ARN

Android Release Notes

Rev. android-13.0.0_1.2.0 — 14 April 2023 **Release notes**

Document Information

Information	Content
Keywords	Android, i.MX, android-13.0.0_1.2.0
Abstract	i.MX android-13.0.0_1.2.0 is a release for Android 13 on the i.MX 8M Mini, i.MX 8M Nano, i.MX 8M Plus, i.MX 8M Quad, i.MX 8ULP, i.MX 8QuadMax, and i.MX 8QuadXPlus applications processors of NXP.

1 Release Description

i.MX android-13.0.0_1.2.0 is a release for Android 13 on the i.MX 8M Mini, i.MX 8M Nano, i.MX 8M Plus, i.MX 8M Quad, i.MX 8ULP, i.MX 8QuadMax, and i.MX 8QuadXPlus applications processors of NXP.

i.MX android-13.0.0_1.2.0 release includes all necessary code, documents, and tools to assist users in building and running Android 13 on the i.MX 8M Mini EVK, i.MX 8M Nano EVK, i.MX 8M Plus EVK, i.MX 8M Quad EVK, i.MX 8ULP EVK i.MX 8QuadMax MEK and i.MX 8QuadXPlus MEK Board. The corresponding release quality for each board is listed in the following table.

Table 1. Release description

Platform name	Release quality
i.MX 8M Mini EVK	GA (RFP)
i.MX 8M Nano EVK	GA (RFP)
i.MX 8M Plus EVK	GA (RFP)
i.MX 8M Quad EVK	GA (RFP)
i.MX 8ULP EVK	Beta (PRC)
i.MX 8QuadMax	GA (RFP)
i.MX 8QuadXPlus	GA (RFP)

The prebuilt images are also included for a quick trial on NXP i.MX 8M Mini EVK, i.MX 8M Nano EVK, i.MX 8M Plus EVK, i.MX 8M Quad EVK i.MX 8ULP EVK, i.MX 8QuadMax MEK, i.MX 8QuadXPlus MEK Board and Platforms.

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 for 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 8M Mini EVK
  Supported daughter boards:
  – With DDR4 RAM, ROHM BD71847 PMIC chip
  – With LPDDR4 RAM, NXP PCA9450 PMIC chip, and NXP 88W8987 Wi-Fi/Bluetooth module.
  Supported mother board:
  – Rev. C mother board
- i.MX 8M Nano EVK
  Supported daughter boards:
  – With DDR4 RAM, ROHM BD71847 PMIC chip
  – With LPDDR4 RAM, NXP PCA9450 PMIC chip and NXP 88W8987 Wi-Fi/Bluetooth module
  Supported mother board:
  – Rev. C mother board
- i.MX 8M Plus (Silicon Revision A1) EVK Board and Platform
- i.MX 8M Quad EVK Rev. A Board and Platform
- i.MX 8ULP (A1) EVK Board and Platform, i.MX 8ULP (A1) EVK 9x9 Board and Platform.
- i.MX 8QuadMax (Silicon Revision B0) MEK Board and Platform
- i.MX 8QuadXPlus (Silicon Revision B0 and C0) MEK Board and Platform

3 Release Package Contents

The android-13.0.0_1.2.0 release package includes the following software and documents.

Table 2. Release package contents

i.MX Android proprietary source code package	• `imx-android-13.0.0_1.2.0.tar.gz`: i.MX Android proprietary source code package to enable Android on i.MX boards. For example, Hardware Abstraction Layer implementation, hardware codec acceleration.
Documents	The following documents are included in `android-13.0.0_1.2.0_docs.zip`: • *Android Quick Start Guide* (AQSG): 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. • *i.MX Android Security User's Guide* (ASUG): A document that describes how to do customization work on security features supported by i.MX Android software. • *i.MX TensorFlow Lite on Android User's Guide* (IMXTFLUG): A document that describes the TensorFlow Lite on Android platform. • *i.MX Graphics User's Guide* (IMXGRAPHICUG): A document that describes GPU 2D API, Tools, Memory, and Application programming guidelines.
Prebuilt images	You can test the Android platform with a prebuilt image on i.MX reference board before building any code: • `android-13.0.0_1.2.0_image_8mmevk.tar.gz`: Prebuilt images with NXP extended features for the i.MX 8M Mini EVK board. • `android-13.0.0_1.2.0_image_8mnevk.tar.gz`: Prebuilt images with NXP extended features for the i.MX 8M Nano EVK board. • `android-13.0.0_1.2.0_image_8mpevk.tar.gz`: Prebuilt images with NXP extended features for the i.MX 8M Plus EVK board. • `android-13.0.0_1.2.0_image_8mqevk.tar.gz`: Prebuilt images with NXP extended features for the i.MX 8M Quad EVK board. • `android-13.0.0_1.2.0_image_8ulpevk.tar.gz`: Prebuilt images with NXP extended features for the i.MX 8ULP EVK board and i.MX 8ULP EVK 9x9 board. • `android-13.0.0_1.2.0_image_8qmek.tar.gz`: Prebuilt images with NXP extended features for the i.MX 8QuadMax MEK board and i.MX 8QuadXPlus MEK board. 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 3. Features

Feature	i.MX 8M Mini EVK	i.MX 8M Nano EVK	i.MX 8M Plus EVK	i.MX 8M Quad EVK	i.MX 8ULP EVK	i.MX 8Quad Max MEK	i.MX 8 Quad XPlus MEK	Remarks
Google Android 13 release	Y	Y	Y	Y	Y	Y	Y	Based on android-13.0.0_r30 release

Table 3. Features*...continued*

Feature	i.MX 8M Mini EVK	i.MX 8M Nano EVK	i.MX 8M Plus EVK	i.MX 8M Quad EVK	i.MX 8ULP EVK	i.MX 8Quad Max MEK	i.MX 8 Quad XPlus MEK	Remarks
Linux 5.15.74 kernel (merge with AOSP kernel)	Y	Y	Y	Y	Y	Y	Y	Based on Linux OS BSP LF5.15.71_2.2.0 release.
Generic Kernel Image	Y	Y	Y	Y	Y	N	N	Based on AOSP GKI android13-5.15-2023-01_r1 release
U-Boot	Y	Y	Y	Y	Y	Y	Y	v2022.04.
Trusty OS	Y	Y	Y	Y	Y	Y	Y	-
Graphic-HW	Y	Y	Y	Y	Y	Y	Y	VeriSilicon GC7000NanoUltra GPU with the 6.4.3.p4 driver for i.MX 8M Mini EVK. VeriSilicon GC7000UL GPU with 6.4.3.p4 driver for i.MX 8M Nano EVK and i.MX 8M Plus EVK. VeriSilicon GC7000L GPU with 6.4.3.p4 driver for i.MX 8M Quad EVK. VeriSilicon GCNANOULTRA31 GPU with 6.4.3.p4 driver for i.MX 8ULP EVK. VeriSilicon GC7000XSVX GPU with 6.4.3.p4 driver FOR i.MX 8Quad Max. VeriSilicon GC7000L GPU with 6.4.3.p4 driver for i.MX 8Quad XPlus.
Graphic-HW 3D acceleration	Y	Y	Y	Y	Y	Y	Y	OpenGL ES1.1/2.0 through GC7000NanoUltra for i.MX 8M Mini EVK. OpenGL ES1.1/2.0/3.1 through GC7000UL for i.MX 8M Nano EVK and i.MX 8M Plus EVK. OpenGL ES1.1/2.0/3.1 through GC7000L for i.MX 8M Quad EVK. OpenGL ES1.1/2.0/3.1 through GCNANOULTRA31 for i.MX 8ULP EVK OpenGL ES 1.1/2.0/3.1/3.2 via GC7000XSVX for i.MX 8Quad Max MEK OpenGL ES 1.1/2.0/3.1 via GC7000L

Table 3. Features*...continued*

Feature	i.MX 8M Mini EVK	i.MX 8M Nano EVK	i.MX 8M Plus EVK	i.MX 8M Quad EVK	i.MX 8ULP EVK	i.MX 8Quad Max MEK	i.MX 8 Quad XPlus MEK	Remarks
Android Neural Network API acceleration	N	Y	Y	Y	Y	Y	Y	Android Neural Network API 1.3 accelerated through GC7000 UL for i.MX 8M Nano EVK. Android Neural Network API 1.3 accelerated through GC7000L for i.MX 8M Quad EVK. Android Neural Network API 1.3 accelerated through NPU for i.MX 8M Plus EVK. Android Neural Network API 1.3 accelerated through GCNANOULTRA31 for i.MX 8ULP EVK Android Neural Network API 1.3 accelerated through GC7000L for i.MX 8Quad XPlus. Android Neural Network API 1.3 accelerated through GC7000XSVX for i.MX 8Quad Max.
Graphic-HW accelerated UI surface composition	Y	Y	Y	Y	Y	Y	Y	OpenGL ES2.0 through GC7000NanoUltra for i.MX 8M Mini EVK. OpenGL ES3.1 through GC7000UL for i.MX 8M Nano EVK and i.MX 8M Plus EVK. OpenGL ES3.1 through GC7000L for i.MX 8M Quad EVK. OpenGL ES3.1 via GCNANOULTRA31 for i.MX 8ULP EVK. OpenGL ES 3.2 via GC7000 XSVX for i.MX 8Quad Max MEK. OpenGL ES 3.1 via GC7000L for i.MX 8QuadXPlus MEK.
SCFW	N	N	N	N	N	Y	Y	Version 1.15.0
SECO firmware	N	N	N	N	N	Y	Y	Version 3.8.5.
Boot source	SD/ eMMC	SD/ eMMC	SD/ eMMC	SD/ eMMC	eMMC	SD/ eMMC	SD/ eMMC	-
Splash Screen	Y	Y	Y	Y	Y	Y	Y	-
UI (input)	Y	Y	Y	Y	Y	Y	Y	USB Mouse and Multi-touch on the MIPI panel display.

Table 3. Features*...continued*

Feature	i.MX 8M Mini EVK	i.MX 8M Nano EVK	i.MX 8M Plus EVK	i.MX 8M Quad EVK	i.MX 8ULP EVK	i.MX 8Quad Max MEK	i.MX 8 Quad XPlus MEK	Remarks
UI (display)	MIPI-DSI-to-HDMI/ MIPI panel	MIPI-DSI-to-HDMI/ MIPI panel	HDMI/ MIPI-to-HDMI/ MIPI panel/ LVDS-to-HDMI/ LVDS panel/ dual channel LVDS to HDMI	HDMI/ MIPI-DSI-to-HDMI/ MIPI panel	HDMI/ MIPI/ EPDC	HDMI/ MIPI-to-HDMI/ MIPI-panel/ LVDS-to-HDMI Display	HDMI Display	i.MX 8M Mini EVK max resolution: • MIPI-to-HDMI: 1920x1080 • MIPI Panel: 1080x1920 i.MX 8M Nano EVK max resolution: • MIPI-to-HDMI: 1920x1080 • MIPI Panel: 1080x1920 i.MX 8M Plus EVK max resolution: • Physical HDMI: 3840x2160 • MIPI-to-HDMI: 1920x1080 • LVDS-to-HDMI: 1280x720 • LVDS panel: 1920x1200 • MIPI panel: 1080x1920 • Dual-channel LVDS to HDMI: 1920x1080 i.MX 8M Quad EVK max resolution: • Physical HDMI: 3840x2160 • MIPI-to-HDMI: 1280x720 • MIPI panel: 1080x1920 i.MX 8ULP EVK max resolution: • HDMI: 720x480 • MIPI: 720x1280 • EPDC: 1024x758 i.MX 8Quad Max MEK max resolution: • physical HDMI:3840x2160 • LVDS-to-HDMI/MIPI-to-HDMI: 1920x1080 • MIPI panel: 1080x1920 i.MX 8QuadXPlus MEK max resolution: • LVDS-to-HDMI/MIPI-to-HDMI: 1920x1080
UI (dual displays, UI mirror displayed on second device)	N	N	Y	Y	N	Y	Y	i.MX 8M Quad EVK and i.MX 8M Plus EVK supports on MIPI-DSI-to-HDMI and HDMI dual displays. i.MX 8Quad Max MEK and i.MX 8QuadXPlus MEK support dual LVDS-to-HDMI display
UI (brightness control)	Y	Y	Y	Y	Y	Y	N	With MIPI panel display for all boards.

Table 3. Features*...continued*

Feature	i.MX 8M Mini EVK	i.MX 8M Nano EVK	i.MX 8M Plus EVK	i.MX 8M Quad EVK	i.MX 8ULP EVK	i.MX 8Quad Max MEK	i.MX 8 Quad XPlus MEK	Remarks
								With LVDS panel display for i.MX 8M Plus EVK.
Storage - External Media	Y	Y	Y	Y	Y	Y	Y	i.MX 8M Mini EVK and i.MX 8M Nano EVK support U-disk on the USB 2.0 port. i.MX 8M Plus EVK and i.MX 8M Quad EVK support U-disk on the USB Type-A host port. i.MX 8ULP EVK supports U-disk on the USB 0 port and USB 1 port. i.MX 8Quad Max MEK and i.MX 8QuadXPlus MEK support U-disk on the usb2.0 port.
Connectivity - Ethernet	N	N	N	N	N	N	N	-
Connectivity - Bluetooth wireless technology	Y	Y	Y	Y	Y	Y	Y	Hardware: • NXP 88W8987 for i.MX 8M Mini EVK LPDDR4 board and i.MX 8M Nano EVK LPDDR4 board • NXP 88W8997 for i.MX 8M Plus EVK. • PCIE9098 (Murata LBEE5 ZZ1XL) for i.MX 8M Quad EVK Rev. A board, i.MX 8Quad Max MEK and i.MX 8 QuadXPlus MEK. • NXP IW416 (v2) for i.MX 8ULP EVK board Profiles: • A2DP Source • AVRCP • BLE Host • HSP • HID Host • HID Device • PAN • OPP
Connectivity - Wi-Fi	Y	Y	Y	Y	Y	Y	Y	Hardware: • NXP 88W8987 for i.MX 8M Mini EVK LPDDR4 board and i.MX 8M Nano EVK LPDDR4 board • NXP 88W8997 for i.MX 8M Plus EVK.

Table 3. Features*...continued*

Feature	i.MX 8M Mini EVK	i.MX 8M Nano EVK	i.MX 8M Plus EVK	i.MX 8M Quad EVK	i.MX 8ULP EVK	i.MX 8Quad Max MEK	i.MX 8 Quad XPlus MEK	Remarks
								• PCIE9098 (Murata LBEE5 ZZ1XL) for i.MX 8MQuad EVK Rev. A board, i.MX 8Quad Max MEK and i.MX 8 QuadXPlus MEK. • NXP IW416 (v2) for i.MX 8ULP EVK board Features: • STA mode • AP mode • Wi-Fi Direct • AP/STA Concurrency • MAC randomization
Connectivity - USB Tethering	Y	Y	Y	Y	Y	Y	Y	Supports Wi-Fi and Ethernet as upstream.
Power - CPU Freq	Y	Y	Y	Y	N	Y	Y	-
Power - Bus Freq	Y	Y	Y	Y	N	Y	Y	-
ISP	N	N	Y	N	N	N	N	VeriSilicon ISP8000NANO_ V1802 with 4.2.2p21 driver/ server for i.MX 8M Plus EVK.
Media - Music Play	Y	Y	Y	Y	Y	Y	Y	SSI+WM8524 for i.MX 8M Mini EVK, i.MX 8M Nano EVK, and i.MX 8M Quad EVK. SSI+WM8960 for i.MX 8M Plus EVK. SSI+WM8960 for i.MX 8ULP EVK. WM8960+CS42888+HDMI for i.MX 8Quad Max MEK. WM8960+CS42888 for i.MX 8 QuadXPlus MEK.
Media - Sound Record	Y	Y	Y	Y	Y	Y	Y	PDM for i.MX 8M Mini EVK, i. MX 8M Nano EVK. AK5558 for i.MX 8M Quad EVK SSI+WM8960+PDM for i.MX 8M Plus EVK. SSI+WM8960 for i.MX 8ULP EVK. ESAI+CS42888 for i.MX 8Quad Max MEK and i.MX 8 QuadXPlus MEK.
Media - Video Play	Y	Y	Y	Y	Y	Y	Y	For i.MX 8M Mini, i.MX 8M plus, i.MX 8M Quad, i.MX 8Quad Max and i.MX 8

Table 3. Features*...continued*

Feature	i.MX 8M Mini EVK	i.MX 8M Nano EVK	i.MX 8M Plus EVK	i.MX 8M Quad EVK	i.MX 8ULP EVK	i.MX 8Quad Max MEK	i.MX 8 Quad XPlus MEK	Remarks
								QuadXPlus which have VPU integrated, check the *i.MX Android Extended Codec Release Notes* (IMXACRN) to find the information about the supported format, resolution, frame rate, and bit rate. For i.MX 8M Nano and i.MX 8ULP, which do not have VPU integrated, the video playback is supported by Google software decoder.
Media-HDR Video Play	N	N	N	Y	N	N	N	-
Media - Camera	Y	Y	Y	Y	Y	Y	Y	OV5640 CSI MIPI camera for i.MX 8M Mini EVK, i.MX 8M Nano EVK, i.MX 8M Quad EVK i.MX 8ULP EVK, i.MX 8Quad Max MEK and i.MX 8 QuadXPlus MEK. For i.MX 8M Plus EVK: • Two Basler cameras (max resolution 1920x1080) • Basler + OV5640 (Basler max resolution 3840x2160 depends on the boot parameter) • Single basler (max resolution 3840x2160 depends on the boot parameter) • Single OV5640 • Two OS08A20 (max resolution 1920x1080) • Single OS08A20 (max os08a20 resolution can reach 3840x2160 depends on the boot parameter)
Media HDMI RX	N	N	N	N	N	Y	N	-
Media - TVIN	N	N	N	N	N	N	N	-
Media - Dual Camera	Y	Y	Y	Y	Y	Y	Y	-
Media - Camcorder	Y	Y	Y	Y	Y	Y	Y	-
Media - USB Camera	Y	Y	Y	Y	Y	Y	Y	USB camera supports C920, C930, and C270. Can only

Table 3. Features*...continued*

Feature	i.MX 8M Mini EVK	i.MX 8M Nano EVK	i.MX 8M Plus EVK	i.MX 8M Quad EVK	i.MX 8ULP EVK	i.MX 8Quad Max MEK	i.MX 8 Quad XPlus MEK	Remarks
								work with the Camera2 Basic application.
Media - USB Mic	Y	Y	Y	Y	Y	Y	Y	-
Media - HDMI audio output	N	N	Y	Y	Y	Y	N	-
Media-DSD Playback	N	N	N	N	N	N	N	-
Media-PlayReady DRM	N	N	N	N	N	N	N	-
Media-WideVine DRM	Y	N	Y	Y	N	N	N	Supports WideVine DRM Level 3 for i.MX 8M Mini EVK with GMS package. Supports WideVine DRM Level 1 for i.MX 8M Plus EVK and i.MX 8M Quad EVK.
Media-MCU Playback	Y	N	Y	N	Y	N	N	Audio playback based on: • FreeRTOS on the Cortex-M4 core for i.MX 8M Mini EVK. • FreeRTOS on the Cortex-M7 core for i.MX 8M Nano EVK. • FreeRTOS on Cortex-M33 core for i.MX 8ULP EVK.
Media-Hi-Res audio output	Y	N	N	Y	N	Y	Y	High-resolution audio output from Audio Expansion Board for i.MX 8M Mini EVK and i.MX 8M Quad EVK. • 2 channel: 384000, 768000 sampling rate • 4 channel: 48000, 96000, 192000, 384000, 768000 sampling rate • 6 channel: 48000, 96000, 192000, 384000 sampling rate • 8 channel: 48000, 96000, 192000, 384000 sampling rate For i.MX 8Quad Max MEK and i.MX 8QuadXPlus MEK • 4/6/8 channel: 48000, 96000, 192000 sampling rate
Misc - ADB over USB	Y	Y	Y	Y	Y	Y	Y	-

Table 3. Features*...continued*

Feature	i.MX 8M Mini EVK	i.MX 8M Nano EVK	i.MX 8M Plus EVK	i.MX 8M Quad EVK	i.MX 8ULP EVK	i.MX 8Quad Max MEK	i.MX 8 Quad XPlus MEK	Remarks
Misc - Fastboot utility	Y	Y	Y	Y	Y	Y	Y	-
Misc - SW update and factory reset	Y	Y	Y	Y	Y	Y	Y	-
Sensor - Magnetometer	N	N	N	N	N	Y	Y	FXOS8700
Sensor - Accelerometer	N	N	N	N	N	Y	Y	FXOS8700
Sensor - Gyroscope	N	N	N	N	N	Y	Y	FXAS2100
Sensor - Light	N	N	N	N	N	Y	Y	ISL29023
Sensor - Pressure	N	N	N	N	N	Y	Y	MPL3115
Sensor - Temperature	N	N	N	N	N	Y	Y	MPL3115
Sensor- Pedometer	N	N	N	N	Y	N	N	-
File Based Encryption	Y	Y	Y	Y	Y	Y	Y	-
USB Accessory	Y	Y	Y	Y	Y	Y	Y	Google AOA v2.0
Ethernet APK	Y	Y	Y	Y	Y	Y	Y	-
imx-chip-tool APK	N	Y	N	N	N	N	N	Support Matter devices control tool imx-chip-tool apk
webGL	Y	Y	Y	Y	Y	Y	Y	-
Vulkan	N	Y	Y	Y	Y	Y	Y	-
OTA for A/B	Y	Y	Y	Y	Y	Y	Y	-
USB Type-C PD	Y	Y	Y	Y	N	Y	Y	Supports power role switch with devices that support USB power delivery.
DM Verity	Y	Y	Y	Y	Y	Y	Y	-
TEE backed Keymint HAL	Y	Y	Y	Y	Y	Y	Y	This is based on i.MX Trusty OS TEE firmware.
TEE backed AVB	Y	Y	Y	Y	Y	Y	Y	This is based on i.MX Trusty OS TEE firmware and secure storage of eMMC chip. In this release, users need to initialize the RPMB part manually.

5 Multimedia Codecs

For multimedia codecs and features, see *i.MX Android Extended Codec Release Notes* (IMXACRN).

6 Extended Features

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. Extended codec packages are provided on nxp.com with controlled access because they require additional licensing by a third party. Contact your sales representative for access.

For detailed extended and additional features, see the *i.MX Android Extended Codec Release Notes* (IMXACRN).

7 Change Logs

Compared to the android-13.0.0_1.0.0 release, android-13.0.0_1.2.0 release has the following major changes:

- Upgraded the Android code base from android-13.0.0_r7 to android-13.0.0_r30.
- Upgraded the kernel from v5.15.52 to v5.15.74.
- Upgraded ISP from v4.2.2.p19 to v4.2.2.p21.
- Supports CFI and UBSAN in Trusty OS.
- Supports compress TEE images at building time and decompress them at runtime.
- EPDC switches to use partial update mode by default in driver.
- Supports Matter device control tool `imx-chip-tool apk` on i.MX 8M Nano EVK.
- Supports PCIE9098 (Murata LBEE5ZZ1XL) on i.MX 8MQuad EVK, 8QuadMAX MEK, and 8QuadXPlus MEK.
- Supports i.MX 8ULP (A1) EVK 9x9 board.
- Supports new i.MX 8M MINI BB with Realtek RTL8211 ENET PHY.

8 Known Issues and Limitations

The known issues about the hardware and hardware rework instructions are not included in this document. There may be hardware-related reference materials for some reference boards. Make sure to check the link i.MX Application Processors to see if it is applicable.

Table 4. Known issues and limitations

Issue description	Remarks
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.
U-Boot hangs when erasing Kingston SD card.	U-Boot hangs when sending the erase command on some Kingston SD cards.
Manufacturing protection feature is not ready on i.MX 8ULP, so features which require the manufacturing protection public key like secure unlock and secure provisioning would be impacted.	-
CTS BT module on GMS image failed after integrating the SDIO-UART W8987 firmware version 16.92.21.p69.	On i.MX 8M Mini EVK and i.MX EVK 8M Nano EVK.

Table 4. Known issues and limitations*...continued*

Issue description	Remarks
Three cases in CTS CtsNetTestCases module failed after swicthing to PCIE9098 (Murata LBEE5ZZ1XL).	On i.MX 8M Quad EVK, i.MX EVK 8Quad Max MEK, and i.MX 8QuadXPlus MEK.
Wi-Fi direct could not work on PCIE9098 (Murata LBEE5ZZ1 XL) for some phone devices.	On i.MX 8M Quad EVK, i.MX EVK 8Quad Max MEK, and i.MX 8QuadXPlus MEK.

9 Revision History

Revision history

Revision number	Date	Substantive changes
P9.0.0_1.0.0-beta	11/2018	Initial release
P9.0.0_1.0.0-ga	01/2019	i.MX 8M, i.MX 8QuadMax, i.MX 8QuadXPlus GA release.
P9.0.0_2.0.0-ga	04/2019	i.MX 8M, i.MX 8QuadMax, i.MX 8QuadXPlus GA release.
P9.0.0_2.0.0-ga	08/2019	Updated the location of the SCFW porting kit.
android-10.0.0_1.0.0	02/2020	i.MX 8M Mini, i.MX 8M Quad, i.MX 8QuadMax, and i.MX 8QuadXPlus GA release.
android-10.0.0_1.0.0	03/2020	Deleted the Android 10 image.
android-10.0.0_2.1.0	04/2020	i.MX 8M Plus Alpha and i.MX 8QuadXPlus Beta release.
android-10.0.0_2.0.0	05/2020	i.MX 8M Mini, i.MX 8M Nano, i.MX 8M Quad, i.MX 8QuadMax, and i.MX 8 QuadXPlus GA release.
android-10.0.0_2.3.0	07/2020	i.MX 8M Plus EVK Beta1 release, and all the other i.MX 8 GA release.
android-11.0.0_1.0.0	12/2020	i.MX 8M Plus EVK Beta release, and all the other i.MX 8 GA release.
android-11.0.0_2.0.0	04/2021	i.MX 8M Mini, i.MX 8M Nano, i.MX 8M Plus, and i.MX 8M Quad GA release.
android-11.0.0_2.2.0	07/2021	i.MX 8M Mini, i.MX 8M Nano, i.MX 8M Plus, and i.MX 8M Quad GA release.
android-11.0.0_2.4.0	10/2021	i.MX 8ULP EVK Alpha release, i.MX 8M Mini, i.MX 8M Nano, i.MX 8M Plus, and i.MX 8M Quad GA release.
android-11.0.0_2.6.0	01/2022	i.MX 8ULP EVK Beta release, i.MX 8M Mini, i.MX 8M Nano, i.MX 8M Plus, and i.MX 8M Quad GA release.
android-12.0.0_1.0.0	03/2022	i.MX 8ULP EVK Beta release, i.MX 8M Mini, i.MX 8M Nano, i.MX 8M Plus, and i.MX 8M Quad GA release.
android-12.0.0_2.0.0	07/2022	i.MX 8ULP EVK Beta release, i.MX 8M Mini, i.MX 8M Nano, i.MX 8M Plus, and i.MX 8M Quad GA release.
android-12.1.0_1.0.0	10/2022	i.MX 8ULP EVK Beta release, i.MX 8M Mini, i.MX 8M Nano, i.MX 8M Plus, i.MX 8M Quad, i.MX 8QuadMax, and i.MX 8QuadXPlus GA release.
android-13.0.0_1.0.0	01/2023	i.MX 8ULP EVK Beta release, i.MX 8M Mini, i.MX 8M Nano, i.MX 8M Plus, i.MX 8M Quad, i.MX 8QuadMax, and i.MX 8QuadXPlus GA release.
android-13.0.0_1.2.0	03/2023	i.MX 8ULP EVK Beta release, i.MX 8M Mini, i.MX 8M Nano, i.MX 8M Plus, i.MX 8M Quad, i.MX 8QuadMax, and i.MX 8QuadXPlus GA release.

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