

ENH104VD1-500 10.4" Enhanced VGA AMLCD Display

Enhanced Brightness for Outdoor Viewability

The ENH104VD1-500 color TFT LCD provides improved optical performance based on the enhancement of a standard Sharp LQ104V1DG21 color active matrix LCD module. The incorporation of high efficiency optical films provides an increase of approximately 40% over the typical luminance of the stock display. The use of index matching (IM) films allows for improved contrast in high ambient lighting conditions. The ENH104VD1-500 is available in two surface treatments – IM/Clear (glossy) or IM/110 (a 10% diffusion).

The enhanced module is composed of a color TFT LCD panel, driver ICs, control circuit and power supply circuit and a backlight unit. Graphics and text can be displayed on a 640 x 480 pixel panel with 262,144 colors by supplying 18-bit data signals (6-bits/color), four timing signals, +3.3V / +5V DC supply voltage for the TFT panel and supply voltage for the backlight. The TFT LCD panel used for this module is a low-reflection and high color saturation type. Viewing angle is 6 o'clock direction. The module offers a wide viewing angle and high brightness (500 cd/m² typical). The backlight-driving DC/AC inverter is not built into this module.

ENH104VD1-500 meets the environmental specifications of the stock Sharp LQ104V1DG21. WEDC provides a full one year warranty to the enhanced performance product.



Performance Features

- VGA 640(H) x 480(V) Resolution
- 500 nit typical Luminance
- TTL Interface
- High Contrast Ratio/High Aperture Ratio
- Higher Brightness per Watt

Applications

- Industrial automation
- Kiosk Systems
- GPS and Marine Navigation
- Instrumentation

Surface Treatments

- Diffuse front surface, IM/110
- Glossy front surface, IM/Clear

Display Characteristics

- Display Format: 640 Pixels (H) x 480 Pixels (V)
- Active Viewing Area: 211.2mm (H) x 158.4mm (V)
- Pixel Configuration: RGB Vertical Stripe
- Pixel Pitch: 0.330mm (H) x 0.330mm (V)
- Display Mode: Normally White

Viewing Angle

- Typical: 70/70/40/70 CR>10

Luminance

- Typical: 500 cd/m²

Response Time

- Typical: Rise 20ms / Fall 40ms

Operating Temperature

- Topa -10°C to +65°C (Ambient)

Storage Temperature

- Tstg -30°C to +70°C

When looking for a high-efficiency enhanced display system to integrate into your high-end product application, start with White Electronic Designs. Our people, processes and products are committed to the design, development and delivery of advanced display technology that expands possibilities in ways that consistently translate to success. And that's just the beginning Call **503.690.2460** or visit **www.whiteedc.com**.



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Backlight Specification

The backlight system is an edge-lighting type with 2 CCFLs (Cold Cathode Fluorescent Lamp). The characteristics of the lamp are shown in the following table. The values below are for one CCFL.

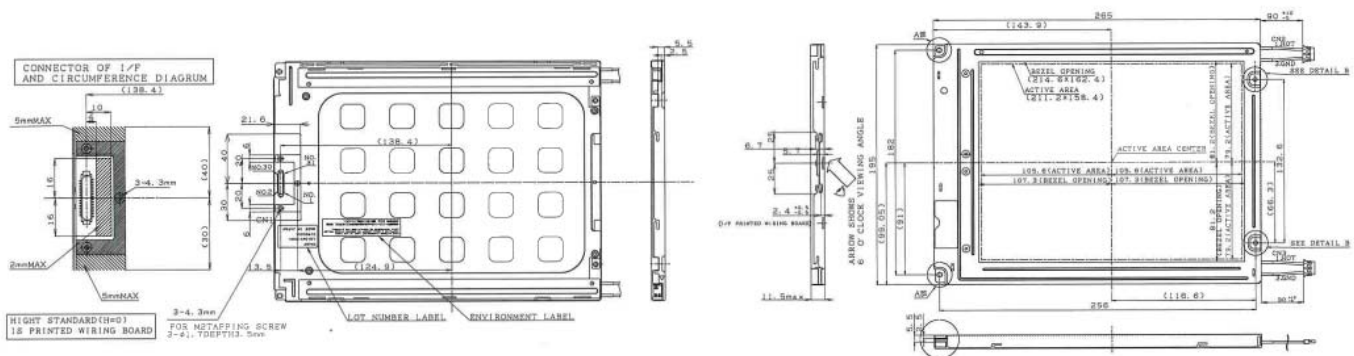
Parameter	Symbol	Min.	Typ.	Max	Unit	Remark
Lamp Current	I_L	2.0	6.0	6.5	mArms	
Lamp Power Consumption	P_L	-	3.0	-	W	
Lamp Frequency	F_L	20	35	60	kHz	
Kick-off Voltage	V_s	-	-	950	Vrms	TA = 25°C
Lamp Life Time	LL	50,000	-	-	Hour	TA = 0°C

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max	Unit
Input Voltage	V_i	TA = 25°C	-0.3 ~ $V_{CC} + 0.3$	V	Note 1
+5V Supply Voltage	V_{CC}	TA = 25°C	0 ~ +6	V	
Storage Temperature	Tstg	-	-30 ~ +70	°C	
Operating Temperature	Topa	-	-10 ~ +65	°C	Ambient

Note 1: Humidity 95% RH Max. (TA > 40°C)
 Maximum wet-bulb temperature at 39°C or less. (TA > 40°C)
 No condensation.

Mechanical Drawing



Ordering Information

Part Number	Model	Description
100-0015-00		500 nit – Glossy front surface, IM/Clear
100-0015-01	ENH104VD1-500	500 nit – Diffused front surface, IM/110
100-0015-02		500 nit – No front surface treatment

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