

**26 cm (10.4 inches), 640 × 480 pixels, 262,144 colors,  
Incorporated two-lamp/Edge-light type backlight  
Ultra Wide viewing angle**

**DESCRIPTION**

NL6448AC33-29 is a TFT (thin film transistor) active matrix color liquid crystal display (LCD) comprising amorphous silicon TFT attached to each signal electrode, a driving circuit and a backlight. NL6448AC33-29 has a built-in backlight. Backlight includes long-life-lamps and the lamps are replaceable.

The 26 cm (10.4 inches) diagonal display area contains 640 × 480 pixels and can display 262,144 colors simultaneously.

NL6448AC33-29 is suitable for industrial application use, because the viewing angle is ultra wide and the luminance is high. Also the viewing direction is selectable either upper or lower side changing scan direction.

**FEATURES**

- Ultra wide viewing angle with lateral electric field
- High luminance (250 cd/m<sup>2</sup>, typ.)
- Low reflection
- 6-bit digital RGB interface
- Data enable (DE) function
- Incorporated edge type backlight with lamps (Two lamps, with inverter)
- Lamp holder replaceable (Type No.: 104LHS31)
- Reversible scan direction
- Variable luminance control
- Easy to assemble a touch panel
- No antiglare treatment

**APPLICATIONS**

- Display terminals for control system
- Monitors for process controller
- Industrial PC



The information in this document is subject to change without notice.

**STRUCTURE AND FUNCTIONS**

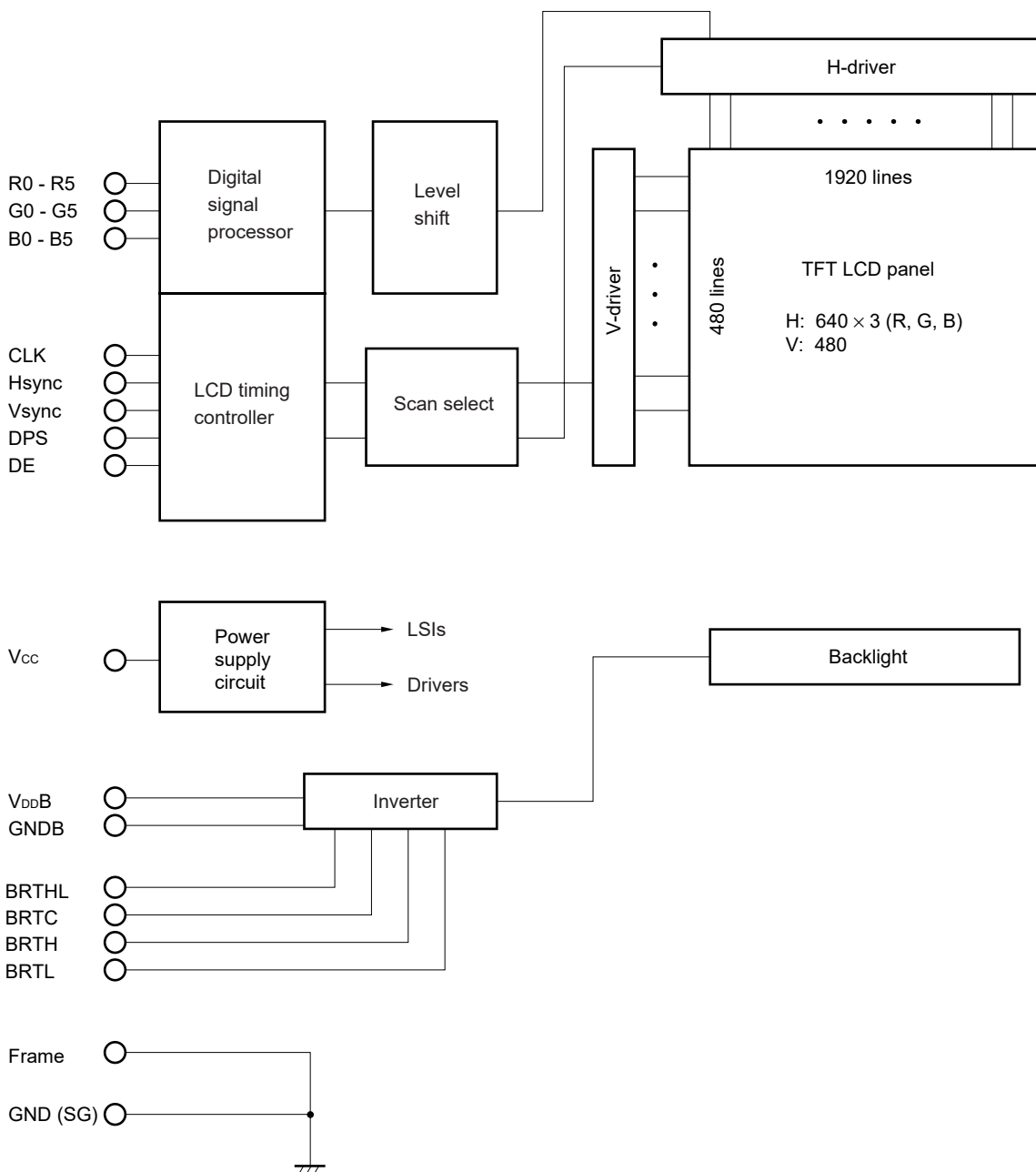
A color TFT (thin film transistor) LCD module is comprised of a TFT liquid crystal panel structure, LSIs for driving the TFT array, and a backlight assembly. The TFT panel structure is created by sandwiching liquid crystal material in the narrow gap between a TFT array glass substrate and a color filter glass substrate. After the driver LSIs are connected to the panel, the backlight assembly is attached to the backside of the panel.

RGB (red, green, blue) data signals from a source system is modulated into a form suitable for active matrix addressing by the onboard signal processor and sent to the driver LSIs which in turn addresses the individual TFT cells.

Acting as an electro-optical switch, each TFT cell regulates light transmission from the backlight assembly when activated by the data source. By regulating the amount of light passing through the array of red, green, and blue dots, color images are created with clarity.

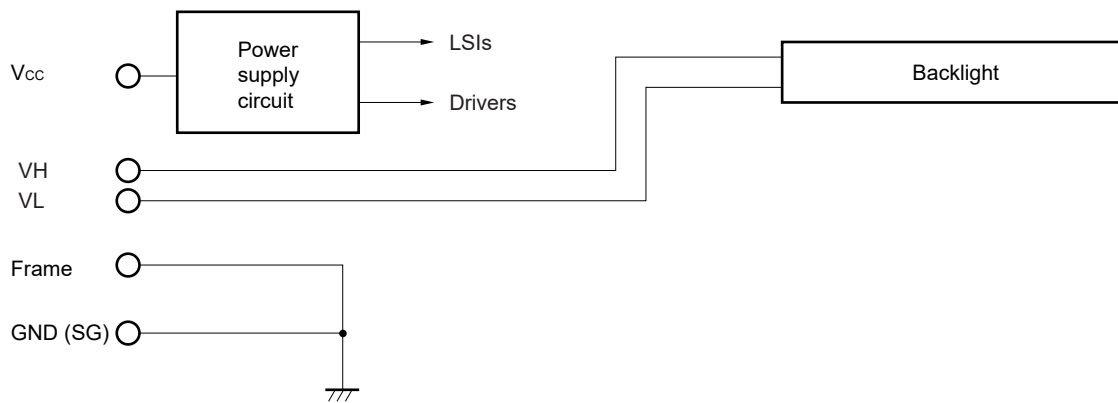
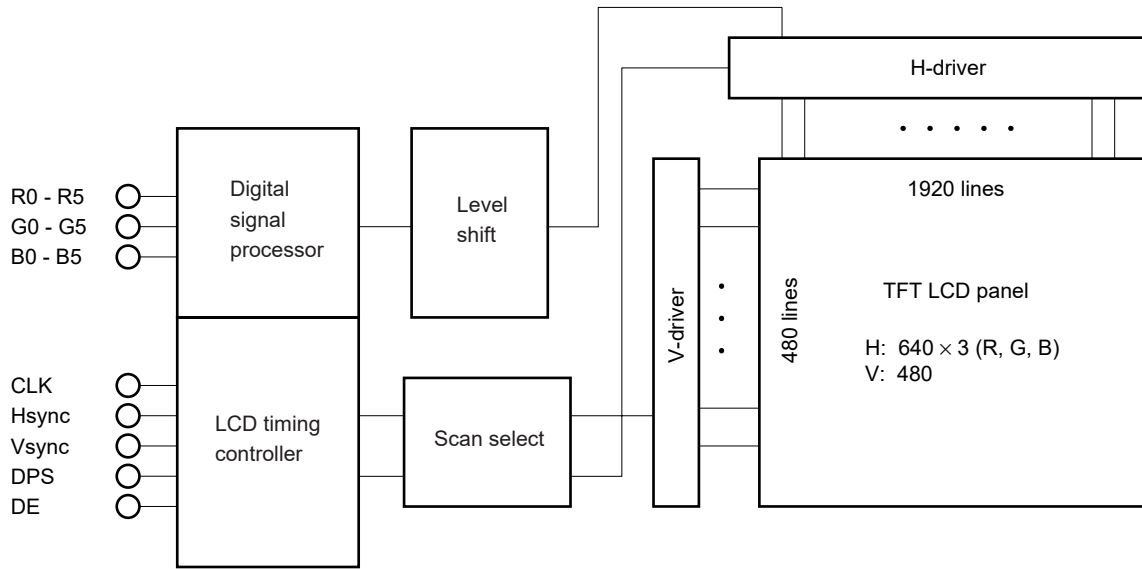
**BLOCK DIAGRAM**

<1> In case of use the inverter of NEC



**Note** Both frame and GNDB (Backlight ground) are not contacted to the lamp holder.

<2> In case of use the inverter of customers



**Note** Both frame and GNDB (Backlight ground) are not contacted to the lamp holder.

**OUTLINE OF CHARACTERISTICS (at room temperature)**

Display area	211.2 (H) × 158.4 (V) mm
Drive system	a-Si TFT active matrix
Display colors	262,144 colors
Number of pixels	640 × 480 pixels
Pixel arrangement	RGB vertical stripe
Pixel pitch	0.33 (H) × 0.33 (V) mm
Module size	243.0 (H) × 185.1 (V) × 10.5 typ. (D) mm
Inverter size	25.0 (H) × 105.0 (V) × 10.2 max. (D) mm
Weight	510 g (typ.) + 15 g (typ., inverter)
Contrast ratio	150 : 1 (typ.)
Viewing angle (more than the contrast ratio of 10 : 1)	Horizontal : 80° (typ., left side, right side) Vertical : 80° (typ., up side, down side)
Designed viewing direction	Optimum grayscale ( $\gamma = 2.2$ ): perpendicular
Color gamut	45% (typ., At center, to NTSC)
Response time	50 ms (typ.), black to white
Luminance	250 cd/m <sup>2</sup> (typ.)
Signal system	6-bit digital signals for each of RGB primary colors, synchronous signals (Hsync, Vsync), dot clock (CLK)
Supply voltages	3.3 V [5.0 V] (Logic, LCD driving), 12.0 V (Backlight)
Backlight	Edge light type, two cold cathode fluorescent lamp
Power consumption	7.1 W (typ., 3.3 V, 12.0 V)

**GENERAL SPECIFICATIONS**

Item	Specification	Unit
Module size	243.0 ± 0.5 (H) × 185.1 ± 0.5 (V) × 11.2 max. (D)	mm
Inverter size	25.0 ± 0.5 (H) × 105.0 <sup>+0.7</sup> <sub>-0.3</sub> (V) × 10.2 max. (D)	mm
Display area	211.2 (H) × 158.4 (V)	mm
Number of dots	640 × 3 (H) × 480 (V)	dot
Number of pixels	640 (H) × 480 (V)	pixel
Dot pitch	0.11 (H) × 0.33 (V)	mm
Pixel pitch	0.33 (H) × 0.33 (V)	mm
Pixel arrangement	RGB (Red, Green, Blue) vertical stripe	–
Display colors	262,144	color
Weight	Module: 530 (max.) + Inverter: 20 (max.)	g

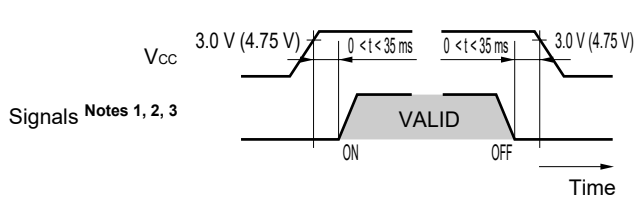
**ABSOLUTE MAXIMUM RATINGS**

Parameter	Symbol	Rating	Unit	Remarks
Supply voltage	V <sub>CC</sub>	–0.3 to 6.5	V	T <sub>a</sub> = 25°C V <sub>i</sub> – V <sub>CC</sub> < 0.3
Input voltage	V <sub>i</sub>	–0.3 to 6.5	V	
Supply voltage	V <sub>DD</sub> B	–0.3 to 15.0	V	
Input voltage	BRTC	–0.3 to 7.0	V	
Lamp voltage	V <sub>L</sub>	2000	V <sub>rms</sub>	
Storage temp.	T <sub>ST</sub>	–20 to 60	°C	–
Operating temp.	T <sub>OP</sub>	0 to 50	°C	Module surface <sup>Note</sup>
Humidity (No condensation)	RH	≤ 95% relative humidity	–	T <sub>a</sub> ≤ 40°C
		≤ 85% relative humidity	–	40 < T <sub>a</sub> ≤ 50°C
		Absolute humidity shall not exceed T <sub>a</sub> = 50°C, 85% relative humidity level.	–	T <sub>a</sub> > 50°C

**Note** Measured at the display area



**SUPPLY VOLTAGE SEQUENCE**



- Notes**
1. The supply voltage for input signals should be the same as V<sub>CC</sub>.
  2. Apply V<sub>DD</sub>B within the LCD operation period. When the backlight turns on before LCD operation or the LCD operation turns off before the backlight turns off, the display may momentarily become white.
  3. While the power is off, please keep whole signals (Hsync, Vsync, CLK, DE, and DATA) at low level or high impedance.

**INTERFACE AND PIN CONNECTION**

(1) Interface signals, power supply

Module side connector	Mating connector
CN1 ... DF9C-31P-1V (No.1 to 31)	DF9-31S-1V, DF9M-31S-1R .....(1)
	IL-310-T31S-VF .....(2)

Supplier: (1) HIROSE ELECTRIC CO., LTD., (2) Japan Aviation Electronics Industry Limited (JAE)

Pin No.	Symbol	Function
1	GND	Ground (SG) <sup>Note 4</sup>
2	CLK	Dot clock
3	Hsync	Horizontal sync.
4	Vsync	Vertical sync.
5	GND	Ground <sup>Note 4</sup>
6	R0	Red data (LSB)
7	R1	Red data
8	R2	Red data
9	R3	Red data
10	R4	Red data
11	R5	Red data (MSB)
12	GND	Ground <sup>Note 4</sup>
13	G0	Green data (LSB)
14	G1	Green data
15	G2	Green data
16	G3	Green data
17	G4	Green data
18	G5	Green data (MSB)

Pin No.	Symbol	Function
19	GND	Ground <sup>Note 4</sup>
20	B0	Blue data (LSB)
21	B1	Blue data
22	B2	Blue data
23	B3	Blue data
24	B4	Blue data
25	B5	Blue data (MSB)
26	GND	Ground <sup>Note 4</sup>
27	DE	Data enable <sup>Note 2</sup>
28	V <sub>CC</sub>	Power supply <sup>Note 1</sup>
29	V <sub>CC</sub>	Power supply <sup>Note 1</sup>
30	N. C.	Non-connection
31	DPS	Scan direction select <sup>Note 3</sup>

LSB : Least Significant Bit

MSB : Most Significant Bit

以上内容仅为本文档的试下载部分，为可阅读页数的一半内容。如要下载或阅读全文，请访问：<https://d.book118.com/118067003004006120>