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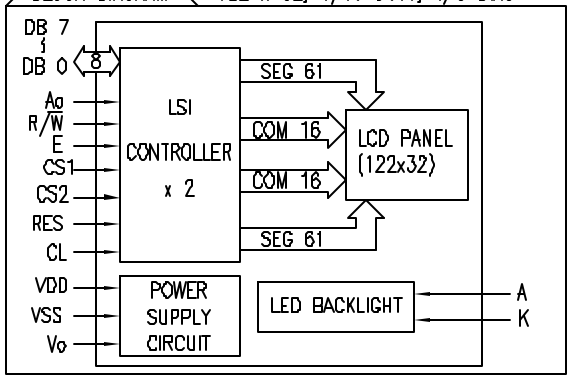
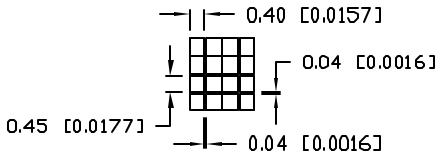
PART NUMBER	REV.
LCM-X12232GXX/C	

REV.	E.C.N. NUMBER AND REVISION COMMENTS	DATE

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

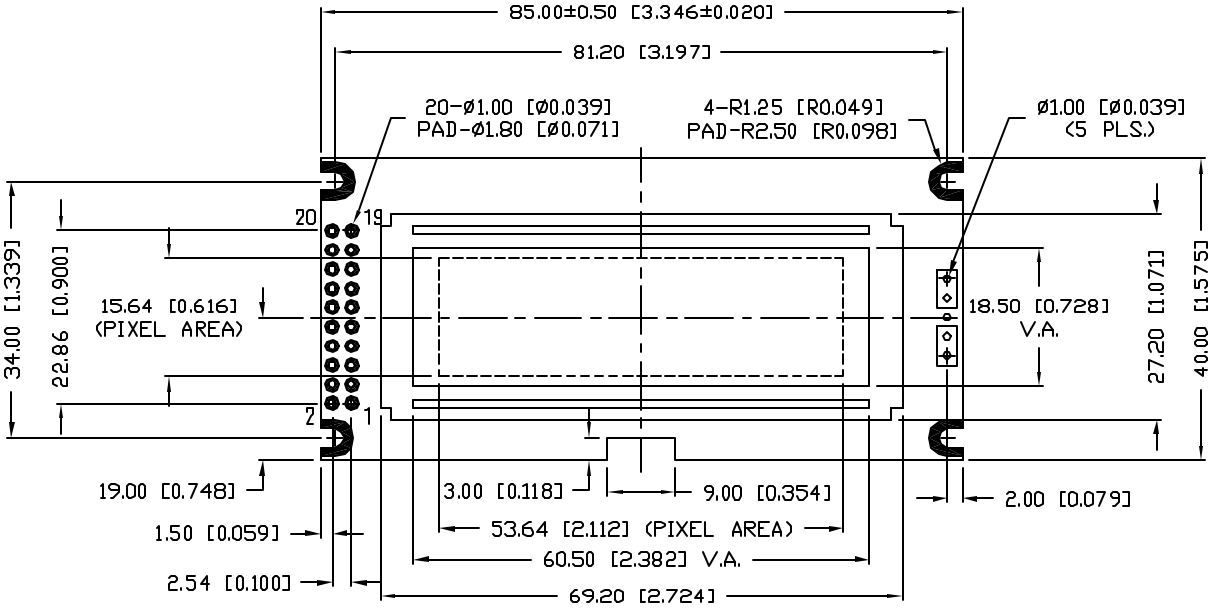


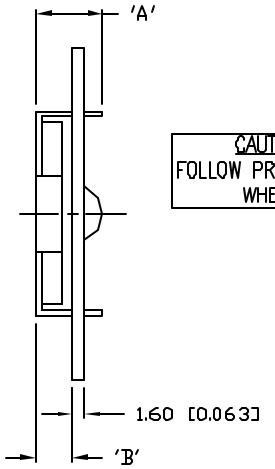
PIXEL DETAIL



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

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*UNLESS OTHERWISE SPECIFIED TOLERANCE IS ±0.25mm (±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
	LCM-X12232GXX/C	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.		
122 x 32 DOT MATRIX GRAPHIC MODULE, 1/16 DUTY, 1/5 BIAS.		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.	DRAWN BY: SA/BC	CHECKED BY: / APPROVED BY: / DATE: 12-9-98 / PAGE: 1 OF 2 / SCALE: N/A

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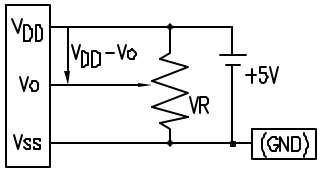
LCM-X12232GXX/C	

REV.	E.C.N. NUMBER AND REVISION COMMENTS	DATE

PIN CONFIGURATION

PIN NO.	SYMBOL	LEVEL	FUNCTION	
1	Vss	-	POWER SUPPLY	GND (0V)
2	V_{DD}	-		5V
3	Vo	-		FOR LCD DRIVE
4	A0	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 SIGANL 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_{DD}-Vo: LCD DRIVING VOLTAGE
VR: 10KΩ -20KΩ



READ/WRITE TIMING FOR 68 PORT MPU

PARAMETER		SIGNAL	SYMBOL	MIN	MAX	UNIT
ADDRESS HOLD TIME		CS R/W A0	t_{AH6}	10	-	ns
ADDRESS SETUP TIME			t_{AS6}	20	-	ns
SYSTEM CYCLE TIME			t_{CYC6}	1000	-	ns
DATA SETUP TIME		DO~D7	t_{DS6}	80	-	ns
DATA HOLD TIME			t_{DH6}	10	-	ns
OUTPUT DISABLE TIME			t_{OH6}	10	60	ns
ACCESS TIME			t_{ACC6}	-	90	ns
ENABLE PULSE WIDTH	(READ)	E	t_{EW}	100	-	ns
	(WRITE)			80	-	ns

ELECTRICAL CHARACTERISTICS

V_{DD}=4.5V to 5.5V, T_A=25°C

ITEM		SYMBOL	CONDITION	STANDARD VALUE			UNIT
				MIN.	TYP.	MAX.	
SUPPLY VOLTAGE FOR LOGIC		V_{DD}-Vss	-	-	5.0	-	V
SUPPLY CURRENT FOR LOGIC		I_{DD}	V_{DD}=5V	-	-	3.0	mA
INPUT VOLTAGE**	HIGH	V_{IH}	-	0.2	-	V_{DD}	V
	LOW	V_{IL}	-	0	-	0.8	V
OUTPUT VOLTAGE***	HIGH	V_{OH}	I_{OH}=-3mA	2.4	-	-	V
	LOW	V_{OL}	I_{OL}=3mA	-	-	0.4	V
*LED BACKLIGHT	VOLTAGE	Vf	-	-	4.2	4.6	V
	CURRENT	If	-	-	170	330	mA
	POWER CUNSUMPTION	PD	-	-	710	-	mW
	LUMINOUS	L	If=170mA	70	-	-	cd/m²
	COLOR	-	-	-	-	-	nm

*ONLY APPLIES TO MODULES WITH BACKLIGHT
**APPLIED TO TERMINALS DB0~DB7
***APPLIED TO TERMINALS E, A0, DB0~DB7

ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	TEST CONDITION	STANDARD VALUE		UNIT
			MIN	MAX	
SUPPLY VOLTAGE FOR LOGIC	V_{DD}-Vss	Ta=25°C	4.75	5.25	V
SUPPLY VOLTAGE FOR LCD DRIVE	V_{DD}-Vo	-	4.8@50°C	5.2@0°C	V
INPUT VOLTAGE	V_I	Ta=25°C	Vss	V_{DD}	V
OPERATING TEMPERATURE	Topr	LCM-S	0	50	°C
		LCM-H	-20	70	°C
STORAGE TEMPERATURE	Tstg	LCM-S	-20	70	°C
		LCM-H	-30	85	°C

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122 x 32 DOT MATRIX CHAPHIC MODULE,
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