

Introduction

The LMG237B-190EG02 is a 19" sunlight readable LCD module. The module uses an AUO M190EG02 LCD panel and a VHB (very high brightness) LED backlight to achieve a maximum screen brightness of 1,100 Cd/m² (nits). At this brightness, the power consumption of the LED backlight is only 30 Watts.

For applications in very low lighting environments, the screen brightness can be adjusted down to less than 1 Cd/m² with a proper LED drive board using PWM (Pulse Width Modulation) dimming control.

Display Specifications

LCD Active Area Dimensions (mm)	376.3 (H) x 301.1 (H)
Outline Dimensions (mm)	396 (H) x 324 (V) x 16.5 (D) Typ.
Display Resolution	1280 x 1024
Operating Temperature	0 to 50 °C
LCD Module Weight	2 Kg
Front Surface Treatment	Hard coating (3H), anti-glare treatment

Optical Characteristics (notes 1, 2)

Parameters	Typical Value	Units	Conditions
LCD Screen Luminance	1,100	Cd/m ²	LCD displays the brightest White
Backlight Power Consumption	30	Watts	Excluding driver board loss, @850 nits
Typical LCD Contrast Ratio	800:1		White vs. Black (measured in the dark along the normal direction)
Typical Viewing Angles			
3:00 - 9:00 directions	±80	Degrees	Contrast ratio ≥ 10
6:00 - 12:00 directions	±80	Degrees	Contrast ratio ≥ 10
LCD Screen Chromaticity (x, y)			
White	(0.264, 0.293)		Measured at the normal direction
Red	(0.611, 0.349)		Measured at the normal direction
Green	(0.290, 0.625)		Measured at the normal direction
Blue	(0.140, 0.042)		Measured at the normal direction

Note 1: Please refer to the AUO M190EG02 LCD Data Sheet for LCD electrical specifications & general precautions.

Note 2: Luminance measured at about 1 minute after initial turn on at 25° C ± 2° C ambient temperature.

LED Backlight Driving Specifications

The LCD module has a VHB backlight with 2 LED lamps. Each LED lamp has 48 white LEDs that are electrically connected into 6 strings in parallel. Each string has 8 LEDs connected in series.

Each LED lamp is terminated with a JST 2-pin connector, BHRS-02VS-1. The JST mating connector part number is SM02-BHSS-1-TB.

LED Backlight Driving Specifications (continue)

At the maximum screen brightness setting of 1,100 nits, the driving conditions of each LED lamp are:

LED strip driving voltage	25	Vdc (typ)
LED strip driving current	600	mA

Thus, it requires a board with 2 LED driving channels. Each channel can deliver a maximum current of 600 mA. At this level, the total power consumption of the backlight is 30 Watts.

Thermal Management

The LED backlight in the LMG237A is very efficient. Thus, even at 1,100 nits screen brightness, the backlight power will not cause a significant increase of the LCD temperature.

For outdoor applications, the LCD may be subject to direct sunlight exposure and can absorb a large amount of solar heat. In the worst case, a 19" LCD can absorb upto 110 Watts, which is 3.7 times the LED backlight power. As a result, the LCD temperature can rise significantly, particularly if there is a cover plate in front of the LCD.

As the LCD temperature rises beyond certain level, both the LED efficiency and the LED life span decrease. Also, if the LCD temperature exceeds the N - I (nematic to isotropic) transition point of the liquid crystal material, the LCD loses its display function. Thus, it is important to implement cooling measures to maintain the LCD temperature below 50 °C to ensure good display performance and long backlight life span.

For outdoor applications in cold winter weather, the ambient temperature may drop well below 0°C. The thermal management (cooling and heating) system should be designed according to the worst case conditions anticipated to ensure the proper operation of the LMG237B-190EG02 LCD and its LED backlight.

Backlight Life

The half brightness life of the VHB backlight in the LMG237B-190EG02 LCD module is rated at 30,000 hours. The half brightness life is the number of operating hours before the backlight luminance (seen as the LCD screen brightness) drops down to 50% of its initial value.

LCD Mounting

The LMG237B-190EG02 is a side mount LCD module. The locations of the mounting holes and the screw size are shown in the mechanical drawing.

Please use four M3 screws to mount the LMG237B-190EG02 LCD module. The maximum screw penetration depth inside the LCD module is 5 mm. The maximum torque used to tighten the screws is 5 kg-cm (4.3 lb-in). Excessive depth of penetration and amount of tightening torque can potentially cause unrecoverable damage to the LCD module

Mechanical Dimensions

