

EXAMINED BY :  <i>Jony Chen</i>	EMERGING DISPLAY  TECHNOLOGIES CORPORATION	FILE NO . CAS-10206
APPROVED BY:  <i>David Chang</i>		ISSUE : MAR.13,2000
		TOTAL PAGE : 7
		VERSION : 1

CUSTOMER	ACCEPTANCE	SPECIFICATIONS
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MODEL NO. :

161A0(EL TYPES)

FOR MESSRS :

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CUSTOMER'S APPROVAL

DATE : \_\_\_\_\_

BY : \_\_\_\_\_

EMERGING DISPLAY  
TECHNOLOGIES CORPORATION

MODEL NO . 161A0(EL TYPES)	VERSION 1
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RECORDS OF REVISION	DOC . FIRST ISSUE MAR.13,2000
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DATE	REVISED PAGE NO.	SUMMARY

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 Module  
W : Wide Temp. Module

**E D 16 1 A0 G E B \***

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

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

\* : AVAILABLE ONLY FOR TN TYPE

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1. GENERAL SPECIFICATIONS

1.1 GENERAL SPECIFICATIONS  
PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :  
EU - 002 A

1.2 APPLICATION NOTES FOR CONTROLLER / DRIVER : KS0066  
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 \* 1 LINE
- (2) MODULE SIZE ----- 80.0W \* 36.0H \* 10.0D (max.) mm
- (3) EFFECTIVE AREA ----- 64.5W \* 13.8H mm
- (4) CHARACTER FONT ----- 5 \* 7 DOTS + CURSOR
- (5) CHARACTER SIZE ----- 3.07W \* 6.56H mm
- (6) CHARACTER PITCH ----- 3.77W mm
- (7) DOT SIZE ----- 0.55W \* 0.75H mm
- (8) DOT PITCH ----- 0.63W \* 0.83H mm
- (9) LCD TYPE \*
- (10) DRIVING METHOD ----- 1 / 16 DUTY MULTIPLEX DRIVE
- (11) VIEWING DIRECTION \*
- (12) BACKLIGHT \*

\* 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 - VO	0	13.0	V	
INPUT VOLTAGE	VI	VSS	VDD	V	
STATIC ELECTRICITY	—	—	100	V	NOTE (1)
POWER SUPPLY FOR EL BACKLIGHT	VEL	—	AC200	Vrms	fEL =1.0KHZ 60 SEC. MAX
	fEL	—	2.0	KHZ	AC115 Vrms 60 SEC. 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 <sup>2</sup> (0.5 G)	—	19.6 m/s <sup>2</sup> (2 G)	
SHOCK		—	29.4 m/s <sup>2</sup> (3 G)	—	490.0 m/s <sup>2</sup> (50 G)	XYZ DIRECTIONS
CORROSIVE GAS		NOT ACCEPTABLE		NOT ACCEPTABLE		

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

60°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 = 400 HZ	—	100	—	Vrms	
	IEL	VEL = 100 V fEL = 400 HZ	—	1.7	—	mArms	

5. OPTICAL CHARACTERISTICS.

		Ta = 25 °C		VDD = 5.0 V					
ITEM	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 = 60°C	—	104	—		
		tf ( fall )		Ta = -20°C	—	2316	—		
				Ta = 25°C	—	174	—		
				Ta = 60°C	—	85	—		
THE BRIGHTNESS OF BACK-LIGHT	B	∅=10° θ=0°	10	—	—	cd/m <sup>2</sup>	1, 2		
			22	—	—		1, 3		

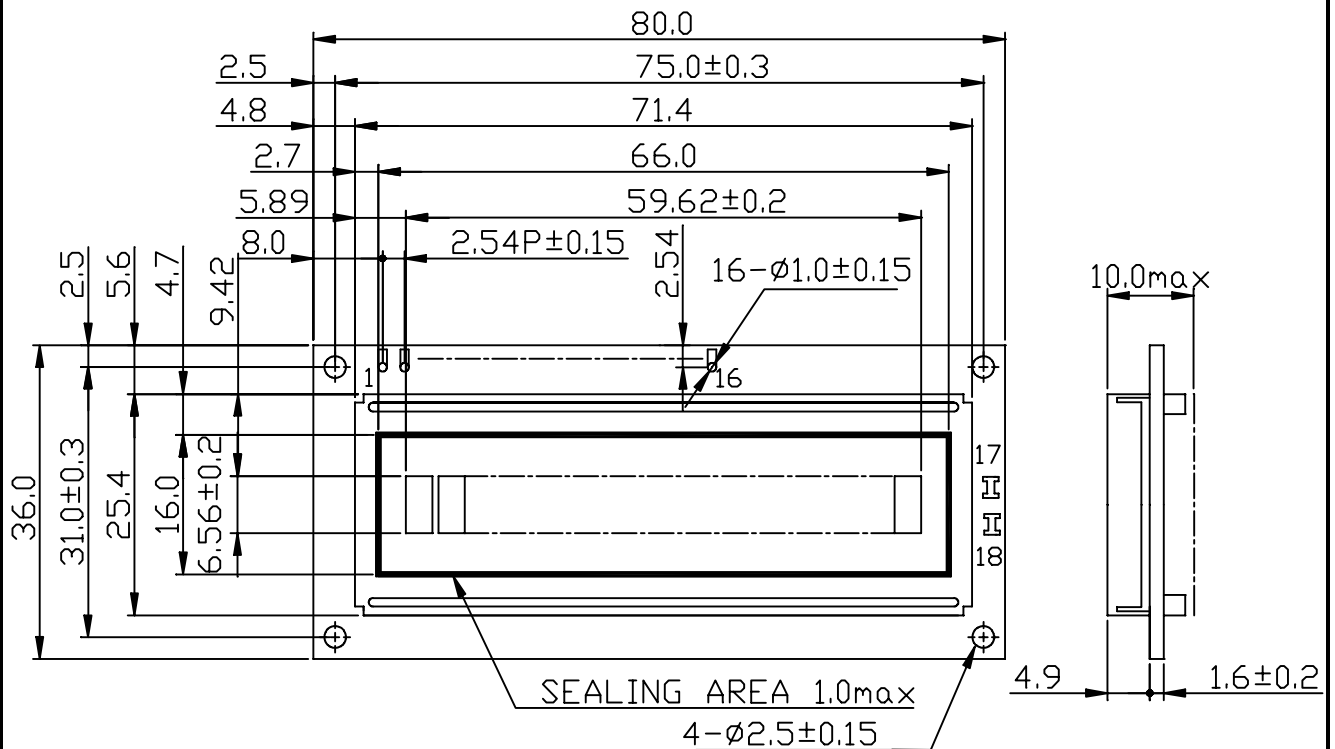
NOTE (1) : PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATION : E U - 002 A

NOTE (2) : POLARIZER MODE : TRANSFLECTIVE

NOTE (3) : POLARIZER MODE : TRANSMISSIVE

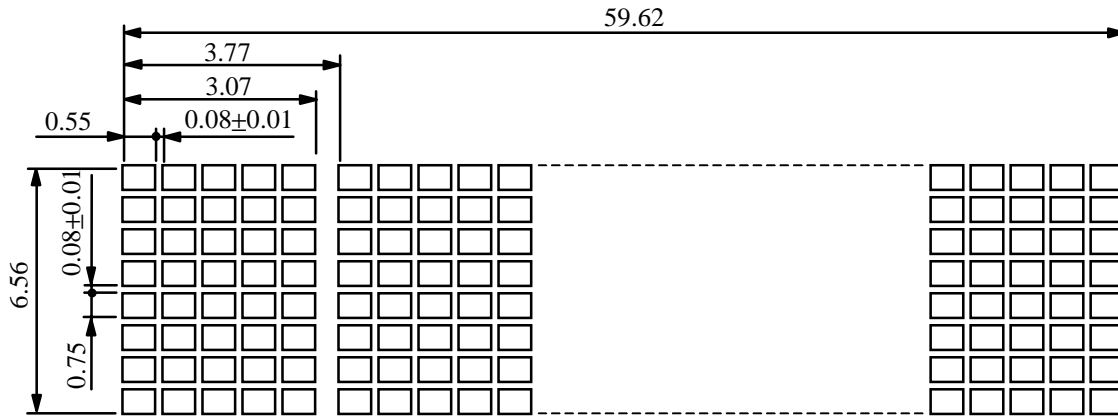
6. OUTLINE DIMENSION



UNIT : mm  
SCALE : NTS  
NOT SPECIFIED TOLERANCE IS ± 0.3

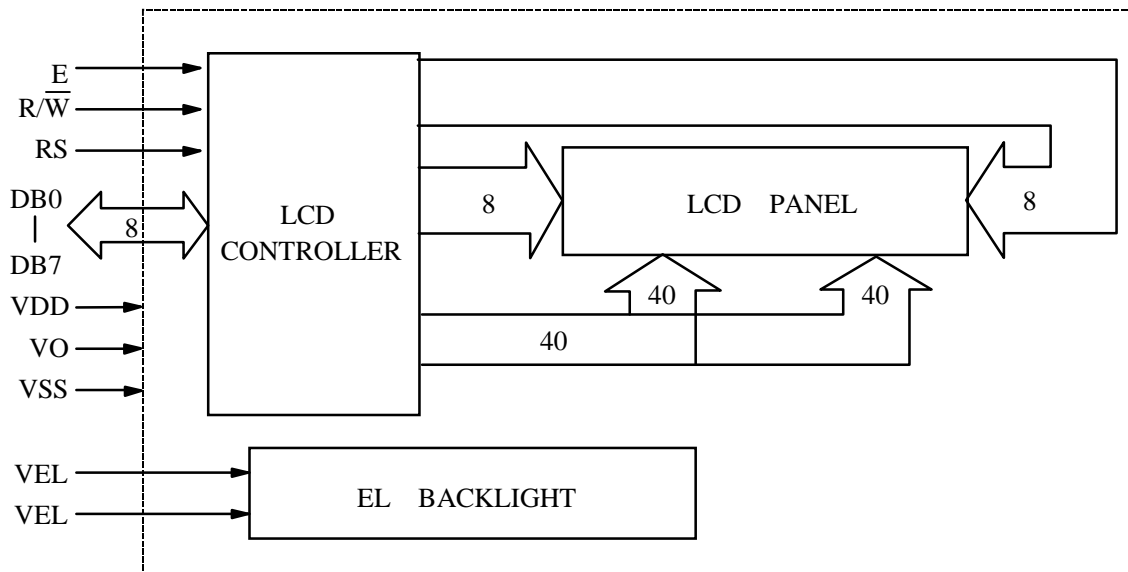


7. DETAIL DRAWING OF DOT MATRIX



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

8. BLOCK DIAGRAM

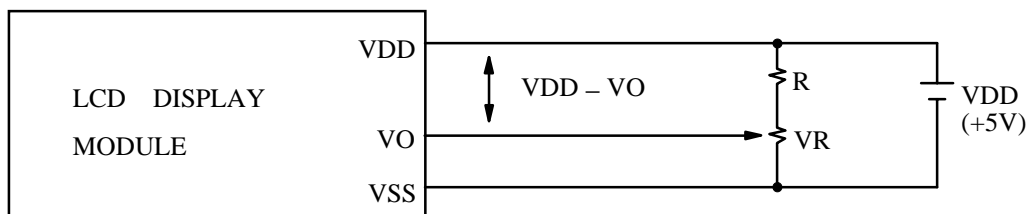


9. INTERFACE SIGNALS

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

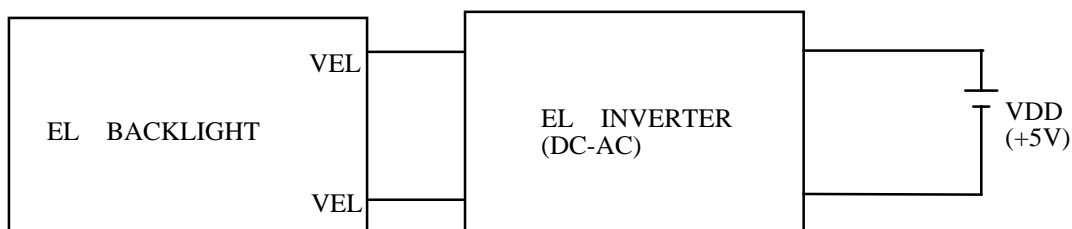


VDD - VO: LCD DRIVING VOLTAGE

VR : 10KΩ ~ 20KΩ

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

### 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	C0	C1	C2	C3	C4	C5	C6	C7