

Introduction

The LMG237C-190EG02 is an updated version of the 19" sunlight readable LCD module using the AUOM190EG02 LCD panel. For the LMG237C version, the VHB (very high brightness) LED backlight is upgraded to achieve a maximum screen brightness of 1,350 Cd/m² (nits). At this brightness, the power consumption of the LED backlight is at 30.5 Watt. Comparing to the previous version, LMG237B-190EG02, the screen brightness increases by nearly 23%, yet the backlight power remains about the same.

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 (note)

Parameters	Typical Value	Units	Conditions
LCD Screen Luminance	1,350	Cd/m ²	LCD displays the brightest White
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: Luminance measured at about 1 minute after initial turn on at 25° C ± 2° C ambient temperature.

TFT LCD Power Specifications

Parameters	Min.	Typ.	Max	Units	Conditions
Vcc Logic/LCD Drive Voltage	4.0	5.0	5.5	Volt	+/- 10%
Icc Input Current	~	1.05	1.16	A	Vcc = 5V, all black pattern at 75 Hz
Irush Inrush Current			3.0	A	
Vccrp Logic/LCD Drive Ripple Volt.			200	mv (p-p)	With panel loading

Operating LCD & Input Signal Specifications

Landmark MG36 controller card operate the LMG237C LCD with either VGA or DVI input video signal.

On the other hand, if the LMG237C LCD is operated with another controller card or directly from a single board computer, please refer to the AUO M190EG02 LCD data sheet for the LCD specification and the input signal characteristics such as pixel format, input date format, signal description, interface timing, as well as the LVDS interface input connector, and pin assignments. .

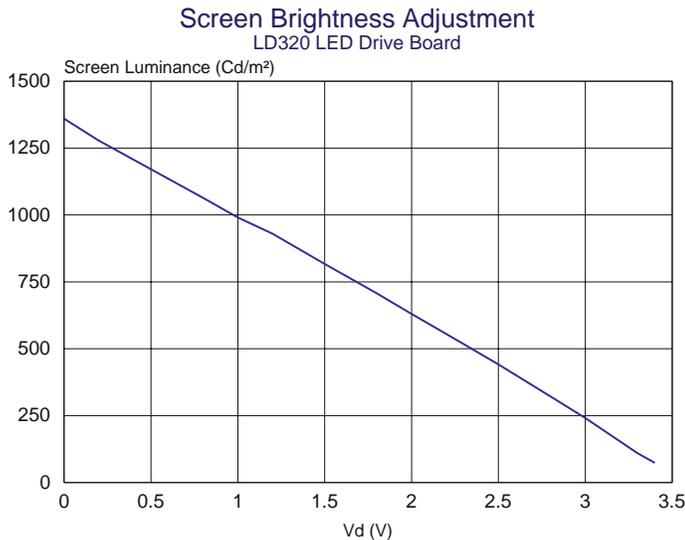
LED Backlight Driving Specifications

The LCD module has a VHB backlight with 2 LED strips Each LED lamp has 48 white LEDs. Each LED strip is terminated with a JST 2-pin connector, BHRS-02VS-1. The JST mating connector part number is SM02-BHSS-1-TB.

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

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

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



The Landmark LD320 drive board has 2 LED driving channels that is suitable to operates the LMG237C backlight. It uses a DC voltage for brightness adjustment (dimming). The figure on the left shows the LCD screen brightness versus the DC dimming voltage Vd.

At Vd = 3.3V, the screen brightness is dimmed down to about 110 nits. At Vd = 3.4V, the brightness is down to about 75 nits. It is not recommended to have Vd over 3.5V which may degrade the LCD brightness uniformity. For more detail information, please refer to the LD320 data sheet.

Backlight Life

The half brightness life of the VHB backlight in the LMG237C-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.

Thermal Management

The LED backlight in the LMG237C-190EG02 is very efficient. At 1,350 nits screen brightness, the backlight power is about 30 W. This is only 10.4 W more than the backlight power of the AUO M190EG02 at 240 nits brightness. As.

Thermal Management (continue)

a result, running LMG237C at 1,350 nits brightness 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 LMG237C-190EG02 LCD and its LED backlight.

LCD Mounting

The LMG237C-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 LMG237C-190EG02 LCD module. The maximum screw penetration depth inside the LCD module is 4 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

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Mechanical Dimensions

