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M16C/65 群

定时器 A 操作（事件计数模式、自由运行方式）

1. 要点

在事件计数模式中，可以选择如表 1 中所列的各种功能。在表 1 中用符号“○”表示本篇资料所选的项目，图 1 是定时器的工作时序图。本篇资料的参考例程是定时器 A1 选择事件计数模式的例子。

2. 说明

本篇资料，适用于 M16C/65 群单片机。

本篇应用说明也适用于 M16C 族中与上面所述的群具有相同 SFR（特殊功能寄存器）定义的产品。关于产品功能的改进，请参看手册中的相关信息。在使用本篇应用说明的程序前，需进行详细的评价。

3. 选定功能

表 1. 选定功能

| 设定项目 | 设定内容 | |
|--------|-----------------------|----------------------|
| 计数源 | <input type="radio"/> | TAiIN 引脚的输入信号（下降沿计数） |
| | <input type="radio"/> | TAiIN 引脚的输入信号（上升沿计数） |
| | <input type="radio"/> | 计数器上溢（TB2/TAj 上溢） |
| 脉冲输出功能 | <input type="radio"/> | 无脉冲输出 |
| | <input type="radio"/> | 有脉冲输出 |
| 计数工作方式 | <input type="radio"/> | 重加载方式 |
| | <input type="radio"/> | 自由运行方式 |

注: $j = i - 1$, 但当 $i = 0$ 时 $j = 4$ 。

4. 定时器 A 的操作

- (1) 把计数开始标志位置为“1”，计数器开始对计数脉冲源的下降沿计数。
- (2) 即使在发生下溢时，重加载寄存器的设定值也不被加载到计数器，计数器继续进行计数。同时，定时器 Ai 中断请求位置为“1”。
- (3) 如果在计数中切换递增/递减计数方式，那么将从计数脉冲的下一个有效沿开始，切换递增/递减计数方式。
- (4) 即使在发生上溢时，重加载寄存器的设定值也不被加载到计数器，计数器继续进行计数。同时，定时器 Ai 中断请求位置为“1”。

选择事件计数模式的定时器工作时序图如下所示：

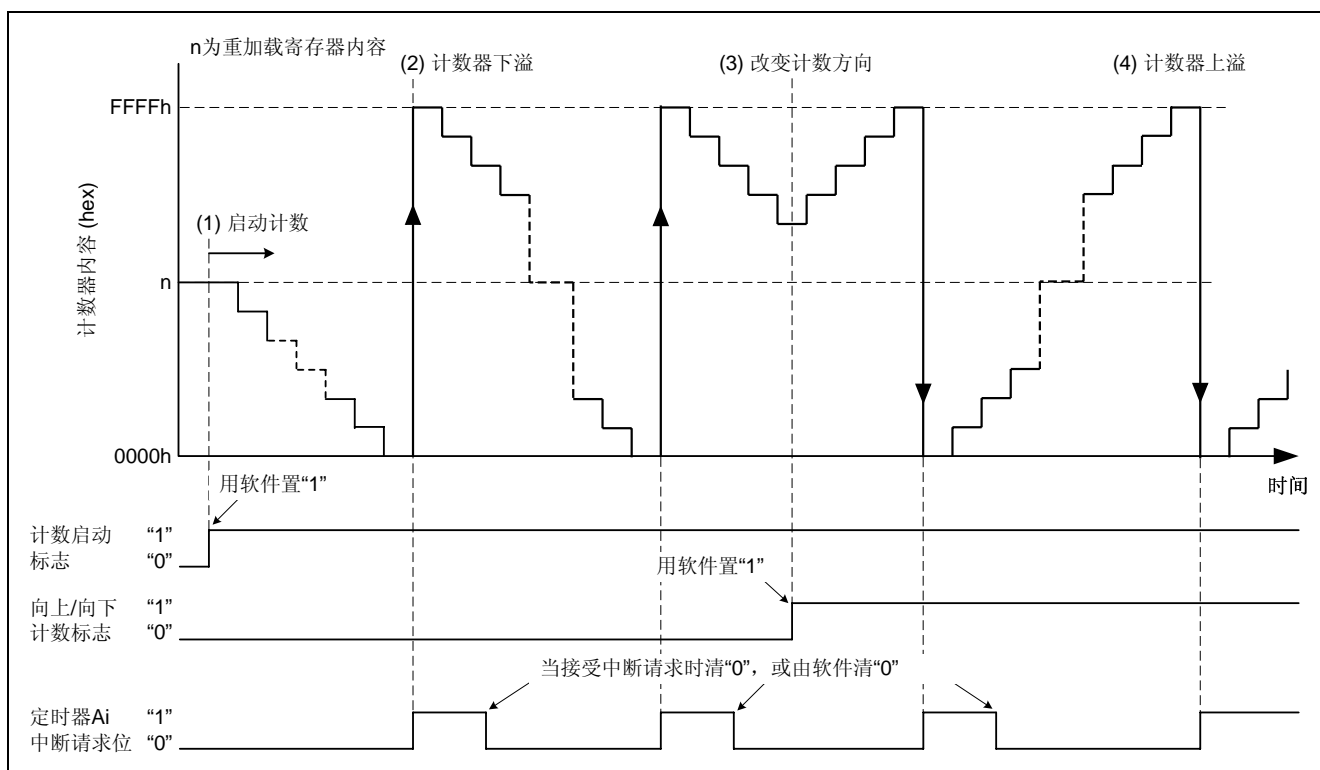
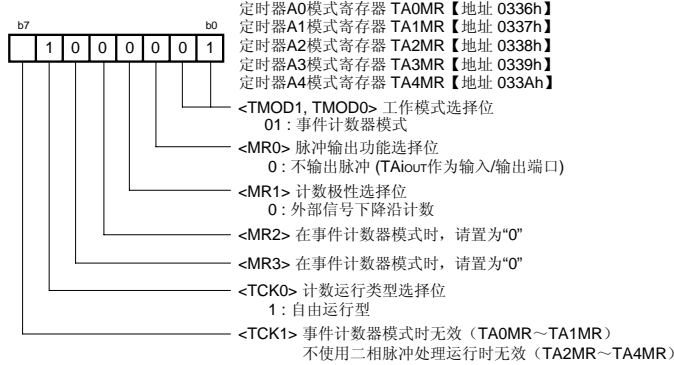


图 1. 选择事件计数模式、自由运行方式时的工作时序图

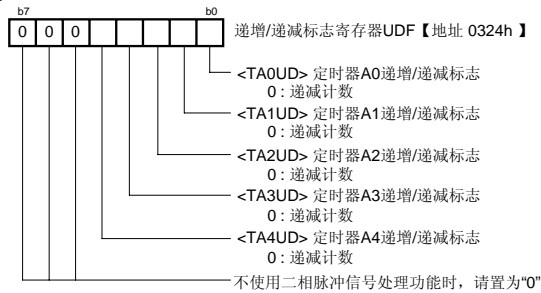
5. 寄存器设置

为了能够实现定义在“4. 定时器 A 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/65 群的硬件手册。

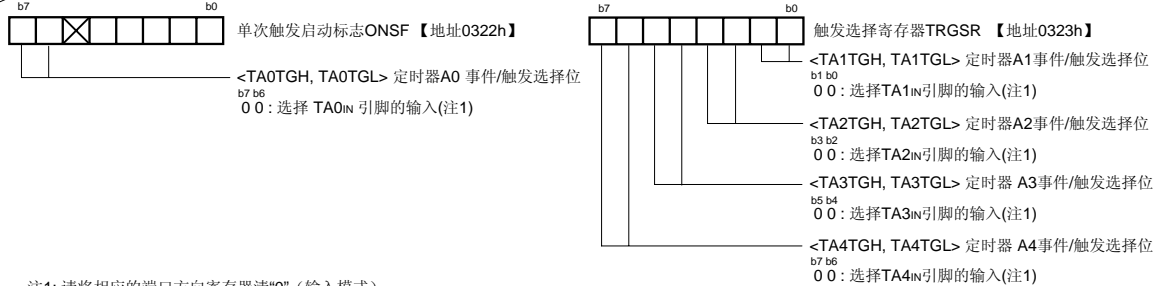
(1)选择事件计数器模式和功能



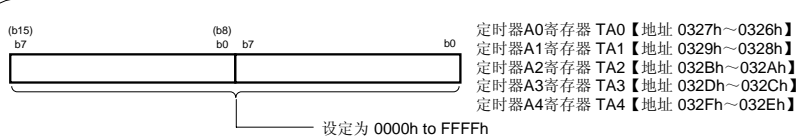
(2)递增/递减标志寄存器



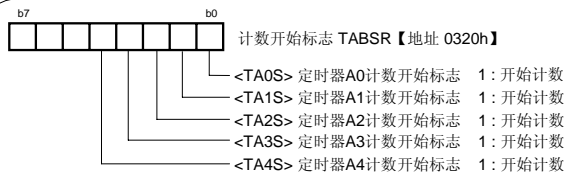
(3)单次触发启动标志和触发选择寄存器



(4) 设置定时器Ai寄存器 (i=0~4)



(5) 设置定时器计数开始标志位



开始计数

6. 参考文献

数据手册

M16C/65 群硬件手册

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