

Ittiam WMA Pro Decoder

WMA Pro Decoder

Microsoft® Windows Media™ Audio 9 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 among WMA stream formats to support stereo, 5.1 and 7.1 discrete audio channels. Additionally, these new codecs contain support for 16 and 24 bit audio and sampling rates up to 96 KHz.

Ittiam's WMA Pro Decoder is an implementation of the WMA9 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 M1 profile only. It can decode stereo and 5.1 coded files with bitrate upto 384 Kbps and sample rates of 44.1 KHz and 48 KHz.

Features

- Decoding of WMA Pro bit stream.
- M0 and M1 profiles of decoding.
- Supports all bit-rates from 128 Kbps to 384 Kbps.
- Supports sample rates of 44.1 KHz and 48 KHz.
- Supports both 16-bit and 24-bit output.
- Supports up to 5.1 channel output.
- The decoder is compliant for M1 profile QL2 Quality Level.
- Implementation is fully compliant to the Windows Media Technology implementation test specification.
- Supports a simple C callable routine with flexible memory allocation scheme.
- Supports TI XDM API.
- Multi-channel, re-entrant software.
- The implementation has been tested on a variety of bitstreams and audio files for robustness and quality.

- Optimized for low footprint and processing power.

Features not supported

- Profiles higher than M1 (refer to Table 2.1 in IA-WMA-PRO-Dec-C64xPlus-TR.pdf).
- XDM control commands other than XDM_GETBUFINFO and XDM_GETSTATUS.

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 v9.0 doc). The decoder has also been tested for robustness against bitstream errors.

Resource Requirements on C64xPlus Processor

| Function | MCPS | Pgm | Tables | Static | Scratch |
|---------------------|------|----------|--------|----------|---------|
| | Peak | ROM (KB) | | RAM (KB) | |
| Decode (M1 Profile) | 51 | 106.15 | 43.45 | 49 | 72 |

Note: Input/ Output buffer details are given on next page.

Details of resource requirement on C64xPlus

CPU Loading

| CPU | Simulator | | Hardware | |
|-------------|-----------|-----------|----------|-----------|
| Description | Ave MCPS | Peak MCPS | Ave MCPS | Peak MCPS |
| M1 Profile | 45 | 51 | 127 | 141 |

Memory Usage (KB)

| Profile | Program | Tables | Static | Scratch | Stack | Input | Output |
|------------|---------|--------|--------|---------|-------|-------|---------|
| M1 Profile | 106.15 | 43.45 | 49 | 72 | 1.2 | 0.125 | 24 / 36 |

Note:

- Performance numbers on Simulator generated on CCS 3.2.39.5 with C64x+ Cycle Accurate Simulator with 0 wait state memory access.
 - MCPS indicates the CPU usage for processing 5.1 channels/ 384 Kbps/ 48 KHz/ 24 bit stream.
 - Hardware configuration performance generated on a DM6446 processor with all the program and data placed in external memory, with cache configuration of 32 KB L1 P Cache, 16 KB L1 D cache and 64 KB L2 cache, and cache thrashed after decoding each frame.
 - MCPS numbers on the hardware will vary with the I-Cache and D-Cache size and with the memory configuration / placement.
 - Output buffer size is 24/ 36 KB for 16/ 24 bit output.
 - Program memory does not include the code size of the testbench and standard library functions.
 - Data memory should be aligned to desired byte-boundary to meet the performance / functionality requirement.
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