



ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CLASS B CERTIFICATION

Test report file number : E03OR-006

Applicant : Sang Young International Ltd.

Address : Seolin Bulding 501, 45-15, Yoido-Dong, Youngdungpo-Gu, Seoul, Korea

Manufacturer : Sang Young International Ltd.

Address : Seolin Bulding 501, 45-15, Yoido-Dong, Youngdungpo-Gu, Seoul, Korea

Type of Equipment : 17" TFT-LCD MONITOR

FCC ID. : RLCSY1701

Model Name : SY1701A

Multiple Model Name : SY1701B

Serial Number : N/A

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

Date of Incoming : August 19, 2003

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SUMMARY

The equipment complies with the regulation; *PART 15 SUBPART B, Class B Computing Device Peripherals.*

This test report contains only the result 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.

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1. VERIFICATION OF COMPLIANCE

APPLICANT : Sang Young International Ltd.
 ADDRESS : Seolin Bulding 501, 45-15, Yoido-Dong, Youngdungpo-Gu, Seoul, Korea
 CONTACT PERSON : Mr. Michael Jeung / Assistant Manager
 TELEPHONE NO. : +82-2-786-4470
 FCC ID : RLCSY1701
 MODEL NAME : SY1701A
 SERIAL NUMBER : N/A
 DATE : October 06, 2003

| | |
|---|--|
| DEVICE TYPE | Peripheral Device for Class B Personal Computing Device -UNINTENTIONAL RADIATOR |
| E.U.T. DESCRIPTION | 17" TFT-LCD MONITOR |
| THIS REPORT CONCERNS | ORIGINAL GRANT |
| MEASUREMENT PROCEDURES | ANSI C63.4/1992 |
| TYPE OF EQUIPMENT TESTED | PRE-PRODUCTION |
| KIND OF EQUIPMENT AUTHORIZATION REQUESTED | CERTIFICATION |
| EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART (S) | PART 15 SUBPART B, SECTION 15.101 |
| MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE | YES |
| 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 Sang Young International Ltd., Model SY1701A (referred to as the EUT in this report) is a 17" TFT-LCD MONITOR that is connected a personal computer. The Product specification described herein was obtained from product data sheet or user's manual.

| | |
|--|---|
| CHASSIS TYPE | Plastic |
| LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>=1MHz) | 24.000 MHz on the main board |
| LCD PANEL SPEC. | LM170E01 / LG Philips LCD |
| INPUT VIDEO SIGNAL | VGA Compatible Analog RGB |
| DISPLAY MODE | Normally White |
| DISPLAY RESOLUTION | Maximum: 1280 X 1024, 75Hz |
| POWER REQUIREMENT | DC 12V, 3.3A from the AC/DC Adaptor |
| USED AC/DC ADAPTERS | FSP040-1AD101C manufactured by FSP Group Inc. |
| NUMBER OF LAYERS | Main Board: 4 Layers |
| EXTERNAL CONNECTORS | Audio In/Out, DC In |

2.2 Model Differences:

The difference(s) compared to the EUT is as follows:

| | | Model Differences |
|----------------|---------|---|
| Basic Model | SY1701A | - |
| Multiple Model | SY1701B | Only type designation, except for the OSD button. |

2.3 Related Submittal(s) / Grant(s)

-. Original submittal only



2.4 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 |
|----------------|-------------------------------|--------------------------|------------|--------------|
| SY1701A | Sang Young International Ltd. | 17" TFT-LCD MONITOR(EUT) | RJLSY1701 | PC |
| FSP040-1AD101C | FSP Group Inc. | AC/DC ADAPTER | N/A | EUT |
| GX240 | DELL Computer Corp. | PC | DoC | - |
| SK-8110 | SILITEK | KEYBOARD | DoC | PC |
| M-SAS51 | Logitech | MOUSE | JNZ211167 | PC |
| 2225C | HP | PRINTER | DSI6XU2225 | PC |
| 020-0470 | Cardinal | MODEM | GDE0196 | PC |
| SMS-015N | Sungil Precision Co., Ltd. | SPEAKER | N/A | PC |

2.5 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 the 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, Gwangju-Si, Gyeonggi-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 | N/A | N/A | N/A |
| OSD Board | N/A | 170SD-01A | N/A |
| Inverter Board | Frontek Co., Ltd. | P1742E02 | N/A |
| LCD Panel | LG Philips LCD | LM170E01 | 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 1280 X 1024, 75Hz.



3.3 Cable Description

| | Power Cord Shielded (Y/N) | I/O cable Shielded (Y/N) | Length (M) |
|---------------------------|------------------------------|-----------------------------|----------------|
| 17" TFT-LCD MONITOR (EUT) | N | Y | 1.5(P), 1.5(D) |
| AC/DC ADAPTER | N | N/A | 1.5(P) |
| PERSONAL COMPUTER | N | - | 1.8(P), - |
| KEYBOARD | N/A | Y | 1.5(D) |
| MOUSE | N/A | Y | 1.5(D) |
| PRINTER | N | Y | 1.8(P), 1.5(D) |
| SPEAKER | N/A | N | 1.5(D) |
| MODEM | N | Y | 1.8(P), 1.5(D) |

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

3.4 Noise Suppression Parts on Cable

| | Ferrite Bead (Y/N) | Location | Metal Hood (Y/N) | Location |
|---------------------------|-----------------------|----------|---------------------|----------|
| 17" 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 |
| SPEAKER | N | N/A | Y | BOTH END |
| MODEM | N | N/A | Y | BOTH END |

3.5 Equipment Modifications

- The rating of R135, R136 and R138 were changed from 0 Ohm to 65 Ohm.
- The resistors(R177) was changed to bead(200 Ohm).
- The bead(120 Ohm) was added to the pins(70, 74-81, 86-93, 96, 97) of U4.
- The bead(120 Ohm) was added to the pin(3) of J102.
- The bead(1 KOhm) was added to the pins(1, 10, 11) of J102.
- The bead(120 Ohm) was added to the pin(3) of J103.
- The bead(1 KOhm) was added to the pin(1) of J103.
- The ferrite core was added to the J108 cable.
- The EMI gasket was added to the LCD Panel.



3.6 Configuration of Test System

Line Conducted Test: The power of the EUT was supplied by 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 | - |
| Resolution: 1280 X 1024 | 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 | - |
| Resolution: 1280 X 1024 | 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 : 38% Temperature : 22°C
 Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.107(a)
 Type of Test : CLASS B
 Result : PASSED BY -3.79 dB at 0.51 MHz when used an Average detector mode

EUT : 17" TFT-LCD MONITOR Date : August 20, 2003
 Operating Condition : Continuously displayed "H" characters on the screen of the EUT
 Detector : CISPR Quasi-Peak and Average(6 dB Bandwidth: 9 kHz)
 Resolution : 1280 X 1024, 75Hz

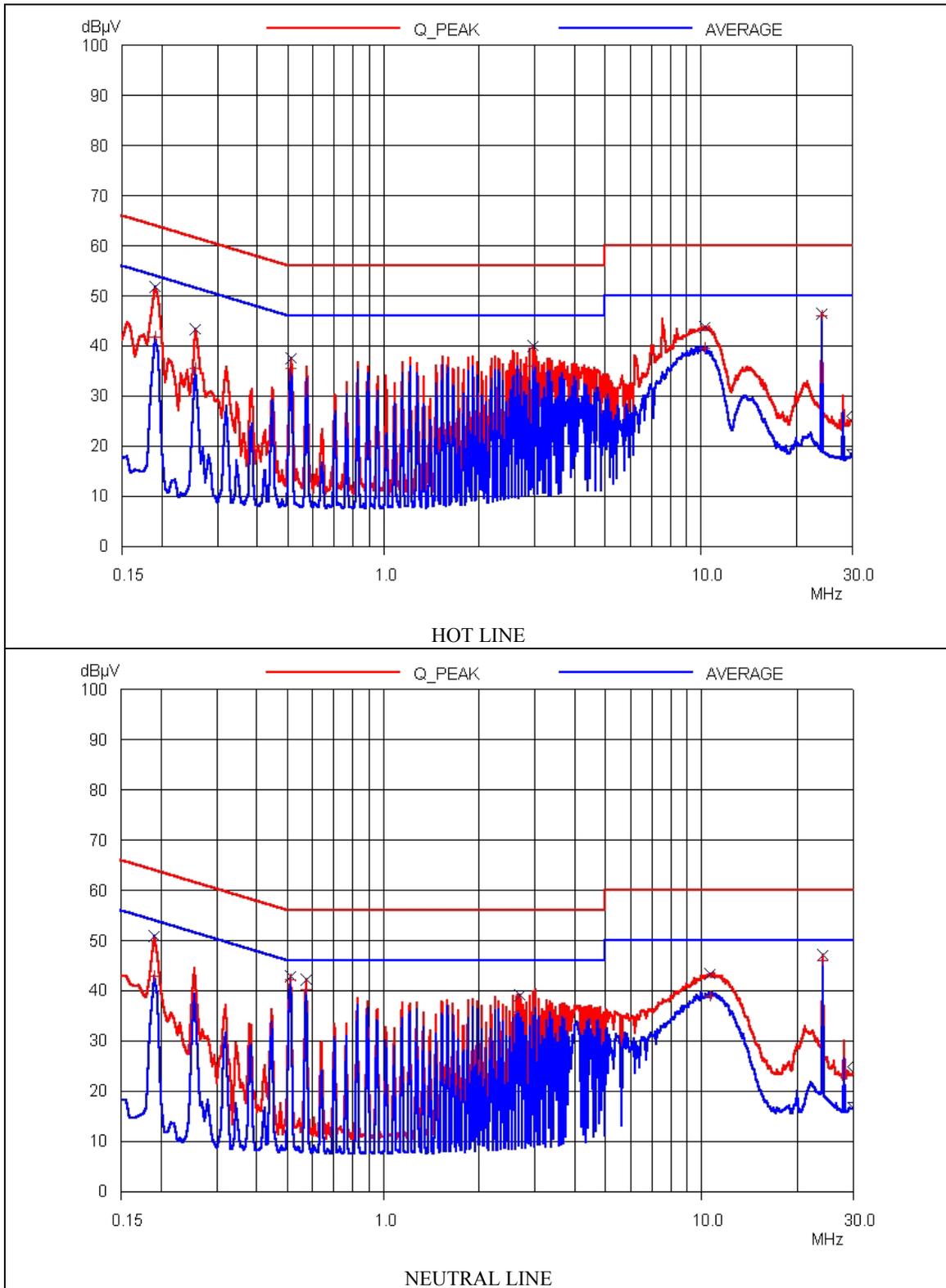
| Frequency (MHz) | Line | Peak (dBuV) | | Margin (dB) |
|-----------------|------|----------------|------------|-------------|
| | | Emission level | Q.P Limits | |
| 0.19 | H | 51.88 | 64.04 | -12.16 |
| 0.51 | N | 42.96 | 56.00 | -13.04 |
| 0.57 | N | 42.12 | 56.00 | -13.88 |
| 2.94 | H | 39.96 | 56.00 | -16.04 |
| 10.23 | H | 43.71 | 60.00 | -16.29 |
| 24.00 | N | 47.00 | 60.00 | -13.00 |
| Frequency (MHz) | Line | Average (dBuV) | | Margin (dB) |
| | | Emission level | Limits | |
| 0.19 | H | 41.86 | 54.04 | -12.18 |
| 0.51 | N | 42.21 | 46.00 | -3.79 |
| 0.57 | N | 40.21 | 46.00 | -5.79 |
| 2.94 | H | 35.96 | 46.00 | -10.04 |

Line Conducted Emission Tabulated Data

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

See next page for an overview sweep performed with peak and average detector.

Tested by: Sue-Yong, Lee / Test Engineer





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 : 35 % Temperature : 24°C
 Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109(a)
 Type of Test : CLASS B
 Result : PASSED BY -2.93 dB at 450.56 MHz

EUT : 17" TFT-LCD MONITOR Date : September 02, 2003
 Operating Condition : Continuously displayed "H" characters on the screen of EUT
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)
 Distance : 3 Meter
 Resolution : 1280 X 1024, 75Hz

| Radiated Emission | | 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) |
| 46.47 | 19.80 | V | 12.24 | 0.13 | 32.17 | 40.00 | -7.83 |
| 81.36 | 21.20 | V | 6.94 | 0.50 | 28.64 | 40.00 | -11.36 |
| 92.99 | 20.95 | V | 9.15 | 0.41 | 30.51 | 43.52 | -13.01 |
| 109.46 | 21.84 | V | 11.66 | 0.50 | 34.00 | 43.52 | -9.52 |
| 111.40 | 23.20 | V | 11.91 | 0.42 | 35.53 | 43.52 | -7.99 |
| 168.57 | 15.62 | V | 15.61 | 0.66 | 31.89 | 43.52 | -11.63 |
| 257.72 | 19.54 | H | 17.59 | 0.44 | 37.57 | 46.02 | -8.45 |
| 310.05 | 22.51 | H | 13.77 | 0.71 | 36.99 | 46.02 | -9.03 |
| 394.36 | 21.44 | H | 15.62 | 0.85 | 37.91 | 46.02 | -8.11 |
| 405.02 | 21.79 | H | 15.86 | 0.79 | 38.44 | 46.02 | -7.58 |
| 450.56 | 25.14 | H | 16.80 | 1.15 | 43.09 | 46.02 | -2.93 |
| 799.40 | 17.28 | H | 20.91 | 1.39 | 39.58 | 46.02 | -6.44 |

Radiated Emission Tabulated Data

Remark : In case any frequency has margin less than -3 dB, it may be exceeded restriction limits by the environment condition.

Tested by: Sue-Yong, 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)

= 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 | NOV/02 | 12MONTH | ■ |
| 2. | Test receiver | R/S | ESHS 10 | 834467/007 | APR/03 | 12MONTH | ■ |
| 3. | Spectrum analyzer | HP | 8566B | 3407A08547 | MAY/03 | 12MONTH | ■ |
| 4. | Spectrum analyzer | HP | 8568B | 3109A05456 | MAY/03 | 12MONTH | ■ |
| 5. | RF preselector | HP | 85685A | 3107A01264 | MAY/03 | 12MONTH | ■ |
| 6. | Quasi-Peak Adapter | HP | 85650A | 3107A01542 | MAY/03 | 12MONTH | ■ |
| 7. | TRILOG Broadband Antenna | Schwarzbeck | VULB9163 | VULB9163 166 | FEB/03 | 12MONTH | |
| 8. | Biconical antenna | EMCO Schwarzbeck | 3104C VHA9103 | 9109-4443 9109-4444 91031852 | MAY/03 JUL/03 AUG/03 | 12MONTH | ■ |
| 9. | Log Periodic antenna | EMCO Schwarzbeck | 3146 9108-A(494) | 9109-3213 9109-3214 9109-3217 62281001 | AUG/02 JUL/03 MAY/03 AUG/02 | 12MONTH | ■ |
| 10. | LISN | EMCO | 3825/2 | 9109-1867 9109-1869 | AUG/03 OCT/02 | 12MONTH | ■ |
| 11. | Position Controller | EMCO | 1090 | 9107-1038 | N/A | N/A | ■ |
| 12. | Turn Table | EMCO | 1080-1.21 | 9109-1576 | N/A | N/A | ■ |
| 13. | Antenna Master | EMCO | 1070-1 | 9109-1624 | N/A | N/A | ■ |