NXP Semiconductors
Release Notes

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Android™ Release Notes

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1 Release Description

The i.MX Android™ O8.1.0_1.4.0_7ULP-ga release is an RFP (GA) release for the Android Oreo (O) 8.1 platform on i.MX 7ULP applications processors.

i.MX Android O8.1.0_1.4.0_7ULP-ga release includes all necessary code, documents, and tools to assist users in building and running the Android 8.1 platform on the i.MX 7ULP hardware boards. Pre-built images are also included for a quick trial on the following platforms:

- i.MX 7ULP EVK board and platform

This release includes all porting and enhancements based on the 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 and the binary needed to boot the ARM Cortex-A7 core from the ARM Cortex-M4.

2 Supported Hardware SoC/ Boards

The supported hardware system-on-chip (SoCs)/boards are listed as follows:

- i.MX 7ULP EVK board and platform

3 Release Package Contents

The release package includes the following software and documents.

Table 1. Release package contents

i.MX Android proprietary source code package	• imx-o8.1.0_1.4.0_7ulp-ga.tar.gz: i.MX Android proprietary source code package to enable Android on i.MX boards.
Documents	The following documents are included in android_o8.1.0_1.4.0_7ulp-ga_docs.tar.gz • *Android™ Quick Start Guide* (AQSUG): A document that explains how to run the Android platform on an i.MX board using prebuilt images. • *Android™ User's Guide* (AUG): A document describing procedures for configuring and building this release package. • *Android™ Release Notes* (ARN): A document that introduces key updates and known issues in this release. • *i.MX Android™ Extended Codec Release Notes* (IMXACRN): A document that provides the extended codec information. • *Android™ Frequently Asked Questions* (AFAQ): A document that contains the answers to the Frequently Asked Questions (FAQs). • *i.MX Graphics User's Guide* (IMXGRAPHICUG): A document that describes GPU 2D API, Tools, Memory, and Application programming guidelines.
Tools	Tools in android_o8.1.0_1.4.0_7ulp-ga_tools.tar.gz • MFGTool: Manufacturing tools for i.MX platform. • VivanteVTK-v6.2.2.1.7.0.tgz: GPU tools for Vivante GPU 6.2.2 p1 driver. For more information about these tools, see *i.MX Graphics User's Guide* (IMXGRAPHICUG).
Prebuilt images	You can test the Android platform with a prebuilt image on i.MX reference board before building any code: • android_o8.1.0_1.4.0_7ulp-ga_image_7ulpevk.tar.gz: Prebuilt images with NXP extended features for the i.MX 7ULP EVK board. The extended features include additional multimedia format support. • Prebuilt imx7ulp_m4_demo.img is loaded and executed by the Arm Cortex-M4 core. It is flashed to the NOR flash and supplies some essential functions to run Linux. All prebuilt images are in a separate package. See the *Android™ Quick Start Guide* (AQSUG) and *Android™ User's Guide* (AUG) to choose the appropriate image.

4 Features

This section contains features in this package.

Table 2. Features

Feature	i.MX 7ULP EVK	Remarks
Google Oreo 8.1 release	Y	Based on the android-8.1.0_r23 release.
Linux 4.9.94 kernel (merged with AOSP kernel)	Y	Based on the Linux BSP 4.9.88_2.0.0_ga release
U-Boot	Y	v2017.03

Table continues on the next page...

Table 2. Features (continued)

Feature	i.MX 7ULP EVK	Remarks
Cortex-M4 core image	Y	Based on the imx7ulp-m4-demo-2.4.0.bin release package
Graphic-HW	Y	VeriSilicon GC7000 GPU with 6.2.2 p1 driver
Graphic-HW 3D acceleration	Y	OpenGLES 1.1/2.0 through GC7000 NanoULTRA
Graphic-HW accelerated UI surface composition	Y	HWC through GPU 2D
Boot source	External SD	-
Splash Screen	Y	-
UI (input)	USB Mouse	-
UI (display)	HDMI/MIPI display	-
UI (dual display, LVDS+HDMI, UI mirror displayed on second device)	N	-
UI (brightness control)	Y	-
Storage - External Media	Y	UDisk
Connectivity - Ethernet	N/A	-
Connectivity - Bluetooth® wireless technology	Y	Hardware: • Qualcomm 1PJ (QCA-9377) Profiles: • A2DP Source • AVRCP • BLE Host
Connectivity - Wi-Fi	Y	Hardware: • Qualcomm 1PJ (QCA-9377) Features: • AP mode
Connectivity - USB Tethering	N	Supports Wi-Fi as upstream
Power - CPU Freq	Y	-
Power - Bus Freq	Y	-
Media - Music Play	Y	-
Media - Sound Record	Y	-
Media - Video Play	Y	-
Media - Camera	N	-
Media - TVIN	N/A	-
Media - Dual Camera	N	-
Media - Camcorder	N	-
Media - USB Camera	Y	Logitech: • C920 • C525 • C270
Media - USB Mic	Y	-
Media - HDMI audio output	N/A	-

Table continues on the next page...

Table 2. Features (continued)

Feature	i.MX 7ULP EVK	Remarks
Misc - ADB over USB	Y	-
Misc - Fastboot utility	Y	-
Misc - SW update and factory reset	Y	-
Sensor - Magnetometer	N	-
Sensor - Accelerometer	N	-
Sensor - Gyroscope	N/A	-
Sensor - Light	N	-
Sensor - Pressure	N/A	-
Sensor - Temperature	N/A	-
Sensor-step detector	Y	-
Sensor-step counter	Y	-
File Base Encryption	Y	-
USB Accessory	Y	Google AOA v2.0
Screen Recording	N/A	-
Ethernet APK	N	-
webGL	Y	-

5 Multimedia Codecs

For multimedia codecs and features, see Section 5 in the Android 8.1 Compatibility Definition Document(CDD).

6 Extended Feature Packages

An enhanced multimedia experience is available for the Android platform. This release delivers an error-resilient, feature-rich multimedia solution by extending the existing multimedia features of the Android platform and introduces additional features.

For detailed extended and additional features, see *i.MX Android Extended Codec Release Notes* (IMXACRN). For more information, contact "L2manager-android@nxp.com".

7 Change Log

Compared to the N7.1.2_1.1.0_7ULP-PRC release, this release has the following major changes:

- Upgraded the Android code base from android-7.1.2_r5 to android-8.1.0_r23.
- Removed device partition and added vendor partition.
- Upgraded Camera HAL API version from 3.0 to 3.2.
- Enabled DRM-based gralloc and EGL. Upgraded the kernel from v4.1.33 to v4.9.94.

- Added step detector and step counter.
- Changed Wi-Fi hardware from Broadcom 1DX_BCM4343 to Qualcomm 1PJ (QCA-9377).

8 Known Issues and Limitations

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

Table 3. Known issues and limitations

Issue description	Remarks
System may be down or panic when bootup with the following error information: 'mmcblk0: error -110 sending status command'	This issue may be raised on the sdr104 card.
The board cannot boot up when it is connected with the PC through the USB cable on the USB OTG port.	Hardware issue.
The kernel does not support software shutdown.	• The system shuts down for a while (about 10 seconds), and then it boots up again when rebooting with parameter RB_POWER_OFF. • The system does not realize pm_power_off on i.MX 7ULP EVK.
U-Boot goes down when erasing Kingston's SD card.	Due to low erasing speed, U-Boot is down when sending the erase command on some Kingston SD cards.
The system UI may not respond after system reboot.	It is a hardware performance limitation. Due to low CPU performance, the system UI may meet Application Not Responding (ANR).
The camera application may freeze after the device is locked and woken up during camera recording.	It is a hardware performance limitation. During powering off, the performance gets worse and works slower, some resources cannot be released.
The camera application may crash when some background section options are selected in the video section.	It is a hardware performance limitation. Only 240p recording is supported, but this function needs to support 480p.
Fail to play some 480p or 720p video.	It is a hardware performance limitation. Only video playback with resolution 480p and below is supported.
The CtsPrintTestCases module is not executed.	The process crashes and the CtsPrintTestCases module is not executed. The CtsPrintTestCases module cannot be executed with the LDPI device, because there is

Table 3. Known issues and limitations

Issue description	Remarks
	no related LDPI resources in the framework.

9 Revision History

Table 4. Revision history

Revision number	Date	Substantive changes
N7.1.2_1.1.0_7ULP-PRC	06/2017	Initial release
O8.1.0_1.4.0_7ULP-ga	06/2018	i.MX 7ULP GA release

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