LCD / LCM SPECIFICATION



WINSTAR Display Co.,Ltd.
華凌光電股份有限公司

Represented by:

first FC components
FIRST Components s.r.l.
www.first-components.com
technical@first-components.com
+39 0332 1888005

Winstar Display Co., LTD
華凌光電股份有限公司

SPECIFICATION

CUSTOMER : _____

MODULE NO.: WH4004A1-YGH-CT#

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

SALES BY	APPROVED BY	CHECKED BY	PREPARED BY

VERSION	DATE	REVISED PAGE NO.	SUMMARY
0	2022/11/03		First issue

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Winstar Display Co.,

華凌光電股份有限公司

	MODLE NO：
RECORDS OF REVISION	**DOC. FIRST ISSUE**

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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	40 characters x 4Lines	—
Module dimension	190.0 x 54.0 x 13.6 (MAX)	mm
View area	147.0 x 29.5	mm
Active area	140.45 x 23.16	mm
Dot size	0.50 x 0.55	mm
Dot pitch	0.57 x 0.62	mm
Character size	2.78 x 4.89	mm
Character pitch	3.53 x 6.09	mm
LCD type	STN Positive, Gray Transflective (In LCD production, It will occur slightly color difference. We can only guarantee the same color in the same batch.)	
Duty	1/16	
View direction	6 o'clock	
Backlight Type	LED, Yellow Green	
IC	ST7066U	
Interface	68 series	

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Absolute Maximum Ratings

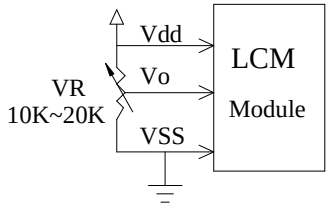
Item	Symbol	Min	Typ	Max	Unit
Operating Temperature	T_{OP}	-20	—	+70	℃
Storage Temperature	T_{ST}	-30	—	+80	℃
Input Voltage	V_I	V_{SS}	—	V_{DD}	V
Supply Voltage For Logic	V_{DD}-V_{SS}	-0.3	—	7	V
Supply Voltage For LCD	V_{DD}-V_o	-0.3	—	13	V

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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_{DD}-V_0	Ta=-20℃	—	—	5.7	V
*Note		Ta=25℃	4.2	4.35	4.5	V
		Ta=70℃	3.8	—	—	V
Input High Volt.	V_{IH}	—	0.7 V_{DD}	—	V_{DD}	V
Input Low Volt.	V_{IL}	—	V_{SS}	—	0.6	V
Output High Volt.	V_{OH}	—	3.9	—	V_{DD}	V
Output Low Volt.	V_{OL}	—	0	—	0.4	V
Supply Current	I_{DD}	V_{DD}=5.0V	1.8	3.5	7.0	mA

* Note: Please design the VOP adjustment circuit on customer's main board

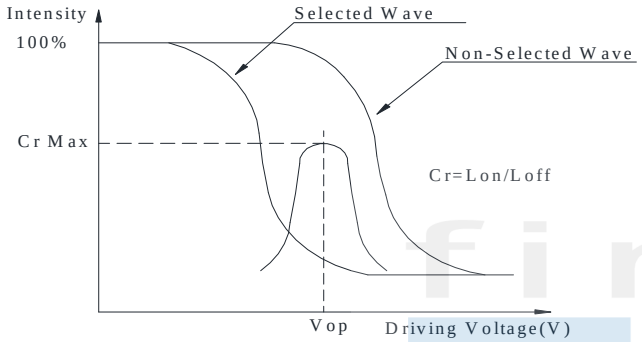


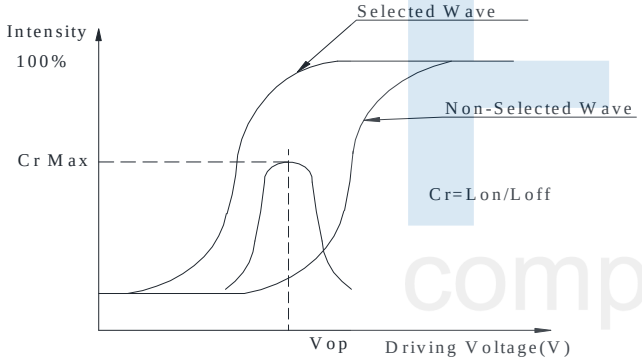
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Optical Characteristics

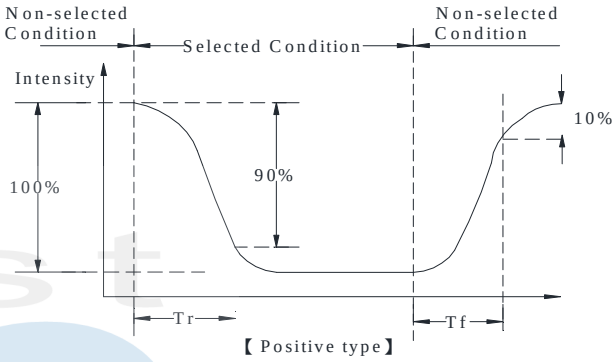
Item	Symbol	Condition	Min	Typ	Max	Unit
View Angle	θ	CR≧2	0	—	20	$\phi = 180^\circ$
	θ	CR≧2	0	—	40	$\phi = 0^\circ$
	θ	CR≧2	0	—	30	$\phi = 90^\circ$
	θ	CR≧2	0	—	30	$\phi = 270^\circ$
Contrast Ratio	CR	—	—	3	—	—
Response Time	T rise	—	—	150	200	ms
	T fall	—	—	150	200	ms

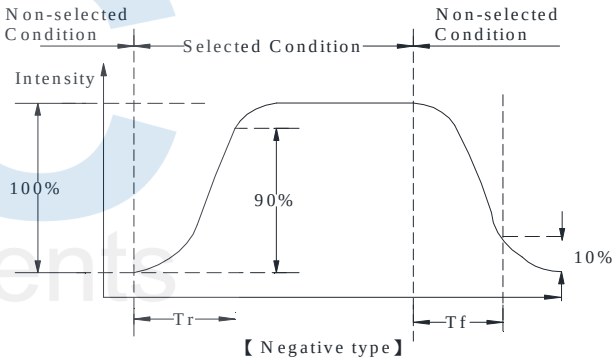
Definition of Operation Voltage (Vop)





Definition of Response Time (Tr , Tf)



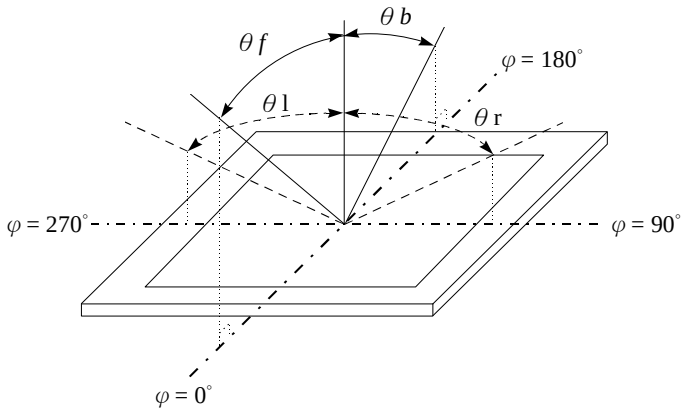


Conditions :

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)

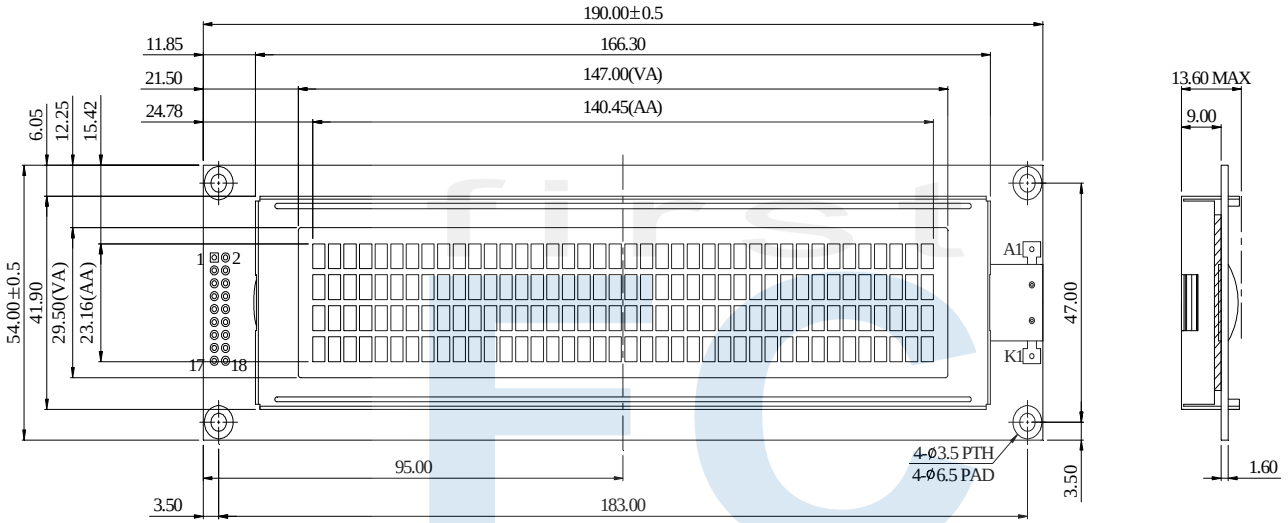


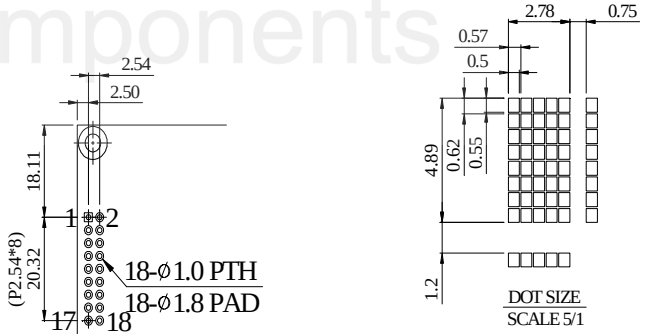
Interface Pin Function

Pin No.	Symbol	Level	Description
1	DB7	H/L	Data bus line
2	DB6	H/L	Data bus line
3	DB5	H/L	Data bus line
4	DB4	H/L	Data bus line
5	DB3	H/L	Data bus line
6	DB2	H/L	Data bus line
7	DB1	H/L	Data bus line
8	DB0	H/L	Data bus line
9	E1	H,H→L	Chip enable signal
10	R/W	H/L	H: Read(Module→MPU) L: Write(MPU→Module)
11	RS	H/L	H: DATA, L: Instruction code
12	VO	(Variable)	Operating voltage for LCD
13	V_{SS}	0V	Ground
14	V_{DD}	5.0V	Supply Voltage for logic
15	E2	H,H→L	Chip enable signal
16	NC	—	NC
17	A	—	Power Supply for LED+
18	K	—	Power Supply for LED-

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Contour Drawing &Block Diagram





PIN NO.	SYMBOL
1	DB7
2	DB6
3	DB5
4	DB4
5	DB3
6	DB2
7	DB1
8	DB0
9	E1
10	R/$\overline{W}$
11	RS
12	Vo
13	Vss
14	Vdd
15	E2
16	NC
17	A
18	K

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

Backlight Information

Specification

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	TEST CONDITION
Supply Current	ILED	300	600	720	mA	V=4.2V
Supply Voltage	V	3.85	4.2	4.35	V	—
Reverse Voltage	VR	—	—	8	V	—
Luminance (Without LCD)	IV	210	260	—	CD/M^2	ILED=600mA
Wave Length	λp	569	572	575	nm	ILED=600mA
Life Time	—	—	100000	—	Hr.	ILED≦600mA 25℃,50-60%RH
Color	Yellow Green					

Note: A backlight driven by voltage will keep the drive current under the safe area (current between minimum and maximum).
If the B/L LED is driven by current only, the drive voltage cannot be considered as a reference value.

Drive from pin17,pin18

