



# AND150X4L06-HB-KIT

## 15.0\" XGA Color TFT LCD Module

### Features

- 15.0\" XGA color display (1024 x 768 pixels) that can displays 16.2M colors
- DE (Data Enable) only mode
- LVDS Interface with 1 pixel/clock
- Optimum viewing angle is at 6 o'clock direction
- 2 CCFL Backlight units
- Applications: Desktop monitor/stor

Product specifications contained herein may be changed without prior notice. It is therefore advisable to contact Purdy Electronics before proceeding with the design of equipment incorporating this product.

### Mechanical Specifications

Item	Specification	Unit
Bezel Opening Area	307.5 (W) x 231.4 (H)	mm
Number of Pixels	1024 (W) x R.G.B x 768 (H)	pixels
Active Area	304.128 (W) x 228.096 (H) x 15 max (D)	mm
Pixel Pitch	0.297 (W) x 0.297 (H)	mm
Pixel Arrangement	RGB vertical stripe	–
Driver Element	a-Si TFT active matrix	
Display Colors	16,194,277	color
Transmissive Mode	Normally white	–

### Absolute Maximum Ratings

Item	Symbol	Min	Max	Unit
Operation Humidity	H <sub>OP</sub>	10	90	%
Shock (Non-Operating)	S <sub>NOP</sub>	–	50	G
FL Driving Frequency	f <sub>FL</sub>	0	100	kHz
Vibration (Non-Operating)	V <sub>NOP</sub>	–	1.5	G
Operating Ambient Temperature	T <sub>op</sub>	0	50	°C
Storage Temperature	T <sub>st</sub>	-20	60	°C
Storage Humidity (Max. wet bulb temp = 39°C)	–	10	90	%RH

### Mechanical Specifications

Item	Min.	Typ.	Max.	Unit
Module Size	Horizontal (H)	320.5	321.0	321.5 mm
	Vertical (V)	244.9	245.4	245.9 mm
	Depth (D)	–	9.7	10 mm
Weight	–	–	930	g

### Electrical Specifications (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit
Power Supply Voltage	V <sub>DD</sub>	-0.3	–	4.0	V
Backlight Lamp Voltage	V <sub>L</sub>	–	–	2.5K	V(rms)
Backlight Lamp Current	I <sub>L</sub>	–	–	8.5	mA(rms)
Backlight Lamp Frequency	F <sub>L</sub>	–	–	80	KHz

### Electrical Characteristics for TFT LCD Module

Item	Symbol	Value			Unit
		Min.	Typ.	Max.	
Power Supply Voltage	V <sub>DD</sub>	3.0	3.3	3.6	V
Ripple Voltage	V <sub>RP</sub>	–	–	100	mVp-p
Rush Current	I <sub>RUSH</sub>	–	–	2.0	A
Power Supply Current (White)	I <sub>CC</sub>	–	400	–	mA
Power Supply Current (Black)		–	550	–	mA
Diff. Input Voltage for LVDS Receiver Threshold - H Level	V <sub>IH</sub>	–	–	100	mV
Diff. Input Voltage for LVDS Receiver Threshold - L Level	V <sub>IL</sub>	-100	–	–	mV
Terminating Resistor	R <sub>T</sub>	–	100	–	Ohm

### Optical Specifications (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit
Contrast	CR	200	350	–	–
Response	T <sub>R</sub>	–	6	10	ms
	T <sub>F</sub>	–	17	25	ms
Luminance	L	200	250	–	cd/m <sup>2</sup>

**Optical Specifications (continued)**

Item		Symbol	Condition	Min.	Typ.	Max.	Unit
White Variation		$\delta W$		–	1.25	1.40	–
Color Chromaticity	Red	R <sub>x</sub>	$\theta_x = 0^\circ, \theta_y = 0^\circ$ Viewing Normal Angle	0.603	0.633	0.663	–
		R <sub>y</sub>		0.327	0.357	0.387	–
	Green	G <sub>x</sub>		0.270	0.300	0.330	–
		G <sub>y</sub>		0.556	0.586	0.616	–
	Blue	B <sub>x</sub>		0.112	0.142	0.172	–
		B <sub>y</sub>		0.064	0.094	0.124	–
	White	W <sub>x</sub>		0.283	0.313	0.343	–
		W <sub>y</sub>		0.299	0.329	0.359	–
Viewing Angle	Horizontal	$\theta_x +$	CR $\geq$ 10	50	60	–	Deg.
		$\theta_x -$		50	60	–	
	Vertical	$\theta_y +$		30	40	–	
		$\theta_y -$		50	60	–	

**Backlight Unit**

Item	Symbol	Value			Unit
		Min.	Typ.	Max	
Lamp Input Voltage	V <sub>L</sub>	522	585	644	V <sub>RMS</sub>
Lamp Current	I <sub>L</sub>	2.0	8.0	8.5	mA <sub>RMS</sub>
Lamp Turn On Voltage	V <sub>S</sub>	–	–	1180 (25 °C)	V <sub>RMS</sub>
		–	–	1350 (0 °C)	V <sub>RMS</sub>
Operating Frequency	F <sub>L</sub>	40	50	80	KHz
Lamp Life Time	L <sub>BL</sub>	40,000	–	–	Hrs
Power Consumption	P <sub>L</sub>	–	9.36	–	mW

**Optical Characteristics - Test Conditions**

Item	Symbol	Value	Unit
Ambient Temperature	T <sub>a</sub>	25 ± 2	°C
Ambient Humidity	H <sub>a</sub>	50 ± 10	%RH
Supply Voltage	V <sub>DD</sub>	3.3	V
Input Signal	According to typical value in ELECTRIC CHARACTERISTICS		
Inverter Current	I <sub>L</sub>	8.0	mA

**Input Signal Timing Specifications**

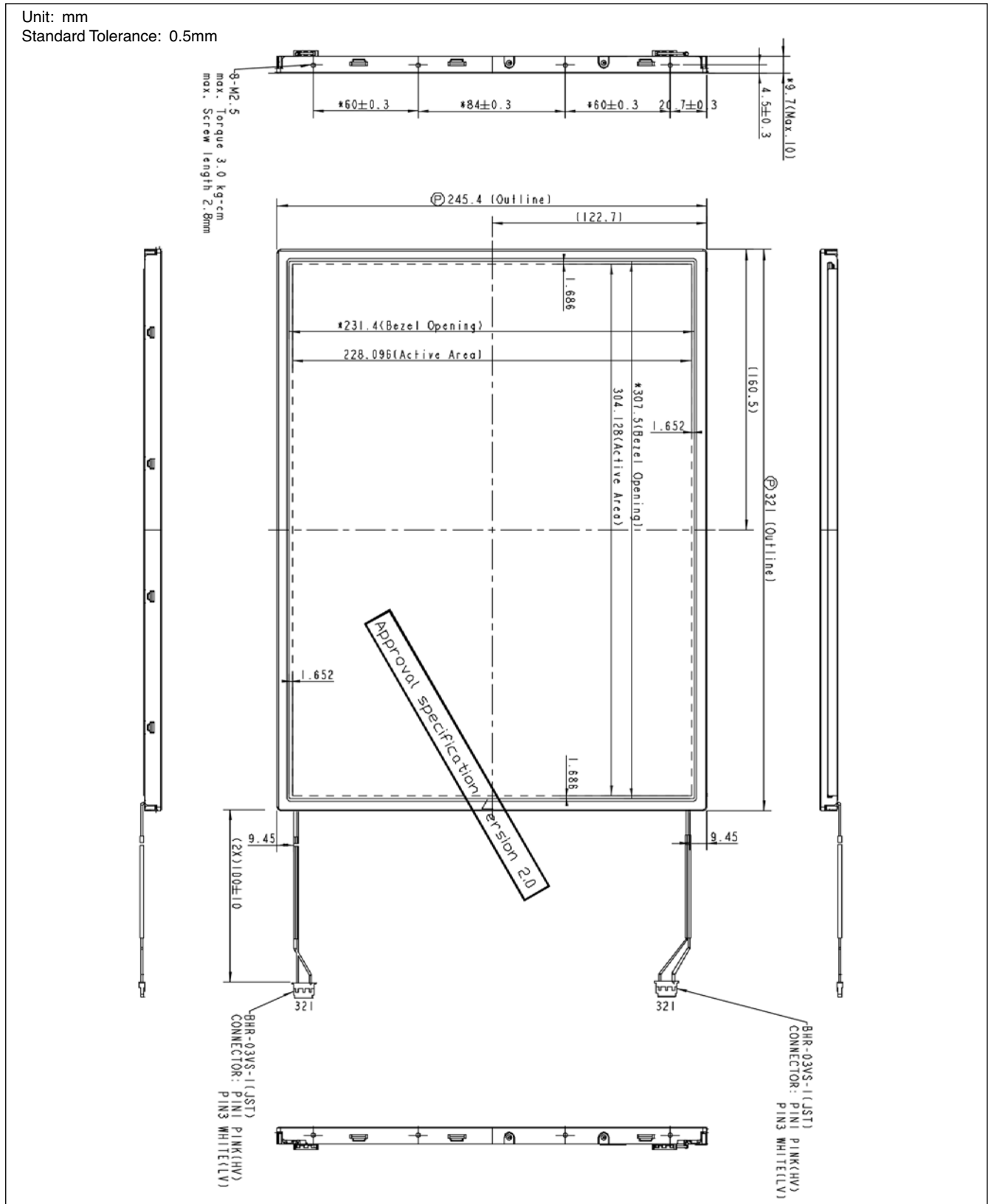
Signal	Item	Symbol	Min.	Typ.	Max.	Unit
DCLK	Pixel Clock	1/T <sub>C</sub>	–	65	80	MHz
DE	Vertical Total Time	T <sub>V</sub>	769	806	1200	T <sub>H</sub>
	Vertical Address Time	T <sub>VD</sub>	768	768	768	T <sub>H</sub>
	Horizontal Total Time	T <sub>H</sub>	1120	1344	1600	T <sub>C</sub>
	Horizontal Address Time	T <sub>HD</sub>	1024	1024	1024	T <sub>C</sub>

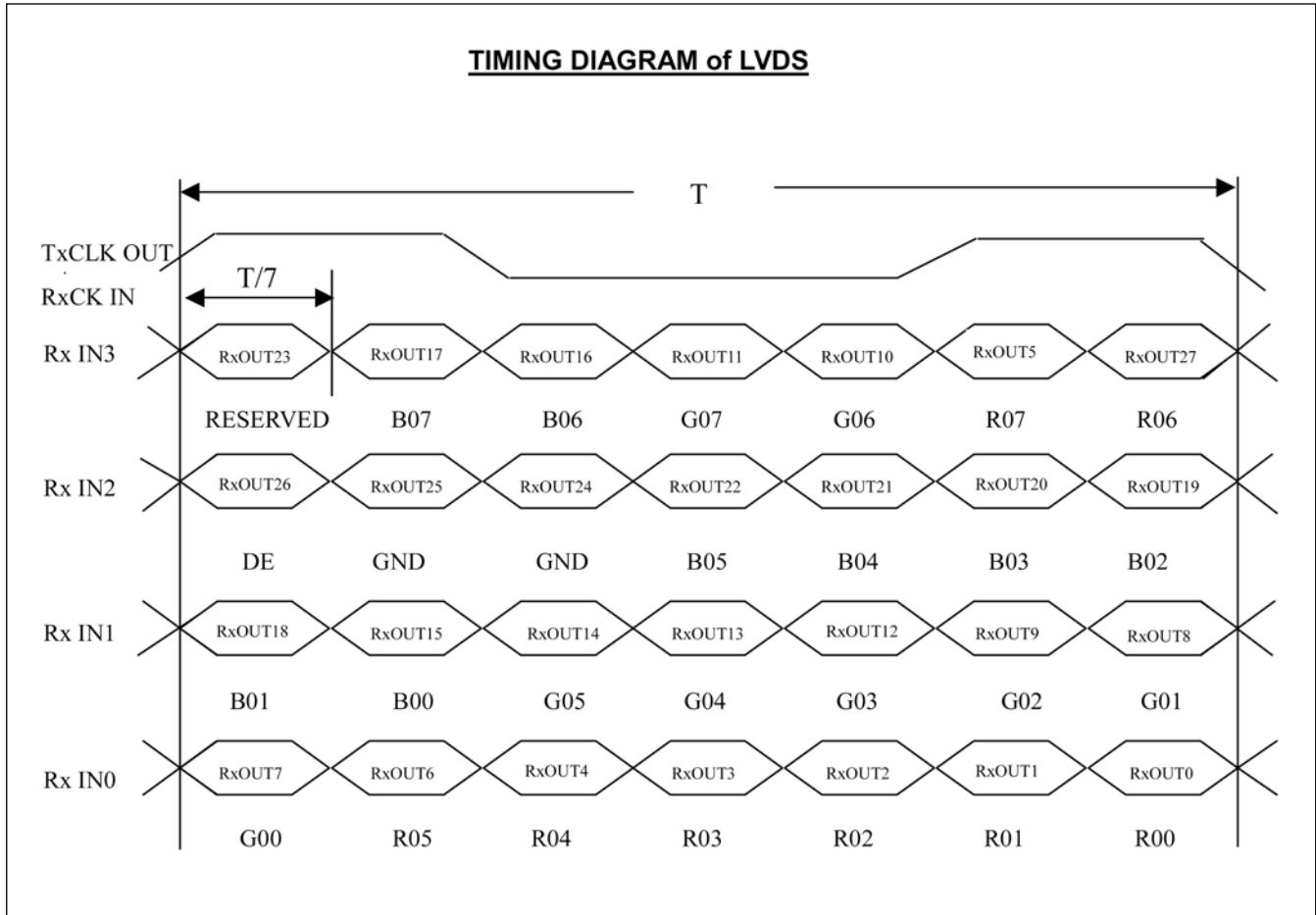
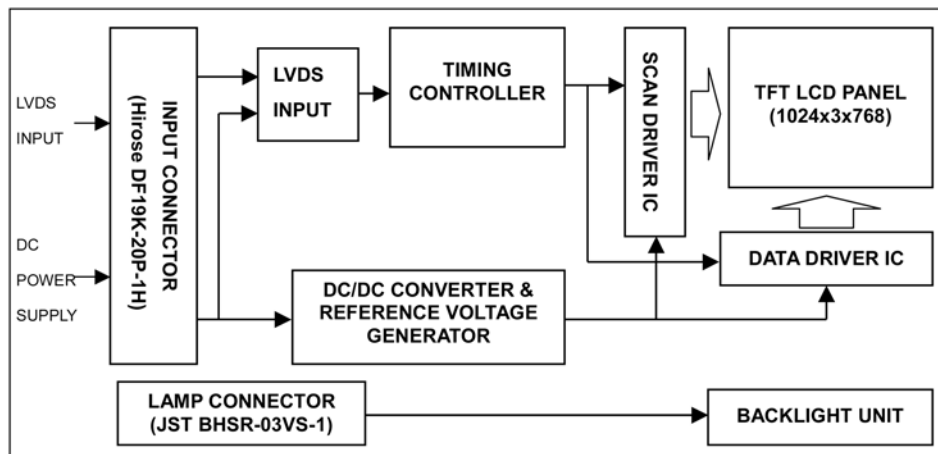


## Dimensional Outline

Unit: mm

Standard Tolerance: 0.5mm



**Timing Chart****Block Diagram**



## Color Data Input Assignment

The brightness of each primary color (red, green & blue) is based on the 8-bit gray scale data input for the color. The higher the binary input, the brighter the color. The table below provides the assignment of color vs. data input. (0: Low Level Voltage, 1: High Level Voltage)

Color		Data Signal																							
		Red								Green								Blue							
R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0		
Basic Colors	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Red	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Green	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	
	Cyan	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	Magenta	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Gray Scale of Red	Red (0)/ Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Red (1)	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Red (2)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	:	:								:								:							
	:	:								:								:							
	Red (252)	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Red (252)	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Red (252)	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Gray Scale of Green	Green(0)/ Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Green (1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
	Green (2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
	:	:								:								:							
	:	:								:								:							
	Green (252)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	
	Green (252)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	
	Green (252)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	
Gray Scale of Blue	Blue (0)/ Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Blue (1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
	Blue (2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
	:	:								:								:							
	:	:								:								:							
	Blue (252)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1
	Blue (252)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0
	Blue (252)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

**Input Terminal Pin Assignment (See NOTES Below)****TFT LCD Module**

Pin No.	Symbol	Function	Polarity
1	VDD	Power Supply +3.3V (typical)	
2	VDD	Power Supply +3.3V (typical)	
3	GND	Ground	
4	GND	Ground	
5	RX0-	LVDS Differential Data Input	Negative
6	RX0+	LVDS Differential Data Input	Positive
7	GND	Ground	
8	RX01-	LVDS Differential Data Input	Negative
9	RX1+	LVDS Differential Data Input	Positive
10	GND	Ground	
11	RX2-	LVDS Differential Data Input	Negative
12	RX2+	LVDS Differential Data Input	Positive
13	GND	Ground	
14	RXCLK-	LVDS Differential Data Input	Negative
15	RXCLK+	LVDS Differential Data Input	Positive
16	GND	Ground	
17	RX3-	LVDS Differential Data Input	Negative
18	RX3+	LVDS Differential Data Input	Positive
19	GND	Ground	
20	NC	Reserved	

**Backlight Unit**

Pin	Symbol	Description	Color
1	HV1	High Voltage	Pink/Blue
3	LV	Ground	White/Black

**NOTES****TFT LCD MODULE:****Connector Part No.: [Hirose] DF19K-20P-1H****Matching Socket Part No.: [Hirose] DF19-20S-1C****BACKLIGHT UNIT****Connector Part No.: BHR-03VS-1 (JST) or equivalent****Matching Connector Part No.: SM02B-BHS-1-TB (JST) or equivalent**