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CUSTOMER ACCEPTANCE SPECIFICATIONS

MODEL :

162G0(WHITE LED TYPES)
(RoHS)

FOR MESSRS :

CUSTOMER'S APPROVAL

DATE :

BY :

EMERGING DISPLAY
TECHNOLOGIES CORPORATION

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RECORDS OF REVISION	DOC . FIRST ISSUE	SEP.07,2005
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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 1 6 2 G 0 B M W

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

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1. GENERAL SPECIFICATIONS

1.1 GENERAL SPECIFICATIONS
PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :
EU - 002B

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

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :
EU - KS0066

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 ----- 16 CH * 2 LINES
- (2) MODULE SIZE ----- 80.0W * 36.0H * 13.0D (max.) mm
- (3) EFFECTIVE AREA ----- 66.0W * 16H mm
- (4) CHARACTER FONT ----- 5 * 7 DOTS + CURSOR
- (5) CHARACTER SIZE ----- 2.96W * 5.56H mm
- (6) CHARACTER PITCH ----- 3.55W * 5.94H mm
- (7) DOT SIZE ----- 0.56W * 0.66H mm
- (8) DOT PITCH ----- 0.60W * 0.70H mm
- (9) LCD TYPE *
- (10) DRIVING METHOD ----- 1 / 16 DUTY MULTIPLEX DRIVE
- (11) VIEWING DIRECTION ----- 6 O'CLOCK
- (12) BACK-LIGHT ----- LED ; COLOR : 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	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)
LED POWER DISSIPATION	PD	—	0.2	W	
LED FORWARD CURRENT	IF	—	50	mA	
LED REVERSE VOLTAGE	VR	—	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	- 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)	—	1 9 . 6 m /s ² (2 G)	
SHOCK	—	2 9 . 4 m /s ² (3 G)	—	4 9 0 . 0 m /s ² (5 0 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 (96HR MAX.)

Ta > 60°C : ABSOLUTE HUMIDITY MUST BE

LOWER THAN THE HUMIDITY OF 90%RH AT 60°C(96HR 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	—	1.0	3.0	mA
RECOMMENDED LCD DRIVING VOLTAGE	VDD - VO θy = 10°, θx = 0° DUTY = 1/16	Ta = -20 °C	3.9	4.4	4.9	V
		Ta = 25 °C	3.9	4.4	4.9	V
		Ta = 70 °C	3.9	4.4	4.9	V
CLOCK OSCILLATION FREQUENCY	FOSC	Ta = 25 °C	—	270	—	KHz
LED FORWARD VOLTAGE	VF	IF = 20mA	—	3.6	4	V
LED FORWARD CURRENT	IF	—	—	20	50	mA
LED REVERSE CURRENT	IR	VR = 5V	—	—	0.2	mA

5. OPTICAL CHARACTERISTICS .

Ta = 25 °C

VDD = 5.0 ±0.25V

I T E M	SYMBOL		CONDITION	Ta = 25 °C			UNIT	NOTE	
				MIN .	TYP .	MAX .			
VIEWING ANGLE	θ_{y+}		K *	$\theta_{x=0^\circ}$	(53)	(58)	—	deg .	1
	θ_{y-}				(43)	(48)	—		
	θ_{x+}		K *	$\theta_{y=0^\circ}$	(60)	(65)	—		
	θ_{x-}				(60)	(65)	—		
CONTRAST RATIO	K	STN	$\theta_{y-} = 10^\circ, \theta_{x} = 0^\circ$	2.0	3.0	—	deg .	1	
		FSTN		3.5	5.3	—			
RESPONSE TIME	tr (rise)		$\theta_{x} = 0^\circ$ $\theta_{y-} = 10^\circ$	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 MODULE	L		IF=20.0mA	9	12	—	cd/m ²	1, 2	
				6	8	—		1, 3	

K* = STN : K ≥ 1.5

FSTN : K ≥ 2.0

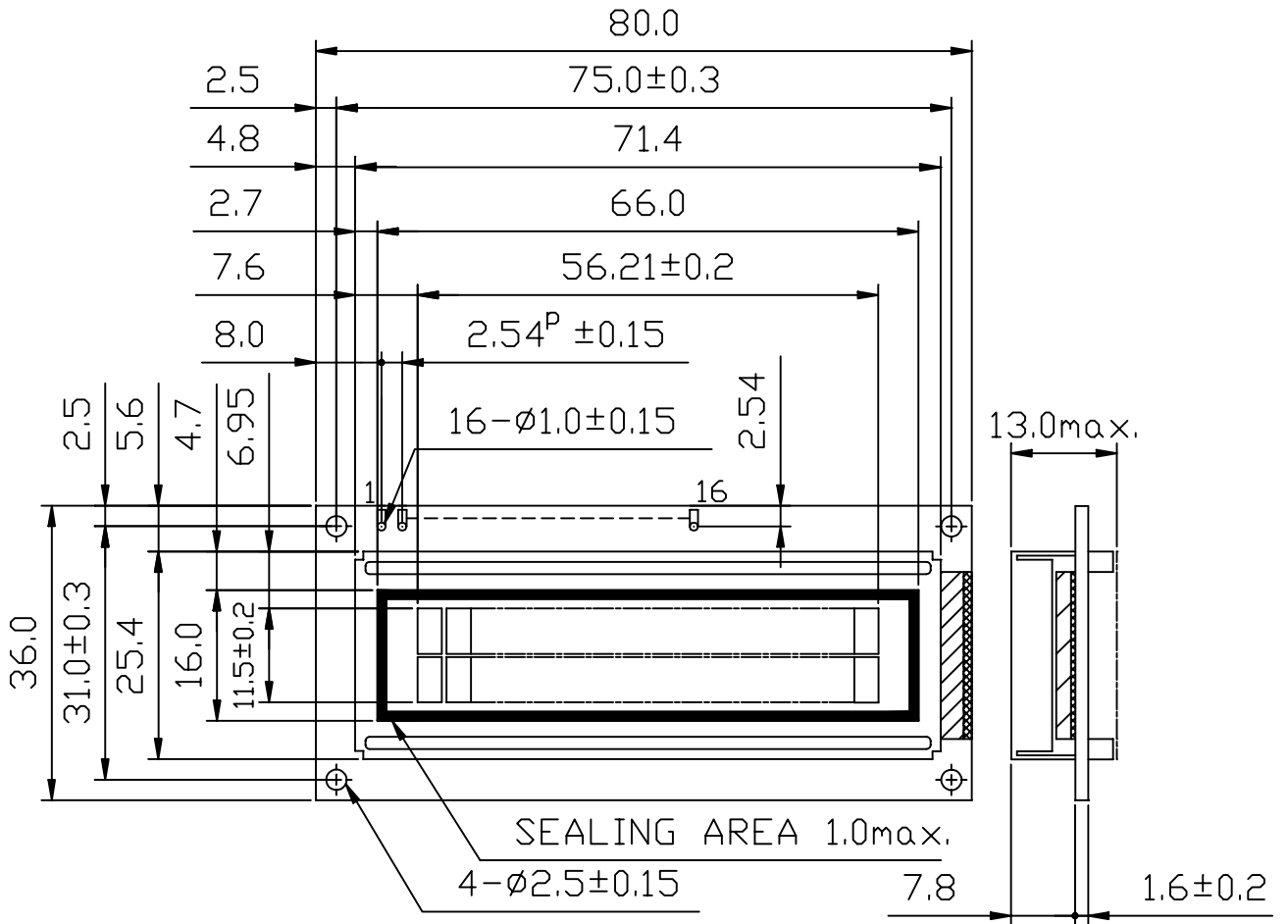
NOTE (1) : PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATION : EU-002B

NOTE (2) : POLARIZER MODE : TRANSMISSIVE

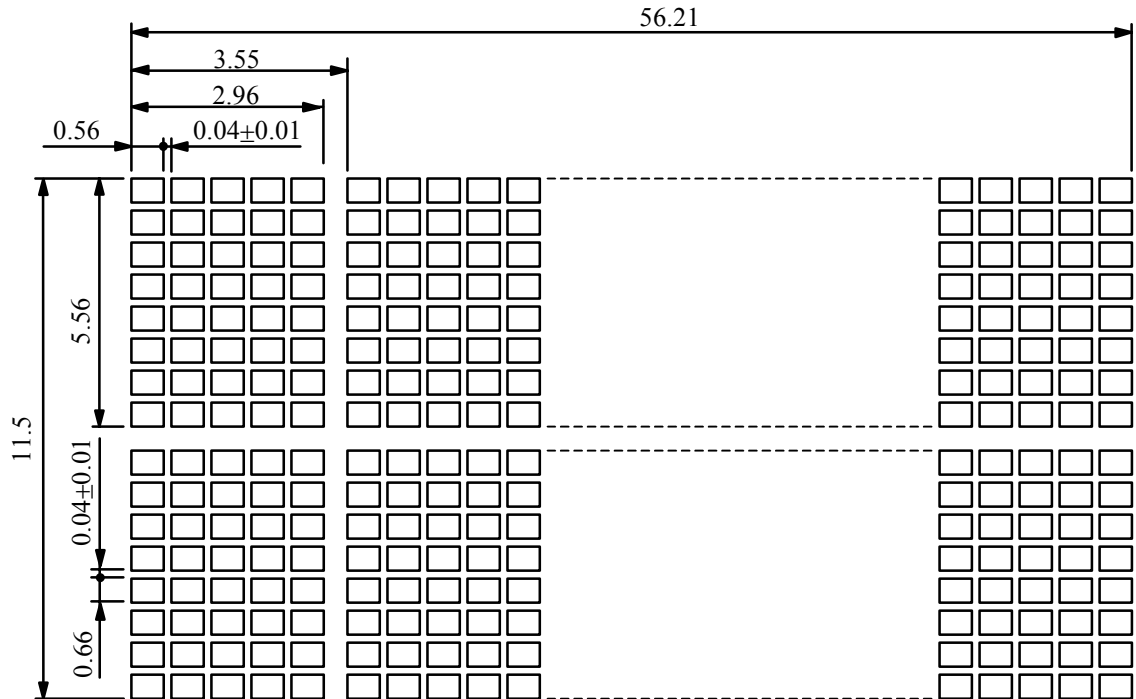
NOTE (3) : POLARIZER MODE : TRANSFLECTIVE

6. OUTLINE DIMENSIONS



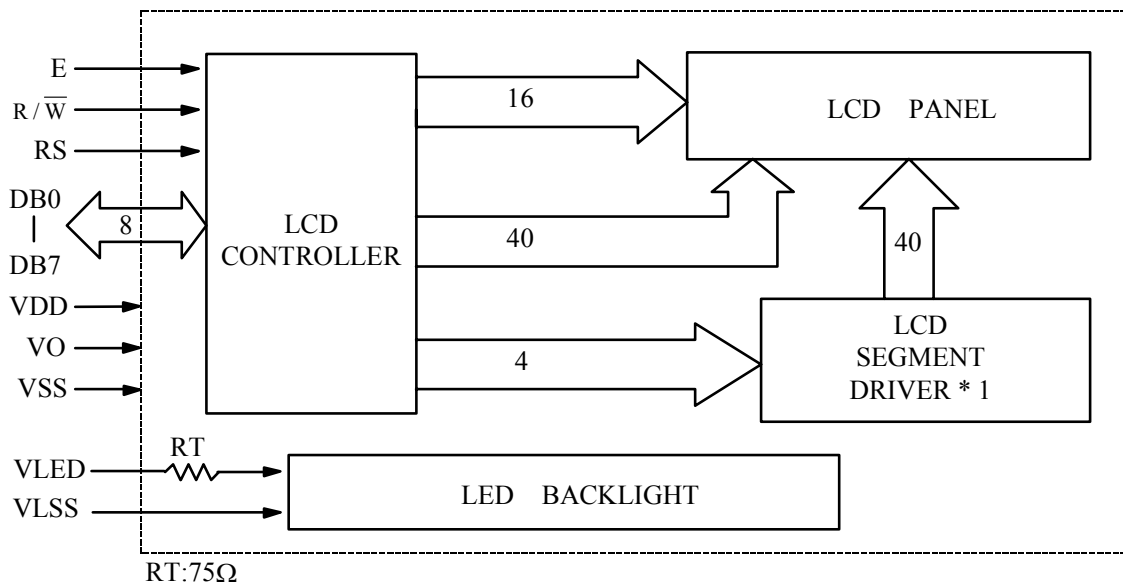
UNIT : mm
SCALE : NTS
NOT SPECIFIED TOLERANCE IS ±0.5

7. DETAIL DRAWING OF DOT MATRIX



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

8. BLOCK DIAGRAM

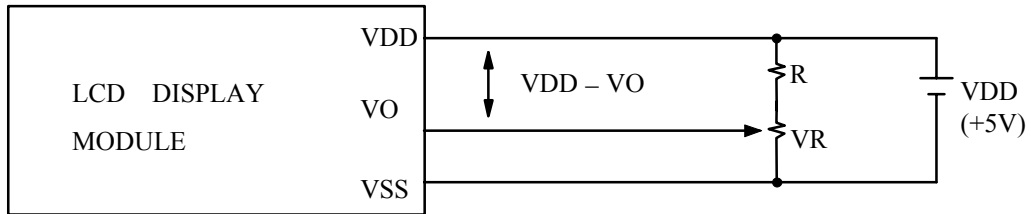


9. INTERFACE SIGNALS

PIN NO.	SYMBOL	DESCRIPTION	FUNCTION
1	VSS	GROUND	0V (GND)
2	VDD	POWER SUPPLY FOR LOGIC CIRCUIT	+5V
3	VO	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

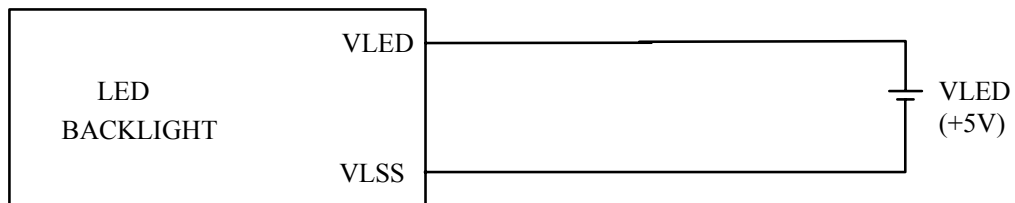


VDD - VO : LCD DRIVING VOLTAGE

VR : 10KΩ ~ 20KΩ

RECOMMENDED RESISTOR R : $VDD - VO \geq 1.5 V$

10.2 POWER SUPPLY FOR LED BACKLIGHT



11. DISPLAY DATA RAM ADDRESS

CHARACTER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
LINE 1	80	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F
LINE 2	C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF