dB |
| 15.109(e)      | Radiated Emissions Measurement | Passed by -4.50dB  |

The data collected shows that the **Smart System, Inc. USB optical mouse with smart card reader & token** complies with technical requirements of above rules part 15.107(e) and 15.109(e) Class B Limits.

The equipment is not modified anything, mechanical or circuits to improve EMI status during a measurement.

No EMI suppression device(s) was added and/or modified during testing.

## 5. TEST RESULTS

### 5.2 Conducted Emissions Measurement

|                       |                                                                     |
|-----------------------|---------------------------------------------------------------------|
| EUT                   | USB optical mouse with smart card reader & token / OMS-100 (SN:N/A) |
| Limit apply to        | 15.107(e) : CISPR Pub.22(1997) Class B                              |
| Test Date             | November 13, 2002                                                   |
| Operating Condition   | Test Program execute (Data read & write mode)                       |
| Environment Condition | Humidity Level : 33 %RH, Temperature : 21                           |
| Result                | Passed by -10.10dB                                                  |

### Conducted Emission Test Data

The following table shows the highest levels of conducted emissions on both polarization of live and neutral line.

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

| Frequency<br>[MHz] | Reading<br>[dBμV] |         | Phase<br>(*H/**N) | Limit<br>[dBμV] |         | Margin<br>[dB] |         |
|--------------------|-------------------|---------|-------------------|-----------------|---------|----------------|---------|
|                    | Quasi-peak        | Average |                   | Quasi-peak      | Average | Q.Peak         | Average |
| 0.156              | 33.70             | -       | N                 | 65.67           | 55.67   | 31.97          |         |
| 0.236              | 39.20             | -       | N                 | 62.23           | 52.23   | 23.03          |         |
| 0.595              | 38.50             | -       | N                 | 56.00           | 46.00   | 17.50          |         |
| 0.950              | 38.30             | -       | H                 |                 |         | 17.70          |         |
| 1.690              | 45.90             | 34.00   | N                 |                 |         | 10.10          | 12.00   |
| 1.935              | 45.40             | 37.70   | N                 |                 |         | 10.60          | 8.30    |
| 6.730              | 37.00             | -       | N                 | 60.00           | 50.00   | 23.00          |         |
| 13.40              | 35.00             | -       | N                 |                 |         | 25.00          |         |
| 15.88              | 36.10             | -       | H                 |                 |         | 23.90          |         |
| 23.86              | 43.00             | -       | N                 |                 |         | 17.00          |         |

NOTES :

1. \* H : HOT Line , \*\*N : Neutral Line
2. Margin value = Limit - Reading
3. Measurement were performed at the AC Power Inlet of PC in the frequency band of 150kHz ~ 30MHz according to the CISPR 22 Class B
4. If the Reading Quasi-Peak value is bellowed the Average Limit, Do not test Average Mode.

*Ho Jin, Kim*

Tested by : Ho Jin, Kim  
Test Engineer

## 5. TEST RESULTS

Line Polarity : Hot

### ETL INC. CONDUCTED EMISSION

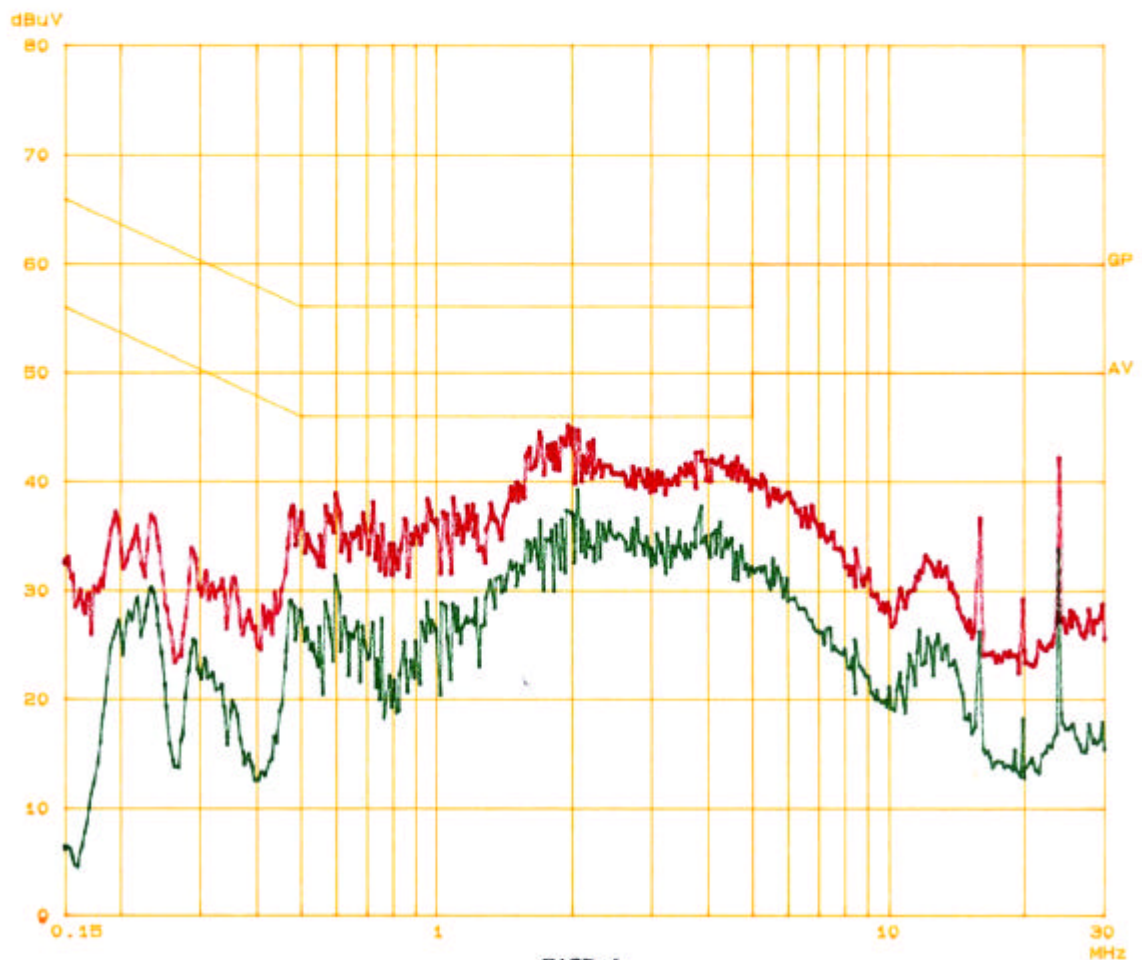
EUT: OMS-100  
Manuf: Smart System Inc.  
Test Spec: CISPR 22  
Comment: HOT

#### Scan Settings (3 Ranges)

| Frequencies |      |      | Receiver Settings |          |        |       |         |       |
|-------------|------|------|-------------------|----------|--------|-------|---------|-------|
| Start       | Stop | Step | IF BW             | Detector | N-Time | Atten | Presamp | OpRge |
| 150k        | 500k | 2k   | 10k               | PK+AV    | 20ms   | AUTO  | LN OFF  | 60dB  |
| 500k        | 5M   | 5k   | 10k               | PK+AV    | 20ms   | AUTO  | LN OFF  | 60dB  |
| 5M          | 30M  | 10k  | 10k               | PK+AV    | 20ms   | AUTO  | LN OFF  | 60dB  |

Final Measurement: x GP / + AV  
 Meas Time: 1 s  
 Subranges: 50  
 Acc Margin: 3dB

Transducer No. 1 Start 150k Stop 30M Name EN55022



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## 5. TEST RESULTS

Line Polarity : Neutral

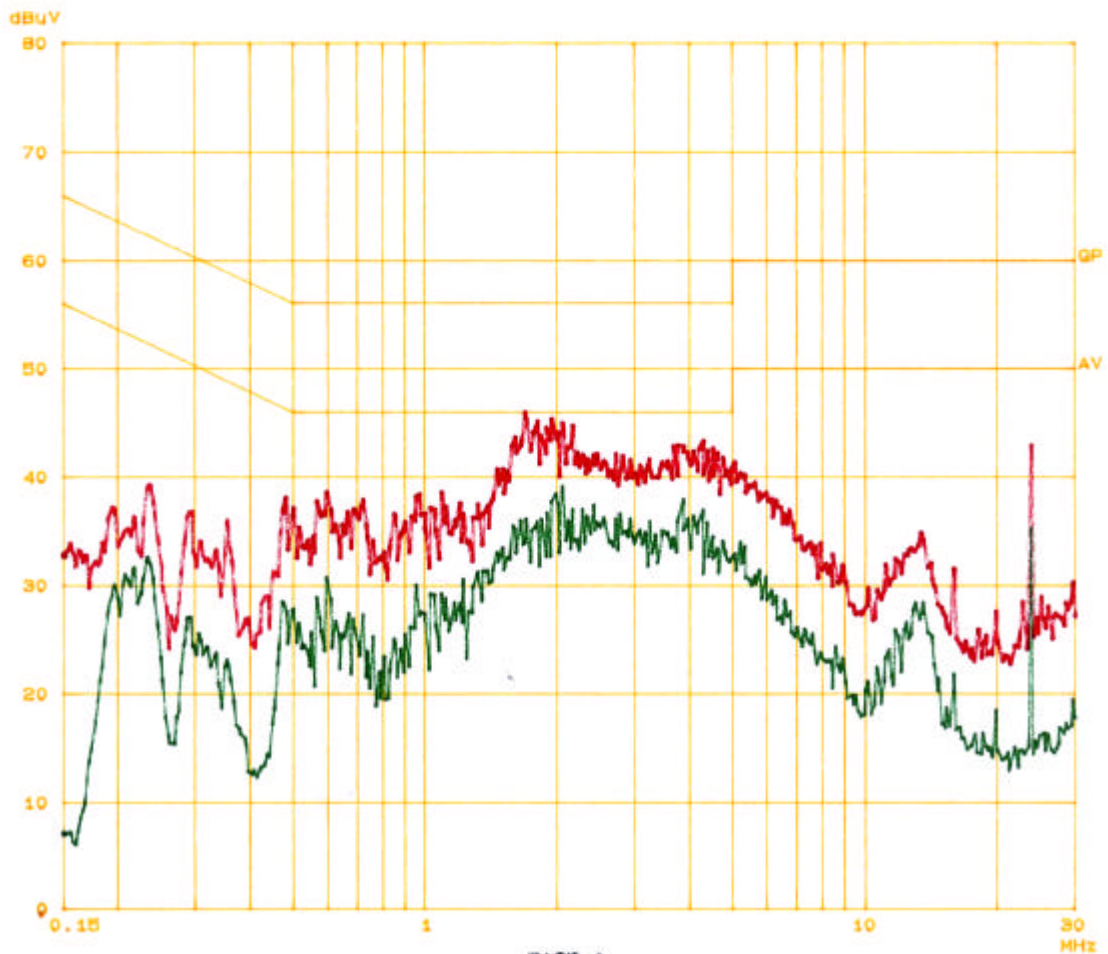
### ETL INC. CONDUCTED EMISSION

EUT: OMS-100  
Manuf: Smart System Inc.  
Test Spec: CISPR 22  
Comment: NEUTRAL

| Scan Settings (3 Ranges) |      |      | Receiver Settings |          |        |       |        |       |
|--------------------------|------|------|-------------------|----------|--------|-------|--------|-------|
| Start                    | Stop | Step | IF BW             | Detector | M-Time | Atten | Preamp | OpRge |
| 150k                     | 500k | 2k   | 10k               | PK+AV    | 20ms   | AUTO  | LN OFF | 60dB  |
| 500k                     | 5M   | 5k   | 10k               | PK+AV    | 20ms   | AUTO  | LN OFF | 60dB  |
| 5M                       | 30M  | 10k  | 10k               | PK+AV    | 20ms   | AUTO  | LN OFF | 60dB  |

| Final Measurement: | x GP / + AV | Transducer No. | Start | Stop | Name    |
|--------------------|-------------|----------------|-------|------|---------|
| Meas Time:         | 1 s         | 1              | 150k  | 30M  | EN55022 |
| Subranges:         | 50          |                |       |      |         |
| Acc Margin:        | 3dB         |                |       |      |         |



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## 5. TEST RESULTS

### 5.3 Out-of-band Radiated Emissions

|                       |                                                                     |
|-----------------------|---------------------------------------------------------------------|
| EUT                   | USB optical mouse with smart card reader & token / OMS-100 (SN:N/A) |
| Limit apply to        | 15.109(e) : CISPR Pub.22(1997) Class B                              |
| Test Date             | November 13, 2002                                                   |
| Operating Condition   | Test Program execute (Data read & write mode)                       |
| Environment Condition | Humidity Level : 33 %RH, Temperature : 21                           |
| Result                | Passed by - 4.50dB                                                  |

#### Radiated Emission Test Data

The following table shows the highest levels of radiated emissions on both polarization of horizontal and vertical.

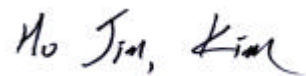
Detector mode : CISPR Quasi-Peak mode ( 6dB Bandwidth : 120 kHz )

Measurement Distance : 10 meters

| Frequency [MHz] | Reading [dB $\mu$ V] | Polarization (*H/**V) | Ant. Factor [dB] | Cable Loss [dB] | Emission Level [dB $\mu$ V/m] | Limit [dB $\mu$ V/m] | Margin [dB] |
|-----------------|----------------------|-----------------------|------------------|-----------------|-------------------------------|----------------------|-------------|
| 126.50          | 11.92                | H                     | 8.69             | 2.89            | 23.50                         | 30.0                 | 6.5         |
| 159.33          | 4.07                 | V                     | 18.03            | 2.40            | 24.50                         | 30.0                 | 5.5         |
| 162.83          | 3.12                 | H                     | 18.55            | 2.40            | 24.07                         | 30.0                 | 5.9         |
| 174.45          | 11.60                | H                     | 11.50            | 2.40            | 25.50                         | 30.0                 | 4.5         |
| 180.55          | 10.53                | V                     | 10.76            | 3.71            | 25.00                         | 30.0                 | 5.0         |
| 186.61          | 10.51                | H                     | 10.23            | 3.77            | 24.50                         | 30.0                 | 5.5         |
| 210.53          | 11.58                | H                     | 9.42             | 4.00            | 25.00                         | 30.0                 | 5.0         |
| 222.70          | 10.83                | H                     | 10.17            | 4.00            | 25.00                         | 30.0                 | 5.0         |
| 260.00          | 8.06                 | H                     | 12.84            | 3.10            | 24.00                         | 37.0                 | 13.0        |
| 270.80          | 11.68                | H                     | 12.90            | 3.42            | 28.00                         | 37.0                 | 9.0         |

#### NOTES :

- \* H : Horizontal polarization , \*\* V : Vertical polarization
- Emission Level = Reading + Antenna factor + Cable loss
- Margin value = Limit - Emission Level
- The measurement was performed for the frequency range 30MHz ~ 1000MHz according to the CISPR 22 Class B



Tested by : Ho Jin, Kim  
Test Engineer

## 6. SAMPLE CALCULATION

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### Sample Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor.  
The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF$$

where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Attenuation Factor

$$\text{dB}(\mu\text{V}/\text{m}) = 20 \log_{10} (\mu\text{V} / \text{m}) : \text{Equation 1}$$

$$\text{dB}\mu\text{V} = \text{dBm} + 107 : \text{Equation 2}$$

Example 1 : @ 1.69MHz

|                          |   |                               |
|--------------------------|---|-------------------------------|
| Class B Limit            | = | 630.9 $\mu\text{V}$ = 56 dBuV |
| Reading                  | = | 45.90 dBuV                    |
| Convert to $\mu\text{V}$ | = | 197.24 $\mu\text{V}$          |
| Margin                   | = | 45.30 – 56.00 = -10.10        |
|                          | = | -10.10 dB below Limit         |

Example 2 : @ 174.45 MHz

|                             |   |                                   |
|-----------------------------|---|-----------------------------------|
| Class B Limit               | = | 31.62 $\mu\text{V}$ = 30.0 dBuV/m |
| Reading                     | = | 11.60 dBuV                        |
| Antenna Factor + Cable Loss | = | 13.90 dB                          |
| Total                       | = | 25.50 dBuV/m                      |
| Margin                      | = | 25.50 – 30.0 = -4.50              |
|                             | = | -4.50 dB below Limit              |

## 7. TEST EQUIPMENT LIST

### List of Test Equipments Used for Measurements

|                                     | Test Equipment          | Model       | Mfg.         | Serial No.  | Cal. Due Date |
|-------------------------------------|-------------------------|-------------|--------------|-------------|---------------|
| <input checked="" type="checkbox"/> | Spectrum Analyzer       | R3261A      | Advantest    | 21720033    | 03-10-23      |
| <input checked="" type="checkbox"/> | Spectrum Analyzer       | HP E7402A   | HP           | US39110107  | 03-05-16      |
| <input checked="" type="checkbox"/> | Receiver                | ESVS 10     | R & S        | 835165/001  | 03-04-06      |
| <input checked="" type="checkbox"/> | EMI Test Receiver       | ESHS 30     | R & S        | 040190/002  | 03-03-19      |
| <input checked="" type="checkbox"/> | Preamplifier            | HP8447D     | HP           | 2944A07626  | 03-01-10      |
| <input type="checkbox"/>            | Preamplifier            | HP 8347A    | HP           | 2834A00544  | 03-05-23      |
| <input checked="" type="checkbox"/> | LISN                    | 3825/2      | EMCO         | 9006-1669   | 02.12.27      |
| <input checked="" type="checkbox"/> | LISN                    | 3825/2      | EMCO         | 9208-1995   | 02.12.27      |
| <input checked="" type="checkbox"/> | TriLog Antenna          | VULB9160    | Schwarz Beck | 3082        | 03-06-19      |
| <input type="checkbox"/>            | LogBicon                | VULB9165    | Schwarz Beck | 2023        | 03-06-21      |
| <input type="checkbox"/>            | Dipole Antenna          | VHAP        | Schwarz Beck | 964         | 03-05-03      |
| <input type="checkbox"/>            | Dipole Antenna          | VHAP        | Schwarz Beck | 965         | 03-05-03      |
| <input type="checkbox"/>            | Dipole Antenna          | UHAP        | Schwarz Beck | 949         | 03-05-03      |
| <input type="checkbox"/>            | Dipole Antenna          | UHAP        | Schwarz Beck | 950         | 03-05-03      |
| <input type="checkbox"/>            | Broad band Horn Antenna | BBHA 9120 D | Schwarz Beck | 277         | 03-11-03      |
| <input checked="" type="checkbox"/> | Turn-Table              | DETT-03     | Daeil EMC    | -           | N/A           |
| <input checked="" type="checkbox"/> | Antenna Master          | DEAM-03     | Daeil EMC    | -           | N/A           |
| <input type="checkbox"/>            | Plotter                 | 7440A       | H.P          | 2725A 75722 | N/A           |
| <input checked="" type="checkbox"/> | Chamber                 | DTEC01      | DAETONG      | -           | N/A           |
| <input type="checkbox"/>            | Thermo Hygrograph       | 3-3122      | ISUZU        | 3312201     | 02-12-20      |
| <input type="checkbox"/>            | BaroMeter               | -           | Regulus      | -           | -             |