

PRODUCT SPECIFICATION **FOR LCD MODULE**

Revision: 1.0

Model No: LSL018I01-QS-V1

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

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

LSL018I01-QS-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 1.8 inch and the resolution is 360(RGB)*360, the panel can display up to 262k colors.

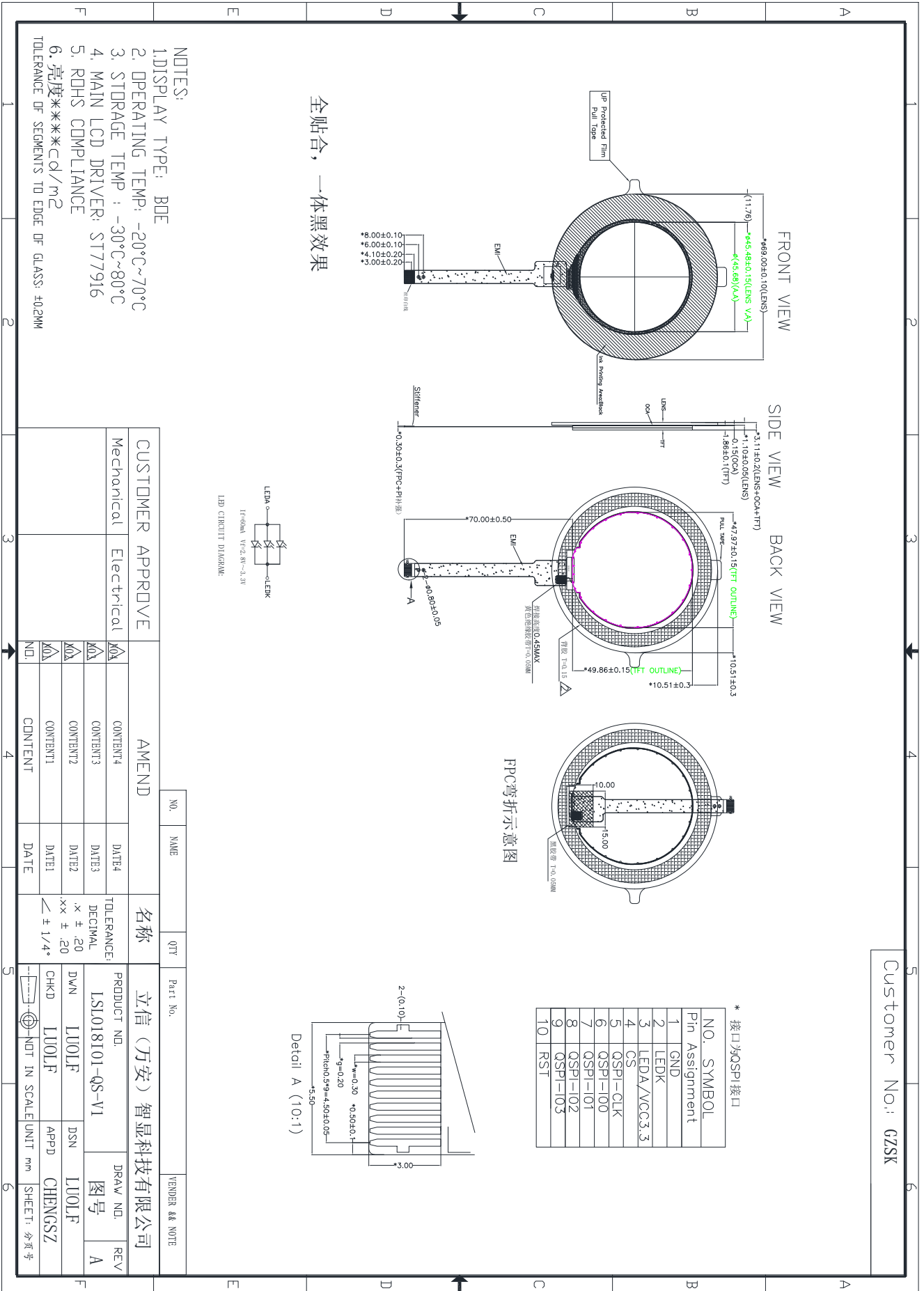
2. Physical Features

Display Mode	TFT-LCD Module
	Active matrix TFT, Transmissive type
Display Format	Graphic 360(RGB)×360 Dot-matrix
Input Data	QSPI
Viewing Direction (Grayscale Inversion)	Free (IPS)
Drive	ST77916

3. Mechanical Specification

Item	Specification	Unit
Module size (H×V×D)	69.0 ×69.0 ×3.11	mm
Number of dots	360(RGB) ×360	pixel
Active area (H×V)	45.684×45.684	mm

4. Outline Dimension



Customer No.: GZSK

* 接口为QSPI 接口

NO.	SYMBOL
1	GND
2	LEDK
3	LEDA/VCC3.3
4	CS
5	QSPI-CLK
6	QSPI-IO0
7	QSPI-IO1
8	QSPI-IO2
9	QSPI-IO3
10	RST

CUSTOMER APPROVE		AMEND		名称		Part No.		VENDOR & NOTE	
Mechanical	Electrical	CONTENT4	DATE4	立信(万安)智显科技有限公司	PRODUCT NO.	DRAW NO.	REV		
		CONTENT3	DATE3		L.SL018101-QS-V1	图号	A		
		CONTENT2	DATE2		DWN LU0LF	DSN	LU0LF		
		CONTENT1	DATE1		CHKD LU0LF	APPD	CHENGGSZ		
		CONTENT	DATE		NOT IN SCALE UNIT mm	SHEET: 分页号			

5. Absolute Maximum Ratings

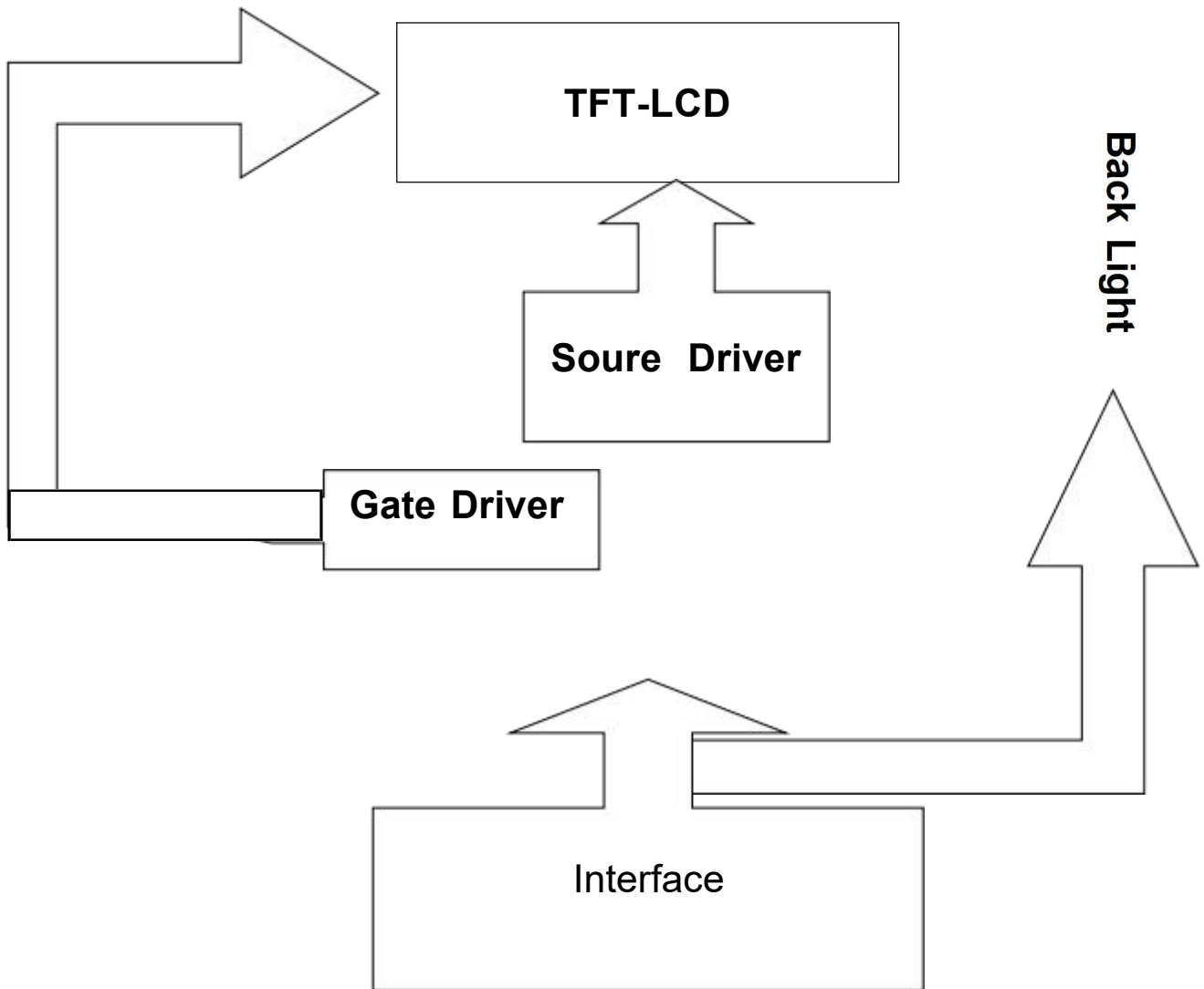
Item	Symbol	Min	Max	Unit	Remark
Supply voltage	VCC	-0.3	4.6	V	Note1 Note2
Supply voltage	IOVCC	-0.3	4.0	V	
Operating temperature	TOPR	-20	70	°C	
Storage temperature	TSTR	-30	80	°C	

6. Electrical Characteristics

Item	Symbol	Rating			Unit	Remark	
		Min	Typ	Max			
Supply voltage	VCC	2.65	2.8	3.3	V	Note1	
Supply voltage	IOVCC	1.65	1.8	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	GND	P	Ground
2	LEDK	P	Power for LED backlight cathode
3	LEDA/VCC3.3V	P	Power for LED backlight anode/power supply
4	CS	I	Chip select pin
5	QSPI_SCK	I	Clock in SPI interface. (SCL)
6	QSPI_IO0	I	QSPI interface data bus
7	QSPI_IO1	I	QSPI interface data bus
8	QSPI_IO2	I	QSPI interface data bus
9	QSPI_IO3	I	QSPI interface data bus
10	RST	I	This signal will reset the device and it must be applied to properly initialize the chip

7-3 Timing Characteristics

7.4.5 QSPI Interface Characteristics:

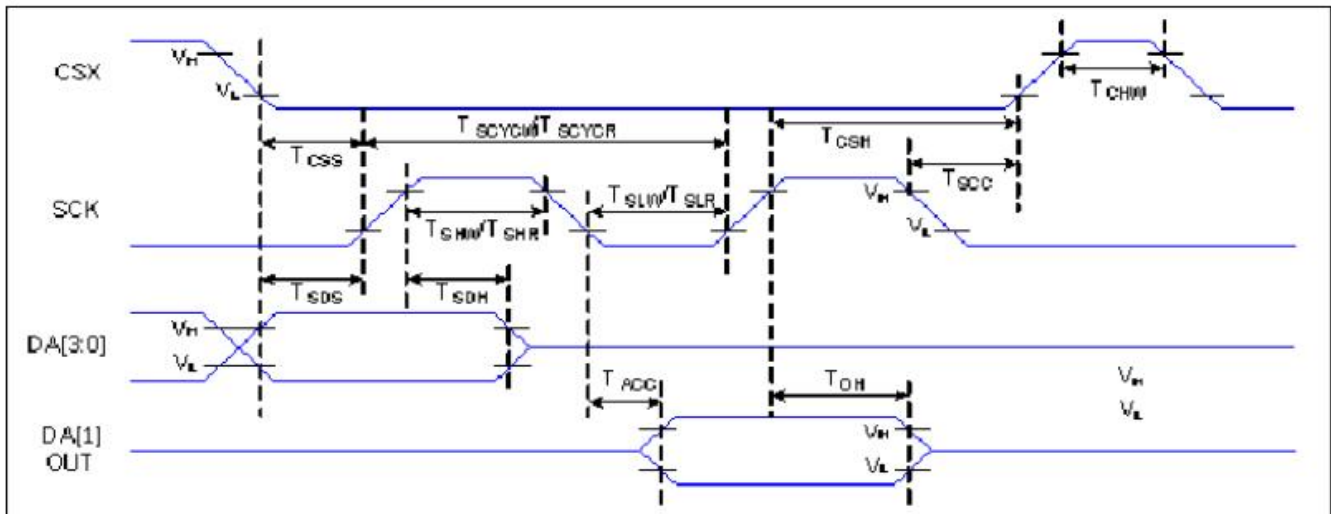


Figure 7 QSPI Interface Timing Characteristics

VDDI=1.65 to 3.3V, VDD=2.65 to 3.3V, GND=RGND=0V, Ta=25°C

Signal	Symbol	Parameter	Min	Max	Unit	Description
CSX	T _{CSS}	Chip select setup time (write)	15		ns	
	T _{CSH}	Chip select hold time (write)	15		ns	
	T _{CSS}	Chip select setup time (read)	60		ns	
	T _{SCC}	Chip select hold time (read)	65		ns	
	T _{CHW}	Chip select "H" pulse width	40	200	ns	Note1
SCL	T _{SCYCW}	Serial clock cycle (Write)	16		ns	
	T _{SHW}	SCL "H" pulse width (Write)	7		ns	
	T _{SLW}	SCL "L" pulse width (Write)	7		ns	
	T _{SCYCR}	Serial clock cycle (Read)	150		ns	
	T _{SHR}	SCL "H" pulse width (Read)	60		ns	
	T _{SLR}	SCL "L" pulse width (Read)	60		ns	
SDA (DIN)	T _{SDS}	Data setup time	7		ns	
	T _{SDH}	Data hold time	7		ns	
DOUT	T _{ACC}	Access time	10	50	ns	For maximum CL=30pF
	T _{OH}	Output disable time	15	50	ns	For minimum CL=8pF

Table 5 QSPI Interface Characteristics

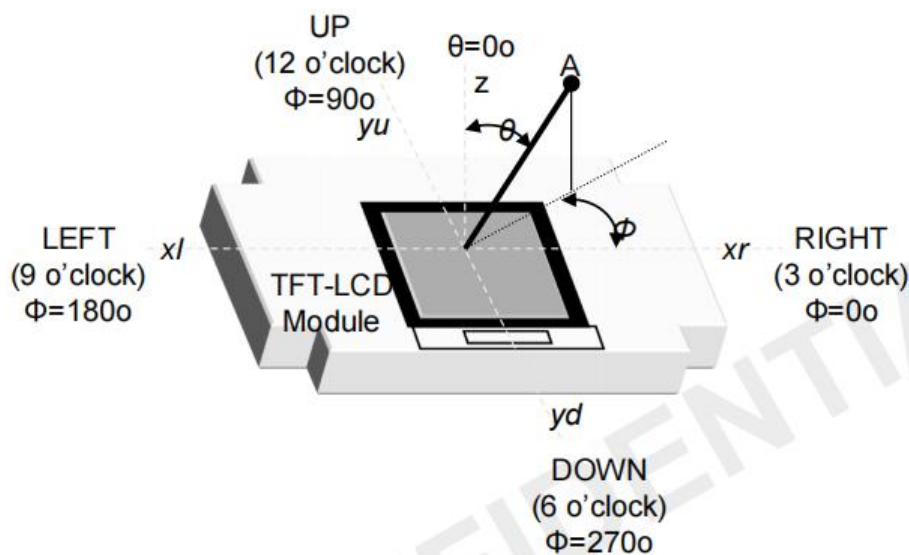
Note : The rising time and falling time (Tr, Tf) of input signal are specified at 15 ns or less. Logic high and low levels are specified as 30% and 70% of VDDI for Input signals.

8. Electro-Optical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Response time	Tr +Tf	$\theta_x = \theta_y = 0$	---	25	35	ms	Note 1
Contrast Ratio	CR		800	1200	---	---	Note 2
Transmittance	T%		3.4	4.0	---	%	
Color Chromaticity (CIE1931)	White	W x	---	0.297	---	---	
		W y	---	0.337	---	---	
Viewing angle	θ_T	CR > 10	80	85	---	Deg.	Note 3
	θ_B		80	85	---		
	θ_L		80	85	---		
	θ_R		80	85	---		

Note 5.1: 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 5).

<Figure 5. Viewing Angle Range Is Defined As Follows>



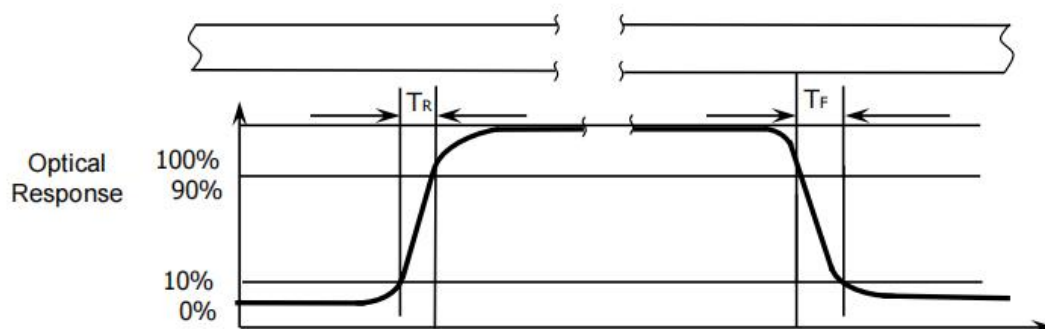
Note 5.2: Contrast measurements shall be made at viewing angle of $\Theta=0^\circ$ and at the center of the LCD surface. Luminance shall be measured with all pixels in the view field set first to white, then to the dark (black) state. Luminance Contrast Ratio (CR) is defined mathematically.

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

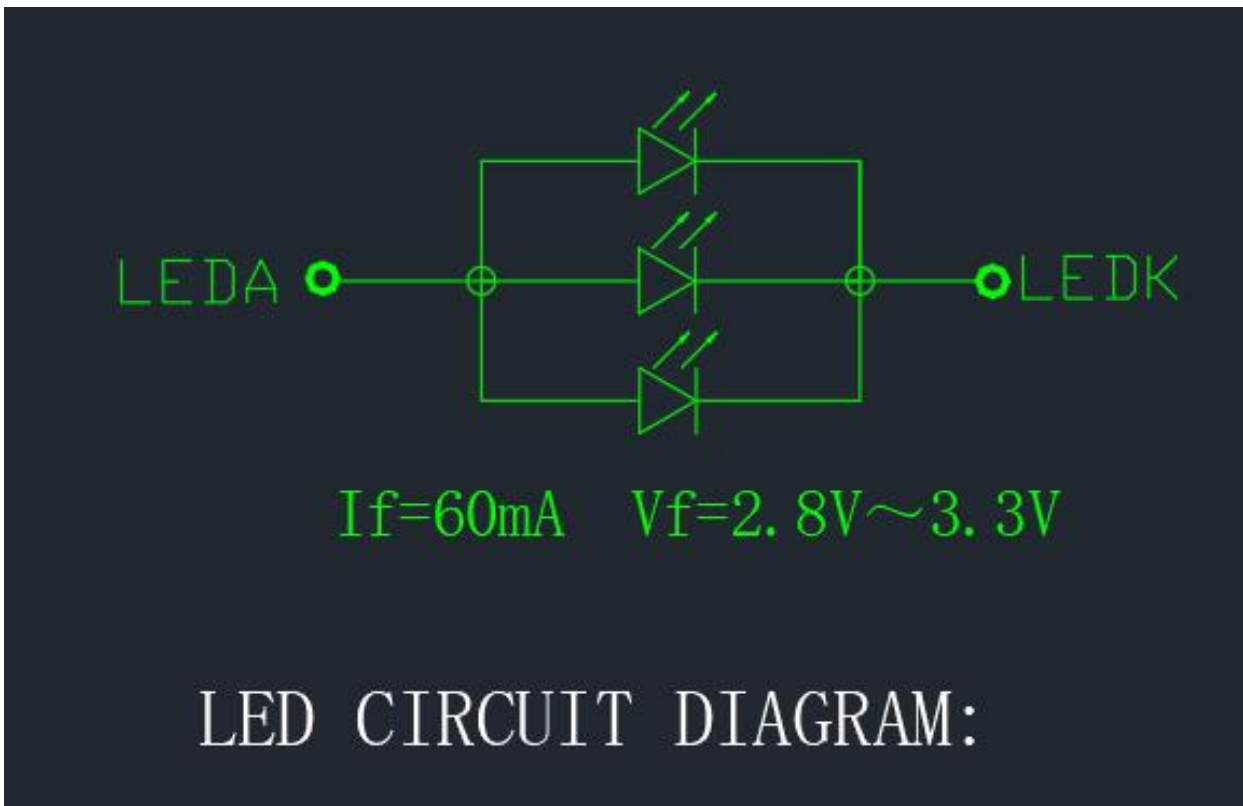
Note 5.3: Transmittance is the Value with Polarizer(HC+Clear) & silicate BLU (Film structure is on Table 6) .

Note 5.5: The electro-optical response time measurements shall be made as Figure 6 by switching the “data” input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is T_r , and 90% to 10% is T_f .

<Figure 6. Response Time Testing>



Note(4) Backlight circuit



9.Records Of Version

Version	Revise Date	Page	Content
00		ALL	New released