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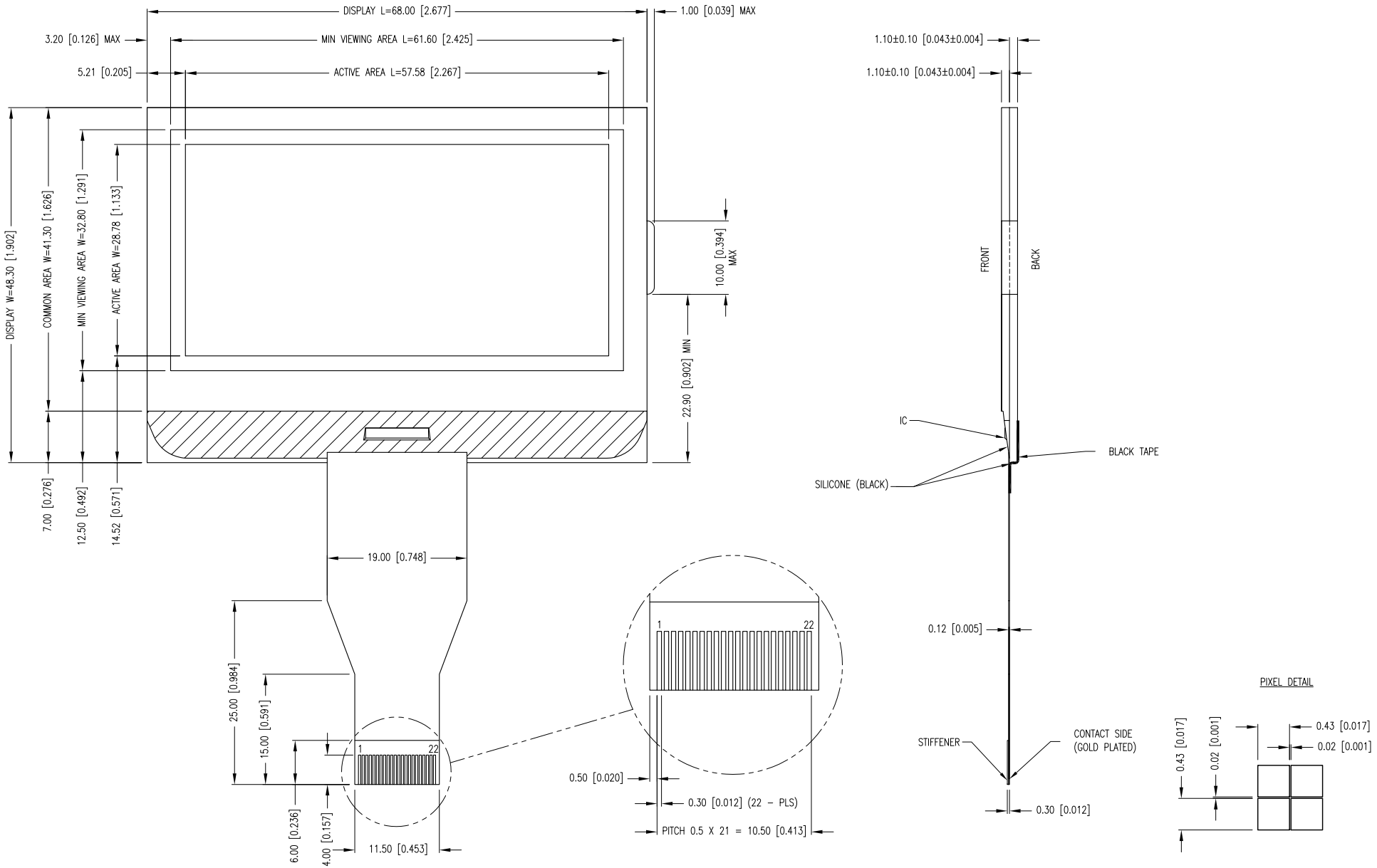
DATE	E.C.N. NUMBER AND REVISION COMMENTS		REV.
6.1.15	E.C.N. #11953.		A



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UNCONTROLLED DOCUMENT

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128x64 GRAPHIC BISTABLE, YELLOW PIXELS ON BLACK BACKGROUND, 3.3V, VLCD = 25V, 1/64 DUTY, 1/9 BIAS

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

DATE:	09.30.10	DRAWN BY:	AB
PAGE:	1 OF 3	CHKD BY:	KF
SCALE:	N/A	APRVD BY:	BC
UNIT:	mm [INCH]		Pb

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PIN CONFIGURATION

PIN NO.	SYMBOL	FUNCTION
1	NC	NO CONNECT.
2	PS0,PS1,PS2	THESE PINS ARE FOR SELECTING DIFFERENT BUS INTERFACE. BUS INTERFACE SELECTION: PS2 | PS1 | PS0 | MPU INTERFACE L | H | H | 8-BIT 6800 PARALLEL INTERFACE
3		
4		NOTE (1) L IS CONNECTED TO VSS (2) H IS CONNECTED TO VDDIO
5	CLS	THIS PIN IS THE INTERNAL CLOCK ENABLE PIN. WHEN THIS PIN IS PULLED HIGH TO VDDIO, INTERNAL CLOCK IS ENABLED. THE INTERNAL CLOCK WILL BE DISABLED WHEN IT IS PULLED LOW TO VSS, AN EXTERNAL CLOCK SOURCE MUST BE INPUT TO CL PIN FOR NORMAL OPERATION.
6	D/C#	THIS PIN IS DATA/COMMAND CONTROL PIN. A HIGH AT D/C INDICATES DATA INPUT WHILE A LOW AT D/C INDICATES COMMAND INPUT. IN I2C MODE, THIS PIN ACTS AS SA0 FOR SLAVE ADDRESS SELECTION.
7	E(R/D#)	THIS PIN IS MCU INTERFACE INPUT. WHEN 6800 INTERFACE MODE IS SELECTED, THIS PIN WILL BE USED AS THE ENABLE (E) SIGNAL. READ/WRITE OPERATION IS INITIATED WHEN THIS PIN IS PULLED HIGH AND THE CHIP IS SELECTED.
8	R/W#(WR#)	THIS PIN IS MCU INTERFACE INPUT. WHEN 6800 INTERFACE MODE IS SELECTED, THIS PIN WILL BE USED AS READ/WRITE (R/W#) SELECTION INPUT. READ MODE WILL BE CARRIED OUT WHEN THIS PIN IS PULLED HIGH AND WRITE MODE WHEN LOW.
9	CS1#	THESE PINS ARE THE CHIP SELECT INPUTS FOR COMMUNICATION BETWEEN MCU. TO SELECT THE CHIP CS1# MUST BE LOW AND CS2 MUST SET HIGH.
10	RES#	THIS PIN IS THE RESET SIGNAL INPUT. INITIALIZATION OF THE CHIP IS STARTED ONCE THIS PIN IS PULLED LOW. MINIMUM PULSE WIDTH FOR RESET SEQUENCE IS 20µS.
11	CL	THIS PIN IS THE DISPLAY CLOCK INPUT/OUTPUT.
12	D0	THESE PINS ARE THE 8-BIT BI-DIRECTIONAL DATA BUS. IN SERIAL INTERFACE MODE, D1 IS THE SERIAL DATA INPUT (SDIN), D0 IS THE SERIAL CLOCK INPUT, (SCLK).
13	D1	
14	D2	
15	D3	
16	D4	
17	D5	
18	D6	
19	D7	
20	BUSY	A HIGH LEVEL INDICATES BUSY STATUS (OUTPUT DRIVING WAVEFORM) OF THE DRIVER.
21	VDD	THIS PIN IS THE SYSTEM POWER SUPPLY PIN OF THE LOGIC BLOCK.
22	VSS	THIS IS A GROUND PIN.

ABSOLUTE MAXIMUM RATINGS

SYMBOL	PARAMETER	FUNCTION	SYMBOL
V_{DD}	SUPPLY VOLTAGE	−0.3 TO +3.6	V
V_{DDIO}		−0.3 TO MIN (V_{DD} +0.5,+3.6)	V
V_O		−0.3 TO +38	V
V_{CI}		−0.3 TO +3.6	V
V_{IN}	INPUT VOLTAGE	V_{SS} −0.3 TO V_{DDIO} +0.3	V
T_A	OPERATING TEMPERATURE RANGE	−20° TO +70°	°C
T_{STG}	STORAGE TEMPERATURE RANGE	−30° TO +80°	°C

MAXIMUM RATINGS ARE THOSE VALUES BEYOND WHICH DAMAGES TO THE DEVICE MAY OCCUR. FUNCTIONAL OPERATION SHOULD BE RESTRICTED TO THE LIMITS IN THE ELECTRICAL CHARACTERISTICS TABLES OR PIN DESCRIPTION SECTION.

THIS DEVICE CONTAINS CIRCUITRY TO PROTECT THE INPUTS AGAINST DAMAGE DUE TO HIGH STATIC VOLTAGES OR ELECTRIC FIELDS; HOWEVER, IT IS ADVISED THAT NORMAL PRECAUTIONS BE TAKEN TO AVOID APPLICATION OF ANY VILTAGE HIGHER THAN MAXIMUM RATED VOLTAGES TO THIS HIGH IMPENDANCE CIRCUIT. THIS DEVICE MAY BE LIGHT SENSITIVE. CAUTION SHOULD BE TAKEN TO AVOID EXPOSURE OF THIS DEVICE TO ANY LIGHT SOURCE DURING NORMAL OPERATION. THIS DEVICE IS NOT RADIATION PROTECTED.

DC CHARACTERISTICS

ITEM	SYMBOL	MIN.	TYP.	MAX.	CONDITION	UNIT
OPERATING VOLTAGE (1)	V_{DD}	2.4	3.3	3.5	--	V
OPERATING VOLTAGE (2)	V_{LCD}	10.0	25.0	35.0	--	V
DYNAMIC CURRENT CONSUMPTION	I_{DD}	--	TBD	--	--	µA

AC CHARACTERISTICS

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT
t_{cycle}	CLOCK CYCLE TIME	100	–	–	NS
t_{AS}	ADDRESS SETUP TIME	0	–	–	NS
t_{AH}	ADDRESS HOLD TIME	20	–	–	NS
t_{DSW}	WRITE DATA SETUP TIME	30	–	–	NS
t_{DHW}	WRITE DATA HOLD TIME	20	–	–	NS
t_{DHR}	READ DATA HOLD TIME	10	–	50	NS
t_{OH}	OUTPUT DISABLE TIME	–	–	40	NS
t_{ACC}	ACCESS TIME (RAM)	15	–	–	NS
	ACCESS TIME (COMMAND)	15	–	–	NS
PW_{CSL}	CHIP SELECT LOW PULSE WIDTH (READ RAM)	250	–	–	NS
	CHIP SELECT LOW PULSE WIDTH (READ COMMAND)	250	–	–	NS
	CHIP SELECT LOW PULSE WIDTH (WRITE)	50	–	–	NS
PW_{CSH}	CHIP SELECT HIGH PULSE WIDTH (READ)	100	–	–	NS
	CHIP SELECT HIGH PULSE WIDTH (WRITE)	50	–	–	NS
t_R	RISE TIME	–	–	10	NS
t_F	FALL TIME	–	–	10	NS

RELIABILITY TEST

TESTS ITEM	CONDITION
HIGH TEMP. STORAGE	+80°C x 96hrs
LOW TEMP. STORAGE	−30°C x 96hrs
HIGH TEMP. OPERATION	+70°C x 96hrs
LOW TEMP. OPERATION	−20°C x 96hrs
HIGH TEMP., HIGH HUMIDITY	+60°C x 90%RH x 96hrs
THERMAL SHOCK	−20°C x 30min →25°C x 10s→ +70°C x 30min x 5 CYCLES
VIBRATION TEST	FREQUENCY x SWING x TIME 40Hz x 4mm x 4hrs
DROP TEST	HEIGHT x No. OF DROP 1.0m x 6 DROPS

OPERATING LIFE TIME: 50,000 HOURS
(AT ROOM TEMPERATURE WITHOUT DIRECT IRRADIATION OF SUNLIGHT).

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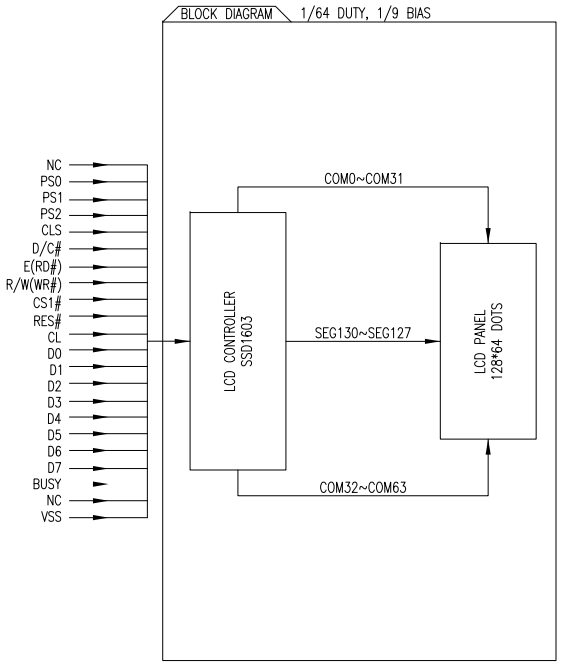

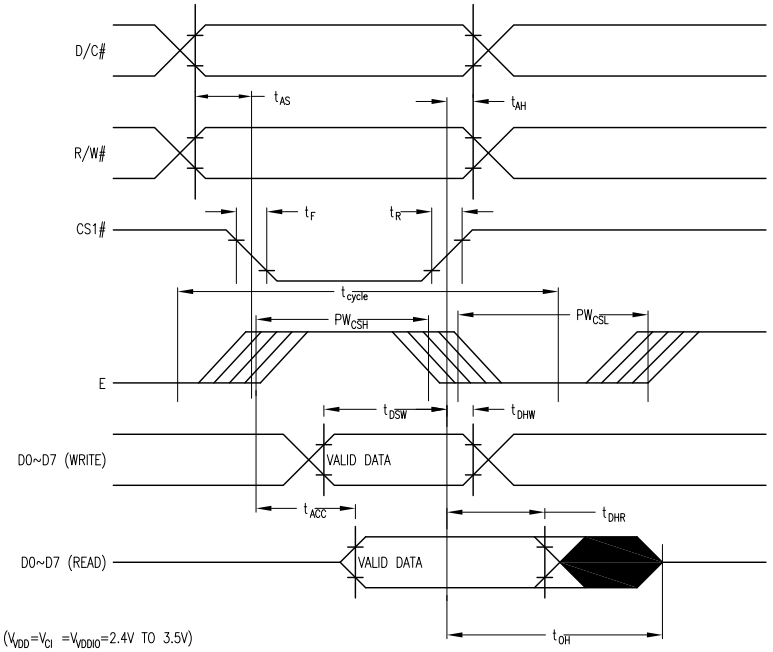

(V_{DD}=V_{CI} =V_{DDIO}=2.4V TO 3.5V)

THE PW_{CSH} TIMING REFERENCE IS 50% OF THE RISING/FALLING EDGE OF E OR CS1# PIN.
THE t_{DSW} AND t_{DHW} TIMING IS REFERENCE TO THE 50% OF RISING/FALLING EDGE OF E OR CS1# PIN.

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