Model: HSD123KPW1-A30

原装FOB组装

Note: 1.Please contact HannStar Display Corp. before designing your product based on this module specification.
2.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.
3.The mark " ** " of Model means sub-model code.

Record of Revisions

Rev.	Date	Sub-Model	Description of change
1.0	May., 16, 2017	A**	Formal Specification was first released
--	Sep., 29, 2017	--	Modify 3.1 Optical specification –item Note (P.6) 6.3 Power On / Off Sequence (P.17) 7.0 Reliability test items(P.19)
2.0	Nov., 01,2017	--	Modify 2.2 Environment Absolute Rating (P.5) 7.0 Reliability test items(P.19)
3.0	Mar., 14,2018		Modify 2.2 Environment Absolute Rating (P.5) 6.2 Interface Timing (DE mode) (P.15) 7.0 Reliability test items(P.19) 8.0 OUTLINE DIMENSION(P.20)
4.0	Apr.,13,2020		Modify 6.3 Power On / Off Sequence (P.17)

Contents

1.0 GENERAL DESCRIPTION

1.1 Introduction

HannStar Display model HSD123KPW1-A30 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 and a back light system. This TFT LCD has a 12.28” (8:3) inch diagonally measured active display area with 5760 x 720 dot (1920 horizontal by 720 vertical pixel) resolution.

1.2 Features

- 12.28 (8:3 diagonal) inch configuration
- 16.7M
- ROHS / Halogen Free Compliance

1.3 Applications

- Automobile

1.4 General information

Item		Specification	Unit
Outline Dimension		310 (H) x 128.0(V) x6.3(Typ.)	mm
Display area		292.032(H) x 109.512(V)	mm
Number of Pixel		1920 RGB (H) x 720(V)	pixels
Pixel pitch		0.1521(H) x 0.1521 (V)	mm
Pixel arrangement		RGB Vertical stripe	
Display mode		Normally Black	
NTSC		70 (typ.)	%
Surface treatment		AG	
Weight		520 (Typ.)	g
Back-light		Single LED (Side-Light type)	
Power Consumption	Logic System (White Pattern)	2W (Max)	W
	B/L System	8.976 (Max.)	W

1.5 Mechanical Information

Item		Min.	Typ.	Max.	Unit
Module Size	Horizontal (H)	309.7	310	310.3	mm
	Vertical (V)	127.7	128.0	128.3	mm
	Depth (D)	6.0	6.3	6.6	mm
Weight		—	520	—	g

2.0 ABSOLUTE MAXIMUM RATINGS

2.1 Electrical Absolute Rating

2.1.1 TFT LCD Module

Parameters	Symbol	Min.	Max.	Unit	Note
Power Logic	VDD	-0.3	3.6	V	

2.2 Environment Absolute Rating

Item	Symbol	Min.	Max.	Unit	Note
Operating Temperature	T_{opa}	-20	70	℃	
Storage Temperature	T_{stg}	-30	80	℃	

3.0 OPTICAL CHARACTERISTICS

3.1 Optical specification

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Contrast		CR	Θ=0 Normal viewing angle		800	—		(1)(2)
Response time	Rising	T_R		—	17		msec	(1)(3)
	Falling	T_F		—	18			
White luminance (Center)		Y_L		600	650		—	(1)(4) (I_L=480mA)
Color chromaticity (CIE1931)	White	W_x		0.273	0.313	0.353		(1)(4)
		W_y		0.289	0.329	0.369		
	Red	R_x		0.611	0.651	0.691		
		R_y		0.293	0.333	0.373		
	Green	G_x		0.256	0.296	0.336		
		G_y		0.572	0.612	0.642		
	Blue	B_x		0.103	0.143	0.183		
		B_y		0.058	0.098	0.138		
Viewing angle	Hor.	Θ_L	CR>10	—	85	—		
		Θ_R		—	85	—		
	Ver.	Θ_U		—	85	—		
		Θ_D		—	85	—		
Brightness uniformity		B_{UNI}	Θ=0	70	80	—	—	(5)
Optima View Direction		Free						(6)

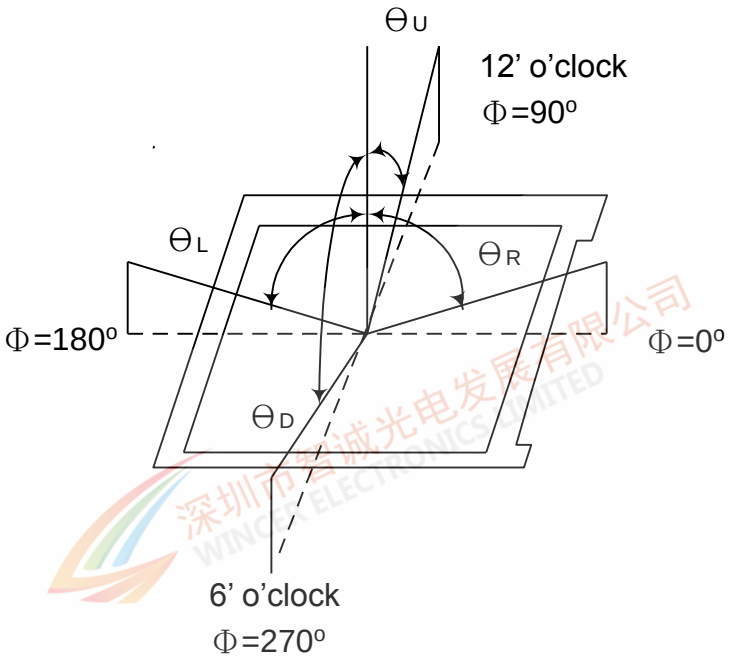
3.2 Measuring Condition

- Measuring surrounding：dark room
- LED current I_L：**480mA**
- Ambient temperature：25±2°C
- 15min. warm-up time.

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

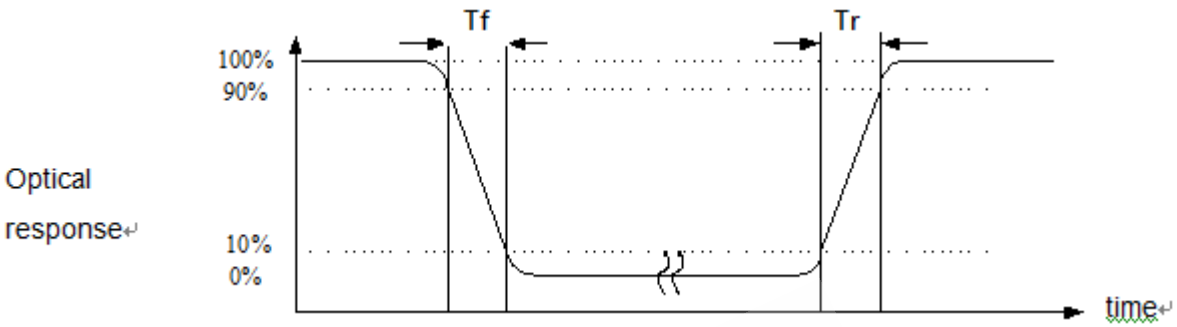
Note (1) Definition of Viewing Angle:



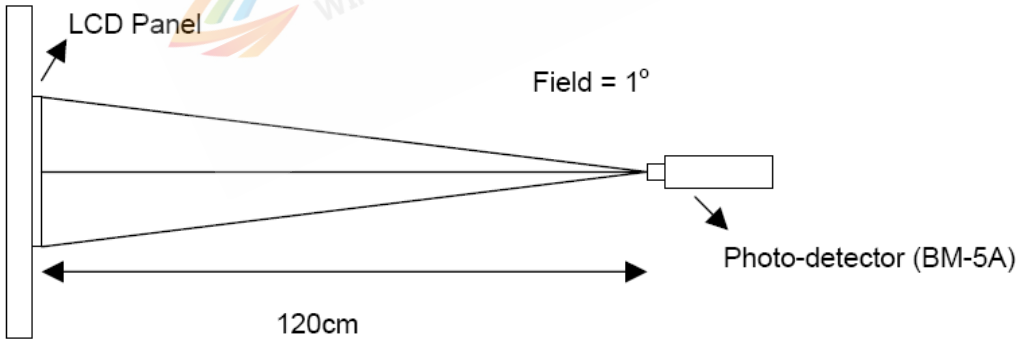
Note (2) Definition of Contrast Ratio (CR) :
measured at the center point of panel

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

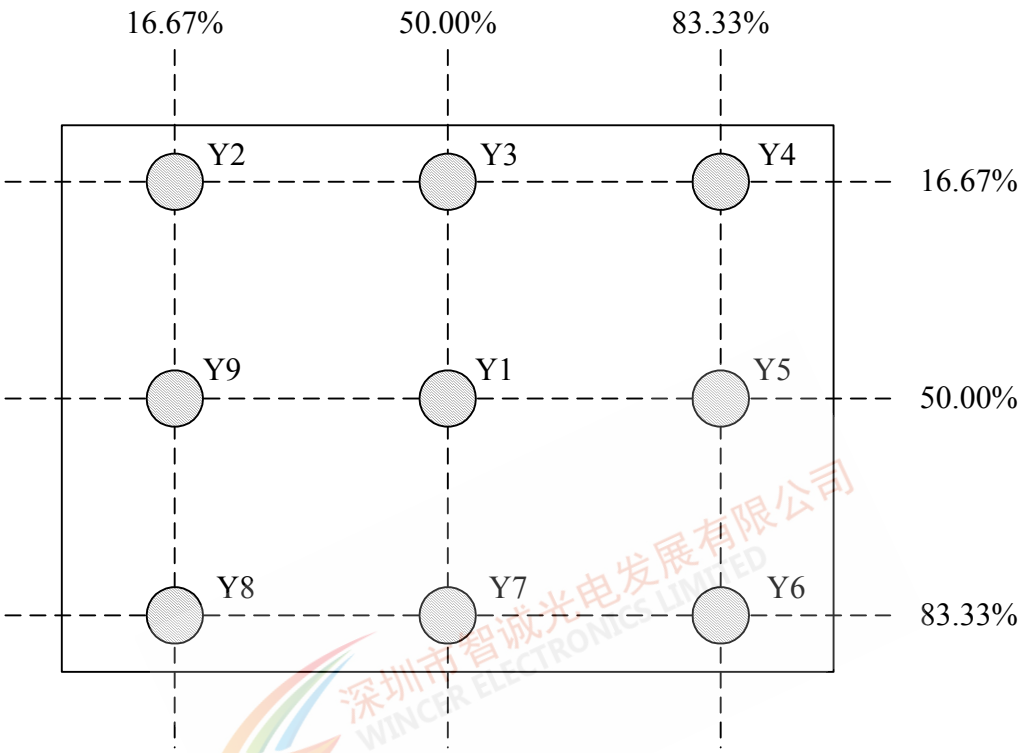
Note (3) Definition of Response Time : Sum of T_R and T_F



Note (4) Definition of optical measurement setup



Note (5) Definition of brightness uniformity

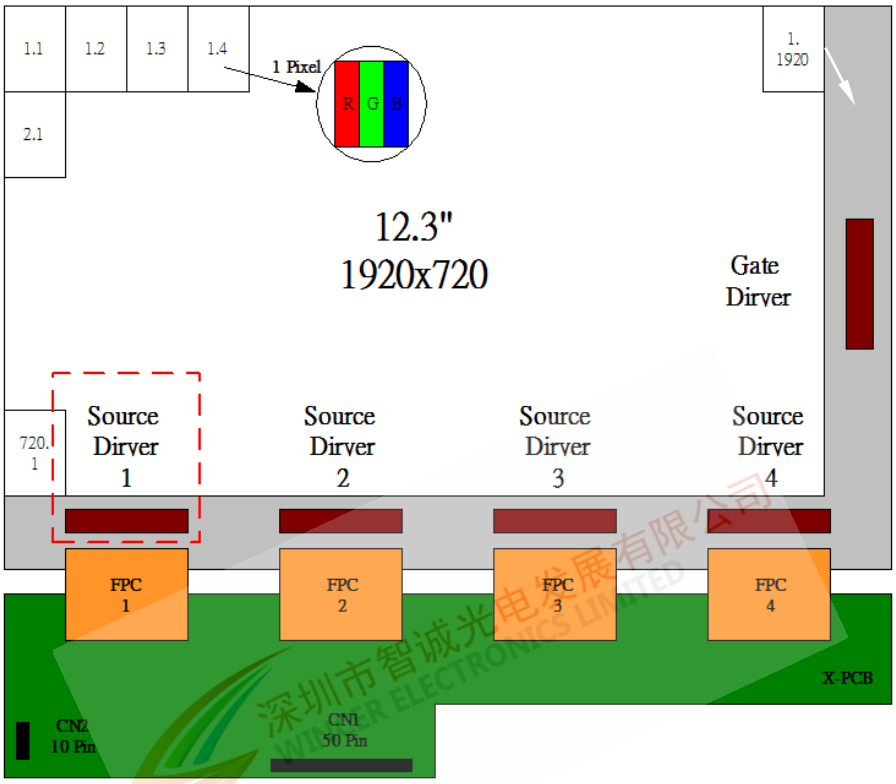


$$\text{Luminance uniformity} = \frac{\text{(Min Luminance of 9 points)}}{\text{(Max Luminance of 9 points)}} \times 100\%$$

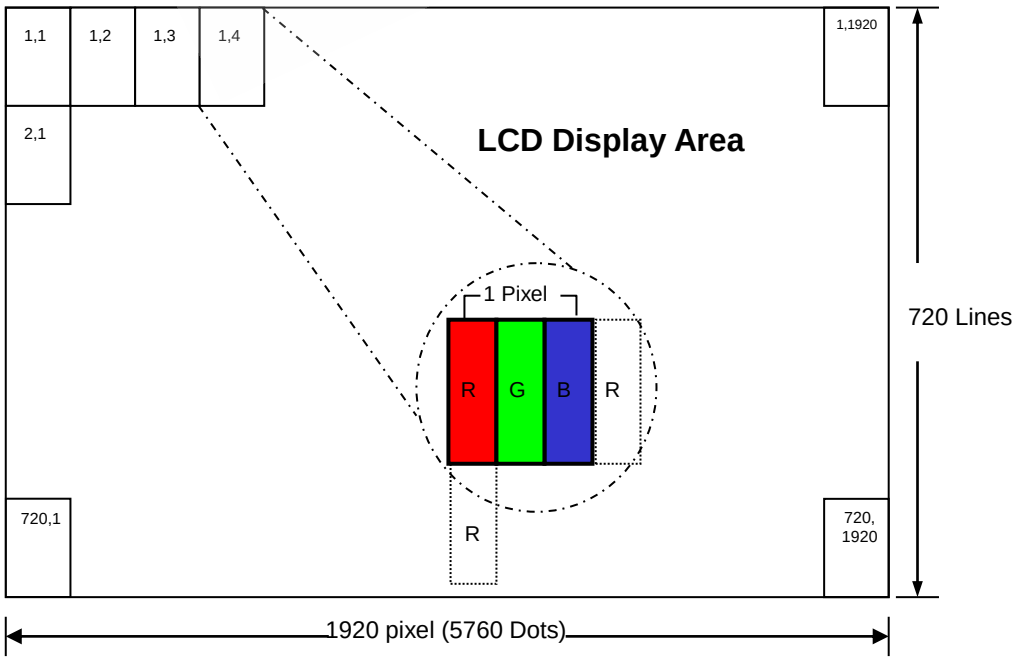
Note (6)：Rubbing Direction (The different Rubbing Direction will cause the different optima view direction.

4.0 BLOCK DIAGRAM

4.1 TFT LCD Module:



4.2 Pixel Format



4.3 Relationship Between Displayed Color and Input

	Display	MSB R7	R6	R5	R4	R3	R2	R1	LSB R0	MSB G7	G6	G5	G4	G3	G2	G1	LSB G0	MSB B7	B6	B5	B4	B3	B2	B1	LSB B0	Gray scale Level
Basic color	Black	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	-
	Blue	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	H	H	H	H	H	-
	Green	L	L	L	L	L	L	L	L	H	H	H	H	H	H	H	H	L	L	L	L	L	L	L	L	-
	Light Blue	L	L	L	L	L	L	L	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	-
	Red	H	H	H	H	H	H	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	-
	Purple	H	H	H	H	H	H	H	H	L	L	L	L	L	L	L	L	H	H	H	H	H	H	H	H	-
	Yellow	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	L	L	L	L	L	L	L	-
	White	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	-
Gray scale of Red	Black	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L0
	Dark	L	L	L	L	L	L	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L1
	↑	L	L	L	L	L	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L2
	↑					:								:								:				L3…L251
	↓	H	H	H	H	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L252
	Light	H	H	H	H	H	H	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L253
		H	H	H	H	H	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L254
	Red	H	H	H	H	H	H	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	Red L255
Gray scale of Green	Black	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L0
	Dark	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	L	L	L	L1
	↑	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	L	L	L	L	L2
	↑					:								:								:				L3…L251
	↓	L	L	L	L	L	L	L	L	H	H	H	H	H	H	L	L	L	L	L	L	L	L	L	L	L252
	Light	L	L	L	L	L	L	L	L	H	H	H	H	H	H	L	H	L	L	L	L	L	L	L	L	L253
		L	L	L	L	L	L	L	L	H	H	H	H	H	H	H	L	L	L	L	L	L	L	L	L	L254
	Green	L	L	L	L	L	L	L	L	H	H	H	H	H	H	H	H	L	L	L	L	L	L	L	L	Green L255
Gray scale of Blue	Black	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L0
	Dark	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L1
	↑	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L2
	↑					:								:								:				L3…L251
	↓	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	H	H	H	L	L	L252
	Light	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	H	H	H	L	H	L253
		L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	H	H	H	H	L	L254
	Blue	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	H	H	H	H	H	Blue L255
Gray scale of White & Black	Black	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L0
	Dark	L	L	L	L	L	L	L	H	L	L	L	L	L	L	L	H	L	L	L	L	L	L	L	H	L1
	↑	L	L	L	L	L	L	H	L	L	L	L	L	L	L	H	L	L	L	L	L	L	L	H	L	L2
	↑					:								:								:				L3…L251
	↓	H	H	H	H	H	H	L	L	H	H	H	H	H	H	L	L	H	H	H	H	H	H	L	L	L252
	Light	H	H	H	H	H	H	L	H	H	H	H	H	H	H	L	H	H	H	H	H	H	H	L	H	L253
		H	H	H	H	H	H	H	L	H	H	H	H	H	H	H	L	H	H	H	H	H	H	H	L	L254
	White	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	White L255

5.0 INTERFACE PIN CONNECTION

FPC connector is used for electronics interface.

AORORA F31L-1A7H1-21050 , 50PIN

Pin no.	Symbol	Function
1	GND	Power Ground
2	NC	No connector
3	VCC	Digital Power
4	VCC	Digital Power
5	GND	Power Ground
6	GND	Power Ground
7	NC	No connector
8	NC	No connector
9	GND	Power Ground
10	ORXIN0-	Odd pixel negative LVDS differential clock input
11	ORXIN0+	Odd pixel positive LVDS differential clock input
12	ORXIN1-	Odd pixel negative LVDS differential clock input
13	ORXIN1+	Odd pixel positive LVDS differential clock input
14	ORXIN2-	Odd pixel negative LVDS differential clock input
15	ORXIN2+	Odd pixel positive LVDS differential clock input
16	ORXCLKIN-	Odd pixel negative LVDS differential clock input
17	ORXCLKIN+	Odd pixel positive LVDS differential clock input
18	ORXIN3-	Odd pixel negative LVDS differential clock input
19	ORXIN3+	Odd pixel positive LVDS differential clock input
20	ERXIN0-	Even pixel negative LVDS differential clock input
21	ERXIN0+	Even pixel positive LVDS differential clock input
22	ERXIN1-	Even pixel negative LVDS differential clock input
23	ERXIN1+	Even pixel positive LVDS differential clock input
24	ERXIN2-	Even pixel negative LVDS differential clock input
25	ERXIN2+	Even pixel positive LVDS differential clock input
26	ERXCLKIN-	Even pixel negative LVDS differential clock input
27	ERXCLKIN+	Even pixel positive LVDS differential clock input
28	ERXIN3-	Even pixel negative LVDS differential clock input

29	ERXIN3+	Even pixel positive LVDS differential clock input
30	GND	Power Ground
31	NC	No connector
32	RESETB	Global reset pin,active low.
33	STBYB	Standby mode,active low.
34	CA3	Cascade signal pin. Abnormal signal detection indicator. Combine HV/DE/Clock/STV/UVP detection result.
35	SCL(NC)	Serial interface clock input.(User NC)
36	SDA(NC)	Serial interface data input/output.(User NC)
37	CSB(NC)	Serial interface chip enable.(User NC)
38	GND	Power Ground
39	GND	Power Ground
40	NC	No connector
41	LEDA	LED power (Anode)
42	LEDA	LED power (Anode)
43	LEDA	LED power (Anode)
44	NC	No connector
45	LEDK1	Cathode 1
46	LEDK2	Cathode 2
47	LEDK3	Cathode 3
48	LEDK4	Cathode 4
49	NTC_A	NTC_Anode
50	NTC_K	NTC_Cathode

6.0 ELECTRICAL CHARACTERISTICS

6.1 TFT LCD Module

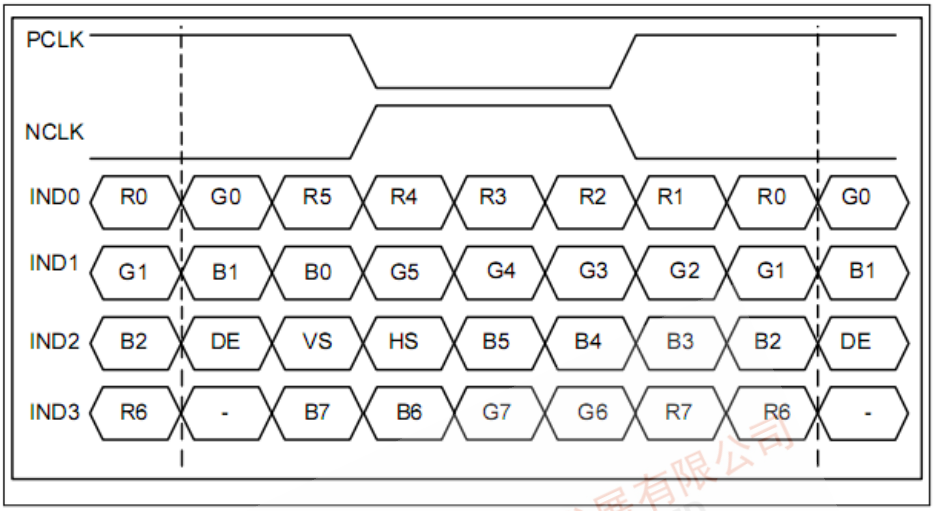
Item	Symbol	Min.	Typ.	Max.	Unit	Note
Supply Voltage	VDD	3	3.3	3.6	V	
Input signal voltage	ViH	VDD*0.7	-	VDD	V	
	ViL	0	-	VDD*0.3	V	
Current of power supply	IDD	--	--	400	mA	VDD =3.3V

6.2 Switching Characteristics for LVDS Receiver

Item	Symbol	Min.	Typ.	Max.	Unit	Conditions
Differential Input High Threshold	Vth	—	—	100	mV	V_{CM}=1.2V
Differential Input Low Threshold	Vtl	-100	—	—	mV	
Input Current	I_{IN}	-10	—	+10	uA	
Differential input Voltage	$\|V_{ID}\|$	0.2	—	0.6	V	
Common Mode Voltage Offset	V_{CM}	1	1.2	1.7-($\|V_{ID}\|$/2)	V	

6.1 Bit LVDS input

6.1.1 8Bit LVDS input

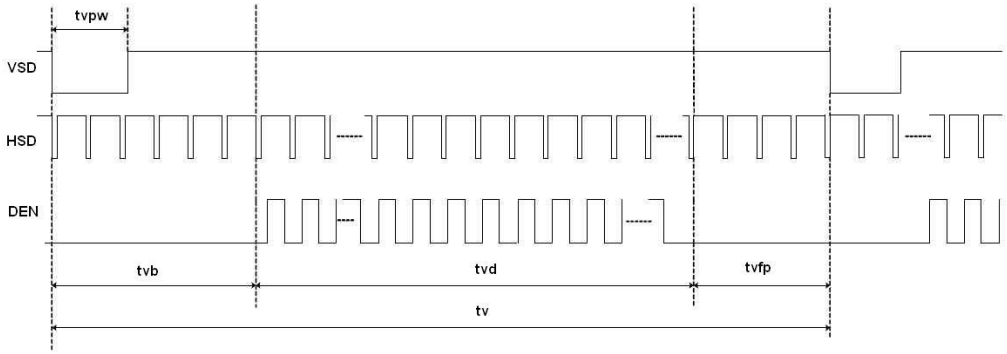


6.2 Interface Timing (DE mode)

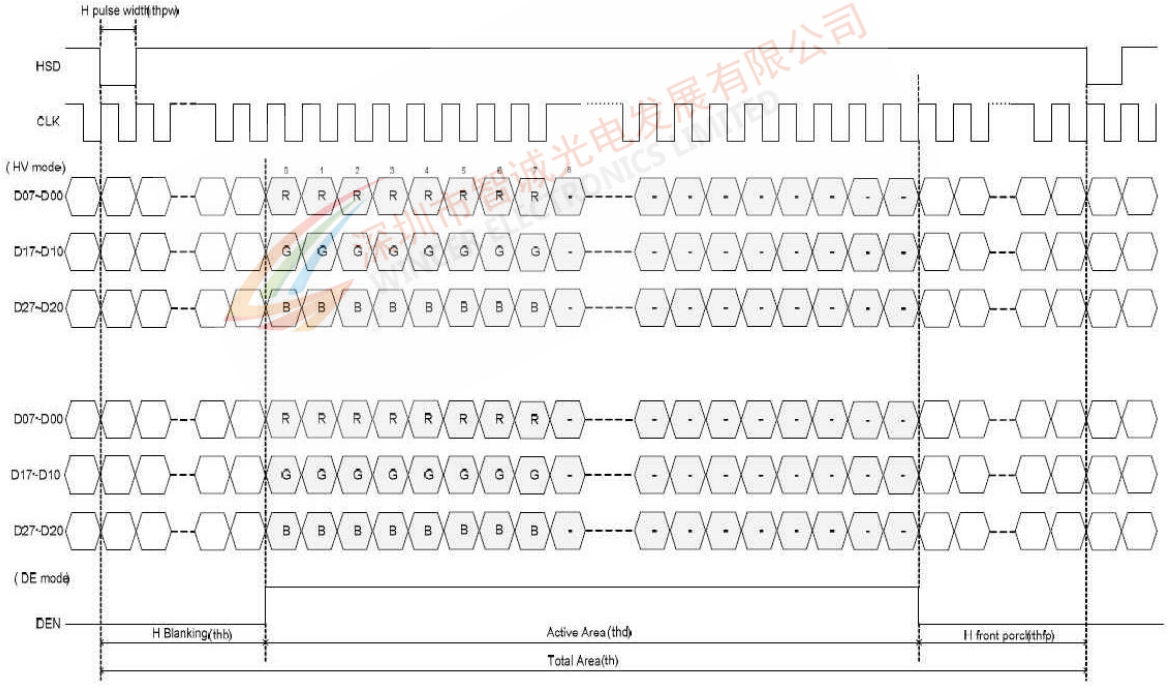
Interface Timing (DE mode) Two Port LVDS Timing.(1920xRGBx720)					
Item	Symbol	**Min.**	**Typ.**	**Max.**	Unit
Frame Rate	FR	**55**	**60**	**65**	Hz
Frame Period	T_v	**730**	**792**	**864**	line
Vertical Display Time	T_{vd}	**720**	**720**	**720**	line
Vertical Blanking Time	T_{vb}	**10**	**72**	**144**	line
1 Line Scanning Time	T_h	**984**	**992**	**1104**	clock
Horizontal Display Time	T_{hd}	**960**	**960**	**960**	clock
Horizontal Blanking Time	T_{hb}	**24**	**32**	**144**	clock
Clock Rate	F_{DCLK}	**45**	**47.5**	**50**	MHz

Timing Diagram of Interface Signal (DE mode)

(1) Vertical input timing

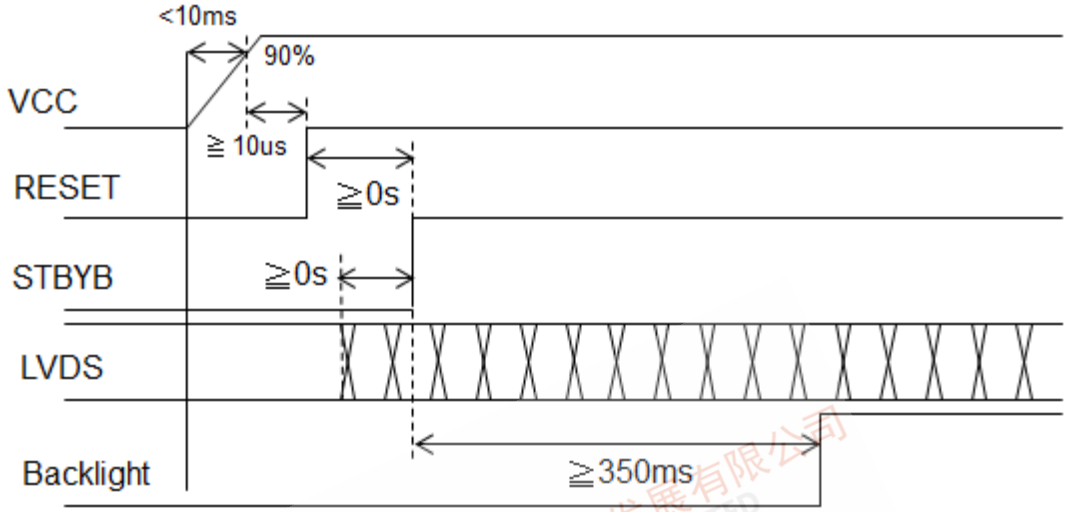


(2) Horizontal Vertical input timing

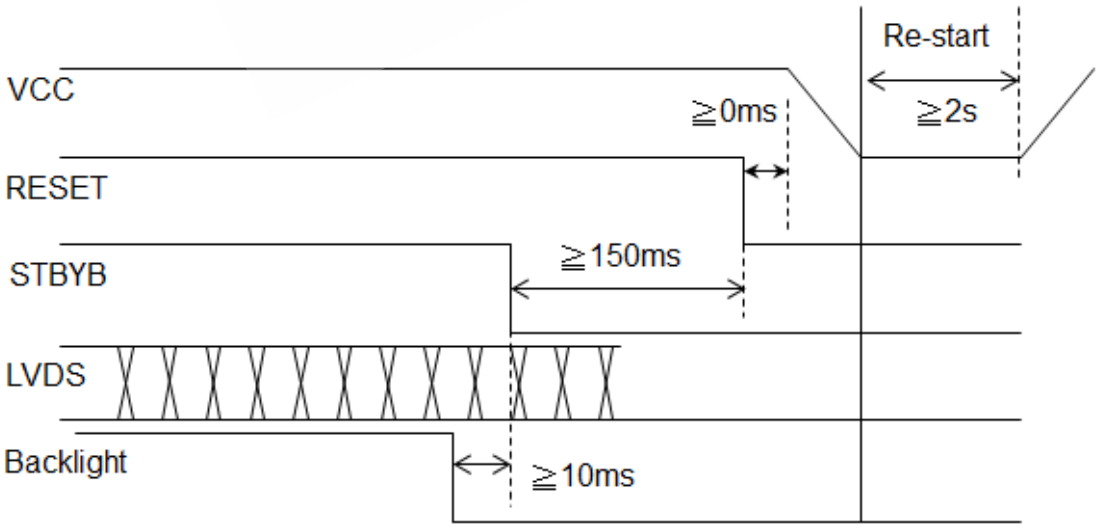


6.3 Power On / Off Sequence

6.3.1 Power On Sequence



6.3.2 Power Off Sequence



6.4 Backlight Unit

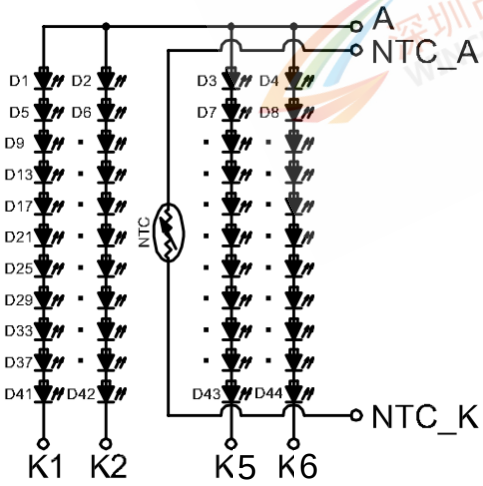
Parameter	Symbol	Min	Typ	Max	Units	Condition
LED Current	I_F	--	480	--	mA	Ta=25℃
LED Voltage	V_F	22.4	24	25.6	Volt	Ta=25℃
LED Life-Time	N/A	30,000	--	--	Hour	Ta=25℃ I_F=80mA Note (2)

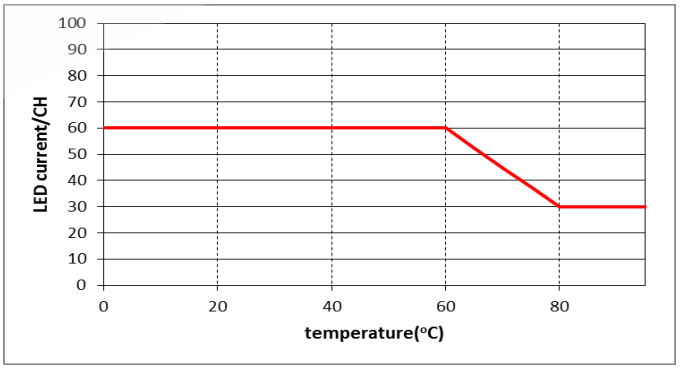
Note (1) LED life time (Hr) can be defined as the time in which it continues to operate under the condition: Ta=25±3 ºC, typical IL value indicated in the above table until the brightness becomes less than 50%.

Note (2) The “LED life time” is defined as the module brightness decrease to 50% original brightness at Ta=25℃ and IL= 480 mA. The LED lifetime could be decreased if operating IL is larger than TDB mA. The constant current driving method is suggested.

Note (3) LED Light Bar Circuit 8S6 P =48pcs LED

Note (4) LED temperature current curve, The temperature at 60 degrees before the output 60mA / CH, 60 degrees to 80 degrees when the linear drop to 30mA.





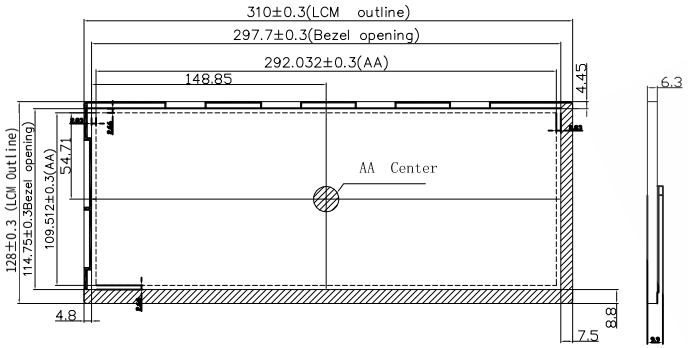
7.0 Reliability test items

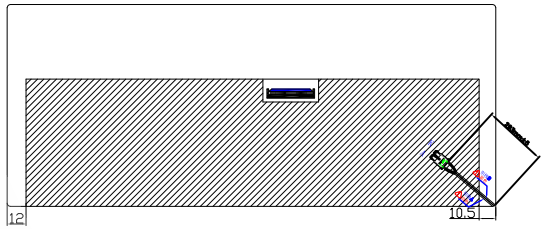
No.	Item	Conditions	Remark
1	High Temperature Storage	Ta=+80°C, 240hrs	
2	Low Temperature Storage	Ta=-30°C, 240hrs	
3	High Temperature Operation	Ta=+70°C, 240hrs	
4	Low Temperature Operation	Ta=-20°C, 240hrs	
5	High Temperature and High Humidity (operation)	Ta=+60°C, 90%RH, 240hrs	
6	Thermal Cycling Test (non operation)	-30°C(30min) → +80°C(30min), 100 cycles	
7	Electrostatic Discharge	±200V,200pF(0Ω) 1 time/connector	
8	Vibration	1.Random: 1.04G, 5~500Hz, XYZ, 30min/each direction 2.Sine: Freq. 8~33.3Hz, Stoke: 1.3mm Sweep: 2.9G, 33.3~400Hz X/Z: 2hrs, Y: 4hrs	
9	Shock	Half-Sine, 100G, 6ms, ±XYZ, 3time	
10	Vibration (with carton)	Random: 0.015G^2/Hz, 5~200Hz -6dB/Octave, 200~400Hz XYZ 各方向 2hrs	
11	Drop (with carton)	Drop height condition, basis on the product weight and follow QB100-0027 1 corner, 3 edges, 6 surfaces	

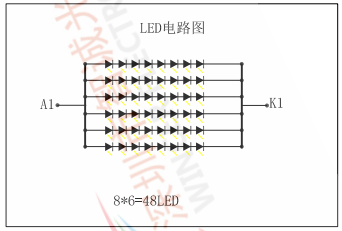
Note1 : There is no display function NG issue occurred, all the cosmetic specification is judged before the reliability stress.

Note2 : All of the function & cosmetic Judgment basis base on IIS Spec. at room temperature. (The tested module must have enough recovery time at least 2 hours at room temperature.)

Note3 : The test condition definition panel's surface temperature.







Notes:

1. RoHS must be complied.
2. △1 Modification rev. number
3. Draft angle 1.0° :
4. "* " ICON MEAN IMPORTANT DIM.
5. All radii without dimension R0.3, Unspecified Tolerances is:±0.30
6. Circuit Diagram:

Electrical-Optical Characteristics(Ta=25° C):

Item		Symbol	min.	typ.	max.	Unit	Condition
B/L	Luminance	Lv	--	--	--	cd/m²	If=480 mA 8串6并电流
	Uniformity	Avg	--	--	--	%	
	Colour Coordinate	X	--	--	--		
		Y	--	--	--		
LCM	Luminance	Lv	600	650	700	cd/m²	Measure tolerance: Luminance:±5% Colour coordinate:±0.008 Voltage:±0.1V
	Uniformity	Avg	80	85		%	
	Colour Coordinate	X	0.26		0.38		
		Y	0.26		0.38		
Forward Voltage		Vf	22.2	24	25.6	V	

●Operating Temperature:-20~+70° C ●Storage Temperature: -30~+80° C

●Storage condition Recommended: temperature (25° C±5° C) and humidity (65%RH±20%RH)

ISSUE	AMENDMENT	DATE
△0	NEW ISSUE	19.08.23

序号	名称	材质	用量
12	LCD	12.3寸 AUO	1
11	铁框下盖	(材质见订单要求)T=0.3	1
10	铁框上盖	(材质见订单要求)T=0.3	1
9	增光膜	TP-115 0°	1
8	增光膜	SP-65T 90°	1
7	扩散膜	CH27	1
6	反光膜	RW188	1
5	FPC	PI+RA铜	1
4	PCB	FR-4	1
3	LED	见订单要求	21
2	胶框	PC 黑	1
1	导光板	PMMA	1

MODEL NO.: REV: V00

CUSTOMER'S NO.: REV: 0

J060-12.3寸包胶模组图

SHEET 1 of 1 | SCALE 1 : 1 | THE THIRD ANGLE PROJECTION | UNIT: mm

DESIGN:

CHECKED:

COUNTERSIGN:

APPROVED: