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i.MX Android Extended Codec Release Notes

Rev. automotive-12.1.0_1.1.0 —   **Release notes**
15 December 2022

Document information

Information	Content
Keywords	Android, i.MX, automotive-12.1.0_1.1.0
Abstract	The features described in the release notes are NXP extended media formats and codecs based on Android native media framework.

1 Release Description

The features described in the release notes are NXP extended media formats and codecs based on Android native media framework.

Only codecs that have no license restriction are included in the standard release package.

Codecs that have license restriction are provided in separate packages. For more details, see Section 6 Section 6.

2 Supported Hardware SoCs/Boards

- i.MX 8QuadMax MEK
- i.MX 8QuadXPlus MEK

3 What's New

- Switched to upstream kernel driver for Amphion VPU. RealVideo format is not supported on i.MX 8QuadXPlus and 8QuadMax.
- Enhanced stability and robustness.

4 Enhanced Features

4.1 Local playback

This section describes the local playback information.

4.1.1 Enhanced and extended formats and codecs

The following table provides the information about the enhanced codecs.

Table 1. Enhanced codecs

File extension	Demuxers	Video decoders	Audio decoders
`.mp3`	-	-	MP3
`.aac`/`.adts`	-	-	AAC LC/PLUS
`.wav`	-	-	LPCM
`.flac`	-	-	FLAC
`.amr`/`.awb`	-	-	AMR-NB/AMR-WB
`.mp4` `.mov`	MP4	MPEG4 SP/ASP except GMC H.264 BP/MP/HP MPEG2 H.263 MJPEG HEVC	AAC LC/PLUS MP3 Vorbis PCM
`.m4a`	MP4	-	AAC LC/PLUS

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Release notes

Rev. automotive-12.1.0_1.1.0 — 15 December 2022

2 / 13

Table 1. Enhanced codecs...*continued*

File extension	Demuxers	Video decoders	Audio decoders
`.3gp`	MP4	MPEG4 SP/ASP except GMC H.264 BP/MP/HP H.263 HEVC	AAC LC/PLUS AMR-NB AMR-WB
`.avi`	AVI	MPEG4 SP/ASP except GMC Xvid H.264 BP/MP/HP H.263 MJPEG HEVC	AAC LC/PLUS MP3 LPCM
`.wma`	ASF	-	WMA STD, PRO, Lossless
`.wmv`/`.asf`	ASF	VC-1 SP/MP/AP HEVC	WMA STD, PRO, Lossless
`.mkv`/`.mka`	MKV	H.264 BP/MP/HP MPEG4 SP/ASP except GMC Xvid VC-1 SP/MP/AP HEVC VP8 VP9 MPEG2 H.263	AAC MP3 WMA STD, PRO, Lossless Vorbis Opus PCM
`.flv`	FLV	Sorenson H.263 H.264 BP/MP/HP	MP3 AAC

`.mpg`
`.vob`
`.ts`
`.m2ts`
	MPEG2/PS	MPEG2 BP/MP	MP3
			AAC
			LPCM

	MPEG2/TS	MPEG2 BP/MP H.264 BP/MP/HP HEVC	
`.webm`	MKV	VP8 VP9	MP3 AAC LC/PLUS
`.rmvb`	RM	RV 8/9/10	RA
`.rm`	RM	RV 8/9/10	AAC
`.ra`	RM	-	RA

Note:

- *For detailed video and audio codec capability, see Section 5 Section 5.*
- *ASF, WMV, WMA, and RMVB are restricted codec packages and are not generally available. Install them from the Restricted Codec Package.*
- *MJPEG subtypes and MJPEG_2000 and MJPEG_B are not supported.*
- *MJPEG only supports YUV420 and YUV422 (horizontal) color formats.*
- *To enable tile format, use this command on board console:*

```
setprop media.hantro_vpu.enable-tile 1
```

4.2 Streaming playback

The following table provides the information about streaming playback.

Table 2. Feature matrix for streaming playback

Protocol	File format

HTTP	`.mp4/.3gp/.mov`
	`.flv/.f4v`
	`.avi`
	`.wmv/.asf`
	`.mpg/.vob/.ts`
	`.mp3`
	`.aac`
	`.wma`
	`.mkv`

RTP	`.ts`
UDP	`.ts`

To set up RTP/UDP streaming, perform the following operations:

- Install vlc 1.1.5 on Windows OS or Ubuntu.
- For UDP streaming server, run VLC with the following command:

```
vlc -vvv stream_file_name --sout udp://:1234
```

- For the RTP streaming server:
  1. Start VLC with the GUI, and select Media Streaming .
  2. Press Add to load the stream file, press Stream, and click Next.
  3. Select RTP/Mpeg Transport Stream from the drop-down list, and click Add.
  4. Enter your board IP address (such as 10.193.101.11) and base port number 5004, and deselect Activate Transcoding.
  5. Press Stream at the bottom. The server is started.
- For the UDP streaming client, run the Gallery on the Android platform with the following command:

```
am start -n com.android.gallery3d/
com.android.gallery3d.app.MovieActivity -d udp://:1234
```

- For the RTP streaming client, run Gallery on the Android platform with the following command:

```
am start -n com.android.gallery3d/
com.android.gallery3d.app.MovieActivity -d rtp://:5004
```

- For the uni-cast, use the client IP address when starting the server, and use the server IP address when starting the client.

4.3 Audio pass through streaming

Audio pass through supports audio AC-3 and DD-plus. To enable audio pass through, run the following command to set the property:

```
setprop vendor.persist.audio.pass.through 2000
```

IMXACRN

Release notes **Rev. automotive-12.1.0_1.1.0 — 15 December 2022**

4 / 13

5 Codec Specification

5.1 Video decoder for i.MX with VPU hardware

Table 3. Video decoder for i.MX with VPU hardware

	Format	Platform	Profile	Min. Resolution	Max. Resolution	Frame Rate	Bit Rate	Comment
Video Decoder	HEVC	i.MX 8M Quad	main/ main 10	144 x 144	4096 x 2304	60 fps	160 Mbps	-
		i.MX 8M Plus i.MX 8M Mini	main/ main 10	144 x 144	1920 x 1080	60 fps	100 Mbps	-
		i.MX 8Quad XPlus	main	144 x 144	4096 x 2160	30 fps	100 Mbps	-
		i.MX 8Quad Max	main	144 x 144	4096 x 2160	60 fps	100 Mbps	-
	H.264	i.MX 8M Quad	HP/MP/ BP	48 x 48	4096 x 2304	30 fps	60 Mbps	-
		i.MX 8M Plus i.MX 8M Mini	HP/MP/ BP	48 x 48	1920 x 1080	60 fps	60 Mbps	-
		i.MX 8Quad XPlus	HP/MP/ BP	64 x 64	4096 x 2160	30 fps	50 Mbps	-
		i.MX 8Quad Max	HP/MP/ BP	64 x 64	4096 x 2160	30 fps	50 Mbps	-
		i.MX6	HP/MP/ BP	64 x 64	1920 x 1080	60 fps	50 Mbps	-
	VP9	i.MX 8M Quad	profile 0, 2	144 x 144	4096 x 2304	60 fps	100 Mbps	-
		i.MX 8M Plus i.MX 8M Mini	profile 0, 2	144 x 144	1920 x 1080	60 fps	100 Mbps	-
	VP8	i.MX 8M Quad	-	48 x 48	1920 x 1080	60 fps	60 Mbps	-
		i.MX 8M Plus i.MX 8M Mini	-	48 x 48	1920 x 1080	60 fps	60 Mbps	-
		i.MX 8Quad XPlus	-	64 x 64	1920 x 1080	60 fps	60 Mbps	-

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Release notes **Rev. automotive-12.1.0_1.1.0 — 15 December 2022**

5 / 13

Table 3. Video decoder for i.MX with VPU hardware...*continued*

	Format	Platform	Profile	Min. Resolution	Max. Resolution	Frame Rate	Bit Rate	Comment
		i.MX 8Quad Max	-	64 x 64	1920 x 1080	60 fps	60 Mbps	-
		i.MX6Q	-	64 x 64	1920 x 1080	30 fps	20 Mbps	-
		i.MX6DualLite	-	64 x 64	1280 x 720	30 fps	20 Mbps	-
	MPEG4/ XVID	i.MX 8M Quad	SP/ASP	48 x 48	1920 x 1080	60 fps	-	-
		i.MX 8Quad XPlus	SP/ASP	64 x 64	1920 x 1080	60 fps	-	-
		i.MX 8Quad Max	SP/ASP	64 x 64	1920 x 1080	60 fps	-	-
		i.MX6	SP/ASP	64 x 64	1920 x 1080	30 fps	40 Mbps	-
	MPEG2	i.MX 8M Quad	MP	48 x 48	1920 x 1080	60 fps	-	-
		i.MX 8Quad XPlus	MP	64 x 64	1920 x 1080	60 fps	-	-
		i.MX 8Quad Max	MP	64 x 64	1920 x 1080	60 fps	-	-
		i.MX6	MP	64 x 64	1920 x 1080	30 fps	50 Mbps	-
	H.263	i.MX 8M Quad	P0/P3	48 x 48	1920 x 1080	60 fps	-	-
		i.MX 8Quad XPlus	P0/P3	64 x 64	1920 x 1080	60 fps	-	-
		i.MX 8Quad Max	P0/P3	64 x 64	1920 x 1080	60 fps	-	-
		i.MX6	P0/P3	64 x 64	1920 x 1080	30 fps	20 Mbps	-
	WMV9/ VC1	i.MX 8M Quad	AP/MP/ SP	48 x 48	1920 x 1080	60 fps	-	-
		i.MX 8Quad XPlus	AP/MP/ SP	64 x 64	1920 x 1080	60 fps	-	-
		i.MX 8Quad Max	AP/MP/ SP	64 x 64	1920 x 1080	60 fps	-	-

IMXACRN

Release notes   **Rev. automotive-12.1.0_1.1.0 — 15 December 2022**

6 / 13

Table 3. Video decoder for i.MX with VPU hardware...*continued*

	Format	Platform	Profile	Min. Resolutio	Max. Resolutio	Frame Rate	Bit Rate	Comment
		i.MX6	AP/MP/SP	64 x 64	1920 x 1080	30 fps	45 Mbps	-
	MJPEG	i.MX 8M Quad	-	48 x 48	1920 x 1080	60 fps	180 Mpixl	-
		i.MX 8Quad XPlus	-	64 x 64	1920 x 1080	60 fps	-	-
		i.MX 8Quad Max	-	64 x 64	1920 x 1080	60 fps	-	-
		i.MX6	-	64 x 64	1920 x 1080	30 fps	120 Mpixl	-
	RV	i.MX 8M Quad	8/9/10	48 x 48	1920 x 1080	60 fps	-	-
		i.MX6	8/9/10	64 x 64	1920 x 1080	30 fps	40 Mbps	-
	Sorenson Spark	i.MX 8Quad Max	-	64 x 64	1920 x 1080	60 fps	-	-
		i.MX 8Quad XPlus	-	64 x 64	1920 x 1080	60 fps	-	-

Note:

Please find supported formats based on each platform.

5.2 Video encoder for i.MX with VPU hardware

Table 4. Video encoder for i.MX with VPU hardware

	Format	Platform	Profile	Min. Resolutio	Max. Resolutio	Frame Rate	Bit Rate	Comment
Video Encoder	H.265	i.MX 8M Plus	main/ main 10	64 x 64	1920 x 1080	60 fps	-	-
	H.264	i.MX 8M Mini i.MX 8M Plus	HP/MP/ BP	132 x 96	1920 x 1080	60 fps	40 Mbps	-
		i.MX 8Quad XPlus	HP/MP/ BP	64 x 64	1920 x 1080	30 fps	-	-
		i.MX 8Quad Max	HP/MP/ BP	64 x 64	1920 x 1080	30 fps	-	-
		i.MX 6	BP	64 x 64	1920 x 1080	30 fps	20 Mbps	-

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Release notes

Rev. automotive-12.1.0_1.1.0 — 15 December 2022

7 / 13

Table 4. Video encoder for i.MX with VPU hardware*...continued*

	Format	Platform	Profile	Min. Resolutio	Max. Resolutio	Frame Rate	Bit Rate	Comment
	VP8	i.MX 8M Mini	-	132 x 96	1920 x 1080	30 fps	60 Mbps	-
	MPEG4	i.MX 6	SP	64 x 64	1280 x 720	30 fps	12 Mbps	-
	H.263	i.MX 6	P3	64 x 64	1280 x 720	30 fps	8 Mbps	-

5.3 Audio decoder

Table 5. Audio decoder

	Platform	Feature/ Profile	Feature/ Profile	Channel	Sample rate (kHz)	Bit rate (kbps)	Comment
DSP Audio Decoder	i.MX 8M Plus i.MX Quad XPlus i.MX 8Quad Max	MP3	MPEG-1 (Layer-1/ Layer-2/ Layer-3)	stereo/ mono	<= 48	32-448	-
			MPEG-2 (Layer-1/ Layer-2/ Layer-3)		<= 24	8-256	-
			MPEG-2.5 (Layer-3)		<= 12	8-160	-
Software Audio Decoder	i.MX All	MP3	MPEG-1 (Layer-1/ Layer-2/ Layer-3) MPEG-2 (Layer-1/ Layer-2/ Layer-3) MPEG-2.5 (Layer-3)	stereo/ mono	8-448	8-448	-
		AACLC	MPEG-2 AACLC MPEG-4 AACLC	<=5.1	8-96	8-368	Use the default AAC decoder of the Android OS.
		HE-AAC	HE-AAC V1 HE-AAC V2	stereo/ mono	8-96	Mono: 8-384 stereo: 16-768	Use the default AAC decoder of the Android OS.
		WMA STD	L1 @ QL1	stereo/ mono	44.1	64-161	-
			L2 @ QL1		<= 48	<= 161	-

Table 5. Audio decoder...*continued*

	Platform	Feature/ Profile	Feature/ Profile	Channel	Sample rate (kHz)	Bit rate (kbps)	Comment
			L3 @ QL1		<= 48	<= 385	-
		WMA Pro	M0a @ QL2	stereo/ mono	<= 48	48-192	-
			M0b @ QL2	stereo/ mono	<= 48	<= 192	-
			M1 @ QL2	<= 5.1	<= 48	<= 384	-
			M2 @ QL2	<= 5.1	<= 96	<= 768	-
			WMA Pro	<= 7.1	<= 96	<= 1500	-
		WMA Lossless	N1	stereo/ mono	<= 48	<= 3000	-
			N2	<=5.1	<= 96	<= 3000	-
			N3	<=7.1	<= 96	<= 3000	-
		RA	cook	stereo/ mono	8, 11.025, 22.05, 44.1	-	-

5.4 Audio encoder

Use Android OS default audio encoders.

6 License-Restricted Codecs

For information about receiving the restricted codec packages, contact an NXP representative.

6.1 Package list

The following features are supplementary to standard codec release packages.

Table 6. License limited codecs

Package name	Feature
`fsl_ms_codec.tar.gz`	• Demuxer: ASF • Video Decoder: WMV • Audio Codec: WMA
`fsl_real_dec.tar.gz`	• Demuxer: RM • Audio Decoder: RA
`imx_dsp.tar.gz`	Audio hardware codec: Hi-Fi firmware
`imx_dsp_codec.tar.gz`	Audio hardware codec: MP3

6.2 How to install the license limited codecs

See the readme file for each package.

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Release notes

Rev. automotive-12.1.0_1.1.0 — 15 December 2022

9 / 13

7   Limitations of This Release

- The minimum resolution is 64*64
- Complex Profile of WMV9 is not supported
- Multimedia files that do not have index table may not be searchable
- Corrupted multimedia files may not be searchable and may have an incorrect duration

8   Known Issues

None.

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 8Quad Max, and i.MX 8QuadXPlus 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_1.1.0-AUTO	01/2021	i.MX 8QuadXPlus/8QuadMax MEK GA release
android-11.0.0_1.2.0	03/2021	i.MX 8M Plus EVK GA release.
android-11.0.0_1.2.1	06/2021	i.MX 8M Plus EVK 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	01/2021	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.

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Release notes

Rev. automotive-12.1.0_1.1.0 — 15 December 2022

10 / 13

Revision history...*continued*

Revision number	Date	Substantive changes
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.
automotive-12.1.0_ 1.1.0	12/2022	i.MX 8QuadXPlus/8QuadMax MEK (Silicon Revision B0, C0) GA release

IMXACRN

Release notes

Rev. automotive-12.1.0_1.1.0 — 15 December 2022

11 / 13

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Release notes

Rev. automotive-12.1.0_1.1.0 — 15 December 2022

12 / 13

Contents