

JLX172104G-590-BN 使用说明书

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1. 概述

晶联讯电子专注于液晶屏及液晶模块的研发、制造。所生产 JLX172104G-590-BN 型液晶模块由于使用方便、显示清晰，广泛应用于各种人机交流面板。

JLX172104G-590-BN 可以显示 172 列*104 行点阵单色图片，或显示 16*16 点阵的汉字 10 个*6 行，或显示 8*16 点阵的英文、数字、符号 21 个*6 行。或显示 5*8 点阵的英文、数字、符号 21 个*13 行。

2. JLX172104G-590-BN 图像型点阵液晶模块的特性

2.1 结构牢：背光带有挡墙，焊接式 FPC。

2.2 IC 采用矽创公司 ST75256, 功能强大，稳定性好

2.3 功耗低：不带背光 1mW (3.3V*0.3mA)，带背光不大于 150mW (3.3V*45mA)；

2.4 显示内容：

(1) 172*104 点阵单色图片，或其它小于 172*104 点阵的单色图片；

(2) 可选用 16*16 点阵或其他点阵的图片来自编汉字，按照 16*16 点阵汉字来计算可显示 10 字*6 行；

(3) 按照 8*16 点阵汉字来计算可显示 21 字*6 行；

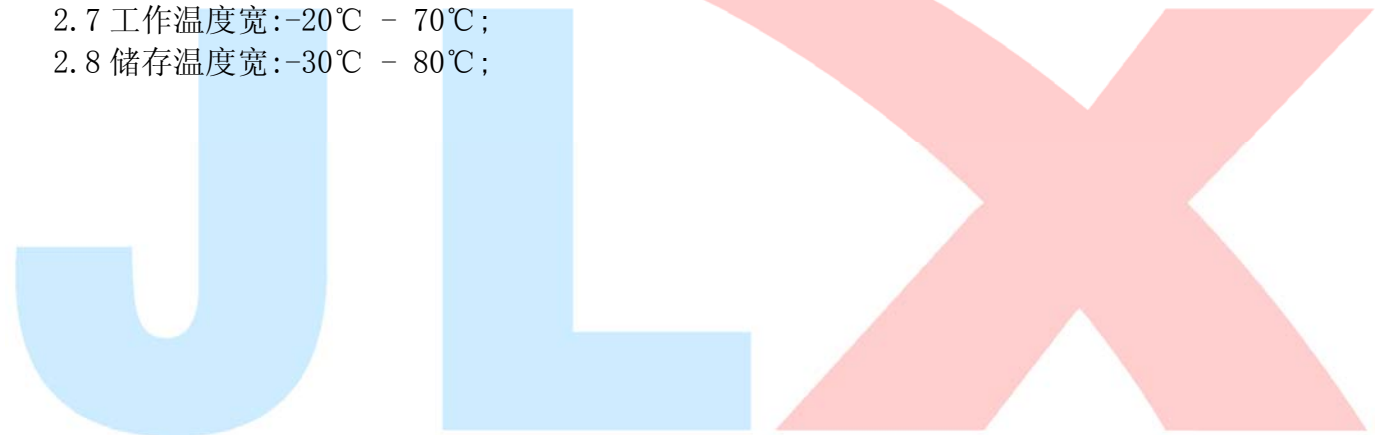
(4) 按照 5*8 点阵汉字来计算可显示 21 字*13 行；

2.5 指令功能强：可软件调对比度；

2.6 接口简单方便：采用 4 线 SPI 串行接口。

2.7 工作温度宽：-20℃ - 70℃；

2.8 储存温度宽：-30℃ - 80℃；



3.1 外形尺寸及接口引脚功能

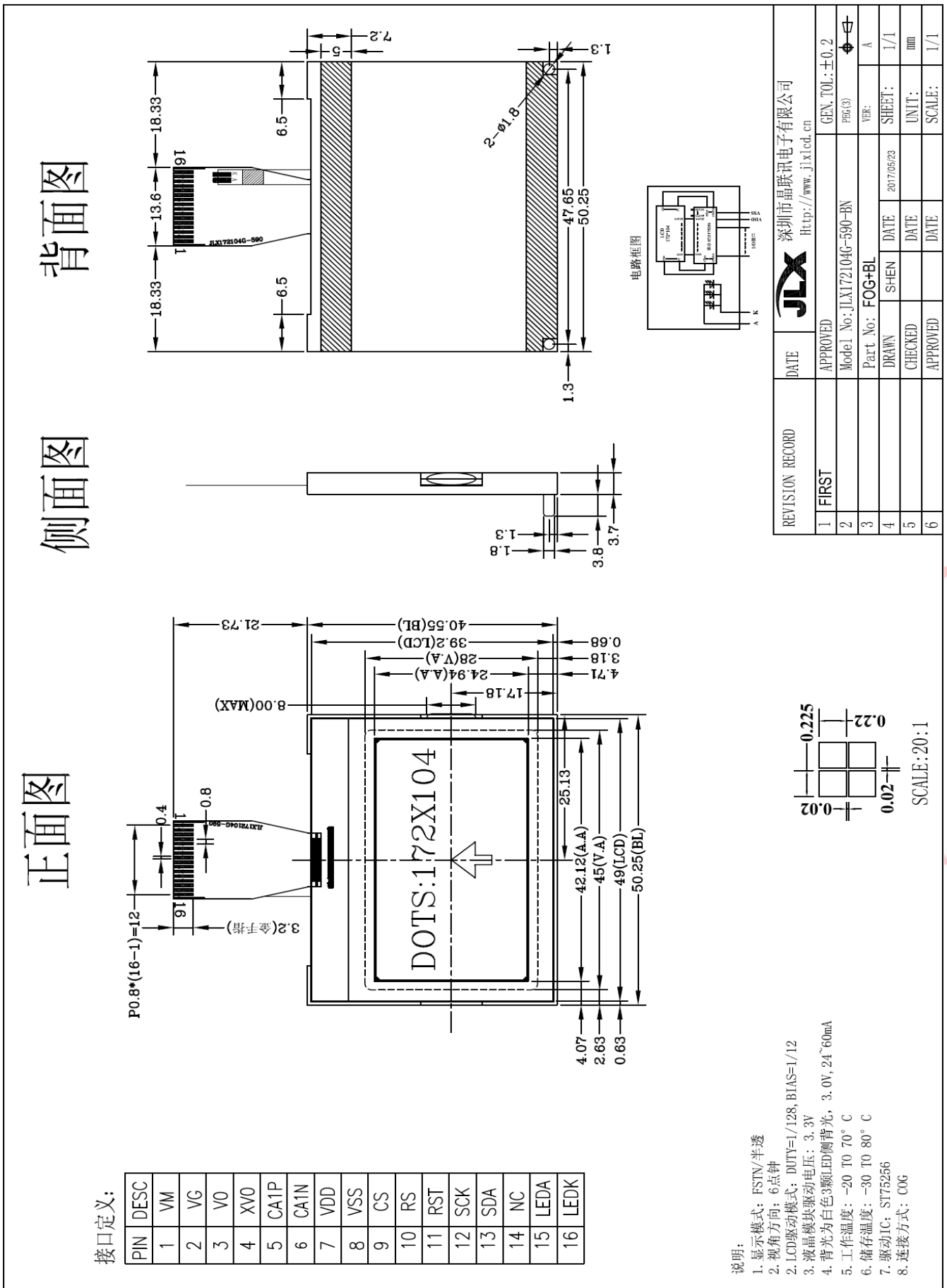


图 1. 外形尺寸

3.2 模块的接口引脚功能

引线号	符号	名称	功能
1	VM	偏压电路	LCD 偏置驱动电压, VM 与 VSS 之间接一个电容
2	VG	偏压电路	LCD 偏置驱动电压, VG 与 VSS 之间接一个电容
3	V0	倍压电路	V0 与 XV0 之间接一个电容
4	XV0	倍压电路	
5	CA1P	倍压电路	CA1P 与 CA1N 之间接一个电容
6	CA1N	倍压电路	
7	VDD	供电电源正极	接 3.3V
8	VSS	接地	0V
9	CS	片选	低电平片选
10	RS	寄存器选择信号	H: 数据寄存器 0: 指令寄存器
11	RST	复位	低电平复位, 复位完成后, 回到高电平, 液晶模块开始工作
12	SCK	串行时钟	串行时钟
13	SDA	串行数据	串行数据
14	NC	NC	空脚
15	LEDA	背光电源正极	接 3.0V (或串 20 欧电阻接 3.3V, 串 120 欧电阻接 5.0V)
16	LEDK	背光电源负极	接地

表 1: 模块接口引脚功能

4. 基本原理

4.1 液晶屏 (LCD)

在 LCD 上排列着 172×104 点阵, 172 个列信号与驱动 IC 相连, 104 个行信号也与驱动 IC 相连, IC 邦定在 LCD 玻璃上 (这种加工工艺叫 COG)。

4.2 工作电路图:

图 2 是 JLX172104G-590 图像点阵型模块的电路框图, 它由驱动 IC ST75256 及几个电阻电容组成。

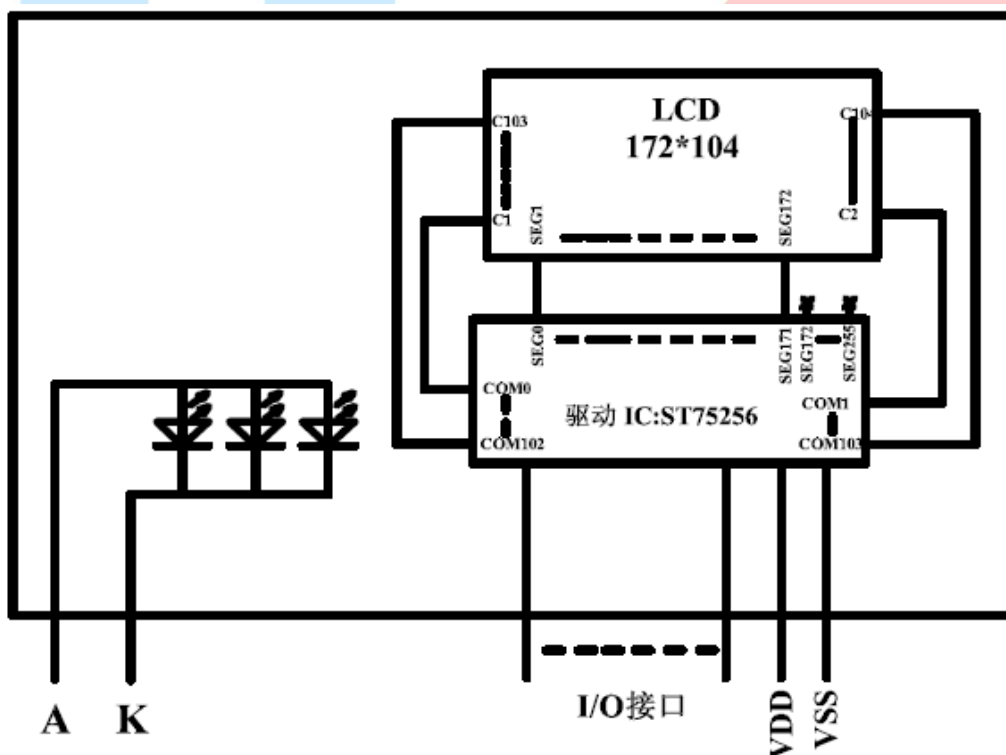


图 2: JLX172104G-590-BN 图像点阵型液晶模块的电路框图

4.2 背光参数

该型号液晶模块带 LED 背光源。它的性能参数如下:

工作温度: $-20^{\circ}\text{C} \sim +70^{\circ}\text{C}$;

存储温度: $-30^{\circ}\text{C} \sim +80^{\circ}\text{C}$;

背光板为白色。

正常工作电流为: $24 \sim 60\text{mA}$ (LED 灯数共 3 颗);

工作电压: 3.0V ;

5. 技术参数

5.1 最大极限参数 (超过极限参数则会损坏液晶模块)

名称	符号	标准值			单位
		最小	典型	最大	
电路电源	VDD - VSS	-0.3	—	5.5	V
LCD 驱动电压	VDD - V0	-0.3	—	13.5	V
静电电压		—	—	100	V
工作温度		-20	—	+70	$^{\circ}\text{C}$
储存温度		-30	—	+80	$^{\circ}\text{C}$

表 2: 最大极限参数

5.2 直流 (DC) 参数

名称	符号	测试条件	标准值			单位
			MIN	TYPE	MAX	
工作电压	VDD	—	2.6	3.3	3.6	V
背光工作电压	VLED	—	2.9	3.0	3.1	V
输入高电平	VIH	—	0.8VDD	—	VDD	V
输入低电平	VIO	—	0	—	0.2VDD	V
输出高电平	VOH	$I_{OH} = 0.2\text{mA}$	0.8VDD	—	VDD	V
输出低电平	VOO	$I_{OO} = 1.2\text{mA}$	0	—	0.2VDD	V
模块工作电流	IDD	VDD = 3.0V	—	0.3	1.0	mA
背光工作电流	ILED	VLED=3.0V	24	45	60	mA

表 3: 直流 (DC) 参数

6. 读写时序特性 (AC 参数)

6.1 4 线 SPI 串行接口写时序特性 (AC 参数)

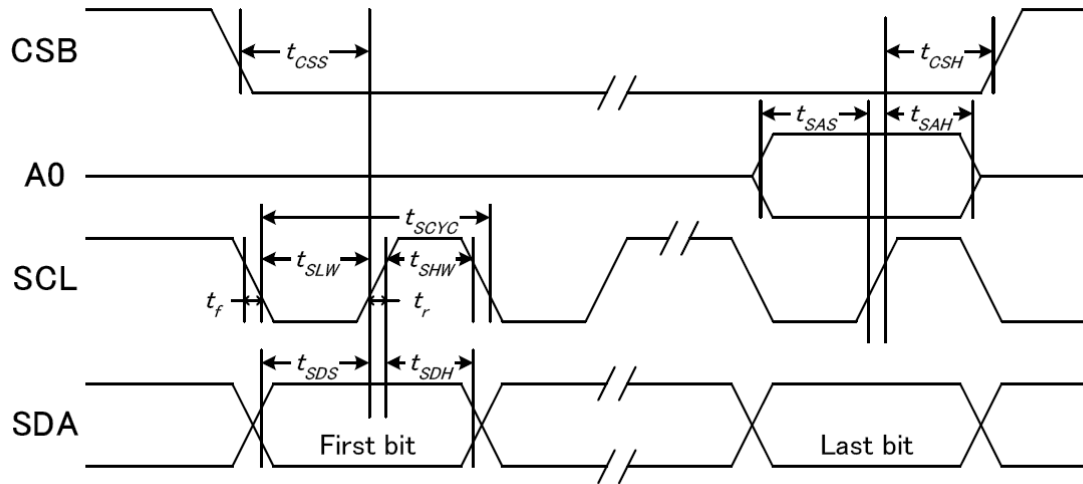


图 3. 从 CPU 写到 ST75256 (Writing Data from CPU to ST75256)

表 4. 写数据到 ST75256 的时序要求

项目	符号	测试条件	极限值			单位
			MIN	TYPE	MAX	
4线 SPI串口时钟周期 (4-line SPI Clock Period)	tSCYC	引脚: SCL	80	---	---	ns
保持SCK高电平脉宽 (SCL "H" pulse width)	tSHW		30	---	---	ns
保持SCLK低电平脉宽 (SCL "L" pulse width)	tSLW		30	---	---	ns
地址建立时间 (Address setup time)	tSAS	引脚: A0	20	---	---	ns
地址保持时间 (Address hold time)	tSAH		20	---	---	ns
数据建立时间 (Data setup time)	tSDS	引脚: SID	20	---	---	ns
数据保持时间 (Data hold time)	tSDH		20	---	---	ns
片选信号建立时间 (CS-SCL time)	tCSS	引脚: CSB	20	---	---	ns
片选信号保持时间 (CS-SCL time)	tCSH		20	---	---	ns

VDD = 1.8~3.3V ± 5%, Ta = -30~85°C

输入信号的上升和下降时间 (TR, TF) 在 15 纳秒或更少的规定。

所有的时间, 用 20%和 80%作为标准规定的测定。

6.4 电源启动后复位的时序要求 (RESET CONDITION AFTER POWER UP):

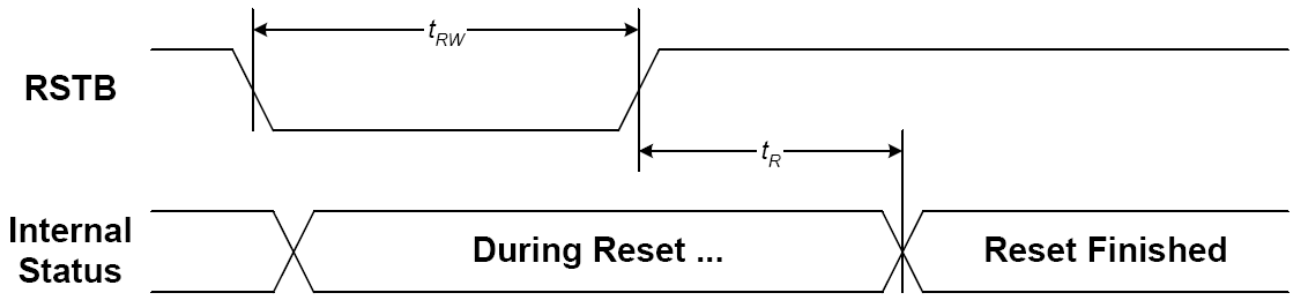
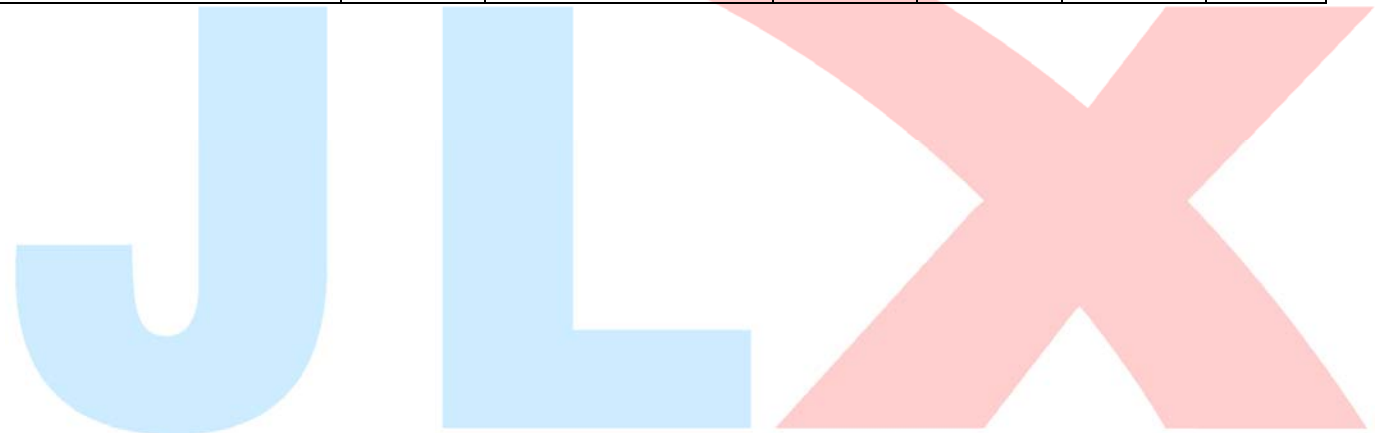


图 4: 电源启动后复位的时序

表 5: 电源启动后复位的时序要求

项目	符号	测试条件	极限值			单位
			MIN	TYPE	MAX	
复位时间	T_{RW}		--	--	1	us
复位保持低电平的时间	T_{RD}	引脚: RESET, WR	1	--	--	ms



7. 指令功能:

7.1 指令表

表 6

指令名称	指令码										
	RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0	
(1)扩展指令1	0	0	0	0	1	1	EXT1	0	0	EXT0	扩展指令 1、2、3、4 OX30:扩展指令 1
Ext[1:0]=0,0(Extension Command/扩展指令 1) OX30 扩屏指令 1 一定要调用 OX30 才能用扩展指令 1											
(2)显示开/关 (display on/off)	0	0	1	0	1	0	1	1	1	0	显示开/关: OXAE:关, OXAF: 开
(3)正显/反显 (Inverse Display)	0	0	1	0	1	0	0	1	1	0	显示正显/反显 OXA6:正显, 正常 OXA7: 反显
(4)所有点阵开/关 (All Pixel ON/OFF)	0	0	0	0	1	0	0	0	1	0	OX22: 所有点阵关 OX23: 所有点阵开
(5) 控制液晶屏显示 (Display Control)	0	0	1	1	0	0	1	0	1	0	OXCA:显示控制
	1	0	0	0	0	0	0	CLD	0	0	OX00:设置 CL 驱动频率: CLD=0
	1	0	DT7	DT6	DT5	DT4	DT3	DT2	DT1	DT0	OX7F:点空比: Duty=128
	1	0	0	0	LF4	F1	LF3	LF2	LF1	LF0	OX20:帧周期
(6)省电模式 (Power save)	0	0	1	0	0	1	0	1	0	SLP	OX94: SLP=0, 退出睡眠模式 OX95: SLP=1, 进入睡眠模式
	0	0	0	1	1	1	0	1	0	1	OX75: 页地址设置
(7)页地址设置 (Set Page Address)	1	0	YS7	YS6	YS5	YS4	YS3	YS2	YS1	YS0	OX00: 起始页地址
	1	0	YE7	YE6	YE5	YE4	YE3	YE2	YE2	YE0	OX1F: 结束页地址, 每 4 行为 1 页
	0	0	0	0	0	1	0	1	0	1	OX15: 列地址设置
(8)列地址设置 (Set Column Address)	1	0	XS7	XS6	XS5	XS4	XS3	XS2	XS1	XS0	OX00: 起始列地址
	1	0	XE7	XE6	XE5	XE4	XE3	XE2	XE1	XE0	OXFF: 结束列地址 XE=256
	0	0	1	0	1	1	1	1	0	0	OXBC: 行列扫描方向
(9)行列扫描方向 (Data Scan Direction)	1	0	0	0	0	0	0	MV	MX	MY	OX00: MX、MY=Normal
	0	0	0	1	0	1	1	1	0	0	OX5C: 写数据
(10)写数据到液晶屏 (Write Data)	1	0	D7	D6	D5	D4	D3	D2	D1	D0	8 位显示数据
	0	0	0	1	0	1	1	1	0	1	OX5D: 读数据
(11)读液晶屏显示数据 (Read Data)	1	1	D7	D6	D5	D4	D3	D2	D1	D0	8 位显示数据
	0	0	1	0	1	0	1	0	0	0	OXA8: 指定显示区域
(12)指定区域显示数据 (Partial In)	1	0	PTS7	PTS6	PTS5	PTS4	PTS3	PTS2	PTS1	PTS0	起始区域地址: 00h≤PTS≥A1h
	1	0	PTE7	PTE6	PTE5	PTE4	PTE3	PTE2	PTE1	PTE0	结束区域地址: 00h≤PTE≥A1h
	0	0	1	0	1	0	1	0	0	1	OXA9: 退出指定区域显示
(13) 退出指定区域显示 (Partial Out)	0	0	1	0	1	0	1	0	0	1	OXA9: 退出指定区域显示
(14)读/改/写	0	0	1	1	1	0	0	0	0	0	OXE0: 进入读/改/写
(15)退出读/改/写	0	0	1	1	1	0	1	1	1	0	OXEE: 退出读/改/写
(16)指定显示滚动区域 (Scroll Area)	0	0	1	0	1	0	1	0	1	0	OXAA: 滚动区域设置
	1	0	TL7	TL6	TL5	TL4	TL3	TL2	TL1	TL0	TL[7:0]:起始区域地址
	1	0	BL7	BL6	BL5	BL4	BL3	BL2	BL1	BLO	BL[7:0]:结束区域地址
	1	0	NSL7	NLS6	NSL5	NSL4	NSL3	NSL2	NSL1	NSLO	NSL[7:0]:指定行数
	1	0	0	0	0	0	0	0	SCM1	SCM0	SCM[1:0]:显示模式

(17)显示初始行设置 (Set Start Line)	0	0	1	0	1	0	1	0	1	1	0XAB: 滚动开始初始行设置 00h≤SL≥A1h
	1	0	SL7	SL6	SL5	SL4	SL3	SL2	SL1	SL0	
(18)开振荡电路	0	0	1	1	0	1	0	0	0	1	0XD1: 开内部振荡电路
(19)关振荡电路	0	0	1	1	0	1	0	0	1	0	0XD2: 关内部振荡电路
(20)电源控制 (Power Control)	0	0	0	0	1	0	0	0	0	0	0X20: 电源控制 0X0B: VB、VF、VR=1
	1	0	0	0	0	0	VB	0	VF	VR	
(21)液晶内部电压设置 (Set Vop)	0	0	1	0	0	0	0	0	0	1	0X81: 设置对比度
	1	0	0	0	Vop5	Vop4	Vop3	Vop2	Vop1	Vop0	0X26: 微调对比度, 范围 0X00-0XFF
	1	0	0	0	0	0	0	Vop7	Vop6	Vop5	0X04: 粗调对比度, 范围 0X00-0X07 先微调再粗调, 顺序不能变
(22)液晶内部电压控制 (Vop Control)	0	0	1	1	0	1	0	1	1	VOL	0XD6: VOP 每格增加 0.04V 0XD7: VOP 每格减少 0.04V
(23)读寄存器模式	0	0	0	1	1	1	1	1	0	REG	0X7C: 读寄存器值 Vop[5:0] 0X7D: 读寄存器值 Vop[8:6]
(24)空操作	0	0	0	0	1	0	0	1	0	1	0X25: 空操作
(25)读状态 (并行、IIC)	0	1	D7	D6	D5	D4	D3	D2	D1	D0	读状态字节
(26)读状态 (串行接口)	0	0	1	1	1	1	1	1	1	0	读状态字节
	0	1	D7	D6	D5	D4	D3	D2	D1	D0	
(27)数据格式选择 (Data Format Select)	0	0	0	0	0	0	1	D0	0	0	0X80: 数据 D7→D0 0XC0: 数据 D0→D7
	1	0	0	0	0	0	0	0	0	0	
(28)显示模式 (Display Mode)	0	0	1	1	1	1	0	0	0	0	0XF0: 显示模式设置 0X10: 黑白模式 0X11: 4 灰级度模式
	1	0	0	0	0	1	0	0	0	DM	
(29)ICON设置	0	0	0	1	1	1	0	1	1	ICON	0X77: 使能 ICON RAM 0X76: 禁用 ICON RAM
(30)设置主/从模式	0	0	0	1	1	0	1	1	1	MS	0X6E: 主模式(使用主模式) 0X6F: 从模式
Ext[1:0]=0,1(Extension Command 2) 0X31 扩屏指令 2 一定要调用 0X31 才能用扩展指令 2											
(31)灰度设置 Set Gray Level	0	0	0	0	1	0	0	0	0	0	0X20: 灰度级设置 GL[4:0]: 浅灰度级设置 GD[4:0]: 深灰度级设置
	1	0	0	0	0	0	0	0	0	0	
	1	0	0	0	0	0	0	0	0	0	
	1	0	0	0	0	0	0	0	0	0	
	1	0	0	0	0	GL4	GL3	GL2	GL1	GL0	
	1	0	0	0	0	GL4	GL3	GL2	GL1	GL0	
	1	0	0	0	0	GL4	GL3	GL2	GL1	GL0	
	1	0	0	0	0	0	0	0	0	0	
	1	0	0	0	0	0	0	0	0	0	
	1	0	0	0	0	GD4	GD3	GD2	GD1	GD0	
	1	0	0	0	0	0	0	0	0	0	
	1	0	0	0	0	0	0	0	0	0	
	1	0	0	0	0	GD4	GD3	GD2	GD1	GD0	
	1	0	0	0	0	GD4	GD3	GD2	GD1	GD0	
	1	0	0	0	0	0	0	0	0	0	
	1	0	0	0	0	0	0	0	0	0	
(32)LCD偏压比设置	0	0	0	0	1	1	0	0	1	0	0X32: 偏压比设置

	1	0	0	0	0	0	0	0	0	0	0	
	1	0	0	0	0	0	0	0	BE1	BE0		0X01: 升压电容频率
	1	0	0	0	0	0	0	BS2	BS1	BS0		0X02: 偏压比, BIAS=1/12
(33)升压倍数 (Booster Level)	0	0	0	1	0	1	0	0	0	1		0X51: 内建升压倍数设置
	1	0	0	1	1	1	1	0	1	BST		0X7B: 10 倍
(34)电压驱动选择	0	0	0	1	0	0	0	0	0	0	DS	0X41: LCD 内部升压
(35)自动读取控制	0	0	1	1	0	1	0	1	1	1		XARD=0: 使能自动读
	1	0	1	0	0	XARD	1	1	1	1		XARD=0: 不使能自动读
(36)控制OTP读写	0	0	1	1	1	0	0	0	0	0		0xe0: OTP 读写
	1	0	0	0	ER/ RD	0	0	0	0	0		WR/RD=0; 0x00, 使能 OTP 读 ER/RD=1; 0x20, 使能 OTP 写
(37)控制OTP出	0	0	1	1	1	0	0	0	0	1		控制 OTP 出
(38)写OTP	0	0	1	1	1	0	0	0	1	0		写 OTP
(39)读OTP	0	0	1	1	1	0	0	0	1	1		读 OTP
(40)OTP选择控制	0	0	1	1	1	0	0	1	0	0		0xe4: OTP 选择控制
	1	0	1	Ctrl	0	0	1	0	0	1		Ctrl=1: 0xc9, 不使能 OTP Ctrl=0: 0x89, 使能 OTP
(41)OTP程序设置	0	0	1	1	1	0	0	1	0	1		OTP 程序设置
	1	0	0	0	0	0	1	1	1	1		
(42)帧速率	0	0	1	1	1	1	0	0	0	0		0xf0: 帧速率设置在不同的温度范围
	1	0	0	0	0	FRA4	FRA3	FRA2	FRA1	FRA0		
	1	0	0	0	0	FRB4	FRB3	FRB2	FRB1	FRB0		
	1	0	0	0	0	FRC4	FRC3	FRC2	FRC1	FRC0		
	1	0	0	0	0	FRD4	FRD3	FRD2	FRD1	FRD0		
(43)温度范围	0	0	1	1	1	1	0	0	1	0		0xf2: 温度范围设置
	1	0	0	TA6	TA5	TA4	TA3	TA2	TA1	TA0		
	1	0	0	TB6	TB5	TB4	TB3	TB2	TB1	TB0		
	1	0	0	TC6	TC5	TC4	TC3	TC2	TC1	TC0		
(44)温度梯度补偿	0	0	1	1	1	1	0	1	0	0		0xf4: 温度补偿系数设置
	1	0	MT13	MT12	MT11	MT10	MT03	MT02	MT01	MT00		
	1	0	MT33	MT32	MT31	MT30	MT23	MT22	MT21	MT20		
	1	0	MT53	MT52	MT51	MT50	MT43	MT42	MT41	MT40		
	1	0	MT73	MT72	MT71	MT70	MT63	MT62	MT61	MT60		
	1	0	MT93	MT92	MT91	MT90	MT83	MT82	MT81	MT80		
	1	0	MTB3	MTB2	MTB1	MTB0	MTA3	MTA2	MTA1	MTA0		
	1	0	MTD3	MTD2	MTD1	MTD0	MTC3	MTC2	MTC1	MTC0		
	1	0	MTF3	MTF2	MTF1	MTF0	MTE3	MTE2	MTE1	MTE0		
Ext[1:0]=1,0(Extension Command 3) 0x38 扩屏指令 3 一定要调用 0X38 才能用扩展指令 3												
(45) ID 设置	0	0	1	1	0	1	0	1	0	1		0xd5: ID 设置
	1	0	ID7	ID6	ID5	ID4	ID3	ID2	ID1	ID0		
(46) 读 ID	0	0	0	1	1	1	1	1	1	RID		RID=1: 0x7f, 使能
Ext[1:0]=1,1(Extension Command 4) 0x39 扩屏指令 4 一定要调用 0X39 才能用扩展指令 4												
(47) 使能 OTP	0	0	1	1	0	1	0	1	1	0		0xd6: 使能 OTP
	1	0	0	0	0	EOTP	0	0	0	0		EOTP=1; 不使能 EOTP, 一般不使能 EOTP EOTP=0; 使能 EOTP

请详细参考 IC 资料”ST75256.PDF”。

7.2 点阵与 DD RAM 地址的对应关系

请留意页的定义：PAGE, 与平时所讲的“页”并不是一个意思，在此表示 **8 个行就是一个“页”**，一个 172*104 点阵的屏分为 13 个“页”，从第 0 “页” 到第 12 “页”。

DB7--DB0 的排列方向：数据是从下向上排列的。最低位 D0 是在最上面，最高位 D7 是在最下面。
每一位 (bit) 数据对应一个点阵，通常“1”代表点亮该点阵，“0”代表关掉该点阵。 如下图所示：

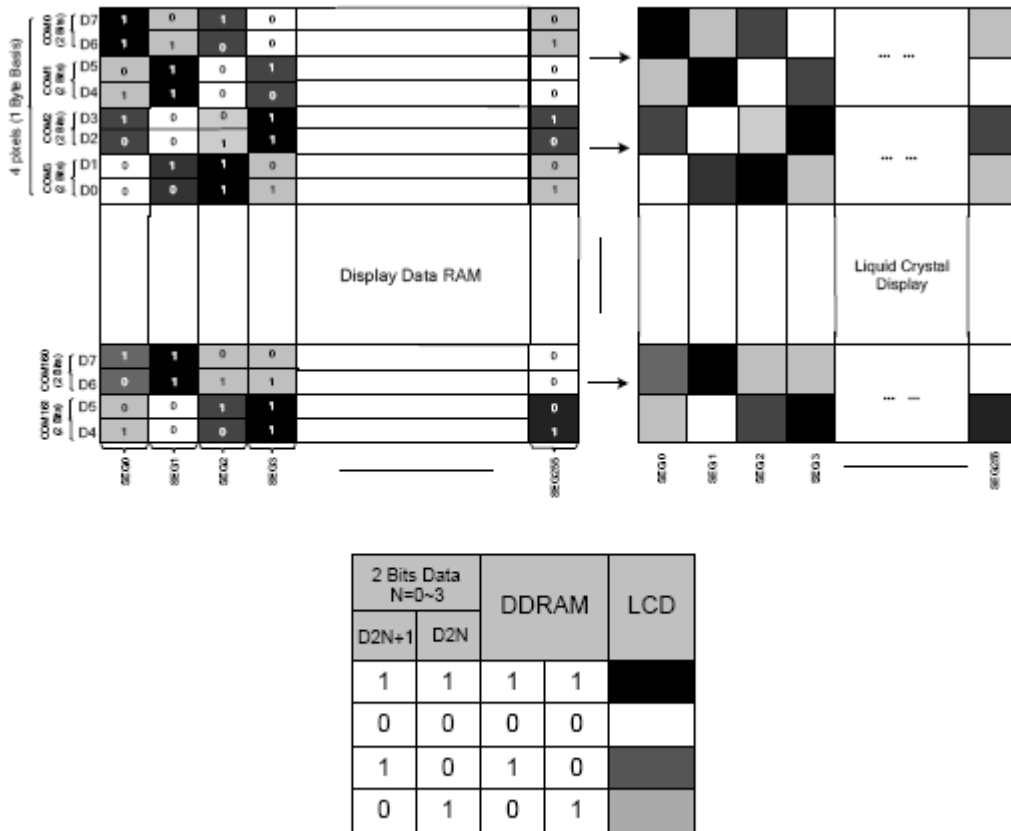
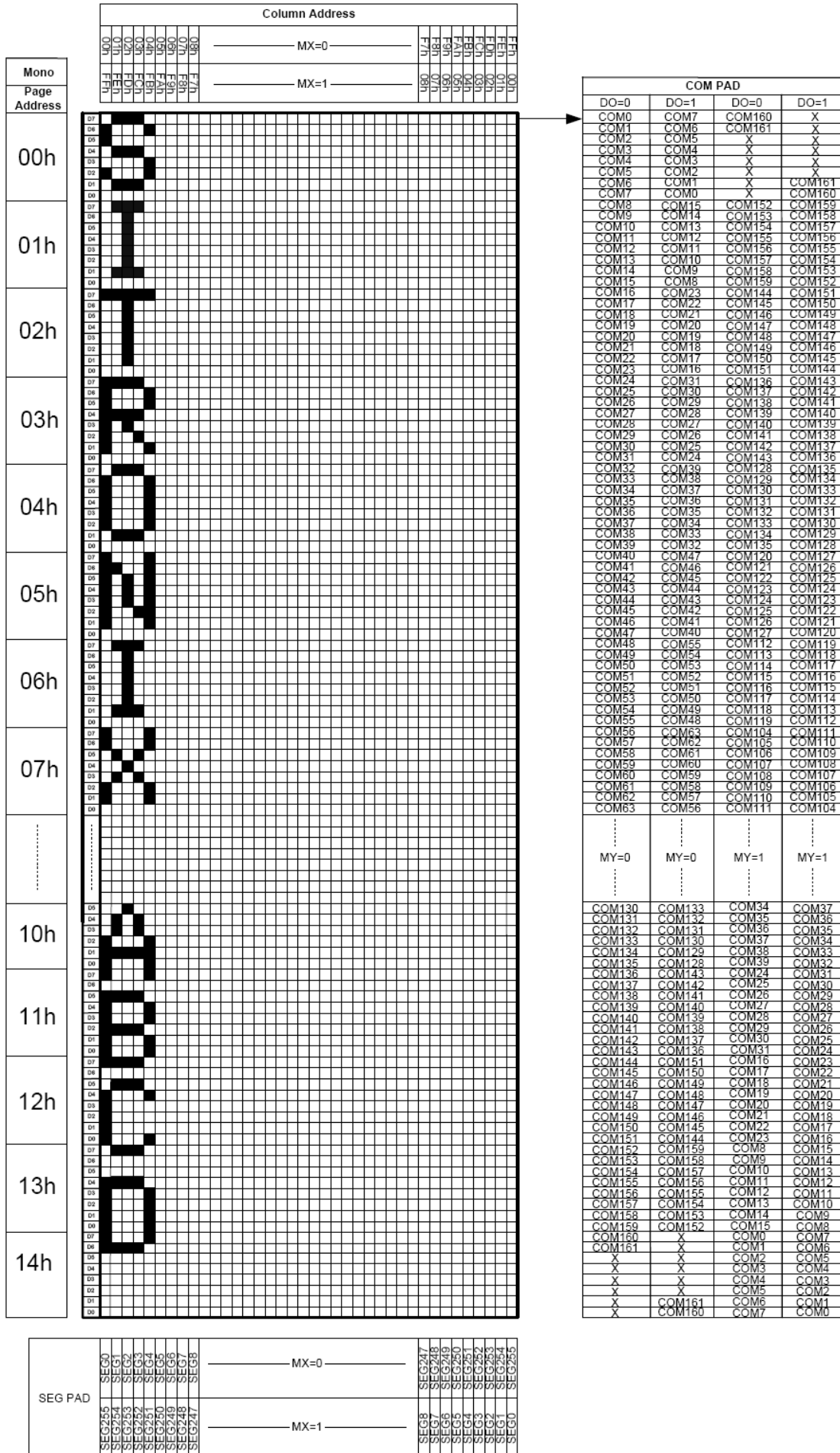


Figure 21 DDRAM Mapping (4-Level Gray Scale Mode)

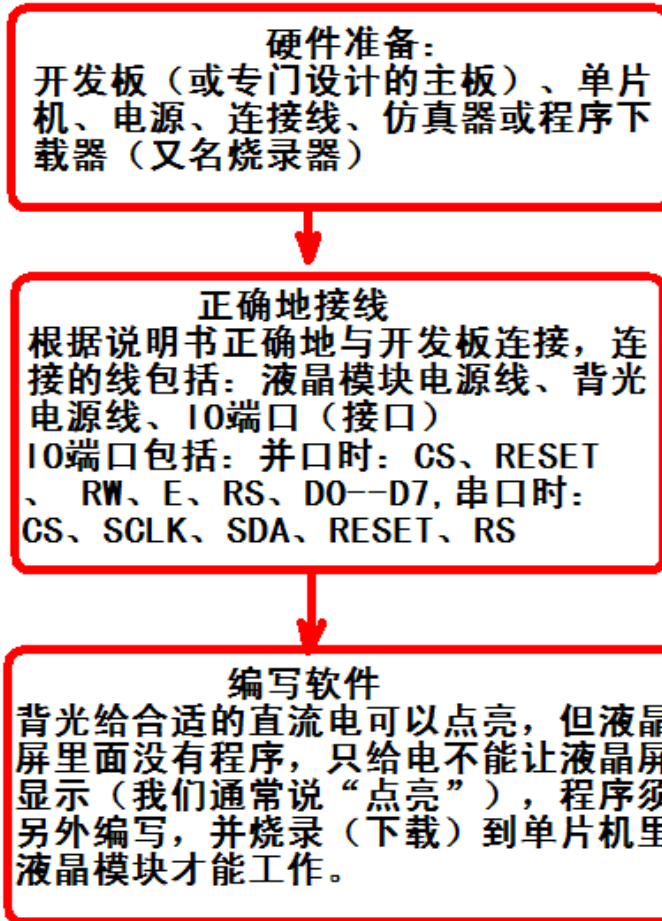
下图摘自 ST75256 IC 资料，可通过 “ST75256.PDF” 之第 37 页获取最佳效果。



7.4 初始化方法

用户所编的显示程序, 开始必须进行初始化, 否则模块无法正常显示, 过程请参考程序

点亮液晶模块的步骤



7.4 程序举例:

7.4.1 串行接口

液晶模块与 MPU(以 8051 系列单片机为例)接口图如下:

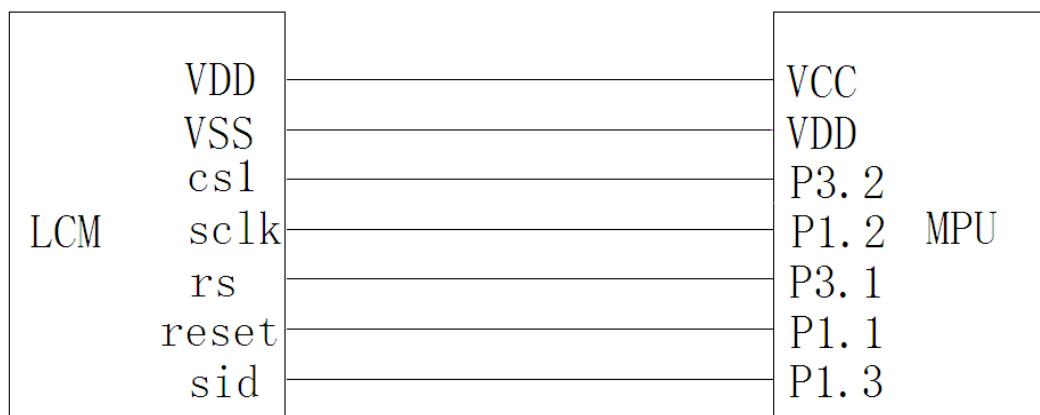
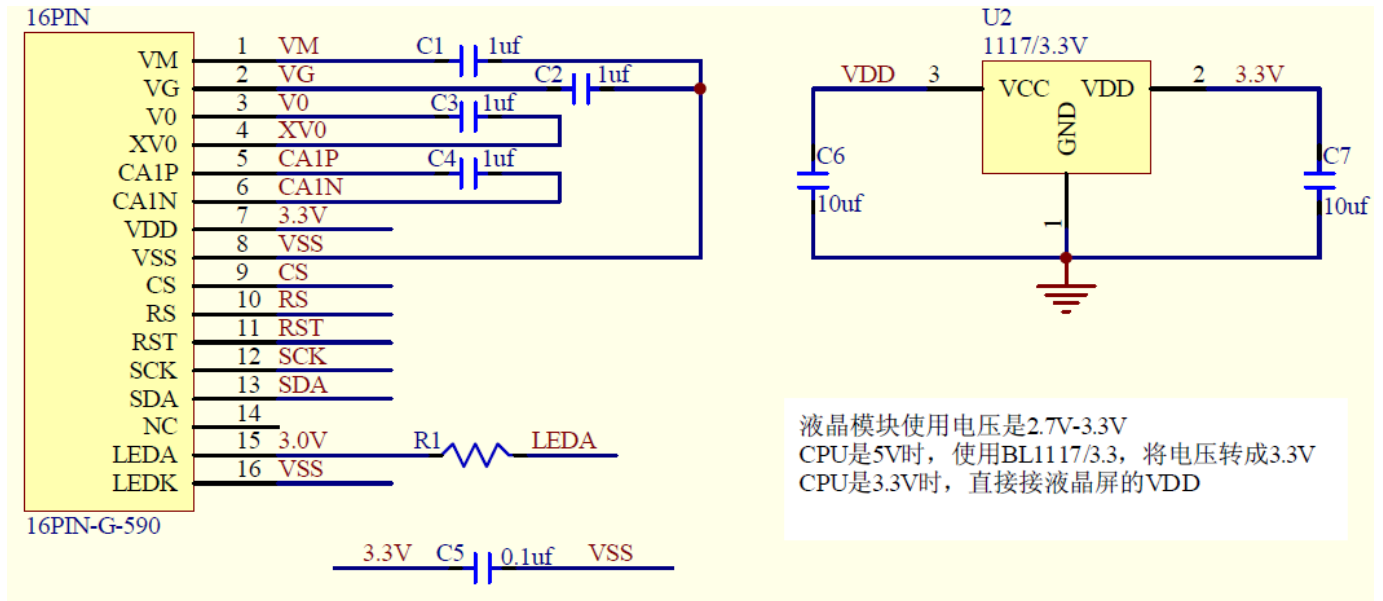


图 5. 串行接口



```

/* 液晶模块型号：JLX72104G-590-BN
   4 线串行接口
   驱动 IC 是:ST75256
   版权所有：晶联讯电子：网址 http://www.jlxlcd.cn;
*/

```

```

#include <reg52.H>
#include <intrins.h>

sbit lcd_cs1 = P3^2;//CS
sbit lcd_reset= P1^1;//RST
sbit lcd_sclk = P1^2;//串行时钟
sbit lcd_rs = P3^1;//RS
sbit lcd_sid = P1^3;//串行数据

sbit key = P2^0; //按键

```

```

#define uchar unsigned char
#define uint unsigned int
#define ulong unsigned long

```

```

uchar code J[];
uchar code L[];
uchar code X[];
uchar code num1[];
uchar code num7[];
uchar code num2[];
uchar code num0[];
uchar code num4[];
uchar code G[];

```

```
uchar code henggang[];
uchar code num5[];
uchar code num9[];
uchar code shen[];
uchar code zhen[];
uchar code jing[];
uchar code lian[];
uchar code xun[];
uchar code ye[];
uchar code mo[];
uchar code kuai[];
uchar code chang[];
uchar code shen1[];
uchar code zhen1[];
uchar code jing1[];
uchar code lian1[];
uchar code xun1[];
uchar code dian1[];
uchar code zi1[];
uchar code jing2[];
uchar code lian2[];
uchar code xun2[];
uchar code dian2[];
uchar code zi2[];

uchar code bmp1[];
uchar code bmp2[];
uchar code bmp_4gray_1[];
```

/*延时: 1 毫秒的 i 倍*/

```
void delay(int i)
{
    int j,k;
    for(j=0;j<i;j++)
        for(k=0;k<110;k++);
}
```

/*延时: 1us 的 i 倍*/

```
void delay_us(int i)
{
    int j,k;
    for(j=0;j<i;j++)
        for(k=0;k<1;k++);
}
```

/*等待一个按键, 我的主板是用 P2.0 与 GND 之间接一个按键*/


```
void waitkey()
{
    repeat:
        if (key==1) goto repeat;
        else delay(800);
}

//写指令到 LCD 模块
void transfer_command_lcd(int data1)
{
    char i;
    lcd_cs1=0;
    lcd_rs=0;
    for(i=0;i<8;i++)
    {
        lcd_sclk=0;
        if(data1&0x80) lcd_sid=1;
        else lcd_sid=0;
        lcd_sclk=1;
        data1<<=1;
    }
    lcd_cs1=1;
}

//写数据到 LCD 模块
void transfer_data_lcd(int data1)
{
    char i;
    lcd_cs1=0;
    lcd_rs=1;
    for(i=0;i<8;i++)
    {
        lcd_sclk=0;
        if(data1&0x80) lcd_sid=1;
        else lcd_sid=0;
        lcd_sclk=1;
        data1<<=1;
    }
    lcd_cs1=1;
}

void initial_lcd()
{
    lcd_reset=0;
    delay(100);
    lcd_reset=1;
}
```



```

delay(100);

transfer_command_lcd(0x30); //EXT=0
transfer_command_lcd(0x94); //Sleep out
transfer_command_lcd(0x31); //EXT=1
transfer_command_lcd(0xD7); //Autoread disable
transfer_data_lcd(0X9F); //

transfer_command_lcd(0x32); //Analog SET
transfer_data_lcd(0x00); //OSC Frequency adjustment
transfer_data_lcd(0x01); //Frequency on booster capacitors->6KHz
transfer_data_lcd(0x03); //Bias=1/11

transfer_command_lcd(0x20); // Gray Level
transfer_data_lcd(0x01);
transfer_data_lcd(0x03);
transfer_data_lcd(0x05);
transfer_data_lcd(0x07);
transfer_data_lcd(0x09);
transfer_data_lcd(0x0b);
transfer_data_lcd(0x0d);
transfer_data_lcd(0x10);
transfer_data_lcd(0x11);
transfer_data_lcd(0x13);
transfer_data_lcd(0x15);
transfer_data_lcd(0x17);
transfer_data_lcd(0x19);
transfer_data_lcd(0x1b);
transfer_data_lcd(0x1d);
transfer_data_lcd(0x1f);

transfer_command_lcd(0x30); //EXT=0
transfer_command_lcd(0x75); //Page Address setting
transfer_data_lcd(0X00); // XS=0
transfer_data_lcd(0X4F); // XE=159
transfer_command_lcd(0x15); //Clumn Address setting
transfer_data_lcd(0X00); // XS=0
transfer_data_lcd(0Xff); // XE=256 ff

transfer_command_lcd(0xBC); //Data scan direction
transfer_data_lcd(0x02); //MX.MY=Normal
transfer_data_lcd(0xA6);

transfer_command_lcd(0x0c); //数据格式选择,0x0C 是低位在前 D0-D7,0x08 是高位在前 D7-D0

transfer_command_lcd(0xCA); //Display Control

```

```

transfer_data_lcd(0X00); //
transfer_data_lcd(0X9F); //Duty=160
transfer_data_lcd(0X20); //Nline=off

transfer_command_lcd(0xF0); //Display Mode
transfer_data_lcd(0X10); //10=Monochrome Mode,11=4Gray

transfer_command_lcd(0x81); //EV control
transfer_data_lcd(0x08); //VPR[5-0]
transfer_data_lcd(0x04); //VPR[8-6]
transfer_command_lcd(0x20); //Power control
transfer_data_lcd(0x0B); //D0=regulator ; D1=follower ; D3=booste, on:1 off:0
delay_us(100);
transfer_command_lcd(0xAF); //Display on
}

```

/*写 LCD 行列地址: X 为起始的列地址, Y 为起始的行地址, x_total,y_total 分别为列地址及行地址的起点到终点的差值 */

```
void lcd_address(int x,int y,x_total,y_total)
```

```

{
    x=x+83;
    y=y-1;

    transfer_command_lcd(0x15); //Set Column Address
    transfer_data_lcd(x);
    transfer_data_lcd(x+x_total-1);

    transfer_command_lcd(0x75); //Set Page Address
    transfer_data_lcd(y);
    transfer_data_lcd(y+y_total-1);
    transfer_command_lcd(0x30);
    transfer_command_lcd(0x5c);
}

```

/*清屏*/

```
void clear_screen(int x,int y)
```

```

{
    int i,j;

    lcd_address(x,y,172,13);

    for(i=0;i<13;i++)
    {
        for(j=0;j<172;j++)
        {
            transfer_data_lcd(0x00);
        }
    }
}

```

```
    }  
  }  
}
```

```
//=====测试画面=====
```

```
void test(int x,int y)  
{  
    int i,j;  
  
    lcd_address(x,y,172,13);  
  
    for(i=0;i<13;i++)  
    {  
        for(j=0;j<172;j++)  
        {  
            transfer_data_lcd(0xff);  
        }  
    }  
}
```

```
void test1(int x,int y)  
{  
    int i,j;  
  
    lcd_address(x,y,172,13);  
  
    for(i=0;i<13;i++)  
    {  
        for(j=0;j<172;j++)  
        {  
            transfer_data_lcd(0x55);  
        }  
    }  
}
```

```
void test2(int x,int y)  
{  
    int i,j;  
  
    lcd_address(x,y,172,13);  
  
    for(i=0;i<13;i++)  
    {  
        for(j=0;j<172;j++)  
        {  
            transfer_data_lcd(0xaa);  
        }  
    }  
}
```

```

    }
}
//=====

```

```

/*显示 172*104 点阵的图像*/
void disp_172x104(int x,int y,char *dp)

```

```

{
    int i,j;

    lcd_address(x,y,172,13);

    for(i=0;i<13;i++)
    {
        for(j=0;j<172;j++)
        {
            transfer_data_lcd(*dp);
            dp++;
        }
    }
}

```

```

/*显示 32*32 点阵的汉字或等同于 32*32 点阵的图像*/
void disp_32x32(int x,int y,uchar *dp)

```

```

{
    int i,j;
    lcd_address(x,y,32,4);
    for(i=0;i<4;i++)
    {
        for(j=0;j<32;j++)
        {
            transfer_data_lcd(*dp);
            dp++;
        }
    }
}

```

```

/*显示 24*24 点阵的汉字或等同于 24*24 点阵的图像*/
void disp_24x24(int x,int y,uchar *dp)

```

```

{
    int i,j;
    lcd_address(x,y,24,3);
    for(i=0;i<3;i++)
    {
        for(j=0;j<24;j++)
        {

```

```

        transfer_data_lcd(*dp);
        dp++;
    }
}

```

/*显示 16*16 点阵的汉字或等同于 16*16 点阵的图像*/

```
void disp_16x16(int x,int y,uchar *dp)
```

```

{
    int i,j;
    lcd_address(x,y,16,2);
    for(i=0;i<2;i++)
    {
        for(j=0;j<16;j++)
        {
            transfer_data_lcd(*dp);
            dp++;
        }
    }
}

```

/*显示 12*24 点阵的汉字或等同于 16*32 点阵的图像*/

```
void disp_12x24(int x,int y,uchar *dp)
```

```

{
    int i,j;
    lcd_address(x,y,12,3);
    for(i=0;i<3;i++)
    {
        for(j=0;j<12;j++)
        {
            transfer_data_lcd(*dp);
            dp++;
        }
    }
}

```

```
void disp_4gray_172x104(int x,int y,uchar *dp)
```

```

{
    int i,j;
    lcd_address(x,y,172,26);
    for(i=0;i<26;i++)
    {
        for(j=0;j<172;j++)
        {
            transfer_data_lcd(*dp);
            dp++;
        }
    }
}

```

```

    }
}

//-----
void main ()
{
    initial_lcd(); //对液晶模块进行初始化设置
    while(1)
    {
        clear_screen(1,1);
        transfer_command_lcd(0xF0); //Display Mode
        transfer_data_lcd(0X11); //10=Monochrome Mode,11=4Gray
        disp_4gray_172x104(1,1,bmp_4gray_1); //显示一幅 172*104 点阵的 4 灰度级图。
        waitkey();
        transfer_command_lcd(0xF0); //Display Mode
        transfer_data_lcd(0X10); //10=Monochrome Mode,11=4Gray
        clear_screen(1,1); //清屏
        disp_172x104(1,1,bmp1); //显示一幅 240*160 点阵的黑白图。地址从 1 开
始
        waitkey();
        disp_172x104(1,1,bmp2); //显示一幅 240*160 点阵的黑白图。地址从 1 开
始
        waitkey();
        clear_screen(1,1); //清屏
        disp_32x32(7,1,jing2); //地址从 1 开始
        disp_32x32((32*1+7),1,lian2);
        disp_32x32((32*2+7),1,xun2);
        disp_32x32((32*3+7),1,dian2);
        disp_32x32((32*4+7),1,zi2);
        disp_24x24(3+24*0,5,shen1);
        disp_24x24(3+24*1,5,zhen1);
        disp_24x24(3+24*2,5,jing1);
        disp_24x24(3+24*3,5,lian1);
        disp_24x24(3+24*4,5,xun1);
        disp_24x24(3+24*5,5,dian1);
        disp_24x24(3+24*6,5,zi1);
        disp_16x16(7+16*0,8,shen);
        disp_16x16(7+16*1,8,zhen);
        disp_16x16(7+16*2,8,jing);
        disp_16x16(7+16*3,8,lian);
        disp_16x16(7+16*4,8,xun);
        disp_16x16(7+16*5,8,ye);
        disp_16x16(7+16*6,8,jing);
        disp_16x16(7+16*7,8,mo);
        disp_16x16(7+16*8,8,kuai);
    }
}

```

```

disp_16x16(7+16*9,8,chang);
disp_12x24(3+12*0,10,J);
disp_12x24(3+12*1,10,L);
disp_12x24(3+12*2,10,X);
disp_12x24(3+12*3,10,num1);
disp_12x24(3+12*4,10,num7);
disp_12x24(3+12*5,10,num2);
disp_12x24(3+12*6,10,num1);
disp_12x24(3+12*7,10,num0);
disp_12x24(3+12*8,10,num4);
disp_12x24(3+12*9,10,G);
disp_12x24(3+12*10,10,henggang);
disp_12x24(3+12*11,10,num5);
disp_12x24(3+12*12,10,num9);
disp_12x24(3+12*13,10,num0);
waitkey();
clear_screen(1,1); //清屏
test(1,1);
waitkey();
test1(1,1);
waitkey();
test2(1,1);
waitkey();
}
}

uchar code J[]={
/*-- 文字: J --*/
/*-- 新宋体 18; 此字体下对应的点阵为: 宽 x 高=12x24 --*/
0x00,0x00,0x00,0x20,0x20,0x20,0xE0,0xE0,0xE0,0x20,0x20,0x20,0x00,0x00,0x00,0x00,
0x00,0x00,0xFF,0xFF,0xFF,0x00,0x00,0x00,0x60,0xE0,0xE0,0xA0,0x80,0xC0,0xFF,0x7F,
0x3F,0x00,0x00,0x00,
};

uchar code L[]={
/*-- 文字: L --*/
/*-- 新宋体 18; 此字体下对应的点阵为: 宽 x 高=12x24 --*/
0x20,0xE0,0xE0,0xE0,0xE0,0x20,0x00,0x00,0x00,0x00,0x00,0x00,0xFF,0xFF,0xFF,
0xFF,0x00,0x00,0x00,0x00,0x00,0x00,0x10,0x1F,0x1F,0x1F,0x1F,0x10,0x10,0x10,
0x18,0x1C,0x1E,0x00,
};

uchar code X[]={
/*-- 文字: X --*/
/*-- 新宋体 18; 此字体下对应的点阵为: 宽 x 高=12x24 --*/
0x20,0x20,0xE0,0xE0,0xE0,0x20,0x00,0xA0,0xE0,0xE0,0x20,0x00,0x00,0x00,0x01,0x07,

```

```
0xDF,0xFE,0xFC,0xEF,0x83,0x00,0x00,0x00,0x10,0x18,0x1C,0x1F,0x13,0x00,0x01,0x17,
0x1F,0x1E,0x18,0x00,
};
```

```
uchar code num1[]={
/*-- 文字: 1 --*/
/*-- 新宋体 18; 此字体下对应的点阵为: 宽 x 高=12x24 --*/
0x00,0x00,0x80,0x80,0x80,0xC0,0xE0,0xE0,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,
0x00,0xFF,0xFF,0xFF,0x00,0x00,0x00,0x00,0x00,0x00,0x10,0x10,0x18,0x1F,0x1F,0x1F,
0x10,0x10,0x00,0x00,
};
```

```
uchar code num7[]={
/*-- 文字: 7 --*/
/*-- 新宋体 18; 此字体下对应的点阵为: 宽 x 高=12x24 --*/
0x00,0xE0,0xE0,0xE0,0x60,0x60,0x60,0x60,0xE0,0xE0,0x60,0x00,0x00,0x03,0x03,0x00,
0x80,0xE0,0xF8,0x3E,0x07,0x01,0x00,0x00,0x00,0x00,0x00,0x00,0x1F,0x1F,0x1F,0x00,
0x00,0x00,0x00,0x00,
};
```

```
uchar code num2[]={
/*-- 文字: 2 --*/
/*-- 新宋体 18; 此字体下对应的点阵为: 宽 x 高=12x24 --*/
0x00,0x80,0xC0,0xE0,0x60,0x20,0x20,0x60,0xE0,0xC0,0x80,0x00,0x00,0x03,0x03,0x03,
0x80,0xC0,0xE0,0x78,0x3F,0x1F,0x07,0x00,0x18,0x1C,0x1E,0x1B,0x19,0x18,0x18,0x18,
0x1C,0x1F,0x1F,0x00,
};
```

```
uchar code num0[]={
/*-- 文字: 0 --*/
/*-- 新宋体 18; 此字体下对应的点阵为: 宽 x 高=12x24 --*/
0x00,0x00,0xC0,0xE0,0xE0,0x20,0x20,0xE0,0xE0,0xC0,0x00,0x00,0x78,0xFF,0xFF,0xFF,
0x00,0x00,0x00,0x00,0xFF,0xFF,0xFF,0x00,0x00,0x03,0x0F,0x1F,0x1C,0x10,0x10,0x1C,
0x1F,0x0F,0x03,0x00,
};
```

```
uchar code num4[]={
/*-- 文字: 4 --*/
/*-- 新宋体 18; 此字体下对应的点阵为: 宽 x 高=12x24 --*/
0x00,0x00,0x00,0x00,0x00,0x80,0xE0,0xF0,0xF0,0x00,0x00,0x00,0x80,0xE0,0xF8,0xBC,
0x8F,0x83,0xFF,0xFF,0xFF,0x80,0x80,0x00,0x00,0x00,0x00,0x00,0x10,0x10,0x1F,0x1F,
0x1F,0x18,0x10,0x00,
};
```

```
uchar code G[]={
```



```
/*-- 文字: G --*/  
/*-- 新宋体 18; 此字体下对应的点阵为: 宽 x 高=12x24 --*/  
0x00,0x80,0xC0,0xE0,0xE0,0x20,0x20,0x60,0xE0,0xE0,0x80,0x00,0xFE,0xFF,0xFF,0x03,  
0x00,0x00,0x40,0x40,0xC0,0xC1,0xC1,0x00,0x01,0x07,0x0F,0x1F,0x18,0x10,0x10,0x18,  
0x1F,0x0F,0x0F,0x00,  
};
```

```
uchar code henggang[]={  
/*-- 文字: - --*/  
/*-- 新宋体 18; 此字体下对应的点阵为: 宽 x 高=12x24 --*/  
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x10,0x10,0x10,0x10,  
0x10,0x10,0x10,0x10,0x10,0x10,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
0x00,0x00,0x00,0x00,  
};
```

```
uchar code num5[]={  
/*-- 文字: 5 --*/  
/*-- 新宋体 18; 此字体下对应的点阵为: 宽 x 高=12x24 --*/  
0x00,0x00,0xE0,0xE0,0x60,0x60,0x60,0x60,0x60,0x60,0x60,0x00,0x00,0x30,0x3F,0x3F,  
0x18,0x08,0x08,0x18,0xF8,0xF0,0xE0,0x00,0x00,0x0F,0x0F,0x1F,0x10,0x10,0x10,0x18,  
0x1F,0x0F,0x07,0x00,  
};
```

```
uchar code num9[]={  
/*-- 文字: 9 --*/  
/*-- 新宋体 18; 此字体下对应的点阵为: 宽 x 高=12x24 --*/  
0x00,0x80,0xC0,0xE0,0x60,0x20,0x20,0x60,0xE0,0xC0,0x80,0x00,0x0E,0x3F,0x7F,0x7F,  
0x60,0x40,0x60,0x60,0xFF,0xFF,0xFF,0x00,0x00,0x0C,0x1C,0x1C,0x1C,0x10,0x18,0x1E,  
0x0F,0x07,0x01,0x00,  
};
```

```
uchar code shen[]={  
/*-- 文字: 深 --*/  
/*-- 新宋体 12; 此字体下对应的点阵为: 宽 x 高=16x16 --*/  
0x10,0x61,0x06,0xE0,0x00,0x26,0x22,0x1A,0x02,0xC2,0x0A,0x12,0x32,0x06,0x02,0x00,  
0x04,0xFC,0x03,0x20,0x20,0x11,0x11,0x09,0x05,0xFF,0x05,0x09,0x19,0x31,0x10,0x00,  
};
```

```
uchar code zhen[]={  
/*-- 文字: 圳 --*/  
/*-- 新宋体 12; 此字体下对应的点阵为: 宽 x 高=16x16 --*/  
0x10,0x10,0x10,0xFE,0x10,0x10,0xFE,0x00,0x00,0xFC,0x00,0x00,0x00,0xFE,0x00,0x00,  
0x08,0x08,0x04,0x47,0x24,0x18,0x07,0x00,0x00,0x1F,0x00,0x00,0x00,0x7F,0x00,0x00,  
};
```

```
uchar code jing[]={
```

```
/*-- 文字: 晶 --*/  
/*-- 新宋体 12; 此字体下对应的点阵为: 宽 x 高=16x16 --*/  
0x00,0x00,0x00,0x00,0x7E,0x2A,0x2A,0x2A,0x2A,0x2A,0x2A,0x7E,0x00,0x00,0x00,0x00,  
0x00,0x7F,0x25,0x25,0x25,0x25,0x7F,0x00,0x00,0x7F,0x25,0x25,0x25,0x25,0x7F,0x00,  
};
```

```
uchar code lian[]={  
/*-- 文字: 联 --*/  
/*-- 新宋体 12; 此字体下对应的点阵为: 宽 x 高=16x16 --*/  
0x02,0xFE,0x92,0x92,0x92,0xFE,0x12,0x11,0x12,0x1C,0xF0,0x18,0x17,0x12,0x10,0x00,  
0x08,0x1F,0x08,0x08,0x04,0xFF,0x05,0x81,0x41,0x31,0x0F,0x11,0x21,0xC1,0x41,0x00,  
};
```

```
uchar code xun[]={  
/*-- 文字: 讯 --*/  
/*-- 新宋体 12; 此字体下对应的点阵为: 宽 x 高=16x16 --*/  
0x20,0x21,0x2E,0xE4,0x00,0x42,0x42,0xFE,0x42,0x42,0x42,0x02,0xFE,0x00,0x00,0x00,  
0x00,0x00,0x00,0x7F,0x20,0x10,0x00,0x7F,0x00,0x00,0x00,0x00,0x3F,0x40,0x38,0x00,  
};
```

```
uchar code ye[]={  
/*-- 文字: 液 --*/  
/*-- 新宋体 12; 此字体下对应的点阵为: 宽 x 高=16x16 --*/  
0x10,0x61,0x06,0xE0,0x18,0x84,0xE4,0x1C,0x84,0x65,0xBE,0x24,0xA4,0x64,0x04,0x00,  
0x04,0x04,0xFF,0x00,0x01,0x00,0xFF,0x41,0x21,0x12,0x0C,0x1B,0x61,0xC0,0x40,0x00,  
};
```

```
uchar code mo[]={  
/*-- 文字: 模 --*/  
/*-- 新宋体 12; 此字体下对应的点阵为: 宽 x 高=16x16 --*/  
0x10,0xD0,0xFF,0x50,0x90,0x04,0xF4,0x54,0x5F,0x54,0x54,0x5F,0xF4,0x04,0x00,0x00,  
0x03,0x00,0xFF,0x00,0x00,0x84,0x85,0x45,0x35,0x0F,0x15,0x25,0x65,0xC4,0x44,0x00,  
};
```

```
uchar code kuai[]={  
/*-- 文字: 块 --*/  
/*-- 新宋体 12; 此字体下对应的点阵为: 宽 x 高=16x16 --*/  
0x10,0x10,0xFF,0x10,0x10,0x00,0x08,0x08,0xFF,0x08,0x08,0x08,0xF8,0x00,0x00,0x00,  
0x08,0x18,0x0F,0x04,0x85,0x41,0x31,0x0D,0x03,0x05,0x09,0x11,0x31,0x61,0x21,0x00,  
};
```

```
uchar code chang[]={  
/*-- 文字: 厂 --*/  
/*-- 新宋体 12; 此字体下对应的点阵为: 宽 x 高=16x16 --*/  
0x00,0x00,0xFE,0x02,0x02,0x02,0x02,0x02,0x02,0x02,0x02,0x02,0x02,0x02,0x02,0x00,  
0x40,0x30,0x0F,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
};
```

};

```
uchar code shen1[]={
/*-- 文字: 深 --*/
/*-- 新宋体 18; 此字体下对应的点阵为: 宽 x 高=24x24 --*/
0x00,0x00,0x00,0x18,0x78,0x70,0x70,0x80,0xC0,0xE0,0xF8,0xB8,0xD0,0xD0,0x90,0x50,
0xD0,0xD0,0xD0,0xF0,0x38,0x38,0x10,0x00,0x01,0x03,0x0E,0x1E,0xDC,0xF8,0x7F,0x27,
0x28,0x2C,0x2E,0xA3,0xE3,0xE1,0xFE,0xFE,0xE4,0xE0,0x23,0x27,0x37,0x36,0x20,0x00,
0x00,0x02,0x72,0x7F,0x7F,0x23,0x20,0x30,0x18,0x1C,0x0E,0x07,0x03,0x01,0xFF,0x7F,
0x71,0x07,0x0F,0x1E,0x1C,0x18,0x10,0x00,
};
```

```
uchar code zhen1[]={
/*-- 文字: 圳 --*/
/*-- 新宋体 18; 此字体下对应的点阵为: 宽 x 高=24x24 --*/
0x00,0x00,0x00,0x00,0xFC,0xFC,0xFC,0x08,0x00,0x00,0xFC,0xFC,0xFC,0x08,0x00,0xF0,
0xF0,0xE0,0x00,0x00,0xFC,0xFC,0x08,0x00,0x02,0x02,0x02,0x02,0xFF,0xFF,0xFF,0x03,
0x03,0x03,0xFF,0xFF,0xFF,0x00,0x00,0xFF,0xFF,0xFF,0x00,0x00,0xFF,0xFF,0x00,0x00,
0x04,0x0C,0x0C,0x0E,0x07,0x43,0x43,0x63,0x39,0x1F,0x0F,0x07,0x00,0x00,0x00,0x0F,
0x0F,0x07,0x00,0x00,0x7F,0x7F,0x38,0x00,
};
```

```
uchar code jing1[]={
/*-- 文字: 晶 --*/
/*-- 新宋体 18; 此字体下对应的点阵为: 宽 x 高=24x24 --*/
0x00,0x00,0x00,0x00,0x00,0x00,0xFC,0xFC,0xFC,0x48,0x48,0x48,0x48,0x48,0x48,0x48,
0xFC,0xFC,0xFC,0x08,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0xF0,0xF0,0xF0,0x20,0x2F,0x2F,
0xE7,0xF2,0xF2,0x22,0x02,0xF2,0xF2,0x22,0x27,0x27,0x27,0xF0,0xF0,0xF0,0x20,0x00,
0x00,0x00,0x7F,0x7F,0x7F,0x22,0x22,0x22,0x7F,0x7F,0x7F,0x00,0x00,0x7F,0x7F,0x22,
0x22,0x22,0x22,0x7F,0x7F,0x7F,0x00,0x00,
};
```

```
uchar code lian1[]={
/*-- 文字: 联 --*/
/*-- 新宋体 18; 此字体下对应的点阵为: 宽 x 高=24x24 --*/
0x10,0x10,0xF0,0xF0,0xF0,0x10,0x10,0xF0,0xF0,0xF8,0x18,0x18,0x1C,0x7C,0x78,0x30,
0xC0,0xF8,0x3E,0x9E,0x8C,0x80,0x00,0x00,0x00,0x00,0xFF,0xFF,0xFF,0x22,0x22,0xFF,
0xFF,0xFF,0x11,0x11,0x11,0x11,0xFF,0xFF,0xFF,0xF1,0x11,0x11,0x18,0x19,0x31,0x20,
0x00,0x0C,0x0F,0x0F,0x07,0x06,0x06,0x7F,0x7F,0x7F,0x41,0x61,0x38,0x1E,0x0F,0x07,
0x01,0x07,0x1F,0x3C,0x78,0x70,0x20,0x20,
};
```

```
uchar code xun1[]={
/*-- 文字: 讯 --*/
/*-- 新宋体 18; 此字体下对应的点阵为: 宽 x 高=24x24 --*/
0x00,0x00,0x00,0x04,0x1C,0x38,0x38,0x30,0x10,0x10,0x10,0x10,0xF0,0xF0,0x50,0x10,
```

```
0x10,0xF8,0xF8,0xF8,0x10,0x00,0x00,0x00,0x04,0x04,0x04,0x04,0x04,0xFE,0xFE,0x16,
0x10,0x10,0x10,0x10,0xFF,0xFF,0x18,0x1C,0x0C,0x3F,0xFF,0xFF,0x00,0x00,0x00,0x00,
0x00,0x00,0x00,0x00,0x10,0x3F,0x3F,0x1C,0x0E,0x03,0x01,0x00,0x7F,0x3F,0x00,0x00,
0x00,0x00,0x07,0x1F,0x3F,0x3F,0x7F,0x00,
};
```

```
uchar code dian1[]={
/*-- 文字: 电 --*/
/*-- 新宋体 18; 此字体下对应的点阵为: 宽 x 高=24x24 --*/
0x00,0x00,0x00,0xC0,0xC0,0xC0,0x40,0x40,0x40,0x40,0xFC,0xFC,0xFC,0x44,0x40,0x40,
0x40,0xC0,0xC0,0xC0,0x80,0x00,0x00,0x00,0x00,0x00,0x00,0xFF,0xFF,0xFF,0x08,0x08,
0x08,0x08,0xFF,0xFF,0xFF,0x08,0x08,0x08,0x08,0xFF,0xFF,0xFF,0x00,0x00,0x00,0x00,
0x00,0x00,0x00,0x03,0x03,0x03,0x01,0x01,0x01,0x01,0x3F,0x7F,0x7F,0x41,0x41,0x41,
0x41,0x43,0x43,0x61,0x7E,0x7E,0x30,0x00,
};
```

```
uchar code zi1[]={
/*-- 文字: 子 --*/
/*-- 新宋体 18; 此字体下对应的点阵为: 宽 x 高=24x24 --*/
0x00,0x00,0x00,0x08,0x08,0x08,0x08,0x08,0x08,0x08,0x08,0x88,0x88,0x88,0xC8,0x68,
0x78,0x38,0x1C,0x1C,0x18,0x10,0x00,0x00,0x00,0x08,0x08,0x08,0x08,0x08,0x08,0x08,
0x08,0x08,0x08,0xFF,0xFF,0xFF,0x0A,0x08,0x08,0x08,0x08,0x0C,0x0C,0x0C,0x18,0x00,
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x20,0x20,0x60,0x60,0x7F,0x7F,0x3F,0x00,0x00,
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,
};
```

```
uchar code jing2[]={
/*-- 文字: 晶 --*/
/*-- 新宋体 23; 此字体下对应的点阵为: 宽 x 高=32x31 --*/
/*-- 高度不是 8 的倍数, 现调整为: 宽度 x 高度=32x32 --*/
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0xF8,0xF8,0xF8,0xF8,0x10,0x10,0x10,0x10,
0x10,0x10,0x10,0x10,0x10,0xF8,0xFC,0xFC,0x18,0x00,0x00,0x00,0x00,0x00,0x00,0x00,
0x00,0x00,0x00,0x80,0x80,0x00,0x00,0x00,0x7F,0x7F,0x3F,0x3F,0x91,0x91,0x11,0x11,
0x11,0x91,0x11,0x11,0x11,0x3F,0x3F,0x3F,0x00,0x00,0x80,0x80,0x00,0x00,0x00,0x00,
0x00,0x00,0x00,0xFF,0xFF,0xFF,0x41,0x41,0x41,0x41,0x41,0xFF,0xFF,0xFF,0x03,0x00,
0x00,0xFF,0xFF,0xFF,0x41,0x41,0x41,0x41,0x41,0xFF,0xFF,0xFF,0x03,0x00,0x00,0x00,
0x00,0x00,0x00,0x3F,0x3F,0x1F,0x08,0x08,0x08,0x08,0x08,0x1F,0x1F,0x1F,0x00,0x00,
0x00,0x3F,0x3F,0x1F,0x08,0x08,0x08,0x08,0x08,0x1F,0x1F,0x1F,0x00,0x00,0x00,0x00,
};
```

```
uchar code lian2[]={
/*-- 文字: 联 --*/
/*-- 新宋体 23; 此字体下对应的点阵为: 宽 x 高=32x31 --*/
/*-- 高度不是 8 的倍数, 现调整为: 宽度 x 高度=32x32 --*/
0x00,0x20,0x20,0xE0,0xE0,0xE0,0x20,0x20,0x20,0xE0,0xE0,0xF0,0x38,0x18,0x30,0x2C,
0x3C,0xF8,0xF0,0xE0,0x00,0x80,0xE0,0xFC,0x7C,0x1C,0x08,0x08,0x00,0x00,0x00,0x00,
};
```

```
0x00,0x00,0x00,0xFF,0xFF,0xFF,0x08,0x08,0x08,0xFF,0xFF,0xFF,0x04,0x04,0x04,0x04,
0x04,0x04,0x04,0xFC,0xFE,0xFF,0x07,0x04,0x06,0x07,0x83,0xC7,0xC6,0x80,0x00,0x00,
0x00,0x00,0x00,0xFF,0xFF,0xFF,0x82,0xC2,0xC2,0xFF,0xFF,0xFF,0x21,0x21,0x21,0x01,
0x01,0x81,0xF9,0xFF,0x7F,0x1F,0xFF,0xF1,0xC1,0x01,0x01,0x01,0x01,0x01,0x00,
0x00,0x01,0x03,0x03,0x01,0x01,0x00,0x00,0x00,0x3F,0x3F,0x3F,0x20,0x30,0x18,0x1C,
0x0E,0x07,0x03,0x01,0x00,0x00,0x00,0x03,0x07,0x0F,0x1E,0x1C,0x18,0x18,0x00,0x00,
};
```

```
uchar code xun2[]={
/*-- 文字: 讯 --*/
/*-- 新宋体 23; 此字体下对应的点阵为: 宽 x 高=32x31 --*/
/*-- 高度不是 8 的倍数, 现调整为: 宽度 x 高度=32x32 --*/
0x00,0x00,0x00,0x00,0x08,0x18,0x78,0xF8,0xF0,0x60,0x20,0x20,0x20,0x20,0x20,0xA0,
0xA0,0xA0,0xA0,0x20,0x20,0x20,0x20,0xF0,0xF8,0xF0,0x20,0x00,0x00,0x00,0x00,0x00,
0x00,0x20,0x20,0x20,0x20,0x20,0xF0,0xF0,0xF0,0x30,0xA0,0x80,0x80,0x80,0x80,0xFF,
0xFF,0xFF,0x81,0xC0,0xE0,0x60,0xC0,0xFF,0xFF,0xFF,0x00,0x00,0x00,0x00,0x00,0x00,
0x00,0x00,0x00,0x00,0x00,0xFF,0xFF,0xFF,0x80,0xC0,0xE0,0x60,0x20,0x00,0xFF,
0xFF,0xFF,0x00,0x00,0x00,0x00,0x00,0x7F,0xFF,0xFF,0xC0,0x80,0xF0,0xF0,0x00,0x00,
0x00,0x00,0x00,0x00,0x00,0x07,0x0F,0x0F,0x07,0x03,0x00,0x00,0x00,0x00,0x1F,
0x1F,0x1F,0x00,0x00,0x00,0x00,0x00,0x00,0x03,0x07,0x0F,0x1F,0x1F,0x1F,0x00,0x00,
};
```

```
uchar code dian2[]={
/*-- 文字: 电 --*/
/*-- 新宋体 23; 此字体下对应的点阵为: 宽 x 高=32x31 --*/
/*-- 高度不是 8 的倍数, 现调整为: 宽度 x 高度=32x32 --*/
0x00,0x00,0x00,0x00,0x80,0x80,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0xFC,0xFC,0xFC,
0x08,0x00,0x00,0x00,0x00,0x00,0x80,0x80,0x00,0x00,0x00,0x00,0x00,0x00,0x00,
0x00,0x00,0x00,0x00,0xFF,0xFF,0xFF,0x41,0x41,0x41,0x41,0x41,0xFF,0xFF,0xFF,
0x41,0x41,0x41,0x41,0x41,0xFF,0xFF,0xFF,0xFF,0x02,0x00,0x00,0x00,0x00,0x00,
0x00,0x00,0x00,0x00,0xFF,0xFF,0x7F,0x10,0x10,0x10,0x10,0x10,0x10,0xFF,0xFF,0xFF,
0x10,0x10,0x10,0x10,0x10,0x10,0x3F,0x3F,0x3F,0x3F,0xC0,0xC0,0x00,0x00,0x00,0x00,
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x0F,0x1F,0x1F,
0x18,0x10,0x10,0x10,0x10,0x10,0x10,0x10,0x18,0x1F,0x1F,0x1E,0x08,0x00,0x00,
};
```

```
uchar code zi2[]={
/*-- 文字: 子 --*/
/*-- 新宋体 23; 此字体下对应的点阵为: 宽 x 高=32x31 --*/
/*-- 高度不是 8 的倍数, 现调整为: 宽度 x 高度=32x32 --*/
0x00,0x00,0x00,0x00,0x10,0x10,0x10,0x10,0x10,0x10,0x10,0x10,0x10,0x10,0x10,
0x10,0x10,0x10,0x90,0xD0,0xF0,0x70,0x78,0x38,0x38,0x30,0x20,0x00,0x00,0x00,0x00,
0x00,0x40,0x40,0x40,0x40,0x40,0x40,0x40,0x40,0x40,0x40,0x40,0x40,0x40,0xFE,0xFE,
0xFC,0x4E,0x4B,0x41,0x41,0x40,0x40,0x40,0x40,0x60,0x70,0x70,0xE0,0xC0,0x00,0x00,
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0xFF,0xFF,
0xFF,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,
};
```

```
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x04,0x0C,0x08,0x18,0x38,0x3F,0x3F,  
0x1F,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
};
```

```
uchar code bmp1[]={  
/*-- 调入了一幅图像: G:\WORK\记录文档\图片\172104 点阵图片\G-590.bmp --*/  
/*-- 宽度 x 高度=172x104 --*/  
0xFF,0xFF,0x03,0x03,0x03,0x03,0x03,0x03,0x03,0x03,0x03,0x03,0x03,0x03,0x03,0x03,  
0x03,0x03,0x03,0x03,0x03,0x03,0x03,0x03,0x13,0x63,0x03,0x03,0x63,0x23,0xA3,0x23,  
0x23,0xA3,0x23,0x23,0x63,0x23,0x03,0x03,0x03,0x03,0xE3,0x03,0x03,0xE3,0x03,0x03,  
0xC3,0x03,0x03,0x03,0xE3,0x03,0x03,0x43,0x43,0x43,0x43,0x43,0x43,0x43,0x43,0x43,  
0x43,0x43,0x43,0x43,0x43,0x43,0x03,0x03,0x03,0x03,0x03,0x03,0xE3,0xA3,0xA3,0xA3,  
0xA3,0xA3,0xE3,0x03,0x03,0x03,0x03,0x23,0xE3,0x23,0x23,0x23,0xE3,0x23,0x13,0x23,  
0xC3,0x03,0x83,0x73,0x23,0x03,0x03,0x03,0x13,0xE3,0x43,0x03,0x23,0x23,0xE3,0x23,  
0x23,0x23,0x23,0xE3,0x03,0x03,0x03,0x03,0x03,0x83,0x83,0x83,0x83,0x83,0xF3,0x83,  
0x83,0x83,0x83,0x83,0x03,0x03,0x03,0x03,0x03,0x23,0x23,0x23,0x23,0x23,0x23,0x23,  
0xA3,0x63,0x23,0x03,0x03,0x03,0x03,0x03,0x03,0x03,0x03,0x03,0x03,0x03,0x03,0x03,  
0x03,0x03,0x03,0x03,0x03,0x03,0x03,0x03,0x03,0x03,0x03,0x03,0x03,0x03,0x03,0x03,  
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
0x00,0x00,0x00,0x41,0xC6,0x30,0x0E,0x00,0x12,0x12,0x91,0x50,0xFC,0x50,0x91,0x93,  
0x10,0x00,0x00,0x81,0x81,0x41,0x7F,0x41,0x81,0x7F,0x00,0x00,0xFF,0x00,0x00,0x00,  
0xFF,0x00,0x00,0x00,0x00,0x00,0xFE,0x02,0x02,0x02,0xFF,0x02,0x02,0x02,0x02,0xFE,  
0x00,0x00,0x00,0x00,0xF0,0x50,0x50,0x57,0x52,0xF2,0x02,0x02,0xF2,0x52,0x57,0x50,  
0x50,0xF0,0x00,0x80,0xFF,0x89,0x89,0x49,0xFF,0x51,0x11,0x11,0x11,0xFF,0x11,0x11,  
0x11,0x11,0x00,0x02,0x02,0x02,0xFE,0x00,0x04,0x04,0xFF,0x04,0x04,0x04,0x00,0xFF,  
0x00,0x80,0x00,0x00,0x00,0xFF,0x44,0x44,0x44,0x44,0xFF,0x44,0x44,0x44,0x44,0xFF,  
0x00,0x00,0x00,0x10,0x10,0x10,0x10,0x10,0x10,0x10,0x10,0xFE,0x11,0x10,0x10,0x10,  
0x18,0x10,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
0x00,0x00,0x00,0x00,0x00,0x00,0xFF,0xFF,0xFF,0xFF,0x00,0x00,0x00,0x00,0x00,0x00,  
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
0x0F,0x80,0x82,0x82,0x81,0x81,0x00,0x80,0x8F,0x80,0x00,0x01,0x03,0x01,0x00,0x80,  
0x80,0x80,0x04,0x02,0x81,0x80,0x80,0x00,0x01,0x00,0x80,0x00,0x07,0x00,0x00,0x00,  
0x80,0x80,0x83,0x80,0x80,0x80,0x0F,0x00,0x00,0x81,0x82,0x81,0x80,0x00,0x00,0x00,  
0x07,0x02,0x82,0x02,0x02,0x07,0x00,0x00,0x07,0x02,0x82,0x82,0x02,0x07,0x00,0x00,  
0x01,0x00,0x00,0x00,0x8F,0x00,0x08,0x04,0x03,0x80,0x81,0x82,0x8C,0x04,0x00,0x00,  
0x00,0x00,0x07,0x02,0x01,0x00,0x07,0x00,0x80,0x80,0x80,0x83,0x84,0x83,0x00,0x00,  
0x00,0x00,0x80,0x80,0x00,0x00,0x03,0x04,0x04,0x04,0x84,0x84,0x04,0x07,0x00,0x00,  
0x00,0x00,0x00,0x00,0x04,0x08,0x07,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
0x00,0x00,0xFF,0xFF,0xFF,0xFF,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0xFF,  
0x00,0x00,0x00,0x00,0xFF,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x01,0xC6,0x38,0x38,  
0xC6,0x01,0x00,0x00,0x01,0x01,0xFF,0x00,0x00,0x00,0x00,0x00,0x03,0x00,0xF0,0x0C,  
0x03,0x00,0x00,0x00,0x07,0x80,0x40,0x20,0x18,0x07,0x00,0x00,0x01,0x01,0xFF,0x00,  
0x00,0x00,0x00,0x00,0xFE,0x01,0x00,0x00,0x01,0xFE,0x00,0x00,0x70,0x4C,0x42,0x41,  
0xFF,0x40,0x00,0x7C,0x83,0x00,0x00,0x20,0xE3,0x20,0x00,0x00,0x10,0x10,0x10,0x10,
```



```
0xC6,0xC1,0xC0,0xC8,0xC4,0xC2,0xC1,0xC0,0xC1,0xC2,0xCE,0xC4,0xC0,0xC0,0xC0,0xC0,  
0xC2,0xC2,0xC2,0xC1,0xC1,0xC0,0xC0,0xCF,0xC0,0xC0,0xC1,0xC2,0xC1,0xC0,0xC0,0xC0,  
0xC0,0xC0,0xC0,0xC0,0xC0,0xC0,0xC0,0xC0,0xC0,0xC0,0xC0,0xC0,0xC0,0xC0,0xC0,  
0xC0,0xC5,0xC3,0xC0,0xC0,0xC0,0xC0,0xC0,0xC0,0xC0,0xC0,0xC0,0xC0,0xC0,0xC4,  
0xC3,0xC0,0xC2,0xC4,0xC3,0xC0,0xC0,0xC7,0xC2,0xC1,0xC0,0xC3,0xC6,0xC2,0xC0,0xC8,  
0xC8,0xC4,0xC4,0xC2,0xC1,0xC0,0xC0,0xC0,0xC4,0xC8,0xC7,0xC0,0xC0,0xC0,0xC0,0xC2,  
0xC2,0xC2,0xC2,0xC2,0xC2,0xC2,0xC3,0xC2,0xC2,0xC2,0xC2,0xC2,0xC2,0xC2,0xC0,0xC0,  
0xC4,0xC4,0xC4,0xC4,0xC4,0xC4,0xC7,0xC4,0xC4,0xC4,0xC4,0xC4,0xC6,0xC4,0xC0,0xC0,  
0xC0,0xC0,0xC0,0xC0,0xC0,0xC0,0xC0,0xC0,0xC0,0xC0,0xC0,0xC0,0xC0,0xC0,0xC0,0xC0,  
};
```

```
uchar code bmp2[]={  
/*-- 调入了一幅图像: G:\WORK\记录文档\图片\172104 点阵图片\猫.bmp --*/  
/*-- 宽度 x 高度=172x104 --*/  
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x80,0xC0,0xE0,0x70,0x70,0x38,  
0x1C,0x0E,0x8E,0x0F,0x3E,0xF8,0xE0,0x80,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
0x00,0x00,0x00,0x00,0x00,0xF0,0x50,0x50,0x50,0x50,0x50,0x50,0x50,0xF0,0x00,0x00,0x00,  
0x00,0x10,0xF0,0x90,0x90,0x90,0xF0,0x90,0x88,0x90,0xE0,0x80,0xC0,0xB8,0x90,0x80,  
0x00,0x00,0x08,0x70,0x20,0x00,0x10,0x10,0xF0,0x10,0x10,0x10,0x10,0xF0,0x00,0x00,  
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
0x00,0x00,0x00,0x00,0x80,0x80,0xC0,0xC0,0xC0,0xE0,0x60,0x60,0x70,0x30,0x70,0xF0,  
0x30,0x38,0x38,0xDC,0x9E,0x07,0x03,0x01,0x00,0x00,0x00,0x00,0x38,0x26,0x21,0x27,  
0x38,0x00,0x1F,0x7F,0xFC,0xE0,0xC0,0xC0,0x80,0x80,0x00,0x00,0x00,0x00,0x00,0x00,  
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
0x28,0x2B,0x29,0xF9,0x01,0x01,0xF9,0x29,0x2B,0x28,0x28,0xF8,0x00,0x40,0xFF,0x44,  
0x44,0x24,0xFF,0x28,0x08,0x08,0x88,0x7F,0x88,0x08,0x08,0x08,0x00,0x01,0x01,0x01,  
0xFF,0x00,0x82,0x02,0xFF,0x02,0x02,0x02,0x00,0xFF,0x00,0xC0,0x00,0x00,0x00,0x00,  
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
0x00,0x00,0x00,0x80,0xC0,0xE0,0x60,0x30,0x38,0x38,0x4C,0x4E,0x46,0x47,0x83,  
0x83,0x81,0x01,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x01,0x02,0x0C,0x18,0x20,  
0x43,0x87,0x19,0x22,0xC2,0x84,0x04,0x04,0x08,0x08,0x18,0x10,0x20,0xC0,0x00,0x00,  
0x00,0x00,0x01,0x01,0x03,0x03,0x07,0x07,0x0E,0x1C,0x38,0x38,0x70,0xE0,0xC0,0x80,  
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x03,0x01,0x01,0x01,0x81,0x83,  
0x80,0xC0,0xC3,0xC1,0xC1,0xC1,0xE3,0xE0,0xE0,0xE0,0x60,0x60,0x60,0x67,0x60,  
0x64,0x62,0xE1,0xE0,0xE0,0xE1,0xC6,0xC2,0xC0,0xC0,0xC0,0x80,0x83,0x81,0x80,0x00,  
0x03,0x00,0x00,0x00,0x00,0x01,0x02,0x01,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,  
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,
```

0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x80,0x80,
0xC0,0xE0,0x60,0x70,0x30,0x30,0x38,0x18,0x18,0x18,0x18,0x18,0x1C,0x1E,0x0E,0x07,
0x03,0x01,0x00,0x00,0x01,0x03,0x0E,0x3E,0xE4,0x04,0x0C,0x08,0x18,0x11,0x21,0x42,
0x82,0x04,0x0C,0x18,0x30,0x60,0xC0,0x00,0x00,0x00,0x00,0x00,0x00,0x01,0x02,0x0C,
0x70,0xC1,0x03,0x02,0x06,0x04,0x04,0x04,0x02,0x03,0x00,0x00,0xC0,0x60,0x70,0x30,
0x98,0x88,0xDC,0x58,0x58,0x48,0x48,0xD8,0xF8,0xFE,0x33,0x0F,0x0F,0x1E,0x38,0x70,
0xB8,0x3C,0x1C,0x0C,0x0E,0x06,0x07,0x07,0x03,0x03,0x03,0x01,0x01,0x01,0x00,0x00,
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,
0x00,0x00,0x00,0x00,0x00,0x00,0x01,0x01,0x01,0x01,0x03,0x03,0x03,0x07,0x07,0x06,
0x0E,0x0E,0x0C,0x1C,0x18,0x18,0x30,0x70,0x60,0xE0,0xC0,0xC0,0x80,0x00,0x00,0x00,
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x01,0x03,0x07,0x07,0x0E,0x1C,0x3C,
0x78,0xF0,0xE2,0xC3,0x86,0x0A,0x1B,0x33,0x1F,0x00,0x00,0x00,0x00,0x00,0x00,0x00,
0x00,0x00,0x00,0x00,0x03,0x1E,0x70,0x80,0x00,0x00,0x00,0x00,0x00,0x03,0x0E,0xF8,
0x00,0x00,0x00,0x03,0x06,0x18,0x60,0x80,0x00,0x00,0x00,0x00,0x00,0x01,0x3E,0xE0,
0x00,0x00,0x00,0x00,0xE0,0x3C,0x06,0xE7,0x39,0x0C,0x02,0x01,0x00,0x00,0x00,0x00,
0x00,0x00,0xE0,0xFC,0xFC,0x59,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x03,0xFC,0x00,0x00,
0x00,0x00,0x80,0x80,0x00,0x40,0x40,0x20,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x01,0x03,0x07,0x0E,0x1E,0x1C,0x78,0xF0,0xC0,
0x80,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x01,0x03,
0x07,0x1F,0xFE,0xFC,0xF0,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,
0x00,0x00,0x00,0x01,0x03,0x06,0x04,0x04,0x04,0x02,0x03,0x00,0x00,0x00,0x00,0x00,
0x00,0x00,0x00,0x01,0x03,0x0C,0x18,0x30,0x20,0x20,0x30,0x1F,0x00,0x00,0x00,0x00,
0xFF,0xF0,0x3F,0x01,0x00,0x00,0x00,0x00,0x80,0xC0,0xE0,0xF0,0xF8,0x7F,0x1F,0x17,
0x01,0x80,0x40,0x20,0x20,0x90,0x88,0xC8,0xFC,0x3F,0x22,0x12,0x11,0x81,0x88,0x88,
0x08,0x44,0x44,0x44,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,
0x80,0xC0,0x40,0x60,0x20,0x30,0x10,0x10,0x18,0x08,0x08,0x0C,0x0C,0x04,0x04,0x04,
0x04,0x04,0x04,0x04,0x04,0x04,0x08,0x08,0x08,0x18,0x10,0x20,0x60,0x40,0x80,
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x01,0x07,0x1F,0x3C,0xF0,
0xE0,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,
0x00,0x00,0x00,0x00,0x80,0x80,0xC0,0xE0,0xE0,0x70,0x70,0x78,0x78,0x78,0x7B,0xDF,
0xBF,0xBF,0xF0,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x80,0xC0,0x40,0x70,0x78,0x68,
0x88,0x88,0xCC,0x48,0x4C,0x46,0x6E,0x23,0x23,0x33,0x33,0x32,0x32,0x32,0x32,0x12,
0x16,0x14,0x14,0x14,0x34,0x28,0x38,0x30,0x30,0x20,0x20,0x40,0x43,0xDF,0xF8,0x40,
0x60,0x60,0xC3,0x07,0x07,0x03,0x03,0x10,0x09,0x54,0x32,0x2B,0x15,0xD0,0x6A,0x29,
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