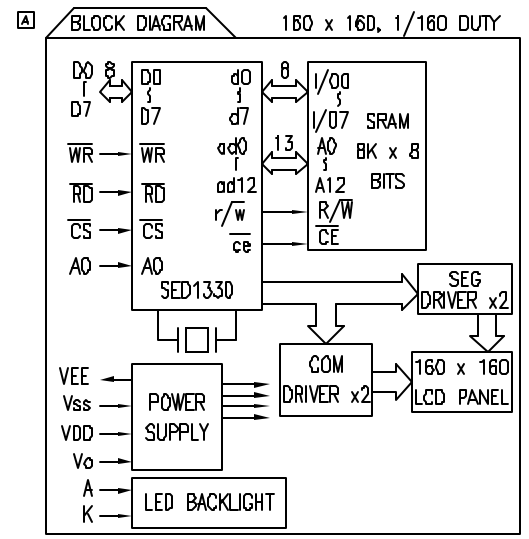
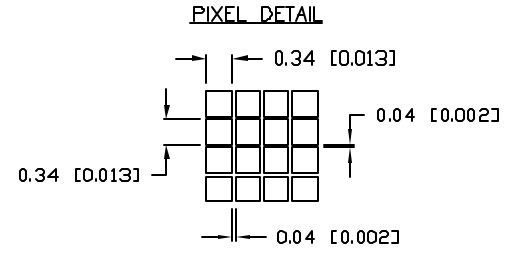
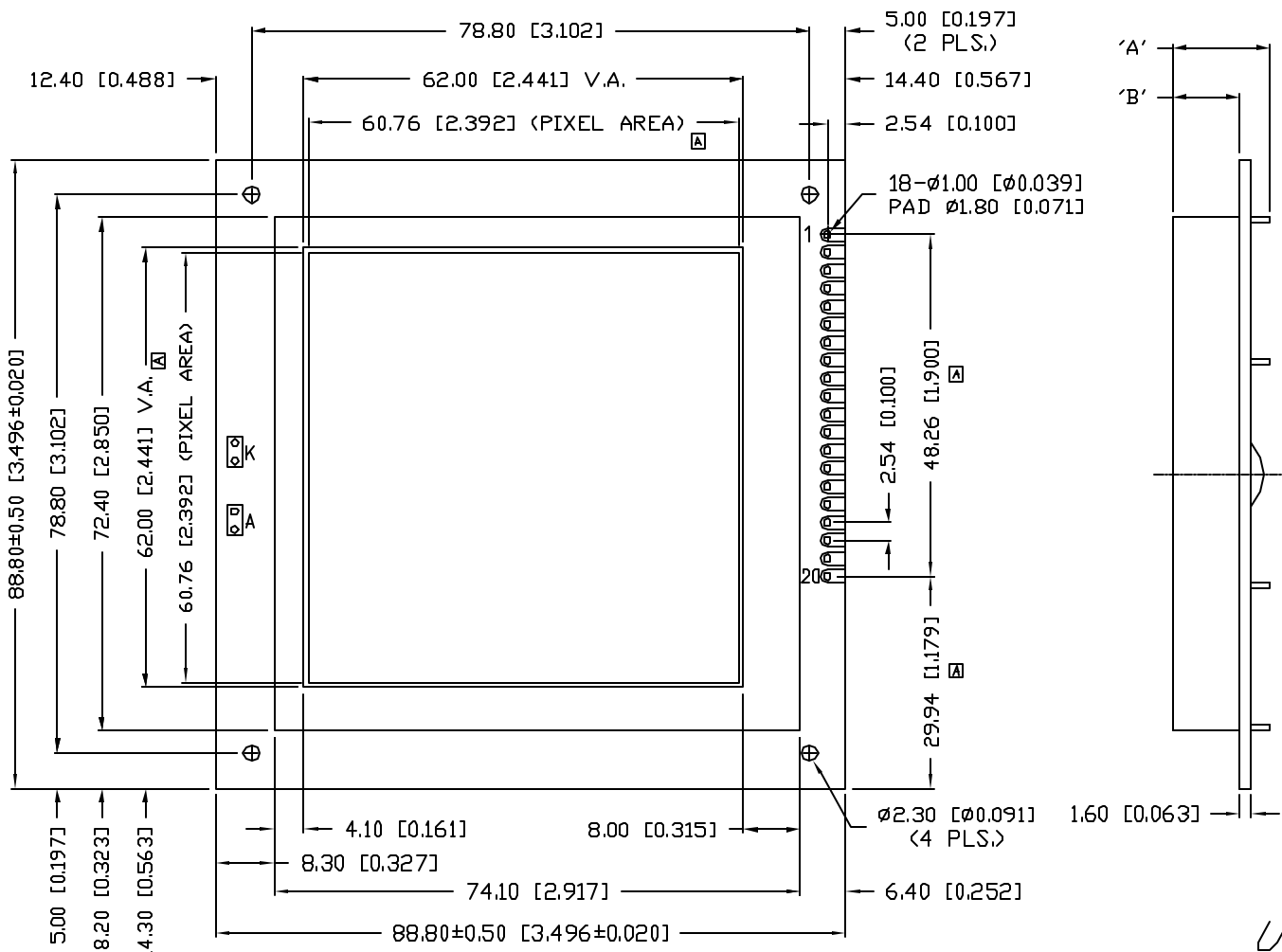


# UNCONTROLLED DOCUMENT

P/N PREFIX/SUFFIX TABLE			
LCM-X	GXX	DESCRIPTION	
STANDARD	S	SR	STN, REFLECTIVE
HIGH TEMP.	H	SF	STN, TRANSFLECTIVE(W/ BACKLIGHT)

TYPE	DIM.	A	B
WITH BACKLIGHT		13.8	9.4
NO BACKLIGHT		9.7	4.8

PART NUMBER		REV.
LCM-X160160GXX		A
REV.	E.C.N. NUMBER AND REVISION COMMENTS	DATE
A	E.C.N. #10738. & #10BRDR.	5.21.01



**CAUTION: STATIC SENSITIVE DEVICE**  
 FOLLOW PROPER E.S.D. HANDLING PROCEDURES  
 WHEN WORKING WITH THIS PART.

# UNCONTROLLED DOCUMENT

\*UNLESS OTHERWISE SPECIFIED TOLERANCES PER DECIMAL PRECISION ARE: X=±1 (±0.038), X.X=±0.5 (±0.020), X.XX=±0.25 (±0.010), X.XXX=±0.127 (±0.005). LEAD SIZE=±0.05 (±0.002), LEAD LENGTH=±0.75 (±0.030). MIN.= +DECIMAL PRECISION MAX.= +0.00 -DECIMAL PRECISION

REV.	PART NUMBER
A	LCM-X160160GXX
160 x 160 DOT MATRIX GRAPHIC MODULE, 1/160 DUTY, STN WITH NEGATIVE CHARGE PUMP.	

**CONFIDENTIAL INFORMATION**  
 THE INFORMATION CONTAINED IN THIS DOCUMENT IS THE PROPERTY OF LUMEX INC. EXCEPT AS SPECIFICALLY AUTHORIZED IN WRITING BY LUMEX INC., THE HOLDER OF THIS DOCUMENT SHALL KEEP ALL INFORMATION CONTAINED HEREIN CONFIDENTIAL AND SHALL PROTECT SAME IN WHOLE OR IN PART FROM DISCLOSURE AND DISSEMINATION TO ALL THIRD PARTIES.

**RELIABILITY NOTE**  
 OUR MANY YEARS OF EXPERIENCE DATA ACCUMULATION INDICATE THAT SOLDER HEAT IS A MAJOR CAUSE OF EARLY AND FUTURE FAILURE. PLEASE PAY ATTENTION TO YOUR SOLDERING PROCESS.

		290 E. HELEN ROAD PALATINE, IL 60067-6976 PHONE: +1.847.359.2790 US WEB: www.lumex.com TW WEB: www.lumex.com.tw	
DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE: 12.1.98
SA/CT			PAGE: 1 OF 2
			SCALE: N/A

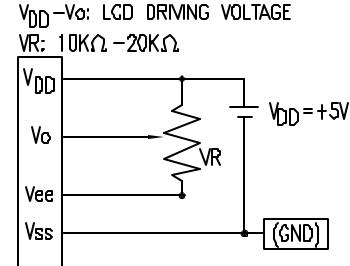
PART NUMBER		REV.
LCM-X160160GXX		A
REV.	E.C.N. NUMBER AND REVISION COMMENTS	DATE
A	E.C.N. #10738. & #10BRDR.	5.21.01

**A** PIN CONFIGURATION

PIN NO.	SYMBOL	LEVEL	FUNCTION
1	V <sub>SS</sub>	0V	GND
2	V <sub>DD</sub>	5V	SUPPLY VOLTAGE FOR LOGIC
3	V <sub>O</sub>	-	CONTRAST VOLTAGE FOR LCD DRIVE(VARIABLE)
4	R <sub>D</sub>	L	READ SIGNAL
5	W <sub>R</sub>	L	WRITE SIGNAL
6	S <sub>S</sub>	L	CHIP SELECT
7	AD	H/L	DATA TYPE SELECT
8~15	DB0~DB7	H/L	DATA BUS
16	RES	L	RESET SIGNAL (NOTE 1)
17	VEE	-	POWER SUPPLY VOLTAGE FOR LCD
18	A	4.2V	ANODE LED BACKLIGHT
19	K	-	CATHODE LED BACKLIGHT
20	(N/C)	-	NO CONNECTION

NOTES:

- RES IS A SCHMITT TRIGGER INPUT. THE PULSEWIDTH ON RES MUST BE AT LEAST 200μs. PULSES OF MORE THAN A FEW SECONDS WILL CAUSE DC VOLTAGES TO BE APPLIED TO THE LCD PANEL.



ELECTRICAL CHARACTERISTICS

V<sub>DD</sub>=4.75V to 5.25V, T<sub>A</sub>=25°C

ITEM	SYMBOL	CONDITION	STANDARD VALUE			UNIT	
			MIN.	TYP.	MAX.		
SUPPLY VOLTAGE FOR LOGIC	V <sub>DD</sub> -V <sub>SS</sub>	-	4.75	5.0	5.25	V	
SUPPLY VOLTAGE FOR LCD DRIVE	V <sub>DD</sub> -V <sub>EE</sub>	-	-	18.2	-	V	
SUPPLY CURRENT FOR LOGIC	I <sub>DD</sub>	-	-	-	20	mA	
INPUT VOLTAGE	HIGH	V <sub>IH</sub>	0.2	-	V <sub>DD</sub>	V	
	LOW	V <sub>IL</sub>	0	-	0.8	V	
OUTPUT VOLTAGE	HIGH	V <sub>OH</sub>	I <sub>OH</sub> =-3.0mA	2.4	-	V	
	LOW	V <sub>OL</sub>	I <sub>OL</sub> =3.0mA	-	-	0.4	V
*LED BACKLIGHT	VOLTAGE	V <sub>f</sub>	I <sub>f</sub> =560mA	-	4.2	4.5	V
	CURRENT	I <sub>f</sub>	-	-	560	-	mA
	POWER CONSUMPTION	P <sub>D</sub>	-	-	2.8	-	W
	LUMINOUS	L	I <sub>f</sub> =560mA	60	-	-	cd/m <sup>2</sup>
	COLOR	-	-	-	570	-	nm

\*ONLY APPLIES TO MODULES WITH BACKLIGHT

ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	TEST CONDITION	STANDARD VALUE		UNIT
			MIN	MAX	
SUPPLY VOLTAGE FOR LOGIC	V <sub>DD</sub> -V <sub>SS</sub>	T <sub>a</sub> =25°C	0	7.0	V
SUPPLY VOLTAGE FOR LCD DRIVE	V <sub>DD</sub> -V <sub>EE</sub>	-	17.2@40°C	19.2@0°C	V
INPUT VOLTAGE	V <sub>I</sub>	T <sub>a</sub> =25°C	V <sub>SS</sub>	V <sub>DD</sub>	V
OPERATING TEMPERATURE	T <sub>opr</sub>	LCM-S	0	50	°C
		LCM-H	-20	70	°C
STORAGE TEMPERATURE	T <sub>stg</sub>	LCM-S	-20	70	°C
		LCM-H	-30	85	°C

\*UNLESS OTHERWISE SPECIFIED TOLERANCES PER DECIMAL PRECISION ARE: X=±1 (±0.039), XX=±0.5 (±0.020), XXX=±0.25 (±0.010), XXXX=±0.127 (±0.005). LEAD SIZE=±0.05 (±0.002), LEAD LENGTH=±0.75 (±0.030). MIN= +DECIMAL PRECISION -0.00 MAX= +0.00 -DECIMAL PRECISION

REV.	PART NUMBER
A	LCM-X160160GXX
160 x 160 DOT MATRIX GRAPHIC MODULE, 1/160 DUTY, STN WITH NEGATIVE CHARGE PUMP.	

**CONFIDENTIAL INFORMATION**  
 THE INFORMATION CONTAINED IN THIS DOCUMENT IS THE PROPERTY OF LUMEX INC. EXCEPT AS SPECIFICALLY AUTHORIZED IN WRITING BY LUMEX INC., THE HOLDER OF THIS DOCUMENT SHALL KEEP ALL INFORMATION CONTAINED HEREIN CONFIDENTIAL AND SHALL PROTECT SAME IN WHOLE OR IN PART FROM DISCLOSURE AND DISSEMINATION TO ALL THIRD PARTIES.

**RELIABILITY NOTE**  
 OUR MANY YEARS OF EXPERIENCE DATA ACCUMULATION INDICATE THAT SOLDER HEAT IS A MAJOR CAUSE OF EARLY AND FUTURE FAILURE. PLEASE PAY ATTENTION TO YOUR SOLDERING PROCESS.



290 E. HELEN ROAD  
 PALATINE, IL 60067-6976  
 PHONE: +1.847.359.2790  
 US WEB: www.lumex.com  
 TW WEB: www.lumex.com.tw

DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
SA/CT			12.1.98
			PAGE: 2 OF 2
			SCALE: N/A