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瑞萨电子公司网址：<http://www.renesas.com>

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M16C/64 群

定时器 A 操作（事件计数模式中二相脉冲信号处理、正常处理运行）

1. 要点

在事件计数模式中处理二相脉冲信号，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 A2 选择事件计数模式的例子。

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	
计数工作方式		重加载方式
	○	自由运行方式
二相脉冲处理（注）	○	普通处理
		4 倍频处理
输出极性控制	○	输出波形“高”电平有效
		输出波形“低”电平有效（输出反转）

注：定时器 A3 能选择两种运行方式。定时器 A2 只能选择为正常处理运行方式，定时器 A4 只能选择为 4 倍频处理运行方式。

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 Ai 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 Ai 中断请求位置为“1”。

注意事项：

- 当 TAIOUT 引脚保持为“高”电平时，TAiIN 引脚的输入边沿将作为有效沿。
- 递增/递减计数的条件如下所示：

当 TAIOUT 引脚的输入信号电平为“高”时，对 TAIIN 引脚的上升沿进行递增计数。

当 TAIOUT 引脚的输入信号电平为“高”时，对 TAIIN 引脚的下降沿进行递减计数。

选择事件计数模式的定时器工作时序图如下所示：

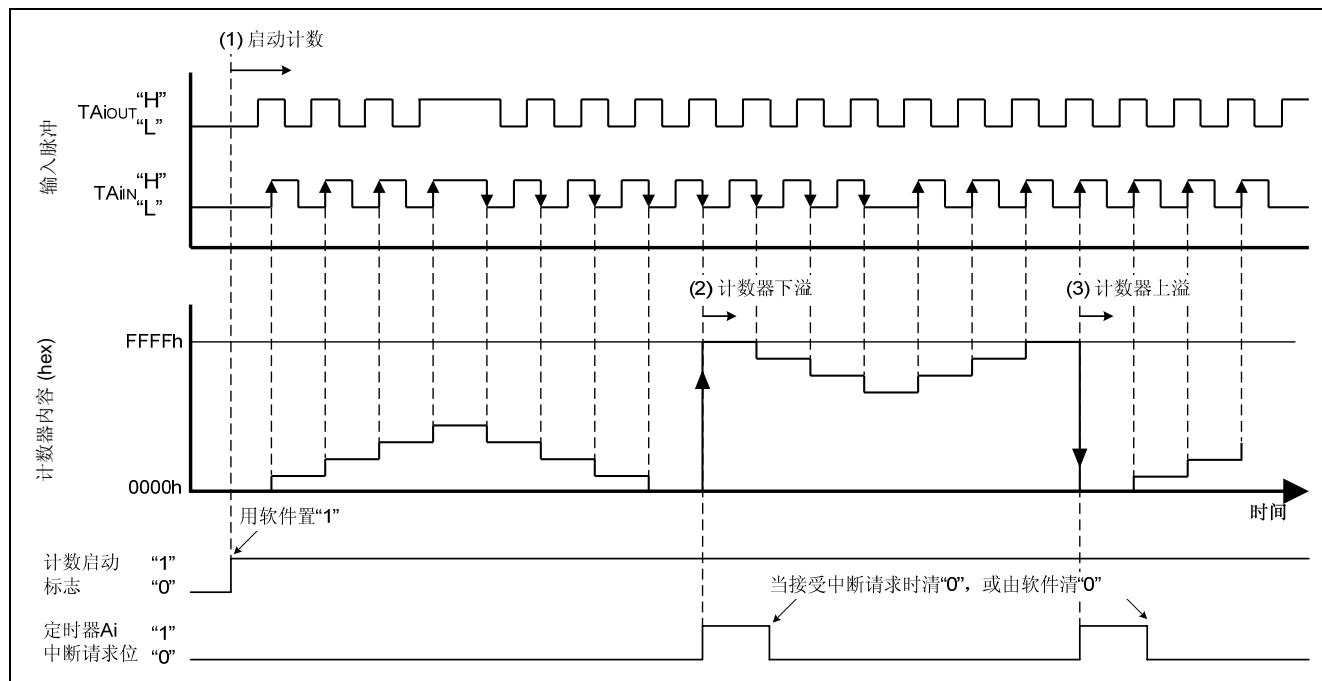
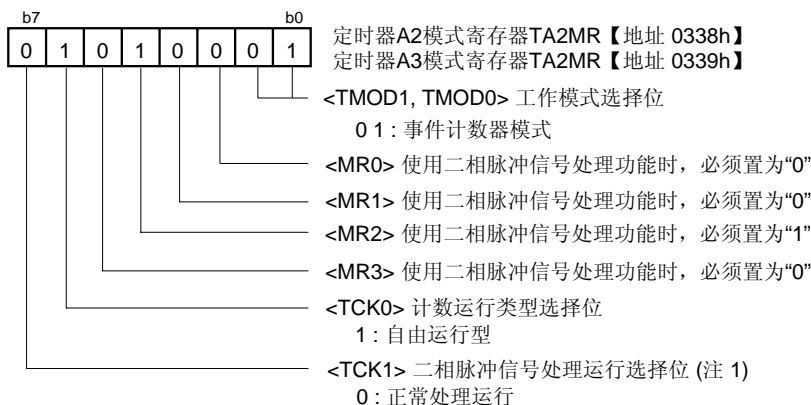


图 1. 选择事件计数模式中二相脉冲信号处理、正常处理运行方式时的工作时序图

5. 寄存器设置

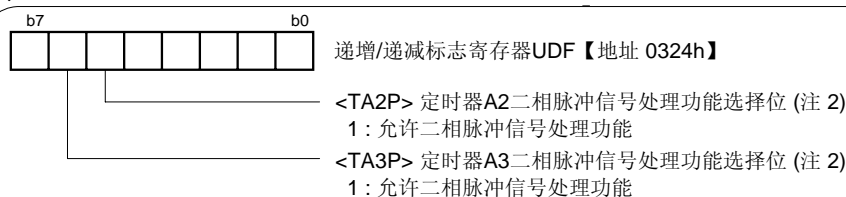
为了能够实现定义在“4. 定时器 A 的操作”的功能，下列寄存器必须按步骤顺序进行设置。对于每个寄存器的具体结构，请参考 M16C/64 群的硬件手册。

(1) 选择事件计数器模式和功能



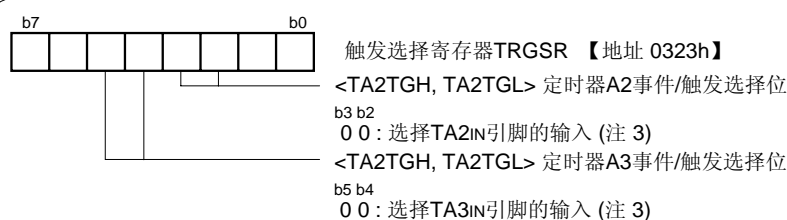
注 1: 此位对定时器A3有效。定时器A2与此位无关，可以置“0”或置“1”。

(2) 二相脉冲信号处理功能选择



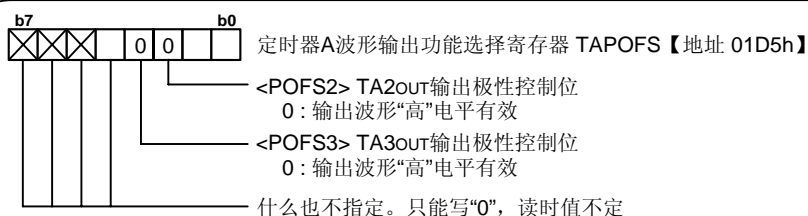
注 2: 必须将TAiIN、TAiOUT引脚相对应的端口方向寄存器清“0”（输入模式）。

(3) 触发选择寄存器

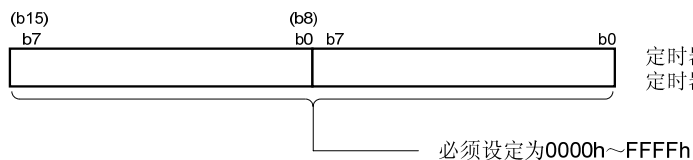


注 3: 必须将相应的端口方向寄存器清“0”（输入模式）。

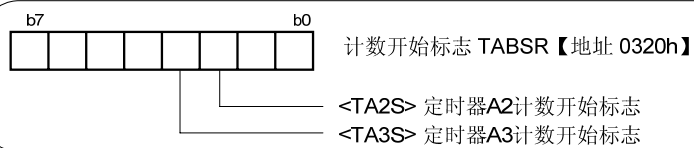
(4) 选择定时器波形输出功能



(5)设置定时器A_i寄存器 (i=2~3)



(76)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/64 群硬件手册

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修订记录

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