LCD / LCM SPECIFICATION



WINSTAR Display Co.,Ltd.
華凌光電股份有限公司

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Winstar Display Co., LTD

SPECIFICATION

CUSTOMER : _____

MODULE NO.: WO1602AT-89LJ#FC

APPROVED BY: (FOR CUSTOMER USE ONLY)	PCB VERSION: DATA:

SALES BY	APPROVED BY	CHECKED BY	PREPARED BY

VERSION	DATE	REVISED PAGE NO.	SUMMARY
C	2023/01/18		Modify Backlight Information(Note)

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Winstar Display Co.,

華凌光電股份有限公司

MODLE NO：

DOC. FIRST ISSUE

RECORDS OF REVISION

VERSION	DATE	REVISED PAGE NO.	SUMMARY
0	2021/07/22		First issue
A	2021/07/29		Modify pull tape.
B	2022/04/02		Modify Backlight Information
C	2023/01/18		Modify Backlight Information(Note)

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Precautions in use of LCD Modules

(1)Avoid applying excessive shocks to the module or making any alterations or modifications to it.

(2)Don’t make extra holes on the printed circuit board, modify its shape or change the components of LCD module.

(3)Don’t disassemble the LCM.

(4)Don’t operate it above the absolute maximum rating.

(5)Don’t drop, bend or twist LCM.

(6)Soldering: only to the I/O terminals.

(7)Storage: please storage in anti-static electricity container and clean environment.

(8) Winstar have the right to change the passive components, including R3,R6 & backlight adjust resistors. (Resistors,capacitors and other passive components will have different appearance and color caused by the different supplier.)

(9)Winstar have the right to change the PCB Rev. (In order to satisfy the supplying stability, management optimization and the best product performance...etc, under the premise of not affecting the electrical characteristics and external dimensions, Winstar have the right to modify the version.)

(10) To ensure the stability of the display screen, please apply screen saver after showing 30 mins of fixed display content.

(11)Please heat up a little the tape sticking on the components when removing it; otherwise the components might be damaged.

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General Specification

Item	Dimension	Unit
Number of Characters	16 characters x 2 Lines	—
Module dimension	74.2x 25.2 x6.3	mm
View area	61.0 x 15.1	mm
Active area	56.2 x 11.5	mm
Dot size	0.55 x 0.65	mm
Dot pitch	0.60 x 0.70	mm
Character size	2.95 x 5.55	mm
Character pitch	3.55 x 5.95	mm
LCD type	VA Negative Transmissive (In LCD production, It will occur slightly color difference. We can only guarantee the same color in the same batch.)	
Duty	1/17duty , 1/5 Bias	
View direction	12 o'clock	
Backlight Type	LED, White	
IC	ST7028-1A	
Interface	I2C	

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Absolute Maximum Ratings

Item	Symbol	Min	Typ	Max	Unit
Operating Temperature	TOP	-20	—	+70	℃
Storage Temperature	TST	-30	—	+80	℃
Power Supply Voltage	VDD	-0.3	—	4.0	V
Supply Voltage For LCD Drive	VOP=V0-VSS	-0.3	—	13.0	V
Input voltage range	VIN	-0.3	—	VDD+0.3	V

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Electrical Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage For Logic	V_{DD}-V_{SS}	–	3	3.3	3.6	V
Supply Voltage For LCD	Vop	Ta=-20℃	–	–	–	V
		Ta=25℃	6.8	7.0	7.2	V
		Ta=70℃	–	–	–	V
Input High Volt.	V_{IH}	–	0.7 V_{DD}	–	V_{DD}	V
Input Low Volt.	V_{IL}	–	–	–	0.2 V_{DD}	V
Output High Volt.	V_{OH}	–	0.8 V_{DD}	–	V_{DD}	V
Output Low Volt.	V_{OL}	–	–	–	0.2V_{DD}	V
Supply Current	I_{DD}	–	–	–	1.5	mA

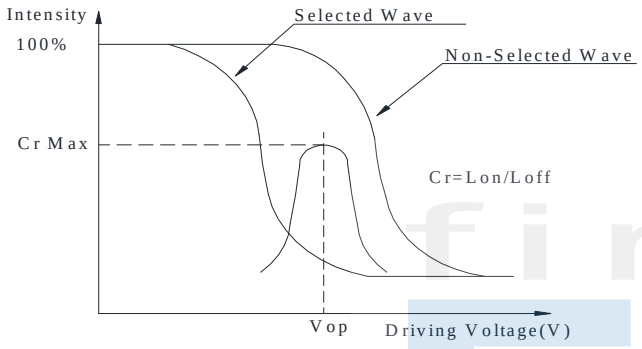
Please kindly consider to design the Vop to be adjustable while programing the software to match LCD contrast tolerance.

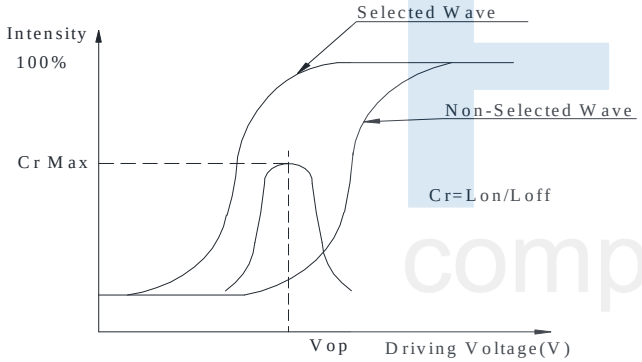
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Optical Characteristics

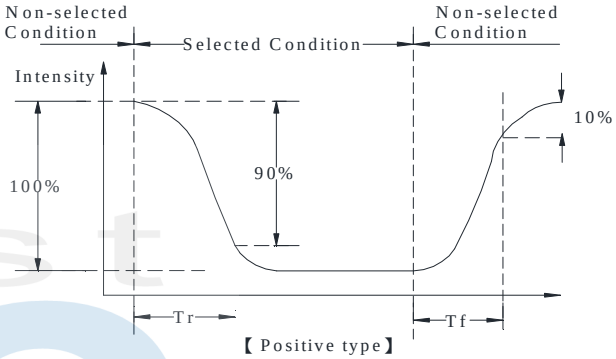
Item	Symbol	Condition	Min	Typ	Max	Unit
View Angle	θ	CR≧2	—	—	45	$\phi = 180^\circ$
	θ	CR≧2	—	—	20	$\phi = 0^\circ$
	θ	CR≧2	—	—	35	$\phi = 90^\circ$
	θ	CR≧2	—	—	35	$\phi = 270^\circ$
Contrast Ratio	CR	—	—	2	5	—
Response Time	T rise	—	—	80	160	ms
	T fall	—	—	100	200	ms

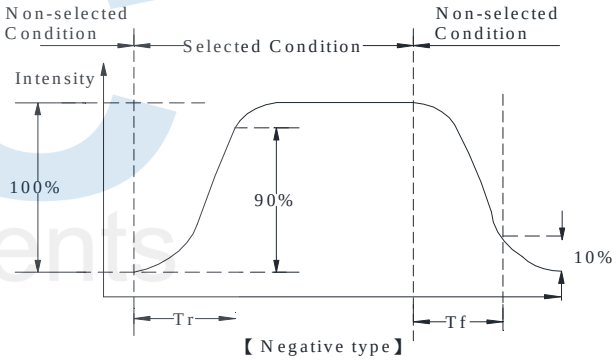
Definition of Operation Voltage (Vop)





Definition of Response Time (Tr , Tf)



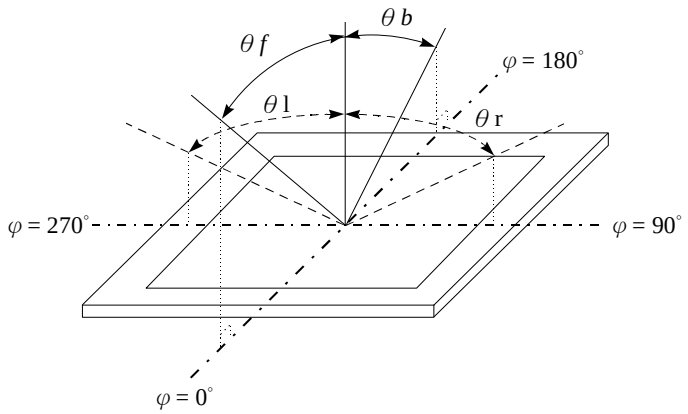


Conditions :

Operating Voltage : Vop Viewing Angle(θ ， φ) : 0°， 0°

Frame Frequency : 64 HZ Driving Waveform : 1/N duty , 1/a bias

Definition of viewing angle(CR≧2)



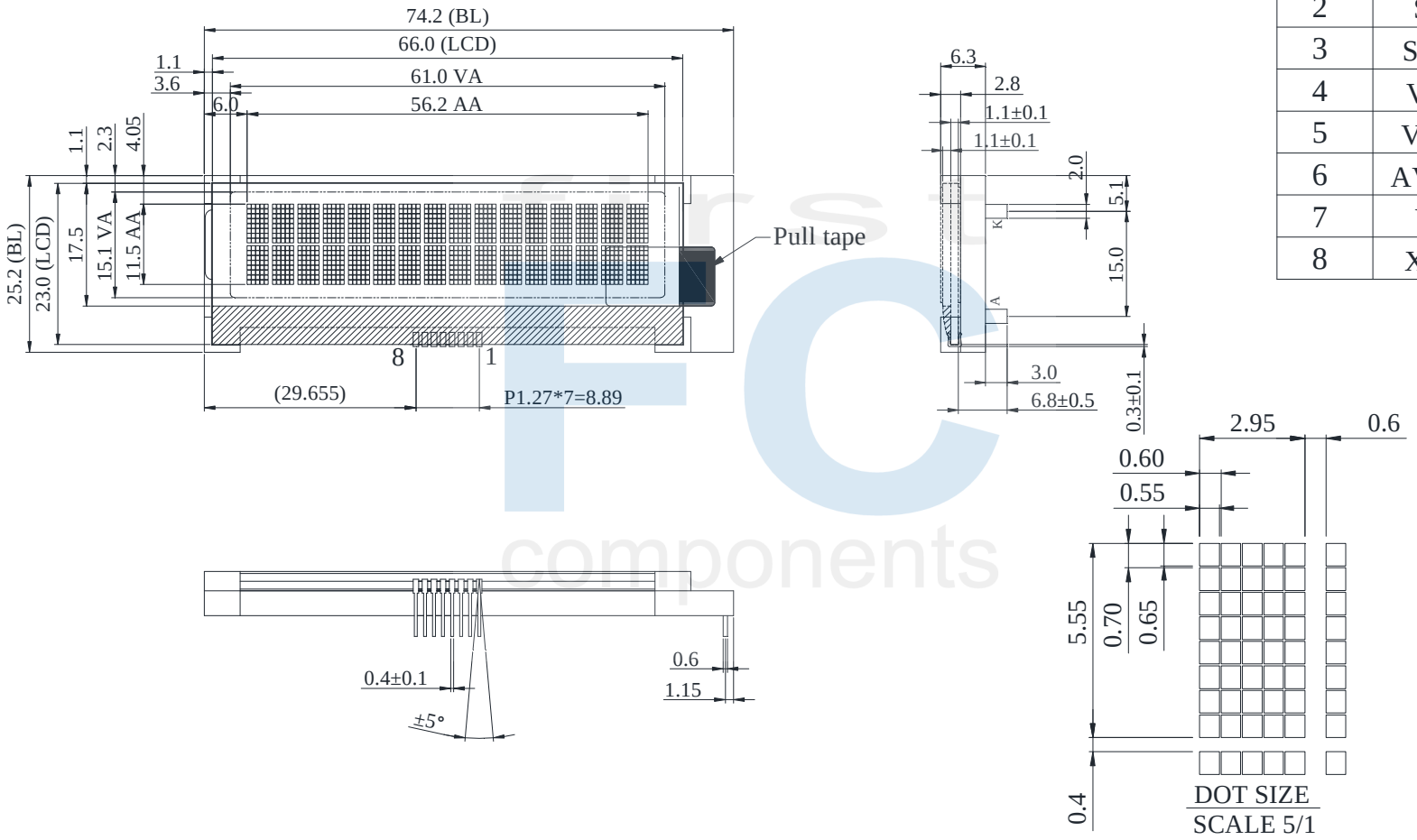
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Interface Pin Function

Pin	Symbol	Function Description
1	RSTB	External reset pin
2	SCL	Serial clock input
3	SDA	Serial Data signal
4	VSS	Ground
5	VDD	Power supply
6	AVDD	AVDD is the source of VG regulator.
7	V0	V0 is the LCD driving voltage for common circuits at negative frame.
8	XV0	XV0 is the LCD driving voltage for common circuits at positive frame.

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Contour Drawing



PIN NO.	SYMBOL
1	RSTB
2	SCL
3	SDA
4	VSS
5	VDD
6	AVDD
7	V0
8	XV0

The non-specified tolerance of dimension is ±0.3mm.