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APPROVED BY: <i>David Chang</i>		ISSUE : SEP.20,1999
		TOTAL PAGE : 7
		VERSION : 3

CUSTOMER	ACCEPTANCE	SPECIFICATIONS
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MODEL NO. :

162A0(REFLECTIVE TYPES)

FOR MESSRS :

CUSTOMER'S APPROVAL

DATE :

BY :

EMERGING DISPLAY
TECHNOLOGIES CORPORATION

MODEL NO .
162A0(REFLECTIVE TYPES)

VERSION
3

RECORDS OF REVISION

DOC . FIRST ISSUE

OCT.24,1997

DATE	REVISED PAGE NO.	SUMMARY
DEC.16,1997	2 , 3	THE ENTIRE PAGES REVISED
SEP.20,1999	1 ~ 3	THE ENTIRE PAGES REVISED

NUMBERING SYSTEM

Polarizer Mode	Backlight	Code value
Reflective	—	R

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

E D 1 6 2 A 0 T R *

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

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

* : AVAILABLE FOR TN TYPE

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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 *

* 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	

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	N.T.	0 °C	50 °C	-20 °C	70 °C	NOTE (2) , (3)
	W.T.	-20 °C	70 °C	-30 °C	80 °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 W.T.) : 48HR MAX .

70°C (80°C FOR W.T.) : 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	TN	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	STN	Ta = -20 °C	___	4.4	___	V
			Ta = 25 °C	___	4.4	___	V
			Ta = 70 °C	___	4.4	___	V
CLOCK OSCILLATION FREQUENCY	FOSC	Ta = 25 °C	___	270	___	KHZ	

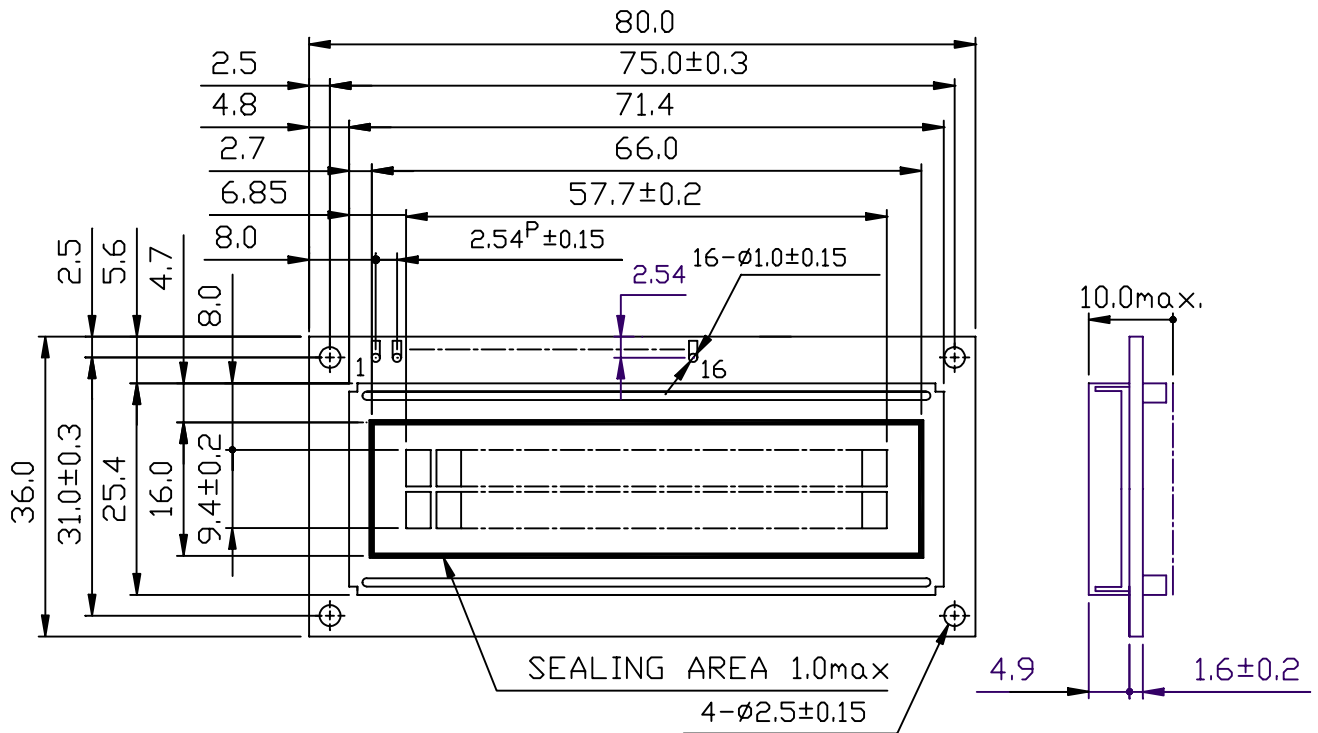
5. OPTICAL CHARACTERISTICS .

		Ta = 25°C		VDD = 5.0 V					
I T E M	SYMBOL	CONDITION	MIN .	TYP .	MAX .	UNIT	NOTE		
VIEWING AREA	TN	∅ 2 - ∅ 1	K ≥ 1.4	20	___	___	deg.	1	
	STN			30	___	___	deg.	1	
CONTRAST RATIO	TN	K	∅ = 25°, θ = **	___	3	___	___	1	
	STN			∅ = 10°, θ = 0°	5	___	___	___	1
RESPONSE TIME	N.T.	tr (rise)	∅ = 25°	Ta = 25°C	___	150	250	ms	1
				Ta = 25°C	___	100	150		
	W.T.	tr (rise)	∅ = 10°	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	___		

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

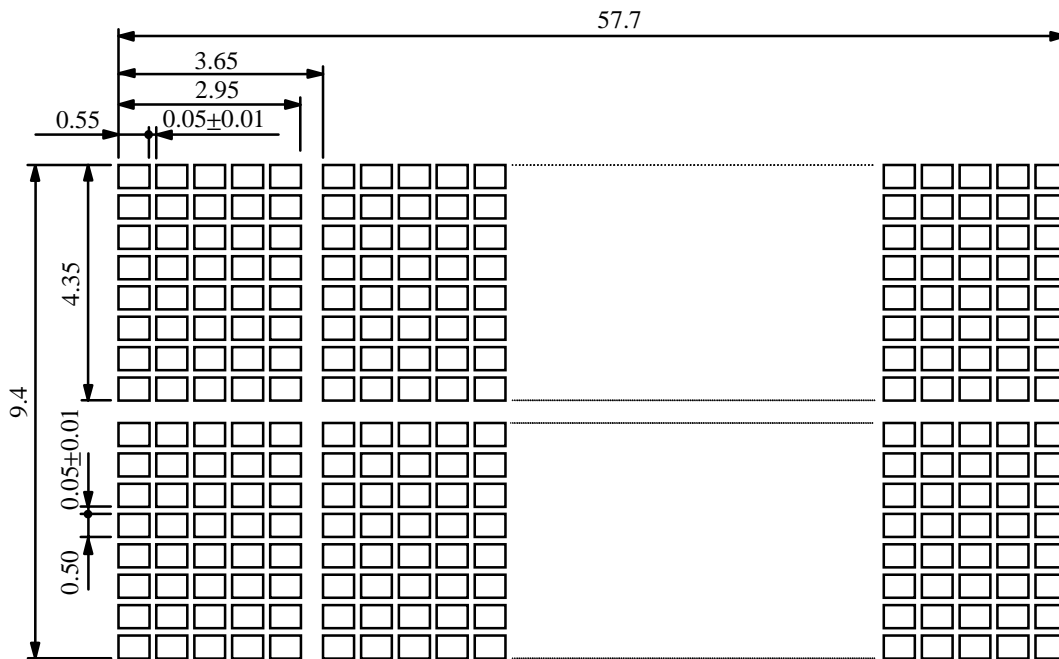
NOTE (1) : PLEASE REFER TO :
CUSTOMER ACCEPTANCE STANDARD SPECIFICATION .
EU - 002A

6. OUTLINE DIMENSION



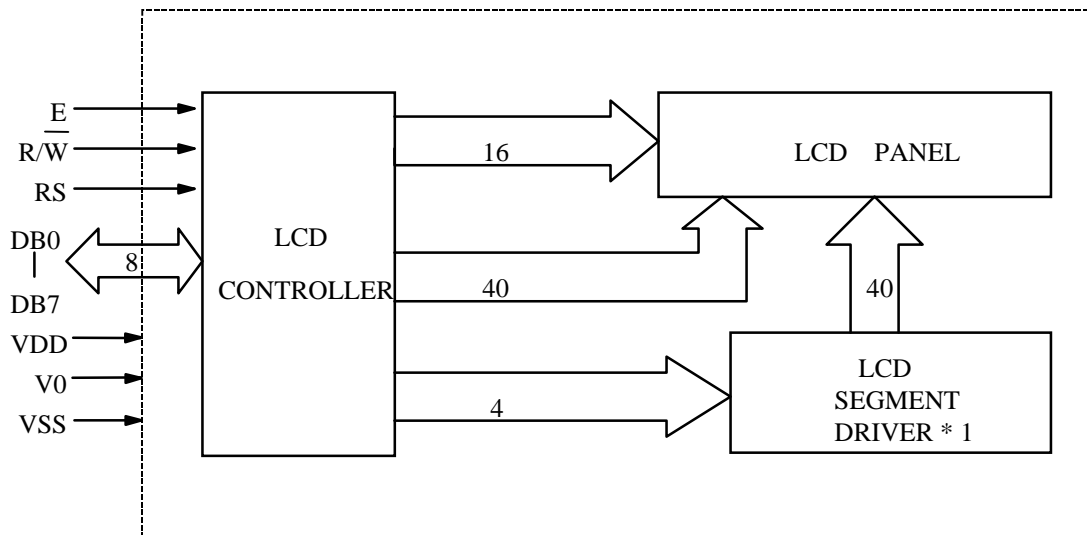
UNIT : mm
SCALE : NTS
NOT SPECIFIED TOLERANCE IS ± 0.5

7. DETAIL DRAWING OF DOT MATRIX



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

8. BLOCK DIAGRAM

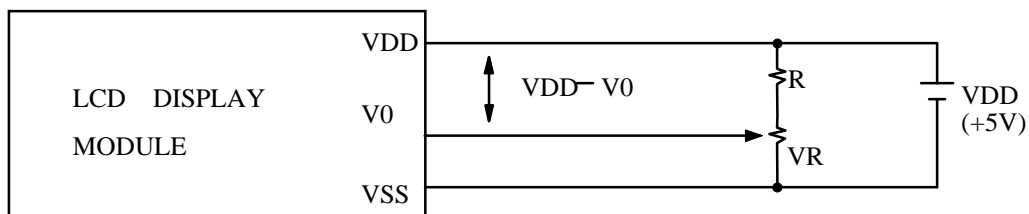


9. INTERFACE SIGNALS

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		

10. POWER SUPPLY

10.1 POWER SUPPLY FOR LCD MODULE



$VDD - V0$: LCD DRIVING VOLTAGE

VR : $10K \Omega \sim 20K \Omega$

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

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