



# ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CLASS B CERTIFICATION

Test report file number : E022R-049

Applicant : TAEWON Electronics Co., Ltd.  
Address : #308, Junang Induspia B/D, 517-13 Sangdaewon-Dong, Jungwon-Gu, Sungnam-City, Kyungki-Do, Korea  
Manufacturer : TAEWON Electronics Co., Ltd.  
Address : #308, Junang Induspia B/D, 517-13 Sangdaewon-Dong, Jungwon-Gu, Sungnam-City, Kyungki-Do, Korea  
Type of Equipment : TFT LCD Monitor  
FCC ID. : PH5INFO151010  
Model / Type No. : Infogate1510-10  
Serial number : N/A  
Total page of Report : 13 pages (including this page)  
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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 generally valid assessment of the features of the respective products of the mass-production.

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## 1. VERIFICATION OF COMPLIANCE

APPLICANT : TAEWON Electronics Co., Ltd.  
ADDRESS : #308, Junang Induspia B/D, 517-13 Sangdaewon-Dong, Jungwon-Gu, Seongnam-City, Kyungki-Do, Korea  
CONTACT PERSON : Seoung-Min, Joung / Chief  
TELEPHONE NO : +82-31-740-9009  
FCC ID : PH5INFO151010  
MODEL NO/NAME : Infogate1510-10  
SERIAL NUMBER : N/A  
DATE : February 22, 2002

|                                                         |                                                                           |
|---------------------------------------------------------|---------------------------------------------------------------------------|
| DEVICE TYPE                                             | Peripheral Device for Class B Computing Device<br>-UNINTENTIONAL RADIATOR |
| E.U.T. DESCRIPTION                                      | TFT LCD Monitor                                                           |
| THIS REPORT CONCERNS                                    | ORIGINAL GRANT                                                            |
| MEASUREMENT PROCEDURES                                  | ANSI C63.4/1992                                                           |
| 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 TAEWON Electronics Co., Ltd., Model Infogate1510-10 (referred to as the EUT in this report) is a TFT LCD Monitor.

Product specification described herein was obtained from product data sheet or user's manual.

|                                              |                                                                              |
|----------------------------------------------|------------------------------------------------------------------------------|
| CHASSIS TYPE                                 | Plastic – Non coated                                                         |
| LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>=1MHz) | 12.0 MHz, 14.31818 MHz on the main board                                     |
| LCD PANEL SPEC.                              | LM151X4(A3) / LG Philips                                                     |
| DISPLAY AREA                                 | 307.2 (H) x 230.4 (V) mm, 15.1 inch                                          |
| DISPLAY COLORS                               | 262,144                                                                      |
| NUMBER OF PIXELS                             | 1024 x 768 pixel, 75Hz                                                       |
| PIXEL ARRANGEMENT                            | RGB Vertical Stripe                                                          |
| PIXEL PITCH                                  | 0.300 (H) x 0.300 (V) mm                                                     |
| DISPLAY MODE                                 | Normally White                                                               |
| DISPLAY RESOLUTION                           | Maximum : 1024 x 768, 75Hz                                                   |
| FREQUENCY                                    | Horizontal : 30 ~ 62 KHz<br>Vertical : 43 ~ 75 Hz                            |
| POWER REQUIREMENT                            | AC/DC Adaptor Used (Input: 100-240Vac, 50-60Hz, 1.2A // Output: 12Vdc, 3.5A) |
| USED AC/DC ADAPTERS                          | F1650K manufactured by ILAN Elec. Ltd.                                       |
| NUMBER OF LAYERS                             | Main Board : 4 Layers<br>OSD Board & Inverter Board : 2 Layers               |
| EXTERNAL CONNECTORS                          | DC Inlet, D-Sub 15pin Connector                                              |

Model Differences:

-. None



## 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                 | Description           | FCC ID        | Connected to |
|-----------------|------------------------------|-----------------------|---------------|--------------|
| Infogate1510-10 | TAEWON Electronics Co., Ltd. | TFT LCD Monitor (EUT) | PH5INFO151010 | PC           |
| F1650K          | ILAN Elec. Ltd.              | AC/DC ADAPTER         | N/A           | EUT          |
| Deskpro EXM     | COMPAQ                       | PC                    | DoC           | EUT          |
| KB-9963         | COMPAQ                       | KEYBOARD              | DoC           | PC           |
| M-S48a          | LOGITECH                     | MOUSE                 | JNZ201213     | PC           |
| 2225C           | HP                           | PRINTER               | DSI6XU2225    | PC           |
| 020-0470        | CARDINAL                     | MODEM                 | GDE0196       | PC           |

## 2.4 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.

## 2.5 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 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 |
|----------------|------------------------------|-------------------|--------|
| Main Board     | TAEWON Electronics Co., Ltd. | INFOGATE 1510-10  | N/A    |
| Inverter Board | N/A                          | N/A               | N/A    |
| OSD Board      | TAEWON Electronics Co., Ltd. | N/A               | N/A    |
| LCD Panel      | LG Philips                   | LM151X4(A3)       | 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.

The test was performed about each resolution from minimum resolution to maximum resolution for getting maximum noise level and the investigated maximum resolution mode of the EUT was 1024 x 768, 75Hz.

### 3.3 Cable Description

|                       | Power Cord<br>Shielded (Y/N) | I/O cable Shielded<br>(Y/N) | Length (M)     |
|-----------------------|------------------------------|-----------------------------|----------------|
| TFT LCD Monitor (EUT) | N                            | Y                           | 1.5(P), 1.2(D) |
| AC/DC ADAPTER         | N                            | N/A                         | 1.2(P)         |
| PERSONAL COMPUTER     | N                            | Y                           | 1.5(P), 1.2(D) |
| KEYBOARD              | N/A                          | Y                           | 1.5(D)         |
| MOUSE                 | N/A                          | Y                           | 1.5(D)         |
| PRINTER               | N                            | Y                           | 1.5(P), 1.2(D) |
| MODEM                 | 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<br>(Y/N) | Location | Metal Hood<br>(Y/N) | Location |
|-----------------------|-----------------------|----------|---------------------|----------|
| TFT LCD Monitor (EUT) | Y                     | BOTH END | Y                   | BOTH END |
| AC/DC ADAPTER         | Y                     | EUT END  | Y                   | EUT END  |
| PERSONAL COMPUTER     | -                     | -        | -                   | -        |
| KEYBOARD              | N                     | N/A      | Y                   | PC END   |
| MOUSE                 | N                     | N/A      | Y                   | PC END   |
| PRINTER               | N                     | N/A      | Y                   | BOTH END |
| MODEM                 | N                     | N/A      | Y                   | BOTH 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 was no Modified items during EMI test”



## 3.6 Configuration of Test System

**Line Conducted Test:** The EUT was connected to AC/DC adapter 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 emission test was conducted using the procedure in ANSI C63.4/1992 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) |
|------------------------|-------------------------------------------------------|
| Resolution: 640 x 480  |                                                       |
| Resolution: 800 x 600  |                                                       |
| Resolution: 1024 x 768 | 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) |
|------------------------|-------------------------------------------------------|
| Resolution: 640 x 480  |                                                       |
| Resolution: 800 x 600  |                                                       |
| Resolution: 1024 x 768 | 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 : 42 %

Temperature : 20°C

Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.107

Type of Test : CLASS B

Result : PASSED BY -7.30 dB at 4.13 MHz

EUT : TFT LCD Monitor

Date : January 24, 2002

Operating Condition : Continuously displayed "H" characters on the screen of EUT

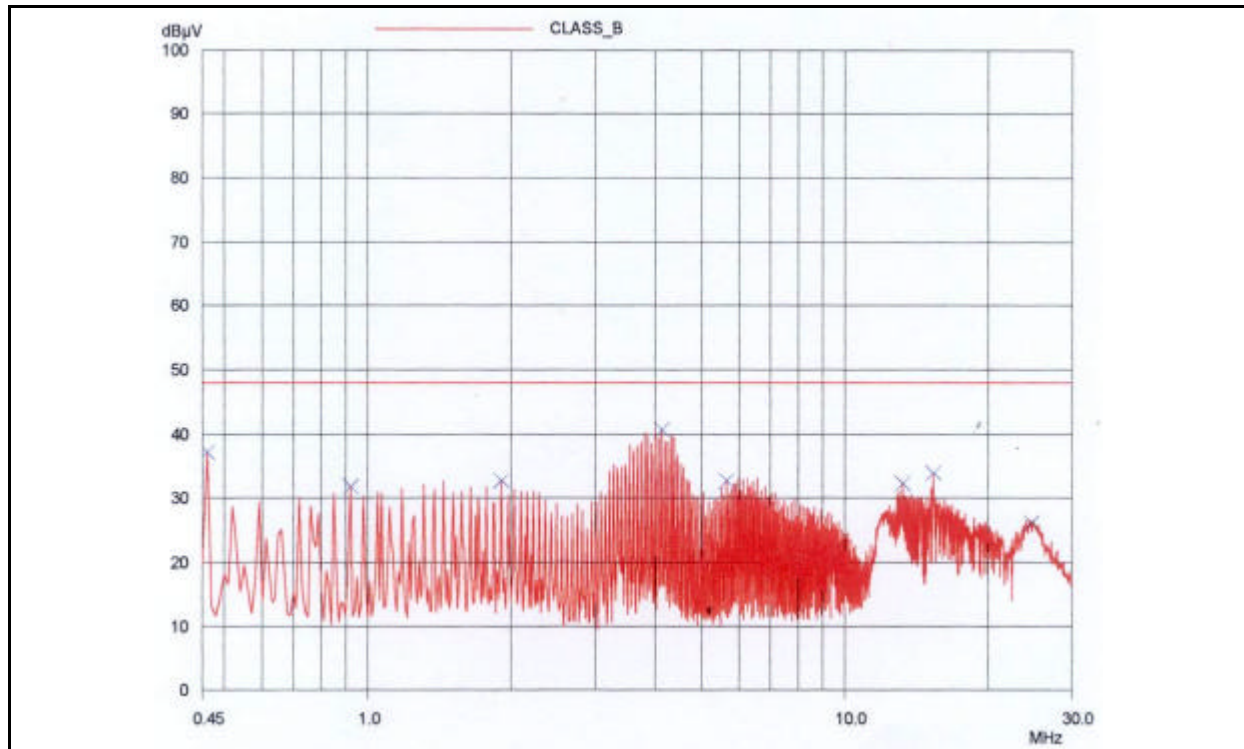
Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

Resolution : 1024 x 768, 75Hz

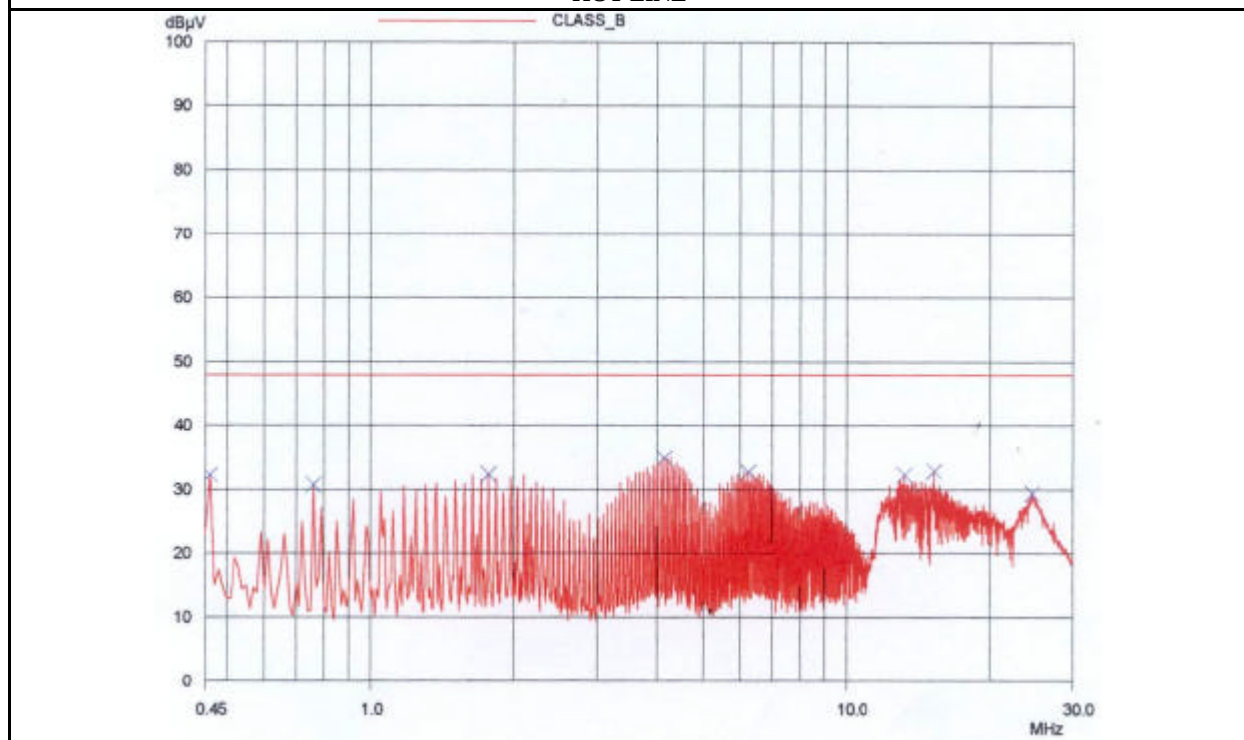
| Power Line Conducted Emission |                     |           | FCC CLASS B     |                |
|-------------------------------|---------------------|-----------|-----------------|----------------|
| Frequency<br>(MHz)            | Amplitude<br>(dBuV) | Conductor | Limit<br>(dBuV) | Margin<br>(dB) |
| 0.46                          | 37.19               | HOT       | 48.00           | -10.81         |
| 0.92                          | 31.71               | HOT       | 48.00           | -16.29         |
| 1.90                          | 32.70               | HOT       | 48.00           | -15.30         |
| 4.13                          | 40.70               | HOT       | 48.00           | -7.30          |
| 6.24                          | 32.74               | NEUTRAL   | 48.00           | -15.26         |
| 13.27                         | 32.32               | NEUTRAL   | 48.00           | -15.68         |
| 15.29                         | 33.93               | HOT       | 48.00           | -14.07         |
| 24.64                         | 29.44               | NEUTRAL   | 48.00           | -18.56         |

Line Conducted Emission Tabulated Data

  
Tested by : Seung-Hyun, Nam / Test Engineer



HOT LINE



NEUTRAL LINE



## 5.2 Radiated Emission Test for Digital mode

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

Humidity Level : 36 %

Temperature : 15°C

Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109

Type of Test : CLASS B

Result : PASSED BY -4.95 dB at 551.6 MHz

EUT : TFT LCD Monitor

Date: January 25, 2002

Operating Condition : Continuously displayed "H" characters on the screen of EUT

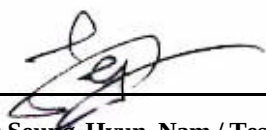
Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

Distance : 3 Meter

Resolution : 1024 x 768, 75Hz

| 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) |
| 78.77             | 18.90          | V    | 6.53               | 1.00          | 26.43            | 40.00             | -13.57         |
| 80.64             | 20.40          | H    | 6.49               | 1.01          | 27.90            | 40.00             | -12.10         |
| 94.55             | 20.10          | V    | 9.86               | 1.13          | 31.09            | 43.50             | -12.41         |
| 120.95            | 18.50          | V    | 13.22              | 1.23          | 32.95            | 43.50             | -10.55         |
| 147.90            | 18.30          | V    | 13.70              | 1.34          | 33.34            | 43.50             | -10.16         |
| 154.45            | 18.80          | H    | 14.42              | 1.37          | 34.59            | 43.50             | -8.91          |
| 201.20            | 20.10          | H    | 11.27              | 1.58          | 32.95            | 43.50             | -10.55         |
| 236.00            | 27.80          | H    | 11.18              | 1.76          | 40.74            | 46.00             | -5.26          |
| 402.00            | 20.30          | V    | 15.48              | 2.43          | 38.21            | 46.00             | -7.79          |
| 472.40            | 19.20          | H    | 17.00              | 2.59          | 38.79            | 46.00             | -7.21          |
| 551.60            | 20.10          | V    | 18.17              | 2.78          | 41.05            | 46.00             | -4.95          |
| 604.00            | 17.10          | V    | 18.86              | 2.92          | 38.88            | 46.00             | -7.12          |
| 708.40            | 16.20          | H    | 20.84              | 3.36          | 40.40            | 46.00             | -5.60          |

Radiated Emission Tabulated Data

  
Tested by: Seung-Hyun, Nam / 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                          | OCT/01   | 12MONTH |     |
| 2.  | Test receiver        | R/S  | ESHS10    | 834467/007                          | APR/01   | 12MONTH |     |
| 3.  | Spectrum analyzer    | HP   | 8568B     | 3026A0226                           | APR/01   | 12MONTH |     |
| 4.  | RF preselector       | HP   | 85685A    | 3107A01264                          | APR/01   | 12MONTH |     |
| 5.  | Quasi-Peak Adapter   | HP   | 85650A    | 3107A01542                          | APR/01   | 12MONTH |     |
| 6.  | Dipole Antenna       | EMCO | 3121C     | 9107-745                            | JUN/01   | 12MONTH |     |
| 7.  | Biconical antenna    | EMCO | 3104C     | 9109-4441<br>9109-4443<br>9109-4444 | MAR/01   | 12MONTH |     |
| 8.  | Log Periodic antenna | EMCO | 3146      | 9109-3213<br>9109-3214<br>9109-3217 | JUN/01   | 12MONTH |     |
| 9.  | LISN                 | EMCO | 3825/2    | 9109-1867<br>9109-1869              | JUN/01   | 12MONTH |     |
| 10. | RF Amplifier         | HP   | 8447F     | 3113A04554                          | JUN/01   | N/A     |     |
| 11. | Spectrum Analyzer    | HP   | 8591A     | 3131A02312                          | APR/01   | 12MONTH |     |
| 12. | Computer System      | HP   | 98581C    | 98543A                              | N/A      | N/A     |     |
|     | Hard disk drive      |      | 9153C     | CMC762Z9153                         | N/A      | N/A     |     |
| 13. | Plotter              | HP   | 7475A     | 30052 22986                         | N/A      | N/A     |     |
| 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     |     |