



SPECIFICATION

FOR

TFT LCD MODULE

CUSTOMER : _____

CUSTOMER MODULE : _____

HL MODEL : HG097XG006T01

☐ Preliminary Specification

☒ Final Specification

Customer Confirmation column:

Approved by : _____ Dept. : _____ Data : _____

Please return one of the copies of the specification with your signature to us within two weeks after you receive this document. If it is not returned, we will assume that you agree to the entire contents of this specification document.

Designed by	Checked by	Approved by



Revision History

Version NO.	DATE	Description	Remak
V1.0	2020.01.13	FIRST ISSUE	



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1. GENERAL INFORMATION

1.1 features

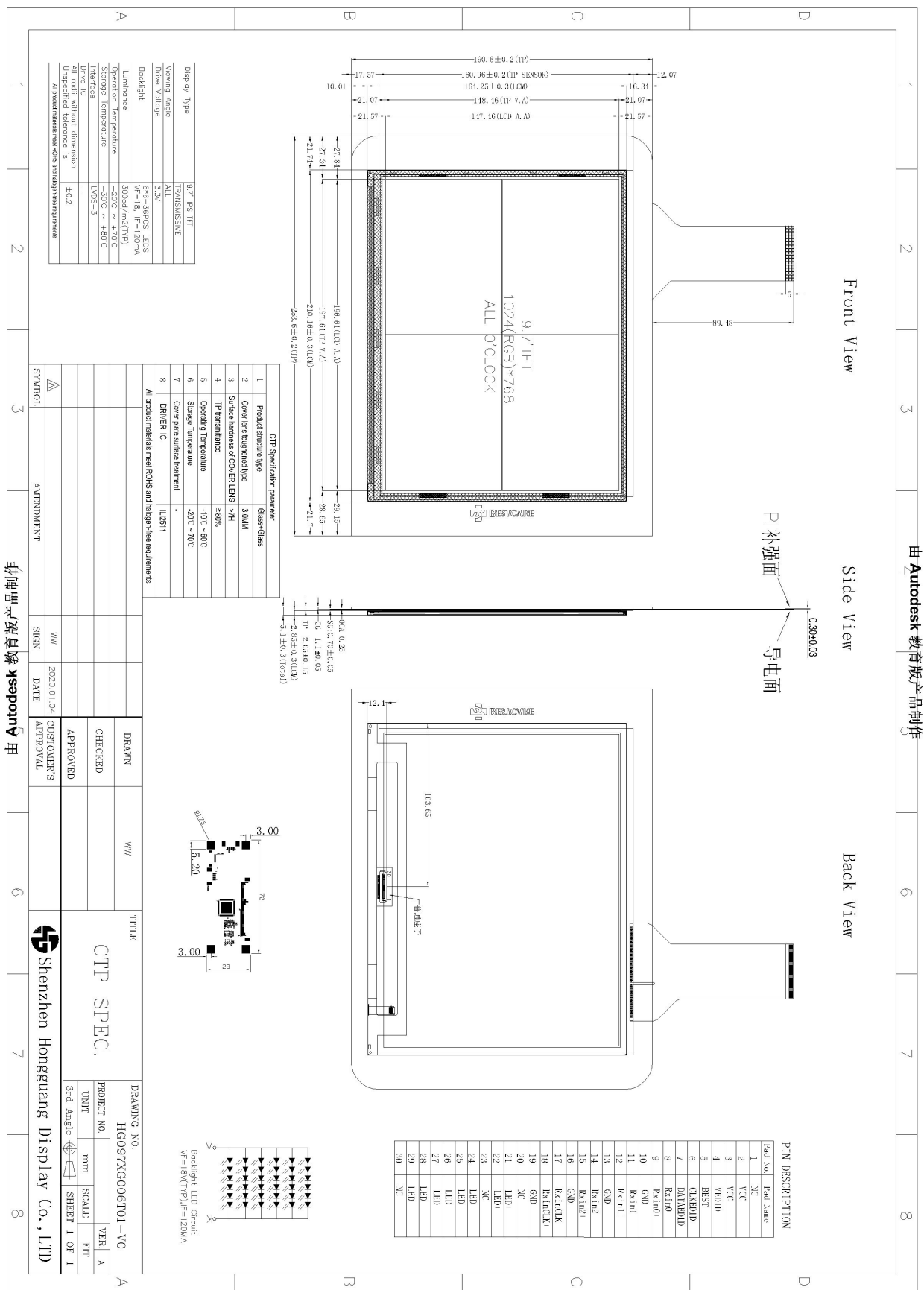
- 1) Structure: TFT PANNEL+IC+FPC+BL+CTP+PCBA
- 2) IPS Type LCD 1024 dot-segment and 768 dot-common outputs
- 3) 16.7M Color can be selected by software
- 4) White LED back light
- 5) LVDS-3 interface
- 6) Operation Temperature : -10~60℃
- 7) Storage Temperature : -20~70℃
- 8) CTP cover lens : 1.1mm Asahi glass
- 9) CTP structure : G+G, USB PCB
- 10) LED life time: -/

1.2 General specification

Item of	Contents	Unit
Panel Size	9.7	inch
LCD Type	a-si/TRANSMISSIVE	/
Display mode	Normally Black	/
Pixel arrangement	1024*3(RGB)*768	Dots
Pixel pitch (W*H)	0.192(H)*0.192 (V)	um
Active Area	196.61(V) × 147.46(H)	Mm
Module area (W*H*T)	253.6(V) × 190.6(H) × 5.1(T)	Mm
Recommended Viewing Direction	ALL	0' clock
IC	-	/
Interface	3 lane LVDS	/
Luminance for LCM+TP	270	cd/m2
Weight	TBD	g

2. DIAGRAM FOR LCM+TP

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3. LCM main parameters

3.1 I/O connection

LCM Pin NO.	Symbol	Description
1	NC	NC
2-3	VCC	VCC 3.3V
4	VEDID	NC
5	BIST	NC
6	CLKEDID	NC
7	DATAEDID	NC
8	Rxin0-	LVDS differential data input
9	Rxin0+	LVDS differential data input
10	GND	Ground
11	Rxin1-	LVDS differential data input
12	Rxin1+	LVDS differential data input
13	GND	Ground
14	Rxin2-	LVDS differential data input
15	Rxin2+	LVDS differential data input
16	GND	Ground
17	RxinCLK-	LVDS differential clock input
18	RxinCLK+	LVDS differential clock input
19	GND	Ground
20	NC	NC
21-22	LED+	LED Cathode (Positive)
23	NC	NC
24-29	LED Cathode 6B	LED Cathode (Negative)
30	NC	NC



3.2. ABSOLUTE MAXIMUM RATINGS

(GND=AGND=0V)

Parameter of absolute maximum ratings 参数	Symbol 符号	Min 最小值	Max 最大值	Unit 单位
Power supply voltage1	VCC	-0.3	4	V
Backlight forward current	I _{LED}	-0.001	30	mA(For each led)
Operating temperature	T _{op}	-10	60	°C
Storage temperature	T _{st}	-20	70	°C
Humidity	RH	-	90%(Max)/50°C	RH



3.3. ELECTRO-OPTICAL CHARACTERISTICS

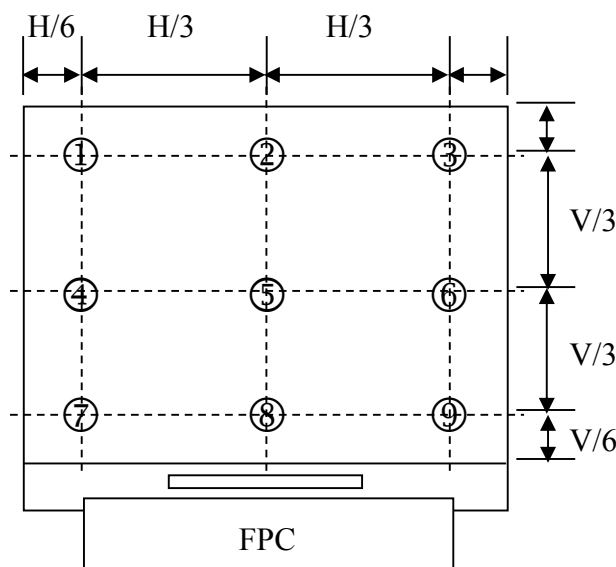
Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Contrast Ratio (Center point)		C/R	-	600	800	-	-	Note(1)
Luminance uniformity		U_w	$\theta = 0$. Normal viewing angle B/L On Note(1)	70	80	-	%	Note(2)
Response Time		$Tr + Tf$		-	16	25	ms	Note(3)
Color Chromaticity (CIE 1931)	White	W_x			0.306		参考 值	Note(5)
		W_y			0.320			
	Red	R_x			0.642			
		R_y			0.335			
	Green	G_x		-0.02	0.315	+0.02		
		G_y			0.609			
	Blue	B_x			0.154			
		B_y			0.054			
Viewing Angle	Hor.	$\phi 3R$	$C/R \geq 10$		80	-	Deg	Note(4)
		$\phi 9L$			80	-		
	Ver.	$\phi 12U$			80	-		
		$\phi 6D$		-	80	-		



Note1 Definition of Contrast Ratio (CR):

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

Note2: Definition of Luminance Uniformity: Active area is divided into 9 measuring areas (Shown in below), every measuring point is placed at the center of each measuring area.



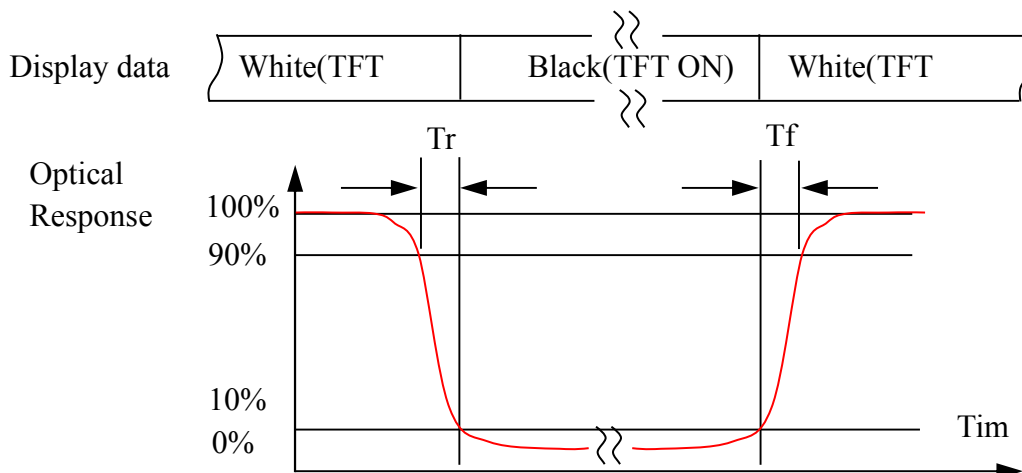
The spot locations for luminance measurement

$$\text{Luminance Uniformity} = \frac{B_{\min}}{B_{\max}} \times 100\%$$

$B_{\max}$: The measured maximum luminance of all measurement position.

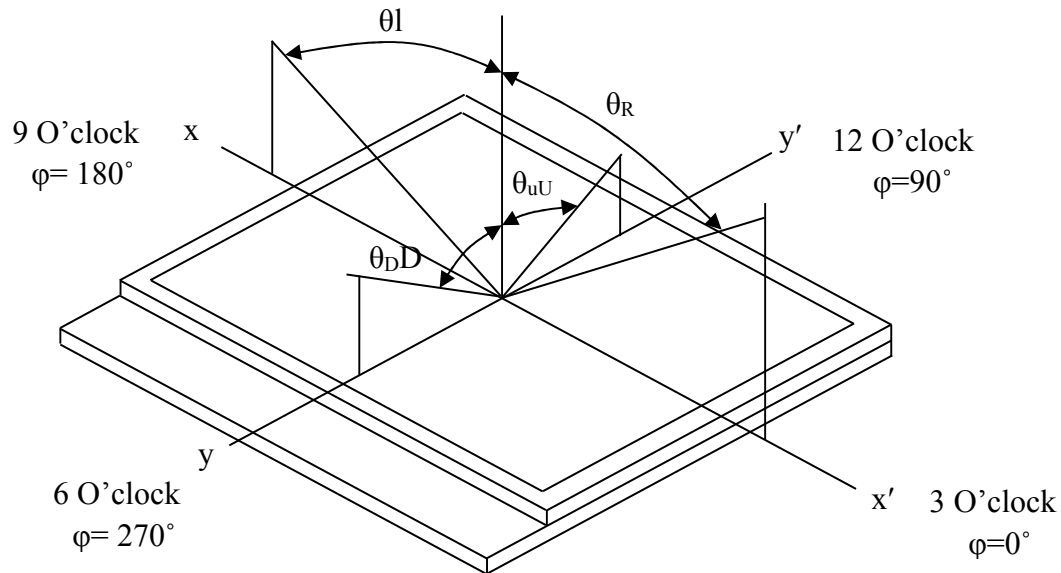
$B_{\min}$: The measured minimum luminance of all measurement position.

Note 3: Definition of Response time: Sum of T_r and T_f





Note4.Definition of Viewing Angle: The viewing angle range that the $CR \geq 10$



Note 5: Definition of Color Chromaticity (CIE 1931)

Color coordinate of white & red, green, blue at center point.



4. PCB 参数

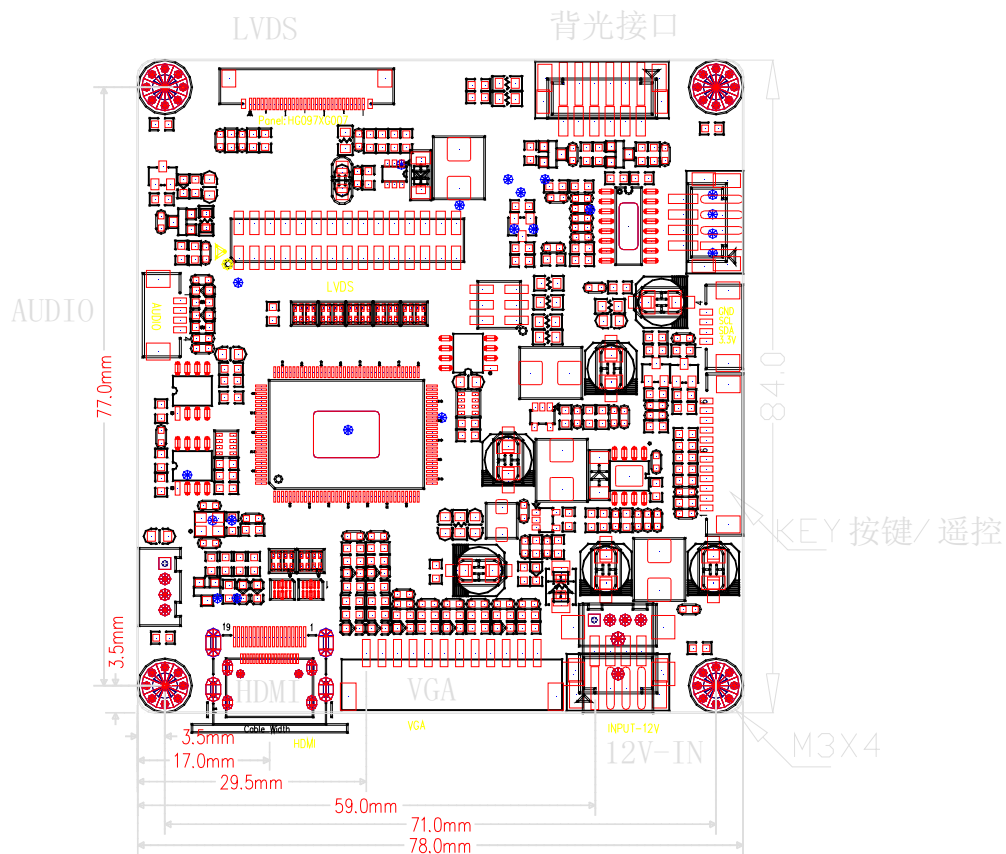
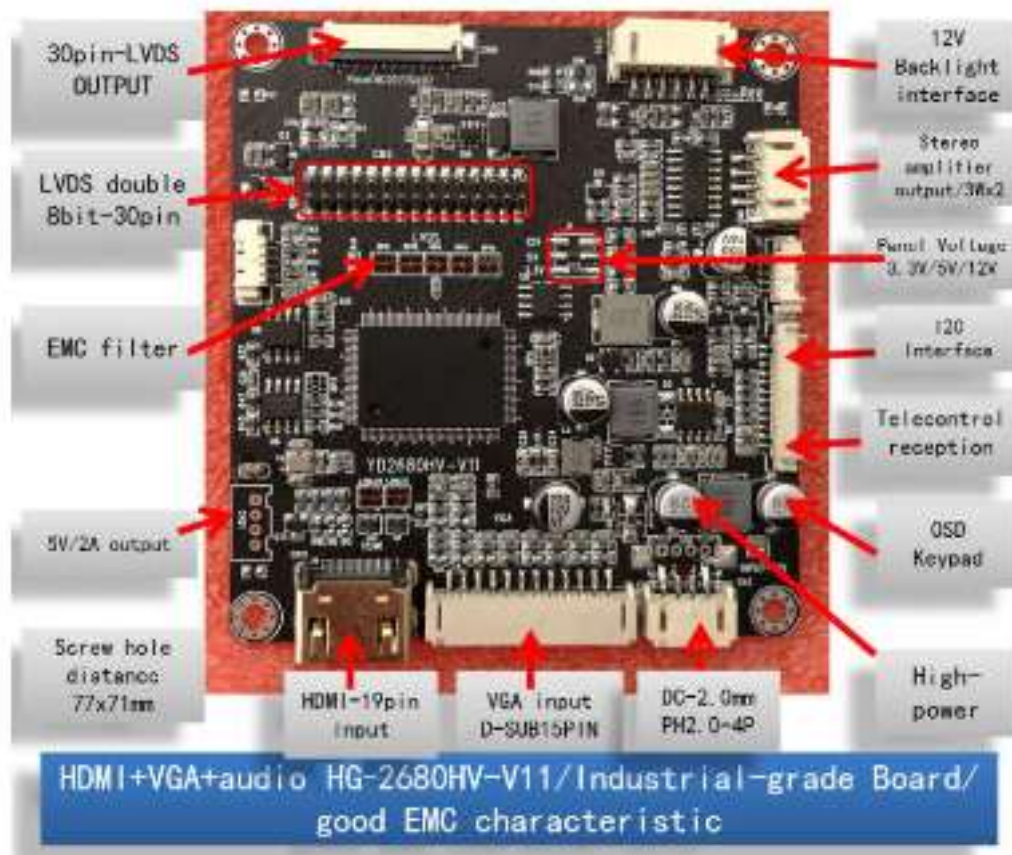
4.1 概要

HG2680HV-V11LCD 驱动板主要针对 TFT 类液晶屏设计，适用于液晶显示屏和其它一些平板显示屏。

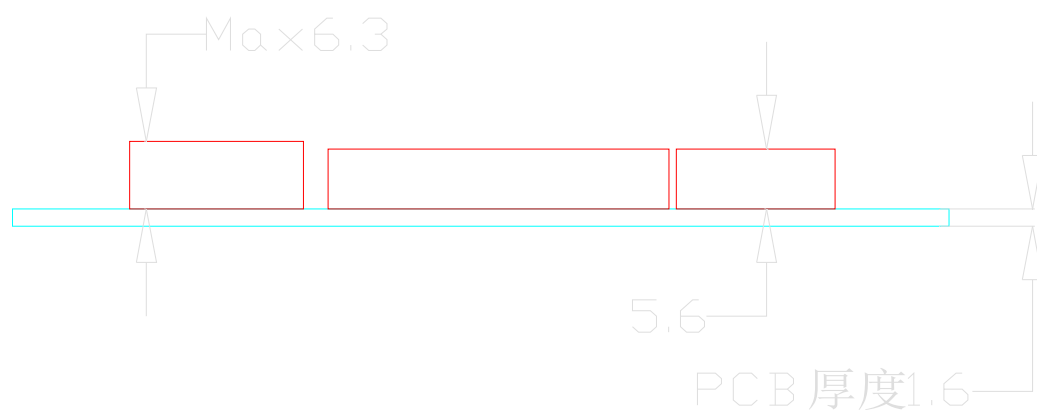
1. 输入信号类型：数字高清 (HDMI)、模拟 (RGB, VGA), PAL/NTSC 制式的复合视频 /VIDEO (默认 NC)。
2. 板卡支持宽电压输入 8V~25V; 典型值 12V (屏供电为 12V 时，板卡供电必须为 12V)
3. 宽温工作范围：-20℃~+70℃
4. 可支持跳帽选择屏参 800x480~~190x1200。👉
5. 板卡自带 LED 背光驱动电路；支持中小尺寸 LED 背光 9~25V 电压驱动。
6. 板卡自带 T-CON 电路，可直接驱动中小尺寸 LVDS/TTL 不带 T-CON 的 LCD
7. 背光供电支持 5V/12V (默认 12V)，支持 PWM 占空比调节背光亮度
8. 显示输出接口：LVDS 双 8BIT、TTL18bit/24bit
9. 适应 PC(个人计算机)显卡的高清 HDMI、模拟 RGB (VGA) 的分辨率: 480x272, VGA, SVGA, XGA, SXGA, WXGA+, UXGA, 1920X1200 等 VESA 标准信号；
10. 特点：此板卡具有操作简单、性能可靠的特点。



4.2 布局与尺寸图



高度尺寸:



4.2 接口概览

接口	用途	连接器说明	备注
CN1	12V 直流电源输入	4P, 2.0Pitch, 单排, 180°, 插座 (JST/CVILUX)	
CN2	12V 直流电源输入	DC JACK, 内正外负, 正极外径 $\phi 2.0\text{mm}$, 负极内径 $\phi 5.5\text{mm}$ (JST/CVILUX)	默认 NC
CN30	逆变器接口	6P, 2.0Pitch, 单排, 180°, 插座	
CN12	HDMI 输入	HDMI-19pin, 90°, 台湾插座	
CN5	LVDS/输出接口	2×15P, 2.0pitch, 双排, 180°, 插座 (JST/CVILUX)	
CN3	OSD 调节键盘接口	12P, 1.25mmPitch, 单排, 90°, 插座 (molex)	
CN26	I2C 接口	4P, 1.25mmPitch, 单排, 90°, 插座 (molex)	默认 NC
CN9	VGA 输入	12P, 2.0Pitch, 单排, 90°, 插座 (JST/CVILUX)	默认 NC
CN11	立体声/左右声道音频输出	4P, 2.0Pitch, 单排, 90°, 插座 (JST/CVILUX)	
CN18	audio 输入/输出	4P, 1.25mmPitch, 单排, 90°, 插座 (molex)	默认 NC
CN17	5V/2A 输出	4P, 1.25mmPitch, 单排, 90°, 插座 (molex)	默认 NC
J1	液晶屏供电选择	1-2 短路为 3.3V, 3-4 短路为 5V, 5-6 短路为 12V	

5. RELIABILITY TEST CONDITIONS

No	Test Item	Test Condition	STANDARD
1	High Temperature Storage	+70°C / 48Hours	1. Functional test is OK. Missing Segment, short, unclear segment, on-display, display abnormally and liquid crystal leak are un-allowed. 2. No low temperature bubbles, end seal loose and fall, frame rainbow.
2	Low Temperature Storage	-20°C / 48Hours	
3	High Temperature Operating	+60°C / 48Hours	
4	Low Temperature Operating	-10°C / 48Hours	
5	Thermal and cold shock	0°C↔+50°C x 10cycles (30min) (5min) (30min)	
6	Operate at High Temperature and Humidity	50°C x 90%RH / 24H	
7	Vibration Test	Frequency: 10Hz~55Hz~10Hz Amplitude:1.5mm, 2 hours for each direction of X, Y, Z	1. Function test is OK. 2. No glass crack, chipped glass, end seal loose and fall, epoxy frame crack and so on. 3. No structure loose and fall.
8	Dropping test	Drop to the ground from 0.6m height, 1 corner, 3 edges, 6 surfaces.	
9	ESD test	Contact: ±6KV Air: ±10KV 150PF/330Ω,5Points/pa nel,5times	The test results shall be subject to the whole machine test.

NOTE:

1. The reliability items will be fully performed in new sample qualification,
2. The reliability status will be tested as monitor during mass production. Individual reliability test shall be performed by lot , Moreover, the individual reliability item shall be decided according to reliability plan.
3. All samples are inspected after keeping in the room with normal temperature and humidity for 2 hours or above.
4. Vibration test: It is not necessary to test for those products without assembly frame , backlight , PCB and so on.
5. Dropping test : It is necessary for affirming new package.
6. For the high temperature and high humidity test, pure water of over 10 MΩ.cm should be used.
7. Each test item applies for test LCM only once .Then tested LCM cannot be used again in any other test item.
8. The quantity of LCM examination for each test item is 5pcs to 10pcs.



6. INSPECTION STANDARDS

6.1 AQL Sampling inspection standard

使用 GB/T 2828-2003 一般 II 水平, 采用正常检查一次抽样方式; 具体抽检方式参照《成品检验管理程序》、《抽样管理规范》

缺陷区分	AQL 允收水准
严重缺陷	0 收 1 退
重缺	0.4
轻缺	1.0

6.2 Inspect the condition

6.2.1 在 20—40W 日光灯的照明条件下, 样品离检查者眼睛约 30cm 处进行检查。检验方向以垂直线前后左右 45° (以时钟 3 点、6 点、9 点、12 点)

6.2.2 检验者视力需达到标准视力 1.0 以上。

6.2.3 检验者需戴静电手环、两手八个手指套。

6.2.4 外观检验者以目视检查或以菲林对比卡比对。

6.2.5 电性测试使用电测测架, 主板, 电源线及单片机。

6.2.6 若标准与规格书不符时, 以产品发行之规格书特殊检验规格、工程变更为准

6.2.7 辉色度检测请参照样品, 检测方法依照辉色度检验标准。

6.2.8 电测检验环境: 照度为 200LUX 以下, 外观检验环境: 照度为 600LUX-1000LUX, 检验时间: 1 秒-3 秒。

6.2.9 检验工具: 电测测架, 主板, 电源线及单片机, 菲林对比卡, 游标卡尺, 放大镜, 实体显微镜 (必要时) 等等。

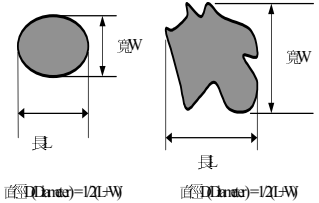
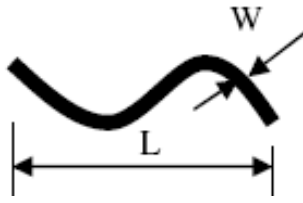
6.3 Judgment criterion

小尺寸点、线判定标准: (6.2 寸以内)

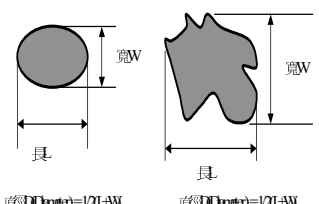
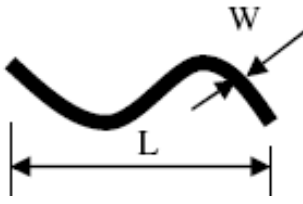
1	点状缺陷 (磨伤、异物、针孔、凹痕、缺膜、气泡、白点、彩点、脏点)		判定 (A/B/C 区)	$D \leq 0.10$, 忽略不计, 但密集型不允许	MI	OK
				$0.1 < D \leq 0.15, ds \geq 10$		$N \leq 2$
				$0.15 < D \leq 0.2, ds \geq 10$		$N \leq 1$
				LCD 亮点: $0.15 < D$		$N \leq 1$
				$D > 0.2$		NG
			判定 (D 区)	同背面丝印油墨区杂质判定标准		
			注: 1) D 区的点状缺陷需在不影响 CTP 功能、客户组装及整机的外观的情况下, 判定 OK			MI
2	线状缺陷 (磨伤、无感划伤、毛屑、纤维等)		判定 (A/B/C 区)	$W \leq 0.03mm, L \leq 3mm, ds \geq 10$	MI	$N \leq 2$
				$0.03mm < W \leq 0.05mm, L \leq 3mm, ds \geq 10$		$N \leq 1$
				$W > 0.05mm$ 或 $L > 3mm$		NG



中尺寸点、线判定标准：（6.2 8 寸以内）

1	点状缺陷 (磨伤、异物、针孔、凹痕、缺膜、气泡、白点、彩点、脏点)		判定(A/B/C区)	$D \leq 0.10$, 忽略不计, 但密集型不允许	MI	OK
				$0.15 < D \leq 0.25, ds \geq 10$		$N \leq 2$
				$0.25 < D \leq 3, ds \geq 10$		$N \leq 1$
				LCD 亮点: $0.2 < D$		$N \leq 1$
				$D > 0.3$		NG
			判定(D区)	同背面丝印油墨区杂质判定标准		
			注: 1) D区的点状缺陷需在不影响CTP功能、客户组装及整机的外观的情况下, 判定 OK			MI
2	线状缺陷 (磨伤、无感划伤、毛屑、纤维等)		判定(A/B/C区)	$W \leq 0.03mm, L \leq 3mm, ds \geq 10$	MI	$N \leq 2$
				$0.03mm < W \leq 0.05mm, L \leq 3mm, ds \geq 10$		$N \leq 1$
				$W > 0.05mm$ 或 $L > 3mm$		NG

大尺寸点、线判定标准：（8.1~13.3 寸以内）

1	点状缺陷 (磨伤、异物、针孔、凹痕、缺膜、气泡、白点、彩点、脏点)		判定(A/B/C区)	$D \leq 0.1$, 忽略不计, 但密集型不允许	MI	OK
				$0.15 < D \leq 0.3, ds \geq 10$		$N \leq 2$
				$0.3 < D \leq 0.35, ds \geq 10$		$N \leq 1$
				LCD 亮点: $0.25 < D$		$N \leq 1$
				$D > 0.35$		NG
			判定(D区)	同背面丝印油墨区杂质判定标准		
			注: 1) D区的点状缺陷需在不影响CTP功能、客户组装及整机的外观的情况下, 判定 OK			MI
2	线状缺陷 (磨伤、无感划伤、毛屑、纤维等)		判定(A/B/C区)	$W \leq 0.05mm, L \leq 5mm, ds \geq 10$	MI	$N \leq 2$
				$0.05mm < W \leq 0.07mm, L \leq 5mm, ds \geq 10$		$N \leq 1$
				$W > 0.07mm$ 或 $L > 5mm$		NG



7. PACKAGE DRAWING

