EXAMINED BY : Tony Chen	EMERGING DISPLAY	FILE NO . CAS-10116
		ISSUE : FEB.15,2000
APPROVED BY: David Chang	TECHNOLOGIES CORPORATION	TOTAL PAGE : 7
		VERSION : 3

CUSTOMER ACCEPTANCE SPECIFICATIONS

MODEL :

40400 (EL TYPES)

FOR MESSRS :

CUSTOMER'S APPROVAL

DATE :

BY :

ACDS 175-177 route de Genas - 69100 VILLEURBANNE - France
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EMERGING DISPLAY TECHNOLOGIES CORPORATION	MODEL : 40400 (EL TYPES)	VERSION 3
RECORDS OF REVISION	DOC . FIRST ISSUE APR.20,1998	

DATE	REVISED PAGE NO.	SUMMARY
OCT.15,1998	3	4. ELECTRICAL CHARACTERISTICS RECOMMENDED LCD DRIVING VOLTAGE HAS BEEN REVISIED : N.T. : TA = 0℃ 4.6 → 4.4 TA = 25℃ 4.2 → 4.0 TA = 50℃ 3.8 → 3.6 W.T. : TA = -20℃ 4.85 → 4.4 TA = 25℃ 4.85 → 4.4 TA = 70℃ 4.85 → 4.0
		5. OPTICAL CHARACTERISTICS REVISING THE NOTE OF “THE BRIGHTNESS OF BACKLIGHT” . NOTE : 2 → 1, 2 3 → 1, 3
FEB.15,2000	4	6. OUTLINE DIMENSION ADD SEALING AREA : 1.0mm max

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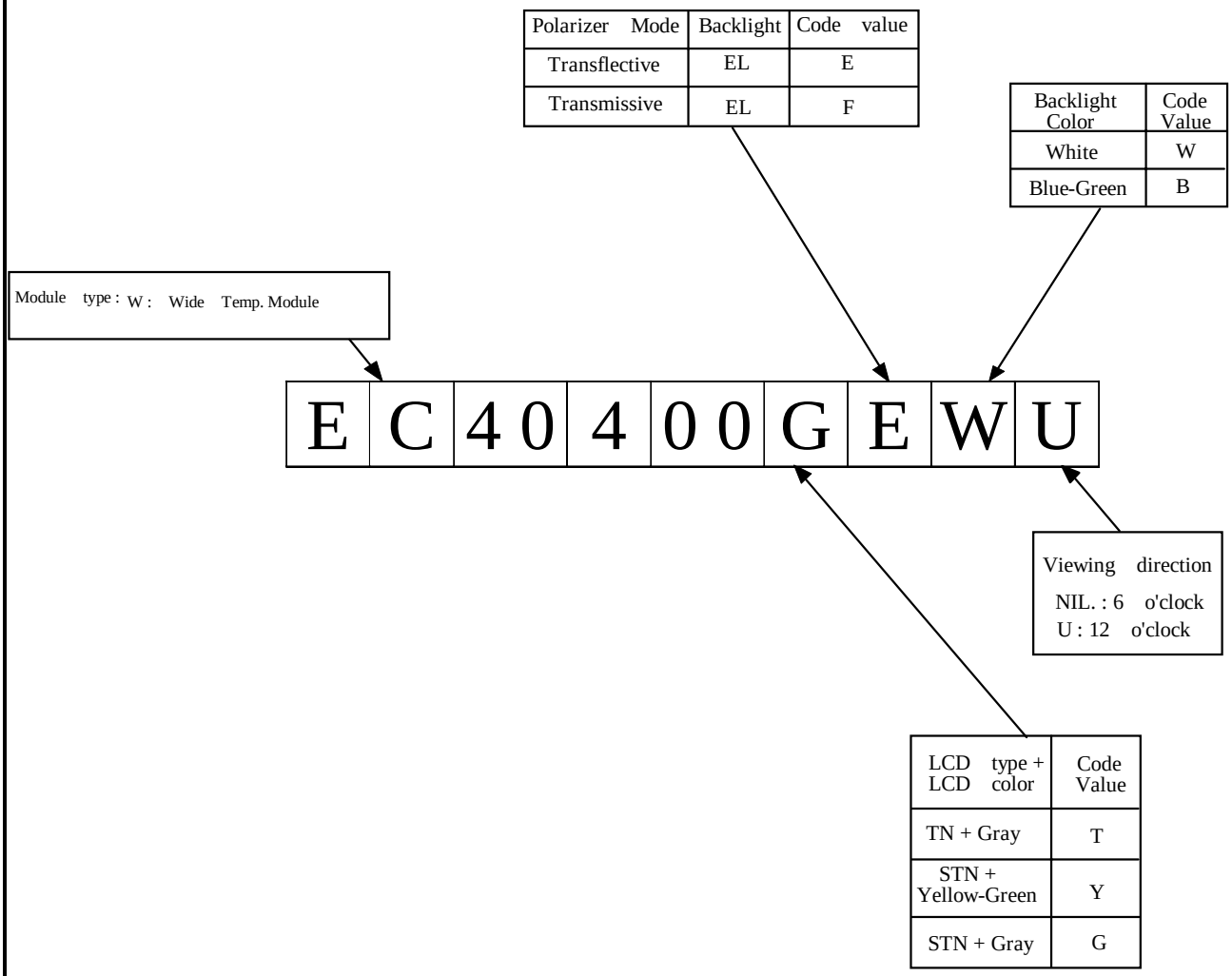
NUMBERING SYSTEM



NOTE : WIDE TEMPERATURE IS NOT AVAILABLE FOR TN TYPE

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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 : HD44780U
PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

E U - H D 4 4 7 8 0 U

1.3 THIS INDIVIDUAL SPECIFICATIONS IS PRIOR TO GENERAL SPECIFICATIONS .

2. MECHANICAL SPECIFICATIONS

(1)	NUMBER OF CHARACTER	40 CH * 4 LINES
(2)	MODULE SIZE	190.0W * 54.0H * 10.0D (max.) mm
(3)	EFFECTIVE AREA	149.0W * 31.0H mm
(4)	CHARACTER FONT	5 * 7 DOTS + CURSOR
(5)	CHARACTER SIZE	2.78W * 4.89H mm
(6)	CHARACTER PITCH	3.53W * 5.49H mm
(7)	DOT SIZE	0.50W * 0.55H mm
(8)	DOT PITCH	0.57W * 0.62H mm
(9)	LCD TYPE *	
(10)	DRIVING METHOD	1 / 16 DUTY MULTIPLEX DRIVE
(11)	VIEWING DIRECTION *	
(12)	BACK - LIGHT *	

* PLEASE REFER TO NUMBERING SYSTEM
NOTE : N.T. : NORMAL TEMPERATURE
NOTE : W.T. : WIDE TEMPERATURE

3. ABSOLUTE MAXIMUM RATINGS

3.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS. (AT Ta = 25 ℃)

PARAMETER		SYMBOL	MIN.	MAX.	UNIT	REMARK
POWER SUPPLY FOR LOGIC		VDD — VSS	0	7.0	V	
POWER SUPPLY FOR LCD DRIVE		VDD — VO	0	13.0	V	
INPUT VOLTAGE		VI	VSS	VDD	V	
STATIC ELECTRICITY		—	—	100	V	NOTE (1)
POWER SUPPLY FOR EL BACKLIGHT	VOLTAGE	VEL	—	AC200	Vrms	fEL=1.0KHZ 60 SEC. MAX
	FREQUENCY	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.

ITEM		OPERATING		STORAGE		REMARK
		MIN.	MAX.	MIN.	MAX.	
AMBIENT TEMPERATURE	N.T.	0 ℃	50 ℃	-20 ℃	60 ℃	NOTE (2), (3)
	W.T.	-20℃	60 ℃	-30 ℃	70 ℃	
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		

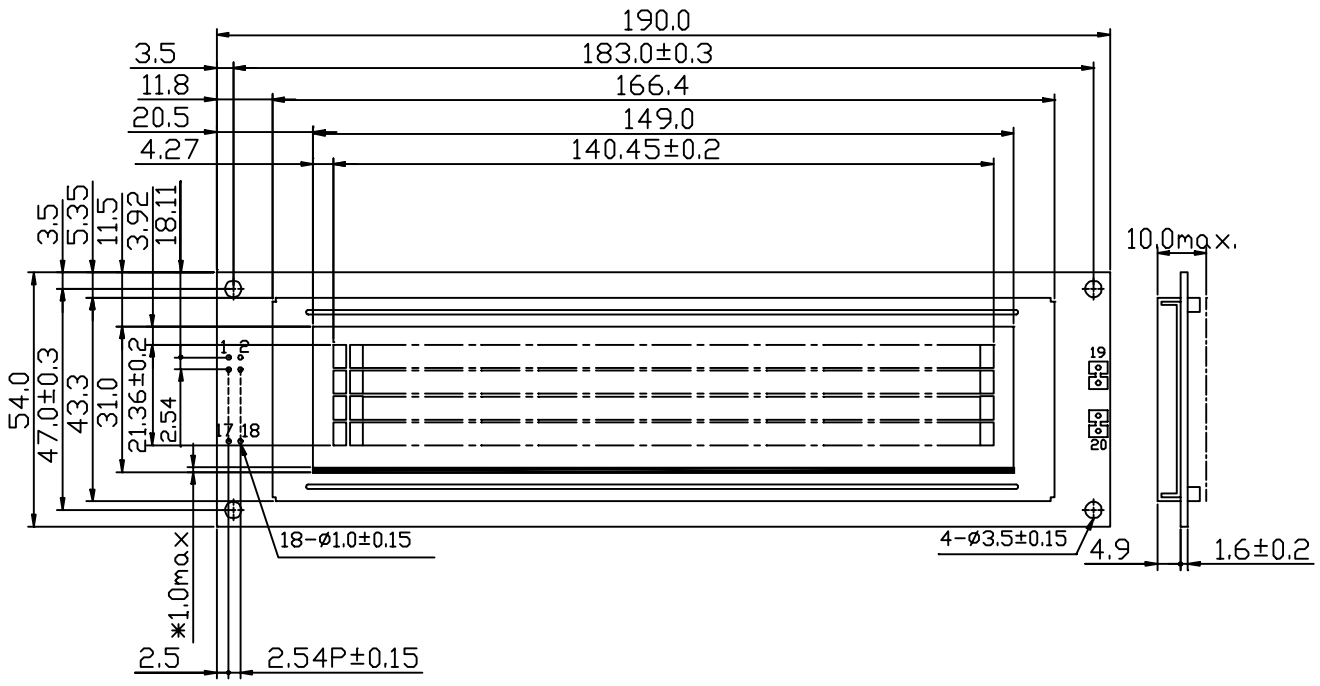
NOTE (2) : Ta AT -20℃(-30℃ FOR W.T.) : 48HR MAX.
60℃(70℃ FOR W.T.) : 48HR MAX.
NOTE (3) : BACKGROUND COLOR CHANGES SLIGHTLY DEPENDING ON AMBIENT TEMPERATURE THIS PHENOMENON IS REVERSIBLE.

4. ELECTRICAL CHARACTERISTICS

Ta = 25℃ VDD = 5.0 ± 0.25 V

PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
H LEVEL INPUT VOLTAGE	VIH	—	2.2	—	—	V
L LEVEL INPUT VOLTAGE	VIL	—	—	—	0.6	V

6 . OUTLINE DIMENSION



* : SEALING AREA
UNIT : mm
SCALE : NTS
NOT SPECIFIED TOLERANCE IS ± 0.5

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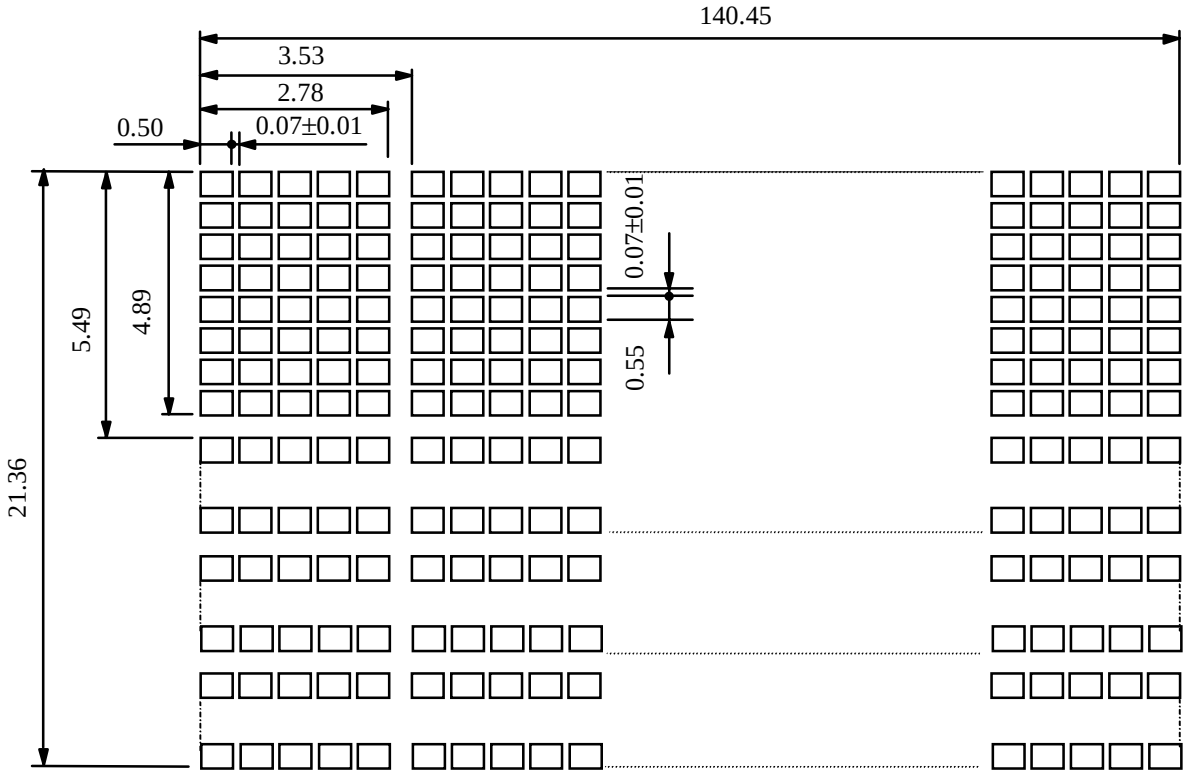
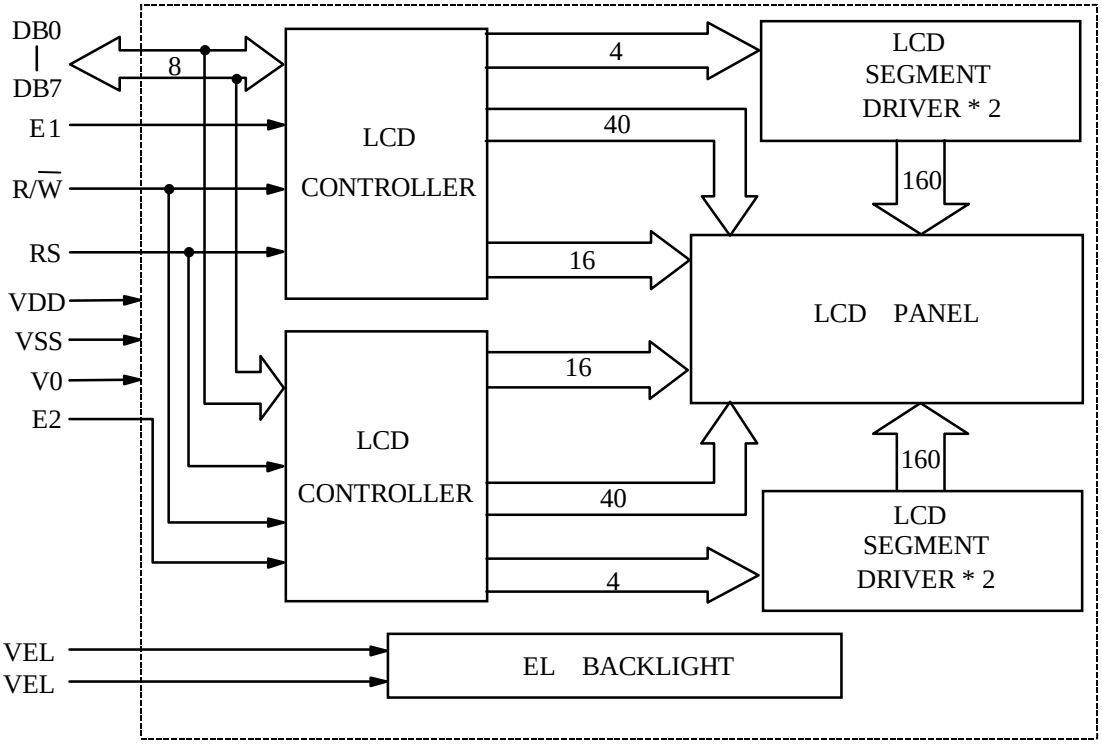
7 . DETAIL DRAWING OF DOT MATRIX



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

8 . BLOCK DIAGRAM

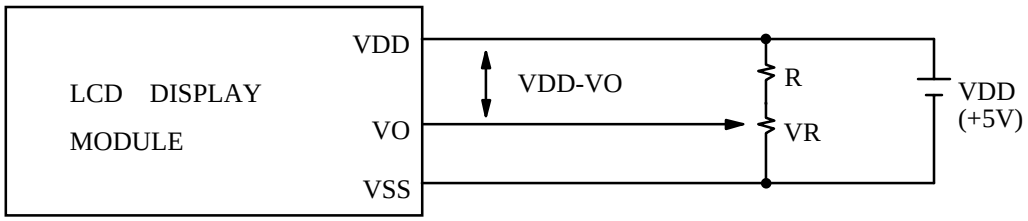


9 . INTERFACE SIGNALS

PIN NO.	SYMBOL	DESCRIPTION	FUNCTION
1	DB7	DATA INPUT/OUTPUT LINES	4 BIT/8BIT SELECTABLE 4 BIT : DB4 - DB7 8 BIT : DB0 - DB7
2	DB6		
3	DB5		
4	DB4		
5	DB3		
6	DB2		
7	DB1		
8	DB0		
9	E1	ENABLE INPUT	
10	$R/\overline{W}$	READ/WRITE SELECTION	$R/\overline{W}$ = 0 : REGISTER WRITE $R/\overline{W}$ = 1 : REGISTER READ
11	RS	INSTRUCTION/DATA REGISTER SELECTION	RS = 0 : INSTRUCTION REGISTER RS = 1 : DATA REGISTER
12	VO	LCD CONTRAST ADJUSTMENT	
13	VSS	GROUND	OV (GND)
14	VDD	POWER SUPPLY FOR LOGIC CIRCUIT	+5V
15	E2	ENABLE INPUT	
16	NC	NO CONNECTION	
17	NC	NO CONNECTION	
18	NC	NO CONNECTION	
19	VEL	POWER SUPPLY FOR EL BACKLIGHT	
20	VEL		

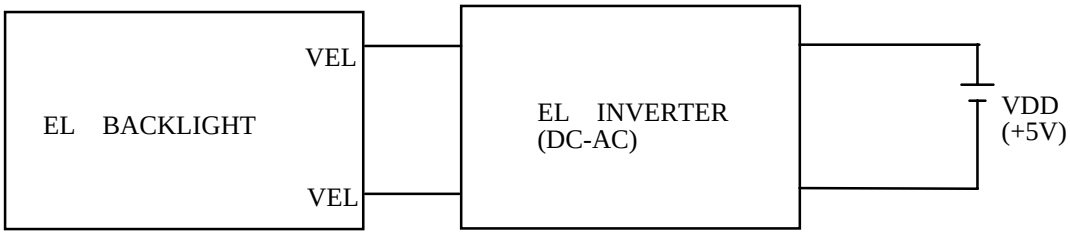
10. POWER SUPPLY

10.1 POWER SUPPLY FOR LCD MODULE



VDD -VO : LCD DRIVING VOLTAGE
VR : 10K Ω ~ 20K Ω
RECOMMENDED RESISTOR R : VDD - VO ≧ 1.5 V
W.T. : VO IS NC

10.2 POWER SUPPLY FOR EL BACKLIGHT



RECOMMENDED INVERTER : SOUN-50700

11. DISPLAY DATA RAM ADDRESS

CHARACTER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
LINE 1	80	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90	91	92	93
LINE 2	C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF	D0	D1	D2	D3
LINE 3	80	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F	90	91	92	93
LINE 4	C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF	D0	D1	D2	D3
CHARACTER	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
LINE 1	94	95	96	97	98	99	8A	9B	9C	9D	9E	9F	A0	A1	A2	A3	A4	A5	A6	A7
LINE 2	D4	D5	D6	D7	D8	D9	DA	DB	DC	DD	DE	DF	E0	E1	E2	E3	E4	E5	E6	E7
LINE 3	94	95	96	97	98	99	8A	9B	9C	9D	9E	9F	A0	A1	A2	A3	A4	A5	A6	A7
LINE 4	D4	D5	D6	D7	D8	D9	DA	DB	DC	DD	DE	DF	E0	E1	E2	E3	E4	E5	E6	E7