LCD / LCM SPECIFICATION



WINSTAR Display Co.,Ltd.
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Winstar Display Co., LTD

SPECIFICATION

CUSTOMER : _____

MODULE NO.: WO1602AT-85HI5#FC

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

SALES BY	APPROVED BY	CHECKED BY	PREPARED BY

VERSION	DATE	REVISED PAGE NO.	SUMMARY
A	2020/12/29		Add Interface

First FC components

Winstar Display Co.,

MODLE NO：

WO1602AT-85HI5#FC

RECORDS OF REVISION			DOC. FIRST ISSUE
VERSION	DATE	REVISED PAGE NO.	SUMMARY
0	2020/07/10		First issue
A	2020/12/29		Add Interface

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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	66.0 x 28.0 x 9.3	mm
View area	40.0 x 9.98	mm
Active area	38.0 x 7.98	mm
Dot size	0.36 x 0.43	mm
Dot pitch	0.41 x 0.48	mm
Character size	2.00 x 3.79	mm
Character pitch	2.40 x 4.19	mm
LCD type	FSTN Positive Transflective, (In LCD production, It will occur slightly color difference. We can only guarantee the same color in the same batch.)	
Duty	1/16 , 1/5 Bias	
View direction	6 o'clock	
Backlight Type	LED, White	
IC	ST7032i	
Interface	I2C	

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Absolute Maximum Ratings

Item	Symbol	Min	Typ	Max	Unit
Operating Temperature	T_{OP}	-20	—	+70	℃
Storage Temperature	T_{ST}	-30	—	+80	℃
Input Voltage	V_{IN}	-0.3	—	V_{DD}+0.3	V
Power Supply Voltage	V_{DD}-V_{SS}	-0.3	—	+6.0	V
LCD Driver Voltage	V_{LCD}	2.7	—	7.0	V

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Electrical Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage For Logic	V_{DD}-V_{SS}	—	4.5	5.0	5.5	V
Supply Voltage For LCD	V_{LCD}	Ta=-20℃ Ta=25℃ Ta=70℃	— 4.3 —	— 4.5 —	— 4.7 —	V V 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(No include LED Backlight)	I_{DD}	—	—	0.2	1	mA

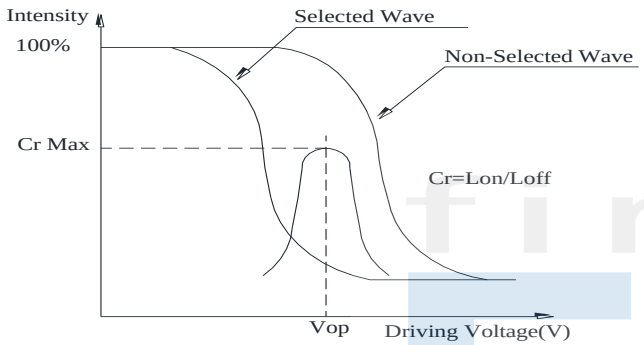
Note1: Please kindly consider to design the Vop to be adjustable while programing the software to match LCD contrast tolerance.

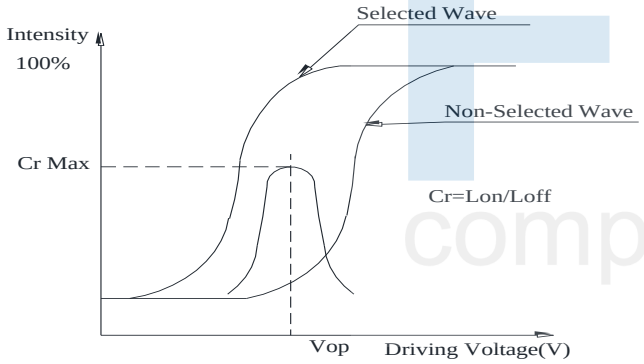
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Optical Characteristics

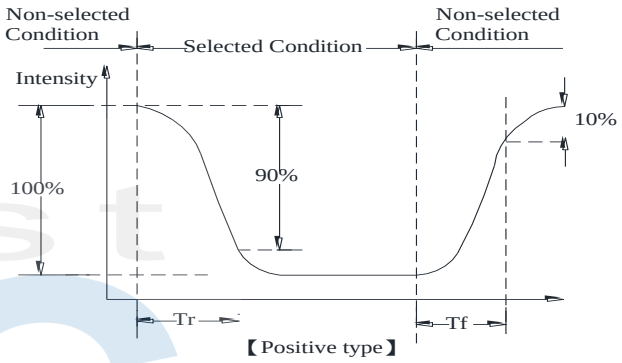
Item	Symbol	Condition	Min	Typ	Max	Unit
View Angle	θ	CR≧2	0	—	30	ϕ = 180°
	θ	CR≧2	0	—	60	ϕ = 0°
	θ	CR≧2	0	—	45	ϕ = 90°
	θ	CR≧2	0	—	45	ϕ = 270°
Contrast Ratio	CR	—	—	5	—	—
Response Time	T rise	—	—	150	200	ms
	T fall	—	—	150	200	ms

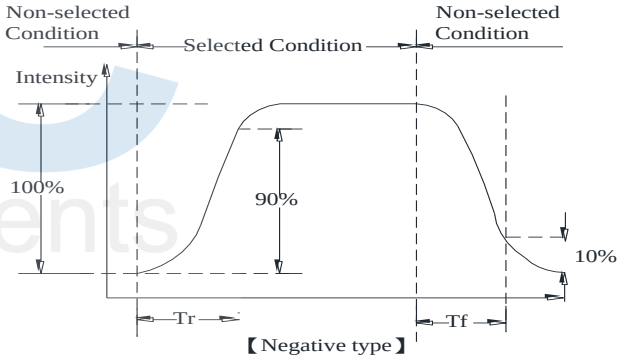
Definition of Operation Voltage (Vop)





Definition of Response Time (Tr , Tf)



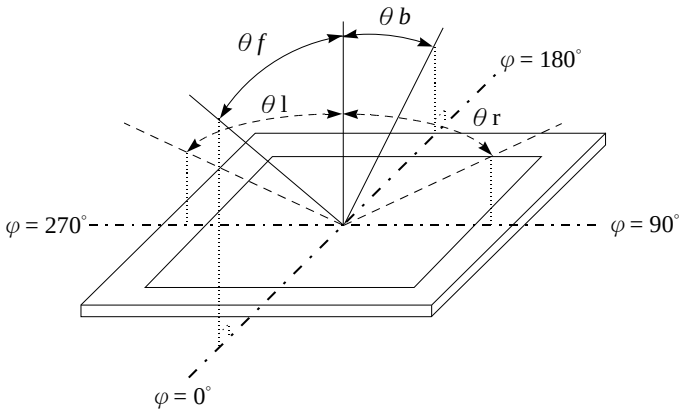


Conditions :

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)



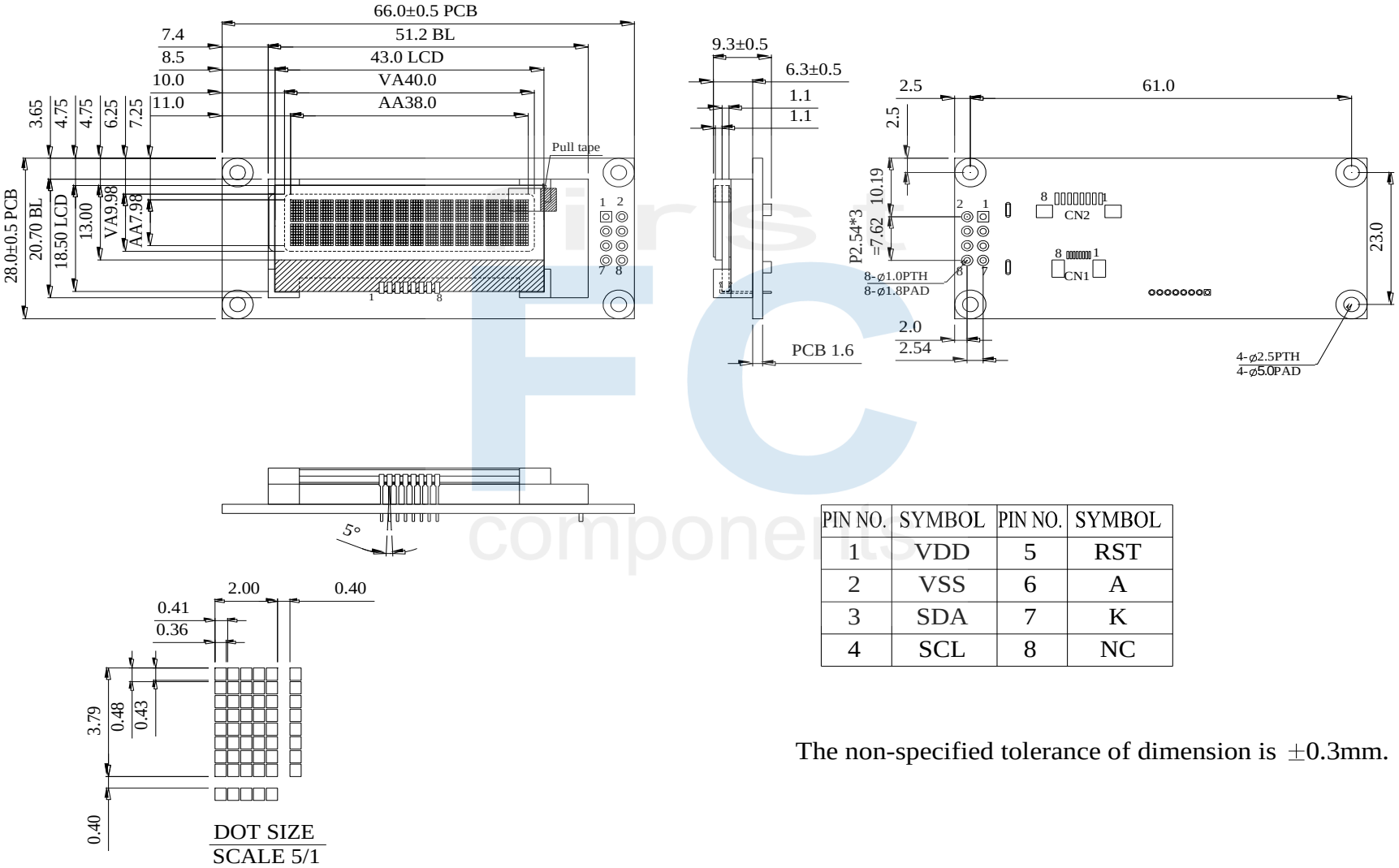
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Interface Pin Function

Pin No.	Symbol	Level	Description
1	VDD	P	Power supply
2	VSS	P	Ground
3	SDA	-	(In I2C interface DB7 (SDA) is input data. SDA and SCL must connect to I2C bus (I2C bus is to connect a resister between SDA/SCL and the power of I2C bus).
4	SCL	-	(In I2C interface DB6 (SCL) is clock input. SDA and SCL must connect to I2C bus (I2C bus is to connect a resister between SDA/SCL and the power of I2C bus).
5	RST	-	RESET (Low active)
6	A	-	LED+
7	K	-	LED-
8	NC	-	No Connection

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Contour Drawing



PIN NO.	SYMBOL	PIN NO.	SYMBOL
1	VDD	5	RST
2	VSS	6	A
3	SDA	7	K
4	SCL	8	NC

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