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i.MX Android™ Extended Codec Release Notes

Contents

1 Release Description

The features described in the release notes are supported by implemented media framework OMXPlayer. They are only available after you have installed the android_M6.0.1_1.0.0_omxplayer_source.tar.gz software package.

Only codecs that have no license restriction are included in OMXPlayer package.

Codecs that have license restriction are provided in separate packages. Further details are provided in Section 6.

2 Supported Hardware SoCs/Boards

- i.MX 6Quad SABRE-SD board and platform
- i.MX 6DualLite SABRE-SD platform
- i.MX 6Quad SABRE-AI platform
- i.MX 6DualLite SABRE-AI platform
- i.MX 6SoloX SABRE-SD platform
- i.MX 6SoloLite EVK platform
- i.MX 6QualPlus SABRE-AI platform
- i.MX 6QualPlus SABRE-SD platform

3 What's New in This Release

- Enhanced stability and robustness.
- Supported Monkey's Audio (APE) playback.

4 Enhanced Features

For the i.MX 6Dual/Quad and i.MX 6DualLite, the enhanced features include the following:

- Local Playback
  - Enhanced and extended formats and codecs
  - Trick mode playback
  - Multiple audio track selection
- Recording
- Streaming playback
- Audio pass through
- Subtitle

For the i.MX 6SoloX, i.MX 6SoloLite, and i.MX 7Dual, the enhanced features include the following:

- Local Playback
  - Enhanced and extended formats and codecs
- HTTP streaming playback

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. Freescale enhanced codecs

File extension	Demuxers	Video decoders	Audio decoders
.mp3	-	-	MP3
.aac/.adts	-	-	AAC LC/PLUS
.wav	-	-	LPCM
.flac	-	-	FLAC
.ape	-	-	APE
.amr/.awb	-	-	AMR-NB/AMR-WB
.mp4	MP4	MPEG4 SP/ASP except GMC	AAC LC/PLUS
.mov		H.264 BP/MP/HP	MP3
.f4v		H263	Dolby Digital Plus

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Table 1. Freescale enhanced codecs (continued)

File extension	Demuxers	Video decoders	Audio decoders
		MJPEG HEVC	
.m4a	MP4		AAC LC/PLUS
.3gp	MP4	MPEG4 SP/ASP except GMC H.264 BP/MP/HP H263 HEVC	AAC LC/PLUS AMR-NB AMR-WB
.avi	AVI	MPEG4 SP/ASP except GMC Xvid H.264 BP/MP/HP H263 MJPEG HEVC	AAC LC/PLUS MP3 LPCM
.wma	ASF	-	WMA STD, PRO, Lossless Dolby Digital Plus
.wmv/.asf	ASF	VC-1 SP/MP/AP WMV 7/8 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	AAC MP3 WMA STD, PRO, Lossless Vorbis Dolby Digital Plus Opus
.flv/.f4v	FLV	Sorenson H263 H.264 BP/MP/HP	MP3 AAC
.mpg	MPEG2/PS	MPEG2 BP/MP	MP3
.vob .ts .m2ts	MPEG2/TS	MPEG2 BP/MP H.264 BP/MP/HP	AAC AC3 LPCM Dolby Digital Plus
.webm	MKV	VP8	MP3 AAC LC/PLUS
.rmvb	RM	RV 8/9/10	RA
.rm	RM	RV 8/9/10	AAC
.ra	RM	-	RA

NOTE

- AC3, AACPlus, ASF, WMV, WMA, DDPlus, 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.

4.1.2 Trick mode playback

Trick mode playback is supported by the extended API setPlaySpeed(int[] Speed).

- 0 < Speed[0] < 2: This is slow playback, video played with audio.
- -16 <= Speed[0] <= -2: This is fast backward, audio is muted and shows video key frames with selected speed.
- 2 <= Speed[0] <= 16: This is fast forward, audio is muted and shows video key frames with selected speed.
- Result speed is stored in Speed[0]. Check whether this call succeeds or fails.

4.1.3 Multiple audio track selection

Audio track section is supported if the file has multiple audio tracks at runtime. For Android™ Jelly Bean platform or later versions, selection is implemented through MediaPlayer::selectTrack API.

4.2 Recording

The following table provides the information about recording.

Table 2. Feature matrix for recording

File extension	Video encoders	Audio encoders
.3gp	H263	AMR-NB
	H264	AMR-WB
	MPEG4	AAC LC
.mp4	H263	MP3
	H264	AAC LC
	MPEG4	

NOTE

- All video codecs are accelerated with the Video Processing Unit (VPU).
- AMR-NB, AMR-WB, and MP3 encoder are optimized by Freescale.
- AAC LC encoder is from Google native encoder.

4.3 Streaming playback

The following table provides the information about streaming playback.

Table 3. Feature matrix for streaming playback

Protocol	File format
HTTP	.mp4/.3gp/.mov .flv/ .f4v .avi .wmv/.asf .mpg/.vob/.ts .mp3 .aac .wma .mkv
RTSP	.mp4
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 command:

```
vlc -vvv stream_file_name --sout udp://224.0.1.1:1234
```

- For the RTP streaming server:
  a. Start vlc with the GUI, and select MediaStreaming.
  b. Press Add to load the stream file, press Stream, and click Next.
  c. Select RTP/Mpeg Transport Stream from the drop-down list, and click Add.
  d. Enter the IP address 224.0.1.1 and base port number 5004, and deselect Activate Transcoding.
  e. Press Stream at the bottom. The server is started.
- For the UDP streaming client, run the Gallery on the Android platform with the command:

```
am start -n com.android.gallery3d/com.android.gallery3d.app.MovieActivity -d udp://
224.0.1.1:1234
```

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

```
am start -n com.android.gallery3d/com.android.gallery3d.app.MovieActivity -d rtp://
224.0.1.1:5004
```

- For the uni-cast, use the client IP address instead of 224.0.1.1 when starting the server, and use the server IP address instead of 224.0.1.1 when starting the client.

4.4 Audio pass through

The following table provides the information on audio pass through.

Table 4. Feature matrix for audio pass through

File extension	Audio format
.avi .mkv	AC3

Table 4. Feature matrix for audio pass through

File extension	Audio format
.mpg .vob .ts	

The steps to enable or disable the audio pass through feature are given below:

1. Boot the board in dual display mode.
2. Connect the board with the Audio/Video receiver through the HDMI cable.
3. Start the **AudioRoute** application, and select the **Enable passthrough** check box to enable audio pass through.
4. Start the **AudioRoute** application, and clear the **Enable passthrough** check box to disable audio pass through.

4.5 Subtitle

The following table provides the information on subtitle.

Type	Format
In Band	SRT UTF-8
Out Band	SRT UTF-8

5 Codec Specification

5.1 Video decoder for i.MX 6Quad/Dual/DualLite

Table 5. Video decoder for i.MX 6Quad/Dual/DualLite

Feature	Profile	Max. resolution	Min. resolution	Max. framerate	HW/SW	Bitrate	Comments
MPEG2	MP	1920 * 1080	64 * 64	30 fps	HW	50 Mbps	-
MPEG4/Xvid	SP	1920 * 1080	64 * 64	30 fps	HW	40 Mbps	-
	ASP	1920 * 1080	64 * 64	30 fps	HW		-
H.263	P3	1920 * 1080	64 *64	30 fps	HW	20 Mbps	-
H.264	BP	1920 * 1080	64 * 64	30 fps	HW	50 Mbps	-
	MP	1920 * 1080	64 * 64	30 fps	HW		-
	HP	1920 * 1080	64 * 64	30 fps	HW		-
VC-1	SP	1920 * 1080	64 * 64	30 fps	HW	45 Mbps	-
	MP	1920 * 1080	64 * 64	30 fps	HW		-
	AP	1920 * 1080	64 * 64	30 fps	HW		-

Table continues on the next page...

Table 5. Video decoder for i.MX 6Quad/Dual/DualLite (continued)

Feature	Profile	Max. resolution	Min. resolution	Max. framerate	HW/SW	Bitrate	Comments
VP8	-	1280 * 720	64 * 64	30 fps	HW	20 Mbps	i.MX 6Quad
		1920 * 1080	64 * 64	30 fps	HW		i.MX 6DualLite
MJPEG	-	1920 * 1080	64 * 64	30 fps	HW	120 Mpixl/s	-
RV	8/9/10	1920 * 1080	64 * 64	30 fps	H/W	40 Mbps	-
WMV7/8	-	640 * 480	64 * 64	15 fps	SW	-	-
SorensonH263	-	720 * 480	64 * 64	30 fps	SW	-	-
VP9	-	720 * 480	64 * 64	30 fps	SW	-	-
HEVC	Main	720 * 480	64 * 64	30 fps	SW	-	-

5.2 Video decoder for i.MX 6SoloX/SoloLite

Table 6. Video encoder for i.MX 6SoloX/SoloLite

Feature	Profile	Max. resolution	Min. resolution	Max. framerate	HW/SW	Comments
MPEG4	SP	720 * 480	64 * 64	30 fps	SW	-
	ASP	720 * 480	64 * 64	30 fps	SW	-
H.263	-	720 * 480	64 * 64	30 fps	SW	-
H.264	BP	720 * 480	64 * 64	30 fps	SW	-
	MP	720 * 480	64 * 64	30 fps	SW	-
	HP	720 * 480	64 * 64	30 fps	SW	-
VP8	-	720 * 480	64 * 64	30 fps	SW	-
VP9	-	720 * 480	64 * 64	30 fps	SW	-
HEVC	Main	720 * 480	64 * 64	30 fps	SW	-

5.2 Video encoder for i.MX 6Quad/Dual/DualLite

Table 7. Video encoder for i.MX 6Quad/Dual/DualLite

Feature	Profile	Max. resolution	Min. resolution	Max. framerate	HW/SW	Bitrate	Comments
MPEG4	SP	1280 * 720	64 * 64	30 fps	HW	12 Mbps	-
H.263	P3	1280 * 720	64 * 64	30 fps	HW	8 Mbps	-
H.264	BP	1920 * 1080	64 * 64	30 fps	HW	14 Mbps	-

5.4 Audio decoder

Table 8. Audio decoder

Encoder	Feature/Profile	Channel	Rate (KHz)	Bitrate	HW/SW	Comments
MP3	MPEG-1 (Layer-1/ Layer-2/Layer-3) MPEG-2 (Layer-1/ Layer-2/Layer-3) MPEG-2.5 (Layer-3)	stereo/mono	<=48	8-448	SW	-
AACLC	MPEG-2 AACLC	<=5.1	8-96	8-256	SW	-
	MPEG-4 AACLC					
HE-AAC	HE-AAC V1 HE-AAC V2	stereo/mono	8-96	Mono: 8-384 stereo:16-768	SW	-
WMA10 Std	L1 @ QL1	stereo/mono	44.1	64-161	SW	-
	L2 @ QL1	stereo/mono	<=48	<=161	SW	-
	L3 @ QL1	stereo/mono	<=48	<=385	SW	-
WMA10 Pro	M0a @ QL2	stereo/mono	<=48	48-192	SW	-
	M0b @ QL2	stereo/mono	<=48	<=192	SW	-
	M1 @ QL2	<=5.1	<=48	<=384	SW	-
	M2 @ QL2	<=5.1	<=96	<=768	SW	-
	M3 @ QL2	<=7.1	<=96	<=1500	SW	-
WMA 9 Lossless	N1	stereo/mono	<=48	<=3000	SW	-
	N2	<=5.1	<=96	<=3000	SW	-
	N3	<=7.1	<=96	<=3000	SW	-
AC-3	-	<=5.1	<=48	32-640	SW	-
FLAC	-	<=7.1	8-192	-	N/A	-
DD-plus	-	<=7.1	32, 44.1, 48 64, 88.2, 96	<=6.144 Mbps	SW	-
RA	cook	stereo/mono	8k, 11.025k, 22.05k, 44.1k	-	SW	-

5.5 Audio encoder

Table 9. Audio encoder

Encoder	Feature/Profile	Channel	Rate (KHz)	Bitrate	HW/SW
MP3	MPEG-1/Layer-3	Stereo/Mono	32, 44.1, 48	32 k, 48 k, 56 k, 64 k, 80 k, 96 k, 112 k, 128 k, 160 k, 192 k, 224 k, 256 k, 320 k	SW

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Table 9. Audio encoder (continued)

Encoder	Feature/Profile	Channel	Rate (KHz)	Bitrate	HW/SW
AMR NB	-	-	8	12.2, 10.2, 7.9, 7.4, 6.7, 5.9, 5.15, 4.75	SW
AMR WB	-	-	16	23.85, 23.05, 19.85, 18.25, 15.85, 14.25, 12.65, 8.85, 6.6 k	SW

6 License Restricted Codecs

For information about receiving the restricted codec packages, contact a representative or visit www.freescale.com/imxcommunity.

6.1 Package list

The following features are supplementary to standard codec release packages.

Table 10. License limited codecs

Package name	Feature
fsl_ac3_dec.tar.gz	Audio Codec: AC3
fsl_ddp_dec.tar.gz	Audio Codec: DD Plus
fsl_aacp_dec.tar.gz	Audio Codec: AACPlus
fsl_ms_codec.tar.gz	• Demuxer: ASF • Video Decoder: WMV • Audio Codec: WMA
fsl_real_dec.tar.gz	• Demuxer: RM • Video Decoder VPU firmware • Audio Decoder: RA

6.2 How to install the license limited codecs

See the readme file of each package.

7 Extending the Android Multimedia Framework APIs

```
/* trick mode */
/**
* Set playback speed.
*
* @param Speed[]  contains only one item which is normal speed multiplied by 0x10000
* Range of normalized speed is:
```

```
     *         [-16,-2] means rewind, [0.1, 16] means fast forward, step is 0.1
     * when normalized speed is [0.1, 1.9] audio is outputted, otherwise audio
     * is not outputted.
     * After this function call returns, result speed is stored in Speed[0], to show whether
it succeeds or fails.
     */
     public native void setPlaySpeed(int[] Speed);
```

8 How to Install the OMXPlayer Package

To install the OMXPlayer package, perform the following steps:

1. Copy the OMXPlayer package to the Android root directory.
2. Go to the Android root directory and decompress the OMXPlayer package.

   This step generates the device/fsl-codec, external/fsl_imx_omx, clean_obj_before_building.sh, and switch_build_to.sh.

```
$ source build/envsetup.sh
$ lunch <target build platform> # e.g., sabresd_6dq-user
$./switch_build_to.sh full
$./clean_obj_before_building.sh
$make
```

9 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

10 Known Issues

None.

11 Revision History

Table 11. Revision history

Revision number	Date	Substantive changes
M6.0.1_1.0.0	04/2016	Initial release

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