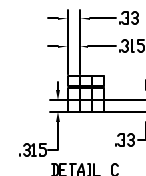
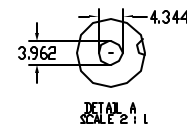
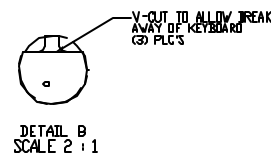
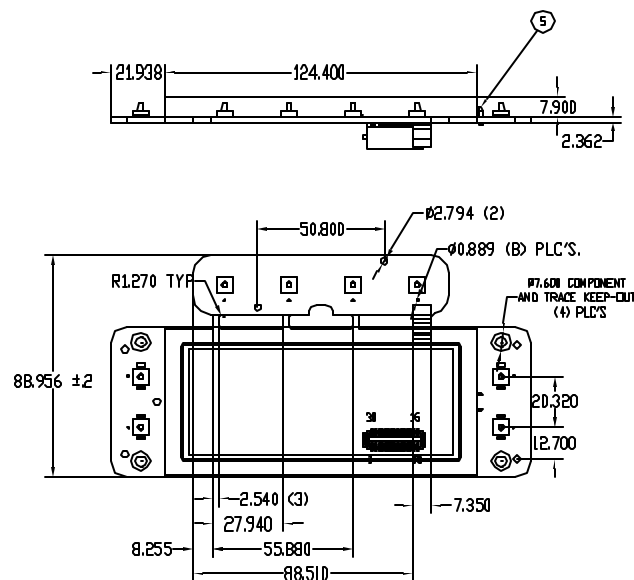
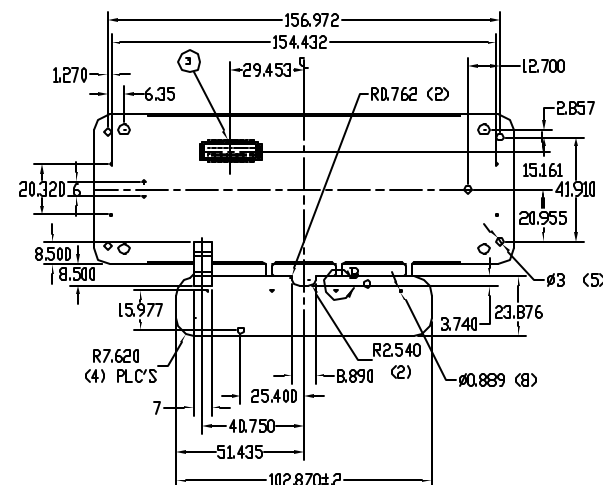
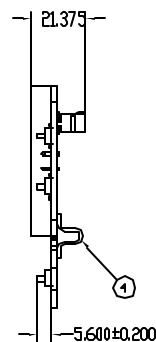
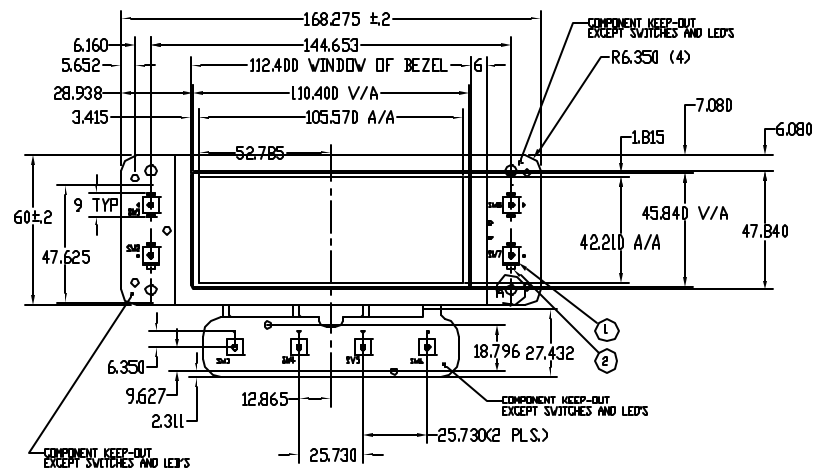


UNCONTROLLED DOCUMENT



5	HEATER, MINCO P/N H24173 OR WATLOW APPROVED EQV.	1
4	FLEX CONNECTOR, 6 POSITION 32mm LONG	1
3	CONNECTOR, AMP P/N 5-147377-3	1
2	LED, LUNEX SNL-LXD815GC-TR	8
1	TACT SWITCH, JTT P/N KSC52LJ	8
ITEM	DESCRIPTION	QTY

NOTES:

- NOTES:
1. RESOLUTION: 320X128 DOTS. DOT SIZE: 315X315.
DOT PITCH: 33 X 33. SEE DETAIL C
 2. BACKLIGHTED: YELLOW-GREEN
 3. FRAME: SUS304 (SS, 0.5T)
 4. UNIT OF MEASURE: mm

*UNLESS OTHERWISE SPECIFIED TOLERANCE PER DECIMAL PRECISION IS: ± 0.25 (± 0.010)

REV.

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PART NUMBER

LCM-H320128GSF-Y

320x128 GRAPHIC LCD MOD, STN YELLOW, LED BKLT,
TRANSFLECTIVE, -40C TO 85C OPERATING TEMPERATURE,
1/128 DUTY, 1/13 BIAS, VLCD=18.1V, 6:00 VIEW.

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JC

CHECKED BY:

APPROVED BY:

DATE: 10.27.05

PAGE: 1 OF 5

SCALE: N/A

ELECTRICAL CHARACTERISTICS $V_{SS}=0V$, $V_{DD}=LV_{DD}=3.3V - 0.3V$, $T_a=-40^{\circ}C \sim 85^{\circ}C$

ITEM	SYMBOL	TEST CONDITION	STANDARD VALUE			UNIT
			MIN	TYP.	MAX.	
OPERATING VOLTAGE	V_{DD}	-	2.7	3.5	4.5	V
OPERATING VOLTAGE FOR LCD	V_{LCD}	-	-	18.1	-	V
INPUT LEAKAGE CURRENT	I_{iL}	$V_i = V_{DD}$. SEE PAGE 5	-	0.05	2.0	μA
OUTPUT LEAKAGE CURRENT	I_{oL}		-	0.10	5.0	μA
HIGH LEVEL OUTPUT VOLTAGE	V_{OH}	$I_{OH} = -3.0mA$ SEE NOTE 1.	2.4	-	-	V
LOW LEVEL OUTPUT VOLTAGE	V_{OL}	$I_{OH} = 3.0mA$ SEE NOTE 1.	V_{SS}	-	0.2 V_{SS}	V
HIGH LEVEL INPUT VOLTAGE	V_{IH}	LV TTL LVL. $V_{DD} = MAX$	2.0	-	-	V
LOW LEVEL INPUT VOLTAGE	V_{IL}	SEE NOTE 1	-	-	0.8	V
POSITIVE TRIGGER VOLTAGE	V_{T1+}	LV TTL SCHMITT	1.1	-	2.4	V
NEGATIVE TRIGGER VOLTAGE	V_{T1-}	LV TTL SCHMITT	0.6	-	1.8	V
HYSTERESIS VOLTAGE	V_{H1}	LV TTL SCHMITT	0.1	-	-	V
PULLDOWN RESISTANCE	R_{PD}	$V_i = V_{DD}$	20	50	120	KOHM
OPERATING SUPPLY CURRENT	I_{OPR}	$F_{OSC} = 10MHz$ NONLOADED 256x200 DOT	-	TBD	TBD	V
QUIESCENT SUPPLY CURRENT	I_{QH}	SLEEP MODE XCG1, $CS\#, RD\# = V_{DD}$	-	-	35	μA

PIN CONFIGURATION

3D PIN CONNECTOR, AMP PART # 5-147377-3

PIN NO.	SYMBOL	FUNCTION
1	VDD	POWER SUPPLY FOR LOGIC CIRCUIT
2	VSS	GROUND
3	/RD	8080 FAMILY INTERFACE ACTS AS THE ACTIVE-LOW READ STROBE
4	/RW	8080 FAMILY INTERFACE ACTS AS THE ACTIVE-LOW WRITE STROBE
5	A0	8080 FAMILY INTERFACE
6	/RES	RST FUCTION TO SID13700
7	/CS1	CHIP SELECT
8~15	D0~D7	DATA BUS LINE
16	/WAIT	BUSY STATUS FROM SID13700
17	VSS	GROUND
18	VLED	POWER SUPPLY FOR LED BACKLIGHT
19	VSSS	POWER SUPPLY FOR LED BACKLIGHT (GND)
20	VHTR+	POWER SUPPLY (+) FOR HEATER
21	VHTR-	POWER SUPPLY (-) FOR HEATER
22	VLEDKY	POWER SUPPLY FOR LED KEYPAD
23	SW1	SWITCH # 1 INPUT
24	SW2	SWITCH # 2 INPUT
25	SW3	SWITCH # 3 INPUT
26	SW4	SWITCH # 4 INPUT
27	SW5	SWITCH # 5 INPUT
28	SW6	SWITCH # 6 INPUT
29	SW7	SWITCH # 7 INPUT
30	SW8	SWITCH # 8 INPUT

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REV.

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LCM-H320128GSF-Y

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PAGE: 2 OF 5

SCALE: N/A

320x128 GRAPHIC LCD MOD, STN YELLOW, LED BKLT,
TRANSFLECTIVE, -40C TO 85C OPERATING TEMPERATURE,
1/128 DUTY, 1/13 BIAS, V_{LCD}=18.1V, 6:00 VIEW.

ABSOLUTE MAXIMUM LIMIT

ITEM	SYMBOL	TEST CONDITION	UNIT
POWER SUPPLY VOLTAGE	HVDD	-0.3-7.0	V
	LVDD	-0.3-4.0	V
INPUT VOLTAGE	HVIN	-0.3-HVDD+0.5	V
	LVIN	-0.3-LVDD+0.5	V
OUTPUT VOLTAGE	HVOUT	-0.3-HVDD+0.5	V
	LVOUT	-0.3-LVDD+0.5	V
OUTPUT CURRENT PER PIN	IOUT	±30	mA
OPERATING TEMPERATURE	TOPR	-40 - 85	°C
STORAGE TEMPERATURE	TSTG	-40 - 85	°C
SOLDERING TEMP. AND TIME	TOLDER	HEAT RESISTANCE RANK SE2	-

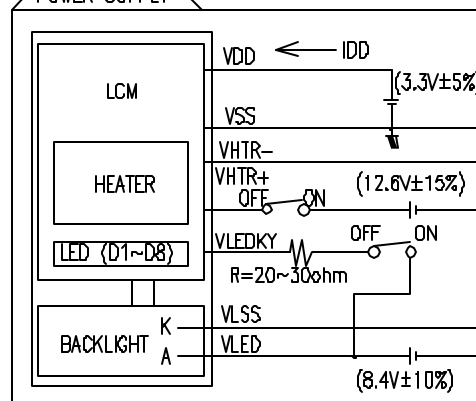
NOTES:

1. WHEN USING A POWER SUPPLY WITH HIGH IMPEDANCE, A LARGE POTENTIAL DIFFERENCE BETWEEN THE CHIP'S INTERNAL POWER SUPPLY VOLTAGE AND THE INPUT VOLTAGE MAY OCCUR, THUS MAKING THE POWER SUPPLY SUSCEPTIBLE TO LATCH-UP. THEREFORE, PAY PARTICULAR ATTENTION TO THE POWER SUPPLY AND ITS WIRING.
2. ALL THE VOLTAGE ARE BASED ON VSS-DV
3. THE SYMBOL H*** INDICATES 5 V-BLOCKS PINS, L*** INDICATES 3.3 V-BLOCKS PINS.

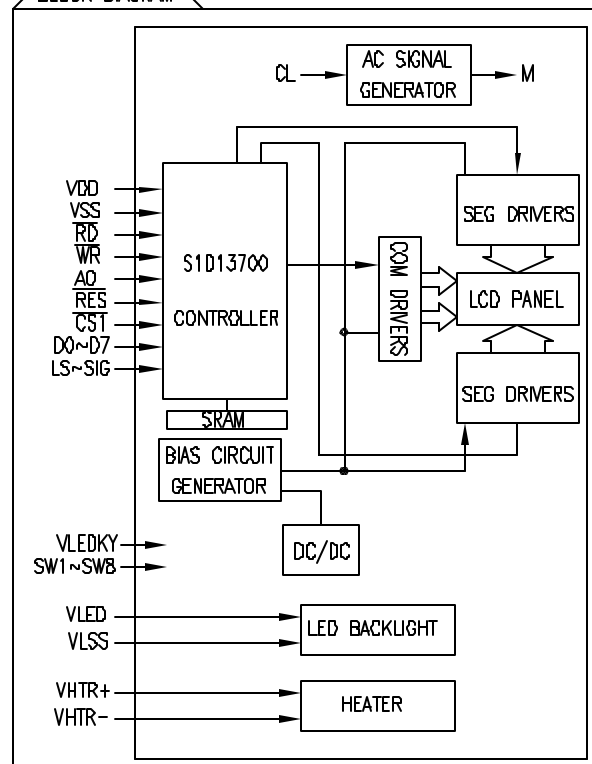
ELECTRICAL CHARACTERISTICS OF BACKLIGHT

ITEM	SYMBOL	CONDITION	STANDARD VALUE			UNIT
			MIN	TYP.	MAX.	
PEAK FORWARD CURRENT	IP	40mA×2	-	-	80.0	mA
MAX. REVERSE VOLTAGE	VR	Ir=10uA×2	-	-	16	V
APPLIED FORWARD CURRENT	If	Vf=8.4V	-	-	16	mA
APPLIED FORWARD VOLTAGE	Vf	-	-	8.4	9.2	V
LED POWER CONSUMPTION	Pf	-	-	-	736	mW
LED LIFE TIME	Lt	If=40x2mA	-	40000	-	hrs
BACKLIGHT BRIGHTNESS LCD Vled=8.4V	ALC ON	-	5	6.6	-	Cd/m2
	ALC OFF	-	-	22.7	34.0	
BACKLIGHT WAVELENGTH	-	-	-	570	-	nm

POWER SUPPLY



BLOCK DIAGRAM



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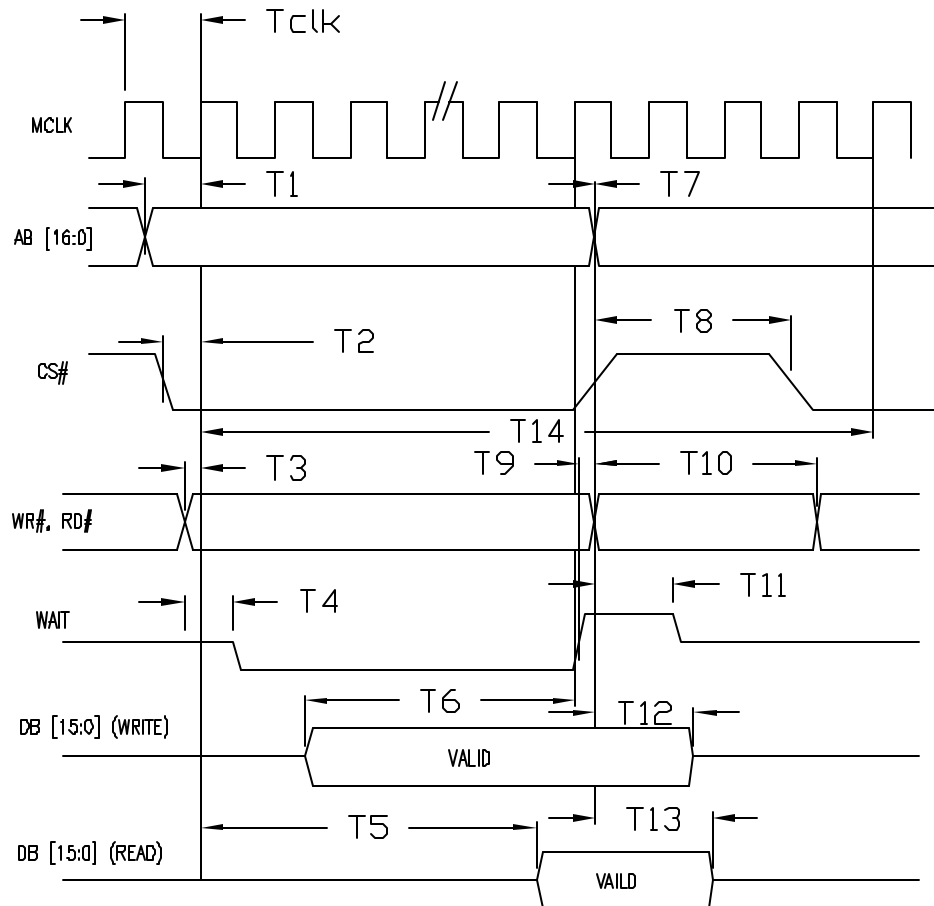
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PAGE: 3 OF 5

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320x128 GRAPHIC LCD MOD, STN YELLOW, LED BKLT,
TRANSFLECTIVE, -40C TO 85C OPERATING TEMPERATURE,
1/128 DUTY, 1/13 BIAS, VLED=18.1V, 6:00 VIEW.

TIMING DIAGRAM (GENERIC BUS/80-SERIES MPU)



AC CHARACTERISTICS

ITEM	SYMBOL	MIN	MAX	UNIT	CONDITION
BUS CLOCK FREQ.	fCLK	-	64	MHz	
ADDRESS SETUP TIME	TCLK	1/fCLK	-	ns	
AB [16:0] SETUP TO FIRST CLK RISE EDGE CS#=0 AND EITHER RD#=0 OR WR#=0	T1	12	-	ns	
CS# SETUP TO CLK RISING EDGE	T2	11	-	ns	
RD#, WR# SETUP CLK RISING EDGE	T3	11	-	ns	
RD#, WR# CHANGE TO WAIT# LOW	T4	1	7	ns	
RD# FALLING EDGE TO DB[15:0]	T5	3Tc+11	-	Tclk	
DB[15:0] SETUP 4TH RISING CLK AFTER CS#=0 AND WR#=0	T6	1	-	Tclk	
AB[16:0], CS# HOLD RD#, WR# RISE	T7	10	-	ns	
CS# DEASSERTED TO REASSERTED					
-WHEN READ	T8	1Tclk	-	ns	
-WHEN WRITE (NEXT CYCLE=WR)		2Tclk+10	-	ns	
-WHEN WRITE (NEXT CYCLE=RD)		5Tclk+10	-	ns	
WAIT# TO RD#, WR#	T9	0	-	ns	
CS# DEASSERTED TO REASSERTED					
-WHEN READ	T10	1Tclk	-	ns	
-WHEN WRITE (NEXT CYCLE=WR)		2Tclk+10	-	ns	
-WHEN WRITE (NEXT CYCLE=RD)		2Tclk+10	-	ns	
RISE EITHER RD# OR WR# TO WAIT# HIGH IMPEDANCE 0.5 Tclk	T11	-	0.5	Tclk	
D[15:0] HOLD FROM WR# (WR CYCLE)	T12	1	-	ns	
D[15:0] HOLD FROM RD# (RD CYCLE)	T13	1	-	ns	
CYCLE LENGTH					
READ	T14	6	-		
WRITE(NEXT WR CYCLE)		7	-	Tclk	
WRITE(NEXT RD CYCLE)		10	-		

1. THE INPUT SIGNAL RISE & FALL TIME (TR, TF) ARE SPECIFIED @ 15ns OR LESS.
2. ALL TIMING IS SPECIFIED USING 20% AND 80% OF VDD AS STANDARD.

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320x128 GRAPHIC LCD MOD, STN YELLOW, LED BKLT,
TRANSFLECTIVE, -40C TO 85C OPERATING TEMPERATURE,
1/128 DUTY, 1/13 BIAS, V_{CC}=18.1V, 6:00 VIEW.

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DATE: 10.28.05

PAGE: 4 OF 5

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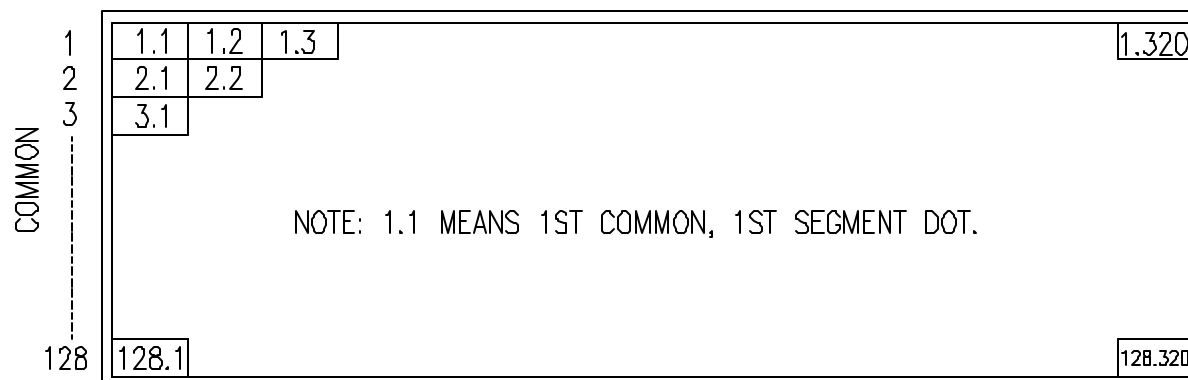
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A SEE PAGE #1

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DISPLAY PATTERN

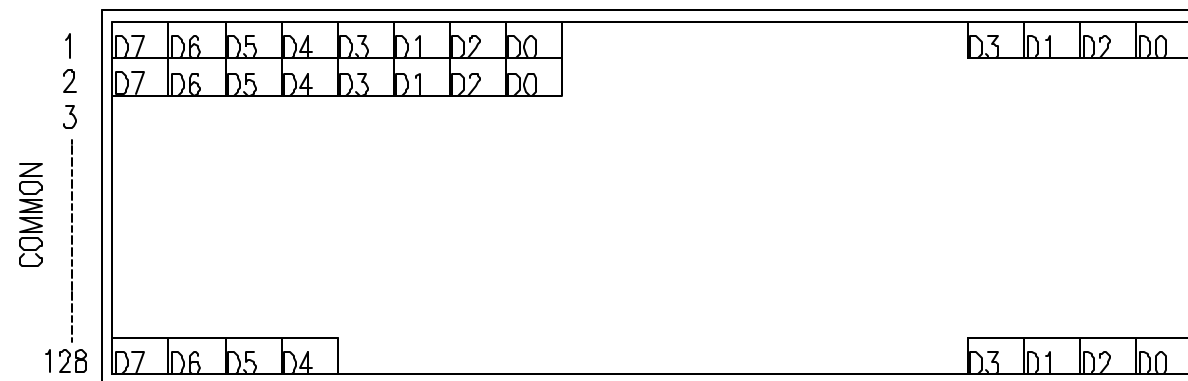
SEGMENT

1 2 3 ----- 320



SEGMENT

1 2 3 4 5 6 7 8 ----- 320



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