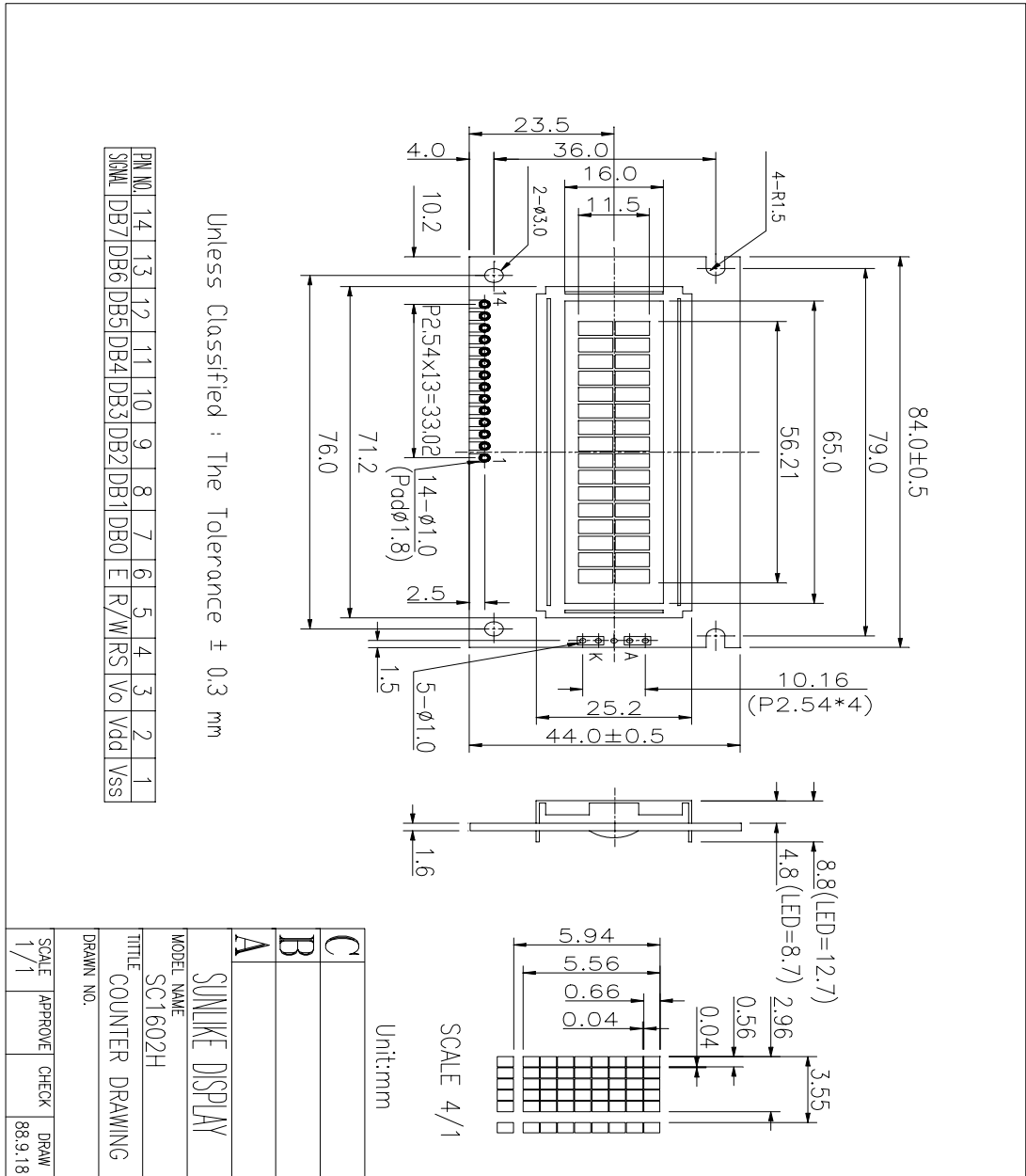


## GENERAL SPECIFICATION

ITEM	DESCRIPTION				
Product No	SC1602HSLB-XH-HS				
LCD Type	<input checked="" type="checkbox"/> STN Gray Positive	<input type="checkbox"/> STN Yellow Green Positive	<input type="checkbox"/> STN Blue Negative		
	<input type="checkbox"/> TN Negative		<input type="checkbox"/> TN Positive		
	<input type="checkbox"/> FSTN Negative White & Black		<input type="checkbox"/> FSTN Positive Black & White		
Rear Polarizer	<input type="checkbox"/> Reflective		<input checked="" type="checkbox"/> Transflective		<input type="checkbox"/> Transmissive
Backlight Type	<input type="checkbox"/> NO B/L	<input checked="" type="checkbox"/> LED		<input type="checkbox"/> CCFL	<input type="checkbox"/> EL
Backlight Color	<input checked="" type="checkbox"/> Yellow Green	<input type="checkbox"/> Green	<input type="checkbox"/> Amber	<input type="checkbox"/> White	<input type="checkbox"/> Blue Green
View Direction	<input checked="" type="checkbox"/> 6 O'clock			<input type="checkbox"/> 12 O'clock	
Temperature Range	<input type="checkbox"/> Normal			<input checked="" type="checkbox"/> Wide	
Frame	<input type="checkbox"/> Black			<input checked="" type="checkbox"/> Silver	

### TO BE VERY CAREFUL !

The LCD driver ICs are made by CMOS process, which are very easy to be damaged by static charge, make sure the user is grounded when handling the LCM.



## ABSOLUTE MAXIMUM RATING

### (1) Electrical Absolute Ratings

Item	Symbol	Min.	Max.	Unit	Note
Power Supply for Logic	$V_{DD}-V_{SS}$	-0.3	7.0	Volt	
Power Supply for LCD	$V_{DD}-V_O$	-0.3	12.0	Volt	
Input Voltage	$V_I$	-0.3	$V_{DD}$	Volt	
LED Power Dissipation	$P_{AD}$	-	0.9	W	
LED Forward current	$I_{AF}$	-	195	mA	
LED Reverse Voltage	$V_R$	-	8	V	

### (2) Environmental Absolute Maximum Ratings

Item	Normal Temperature				Wide Temperature			
	Operating		Storage		Operating		Storage	
	Min,	Max.	Min,	Max.	Min,	Max.	Min,	Max.
Ambient Temperature	0°C	+50°C	-20°C	+70°C	-20°C	+70°C	-30°C	+80°C
Humidity(without condensation)	Note 2,4		Note 3,5		Note 4,5		Note 4,6	

Note 2  $T_a \leq 50^\circ\text{C}$ : 80% RH max

$T_a > 50^\circ\text{C}$ : Absolute humidity must be lower than the humidity of 85%RH at  $50^\circ\text{C}$

Note 3  $T_a$  at  $-20^\circ\text{C}$  will be <48hrs at  $70^\circ\text{C}$  will be <120hrs when humidity is higher than 70%.

Note 4 Background color changes slightly depending on ambient temperature. This phenomenon is reversible.

Note 5  $T_a \leq 70^\circ\text{C}$ : 75RH max

$T_a > 70^\circ\text{C}$ : absolute humidity must be lower than the humidity of 75%RH at  $70^\circ\text{C}$

Note 6  $T_a$  at  $-30^\circ\text{C}$  will be <48hrs, at  $80^\circ\text{C}$  will be <120hrs when humidity is higher than 70%.

## ELECTRICAL CHARACTERISTICS

Item	Symbol	Condition	Min.	Typ	Max.	Unit	note
Power Supply for Logic	$V_{DD}-V_{SS}$	-	4.5	5.0	5.5	Volt	
Input Voltage	$V_{IL}$	L level	0	-	0.6	Volt	
	$V_{IH}$	H level	2.2	-	$V_{DD}$	Volt	
LCM Recommend LCD Module Driving Voltage	$V_{DD}-V_O$	$T_a=0^{\circ}C$	-	-	-	Volt	
		$T_a=25^{\circ}C$	4.2	4.5	4.8		
		$T_a=50^{\circ}C$	-	-	-		
Power Supply Current for LCM	$I_{DD}$	$V_{DD}=5.0V$ $V_{DD}-V_O=4.5V$	-	2.0	3.0	mA	
LED Forward Voltage	$V_F$	$I_f=140\text{ mA}$	-	4.2	4.6	Volt	
LED Forward Current	$I_F$	-	-	140	-	mA	
LED Reverse Current	$I_R$	$V_R=8V$	-	-	0.2	mA	

## OPTICAL CHARACTERISTICS

Item	Symbol	Condition	Min.	Typ	Max.	Unit	note
Viewing angle range	$\Phi f(12\text{ o'clock})$	When $Cr \geq 1.4$	-	10	-	Degree	9,10
	$\Phi b(6\text{ o'clock})$		-	30	-		
	$\Phi l(9\text{ o'clock})$		-	30	-		
	$\Phi r(3\text{ o'clock})$		-	30	-		
Rise Time	$T_r$	$V_{DD}-V_O=4.5V$ $T_a=25^{\circ}C$	-	200		mS	
Fall Time	$T_f$		-	250			
Frame frequency	$F_{rm}$		-	64	-	Hz	8,10
Contrast	$Cr$		-	3.0	-		7
The Brightness Of Backlight	$L$	$I_F=140\text{ mA}$	120	190	-	$cd/m^2$	
Peak Emission Wavelength	$\lambda P$		-	570	-	nm	

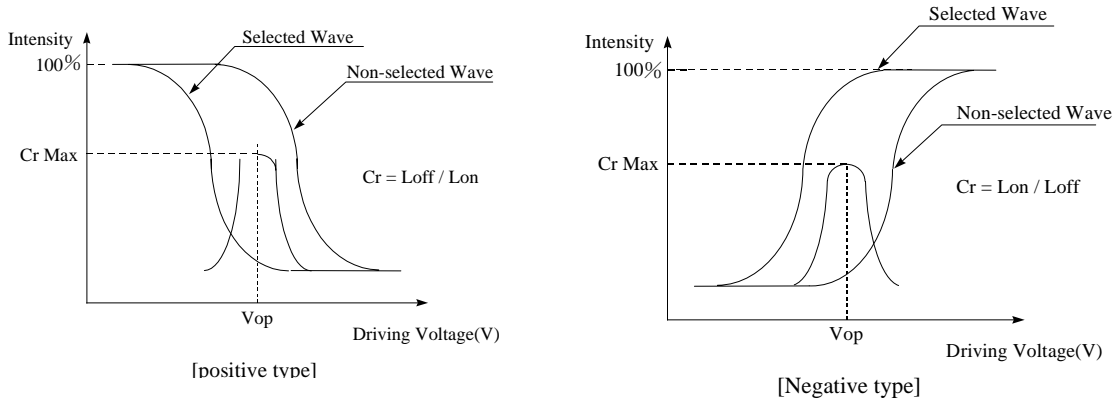
## MECHANICAL SPECIFICATION

ITEM	DESCRIPTION
Product No.	SC1602H
Module Size	84.0(W) × 44.0(H) × 12.7 max(D)
Viewing Area	65.0(W)mm × 16.0(H)mm
Dot Size	0.56(W)mm × 0.66(H)mm
Dot Pitch	0.60(W)mm × 0.70(H)mm
Display Format	16 characters (W) × 2 lines (H)
Duty Ratio	1/16 Duty
Controller	KS0066 or Equivalent

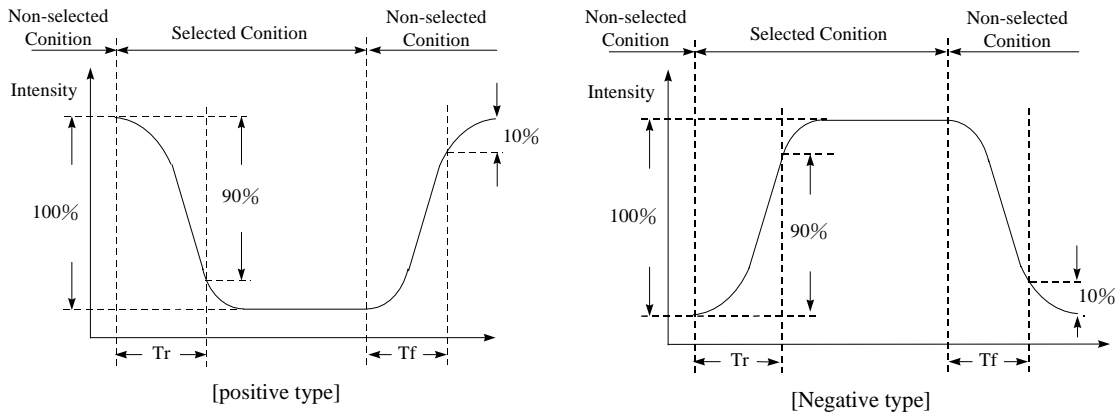
## INTERFACE PIN ASSIGNMENT

Pin No.	Pin Out	Level	Description
1	VSS	0V	Power Supply Ground
2	VDD	5V	Power Supply Voltage
3	Vo	---	Contrast Adj
4	RS	H/L	Register Select
5	R/W	H/L	Read / Write
6	E	H,H→L	Enable Signal
7	DB0	H/L	Data Bit 0
8	DB1	H/L	Data Bit 1
9	DB2	H/L	Data Bit 2
10	DB3	H/L	Data Bit 3
11	DB4	H/L	Data Bit 4
12	DB5	H/L	Data Bit 5
13	DB6	H/L	Data Bit 6
14	DB7	H/L	Data Bit 7

## [Note 7] Definition of Operation Voltage (Vop)



## [Note 8] Definition of Response Time (Tr, Tf)



### Conditions:

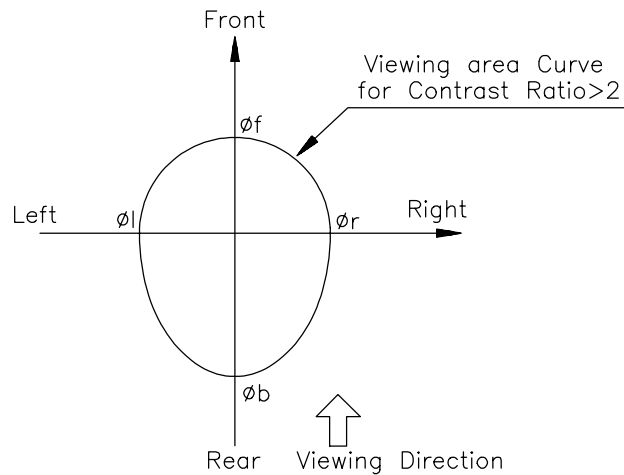
**Operating Voltage : Vop**

**Frame Frequency : 64 Hz**

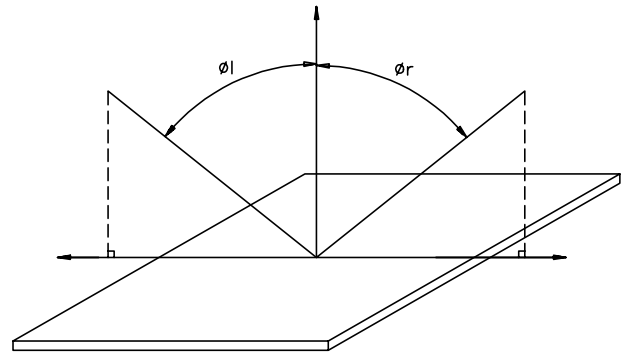
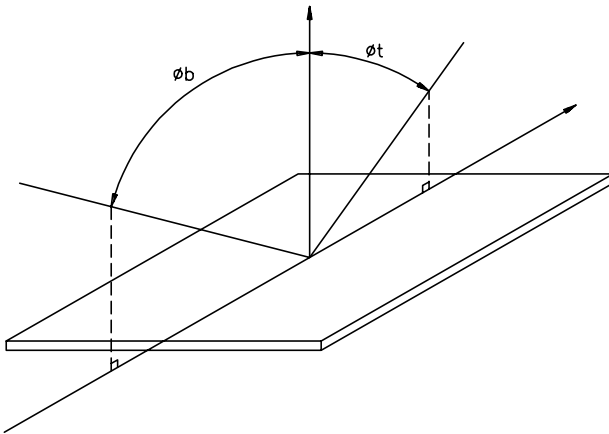
**Viewing Angle ( $\theta, \varphi$ ):  $0^\circ, 0^\circ$**

**Driving Wave form : 1/N duty, 1/a bias**

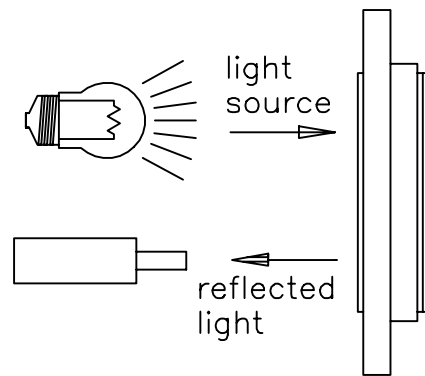
## [Note 9] Definition of Viewing Direction



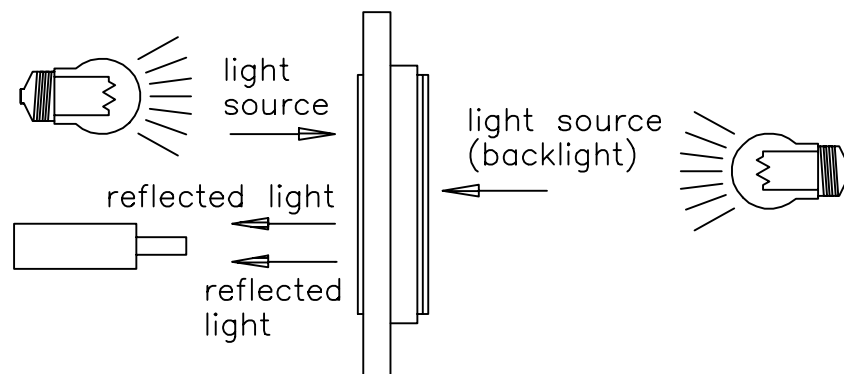
## [Note 10] Definition of viewing angle



## [Note 11] Description of Measuring Equipment

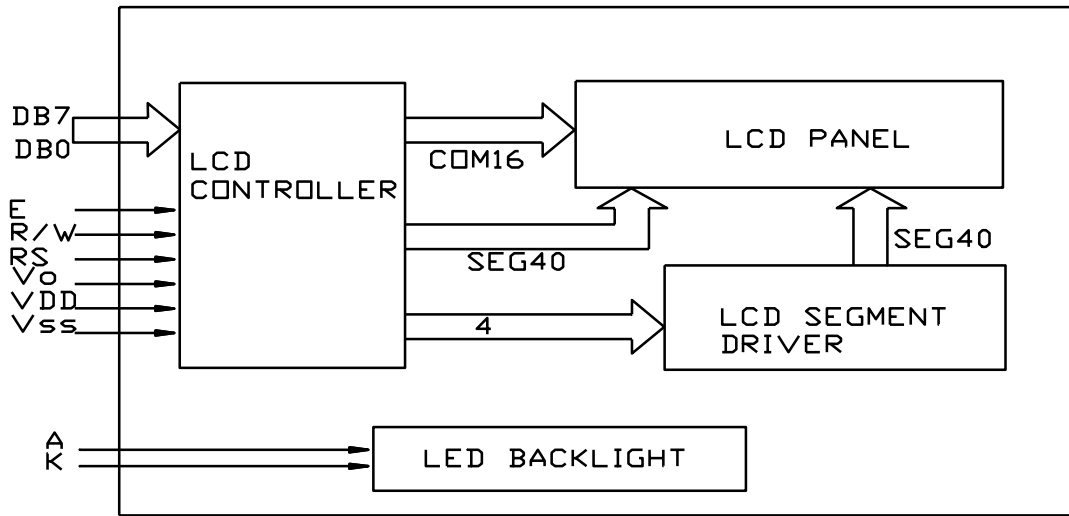


Reflective type



Transflective type

## BLOCK DIAGRAM



## POWER SUPPLY

