Freescale Semiconductor
Release Notes

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i.MX50 RDP 10.12.01 Linux

Release Notes

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

Contents

Freescale Semiconductor, Inc.

1 Release Contents

1.1 Contents

This release consists of 4 package files: `L2.6.35_10.12.01_ER_images_MX5X.tar.gz`, `L2.6.35_10.12.01_ER_source.tar.gz`, `L2.6.35_10.12.01_ER_docs.tar.gz` and `Mfgtools-Rel-10.12.01_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_10.12.01_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
rootfs.ext2.gz	rootfs package
rootfs.jffs2	rootfs binary image
uImage	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 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_10.12.01_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-10.12.01.tar.gz	Source code for the unit tests
pkgs/ imx-lib-10.12.01.tar.gz	Source code for the libraries
pkgs/ linux-2.6.35-imx_10.12.01.bz2	Freescale 2.6.35-10.12.01 kernel patches

File	Description
pkgs/ u-boot-v2009.08-imx_10.12.01.tar.bz2	i.MX U-Boot patches based on U-Boot version 200908
pkgs/firmware-imx-10.12.01.tar.gz	i.MX firmware packages
pkgs/atheros-wifi-10.12.01.tar.gz	Source code of the Atheros WiFi AR6102 drivers
pkgs/ xserver-xorg-video-imx-10.12.01.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_10.12.01_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-10.12.01_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-10.12.01.tar.gz`
- Files in package `amd-gpu-bin-mx51-10.12.01.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 RDP Components

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

Table 2-1 Kit Components

Item	Description
Boards	i. i.MX50 RDP 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:

- ENGR00136170 Add ZQ calibration revision for TO1.1
- ENGR00133542 Add SRPG support for TO1.1
- ENGR00133579 Uboot ESDHCv3: Remove workaround for DLL for MX50 TO 1.1
- ENGR00132537 EPDC fb: Support on-the-fly pixel conversion to monochrome using ePxP
- ENGR00134274 EPDC fb: Optimize update flow by merging compatible updates
- ENGR00133183 Support PWM LCD backlight
- ENGR00136909 Drop DDR freq to 133MHz in medium setpoint
- ENGR00135048 Add support for bus-frequency scaling.
- ENGR00133178 Add ONFI Nand support
- ENGR00137101 Add TOGGLE nand support

3.1.1 Dynamic ZQ Calibration Features

- In U-Boot, the option CONFIG_ZQ_CALIB should be turned on for MX50 TO1.1, and should be turned off for MX50 TO1.0
- In Kernel, the option CONFIG_MXC_ZQ_CALIBRATION should be turned on for dynamic ZQ calibration. Again, ZQ calibration only works on TO1.1. But fortunately, the driver will determine if ZQ calibration is needed according to the chip version, so this option can be just kept for both versions.
- To make ZQ calibration work, the hardware board should meet the requirement in IC spec: “DRAM_CALIBRATION--This pin is the ZQ calibration used to calibrate DRAM Ron and ODT. For LPDDR2, this pin should be connected to ground through a 240 ohm 1% resistor. For DDR2 and LPDDR1, this pin should be connected to ground through a 300 ohm 1% resistor. “

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: 2.6.35
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. Supports FEC and console output. Supports MMC4.4 (Not tested on RDP board)
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 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.
MultiMedia Drivers		
IPU V3 driver	No	
V4L2 Output/Capture	No	Support V4L2 output. No V4L2 capture support.
Camera	No	
TVOut	No	
TVIN	No	
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	

Feature	Supported?	Comments
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	Yes	Supports keypad on Add-on board
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	Yes	
NAND	Yes	Supports GPMI NAND, ONFI NAND and Toggle NAND.
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 on the RDP 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=ttymxc0	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/mmcblk0p2	Used in "boot from tftp/NFS" (i.e., root=/dev/nfs); Used in "boot from SD" (i.e., root=/dev/mmcblk0p2)
rootfstype	Indicates the file system type of the root file system	rootfstype=ext4	Used in "boot from SD" together with "root=/dev/mmcblk0p2"
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	Hardware	Can't be used simultaneously.	Designed board shares some pins.
MMC 4.4	Hardware	Not verified on RDP 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.
Hardware Reset	Hardware/Software	When DVFS core is enabled, the hardware reset key can not reset the system.	Will be fixed in upcoming release.

Features	Category	Description	Resolution/Workaround
SDIO WiFI	Hardware	SDIO WiFi card(SD31) can easily get failed(DAT CRC error) on RDP board on both SD slot1 and slot2 (for both TO1.0 and TO1.1 chip).	Workaround can be either of the following: 1) Change the voltage to 3.0v 2) Lower the SD clock to 25Mhz. Interesting thing is SD31 works fine on ARM2 board. And SD32 (new version of SD31) works fine on both ARM2 and RDP board. Root cause is not identified.

How to Reach Us:

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www.freescale.com

Web Support:
http://www.freescale.com/support

USA/Europe or Locations Not Listed:
Freescale Semiconductor
Technical Information Center, EL516
2100 East Elliot Road
Tempe, Arizona 85284
+1-800-521-6274 or +1-480-768-2130
www.freescale.com/support

Europe, Middle East, and Africa:
Freescale Halbleiter Deutschland GmbH
Technical Information Center
Schatzbogen 7
81829 Muenchen, Germany
+44 1296 380 456 (English)
+46 8 52200080 (English)
+49 89 92103 559 (German)
+33 1 69 35 48 48 (French)
www.freescale.com/support

Japan:
Freescale Semiconductor Japan Ltd.
Headquarters
ARCO Tower 15F
1-8-1, Shimo-Meguro, Meguro-ku,
Tokyo 153-0064, Japan
0120 191014 or +81 3 5437 9125
support.japan@freescale.com

Asia/Pacific:
Freescale Semiconductor China Ltd.
Exchange Building 23F
No. 118 Jianguo Road
Chaoyang District
Beijing 100022
China
+86 010 5879 8000
support.asia@freescale.com

For Literature Requests Only:
Freescale Semiconductor Literature Distribution Center
P.O. Box 5405
Denver, Colorado 80217
1-800-441-2447 or 303-675-2140
Fax: 303-675-2150
LDCForFreescaleSemiconductor@hibbertgroup.com

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