Ittiam WMA Pro Decoder on Cortex A9 NEON

WMA Pro Decoder

Microsoft® Windows Media™ Audio 10 Professional (WMA Pro) codec is a popular audio coding standard, which is a part of the Microsoft® Windows Media ® series of technologies. WMA Pro was introduced by Microsoft Corporation in 2002. This codec was the first of its kind to support stereo, 5.1 and 7.1 discreet audio channels.

Ittiam's WMA Pro Decoder is an implementation of the WMA10 Decoder (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.

This version of the decoder has the support for both M0 and M1 profile. It can decode stereo files and 5.1 coded files with bitrates up to 384 kbps and sample rates upto 48 kHz.

Features

- Decoding of WMA Pro bit stream with M0 and M1 profiles with up to 5.1 channels of output
- Supports all bit-rates upto 384 kbps and sample rates upto 48 kHz
- Supports 16-bit and 24-bit output
- Supports 5.1-to-stereo and 5.1-to-mono down mix
- The decoder is compliant for M0 and M1 profile QL1 compliance level
- Supports a simple C callable with flexible memory allocation scheme.
- Multi-channel, Reentrant software

Decoder Validation

The WMA Pro decoder implementation has been tested for conformance against the WMA Test specification (as defined in the Windows Media Technology implementation test specification v10.0.doc).

Resource requirements on Cortex-A9 Processor

CPU Load (MCPS)		Program Memory (Kbytes)	Data Memory (Kbytes)		
Peak	Average		Table	Scratch	Persistent
54.2	39.7	250	82.7	48	50

Note

Input/ Output buffers details are given in the next page.

MCPS indicate the CPU usage for processing M0 profile 2 channel 96kbps 48 kHz.

Ittiam Systems (P) Ltd
The Consulate, 1 Richmond Road
Bangalore 560 025, India

Details of Cortex A9 Resources required

CPU Loading

Description	Hardware Configuration	
	MCPS Ave	MCPS Peak
M0 Profile (2 channel, 96kbps, 48kHz)	39.7	54.2
M1 profile non-LBR (48 Khz, 5.1 Channel,384 Kbps)	43.3	53.8

Memory Usage

Program	Tables	Persistent	Scratch	Input	Output
250	82.7	50	48	20	36

Note:

- Data memory should be aligned to desired byte-boundary to meet the performance/functionality requirement
- Program memory doesn't include the code size of the test bench and standard library functions
- Hardware performance generated on OMAP 4430 with 32Kb of I-Cache and 32 Kb of D-Cache and 1Mb L2 cache.
- Hardware performance generated under CodeSourcery Linux , using the ARM-GCC 4.2.1 Compiler
- Program Memory size obtained using CodeSourcery ARM-GCC 4.2.1 toolchain
- MCPS numbers on the hardware will vary with the I-Cache and D-Cache size and with the memory configuration/place