

# LCD12864 系列点阵型液晶显示模块

## 使用说明书

### 一、OCM12864 液晶显示模块概述

- OCM12864 液晶显示模块是 128×64 点阵型液晶显示模块，可显示各种字符及图形，可与 CPU 直接接口，具有 8 位标准数据总线、6 条控制线及电源线。采用 KS0107 控制 IC。
  - 外观尺寸：113×65×11mm(ocm12864-1)，93×70×10mm(ocm12864-2)  
78×70×10mm(ocm12864-3)，
  - 视域尺寸：73.4×38.8mm(ocm12864-1) 70.7×38mm(ocm12864-2)，  
64×44mm(ocm12864-3)
  - 重量：大约 g
- 补充说明：外观尺寸可根据用户的要求进行适度调整。

### 二、最大工作范围

- 逻辑工作电压(Vcc)：4.5~5.5V
- 电源地(GND)：0V
- LCD 驱动电压(Vee)：0~-10V
- 输入电压：Vee~Vdd
- 工作温度(Ta)：0~55℃(常温) / -20~70℃(宽温)
- 保存温度(Tstg)：-10~65℃

### 三、电气特性(测试条件 Ta=25, Vdd=5.0+/-0.25V)

- 输入高电平(Vih)：3.5Vmin
- 输入低电平(Vil)：0.55Vmax
- 输出高电平(Voh)：3.75Vmin
- 输出低电平(Vol)：1.0Vmax
- 工作电流：2.0mAmx

### 四、接口说明

12864-3A 接口说明表

管脚号	管脚	电平	说明
1	CSA	H/L	片选择信号，低电平时选择前 64 列。
2	CSB	H	片选择信号，低电平时选择后 64 列。
3	GND	0V	逻辑电源地。
4	VCC	5V	逻辑电源。
5	VEE	-10V	LCD 驱动电源。
6	D/I	H/L	数据\指令选择，高电平：数据 D0-D7 将送入显示 RAM； 低电平：数据 D0-D7 将送入指令寄存器执行。
7	R/W	H/L	读\写选择，高电平：读数据；低电平：写数据。
8	E	H. H/L	读写使能，高电平有效，下降沿锁定数据。
9	DB0	H/L	数据输入输出引脚。

10	DB1	H/L	数据输入输出引脚。
11	DB2	H/L	数据输入输出引脚。
12	DB3	H/L	数据输入输出引脚。
13	DB4	H/L	数据输入输出引脚。
14	DB5	H/L	数据输入输出引脚。
15	DB6	H/L	数据输入输出引脚。
16	DB7	H/L	数据输入输出引脚。

五、指令描述

1、显示开/关设置

CODE: R/W D/I DB7 DB6 DB5 DB4 DB3 DB2 DB1 DB0

L	L	L	L	H	H	H	H	H	H/L
---	---	---	---	---	---	---	---	---	-----

功能：设置屏幕显示开/关。  
DB0=H，开显示；DB0=L，关显示。不影响显示 RAM(DD RAM) 中的内容。

2、设置显示起始行

CODE: R/W D/I DB7 DB6 DB5 DB4 DB3 DB2 DB1 DB0

L	L	H	H	行地址（0~63）					
---	---	---	---	-----------	--	--	--	--	--

功能：执行该命令后，所设置的行将显示在屏幕的第一行。显示起始行是由 Z 地址计数器控制的，该命令自动将 A0-A5 位地址送入 Z 地址计数器，起始地址可以是 0-63 范围内任意一行。Z 地址计数器具有循环计数功能，用于显示行扫描同步，当扫描完一行后自动加一。

3、设置页地址

CODE: R/W D/I DB7 DB6 DB5 DB4 DB3 DB2 DB1 DB0

L	L	H	L	H	H	H	页地址（0~7）
---	---	---	---	---	---	---	----------

功能：执行本指令后，下面的读写操作将在指定页内，直到重新设置。页地址就是 DD RAM 的行地址，页地址存储在 X 地址计数器中，A2-A0 可表示 8 页，读写数据对页地址没有影响，除本指令可改变页地址外，复位信号(RST)可把页地址计数器内容清零。

DD RAM 地址映像表

Y 地址										
0	1	2	.....				61	62	63	
DB0										X=0
∫ PAGE0										
DB7										
DB0										X=1
∫ PAGE1										
DB7										

X=0

X=1

	::	
	::	
	::	
	::	
DB0		X=7
∫	PAGE6	
DB7		
DB0		X=8
∫	PAGE7	
DB7		

#### 4、设置列地址

CODE: R/W D/I DB7 DB6 DB5 DB4 DB3 DB2 DB1 DB0

L	L	L	H	列地址 (0~63)
---	---	---	---	------------

功能：DD RAM 的列地址存储在 Y 地址计数器中，读写数据对列地址有影响，在对 DD RAM 进行读写操作后，Y 地址自动加一。

#### 5、状态检测

CODE: R/W D/I DB7 DB6 DB5 DB4 DB3 DB2 DB1 DB0

H	L	BF	L	ON/OFF	RST	L	L	L	L
---	---	----	---	--------	-----	---	---	---	---

功能：读忙信号标志位 (BF)、复位标志位 (RST) 以及显示状态位 (ON/OFF)。

BF=H：内部正在执行操作； BF=L：空闲状态。

RST=H：正处于复位初始化状态； RST=L：正常状态。

ON/OFF=H：表示显示关闭； ON/OFF=L：表示显示开。

#### 6、写显示数据

CODE: R/W D/I DB7 DB6 DB5 DB4 DB3 DB2 DB1 DB0

L	H	D7	D6	D5	D4	D3	D2	D1	D0
---	---	----	----	----	----	----	----	----	----

功能：写数据到 DD RAM，DD RAM 是存储图形显示数据的，写指令执行后 Y 地址计数器自动加 1。D7-D0 位数据为 1 表示显示，数据为 0 表示不显示。写数据到 DD RAM 前，要先执行“设置页地址”及“设置列地址”命令。

#### 7、读显示数据

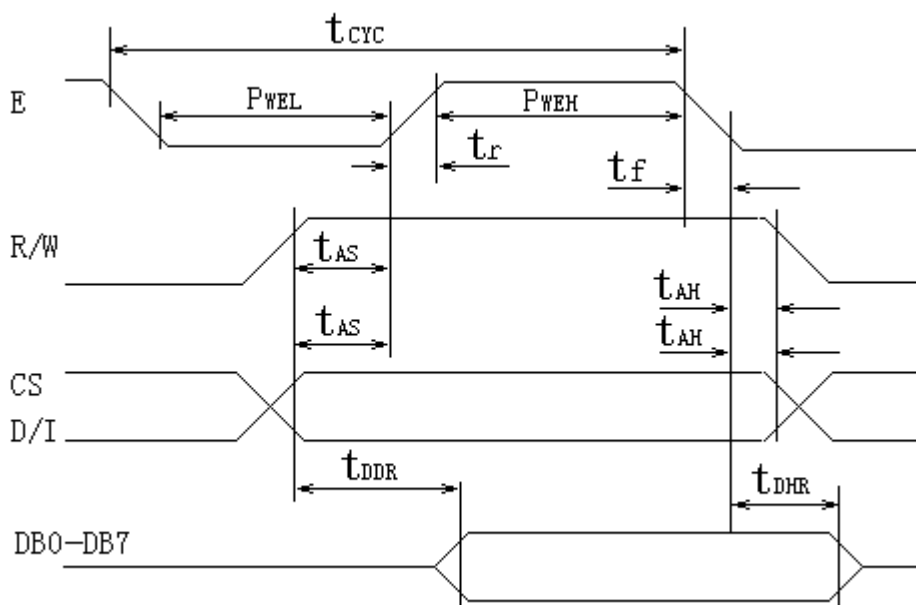
CODE: RS R/W DB7 DB6 DB5 DB4 DB3 DB2 DB1 DB0

H	H	D7	D6	D5	D4	D3	D2	D1	D0
---	---	----	----	----	----	----	----	----	----

功能：从 DD RAM 读数据，读指令执行后 Y 地址计数器自动加 1。从 DD RAM 读数据前要先执行“设置页地址”及“设置列地址”命令。

### 六、接口时序

#### 1. 写操作时序



时序 1

## 1. 读操作时序

时序 2

时序参数表:

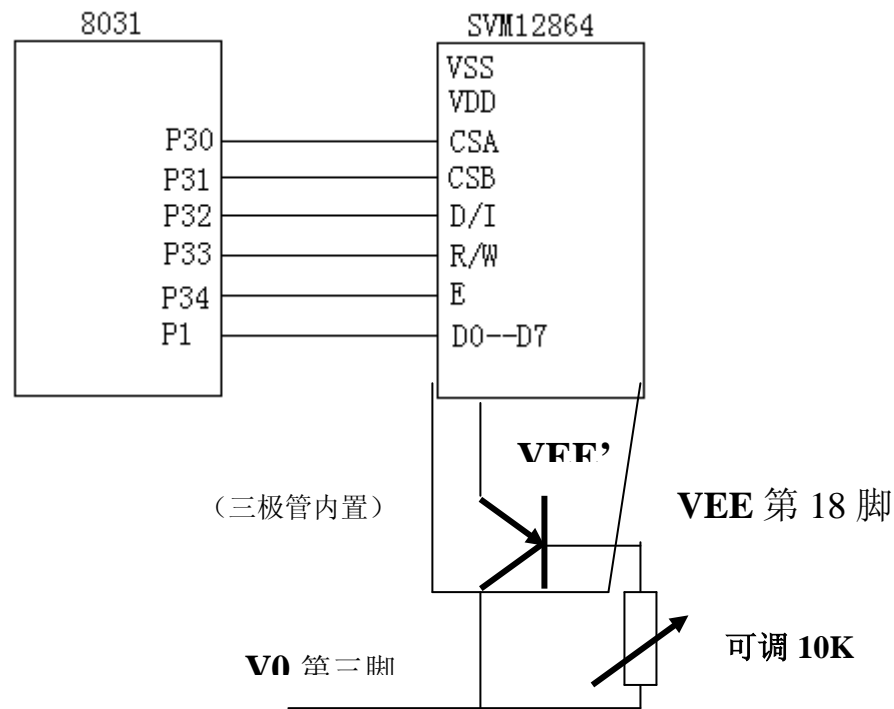
名称	符号	最小值	典型值	最大值	单位
E 周期时间	T <sub>cyc</sub>	1000			ns
E 高电平宽度	P <sub>weh</sub>	450			ns
E 低电平宽度	P <sub>wel</sub>	450			ns
E 上升时间	T <sub>r</sub>			25	ns
E 下降时间	T <sub>f</sub>			25	ns
地址建立时间	T <sub>as</sub>	140			ns
地址保持时间	t <sub>aw</sub>	10			ns
数据建立时间	T <sub>dsw</sub>	200			ns
数据延迟时间	T <sub>ddr</sub>			320	ns
写数据保持时间	T <sub>dhw</sub>	10			ns
读数据保持时间	T <sub>dhr</sub>	20			ns

## 七、屏幕显示与 DD RAM 地址映射关系

	Y1	Y2	Y3	Y4	.....	Y62	Y63	Y64	
Line 0	1/0	1/0	1/0	1/0	.....	1/0	1/0	1/0	DB0
Line 1	1/0	1/0	1/0	1/0	.....	1/0	1/0	1/0	DB1
Line 2	1/0	1/0	1/0	1/0	.....	1/0	1/0	1/0	DB2
Line 3	1/0	1/0	1/0	1/0	.....	1/0	1/0	1/0	DB3
X=0 Line 4	1/0	1/0	1/0	1/0	.....	1/0	1/0	1/0	DB4
Line 5	1/0	1/0	1/0	1/0	.....	1/0	1/0	1/0	DB5
Line 6	1/0	1/0	1/0	1/0	.....	1/0	1/0	1/0	DB6
Line 7	1/0	1/0	1/0	1/0	.....	1/0	1/0	1/0	DB7

					.....					
					.....					
					.....					
X=7	Line60	1/0	1/0	1/0	1/0	.....	1/0	1/0	1/0	DB4
	Line61	1/0	1/0	1/0	1/0	.....	1/0	1/0	1/0	DB5
	Line62	1/0	1/0	1/0	1/0	.....	1/0	1/0	1/0	DB6
	Line63	1/0	1/0	1/0	1/0	.....	1/0	1/0	1/0	DB7

八、测试硬件电路



九、读写模块程序举例

- 写指令子程序 (INST)
 

```

SETB    E
CLR D_I
CLR R_W
MOV P1, A
CLR E
RET
      
```
- 写数据子程序 (DATA)
 

```

SETB    E
SETB    D_I
CLR R_W
MOV P1, A
CLR E
RET
      
```
- 写一页显示 RAM 数据 (假设指令子程序为 INST，数据子程序为 DATA)
 

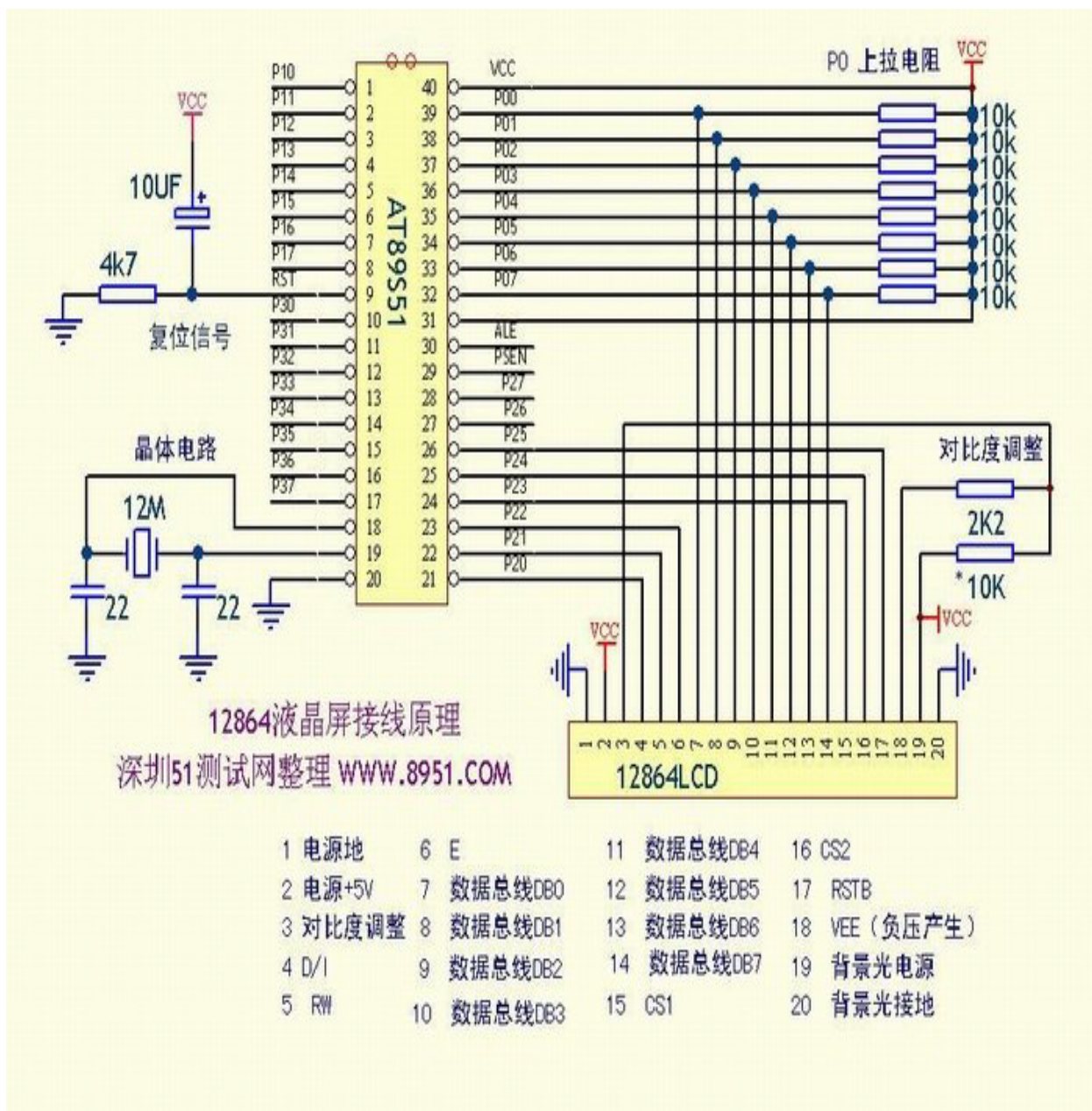
```

MOV  A, #0B8H
LCALL INST          ; 置页地址为 0 页
MOV  A, #40H
      
```

```

LCALL INST          ; 置列地址为 0 列
MOV R2, #40H
MOV R1, #00H
MOV DPTR, #ADDR
LOOP: MOVA, R1
MOVC A, @A+DPTR
LCALL DATA
INC R1
DJNZ R2, LOOP

```



带中文字库的 128X64 是一种具有 4 位/8 位并行、2 线或 3 线串行多种接口方式，内部含有国标一级、二级简体中文字库的点阵图形液晶显示模块；其显示分辨率为 128×64，内置

8192 个 16\*16 点汉字, 和 128 个 16\*8 点 ASCII 字符集. 利用该模块灵活的接口方式和简单、方便的操作指令, 可构成全中文人机交互图形界面。可以显示 8×4 行 16×16 点阵的汉字. 也可完成图形显示. 低电压低功耗是其又一显著特点。由该模块构成的液晶显示方案与同类型的图形点阵液晶显示模块相比, 不论硬件电路结构或显示程序都要简洁得多, 且该模块的价格也略低于相同点阵的图形液晶模块。

#### 基本特性:

- 1 低电源电压 (VDD: +3.0—+5.5V)
- 1 显示分辨率: 128×64 点
- 1 内置汉字字库, 提供 8192 个 16×16 点阵汉字(简繁体可选)
- 1 内置 128 个 16×8 点阵字符
- 1 2MHZ 时钟频率
- 1 显示方式: STN、半透、正显
- 1 驱动方式: 1/32DUTY, 1/5BIAS
- 1 视角方向: 6 点
- 1 背光方式: 侧部高亮白色 LED, 功耗仅为普通 LED 的 1/5—1/10
- 1 通讯方式: 串行、并口可选
- 1 内置 DC-DC 转换电路, 无需外加负压
- 1 无需片选信号, 简化软件设计
- 1 工作温度: 0℃ - +55℃, 存储温度: -20℃ - +60℃

#### 模块接口说明

## 2.1 串口接口管脚信号

管脚号	名称	LEVEL	功能
1	VSS	0V	电源地
2	VDD	+5V	电源正 (3.0V——5.5V)
3	V0	-	对比度 (亮度) 调整
4	CS	H/L	模组片选端, 高电平有效
5	SID	H/L	串行数据输入端
6	CLK	H/L	串行同步时钟: 上升沿时读取 SID 数据
15	PSB	L	L: 串口方式 (见注释 1)
17	/RESET	H/L	复位端, 低电平有效 (见注释 2)
19	A	VDD	背光源电压 +5V (见注释 3)
20	K	VSS	背光源负端 0V (见注释 3)

\*注释 1: 如在实际应用中仅使用串口通讯模式, 可将 PSB 接固定低电平, 也可以将模块上的 J8 和 “GND” 用焊锡短接。

\*注释 2: 模块内部接有上电复位电路, 因此在不经常复位的场合可将该端悬空。

\*注释 3: 如背光和模块共用一个电源, 可以将模块上的 JA、JK 用焊锡短接。

## 2.2 并行接口

管脚号	管脚名称	电平	管脚功能描述
1	VSS	0V	电源地
2	VCC	3.0+5V	电源正
3	V0	-	对比度 (亮度) 调整
4	RS (CS)	H/L	RS= “H”, 表示 DB7——DB0 为显示数据
			RS= “L”, 表示 DB7——DB0 为显示指令数据
5	R/W (SID)	H/L	R/W= “H”, E= “H”, 数据被读到 DB7——DB0
			R/W= “L”, E= “H→L”, DB7——DB0 的数据被写到 IR 或 DR
6	E (SCLK)	H/L	使能信号
7	DB0	H/L	三态数据线
8	DB1	H/L	三态数据线



9	DB2	H/L	三态数据线
10	DB3	H/L	三态数据线
11	DB4	H/L	三态数据线
12	DB5	H/L	三态数据线
13	DB6	H/L	三态数据线
14	DB7	H/L	三态数据线
15	PSB	H/L	H: 8 位或 4 位并口方式, L: 串口方式 (见注释 1)
16	NC	-	空脚
17	/RESET	H/L	复位端, 低电平有效 (见注释 2)
18	VOUT	-	LCD 驱动电压输出端
19	A	VDD	背光源正端 (+5V) (见注释 3)
20	K	VSS	背光源负端 (见注释 3)

\*注释 1: 如在实际应用中仅使用并口通讯模式, 可将 PSB 接固定高电平, 也可以将模块上的 J8 和 “VCC” 用焊锡短接。

\*注释 2: 模块内部接有上电复位电路, 因此在不经常需要复位的场合可将该端悬空。

\*注释 3: 如背光和模块共用一个电源, 可以将模块上的 JA、JK 用焊锡短接。

#### 四. 模块主要硬件构成说明

##### 控制器接口信号说明:

##### 1、RS, R/W 的配合选择决定控制界面的 4 种模式:

RS	R/W	功能说明
L	L	MPU 写指令到指令暂存器 (IR)
L	H	读出忙标志 (BF) 及地址计数器 (AC) 的状态
H	L	MPU 写入数据到数据暂存器 (DR)
H	H	MPU 从数据暂存器 (DR) 中读出数据

##### 2、E 信号

E 状态	执行动作	结果
高——>低	I/O 缓冲——>DR	配合 /W 进行写数据或指令
高	DR——>I/O 缓冲	配合 R 进行读数据或指令
低/低——>高	无动作	

● **忙标志:BF** BF 标志提供内部工作情况. BF=1 表示模块在进行内部操作, 此时模块不接受外部指令和数据. BF=0 时, 模块为准备状态, 随时可接受外部指令和数据. **利用 STATUS RD 指令, 可以将 BF 读到 DB7 总线, 从而检验模块之工作状态.** ● **字型产生 ROM (CGROM)** 字型产生 ROM (CGROM) 提供 8192 个此触发器是用于模块屏幕显示开和关的

控制。DFF=1 为开显示 (DISPLAY ON), DDRAM 的内容就显示在屏幕上, DFF=0 为关显示 (DISPLAY OFF)。

● DFF 的状态是指令 DISPLAY ON/OFF 和 RST 信号控制的。

● 显示数据 RAM (DDRAM) 模块内部显示数据 RAM 提供  $64 \times 2$  个位元组的空间, 最多可控制 4 行 16 字 (64 个字) 的中文字型显示, 当写入显示数据 RAM 时, 可分别显示 CGROM 与 CGRAM 的字型; 此模块可显示三种字型, 分别是半角英数字型 (16\*8)、CGRAM 字型及 CGROM 的中文字型, 三种字型的选择, 由在 DDRAM 中写入的编码选择, 在 0000H—0006H 的编码中 (其代码分别是 0000、0002、0004、0006 共 4 个) 将选择 CGRAM 的自定义字型, 02H—7FH 的编码中将选择半角英数字的字型, 至于 A1 以上的编码将自动的结合下一个位元组, 组成两个位元组的编码形成中文字型的编码 BIG5 (A140—D75F), GB (A1A0—F7FFH)。

● 字型产生 RAM (CGRAM) 字型产生 RAM 提供图象定义 (造字) 功能, 可以提供四组  $16 \times 16$  点的自定义图象空间, 使用者可以将内部字型没有提供的图象字型自行定义到 CGRAM 中, 便可和 CGROM 中的定义一样地通过 DDRAM 显示在屏幕中。

● 地址计数器 AC 地址计数器是用来贮存 DDRAM/CGRAM 之一的地址, 它可由设定指令暂存器来改变, 之后只要读取或是写入 DDRAM/CGRAM 的值时, 地址计数器的值就会自动加一, 当 RS 为 “0” 时而 R/W 为 “1” 时, 地址计数器的值会被读取到 DB6—DB0 中。

#### 应用说明

用带中文字库的 128X64 显示模块时应注意以下几点:

①欲在某一个位置显示中文字符时, 应先设定显示字符位置, 即先设定显示地址, 再写入中文字符编码。

②显示 ASCII 字符过程与显示中文字符过程相同。不过在显示连续字符时, 只须设定一次显示地址, 由模块自动对地址加 1 指向下一个字符位置, 否则, 显示的字符中将会有有一个空 ASCII 字符位置。

③当字符编码为 2 字节时, 应先写入高位字节, 再写入低位字节。

④模块在接收指令前, 向处理器必须先确认模块内部处于非忙状态, 即读取 BF 标志时 BF 需为 “0”, 方可接受新的指令。如果在送出一个指令前不检查 BF 标志, 则在前一个指令和这个指令中间必须延迟一段较长的时间, 即等待前一个指令确定执行完成。指令执行的时间请参考指令表中的指令执行时间说明。

⑤“RE” 为基本指令集与扩充指令集的选择控制位。当变更 “RE” 后, 以后的指令集将维持在最后的状态, 除非再次变更 “RE” 位, 否则使用相同指令集时, 无需每次均重设 “RE” 位。

用 51 单片机应用于 12864 液晶显示程序 (带字库汉字显示演示程序, 可用于本站 XL 系列实验仪)

;12864 (带字库汉字显示演示程序

```
*****  
;  
;* sxj1974@163.com (51c51 test web) www.8951.com *
```

;\* Create by :石学军 www.51c51.com 更多例程请登陆网站 \*

,\*\*\*\*\*

RS EQU P2.0

RW EQU P2.1

E EQU P2.2

PSB EQU P2.3

RST EQU P2.5

;-----

LCD\_X EQU 30H

LCD\_Y EQU 31H

COUNT EQU 32H

COUNT1 EQU 33H

COUNT2 EQU 34H

COUNT3 EQU 35H

;-----

LCD\_DATA EQU 36H

LCD\_DATA1 EQU 37H

LCD\_DATA2 EQU 38H

STORE EQU 39H

;-----

ORG 0000H

LJMP MAIN

ORG 0100H

;-----

**MAIN:**

MOV SP,#5FH

CLR RST ;复位

LCALL DELAY4

SETB RST

NOP

SETB PSB ;通讯方式为 8 位数据并口

,\*\*\*\*\*初始化\*\*\*\*\*

**LGS0:** MOV A,#34H ;34H--扩充指令操作

LCALL SEND\_I

MOV A,#30H ;30H--基本指令操作

LCALL SEND\_I

MOV A,#01H ;清除显示

LCALL SEND\_I

MOV A,#06H ;指定在资料写入或读取时，光标的移动方向

LCALL SEND\_I ;DDRAM 的地址计数器(AC)加 1

MOV A,#0CH ;开显示,关光标,不闪烁

LCALL SEND\_I

```

;=====
TU_PLAY1:
MOV DPTR,#TU_TAB1 ;显示图形
LCALL PHO_DISP
LCALL DELAY3

;=====
;;显示汉字和字符
;加入 80ms 的延时，使你能够看清楚显示的过程
;根据汉字显示坐标分段写入（顺序写入）
;=====
HAN_WR2:
LCALL CLEAR_P
HAN_WR2A:
MOV DPTR,#TAB1A ;显示汉字和字符
MOV COUNT,#10H ;地址计数器设为 16。
MOV A,#80H ;第一行起始地址
LCALL SEND_I
LCALL QUSHU
HAN_WR2B:
MOV DPTR,#TAB1B ;显示汉字和字符
MOV COUNT,#10H ;地址计数器设为 16。
MOV A,#90H ;第二行起始地址
LCALL SEND_I
LCALL QUSHU
HAN_WR2C:
MOV DPTR,#TAB1C ;显示汉字和字符
MOV COUNT,#10H ;地址计数器设为 16。
MOV A,#88H ;第三行起始地址
LCALL SEND_I
LCALL QUSHU
HAN_WR2D:
MOV DPTR,#TAB1D ;显示汉字和字符
MOV COUNT,#10H ;地址计数器设为 16。
MOV A,#98H ;第四行起始地址
LCALL SEND_I
LCALL QUSHU
LCALL DELAY3
LCALL FLASH
LCALL CLEAR_P
JMP TU_PLAY2
;-----
;TU_PLAY1:
MOV DPTR,#TU_TAB1 ;显示图形

```

LCALL PHO\_DISP

LCALL DELAY3

;-----

TU\_PLAY2:

MOV DPTR,#TU\_TAB2 ;显示图形

LCALL PHO\_DISP

LCALL DELAY3

;-----

TU\_PLAY3:

MOV DPTR,#TU\_TAB4 ;显示图形

LCALL PHO\_DISP

LCALL DELAY3

;-----

;显示点阵

;-----

LATPLAY1:

MOV A,#01H ;清屏

LCALL SEND\_I

MOV LCD\_DATA1,#0CCH ;显示点阵

MOV LCD\_DATA2,#0CCH

LCALL LAT\_DISP

LCALL DELAY3

LCALL CLEAR\_P

KU\_PLAY2:

LJMP TU\_PLAY1

;=====

;全屏显示图形子程序

;=====

PHO\_DISP:

MOV COUNT3,#02H

MOV LCD\_X,#80H

PHO\_DISP1:

MOV LCD\_Y,#80H

MOV COUNT2,#20H

PHO\_DISP2:

MOV COUNT1,#10H

LCALL WR\_ZB

PHO\_DISP3:

CLR A

```
MOVC A,@A+DPTR
LCALL SEND_D
INC DPTR
DJNZ COUNT1,PHO_DISP3
INC LCD_Y
DJNZ COUNT2,PHO_DISP2
MOV LCD_X,#88H
DJNZ COUNT3,PHO_DISP1
```

```
MOV A,#36H
LCALL SEND_I
MOV A,#30H
LCALL SEND_I
RET
```

```
;-----
```

**CLRRAM:**

```
MOV LCD_DATA1,#00H ;GDRAM 写 0 子程序
MOV LCD_DATA2,#00H
LCALL LAT_DISP
RET
```

```
;=====
```

;显示点阵子程序

```
;=====
```

**LAT\_DISP:**

```
MOV COUNT3,#02H
MOV LCD_X,#80H
```

**LAT\_DISP1:**

```
MOV LCD_Y,#80H
CLR F0
MOV COUNT2,#20H
```

**LAT\_DISP2:**

```
MOV COUNT1,#10H
LCALL WR_ZB
```

**LAT\_DISP3:**

```
JB F0,LAT_DISP32
MOV LCD_DATA,LCD_DATA1
AJMP LAT_DISP31
```

**LAT\_DISP32:**

```
MOV LCD_DATA,LCD_DATA2
```

**LAT\_DISP31:**

```
MOV A,LCD_DATA
LCALL SEND_D
DJNZ COUNT1,LAT_DISP31
INC LCD_Y
```

```
CPL F0
DJNZ COUNT2,LAT_DISP2
MOV LCD_X,#88H
DJNZ COUNT3,LAT_DISP1
```

```
MOV A,#36H
LCALL SEND_I
MOV A,#30H
LCALL SEND_I
RET
```

```
;-----
```

**WR\_ZB:**

```
MOV A,#34H
LCALL SEND_I
MOV A,LCD_Y
LCALL SEND_I
MOV A,LCD_X
LCALL SEND_I
MOV A,#30H
LCALL SEND_I
RET
```

```
;=====
```

**FLASH:**

```
MOV A,#08H ;关闭显示
LCALL SEND_I
LCALL DELAY5
MOV A,#0CH ;开显示,关光标,不闪烁
LCALL SEND_I
LCALL DELAY5
MOV A,#08H ;关闭显示
LCALL SEND_I
LCALL DELAY5
MOV A,#0CH ;开显示,关光标,不闪烁
LCALL SEND_I
LCALL DELAY5
MOV A,#08H ;关闭显示
LCALL SEND_I
LCALL DELAY5
RET
```

```
;=====
```

;清屏

```
;=====
```

**CLEAR\_P:**

```
MOV A,#01H ;清屏
```

```

LCALL SEND_I
MOV A,#34H
LCALL SEND_I
MOV A,#30H
LCALL SEND_I
RET
;=====
;查表取数据送显示
;=====
QUSHU:
CLR A
MOVC A,@A+DPTR ;查表取数据
LCALL SEND_D ;送显示
INC DPTR
LCALL DELAY4 ;延时 80ms,
DJNZ COUNT,QUSHU
RET

;=====
;写数据子程序
;RS=1,RW=0,E=高脉冲,D0-D7=数据
;=====
SEND_D:
LCALL CHK_BUSY ;写数据子程序
SETB RS
CLR RW
MOV P0,A
SETB E
NOP
NOP
CLR E
RET
;=====
;写指令子程序
;RS=0,RW=0,E=高脉冲,D0-D7=指令码
;=====
SEND_I:
LCALL CHK_BUSY
CLR RS
CLR RW
MOV P0,A
SETB E
NOP
NOP

```



```

CLR E
RET
;=====
;读数据子程序
;RS=1,RW=1,E=H,D0-D7=数据
;=====
READ_D:
LCALL CHK_BUSY ;读数据子程序
SETB RS
SETB RW
SETB E
NOP
MOV A,P0
CLR E
MOV STORE,A
RET
;=====
;;测忙碌子程序
;RS=0,RW=1,E=H,D0-D7=状态字
;=====
CHK_BUSY:
MOV P0,#0FFH ;测忙碌子程序
CLR RS
SETB RW
SETB E
JB P0.7,$
CLR E
RET
;=====
;延时子程序

DELAY3:
MOV R5,#16H
DEL31: MOV R6,#100
DEL32: MOV R7,#0FFH
DEL33: DJNZ R7,DEL33
DJNZ R6,DEL32
DJNZ R5,DEL31
RET

DELAY2:
MOV R6,#0CH
DEL21: MOV R7,#18H
DEL22: DJNZ R7,DEL22

```

```
DJNZ R6,DEL21
RET
```

#### DELAY1:

```
MOV R6,#06H
DEL11: MOV R7,#08H
DEL12: DJNZ R7,DEL12
DJNZ R6,DEL11
RET
```

#### DELAY4:

```
MOV R6,#100
DEL41: MOV R7,#200
DEL42: DJNZ R7,DEL42
DJNZ R6,DEL41
RET
```

#### DELAY5:

```
MOV R5,#05H
DEL51: MOV R6,#100
DEL52: MOV R7,#0FFH
DEL53: DJNZ R7,DEL53
DJNZ R6,DEL52
DJNZ R5,DEL51
RET
```

```
,*****
,
```

#### TAB1:

```
TAB1A: DB ' 51 单片机学习网（深圳学林电子有限公司） ' ;显示在第一行
TAB1C: DB '自学单片机第一站' ;显示在第三行
TAB1B: DB ' WWW.8951.COM ' ;显示在第二行
TAB1D: DB 'TEL 755-89956892' ;显示在第四行
```

```
,*-----*
;* Bitmap 点阵数据表 *
;* 图片: E:图形 8.bmp,横向取模左高位,数据排列:从左到右从上到下 *
;* 图片尺寸: 128 * 64 *
,*-----*
```

#### TU\_TAB1: ; 数据表

```
db 0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh
db 80h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h
db 80h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h
db 80h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h
db 80h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h
db 80h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h
```

db 80h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 80h, 00h, 00h, 00h, 00h, 3Ch, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 80h, 00h, 00h, 00h, 00h, 7Fh, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 80h, 00h, 00h, 00h, 00h,0FFh,0C0h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 80h, 00h, 00h, 00h, 01h,0BFh,0F8h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 80h, 00h, 00h, 00h, 01h,0FFh,0DCh, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 80h, 00h, 00h, 00h, 01h, 1Fh,0FEh, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 80h, 00h, 00h, 00h, 01h,0DFh,0FFh, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 80h, 00h, 00h, 00h, 00h,0FFh,0FFh, 19h, 8Ch, 03h, 06h, 00h, 18h, 00h,0FFh,0E1h  
db 80h, 00h, 00h, 00h, 00h, 3Fh,0FFh, 0Ch,0CCh, 03h, 06h, 00h, 18h, 00h,0FFh,0E1h  
db 80h, 00h, 00h, 00h, 00h, 7Fh,0FFh, 04h, 58h, 03h, 06h, 01h,0FFh,0C0h, 00h,0C1h  
db 80h, 00h, 00h, 00h, 00h, 7Fh,0DAh, 3Fh,0FEh, 0Fh,0DFh,0C1h,0FFh,0C0h, 01h, 81h  
db 80h, 00h, 00h, 00h, 00h, 7Fh, 8Ch, 3Fh,0FEh, 0Fh,0DFh,0C1h, 98h,0C0h, 07h, 01h  
db 80h, 00h, 00h, 00h, 00h, 7Fh,0B8h, 30h, 06h, 03h, 06h, 01h, 98h,0C0h, 06h, 01h  
db 80h, 00h, 00h, 00h, 00h,0FEh,0C0h, 0Fh,0F8h, 03h, 8Eh, 01h,0FFh,0C3h,0FFh,0F9h  
db 80h, 00h, 00h, 00h, 00h, 7Eh, 00h, 0Fh,0F8h, 07h,0CFh, 01h, 98h,0C3h,0FFh,0F9h  
db 80h, 00h, 00h, 00h, 00h, 7Fh, 00h, 00h, 60h, 07h, 5Fh, 81h, 98h,0C0h, 06h, 01h  
db 80h, 00h, 00h, 00h, 00h, 7Fh, 80h, 3Fh,0FEh, 0Fh, 36h,0C1h,0FFh,0C0h, 06h, 01h  
db 80h, 00h, 00h, 00h, 00h, 1Fh, 80h,0BFh,0FEh, 0Bh, 36h, 61h,0FFh,0C0h, 06h, 01h  
db 80h, 00h, 00h, 00h, 00h, 1Fh,0C7h, 00h,0C0h, 03h, 66h, 21h, 98h, 30h, 06h, 01h  
db 80h, 00h, 00h, 00h, 15h, 5Fh,0C7h, 00h,0C0h, 03h, 06h, 00h, 18h, 30h, 06h, 01h  
db 80h, 00h, 02h,0E0h, 06h, 7Fh,0CEh, 03h,0C0h, 03h, 06h, 00h, 1Fh,0F0h, 1Eh, 01h  
db 80h, 00h, 04h, 54h, 4Fh,0FFh,0FCh, 01h, 80h, 03h, 06h, 00h, 0Fh,0E0h, 0Ch, 01h  
db 80h, 00h, 03h,0FDh, 3Fh,0FFh,0D9h,0C0h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 80h, 00h, 1Dh,0FFh,0FFh,0FFh, 87h, 80h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 80h, 00h, 2Bh,0FFh,0F8h, 7Fh, 06h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 80h, 00h, 3Fh,0BFh,0F8h, 09h, 0Fh, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 80h, 00h, 1Fh, 9Fh,0F0h, 00h,0BCh, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 9Dh,0FEh, 1Fh, 8Fh,0F0h, 00h,0F8h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 9Fh,0FCh, 17h, 8Fh,0F0h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 81h,0FFh,0CFh, 9Fh,0E0h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 82h,0FFh,0FFh, 9Ch, 80h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 81h, 7Fh,0FFh,0FCh, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 80h, 6Fh,0FEh, 30h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 80h, 03h,0FCh, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 80h, 00h, 34h, 14h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 80h, 00h, 0Eh, 18h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 80h, 00h, 02h, 30h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 80h, 00h, 01h,0E0h, 00h, 00h, 7Fh, 04h, 00h, 3Fh, 82h, 00h, 00h, 00h, 00h, 01h  
db 80h, 00h, 00h, 00h, 00h, 00h, 7Fh, 0Ch, 00h, 3Fh, 86h, 00h, 00h, 00h, 00h, 01h  
db 80h, 00h, 00h, 00h, 00h, 00h, 7Fh, 1Ch, 00h, 3Fh, 8Eh, 00h, 00h, 00h, 00h, 01h  
db 83h,0BBh, 9Dh,0DCh,0EEh,0E0h, 70h, 7Ch, 38h, 38h, 3Eh, 00h,0E0h, 38h, 3Bh, 31h  
db 83h,0BBh, 9Dh,0DCh,0EEh,0E0h, 70h, 7Ch, 3Ch, 38h, 3Eh, 00h,0F0h, 7Ch, 3Fh,0F9h  
db 83h,0BBh, 9Dh,0DCh,0EEh,0E0h, 76h, 1Ch, 7Eh, 3Bh, 0Eh, 01h,0F8h,0FEh, 3Fh,0F9h

```

db 83h,0BBh, 9Dh,0DCh,0EEh,0E0h, 7Fh, 1Ch, 76h, 3Fh, 8Eh, 01h,0D8h,0EEh, 3Bh,0B9h
db 83h,0BBh, 9Dh,0DCh,0EEh,0E0h, 7Fh, 1Ch, 76h, 3Fh, 8Eh, 01h,0D8h,0EEh, 3Bh,0B9h
db 83h,0BBh, 9Dh,0DCh,0EEh,0E0h, 77h, 1Ch, 76h, 3Bh, 8Eh, 01h,0D8h,0EEh, 3Bh,0B9h
db 81h,0BBh, 0Dh,0D8h, 6Eh,0C0h, 07h, 1Ch, 70h, 03h, 8Eh, 01h,0C0h,0EEh, 3Bh,0B9h
db 81h,0ABh, 0Dh, 58h, 6Ah,0C0h, 07h, 1Ch, 70h, 03h, 8Eh, 01h,0C0h,0EEh, 3Bh,0B9h
db 81h,0ABh, 0Dh, 58h, 6Ah,0C0h, 77h, 1Ch, 70h, 3Bh, 8Eh, 01h,0C0h,0EEh, 3Bh,0B9h
db 81h,0ABh, 0Dh, 58h, 6Ah,0C0h, 77h, 1Ch, 76h, 3Bh, 8Eh, 01h,0D8h,0EEh, 3Bh,0B9h
db 81h,0EFh, 0Fh, 78h, 7Bh,0C0h, 77h, 1Ch, 76h, 3Bh, 8Eh, 01h,0D8h,0EEh, 3Bh,0B9h
db 81h,0EFh, 0Fh, 78h, 7Bh,0DCh, 77h, 1Ch, 76h, 3Bh, 8Eh, 39h,0D8h,0EEh, 3Bh,0B9h
db 81h,0EFh, 0Fh, 78h, 7Bh,0DCh, 7Fh, 1Ch, 7Eh, 3Fh, 8Eh, 39h,0F8h,0FEh, 3Bh,0B9h
db 81h,0EFh, 0Fh, 78h, 7Bh,0DCh, 3Eh, 1Ch, 3Ch, 1Fh, 0Eh, 38h,0F0h, 7Ch, 3Bh,0B9h
db 81h,0EFh, 0Fh, 78h, 7Bh,0DCh, 1Ch, 1Ch, 3Ch, 0Eh, 0Eh, 38h,0F0h, 78h, 3Bh,0B9h
db 80h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h
db 0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh

```

```

; *----- *
;* Bitmap 点阵数据表 *
;* 图片: E:图形 12.bmp,横向取模左高位,数据排列:从左到右从上到下 *
;* 图片尺寸: 128 * 64 *
; *----- *

```

TU\_TAB2: ; 数据表

```

db 40h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 03h, 65h,0E8h, 80h, 00h, 01h
db 9Ah,0D6h,0B4h, 42h, 00h, 00h, 00h, 00h, 00h, 00h, 34h,0DAh,0D0h, 00h, 00h, 01h
db 0A4h, 00h, 02h, 10h, 6Bh, 30h, 00h, 00h, 00h, 00h, 8Bh,0FFh, 30h, 00h, 00h, 01h
db 42h,0D6h,0B0h, 42h, 80h, 00h, 00h, 00h, 00h, 16h, 77h,0FEh,0C0h, 00h, 00h, 01h
db 42h,0D6h,0B0h, 42h, 80h, 00h, 00h, 00h, 00h, 16h, 77h,0FEh,0C0h, 00h, 00h, 01h
db 0B9h, 20h, 04h, 00h, 00h, 02h, 10h, 00h, 00h, 00h,0BCh,0BCh, 00h, 00h, 00h, 01h
db 46h,0D6h,0B1h,0ACh, 6Bh, 30h, 00h, 00h, 02h, 29h,0CBh, 40h, 00h, 00h, 00h, 01h
db 0FFh,0F9h, 04h, 01h, 00h, 00h, 00h, 00h, 01h, 16h,0B4h,0A0h, 00h, 00h, 00h, 01h
db 0FFh,0FFh,0F2h, 50h, 00h, 40h, 00h, 00h, 00h, 29h, 4Bh, 00h, 00h, 00h, 01h
db 0FFh,0FFh,0F2h, 50h, 00h, 40h, 00h, 00h, 00h, 29h, 4Bh, 00h, 00h, 00h, 01h
db 0FFh,0FFh,0BDh, 82h, 94h, 00h, 40h, 00h, 00h,0C9h, 30h, 02h, 00h, 00h, 00h, 01h
db 0FFh,0FFh,0FBh,0B0h, 00h, 08h, 00h, 00h, 05h, 16h, 44h, 40h, 00h, 00h, 00h, 01h
db 0FFh,0FFh,0FFh,0EFh, 90h, 40h, 00h, 00h, 00h, 21h, 00h, 04h,0C8h, 30h, 00h, 01h
db 0A5h,0FFh,0FFh,0FDh, 6Bh, 00h, 00h, 00h, 00h,0C8h, 00h, 99h, 16h,0FAh, 40h, 01h
db 0A5h,0FFh,0FFh,0FDh, 6Bh, 00h, 00h, 00h, 00h,0C8h, 00h, 99h, 16h,0FAh, 40h, 01h
db 82h, 2Fh,0FFh,0FFh,0E8h, 84h, 00h, 00h, 00h, 00h, 08h, 00h,0DFh,0FFh,0ECh, 01h
db 24h,0C1h, 7Fh,0FFh,0F4h, 30h, 00h, 00h, 00h, 00h, 00h,0A7h,0FFh,0FFh,0FCh, 01h
db 42h, 28h, 05h,0BFh,0FBh, 80h, 00h, 00h, 00h, 00h, 04h, 1Bh,0FFh,0FFh,0FFh, 81h
db 98h,0C1h, 4Ah, 53h,0ECh, 48h, 00h, 00h, 00h, 00h, 40h, 7Fh,0FFh,0FFh,0FFh,0E1h
db 98h,0C1h, 4Ah, 53h,0ECh, 48h, 00h, 00h, 00h, 00h, 40h, 7Fh,0FFh,0FFh,0FFh,0E1h
db 42h, 28h, 00h, 0Ch, 77h, 82h, 00h, 00h, 00h, 00h, 33h,0BFh,0FFh,0FFh,0FFh, 89h
db 18h,0C1h, 4Ah, 51h, 9Bh, 74h, 00h, 00h, 00h, 00h, 04h,0FFh, 3Fh,0FFh,0DFh,0F1h
db 0C2h, 28h, 00h, 0Ch, 04h, 80h, 00h, 00h, 00h, 00h, 40h,0FEh, 1Fh,0F9h,0C3h,0F9h

```

db 1Ah,0D6h,0B5h,0A1h, 6Bh, 75h, 80h, 00h, 00h, 00h, 8Fh,0FCh, 3Fh,0F2h, 0Fh, 1Fh  
db 1Ah,0D6h,0B5h,0A1h, 6Bh, 75h, 80h, 00h, 00h, 00h, 8Fh,0FCh, 3Fh,0F2h, 0Fh, 1Fh  
db 0C5h, 29h, 79h, 8Ch, 00h, 88h, 00h, 00h, 00h, 00h, 03h,0F8h, 1Fh,0C8h, 52h, 81h  
db 22h,0FFh,0FFh,0F2h, 6Bh, 35h, 80h, 00h, 00h, 00h, 37h,0C2h, 3Fh,0FBh,0FCh, 09h  
db 9Ah,0FFh,0FFh,0FFh, 00h, 48h, 00h, 00h, 00h, 00h, 07h,0D8h, 1Fh,0FFh,0E3h, 81h  
db 9Ah,0FFh,0FFh,0FFh, 00h, 48h, 00h, 00h, 00h, 00h, 07h,0D8h, 1Fh,0FFh,0E3h, 81h  
db 47h,0FFh,0FFh,0FFh,0F3h, 35h, 80h, 00h, 00h, 00h, 8Fh,0C1h, 0Fh,0FFh,0ACh, 01h  
db 0B9h,0FFh,0FFh,0FFh,0FCh, 4Ah, 20h, 00h, 00h, 00h, 0Fh,0A4h, 07h,0FEh, 40h, 01h  
db 5Fh,0FFh,0C7h,0FFh,0FCh,0B5h, 80h, 00h, 00h, 00h, 4Fh,0DAh,0FFh,0F8h, 00h, 01h  
db 0A7h,0FFh,0B7h,0FFh,0FFh, 8Ah, 20h, 00h, 00h, 00h, 0Fh,0FFh,0EFh, 40h, 00h, 01h  
db 0A7h,0FFh,0B7h,0FFh,0FFh, 8Ah, 20h, 00h, 00h, 00h, 0Fh,0FFh,0EFh, 40h, 00h, 01h  
db 7Fh,0FFh, 47h,0FDh, 7Fh,0C5h, 80h, 00h, 00h, 00h, 3Fh,0DAh,0D0h, 00h, 00h, 01h  
db 0A7h,0FEh, 37h,0FFh, 7Ch,0FAh, 50h, 00h, 00h, 00h, 0Ch,0A4h, 08h, 00h, 00h, 01h  
db 0DFh,0FEh, 43h,0FFh,0F8h,0C1h, 80h, 00h, 00h, 00h, 48h, 01h, 00h, 00h, 00h, 01h  
db 27h,0FFh, 4Bh,0FFh,0FFh,0FAh, 2Ch, 00h, 00h, 00h, 03h, 58h, 20h, 00h, 00h, 01h  
db 27h,0FFh, 4Bh,0FFh,0FFh,0FAh, 2Ch, 00h, 00h, 00h, 03h, 58h, 20h, 00h, 00h, 01h  
db 9Bh,0FFh,0C3h,0FFh,0FFh,0F1h,0C0h, 00h, 00h, 00h, 08h, 00h, 00h, 00h, 00h, 01h  
db 64h, 3Fh,0FDh,0FFh, 6Bh, 7Ch, 10h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 03h,0D7h,0FFh,0FDh, 10h, 01h,0A0h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 0D8h, 29h, 4Fh,0A2h, 80h,0B5h, 90h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 0D8h, 29h, 4Fh,0A2h, 80h,0B5h, 90h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 05h, 10h,0B0h, 4Ch, 0Bh, 08h, 40h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 0A0h,0C9h, 0Ah, 00h, 00h, 42h, 10h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 04h, 10h, 40h, 21h, 64h, 09h,0A0h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 0A2h,0C1h, 35h, 8Ch, 00h, 44h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 0A2h,0C1h, 35h, 8Ch, 00h, 44h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 00h, 16h, 00h, 21h, 14h, 09h,0A0h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 0A5h, 00h,0B5h, 80h, 83h, 44h, 0Ch, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 00h, 26h, 00h, 12h, 08h, 09h,0A0h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 0DAh, 00h,0B4h, 40h, 60h, 44h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 0DAh, 00h,0B4h, 40h, 60h, 44h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 80h,0C8h, 00h, 00h, 04h, 01h,0A0h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 0A2h, 20h, 89h, 91h, 10h, 8Ah, 10h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 44h, 06h, 00h, 00h, 00h, 30h, 40h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 44h, 06h, 00h, 00h, 00h, 30h, 40h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 80h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 80h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 80h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 80h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh

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,*----- *
,* Bitmap 点阵数据表 *
,* 图片: E:图形 13.bmp,横向取模左高位,数据排列:从左到右从上到下 *
,* 图片尺寸: 128 * 64 *
,*----- *
TU_TAB4: ; 漂亮姑娘看过来

db 0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh
db 80h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h
db 80h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h
db 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h
db 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h
db 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h
db 00h, 00h, 00h, 00h, 00h, 00h, 00h, 11h,0FFh, 80h, 40h, 08h, 30h, 10h, 20h, 00h
db 00h, 00h, 00h, 00h, 00h, 00h, 00h, 0Ch, 68h, 3Fh,0FFh, 08h, 30h, 11h,0F8h, 00h
db 00h, 00h, 00h, 00h, 00h, 00h, 00h, 0Ch, 68h, 3Fh,0FFh, 08h, 30h, 11h,0F8h, 00h
db 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h,0FFh, 00h, 00h, 7Fh,0FEh, 7Dh, 08h, 00h
db 00h, 00h, 00h, 00h, 00h, 00h, 00h, 11h, 6Bh, 07h,0FCh, 16h, 30h, 2Dh,0F8h, 00h
db 00h, 00h, 00h, 00h, 00h, 00h, 00h, 0Dh,0FFh, 04h, 0Ch, 16h, 30h, 2Dh, 08h, 00h
db 00h, 00h, 00h, 00h, 00h, 00h, 00h, 0Ch, 00h, 3Fh,0FFh, 16h, 30h, 2Dh,0F8h, 00h
db 00h, 00h, 00h, 00h, 00h, 00h, 00h, 0Ch, 00h, 3Fh,0FFh, 16h, 30h, 2Dh,0F8h, 00h
db 00h, 00h, 00h, 00h, 00h, 00h, 00h, 0Ch,0FFh, 30h, 01h, 66h,0FEh, 2Dh, 26h, 00h
db 00h, 00h, 00h, 00h, 00h, 00h, 00h, 1Ch, 00h, 03h,0F0h, 76h, 82h, 2Dh, 28h, 00h
db 00h, 00h, 00h, 00h, 00h, 00h, 00h, 0Dh,0FFh, 82h, 11h, 08h, 82h, 11h, 10h, 00h
db 00h, 00h, 00h, 00h, 00h, 00h, 00h, 0Ch, 8Bh, 04h, 11h, 16h, 82h, 2Dh, 28h, 00h
db 00h, 00h, 00h, 00h, 00h, 00h, 00h, 0Ch, 8Bh, 04h, 11h, 16h, 82h, 2Dh, 28h, 00h
db 00h, 00h, 00h, 00h, 00h, 00h, 00h, 0Dh, 18h,0B8h, 1Fh, 60h,0FEh, 41h,0C6h, 00h
db 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h
db 00h, 07h, 8Fh,0FFh, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h
db 00h, 08h, 70h, 40h,0EFh, 80h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h
db 00h, 08h, 70h, 40h,0EFh, 80h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h
db 00h, 10h, 00h, 80h, 10h, 60h, 00h, 0Fh,0FFh, 30h, 0Ch, 00h, 80h, 00h, 00h, 00h
db 00h, 20h, 18h, 38h, 20h, 60h, 00h, 00h, 60h, 08h, 0Ch, 1Fh,0FCh, 1Ch, 00h, 00h
db 00h,0C0h, 64h, 45h, 00h, 60h, 00h, 03h,0FCh, 0Bh,0FFh, 00h, 80h, 3Eh, 00h, 00h
db 00h,0C1h, 00h, 01h, 00h, 10h, 00h, 00h, 80h, 00h, 0Ch, 08h, 88h, 3Eh, 00h, 00h
db 00h,0C1h, 00h, 01h, 00h, 10h, 00h, 00h, 80h, 00h, 0Ch, 08h, 88h, 3Eh, 00h, 00h
db 01h, 01h, 00h, 00h,0C0h, 10h, 00h, 1Fh,0FFh,0BDh, 8Ch, 06h,0B0h, 3Eh, 00h, 00h
db 02h, 0Eh, 18h, 1Ch,0C0h, 10h, 00h, 01h, 00h, 04h, 4Ch, 7Fh,0FEh, 1Ch, 00h, 00h
db 02h, 16h, 64h, 22h, 20h, 10h, 00h, 03h,0FCh, 04h, 4Ch, 01h,0C0h, 1Ch, 00h, 00h
db 02h, 16h, 64h, 22h, 20h, 10h, 00h, 03h,0FCh, 04h, 4Ch, 01h,0C0h, 1Ch, 00h, 00h
db 04h,0E8h, 83h, 41h, 1Ch, 08h, 00h, 0Dh, 04h, 04h, 0Ch, 06h,0B0h, 00h, 00h, 00h
db 07h, 10h, 8Fh, 47h, 03h, 88h, 00h, 11h,0FCh, 04h, 3Ch, 08h, 88h, 1Ch, 00h, 00h
db 00h, 20h, 6Ch, 26h, 01h, 78h, 00h, 01h, 04h, 0Ah, 00h, 70h, 86h, 1Ch, 00h, 00h

```

db 00h,0C0h, 18h, 1Ch, 00h, 80h, 00h, 01h,0FCh, 31h,0FFh, 00h, 80h, 00h, 00h, 00h  
db 00h,0C0h, 18h, 1Ch, 00h, 80h, 00h, 01h,0FCh, 31h,0FFh, 00h, 80h, 00h, 00h, 00h  
db 00h,0C1h, 87h, 80h, 00h, 80h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h  
db 01h, 06h, 78h, 3Ch, 20h, 60h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h  
db 01h, 08h, 07h,0C2h,0C0h, 60h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h  
db 01h, 08h, 00h, 01h,0C0h, 60h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h  
db 01h, 08h, 00h, 01h,0C0h, 60h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h  
db 01h, 08h, 18h, 01h,0C0h, 60h, 00h, 00h, 00h,0F1h,0F3h, 87h,0C0h, 00h, 00h, 00h  
db 00h,0C6h, 18h,0C2h, 20h, 80h, 00h, 00h, 03h, 0Eh, 1Ch, 78h, 70h, 00h, 00h, 00h  
db 00h,0C1h, 00h,0C2h, 00h, 80h, 00h, 00h, 04h, 44h, 11h, 10h, 38h, 00h, 00h, 00h  
db 00h, 26h,0E0h, 04h, 01h, 00h, 00h, 00h, 04h, 80h, 12h, 00h, 38h, 00h, 00h, 00h  
db 00h, 26h,0E0h, 04h, 01h, 00h, 00h, 00h, 04h, 80h, 12h, 00h, 38h, 00h, 00h, 00h  
db 00h, 11h, 18h, 38h, 03h, 00h, 00h, 00h, 04h, 80h, 12h, 00h, 38h, 00h, 00h, 00h  
db 00h, 0Eh, 87h,0C2h, 1Ch, 00h, 00h, 00h, 04h, 00h, 10h, 00h, 38h, 00h, 00h, 00h  
db 00h, 01h,0E0h, 04h,0E0h, 00h, 00h, 00h, 03h, 00h, 1Ch, 00h, 70h, 00h, 00h, 00h  
db 00h, 1Eh, 18h, 3Fh, 1Eh, 00h, 00h, 00h, 00h, 80h, 32h, 00h,0C0h, 00h, 00h, 00h  
db 00h, 1Eh, 18h, 3Fh, 1Eh, 00h, 00h, 00h, 00h, 80h, 32h, 00h,0C0h, 00h, 00h, 00h  
db 00h, 38h, 07h,0C0h, 0Fh, 00h, 00h, 00h, 00h, 40h, 61h, 01h, 80h, 00h, 00h, 00h  
db 00h,0E9h,0FFh,0FFh, 0Dh, 80h, 00h, 00h, 00h, 31h,0C0h, 87h, 00h, 00h, 00h, 00h  
db 01h,0E9h, 1Bh,0B9h, 0Dh,0E0h, 00h, 00h, 00h, 0Bh, 80h, 6Eh, 00h, 00h, 00h, 00h  
db 03h,0C9h,0F0h, 1Fh, 0Ch,0F0h, 00h, 00h, 00h, 06h, 00h, 18h, 00h, 00h, 00h, 00h  
db 03h,0C9h,0F0h, 1Fh, 0Ch,0F0h, 00h, 00h, 00h, 06h, 00h, 18h, 00h, 00h, 00h, 00h  
db 07h, 06h,0E0h, 06h, 10h, 78h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h  
db 07h,0C1h, 00h, 00h, 20h,0F8h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h  
db 07h,0E0h, 80h, 00h,0C1h,0F8h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h  
db 07h,0E0h, 80h, 00h,0C1h,0F8h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h  
db 80h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 01h  
db 0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh,0FFh

end