

EXAMINED BY :	EMERGING DISPLAY TECHNOLOGIES CORPORATION	FILE NO . CAS-10301
		ISSUE : SEP.30,2002
APPROVED BY:		TOTAL PAGE : 8
		VERSION : 1

CUSTOMER	ACCEPTANCE	SPECIFICATIONS
MODEL NO. : <u>32F70(LED TYPES)</u> FOR MESSRS : _____ CUSTOMER'S APPROVAL DATE : _____ BY : _____		

EMERGING DISPLAY
TECHNOLOGIES CORPORATION

MODEL NO .
32F70(LED TYPES)

VERSION
1

RECORDS OF REVISION

DOC . FIRST ISSUE
SEP.30,2002

DATE

REVISED
PAGE
NO.

SUMMARY

NUMBERING SYSTEM

Polarizer Mode	Backlight	Code value
Transflective	LED	L
Transmissive	LED	M

Backlight Color	Code Value
White	W

E	W	3	2	F	7	0	B	M	W
---	---	---	---	---	---	---	---	---	---

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

TABLE OF CONTENTS

NO.	ITEM	PAGE
1.	GENERAL SPECIFICATIONS -----	1
2.	MECHANICAL SPECIFICATIONS -----	1
3.	ABSOLUTE MAXIMUM RATINGS -----	2
4.	ELECTRICAL CHARACTERISTICS -----	3
5.	OPTICAL CHARACTERISTICS -----	4
6.	OUTLINE DIMENSION -----	5
7.	BLOCK DIAGRAM -----	6
8.	DETAIL DRAWING OF DOT MATRIX -----	7
9.	INTERFACE SIGNALS -----	7
10.	POWER SUPPLY -----	8

1. GENERAL SPECIFICATIONS

1.1 GENERAL SPECIFICATIONS

PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

EU - 001A

1.2 APPLICATION NOTE FOR CONTROLLER/DRIVER:SED1335 F

PLEASE REFER TO:

CUSTOMER ACCEPTANCE STANDAR SPECIFICATIONS:

EU - SED1335 F

1.3 THIS INDIVIDUAL SPECIFICATION IS PRIOR TO GENERAL SPECIFICATIONS .

2. MECHANICAL SPECIFICATIONS

- (1) NUMBER OF DOTS ----- 320W * 240H DOTS
- (2) MODULE SIZE ----- 139.0W * 102.5H * 13.2D 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 ----- 0.30W * 0.30 mm
- (7) LCD TYPE *
- (8) DRIVING METHOD ----- 1 / 240 DUTY MULTIPLEX DRIVE
- (9) VIEWING DIRECTION ----- 6 O'CLOCK
- (10) BACKLIGHT ----- LED , WHITE

* 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	6 . 0	V	
POWER SUPPLY FOR LCD DRIVING	VDD – VEE	0	30 . 0	V	
INPUT VOLTAGE	VI	VSS	VDD	V	
STATIC ELECTRICITY	—	—	1 0 0	V	NOTE (1)

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	- 1 0 °C	6 0 °C	- 2 0 °C	7 0 °C	NOTE (2) , (3), (4)
HUMIDITY	—	8 5 % RH	—	8 5 % RH	WITHOUT CONDENSATION
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	—	2 9 . 4 m /s ² (3 G)	—	490 . 0 m /s ² (5 0 G)	1 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 .

NOTE (4) : CCFL BACKLIGHT IS NOT AVAILABLE TO FUNCTION BELOW 0°C

4 . ELECTRICAL CHARACTERISTICS

Ta = 25 °C		VDD = 5.0 V		VEE – VSS = -22V		
PARAMETER	SYMBOL	CONDITION	MIN .	TYP.	MAX .	UNIT
POWER SUPPLY VOLTAGE FOR LOGIC	VDD – VSS	—	4.75	5.0	5.25	V
POWER SUPPLY VOLTAGE FOR LCD DRIVE	VEE – VSS	—	-21.5	-22.0	-22.5	V
INPUT VOLTAGE	VIH	H LEVEL	0.5*VDD	—	—	V
NOTE (1)	VIL	L LEVEL	—	—	0.2*VDD	V
OUTPUT VOLTAGE	VOH	H LEVEL	2.4	—	—	V
NOTE (1)	VOL	L LEVEL	—	—	VSS+0.4	V
POWER SUPPLY CURRENT FOR LOGIC NOTE (2)	IDD	VDD – VSS = 5.0 V VDD – VO = (23.5)V	—	25.0	—	mA
POWER SUPPLY CURRENT FOR LCD DRIVE NOTE (2)	IEE	VDD – VSS = 5.0 V VDD – VO = (23.5)V	—	6.0	—	mA
RECOMMENDED LCD DRIVING VOLTAGE NOTE (3)	VDD – VO Ø = 10 ° θ = 0 ° DUTY =1/240	Ta = - 10 °C	25.6	26.6	27.6	V
		Ta = 25 °C	22.5	23.5	24.5	V
		Ta = 60 °C	17.4	18.4	19.4	V
CLOCK OSCILLATION FREQUENCY	fOSC	—	—	8	—	MHZ
LED FORWARD VOLTAGE	VLED – VLSS	—	—	5.0	—	V
LED FORWARD VOLTAGE	IF	VLED–VLSS=5.0V	—	16.0	—	mA

NOTE (1): APPLIED TO TERMINALS DO TO D7, AO, $\overline{CS}$, E, R/ $\overline{W}$.

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

6. OPTICAL CHARACTERISTICS

Ta = 25 °C

VDD = 5.0 V

I T E M		SYMBOL	CONDITION		MIN .	TYP .	MAX.	UNIT	NOTE
VIEWING AREA	STN	Ø2 – Ø 1	K	≥ 2 . 0	—	40	—	d e g .	1
	FSTN				—	50	—	d e g .	1
CONTRAST RATIO	STN	K	Ø = 10 ° θ = 0°	—	10	—	—	1	
	FSTN			—	20	—	—	1	
RESPONSE TIME		tr (rise)	Ø=10° θ = 0°	Ta = -10 °C	—	2149	—	ms	1
				Ta = 25 °C	—	228	—		
				Ta = 60 °C	—	124	—		
		tf (fall)		Ta = -10 °C	—	1709	—		
				Ta = 25 °C	—	191	—		
				Ta = 60 °C	—	96	—		
BRIGHTNESS OF MODULE		B	VLED – VLSS = 5.0 V	(7)	—	—	cd / m²	1 , 2	
				(5)	—	—		1 , 3	
CHROMATICITY COORDINATES		X	IF = 160 mA	0.26	0.315	0.33	—	—	
		Y		0.29	0.305	0.32			

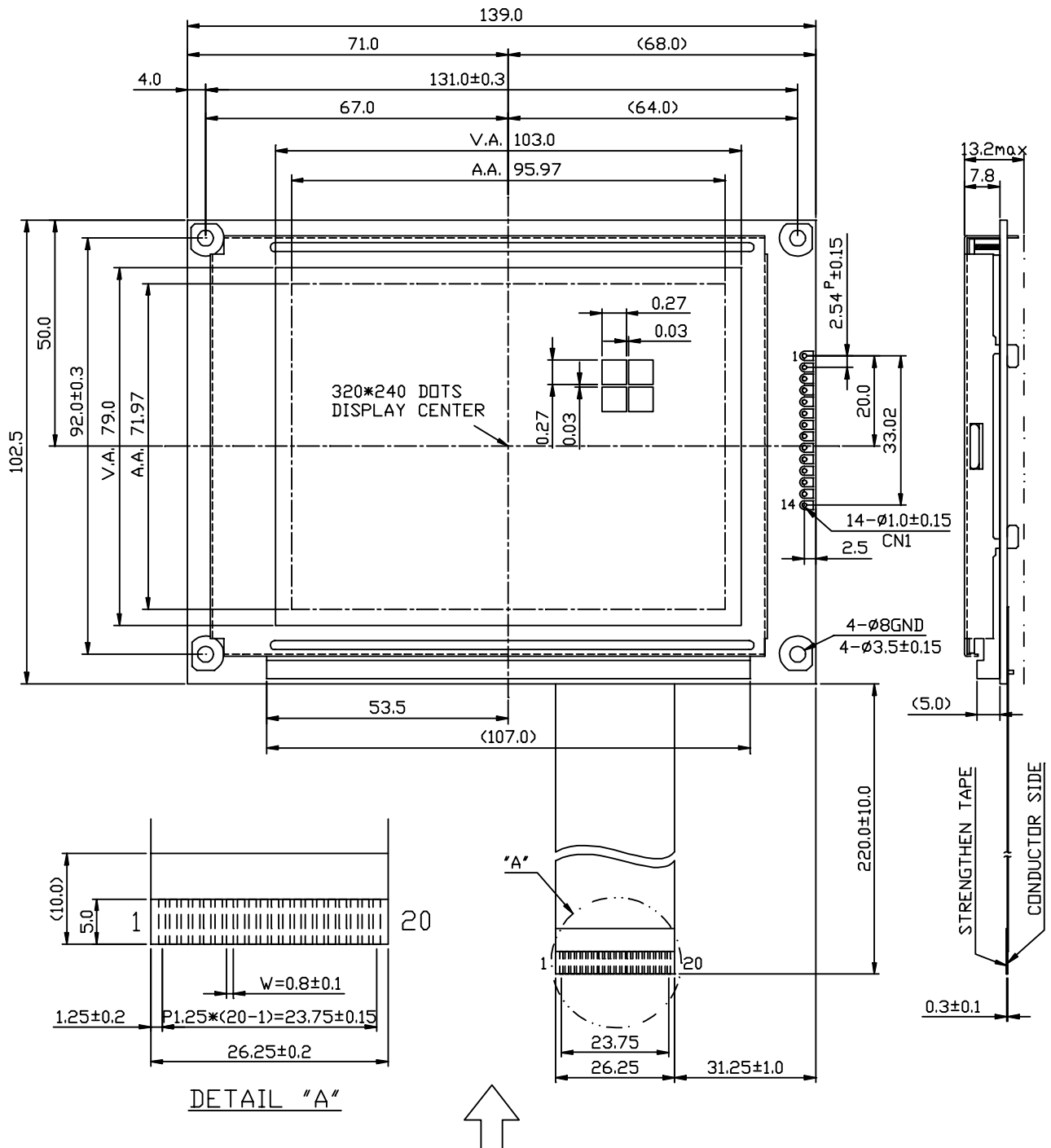
NOTE (1) : PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS. (EU - 002A)

NOTE (2) : POLARIZER MODE : TRANSMISSIVE

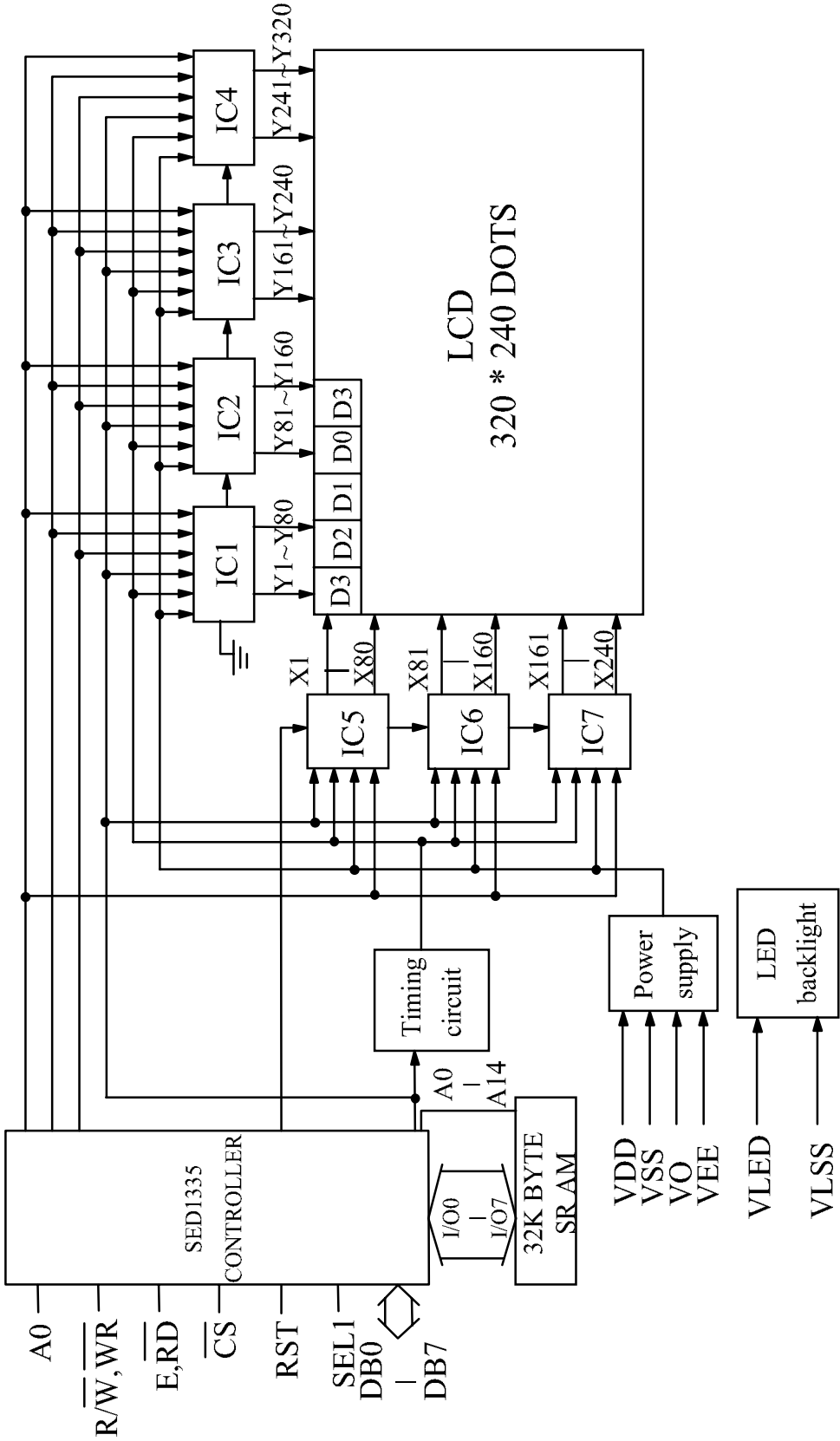
NOTE (3) : POLARIZER MODE : TRANSFLECTIVE

6. OUTLINE DIMENSION

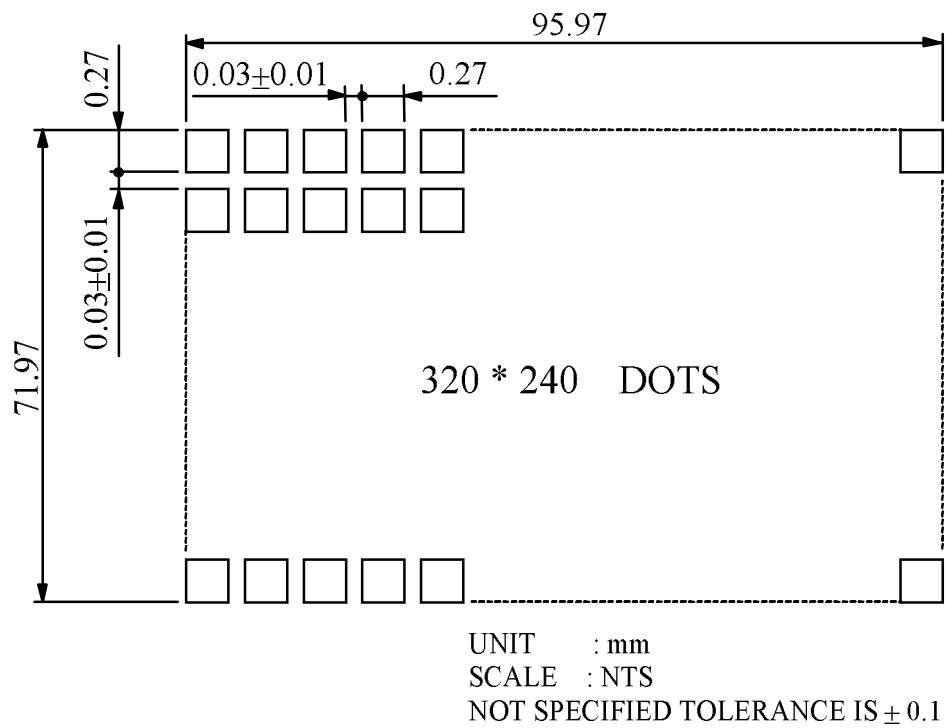


UNIT : mm
SCALE : NTS
NOT SPECIFIED TOLERANCE IS ± 0.3

7. BLOCK DIAGRAM



8. DETAIL DRAWING OF DOT MATRIX



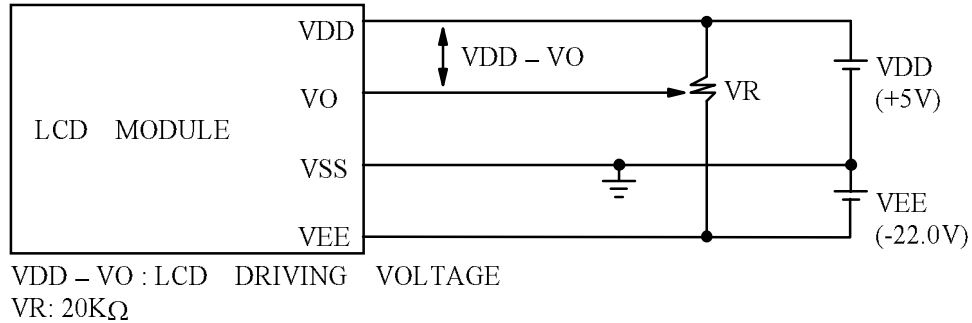
9. INTERFACE SIGNALS

PIN NO	SYMBOL	LEVEL	FUNCTION						
1	VLED	—	POWER FOR LED (+5V)						
2	VLSS	—	POWER FOR LED (GND)						
3	VSS	—	GROUND						
4	VDD	—	POWER SUPPLY FOR LOGIC CIRCUIT						
5	VO	—	OPERATING VOLTAGE FOR LCD DRIVING						
6	A0	—	8080 FAMILY INTERFACE						
			AO	$\overline{\text{RD}}$	$\overline{\text{WR}}$	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			
			AO	R/ $\overline{\text{W}}$	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			
			7	$\overline{\text{WR}}$, R/ $\overline{\text{W}}$	H/L	8080 FAMILY INTERFACE ACTS AS THE ACTIVE-LOW WRITE STROBE .			
						6800 FAMILY INTERFACE ACTS AS THE READ/ WRITE CONTROL			
SIGNAL .									
8	$\overline{\text{RD}}$, E	H/L	8080 FAMILY INTERFACE ACTS AS THE ACTIVE-LOW READ STROBE .						
			6800 FAMILY INTERFACE ACTS AS THE ACTIVE-HIGH ENABLE CLOCK .						
9	D0	H/L	DISPLAY DATA						
16	D7								
17	$\overline{\text{CS}}$	H/L	CHIP SELECT						
18	$\overline{\text{RST}}$	H/L	RESET						
19	VEE	—	POWER SUPPLY FOR LCD DRIVING						
20	SEL1	H/L	8080 OR 6800 FAMILY INTERFACE SELECT , H:6800 , L:8080						

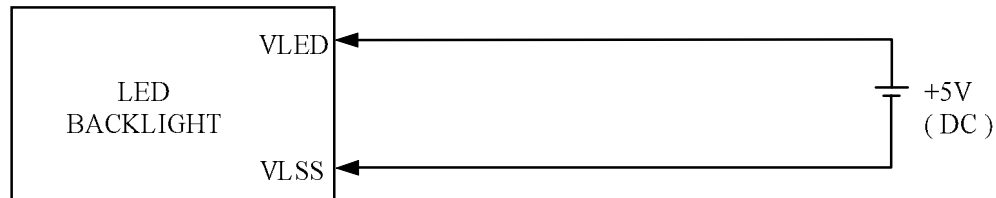
INTERFACE	PIN	SINGAL	LEVEL	FUNCTION
CCFL	1	VCCFL	—	POWER SUPPLY FOR CCFL DRIVING
	2 ~ 3	NC	—	NO CONNECTION
	4	VCCFL	—	POWER SUPPLY FOR CCFL DRIVING

11. POWER SUPPLY

11.1 POWER SUPPLY FOR LCM



11.2 POWER SUPPLY FOR LED BACK - LIGHT



11.3 TIMING OF POWER SUPPLY AND INTERFACE SIGNAL

