产品技术资料

TECHNICAL DATA | 2.4英寸 240×320 SPI TFT液晶显示模组

2.4英寸 240×320 SPI TFT 液晶显示模组



资料项目	内容
文档版本	R1 资料整理版 / 2026-10-29
显示与接口	240 RGB×320 / 262K / 4 Line SPI / 10 Pin FPC
模组外形	42.72×60.26×2.34 mm
资料用途	产品选型、结构核对与技术沟通；不替代双方确认的工程规格书

本整理版包含机械尺寸、引脚、电气、时序、光学、可靠性参考条件和使用注意事项。
未指定新的产品型号；未设置设计、审核或客户确认签名。原始工程版本及差异见独立《资料备注》。

目录与版本说明

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版本与使用说明

1. R1 为百优资料整理版本，与原工程版本 V1 区别记录，不表示新增工程批准。
2. 驱动命名在来源标题与正文之间存在差异；本版正文沿用 ST7789。
3. VCC 范围在原资料不同页中有差异，IOVCC 未在10针引脚表单列。接线前应确认电平与连接方式。
4. 本版保留原有技术内容和试验条件；可靠性章节不是百优实测、认证或量产验证报告。
5. 原图 RoHS 标注的证明文件未随附，不作为百优已确认认证声明。
6. 本资料无审批人员或客户签核。最终规格以双方确认规格书为准。

基本规格

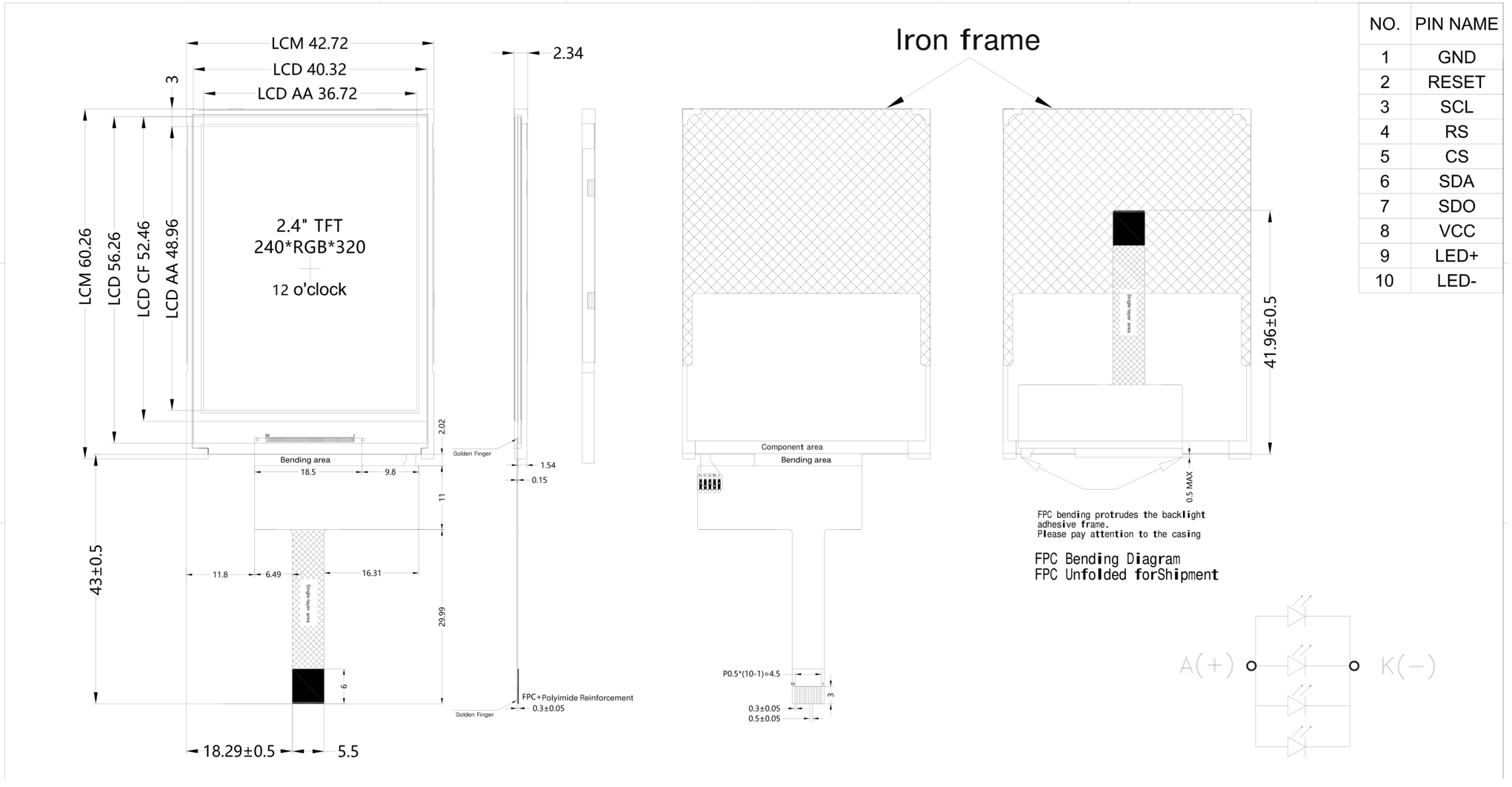
GENERAL SPECIFICATIONS | 2.4英寸 240×320 SPI TFT液晶显示模组

1. General Specifications

Item	Specification	Unit
Display Mode	Normally Black, Transmissive	/
Viewing Direction	12 o'clock	/
Colors	262K	/
Drive IC	ST7789	/
Interface Type	4 Line SPI	/
Dimensional Outline	42.72(W) x 60.26(H) x 2.34(T)	mm
LCD Active Area	36.72(W) x 48.96(H)	mm
Resolution	240 RGB(H) x 320(V)	pixels
Pixel Pitch	0.153(W) x 0.153(H)	mm

机械尺寸图

机械尺寸图 / MECHANICAL DRAWING | 2.4英寸 240×320 SPI TFT液晶显示模组



NO.	PIN NAME
1	GND
2	RESET
3	SCL
4	RS
5	CS
6	SDA
7	SDO
8	VCC
9	LED+
10	LED-

显示/电气参数	规格	结构/环境参数	规格
Display type	TFT / Normally Black	LCM luminance	400 cd/m2 TYP
Pixels / color	240RGB×320 / 262K	Backlight	White / IF=80mA / VF=3.2V
Viewing direction	12 o ’ clock	Operating temperature	-20 ° C to +70 ° C
Drive IC / interface	ST7789 / 4 Line SPI	Storage temperature	-30 ° C to +80 ° C
Document revision	R1 资料整理版 / 2026-10-29	Unspecified tolerance	±0.1 mm
产品通用名称	2.4英寸 240×320 SPI TFT液晶显示模组	合规标注说明	见独立资料备注，未随附合规证明

图示非1:1；单位 mm，尺寸、公差及方向以图中标注为准。

极限、电气与背光参数

RATINGS / ELECTRICAL / BACKLIGHT | 2.4英寸 240×320 SPI TFT液晶显示模组

3. Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Logic Supply Voltage	IOVCC	-0.3	4.6	**V**
Analog Supply Voltage	VCC	-0.3	4.6	**V**
Operating temperature	Top	-20	70	℃
Storage temperature	Tst	-30	80	℃
Humidity	RH	--	90%(Max60C)	RH

4. ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Min	Typ	Max	Unit
Logic Supply Voltage	IOVCC	1.65	1.8/2.8	3.3	V
Analog Supply Voltage	VCC	2.6	2.8	3.3	--
Input Current	Idd	--	20	--	mA

5. BACKLIGHT CHARACTERISTICS

Item	Symbol	Min	Typ	Max	Unit	Condition
Forward Voltage	Vf	3.0	3.2	3.4	V	--
Forward Current	If	--	80	--	mA	--
Operating Life Time	--	--	10000	--	Hrs	

Note 1: The LED Supply Voltage is defined by the number of LED at Ta=25℃

Note 2: Operating life means brightness goes down to 50% initial brightness. Typical operating life time is estimated data.

引脚定义

PIN DESCRIPTIONS | 2.4英寸 240×320 SPI TFT液晶显示模组

6. PIN DESCRIPTIONS

Pin.No	Symbol	Description
1	GND	Ground
2	RESET	LCM Reset pin
3	SCL	Serial clock pin.
4	RS	Register select pin（Instruction/Data Register Select Pin） RS='1': Display data.（RS=' 1' :Select data register） RS='0': Command data.（RS=' 0' :Select the instruction register）
5	CS	Chip select pin("Low" enable)
6	SDA	Serial data input
7	SDO	Serial data output.
8	VCC	Power supply for Analog（2.8V-3.3V）
9	LED+	Anode of Backlight
10	LED-	Cathode of Backlight

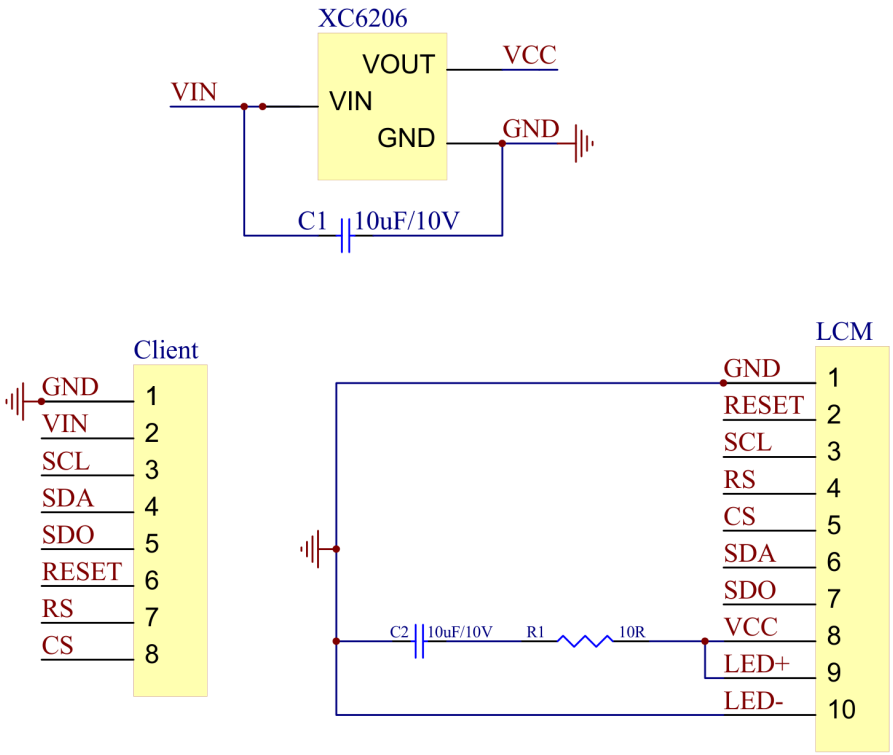
NOTE: The backlight LED can be powered separately or share a set of voltage supply with the VCC.

VCC范围及IOVCC连接存在资料差异，接线前请核对确认版规格书。

接口连接参考图

SCHEMATIC DIAGRAM | 2.4英寸 240×320 SPI TFT液晶显示模组

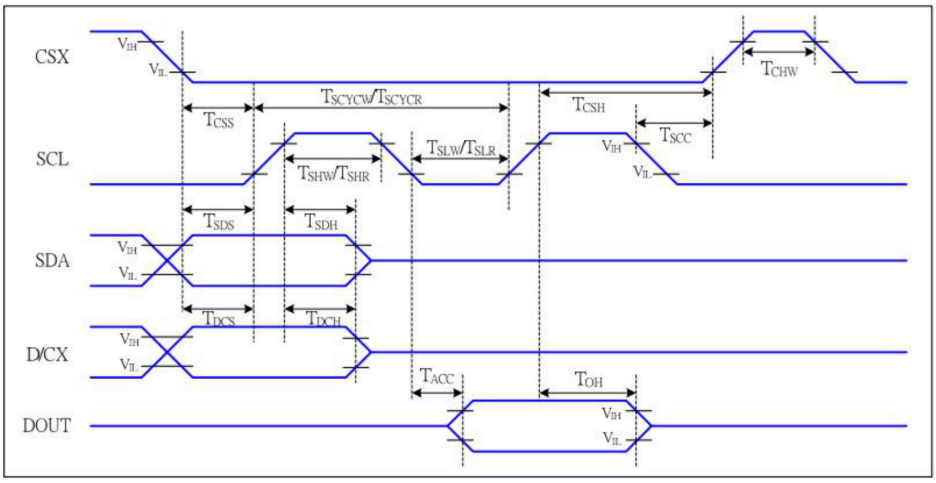
7. Schematic Diagram



4线串行接口时序

SERIAL INTERFACE TIMING | 2.4英寸 240×320 SPI TFT液晶显示模组

8. Timing Characteristics



4-line serial Interface Timing Characteristics

VDDI=1.65 to 3.3V, VDD=2.4 to 3.3V, AGND=DGND=0V, Ta=25℃

Signal	Symbol	Parameter	MIN	MAX	Unit	Description
CSX	T_{CSS}	Chip select setup time (write)	15		ns	
	T_{CSH}	Chip select hold time (write)	15		ns	
	T_{CSS}	Chip select setup time (read)	60		ns	
	T_{SCC}	Chip select hold time (read)	65		ns	
	T_{CHW}	Chip select “H” pulse width	40		ns	
SCL	T_{SCYCW}	Serial clock cycle (Write)	16		ns	-write command & data ram
	T_{SHW}	SCL “H” pulse width (Write)	7		ns	
	T_{SLW}	SCL “L” pulse width (Write)	7		ns	
	T_{SCYCR}	Serial clock cycle (Read)	150		ns	-read command & data ram
	T_{SHR}	SCL “H” pulse width (Read)	60		ns	
	T_{SLR}	SCL “L” pulse width (Read)	60		ns	
D/CX	T_{DCS}	D/CX setup time	10		ns	
	T_{DCH}	D/CX hold time	10		ns	
SDA (DIN)	T_{SDS}	Data setup time	7		ns	
	T_{SDH}	Data hold time	7		ns	
DOUT	T_{ACC}	Access time	10	50	ns	For maximum CL=30pF For minimum CL=8pF
	T_{OH}	Output disable time	15	50	ns	

4-line serial Interface Characteristics

Note : The rising time and falling time (Tr, Tf) of input signal are specified at 15 ns or less. Logic high and low levels are specified as 30% and 70% of VDDI for Input signals.

光学特性

OPTICAL CHARACTERISTICS | 2.4英寸 240×320 SPI TFT液晶显示模组

9. OPTICAL CHARACTERISTICS

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Response time (By Quick)	Tr+Tf	θ= 0°	-	30		ms	Note 5
Contrast ratio	CR	θ= 0°	-	250	-		Note 2,6
Viewing angle	Top	CR≧10	-	45	-	deg.	Note 2,6,7
	Bottom	CR≧10	-	20	-		
	Left	CR≧10	-	45	-		
	Right	CR≧10	-	45	-		
Color chromaticity (CF only with ITO, light source is C light, CIE 1931)	Wx	θ= 0°	-0.02	0.308	+0.02		Note 3
	Wy			0.325			
	Rx			0.612			
	Ry			0.329			
	Gx			0.299			
	Gy			0.567			
	Bx			0.144			
	By			0.110			
NTSC			-	55	-	%	Note 3
Cross talk	Ct		-	2	-	%	Note 9
Transmittance	Trans		-	5	-	%	Note 4

Note 1: Ambient temperature = 25°C.

Note 2: To be measured with a viewing cone of 2°by Topcon luminance meter BM-5A.

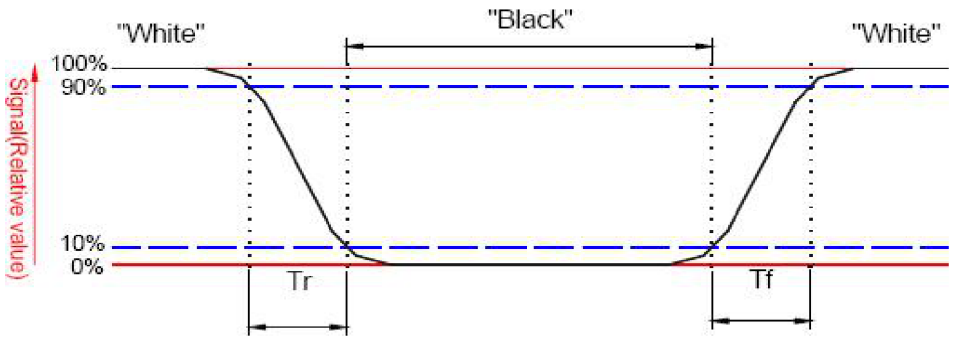
Note 3: To be measured with Otsuta chromaticity meter LCF-2100M, CF only measure under C light simulation.

Note 4: CTC shipping status is cell without polarizer. Transmittance of Specification is cell with polarizer. The tolerance of Transmittance is ±10%.

光学测量说明 I

OPTICAL MEASUREMENT NOTES I | 2.4英寸 240×320 SPI TFT液晶显示模组

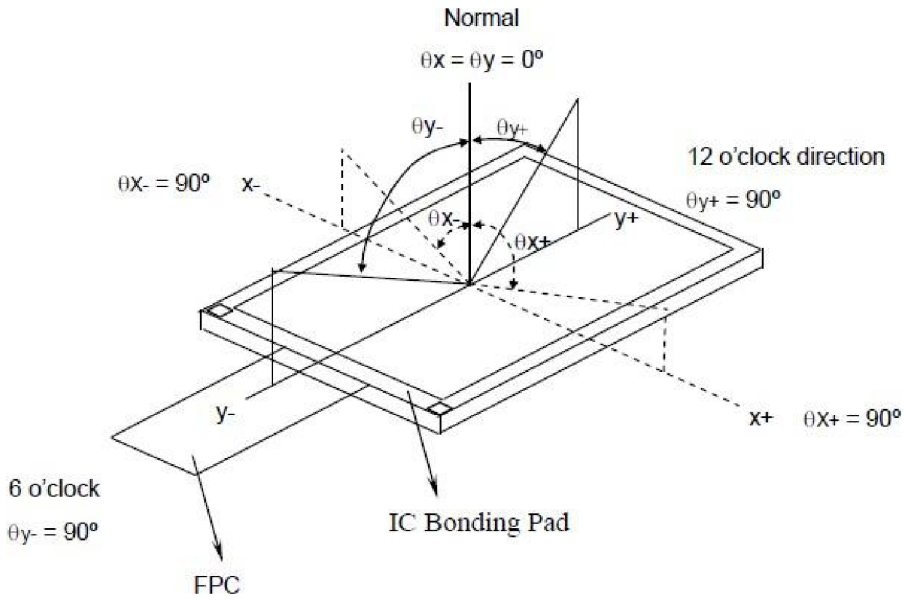
Note 5: Definition of response time:The output signals of TRD-100 are measured when the input signals are changed to “White” (falling time) and from “White” to “Black” (rising time), respectively. The interval is between the 10% and 90% of amplitudes. Refer to figure as below.



Note 6: Contrast ratio is calculated by the following formula:

$$\text{Contrast ratio (CR)} = \frac{\text{Brightness on the "white" state}}{\text{Brightness on the "black" state}}$$

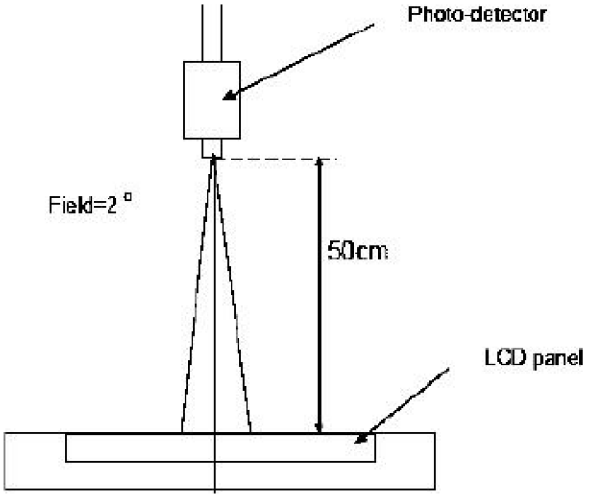
Note 7: Definition of viewing angle



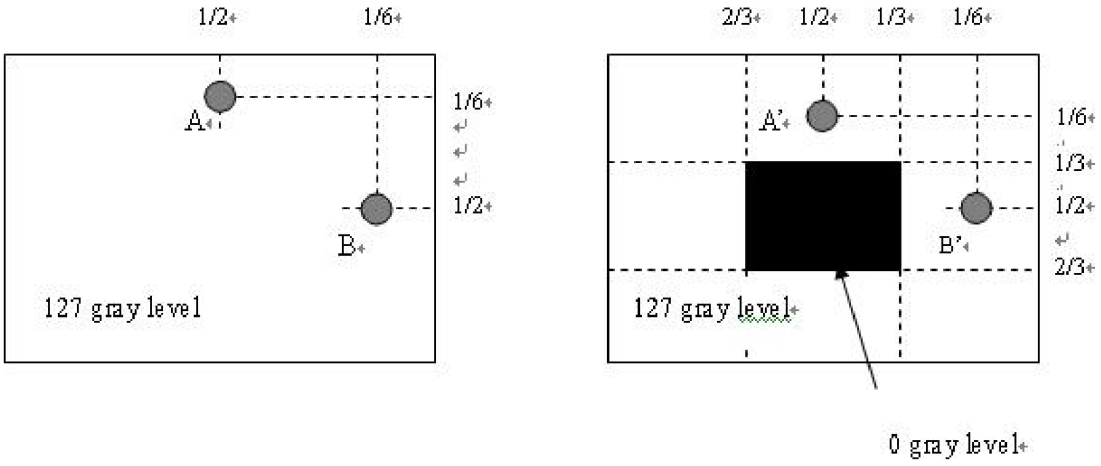
光学测量说明 II

OPTICAL MEASUREMENT NOTES II | 2.4英寸 240×320 SPI TFT液晶显示模组

Note 8: Optical characteristic measurement setup.



Note 9:



I LA-LA' I / LA	x 100%= 2% max., LA and LA' are brightness at location A and A'
I LB-LB' I / LB	x 100%= 2% max., LB and LB'are brightness at location B and B'

可靠性参考条件

RELIABILITY REFERENCE CONDITIONS | 2.4英寸 240×320 SPI TFT液晶显示模组

10 Reliability

10.1 MTBF

The LCD module shall be designed to meet a minimum MTBF value of 50000 hours with normal.

10.2 Test Condition

No	ITEM	CONDITION	CRITERION
1	High Temperature Non-Operating Test	80℃*240Hrs	.No Defect Of Operational Function In Room Temperature Are Allowable .IDD of LCM in Pre-and Post-Test Should Follow Specification
2	Low Temperature Non-Operating Test	-30℃*240Hrs	
3	High Temperature/Humidity Non Operating Test	60℃*90%RH*240Hrs	
4	High Temperature Operating Test	70℃*240Hrs	
5	Low Temperature Operating Test	-20℃*240Hrs	
6	Thermal Shock Test	-20 ℃(30Min)<>70 ℃(30Min) *10CYCLES	

Notes:

1. Judgments should be made after exposure in room temperature for two hours.
2. The distill water is used for the high temperature/humidity test.
3. The sample above is individually for every reliability tests condition.

本页为原技术资料设计目标与试验条件，非百优实测或认证报告。

储存与使用注意事项

11. Precautions

11.1 Storage Conditions

(1) Store the panel or module in a dark place where the temperature is 23±5℃and the humidity is below 45±20%RH.

(2) Store in anti-static electricity container.

(3) Store in clean environment, free from dust, active gas, and solvent.

(4) Do not place the module near organics solvents or corrosive gases.

(5) Do not crush, shake, or jolt the module.

11.2 Handling Precautions

(1) Avoid static electricity, which can damage the CMOS LSI

(2) The polarizing plate of the display is very fragile, please handle if very carefully.

(3)Do not give external shock.

(4) Do not apply excessive force on the surface.

(5) Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the surface of plate.

(6) Do not operate it above the absolute maximum rating.

(8)Do not remove the panel or frame from the module.