



BR150S10(HT)

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Product Specification

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SPECIFICATION  
FOR  
APPROVAL

Title	15.0" XGA LED BACKLIGHT TFT LCD
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BUYER	
MODEL	BR150S10
SUFFIX	HT



## Product Specification

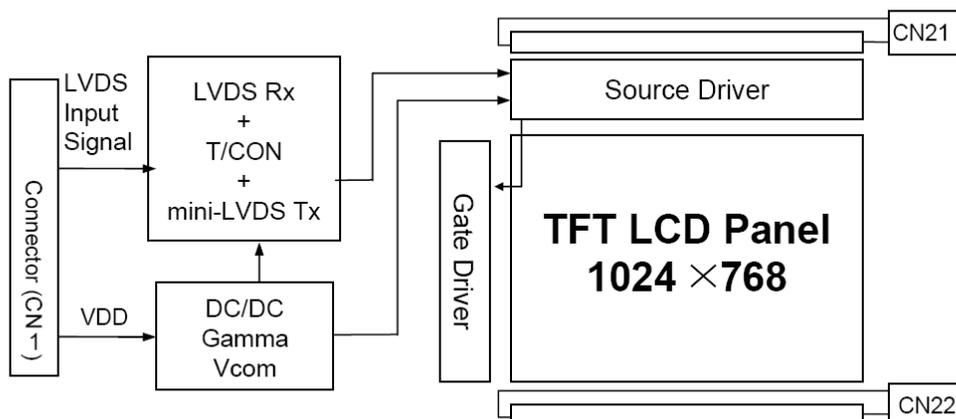
### 1. General Description

The BR150S10 is a Color Active Matrix Liquid Crystal Display with an integral Light Emitting Diode (LED) backlight system. The matrix employs a-Si Thin Film Transistor as the active element.

It is a transmissive type display operating in the normally white mode. This TFT-LCD has a 15.0 inch diagonal measured active display area with XGA resolution(768 vertical by 1024 horizontal pixel array) Each pixel is divided into Red, Green and Blue sub-pixels or dots which are arranged in vertical stripes.

Gray scale or the brightness of the sub-pixel color is determined with a 6-bit gray scale signal for each dot,thus, presenting a palette of more than 16.2M colors .

The BR150S10 has been designed to apply the interface method that enables low power, high speed,low EMI. FPD Link or compatible must be used as a LVDS(Low Voltage Differential Signaling) chip.



### General Features

Active screen size	15.0 inch diagonal
Outline Dimension	326.5(H) x 253.5(V) x 11.4(D) mm(Typ.)
Pixel Pitch	0.297mm x 0.297mm
Pixel Format	1024 horiz. by 768 vert. Pixels. RGB stripe arrangement
Display Colors	16.2M colors
Luminance, white	1000 cd/m <sup>2</sup> (Typ. Center 1 point)
Power Consumption	19.8 Watts(Typ.)
Weight	1250g (Typ.)
Display operating mode	Transmissive mode, normally white
Surface treatments	Hard coating (3H), Anti-glare treatment of the front polarizer



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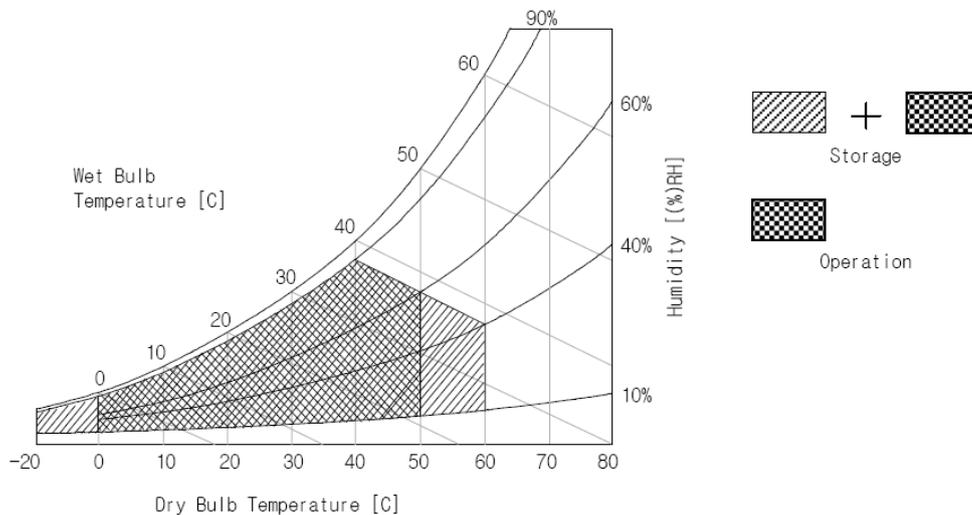
### 2. Absolute maximum ratings

The following are maximum values which, if exceeded, may cause faulty operation or damage to the unit.

**Table 1. Absolute Maximum Ratings**

Parameter	Symbol	Values		Units	Notes
		Min	Max		
Power Supply Input Voltage	V <sub>CC</sub>	-0.3	+5.5	V <sub>dc</sub>	At 25°C
Operating Temperature	T <sub>OP</sub>	-10	+50	°C	1
Storage Temperature	T <sub>ST</sub>	-20	+60	°C	1
Operating Ambient Humidity	H <sub>OP</sub>	10	+90	%RH	1
Storage Humidity	H <sub>ST</sub>	10	+90	%RH	1

Note : 1. Temperature and relative humidity range are shown in the figure below. Wet bulb temperature should be 39 °C Max, and no condensation of water.



**Figure 2. Temperature and relative humidity**



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### 3. Electrical specifications

#### 3-1. Electrical characteristics

The BR150S10 requires two power inputs. One is employed to power the LCD electronics and to drive the TFT array and liquid crystal. Another which powers the LED Backlight .LED Backlight Driver is an internal unit to the LCD.

**Table 2. Electrical Characteristics**

Parameter	Symbol	Values			Units	Notes
		Min	Type	Max		
Power Supply Input Voltage	V <sub>CC</sub>	3.0	3.3	3.6	V	
Permissive Power Input Ripple	V <sub>RF</sub>	-	-	100	mV	
Power Supply Input Current	I <sub>CC</sub>	-	700	1000	mA	1
Power Consumption	P <sub>C</sub>	-	2.5	3.3	Watts	
In Rush Current	I <sub>RUSH</sub>	-	2.0	3.0	A	2
Power Supply Input Voltage	V <sub>BL</sub>	9	12	18	V	3
Power Supply Input Current	I <sub>BL</sub>	-	1.38	-	A	
LED BL Power Consumption	P <sub>BL</sub>	-	16.56	-	Watts	4
Life Time		50,000			Hrs	5

**Note:** Do not attach a conducting tape to lamp connecting wire. If the lamp wire attach to conducting tape TFT-LCD Module have a low luminance.

- 1.The specified current and power consumption are under the V<sub>CC</sub>=3.3 V, 25°C, f<sub>v</sub> (frame frequency)=60Hz condition.
- 2.The duration of rush current is about 2ms. And V<sub>CC</sub> rise time is 520us ± 20%.
- 3.Operating voltage is measured under 25°C.
- 4.The LED Backlight power consumption shown above include LED Diver Module under 25°C.
- 5.The life time is determined as the time at which brightness of lamp is 50% compared to that of initial value at the typical lamp current on condition of continuous operating at 25°C.



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### 3-2. Interface Connections

- CN11 : Module Side Connector : DF14H-20P-1.25H (Hirose) or Equivalent  
User Side Connector : DF14-20S-1.25C (Hirose) or equivalent

Pin No	Symbol	Function	Remark
1	VDD	Power Supply, 3.3V (typical)	
2	VDD	Power Supply, 3.3V (typical)	
3	VSS	Ground	
4	VSS	Ground	
5	RIN0-	- LVDS differential data input (R0-R5, G0)	
6	RIN0+	+ LVDS differential data input (R0-R5, G0)	
7	VSS	Ground	
8	RIN1-	- LVDS differential data input (G1-G5, B0-B1)	
9	RIN1+	+ LVDS differential data input (G1-G5, B0-B1)	
10	VSS	Ground	
11	RIN2-	- LVDS differential data input (B2-B5, HS, VS, DE)	
12	RIN2+	+ LVDS differential data input (B2-B5, HS, VS, DE)	
13	VSS	Ground	
14	CLKIN-	- LVDS differential clock input	
15	CLKIN+	+ LVDS differential clock input	
16	VSS	Ground	
17	RIN3-	- LVDS differential data input (R6-R7, G6-G7, B6-B7)	
18	RIN3+	+ LVDS differential data input (R6-R7, G6-G7, B6-B7)	
19	VSS	Ground	
20	NC	No Connection	



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**Table 4. LED Backlight Driver connector pin configuration**

<b>Pin</b>	<b>Symbol</b>	<b>Description</b>	<b>Notes</b>
1	Vcc	LED Driver Power Supply Input Voltage	1
2	Vcc	LED Diver Power Supply Input Voltage	
3	On/Off	LED Backlight On/Off Control (0.0V-5.0V)	
4	Dim	Analog dimming voltage(0.0V-3.3V) or PWM Dimming input	2
5	GND	Ground	3
6	GND	Ground	

**Notes:**

1. The LED Driver Power supply Input Voltage Base on Table 2.
2. This Dim Voltage control brightness.

<b>Voltage</b>	<b>Function</b>	<b>Voltage</b>	<b>Function</b>
0V	Minimum Duty (20%)	3.3V	Maximum Duty (100%)

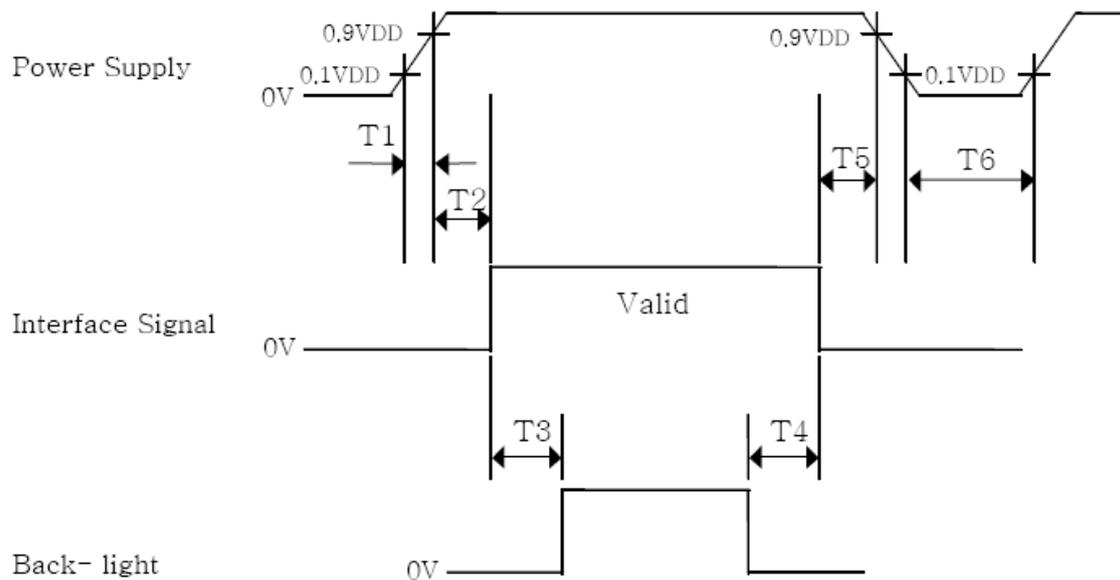
3. The backlight ground should be common with LCD metal frame.



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### 3-3. Power Sequence

To prevent a latch-up or DC operation of the LCD module, the power on/off sequence shall be as shown in below



- $0 \leq T1 \leq 10 \text{ ms}$
- $0 \leq T2 \leq 50 \text{ ms}$
- $200\text{ms} \leq T3$
- $500\text{ms} \leq T4$
- $0 \leq T5 \leq 50\text{ms}$
- $500\text{ms} \leq T6$

#### Notes:

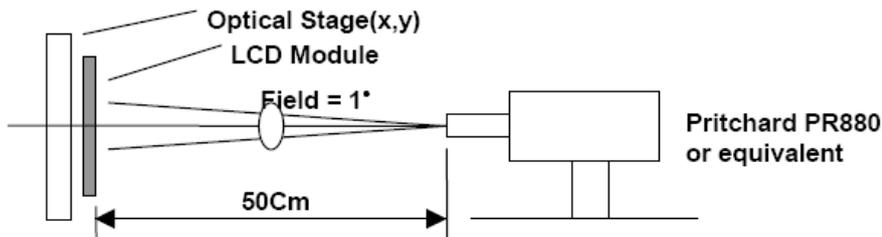
1. When the power supply VDD is 0V, Keep the level of input signals on the low or keep high impedance.
2. Do not keep the interface signal high impedance when power is on. Back Light must be turn on after power for logic and interface signal are valid.



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4. Optical Specifications

Optical characteristics are determined after the unit has been 'ON' and stable for approximately 30 minutes in a dark environment at 25 °C. The values specified are measured at an approximate distance 50cm from the LCD surface at a viewing angle 0 °.



[Figure 9] Optical characteristic measurement equipment and method

Table 5. Optical characteristics

Parameter	Symbol	Values			Units
		Min	Type	Max	
Contrast ratio	CR	400	500	-	
Surface luminance, white	L <sub>wH</sub>	900	1000	-	cd/m <sup>2</sup>
White luminance uniformity	Δ Y	75	80	-	%
Response time	G to G	-	8	-	ms
Color Temperature			10000		K
Color Gamut(NTSC %)			72		%
Viewing angle (by CR >10)	x axis, right( φ =0° )	65	75	-	degree
	x axis, left ( φ =180° )	65	75	-	
	y axis, up ( φ =90° )	60	70	-	
	y axis, down ( φ =270° )	50	60	-	
Cross Talk	CT	-	-	2.0	%

Notes:

1. Contrast Ratio(CR) is defined mathematically as :

$$CR = \text{Surface Luminance at all white pixels} / \text{Surface Luminance at all black pixels}$$

It is measured at center 1-point.

2. Surface luminance is determined after the unit has been 'ON' and 1Hour after lighting the backlight in a dark environment at 25 ± 2° C. Surface luminance is the luminance value at center 1-point across the LCD surface 50cm from the surface with all pixels displaying L255 white.

3. The White luminance uniformity on LCD surface is then expressed as :

$$\Delta Y = ( \text{Minimum Luminance of 9points} / \text{Maximum Luminance of 9points} ) * 100$$



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### 5. Mechanical Characteristics

Table 6. provides general mechanical characteristics for the model BR150S10. Please refer to Figure 5 regarding the detailed mechanical drawing of the LCD.

**Table 6. Mechanical characteristics**

Outside dimensions	Horizontal	326.5 ± 0.5mm
	Vertical	253.5 ± 0.5mm
	Depth	11.4 ± 0.5mm
Active display area	Horizontal	304.128mm
	Vertical	228.096mm
Weight(approximate)	1200g(Typ.), 1250g(Max.)	
Surface Treatment	Hard coating(3H) Anti-glare treatment of the front polarizer	

