ME DISPLAYS

SPECIFICATIONS

FOR

LCD MODULE

CGM12864

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- **FEATURES**

Number of Dots	*128 x 64*
Built-in Controller IC	*HD61202*
Duty Cycle	*1/64 Duty*
Biasing	*1/9 Biasing*
Operating Voltage	*14.43V*
Glass to PCB	*Zebra and Heat Seal Connector*
Options	*EL/LED Backlight, STN*

- **MECHANICAL PARAMETERS**

Module Size	*78.0W x 70.0H x 9.2 mm*
Viewing Area Size	*62.0W x 44.0H mm*
Dot Size	*0.55 x 0.39 mm*
Dot Pitch	*0.60 x 0.44 mm*

- **ABSOLUTE MAXIMUM**

Item	Symbol	Min.	Max	Unit
Power Supply Voltage	Vdd	-0.3	+7.0	V
Power Supply for LCD Drive	Vlcd	Vdd-19.0	Vdd+0.3	V
Input Voltage	Vi	-0.3	Vdd+0.3	V
Operating Temperature	Ta	-10	+60	C
Storage Temperature	Tstg	-20	+70	C

- **ELECTRICAL CHARACTERISTICS**

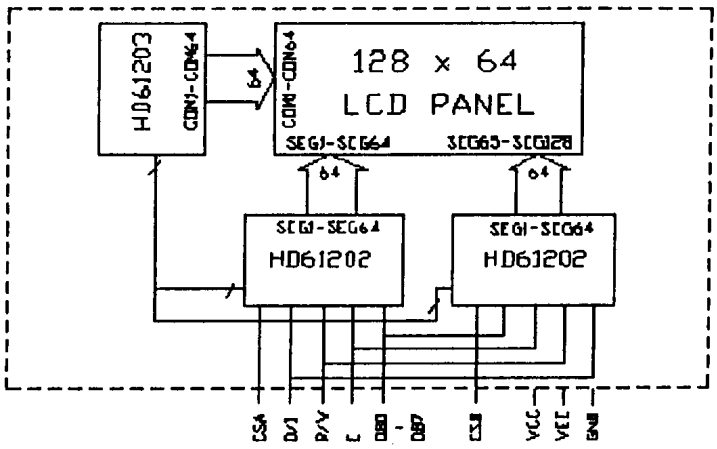
(Vdd=5.0V ± 10%, Ta=25C)

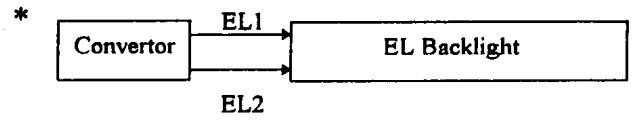
Item	Symbol	Conditions	Min	Typ	Max	U
Power Supply for Logic	Vdd	--	4.5	5.0	5.5	V
Input "High" Voltage	Vih	E, R/W, RS	2.0	--	Vdd	V
Input "Low" Voltage	Vil	DB0-DB7	0	--	0.8	V
Output "High" Voltage	Voh	DB0-	2.4	--	-	V
Output "Low" Voltage	Vol	DB7	-	-	0.4	V
Power Supply Current	Idd	During Display	-	--	2750	uA

- **PIN ASSIGNMENT**

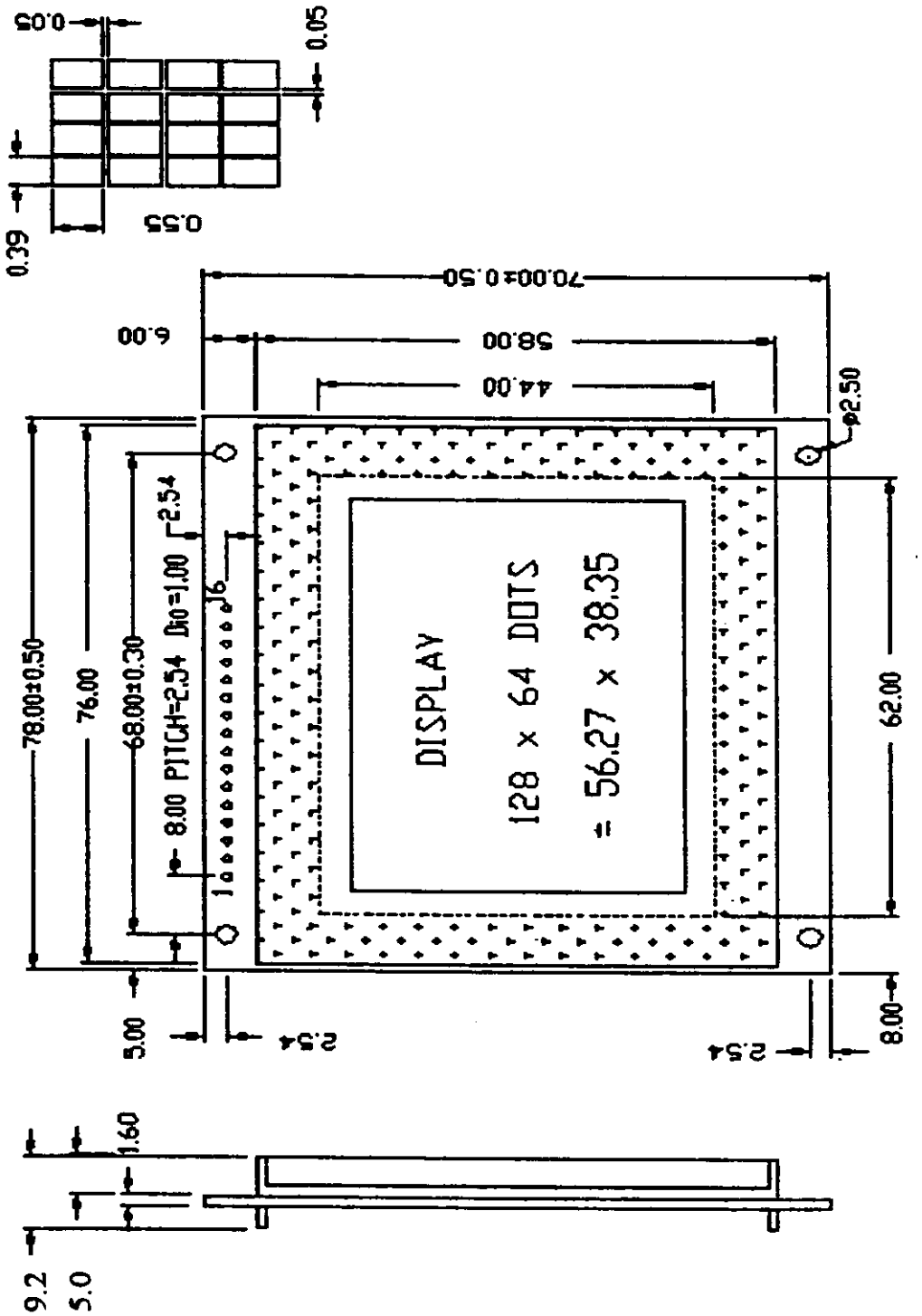
No.	Symbol	Level	Function
1	CSA	--	Chip Selection
2	CSB	--	Chip Selection
3	GND	--	Power Ground (0V)
4	Vcc	--	Supply Voltage (+5V)
5	Vee	--	Supply Voltage for LCD (0 ~ -10V)
6	D/I	H, H→L	H: Data, L: Instruction
7	R/W	H/L	H: Read, L: Write
8	E	H/L	Enable Signal
9	DB7	H/L	Data Bus
10	DB6	H/L	Data Bus
11	DB5	H/L	Data Bus
12	DB4	H/L	Data Bus
13	DB3	H/L	Data Bus
14	DB2	H/L	Data Bus
15	DB1	H/L	Data Bus
16	DB0	H/L	Data Bus

- **BLOCK DIAGRAM**





- **DIAGRAM CGM12864**



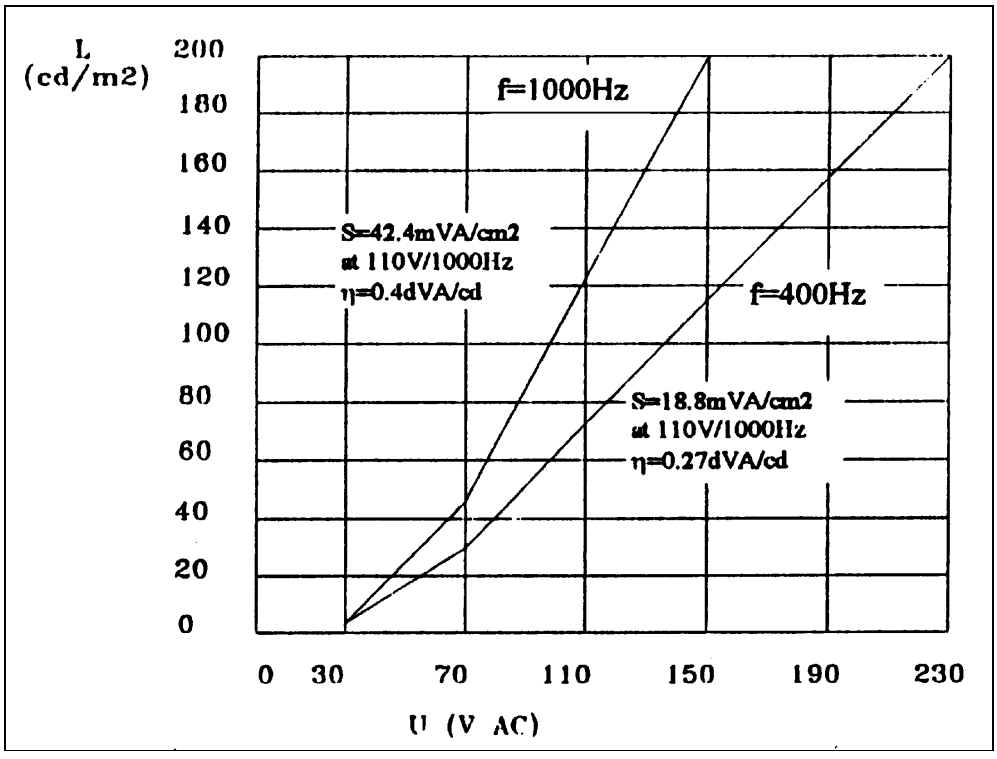
- **BACKLIGHT CHARASTERISTICS**

EL BACKLIGHT
Electrical Data

Parameter	Description
Power Supply	Up to max. 230 RMS
Wave Shape	Sinusoidal
Frequency	Up to max. 3 KHz
Efficiency η	(dvA/cd)
Capacity	0.50 nF/cm^2
Operating Current	160mA

Optical Data

Parameter	Description
Power Supply	110v 400Hz sinusoidal
Luminous Intensity	69.3 cd/m2 resp 20.4fl
Emission	Color Green/Blue 500nm x=0.173, y=0.407
Homogenity	± 5%
Useful Life	Unlimited
Brightness Uniformity (Relative Humidity <80%)	1000h approx. 80% 5000h approx. 50%



LED BACKLIGHT

Characterisitcs

Low Voltage Driving (DC) is available without invertor
No noise occurrence
Life : 20K Hours

Item	Symbol	Conditions	Min	Typ.	Max.	Unit
Power Dissipation	Po	--		1.1		W
Reverse Current	IR	VR=8V	--	--	0.2	mA
Reverse Voltage	VR	--	--	8	--	V
Peak Forward Current	IF	--	--	250	--	mA
Forward Voltage	VF	IF=100mA	--	4.2	4.4	V
Luminous Intensity	IV	TA=25C	--	14	--	cd/m2

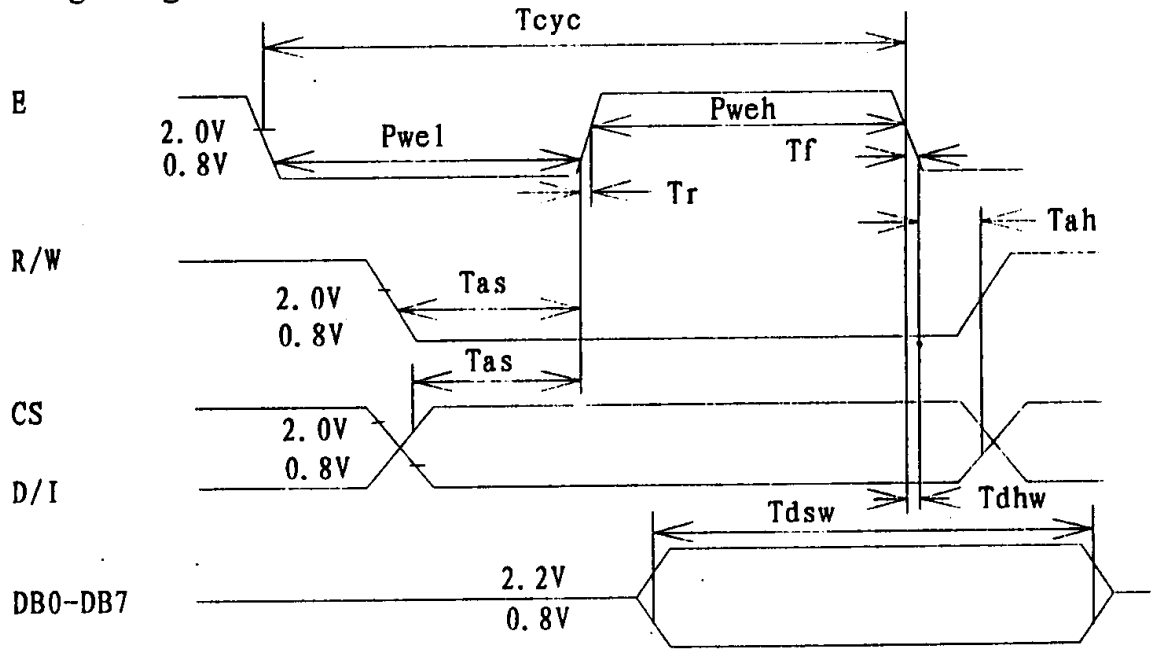
- **AC CHARACTERISTICS**

(Vdd=5V ± 10%, Vss=0V, Ta=25°C)

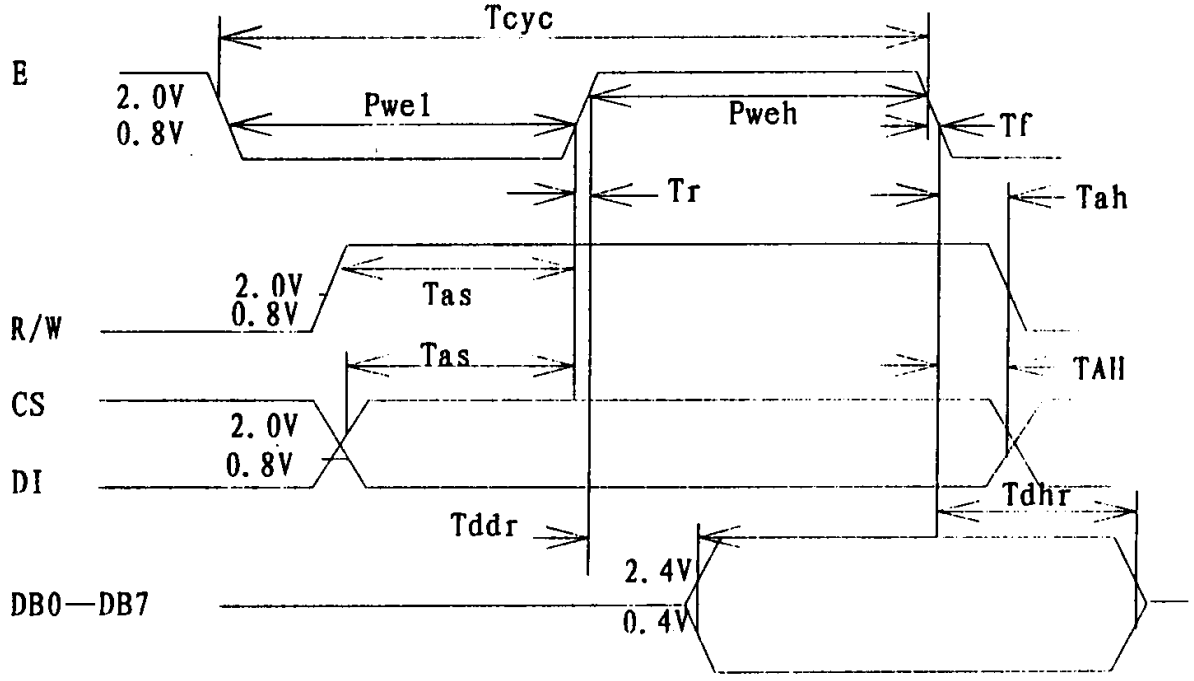
Item	**Symbol**	**Min**	**Max**	**Unit**
Enable Cycle Time	T_{CYC}	1000	--	ns
Enable Pulse Width	$P_{WEH,}$ P_{WEL}	450	--	ns
Enable Rise/Fall Time	t_{Er}, t_{Ef}	--	25	ns
Address Set-up Time	t_{AS}	140	--	ns
Address Hold Time	t_{AH}	10	--	ns
Data Set-up Time	t_{DSW}	200	--	ns
Data Delay Time	t_{DDR}	--	320	ns
Data Hold Time (Writing)	t_{DHW}	10	--	ns
Data Hold Time (Reading)	t_{DHR}	20	--	ns

- **TIMING CHARACTERISTICS**

Writing timing



Reading Timing



- **CONTROL AND DISPLAY COMMAND**

Command	R/W	D/I	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0	Remark
Display on/off	L	L	L	L	H	H	H	H	H	L/H	Controls the display on or off. Internal status and display RAM data is not affected. L: OFF, H: ON
Set Address	L	L	H	H	Y address (0~63)						Sets the Y address in the Y address counter
Set Page (X Address)	L	L	H	L	H	H	H	page (0~7)			I/D: Set Cursor Move Direction H-Increase L-Decrease SH: Specifies Shift of Display H-Display is Shifted L-Display is Not Shifted
Display Start Line	L	L	H	H	Display start line (0~63)						D: Display (H-on, L-off) C: Cursor (H-on, L-off) B: Blinking (H-o, L-off)
Status Read	H	L	Busy	L	On/Off	Reset	L	L	L	L	Read the status: busy 1: working, 0: ready ADC 1: clockwise output, 0: counterclockwise On/Off 1: disp off, 0: disp on Reset 1: reset, 0: normal
Write Display Data	L	H	Write Data								Write data (DB0:7) into display data RAM. After writing instruction, Y address is increased by 1 automatically
Read Display Data	L	L	Read Data								Read data (DB0:7) from display data RAM to the data bus