



富相科技股份有限公司

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PART NO : GC1602PWSKY1B(LM1230SGL)
FOR MESSRS : _____

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Accepted by : _____

Proposed by :  _____

Date : 09,12,2002

RECORD OF REVISION

DATE	PAGE	SUMMARY

3. GENERAL SPECIFICATIONS AND MECHANICAL DATA

3.1 GENERAL SPECIFICATIONS

PLEASE REFER TO :

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

3.2 THIS INDIVIDUAL SPECIFICATIONS IS PRIOR TO GENERAL SPECIFICATIONS.

3.3 MECHANICAL DATA

- (1) NUMBER OF CHARACTER ----- 16 CH*2 LINES
- (2) MODULE SIZE ----- 85.0W*30.0H*13.0T (Max) mm
- (3) VIEWING AREA ----- 64.5W*16.0H mm
- (4) DISPLAY AREA ----- 57.7W*9.4H mm
- (5) CHARACTER PATTERN ----- 5*7 DOTS+CORSOR
- (6) CHARACTER SIZE ----- 2.95W*4.35H mm
- (7) CHARACTER PITCH ----- 3.65 W*5.05H mm
- (8) DOT SIZE ----- 0.55W*0.50H mm
- (9) DOT PITCH ----- 0.60W*0.55Hmm
- (10) VIEWING DIRECTION ----- 6O'CLOCK
- (11) LCD TYPE ----- STN,GRAY,TRANSFLECTIVE
- (12) LED COLOR-----YELLOW-GREEN

4. ABSOLUTE MAXIMUM RATINGS

4.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS.

ITEM	SYMBOL	MIN.	MAX.	UNIT	COMMENT
POWER SUPPLY FOR LOGIC	VDD-VSS	0	6.0	V	
POWER SUPPLY FOR LCD DRIVE	VDD-VO	0	13.5	V	
INPUT VOLTAGE	VI	VSS	VDD	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)	10 Msec XYZ DIRECTIONS 1 TIME EACH
CORROSIVE GAS	NOT ACCEPTABLE		NOT ACCEPTABLE		

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

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

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 BL	VDD = 5.0 V	-----	131	-----	mA
RECOMMENDED LCD DRIVING VOLTAGE NOTE (1)	VDD-VO DUTY=1/16 Φ = 10°	Ta = 0°C	-----	(4.6)	-----	V
		Ta = 25 °C	-----	4.4	-----	V
		Ta = 50 °C	-----	(4.2)	-----	V

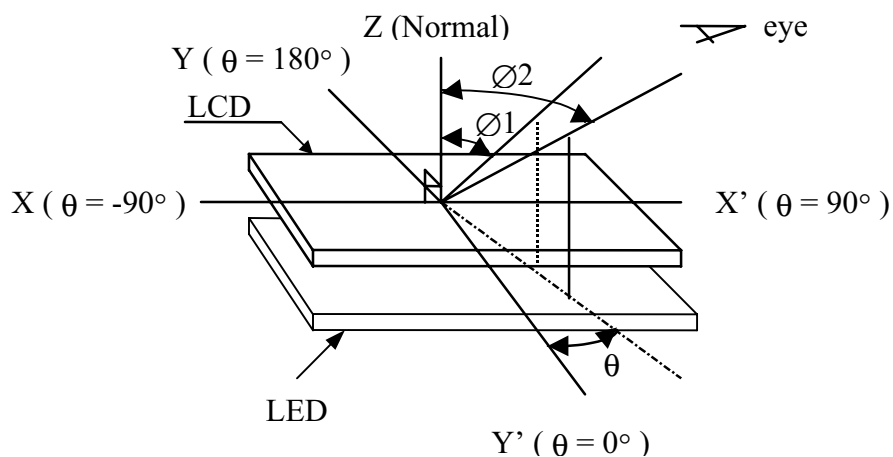
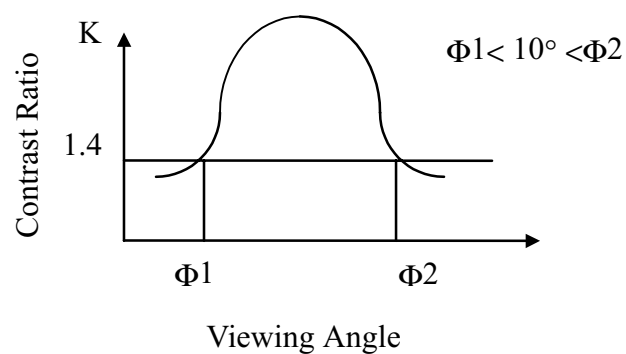
NOTE(1) : RECOMMENDED LCD DRIVING VOLTAGE MAY FLUCTUATE
ABOUT ± 0.5V BY EACH MODULE.

6. OPTICAL CHARACTERISTICS

Ta = 25°C

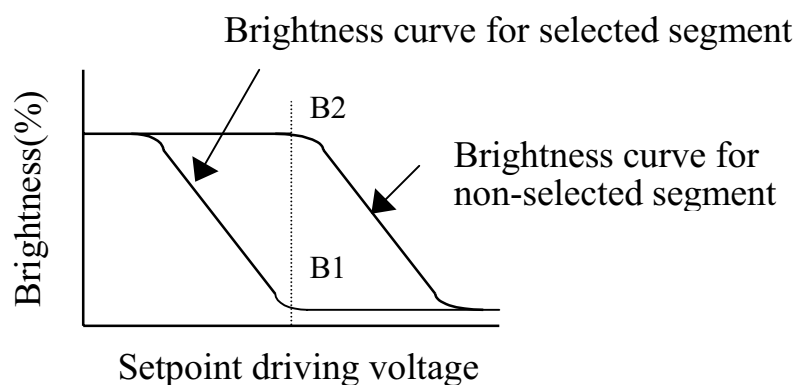
VDD = 5.0± 0.25V

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING ANGLE	$\Phi 2-\Phi 1$	K= 1.4	-----	40	-----	deg.	1
CONTRAST RATIO	K	$\Phi = 10^\circ$ $\theta = 0^\circ$	-----	2	-----	-----	1,2
RESPONSE TIME	tr(rise)	$\Phi = 10^\circ$ $\theta = 0^\circ$	-----	250	400	ms	4
	tf(fall)	$\Phi = 10^\circ$ $\theta = 0^\circ$	-----	350	450	ms	4
THE BRIGHTNESS OF BACKLIGHTING SOURCE	B	$\Phi = 0^\circ$ $\theta = 0^\circ$	-----	10	-----	cd/m ²	5
	λp	-----	565	570	575	nm	

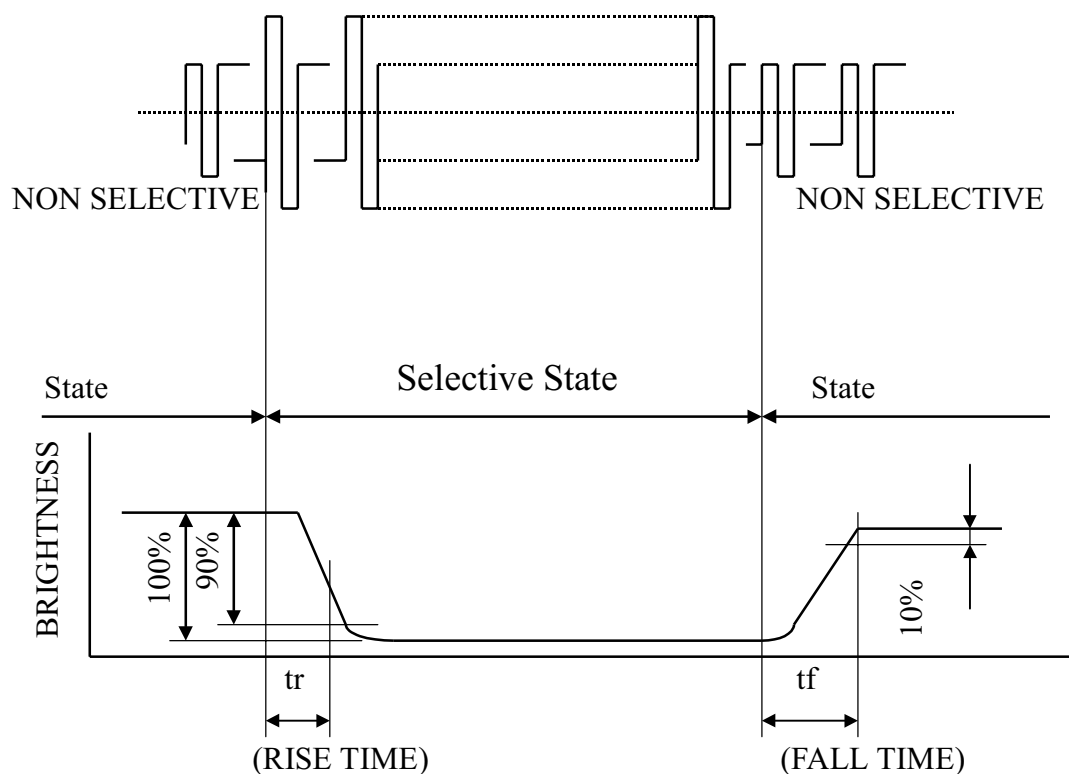
NOTE (1) : DEFINITION OF θ AND Φ NOTE (2) : DEFINITION OF VIEWING ANGLE $\Phi 1$ AND $\Phi 2$ 

NOTE (3) : DEFINITION OF CONTRAST“K”

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

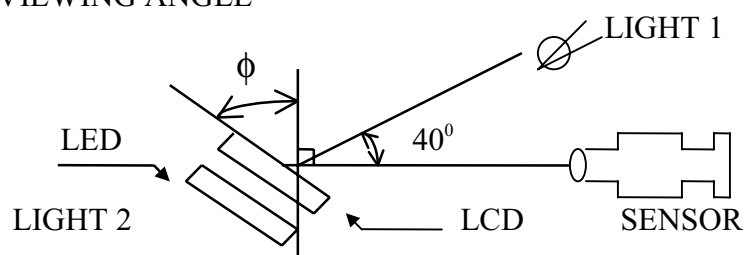


NOTE(4) : DEFINITION OF OPTICAL RESPONSE

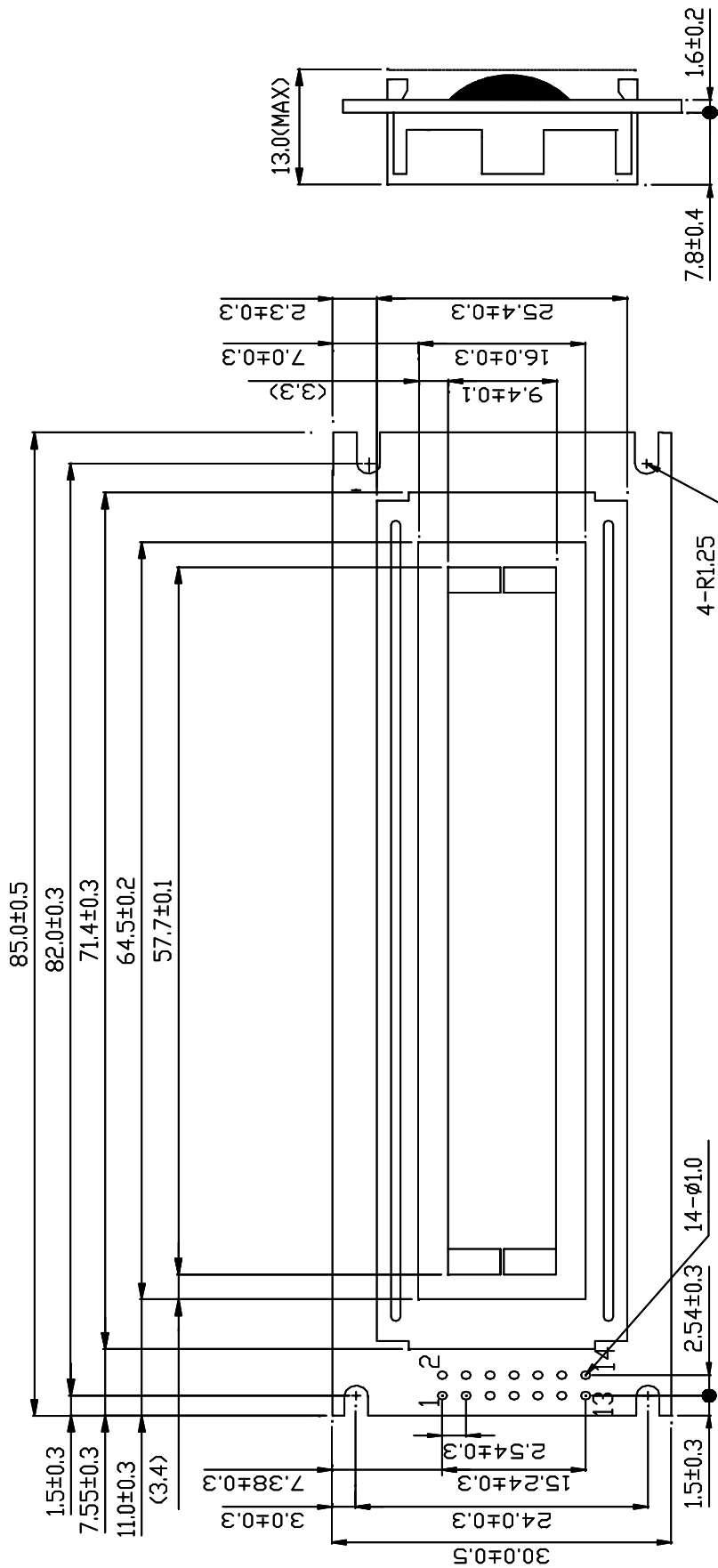


NOTE(5) : OPTICAL OF LIGHT

VIEWING ANGLE

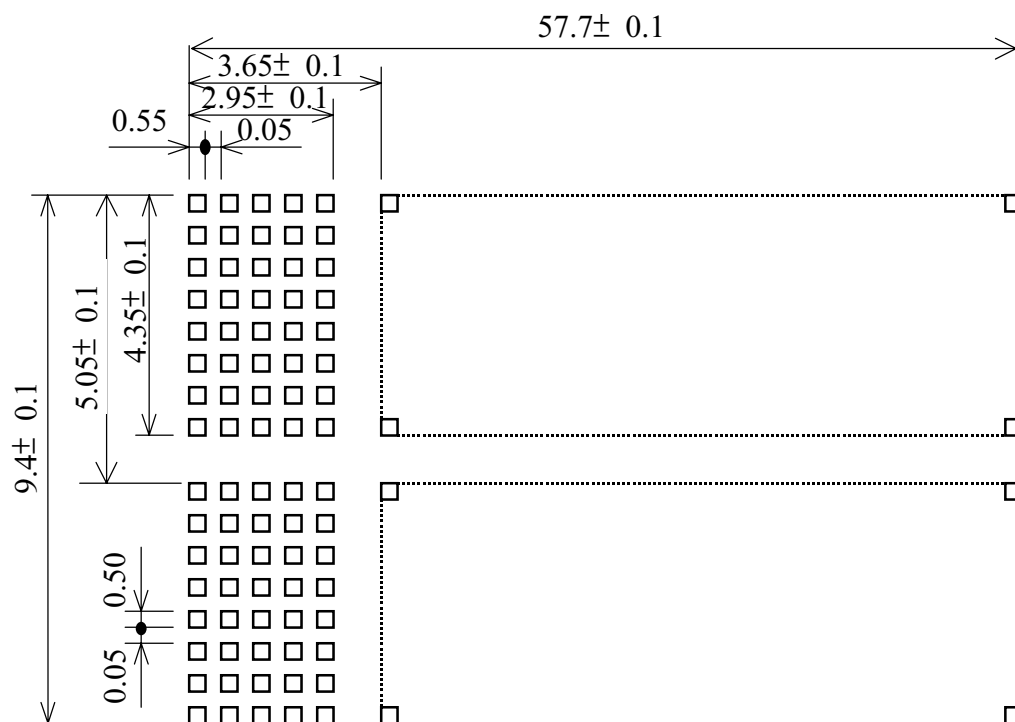
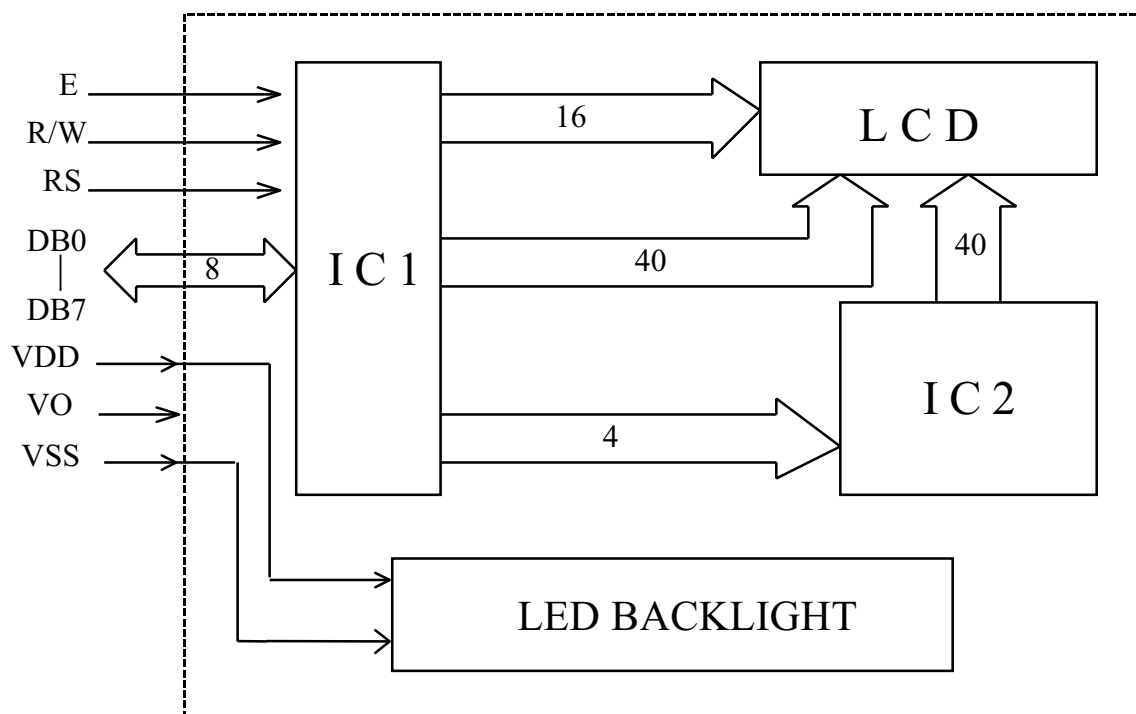


UNIT : mm
SCALE : NTS
NO SPECIFIED



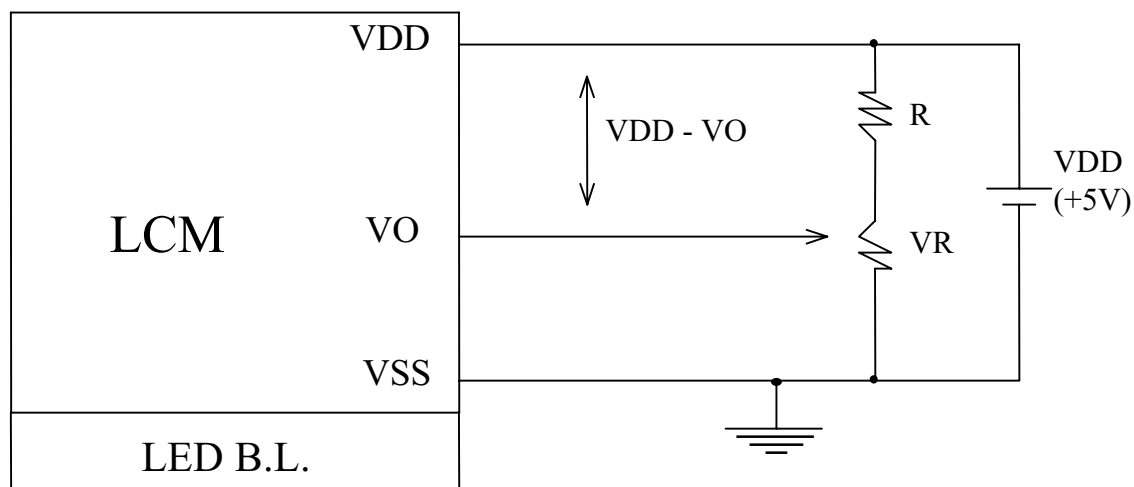
INTERFACE PIN CONNECTION

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

7.1 DETAIL DRAWING OF MATRIX PATTERN.NO SPECIFIED TOLERANCE: ± 0.01 **7.2 BLOCK DIAGRAM.**

8. POWER SUPPLY.

8.1 POWER SUPPLY FOR LCM AND LED BACKLIGHT.



VDD - VO : LCD DRIVING VOLTAGE

VR : 10K Ω ~ 20K Ω