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M16C/64 群

SI/O3、SI/O4 的操作

1. 要点

SI/O3、SI/O4 的操作，可选择如表 1 中所列的各种功能。在表 1 中用符号“〇”表示本篇资料所选的项目，图 1 是 SI/O3、SI/O4 发送数据的工作时序图。

2. 说明

本篇资料，适用于 M16C/64 群单片机。

本篇资料中的参考例程也适用于 M16C 族产品中与 M16C/64 群具有相同 SFR（特殊功能寄存器）定义的产品。

由于 M16C 系列产品中有些功能会有所改进，请参看用户手册。如果使用本篇资料中所列功能时，请仔细检查每一步操作。

3. 选定功能

表 1. 选定功能

设定项目	设定内容		设定项目	设定内容	
传送时钟源	O	内部时钟（f1SIO/f2SIO/f8SIO/f32SIO）	SOUTi 初始值设定功能	O	不使用
		外部时钟（CLKi 引脚）			使用
传送时钟	O	LSB 先	SOUTi 输出控制功能（传送后 SOUTi 的状态）		高阻抗
		MSB 先		O	保持最后一位的电平

4. 串行 I/O 的操作

(1) 写入发送数据，即标志着发送开始。此数据将随着传送时钟的下降沿，通过 SOUTi 引脚同步输出。

(2) SOUT 发送完一位数据后，中断请求位将会变为“1”。

(3) 当 S34C2 寄存器的 SM26 位、SM27 位设定为“1”（保持最后一位的电平）时，全部传输结束后，在变为高阻态之前，SOUT 引脚将保持最后一个传输数据；保持时间为 1/2 传输时钟周期。

注：
- 在传送过程中，请不要向 SI/Oi 发送/接收寄存器（i = 3、4，地址分别为 0360h 和 0364h）写入数据。
- 请在发送和接收停止时，写 SI/Oi 发送/接收寄存器。

使用 SI/O3、SI/O4 发送数据的工作时序图如下所示：

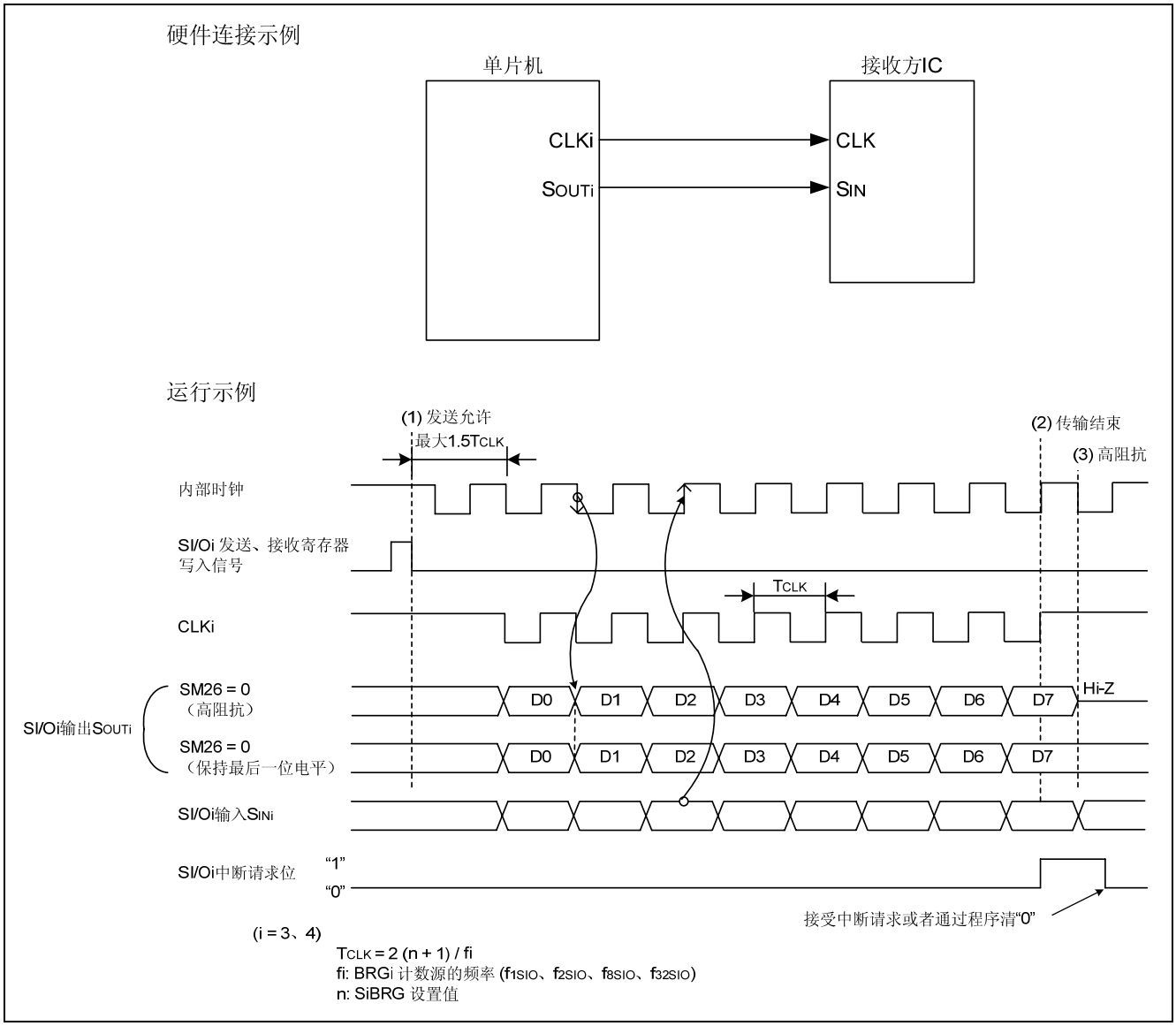
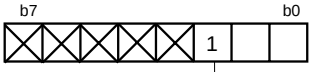


图 1. SI/O3、SI/O4 发送数据的工作时序

5. 寄存器设置

为了能实现定义在“4. 串行 I/O 的操作”的功能，下列寄存器必须按步骤顺序进行设置。对于每个寄存器的具体结构，请参考 M16C/64 群的硬件手册。

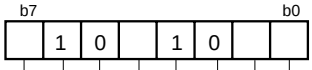
清除保护 （设置为写入允许状态）



保护寄存器【地址 000Ah】
PRCR

允许对端口P9方向寄存器（地址 03F3h）和 SI/Oi控制寄存器(i=3,4)（地址 0272h，0276h）写入操作
1 : 写入允许

设置SI/Oi发送、接收控制寄存器(i = 3、4) (注 1)



SI/Oi 发送、接收控制寄存器 (i = 3、4)【地址 0272h, 0276h】
SiC(i=3,4)

内部同步时钟选择位
b1 b0
0 0 : 选择f_{1SIO}或者f_{2SIO}
0 1 : 选择f_{8SIO}
1 0 : 选择f_{32SIO}
1 1 : 不能设定

SOUTi 输出禁止位
0 : SOUTi 输出

SI/Oi 端口选择位
1 : SOUTi 输出、CLKi 功能

CLK极性选择位
0 : 在传送时钟的下降沿输出发送数据，在上升沿输入接收数据
1 : 在传送时钟的上升沿输出发送数据，在下降沿输入接收数据

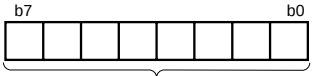
传送格式选择位
0 : LSB先发送

同步时钟选择位
1 : 内部时钟

SOUTi 初始值设定位（当bit 3 = 0时有效）
0 : 输出“L”电平
1 : 输出“H”电平

注1：请在设置保护寄存器后连续设置SI/Oi控制寄存器。

设置SI/Oi波特率寄存器 (i = 3、4)

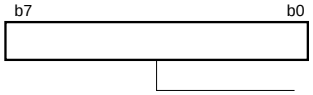


SI/Oi 波特率寄存器 (i = 3、4)【地址 0273h, 0277h】
SiBRG (i = 3, 4)

可以被设置为00h ～ FFh (注 1)

注1：当数据发送、接收停止后再设置SI/Oi 波特率寄存器。

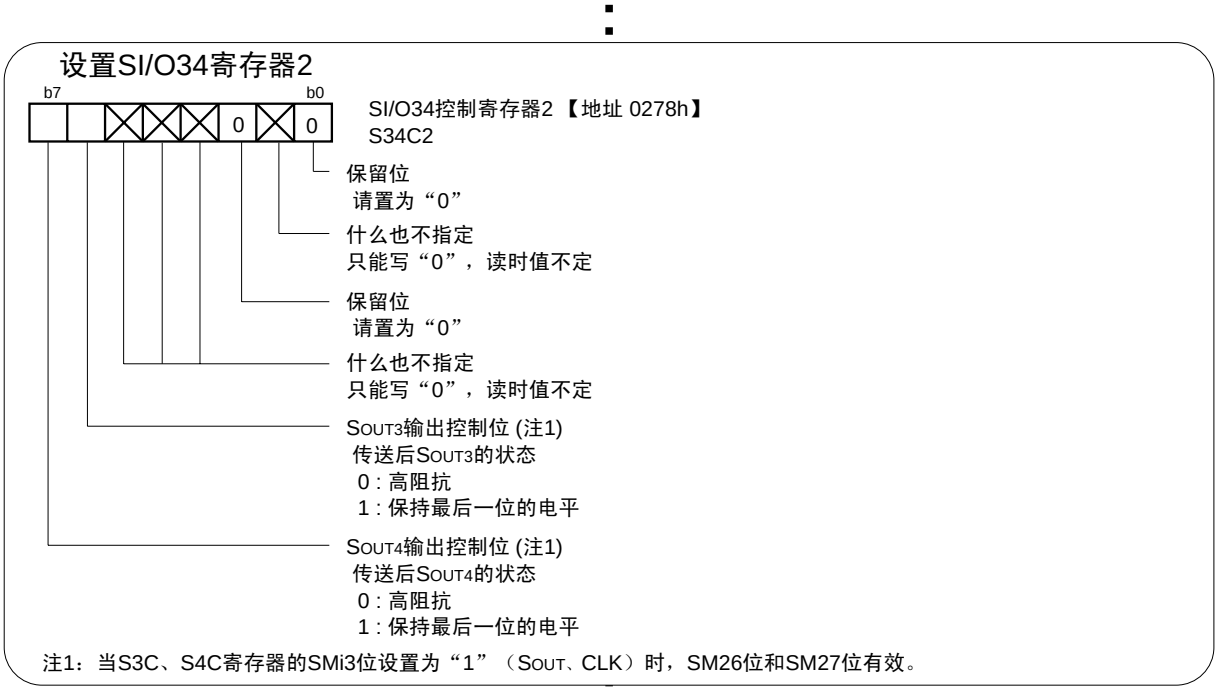
写入发送数据

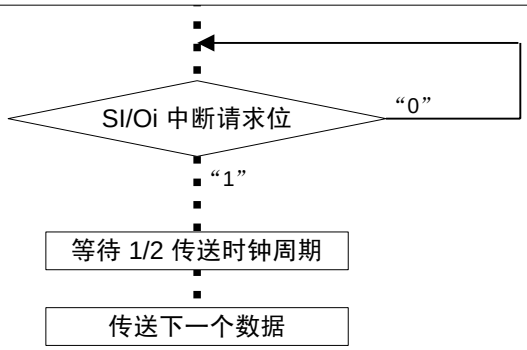


SI/Oi 发送接收寄存器 (i = 3、4)【地址 0270h, 0274h】
SiTRR (i = 3、 4)

设置传送的数据 (注1)

注1：当数据发送、接收停止后再设置SI/Oi 发送接收寄存器。


设置SI/O34寄存器2
b7
b0
0
0
SI/O34控制寄存器2 【地址 0278h】
S34C2
保留位
请置为“0”
什么也不指定
只能写“0”，读时值不定
保留位
请置为“0”
什么也不指定
只能写“0”，读时值不定
SOUT3输出控制位 (注1)
传送后SOUT3的状态
0：高阻抗
1：保持最后一位的电平
SOUT4输出控制位 (注1)
传送后SOUT4的状态
0：高阻抗
1：保持最后一位的电平
注1：当S3C、S4C寄存器的SMi3位设置为“1”（SOUT、CLK）时，SM26位和SM27位有效。


SI/Oi 中断请求位
“0”
“1”
等待 1/2 传送时钟周期
传送下一个数据

6. 参考文献

数据手册

M16C/64 群硬件手册
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		页	要点
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