PRODUCT SPECIFICATION FOR LCD MODULE

Revision: 1.0

Model No: LSC018I02-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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目录

1. General Description

LSC018I02-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

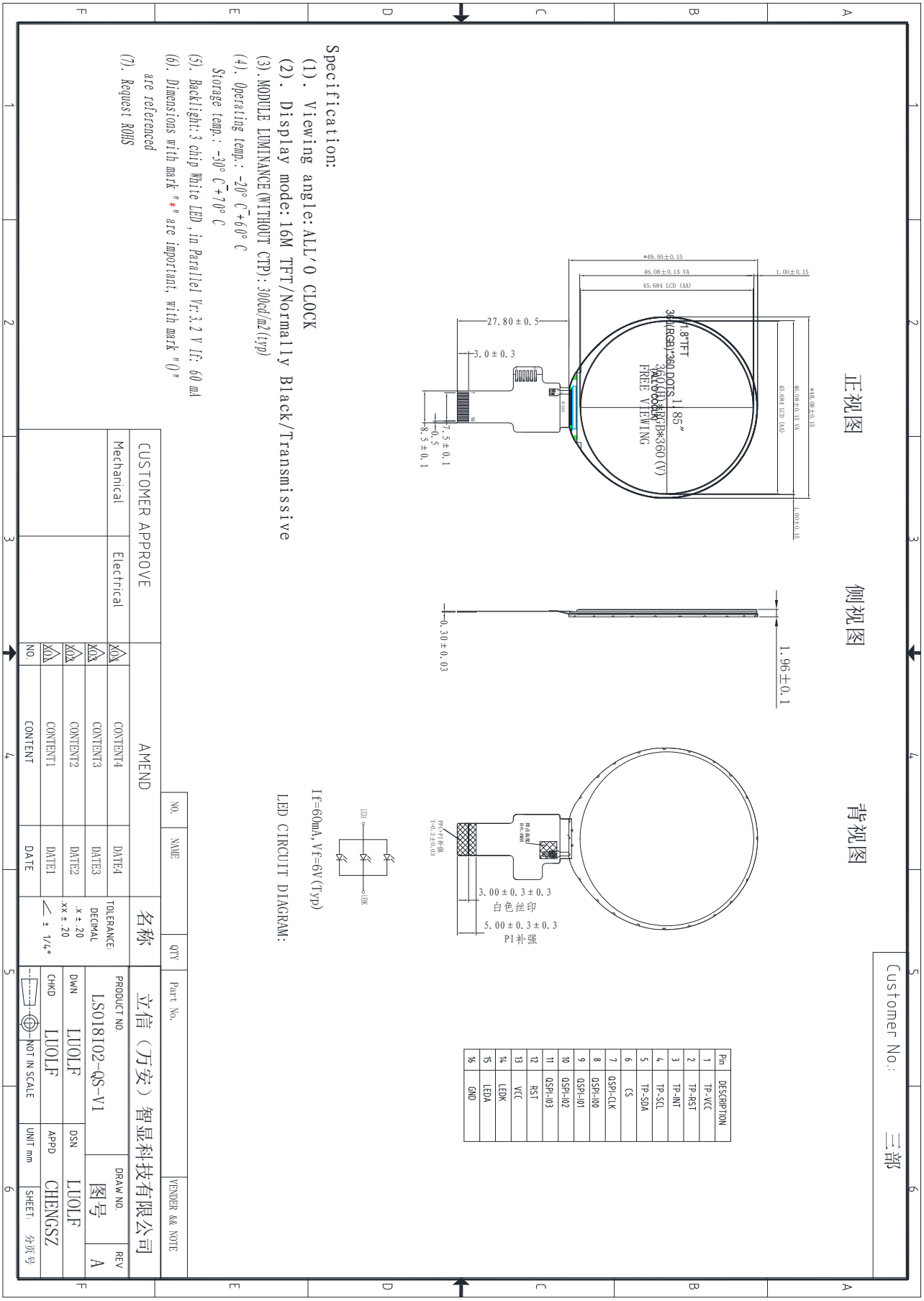
Display Mode	TFT-LCD Module
	Active matrix TFT, Transmissive type
Display Format	Graphic 360(RGB)×360 Dot-matrix
Input Data	QSPI
Viewing Direction （Grayscale Inversion）	Free（IPS）
Drive	ST77916

3. Mechanical Specification

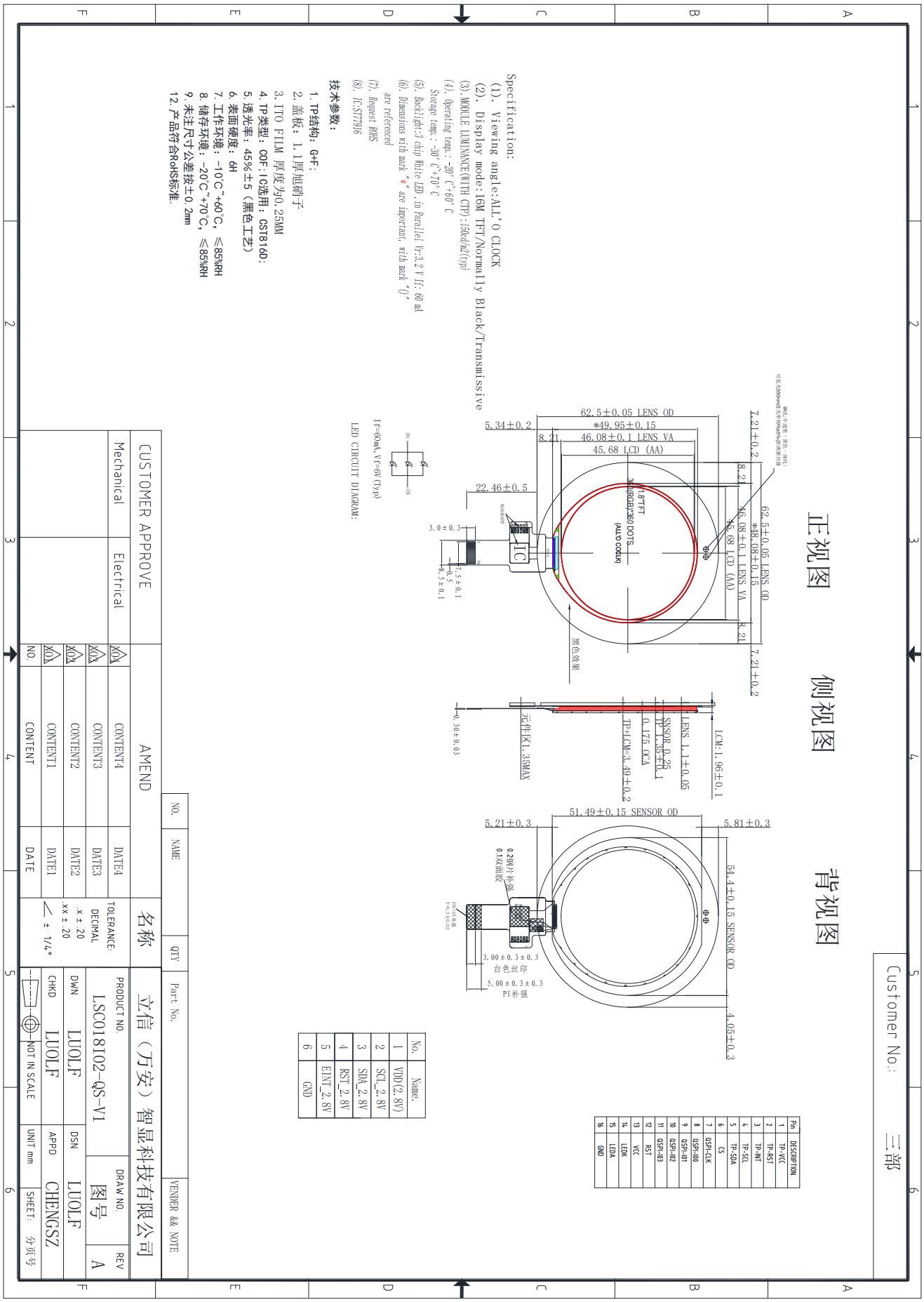
Item	Specification	Unit
Module size (H×V×D)	62.5 ×62.5 ×3.49	mm
Number of dots	360(RGB) ×360	pixel
Active area (H×V)	45.684×45.684	mm

4. Outline Dimension

LCM



总成


正视图
侧视图
背视图
Customer No.:
三部
Specification:
(1). Viewing angle:ALL'O CLOCK
(2). Display mode:16M TFT/Normally Black/Transmissive
(3).MODULE LUMINANCE(WITH CTP):150cd/m2(typ)
(4). Operating temp.: -20° C~+60° C
Storage temp.: -30° C~+70° C
(5). Backlight:3 chip White LED, in Parallel Vr:3.2 V If: 60 mA
(6). Dimensions with mark "*" are important, with mark "()" are referenced
(7). Request ROHS
(8). IC:ST7916
技术参数：
1. TP结构：G+F；
2. 盖板：1.1厚旭硝子
3. ITO FILM 厚度为0.25MM
4. TP类型：OOF;IC选用：GST816D;
5. 透光率：45%±5（黑色工艺）
6. 表面硬度：6H
7. 工作环境：-10℃~+60℃，≤85%RH
8. 储存环境：-20℃~+70℃，≤85%RH
9. 未注尺寸公差按±0.2mm
12. 产品符合RoHS标准.
62.5±0.05 LENS OD
*49.95±0.15
46.08±0.1 LENS VA
45.68 LCD (AA)
5.34±0.2
8.21
7.21±0.2
22.46±0.5
3.0±0.3
1.87"TFT
360(RGB)*360 DOTS
(ALL'O CLOCK)
IC
黑色效果
LENS 1.1±0.05
SENSOR 0.25
TP 1.35±0.1
0.175 OCA
TP+LCM=3.49±0.2
LCM:1.96±0.1
元件区1.35MAX
0.30±0.03
51.49±0.15 SENSOR OD
5.21±0.3
5.81±0.3
54.4±0.15 SENSOR OD
4.05±0.3
0.2钢片补强
0.1双面胶
3.00±0.3±0.3
白色丝印
5.00±0.3±0.3
PI补强
LED CIRCUIT DIAGRAM:
IF=60mA,VF=6V(Typ)
Pin DESCRIPTION
1 TP-VCC
2 TP-RST
3 TP-INT
4 TP-SCL
5 TP-SDA
6 CS
7 QSPI-CLK
8 QSPI-D0
9 QSPI-D1
10 QSPI-D2
11 QSPI-D3
12 RST
13 VCC
14 LEDK
15 LEDA
16 GND
No. Name.
1 VDD(2.8V)
2 SCL_2.8V
3 SDA_2.8V
4 RST_2.8V
5 EINT_2.8V
6 GND
CUSTOMER APPROVE
AMEND
NO. NAME QTY Part No. VENDER && NOTE
Mechanical
Electrical
NO. CONTENT DATE
01 CONTENT1 DATE1
02 CONTENT2 DATE2
03 CONTENT3 DATE3
04 CONTENT4 DATE4
名称
TOLERANCE:
DECIMAL
.x ± 20
.xx ± 20
∠ ± 1/4°
立信（万安）智显科技有限公司
PRODUCT NO. LSC018I02-QS-V1
DRAW NO. 图号
REV A
DWN LUOLF
DSN LUOLF
CHKD LUOLF
APPD CHENGSZ
NOT IN SCALE
UNIT mm
SHEET: 分页号

5. Absolute Maximum Ratings

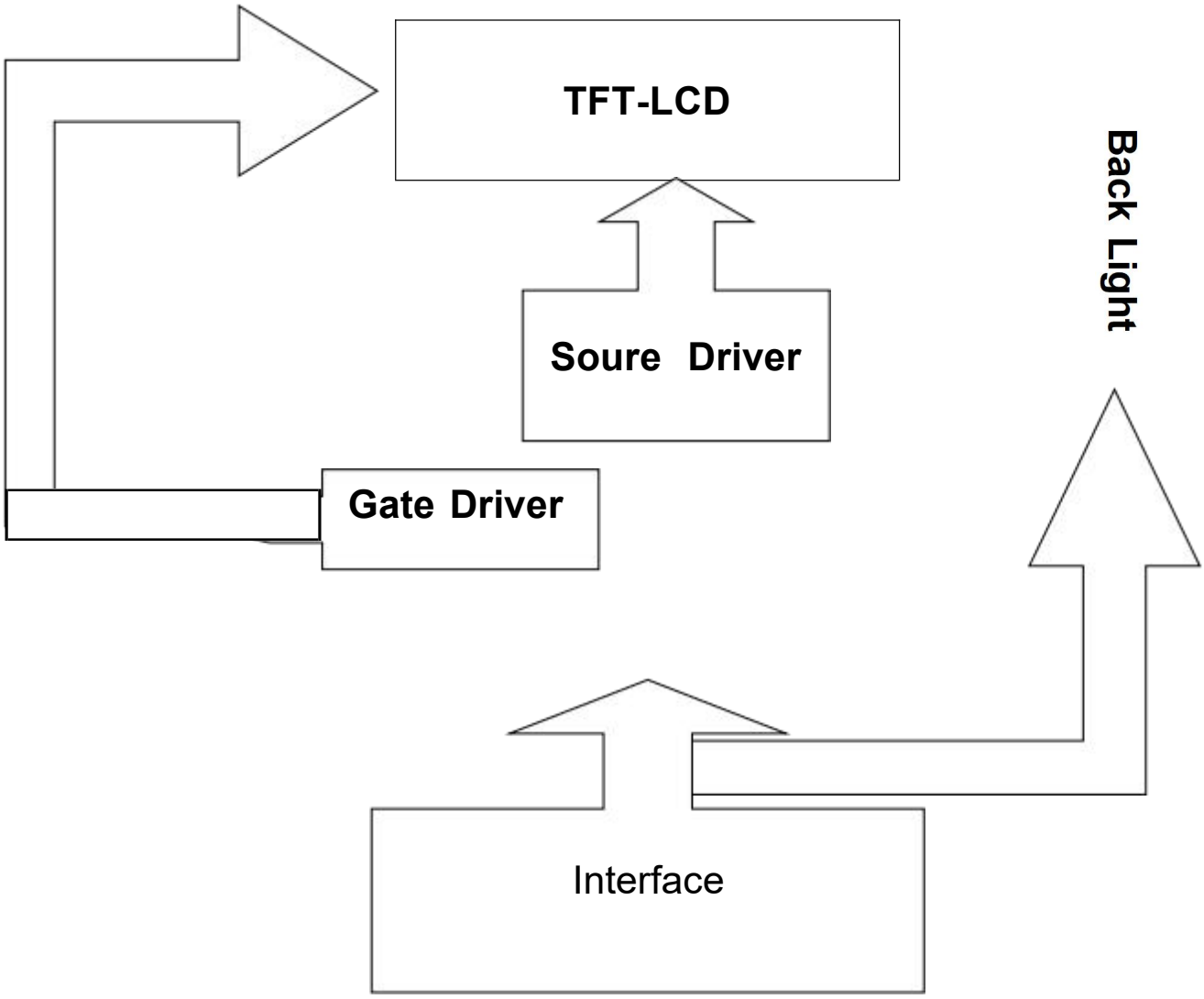
Item	Symbol	Min	Max	Unit	Remark
Supply voltage	VCC	-0.3	4.6	V	Note1 Note2
Supply voltage	IOVCC	-0.3	4.0	V	
Operating temperature	TOPR	-20	70	℃	
Storage temperature	TSTR	-30	80	℃	

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	TP_VCC		power supply
2	TP_RST		Reset Pin for TP
3	TP_INT		Interrupt signal for TP
4	TP_SCL		SCL pin for TP
5	TP_SDA		SDA pin for TP
6	CS		Chip select pin
7	QSPI_CLK		Clock in SPI interface. (SCL)
8	QSPI_IO0		QSPI interface data bus
9	QSPI_IO1		QSPI interface data bus
10	QSPI_IO2		QSPI interface data bus
11	QSPI_IO3		QSPI interface data bus
12	RST		This signal will reset the device and it must be applied to properly initialize the chip
13	VCC		power supply
14	LEDK		Power for LED backlight cathode
15	LEDA		Power for LED backlight anode
16	GND		Ground

7-3 Timing Characteristics

7.4.5 QSPI Interface Characteristics:

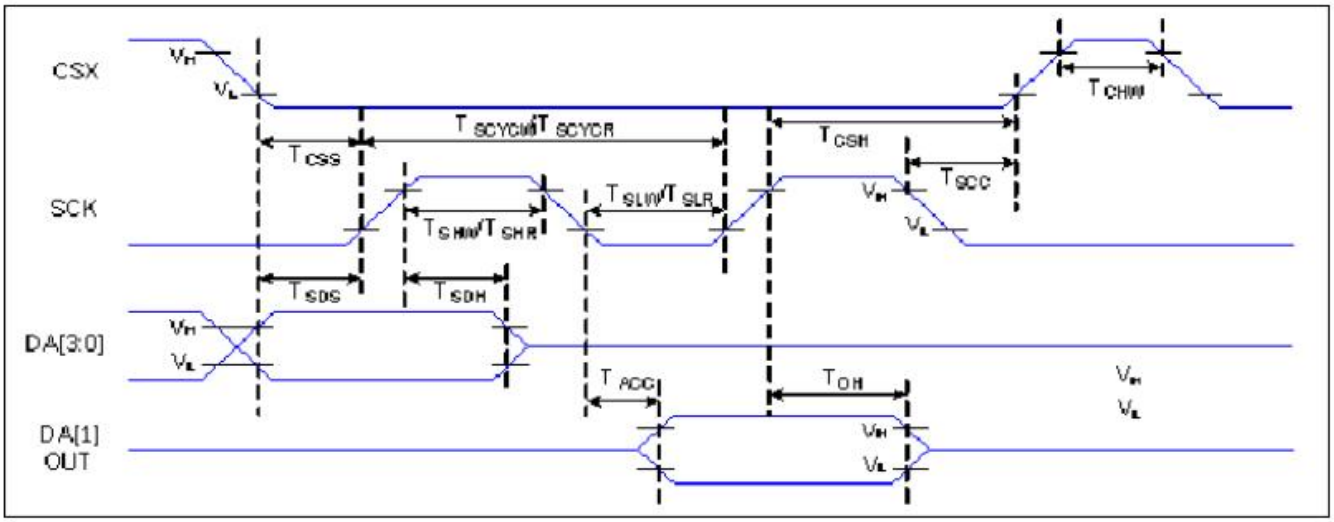


Figure 7 QSPI Interface Timing Characteristics

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

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		ns	
			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

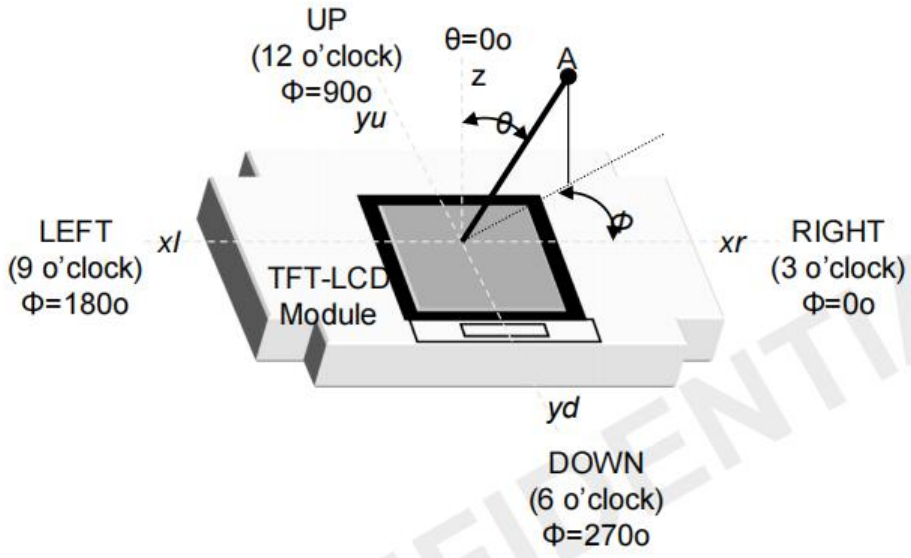
Note : The rising time and falling time (Tr, Tf) of input signal are specified at 15 ns or less. Logic high and low levels are specified as 30% and 70% of VDDI for Input signals.

8. Electro-Optical Characteristics

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Response time		Tr +Tf	θx = θy =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	θx = θy =0	---	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>



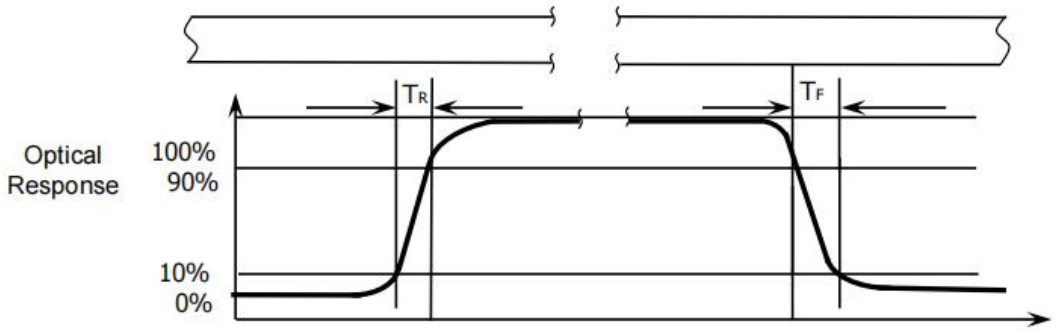
Note 5.2: Contrast measurements shall be made at viewing angle of Θ=0° and at the center of the LCD surface. Luminance shall be measured with all pixels in the view field set first to white, then to the dark (black) state. Luminance Contrast Ratio (CR) is defined mathematically.

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

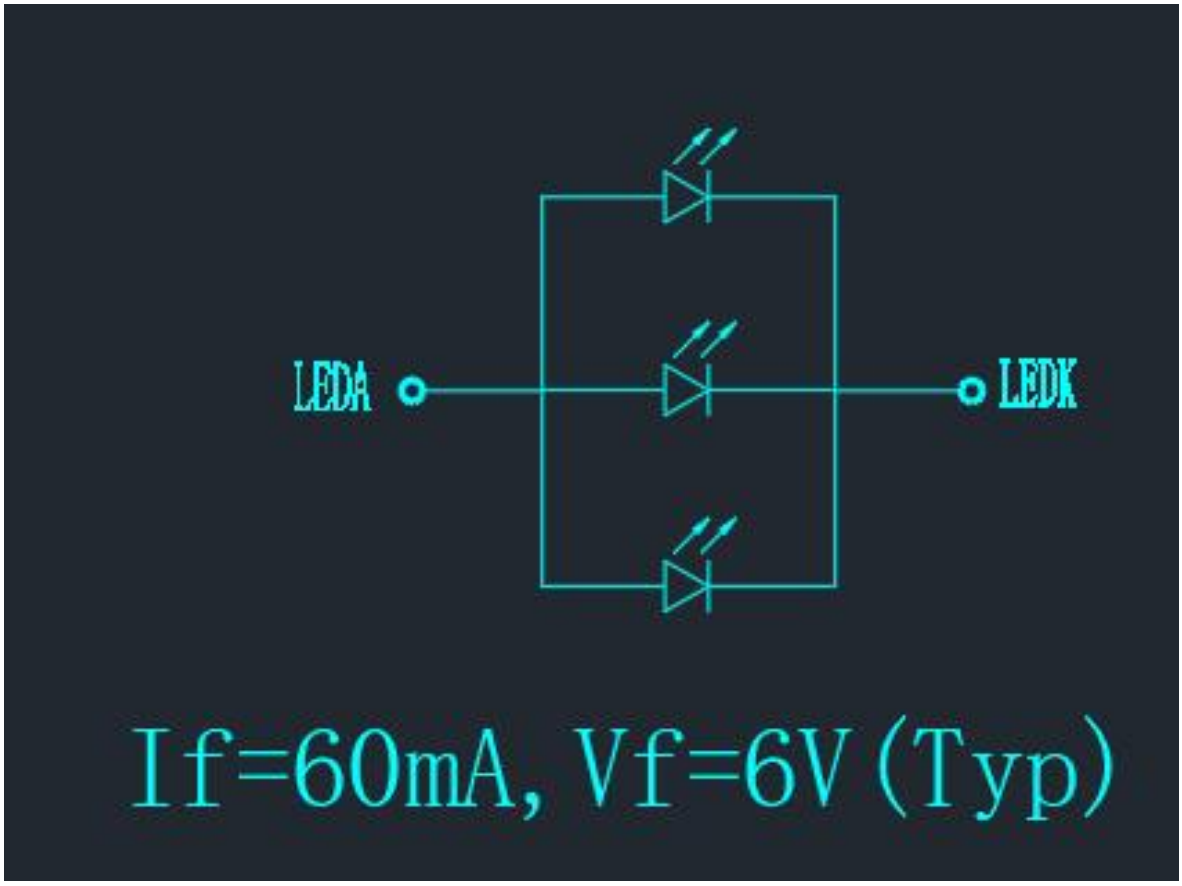
Note 5.3: Transmittance is the Value with Polarizer(HC+Clear) & silicate BLU（Film structure is on Table 6）.

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 Tr, and 90% to 10% is Tf.

<Figure 6. Response Time Testing>



Note(4) Backlight circuit



9.Records Of Version

Version	Revise Date	Page	Content
00	2024-12-2	ALL	New released