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PART NO : GC2002N5SBY1B(LM1077SYL)
FOR MESSRS. :_____

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Accepted by :_____ Proposed by :_____
Date : 09,20,2002

RECORD OF REVISION

DATE	PAGE	SUMMARY
2001,07,31	ALL	CHANGE ALL PAGE ADDRESS AND TEL.
2002,04,01	ALL	CHANGE COMPANY NAME & LOGO &ADDRESS,FAX,TEL
	03	(2)MODULE SIZE 38.0H→37.0H
	04	4.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS POWER SUPPLY FOR LCD DRIVE MAX.7.0→6.0 DELETE POWER SUPPLY FOR LED 4.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS SHOCK STORAGE MAX.490.0m/s^2 (50G)→49.0m/s^2 (5G)
	05	5.ELECTRICAL CHARACTERISTICS POWER SUPPLY CURRENT (LOGIC) SYMBOL IDD→IDD(INCLUDING LED B/L) CONDITION VDD=5.0V→VDD-VSS=5.0V TYP. 1.0 → 241 MAX.3.0 → ----- RECOMMENDED LCD DRIVING VOLTAGE SYMBOL Φ=10°→Φ=10° θ =0° Ta=0°C MAX. 4.6→ (4.6) Ta=50°C MAX. 3.5→(3.5) DELETE POWER SUPPLY CURRENT FOR LED
	06	6.OPTICAL CHARACTERISTICS VIEWING AREA MIN.40→----- TYP.-----→40 CONTRAST RATIO MIN.3→----- TYP.-----→2 THE BRIGHTNESS OF BACKLIGHTING SOURCE DELETE CONDITION (*) TYP.-----→50 NOTE 5,6→5 ADD WAVELENGTH
	07	ADD NOTE(5) OPTICAL OF LIGHT
	08	INTERFACE PIN NO.15,16 REFER TO PAGE 10→ NC
	09	ADD TOLERANCE CHANGE 7.2 BLOCK DIAGRAM.
	10	CHANGE 8.1 POWER SUPPLY FOR LCM AND LED BACKLINGT. DELETE NOTE
2002,08,01	ALL	CHANGE PART NO.LM1077SYL→GC2002N7SBY1B
2002,09,20	ALL	CHANGE PART NO.GC2002N7SBY1B→ GC2002N5SBY1B

3. GENERAL SPECIFICATIONS AND MECHANICAL DATA

3.1 GENERAL SPECIFICATIONS

PLEASE REFER TO:

"CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS (SP-10-001)".

3.2 THIS INDIVIDUAL SPECIFICATION IS PRIOR TO GENERAL SPECIFICATIONS.

3.3 MECHANICAL DATA

(1) NUMBER OF DOTS ---------- 20CH*2LINES
(2) MODULE SIZE ---------- 116.0W*37.0H*14.0T (MAX) mm
(3) VIEWING AREA ---------- 83.0W*18.6H mm
(4) CHARACTER PATTERN ---------- 5 * 7dots + CURSOR
(5) CHARACTER SIZE ---------- 3.20W *5.55H mm
(6) CHARACTER PITCH ---------- 3.70W * 5.95H mm
(7) DOT SIZE ---------- 0.60W * 0.65H mm
(8) DOT PITCH ---------- 0.65W * 0.70H mm
(9) LCD TYPE ---------- STN, YELLOW-GREEN, 6 O'CLOCK, TRANSFLECTIVE
(10) LED COLOR ---------- YELLOW-GREEN

4. ABSOLUTE MAXIMUM RATINGS

4.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	COMMENT
POWER SUPPLY FOR LOGIC	V_{DD}-V_{SS}	-----	6.0	V	
POWER SUPPLY FOR LCD DRIVE	V_{DD}-V_O	-----	6.0	V	
INPUT VOLTAGE	V_I	V_{SS}	V_{DD}	V	
STATIC ELECTRICITY	-----	-----	100	V	NOTE (1)

NOTE(1) : TEST METHOD AND CONDITIONS: AFTER CHARGING UP 200PF CAPACITOR BY STATED VOLTAGE, THE CAPACITOR IS CONNECTED WITH INTERFACE PINS OF THE MODULE.

4.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	OPERATING		STORAGE		COMMENT
	MIN.	MAX.	MIN.	MAX.	
AMBIENT TEMPERATURE	0°C	50°C	-10°C	60°C	NOTE(2)
HUMIDITY	NOTE (3)		NOTE (3)		WITHOUT CONDENSATION
VIBRATION	－－	4.9 m/s^2 (0.5G)	－－	19.6 m/s^2 (2G)	10~300HZ XYZ DIRECTIONS 1 Hr. EACH
SHOCK	－－	29.4 m/s^2 (3G)	－－	49.0 m/s^2 (5G)	10mS XYZ DIRECTIONS 1 TIME EACH
CORROSIVE GAS	NOT ACCEPTABLE		NOT ACCEPTABLE		

NOTE(2) : Ta AT -10℃ : 48HR MAX.
60℃ : 168HR MAX.

NOTE(3) : Ta ≦ 40℃ : 90% RH MAX.
Ta ＞ 40℃ : ABSOLUTE HUMIDITY MUST BE LOWER THAN THE HUMIDITY OF 90%RH AT 40℃.

5. ELECTRICAL CHARACTERISTICS

Ta = 25°C VDD = 5.0 ± 0.25V

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
INPUT VOLTAGE (H LEVEL)	VIH	-------	2.2	-----	-----	V
INPUT VOLTAGE (L LEVEL)	VIL	-------	-----	-----	0.6	V
OUTPUT VOLTAGE (H LEVEL)	VOH	-IOH = 0.2mA	2.4	-----	-----	V
OUTPUT VOLTAGE (L LEVEL)	VOL	IOL = 1.2mA	-----	-----	0.4	V
POWER SUPPLY CURRENT (LOGIC)	IDD (INCLUDING LED B/L)	VDD-VSS = 5.0 V	-----	241	-----	mA
RECOMMENDED LCD DRIVING VOLTAGE NOTE (1)	VDD-VO DUTY=1/16 Φ = 10° θ=0°	Ta = 0℃	-----	(4.6)	-----	V
		Ta = 25 ℃	-----	4.2	-----	V
		Ta = 50 ℃	-----	(3.5)	-----	V
CLOCK OSCILLATION FREQUENCY	FOSC	Ta = 25°C	-----	270	-----	KHz

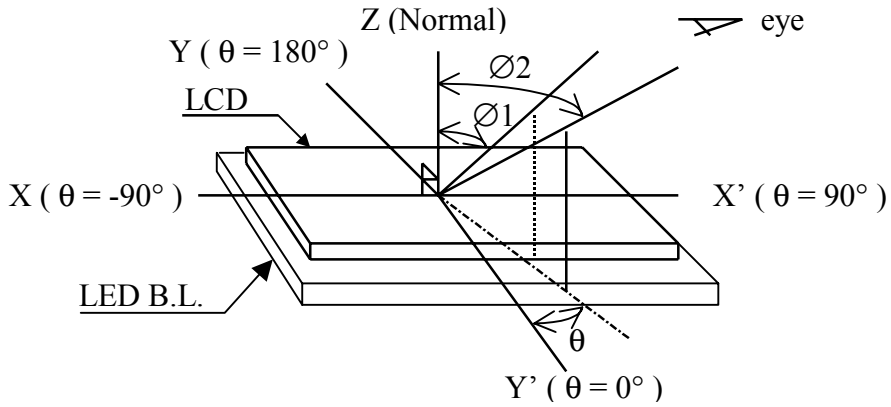
NOTE (1): RECOMMENDED LCD DRIVING VOLTAGE MAY FLUCTUATE ABOUT ± 0.5V BY EACH MODULE.

6. OPTICAL CHARACTERISTICS

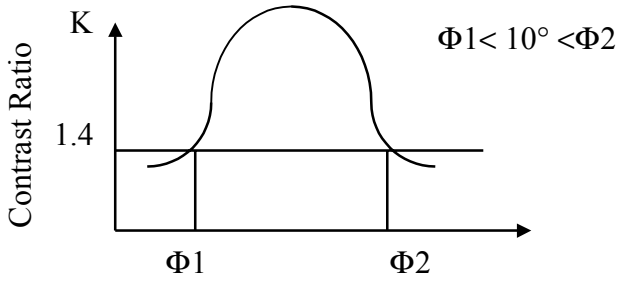
Ta = 25°C VDD = 5.0±0.25V

I T E M	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING AREA	Φ2-Φ1	K= 1.4	-----	40	-----	deg.	1
CONTRAST RATIO	K	Φ = 10° θ = 0°	-----	2	-----	-----	2,3
RESPONSE TIME	tr (rise)	Φ = 10° θ = 0°	-----	250	400	ms	4
	tf (fall)	Φ = 10° θ = 0°	-----	350	450	ms	4
THE BRIGHTNESS OF BACKLIGHTING SOURCE	B	Φ =0° θ =0°	-----	50	-----	cd/m^2	5
	λ p	-----	565	570	575	nm	

NOTE (1): DEFINITION OF θ AND Φ



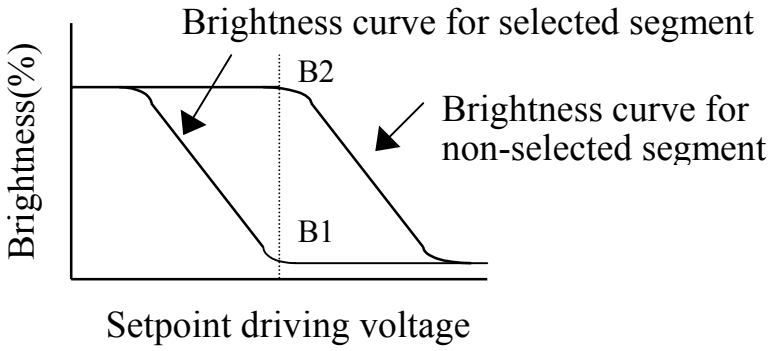
NOTE (2): DEFINITION OF VIEWING ANGLE Φ1 AND Φ2



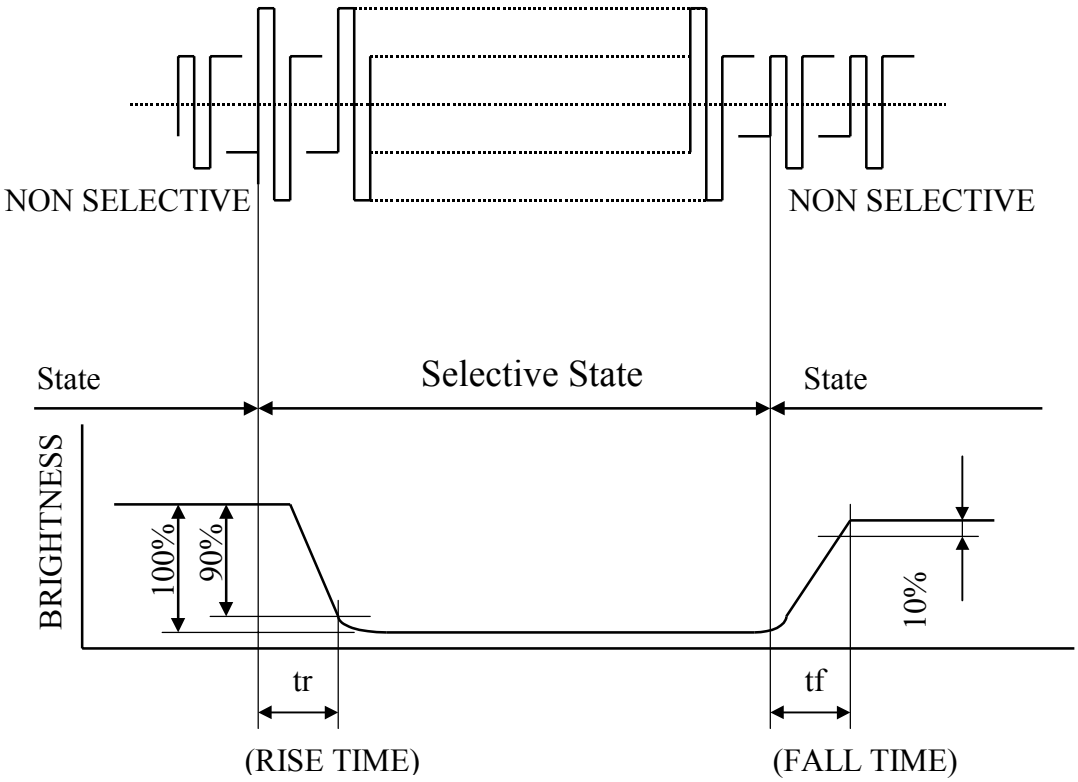
Viewing Angle

NOTE (3) : DEFINITION OF CONTRAST "K"

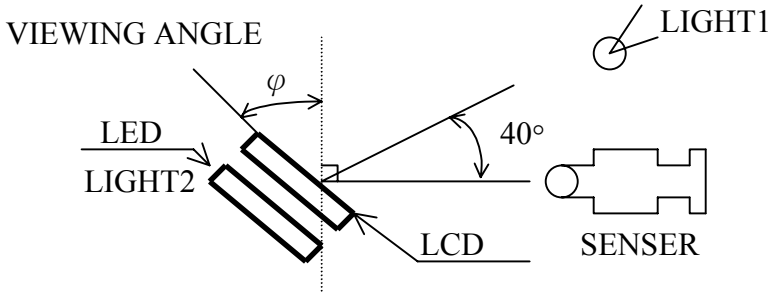
$$K = \frac{\text{Brightness of non-selected segment (B2)}}{\text{Brightness of selected segment (B1)}}$$



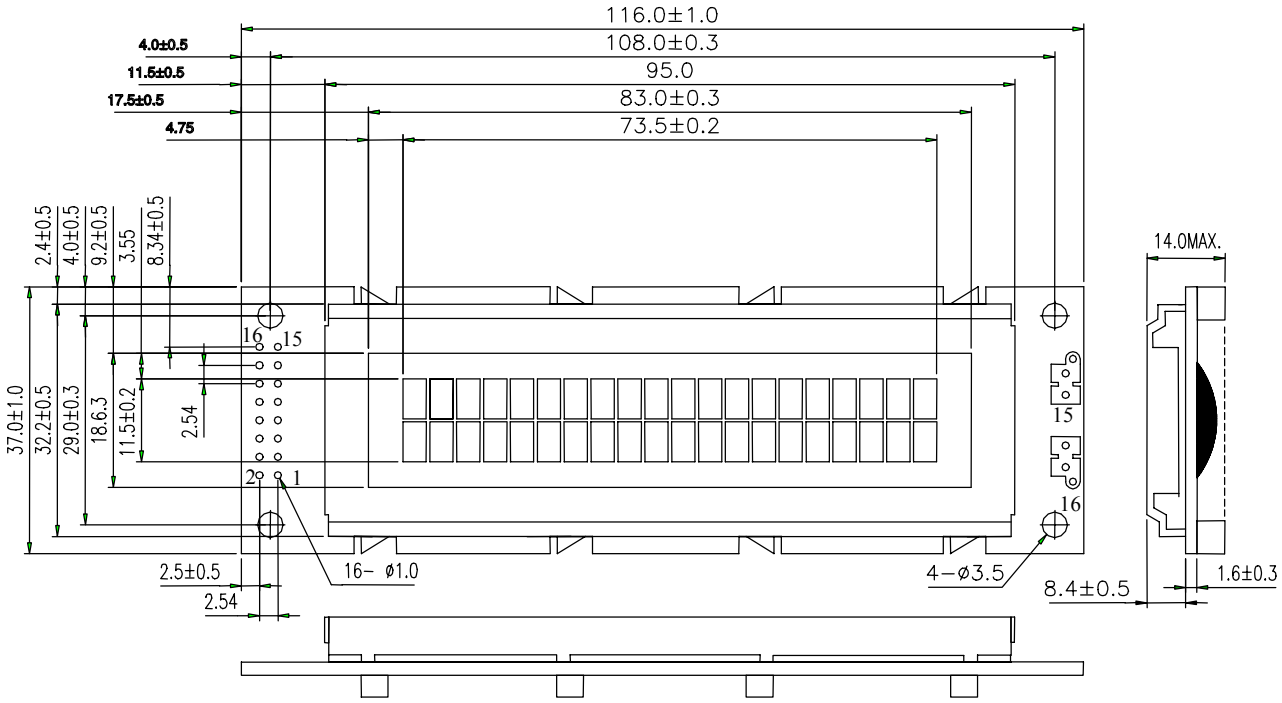
NOTE(4) : DEFINITION OF OPTICAL RESPONSE



NOTE (5) : POSITION OF LIGHT



7. OUTLINE DIMENSION



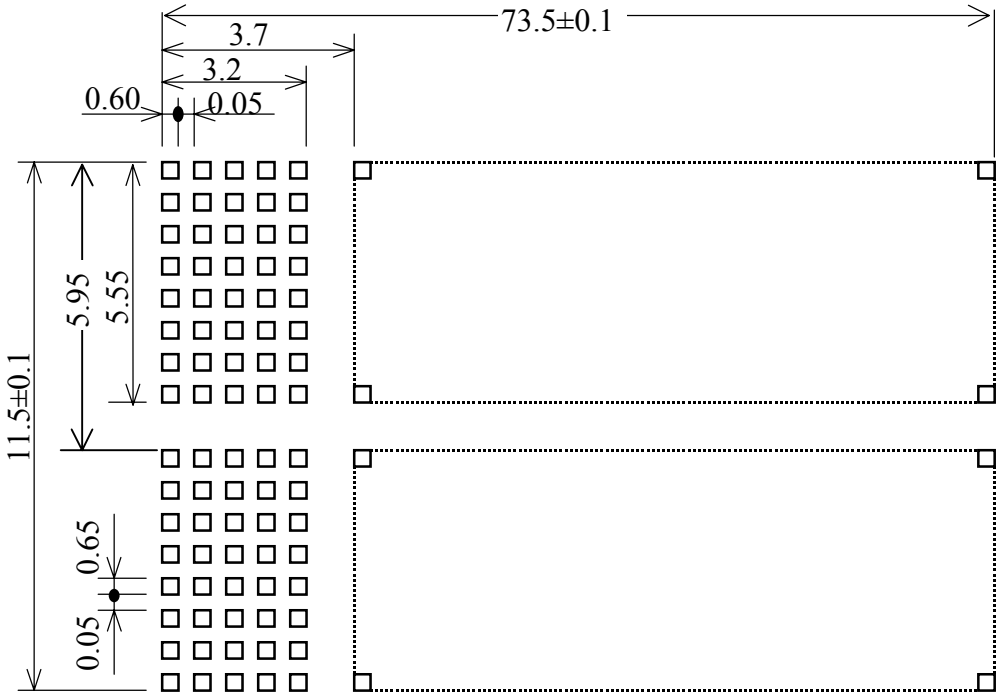
UNIT: mm
SCALE: NTS
NOT SPECIFIED TOLERANCE:± 0.5 mm

INTERFACE PIN CONNECTION:

PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
SYMBOL	VSS	VDD	VO	RS	R/W	E	DB0	DB1	DB2	DB3	DB4	DB5	DB6	DB7

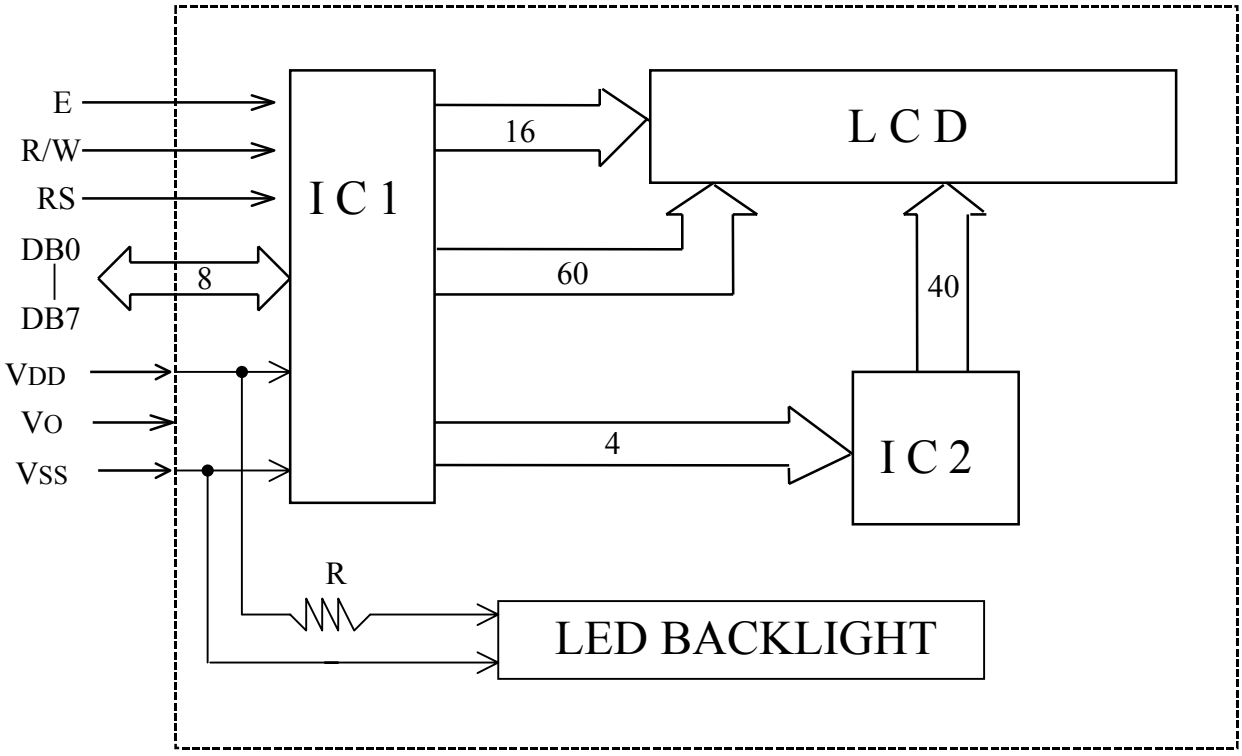
PIN NO.	15	16
SYMBOL	NC	

7. 1 DETAIL DRAWING OF MATRIX PATTERN



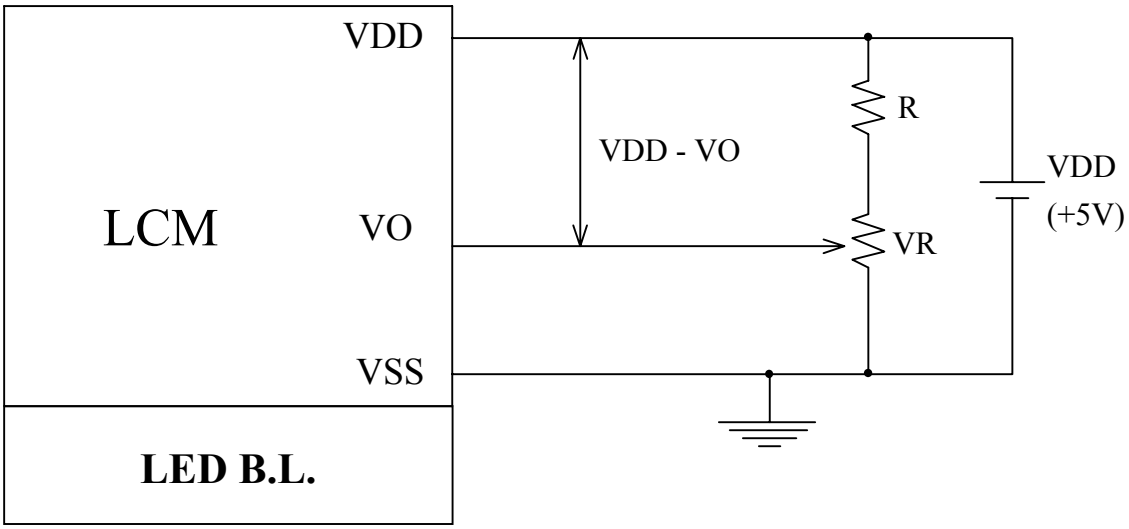
NOT SPECIFIED TOLERANCE: ±0.01mm

7.2 BLOCK DIAGRAM.



8. POWER SUPPLY.

8.1 POWER SUPPLY FOR LCM AND LED BACKLIGHT.



VDD -VO : LCD DRIVING VOLTAGE
VR : 10KΩ ~ 20KΩ