

# L1671

## 5. SPECIFICATION

### ■ Features of L1671 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)	80.0×36.0×11.3	mm
Module size (H×V×T) (Built-in LED backlight type)	80.0×36.0×15.8	mm
Viewing area (H×V)	64.5×13.8	mm
Character size (5×7 dot, H×V)	3.07×5.73	mm
Dot size (H×V)	0.55×0.75	mm
Dot space	0.08	mm
Center to center dimension of mounting holes (H×V)	75.0×31.0	mm
Weight (Reflective type)	25	g
Weight (Built-in LED backlight type)	35	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	V
Current consumption	$I_{DD}$	$T_a = 25^\circ C$ $V_{DD} = 5V$	—	1.5	2.5	mA
	$I_{LC}$	$V_{LC} = 0.25V$	—	0.2	1.0	mA
Clock oscillation frequency	$f_{osc}$	Resistance oscillation	190	270	350	kHz

\* Applied to DB<sub>0</sub> ~ DB<sub>7</sub>, E, R/W, RS

\*\* Applied to DB<sub>0</sub> ~ DB<sub>7</sub>

#### 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	$\theta_1$	$C \geq 2.0$ $\theta = 0^\circ$	—	—	-15	deg.
	$\theta_2$		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	$\theta_1$	$C \geq 2.0$ $\theta = 0^\circ$	—	—	-10	deg.
	$\theta_2$		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.

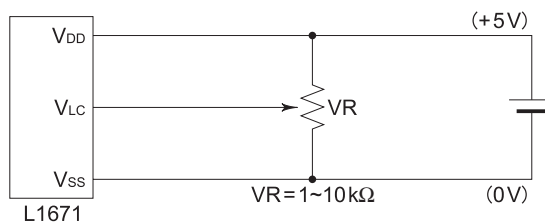
$V_{opr} = V_{DD}-V_{LC}$

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

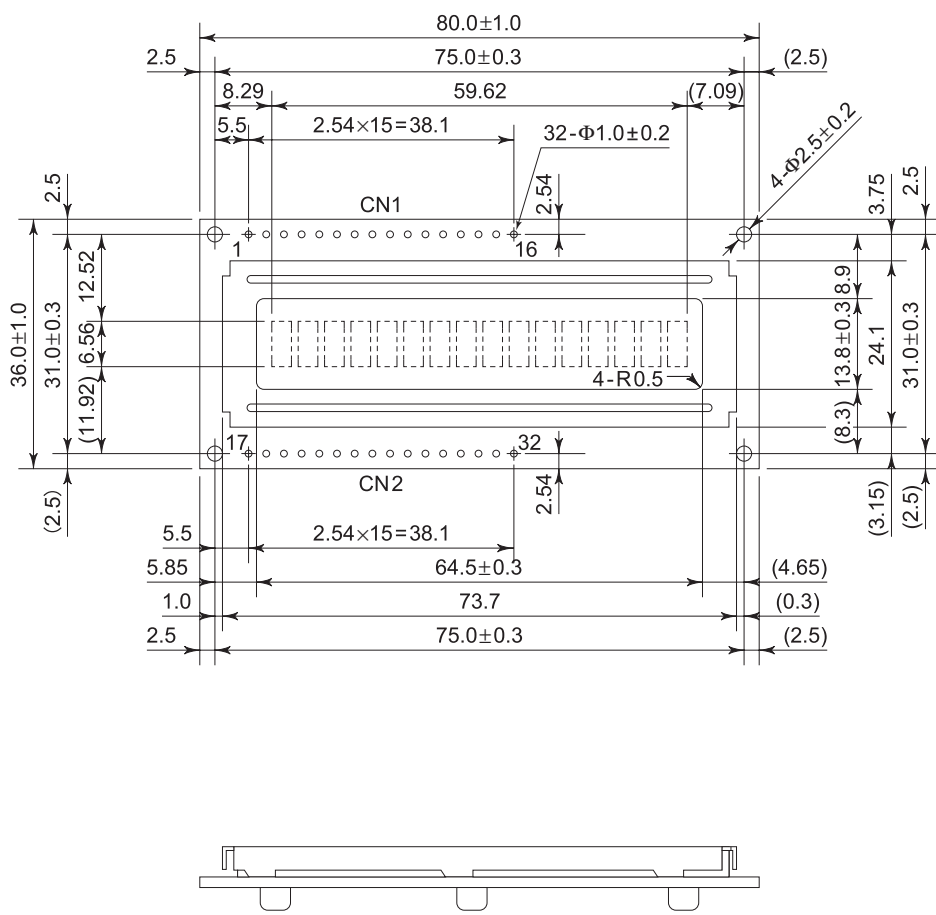
■ STN Reflective type

Item	L167100J000
Mechanical Characteristics	A
Absolute Maximum Ratings	B
Electrical Characteristics	C
Optical Characteristics	D-1
Recommended Operating Voltage	E

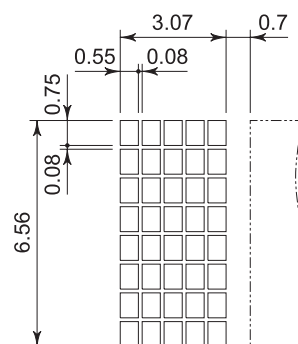
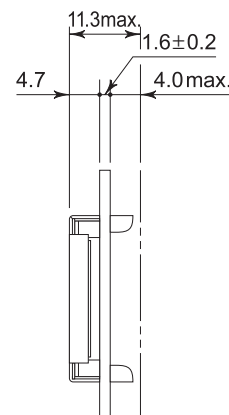
F-1 Power Supply



F-2 Dimensions



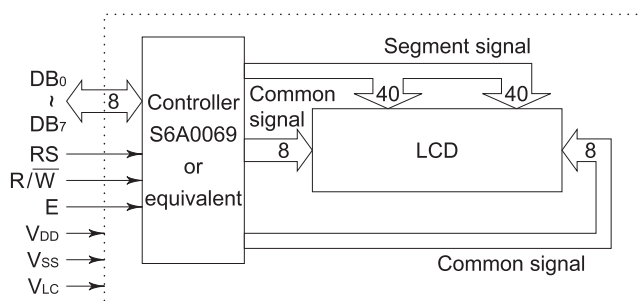
Unit : mm  
General tolerance : ±0.5



F-3 Pin Functions

No.	No.	Name	Function
1	17	V <sub>SS</sub>	GND
2	18	V <sub>DD</sub>	Power supply voltage +5V
3	19	V <sub>Lc</sub>	Liquid crystal driving voltage
4	20	RS	L : Instruction code input H : Data input
5	21	R/W	L : Data write (LCM ← MPU) H : Data read (LCM → MPU)
6	22	E	Enable
7	23	DB <sub>0</sub>	Data bus line
8	24	DB <sub>1</sub>	Data bus line
9	25	DB <sub>2</sub>	Data bus line
10	26	DB <sub>3</sub>	Data bus line
11	27	DB <sub>4</sub>	Data bus line
12	28	DB <sub>5</sub>	Data bus line
13	29	DB <sub>6</sub>	Data bus line
14	30	DB <sub>7</sub>	Data bus line
15	31	NC	—
16	32	NC	—

F-4 Block Diagram

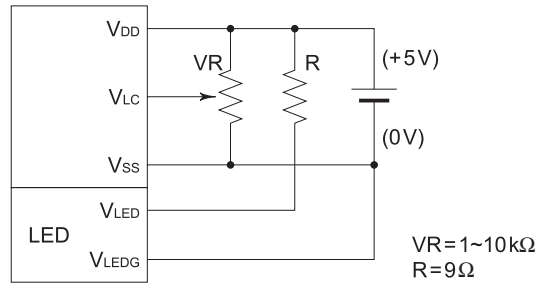


# L1671

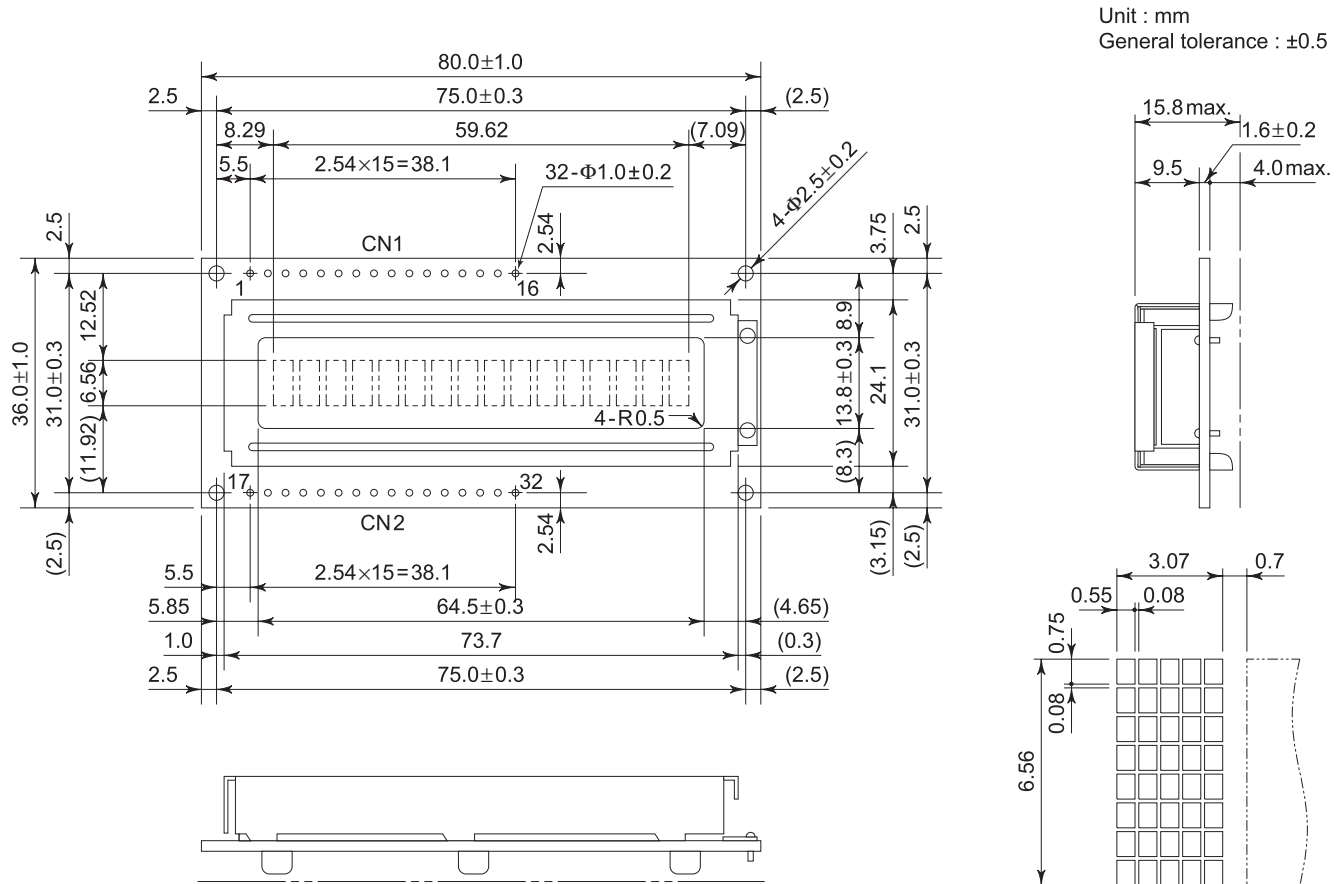
■ STN Transflective,  
Built-in LED Backlight type

Item	L1671B1J000
Mechanical Characteristics	A
Absolute Maximum Ratings	B
Electrical Characteristics	C
Optical Characteristics	D-2
Recommended Operating Voltage	E

### G-1 Power Supply



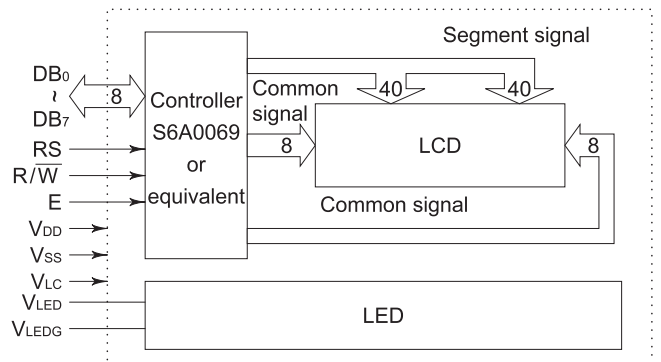
### G-2 Dimensions



### G-3 Pin Functions

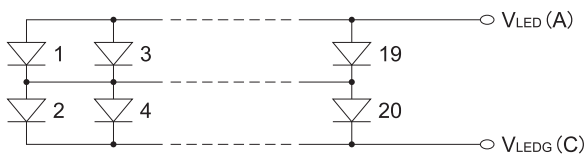
No.	No.	Name	Function
1	17	V <sub>SS</sub>	GND
2	18	V <sub>DD</sub>	Power supply voltage +5V
3	19	V <sub>LC</sub>	Liquid crystal driving voltage
4	20	RS	L : Instruction code input H : Data input
5	21	R/W	L : Data write (LCM ← MPU) H : Data read (LCM → MPU)
6	22	E	Enable
7	23	DB <sub>0</sub>	Data bus line
8	24	DB <sub>1</sub>	Data bus line
9	25	DB <sub>2</sub>	Data bus line
10	26	DB <sub>3</sub>	Data bus line
11	27	DB <sub>4</sub>	Data bus line
12	28	DB <sub>5</sub>	Data bus line
13	29	DB <sub>6</sub>	Data bus line
14	30	DB <sub>7</sub>	Data bus line
15	31	V <sub>LED</sub>	Anode
16	32	V <sub>LEDG</sub>	Cathode

### G-4 Block Diagram



G-5 LED Backlight

G-5-1 LED Circuit Diagram

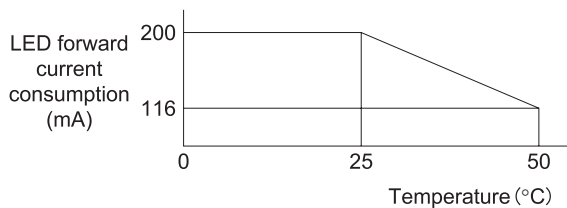


G-5-2 Absolute Maximum Ratings

Ta = 25°C

Item	Symbol	Specifications	Unit
LED forward current consumption*	I <sub>F</sub>	200	mA
LED reverse voltage	V <sub>R</sub>	8	V
LED allowable dissipation	P <sub>D</sub>	0.8	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 <sub>F</sub>	I <sub>F</sub> = 100mA	3.8	4.1	4.4	V
LED reverse current	I <sub>R</sub>	V <sub>R</sub> = 8V	—	—	1.0	mA

G-5-4 Optical Characteristics

Ta = 25°C

Item	Symbol	Conditions	Specifications	Unit
Surface brightness (panel upper side)	B <sub>p</sub>	I <sub>F</sub> = 100mA V <sub>opr</sub> = 0V	8 min. 10 typ.	cd/m <sup>2</sup>
LED brightness	L	I <sub>F</sub> = 100mA	40 min. 50 typ.	cd/m <sup>2</sup>
LED service life			50,000 typ.	h
LED color			Yellowgreen	