

# **i.MX50 RD3 11.04.01 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: `L2.6.35_11.04.01_ER_images_MX5X.tar.gz`, `L2.6.35_11.04.01_ER_source.tar.gz`, `L2.6.35_11.04.01_ER_docs.tar.gz` and `Mfgtools-Rel-11.04.01_ER.tar.gz`.

Release version is named as “L<Kernel\_version>\_<yy>.<mm>.<ij>”.

- <Kernel\_version>: BSP Kernel version. “L2.6.35” indicates this BSP release is based on kernel version 2.6.35.
- <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. L2.6.35\_11.04.01\_ER\_images\_MX50.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
u-boot-mx50-ddr2.bin	Uboot bootloader for the i.MX50 Armadillo2 board with DDR2
u-boot-mx50-rdp.bin	Uboot bootloader for the i.MX50 RDP board with LPDDR2
u-boot-mx50-rd3.bin	Uboot bootloader for the i.MX50 RD3 board with LPDDR2
rootfs.ext2.gz	rootfs package
rootfs.jffs2	rootfs binary image
ulmage	Binary kernel image for the Linux 2.6.35 kernel. The same image can run in i.MX50/i.MX51/i.MX53 boards. It supports MX50 RDP/RD3 board, and ARM2 (mDDR/LPDDR2/DDR2) board.
zImage	Another format of above binary kernel image for the Linux 2.6.35 kernel.

**Table 1-2. L2.6.35\_11.04.01\_ER\_source.tar.gz content**

File	Description
EULA	Freescale End User License Agreement
install	Install script for LTIB
ltib.tar.gz	LTIB (Linux Target Image Builder)
package_manifest.txt	Freescale LTIB open source packages
pkgs	Source and patches for the root file system
pkgs/ imx-test-11.04.01.tar.gz	Source code for the unit tests

File	Description
pkgs/ imx-lib-11.04.01.tar.gz	Source code for the libraries
pkgs/ linux-2.6.35-imx_11.04.01.bz2	Freescall 2.6.35-11.04.01 kernel patches
pkgs/ u-boot-v2009.08-imx_11.04.01.tar.bz2	i.MX U-Boot patches based on U-Boot version 200908
pkgs/firmware-imx-11.04.01.tar.gz	i.MX firmware packages
pkgs/atheros-wifi-11.04.01.tar.gz	Source code of the Atheros WiFi AR6102 drivers
pkgs/ xserver-xorg-video-imx-11.04.01.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-4.4.4-glibc-2.11.1-multilib-1.0-1.i386.rpm	FSL Open source optimized toolchain gcc 4.4.4 which enables NEON for ARM cortex-A8.
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. L2.6.35\_11.04.01\_ER\_docs.tar.gz content**

File	Description
EULA	Freescall 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-11.04.01\_ER.tar.gz content**

File	Description
Drivers	Host drivers
Profiles	Profiles for each platforms
Document	User manual for tool developers
Utils	cfimager.exe is used to flash boot images and create FAT partition on SD/MMC cards on the host PC. sb_loader.exe is used to download an image to target platform to run.
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\_11.04.01.tar.gz
- Files in package amd-gpu-bin-mx51-11.04.01.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 RD3 Components

Table 2-1 lists the hardware items contained in the i.MX50 RD3 package.

**Table 2-1 Kit Components**

Item	Description
Boards	i. i.MX50 RD3 Board (LPDDR2) ii. Add-on board with E-Ink panel and keypad
Display	i. SEIKO WVGA 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:

- ENGR00141508 Add new PMIC MC34708 driver support on RD3
- ENGR00140983 Support SII902X HDMI on MX50 RD3
- ENGR00142123 Add CLAA WVGA driver support on RD3
- ENGR00140486 Add SPI NOR M25P32 Flash on RD3
- ENGR00142581 Make SEIKO WVGA panel work on J12 on RD3

## 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
<b>Kernel</b>		
Kernel	Yes	Kernel version: 2.6.35
File System	Yes	EXT2/EXT3/EXT4 are used as the file system in MMC/SD
<b>Bootloader</b>		
U-Boot	Yes	U-Boot delivery is based on U-Boot version 200908. Supports SPI NOR and MMC/SD slot1, slot2. Supports FEC and console output. Supports MMC4.4 (Not tested on RD3 board)
<b>Machine Specific Layer</b>		
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	
<b>Character</b>		

Feature	Supported?	Comments
<b>Device Drivers</b>		
MXC UART	Yes	Console support via internal UART1, UART2/UART3
<b>Graphic Drivers</b>		
Frame Buffer Driver	Yes	MXC Frame buffer driver for both EDPC 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.
<b>MultiMedia Drivers</b>		
IPU V3 driver	No	
V4L2 Output/Capture	No	Support V4L2 output. No V4L2 capture support.
Camera	No	
TVOut	No	
TVIN	No	
VPU	No	
<b>Power Management Drivers</b>		
PMIC	Yes	Supports the MC34708 2.1 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	
<b>Sound Drivers</b>		
S/PDIF	No	
ASoC (SSI/AUDMUX)	Yes	Supports the SGTL5000 stereo audio codec under ASoC framework Supports audio playback and record
ESAI/ CS42888	No	
<b>Input Device Drivers</b>		
Keypad	Yes	Supports keypad on Add-on board
Touch panel	Yes	Supports touch panel via MC34708 ADC on WVGA panel
USB devices	Yes	Supports USB mouse and USB keypad via USB ports
<b>MTD driver</b>		
SPI NOR	Yes	
NAND	Yes	Supports GPMI NAND, ONFI NAND and Toggle NAND.
SATA	No	
<b>Networking Drivers</b>		
FEC	Yes	Supports LAN8720A PHY
MediaLB	No	
FlexCAN	No	
<b>USB Drivers</b>		
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.

Feature	Supported?	Comments
<b>Security Drivers</b>		
Security drivers	Yes	Supports DCP and RNGB
<b>General drivers</b>		
SRTC	Yes	
MC34708 RTC driver	Yes	The MC34708 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 on the RD3 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
hdmi	Enable Sii902x HDMI module	hdmi	Used when use HDMI
lcd	Indicates which LCD panel's used	lcd=1 lcd=1,j12 lcd=2	"lcd=1" when use SEIKO panel on J13 "lcd=1,j12" when use SEIKO panel on J12 "lcd=2" when use CLAA panel on J12

## 6 Known Issues/Limitations

Please read through all hardware related materials and ensure the necessary hardware reworks are done before using the software. Table 6-1 lists some key known issues.

**Table 6-1 Known issues and workarounds**

Features	Category	Description	Resolution/Workaround
FEC/ LCDIF Framebuffer	Hardware	If SEIKO WVGA panel work on J13 and FEC can't be used simultaneously.	Designed board shares some pins.  A patch is provided to make SEIKO WVGA panel work on J12 on RD3 (ENGR00142581), which has no conflict with FEC.
MMC 4.4	Hardware	Not verified on RD3 board because BGA-type card slot is not soldered.	Need board rework.
eMMC/SD	Hardware	Meet write CRC error when works with AHB @24Mhz and SD CLK @50Mhz	Not identified whether it's a hardware issue.
Keypad	Hardware	Keypad conflicts with Boot Configuration pins.	At the point that U-Boot is running but Keypad driver is not loaded yet, put all Boot Configuration pins on SW5 to ON.
Keypad	Hardware	KEY_ROW0 is used as GPIO to set PWR_EN for SEIKO WVGA. If SEIKO WVGA panel works on J12, some keys are not functional.	Designed board shares the pin. No workaround.
Battery	PMIC(Ripley 2.1)	The charging current is not very accurate, so currently we only support AUX5V charging, USB charger and dedicated charger are not supported.	Will be fixed in upcoming release if we get new version of Ripley(MC34708).
Battery	Hardware/PMI C(Ripley 2.1)	The charger would stop charging if USB OTG is connected.	Need hardware rework to let Ripley know the USB type and decide what to do, since the USB port's priority is higher than AUX5V. Will be fixed in the upcoming release once the hardware team gives out a proper rework.



Features	Category	Description	Resolution/Workaround
ADC	PMIC(Ripley 2.1)	The ADC reading of battery voltage/current may cause system reboot if we quickly switch on/off of AUX5V.	Already know the root cause, will be fixed in upcoming release once we make sure there is no side-effect with this work around.
SEIKO WVGA LCD	Software	SEIKO WVGA LCD panel can't work on J12 port. (This is a new requirement. This Panel can also work on J13.)	There's a patch provided to support this feature, named "ENGR00142581-1 MX50 RD3: Make SEIKO WVGA panel work on J12" and "ENGR00142581-2 MX50 RD3: Add PINMUX setting callback in wvga driver"
NAND Boot	Soc/Hardware	NAND boot need rework on board.	To make NAND boot works, NANDF_RB and NANDF_CS0 must be pulled up, which is configured by EIM_DA10, EIM_DA14. But these two pins have also been used for boot config (BT2_CFG2, BT2_CFG6). So if they're both been pulled up, some boot options can't be used.
MFG Tool	Software	Previous version works only on RDP board. To make it work on RD3, some adjustment is needed.	In the MFG tool, 1. overwrite Profiles\MX50 Linux Update\OS Firmware\u-boot.bin with Profiles\MX50 Linux Update\OS Firmware\u-boot-mx50-rd3.bin 2. Apply patch "ENGR00142745 MX50 RD3: Fix missing pmic config in imx5_update_defconfig", use the imx5_update_config to build the ulmage, and use it to overwrite Profiles\MX50 Linux Update\OS Firmware\ulmage

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