PRODUCT SPECIFICATION FOR LCD MODULE

Revision: 1.0

Model No: LSC0185I02-QS-V1

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

APPROVED SIGNATURE

■ Approved Product Specification only

□ Approved Product Specification and Samples

Prepared By	Checked By	Approved By

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1. General Description

LSC0185I02-QS-V1 is a color active matrix a-Si LCD Q-Panel, using a-Si (amorphous silicon) TFTs (Thin Film Transistors) as an active switching devices. The Q-Panel has a 1.82 inch diagonally measured active area with 320×386 resolutions (320 horizontal by 386 vertical pixel array). Each pixel is divided into BLUE，GREEN, RED dots which are arranged in vertical stripe and this Q-Panel can display 16.7M colors.

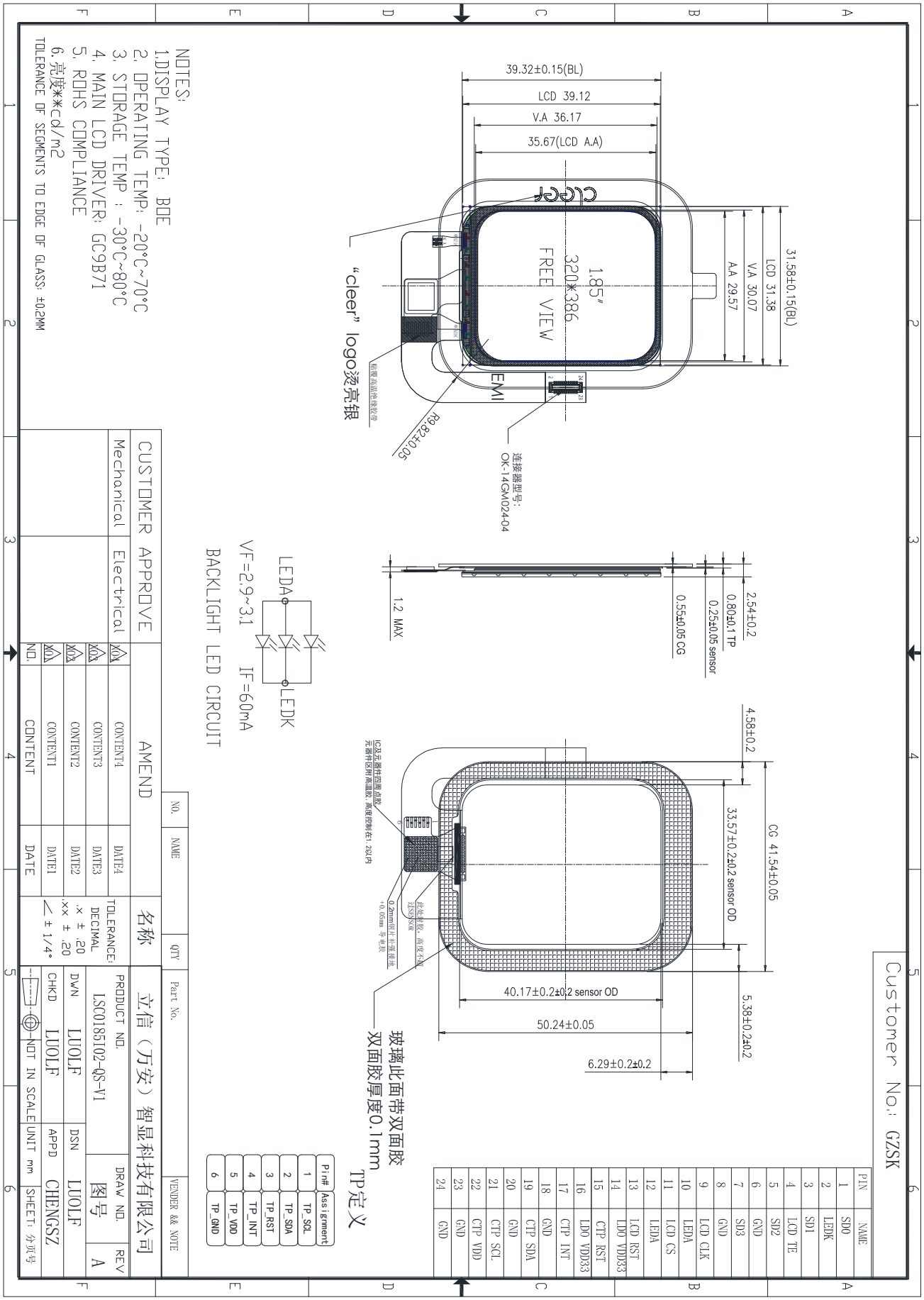
2. Physical Features

Display Mode	TFT-LCD Module
	Active matrix TFT, Transmissive type
Display Format	Graphic 320(RGB)×386 Dot-matrix
Input Data	QSPI
Viewing Direction （Grayscale Inversion）	Free（IPS）
Drive	GC9B71

3. Mechanical Specification

Item	Specification	Unit
Module size (H×V×D)	41.54 ×50.24 ×2.54	mm
Number of dots	320(RGB) ×386	pixel
Active area (H×V)	29.57×35.67	mm

4. Outline Dimension



5. Absolute Maximum Ratings

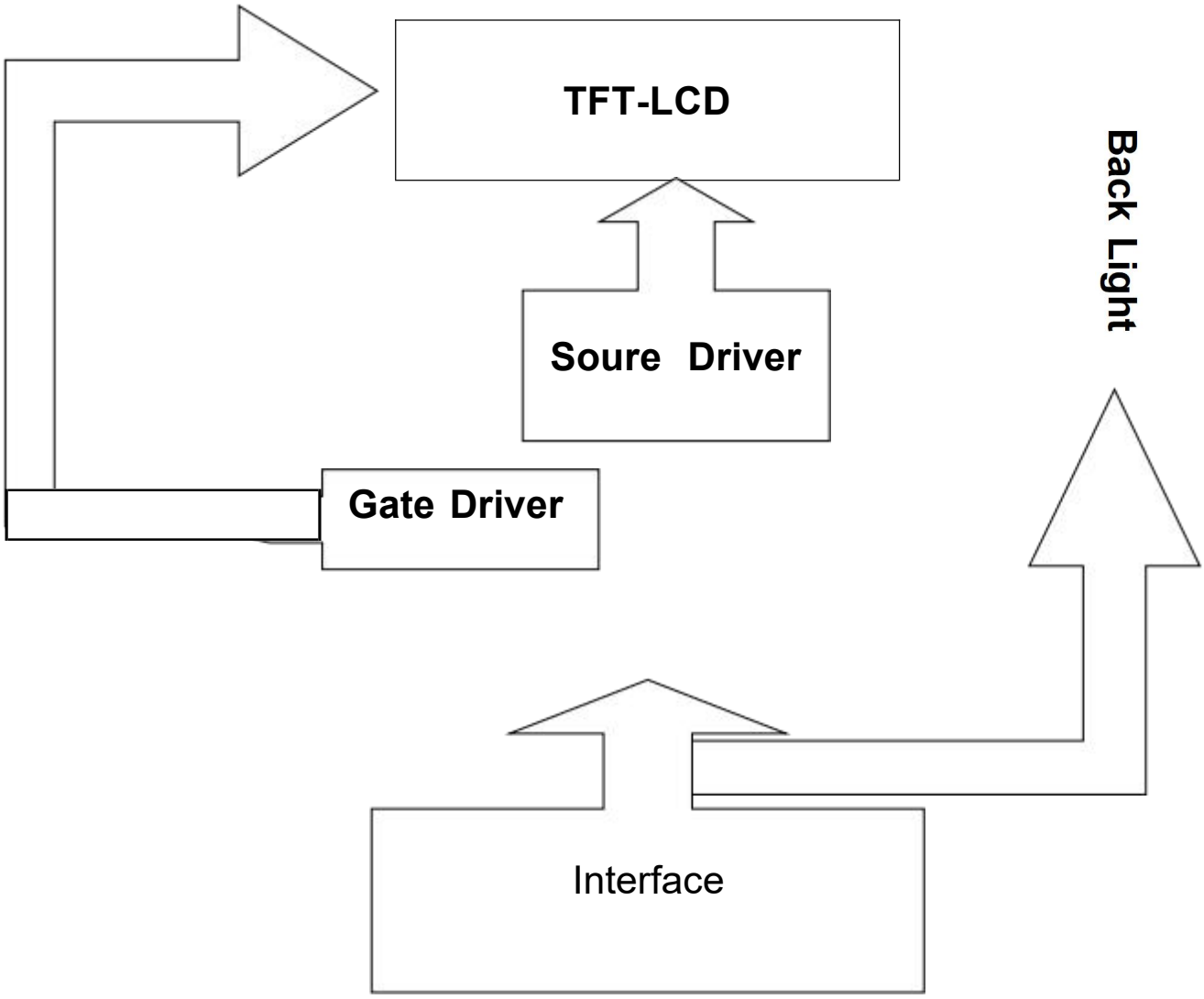
Item	Symbol	Min	Max	Unit	Remark
Supply voltage	VCC	-0.3	4.6	V	Note1 Note2
Supply voltage	IOVCC	-0.3	4.6	V	
Operating temperature	TOPR	-20	70	℃	
Storage temperature	TSTR	-30	80	℃	

6. Electrical Characteristics

Item		Symbol	Rating			Unit	Remark
			Min	Typ	Max		
Supply voltage		VCC	2.5	2.8	3.3	V	Note1
Supply voltage		IOVCC	1.65	2.8	3.3	V	
Input Voltage	L level	VIL	0	---	0.3*IOVCC	V	
	H level	VIH	0.7*IOVCC	---	IOVCC	V	

7. Module Function Description

7-1. Block Diagram Of LCM

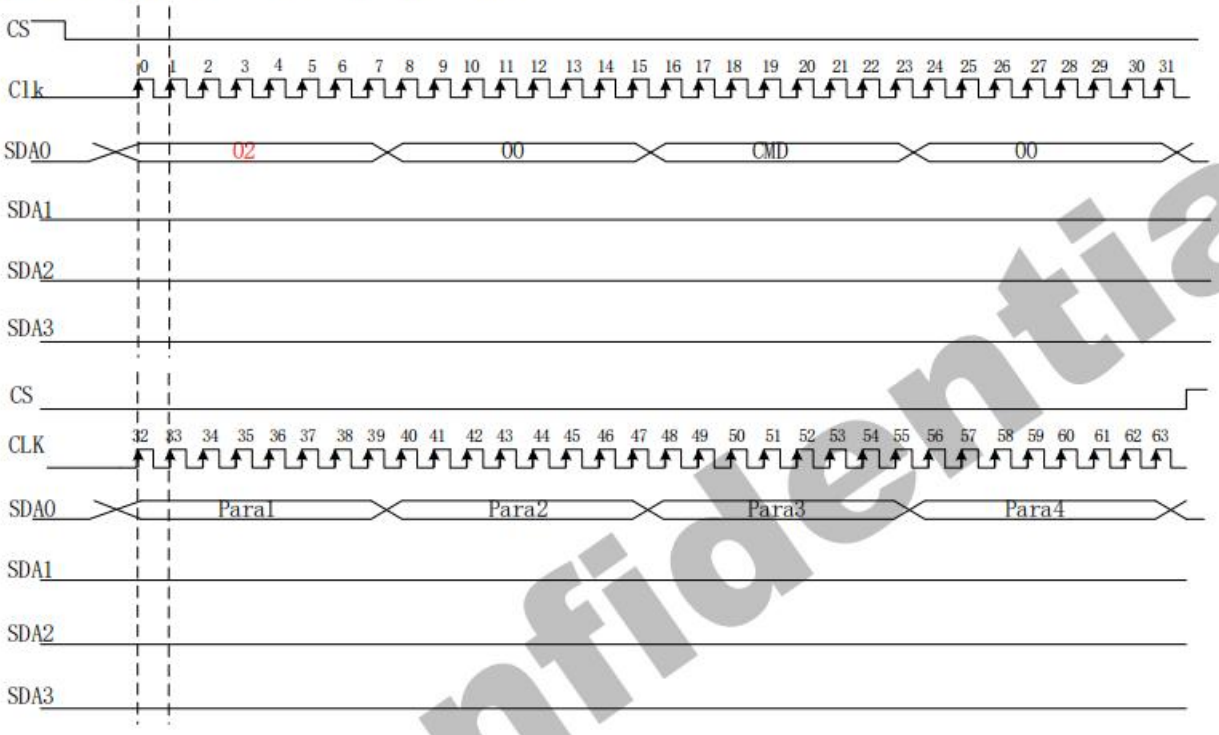


7-2. Pin Description

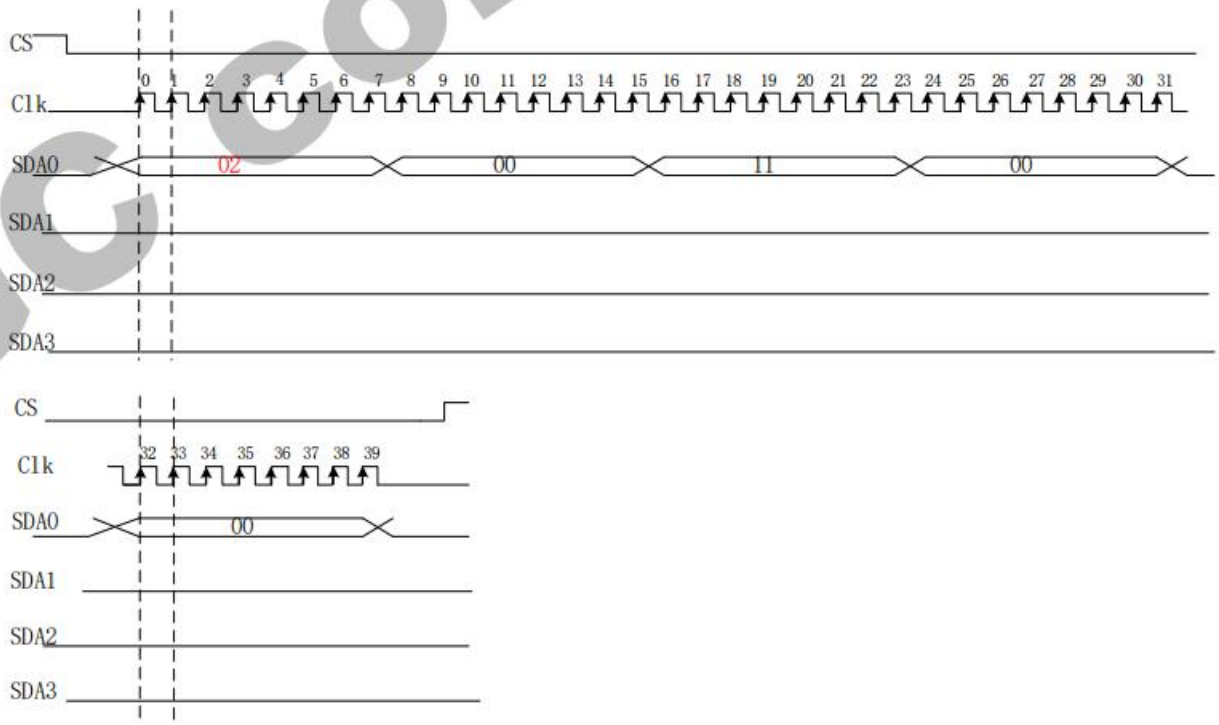
PIN NO.	Symbol	I/O	Description
1	SD0	I	QSPI interface data bus
2	LEDK	P	Power for LED backlight cathode
3	SD1	I	QSPI interface data bus
4	LCD_TE	O	Tearing effect output pin to synchronize MPU to frame writing
5	SD2	I	QSPI interface data bus
6	GND	P	Ground
7	SD3	I	QSPI interface data bus
8	GND	P	Ground
9	LCD_CLK	I	Clock in SPI interface. (SCL)
10	LEDA	P	Power for LED backlight anode
11	LCD_CS	I	Chip select pin
12	LEDA	P	Power for LED backlight anode
13	LCD_RST	I	This signal will reset the device and it must be applied to properly initialize the chip
14	VDD3.3V	P	power supply
15	CTP_RST	I	Reset Pin for TP
16	VDD3.3V	P	power supply
17	CTP_INT	I	Interrupt signal for TP
18	GND	P	Ground
19	CTP_SDA	I	SDA pin for TP
20	GND	P	Ground
21	CTP_SCL	I	SCL pin for TP
22	CTP_VDD	P	power supply
23	GND	P	Ground
24	GND	P	Ground

7-3 Timing Characteristics

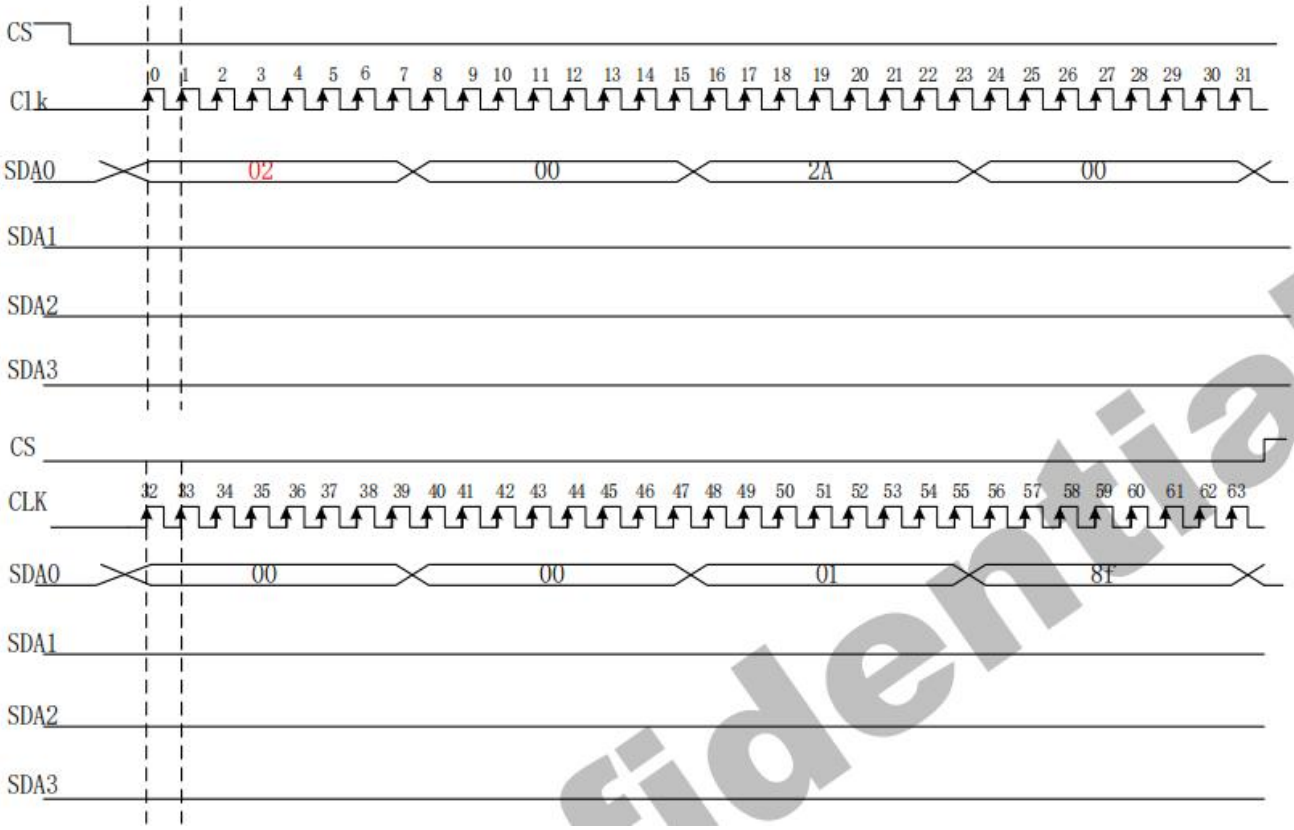
The GC9B71 reads the data at the rising edge of SCL signal.
The timing of Write Cycle Sequence is shown as below
CMD_WR only use SDA0/D0, first byte=0x02



Eg:11

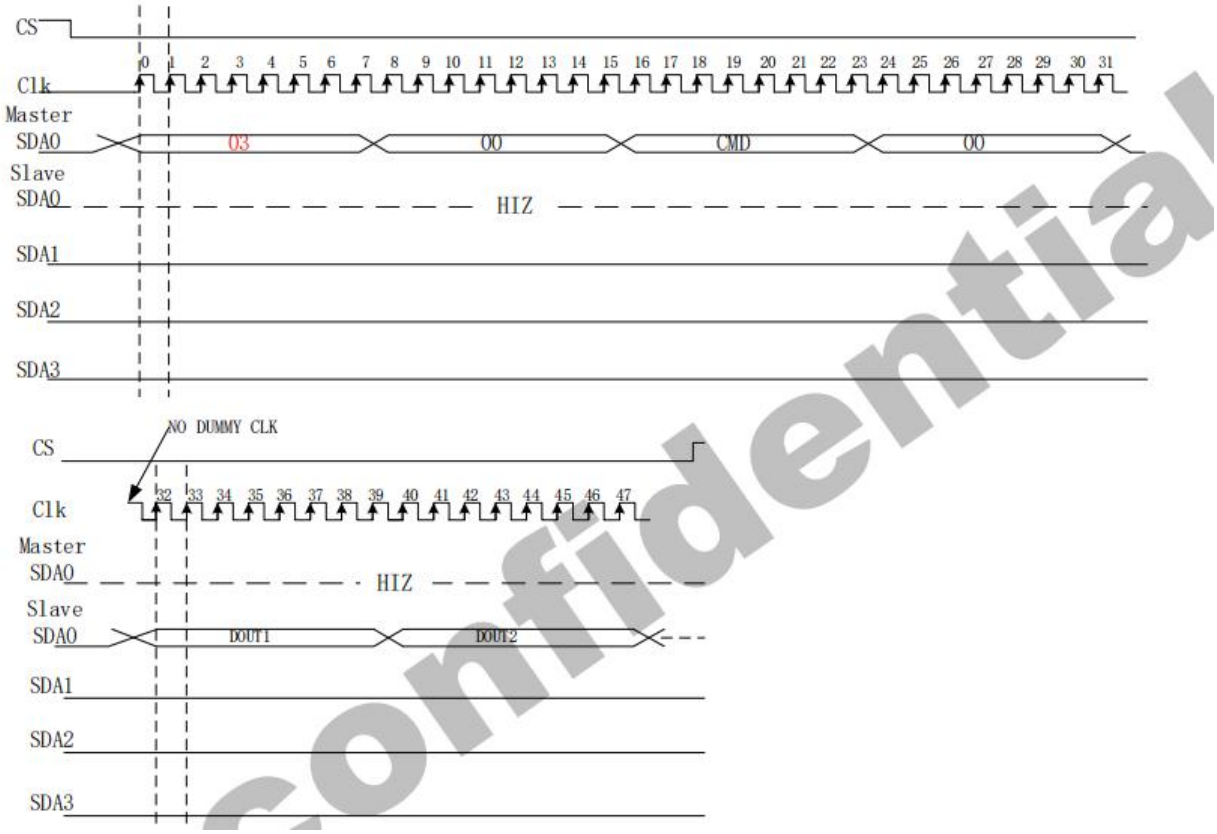


Eg:2A=00,00,01,8f



The timing of Read Cycle Sequence is shown as below

CMD_RD: Only Use SDA0/D0, First Byte=0x03

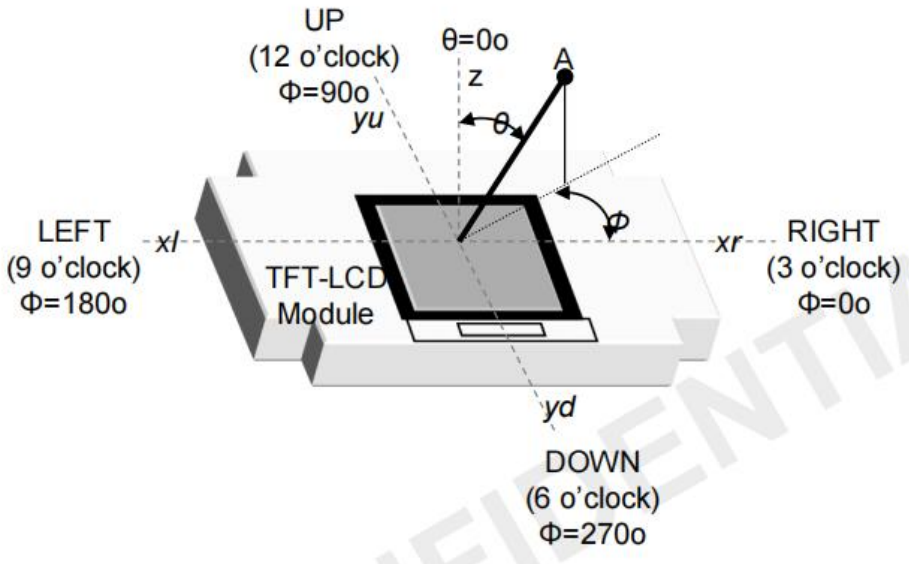


8. Electro-Optical Characteristics

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Response time		Tr +Tf	θx = θy =0	---	30	35	ms	Note 1
Contrast Ratio		CR		1000	1200	---	---	Note 2
Transmittance		T%		3.15	3.7	---	%	
Color Chromaticity (CIE1931)	White	W x	θx = θy =0	---	0.292	---	---	
		W y		---	0.333	---	---	
Viewing angle	θ_T		CR > 10	80	85	---	Deg.	Note 3
	θ_B			80	85	---		
	θ_L			80	85	---		
	θ_R			80	85	---		

Note 4.1: Viewing angle is the angle at which the contrast ratio is greater than 10. The viewing angles are determined for the horizontal or 3, 9 o'clock direction and the vertical or 6, 12 o'clock direction with respect to the optical axis which is normal to the LCD surface (see Figure 6).

<Figure 6. Viewing Angle Range Is Defined As Follows>



Note 4.2: Contrast measurements shall be made at viewing angle of Θ=0° and at the center of the LCD surface. Luminance shall be measured with all pixels in the view field set first to white, then to the dark (black) state. Luminance Contrast Ratio (CR) is defined mathematically.

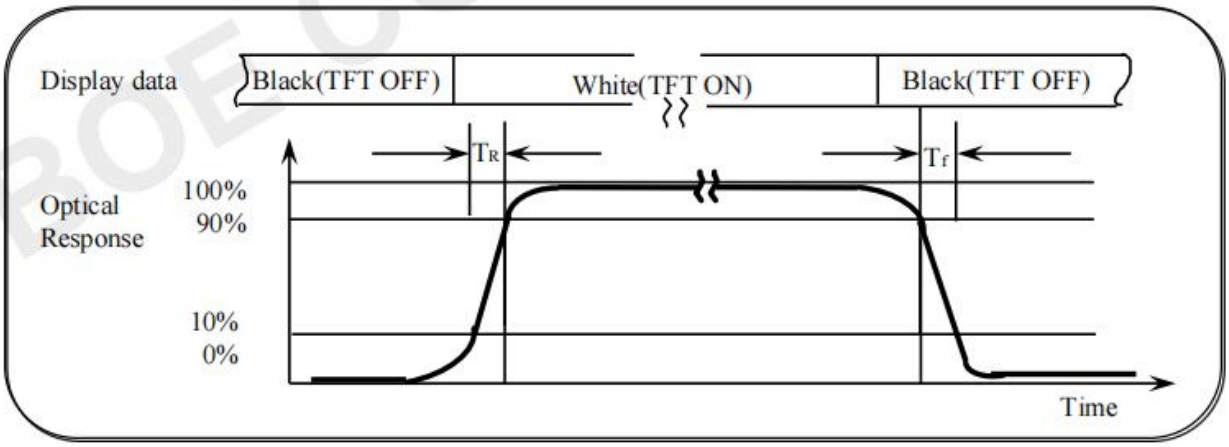
$$CR = \frac{\text{Luminance when displaying a white raster}}{\text{Luminance when displaying a black raster}}$$

Note 4.3: Transmittance is the Value with Polarizer (HC+Clear) &silicate BLU (Film structure is on Table 5.1).

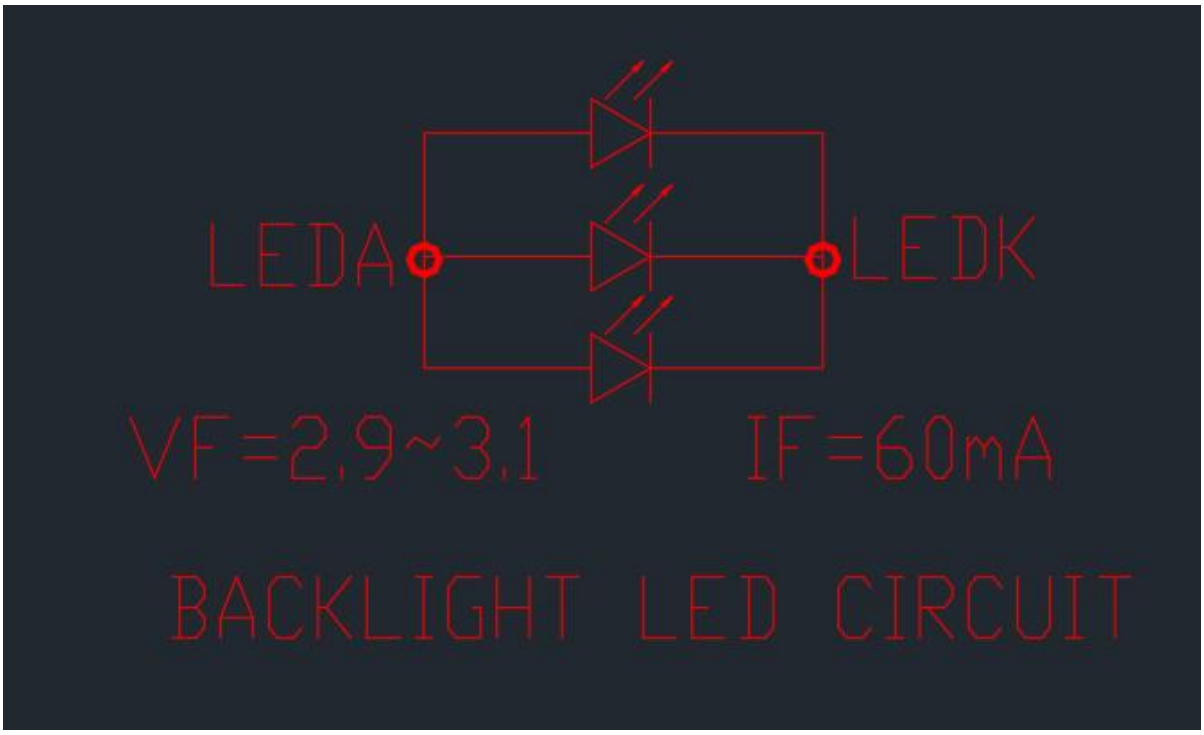
Note 4.4: The color chromaticity coordinates specified in Table 5 shall be calculated from the spectral data measured with all pixels first in red, green, blue and white. Measurements shall be made at the center of the panel.

Note 4.5: The electro-optical response time measurements shall be made as Figure 7 by switching the "data" input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is Tr, and 90% to 10% is Tf.

<Figure 7. Response Time Testing>



Note(4) Backlight circuit



9.Records Of Version

Version	Revise Date	Page	Content
00	2024-11-4	ALL	New released