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**TITLE: HM15X13-A01  
Product Specification**

Rev. A

Hyundai Display Technology Inc.

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**REVISION HISTORY**

REV.	ECN NO.	DESCRIPTION OF CHANGES	DATE	PREPARED
0		Initial Release	Jan.28.2002	YJ. Yoon
A	E204-F002	Update 1. Update the Power Consumption & IDD (6p) Power Consumption :27(Max) → 27(Typ), IDD : 2.5(Max) → 2.7(Max) 2. Add the Note 1 at 8.1 (14p) 3. Change the key operation and add the Note 2 at 8.2 (14p)	Apr.09.2002	YJ.YOON
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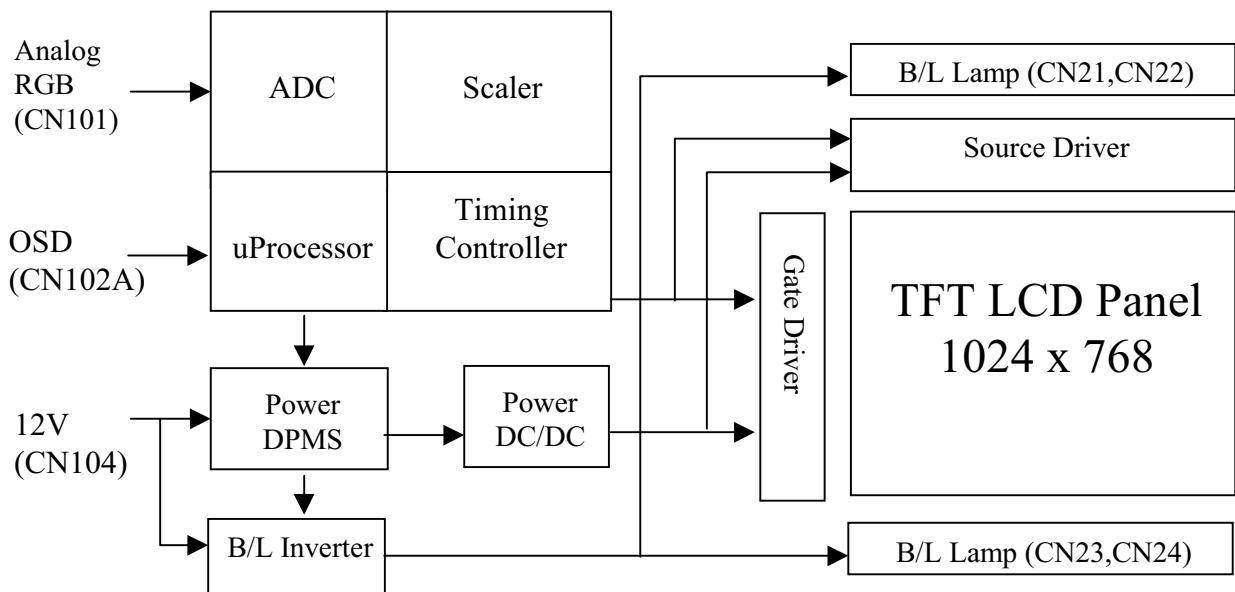
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**1.0 GENERAL DESCRIPTION**

1.1 Introduction

HM15X13-A01 is an Intelligent Module™ that is integrating conventional LCM and A/D board. This module has a 15.0 inch diagonally measured active area with XGA resolutions (1024 x 768) and can display 16,194,277 colors with Dithering. HM15X13-A01 accepts standard analog RGB and Sync signals from any XGA, SVGA, VGA video controller signals and supports from XGA to VGA resolutions at vertical refresh rate to 75Hz.



1.2 Features

- Desk-top type of PC Use
- Display terminals for control system
- Monitors for process controller
- Analog RGB, Separated Sync
- Corresponding to DDC1 and DDC2B
- Corresponding to VESA DPMS
- Multi-scan function: XGA, SVGA, VGA
- On Screen Display
- 16,194,277 Colors (using the Dithering)
- High luminance, High Contrast Ratio, High speed Response
- Wide viewing angle
- Incorporated backlight (4 lamps, Inverter Include)
- Multi Language Selection

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## 1.3 General Specifications

Parameter	Specification	Unit	Remarks
Active area	304.128 (H) × 228.096(V)	mm	
Number of pixels	1024(H) × 768(V)	pixels	
Pixel pitch	0.297(H) × 0.297(V)	mm	
Pixel arrangement	RGB Vertical stripe		
Display colors	16,194,277 (using the Dithering)	colors	
Display mode	Normally white		
Dimensional outline	331.6(H)±0.5×254.7(V)±0.5×20.0(D) Typ.	mm	
Weight	1,510 Max	g	
Back-light	Top/Bottom edge side 4-CCFL type		Note 1
Surface treatment	Haze 25, Anti-glare & hard-coating 3H		

Note:

1. CCFL (Cold Cathode Fluorescent Lamp)

**2.0 ABSOLUTE MAXIMUM RATINGS**

Parameter	Symbol	Min.	Max.	Unit	Remarks
Power Input Voltage	V <sub>DD</sub>	-0.3	14.0	V	Ta = 25°C
Backlight Power Supply Voltage	V <sub>DDB</sub>	-0.3	14.0	V	
Logic Input Voltage	V <sub>IN1</sub>	-0.3	5.0	V	Ta = 25°C
RGB Input Voltage	V <sub>IN2</sub>	-0.3	2.5	V	V <sub>DD</sub> =12V
Operating Temperature (Humidity)	T <sub>OP</sub>	0	+50	°C	≤ 40 °C
	RH		80	%	
Storage Temperature (Humidity)	T <sub>ST</sub>	-20	+60	°C	≤ 40 °C
	RH		90	%	

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**3.0 ELECTRICAL SPECIFICATIONS****3.1 Electrical Specifications**

- Maximum : Vertical Two Line Skip
- Typical : Eight Color Bar

Frequency : 75Hz, Ta = 25± 2°C

Parameter	Symbol	Min	Typ	Max	Unit	Remark
Input Voltage	VDD	10.8	12.0	13.2	V	
Input Current	IDD	2.0	2.25	2.7	A	

**3.2 Video signal (R, G, B) input and Sync Signal Input**

Ta = 25± 2°C

Parameter		Min.	Typ.	Max.	Unit	Remarks
Maximum Amplitude (White- black)		0 (Black)	0.7 (White)	-	Vp-p	Note 1
Sync	Amplitude	2.0	3.3	5.0	Vp-p	Note 2
	H- Scan Frequency	24.8	-	60.0	KHz	
	V-Scan Frequency	56		75	Hz	

Note:

1. Contrast adjustment is needed if the amplitude exceeds 0.7 Vp-p.  
Impedance is 75 Ohm±5%. @Max 50pF
2. Polarity is positive and negative at TTL level  
Impedance is 470-Ohm min. @Max 1000pF

**3.3 DPMS (Display Power Management Signaling)**

Measuring condition: VDD=12.0V

Frequency : 75Hz, Ta = 25± 2°C

VESA DPMS	Signal			Power Consumption.	Unit	LED status
	Horizontal	Vertical	Video			
Power On	Pulses	Pulses	Active	30(Max) 27(Typ)	W	Green
Standby	No Pulses	Pulses	Blanked	Less than 1.5	W	Amber
Suspend	Pulses	No Pulses	Blanked	Less than 1.5	W	Amber
Active Off	No Pulses	No Pulses	Blanked	Less than 1.5	W	Amber

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**4.0 OPTICAL SPECIFICATIONS**

The measurement shall be executed after 30 minutes warm-up period.

Measuring equipment: TOPCON-BM5.

Measuring condition: 1)  $f_v=60\text{Hz}$ ,  $f_{DCLK}=32.5\text{MHz}$  @after RESET

2) Contrast, Brightness = maximum

$T_a= 25 \pm 2^\circ\text{C}$

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Remark		
Viewing Angle range	Horizontal	$\theta_3$	70	80	-	Deg.	Note 1		
		$\theta_9$	70	80	-	Deg.			
	Vertical	$\theta_{12}$	40	45	-	Deg.			
		$\theta_6$	70	80	-	Deg.			
	Horizontal	$\theta_3$	CR > 10	60	65	-	Deg.	Note 2	
		$\theta_9$		60	65	-	Deg.		
		Vertical		$\theta_{12}$	35	40	-		Deg.
				$\theta_6$	50	55	-		Deg.
Luminance Contrast ratio	CR		300	350	-		Note 3		
Luminance of White	$Y_w$		200	250	-	cd/m <sup>2</sup>	Note 4		
White luminance uniformity	$\Delta Y$		-	-	1.4		Note 5		
Reproduction Of color	White	$\theta = 0^\circ$ $\phi = 0^\circ$ IBL=6.0mA	$x_w$	0.288	0.318	0.348		Note 6	
			$y_w$	0.300	0.330	0.360			
	Red		$x_R$	0.609	0.639	0.669			
			$y_R$	0.299	0.329	0.359			
	Green		$x_G$	0.273	0.303	0.333			
			$y_G$	0.553	0.583	0.613			
	Blue		$x_B$	0.113	0.143	0.173			
			$y_B$	0.070	0.100	0.130			
Response Time (Rise + Decay)	$T_{total}$		-	20	25	ms	Note 7		
Cross Talk	CT		-	-	2.0	%	Note 8		
Luminance Control range	-	Maximum Luminance (100%)	-	(10-100)	-	%	-		
Lamp lifetime	Hr	IBL=6.0mA	40,000	50,000	-	hrs	Note 9		

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## Note:

1. Viewing angle is the angle at which the contrast ratio is greater than 5. The viewing are determined for the horizontal or 3, 9 o'clock direction and the vertical or 6, 12 o'clock direction with respect to the optical axis which is normal to the LCD surface (see FIGURE 1 shown in Appendix).
2. Viewing angle is the angle at which the contrast ratio is greater than 10. The other condition is note 1.
3. Contrast measurements shall be made at viewing angle of  $\theta = 0^\circ$  and at the center of the LCD surface. Luminance shall be measured with all pixels in the view field set first to white, then to the dark (black) state. (See FIGURE 1 shown in Appendix) Luminance Contrast Ratio (CR) is defined mathematically.

$$CR = \frac{\text{Luminance when displaying a white raster}}{\text{Luminance when displaying a black raster}}$$

4. Center Luminance of white is defined as the LCD surface. Luminance shall be measured with all pixels in the view field set first to white. This measurement shall be taken at the locations shown in FIGURE 2 for a total of the measurements per display.
5. The White luminance uniformity on LCD surface is then expressed as :  $\Delta Y = \text{Maximum Luminance of 13 points} / \text{Minimum Luminance of 13 points}$  (see FIGURE 2 shown in Appendix).
6. The color chromaticity coordinates shall be calculated from the spectral data measured with all pixels first in red, green, blue and white. Measurements shall be made at the center of the panel.
7. The electro-optical response time measurements shall be made as FIGURE 3 shown in Appendix by switching the "data" input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is  $T_d$ , and 90% to 10% is  $T_r$ .
8. Cross-Talk of one area of the LCD surface by another shall be measured by comparing the luminance ( $Y_A$ ) of a 25mm diameter area, with all display pixels set to a gray level, to the luminance ( $Y_B$ ) of that same area when any adjacent area is driven dark. (See FIGURE 4 shown in Appendix).
9. Definition of lamp only lifetime is average life shall be defined as remained rate under 50% of total amount at the life test.

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## 5.0 INTERFACE CONNECTION

### 5.1 ADC Board Side

(1) CN101: Analog (R, G, B) input connector

Module Side: S12B-PH-SM3-TB (JST) or 1294A-1203R (UJU)

User Side: PHR-12 (JST) or equivalent

Pin No	Symbol	Function	15pin D-sub
1	SCL	DDC Clock	15
2	SDA	DDC Data	12
3	+5V	+5V Power	9
4	VSY	Vertical Sync	14
5	HSY	Horizontal Sync	13
6	SGND	Sync Ground	10
7	B	Analog Blue	3
8	BGND	Blue Ground	8
9	G	Analog Green	2
10	GGND	Green Ground	7
11	R	Analog Red	1
12	RGND	Red Ground	6

(2) CN102A: OSD input connector (Default)

Module Side: 53261-0890 (Molex)

User Side: 51021-0800 (Molex) or equivalent

Pin No	Symbol	Function
1	SW1	OSD Select
2	SW2	OSD Left (-)
3	SW3	OSD Right (+)
4	SW4	OSD Menu
5	LED1	LED Green
6	LED2	LED Red
7	GND	Ground
8	POWER	On / Off

(3) CN104: Power input connector

Module Side: S4B-PH-SM3-TB (JST) or 1294A-0403R (UJU)

User Side: PHR-4 (JST) or equivalent

Pin No	Symbol	Function
1	VDD	+12V Power Supply
2	VDD	+12V Power Supply
3	GND	Ground
4	GND	Ground

## (4) CN105: Backlight inverter output connector

Module Side: 53261-0890 (Molex)

Inverter Side: 51021-0800 (Molex) or equivalent

Pin No	Symbol	Function
1	GND	Ground
2	CBTNS	0.0~3.3VDC
3	GND	Ground
4	CBKLT	0/3.3V DC (High Active)
5	GND	Ground
6	GND	Ground
7	VDDB	+12V Power Supply
8	VDDB	+12V Power Supply

## 5.2 Inverter Side

## (1) CN201: Inverter input connector

Inverter Side: 53261-0890 (Molex)

Pin No	Symbol	Function
1	VDDB	+12V Power Supply
2	VDDB	+12V Power Supply
3	GND	Ground
4	GND	Ground
5	CBKLT	0/3.3V DC (High Active)
6	GND	Ground
7	CBTNS	0.0~3.3VDC
8	GND	Ground

## (2) CN202, CN203, CN204, CN205: Back light mating connector

Inverter Side: SM02B-BHSS-1 (JST)

Pin No	Symbol	Function
1	HOT	High Voltage
2	COLD	Ground

## 5.3 Lamp Side

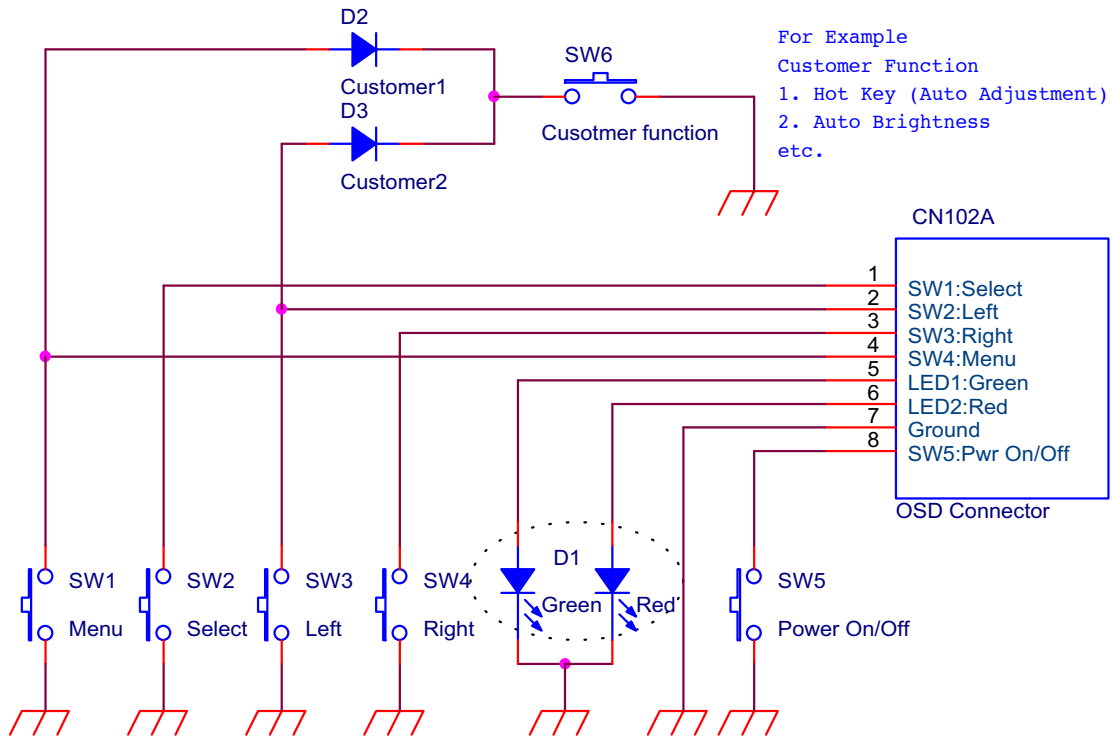
## (1) CN21, CN22, CN23, CN24: Backlight connector

Module Side: BHSR-02VS-1 (JST)

User Side: SM02B-BHSS-1 (JST) or equivalent

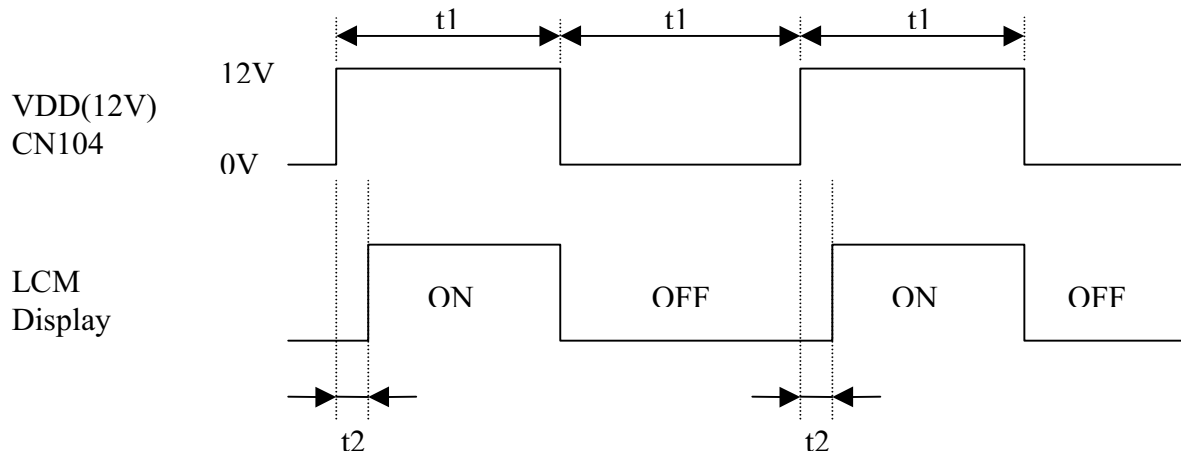
Pin No	Symbol	Function
1	HOT	High Voltage (Pink & Cyan)
2	COLD	Ground (White & Black)

Note: Recommended OSD keyboard interface is below.

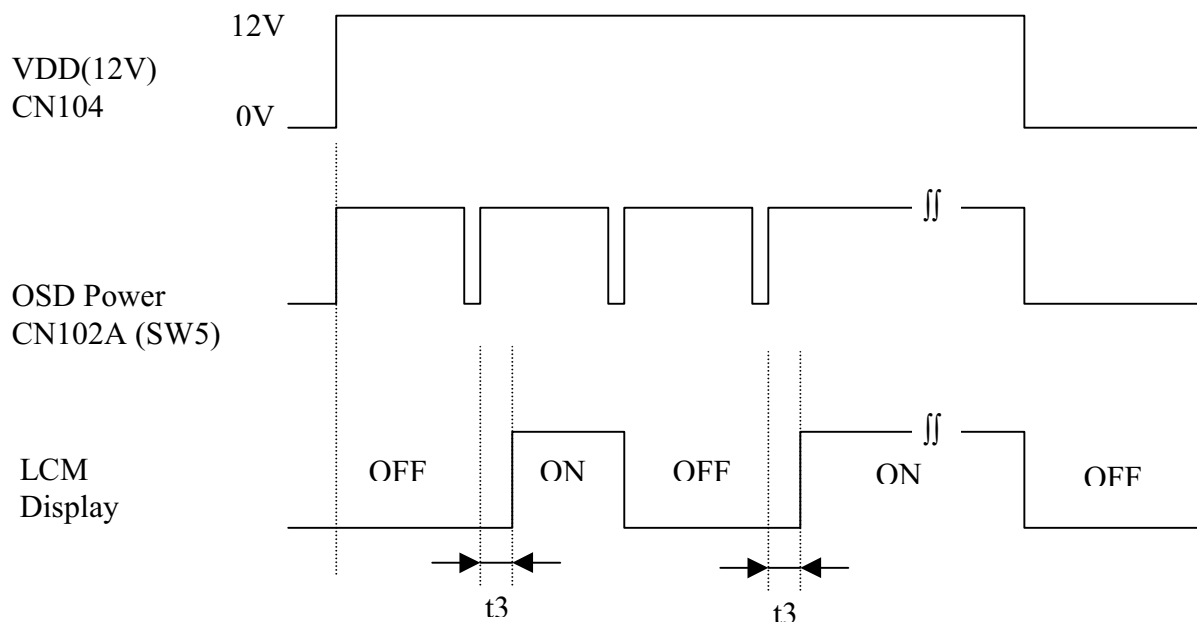


**6.0 POWER SEQUENCE**

6.1 Hard Start (Customer Optional)



6.2 Soft Start (Default)



$t_1 > 5\text{sec}$   
 $t_2 > 3\text{sec}$   
 $t_3 > 3\text{sec}$



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**7.0 MONITOR MODES**

7.1 Compatible Timing

Resolution	Horizontal		Vertical		Pixel Clock (MHz)	Remark
	Freq. (KHz) & Polarity		Freq. (Hz) & Polarity			
640 x 350	31.47	+	70.09	-	25.175	VGA
640 x 400	24.83	-	56.42	-	21.053	PC98
	31.47	-	70.09	+	25.175	VGA
640 x 480	31.47	-	59.94	-	25.175	VGA
	37.86	-	72.81	-	31.500	VESA
	37.50	-	75.00	-	31.500	VESA
720 x 400	31.47	-	70.08	+	28.321	US Text
800 x 600	35.16	+	56.25	+	36.000	VESA
	37.88	+	60.32	+	40.000	VESA
	48.08	+	72.19	+	50.000	VESA
	46.88	+	75.00	+	49.500	VESA
1024 x 768	48.36	-	60.00	-	65.000	VESA
	56.48	-	70.07	-	75.000	VESA
	60.02	+	75.03	+	78.750	VESA

7.2 Timing Table

Resolution	Horizontal		Vertical		Pxl Clk (MHz)	Horizontal			Vertical			Remark
	(KHz)		(Hz)			Total	Sync	BP	Total	Sync	BP	
640 x 350	31.47	+	70.09	-	25.175	800	96	48	449	2	60	VGA
640 x 400	24.83	-	56.42	-	21.053	848	64	84	440	8	32	PC98
	31.47	-	70.09	+	25.175	800	96	48	449	2	35	VGA
640 x 480	31.47	-	59.94	-	25.175	800	96	40	525	2	25	VGA
	37.86	-	72.81	-	31.500	832	40	120	520	3	20	VESA
	37.50	-	75.00	-	31.500	840	64	120	500	3	16	VESA
720 x 400	31.47	-	70.08	+	28.321	900	108	54	449	2	35	US text
800 x 600	35.16	+	56.25	+	36.000	1024	72	128	625	2	22	VESA
	37.88	+	60.32	+	40.000	1056	128	88	628	4	23	VESA
	48.08	+	72.19	+	50.000	1040	120	64	666	6	23	VESA
	46.88	+	75.00	+	49.500	1056	80	160	625	3	21	VESA
1024 x 768	48.36	-	60.00	-	65.000	1344	136	160	806	6	29	VESA
	56.48	-	70.07	-	75.000	1328	136	144	806	6	29	VESA
	60.02	+	75.03	+	78.750	1312	96	176	800	3	28	VESA

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**8.0 OSD FUNCTION**

This OSD function is HYDIS's standard version. OSD menu is customized specification.

Adjustable switch key: Menu, Select, Left, Right (Refer to recommend key interface)

**8.1 Main Function**

Main Menu (Menu ◀▶ Key)	Sub Menu (Select Key)	Value Range (◀▶ key)	Default Value	Function
Brightness		0 to 50	50	Control the backlight
Contrast	Auto	-	-	Automatically adjust the contrast
	Contrast	0 to 60	48	Adjust the contrast (Gain control)
	Black level	0 to 60	57	Adjust the black level (Offset control)
Position	Auto	-	-	Automatically adjust the position
	H-Pos	0 to 100	50	Adjust the horizontal display position
	V-Pos	0 to 40	20	Adjust the vertical display position
Clock & Phase	Auto	-	-	Automatically adjust the clock and phase
	Clock	0 to 120	60	Adjust the clock frequency
	Phase	0 to 31	15	Adjust the clock phase
Language	-	-	-	Select the English, German, French Italian and Spanish
Color Level	Cool	-	-	High color temperature
	Standard	-	Default	Standard color temperature
	Warm	-	-	Low color temperature
	R-Contrast	0 to 63	31	Control the red color level
	G-Contrast	0 to 63	31	Control the green color level
	B-Contrast	0 to 63	31	Control the blue color level
OSD Adjustment	H-Pos	-	-	Move the OSD position horizontally
	V-Pos	-	-	Move the OSD position vertically
Exit	All reset	-	-	Initialize the default value
	Save+Exit	-	-	Save and then Exit the menu screen

Note:

1. If satisfactory results are not obtained using the Auto at Clock & Phase, use the Clock adjustment and then use phase, again

**8.2 Factory Mode Function (Menu + Select + Power On Key)**

Item	Key	Function / Description	Remark
Self Test	-	Display aging test pattern	Note 1
EEPROM Clear	▶	Clear the EEPROM	Note 2
Model Name	-	Product model name	User Specification
Version	-	Firmware version	User Specification
CKS	-	Firmware checksum	

Note:

1. Without Signal, Self test pattern is Red, Green, Blue, Magenta, Cyan and Yellow.
2. If EEPROM is changed, it must be operate EEPROM clear.  
EEPROM Method: 1) Operating EEPROM Clear, 2) Select EEPROM clear Yes.

**8.3 Display Item**

Item	Functions
OUT OF ADJUSTING	Displayed when AA (Auto Adjustment) or
OUT OF TIMING	Displayed when H-Sync. Or V-Sync are out of range
NO SIGNAL	Displayed when there is no signal

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**9.0 RELIABILITY TEST**

No	Test Items	Conditions
1	High temperature storage test	Ta = 60 °C, 240 hrs
2	Low temperature storage test	Ta = -20 °C, 240 hrs
3	High temperature & high humidity operation test	Ta = 50 °C, 80 %RH, 240 hrs
4	High temperature operation test	Ta = 50 °C, 240 hrs
5	Low temperature operation test	Ta = 0 °C, 240 hrs
6	Thermal shock	Ta = -20 °C ↔ 60 °C (30 min), 100 cycle
7	Vibration test (Non-operating)	Frequency : 10 ~ 500 Hz Gravity/AMP : 1.5G Period : X, Y, Z 30 min
8	Shock test (Non-operating)	Gravity : 150G Pulse width : 6ms, half sine wave ± X, ± Y, ± Z Once for each direction
9	Electrostatic discharge test	Air : 150 pF, 330Ω, 15KV Contact : 150 pF, 330Ω, 8KV

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**10.0 ENVIRONMENT & SAFETY**

10.1 Mercury Disposal Label

<p>Cold cathode fluorescent lamp in LCD panel contains a small amount of mercury, Please follow local ordinances or regulation for disposal.</p>	<p>? □□□ディスプレイパネルは? 光管が□み? まれていまして、□□□□? の? 例□は規□に? って? 棄して□さい。</p>
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10.2 Safety Label (Product Label)




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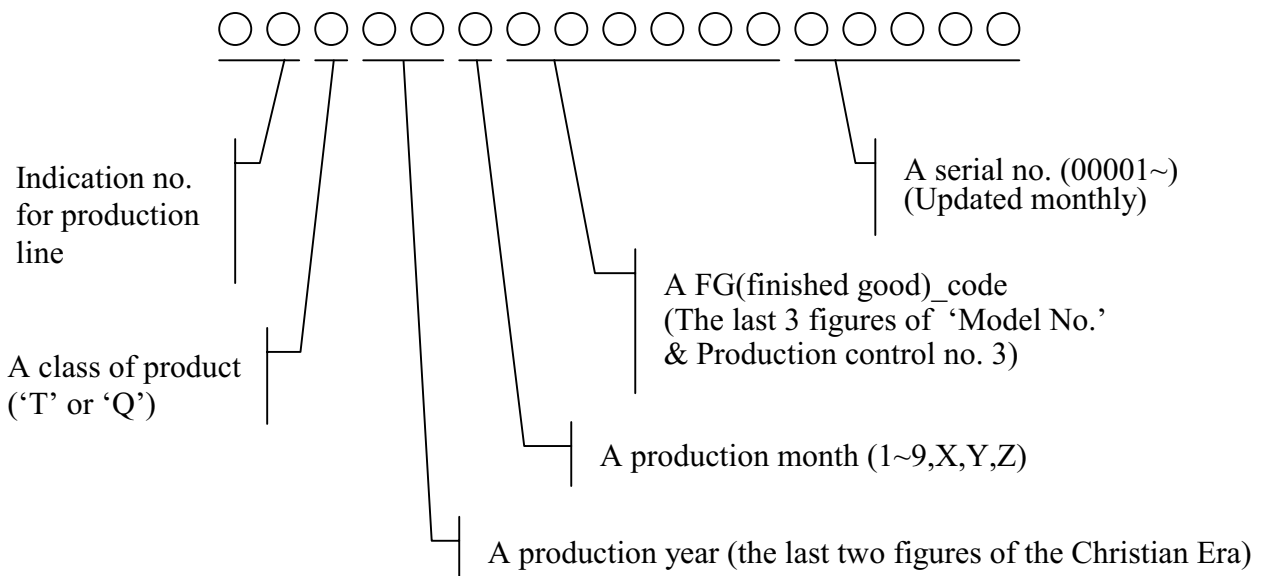


MADE IN KOREA      □□□□□□□□□□□□□□□□

— Model No.

— Lot No.

How to express 'Lot No.'



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**11.0 HANDLING & CAUTIONS**

## 11.1 Cautions when taking out the module

- Pick the pouch only, when taking out module from a shipping package.

## 11.2 Cautions for handling the module

- As the electrostatic discharges may break the LCD module, handle the LCD module with care. Peel a protection sheet off from the LCD panel surface as slowly as possible.
- As the LCD panel and backlight element are made from fragile glass material, impulse and pressure to the LCD module should be avoided.
- As the surface of the polarizer is very soft and easily scratched, use a soft dry cloth without chemicals for cleaning.
- Do not pull the interface connector in or out while the LCD module is operating.
- Put the module display side down on a flat horizontal plane.
- Handle connectors and cables with care.

## 11.3 Cautions for the operation

- When the module is operating, do not lose synchronous signals. If these signals were lost, the LCD panel would be damaged.
- Obey the supply voltage sequence. If wrong sequence were applied, the module would be damaged.

## 11.4 Cautions for the atmosphere

- Dewdrop atmosphere should be avoided.
- Do not store and/or operate the LCD module in a high temperature and/or humidity atmosphere. Storage in an electro-conductive polymer-packing pouch and under relatively low temperature atmosphere is recommended.

## 11.5 Cautions for the module characteristics

- Do not apply fixed pattern data signal to the LCD module at product aging.
- Applying fixed pattern for a long time may cause image sticking.

## 11.6 Other cautions

- Do not disassemble and/or re-assemble LCD module.
- Do not re-adjust variable resistor or switch etc.
- When returning the module for repair or etc, please pack the module not to be broken. We recommend using the original shipping packages.

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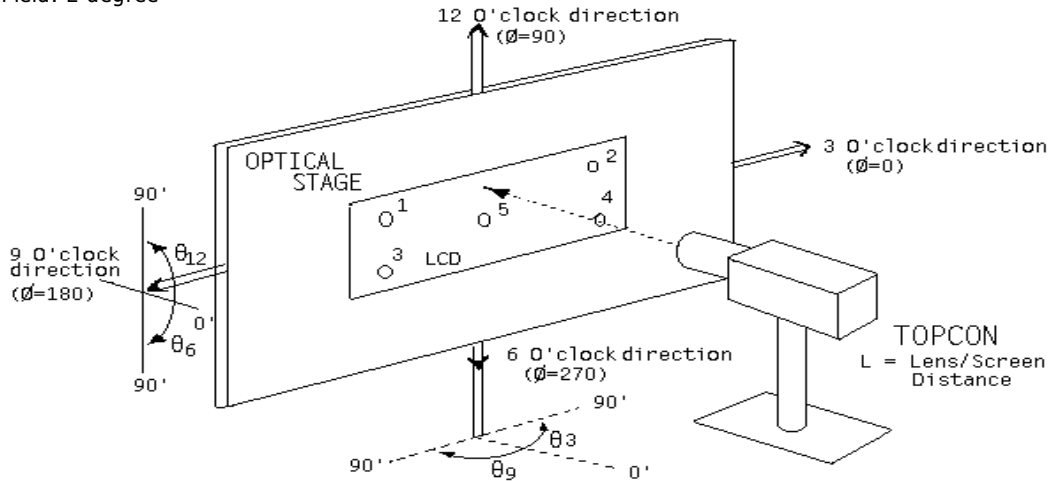
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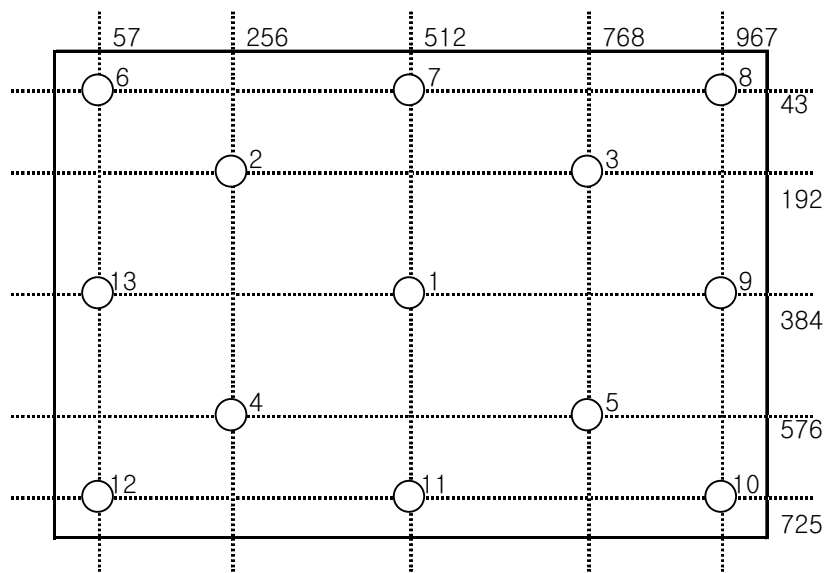
**12.0 APPENDIX**

**Figure 1. Measurement Set Up**

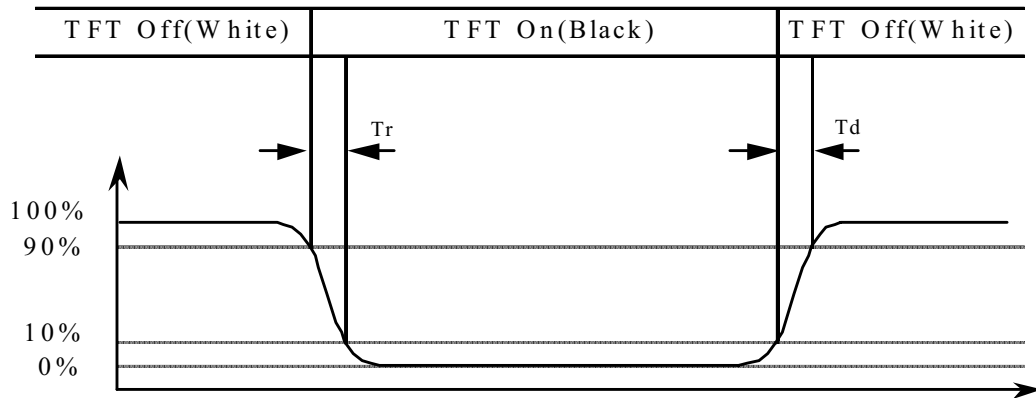
Measuring distance: 50Cm  
Field: 2 degree



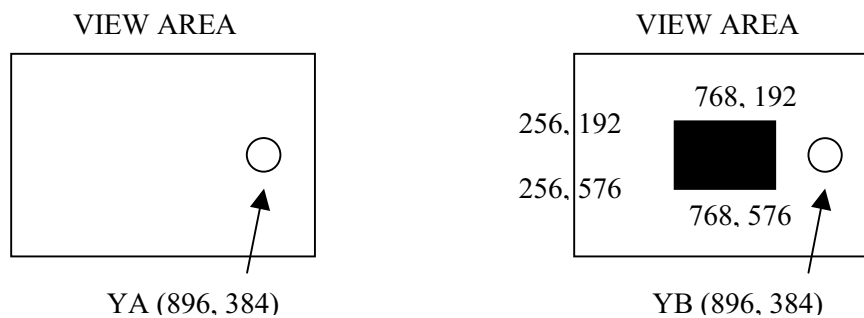
**Figure 2. Average Luminance Measurement Locations & Uniformity Measurement Locations**



**Figure 3. Response Time Testing**



**Figure 4. Cross Modulation Test Description**



$$\text{Cross-Talk} = \left| \frac{Y_B - Y_A}{Y_A} \right| \times 100$$

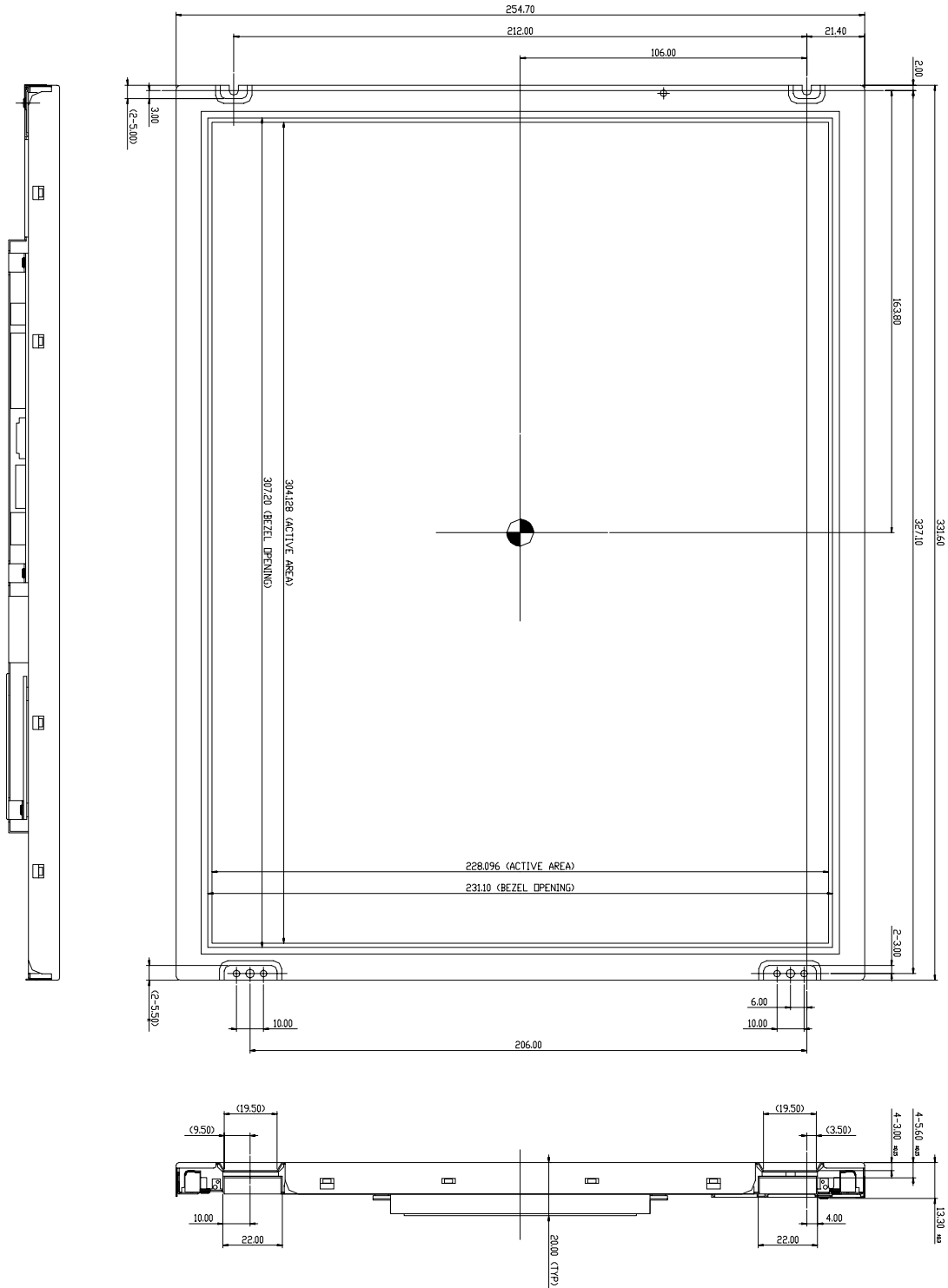
Where:

$Y_A$  = Initial luminance of measured area ( $\text{cd/m}^2$ )

$Y_B$  = Subsequent luminance of measured area ( $\text{cd/m}^2$ )

The location measured will be exactly the same in both patterns.

**Figure 5. TFT-LCD Module Outline Dimensions (Front view)**



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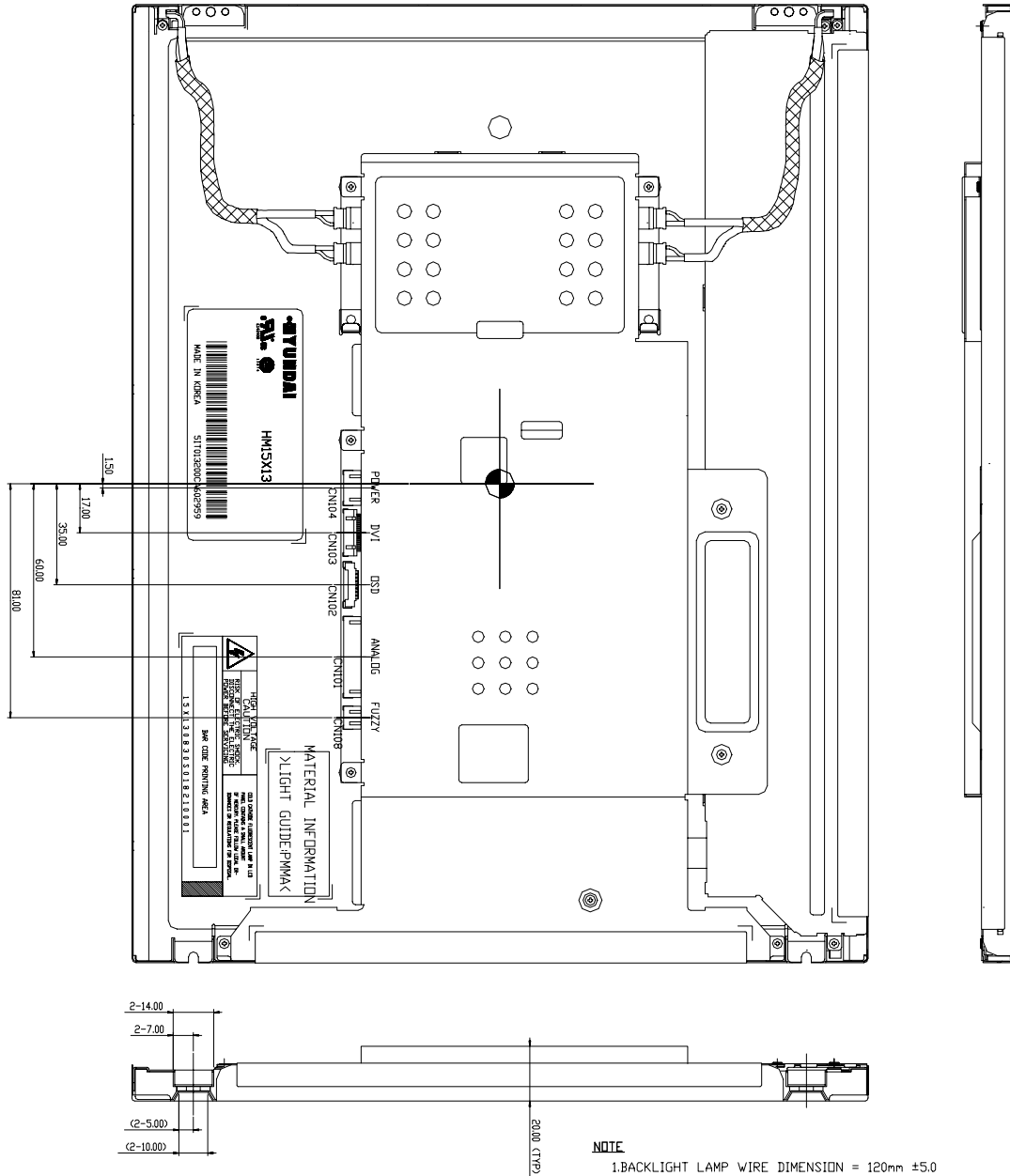
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**Figure 6. TFT-LCD Module Outline Dimensions (Rear view)**



**NOTE**  
 1.BACKLIGHT LAMP WIRE DIMENSION = 120mm ±5.0  
 2.CN101 : UJU 1294A-0203R (12PIN)  
 CN102A : MOLEX 53261-0890 (8PIN) ; DEFAULT  
 CN102B : MOLEX 52207-0990 (9PIN) ; CUSTOMER OPTIONAL  
 CN104 : UJU 1294A-0403R (4PIN)  
 3.GENERAL TOLERANCE: LINEAR - ±0.50

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**Table 1. EDID Firmware Content**

Byte # (decimal)	Byte # (HEX)	Field Name and Comments	Value (HEX)	Value (binary)
0	00	Header	00	00000000
1	01		FF	11111111
2	02		FF	11111111
3	03		FF	11111111
4	04		FF	11111111
5	05		FF	11111111
6	06		FF	11111111
7	07		00	00000000
8	08	EISA manufacturer code=User Define, Default=<blank>	00	00000000
9	09	(Compressed ASCII)	00	00000000
10	0A	Product code = User Define, Default=<blank>	00	00000000
11	0B	(Hex, LSB first)	00	00000000
12	0C	32-bit serial number = 00000000	00	00000000
13	0D		00	00000000
14	0E		00	00000000
15	0F		00	00000000
16	10	Week of manufacture = 00	00	00000000
17	11	Year of manufacture = 2002	0C	00001100
18	12	EDID Structure version # =1	01	00000001
19	13	EDID revision # =1	01	00000001
20	14	Video input definition = Analog, 1.0Vp-p, Separate	08	00001000
21	15	Max H image size (cm) = 30 cm	1E	00011110
22	16	Max V image size (cm) = 23 cm	17	00010111
23	17	Display gamma = 2.2	78	01111000
24	18	Feature support (DPMS) = Standby, Suspend, Active off, RGB	E8	11101000
25	19	Red / Green low bits	88	10001000
26	1A	Blue / White low bits	A5	10100101
27	1B	Red x = 0.639	A3	10100011
28	1C	Red y = 0.329	54	01010100
29	1D	Green x = 0.303	4D	01001101
30	1E	Green y = 0.583	95	10010101
31	1F	Blue x = 0.143	24	00100100
32	20	Blue y = 0.100	19	00011001
33	21	White x = 0.318	51	01010001
34	22	White y = 0.330	54	01010100
35	23	Established timing I = 720x400@70Hz/ 640x480@60Hz, 67Hz, 72Hz, 75Hz / 800x600@56Hz, 60Hz	BF	10111111
36	24	Established timing II = 800x600@72Hz, 75Hz / 1024x768@60Hz, 70Hz, 75Hz	CE	11001110
37	25	Established timing III / Manufacturer reserved timings	00	00000000
38	26	Standard timing identification # 1	01	00000001
39	27	Unused	01	00000001

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Byte # (decimal)	Byte # (HEX)	Field Name and Comments	Value (HEX)	Value (binary)
40	28	Standard timing identification # 2	01	00000001
41	29	Unused	01	00000001
42	2A	Standard timing identification # 3	01	00000001
43	2B	Unused	01	00000001
44	2C	Standard timing identification # 4	01	00000001
45	2D	Unused	01	00000001
46	2E	Standard timing identification # 5	01	00000001
47	2F	Unused	01	00000001
48	30	Standard timing identification # 6	01	00000001
49	31	Unused	01	00000001
50	32	Standard timing identification # 7	01	00000001
51	33	Unused	01	00000001
52	34	Standard timing identification # 8	01	00000001
53	35	Unused	01	00000001
54	36	Detail timing descriptor # 1 / Monitor Descriptor # 1	64	01100100
55	37	1024x768 @ 60Hz: pixel clock = 65MHz	19	00011001
56	38	Horizontal Active = 1024	00	00000000
57	39	Horizontal Blanking = 408	98	10011000
58	3A		41	01000001
59	3B	Vertical Active = 768	00	00000000
60	3C	Vertical Blanking = 38	26	00100110
61	3D		30	00110000
62	3E	Horizontal sync. offset = 24	18	00011000
63	3F	Horizontal sync. pulse width = 136	88	10001000
64	40	Vertical sync. offset = 3, Vertical sync. pulse width = 6	36	00110110
65	41		00	00000000
66	42	Horizontal image size = 300 mm	2C	00101100
67	43	Vertical image size = 230 mm	E6	11100110
68	44		10	00010000
69	45	No horizontal border	00	00000000
70	46	No vertical border	00	00000000
71	47	Separate digital sync., H/V polarity = +/-	06	00000110
72	48	Detail timing descriptor # 2 / Monitor Descriptor # 2	00	00000000
73	49	Flag (2byte)	00	00000000
74	4A	Reserved	00	00000000
75	4B	FF (Hex) defines Serial Number (ASCII)	FF	11111111
76	4C	Flag	00	00000000
77	4D	1st character / User define, Descriptor termination	0A	00001010
78	4E	2nd character	20	00100000
79	4F	3rd character	20	00100000
80	50	4th character	20	00100000
81	51	5th character	20	00100000
82	52	6th character	20	00100000
83	53	7th character	20	00100000
84	54	8th character	20	00100000

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Byte # (decimal)	Byte # (HEX)	Field Name and Comments	Value (HEX)	Value (binary)
85	55	9th character	20	00100000
86	56	10th character	20	00100000
87	57	11th character	20	00100000
88	58	12th character	20	00100000
89	59	13th character	20	00100000
90	5A	Detail timing descriptor # 3 / Monitor Descriptor # 3	00	00000000
91	5B	Flag (2byte)	00	00000000
92	5C	Reserved	00	00000000
93	5D	FD (Hex) defines Monitor Range Limits	FD	11111101
94	5E	Flag	00	00000000
95	5F	Min. Vertical rate = 56 Hz	38	00111000
96	60	Max. Vertical rate = 75 Hz	4B	01001011
97	61	Min. Horizontal rate = 25 KHz	19	00011001
98	62	Max. Horizontal rate = 60 KHz	3C	00111100
99	63	Support Pixel Clock = 94.5 MHz	0A	00001010
100	64	No secondary timing formula supported	00	00000000
101	65	Descriptor termination	0A	00001010
102	66		20	00100000
103	67		20	00100000
104	68		20	00100000
105	69		20	00100000
106	6A		20	00100000
107	6B		20	00100000
108	6C	Detail timing descriptor # 4 / Monitor Descriptor #4	00	00000000
109	6D	Flag (2byte)	00	00000000
110	6E	Reserved	00	00000000
111	6F	FC(Hex)defines Monitor Name/User define, default=i-module	FC	11111100
112	70	Flag	00	00000000
113	71	1st character = i	69	01101001
114	72	2nd character = -	2D	00101101
115	73	3rd character = m	6D	01101101
116	74	4th character = o	6F	01101111
117	75	5th character = d	64	01100100
118	76	6th character = u	75	01110101
119	77	7th character = l	6C	01101100
120	78	8th character = e	65	01100101
121	79	9th character / Descriptor termination	0A	00001010
122	7A	10th character	20	00100000
123	7B	11th character	20	00100000
124	7C	12th character	20	00100000
125	7D	13th character	20	00100000
126	7E	Extension flag = 0 EDID extension blocks	00	00000000
127	7F	Checksum	57	01010111

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