

EXAMINED BY :  <i>David Chang</i>	EMERGING DISPLAY  TECHNOLOGIES CORPORATION	FILE NO . CAS-50067
APPROVED BY :  <i>Eric Le...</i>		ISSUE : DEC.05,2001
		TOTAL PAGE : 10
		VERSION : 3

CUSTOMER	ACCEPTANCE	SPECIFICATIONS
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MODEL NO . :

EW 3 2 F 5 1 F L Y

FOR MESSRS :

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CUSTOMER'S APPROVAL

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

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



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1. GENERAL SPECIFICATIONS

1.1 GENERAL SPECIFICATIONS  
PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

E U - 0 0 1 A

1.2 THIS INDIVIDUAL SPECIFICATION IS PRIOR TO GENERAL  
SPECIFICATIONS .

2. MECHANICAL SPECIFICATIONS

- (1) NUMBER OF DOTS ----- 320W \* 240H DOTS
- (2) MODULE SIZE ----- 134.5W \* 117.0H \* 14.5D(max.)mm
- (3) EFFECTIVE AREA ----- 103.0W \* 79.0H mm
- (4) ACTIVE AREA ----- 95.97W \* 71.97H mm
- (5) DOT SIZE ----- 0.27W \* 0.27H mm
- (6) DOT PITCH ----- 0.3W \* 0.3H mm
- (7) LCD TYPE ----- FSTN,BLACK/WHITE,TRANSFLECTIVE
- (8) DRIVING METHOD ----- 1 / 240 DUTY MULTIPLEX DRIVE
- (9) VIEWING DIRECTION ----- 6 O'CLOCK
- (10) BACKLIGHT ----- LED , COLOR : YELLOW-GREEN
- (11) TEMPERATURE COMPENSATION CIRCUIT IS BUILT IN

### 3. ABSOLUTE MAXIMUM RATINGS

#### 3.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS .

PARAMETER	SYMBOL	MIN .	MAX .	UNIT	REMARK
POWER SUPPLY FOR LOGIC	VDD – VSS	0	7.0	V	
POWER SUPPLY FOR LCD DRIVING	VDD – VEE	0	3.5	V	
INPUT VOLTAGE	VI	VSS	VDD	V	
STATIC ELECTRICITY	—	—	100	V	NOTE (1)
LED POWER VOLTAGE	VLED	—	2.7	V	
LED FORWARD CURRENT	IF	—	80	Ma	

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	70 °C	- 30 °C	80 °C	NOTE (2) , (3)
HUMIDITY	—	90 % RH	—	90 % RH	WITHOUT CONDENSATION
VIBRATION	—	2.45 m/s <sup>2</sup> (0.25 G)	—	11.76 m/s <sup>2</sup> (1.2 G)	10~100 HZ XYZ DIRECTIONS 1 Hr . EACH
SHOCK	—	29.4 m/s <sup>2</sup> (3 G)	—	490.0 m/s <sup>2</sup> (50 G)	1 Mseconds XYZ DIRECTIONS 1 TIME EACH
CORROSIVE GAS	NOT ACCEPTABLE		NOT ACCEPTABLE		

NOTE (2) : Ta AT -30°C : 48HR MAX .

80°C : 168HR MAX .

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

4. ELECTRICAL CHARACTERISTICS

Ta = 25 °C

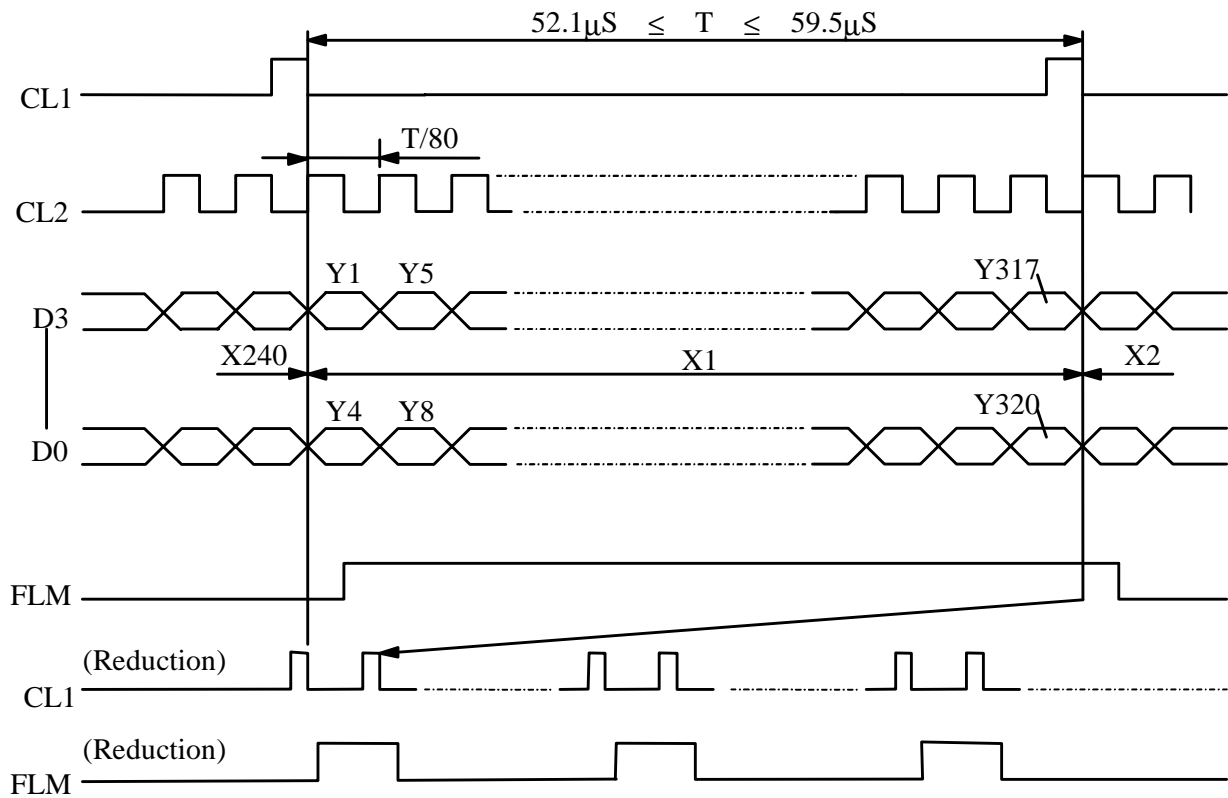
VDD = 5.0 V

PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
POWER SUPPLY VOLTAGE FOR LOGIC	VDD - VSS	—	4.5	5.0	5.5	V
POWER SUPPLY VOLTAGE FOR LCD DRIVE	VEE - VSS	—	-26.5	-27.0	-27.5	V
INPUT VOLTAGE NOTE (1)	VIH	H LEVEL	0.8*VDD	—	—	V
	VIL	L LEVEL	—	—	0.2*VDD	V
POWER SUPPLY CURRENT FOR LOGIC	IDD	VDD-VSS = 5.0 V VEE-VSS = -27.0	—	4	8	mA
POWER SUPPLY CURRENT FOR LCD DRIVE	IEE	VDD-VSS = 5.0 V VEE-VSS = -27.0	—	5	10	mA
RECOMMENDED LCD DRIVING VOLTAGE NOTE (2)	VDD-VLCD ∅ = 10 ° θ = 0 °	Ta = -20 °C	—	23.7	—	V
		Ta = 25 °C	—	22.7	—	V
		Ta = 70 °C	—	19.1	—	V
	VDD - VO	Ta = 25 °C	—	12.5	—	V
FLM FREQUENCY	f FLM	—	70	75	80	HZ
POWER SUPPLY FOR LED	VLED	—	21	24	27	V
	ILED	VLED = 24V	—	40	50	mA

NOTE (1): APPLIED TO TERMINALS M, FLM, CL1, CL2, D0-D3.

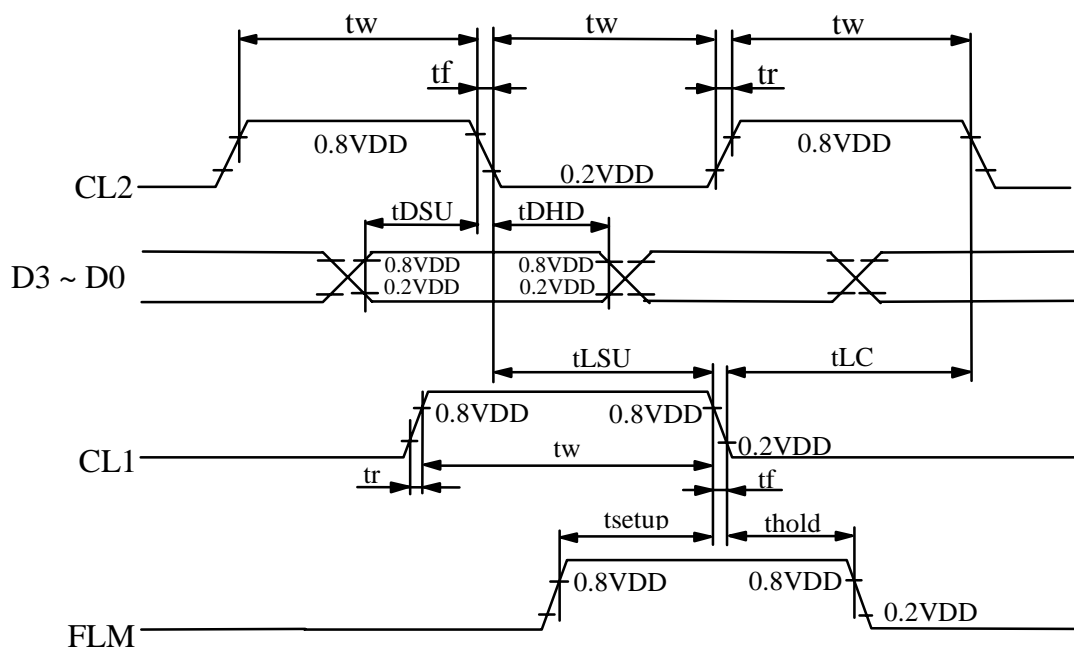
NOTE (2): RECOMMENDED LCD DRIVING VOLTAGE MAY FLUCTUATE ABOUT ± 1.0V BY EACH MODULE.

5. TIMING CHARACTERISTICS  
5.1 INTERFACE TIMING



5.2 SWITCHING CHARACTERISTICS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
Frequency of maximum	$f_{cp}$	—	—	8	MHZ
CL1, CL2, pulse	$t_w$	45	—	—	ns
Rise, fall	$t_r, t_f$	—	—	15	ns
Data setup	$t_{DSU}$	20	—	—	ns
Data hold	$t_{DHD}$	20	—	—	ns
CL1 setup	$t_{LSU}$	80	—	—	ns
CL1 → CL2 time	$t_{LC}$	80	—	—	ns
FLM setup	$t_{setup}$	100	—	—	ns
FLM hold	$t_{hold}$	100	—	—	ns
M delay	$t_{DF}$	—	—	300	ns





6. OPTICAL CHARACTERISTICS

Ta = 25 °C

VDD = 5.0 V

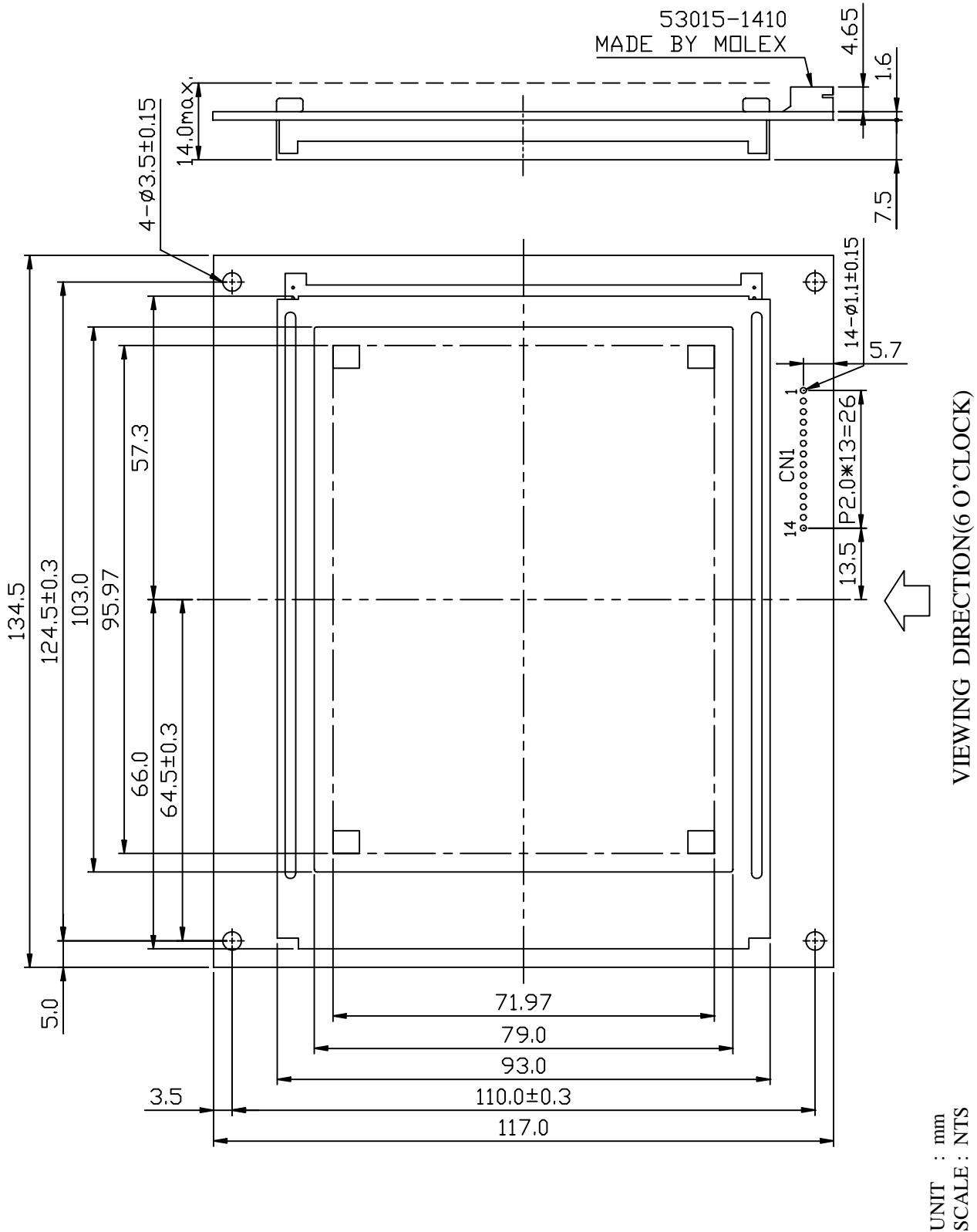
VDD-VLCD = (22.7V)

I T E M	SYMBOL	CONDITION	MIN .	TYP .	MAX.	UNIT	NOTE	
VIEWING AREA	$\varnothing 2 - \varnothing 1$	$K \geq 2.0$	—	50	—	deg.	1	
CONTRAST RATIO	K	$\varnothing = 10^\circ \theta = 0^\circ$	—	20	—	—	1	
RESPONSE TIME	tr ( rise )	$\varnothing=10^\circ$ $\theta = 0^\circ$	Ta = - 20 °C	—	6268	—	ms	1
			Ta = 25 °C	—	228	—		
	Ta = 70 °C		—	104	—			
	tf ( fall )		Ta = - 20 °C	—	5714	—		
			Ta = 25 °C	—	191	—		
			Ta = 70 °C	—	86	—		
BRIGHTNESS OF BACKLIGHT	B	—	—	3.5	—	cd / m <sup>2</sup>	—	

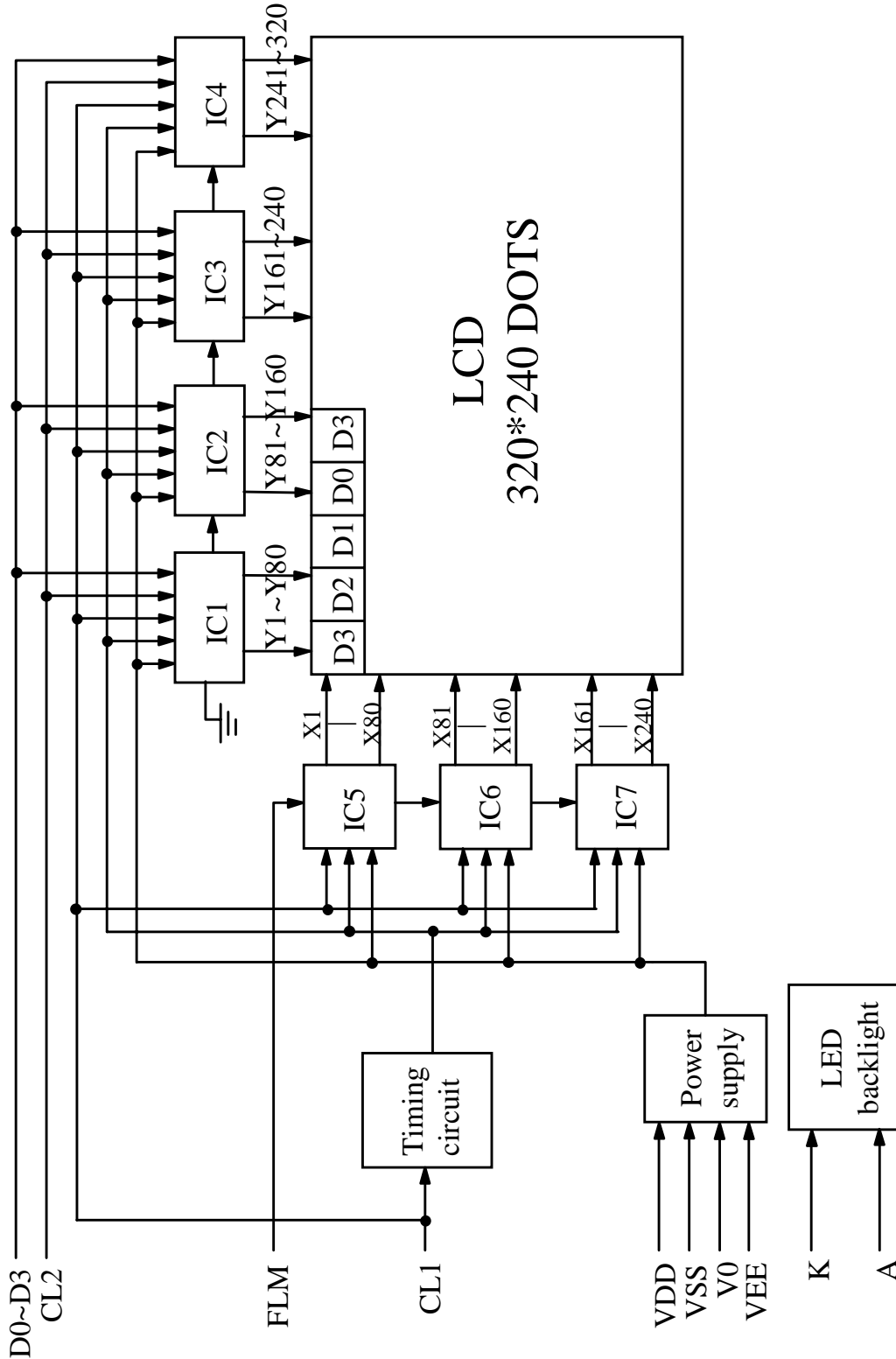
NOTE (1) : PLEASE REFER TO :  
CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS.

EU - 001A

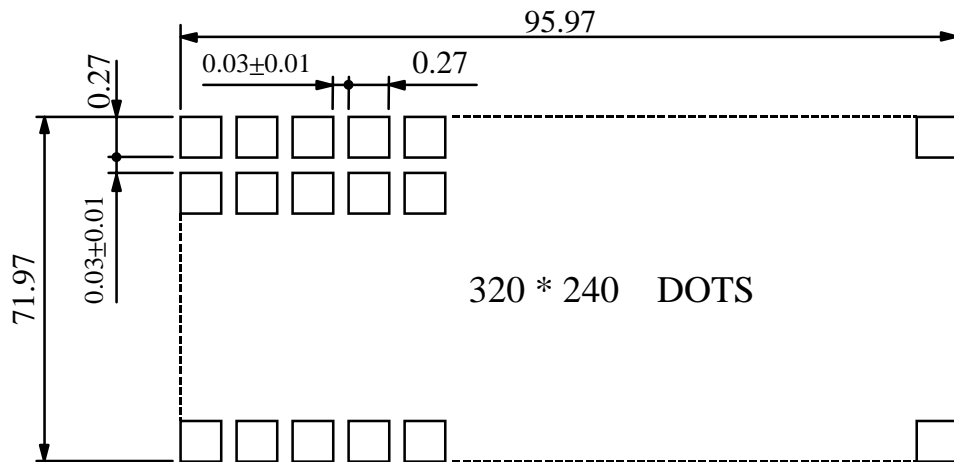
7. OUTLINE DIMENSION



8. BLOCK DIAGRAM



9. DETAIL DRAWING OF DOT MATRIX



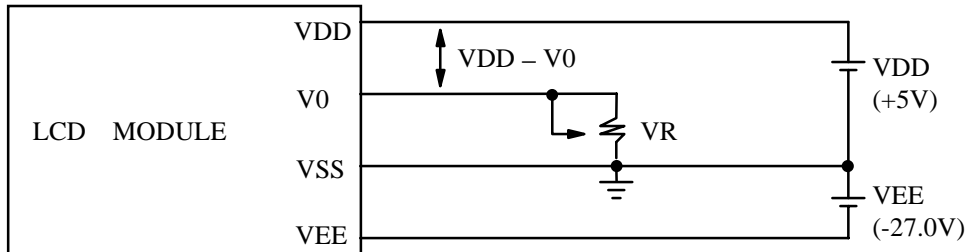
UNIT: mm  
SCALE : NTS  
NOT SPECIFIED TOLERANCE IS  $\pm 0.1$

10. INTERFACE SIGNALS

PIN NO	SYMBOL	LEVEL	FUNCTION
1	VO	—	OPERATING VOLTAGE FOR LCD DRIVING
2	VEE	—	POWER SUPPLY FOR LCD DRIVING
3	D3	H / L	DISPLAY DATA
4	D2	H / L	
5	D1	H / L	
6	D0	H / L	
7	VSS	—	GROUND
8	VDD	—	POWER SUPPLY FOR LOGIC CIRCUIT
9	CL2	H → L	DISPLAY DATA SHIFT
10	CL1	H → L	DISPLAY DATA LATCH
11	FLM	H	THE FLM SIGNAL INDICATING THE BEGINNING OF EACH DISPLAY CYCLE
12	K	—	POWER SUPPLY FOR LED BACKLIGHT(GND)
13	A	—	POWER SUPPLY FOR LED BACKLIGHT(+24V)
14	NC	—	NO CONNECTION

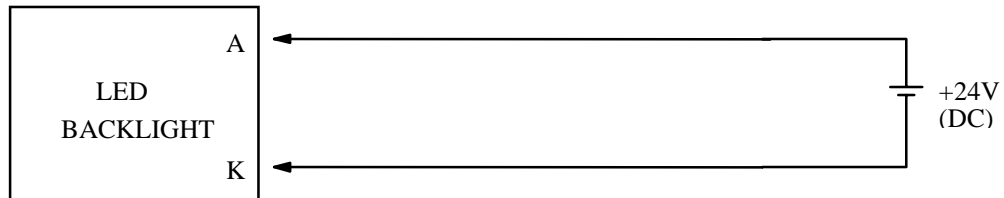
1 1 . POWER SUPPLY

1 1 . 1 POWER SUPPLY FOR LCM



VDD - V0 : LCD DRIVING VOLTAGE  
VR : 30KΩ ~ 50KΩ

1 1 . 2 POWER SUPPLY FOR LED BACK - LIGHT



1 1 . 3 TIMING OF POWER SUPPLY AND INTERFACE SIGNAL

