

EXAMINED BY :	EMERGING DISPLAY TECHNOLOGIES CORPORATION	FILE NO . CAS-00923
<i>Vincent Wh</i>		ISSUE : DEC.15,2004
APPROVED BY:		TOTAL PAGE : 9
<i>Eric Lee</i>		VERSION : 4

CUSTOMER	ACCEPTANCE	SPECIFICATIONS
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MODEL NO. :
1 2 A 0 0 (E L T Y P E S)
FOR MESSRS :

CUSTOMER'S APPROVAL
DATE : _____
BY : _____

EMERGING DISPLAY
TECHNOLOGIES CORPORATION

MODEL NO.	VERSION	PAGE
12A00(EL TYPES)	4	0-1

RECORDS OF REVISION	DOC . FIRST ISSUE	OCT.15,1997
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	8	10. BLOCK DIAGRAM ADD ※IC1,IC2 : SED1520D0A OR EQUIVALENT																																																																						

NUMBERING SYSTEM

Polarizer Mode	Backlight	Code value
Transflective	EL	E
Transmissive	EL	F

Backlight Color	Code Value
White	W

E	W	1	2	A	0	0	G	E	W
---	---	---	---	---	---	---	---	---	---

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

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5.	TIMING CHARACTERISTICS -----	4
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EMERGING DISPLAY
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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 : SED1520D0A

PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

E U - S E D 1 5 2 0 D 0 A

1.3 THIS INDIVIDUAL SPECIFICATIONS IS PRIOR TO GENERAL SPECIFICATIONS .

2. MECHANICAL SPECIFICATIONS

- | | | |
|-----------------------|-------|----------------------------------|
| (1) NUMBER OF DOTS | ----- | 122 * 32 DOTS |
| (2) MODULE SIZE | ----- | 69.2W * 31.75H * 8.0D (MAX.) mm |
| (3) EFFECTIVE AREA | ----- | 57.2W * 17.2H mm |
| (4) ACTIVE AREA | ----- | 52.41W * 13.71H mm |
| (5) DOT SIZE | ----- | 0.38W * 0.38H mm |
| (6) DOT PITCH | ----- | 0.43W * 0.43H mm |
| (7) LCD TYPE * | | |
| (8) DRIVING METHOD | ----- | 1 / 32 DUTY MULTIPLEX DRIVER |
| (9) VIEWING DIRECTION | ----- | 6 O' CLOCK |
| (10) BACK LIGHT * | | |

* PLEASE REFER TO NUMBERING SYSTEM

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3. ABSOLUTE MAXIMUM RATINGS
3.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS. (AT Ta = 25 °C)

PARAMETER	SYMBOL	MIN.	MAX.	UNIT	REMARK
SUPPLY VOLTAGE FOR LOGIC	VDD-VSS	0	8.0	V	
INPUT VOLTAGE	VI	VSS	VDD	V	
STATIC ELECTRICITY	—	—	100	V	NOTE (1)
POWER SUPPLY FOR EL BACKLIGHT	VEL	—	AC 200	Vrms	f EL = 1.0 KHz 60 SEC. MAX
	f EL	—	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 ² (0.5 G)	—	19.6 m/s ² (2 G)	
SHOCK	—	29.4 m/s ² (3 G)	—	490.0 m/s ² (50 G)	XYZ DIRECTIONS
CORROSIVE GAS	NOT ACCEPTABLE		NOT ACCEPTABLE		

NOTE(2) : Ta AT -30°C : 48HR MAX.

60°C : 168HR MAX.

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

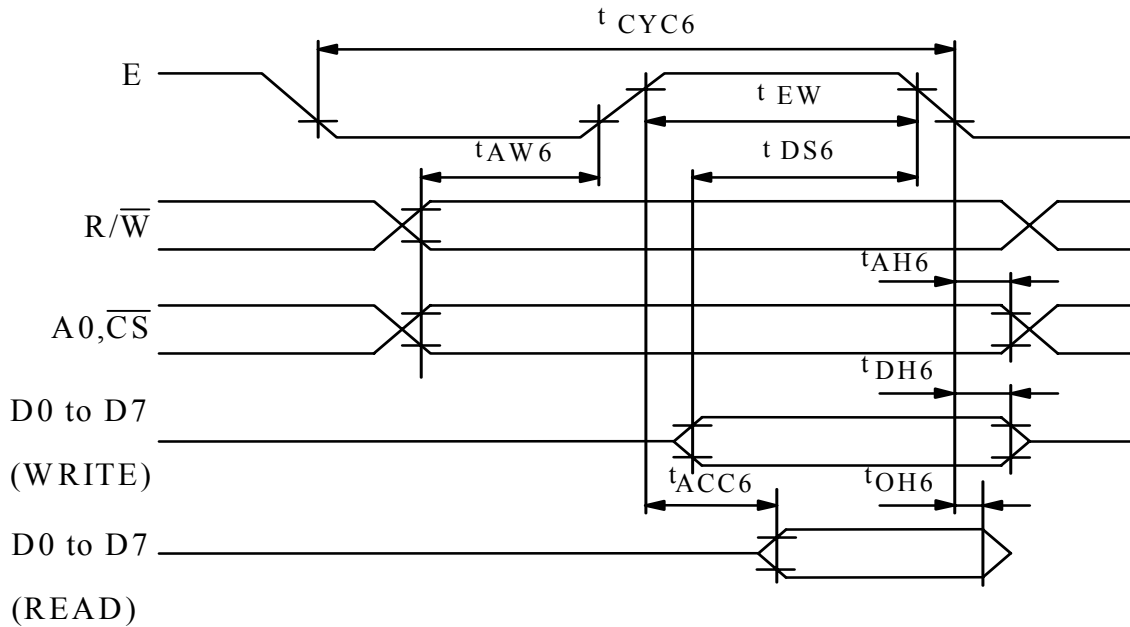
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4. ELECTRICAL CHARACTERISTICS

PARAMETER		SYMBOL	CONDITION	MIN .	TYP .	MAX .	UNIT
POWER SUPPLY VOLTAGE	RECOMMENDED	VDD-VSS	—	4.5	5.0	5.5	V
	ALLOWABLE	VDD-VSS	—	2.4	—	7.0	V
HIGH LEVEL INPUT VOLTAGE	FOR TTL	VIHT	NOTE (1)	2.0	—	VDD	V
	FOR CMOS	VIHC	NOTE (2)	4.0	—	VDD	V
LOW LEVEL INPUT VOLTAGE	FOR TTL	VILT	NOTE (1)	0	—	0.8	V
	FOR CMOS	VILC	NOTE (2)	0	—	1.0	V
HIGH LEVEL OUTPUT VOLTAGE	FOR TTL	VOHT	IOH= -3.0 mA NOTE (3)	2.4	—	—	V
LOW LEVEL OUTPUT VOLTAGE	FOR TTL	VOLT	IOL= 3.0 mA NOTE (3)	—	—	0.4	V
POWER SUPPLY CURRENT (INCLUDE DC TO DC CONVERTER)		IDD	VDD-VSS=5V	—	2.5	5	mA
LCD DISPLAY DUTY RATIO		DUTY	—	—	32	—	—
OSCILLATION FREQUENCY	f _{OSC}	VDD = 5.0 V RF = 1.0MΩ	15	18	21	KHz	
		VDD = 3.0 V RF = 1.0MΩ	11	16	21	KHz	
RESET TIME		t _R	—	1.0	—	1000	μS
RECOMMENDED LCD DRIVING VOLTAGE	VDD - VO ∅= 10° θ = 0°	Ta = -20°C	5.0	5.5	6.0	V	
		Ta = 25°C	5.0	5.5	6.0	V	
		Ta = 60°C	4.7	5.2	5.7	V	
POWER SUPPLY FOR EL	VEL	f EL = 400 Hz	—	110	—	V _{rms}	
	IEL	VEL = 110 V f EL = 400 Hz	—	1.7	—	mA _{rms}	

NOTE (1): APPLIED TO TERMINALS A0, DB0~DB7, E, R/W.

NOTE (2): APPLIED TO TERMINALS RES.

NOTE (3): APPLIED TO TERMINALS DB0~DB7

5. TIMING CHARACTERISTICS
MPU BUS READ/WRITE (68-FAMILY MPU)


PARAMETER	SYMBOL	CONDITION	RATING		UNIT	SIGNAL
			MIN	MAX		
SYSTEM CYCLE TIME	t_{CYC6}		1000	—	nS	
ADDRESS SETUP TIME	t_{AW6}		20	—	nS	A0,CS,R/W
ADDRESS HOLD TIME	t_{AH6}		10	—	nS	
DATA SETUP TIME	t_{DS6}		80	—	nS	
DATA HOLD TIME	t_{DH6}		10	—	nS	D0 to D7
OUTPUT DISABLE TIME	t_{OH6}	CL = 100 pF	10	60	nS	
ACCESS TIME	t_{ACC6}		—	90	nS	
ENABLE PULSEWIDTH	READ	t_{EW}	100	—	nS	E
	WRITE		8	—	nS	

NOTES :

- t_{CYC6} IS THE CYCLE TIME OF CS E=H, NOT THE CYCLE TIME OF E.
- INCREASE PARAMETER VALUES BY 200% WHEN $V_{DD} = 3.0$ V
- ALL INPUTS MUST HAVE A RISE AND FAL TIME OF LESS THAN 15 nS .

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6. OPTICAL CHARACTERISTICS
 $T_a = 25^\circ\text{C}$
 $VDD = 5.0\text{ V}$
 $VDD - V_0 = 5.5\text{ V}$

I T E M		SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING ANGLE	STN	$\varnothing 2 - \varnothing 1$	$K \geq 1.4$	4.0	—	—	deg.	1
	FSTN			5.0	—	—	deg.	1
CONTRAST	STN	K	$\varnothing = 10^\circ$ $\theta = 0^\circ$	2.0	3.5	—	—	1
	FSTN			2.0	3.5	—	—	1
REPOSENSE TIME	tr (rise)	$\varnothing = 10^\circ$ $\theta = 0^\circ$	Ta = -20°C	—	5538	11076	ms	1
			Ta = 25°C	—	228	456		
			Ta = 50°C	—	150	300		
	tf (fall)		Ta = -20°C	—	2316	4632		
			Ta = 25°C	—	174	348		
			Ta = 50°C	—	110	220		
THE BRIGHTNESS OF MODULE	L	$\varnothing = 10^\circ, \theta = 0^\circ$	4.5	5.5	—	cd/m ²	1, 2	
			6.8	8.3	—		1, 3	

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

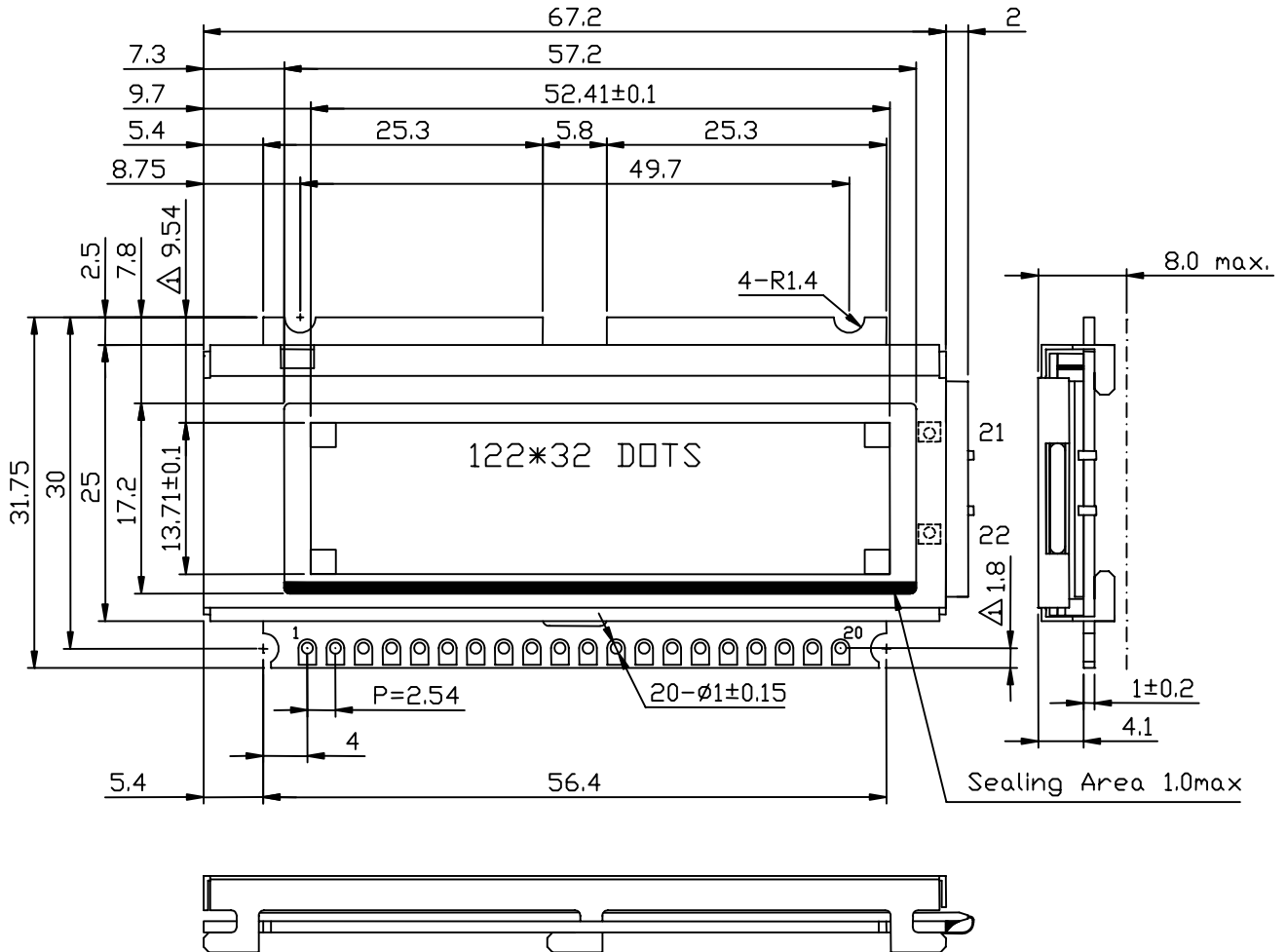
E U - 0 0 2 A

NOTE (2) : POLARIZER MODE : TRANSFLECTIVE.

NOTE (3) : POLARIZER MODE : TRANSMISSIVE.

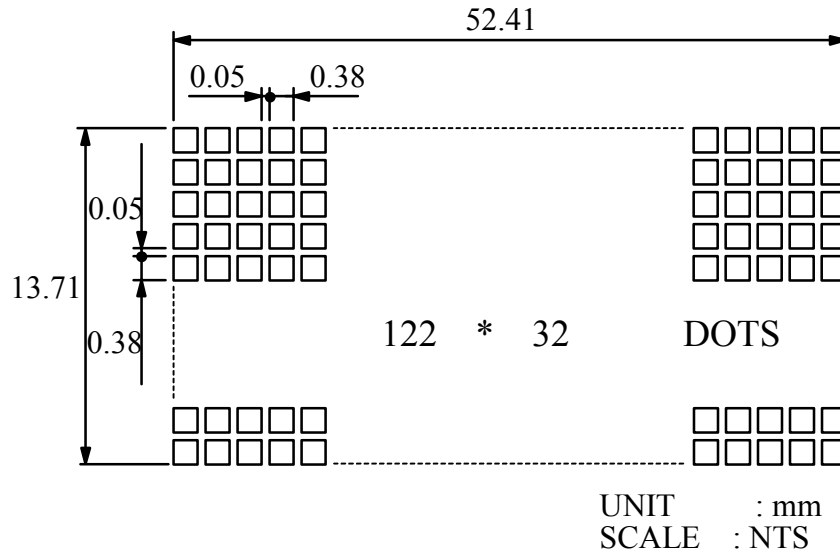
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7. OUTLINE DIMENSIONS



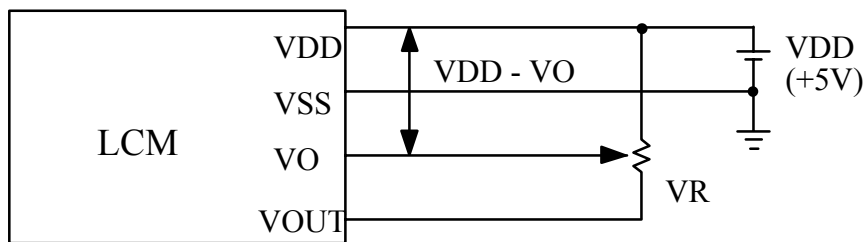
UNIT : mm
 SCALE : NTS
 NOT SPECIFIED TOLERANCE IS ± 0.5
 NOTE : MARK Δ MODIFY (NUMBER NOTE MODIFY VERSION)

8. DETAIL DRAWING OF DOT MATRIX



9. POWER SUPPLY

9.1 POWER SUPPLY FOR LCM



VDD-VO : LCD DRIVING VOLTAGE
VR : 10KΩ ~20KΩ

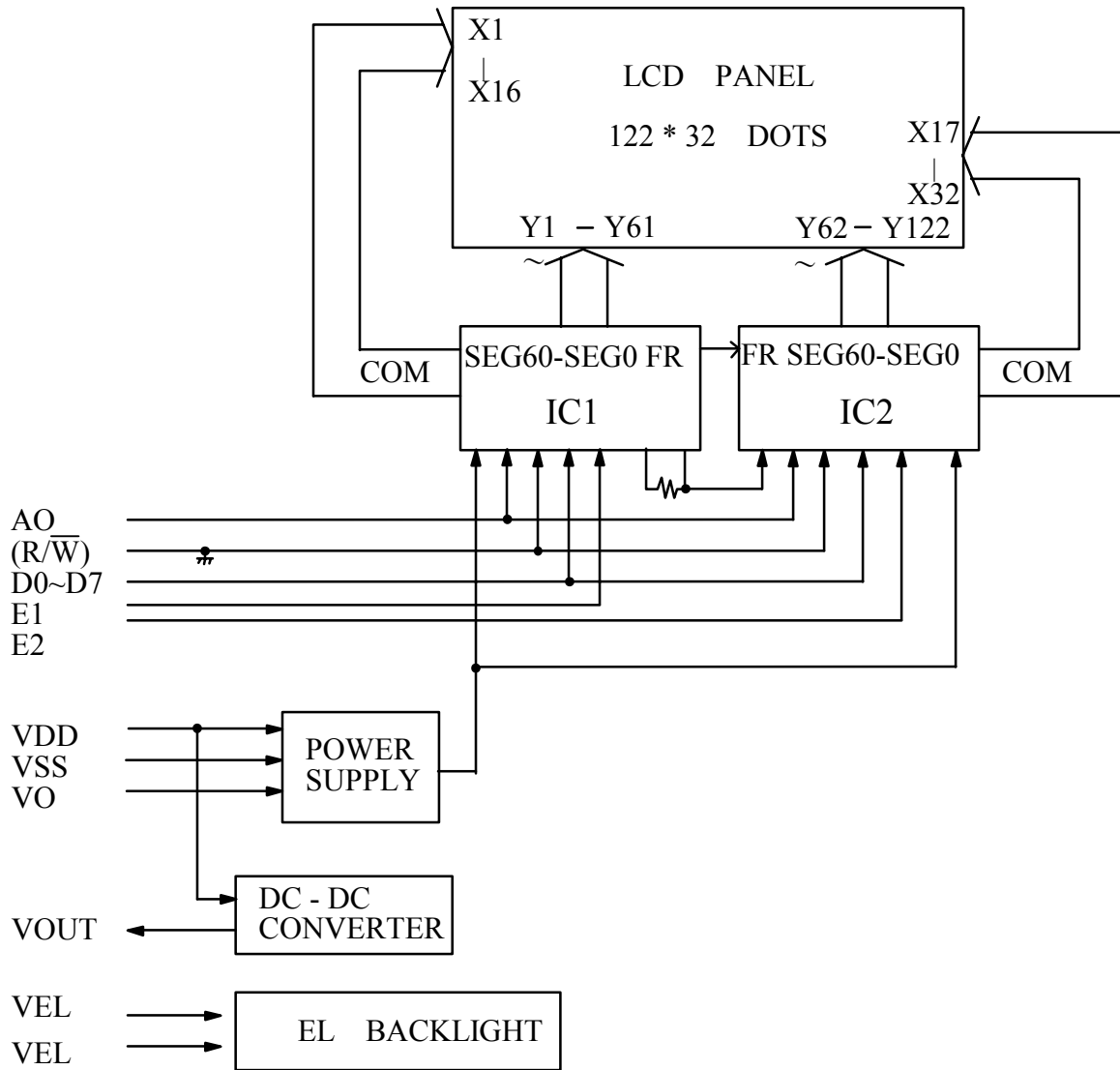
9.2 POWER SUPPLY FOR EL BACK LIGHT



RECOMMENDED INVERTER :
SOUN50150(SUPER OPTICS)

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10. BLOCK DIAGRAM



※IC1,IC2 : SED1520D0A OR EQUIVALENT

11. INTERFACE SIGNALS .

PIN NO .	SYMBOL	DESCRIPTION
1	VSS	GROUND (0V)
2	VDD	POWER SUPPLY FOR LOGIC CIRCUIT
3	V0	OPERATING VOLTAGE FOR LCD DRIVING
4	VOU	POWER SUPPLY FOR LCD DRIVING (GENERATED BY DC - DC , -5V)
5	A0	DATA/COMMAND SELECT INPUT A0 = 0 : COMMAND A0 = 1 : DATA
6	E1	ENABLE CLOCK INPUT FOR IC1
7	E2	ENABLE CLOCK INPUT FOR IC2
8	DB0	TRI - STATE , BI - DIRECTIONAL I/O BUS
9	DB1	TRI - STATE , BI - DIRECTIONAL I/O BUS
10	NC	NOT USED
11	NC	NOT USED
12	DB2	TRI - STATE , BI - DIRECTIONAL I/O BUS
13	DB3	TRI - STATE , BI - DIRECTIONAL I/O BUS
14	DB4	TRI - STATE , BI - DIRECTIONAL I/O BUS
15	DB5	TRI - STATE , BI - DIRECTIONAL I/O BUS
16	DB6	TRI - STATE , BI - DIRECTIONAL I/O BUS
17	DB7	TRI - STATE , BI - DIRECTIONAL I/O BUS
18	NC	NOT USED
19	VEL	POWER SUPPLY FOR EL BACK - LIGHT
20	VEL	POWER SUPPLY FOR EL BACK - LIGHT