



(V) Preliminary Specifications
 () Final Specifications

Module	12.1 Inch Color TFT-LCD
Model Name	G121SN01 V4

<p>Customer</p> <p>Checked & Approved by</p> <p>_____</p>	<p>Date</p> <p>_____</p>
<p>Note: This Specification is subject to change without notice.</p>	

<p>Approved by</p> <p>_____</p>	<p>Date</p> <p>_____</p>
<p>Prepared by</p> <p>_____</p>	<p>Date</p> <p>_____</p>
<p>General Display Business Division / AU Optronics corporation</p>	



Contents

1. Operating Precautions	4
2. General Description	5
2.1 Display Characteristics	5
2.2 Optical Characteristics.....	6
3. Functional Block Diagram	9
4. Absolute Maximum Ratings	10
4.1 Absolute Ratings of TFT LCD Module	10
4.2 Absolute Ratings of Environment.....	10
5. Electrical Characteristics	11
5.1 TFT LCD Module	11
5.2 Backlight Unit.....	13
6. Signal Characteristics	14
6.1 Pixel Format Image	14
6.2 Scanning Direction.....	14
6.3 TFT-LCD Interface Signal Description	15
6.4 The Input Data Format.....	16
6.5 TFT-LCD Interface Timing.....	18
6.6 Power ON/OFF Sequence	19
7. Connector & Pin Assignment	20
7.1 TFT-LCD Signal (CN1): LCD Connector	20
7.2 LED Backlight Unit (CN2): Backlight Connector	20
8. Reliability Test Criteria	21
9. Mechanical Characteristics	22
9.1 LCM Outline Dimension (Front View)	22
9.2 LCM Outline Dimension (Rear View)(Pin 1 position)	23
10. Label and Packaging	24
10.1 Shipping Label (on the rear side of TFT-LCD display)	24
10.2 Carton Package	24
11 Safety	25
11.1 Sharp Edge Requirements	25
11.2 Materials	25
11.3 Capacitors	25
11.4 National Test Lab Requirement.....	25



Record of Revision

Version and Date	Page	Old description	New Description
0.0 2009/02/03	All	First Edition	



1. Operating Precautions

- 1) Since front polarizer is easily damaged, please be cautious and not to scratch it.
- 2) Be sure to turn off power supply when inserting or disconnecting from input connector.
- 3) Wipe off water drop immediately. Long contact with water may cause discoloration or spots.
- 4) When the panel surface is soiled, wipe it with absorbent cotton or soft cloth.
- 5) Since the panel is made of glass, it may be broken or cracked if dropped or bumped on hard surface.
- 6) To avoid ESD (Electro Static Discharge) damage, be sure to ground yourself before handling TFT-LCD Module.
- 7) Do not open nor modify the module assembly.
- 8) Do not press the reflector sheet at the back of the module to any direction.
- 9) In case if a module has to be put back into the packing container slot after it was taken out from the container, do not press the center of the LED light bar edge. Instead, press at the far ends of the LED light bar edge softly. Otherwise the TFT Module may be damaged.
- 10) At the insertion or removal of the Signal Interface Connector, be sure not to rotate nor tilt the Interface Connector of the TFT Module.
- 11) TFT-LCD Module is not allowed to be twisted & bent even force is added on module in a very short time. Please design your display product well to avoid external force applying to module by end-user directly.
- 12) Small amount of materials without flammability grade are used in the TFT-LCD module. The TFT-LCD module should be supplied by power complied with requirements of Limited Power Source (IEC60950 or UL1950), or be applied exemption.
- 13) Severe temperature condition may result in different luminance, response time and lamp ignition voltage.
- 14) Continuous operating TFT-LCD display under low temperature environment may accelerate lamp exhaustion and reduce luminance dramatically.
- 15) The data on this specification sheet is applicable when LCD module is placed in landscape position.
- 16) Continuous displaying fixed pattern may induce image sticking. It's recommended to use screen saver or shuffle content periodically if fixed pattern is displayed on the screen.



2. General Description

This specification applies to the Color Active Matrix Liquid Crystal Display G121SN01 V4 composed of a TFT-LCD display, a driver and power supply circuit, and a LED backlight system.

The screen format is intended to support SVGA (800(H) x 600(V)) screen and 16.2M (RGB 8-bits) or 262k colors (RGB 6-bits).

LED driving board for backlight unit is included in G121SN01 V4 and the LED unit is replaceable.

All input signals are LVDS interface and compatible with G121SN01 V3.

G121SN01 V4 designed with wide viewing angle; wide temperature and long life LED backlight is well suited for industrial applications.

G121SN01 V4 is a RoHS product.

2.1 Display Characteristics

The following items are characteristics summary on the table under 25 °C condition:

Items	Unit	Specifications
Screen Diagonal	[inch]	12.1
Active Area	[mm]	246 (H) x 184.5 (V)
Pixels H x V		800 x 3(RGB) x 600
Pixel Pitch	[mm]	0.3075 x 0.3075
Pixel Arrangement		R.G.B. Vertical Stripe
Display Mode		TN, Normally White
Nominal Input Voltage VDD	[Volt]	3.3 (typ.)
Typical Power Consumption	[Watt]	6.7 W All black pattern
Weight	[Grams]	580 (Max.)
Physical Size	[mm]	279.0(H) x 209.0(V) x 9.0(D) (Typ.)
Electrical Interface		1 channel LVDS
Surface Treatment		Anti-glare, Hardness 3H
Support Color		16.2M / 262K colors
Temperature Range		
Operating	[°C]	-30 to +85
Storage (Non-Operating)	[°C]	-30 to +85
RoHS Compliance		RoHS Compliance



2.2 Optical Characteristics

The optical characteristics are measured under stable conditions at 25°C (Room Temperature):

Item	Unit	Conditions	Min.	Typ.	Max.	Remark
White Luminance	[cd/m ²]	I _F = 80mA/1 LED Line (center point)	330	450	-	Note 1
Uniformity	%	5 Points	75	-	-	Note 2, 3
Contrast Ratio			500	700	-	Note 4
Response Time	[msec]	Rising	-	10	20	Note 5
	[msec]	Falling	-	25	35	
	[msec]	Raising + Falling	-	35	55	
Viewing Angle	[degree]	Horizontal (Right) CR = 10 (Left)	70	80	-	Note 6
	[degree]		70	80	-	
	[degree]	Vertical (Upper) CR = 10 (Lower)	55	65	-	
Color / Chromaticity Coordinates (CIE 1931)		Red x	TBD	TBD	TBD	
		Red y	TBD	TBD	TBD	
		Green x	TBD	TBD	TBD	
		Green y	TBD	TBD	TBD	
		Blue x	TBD	TBD	TBD	
		Blue y	TBD	TBD	TBD	
		White x	TBD	TBD	TBD	
		White y	TBD	TBD	TBD	
Color Gamut	%			55	-	

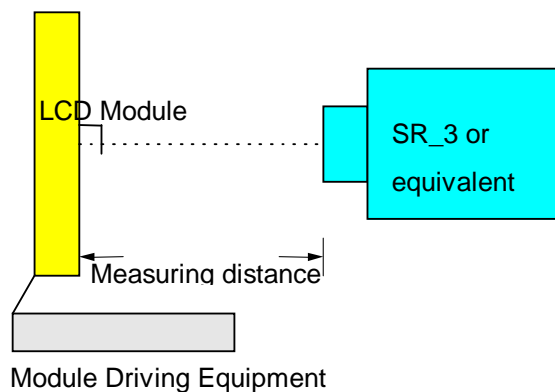
Note 1: Measurement method

Equipment Pattern Generator, Power Supply, Digital Voltmeter, Luminance meter (SR_3 or equivalent)

Aperture 1° with 50cm viewing distance

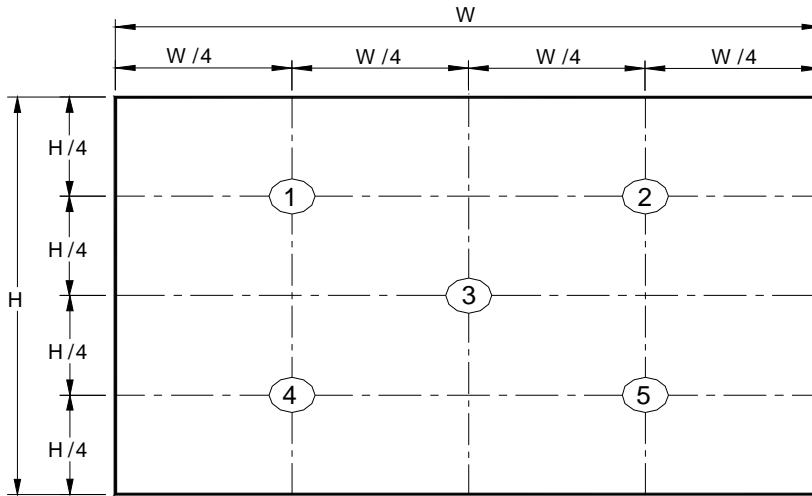
Test Point Center

Environment < 1 lux





Note 2: Definition of 5 points position (Display active area: 246mm (H) x 184.5mm (V))



Note 3: The luminance uniformity of 5 points is defined by dividing the minimum luminance values by the maximum test point luminance

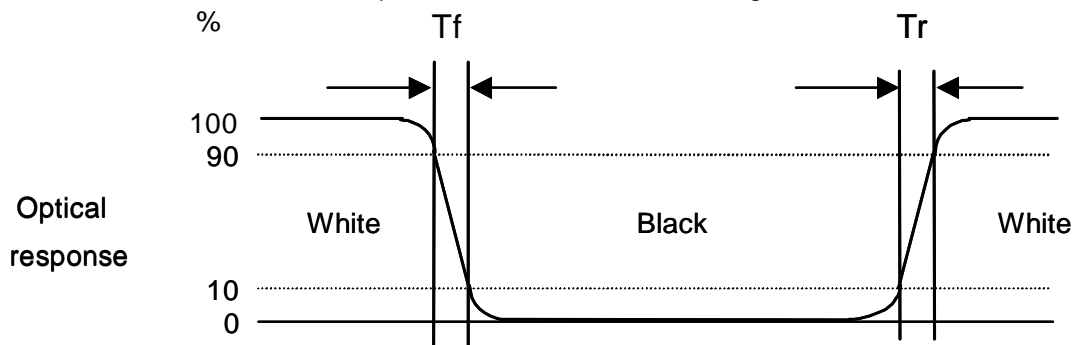
$$\delta_{w9} = \frac{\text{Minimum Brightness of five points}}{\text{Maximum Brightness of five points}}$$

Note 4: Definition of contrast ratio (CR):

$$\text{Contrast ratio (CR)} = \frac{\text{Brightness on the "White" state}}{\text{Brightness on the "Black" state}}$$

Note 5: Definition of response time:

The output signals of photo detector are measured when the input signals are changed from "White" to "Black" (falling time) and from "Black" to "White" (rising time), respectively. The response time interval is between 10% and 90% of amplitudes. Please refer to the figure as below.

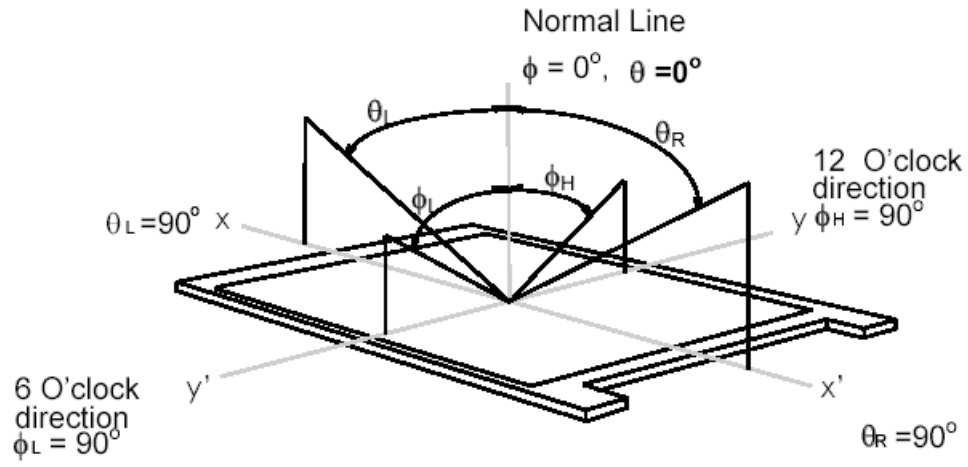


Note 6: Definition of viewing angle

Viewing angle is the measurement of contrast ratio ≥ 10 , at the screen center, over a 180° horizontal and 180° vertical range (off-normal viewing angles). The 180° viewing angle range is broken down as below: 90° (θ) horizontal left and right, and 90° (Φ) vertical high (up) and low (down). The measurement direction is typically perpendicular to the display surface with the screen rotated to its center to develop

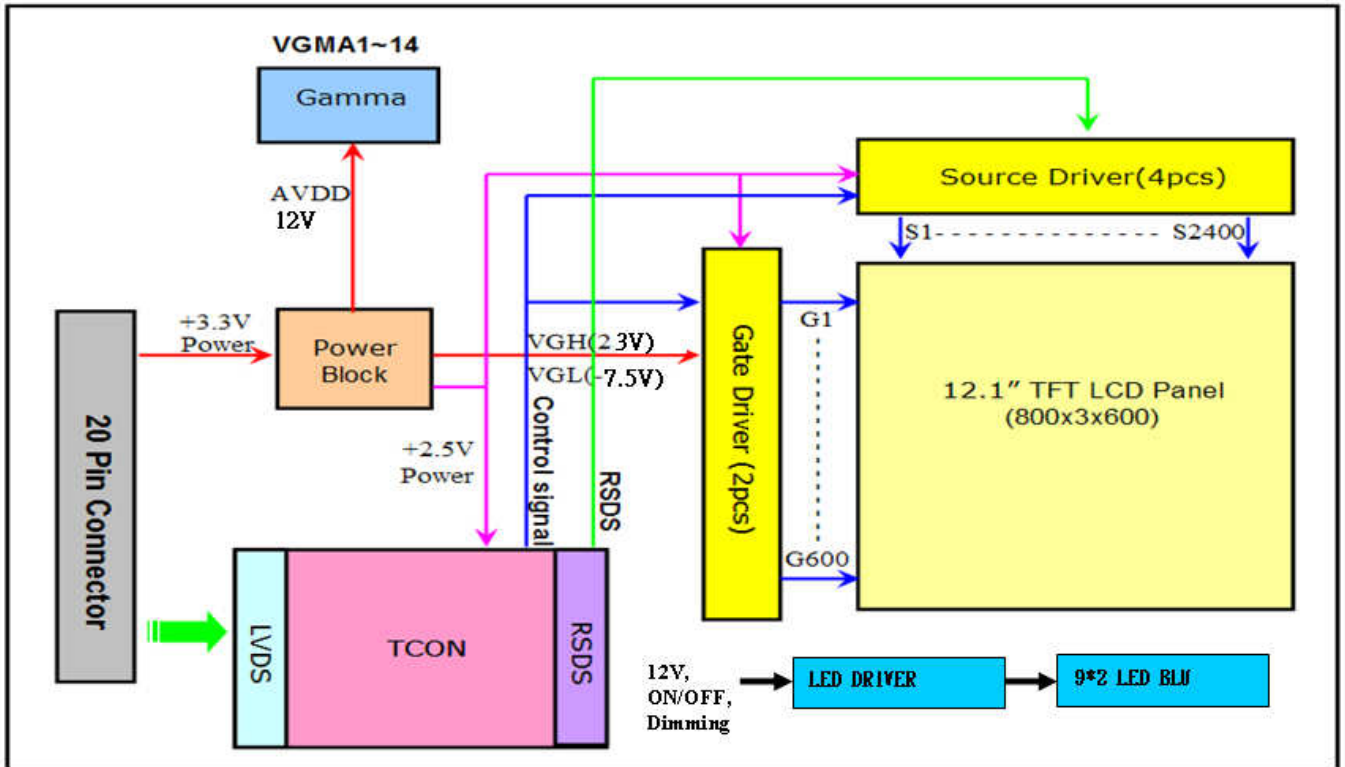


the desired measurement viewing angle.



3. Functional Block Diagram

The following diagram shows the functional block of the 12.1 inch color TFT/LCD module:





4. Absolute Maximum Ratings

4.1 Absolute Ratings of TFT LCD Module

Item	Symbol	Min	Max	Unit
Logic/LCD Drive	Vin	-0.3	+3.6	[Volt]

4.2 Absolute Ratings of Environment

Item	Symbol	Min	Max	Unit
Operating Temperature	TOP	-30	+85	[°C]
Operation Humidity	HOP	5	95	[%RH]
Storage Temperature	TST	-30	+85	[°C]
Storage Humidity	HST	5	95	[%RH]

Note: Maximum Wet-Bulb should be 39°C and no condensation.

