液晶屏规格书

LCD Datasheet

型号 / MODEL NO: **LN80600T104TB3001**

版本 / SPEC VERSION: **V03**

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本技术规格如有更改，恕不另行通知
This technical specification is subjected to change without notice

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修订记录 / Record of Revision

版本 Rev	日期 Date	说明 Description	编辑人 Editor
00	2019-08-14	首次发布 First Release	龚桂英
01	2019-09-25	增加驱动 IC / Add driver IC	龚桂英
02	2020-09-02	校对 check	周彪
03	2021-1-27	更新响应时间 Update response time	周彪

1 一般参数 / General Feature

特征 Feature		规格 Spec
显示规格 Display Spec.	尺寸 Size	10.4 inch
	分辨率 Resolution	800×600
	像素配置 Pixel Configuration	RGB vertical Stripe
	像素间距 Pixel Pitch (W x H) (mm)	0.264×0.264
机械参数 Mechanical Characteristic	外形尺寸 LCM (W x H x D) (mm)	228.40x175.40x5.90
	AA 区 Active Area (W x H) (mm)	211.20x158.40
	重量 Weight	360 g
温度范围 Temperature Range	工作温度 Operating Temp.	-20~70℃
	存储温度 Storage Temp.	-30~80℃
电气特性 Electrical Characteristics	接口 Interface	TTL
	色深 Color Depth	16.7M
	驱动 IC Driver IC	HX8282-A02*1+HX8696-A00*1

备注：

符合最新 RoHS 指令要求/ Requirements on Environmental Protection : RoHS

2 输入/输出定义 / Input/Output Terminals

Pin NO.	Symbol	Function	Remark
1	GND	Power ground	
2	AVDD	Power Supply	
3	VCC	Power Supply	
4	R0	Red data Input(LSB)	
5	R1	Red data Input	
6	R2	Red data Input	
7	R3	Red data Input	
8	R4	Red data Input	
9	R5	Red data Input	
10	R6	Red data Input	
11	R7	Red data Input(MSB)	
12	G0	Green data Input(LSB)	
13	G1	Green data Input	
14	G2	Green data Input	
15	G3	Green data Input	
16	G4	Green data Input	
17	G5	Green data Input	
18	G6	Green data Input	
19	G7	Green data Input(MSB)	
20	B0	Blue data Input(LSB)	
21	B1	Blue data Input	
22	B2	Blue data Input	
23	B3	Blue data Input	
24	B4	Blue data Input	
25	B5	Blue data Input	
26	B6	Blue data Input	
27	B7	Blue data Input(MSB)	
28	DCLK	Clock input(Latch data at falling edge)	
29	DE	Data enable	
30	HSYNC	Horizontal sync input. Negative polarity	
31	VSYNC	Vertical sync input. Negative polarity	
32	MODE	DE/SYNC mode select .normally pull high H:DE mode .L:HV sync mode	
33	NC	No connection	
34	NC	No connection	
35	NC	No connection	
36	VCC	Power Supply	
37	NC	No connection	
38	GND	Power Ground	
39	GND	Power Ground	
40	AVDD	Power Supply	
41	VCOM	VCOM DC input	
42	DITH	Dithering setting DITH="H" 6bit resolution;	
43	NC	No connection	
44	NC	No connection	
45	NC	No connection	
46	NC	No connection	
47	NC	No connection	
48	NC	No connection	

49	NC	No connection	
50	NC	No connection	
51	NC	No connection	
52	NC	No connection	
53	NC	No connection	
54	NC	No connection	
55	NC	No connection	
56	VGH	TFT turn on voltage	
57	VCC	Power Supply	
58	VGL	TFT turn off voltage	
59	GND	Power Ground	
60	NC	No connection	

3 电气特性 / Electrical Characteristics

3.1 驱动规格 / Driving TFT LCD Panel

Item	Symbol	Min	Type	Max	Unit	Remark
Digital power Voltage	VCC	3.0	3.3	3.6	V	
Analog power Voltage	AVDD	10.8	11	11.2	V	
Gate on voltage	VGH	23	25	27	V	
Gate off voltage	VGL	-7.5	-7.0	-6.5	V	
Common voltage	VCOM	3.85	3.90	3.95	V	

3.2 背光规格 / LED back light specification

Item	Symbol	Values			Unit	Remark
		Min.	Type.	Max.		
Voltage for LED Backlight	VL	-	9.6	-	V	
Current for LED Backlight	IL	-	240	-	mA	
Luminance(with LCD)	Lv	-	300	-	cd/m²	
Life time	-	-	30000	-	Hr	

Note：36 LEDs (3 LEDs Serial, 12 ways Parallel)

IL is defined for twelve channels.

Optical performance should be evaluated at Ta=25℃ only. If LED is driven by high current, high ambient temperature & humidity condition, The life time of LED will be reduced. Operating life means brightness goes down to 50% of initial brightness. Typical operating life time is estimated data.

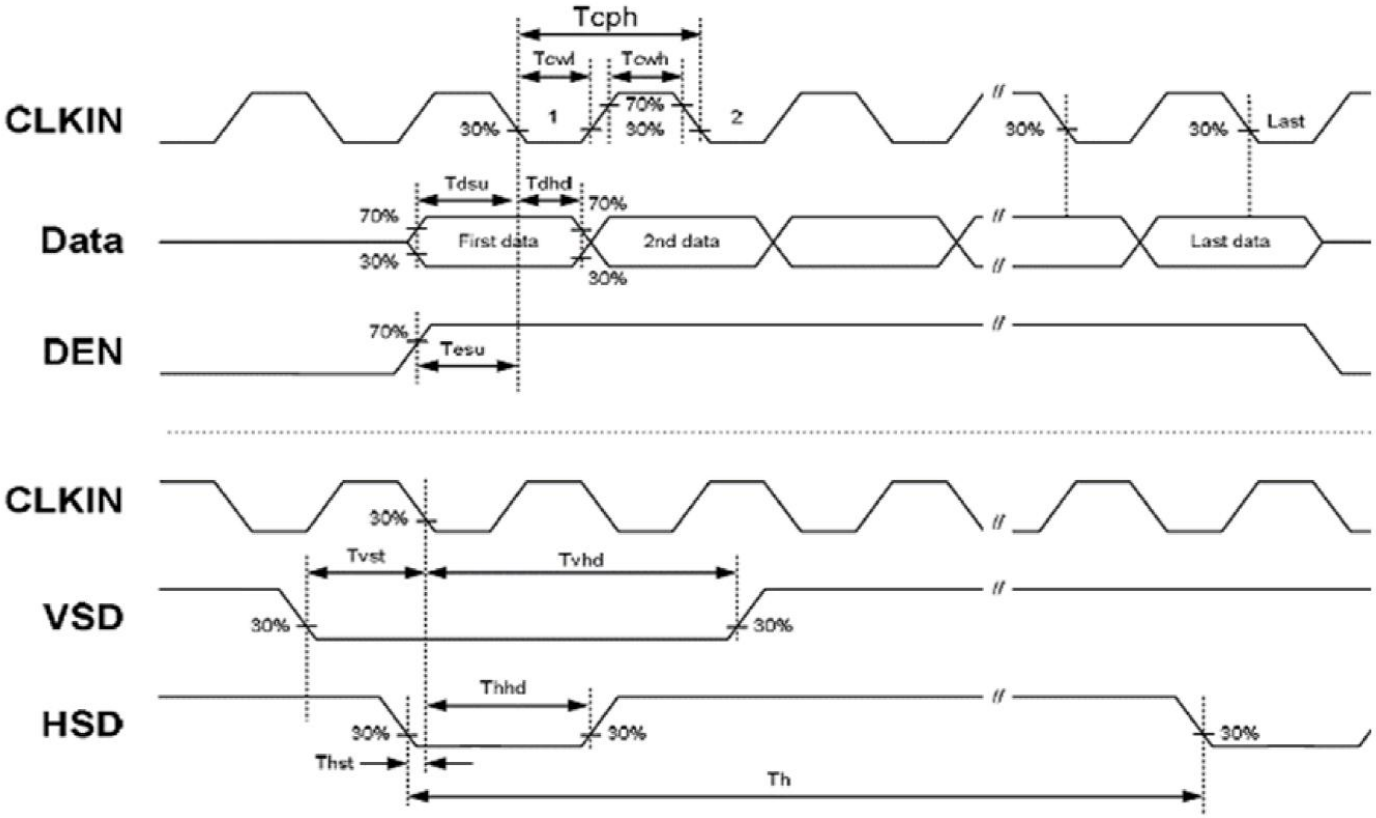
4 时序特性 / Timing Characteristics

4.1 时序参数 Timing Parameter

VCC=3.3V, GND=0V, Ta=25℃

Parameter	Symbol	Min	Typ	Max	Unit	Remark
DCLK frequency	F_{clk}	32.6	39.6	62.4	MHz	
DCLK cycle time	T_{cph}	14	-	-	ns	
DCLK pulse width	T_{cw}	40%	50%	60%	T_{cph}	
VS setup time	T_{vst}	5	-	-	ns	
VS hold time	T_{vhd}	5	-	-	ns	
HS setup time	T_{hst}	5	-	-	ns	
HS hold time	T_{hhd}	5	-	-	ns	
Data setup time	T_{dsu}	5	-	-	ns	Data to DCLK
Data hold time	T_{dhd}	5	-	-	ns	Data to DCLK
DE setup time	T_{esu}	5	-	-	ns	
DE hold time	T_{ehd}	5	-	-	ns	

4.2 输入时钟和数据时序表 Input Clock and Data timing Diagram



4.3 TCON 推荐时序 Recommended Input Timing setting of TCON

●HV SYNC MODE

Parameter		Symbol	Min.	Typ.	Max.	Unit	Remarks
Dclk frequency		1/Tclk	34.5	39.6	50.4	MHz	
HSD	Horizontal total	Th	900	1000	1200	Tclk	
	Horizontal blanking	Thb	100	200	400	Tclk	
	Valid Data Width	Thd		800		Tclk	
	Pulse Width	Thpw	1	-	40	Tclk	
	Back Porch	Thb		88		Tclk	
	Front Porch	Thfp	12	112	312	Tclk	
VSD	Frame rate	-	-	60	70	Hz	
	Vertical total	Tv	604	628	800	Th	
	Vertical blanking	Tvb	4	28	200	Th	
	Valid Data Width	Tvd		600		Th	
	Pulse Width	Tvpw	1	-	20	Th	
	Back Porch	Tvb		39		Th	
	Front Porch	Tvfp	1	21	61	Th	

Note: DE signal is necessary.

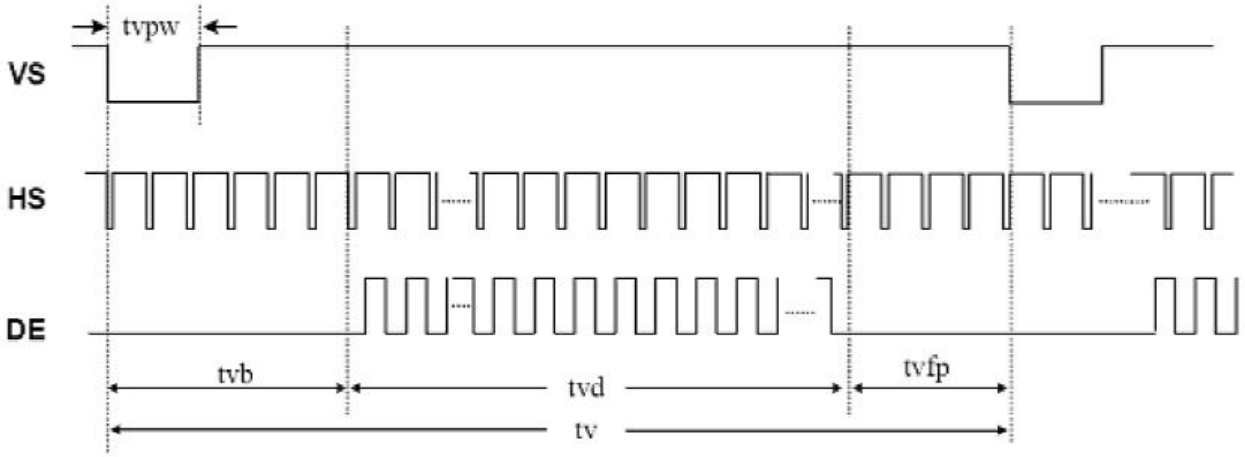
●DE MODE

Parameter		Symbol	Min	Typ	Max	Unit	Remark
DCLK Frequency		Fclk	32.6	39.6	62.4	MHZ	
HSD	Horizontal total	Th	890	1000	1300	tclk	
	Valid Data Width	Thd		800		tclk	
	Horizontal blanking	Thb+ Thfp	90	200	500	tclk	
VSD	Vertical total	Tv	610	660	800	th	
	Valid Data Width	Tvd		600		th	
	Vertical blanking	Tvb+ Tvfp	10	60	200	th	

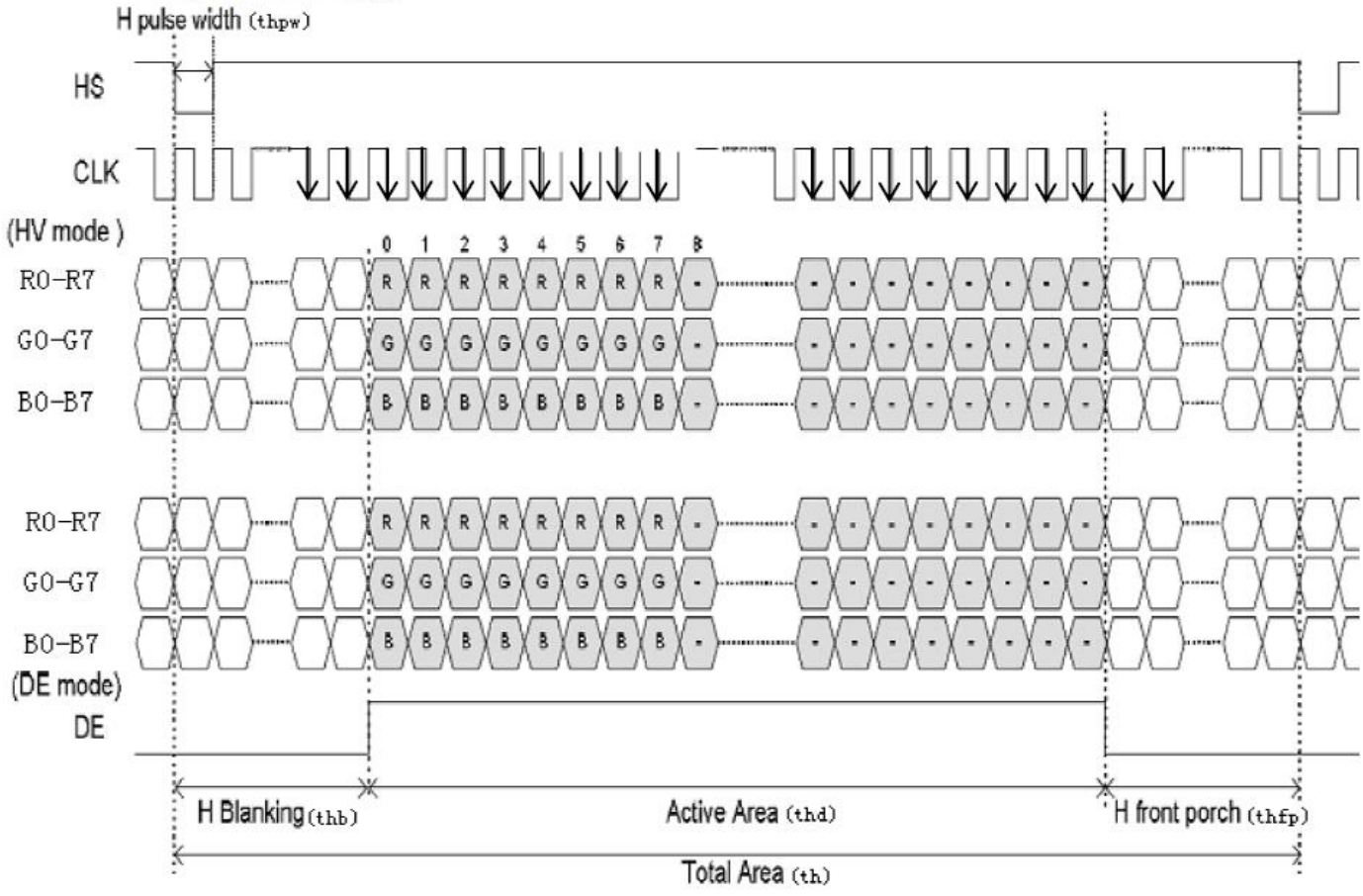
Note: HSD&VSD signal is unnecessary.

●Data input timing format

Vertical timing

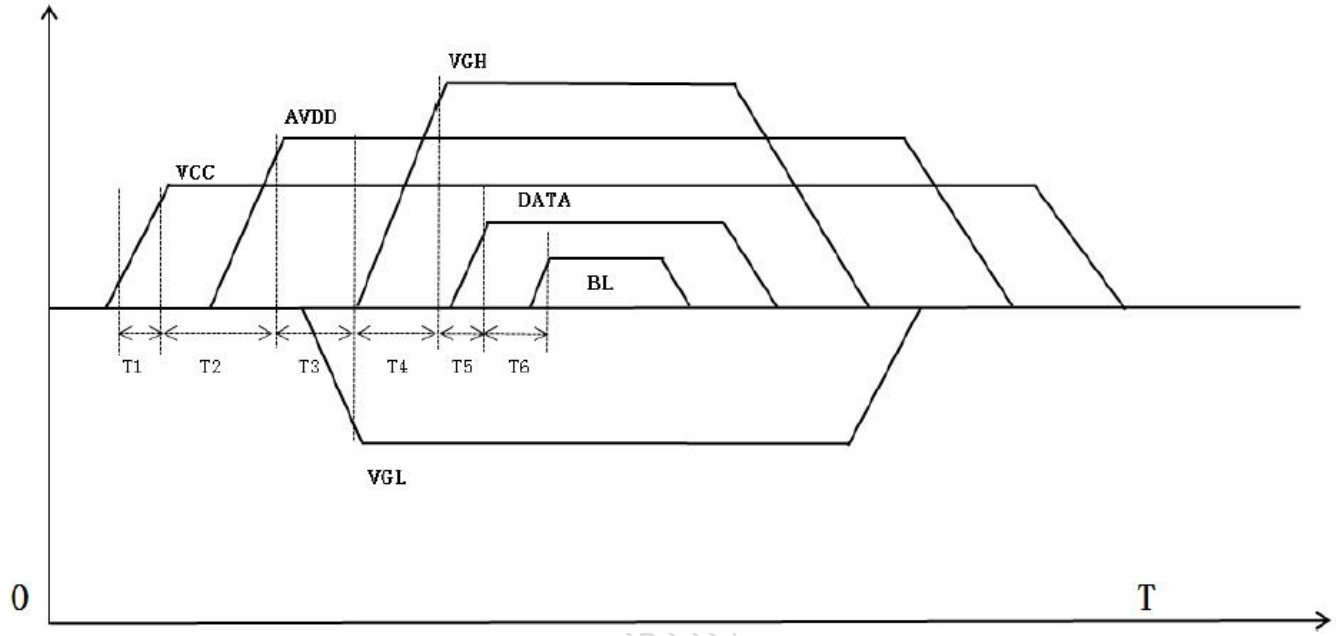


Horizontal timing



4.4 电源描述 Recommended Input Timing setting of TCON

Item	Symbol	Min	Typ	Max	Unit	Remark
VCC 3.3V rising time	T1	0	-	20	ms	
VCC to AVDD on time	T2	16.7	-	-	ms	
AVDD to VGL on time	T3	>0	-	-	ms	
VGL to VGH on time	T4	>0	-	-	ms	
VGH to DATA on time	T5	>0	-	-	ms	
DATA to BL on time	T6	>0	-	-	ms	



5 光学特性 / Optical Characteristics

Item	Symbol	Condition	Min.	TYP.	Max.	Unit	Remark
可视视角 Viewing angle	Top	CR≧10	50	60	-	Deg.	Note 2
	Bottom		60	70	-		
	Left		60	70	-		
	Right		60	70	-		
对比度 Contrast ratio	CR	θ= 0°	400	500	-		
响应时间 Response time	T_{ON}	25℃	-	10	15	ms	Note 4
	T_{OFF}		-	15	25		
相对色温 Colour temperature	Tc		-	8200	-	K	Note 3
色度 Color chromaticity	Wx		0.232	0.282	0.332		Note 1
	Wy		0.2834	0.3334	0.3834		
	Rx		0.5236	0.5736	0.6236		
	Ry		0.3042	0.3542	0.4042		
	Gx		0.2599	0.3099	0.3599		
	Gy		0.5278	0.5778	0.6278		
	Bx		0.0965	0.1465	0.1965		
	By		0.0475	0.0975	0.1475		

测试条件 / Test conditions:

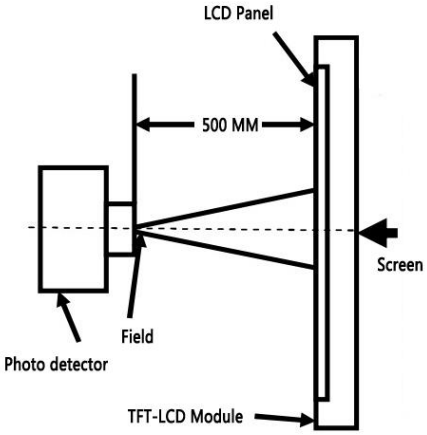
If= 180 mA,环境温度 25℃。

If=180 mA, and the ambient temperature is 25℃.

备注 1 ：光学测量系统的定义

光学测试必须在暗室中进行，液晶屏点亮五分钟后开始测试，测试液晶屏的显示中心，

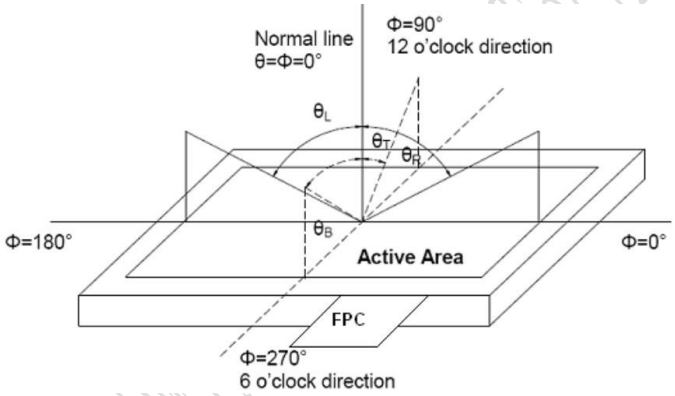
Note 1: Definition of optical measurement system.
The optical characteristics should be measured in dark room. After 5 Minutes operation, the optical properties are measured at the center point of the LCD screen



备注 2：视角范围和测量定义。

通过 BM-7A 在 LCD 中心点测量视角。

Note 2: Definition of viewing angle range and measurement system.
The viewing angle is measured at the center point of the LCD by BM-7A。



备注 3：色温定义。

光源的辐射在可见区和绝对黑体的辐射完全相同时，此时黑体的温度就称此光源的色温。色温是衡量光源颜色（冷色，暖色）程度的一种指标。

暖色<3300K；中间色 3300~5000K；冷色>5000K。

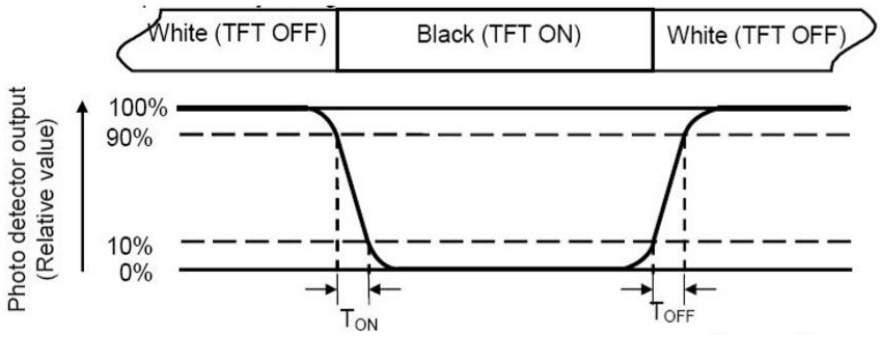
Note 3: When the radiation of the light source is exactly the same in the visible region and the absolute blackbody, the temperature of the blackbody is called the color temperature of the light source.Color temperature is an index to measure the degree of light source color (cold color, warm color).
Warm color < 3300K, intermediate color 3300 ~ 5000K, cold color > 5000K.

备注 4：响应时间定义。

响应时间被定义为“ 白”状态和“ 黑”状态之间的 LCD 光学切换时间间隔。 上升时间（TON）是光电探测器输出强度从 90%变为 10%之间的时间。下降时间（TOFF）是光电检测器输出强度从 10%变为 90%之间的时间。

Note 4: The response time is defined as the LCD optical switching time interval between “White” state and “ Black” state. Rise time (TON) is the time between photo detector output intensity

changed from 90% to 10%. And fall time (TOFF) is the time between photo detector output intensity changed from 10% to 90%.



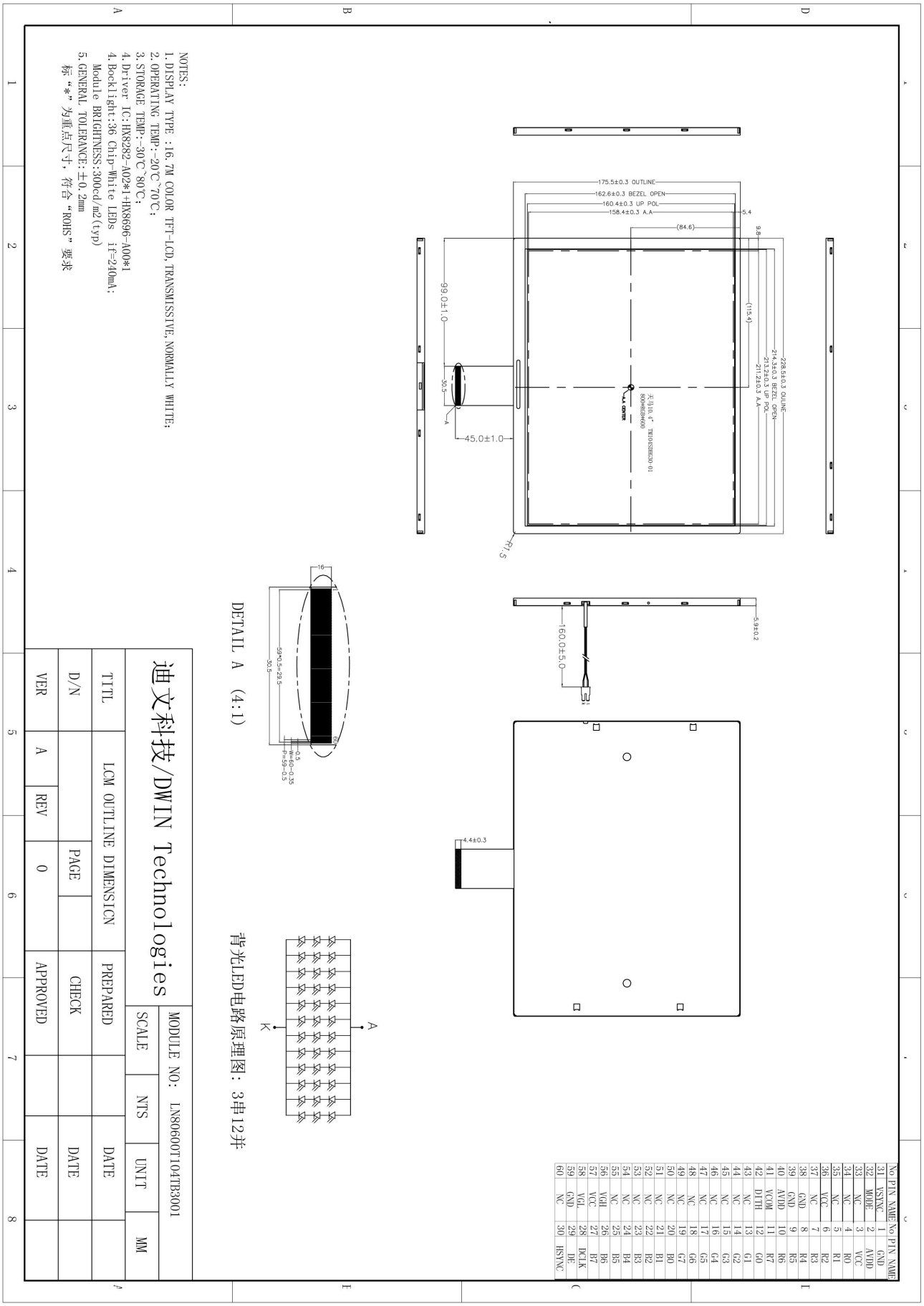
备注 5：色度定义。
LCD 中心测得的色坐标。
Note 5: Definition of color chromaticity (CIE1931) .
Color coordinates measured at center point of LCD.

备注 6：亮度定义。
在中心点测量白色状态的亮度。
Note 6: Definition of Luminance .
Measure the luminance of white state at center point.

6 环境可靠性测试 / Environmental / Reliability Test

序号 No.	项目 Test Item	条件 Condition	备注 Remarks
1	高温工作 High Temperature Operation	Ta=+60℃，24hours	IEC60068-2-1:2007 GB2423.2-2008
2	低温工作 Low Temperature Operation	Ta=-10℃，24hours	IEC60068-2-1:2007 GB2423.1-2008
3	高温存储 High Temperature Storage	Ta=+70℃，24hours	IEC60068-2-1:2007 GB2423.2-2008
4	低温存储 Low Temperature Storage	Ta=-20℃，24hours	IEC60068-2-1:2007 GB2423.1-2008
5	高温高湿 Storage at High Temperature and Humidity	Ta=+60℃，90% RH max，24hours	IEC60068-2-78 :2001 GB/T2423.3-2006
6	冷热冲击验证（非操作状态） Thermal Shock (non-operation)	-10℃ 30 min~+60℃ 60 min, Change time: 5min, 10 Cycle	Start with cold temperature, End with high temperature, IEC60068-2-14:1984, GB 2423.22-2002
7	静电测试（非操作状态） ESD(non-operation)	C=150pF,R=330Ω,5point/panel Air:±15Kv,5times; Contact:±8Kv,5times(Environment:15℃~35℃, 30%~60%.86Kpa~106Kpa)	IEC61000-4-2:2001 GB/T 17626.2-2006
8	振动试验 Vibration Test	Frequency range:10~55Hz Stroke:1.5mm Sweep:10Hz~55Hz~10Hz 2 hours for each direction of X.Y.Z. (6 hours for total)	IEC60068-2-6:1982 GB/T 2423.10-1995
9	冲击试验（非操作状态） Mechanical Shock (Non OP)	Half Sine Wave 100G 6ms, ±X,±Y,±Z 3times for each direction	IEC60068-2-27:1987 GB/T 2423.5-1995
10	包装跌落试验 Package Drop Test	Height:60cm,1corner,3 edges,6 surfaces	IEC60068-2-32:1990 GB/T 2423.8-1995

7 尺寸图 / Mechanical Drawing



No	PIN_NAME	No	PIN_NAME
31	VSYNC	1	GND
32	MODE	2	AVDD
33	NC	3	VCC
34	NC	4	R0
35	NC	5	R1
36	VCC	6	R2
37	NC	7	R3
38	GND	8	R4
39	GND	9	R5
40	AVDD	10	R6
41	VCOM	11	R7
42	DITH	12	G0
43	NC	13	G1
44	NC	14	G2
45	NC	15	G3
46	NC	16	G4
47	NC	17	G5
48	NC	18	G6
49	NC	19	G7
50	NC	20	B0
51	NC	21	B1
52	NC	22	B2
53	NC	23	B3
54	NC	24	B4
55	NC	25	B5
56	VGH	26	B6
57	VCC	27	B7
58	VGL	28	DCLK
59	GND	29	DE
60	NC	30	HSYNC

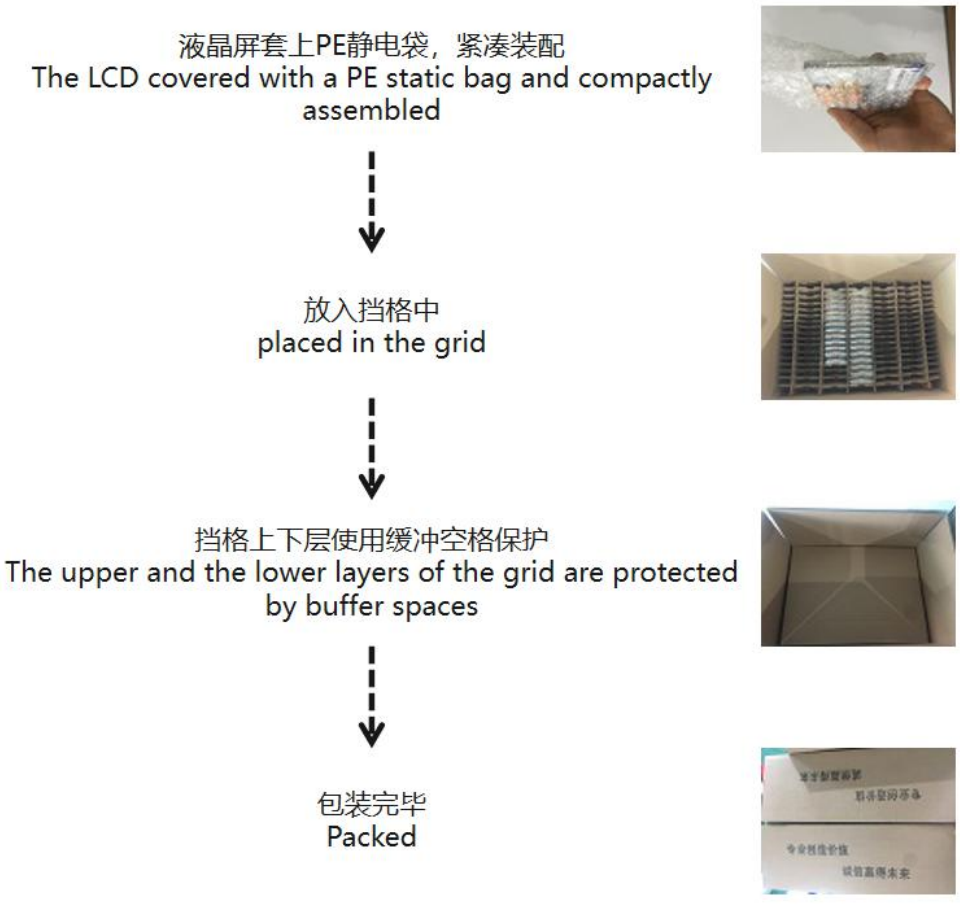
8 包装和物理尺寸 Packing Capacity & Dimension

尺寸 Dimension			
外形尺寸(mm) Dimension	228.40x175.40x5.90		
净重量 Net Weight	360 g		
包装标准 Packing Capacity			
包装箱尺寸 Size	LCD 尺寸及分辨率（LCD Size and Resolution）	层数（层） Layer	总数量（片） Quantity(Pcs)
405mm(L)x280mm(W)	10.4 寸（inch）800*600	1	30

包装说明（Packing instruction）：

液晶屏套上 PE 静电袋，紧凑装配，放入挡格中，挡格上下层使用缓冲空格保护。

The LCD is placed in the grid ,covered with a PE static bag and compactly assembled,the upper and the lower layers of the grid are protected by buffer spaces.



9 使用 LCD 注意事项 / Precautions for Use of LCD Modules

9.1 处理注意事项

9.1.1 显示面板由玻璃制成，不要将其从高处坠落等方式使其受到机械冲击。

9.1.2 如果显示面板损坏，且其中的液晶物质泄漏，请确保不要让任何东西进入您的口腔内，如果该物质接触到您的皮肤或衣服，请立即用肥皂和水将其冲洗干净。

9.1.3 请勿对显示面或邻近的区域施加过大的压力，可能会导致色调的变化。

9.1.4 液晶屏显示表面覆盖的偏振片很软且容易刮伤，请小心使用。

9.1.5 如果显示器表面出现脏污，请在其表面哈气，并使用无尘布轻轻擦拭，如仍未完全清除，只能使用液晶屏专用清洁剂，如下有机溶剂都不能使用：

--异丙醇

--乙醇类

--酮

--芳香溶剂

9.1.6 请勿试图拆卸液晶屏模组。

9.1.7 如果逻辑电路电源关闭，则不要应用输入信号。

9.1.8 为防止静电破坏元件，应小心维护。

9.1.9 最佳工作环境：

9.1.9.1 搬运液晶屏时，确保将车身接地。

9.1.9.2 装配所需的工具，如烙铁，必须正确接地。

9.1.9.3 为减少静电，请勿在干燥的环境下进行组装使用.

9.1.9.4 液晶屏表面覆盖有保护膜，请注意小心撕下保护膜，减少产生静电。

9.2 储存预防措施

9.2.1 储存液晶屏时，应避免暴露在阳光下或高温高湿环境下。

9.2.2 液晶屏长时间存放建议条件为：温度:0℃～40℃相对湿度:≤80%

9.2.3 液晶屏应存放于室内，环境中不含酸、碱和有害气体。

9.3 运输预防措施

9.3.1 液晶显示模块在运输过程中应无坠落和剧烈震动，并应避免过度挤压、积水、潮湿和阳光照射。

9.1 Handling Precautions

9.1.1 The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.

9.1.2 If the display panel is damaged and the liquid crystal substance inside it leaks out, be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes, promptly wash it off using soap and water.

9.1.3 Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.

9.1.4 The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.

9.1.5 If the display surface is contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If still not completely clear, Can only use LCD dedicated cleaner,the following organic solvent can not be used:

- Isopropyl alcohol
- Ethyl alcohol
- Ketone
- Aromatic solvents

9.1.6 Do not attempt to disassemble the LCD Module.

9.1.7 If the logic circuit power is off, do not apply the input signals.

9.1.8 To prevent destruction of the elements by static electricity, be careful to maintain an

9.1.9 optimum work environment.

9.1.9.1 Be sure to ground the body when handling the LCD Modules.

9.1.9.2 Tools required for assembly, such as soldering irons, must be properly ground.

9.1.9.3 To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.

9.1.9.4 The LCD Module is coated with a film to protect the display surface. Be care when peeling off this protective film since static electricity may be generated.

9.2 Storage precautions

9.2.1 When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps.

9.2.2 The LCD modules should be stored under the storage temperature range. If the LCD modules will be stored for a long time, the recommend condition is:

Temperature : 0℃ ～ 40℃ Relatively humidity: ≤80%

9.2.3 The LCD modules should be stored in the room without acid, alkali and harmful gas.

9.3 Transportation Precautions

8.3.1 The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, damp and sunshine.