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STM PWM output说明

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
STCKn	输入引脚，外部时钟输入，可作为 STM 的时钟源
STPn	输出引脚，根据设定输出指定 PWM 信号
STPnB	输出引脚，STPn的反向输出

example 说明

此范例演示了 STM 的 PWM 模式的使用

PWM duty 和 period 配置说明

```
#define STM_BITS 10

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

STM_cfg_PWM_t cfg;
if (cfg.dutyPeriod == STM_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 == STM_PWM_DUTY_CCRP_PERIOD_CCRA){
    if (cfg.ccrpData == 0){
        duty = COUNT_MAX;
    }
    else{
        duty = cfg.ccrpData * CCRP_P;
    }
    period = CCAR;
}
```

程序说明

demo code说明

1. config sys clock

STM clock 来自系统时钟，因此系统时钟一定要配置正确

2. config STM to pwm output mode

- 范例设置：clockSource($F_{sys}/4$),dutyPeriod (STM_PWM_DUTY_CCRA_PERIOD_CCRP) · CCRA = 256 · CCRP = 5
- 若系统频率为8MHz(10-bit)
 - Pwm 频率 = $(F_{sys}/4)/(5*128) = 3.125Khz$
 - duty = $256/(5*128) = 40.0\%$
- 若系统频率为8MHz(16-bit)

Pwm 频率 = $(F_{sys}/4)/(5*256) = 1.562\text{KHz}$

duty = $256/(5*256) = 20.0\%$

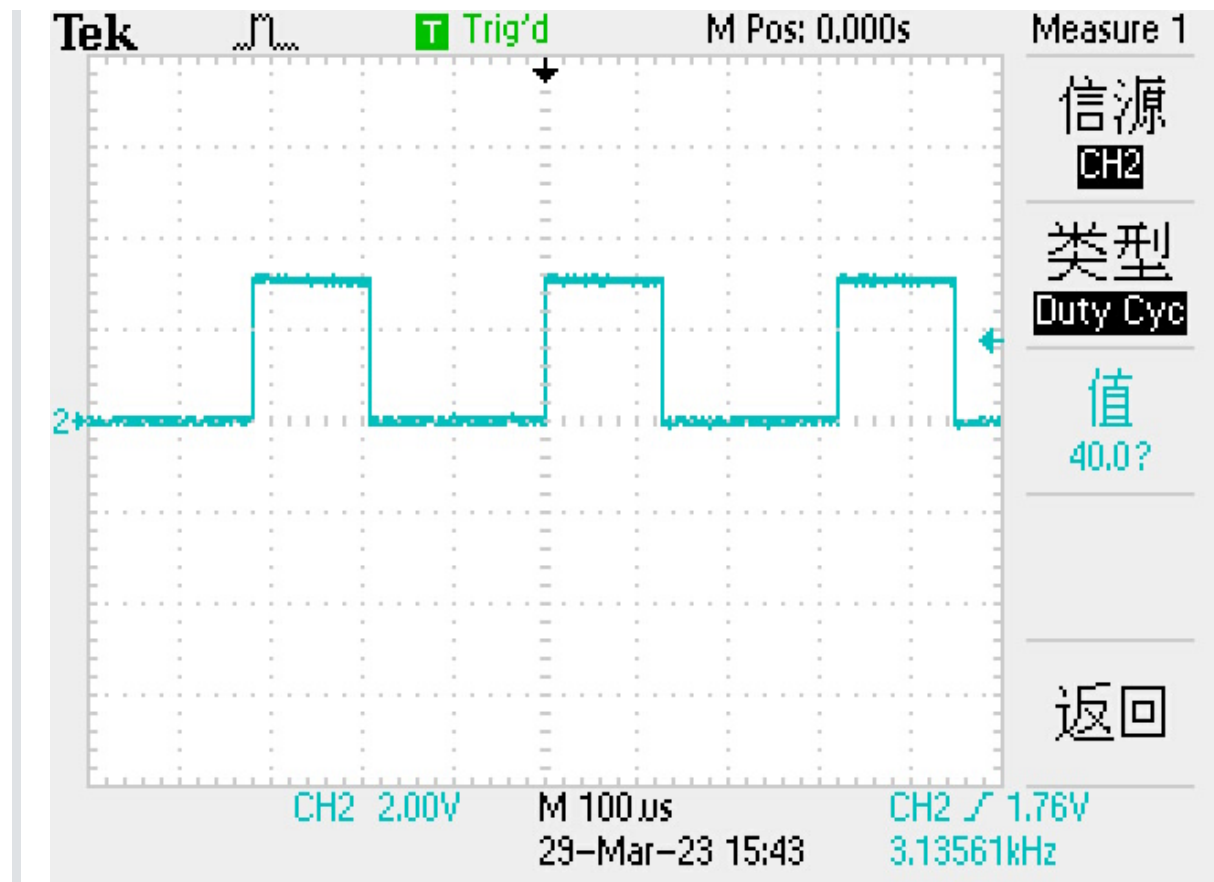
3. config output pin
4. enable STM
5. enable Interrupt : Non-required

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 STnP 或者 STnPB 即可看到对应的输出波形，比如下述为10-bit STM示意图



FAQ