Ittiam WMA Encoder

WMA Encoder

Microsoft® Windows Media™ Audio (WMA) codec is a popular audio coding standard, which is a part of the Microsoft® Windows Media ® series of technologies. WMA is designed to encode all types of audio content, from speech-only audio recorded with a sampling rate of 8 kilohertz (kHz), to 48 kHz high-quality stereo music.

Ittiam's WMA Encoder is an implementation of the WMA V8 Encoder (Windows Media Porting Kit (WMPK) and is provided subject to the terms and conditions of the Microsoft Corporation Implementation License Agreement to other Licensees of the same.

Features

- Encoding of WMA V8 Standard bitstream.
- Supports all bitrates from 5 kbps to 192 kbps which are supported for WMA V8 Config.
- Supports encoding of all sample rates from 8 kHz to 48 kHz.
- Implementation is fully compliant to the Windows Media Technology implementation test specification.
- Supports a simple C callable with flexible memory allocation scheme.
- Multi-channel, Reentrant software.
- The implementation has been tested on a variety bitstreams and audio files for robustness and quality.
- Optimized for low footprint and processing power.

Encoder Validation

The WMA encoder implementation has been tested for conformance against the WMA Test specification (as defined in the "IC Test Spec v9.0 - Revision I.doc").

Performance Specification on C64x+

CPU Load (MCPS)			
Description	Frame Peak	Frame Average	Packet Peak
WMA Encode 160kbps (high rate)	66.47	37.46	47.47

WMA Encode 160 kbps (high rate)						
Program Memory (Kbytes)	Data Memory (Kbytes)					
	Table	Scratch	Stack	Persistent	Input buffer	Output buffer
209.06	103.12	98	1.7	62.8	32	7.28

Note: Performance specification measurements are carried on Simulator assuming zero-wait states.

The worst case MCPS given above for high rate is for an audio stream "test2_44khz_short.wav" which is a 44.1 kHz stereo file encoded at 160kbps. A packet corresponds to 1 WMA Packet. A packet consists of N frames (Ex: N is 8 for 44.1 & 48 KHz.) Refer WMA V8 Config.

Kane Computing Ltd
7 Theatre Court, London Road,
Northwich, Cheshire, CW9 5HB, UK.
Tel: +44(0)1606 351006
Fax: +44(0)1606 351007/8
Email: sales@kanecomputing.com
Web: www.kanecomputing.co.uk

Details of C64x+ Resources required

CPU Loading

Description	Simulator			Hardware		
	Frame MCPS		Packet Peak	Frame MCPS		Packet Peak
	Avg	Peak		Avg	Peak	
WMA encode 160 kbps, 44.1kHz	37.46	66.47	47.47	61.02	113.97	79.92
WMA encode 32 kbps, 44.1kHz	67.54	118.39	86.25	92.89	166.45	118.82
WMA encode 16 kbps, 16kHz	58.84	80.01	68.34	82.87	118.58	98.15

Memory Usage (KB)

Bitrate	Program	Tables	Persistent	Scratch	Stack	Input	Output
160 kbps, 44.1kHz	209.06	103.12	62.8	98	1.7	32	7.28
32 kbps, 44.1kHz	209.06	103.12	59.02	98	3	32	1.5
16 kbps, 16kHz	209.06	103.12	43.8	44	2.8	8	0.66

Note:

- Performance generated on *CCS 3.2.39.5 with C64x+ Cycle Accurate Simulator with 0 wait state memory access*
- Hardware Configuration performance generated on a DM6446 processor with all data and program memory sections placed in the external memory, with cache configuration of 32 KB L1 P Cache, 16 KB L1 D Cache & 64 KB L2 Cache, and cache thrashed after encoding each frame.
- MCPS numbers on the hardware will vary with the I-Cache and D-Cache size and with the memory configuration/placement.
- Program memory doesn't include the code size of the test bench and standard library functions.
- Data memory should be aligned to desired byte-boundary to meet the performance/functionality requirement
- MCPS/MIPS indicate the CPU usage for processing 44.1kHz stereo file "test2_44kHz_short.wav" at 160kbps for High-Rate mode, at 32kbps for Mid-Rate mode and 44.1kHz stereo file "test2_16kHz_short.wav" at 16kbps for Low-Rate mode.