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APPROVED BY: <i>David Chang</i>		ISSUE : NOV.09,1999
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		VERSION : 2

CUSTOMER	ACCEPTANCE	SPECIFICATIONS
<div>MODEL : <u>162G0(LED TYPES)</u> FOR MESSRS : _____</div>		

CUSTOMER'S APPROVAL

DATE :

BY :

MITSUTECH INT'L CORP.

MODEL NO.

VERSION

162G0 (LED TYPES)

2

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DATE

REVISED
PAGE
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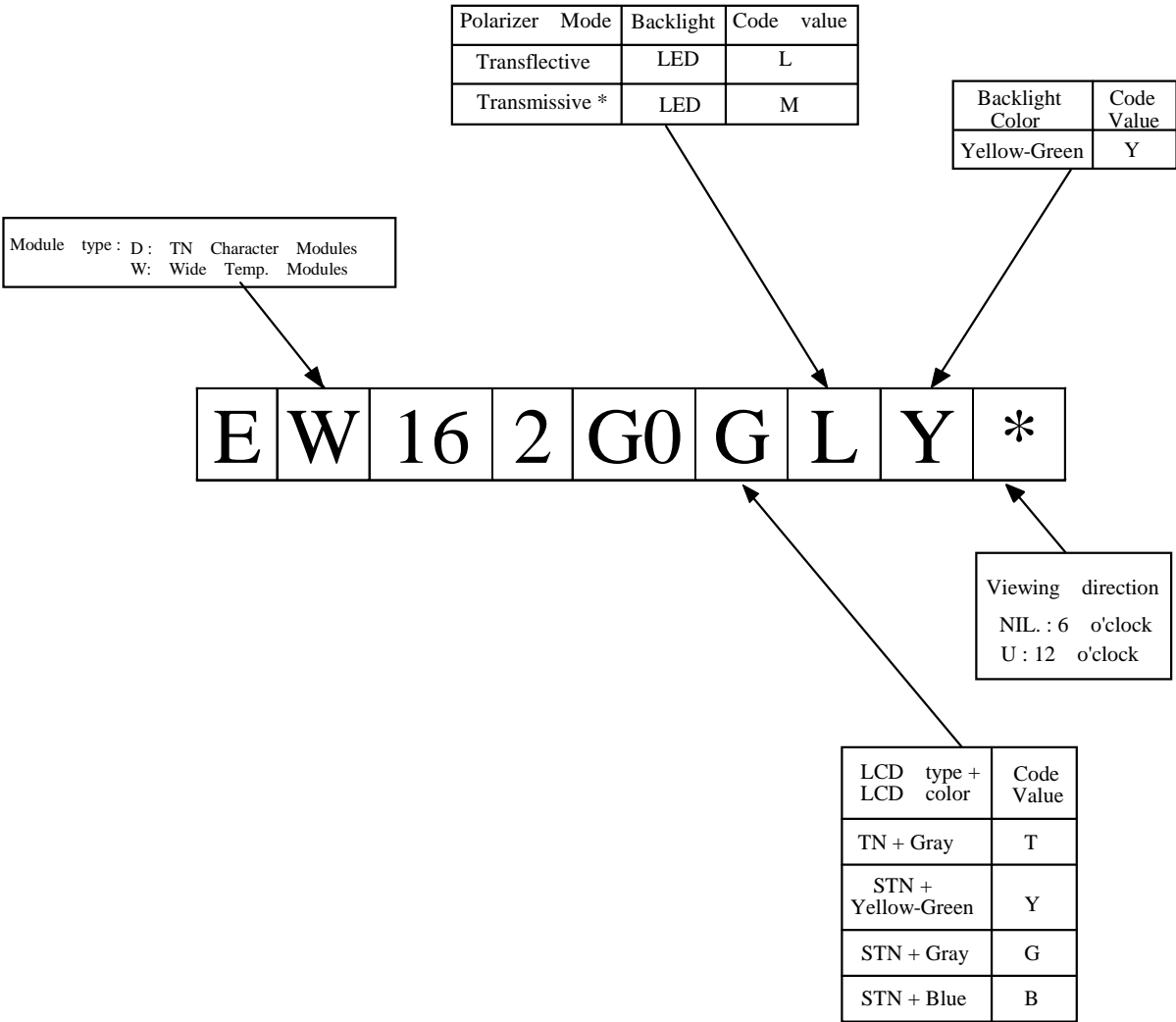
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THE ENTIRE PAGES REVISED

MODEL NO.	VERSION
162G0 (LED TYPES)	2

NUMBERING SYSTEM



* : AVAILABLE ONLY 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 :

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 .

2. MECHANICAL SPECIFICATIONS

- (1) NUMBER OF CHARACTER ----- 16 CH * 2 LINES
- (2) MODULE SIZE ----- 80.0W * 36.0H * 14.0D (max.) mm
- (3) EFFECTIVE AREA ----- 64.5W * 13.8H 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 *
- (12) BACK-LIGHT *

* PLEASE REFER TO NUMBERING SYSTEM

3. ABSOLUTE MAXIMUM RATINGS

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

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	—	1.26	W	
LED FORWARD CURRENT	IF	—	220	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	ED	0 °C	50 °C	-20 °C	70 °C	NOTE (2), (3)
	EW	-20 °C	70 °C	-30 °C	80 °C	
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°C (-30°C FOR EW) : 48HR MAX .

70°C (80°C FOR EW) : 168HR MAX .

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

4. ELECTRICAL CHARACTERISTICS

Ta = 25°C

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
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	ED	Ta = 0 °C	—	4.2	V
	∅ = 25°, θ = **		Ta = 25 °C	—	3.8	V
	DUTY= 1/16		Ta = 50 °C	—	3.4	V
	VDD − VO	EW	Ta = - 20 °C	—	4.4	V
	∅ = 10°, θ = 0°		Ta = 25 °C	—	4.4	V
	DUTY= 1/16		Ta = 70 °C	—	4.4	V
CLOCK OSCILLATION FREQUENCY	FOSC	Ta = 25 °C	—	270	—	KHZ
LED FORWARD VOLTAGE	VF	IF=110mA	—	4.2	4.6	V
LED FORWARD CURRENT	IF	—	—	110	—	mA
LED REVERSE CURRENT	IR	VR=8V	—	—	0.2	mA

5. OPTICAL CHARACTERISTICS.

Ta = 25 °C

VDD = 5.0 V

I T E M		SYMBOL	CONDITION		MIN .	TYP .	MAX .	UNIT	NOTE	
VIEWING AREA		Ø 2 - Ø1	K ≥ 1.4		3 0	—	—	deg.	1	
CONTRAST RATIO		K	Ø = 10° θ = **		5	—	—	—	1	
RESPONSE TIME	ED	tr (rise)	Ø = 25° θ = **	Ta = 25°C	—	150	250	ms	1	
		tf (fall)		Ta = 25°C	—	100	150			
	EW	tr (rise)	Ø = 10° θ = 0°	Ta = -20°C	—	5538	—			
				Ta = 25°C	—	228	—			
				Ta = 70°C	—	104	—			
		tf (fall)		Ta = -20°C	—	2316	—			
				Ta = 25°C	—	174	—			
				Ta = 70°C	—	85	—			
THE BRIGHTNESS OF BACK-LIGHT		L	VDD = 5.0 V	—	20	—	cd/m²	1, 2		
				—	40	—		1, 3		
PEAK EMISSION WAVELENGTH		λ P	VDD = 5.0 V		—	5 7 2	—	nm	1	

** θ = 0° WHEN VIEWING DIRECTION IS 6 O'CLOCK

θ = 180° WHEN VIEWING DIRECTION IS 12 O'CLOCK

NOTE (1) : PLEASE REFER TO :

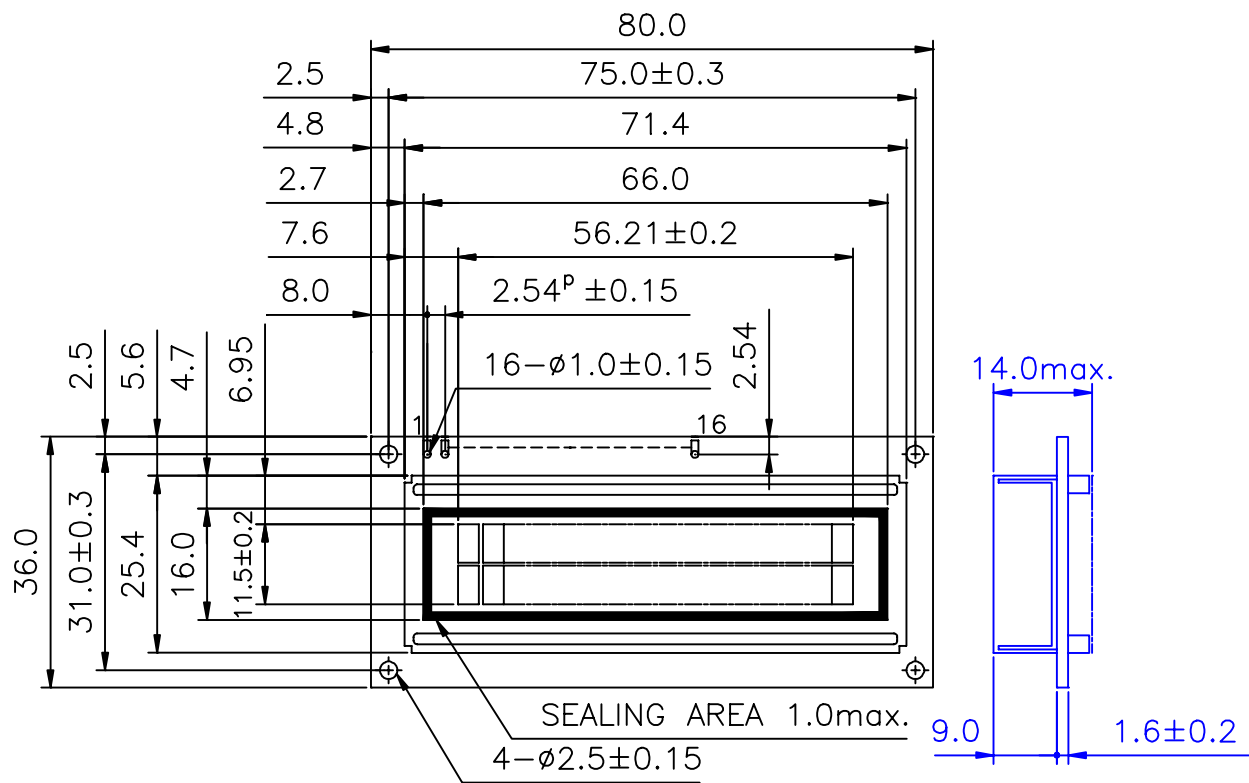
CUSTOMER ACCEPTANCE STANDARD SPECIFICATION : EU-002A

NOTE (2) : POLARIZER MODE : TRANSFLECTIVE

NOTE (3) : POLARIZER MODE : TRANSMISSIVE

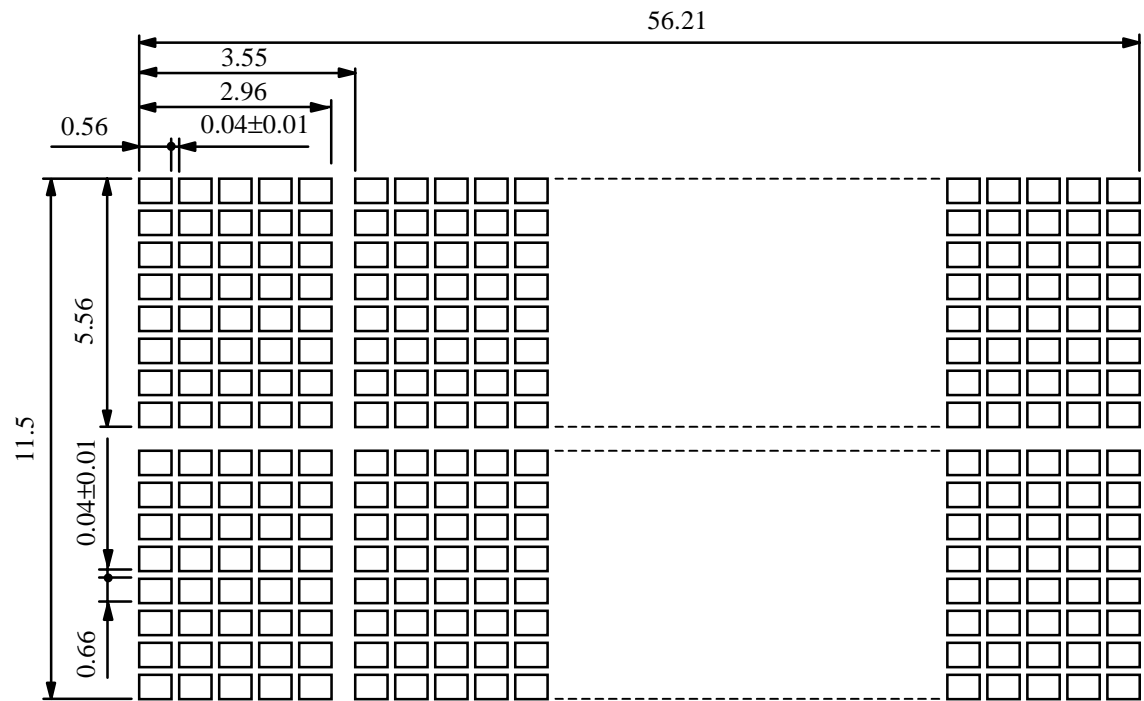
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6. OUTLINE DIMENSION



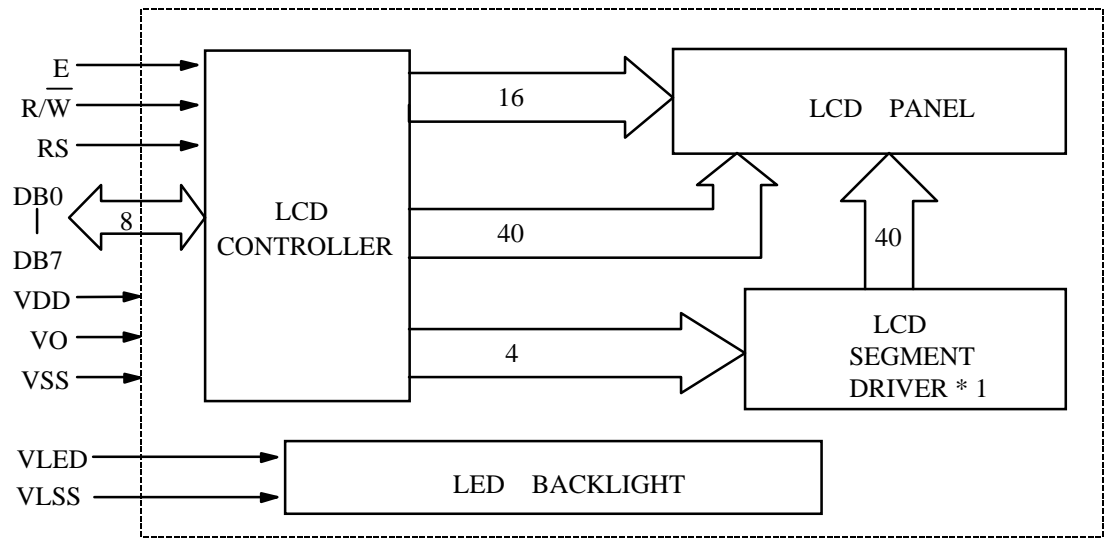
UNIT : mm
SCALE : NTS
NOT SPECIFIED TOLERANCE IS ±0.5

7. DETAIL DRAWING OF DOT MATRIX



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

8. BLOCK DIAGRAM

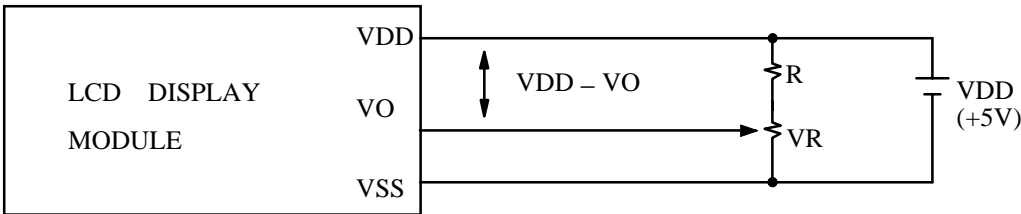


9. INTERFACE SIGNALS

PIN NO.	SYMBOL	DESCRIPTION	FUNCTION
1	VSS	GROUND	0V (GND)
2	VDD	POWER SUPPLY FOR LOGIC CIRCUIT	+5V
3	VO	LCD CONTRAST ADJUSTMENT	
4	RS	INSTRUCTION/DATA REGISTER SELECTION	RS = 0 : INSTRUCTION REGISTER RS = 1 : DATA REGISTER
5	$\overline{R/\overline{W}}$	READ/WRITE SELECTION	$\overline{R/\overline{W}}$ = 0 : REGISTER WRITE $\overline{R/\overline{W}}$ = 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)

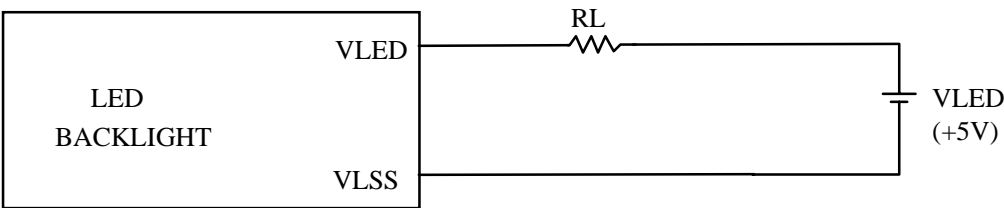
1 0 . POWER SUPPLY

1 0 . 1 POWER SUPPLY FOR LCD MODULE



VDD – VO : LCD DRIVING VOLTAGE
VR : 10KΩ ~ 20KΩ
RECOMMENDED RESISTOR R : $VDD - VO \geq 1.5 V$

1 0 . 2 POWER SUPPLY FOR LED BACKLIGHT



RECOMMENDED RESISTOR $RL = 6 \sim 15\Omega, 1/4 W$, (CONTROLLED BY USER)
* THE BRIGHTNESS WOULD BE ALTERED SUBJECT TO DIFFERENT VALUES OF RL

1 1 . 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