

# MEASUREMENT/TECHNICAL REPORT

HYUNDAI ELECTRONICS INDUSTRIES CO.,LTD.

MODEL : S770

This report concerns(check one) : Original grant ☒ Class ☐ ±change ☐

Equipment type : MONITOR

Deferred grant requested per 47 CFR 0.457(d)(1)(☐ ☒? yes ☐ no ☒

If yes, defer until: \_\_\_\_\_

\_\_\_\_\_ agrees to notify the Commission by \_\_\_\_\_

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? yes ☐ no ☒

If no, assumed Part 15, Subpart B for unintentional radiators - the new 47 CFR [10-1-91 Edition] provision.

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# 1. GENERAL INFORMATION

## 1.1 Product Description

The Hyundai Electronics Industries Co., Ltd. Model S770(referred to as the EUT in this report) is a 17"COLOR Monitor HOR. Freq. 68.7kHz w/max. Resolution of 1024 i 768 Non-Interlaced.

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

|                                               |                                                                                                                                                                                                                               |
|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CHASSIS TYPE                                  | PLASTIC                                                                                                                                                                                                                       |
| LIST OF EACH OSC. OR XTAL. FREQ.(FREQ.i 1MHz) | 6 MHz                                                                                                                                                                                                                         |
| CHIPSET BRAND AND PART NO.                    | MOTOROLA : LSC4388P1<br>MOTOROLA : LSC500880B<br>PHILIPS : TDA4854<br>PHILIPS : TDA4856<br>MOTOROLA : MC13282EP<br>SGS TOMSON : UC3842<br>MICRO CHIP : 24LC21<br>MICRO CHIP : 24LC08<br>Calogic : CAV1404T<br>SAMSUNG : KA358 |
| POWER REQUIREMENT                             | 100 - 240 VAC/50 Hz OR 60 Hz 1.3A                                                                                                                                                                                             |
| NUMBER OF LAYERS                              | MAIN BOARD 1 LAYER<br>CRT SOCKET BOARD 1 LAYER                                                                                                                                                                                |
| MAX. RESOLUTION                               | 1024 X 768 NON-INTERLACED (@ 68.7kHz/85Hz)                                                                                                                                                                                    |
| H-SYNC FREQUENCY RANGE                        | 30 kHz i - 70 kHz                                                                                                                                                                                                             |
| V-SYNC FREQUENCY RANGE                        | 50 Hz i - 150 Hz                                                                                                                                                                                                              |
| CRT SIZE                                      | 17" (LG / Type : M41LFQ803X20)                                                                                                                                                                                                |
| VIDEO CONNECTOR TYPE                          | D-SUB 15-PIN,                                                                                                                                                                                                                 |

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

ORIGINAL SUBMITTAL ONLY

### 1.3 Tested System Details

The Model names for all equipment, plus descriptions used in the tested system (including inserted cards) are:

| DEVICE TYPE        | MANUFACTURER | MODEL NUMBER | FCC ID / DoC    | CONNECTED TO |
|--------------------|--------------|--------------|-----------------|--------------|
| COLOR MONITOR(EUT) | HYUNDAI      | S770         | CKLS770         | HOST         |
| PC(HOST)           | H/P          | HP BRIO 80XX | DoC             | N/A          |
| KEYBOARD           | H/P          | SK-2501-2D-K | DZL211029       | HOST         |
| PRINTER            | H/P          | C2168A       | B94C2121X       | HOST         |
| MODEM              | HYUNDAI      | HMD-2404M    | CKL8J7HMD-2404M | HOST         |
| MOUSE              | H/P          | M-S34        | GYUR38SK        | HOST         |

### 1.4 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4/1992. Radiated testing was performed at an antenna to EUT distance of 3 meters.

### 1.5 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data are located at the 254-1,MAEKOK-RI,HOBUP-MYUN,ICHON-SI,KYOUNGKI-DO, 467-701,KOREA. The site is constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. Detailed description of test facility was submitted to the Commission on May 22, 1997 and accepted dated July 25,1997(1300F2)

## 2. PRODUCT LABELLING AND USER INFORMATION

### 2.1 Product Label

Following is a copy of the label that will be placed on the rear side of the cabinet.

**Figure 3.1 PRODUCT LABEL**

Both the FCC ID and compliance statement are included in the product label

|                                                                                                                                                                                                                                                                                                          |                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| <b>•HYUNDAI</b>                                                                                                                                                                                                                                                                                          |                          |
| Model NO                                                                                                                                                                                                                                                                                                 | : S770                   |
| POWER                                                                                                                                                                                                                                                                                                    | : AC 100-240VAC<br>1.3 A |
| FCC ID                                                                                                                                                                                                                                                                                                   | : CKLS770                |
| Serial No :                                                                                                                                                                                                                                                                                              |                          |
| <p>This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:</p> <p>(1) This device may not cause harmful interference, and</p> <p>(2) This device must accept any interference received, including interference that may cause undesired operation.</p> |                          |
| <p>" Product complies with DHHS Rules-21 CFR subchapter J-applicable at date of manufacture"</p> <p><b>HYUNDAI ELECTRONICS AMERICA</b><br/>166 Baypoint Parkway, San Jose , CA 95134<br/>MANUFACTURED BY HYUNDAI ELECTRONICS IND. CO., LTD.</p> <p><b>MADE IN KOREA</b></p>                              |                          |

### 2.2 User Information

Attachment A is the user's guide for the S770 COLOR MONITOR. The information to the user required by the FCC rules section 15.21 and 15.105 are included in the front page of the manual.

### **3.SYSTEM TEST CONFIGURATION**

#### **3.1 Justification**

The device was configured for testing in a typical fashion (as a customer would normally use it). During the tests, the following components and I/O cards inside the E.U.T were used.

| DEVICE TYPE      | MANUFACTURE | MODEL/PART NUMBER |
|------------------|-------------|-------------------|
| MAIN BOARD       | HYUNDAI     | E42087158**       |
| CRT SOCKET BOARD | HYUNDAI     | E42087158**       |

#### **3.2 EUT exercise Software**

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The software, contained on a 3-1/2 inch disc, was inserted into drive A and is auto starting on power-up. Once loaded, the program sequentially exercises each system component in turn. The sequence used is :(1) Display test, (2) RS 232 test (3) Key board test,(4) Printer test,(5) FDD test,(6) HDD test. The complete cycle takes about 20 seconds and is repeated continuously. As the keyboard and mouse are strictly input devices, no data is transmitted to them during test. They are however, continuously scanned for data input activity. The video resolution modes setup and change program was used during the radiated and conducted emission testing.

### 3.3 Cable Description

|                       | Power Cord<br>Shielded (Y/N) | I/O Cable Shielded<br>(Y/N) | Length (M)     |
|-----------------------|------------------------------|-----------------------------|----------------|
| PC(HOST)              | N                            | N/A                         | 1.5(P)         |
| COLOR<br>MONITOR(EUT) | N                            | Y                           | 1.5(P), 1.5(D) |
| PARALLEL              | N                            | Y                           | 1.5(P), 1.5(D) |
| KEYBOARD              | N/A                          | Y                           | 1.0(D)         |
| SERIAL                | N                            | Y                           | 1.5(P), 1.5(D) |
| MOUSE(PS/2)           | N/A                          | Y                           | 1.8(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 |
|-----------------------|-----------------------|----------|---------------------|----------|
| PC(HOST)              | N                     | N/A      | N                   | N/A      |
| COLOR<br>MONITOR(EUT) | Y                     | PC END   | Y                   | PC END   |
| KEYBOARD              | Y                     | PC END   | Y                   | PC END   |
| PARALLEL              | N                     | N/A      | Y                   | BOTH END |
| SERIAL                | N                     | N/A      | Y                   | BOTH END |
| MOUSE(PS/2)           | N                     | N/A      | Y                   | PC END   |

### **3.5 Equipment Modifications**

**N/A**

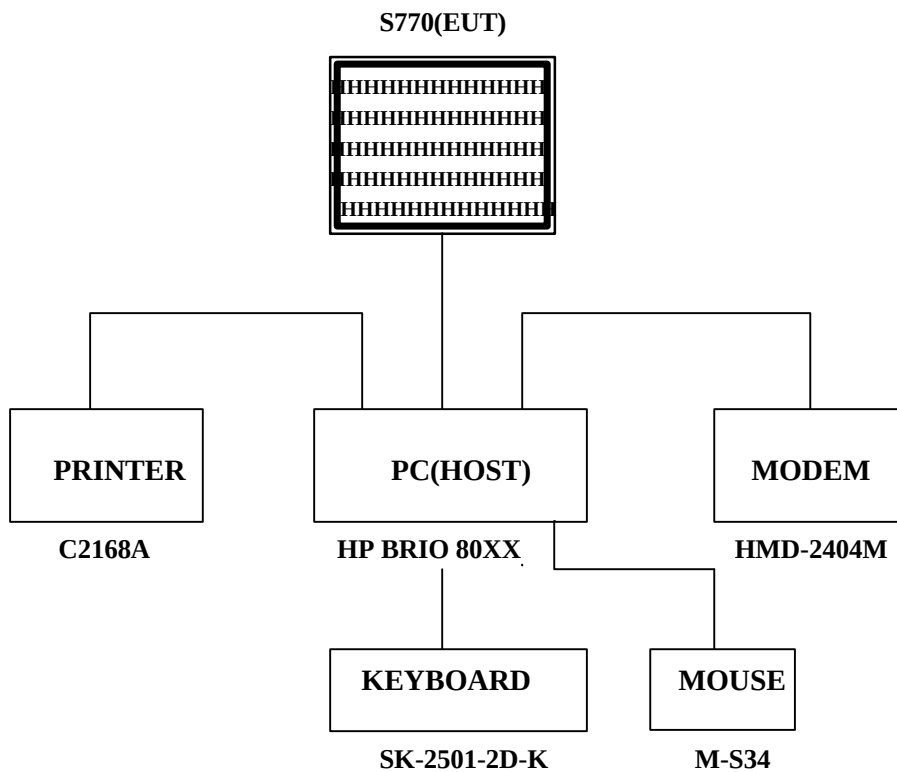
### 3.6 Configuration of Test system

**Line Conducted Test :** EUT was connected to LISN, all other supporting equipment were connected to another LISN.

Preliminary Power line Conducted Emission tests were performed by using the procedure in ANSI C63.4/1992 7.2.3 to determine the worse operating conditions.

**Radiated Emission Test :** Preliminary Radiated Emissions tests were conducted using the procedure in ANSI C63.4/1992 8.3.1.1 to determine the worse operating condition. Final Radiated Emission tests were conducted at 3 meter open area test site.

#### [Configuration of Tested System]



## 4. PRELIMINARY TESTS

### 4.1 AC Power line Conducted Emission Tests

During Preliminary Tests, the following operating mode were investigated

| Processor Speed (MHz) | Video Resolution (w/max)                 | The worst operating condition |
|-----------------------|------------------------------------------|-------------------------------|
| Pentium 75 MHz        | 1280 i 1024 Non-Interlaced (64KHz/60Hz)  |                               |
| Pentium 75 MHz        | 1024 i 768 Non-Interlaced (68.7KHz/85Hz) | X                             |
| Pentium 75 MHz        | 800 i 600 Non-Interlaced (64KHz/100Hz)   |                               |
| Pentium 75 MHz        | 640 i 480 Non-Interlaced (63.6KHz/120Hz) |                               |

### 4.2 Radiated Emission Tests

During Preliminary Tests, the following operating mode were investigated

| Processor Speed (MHz) | Video Resolution (w/max)                 | The worst operating condition |
|-----------------------|------------------------------------------|-------------------------------|
| Pentium 75 MHz        | 1280 i 1024 Non-Interlaced (64KHz/60Hz)  |                               |
| Pentium 75 MHz        | 1024 i 768 Non-Interlaced (68.7KHz/85Hz) | X                             |
| Pentium 75 MHz        | 800 i 600 Non-Interlaced (64KHz/100Hz)   |                               |
| Pentium 75 MHz        | 640 i 480 Non-Interlaced (63.6KHz/120Hz) |                               |

Tested by Sang Jun, Lee

Date : JAN. 15. 1999





## 7. 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

Assume a receiver reading of 21.5 dBuV is obtained. The Antenna Factor of 7.4 and a Cable Factor of 1.1 is added. The 30 dBuV/m value was mathematically converted to its corresponding level in uV/m.

$$FS = 21.5 + 7.4 + 1.1 = 30 \text{ dBuV/m}$$

$$\text{Level in uV/m} = \text{Common Antilogarithm} [(30 \text{ dBuV/m})/20] = 31.6 \text{ uV/m}$$