



SigmaStar Camera **Pwm 使用参考**



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REVISION HISTORY

Revision No.	Description	Date
{000001}	• {Initial release}	{05/06/2019}



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1. 概述

1.1. 概述

2. PWM 的参数：

2.1. Duty_cycle:

占空比。

Echo 25 > duty_cycle 表示占空比是 25%。

2.2. Period:

Frequency。

Echo 2000 > period

表示 2K HZ 的 frequency 的 pwm 波。

2.3. Enable/disable:

使能；

2.4. Polarity:

极性。

如果是 normal。那么 duty_cycle=25%，表示高电平占的比例是 25%。

如果是 inverse，那么就反之。

3. KERNEL 的配置：

3.1. dts 的配置：

```
pwm {
    compatible = "sstar,infinity-pwm";
    reg = <0x1F003400 0x600>;
    clocks = <&CLK_xtali_12m>;
    npwm = <4>;
    pad-ctrl = <PAD_TTL0 PAD_TTL12 PAD_FUART_TX PAD_FUART_RX>;
    status = "ok";
};
```

npwm: 4; 表示 pwm 有 4 组;

Pad-ctrl: 配置要做为 PWM 的 4 组 pad, 如果不须配置到 4 组, pad 对应的数值可以设为 PAD_UNKNOWN。由于是共享 gpio 的, 当 gpio 被当作 pwm 使用的时候, driver 会自动做切 pad 动作。如 Display Demo Board:

Infinity2m-ssc011a-s01a.dtsi 中加入:

```
pwm {
    compatible = "sstar,infinity-pwm";
    reg = <0x1F003400 0x600>;
    clocks = <&CLK_xtali_12m>;
    npwm = <2>;
    pad-ctrl = <PAD_GPIO4 PAD_GPIO5>;
    status = "ok"; // no available pads
};
```

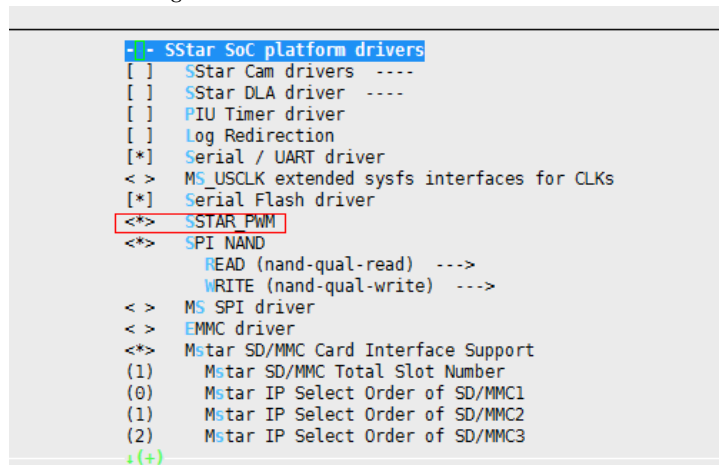
PAD_GPIO4->PWMO PAD_GPIO5->PWM1

Infinity2m-ssc011a-s01a-padmux.dtsi

修改:

```
<PAD_GPIO4          PINMUX_FOR_PWMO_MODE_3          MDRV_PUSE_PWMO >,
<PAD_GPIO5          PINMUX_FOR_PWM1_MODE_4          MDRV_PUSE_PWM1 >;
```

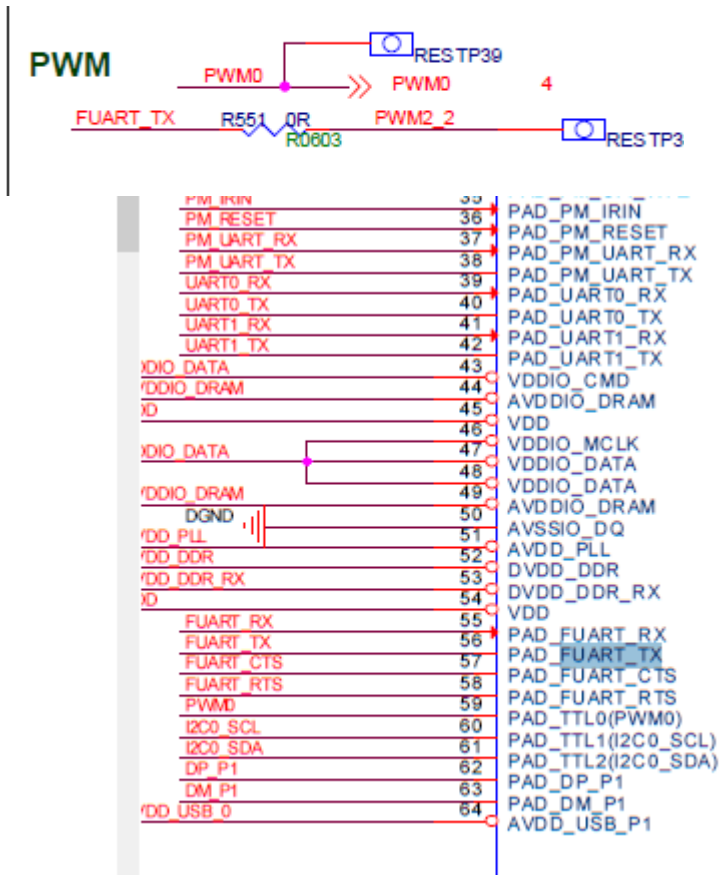
Kernel config:



```

- SStar SoC platform drivers
  [ ] SStar Cam drivers ----
  [ ] SStar DLA driver ----
  [ ] PIU Timer driver
  [ ] Log Redirection
  [*] Serial / UART driver
  <> MS_USCLK extended sysfs interfaces for CLKS
  [*] Serial Flash driver
  <*> SSTAR_PWM
  <*> SPI NAND
      READ (nand-qual-read) --->
      WRITE (nand-qual-write) --->
  <> MS SPI driver
  <> EMMC driver
  <*> Mstar SD/MMC Card Interface Support
      (1) Mstar SD/MMC Total Slot Number
      (0) Mstar IP Select Order of SD/MMC1
      (1) Mstar IP Select Order of SD/MMC2
      (2) Mstar IP Select Order of SD/MMC3
  (+)
  
```

4. 客户硬件举例：

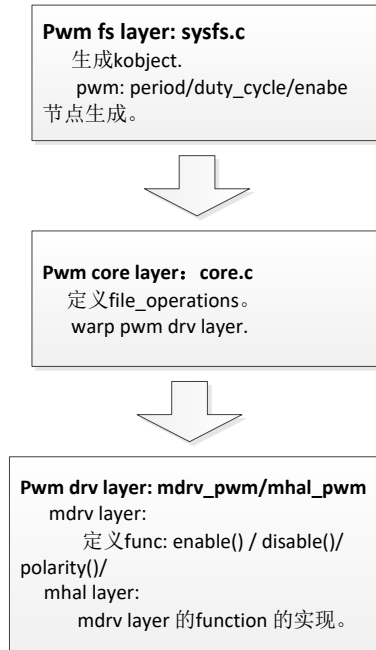


通过查看：`drivers\ssstar\include\infinity2m\gpio.h`

```
#define PAD_FUART_RX          15
#define PAD_FUART_TX          16
#define PAD_FUART_CTS         17
#define PAD_FUART_RTS         18
#define PAD_TTL0               19
#define PAD_TTL1               20
#define PAD_TTL2               21
#define PAD_TTL3               22
```

所以，只需要再配置好 dts 就可以了。

5. PWM 的架构



6. USER MODE 对 PWM 的控制 :

1. Export PWM number (例如 USB PAD_PWM0)

Command:

```
cd /sys/class/pwm/pwmchip0
```

```
echo 0 > export
```

2. Set period(frequency) / duty_cycle / polarity / enable

Command:

```
cd pwm0
```

```
echo xxxx > period
```

In our driver implementation, xxxx indicates output frequency

ex: echo 2000 > period will generate 2KHz waveform

```
echo xx > duty_cycle
```

ex: echo 25 > duty_cycle will generate 25% duty_cycle

```
echo inversed > polarity
```

Inverse output waveform, default is **normal**

```
echo 1 > enable
```

Enable output waveform

对应 user 层代码:

即:

Open 一个节点;

Write 节点;