

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

SPECIFICATION

CUSTOMER : _____

MODULE NO.: WO240128-84IC#FC

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

SALES BY	APPROVED BY	CHECKED BY	PREPARED BY

VERSION	DATE	REVISED PAGE NO.	SUMMARY
0	2025/02/11		First issue

General Specification

Item	Dimension	Unit
Number of Characters	240 x 128 dots	—
Module dimension	98.7x 67.7 x 5.7	mm
View area	92.0 x 53.0	mm
Active area	83.975 x 44.775	mm
Dot size	0.325 x0.325	mm
Dot pitch	0.35 x 0.35	mm
LCD type	STN Negative, Blue Transmissive (In LCD production, It will occur slightly color difference. We can only guarantee the same color in the same batch.)	
Duty	1/128 , 1/12 Bias	
View direction	6 o'clock	
Backlight Type	LED White	
IC	UC1528c	
Interface	6800/8080/4-Line SPI/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	℃
Supply Voltage For Logic	V_{DD}	-0.3	—	+4.0	V
Supply Voltage For LCD Drive	V_{LCD}	-0.3	—	+18.0	V
Input voltage range	V_{IN}	-0.4	—	V_{DD}+0.5	V

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Electrical Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage For Logic	V_{DD}-V_{SS}	—	2.7	3.0	3.3	V
Supply Voltage For LCM	V_{LCD}	Ta=-20℃	—	—	—	V
		Ta=25℃	14.9	15.2	15.5	V
		Ta=70℃	—	—	—	V
Input High Volt.	V_{IH}	—	0.8 V_{DD}	—	V_{DD}	V
Input Low Volt.	V_{IL}	—	V_{SS}	—	0.2 V_{DD}	V
Output High Volt.	V_{OH}	—	0.8 V_{DD}	—	V_{DD}	V
Output Low Volt.	V_{OL}	—	V_{SS}	—	0.2 V_{DD}	V
Supply Current (No include LED Backlight)	I_{DD}	V_{DD}=3.0V	—	1.18	2.5	mA

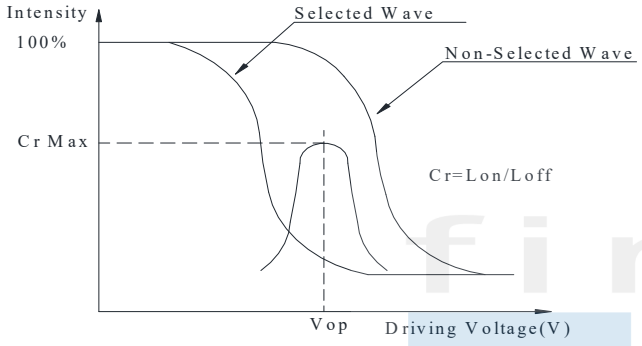
Please kindly consider to design the Vop to be adjustable while programing the software to match LCD contrast tolerance.

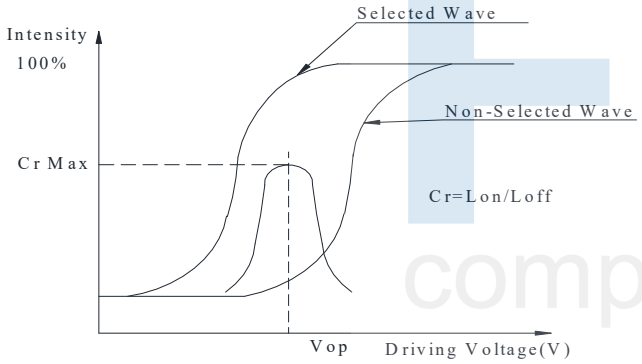
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Optical Characteristics

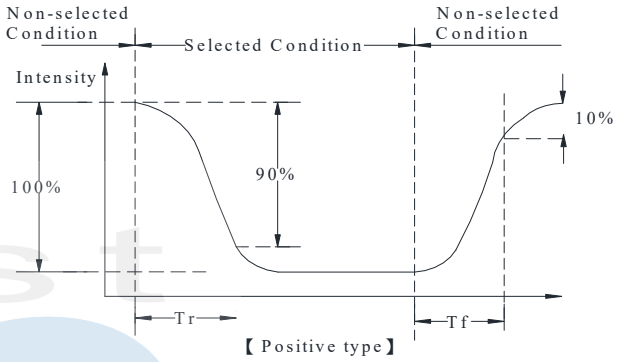
Item	Symbol	Condition	Min	Typ	Max	Unit
View Angle	θ	CR≧2	0	—	20	$\phi = 180^\circ$
	θ	CR≧2	0	—	40	$\phi = 0^\circ$
	θ	CR≧2	0	—	30	$\phi = 90^\circ$
	θ	CR≧2	0	—	30	$\phi = 270^\circ$
Contrast Ratio	CR	—	—	3	—	—
Response Time	T rise	—	—	200	300	ms
	T fall	—	—	250	350	ms

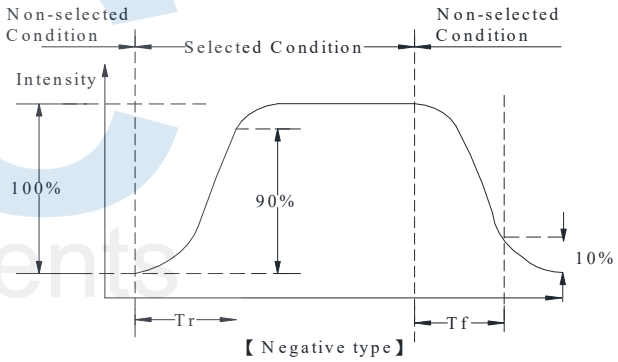
Definition of Operation Voltage (Vop)





Definition of Response Time (Tr , Tf)



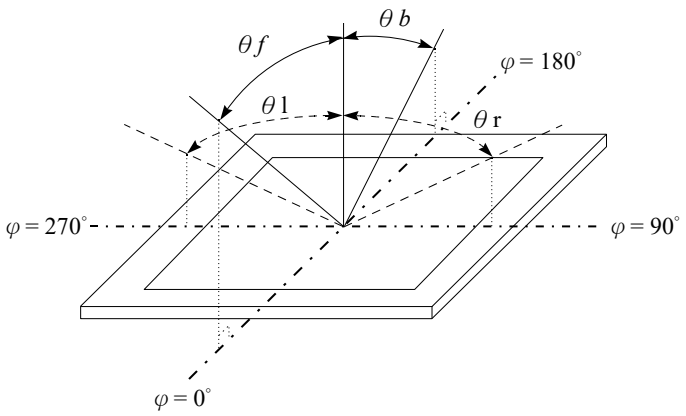


Conditions :

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)

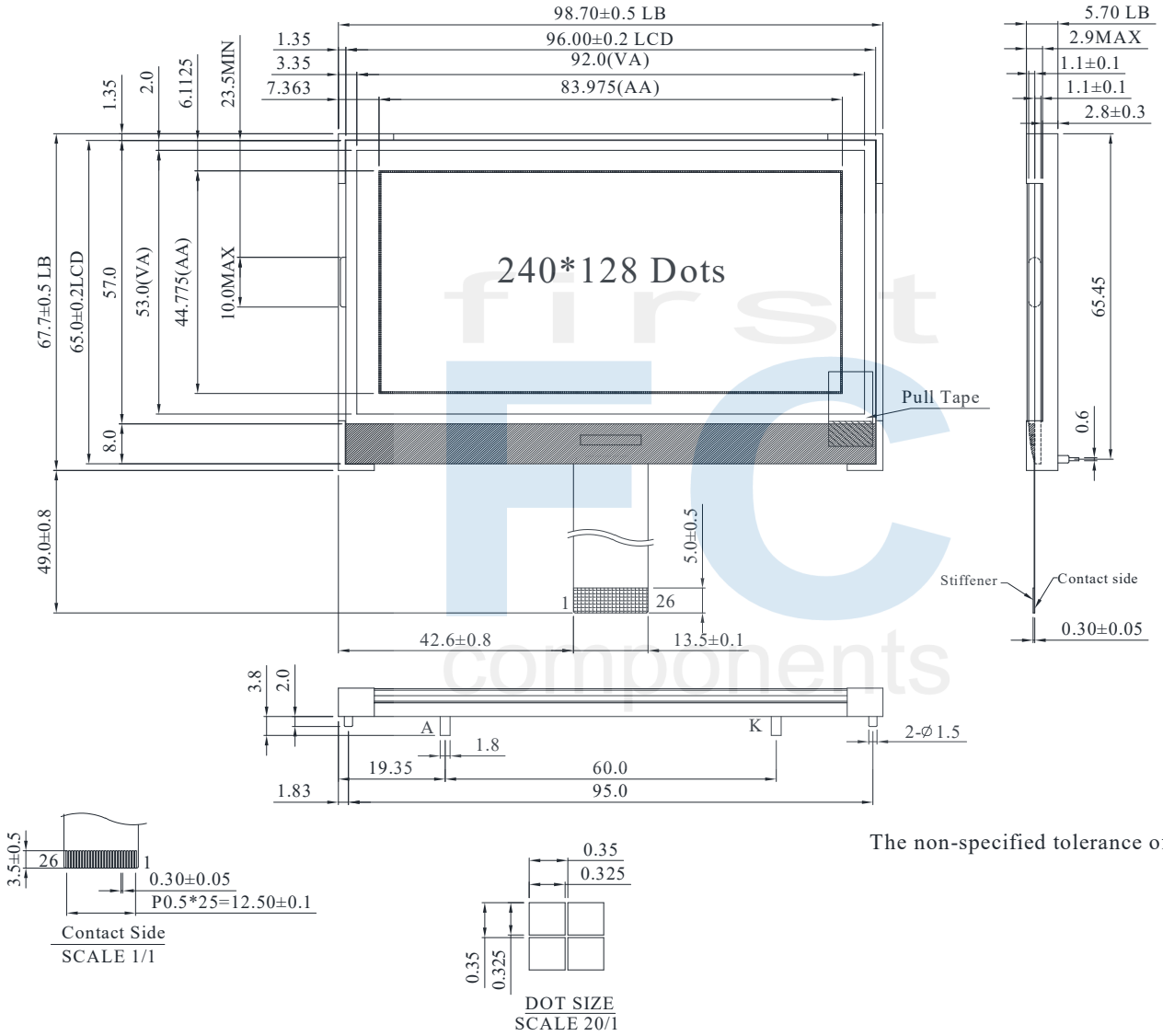


Interface Pin Function

<table>
<tr><th>Pin No</th><th>Symbol</th><th>Function Description</th></tr>
<tr><td>1</td><td>ESD</td><td>ESD</td></tr>
<tr><td>2</td><td>VB0+</td><td rowspan="4">LCD Bias Voltages.</td></tr>
<tr><td>3</td><td>VB1+</td></tr>
<tr><td>4</td><td>VB1-</td></tr>
<tr><td>5</td><td>VB0-</td></tr>
<tr><td>6</td><td>VLCD</td><td>High voltage LCD Power Supply.</td></tr>
<tr><td>7</td><td>VDD</td><td rowspan="2">Power supply</td></tr>
<tr><td>8</td><td>VDD</td></tr>
<tr><td>9</td><td>VSS</td><td>Ground</td></tr>
<tr><td>10</td><td>BM1</td><td rowspan="2">Bus mode: The interface bus mode is determined by BM[1:0]:
<table><tr><th>Mode</th><th>BM[1:0]</th></tr><tr><td>8080 (8-bit)</td><td>10</td></tr><tr><td>6800 (8-bit)</td><td>11</td></tr><tr><td>4-wire SPI w/ 8-bit token (S8)</td><td>01</td></tr><tr><td>2-wire SPI (I²C)</td><td>00</td></tr></table></td></tr>
<tr><td>11</td><td>BM0</td></tr>
<tr><td>12</td><td>WR1</td><td rowspan="2">WR[1:0] controls the read/write operation of the host interface. See section Host Interface for more detail.</td></tr>
<tr><td>13</td><td>WR0</td></tr>
<tr><td>14</td><td>CD</td><td>Select Control data or Display data for read/write operation.
”L”: Control data ”H”: Display data / command</td></tr>
<tr><td>15</td><td>CS1</td><td rowspan="2">Chip Select. Chip is selected when CS1=”H” and CS0 = “L”. When the chip is not selected, DB[7:0] will be high impedance.</td></tr>
<tr><td>16</td><td>CS0</td></tr>
<tr><td>17</td><td>RST</td><td>Hardware reset input pin</td></tr>
<tr><td>18</td><td>D0</td><td rowspan="8">Bi-directional bus for both serial and parallel host interfaces.
In serial modes, connect DB[0] to SCK, DB[3] to SDAI for write and DB[5:4] to SDAO for read. SDAI and SDAO may be connected together if necessary.
<table><tr><th></th><th>D7</th><th>D6</th><th>D5</th><th>D4</th><th>D3</th><th>D2</th><th>D1</th><th>D0</th></tr><tr><td>8-bit (BM=1x)</td><td colspan="8">DB[7:0]</td></tr><tr><td>S8 (BM=01)</td><td>–</td><td>–</td><td>SDAO</td><td>SDAO</td><td>SDAI</td><td>–</td><td>–</td><td>SCK</td></tr><tr><td>I²C (BM=00)</td><td>–</td><td>–</td><td>SDAO</td><td>SDAO</td><td>SDAI</td><td>–</td><td>–</td><td>SCK</td></tr></table></td></tr>
<tr><td>19</td><td>D1</td></tr>
<tr><td>20</td><td>D2</td></tr>
<tr><td>21</td><td>D3</td></tr>
<tr><td>22</td><td>D4</td></tr>
<tr><td>23</td><td>D5</td></tr>
<tr><td>24</td><td>D6</td></tr>
<tr><td>25</td><td>D7</td><td>Connect unused pins to VSS.</td></tr>
<tr><td>26</td><td>ESD</td><td>ESD</td></tr>
</table>

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Contour Drawing



Pin No.	Symbol
1	ESD
2	VB0+
3	VB1+
4	VB1-
5	VB0-
6	VLCD
7	VDD
8	VDD
9	VSS
10	BM1
11	BM0
12	WR1
13	WR0
14	CD
15	CS1
16	CS0
17	RST
18	D0
19	D1
20	D2
21	D3
22	D4
23	D5
24	D6
25	D7
26	ESD

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