

AM3517 EVM Linux PSP

Release Notes



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Table of Contents

| | |
|--|----|
| Release Notes | 1 |
| 1. General Information | 2 |
| 1.1. Related Documentation | 2 |
| 1.2. Tool Chain Version Used In This Release | 2 |
| 1.3. Limitations | 2 |
| 2. Components | 3 |
| 2.1. U-Boot | 3 |
| 2.2. Baseport | 3 |
| 2.3. Audio Driver | 3 |
| 2.4. NAND Driver | 4 |
| 2.5. USB Driver | 4 |
| 2.6. V4L2 and FBDEV Display Driver | 6 |
| 2.7. Capture Driver | 8 |
| 2.8. Ethernet Driver | 9 |
| 2.9. MMC/SD Driver | 10 |
| 2.10. Power Management | 10 |
| 2.11. Root Filesystem | 11 |
| 3. Fixed in this release | 12 |
| 3.1. USB | 12 |
| 4. Summary of changes | 13 |
| 5. Reporting Issues | 14 |

Release Notes

This release notes provides important information that will assist you in using the 3517 EVM Linux PSP. This document contains product information and known issues that are specific to the Linux PSP for the 3517 EVM.

The PSP Package serves to provide a fundamental software platform for development, deployment and execution. This abstracts the functionality provided by the hardware. The product forms the basis for all application development on this platform.



Important

This release is based on open source Linux Kernel Version 2.6.31-rc7. It has been tested on the 3517(beta) EVM.



Note

This release package includes a series of patches on top of the "pm" branch maintained at "<http://git.kernel.org/?p=linux/kernel/git/tmlind/linux-omap-2.6.git;a=shortlog;h=pm>". Baseline: [Commit:ef25c2a0e0]: OMAP3: PM: defconfig: enable SRF by default. History on this branch gets rewritten with subsequent merges.

The release notes contain following sections:

- General Information
 - Related Documentation
 - Tool Chain Version used in this release
 - Limitations
- Driver Information
- Reporting Issues

1. General Information

The release package includes the following deliverables:

- Boot loader (U-Boot) sources
- Pre-built binary of U-Boot (u-boot.bin)
- Linux Kernel Sources (based on v2.6.31-rc7)
- Pre-built Linux kernel image (uImage)
- Sample applications that illustrate usage of audio/video drivers.
- Pre-built RAM disk image containing root file system (built using OpenEmbedded/Angstrom Distribution)
- Pre-built NFS mountable root file system (built using OpenEmbedded/Angstrom Distribution)

1.1. Related Documentation

In addition to these release notes, the release package includes the following documentation:

- User Guide
- Data Sheet

1.2. Tool Chain Version Used In This Release

- Code Sourcery arm-2009q1

1.3. Limitations

2. Components

2.1. U-Boot

This section provides an overview of the U-Boot driver.

The u-boot sources are based on the open source implementation from mainline U-Boot. (commit id: e60beb13cf0... tag: v2009.03)

The tree can be accessed at

denx-u-boot.git [<http://git.denx.de/cgi-bin/gitweb.cgi?p=u-boot.git;a=summary>]

2.1.1. Features

1. Supports boot from Micron NAND, MMC.
2. Supports read, write and erase operations on Micron NAND.
3. Supports 256MB of DDR RAM.
4. Supports bad block management on Micron NAND.
5. Supports TFTP protocol to fetch binary images.

2.1.2. Known Issues and Limitations

2.2. Baseport

2.2.1. Features

1. Based on 2.6.31-rc7 kernel (commit:ef25c2a0...) from the linux-omap git(pm branch). The GIT can be accessed at linux-omap GIT. [<http://git.kernel.org/?p=linux/kernel/git/tmlind/linux-omap-2.6.git;a=shortlog;h=pm>]

2.2.2. Known Issues and Limitations

2.3. Audio Driver

2.3.1. Features

1. Supports AIC23 audio codec under ALSA SoC framework.
2. Supports audio in both mono and stereo modes.
3. Supports multiple sample rates (8KHz, 16KHz, 22.05KHz, 32KHz, 44.1KHz, 48KHz, 64KHz, 88.2KHz and 96KHz) for both playback and capture.

4. Supports simultaneous playback and record (full-duplex mode).
5. Supports start, stop, pause and resume feature.
6. Supports mixer interface for AIC23 audio codec.

2.3.2. Known Issues and Limitations

1. SDOCM00062646: Artifacts are present in Audio AIC23 capture for 48 KHz sampling rate.

2.4. NAND Driver

This sections provides an overview of the NAND driver.

2.4.1. Features

1. Supports JFFS2 file system.
2. Out of total 512MB, NAND has been divided into 5 partitions listed below:
 - a. 512 KB Read only partition for X-Loader.
 - b. 1792 KB Read-only partition for u-boot
 - c. 256 KB Read-only partition for environment variables.
 - d. 5 MB Read/Write partition for Linux.
 - e. Remaining space is used for file system and others (Read/Write).

2.4.2. Known Issues and Limitations

1. NAND mount operation, read and write operations are slow on a filled flash.
2. NAND driver cannot be built as a module

2.5. USB Driver

This section provides an overview of the USB driver.

2.5.1. Features

2.5.1.1. MUSB OTG : Slave mode

1. Supports data transfer in DMA and interrupt mode.
2. File backed storage driver with SD media as the storage medium.

3. CDC/RNDIS gadget.

2.5.1.2. MUSB OTG : Host Mode (MSC, HID, Audio, Video)

1. USB Host works fine in DMA and Interrupt mode
2. USB mouse and USB keyboard functionality.
3. USB MSC functionality.
4. USB Audio, Video has been tested with aplay and mplayer.

2.5.1. MUSB OTG : OTG Mode (HNP, SRP)

1. Device to Host role switching (HNP).
2. Request A-device for enabling Vbus (SRP).

2.5.2. EHCI Host: (MSC, HID, Audio, Video)

1. USB mouse and USB keyboard functionality via a high speed hub.
2. High speed USB MSC functionality.
3. USB Audio, Video has been tested with aplay and mplayer.

2.5.2. MUSB OTG: Known Issues and Limitations

1. Vbus is switched off when devices are not connected so if attached device is not detected then please restart the session using below command.

```
$ echo "F" > /proc/driver/musb_hdrc
```

2. Image flickering has been observed for 640*480 size image capture from Creative USB camera which uses high bandwidth isochronous transfer and with Logitech camera 640*480 image capture fails. When audio is played in parallel to 640*480 size capture on Creative camera then audio quality is affected.
3. USB audio/video stress failure observed when both audio and video are run in parallel for one full day.
4. Ping failure is observed in RNDIS driver when ping of 64K size is performed from EVM to Windows XP. This is known limitation with Windows XP.
5. NFS retry message is observed when CDC/RNDIS module is inserted after bootup.
6. Mplayer application exits when USB camera streaming is performed for image size 320X240 and above. This is observed with EHCI port also.

7. MUSB blocks the system to enter into memory suspend state.
8. File-storage gadget enumeration fails with Linux-2.4 host machine.
9. Write from XP to target is slow due to debug messages on console.

2.5.3. EHCI: Known Issues and Limitations

1. Only high speed devices can be connected directly to EHCI port. All low/full speed devices can be connected via a high speed hub to EHCI port.
2. EHCI driver doesn't leverage the power saving features supported by the silicon as it doesn't enable/disable ushohost clocks effectively while doing data transfer.
3. Compilation warning have been observed for some functions.
4. ECHI ports becomes unusable when a full speed device is connected and disconnected.

2.6. V4L2 and FBDEV Display Driver

This sections lists the features, limitations and issues in the V4L2 display driver and FBDEV display driver. V4L2 display driver controls both video pipelines of the DSS and FBDEV driver controls graphics pipeline of DSS.

This release is based on the DSS2 library and basic Frame buffer driver submitted by Tomi to the open source community which includes all the development activities, bug fixes like, rotation, wait_for_vsync, etc...

V4L2 driver is built on top of Tomi's DSS2 library.

Link to Tomi's Repository -
[git://gitorious.org/linux-omap-dss2/linux.git](https://gitorious.org/linux-omap-dss2/linux.git)

2.6.1. Features

Supported Pixel formats - Video plane: YUV, UYVU, RGB565, RGB24P and RGB24 unpacked and ARGB on Video2, GFX plane: RGB565, RGB24P, RGB24, RGB32, ARGB and RGBA

1. Video pipelines controlled through V4L2 user interface. Graphic pipeline controlled through FBDEV user interface.
2. Supports LCD display interface at WQVGA resolution (480*272)
3. Supports TV display interface at NTSC and PAL resolutions (Only S-Video out is supported)
4. Configuration of parameters such as height and width of display screen, bits-per-pixel etc.

5. Supports setting up of OSD window destinations (TV or LCD) through sysfs on FBDEV interface while compile time option for V4L2 interface for video window.
6. Supports driver allocated (mmaped) and user, memory buffer in V4L2 and only driver allocated buffers in FBDEV.
7. Supports rotation - 0, 90, 180 and 270 degrees.
8. Supports DVI interface with configurable through SYSFS or boot argument.
9. Scaling is supported from 1/2X to 8X on video pipelines. Hardware supports scaling from 1/4x to 8x.
10. Wait for Vsync and Panning supported with FBDEV.
11. Alpha blending supported on video and graphics planes.
12. Source and destination color keying is supported through v4L2 ioctls.

2.6.2. Known limitations and features not supported

1. Sync Lost is observed when incorrect parameters are programmed on video and graphics pipeline.
2. For RGB888 rotation is not supported because of hardware limitation.
3. PAL resolution can be set maximum to 720 X 574 instead of 720 X 576 because of hardware limitation. It is mentioned in hardware errata.
4. Upscaling and downscaling with images more that 720X574 resolution is not supported because of dss functional clock frequency limitation.
5. Linking feature not supported on video pipelines.
6. Dynamic configuration of modes in TV not supported.
7. Pixel clock for display is not coming exactly what is required. So frame rate will not be exact 60Fps but it will be very near to it. Since the pixel clock is not coming exact driver will throw some warning messages. But that can be ignored.

2.6.3. Known issues

1. SDOCM00053357: Flicker and color corruption observed on TV display
2. SDOCM00053359: Sharpness is reduced when image is up-scaled.

3. SDOCM00053361: Directing any of the pipeline to TV cuts image on top left corner by few pixels.
4. SDOCM00053362: Frame rate may fall below 60Hz when rotation enabled for V4L2 driver under heavy system load.
5. SDOCM00053364: down scaling is not supported beyond 1/2x.
6. SDOCM00056810/SDOCM00062554: Video V4L2: V4L2 driver does not support modular build.
7. SDOCM00062720: DVI out is not working.
8. SDOCM00062721: Kconfig option for selection between PAL & NTSC is not USED
9. SDOCM00059300: Suspend/Resume is not supported when any of output is on TV (VENC).

This is mainly due to the hardware issue, VENC doesn't work properly after multiple enable/disable cycles.

2.7. Capture Driver

This section provides overview of the V4L2 Capture driver for AM3517.

This release is based on the Community based DM6446 CCDC and Master Camera driver.

2.7.1. Features

1. Supports AM3517 Camera driver and TVP5146 decoder driver modules (built-in and as kernel modules)
2. Supports one software channel of capture and a corresponding device node (/dev/video0) is created.
3. Supports single I/O instance and multiple control instances.
4. Supports both memory map and user pointers buffer access mechanism.
5. Supports dynamic switching of input interfaces with some necessary restrictions wherever applicable.
6. Supports NTSC and PAL standards on Composite and S-Video interfaces.
7. Supports 10-bit BT.656 capture in UYVY and YUYV interleaved formats.
8. Supports standard V4L2 IOCTLs to get/set various control parameters like brightness, contrast, saturation, hue and auto gain control.

2.7.2. Known Constraints and Limitations

1. Dynamic switching of resolution and dynamic switching of interfaces is not supported when streaming is on.
2. Driver buffer addresses and pitch must be aligned to 32 byte boundary.
3. Cropping and scaling operations and their corresponding V4L2 IOCTLs are not supported.
4. Driver doesn't supports IO memory.

2.7.3. Known Issues

1. SDOCM00055260: In loopback sample application, the video displayed on the LCD has interlacing artifacts when viewing fast moving objects. This is because the input video is in interlaced mode @ 30 FPS while the LCD works in progressive mode @ 60 FPS. The frame rate conversion and de-interlacing is not done in the current sample application.
2. SDOCM00062613: control IOCTL's are not supported.
3. SDOCM00062553: Driver is receiving multiple fields from CCDC, due to this frames appears to stuck on LCD.
4. SDOCM00062554: Modular build is not supported.
5. SDOCM00062552: Capture is giving Greenish output.
6. SDOCM00062555: Sometimes drivers fails to detect TVP5146 decoder.
7. SDOCM00062722: saMmapLoopback.c - Kernel is able to allocate only 2 Mmap buffers and application is by default requesting for 3, which causes it to be failed.

2.8. Ethernet Driver

2.8.1. Features

1. Supports operations at 10/100 Mbps.
2. Support for multicast and broadcast frames.
3. Support for auto-negotiation
4. Supports Promiscuous mode of operation
5. Supports full duplex and half duplex mode of operation

2.8.2. Known Issues and Limitations

1. Ethernet driver is validated as kernel built-in only
2. MAC address programmed in u-boot is not retained across kernel boot. The MAC address needs to explicitly passed through bootargs failing which a random MAC address is auto-generated.
3. Low performance numbers observed with iperf utility(for low tcp window size)
4. Ethernet driver statistics are not updated for error packet count

2.9. MMC/SD Driver

This sections provides an overview of the MMC/SD driver.

2.9.1. Features

1. Supports MMC and SD memory cards
2. Supports 1-bit and 4-bit modes.
3. Supports high-speed and high-capacity SD cards.

2.9.2. Known Issues and Limitations

1. SDIO functionality is not supported
2. Interop Issues: Some MMC cards report compliance to MMC 4.x Specs though they can run at max.clock rate of 20MHz(notably Transcend cards)- the driver fails with such faulty cards.
3. MMC 8-bit mode has not been validated. Hence some MMC 8-bit card may not be enumerated.
4. MMC/SD cards cannot be removed while mount operation is in progress. If the card is removed, data integrity cannot be guaranteed.

2.10. Power Management

2.10.1. Features

This is the list of features supported in this release:

1. Linux Voltage Regulator Framework supporting following PMIC's
 1. TPS65023
 2. TPS65073

2. Custom I2C read/write API's to access TPS65073 device registers.

**Note**

The look and feel of the custom API's might change in future releases when TPS65073 driver adopts MFD (Multi Function Driver) framework.

2.10.2. Known Issues and Limitations:

1. Software support for TPS65073 is validated only on OMAP3530 EVM as hardware support on AM3517 EVM is not available yet.
2. Suspend/Resume functionality can be demonstrated only with omap3517_pm_defconfig. Wakeup is only by UART and internal timer (GPT1) activity.

2.11. Root Filesystem

This sections provides an overview of the Root Filesystem.

The root filesystem binaries are built using Arago(based on OpenEmbedded)

2.11.1. Features

1. Includes ramdisk image
2. Includes NFS mountable filesystem
3. Supports for udev for initial population and dynamic updates to device nodes.

2.11.2. Known Issues and Limitations

1. Init scripts always start up the DHCP client. This can interfere if your IP address is statically assigned(through bootargs)

3. Fixed in this release

3.1. USB

| | |
|---------------|--|
| SDOCM00060322 | MUSB: PIO mode build fails |
| SDOCM00060328 | MUSB: Kernel crash when DMA enabled module is inserted/removed in a loop |

4. Summary of changes

Since this is the first AM3517 release, this section is empty.

5. Reporting Issues

To report issues in this release, send an email to software support [mailto:softwaresupport@ti.com] describing the issue.