

User's Guide

GXM12232-1SL

Liquid Crystal Display Module

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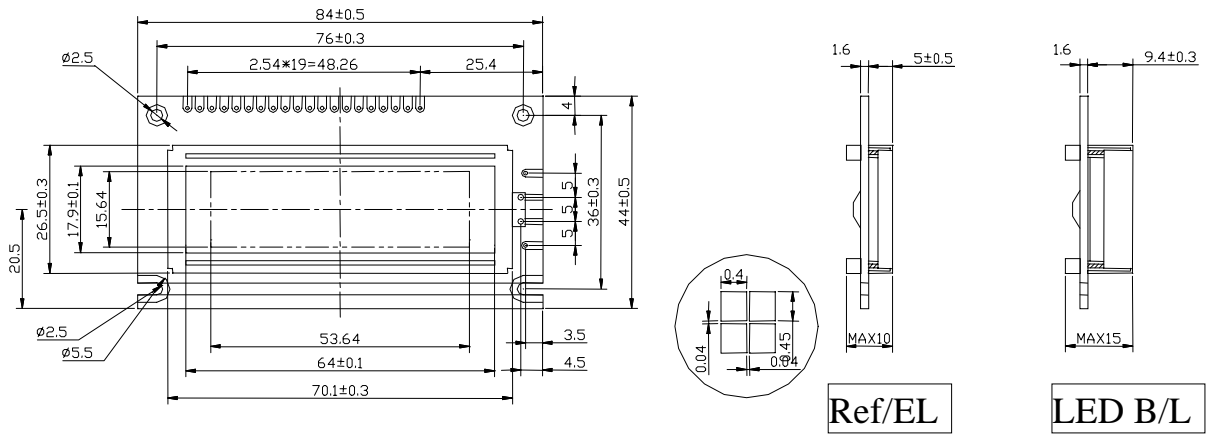
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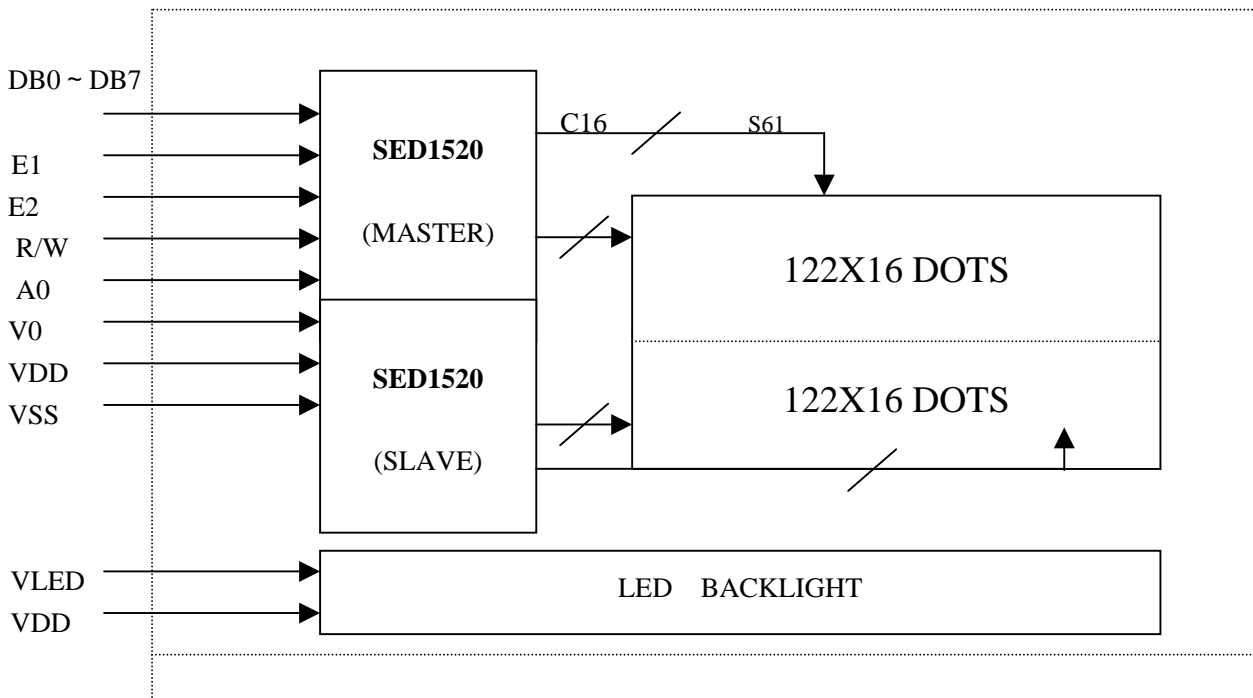
DIAPLAY DATA RAM ADDRESS MAP

Mechanical Diagram

GXM12232-1



BLOCK DIAGRAM



PIN ASSIGNMENTS

Pin	Symbol	Level	Function
1	V _{SS}	---	GND (0V)
2	V _{DD}	---	Power Supply For Logic
3	V _O	---	Power Supply For LCD Drive
4	A0	H/L	H Data L Instruction
5	NC		No connection
6	E2	H/L	Enable signal 2
7	NC		No connection
8	/RD(E1)	-H/L	/RD for 80 series, E for 68 series (Enable signal 1)
9	/WR(R/W)	---	/WD for 80 series, R/W for 68 series
10	DB0	H/L	Data Bus Line
11	DB1	H/L	
12	DB2	H/L	
13	DB3	H/L	
14	DB4	H/L	
15	DB5	H/L	
16	DB6	H/L	
17	DB7	H/L	
18	/RES	H/L	Reset Signal, H 80 Series, L 68 series
19	LEDA	---	Power Supply For LED Backlight
20	LEDK	---	

ABSOLUTE MAXIMUM RATINGS(T_a=25)

Parameter	Symbol	Min	Max	Unit
Supply Voltage for logic	VDD	0	6.7	V
Supply Voltage for LCD	VDD-V _O	0	10	V
Input voltage	V _I	0	VDD	V
Operating Temp.	TOP	-10	+50	
Storage Temp.	TST	-20	+70	

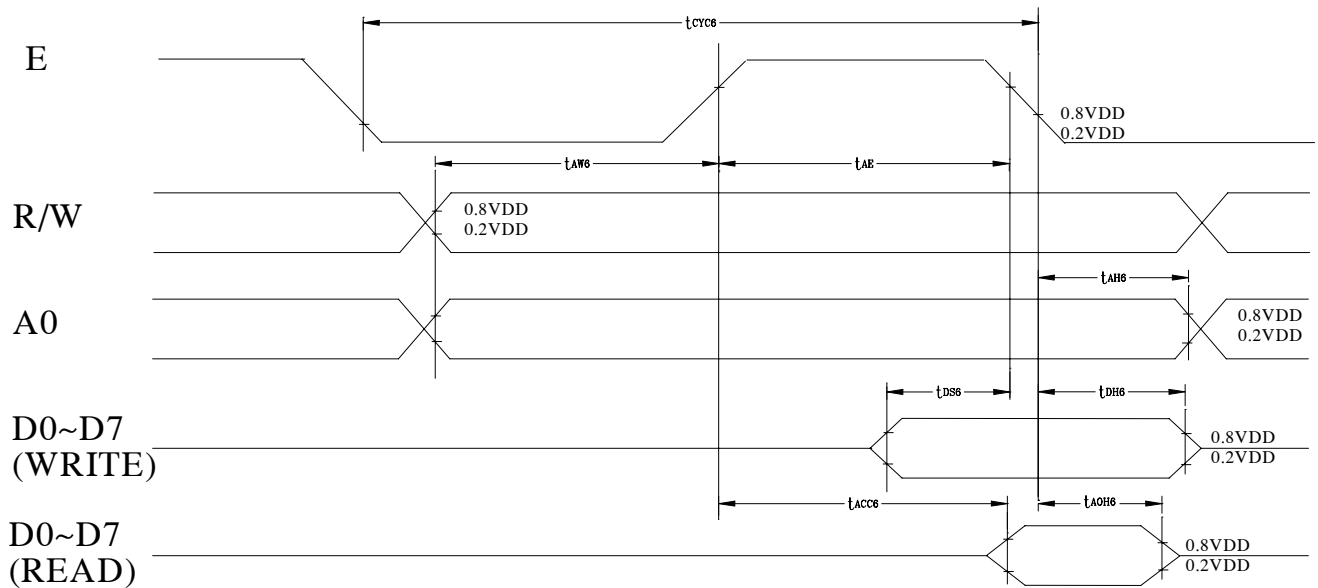
ELECTRICAL CHARACTERISTICS(VDD=+5V±10%,VSS=0V,Ta=25)

DC Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Supply voltage for logic	VDD	----	4.5	5.0	5.5	V
Supply current for logic	IDD	----	----	0.8	1.5	mA
Operating voltage for LCD	VDD-V0	25	----	4.5	----	V
Supply voltage for LED backlight	VLED	----	----	4.2	----	V
Supply current for LED backlight	ILED	VLED=4.2V	----	110	----	mA

AC Characteristics

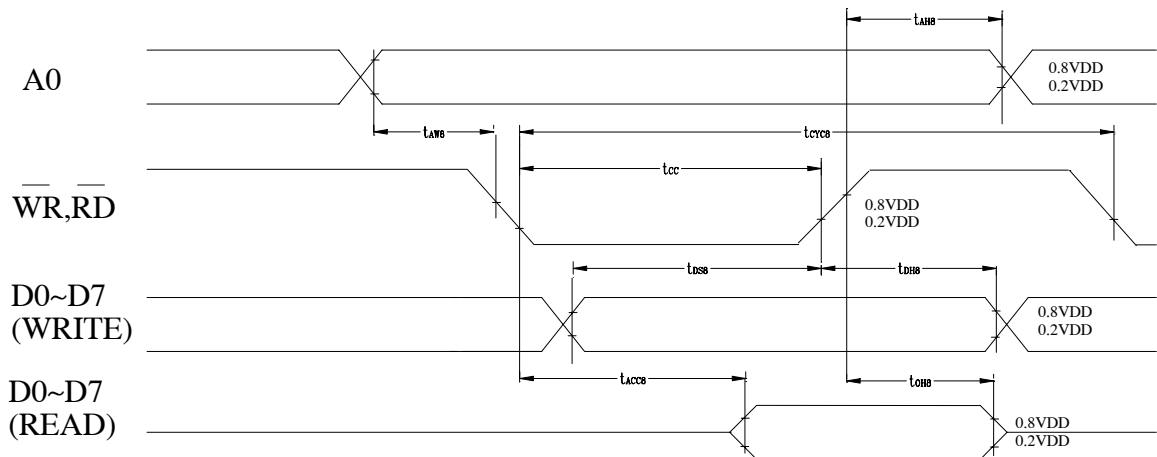
Read/Write operation sequence(68 Type MPU)



Ta=-20 to +75 ,VDD=5.0V±10%,VSS=0V

Parameter	Symbol	Min	Max	unit	Condition
System cycle time	t_{CYC6}	1000	-----	ns	
Address setup time	t_{AW6}	20	-----	ns	
Address hold time	t_{AH6}	10	-----	ns	
Enable pulse width	Read	t_{EW}	100	-----	ns
	Write	t_{EW}	80	-----	ns
Data setup time	t_{DS6}	80	-----	ns	
Data hold time	t_{DH6}	10	-----	ns	
Access time	t_{ACC6}	----	90	ns	CL=100Pf
Output disable time	t_{OH6}	10	60	ns	
Input wave form rise time	t_r	----	15	ns	

Read/Write operation sequence(80 Type MPU)



$T_a = -20$ to $+75$, $V_{DD} = 5.0V \pm 10\%$, $V_{SS} = 0V$

Parameter	Symbol	Min	Max	unit	Condition
System cycle time	t_{CYC8}	1000	-----	ns	
Address setup time	t_{AW8}	20	-----	ns	
Address hold time	t_{AH8}	10	-----	ns	
Control pulse width	t_{CC}	200	-----	ns	
Data setup time	t_{DSS}	80	-----	ns	
Data hold time	t_{DHS}	10	-----	ns	
RD access time	t_{ACC8}	----	90	ns	CL=100Pf
Output disable time	t_{CH8}	10	60	ns	

OPERATING PRINCIPLES & METHODS

Control and Display Command

Command	R/W	RD	A0	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0	Function
Display ON/OFF	0	1	0	1	0	1	0	1	1	1	0/1	Whole display ON/OFF 1: ON , 0: OFF(Power Save mode if the static drive on)
Display start line	0	1	0	1	1	0	Display start line (0 to 31)				Determine the display line correspond to the com0.	
Set page address	0	1	0	1	0	1	1	1	0	Page(0 to 3)		Set the page of display .Data RAM to the Column Register
Set column address	0	1	0	0	Column address (0 to 79)						Set the Column Address of Display data RAM to the column register	

Read status	0	0	1	Bus y	ADC	On/ Off	Rese t	0	0	0	0	Read the status. BUSY 1: Working 0: Ready ADC 1: Clockwise output 0: Counter clockwise ON/OFF 1: Display off 0: Display on RESET 1: Reset 0: Normal
Write display data	1	1	0	Write data								Write data from data bus into display RAM
Read display data	1	0	1	Read data								Read data from display RAM onto data bus
Select ADC	0	1	0	1	0	1	0	0	0	0	0/1	Determine the clockwise or counterclockwise reading of the display data RAM 0: Clockwise Output 1: Counterclockwise Output
Static drive ON/OFF	0	1	0	1	0	1	0	0	1	0	0/1	Select the dynamic or static driving 1: Static driving(Power save) 0: Dynamic driving
Select duty	0	1	0	1	0	1	0	1	0	0	0/1	Select the duty ratio 1: 1/32 duty 0: 1/16 duty
Read-Modify-Write	0	1	0	1	1	1	0	0	0	0	0	Increment the column address register when writing but no-change when reading.
Reset	0	1	0	1	1	1	0	0	0	1	0	Set the display start line register to 1st line ,Column add. Counter and page add. register to "0".
End	0	1	0	1	1	1	0	1	1	1	0	Release from the Read Modify Write Mode.

DIAPLAY DATA RAM ADDRESS MAP

Page	Data			Com NO.	Driver
1	DB0 DB7	122 × 16 Pixels		0	Master
2	DB0 DB7			15	
3	DB0 DB7	122 × 16 Pixels		16	Slave
4	DB0 DB7			31	
	Seg NO.	0 ----- 60	0----- 60		
	Driver	Master	Slave		