

BOE LCD Module SPECIFICATION

液晶显示模组规格书

Customer Name 客户名称	
Customer Model 客户机型	
Part Number	M0014WO-LH065
Date 日期	2024-11-16
Version 版本	01

☒ Preliminary Specification

☐ Final Specification

Customer's Acceptance 客户承认：

This module uses RoHS material. 模块使用环保材料.

Comment 承认意见	Approved by 承认人

Written by 撰写		Checked by 审核	Approved by 批准
研发部	工程部	研发部	研发中心

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RevisionRecord

修改记录

Rev No 版本号	Date 时间	Description 内容
V01	2024-11-16	Preliminary Specification Release.

1. General Specifications 基本规格

No.	Item 项目	Specification 规格	Unit 单位	Remark
1	LCD Size 液晶面板尺寸	1.43	inch	-
2	Panel Type 面板类型	AMOLED	-	-
3	Resolution 分辨率	466xRGBx466	Pixel	-
4	Display Mode 显示模式	Normally Black	-	-
5	Number of Colors 颜色数量	16.7M	-	-
6	Viewing Direction 视角	ALL	-	Note1
7	NTSC 色彩饱和度	100%	-	Typ.
8	Contrast Ratio 对比度	100000	-	Typ.
9	Luminance 亮度	650	cd/m2	Typ.
10	ASSY Module Size 总成模组尺寸	42.76x42.05x2.63	mm	Note1
11	Panel Active Area 可视区域	36.35(H)x36.35(V)	mm	Note1
12	Pixel Pitch 像素尺寸	78	um	-
13	Pixel Arrangement 像素排列	REAL RGB	-	-
14	Weight 重量	TBD	g	-
15	Driver IC 驱动芯片	ST7801N	-	-
16	Driver IC RAM Size 记忆体	RAM	bit	-
17	Light Source 背光源	No	-	-
18	Interface 接口方式	QSPI	-	-
19	Operating Temperature 工作温度	-20~+70	°C	-
20	Storage Temperature 存储温度	-30~+80	°C	-

Note 1: Please refer to the mechanical drawing ; 注 1 : 请参照模组图 ;

2. Pin Assignments 接口定义

Pin No. Pin 序号	Symbol 符号	Function 功能描述
1-5	NC	
6-8	D3/D2/D0	QSPI data pin
9	LCD-RST	Reset signal pin, Active low.
10	LCD-CLK	Clock signal pin
11	D1	QSPI data pin
12	LCD-CS	Chip select pin of serial interface.Low enable
13	LCD-TE	Output a frame head pulse signal
14	NC	
15	GND	Ground
16	VCI_EN	Power IC for analog system and booster circuit
17	NC	
18	VCC3.3	Power supply for digital system and booster circuit
19	VBAT	power IC supply for analog system circuit
20	GND	Ground
21-25	NC	
26	TP-INT	TP interrupt signal
27	TP-SDA	TP I2C data signal pin
28	TP-SCL	TP I2C clock signal pin
29	TP-RST	TP reset signal pin
30	GND	Ground

3. Electrical Specification 电气特性

3.1 Typical Operation Conditions 典型工作条件

Item 项目	Symbol	Min.最小	Typ.典型	Max.最大	Unit
I/O Supply Voltage 接口电压	IOVCC	1.65	1.8	3.3	V
Supply Voltage 电源电压	VCC	2.7	3.3	3.6	V
	ELVDD	2.8	3.3	4.0	V
	ELVSS	-0.6	-3.3	-4.5	V
Input High Voltage 输入高电平	V _{IH}	0.8*IOVCC	-	IOVCC	V
Input Low Voltage 输入低电平	V _{IL}	0	-	0.2*IOVCC	V
Output High Voltage 输出高电平	V _{OH}	0.8*IOVCC	-	IOVCC	V
Output Low Voltage 输出低电平	V _{OL}	0	-	0.2*IOVCC	V
Frame frequency	F _{frm}	-	50	-	HZ

3.2 Power consumption of display panel

Item		Symbol		Condition	Symbol	Min.	Typ.	Max.	Unit
Power Consumption	Normal mode	Driver IC	VCI	100% Pixel On,400nits,60Hz Vin 3.7V VCI 3.3V VDDIO 1.8V	Ivci	-	2.02	5.059	mA
			VDDIO		Pvci	-	6.666	16.695	mW
					Ivddio	-	1.88	2.878	mA
			Pvddio		-	3.384	5.18	mW	
		DCDC	Vin	Ivin	-	45.15	54.989	mA	
			Pvin	-	167.055	203.459	mW		
	Idle mode	Driver IC	VCI	10% Pixel On,50nits,15Hz VCI 3.3V VDDIO 1.8V	Ivci	-	1.74	4.339	mA
			VDDIO		Pvci	-	5.742	14.319	mW
					Ivddio	-	0.77	1.156	mA
			Pvddio		-	1.386	2.081	mW	
	Sleep mode		VDDIO	VCI 3.3V VDDIO 1.8V	Ivci	-	-	50	uA
					Pvci	-	-	165	uW
			VDDIO		Ivddio	-	-	180	uA
					Pvddio	-	-	324	uW
	Deep standby mode	Driver IC	VCI	VCI 3.3V VDDIO 1.8V	Ivci	-	-	4	uA
			VDDIO		Pvci	-	-	13.2	uW
					Ivddio	-	-	1	uA
			Pvddio		-	-	1.8	uW	

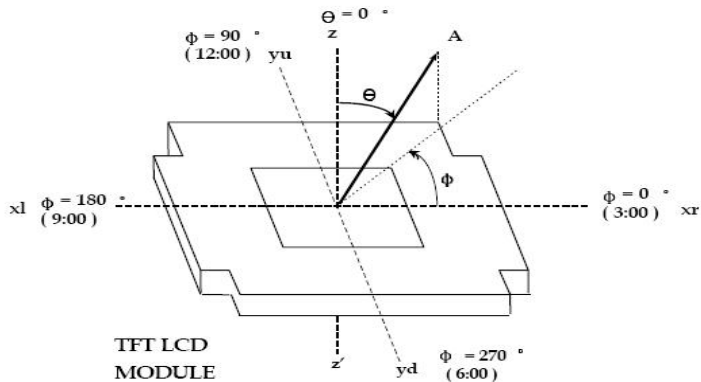
4. Optical Specification 光学参数

4.1 Optical Characteristics 光学特性

4.1LCMOptical Characteristics 液晶 模组光学特性 Item		Symbol	Condition	Min.	Typ.	Max.	Unit
Viewing Angle Range 视角	Left	θ_L	CR>10			80	degree
	Right	θ_R				80	
	Top	θ_T				80	
	Bottom	θ_B				80	
Response Time 响应时间		Ton+Toff	$\theta=\Phi=0^\circ$	-	2	3	ms
Contrast Ratio 对比度		CR	$\theta=\Phi=0^\circ$	100000	-	-	TYP.
Luminance 亮度		L	$\theta=\Phi=0^\circ$	-	650	-	cd/m ²
Color Chromaticity (CIE1931) 色坐标	White	W_x	Normal $\theta=\Phi=0^\circ$		0.28		-
		W_y			0.31		
	Red	R_x			0.68		
		R_y			0.32		
	Green	G_x			0.19		
		G_y			0.79		
	Blue	B_x			0.15		
		B_y			0.05		
Uniformity 均匀度		U _L	$\theta=\Phi=0^\circ$	-	TBD	-	%
Flicker 闪烁		-	-	≤20%			-

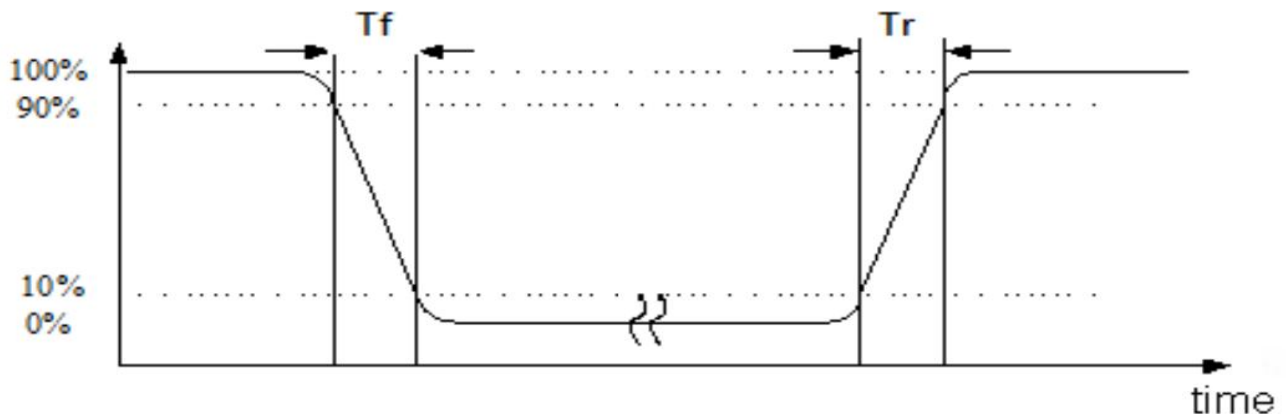
4.2 Measurement system 测量系统

4.2.1 LCM Viewing Angle



Viewing angle is the angle at which the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD surface.

4.2.2 Response time



Response time is the time required for the display to transition from white to black (Rising time, Tr) and from black to white (Falling time, Tf) for additional information.

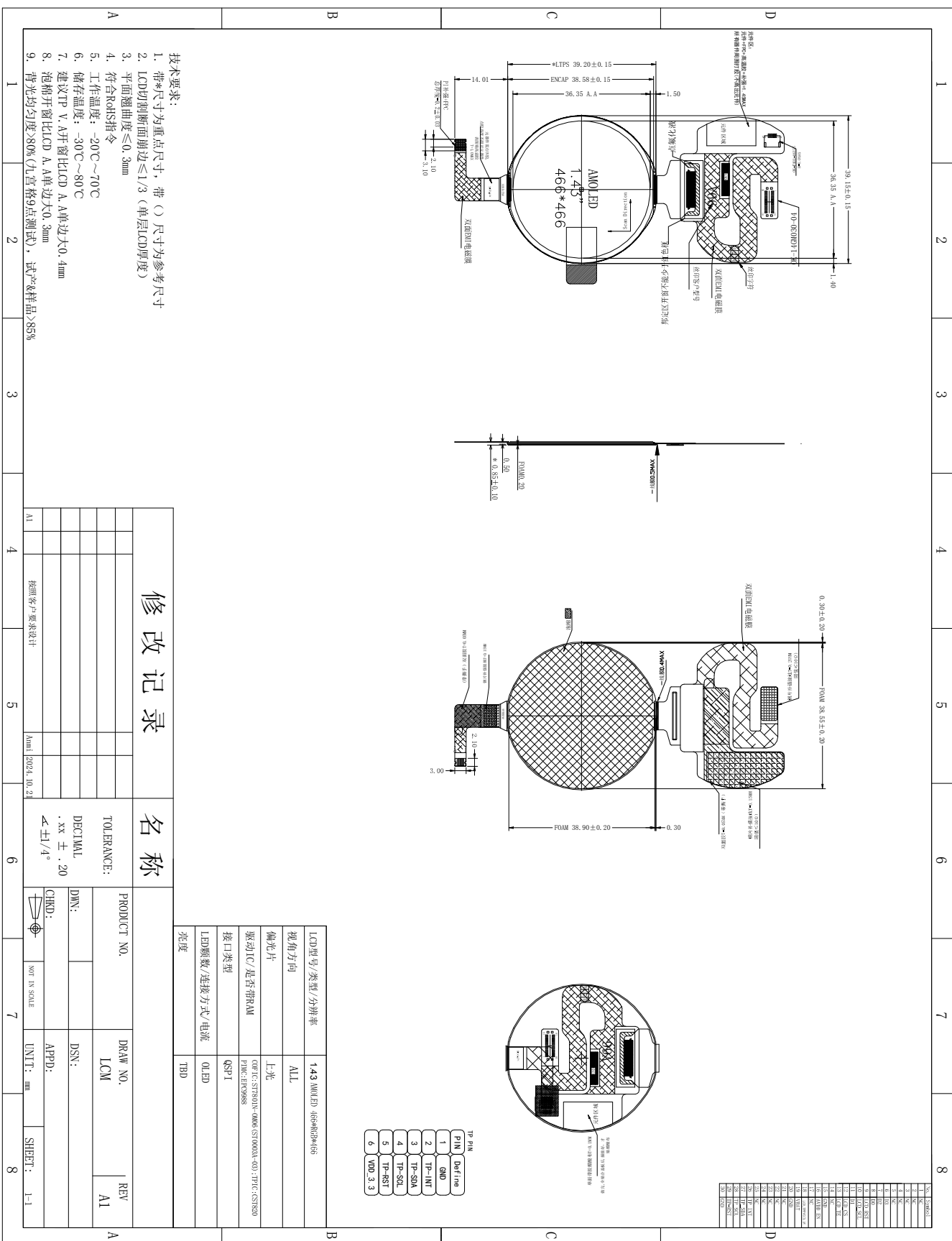
4.2.3 Contrast Ratio (CR)

Contrast Ratio (CR) is defined mathematically as:

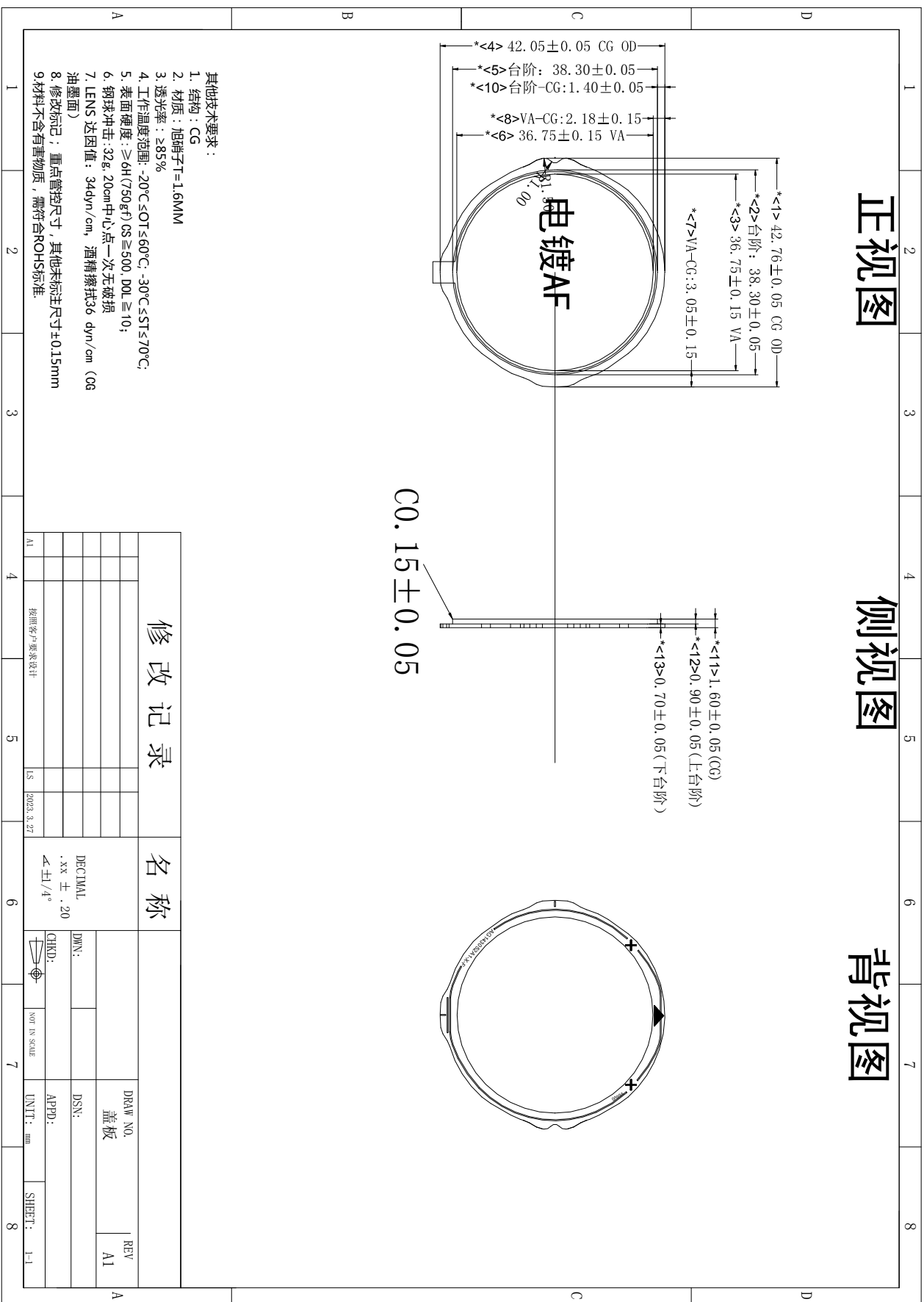
$$\text{Contrast Ratio} = \frac{\text{Surface Luminance with all white pixels}}{\text{Surface Luminance with all black pixels}}$$

Surface luminance is the center point across the LCD surface 500mm from the surface with all pixels displaying white.

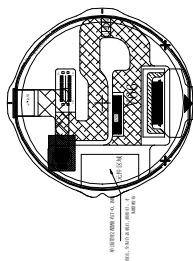
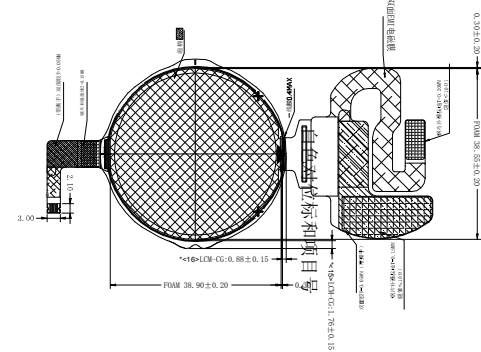
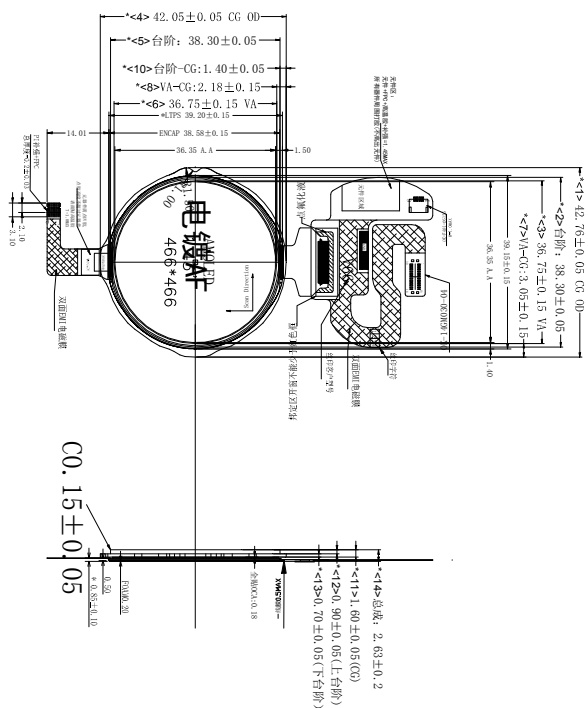
5. Mechanical Drawing 模组图



6. 盖板



7. ASSY Mechanical Drawing



弯折参考图

PIN	Define
1	GND
2	TP-INT
3	TP-SDA
4	TP-SCL
5	TP-RST
6	VDD_3.3

总成图

1. 结构: CG
 2. 衬板: 旭硝子=1.5MM
 3. 透光率: ≥85%
 4. 工作温度范围: -20℃≤OT≤60℃, -30℃≤ST≤70℃,
 5. 表面硬度: ≥6H(750gf) GS≤600 DOL≤10g
 6. 期望寿命: ≥2、200m/h点一次无破损
 7. LENS 达因值: 34dyN/cm, 酒精擦拭36 dyN/cm (CG 油墨面)
 8. 规格而已: 重点规格尺寸, 其他材料尺寸±0.15mm
9. 材料不含有害物质, 需符合ROHS认证。

修改记录

修改记录

修改记录			
A1	按照客户要求设计	Ami	2024.10.2

名稱	TOLERANCE:		DRAW NO.	REV
	DECIMAL		TP+LCM	A1-T
	.xx ± .20			
	± .1 / .1°			
				
				
CHHD:	UNIT: mm	SHEET: 1-1		
APPD:				
DSN:				
DMN:				

LED型号/英尺/分辨率	1.3 300LED 460000x106
视场方向	ALL
偏置片	无光
驱动IC/是否带ROM	091C-27700N (0901S0004.0) 1770C-057800 P901-EL970968
接口类型	QSP1
LED频数/连接方式/电流	0L1B
亮度	THD

No.	Symbol
1	AC
2	AC
3	AC
4	AC
5	AC
6	AC
7	AC
8	AC
9	AC
10	AC
11	AC
12	AC
13	AC
14	AC
15	AC
16	AC
17	AC
18	AC
19	AC
20	AC
21	AC
22	AC
23	AC
24	AC
25	AC
26	AC
27	AC
28	AC
29	AC
30	AC

8. Reliability Test Items 可靠性测试项目

Test Item 测试项目	TestCondition 测试条件	Test result determinant gist 实验结果判定
High temperature storage 高温存储	80±3℃ , 96H ;	Inspection after 2~4hours storage at room temperature, the sample shall be free from defects: 试验结束后,已测试的LCD样品必须在室内正常温湿度环境下放置2~4个小时以上才能进行功能和外观检查 , 样品不允许有以下缺陷 : 1.Air bubble in the LCD; 模块中有气泡 ; 2.Non-display; 不显示 ; 3.Glass crack; 玻璃破碎 ; 4. The electrical characteristics requirements shall be satisfied. 需要满足模块电气性能。
Low temperature storage 低温存储	-30±3℃ , 96H ;	
High temperature operation 高温运行测试	70±3℃ , 96H ;	
Low temperature operation 低温运行测试	-20±3℃ , 96H ;	
High temperature /humidity 高温高湿	50℃±3℃,90%±3%RH , 96H ;	
Thermal Shock 冷热冲击	-30℃/0.5h~+80℃/0.5h for a total 24 cycles ;	
Vibration Test 振动测试	Frequency 10Hz~55Hz~10Hz Amplitude : 1.5mm, X , Y , Z direction for total 1H ; (Packing condition)	
ESD test 静电测试	±8KV, Air Mode, 150pF/330Ω ;	

Remark: 注意 :

1. The test samples should be applied to only one test item.

每个被测试的模块只能用于其中的一个测试项目。

2. Sample size for each test item is 2pcs.

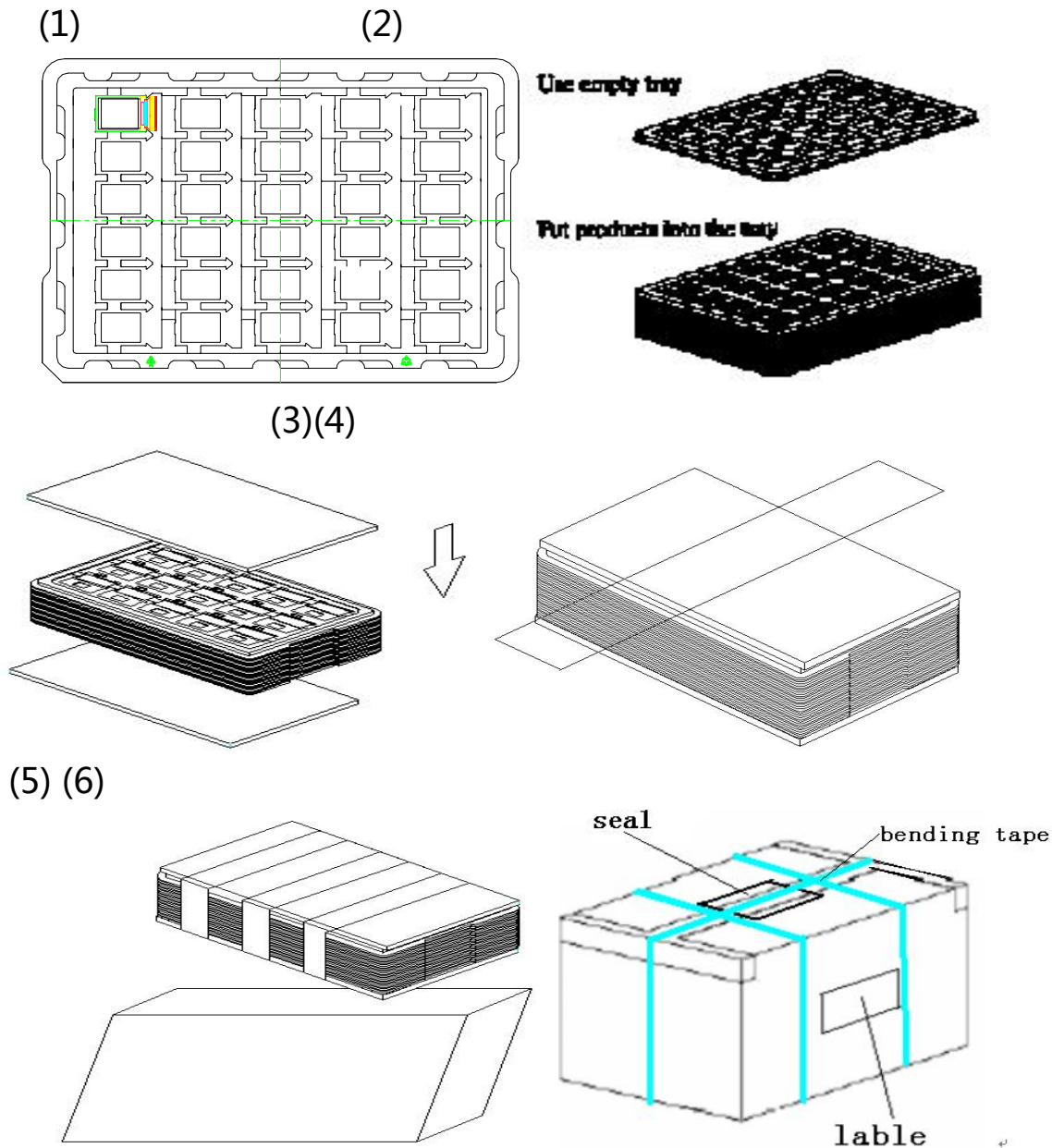
每个测试项目的样品数量为2片。

3. Failure Judgment Criterion: Basic Specification, Electrical Characteristic, Mechanical Characteristic, Optical Characteristic.

故障判断标准:基本规格,电气特性,机械特性,光电特性。

9. Packing and Storage Specification(Reference Only)包装存储

8.1 Packing Method 包装方法



1. Put module into tray cavity. 把模块放进托盘.
2. Tray stacking. 托盘叠装.
3. Put 1 foam under the tray stack and 1 foam above. 在托盘上下放卡板.
4. Fix the cardboard to the tray stack with adhesive tape. 绑胶带.
5. Put the tray stack into carton. 把邦好的托盘放进纸箱.
6. Carton sealing with adhesive tape. 封纸箱.

8.2 Storage Method 存储方法

1.Store in an ambient temperature of $23^{\circ}\text{C}\pm 5^{\circ}\text{C}$, and in a relative humidity of $55\%\pm 15\%$. Don't exceed 12 months and expose to sunlight or fluorescent light.

存储环境温度为 $23\pm 5^{\circ}\text{C}$ ，相对湿度为 $55\%\pm 15\%$ ，存储不能超过12个月，不要长时间暴晒。

2. Store in a clean environment, free from dust, active gas, and solvent.

存储在一个干净的环境，不受灰尘，活性气体和溶剂污染。

3. Store in antistatic container.

存储在防静电环境。

10. Announcements 注意事项

1.Do not attempt to disassemble or process the LCD module.

请勿拆卸液晶显示模块。

2.Do not make extra holes on the printed circuit board, modify its shape or change the positions of components to be attached.

不要在印制电路板上钻额外的孔，修改形状或更改印制线路板上元件的位置。

3.Except for soldering the interface, do not make any alterations or modifications with a soldering iron; Ensure welding temperature at 320°C to 350°C , the welding time control within the 10 s, welding note don't stay too long in the same place to avoid scald FPC.

除焊接接口外，不要用烙铁做任何更改；焊接温度保证在 320°C - 350°C ，焊接时间控制在 10S 以内，焊接时注意不要在同一处停留时间太久以免烫伤 FPC。

4. Other matters in not clear before use, please contact our staff to guide.

其他事项在不清楚使用之前，请联系我司人员指导进行。

-END-