

i.MX51 EVK 10.11.01 Linux

Release Notes

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

Contents

1	Release Contents	2
1.1	Contents	2
1.2	Cross Platform Matrix	3
1.3	License	4
2	System Requirements.....	4
2.1	Linux Host server	4
2.2	ATK tool	4
2.3	Manufacturing Tool	4
2.4	i.MX51 EVK Components	4
3	What's New.....	5
3.1	New Features	5
3.2	Defect Fixes.....	5
3.3	Gnome Mobile Notes	6
4	BSP Supported Features	6
5	Kernel boot parameters	8
6	Known Issues/Limitations.....	9



1 Release Contents

1.1 Contents

This release consists of the following package files:

- L2.6.35_10.11.01_ER_images_MX5X.tar.gz
- L2.6.35_10.11.01_ER_source.tar.gz
- L2.6.35_10.11.01_ER_docs.tar.gz

Tools binary is in Mfgtools-Rel-10.11.01_ER_MX51_UPDATER.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 2.6.31 version.
- <yy>.<mm>.<ij>”: Release time. “09.12.00” indicates this BSP is released on December, 2009.

Tables 1-1 to 1-4 list the contents included in each package.

Table 1-1. L2.6.35_10.11.01_ER_images_MX5X.tar.gz content

File	Description
u-boot-3ds.bin	Uboot bootloader for i.MX51 3-Stack board
u-boot-bbg.bin	Uboot bootloader for i.MX51 EVK board
ulmage	Binary kernel image for Linux 2.6.35 kernel. The same image can run in i.MX5 boards.
amd-gpu-x11-bin-mx51_10.11.01-1_armel.deb	Debian package for amd gpu driver and the application for X11
atheros-wifi_10.11.01-1_armel.deb	Debian package for Atheros WiFi AR6102 driver
firmware-imx_10.11.01-1_armel.deb	Debian package for the firmwares which includes VPU, Atheros WiFi.
imx-lib_10.11.01_armel.deb	Debian package for imx-lib binary
imx-test_10.11.01-1_armel.deb	Debian package for imx unit test binary
kernel_2.6.35.3-imx_10.11.01_armel.deb	Debian package for the linux kernel image, kernel modules and the header files.
libz160-bin_10.11.01-1_armel.deb	Debian package for GPU Z160 2D driver
modeps_10.11.01-1_armel.deb	Debian package for module dependencies
xserver-xorg-video-imx_10.11.01-2_armel.deb	Debian package for i.MX accelerated video driver
udev-fsl-rules_10.11.01-5_armel.deb	Debian package for udev rule

Table 1-2. L2.6.35_10.11.01_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 package lists
pkgs	Source and patches for root file system
pkgs/ imx-test-10.11.01.tar.gz	Source code for the unit tests
pkgs/ imx-lib-10.11.01.tar.gz	Source code for the libraries
pkgs/ linux-2.6.35.3-imx_10.11.01.bz2	Freescale 2.6.35.3-10.10.01 kernel patches
pkgs/ u-boot-v2009.08-imx_10.11.01.tar.bz2	i.MX U-Boot patches based on U-Boot version 200908
pkgs/firmware-imx-10.11.01.tar.gz	i.MX firmware packages
pkgs/atheros-wifi-10.11.01.tar.gz	Source code of the Atheros WiFi AR6102 drivers
pkgs/ xserver-xorg-video-imx-10.11.01.tar.gz	Source code of the i.MX accelerated video driver
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_10.11.01_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.MX51 Linux BSP Release Notes, User's Guide, Reference Manual

Table 1-4. Mfgtools-Rel-10.11.01_ER_MX51_UPDATER.tar.gz content

File	Description
MfgTool.exe	Mfgtool host tools
Profiles/MX51 Linux Update/OS Firmware/ucl.xml	Main Control file
Profiles/MX51 Linux Update/OS Firmware/u-boot.bin, ulmage, initramfs.cpio.gz.uboot	Linux Firmware for Mfg.
Profiles/MX51 Linux Update/OS Firmware/files	Demo Linux image.

1.2 Cross Platform Matrix

For basic environment compatibility among different i.MX devices, see the file `CompatMatrix.html` referenced in `readme.html`.

For features list supported among different i.MX devices, see the file `FeatureMatrix.html` referenced in `readme.html`.

1.3 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-10.11.01.tar.gz`
- Files in package `amd-gpu-bin-mx51-10.11.01.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 needed to setup a Linux host server. To build the Gnome Mobile profile it is recommended to install Ubuntu 9.04 in the Linux host.

2.2 ATK tool

Use Advanced ToolKit application V1.7.1. Or use `Mfgtools-Rel-10.11.01_ER_MX51_UPDATER.tar.gz` for the image downloading.

2.3 Manufacturing Tool

Windows XP SP3

2.4 i.MX51 EVK Components

Table 2-1 list the hardware items contained in the i.MX51 EVK package. Additional accessory cards and CLAA WVGA display panel are optional.

Table 2-1 Kit Components

Item	Description
Boards	i. MX51 EVK Main Board ii. MX51 EVK accessory card (optional)
Display	i. DVI monitor ii. CLAA WVGA panel (optional) iii. MITSUBISHI LVDS panel (optional)
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
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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:

- Upgrade Linux kernel to 2.6.35.3 version
- Upgrade GPU driver to AMD Production R1.2 release
- Upgrade SDMA script to V1.1.0 version to support SSI dual FIFO.
- Upgrade vpu firmware to v1.4.14
- Switch IOMUX to V3 version.
- USB restructure for better wakeup support.
- Add power key driver support.
- Add SSI3 support

3.2 Defect Fixes

See `ResolvedDefects.html`, referenced inside the file `readme.html`, for the list of the defects fixed in this release. The following highlights some important bug fixes:

- ENGR00133689 MX51 U-Boot: set MC13892 charge output voltage as 4.2V
- ENGR00133756 UBOOT: Remove the 2G limitation from NAND driver
- ENGR00133749 Remove the 2G limitation from NAND driver
- ENGR00133737 MXC SDMA: fix system hangs when play audio with irq threaded
- ENGR00133635 mc13892: fix pmic ADC issue and lost irq issue
- ENGR00133034 ipuv3: fix black flash issue during high resolution video playback

- ENGR00131644 PMIC: Charger removal may not be detected
- ENGR00132971 Workaround for imx5x M4IF burst len errata for armv7 neon

3.3 Gnome Mobile Notes

To build the GNOME Mobile profile with LTIB, you must use Ubuntu 9.04 or above version as the Linux host. For HOST server setup, See ltib_build_host_setup.pdf.

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: 2.6.35.3
File System	Yes	EXT2/EXT3/EXT4 are used as the file system in MMC/SD, Hard Disk
Bootloader		
U-Boot	Yes	U-Boot delivery is based on U-Boot version 200908. Supports SPI NOR and MMC/SD boot Supports FEC and console output. Support fuse and clock operations.
Machine Specific Layer		
ARM Core	Yes	Supports Cortex-A8
Interrupt	Yes	Supports MXC TZIC module
Clock	Yes	Control system frequency, clock tree distribution, and provide support for low power management
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. IOMUX-V3 version is used.
SPBA	Yes	Provides the interfaces to allow different masters to take or release ownership of a shared peripheral
SDMA	Yes	SDMA script version is V1.1.0.
Character Device Drivers		
MXC UART	Yes	Console support via internal UART1, UART2
Graphic Drivers		
Frame Buffer Driver	Yes	MXC Frame buffer driver for IPU V3
DVI monitor	Yes	The supported pixel format is IPU_PIX_FMT_RGB24. The default resolution is 1024x768. Support DVI resolution up to 1280x1024. Only the default resolution 1024x768 is tested mainly.
VGA monitor	Yes	Support VGA monitor.
WVGA	Yes	Supports 16bit CLAA WVGA panel with the resolution 800X480. The pixel format is IPU_PIX_FMT_RGB565

Feature	Supported?	Comments
LVDS	Yes	Supports MITSUBISHI LVDS panel with the resolution 1024X768. The pixel format is IPU_PIX_FMT_LVDS666
GPU	Partial	GPU software version: AMD Production Release 1.2. Supports Z430 (3D) and Z160 (2D). Support s OpenGL ES 2.0 and 1.1, OpenVG 1.1, C2D custom API using Z160 Provides debian packages to support EGL X-Window in Ubuntu 10.04
MultiMedia Drivers		
IPU V3 driver	Yes	Provides the interfaces to access IPU V3 modules
V4L2 Output/Capture	Yes	Provides V4L2 implementations. Currently V4L only supports one instance. IPU library located into imx-lib package can support multiple instances. De-interface function for split mode (> 1024x1024) is not supported in this version.
Camera	Yes	Supports OmniVision OV3640 camera via IPU CSI interface. OV3640 driver supports QVGA, VGA, XGA, NTSC, PAL modes. It supports 15fps and 30fps.
TVOut	Partial	Supports embedded TV encoder. Supports PAL, NTSC, 720P modes. Support TVOut crop feature. Please add 'tve' option to bootup command line to enable TVE driver.
VPU	Yes	VPU firmware version: v1.4.14 Supports VPU encoder and VPU decoder For Real Video and DivX3 support information contact a Freescale representative
Power Management Drivers		
PMIC	Yes	Supports MC13892 2.0/2.0a via SPI interface. Support regulator management for voltage controls.
Lower Power mode	Yes	Supports stop mode in mem state
DVFS-Core	Yes	Supports hardware DVFS core driver
DVFS-Peripheral	Yes	Supports DVFS peripheral feature via sysfs interface. Know limitations: <ul style="list-style-type: none"> The pixel clock frequency has to be below 54MHz. The divider to generate the pixel clock frequency (either from IPU_HSP or IPU_DI0_CLK or IPU_DI1_CLK) has to be even.
CPUFreq	Yes	CPUFreq can be used for CPU frequency adjustment
Bus scaling	Yes	Bus scaling driver can be used for bus frequency adjustment
XEC	Yes	XEC is used to save power by adjusting backlight. For XEC delivery, contact a Freescale representative
Sound Drivers		
S/PDIF	Yes	Supports S/PDIF Transmit. Support 44.1KHZ. To support 48K and 32K sample rates requires to connect 24.576MHZ OSC to CKIH2.
ASoC (SSI/AUDMUX)	Yes	Supports STGL5000 stereo audio codec under ASoC framework Supports audio playback and record
Input Device Drivers		
Keypad	Yes	Supports the keypad on the optional accessory card
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	Supports atmel 4M SPI NOR flash
Networking Drivers		
FEC	Yes	Supports LAN8700 PHY
USB Drivers		
USB Host	Yes	Support USB HOST1 and USB OTG host Can support USB camera and USB SATA devices Note that USB OTG host mode is disabled by default in the MX5 configuration

Feature	Supported?	Comments
USB Device	Yes	Support USBOTG device mode
USBOTG	Yes	Support USBOTG PIN detect function
Security Drivers		
Security drivers	Yes	Support SCC2, SAHARA drivers
General drivers		
SRTC	Yes	Support for LP domain. It's disabled by default.
MC13892 RTC driver	Yes	MC13892 RTC driver is enabled by default
MMC/SD/SDIO	Yes	Support i.MX eSDHC module with PIO and DMA modes
WatchDog	Yes	Support Watchdog reset
I2C	Yes	Support I2C master. Support I2C1, I2C2
SPI	Yes	Support SPI master mode
1-Wire	Yes	Support DS2438 via 1-Wire
PWM	Yes	Support backlight driver via PWM for WVGA panel. Hardware rework is needed to test this feature
USB BT dongle	Yes	Enables BLUEZ.
WiFi	Yes	Support Atheros AR6102 and AR6003. AR6003 is enabled by default.

5 Kernel boot parameters

Depend on different booting/usage scenarios, you may need different kernel boot parameters.

Kernel Parameters	Description	Typical Values	Used When
console	Where to output kernel log by printk	console=ttyMXC0	<i>All cases</i>
ip	Tell kernel how/whether to get IP address	ip=none ip = dhcp ip=static_ip_address	<i>"ip=dhcp" or "ip=static_ip_address" is mandatory in "boot from TFTP/NFS".</i>
nfsroot	where is NFS server/directory	nfsroot=<ip_address>:<rootfs path>	<i>Used in "boot from tftp/NFS" together with "root=/dev/nfs"</i>
root	Indicate where is the root file system	root=/dev/nfs or root=/dev/mmcblk0p2	<i>Used in "boot from tftp/NFS" (i.e. root=/dev/nfs); Used in "boot from SD" (i.e. root=/dev/mmcblk0p2)</i>
rootfstype	indicate file system type of the root file system	rootfstype=ext4	<i>Used in "boot from SD" together with "root=/dev/mmcblk0p2"</i>
rootwait	Wait (indefinitely) for root device to show up.	rootwait	<i>Used when mounting SD rootfs</i>

video	tell kernel/driver which resolution/depth and refresh rate should be used for display port 0 or 1. See the parameter information under Documentation/fb/modedb.txt Can also tell kernel/driver which IPU display interface format should be used.	1.video=mxcdi0fb:RGB24,1024x768M-16@60 2.video=mxcdi1fb:RGB565,CLAA-WVGA, di1_primary 3.video=mxcdi1fb:YUV444,720P60 tve 4.video=mxcdi0fb: LVDS666,XGA 5.video=mxcdi1fb:RGB565,1024x768 M-16@60 di1_primary	1. Used when display on DVI monitor for display port 0. 2. Used when display on WVGA LCD for display port 1. 3. Used when display on 720P TV for display port 1. If for NTSC or PAL, just replace 720P60 to TV-NTSC or TV-PAL. 4. Used when display on Mitsubishi_xga LVDS for display port 0. 5. Used when display on VGA for display port 1, if want it as primary, add di1_primary.
di1_primary	tell kernel/driver using DI1 as primary display	di1_primary	Used when primary display is on DI1 port.
tve	Tell kernel/driver to enable TVE driver	tve	Used when display on TVOut
dmfc	Tell kernel/driver how to set IPU DMFC segment size	None Or dmfc=3	"dmfc=1" means DMFC_HIGH_RESOLUTION_DC, "dmfc=2" means DMFC_HIGH_RESOLUTION_DP, "dmfc=3" means DMFC_HIGH_RESOLUTION_ONLY_DP. NOTE: DMFC_HIGH_RESOLUTION_ONLY_DP can only be set by the command line
mem	Tell kernel how much memory can be used.	None or mem=414M	Note: 512M -<mem> -<gpu_memory> is reserved for X-Acceleration.
gpu_memory	Tell kernel how much memory is reserved for GPU usage.	None or gpu_memory =64M	Used to indicate the memory size reserved for GPU.
w1	tell kernel/driver using 1Wire instead of S/PDIF	w1	Used to avoid conflict between 1Wire and S/PDIF. If w1 is added in the command line, 1-Wire device is initialized; otherwise, S/PDIF will be used.

6 Known Issues/Limitations

See [UnresolvedEnhancements.html](#) and [UnresolvedDefects.html](#), referenced in the file [readme.html](#), to see a complete list of known issues. Table 5-1 lists some key limitations and hardware workarounds.

Table 5-1 Known issues and workarounds

Features	Category	Description	Resolution/Workaround
General	Hardware	The GPIO PINs of some modules conflict in the i.MX51 EVK board.	To avoid GPIO conflict in initialization phase, more command options are provided in boot up command line <code>exec</code> to indicate which module should be initialized: - <code>w1</code> : Used to avoid conflict between 1Wire and S/PDIF. If <code>w1</code> is added in the command line, 1-Wire device is initialized; otherwise, S/PDIF will be used.
Boot	Hardware	Sometimes the board cannot boot from SPI-NOR or MMC on EVK3.0.	Ensure Hardware fix ECO24315 is applied on your board.
Display	Hardware	ENGR115229: The green color stripe is shown in TVOut 720p when the DI0 with DVI 1024x768 resolution and the DI1 with TVout 720p are enabled together.	IPU is able to output about 110Mhz total data (DI0 + DI1). Defining TVE output for 720P will require about 70MHz. So adding UI on LCD in resolution higher than SVGA (800x600) is above IPU abilities. So when enabling TVout 720p, blank fb0 via <code>echo 1 > /sys/class/graphics/fb0/blank</code> or set the resolution of DI0 to 800x600 via command option <code>"video=mxcdi0fb:RGB24,800x600-16@60"</code>
Display	Configuration	The default resolution of DVI monitor is 1024x768.	The default resolution is 1024x768 (without reading the monitor preferences stored in the EDID). If a different resolution is desired, it can be specified on the boot command line with the command: <code>video=mxcdi0fb:RGB24,1024x768-16@60</code> where 1024x768 is the resolution desired.
Display	Configuration	Display automatic blank functionality is enabled by default. So the display will power off automatically when the time is expired.	To disable LCD automatic blank functionality, enter the command: <code>echo -e "\033[9;0]" > /dev/tty0</code> When the display is off, enter the following command to power on the display: <code>echo 0 > /sys/class/graphics/fb0/blank</code>
Display	Configuration	The IPU DMFC is a FIFO before data output to the display HW. The DMFC size control needs to be done for the display with high resolution. The kernel can control DMFC size dynamically in partial way. The user can also control DMFC size by the command line.	There are 4 setting of DMFC size: - DMFC_NORMAL: Segment 0,1 for DC, 4,5 for DP-BG, 6,7 for DP-FG. - DMFC_HIGH_RESOLUTION_DC: Segment 0~3 for DC, 4,5 for DP-BG, 6,7 for DP-FG. - DMFC_HIGH_RESOLUTION_DP: Segment 0,1 for DC, 2~5 for DP-BG, 6,7 for DP-FG. - DMFC_HIGH_RESOLUTION_ONLY_DP: Segment 0~3 for DP-BG, 4~7 for DP-FG. IPU display driver tries to enlarge relative DMFC segment size when it meets high resolution

Features	Category	Description	Resolution/Workaround
			<p>condition. But if DMFC is already in high resolution setting, DMFC doesn't change.</p> <p>For the options in the command line, see the bellows:</p> <ul style="list-style-type: none"> - "dmfc=1" means DMFC_HIGH_RESOLUTION_DC, - "dmfc=2" means DMFC_HIGH_RESOLUTION_DP, - "dmfc=3" means DMFC_HIGH_RESOLUTION_ONLY_DP. <p>NOTE: DMFC_HIGH_RESOLUTION_ONLY_DP can only be set by the command line.</p>
Display	hardware	IDMAC of IPUv3 can not process extremely high resolution non-interleaved YUV frames (such as YUV422P and YUV444P), because UV-offset (UBO and VBO in CPMEM are 22-bit) may overflow.	<p>When using v4l2 output or IPU / Screenlayer library, the user need to make sure the UV-offset will not exceed IPU limitation for non-interleaved YUV pixel format.</p> <p>For instance, if the pixel format is YUV422P(P means planar), the u-offset and the v-offset can be calculated in this way:</p> $u_offset = (width * (height - pos_y) - pos_x) + (width * pos_y) / 2 + pos_x / 2$ $v_offset = u_offset + (width * height) / 2$ <p>where, width is the width of the original YUV frame, height is the height of the original YUV frame, pos_x is the horizontal offset value if cropping is needed, pos_y is the vertical offset value if cropping is needed.</p> <p>The user should make sure this condition is true: u_offset / 8 <= 0x3fffff and v_offset / 8 <= 0x3fffff.</p>
Video	Configuration	When playing the video for a long time, allocation of contiguous memory may fail (memory fragmentation).	To play video when the system memory is low, run the command: <code>echo 1 > /proc/sys/vm/lowmem_reserve_ratio</code> to protect the DMA zone and avoid memory allocation errors.
Backlight	hardware	The backlight of WVGA panel cannot be adjusted by default.	To adjust the backlight of WVGA panel via PWM, the hardware can be reworked as follows: <ol style="list-style-type: none"> 1. Remove R115 on WVGA daughter board 2. Add a wire from R302 in EVK board to R115 PIN far away to J1 in WVGA daughter board

Features	Category	Description	Resolution/Workaround
			To enable PWM backlight driver, enable the following menu options: <ol style="list-style-type: none"> 1. System Type > Enable PWM driver 2. Device Drivers > Graphics support > Backlight & LCD device support > Generic PWM based Backlight Driver
Audio/ DVI	hardware	Some DVI monitor/cable configurations can cause the audio failure due to I ² C conflict.	Reading the EDID is broken on i.MX51 BBG2.5 boards due to the use of an unsuitable level shifter in the board design. The users are urged to not follow the reference design for circuitry to read the EDID. A possible alternative is the MAX3816 although our hardware team has not validated that suggestion yet. The software has disabled the DVI EDID reading feature. If audio fails when a DVI monitor is connected, the I ² C bus to the DVI connector may need to be cut.
FEC	hardware	Sometimes the board cannot boot up if a network cable is plugged into the FEC port.	Rework the board to connect GND_ENT to GND.
FEC	Configuration	If MAC address is 0x00....0x00, the kernel cannot open the Ethernet device so that NFS cannot be mounted	Set MAC address via "iim blow fecmac" command in the U-Boot console.
Camera (OV3640)	Hardware	Camera cannot work. I2C error is reported	Orient the camera sensor with the lens toward the main board. Hardware rework for I2C is needed.
Camera	Hardware	ENGcm09128: Under certain conditions, the DMA controller in the IPU may cause image corruption. This applies to all IPU image sources, including both an external smart camera sensor and general images stored in memory. The problem most frequently occurs with non-interleaved YUV420 formatted images that are rotated. The problem applies to WRITE channels only, READ channels are not affected.	Only interleaved YUV and RGB output pixel formats are supported by IPU idmac channels for MX51 TO2 chips. This means V4l2 capture and V4l2 still capture don't support non-interleaved output pixel format. See the Test Document to get the detailed camera test steps.

Features	Category	Description	Resolution/Workaround
		This errata only impacts MX51TO2.	
Camera	BSP	Camera encoding cannot work together with an interlaced video playback	The VDI uses PRP channel which conflicts with the camera. The solution is to disconnect the PRP channel from the VDI. The solution will be integrated in future release.
GPU	BSP	The OpenVG is not supported when the 'uio_pdrv_genirq.ko' kernel module is loaded. This kernel module is needed to support X acceleration.	The 'tiger' sample is for OpenVG and should not be run if X- acceleration is enabled.
Audio	Hardware	ENGR00114234 ALSA: cannot capture voice from headset with microphone in J13. Possibility: 100%	J13 is connected to the microphone and the right headphone channel. So please ensure the headset used can support it if using it for microphone test. We recommend to plugging a tiny microphone to the microphone connector X1 on the backside of the board.
Rootfs	BSP	Mounting the root file system on some MMC/SD cards or hard disks may fail.	This issue is related to timing. Add <code>rootdelay=5</code> or <code>rootwait</code> command option in the launch command, it ensures additional time is reserved for storage initialization before mounting the rootfs.
U-Boot	BSP	U-Boot only supports to save environment to the first device. In EVK board, the environment is stored to MMC-SD card whether booting from MMC or SPI-NOR.	The workaround is to build different bootloader for different boot modes. So the first device is the boot device.
Audio	System	ENGR00119077: Play the audio. Then the system enters suspend. After resume, no audio sound can be heard.	The audio codec has been resumed firstly. The user can hear the sound once. Then it appears that <code>dam_mux_put</code> is called by the application which causes the codec power to enter standby again. Still investigating.
Audio	System	ENGR00118501: ALSA underrun error occurs when testing 88k stereo wav file with ubuntu 9.10 rootfs. Possibility: 100%	If adding "--disable-resample" option in <code>aplay</code> command, the issue can not be observed.

Features	Category	Description	Resolution/Workaround
Audio	BSP	ENGR00133191 ALSA: FIFO error when play during recording.	It is caused by SGTL5000 symmetrical mode support. It's possible to cause two sub-streams initialized alternatively. The workaround is to add delay between arecord and aplay operations.
Video		ENGcm11767 The system crashes when running 720P playback and 3D cube demo application at the same time on WVGA display.	The workaround is to disable CONFIG_MXC_VPU_IRAM which means to use DDR buffer for VPU instead of IRAM.
Video	BSP	If setting the video mode as "video=mxcdi0fb:RGB24,720P60" to use external clk, Ubuntu X window startup is failed.	This is because FB_SYNC_EXT was used to represent external clock, but actually it represents ext sync. Some applications don't recognize it which will cause fb display failed. Please apply the patches "0001-ENGR00133954-1-MSL-remove-FB_SYNC_EXT-flag.patch" and "0002-ENGR00133954-2-ipuv3-remove-FB_SYNC_EXT-flag.patch".
Video	BSP	ENGR00132543 [MX51_BSP] TVout: The last frame will be display again at the beginning of new display. 100%	Please apply the patch "0003-ENGR00132543-v4l2-output-fill-black-in-stream-off.patch". This patch is to fill black data in stream off, otherwise the last frame will keep in frame buffer.
Video	BSP	[LMX51_Ubuntu] Dual display: Can't display the video on LCD via DVI. 100%	Please apply the patch "0004-ENGR00134076-ipuv3-should-not-set-burst-size-again.patch"
UART	BSP	ENGR00133848 Since the display module may change PLL3 on the fly when the display module use external clock. So the child clocks on PLL3 such as UART were impacted and caused console wrong.	The fix to change UART parent clock as PLL2 instead of PLL3. See "0001-ENGR00133848-imx51-MSL-uart-change-uart-default-pare.patch".
MFG	BSP	MFG tool can not work well on some MX51 BBG boards and stop at battery driver.	Please apply for the patch "0001-ENGR00134116-MX5-MFG-disable-battery-driver.patch".

Features	Category	Description	Resolution/Workaround
USB	Hardware	38120513 (Android: System can not remount SD space automatically after the USB cable is unplugged).	The driver detects disconnect event when the VBUS is lost. However, the VBUS PAD on some boards are broken and can not drop to 0V when the USB device is detached according to ENGcm11192. Recommend to add 4.7V uf capacitor on VBUS when designing the board to avoid VBUS pad damage. Contact Hardware team for the detailed change list.
USB	BSP	When executing the command "echo suspend > /sys/bus/usb/devices/2-1/power/level", the error "hub 2-1:1.0: suspend error -16" is reported.	Please note BBG board has one USB-SATA controller. Before suspending the USB 2-1, the sub devices must be suspended firstly. For example, execute the suspend command as the following: <ul style="list-style-type: none"> echo suspend > /sys/bus/usb/device/2-1.6/power/level /* suspend the usb-sata */ echo suspend /sys/bus/usb/device/2-1/power/level /* suspend the hub which connects to the host1 */
toolchain	System	Memcpy performance with codesoucery toolchain gcc-4.3.3 is not better when comparing with FSL 4.1.2 toolchain.	Codesoucery toolchain gcc 4.3.3 is disabled in MX51 LTIB default profile.

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