Surenoo STP0350B1-320480 Series TFT LCD Display Screen Panel User Manual

Contents

STP0350B1-320480 Series TFT LCD Display Screen Panel

Product Information: STP0350B1-320480(TN) TFT LCD PANEL

The STP0350B1-320480(TN) series TFT LCD panel is manufactured by Shenzhen Surenoo Technology Co., Ltd. The panel has a display format of graphic 320RGB*480 dot-matrix 320xRGBx480 with a transmissive display mode and 8bit/16bit interface input data. It is equipped with the ILI9488 drive and CTP: GT911 touch panel driver. The LCD panel measures 3.5 inches and has a viewing direction of 12 o'clock.

Mechanical Specification
The LCD panel has an active area of 48.96(W)*73.44 (H) mm with a resolution of 320RGB*480 dots. The pixel size is 0.153(W)*0.153(H) mm. The CTP has a dimensional outline of 55.26(W)*84.52(H)*4.13(T) mm, while the RTP has a dimensional outline of 55.26(W)*84.52(H)*4.00(T) mm, and the NTP has a dimensional outline of 55.26(W)*84.52(H)*2.70(T) mm.

Module Function Description
The TFT LCD PANEL has 26 pins, including GND, VDDA, VDDI, CSX, DCX, WRX, RDX, RESET, DB0-DB7, and DB8-DB15.

Electrical Maximum Ratings
The minimum and maximum supply voltage for VDDI is 1.8V and 3.3V, respectively, while the minimum and maximum supply voltage for VDDA is 2.8V and 3.3V, respectively. The operating temperature range is -20°C to 70°C, while the storage temperature range is -30°C to 80°C.

Brightness Characteristic & Power Dissipation
The LED module forward voltage has a minimum of 29V and a typical value of 3.1V with a maximum of 3.3V. The LED module current has no minimum value, a typical value of 128mA, and no maximum value. The LCD surface luminance has a typical value of 300 cd/m2, while the LCM surface brightness uniformity has a typical value of 0.39%. The LCD power dissipation varies depending on the voltage and current, with PLCD = VDD * (ILED+ILCD).

Product Usage Instructions

The STP0350B1-320480(TN) TFT LCD PANEL is commonly used in various electronic devices, including but not limited to smartphones, tablets, laptops, and other display devices. Before using the product, ensure that the device's power supply voltage is within the specified range of 1.8V to 3.3V for VDDI and 2.8V to 3.3V for VDDA.

The LCD panel can be connected to the device using an 8bit or 16bit interface input data. The panel is equipped with the ILI9488 drive and CTP: GT911 touch panel driver. The touch panel driver can be used to provide touch functionality to the display device.

The LCD panel has 26 pins, including GND, VDDA, VDDI, CSX, DCX, WRX, RDX, RESET, DB0-DB7, and DB8-DB15. The pins can be connected to the device's circuit board using the corresponding pin definitions.

When using the LCD panel, ensure that the operating temperature range is within -20°C to 70°C, while the storage temperature range is within -30°C to 80°C. The brightness and power dissipation values should also be considered when designing the device that will use the LCD panel.

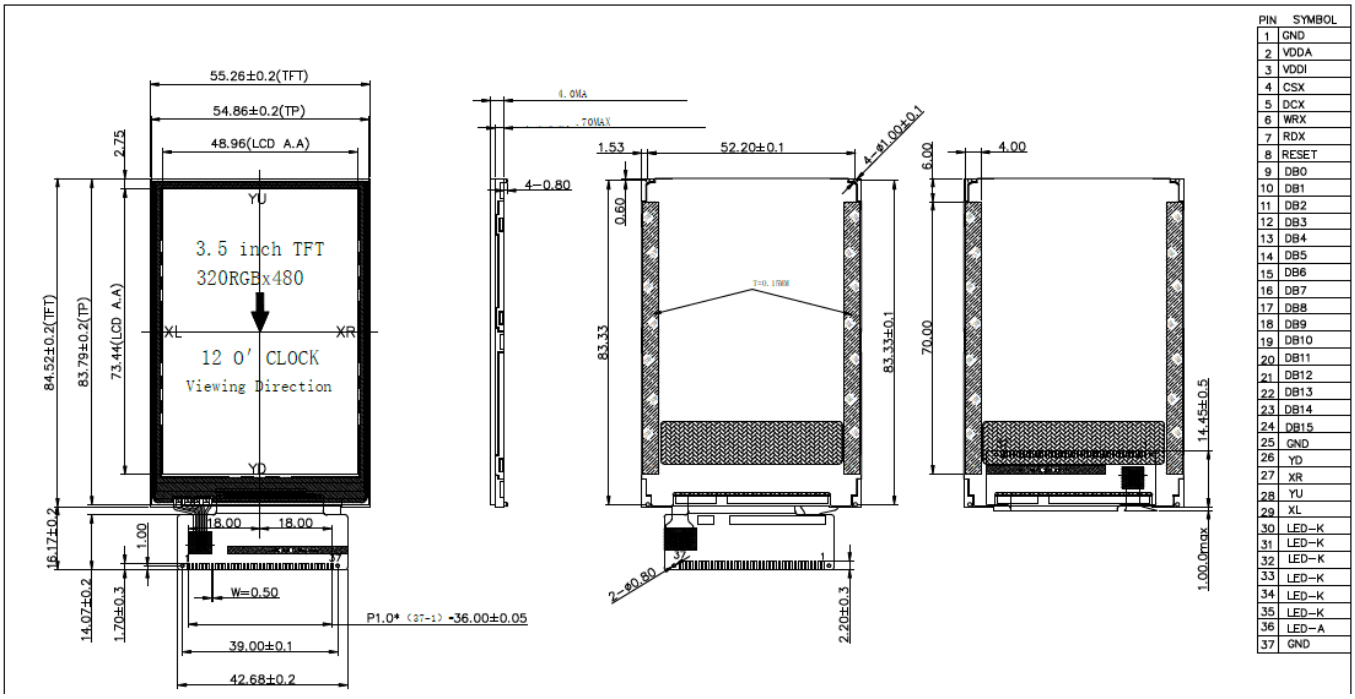
General Description

MODEL NO	**STP0350B1-320480(TN)**
Display Mode	Transmissive
Display Format	Graphic 320RGB*480 Dot-matrix 320xRGBx480
Input Data	8bit/16bit interface
Viewing Direction	12 o'clock 12
Drive	ILI9488 CTP: GT911

Mechanical Specification

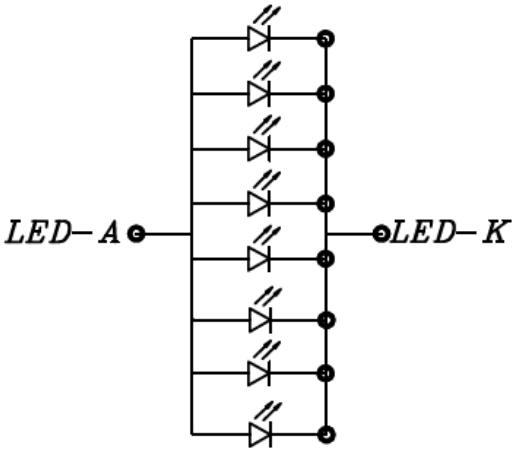
Item	Specifications	Unit
Dimensional outline	**CTP:** 55.26(W)*84.52(H)*4.13(T) **RTP:** 55.26(W)*84.52(H)*4.00(T) **NTP:** 55.26(W)*84.52(H)*2.70(T)	mm
Resolution	320RGB*480	dots
LCD Active area	48.96(W)*73.44 (H)	mm
Pixel size	0.153(W)*0.153(H)	mm

Mechanical Dimension



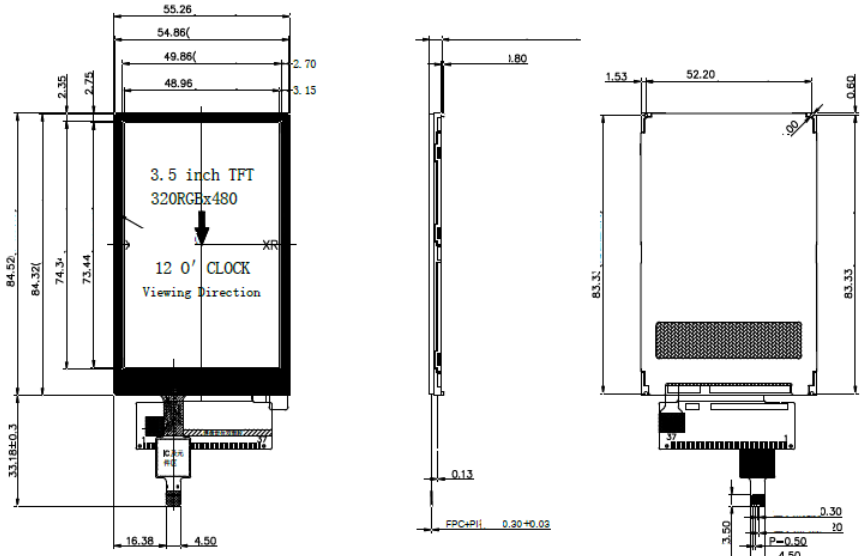
NOTES:

1. DISPLAY TYPE:TFT
2. OPERATING TEMP: -20°C~70°C
3. STORAGE TEMP: -30°C~80°C
4. LCD DRIVER: COG(IC:ILI9488);
5. BACKLIGHT: 8 CHIP-WHITE LED (Parallels)
6. GENERAL TOLERANCE:±0.20
7. ROHS



SHENZHEN SURENOO TECHNOLOGY CO.,LTD.					
	STP0350B1-320480(TN)				
	LCM				
	v0.0		MM		
	2014.03.19		1:1		
UNMRKED TOLERANCE:±0.20 mm					1 OF 1

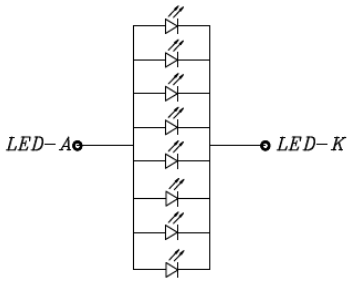
Mechanical Dimension (CTP)



1	GND
2	VDDA
3	VDDI
4	CSX
5	DCX
6	WRX
7	RDX
8	RESET
9	DB0
10	DB1
11	DB2
12	DB3
13	DB4
14	DB5
15	DB6
16	DB7
17	DB8
18	DB9
19	DB10
20	DB11
21	DB12
22	DB13
23	DB14
24	DB15
25	GND
26	NC
27	NC
28	NC
29	NC
30	LED-K
31	LED-K
32	LED-K
33	LED-K
34	LED-K
35	LED-K
36	LED-A
37	GND

NOTES:

1. DISPLAY TYPE:TFT
2. OPERATING TEMP: -20°C~70°C
3. STORAGE TEMP: -30°C~80°C
4. LCD DRIVER: COG(IC:ILI9488);
5. BACKLIGHT: 8 CHIP-WHITE LED (Parellel)
6. GENERAL TOLERANCE:±0.20
7. ROHS

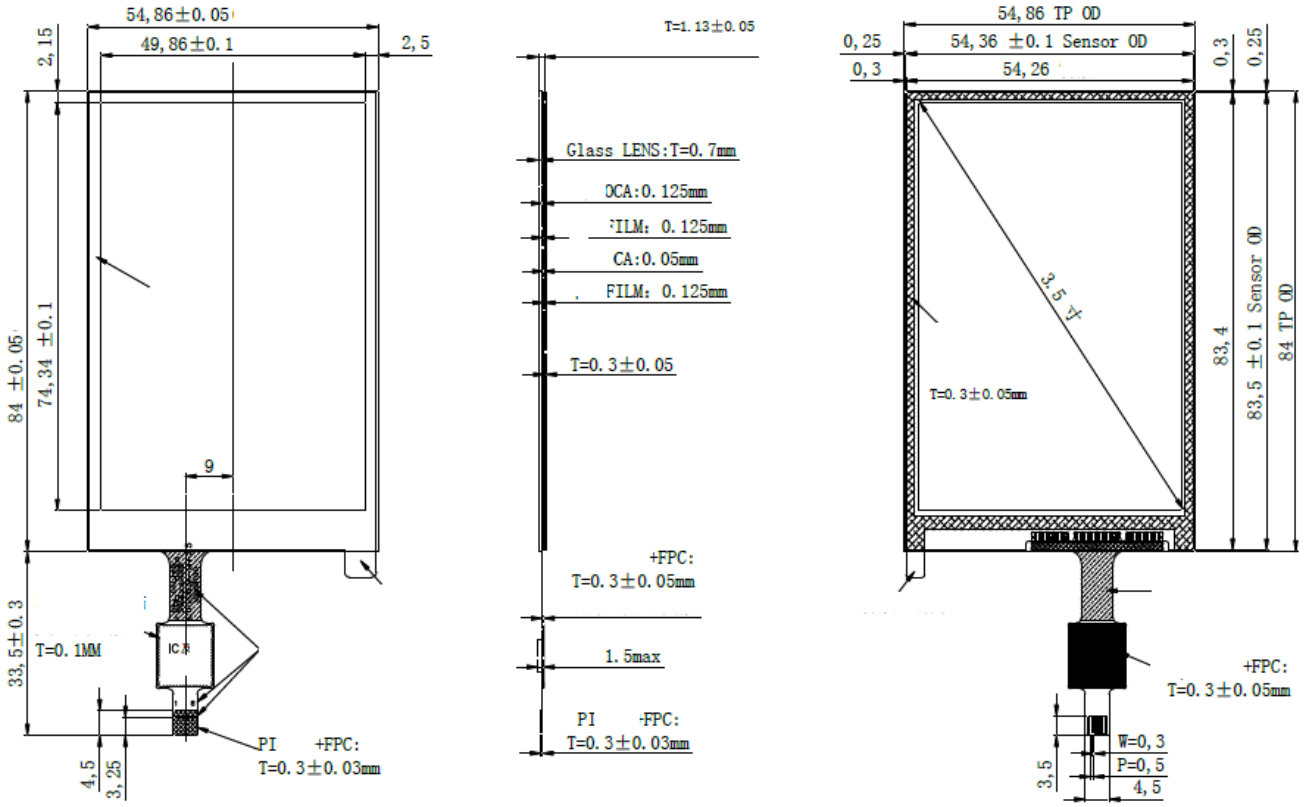


CIRCUIT DIAGRAM
(I=120MA V=2.9-3.3V)

PIN NO.	Definition
1	VDD_3.3V
2	RST
3	INT_3.3V
4	NC
5	NC
6	SCL
7	SDA
8	GND

Note:CTP driver: GT911

SHENZHEN SURENOO TECHNOLOGY CO.,LTD.					
	STP0350B1-320480-CTP				
	V0		MM		
	2021-9-6		1:1		
UNMRKED TOLERANCE:±0.20 mm					1 OF 1



NOTES

1. Glass +Film +Film
2. GT911
3. ≥85%
4. ≥6H
5. -20℃~+70℃ ≤90%RH
6. -30℃~+80℃ ≤90%RH
7. I2C COF
8. 3.3V 3.3V
9. ±0.15

PIN NO.	Definition
1	VDD_3.3V
2	RST
3	INT_3.3V
4	NC
5	NC
6	SCL
7	SDA
8	GND

Note:CTP driver: GT911

SHENZHEN SURENOO TECHNOLOGY CO.,LTD.					
	CTP2063A-GFF3.5				
	3.5				
	V0		MM		
	2021.09.06		1:1		
UNMRKED TOLERANCE:±0.20 mm					1 OF 1

Electrical Maximum Ratings

Item	Symbol	Min	Max	Unit	Note
Supply voltage (VDDI	V	1.8	3.3	V	–
Supply voltage (VDDA	V	2.8	3.3	V	–
Operating temperature	TOPR	-20	70	℃	–
Storage temperature	TSTR	-30	80	℃	–

NOTE: VDDI 2.8V~3.3V

Brightness characteristic & Power dissipation

Item	Symbol	Min	Typical	Max	Unit
LED module Forward voltage	VLED	2 9	3.1	3.3	V
LED module current	ILED	–	128	–	mA
LCD Surface Luminance	LS	280	300	–	Cd/m2
LCM Surface brightness uniform	LD	80	–	–	%
LCD power dissipation	PLCD	–	0.39	–	W

NOTE: PLCD=VDD * (ILED+ILCD)

Module Function Description

PIN No.	Symbol	Description	Notes
1	**GND**	Ground	–
2	**VDDA**	Power Supply for Analog, Digital System and Booster Circuit.(2.8-3.3V)	–
3	**VDDI**	Power Supply for I/O System. 1.8-3.3V)	–
4	**CSX**	• Chip selection pin Low enable. High disable.	–

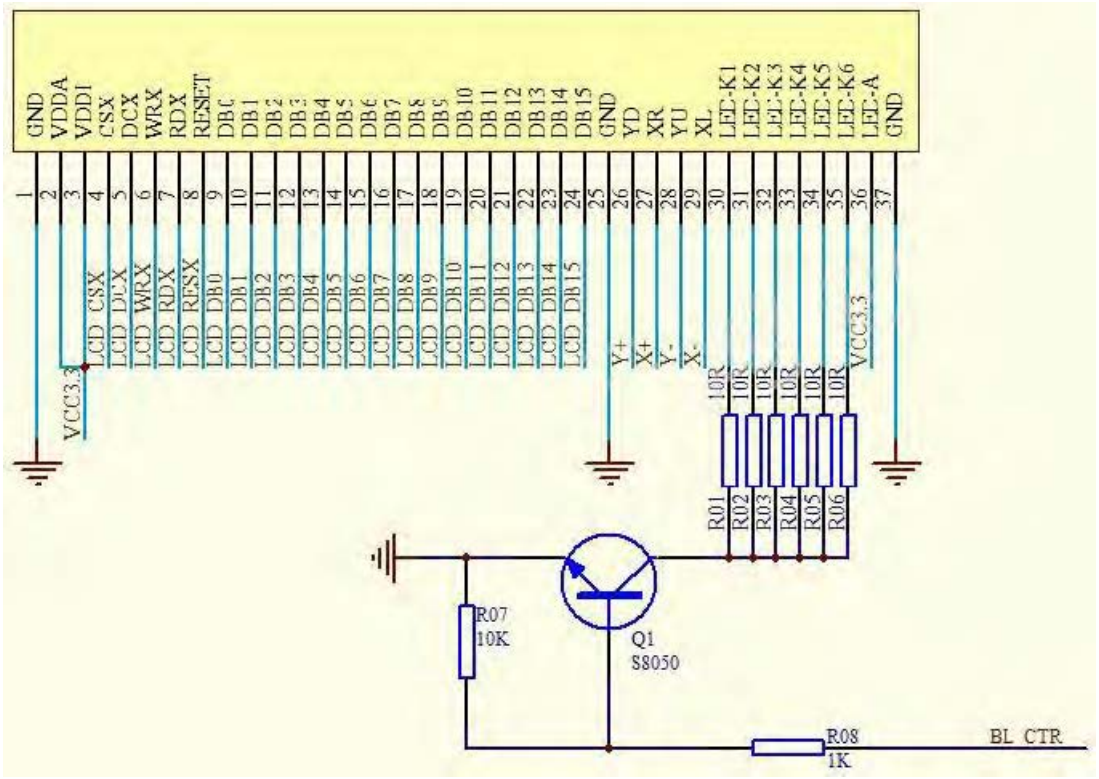
5	**DCX**	• Display data/command selection pin in parallel interface. DCX='1': display data or parameter. (DCX=1:) DCX='0':) command data (DCX=0:)	–
6	**WRX**	• Write enable in MCU parallel interface.	–
7	**RDX**	• Read enable in 8080 MCU parallel interface. • If not used, please fix this pin at VDDI or GND.	–
8	**RESET**	• This signal will reset the device and it must be applied to properly initialize the chip. • Signal is active low.	–
9-16	**DB0-DB7**	MCU parallel interface data bus.	–
17-24	**DB8-DB15**	MCU parallel interface data bus.	–
25	**GND**	Ground	–
26	**YD**	Touch panel Logical foot	–

27	**XR**	Touch panel Logical foot	–
28	**YU**	Touch panel Logical foot	–
29	**XL**	Touch panel Logical foot	–
30	**LED-K1**	Cathode of Backlight	–
31	**LED-K2**	Cathode of Backlight	–
32	**LED-K3**	Cathode of Backlight	–
33	**LED-K4**	Cathode of Backlight	–
34	**LED-K5**	Cathode of Backlight	–
35	**LED-K6**	Cathode of Backlight	–
36	**LED-A**	Anode of Backlight (2.9V-3.3V Typical:3.1V) :3.1V	–
37	**GND**	Ground	–

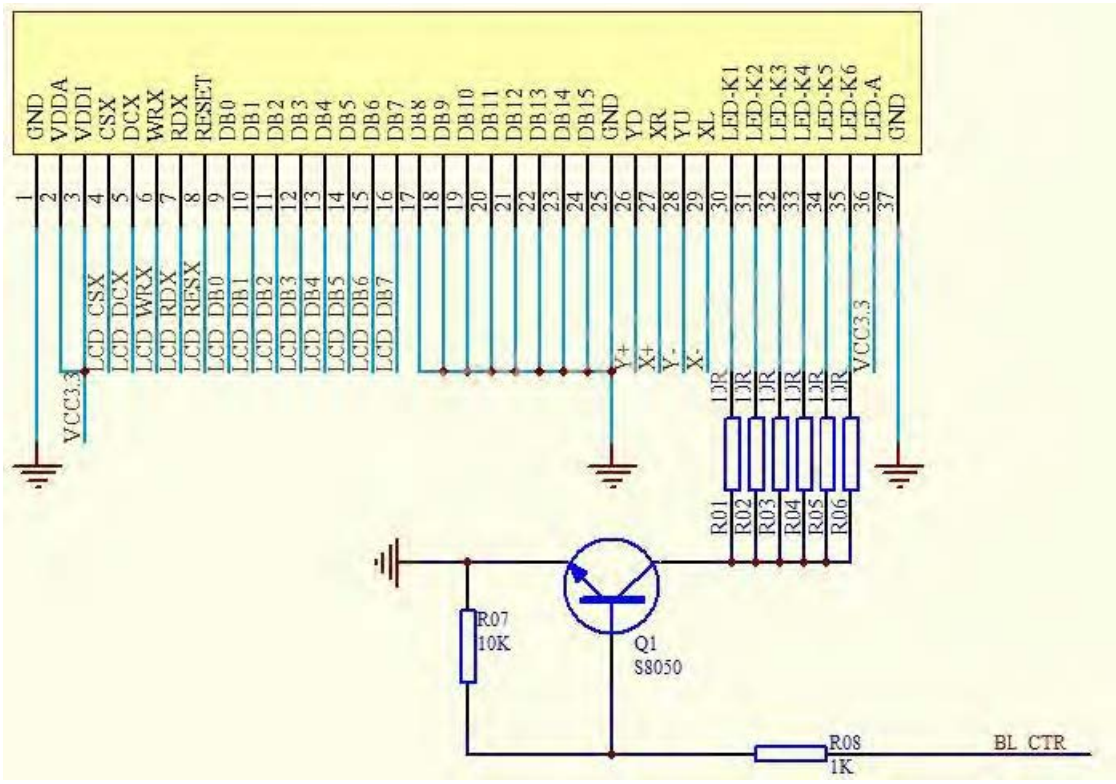
CTP Interface Description

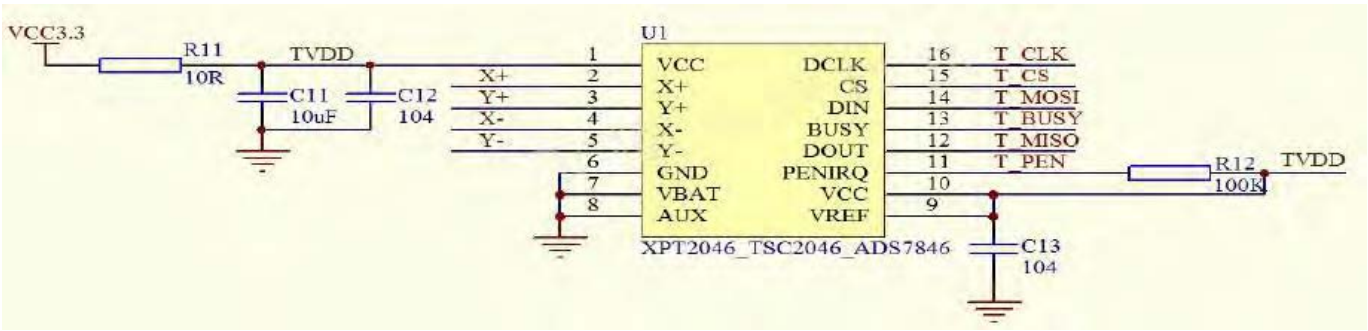
NO.	Symbol	I/O	DESCRIPTION
1	VDD	Power supply	CTP Power input
2	RESET	I	CTP external reset signal, Low is active
3	INT	O	CTP External interrupt to the host
4	NC	–	No Connection
5	NC	–	No Connection
6	SCL	I	CTP I2C clock input
7	SDA	I/O	CTP I2C data input and output
8	GND	Power supply	Power ground

STP0350B-16


GND
VDDA
VDDI
CSX
DCX
WRX
RDX
RESET
DB0
DB1
DB2
DB3
DB4
DB5
DB6
DB7
DB8
DB9
DB10
DB11
DB12
DB13
DB14
DB15
GND
YD
XR
YU
XL
LED-K1
LED-K2
LED-K3
LED-K4
LED-K5
LED-K6
LED-A
GND
LCD_CSX
LCD_DCX
LCD_WRX
LCD_RDX
LCD_RESX
LCD_DB0
LCD_DB1
LCD_DB2
LCD_DB3
LCD_DB4
LCD_DB5
LCD_DB6
LCD_DB7
LCD_DB8
LCD_DB9
LCD_DB10
LCD_DB11
LCD_DB12
LCD_DB13
LCD_DB14
LCD_DB15
Y+
X+
Y-
X-
VCC3.3
VCC3.3
10R
R01
R02
R03
R04
R05
R06
R07
10K
Q1
S8050
R08
1K
BL_CTR

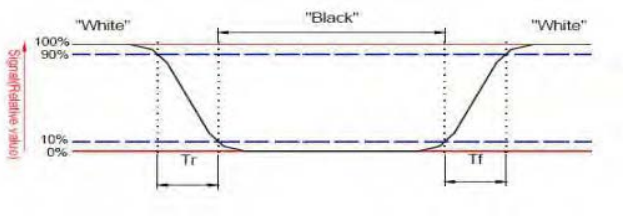
STP0350B-8


GND
VDDA
VDDI
CSX
DCX
WRX
RDX
RESET
DB0
DB1
DB2
DB3
DB4
DB5
DB6
DB7
DB8
DB9
DB10
DB11
DB12
DB13
DB14
DB15
GND
YD
XR
YU
XL
LED-K1
LED-K2
LED-K3
LED-K4
LED-K5
LED-K6
LED-A
GND
LCD_CSX
LCD_DCX
LCD_WRX
LCD_RDX
LCD_RESX
LCD_DB0
LCD_DB1
LCD_DB2
LCD_DB3
LCD_DB4
LCD_DB5
LCD_DB6
LCD_DB7
Y+
X+
Y-
X-
VCC3.3
VCC3.3
10R
R01
R02
R03
R04
R05
R06
R07
10K
Q1
S8050
R08
1K
BL_CTR


VCC3.3
R11
10R
TVDD
C11
10uF
C12
104
X+
Y+
X-
Y-
U1
VCC
X+
Y+
X-
Y-
GND
VBAT
AUX
DCLK
CS
DIN
BUSY
DOUT
PENIRQ
VCC
VREF
T_CLK
T_CS
T_MOSI
T_BUSY
T_MISO
T_PEN
R12
100K
TVDD
C13
104
XPT2046_TSC2046_ADS7846

Response time & Contrast ratio

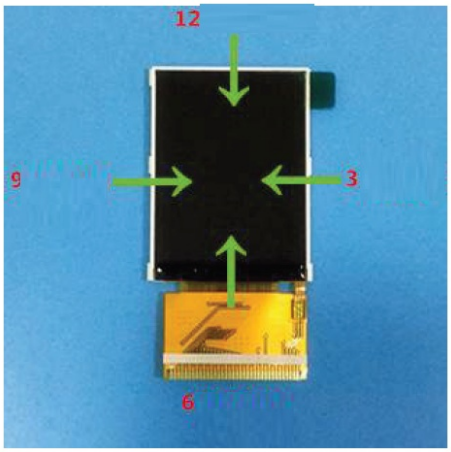
Item	Symbol	Condition	Remark			Unit
			Min.	Typ.	Max.	
Response time	Tr+Tf	θ=0°	–	20	40	ms
Contrast ratio	CR	θ=0°	–	500	–	–

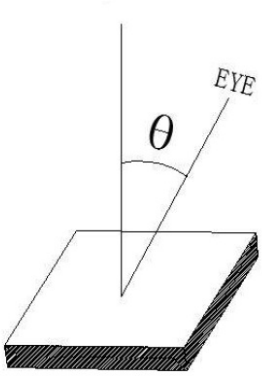


$$\text{Contrast ratio (CR)} = \frac{\text{Brightness on the "white" state}}{\text{Brightness on the "black" state}}$$

Viewing Angle

Item	Symbol	Condition	Remark			Unit
			Min.	Typ.	Max.	
Viewing angle	Top 12	CR≥10	50	60	–	Deg.
	Bottom 6	CR≥10	50	60	–	
	Left 9	CR≥10	60	70	–	
	Right 3	CR≥10	60	70	–	

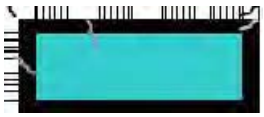


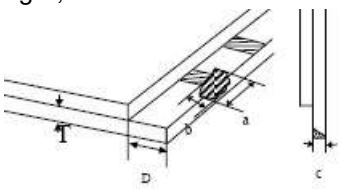
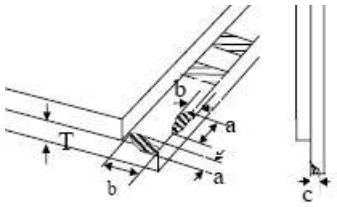


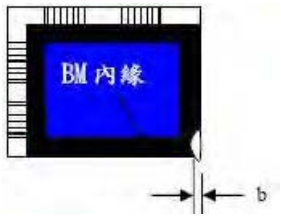
Reliability Trial

NO.	ITEM	CONDITION	CRITERION
1	High Temperature Non-Operating Test	80℃*120Hrs	No Defect Of
			Operational
2	Low Temperature Non-Operating Test	-30℃*120Hrs	Function In Room
			Temperature Are
3	High Temperature/Humidity Non Operating Test	60℃*90%RH*120Hrs	Allowable
4	High Temperature Operating Test	70℃*72Hrs	
5	Low Temperature Operating Test	-20℃*72Hrs	
6	Thermal Shock Test	-20 ℃ (30Min) n 70 ℃	
		(30Min) *10CYCLES	

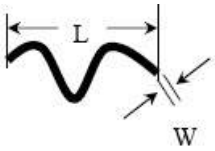
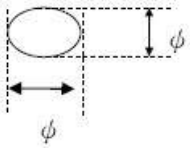
Inspection standards
Glass defect

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 limit ed sample	

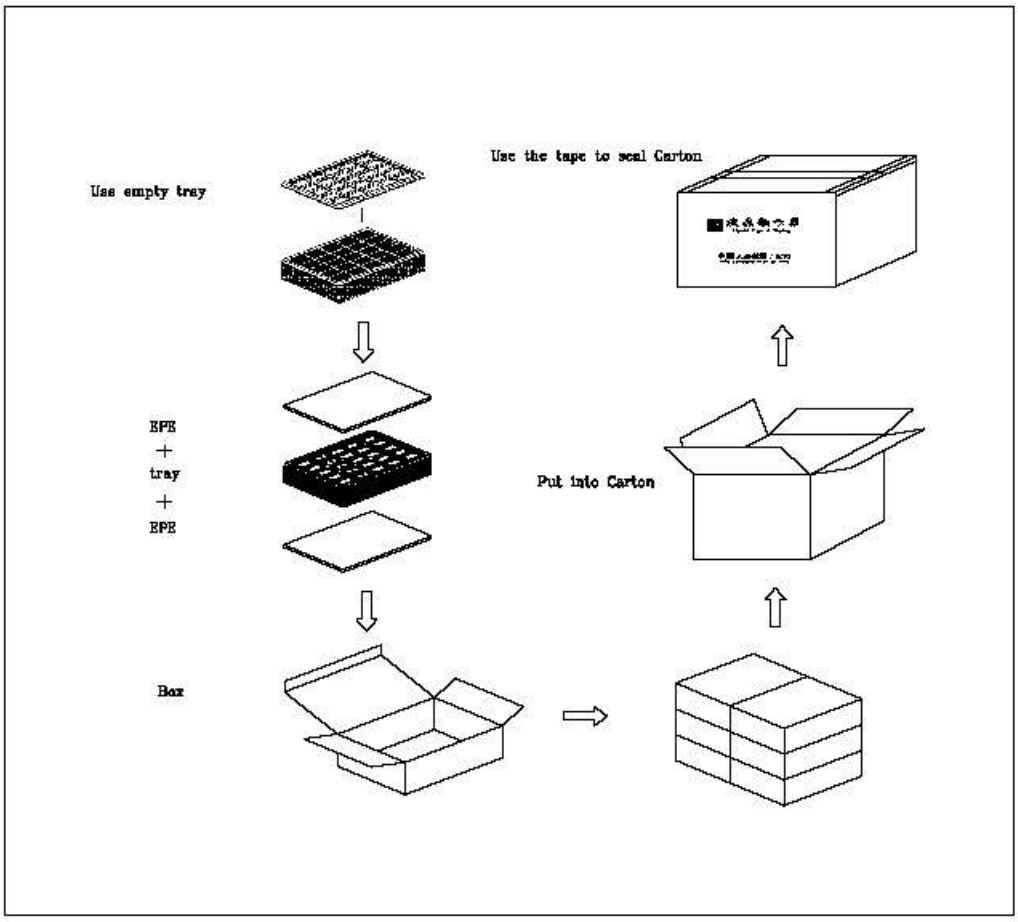
3	Glass extrude the conductive area (minor defect)	a: disregards and no influence assemblage. 1. b≤1/3Pin width(non bonding area) Accept 2. bonding area≤0.5mm Accept	A: Length, b: Width
4	Pin-side ,conductive area damaged (minor defect)	(a c: disregards) b≤1/3of effective length for bonding electrode Accept	a: length, b: Width, c: Thickness
5	Pin-side,non-conductive area damaged (minor defect)	1)Damage area don't touch the ITO (Including contraposition mark, except scribing mark Accept	a: Length, b: Width c: Thickness 
		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 

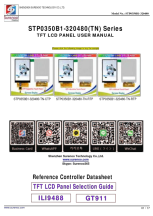
LCD appearance defect(View area)

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	

Package Method



Documents / Resources

	Surenoo STP0350B1-320480 Series TFT LCD Display Screen Panel [pdf] User Manual STP0350A3 B1-320480, STP0350B1-320480, STP035A3 0B1-320480, STP0350B1-320480 Series, STP0350B1-320480 Series TFT LCD Display Screen Panel, TFT LCD Display Screen Panel, Display Screen Panel, Screen Panel

References

- Surenoo Tech: Professional LCD Module Supplier Since 2005