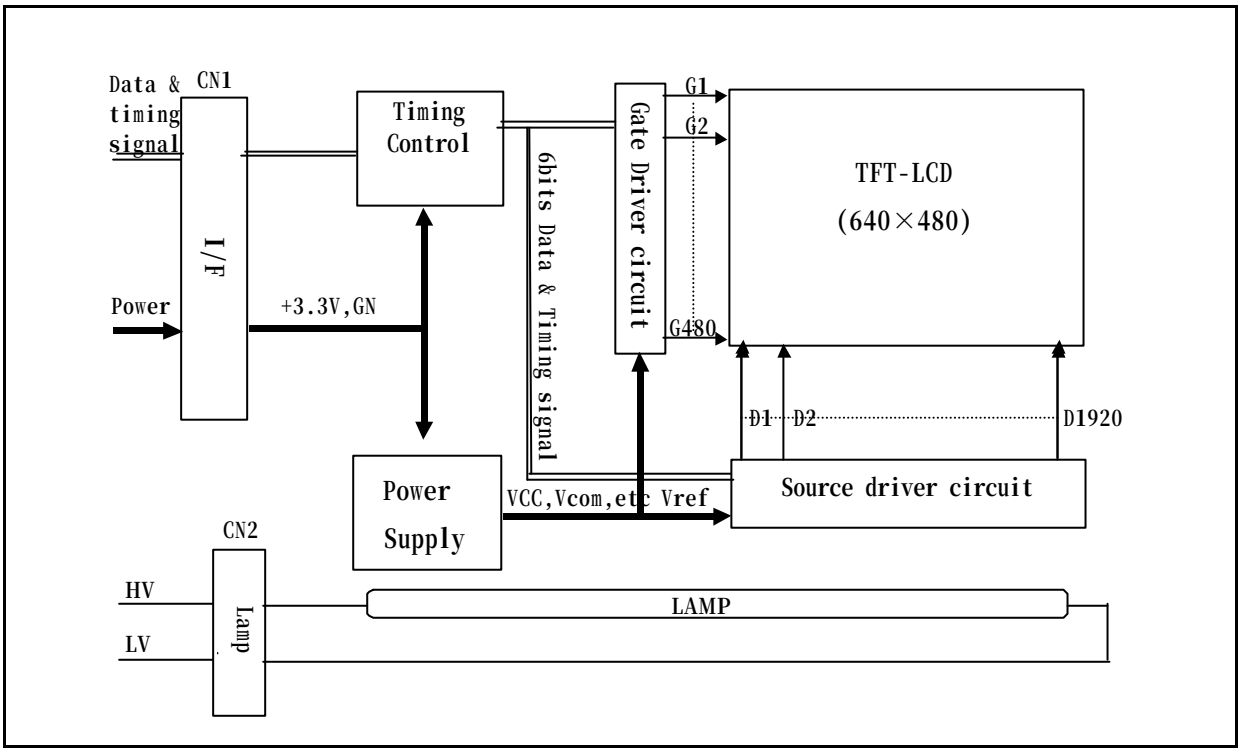
1. General Description

The LG.Philips LCD Co., Ltd. model LP104V2 LCD is a Color Active Matrix Liquid Crystal Display with an integral Cold Cathode Fluorescent Tube(CCFT) back light 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 10.4 inch diagonally measured active display area with VGA resolution(480 vertical by 680 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 LP104V2 LCD is intended to support application where low power is a critical factor and graphic displays are important. In combination with the vertical arrangement of the sub-pixels, the LP104V2 characteristics provide an excellent flat panel display for office automation products such as Notebook PC.



General Display Characteristics

The following are general feature of the model LP104V2 LCD;

Active display area	10.4 inches(26.42cm) diagonal
Outsize dimensions	246.5(H) × 179.4(V) × 8.0(W) mm(typ)
Pixel pitch	0.33 mm × 0.33 mm
Pixel format	640 horiz. By 480 vert. pixels RGB stripe arrangement
Color depth	6-bit, 262,144 colors
Display operating mode	transmissive mode, normally white
Surface treatments	hard coating(3H), anti-glare treatment of the front polarizer
Weight	400g (Typ.)

2. Electrical Specifications

The LP104V2 requires two power inputs. One is employed to power the LCD electronics and to drive the voltages to drive the TFT array and liquid crystal. The second input which powers the backlight CCFT, 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.		
MODULE:						
Power Supply Input Voltage	V_{DD}	3.0	3.3	3.6	Vdc	
Power Supply Input Current	I_{DD}	-	170	227	mA	1
Power Consumption	P_{DD}	-	0.56	0.75	Watts	1
Ripple/Noise		-	-			
Logic Input Level, High	V_{IH}	2.0	-	VDD	V	2
Logic Input Level, Low	V_{IL}	Vss	-	0.8	V	2
BACK LIGHT						
Lamp current	It	2.0	5.0	6.0	mA	
Lamp voltage	V_t	490	515	630	V_{RMS}	
Lamp frequency	Ft	40	60	80	KHz	3
Kick-Off Voltage	Vk	-	-	845	V_{RMS}	25±2°C
		-	-	1015	V_{RMS}	0±2°C
Lamp life time	Lt	20000	-	-	Hrs	25±2°C
Power Consumption	PBL	1.3	2.6	2.9	Watts	4

Notes: 1. The current draw and power consumption specified is for 3.3 Vdc at 25°C, fv at 60Hz and black signal displayed.

2. Logic levels are specified for VDD of 3.3 Vdc at 25 °C. The values specified apply to all logic inputs; Hsync, Vsync, clock, data signals, etc.

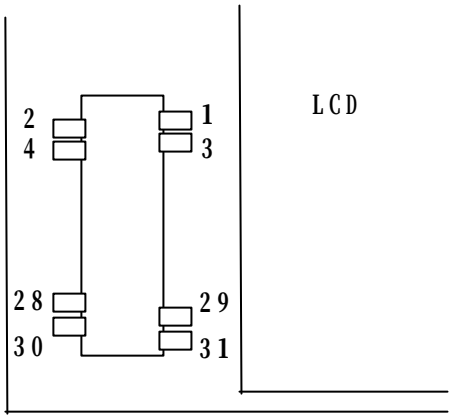
3. Lamp frequency may produce interference with horizontal sync. frequency , and may cause beat on the display. Therefore lamp frequency shall be detached as much as from the horizontal sync. and from the harmonics of horizontal synchronous to avoid interference.

4. DC/AC inverter for backlight is not built in this module.
Back light power consumption shown above does not concern the efficiency of the inverter.

3. Interface Pin Configuration

* Used connector : DF9B-31P-1V(HIROSE), Matching side : DF9B-31S-1V(HIROSE)

Table 2 INTERFACE PIN CONFIGURATION

Pin	Symbol	Description	Notes
1	GND	Ground	I/F PIN ARRANGEMENT (Transparent view)  TOP VIEW
2	CLK	Data clock	
3	Hsync	Horizontal sync.	
4	Vsync	Vertical sync.	
5	GND	Ground	
6	R0	Red data(LSB)	
7	R1	Red data	
8	R2	Red data	
9	R3	Red data	
10	R4	Red data	
11	R5	Red data(MSB)	
12	GND	Ground	
13	G0	Green data(LSB)	
14	G1	Green data	
15	G2	Green data	
16	G3	Green data	
17	G4	Green data	
18	G5	Green data(MSB)	
19	GND	Ground	
20	B0	Blue data(LSB)	
21	B1	Blue data	
22	B2	Blue data	
23	B3	Blue data	
24	B4	Blue data	* NC (30, 31pin) should be electrically opened during operation. * The metal top case is connected to GND. * All GND(ground) pins should be connected together and to Vss which also be connected to the LCD's metal frame. * All Vdd(power input) pins should be connected together.
25	B5	Blue data(MSB)	
26	GND	Ground	
27	DTMG	Data timing signal	
28	VDD	Power supply +3.3V	
29	VDD	Power supply +3.3V	
30	NC	No connection	
31	NC	No connection	

The backlight interface connector is a model BHR-03VS-1, manufactured by JST. The mating connector part number is SM02(0.8)B-BHS-1-TB or equivalent. The pin configuration for the connector is shown in the table below.

Table 3 BACKLIGHT CONNECTOR PIN CONFIGURATION

Pin	Symbol	Description	Notes
1	HV	Lamp power input	1
2	NC	NC	
3	LV	Ground	2

Notes: 1. The HV pin(wire) is colored pink. The LV pin(wire) color is white.
2. The Lamp housing should be common with ground(metal frame).

4. Mechanical Characteristics

The chart below provides general mechanical characteristics for the model LP104V2 LCD. In addition, the figure below is a detailed mechanical drawing of the LCD. Note that dimension are given for reference purposes only.

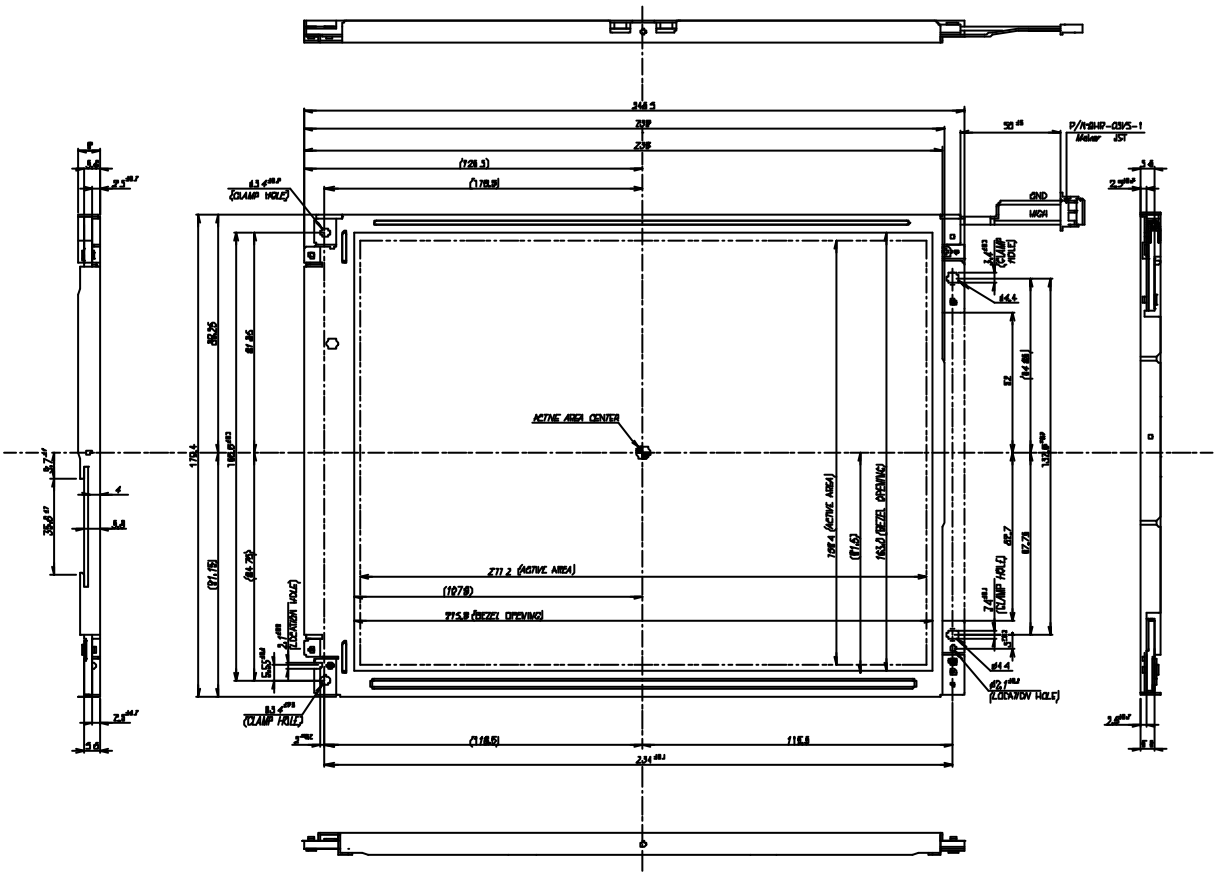
Outside dimensions :

Width	246.5mm(TYP.)
Height	179.4mm(TYP.)
Thickness	8.0mm(TYP.)

Active Display area :

Width	211.2mm
Height	158.4mm

Weight (approximate) : 400(±10) g



NOTES

1. Unspecified dimension tolerences are ±0.5

< LCM FRONT SIDE >

5.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.