

PRODUCT SPECIFICATION **FOR LCD MODULE**

Revision: 1.0

Model No: LSC040I01-R-V1

Module Type: COG+FPC+B/L+CTP

APPROVED SIGNATURE

- Approved Product Specification only
- Approved Product Specification and Samples

<u>Prepared By</u>	<u>Checked By</u>	<u>Approved By</u>

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1. General Description

LSC040I01-R-V1 is a transmissive type a-Si TFT-LCD (amorphous silicon thin film transistor liquid crystal display) module, which is composed of a TFT-LCD panel, a driver circuit and a backlight unit. The panel size is 3.95 inch and the resolution is 480(RGB)*480, the panel can display up to 16.7 M colors.

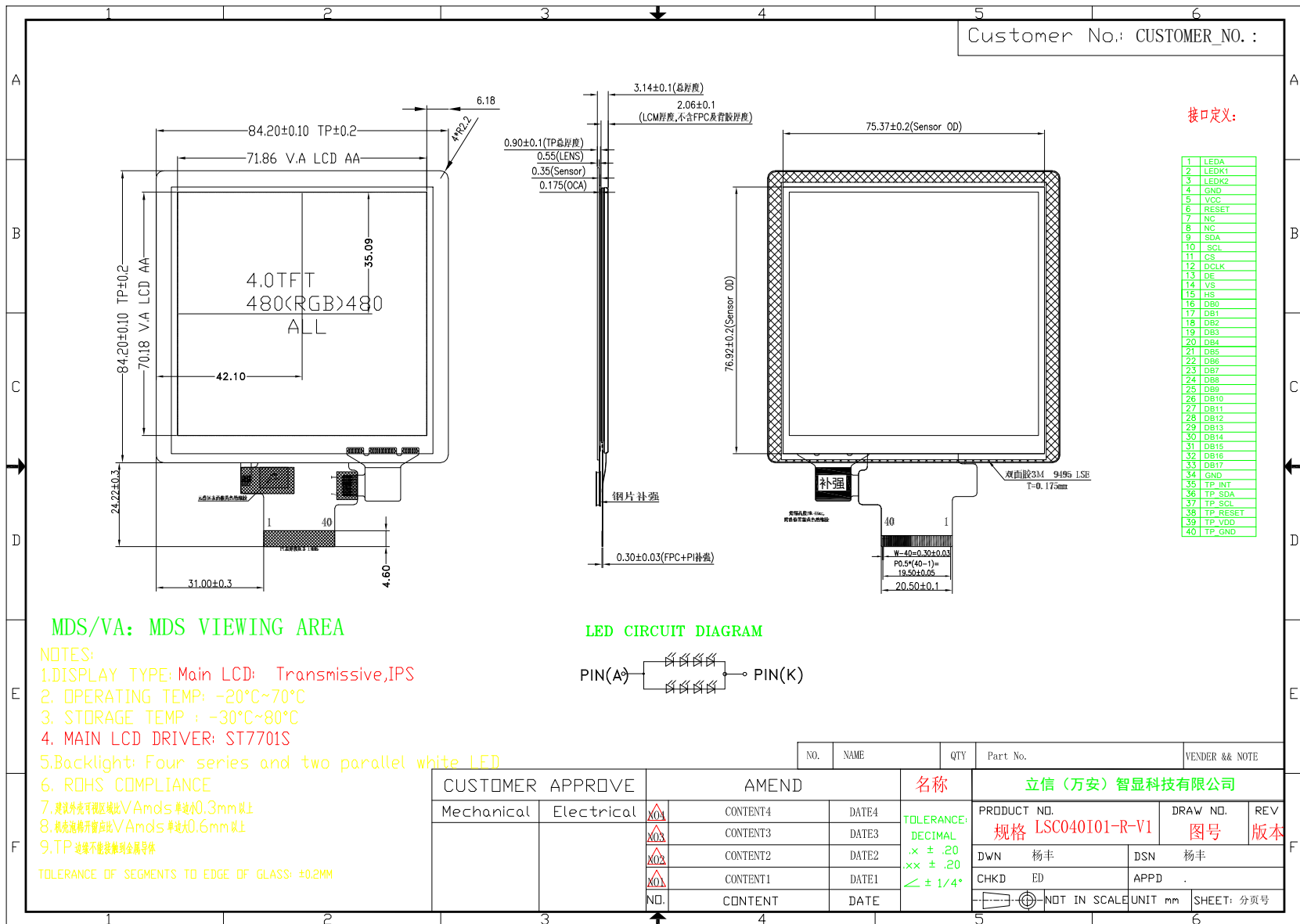
2. Physical Features

Display Mode	TFT-LCD Module
	Active matrix TFT, Transmissive type
Display Format	Graphic 480(RGB)×480 Dot-matrix
Input Data	3SPI+RGB
Viewing Direction (Grayscale Inversion)	Free (IPS)
Drive	ST7701S

3. Mechanical Specification

Item	Specification	Unit
Module size (H×V×D)	84.3 ×84.3 ×3.2	mm
Number of dots	480(RGB) ×480	pixel
Active area (H×V)	71.86×70.18	mm

4. Outline Dimension



5. Absolute Maximum Ratings

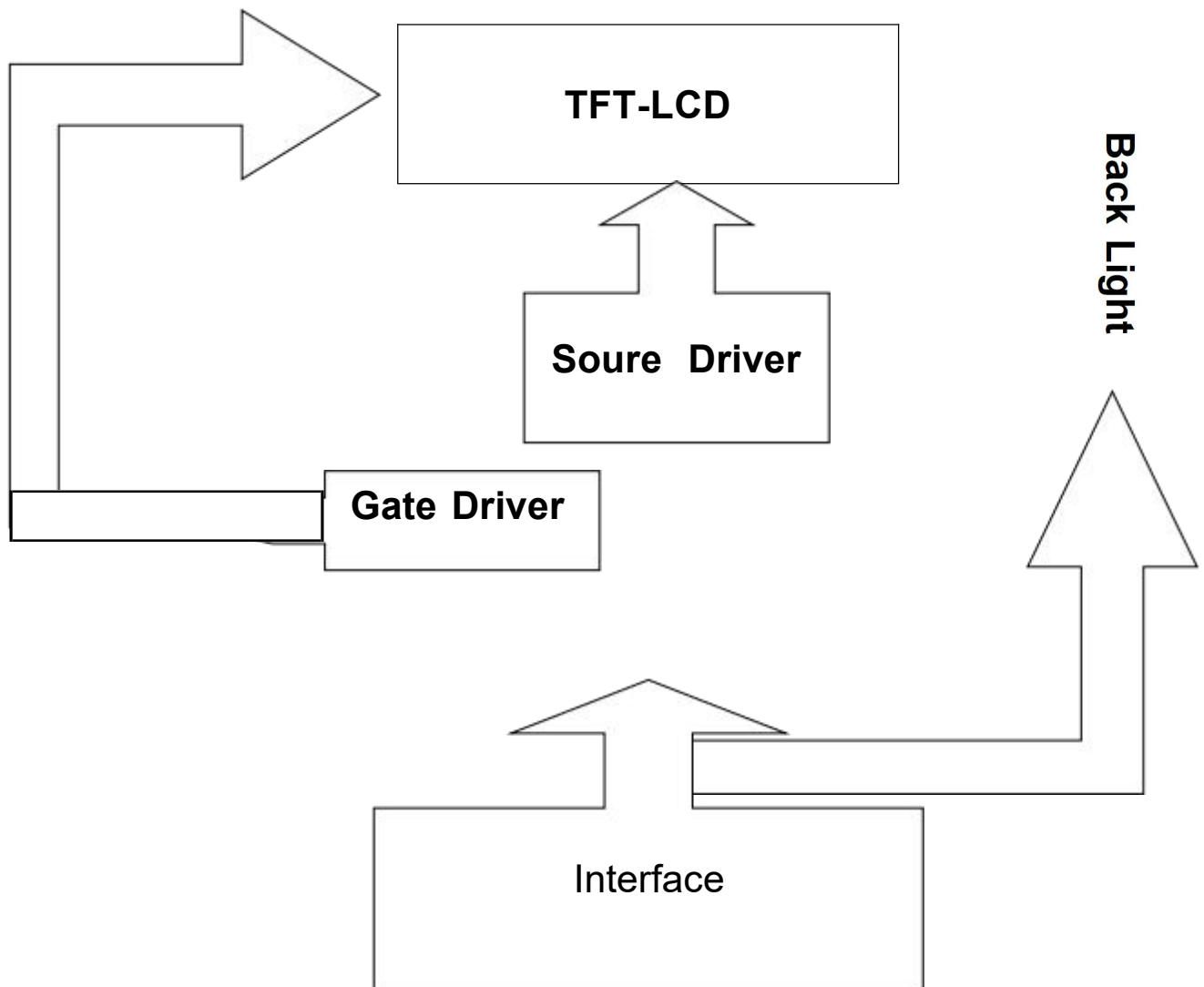
Item	Symbol	Min	Max	Unit	Remark
Supply voltage	VCC	-0.3	3.6	V	Note1 Note2
Operating temperature	TOPR	-20	70	°C	
Storage temperature	TSTR	-30	80	°C	

6. Electrical Characteristics

Item		Symbol	Rating			Unit	Remark
			Min	Typ	Max		
Supply voltage		VCC	2.8	3.3	3.6	V	Note1
Input Voltage	L level	VIL	0	---	0.2*VCC	V	
	H level	VIH	0.8*VCC	---	VCC	V	

7. Module Function Description

7- 1. Block Diagram Of LCM



7-2. Pin Description

1	LED A	LED ANODE
2	LED K1	LED CATHODE
3	LED K2	LED CATHODE
4	GND	Ground
5	VCI	Power supply
6	RESET	Reset Signal ,Active Low
7	NC	NC
8	NC	NC
9	SDA	SPI Data signal
10	SCK	SPI Clock signal
11	CS	SPI Chip select signal
12	PCLK	RGB dot clock signal
13	DE	RGB data enable signal
14	VSYNC	RGB frame synchronizing signal
15	HSYNC	RGB line synchronizing signal
16~33	DB0~DB17	RGB data signal (DB0:BLUE LSB;DB5:BLUE MSB;DB6:GREEN LSB;DB11:GREEN, MSB;DB12:RED LSB;DB17:RED MSB)
34	GND	Ground
35	TP_INT	Touch Interrupt
36	TP_SDA	Touch IIC Data signal
37	TP_SCL	Touch IIC Clock signal
38	TP_RESET	Touch Reset Signal
39	TP_VCI	Touch Power supply
40	GND	Ground

7-3 Timing Characteristics

7.3.1 RGB Interface Characteristics

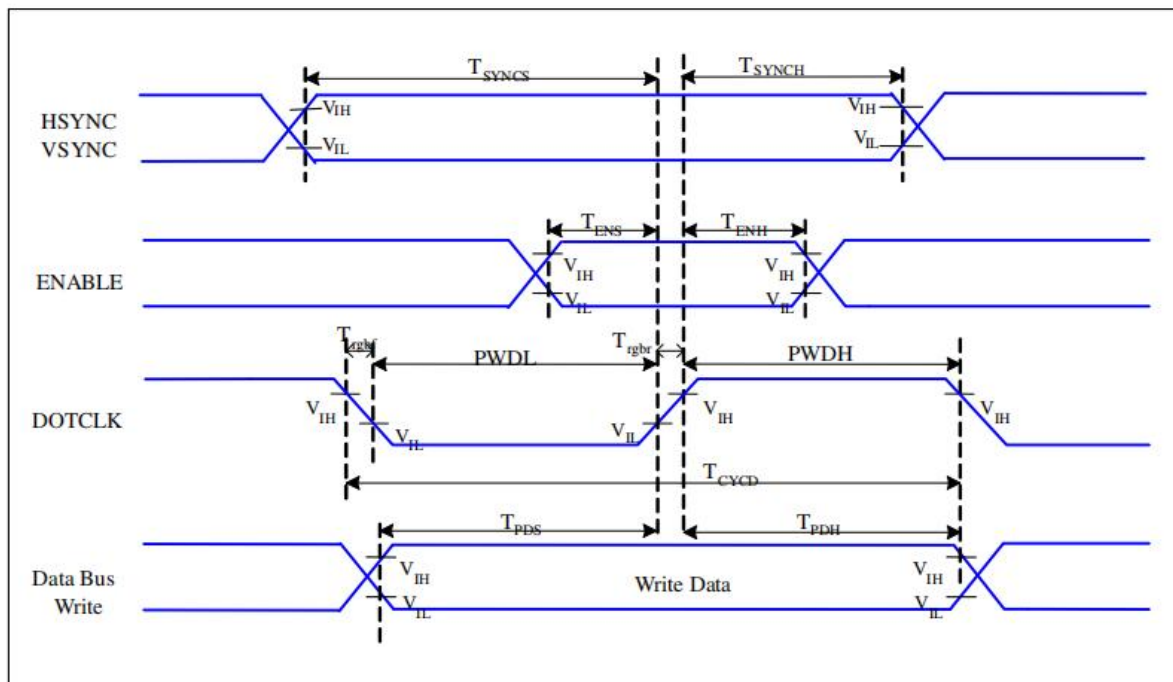


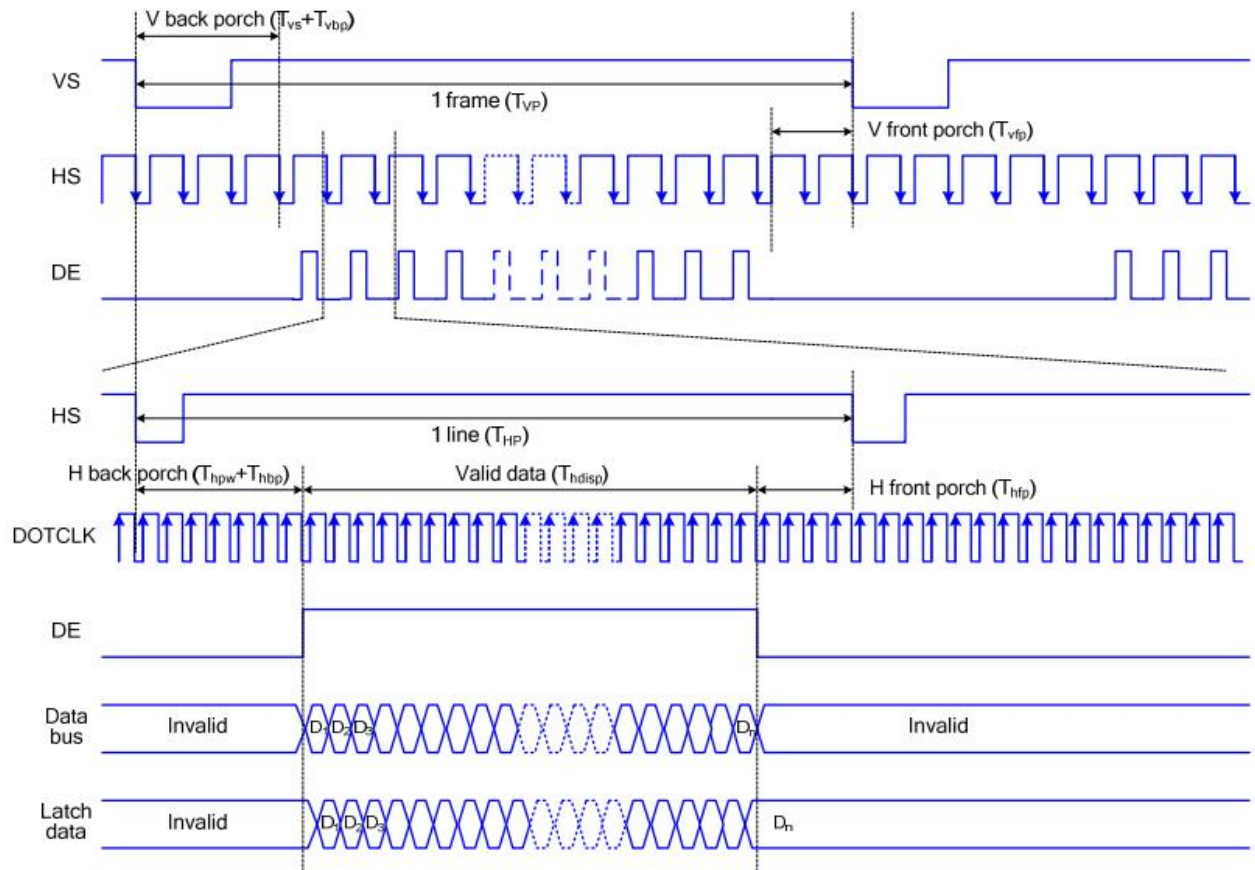
Figure 3 RGB Interface Timing Characteristics

$V_{DDI}=1.8, V_{DD}=2.8, A_{GND}=D_{GND}=0V, T_a=25^{\circ}C$

Signal	Symbol	Parameter	MIN	MAX	Unit	Description
HSYNC, VSYNC	T_{SYNCS}	VSNC, HSYNC Setup Time	5	-	ns	
ENABLE	T_{ENS}	Enable Setup Time	5	-	ns	
	T_{ENH}	Enable Hold Time	5	-	ns	
DOTCLK	PWDH	DOTCLK High-level Pulse Width	15	-	ns	
	PWDL	DOTCLK Low-level Pulse Width	15	-	ns	
	T_{CVCD}	DOTCLK Cycle Time	33	-	ns	
	Trghr, Trghf	DOTCLK Rise/Fall time	-	15	ns	
DB	T_{PDS}	PD Data Setup Time	5	-	ns	
	T_{PDH}	PD Data Hold Time	5	-	ns	

Table 6 18/16 Bits RGB Interface Timing Characteristics

The timing chart of RGB interface DE mode is shown as follows.



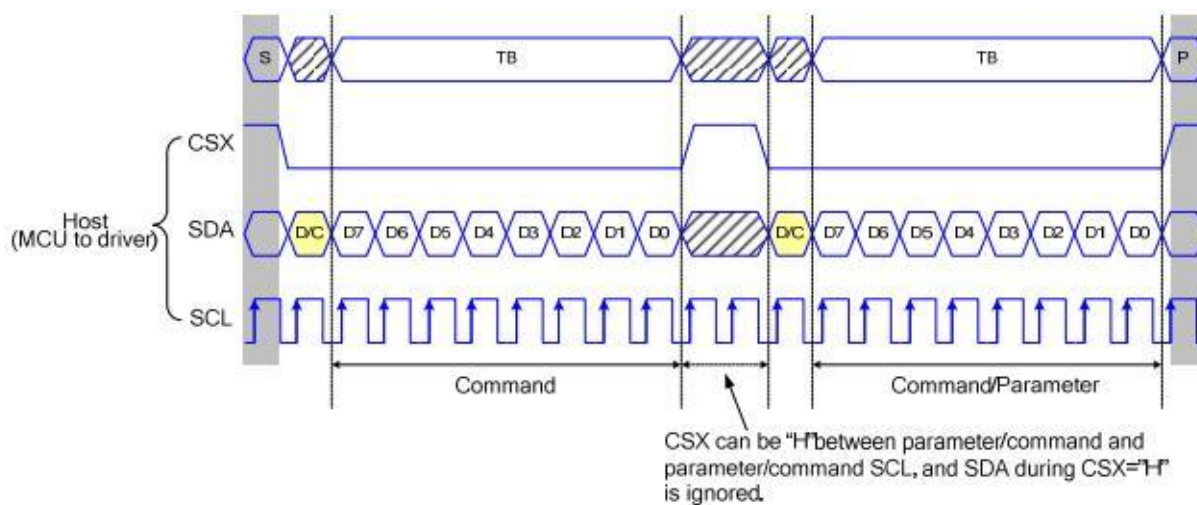
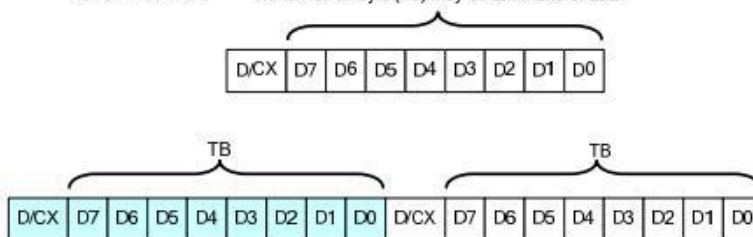
Note: The setting of front porch and back porch in host must match that in IC as this mode.

7.3.3 SPI Interface Timing

The write mode of the interface means the micro controller writes commands and data to the LCD driver. 3-lines serial data packet contains a control bit D/CX and a transmission byte. In 4-lines serial interface, data packet contains just transmission byte and control bit D/CX is transferred by the D/CX pin. If D/CX is "low", the transmission byte is interpreted as a command byte. If D/CX is "high", the transmission byte is command register as parameter.

Any instruction can be sent in any order to the driver. The MSB is transmitted first. The serial interface is initialized when CSX is high. In this state, SCL clock pulse or SDA data have no effect. A falling edge on CSX enables the serial interface and indicates the start of data transmission.

3-line serial data stream format: Transmission byte (TB) may be command or data

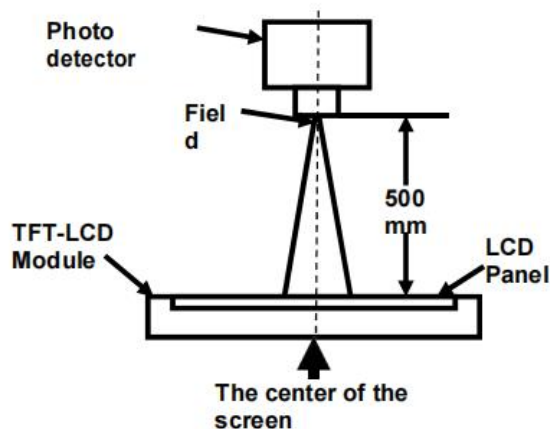


8. Electro-Optical Characteristics

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Response time		Tr +Tf	$\theta_x = \theta_y = 0$	---	30	40	ms	Note 1
Contrast Ratio		CR		700	900	---	---	Note 2
Transmittance		T%			TBD	---	%	
Color Chromaticity (CIE1931)	White	W x	$\theta_x = \theta_y = 0$	---	0.27	---	---	
		W y		---	0.29	---	---	
Viewing angle	θ_T		CR > 10	---	80	---	Deg.	Note 3
	θ_B			---	80	---		
	θ_L			---	80	---		
	θ_R			---	80	---		
Luminance ($I_F = 20mA$)		L		420	450	---	cd/m2	Note4

Note 1: Definition of optical measurement system.

The optical characteristics should be measured in dark room. After 5 minutes operation, the optical properties are measured at the center point of the LCD screen. All input terminals LCD panel must be ground when measuring the center area of the panel.



Item	Photo detector	Field
Contrast Ratio	SR-3A	1°
Luminance		
Chromaticity		
Lum Uniformity		
Response Time	BM-7A	2°

Note 2: Definition of viewing angle range and measurement system.

viewing angle is measured at the center point of the LCD by CONOSCOPE(ergo-80).

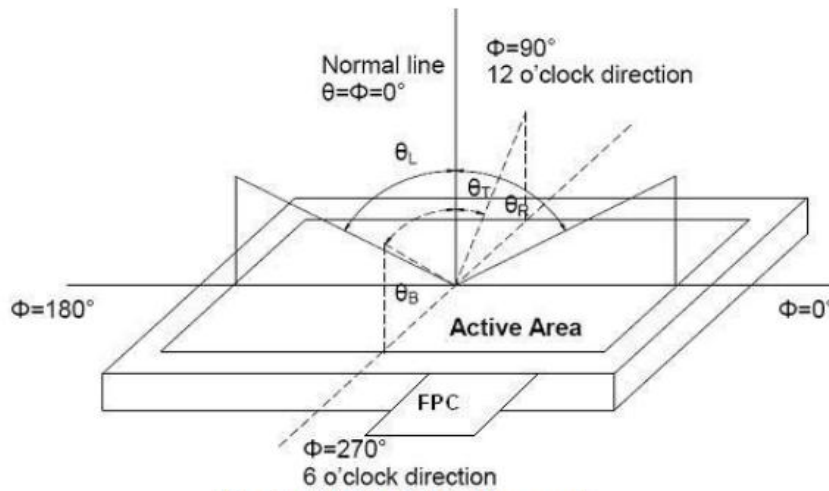
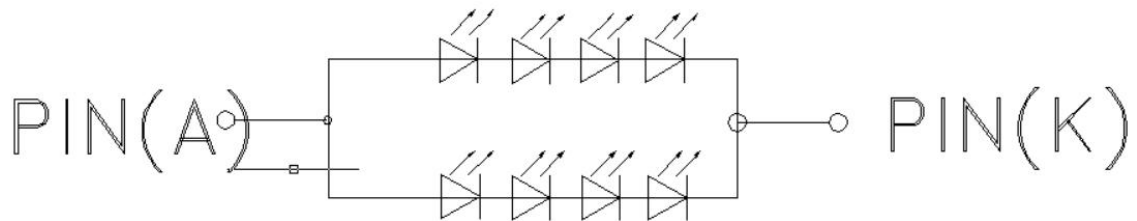


Fig. 1 Definition of viewing angle

Note(4) Backlight circuit



$$IF=40\sim45MA \quad VF=12.8V$$

9.Records Of Version

Version	Revise Date	Page	Content
00	2024-3-18	ALL	New released