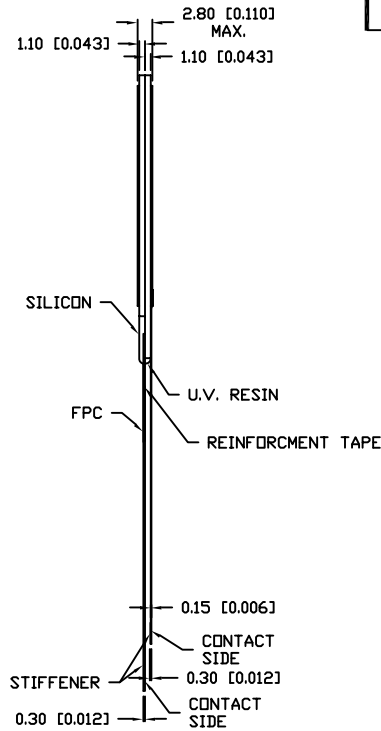
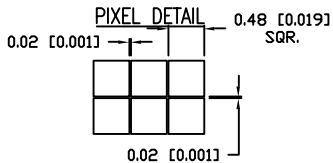
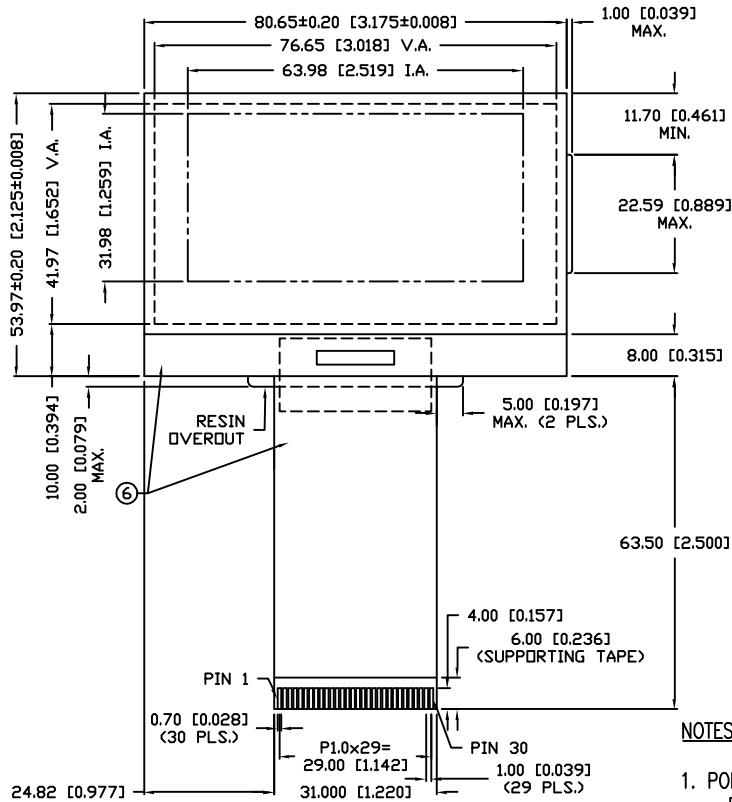


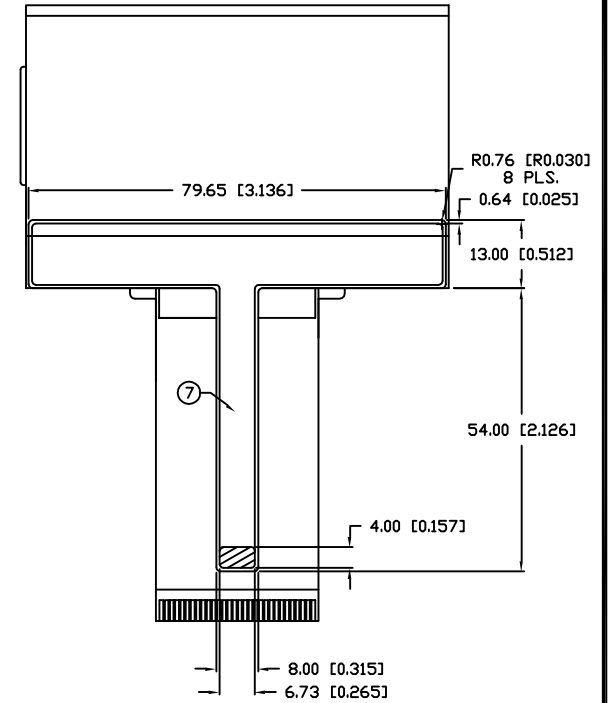
UNCONTROLLED DOCUMENT

PART NUMBER		REV.
LCM-H12864CGWF/C		D
REV.	E.C.N. NUMBER AND REVISION COMMENTS	DATE
A	E.C.N. #10866.	5.20.02
B	E.C.N. #10975.	4.8.03
C	E.C.N. #11020.	7.30.03
D	E.C.N. #11049.	11.4.03

FRONT VIEW



REAR VIEW



NOTES:

1. POLARIZER  
FRONT AND REAR: NITTO DENKO OR SANRITZ
2. IC: S1D15605D01B OR S1D15605D00B.
3. OPERATING TEMPERATURE: -20°C TO +70°C.
4. STORAGE TEMPERATURE: -30°C TO +80°C.
5. DUTY CYCLE: 1/64, 1/7 BIAS.
6. PART IDENTIFICATION: PART NUMBER: 41-136498-001 AND DATE CODE SHALL BE PLACED IN OR ON THE EDGE NEAR THE NON VIEWABLE AREA INDICATED, OR PLACED ON THE TAIL OR PLACED ON A LABEL ON THE TAIL.
7. LXP-H12864-EMI.

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UNCONTROLLED DOCUMENT

REV.	PART NUMBER
D	LCM-H12864CGWF/C

128 x 64 CHIP ON GLASS LCD MODULE, FSTN, TRANSFLECTIVE, -20°C TO +70°C OPERATING TEMP, 6:00 VIEW ANGLE, VLCD = 10V, 1/64 DUTY, 1/7 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.



290 E. HELEN ROAD  
PALATINE, IL 60067-6976  
PHONE: +1.847.359.2790  
US WEB: www.lumex.com  
TW WEB: www.lumex.com.tw

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CT			3.15.02
			PAGE: 1 OF 5
			SCALE: N/A

PART NUMBER		REV.
LCM-H12864CGWF/C		D
REV.	E.C.N. NUMBER AND REVISION COMMENTS	DATE
	SEE PAGE 1.	

PIN CONFIGURATION			
PIN NO.	SYMBOL	LEVEL	FUNCTION
1	IRS	H/L	INTERNAL RESISTOR SELECT INPUT H: USE INTERNAL RESISTORS L: DO NOT USE INTERNAL RESISTORS
2	V <sub>R</sub>	H/L	VOLTAGE REGULATOR OUTPUT
3~7	V <sub>5</sub> ~V <sub>1</sub>	H/L	MULTILEVEL POWER SUPPLY FOR LCD DRIVE
8	CAP2+	-	DC/DC VOLTAGE CONVERTER
9	CAP2-	-	DC/DC VOLTAGE CONVERTER
10	CAP1-	-	DC/DC VOLTAGE CONVERTER
11	CAP1+	-	DC/DC VOLTAGE CONVERTER
12	CAP3-	-	DC/DC VOLTAGE CONVERTER
13	V <sub>OUT</sub>	-	DC/DC VOLTAGE CONVERTER
14	V <sub>SS</sub>	-	GROUND
15	VDD	-	POWER SUPPLY
16~23	DB7~DB0	H/L	8-BIT BIDIRECTIONAL DATA BUS
24	$\overline{RD}$	L	READ SIGNAL
25	$\overline{WR}$	L	WRITE SIGNAL
26	AO	H/L	REGISTER SELECT: H: DISPLAY DATA, L: CONTROL DATA
27	$\overline{RES}$	L	RESET SIGNAL
28	$\overline{CS1}$	L	CHIP SELECT SIGNAL
29	CL	H/L	DISPLAY CLOCK INPUT
30	N/C	-	NO CONNECTION

ABSOLUTE MAXIMUM RATINGS


ITEM	SYMBOL	STANDARD VALUE		UNIT	
		MIN	MAX		
POWER SUPPLY VOLTAGE	V <sub>DD</sub>	-0.3	7.0	V	
POWER SUPPLY VOLTAGE (1)	WITH TRIPLE STEP-UP WITH QUAD STEP-UP	V <sub>SS2</sub>	-7.0	0.3	V
			-6.0	0.3	V
			-4.5	0.3	V
POWER SUPPLY VOLTAGE (VDD STANDARD)	V <sub>5</sub> , V <sub>OUT</sub>	-18.0	0.3	V	
POWER SUPPLY VOLTAGE (VDD STANDARD)	V <sub>1</sub> ~ V <sub>4</sub>	V <sub>5</sub>	0.3	V	
INPUT VOLTAGE	V <sub>IN</sub>	-0.3	V <sub>DD</sub> +0.3	V	
OUTPUT VOLTAGE	V <sub>O</sub>	-0.3	V <sub>DD</sub> +0.3	V	
OPERATING TEMPERATURE	T <sub>opr</sub>	-20	+70	°C	
STORAGE TEMPERATURE	T <sub>str</sub>	-30	+80	°C	

(1) V<sub>DD</sub> ≥ V<sub>1</sub> ≥ V<sub>2</sub> ≥ V<sub>3</sub> ≥ V<sub>4</sub> ≥ V<sub>5</sub>.

ELECTRICAL CHARACTERISTICS

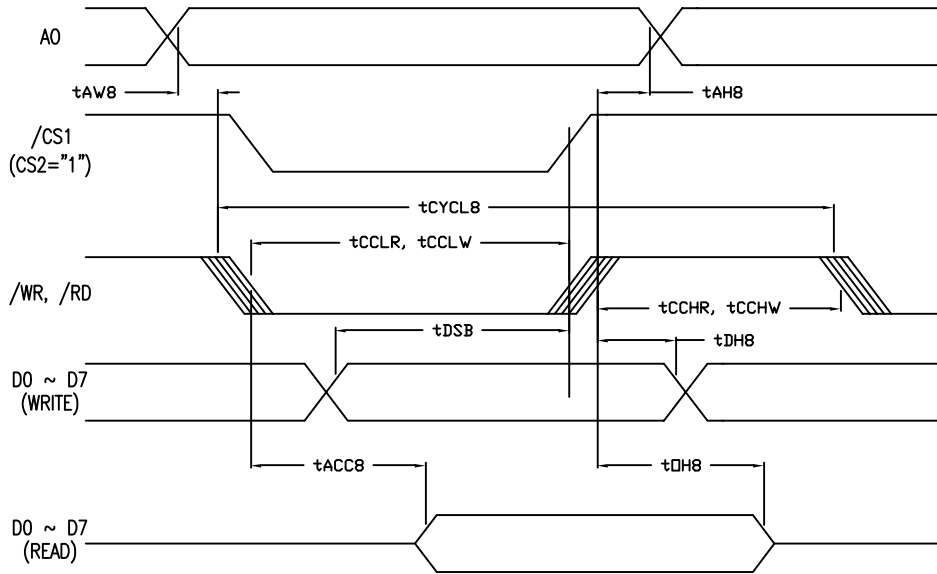
ITEM	SYMBOL	STANDARD VALUE			TEST CONDITION	UNIT
		MIN	TYP	MAX		
OPERATING VOLTAGE (1)	RECOMMENDED VOLTAGE	V <sub>DD</sub>	2.7	-	0.3	V
	POSSIBLE OPERATING VOLTAGE		1.8	-	5.5	
OPERATING VOLTAGE (2)	RECOMMENDED VOLTAGE	V <sub>SS2</sub>	-3.3	-	-2.7	RELATIVE TO V <sub>DD</sub>
	POSSIBLE OPERATING VOLTAGE		-6.0	-	-1.8	RELATIVE TO V <sub>DD</sub>
OPERATING VOLTAGE (3)	POSSIBLE OPERATING VOLTAGE	V <sub>5</sub>	-16.0	-	4.5	RELATIVE TO V <sub>DD</sub>
	POSSIBLE OPERATING VOLTAGE	V <sub>1</sub> , V <sub>2</sub>	0.4 * V <sub>5</sub>	-	V <sub>DD</sub>	RELATIVE TO V <sub>DD</sub>
	POSSIBLE OPERATING VOLTAGE	V <sub>3</sub> , V <sub>4</sub>	V <sub>5</sub>	-	0.6 * V <sub>5</sub>	RELATIVE TO V <sub>DD</sub>
INPUT VOLTAGE	HIGH	V <sub>IHC</sub>	0.8*V <sub>DD</sub>	-	V <sub>DD</sub>	
	LOW	V <sub>ILC</sub>	V <sub>SS</sub>	-	0.2*V <sub>DD</sub>	
OUTPUT VOLTAGE	HIGH	V <sub>OHC</sub>	0.8*V <sub>DD</sub>	-	V <sub>DD</sub>	I <sub>OH</sub> =-0.5mA
	LOW	V <sub>OLC</sub>	V <sub>SS</sub>	-	0.2*V <sub>DD</sub>	I <sub>OL</sub> =0.5mA
INPUT LEAKAGE CURRENT	I <sub>IL</sub>	-1.0	-	1.0		
OUTPUT LEAKAGE CURRENT	I <sub>LO</sub>	-3.0	-	3.0	V <sub>IN</sub> =V <sub>DD</sub> OR V <sub>SS</sub>	uA

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D	LCM-H12864CGWF/C				
<p>128 x 64 CHIP ON GLASS LCD MODULE, FSTN, TRANSFLECTIVE, -20°C TO +70°C OPERATING TEMP, 6:00 VIEW ANGLE, VLCD = 10V, 1/64 DUTY, 1/7 BIAS.</p>		<p>DRAWN BY: CT</p>	<p>CHECKED BY:</p>	<p>APPROVED BY:</p>	<p>DATE: 3.15.02</p> <p>PAGE: 2 OF 5</p> <p>SCALE: N/A</p>

PART NUMBER		REV.
LCM-H12864CGWF/C		D
REV.	E.C.N. NUMBER AND REVISION COMMENTS	DATE
	SEE PAGE 1.	

TIMING DIAGRAM




AC CHARACTERISTICS

(VDD=4.5V~5.5V, T<sub>a</sub>=-20°C TO +70°C)

ITEM	SIGNAL	SYMBOL	MIN	MAX	UNIT	CONDITION
ADDRESS HOLD TIME	A0	tAH8	0	-	ns	
ADDRESS SETUP TIME	A0	tAW8	0	-	ns	
SYSTEM CYCLE TIME	A0	tCY8	166	-	ns	
CONTROL L PULSE WIDTH (/WR)	/WR	tCCLW	30	-		
CONTROL L PULSE WIDTH (/RD)	/RD	tCCLR	70	-	ns	
CONTROL H PULSE WIDTH (/WR)	/WR	tCCHW	30	-		
CONTROL H PULSE WIDTH (/RD)	/RD	tCCHR	30	-		
DATA SETUP TIME	D0 ~ D7	tDSB	30	-	ns	
ADDRESS HOLD TIME		tDH8	10	-	ns	
/RD ACCESS TIME		tACC8	-	70	ns	CL=100pF
OUTPUT DISABLE TIME		tOH8	5	50	ns	CL=100pF

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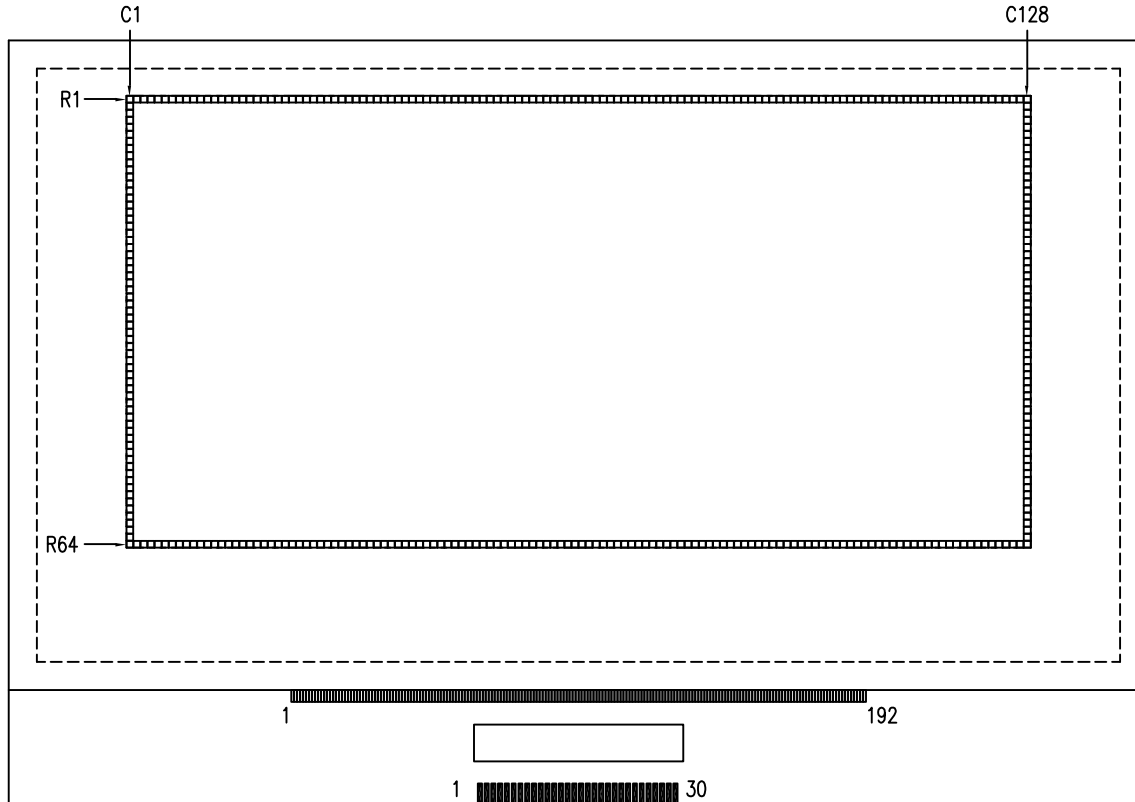
REV. D	PART NUMBER LCM-H12864CGWF/C	<p><b>CONFIDENTIAL INFORMATION</b></p> <p>THE INFORMATION CONTAINED IN THIS DOCUMENT IS THE PROPERTY OF LUMEX INC. EXCEPT AS SPECIFICALLY AUTHORIZED IN WRITING BY LUMEX INC., THE HOLDER OF THIS DOCUMENT SHALL KEEP ALL INFORMATION CONTAINED HEREIN CONFIDENTIAL AND SHALL PROTECT SAME IN WHOLE OR IN PART FROM DISCLOSURE AND DISSEMINATION TO ALL THIRD PARTIES.</p> <p><b>RELIABILITY NOTE</b></p> <p>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.</p>	 <p>290 E. HELEN ROAD PALATINE, IL 60067-6976 PHONE: +1.847.359.2790 US WEB: www.lumex.com TW WEB: www.lumex.com.tw</p>
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PART NUMBER		REV.
LCM-H12864CGWF/C		D
REV.	E.C.N. NUMBER AND REVISION COMMENTS	DATE
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LABELING



PAD NO.	CONFIGURATION
1	COM31[R33(C1-C128)]
2	COM30[R34(C1-C128)]
31	COM1[R63(C1-C128)]
32	COM0[R64(C1-C128)]
33	SEG0[C1(R1-R64)]
34	SEG1[C2(R1-R64)]
159	SEG126[C127(R1-R64)]
160	SEG127[C128(R1-R64)]
161	COM32[R32(C1-C128)]
162	COM33[R31(C1-C128)]
191	COM62[R2(C1-C128)]
192	COM63[R1(C1-C128)]

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