	液晶模块说明书	SPEC NO	
	YM12232C	REV NO	1.0

液晶显示模块
中文说明书

产品类型:	**标准产品**
产品系列号：	YM12232C
产品描述:	122x32 **图形点阵** **控制器：**SED1520，LED **薄背光**

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发行日期:	2002.8

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目　　录

一.基本特征

1. 显示特性

(1) STN 正显 半透模式;
(2) 显示颜色:绿底兰字;
(3) 显示角度:6 点钟直视;
(4) 驱动方式:1/32 Duty,1/6 Bias

2. 机械特性

(1) 外观尺寸:见外观图;
(2) 点阵:122×32 点;
(3) 点尺寸:0.36(W)×0.36(H) (MM);
(4) 点间距:0.40(W)×0.40(H) (MM)

3.引脚特性:

管脚号	管脚名称	LEVER	管脚功能描述
1	VDD	+3∽5V	电源电压
2	VSS	0V	电源地
3	VLCD	--	LCD 外接驱动负电压
4	RES	H/L	复位信号(低电平有效)
5	E1	H/L	读写使能信号
6	E2	H/L	读写使能信号)
7	R/W	H/L	读写选择信号
8	A0	H/L	D/I=“H”，表示 DB7～DB0 为显示数据 D/I=“L”，表示 DB7～DB0 为显示指令数据
9	DB0	H/L	数据线
10	DB1	H/L	数据线
11	DB2	H/L	数据线
12	DB3	H/L	数据线
13	DB4	H/L	数据线
14	DB5	H/L	数据线
15	DB6	H/L	数据线
16	DB7	H/L	数据线

二.限定参数:

Item	Symbol	Standard Value	Unit	Condition
Power supply voltage	VDD	0~+7.0	V	
LCD driving voltage	VDD~VLCD	0~+12.0		
Input voltage	VIN	VND≤VIN≤VDD		
Operating temperature range	Top	0~+40	℃	No condition
Storage temperature range	Tst	-10~+60		

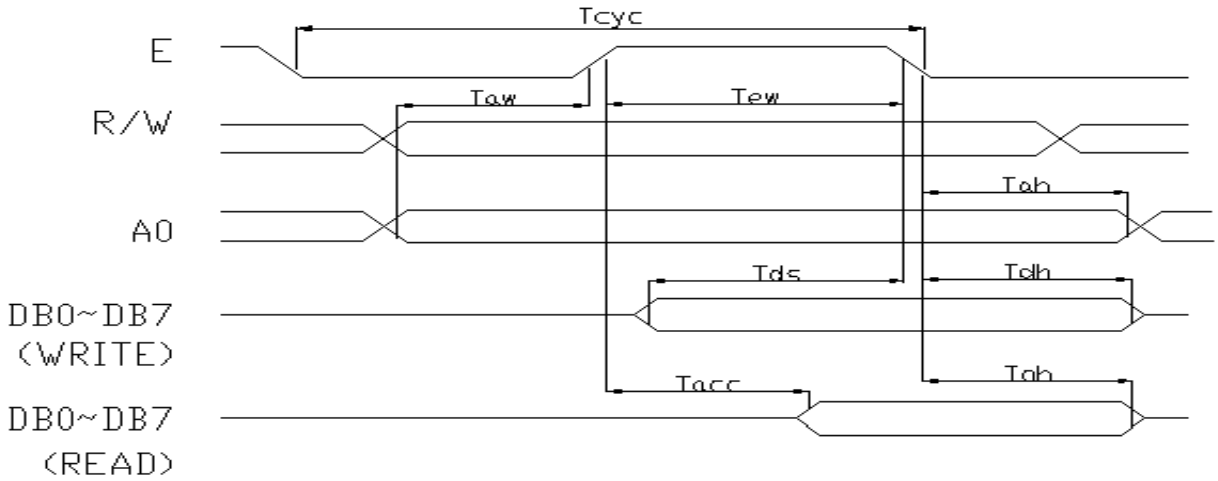
三. 直流特性:

（Ta=0~40℃，VDD=2.7~4.5V）

Item	Symbol	Standard Value			Unit
		MIN	TYP	MAX	
Power Supply	VDD	2.4	5.0	6.0	V
LCD Driving Voltage	VLCD	--	0	--	V
Input High Voltage	VIH	0.8VDD		VDD	V
Output High Voltage	VOH	0.5VDD			V
Input Low Voltage	VIL	GND		0.2VDD	V
Output Low Voltage	VOL			0.1VDD	V
Power Supply Current	IDD		--	240	uA
I/0 Leak Current	IL	-3.0		3.0	uA
Stand-by Current	IDDQ		0.05	10.	uA

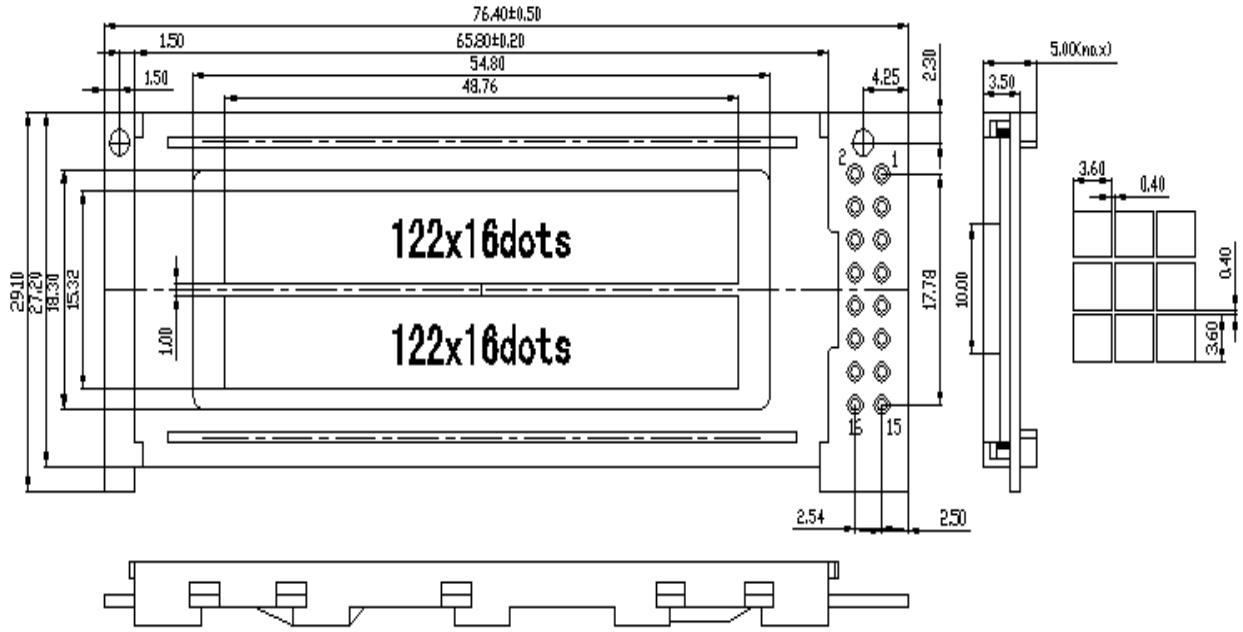
四. 交流特性:

Signal	Parameter	Symbol	MIN	MAX	Unit	Condition
A0,/RW	System cycle time	Tcyc	2000	--	ns	
	Address setup time	Taw	40	--	ns	
	Address hold time	Tah	20	--	ns	
D0~D7	Data setup time	Tds	160	--	ns	
	Data hold time	Tdh	20	--	ns	
	Output disable time	Tch	20	120	ns	CL=100p F
	Access time	Tacc	--	180	ns	
E	Enable pulse width(Read)	Tew	200	--		
	Enable pulse width(Write)		160	--	ns	
Input wave width rise time		Tr	--	15	ns	

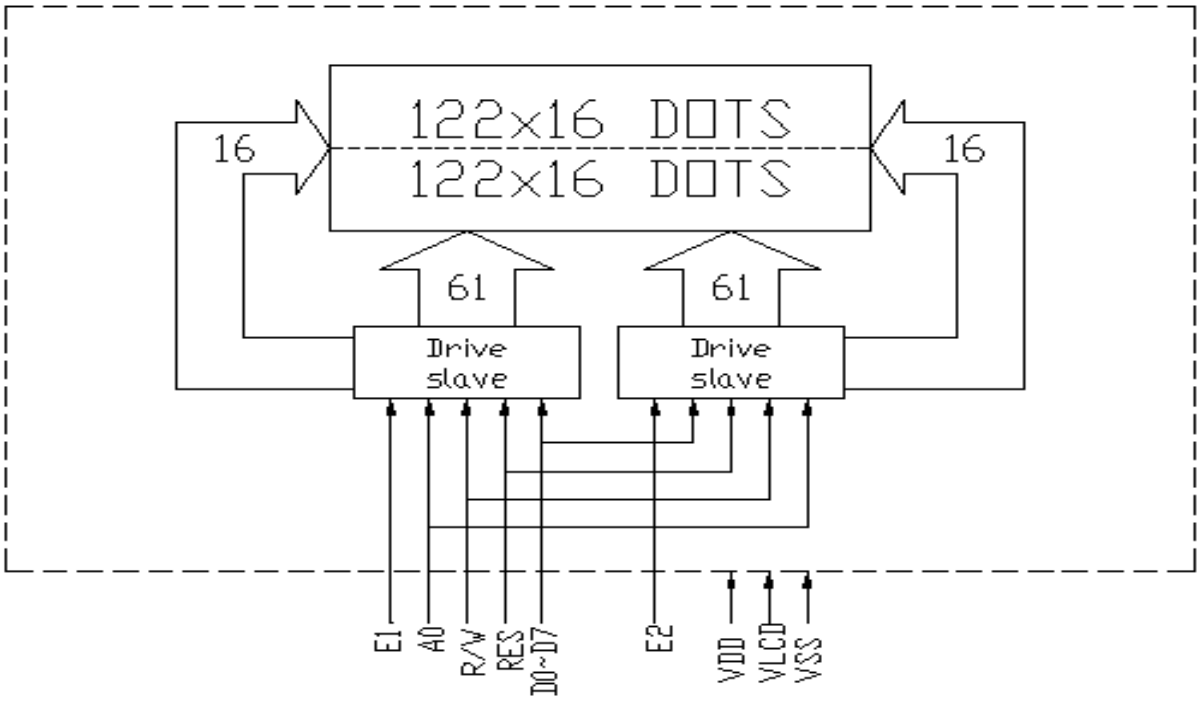


Bus Read /Write Operaion Sequence

五. 机械尺寸图:



六. 原理图:



七. DDRAM 地址表

Page	Data		Com No	Drive
2	D0 : D7	: : 122 X 16 PLXELS	0 : : 15	Slave
3	D0 : D7	: : 122 X 16 PLXELS		
0	D0 : D7	: : 122 X 16 PLXELS	16 : : 31	Master
1	D0 : D7	: : 122 X 16 PLXELS		

Column Addr	ADC=0	00H •••• 3C	00H •••• 3C
	Seg No	0 •••• 60	0 •••• 60
	Drive	Slave	Master

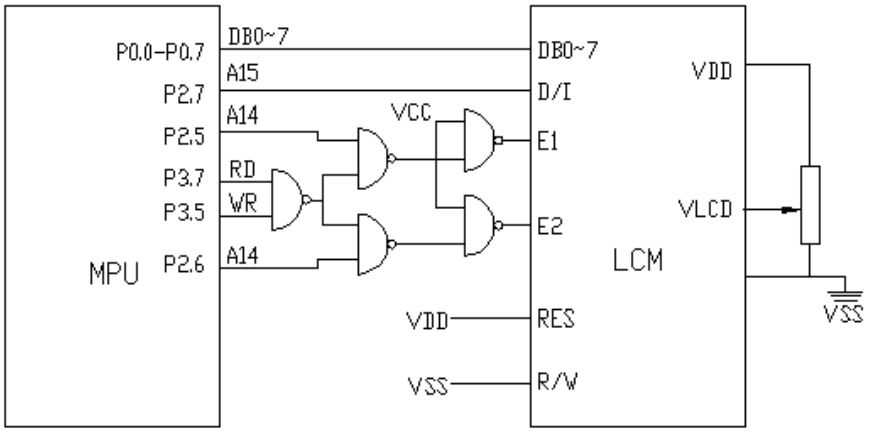
八. 指令表:

INSTRCTION	CODE										FUNCTION
	R/W	D/I	D7	D6	D5	D4	D3	D2	D1	D0	
DISPLAY ON/OFF	0	0	1	0	1	0	1	1	1	1/0	Switch the entire display ON or OFF，regardless of the display RAM's Data or the internal status. 1: ON 0: OFF
Display Start Line	0	0	1	1	0	Display start Line (0 •••• 31)					Determines the line of RAM data to be displayed at the display's top line (COM0)
Page Address set	0	0	1	0	1	1	1	0	PAGE: (0~3)		Sets the page of the Display in the Address register(X address)
Column (seg) Address set	0	0	0	Column address(0~79)							Sets the column of the Display in the column address register(Y address)
Status Read	1	0	Busy	ADC	ON/OFF	RST	0	0	0	0	Read status Busy 1:insternal operation 0:Ready ADC 1:Rightward output 0:Leftward RST 1:Reseting 0:Normal ON/OFF 1:Display off 0:Display on

Write Display Data	0	1	Write data								Writes the data on the Data bus to RAM
Read Display Data	1	1	Read data								Reads data from the Display RAM onto the Data BUS
ADC Select	0	0	1	0	1	0	0	0	0	0/1	Determine the clockwise or Counterclockwise reading of the display Data RAM 0: Clockwise 1: Counterclockwise
Static Drive ON/OFF	0	0	1	0	1	0	0	1	0	0/1	Select the dynamic or static Driving. 1:Static driving 0: Dynamic driving
Duty Ratio Select	0	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	0	1	1	1	0	0	0	0	0	Increment the column Address register when writing. But no-change when reading.
End	0	0	1	1	1	0	1	1	1	0	Release from the Read Modify Write Mode.
Reset	0	0	1	1	1	0	0	0	1	0	Set the Display Start Line Register to 1st line, column Address count to 0 and Page Add. Resister to 0.
Power Save(dual command)	0 0	0 0	0 0	1 1	0 0	1 1	0 0	1 1	1 0	0 1	Set the power save mode by selecting display off and static driving on

九．应用举例

YM12232C与单片机 8031 的一种接口如图 5 所示：（VDD=+5V）



利用图 5 举例介绍编程实例

```
            ORG   0100H
INITM：MOV   A，#0E2H            ；RESET
        LCALL    OUTMI
        LCALL    OUTSI
        MOV   A，#0AEH           ；OFF DISPLAY
        LCALL    OUTMI
        LCALL    OUTSI
        MOV   A，#0A4H           ；OFF STATIC DRIVE
        LCALL    OUTMI
        LCALL   OUTSI
        MOV   A，#0A9H           ；SELECT 1/32 DUTY
        LCALL    OUTMI
        LCALL    OUTSI
        MOV   A，#0A0H           ；ADC SELECT RIGHTWARS OUTPUT
        LCALL    OUTMI
        LCALL    OUTSI
        MOV   A，#0EEH           ；READ MODIFY WRITE OFF
        LCALL    OUTMI
        LCALL    OUTSI
        MOV   A，#00H            ；COLUMN ADDRESS SET
        LCALL    OUTMI
        LCALL    OUTSI
        MOV   A，#0C0H           ；SET DISPLAY START LINE
        LCALL    OUTMI
        LCALL    OUTSI
        MOV   A，#0AFH           ；ON DISPLAY
        LCALL    OUTMI
        LCALL    OUTSI
；DISPLAY  “*”
        MOV   R2，#0B8H
  DIS2：MOV   A，R2
        LCALL   OUTMI
        LCALL   OUTSI
        MOV A，#00H
        LCALL   OUTMI
        LCALL   OUTSI
        MOV   R1，#1FH
  DIS1：MOV   A，#55H
        LCALL    OUTMI
        LCALL    OUTSI
        MOV   A，#0AAH
        LCALL    OUTMI
```

```
        LCALL   OUTSI
        DJNZ  R1，DIS1
        INC  R2
        CJNE  R2，#0BCH，DIS2
        LCALL   MS40
        LCALL   MS40
        LCALL   MS40
        LCALL   MS40
        MOV  A，#0AFH

；DISPLAY“横条”
        MOV  R2，#0B8H
  DIS3：MOV  A，R2
        LCALL   OUTMI
        LCALL   OUTSI
        MOV  A，#00H
        LCALL   OUTMI
        LCALL   OUTSI
        MOV  R1，#3DH
  DIS4：MOV  A，#55H
        LCALL   OUTMD
        LCALL   OUTSD
        DJNZ  R1 ，DIS4
        INC  R2
        CJIE  R2，#0BCH，DIS3
        LCALL   MS40
        LCALL   MS40
        LCALL   MS40
        LCALL   MS40
        MOV  A，#0AFH
        LCALL   OUTMI
        LCALL   OUTSI

；DISPLAY“竖条”
        MOV  R2，#0B8H
  DIS5：MOV  A，R2
        LCALL   OUTMI
        LCALL   OUTSI
        MOV  A，#00H
        LCALL   OUTMI
        LCALL   OUTSI
        MOV  R1，#1EH
  DIS6：MOV  A，#00H
        LCALL   OUTMI
```

```
        LCALL    OUTSI
        MOV   A，#0FFH
        LCALL    OUTMI
        LCALL    OUTSI
        DJNZ   R1，DIS6
        MOV   A，#3CH
        LCALL    OUTMI
        LCALL    OUTSI
        MOV   A，#00H
        LCALL    OUTMI
        LCALL    OUTSI
        INC   R2
        CJNE   R2，#0BCH，DIS5
        LCALL    MS40
        LCALL    MS40
        LCALL    MS40
        LCALL    MS40
        MOV   A，#0AFH

；DISPLAY 汉字“两只黄鹂鸣翠柳 一行白鹭上青天”
INITMC：MOV   DPTR，#CHINESE
         MOV   R1   #00H
         MOV   B，#B8H
DISPWORDM：PUSH   B
        MOV    A，B
        LCALL   OUTMI
        LCALL   OUTST
        MOV   A，#00H
        LCALL   OUTMI
        MOV   R2   #7AH
DISPWORD1：MOV   A，R1
        MOVC   A，@A+DPTR
        LCALL   OUTMD
        INC   DPTR
        DEC   R2
        CJNE   R2，#3DH，DISPWORD1
        MOV   A，#00H
        LCALL   OUTST
DISPWORD2：MOV   A，R1
        MOVC   A，@A+DPTR
        LCALL   OUTSD
        INC   DPTR
        DJNZ   R2，DISPWORD2
```

```
        MOV   R1，#00H
        POP   B
        INC   B
        MOV   A，B
        CINZ   A，#0BCH，DISPWORDM
        LCALL   MS40
        LCALL   MS40
        LCALL   MS40
        LCALL   MS40

        AJMP   INITM

MS40：  MOV   R7，#0E8H
MS2：   MOV   R6，#0FFH
MS1：   DJNA   R6，MS1
        DJNZ   R7，MS2
        RET

；OUT   INSTRCTION   TO   MASTER 6450
OUTMI：PUSH   DPH
        PUSH   DPL
        MOV   DPTR，#6000H
        MOVX   @DPTR，A
        POP   DPL
        POP   DPH
        RET

；OUT   INSRCTION   TO SLAVE 6450
OUTSI：PUSH   DPH
       PUSH   DPL
       MOV   DPTR，#5000H
       MOVX   @DPTR，A
       POP   DPL
       POP   DPH
       RET

；OUT   DATA TO   MASTER 6450
OUTMD：PUSH   DPH
       PUSH   DPL
       MOV   DPTR，#0E000H
       MOVX   @DPTR，A
       POP   DPL
       POP   DPH
       RET
```

```
; OUT  DATA TO  SLAVE 6450
OUTSD: PUSH  DPH
       PUSH  DPL
       MOV  DPTR, #0D000H
       MOVX  @DPTR, A
       POP  DPL
       POP  DPH
       RET

CHINESE:; (PAGE0)
DB 00H,00H
DB 00H,80H,80H,80H,80H,80H,80H,80H,80H,80H,80H,80H,80H,80H,0C0H,80H,00
DB 00,00,10H,88H,0C4H,23H,40H,42H,42H,42H,42H,42H,0C2H,43H,62H,40H,00
DB 00,00,00,0F8H,08H,0CH,0AH,09H,08H,08H,08H,08H,08H,0FCH,08H,00,00
DB 00,80H,0EEH,8AH,0FAH,0AAH,0AEH,80H,24H,0E3H,0B6H,0AAH,0B6H,0E2H,20H,20H,00
DB 00,00,00,00,00,00,00,00,0FFH,20H,20H,20H,30H,20H,00,00,00
DB 00,40H,44H,54H,54H,54H,54H,54H,7FH,54H,54H,54H,54H,56H,44H,40H,00
DB 00,40H,42H,42H,42H,42H,42H,42H,0FEH,42H,42H,42H,42H,43H,62H,40H,00
0B 00
; (PAGE1)
DB 00,00
0B 00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00
DB 00,02H,01H,00,0FFH,00,00,00,00,00,40H,80H,7FH,00,00,00,00
DB 00,00,00,7FH,21H,21H,21H,21H,21H,21H,21H,21H,7FH,00,00,00
DB 00,00,40H,40H,5H,52H,53H,56H,5AH,52H,5AH,56H,90H,90H,78H,10H,00
DB 00,40H,40H,40H,40H,40H,40H,40H,7FH,40H,40H,40H,40H,40H,60H,40H,00
DB 00,00,00,00,0FFH,15H,15H,15H,15H,15H,55H,95H,7FH,00,00,00,00
DB 00,80H,80H,40H,20H,10H.0CH,03H,00,03H,0CH,10H,20H,40H,0C0H,40H,00
DB 00
; (PAGE2)
DB 00,00
DB 00,02H,02H,0F2H,12H,12H,0FEH,12H,12H,12H,0FEH,12H,12H,0F2H,03H,02H,00
DB 00,00,00,00,0FCH,04H,04H,04H,04H,04H,04H,04H,0FEH,04H,00,00,00
DB 00,20H,20H,24H,24H,24H,3FH,24H,0E4H,24H,3FH,24H,24H,24H,30H,20H,00
DB 00,04H,0E4H,24H,0E4H,04H,0E4H,26H,0E4H,00,0FCH,06H,55H,84H,7CH,00,00
DB 00,00,0FCH,04H,04H,0FCH,04H,00,0FCH,06H,15H,44H,84H,7EH,04H,00,00
DB 00,00,40H,41H,55H,0C9H,41H,5FH,60H,41H,55H,0C9H,41H,5FH,40H,00,00
DB 00,10H,0D0H,0FFH,90H,10H,0FEH,02H,02H,0F9H,00,0FEH,02H,02H,0FFH,02H,00
DB 00
; (PAGE3)
DB 00,00
DB 00,00,00,0FFH,08H,04H,03H,14H,08H,04H,03H,44H,98H,7FH,00,00,00
DB 00,00,80H,40H,23H,11H,19H,01H,01H,01H,09H,11H,23H,60H,0C0H,00,00
```

```
DB 00,00,80H,80H,5FH,55H,35H,15H,1FH,15H,35H,35H,5FH,40H,80H,00,00
DB 00,00,7FH,02H,7FH,00,7FH,02H,7FH,10H,13H,12H,1AH,52H,82H,7EH,00
DB 00,00,0FH,04H,04H,0FH,10H,10H,13H,12H,12H,1AH,52H,82,7FH,02H,00
DB 00,08H,08H,0AH,09H,08H,09H,0AH,0FCH,0AH,09H,08H,09H,0AH,08H,08H,00
DB 00,01H,00,0FFH,00,01H,8FH,44H,22H,1FH,00,0FFH,08H,10H,0FH,00,00
DB 00
```