

L1672

■ Features of L1672 Series

- 16 characters × 1 line
- STN gray type LCD is used
- 5 × 7 dot matrix + cursor
- 1/16 duty
- 5V single power supply

■ Specification

A. Mechanical Characteristics

Item	Specifications	Unit
Module size (H×V×T) (Reflective type)	85.0×30.0×10.1	mm
Module size (H×V×T) (Built-in LED backlight type)	85.0×30.0×15.8	mm
Viewing area (H×V)	62.0×16.0	mm
Character size (5×7 dot, H×V)	2.78×4.27	mm
Dot size (H×V)	0.50×0.55	mm
Dot space	0.07	mm
Center to center dimension of mounting holes (H×V)	82.0×24.0	mm
Weight (Reflective type)	25	g
Weight (Built-in LED backlight type)	40	g

H : Horizontal, V : Vertical, T : Thickness (max.)

B. Absolute Maximum Ratings

$V_{SS} = 0V$

Item	Symbol	Conditions	Min.	Max.	Unit
Power supply voltage	V_{DD}		-0.3	7.0	V
	V_{LC}		$V_{DD}-13.0$	$V_{DD}+0.3$	V
Input voltage	V_{IN}		-0.3	$V_{DD}+0.3$	V
Operating temp.	T_{opr}		0	+50	°C
Storage temp.	T_{stg}		-20	+60	°C
Storage humidity		≤48hrs	+20	+85	%RH
		≤1000hrs	+20	+65	%RH

C. Electrical Characteristics

$V_{DD} = 5V \pm 5\%$, $V_{SS} = 0V$, $T_a = 0^\circ C$ to $50^\circ C$

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Power supply voltage	V_{DD}		4.75	5.00	5.25	V
	$V_{DD}-V_{LC}$		1.5	—	10.0	V
Input voltage*	High	V_{IH1}	2.2	—	V_{DD}	V
	Low	V_{IL1}	0	—	0.6	V
Output voltage**	High	V_{OH1}	$-I_{OH} = 0.205mA$	2.4	—	V
	Low	V_{OL1}	$I_{OL} = 1.2mA$	—	—	0.4
Current consumption	I_{DD}	$T_a = 25^\circ C$ $V_{DD} = 5V$ $V_{LC} = 0.25V$	—	1.5	2.5	mA
	I_{LC}		—	0.2	1.0	mA
Clock oscillation frequency	f_{osc}	Resistance oscillation	190	270	350	kHz

* Applied to DB₀ ~ DB₇, E, R/ \bar{W} , RS

** Applied to DB₀ ~ DB₇

D. Optical Characteristics

D-1 Reflective type

Viewing angle : 6 o'clock ($\theta = 0^\circ$), $T_a = 25^\circ C$, $V_{opr} = 4.75V$

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Viewing angle	θ_1	$C \geq 2.0$ $\theta = 0^\circ$	—	—	-15	deg.
	θ_2		55	—	—	
	$\theta_2 - \theta_1$		70	—	—	
Contrast	C	$\theta = 25^\circ$, $\theta = 0^\circ$	2	4	—	—
Response time (rise)	t_{on}	$\theta = 0^\circ$	—	270	400	ms
Response time (fall)	t_{off}	$\theta = 0^\circ$	—	60	100	
Response time (rise)	t_{on}	$\theta = 0^\circ$, $\theta = 0^\circ$ $T_a = 0^\circ C$ $V_{opr} = 5.0V$	—	720	1100	ms
Response time (fall)	t_{off}		—	170	350	

D-2 Transflective type

Viewing angle: 6 o'clock ($\theta = 0^\circ$), $T_a = 25^\circ C$, $V_{opr} = 4.75V$, Backlight OFF

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Viewing angle	θ_1	$C \geq 2.0$ $\theta = 0^\circ$	—	—	-10	deg.
	θ_2		50	—	—	
	$\theta_2 - \theta_1$		60	—	—	
Contrast	C	$\theta = 25^\circ$, $\theta = 0^\circ$	2	4	—	—
Response time (rise)	t_{on}	$\theta = 0^\circ$	—	270	400	ms
Response time (fall)	t_{off}	$\theta = 0^\circ$	—	60	100	
Response time (rise)	t_{on}	$\theta = 0^\circ$, $\theta = 0^\circ$ $T_a = 0^\circ C$ $V_{opr} = 5.0V$	—	720	1100	ms
Response time (fall)	t_{off}		—	170	350	

E. Recommended Operating Voltage

The recommended value of (V_{opr}) for an ambient temperature is as follows.

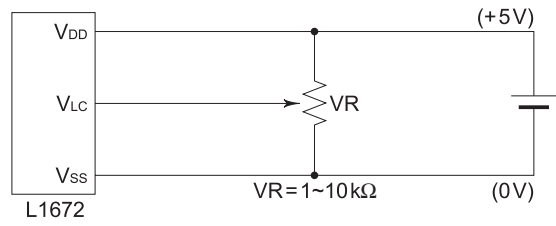
$V_{opr} = V_{DD}-V_{LC}$

Temperature (°C)	0	25	50
V_{opr} (V)	5.00	4.75	4.50

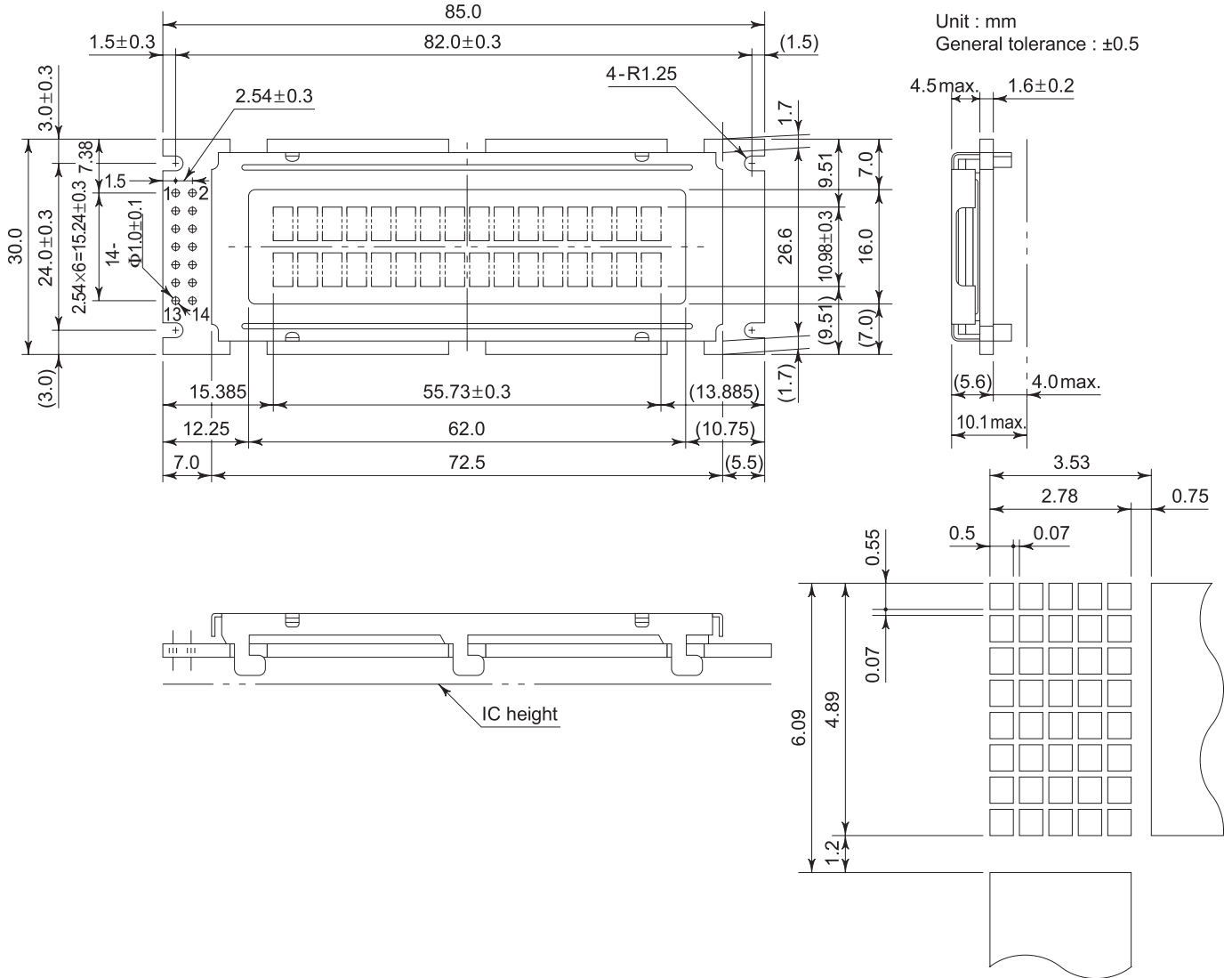
■ STN Reflective type

Item	L167200J000
Mechanical Characteristics	A
Absolute Maximum Ratings	B
Electrical Characteristics	C
Optical Characteristics	D-1
Recommended Operating Voltage	E

F-1 Power Supply



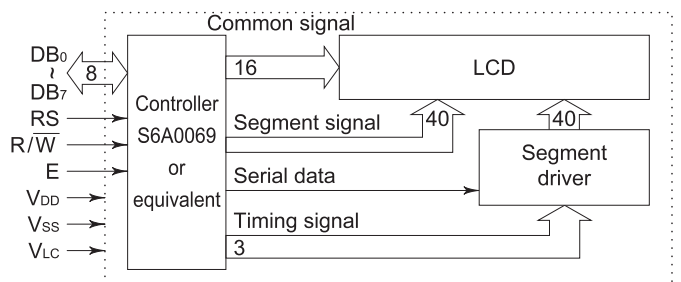
F-2 Dimensions



F-3 Pin Functions

No.	Name	Function
1	DB ₇	Data bus line
2	DB ₆	Data bus line
3	DB ₅	Data bus line
4	DB ₄	Data bus line
5	DB ₃	Data bus line
6	DB ₂	Data bus line
7	DB ₁	Data bus line
8	DB ₀	Data bus line
9	E	Enable
10	R/W	L : Data write (LCM ← MPU), H : Data read (LCM → MPU)
11	RS	L : Instruction code input, H : Data input
12	VL _c	Liquid crystal driving voltage
13	V _{SS}	GND
14	V _{DD}	Power supply voltage +5V

F-4 Block Diagram

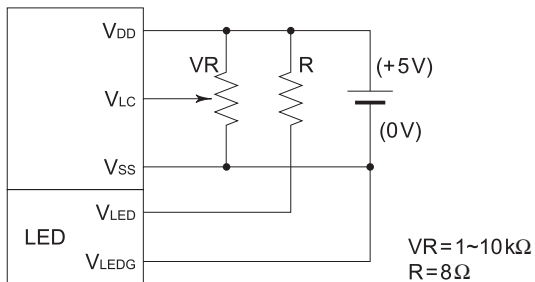


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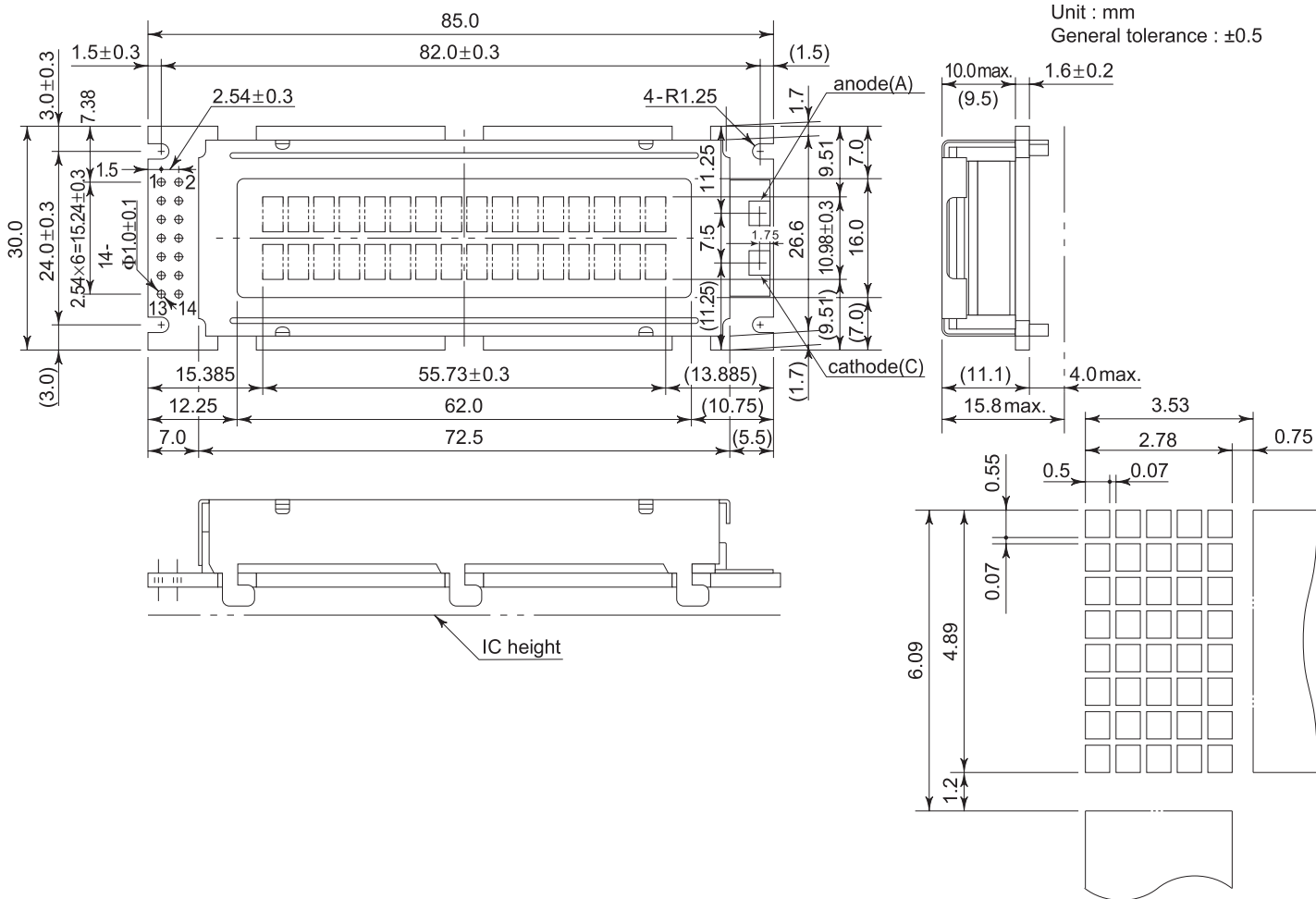
■ STN Transflective, Built-in LED Backlight type

Item	L1672B1J000
Mechanical Characteristics	A
Absolute Maximum Ratings	B
Electrical Characteristics	C
Optical Characteristics	D-2
Recommended Operating Voltage	E

G-1 Power Supply



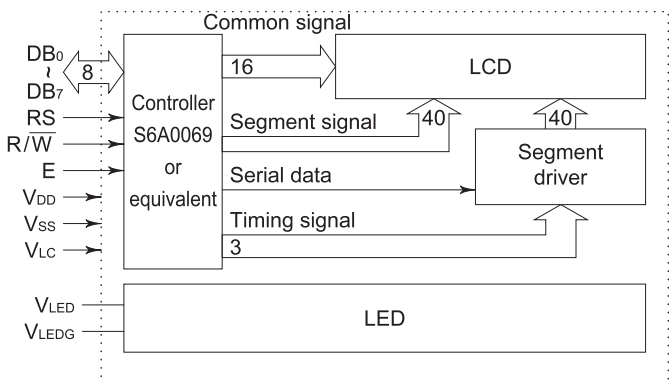
G-2 Dimensions



G-3 Pin Functions

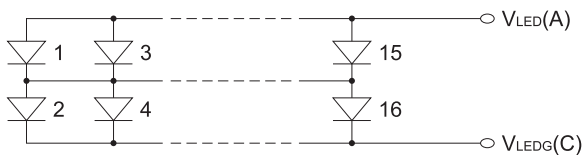
No.	Name	Function
1	DB ₇	Data bus line
2	DB ₆	Data bus line
3	DB ₅	Data bus line
4	DB ₄	Data bus line
5	DB ₃	Data bus line
6	DB ₂	Data bus line
7	DB ₁	Data bus line
8	DB ₀	Data bus line
9	E	Enable
10	R/W	L : Data write (LCM ← MPU), H : Data read (LCM → MPU)
11	RS	L : Instruction code input, H : Data input
12	V _{LC}	Liquid crystal driving voltage
13	V _{SS}	GND
14	V _{DD}	Power supply voltage +5V

G-4 Block Diagram



G-5 LED Backlight

G-5-1 LED Circuit Diagram

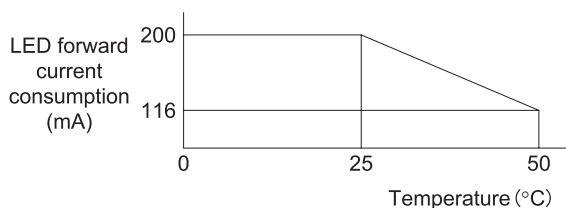


G-5-2 Absolute Maximum Ratings

Ta = 25°C

Item	Symbol	Specifications	Unit
LED forward current consumption*	I _F	200	mA
LED reverse voltage	V _R	8	V
LED allowable dissipation	P _D	0.92	W

* LED forward current consumption and operating temperature characteristics are as follows.



G-5-3 Electrical Characteristics

Ta = 25°C

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
LED forward input voltage	V _F	I _F = 112mA	3.8	4.1	4.4	V
LED reverse current	I _R	V _R = 8V	—	—	1.6	mA

G-5-4 Optical Characteristics

Ta = 25°C

Item	Symbol	Conditions	Specifications	Unit
Surface brightness (panel upper side)	B _p	I _F = 112mA V _{opr} = 0V	8 min. 10 typ.	cd/m ²
LED brightness	L	I _F = 112mA	40 min. 50 typ.	cd/m ²
LED service life			50,000 typ.	h
LED color			Yellowgreen	