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PTM SinglePulseOutput说明

在单脉冲输出模式下，可由软件或外部输入信号触发计数器开始计时，并产生单脉冲起始沿，比较器 A 分别将计数器与对应的 CCRA 寄存器设置值进行比较，当比较结果相同时触发 CCRA 中断，同时输出单脉冲结束沿。单脉冲输出模式可输出宽度可调的高脉冲或低脉冲信号，适用于调节控制信号宽度等功能需求场合。

在单脉冲输出模式下，TM 功能引脚的功能说明如下表。

引脚名称(n为TM 编号)	功能
PTCKn	输入引脚，外部时钟输入，可作为 PTM 的时钟源
PTPn	输出引脚，单脉冲输出
PTPnB	输出引脚，PTPn的反向输出

单脉冲输出模式是当触发信号到达时，由PTM的输出引脚(PTP 、PTPB)输出一个脉冲，该脉冲的宽度由 CCRA 决定。

1. 触发信号

- ①软件触发：PTnON，通过开启 PTM 触发，计数达到 CCRA 时，PTnON 会自动 clear
 - ②硬件触发：PTCK pin，PTCK pin 输入上升沿信号（此时自动置位 PTnON）
2. 输出脉冲

- 一旦触发，脉冲开始传输，直到计数达到 CCRA 或者软件将 PTnON 置位0 则脉冲结束

example 说明

此范例演示了 PTM 的Single Pulse Output模式的使用

程序说明

1. `config sys clock`

PTM clock 来自系统时钟，因此系统时钟一定要配置正确

2. `config PTM to Single Pulse Output mode`

- 范例设置：时钟源为 Fsys/4，count = 500
 - $T = 1/(F_{sys}/4) * count$
 - 4M : $T = 1/(4/4) * count = 500 \text{ us}$
 - 8M : $T = 1/(8/4) * count = 250 \text{ us}$
- 范例设置：输出引脚不反相，PTM 输出脚高有效

3. `config output pin`

4. `enable PTM`

5. `enable Interrupt : Non-required`

根据需求设定

现象说明

连接 e-link 和目标板，将程序下载到 MCU 并运行

通过示波器测量 PTnP 或者 PTnPB 即可看到对应的输出波形

下图为 8 MHz 下 PT0P 的波形提供参考

由于为单次触发，建议将示波器设置为 trigger 模式，范例为高电平有效，因此 trigger 为上升沿



FAQ