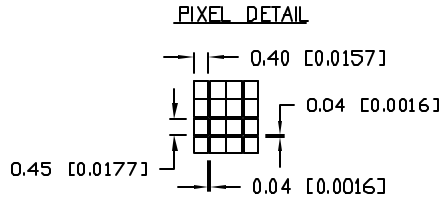
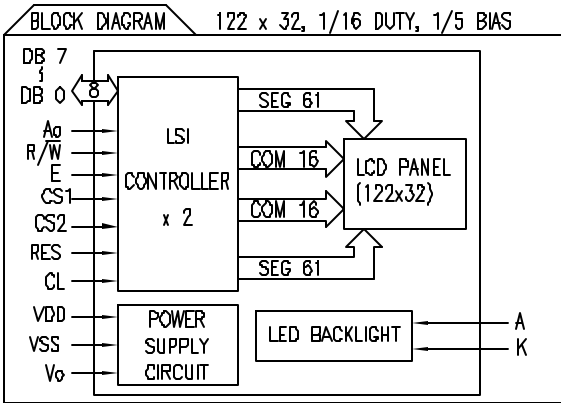


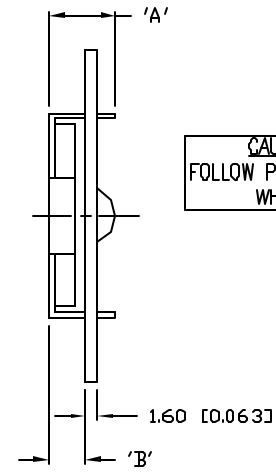
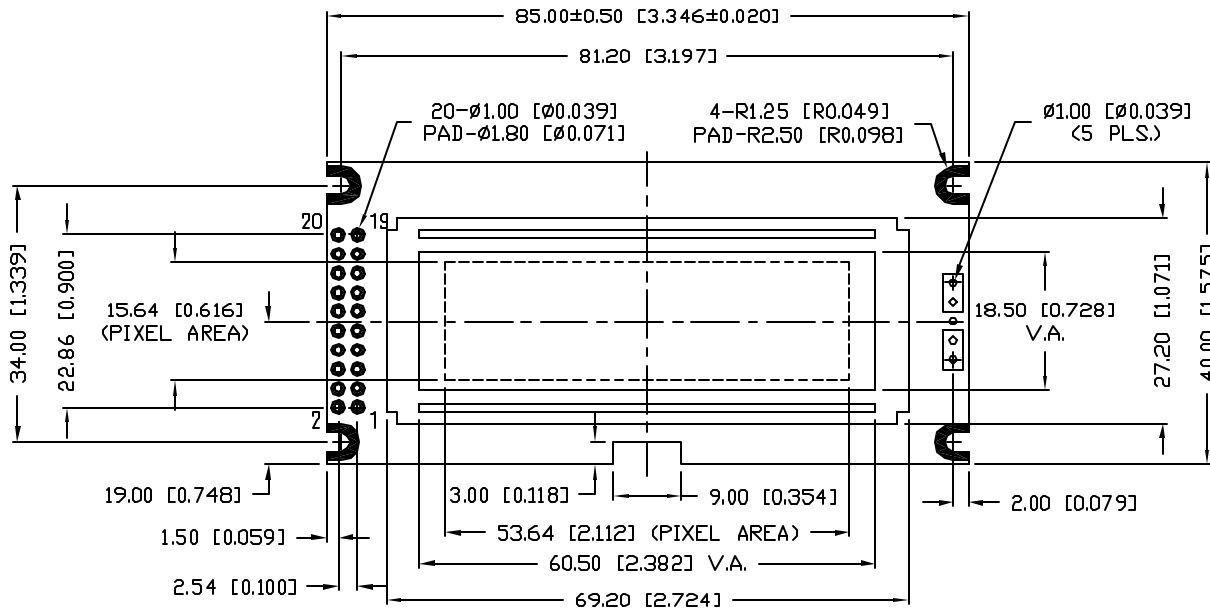
PART NUMBER		REV.
LCM-X12232GXX/C		
REV.	E.C.N. NUMBER AND REVISION COMMENTS	DATE



**P/N PREFIX/SUFFIX TABLE**

LCM-X	DXX	DESCRIPTION
STANDARD	S	SR STN, REFLECTIVE
HIGH TEMP.	H	SF STN, TRANFLECTIVE(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.

REV.	PART NUMBER
	LCM-X12232GXX/C
122 x 32 DOT MATRIX GRAPHIC MODULE, 1/16 DUTY, 1/5 BIAS.	

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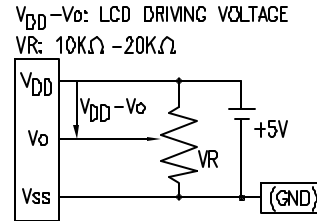
**RELIABILITY NOTE**  
OUR MANY YEARS OF EXPERIENCE DATA ACCUMULATION INDICATE THAT SOLDER HEAT IS A MAJOR CAUSE OF EARLY AND FUTURE FAILURE. PLEASE PAY ATTENTION TO YOUR SOLDERING PROCESS.

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PART NUMBER		REV.
LCM-X12232GXX/C		
REV.	E.C.N. NUMBER AND REVISION COMMENTS	DATE

PIN CONFIGURATION					
PIN NO.	SYMBOL	LEVEL	FUNCTION		
1	V <sub>SS</sub>	-	POWER SUPPLY	GND (DV)	
2	V <sub>DD</sub>	-		5V	
3	V <sub>O</sub>	-		FOR LCD DRIVE	
4	A <sub>D</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	



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>D</sub>	t <sub>CYC6</sub>	1000	-	ns
DATA SETUP TIME	D0~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)	E	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
			MIN	MAX	
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.	PART NUMBER
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