

Ruggedized, Sunlight Readable 5.6" Color Active Matrix LCD Module

Electronic Designs, Inc. (EDI) has developed a 5.6" diagonal, ruggedized, sunlight readable color active matrix LCD display head for use in harsh, sunlight readable applications. Designed for use in commercial and military cockpits as a multifunctional color display assembly, EDI's display head utilizes proven ruggedization techniques and high performance commercial off the shelf AMLCD technology to provide a cost effective solution for tough applications.

- Active Matrix TFT
- Landscape Mode
- 4:3 Aspect Ratio
- Resolution: 320xRGBx234 1/4 VGA
- Accepts 2 Channels RGB Analog Input
- Accepts NTSC (Composite Video)
- Accepts S-Video (Y/C)
- $\pm 55^\circ$ Horiz; $+55^\circ/-35^\circ$ Vert Viewing
- Anti-reflective
- EMI Shielded (option)
- High Bright/Long Life Backlight

General Panel Specifications

Parameter	Specification	Units
Panel Dimensions	126(H)x96.3(V)x7.1(D)	mm
Screen Size	5.6 diag. (140 mm)	in.
Effective Viewing Area	114.2(H)x83.5(V)	mm
Active Area	95.36	cm ²
Display Format	320xRGBx234	pixels
Viewing Orientation	6:00*	
Dot Pitch	0.119(H)x0.357(V)	mm
Pixel Configuration	RGB Vertical Stripe	
Display Mode	Normally White	
Transmissivity	5.5%	

*12:00 viewing available w/ scan reversal

Environmental Characteristics

Temperature:

Operating (w/o heater):

-30°C to +85°C

Operating (w/heater)¹:

-40°C to +85°C

Non Operational:

-55°C to +90°C

MTBF:

AMLCD > 40,000 hours²

Backlight > 17,000 hours²

1. Ruggedized with 25ohm/sq. heater
2. Under nominal temperature conditions



Interface Characteristics

Driver Signal Compatibility:

Accepts RGB Analog using NTSC or PAL timing

Accepts NTSC
Accepts S-Video
Accepts External Dot Clock
Accepts Discrete and Composite Sync Signals

Viewing Angle

EDI offers for the first time a Wide Viewing Angle 5.6" ruggedized unit. EDI has the capability to enhance the viewing area by the application of compensation films. This enhancement offers systems integrators to utilize this panel in cross cockpit applications where sunlight readability at extreme angles is critical.

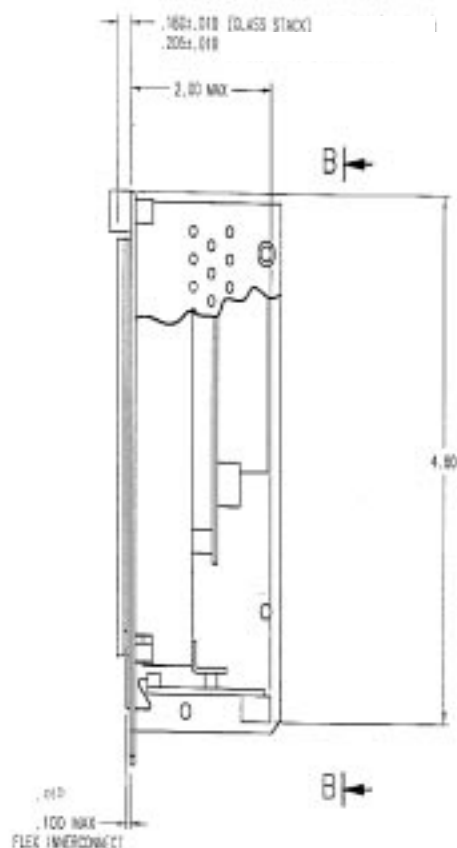
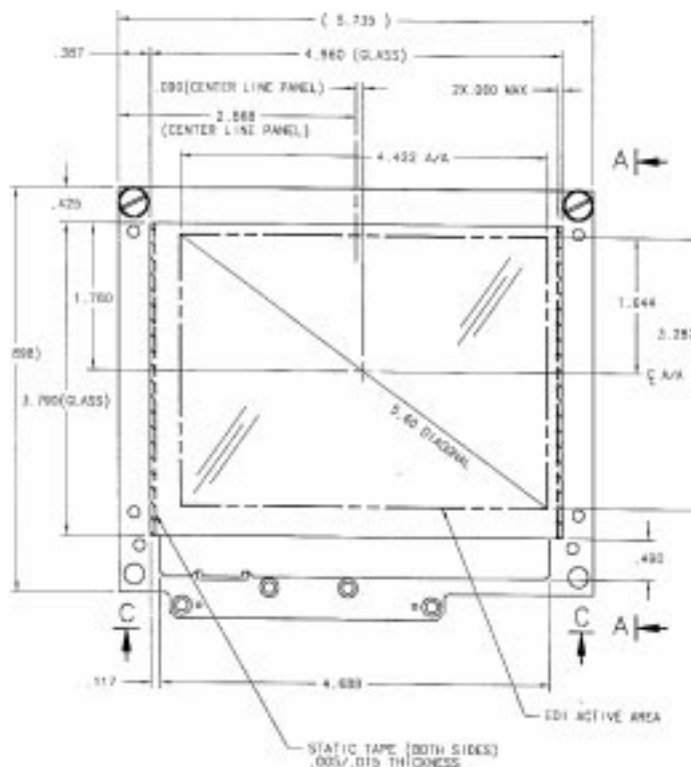
Left/Right: 55°/55°
Top/Bottom: 35°/55°

Shall Maintain a contrast ratio of 10:1 in dark ambient conditions.

Power Input Specifications

Parameter	Symbol	Min	Typ	Max	Units
Positive Input Voltage	VS	10.5	12.0	13.0	V
Negative Input Voltage	VSL	-8.0	-12.0	-13.0	V
Analog Input Voltage	Vah	0.7	0.74	1.0	Vp-p
Digital Input Voltage	Vdh	3.7	--	5.1	V
	Vdl	0	--	1.0	V

Mechanical



Parameter		Typ	Units
Response Time	Rise	30	ms
	Decay	50	ms
Transmission		5.5%	%
Specular Reflectance		1.5%	%
Diffuse Reflectance		0.4%	%
Dot Pitch	Horizontal	0.119	mm
	Vertical	0.357	mm
Chromaticity Coordinates			
Red	x	0.612	
	y	0.343	
Green	x	0.302	
	y	0.596	
Blue	x	0.156	
	y	0.172	
White	x	0.337	
	y	0.397	
Black	x	0.298	
	y	0.364	

The EDI 5.6" backlight is a closed loop luminance sensed system. A luminance sensor monitors the luminance output of the bulb and compares its output with the input voltage setting, and regulates the luminance output. The luminance is maintained over time and temperature variations.

This system is a multi-bulb approach, which offers built in redundancy that provides light output in the case of a single bulb failure. There is a built-in lamp heater assembly as well, which maintains the bulb temperature at its optimum level.

External shutdown of the heater and lamp power are controlled via an external input. Users will be warned as to when lamp maintenance should be performed through an output pin that signals high when replacement is needed.

The external voltage input is a differential input, providing common mode rejection of common mode noise. The luminance output versus input voltage response has been made non-linear at the low luminance end to provide easy adjustments at the low end.

Luminance Range: 0.04 - 0.065 min
100 - 120 max

Control Voltage: 0.000 to 5.000 Volts
(The adjustment range is monotonic with 8 BIT resolution.)

Uniformity: 30% Calculated
|X-Xbar|/Xbar measured at 5 spots

Power: 12 Watts Max (12V @1A)