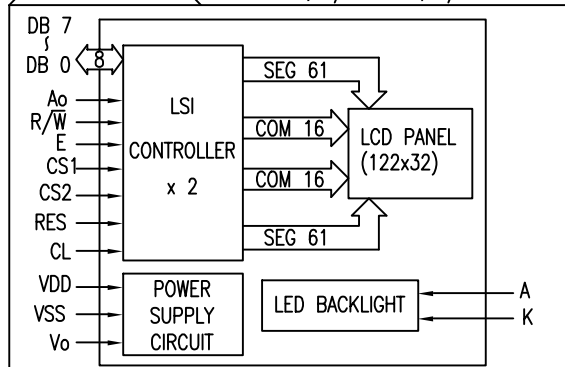


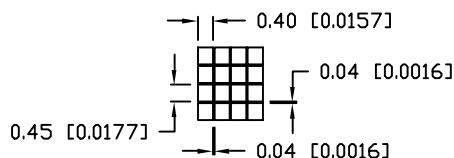
# UNCONTROLLED DOCUMENT

A B

BLOCK DIAGRAM 122 x 32, 1/16 DUTY, 1/5 BIAS



PIXEL DETAIL



PART NUMBER

LCM-X12232GXX

REV.

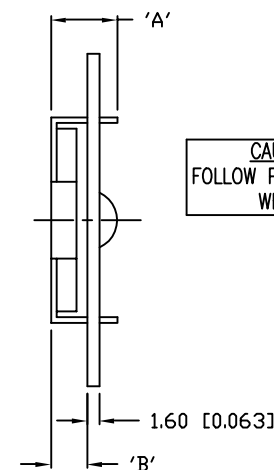
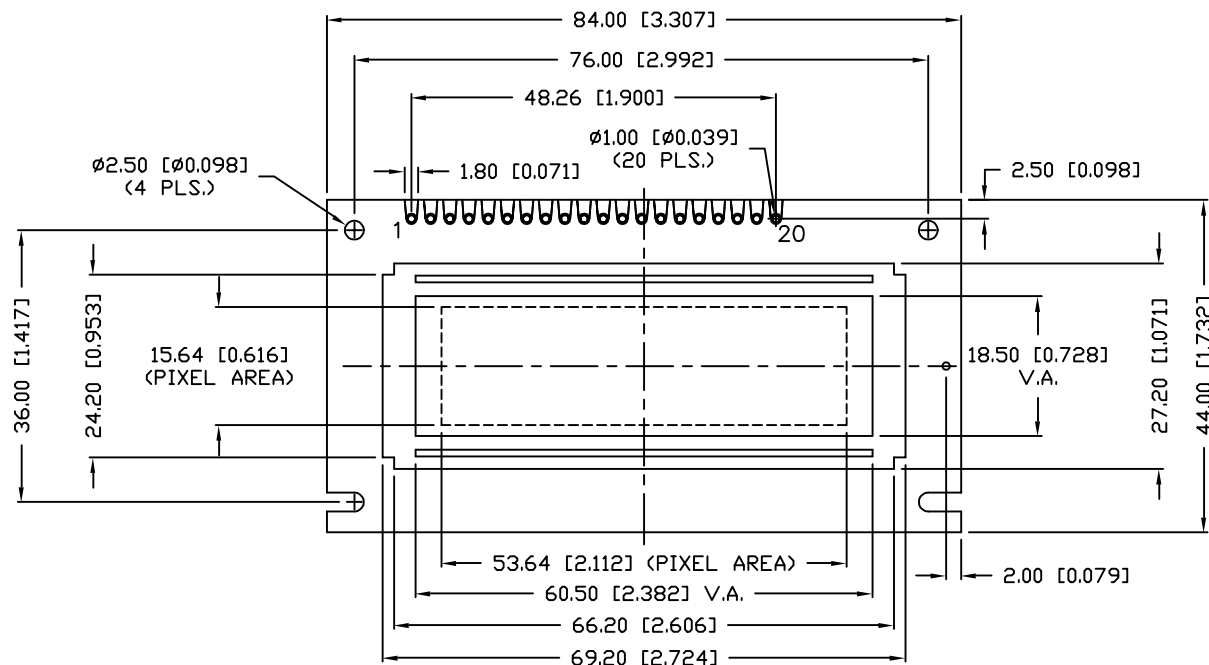
B

REV.	E.C.N. NUMBER AND REVISION COMMENTS	DATE
A	E.C.N. #10433./	6-8-98
B	E.C.N. #10BRDR. & REDRAWN.	10-2-98

P/N PREFIX/SUFFIX TABLE

LCM-X	DX	DESCRIPTION
STANDARD	S	STN, REFLECTIVE
HIGH TEMP.	H	STN, TRANSLUCTIVE(W/ BACKLIGHT)

TYPE	DIM.	A	B
WITH BACKLIGHT	12.7	8.7	
NO BACKLIGHT	8.8	4.8	



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

# UNCONTROLLED DOCUMENT

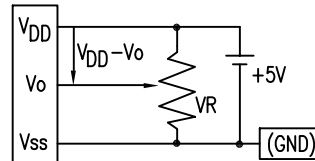
\*UNLESS OTHERWISE SPECIFIED TOLERANCE IS  $\pm 0.25\text{mm}$  ( $\pm 0.010"$ )

REV.	PART NUMBER	CONFIDENTIAL INFORMATION	LUMEX INCORPORATED	290 E. HELLEN ROAD PALATINE, ILLINOIS 60067 PHONE: 1-847-359-2790 WEB: HTTP://WWW.LUMEX.COM
B	LCM-X12232GXX	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.	SA/BC
122 x 32 DOT MATRIX GRAPHIC MODULE, 1/16 DUTY, 1/5 BIAS.		DRAWN BY: CHECKED BY: APPROVED BY: DATE: 4-6-98 PAGE: 1 OF 2 SCALE: N/A		

PIN CONFIGURATION			FUNCTION	
PIN NO.	SYMBOL	LEVEL		
1	V <sub>SS</sub>	-	POWER SUPPLY	GND (0V)
2	V <sub>DD</sub>	-		5V
3	V <sub>O</sub>	-		FOR LCD DRIVE
4	A <sub>O</sub>	H/L	REGISTER SELECT SIGNAL H: DATA INPUT L: INSTRUCTION INPUT	
5	CS1	H,H->L	CHIP SELECT SIGNAL FOR IC1	
6	CS2	H,H->L	CHIP SELECT SIGNAL FOR IC2	
7	CL	H/L	CLOCK INPUT (2kHz)	
8	E	H/L	ENABLE SIGNAL (NO PULL-UP RESISTOR)	
9	R/W	H/L	H: DATA READ (MODULE-->MPU) L: DATA WRITE (MODULE<-->MPU)	
10~17	DB0~DB7	H/L	DATA BIT 0-7	
18	RST	L	RESET SIGNAL	
19	A	-	ANODE	LED BACKLIGHT
20	K	-	CATHODE	LED BACKLIGHT

V<sub>DD</sub>-V<sub>O</sub>: LCD DRIVING VOLTAGE

VR: 10KΩ-20KΩ



READ/WRITE TIMING FOR 68 PORT MPU

PARAMETER	SIGNAL	SYMBOL	MIN	MAX	UNIT
ADDRESS HOLD TIME	CS	t <sub>AH6</sub>	10	-	ns
ADDRESS SETUP TIME	R/W	t <sub>AS6</sub>	20	-	ns
SYSTEM CYCLE TIME	A <sub>O</sub>	t <sub>CYC6</sub>	1000	-	ns
DATA SETUP TIME	DO~D7	t <sub>DS6</sub>	80	-	ns
DATA HOLD TIME		t <sub>DH6</sub>	10	-	ns
OUTPUT DISABLE TIME		t <sub>OH6</sub>	10	60	ns
ACCESS TIME		t <sub>ACC6</sub>	-	90	ns
ENABLE PULSE WIDTH	(READ)	t <sub>EW</sub>	100	-	ns
	(WRITE)		80	-	ns

ELECTRICAL CHARACTERISTICS

V<sub>DD</sub>=4.5V to 5.5V, 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>	-	-	5.0	-	V
SUPPLY CURRENT FOR LOGIC	I <sub>DD</sub>	V <sub>DD</sub> =5V	-	-	3.0	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> =-3mA	2.4	-	V
	LOW	V <sub>OL</sub>	I <sub>OL</sub> =3mA	-	0.4	V
*LED BACKLIGHT	VOLTAGE	V <sub>f</sub>	-	4.2	4.6	V
	CURRENT	I <sub>f</sub>	-	170	330	mA
	POWER CONSUMPTION	PD	-	710	-	mW
	LUMINOUS	L	I <sub>f</sub> =170mA	70	-	cd/m <sup>2</sup>
	COLOR	-	-	-	-	nm

\*ONLY APPLIES TO MODULES WITH BACKLIGHT

Ⓐ \*\*APPLIED TO TERMINALS DB0~DB7

\*\*\*APPLIED TO TERMINALS E, A<sub>O</sub>, DB0~DB7

ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	TEST CONDITION	STANDARD VALUE		UNIT
SUPPLY VOLTAGE FOR LOGIC	V <sub>DD</sub> -V <sub>SS</sub>	T <sub>a</sub> =25°C	4.75	5.25	V
SUPPLY VOLTAGE FOR LCD DRIVE	V <sub>DD</sub> -V <sub>O</sub>	-	4.8@50°C	5.2@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

REV.

B

PART NUMBER

LCM-X12232GXX

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## RELIABILITY NOTE

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122 x 32 DOT MATRIX GRAPHIC MODULE,  
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DRAWN BY: CHECKED BY: APPROVED BY: DATE: 4-6-98

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PAGE: 2 OF 2

SCALE: N/A

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