

DISPLAYTRONIC

A DIVISION OF ZE XIAMEN CO., LTD.

SPECIFICATIONS FOR LIQUID CRYSTAL DISPLAY

PART NUMBER:

AGM 1264A SERIES

DATE:

NOV 8, 2005

1.0 MECHANICAL DIAGRAM

Pin assignment

NO.	PIN NAME	NO.	PIN NAME
1	VSS	11	DB4
2	VDD	12	DB5
3	RES	13	DB6
4	A0	14	DB7
5	R/W	15	P/S
6	E	16	CS1
7	DB0	17	HPN
8	DB1	18	LED+
9	DB2	19	C86
10	DB3	20	NC

NOTE:

- UNLESS OTHERWISE SPECIFIED STANDARD TOLERANCE $\pm 0.2\text{mm}$.
- LCD DISPLAY MODE: STN/POSITIVE/YELLOW-GREEN/TRANSPARENT TYPE
- VIEWING ANGLE: 6° O'CLOCK.
- OPERATING TEMP: -20 TO 70 DEGREE
- STORAGE TEMP: -30 TO 80 DEGREE.
- THE LCD DRIVING CONDITION IS: 1/650, 1/9B, VOP=8.7V.
- NO ANY TRACE AND GROUND PLANE AT PCB.
- LOGIC SUPPLY VOLTAGE $V_{cc}=2.7\sim 3.3\text{V}$
- LOGIC SUPPLY CURRENT MAX. 0.65MA
- LED SUPPLY CURRENT $I_{led}=0.9\sim 1.2\text{MA}@3.3\text{V}$
- AVERAGE LUMINOUS=1.0 CD/M AT $I_{led}=0.9\sim 1.2\text{MA}@3.3\text{V}$
- 2,3,4,5,6,16PIN ESD PROTECT.

REVISION RECORD

NO.	NAME	DATE	DRAWING NO.	DRAWN BY:	DATE:
1			AGM1264A-LCM-01	CHECKED BY:	DATE:
2			REVISION:	APPROVED BY:	DATE:
3			VER.1		UNIT: mm
4					SCALE:

TITLE: AGM1264A SERIES LCD MODULE

DISPLAYS, INC.

2.0 MECHANICAL SPECS

1. Number of dots	128x64
2. Module dimention	100mm(L) x 62mm(W) x 16.1mm(H) for LED backlight version
3. Effective display area	70mm(W)x42.5mm(H)
4. Dot Size	0.5mm(W) x 0.45mm(H)
5. Dot Pitch	0.55mm(W) x 0.5mm(H)
6. Driver method	1/65 duty, 1/9 bias, Vop=8.7v
7. Display mode	Positive
8. LCD type	STN/YELLOW-GREEN
9. Controller IC	NT7532
10. Display type	TRANSFLECTIVE
11. Backlight Options	Led, Super Green
12. Temperature Range Options	-20°C ~ 70°C
13. Temperature Range Storage	-30°C ~ 80°C

3.0 ABSOLUTE MAXIMUM RATINGS

Item	Min	Typ	Max	Unit
Operating temperature	-40	-	85	°C
Storage temperature	-55	-	125	°C
DC Supply Voltage(VDD VDD2)	-0.3		3.6	V
DC Supply Voltage(Vout)	-0.3		12	V
DC Supply Voltage(V0)	-0.3		9.9	V
Input Voltage	-0.3		VDD+0.3	V

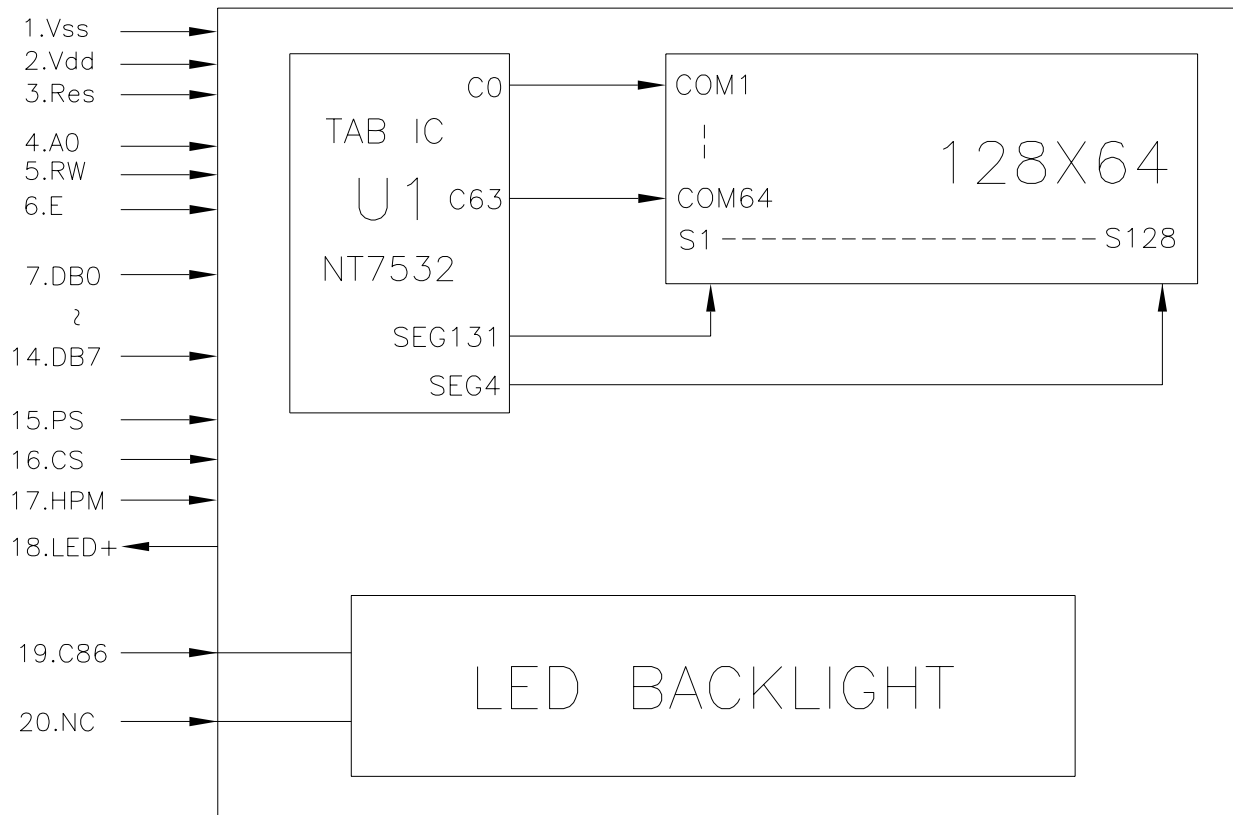
4.0 ELECTRICAL CHARACTERISTICS

Item	Symbol	Condition	Min	Typ	Max	Unit
Power Supply	$V_{DD}-V_{SS}$			3.3		V
Input voltage (high)	V_{ih}	H level	$0.8 V_{DD}$	-	$V_{DD} + 0.3$	V
Input voltage (low)	V_{il}	L level	0	-	$0.2 V_{DD}$	V
Power Supply Current	I_{dd}	Vdd=3.3V		1.5	1.8	mA
LED Power Supply Voltage	$V_{LED+} - V_{SS}$		2.5	3.3	3.6	V
LED Power Supply Current	I_{BL}	RL=820Ω		0.9	1.2	mA

5.0 OPTICAL CHARACTERISTICS

NO	Item	Symbol	Temp	Min.	Typ.	Max.	Unit
1	Vth Voltage	0°C	Vth 2	—	9.02	9.26	V
		25°C	Vth 1	—	8.84	9.05	
		70°C	Vth 2	—	8.61	8.88	
2	Contrast Ratio	Cr	25°C	2	6.47	—	—
3	Viewing Angle	$\theta 2-\theta 1$		28	—	102	deg.
		$\phi 2-\phi 1$		—	30	—	
4	Responce Tlme	Tr	0°C	—	—	—	msec
			25°C	—	133	171	
		Tf	0°C	—	—	—	
			25°C	—	205	345	
5	Current Consumption		25°C	—	—	1.2	$\mu\text{A}/\text{Cm}^2$
6	Frame Frequency	fF	—	—	64	—	Hz

6.0 BLOCK DIAGRAM



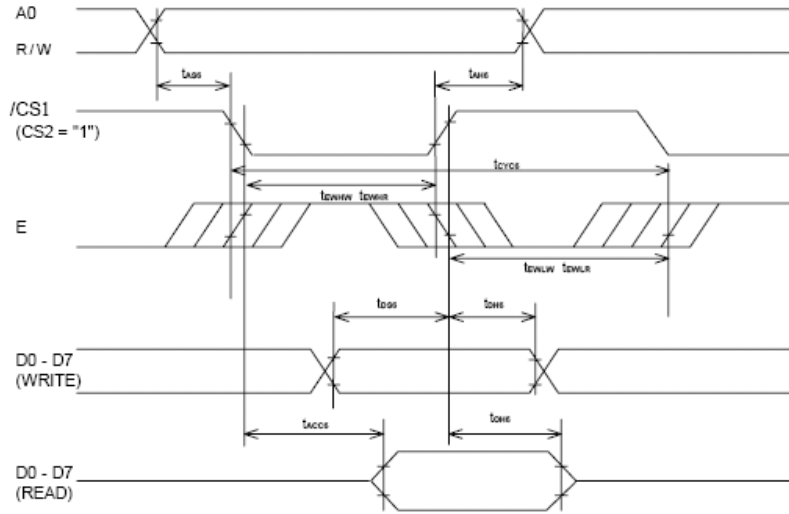
7.0 PIN ASSIGNMENT

Pin No	I/O	Name	Description
1	—	V _{SS}	Chip's GND pin.
2	—	V _{DD}	Chip's power supply pin +3.3V.
3	I	$\overline{\text{RES}}$	When $\overline{\text{RES}}$ is set to "L", the settings are initialized. The reset operation is performed by the $\overline{\text{RES}}$ signal level.
4	I	A0	This is connected to the least significant bit of the normal MPU address bus, and it determines whether the data bits are data or a command A0 = "H" indicating that D0 to D7 are display data, and A0 = "L" indicating that D0 to D7 are control data.
5	I	$\text{R}/\overline{\text{W}}$	When connected to a 6800 series MPU, this is the read/write control signal input terminal when $\text{R}/\overline{\text{W}}$ ="H";Read, When $\text{R}/\overline{\text{W}}$ ="L";Write.
6	I	E	When connected to a 6800 series MPU, this is active HIGH, This is used as an enable clock input of the 6800 series MPU.
7 14	I/O	DB0 DB7	This is an 8-bit bidirectional data bus that connects to an 8-bit or 16-bit standard MPU data bus. When the chip select is inactive, Do to D7 are set to high impedance.
15	I	P/S	This is the paralled data input/serial data input switch terminal. P/S="H":Paralled data input. P/S="L":Serial data input.
16	I	$\overline{\text{CS1}}$	When CS1="L"(CS2="H"), then the chip select become active, and data/command I/O is enabled.
17	I	$\overline{\text{HPM}}$	This is the power control terminal for the power supply circuit for liquid crystal drive. HPM="H", Normal mode. HPM="L", High power mode.
18	—	LED(+)	LED B/L power supply pin +3.3V.
19	I	C86	This the MPU interface switch terminal C86="H":6800 serial MPU interface. C86="L":8080 serial MPU interface.
20	—	NC	Nc connection.

NOTE:The P/S, HPM, C86 have been connected to Vdd. So you can negnore the three pins.

8.0 TIMING CHARACTERISTICS

System buses Read/Write Characteristics 2 (6800 Series MPU)



($V_{DD} = 2.4 - 3.5V$, $T_A = -20 - 70^{\circ}C$)

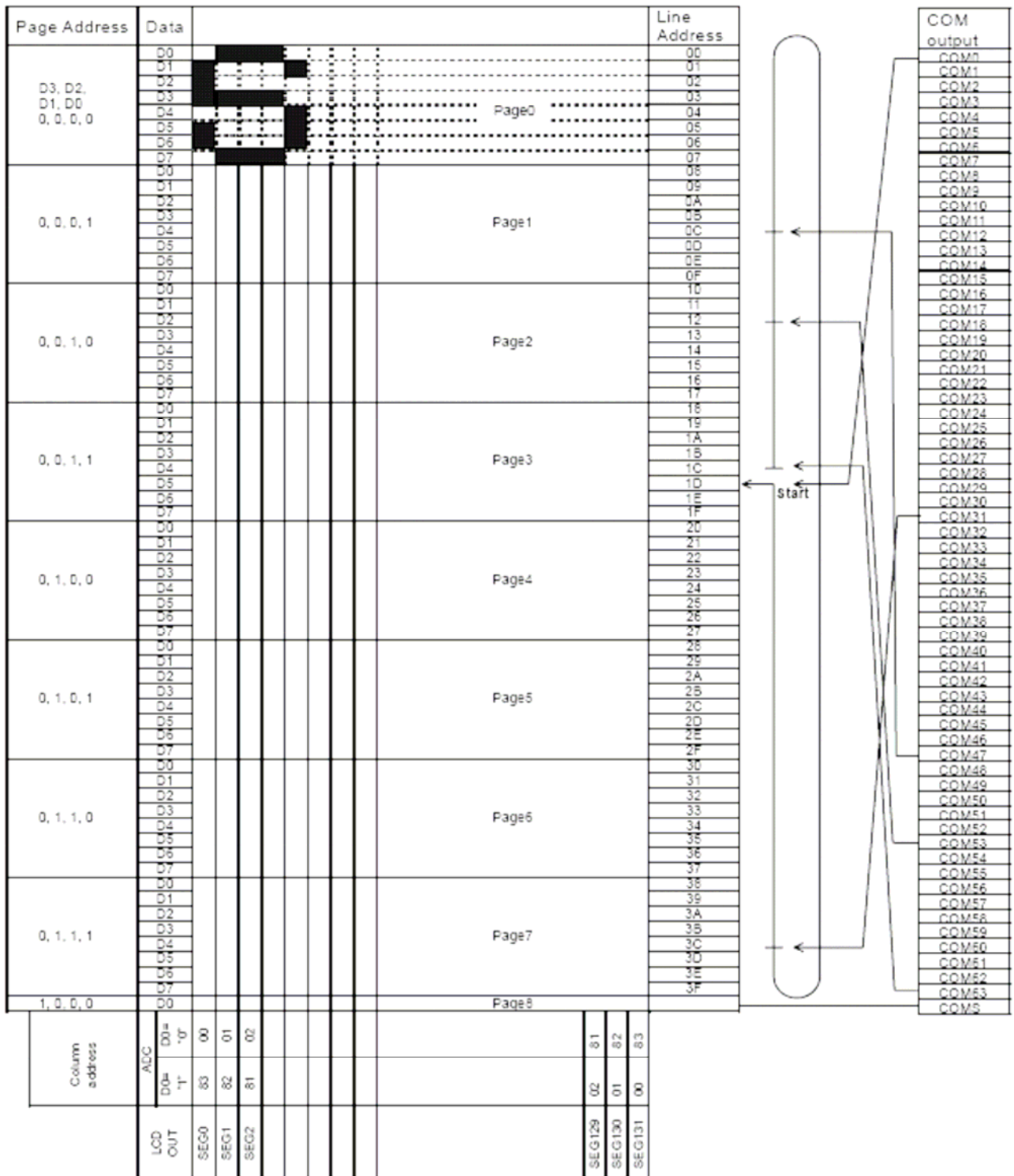
Symbol	Parameter	Min.	Typ.	Max.	Unit	Conditions
tCYC6	System cycle time	300			ns	
tAS6	Address setup time	0			ns	
tAH6	Address hold time	0			ns	
tDS6	Data setup time	40			ns	
tDH6	Data hold time	15			ns	
tOH6	Output disable time	10		100	ns	$C_L = 100pF$
tACC6	Access time			140	ns	$C_L = 100pF$
tEWHR	Enable H pulse width (Read)	120			ns	
tEWHW	Enable H pulse width (Write)	90			ns	
tEWLR	Enable L pulse width (Read)	60			ns	
tEWLW	Enable L pulse width (Write)	120			ns	

*1. The input signal rise time and fall time (t_r , t_f) is specified at 15ns or less. When the system cycle time is extremely fast, $(t_r+t_f) \leq (t_{CYC6}-t_{EWLW}-t_{EWHW})$ for $(t_r+t_f) \leq (t_{CYC6}-t_{EWLR}-t_{EWHR})$ are specified.

*2. All timing is specified using 20% and 80% of V_{DD} as the reference.

*3. tEWLW and tEWLR are specified as the overlap between /CS1 being "L" (CS2 = "H") and E.

9.0 GRAPHIC DISPLAY DATA RAM(GDRAM) ADDRESS MAP



10.0 COMMAND SET DESCRIPTION

Instuction	Code											Function
	A0	R/D	WR	D7	D6	D5	D4	D3	D2	D1	D0	
(1) Display ON/OFF	0	1	0	1	0	1	0	1	1	1	D	Turns on LCD panel when goes high, and turns off when goes low
(2) Set Dlsplay Start Line	0	1	0	0	1	Display start address					Specifies RAM display line for COM0	
(3) Set Page Address	0	1	0	1	0	1	1	Page address				Sets the display RAM page in Page Address register
(4-1) Set Column Address 4 higher bits	0	1	0	0	0	0	1	Higher column address				Sets 4 higher blts of column address of display RAM in register
(4-2) Set Column Address 4 lower blts	0	1	0	0	0	0	0	lower column address				Sets 4 lower blts of column address of dlsplay RAM In register
(5) Read Status	0	0	1	Status				0	0	0	0	Reads the status information
(6) Write Dlsplay Data	1	1	0	Write data								Writes data in display RAM
(7) Read Display Data	1	0	1	Read data								Reads data from dlsplay RAM
(8) ADC select	0	1	0	1	0	1	0	0	0	0	D	Sets the dlsplay RAM address SEG output correspondence
(9) Normal/Reverse Dlsplay	0	1	0	1	0	1	0	0	1	1	D	Normal indication when low, but full Indicatlon when high
(10) Entire Display ON/OFF	0	1	0	1	0	1	0	0	1	0	0 1	Selects normal display (0) or Entire Display ON (1)
(11) Set LCD Bias	0	1	0	1	0	1	0	0	0	1	D	Sets LCD drive voltage blas ratio
(12) Read-Modify-Write	0	1	0	1	1	1	0	0	0	0	0	Increments Column Address counter during each write
(13) End	0	1	0	1	1	1	0	1	1	1	0	Releases the Read-Modify-Write
(14) Reset	0	1	0	1	1	1	0	0	0	1	0	Resets internal functions
(15) Common output mode select	0	1	0	1	1	0	0	D	*	*	*	Selects COM output scan direction, *Invalid data
(16) Set Power Control	0	1	0	0	0	1	0	1	Operation status		Selects the power clrcult operatlon mode	
(17) V0 voltage regulator Internal reslstor ratlo set	0	1	0	0	0	1	0	0	Reslstor ratio		Select internal resistor ratio Rb/ Ra) mode	
(18) Electronic volume mode set Electronic Volume Register set	0	1	0	1	0	0	0	0	0	0	1	Sets the V0 output voltage electronic volume register
	0	1	0	*	*	Electronic control value						
(19) Set static Indlcator On/Off Set Statlc Indlcator register	0	1	0	1	0	1	0	1	1	0	D	Sets static indicator On/Off 0: OFF 1: ON
	0	1	0	*	*	*	*	*	*	Mode		Sets the flashing mode
(20) Power Save	-	-	-	-	-	-	-	-	-	-	-	Commpound command of dlsplay OFF and entire display ON
(21) NOP	0	1	0	1	1	1	0	0	0	1	1	Command for non-operation
(22) Test Command	0	1	0	1	1	1	1	*	*	*	*	IC Test command. Do not use!
(23) Test Mode Reset	0	1	0	1	1	1	1	0	0	0	0	Command of test mode reset

Note: Do not use any other command, or system malfunction may result.