STP0177C-128160 Series

TFT LCD PANEL USER MANUAL

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Reference Controller Datasheet

TFT LCD Panel Selection Guide

ST7735S

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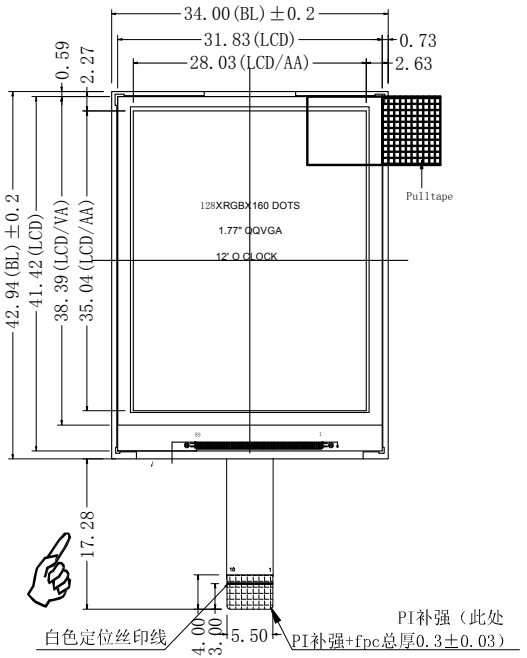
1.General Description 基本描述

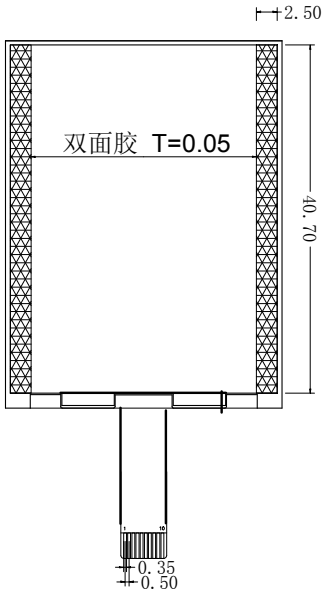
MODEL NO 产品型号	STP0177C-128160
Display Mode 显示模式	Transmissive 全透
Display Format 显示格式	Graphic 128RGB*160 Dot-matrix 128xRGBx160 图形点阵
Input Data 显示屏接口类型	SPI-4wire interface 四线串口
Viewing Direction 视角方向	12 o'clock 12 点钟
Drive 显示屏驱动芯片	ST7735S (台湾矽创)

2. Mechanical Specification 机械规格

Item	Specifications	Unit
Dimensional outline 显示屏外围尺寸	33.30(W)*42.94(H)*2.30+/-0.1(T) (FPC not include)	mm
Resolution 分辨率	128RGB*160	dots
LCD Active area 显示尺寸	28.03 (W)*35.04 (H)	mm
Pixel size 像素尺寸	0.219(W)*0.219(H)	mm

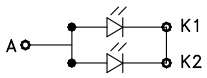
3.Mechanical Dimension 机械尺寸图





PIN	DESCRIPTION
1	LED-K
2	LED-A
3	VCC
4	TE
5	CS
6	RESET
7	DC
8	SCL
9	SDA
10	GND

Display mode: normal white.
Viewing direction: 12 o'clock
Driver IC: ST7735S
Operating temperature: -20 to 70.
Storage temperature: -30 to 80.
RoHS compliance.



Backlight circuit
15mA*2, 3.2V DC

SHENZHEN SURENOO TECHNOLOGY CO.,LTD.				
	比例 1:1	单位 MM	审核	设计
产品编码	STP0177C-128160	公差		
客户项目		±0.2		2018.11.28

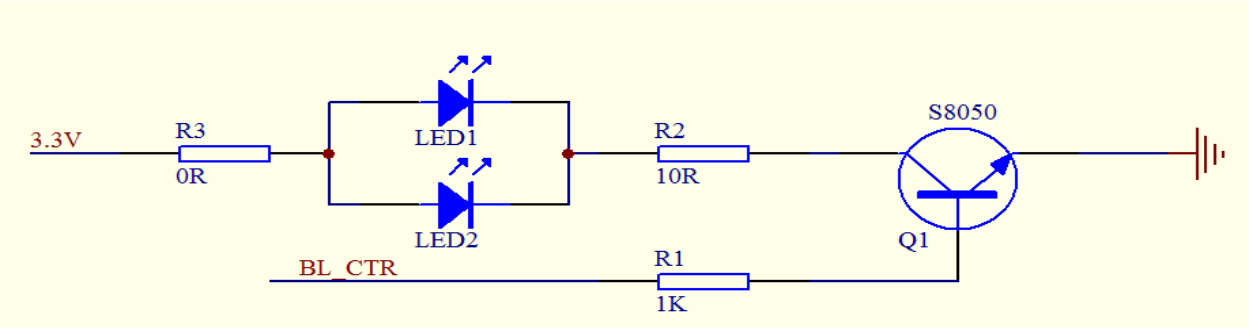
4. Electrical Maximum Ratings 电气极限

Item 项目	Symbol 符号	Min 最小值	Max 最大值	Unit 单位	Note 备注
Supply voltage（IOVCC） 工作电压(IOVCC)	V	1.65	3.3	V	1.8
Supply voltage（ VCC ） 工作电压(VCC)	V	2.5	3.5	V	2.8
Operating temperature 工作温度范围	T_{OPR}	-20	70	℃	
Storage temperature 存储温度范围	T_{STR}	-30	80	℃	

5. Backlight Characteristic 背光特性

Item 项目	Symbol 符号	Min 最小值	Typical 典型值	Max 最大值	Unit
LED module Forward voltage LED 背光源正向电压	V_{LED}	3．0	3.3	3.4	V
LED module current LED 背光源电流	I_{LED}	-	30	-	mA
LCD Surface Luminance 显示屏表面亮度	L_S	150	200	-	Cd/m^2
LCM Surface brightness uniform LED 背光源均匀度	L_D	80	-	-	%

附：背光源参考电路



6. Module Function Description 显示屏脚位定义

端口	符号	描述
1	LED-K	背光负极
2	LED-A	背光正极(3.3V)
3	VCC	系统电压(2.8V)
4	TE	同步数据
5	CS	片选，低有效
6	RESET	复位信号
7	DC	数据输出
8	SCL	时钟
9	SDA	数据输入
10	GND	地

电气特性

1 TFT-LCD 模组特性

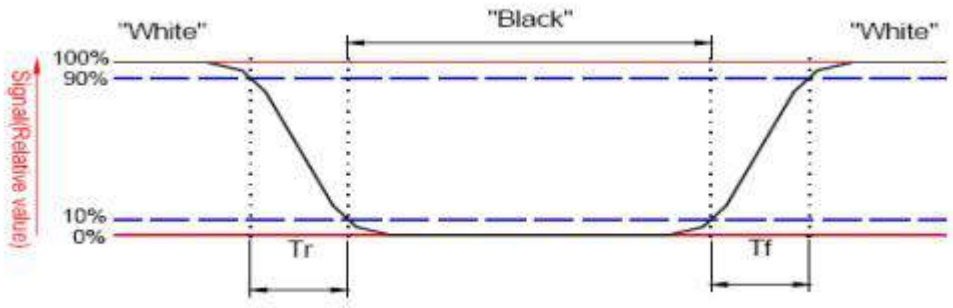
类型	符号	条件	最小值	典型值	最大值	单位
系统电压	VCC	--	2.5	2.8	3.5	V
逻辑电压	IOVCC	--	1.65	1.8	3.3	V
逻辑电平	VIH	IOVCC=1.8-3.3V	0.8* V_{IOVCC}	--	IOVCC	V
	VIL		VSSI	--	0.2* V_{IOVCC}	V
工作电流	IDD	VCC=2.8V		TBD		mA

2 背光特性

类型	符号	条件	最小值	典型值	最大值	单位
电流	IF	VF=3.2V	--	30	40	mA
正向电压	VF	IF=15mA	3.0	--	3.4	V
亮度	Lv		--	--	--	cd/m^2
均匀度	ΔBp		80	--	--	%

7.Response time&Contrast ratio 响应时间与对比度

Item 项目	Symbol 符号	Condition 条件	Remark			Unit 单位
			Min. 最小值	Typ. 典型值	Max. 最大值	
Response time 响应时间	Tr+Tf	θ =0°	-	30	60	ms
Contrast ratio 对比度	CR	θ =0°	200	300	-	



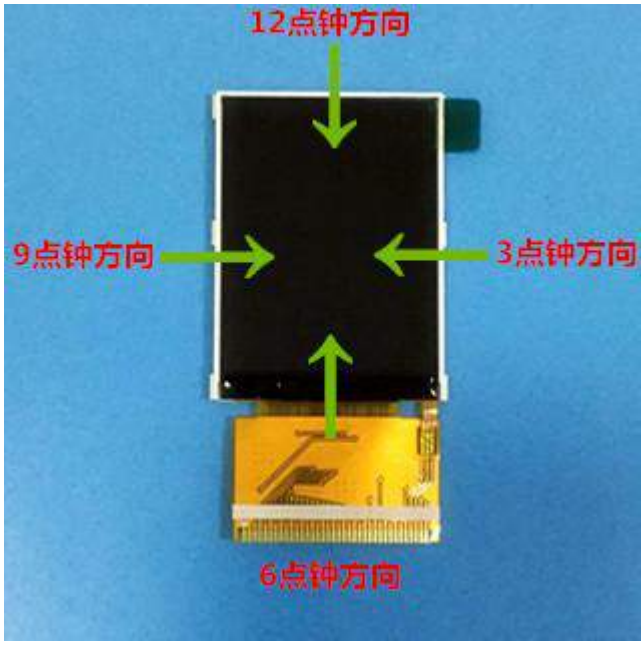
响应时间图示

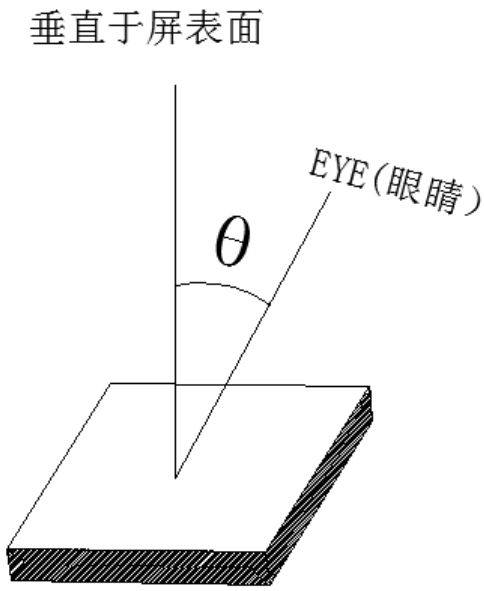
$$\text{Contrast ratio (CR)} = \frac{\text{Brightness on the "white" state}}{\text{Brightness on the "black" state}}$$

对比度计算公式

8.Viewing Angle 视角宽度

Item 项目	Symbol 符号	Condition 条件	Remark			Unit 单位
			Min. 最小值	Typ. 典型值	Max. 最大值	
Viewing angle 视角宽度	Top 12 点钟方向	CR≥10 对比度大于等于 10	20	30	-	Deg. 度
	Bottom 6 点方向	CR≥10 对比度大于等于 10	40	45	-	
	Left 9 点钟方向	CR≥10 对比度大于等于 10	40	45	-	
	Right 3 点钟方向	CR≥10 对比度大于等于 10	40	45	-	





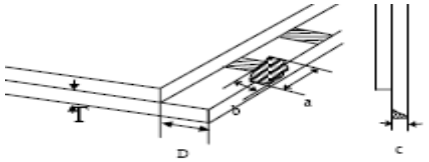
NOTE:3 点, 6 点, 9 点, 12 点方向视角的大小指的是垂直于屏表面的线眼睛视线之间的夹角(0）。

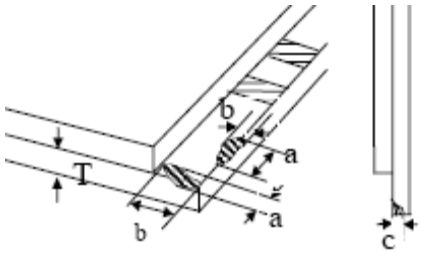
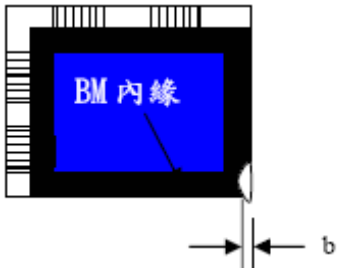
9. Reliability Trial 可靠性实验

NO. 序号	ITEM 实验项目	CONDITION 实验环境	CRITERION 实验规范
1	High Temperature Non-Operating Test 高温存储实验	80℃*120Hrs	No Defect Of Operational Function In Room Temperature Are Allowable 室温运行功能无缺陷
2	Low Temperature Non-Operating Test 低温存储实验	-30℃*120Hrs	
3	High Temperature/Humidity Non Operating Test 高温高湿实验	60℃*90%RH*120Hrs	
4	High Temperature Operating Test 高温工作实验	70℃*72Hrs	
5	Low Temperature Operating Test 低温工作实验	-20℃*72Hrs	
6	Thermal Shock Test 热冲实验	-20 ℃ (30Min) n 70 ℃ (30Min) *10CYCLES	

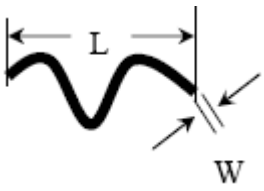
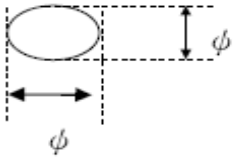
10.Inspection standards 检验标准

10.1Glass defect

NO	Defect item	Criteria	Remark
1	Dimension Unconformity (Major defect)	By Engineering Drawing	
2	Cracks (Major defect)	1. Linear cracks panel 【Reject】 2. Nonlinear crack contrast by limited sample	
3	Glass extrude the conductive area (minor defect)	a: disregards and no influence assemblage. 1) b≤1/3Pin width(non bonding area) 【Accept】 2)bonding area≤0.5mm 【Accept】	A: Length, b: Width
4	Pin-side ,conductive area damaged (minor defect)	(a c: disregards) b≤1/3of effective length for bonding electrode 【Accept】	a: length, b: Width, c: Thickness 
5	Pin-side,non-conductive area damaged	1)Damage area don't touch the ITO (Inclueling contraposition mark,	a: Length, b: Width c: Thickness

	(minor defect)	except scribing mark) 【Accept】 2)C<T b≦BM1/3of width 【Accept】 3)c=T b not touch the seal glue 【Accept】 4)a disregards	
6	Non-pin-side damage (minor defect)	c<T 1)b exceeds 1/3Bm 【Reject】 c=T b not touch the seal glue 【Reject】	c: Thickness b: width of  damage

10.2LCD appearance defect(View area)

NO	Defect item	Criteria		Remark
1	Fiber、glass cratch、polarizer scratch/folded (minor defect)	Specification	Allowable	note1:L: Length, W: Width note2: disregard if out of AA 
		W≦0.03mm	disregard	
		0.03mm<W≦0.05mm; L≦3.0mm	2	
		0.05mm<W≦0.1mm; L≦3.0mm	1	
		W>0.1mm;L>3.0mm	0	
2	Polarizer bubble、concave and convex (minor defect)	Φ≦0.2mm	disregard	note1: Φ=(L+W)/2,L:Length, W :Width note2:disregard if out of AA
		0.2mm<Φ≦0.3mm	2	
		0.3mm<Φ≦0.5mm	1	
		0.5mm<Φ	0	
3	Black dots、dirty dots、impurities、eye winker (minor defect)	Φ≦0.15mm	disregard	note2:disregard if out of AA 
		0.15mm<Φ≦0.25mm	2	
		0.25mm<Φ≦0.3mm	1	
		0.3mm<Φ	0	
4	Polarizer prick (minor defect)	Φ≦0.1mm	disregard	note1: Φ=(L+W)/2,L=Length, W=Width note2:the distance between two dots>5mm
		0.1mm<Φ≦0.25mm	3	
		Φ>0.25mm	0	

11.Package Method 包装方法

模块出货包装示意图：