

Android Release Notes

1 Release Description

i.MX Android kk4.4.2_1.0.0 is a GA release for Android 4.4.2 KitKat (KK) on Freescale's i.MX 6Quad, i.MX 6Dual, i.MX 6DualLite, i.MX 6Solo, and i.MX 6SoloLite applications processors.

i.MX Android kk4.4.2_1.0.0-ga release includes all necessary codes, documents and tools to assist users in building and running Android 4.4.2 on the i.MX 6Quad, i.MX 6DualLite, and i.MX 6SoloLite hardware boards from scratch. The pre-built images are also included for a quick trial on Freescale i.MX 6Quad SABRE-SD board and platform, i.MX 6DualLite SABRE-SD platform, and i.MX 6SoloLite EVK platform. This release includes all Freescale porting and enhancements based on Android open source code.

Most of the deliveries in this release are provided in source code with the exception of some proprietary modules/libraries from third parties.

2 Supported Hardware SoC/Boards

- i.MX 6Quad SABRE-SD board and platform
Full validation test
- i.MX 6DualLite SABRE-SD platform

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Release Package Contents

Full validation test

- i.MX 6Quad SABRE-AI board and platform

FUN validation test

- i.MX 6DualLite SABRE-AI board and platform

BAT validation test

- i.MX 6SoloLite EVK platform

Full validation test

3 Release Package Contents

Release package contains software and documentation.

The kk4.4.2_1.0.0-ga release package includes the following software and documents:

Android source code patch	<ul style="list-style-type: none">• android_kk4.4.2_1.0.0-ga_core_source.tar.gz: Freescale i.MX specific patches (apply to Google Android repo) to enable Android on i.MX based boards. For example, Hardware Abstraction Layer implementation, hardware codec acceleration, etc.
Documents	<p>The following documents are included in android_kk4.4.x_1.0.0-ga_docs.tar.gz</p> <ul style="list-style-type: none">• Android Quick Start Guide: A manual that explains how to run Android on an i.MX board by using prebuilt images.• Android User's Guide: A detailed manual for this release package.• Android Frequently Asked Questions: A document that contains Frequently Asked Questions (FAQs).• Android Release Notes: A document that introduces key updates and known issues in this release.• i.MX 6 G2D API User Guide: A document that introduces the G2D API usages.
Tools	<p>Tools in android_kk4.4.2_1.0.0-ga_tools.tar.gz</p> <ul style="list-style-type: none">• MFGTool: Manufacturing tools for i.MX platform.• tool/tetherxp.inf: USB tethering windows .inf driver configuration file.
Prebuilt images	<p>You can test Android with a prebuilt image on i.MX reference board before building any code:</p> <ul style="list-style-type: none">• android_kk4.4.2_1.0.0-ga_core_image_6qsabresd.tar.gz: Prebuilt images with default android features for the SABRE-SD board.• android_kk4.4.2_1.0.0-ga_core_image_6qsabreauto.tar.gz: Prebuilt images with default android features for the SABRE-AI board.• android_kk4.4.2_1.0.0-ga_core_image_6slevk.tar.gz: Prebuilt images with default android features for the 6SoloLite EVK platform.• android_kk4.4.2_1.0.0-ga_full_image_6qsabresd.tar.gz: Prebuilt images with Freescale Extended Multimedia features for the SABRE-SD board. For more information about the Freescale Extended Multimedia Feature Package, please refer to Section 6.• android_kk4.4.2_1.0.0-ga_full_image_6qsabreauto.tar.gz: Prebuilt images with Freescale Extended Multimedia features for the SABRE-AI board. For more information about the Freescale Extended Multimedia Feature Package, please refer to Section 6. <p>All prebuilt images are in another package. See Android Quick Start Guide and Android User's Guide to understand which image should be used in which case.</p>

4 Features

This section contains features in this package.

Feature	i.MX 6Quad SABRE-SD and i.MX 6DualLite SABRE-SD	i.MX 6Quad SABRE-AI and i.MX 6DualLite SABRE-AI	i.MX 6SoloLite EVK	Comments
Linux 3.0.35 kernel	Y	Y	Y	Based on Linux BSP L3.0.35_4.1.0 GA release
Google KitKat 4.4.2 release	Y	Y	Y	Based on android-4.4.2_r1 release
Boot source	eMMC, External SD	SD, NAND Note: For differences between SD and External SD, see Android User Guide and FAQs for boot from different sources.	External SD	Default NAND chip supported is Micron MT29F8G08ABABAWP
Splash Screen for LVDS	Y	N	N	-
UI (input)	Multi-touch on LVDS panel	Multi-touch on LVDS panel	N	-
UI (display)	LVDS panel, HDMI display	LVDS panel, HDMI display	LCD panel	-
UI (dual display, LVDS+HDMI, UI mirror displayed on second device)	Y	Y	N	-
UI (brightness control)	Y	Y	Y	-
Storage - External Media	Y	Y	Y	SD, External SD, and UDisk
Connectivity - Ethernet	Y	Y	Y	-
Connectivity - BT	Y	N	N	Hardware: <ul style="list-style-type: none"> Silex AR6233X SDIO card Profiles: <ul style="list-style-type: none"> A2DP HID OPP PBAP AVRCP PAN FTP
Connectivity - Wi-Fi	Y	Y	Y	Hardware: <ul style="list-style-type: none"> Atheros AR6103 SDIO card

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Features

Feature	i.MX 6Quad SABRE-SD and i.MX 6DualLite SABRE-SD	i.MX 6Quad SABRE-AI and i.MX 6DualLite SABRE-AI	i.MX 6SoloLite EVK	Comments
				<ul style="list-style-type: none"> Silex AR6233X SDIO card Realtek 8723AS SDIO card Features: <ul style="list-style-type: none"> AP mode Wake on Wireless
Connectivity - 3G	Y	N	N	Hardware: <ul style="list-style-type: none"> HUAWEI EM770W modem Infineon Amazon 1 modem ZTE FM210 modem
Connectivity - GPS	Y	N	N	Locosys AH-1613
Connectivity - USB Tethering	Y	Y	Y	Supports Wi-Fi or Ethernet as upstream
Power - Battery status report	Y	N/A	N/A	Known limitations about the accuracy in some use cases
Power - CPU Freq	Y	Y	Y	-
Power - Bus Freq	Y	Y	Y	-
Media - Music Play	Y	Y	Y	SSI WM8962 for SABRE-SD, ESAI CS42888 for SABRE-AI
Media - Sound Record	Y	Y	Y	SSI WM8962 for SABRE-SD, ESAI CS42888 for SABRE-AI
Media - Video Play	Y	Y	Y	-
Media - Camera	Y	Y	Y	Camera panorama is not supported on the i.MX6SoloLite EVK board.
Media - TVIN	N/A	Y	N/A	PAL/NTSC
Media - Dual Camera	Y	Y	N	Hardware for Sabre SD: <ul style="list-style-type: none"> Front Camera: OV5642/OV5640 CSI camera Rear Camera: OV5640 MIPI camera Hardware for Sabre AI: <ul style="list-style-type: none"> Front Camera: UVC camera Rear Camera: TV IN
Media - Camcorder	Y	Y	Y	Hardware for MX6SL EVK: <ul style="list-style-type: none"> Front Camera: UVC camera Rear Camera: OV5640
Media - USB Camera	Y	Y	Y	Logitech: <ul style="list-style-type: none"> C250 E3500 Camera panorama is not supported on the i.MX6SoloLite EVK board.
Media - USB Mic	Y	Y	N	-
Media - Movie Studio	Y	Y	N	-

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Feature	i.MX 6Quad SABRE-SD and i.MX 6DualLite SABRE-SD	i.MX 6Quad SABRE-AI and i.MX 6DualLite SABRE-AI	i.MX 6SoloLite EVK	Comments
Media - HDMI audio output	Y	Y	N	-
Graphic - HW 3D acceleration	Y	Y	N	OpenGL-ES 1.1/2.0 via GC2000 or GC880 3D core
Graphic - HW accelerated UI surface composition	Y	Y	Y	-
Misc - ADB over USB	Y	Y	Y	-
Misc - Fastboot utility	Y	Y	Y	-
Misc - SW update and factory reset	Y	Y	Y	-
Sensor - Magnetometer	Y	Y	N	Freescale MAG3110
Sensor - Accelerometer	Y	Y	N	Freescale MMA8451Q
Sensor - Light	Y	N	N	Intersil ISL29023
NTFS-3G File System	Y	Y	Y	For external Storage
NAND	N	Y	N	Tested NAND chip: - Micron 29F8G08ABABA
Wi-Fi Display Source and Sink	Y	Y	N	Hardware: <ul style="list-style-type: none"> • Realtek 8723AS SDIO card • Atheros AR6103 SDIO card • Silex AR6233X SDIO card
Wi-Fi Display Sink	Y	Y	N	Hardware: <ul style="list-style-type: none"> • Realtek 8723AS SDIO card • Atheros AR6103 SDIO card • Silex AR6233X SDIO card • Only available on android_kk4.4.2_1.0.0_wfdsink_source. tar.gz
Wi-Fi Display UIBC	Y	N	N	-
Data Partition Encryption	Y	Y	Y	Not supported for NAND boot in Sabre-AI
USB Accessory	Y	Y	Y	Google AOA v2.0
webrtc	Y	N	N	-
Infrared transmitter	Y	N	N	-
Screen Recording	Y	Y	N	-
Ethernet APK	Y	Y	Y	-
webGL	Y	Y	N	-

5 Multimedia Codecs

Please refer to the Google Android 4.4 Compatibility Definition Document (CDD), Section 5 for multimedia codecs and features.

6 Freescale Extended Feature Packages

Available for the release are several packages to extend the base Android Multimedia features. For more information and details about any of the below packages, please send inquiry to L2manager-android@freescale.com.

6.1 Extended multimedia feature package

Freescale offers an enhanced multimedia experience for Android. This package delivers an error resilient, feature rich multimedia solution by extending the existing multimedia features of Android and introduces additional features. Extended and additional features include:

- Local playback
 - Freescale Enhanced Codecs, Demultiplexer, and File Format support
 - MOV, AVI, ASF, FLV, MPEG-PS, MPEG-TS
 - Trick Mode Playback
 - Multiple Audio Track Selection
- Recording
- Streaming playback
 - HTTP
 - RTSP
 - HTTPLive
 - RTP
 - UDP
- Subtitle support

6.2 Microsoft codec support

Licensed package feature support is described in the following table.

File extension	Demuxers	Video decoders	Audio decoders
.wma	ASF		WMA STD, PRO, Lossless
.wmv/.asf	ASF	VC-1 SP/MP/AP WMV 7/8	WMA STD, PRO, Lossless
.mkv/.mka	MKV	VC-1 SP/MP/AP	WMA STD, PRO, Lossless

6.3 Dolby digital audio

Freescale offers two Dolby Digital Audio solutions which can be integrated into the Extended Multimedia Package.

- Dolby Digital (AC-3) with support for Audio Pass-through
- Dolby Digital Plus

6.4 Wi-Fi Display Sink feature package

Freescall extends Android by offering a Wi-Fi Display Sink feature. The Wi-Fi hardware module used for this feature is the Realtek 8723AS SDIO Card, but the design of this feature allows porting to any Wi-Fi hardware module. Using the Freescale Wi-Fi Display Sink API and the demonstration application, users can easily develop their own Sink Application. This feature has been verified using several of the most popular Android phones and tablets.

7 Change Lists

Compared to the kk4.4.2_1.0.0-beta release, this release has the following major changes:

- Enabled UIBC for both Wi-Fi Display Source and Sink on the Sabre-SD board.
- Improved the stability of Wi-Fi Display connection between Source and Sink.
- Fixed several CTS case failure issues.
- Upgraded the VPU firmware to v3.1.1_r46058, and VPU library to v5.4.25.
- Restored the CP15 register after resuming in the Linux Kernel.
- Saved time of taking pictures by using VPU for JPEG encoder of the Camera.
- Fixed several GPU issues on triggering low memory killer.
- Fixed several GPU issues on the Monkey test.
- Fixed the screen fresh issue on adjusting backlight of i.MX 6SoloLite EVK.
- Fixed the Watchdog configuration conflict in the Linux Kernel.
- Fixed the issue that the SD card cannot be detected after suspending and resuming.
- Enhanced Ethernet APK in several features.
- Fixed several GPU issues on multi-thread stress test.

8 Known Issues and Limitations

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

Issue description	Comments
Huawei EM770W 3G modem with China Mobile SIM card consumes too much power, which will flash the LVDS screen.	-
Battery level info is incorrect when charged in MX6DQ/MX6DL SABRE-SD board and platform. 100%	To resolve this issue, add a fuel gauge in hardware.
UI is Landscape while camera preview is portrait on the SABRE-SD platform.	SABRE-SD platform issue. See " <i>i.MX Android Camera Issue on the SDP Board</i> " for more details.
PCIe does not support Hot Plug and Power Management.	PCIe Intel Wi-Fi source code has been integrated into this release. However, PCIe is not enabled by default because the power management is not supported. See community.freescale.com/docs/DOC-94045 about the instructions to enable PCIe Wi-Fi.
L/R channel is swapped in SABRE-AI board.	It is hardware issue. Please connect red line to white port, white line to red port.
3G modem cannot work if the BT in bootargs of the bootloader is enabled.	The I/O pin KEY_COL4 is either used by UART5 as UART RTS pin or by 3G modem as DISABLE pin.

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CTS Known Issues

Issue description	Comments
i.MX 6Quad TO1.2 and i.MX 6DualLite TO1.1 are not supported in wait mode.	-
Google USB driver must be installed multiple times for the MTP, PTP, MTP&ADB, PTP&ADB, and ADB function settings.	Some Windows XP environments may display MTP and PTP windows even though PTP only is enabled in the device.
When Accessibility -> Magnification is enabled, several blue lines appear if sliding from bottom when playing a video.	Known issue, it is related with DPI, and should be Android SystemUI or Gallery3D layout issue. There will be no such issue if set DPI to 128 in init.freescale.rc, but we set DPI to 160 by default for some reasons in the release.
There will be silence in the first few seconds for HDMI output when connecting the board to a TV set.	This issue is related with the TV set. Some TV sets have no issues while some TV sets have issues.
There are some function limitations and poor performance in Wi-Fi Display Source and Sink case by using the Atheros AR6103 and Silex AR6233X sdio card. Sometimes the group formation may fail in the first Wi-Fi display connection, which is a known issue of Atheros.	MCC is not supported. Sometimes frames may drop, especially when the user interface is switched in setting.
Wi-Fi Display Source may not be able to connect with Wi-Fi Display Sink after switching Wi-Fi Display Sinks of different vendors.	Still under debugging.
Bluetooth and WLAN do not work together.	Still under debugging.
The system gets no response or reboot after the long-time GPU multiple-instance test.	Still under debugging.

9 CTS Known Issues

For details, see the *CTS and CTS-Verifier Test Report*.

How to Reach Us:

Home Page:
freescale.com

Web Support:
freescale.com/support

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