

AZ DISPLAYS, INC.

SPECIFICATIONS FOR LIQUID CRYSTAL DISPLAY

PART NUMBER:

AGM9624A

DATE:

September 6, 2005

General Specification

Driving IC S6B0724A

Interface With Parallel MPU 8080 Series

Display Specification

Display Dot Matrix :96*24

Display Mode:Positive/Transflective/FSTN Type

Viewing Angle :6:00 Clock

Display Duty:1/33 Driving Bias:1/6 Driving Voltage:7.5V

Mechanical Characteristics(Unit:mm)

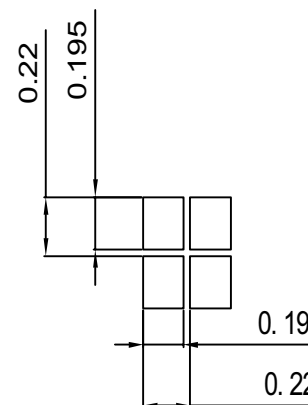
External Dimension:27.09* 17.76*1.7

View Area:24.09* 8.26

Dots Size:0.19*0.195

Dots Pitch:0.22* 0.22

AGM9624A



NO	SYMBOL
1	V0
2	V4
3	V3
4	V2
5	V1
6	C2-
7	C2+
8	C1+
9	C1-
10	C3+
11	VOUT
12	VSS
13	VDD
14	D7
15	D6
16	D5
17	D4
18	D3
19	D2
20	D1
21	D0
22	E_FDB
23	R/W_VFB
24	RS
25	/ RES
26	/ CS1

1. VIEWING ANGLE: 6:00 0' CLOCK
2. DISPLAY MODE: Shown as in table 3
3. DRIVING VOLTAGE: 7.5V, DUTY: 1/33, BIAS: 1/6, FREQUENCY: 64Hz
4. OPERATING TEMP.: -20° C TO 70° C
5. STORAGE TEMP.: -30° C TO 80° C
6. CONNECTOR: FPC+COG TYPE

6				AZ DISPLAYS, INC.	<table border="0"> <tr> <td colspan="2">TOLERANCES UNLESS OTHERWISE NOTED</td> <td colspan="2">APPLICATION:</td> </tr> <tr> <td>.1 - .50</td> <td></td> <td>☐ Electrom</td> <td>☐ Def. Equipments</td> </tr> <tr> <td>.51 - 2.0</td> <td></td> <td>☐ Others</td> <td>☐ Remanife</td> </tr> <tr> <td colspan="2">ALL DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED</td> <td>☐ New Applications</td> <td>☐ Modifications</td> </tr> <tr> <td colspan="2">CUSTOMER: 巨象</td> <td colspan="2">SAMPLE: ☐ Yes ☐ No</td> </tr> <tr> <td colspan="2">GEOMETRIC TOL:</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">DRAW 2-STEP:</td> <td colspan="2"></td> </tr> <tr> <td colspan="2">DRAW 7-STEP:</td> <td colspan="2"></td> </tr> </table>	TOLERANCES UNLESS OTHERWISE NOTED		APPLICATION:		.1 - .50		☐ Electrom	☐ Def. Equipments	.51 - 2.0		☐ Others	☐ Remanife	ALL DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED		☐ New Applications	☐ Modifications	CUSTOMER: 巨象		SAMPLE: ☐ Yes ☐ No		GEOMETRIC TOL:				DRAW 2-STEP:				DRAW 7-STEP:			
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Absolute Maximum Ratings

Item	Symbol	Standard			Unit
Power supply voltage	$V_{DD}-V_{SS}$	0	-	5.5	V
Input voltage	V_{IN}	VSS	-	VDD	
Operating temperature range	T_A	-20	-	+70	"
Storage temperature range	T_{STO}	-30	-	+80	

*Wide temperature range is available

Interface Pin Description

Pin No	Symbol	I/O	Function
26	CS1B	I	This is the chip select signal .When CS1B=# "L" and CS2=# "H",then the chip select becomes active,and data/command I/O is enabled
25	RESETB	I	When RESETB is set to "L",the setting are initialized The RESETB operation is performed by the RESETB signal level
24	RS	I	Select register. 0:Instruction register (for write) Busy flag &address counter(for read) 1:Data register(for write and read).
23	RW-WRB	I	Read/write select signal.
22	E-RDB	I	Operation (data read/write) enable signal.
21	DB0	I/O	This is an 8-bit bi-directional data bus that connects to an 8-bit or 16-bit standard MPU data bus. When the serial interface is selected,then D7 serves as the serial data input terminal and D6 serves as the serial clock input terminal.At this time,D0-D5 are set to high impedance. When the chip select is inactive,D0 to D7 are set to high impedance.
20	DB1		
19	DB2		
18	DB3		
17	DB4		
16	DB5		
15	DB6		
14	DB7		
13	VDD	Supply	Power supply for logic
12	VSS	Supply	Ground.
11	VOUT	O	DC/DC voltage converter output
10	C3+	O	Capacitor3+ for internal DC/DC voltage converter
9	C1-	O	Capacitor1- for internal DC/DC voltage converter
8	C1+	O	Capacitor1+ for internal DC/DC voltage converter
7	C2+	O	Capacitor2+ for internal DC/DC voltage converter
6	C2-	O	Capacitor2- for internal DC/DC voltage converter

5	V1	Supply	LCD driver supply voltages.The voltage determined by LCD cell is impedangce-converted by a resistive driver or an operation amplifier for application .Voltages should be the following relationship: $V0>V1>V2>V3>V4>VSS$ When the on-chip operating power circuit is on,the following are given to V1 to V4 by the on-chip power circuit .Voltage selection is performed by the set LCD bias command.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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Electrical Characteristics

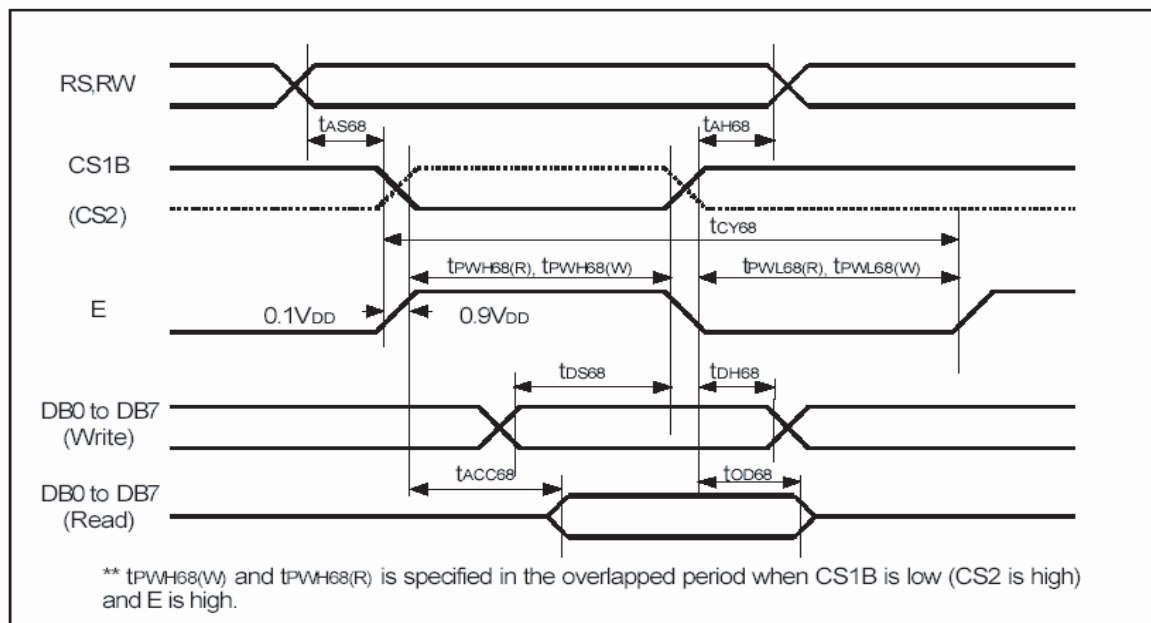
DC Characteristics

(VSS = 0V, VDD = 2.4 to 5.5V, Ta = -40 to 85°C)

Item		Symbol	Condition		Min.	Typ.	Max.	Unit	Pin used
Operating voltage (1)		VDD	Select by product code		2.4	-	3.6	V	VDD *1
					2.4	-	5.5		
Operating voltage (2)		V0			4.5	-	15.0	V	V0 *2
Input voltage	High	VIH			0.8VDD	-	VDD	V	*3
	Low	VIL			VSS	-	0.2VDD		
Output voltage	High	VOH	IOH = -0.5mA		0.8VDD	-	VDD	V	*4
	Low	VOL	IOL = 0.5mA		VSS	-	0.2VDD		
Input leakage current		IIL	VDD = 3.0V VIN = VDD or VSS		- 1.0	-	+ 1.0	μA	*5
Output leakage current		IOZ	VIN = VDD or VSS		- 3.0	-	+ 3.0	μA	*6
LCD driver ON resistance		RON	Ta = 25°C, V0 = 8V		-	2.0	3.0	kΩ	SEGn COMn *7
Oscillator frequency	Internal	fOSC	VDD = 3.0V Ta = 25°C Duty ratio = 1/65		32.7	43.6	54.5	kHz	CL *8
	External	fCL			4.09	5.45	6.81		
Voltage converter input voltage		VCI	× 2		2.4	-	5.5	V	VCI
			× 3		2.4	-	5.0		
			× 4		2.4	-	3.75		
			× 5		2.4	-	3.0		
Voltage converter output voltage		VOUT	×2 / ×3 / ×4 / ×5 voltage conversion (no-load)		95	99	-	%	VOUT
Voltage regulator operating voltage		VOUT			6.0	-	16.0	V	VOUT
Voltage follower operating voltage		V0			4.5	-	15.0	V	V0 *9
Reference voltage		VREF	VDD= 3.0V Ta = 25°C	- 0.05%/°C	2.04	2.1	2.16	V	*10

AC Characteristics

Read / Write Characteristics (6800-series Microprocessor)



(VDD = 2.4 to 3.6V, Ta = -40 to +85°C)

Item	Signal	Symbol	Min.	Typ.	Max.	Unit	Remark
Address setup time	RS,RW	t_{AS68}	0	-	-	ns	
Address hold time	RS,RW	t_{AH68}	0	-	-	ns	
System cycle time	E	t_{CY68}	300	-	-	ns	
Enable Pulse High Width	Read	$t_{PWH68(R)}$	120			ns	
	Write	$t_{PWH68(W)}$	60			ns	
Enable Pulse Low Width	Read	$t_{PWL68(R)}$	60			ns	
	Write	$t_{PWL68(W)}$	60			ns	
Data setup time	DB7 To DB0	t_{DS68}	40	-	-	ns	
Data hold time		t_{DH68}	15	-	-	ns	
Access time		t_{ACC68}	-	-	140	ns	CL = 100 pF
Output disable time		t_{OD68}	10	-	100	ns	

(VDD = 4.5 to 5.5V, Ta = -40 to +85°C)

Item	Signal	Symbol	Min.	Typ.	Max.	Unit	Remark
Address setup time	RS,RW	t_{AS68}	0	-	-	ns	
Address hold time	RS,RW	t_{AH68}	0	-	-	ns	
System cycle time	E	t_{CY68}	166	-	-	ns	
Enable Pulse High Width	Read	$t_{PWH68(R)}$	70			ns	
	Write	$t_{PWH68(W)}$	30			ns	
Enable Pulse Low Width	Read	$t_{PWL68(R)}$	30			ns	
	Write	$t_{PWL68(W)}$	30			ns	
Data setup time	DB7 To DB0	t_{DS68}	30	-	-	ns	
Data hold time		t_{DH68}	10	-	-	ns	
Access time		t_{ACC68}	-	-	70	ns	CL = 100 pF
Output disable time		t_{OD68}	10	-	50	ns	

Note: 1. The input signal rising time and falling time (t_r , t_f) is specified at 15ns or less. Or ($t_r + t_f$) < ($t_{CY68} - t_{PWL68(W)} - t_{PWH68(W)}$) for write, ($t_r + t_f$) < ($t_{CY68} - t_{PWL68(R)} - t_{PWH68(R)}$) for read.

Application Example

1.

8951	P1.0	DB0
	P1.1	DB1
	P1.2	DB2
	P1.3	DB3
	P1.4	DB4
	P1.5	DB5
	P1.6	DB6
	P1.7	DB7
	P3.0	E
	P3.1	RW
	P3.2	RS
	P3.3	RESETB
	P3.4	CS1
		S6b0724

2.

