EXAMINED BY : Kevin Kuo	EMERGING DISPLAY	FILE NO . CAS-10443
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		VERSION : 1

CUSTOMER ACCEPTANCE SPECIFICATIONS

MODEL NO. :

40200(LED TYPES)

(RoHS)

FOR MESSRS :

_____

CUSTOMER'S APPROVAL

DATE :

_____

BY :

_____

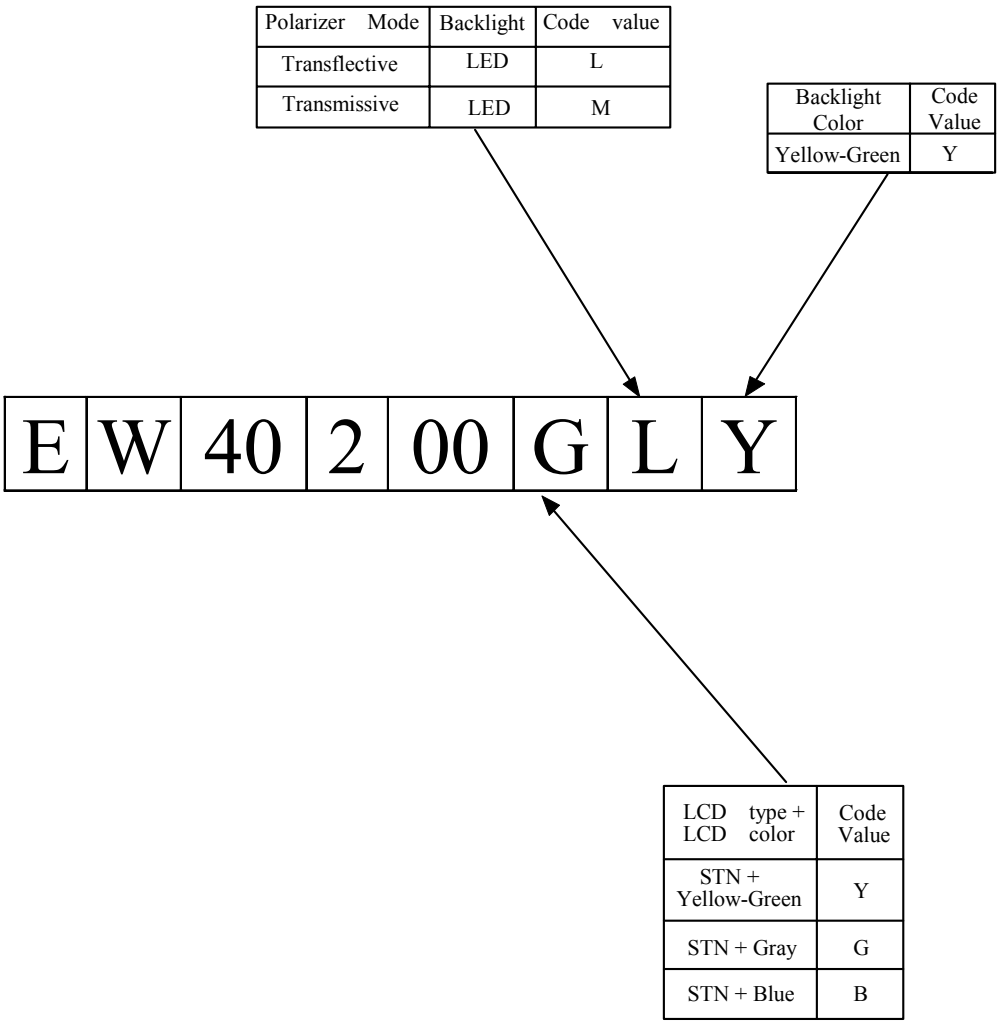
EMERGING DISPLAY TECHNOLOGIES CORPORATION	MODEL : 40200(LED TYPES) (RoHS)	VERSION 1	PAGE 0-1

RECORDS OF REVISION

DOC . FIRST ISSUE OCT.14,2005

DATE	REVISED PAGE NO.	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 B

1.2 APPLICATION NOTES FOR CONTROLLER / DRIVER :
PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

E U - K S 0 0 6 6

1.3 THIS INDIVIDUAL SPECIFICATIONS IS PRIOR TO GENERAL SPECIFICATIONS .

1.4 MATERIAL SAFETY DESCRIPTION
ASSEMBLIES SHALL COMPLY WITH EUROPEAN ROHS REQUIREMENTS, INCLUDING PROHIBITED MATERIALS/COMPONENTS CONTAINING LEAD,MERCURY, CADMIUM, HEXAVALENT CHROMIUM, POLYBROMINATED BIPHENYLS (PBB) AND POLYBROMINATED DIPHENYL ETHERS (PBDE)

2. MECHANICAL SPECIFICATIONS

(1)	NUMBER OF CHARACTER	40 CH * 2 LINES
(2)	MODULE SIZE	182.0W * 33.5H * 14.0D (max.) mm
(3)	EFFECTIVE AREA	154.4W * 15.8H mm
(4)	CHARACTER FONT	5 * 7 DOTS + CURSOR
(5)	CHARACTER SIZE	3.20W * 5.55H mm
(6)	CHARACTER PITCH	3.70W * 5.95H mm
(7)	DOT SIZE	0.60W * 0.65H mm
(8)	DOT PITCH	0.65W * 0.70H mm
(9)	LCD TYPE *	
(10)	DRIVING METHOD	1 / 16 DUTY MULTIPLEX DRIVE
(11)	BACK-LIGHT *	

* 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 DRIVE	VDD – VO	0	13 . 0	V	
INPUT VOLTAGE	VI	VSS	VDD	V	
STATIC ELECTRICITY	—	—	1 0 0	V	NOTE (1)
LED POWER DISSIPATION	PD	—	2 . 7	W	
LED FORWARD CURRENT	IF	—	5 8 0	mA	
LED REVERSE VOLTAGE	VR	—	8	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	- 2 0°C	7 0 °C	- 3 0 °C	8 0 °C	NOTE (1) , (3)
HUMIDITY	NOTE (2)		NOTE (2)		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 (1) : BACKGROUND COLOR CHANGES SLIGHTLY DEPENDING ON AMBIENT TEMPERATURE THIS PHENOMENON IS REVERSIBLE .
NOTE (2) : Ta ≤ 60°C : 90%RH MAX. (96HRS MAX.)
Ta > 60°C : ABSOLUTE HUMIDITY MUST BE LOWER THAN THE HUMIDITY OF 90%RH AT 60°C. (96HRS MAX.)
NOTE (3) : Ta AT -30°C : WILL BE < 48hrs
80°C : WILL BE < 168hrs

4. ELECTRICAL CHARACTERISTICS

Ta = 25 °C VDD = 5.0 ± 0.25 V

PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
POWER SUPPLY VOLTAGE FOR LOGIC	VDD	—	4.75	5.0	5.25	V
H LEVEL INPUT VOLTAGE	VIH	—	2.2	—	—	V
L LEVEL INPUT VOLTAGE	VIL	—	—	—	0.6	V
H LEVEL OUTPUT VOLTAGE	VOH	–IOH = 0.2 mA	2.4	—	—	V
L LEVEL OUTPUT VOLTAGE	VOL	IOL = 1.2 mA	—	—	0.4	V
POWER SUPPLY CURRENT (LOGIC)	IDD	VDD = 5.0 V	—	2.0	5.0	mA
RECOMMENDED LCD DRIVING VOLTAGE	VDD – VO θy-= 10° θx= 0° DUTY= 1/16	Ta = - 20 ℃	3.9	4.4	4.9	V
		Ta = 25 ℃	3.9	4.4	4.9	V
		Ta = 70 ℃	3.9	4.4	4.9	V
CLOCK OSCILLATION FREQUENCY	FOSC	Ta = 25 ℃	—	270	—	KHz
LED FORWARD VOLTAGE	VF	IF = 280 mA	—	4.2	4.6	V
LED FORWARD CURRENT	IF	—	—	280	—	mA
LED REVERSE CURRENT	IR	VR = 8 V	—	—	0.2	mA

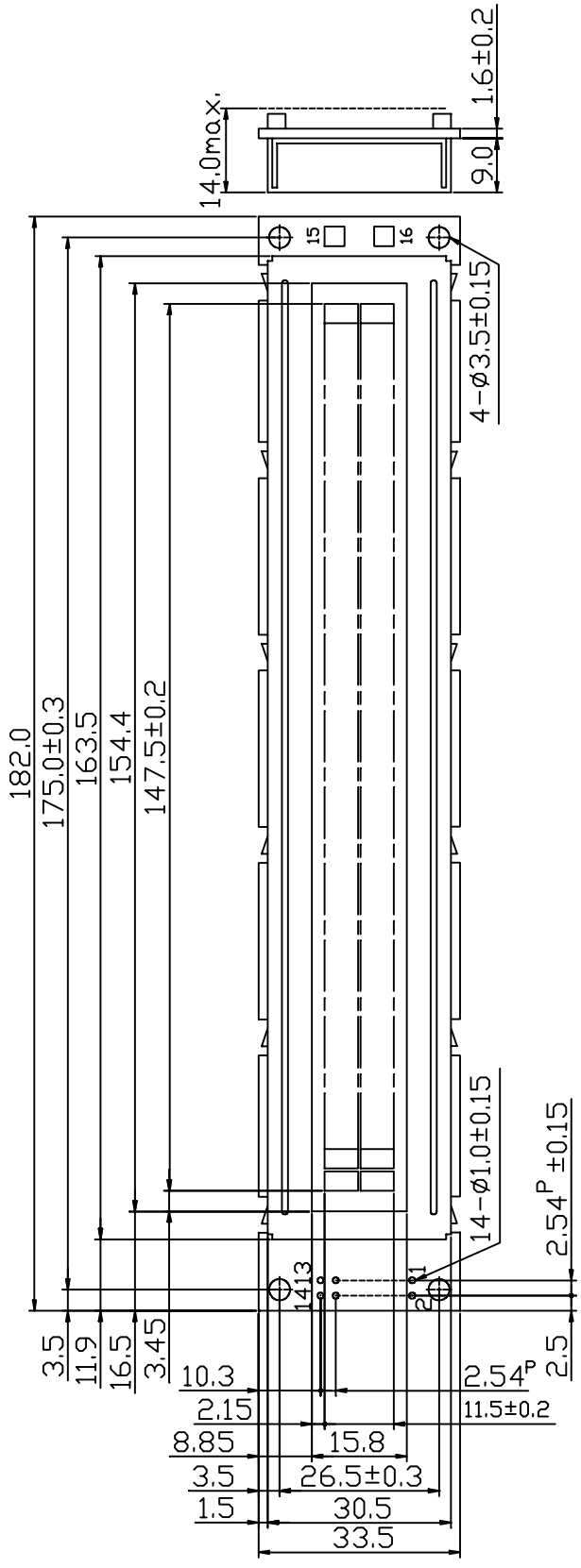
5. OPTICAL CHARACTERISTICS.

Ta = 25 °C VDD = 5.0 ± 0.25 V

ITEM	SYMBOL	CONDITION		MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING ANGLE	θy+	K ≥ 1.5	θx=0°	(60)	(65)	—	deg.	1
	θy-			(50)	(55)	—		
	θx+		θy=0°	(42)	(47)	—		
	θx-			(44)	(49)	—		
CONTRAST RATIO	K	θy-=10° , θx=0°		2.6	5.1	—	—	1
RESPONSE TIME	tr (rise)	θy-=10° θx=0°	Ta = -20 °C	—	5538	7199	ms	1
			Ta = 25 °C	—	228	296		
			Ta = 70 °C	—	104	135		
	tf (fall)		Ta = -20 °C	—	2316	3011		
			Ta = 25 °C	—	174	226		
			Ta = 70 °C	—	85	111		
THE BRIGHTNESS OF BACK-LIGHT	L	IF = 280 mA		15	20	—	cd/m^2	1, 2
				22.5	30	—		1, 3
PEAK EMISSION WAVELENGTH	λP	IF = 280 mA		569	572	575	nm	1

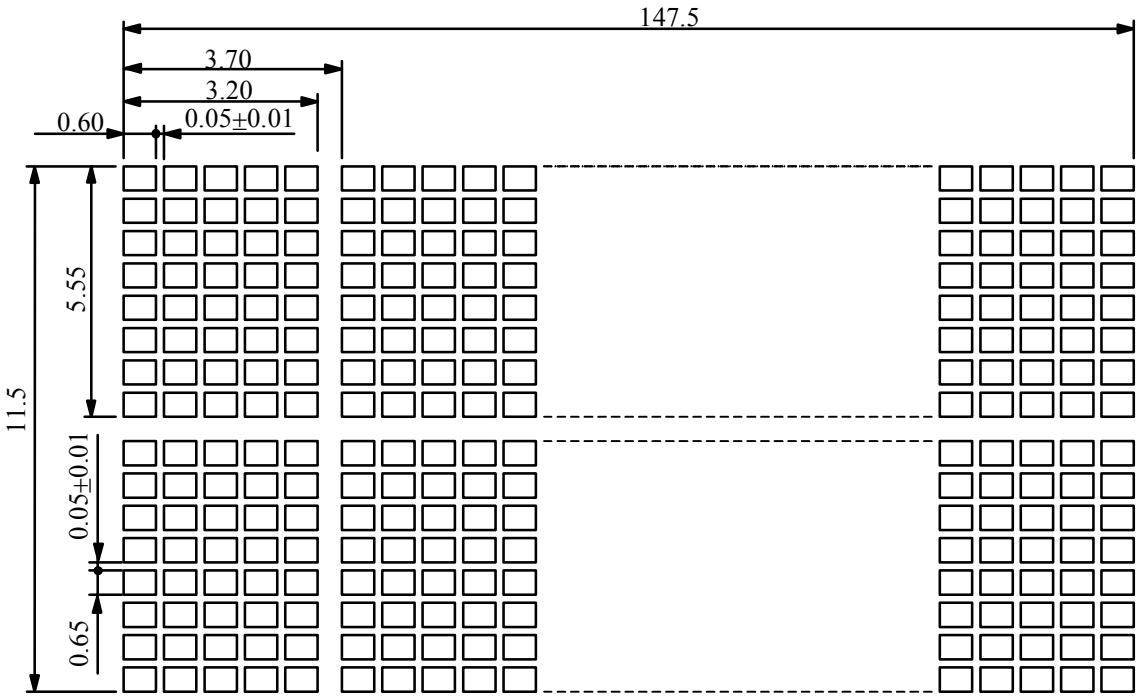
NOTE (1) : PLEASE REFER TO :
CUSTOMER ACCEPTANCE STANDARD SPECIFICATION : EU-002B
NOTE (2) : POLARIZER MODE : TRANSFLECTIVE
NOTE (3) : POLARIZER MODE : TRANSMISSIVE

6 . OUTLINE DIMENSION



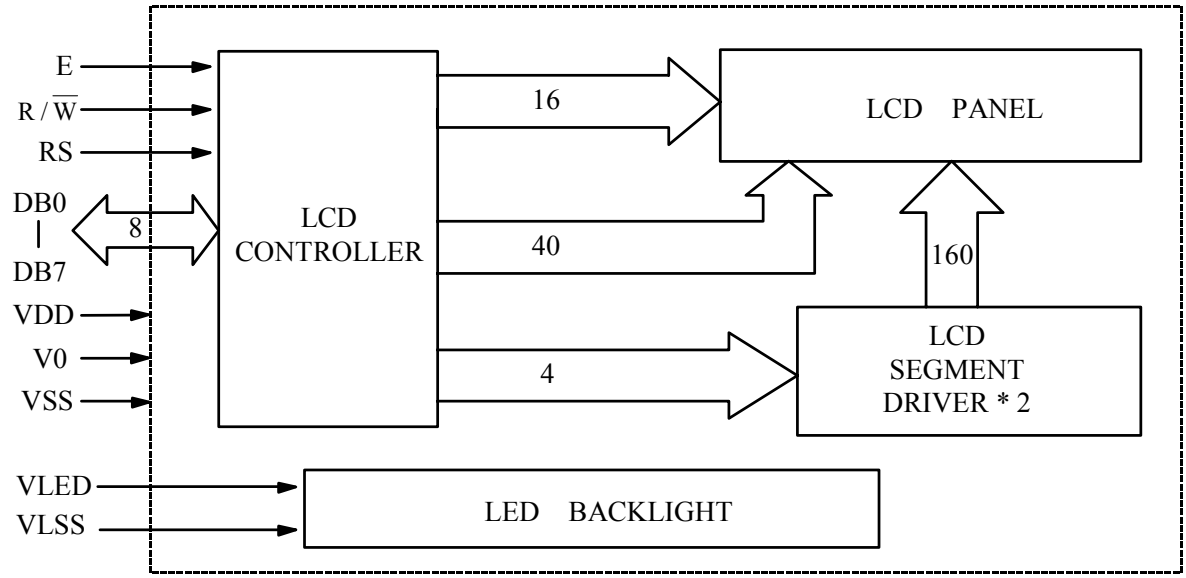
UNIT : mm
SCALE : NTS
NOT SPECIFIED TOLERANCE IS ±0.5

7. DETAIL DRAWING OF DOT MATRIX



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

8. BLOCK DIAGRAM

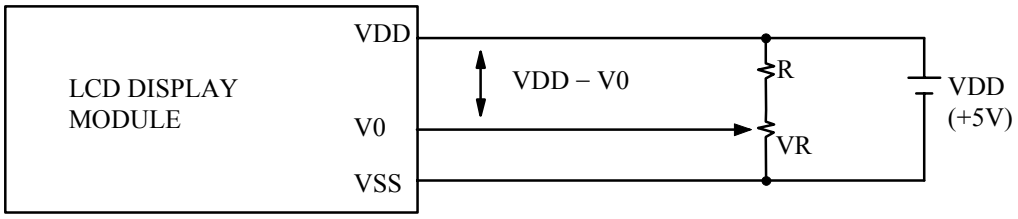


9. INTERFACE SIGNALS

PIN NO.	SYMBOL	DESCRIPTION	FUNCTION
1	VSS	GROUND	0V (GND)
2	VDD	POWER SUPPLY FOR LOGIC CIRCUIT	+5V
3	V0	LCD CONTRAST ADJUSTMENT	
4	RS	INSTRUCTION/DATA REGISTER SELECTION	RS = 0 : INSTRUCTION REGISTER RS = 1 : DATA REGISTER
5	R / $\overline{W}$	READ/WRITE SELECTION	R / $\overline{W}$ = 0 : REGISTER WRITE R / $\overline{W}$ = 1 : REGISTER READ
6	E	ENABLE INPUT	
7	DB0	DATA INPUT/OUTPUT LINES	4 BIT/8BIT SELECTABLE 4 BIT : DB4 - DB7 8 BIT : DB0 - DB7
8	DB1		
9	DB2		
10	DB3		
11	DB4		
12	DB5		
13	DB6		
14	DB7		
15	VLED	POWER SUPPLY FOR LED BACKLIGHT (ANODE)	
16	VLSS	POWER SUPPLY FOR LED BACKLIGHT (CATHODE)	0V (GND)

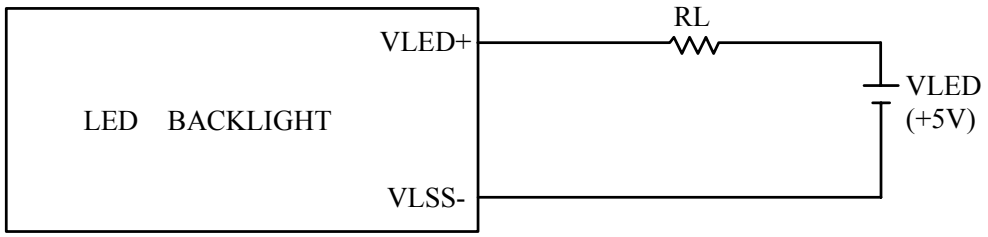
10. POWER SUPPLY

10.1 POWER SUPPLY FOR LCD MODULE



VDD – V0 : LCD DRIVING VOLTAGE
VR : 10KΩ ~ 20KΩ
RECOMMENDED RESISTOR R : VDD – V0 ≥ 1.5 V

10.2. POWER SUPPLY FOR LED BACK-LIGHT



RECOMMENDED RESISTOR RL : 2.8~5.6Ω,1/2 WATT (CONTROLLED BY USER)
* THE BRIGHTNESS WOULD BE ALTERED SUBJECT TO DIFFERENT VALUES OF RL

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
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