

EXAMINED BY :	EMERGING DISPLAY  TECHNOLOGIES CORPORATION	FILE NO . CAS-10235
Kevin Kuo		ISSUE : MAR.20,2002
APPROVED BY:		TOTAL PAGE : 8
<i>Roger Yang</i>		VERSION : 3

CUSTOMER	ACCEPTANCE	SPECIFICATIONS
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MODEL NO. :

32FA1(LED 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 .  
32FA1(LED TYPES)

VERSION  
3

DOC . FIRST ISSUE

JAN.19,2001

RECORDS OF REVISION

DATE	REVISED PAGE NO.	SUMMARY																								
OCT.03,2001	3	4. ELECTRICAL CHARACTERISTICS <table border="1"> <thead> <tr> <th>RECOMMENDED LCD DRIVING RESISTER VALUE NOTE ( 3 )</th> <th>VR7 - VSS ∅ = 10° θ = 0° DUTY =1/240</th> <th>Ta = -20 °C</th> <th>—</th> <th>24.2</th> <th>—</th> <th>V</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <th>Ta = 25 °C</th> <td>—</td> <td>21.7</td> <td>—</td> <td>V</td> </tr> <tr> <td></td> <td></td> <th>Ta = 70 °C</th> <td>—</td> <td>19.2</td> <td>—</td> <td>V</td> </tr> </tbody> </table>	RECOMMENDED LCD DRIVING RESISTER VALUE NOTE ( 3 )	VR7 - VSS ∅ = 10° θ = 0° DUTY =1/240	Ta = -20 °C	—	24.2	—	V			Ta = 25 °C	—	21.7	—	V			Ta = 70 °C	—	19.2	—	V			
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6	7. BLOCK DIAGRAM REVISED DC/DC																									
8	10. POWER SUPPLY REE → VEE																									
	7	9. INTERFACE SIGNALS PIN 17 REE → VEE																								
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8	10. POWER SUPPLY 10.1 POWER SUPPLY FOR LCM : ADD VLCD																									

NUMBERING SYSTEM

Polarizer Mode	Backlight	Code value
Transflective	LED	L
Transmissive	LED	M

Backlight	Code Value
White	W

E W 3 2 F A 1 F L W

LCD type + color	Code Value
STN + Blue	B
FSTN + White	F
FSTN + Black	N

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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 :

PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

EU - SED 1335

1.3 THIS INDIVIDUAL SPECIFICATION IS PRIOR TO GENERAL SPECIFICATIONS .

2. MECHANICAL SPECIFICATIONS

- (1) NUMBER OF DOTS ----- 320W \* 240H DOTS  
(2) MODULE SIZE ----- 93.8W \* 66.6H \* 8.5D mm  
(3) EFFECTIVE AREA ----- 78.8W \* 59.6H mm  
(4) ACTIVE AREA ----- 76.79W \* 57.59H mm  
(5) DOT SIZE ----- 0.23W \* 0.23H mm  
(6) DOT PITCH ----- 0.24W \* 0.24H mm  
(7) LCD TYPE \*  
(8) DRIVING METHOD ----- 1 / 240 DUTY MULTIPLEX DRIVE  
(9) BACKLIGHT ----- LED , COLOR : WHITE  
(10) VIEWING DIRECTION ----- 6 O'CLOCK

\* PLEASE REFER TO NUMBERING SYSTEM .

### 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	VR7 – VSS	—	27	V	
INPUT VOLTAGE	VI	VSS	VDD	V	
STATIC ELECTRICITY	—	—	100	V	NOTE (1)
POWER SUPPLY FOR LED	VLED – VLSS	—	5	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	- 20 °C	70 °C	- 20 °C	70 °C	NOTE (2) , (3)
HUMIDITY	—	85 % RH	—	85 % 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)	10 mSECONDS XYZ DIRECTIONS 1 TIME EACH
CORROSIVE GAS	NOT ACCEPTABLE		NOT ACCEPTABLE		

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

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

4 . ELECTRICAL CHARACTERISTICS

Ta = 25 °C

VDD-VSS = 5 . 0 V

PARAMETER	SYMBOL	CONDITION	MIN .	TYP.	MAX .	UNIT
POWER SUPPLY VOLTAGE FOR LOGIC	VDD - VSS	—	2.5	—	5.0	V
INPUT VOLTAGE NOTE ( 1 )	VIH	H LEVEL	0.5*VDD	—	—	V
	VIL	L LEVEL	—	—	0.2*VDD	V
OUTPUT VOLTAGE NOTE ( 1 )	VOH	H LEVEL	2.4	—	—	V
	VOL	L LEVEL	—	—	VSS+0.4	V
POWER SUPPLY CURRENT FOR LOGIC NOTE ( 2 )	IDD	VDD - VSS = 5 . 0 V VR7 - VSS = 2 1 . 7 V	—	80	—	mA
RECOMMENDED LCD DRIVING VOLTAGE	VLCD - VSS ∅ = 10° θ = 0° DUTY = 1 / 240	Ta = -20 °C	23.2	24.2	25.2	V
		Ta = 25 °C	20.7	21.7	22.7	V
		Ta = 70 °C	18.2	19.2	20.2	V
CLOCK OSCILLATION FREQUENCY	f OSC	—	—	8	—	MHZ
POWER SUPPLY FOR LED	VLED - VLSS	IF = 100 mA	—	5	—	V

NOTE ( 1 ) : APPLIED TO TERMINALS D0 TO D7 , A0 ,  $\overline{CS}$  ,  $\overline{WR}(R/\overline{W})$  ,  $\overline{RD}(E)$  , SEL1 .

NOTE ( 2 ) : THE DISPLAY PATTERN IS ALL “ OFF ” / “ ON ” .

5. OPTICAL CHARACTERISTICS

Ta = 25 °C

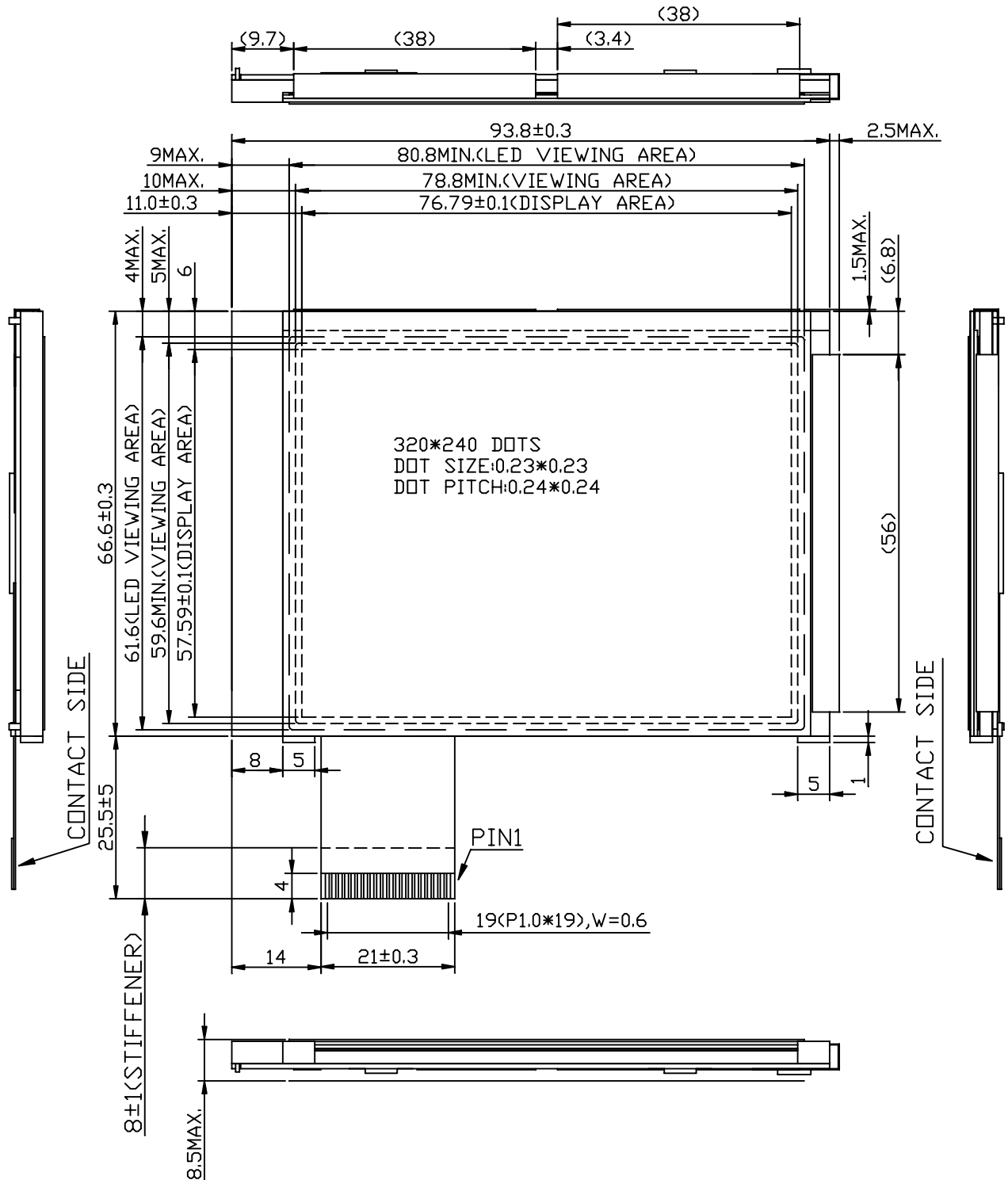
VDD = 5.0 V

I T E M		SYMBOL	CONDITION	MIN .	TYP .	MAX.	UNIT	NOTE
VIEWING AREA	STN	$\varnothing 2 - \varnothing 1$	$K \geq 2.0$	—	40	—	deg.	1
	FSTN			50	—	—	deg.	1
CONTRAST RATIO	STN	K	$\varnothing = 10^\circ$ $\theta = 0^\circ$	3	—	—	—	1
	FSTN			5	—	—	—	1
RESPONSE TIME	t r ( rise )		$\varnothing = 10^\circ$ $\theta = 0^\circ$	—	( 330 )	—	msec	1
	t f ( fall )			—	( 330 )	—	msec	1
BRIGHTNESS OF BACKLIGHT		B	—	10	—	—	cd / m <sup>2</sup>	1

NOTE (1) : PLEASE REFER TO :  
CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS. (EU - 001A)

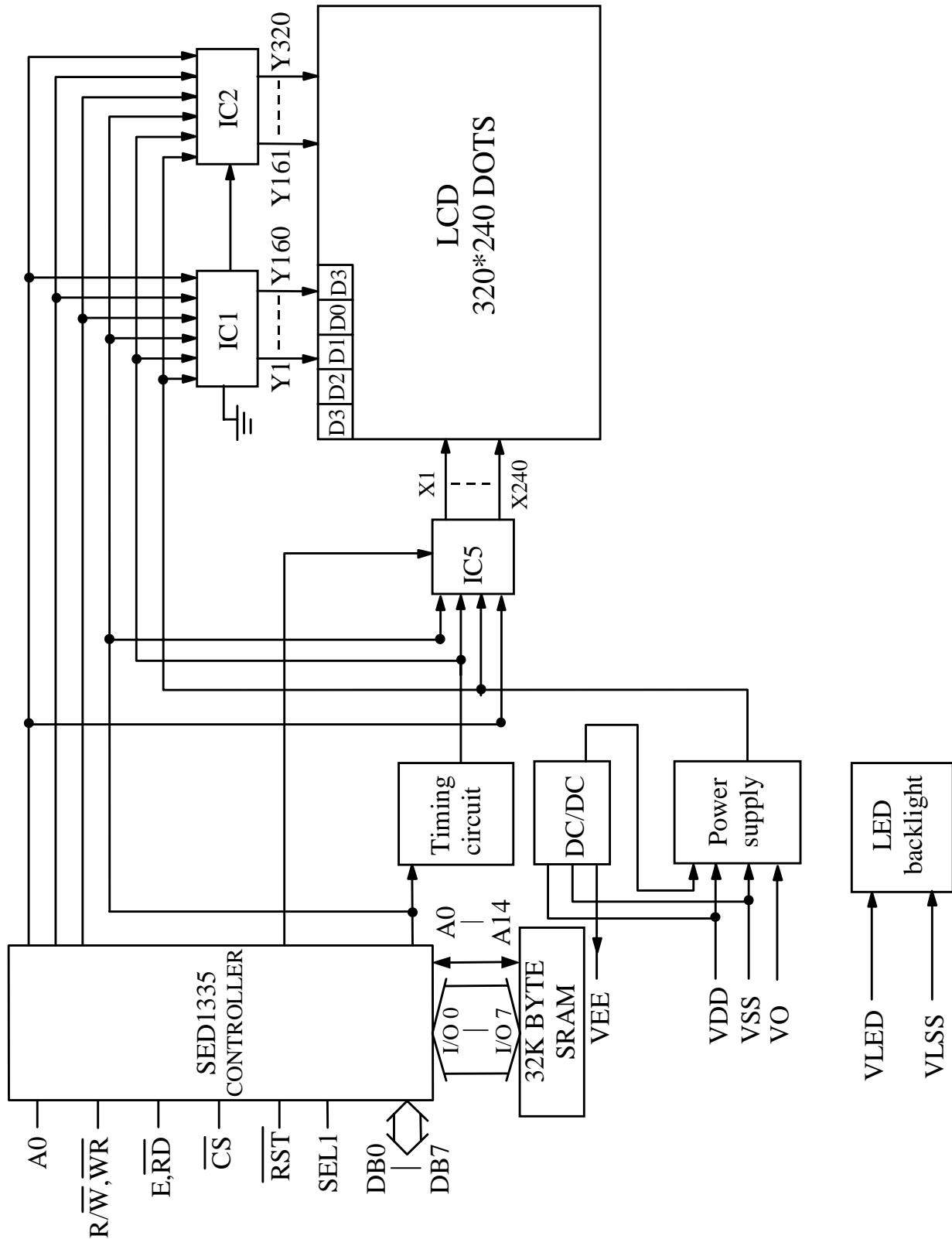


6. OUTLINE DIMENSION

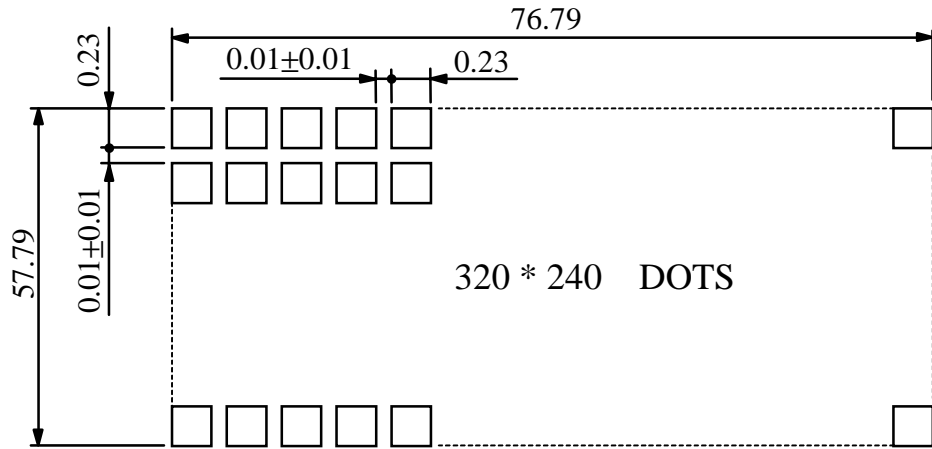


UNIT : mm  
SCALE : NTS  
NOT SPECIFIED TOLERANCE IS  $\pm 0.5$

7. BLOCK DIAGRAM



8. DETAIL DRAWING OF DOT MATRIX



320 \* 240 DOTS

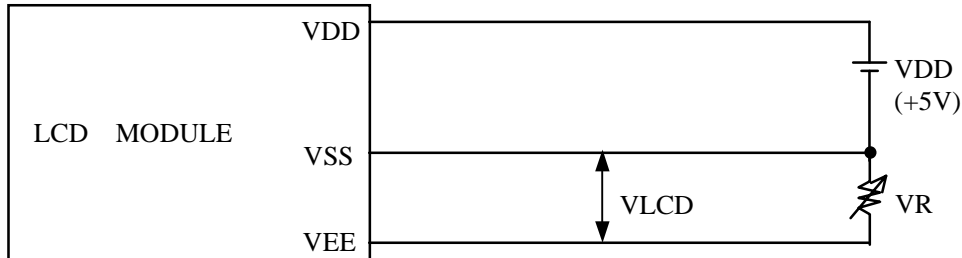
UNIT : mm  
SCALE : NTS  
NOT SPECIFIED TOLERANCE IS ± 0.1

9. INTERFACE SIGNALS

PIN NO	SYMBOL	LEVEL	FUNCTION																				
1	VSS	—	GROUND																				
2	VDD	—	POWER SUPPLY FOR LOGIC CIRCUIT																				
3	N.C	—	N.C.																				
4	A0	—	8080 FAMILY INTERFACE																				
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5	$\overline{WR}, R/\overline{W}$	H/L	8080 FAMILY INTERFACE ACTS AS THE ACTIVE-LOW WRITE STROBE . 6800 FAMILY INTERFACE ACTS AS THE READ/ WRITE CONTROL SIGNAL .																				
6	$\overline{RD}, E$	H/L	8080 FAMILY INTERFACE ACTS AS THE ACTIVE-LOW READ STROBE . 6800 FAMILY INTERFACE ACTS AS THE ACTIVE-HIGH ENABLE CLOCK .																				
7   14	D0   D7	H/L	DISPLAY DATA																				
15	$\overline{CS}$	H/L	CHIP SELECT																				
16	$\overline{RST}$	H/L	RESET																				
17	VEE	—	CONNECTION RESISTER TO GND (FOR CONTRST ADJUST)																				
18	SEL1	H/L	8080 OR 6800 FAMILY INTERFACE SELECT , H:6800 , L:8080																				
19	VLED	—	POWER SUPPLY FOR LED B.L																				
20	VLSS	—	POWER SUPPLY FOR LED B.L																				

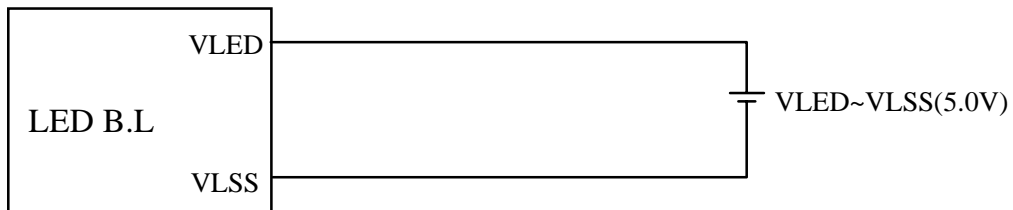
10. POWER SUPPLY

10.1 POWER SUPPLY FOR LCM



VR: 20K $\Omega$

10.2 POWER SUPPLY FOR LED BACK - LIGHT



10.3 TIMING OF POWER SUPPLY AND INTERFACE SIGNAL

