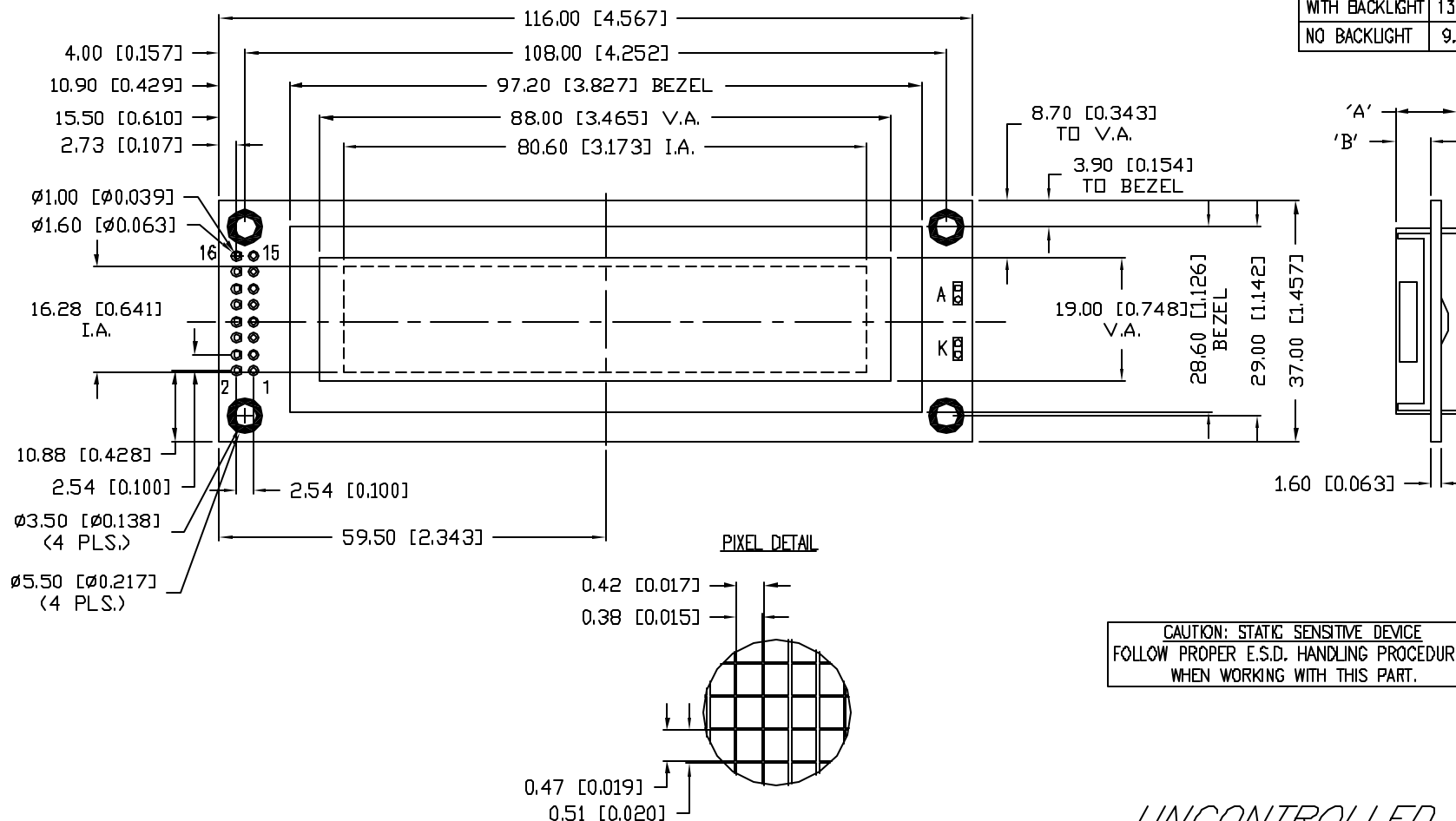


P/N PREFIX/SUFFIX TABLE		
LCM-X	DX	DESCRIPTION
STANDARD	SR	STN, REFLECTIVE
	SF	STN, TRANSFLECTIVE(W/ BACKLIGHT)
HIGH TEMP.	TR	TN, REFLECTIVE
	TF	TN, TRANSFLECTIVE(W/ BACKLIGHT)

TYPE	DIM.	A	B
WITH BACKLIGHT	13.4	9.4	
NO BACKLIGHT	9.5	5.4	



*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-X19232GXX/C

192 x 32 GRAPHIC LCD MODULE, 1/32 DUTY,
CONTROLLER: ST7920

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:

JC

CHECKED BY:

APPROVED BY:

DATE: 10.30.06

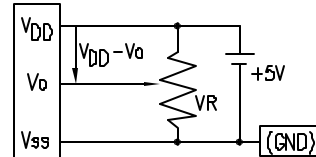
PAGE: 1 OF 3

SCALE: N/A

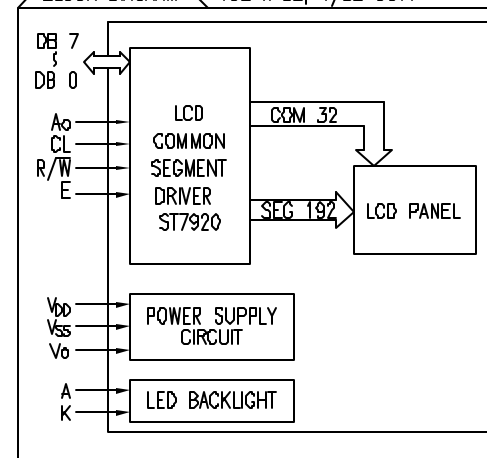
PIN CONFIGURATION

PIN NO.	SYMBOL	LEVEL	FUNCTION
1	V _{SS}	—	POWER SUPPLY GND (0V) 5V FOR LCD DRIVE
2	V _{DD}	—	
3	V _a	—	
4	RS	H/L	REGISTER SELECT SIGNAL H: DATA INPUT L: INSTRUCTION INPUT
5	R/W	H/L	H: DATA READ (MODULE→MPU) L: DATA WRITE (MODULE←MPU)
6	E	H,H→L	ENABLE
7~14	DB0~DB7	H/L	DATA BUS—SOFTWARE SELECTABLE 4 OR 8 BIT MODE.
15	A	—	ANODE
16	K	—	CATHODE

V_{DD}-V_a: LCD DRIVING VOLTAGE
VR: 10KΩ-20KΩ



BLOCK DIAGRAM 192 x 32, 1/32 DUTY



ELECTRICAL CHARACTERISTICS

V_{DD}=4.7V to 5.3V, T_A=25°C

ITEM		SYMBOL	CONDITION	STANDARD VALUE			UNIT
				MIN.	TYP.	MAX.	
SUPPLY VOLTAGE FOR LOGIC		$V_{DD}-V_{SS}$	—	4.5	5.0	5.5	V
SUPPLY VOLTAGE FOR LCD DRIVE		$V_{DD}-V_o$	$V_{DD}=5V$	4.4	4.8	5.2	V
SUPPLY CURRENT FOR LOGIC		I_{DD}	$V_{DD}=5V$	—	1.2	2.0	mA
INPUT VOLTAGE	HIGH	V_{IH}	—	2.2	—	4.7	V
	LOW	V_{IL}	—	0	—	0.6	V
OUTPUT VOLTAGE	HIGH	V_{OH}	—	2.4	—	—	V
	LOW	V_{OL}	—	—	—	0.4	V
*LED BACKLIGHT	VOLTAGE	V_f	—	—	4.2	4.5	V
	CURRENT	I_f	—	—	20	—	mA
	POWER CONSUMPTION	P_D	—	—	84	—	mW
	LUMINOUS	L	—	70	—	—	cd/m ²
	COLOR	—	—	—	—	—	nm

*ONLY APPLIES TO MODULES WITH BACKLIGHT

ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	TEST CONDITION	STANDARD VALUE		UNIT
			MIN	MAX	
SUPPLY VOLTAGE FOR LOGIC	V _{DD} -V _{SS}	T _a =25°C	0	8	V
SUPPLY VOLTAGE FOR LCD DRIVE	V _{DD} -V _a	—	0	7	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 MAX.= +0.00 -0.00 -DECIMAL PRECISION

REV.

PART NUMBER

LCM-X19232GXX/C

192 x 32 GRAPHIC LCD MODULE, 1/32 DUTY,
CONTROLLER: ST7920

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:

JC

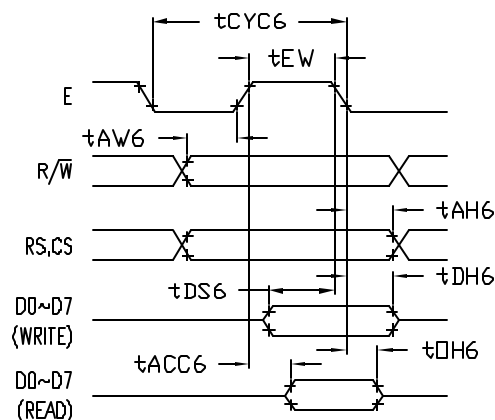
DATE: 10/26/06

PAGE: 2 OF 3

SCALE: N/A

TIMING CHARACTERISTICS

PARAMETER	SYMBOL	MIN	MAX	UNIT
SYSTEM CYCLE TIME	t_{CYC6}	1200	—	ns
ADDRESS SETUP TIME	t_{AW6}	10	—	ns
ADDRESS HOLD TIME	t_{AH6}	20	—	ns
DATA SETUP TIME	t_{DS6}	40	—	ns
DATA HOLD TIME	t_{DH6}	20	—	ns
OUTPUT DISABLE TIME	t_{OH6}	10	60	ns
ACCESS TIME	t_{ACC6}	—	90	ns
ENABLE PULSE WIDTH	(READ)	t_{EW}	140	ns
	(WRITE)	t_{EW}	140	ns



*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 MAX.= +0.00
-0.00 -DECIMAL PRECISION

REV.

PART NUMBER

LCM-X19232GXX/C

192 x 32 GRAPHIC LCD MODULE, 1/32 DUTY,
CONTROLLER: ST7920

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:

JC

CHECKED BY:

APPROVED BY:

DATE: 10.26.06

PAGE: 3 OF 3

SCALE: N/A