SPECIFICATION

Product Type: ___5″ TFTLCDModule___

LCDNunmber: ___HSD050IDW-A20___

LY ModuleNo: ___LY050ML15-12A___

CS M R APPRO D	PREPARE BY	CHC KB Y	APPRO DB Y
SP E R APPRO D	PREPARE BY	CHC KB Y	APPRO DB Y
	OR		L

C E UL RoHS ENERGY STAR

Contents

1.0 General Description

1.1 Introduction

HannStar Display model HSD050IDW1-A00-0299 is a color active matrix thin film transistor (TFT) liquid crystal display (LCD) that uses amorphous silicon TFT as aswitching device. This model is composed of a TFT LCD panel, a driving circuit. This TFT LCD has a 5.0 (15:9) inch diagonally measured active display area with WVGA (800 horizontal by 480 vertical pixel) resolution.

1.2. Features

■ 5.0 (15:9 diagonal) inch configuration
■ 6 bits + FRC driver with 1 channel TTL interface
■ RoHS and Halogen-Free Compliance

1.3 Applications

■ Personal Navigation Device
■ Multimedia applications and Others AV system

1.4. General information

Item	Specification	Unit
Outline Dimension	120.7 (H) x 75.8 (V) x 3.1 (D)	mm
Display area	108 (H) x 64.8 (V)	mm
Number of Pixel	800 RGB (H) x 480 (V)	pixels
Pixel pitch	0.135 (H) x 0.135 (V)s	mm
Pixel arrangement	RGB Vertical stripe	
Display mode	Normally white	

2.0 Absolute Maximum Ratings

2.1 Electrical Absolute Rating

2.1.1 TFT LCD Module

Item	Symbol	Min.	Max.	Unit	Note
Power supply voltage	V_{DD}	−0.5	5.0	V	GND=0
Logic Signal Input Level	V_I	−0.3	V_{DD} +0.3	V	

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) Ta =25±2℃

2.2 Environment Absolute Rating

Item	Symbol	Min.	Max.	Unit	Note
Operating Temperature	Topa	−10	60	℃	
Storage Temperature	Tstg	−20	70	℃	

2.3 Back-light Unit:

PARAMETER	Sym.	Min.	Typ.	Max.	Unit	Test Condition	Note
LED Current	IF	–	40	–	mA	–	–
LED Voltage (Total)	VF	18	19.8	21	V	–	–
Life Time		–	25000	–	Hr.	I≦40mA	–
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) Ta=25±2℃

(3) Test condition: LED Current 40mA

LED 电 路 图

A   K
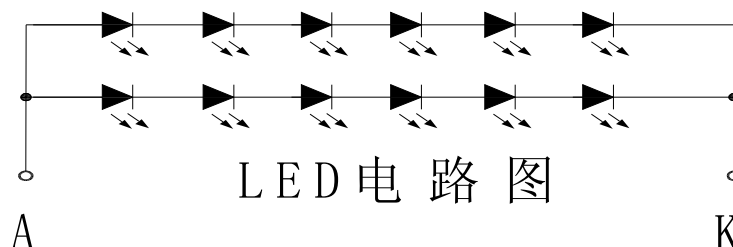
3.0 Optical Characteristics

3.1 Optical specification

| Item		Symbol	Condition	Min.	Typ.	Max	Unit	Note
LCM luminance (Center)		Y_L	I=40mA	320	350	—	cd/㎡	9 point AVG
Thresholk voltage		VSAT		–	2.4	–		
		VTH		–	1.4	–		
Transmittance(With PZ)		T		–	6.78	–		
Brightness uniformity		BUNI	$\Theta=0$	75			%	(5)(6)
Contrast		CR		480	600	_		(2)(3)
Response time	Rising	T_R	$\theta=0$ Normal viewing angle	—	3	6	msec	(2)(4)
	Falling	T_F		—	7	14		
Color gamut		S		–	50	–	%	C light
Color chromaticity (CIE1931)	White	W_X		0.30	0.32	0.34		
		W_Y		0.32	0.34	0.36		
Viewing angle	Hor.	θ_L	CR>10	65	75	—		(2)(5)
		θ_R		65	75	—		
	Ver.	θ_U		50	60	—		
		θ_D		60	70	—		
Optima View Direction		6 Oclock						(5)

3.2 Measuring Condition

■ Measuring surrounding : dark room

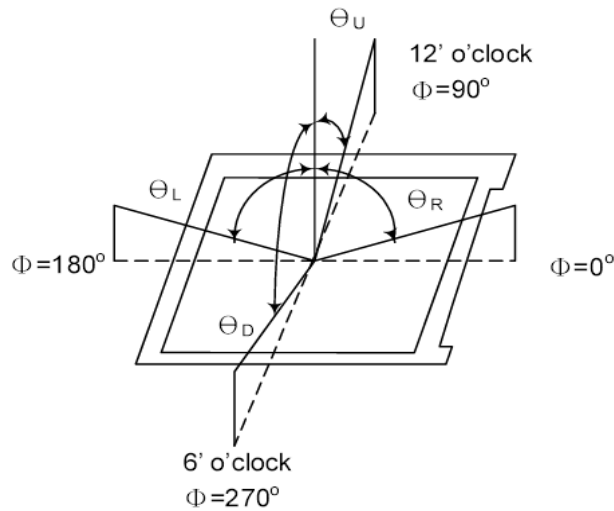■ Ambient temperature : 25±2℃

■ 30min. warm-up time.

3.3 Measuring Equipment

■ TOPCON BM-7

■ Measuring spot size : field 2°

Note (1) Definition of Vsat and Vth (at 20℃)
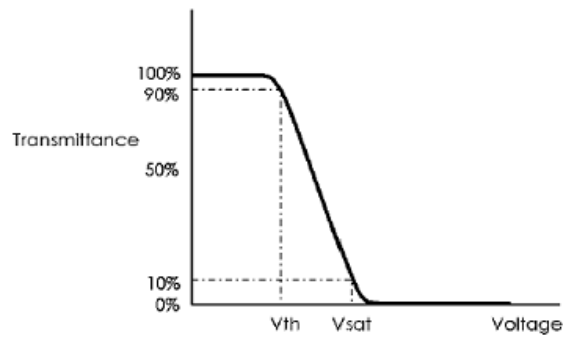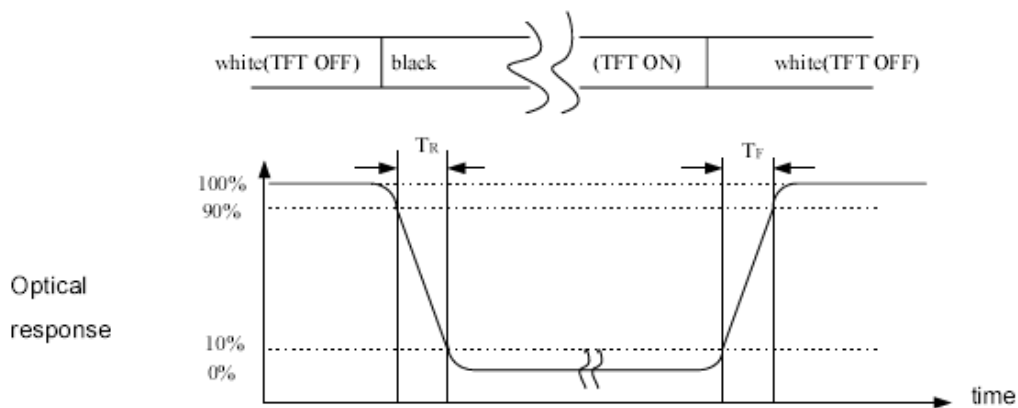

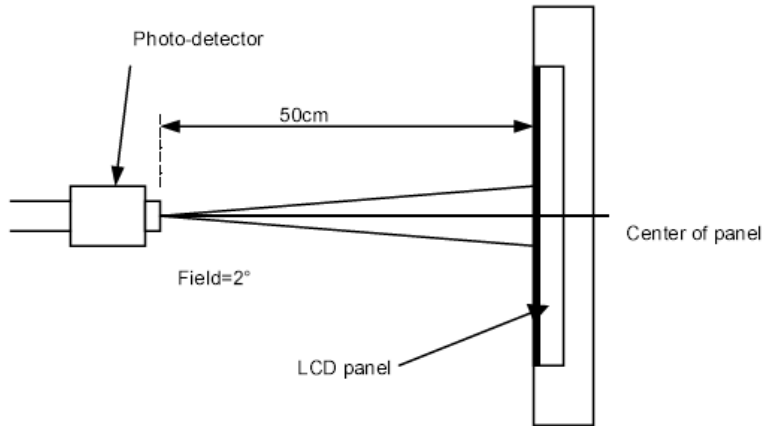**Note (2)** Definition of Viewing Angle :

Note (3) Definition of Contrast Ratio(CR) :
measured at the center point of panel

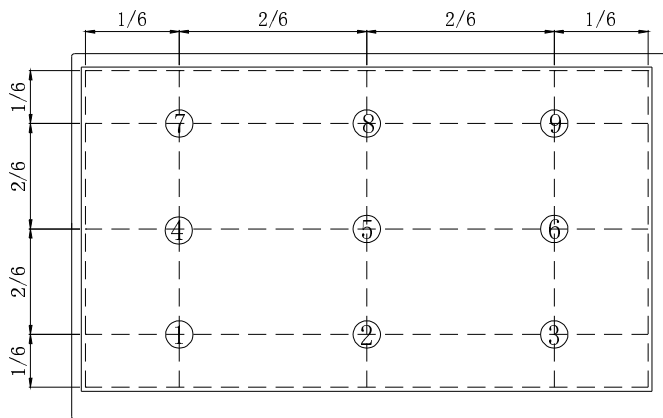$$CR = \frac{\text{Luminance with all pixels white}}{\text{Luminance with all pixels black}}$$

Note (4) Definition of Response Time : Sum of T_R and T_F

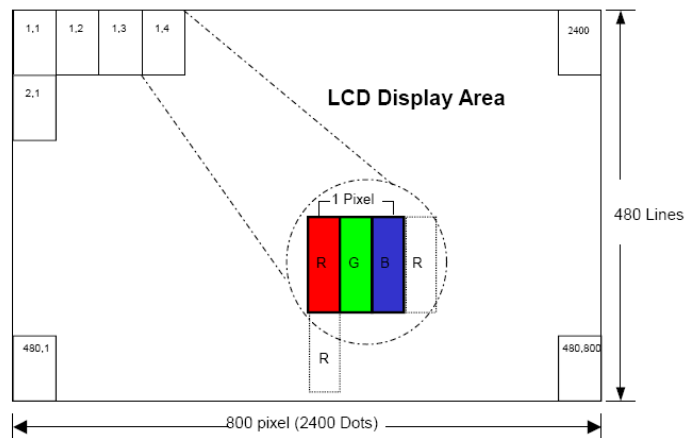**Note (5)** Definition of optical measurement setup

Note (6) Definition of brightness uniformity

4.0 Block Diagram

4.1 Pixel Format

5.0 Interface Pin Connection

FPC connector is used for electronics interface.

The recommended model is FH19SC-40S-0.5SH (51) manufactured by HIROSE.

Pin No.	Symbol	I/O	Function
1	V_{LED-}	P	Power for LED backlight cathode
2	V_{LED+}	P	Power for LED backlight anode
3	GND	P	Power ground
4	V_{DD}	P	Power voltage
5	R0	I	Red data (LSB)
6	R1	I	Red data
7	R2	I	Red data
8	R3	I	Red data
9	R4	I	Red data
10	R5	I	Red data
11	R6	I	Red data
12	R7	I	Red data (MSB)
13	G0	I	Green data (LSB)
14	G1	I	Green data
15	G2	I	Green data
16	G3	I	Green data
17	G4	I	Green data
18	G5	I	Green data
19	G6	I	Green data
20	G7	I	Green data (MSB)
21	B0	I	Blue data (LSB)
22	B1	I	Blue data
23	B2	I	Blue data
24	B3	I	Blue data
25	B4	I	Blue data
26	B5	I	Blue data
27	B6	I	Blue data
28	B7	I	Blue data (MSB)
29	DGND	I	Digital ground
30	DCLK	I	Pixel clock
31	DISP	I	Display on/ off
32	HSYNC	I	Horizontal sync signal
33	VSYNC	I	Vertical sync signal
34	DE	I	Data enable
35	NC	-	No Connect
36	GND	P	Power ground
37	X_R	I/O	Right electrode - differential analog
38	Y_B	I/O	Bottom electrode - differential analog
39	X_L	I/O	Left electrode - differential analog
40	Y_T	I/O	Top electrode - differential analog

I/O: I: input, O: output, P: power

6. Electrical Characteristics

6.1 TFT LCD Module

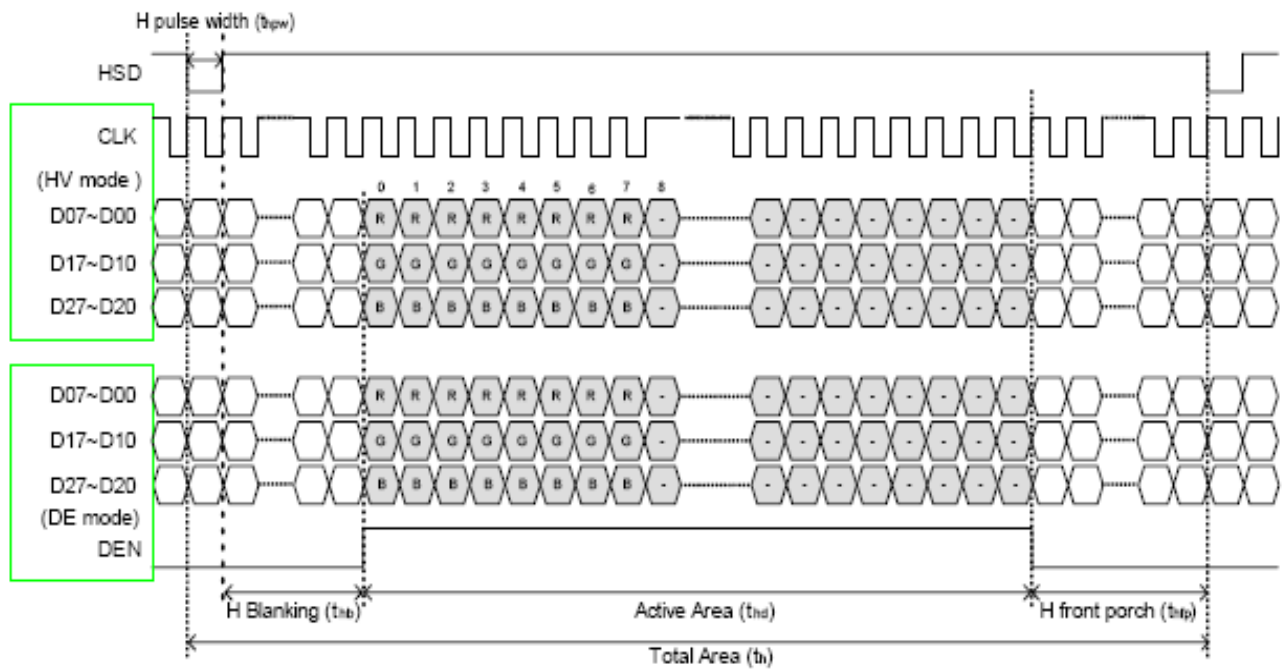| Item	Symbol	Min.	Typ.	Max.	Unit	Note
Supply Voltage	V_{DD}	3.0	3.3	3.6	V	
Input signal voltage	V_{IH}	$0.7V_{DD}$	–	V_{DD}	V	(1)
	V_{IL}	GND	–	$0.3V_{DD}$	V	(1)
Current of power supply	I_{DD}	–	–	220	mA	VDD=3.3V

Note (1): HSYNC, VSYNC, DE, R/G/B Data
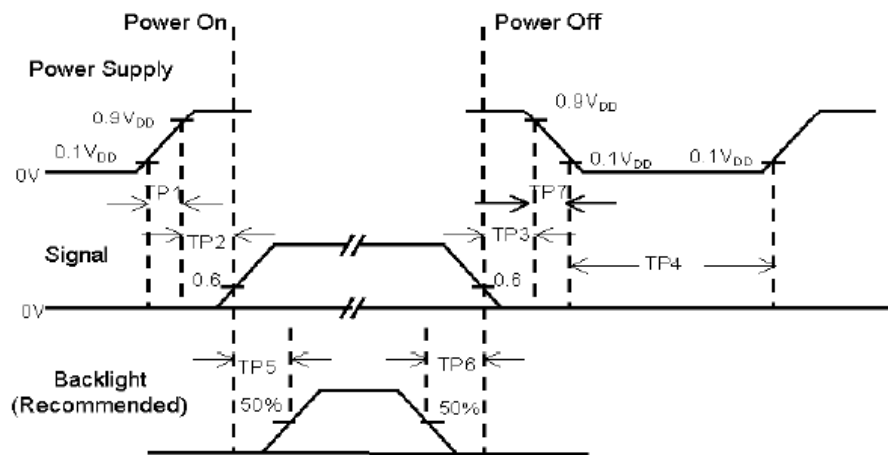Note (2): GND=0V

6.2 AC Characteristics

Item	Symbol	Min.	Typ.	Max.	Unit	Note
DCLK cycle time	Tclk	25			ns	
DCLK frequency	fclk		33	40	MHz	
DCLK pulse duty	Tcwh	40	50	60	%	
VSYNC setup time	Tvst	8			ns	
VSYNC hold time	Tvhd	8			ns	
HSYNC setup time	Thst	8			ns	
HSYNC hold time	Thhd	8			ns	
Data setup time	Tdasu	8			ns	
Data hold time	Tdahd	8			ns	
DE setup time	Tdesu	8			ns	
DE hold time	Tdehd	8			ns	
Horizontal display area	Thd		800		Tcph	
HSYNC period time	Th		928		Tcph	
HSYNC width	Thwh	1	48		Tcph	
HSYNC back porch	Thbp		40		Tcph	
HSYNC front porch	Thfp		40		Tcph	
Vertical display area	Tvd		480		th	
VSYNC period time	Tv		525		th	
VSYNC width	Tvwh		3		th	
VSYNC back porch	Tvbp		29		th	
VSYNC front porch	Tvfp		13		th	

6.3 Timing Diagram of Interface Signal

Sampling clock timing

Horizontal display timing range

Vertical timing

VSD

HSD

DE

tvpw

tvb tvd tvfp

tv

6.4 Power Sequence

Power On   Power Off

Power Supply

0.9V_DD   0.9V_DD
0.1V_DD   0.1V_DD   0.1V_DD
0V

TP1   TP7

Signal

TP2   TP3   TP4
0.6   0.6
0V

Backlight
(Recommended)

TP5   TP6
50%   50%
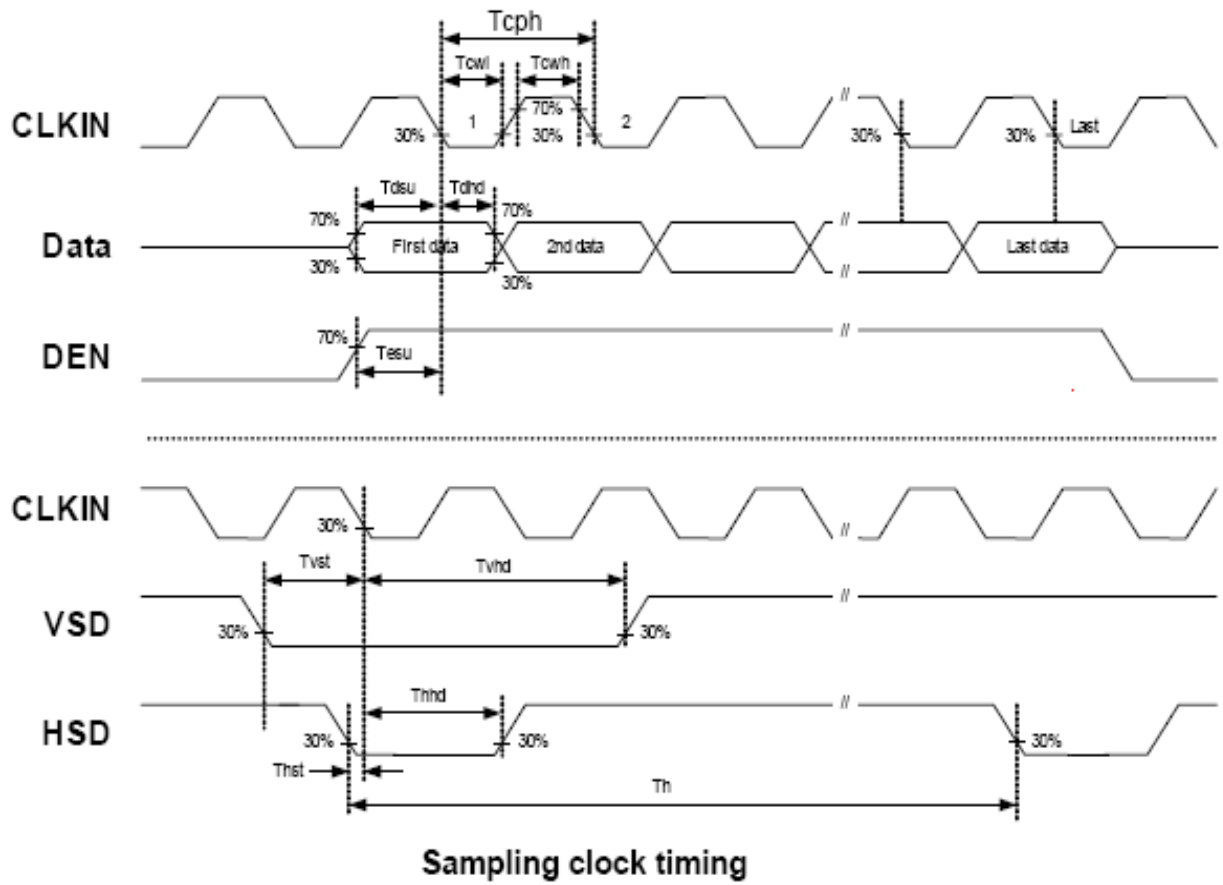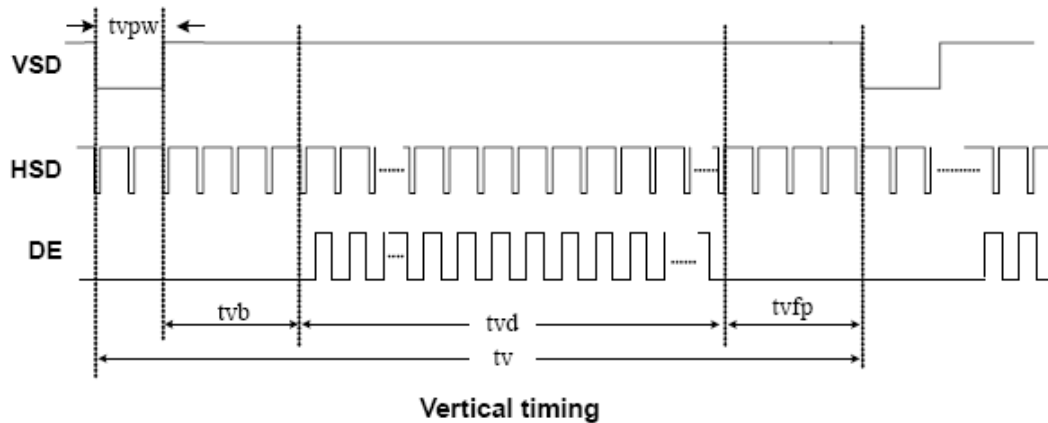
Item	Min.	Typ.	Max.	Unit	Remark
TP1	0.5	--	10	msec	
TP2	0	--	50	msec	
TP3	0	--	50	msec	
TP4	1000	--	--	msec	
TP5	200	--	--	msec	
TP6	200	--	--	msec	
TP7	0.5	--	10	msec	

Note : (1) The supply voltage of the external system for the module input should be the same as the definition of V_{DD}.

(2) Apply the lamp volatge within the LCD operation range. When the back-light turns on before the LCD operation or the LCD truns off before the back-light turns off, the display may momentarily become white.

(3) In case of VDD = off level, please keep the level of input signal on the low or keep a high impedance.

(4) TP4 should be measured after the module has been fully discharged between power off and on period.

(5) Interface signal shall not be kept at high impedance when the power is on.

7.0 Reliability test items

NO	Item	Conditions	Remark
1	High Temperature Storage	Ta=+70℃,240hrs	
2	Low Temperature Storage	Ta=-20℃,240hrs	
3	High Temperature Operation	Ta=+60℃,240hrs	
4	Low Temperature Operation	Ta=-10℃,240hrs	
5	High Temperature and High Humidity (operation)	Ta=+60℃,90%RH,240hrs	
6	Thermal Cycling Test (non operation)	-20℃(0.5hr)→+70℃(0.5hr),200cycles	
7	Vibration	1.Random:1.04G,10-500HZ,X,Y,Zdirection 30min/each direction 2.Sweep sine:1.5G, 5~500Hz, X/Y/Z,30min/each direction	
8	Shock	100G,6ms, ±X, ±Y, ±Z 3 time for each direction	JIS C7021, A-10 (Condition A)
9	Vibration (with carton)	Random:1.04Grms, 10~500Hz, X/Y/Z 45min/each direction Fixed:5Hz, 1.5Grms, X/Y/Z 45min/each direction	
10	Drop (with carton)	Height:60cm 1 corner, 3 edges, 6 surfaces	JIS Z0202
11	Electrostatic Discharge	±200V,200PF,0Ω1 time/each terminal	

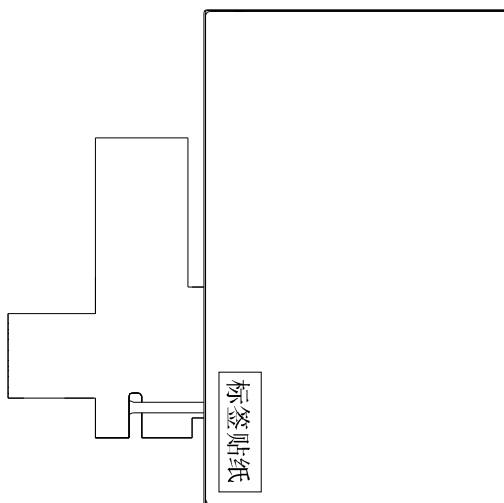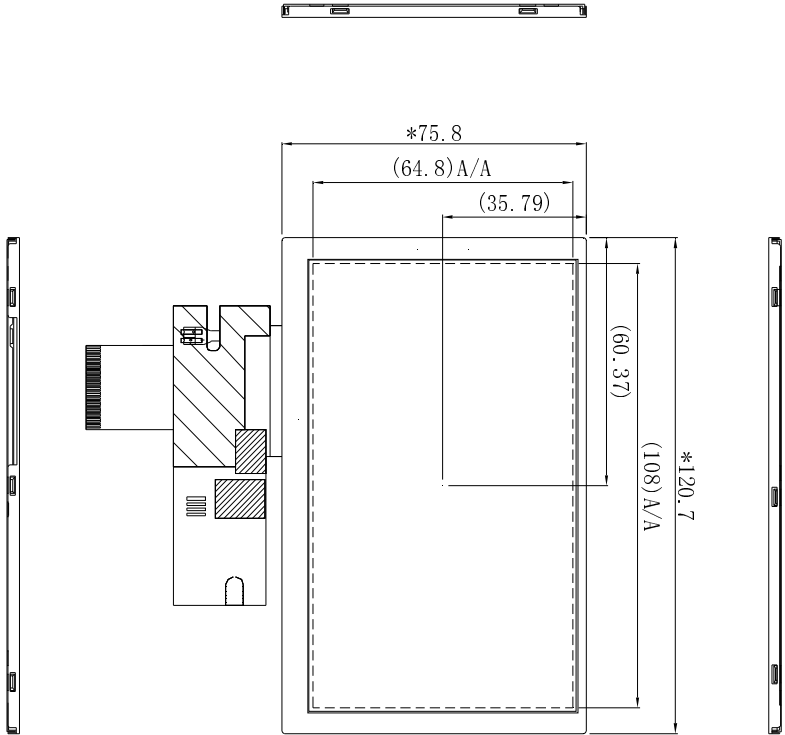Note: All tests above are practiced at module type.
   There is no display function NG issue occurred, All the cosmetic specification is judged before
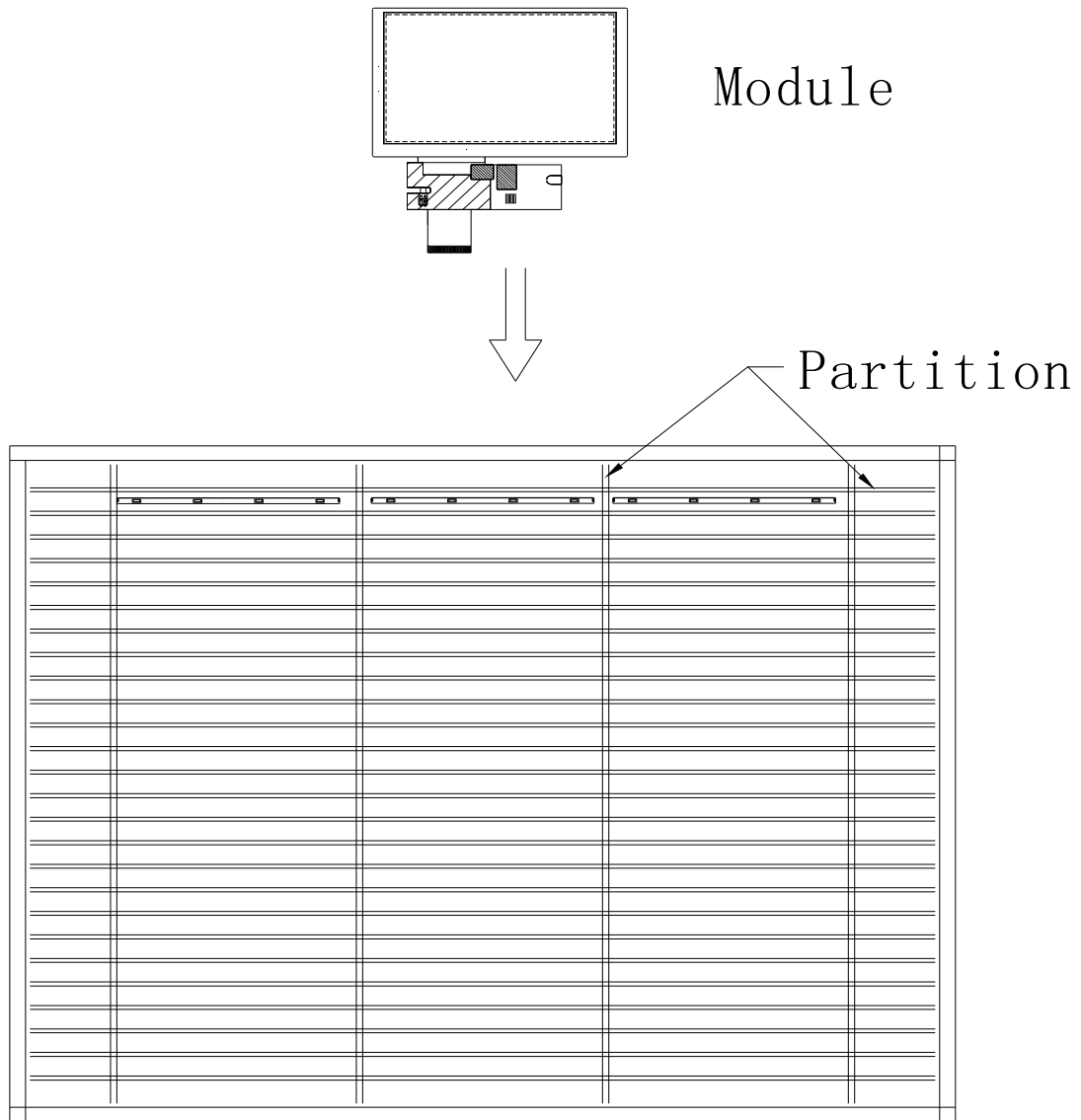   the reliability stress.

8.0 Outline dimension

Notes:
1. Unit: mm
2. Do not scale drawing.
3. All radii without dimension R0.2
4. Luminous lustensity(@ AVG):
   320cd/m^2(Min) ; 350cd/m^2(Typ) ;
5. Uniformity : 75%(Min)
   VF:18V(Min) ;19.8V(Typ) ;21V(Max) ; IF:40mA(Fix)
6. The color coordinates:

	MIN	TYP	MAX
x	0.30	0.32	0.34
y	0.32	0.34	0.36

7. ⚠ Modification rev. number
8. draft angle 1.0°
9. Genral Tolerance:±0.2
10. Mark mold cavity indentification in recess approximately
    where indicated.
11. "*" For important dimension,( ) for reference dimention
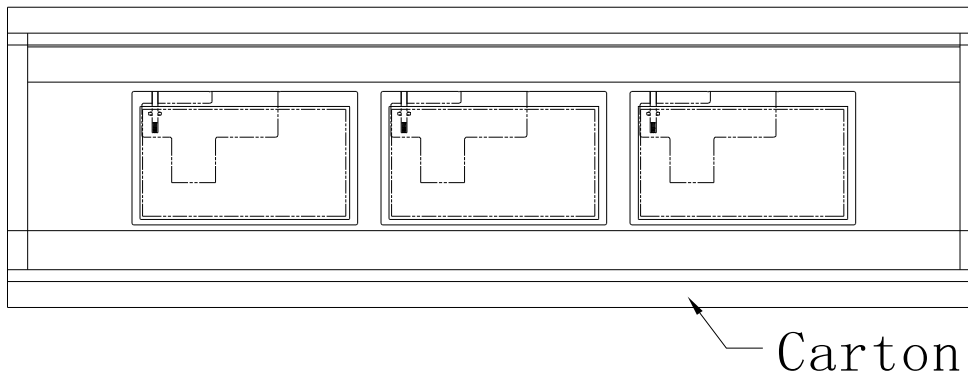12. RoHs must be complied.(Use Lead-free process)

RoHS

*75.8
(64.8)A/A
(35.79)
(60.37)
(108)A/A
*120.7
*3.1

LED电路图

A

K

标签贴纸

9.0 Packing form

Module

Partition

Total:75PCS Module/Carton

Carton

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 ife-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 connectoror 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.

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.