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CTM PWM output説明

在 PWM (pulse width modulation, PWM) 输出模式下，可输出 Duty、Period 可调的 PWM 波形。
PWM输出是对模拟电路进行控制的一种非常有效的技术，广泛应用于测量、通信、功率控制等领域。

在 PWM 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
CTCKn	输入引脚，外部时钟输入，可作为 CTM 的时钟源
CTPn	输出引脚，根据设定输出指定 PWM 信号
CTPnB	输出引脚，CTPn的反向输出

example 說明

此范例演示了 CTM 的 PWM 模式的使用

PWM duty 和 period 配置说明

```
#define CTM_BITS 10

#if CTM_BITS == 10
    #define CCRP_P 128
    #define COUNT_MAX 1024
#elif CTM_BITS == 16
    #define CCRP_P 256
    #define COUNT_MAX 65536
#endif

CTM_Cfg_PWM_t cfg;
if (cfg.dutyPeriod == CTM_PWM_DUTY_CCRA_PERIOD_CCRP){
    if (cfg.ccrpData == 0){
        period = COUNT_MAX;
    }
    else{
        period = cfg.ccrpData * CCRP_P;
    }
    duty = cfg.ccraData;
}
else if (cfg.dutyPeriod == CTM_PWM_DUTY_CCRP_PERIOD_CCRA){
    if (cfg.ccrpData == 0){
        duty = COUNT_MAX;
    }
    else{
        duty = cfg.ccrpData * CCRP_P;
    }
    period = CCAR;
}
```

程序说明

1. config sys clock

CTM clock 来自系统时钟，因此系统时钟一定要配置正确

2. config CTM to pwm output mode

- 范例设置：clockSource($F_{sys}/4$), dutyPeriod
($CTM_PWM_DUTY_CCRA_PERIOD_CCRP$) · CCRA = 256 · CCRP = 5
- 若系统频率为4MHz · 10-bit CTM
 - Pwm 频率 = $(F_{sys}/4)/(5 \times 128) = 1.562Khz$
 - duty = $256 / (5 \times 128) = 40.0\%$
- 若系统频率为8MHz · 16-bit CTM
 - Pwm 频率 = $(F_{sys}/4)/(5 \times 128) = 3.124Khz$
 - duty = $256 / (5 \times 128) = 40.0\%$

3. `config output pin`
4. `enable CTM`
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 CTnP 或者 CTnPB 即可看到对应的输出波形



FAQ
