

i.MX 6SoloLite EVK Linux Release Notes

Contents

1 Release Contents

This document contains important information about the package contents, supported features, and known issues/limitations.

Additionally, the following sections contain release contents and license information.

Supported HW SoC/Board

- i.MX 6SoloLite EVK

1.1 Contents

This release consists of the following package files:

- L3.10.17_1.0.0_20140404_Yocto_release.tar.gz
- L3.10.17_1.0.0_20140404_images_MX6SL.tar.gz
- L3.10.17_1.0.0_20140404_docs.tar.gz

The release version is named as
"L<Kernel_version>_<x.y.z>_<yymmdd>."

"<Kernel_version>": BSP Kernel version. (For example, "L3.10.17" indicates that this BSP release is based on the kernel version 3.10.17.)

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Release Contents

"<x.y.z>": Semantic versioning specification, where X is the major version, Y is the minor version and Z is the patch version.

"<yymmdd>": Release candidate build date.

This is the first minor release for i.MX 6SoloLite after GA.

Tables below list the contents included in each package:

Table 1. Release Metadata

Package	Version	Boards Supported
Linux Kernel	3.10.17	EVK Board
U-Boot	2013.04	EVK Board

Table 2. L3.10.17_1.0.0_20140404_images_MX6SL.tar.gz Content

File	Description
ulmage_imx_v7_defconfig	Binary kernel image for Linux 3.10.17 kernel.
zImage	
ulmage-imx6sl-evk.dtb ulmage-imx6sl-evk-csi.dtb ulmage-imx6sl-evk-ldo.dtb	Device Tree files.
fsl-image-weston-imx6slevk.ext3 fsl-image-dfb-imx6slevk.ext3 fsl-image-fb-imx6slevk.ext3	Yocto rootfs image with ext3 format.
fsl-image-x11-imx6slevk.sdcard	Yocto imx6slevk.

Table 3. L3.10.17_1.0.0_20140404_yocto.tar.gz Content

File	Description
EULA	Freescale End User License Agreement
Freescale_Yocto_Project_Users_Guide.pdf	Freescale Yocto Project User's Guide

Table 4. L3.10.17_1.0.0_20140404_docs.tar.gz Content

File	Description
EULA	Freescale End User License Agreement
doc/mx6	i.MX 6 Linux BSP Release Notes, User's Guide, and Reference Manual

1.2 License

All source code files of the Board Support Package (BSP) are either GNU General Public License (GPL), GNU Lesser General Public License (LGPL), or another open source license.

The following binary files contained in the included root file systems are built from proprietary source not included in the BSP:

Files in package `gpu-viv-bin-mx6q-L3.10.17_1.0.0-hfp.bin`

2 System Requirements

The following subsections introduce the system requirements.

2.1 Linux Host Server

For more information, please see *Freescale Yocto User Guide*

2.2 EVK Board Components

Table below lists the hardware items contained in the EVK Board package. Read EVK Board Hardware User Guide before using it.

Table 5. Kit Components

Item	Description
Boards	i.MX 6SoloLite EVK
Cables	To connect the Debug port to a host computer, use a micro-B USB cable and connect J26 to the host computer. Drivers for the FTDI chip can be found at: http://www.ftdichip.com/Drivers/VCP.htm USB type A/M to MicroUSB type B/M shielded cable. Ethernet straight cable.
Power Supply	Dedicated power supply box.

3 What's New?

This section describes the changes in this release including new features and defect fixes.

3.1 New Features

See `ResolvedEnhancements.html` for the complete list of new features and enhancements since the last release.

A summary of the main new features is as follows:

- Released based on the Yocto project
- media: supports the runtime PM for busfreq for elcdif/epdc/pxp
- U-Boot: supports the DPDC splash screen
- MfgTooL: supports i.MX 6SoloLite-EVK
- HWRNG: supports the HWRNG driver with device tree

3.2 Supported Power Management Features

- CPUIdle framework support with two working levels: purely WFI and WFI with wait mode enabled.
- CPUFreq driver support: CPU frequency adjusted based on the CPU loading, Interactive governor
- CPU/GPU frequency throttle
- GPU dynamic power management
- Low power mode support: standby and dormant(mem) mode
- LDO bypass
- Thermal temperature support

3.3 Defect Fixes

See the log of each git repo by using the command git log, for the list of the defects fixed in this release. Only hot fixes are listed here.

- ARM: 7669/1: keeps _my_cpu_offset consistent with the generic one
- ARM: 7957/1: adds DSB after the icache flushes in __flush_icache_all()
- ENGR00293898 PXP: sets the pxp_dispatch kernel thread to be freezable to avoid hang-up
- ENGR00294115 PXP: corrects the pxp_dispatch thread exit logic
- ENGR00294114 PXP: corrects the PS U/V buffer settings when the format is YVU420P

4 BSP Supported Features for i.MX 6SoloLite EVK

Table below describes the features that are supported in this BSP release.

Table 6. Supported Features for i.MX 6SoloLite EVK

Feature	Supported	Comments
Kernel		
Kernel	Yes	Kernel version: 3.10.17
File System	Yes	EXT2/EXT3/EXT4 are used as the file system in MMC/SD card.
Bootloader		
U-Boot	Yes	<ul style="list-style-type: none"> • U-Boot delivery is based on U-Boot version v2013.04. • Supports LPDDR2 400MHz@32bit, ENET, UART, MMC/SD, eMMC4.3/4.4, SPI-NOR, Clock, Anapop regulator, boot using L2Cache as OCRAM, and secure boot.
Machine Specific Layer		
ARM Core	Yes	Supports Cortex-A9. Supports reboot and power-off.
Memory	Yes	1 GB memory is used.
Interrupt	Yes	GIC
Clock	Yes	Controls system frequency and clock tree distribution.
Timer (GPT)	Yes	System timer tick support.
GPIO/EDIO	Yes	GPIO is initialized in earlier phase according to hardware design.
IOMUX	Yes	Provides the interfaces for I/O configuration. IOMUX-V3 version is used.

Table continues on the next page...

Table 6. Supported Features for i.MX 6SoloLite EVK (continued)

DMA Engine		
SDMA	Yes	Conforms to DMA engine framework.
Character Device Drivers		
MXC UART	Yes	Console support via internal Debug UART.
Graphic Drivers		
CSI	Yes	Support CSI Camera (ov5640)
HDMI	Yes	Support external HDMI (sii902x)
WVGA panel	Yes	Supports SEIKO WVGA panel.
EPDC	Yes	<p>Enable EPDC:</p> <ul style="list-style-type: none"> - Support for RGB565 frame buffer format. - Support for Y8 frame buffer format. - Support for full and partial EPD screen updates. - Support for up to 256 panel-specific waveform modes. - Support for automatic optimal waveform selection for a given update. - Support for synchronization by waiting for a specific update request to complete. - Support for screen updates from an alternate (overlay) buffer. - Support for automated collision handling. - Support for 64 simultaneous update regions. - Support for pixel inversion in a Y8 frame buffer format. - Support for posterization of the update contents (driving all pixels to either solid black or white). - Supports use of a color map to remap Y8 frame buffer contents. - Support for 90, 180, and 270 degree HW-accelerated frame buffer rotation. - Support for panning (y-direction only). - Support for three EPDC driver display update schemes: Snapshot, Queue, and Queue and Merge. - Support for user control of the delay between completing all updates and powering down the EPDC. - Support for dithering.
GPU	Yes	GC355, GC320
Multimedia Drivers		
PxP	Yes	Conforms to DMA engine framework.
Power Management Drivers		
Anatop Regulator	Yes	Supports Anatop regulator management.
Lower Power mode	Yes	Supports standby mode (map to SoC stop mode). Supports mem mode (map to SoC DSM mode).
CPUIdle	Yes	2 levels cpu idle supported: purely WFI and WFI with wait mode enabled.
CPUFreq	Yes	CPUFreq can be used for CPU frequency adjustment. The userspace, performance, conservative, and powersave governors are supported and conservative governor is enabled by default.
BusFreq	Yes	Supports the system bus clock frequency scaling.

Table continues on the next page...

Table 6. Supported Features for i.MX 6SoloLite EVK (continued)

Battery charging	Yes	Done by hardware. No software intervention.
Sound Drivers		
WM8962/SSI	Yes	Supports playback.
Input Device Drivers		
Touch panel	Yes	Supports E Ink touch screen on DC2/DC3 add-on card.
Keypad	No	Supports 4x4 keypads on DC2/DC3 add-on card.
USB devices	Yes	Supports USB mouse and USB keypad via USB ports.
MTD driver		
SPI-NOR	Yes	Supports M25P32 SPI-NOR flash.
Networking Drivers		
ENET	Yes	
USB Drivers		
USB	Yes	<ul style="list-style-type: none"> - Supports USB OTG2.0 port. - USB Host mode: MSC, HID, UVC, USB audio. - USB device mode: MSC, Ethernet, Serial. - USB OTG pin detect.
Security Drivers		
Security drivers DCP/RNGB	No	
General drivers		
uSDHC	Yes	<ul style="list-style-type: none"> - Supports SDHC2, SDHC3 - SD2.0/SD3.0 - SDIO3.0 - eMMC 1bit/4bit/8bit SDR/DDR mode - SDXC - eMMC4.5
WatchDog	Yes	Supports Watchdog reset.
I2C	Yes	Supports I2C master.
SPI	Yes	Supports SPI master mode.
PWM	Yes	Supports the backlight driver via PWM.
Temperature monitor	Yes	Requires chip calibration data.
Accelerometer	Yes	Supports MMA8450 sensor driver.
Wi-Fi	Yes	Supports AR6003 Wi-Fi.
Bluetooth	No	

5 Kernel Boot Parameters

Depending on the booting/usage scenario, you may need different kernel boot parameters.

Table below describes the different boot parameters.

Table 7. Kernel Boot Parameters

Kernel Parameters	Description	Typical Values	Used When
console	Where to output kernel logging by printk.	console=ttymxc0,115200	All cases
ip	Tell kernel how or whether to get IP address.	ip=none ip=dhcp ip=static_ip_address	"ip=dhcp" or "ip=static_ip_address" is mandatory in "boot from TFTP/NFS."
nfsroot	The location of the NFS server/directory.	nfsroot=<ip_address>:<rootfs path>	Used in "boot from tftp/NFS" together with "root=/dev/nfs."
root	The location of the root file system.	root=/dev/nfs or root=/dev/mmcbk0p2	Used in "boot from tftp/NFS" (that is, root=/dev/nfs); Used in "boot from SD" (that is, root=/dev/mmcbk0p2).
rootfstype	Indicates the file system type of the root file system.	rootfstype=ext4	Used in "boot from SD" together with "root=/dev/mmcbk1p2."
rootwait	Wait (indefinitely) for root device to show up.	rootwait	Used when mounting SD root file system.
mem	Tell kernel how much memory can be used.	None or mem=864M	Note: MemTotal-<mem> - <gpu_memory> is reserved.
max17135	Configure Maxim17135 EPD PMIC pass number and VCOM voltage.	max17135:pass=[pass_num],vcom=[vcom_uV]	Used when enabling EPDC. pass_num should equal 2 for all IMXEBOOKDC2 cards. vcom_uV, in microvolts, should be equal to the value printed on the cable connector that is attached the E Ink panel being used.
video	Tells EPDC FB driver which E Ink panel is in use and what bpp should be used for the Frame Buffer.	video=mxcepdcfb:E060SCM,bpp=16	Used when enabling EPDC to select the correct E Ink panel parameters to use. bpp=16 selects RGB565 FB pix format bpp=8 selects Y8 FB pixel format
video	Tells ELCDIF FB driver which LCD panel is in use and which bpp should be used for the Frame Buffer.	video=mx_elcdif_fb:SEIKO-WVGA,bpp=16	Used when enabling LCDIF to select the correct panel parameters to use. bpp=16 selects RGB565 FB pix format Note: if only use EPDC FB, then turn off ELCDIF FB by "video=mx_elcdif_fb:off"
fec.macaddr	Tells the Ethernet Mac address.	fec.macaddr=0x00,0x04,0x9f,0x01,0x30,0x05	Changes the MAC address.

6 Known Issues/Limitations for i.MX 6SoloLite EVK

Read through all hardware related reference material and ensure the necessary hardware modifications have been made before using the software.

Table below lists some key known issues.

Table 8. Known Issues and Workarounds for i.MX 6SoloLite EVK

Feature	Category	Description	Resolution/Workaround
EPDC	Software	Enabling E-Ink Auto-update mode (Device Drivers > Graphics Support > E-Ink Auto-update Mode Support) causes E Ink panel updates to be distorted and flaky.	Disable the E-Ink Auto-update Mode feature in the menuconfig.
Thermal	Hardware	Temperature Monitor should only be enabled for chips that have undergone proper thermal sensor calibration.	Ensure proper temperature calibration before using the temperature monitor.
GPU	Software	Driver recovery mechanism may not work properly sometimes.	No.
System	Hardware	Reboot may not work on EVK board.	Reboot function should be always okay if the hardware can trigger PMIC reset(which ensures RESET key and watchdog reset can control PMIC_ON_REQ pin).
CSI/EPDC	Hardware	Cannot be used simultaneously since these two modules share the same pins on the EVK board.	The board file in BSP will configure these pins for proper function via DTS. Use imx6sl-evk.dts for EPDC, and imx6sl-evk-csi.dts for CSI.
X-Acceleration	Hardware/ Software	meet out of memory during x11perf test.	It's a system limitation since the x11perf needs a lot of memory. No work-around on the EVK board (only with LPDDR2 memory of 512MB). Users may use a larger memory to work-around this issue.
Mfgtool2	Software	Mfgtool2 may fail to execute "frf" command if there is no "send" or "pipe" command executed prior to it.	Remove this "frf" command from ucl2.xml can fix this issue.
FUSE for RTC	Hardware	SEC_CONFIG[0] fuse bit is not burned which leads the RTC not to be functional.	In U-Boot prompt, run the command "imxotp blow --force 4 0x2".
GPU2D	Software	The filter blt operation may cause 2D core hang and recovery in certain conditions. "GPU[1] hang, automatic recovery" is displayed.	Eliminate filter blt operation for GPU2D can workaround this issue.
GPU2D	Hardware/ Software	GPU2D may cause system lock-up in very rare conditions.	Disable the 2D acceleration. This issue is from the theory analysis, never be duplicated in any Linux tests.
MMC	Software	Hynix eMMC: times out when Yocto rootfs automatically mounts the RPMB partition.	Rootfs should not automatically mounts RPMB partition which is a secure partition.
SDIO3.0	Software	No available device to do the SDIO 3.0 test.	-

Table continues on the next page...

Table 8. Known Issues and Workarounds for i.MX 6SoloLite EVK (continued)

HDMI	Software	ENGR00298771, MX6SL EVK: on some special resolutions, such as 1400x1050, The Yocto GUI display on HDMI would be distorted. It is caused by xrandr and would expand the frame buffer size to 1408x1050 to align with 16 bytes. However, imx6SL elcdif does not support stride buffer and cannot crop 1400x1050 from the buffer 1408x1050, and then causes distortion.	No. Only found on 1400x1050 mode until now.
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