



PRODUCT SPECIFICATION

MODEL: WD128FHL50TA-A0-----

<◇>PRELIMINARY SPECIFICATION

<◆>APPROVAL SPECIFICATION

CUSTOMER APPROVED	DESIGNED	CHECKED	APPROVED

SUPPLIER APPROVED	DESIGNED	CHECKED	APPROVED
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Record of Revisions

Rev.	Date	Sub-Model	Description of change
1.0	Jan., 21, 2019	A**	Preliminary Specification was first released (for Mock-up sample)



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1.0 GENERAL DESCRIPTION

1.1 Introduction

HannStar Display model IWD128FHL50TA-A0----- 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 12.8" (16:9) inch diagonally measured active display area with 5760 x 1080 dot (1920 horizontal by 1080 vertical pixel) resolution.

1.2 Features

- 12.8 (16:9 diagonal) inch configuration
- 16.7M
- ROHS / Halogen Free Compliance

1.3 Applications

- Automobile

1.4 General information

Item	Specification	Unit
Outline Dimension	307.18(H) x 183.28(V) x 9.1(Typ.)	mm
Display area	283.392(H) x 159.408(V)	mm
Number of Pixel	1920 RGB (H) x 1080(V)	pixels
Pixel pitch	0.1476(H) x 0.1476 (V)	mm
Pixel arrangement	RGB Vertical stripe	
Display mode	Normally Black	
NTSC	75 (typ.)	%
Surface treatment	Glare	
Weight	460 (Typ.)	g
Back-light	Single LED (Side-Light type)	
Power Consumption	Logic System (White Pattern)	W
	B/L System	W

1.5 Mechanical Information

Item	Min.	Typ.	Max.	Unit
Module Size	Horizontal (H)	307.18		mm
	Vertical (V)	183.28		mm
	Depth (D)	9.1		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	VCC	-0.3	4	V	

2.2 Environment Absolute Rating

Item	Symbol	Min.	Max.	Unit	Note
Operating Temperature	T _{opa}	-30	85	°C	
Storage Temperature	T _{stg}	-40	90	°C	



3.0 OPTICAL CHARACTERISTICS

3.1 Optical specification

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Contrast		CR	$\Theta=0$ Normal viewing angle		1400	—		(1)(2)
Response time	Rising	T _R		—	13	16	msec	(1)(3)
	Falling	T _F		—	12	14		
White luminance (Center)		Y _L		530	650	—	cd/m ²	(1)(4) (I _L =280mA)
Color chromaticity (CIE1931)	White	W _x			TBD			(1)(4)
		W _y			TBD			
	Red	R _x			TBD			
		R _y			TBD			
	Green	G _x			TBD			
		G _y			TBD			
	Blue	B _x			TBD			
		B _y			TBD			
Viewing angle	Hor.	Θ_L	CR>10	80	85	—		
		Θ_R		80	85	—		
	Ver.	Θ_U		80	85	—		
		Θ_D		80	85	—		
Brightness uniformity		B _{UNI}	$\Theta=0$	70	80	—	%	(5)
Optima View Direction		Free						(6)

3.2 Measuring Condition

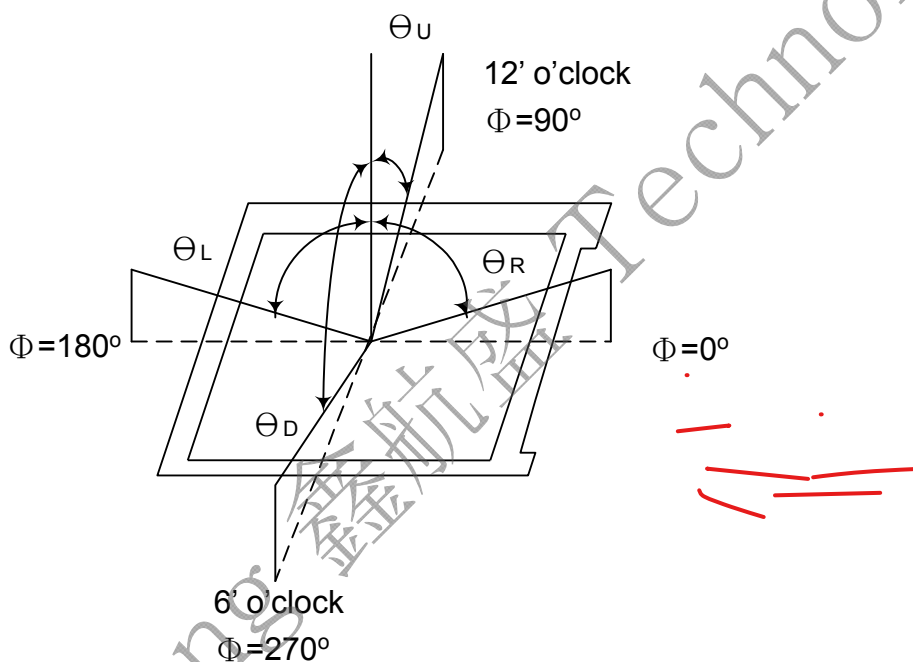
- Measuring surrounding : dark room
- LED current I_L : **280mA**
- Ambient temperature : $25\pm 2^\circ C$
- 15min. warm-up time.



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:

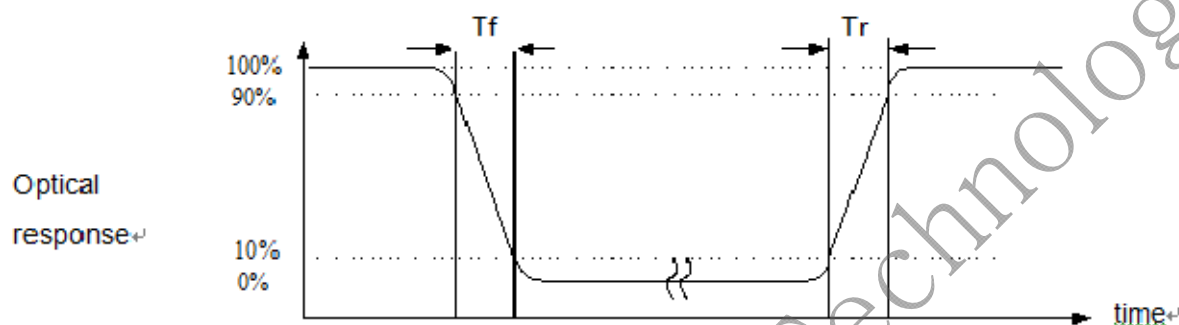


Note (2) Definition of Contrast Ratio (CR) :
measured at the center point of panel

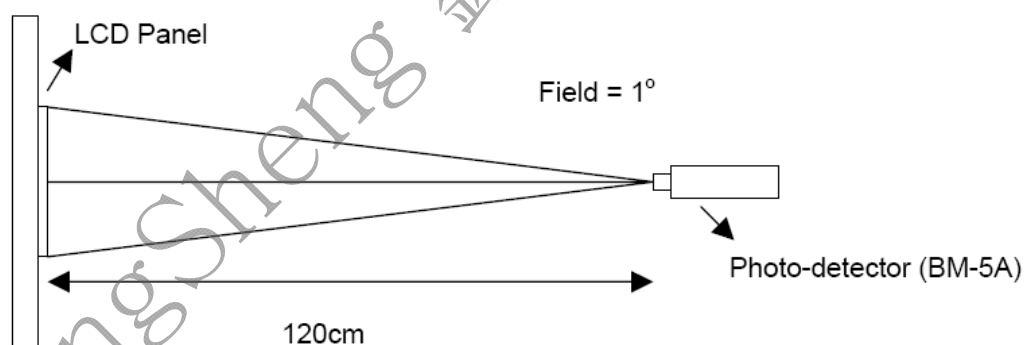
$$CR = \frac{\text{Luminance with all pixels white}}{\text{Luminance with all pixels black}}$$



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

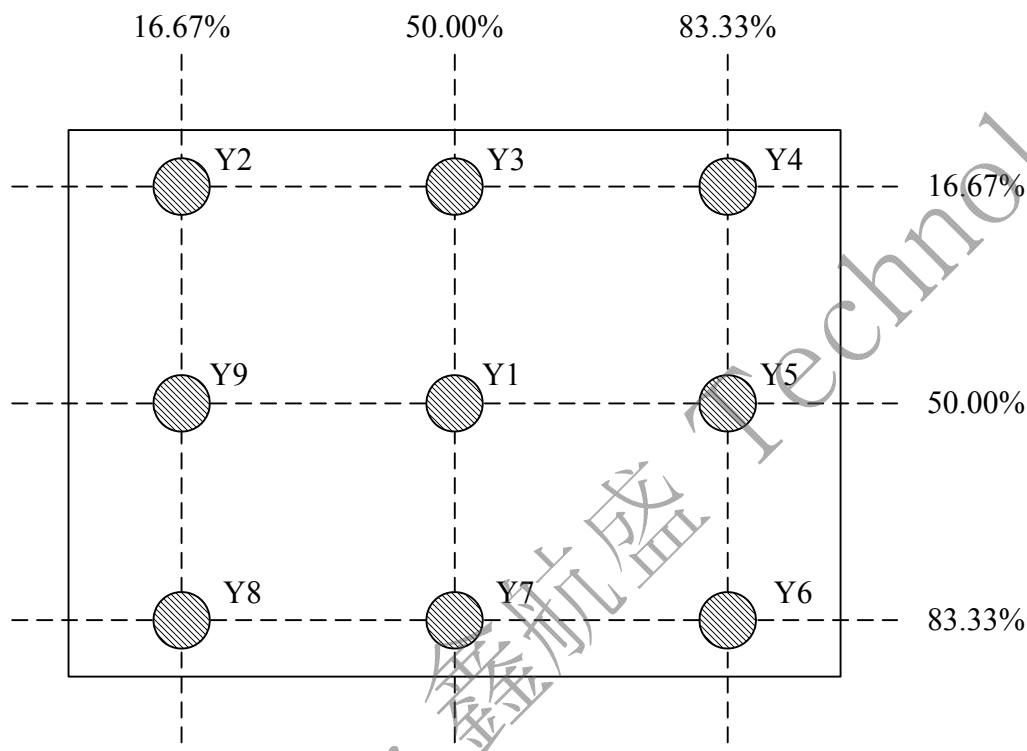


Note (4) Definition of optical measurement setup





Note (5) Definition of brightness uniformity



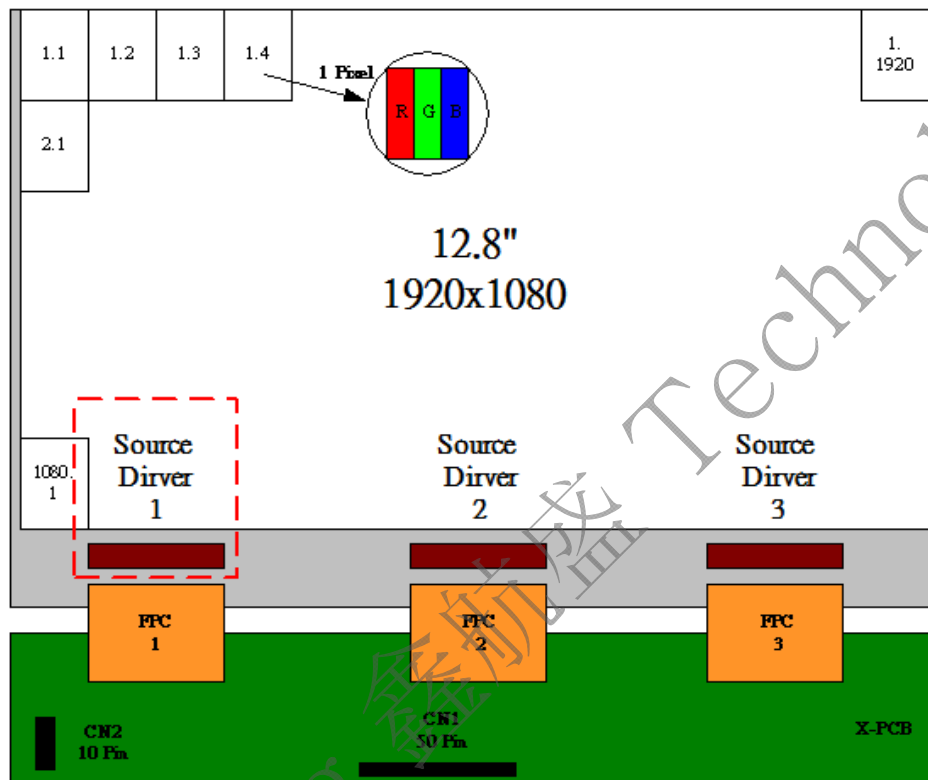
$$\text{Luminance uniformity} = \frac{(\text{Min Luminance of 9 points})}{(\text{Max Luminance of 9 points})} \times 100\%$$

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

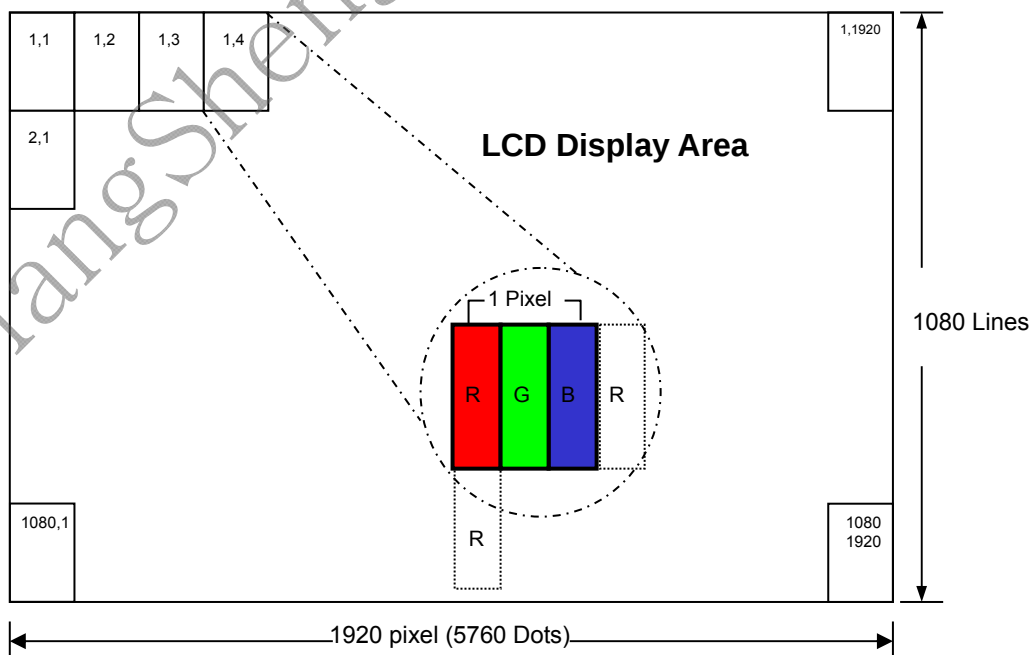


4.0 BLOCK DIAGRAM

4.1 TFT LCD Module:



4.2 Pixel Format





4.3 Relationship Between Displayed Color and Input

	Display	MSB LSB								MSB LSB								MSB LSB								Gray scale Level
		R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0	
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 ↑ ↓ Light	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L1
		L	L	L	L	L	L	L	H	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 ↑ ↓ Light	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	H	L	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 ↑ ↓ Light	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L1
		L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	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	L	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 ↑ ↓ Light	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L1
		L	L	L	L	L	L	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	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	L	H	H	H	H	H	H	H	L	H	L	L253
		H	H	H	H	H	H	H	L	H	H	H	H	H	H	L	H	H	H	H	H	H	L	L	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

CN1 FPC connector is used for electronics interface.

AORORA F31L-1A7H1-21050 or BJD 101049-205050 (50PIN)

Pin no.	Symbol	Function
1	GND	Power ground
2	NC/BIST	No connector(BIST Pin)
3	VCC	Digital Power/Vin = 3.3V
4	VCC	Digital Power/Vin = 3.3V
5	GND	Power ground
6	GND	Power ground
7	NC	No connector(Serial interface OTP Power)
8	NC	No connector
9	GND	Power ground
10	ORXIN0-	Negative LVDS differential data input (Odd data)
11	ORXIN0+	Positive LVDS differential data input (Odd data)
12	ORXIN1-	Negative LVDS differential data input (Odd data)
13	ORXIN1+	Positive LVDS differential data input (Odd data)
14	ORXIN2-	Negative LVDS differential data input (Odd data)
15	ORXIN2+	Positive LVDS differential data input (Odd data)
16	ORXCLKIN-	Negative LVDS differential clock input (Odd clock)
17	ORXCLKIN+	Positive LVDS differential clock input (Odd clock)
18	ORXIN3-	Negative LVDS differential data input (Odd data)
19	ORXIN3+	Positive LVDS differential data input (Odd data)
20	ERXIN0-	Negative LVDS differential data input (Even data)
21	ERXIN0+	Positive LVDS differential data input (Even data)
22	ERXIN1-	Negative LVDS differential data input (Even data)
23	ERXIN1+	Positive LVDS differential data input (Even data)
24	ERXIN2-	Negative LVDS differential data input (Even data)
25	ERXIN2+	Positive LVDS differential data input (Even data)
26	ERXCLKIN-	Negative LVDS differential clock input (Even clock)
27	ERXCLKIN+	Positive LVDS differential clock input (Even clock)
28	ERXIN3-	Negative LVDS differential data input (Even data)
29	ERXIN3+	Positive LVDS differential data input (Even data)



30	GND	Power ground
31	FAULT	FAULT signal output(normal=L,abnormal=H)
32	RESET	Global reset pin,active low.
33	STBYB	Standby mode,active low.
34	NC	No connector(Serial interface chip enable.CSB)
35	NC	No connector(Serial interface clock input.SCL)
36	NC	No connector(Serial interface data input/output.CDA)
37	NC	No connector(Serial interface data input/output.CDA)
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	LEDK	Cathode 1
46	LEDK	Cathode 2
47	LEDK	Cathode 3
48	LEDK	Cathode 4
49	NTC_A	NTC_Anode
50	NTC_K	NTC_Cathode
Note: NTC :Murata NCU15XH103F6SRC		

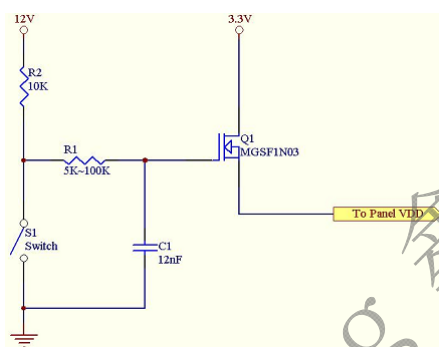


6.0 ELECTRICAL CHARACTERISTICS

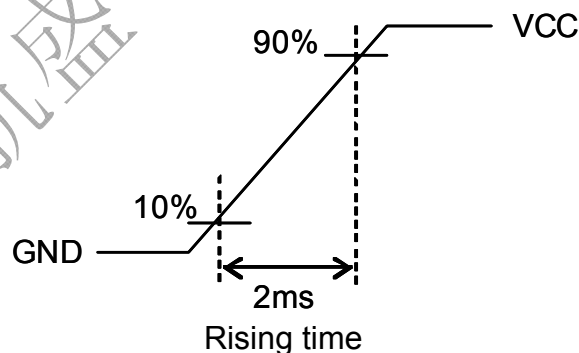
6.1 TFT LCD Module

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Supply Voltage	VCC	3	3.3	3.6	V	
Input signal voltage	ViH	VCC*0.7	-	VCC	V	
	ViL	0	-	VCC*0.3	V	
Current of power supply	I _{DD}	--	--	500	mA	VCC = 3.3V White pattern
Inrush current	I _{RUSH}	—	—	2.0	A	Note*

Note* : Inrush current test circuit and rising time setting (power on)



Test circuit



6.2 Switching Characteristics for LVDS Receiver

Item	Symbol	Min.	Typ.	Max.	Unit	Conditions
Differential Input High Threshold	V _{th}	—	—	100	mV	V _{CM} =1.2V
Differential Input Low Threshold	V _{tl}	-100	—	—	mV	
Input Current	I _{IN}	-10	—	+10	uA	
Differential input Voltage	V _{ID}	0.1	—	0.6	V	
Common Mode Voltage Offset	V _{CM}	1	1.2	1.7-(V _{ID} /2)	V	



6.3 Bit LVDS input

6.3.1 8Bit LVDS input





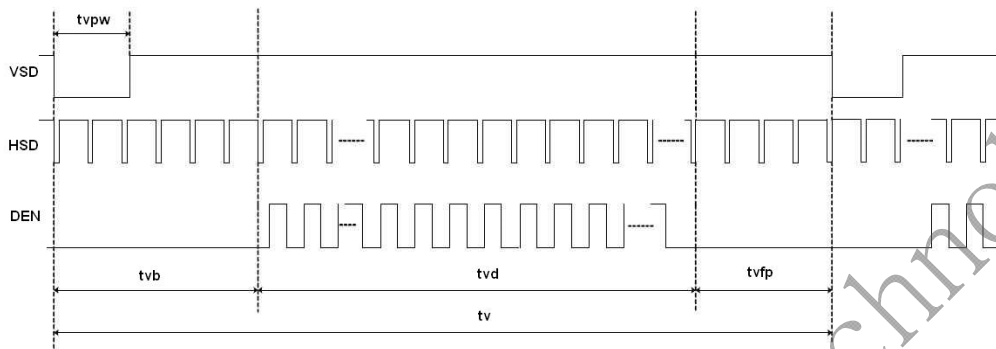
6.4 Interface Timing (DE mode)

Interface Timing (DE mode) Two Port LVDS Timing.(1920xRGBx1080)					
Item	Symbol	Min.	Typ.	Max.	Unit
Frame Rate	FR	55	60	65	Hz
Vertical Display Time	T _{vd}	1080			H
Vertical pulse width	T _{vpw}	1	3	20	H
Vertical back porch	T _{vbp}	2	24	200	H
Vertical front porch	T _{vfp}	5	8	200	H
Frame Period	T _v	1087	1112	1404	H
Horizontal Display Time	T _{hd}	960			DCLK
Horizontal pulse width	T _{hpw}	10	12	200	DCLK
Horizontal back porch	T _{hbp}	5	16	200	DCLK
Horizontal front porch	T _{hfp}	24	26	200	DCLK
1 Horizontal line	T _v	989	1012	1248	DCLK
Clock Rate	F _{DCLK}	64.5	66.9	80	MHz

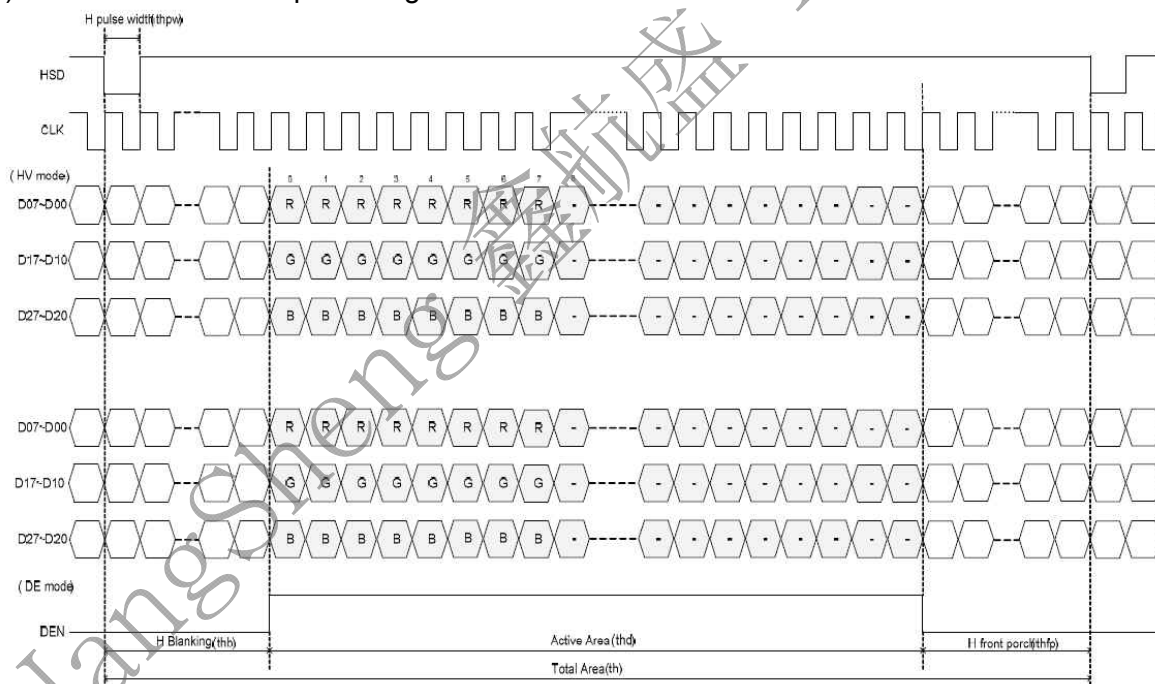


Timing Diagram of Interface Signal (DE mode)

(1) Vertical input timing



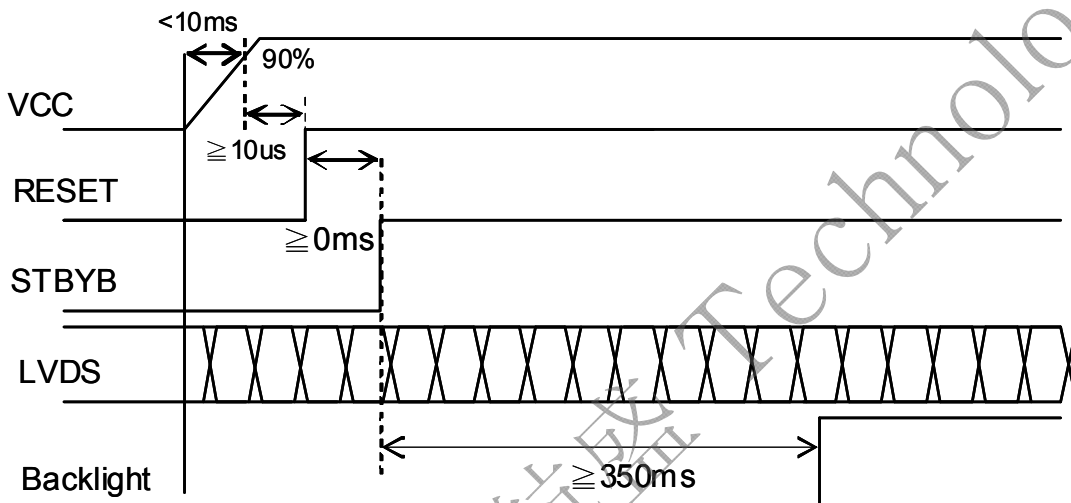
(2) Horizontal Vertical input timing



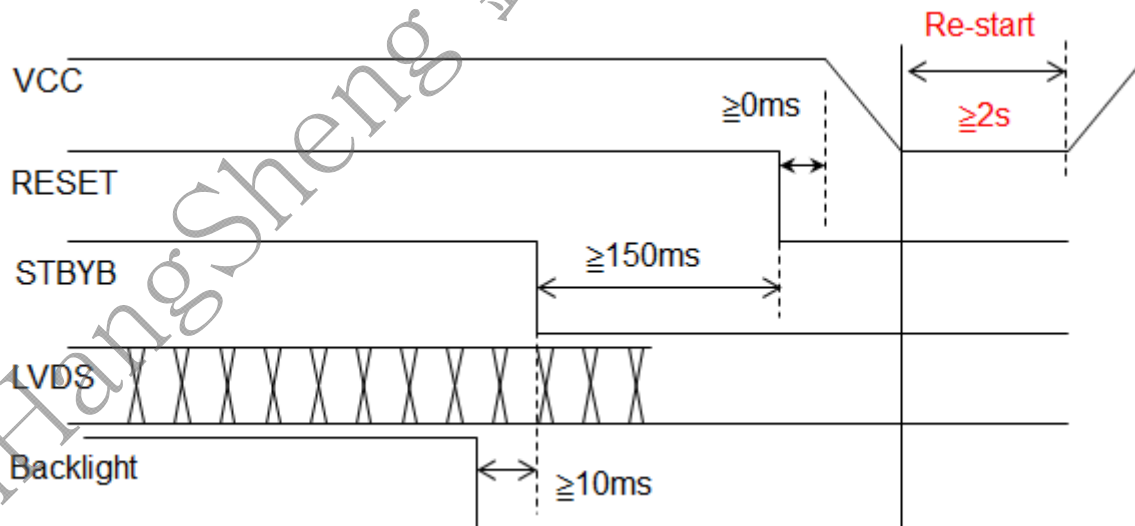


6.5 Power On / Off Sequence

Power ON



Power OFF





6.6 Backlight Unit

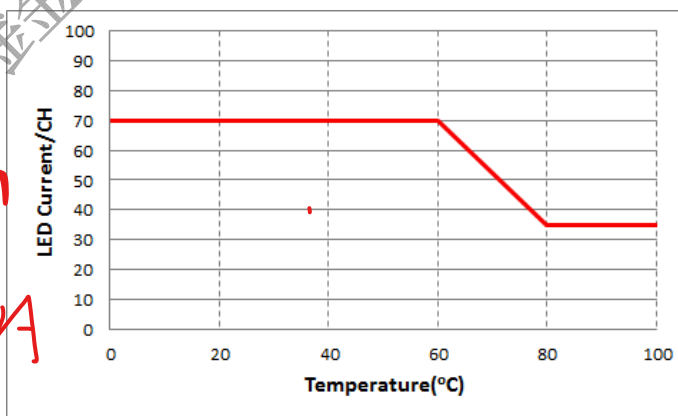
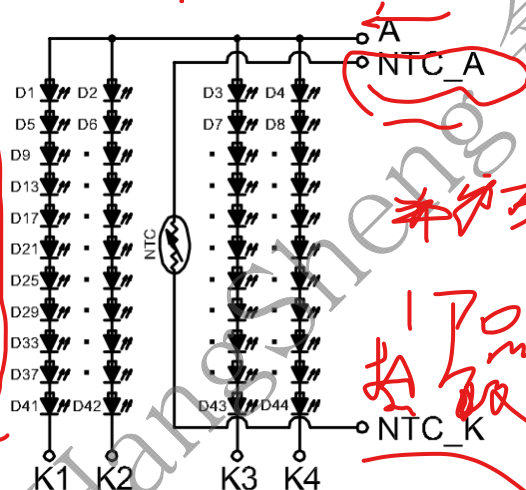
Parameter	Symbol	Min	Typ	Max	Units	Condition
LED Current	I_F	--	340	--	mA	$T_a=25^{\circ}\text{C}$
LED Voltage	V_F	--	38.4	40.8	Volt	$T_a=25^{\circ}\text{C}$
LED Life-Time	N/A	30,000	--	--	Hour	$T_a=25^{\circ}\text{C}$ $I_F=70\text{mA}$ Note (2)

Note (1) LED life time (Hr) can be defined as the time in which it continues to operate under the condition: $T_a=25\pm 3^{\circ}\text{C}$, typical I_L 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 $T_a=25^{\circ}\text{C}$ and $I_L=340\text{mA}$. The LED lifetime could be decreased if operating I_L is larger than 300 mA. The constant current driving method is suggested.

Note (3) LED Light Bar Circuit 12S4P = 48pcs LED

Note (4) LED temperature current curve. The temperature at 60 degrees before the output 70mA / CH, 60 degrees to 80 degrees when the linear drop to 35mA





7.0 RELIABILITY TEST ITEMS

No.	Item	Conditions	Remark
1	High Temperature Storage	Ta=+90°C, 500hrs	1, 2, 3
2	Low Temperature Storage	Ta=-40°C, 500hrs	1, 2, 3
3	High Temperature Operation	Ta=+85°C, 500hrs	1, 2, 3
4	Low Temperature Operation	Ta=-30°C, 500hrs	1, 2, 3
5	High Temperature and High Humidity (operation)	Ta=+65°C, 90%RH, 240hrs	1, 2, 3
6	Thermal Cycling Test (non operation)	-30°C(30min)→+85°C(30min),100 cycles	1, 2, 3
7	Electrostatic Discharge	Contact = ± 8 kV, class B;(R=330Ω,C=150pF) Air = ± 15 kV, class B;(R=330Ω,C=150pF) 1 time for each point.	
8	Vibration	1.Random: 1.04G, 10~500Hz, XYZ, 30min/each direction 2.Sine: Freq:1.5G, 8~33.3Hz, Stoke: 1.3mmhz Sweep: 2.9G, 333.3~400 X/Z: 2hrs, Y:4hrs	
9	Shock	Half-Sine, 100G, 6ms, ±XYZ, 1time	
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 Follw 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: The test result shall be evaluated after the sample has been left at room temperature and humidity for 2 hours without load. No condensation shall be accepted. The sample shall be free from defects:

(Air bubble in the LCD 、 Seal leak 、 Non-display 、 Missing segments 、 Glass crack).

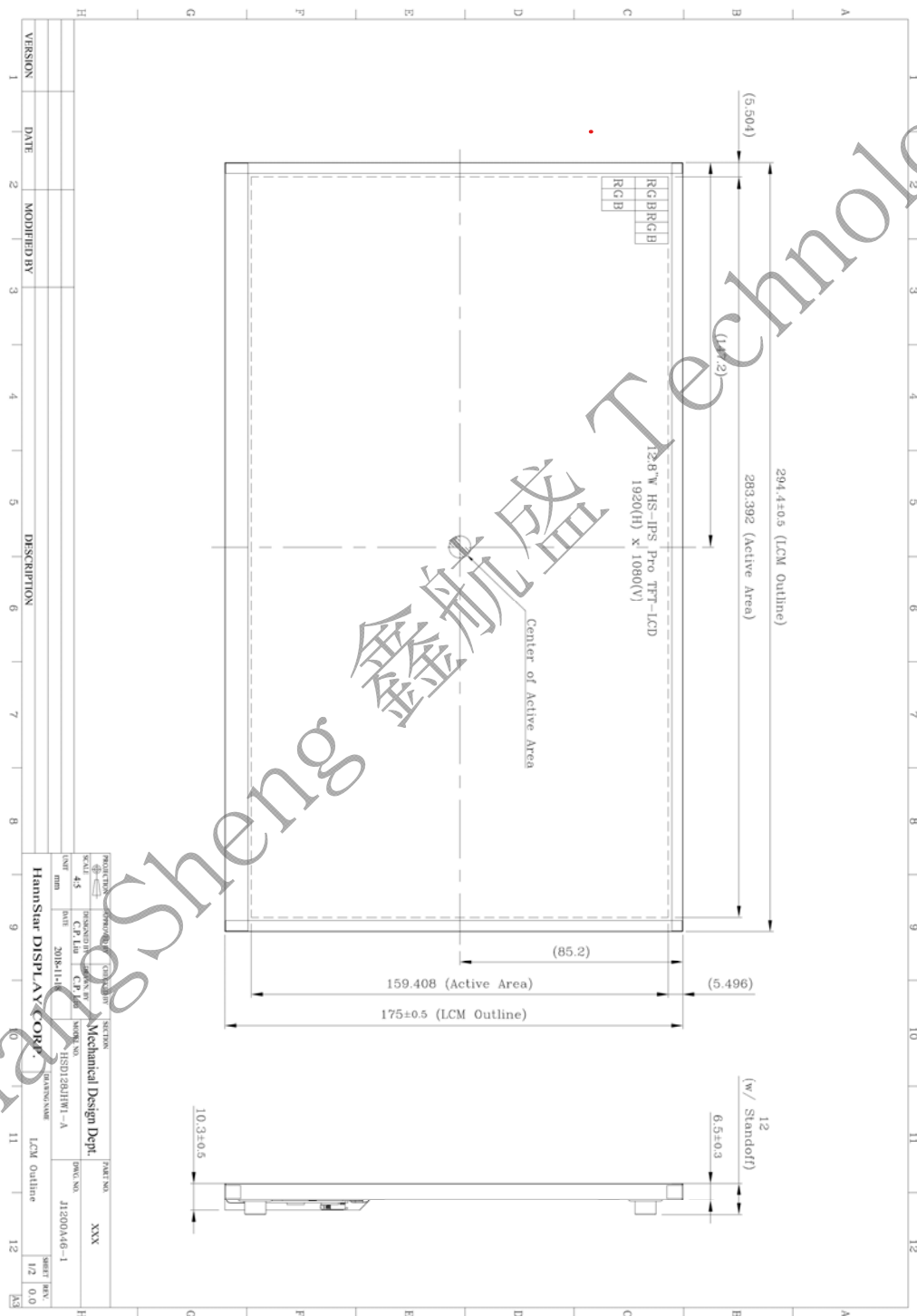
Note3: The test condition definition panel's surface temperature.

Note4: Each test item applies for a test sample only once, the test sample cannot be used again in any other test item.



8.0 OUTLINE DIMENSION

Unit : mm



Note: General tolerance: +/- 0.3mm



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GENERAL TOLERANCES 公差表		
FIELD 尺寸范围	1~	公差
0.00 - 0.50	1~	±0.05
0.51 - 30.00	2~	±0.08
30.01 - 60.00	3~	±0.10
60.01 - 120.0	4~	±0.12
120.0 - 180.0	5~	±0.15
180.0 - 250.0	6~	±0.20
Angle (角度)	7~	±1°

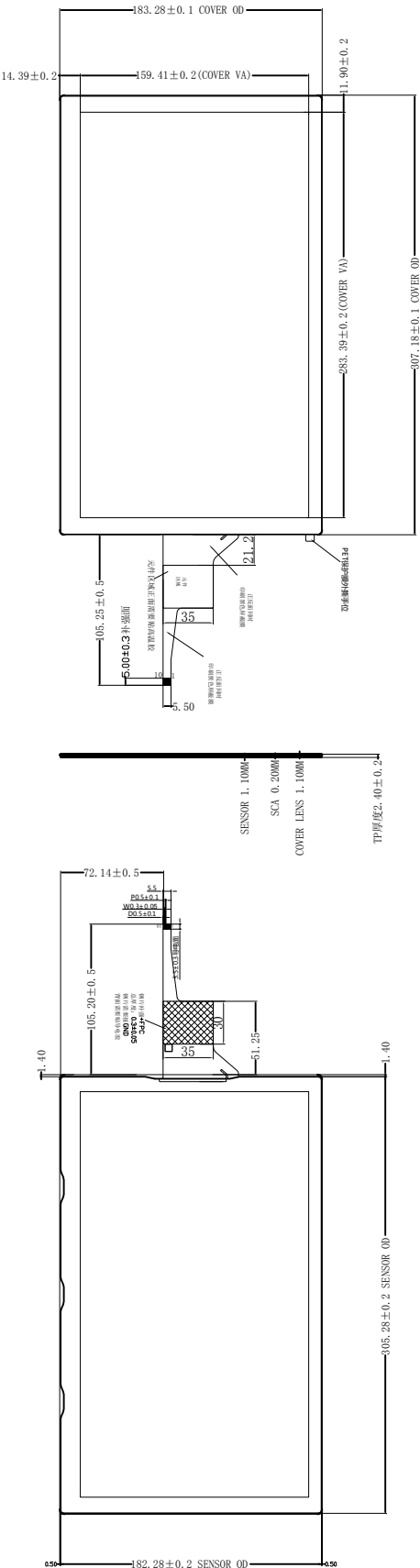
RoHS

正视图

侧视图

背视图

TP



由 Autodesk 教育版产品制作

技术参数:

- 1.结构: G+G
- ITO GLASS:1.1mm
- COVER GLASS:1.1mm
- 引线:FPC (PINCH=0.5mm)
- 总厚度: 2.4±0.2mm(TP)
- IC型号: GT911
- 2.工作电压: 3.3 V
- 3.透光率: ≥85%
- 4.表面硬度: ≥6H
- 5.工作环境: -20℃~+70℃, ≤90%RH
- 6.储存环境: -30℃~+80℃, ≤90%RH
- 7.未注尺寸公差按±0.2mm

G+G

COVER GLASS (1.1mm)
OCF (0.20mm)
SENSOR GLASS (1.1mm)

评估图

NO.	REV	DATE	DESCRIPTION	REVISER
序号	修订	修订日期	修订内容	修订者

REV	PART No.	料 號	WD128****A0
SCALE	DESCRIPTION	描述	COVER
SCALE	MATERIAL	材 質	G+G
1:1	COLOR	顏色	白色
1:1	UNIT	單位	mm
1:1	DATE	日期	022-01-18

APPROVED BY 核准

CHECKED BY 審核

DRAWN BY 繪圖

CSK



深圳市鑫航盛科技有限公司
SHEN ZHEN XINHENGSHENG TECHNOLOGY CO., LTD

PIN	ASSI	QW	17
1	RESET		
2	VCC		
3	GND		
4	INT		
5	SPK		
6	SCL		
7	NC		
8	NC		
9	NC		
10	NC		

Please Confirm This Drawing On/Before
請簽回此圖



HSD 12.8 1920*1080

总 成 图

TOLERANCE GRADE (±)		DIMENSION RANGE 尺寸範圍									
0	5	15	60	150	300						
5	15	60	150	300	630						
□ A	0.05	0.10	0.15	0.20	0.25	0.30					
▣ B	0.10	0.15	0.20	0.25	0.30	0.35					

UNLESS OTHERWISE SPECIFIED

公差以上表所示，除非另有指定

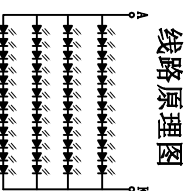
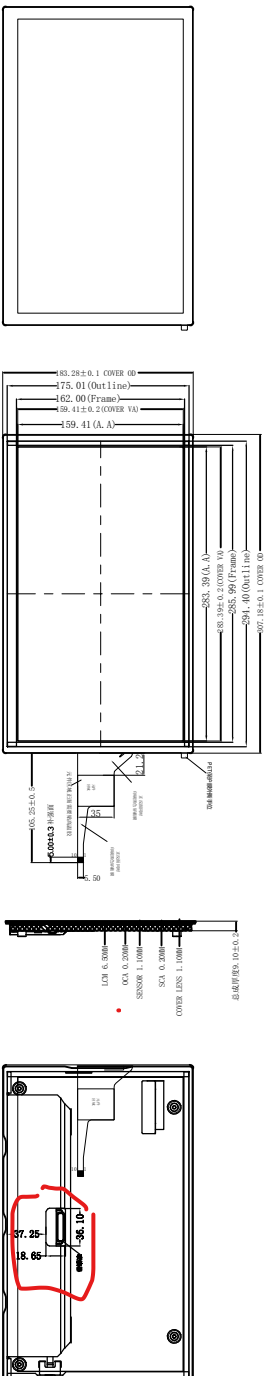
公差以上表所示，除非另有指定

出货效果图

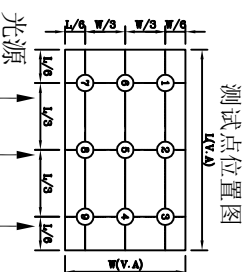
正视图

侧视图

背视图



线路原理图



测试点位置图

PIN DEFIND			
pin	Assigment	pin	Assigment
1	QND	31	NC
2	NC	32	RESETB
3	VCC	33	STPBW
4	QND	34	QDA
5	QND	35	SOL (NC)
6	QND	36	SDA (NO)
7	NC	37	CSB (NO)
8	NC	38	QND
9	QND	39	QND
10	QND	40	NC
11	QND	41	NC
12	QND	42	NC
13	QND	43	NC
14	QND	44	NC
15	QND	45	NC
16	QND	46	NC
17	QND	47	NC
18	QND	48	NC
19	QND	49	MTC A
20	QND	50	MTC R
21	QND	51	QND
22	QND	52	QND
23	QND	53	QND
24	QND	54	QND
25	QND	55	QND
26	QND	56	QND
27	QND	57	QND
28	QND	58	QND
29	QND	59	QND
30	QND	60	QND

PIN# ASSIGNMENT	
1	RESET
2	VCC
3	QND
4	INT
5	SDA
6	SOL
7	NC
8	NC
9	NC
10	NC

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Notes:

1. RoHS must be complied.

2. **Δ** Modification rev. number

3. Draft angle 1.5° :

4. () reference dimension, ☐:critical dimension **#02**

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

LED: 12*4=48 PCS

項目		符号	単位	測定条件
Item				Condition
燈箱高度	Average Luminous Height	1/r	550 720	—
平均照度	Average Luminous Intensity	1/v	500 650	—
色座標	Chromaticity	u, v	78	0.33
色座標	Colour coordinate	x, y	0.27	0.34
功率	Power Dissipation	Pd	—	mW
正向电压	Forward Voltage	Vf	38.4	40.8
反向电流	Reverse Current	Ir	—	uA
工作温度	Operating Temperature Range	Tj	—20	70
Storage Temperature Range	Storage Temperature Range	Tstg	—80	°C

注1: 符号 r 表示光通量, v 表示光强, u 表示色度, x 表示色度。
 注2: 1/r 表示平均照度, 1/v 表示平均光强, u, v 表示色度座標。
 注3: 色度座標 x, y 表示色度座標。
 注4: 功率 Pd 表示耗散功率, 正向电压 Vf 表示正向电压, 反向电流 Ir 表示反向电流。
 注5: 工作温度 Tj 表示工作温度, Storage Temperature Range 表示存储温度。

A

序号	NO.	REV	修订日期	修订内容	修订者
△			21. 01. 07	首次设计	王雷

试做图

REV 版本	PART No. 料 號	WD128FHL-507A-A0-***		APPROVED 核准	BY CHECKED BY 審核	DRAWN BY 繪圖
A0	Material 客戶料号	*****				
SCALE 比例	MATERIAL 规格	307.18*183.28*9.1				
1:1	COLOR 顏色	UNIT 單位	mm			
	DATE 日期	2021-01-07			深圳市鑫航盛科技有限公司 SHEN ZHEN XINHAOSHENG TECHNOLOGY CO., LTD	

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9.0 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: Code 8 is defined by the last number of the year, for example

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 Detail of Lot Mark

- (1) Below label is attached on the backside of the LCD module. See Section 8.0: Outline Dimension.
- (2) The detail of Lot Mark is attached as below.
- (3) This is subject to change without prior notice.





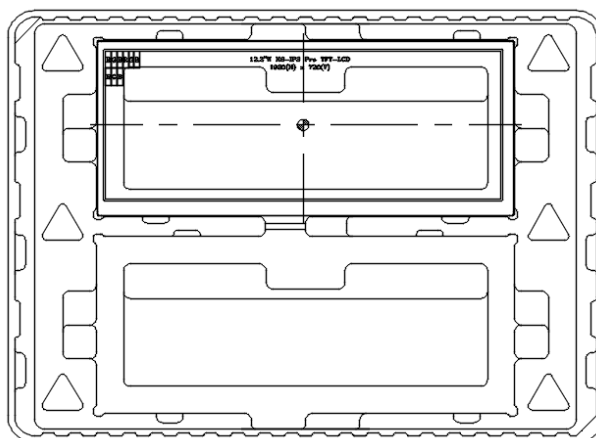
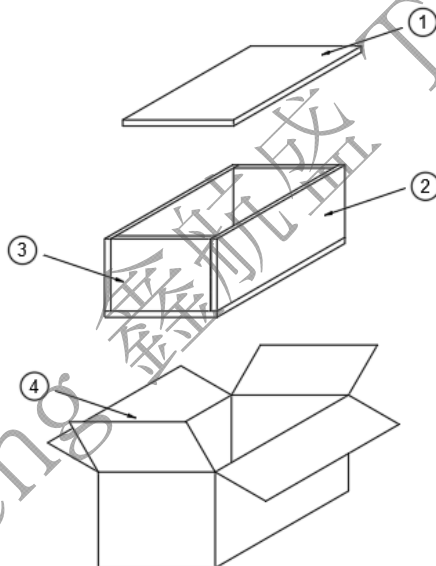
10.0 PACKAGE SPECIFICATION

10.1 Packing form

Item	Q'ty	Material	Size
①	2	EPE Board (T/B)	480 x 360 x 20mm
②	2	EPE Board (L/R)	325 x 235 x 20mm
③	2	EPE Board (F/RE)	480 x 235 x 20mm
④	1	Corrugated Paperboard (AB Flute)	500 x 380 x 312mm
⑤	11	PET Tray	440 x 320 x 24.1mm

(1) Package quantity in one carton: 20 pieces.

10.2 Packing assembly drawings





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.



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.