ENH050QA1-320 5.0″ QVGA Analog AMLCD Display

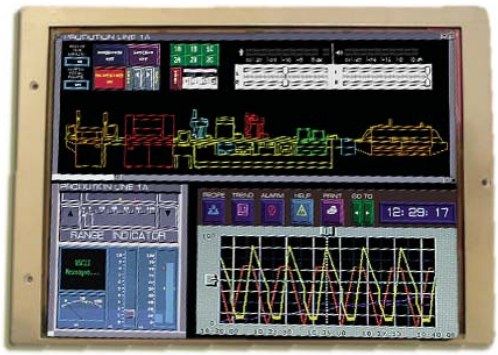
Enhanced Brightness for Outdoor Viewability

Overview

The ENH050QA1-320 color TFT LCD provides improved optical performance based on enhancement of a standard Sharp LQ5AW136 color active matrix LCD module. The incorporation of an index matching (IM) film provides for improved contrast in high ambient lighting conditions. The ENH050QA1-320 is available in two surface treatments – IM/Clear (glossy) or IM/110 (a 10% diffusion).

The enhanced module accepts full color video signal conforming to the NTSC(M) and PAL(B·G) system standards. 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 (320 cd/m^2 typical). The backlight-driving DC/AC inverter is not built into this module.

WEDC's ENH050QA1-320 meets the environmental specifications of the stock Sharp LQ5AW136. WEDC provides a full one year warranty to the enhanced performance product.



Performance Features

- QVGA 320(H) x 234(V) Resolution
- 320 nit typical Luminance
- Analog RGB Interface
- Dual Mode NTSC and PAL(B·G)
- High Contrast Ratio/High Aperture Ratio

Applications

- Portable Instrumentation
- GPS Systems
- Navigation Products
- Automotive

Surface Treatments

- 320 nit – Diffuse front surface, IM/110
- 320 nit – Glossy front surface, IM/Clear

Display Characteristics

Display Format:	320 Pixels (H) x 234 Pixels (V)	
Active Viewing Area:	102.2mm (H) x 74.8mm (V)	
Pixel Configuration:	RGB Vertical Stripe	
Pixel Pitch:	0.3195mm (H) x 0.3195mm (V)	
Display Mode:	Normally White	
Viewing Angle		
Typical:	65/65/40/65	CR > 5
Luminance		
Typical:	320 cd/m^2	
Response Time		
Typical:	Rise 30ms / Fall 50ms	
Operating Temperature		
T_{OPa}	-30 °C to +60 °C (Ambient))	
T_{OPP}	-30 °C to +85 °C (Panel Surface)	
Storage Temperature		
Tstg	-30°C to +85°C	

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Backlight Specification

The backlight system is an edge-lighting type with 1 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 Voltage	V_L	550	610	670		I_L = 6.5mA
Lamp Current	I_L	3.0	6.5	7.0	mArms	
Lamp Frequency	F_L	20	-	70	kHz	
Kick-off Voltage	V_S	-	-	1450	Vrms	T_A = 25°C
		-	-	1500	Vrms	T_A = -30°C
Lamp Life Time	L_L	10,000	-	-	Hour	T_A = 25°C

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Remark
Positive power supply voltage	V_{SH}	-0.3	+9.0	V	
Negative power supply voltage	V_{SL}	-6.0	+0.3	V	
Analog input signals	V_I	-	2.0	Vp-p	Note 1
Digital input/output signals	Vl	-0.3	+5.4	V	Note 2
DC bias voltage of common electrode driving signal	T_{CDC}	V_{SL}	V_{SH}	V	
Storage Temperature	Tstg	-	-30 ~ +85	°C	Note 3
Operating Temperature (Panel)	Topa	-	-30 ~ +85	°C	
Operating Temperature (Ambient)	Topa	-	-30 ~ +60	°C	

Note 1: VBS, VR1 VG1, VB1, VR2, VG2, VB2 terminals (video signal).
Note 2: NTP, HRV, VRV, SAM, VSW, SHY, CLKC, CLK terminals.
Note 3: The temperature of all parts in module should exceed this rating.
Maximum wet-bulb temperature should be less than 58°C, non-condensing.

Power Consumption

Part Number	Symbol	Condition	Min	Typ.	Max	Unit	Remark
Positive supply current	I_{SH}	V_{SH} = +8.0V	-	140	170	mA	
Negative supply current	I_{SL}	V_{SL} = -5.0V	-	55	70	mA	
Total	W_S		-	1.4	1.7	W	
Lamp power consumption	W_L			4.0		W	

Ordering Information

Part Number	Model	Description
100-0004-00	ENH050QA1-320	320 nit – Glossy front surface, IM/Clear
100-0004-01		320 nit – Diffuse front surface IM/110
100-0004-02		320 nit – No front surface treatment

For ordering or additional information on this or any other display product or service, contact White Electronic Designs at:

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