



# ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CLASS B CERTIFICATION

**Test report file number** : E028R-029

**Applicant** : KMTel Co., Ltd.

**Address** : ARA Bldg. 6F 216-5 Sinsung-Dong, Yusan-Gu, Daejeon-City, 305-80, Korea

**Manufacturer** : KMTel Co., Ltd.

**Address** : ARA Bldg. 6F 216-5 Sinsung-Dong, Yusan-Gu, Daejeon-City, 305-80, Korea

**Type of Equipment** : Smart Pointer

**FCC ID** : QMTSP-100R

**Model name** : SP-100R

**Serial number** : N/A

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

**Date of Incoming** : August 8, 2002

**Date of issuing** : August 19, 2002

## SUMMARY

The equipment complies with the regulation; ***FCC PART 15 CFR 47 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.

Prepared by:

Y. K. Nam / Assistant Chief Engineer  
EMC Dept.  
ONETECH Corp.

Reviewed by:

Y. K. Kwon / Chief Engineer  
EMC Dept.  
ONETECH Corp.



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## 1. VERIFICATION OF COMPLIANCE

APPLICANT : KMTel Co., Ltd.  
ADDRESS : ARA Bldg. 6F 216-5 Sinsung-Dong, Yusan-Gu, Daejeon-City, 305-80, Korea  
CONTACT PERSON : Jin, Han / Manager  
TELEPHONE NO : +82-42-361-4665  
FCC ID : QMTSP-100R  
MODEL NAME : SP-100R  
BRAND NAME : SMARTPointer  
SERIAL NUMBER : N/A  
DATE : August 19, 2002

|                                                         |                                                                           |
|---------------------------------------------------------|---------------------------------------------------------------------------|
| DEVICE TYPE                                             | Peripheral Device for Class B Computing Device<br>-Unintentional Radiator |
| E.U.T. DESCRIPTION                                      | Smart Pointer - Receiver                                                  |
| THIS REPORT CONCERNS                                    | ORIGINAL GRANT                                                            |
| MEASUREMENT PROCEDURES                                  | ANSI C63.4/2000                                                           |
| TYPE OF EQUIPMENT TESTED                                | PRE-PRODUCTION                                                            |
| KIND OF EQUIPMENT<br>AUTHORIZATION REQUESTED            | CERTIFICATION                                                             |
| EQUIPMENT WILL BE OPERATED<br>UNDER FCC RULES PART(S)   | FCC PART 15 SECTION 15.101 (CLASS B)                                      |
| MODIFICATIONS ON THE EQUIPMENT<br>TO ACHIEVE COMPLIANCE | No                                                                        |
| FINAL TEST WAS CONDUCTED ON                             | 3 METER OPEN AREA TEST SITE                                               |

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 KMTTEL Co., Ltd., Model SP-100R (refer to the EUT in this report) is a Receiver of the Smart Pointer that receives the RF signal from **the transmitter, M/N: SP-100T, FCC ID: QMTSP-100T** which was manufactured by KMTTEL Co., Ltd. The EUT shall be connected to the USB Port of a personal computer. Product specification described herein was obtained from product data sheet or user's manual.

|                                                 |                          |
|-------------------------------------------------|--------------------------|
| CHASSIS TYPE                                    | Plastic – Non coated     |
| LIST OF EACH OSC. OR<br>CRY. FREQ.(FREQ.>=1MHz) | 4.897MHz                 |
| NUMBER OF LAYERS                                | 2Layers                  |
| EXTERNAL CONNECTOR                              | USB Port                 |
| POWER INPUT VOLTAGE & CONSUMPTION               | DC 5V supplied from a PC |

### Model Differences:

-. No other model differences have been mentioned

### 2.2 Related Submittal(s) / Grant(s)

-. Original submittal only.



### 2.3 Test System Details

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

| Model    | Manufacturer        | FCC ID     | Description            | Connected to |
|----------|---------------------|------------|------------------------|--------------|
| SP-100R  | KMTEL Co., Ltd.     | QMTSP-100R | Smart Pointer<br>(EUT) | NOTE PC      |
| PP01L    | DELL Computer Corp. | DoC        | NOTE PC                | -            |
| ADP-70EB | DELTA Elec.         | N/A        | AC/DC ADAPTOR          | NOTE PC      |
| M-SAS51  | LOGITECH            | JNZ211167  | MOUSE                  | NOTE PC      |
| 2225C    | HP                  | DSI6XU2225 | PRINTER                | NOTE PC      |
| 020-0470 | CARDINAL            | GDE0196    | MODEM                  | NOTE PC      |

### 2.4 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4/2000. Radiated testing was performed at a distance of 3 meters from EUT to the antenna.

### 2.5 Test Facility

The open area test site and conducted measurement facilities are located on at 426-1 Daessangryung-Ri, Chowol-Myun, Kwangju-Si, Kyunggi-Do, 464-080, Korea. Description details of test facilities were submitted to the Commission on January 18, 2002. (Registration Number: 92819)

### 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 |
|-------------|--------------|-------------------|--------|
| RX BOARD    | DAEKYUNG     | HCO-RX315         | N/A    |

#### 3.2 EUT exercise Software

The EUT and peripheral equipments were connected as follows;

The EUT was connected to USB port on the Notebook PC by using extension USB cable and then peripheral equipments were connected to proper ports on the Notebook PC.

During the test, the EUT was operated as follows;

- 1) The EUT receives the signal from the transmitter continuously.
- 2) The windows program 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 takes about 20 seconds and is repeated continuously.

#### 3.3 Cable Description

|                     | Power Cord<br>Shielded (Y/N) | I/O cable Shielded<br>(Y/N) | Length (M)       |
|---------------------|------------------------------|-----------------------------|------------------|
| Smart Pointer (EUT) | N/A                          | Y                           | 1.2 (D)          |
| NOTE PC             | N                            | -                           | 1.5 (P)          |
| MOUSE               | N/A                          | Y                           | 1.8 (D)          |
| PRINTER             | N                            | Y                           | 1.5 (P), 1.5 (D) |
| MODEM               | N                            | Y                           | 1.5 (P), 1.5 (D) |

\* The marked “(P)” means the Power Cable and “(D)” means the Data Cable.



### 3.4 Noise Suppression Parts on Cable

|                     | Ferrite Bead<br>(Y/N) | Location    | Metal Hood<br>(Y/N) | Location    |
|---------------------|-----------------------|-------------|---------------------|-------------|
| Smart Pointer (EUT) | N                     | N/A         | Y                   | NOTE PC END |
| NOTE PC             | -                     | -           | -                   | -           |
| AC/DC ADAPTOR       | Y                     | NOTE PC END | Y                   | NOTE PC END |
| MOUSE               | N                     | N/A         | Y                   | NOPE PC END |
| PRINTER             | N                     | N/A         | Y                   | BOTH END    |
| MODEM               | N                     | N/A         | Y                   | BOTH END    |

### 3.5 Equipment Modifications

-. None

### 3.6 Configuration of Test System

**Line Conducted Test:** The EUT was connected to NOTE PC, and the power line of NOTE 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 C63.4/2000 7.2.3 to determine the worse operating conditions.

**Radiated Emission Test:** Preliminary radiated emission test was conducted using the procedure in ANSI C63.4/2000 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 Conducted Emission Test**

During Preliminary Test, the following operating mode was investigated.

| Operation Mode            | The Worse operating condition (Please check one only) |
|---------------------------|-------------------------------------------------------|
| STANDBY MODE              |                                                       |
| RX and "H" SCROLLING 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 MODE              |                                                       |
| RX and "H" SCROLLING MODE | 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 Emission Test**Humidity Level : 50 %Temperature : 25°CLimits apply to : FCC CFR 47, PART 15, SUBPART BType of Test : CLASS BResult : PASSED BY -12.21 dB at 14.20 MHz

EUT : Smart Pointer

Date: August 12, 2002

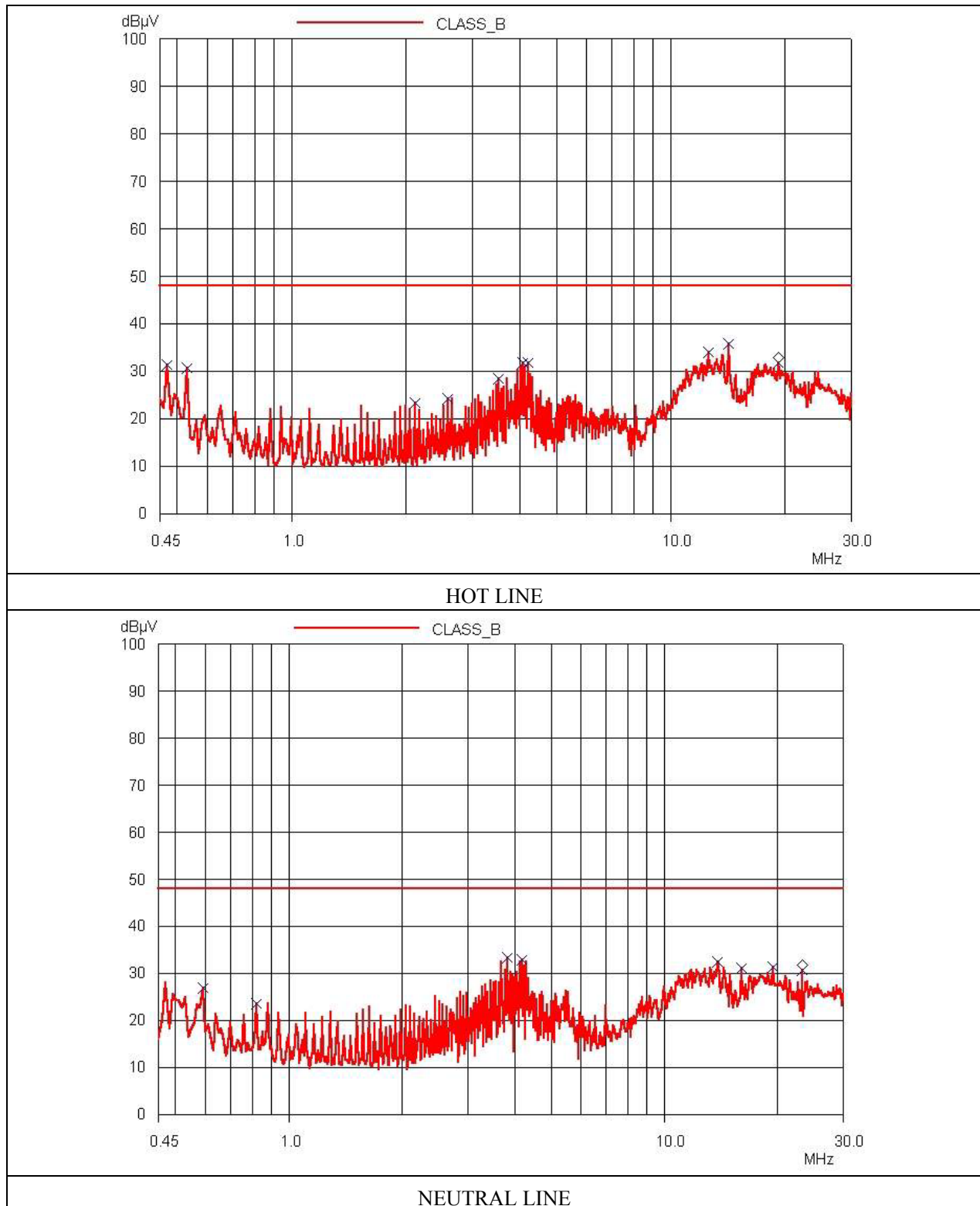
Operating Condition : RX and "H" SCROLLING MODE

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

| Power Line Conducted Emission |                     |           | FCC CLASS B     |                |
|-------------------------------|---------------------|-----------|-----------------|----------------|
| Frequency<br>(MHz)            | Amplitude<br>(dBuV) | Conductor | Limit<br>(dBuV) | Margin<br>(dB) |
| 0.47                          | 31.33               | NEUTRAL   | 48.00           | -16.67         |
| 0.53                          | 30.63               | NEUTRAL   | 48.00           | -17.37         |
| 3.81                          | 33.23               | HOT       | 48.00           | -14.77         |
| 4.16                          | 32.86               | HOT       | 48.00           | -15.14         |
| 12.55                         | 34.01               | NEUTRAL   | 48.00           | -13.99         |
| 14.20                         | 35.79               | NEUTRAL   | 48.00           | -12.21         |
| 19.22                         | 31.68               | NEUTRAL   | 48.00           | -16.32         |

Line Conducted Emission Tabulated Data

  
Tested by: Dan-Gi, 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 : 50 %

Temperature : 25°C

Limits apply to : FCC CFR 47, PART 15, SUBPART B

Type of Test : CLASS B

Result : PASSED BY -12.34 dB at 150.14 MHz

EUT : Smart Pointer

Date: August 12, 2002

Operating Condition : RX and "H" SCROLLING MODE

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

Distance : 3 Meter

| Radiated Emission |                | Ant  | Correction Factors |               | Total            | FCC CLASS B       |                |
|-------------------|----------------|------|--------------------|---------------|------------------|-------------------|----------------|
| Freq.<br>(MHz)    | Amp.<br>(dBuV) | Pol. | Ant.<br>(dBuV/m)   | Cable<br>(dB) | Amp.<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
| 45.69             | 15.60          | V    | 10.81              | 0.89          | 27.30            | 40.00             | -12.70         |
| 58.95             | 14.30          | V    | 9.55               | 0.98          | 24.83            | 40.00             | -15.17         |
| 150.14            | 16.30          | H    | 13.51              | 1.35          | 31.16            | 43.50             | -12.34         |
| 201.35            | 15.00          | H    | 10.93              | 1.58          | 27.51            | 43.50             | -15.99         |
| 254.36            | 12.90          | H    | 12.22              | 1.84          | 26.96            | 46.00             | -19.04         |
| 304.52            | 10.80          | H    | 14.94              | 2.03          | 27.77            | 46.00             | -18.23         |
| 452.31            | 12.90          | H    | 16.36              | 2.55          | 31.81            | 46.00             | -14.19         |
| 512.21            | 13.40          | H    | 17.52              | 2.70          | 33.62            | 46.00             | -12.38         |

Radiated Emission Tabulated Data

Tested by: Dan-Gi, 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)

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= 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                          | OCT/01   | 12MONTH | ■   |
| 2.  | Test receiver        | R/S  | ESHS10    | 834467/007                          | APR/02   | 12MONTH | ■   |
| 3.  | Spectrum analyzer    | HP   | 8568B     | 3026A0226                           | APR/02   | 12MONTH | ■   |
| 4.  | RF preselector       | HP   | 85685A    | 3107A01264                          | APR/02   | 12MONTH | ■   |
| 5.  | Quasi-Peak Adapter   | HP   | 85650A    | 3107A01542                          | APR/02   | 12MONTH | ■   |
| 6.  | Dipole Antenna       | EMCO | 3121C     | 9107-745                            | JUN/02   | 12MONTH |     |
| 7.  | Biconical antenna    | EMCO | 3104C     | 9109-4441<br>9109-4443<br>9109-4444 | APR/02   | 12MONTH | ■   |
| 8.  | Log Periodic antenna | EMCO | 3146      | 9109-3213<br>9109-3214<br>9109-3217 | APR/02   | 12MONTH | ■   |
| 10. | Horn Antenna         | EMCO | 3115      | 9509-4563                           | MAR/02   | 12MONTH |     |
| 11. | LISN                 | EMCO | 3825/2    | 9109-1867<br>9109-1869              | JUL/02   | 12MONTH | ■   |
| 12. | RF Amplifier         | HP   | 8447F     | 3113A04554                          | JUN/02   | N/A     |     |
| 13. | Spectrum Analyzer    | HP   | 8561E     | 3350A00546                          | SEP/01   | 12MONTH | ■   |
| 14. | Spectrum Analyzer    | HP   | 8591A     | 3131A02312                          | APR/02   | 12MONTH |     |
| 15. | Computer System      | HP   | 98581C    | 98543A                              | N/A      | N/A     | ■   |
|     | Hard disk drive      |      | 9153C     | CMC762Z9153                         | N/A      | N/A     | ■   |
| 16. | Plotter              | HP   | 7475A     | 30052 22986                         | N/A      | N/A     | ■   |
| 17. | Position Controller  | EMCO | 1090      | 9107-1038                           | N/A      | N/A     | ■   |
| 18. | Turn Table           | EMCO | 1080-1.21 | 9109-1576                           | N/A      | N/A     | ■   |
| 19. | Antenna Master       | EMCO | 1070-1    | 9109-1624                           | N/A      | N/A     | ■   |

\* Remark ■ means used equipment.