

# 10.1 寸 LED 模组规格书

## SPECIFICATION

<b>承 认 印</b> Approved by	
审核:	确认:

客户确认结果:
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**Customer**

客 户: \_\_\_\_\_

**Product**

品 名: \_\_\_\_\_ 10.1 寸 IPS 模组 \_\_\_\_\_

**Part NO.**

产品料号: \_\_\_\_\_ **ND101HDHLVDS40** \_\_\_\_\_

**DATE**

日 期: \_\_\_\_\_ 2019/09/25 \_\_\_\_\_

Approved 核 准	Checked 审 核	Prepared 制 作
		曾文





# 1.0 General Description

## 1.1 Introduction

ND101HDHLVDS40 Display model 10.1" LCM is a color active matrix thin film transistor (TFT) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. This model is composed of a TFT LCD panel and a driving circuit. This TFT LCD has a 10.1(10:16) inch diagonally measured active display area with (800horizontal by1280 vertical pixel) resolution.

## 1.2. Features

- 10.1 (10:16 diagonal) inch configuration
- MIPI interface
- 16.7M color
- RoHS Compliance
- Halogen Free

## 1.3. General information

Item	Specification	Unit
Outline Dimension	229.3 (H) x 149.1 (V) x2.65(D)	mm
Display area	216.96(H) x 135.6 (V)	mm
Number of Pixel	1280 RGB (H) x800(V)	pixels
Pixel pitch	0.13455(H) x 0.13455(V)s	mm
Pixel arrangement	RGB Vertical stripe	
Display mode	Normally Black	
Color Filter Array	RGB vertical stripes	
Backlight	42 White LED	
Interface	LVDS	
Luminous (Without PET)	1000(TYP) / 900(MIN)	cd/m2
Weight	TBD	g

## 2.0 Absolute Maximum Ratings

### 2.1 Electrical Absolute Rating

Item	Symbol	Min.	Max.	Unit	Note
Power Supply voltage	VDDIN	-0.3	3.6	V	GND=0
	AVDD	-0.3	6.0		
	AVEE	0	-6.0		

### 2.2 Environment Absolute Rating

Item	Symbol	Min.	Max.	Unit	Note
Operating Temperature	Topa	-10	50	°C	
Storage Temperature	Tstg	-20	60	°C	

### 2.3 Back-light Unit:

PARAMETER	Sym.	Min.	Typ.	Max.	Unit	Test Condition	Note
LED Current	IF	–	260	–	mA	–	–
LED Voltage	VF	8.7	9	9.9	V	–	–
Life Time		–	15000	–	Hr.	$I \leq 260\text{mA}$	–
Brightness	Luminous	450	500	--	Nits		--
Color	White						

Note (1) Permanent damage may occur to the LCD module if beyond this specification. Functional operation should be restricted to the conditions described under normal operating conditions.

(2)  $T_a = 25 \pm 2^\circ\text{C}$

(3) Test condition: LED Current 260mA

### 3.0 Optical Characteristics

#### 3.1 Optical specification

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Note	
Transmittance (With PZ)	T		—	4.8	—	%		
Contrast	CR	$\theta=0$ Normal viewing angle	—	800	—		(1)(2)(4)	
Response time	Tr+Tf			30	45	msec	(1)(3)	
Color chromaticity (CIE1931)	Red		$R_x$	-	0.632			CF glass C light
			$R_y$		0.314			
	Green		$G_x$		0.267			
			$G_y$		0.547			
	Blue		$B_x$		0.142			
			$B_y$		0.102			
White	$W_x$			0.302				
	$W_y$			0.321				
Viewing angle	Hor.	$\theta_L$	75	85	—		(1)(4)	
		$\theta_R$	75	85	—			
	Ver.	$\theta_U$	75	85	—			
		$\theta_D$	75	85	—			
View Direction	ALL						(5)	

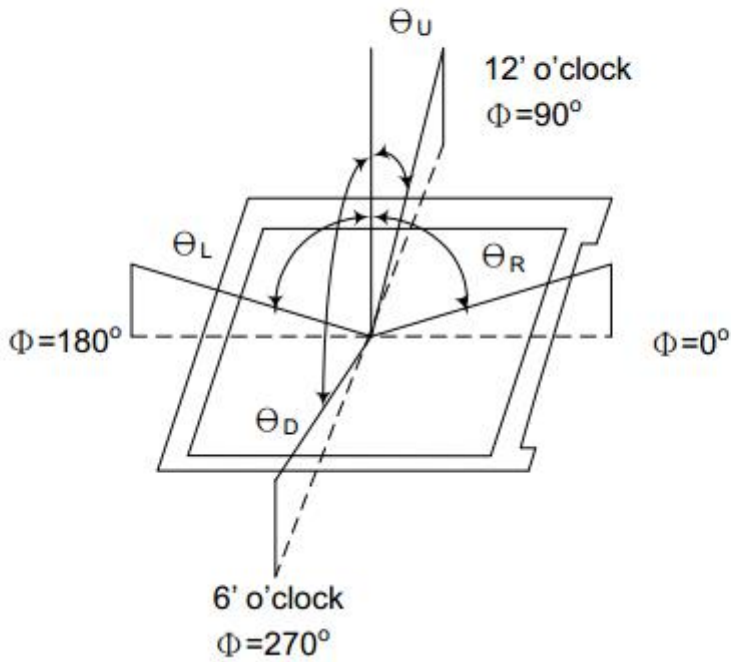
#### 3.2 Measuring Condition

- Measuring surrounding : dark room
- Ambient temperature :  $25\pm 2^\circ\text{C}$
- 15min. warm-up time.

#### 3.3 Measuring Equipment

- TOPCON BM-7
- Measuring spot size : field  $2^\circ$

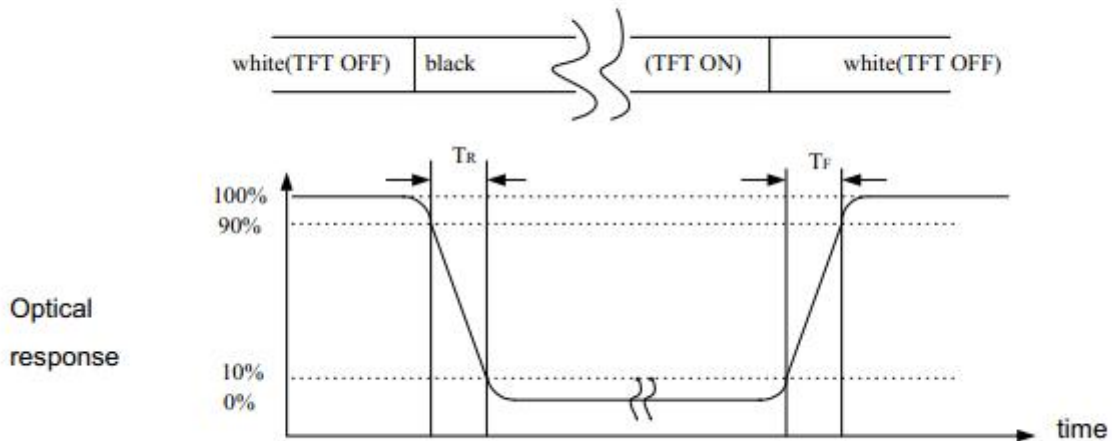
**Note (1)** Definition of Viewing Angle:



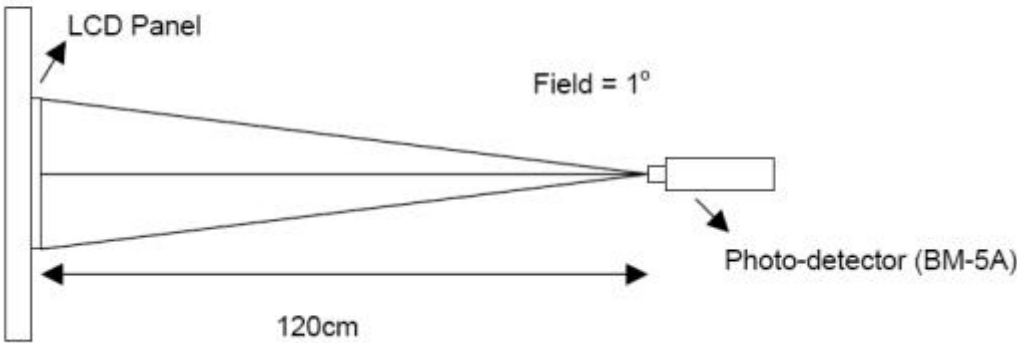
**Note (2)** Definition of Contrast Ratio (CR) :  
measured at the center point of panel

$$CR = \frac{\text{Luminance with all pixels white}}{\text{Luminance with all pixels black}}$$

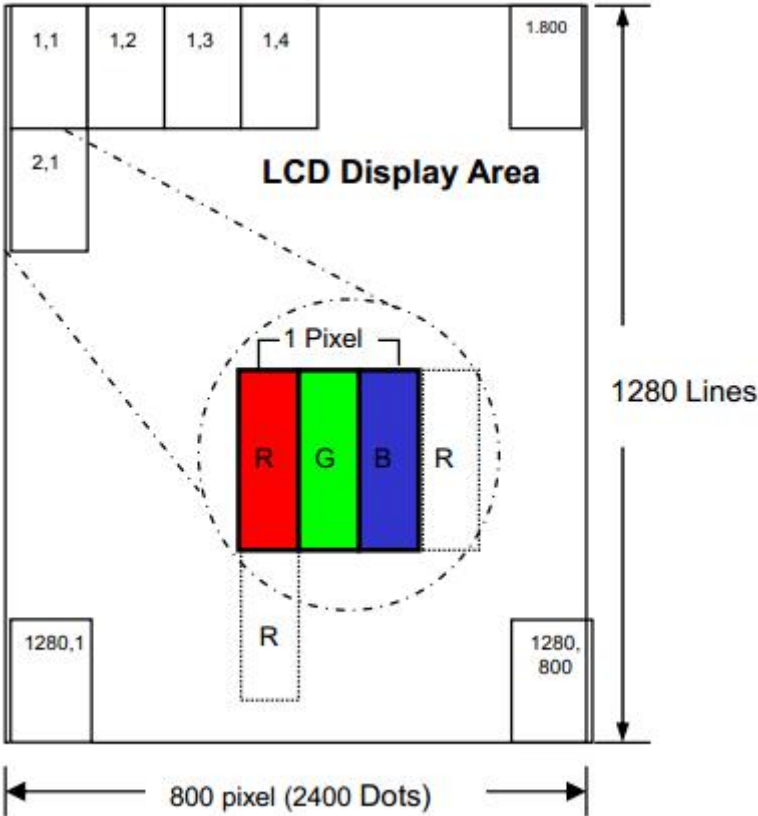
**Note (3)** Definition of Response Time : Sum of  $T_R$  and  $T_F$



**Note (4)** Definition of optical measurement setup



**4.0 Pixel Format**



## 5.0 Interface Pin Connection

### 5.1 TFT LCD Module

PIN NO	SYMBOL	DESCRIPTION
1	NC	NC
2	VDDIN	Power supply VDDIN=3.3V (Typ.)
3	VDDIN	Power supply VDDIN=3.3V (Typ.)
4	VDDIN	Power supply VDDIN=3.3V (Typ.)
5	NC	NC
6	GND	Ground
7	GND	Ground
8	RIN0-	LVDS Negative data signal (-) I
9	RIN0+	LVDS Positive data signal (+)
10	GND	Ground
11	RIN01-	LVDS Negative data signal (-)
12	RIN01+	LVDS Positive data signal (+)
13	GND	Ground
14	RIN02-	LVDS Negative data signal (-)
15	RIN02+	LVDS Positive data signal (+)
16	GND	Ground
17	LVDS_CLK-	LVDS Negative CLK signal (-)
18	LVDS_CLK+	LVDS Positive CLK signal (+)
19	GND	Ground
20	RIN03-	LVDS Negative data signal (-)
21	RIN03+	LVDS Positive data signal (+)
22	GND	Ground
23	NC	NC
24	NC	NC
25	GND	Ground
26	NC	NC
27	NC	NC
28	GND	Ground
29	NC	NC
30	NC	NC
31	LED-	Backlight LED Cathode input pin (-)
32	LED-	Backlight LED Cathode input pin (-)
33	LED-	Backlight LED Cathode input pin (-)
34	NC	NC
35	NC	NC
36	NC	NC
37	NC	NC
38	LED+	Backlight LED Anode input pin (+)
39	LED+	Backlight LED Anode input pin (+)
40	LED+	Backlight LED Anode input pin (+)

## 5.01 ELECTRICAL CHARACTERISTICS

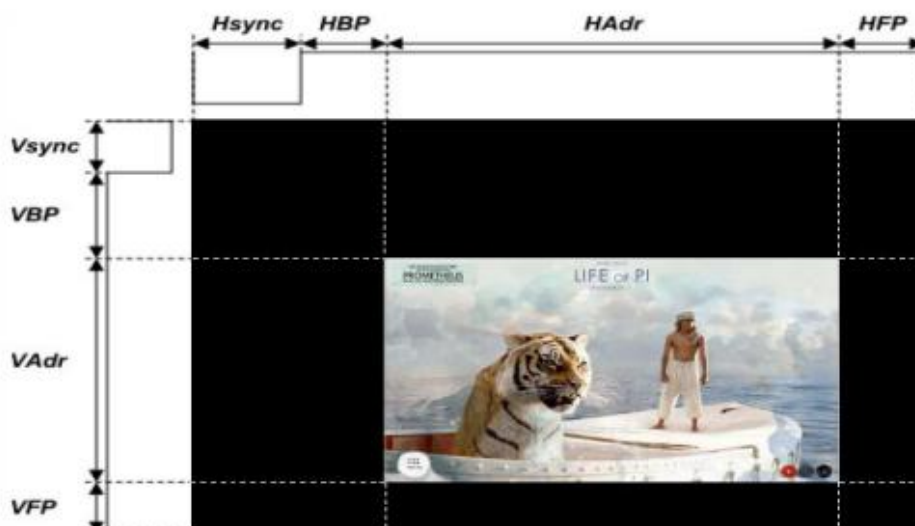
### 5.01.1 TFT LCD Module

Item	Symbol	Min.	Typ.	Max.	Unit	Note
	VCI	3.0	3.3	3.6	V	
Input signal voltage	V <sub>IH</sub>	0.7DV <sub>DD</sub>	-	DV <sub>DD</sub>	V	
	V <sub>IL</sub>	0	-	0.3DV <sub>DD</sub>	V	
Power Current	I <sub>VDD3V3</sub>	-	212	365	mA	

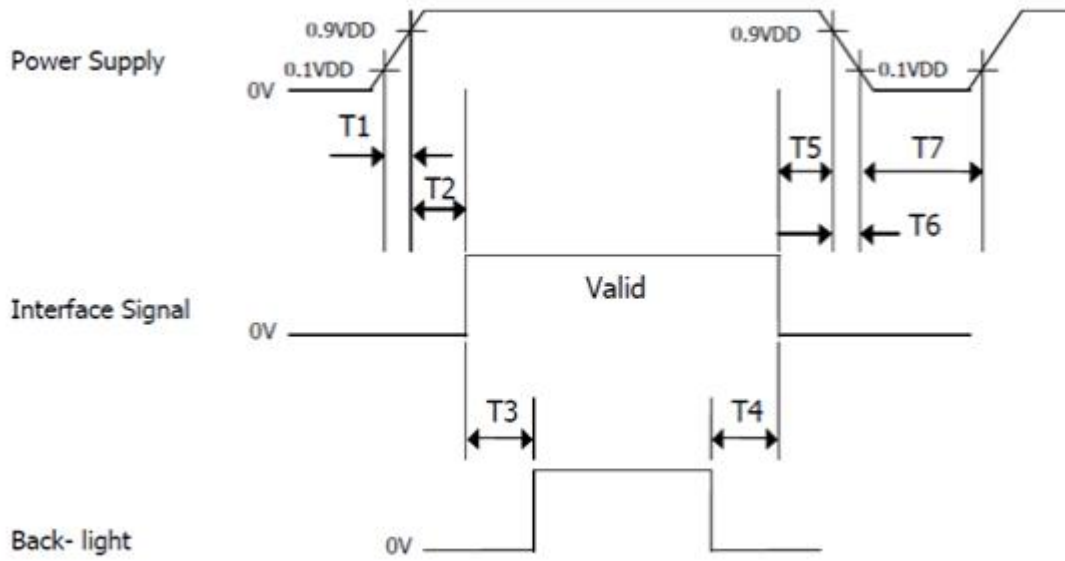
Note (1): GND=0V

### 5.02 LVDS Interface timing Parameter

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
DCLK Frequency	Fdclk	66.3	72.4	78.9	MHz
Horizontal display area	Thd	1280			pixel
HSYNC period time	Th	1380	1440	1500	pixel
HSYNC blanking	thbp+ thfp	100	160	220	pixel
Vertical display area	Tvd	800			H
Frequency	fV	55	60	65	Hz
VSYNC period time	Tv	824	838	872	H
VSYNC blanking	Tvbp+ Tvfp	24	38	72	H



### 5.03 Power Sequence



< Table6. Sequence Table >

Parameter	Values			Units
	Min	Typ	Max	
T1	0	-	10	ms
T2	0	-	50	ms
T3	200	-	-	ms
T4	500	-	-	ms
T5	0	-	50	ms
T6	0	-	10	ms
T7	500	-	-	ms

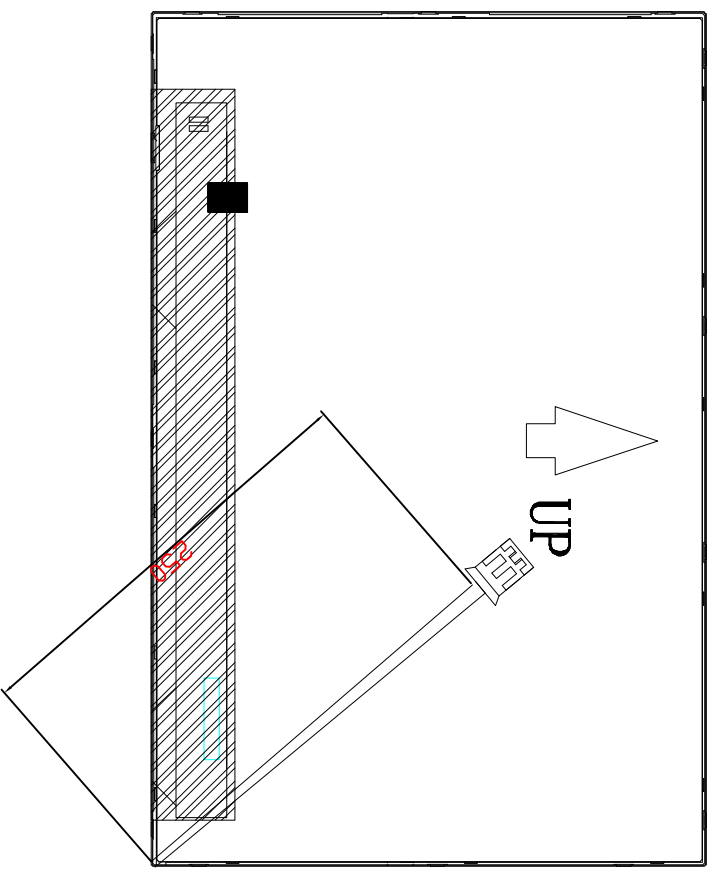
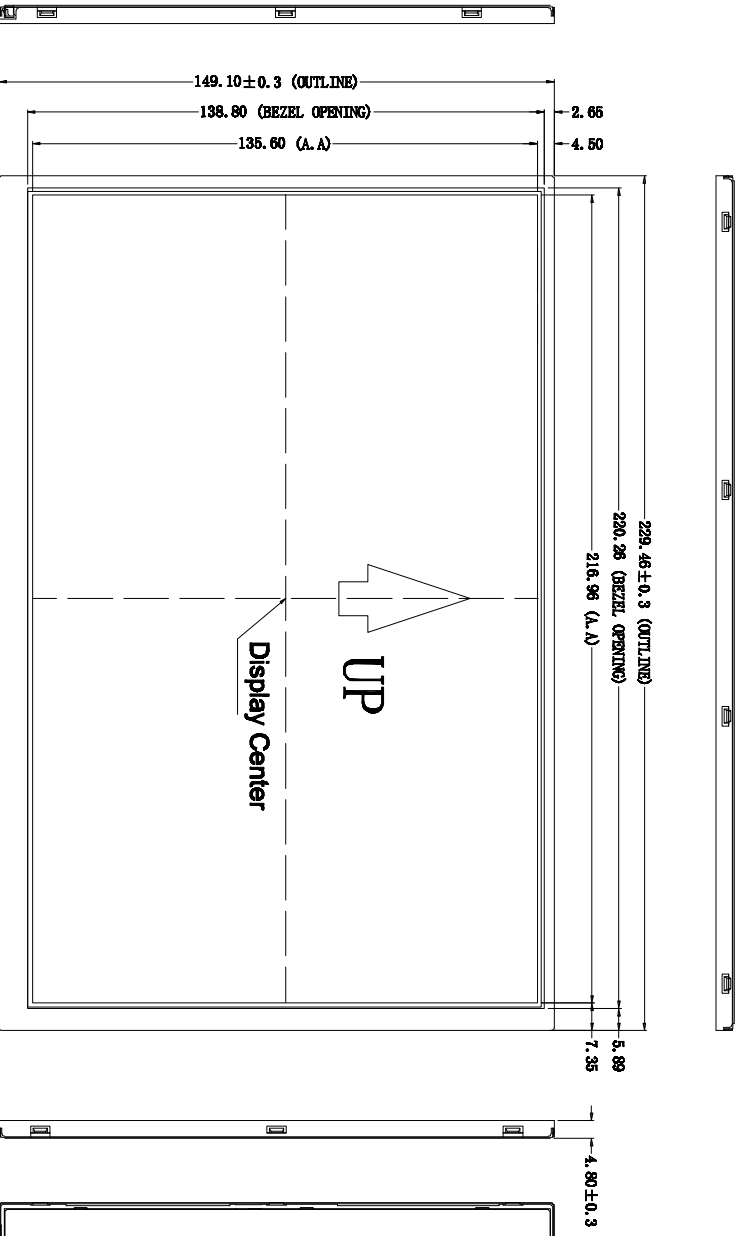
## 6.0 Reliability test items

NO	Item	Conditions	Remark
1	High Temperature Storage	Ta=+85°C,48hrs	
2	Low Temperature Storage	Ta=-35°C,48hrs	
3	High Temperature Operation	Ta=+75°C,48hrs	
4	Low Temperature Operation	Ta=-25°C,48hrs	
5	High Temperature and High Humidity (operation)	Ta=+40°C,90%RH,96hrs	
6	Thermal Cycling Test (non operation)	-20°C(0.5hr)→+60°C(30min),100cycles	

Note: (1) All tests above are practiced at module type.

(2) There is no display function NG issue occurred, All the cosmetic specification is judged before the reliability stress.

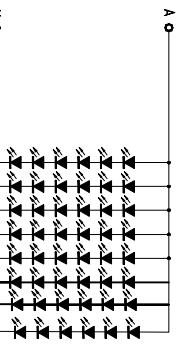
REV	DESCRIPTION:	DATE
V0	新发行	2019.07.30



**ELECTRICAL-OPTICAL CHARACTERISTICS**  
( $T_a=25^{\circ}\text{C}$ . The Ambient temperature  $T_a=25^{\circ}\text{C}$ )

Item	Symbol	Condition	min.	tp.	max.	Unit
Forward Current	$I_f$	$I_f=480\text{ mA}$	16.5	18.0	19.5	V
Reverse Current	$I_r$	$V_r=5\text{ V}$		10	6.3	$\mu\text{A}$
Power dissipation	$P_d$	$I_f=480\text{ mA}$				W
Colour Coordinates	$X$	$I_f=480\text{ mA}$				
BL Luminance (Center Area)	$L_v$	$I_f=480\text{ mA}$		75		$\text{cd}/\text{m}^2$
Luminous Uniformity	$L_v$	$I_f=480\text{ mA}$				%
LCM Luminance (reference)	$L_v$	$I_f=480\text{ mA}$	1200	1500		$\text{cd}/\text{m}^2$
Operating Temperature Range	$T_{op}$	normal use	-20		+80	$^{\circ}\text{C}$
Storage Temperature Range	$T_{stg}$	normal use	-30		+70	$^{\circ}\text{C}$

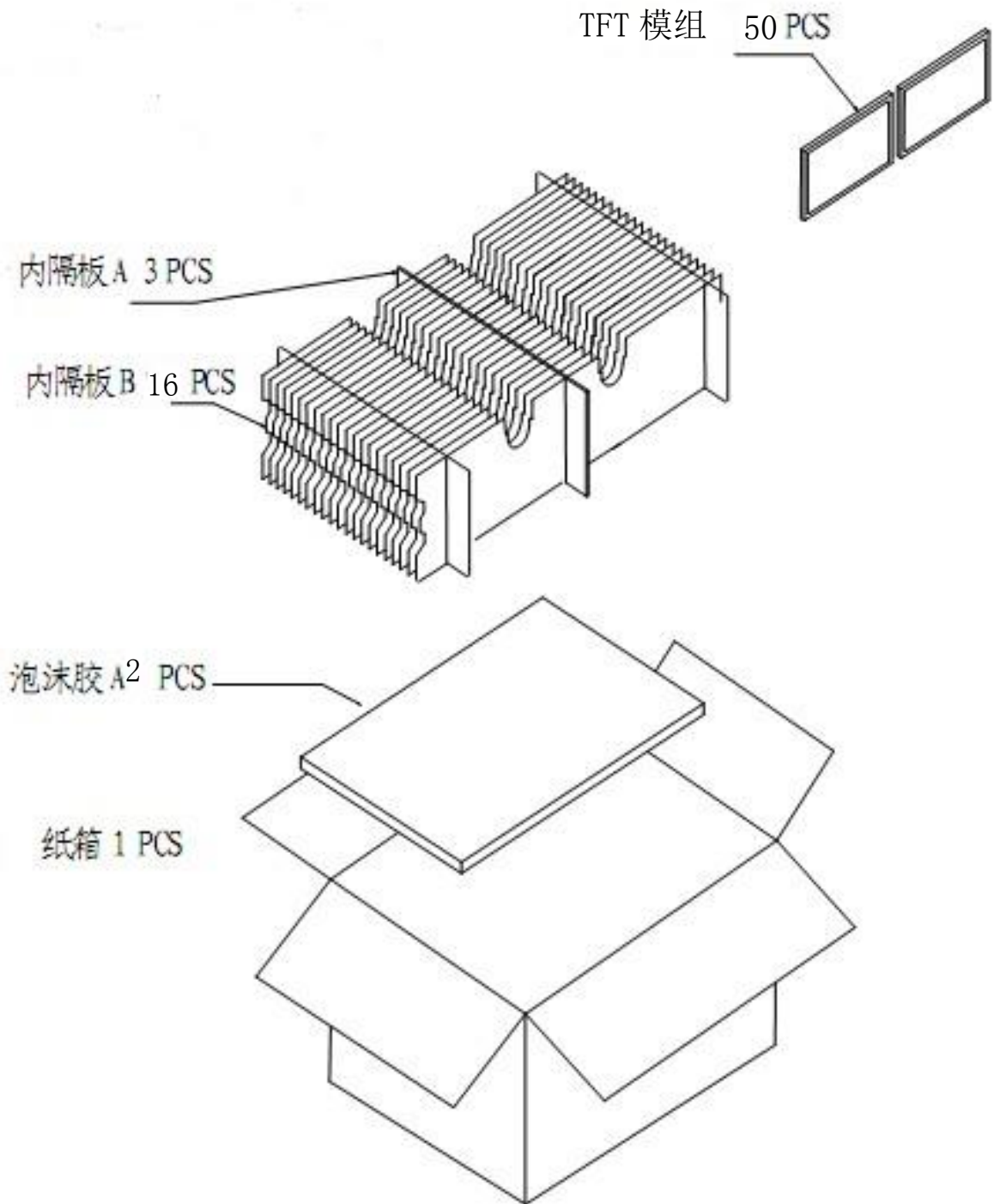
**CIRCUIT DIAGRAM (LED 6X8 = 48 dies)**



PRODUCT NAME:	BL1023-10	CUST NUMBER:		PROJECTION:		SHEET:	1 of 1	SCALE:	FIT
DATE:		APPROVALS:		CHECKS:		APPROVALS:		DATE:	

## 8.0 Packing form

### 8.1 Packing form 1



## **9.0 GENERAL PRECAUTION**

### **9.1 Use Restriction**

This product is not authorized for use in life supporting systems, aircraft navigation control systems, military systems and any other application where performance failure could be life threatening or otherwise catastrophic.

### **9.2 Disassembling or Modification**

Do not disassemble or modify the module. It may damage sensitive parts inside LCD module, and may cause scratches or dust on the display. HannStar does not warrant the module, if customers disassemble or modify the module.

### **9.3 Breakage of LCD Panel**

9.3.1. If LCD panel is broken and liquid crystal spills out, do not ingest or inhale liquid crystal, and do not contact liquid crystal with skin.

9.3.2. If liquid crystal contacts mouth or eyes, rinse out with water immediately.

9.3.3. If liquid crystal contacts skin or cloths, wash it off immediately with alcohol and rinse thoroughly with water.

9.3.4. Handle carefully with chips of glass that may cause injury, when the glass is broken.

### **9.4 Electric Shock**

9.4.1. Disconnect power supply before handling LCD module.

9.4.2. Do not pull or fold the LED cable.

9.4.3. Do not touch the parts inside LCD modules and the fluorescent LED's connector or cables in order to prevent electric shock.

### **9.5 Absolute Maximum Ratings and Power Protection Circuit**

9.5.1. Do not exceed the absolute maximum rating values, such as the supply voltage variation, input voltage variation, variation in parts' parameters, environmental temperature, etc., otherwise LCD module may be damaged.

9.5.2. Please do not leave LCD module in the environment of high humidity and high temperature for a long time.

11.5.3. It's recommended to employ protection circuit for power supply.

### **9.6 Operation**

9.6.1 Do not touch, push or rub the polarizer with anything harder than HB pencil lead.

9.6.2 Use fingerstalls of soft gloves in order to keep clean display quality, when persons handle the LCD module for incoming inspection or assembly.

9.6.3 When the surface is dusty, please wipe gently with absorbent cotton or other soft material.

9.6.4 Wipe off saliva or water drops as soon as possible. If saliva or water drops contact with polarizer for a long time, they may causes deformation or color fading.

9.6.5 When cleaning the adhesives, please use absorbent cotton wetted with a little petroleum benzine or other adequate solvent.

### **9.7 Mechanism**

Please mount LCD module by using mouting holes arranged in four corners tightly.

### **9.8 Static Electricity**

9.8.1 Protection film must remove very slowly from the surface of LCD module to prevent from electrostatic occurrence.

9.8.2. Because LCD module use CMOS-IC on circuit board and TFT-LCD panel, it is very weak to electrostatic discharge. Please be careful with electrostatic discharge. Persons who handle the module should

be grounded through adequate methods.

### **9.9 Strong Light Exposure**

The module shall not be exposed under strong light such as direct sunlight. Otherwise, display characteristics may be changed.

### **9.10 Disposal**

When disposing LCD module, obey the local environmental regulations.