

EMERGING DISPLAY
TECHNOLOGIES CORPORATION

MODEL NO .
32FY0(LED TYPES)

VERSION
1

PAGE
0-1

RECORDS OF REVISION

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DEC.21,2004

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SUMMARY

NUMBERING SYSTEM

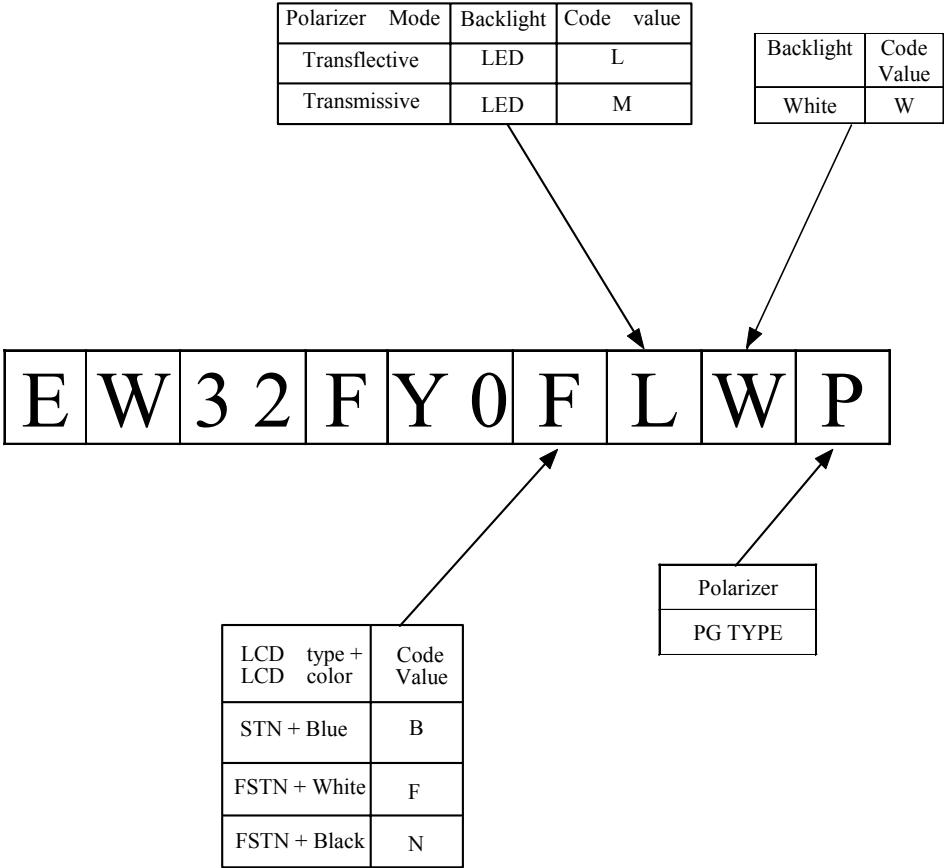


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1. GENERAL SPECIFICATIONS

1.1 GENERAL SPECIFICATIONS

PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

E U - 0 0 2 A

1.2 APPLICATION NOTES FOR CONTROLLER / DRIVER :

PLEASE REFER TO :

E P S O N S 1 D 1 3 7 0 0

1.3 THIS INDIVIDUAL SPECIFICATION IS PRIOR TO GENERAL SPECIFICATIONS .

2. MECHANICAL SPECIFICATIONS

- (1) NUMBER OF DOTS ----- 320W * 240H DOTS
- (2) MODULE SIZE ----- 96.3W * 66.6H * 8.5D (max.)mm
(NOT INCLUDED FFC LENGTH)
- (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 / 242 DUTY MULTIPLEX DRIVE
- (9) BACKLIGHT*
- (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	VEE – VSS	0	2.7	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℃	70℃	-20℃	70℃	NOTE (2) , (3)
HUMIDITY	—	85 % RH	—	85 % RH	WITHOUT CONDENSATION NOTE (4)
VIBRATION	—	2.45 m/s ² (0.25 G)	—	11.76 m/s ² (1.2 G)	10~100 HZ XYZ DIRECTIONS 1 Hr. EACH
SHOCK	—	29.4 m/s ² (3 G)	—	490.0 m/s ² (50 G)	10 mSECONDS XYZ DIRECTIONS 1 TIME EACH
CORROSIVE GAS	NOT ACCEPTABLE		NOT ACCEPTABLE		

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

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

NOTE (4) : Ta AT 40℃(85% RH) : 96HR MAX .

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	—	3.3	—	5.5	V
POWER SUPPLY VOLTAGE FOR LCD DRIVE	VEE – VSS	—	+15	—	+27	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 VEE – VSS = 21.7 V	—	16.0	23.0	mA
POWER SUPPLY CURRENT FOR LCD DRIVE NOTE (2)	IEE	VDD – VSS = 5 . 0 V VEE – VSS = 21.7 V	—	6.0	9.0	mA
RECOMMENDED LCD DRIVING VOLTAGE	VEE – VSS Ø = 10° θ = 0° DUTY =1/240	Ta =-20 °C NOTE(3)	21.5	22.5	23.5	V
		Ta = 25 °C NOTE(4)	20.7	21.7	22.7	V
		Ta = 70 °C NOTE(4)	19.9	20.9	21.9	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} , $\overline{RD}(E)$, $\overline{WR}(R/\overline{W})$.

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

NOTE (3) : THIS DISPLAY PATTERN IS BAR (ONLY , Ta=-20°C)

NOTE (4) : THIS DISPLAY PATTERN IS ALL “Q”.

5. OPTICAL CHARACTERISTICS

Ta = 25 °C

VDD = 5.0 V

I T E M		SYMBOL	CONDITION		MIN .	TYP .	MAX.	UNIT	NOTE	
VIEWING ANGLE	STN	Ø 2 - Ø 1	K ≥ 2 . 0		—	40	—	d e g .	1	
	FSTN				50	—	—	d e g .	1	
CONTRAST RATIO	STN	K	Ø = 1 0 ° θ = 0 °		1.5	3.0	—	—	1	
	FSTN				1.5	3.1	—	—	1	
RESPONSE TIME		t r (rise)	Ø = 1 0 ° θ = 0 °	TA=-20°C	—	4700	7400	ms	1	
						TA=25°C	310			620
						TA=70°C	80			160
		t f (fall)	Ø = 1 0 ° θ = 0 °	TA=-20°C	—	3000	6000			
						TA=25°C	190			380
						TA=70°C	90			180
THE BRIGHTNESS OF MODULE		L	VLED-VSS=5.0V		8	10	—	cd / m ²	1 , 3	
					12	15	—		1 , 4	
					6.4	8.0	—		1 , 5	
THE UNIFORMITY OF MODULE		—			—	—	30	%	2	

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

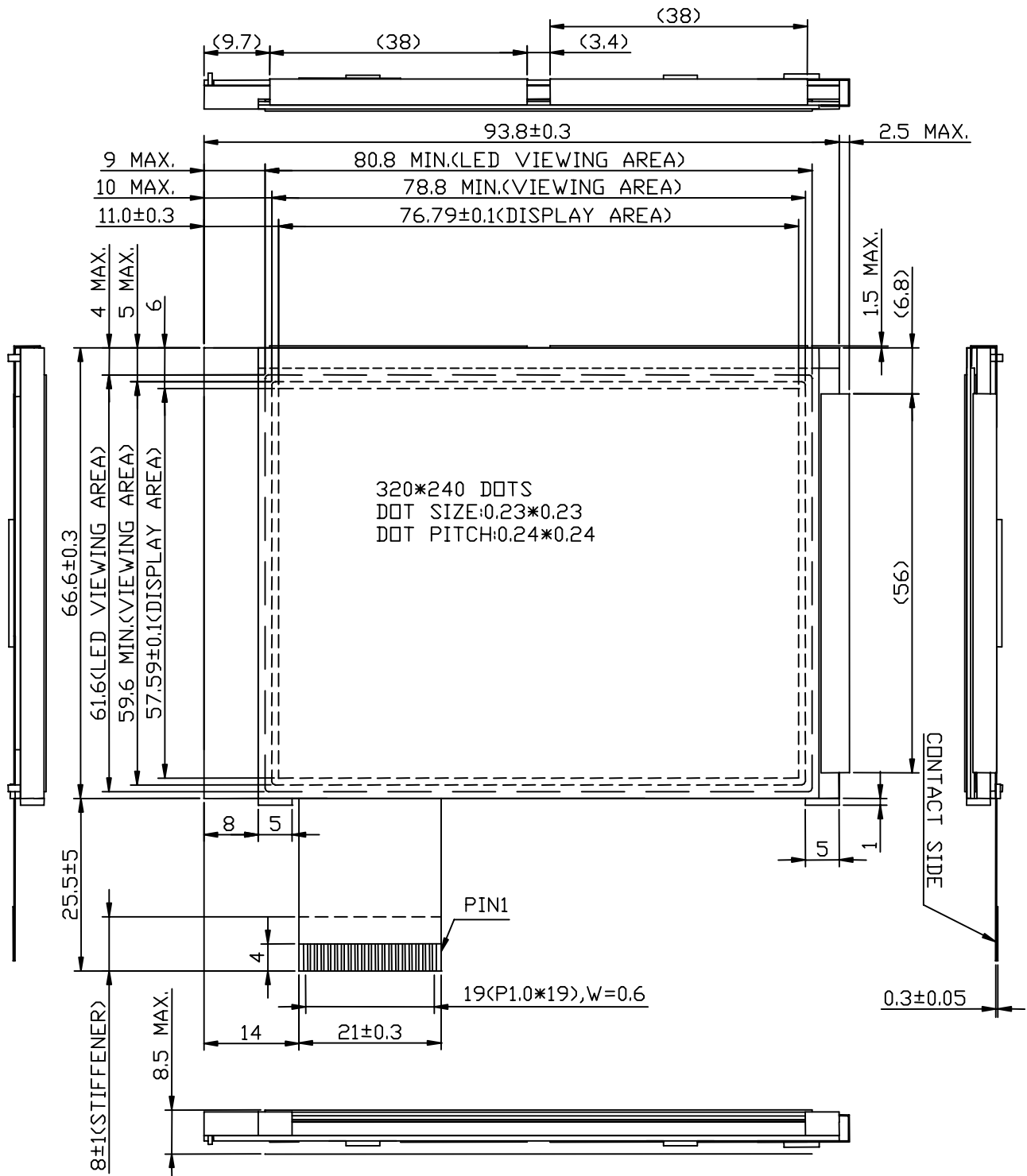
NOTE (2) : BRIGHTNESS AT GLASS SURFACE(NEGATIVE GLASS DISPLAY ALL “ON”
POSITIVE GLASS DISPLAY ALL “OFF”)

NOTE (3) : POLARIZER IS TRANSFLECTIVE TYPE.

NOTE (4) : POLARIZER IS TRANSMISSIVE TYPE.

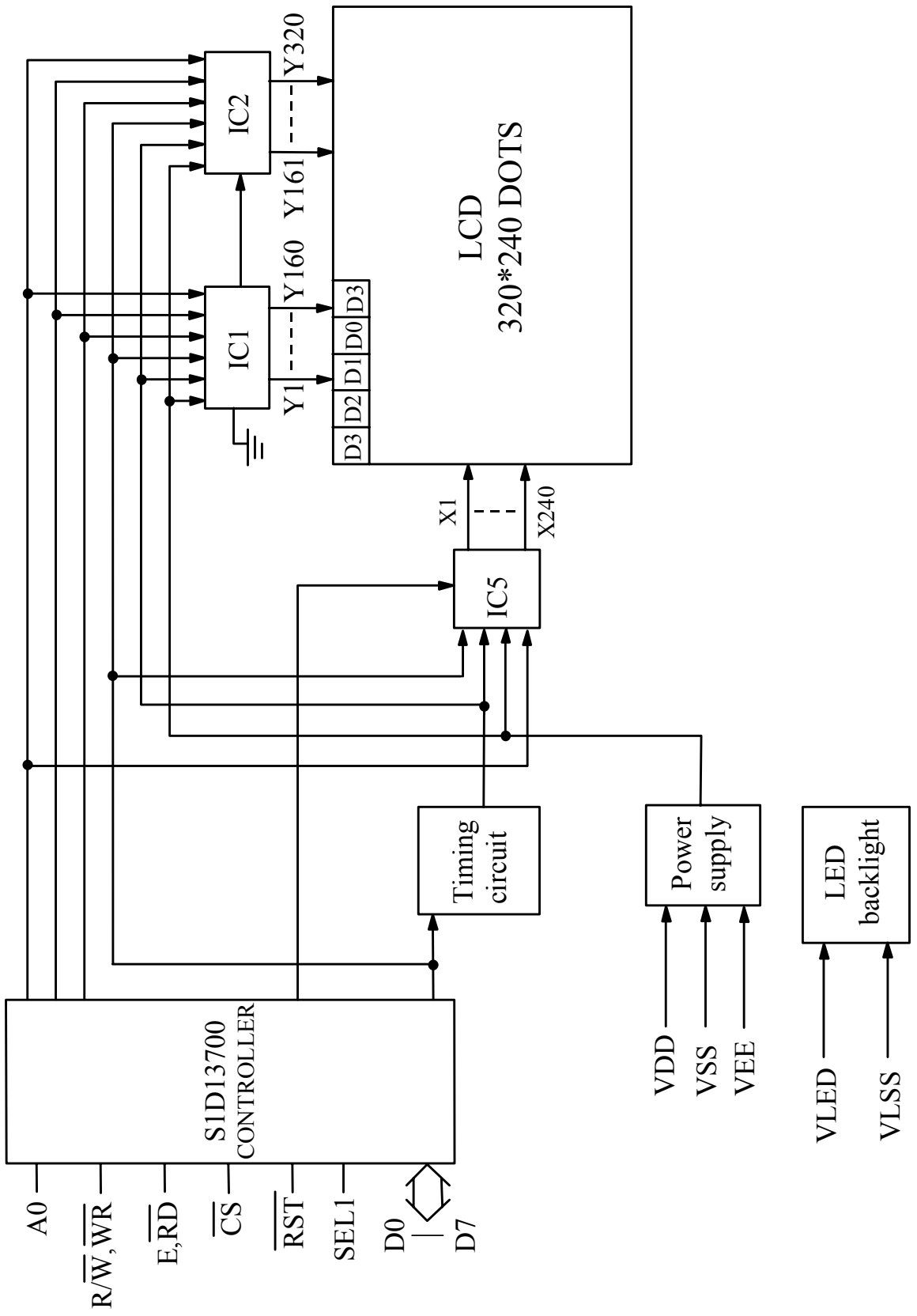
NOTE (5) : POLARIZER IS PG TYPE.

6. OUTLINE DIMENSIONS

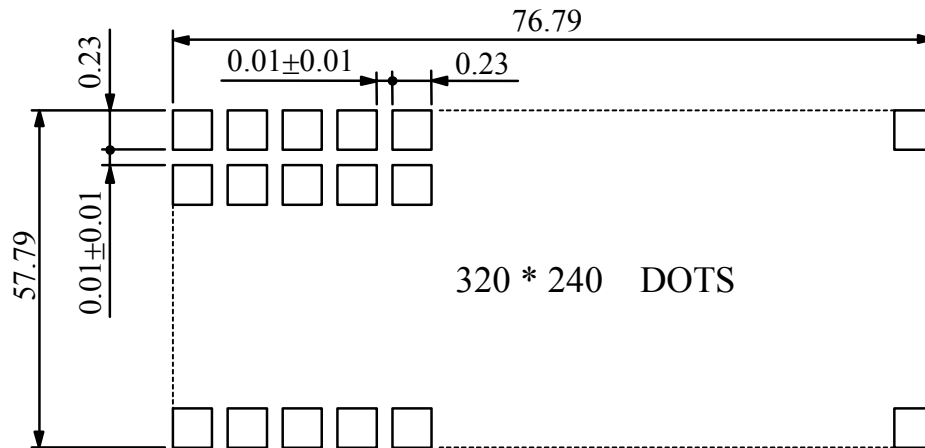


UNIT : mm
SCALE : NTS
NOT SPECIFIED TOLERANCE IS ± 0.5

7. BLOCK DIAGRAM



8. DETAIL DRAWING OF DOT MATRIX



320 * 240 DOTS

UNIT : mm

SCALE : NTS

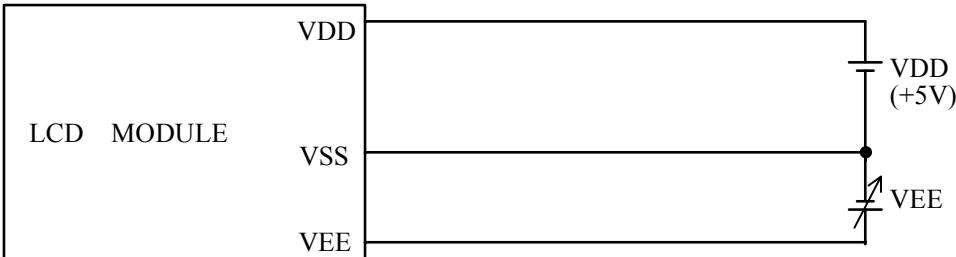
NOT SPECIFIED TOLERANCE IS ± 0.1

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
			AO
			\overline{RD}
			\overline{WR}
			FUNCTION
			0 0 1 STATUS FLAG READ
			1 0 1 DISPLAY DATA AND CURSOR ADDRESS READ
			0 1 0 DISPLAY DATA AND PARAMETER WRITE
			1 1 0 COMMAND WRITE
			6800 FAMILY INTERFACE
			AO
			R / \overline{W}
			E
			FUNCTION
			0 1 1 STATUS FLAG READ
			1 1 1 DISPLAY DATA AND CURSOR ADDRESS READ
			0 0 1 DISPLAY DATA AND PARAMETER WRITE
			1 0 1 COMMAND WRITE
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	—	POWER SUPPLY FOR LCD DRIVING
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

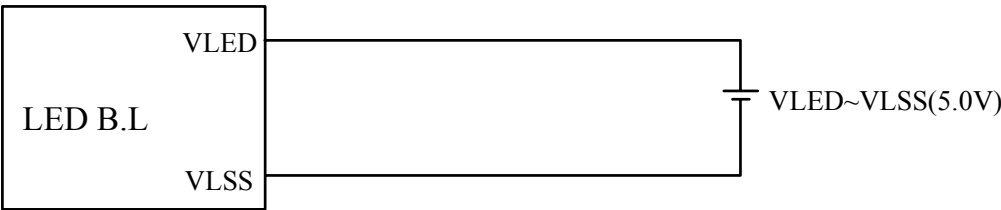
10. POWER SUPPLY

10.1 POWER SUPPLY FOR LCM



VEE – VSS : LCD DRIVING VOLTAGE

10.2 POWER SUPPLY FOR LED BACK - LIGHT



10.3 TIMING OF POWER SUPPLY AND INTERFACE SIGNAL

