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2010年4月1日
瑞萨电子公司

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7544 群

时钟同步串行 I/O

要点

这是串行 I/O 的时钟同步的应用例子。

动作确认器件

本资料说明的应用例子适合下列单片机和使用条件：

- 单片机：7544 群

目录

1. 应用例子的说明	2
1.1 有关数据传送速度	2
1.2 时钟同步串行 I/O 的设定方法	3
1.3 使用时钟同步串行 I/O 的通信（发送和接收）	5
2. 参考文献	8

1. 应用例子的说明

对于时钟同步串行I/O，发送侧和接收侧使用同一个运行时钟。与此时钟同步，同时进行发送侧的发送运行和接收侧的接收运行。如果使用内部时钟作为运行时钟，就通过对发送/接收缓冲寄存器的写信号开始发送和接收。

1.1 有关数据传送速度

同步时钟频率的计算式如下所示：

- 在选择内部时钟时（在使用波特率发生器时）

$$\text{同步时钟频率 [Hz]} = \frac{f(\text{XIN})}{\text{分频比}^*1 \times (\text{BRG设定值}^*2 + 1) \times 4}$$

- 分频比*1：选择“1”或者“4”（通过串行I/O控制寄存器的位0设定）
- BRG设定值*2：设定0~255（0016~FF16）

- 在选择外部时钟时

$$\text{同步时钟频率 [Hz]} = \text{SCLK管脚的输入时钟}$$

1.2 时钟同步串行 I/O 的设定方法

时钟同步串行I/O的设定方法如图1和图2所示。

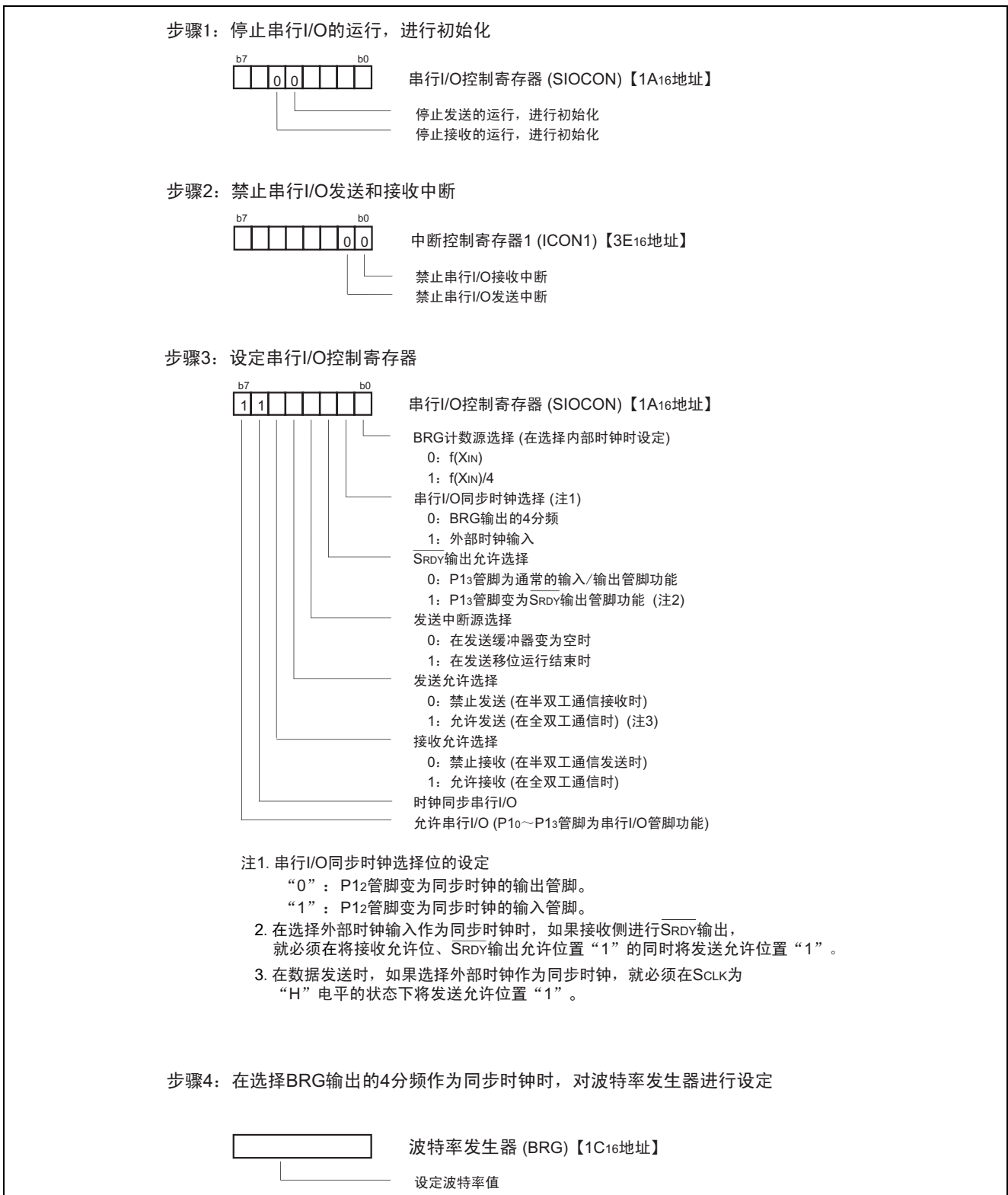
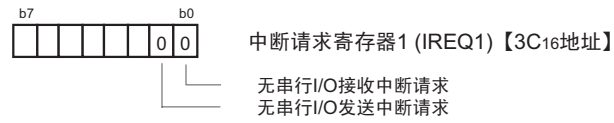
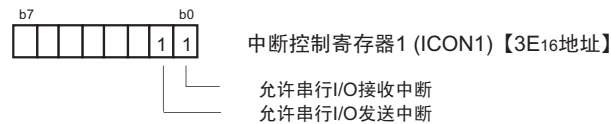


图 1 时钟同步串行 I/O 的设定方法 (1)

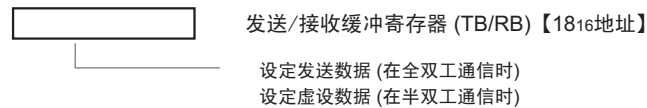
步骤5: 为了不执行不必要的中断处理, 必须将串行I/O发送和接收中断请求位置“0”(无请求)



步骤6: 在执行中断时, 必须将串行I/O发送和接收中断允许位置“1”(允许中断)



步骤7: 开始数据的发送和接收 (注1、2)



注1. 在数据发送时, 如果选择外部时钟作为同步时钟, 就必须在SCLK为“H”电平的状态下进行。

2. 在输入SRDY信号时, 必须在发送数据前将使用的管脚设定为输入模式。

图 2 时钟同步串行 I/O 的设定方法 (2)

1.3 使用时钟同步串行 I/O 的通信（发送和接收）

■要点

使用时钟同步串行I/O，发送和接收2字节的数据。通信控制使用 $\overline{\text{SRDY}}$ 信号。

■说明

使用串行I/O（选择时钟同步串行I/O），同步时钟频率为125kHz（对 $f(\text{XIN})=4\text{MHz}$ 进行32分频）。每隔2ms（由定时器产生）从接收侧输出 $\overline{\text{SRDY}}$ 信号，并且从发送侧将2字节数据传送给接收侧。

连接图、时序图、发送侧控制步骤的例子、接收侧控制步骤的例子分别如图3、图4、图5、图6所示。

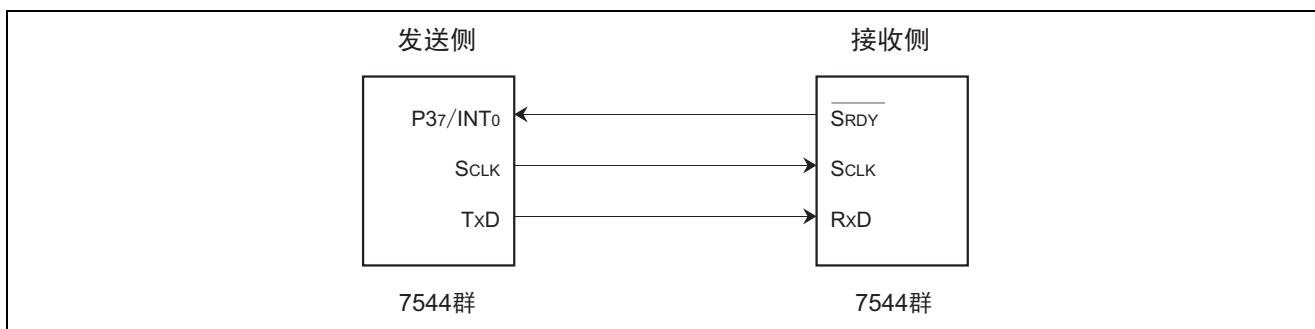


图 3 连接图

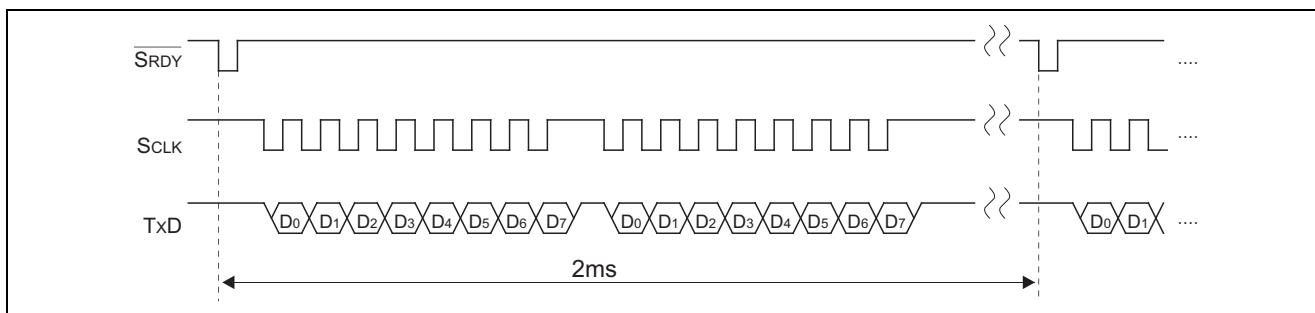


图 4 时序图

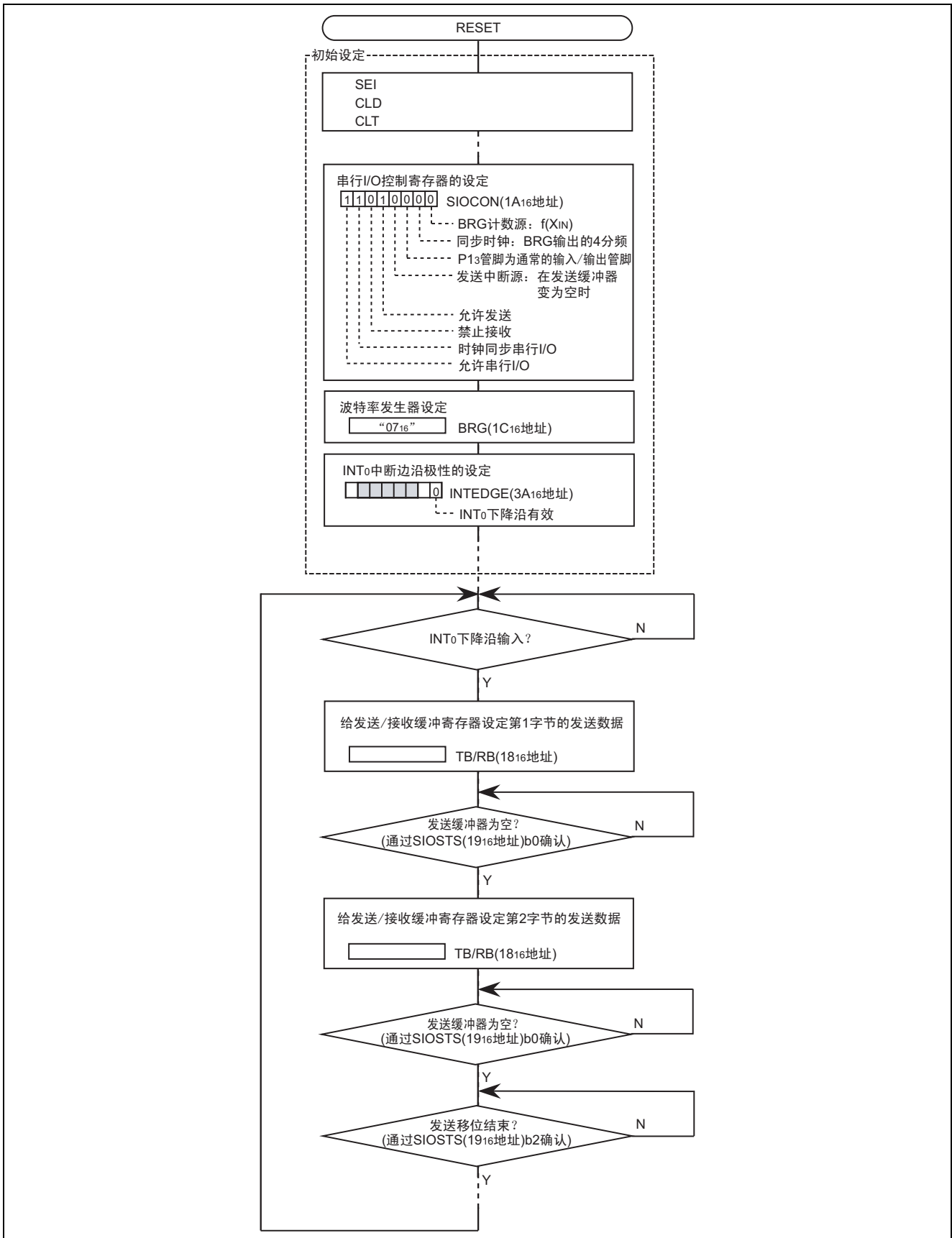


图 5 发送侧的控制步骤例子

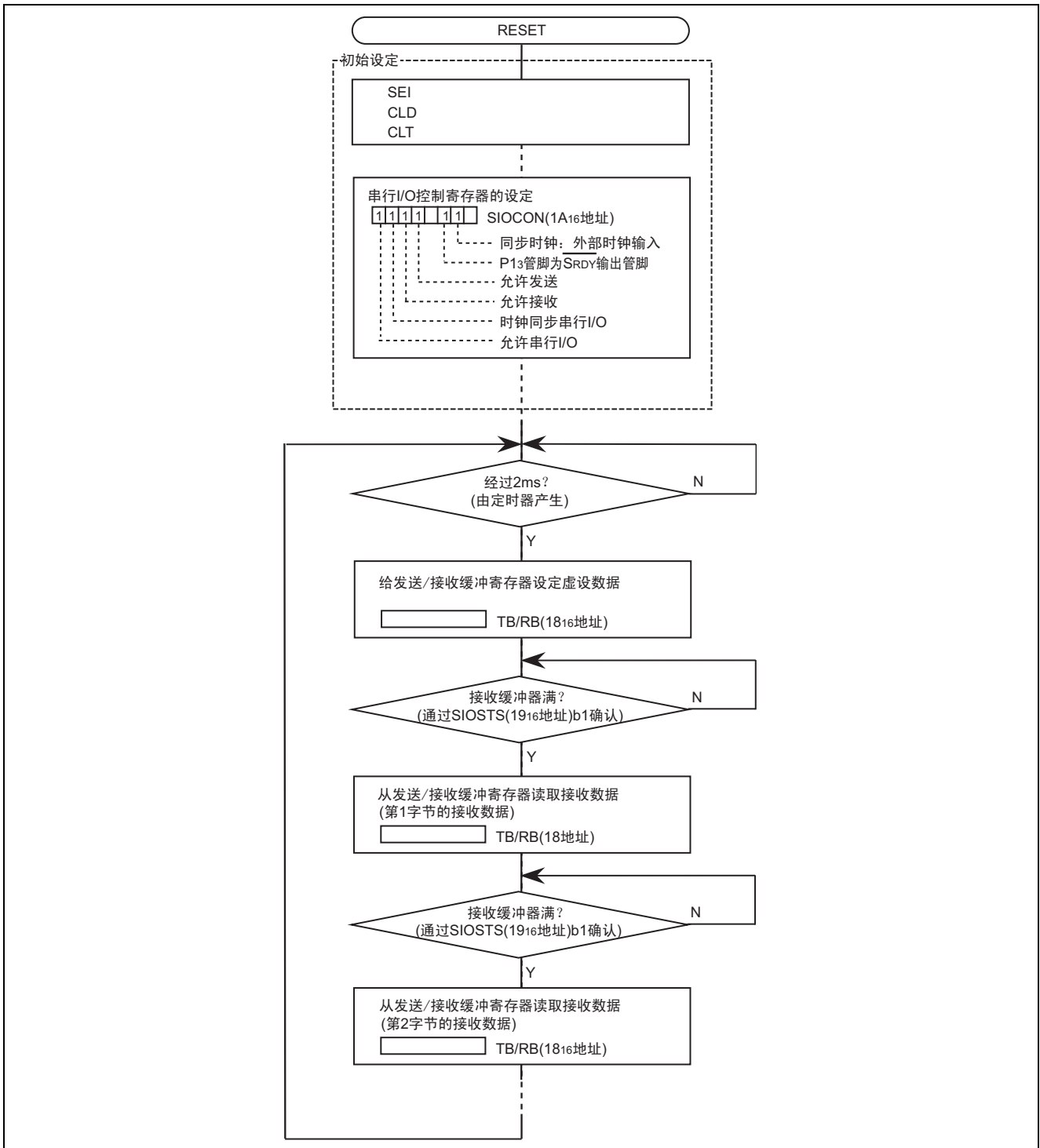


图 6 接收侧的控制步骤例子

2. 参考文献

数据表

7544群数据表（最新版本请从瑞萨科技网页取得）

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修订记录

Rev.	发行日	修订内容	
		页	修订处
1.00	2004.09.15	—	初版发行

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