

# **i.MX51 SDK Windows Embedded CE 6.0**

## **Multimedia Framework**

### **Release Notes**

## **1 Introduction**

This document contains important information about the package contents, and instructions for building Freescale components on an i.MX51 Babbage platform running Windows Embedded CE 6.0.

This document does not provide any details of the architecture or APIs in the codecs.

You should have a basic understanding of Microsoft DirectShow framework.

All features are believed to function correctly, except as noted in this document.

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## 2 Release Contents

### 2.1 SDK Documentation Package

The documentation package provided with this release includes all of the documents in the documentation package.

**Table 1. Document Package**

Document Package	Descriptions
MX51_MMFMWK_WINCE_DOCKIT.zip	Documentation set

The compressed file includes all of the related documents in the document package.

**Table 2. Document Contents**

Document Name	Descriptions
imx51_WinCE60_MMFW_RN.pdf	Release notes
imx51_WinCE60_MMFW_UG.pdf	SDK user's guide

### 2.2 SDK Software Packages

Multimedia framework Software Development Kit (SDK) software packages are the collection of both Freescale developed codec and third party codec. Freescale developed codecs will be archived as the installer package (in .exe files). And the third party codec are archived as SDK patches (in .zip files).

**Table 3. Software Packages Contents**

Package Name	Descriptions
WCE600_MX51-EVK_11.04.02_ER_MM.exe	SDK installer with framework source codes, framework binaries, core lib binaries, core lib header files and support documents
WCE600_MX51_11.04.02_ER_MM_AC3_DEC.zip <sup>1</sup>	Patches for AC3 audio decoder
WCE600_MX51_11.04.02_ER_MM_AACP_DEC.zip <sup>2</sup>	Patches for AACPLUS audio decoder
WCE600_MX51_11.04.02_ER_MM_MSFT.zip <sup>3</sup>	Patches for downmix post processing, WMA audio decoder and WMA audio encoder

<sup>1</sup> AC3 audio decoder has license limitation

<sup>2</sup> AACPLUS audio decoder has license limitation

<sup>3</sup> Audio Downmix post processing, WMA audio decoder and WMA audio encoder has license limitation

## 3 System Requirements

### 3.1 Hardware Requirements

- MX51 Babbage Rev 3.0

### 3.2 Software requirements

- Build machine should be running Microsoft Windows XP.
- Build machine should have the following installed:
  - Windows Embedded CE 6.0 with Platform Builder R3 with 2011M02 QFE.
  - i.MX51 EVK Windows Embedded CE 6.0 BSP for ER1104 release.

## 4 What is new

This section describes the new changes in this release (version 11.04.01), including new features and defect fixes.

### 4.1 New Features and Enhancements

The following table describes the new features and enhancements since last release.

**Table 4. New Features and Enhancements**

Changes and improvements	Descriptions
Changes of audio	1. Re-include MP3 encoder into the standard package instead of special package
Changes of video	1. Upgrade the VPU decoder filter for bug fixing
Changes of parser	1. Enable MKV parser to support .mkv/.mka playback 2. Upgrade mpg parser for bug fixing
Bug Fixings	See Defect Fixes List for details

### 4.2 Defect Fixes

Table 5 describes the issues that have been resolved since the previous release.

**Table 5. Defect Fixes List**

NO.	CR ID	Headline
1	ENGR00140555	[WMX51_MPG] memory leakage if playback one special mpg video in the playlist repeat mode
2	ENGR00137380	[WMX51_BBG]: Audio pops noise when playback to the end for No01.mpg and No02.mpg..
3	ENGR00126805	[WMX51BBG] Streaming: This is a little freeze at the end for some streams
4	ENGR00134173	[WMX51-BBG]: Response is slow, more than 5s if stop than play with PlayWnd/CEPlayit for video.
5	ENGR00137492	[WMX51_BBG]Mpeg2Dec: System shut down if seek one VOBmpeg2 stream.
6	ENGR00121547	[WMX51BBG_SDK]MPEG4Dec: there is no sound of people talking during play this clip.
7	ENGR00124672	[WMX51]Audio goes distorted by audio playback
8	ENGR00139352	[WMX51BBG_SDK]Parser: No data output after specific trick operation.
9	ENGR00139409	[WMX51] GDI go slow in 30Hz refresh mode
10	ENGR00139628	[WMX51_MPG] one MPG video hung during the normal playback
11	ENGR00139634	[WMX51_SDK]Parser: Wrong EC_COMPLETE cause zero current time stamp in SetPosition().
12	ENGR00140396	[WMX5x_H264] video distortion after repeat playback some H264 contents in ceplayer
13	ENGR00111181	[WMX51_CODECE]RVDec: Video blocks often when playing the HD streams
14	ENGR00142027	[WMX51_MPG] one MPEG2 TS video playback can not stop when goes to end of stream
15	ENGR00141488	[WMX5x_VPU_DEC] Cropping source through IFSLBasicVideo interface can not work

## 5 Supported Features

Table 6~Table 9 identifies the features provided by this release.

**Table 6. Audio Features List**

Feature		Profile	Channel	Sample Rate (Hz)	Bit rate (bps)
Audio decoding	AAC	MPEG-2 and MPEG-4 audio low complexity (LC) profile	<=5.1	8K~96K	8K~256K
	aacPlus	MPEG-2 and MPEG-4 audio low complexity (LC) profile HE-AAC 1.2 HE-AAC 2.0	Mono / Stereo	8K~96K	8K~384K (Mono) 16K~768K (Stereo)
	AC3	Dolby AC3	<=5.1	<=48K	32K~640K
	AMR	AMR Narrow Band	Mono	8K	
	MP3	MPEG-1 Audio Layer I MPEG-1 Audio Layer II MPEG-1 Audio Layer III	Mono / Stereo	<=48K	8K~320K
	WMA Standard	WMA V10 Standard L1 profile	Mono / Stereo	44.1K	64K~161K
		WMA V10 Standard L2 profile	Mono / Stereo	<=48K	<=161K
		WMA V10 Standard L3 profile	Mono / Stereo	<=48K	<=385K
	WMA Professional	WMA V10 Professional M0a profile	Mono / Stereo	<=48K	48K~196K
		WMA V10 Professional M0b profile	Mono / Stereo	<=48K	<=192K
		WMA V10 Professional M1profile	<=5.1	<=48K	<=384K
		WMA V10 Professional M2profile	<=5.1	<=96K	<=768K
		WMA V10 Professional M3profile	<=7.1	<=96K	<=1.5M
	WMA Lossless	WMA V10 Lossless N1 profile	Mono / Stereo	<=48K	<=3M
		WMA V10 Lossless N2 profile	<=5.1	<=96K	<=3M
		WMA V10 Lossless N3 profile	<=7.1	<=96K	<=3M
	FLAC	Free Lossless Audio Codec	<=2	<=192K	
	Oggvorbis	Ogg vorbis audio codec	<=2	<=192K	
Audio encoding	MP3	MPEG-1 Audio Layer III	Mono / Stereo	32/ 44.1/ 48K	8K~320K
	WMA	WMA V8 L1 profile	Mono / Stereo	44.1K	64K~161K
		WMA V8 L2 profile	Mono / Stereo	<=48K	<=161K
		WMA V8 L3 profile	Mono / Stereo	<=48K	<=385K

**Table 7. Video Features List**

Feature		Profile	Max Resolution	Min Resolution
Video decoding	H.263	Supports H.263 baseline profile P3	1280 x 720@30fps	64 x 64
	H.264	Supports MPEG-4, Part 10 video H.264 baseline / main / high Profile (BP/MP/HP@L4.1)	1280 x 720@30fps	64 x 64
	MJPEG	Supports JPEG baseline mode	1280 x 720@30fps	16 x 16
	MPEG2	Supports MPEG-1 video Supports MPEG-2 video main profile (MP@HL)	1280 x 720@30fps	64 x 64
	MPEG4	Supports MPEG-4 Part 2 video simple / advanced simple profile (SP/ASP@L5) except GMC	1280 x 720@30fps	64 x 64
	VC-1	Supports VC-1 simple / main / advanced	1280 x 720@30fps	64 x 64

		profile (SP/MP/AP@L3)		
Video encoding	H.263	Supports H.263 baseline profile P3	720 x 576@25fps 720 x 480@30fps	64 x 64
	H.264	Supports MPEG-4, Part 10 video H.264 baseline profile (BP)	720 x 576@25fps 720 x 480@30fps	64 x 64
	MJPEG	Supports JPEG baseline mode	720 x 576@25fps 720 x 480@30fps	64 x 64
	MPEG4	Supports MPEG-4 Part 2 video simple profile (SP)	720 x 576@25fps 720 x 480@30fps	64 x 64

**Table 8. Speech Features List**

Feature		Profile	Sample Rate (Hz)	Bit rate (bps)
Speech decoding / encoding	SBC	SBC encoder	<=48K	
	G.711	G.711 decoder/encoder	8K	64K
	G.723	G.723.1 decoder/encoder	8K	5.3/6.3K
	G.726	G.726 decoder/encoder	8K	16/24/32/40K
	G.729	G.729a/b decoder/encoder	8K	8K
	AMR	AMR Narrow Band decoder/encoder	8K	4.75/5.15/5.9/ 6.7/7.4/7.9/ 10.2/12.2K
		AMR Wide Band decoder/encoder	16K	6.6/8.85/12.65/ 14.25/15.85/ 18.25/19.85/ 23.05/23.85K

**Table 9. Image Features List**

Feature		Profile	Max Resolution	Min Resolution
Image decoding	BMP	Supports BMP	65535 x 65535 <sup>1</sup>	1 x 1
	GIF	Supports GIF 87a, 89a	65535 x 65535 <sup>1</sup>	1 x 1
	JPEG	Supports JPEG baseline mode	8192 x 8192	16 x 16
	PNG	Supports PNG V1.0	65535 x 65535 <sup>1</sup>	1 x 1

Table 10 identifies the feature matrix for audio/video playback.

**Table 10. Playback Feature Matrix**

Filename Extension	Container	Video Codec	Audio Codec	Image Codec
.mp3	MPEG-1 Audio Layer III	N/A	MP3	N/A
.wma	Advanced Systems Format	N/A	WMA	N/A
.aac		N/A	AAC LC, AAC+	N/A
.ac3		N/A	AC3	N/A
.asf .wmv	Advanced Systems Format	VC1	WMA	N/A
.flac		N/A	FLAC	N/A

<sup>1</sup> Actual supported maximum resolution depends on the system memory allocation on the i.MX51 BBG platform

.ogg	OGG	N/A	vorbis	N/A
.mpg	MPEG-2 PS	MPEG-2	MP3, AC3, LPCM	N/A
	MPEG-2 PES	MPEG-2	MP3, AC3, LPCM	N/A
	MPEG-1 SS	MPEG-2	MP3	N/A
	MPEG-2 TS	MPEG-2	MP3, AC3, LPCM	N/A
.vob	MPEG2 PS	MPEG-2	AC3, LPCM	N/A
.mp4 .mov .3gp	MPEG-4 Part 14	H.263, H.264, MPEG4	AAC, MP3, AMR	N/A
.avi	Audio Video Interleave	H.264, MPEG4, MJPEG, Xvid, WMV	AAC, AC3, MP3, WMA	N/A
.m4a	MPEG-4 Part 14	N/A	AAC, MP3	N/A
.m4b	MPEG-4 Part 14	N/A	AAC	N/A
.m4v	MPEG-4 Part 14	H.264, MPEG4	N/A	N/A
.bmp	N/A	N/A	N/A	BMP
.gif	N/A	N/A	N/A	GIF 87a & 89a
.jpg	N/A	N/A	N/A	JPEG baseline mode
.png	N/A	N/A	N/A	PNG v1.0

Table 11 identifies the version number for each component in this release.

**Table 11. Component Versions**

Components		Version
Audio codecs	AAC decoder	3.05.0
	AACPlus decoder	3.05.0
	AC3 decoder	3.00.0
	FLAC decoder	2.01.0
	MP3 decoder	2.05.0
	MP3 encoder	2.06.0
	Oggvorbis decoder	2.02.0
	WMA decoder	3.04.0
	WMA encoder	3.01.0
Audio post-processing	PEQ post-processing	1.07.0
Speech codecs	SBC encoder	2.00.0

	G.711 decoder / encoder	2.00.0
	G.723.1 decoder / encoder	2.00.0
	G.726 decoder / encoder	2.01.0
	G.729AB decoder / encoder	3.01.0
	NB_AMR decoder / encoder	2.02.0
	WB_AMR decoder / encoder	2.01.0
Video codecs (VPU)	H.263 decoder / encoder	1.04.28
	H.264 decoder / encoder	
	MJPEG decoder / encoder	
	MPEG2 decoder	
	MPEG4 decoder / encoder	
	VC1 decoder	
Parsers	AVI Parser	2.04.6
	MP4 Parser	6.01.7
	MPG parser	4.00.0
	MKV Parser	1.00.5
	OGG Parser	1.05.0
Image codecs	BMP decoder	0.03.0
	GIF decoder	0.03.0
	JPEG decoder (VPU+SW)	0.06.1
	PNG decoder	0.04.0



## 6 Known Problems

This section will cover known problem with this release.

### 6.1 Known Defects

Table 12 identifies the engineering change requests that have not been resolved.

**Table 12. Known Defects List**

NO.	CR ID	Headline
1	ENGR142647	[WMX51-BBG] XvidDec: It doesn't restart from the beginning if replay for 2 mkv streams.
2	ENGR142645	[WMX51-BBG] H264Dec: Cannot replay if press "play" after stop for H264_MP51_640x368_23.98_476_mp3_48_2_NoStreamFound.mkv.
3	ENGR142644	[WMX51-BBG] MPEG4Dec: Error pops if stop->seek->play for some mkv streams.
4	ENGR142438	[WMX51-BBG] MPEG2Dec: Video freezes from 11s for MPEG2PS_MP3_MPHL14_160x96_29.97fps_a_48KHz_128kbps_2ch_VBR.mpg.
5	ENGR142434	[WMX51-BBG] MPEG2Dec: Tow MPEG2-vob streams cannot be opened to play.
6	ENGR139392	[WMX5x]AC3: Sample rate is not correct, audio sounds abnormal for AC3_48_448_6_AC3TEST.ac3.
7	ENGR137488	[WMX51_BBG]H264Dec: An error occurred when open H264_MP21_704x352_30_305_MP3_48_69_1_vbr.avi to play.
8	ENGR137486	[WMX51_BBG]XvidDec: One Xvid stream cannot be played.
9	ENGR137384	[WMX51_BBG]: Sometimes noise pops if resume play from FF/FR mode. 30%
10	ENGR137383	[WMX51_BBG]: Stop and then play after FF, playback speed is x2(sometimes with audio) not x1.
11	ENGR137327	[WMX51_BBG]: No.36.wmv: Audio still always exists if FFx2.
12	ENGR126804	[WMX51BBG] Video: Video freeze from 5s~25s for one RV stream
13	ENGR122863	[WMX51BBG_SDK] AudioRec: On channel almost has no sound for the recorded mp3 files.
14	ENGR120473	[WMX51BBG_SDK]VideoRec: with 32G SD storage, the recorded video not smooth, seems like lost a lot of view.
15	ENGR119615	[WMX51BBG_SDK] AudioRecord: It sounds FF during play the recorded audio after about 5s.
16	ENGR119322	[WMX51BBG_SDK]TVout: When switch from TV to DVI or from DVI to TV while playing video clips, video can not be displayed or screen is snowy.

### 6.2 Limitations/Issues

Table 13 identifies the limitations of each component.

**Table 13. Limitations/Issues List**

Items	Description
Audio feature limitations	AAC/aacPlus ADIF File format decoding does not support trick mode seeking, so the Windows CE media player does not display a time progress bar
	AAC/aacPlus decoder only supports up to 2-channel audio playback
	WMA codec supports WMA10 Standard, Professional and Lossless decoding. Due to the Windows CE player limitation, it does not support multiple channel (>2)
	WMA lossless streams playback

	FLAC playback cannot support trick mode
Video feature limitations	The maximum resolution for video decoding is 1280*720, and the minimum resolution is 64*64
Image feature limitations	Due to the VPU supported feature limitation, only JPEG Baseline mode image can be decoded, and minimum resolution is 16*16
	Although image decoders have no limitation on image size, the Windows Embedded CE OS system memory allocation is limited on the i.MX51 BBG platform. Therefore, the image test applications may fail to allocate the memory for large size image decode and display. In general, the image of a size less than (2048x1536) pixels can be decoded and displayed successfully



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