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瑞萨电子公司网址：http://www.renesas.com

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M16C/65 群

定时器 A 操作（事件计数模式中二相脉冲信号处理、自由运行、4 倍频处理运行、Z 相输入）

1. 要点

在这种模式下，通过 Z 相的输入将定时器 A3 的计数值置为“0”，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 A3 使用 INT2 中断时的例子。

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

此功能只能用于定时器 A3 的事件计数模式、二相脉冲信号处理、自由运行和 4 倍频处理，Z 相从 ZP 引脚输入。

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有效沿计数。

(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 A3 中断请求位置为“1”。

(3) 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 A3 中断请求位置为“1”。

(4) 当 Z 相的输入（ZP 引脚（INT2 输入））有上升沿时，定时器的计数值变为“1”。同时，定时器 A3 中断请求位置为“1”。

注意事项：

- 通过检测 Z 相的输入边沿进行计数器的初始化，边沿的极性可以通过 INT2IC 寄存器的 POL 位选择。
- 输入的 Z 相脉宽必须为定时器 A3 计数源的 1 个周期以上。
- 将 TAiIN 引脚和 TAiOUT 引脚的方向寄存器设置为“0”。
- 如果定时器 A3 的下溢时序和 Z 相输入的计数器初始化时序重叠，就连续产生 2 次定时器 A3 的中断请求，所以在使用此功能时不能使用定时器 A3 中断。

选择事件计数模式的定时器工作时序图如下所示：

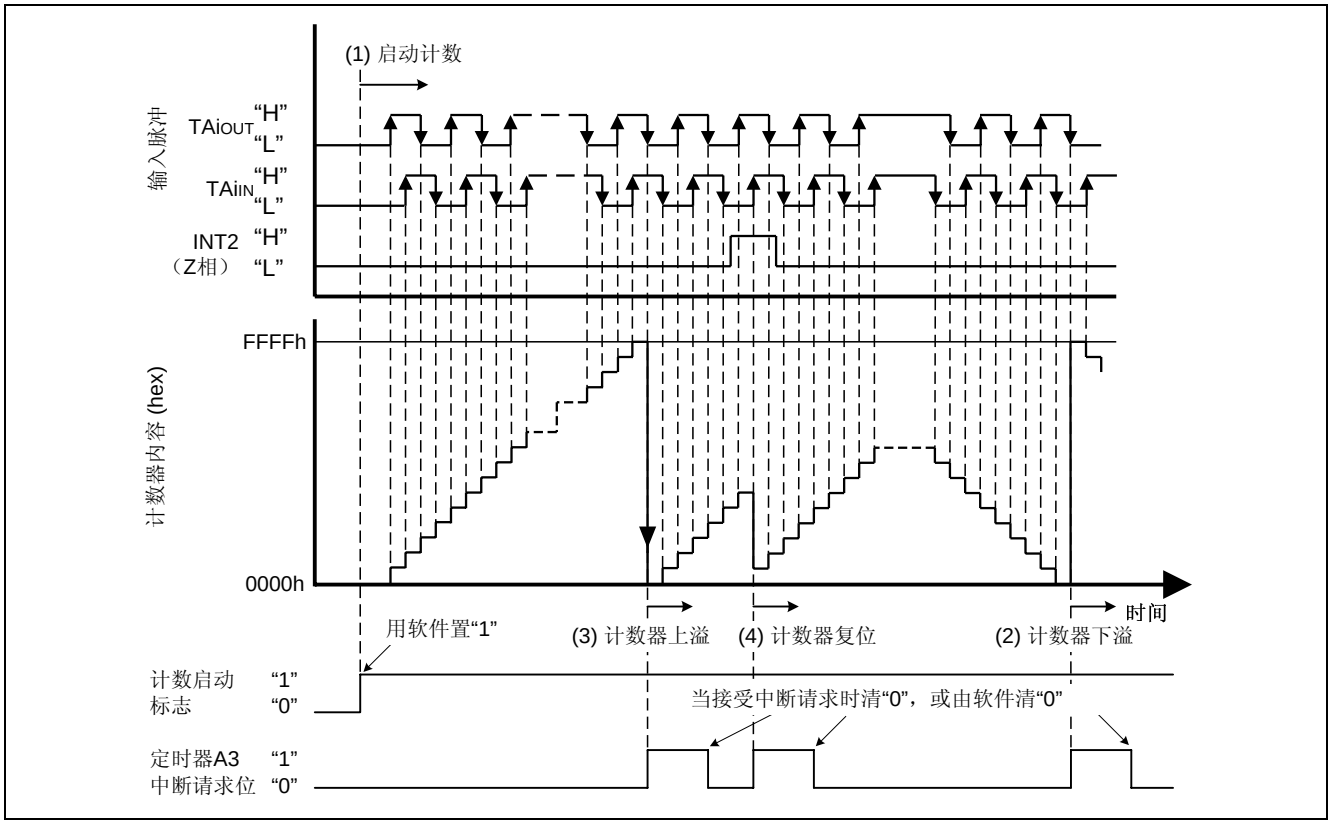
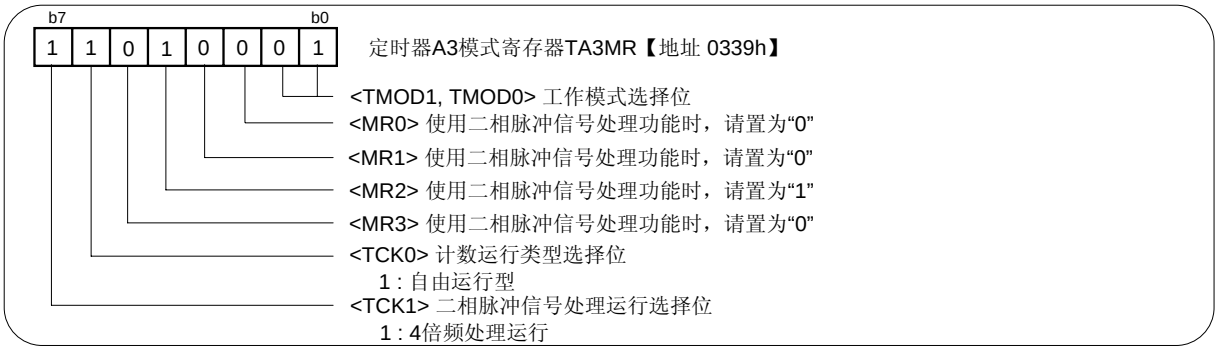


图 1. 选择事件计数模式中二相脉冲信号处理、4 倍频处理、Z 相输入选择时的工作时序图

5. 寄存器设置

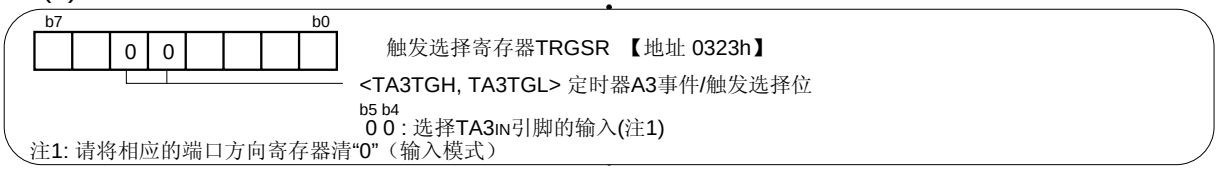
为了能实现定义在“4. 定时器 A 的操作”的功能，下列寄存器必须按步骤顺序进行设置。对于每个寄存器的具体结构，请参考 M16C/65 群的硬件手册。

(1)选择事件计数器模式和功能

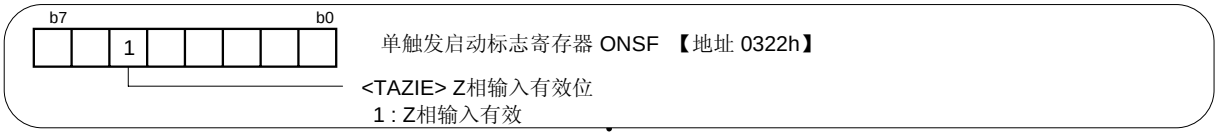


(2)二相脉冲信号处理功能选择

(3)触发选择寄存器



(4)单触发启动标志寄存器



(5)设置定时器A3寄存器

(6)设置Z相 (INT2) 输入极性

(7)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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