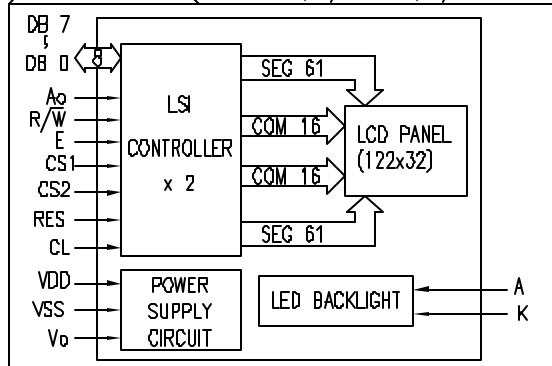
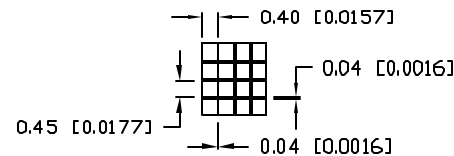


BLOCK DIAGRAM 122 x 32, 1/16 DUTY, 1/5 BIAS



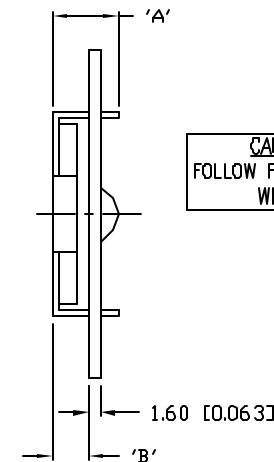
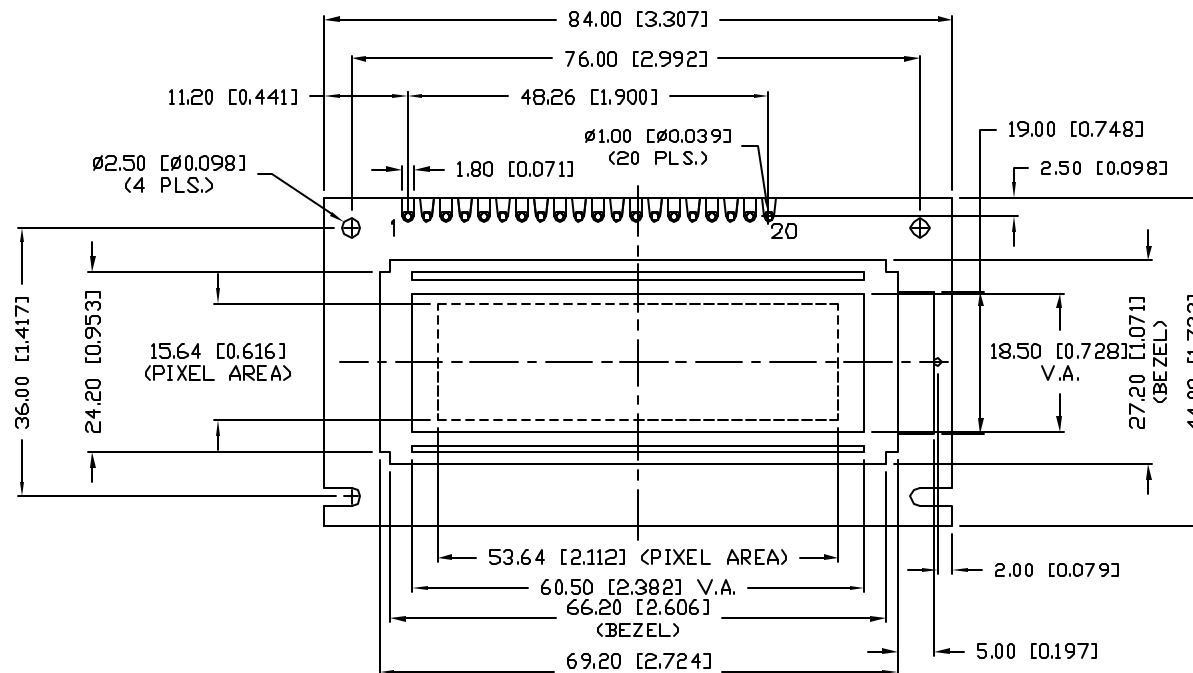
PIXEL DETAIL



P/N PREFIX/SUFFIX TABLE

LCM-X	DX	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.

*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

LCM-S12232GSN-W

122 x 32 DOT MATRIX GRAPHIC MODULE, STN BLUE,
NEGATIVE IMAGE, LOW CURRENT WHITE LED BACKLIGHT,
1/16 DUTY, 1/5 BIAS.

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: 9.24.03

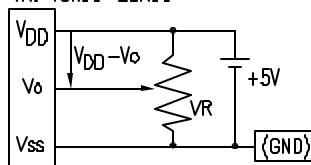
PAGE: 1 OF 2

SCALE: N/A

CT

PIN CONFIGURATION				
PIN NO.	SYMBOL	LEVEL	FUNCTION	
1	V _{SS}	—	POWER SUPPLY	GND (0V)
2	V _{DD}	—		5V
3	V _O	—		FOR LCD DRIVE
4	A _O	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/ $\overline{W}$	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}-V_O: LCD DRIVING VOLTAGE
VR: 10KΩ~20KΩ



READ/WRITE TIMING FOR 68 PORT MPU

PARAMETER	SIGNAL	SYMBOL	MIN	MAX	UNIT
ADDRESS HOLD TIME	CS	t _{AH6}	10	-	ns
ADDRESS SETUP TIME	R/W	t _{AS6}	20	-	ns
SYSTEM CYCLE TIME	A _O	t _{CYC6}	1000	-	ns
DATA SETUP TIME	D0~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} -V _{SS}	-	-	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	V _f	I _f =20mA	3.3	3.4	3.5	V
	CURRENT	I _f	-	10	20	25	mA
	POWER CONSUMPTION	P _D	-	-	53	-	mW
	LUMINOUS	L	I _f =20mA	70	-	-	cd/m ²
	COLOR	-	WHITE	-	-	-	nm

*ONLY APPLIES TO MODULES WITH BACKLIGHT

**APPLIED TO TERMINALS DB0~DB7

***APPLIED TO TERMINALS E, A_O, DB0~DB7

ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	TEST CONDITION	STANDARD VALUE		UNIT
			MIN	MAX	
SUPPLY VOLTAGE FOR LOGIC	V _{DD} -V _{SS}	T _a =25°C	4.75	5.25	V
SUPPLY VOLTAGE FOR LCD DRIVE	V _{DD} -V _O	-	4.8@50°C	5.2@0°C	V
INPUT VOLTAGE	V _I	T _a =25°C	V _{SS}	V _{DD}	V
OPERATING TEMPERATURE	T _{opr}	LCM-S	0	50	°C
		LCM-H	-20	70	°C
STORAGE TEMPERATURE	T _{stg}	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

LCM-S12232GSN-W

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: 9.24.03

PAGE: 2 OF 2

SCALE: N/A

122 x 32 DOT MATRIX GRAPHIC MODULE, STN BLUE,
NEGATIVE IMAGE, LOW CURRENT WHITE LED BACKLIGHT,
1/16 DUTY, 1/5 BIAS.

CT