

EXAMINED BY : <i>Jony Chen</i>	EMERGING DISPLAY TECHNOLOGIES CORPORATION	FILE NO . CAS-10097
APPROVED BY: <i>David Chang</i>		ISSUE : SEP.20,1999
		TOTAL PAGE : 7
		VERSION : 2

CUSTOMER	ACCEPTANCE	SPECIFICATIONS
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MODEL NO. :

162A0(EL TYPES)

FOR MESSRS :

CUSTOMER'S APPROVAL

DATE :

BY :

NUMBERING SYSTEM

Polarizer Mode	Backlight	Code value
Transflective	EL	E
Transmissive	EL	F

Backlight Color	Code Value
White	W
Blue-Green	B

Module type : D : TN Character Modules
W : Wide Temp. Modules

E W 1 6 2 A 0 G E B *

Viewing direction
NIL : 6 o'clock
U : 12 o'clock

LCD type + LCD color	Code Value
TN + Gray	T
STN + Yellow-Green	Y
STN + Gray	G
STN + Blue	B

* : AVAILABLE ONLY FOR TN TYPE

TABLE OF CONTENTS

NO.	ITEM	PAGE
1.	GENERAL SPECIFICATIONS -----	1
2.	MECHANICAL SPECIFICATIONS -----	1
3.	ABSOLUTE MAXIMUM RATINGS -----	2
4.	ELECTRICAL CHARACTERISTICS -----	3
5.	OPTICAL CHARACTERISTICS -----	3
6.	OUTLINE DIMENSION -----	4
7.	DETAIL DRAWING OF DOT MATRIX -----	5
8.	BLOCK DIAGRAM -----	5
9.	INTERFACE SIGNALS -----	6
10.	POWER SUPPLY -----	7
11.	DISPLAY DATA RAM ADDRESS -----	7

1. GENERAL SPECIFICATIONS

1.1 GENERAL SPECIFICATIONS
PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :
EU - 002A

1.2 APPLICATION NOTES FOR CONTROLLER / DRIVER :
PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :
EU - KS0066

1.3 THIS INDIVIDUAL SPECIFICATIONS IS PRIOR TO GENERAL
SPECIFICATIONS .

2. MECHANICAL SPECIFICATIONS

- (1) NUMBER OF CHARACTER ----- 16 CH * 2 LINES
- (2) MODULE SIZE ----- 80.0W * 36.0H * 10.0D (max.) mm
- (3) EFFECTIVE AREA ----- 66.0W * 16.0H mm
- (4) CHARACTER FONT ----- 5 * 7 DOTS + CURSOR
- (5) CHARACTER SIZE ----- 2.95W * 4.35H mm
- (6) CHARACTER PITCH ----- 3.65W * 5.05H mm
- (7) DOT SIZE ----- 0.55W * 0.50H mm
- (8) DOT PITCH ----- 0.60W * 0.55H mm
- (9) LCD TYPE *
- (10) DRIVING METHOD ----- 1/16 DUTY MULTIPLEX DRIVE
- (11) VIEWING DIRECTION *
- (12) BACK-LIGHT *

* PLEASE REFER TO NUMBERING SYSTEM .

3. ABSOLUTE MAXIMUM RATINGS

3.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS . (AT Ta = 25 °C)

PARAMETER	SYMBOL	MIN .	MAX .	UNIT	REMARK
POWER SUPPLY FOR LOGIC	VDD — VSS	0	7.0	V	
POWER SUPPLY FOR LCD DRIVE	VDD — V0	0	13.0	V	
INPUT VOLTAGE	VI	VSS	VDD	V	
STATIC ELECTRICITY	—	—	100	V	
POWER SUPPLY FOR EL BACKLIGHT	VEL	—	AC200	Vrms	fEL=1.0KHZ 60 SEC.MAX.
	fEL	—	2.0	KHZ	AC115 Vrms 60SEC.MAX.

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

3.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS .

I T E M		OPERATING		STORAGE		REMARK
		MIN .	MAX .	MIN .	MAX .	
AMBIENT TEMPERATURE	ED	0 °C	50 °C	-20 °C	70 °C	NOTE (2) , (3)
	EW	-20 °C	60 °C	-30 °C	70 °C	
HUMIDITY		—	90 % RH	—	90 % RH	WITHOUT CONDENSATION
VIBRATION		—	4.9 m/s ² (0.5 G)	—	19.6 m/s ² (2 G)	
SHOCK		—	29.4 m/s ² (3 G)	—	490.0 m/s ² (50 G)	XYZ DIRECTIONS
CORROSIVE GAS		NOT ACCEPTABLE		NOT ACCEPTABLE		

NOTE (2) : Ta AT -20°C (-30°C FOR EW) : 48HR MAX .
70°C (70°C FOR EW) : 168HR MAX .

NOTE (3) : BACKGROUND COLOR CHANGES SLIGHTLY DEPENDING ON AMBIENT TEMPERATURE THIS PHENOMENON IS REVERSIBLE .

4. ELECTRICAL CHARACTERISTICS

Ta = 25°C

VDD = 5.0 ± 0.25V

PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	
H LEVEL INPUT VOLTAGE	VIH	————	2.2	—	—	V	
L LEVEL INPUT VOLTAGE	VIL	————	—	—	0.6	V	
H LEVEL OUTPUT VOLTAGE	VOH	-IOH = 0.2 mA	2.4	—	—	V	
L LEVEL OUTPUT VOLTAGE	VOL	IOL = 1.2 mA	—	—	0.4	V	
POWER SUPPLY CURRENT (LOGIC)	IDD	VDD = 5.0 V	—	1.0	3.0	mA	
RECOMMENDED LCD DRIVING VOLTAGE	VDD - VO ∅=25°,θ=** DUTY= 1/16	ED	Ta = 0 °C	—	4.2	—	V
			Ta = 25 °C	—	3.8	—	V
			Ta = 50 °C	—	3.4	—	V
	VDD - VO ∅=10°,θ=0° DUTY= 1/16	EW	Ta = -20 °C	—	4.4	—	V
			Ta = 25 °C	—	4.4	—	V
			Ta = 60 °C	—	4.4	—	V
CLOCK OSCILLATION FREQUENCY	FOSC	Ta = 25 °C	—	270	—	KHZ	
POWER SUPPLY FOR EL BACKLIGHT	VEL	fEL=400HZ	—	100	—	Vrms	
	IEL	VEL=100V fEL=400HZ	—	3.0	—	mArms	

5. OPTICAL CHARACTERISTICS.

Ta = 25°C

VDD = 5.0 V

I T E M		SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE	
VIEWING AREA	ED	∅ 2 - ∅ 1	K ≥ 1.4	20	—	—	deg.	1	
	EW			30	—	—	deg.	1	
CONTRAST RATIO	ED	K	∅ = 25°, θ = **	—	3	—	—	1	
	EW			∅ = 10°, θ = 0°	5	—	—	—	1
RESPONSE TIME	ED	tr (rise)	∅ = 25° θ = **	Ta = 25°C	—	150	250	ms	1
				Ta = 25°C	—	100	150		
	EW	tr (rise)	∅ = 10° θ = 0°	Ta = -20°C	—	5538	—		
				Ta = 25°C	—	228	—		
				Ta = 70°C	—	104	—		
		tf (fall)		Ta = -20°C	—	2316	—		
				Ta = 25°C	—	174	—		
				Ta = 70°C	—	85	—		
THE BRIGHTNESS OF BACK-LIGHT	B	—	—	10	—	—	cd/m ²	1, 2	
				26	—	—		1, 3	

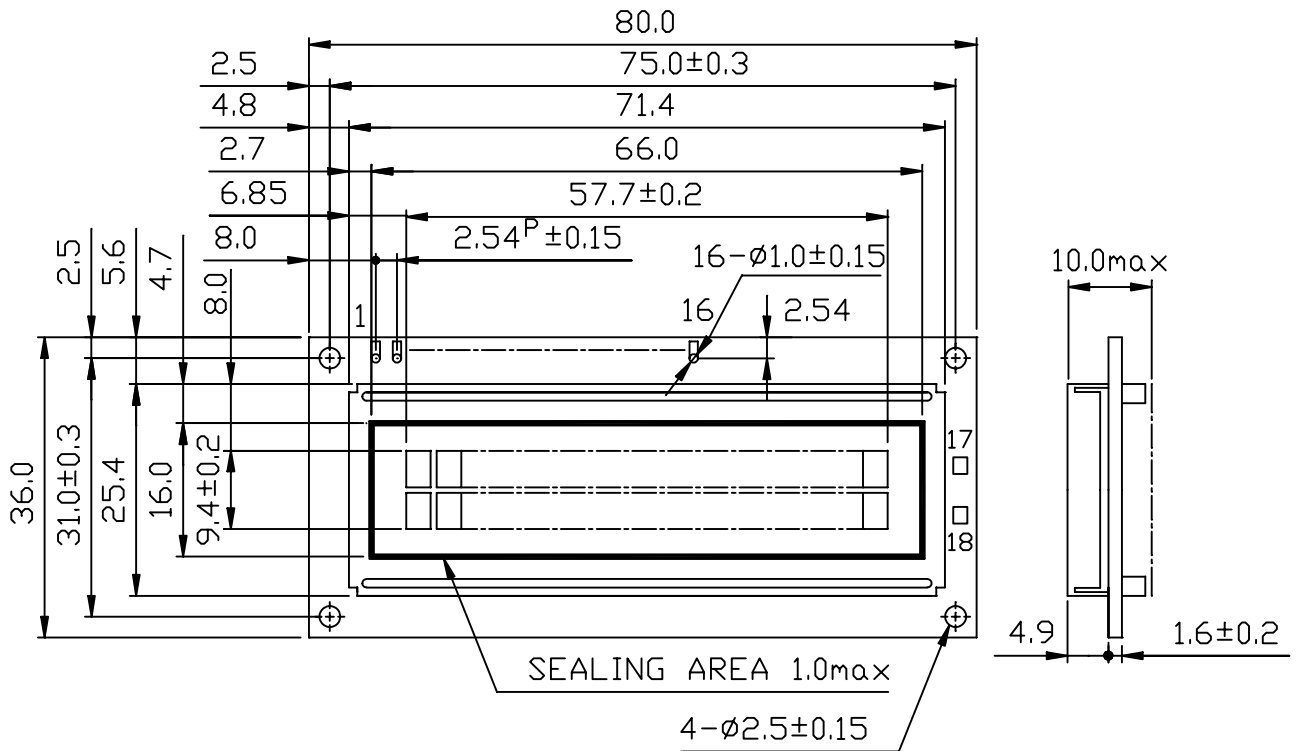
** θ = 0° WHEN VIEWING DIRECTION IS 6 O'CLOCK
θ = 180° WHEN VIEWING DIRECTION IS 12 O'CLOCK

NOTE (1): PLEASE REFER TO :
CUSTOMER ACCEPTANCE STANDARD SPECIFICATION .
EU - 002 A

NOTE (2) : POLARIZER MODE : TRANSFLECTIVE

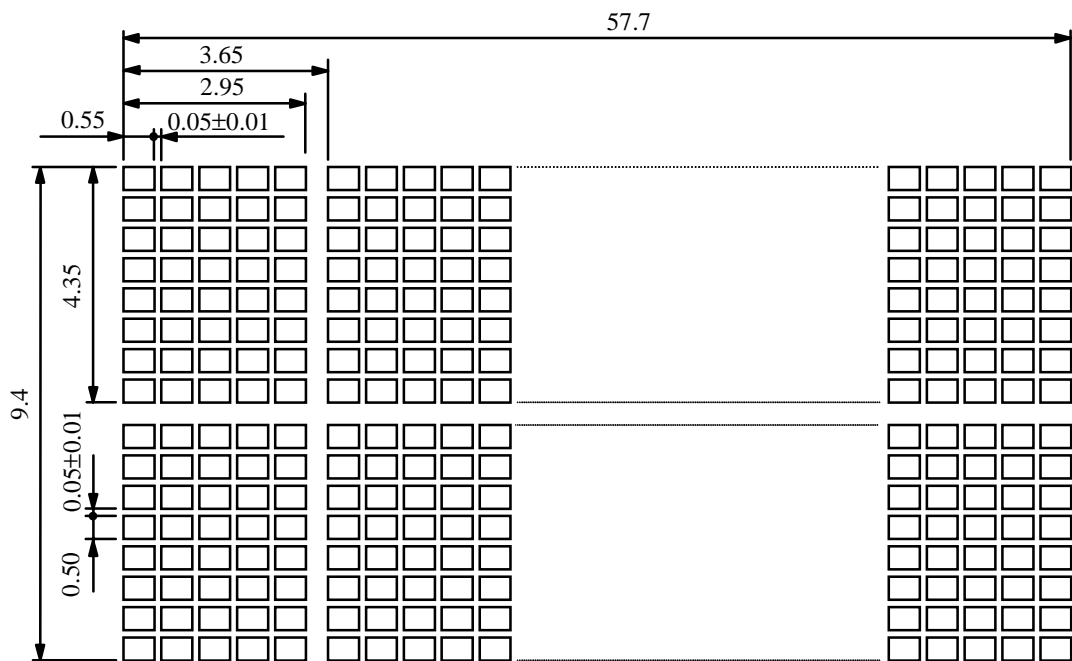
NOTE (3) : POLARIZER MODE : TRANSMISSIVE

6. OUTLINE DIMENSION



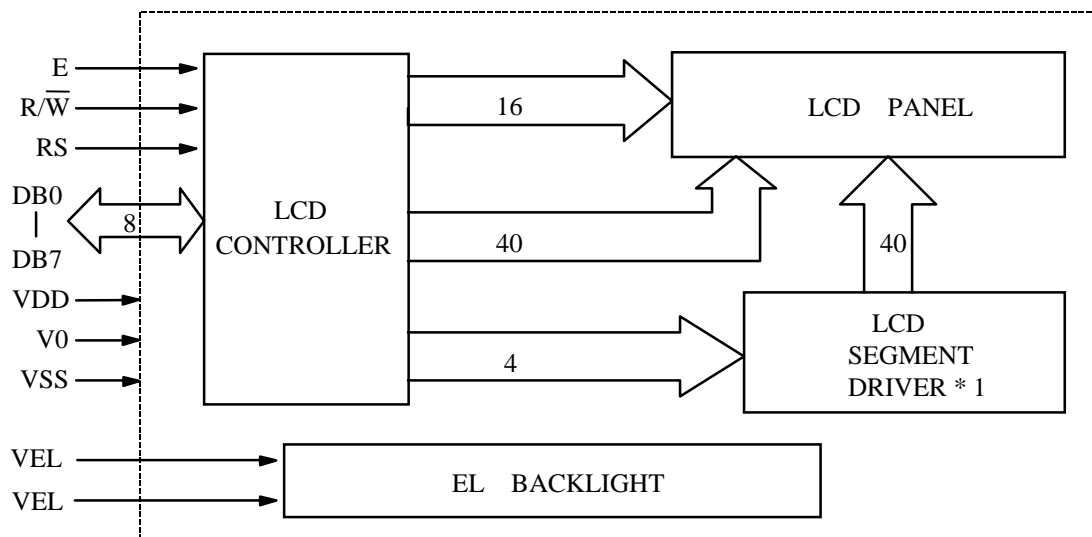
UNIT : mm
SCALE : NTS
NOT SPECIFIED TOLERANCE IS ± 0.5

7. DETAIL DRAWING OF DOT MATRIX



UNIT : mm
SCALE : NTS
NOT SPECIFIED TOLERANCE IS ± 0.1

8. BLOCK DIAGRAM

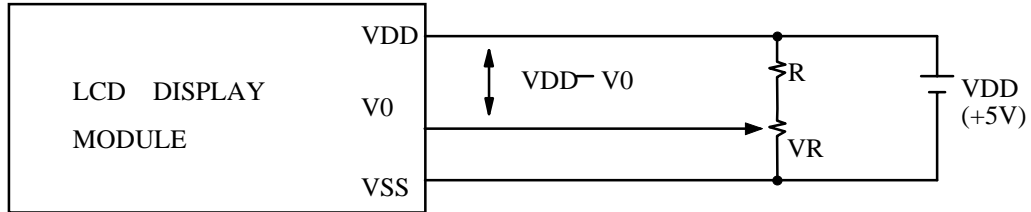


9. INTERFACE SIGNALS

PIN NO.	SYMBOL	DESCRIPTION	FUNCTION
1	VSS	GROUND	0V (GND)
2	VDD	POWER SUPPLY FOR LOGIC CIRCUIT	+5V
3	VO	LCD CONTRAST ADJUSTMENT	
4	RS	INSTRUCTION/DATA REGISTER SELECTION	RS = 0 : INSTRUCTION REGISTER RS = 1 : DATA REGISTER
5	$\overline{R/W}$	READ/WRITE SELECTION	$\overline{R/W}$ = 0 : REGISTER WRITE $\overline{R/W}$ = 1 : REGISTER READ
6	E	ENABLE INPUT	
7	DB0	DATA INPUT/OUTPUT LINES	4 BIT/8BIT SELECTABLE 4 BIT : DB4 - DB7 8 BIT : DB0 - DB7
8	DB1		
9	DB2		
10	DB3		
11	DB4		
12	DB5		
13	DB6		
14	DB7		
15	NC	NOT USE	
16	NC		
17	VEL	POWER SUPPLY FOR EL	
18	VEL	BACKLIGHT	

10. POWER SUPPLY

10.1 POWER SUPPLY FOR LCD MODULE

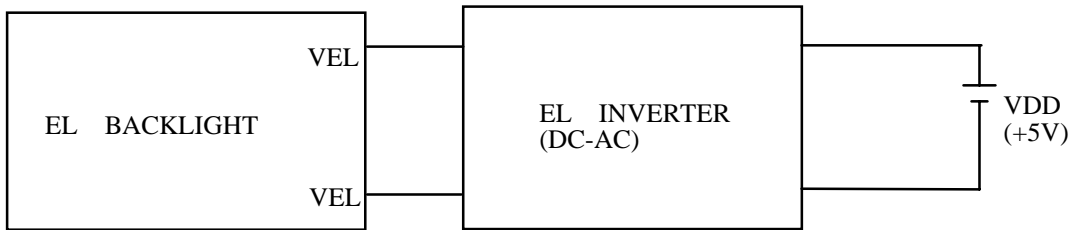


VDD - V0 : LCD DRIVING VOLTAGE

VR : 10K Ω ~ 20K Ω

RECOMMENDED RESISTOR R : $VDD - V0 \geq 1.5 V$

10.2 POWER SUPPLY FOR EL BACKLIGHT



RECOMMENDED INVERTER : SOUN50150

11. DISPLAY DATA RAM ADDRESS

CHARACTER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
LINE 1	80	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F
LINE 2	C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF