



# **GH320240-5701**

## **STN DOTS LCD MODULE**

### **SPECIFICATION**

<b>Standard code</b>	<b>Department</b>	<b>Rev No.</b>
Hunan Huayuan display technology CO.,LTD		A/0
<b>Checked by</b>	<b>Written by</b>	<b>Date</b>
		2015-12-16

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**1、 GENERAL SPECIFICATIONS**

Screen size	5.7"(Diagonal)
Display color	Display color: White Background color: Blue
Type	STN
Viewangle direction	12'clock
Driver mode	1/240 DUTY 1/16 BIAS
Backlight	LED
Driver IC	IST3025T IST3026T or NT7701,NT7702
Data bus	8080 interface and 8-bit
Temperature range	Operation: -20 °C ---- +70°C Storage: -30 °C ---- +80°C
Numbr of Dots	320x 240
Dot size	0.33 x 0.33mm
Dot pitch	0.36 x 0.36mm
Viewing size	122.0 x 92.0mm
Active area	115.17 x 86.37mm
Outline dimension	166.75 x 109.0 x10.6mm Max

**2、 ELECTRICAL CHARACTERISTICS**

Parameter	Symbol	Min	Type	Max	Unit	
Supply voltage for logic	$V_{DD}-V_{SS}$	4.8	5	5.2	V	
Supply Voltage for LCD Driving	$V_{SS}-V_0$	Ta=0 °C	-	-18.5		-
		Ta=25 °C	-17.6	-18.0		-18.4
		Ta=50 °C	-	-17.5		-
Input Voltage	$V_{IH}$	0.7 $V_{DD}$	-	$V_{DD}$		
	$V_{IL}$	0	-	0.3 $V_{DD}$		
Supply current	$I_{DD}$	Backlight	-	50	60	mA
		Without LED	-	230	260	mA
Supply Voltage for LED	$V_{LED}$	-	5.0	5.2	V	
Supply Current for LED	$I_{LED}$	-	180	200	mA	

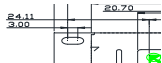
**3、 ABSOLUTE MAXIMUM RATINGS**

Parameter	Symbol	Min	Max	Unit	Remark
Supply voltage for logic	$V_{DD}-V_{SS}$	-0.3	7.0	V	
Supply Voltage for LCD Driving	$V_{LCD}-V_{DD}$	-0.3	26		
Operating temperature	$T_{OP}$	-20	+70	°C	
Storage temperature	$T_{ST}$	-30	+80		
Humidity	RH:	90%	50		Max

4、 OPTICAL CHARACTERISTICS

Item	Symbol	Conditon	Typ.	Unit	Remark
Viewing angle	∅f	CR≥2	40	Radian	∅f
	∅b		30		∅b
	∅l		30		∅l
	∅r		30		∅r
Response time	T <sub>R</sub>	TA=25 °C	120	ms	
	T <sub>F</sub>		130		
Frame Frequency	F <sub>RM</sub>		64	Hz	
Contrast ratio	C <sub>R</sub>		6.0	-	

5、 EXTERNAL DIMENSIONS



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6、 INTERFACE DESCRIPTION

JP1

PIN	DESC	Function
1	S	Frame signal
2	CL1	Line latch signal
3	CL2	Clock signal
4	DISP	Display switch。 L: (Close), H: (Open)
5	VDD	Power supply for Logic circuit and LCD
6	VSS	Ground
7	VEE	Negative voltage output
8	D0	Data Bus
9	D1	Data Bus
10	D2	Data Bus
11	D3	Data Bus
12-15	NC	--
16	VSS	Ground

JP2 JP5 JP6 JP7

PIN	DESC	Function
1	D0	Data Bus
2	D1	Data Bus
3	D2	Data Bus
4	D3	Data Bus

5	DISP	Display switch。 L: (Close), H: (Open)
6	S	Frame signal
7	NC	—
8	CL1	Line latch signal
9	CL2	Clock signal
10	VDD	Power supply for Logic circuit and LCD
11	VSS	Ground
12	VEE	Negative voltage output
13	VO	Contrast adjust
14	GND	Frame ground

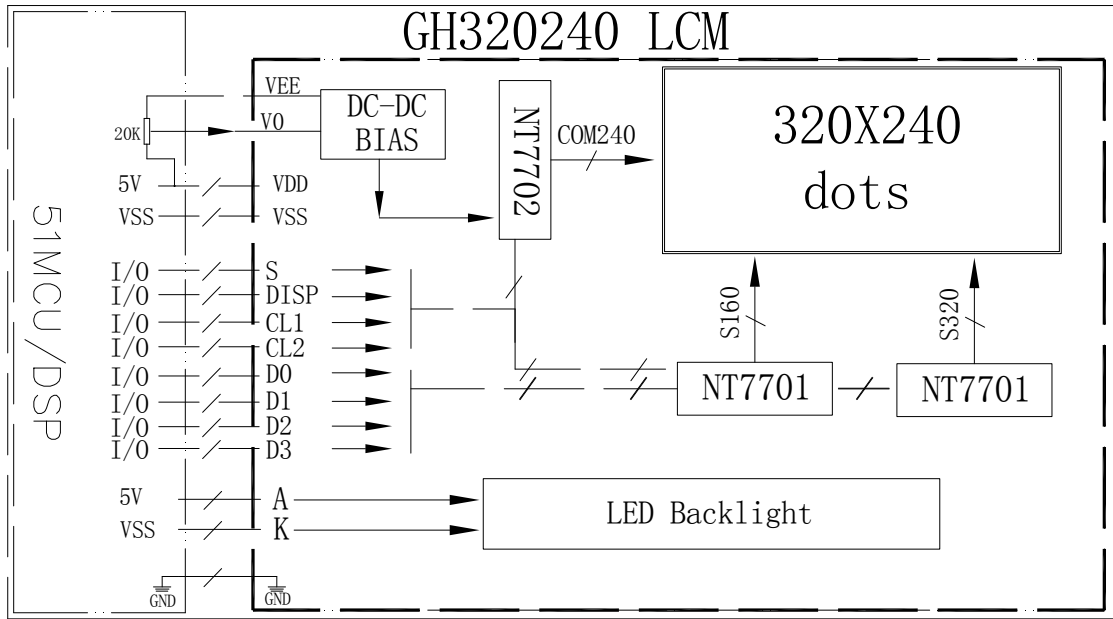
JP3 JP4

PIN	DESC	Function
1	U	NC
2	L	NC
3	D	NC
4	R	NC
5	D0	Data Bus
6	D1	Data Bus
7	D2	Data Bus
8	D3	Data Bus
9	DISP	Display switch。 L: (Close), H: (Open)
10	S	Frame signal
11	NC	--
12	CL1	Line latch signal
13	CL2	Clock signal
14	VDD	Power supply for Logic circuit and LCD
15	VSS	Ground
16	VEE	Negative voltage output
17	V0	Contrast adjust
18	GND	Frame ground

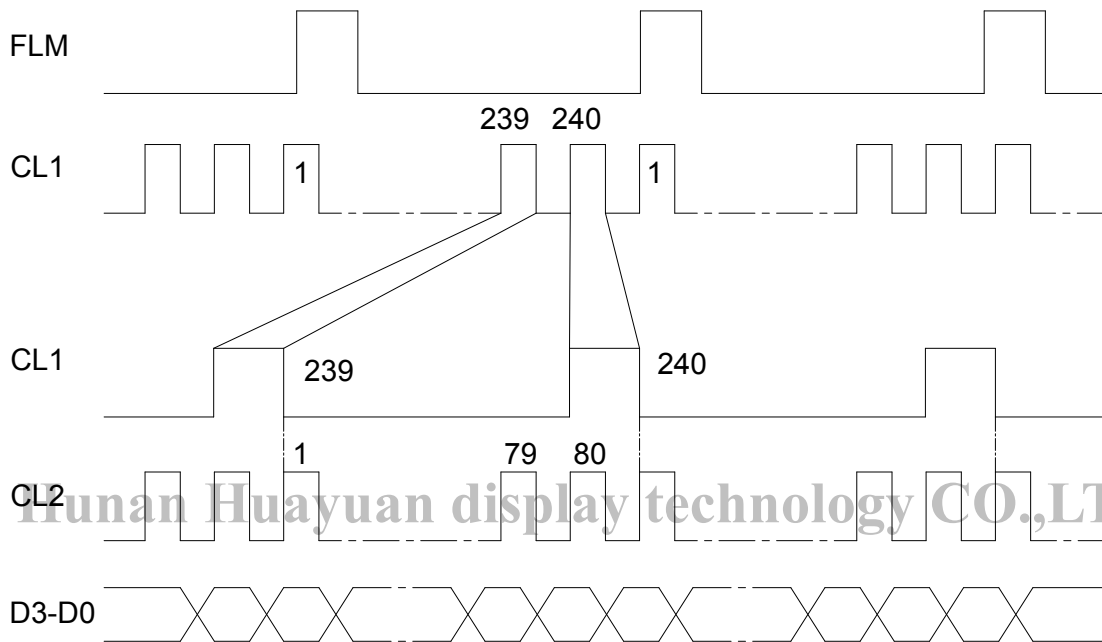
**BLK: pin\*2.0**

<b>1</b>	<b>LED+(5V)</b>	
<b>2</b>	<b>LED-</b>	

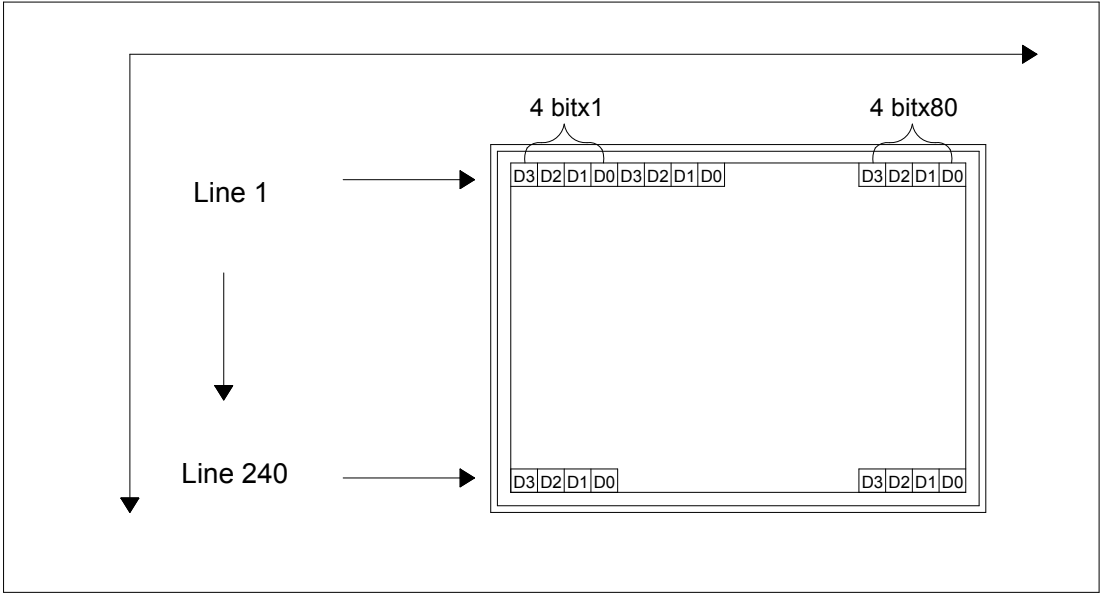
## 7、 BLOCK DIAGRAM



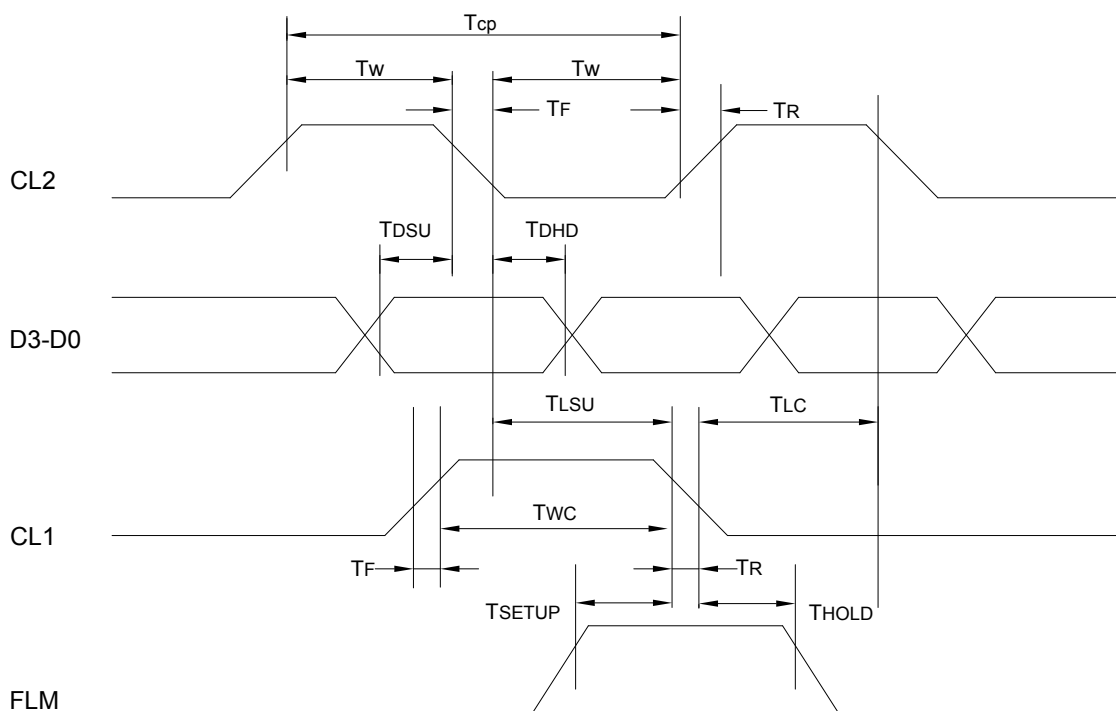
8、 AC TIMING DIAGRAMS



9、 LCD DISPLAY AREA MAPPING DIAGRAM



10、 AC CHARACTERISTICS



Condition of test: (VSS =0V, VDD=4.5V~5.5V, TA=0 to 50 °C)

Parameter	Symbol	VDD=5.0V±10%		Unit
		Min.	Max.	
“CL2” Clock Period	$T_{CP}$	153	-	ns
“CL2” Clock Pulse Width	$T_w$	56	-	ns
Clock Rise,Fall Time	$T_R / T_F$	-	20	ns
Data Setup Time	$T_{DSU}$	50	-	ns
Data Hold Time	$T_{DHD}$	40	-	ns
CL1 Set Up Time	$T_{LSU}$	65	-	ns
CL1 Hold Time	$T_{LC}$	65	-	ns
“FLM” Setup Time	$T_{SETUP}$	100	-	ns
“FLM” Hold Time	$T_{HOLD}$	100	-	ns
“CL1” Pulse Width	$T_{WC}$	70	-	ns

11、 LIQUID CRYSTAL MODULE USE MATTERS NEEDING ATTENTION

1. When using the liquid crystal module you design your product, pay attention to the liquid crystal perspective and uses your consistent.
2. The LCD screen is the glass based, dropping or with a hard object impact will cause cracking or crushing the LCD screen. Especially in the corner.
3. In spite of the polarizer, liquid crystal surface can inhibit the reflective surface, should be careful not to scratch the surface, generally recommend using the protective screen of transparent plastic material in the liquid crystal surface.

4. If the LCD module storage in the following below the required temperature, liquid crystal material condenses and performance deterioration. If the LCD module storage above the specified temperature, molecular crystal orientation will be transformed into liquid, may not be restored to the original state. Beyond the temperature and humidity range, will cause the polarizer peeling or foaming. Therefore, the LCD module should be stored at the specified temperature range.
5. Such as liquid crystal surface in slobber or drop, should immediately erase, avoid long time after induced color changes or leave a stain. The water vapor will cause erosion of ITO electrode
6. If you need to clean the surface of the LCD screen, should use cotton or soft cloth lightly wipe, is still not clear, smooth and then wipe.
7. LCD module driver shall comply with the provisions of the rating index, and avoid the fault and permanent damage. DC voltage applied to the liquid crystal materials, liquid crystal materials will cause rapid deterioration, should ensure the continuous application of M signal to provide AC waveform. Especially, when a power switch shall comply with the order of power supply, avoid driving latch and DC added directly to the LCD screen.
8. Machine Matters needing attention
  - a) The LCD module is arranged on the high precision of the debugging. To avoid the impact of external force, do not modify or change
  - b) Do not tamper with Any prominent part of the metal frame
  - c) Don't punch a hole in PCB or change in shape, do not move or modify elements.
  - d) Don't touch the conductive rubber, especially in the insert backlight board. (such as EL backlight).
  - e) In the installation of the LCD module, ensure that the PCB was not affected by the twisting or bending force force. Conductive rubber contact is very precise, dislocation slightly in the original basis will lead to the missing pixels.
  - f) To avoid pressure on the metal clamping part, otherwise it will lead to the conductive rubber deformation and lost contact, causing the missing pixels.
9. Static electricity: Because the liquid crystal module internal assembly CMOS circuit, must take the following measures to prevent electrostatic
  - a) The operator
    1. Wear anti-static clothing, otherwise the body will produce static electricity.
    2. Any part of the body of the time should not be exposed conductive parts and modules, such as: integrated circuit pin, copper wire PCB, terminal interface part.
  - b) Equipment
    1. The detachment or friction may cause the equipment to generate static electricity, such as personnel, iron, table etc.
    2. the equipment connected to the appropriate resistance (1x10<sup>8</sup> ohm).
    3. Just only Reasonable grounding soldering iron can use
    4. If the use of electric screwdriver, electric batch should be well grounded and adapter (brush) isolation
    5. normally Should be observed overalls, anti static measurement work benches, for work bench, recommend the use of conductive rubber pad
  - c) Floor
    1. The floor is the electrostatic equipment and personnel are an important part of the release. May be due to electrostatic floor insulation cannot release. Set the floor to ground (1x10<sup>8</sup> Ohm)



## d) Humidity

1. Probability of proper humidity can reduce static electricity. General relative humidity should be maintained at more than 50%.

## e) Transportation and storage

1. Because people and packaging materials may be separated or friction caused by static electricity, packaging materials need antistatic treatment. Module should be stored in anti-static bag or other ESD container.

## f) Welding

1. Welding of I/O terminal only. Use only the reasonable grounding and no leakage of iron. Low temperature tin wire filled with solder paste.
2. If the use of flux, should cover the liquid crystal surface, prevent solder spatter. After the removal of flux residues.
3. The welding temperature:  $280^{\circ}\text{C}+10^{\circ}\text{C}$
4. Welding time: 3-4 seconds.

- g) Other: with the protective film attached to the surface of the liquid crystal screen and to prevent scratches on the surface or pollution, in stripping the protective film, should use the static eliminator. Static eliminator should also be installed in the table, from static to prevent

## 10. operating

- 1). The drive voltage should be controlled within a specified range, beyond the range will shorten the service life of the liquid crystal
- 2). Liquid crystal response time will increase with the decrease of temperature
- 3). When the temperature is higher than the operating temperature range, the liquid crystal display will turn black or dark blue, which may lead to "break" column. No matter what, do not squeeze the display area
- 4) Mechanical disturbance during operation (such as in the display region extrusion) may lead to "break" column
11. If the outflow of liquid glass layer damaged, wash thoroughly with soap and water come into contact with the body, although very low toxicity, still need to remind the attention
12. Dismantling the LCD module can cause permanent damage, should be strictly prohibited
13. Liquid crystal with image retention afterglow, in order to avoid image afterglow don't long time display fixed pattern. Image persistence is not liquid crystal deterioration, when the display pattern changes will automatically eliminate
14. Do not use a volatile epoxy resin and silicone adhesives, to prevent the resulting Polaroid color
15. To avoid the liquid crystal module long time exposure to sunlight or ultraviolet irradiation
16. Brightness of the LCD module may be due to the coupling of shunt CCFL lead to the metal shell of the affected. Inverter design should take full account of this part of the leakage. It is necessary to fully assess the LCD module and the inverter is installed in the host apparatus, ensure the requirement of brightness