



SSD20X 功耗调整指引



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REVISION HISTORY

Revision No.	Description	Date
0.1	Initial release	7/22/2018

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1. 打开/关闭 组件

1.1. 可选的组件

在 Infinity-2m 上可选使能的组件有：Analog Power、ETH 和 USB

1.2. Analog Power

可以依據不同應用場景將沒用到的模擬電路電源關閉達到節能目標

1.2.1 可開關的項目

可調整項目有: Audio/EMAC/HDMI ATOP/IDAC ATOP/IDAC LPLL/DISP LPLL/MIPI DPHY TX TOP/SATA ATOP/UPLL 0,1/USB20 P1,P2,P3

```
(infinity2m-spinand-ssc011a-s01a) Builtin DTB
[*] MP_IRQ_TRACE
[ ] Do not generate OF debug node from of_core_init
[*] Skip squashfs bad block
[*] SoC infinity2m (ARCH_MULTI_V7)
[ ] infinity2m FPGA environment
[ ] Power down audio at boot
[ ] Power down EMAC at boot
[*] Power down HDMI_ATOP at boot
[*] Power down IDAC_ATOP at boot
[*] Power down IDAC_LPLL at boot
[ ] Power down DISP_LPLL at boot
[*] Power down MIPI_DPHY_TX_TOP at boot
[*] Power down SATA_ATOP at boot
[ ] Power down UPLL_0 at boot
[ ] Power down UPLL_1 at boot
[ ] Power down USB20_P1 at boot
[ ] Power down USB20_P2 at boot
[ ] Power down USB20_P3 at boot
```

注：如果是 MIPI panel 则不能选上 MIPI_DPHY

1.3. ETH

需要在 U-Boot 及 Linux Kernel 进行调整才能完全关闭该组件

1.3.1 调整 U-Boot

Step1. 取消 MSTAR EMAC 的选项

```
.config - U-Boot 2015.01 Configuration
-> Device Drivers -> MStar drivers

MStar drivers
Arrow keys navigate the menu. <Enter> selects submenus ---> (or empty submenus ----). Highlighted letters are
hotkeys. Pressing <Y> includes, <N> excludes, <M> modularizes features. Press <Esc><Esc> to exit, <?> for
Help, </> for Search. Legend: [*] built-in [ ] excluded <M> module < > module capable

--- MStar drivers
[*] MSTAR ISP NOR FLASH
[*] Save environment to ISP NOR FLASH
[ ] MTD device for ISP NOR FLASH
[*] Enable Mstar partition support
[*] MSTAR SDMMC
[ ] MSTAR eMMC
[*] MSTAR Gpio
[ ] MSTAR NAND
[ ] MSTAR USB
[ ] MSTAR EMAC
[ ] Enable AESDMA
[ ] MSTAR SPINAND
() Append postfix name to compressed file

<Select> < Exit > < Help > < Save > < Load >
```

1.3.2 调整 Linux Kernel

Step1. 取消 EMAC 的选项

```
.config - Linux/arm 4.9.84 Kernel Configuration
+ Device Drivers -> MStar SoC platform drivers
MStar SoC platform drivers
Arrow keys navigate the menu. <Enter> selects submenus ---> (or empty submenus ----). Highlighted letters are
hotkeys. Pressing <Y> includes, <N> excludes, <M> modularizes features. Press <Esc><Esc> to exit, <?> for
Help, </> for Search. Legend: [*] built-in [ ] excluded <M> module < > module capable

(2) Mstar PAD Select Order of SD/MMC3
[ ] Mstar SD/MMC Reverse CDZ Pin
[*] Mstar SD/MMC T-Flash Card Using
(48000000) Mstar SD/MMC1 Maximum Clock
(0) Mstar SD/MMC1 Maximum DownLevel
(0) Mstar SD/MMC1 Pass Level
[*] Mstar SD/MMC1 Int CDZ Support
(48000000) Mstar SD/MMC2 Maximum Clock
(0) Mstar SD/MMC2 Maximum DownLevel
(0) Mstar SD/MMC2 Pass Level
[*] Mstar SD/MMC2 Int CDZ Support
(48000000) Mstar SD/MMC3 Maximum Clock
(0) Mstar SD/MMC3 Maximum DownLevel
(0) Mstar SD/MMC3 Pass Level
[*] Mstar SD/MMC3 Int CDZ Support
< > EMAC
< > IR Remote Control Receiver
<*> Mstar I2C driver
<*> I2C driver support for infinity5
<*> GPIO driver
<*> SW I2C via GPIO support
<*> watchdog driver
<*> sar driver
< > iiccut driver
[*] MS_RTC
< > Mstar RTC driver
<*> Mstar RTCWC driver
[*] Serial Flash driver

<Select> < Exit > < Help > < Save > < Load >
```

Step2. 取消 Networking support 的选项

```
.config - Linux/arm 4.9.84 Kernel Configuration

Linux/arm 4.9.84 Kernel Configuration
Arrow keys navigate the menu. <Enter> selects submenus ---> (or empty submenus ----). Highlighted letters are
hotkeys. Pressing <Y> includes, <N> excludes, <M> modularizes features. Press <Esc><Esc> to exit, <?> for
Help, </> for Search. Legend: [*] built-in [ ] excluded <M> module < > module capable

-* Patch physical to virtual translations at runtime
  General setup --->
[*] Enable loadable module support --->
[*] Enable the block layer --->
  System Type --->
  Bus support --->
  Kernel Features --->
  Boot options --->
  CPU Power Management --->
  Floating point emulation --->
  Userspace binary formats --->
  Power management options --->
[ ] Networking support ----
  Device Drivers --->
  Firmware Drivers --->
  File systems --->
  Kernel hacking --->
  Security options --->
[*] Cryptographic API --->
  Library routines --->
[ ] Virtualization ----

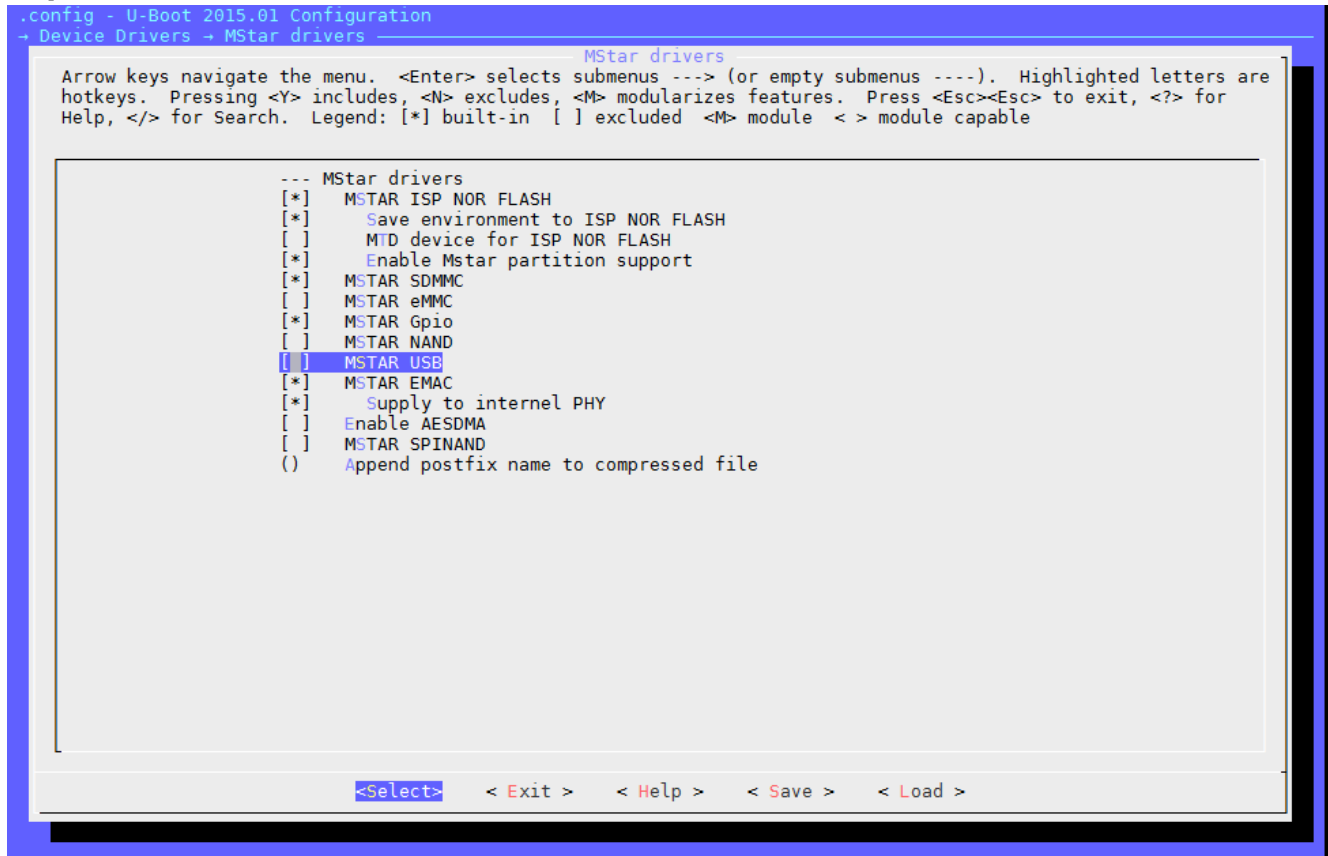
<Select>  < Exit >  < Help >  < Save >  < Load >
```

1.4. USB

需要在 U-Boot 及 Linux Kernel 进行调整才能完全关闭该组件

1.4.1 调整 U-Boot

Step1. 取消 MSTAR USB 的选项



```
.config - U-Boot 2015.01 Configuration
-> Device Drivers -> MStar drivers

MStar drivers
Arrow keys navigate the menu. <Enter> selects submenus ---> (or empty submenus ----). Highlighted letters are
hotkeys. Pressing <Y> includes, <N> excludes, <M> modularizes features. Press <Esc><Esc> to exit, <?> for
Help, </> for Search. Legend: [*] built-in [ ] excluded <M> module <> module capable

--- MStar drivers
[*] MSTAR ISP NOR FLASH
[*] Save environment to ISP NOR FLASH
[ ] MTD device for ISP NOR FLASH
[*] Enable Mstar partition support
[*] MSTAR SDMMC
[ ] MSTAR eMMC
[*] MSTAR Gpio
[ ] MSTAR NAND
[ ] MSTAR USB
[*] MSTAR EMAC
[*] Supply to internal PHY
[ ] Enable AESDMA
[ ] MSTAR SPINAND
[ ] Append postfix name to compressed file

<Select> < Exit > < Help > < Save > < Load >
```

1.4.2 调整 Linux Kernel

Step1. 修改文件 linux-4.9/arch/arm/boot/dts/infinity2m.dtsi (调整 status = "disable"来关闭 USB)

```
Mstar-ehci-1 {
    compatible = "Mstar-ehci-1";
    clocks = <&CLK_utmi>;
    interrupts = <GIC_SPI INT_IRQ_UHC IRQ_TYPE_LEVEL_HIGH>;
    status = "disable";
};

Mstar-ehci-2 {
    compatible = "Mstar-ehci-2";
    clocks = <&CLK_utmi>;
    interrupts = <GIC_SPI INT_IRQ_UHC_INT_P1 IRQ_TYPE_LEVEL_HIGH>;
    status = "disable";
};
```

2. 组件时钟频率配置

2.1. CPU 时钟频率配置

2.1.1 Voltage scaling 配置

- 提供 voltage scaling 的切换，预设是关闭。可通过如下命令设置开启该配置。
`echo 1 > /sys/devices/system/cpu/cpufreq/scaling_voltage`
- 该配置开启后，系统会自动针对目前的温度(T)来进行 voltage 的切换。切换策略如下：
T > 60C : VDD= 0.9V
T < 40C : VDD = 1.0V

2.1.2 Clock scaling 配置

- 提供 clock scaling 範圍的設置，可通過入下命令設置 clock scaling 的範圍。
`echo s_min > /sys/devices/system/cpu/cpufreq/policy0/scaling_min_freq` (default 1GHz)
`echo s_max > /sys/devices/system/cpu/cpufreq/policy0/scaling_max_freq` (default 1GHz)
(note: s_min, s_max 單位是 khz)
- 设置约束：
 - i. s_min 必须小于等于 s_max
 - ii. s_min 必须大于等于 /sys/devices/system/cpu/cpufreq/policy0/cpuinfo_min_freq
 - iii. s_max 必须小于等于 /sys/devices/system/cpu/cpufreq/policy0/cpuinfo_max_freq

2.2. 编码时钟频率配置

2.2.1 编码器配置示例

在 mhal.ko 加载之后，开启视频处理任务之前，即可通过如下命令设置相关频率：

- 读取目前的 isp clock rate, 可通过以下命令取得
`cat /sys/venc/ven_clock`
- 设置 venc clock rate, 可通过以下命令设置
`echo 384000000 > /sys/venc/ven_clock`

2.2.2 编码器时钟频率档位

JPE 的 clock default: 320M

- 216000000



- 288000000
- 320000000

2.2.3 约束

以上的设置应该在模块加载時设置，才能正确的生效。

2.3. 观察 cpu 的温度

`cat /sys/devices/virtual/mstar/msys/TEMP_R`
结果仅供参考，因为误差可以达到 5 摄氏度。