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APPROVED BY:		TOTAL PAGE : 7
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CUSTOMER                      ACCEPTANCE                      SPECIFICATIONS

MODEL NO. :

16240(EL TYPES)

FOR MESSRS :

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CUSTOMER'S APPROVAL

DATE :

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BY :

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EMERGING DISPLAY  
TECHNOLOGIES CORPORATION

MODEL NO. 16240(EL TYPES)	VERSION 3
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RECORDS OF REVISION	DOC . FIRST ISSUE APR.16,1998
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DATE	REVISED PAGE NO.	SUMMARY
APR.08,1999	—	NUMBERING SYSTEM : VIEWING DIRECTION → DELETED
	1	2 . MECHANICAL SPECIFICATIONS : (11) VIEWING DIRECTION → 6 O'CLOCK
	3	5 . OPTICAL CHARACTERISTICS : **θ = 0 ° WHEN VIEWING DIRECTION IS 6 O'CLOCK → DELETED θ = 180 ° WHEN VIEWING DIRECTION IS 12 O'CLOCK → DELETED
SEP.13,2000	1	1.2 APPLICATION NOTES FOR CONTROLLER / DRIVER : HD44780U → KS0066 PLEASE REFER TO : CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS : EU - HD 4 4 7 8 0 U → EU - KS 0 0 6 6 DELETED ( 11 ) : VIEWING DIRECTION----6 O'CLOCK
	1 , 2 , 3	DELETED NORMAL TEMPERATURE TYPE AND TN + GRAY TYPE .
	2 , 3	REVISED OPERATING TEMPERATURE MAX. = 60 °C → 50 °C STORAGE TEMPERATURE MAX. = 70 °C → 60 °C

NUMBERING SYSTEM

Polarizer Mode	Backlight	Code value
Transflective	EL	E
Transmissive	EL	F

Backlight Color	Code Value
White	W

E W 16 2 40 G E W

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

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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 : 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 \* 2 LINES
- (2) MODULE SIZE ----- 122.0W \* 44.0H \* 10.5D (max.) mm
- (3) EFFECTIVE AREA ----- 99.0W \* 24.0H mm
- (4) CHARACTER FONT ----- 5 \* 7 DOTS + CURSOR
- (5) CHARACTER SIZE ----- 4.84W \* 9.66H mm
- (6) CHARACTER PITCH ----- 6.0W \* 10.34H mm
- (7) DOT SIZE ----- 0.92W \* 1.10H mm
- (8) DOT PITCH ----- 0.98W \* 1.16H mm
- (9) LCD TYPE \*
- (10) DRIVING METHOD ----- 1 / 16 DUTY MULTIPLEX DRIVE
- (11) 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	VOLTAGE	VEL	—	AC200	Vrms	fEL =1.0 KHZ 60 SEC. MAX
	FREQUENCY	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	- 20 °C	50 °C	- 30 °C	60 °C	NOTE (2) , (3)
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 -30°C : 48HR MAX .  
60°C : 48HR MAX .

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

#### 4. ELECTRICAL CHARACTERISTICS

Ta = 25 °C

VDD = 5.0 ± 0.25 V

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	—	2.0	5.0	mA
RECOMMENDED LCD DRIVING VOLTAGE	VDD - VO ∅ = 10° θ = 0° DUTY= 1/16	Ta = -20 °C	—	4.5	—	V
		Ta = 25 °C	—	4.5	—	V
		Ta = 50 °C	—	4.5	—	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	—	4.2	—	mArms

#### 5. OPTICAL CHARACTERISTICS .

Ta = 25 °C

VDD = 5.0 V

I T E M	SYMBOL	CONDITION	MIN .	TYP .	MAX .	UNIT	NOTE	
VIEWING AREA	∅ 2 - ∅ 1	K ≥ 1.4	30	—	—	deg.	1	
CONTRAST RATIO	K	∅ = 10° θ = 0°	5	—	—	—	1	
RESPONSE TIME	tr ( rise )	∅ = 10° θ = 0°	Ta = -20 °C	—	1790	—	ms	1
			Ta = 25 °C	—	110	—		
			Ta = 50 °C	—	60	—		
	tf ( fall )		Ta = -20 °C	—	1770	—		
			Ta = 25 °C	—	100	—		
			Ta = 50 °C	—	50	—		
THE BRIGHTNESS OF BACKLIGHT	B	∅ = 10°	—	10	—	cd/m <sup>2</sup>	1, 2	
		θ = 0°	—	23	—		1, 3	

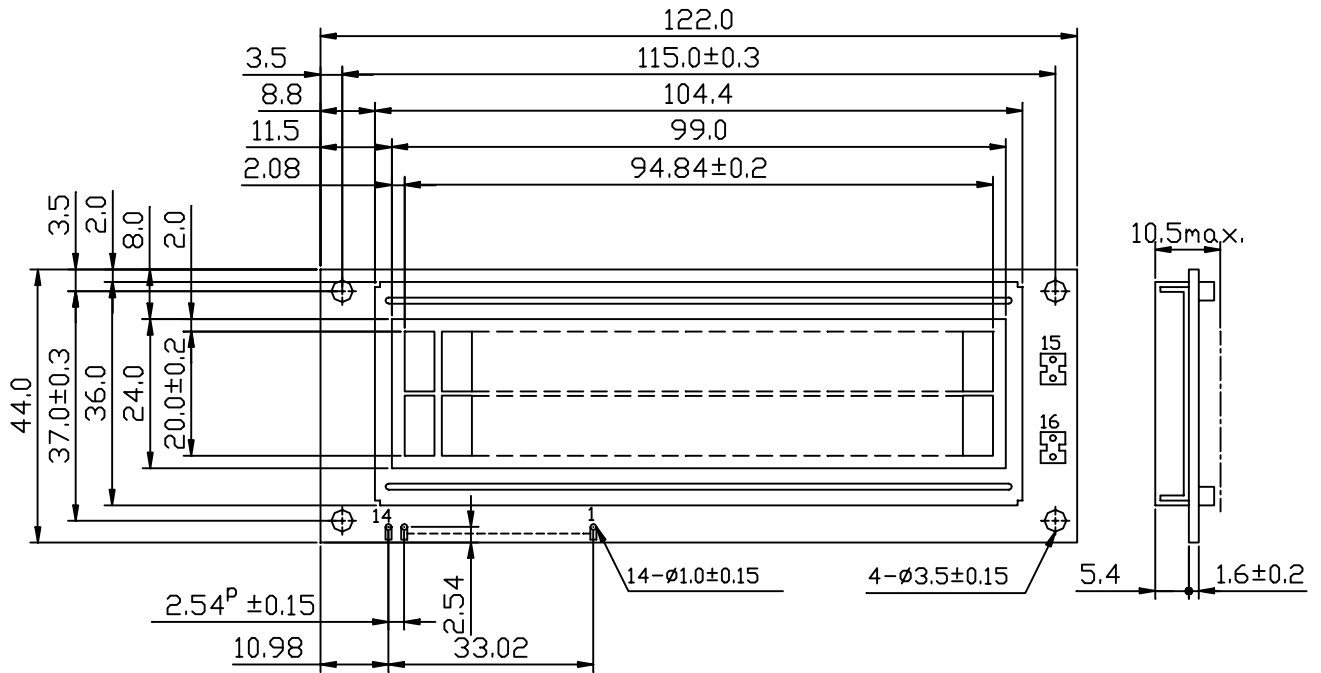
NOTE (1) : PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATION : EU-002A

NOTE (2) : POLARIZER MODE : TRANSFLECTIVE

NOTE (3) : POLARIZER MODE : TRANSMISSIVE

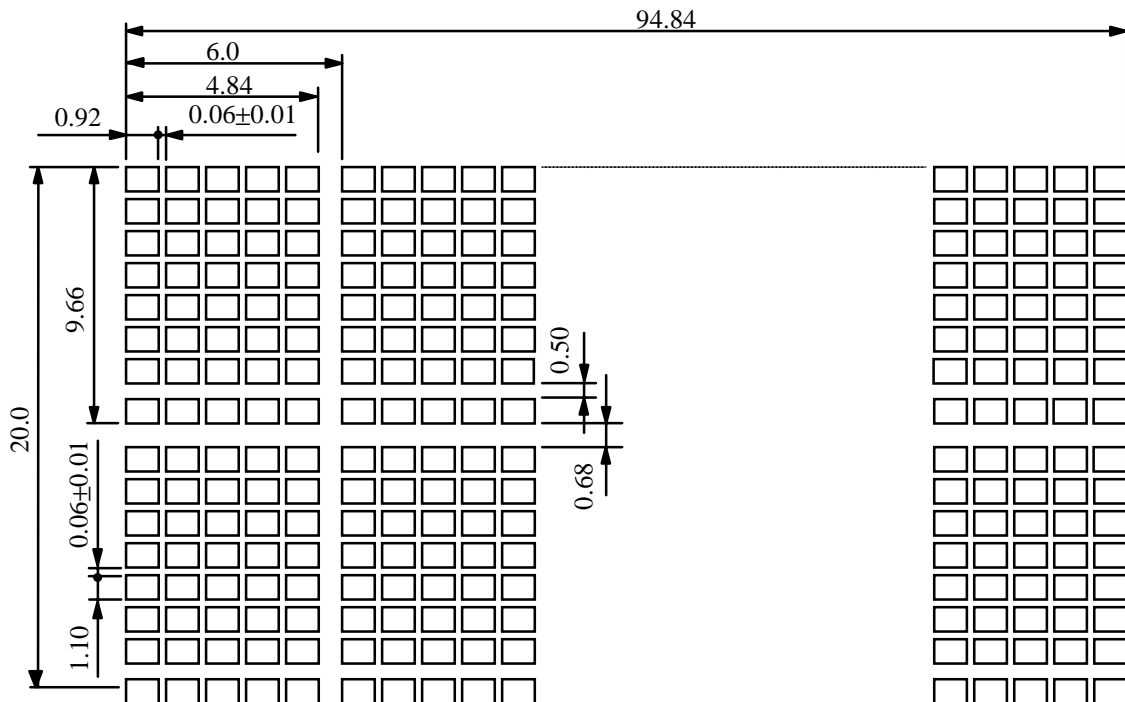
6. OUTLINE DIMENSION



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

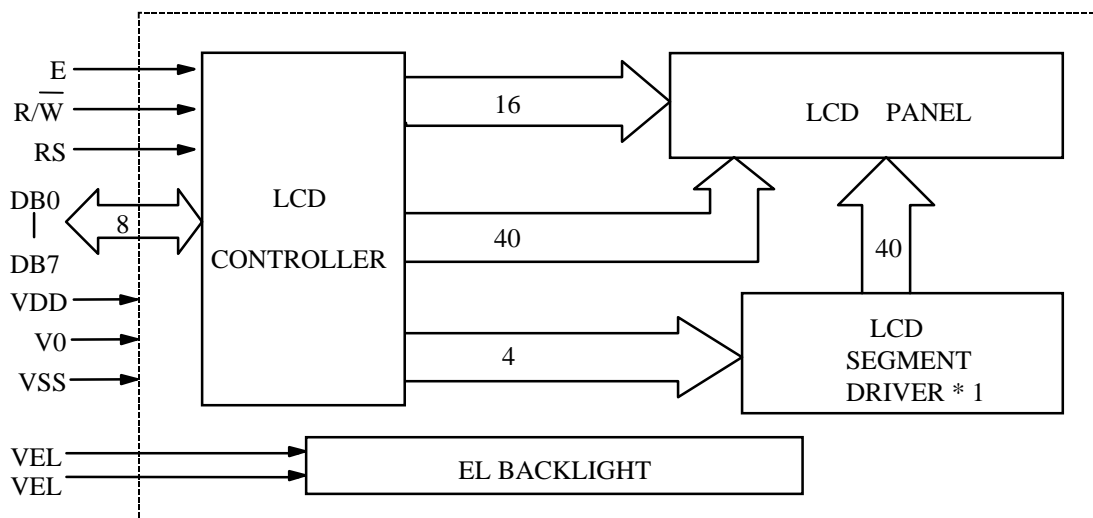


7. DETAIL DRAWING OF DOT MATRIX



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

8. BLOCK DIAGRAM

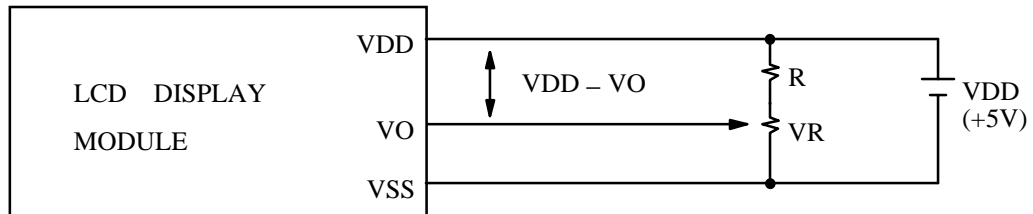


9. INTERFACE SIGNALS

PIN NO.	SIGNAL	DESCRIPTION	FUNCTION
1	VSS	GROUND	0 V ( GND)
2	VDD	POWER SUPPLY FOR LOGIC CIRCUIT	+5V
3	V0	LCD CONTRAST ADJUSTMENT	
4	RS	INSTRUCTION / DATA REGISTER SELECTION	RS = 0 : INSTRUCTION REGISTER RS = 1 : DATA REGISTER
5	R/ $\overline{W}$	READ / WRITE SELECTION	R / $\overline{W}$ = 0 : REGISTER WRITE R / $\overline{W}$ = 1 : REGISTER READ
6	E	ENABLE INPUT	
7~14	DB0~DB7	DATA INPUT / OUTPUT LINES	4 BIT / 8 BIT SELECTABLE 4 BIT : DB4 – DB7 8 BIT : DB0 – DB7
15	VEL	POWER SUPPLY FOR EL BACKLIGHT	
16	VEL	POWER SUPPLY FOR EL BACKLIGHT	

10. POWER SUPPLY

10.1 POWER SUPPLY FOR LCD MODULE

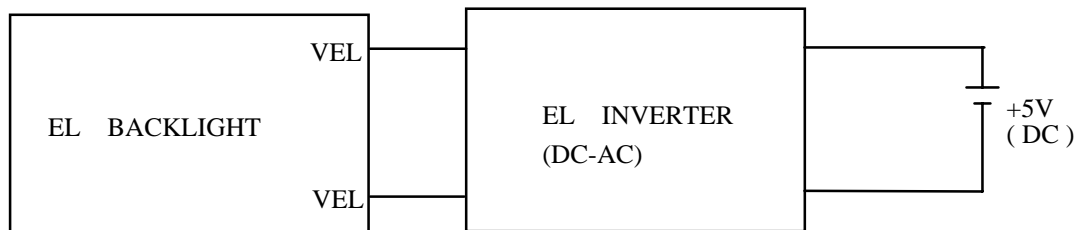


VDD - VO : LCD DRIVING VOLTAGE

VR : 10KΩ ~ 20KΩ

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

10.2 POWER SUPPLY FOR EL BACKLIGHT



RECOMMENDED INVERTER : SOUN50350

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