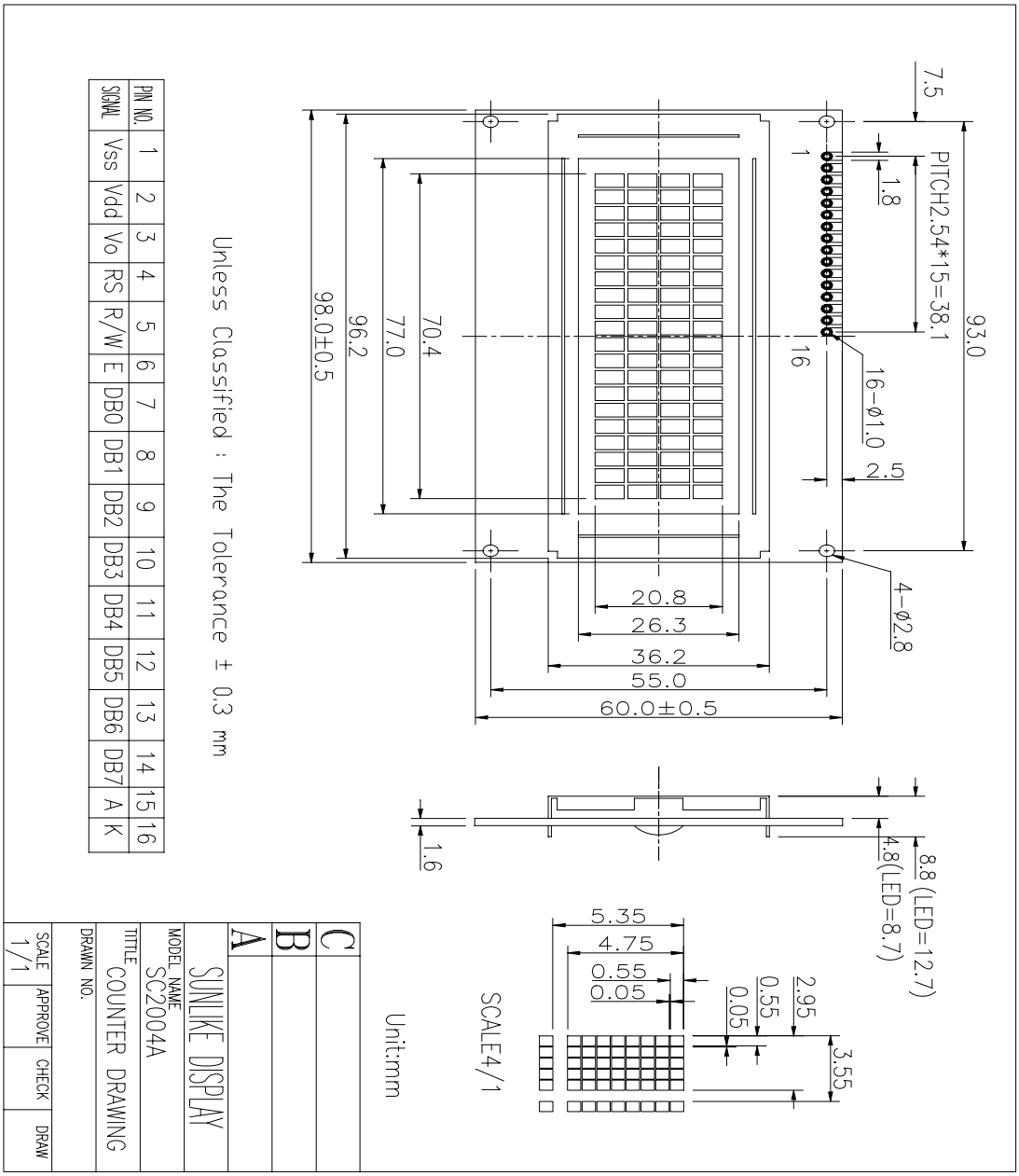
TIEM	DESCRIPTION				
Product No	SC2004AULB-SO-GB-K				
LCD Type	☐ STN Gray	☑ STN Yellow Green	☐ STN Blue		
	☐ TN Negative	☐ TN Positive			
Rear Polarizer	☐ Reflective	☑ Transflective	☐ Transmissive		
Backlight Type	☑ LED	☐ Internal Power	☐ EL	☐ 5V input	
Backlight Color	☐ White	☐ Amber	☐ Blue Green	☑ Yellow Green	☐ Other
View Direction	☑ 6 O'clock	☐12 O'clock			
Temperature Range	☑ Normal	☐ Wide			
Frame	☑ Black	☐ Silver			
EL Inverter	☐ Build-in	☐Not Build-in			

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.



PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SIGNAL	Vss	Vdd	Vo	RS	R/W	E	DB0	DB1	DB2	DB3	DB4	DB5	DB6	DB7	A	K

GENERAL SPECIFICATION

Item	Content
Display Format	20 characters (W)×4 lines (H)
Dimensional Outline(mm)	98.0(W)×60.0(H)×12.7 max(D)
Display mode	Transflective Type/Positive
Circuit	Common-Driver IC, Build-in Controller
Interface	Data (D0～D7), RS, R/W , E

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}	-	1.9	W	
LED Forward current	I_{AF}	-	420	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℃	+50℃	-20℃	+70℃	-20℃	+70℃	-30℃	+80℃
Humidity(without condensation)	Note 2,4		Note 3,5		Note 4,5		Note 4,6	

Note 2 Ta≦50℃: 80% RH max
Ta>50℃: Absolute humidity must be lower than the humidity of 85%RH at 50℃
Note 3 Ta at -20℃ will be<48hrs at 70℃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 Ta≦70℃: 75RH max
Ta>70℃: absolute humidity must be lower than the humidity of 75%RH at 70℃
Note 6 Ta at -30℃ will be <48hrs, at 80 ℃ 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	V_{SS}	0.2 V_{DD}	-	Volt	
	V_{IH}	H level	0.8 V_{DD}	V_{DD}	-	Volt	
LCM Recommend LCD Module Driving Voltage	V_{DD} –V_O	Ta＝0℃	-	-	-	Volt	
		Ta＝25℃	4.2	4.5	4.8		
		Ta＝50℃	-	-	-		
Power Supply Current for LCM	I_{DD}	V_{DD} =5.0V V_{DD}-V_O =4.5V	-	3.0	4.0	mA	
LED For Ward Doltage	V_F	If＝280 mA	-	4.2	4.6	Volt	
LED For Ward Current	I_F	-	-	280	-	mA	
LED Reverse Current	I_R	VR=8V	-	-	0.2	mA	

OPTICAL CHARACTERISTICS

Item	Symbol	Condition	Min.	Typ	Max.	Unit	note
Viewing angle range	Φf(12 o'clock)	When Cr≧ 1.4	-	10	-	Degree	9,10
	Φb(6 o'clock)		-	30	-		
	Φl(9 o'clock)		-	30	-		
	Φr(3 o'clock)		-	30	-		
Rise Time	Tr	V_{DD}-V_O =4.5V Ta=25℃	-	200		mS	
Fall Time	Tf		-	250			
Frame frequency	Frm		-	64	-	Hz	8,10
Contrast	Cr		-	3.0	-		7
The Brightness Of Backlight	L	IF=280 mA	90	140	-	cd/㎡	
Peak Emission Wavelength	λP		-	570	-	nm	

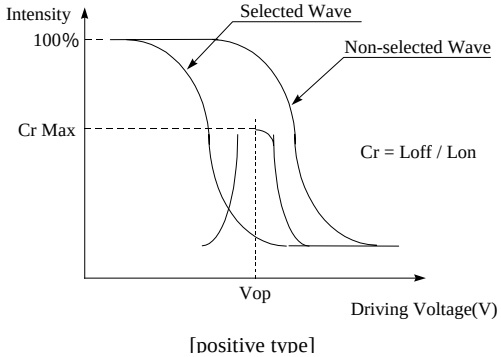
MECHANICAL SPECIFICATION

ITEM	DESCRIPTION	
Product No.		SC2004A
Module Size		98.0(W)×60.0(H)×12.7 max(D)
Dot Size		0.55 (W)mm×0.55(H)mm
Dot Pitch		0.60(W)mm×0.60(H)mm
Display Format		20 characters (W)×4 lines (H)
Duty Ratio		1/16 Duty
Controller		KS0066 or Equivalent

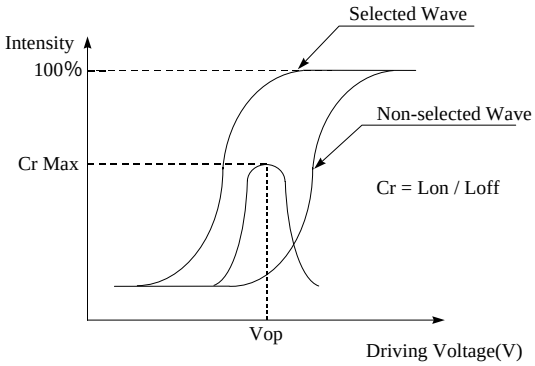
INTERFACE PIN ASSIGNMENT

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
15	A	4.2V	LED Power Supply (+)
16	K	0V	LED Power Supply (−)

[Note 7] Definition of Operation Voltage (Vop)

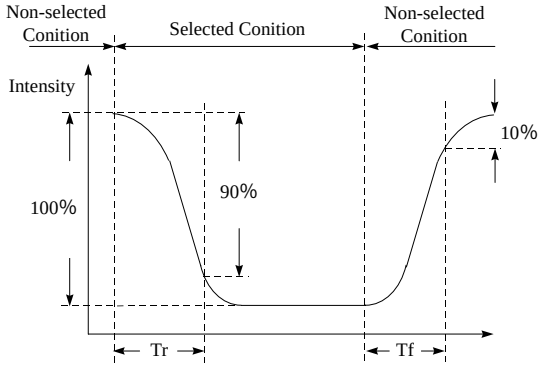


[positive type]

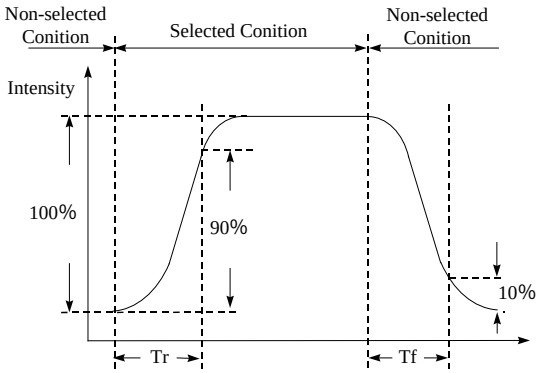


[Negative type]

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



[positive type]



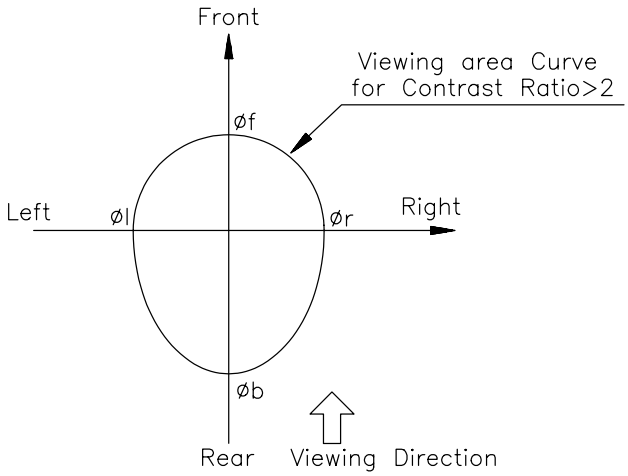
[Negative type]

Conditions:

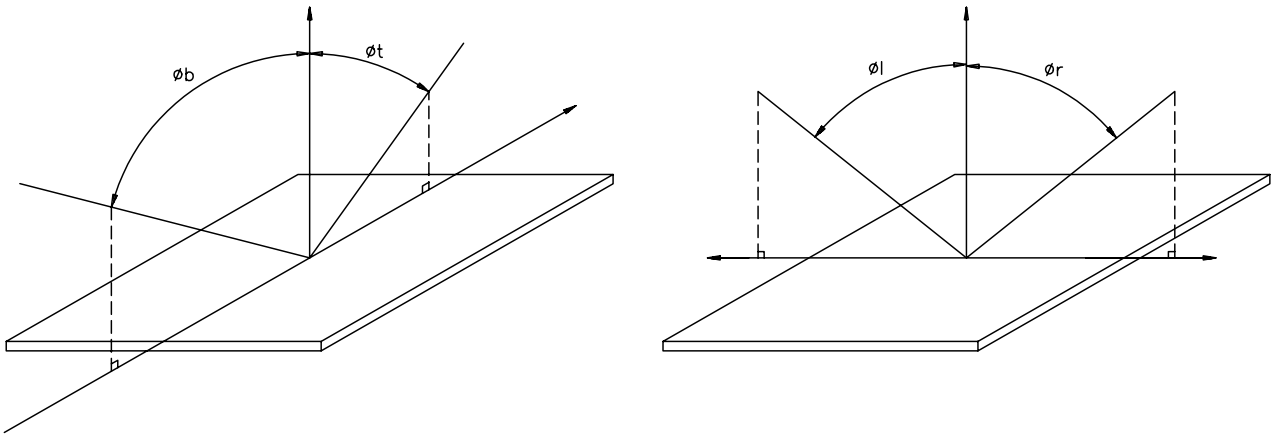
Operating Voltage : Vop **Viewing Angle(θ , φ): 0° , 0°**

Frame Frequency : 64 Hz **Driving Wave form : 1/N duty, 1/a bias**

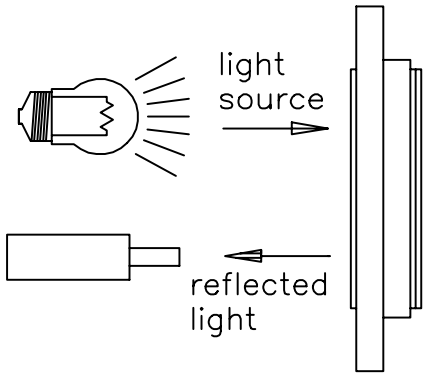
[Note 9] Definition of Viewing Direction



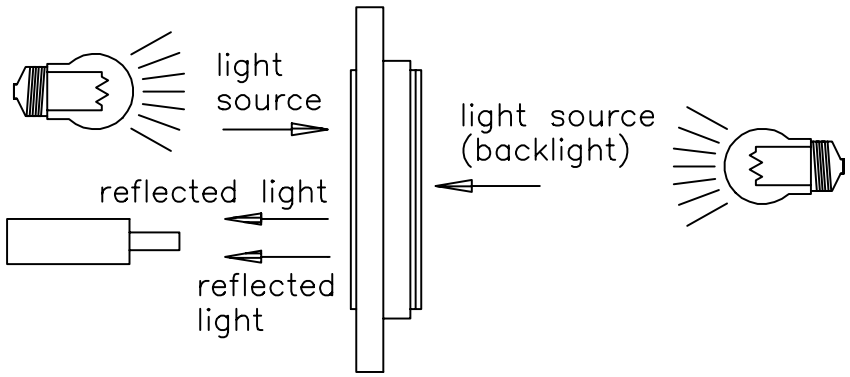
[Note 10] Definition of viewing angle



[Note 11] Description of Measuring Equipment

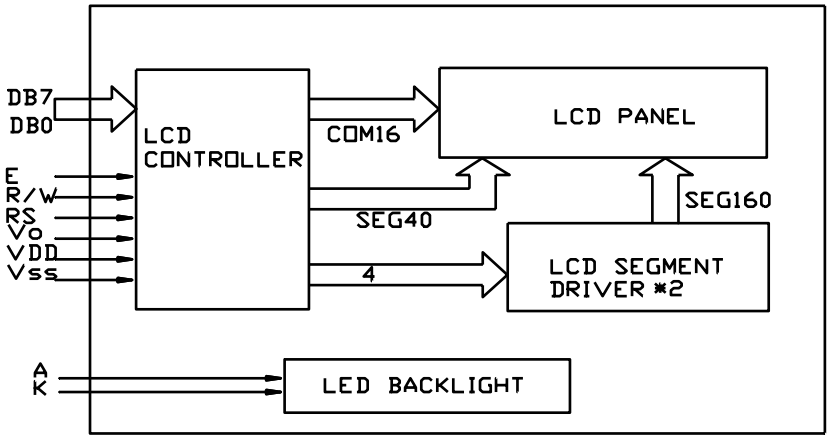


Reflective type



Transflective type

BLOCK DIAGRAM



POWER SUPPLY