

# SPECIFICATIONS

**Version: V0**  
**This module uses ROHS material**

**PRODUCT:** TFT LCD MODULE

**MODEL NO:** HT0700EI02A

**SUPPLIER:** HTDisplay

**ISSUED DATE:** 2019-12-23

- Preliminary Specification
- Final Product Specification

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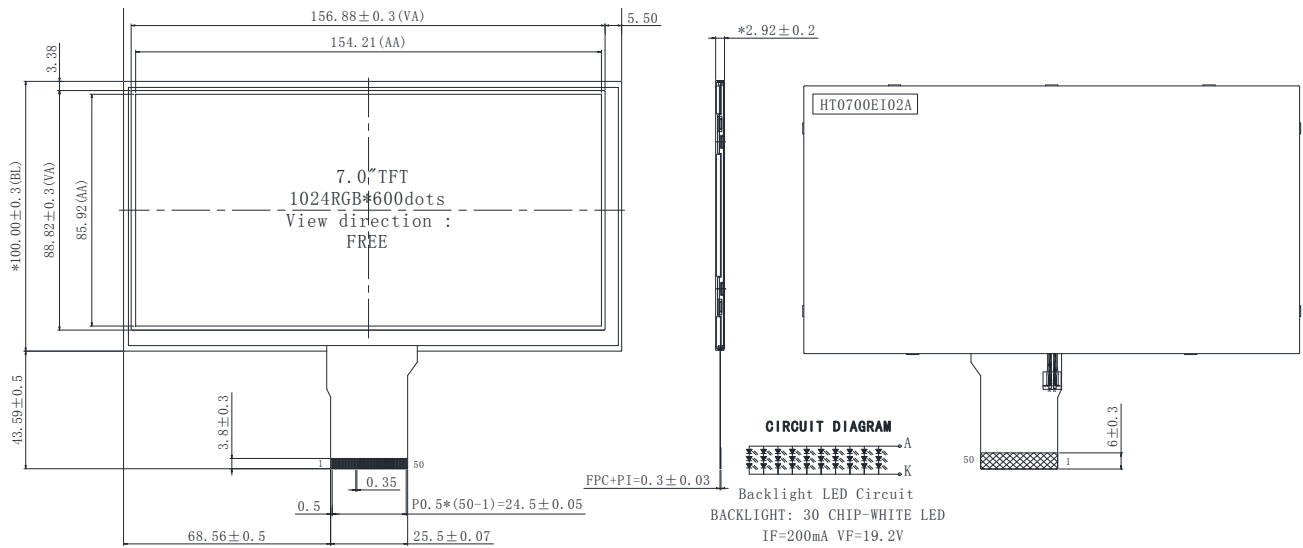


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## 1. General information

Feature	Spec	Unit
LCD size	7.0	inch
Resolution	1024 RGB x 600 Dots	---
Pixel pitch (WxH)	0.0502 x 0.1432	mm
Active area	154.21 (W) x 85.92 (H)	mm
Viewing area	156.88 x 88.82	mm
Display Mode	IPS,NW	---
LCM Outline( with TP) (WxHxT)	164.90 × 100.00 × 2.92	mm
With/Without TP	Without	---
Weight (g)	TBD	g
TFT Driver IC	EK79001HN,EK73215BCGA	---
TFT Interface	RGB 24 bit	---
TFT Input voltage	3.3	V
TFT Power consumption	TBD	mW
Backlight Power consumption	TBD	mW
LCM brightness	MIN 1000	Cd/m <sup>2</sup>

## 2. Mechanical drawing



## 3. Absolute maximum ratings

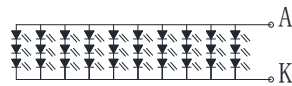
Item	Symbol	Min.	Max.	Unit
Supply voltage for logic	VDD	-0.3	3.6	V
Input voltage	VIN	-0.3	VDD+0.3	V
Operating temperature	TOP	-20	70	°C
Storage temperature	TST	-30	80	°C
Humidity	RH	--	90%(Max60 °C)	RH

#### 4. Electrical characteristics

Item	Symbol	Min.	Typ.	Max.	Unit
Supply voltage for logic	VDD	2.3	3.3	3.6	V
Input Current	I <sub>dd</sub>	--	TBD	TBD	mA
Input voltage 'H' level	V <sub>IH</sub>	0.7VDD	--	VDD	V
Input voltage 'L' level	V <sub>IL</sub>	VSS	--	0.3VDD	V
Output voltage 'H' level	V <sub>OH</sub>	0.8VDD	--	VDD	V
Output voltage 'L' level	V <sub>OL</sub>	VSS		0.2VDD	V

#### 5. Backlight characteristics

Item	Symbol	Min.	Typ.	Max.	Unit	Condition
Forward Current	I <sub>f</sub>	180	200	220	mA	
Forward Voltage	V <sub>f</sub>	16.8	19.2	20.4	V	
LED Life Time	L <sub>L</sub>	--	40000	--	Hrs	T <sub>a</sub> =25°C



Backlight LED Circuit  
 BACKLIGHT: 30 CHIP-WHITE LED  
 I<sub>F</sub>=200mA V<sub>F</sub>=19.2V

Figure 2

Note1: Under LCM operating, the stable forward current should be inputted. And forward voltage is for reference only.

Note2: Optical performance should be evaluated at T<sub>a</sub>=25°C. if LED is driven by high current, high ambient temperature & Humidity condition. The life time of LED will be reduced. Operating life means brightness goes down to 50% initial brightness. Typical operating life time is estimated data.

## 6. Electro-optical characteristics

### Optical Specification

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Note	
Transmittance	T(%)	Θ=0 Normal Viewing angle	4.8	5.0	—	%	Note 1	
Contrast Ratio	CR		—	800	—	—	Note 2	
Response Time	T <sub>ON</sub> +T <sub>OFF</sub>		—	30	40	msec	Note 5	
Color Gamut	(%)		—	50	—	%		
Color Chromaticity (CIE1931)	White		W <sub>X</sub>	-0.03	0.308	+0.03	—	Note 4
			W <sub>Y</sub>		0.336			
	Red		R <sub>X</sub>		0.599			
		R <sub>Y</sub>	0.338					
	Green	G <sub>X</sub>	0.299					
		G <sub>Y</sub>	0.550					
	Blue	B <sub>X</sub>	0.139					
B <sub>Y</sub>		0.131						
Viewing Angle	Hor.	Θ <sub>L</sub>	—	85	—	—	Note 1	
		Θ <sub>R</sub>	—	85	—			
	Ver.	Θ <sub>U</sub>	—	85	—			
		Θ <sub>D</sub>	—	85	—			
Optimal View Direction	Free							

#### Note :

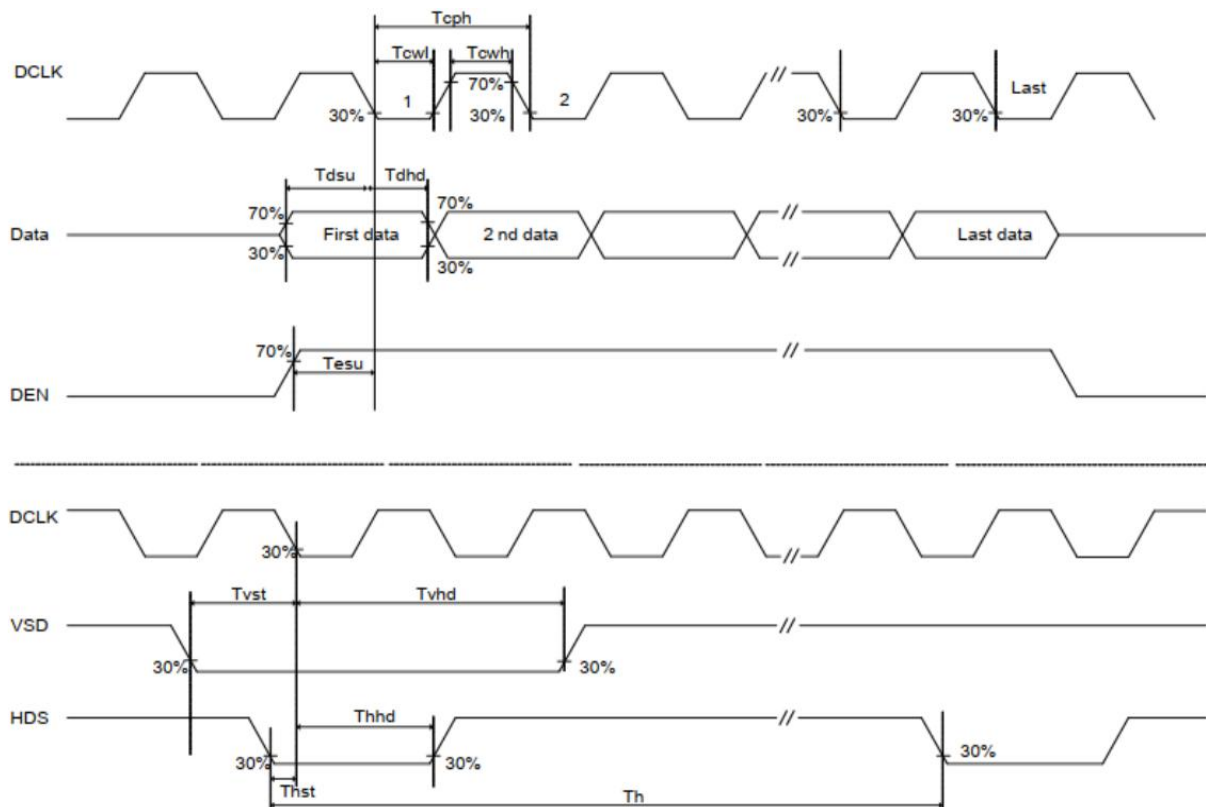
- Viewing angle is the angle at which the contrast ratio is greater than 10. The viewing angles are determined for the horizontal or 3, 9 o' clock direction and the vertical or 6, 12 o' clock direction with respect to the optical axis which is normal to the LCD surface (see FIGURE 5).
- Contrast measurements shall be made at viewing angle of  $\theta = 0$  and at the center of the LCD surface. Luminance shall be measured with all pixels in the view field set first to white, then to the dark (black) state . (see FIGURE 5) Luminance Contrast Ratio (CR) is defined mathematically.

$$CR = \frac{\text{Luminance when displaying a white raster}}{\text{Luminance when displaying a black raster}}$$

- Transmittance is the Value with Polarizer.
- The color chromaticity coordinates specified in Table 6 shall be calculated from the spectral data measured with all pixels first in red, green, blue and white. Measurements shall be made at the center of the panel.
- The elector-optical response time measurements shall be made as FIGURE 6 by switching the "data" input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is Tr, and 90% to 10% is TD.

## 7. Read/Write timing

Item	Symbol	Min.	Typ.	Max.	Unit	Condition
VDD Power On Slew rate	$T_{POR}$	1	--	20	ms	From 0V 90%ADD
RST pulse width	$T_{RST}$	50	--	--	ns	DCLK=65MHz
DCLK cycle time	$T_{CPH}$	14	--	--	ns	
DCLK pulse duty	$T_{CWH}$	40	50	60	%	
VSD setup time	$T_{VST}$	5	--	--	ns	
VSD hold time	$T_{VHD}$	5	--	--	ns	
HSD setup time	$T_{HST}$	5	--	--	ns	
HSD hold time	$T_{HHD}$	5	--	--	ns	
Data set-up time	$T_{DSU}$	5	--	--	ns	
Data hold time	$T_{DHD}$	5	--	--	ns	D0[7:0],D1[7:0],D2[7:0] to DCLK
DE setup time	$T_{ESU}$	5	-	--	ns	D0[7:0],D1[7:0],D2[7:0] to DCLK
DE hold time	$T_{EHD}$	5	--	--	ns	
Output stable time	$T_{SST}$	--	--	3	us	Dual gate



Parallel Input Clock and Data timing

Note: This section is only for reference, Details please refer to the IC specification.



## 8. Interface description

### TFT interface

No.	SYMBOL	Description
1-2	LEDA	LED power anode.
3-4	LEDK	LED power cathode.
5	GND	System ground.
6	VCOM	Power supply for the TFT-LCD common electrode.
7	VDD	Power Supply for Logic.
8	MODE	DE/SYNC mode select.
9	DE	Data input enable. Display access is enabled when DE is "H".
10	VSYNC	Vertical Sync Input
11	HSYNC	Horizontal Sync Input
12-19	B7-B0	Parallel 8-bit digital Blue data input.
20-27	G7-G0	Parallel 8-bit digital Green data input.
28-35	R7-R0	Parallel 8-bit digital Red data input.
36	GND	System ground.
37	DCLK	Pixel clock input pin.
38	GND	System ground.
39	L/R	Horizontal shift direction (source output) selection
40	U/D	Vertical shift direction (gate output) selection
41	VGH	Positive power supply for gate driver.
42	VGL	Negative power supply for gate driver.
43	AVDD	DC/DC converter for positive source OP-AMP driver.
44	RES	This signal will reset the device and must be applied to properly initialize the chip. Signal is active low.
45	NC	-
46	VCOM	Power supply for the TFT-LCD common electrode.
47	DITHB	Dithering function enable control, normally pull high.
48	GND	System ground.
49-50	NC	-

## 9. Reliability test conditions

No.	Test Item	Test condition	Remark
1	High Temperature Storage	80°C±2°C 240H	IEC60068-2-1:2007 GB2423.2-2008
2	Low Temperature Storage	-30°C±2°C 240H	IEC60068-2-1:2007 GB2423.1-2008
3	High Temperature Operation	70°C±3°C 240H	IEC60068-2-1:2007 GB2423.2-2008
4	Low Temperature Operation	-20°C±3°C 240H	IEC60068-2-1:2007 GB2423.1-2008
5	High Temperature /Humidity Storage	40°C±3°C 90%RH 240H	IEC60068-2-78:2007 GB2423.3-2006
6	Temperature Cycle	-30°C←→25°C←→80°C 5min 30min ←→25°C , 5min after 10cycle, Restore 4H at 25°C	IEC60068-2-14:1984 GB2423.22-2002
7	Vibration Test	10Hz~150Hz, 100m/s <sup>2</sup> , 120min	IEC60068-2-6:1982 GB/T2423.10-1995
8	Mechanical shock	100G ±X,±Y,±Z 3times for each direction	IEC60068-2-27:1987 GB/T2423.5-1995
9	Packing vibration test	0.015G <sup>2</sup> /Hz from 50~200Hz 6dB/Octave from 200~500Hz 2hours for each direction of X,Y,Z	IEC60068-2-34 GB/T2423.11
10	Dropping test	Drop to the ground from 0.5m height, one time, every side of carton. (Packing condition)	IEC60068-2-32:1990 GB/T2423.8-1995
11	ESD test	Voltage:±10KV R: 330Ω C: 150pF Air discharge, 10time	IEC61000-4-2:2001 GB/T17626.2-2006

**Note1:**

The component placed on a vibrating platform as it is assembled in the machine, wires included, is subjected to sinusoidal vibration in all directions XYZ

**Note2:**

After completing the reliability test, leave the samples under the room temperature and for the following inspection items:

1. No clearly visible defects or deterioration of display quality allowed.
2. No function-related abnormalities.
3. Connected parts still connecting tightly.
4. Display characteristics fulfill initial value contrast ratio should be an least 30% of initial value.

## **10. Storage and use precautions**

**When storing and using the LCD modules, the following precaution are necessary:**

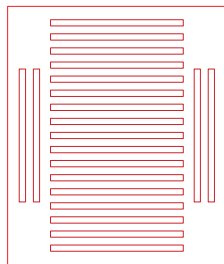
- 10.1 Store them in a sealed polyethylene bag. If properly sealed, there is no need for the desiccant.
- 10.2 Store them in a dark place. Do not expose to sunlight or fluorescent light, keep the temperature between 0°C and 35°C, and keep the relative humidity between 40%RH and 60%RH.
- 10.3 The LCD modules should be stored in the room without acid, alkali and harmful gas.
- 10.4 The polarizer surface should not come in contact with any other objects (We advise you to store them in the anti-static electricity container in which they were shipped).
- 10.5 The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, damp and sunshine.
- 10.6 Liquid crystals solidify under low temperature (below the storage temperature range) leading to defective orientation or the generation of air bubbles (black or white). Air bubbles may also be generated if the module is subject to a low temperature.
- 10.7 If the LCD modules have been operating for a long time showing the same display patterns, the display patterns may remain on the screen as ghost images and a slight contrast irregularity may also appear. A normal operating status can be gained by suspending use for some time. It should be noted that this phenomenon does not adversely affect performance reliability.
- 10.8 The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.
- 10.9 If the display panel is damaged and the liquid crystal substance inside it leaks out, be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes, promptly wash it off using soap and water.
- 10.10 Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.
- 10.11 The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.
- 10.12 If the display surface is contaminated, gently wipe it with a soft dry cloth. If still not completely clear, moisten cloth with one of the following solvents:
  - Isopropyl alcohol
  - Ethyl alcoholSolvents other than those mentioned above may damage the polarizer. Especially, do not use the following:
  - Water
  - Ketone
  - Aromatic solvents
- 10.13 Do not attempt to disassemble the LCD Module.

10.14 If the logic circuit power is off, do not apply the input signals.

10.15 To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.

- Be sure to ground the body when handling the LCD Modules.
- Tools required for assembly, such as soldering irons, must be properly ground.
- To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions
- The LCD Module is coated with a film to protect the display surface. -
- Be care when peeling off this protective film since static electricity may be generated.
- Exposed area of the printed circuit board.
- Terminal electrode sections

## 11. Packing

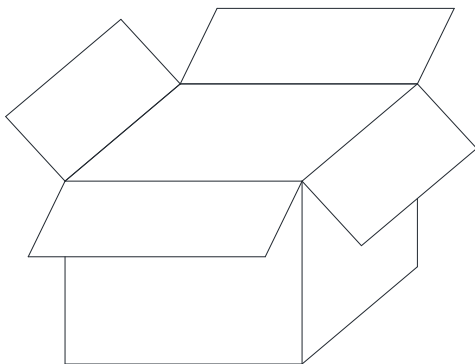


(1)

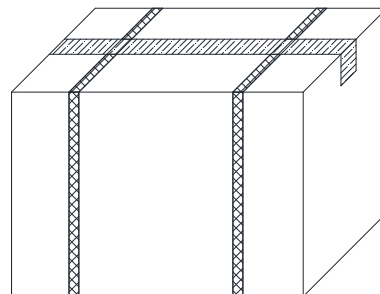
(1) Place the module into the pearl cotton tray.

(2) Place the pearl cotton tray into the carton.

(3) Wrap the carton well.



(2)



(3)