

# Ittiam AAC Decoder

## AAC Decoder

MPEG-2/4 AAC-LC (Advanced Audio Coding - Low Complexity version) is a popular audio coding technique recommended by MPEG committee. The codec handles audio signals sampled in the range of 8 kHz to 96 kHz. It operates on a frame of 1024 samples. The bit-rate can vary in the range from 8 to 576 kbps / channel (depending on the sampling rate). Low Complexity version of AAC provides good compromise between the codec complexity and the audio quality.

## Features

Features supported:

- MPEG2 and MPEG4 AAC LC (Low complexity).
- Supports all sampling frequencies & bit rates for AAC only bit-streams.
- Channels: Mono/Stereo/Dual-Mono
- Tools: TNS (Temporal Noise Shaping), PNS (Perceptual Noise Shaping), Intensity Stereo & Mid/Side Stereo
- Bit-streams: ADIF, ADTS, GA Header
- Compliance: ISO/IEC 13818 - 4, 14496 – 4 (MPEG AAC and PNS Conformance)
- Supports TI XDMI API
- Robust against erroneous bit-streams
- Optimized for low footprint & processing power
- 16 bit WAV Output format support

Features not supported:

- More than 2 channels of audio.
- SBR & PS Decoding
- Channel Coupling
- DRC

## Decoder Validation

The MPEG-4 AAC LC decoder implementation has been validated using the latest conformance tool given by MPEG-4.

## Resource requirements on C64x+ Processor

Decoder Mode	MCPS	Pgm	Tables	Static	Scratch
	Peak	ROM (kB)		RAM (kB)	
AAC	5.2	41.1	19.2	3.5	8.0

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

MCPS measurement done on 0 wait-state memory access



**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 Configuration	
	MCPS	MCPS	MCPS	MCPS
	Ave	Peak	Ave	Peak
AAC	4.3	5.2	8.2	8.7

### Memory Usage (kB)

Program	Tables	Static	Scratch	Stack	Input	Output
41.1	19.2	3.5	8.0	1.1	1.5	4.0

**Note:**

- Simulator 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 decoding each frame.
- MCPS numbers on the hardware will vary with the I-Cache and D-Cache size and with the memory configuration/placement
- MCPS/MIPS indicate the CPU usage for processing 2 channel music stream (AAC, al05\_48.adts 48 kHz, 128 kbps, without TNS).
- 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

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