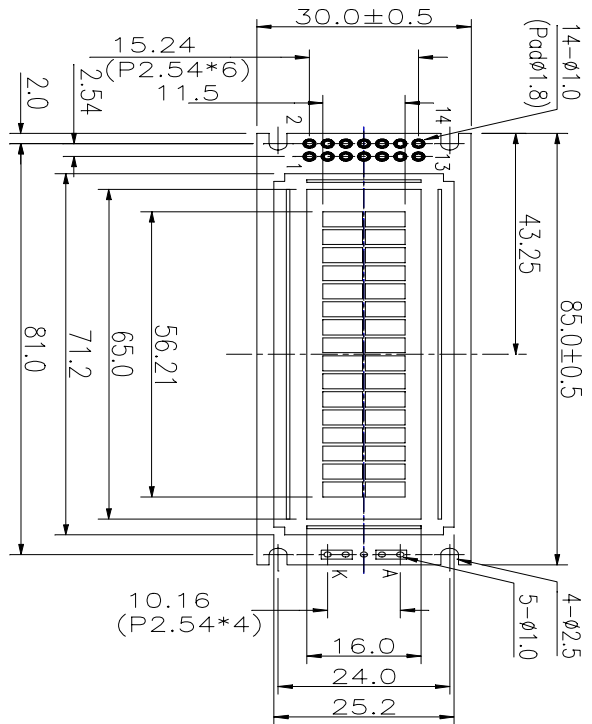


## GENERAL SPECIFICATION

TIEM	DESCRIPTION			
Product No	SC1602BULT-SH-GS			
LCD Type	<input type="checkbox"/> STN Gray Positive	<input checked="" 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"/> Amber	<input type="checkbox"/> White	<input type="checkbox"/> Blue Green
View Direction	<input type="checkbox"/> 6 O'clock		<input checked="" type="checkbox"/> 12 O'clock	
Temperature Range	<input checked="" type="checkbox"/> Normal		<input type="checkbox"/> Wide	
Frame	<input type="checkbox"/> Black		<input checked="" type="checkbox"/> Silver	

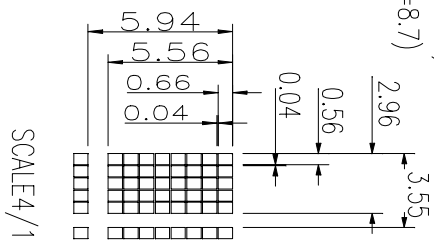
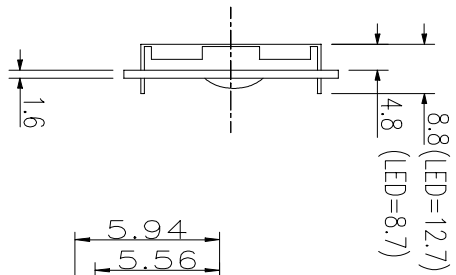
### TO BE VERY CAREFUL !

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.



Unless Classified : The Tolerance ± 0.3 mm

PIN NO.	1	3	5	7	9	11	13
SIGNAL	Vdd	Vo	R/W	DB0	DB2	DB4	DB6
PIN NO.	2	4	6	8	10	12	14
SIGNAL	Vss	RS	E	DB1	DB3	DB5	DB7



Unit:mm

<b>C</b>				
<b>B</b>				
<b>A</b>	SUNLIKE DISPLAY			
	MODEL NAME	SC1602B		
	TITLE	COUNTER DRAWING		
	DRAWN NO.			
	SCALE	APPROVE	CHECK	DRAW
	1/1			

## 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	-	$\text{cd/m}^2$	
Peak Emission Wavelength	$\lambda_P$		-	570	-	nm	

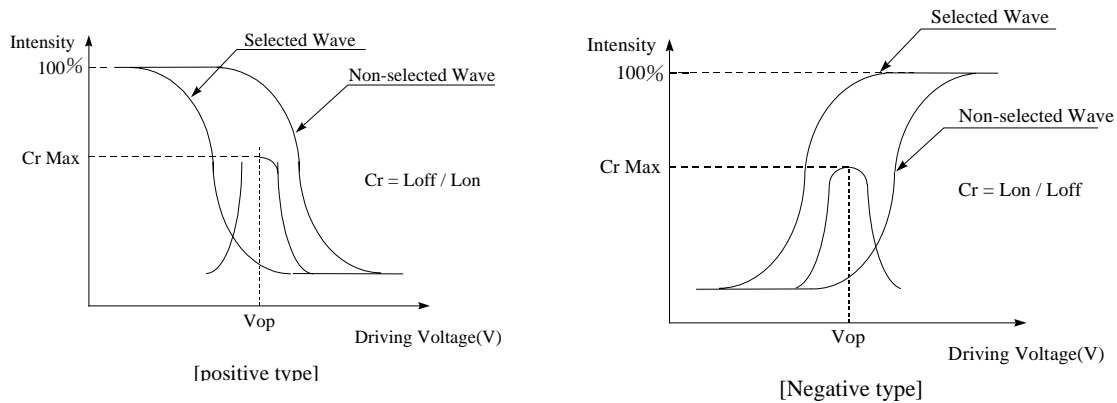
## MECHANICAL SPECIFICATION

ITEM	DESCRIPTION
Product No.	SC1602B
Module Size	85.0(W)×30.0(H)×8.8(LED=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

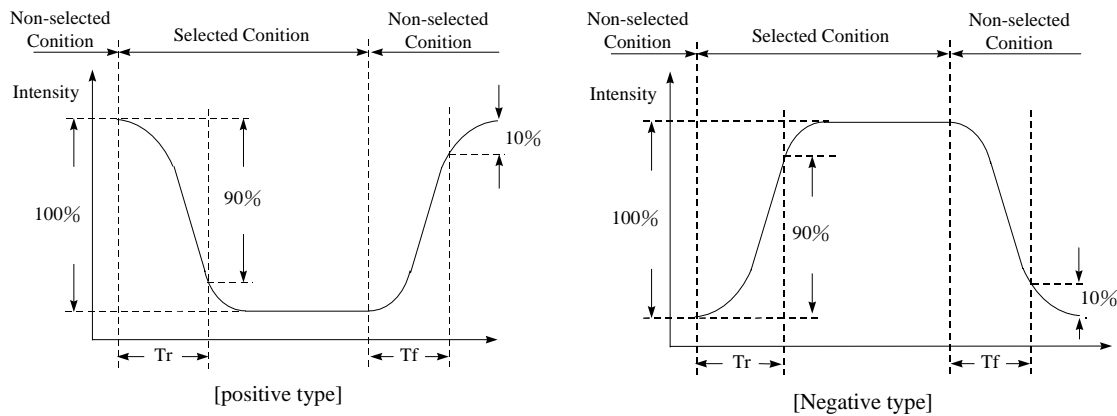
## INTERFACE PIN ASSIGNMENT

Pin No.	Pin Out	Level	Description
1	VDD	5V	Power Supply Voltage
2	VSS	0V	Power Supply Ground
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:

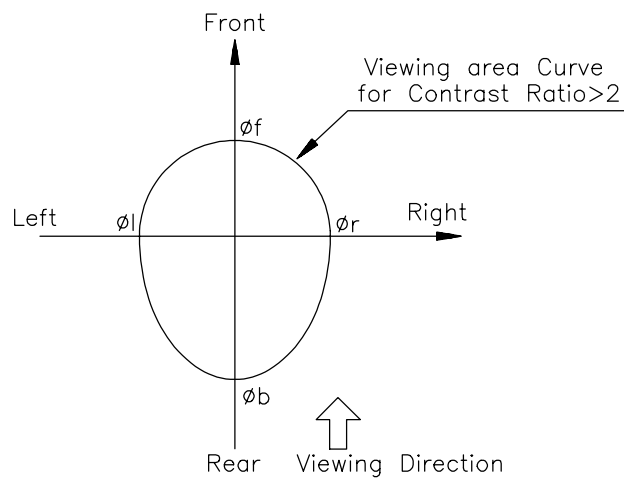
Operating Voltage : Vop

Frame Frequency : 64 Hz

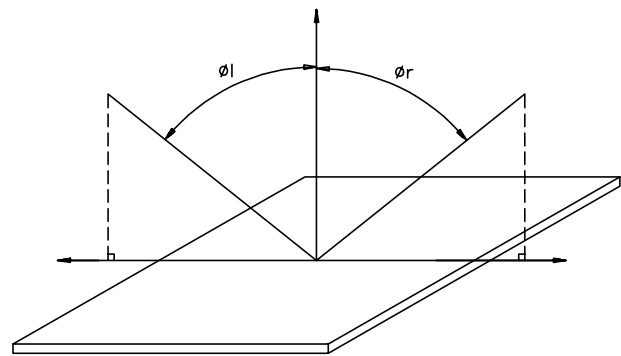
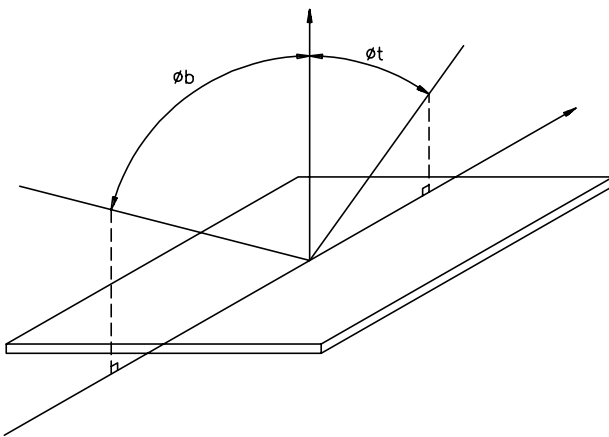
Viewing Angle ( $\theta, \varphi$ ):  $0^\circ, 0^\circ$

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

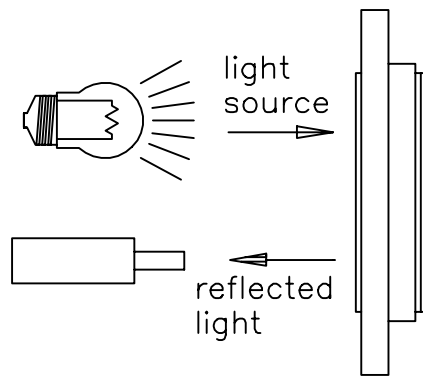
## [Note 9] Definition of Viewing Direction



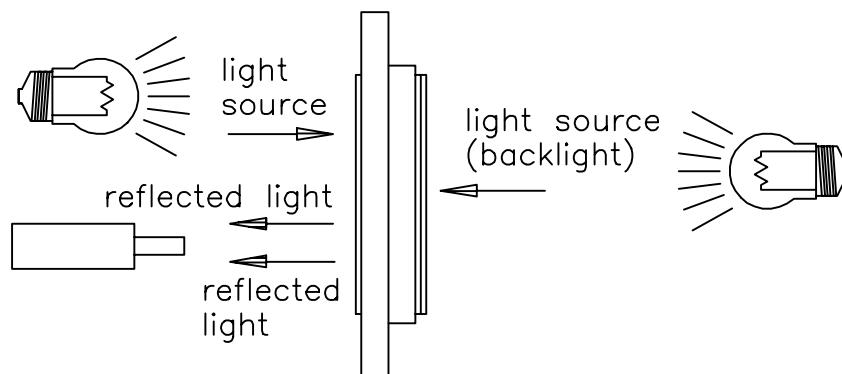
## [Note 10] Definition of viewing angle



## [Note 11] Description of Measuring Equipment

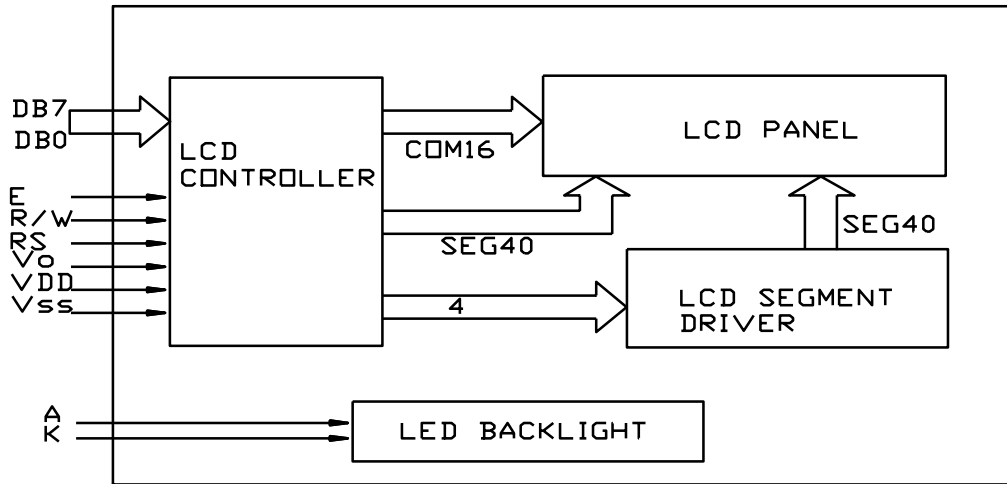


Reflective type



Transflective type

## BLOCK DIAGRAM



## POWER SUPPLY

