



一众显示科技有限公司

TEAM SOURCE DISPLAY TECH. CO, LTD.

TFT-LCD Module Specification

Module NO.: TST070WSBE-37BC

Version: V1.2

☐ APPROVAL FOR SPECIFICATION

☐ APPROVAL FOR SAMPLE

For Customer' s Acceptance:	
Approved by	Comment

Team Source Display:		
Presented by	Reviewed by	Approved by
Zahi	Aron	Aron

Version No.	Date	Content	Remark
V1.0	2022-04-06	Initial Release	
V1.1	2022-08-12	corrected parameter	
V1.2	2024-7-4	Change voltage parameter	

CONTENTS

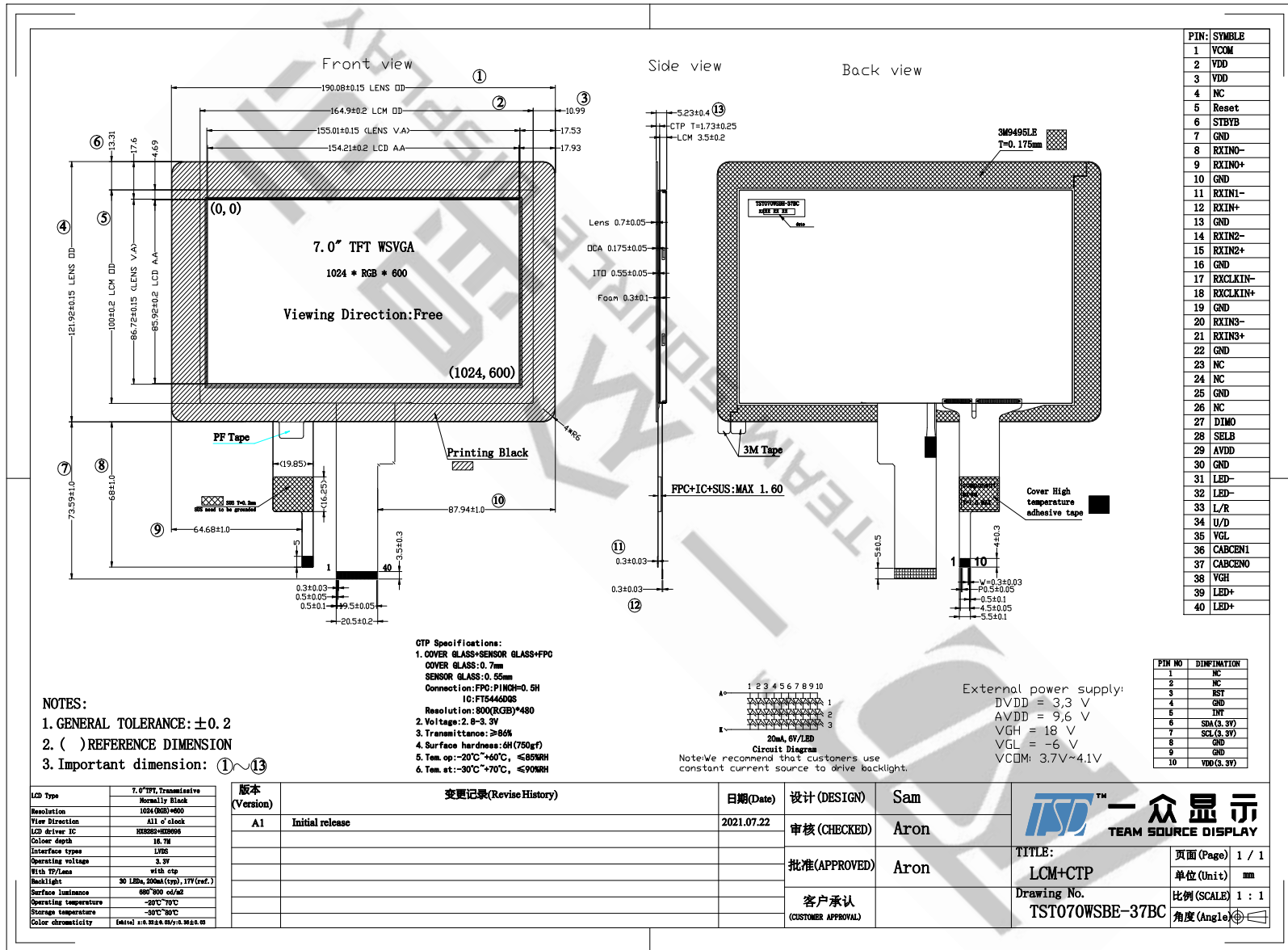
1 GENERAL CHARACTERISTICS.....	- 3 -
2 PRODUCT DRAWINGS.....	- 4 -
3 INTERFACE DESCRIPTION.....	- 5 -
3.1 LCM INTERFACE DESCRIPTION.....	- 5 -
4 TIMING CHARACTERISTICS.....	- 7 -
4.1 6BIT LVDS INPUT.....	- 7 -
4.2 8BIT LVDS INPUT.....	- 7 -
4.3 INTERFACE TIMING(DE MODE).....	- 8 -
5 ABSOLUTE MAXIMUM RATINGS.....	- 9 -
6 ELECTRICAL CHARACTERISTICS.....	- 9 -
7 BACKLIGHT CHARACTERISTICS.....	- 9 -
8 LCD OPTICAL SPECIFICATIONS.....	- 10 -
9 CAPACITIVE TOUCH PANEL SPECIFICATIONS.....	- 12 -
9.1 MECHANICAL CHARACTERISTICS.....	- 12 -
9.2 ELECTRICAL CHARACTERISTICS.....	- 12 -
9.3 INTERFACE TIMING CHARACTERISTICS.....	- 12 -
10 RELIABILITY TEST.....	- 13 -
11 MTBF.....	- 13 -
12 SUGGESTIONS FOR USING LCD MODULES.....	- 13 -
12.1 HANDLING OF LCM.....	- 13 -
12.2 STORAGE.....	- 14 -

1 General Characteristics

ITEM	Specification	Unit
LCD Type	a-Si TFT, Transmissive, Normally black, IPS	-
LCD Size	7.0	inch
Resolution (W x H)	1024x (RGB) × 600	pixel
CTP+LCM size	190.08(H) x 121.92(V) x 5.23(T)	mm
Active Area	154.21 (H) x 85.92 (V)	mm
Dot Pitch	0.0642(H) × 0.1790(V)	mm
Viewing Direction	ALL o'clock	-
Color Depth	16.7M	-
Pixel Arrangement	RGB-stripe	-
Backlight Type	30 LEDs, 200mA, 17V	-
Surface Luminance	680(Min), 800(TYP)	cd/m ²
Lens Surface Treatment	Clear	-
LCD Driver IC	HX8282&HX8696	-
Interface Type	LVDS	-
Input Voltage	3.3	V
With/Without TP	With CTP(FT5446DQS)	-
Weight	TBD	g

Note 1: RoHS compliant

Note 2: LCM weight tolerance: ± 5%.



3 Interface description

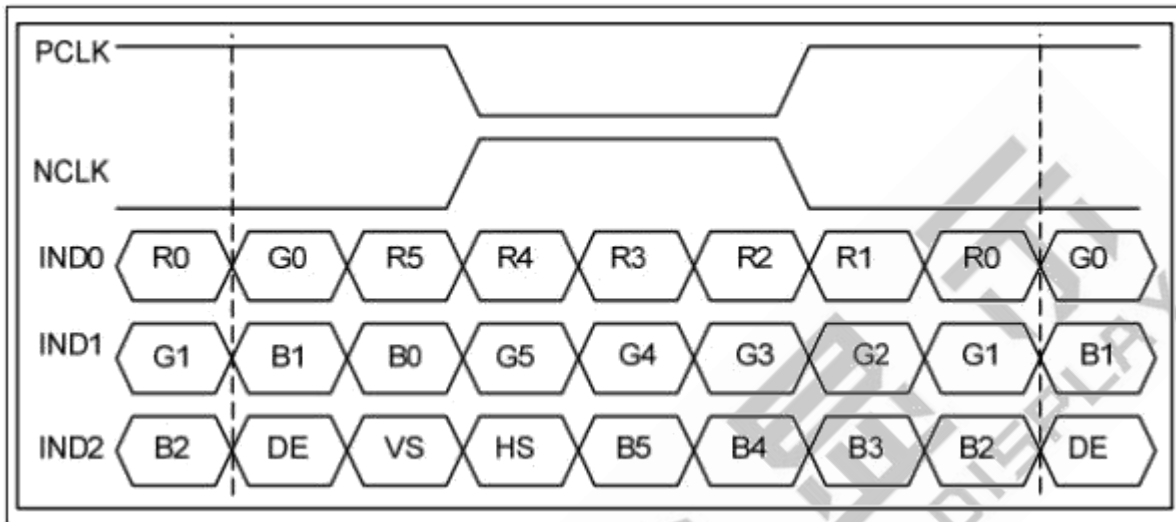
3.1 LCM interface description

PIN NO.	Symbol	description
1	VCOM	VCOM Voltage input
2	VDD	Power supply +3.3V
3	VDD	
4	NC	No connect
5	RESET	Global reset,Keep VDD during,Normally pull high
6	STBYB	Standby mode control,Normally pull high When STBYB=H,all the functions are on(Default pulls high) When STBYB=L,TCON and source driver are off and all output are GND.
7	GND	System Ground. (0V)
8	RXIN0-	Lvds data input(-)
9	RXIN0+	Lvds data input(+)
10	GND	System Ground. (0V)
11	RXIN1-	Lvds data input(-)
12	RXIN1+	Lvds data input(+)
13	GND	System Ground. (0V)
14	RXIN2-	Lvds data input(-)
15	RXIN2+	Lvds data input(+)
16	GND	System Ground. (0V)
17	RXCLKIN-	Lvds clock input(-)
18	RXCLKIN+	Lvds clock input(+)
19	GND	System Ground. (0V)
20	RXIN3-	Lvds data input(-)
21	RXIN3+	Lvds data input(+)
22	GND	System Ground. (0V)
23-24	NC	No connect
25	GND	System Ground. (0V)
26	NC	No connect
27	DIMO	DIMO

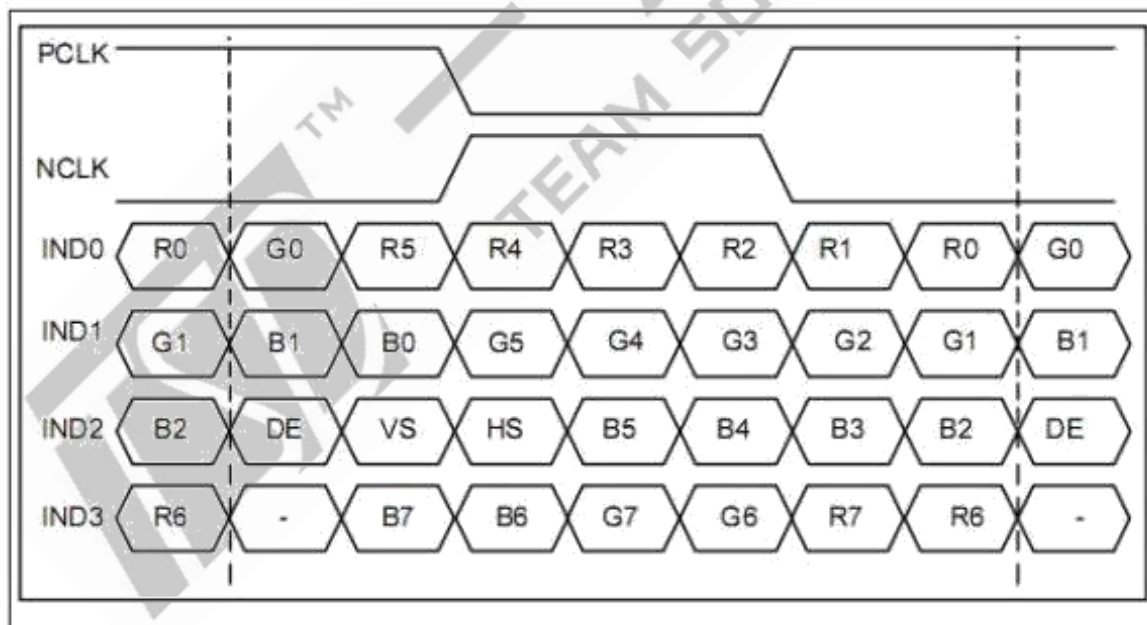
28	SELB	6bit/8bit mode select
29	AVDD	Power supply input
30	GND	System Ground. (0V)
31-32	LED-	Backlight K Cathode input pin.
33	L/R	Source driver internal shift register is controlled by this pin as shown below:Normally pull high. L/R=H, SO1→SO2.... SO1536(default) L/R=L, SO1536→SO1534→..... SO1
34	U/D	Gate driver Up/down scan setting. Normally pull low. When U/D=H, reverse scan STV1 output vertical start pulse and UD pin output "H" to Gate dirver, When U/D=L,normal scan(default),STV2 output vertical start pulse and UD pin output "L" to Gate dirver,
35	VGL	Gate off voltage
36	CABCEN1	Backlight
37	CABCEN0	Backlight
38	VGH	Gate on voltage
39-40	LED+	Backlight A Anode input pin.

4 Timing Characteristics

4.1 6bit lvds input



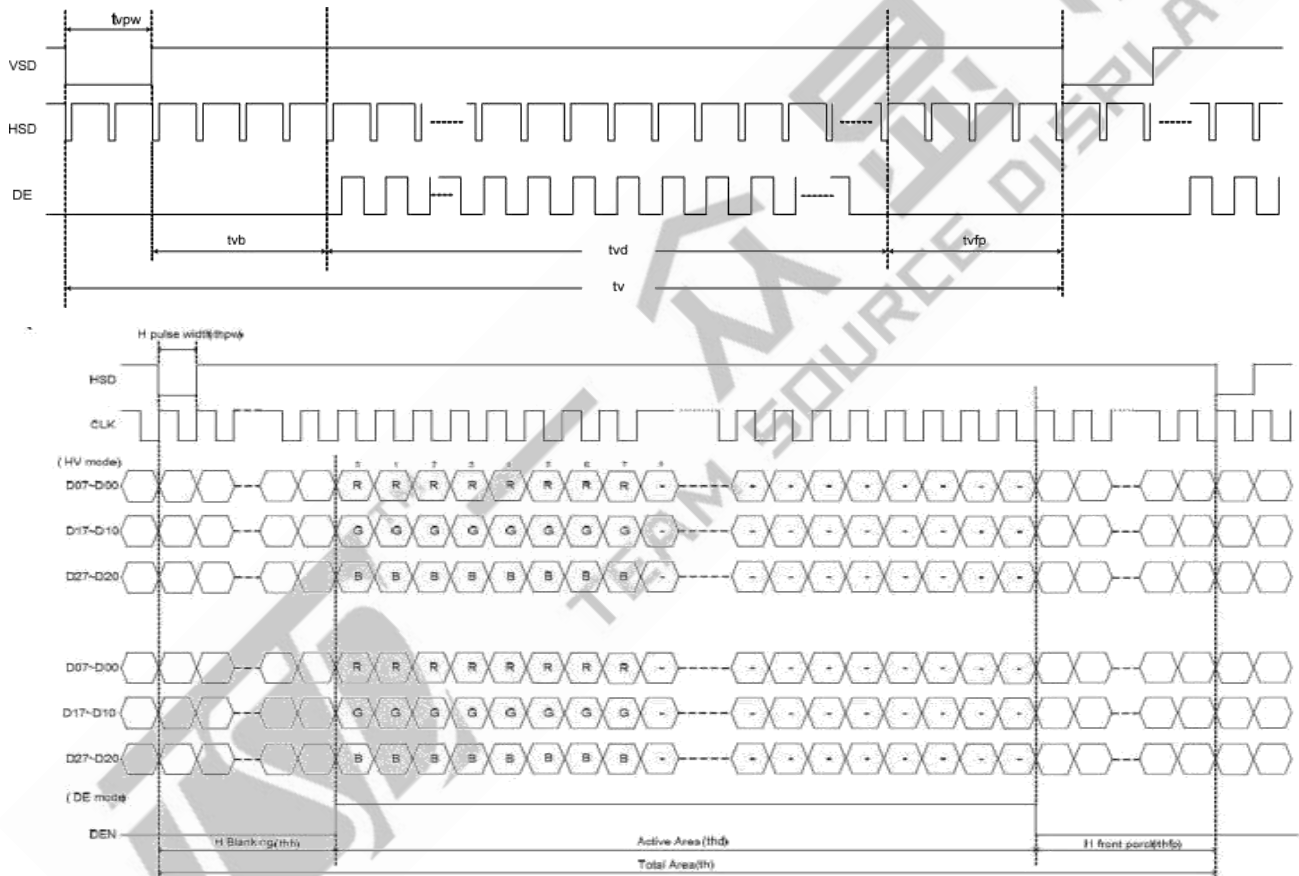
4.2 8bit lvds input



4.3 Interface Timing(DE mode)

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
DCLK Frequency	fclk	40.8	51.2	67.2	MHz
Horizontal Display Area	thd	1024			DCLK
HSD Period	th	1114	1344	1400	DCLK
HSD Blanking	thb+ thfp	90	320	376	DCLK
Vertical Display Area	tvd	600			T _H
VSD Period	tvbp	610	635	800	T _H
VSD Blanking	tvbp+ tvfp	10	35	200	T _H

Table 10.4: DE mode (1024x600)



5 Absolute Maximum Ratings

PARAMETER	SYMBOL	MIN	MAX	UNIT
Supply Voltage for Analog	VDD	-0.5	5.0	V
Operating Temperature	TOP	-20	70	° C
Storage Temperature	TST	-30	80	° C
Humidity	RH	-	90%(Max 60° C)	RH

6 Electrical Characteristics

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Analog operating voltage	VDD	3.0	3.3	3.6	V
Power supply input	AVDD	8.0	(9.6)	13.5	V
Gate on voltage	VGH	17	(18)	19	V
Gate off voltage	VGL	-5.5	(-6)	-6.5	
Input signal voltage	VCOM	3.0	3.2	3.5	V

7 Backlight Characteristics

ITEM	SYMBOL	MIN	TYP	MAX	UNIT
Voltage for LED backlight	V _f		17		V
Current for LED backlight	I _f	-	200	-	mA
Power consumption	W _{bl}	-	1920	-	mW
Uniformity	Avg	80	-	-	%
LED Life Time	-	30000	40000	-	Hrs

Note:

1. The LED life time is defined as the module brightness decrease to 50% original brightness at Ta=25°C, 60%RH ±5 %.
2. The life time of LED will be reduced if LED is driven by high current, high ambient temperature and humidity conditions.
3. Typical operating life time is an estimated data.
4. Permanent damage to the device may occur if maximum values are exceeded or reverse voltage is loaded .Functional operation should be restricted to the conditions described under normal operating conditions.

8 LCD Optical specifications

Item	Symbol	Condition	Specification			Unit	Remark
			Min	Typ	Max		
Response time (By Quick)	Tr+Tf	$\theta = 0^\circ$	-	25	-	ms	Note 5
Contrast ratio	CR	$\theta = 0^\circ$	500	800	-		Note 2,6
Viewing angle	Top	$CR \geq 10$	-	85	-	Deg.	Note 2,6,7
	Bottom	$CR \geq 10$	-	85	-		
	Left	$CR \geq 10$	-	85	-		
	Right	$CR \geq 10$	-	85	-		
Color chromaticity (CIE1931)	Wx	$\theta = 0^\circ$		0.320	-		Note 3
	Wy			0.360	-		
	Rx				-		
	Ry				-		
	Gx				-		
	Gy				-		
	Bx				-		
	By				-		
NTSC			-	50%	-		Note 3
Transmittance	Trans		-	6.03%	-		Note 4

Note 1: Ambient temperature = 25°C.

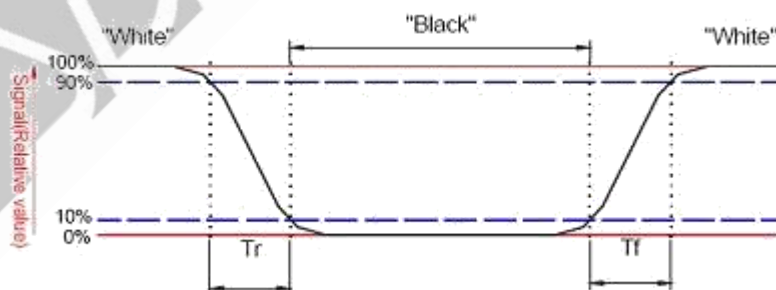
Note 2: To be measured with a viewing cone of 2° by Topcon luminance meter BM-7.

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

Note 4: BOE shipping status is cell without polarizer. Transmittance of Specification is cell with polarizer. The tolerance of Transmittance is $\pm 10\%$.

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.

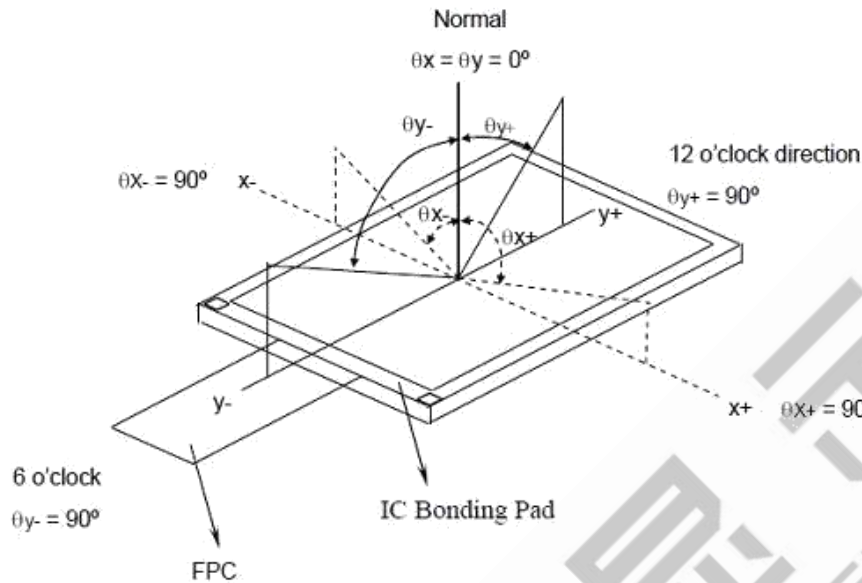


Note 6: Definition of contrast ratio:

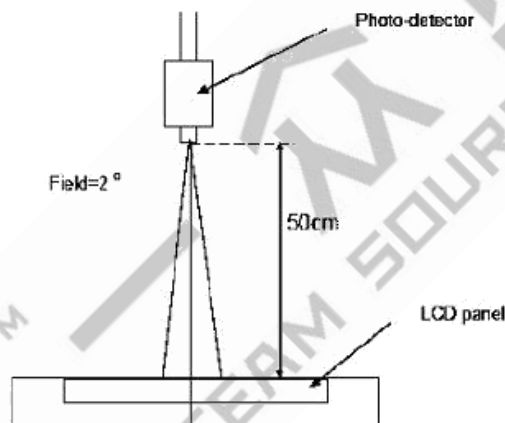
Contrast ratio is calculated by the following formula.

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

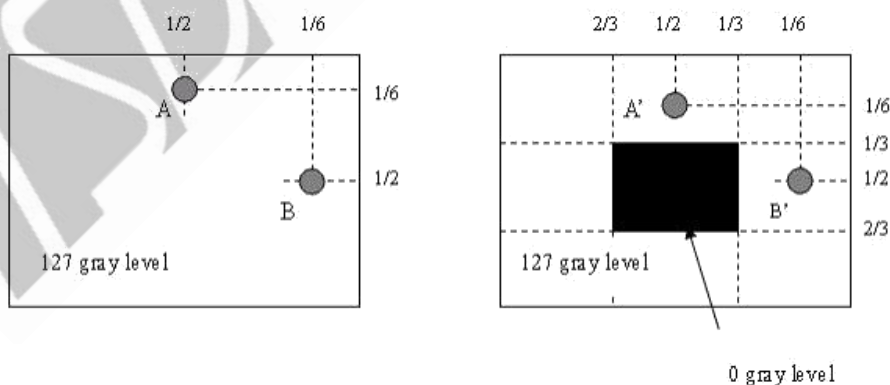
Note 7: Definition of viewing angle



Note 8: Optical characteristic measurement setup.



Note 9:



$1 \text{ LA-LA}'1 / \text{LA} \times 100\% = 2\% \text{ max.}$, LA and LA' are brightness at location A and A'.

$1 \text{ LB-LB}'1 / \text{LB} \times 100\% = 2\% \text{ max.}$, LB and LB' are brightness at location B and B'.

9 Capacitive Touch Panel specifications

9.1 Mechanical characteristics

DESCRIPTION	INL SPECIFICATION	REMARK
Touch Panel Size	7.0	
Outline Dimension (OD)	190.08(H) x 121.92(V) mm	Cover Lens Outline
Product Thickness	1.73mm(± 0.25)	
Glass Thickness	0.7mm	
Ink View Area	154.21x85.92mm	
Input Method	5 Fingers	
Activation Force	Touch	
Surface Hardness	$\geq 6H$	

9.2 Electrical characteristics

DESCRIPTION		SPECIFICATION
Operating Voltage		DC 2.8~3.6V
Power Consumption (IDD)	Active Mode	12~4.5mA
	Sleep Mode	TBD
Interface		I ² C
Controller IC		FT5446
I ² C address		0x70
Resolution		1024*600

9.3 Interface timing characteristics

PARAMETER	MIN	MAX	UNIT
SCL Frequency	-	400K	Hz
Bus Free Time Between a STOP and START Condition	1.3	-	uS
Hold Time (repeated) START Condition	0.6	-	uS
Data Setup Time	100	-	nS
Setup Time for Repeated START Condition	0.6	-	uS
Setup Time for STOP Condition	0.6	-	uS

10 RELIABILITY TEST

NO.	TEST ITEM	TEST CONDITION	INSPECTION AFTER TEST
1	High Temperature Storage	80±2°C/96 hours	Inspection after 2~4 hours storage at room temperature and humidity. The condensation is not accepted. The sample shall be free from defects:
2	Low Temperature Storage	-30±2°C/96 hours	
3	High Temperature Operating	70±2°C/96 hours	
4	Low Temperature Operating	-20±2°C/96 hours	
5	Temperature Cycle	-30±2°C ~ 25~ 80± 2°C × 10 cycles (30 min.) (5min.) (30min.)	1. Air bubble in the LCD 2. Seal leak 3. Non-display 4. Missing segments 5. Glass crack
6	Damp Proof Test	60°C ±5°C × 90%RH/96 hours	
7	Packing Drop Test	Height: 60 cm 1 corner, concrete floor	
8	Electrostatic Discharge Test	C=150pF, R=330 Ω Air: ±8KV 150pF/330Ω 30 times Contact: ±4KV,20 times	

11 MTBF

Functions, performance, appearance, etc. shall be free from remarkable deterioration within **50,000 hours** under ordinary operating and storage conditions room temperature ($25 \pm 5^{\circ}\text{C}$), normal humidity ($50 \pm 10\% \text{ RH}$), and in area not exposed to direct sunlight.

12 Suggestions for using LCD modules

12.1 Handling of LCM

1. The LCD screen is made of glass. Don't give excessive external shock, or drop from a high place.
2. If the LCD screen is damaged and the liquid crystal leaks out, do not lick and swallow. When the liquid is attach to your hand, skin, cloth etc, wash it off by using soap and water thoroughly and immediately.
3. Don't apply excessive force on the surface of the LCM.
4. If the surface is contaminated, clean it with soft cloth. If the LCM is severely contaminated, use Isopropyl alcohol/Ethyl alcohol to clean. Other solvents may damage the polarizer. The following solvents is especially prohibited: water , ketone Aromatic solvents etc.
5. Exercise care to minimize corrosion of the electrode. Corrosion of the electrodes is accelerated by water droplets, moisture condensation or a current flow in a high-humidity environment.
6. Install the LCD Module by using the mounting holes. When mounting the LCD module make sure it is free of twisting, warping and distortion. In particular, do not forcibly pull or bend the I/O cable or the backlight cable.
7. Don't disassemble the LCM.
8. To prevent destruction of the elements by static electricity, be careful to maintain an optimum work

environment.

- Be sure to ground the body when handling the LCD modules.
- Tools required for assembling, such as soldering irons, must be properly grounded.
- To reduce the amount of static electricity generated, do not conduct assembling and other work under dry conditions.
- The LCD module is coated with a film to protect the display surface. Exercise care when peeling off this protective film since static electricity may be generated.

9. Do not alter, modify or change the the shape of the tab on the metal frame.

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

11. Do not damage or modify the pattern writing on the printed circuit board.

12. Absolutely do not modify the zebra rubber strip (conductive rubber) or heat seal connector

13. Except for soldering the interface, do not make any alterations or modifications with a soldering iron.

14. Do not drop, bend or twist LCM.

12.2 Storage

1. Store in an ambient temperature of 5 to 45 °C, and in a relative humidity of 40% to 60%. Don't expose to sunlight or fluorescent light.
2. Storage in a clean environment, free from dust, active gas, and solvent.
3. Store in antistatic container.

