

i.MX50 ARM2 10.09.00 Linux

Release Notes

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

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1 Release Contents

1.1 Contents

This release consists of 4 package files: L2.6.31_10.09.00_ER_images_MX5X.tar.gz, L2.6.31_10.09.00_ER_source.tar.gz, L2.6.31_10.09.00_ER_docs.tar.gz and Mfgtools-Rel-10.09.00_ER.tar.gz.

Release version is named as “L<Kernel_version>_<yy>.<mm>.<ij>”.

- <Kernel_version>: BSP Kernel version. “L2.6.31” indicates this BSP release is based on kernel version 2.6.31.
- <yy>.<mm>.<ij>”: Release time. For example, “09.12.00” indicates this BSP is released on December, 2009.

Tables 1-1 to 1-4 list the content included in each file.

Table 1-1. L2.6.31_10.09.00_ER_images_MX5X.tar.gz content

File	Description
u-boot-mx50-mddr.bin	Uboot bootloader for the i.MX50 Armadillo2 board with mDDR
u-boot-mx50-lpddr2.bin	Uboot bootloader for the i.MX50 Armadillo2 board with LPDDR2
ulmage	Binary kernel image for the Linux 2.6.31 kernel. The same image can run in i.MX50/i.MX51/i.MX53 boards. It supports MX50 mDDR/LPDDR2 board.
amd-gpu-x11-bin-mx51_10.09.00-1_armel.deb	Debian package for the GPU driver and the application for X11
atheros-wifi_10.09.00-1_armel.deb	Debian package for the Atheros WiFi AR6102 driver
firmware-imx_10.09.00-1_armel.deb	Debian package for the firmware files which includes VPU and Atheros WiFi.
imx-lib_10.09.00-1_armel.deb	Debian package for imx-lib binary
imx-test_10.09.00-1_armel.deb	Debian package for the imx unit test binary
kernel_2.6.31-imx_10.09.00_armel.deb	Debian package for the Linux kernel image, kernel modules and the header files.
libz160-bin_10.09.00-1_armel.deb	Debian package for the GPU Z160 2D driver
modeps_10.09.00-1_armel.deb	Debian package for module dependencies
xserver-xorg-video-imx_10.09.00-1_armel.deb	Debian package for the i.MX accelerated video driver
udev-fsl-rules_10.09.00-5_armel.deb	Debian package for udev rules

Table 1-2. L2.6.31_10.09.00_ER_source.tar.gz content

File	Description
EULA	Freescall End User License Agreement
install	Install script for LTIB
ltib.tar.gz	LTIB (Linux Target Image Builder)

File	Description
package_manifest.txt	Freescale LTIB open source packages
pkgs	Source and patches for the root file system
pkgs/ imx-test-10.09.00.tar.gz	Source code for the unit tests
pkgs/ imx-lib-10.09.00.tar.gz	Source code for the libraries
pkgs/ linux-2.6.31-imx_10.09.00.bz2	Freescale 2.6.31-10.09.00 kernel patches
pkgs/ u-boot-v2009.08-imx_10.09.00.tar.bz2	i.MX U-Boot patches based on U-Boot version 200908
pkgs/firmware-imx-10.09.00.tar.gz	i.MX firmware packages
pkgs/atheros-wifi-10.09.00.tar.gz	Source code of the Atheros WiFi AR6102 drivers
pkgs/ xserver-xorg-video-imx-10.09.00.tar.gz	Source code of the i.MX accelerated video driver
pkgs/tc-fsl-x86lnx-armeabi-nptl-4.1.2-3.i386.rpm	FSL Open source optimized toolchain gcc 4.1.2 for ARM9 and ARM11 which is used for i.MX profiles by default.
pkgs/gcc-4.3.3-glibc-2.8-cs2009q1-203-1.i386.rpm	Codesourcery toolchain gcc 4.3.3.
tftp.zip	A Windows TFTP server program

Table 1-3. L2.6.31_10.09.00_ER_docs.tar.gz content

File	Description
EULA	Freescale End User License Agreement
readme.html	Readme file containing links to additional documentation
doc/mx5	i.MX50 Linux BSP Release Notes, User's Guide.

Table 1-4. Mfgtools-Rel-10.09.00_ER.tar.gz content

File	Description
Drivers	Host drivers
Profiles	Profiles for each platforms
Document	User manual for tool developers
Manufacturing Tool Quick Start Manual.doc	Quick start manual for tool users
MfgTool.exe	Executable file

1.2 License

All Board Support Package (BSP) source-code files are GNU General Public License (GPL) or 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 libz160-bin-10.09.00.tar.gz
- Files in package amd-gpu-bin-mx51-10.09.00.tar.gz

2 System Requirements

2.1 Linux Host server

To build with LTIB or to program images to an MMC/SD card it is necessary to setup a Ubuntu 9.04 Linux host server as detailed in [ltib_build_host_setup.pdf](#).

2.2 i.MX50 ARM2 Components

Table 2-1 lists the hardware items contained in the i.MX50 ARM2 package.

Table 2-1 Kit Components

Item	Description
Boards	i. i.MX50 Main Board (mDDR and LPDDR2) ii. Common ARM2 Base Board
Display	i. CLAA WVGA panel ii. 6" E-Ink panel iii. 9" E-Ink panel
Cables	DB9 M/F RS-232 serial cable USB type A/M to MicroUSB type B/M, shielded cable Ethernet straight cable
Data storage	4GB SD cards or above
Power Supply	100/240 VAC – 5 VDC, 3.8A, with AC adaptors
WiFi daughter card	Optional. WiFi SDIO daughter card for AR6102 or AR6003

3 What's New

The 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:

- Added Security (DCP and RNGB) support
- Added EPDC framebuffer driver support of 9.7" E-Ink display panel
- Added EPD Power Management IOCTL
- Added AHB-to-APBH Bridge with DMA support
- Added GPMI-RAW-NAND mach support
- Added LP-APM support
- Added DVFS-CORE support
- Added demo of X-Accel working with EPDC
- Added V4L2 output driver
- Added OCOTP driver
- Added GPMI Nand and APBH DMA support in U-Boot

3.1.1 Supported Power Management Features

- DVFS-CORE and CPU-FREQ : ARM core frequency is scaled between 160MHz (@0.85V) and 800MHz (@1.05V).
- STOP Mode – All PLLs are OFF. PMIC_STBY pin is asserted. Core voltage is dropped to 0.85V and Vcc voltage is dropped to 0.95V. VDDA is dropped to 0.95V. A few regulators are turned off (VGEN1, VPLL, VCAM, VVIDEO, VAUDIO, VSD). Wakeup from USB, rtc and power button (If added by customer) is supported.
- LPAPM mode (aka Idle mode) : The entire LP domain frequency is dropped to 24MHz (AHB, AXI_A and AXI_B). DDR is left at 266MHz since there was instability is switching it between 24Mhz and 266MHz. Voltage of the LP domain is also left at 1.25V. All PLLs except PLL1 are disabled.
- Automatic Low Power Mode on DDR: The Denali Databahn controller is setup to automatically enter Low Power Mode 4. This allows the DDR to enter into self-refresh after some cycles of inactivity.
- Enhanced Clock Management : Fixed clock dependencies and added clock management for SYS_CLK and DDR_CLK.

3.2 Defect Fixes

See [ResolvedDefects.html](#), referenced inside the file `readme.html`, for the list of the defects fixed in this release.

4 BSP Supported Features

Table 4-1 describes the features that are supported in this BSP release.

Table 4-1 Supported features

Feature	Supported?	Comments
Kernel		
Kernel	Yes	Kernel version: 2.6.31
File System	Yes	EXT2/EXT3/EXT4 are used as the file system in MMC/SD
Bootloader		
U-Boot	Yes	U-Boot delivery is based on U-Boot version 200908. Supports SPI NOR and MMC/SD slot1, slot2, slot3 boot. (slot2, slot3 need board rework) Supports FEC and console output. Supports MMC4.4
Machine Specific Layer		
ARM Core	Yes	Supports Cortex-A8 (800MHz)
Memory	Yes	
Interrupt	Yes	
Clock	Yes	Control system frequency, clock tree distribution
Timer (GPT)	Yes	System timer tick support
GPIO/EDIO	Yes	GPIO is initialized in earlier phase according to hardware design Note that all GPIO activate/deactivate functions used in the drivers are dummies (see the MSL code for the details)
IOMUX	Yes	Provides the interfaces for IO configuration
SPBA	No	
SDMA	Yes	
Character Device Drivers		
MXC UART	Yes	Console support via internal UART1, UART2/UART3
Graphic Drivers		
Frame Buffer Driver	Yes	MXC Frame buffer driver for both EDP and ELCDIF
ePXP	Yes	Support RGB565->Y8 CSC, rotation, horizontal/vertical flip, etc.
DVI monitor	No	
LVDS	No	
GPU	Yes	Supports GPU 2D. No 3D support in hardware.
MultiMedia Drivers		
IPU V3 driver	No	
V4L2 Output/Capture	No	Support V4L2 output. No V4L2 capture support.
Camera	No	
TVOut	No	
TVIN	No	

Feature	Supported?	Comments
VPU	No	
Power Management Drivers		
PMIC	Yes	Supports the MC13892 2.0a PMIC via a SPI interface. Supports regulator management for voltage controls.
Lower Power mode	Yes	Supports stop mode in mem state
DVFS-Core	Yes	Supported.
DVFS-Peripheral	No	
CPUFreq	Yes	
Bus scaling	Yes	
XEC	No	
Sound Drivers		
S/PDIF	No	
ASoC (SSI/AUDMUX)	Yes	Supports the STGL5000 stereo audio codec under ASoC framework Supports audio playback and record
ESAI/ CS42888	No	
Input Device Drivers		
Keypad	No	In upcoming release
Touch panel	Yes	Supports touch panel via MC13892 ADC on WVGA panel
USB devices	Yes	Supports USB mouse and USB keypad via USB ports
MTD driver		
SPI NOR	No	In upcoming release
NAND	Yes	Supports GPMI NAND. Support raw NAND new standard (ONFI2.1) in upcoming release
SATA	No	
Networking Drivers		
FEC	Yes	Supports LAN8720A PHY
MediaLB	No	
FlexCAN	No	
USB Drivers		
USB Host	Yes	Supports USB HOST1 and USB OTG host Note that USB OTG host mode is disabled by default in the MX5 configuration
USB Device	Yes	Supports USBOTG device mode
USBOTG	Yes	Support USB Host/device switch by ID PIN detection.
Security Drivers		
Security drivers	Yes	Supports DCP and RNGB
General drivers		
SRTC	Yes	
MC13892 RTC driver	Yes	The MC13892 RTC driver is enabled by default
MMC/SD/SDIO	Yes	Supports i.MX eSDHC module with PIO and DMA modes. (PIO mode not tested.) Supports eSDHC Slot 1, Slot2, and Slot 3 on the ARM2 board. Support eMMC4.4 DDR and SDR mode.
WatchDog	Yes	Supports Watchdog reset
I2C	Yes	Supports I2C master. Supports I2C1, I2C2
SPI	Yes	Supports SPI master mode
PWM	Yes	Note pins for all PWM channels are used by other modules on designed board
USB BT dongle	Yes	Enables BLUEZ. (Not tested)
WiFi	Yes	Supports Atheros AR6102 and AR6003. AR6003 is enabled by default.

5 Kernel boot parameters

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

Kernel Parameters	Description	Typical Values	Used When
console	Where to output kernel logging by printk	console=ttymx0	All cases
ip	Tell kernel how/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" (i.e., root=/dev/nfs); Used in "boot from SD" (i.e., 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/mmcbk0p2"
rootwait	Wait (indefinitely) for root device to show up.	rootwait	Used when mounting SD rootfs

6 Known Issues/Limitations

Please read through all hardware related materials and ensure the necessary hardware reworks are done before using the software. Table 5-1 lists some key known issues.

Table 6-1 Known issues and workarounds

Features	Category	Description	Resolution/Workaround
FEC/ LCDIF Framebuffer	BSP/Hardware	Can't be used simultaneously.	Designed board shares some pins.
eMMC/SD	Hardware	Toshiba SDR 50M 8 bit and Samsung card (except DDR 50M 8 bit) be broken(write always failed but read ok).	Need board rework. Contact technical support. The init sequence of MMC card in Linux mmc stack also needs to be changed for support Samsung eMMC card, otherwise Samsung card may not work.

Features	Category	Description	Resolution/Workaround
eMMC/SD	Hardware	For DDR 50Mhz, due to HW rework will affect the signal strength, we have to regulate the delay line to make DDR 50Mhz run stably. However, for different boards or HW reworks the delay value maybe different.	Need board rework. Contact technical support. We have implemented an interface in the platform specific code of current driver to allow user to easily regulate the delay line, the delay line range can be 0 to 63. User may try different delay value and choose a stable value to use for their cards.
LPAPM	BSP	instability problem of DDR freq change from 24Mhz to 266Mhz in LPAPM	In current solution, even in LPAPM mode, DDR will remain at 266MHz. Shall be fixed in upcoming release
eMMC/SD	Hardware	Meet write CRC error when works with AHB @24Mhz and SD CLK @50Mhz	Not identified whether it's a hardware issue.
ePXP	BSP/Hardware	With CCM clock gating on/off between two frames processing, the ePXP output has one pixel mismatch.	Not identified. A workaround has provided currently that ePXP driver will automatically turn off CCM clock gating when it has no processing for specified period.
U-Boot	BSP	New feature - Added GPMI Nand and APBH DMA support in U-Boot has not been included in general package	Fixed. Released as patch. 0001-ENGR00127167-Add-gpmi-nfc-and-a-pbh-dma-support-for-m.patch; 0002-ENGR00131792-Fix-mx50-lpddr2-build-errors.patch
DVFS-Core	BSP	reboot fail when dvfs is enabled.	Fixed. Released as patch. (0001-ENGR00126814-MX5-Reboot-fails-when-dvfs-core-is-ena.patch)
USB	BSP	"restructure lower power mode and wakeup function" patch has not been included in general package	Fixed. Released as patch. 0001-ENGR00131616-1-usb-restructure-lower-power-mode-and-.patch; 0002-ENGR00131616-2-usb-restructure-lower-power-mode-and-.patch; 0003-ENGR00131616-3-usb-restructure-lower-power-mode-and-.patch

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