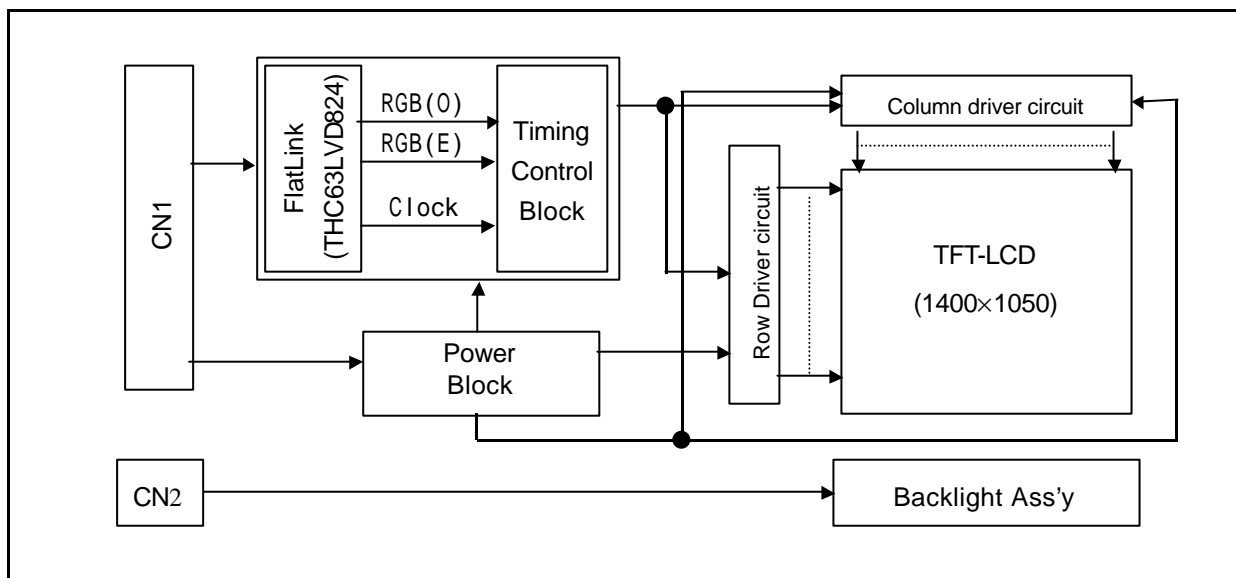


## 1. General Description

The LP141E2-A1 is a Color Active Matrix Liquid Crystal Display with an integral Cold Cathode Fluorescent Lamp(CCFL) backlight system. The matrix employs a-Si Thin Film Transistor as the active element. It is a transmissive type display operating in the normally white mode. This TFT-LCD has a 14.1 inches diagonally measured active display area with SXGA+ resolution (1050 vertical by 1400 horizontal pixel array). Each pixel is divided into Red, Green and Blue sub-pixels or dots which are arranged in vertical stripes. Gray scale or the brightness of the sub-pixel color is determined with a 6-bit gray scale signal for each dot, thus, presenting a palette of more than 262,144 colors.

The LP141E2-A1 has been designed to apply the interface method that enables low power, high speed, low EMI. Flat Link must be used as a LVDS(Low Voltage Differential Signaling) chip.

The LP141E2-A1 is intended to support applications where thin thickness, low power are critical factors and graphic displays are important. In combination with the vertical arrangement of the sub-pixels, the LP141E2-A1 characteristics provide an excellent flat panel display for office automation products such as Notebook PC.



## General Features

Active screen size	14.1 inches(35.7cm) diagonal
Outline dimensions	298.5(H) × 227.0(V) mm (Typ.), 6.0(D) mm(Max.)
Pixel pitch	0.204 mm × 0.204 mm
Pixel format	1400 horiz. by 1050 vert. pixels
	RGB stripe arrangement
Color depth	6bit, 262,144 colors
Luminance,White	185 cd/m <sup>2</sup> (Typ.)
Power Consumption	1.32W typ. (Circuit) / 4.08W Max. (Backlight)
Weight	510g (Typ.)
Display operating mode	Transmissive mode, normally white
Surface treatments	Hard coating (3H), Anti-glare treatment of the front polarizer

## 2. Electrical Specifications

### 2-1. Electrical Characteristics

The LP141E2-A1 requires two power inputs. One is employed to power the LCD electronics and to drive the TFT array and liquid crystal. The second input which powers the CCFL, is typically generated by an inverter. The inverter is an external unit to the LCD.

**Table 1 ELECTRICAL CHARACTERISTICS:**

Parameter	Symbol	Values			Units	Notes
		Min.	Typ.	Max.		
<b>MODULE:</b>						
Power Supply Input Voltage	$V_{CC}$	3.0	3.3	3.6	Vdc	
Power Supply Input Current	$I_{CC}$	-	0.400	0.450	A	1
Differential Impedance	$Z_m$	90	100	110	ohm	2
Power Consumption	$P_c$	-	1.32	1.50	Watts	1
Rush current ( $I^2t$ )		-	-	10	%	3
<b>LAMP</b>						
Operating Voltage	$V_{BL}$	680	725	850	$V_{RMS}$	4
Operating Current	$I_{BL}$	3.0	5.0	6.0	mA	
Established Starting Voltage						5
at 25 °C		-	-	1100	$V_{RMS}$	
at 0 °C		-	-	1450	$V_{RMS}$	
Operating Frequency	$f_{BL}$	45	60	80	KHz	6
Discharge Stabilization time	$T_S$			3	Minutes	7
Power Consumption	$P_{BL}$	-	3.63	4.08	Watts	8
Life Time(at 25 °C)		10,000	15,000	-	Hrs	9

Notes: 1. The specified current and power consumption are under the  $V_{CC} = 3.3V$ ,  $25^\circ C$ ,  $f_v = 50Hz$  condition whereas Black pattern is displayed.

2. This impedance value is needed to proper display and measured form LVDS Tx to the mating connector.

3. Littell Fuse guarantees 100,000 pulses(Inrush current), If  $I^2t$  is less than 22%.

4. The variance of the voltage is +- 10%.

5. The transformer output voltage in the inverter must be high considering to the loss of the ballast capacitor in the inverter.

The voltage above  $V_s$  should be applied to the lamps for more than 1second for start-up.

Otherwise, the lamps may not be turned on.

6. The output of the inverter must have symmetrical(negative and positive) voltage waveform and symmetrical current waveform.(Unsymmetrical ratio is less than 10%) Please do not use the inverter which has unsymmetrical voltage and unsymmetrical current and spike wave.

Lamp frequency may produce interference with horizontal synchronous frequency and as a result this may cause beat on the display. Therefore lamp frequency shall be as away as possible from the horizontal synchronous frequency and from its harmonics in order to prevent interference.

7. Let' s define the brightness of the lamp after being lighted for 5 minutes as 100%.

$T_s$  is the time required for the brightness of the center of the lamp to be not less than 95%.

8. The lamp power consumption shown above does not include loss of external inverter.



9. The life time is determined as the time at which brightness of lamp is 50% compare to that of initial value at the typical lamp current on condition of continuous operating at  $25 \pm 2^\circ C$ .

## 2-2. Interface Connections

This LCD employs two interface connections, a 30 pin connector is used for the module electronics and the other connector is used for the integral backlight system.

The electronics interface connector is a model FI-XB30SR-HF11 manufactured by JAE or equivalent. The pin configuration for the connector is shown in the table below.

**Table 2 MODULE CONNECTOR PIN CONFIGURATION (LVDS) [CN1]**

Pin	Symbol	Description	Notes
1	Mode	Option	<p>1. Interface chips 1.1 LCD : LPZ4E122S6L (Thine) (THC63LVDF824A core + Timing Controller) 1.2 System : THC63LVDM8233A (Thine)</p> <p>2. Mode option -. High : 1-channel(Odd channel) -. Low : 2- channel(Odd, Even channel)</p> <p>3. Connector 2.1 LCD : FI-XB30SR-HF11 (JAE) or compatible 2.2 Mating -. Wire type : FI-X30H (JAE) -. FPC type : FI-X30M (JAE) 2.3 Connector pin arrangement</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p style="text-align: center;">No. 1 . . . 30</p>  <p style="text-align: center;">CN1</p> </div> <p style="text-align: center;">Viewing on Display side</p>  <p style="text-align: right;">CN2</p>
2	Vcc	Supply Voltage(+3.3V)	
3	Vcc	Supply Voltage(+3.3V)	
4	GND	Ground	
5	GND	Ground	
6	NC	No Connection	
7	NC	No Connection	
8	RA1-	Odd Channel Differential signal	
9	RA1+	Odd Channel Differential signal	
10	GND	Ground	
11	RB1-	Odd Channel Differential signal	
12	RB1+	Odd Channel Differential signal	
13	GND	Ground	
14	RC1-	Odd Channel Differential signal	
15	RC1+	Odd Channel Differential signal	
16	GND	Ground	
17	RCLK1-	Odd Channel Differential signal	
18	RCLK1+	Odd Channel Differential signal	
19	GND	Ground	
20	RA2-	Even Channel Differential signal	
21	RA2+	Even Channel Differential signal	
22	GND	Ground	
23	RB2-	Even Channel Differential signal	
24	RB2+	Even Channel Differential signal	
25	GND	Ground	
26	RC2-	Even Channel Differential signal	
27	RC2+	Even Channel Differential signal	
28	GND	Ground	
29	RCLK1-	Even Channel Differential signal	
30	RCLK2+	Even Channel Differential signal	

**Product Specification**

The backlight interface connector is a model BHSR-02VS-1, manufactured by JST. The mating connector part number is SM02B-BHSS-1 or equivalent. The pin configuration for the connector is shown in the table below.

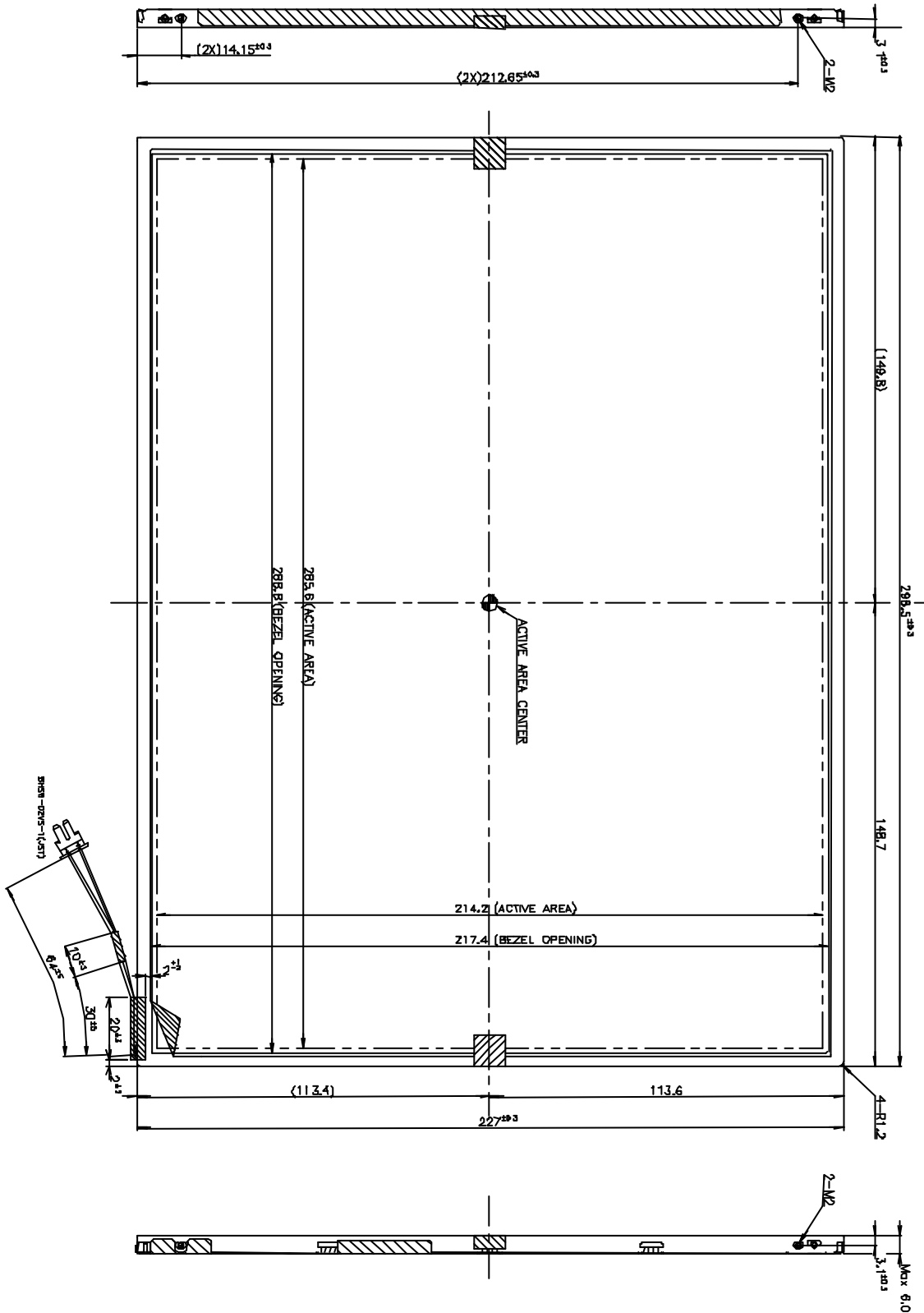
**Table 3 BACKLIGHT CONNECTOR PIN CONFIGURATION [CN2]**

Pin	Symbol	Description	Notes
1	HV	High voltage input	1
2	LV	Low voltage input	2

Notes: 1. The high voltage input terminal is colored white.  
2. The low voltage input terminal is colored black.

Product Specification

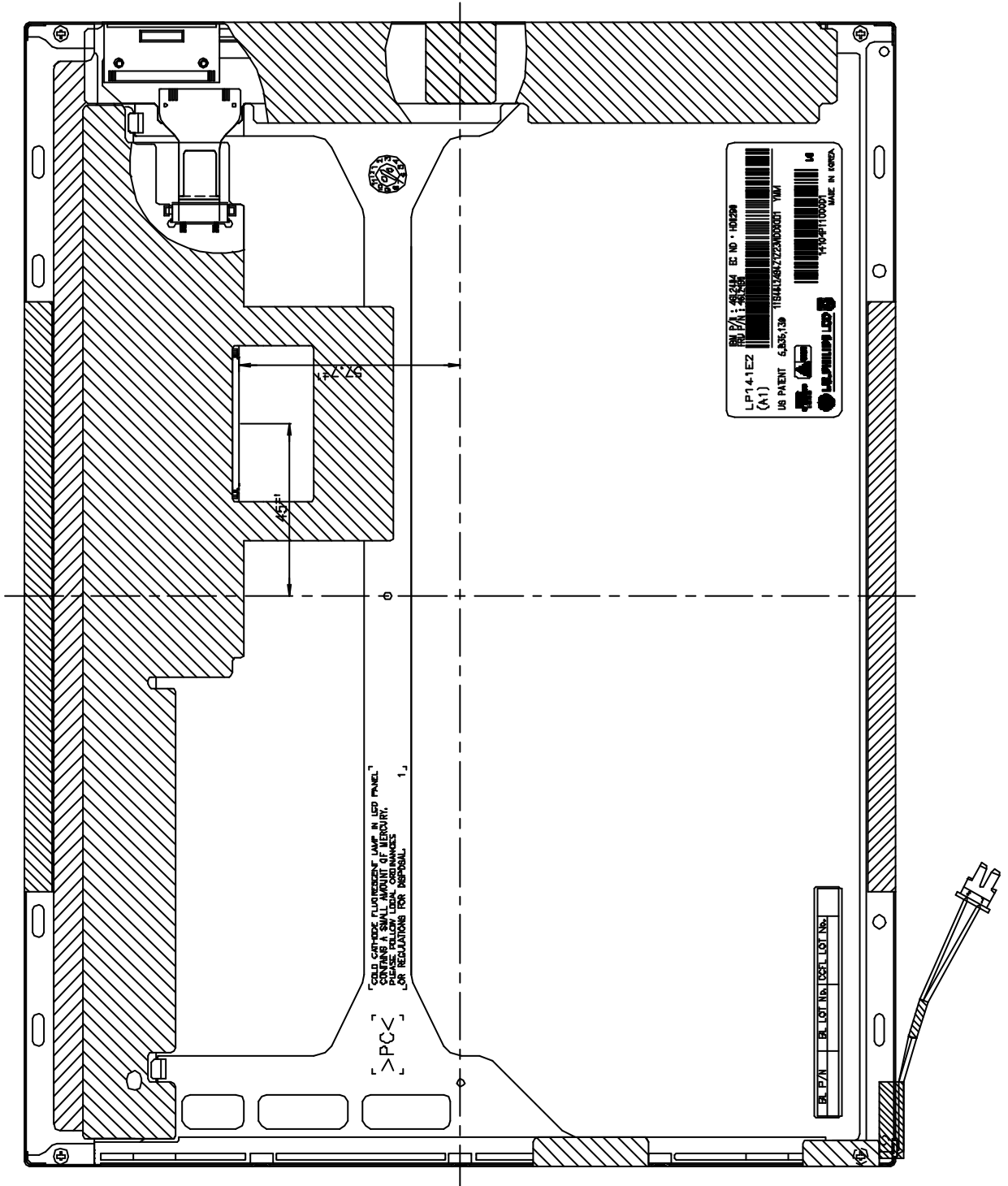
< FRONT VIEW >



- Notes
1. Unspecified dimensional tolerances are + 0.5mm
  2. The dimensions of 298.5 and 227 are measured along 4 edges of active area.
  3. Th part fixing wire increases 0.15mm in thickness because of tape thickness.

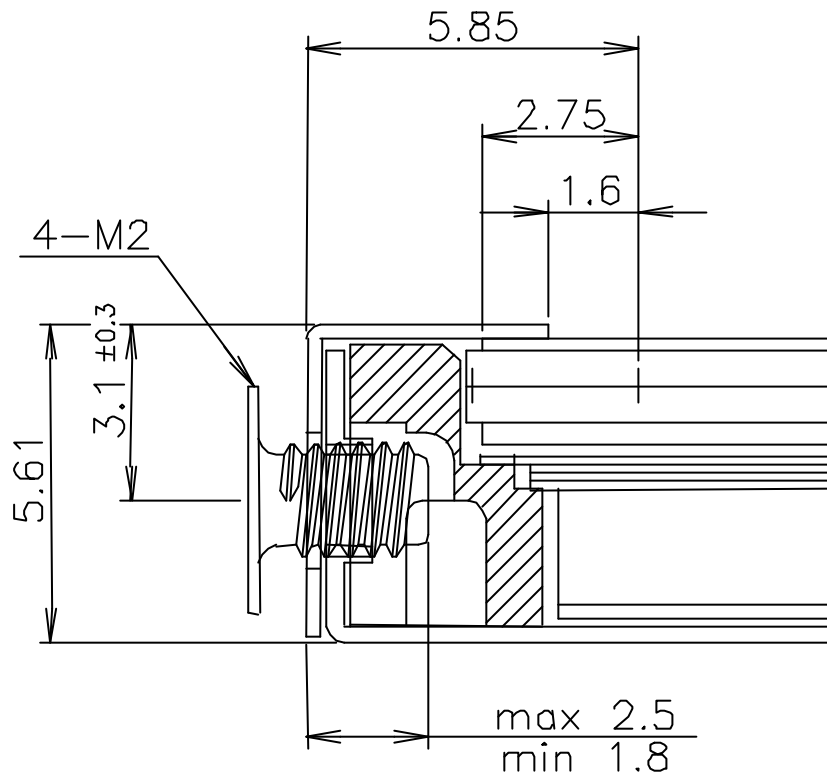
Product Specification

< REAR VIEW >



Product Specification

<DETAIL DESCRIPTION OF SIDE MOUNTING SCREW>



\*SCREW TORQUE : max 3.0kgf.cm

### **3.PRECAUTIONS**

The LCD Products listed on this documents are not suitable for use of Military,Industry,Medical etc. system.

If customers intend to use these LCD products for above application, Please contact ours sales people in advance.