

KS0108B 控制器系列液晶模块使用说明书（二）

第一章 汉升 KS0108B 控制器系列产品介绍

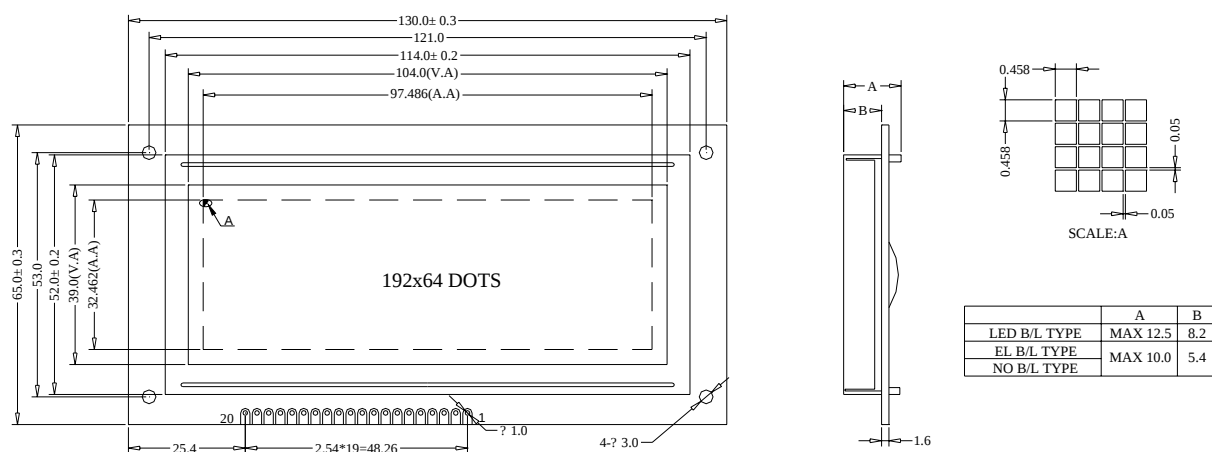
一、KS0108B 控制器系列产品列表

汉升实业有限公司生产的以 KS0108B 为控制器的 192×64 系列主要产品型号如下:

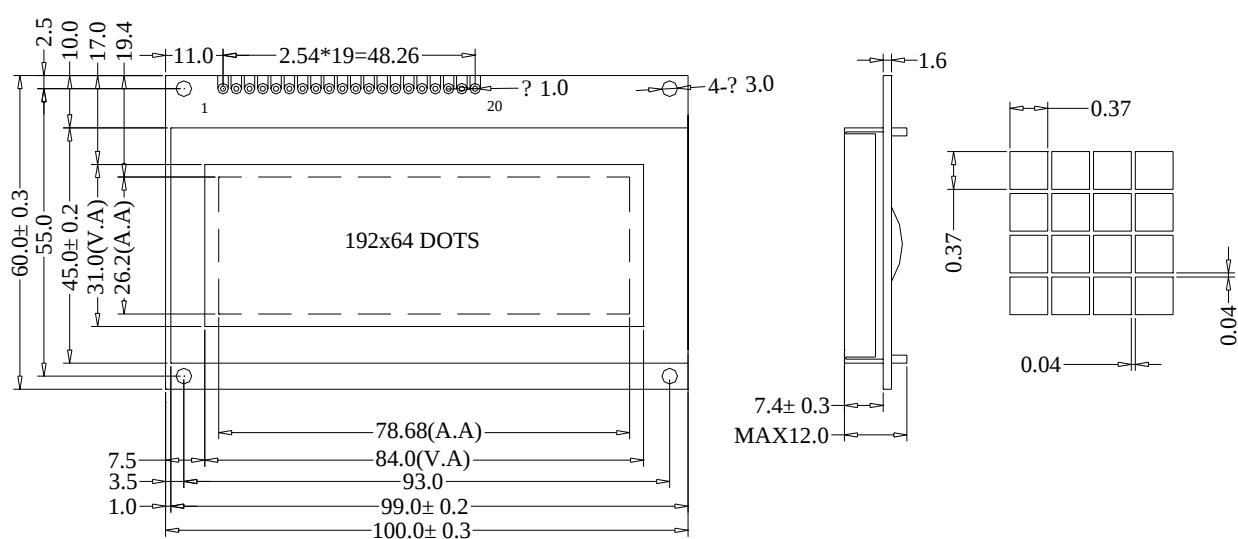
HS19264-1	HS19264-6	HS19264-7	
HS19264B-V3.0	HS19264F	HS19264G	HS19264H

二、192×64 点阵系列主要产品外形图

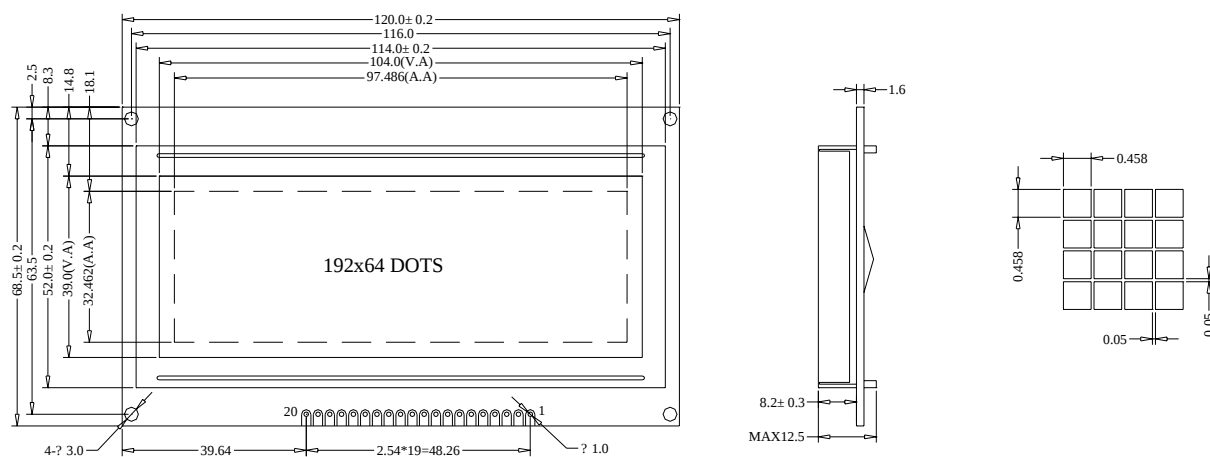
1. 19264-1



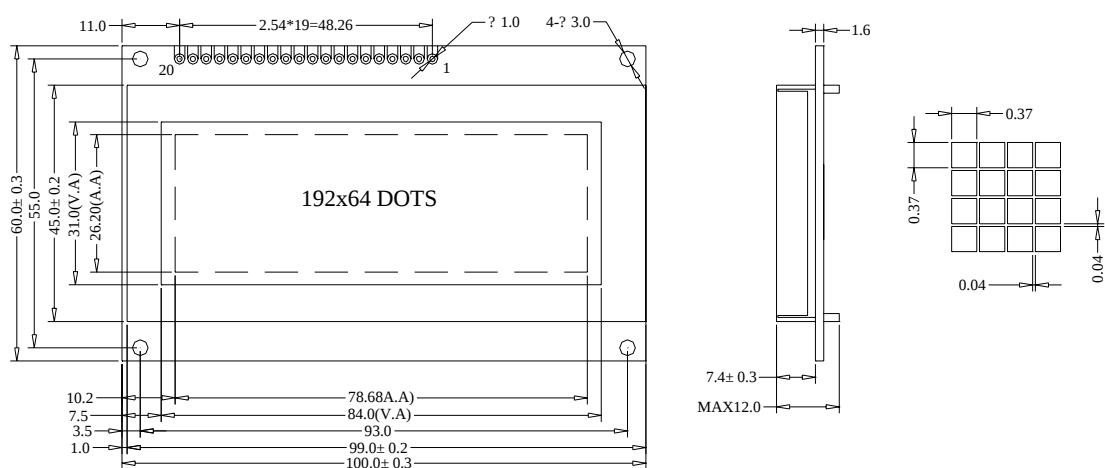
2. 19264-6



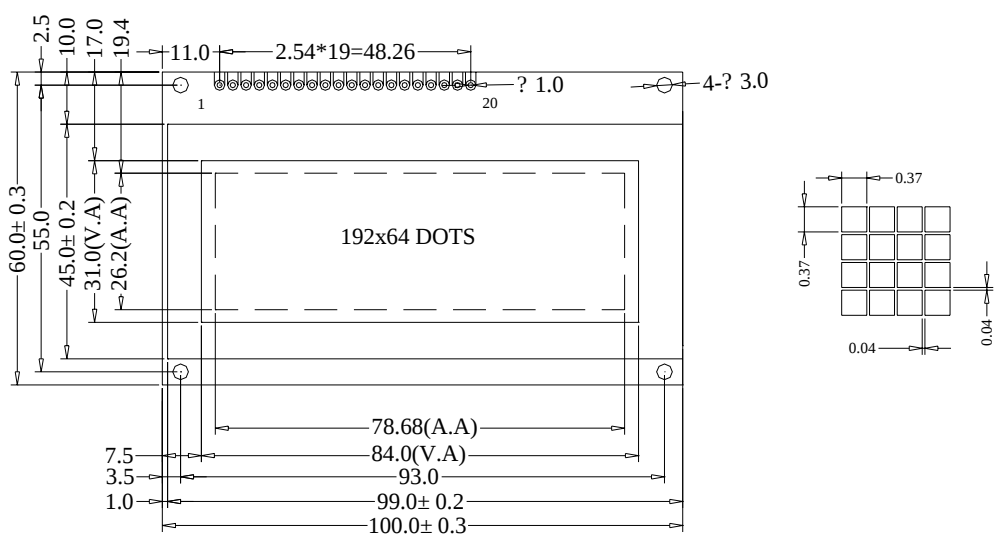
3. 19264-7



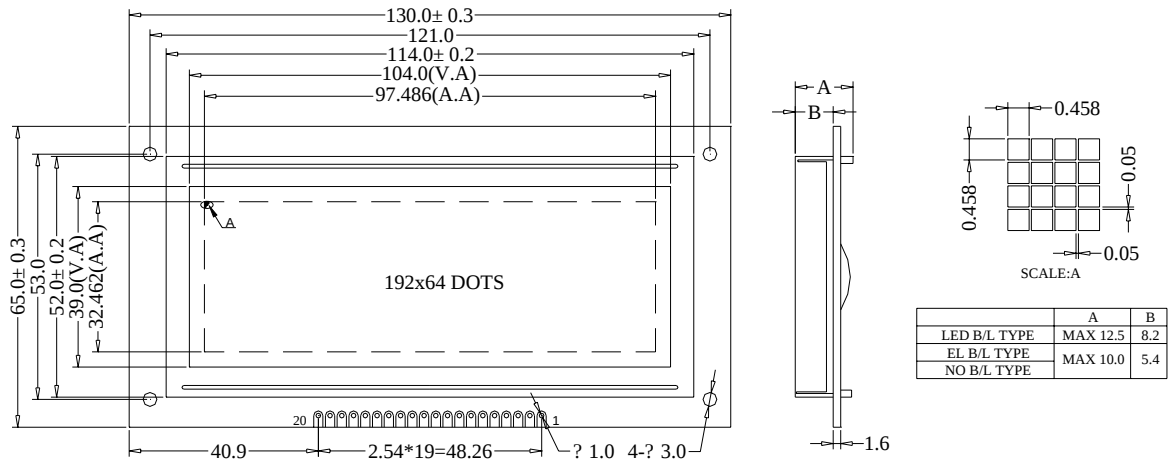
4. 19264F



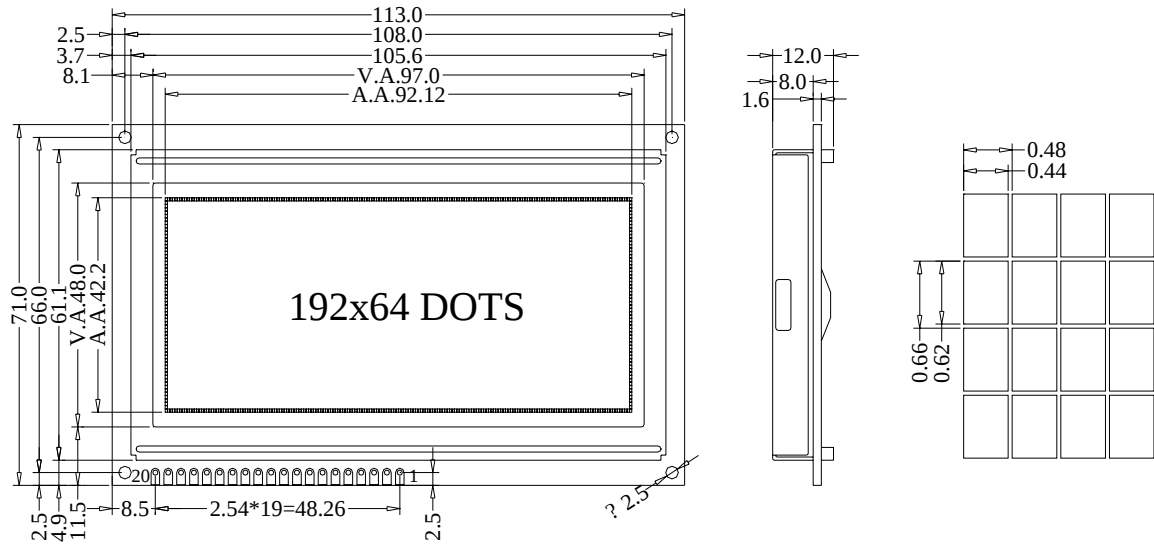
5. 19264B-V3.0



6. 19264G



7. 19264H



三、 接口顺序

	19264-1	19264-6	19264-7	19264B V3.0	19264F	19264G	19264H
1	VSS	DB7	VSS	CSA	CSA	VSS	VSS
2	VDD	DB6	VDD	CSB	CSB	VDD	VDD
3	V0	DB5	V0	VSS	VSS	V0	V0
4	RS	DB4	RS	VDD	VDD	RS	RS
5	R/W	DB3	R/W	V0	V0 (NC)	R/W	R/W
6	E	DB2	E	RS	RS	E	E
7	DB0	DB1	DB0	R/W	R/W	DB0	DB0
8	DB1	DB0	DB1	E	E	DB1	DB1
9	DB2	E	DB2	DB0	DB0	DB2	DB2
10	DB3	R/W	DB3	DB1	DB1	DB3	DB3
11	DB4	RS	DB4	DB2	DB2	DB4	DB4
12	DB5	V0	DB5	DB3	DB3	DB5	DB5
13	DB6	VDD	DB6	DB4	DB4	DB6	DB6
14	DB7	VSS	DB7	DB5	DB5	DB7	DB7
15	CS1	CSB	CS1	DB6	DB6	RST	CS1
16	RST	CSA	RST	DB7	DB7	CS1	CS2
17	CS2	VOUT	CS2	VOUT	LEDA	CS2	CS3
18	CS3	RST	CS3	RST	LEDK	CS3	RST
19	VOUT	LEDA	VOUT	LEDA	VOUT (NC)	LEDA	VOUT
20	LEDA	LEDK	LEDA	LEDK	RST	LEDK	LEDA

* 19264-1, 19264-3, 19264C 接口及外形相同, 只是采用的负压电路不同

* 19264 点阵系列模块接口的片选有 2 片选和 3 片选之分, 关于片选下文有说明。

* Vout 或名 VEE, 意义相同

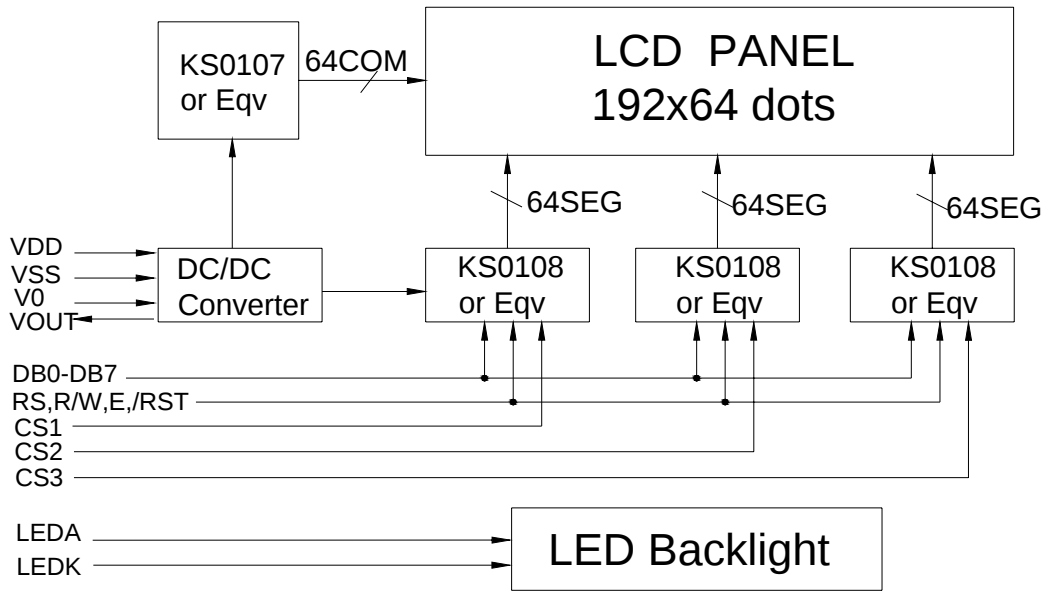
* LEDA 或名 BLA, A; LEDK 或名 BLK, K;

说明: 以上产品都有 STN 黄绿膜, 蓝膜以及 FSTN 产品可选。LED 背光有多种颜色可选, 部分产品可配置 EL 背光。用户可以根据需要自己选定常温、宽温或者超宽温产品。HS19264 系列产品同时支持 5.0V 和 3.3V 电压供电方式。

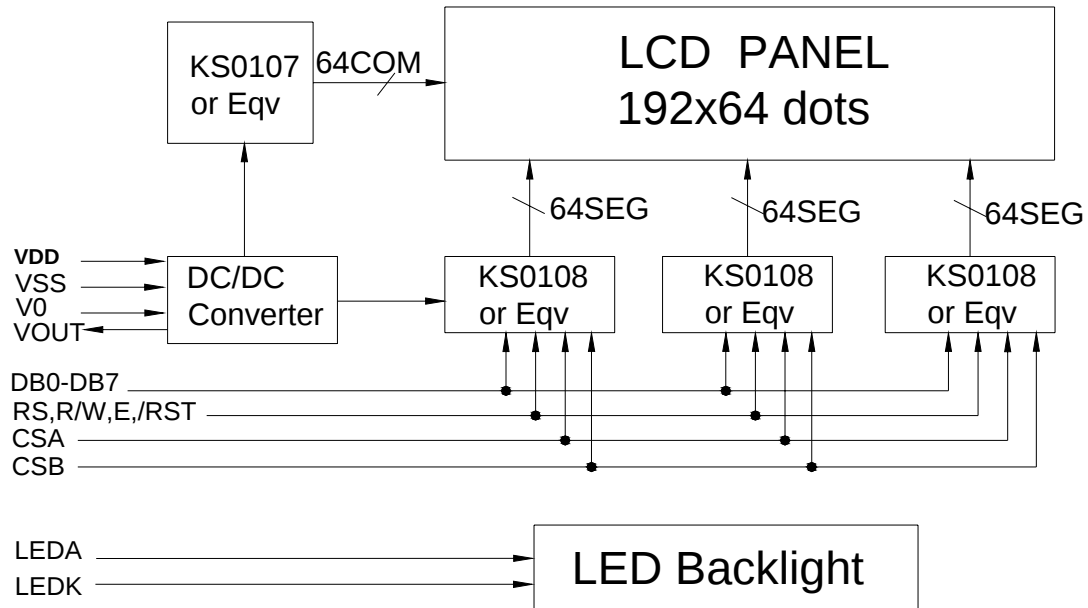
四、 接口说明

名称	型态	电平	功能描述
VSS	—	—	电源地
VDD	输入	—	电源输入（+5V）
V0	输入	—	LCD 驱动电压输入端（对比度调节）
R /W	输入	H/L	读/写信号
CS1	输入	H/L	19264-1, 19264-7, 19264G, 19264H 的片选信号 一般低有效，部分产品高电平有效，具体见各产品外形文件
CS2			
CS3			
CSA	输入	H/L	19264-6, 19264B-V3.0, 19264F 的片选信号，一般低有效， 部分产品高电平有效，具体见各产品外形文件
CSB			
RS	输入	H/L	寄存器选择端 H：命令寄存器；L：数据寄存器
/RST	输入	H/L	复位信号
DB0 ~ DB7	输入/输出	H/L	数据线
VOUT	输入	—	负压输入输出端
LEDA	输入	+5V	背光正极
LEDK	—	0V	背光负极

五、 原理简图



192×64 点阵系列 3 片选模块原理简图



192×64 点阵系列 2 片选模块原理简图

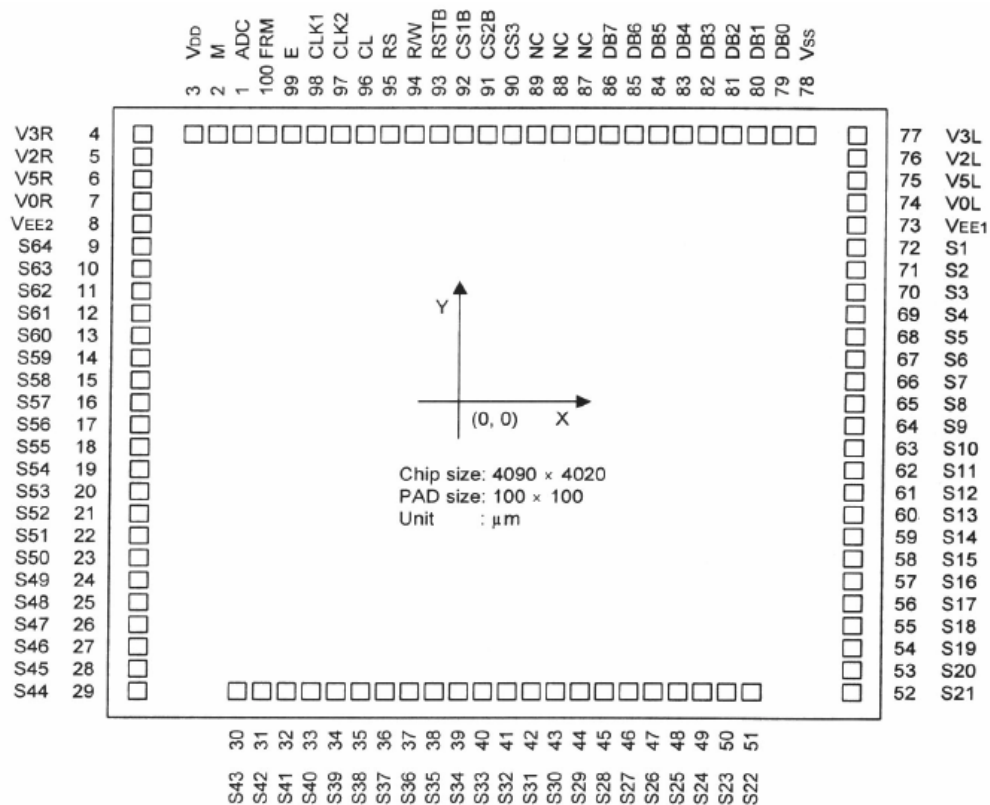
六、 电气特性 (测试条件 $T_a = 25$, $V_{cc} = 5.0 \pm 0.25V$)

1. 逻辑工作电压 (V_{cc}): 4.5~5.5V
2. 电源地 (GND): 0V
3. 输入电压: 0~ V_{cc}
4. 输入高电平 (V_{ih}): 2.0~ V_{cc}
5. 输入低电平 (V_{il}): 0~0.8V
6. 输出高电平 (V_{oh}): 2.4min
7. 输出低电平 (V_{ol}): 0~0.4V
8. 模块工作电流: 见相关产品外形文件
9. 白侧光工作电流: 见相关产品外形文件
10. 底黄绿光工作电流: 见相关产品外形文件
11. 工作频率: 0.4~5.5MHz

第二章 KS0108B 控制驱动器的主要硬件说明

KS0108B 或其兼容控制驱动器，作为 64 路列驱动，内置 $64 \times 64 = 4096$ 位显示 RAM，显示屏上各像素点的显示状态与显示 RAM 的各位数据一一对应，显示 RAM 的数据直接作为图象显示的驱动号。显示数据为“1”，相应的像素点显示；显示数据为“0”，相应的像素点不显示。KS0108B（或其兼容芯片）配备了一套显示 RAM 的管理电路和与计算机的接口电路，允许计算机直接访问显示 RAM。KS0108B 适配 M6800 时序 CPU 接口。

KS0108B 的驱动管脚图如下所示：



KS0108B 或其兼容控制驱动器的引脚功能见下表：

D0-D70	三态	数据总线
R/W	输入	R/W=1，MCU 对 KS0108B 的读操作信号 R/W=0，MCU 对 KS0108B 的写操作信号
CS1B CS2B CS3B	输入	片选信号。仅当 CS1B=CS2B=0 且 CS3B=1 时，KS0108B 才选通。
RS	输入	通道选择信号，C/D=1 指令通道，C/D=0 数据通道
E	输入	使能信号。
RST	输入	复位信号，低有效。复位时，KS0108B 将显示开关和显示起始行寄存器清零。

CS1B，CS2B 和 CS3 为 KS0108B 的片选信号，只有 CS1B=CS2B=0 且 CS3=1 时，KS0108B 才被选通，对 KS0108B 的操作才有效。

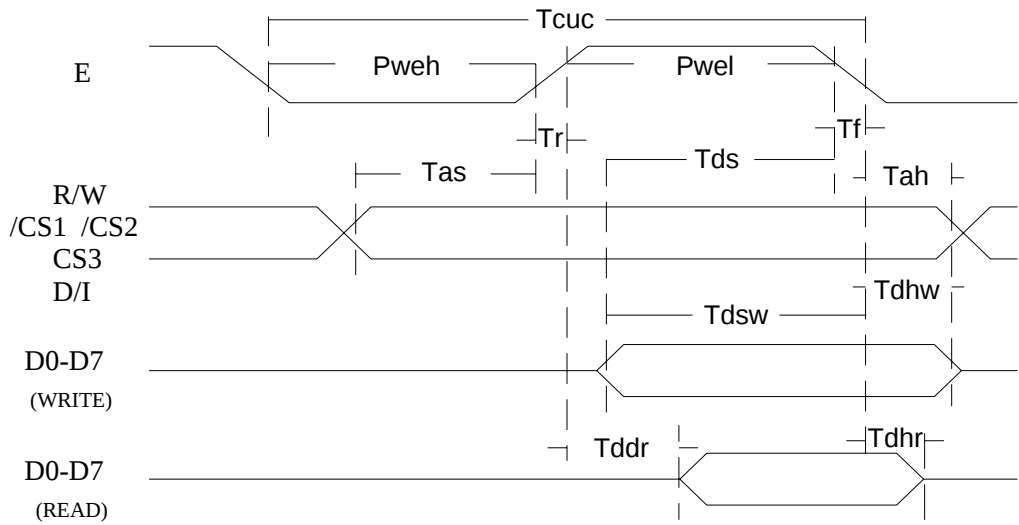
需要指出的是 192×64 点阵系列模块接口的 CSA，CSB 或者 CS1，CS2，CS3 不直接等同于芯片引脚的 CS1B，CS2B，CS3B。但是它们来自于 CS1B，CS2B，CS3B 的组合。

由于每个 KS0108B 只驱动 64 路的列显示，192×64 点阵系列模块分成左、中、右三个 64×64 点阵的部分（姑且单位左屏，中屏，右屏），每部分分别由一个 KS0108B 作为列驱动。对 192×64 点阵系列模块的操作其实是对三个 KS0108B 的分时操作。请参照第一章第五部分的原理简图。

对于有三的片选的 19264-1，19264-7，19264G 和 19264H，每个片选对应一个 KS0108B；对于只有两个片选的 19264-6，19264B-V3.0 和 19264F，两个片选信号最多可以有四种不同的组合，其中三种对应 3 个 KS0108B 剩下一组合未用到，见下表：

CSA	L	L	H	H
CSB	L	H	L	H
	左屏	中屏	右屏	禁止

第三章 KS0108B 控制器的工作时序图及时序参数表



KS0108B的操作时序图

时序参数表（Vdd=2.7~5.5V,Vss=0V Ta= -20℃~+75℃）

项目	符号	最小值	最大值	单位
E 周期时间	Tcyc	1000	—	nS
E 高电平宽度	Pweh	450	—	nS
E 低电平宽度	Pwel	450	—	nS
E 上升时间	Tr	—	25	nS
E 下降时间	Tf	—	25	nS
地址建立时间	Tas	140	—	nS
地址保持时间	Tah	10	—	nS
数据建立时间	Tdsw	200	—	Ns
数据延时时间	Tddr	—	320	Ns
数据保持时间（写）	Tdhw	10	—	nS
数据保持时间（读）	Tdhr	20	—	Ns

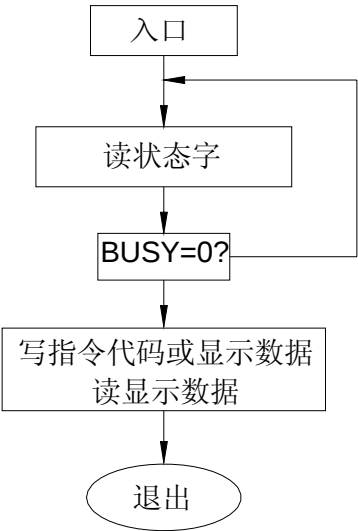
第四章 KS0108B 控制器系列产品指令说明

一、 指令列表

指令名称	控制状态		指令代码							
	RS	R/W	D7	D6	D5	D4	D3	D2	D1	D0
显示开关设置	0	0	0	0	1	1	1	1	1	D
显示起始行设置	0	0	1	1	L5	L4	L3	L2	L1	L0
页面地址设置	0	0	1	0	1	1	1	P2	P1	P0
列地址设置	0	0	0	1	C5	C4	C3	C2	C1	C0
读取状态字	0	1	BUSY	0	ON/OFF	RESET	0	0	0	0
写显示数据	1	0	数 据							
读显示数据	1	1	数 据							

二、 指令功能详解

下面是 KS0108B 指令写入的流程图：



1. 读状态字（read status）

格式

BUSY	0	NO/OFF	RESER	0	0	0	0
------	---	--------	-------	---	---	---	---

- 1) BUSY=1 表示 KS0108B 正在处理计算机发来的指令或数据。此时接口电路被封锁，不能接受除读状态字以外的任何操作。BUSY=0 表示 KS0108B 接口控制电路已处于“准备好”状态，等待计算机的访问。
- 2) ON/OFF：表示当前的显示状态。ON/OFF=1 表示关显示状态
ON/OFF=0 表示开显示状态。
- 3) RESET 表示当前 KS0108B 的工作状态，即反映 RST 端的电平状态。
当 RST 为低电平状态时 KS0108B 处于复位工作状态，RESET=1。
当 RST 为高电平状态时，KS0108B 为正常工作状态，RESET=0。
- 4) 在占领设置和数据读写时要注意状态字中的 BUSY 标志。只有在 BUSY=0 时，计算机对 KS0108B 的操作才能有效。因此计算机在每次对 KS0108B 操作之前，都要读出状态字判断 BUSY 是否为“0”。若不为“0”，则计算机需要等待，直至 BUSY=0 为止。

2. 显示开关 (isplay on/off)

格式	0	0	1	1	1	1	1	D
----	---	---	---	---	---	---	---	---

该指令设置显示开关/触发器的状态，由此控制显示数据锁存器的工作方式，从而控制显示上的显示状态。

D 位为显示开/关的控制位。当 D=1 为显示设置，显示数据锁存器正常工作，显示屏上呈现所许的效果。此时在状态字中 ON/OFF=0。

当 D=0 为关显示设置，显示数据锁存器被置零，显示屏呈不显示状态，但显示存储器并没有被破坏，在状态组中 ON/OFF=1。

3. 显示起始行设置 (Display start line)

格式	1	1	L5	L4	L3	L2	L1	L0
----	---	---	----	----	----	----	----	----

该指令设置了显示起始行寄存器的内容。KS0108B 有 64 行显示的管理能力，该指令中 L5~L0 为显示起始行的地址，取值在 0~3FH (1~64) 范围内，它规定了显示屏上最顶一行所对应的显示存储器的行地址。如果定时间隔地，等间距地修改（如加一或减一）显示起始行寄存器的内容，则显示屏将呈现显示内容向上或向下平滑滚动的显示效果。

4. 页面地址设置 (Set page(X address))

格式	1	0	1	1	1	P2	P1	P0
----	---	---	---	---	---	----	----	----

该指令设置了页面地址---X 地址寄存器的内容。KS0108B 将显示存储器分成了 8 页，指令代码中 P2~P0 就是要确定当前所要选择的页面地址，取值范围为 0~7H，代表第 1~8 页。该指令规定了以后的读/写操作将在哪一个页面上进行。

5. 列地址设置 (Set Y address)

格式	0	1	C5	C4	C3	C2	C1	C0
----	---	---	----	----	----	----	----	----

该指令设置了 Y 地址计数器的内容，C5~C0=0~3FH (1~64) 代表某一页面上的某一单元地址，随后的一次读或写数据将在这个单元上进行。Y 地址计数器具有自动加一功能，在每一次读/写数据后它将自动加一，所以在连续进行读/写数据时，Y 地址计数器不必每次都设置一次。

页面地址的设置和列地址的设置将显示存储器单元唯一地确定下来，为后来的显示数据的读/写作了地址的选通。

6. 写显示数据 (Write display data)

格式	数 据							
----	-----	--	--	--	--	--	--	--

该操作将 8 位数据写入先前已确定的显示存储器的单元内，操作完成后列地址计数器自动加一。

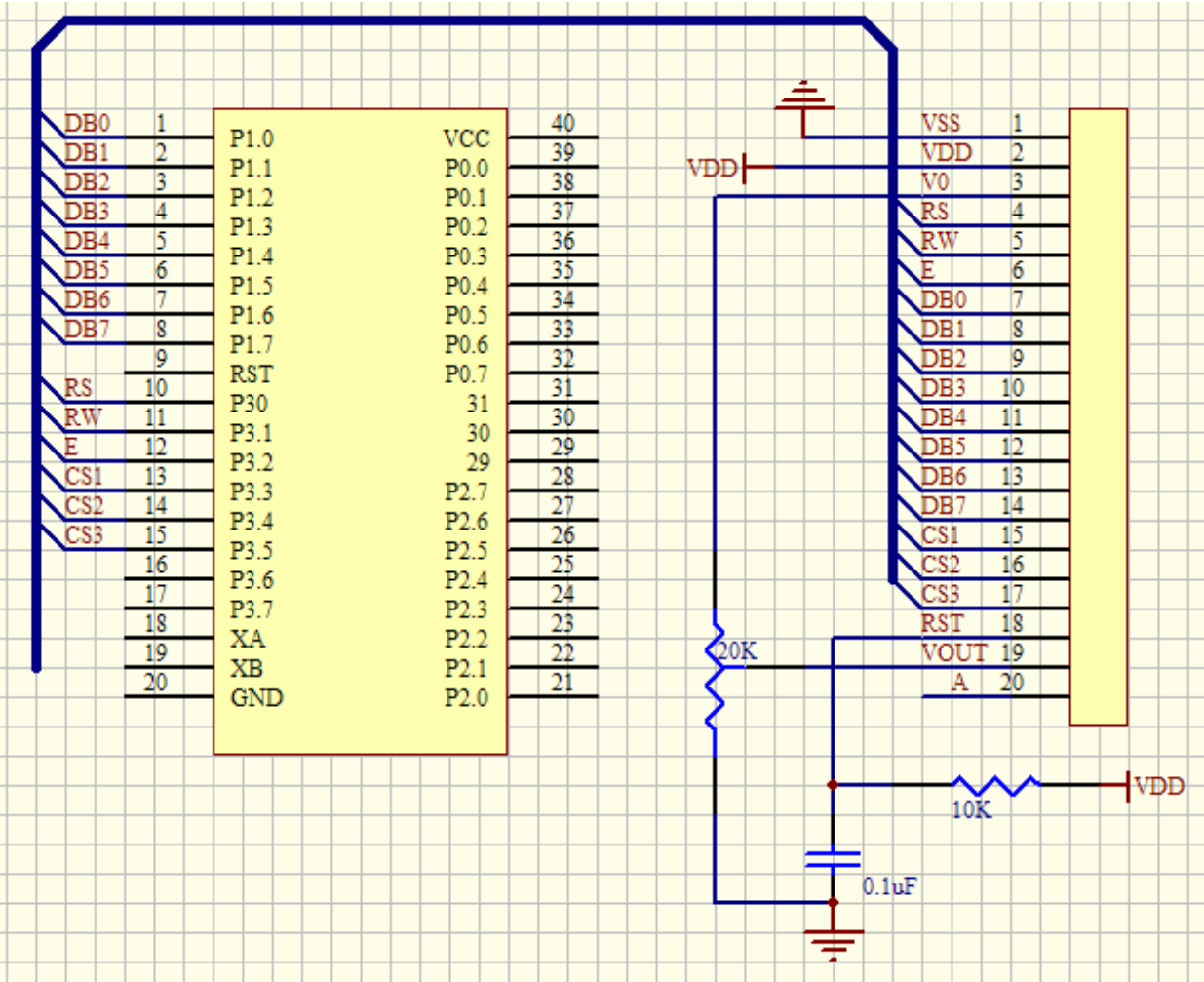
7. 读显示数据 (Read display data)

格式	数 据							
----	-----	--	--	--	--	--	--	--

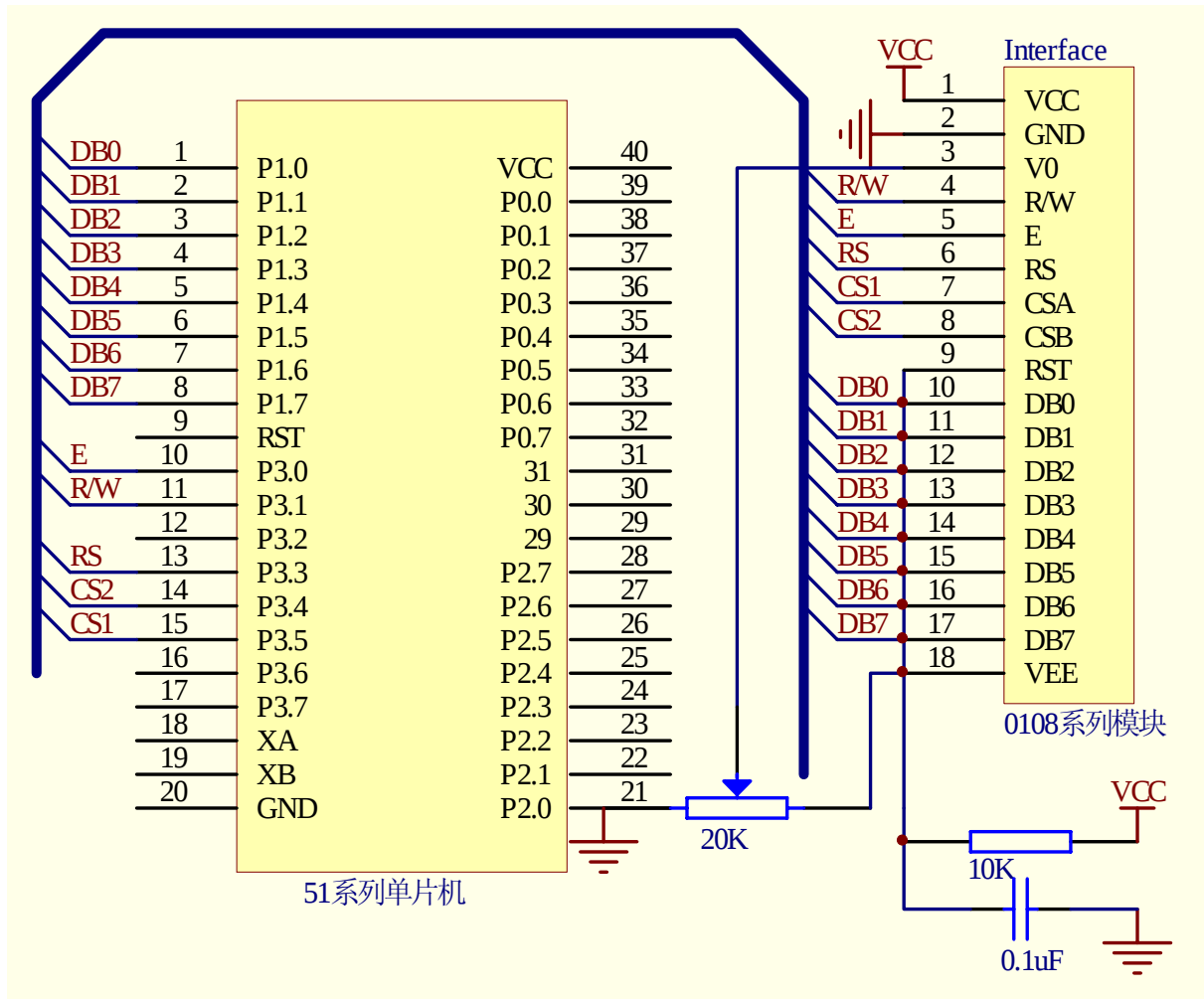
该操作将 KS0108B 接口部的输出寄存器内容读出，然后列地址计数器自动加一。

第五章 KS0108B 系列产品接口方法

一、KS0108B 控制器系列产品与 MCU 的接口方法（间接访问）



192×64点阵系列3片选模块与CPU的连接示例



192×64点阵系列2片选模块与CPU的连接示例

第六章 示例程序

1. 192×64 点阵系列 3 片选模块示例程序

```

;*****
;连线表: CPU=89C52    FOSC=12MHz    /RSET=/(CPU RSET)    D0-D7=P1.0-P1.7
;RS=P3.0    R/W=P3.1    E=P3.2    CS1=P3.3    CS2=P3.4    CS3=P3.5
;*****

RS    EQU    P3.0
RW    EQU    P3.1
EN    EQU    P3.2
CS1   EQU    P3.3
CS2   EQU    P3.4
CS3   EQU    P3.5

DATBUS EQU    P1

```

```
COM    EQU  30H
DAT    EQU  31H
OX     EQU  32H
OY     EQU  33H
XPAGE  EQU  34H
CODER  EQU  35H
COUNT EQU  36H
DOT    EQU  37H
CONT   EQU  38H
```

START:

```
    ORG    0000H
    LJMP   MAIN
    ORG    0060H
```

MAIN:

```
    MOV    SP,#60H
    LCALL  DEL_20MS
    LCALL  INI
;MOV     CONT,#00H
;LCALL   CLEAR
;MOV     CONT,#0FFH
;LCALL   CLEAR
;MOV     DOT,#0AAH
;LCALL   WDOT
;MOV     DOT,#55H
;LCALL   WDOT
;MOV     DOT,#0FFH
;LCALL   WDOT
;MOV     DOT,#00H
;LCALL   WDOT
;MOV     CONT,#0AAH
;LCALL   CLEAR
;MOV     CONT,#55H
;LCALL   CLEAR
    MOV    DPTR,#PIC1
    LCALL  WPIC
    MOV    DPTR,#PIC2
    LCALL  WPIC
    MOV    DPTR,#PIC3
    LCALL  WPIC
    LJMP   MAIN
```

INI:

```
    MOV    COM,#0C0H
```

```
LCALL WC1
LCALL WC2
LCALL WC3
MOV    COM,#3FH
LCALL WC1
LCALL WC2
LCALL WC3
RET
```

CLEAR:

```
MOV    XPAGE,#00H
MOV    R3,#8
```

CLEAR1:

```
MOV    A,XPAGE
ORL    A,#0B8H
MOV    COM,A
LCALL WC1
LCALL WC2
LCALL WC3
MOV    COM,#40H
LCALL WC1
LCALL WC2
LCALL WC3
MOV    R2,#64
```

CLEAR2:

```
MOV    DAT,CONT
LCALL WD1
LCALL WD2
LCALL WD3
DJNZ   R2,CLEAR2
INC    XPAGE
DJNZ   R3,CLEAR1
LCALL DEL_500MS
LCALL DEL_500MS
RET
```

WDOT:

```
MOV    XPAGE,#00H
MOV    R2,#8
```

WDOT1:

```
MOV    A,XPAGE
ORL    A,#0B8H
MOV    COM,A
LCALL WC1
LCALL WC2
```

```
LCALL WC3
MOV  COM,#00H
LCALL WC1
LCALL WC2
LCALL WC3
MOV  R3,#64
MOV  DAT,DOT
```

WDOT2:

```
LCALL WD1
LCALL WD2
LCALL WD3
MOV  A,DAT
CPL  A
MOV  DAT,A
DJNZ R3,WDOT2
INC  XPAGE
DJNZ R2,WDOT1
LCALL DEL_500MS
LCALL DEL_500MS
RET
```

WPIC:

```
MOV  XPAGE,#00H
MOV  R3,#8
```

WP1:

```
MOV  A,XPAGE
ORL  A,#0B8H
MOV  COM,A
LCALL WC1
LCALL WC2
LCALL WC3
MOV  COM,#40H
LCALL WC1
MOV  R2,#64
```

WP2:

```
MOV  A,#00H
MOVC A,@A+DPTR
MOV  DAT,A
INC  DPTR
LCALL WD1
DJNZ R2,WP2
```

```
MOV  COM,#40H
LCALL WC2
MOV  R2,#64
```

WP3:

```
MOV    A,#00H
MOVC   A,@A+DPTR
MOV    DAT,A
INC    DPTR
LCALL  WD2
DJNZ   R2,WP3
```

```
MOV    COM,#40H
LCALL  WC3
MOV    R2,#64
```

WP4:

```
MOV    A,#00H
MOVC   A,@A+DPTR
MOV    DAT,A
INC    DPTR
LCALL  WD3
DJNZ   R2,WP4
INC    XPAGE
DJNZ   R3,WP1
LCALL  DEL_500MS
LCALL  DEL_500MS
LCALL  DEL_100MS
LCALL  DEL_100MS
RET
```

WC1:

```
CLR    CS1
SETB   CS2
SETB   CS3
CLR    RS
SETB   RW
```

WC11:

```
MOV    P1,#0FFH
SETB   EN
MOV    A,P1
CLR    EN
JB     ACC.7,WC11
CLR    RW
MOV    P1,COM
SETB   EN
CLR    EN
RET
```

WC2:

CLR CS2

SETB CS1

SETB CS3

CLR RS

SETB RW

WC21:

MOV P1,#0FFH

SETB EN

MOV A,P1

CLR EN

JB ACC.7,WC21

CLR RW

MOV P1,COM

SETB EN

CLR EN

RET

WC3:

CLR CS3

SETB CS1

SETB CS2

CLR RS

SETB RW

WC31:

MOV P1,#0FFH

SETB EN

MOV A,P1

CLR EN

JB ACC.7,WC31

CLR RW

MOV P1,COM

SETB EN

CLR EN

RET

WD1:

CLR CS1

SETB CS2

SETB CS3

CLR RS

SETB RW

WD11:

MOV P1,#0FFH

SETB EN

MOV A,P1

```
CLR    EN
JB     ACC.7,WD11
SETB   RS
CLR     RW
MOV     P1,DAT
SETB   EN
CLR     EN
RET
```

WD2:

```
CLR     CS2
SETB    CS1
SETB    CS3
CLR     RS
SETB    RW
```

WD21:

```
MOV     P1,#0FFH
SETB    EN
MOV     A,P1
CLR     EN
JB     ACC.7,WD21
SETB    RS
CLR     RW
MOV     P1,DAT
SETB    EN
CLR     EN
RET
```

WD3:

```
CLR     CS3
SETB    CS1
SETB    CS2
CLR     RS
SETB    RW
```

WD31:

```
MOV     P1,#0FFH
SETB    EN
MOV     A,P1
CLR     EN
JB     ACC.7,WD31
SETB    RS
CLR     RW
MOV     P1,DAT
SETB    EN
CLR     EN
```

RET

DEL_20MS:

MOV R0,#20

D2:

MOV R1,#200

D1:

NOP

NOP

NOP

DJNZ R1,D1

DJNZ R0,D2

RET

DEL_100MS:

LCALL DEL_20MS

LCALL DEL_20MS

LCALL DEL_20MS

LCALL DEL_20MS

LCALL DEL_20MS

RET

DEL_500MS:

LCALL DEL_100MS

LCALL DEL_100MS

LCALL DEL_100MS

LCALL DEL_100MS

LCALL DEL_100MS

RET

DEL_1500MS:

LCALL DEL_500MS

LCALL DEL_500MS

LCALL DEL_500MS

RET

PIC1:

DB 0FFH,0FFH,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,

DB 003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,

DB 003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,

DB 003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,

DB 003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,

DB 003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,

DB 003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,083H,083H,003H,003H,003H,

DB 003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,

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DB 070H,03CH,01CH,03CH,070H,0C0H,0C0H,080H,000H,000H,000H,000H,000H,000H,000H,000H,
DB 000H,000H,0F8H,0F8H,008H,088H,0E8H,0F8H,0F8H,048H,048H,0C8H,0E8H,068H,008H,008H,
DB 0FCH,0FCH,000H,000H,000H,000H,000H,000H,000H,010H,010H,0F0H,0F0H,010H,010H,0F0H,
DB 0F0H,018H,008H,088H,0C0H,060H,038H,018H,008H,000H,000H,000H,000H,000H,000H,000H,
DB 000H,000H,000H,000H,000H,000H,000H,0FCH,0FCH,020H,020H,020H,020H,020H,020H,020H,
DB 000H,000H,000H,000H,000H,000H,0F8H,0F8H,010H,090H,0F0H,078H,038H,020H,0A0H,0F0H,
DB 0FCH,0BCH,0A0H,020H,020H,020H,020H,020H,000H,000H,000H,000H,000H,0FFH,0FFH,
DB 0FFH,0FFH,000H,000H,000H,000H,000H,000H,000H,000H,0FFH,0FFH,0FFH,000H,000H,000H,
DB 000H,000H,00FH,01FH,03FH,030H,020H,0E0H,0FFH,07FH,01FH,000H,001H,000H,000H,080H,
DB 060H,030H,01FH,00FH,003H,080H,000H,000H,000H,001H,00DH,00DH,003H,00DH,00DH,001H,
DB 000H,000H,000H,0FCH,0FEH,0FFH,007H,004H,00CH,0FCH,0F8H,0F0H,000H,000H,0E0H,0D0H,
DB 0C8H,0C6H,0C1H,0FFH,0FFH,0FFH,0C0H,000H,000H,008H,008H,00CH,046H,047H,045H,044H,
DB 044H,044H,0FCH,0FCH,044H,044H,047H,047H,047H,046H,006H,004H,004H,000H,000H,000H,
DB 000H,000H,0FFH,0FFH,022H,033H,091H,098H,09FH,037H,06FH,06DH,018H,018H,010H,010H,
DB 0FFH,0FFH,000H,000H,000H,000H,000H,000H,004H,004H,0E4H,0FFH,03FH,004H,004H,0FFH,
DB 0FFH,044H,067H,023H,030H,018H,00CH,087H,0E3H,0E2H,040H,000H,000H,000H,000H,000H,
DB 000H,000H,0FEH,0FEH,042H,042H,042H,043H,043H,042H,042H,042H,0FEH,0FEH,002H,000H,
DB 000H,000H,000H,000H,000H,000H,0FFH,0FFH,040H,0C3H,0C7H,0FCH,0F8H,08CH,08FH,08BH,
DB 088H,0FFH,0FFH,089H,088H,08CH,0C4H,0C0H,080H,000H,000H,000H,000H,000H,0FFH,0FFH,
DB 0FFH,0FFH,000H,000H,000H,000H,000H,000H,004H,004H,007H,007H,007H,004H,004H,000H,
DB 000H,000H,004H,004H,006H,002H,003H,001H,001H,000H,000H,000H,004H,006H,007H,007H,
DB 007H,007H,007H,007H,007H,001H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,
DB 000H,000H,000H,000H,003H,003H,006H,004H,004H,007H,003H,001H,000H,000H,000H,000H,
DB 000H,000H,000H,007H,007H,007H,000H,000H,000H,000H,008H,008H,008H,008H,008H,008H,
DB 008H,008H,00FH,00FH,008H,008H,008H,008H,008H,008H,008H,008H,008H,000H,000H,000H,000H,
DB 000H,000H,01FH,01FH,008H,008H,008H,008H,009H,009H,009H,00BH,00BH,008H,008H,008H,
DB 01FH,01FH,000H,000H,000H,000H,000H,010H,01CH,00EH,003H,001H,000H,000H,000H,00FH,
DB 01FH,010H,018H,008H,00CH,006H,003H,001H,001H,000H,000H,000H,000H,000H,000H,018H,
DB 01CH,00FH,003H,000H,000H,00EH,00EH,008H,000H,002H,00EH,00CH,000H,001H,007H,01EH,
DB 01CH,000H,000H,000H,000H,000H,01FH,01FH,000H,000H,000H,000H,000H,000H,000H,000H,
DB 000H,01FH,01FH,010H,000H,000H,000H,000H,000H,000H,000H,000H,000H,0FFH,0FFH,
DB 0FFH,0FFH,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,
DB 0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,
DB 0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,
DB 0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,
DB 0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,
DB 0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,
DB 0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,
DB 0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,
DB 0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,
DB 0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,
DB 0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0FFH,0FFH,

PIC2:

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[illegible]

DB 0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,
DB 0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,
DB 0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,
DB 0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,
DB 0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,
DB 0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0FFH,0FFH

PIC3:

DB 0FFH,0FFH,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,
DB 003H,003H,003H,083H,083H,043H,003H,0C3H,0E3H,0F3H,0F3H,0FBH,0FBH,0FBH,0FBH,
DB 0FBH,0F3H,0F3H,0E3H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,
DB 003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,
DB 003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,
DB 003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,
DB 003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,
DB 003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,083H,083H,003H,003H,
DB 003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,
DB 003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,
DB 003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,083H,083H,0C3H,
DB 0C3H,0C3H,0C3H,083H,003H,003H,003H,003H,003H,003H,003H,003H,003H,003H,0FFH,0FFH,
DB 0FFH,0FFH,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,00FH,
DB 01FH,03FH,07FH,0FFH,0FEH,0FEH,0FFH,07FH,0FFH,0FFH,0FFH,0FFH,0FFH,0FFH,0E7H,0C7H,
DB 087H,083H,083H,083H,080H,080H,0C0H,0C0H,080H,080H,000H,000H,000H,000H,000H,
DB 000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,
DB 000H,000H,000H,0F8H,0F0H,0E0H,000H,000H,000H,000H,000H,000H,000H,000H,01CH,0BCH,
DB 0F8H,0F0H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,
DB 000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,0F0H,0E0H,0E0H,0C0H,
DB 000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,0C0H,0E0H,0FBH,0FFH,0FFH,0FEH,
DB 0F0H,0F0H,0F0H,0F0H,0F0H,0E0H,0C0H,000H,000H,000H,000H,000H,000H,000H,000H,
DB 000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,
DB 000H,000H,000H,000H,000H,000H,000H,000H,000H,080H,080H,0C0H,0C0H,0C0H,0E1H,0E1H,
DB 0E1H,0E1H,0FFH,0FFH,0FFH,080H,080H,000H,000H,000H,000H,000H,000H,0FFH,0FFH,
DB 0FFH,0FFH,000H,000H,000H,000H,000H,080H,080H,0C0H,0C0H,0C0H,0C0H,0E0H,0E0H,0F0H,
DB 0F8H,0FCH,0F8H,0F8H,0F8H,0FCH,03CH,03CH,01EH,0FFH,0FFH,0FFH,0FFH,07FH,007H,0C7H,
DB 0E7H,0F3H,0FBH,0F9H,0F1H,0E1H,0C1H,0C1H,0C3H,0C3H,0C3H,0C7H,0FFH,0FFH,0FCH,0F8H,
DB 0F0H,0E0H,000H,000H,000H,000H,000H,000H,000H,000H,000H,080H,080H,080H,0C0H,
DB 0E0H,0F0H,0F8H,0FFH,0FFH,0FFH,07FH,01EH,01CH,004H,000H,000H,000H,000H,01EH,0FFH,
DB 0FFH,0FBH,0A0H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,
DB 000H,000H,000H,000H,000H,000H,000H,000H,080H,000H,000H,000H,003H,007H,007H,
DB 00FH,000H,000H,000H,000H,000H,000H,000H,000H,000H,007H,007H,007H,003H,083H,0E7H,
DB 0FFH,07FH,01FH,00FH,007H,003H,001H,000H,000H,000H,000H,000H,000H,000H,000H,
DB 000H,000H,000H,080H,080H,000H,000H,000H,000H,000H,080H,0C0H,0E0H,0E0H,0F0H,
DB 0F0H,0F8H,0F0H,070H,000H,000H,000H,000H,000H,000H,081H,0C1H,0C3H,0E3H,0E3H,0F1H,
DB 0F1H,0FFH,0FFH,07FH,03FH,01FH,01FH,00FH,006H,000H,000H,000H,000H,000H,0FFH,0FFH,
DB 0FFH,0FFH,000H,0C0H,0F8H,0FCH,0FFH,0FFH,0FFH,0FFH,03FH,00FH,00FH,007H,003H,001H,

DB 001H,0F1H,0FFH,0FFH,0FFH,0FFH,0FFH,0F8H,0F8H,0FFH,0FFH,0FFH,0FFH,03FH,01FH,0CFH,
DB 0E7H,0F3H,0FFH,03FH,01FH,007H,001H,001H,001H,001H,001H,001H,001H,001H,001H,
DB 001H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,003H,003H,007H,007H,
DB 007H,007H,0FFH,0FFH,0FFH,0F0H,070H,010H,080H,0C0H,0E0H,0F0H,0F8H,0FCH,07FH,07FH,
DB 0FFH,0FDH,038H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,
DB 000H,000H,000H,000H,000H,000H,000H,0C0H,0FEH,07FH,07FH,070H,038H,000H,000H,000H,
DB 000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,0C0H,0F8H,0FEH,07FH,0CFH,
DB 087H,000H,01CH,01CH,01CH,0F8H,0F8H,0F0H,000H,000H,000H,000H,000H,000H,000H,000H,
DB 000H,000H,000H,03FH,0FFH,0FEH,0F8H,0FCH,0FCH,07EH,01FH,01FH,0CFH,0EFH,0F9H,0FFH,
DB 07FH,01FH,007H,000H,000H,000H,000H,000H,003H,0C3H,0E7H,0F3H,0FFH,0FFH,0FFH,0FFH,
DB 0FFH,0FFH,07FH,07EH,03CH,018H,0E0H,0E0H,0C0H,000H,000H,000H,000H,000H,0FFH,0FFH,
DB 0FFH,0FFH,000H,007H,01FH,01FH,01FH,03FH,01FH,000H,000H,000H,000H,000H,000H,000H,
DB 000H,007H,01FH,03FH,0FFH,0FFH,0CFH,0EFH,0F7H,0F3H,0F1H,0F9H,0FCH,0FEH,0FFH,0FFH,
DB 0FFH,07FH,078H,020H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,
DB 000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,080H,0E0H,
DB 0F0H,0F8H,0FDH,0FFH,0FFH,003H,000H,000H,000H,003H,007H,007H,003H,000H,0E0H,030H,
DB 019H,03EH,0FEH,0FEH,0EEH,0CEH,0FEH,07EH,03CH,00CH,000H,000H,000H,000H,000H,000H,
DB 000H,000H,000H,000H,000H,000H,000H,00FH,0FFH,0FCH,000H,000H,000H,0C0H,000H,000H,
DB 000H,000H,000H,000H,000H,000H,000H,080H,0E0H,0F8H,0FFH,0FFH,0FFH,0E0H,0E0H,0FFH,
DB 0FFH,0FEH,060H,030H,030H,0FBH,0FFH,0FFH,0FEH,038H,038H,038H,018H,038H,038H,038H,
DB 038H,038H,000H,000H,001H,007H,00FH,01FH,03FH,03EH,03FH,01FH,01FH,00FH,007H,000H,
DB 000H,000H,000H,000H,000H,000H,018H,03CH,03FH,01FH,09FH,0CFH,0EFH,0FFH,0FFH,0FFH,
DB 0FFH,0F3H,0F0H,0F0H,070H,000H,000H,003H,0FFH,0FEH,000H,000H,000H,000H,0FFH,0FFH,
DB 0FFH,0FFH,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,
DB 000H,080H,080H,083H,0C7H,0CFH,0EFH,0E7H,0F3H,0FBH,0F9H,0FDH,0FFH,0F7H,0F3H,0FBH,
DB 078H,078H,07CH,03CH,03CH,01EH,018H,000H,000H,000H,000H,000H,000H,000H,000H,000H,
DB 000H,000H,000H,000H,000H,000H,000H,000H,080H,080H,080H,020H,0FCH,07FH,03FH,01FH,
DB 017H,031H,03FH,03FH,03FH,038H,018H,008H,00CH,00CH,00CH,00EH,00EH,01FH,03FH,03EH,
DB 073H,033H,07BH,03FH,00FH,087H,080H,0C0H,0C0H,0C0H,060H,060H,060H,020H,030H,018H,
DB 018H,01CH,00EH,002H,000H,000H,000H,000H,00FH,0C0H,0E0H,0F8H,07EH,01FH,01EH,01EH,
DB 01EH,01EH,00EH,00EH,006H,00FH,0FFH,0FFH,0FFH,0EFH,0C1H,0C1H,080H,080H,0CFH,0CFH,
DB 0C3H,0E0H,0E0H,0F8H,0FCH,0FFH,07FH,01FH,003H,000H,000H,000H,000H,000H,000H,000H,
DB 000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,
DB 000H,0E0H,0FFH,01FH,000H,000H,010H,01CH,05EH,0DFH,06FH,067H,073H,07BH,0FFH,0FFH,
DB 0CFH,007H,003H,000H,000H,000H,000H,000H,0FFH,0FFH,000H,000H,000H,000H,0FFH,0FFH,
DB 0FFH,0FFH,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,018H,
DB 01CH,01FH,00FH,007H,087H,0E3H,0F3H,0FFH,0FFH,0DFH,0C7H,0C3H,0C3H,0C3H,0C7H,0FEH,
DB 0FCH,0FCH,0F8H,0E0H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,
DB 000H,000H,000H,000H,000H,000H,000H,000H,001H,001H,001H,003H,003H,006H,006H,
DB 006H,00EH,00EH,00EH,00EH,00EH,00EH,006H,006H,006H,006H,006H,006H,007H,003H,003H,
DB 003H,003H,003H,001H,001H,001H,001H,000H,000H,000H,000H,000H,000H,000H,000H,000H,
DB 000H,000H,000H,000H,000H,000H,000H,000H,007H,007H,007H,000H,000H,000H,000H,
DB 000H,000H,000H,000H,000H,000H,001H,003H,003H,003H,003H,003H,003H,003H,003H,003H,
DB 003H,003H,001H,001H,001H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,
DB 000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,

DB	008H,03FH,03FH,03EH,000H,000H,000H,000H,000H,000H,000H,000H,000H,000H,003H,003H,
DB	001H,000H,000H,000H,000H,000H,000H,000H,0FFH,0FFH,000H,000H,000H,000H,0FFH,0FFH,
DB	0FFH,0FFH,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,
DB	0C0H,0C0H,0C0H,0C4H,0CFH,0C7H,0C7H,0C3H,0C1H,0C1H,0C1H,0C1H,0C1H,0C1H,0C1H,0C0H,
DB	0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,
DB	0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,
DB	0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,
DB	0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,
DB	0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,
DB	0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,
DB	0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,
DB	0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,
DB	0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,
DB	0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,
DB	0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,
DB	0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C3H,0CFH,0C0H,0C0H,0C0H,0C0H,0FFH,0FFH,

END

2. 192×64 点阵系列 2 片选模块示例程序

;连线表: CPU=89C52 FOSC=12MHz D0-D7=P1.0-P1.7

;RS=P3.3 R/W=P3.1 CSA=P3.5 CSB=P3.4 E=P3.0 /RSET=/(CPU RSET)

RS EQU P3.3

RW EOU P3.1

EN EQU P3.0

CSA EOU P3.4

CSB EQU P3.5

DATBUS EQU P1

COM EQU 30H

DAT EQU 31H

OX EQU 32H

OY EQU 33H

XPAGE EQU 34H

CODER EQU 35H

COUNT EQU 36H

DOT EQU 37H

CONT EQU 38H

START:

```
ORG    0000H
```

```
LJMP  MAIN
```

```
ORG    0060H
```

MAIN:

```
MOV    SP,#60H
LCALL  DEL_20MS
MOV    P3,#0FFH ;CS1=H,CS2=H,无关脚置高
LCALL  INI
MOV    CONT,#00H
LCALL  CLEAR
MOV    CONT,#0FFH
LCALL  CLEAR
MOV    DOT,#0AAH
LCALL  WDOT
MOV    DOT,#55H
LCALL  WDOT
MOV    DOT,#0FFH
LCALL  WDOT
MOV    DOT,#00H
LCALL  WDOT
MOV    CONT,#0AAH
LCALL  CLEAR
MOV    CONT,#55H
LCALL  CLEAR
MOV    DPTR,#PIC1
LCALL  WPIC
MOV    DPTR,#PIC2
LCALL  WPIC
MOV    DPTR,#PIC3
LCALL  WPIC
LJMP   MAIN
```

INI:

```
MOV    COM,#0C0H
LCALL  WC1
LCALL  WC2
LCALL  WC3
MOV    COM,#3FH
LCALL  WC1
LCALL  WC2
LCALL  WC3
RET
```

CLEAR:

```
MOV    XPAGE,#00H
MOV    R3,#8
```

CLEAR1:

```
MOV    A,XPAGE
ORL     A,#0B8H
MOV     COM,A
LCALL  WC1
LCALL  WC2
LCALL  WC3
MOV     COM,#40H
LCALL  WC1
LCALL  WC2
LCALL  WC3
MOV     R2,#64
```

CLEAR2:

```
MOV     DAT,CONT
LCALL  WD1
LCALL  WD2
LCALL  WD3
DJNZ    R2,CLEAR2
INC     XPAGE
DJNZ    R3,CLEAR1
LCALL  DEL_500MS
LCALL  DEL_500MS
RET
```

WDOT:

```
MOV     XPAGE,#00H
MOV     R2,#8
```

WDOT1:

```
MOV     A,XPAGE
ORL     A,#0B8H
MOV     COM,A
LCALL  WC1
LCALL  WC2
LCALL  WC3
MOV     COM,#00H
LCALL  WC1
LCALL  WC2
LCALL  WC3
MOV     R3,#64
MOV     DAT,DOT
```

WDOT2:

```
LCALL  WD1
LCALL  WD2
LCALL  WD3
MOV     A,DAT
CPL     A
```

```
MOV    DAT,A
DJNZ   R3,WDOT2
INC     XPAGE
DJNZ   R2,WDOT1
LCALL  DEL_500MS
LCALL  DEL_500MS
RET
```

WPIC:

```
MOV    XPAGE,#00H
MOV    R3,#8
```

WP1:

```
MOV    A,XPAGE
ORL    A,#0B8H
MOV    COM,A
LCALL  WC1
LCALL  WC2
LCALL  WC3
MOV    COM,#40H
LCALL  WC1
MOV    R2,#64
```

WP2:

```
MOV    A,#00H
MOVC   A,@A+DPTR
MOV    DAT,A
INC     DPTR
LCALL  WD1
DJNZ   R2,WP2
```

```
MOV    COM,#40H
LCALL  WC2
MOV    R2,#64
```

WP3:

```
MOV    A,#00H
MOVC   A,@A+DPTR
MOV    DAT,A
INC     DPTR
LCALL  WD2
DJNZ   R2,WP3
```

```
MOV    COM,#40H
LCALL  WC3
MOV    R2,#64
```

WP4:

```
MOV    A,#00H
```

```
MOVC  A,@A+DPTR
MOV   DAT,A
INC   DPTR
LCALL WD3
DJNZ  R2,WP4
INC   XPAGE
DJNZ  R3,WP1
LCALL DEL_500MS
LCALL DEL_500MS
LCALL DEL_100MS
LCALL DEL_100MS
RET
```

WC1:

```
CLR   CSA
CLR   CSB
CLR   RS
SETB  RW
```

WC11:

```
MOV   P1,#0FFH
SETB  EN
MOV   A,P1
CLR   EN
JB    ACC.7,WC11
CLR   RW
MOV   P1,COM
SETB  EN
CLR   EN
RET
```

WC2:

```
CLR   CSA
SETB  CSB
CLR   RS
SETB  RW
```

WC21:

```
MOV   P1,#0FFH
SETB  EN
MOV   A,P1
CLR   EN
JB    ACC.7,WC21
CLR   RW
MOV   P1,COM
SETB  EN
CLR   EN
```

RET

WC3:

SETB CSA

CLR CSB

CLR RS

SETB RW

WC31:

MOV P1,#0FFH

SETB EN

MOV A,P1

CLR EN

JB ACC.7,WC31

CLR RW

MOV P1,COM

SETB EN

CLR EN

RET

WD1:

CLR CSA

CLR CSB

CLR RS

SETB RW

WD11:

MOV P1,#0FFH

SETB EN

MOV A,P1

CLR EN

JB ACC.7,WD11

SETB RS

CLR RW

MOV P1,DAT

SETB EN

CLR EN

RET

WD2:

CLR CSA

SETB CSB

CLR RS

SETB RW

WD21:

MOV P1,#0FFH

SETB EN

```
MOV    A,P1
CLR    EN
JB     ACC.7,WD21
SETB   RS
CLR    RW
MOV    P1,DAT
SETB   EN
CLR    EN
RET
```

WD3:

```
SETB   CSA
CLR    CSB
CLR    RS
SETB   RW
```

WD31:

```
MOV    P1,#0FFH
SETB   EN
MOV    A,P1
CLR    EN
JB     ACC.7,WD31
SETB   RS
CLR    RW
MOV    P1,DAT
SETB   EN
CLR    EN
RET
```

DEL_20MS:

```
MOV    R0,#20
```

D2:

```
MOV    R1,#200
```

D1:

```
NOP
NOP
NOP
DJNZ   R1,D1
DJNZ   R0,D2
RET
```

DEL_100MS:

```
LCALL  DEL_20MS
LCALL  DEL_20MS
LCALL  DEL_20MS
LCALL  DEL_20MS
```

```
LCALL DEL_20MS
RET

DEL_500MS:
    LCALL DEL_100MS
    LCALL DEL_100MS
    LCALL DEL_100MS
    LCALL DEL_100MS
    LCALL DEL_100MS
    RET

DEL_1500MS:
    LCALL DEL_500MS
    LCALL DEL_500MS
    LCALL DEL_500MS
    RET

PIC1:
;图片数据略

PIC2:
;图片数据略

PIC3:
;图片数据略
END
```

第七章 液晶使用注意事项

附录 1：各种背光电参数

序号	类型	工作电压	每颗灯电流	备注
1	LED 黄绿侧光	4.1V	10mA	
2	LED 黄绿底光	4.1V	10mA	
3	LED 白色侧光	3.0V	15mA	
4	EL 黄光	70VAC	—	需逆变器
5	EL 蓝光	70VAC	—	需逆变器
6	CCFL	逆变器 5V	—	需逆变器

注：以上参数仅作参考，不同型号的背光会稍差异，具体见相关产品资料。

附录 2：注意事项

十分感谢您购买汉升公司的产品，在使用前请您首先仔细阅读以下注意事项，以免给

您造成不必要的损失，您在使用过程中遇到困难时，请拨打我们的服务电话 0755-86114312-8072，我们将尽力为您提供服务和帮助。

1. 处理保护膜

在装好的模块成品表面贴有一层保护膜，以防在装配时沾污显示表面，在整机装配结束前不得撕去，以免弄脏或损坏表面。

2. 加装衬垫

在模块和前面板之间最好加装一块约 0.1 毫米左右的衬垫。面板还应保持平整，以免在装配后产生扭曲，并可提高其抗振性能。

3. 严防静电

模块中的控制、驱动电压是很低、微功耗的 CMOS 电路，极易被静电击穿，静电击穿是一种不可修复的损坏，而人体有时会产生高达几十伏或上百伏的静电，所以，在操作、装配以及使用中都应极其小心，严防静电。为此：

- (1) 不要用手随意去摸外引线、电路板上的电路及金属框。
- (2) 如必须直接接触时，应使人体与模块保持在同一电位，或使人体良好接地。
- (3) 焊接使用的烙铁及装配使用的电动工具必须良好接地，没有漏电。
- (4) 不得使用真空吸尘器进行清洁处理，因为它会产生很强的静电。
- (5) 空气干燥也会产生静电，因此，工作间湿度应在 RH60%以上。
- (6) 取出或放回包装袋或移动位置时，也需小心，防止产生静电。不要随意更换包装或舍弃原包装。

4. 装配操作时的注意事项

- (1) 模块是经过精心设计组装而成的，请勿随意自行加工、修整。
- (2) 金属框爪不得随意扭动、拆卸。
- (3) 不要随意修改加工 PCB 板外形、装配孔、线路及其部件。
- (4) 不得修改导电胶条。
- (5) 不得修改任何内部支架。
- (6) 不要碰、摔、折曲、扭动模块。

5. 焊接

在焊接外引线时，应按如下规程进行操作。

- (1) 烙铁头温度小于 280 度。
- (2) 焊接时间不超过 4 秒。
- (3) 焊接材料：共晶型、低熔点。
- (4) 不要使用酸性助焊剂。
- (5) 重复焊接不要超过三次，且每次重复需间隔 5 分钟。

6. 模块的使用与保养

- (1) 模块的外引线决不允许接错，在您想调试液晶模块时，请注意正确接线，尤其是正负电源的接线不能接错，否则可能造成过流、过压烧电路上的芯片等对液晶模块元器件有损的现象。
- (2) 模块在使用时，接入电源及断开电源，必须在正电源稳定接入以后才能输入信号电平。如在电源稳定前或断开后输入信号电平，有可能损坏模块中的 IC 及电路。
- (3) 点阵液晶模块显示时的对比度、视角与温度、驱动电压的关系很大，所以，如果驱动电压过高，不仅会影响显示效果，还会缩短模块的使用寿命。
- (4) 因为液晶材料的物理特性，液晶的对比度会随温度的变化而相应变化，所以，您加的负压也应随温度作相应调整。大致是温度变化 10 度，电压变化 1 伏。为满足这一要求，您可以做一个温度补偿电路，或者安排一个电位器，随温度调整负电压值。
- (5) 不应在规定工作温度范围外使用，并且不应在超过存储极限温度的范围外存储。如果温度低于结晶温度，液晶就会结晶，如果温度过高，液晶将变成各向同性的液晶，破坏分子取向，使器件报废。
- (6) 用力按显示部分，会产生异常显示。这时切断电源，稍待片刻重新上电，即恢复正常。
- (7) 液晶显示器件或模块表面结雾时，不要通电工作，因为这将引起电极化学反应，产生断线。
- (8) 长期用于阳光及强光下时，被遮部分会产生残留现象。

7. 液晶模块的存储

若长期（如几年以上）存储，我们推荐以下方式：

- (1) 装入聚乙烯口袋（最好有防静电涂层）并将口封住
- (2) 在-10° C —— +35° C 之间存储。
- (3) 放在暗处，避强光。
- (4) 决不能在表面压放任何物品。
- (5) 严格避免在极限温度/湿度条件下存放。

8. 有限责任和保修

如果汉升公司和客户没有发生任何协议，汉升公司将从发货日期算起一年内依据汉升公司液晶显示模块接受标准（按要求提供复印件）更换或修理功能性故障的液晶显示模块。

外观/视觉毛病必须从发货日计起 90 天内送返汉升公司。日期的确认将根据货运文件。汉升公司保证的责任限于上述提及项目的维修和更换，汉升公司不对突发性事件负责任。

保修是以上述注意事项未被忽视为先决条件的，典型的违反例子如下：

- (1) 断裂的液晶显示屏玻璃。

- （2）线路板孔修改或损坏。
- （3）线路板布线损坏。
- （4）电路修改，包括元件的增加。
- （5）线路板随意研磨、雕刻或油漆。
- （6）焊接或更改玻璃框。

模块维修将基于双方协议下列出给顾客的清单。模块必须与防静电包装和故障详细陈述一起送回。顾客安装的连接器和电缆必须坏线路板孔，线路和引线端条件下全部移去在不破坏线路板孔，线路和引线端条件下全部移去。