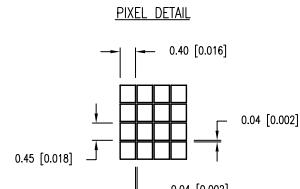
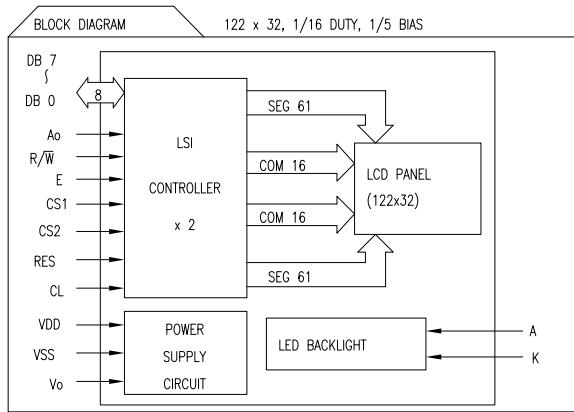
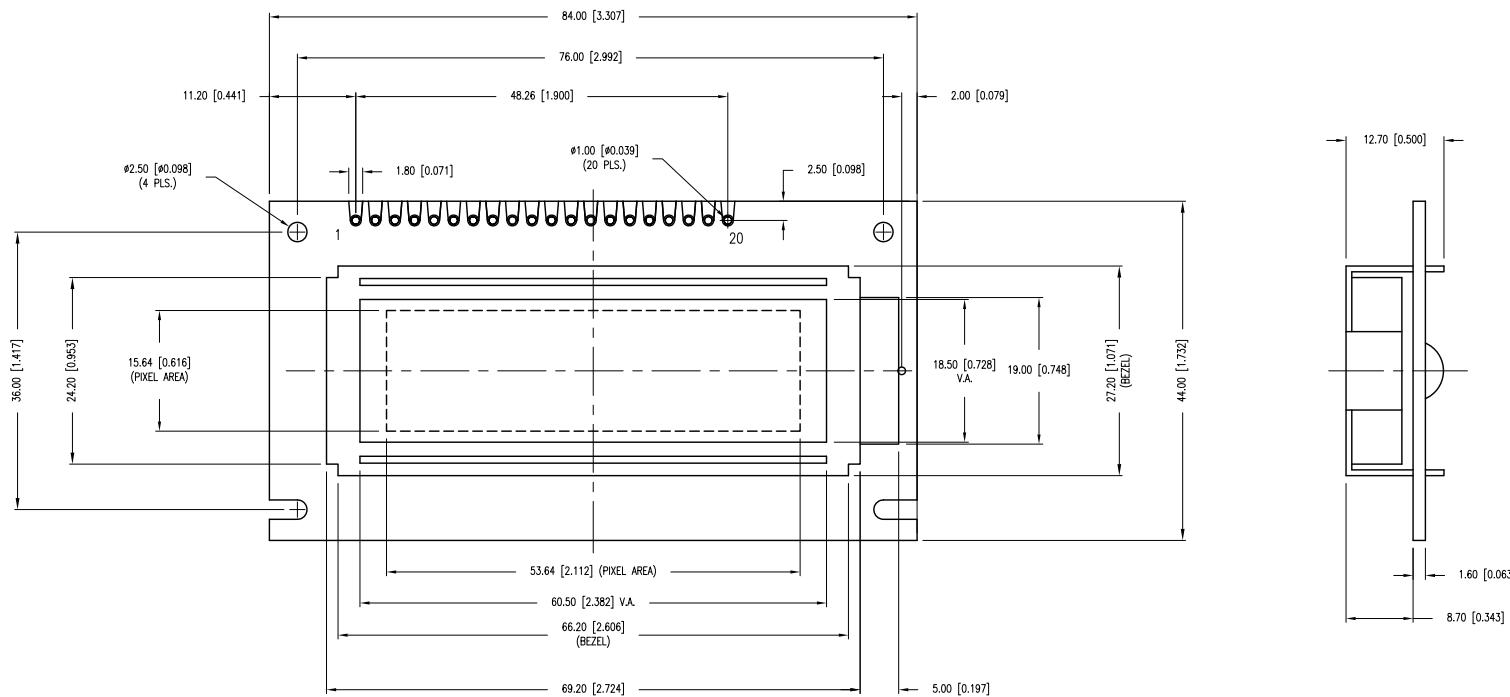


PART NUMBER	LCM-H12232GSF	REV. A
DATE	E.C.N. NUMBER AND REVISION COMMENTS	REV.
08.26.14	E.C.N. #11922.	A

A



CAUTION: STATIC SENSITIVE DEVICE  
FOLLOW PROPER E.S.D. HANDLING PROCEDURES  
WHEN WORKING WITH THIS PART.

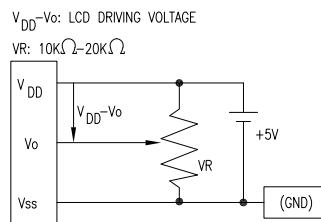


\*UNLESS OTHERWISE SPECIFIED TOLERANCES PER DECIMAL PRECISION ARE: X=±1 (±0.039), XX=±0.5 (±0.020), XXX=±0.25 (±0.010), XXXX=±0.127 (±0.005). LEAD SIZE=±0.05 (±0.002), LEAD LENGTH=±0.75 (±0.030). MIN= +DECIMAL PRECISION MAX= -DECIMAL PRECISION

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#### PIN CONFIGURATION

PIN NO.	SYMBOL	LEVEL	FUNCTION	
1	V <sub>SS</sub>	—	POWER SUPPLY	GND (0V)
2	V <sub>DD</sub>	—		5V
3	V <sub>O</sub>	—		FOR LCD DRIVE
4	A <sub>O</sub>	H/L	REGISTER SELECT SIGNAL H: DATA INPUT L: INSTRUCTION INPUT	
5	C <sub>S1</sub>	H,H->L	CHIP SELECT SIGNAL FOR IC1	
6	C <sub>S2</sub>	H,H->L	CHIP SELECT SIGNAL FOR IC2	
7	C <sub>L</sub>	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	D <sub>B0~D7</sub>	H/L	DATA BIT 0~7	
18	R <sub>ST</sub>	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>O</sub>	t <sub>CYC6</sub>	1000	—	ns
DATA SETUP TIME		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)	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**	V <sub>IH</sub>	HIGH	—	0.2	—	V <sub>DD</sub>
	V <sub>IL</sub>	LOW	—	0	—	V <sub>DD</sub>
OUTPUT VOLTAGE***	V <sub>OH</sub>	HIGH	I <sub>OH</sub> = -3mA	2.4	—	V
	V <sub>OL</sub>	LOW	I <sub>OL</sub> = 3mA	—	0.4	V
*LED BACKLIGHT	VOLTAGE	V <sub>F</sub>	—	—	4.2	4.6
	CURRENT	I <sub>F</sub>	—	—	170	330
	POWER CONSUMPTION	P <sub>D</sub>	—	—	710	mW
	LUMINOUS	L	I <sub>F</sub> =170mA	70	—	cd/m <sup>2</sup>
	COLOR	—	YELLOW GREEN	—	—	nm

\*ONLY APPLIES TO MODULES WITH BACKLIGHT

\*\*APPLIED TO TERMINALS D<sub>B0~D7</sub>

\*\*\*APPLIED TO TERMINALS E, A<sub>O</sub>, D<sub>B0~D7</sub>

#### 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-H	-20	70	°C
STORAGE TEMPERATURE	T <sub>stg</sub>	LCM-H	-30	85	°C

\*UNLESS OTHERWISE SPECIFIED TOLERANCES PER DECIMAL PRECISION ARE: X=±1 (±0.039), X.X=±0.5 (±0.020), X.XX=±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



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122 x 32 DOT MATRIX GRAPHIC MODULE, STN BLUE, LED BACKLIGHT, 1/16 DUTY, 1/5 BIAS.

\*\*THE SPECIFICATIONS MAY CHANGE AT ANY TIME WITHOUT NOTICE DUE TO NEW MATERIALS OR PRODUCT IMPROVEMENT.\*\*

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