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Date : Jan., 06,2016

## HannStar Product Information

Model: HSD077IPW1-A00-0299

**Note:**

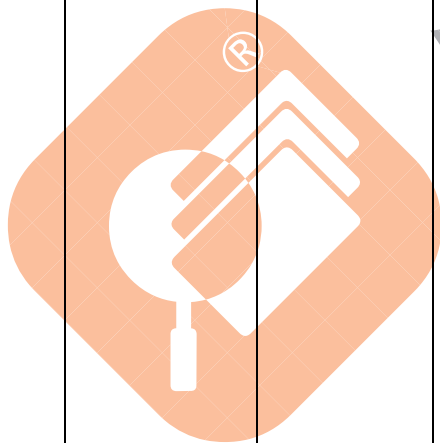
1. The information contained herein is preliminary and may be changed without prior notices.
2. Please contact HannStar Display Corp. before designing your product based on this module specification.
3. The information contained herein is presented merely to indicate the characteristics and performance of our products. No responsibility is assumed by HannStar for any intellectual property claims or other problems that may result from application based on the module described herein.
4. The mark “\*\*” of Model means sub-model code.


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## Record of Revisions

Rev.	Date	Sub-Model	Description of change
1.0	Jan 06, 2016		Product information was first issued.

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## 1.0 GENERAL DESCRIPTION

### 1.1 Introduction

HannStar Display model HSD077IPW1-A00-0299 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, a driving circuit a. This TFT LCD has a 7.7 (16:5) inch diagonally measured active display area with 1280 horizontal by 400 vertical pixel resolutions.

### 1.2 Features

- 7.7 (16:5 diagonal) inch configuration
- 16.2M color by 6 bit +FRC input
- RoHS/ Halogen Free Compliance

### 1.3 Applications


- Automotive

### 1.4 TFT LCD General information

Item	Specification	Unit
Outline Dimension	194.124 x 68.0 (typ)	mm
Display area	186.624 (H) x 58.32 (V)	mm
Number of Pixel	1280 RGB (H) x 400 (V)	pixels
Pixel pitch	0.1458(H) x 0.1458 (V)	mm
Pixel arrangement	RGB Vertical stripe	
Display mode	Normally Black	
NTSC	60 (typ.)	%
Surface treatment	上偏:HC 3H 下偏:AG 霧面	
Weight	TDB g (Typ.)	g

### 1.5 Mechanical Information

Item		Min.	Typ.	Max.	Unit
Module Size	Horizontal (H)	194.024	194.124	194.224	mm
	Vertical (V)	67.9	68.0	68.1	mm
	Depth (D)	1.19	1.27	1.35	mm
Weight		—	40	—	g

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## 2.0 ABSOLUTE MAXIMUM RATINGS

### 2.1 Electrical Absolute Rating

#### 2.1.1 TFT LCD Module

Parameters	Symbol	Min.	Max.	Unit	Note
Power Supply voltage	VDD	-0.5	3.96	V	
	AVDD	-0.5	14.85	V	
	VGH	-0.3	42	V	
	VGL	VGH-42	0.3	V	

#### 2.1.2 Environment Absolute Rating

Item	Symbol	Min.	Max.	Unit	Note
Operating Temperature	T <sub>opa</sub>	-20	70	°C	
Storage Temperature	T <sub>stg</sub>	-30	85	°C	



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### 3.0 OPTICAL CHARACTERISTICS

#### 3.1 Optical specification

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Response time		Tr	$\Theta=0$ Normal viewing angle	—	10	15	msec	(1)(3)
		Tf		—	20	25		
Color chromaticity (CIE1931)	Red	R <sub>x</sub>		0.617	0.647	0.677	under C-light	
		R <sub>Y</sub>		0.299	0.329	0.359		
	Green	G <sub>x</sub>		0.249	0.279	0.309		
		G <sub>Y</sub>		0.52	0.55	0.58		
	Blue	B <sub>x</sub>		0.104	0.134	0.164		
		B <sub>Y</sub>		0.091	0.121	0.151		
	White	W <sub>x</sub>		0.269	0.299	0.329		
		W <sub>y</sub>		0.294	0.324	0.354		
Viewing angle	Hor.	$\Theta_L$	CR>10	80	—	(1)(4)		
		$\Theta_R$		80	—			
	Ver.	$\Theta_U$		80	—			
		$\Theta_D$		80	—			
View Direction		(6)						

#### 3.2 Measuring Condition

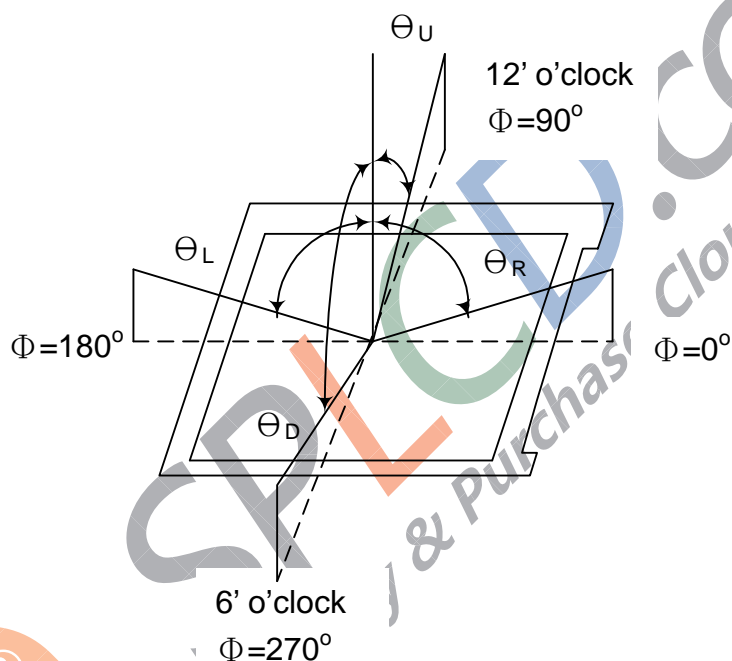
- Measuring surrounding : dark room
- Ambient temperature : 25±2°C
- 15min. warm-up time.

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### 3.3 Measuring Equipment

- FPM520 of Westar Display technologies, INC., which utilized SR-3 for Chromaticity and BM-5A for other optical characteristics.
- Measuring spot size : 20 ~ 21 mm

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

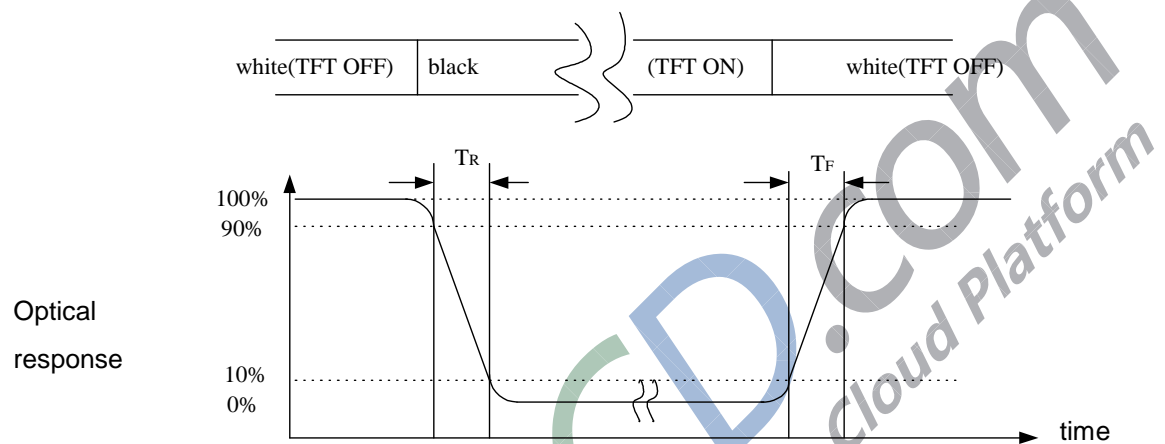


**Note (2)** Definition of Contrast Ratio (CR) :  
measured at the center point of panel

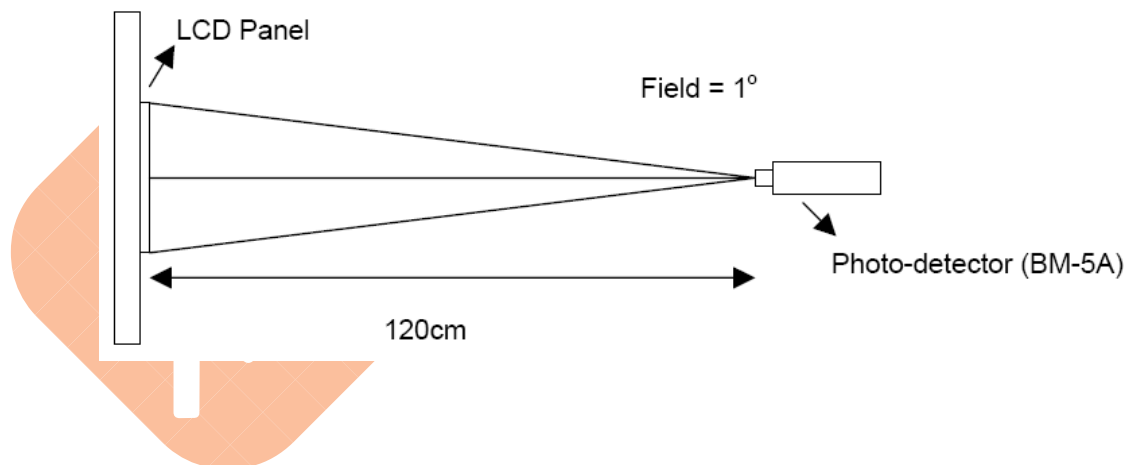
$$CR = \frac{\text{Luminance with all pixels white}}{\text{Luminance with all pixels black}}$$

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



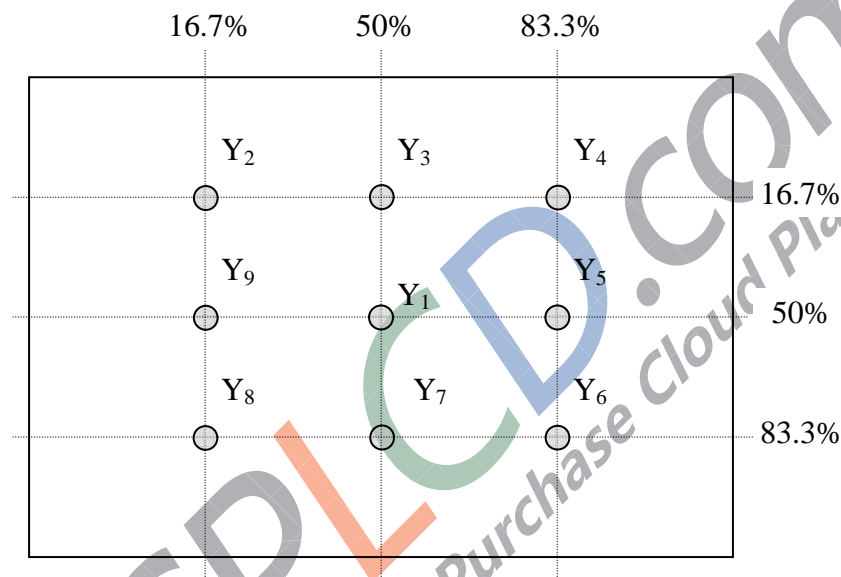
**Note (4)** Definition of optical measurement setup





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**Note (5)** Definition of Average Luminance Uniformity of White (Center)  
Definition of brightness uniformity



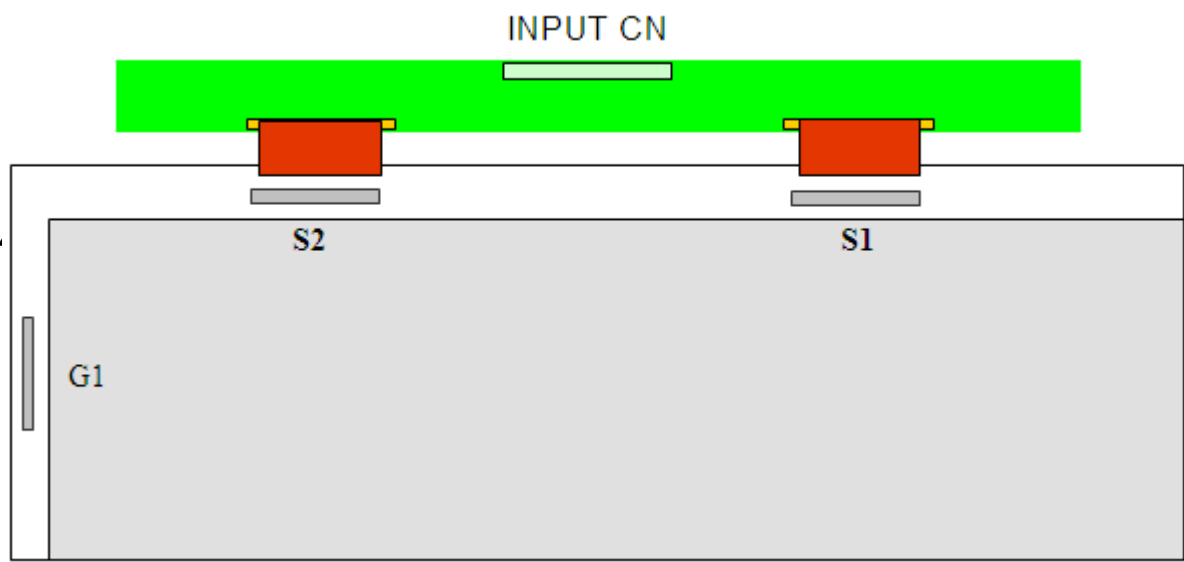
$$\text{Luminance uniformity} = \frac{(\text{Min Luminance of 9 points})}{(\text{Max Luminance of 9 points})} \times 100\%$$

**Note (6)** Rubbing Direction (The different Rubbing Direction will cause the different optimal view direction.)

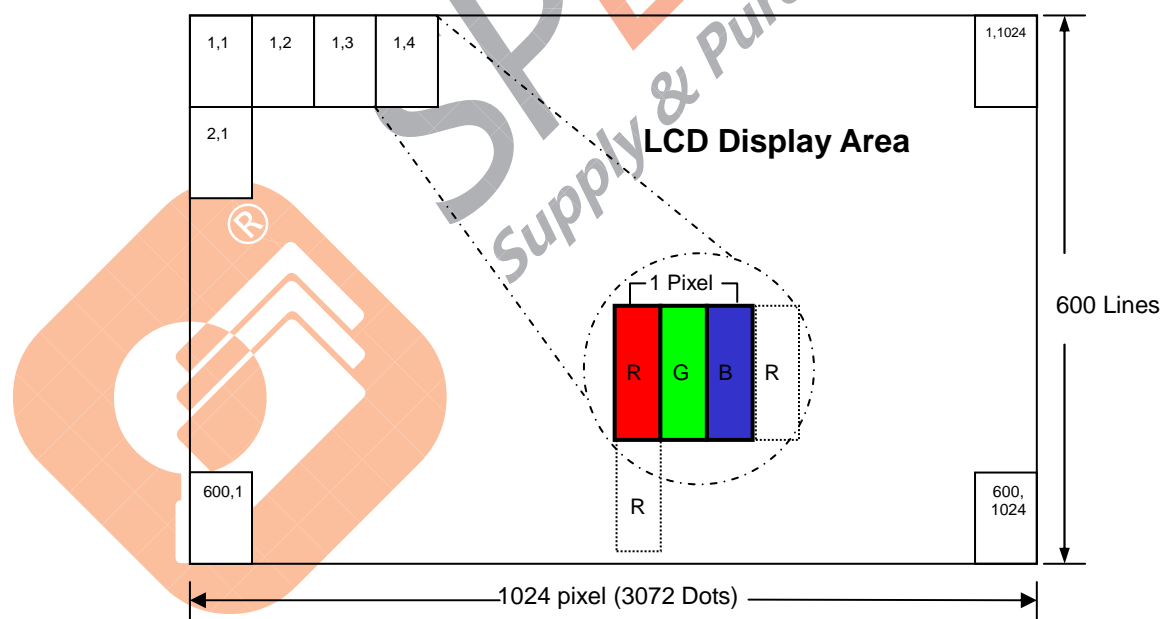
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## 4.0 BLOCK DIAGRAM


### 4.1 TFT LCD Module



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### Relationship Between Displayed Color and Input

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## 5.0 INTERFACE PIN CONNECTION

FPC connector is used for electronics interface.

The recommended model is Hirose FH52-40S-0.5SH

Pin No.	Symbol	I / O	Funcation	Remark
1	VCOM	P	Commom Voltage	
2	VDD	P	Power Voltage for digital circuit	
3	VDD	P	Power Voltage for digital circuit	
4	NC	---	No coonection	
5	Reset	I	Global reset pin	
6	STBYB	I	Standby mode, Normally pulled high STBYB="1",normal operation STBYB="0",timing controller,source driver will turn off, all output are High-Z	
7	GND	P	Ground	
8	RXIN0-	I	- LVDS differential datd input	
9	RXIN0+	I	+ LVDS differential datd input	
10	GND	P	Ground	
11	RXIN1-	I	- LVDS differential datd input	
12	RXIN1+	I	+ LVDS differential datd input	
13	GND	P	Ground	
14	RXIN2-	I	- LVDS differential datd input	
15	RXIN2+	I	+ LVDS differential datd input	
16	GND	P	Ground	
17	RXCLKIN-	I	- LVDS differential datd input	
18	RXCLKIN+	I	+ LVDS differential datd input	
19	GND	P	Ground	
20	RXIN3-	I	- LVDS differential datd input	
21	RXIN3+	I	+ LVDS differential datd input	
22	GND	P	Ground	
23	NC	---	No coonection	
24	NC	---	No coonection	
25	GND	P	Ground	
26	NC	---	No coonection	
27	NC	---	No coonection	
28	SELB	I	6bit/8bit mode select	Note 1
29	AVDD	P	Power for Analog Circuit	
30	GND	P	Ground	
31	LED-	P	LED Cathode	
32	LED-	P	LED Cathode	
33	L/R	I	Horizontal inversion	Note 2
34	U/D	I	Vertical inversion	Note 2
35	VGL	P	Gate OFF Voltage	
36	NC	---	No coonection	
37	NC	---	No coonection	
38	VGH	P	Gate ON Voltage	
39	LED+	P	LED Anode	
40	LED+	P	LED Anode	

I: input O:output P: Power

Note1:

If LVDS input data is 6 bits,SELB must be set to High

If LVDS input data is 8 bits,SELB must be set to Low

Note2:

When L/R="0",set right to left scan direction

When L/R="1",set left to right scan direction

When U/D="0",set top to buttom scan direction

When U/D="1",set buttom to top scan direction

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## 5.1 TFT Design Rules

Item		Specification	unit
Himax X : HX8292-A Y : HX8695-B	Pad number	X : 960 channel Y : 800 channel	
	Pin assignment	<u>Based on the IC Spec.</u>	



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## 6.0 ELECTRICAL CHARACTERISTICS

### 6.1 TFT LCD Module

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
Power Supply voltage	VDD	3.0	3.3	3.6	V	
	AVDD	12.2	12.5	12.8	V	
	VGH	17	18	19	V	(1)
	VGL	-9	-10	-11	V	(2)
	VCOM	5	5.3	5.6	V	(3)

Note :

(1) : VGH is TFT Gate operating Voltage.

(2) : VGL is TFT Gate operating Voltage.

(3) : VCOM must be adjusted to optimize display quality \_ Flicker Pattern .

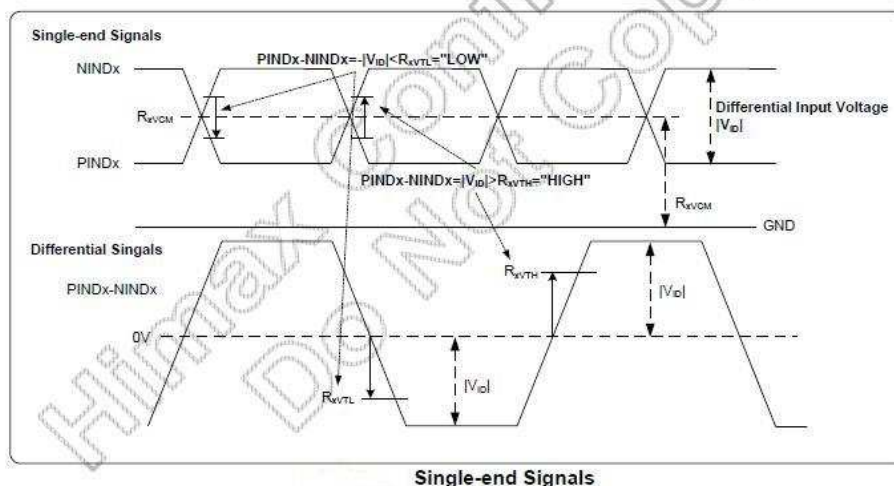
### 6.2 DC Characteristics

#### LVDS Interface

(VDD=2.3 to 3.6V, AVDD=6.5 to 13.5V, GND=AGND=0V, TA=-20°C ~+85°C)

Parameter	Symbol	Spec.			Unit	Condition
		Min.	Typ.	Max.		
Differential input high Threshold voltage	$R_{XVTH}$	-	-	+0.1	V	$R_{XVCM} = 1.2V$
Differential input low threshold voltage	$R_{XVTL}$	-0.1	-	-	V	
Input voltage range (singled-end)	$R_{XVIN}$	0	-	$VDD - 1.2 +  V_{ID} /2$	V	-
Differential input common Mode voltage	$R_{XVCM}$	$ V_{ID} /2$	-	$VDD - 1.2$	V	-
Differential input voltage	$ V_{ID} $	0.2	-	0.6	V	-
Differential input leakage Current	$R_{V_{XIZ}}$	-10	-	+10	$\mu A$	-
LVDS Digital Operating Current	$I_{ddlvds}$	-	TBD	TBD	mA	Fclk=81MHz, VDD=3.3V
LVDS Digital Stand-by Current	$I_{stlvds}$	-	TBD	TBD	$\mu A$	Clock & all Functions are stopped

LVDS Mode DC Electrical Characteristics

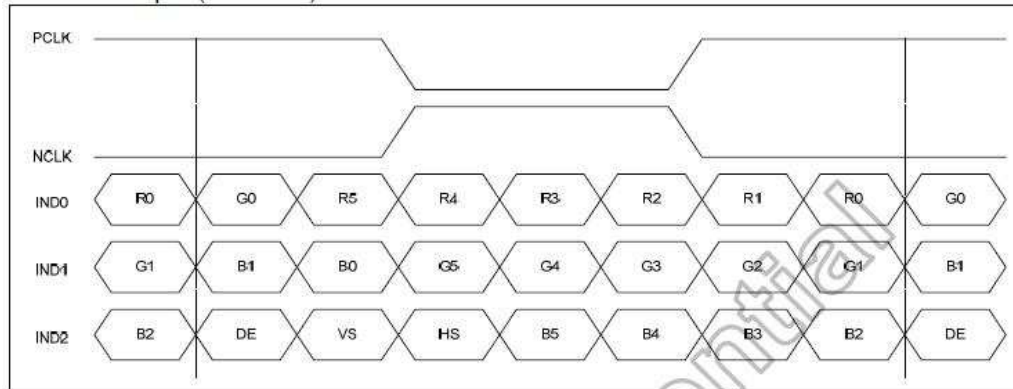


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### 6.3 Interface Data Format

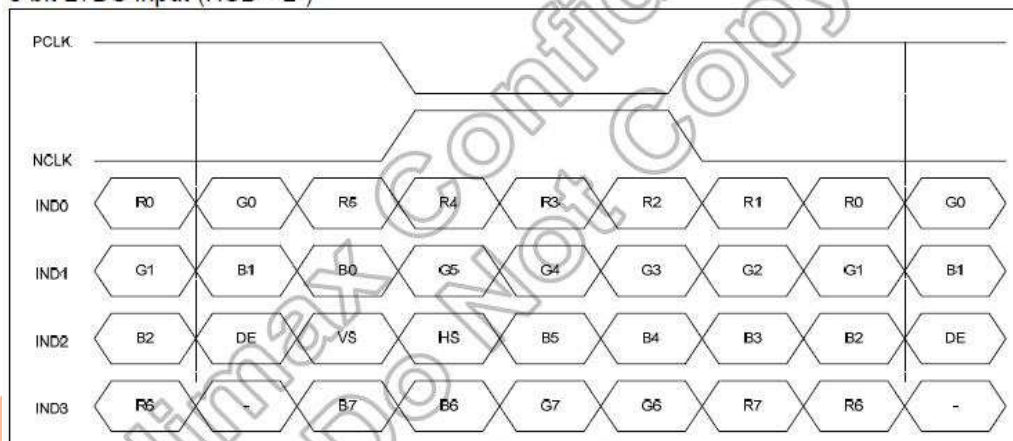
#### LVDS Mode Data Input Format

6 bit LVDS input (HSD="H")



6-bits LVDS Input

8 bit LVDS input (HSD="L")



8-bits LVDS Input

### 6.4 Interface Timing

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
DCLK frequency	fcik	33.7	37.8	42.9	MHz
Horizontal display area	thd	1280			DCLK
HSD period	th	1370	1440	1500	DCLK
HSD blanking	thb+thfp	90	160	220	DCLK
Vertical display area	tvd	400			T <sub>H</sub>
VSD period	tv	410	438	477	T <sub>H</sub>
VSD blanking	tvbp+tvfp	10	38	77	T <sub>H</sub>

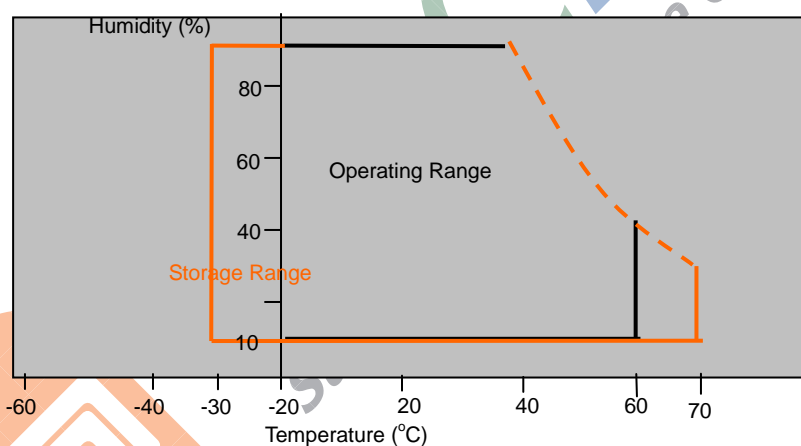
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## 7.0 Reliability test items

No.	Item	Conditions	Remark
1	High Temperature Storage	Ta=+85°C, 240hrs	
2	Low Temperature Storage	Ta=-30°C, 240hrs	
3	High Temperature Operation	Ta=+70°C, 240hrs	
4	Low Temperature Operation	Ta=-20°C, 240hrs	
5	Thermal Cycling Test (non operation)	-20°C(30min)→+70°C(30min),100 cycles	
6	Vibration	Sine Wave 1.5G, 5~500Hz, XYZ 30min/each direction	
7	Shock	Half-Sine, 200G, 2ms, ±XYZ, 1time	

Note: There is no display function NG issue occurred, all the cosmetic specification is judged before the reliability stress.

### Storage / Operating temperature




**Note** .Max wet bulb temp.=39°C







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## 9 LOT MARK

### 9.1 Lot Mark

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----

Code 1,2,3,4,5,6: HannStar internal flow control code.

Code 7: production location.

Code 8: production year.

Code 9: production month.

Code 10,11,12,13,14,15: serial number.

Note (1) Production Year

Year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2015
Mark	6	7	8	9	0	1	2	3	4	5

Note (2) Production Month

Month	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct	Nov.	Dec.
Mark	1	2	3	4	5	6	7	8	9	A	B	C

### 9.2 Location of Lot Mark

- (1) Location: The lot mark is attached to the back side of the LCD module. See Product back view. ( Section 8.0 : OUTLINE DIMENSION )
- (2) Detail of the Lot mark: Print 15 code as lot mark (see 9.1 Lot Mark)
- (3) This is subject to change without prior notice.



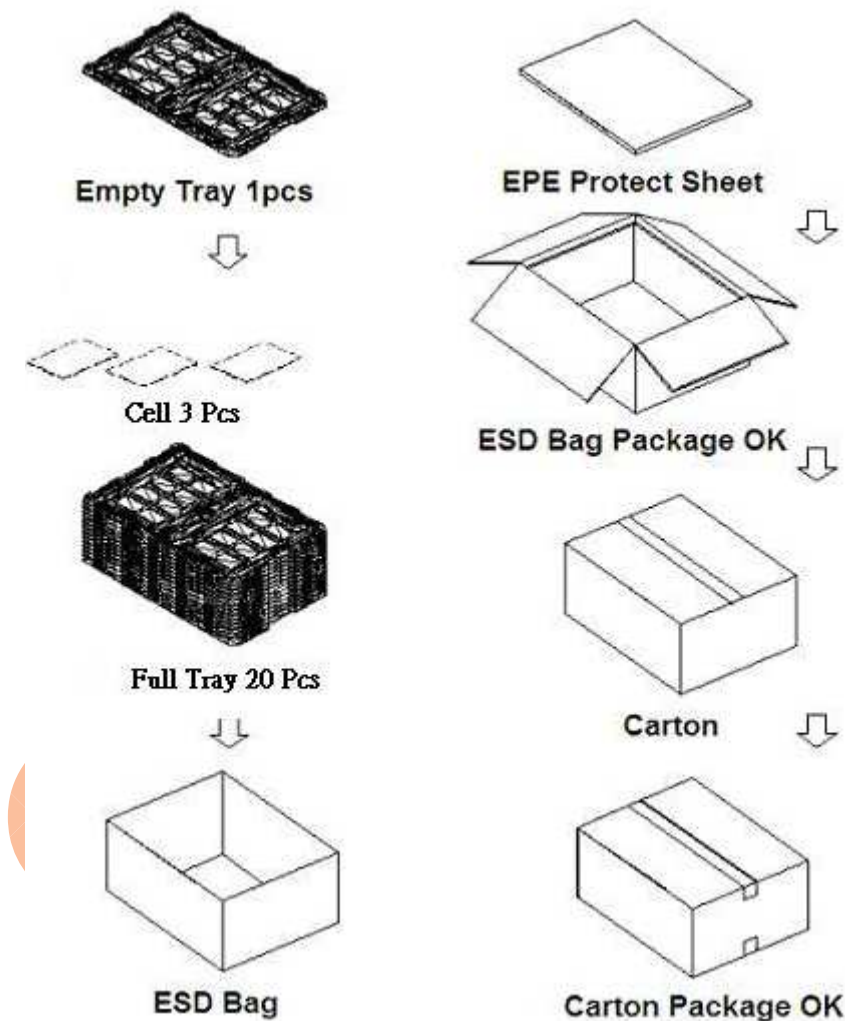
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## 10.0 PACKAGE SPECIFICATION

### 10.1 Packing form

LCM Model	LCM Qty. in the Box	Inner Box Size(mm)	Notice
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### 10.2 Packing assembly drawings



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## 11.0 GENERAL PRECAUTION

### 11.1 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.

### 11.2 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.

### 11.3 Breakage of LCD Panel

- 11.3.1. 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.
- 11.3.2. If liquid crystal contacts mouth or eyes, rinse out with water immediately.
- 11.3.3. If liquid crystal contacts skin or cloths, wash it off immediately with alcohol and rinse thoroughly with water.
- 11.3.4. Handle carefully with chips of glass that may cause injury, when the glass is broken.

### 11.4 Electric Shock


- 11.4.1. Disconnect power supply before handling LCD module.
- 11.4.2. Do not pull or fold the LED cable.
- 11.4.3. Do not touch the parts inside LCD modules and the fluorescent LED's connector or cables in order to prevent electric shock.

### 11.5 Absolute Maximum Ratings and Power Protection Circuit

- 11.5.1. 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.
- 11.5.2. 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.

### 11.6 Operation

- 11.6.1 Do not touch, push or rub the polarizer with anything harder than HB pencil lead.
- 11.6.2 Use fingerstalls of soft gloves in order to keep clean display quality, when persons handle the LCD module for incoming inspection or assembly.
- 11.6.3 When the surface is dusty, please wipe gently with absorbent cotton or other soft material.

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11.6.4 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.

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

### 11.7 Mechanism

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

### 11.8 Static Electricity

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

11.8.2 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.

### 11.9 Strong Light Exposure

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

### 11.10 Disposal

When disposing LCD module, obey the local environmental regulations.

