



**WINSTAR Display Co.,Ltd.**  
**華凌光電股份有限公司**

## SPECIFICATION

**MODULE NO.: WG12232C**

### General Specification

Item	Dimension	Unit
Number of dots	122 x 32	—
Module dimension	84.0 x 44.0 x 13.7 (MAX)	mm
View area	60.0 x 18.0	mm
Active area	53.64 x 15.64	mm
Dot size	0.40 x 0.45	mm
Dot pitch	0.44 x 0.49	mm
Duty	1/32	
Backlight Type	LED	
IC	SBN1661G	
Interface	6800/8080	

## Absolute Maximum Ratings

Item	Symbol	Min	Typ	Max	Unit
Operating Temperature	$T_{OP}$	-20	—	+70	°C
Storage Temperature	$T_{ST}$	-30	—	+80	°C
Input Voltage	$V_I$	-0.3	—	$V_{DD}+0.3$	V
Supply Voltage For Logic	$V_{DD}-V_{SS}$	-0.3	—	+6.0	V
LCD bias voltage	$V_{LCD}$	3.5	—	13	V

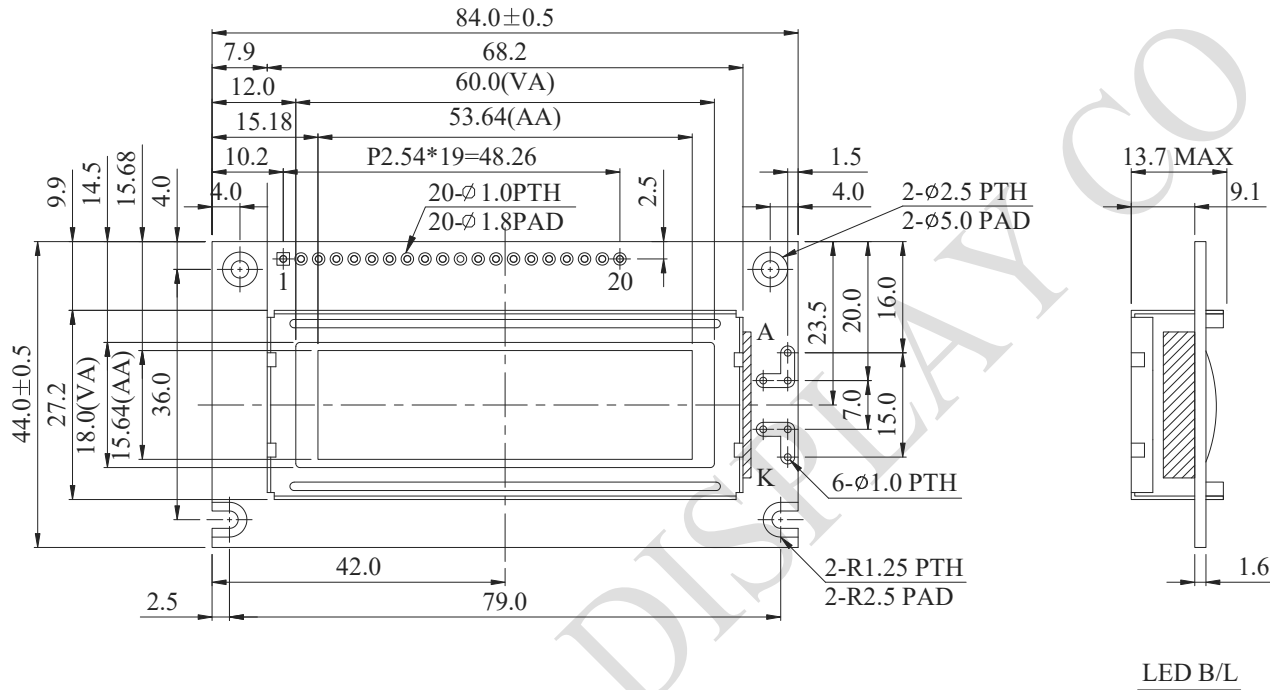
## Electrical Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage For Logic	$V_{DD}-V_{SS}$	—	2.7	3.3	3.6	V
Supply Voltage For LCD	$V_{DD}-V_0$	$T_a=-20^{\circ}\text{C}$	—	—	5.3	V
		$T_a=25^{\circ}\text{C}$	4.3	4.45	4.6	V
		$T_a=+70^{\circ}\text{C}$	4.2	—	—	V
Input High Volt.	$V_{IH}$	$V_{DD}=3.3$	2.7	3.3	$V_{DD}+0.5$	V
Input Low Volt.	$V_{IL}$	—	0	0.7	1.1	V
Output High Volt.	$V_{OH}$	—	$V_{DD}-0.3$	—	$V_{DD}$	V
Output Low Volt.	$V_{OL}$	—	0	—	0.3	V
Supply Current	$I_{DD}$	$V_{DD}=3.0\text{V}$	—	1.0	—	mA

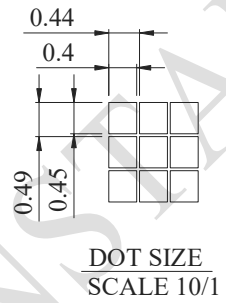
# Interface Pin Function

Pin No.	Symbol	Level	Description
1	VSS	0V	Ground
2	Vdd	3.0V	Power supply for logic
3	Vo	(Variable)	Operating voltage for LCD
4	A0	H/L	H : Data L : Instruction
5	CS1	H/L	Chip select signal for IC1
6	CS2	H/L	Chip select signal for IC2
7	CL	—	External clock 2KHz
8	E	H/L	Enable Signal
9	R/W	H/L	H : Read ; L : Write
10	DB0	H/L	Data bus line
11	DB1	H/L	Data bus line
12	DB2	H/L	Data bus line
13	DB3	H/L	Data bus line
14	DB4	H/L	Data bus line
15	DB5	H/L	Data bus line
16	DB6	H/L	Data bus line
17	DB7	H/L	Data bus line
18	/RES	H/L	68-series MPU when H→L the LCM is reset. 80- series MPU when L→H the LCM is reset. High level:68-series MPU interface Low level:80-series MPU interface
19	Vee	—	Negative voltage output
20	NC	—	No connection

# Contour Drawing



PIN NO.	SYMBOL
1	V <sub>SS</sub>
2	V <sub>DD</sub>
3	V <sub>O</sub>
4	A0
5	CS1
6	CS2
7	CL
8	E
9	R/W
10	DB0
11	DB1
12	DB2
13	DB3
14	DB4
15	DB5
16	DB6
17	DB7
18	RES
19	V <sub>EE</sub>
20	NC



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