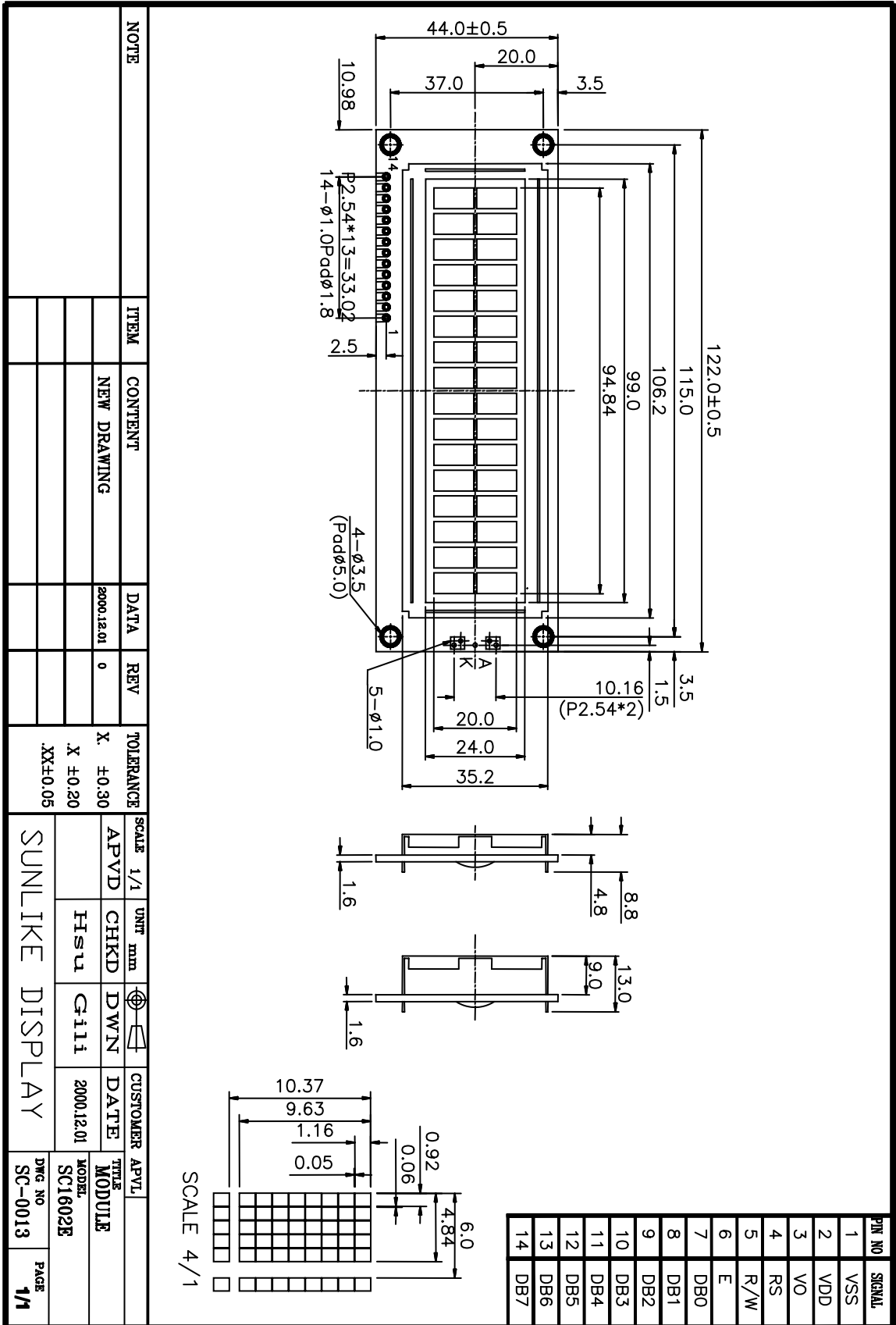


GENERAL SPECIFICATION

ITEM	DESCRIPTION			
Product No	SC1602EHMT-SH-HB-G			
LCD Type	<input type="checkbox"/> STN Gray Positive	<input type="checkbox"/> STN Yellow Green Positive	<input type="checkbox"/> STN Blue Negative	
	<input type="checkbox"/> TN Negative		<input checked="" 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 type="checkbox"/> Transflective	<input checked="" 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 type="checkbox"/> Yellow Green	<input type="checkbox"/> Green	<input type="checkbox"/> White	<input checked="" type="checkbox"/> Amber
View Direction	<input type="checkbox"/> 6 O'clock		<input checked="" type="checkbox"/> 12 O'clock	
Temperature Range	<input type="checkbox"/> Normal		<input checked="" type="checkbox"/> Wide	
Frame	<input checked="" type="checkbox"/> Black		<input 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.



NOTE	ITEM	CONTENT	DATA	REV	TOLERANCE	SCALE	APVD	CHKD	DWVN	DATE	CUSTOMER	APVL	TITLE	MODEL	DWG NO	PAGE
		NEW DRAWING	2000.12.01	0	X ±0.30 X ±0.20 XX ±0.05	1/1	Hsu	G111		2000.12.01	SUNLIKE DISPLAY		MODULE	SC1602E	SC-0013	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}	-	40	mW	
LED Forward current	I_{AF}	-	10	mA	
LED Reverse Voltage	V_R	-	8	V	

(2) Environmental Absolute Maximum Ratings

Item					Wide Temperature			
					Operating		Storage	
					Min,	Max.	Min,	Max.
Ambient Temperature					-30°C	+50°C	-40°C	+60°C
Humidity(without condensation)					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°C

Note 3 T_a at -20°C will be <48hrs at 70°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°C

Note 6 T_a at -30°C will be <48hrs, at 80°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	$I_f=4\text{ mA}$	-	3.7	-	Volt	
LED Forward Current	I_F	-	-	4.0	-	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 $Cr \geq 1.4$	-	30	-	Degree	9,10
	$\Phi_b(6\text{ o'clock})$		-	10	-		
	$\Phi_l(9\text{ o'clock})$		-	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	$I_F=4.0\text{ mA}$	4	6	-	cd/m^2	60%
Peak Emission Wavelength	λ_P		-	605	-	nm	

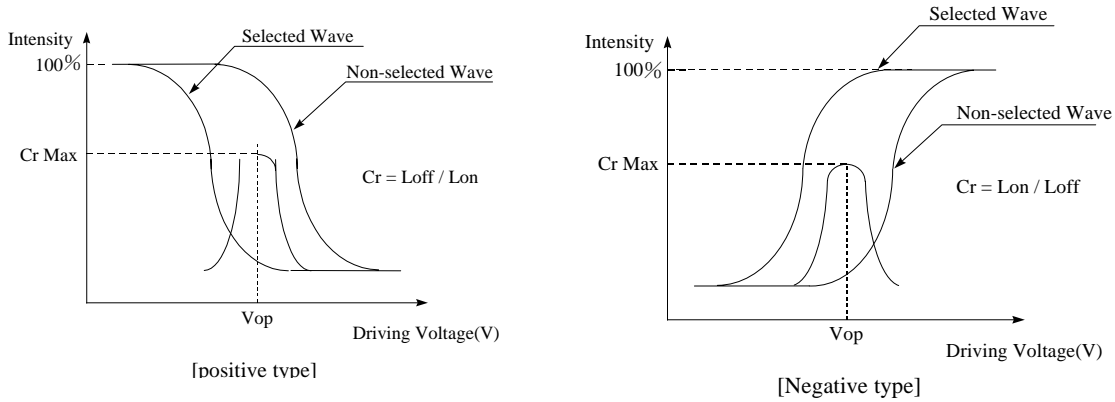
MECHANICAL SPECIFICATION

ITEM	DESCRIPTION
Product No.	SC1602E
Module Size	122.0(W)× 44.0(H)× 8.8(LED=13.0) max(D)
Viewing Area	99.0(W)mm × 24.0(H)mm
Dot Size	0.92(W)mm × 1.16(H)mm
Dot Pitch	0.98(W)mm × 1.21(H)mm
Display Format	16 characters (W) × 2 lines (H)
Duty Ratio	1/16 Duty
Controller	KS0066 or Equivalent

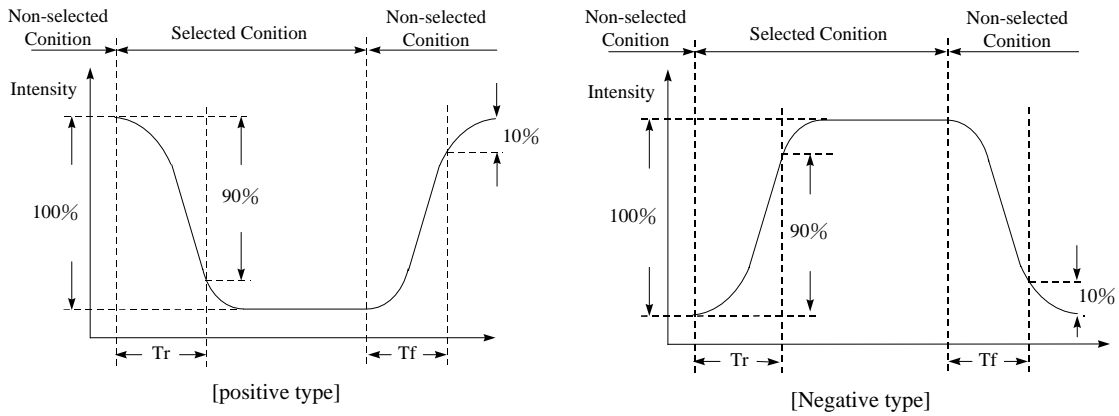
INTERFACE PIN ASSIGNMENT

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:

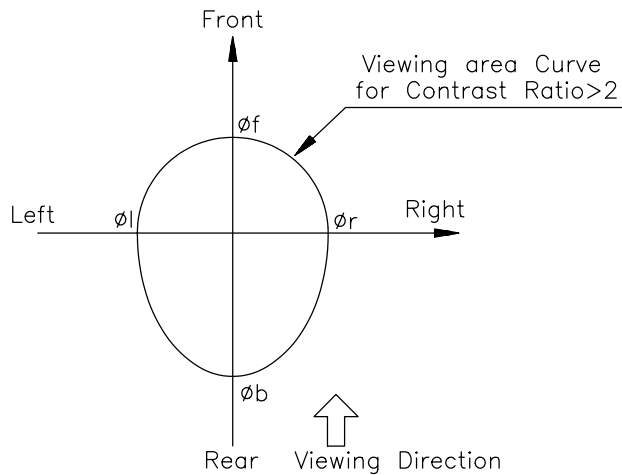
Operating Voltage : Vop

Frame Frequency : 64 Hz

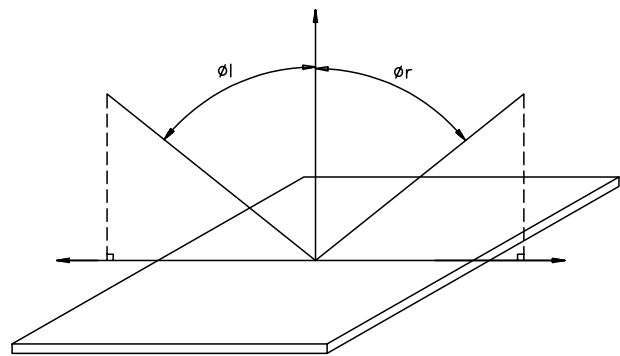
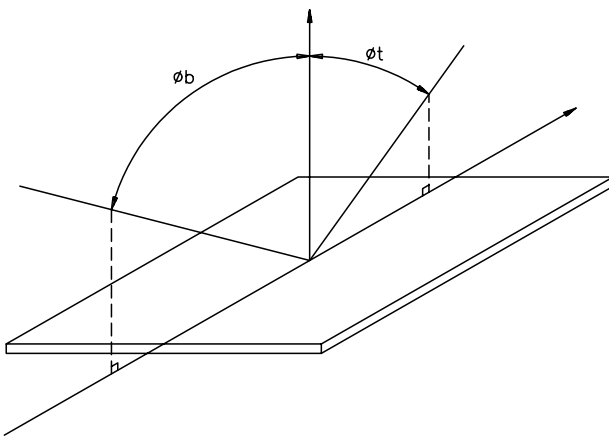
Viewing Angle (θ, φ): $0^\circ, 0^\circ$

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

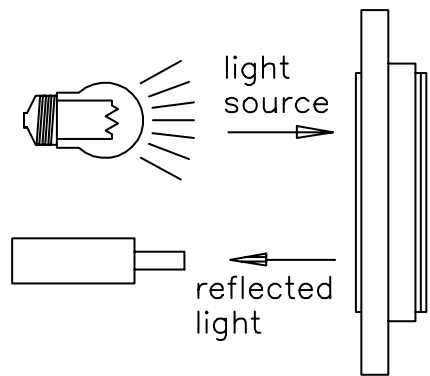
[Note 9] Definition of Viewing Direction



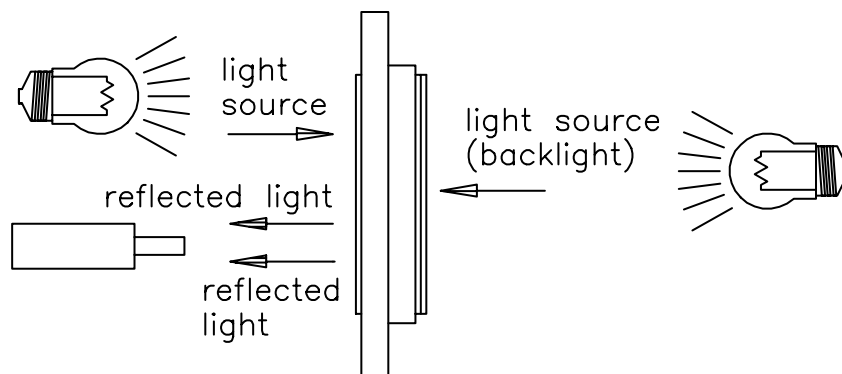
[Note 10] Definition of viewing angle



[Note 11] Description of Measuring Equipment

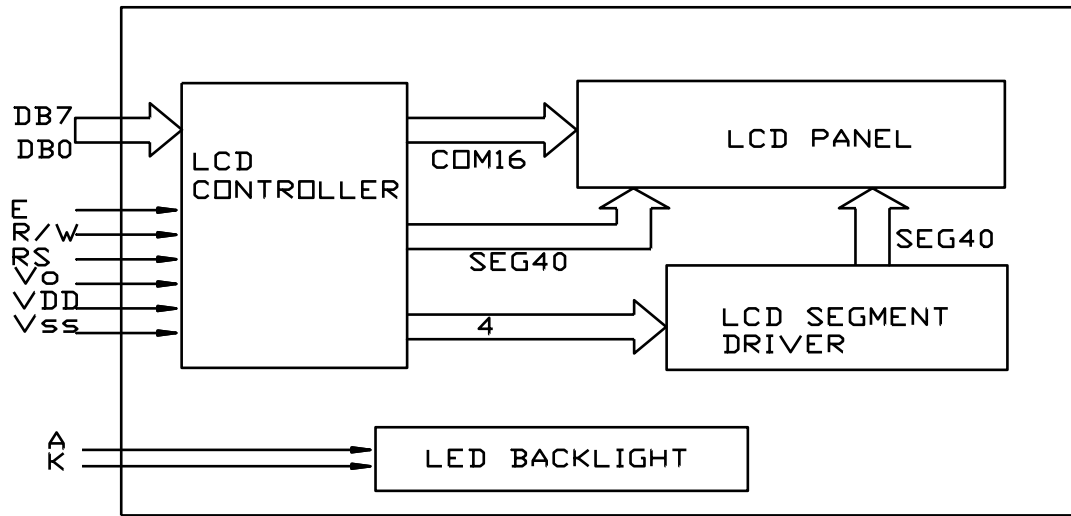


Reflective type



Transflective type

BLOCK DIAGRAM



POWER SUPPLY

