

1. SPECIFICATIONS

1.1 Features

Item	Standard Value
Display Type	20*2 Characteristics
LCD Type	STN Gray Positive Reflective Normal Temp.
Driver Condition	LCD Module : 1/16 Duty , 1/4 Bias
Viewing Direction	6 O'clock
Backlight	—
Weight	58g
Interface	—
Other	—

1.2 Mechanical Specifications

Item	Standard Value	Unit
Outline Dimension	116.0(L)*37.0(W)*10.2(H)(max)	mm
Viewing Area	85.0(L) *18.6(W)	mm
Active Area	73.5(L)*11.5(W)	mm
Dot Size	0.60(L)*0.65(W)	mm
Dot Pitch	0.65(L)*0.70(W)	mm

Note : For detailed information please refer to LCM drawing

1.3 Absolute Maximum Ratings

Item	Symbol	Condition	Min.	Max.	Unit
Power Supply Voltage	V _{DD}	—	-0.3	7.0	V
LCD Driver Supply Voltage	V _{LCD}	—	V _{DD} -10.0	V _{DD} +0.3	V
Input Voltage	V _{IN}	—	-0.3	V _{DD} +0.3	V
Operating Temperature	T _{OP}	Excluded B/L	0	50	°C
Storage Temperature	T _{ST}	Excluded B/L	-20	70	°C
Storage Humidity	H _D	Ta < 40 °C	-	90	%RH

1.4 DC Electrical Characteristics

$V_{DD} = 5.0 \text{ V} \pm 10\%$, $V_{SS} = 0\text{V}$, $T_a = 25^\circ\text{C}$

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Logic Supply Voltage	V_{DD}	—	4.5	5.0	5.5	V
“H” Input Voltage	V_{IH}	—	$0.7 V_{DD}$	-	V_{DD}	V
“L” Input Voltage	V_{IL}	—	-0.3	-	0.6	V
“H” Output Voltage	V_{OH}	$I_{OH} = -0.1\text{mA}$	3.9	-	V_{DD}	V
“L” Output Voltage	V_{OL}	$I_{OL} = 0.1\text{mA}$	-	-	0.4	V
Supply Current	I_{DD}	$V_{DD} = 5.0 \text{ V}$	-	2.0	3.0	mA
LCM Driver Voltage	V_{OP}	0°C	-	-	-	V
		$25^\circ\text{C} *1$	4.3	4.5	4.7	
		50°C	-	-	-	

Note: *1. THE V_{OP} TEST POINT IS $V_{DD} - V_O$

1.5 Optical Characteristics

LCD Panel : 1/16 Duty , 1/5 Bias , $V_{LCD} = 4.8 \text{ V}$, $T_a = 25^\circ\text{C}$

Item	Symbol	Conditions	Min.	Typ.	Max.	Reference
View Angle	θ	$C \geq 2.0$, $\varnothing = 0^\circ$	0°	-	40°	Notes 1 & 2
Contrast Ratio	C	$\theta = 5^\circ$, $\varnothing = 0^\circ$	-	3	-	Note 3
Response Time(rise)	t_r	$\theta = 5^\circ$, $\varnothing = 0^\circ$	-	130ms	195ms	Note 4
Response Time(fall)	t_f	$\theta = 5^\circ$, $\varnothing = 0^\circ$	-	280 ms	420ms	Note 4

2.2 Interface Pin Description

Pin No.	Symbol	Signal Description
1	V _{SS}	Power Supply (V _{SS} =0)
2	V _{DD}	Power Supply (V _{DD} >V _{SS})
3	V _O	Operating voltage for LCD
4	RS	Register Selection input High = Data register Low = Instruction register (for write) Busy flag address counter (for read)
5	$\overline{R/W}$	Read/Write signal input is used to select the read/write mode High = Read mode, Low = Write mode
6	E	Start enable signal to read or write the data
7~10	DB0 ~ DB3	Four low order bi-directional three-state data bus lines. Use for data transfer between the MPU and the LCD module. These four are not used during 4-bit operation.
11~14	DB4~DB7	Four high order bi-directional three-state data bus lines. Used for data transfer between the MPU and the LCD module. DB7 can be used as a busy flag.
15	A	NC
16	K	NC

Contrast Adjust

