

Android™ Release Notes

1 Release Description

The i.MX Android™ P9.0.0_2.3.3-AUTO release is an Android Automotive GA (RFP) release on NXP's i.MX 8QuadXPlus MEK board and platform, which is based on Pie 9.0. It supports the device type In-vehicle infotainment defined in <https://source.android.com/devices/automotive/>.

i.MX Android P9.0.0_2.3.3-AUTO release includes all necessary code, documents, and tools to assist users in building and running Android Automotive on the i.MX 8QuadXPlus MEK board from scratch. Pre-built images are also included for a quick trial on the following platforms:

- i.MX 8QuadXPlus MEK 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.

2 Supported Hardware SoC/Boards

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

- i.MX 8QuadXPlus MEK Board and Platform

3 Release Package Contents

The P9.0.0_2.3.3-AUTO release package includes the following software and documents.

Table 1. Release package contents

i.MX Android proprietary source code package	<ul style="list-style-type: none"> • imx-p9.0.0_2.3.3-auto.tar.gz: i.MX Android Automotive proprietary source code package to enable Android Automotive on i.MX boards. For example, Hardware Abstraction Layer implementation, hardware codec acceleration, etc.
Documents	<p>The following documents are included in android_p9.0.0_2.3.3-auto_docs.tar.gz:</p> <ul style="list-style-type: none"> • <i>Android™ Quick Start Guide (AQSUG)</i>: A document that explains how to run Android Automotive on an i.MX board using prebuilt images.

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Table 1. Release package contents (continued)

	<ul style="list-style-type: none"> • <i>Android™ User's Guide</i> (AUG): A document describing procedures for configuring and building this release package. • <i>Android™ Release Notes</i> (ARN): A document that introduces key updates and known issues in this release. • <i>i.MX Android™ Extended Codec Release Notes</i> (IMXACRN): A document that provides the extended codec information. • <i>i.MX Android™ Security User's Guide</i> (ASUG): A document that describes how to do customization work on security features supported by i.MX Android software. • <i>i.MX Graphics User's Guide</i> (IMXGRAPHICUG): A document that describes GPU 2D API, Tools, Memory, and Application programming guidelines.
Prebuilt images	<p>You can test Android Automotive with a prebuilt image on i.MX reference board before building any code:</p> <ul style="list-style-type: none"> • android_p9.0.0_2.3.3-auto_image_8qmek.tar.gz: Prebuilt images with NXP extended features with the EVS function enabled in the Cortex-M4 CPU core for the i.MX 8QuadXPlus MEK board. The extended features include more multimedia format support. • android_p9.0.0_2.3.3-auto_image_8qmek2.tar.gz: Prebuilt images with NXP extended features without EVS function enabled in the Cortex-M4 CPU core for the i.MX 8QuadXPlus MEK board. <p>All prebuilt images are in a separate package. See the <i>Android™ Quick Start Guide</i> (AQSUG) and <i>Android™ User's Guide</i> (AUG) to choose the appropriate image.</p>

NOTE

VivanteVTK tool is no longer provided in the Android release package. It is available on <https://www.nxp.com/imx6tools> (for example: Tools -> Vivante VTK -> VivanteVTK-v6.2.4.p4.1.7.8).

4 Features

Table 2. Features

Feature	i.MX 8QuadXPlus MEK	Remarks
Google Pie 9.0 release	Y	Based on android-9.0.0_r47 release.
Linux 4.14.98 kernel (merged with the AOSP kernel)	Y	Based on Linux® OS BSP L4.14.98-2.0.0_ga release.
U-Boot	Y	v2018.03
Trusty OS	Y	-
Graphics-HW	Y	VeriSilicon GC7000L GPU for i.MX 8QuadXPlus with 6.2.4.p4 driver
Graphics-HW 3D acceleration	Y	OpenGL ES 1.1/2.0/3.1 through GC7000L for i.MX 8QuadXPlus.

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Table 2. Features (continued)

Feature	i.MX 8QuadXPlus MEK	Remarks
Graphics-HW accelerated UI surface composition	Y	OpenGL ES 3.1 through GC7000L for i.MX 8QuadXPlus.
Boot source	eMMC	-
SCFW	Y	Version 1.2.2
SECO firmware	Y	Version 2.3.1
Splash Screen	Y	Supports USB mouse.
UI (input)	Y	-
UI (display)	HDMI display	Supports LVDS-to-HDMI display.
UI (brightness control)	N	-
Storage - External Media	Y	-
Connectivity - Ethernet	N	-
Connectivity - Bluetooth® wireless technology	Y	Qualcomm 1CQ QCA6174A. Profiles: A2DP Sink, AVRCP, BLE Host, HFP, PBAPClient, MAPMCE, PAN, HID Device.
Connectivity - Wi-Fi	Y	Qualcomm 1CQ QCA6174A. Features: STA mode, AP mode, Wi-Fi Direct, AP/STA Concurrency.
Connectivity - USB Tethering	Y	Supports Wi-Fi as upstream.
Power - CPU Freq	Y	-
Power - Bus Freq	Y	-
Media - Music Play	Y	ESAI+CS42888 (no support for multichannel).
Media - HDMI audio output	N	-
Misc - ADB over USB	Y	-
Misc - Fastboot utility	Y	-
Misc - SW update and factory reset	Y	-
File-based Encryption	Y	-
Ethernet APK	N	-
webGL	Y	-

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Table 2. Features (continued)

Feature	i.MX 8QuadXPlus MEK	Remarks
USB TYPEC PD	Y	-
OTA for A/B	Y	-
TEE backed Keymaster HAL	Y	This is based on i.MX Trusty OS TEE firmware.
TEE backed AVB	Y	This is based on i.MX Trusty OS TEE firmware and secure storage of eMMC chip. In this release, the RPMB part needs to be initialized manually.
Media rearview camera	Y	MAX9286 camera.
Car Audio Policy	Y	Alarm, notification, and system sounds are played from the audio jack on CPU board. Other sounds such as music are played from the extended audio board.

5 Multimedia Codecs

For multimedia codecs and features, see Section 5 in the [Google Pie 9.0 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 more information and details, contact "L2manager-android@nxp.com"

7 Change Log

- Upgraded the Android code base from android-9.0.0_r30 to android-9.0.0_r47.
- Added support for i.MX 8QuadXPlus MEK with c0 chip.

8 Known Issues and Limitations

The known issues about the hardware and hardware rework instructions are not included in this document. 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
The i.MX 8QuadXPlus MEK board may power down during the CTS full running process.	This is an issue about communication between Cortex-A core and Cortex-M core. It will be fixed in the P9.0.0_2.3.5-AUTO release.

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Table 3. Known issues and limitations (continued)

Issue description	Remarks
Power on the i.MX 8QuadXPlus MEK board when the board is connected to the PC through the Type-C cable. This may cause PC shutdown.	This is a hardware known issue about TCPC PHY chip. Check the content on https://community.nxp.com/docs/DOC-345672 to learn how to avoid this issue.
The 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 with only PTP enabled in the device.
For i.MX 8QuadXPlus, it fails to boot from some types of eMMC.	<p>In the default settings, the UUU script burns the boot image into eMMC Boot Partition with 32KB offset. Although it works properly on the MEK board, it fails to read the boot image on some types of eMMC.</p> <p>There are two possible solutions:</p> <ul style="list-style-type: none"> • Download flash.bin in the eMMC Boot Partition + 0KB offset + eMMC fastboot enabled in fuse. • Download flash.bin in the eMMC User Partition + 32KB offset (eMMC fastboot can be either enabled or disabled in fuse). <p>For more information, see https://community.nxp.com/docs/DOC-342285.</p>

9 Revision History

Table 4. Revision history

Revision number	Date	Substantive changes
O8.1.0_1.1.0_AUTO-EAR	02/2018	Initial release
O8.1.0_1.1.0_AUTO-beta	05/2018	i.MX 8QuadXPlus/8QuadMax Beta release
P9.0.0_1.0.2-AUTO-alpha	11/2018	i.MX 8QuadXPlus/8QuadMax Automotive Alpha release
P9.0.0_1.0.2-AUTO-beta	01/2019	i.MX 8QuadXPlus/8QuadMax Automotive Beta release
P9.0.0_2.1.0-AUTO-ga	04/2019	i.MX 8QuadXPlus/8QuadMax Automotive GA release
P9.0.0_2.1.0-AUTO-ga	08/2019	Updated the location of the SCFW porting kit
P9.0.0_2.3.3-AUTO	02/2020	i.MX 8QuadXPlus MEK GA release

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